Report 11155A
September 2000

Integrated Advanced Microwave Sounding Unit-A (AMSU-A)

Performance Verification Report

EOS AMSU-A1 and AMSU-A2 Receiver Assemblies

Contract No. NAS 5-32314
CDRL 208

Submitted to:

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Submitted by:

Aerojet
1100 West Hollyvale Street
Azusa, California 91702

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AMSU-A RECEIVER VERIFICATION TEST REPORT

LEVEL OF ASSEMBLY:	**SUBASSEMBLY**
TEST ITEM:	**AMSU-A1 RECEIVER ASSEMBLY** **P/N: 1356429-1, S/N: F01** **P/N: 1356409-1, S/N: F01** **AMSU-A2 RECEIVER ASSEMBLY** **P/N: 1356441-1, S/N: F01**
TYPE OF HARDWARE:	**EOS FLIGHT MODEL (FM)**
TYPE OF TEST:	**FUNCTIONAL PERFORMANCE**
VERIFICATION TEST PROCEDURE:	**AE-26002/6A**
TEST FACILITY LOCATION:	**AESP** **AZUSA, CALIFORNIA**

SIGNATURE:

TEST ENGINEER: _____ **DATE:** 5/22/'98

1.0 INTRODUCTION

The AMSU-A receiver subsystem comprises two separated receiver assemblies; AMSU-A1 and AMSU-A2 (P/N 1356441-1). The AMSU-A1-1 receiver contains 13 channels and the AMSU-A receiver 2 channels. The AMSU-A1 receiver assembly is further divided into two parts; AMSU-A1-1 (P/N 1356429-1) and AMSU-A1-2 (P/N 1356409-1), which contain 9 and 4 channels, respectively. The receiver assemblies are highlighted in Figures 1 and 2, which illustrate the functional block diagrams of the AMSU-A1 and AMSU-A2 systems.

The AMSU-A receiver subsystem stands in between the antenna and signal processing subsystems of the AMSU-A instrument and comprises the RF and IF components from isolators to attenuators as shown in Figures 1 and 2. It receives the RF signals from the antenna subsystem, down-converts the RF signals to IF signals, amplifies and defines the IF signals to proper power level and frequency bandwidth as specified for each channel, and inputs the IF signals to the signal processing subsystem.

This test report presents the test data of the EOS AMSU-A Flight Model No. 1 (FM-1) receiver subsystem. The tests are performed per the Acceptance Test Procedure for the AMSU-A Receiver Subsystem, AE-26002/6A. The functional performance tests are conducted either at the component or subsystem level. While the component-level tests are performed over the entire operating temperature range predicted by thermal analysis, the subsystem-level tests are conducted at ambient temperature only.

2.0 REASON FOR TEST

The Acceptance Test Procedure for the AMSU-A Receiver Subsystem, AE-26002/6A, is prepared to describe in detail the configuration of the test setups and how the tests are to be conducted to verify that the receiver subsystem meets the specifications as required either in the AMSU-A Instrument Performance and Operation Specification, S-480-80, or in AMSU-A Receiver Subsystem Specification, AE-26608, derived by the Aerojet System Engineering. Test results that verify the conformance to the specifications demonstrates the acceptability of that particular receiver subsystem.

3.0 ACCEPTANCE TEST

The acceptance tests for the AMSU-A receiver subsystem are performed either at the component or subsystem level. The component-level tests are conducted per the Acceptance Test Procedure of each component at supplier's facilities. The subsystem-level tests are conducted per the Acceptance Test Procedure, AE-26002/6A at Aerojet Azusa facility.

The component-level tests include the center frequency, center frequency stability, bandpass characteristics, gain stability, and gain compression. Although the bandpass characteristics can change slightly in subsystem level, these performance are solely dependent on the component characteristics. The subsystem-level tests include the center frequency, IF output power, bandpass characteristics, noise figure, noise power stability, and the tunable short test.

The subsystem-level tests are performed on three receivers; AMSU-A1-1, AMSU-A1-2, and AMSU-A2. However, since the multiplexers of the AMSU-A1 system are inseparably integrated to the receivers, the acceptance tests are conducted with the feedhorns directly connected to respective multiplexers. Likewise, the AMSU-A2 receiver is tested with the feedhorn directly connected to the diplexer that precedes the receiver subsystem These tests are performed at room ambient temperature only.

Wire connections between the D-sub connectors and platinum resistance temperature (PRT) sensors and thermistors, D-sub connector and PLO lock detection terminals, and D-sub connector and survival heaters through the thermal switches are verified by measuring either the resistance between the respective two pins or the voltage across the respective two pins. A failure was encountered during the wire connection tests for the A1-1 receiver. This failure was traced to wrong connection of wires between the D-sub connectors and a thermister (TB53) and corrected by reversing the wire connections. This issue is addressed in TAR No. 003182.

The functional performance tests for the EOS AMSU-A receiver subsystem began with the AMSU-A2 receiver. A higher noise figure (5.29dB) was measured for the channel 1 against the specification of 4.55dB. The cause of this out-of-specification condition was traced to the mixer/IF amplifier (P/N: 1331662-11, S/N: 7A01), and the unit was replaced by another (S/N: 7A11) resulting in a noise figure of 3.81 dB. This anomaly is addressed in F/AR No. 058.

The AMSU-A1-1 receiver tests were performed with the No. 2 phased-locked oscillator (PLO) only as the waveguide attenuator for the No. 1 PLO was not ready at the time of test. Another anomaly was encountered during these tests. The output level for the channels 6 and 7 was higher by 7-8 dB at the lower end of the passband and flattened out at 50-60 MHz. This anomaly resulted in higher noise figures than the predicted; 5.96dB for the channel 6 (pushing it to an out-of specification condition) and 5.09dB for the channel 7 against the specification of 5.2dB each when measured by a power meter. The cause of this anomaly was traced to the dielectric resonator oscillators (DROs) (P/N 1336610-6, S/N 85015 for channel 6 and P/N 1336610-7, S/N 85022 for channel 7). This issue is addressed in F/AR No. 070. The channel 6 DRO was replaced by another unit (S/N 85024) resulting in a noise figure of 4.06dB. The channel 7 DRO was not replaced as no other unit was available at the time of test while the measured noise figure was still within the specification of 5.2dB. During the preliminary system-level tests the power level of the channel 7 DRO was lowered reducing the hump over the lower portion

of the passband. A plotted bandpass characteristic at the reduced LO power level is included in the test report.

The functional performance tests for the A1-1 receiver were continued with the replacement channel 6 DRO and the No. 1 PLO. However, the test procedure was modified for this A1-1 receiver; i) The noise figures were measured with 3 samples instead of 10 samples. ii) The bandpass characteristics for the channels 9 through 14 were not measured with the PLO No.1. iii) Noise stability tests were not conducted for channels 9 through 14 with the PLO No. 1. iv) Tunable short tests were not performed for all channels. (The tunable short test will instead be conducted on the METSAT AMSU-A receiver subsystem.)

The AMSU-A A1-2 receiver was likewise tested according to the modified procedure. The noise figures were measured with 3 samples. Noise stability and tunable short tests were omitted. No anomaly was observed for A1-2 receiver tests.

4.0 ORGANIZATION OF TEST DATA

The test data are organized in the following formats. The test data obtained at the component level are first summarized for each category for all applicable receiver channels. The bandpass characteristics of the filters are summarized only for the data measured at mid-temperature. Supporting component test data over the operating temperature range then follows the summaries.

The subsystem-level test data are organized for each receiver (A1-1, A1-2, and A2), but not in the order of tests. Test data recorded in the test sheet as prepared in the Acceptance Test Procedure and other test plots are included in this test report.

5.0 SUMMARY AND RECOMMENDATIONS

The EOS AMSU-A FM-1 receiver subsystem successfully passed all performance requirements and is delivered to the System Engineering for system integration and test. The test data, in most cases, indicated adequate margin for key performance specifications.

Some tests for the A1 receivers were either simplified or omitted. The noise stability test was conducted only for the channels 9 through 14 of the AMSU-A1-1 receiver with the PLO No.1. The noise stability test was conducted for all mixer/amplifiers at the component level. Tunable short test was not performed and will instead be conducted on the METSAT receivers.

We have encountered two out-of-specification conditions during the functional performance tests for the EOS AMSU-A receiver subsystem. Higher than predicted

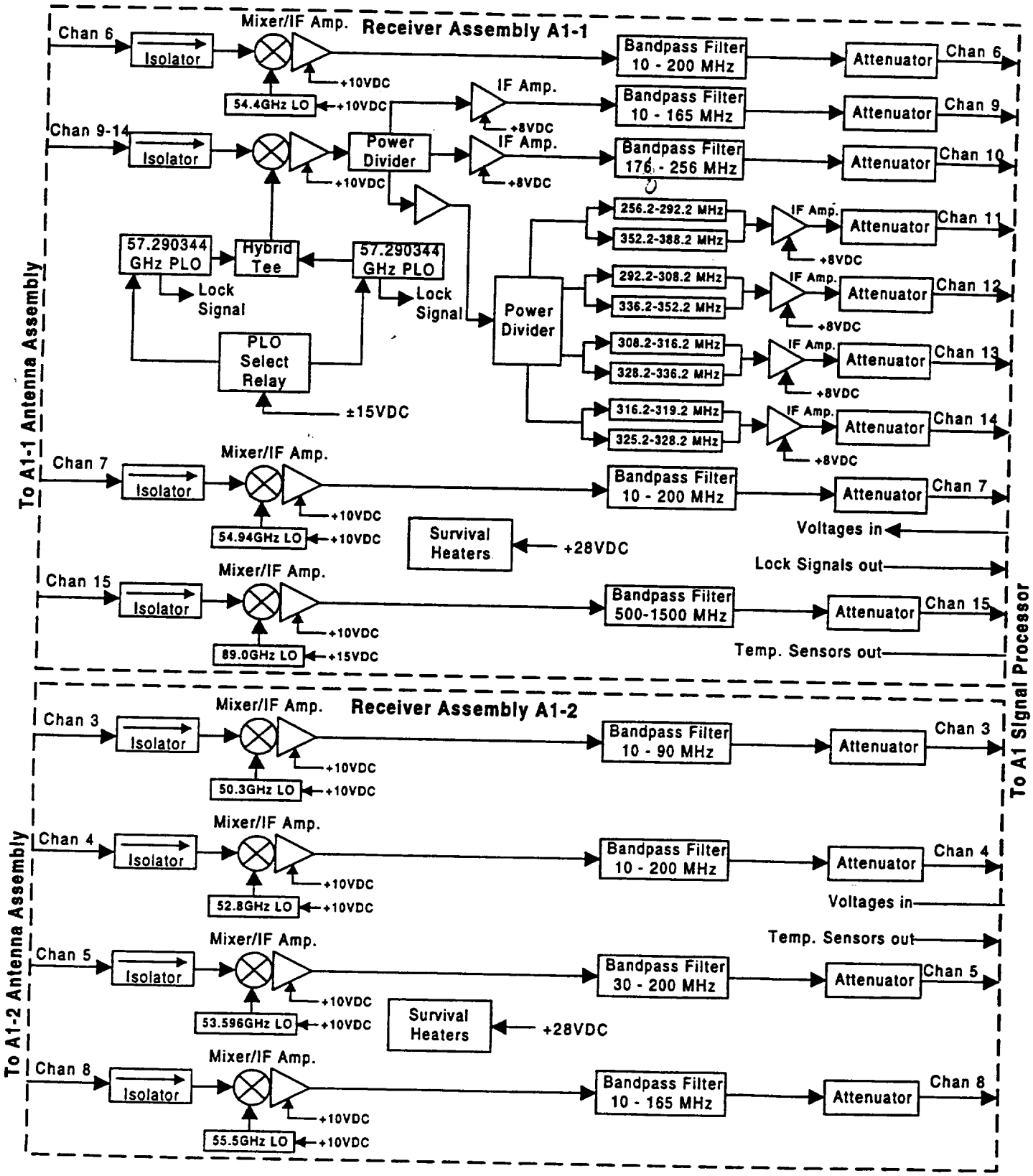


Figure 1. AMSU-A1 Receiver Functional Block Diagram

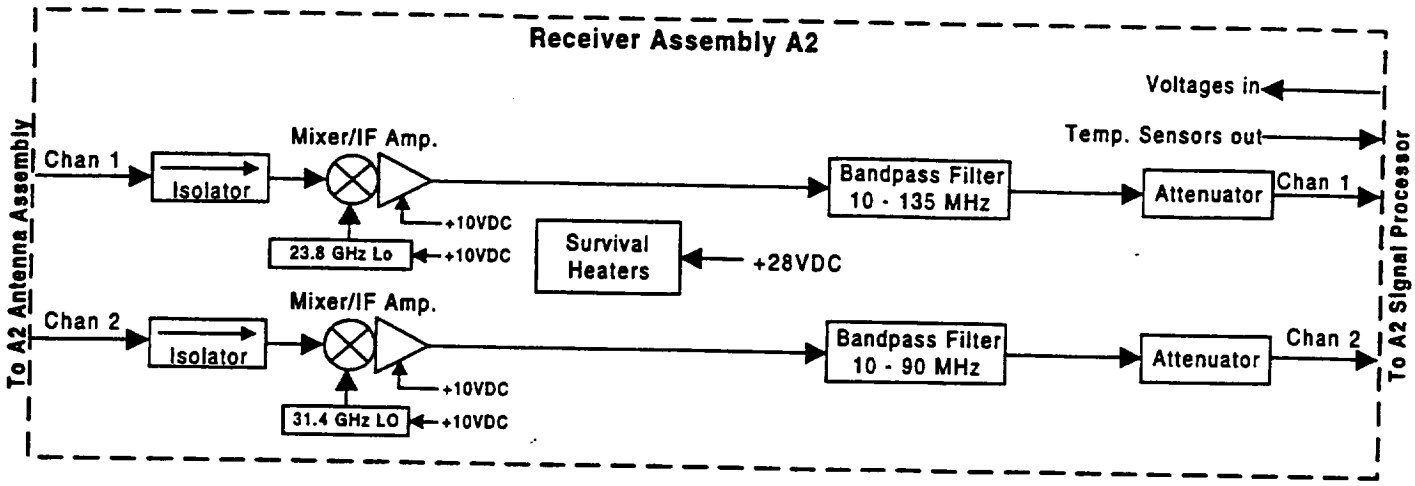


Figure 2. AMSU-A2 Receiver Functional Block Diagram

noise figures were measured for channel 1 of the A2 receiver and channel 6 of the A1-1 receiver (F/AR Nos. 058 and 070). We suspect the channel 1 noise figure anomaly to be the impedance matching at the RF port of the mixer. The channel 6 noise figure anomaly seems to be strongly related with the significant output level change over the passband. Similar phenomenon was observed on the channel 7 which indicated higher noise figure than the predicted and yet met the specification. We conveyed this concern to the System Engineering and requested to pay special attention to it during the system tests.

Lack of hardware has thus far limited us from conducting sufficient trouble-shooting and subsequent root-cause analyses on above-mentioned anomalies. The cause of those anomalies are not clear yet and their dispositions have not been completed at this time. We recommend that these issues are systematically investigated and a firm procedure is established to prevent similar anomalies from occurring on future receiver subsystems.

6.0 TEST DATA

In the following, the component and subsystem-level test data are organized as delineated in Paragraph 4.0.

COMPONENT-LEVEL TEST DATA

CENTER FREQUENCY AND FREQUENCY STABILITY

FOR

LOCAL OSCILLATORS (LOs)
(DROs, PLOs, & GDO)

CENTER FREQUENCY OF LOs

Channel No.	1	2	3	4	5	6	7	8	9-14 *	15
Specification (GHz)	23.8	31.4	50.3	52.8	53.596	54.4	54.94	55.5	57.290344	89.0
Setting Accuracy (+/-GHz)	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.002	0.000086	0.03
Measured (GHz)	23.80004	31.40028	50.30038	52.80022	53.59677	54.40008	54.93996	55.50077	57.290340 57.290329	88.987

* Measured for PLO No. 1 and No. 2.

FREQUENCY STABILITY OF LOs

Channel No.	1	2	3	4	5	6	7	8	9-14 *	15
Short-Term Specification (+/-MHz)	8	8	8	3	3	3	3	6	0.086	80
Setting Accuracy (+/-MHz)	2	2	2	1	1	1	1	2		30
W/ Temp. & Voltage (+/-MHz)	6	6	6	2	2	2	2	6		50
Measured (MHz) Total	+3.45, -0.99	+1.73, -3.14	+3.17, -2.74	+2.79 -1.97	+1.56, -1.45	+0.62, -0.44	+1.66, -0.71	+1.38, -1.75	0.039 0.025	+5., -29.
Long-Term Specification (+/-MHz)	2	2	2	2	2	2	2	2	0.114	50
By Design or Analysis ** (+/-MHz)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.115	76

* Measured for PLO No. 1 and No. 2.

** Based on accelerated life-test data for DROs.

Note: Additional +/-0.1MHz frequency stability reserved for safety margin for channels 11-14.

Channel 1 LO

DRO (P/N: 1336610-1, S/N: 544321)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS K 9604 CF
SERIAL NUMBER: 544321 QUAL TEST _____ AESD 1336610-1
ACCEPT TEST ✓

Basic Electrical Test: Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	18 °C	Table IIIB
Input Voltage	10.0 VDC	10.0 ± 0.2 VDC
Input Current	79 mA	Table IIIB
Input Power, P_{diss}	0.79 W DC	P_{diss} max
Frequency, f_{Tnom}	23.800035 GHz	Table IIIB
RF Output Power, P_{Tnom}	13.8 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	+.035 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at _____ VDC		
Temperature	18 °C	Table IIIB
Input Voltage	10 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	78 mA	Table IIIB
Frequency, f_{meas}	23.800047 GHz	Table IIIB
RF Output Power, P_{meas}	13.8 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at _____ VDC		
Temperature	18 °C	Table IIIB
Input Voltage	10 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	78 mA	Table IIIB
Frequency, f_{meas}	23.800043 GHz	Table IIIB
RF Output Power, P_{meas}	13.8 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at _____ VDC = +.012 MHz
Δf_V at 10.5 VDC or at _____ VDC = +.008 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at _____ VDC = 0 dB
ΔP_V at 10.5 VDC or at _____ VDC = 0 dB

Accept ✓ Reject _____

Test Performed by _____ Date 10/28/97
Litton QA _____ Date OCT 31 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS K 9604 CF — AESD 1336610- 1
SERIAL NUMBER: 544321 — QUAL TEST _____ — ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	9.1	°C	10° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	79	mA	Table IIIB
Input Power, P_{diss}	0.79	W DC	Pdiss max
Frequency, $f_{10°C}$	23.801282	GHz	Table IIIB
RF Output Power, $P_{10°C}$	13.7	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at _____ VDC			
Temperature	9.1	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	79	mA	Table IIIB
Frequency, f_{meas}	23.801287	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at _____ VDC			
Temperature	9.1	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	79	mA	Table IIIB
Frequency, f_{meas}	23.801280	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at _____	VDC =	+.005	MHz
Δf_V at 10.5 VDC or at _____	VDC =	-.002	MHz
Δf_T at 10.0 VDC ($=f_{10°C} - f_{Tnom}$)	=	+1.247	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at _____	VDC =	0	dB
ΔP_V at 10.5 VDC or at _____	VDC =	0	dB
ΔP_T at 10.0 VDC ($=P_{10°C} - P_{Tnom}$)	=	-.1	dB

Accept ✓ Reject _____

Test Performed by DM — Date 10/28/97
Litton Q.A. _____ — Date OCT 31 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
48	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS K9604CF
SERIAL NUMBER: 544321 QUAL TEST _____ AESD 1336610- 1
ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-4.7	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	79	mA	Table IIIB
Input Power, P_{diss}	0.79	W DC	Pdiss max
Frequency, f_{Tmin}	23.803173	GHz	Table IIIB
RF Output Power, P_{Tmin}	13.7	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at _____ VDC			
Temperature	-4.7	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	79	mA	Table IIIB
Frequency, f_{meas}	23.803180	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at _____ VDC			
Temperature	-4.7	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	79	mA	Table IIIB
Frequency, f_{meas}	23.803179	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at _____	VDC =	+.007	MHz
Δf_V at 10.5 VDC or at _____	VDC =	+.006	MHz
Δf_T at 10.0 VDC (=$f_{Tmin} - f_{Tnom}$)		+3.138	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at _____	VDC =	0	dB
ΔP_V at 10.5 VDC or at _____	VDC =	0	dB
ΔP_T at 10.0 VDC (=$P_{Tmin} - P_{Tnom}$)	=	-.1	dB

Accept ✓ Reject _____

Test Performed by _____ Date 10/28/97
Litton Q.A. _____ Date OCT 31 1997

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS K9604CF AESD 1336610- 1
SERIAL NUMBER: 544321 QUAL TEST _____ ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	31	°C	30° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	79	mA	Table IIIB
Input Power, P_{diss}	0.79	W DC	Pdiss max
Frequency, $f_{30°C}$	23.797137	GHz	Table IIIB
RF Output Power, $P_{30°C}$	13.7	dBm	12 to 17 dBm
Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3			
Measurement at 9.5 VDC or at _____ VDC			
Temperature	31	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	79	mA	Table IIIB
Frequency, f_{meas}	23.797143	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at _____ VDC			
Temperature	31	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	79	mA	Table IIIB
Frequency, f_{meas}	23.797131	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at _____	VDC =	+.006	MHz
Δf_V at 10.5 VDC or at _____	VDC =	-.006	MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$)	=	-2.898	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at _____	VDC =	0	dB
ΔP_V at 10.5 VDC or at _____	VDC =	0	dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$)	=	-.1	dB

Accept ✓ Reject _____

Test Performed by DH Date 10/28/97
Litton Q.A. _____ Date OCT 31 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS K9604CF
SERIAL NUMBER: 544321 QUAL TEST _____ AESD 1336610- 1
ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	39.9	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	78	mA	Table IIIB
Input Power, P_{diss}	0.78	W DC	Pdiss max
Frequency, f_{Tmax}	23.796162	GHz	Table IIIB
RF Output Power, P_{Tmax}	13.7	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at _____ VDC			
Temperature	39.9	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	78	mA	Table IIIB
Frequency, f_{meas}	23.796165	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at _____ VDC			
Temperature	39.9	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	78	mA	Table IIIB
Frequency, f_{meas}	23.796159	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at _____	VDC =	+.003	MHz
Δf_V at 10.5 VDC or at _____	VDC =	-.003	MHz
Δf_T at 10.0V ($=f_{Tmax} - f_{Tnom}$)	=	-3.873	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at _____	VDC =	0	dB
ΔP_V at 10.5 VDC or at _____	VDC =	0	dB
ΔP_T at 10.0 VDC ($=P_{Tmax} - P_{Tnom}$)	=	-.1	dB

Accept ✓ Reject _____

Test Performed by DM Date 10/28/97
Litton Q.A. _____ Date 10-31-97

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS K 9604 CF
SERIAL NUMBER: 544321 QUAL TEST _____
AESD 1336610- 1
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION		LIMITS
Output Open and Short. Ref. Test Para. 5.9.5		
Temperature	23 °C	24°C ± 5°C
Frequency:	23.799301 GHz	Table IIIB
RF Output Power:	13.8 dBm	12 to 17 dBm
Input Voltage	10 VDC	10 ± 0.2 VDC
Input Current:	78 mA	Table IIIB
Results:	✓ Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	+.296 MHz (Positive)	Table IIIB
	-.112 MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	+ 3.150 MHz (Positive)	Table IIIB
	- 3.879 MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	+.2 dB (Positive)	1.0 dB
	-.2. dB (Negative)	-1.0 dB

Accept ✓ Reject _____

Test Performed by DH Date 10-29-97

Litton Q.A. _____ Date OCT 31 1997

Channel 2 LO

DRO (P/N: 1336610-2, S/N: 85010)

LITTON
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TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS A 9635 CF
SERIAL NUMBER: 85010 QUAL TEST ✓ AESD 1336610-2 ACCEPT TEST _____

Basic Electrical Test: Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	17.7 °C	Table IIIB
Input Voltage	10.0 VDC	10.0 ± 0.2 VDC
Input Current	116.4 mA	Table IIIB
Input Power, P_{diss}	1.164 W DC	P_{diss} max
Frequency, f_{Tnom}	31.400284 GHz	Table IIIB
RF Output Power, P_{Tnom}	13.75 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	+.284 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at _____ VDC		
Temperature	18.1 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	116.4 mA	Table IIIB
Frequency, f_{meas}	31.400265 GHz	Table IIIB
RF Output Power, P_{meas}	13.75 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at _____ VDC		
Temperature	18.1 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	116.4 mA	Table IIIB
Frequency, f_{meas}	31.400268 GHz	Table IIIB
RF Output Power, P_{meas}	13.75 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at _____ VDC = -.019 MHz
Δf_V at 10.5 VDC or at _____ VDC = -.016 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at _____ VDC = 0 dB
ΔP_V at 10.5 VDC or at _____ VDC = 0 dB

Accept ✓ Reject _____

Test Performed by _____ Date 11-18-97
Litton QA _____ Date NOV 25 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS A 9635 CF
SERIAL NUMBER: 85010 QUAL TEST ✓
AESD 1336610- 2
ACCEPT TEST _____

Temperature Testing at T=10°C. Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	10.6	°C	10° ± 1°C
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	116.3	mA	Table IIIB
Input Power, P_{diss}	1.163	W DC	Pdiss max
Frequency, $f_{10°C}$	31.400910	GHz	Table IIIB
RF Output Power, $P_{10°C}$	13.8	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at _____ VDC			
Temperature	10.6	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	116.3	mA	Table IIIB
Frequency, f_{meas}	31.400900	GHz	Table IIIB
RF Output Power, P_{meas}	13.8	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at _____ VDC			
Temperature	10.6	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	116.3	mA	Table IIIB
Frequency, f_{meas}	31.400920	GHz	Table IIIB
RF Output Power, P_{meas}	13.8	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at _____	VDC =	-.01	MHz
Δf_V at 10.5 VDC or at _____	VDC =	+.01	MHz
Δf_T at 10.0 VDC ($=f_{10°C} - f_{Tnom}$)	=	+.626	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at _____	VDC =	Ø	dB
ΔP_V at 10.5 VDC or at _____	VDC =	Ø	dB
ΔP_T at 10.0 VDC ($=P_{10°C} - P_{Tnom}$)	=	+.05	dB

Accept ✓ Reject _____

Test Performed by _____ Date 11-18-97
Litton Q.A. _____ Date NOV 25 1997

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS A 9635 CF AESD 1336610- 2
SERIAL NUMBER: 85010 QUAL TEST ✓ ACCEPT TEST _____

Temperature Extreme Testing at Tmin. Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-4.9	°C	Table IIIB
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	115.8	mA	Table IIIB
Input Power, P_{diss}	1.158	W DC	Pdiss max
Frequency, f_{Tmin}	31.401440	GHz	Table IIIB
RF Output Power, P_{Tmin}	13.8	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at _____ VDC			
Temperature	-4.9	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	116.0	mA	Table IIIB
Frequency, f_{meas}	31.401430	GHz	Table IIIB
RF Output Power, P_{meas}	13.8	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at _____ VDC			
Temperature	-4.9	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	116.0	mA	Table IIIB
Frequency, f_{meas}	31.401440	GHz	Table IIIB
RF Output Power, P_{meas}	13.8	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at _____	VDC =	-.01	MHz
Δf_V at 10.5 VDC or at _____	VDC =	0	MHz
Δf_T at 10.0 VDC (=f_{Tmin} -f_{Tnom})		71.156	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at _____	VDC =	0	dB
ΔP_V at 10.5 VDC or at _____	VDC =	0	dB
ΔP_T at 10.0 VDC (=P_{Tmin} -P_{Tnom})	=	+.05	dB

Accept ✓ Reject _____

Test Performed by _____ Date 11-18-97
Litton Q.A. _____ Date NOV 25 1997

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS A 9635 CF
SERIAL NUMBER: 85010 QUAL TEST ✓ AESD 1336610- 2 ACCEPT TEST _____

Temperature Testing at T=30°C. Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	30.4	°C	30° ± 1°C
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	117.0	mA	Table IIIB
Input Power, P_{diss}	1.17	W DC	Pdiss max
Frequency, $f_{30°C}$	31.398830	GHz	Table IIIB
RF Output Power, $P_{30°C}$	13.7	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at _____ VDC			
Temperature	30.4	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	117.0	mA	Table IIIB
Frequency, f_{meas}	31.398840	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at _____ VDC			
Temperature	30.4	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	117.0	mA	Table IIIB
Frequency, f_{meas}	31.398840	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at _____	VDC =	+.01	MHz
Δf_V at 10.5 VDC or at _____	VDC =	+.01	MHz
Δf_T at 10.0 VDC (=$f_{30°C}$ - f_{Tnom})	=	-1.454	MHz

Calculate RF Output Power Variation. $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at _____	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at _____	VDC =	ϕ	dB
ΔP_T at 10.0 VDC (=$P_{30°C}$ - P_{Tnom})	=	-.05	dB

Accept ✓ Reject _____

Test Performed by _____ Date 11-18-97
Litton Q.A. _____ Date ~~NOV 25 1997~~

LITTON M60

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS A 9635 CF
SERIAL NUMBER: 8510 QUAL TEST ✓ ACCEPT TEST _____
AESD 1336610- 2

Temperature Extreme Testing at Tmax. Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	41	°C	Table IIIB
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	117.0	mA	Table IIIB
Input Power, P_{diss}	1.17	W DC	Pdiss max
Frequency, f_{Tmax}	31.39748	GHz	Table IIIB
RF Output Power, P_{Tmax}	13.7	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at _____ VDC			
Temperature	41	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	117.0	mA	Table IIIB
Frequency, f_{meas}	31.39748	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at _____ VDC			
Temperature	41	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	117.0	mA	Table IIIB
Frequency, f_{meas}	31.39747	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at _____	VDC =	0	MHz
Δf_V at 10.5 VDC or at _____	VDC =	-.004	MHz
Δf_T at 10.0V (=f_{Tmax} -f_{Tnom})	=	-2.804	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at _____	VDC =	0	dB
ΔP_V at 10.5 VDC or at _____	VDC =	0	dB
ΔP_T at 10.0 VDC (=P_{Tmax}-P_{Tnom})	=	-.05	dB

Accept ✓ Reject _____

Test Performed by DM Date 11-18-97
Litton Q.A. _____ Date NOV 25 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS A 9635 CF
SERIAL NUMBER: 85010 QUAL TEST ✓ AESD 1336610-2 ACCEPT TEST _____

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION		LIMITS
Output Open and Short. Ref. Test Para. 5.9.5		
Temperature	22 °C	24°C ± 5°C
Frequency:	31.400210 GHz	Table IIIB
RF Output Power:	13.8 dBm	12 to 17 dBm
Input Voltage	10.0 VDC	10 ± 0.2 VDC
Input Current:	116.6 mA	Table IIIB
Results:	✓ Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	+.564 ~~+.451~~ SE MHz (Positive)	Table IIIB
	-.312 ~~-.0~~ SE MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V - \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	+1.166 MHz (Positive)	Table IIIB
	-2.823 MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	+.25 dB (Positive)	1.0 dB
	-.15 dB (Negative)	-1.0 dB

Accept ✓ Reject _____

Test Performed by _____ Date 11-21-97

Litton Q.A. _____ Date NOV 25 1997

LITTON M60

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 61 OF 68
56348	A	1300823	B3	

Channel 3 LO

DRO (P/N: 1336610-3, S/N: 85094)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AM
SERIAL NUMBER: 85094 QUAL TEST _____
AESD 1336610-3
ACCEPT TEST ✓

Basic Electrical Test: Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	21.2 °C	Table IIIB
Input Voltage	10.0 VDC	10.0 ± 0.2 VDC
Input Current	194 mA	Table IIIB
Input Power, P_{diss}	1.94 W DC	P_{diss} max
Frequency, f_{Tnom}	50.300 38 GHz	Table IIIB
RF Output Power, P_{Tnom}	13.7 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	+.38 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	21.2 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	192 mA	Table IIIB
Frequency, f_{meas}	50.300 Ko GHz	Table IIIB
RF Output Power, P_{meas}	13.7 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	21.2 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	192 mA	Table IIIB
Frequency, f_{meas}	50.300 41 GHz	Table IIIB
RF Output Power, P_{meas}	13.7 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at _____ VDC = +.02 MHz
Δf_V at 10.5 VDC or at _____ VDC = +.03 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at _____ VDC = ϕ dB
ΔP_V at 10.5 VDC or at _____ VDC = ϕ dB

Accept ✓ Reject _____

Test Performed by _____ Date 12-15-97
Litton QA _____ Date DEC 16 1997

LITTON 03 W

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
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LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AM
SERIAL NUMBER: 85094 QUAL TEST _____
AESD 1336610- 3
ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	11.0	°C	10° ± 1°C
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	192	mA	Table IIIB
Input Power, P_{diss}	1.92	W DC	Pdiss max
Frequency, $f_{10°C}$	50.299 22	GHz	Table IIIB
RF Output Power, $P_{10°C}$	13.7	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	11.0	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	190	mA	Table IIIB
Frequency, f_{meas}	50.299 20	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	11.0	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	190	mA	Table IIIB
Frequency, f_{meas}	50.299 19	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at _____	VDC =	-.02	MHz
Δf_V at 10.5 VDC or at _____	VDC =	-.03	MHz
Δf_T at 10.0 VDC ($=f_{10°C} - f_{Tnom}$)	=	-1.16	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at _____	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at _____	VDC =	ϕ	dB
ΔP_T at 10.0 VDC ($=P_{10°C} - P_{Tnom}$)	=	ϕ	dB

Accept ✓ Reject _____

Test Performed by _____ Date 12-15-97
Litton Q.A. _____ Date DEC 16 1997

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AM
SERIAL NUMBER: 85094 QUAL TEST _____
AESD 1336610- 3
ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-.0	°C	Table IIIB
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	190	mA	Table IIIB
Input Power, P_{diss}	1.90	W DC	Pdiss max
Frequency, f_{Tmin}	50.29969	GHz	Table IIIB
RF Output Power, P_{Tmin}	13.8	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	-.0	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	188	mA	Table IIIB
Frequency, f_{meas}	50.29965	GHz	Table IIIB
RF Output Power, P_{meas}	13.8	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	-.1	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	189	mA	Table IIIB
Frequency, f_{meas}	50.29965	GHz	Table IIIB
RF Output Power, P_{meas}	13.8	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at _____	VDC =	-.04	MHz
Δf_V at 10.5 VDC or at _____	VDC =	-.04	MHz
Δf_T at 10.0 VDC (=f_{Tmin} -f_{Tnom})		-2.69	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at _____	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at _____	VDC =	ϕ	dB
ΔP_T at 10.0 VDC (=P_{Tmin} -P_{Tnom})	=	-.1	dB

Accept ✓ Reject _____

Test Performed by _____ Date 12-15-97
Litton Q.A. _____ Date DEC 16 1997

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AM
SERIAL NUMBER: 85094 QUAL TEST _____
AESD 1336610- 3
ACCEPT TEST ✓

Temperature Testing at T=30°C. Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	29.0	°C	30° ± 1°C
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	195	mA	Table IIIB
Input Power, P_{diss}	1.95	W DC	Pdiss max
Frequency, $f_{30°C}$	50301 49	GHz	Table IIIB
RF Output Power. $P_{30°C}$	15.7	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	29.0	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	193	mA	Table IIIB
Frequency, f_{meas}	50301 52	GHz	Table IIIB
RF Output Power. P_{meas}	13.7	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	29.0	°C	Table IIIB
Input Voltage	10.0	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	193	mA	Table IIIB
Frequency, f_{meas}	50.301 53	GHz	Table IIIB
RF Output Power. P_{meas}	13.7	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at _____	VDC =	+.03	MHz
Δf_V at 10.5 VDC or at _____	VDC =	+.04	MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$)	=	+1.11	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at _____	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at _____	VDC =	ϕ	dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$)	=	ϕ	dB

Accept ✓ Reject _____

Test Performed by _____ Date 12-15-97
Litton Q.A. _____ Date DEC 18 1997

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AM
SERIAL NUMBER: 85094 QUAL TEST _____
AESD 1336610- 3
ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	43.2	°C	Table IIIB
Input Voltage	10.	VDC	10.0 ± 0.2 VDC
Input Current	197	mA	Table IIIB
Input Power, P_{diss}	1.97	W DC	Pdiss max
Frequency, f_{Tmax}	50302 83	GHz	Table IIIB
RF Output Power, P_{Tmax}	13.7	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	43.2	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	195	mA	Table IIIB
Frequency, f_{meas}	50302 83	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	43.2	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	195	mA	Table IIIB
Frequency, f_{meas}	50302 83	GHz	Table IIIB
RF Output Power, P_{meas}	13.7	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at _____	VDC =	ϕ	MHz
Δf_V at 10.5 VDC or at _____	VDC =	ϕ	MHz
Δf_T at 10.0V ($=f_{Tmax} - f_{Tnom}$)	=	+2.45	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at _____	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at _____	VDC =	ϕ	dB
ΔP_T at 10.0 VDC ($=P_{Tmax} - P_{Tnom}$)	=	ϕ	dB

Accept ✓ Reject _____

Test Performed by _____ Date 12-15-97
Litton Q.A. _____ Date DEC 16 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
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TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AM
SERIAL NUMBER: 85094 QUAL TEST _____
AESD 1336610- 3
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION		LIMITS
Output Open and Short. Ref. Test Para. 5.9.5		
Temperature	22 °C	24°C ± 5°C
Frequency:	50.30039 GHz	Table IIIB
RF Output Power:	13.7 dBm	12 to 17 dBm
Input Voltage	10 VDC	10 ± 0.2 VDC
Input Current:	194 mA	Table IIIB
Results:	+.39 Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	+.68 MHz (Positive)	Table IIIB
	-.01 MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	+2.49 MHz (Positive)	Table IIIB
	-2.73 MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	+.4 dB (Positive)	1.0 dB
	-.2 dB (Negative)	-1.0 dB

Accept ✓ Reject _____

Test Performed by DM Date 12-15-97

Litton Q.A. LITTON Date DEC 16 1997

Channel 4 LO

DRO (P/N: 1336610-4, S/N: 85038)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AF/A — AESD 1336610-4
SERIAL NUMBER: 85038 — QUAL TEST _____ — ACCEPT TEST ✓

Basic Electrical Test: Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	22.4 °C	Table IIIB
Input Voltage	10.0 VDC	10.0 ± 0.2 VDC
Input Current	198 mA	Table IIIB
Input Power, P_{diss}	1.98 W DC	P_{diss} max
Frequency, f_{Tnom}	52.80022 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.4 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	±.22 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at _____ VDC		
Temperature	22.5 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	196 mA	Table IIIB
Frequency, f_{meas}	52.80022 GHz	Table IIIB
RF Output Power, P_{meas}	12.4 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at _____ VDC		
Temperature	22.5 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	196 mA	Table IIIB
Frequency, f_{meas}	52.80022 GHz	Table IIIB
RF Output Power, P_{meas}	12.4 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$

Δf_V at 9.5 VDC or at _____ VDC = ϕ MHz
Δf_V at 10.5 VDC or at _____ VDC = ϕ MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$

ΔP_V at 9.5 VDC or at _____ VDC = ϕ dB
ΔP_V at 10.5 VDC or at _____ VDC = ϕ dB

Accept ✓ Reject _____

Test Performed by _____ Date 12-3-97
Litton QA _____ Date DEC 09 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AF/A
SERIAL NUMBER: 85038 QUAL TEST _____
AESD 1336610- 4
ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	10.2	°C	10° ± 1°C
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	197	mA	Table IIIB
Input Power, P_{diss}	1.97	W DC	Pdiss max
Frequency, $f_{10°C}$	52.80152	GHz	Table IIIB
RF Output Power, $P_{10°C}$	12.5	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at _____ VDC			
Temperature	10.1	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	195	mA	Table IIIB
Frequency, f_{meas}	52.80152	GHz	Table IIIB
RF Output Power, P_{meas}	12.5	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at _____ VDC			
Temperature	10.0	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	195	mA	Table IIIB
Frequency, f_{meas}	52.8053	GHz	Table IIIB
RF Output Power, P_{meas}	12.5	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at _____	VDC =	ϕ	MHz
Δf_V at 10.5 VDC or at _____	VDC =	+.01	MHz
Δf_T at 10.0 VDC ($=f_{10°C} - f_{Troom}$)	=	+1.30	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at _____	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at _____	VDC =	ϕ	dB
ΔP_T at 10.0 VDC ($=P_{10°C} - P_{Troom}$)	=	+.1	dB

Accept ✓ Reject _____

Test Performed by DH Date 12-3-97
Litton Q.A. _____ Date ~~DEC 0 9 1997~~

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AF/A AESD 1336610- 4
SERIAL NUMBER: 85038 QUAL TEST _____ ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-.5	°C	Table IIIB
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	196	mA	Table IIIB
Input Power, P_{diss}	1.96	W DC	Pdiss max
Frequency, f_{Tmin}	52.80219	GHz	Table IIIB
RF Output Power, P_{Tmin}	12.5	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at _____ VDC			
Temperature	-.6	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	194	mA	Table IIIB
Frequency, f_{meas}	52.80220	GHz	Table IIIB
RF Output Power, P_{meas}	12.5	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at _____ VDC			
Temperature	-.5	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	194	mA	Table IIIB
Frequency, f_{meas}	52.80220	GHz	Table IIIB
RF Output Power, P_{meas}	12.5	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at _____	VDC =	+.01	MHz
Δf_V at 10.5 VDC or at _____	VDC =	+.01	MHz
Δf_T at 10.0 VDC (=f_{Tmin} -f_{Tnom})		+1.97	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at _____	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at _____	VDC =	ϕ	dB
ΔP_T at 10.0 VDC (=P_{Tmin} -P_{Tnom})	=	+.1	dB

Accept ✓ Reject _____

Test Performed by DH Date 12-3-97
Litton Q.A. _____ Date DEC 09 1997

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AF/A
SERIAL NUMBER: 85038 QUAL TEST _____
AESD 1336610- 4
ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	30.6	°C	30° ± 1°C
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	198	mA	Table IIIB
Input Power, P_{diss}	1.98	W DC	Pdiss max
Frequency, $f_{30°C}$	52.79938	GHz	Table IIIB
RF Output Power, $P_{30°C}$	12.3	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at _____ VDC			
Temperature	30.6	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	196	mA	Table IIIB
Frequency, f_{meas}	52.79938	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at _____ VDC			
Temperature	30.6	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	196	mA	Table IIIB
Frequency, f_{meas}	52.79938	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at _____	VDC =	ϕ	MHz
Δf_V at 10.5 VDC or at _____	VDC =	ϕ	MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$)	=	-.84	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at _____	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at _____	VDC =	ϕ	dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$)	=	-.1	dB

Accept ✓ Reject _____

Test Performed by _____ Date 12-3-97
Litton Q.A. _____ Date DEC 0 9 1997

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AF/A AESD 1336610- 4
SERIAL NUMBER: 85038 QUAL TEST _____ ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	199	mA	Table IIIB
Input Power, P_{diss}	1.99	W DC	Pdiss max
Frequency, f_{Tmax}	52.79826	GHz	Table IIIB
RF Output Power, P_{Tmax}	12.2	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at _____ VDC			
Temperature	44	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	197	mA	Table IIIB
Frequency, f_{meas}	52.19826	GHz	Table IIIB
RF Output Power, P_{meas}	12.2	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at _____ VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	~~52.798~~ 197	mA	Table IIIB
Frequency, f_{meas}	52.79826	GHz	Table IIIB
RF Output Power, P_{meas}	12.2	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at _____	VDC =	ϕ	MHz
Δf_V at 10.5 VDC or at _____	VDC =	ϕ	MHz
Δf_T at 10.0V (=f_{Tmax} -f_{Tnom})	=	-1.96	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at _____	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at _____	VDC =	ϕ	dB
ΔP_T at 10.0 VDC (=P_{Tmax}-P_{Tnom})	=	-.2	dB

Accept ✓ Reject _____

Test Performed by DH Date 12-3-97
Litton Q.A. _____ Date DEC 09 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
56348	A	1300823	B3	

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AF/A
SERIAL NUMBER: 85038 QUAL TEST _____
AESD 1336610-4
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION		LIMITS
Output Open and Short. Ref. Test Para. 5.9.5		
Temperature	21.6 °C	24°C ± 5°C
Frequency:	52.80080 GHz	Table IIIB
RF Output Power:	12.4 dBm	12 to 17 dBm
Input Voltage	10 VDC	10 ± 0.2 VDC
Input Current:	197 mA	Table IIIB
Results:	✓ Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	+.81 MHz (Positive)	Table IIIB
	-.01 MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	+1.98 MHz (Positive)	Table IIIB
	-1.96 MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	+.4 dB (Positive)	1.0 dB
	-.2 dB (Negative)	-1.0 dB

Accept ✓ Reject _____

Test Performed by DH Date 12-5-97

Litton Q.A. _____ Date _____

Channel 5 LO

DRO (P/N: 1336610-5, S/N: 85029)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS = 9036 AG/A
SERIAL NUMBER: 35029 QUAL TEST _____ AESD 1336610-5 ACCEPT TEST ✓

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	21.5 °C	Table IIIB
Input Voltage	10.0 VDC	10.0 ± 0.2 VDC
Input Current	186 mA	Table IIIB
Input Power, P_{diss}	1.86 W DC	P_{diss} max
Frequency, f_{Tnom}	53.596770 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.4 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	+.720 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	21.6 °C	Table IIIB
Input Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	184 mA	Table IIIB
Frequency, f_{meas}	53.596768 GHz	Table IIIB
RF Output Power, P_{meas}	12.4 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	21.6 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	185 mA	Table IIIB
Frequency, f_{meas}	53.596766 GHz	Table IIIB
RF Output Power, P_{meas}	12.4 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at 9.5 VDC = -.002 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = -.004 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at 9.5 VDC = Ø dB
ΔP_V at 10.5 VDC or at 10.5 VDC = Ø dB

Accept ✓ Reject _____

Test Performed by DH Date 10/7/97
Litton QA LITTON Date OCT 16 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9076 AG/A
SERIAL NUMBER: 85029 QUAL TEST _____
AESD 1336610- 5
ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	9.8	°C	10° ± 1°C
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	185	mA	Table IIIB
Input Power, P_{diss}	1.85	W DC	Pdiss max
Frequency, $f_{10°C}$	53.597155	GHz	Table IIIB
RF Output Power, $P_{10°C}$	12.3	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	9.5	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	183	mA	Table IIIB
Frequency, f_{meas}	53.597169	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	9.4	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	184	mA	Table IIIB
Frequency, f_{meas}	53.597170	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	+.014	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	+.015	MHz
Δf_T at 10.0 VDC (=$f_{10°C} - f_{Tnom}$)	=	+.385	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	0	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	0	dB
ΔP_T at 10.0 VDC (=$P_{10°C} - P_{Tnom}$)	=	-.1	dB

Accept ✓ Reject _____

Test Performed by DH Date 10/7/97
Litton Q.A. _____ Date OCT 16 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56248	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A
SERIAL NUMBER: 85029 QUAL TEST _____
AESD 1336610- 5
ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-1.0	°C	Table IIIB
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	185	mA	Table IIIB
Input Power, P_{diss}	1.85	W DC	Pdiss max
Frequency, f_{Tmin}	53.597468	GHz	Table IIIB
RF Output Power, P_{Tmin}	12.2	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	-1.0	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	182	mA	Table IIIB
Frequency, f_{meas}	53.597478	GHz	Table IIIB
RF Output Power, P_{meas}	12.2	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	-1.0	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	183	mA	Table IIIB
Frequency, f_{meas}	53.597486	GHz	Table IIIB
RF Output Power, P_{meas}	12.2	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	+.010	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	+.018	MHz
Δf_T at 10.0 VDC (=$f_{Tmin} - f_{Tnom}$)		+.698	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	0	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	0	dB
ΔP_T at 10.0 VDC (=$P_{Tmin} - P_{Tnom}$)	=	-.2	dB

Accept ✓ Reject _____

Test Performed by DH Date 10/7/97
Litton Q.A. _____ Date OCT 16 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 40 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A
SERIAL NUMBER: 85029 QUAL TEST _____
AESD 1336610- 5
ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	30.5	°C	30° ± 1°C
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	187	mA	Table IIIB
Input Power, P_{diss}	1.87	W DC	Pdiss max
Frequency, $f_{30°C}$	53.496372	GHz	Table IIIB
RF Output Power, $P_{30°C}$	12.3	dBm	12 to 17 dBm
Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3			
Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	30.4	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	185	mA	Table IIIB
Frequency, f_{meas}	53.596380	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	30.2	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	185	mA	Table IIIB
Frequency, f_{meas}	53.596386	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	+.008	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	+.014	MHz
Δf_T at 10.0 VDC ($=f_{30°C} - f_{Tnom}$)	=	-.398	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	0	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	0	dB
ΔP_T at 10.0 VDC ($=P_{30°C} - P_{Tnom}$)	=	-.1	dB

Accept ✓ Reject _____

Test Performed by DH Date 10/7/97
Litton Q.A. _____ Date _____

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A
SERIAL NUMBER: 85029 QUAL TEST _____
AESD 1336610- 5
ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	44.1	°C	Table IIIB
Input Voltage	10.0	VDC	10.0 ± 0.2 VDC
Input Current	187	mA	Table IIIB
Input Power, P_{diss}	1.87	W DC	Pdiss max
Frequency, f_{Tmax}	53.595332	GHz	Table IIIB
RF Output Power, P_{Tmax}	12.3	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	44.4	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	185	mA	Table IIIB
Frequency, f_{meas}	53.595332	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	44.5	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	186	mA	Table IIIB
Frequency, f_{meas}	53.595336	GHz	Table IIIB
RF Output Power, P_{meas}	12.3	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	0	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	+.004	MHz
Δf_T at 10.0V (=f_{Tmax} -f_{Tnom})	=	-1.438	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	0	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	0	dB
ΔP_T at 10.0 VDC (=P_{Tmax}-P_{Tnom})	=	-.1	dB

Accept ✓ Reject _____

Test Performed by DH Date 10/7/97
Litton Q.A. _____ Date OCT 16 1997

LITTON M 9

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AG/A — AESD 1336610-5
SERIAL NUMBER: 85029 — QUAL TEST _____ — ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION		LIMITS
Output Open and Short. Ref. Test Para. 5.9.5		
Temperature	23.0 °C	24°C ± 5°C
Frequency:	53.596733 GHz	Table IIIB
RF Output Power:	12.3 dBm	12 to 17 dBm
Input Voltage	10.0 VDC	10 ± 0.2 VDC
Input Current:	186 mA	Table IIIB
Results:	✓ Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	+.804 MHz (Positive)	Table IIIB
	-.003 MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	+.716 MHz (Positive)	Table IIIB
	-1.438 MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	0 dB (Positive)	1.0 dB
	-.5 dB (Negative)	-1.0 dB

Accept ✓ Reject _____

Test Performed by D H — Date 10/10/97

Litton Q.A. G M — Date OCT 16 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 61 OF 68
56348	A	1300823	B3	

Channel 6 LO

DRO (P/N: 1336610-6, S/N: 85024)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E9036AH/A AESD 1336610-6
SERIAL NUMBER: 85024 QUAL TEST ✓ ACCEPT TEST N/A

Basic Electrical Test: Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	191 mA	Table IIIB
Input Power, P_{diss}	1.91 W DC	P_{diss} max
Frequency, f_{Tnom}	54.400 08 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.3 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.08 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at ——— VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	189 mA	Table IIIB
Frequency, f_{meas}	54.40008 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at ——— VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	190 mA	Table IIIB
Frequency, f_{meas}	54.40009 GHz	Table IIIB
RF Output Power, P_{meas}	12.3 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$

Δf_V at 9.5 VDC or at ——— VDC = 0 MHz
Δf_V at 10.5 VDC or at ——— VDC = 0.01 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$

ΔP_V at 9.5 VDC or at ——— VDC = 0 dB
ΔP_V at 10.5 VDC or at ——— VDC = 0 dB

Accept ✓ Reject ———

Test Performed by [signature] Date 3-14-98
Litton QA [signature] Date ~~MAR 2 0 1998~~

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AH/A AESD 1336610- 6
SERIAL NUMBER: 85024 QUAL TEST ✓ ACCEPT TEST N/A

Temperature Testing at T=10°C. Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	10	°C	10° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	191	mA	Table IIIB
Input Power, P_{diss}	1.91	W DC	Pdiss max
Frequency, $f_{10°C}$	54.39999	GHz	Table IIIB
RF Output Power, $P_{10°C}$	13.3	dBm	12 to 17 dBm
Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1			
Measurement at 9.5 VDC or at ~ VDC			
Temperature	10	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	189	mA	Table IIIB
Frequency, f_{meas}	54.39999	GHz	Table IIIB
RF Output Power, P_{meas}	13.3	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at ~ VDC			
Temperature	10	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	189	mA	Table IIIB
Frequency, f_{meas}	54.40000	GHz	Table IIIB
RF Output Power, P_{meas}	13.3	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at ~	VDC =	0	MHz
Δf_V at 10.5 VDC or at ~	VDC =	0.01	MHz
Δf_T at 10.0 VDC (=$f_{10°C} - f_{Tnom}$)	=	- 0.09	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at ~	VDC =	0	dB
ΔP_V at 10.5 VDC or at ~	VDC =	0	dB
ΔP_T at 10.0 VDC (=$P_{10°C} - P_{Tnom}$)	=	0	dB

Accept ✓ Reject _____

Test Performed by DH 3-18-98 Date 3-14-98
Litton Q.A. _____ Date MAR 20 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 AH/A
SERIAL NUMBER: 85024 QUAL TEST ✓
AESD 1336610- 6
ACCEPT TEST N/A

Temperature Extreme Testing at Tmin. Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	0	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	190	mA	Table IIIB
Input Power, P_{diss}	1.90	W DC	Pdiss max
Frequency, f_{Tmin}	54.39984	GHz	Table IIIB
RF Output Power, P_{Tmin}	13.35	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at — VDC			
Temperature	0	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	188	mA	Table IIIB
Frequency, f_{meas}	54.39984	GHz	Table IIIB
RF Output Power, P_{meas}	13.35	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at — VDC			
Temperature	0	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	189	mA	Table IIIB
Frequency, f_{meas}	54.39985	GHz	Table IIIB
RF Output Power, P_{meas}	13.35	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at —	VDC =	0	MHz
Δf_V at 10.5 VDC or at —	VDC =	0.01	MHz
Δf_T at 10.0 VDC (=$f_{Tmin} - f_{Tnom}$)		- 0.24	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at —	VDC =	0	dB
ΔP_V at 10.5 VDC or at —	VDC =	0	dB
ΔP_T at 10.0 VDC (=$P_{Tmin} - P_{Tnom}$)	=	0.05	dB

Accept ✓ Reject —

Test Performed by DM Date 3-14-98
Litton Q.A. 09 M Date ~~MAR 2 0 '98~~

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 40 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AH/A AESD 1336610- 6
SERIAL NUMBER: 85024 QUAL TEST ✓ ACCEPT TEST N/A

Temperature Testing at T=30°C. Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	31	°C	30° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	192	mA	Table IIIB
Input Power, P_{diss}	1.92	W DC	Pdiss max
Frequency, $f_{30°C}$	54.40022	GHz	Table IIIB
RF Output Power, $P_{30°C}$	13.2	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at ~ VDC			
Temperature	31	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	190	mA	Table IIIB
Frequency, f_{meas}	54.40023	GHz	Table IIIB
RF Output Power, P_{meas}	13.2	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at ~ VDC			
Temperature	31	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	190	mA	Table IIIB
Frequency, f_{meas}	54.40023	GHz	Table IIIB
RF Output Power, P_{meas}	13.2	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at ~	VDC =	0.01	MHz
Δf_V at 10.5 VDC or at ~	VDC =	0.01	MHz
Δf_T at 10.0 VDC (=$f_{30°C} - f_{Tnom}$)	=	0.15	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at ~	VDC =	0	dB
ΔP_V at 10.5 VDC or at ~	VDC =	0	dB
ΔP_T at 10.0 VDC (=$P_{30°C} - P_{Tnom}$)	=	-0.1	dB

Accept ✓ Reject _____

Test Performed by DM Date 3-14-98
Litton Q.A. Date MAR 20 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E9036AH/A
SERIAL NUMBER: 85024 QUAL TEST ✓ AESD 1336610- 6
ACCEPT TEST N/A

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	192	mA	Table IIIB
Input Power, P_{diss}	1.92	W DC	Pdiss max
Frequency, f_{Tmax}	54.39999	GHz	Table IIIB
RF Output Power, P_{Tmax}	13.0	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at ~ VDC			
Temperature	44	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	191	mA	Table IIIB
Frequency, f_{meas}	54.39998	GHz	Table IIIB
RF Output Power, P_{meas}	13.0	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at ~ VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	191	mA	Table IIIB
Frequency, f_{meas}	54.39996	GHz	Table IIIB
RF Output Power, P_{meas}	13.0	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at ~	VDC =	0.01	MHz
Δf_V at 10.5 VDC or at ~	VDC =	-0.03	MHz
Δf_T at 10.0V ($=f_{Tmax} - f_{Tnom}$)	=	-0.09	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at ~	VDC =	0	dB
ΔP_V at 10.5 VDC or at ~	VDC =	0	dB
ΔP_T at 10.0 VDC ($=P_{Tmax} - P_{Tnom}$)	=	-0.3	dB

Accept ✓ Reject ____

Test Performed by [signature] Date 3-14-98
Litton Q.A. LITTON M60 Date MAR 20 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.7
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E 9036 A H/A AESD 1336610- 6
SERIAL NUMBER: 85024 QUAL TEST ✓ ACCEPT TEST N/A

Power Supply Immunity, Ref. Test Para. 5.2.4

SPECIFICATION	MEASUREMENT AT Tnom ±1°C		LIMIT
Initial Measurement			
Temperature	22	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	191	mA	Table IIIB
Input Power	1.91	W DC	Pdiss max
Frequency (f_{Tnom})	54.40027	GHz	Table IIIB
RF Output Power	13.3	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.27	MHz	

Performance After Short Circuit on Power Supply: Ref Test Para 5.2.4.2

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	192	mA	Table IIIB
Input Power	1.92	W DC	Pdiss max
Frequency	54.40022	GHz	Table IIIB
RF Output Power	13.3	dBm	12 to 17 dBm

Over Voltage: Ref Test Para 5.2.4.3

Overvoltage Input Voltage	28	VDC	+28V

Performance After Input Overvoltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	191	mA	Table IIIB
Input Power	1.91	W DC	Pdiss max
Frequency	54.40025	GHz	Table IIIB
RF Output Power	13.3	dBm	12 to 17 dBm

Reverse Polarity: Ref Test Para 5.2.4.4

Reverse Input Voltage	-10	VDC	-10.0 ± 0.2 VDC

Performance After Reverse Input Voltage

Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	191	mA	Table IIIB
Input Power	1.91	W DC	Pdiss max
Frequency, f_{Tnom}	54.40023	GHz	Table IIIB
RF Output Power	13.3	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	0.23	MHz	

Accept ✓ Reject
Test Performed by [signature] Date 3-14-98
Litton Q.A. [signature] Date MAR 20 1998

LITTON
Solid State

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 A+/A AESD 1336610-6
SERIAL NUMBER: 85024 QUAL TEST ✓ ACCEPT TEST N/A

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION		LIMITS
Output Open and Short. Ref. Test Para. 5.9.5		
Temperature	23 °C	24°C ± 5°C
Frequency:	54.40036 GHz	Table IIIB
RF Output Power:	13.3 dBm	12 to 17 dBm
Input Voltage	10 VDC	10 ± 0.2 VDC
Input Current:	192 mA	Table IIIB
Results:	✓ Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	0.47 MHz (Positive)	Table IIIB
	-0.17 MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	0.16 MHz (Positive)	Table IIIB
	-0.27 MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	0.35 dB (Positive)	1.0 dB
	-0.6 dB (Negative)	-1.0 dB

Accept ✓ Reject _____

Test Performed by DM Date 3-17-98

Litton Q.A. _____ Date MAR 20 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 61 OF 68
56348	A	1300823	B3	

Channel 7 LO

DRO (P/N: 1336610-7, S/N: 85022)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET ✓ FINAL DATA SET _____

LITTON TYPE LS E 9036 AJ/A
SERIAL NUMBER: 85022 QUAL TEST _____ AESD 1336610- 7
ACCEPT TEST ✓

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	21.6 °C	Table IIIB
Input Voltage	10.00 VDC	10.0 ± 0.2 VDC
Input Current	194 mA	Table IIIB
Input Power, P_{diss}	1.94 W DC	P_{diss} max
Frequency, f_{Tnom}	54.939960 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.8 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	- 0.04 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.50 VDC		
Temperature	21.6 °C	Table IIIB
Input Voltage	9.50 VDC	9.5 VDC or Para. 5.2.3.2
Input Current	192 mA	Table IIIB
Frequency, f_{meas}	54.939960 GHz	Table IIIB
RF Output Power, P_{meas}	12.8 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	21.7 °C	Table IIIB
Input Voltage	10.50 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	192 mA	Table IIIB
Frequency, f_{meas}	54.939960 GHz	Table IIIB
RF Output Power, P_{meas}	12.8 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$

Δf_V at 9.5 VDC or at 9.5 VDC = 0 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = 0 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$

ΔP_V at 9.5 VDC or at 9.5 VDC = 0 dB
ΔP_V at 10.5 VDC or at 10.5 VDC = 0 dB

Accept ✓ Reject _____

Test Performed by _____ Date 9/8/97
Litton QA _____ Date SEP 25 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B2	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET ✓ FINAL DATA SET _____

LITTON TYPE LS E 9036 AJ/A
SERIAL NUMBER: 85022 QUAL TEST _____
AESD 1336610- 7
ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	10.7	°C	10° ± 1°C
Input Voltage	10.00	VDC	10.0 ± 0.2 VDC
Input Current	193	mA	Table IIIB
Input Power, P_{diss}	1.93	W DC	Pdiss max
Frequency, $f_{10°C}$	54.939392	GHz	Table IIIB
RF Output Power, $P_{10°C}$	12.7	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	10.6	°C	Table IIIB
Input Voltage	9.50	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	191	mA	Table IIIB
Frequency, f_{meas}	54.939392	GHz	Table IIIB
RF Output Power, P_{meas}	12.7	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	10.6	°C	Table IIIB
Input Voltage	10.50	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	191	mA	Table IIIB
Frequency, f_{meas}	54.939391	GHz	Table IIIB
RF Output Power, P_{meas}	12.7	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	0	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	+.001	MHz
Δf_T at 10.0 VDC ($=f_{T_{min}} - f_{10°C}$)	=	-.569	MHz
		-.568	

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	0	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	0	dB
ΔP_T at 10.0 VDC ($=P_{T_{min}} - P_{10°C}$)	=	-.1	dB

Accept ✓ Reject _____

Test Performed by 001 Date 9/8/97
Litton Q.A. _____ Date SEP 25 1997

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET ✓ FINAL DATA SET _____

LITTON TYPE LS E 9036 AJ/A — AESD 1336610- 7
SERIAL NUMBER: 85022 — QUAL TEST _____ — ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-0.8	°C	Table IIIB
Input Voltage	10.00	VDC	10.0 ± 0.2 VDC
Input Current	192	mA	Table IIIB
Input Power, P_{diss}	1.92	W DC	Pdiss max
Frequency, f_{Tmin}	54.938654	GHz	Table IIIB
RF Output Power, P_{Tmin}	12.6	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	-0.9	°C	Table IIIB
Input Voltage	9.50	VDC	9.5 VDC or Para 5.2.3.2
Input Current	190	mA	Table IIIB
Frequency, f_{meas}	54.938649	GHz	Table IIIB
RF Output Power, P_{meas}	12.6	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	-0.9	°C	Table IIIB
Input Voltage	10.50	VDC	10.5 VDC or Para 5.2.3.3
Input Current	191	mA	Table IIIB
Frequency, f_{meas}	54.938649	GHz	Table IIIB
RF Output Power, P_{meas}	12.6	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	-0.05	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	-0.05	MHz
Δf_T at 10.0 VDC (=f_{Tmin} -f_{Tnom})		-1.306	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	0	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	0	dB
ΔP_T at 10.0 VDC (=P_{Tmin} -P_{Tnom})	=	∈.2	dB

Accept ✓ Reject _____

Test Performed by DH — Date 9/8/97
Litton Q.A. KRUN — Date SEP 25 1997

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET V FINAL DATA SET _____

LITTON TYPE LS E 9036 AJ/A — AESD 1336610- 7
SERIAL NUMBER: 85022 — QUAL TEST _____ — ACCEPT TEST V

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	30	°C	30° ± 1°C
Input Voltage	10.00	VDC	10.0 ± 0.2 VDC
Input Current	195	mA	Table IIIB
Input Power, P_{diss}	1.95	W DC	Pdiss max
Frequency, $f_{30°C}$	54.940344	GHz	Table IIIB
RF Output Power, $P_{30°C}$	12.8	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	29.7	°C	Table IIIB
Input Voltage	9.50	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	193	mA	Table IIIB
Frequency, f_{meas}	54.940338	GHz	Table IIIB
RF Output Power, P_{meas}	12.8	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	29.6	°C	Table IIIB
Input Voltage	10.49	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	193	mA	Table IIIB
Frequency, f_{meas}	54.940330	GHz	Table IIIB
RF Output Power, P_{meas}	12.8	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	-.006	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	-.014	MHz
Δf_T at 10.0 VDC ($=f_{T_{min}} - f_{30°C}$)	=	+0.384	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	ϕ	dB
ΔP_T at 10.0 VDC ($=P_{T_{min}} - P_{30°C}$)	=	ϕ	dB

Accept V Reject _____

Test Performed by DM Date 9/8/97
Litton Q.A. [signature] Date SEP 25 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	B2	

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET ✓ FINAL DATA SET _____

LITTON TYPE LS E 9036 AJ/A AESD 1336610- 7
SERIAL NUMBER: 85022 QUAL TEST _____ ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	44.0	°C	Table IIIB
Input Voltage	10.00	VDC	10.0 ± 0.2 VDC
Input Current	196	mA	Table IIIB
Input Power, P_{diss}	1.96	W DC	Pdiss max
Frequency, f_{Tmax}	54.940336	GHz	Table IIIB
RF Output Power, P_{Tmax}	12.8	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	44.6	°C	Table IIIB
Input Voltage	9.49	VDC	9.5 VDC or Para 5.2.3.2
Input Current	194	mA	Table IIIB
Frequency, f_{meas}	54.940333	GHz	Table IIIB
RF Output Power, P_{meas}	12.8	dBm	12 to 17 dBm

Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	44.9	°C	Table IIIB
Input Voltage	10.50	VDC	10.5 VDC or Para 5.2.3.3
Input Current	194	mA	Table IIIB
Frequency, f_{meas}	54.940328	GHz	Table IIIB
RF Output Power, P_{meas}	12.8	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	-.003	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	-.008	MHz
Δf_T at 10.0V ($=f_{meas_{Tmax}} - f_{Tnom}$)	=	+0.376	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	Ø	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	Ø	dB
ΔP_T at 10.0 VDC ($=P_{meas_{Tmax}} - P_{Tnom}$)	=	Ø	dB

Accept ✓ Reject _____

Test Performed by DM Date 9/8/97
Litton Q.A. _____ Date SEP 25 1997

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET ✓ FINAL DATA SET _____

LITTON TYPE LS E 9036 AJ/A — AESD 1336610-7
SERIAL NUMBER: 85022 QUAL TEST _____ ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION		LIMITS
Output Open and Short. Ref. Test Para. 5.9.5		
Temperature	24.0 °C	24°C ± 5°C
Frequency:	5493994 5 GHz	Table IIIB
RF Output Power:	12.6 dBm	12 to 17 dBm
Input Voltage	10.00 VDC	10 ± 0.2 VDC
Input Current:	194 mA	Table IIIB
Results:	✓ Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	+0.274 MHz (Positive)	Table IIIB
	~~-0.052~~ -0.397 MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	+0.384 MHz (Positive)	Table IIIB
	-1.356 -1.320 MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	+.005 dB (Positive)	1.0 dB
	-0.3 dB (Negative)	-1.0 dB

Accept ✓ Reject _____

Test Performed by DH Date 9/11/97

Litton Q.A. _____ Date SEP 25 1997

Channel 8 LO

DRO (P/N: 1336610-8, S/N: 85076)

Channel 8 LO

DRO (P/N: 1336610-8, S/N: 85076)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A
SERIAL NUMBER: 85076 QUAL TEST _____ AESD 1336610-8
ACCEPT TEST ✓

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	20.8	°C	Table IIIB
Input Voltage	10.00	VDC	10.0 ± 0.2 VDC
Input Current	195	mA	Table IIIB
Input Power, P_{diss}	1.95	W DC	P_{diss} max
Frequency, f_{Tnom}	55.500772	GHz	Table IIIB
RF Output Power, P_{Tnom}	13.0	dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	+.772	MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	21.0	°C	Table IIIB
Input Voltage	9.50	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	193	mA	Table IIIB
Frequency, f_{meas}	55.500775	GHz	Table IIIB
RF Output Power, P_{meas}	13.0	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	21.0	°C	Table IIIB
Input Voltage	10.50	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	194	mA	Table IIIB
Frequency, f_{meas}	55.500779	GHz	Table IIIB
RF Output Power, P_{meas}	13.0	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$,

Δf_V at 9.5 VDC or at 9.5 VDC = +.003 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = +.007 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$,

ΔP_V at 9.5 VDC or at 9.5 VDC = Ø dB
ΔP_V at 10.5 VDC or at 10.5 VDC = Ø dB

Accept ✓ Reject _____

Test Performed by _____ Date 9/22/97
Litton QA _____ Date SEP 25 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 38 OF 68
56348	A	1300823	B2	

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A
SERIAL NUMBER: 85076 QUAL TEST _____
AESD 1336610- 8
ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	10.5	°C	10° ± 1°C
Input Voltage	10.00	VDC	10.0 ± 0.2 VDC
Input Current	194	mA	Table IIIB
Input Power, P_{diss}	1.94	W DC	Pdiss max
Frequency, $f_{10°C}$	55.499973	GHz	Table IIIB
RF Output Power, $P_{10°C}$	13.1	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	10.5	°C	Table IIIB
Input Voltage	9.50	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	192	mA	Table IIIB
Frequency, f_{meas}	55.499970	GHz	Table IIIB
RF Output Power, P_{meas}	13.1	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	10.5	°C	Table IIIB
Input Voltage	10.50	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	193	mA	Table IIIB
Frequency, f_{meas}	55.499981	GHz	Table IIIB
RF Output Power, P_{meas}	13.1	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	-.003	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	+.008	MHz
Δf_T at 10.0 VDC ($=f_{T_{10°C}} - f_{10°C}$) $T_{10°C} - T_{NORM}$	=	-.799	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	ϕ	dB
ΔP_T at 10.0 VDC ($=P_{T_{10°C}} - P_{T_{NORM}}$)	=	+.1	dB

Accept ✓ Reject _____

Test Performed by DH Date 9/22/97
Litton Q.A. Litton Date SEP 25 1997

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	B2	

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A — AESD 1336610- 8
SERIAL NUMBER: 85076 — QUAL TEST _____ — ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-1.5	°C	Table IIIB
Input Voltage	10.00	VDC	10.0 ± 0.2 VDC
Input Current	194	mA	Table IIIB
Input Power, P_{diss}	1.94	W DC	Pdiss max
Frequency, f_{Tmin}	55.499053	GHz	Table IIIB
RF Output Power, P_{Tmin}	13.1	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	-1.5	°C	Table IIIB
Input Voltage	9.50	VDC	9.5 VDC or Para 5.2.3.2
Input Current	191	mA	Table IIIB
Frequency, f_{meas}	55.499050	GHz	Table IIIB
RF Output Power, P_{meas}	13.1	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	-1.4	°C	Table IIIB
Input Voltage	10.50	VDC	10.5 VDC or Para 5.2.3.3
Input Current	192	mA	Table IIIB
Frequency, f_{meas}	55.499056	GHz	Table IIIB
RF Output Power, P_{meas}	13.1	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	-.003	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	+.003	MHz
Δf_T at 10.0 VDC (=f_{Tmin} -f_{Tnom})		-1.719	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	∅	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	∅	dB
ΔP_T at 10.0 VDC (=P_{Tmin} -P_{Tnom})	=	+.1	dB

Accept ✓ Reject _____

Test Performed by _____ Date 9/22/97
Litton Q.A. _____ Date SEP 25 1997

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET_____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A
SERIAL NUMBER: 85076 QUAL TEST _____
AESD 1336610- 8
ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	29.6	°C	30° ± 1°C
Input Voltage	10.00	VDC	10.0 ± 0.2 VDC
Input Current	196	mA	Table IIIB
Input Power, P_{diss}	1.96	W DC	Pdiss max
Frequency, $f_{30°C}$	55.501230	GHz	Table IIIB
RF Output Power, $P_{30°C}$	13.0	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	29.8	°C	Table IIIB
Input Voltage	9.50	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	194	mA	Table IIIB
Frequency, f_{meas}	55.501242	GHz	Table IIIB
RF Output Power, P_{meas}	13.0	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	29.5	°C	Table IIIB
Input Voltage	10.50	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	194	mA	Table IIIB
Frequency, f_{meas}	55.501218	GHz	Table IIIB
RF Output Power, P_{meas}	13.0	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	+.012	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	-.012	MHz
Δf_T at 10.0 VDC (=$f_{Tmin} - f_{30°C}$)	=	+.446	MHz
		+.458	

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	ϕ	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	ϕ	dB
ΔP_T at 10.0 VDC (=$P_{Tmin} - P_{30°C}$)	=	ϕ	dB

Accept ✓ Reject _____

Test Performed by _____ Date 9/22/97
Litton Q.A. LITTON Date SEP 25 1997

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A
SERIAL NUMBER: 85076 QUAL TEST _____
AESD 1336610- 8
ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	44.4	°C	Table IIIB
Input Voltage	10.00	VDC	10.0 ± 0.2 VDC
Input Current	197	mA	Table IIIB
Input Power, P_{diss}	1.97	W DC	Pdiss max
Frequency, f_{Tmax}	55.501354	GHz	Table IIIB
RF Output Power, P_{Tmax}	13.0	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	44.0	°C	Table IIIB
Input Voltage	9.50	VDC	9.5 VDC or Para 5.2.3.2
Input Current	195	mA	Table IIIB
Frequency, f_{meas}	56.501365	GHz	Table IIIB
RF Output Power, P_{meas}	13.0	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	44.8	°C	Table IIIB
Input Voltage	10.50	VDC	10.5 VDC or Para 5.2.3.3
Input Current	195	mA	Table IIIB
Frequency, f_{meas}	55.501335	GHz	Table IIIB
RF Output Power, P_{meas}	13.0	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	+.011	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	-.019	MHz
Δf_T at 10.0V ($=f_{meas} - f_{Tmax}$)	=	+.582	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	0	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	0	dB
ΔP_T at 10.0 VDC ($=P_{meas} - P_{Tmax}$)	=	0	dB

Accept ✓ Reject _____

Test Performed by PH Date 9/22/97
Litton Q.A. _____ Date SEP 25 [illegible]

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
56348	A	1300823	B2	

LITTON
Solid State

TEST DATA SHEET 7.23B
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET _____ FINAL DATA SET ✓

LITTON TYPE LS E 9036 AK/A
SERIAL NUMBER: 85076 QUAL TEST _____

AESD 1336610-8
ACCEPT TEST ✓

Frequency Pulling and Load VSWR 2.5:1 max. all phases. Ref Test Para. 5.9

TEST DESCRIPTION			LIMITS
Output Open and Short. Ref. Test Para. 5.9.5			
Temperature	22.1	°C	24°C ± 5°C
Frequency:	55.520701	GHz	Table IIIB
RF Output Power:	13.0	dBm	12 to 17 dBm
Input Voltage	10.00	VDC	10 ± 0.2 VDC
Input Current:	195	mA	Table IIIB
Results:	✓	Acceptable	No Damage or Degradation

Calculate maximum Frequency Accuracy (both positive and negative),
$\Delta f_{acc} = \Delta f_S$ (Use worst-case Δf_S from 7.2, 7.7, and 7.22A) + Δf_H (from 7.22A) + Δf_L (from 7.23A):

Maximum Δf_{acc} =	+.799	MHz (Positive)	Table IIIB
	-.030	MHz (Negative)	Table IIIB

Calculate maximum Short-term Frequency Stability (both positive and negative),
$\Delta f_{V+T} = \Delta f_V + \Delta f_T$ (Use worst-case Δf_V and Δf_T from 7.2 thru 7.6):

Maximum Δf_{V+T} =	+.594	MHz (Positive)	Table IIIB
	-1.198	MHz (Negative)	Table IIIB

Calculate maximum overall RF Output Power Stability (both positive and negative),
$\Delta P_{OV} = \Delta P_V + \Delta P_T$ (Use worst-case ΔP_V and ΔP_T from 7.2 thru 7.6) + ΔP_H (from 7.22A) + ΔP_L (from 7.23A):

Maximum ΔP_{OV} =	+.5 dB	dB (Positive)	1.0 dB
	-.4 dB	dB (Negative)	-1.0 dB

Accept ✓ Reject _____

Test Performed by DH Date 9/24/97

Litton Q.A. _____ Date SEP 25 1997

Channels 9-14 LOs

PLO No. 1 (P/N: 1348360-1, S/N: F01)
TCXO No.1 (P/N: 1348325-1, S/N: 9702-48683)

PLO N0. 2 (P/N: 1348360-1, S/N: F02)
TCXO No.2 (P/N: 1348325-1, S/N: 9702-48684)

Summary of Test Results for AMSU-A Phase Locked Oscillator Testing
Serial Numbers F01 and F02

Both PLO F01 and PLO F02 meet all requirements as defined in AE-26633, the PLO product specification. The following table summarizes how each unit meets and exceeds each requirement.

Paragraph	Description	Requirements	F01	F02
3.2.1.1	Input Voltage and Current	600 mA max, +15V 100 mA max, -15V	531 mA for +15V 64 mA for -15V	497 mA for +15V 64 mA for -15V
3.2.1.2	Operating Temperature	+1°C to +44°C	-16°C to +60°C***	-11°C to +52°C***
3.2.1.3	Start-up	All loads, -30°C and + 60 °C; in vacuum	-30°C and +60°C in vacuum	-30°C and +60°C in vacuum
3.2.1.4 & 3.2.1.5	Frequency Stability from 57.290344 GHz at 22 °C	± 200 kHz	+ 40 kHz, -15 kHz	+0 kHz, -22 kHz
3.2.1.6	RF Output Power	17 to 20 dBm	18.87 dBm	19.84 dBm
3.2.1.7	Output Power Stability	< 1.5 dB	-0.9 dB, +0.35 dB	-0.69 dB, +0.16 dB
3.2.1.8	Load VSWR	2.01:1 or less	Verified	Verified
3.2.1.9	AM Noise	< -130 dBc/Hz @ 1 MHz	-135 dBc/Hz @ 1 MHz -140 dBc/Hz @ >8 MHz*	-136 dBc/Hz @ 1 MHz -143 dBc/Hz @ > 8 MHz*
3.2.1.10	FM Noise	< -100 dBc/Hz @ 1 MHz	-102 dBc/Hz @ 1 MHz -128 dBc/Hz @ > 8 MHz*	-102 dBc/Hz @ 1 MHz -127 dBc/Hz @ > 8 MHz*
3.2.1.11	Spurious and Sub Harmonic Signals	< -90 dBc (No Spur in 110 MHz to 400 MHz)	Better than -92 dBc**	Better than -91 dBc**
3.2.1.12	Harmonics	< 30 dBc	Below -66 dBc	Below -61 dBc
3.2.1.14	Warm-up time	< 30 minutes	Verified	Verified
3.2.1.15	Grounding and Shielding		By Design	By Design
3.2.1.16	Input Voltage Protection		By Design	By Design
3.2.1.17	Reverse Polarity Protection		By Design	By Design
	Environmental Testing			
	Microphonics	AE-26633	TCXO Test	TCXO Test
	Radiation Hardness	AE-26633	By Analysis	By Analysis
	EMI/RFI	AE-26633	Verified	Not Required
	Vibration	AE-26633	Qualification Level	Acceptance Level
	Thermal Vacuum	AE-26633	Yes	Yes
	Weight	2.00 lbs	2.00 lbs	2.00 lbs.

* AMSU-A System Required Frequency
** Spectrum Analyzer Noise Floor = -92 dBm
*** PLO Lockable in this range

TEST DATA SHEET 6 (Sheet 1 of 7)
Functional Testing (Paragraph 4.2.1)

Test Setup Verified: Mark Gilbert
Signature

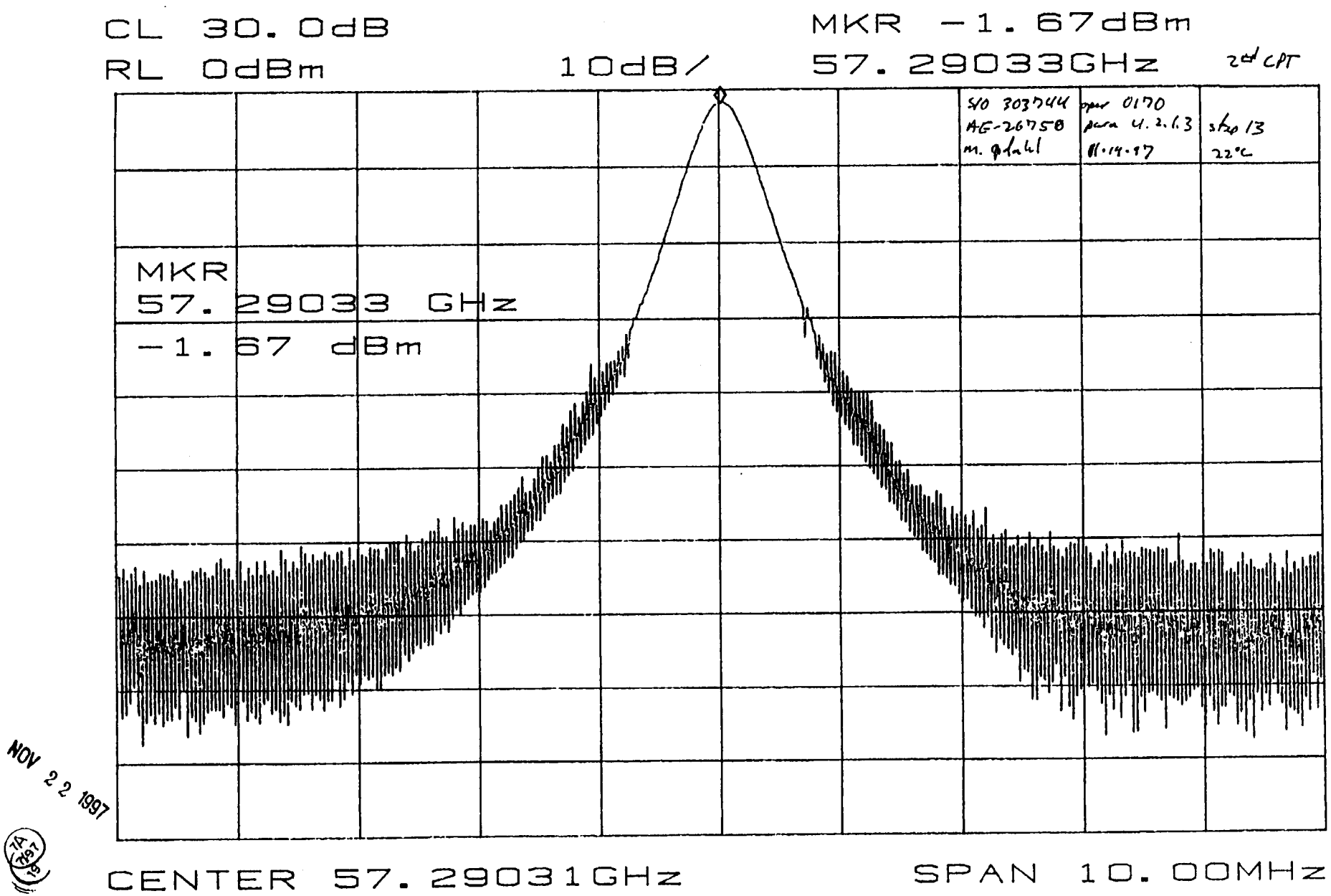
S/O 303744 oper 01.00
AE-26758 para 4.2.1.3
11.19.97

Paragraph 4.2.1.3, Functional Testing:

Step	Test	Expected	Measured	Pass/Fail
~~10~~	~~Current Time~~		~~Time~~	
4	Evacuate vacuum chamber and record pressure	$<10^{-3}$ torr	Pressure = 2.5x10^{-5} torr	Pass
5	Thermal couple readings	TC1 = 22 ± 2 °C	TC1 = 22.5 °C	Pass
		~~TC2 = 22 ± 4 °C~~	TC2 = 25.1 °C	N/A
		~~TC3 = 22 ± 6 °C~~	TC3 = 27.4 °C	N/A
6	~~Record Time and Calculate elapsed Time~~	~~> 30 min~~	~~Current Time~~ ~~Elapsed Time ____ min~~	
7	~~Power On time~~		~~Time~~	
	DRO L/A	< 1V	DRO L/A = .127 V	Pass
	PLO L/A	<1 V	PLO L/A = .123 V	Pass
	Is PLO locked?	Yes	Yes X No ____	Pass
8	~~Warm Up Time~~			
	~~Current Time~~		~~Time~~	
		~~5 to 10 minutes~~	~~Δ Time~~	
	PLO Frequency	57.290344 GHz ± 100 kHz	$Freq_{PLO}$ = 57.290 GHz 340 290	Pass
	PLO Power	17 to 20 dBm	P_{DRO} = 19.97 dBm	Pass
9	Input Voltage and Current			
	VM1 Voltage	+15 ± 0.1 V	VM1 = 15.02 V	Pass
	VM2 Voltage	-15 ± 0.1 V	VM2 = -14.997 V	Pass
	IM1 Current	600mA ~~400 to 500 mA~~ max	IM1 = 517 mA	Pass
	IM2 Current	100mA ~~80 to 120 mA~~ max	IM2 = -61 mA	Pass
	~~VM3 Voltage~~	~~+12 ± 0.1 V~~	~~VM3 = ____ Vo~~	
	~~VM4 Voltage~~	~~-12 ± 0.1 V~~	~~VM4 = ____ Vo~~	
	DRO L/A Voltage	< 1V	DRO L/A = .127 V	Pass
	PLO L/A Voltage	< 1V	PLO L/A = .123 V	Pass
13	RF Output Power and Frequency	17 to 20 dBm	P_{PLO} = 18.97 dBm	Pass
		57.290344 GHz ± 100 kHz	$Freq_{PLO}$ = 57.290340 GHz 291	Pass
14	Frequency vs. Voltage	~~TC1 = 22 ± 2°C~~	~~TC1 = ____ °C~~	Pass
	± 15 V Supplies	+15.2 ± 0.05 V	+Voltage = +15.205 V	Pass
		-15.2 ± 0.05 V	-Voltage = -15.202 V	Pass
			$Freq_{PLO}$ = 57.290340 290 GHz	~~Pass~~ N/A
			P_{PLO} = 18.97 dBm	N/A

Base plate Temp (TC1)

NOV 22 1997


CL 30.0dB
RL 0dBm
10dB/
MKR -1.67dBm
57.29033GHz
2nd CPT
S/O 303744
AG-26758
M. Pahl
oper 0170
para 4.2.6.3
11-14-97
sht 13
22°C
MKR
57.29033 GHz
-1.67 dBm
NOV 22 1997
CENTER 57.29031GHz
SPAN 10.00MHz
*RBW 300kHz
*VBW 300kHz
SWP 50.0ms

PARA	TEST	SPECIFICATION	4.5 FINAL FUNCTIONAL TESTS ±20°C
5.1	**Electronic Tuning Range**		
	Resistance w/fo+375Hz	0Ω to 100kΩ	0 Ω
	Resistance w/fo-375Hz	0Ω to 100kΩ	3.7k Ω
5.2	**Frequency Settability**		
	Frequency Setting	143.22586MHz±71.6Hz	143,225,862 Hz
	Resistor Value	0 to 100kΩ	1.5k Ω
5.3	**Output Frequency**		
		fo±143.2Hz	143,225,865 Hz
5.4	**Input Current**		
		≤ 70 mA	38.29 mA
5.5	**RF Output Power**		
	RF Output Power	+15dBm±1dB	14.74 dBm
5.6	**Frequency and Output Power Stability**		
5.6.2	**Frequency and Output Power vs Voltage**		
step b	Frequency w/Vin=12.00Vdc	fo	143,225,864 Hz
	Power w/Vin=12.00Vdc	+15dBm±1dB (Po)	14.74 dBm
	Frequency w/Vin=12.12Vdc	fo ± 28.6Hz	143,225,868 Hz
	Power w/Vin=12.12Vdc	Po ± 0.5dB	14.85 dBm
	Frequency w/Vin=11.88Vdc	fo ± 28.6Hz	143,225,859 Hz
	Power w/Vin=11.88Vdc	Po ± 0.5dB	14.54 dBm
5.6.4	**Frequency Pulling**		
step a	Freq. w/Load VSWR = 1:1 @ 0°		143,225,864 Hz
step b	Freq. w/Load VSWR = 2:1 @ 0°		143,225,864 Hz
step c	Freq. w/Load VSWR = 1:1 @ 180°		143,225,866 Hz
	Freq. w/Load VSWR = 1:1 @ 90°		143,225,864 Hz
	Freq. w/Load VSWR = 1:1 @ 45°		143,225,866 Hz
	Max. ΔFreq. from step a to c	≤ 14.3Hz	2.0 Hz
5.7	**Harmonics and Spurious**		
	Harmonics	≤ -70dBc	<-70 dBc
	Spurious and Subharmonics	≤ -85dBc	-85 dBc

TESTED BY: [signature]

DATE: 1/9/97

CODE IDENT NO.	DRAWING NO.	REV
14844	A 75519 — 14014	B
FREQUENCY ELECTRONICS, INC.		SHEET 11

A7905-FOR

PARA	TEST	SPECIFICATION	4.5 FINAL FUNCTIONAL TESTS +20°C
5.8	**Phase Noise @:**		
	100Hz	≤ -80dBc	−110 dBc
	1kHz	≤ -115dBc	−139 dBc
	10kHz	≤ -120dBc	−144 dBc
	100kHz	≤ -125dBc	−143 dBc
	1MHz	≤ -130dBc	−142 dBc
	Attach Plot		✓ (√)
5.9	**AM Noise @:**		
	100Hz	≤ -105dBc	−131 dBc
	1kHz	≤ -125dBc	−139 dBc
	10kHz	≤ -130dBc	−150 dBc
	100kHz	≤ -135dBc	−158 dBc
	1MHz	≤ -140dBc	−158 dBc
	Attach Plot		✓ (√)
5.10	**Short Term Stability**		
		±0.1ppm	0.006 ppm
5.6.1	**Frequency vs Temperature**		
	Frequency Δ from -30°C to -1°C	±2005Hz	873.7 Hz
	Frequency Δ from +42°C to +60°C	±2005Hz	286.5 Hz
	Frequency Δ from -1°C to +42°C	±143.2Hz	87.4 Hz
	Power Δ from -1°C to +42°C	±1dB	0.6 dB
	Power Δ from -30°C to +60°C	+13dBm (min)	14.14 dBm
5.6.3	**Frequency and Power Hysteresis**		
	Frequency Hysteresis @ +20°C	±0.3 ppm	0.0 ppm
	Power Hysteresis @ +20°C	±0.25dB	0.01 dB
	Attach Plot		✓ (√)

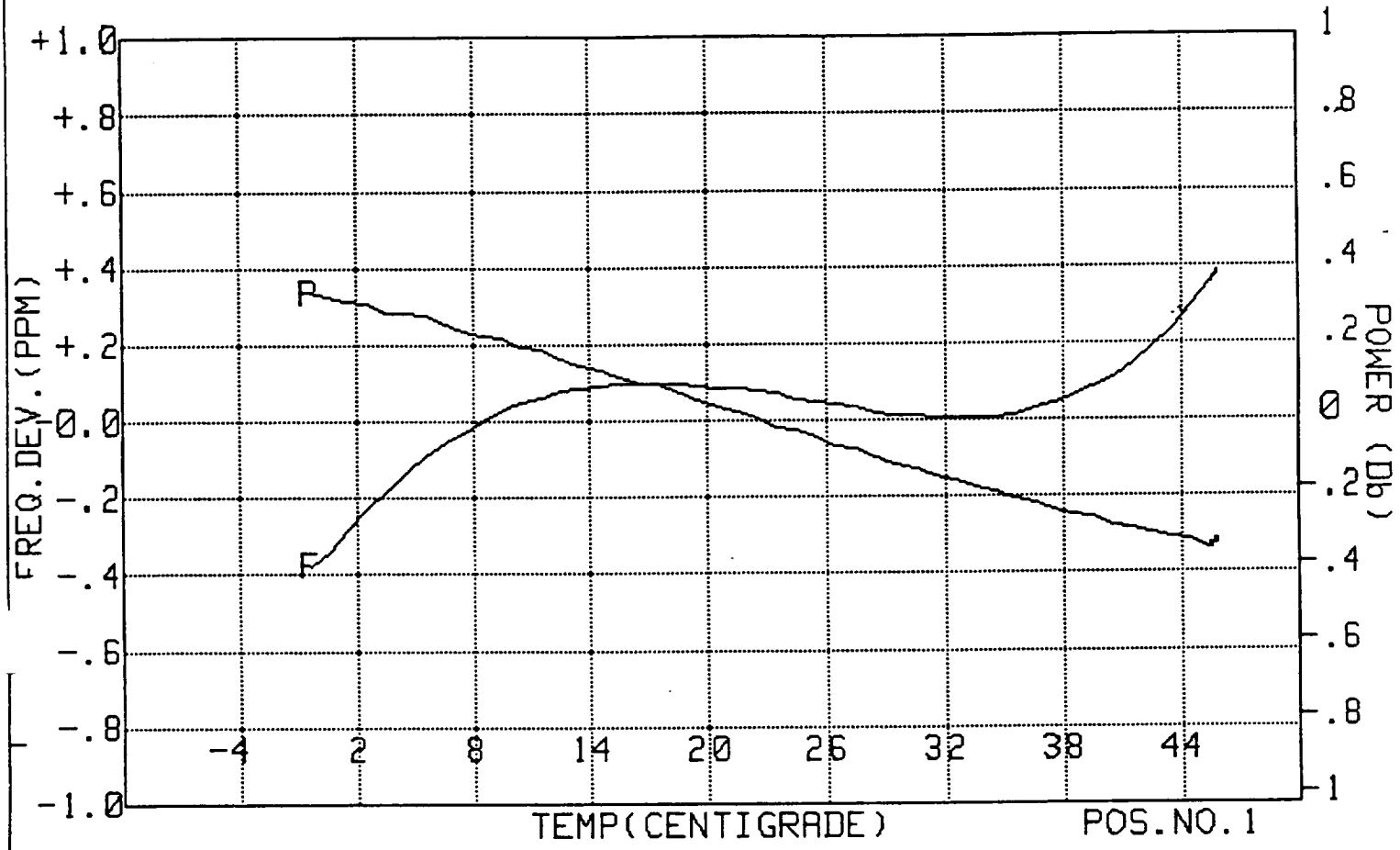
TESTED BY: [signature]

DATE: 1/9/97

OSCILLATOR SLEW RUN PROJ.NO.14118

NOM.FREQ.= 143225860 DUR.OF SLEW= 8.0Hrs SER.NO.02

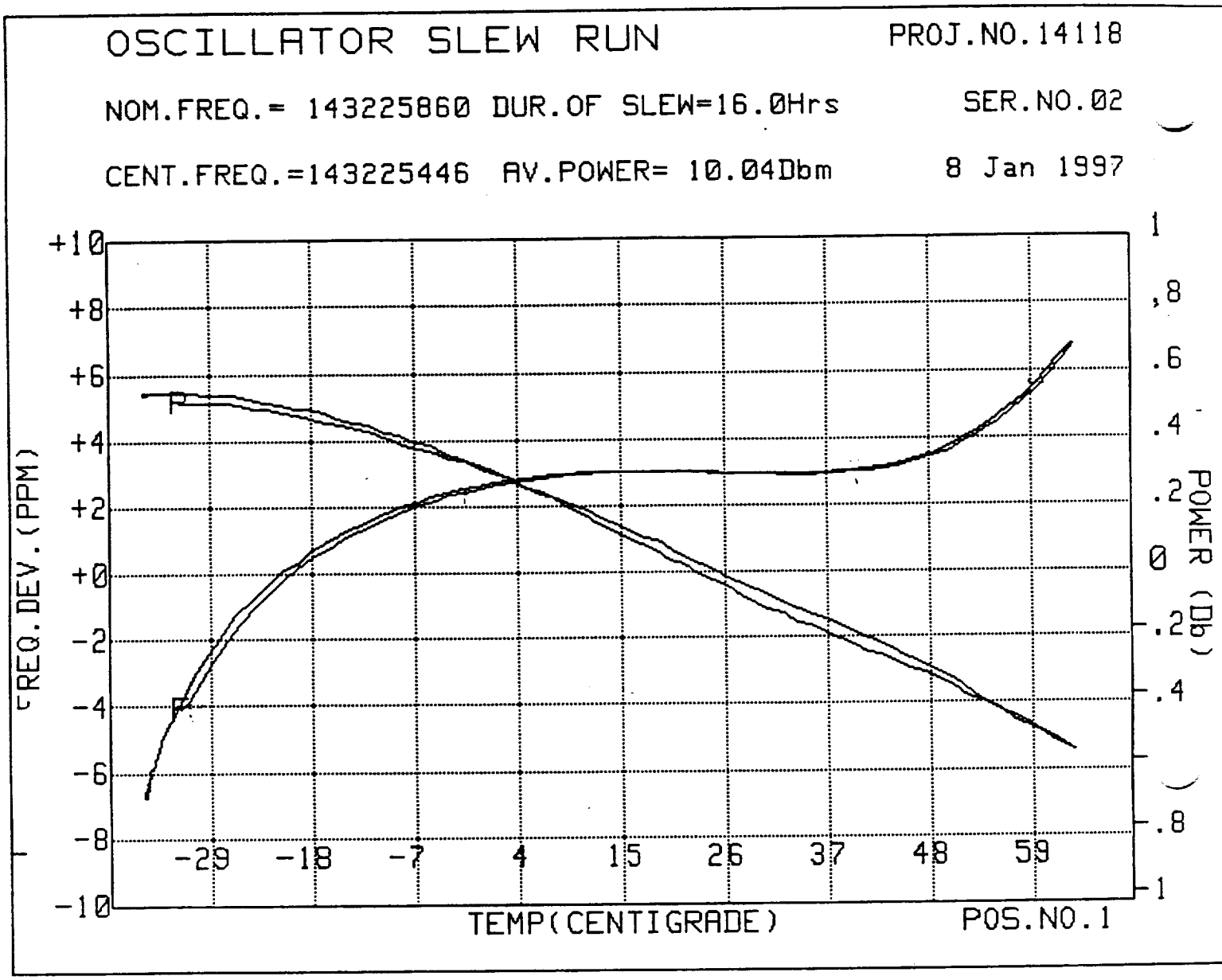
CENT.FREQ.=143225861 AV.POWER= 10.02Dbm 9 Jan 1997



Final functional TEST

PAR. 5.6.1

S/N 9702-48683



Final Functional Test
PAR. 5.6.3
S/N 9702-48683

TEST DATA SHEET 6 (Sheet 1 of 7)
Functional Testing (Paragraph 4.2.1)

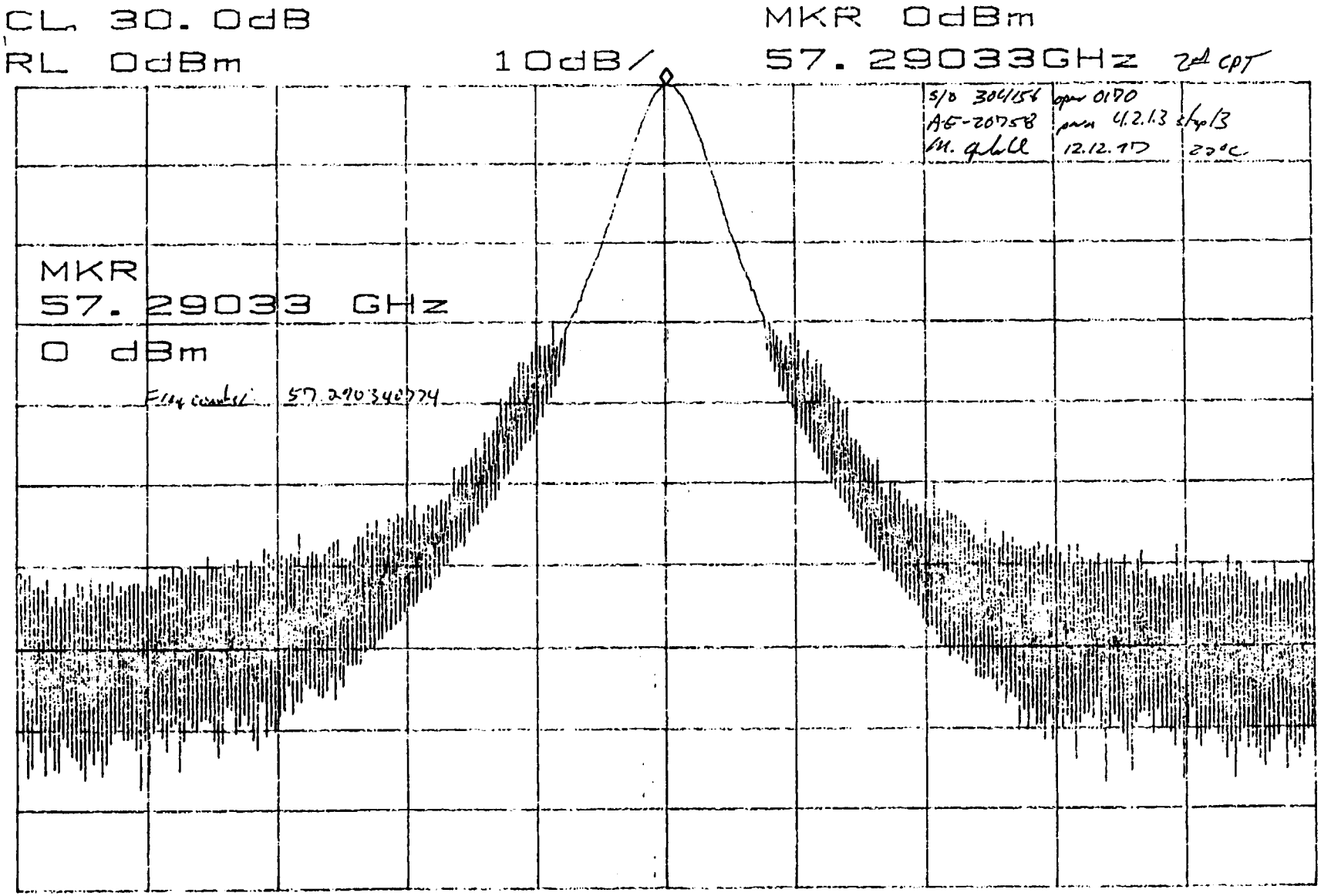
Test Setup Verified: Mark Patel 12/12/97
Signature

Paragraph 4.2.1.3, Functional Testing:

Step	Test	Expected	Measured	Pass/Fail
~~1~~	~~Current Time~~		~~Time~~	
4	Evacuate vacuum chamber and record pressure	$<10^{-2}$ torr	Pressure = _____ torr	
5	Thermal couple readings	TC1 = 22 ± 2 °C	TC1 = 20.4 °C	Pass
		~~TC2 = 22 ± 4 °C~~	TC2 = 20.9 °C	Pass
		~~TC3 = 22 ± 6 °C~~	TC3 = 25.1 °C	Pass
6	~~Record Time and Calculate elapsed Time~~	~~> 30 min~~	~~Current Time~~ _____ ~~Elapsed Time~~ _____ ~~min~~	
7	~~Power On time~~		~~Time~~	
	DRO L/A	< 1V	DRO L/A = .114 V	Pass
	PLO L/A	<1 V	PLO L/A = .119 V	Pass
	Is PLO locked?	Yes	Yes X No _____	Pass
8	~~Warm Up Time~~			
	~~Current Time~~		~~Time~~	
		~~5 to 10 minutes~~	~~Δ Time~~	
	PLO Frequency	57.290344 GHz ± 100 kHz	$Freq_{PLO}$ = 57.290340 GHz	Pass
	PLO Power	17 to 20 dBm	P_{DRO} = 19.84 dBm	Pass
9	Input Voltage and Current			
	VM1 Voltage	+15 ± 0.1 V	VM1 = 15.02 V	Pass
	VM2 Voltage	-15 ± 0.1 V	VM2 = -15.02 V	Pass
	IM1 Current	600 ~~80 to 500 mA~~ max	IM1 = 451 mA	Pass
	IM2 Current	100 ~~80 to 120 mA~~ max	IM2 = 61.7 mA	Pass
	~~VM3 Voltage~~	~~+12 ± 0.1 V~~	~~VM3 =~~ _____ ~~V~~	
	~~VM4 Voltage~~	~~-12 ± 0.1 V~~	~~VM4 =~~ _____ ~~V~~	
	DRO L/A Voltage	< 1V	DRO L/A = .114 V	Pass
	PLO L/A Voltage	< 1V	PLO L/A = .119 V	Pass
13	RF Output Power and	17 to 20 dBm	P_{PLO} = 19.84 dBm	Pass
	~~Frequency~~	57.290344 GHz ± 100 kHz	$Freq_{PLO}$ = 57.290329 GHz	Pass
14	Frequency vs. Voltage	~~TC1 = 22 ± 2°C~~	~~TC1 = 20.4 °C~~	Pass
	± 15 V Supplies	+15.2 ± 0.05 V	+Voltage = 15.20 V	Pass
		-15.2 ± 0.05 V	-Voltage = -15.22 V	Pass
			$Freq_{PLO}$ = 57.290340741 GHz	Pass
			P_{PLO} = 19.85 dBm	Pass

Cover plate off (TC1)

203 I.R. Patel 11/12/97


CL 30.0dB
RL 0dBm
10dB/
MKR 0dBm
57.29033GHz
2nd cpt
s/o 304156
AE-20758
M. Gabell
12.12.97
MKR
57.29033 GHz
0 dBm
CENTER 57.29031GHz
SPAN 10.00MHz
*RBW 300kHz
*VBW 300kHz
SWP 50.0ms
12/12/97

PARA	TEST	SPECIFICATION	4.5 FINAL FUNCTIONAL TESTS +20°C
5.1	**Electronic Tuning Range**		
	Resistance w/fo+375Hz	0Ω to 100kΩ	0 Ω
	Resistance w/fo-375Hz	0Ω to 100kΩ	3.9k Ω
5.2	**Frequency Settability**		
	Frequency Setting	143.22586MHz±71.6Hz	143225844 Hz
	Resistor Value	0 to 100kΩ	1.8k Ω
5.3	**Output Frequency**		
		fo±143.2Hz	143,225,852 Hz
5.4	**Input Current**		
		≤ 70 mA	38.12 mA
5.5	**RF Output Power**		
	RF Output Power	+15dBm±1dB	15.27 dBm
5.6	**Frequency and Output Power Stability**		
5.6.2	**Frequency and Output Power vs Voltage**		
step b	Frequency w/Vin=12.00Vdc	fo	143,225,852 Hz
	Power w/Vin=12.00Vdc	+15dBm±1dB (Po)	15.27 dBm
	Frequency w/Vin=12.12Vdc	fo ± 28.6Hz	143,225,853 Hz
	Power w/Vin=12.12Vdc	Po ± 0.5dB	15.38 dBm
	Frequency w/Vin=11.88Vdc	fo ± 28.6Hz	143,225,850 Hz
	Power w/Vin=11.88Vdc	Po ± 0.5dB	15.16 dBm
5.6.4	**Frequency Pulling**		
step a	Freq. w/Load VSWR = 1:1 @ 0°		143,225,850 Hz
step b	Freq. w/Load VSWR = 2:1 @ 0°		143,225,848 Hz
step c	Freq. w/Load VSWR = 1:1 @ 180°		143,225,850 Hz
	Freq. w/Load VSWR = 1:1 @ 90°		143,225,850 Hz
	Freq. w/Load VSWR = 1:1 @ 45°		143,225,849 Hz
	Max. ΔFreq. from step a to c	≤ 14.3Hz	2.0 Hz
5.7	**Harmonics and Spurious**		
	Harmonics	≤ -70dBc	<-70 dBc
	Spurious and Subharmonics	≤ -85dBc	-85 dBc

TESTED BY: [signature]

DATE: 11/9/97

CODE IDENT NO.	DRAWING NO.	REV
14844	A 75519 — 14014	B
FREQUENCY ELECTRONICS, INC.		SHEET 11

A7905-F01

PARA	TEST	SPECIFICATION	4.5 FINAL FUNCTIONAL TESTS +20°C
5.8	**Phase Noise @:**		
	100Hz	≤ -80dBc	-110 dBc
	1kHz	≤ -115dBc	-138 dBc
	10kHz	≤ -120dBc	-144 dBc
	100kHz	≤ -125dBc	-143 dBc
	1MHz	≤ -130dBc	-141 dBc
	Attach Plot		✓ (√)
5.9	**AM Noise @:**		
	100Hz	≤ -105dBc	-131 dBc
	1kHz	≤ -125dBc	-140 dBc
	10kHz	≤ -130dBc	-150 dBc
	100kHz	≤ -135dBc	-159 dBc
	1MHz	≤ -140dBc	-157 dBc
	Attach Plot		✓ (√)
5.10	**Short Term Stability**		
		±0.1ppm	0.005 ppm
5.6.1	**Frequency vs Temperature**		
	Frequency Δ from -30°C to -1°C	±2005Hz	787.7 Hz
	Frequency Δ from +42°C to +60°C	±2005Hz	286.5 Hz
	Frequency Δ from -1°C to +42°C	±143.2Hz	57.3 Hz
	Power Δ from -1°C to +42°C	±1dB	0.5 dB
	Power Δ from -30°C to +60°C	+13dBm (min)	15.01 dBm
5.6.3	**Frequency and Power Hysteresis**		
	Frequency Hysteresis @ +20°C	±0.3 ppm	0.0 ppm
	Power Hysteresis @ +20°C	±0.25dB	0.0 dB
	Attach Plot		✓ (√)

TESTED BY: _____

DATE: 1/9/97

CODE IDENT NO.	DRAWING NO.	REV
14844	A 75519 — 14014	B

FREQUENCY ELECTRONICS, INC. SHEET 12

OSCILLATOR SLEW RUN

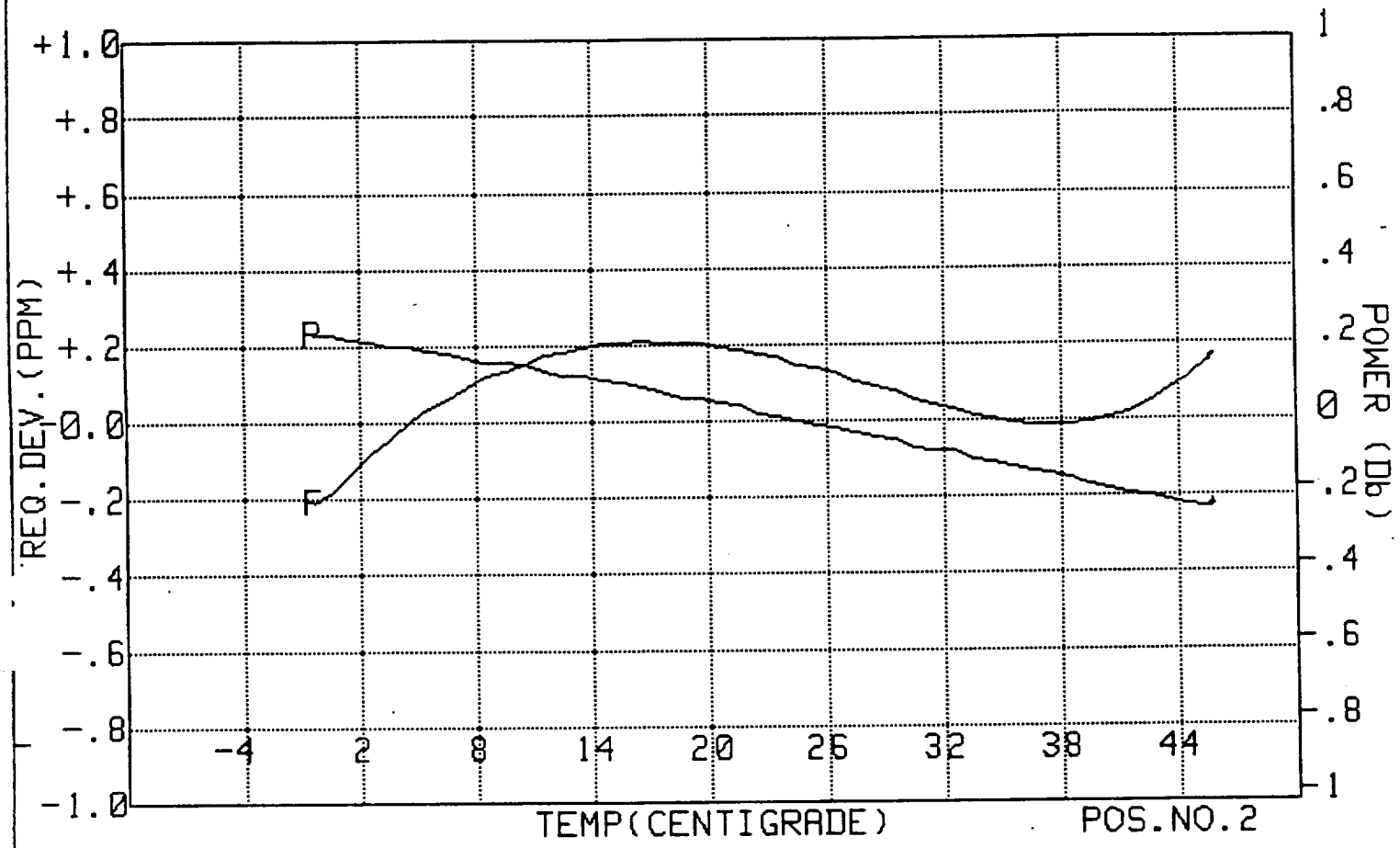
PROJ.NO.14118

NOM.FREQ.= 143225860 DUR.OF SLEW= 8.0Hrs

SER.NO.03

CENT.FREQ.=143225826 AV.POWER= 10.57Dbm

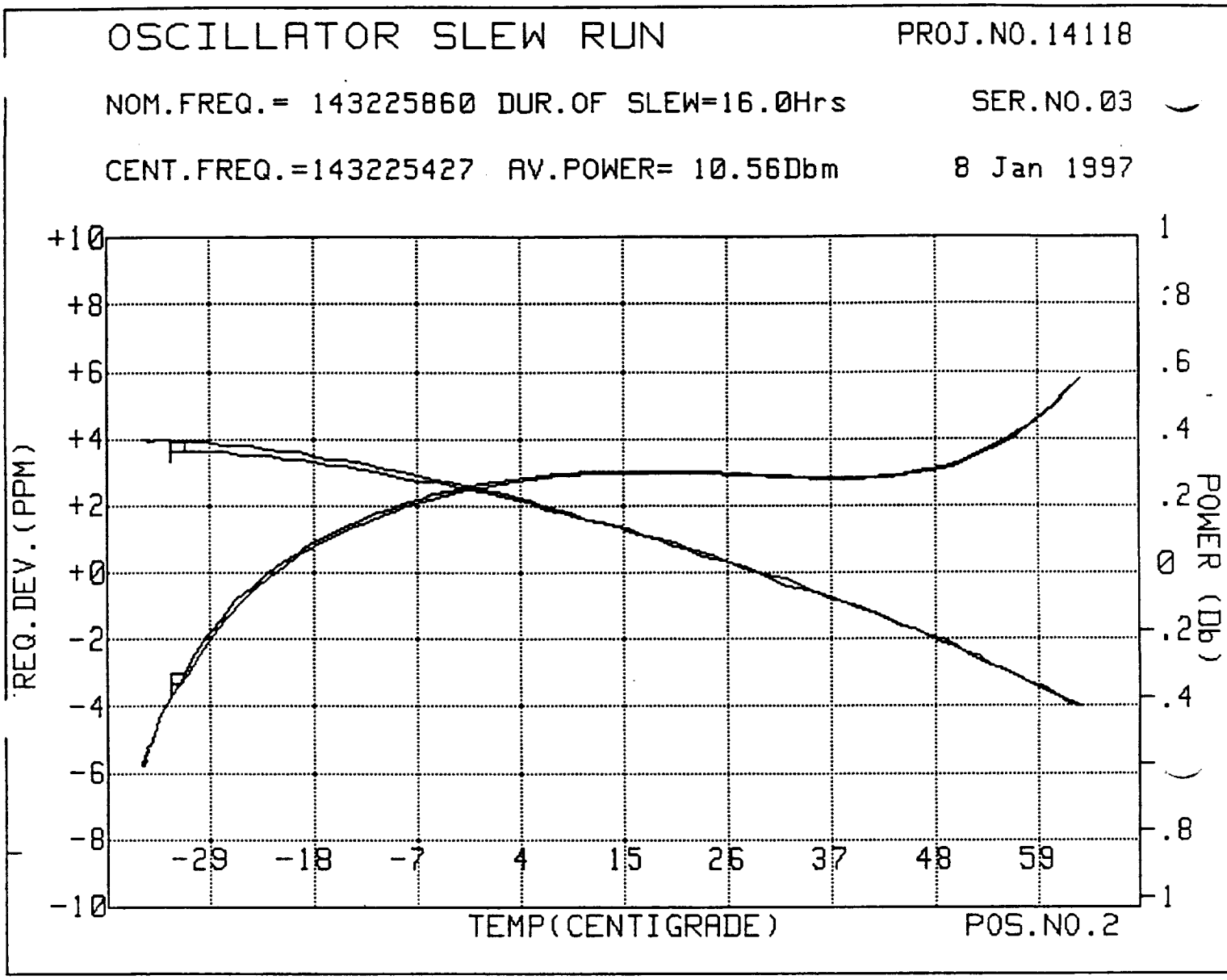
9 Jan 1997



final functional Test

PHR. 5.6.1

SN 9702-48684



Final Functional Test

PAR: 5.6.3

S/N 9702-4868Y

Channel 15 LO

GDO (P/N: 1336610-10, S/N: FM2)

AMSU-A GDO Data Sheet 1

Sequence Description: +20.5°C Comp Test
Millitech Part Number 9050160001; Serial Number FM12
Aerojet Part Number 1336610-10

Date: 4/16/97
Operator: CSX
QC Verify Set-up: MTC 4/16/97

A. Output Power direct: 15.98 dBm; Output Power in test set-up: 13.47 dBm
Output Power Delta: 2.51 dB

B. Unit Temperature: 20.5 °C; Vacuum level: .20 mTorr

C. Baseline Measurements

Vb (volts)	15.0	14.25	15.75	min limit	max limit	Pass/Fail
Vb meas. (Volts)	+15.00	+14.25	+15.75	-.05	+.05	Pass
Ib (mA)	179	179	179	–	230	Pass
fo (GHz)	88.987	88.987	88.987	–	–	
Po (dBm, meas)	+13.47	+13.47	+13.47			
Po (dBm, corr)	+15.98	+15.98	+15.98	13	17	Pass

D. Frequency Pulling, Vb = 15.0 volts; measured 15.00 V

Fref (GHz)	88.987			min limit	max limit	Pass/Fail
Fmax (GHz)	88.9878	+Δ (MHz)	+1.3142	–	+ 5 MHz	Pass
Fmin (GHz)	88.987	- Δ (MHz)	0.3142	-5 MHz	–	Pass

E. Power Pulling

Pref (dBm)	-7.18			min limit	max limit	Pass/Fail
Pmax (dBm)	-7.06	+Δ (dB)	+0.12	–	+0.2dB	Pass
Pmin (dBm)	-7.36	- Δ (dB)	-0.18	-0.2 dB	–	Pass

F. Turn-on current

Vb (volts)	15.0	min limit	max limit	Pass/Fail
Measured Vb	+15.00			Pass
Turn-on current (mA)	179	–	345	Pass
time to peak (ms)	10.8			
time to settle (ms)	10.8			

G. Unit Temperature: 21 °C Vacuum level: 20 mTorr

DATA SHEET ACCEPT/REJECT

Accept	MTC 4/16/97	Reject	
		Test Failure Report No.	
		Report Date	

SIZE	CAGE CODE	DWG. NO.	
A	8V456	TP501600-2	
SCALE	REV. LTR.	A00	SHEET 29

AMSU-A GDO Data Sheet 1

Sequence Description: -2°C Comprehensive Test Date: 4/21/97 - 4/22/97
Millitech Part Number 9050160001; Serial Number EM2 Operator: CST
Aerojet Part Number 1336610-10 QC Verify Set-up: MTC A4 QA

A. Output Power direct: 15.98 dBm; Output Power in test set-up: 13.47 dBm
Output Power Delta: 2.51 dB

B. Unit Temperature: -2 °C; Vacuum level: 15 mTorr

C. Baseline Measurements

Vb (volts)	15.0	14.25	15.75	min limit	max limit	Pass/Fail
Vb meas. (Volts)	+15.00	+14.25	+15.75	-.05	+.05	Pass
Ib (mA)	173	173	173	–	230	Pass
fo (GHz)	58.992	58.992	58.992	–	--	
Po (dBm, meas)	+13.34	+13.34	+13.34			
Po (dBm, corr)	+15.85	+15.85	+15.85	13	17	Pass

D. Frequency Pulling, Vb = 15.0 volts; measured 15.00V

Fref (GHz)	58.992			min limit	max limit	Pass/Fail
Fmax (GHz)	89.4914	+Δ (MHz)	+ 2	–	+ 5 MHz	Pass
Fmin (GHz)	85.489	- Δ (MHz)	- 3	-5 MHz	--	Pass

E. Power Pulling

Pref (dBm)	-6.48		–	min limit	max limit	Pass/Fail
Pmax (dBm)	-6.32	+Δ (dB)	+0.16	–	+0.2dB	Pass
Pmin (dBm)	-6.65	- Δ (dB)	-0.17	-0.2 dB	–	Pass

F. Turn-on current

Vb (volts)	15.0	min limit	max limit	Pass/Fail
Measured Vb	+15.00			Pass
Turn-on current (mA)	173	--	345	Pass
time to peak (ms)	11.0			
time to settle (ms)	11.0			

G. Unit Temperature: -2 °C Vacuum level: 15 mTorr

DATA SHEET ACCEPT/REJECT

Accept	MTC A4 QA	Reject	
		Test Failure Report No.	
		Report Date	

SIZE	CAGE CODE	DWG. NO.
A	8V456	TP501600-2
SCALE	REV. LTR.	SHEET
	A00	29 OF 41

AMSU-A GDO Data Sheet 1

Sequence Description: +43°C Comp Test
Millitech Part Number 9050160001; Serial Number EM2
Aerojet Part Number 1336610-10

Date: COY 4/16/97 4/19/97 - 4/20/97
Operator: COY
QC Verify Set-up: MTC A4 QA

A. Output Power direct: 15.99 dBm; Output Power in test set-up: 13.47 dBm
Output Power Delta: 2.51 dB

B. Unit Temperature: +43 °C; Vacuum level: 18 mTorr

C. Baseline Measurements

Vb (volts)	15.0	14.25	15.75	min limit	max limit	Pass/Fail
Vb meas. (Volts)	+15.00	+14.25	+15.75	-.05	+.05	Pass
Ib (mA)	185	185	185	–	230	Pass
fo (GHz)	88.980	88.980	88.980	–	–	
Po (dBm, meas)	+13.36	+13.36	+13.36			
Po (dBm, corr)	+15.87	+15.87	+15.87	13	17	Pass

D. Frequency Pulling, Vb = 15.0 volts; measured 15.00 V

Fref (GHz)	88.980			min limit	max limit	Pass/Fail
Fmax (GHz)	88.983	+Δ (MHz)	+3	–	+ 5 MHz	Pass
Fmin (GHz)	88.977	-Δ (MHz)	-3	-5 MHz	–	Pass

E. Power Pulling

Pref (dBm)	-6.53			min limit	max limit	Pass/Fail
Pmax (dBm)	-6.35	+Δ (dB)	+0.18	–	+0.2dB	Pass
Pmin (dBm)	-6.70	-Δ (dB)	-0.17	-0.2 dB	–	Pass

F. Turn-on current

Vb (volts)	15.0	min limit	max limit	Pass/Fail
Measured Vb	+15.00			Pass
Turn-on current (mA)	185	–	345	Pass
time to peak (ms)	10.6			
time to settle (ms)	10.6			

G. Unit Temperature: +43 °C Vacuum level: 18 mTorr

DATA SHEET ACCEPT/REJECT

Accept	MTC A4 QA	Reject	
		Test Failure Report No.	
		Report Date	

SIZE	CAGE CODE	DWG. NO.
A	8V456	TP501600-2
SCALE	REV. LTR.	SHEET
	A00	29 0

AMSU-A GDO Data Calculation Sheet 8

Sequence Description: Frequency Accuracy & Stability Calculations Date: 4/23/97
Millitech Part Number 9050160001; Serial Number FM2 Operator: CSK
Aerojet Part Number 1336610-10

A. Frequency Accuracy from Thermal Vacuum, CPT and Final LPT Data

	Parameter, Vb = 15.0 volts	Data Sheet, Section	Date, mm/dd/yy	Measurement
1	+Δ, pulling, +20.5°C, MHz	1, D	4/14/97	+1
2	-Δ, pulling, +20.5°C, MHz	1, D	4/16/97	0
3	+Δ, pulling, +43°C	1, D	4/19/97	+3
4	-Δ, pulling, +43°C	1, D	4/19/97	-3
5	+Δ, pulling, -2°C	1, D	4/21/97	+2
6	-Δ, pulling; -2°C	1, D	4/21/97	-3
7	Set point w / max Hysteresis, GHz	6, E	4/11/97	88.954
8	Set point w / min Hysteresis, GHz	6, E	4/11/97	88.951
9	(Maximum of lines 1, 3, and 5) +7			88.987 GHz
10	(Maximum of lines 2, 4, and 6) +8			88.978 GHz

B. Frequency Accuracy Result

	Result	min limit	max limit	Pass/Fail
A9, GHz	88.987	--	89.030	Pass
A10, GHz	88.978	88.970	--	Pass

CONTINUED, GO TO NEXT PAGE

AMSU-A GDO Data Calculation Sheet 8, continued

Sequence Description: Frequency Accuracy & Stability Calculations Date: 4/23/97
Millitech Part Number 9050160001; Serial Number EM2 Operator: CSY
Aerojet Part Number 1336610-10

C. Frequency Stability from Comprehensive Performance Test Data

	Bias Voltage, volts	Data Sheet, Section	Date, mm/dd/yy	Tcase, °C	Measurement, GHz
1	14.25	1, C	4/16/97	+20.5	58.987
2	15.0	1, C	4/16/97	+20.5	58.987
3	15.75	1, C	4/16/97	+20.5	58.987
4	14.25	1, C	4/21/97	-2	58.992
5	15.0	1, C	4/21/97	-2	58.992
6	15.75	1, C	4/21/97	-2	58.992
7	14.25	1, C	4/19/97	+43	58.980
8	15.0	1, C	4/19/97	+43	58.980
9	15.75	1, C	4/19/97	+43	58.980
10	((Maximum of 1 through 9) -C2)		* 1000 MHz		+5 MHz
11	((Minimum of 1 through 9) -C2)		* 1000 MHz		-7 MHz

D. Frequency Stability Result

	Result	min limit	max limit	Pass/Fail
C10, MHz	+5	–	+50	Pass
C11, MHz	-7	-50	–	Pass

DATA SHEET ACCEPT/REJECT

Accept	MTC A4 QA	*Reject*	
		Test Failure Report No.	
		Report Date	

FREQUENCY STABILITY OF SAW FILTERS

Channel No.	11	12	13	14
Specification (+/-MHz)	0.9	0.9	0.2	0.2
Short-Term Measured (MHz)	+0.55, -0.63	+0.23, -0.19	+0.01, -0.09	+0.07, -0.00
Long-Term By Analysis (+/-MHz)	+0.02	+0.02	+0.02	+0.02
Total	+0.57, -0.63	+0.25, -0.09	+0.03, -0.09	+0.09, -0.00

Note: Additional +/-0.1 MHz frequency stability reserved for safety margin for channels 11-14.

BANDPASS CHARACTERISTICS

FOR

IF FILTERS AND SAW FILTERS

3 dB BANDWIDTH OF IF FILTERS

Channel No.	1	2	3	4	5	6	7	8	9	10	15
Specification (MHz)	135	90	90	200	170	200	200	165	165	78	6000
3 dB bandwidth (MHz) *	127	82	82	192	170	192	192	157	157	78	1020
f_L - f_H (MHz)	8-135	8-90	8-90	8-200	30-200	8-200	8-200	8-165	8-165	178-256	490-1510
Measured (MHz)											
3 dB bandwidth (MHz)	125.48	80.06	80.24	189.74	167.76	190.21	190.24	154.84	154.90	76.49	998.03
f_L - f_H (MHz)	8.64-134.12	9.00-89.06	9.16-89.40	9.21-198.95	31.25-199.01	9.21-199.42	9.22-199.46	9.12-163.96	9.05-163.95	178.92-255.41	490.54-1488.57

* Actual specifications for IF filters.

3 dB BANDWIDTH FOR SAW FILTERS

Channel No.	11	12	13	14
<u>Specification</u>				
3 dB Bandwidth (MHz)	72	32	16	6
f_{L1} - f_{H1} (MHz)	256.2-292.2	292.2-308.2	308.2-316.2	316.2-319.2
f_{L2} - f_{H2} (MHz)	352.2-388.2	336.2-352.2	328.2-336.2	325.2-328.2
<u>Measured</u>				
3 dB Bandwidth (MHz)	69.88	30.89	15.71	5.87
f_{L1} - f_{H1} (MHz)	256.71-291.51	292.62-308.04	308.29-316.12	316.26-319.18
f_{L2} - f_{H2} (MHz)	352.61-387.69	336.47-351.94	328.19-336.07	325.29-328.24

Channel 1 Bandpass Filter

IF Filter (S/N: 1331559-6, S/N: P232-003)

APPENDIX F **ACCEPTANCE TEST REPORT**

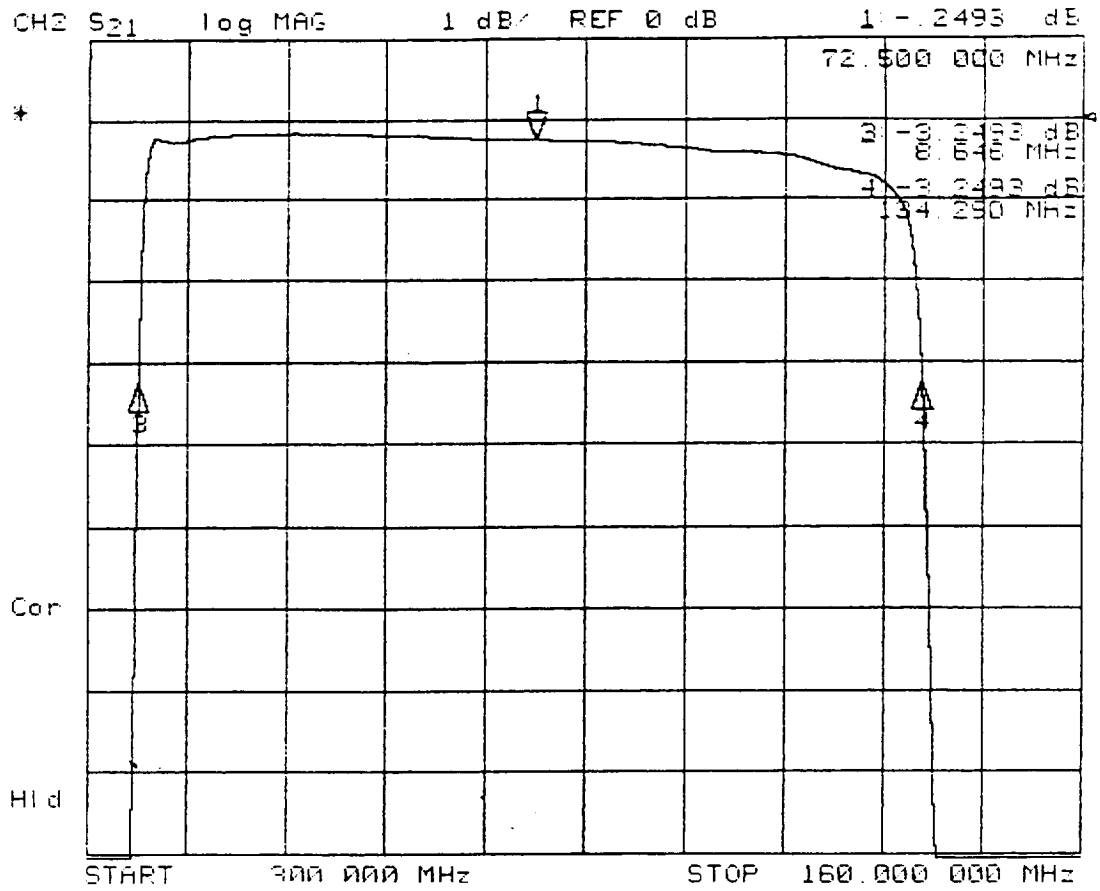
BANDPASS FILTER MODEL HL72.5-125-10SS1 S/N P232-003
AEROJET 1331559-6 REV. E

3.0 dB BANDWIDTH

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	134.29 MHz (133.0-135.0)	134.12 Mhz (133.0-135.0)	133.96 MHz (133.0-135.0)
{8} LOWER 3.0 dB BANDEDGE	8.65 MHz (8.0-10.0)	8.64 Mhz (8.0-10.0)	8.62 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	125.64 MHz (123.0-127.0)	125.48 Mhz (123.0-127.0)	125.34 MHz (123.0-127.0)
{10} ADD {7} AND {8} ÷ 2 =	71.47 MHz (72.5 NOM)	71.38 MHz (72.5 NOM)	71.29 Mhz (72.5 NOM)
{10a} RECORD MEASURED TEMPERATURE	-12.7 °C (-15.0 TO -10.0)	+15.5 °C (12.5 TO 17.5)	+42.8 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

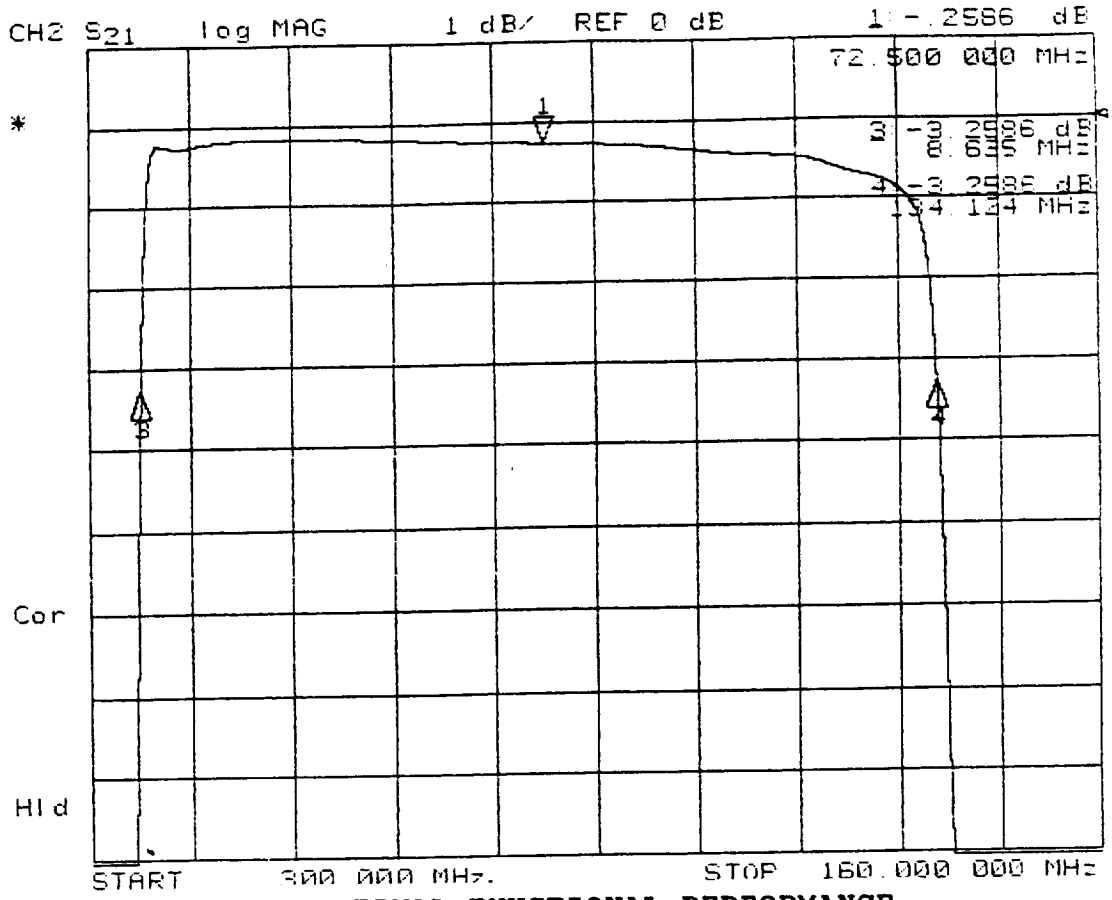
PASSBAND RIPPLE

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	33.44 MHz	32.64 Mhz	32.24 MHz
MIN INSERTION LOSS PERFORMANCE	-0.16 dB	-0.16 dB	-0.17 dB
{11b} 75% BW LOWER BANDEDGE FREQ	10.22 MHz	10.18 Mhz	10.14 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.41 dB	-0.43 dB	-0.45 dB
{11c} 75% BW UPPER BANDEDGE FREQ	103.97 MHz	103.93 Mhz	103.89 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.41 dB	-0.43 dB	-0.46 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.25 dB	0.27 dB	0.29 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.25 dB	0.27 dB	0.29 dB



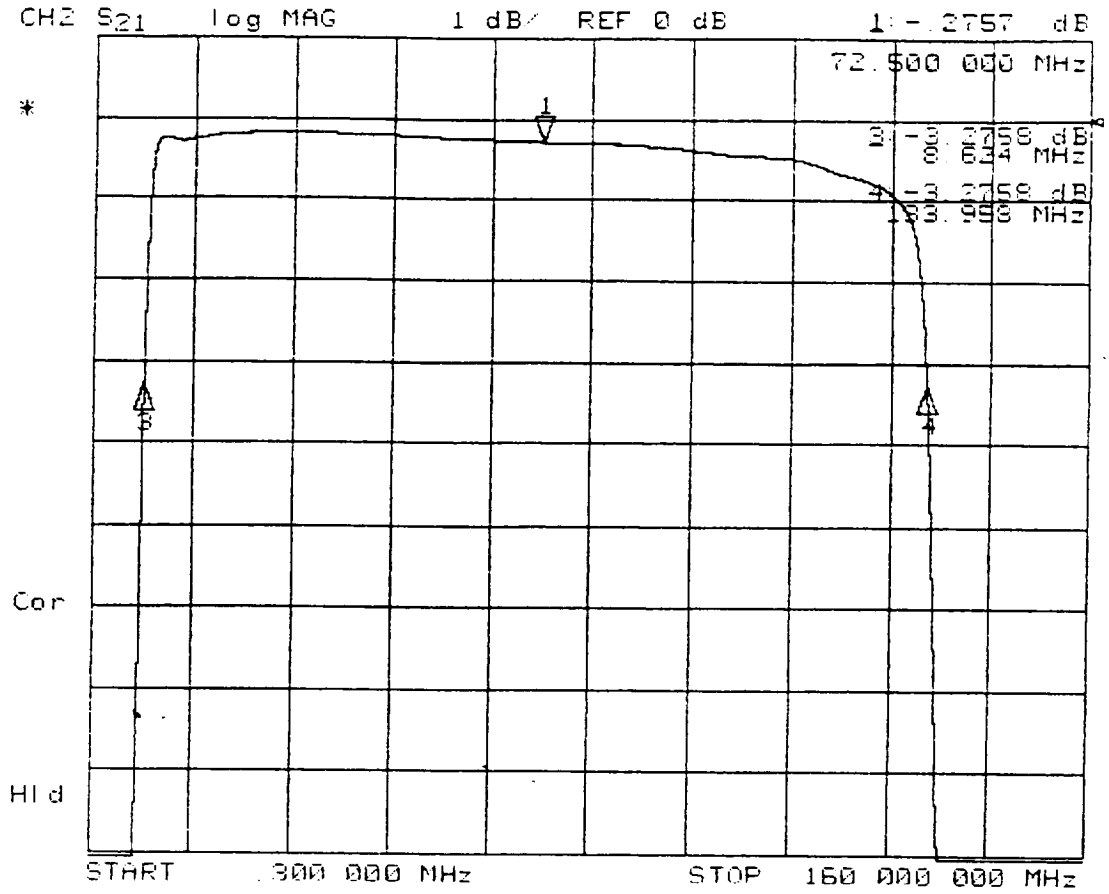
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P232-003
-10C DATA
OPR: R. HOGGATT DATE 11/25/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	16.250000 MHz OFF	72.500000 MHz -.2493 dB
MARKER 2	128.750000 MHz OFF	71.468471 MHz OFF
MARKER 3	25.625000 MHz OFF	8.646337 MHz -3.2493 dB
MARKER 4	119.375000 MHz OFF	134.290606 MHz -3.2493 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P232-003
+15C DATA
OPR: R. HOGGATT DATE 11/25/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	16.250000 MHz OFF	72.500000 MHz -.2586 dB
MARKER 2	128.750000 MHz OFF	71.379748 MHz OFF
MARKER 3	25.625000 MHz OFF	8.635391 MHz -3.2586 dB
MARKER 4	119.375000 MHz OFF	134.124106 MHz -3.2586 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P232-003
+40C DATA
OPR: R. HOGGATT DATE 11/25/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	18.250000 MHz OFF	72.500000 MHz -.2757 dB
MARKER 2	138.750000 MHz OFF	71.291275 MHz OFF
MARKER 3	25.625000 MHz OFF	8.624010 MHz -3.2758 dB
MARKER 4	119.375000 MHz OFF	133.958541 MHz -3.2758 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-6 dB	-6 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX F **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL72.5-125-10SS1 S/N P232-003
AEROJET 1331559-6 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	(PASS)/FAIL	(PASS)/FAIL	(PASS)/FAIL
{11g} ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5 Fc=72.5 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	>100 dB (40.0 dB MIN)	>100 dB (40.0 dB MIN)	>100 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 153.75 MHz TO 1000.0 MHz	-65.2 dB (40.0 dB MIN)	-66.0 dB (40.0 dB MIN)	-66.9 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-13.0 °C (-15.0 TO -10.0)	+15.3 °C (12.5 TO 17.5)	+42.8 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

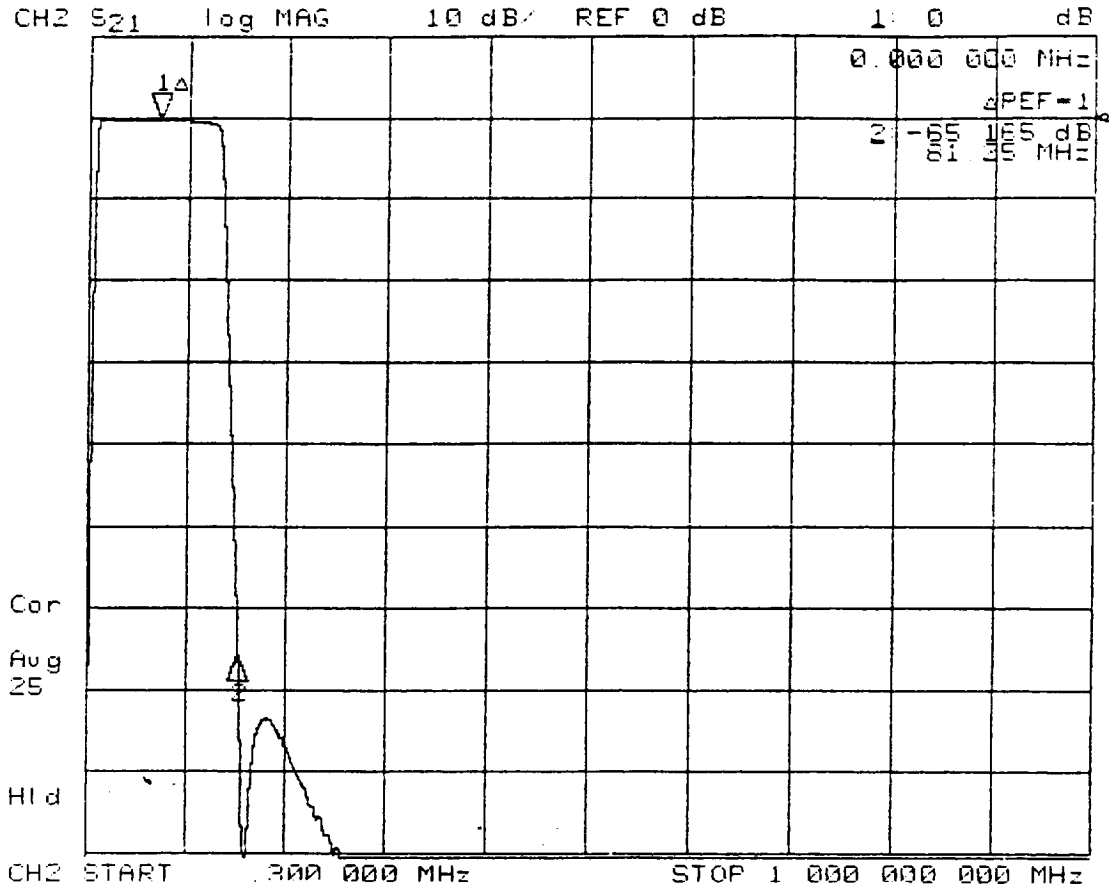
TEST PERFORMED BY R. Hoggatt DATE 11/25/96

NOTE IF TEST WITNESSED BY AESD: _____ GSI: _____ > DOT WITNESSED THIS TIME (DH)

***** END OF FUNCTIONAL PERFORMANCE TEST *****

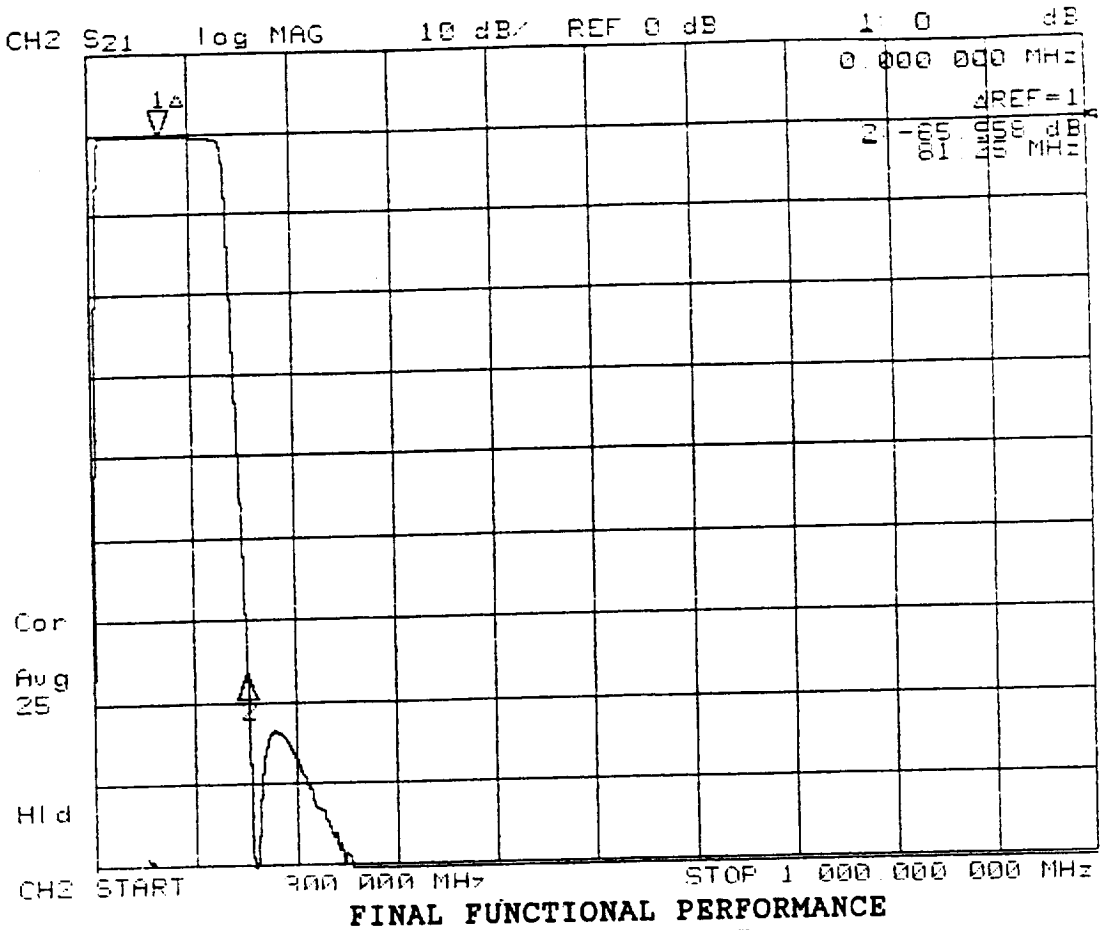
OUTLINE AND MOUNTING DIMENSIONS VERIFICATION
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.500
MOUNTING HOLE CENTER	0.125 ± .010	.124
BETWEEN UPPER MOUNTING HOLES	3.250	3.248
BETWEEN LOWER MOUNTING HOLES	3.250	3.249



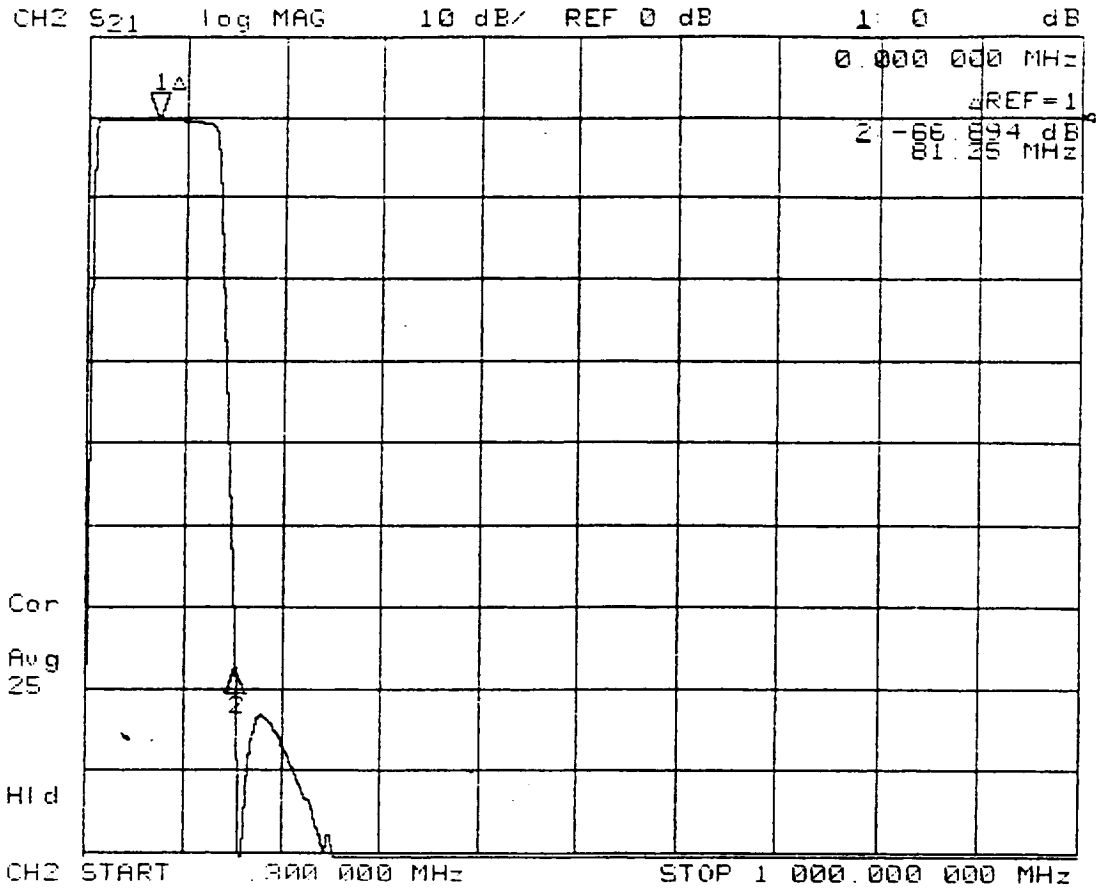
FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P232-003
-10C DATA
OPR: R. HOGGATT DATE 11/25/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	1.000000 MHz OFF	72.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	153.750000 MHz -65.165 dB
MARKER 3	5.000000 MHz OFF	153.750000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P232-003
+15C DATA
OPR: R. HOGGATT DATE 11/25/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	1.000000 MHz OFF	72.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	153.750000 MHz -65.958 dB
MARKER 3	5.000000 MHz OFF	153.750000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P232-003
+40C DATA
OPR: R. HOGGATT DATE 11/25/96

MARKER PARAME...	Channel 1	Channel 2
MARKER 1	1.000000 MHz OFF	72.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	153.750000 MHz -66.894 dB
MARKER 3	5.000000 MHz OFF	153.750000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX F

ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL72.5-125-10SS1 S/N P232-003
AEROJET 1331559-6 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT

PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE +22.3 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-108.0 dB	F11	(*) 80.0	MHz	-0.30 dB
F2	1.0	MHz	-96.6 dB	F12	(*) 100.0	MHz	-0.41 dB
F3	5.0	MHz	-30.5 dB	F13	120.0	MHz	-0.64 dB
F4	7.5	MHz	-9.41 dB	F14	130.0	MHz	-1.03 dB
F5	10.0	MHz	-0.86 dB	F15	135.0	MHz	-5.06 dB
F6	15.0	MHz	-0.29 dB	F16	140.0	MHz	-20.9 dB
F7	25.0	MHz	-0.20 dB	F17	150.0	MHz	-52.5 dB
F8	(*) 45.0	MHz	-0.18 dB	F18	200.0	MHz	-76.6 dB
F9	(*) 65.0	MHz	-0.25 dB	F19	500.0	MHz	-106.2 dB
F10	72.5	MHz	-0.29 dB	F20	1000.0	MHz	-101.6 dB

TEST PERFORMED BY: R. HOGGATT DATE 11/25/96 (DA/S)

NOTE IF TEST WITNESSED BY AESD _____ GSI _____ > DOT WITNESSED THIS TIME

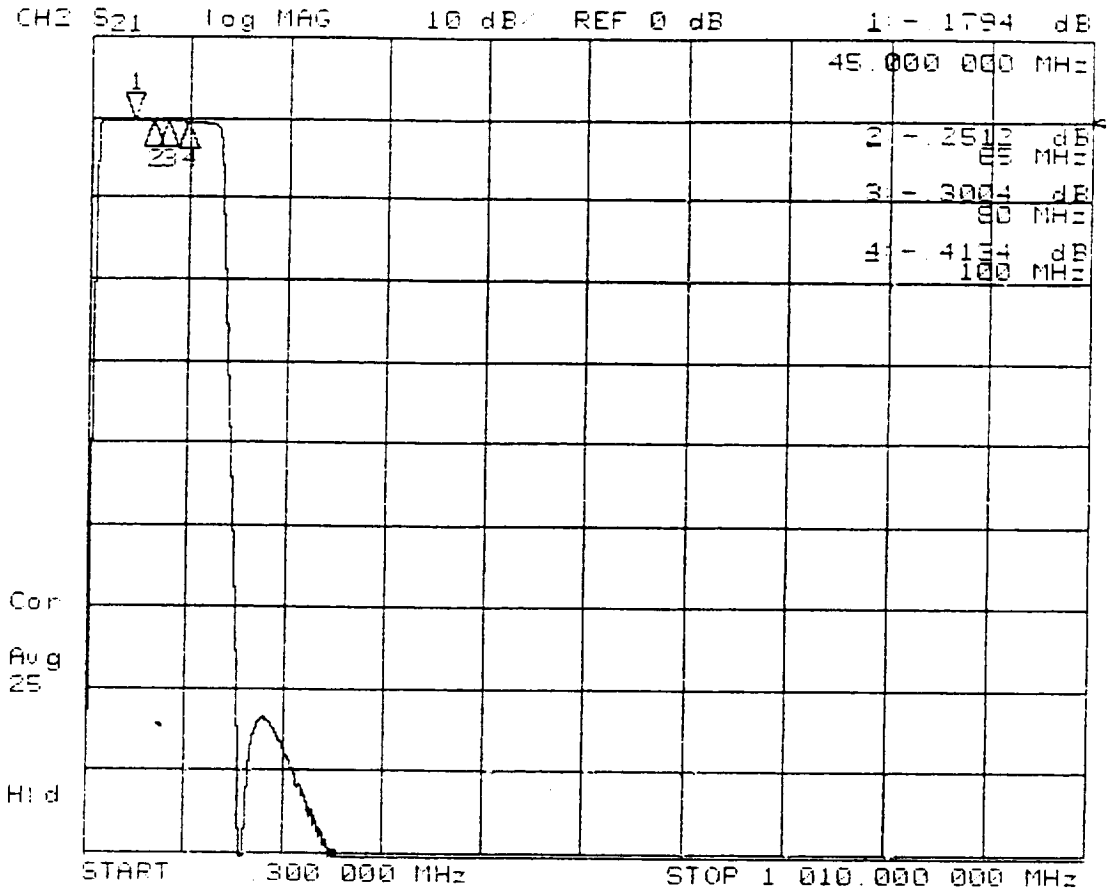
***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST

ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX F PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE.

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P232-003
AMBIENT
OPR: R. HOGGATT DATE 11/25/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	18.250000 MHz OFF	45.000000 MHz -.1794 dB
MARKER 2	128.750000 MHz OFF	65.000000 MHz -.2512 dB
MARKER 3	35.625000 MHz OFF	80.000000 MHz -.3004 dB
MARKER 4	119.375000 MHz OFF	100.000000 MHz -.4134 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Channel 2 Bandpass Filter

IF Filter (S/N: 1331559-3, S/N: P229-012)

APPENDIX C

ACCEPTANCE TEST REPORT

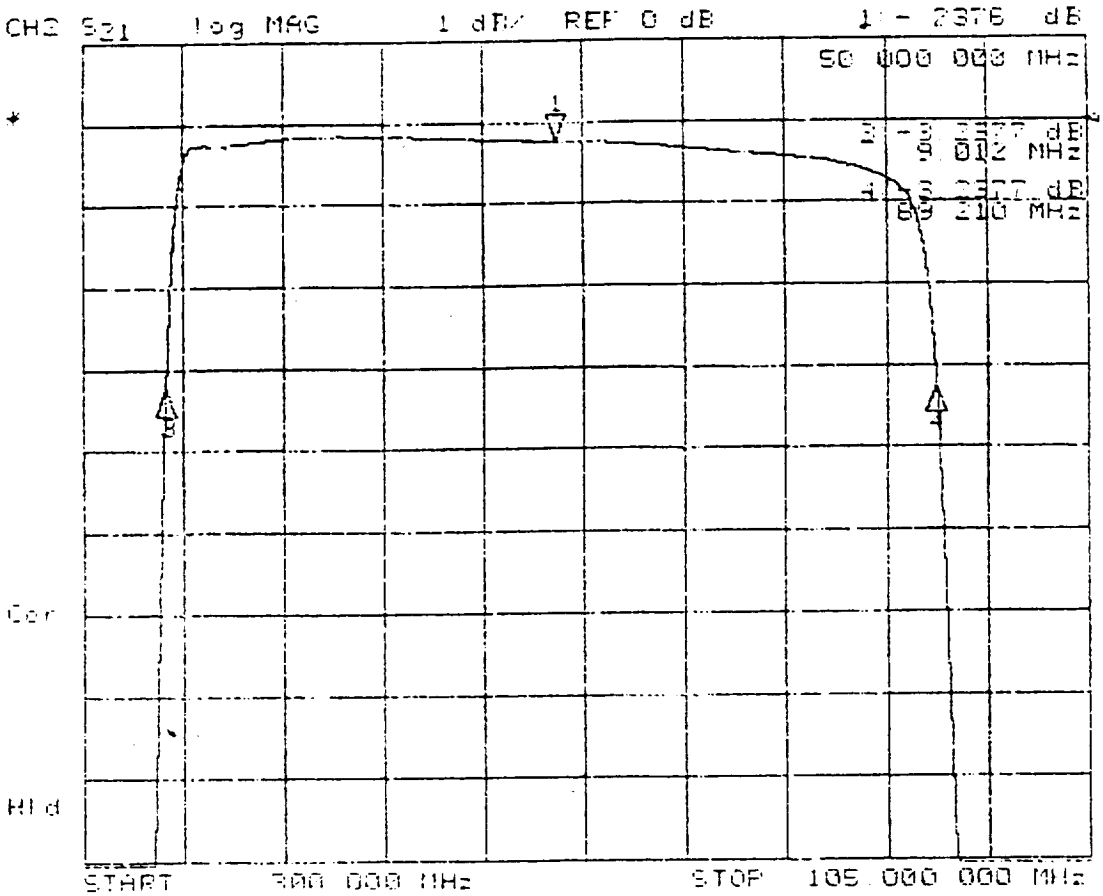
BANDPASS FILTER MODEL HL50-80-10SS1 S/N P229-012
AEROJET 1331559-3 REV. E

3.0 dB BANDWIDTH

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	89.21 MHz (88.0-90.0)	89.06 Mhz (88.0-90.0)	88.92 MHz (88.0-90.0)
{8} LOWER 3.0 dB BANDEDGE	9.01 MHz (8.0-10.0)	9.00 Mhz (8.0-10.0)	8.99 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	80.20 MHz (78.0-82.0)	80.06 Mhz (78.0-82.0)	79.93 MHz (78.0-82.0)
{10} ADD {7} AND {8} ÷ 2 =	49.11 MHz (50.0 NOM)	49.03 MHz (50.0 NOM)	48.96 Mhz (50.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-12.9 °C (-15.0 TO -10.0)	+16.3 °C (12.5 TO 17.5)	+43.7 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

PASSBAND RIPPLE

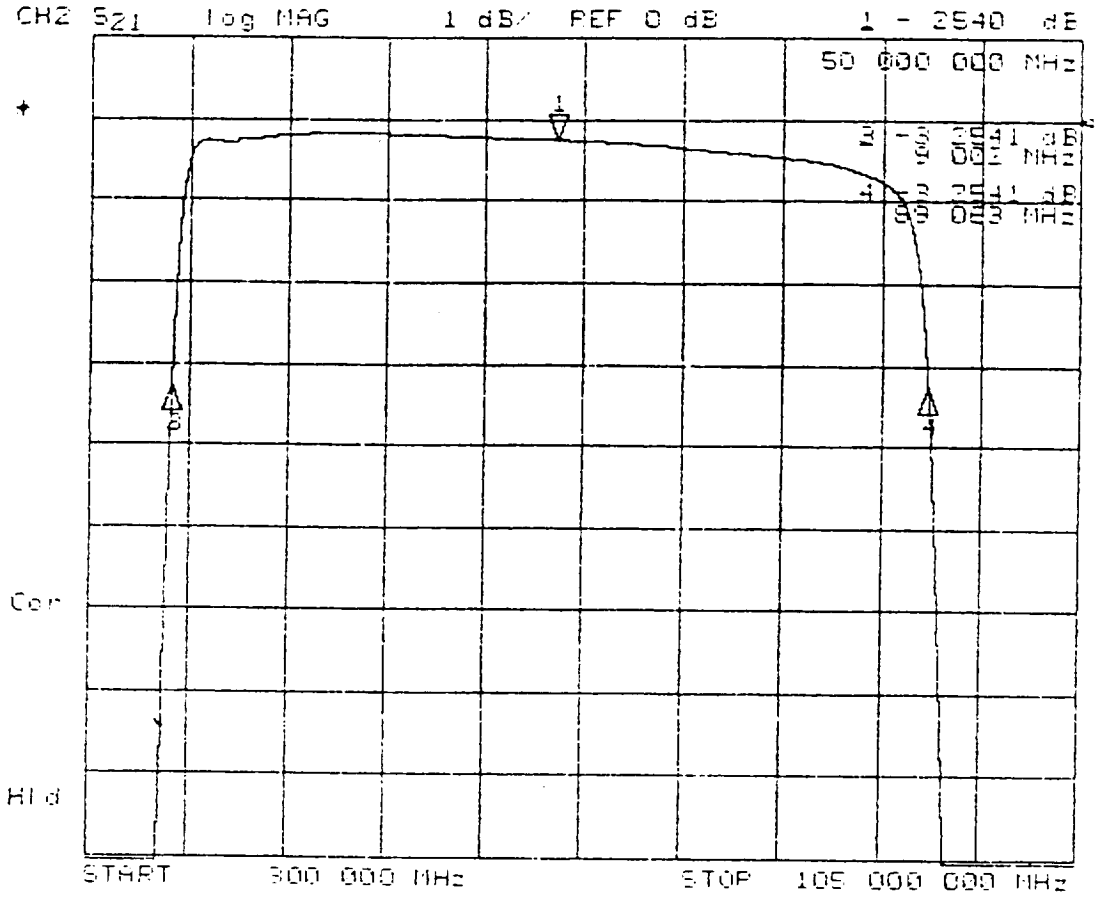
ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	27.26 MHz	27.00 Mhz	27.00 MHz
MIN INSERTION LOSS PERFORMANCE	-0.16 dB	-0.17 dB	-0.18 dB
{11b} 75% BW LOWER BANDEDGE FREQ	11.03 MHz	10.96 Mhz	10.91 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.40 dB	-0.43 dB	-0.45 dB
{11c} 75% BW UPPER BANDEDGE FREQ	71.03 MHz	70.96 Mhz	70.91 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.40 dB	-0.43 dB	-0.45 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.24 dB	0.26 dB	0.27 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.24 dB	0.26 dB	0.27 dB



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P229-012
-10C DATA
OPR: R. HOGGATT DATE DEC 18 1996

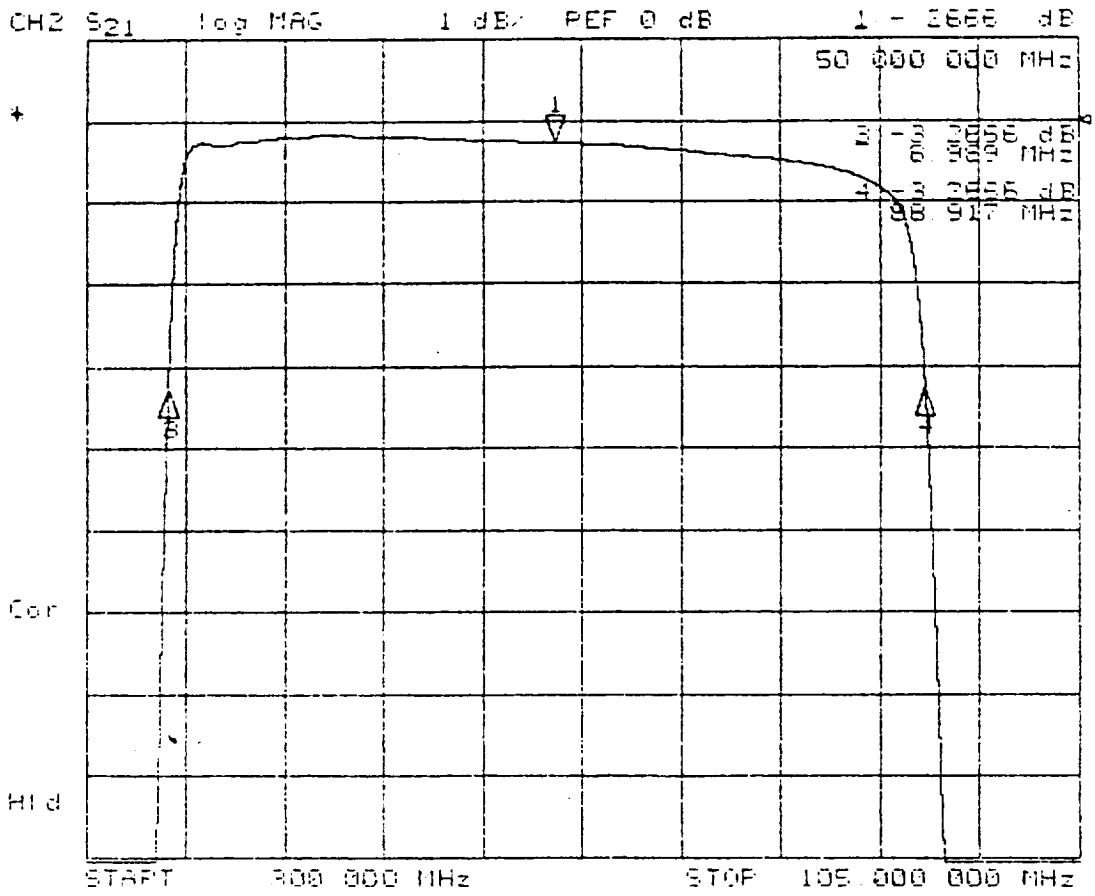
MARKER PARAME... Channel 2

MARKER 1	14.000000 MHz OFF	50.000000 MHz -.2376 dB
MARKER 2	86.000000 MHz OFF	49.111420 MHz OFF
MARKER 3	20.000000 MHz OFF	9.012366 MHz -3.2377 dB
MARKER 4	80.000000 MHz OFF	89.210474 MHz -3.2377 dB
NWA STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2343 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P229-012
+15C DATA
OPR: R. HOGGATT DATE DEC 18 1996

MARKER PARAME...	...annel 1	...annel 2
MARKER 1	14 000000 MHz OFF	50 000000 MHz - 2540 dB
MARKER 2	85 000000 MHz OFF	49 032675 MHz OFF
MARKER 3	30 000000 MHz OFF	9 002168 MHz -3 2541 dB
MARKER 4	80 000000 MHz OFF	88 083183 MHz -3 2541 dB
MKR STIMULUS OFFSET	0 000000 MHz 0 dB	89 425802 MHz -3 2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P229-012
+40C DATA
OPR: R. HOGGATT DATE DEC 18 1996

MARKER PARAMS	Channel 1	Channel 2
MARKER 1	14 000000 MHz OFF	50 000000 MHz - 2666 dB
MARKER 2	88 000000 MHz OFF	48 953472 MHz OFF
MARKER 3	30 000000 MHz OFF	8 989862 MHz -3 2666 dB
MARKER 4	80 000000 MHz OFF	88 917083 MHz -3 3566 dB
MKR STIMULUS OFFSET	0 000000 MHz 0 dB	89 425802 MHz -3 2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX C

ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL50-80-10SS1 S/N P229-012
AEROJET 1331559-3 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	PASS/FAIL	PASS/FAIL	PASS/FAIL
{11g} ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5 Fc=50.0 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	>100 dB (40.0 dB MIN)	>100 dB (40.0 dB MIN)	>100 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 102.0 MHz TO 1000.0 MHz	-53.7 dB (40.0 dB MIN)	-54.5 dB (40.0 dB MIN)	-55.3 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-13.0 °C (-15.0 TO -10.0)	+6.1 °C (12.5 TO 17.5)	+43.8 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

TEST PERFORMED BY R. Hoggatt DA DATE 12/18/96

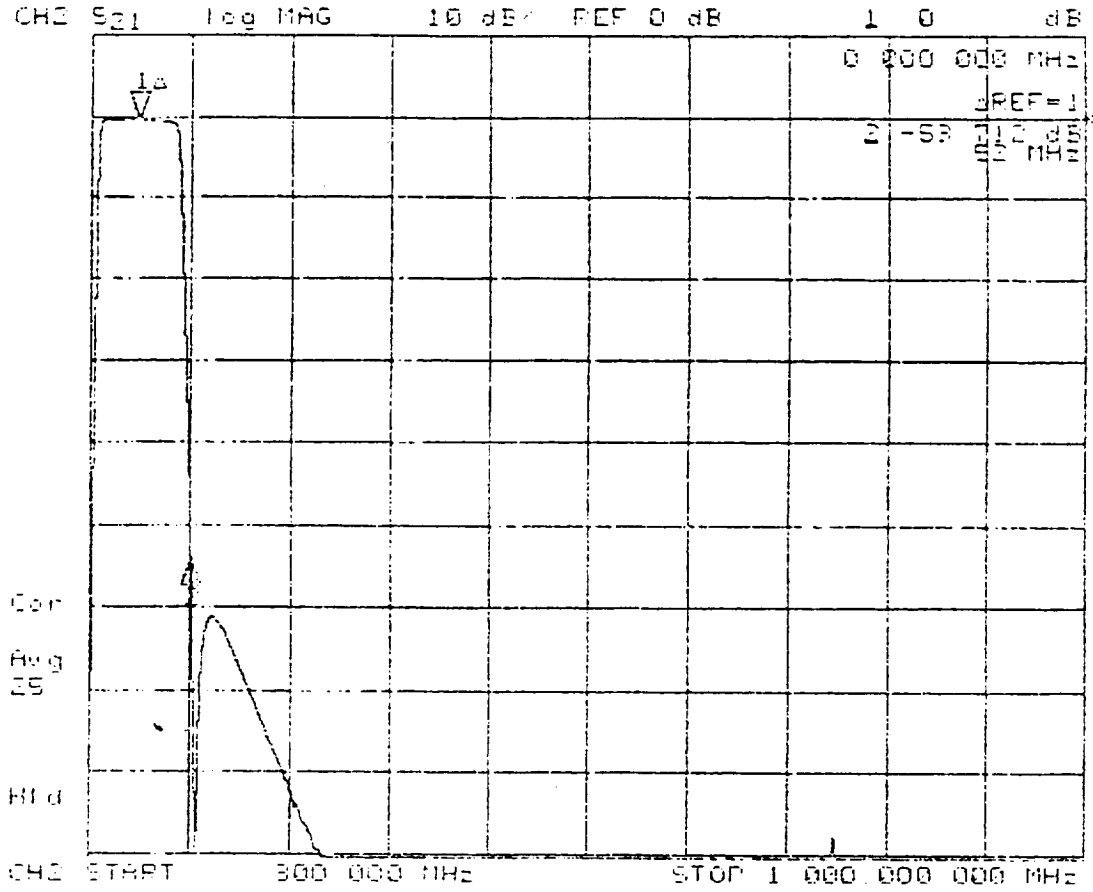
NOTE IF TEST WITNESSED BY AESD: Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

{16} REFERENCE CUSTOMER DRAWING 1331559

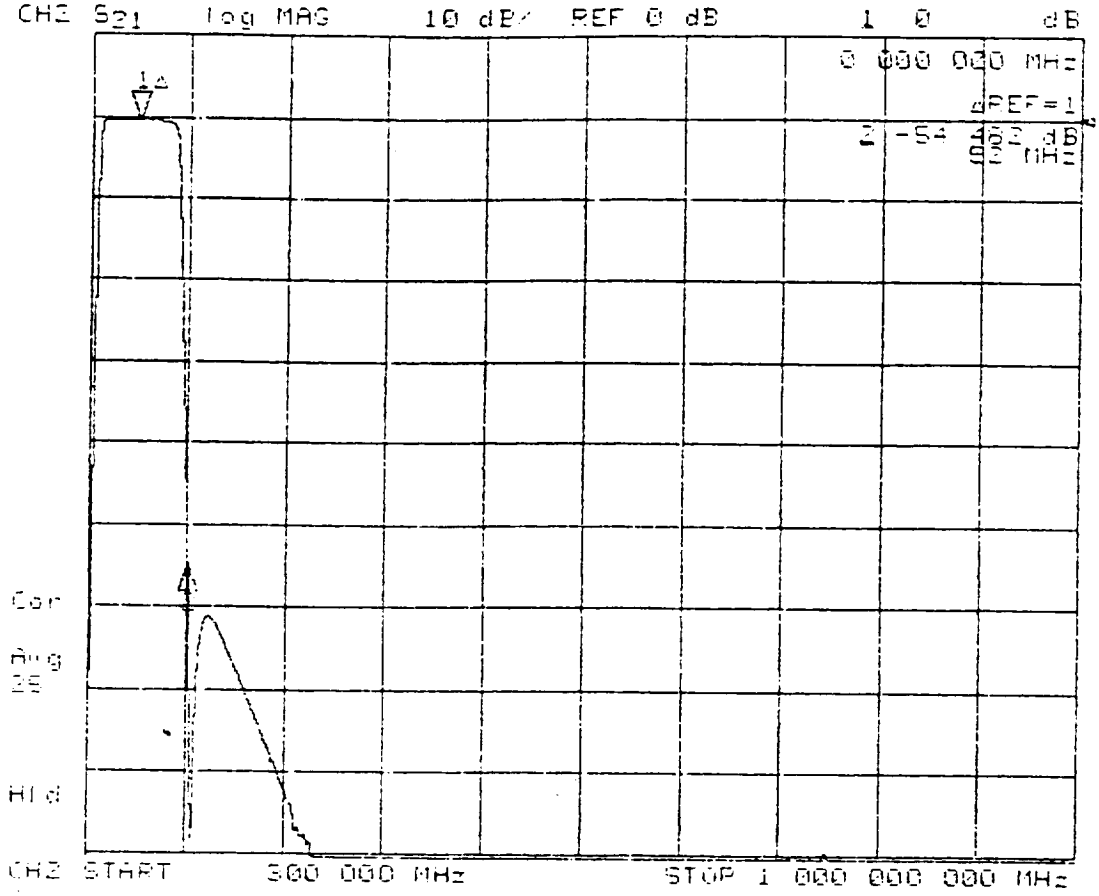
DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.499
MOUNTING HOLE CENTER	0.125 ± .010	0.124
BETWEEN UPPER MOUNTING HOLES	3.250	3.251
BETWEEN LOWER MOUNTING HOLES	3.250	3.250



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P229-012
-10C DATA
OPR: R. HOGGATT DATE DEC 18 1996

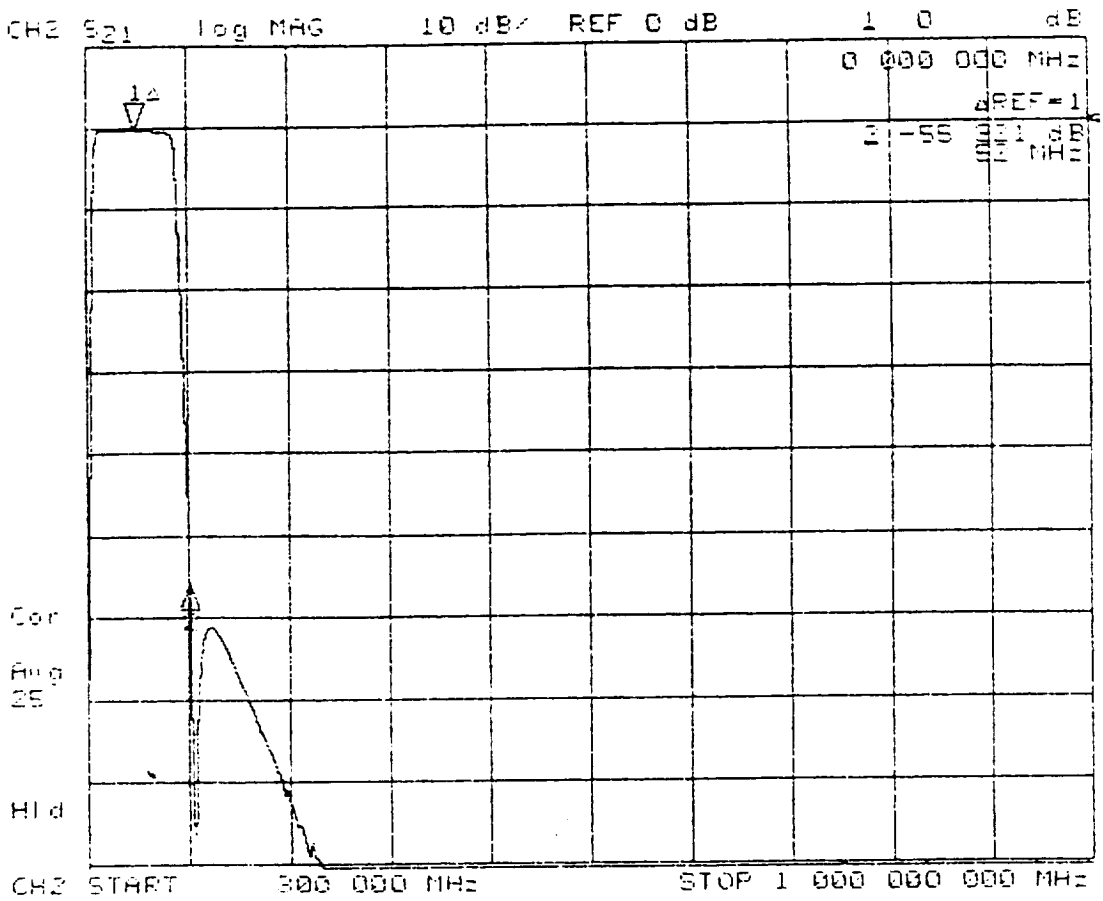
MARKER RESPONSE ... Channel 2

MARKER 1	1 000000 MHz OFF	50 000000 MHz 0 dB
MARKER 2	5 000000 MHz OFF	102 000000 MHz -53 712 dB
MARKER 3	5 000000 MHz OFF	103 000000 MHz OFF
MARKER 4	5 000000 MHz OFF	1000 000000 MHz OFF
MKR STIMULUS OFFSET	0 000000 MHz 0 dB	0 000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P229-012
+15C DATA
OPR: R. HOGGATT DATE DEC 18 1996

MARKER PARAME...	...annel 1	...annel 2
MARKER 1	1 000000 MHz OFF	50 000000 MHz 0 dB
MARKER 2	5 000000 MHz OFF	102 000000 MHz -54 482 dB
MARKER 3	5 000000 MHz OFF	103 000000 MHz OFF
MARKER 4	5 000000 MHz OFF	1000 000000 MHz OFF
MKR STIMULUS OFFSET	0 000000 MHz 0 dB	0 000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P229-012
+40C DATA
OPR: R. HOGGATT DATE DEC 18 1996

MARKER PARAME...	...annel 3	
MARKER 1	1 000000 MHz OFF	50 000000 MHz 0 dB
MARKER 2	5 000000 MHz OFF	102 000000 MHz -55.321 dB
MARKER 3	5 000000 MHz OFF	102 000000 MHz OFF
MARKER 4	5 000000 MHz OFF	1000 000000 MHz OFF
MKR STIMULUS OFFSET	0 000000 MHz 0 dB	0 000000 MHz 0 dB

REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX C

ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL50-80-10SS1 S/N P229-012
AEROJET 1331559-3 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT

PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +22.4 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-104.5 dB	F11	(*) 60.0	MHz	-0.31 dB
F2	1.0	MHz	-95.2 dB	F12	(*) 70.0	MHz	-0.41 dB
F3	5.0	MHz	-31.3 dB	F13	80.0	MHz	-0.62 dB
F4	7.5	MHz	-10.7 dB	F14	85.0	MHz	-0.86 dB
F5	10.0	MHz	-1.49 dB	F15	90.0	MHz	-5.77 dB
F6	15.0	MHz	-0.30 dB	F16	100.0	MHz	-44.5 dB
F7	20.0	MHz	-0.21 dB	F17	200.0	MHz	-82.2 dB
F8	(*) 30.0	MHz	-0.18 dB	F18	300.0	MHz	-108.5 dB
F9	(*) 40.0	MHz	-0.23 dB	F19	500.0	MHz	-102.3 dB
F10	50.0	MHz	-0.27 dB	F20	1000.0	MHz	-104.1 dB

TEST PERFORMED BY R. Hoggatt DATE 12/18/96

NOTE IF TEST WITNESSED BY AESD_ Not witnessed this time. DLD

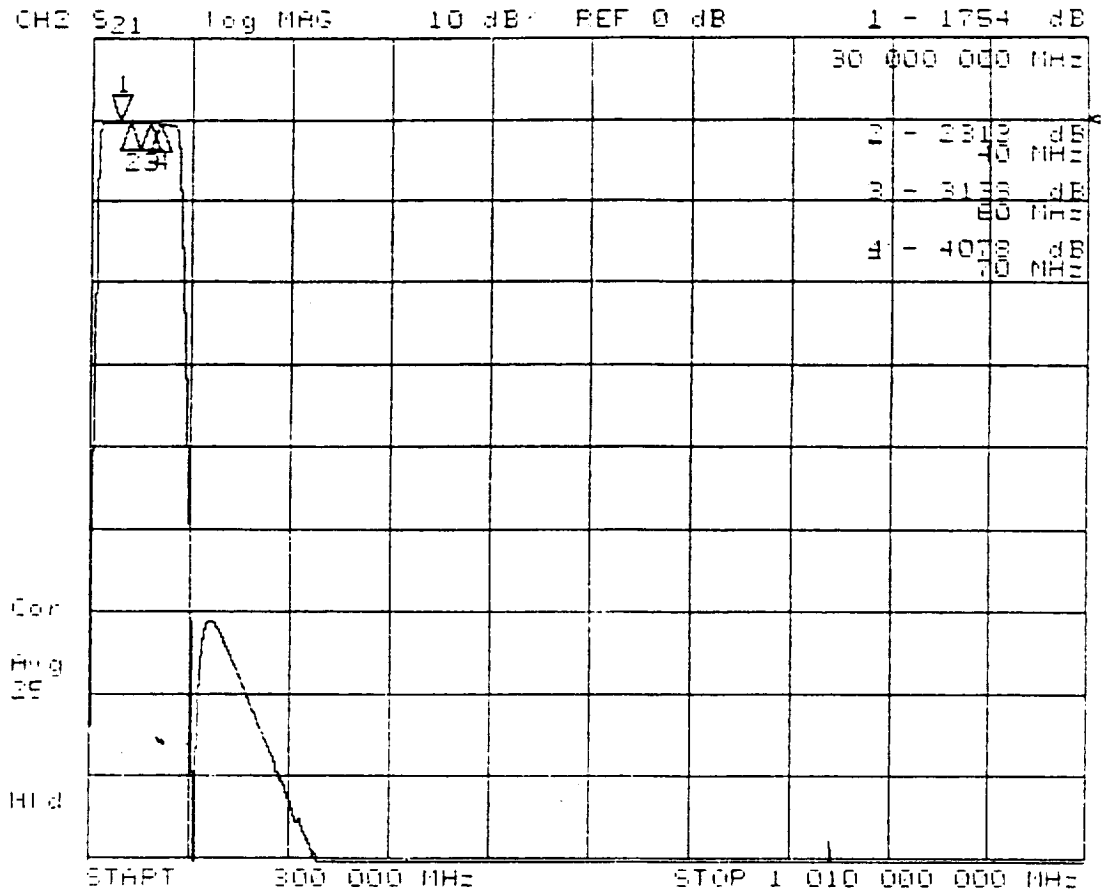
***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST

ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX C PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P229-012
AMBIENT
OPR: R. HOGGATT DATE DEC 18 1996

MARKER PARAME...	...annel 1	...annel 2
MARKER 1	30 000000 MHz OFF	30 000000 MHz - 1754 dB
MARKER 2	40 000000 MHz OFF	40 000000 MHz - 2313 dB
MARKER 3	60 000000 MHz OFF	60 000000 MHz - 3138 dB
MARKER 4	70 000000 MHz OFF	70 000000 MHz - 4078 dB
MKR STIMULUS OFFSET	0 000000 MHz 0 dB	0 000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER MATH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Channel 3 Bandpass Filter

IF Filter (S/N: 1331559-3, S/N: P229-002)

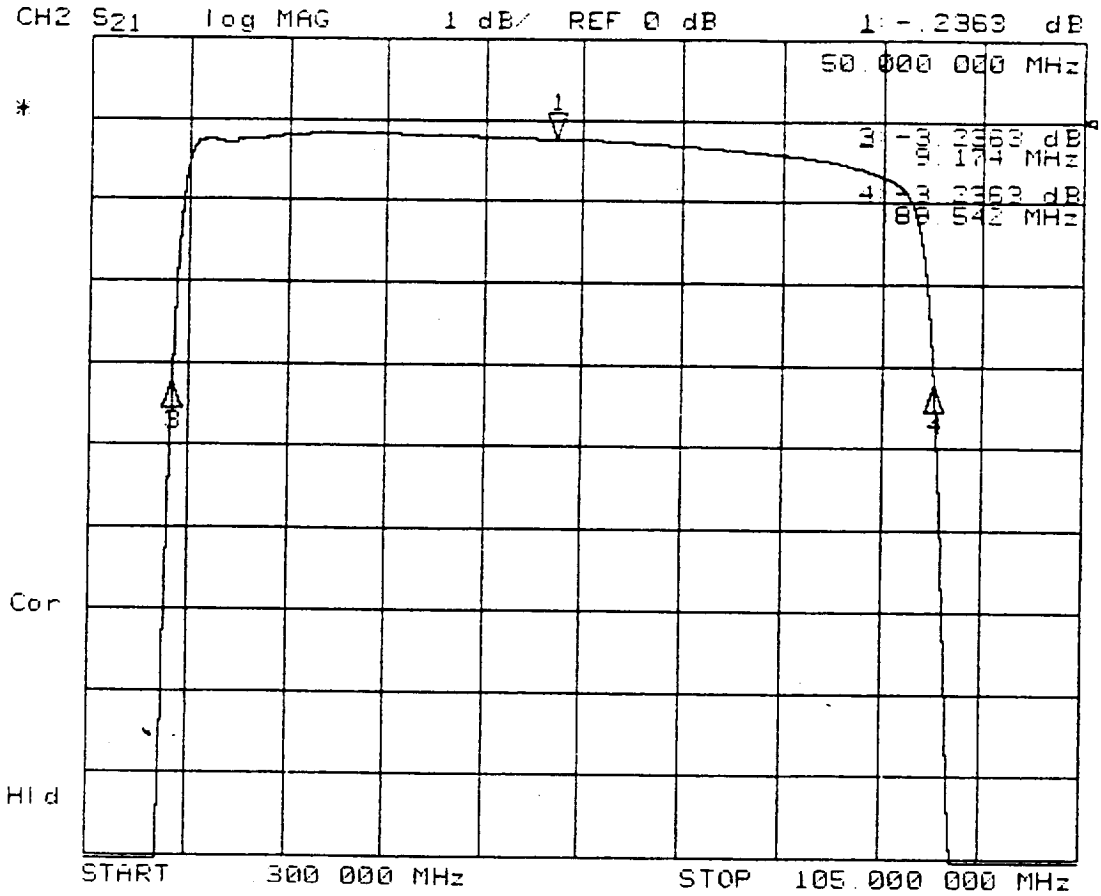
BANDPASS FILTER MODEL HL50-80-10SS1 S/N P229-002
AEROJET 1331559-3 REV. E

3.0 dB BANDWIDTH

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	89.54 MHz (88.0-90.0)	89.40 Mhz (88.0-90.0)	89.24 MHz (88.0-90.0)
{8} LOWER 3.0 dB BANDEDGE	9.17 MHz (8.0-10.0)	9.16 Mhz (8.0-10.0)	9.15 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	80.37 MHz (78.0-82.0)	80.24 Mhz (78.0-82.0)	80.09 MHz (78.0-82.0)
{10} ADD {7} AND {8} ÷ 2 =	49.36 MHz (50.0 NOM)	49.28 MHz (50.0 NOM)	49.20 Mhz (50.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-13.4 °C (-15.0 TO -10.0)	+14.5 °C (12.5 TO 17.5)	+44.0 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

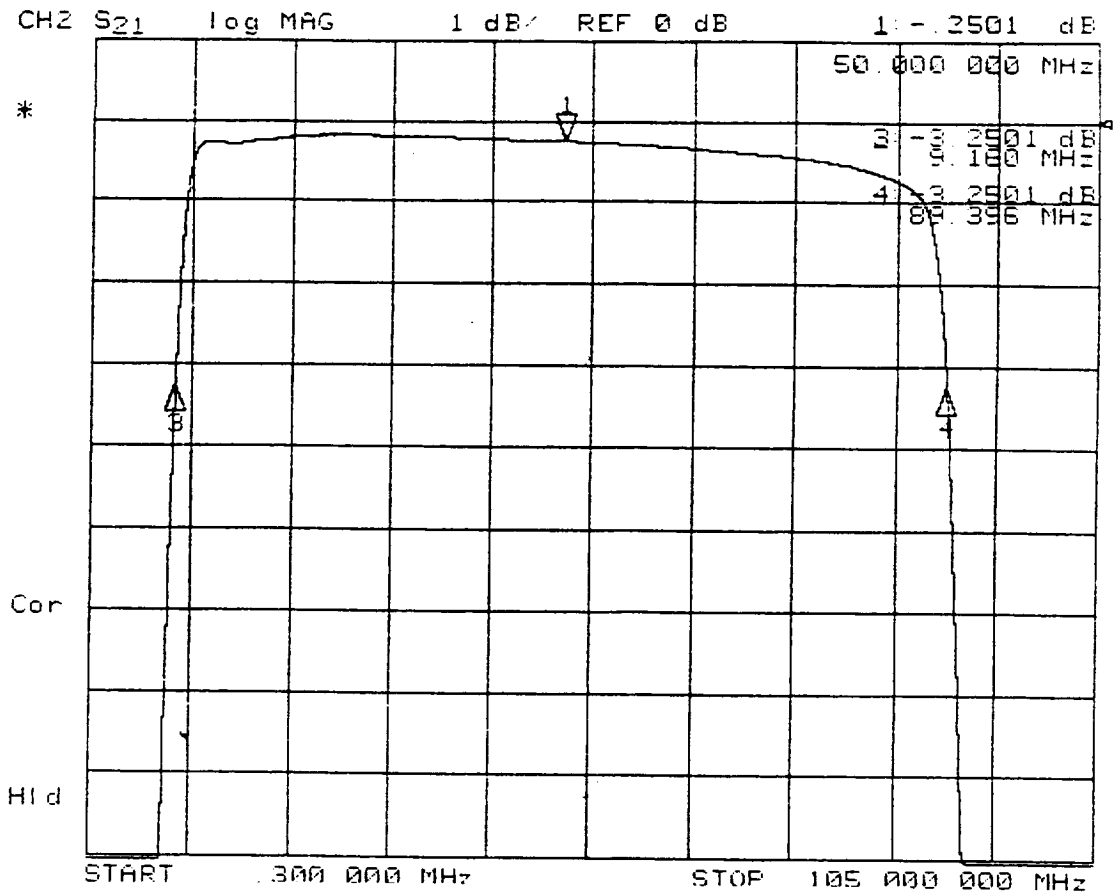
PASSBAND RIPPLE

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	27.00 MHz	27.00 Mhz	27.00 MHz
MIN INSERTION LOSS PERFORMANCE	-0.17 dB	-0.17 dB	-0.18 dB
{11b} 75% BW LOWER BANDEDGE FREQ	11.20 MHz	11.12 Mhz	11.06 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.39 dB	-0.41 dB	-0.43 dB
{11c} 75% BW UPPER BANDEDGE FREQ	71.20 MHz	71.12 Mhz	71.06 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.39 dB	-0.41 dB	-0.43 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.22 dB	0.24 dB	0.25 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.22 dB	0.25 dB	0.25 dB



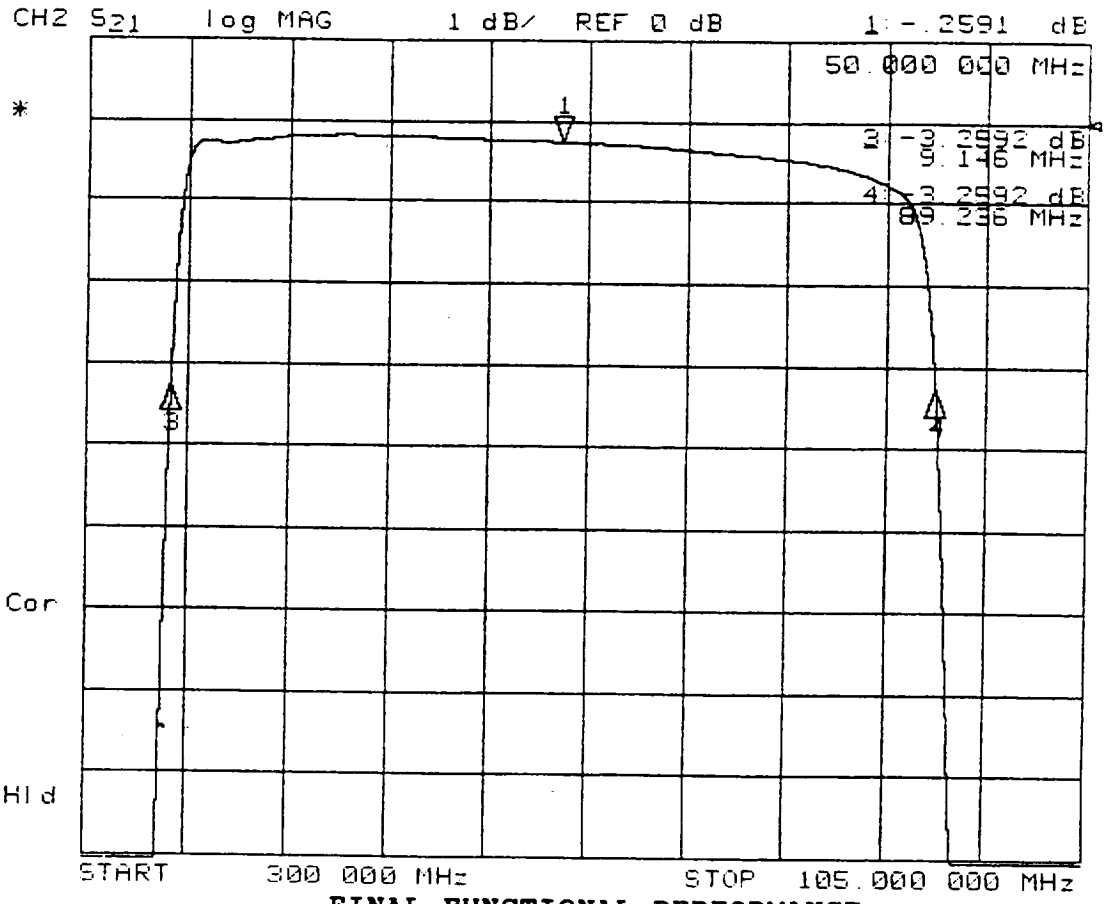
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P229-002
-10C DATA
OPR: R. HOGGATT DATE 11/26/96

MARKER PARAME...	...annel 1	...annel 2
MARKER 1	14.000000 MHz OFF	50.000000 MHz -.2363 dB
MARKER 2	86.000000 MHz OFF	49.358422 MHz OFF
MARKER 3	20.000000 MHz OFF	9.174268 MHz -3.2363 dB
MARKER 4	80.000000 MHz OFF	89.542576 MHz -3.2363 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P229-002
+15C DATA
OPR: R. HOGGATT DATE 11/26/96

MARKER PARAME...	...annel 1	...annel 2
MARKER 1	14.000000 MHz OFF	50.000000 MHz - 2501 dB
MARKER 2	86.000000 MHz OFF	49.278697 MHz OFF
MARKER 3	20.000000 MHz OFF	9.180884 MHz -3.2501 dB
MARKER 4	80.000000 MHz OFF	89.396511 MHz -3.2501 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P229-002
+40C DATA
OPR: R. HOGGATT DATE 11/26/96

MARKER PARAME...	...annel 1	...annel 2
MARKER 1	14.000000 MHz OFF	50.000000 MHz -.2591 dB
MARKER 2	86.000000 MHz OFF	49.191579 MHz OFF
MARKER 3	20.000000 MHz OFF	9.146384 MHz -3.2592 dB
MARKER 4	80.000000 MHz OFF	89.236775 MHz -3.2592 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

BANDPASS FILTER MODEL HL50-80-10SS1 S/N P229-002
AEROJET 1331559-3 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	(PASS)/FAIL	(PASS)/FAIL	(PASS)/FAIL
{11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.5 Fc=50.0 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	>100 dB (40.0 dB MIN)	>100 dB (40.0 dB MIN)	>100 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 102.0 MHz TO 1000.0 MHz	-54.4 dB (40.0 dB MIN)	-53.2 dB (40.0 dB MIN)	-54.1 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-13.5 °C (-15.0 TO -10.0)	+14.5°C (12.5 TO 17.5)	+44.0°C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

TEST PERFORMED BY R. Hoggatt DATE 11/26/96 (DA 5)

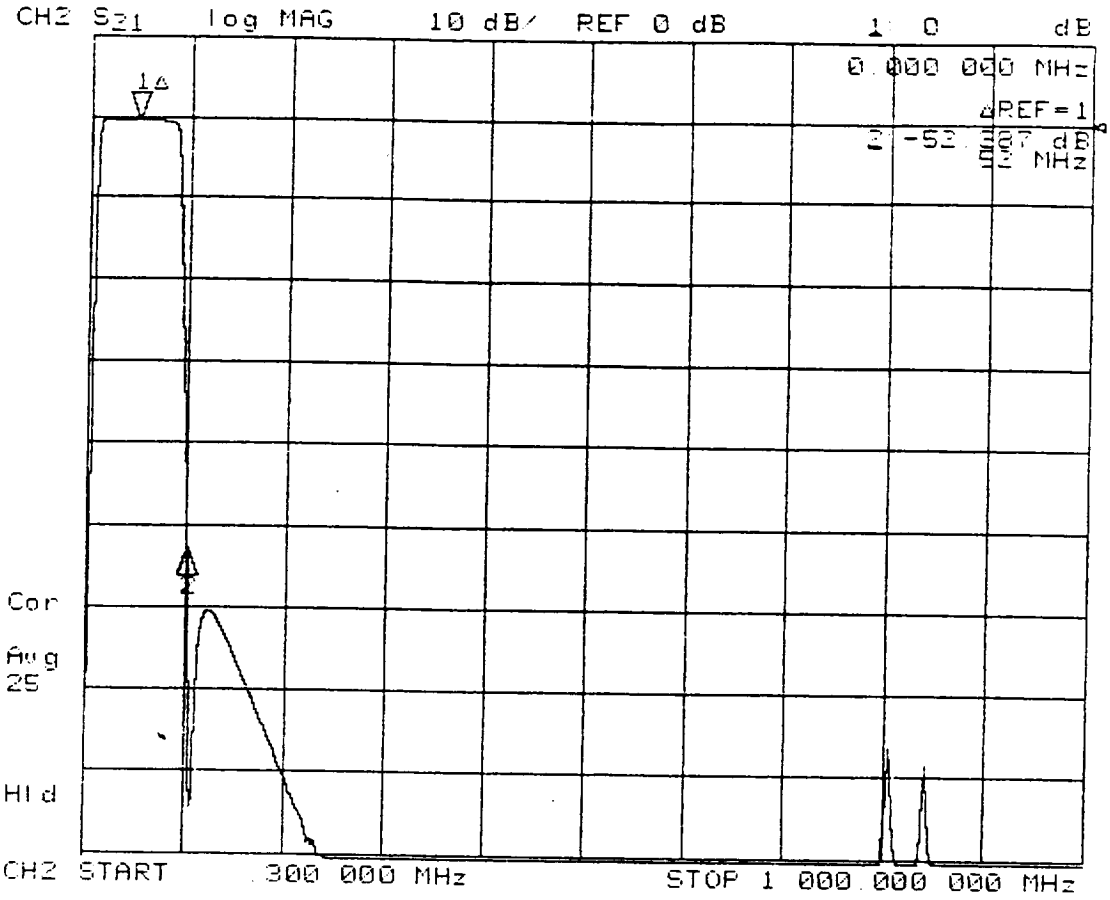
NOTE IF TEST WITNESSED BY AESD: _____ GSI: → NOT WITNESSED THIS TIME

***** END OF FUNCTIONAL PERFORMANCE TEST *****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

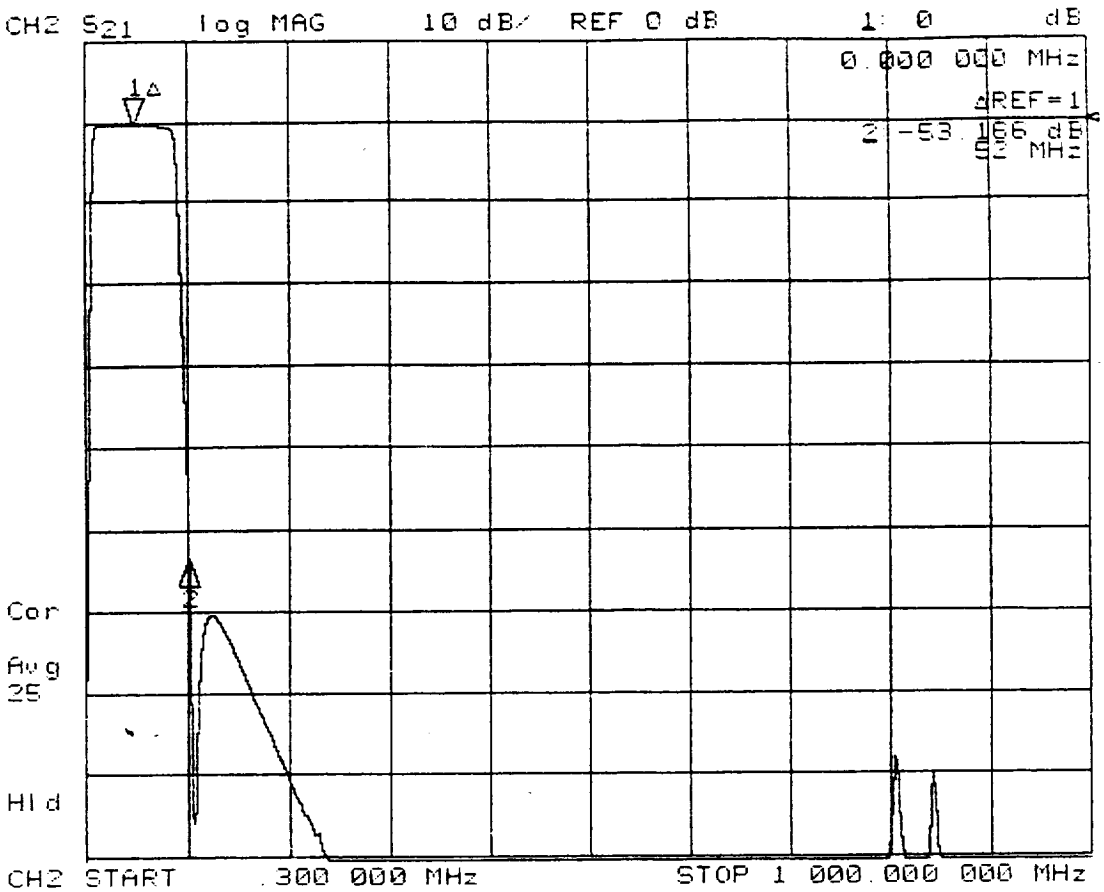
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.50
MOUNTING HOLE CENTER	0.125 ± .010	.126
BETWEEN UPPER MOUNTING HOLES	3.250	3.250
BETWEEN LOWER MOUNTING HOLES	3.250	3.250



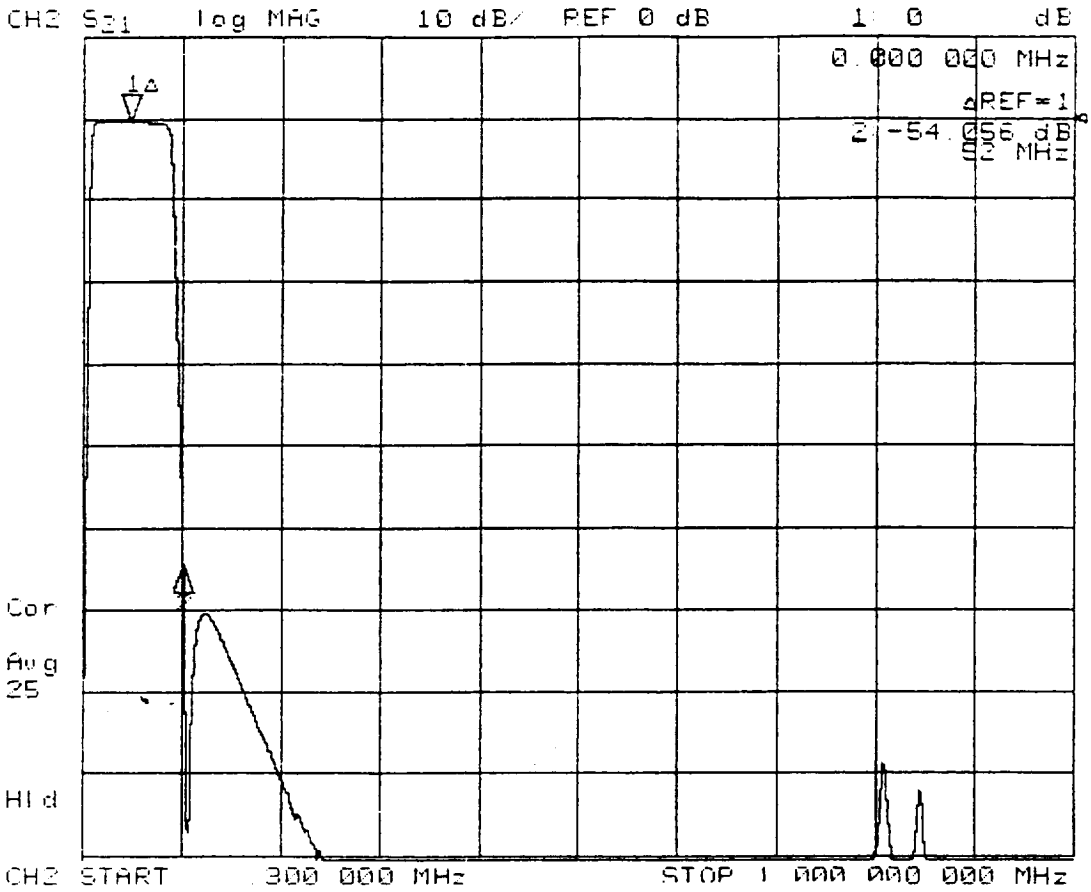
FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P229-002
-10C DATA
OPR: R. HOGGATT DATE 11/26/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	1.000000 MHz OFF	50.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	103.000000 MHz -53.387 dB
MARKER 3	5.000000 MHz OFF	103.000000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P229-002
+15C DATA
OPR: R. HOGGATT DATE 11/26/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	1.000000 MHz OFF	50.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	102.000000 MHz -53.166 dB
MARKER 3	5.000000 MHz OFF	102.000000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P229-002
+40C DATA
OPR: R. HOGGATT DATE 11/26/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	1.000000 MHz OFF	50.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	102.000000 MHz -54.056 dB
MARKER 3	5.000000 MHz OFF	102.000000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFEPENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX C **QUALIFICATION TEST REPORT**

BANDPASS FILTER MODEL HL50-80-10SS1 S/N P229-002
AEROJET 1331559-3 REV. C

BANDPASS CHARACTERISTICS MEASUREMENT
PER QTP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE: +23.5 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-103.6 dB	F11	(*) 60.0	MHz	-0.32 dB
F2	1.0	MHz	-95.1 dB	F12	(*) 70.0	MHz	-0.40 dB
F3	5.0	MHz	-32.1 dB	F13	80.0	MHz	-0.61 dB
F4	7.5	MHz	-11.6 dB	F14	85.0	MHz	-0.82 dB
F5	10.0	MHz	-1.72 dB	F15	90.0	MHz	-4.95 dB
F6	15.0	MHz	-0.31 dB	F16	100.0	MHz	-43.2 dB
F7	20.0	MHz	-0.23 dB	F17	200.0	MHz	-80.2 dB
F8	(*) 30.0	MHz	-0.18 dB	F18	300.0	MHz	-101.1 dB
F9	(*) 40.0	MHz	-0.22 dB	F19	500.0	MHz	-103.3 dB
F10	50.0	MHz	-0.26 dB	F20	1000.0	MHz	-104.9 dB

TEST PERFORMED BY: R. Hoggatt DATE 11/26/96 (DA 5)

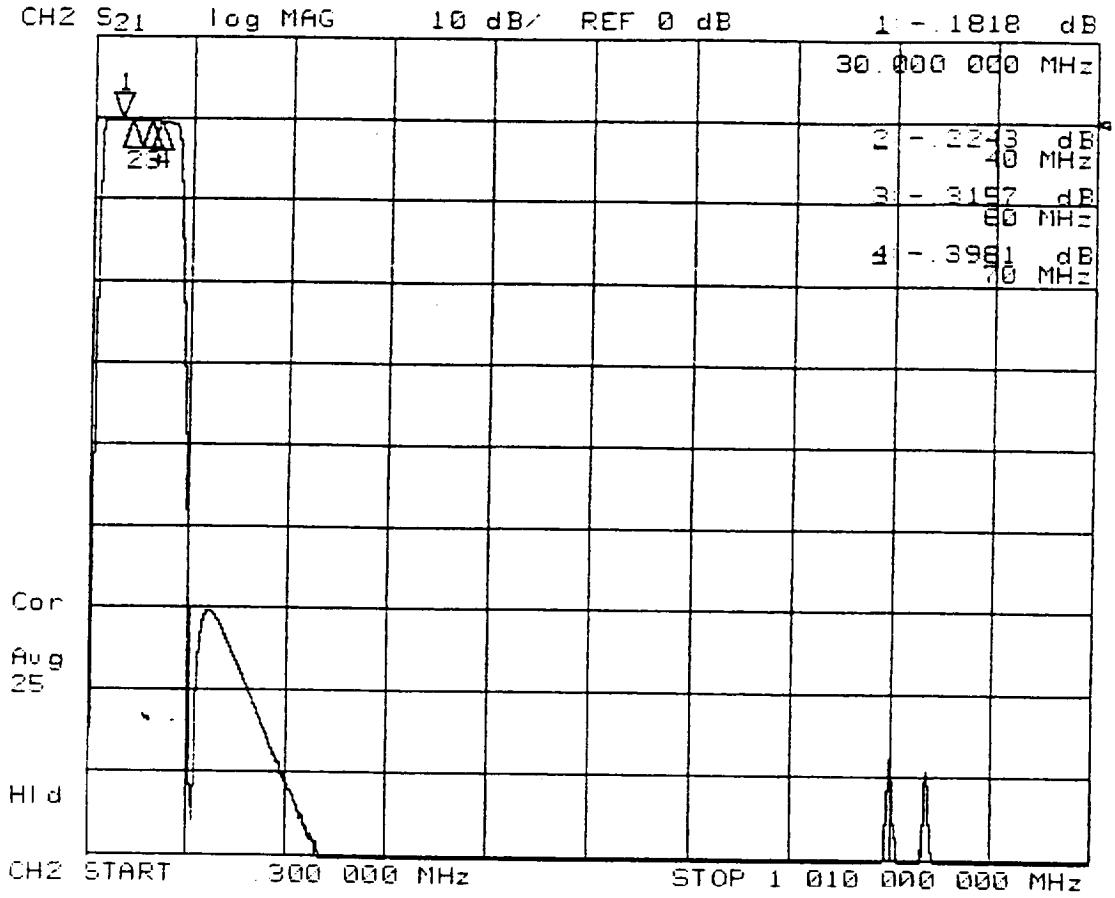
NOTE IF TEST WITNESSED BY AESD _____ GSI _____ → Not witnessed This Time (DA)

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
QUALIFICATION TEST PROCEDURE
63-0005-010 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX C PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER QTP PARA 4.5.1.
b.) INSERTION LOSS PER QTP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER QTP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER QTP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER QTP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER QTP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER QTP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P229-002
AMBIENT
OPR: R. HOGGATT DATE 11/26/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	1.000000 MHz OFF	30.000000 MHz -.1818 dB
MARKER 2	5.000000 MHz OFF	40.000000 MHz -.2243 dB
MARKER 3	5.000000 MHz OFF	60.000000 MHz -.3157 dB
MARKER 4	5.000000 MHz OFF	70.000000 MHz -.3981 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Channel 4 Bandpass Filter

IF Filter (S/N: 1331559-2, S/N: P228-003)

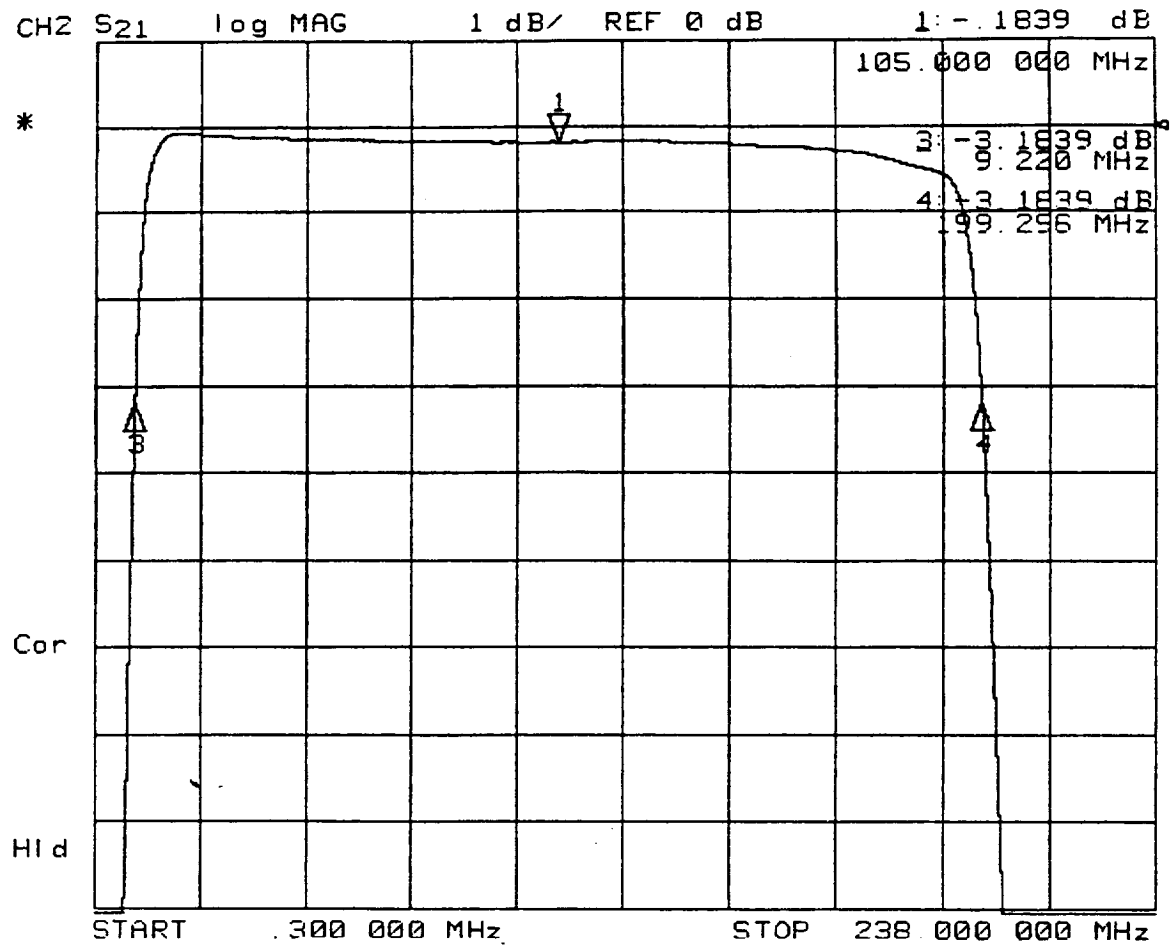
BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-003
AEROJET 1331559-2 REV. E

3.0 dB BANDWIDTH

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	199.30 MHz (198.0-200.0)	198.95 Mhz (198.0-200.0)	198.62 MHz (1480.01500.0)
{8} LOWER 3.0 dB BANDEDGE	9.22 MHz (8.0-10.0)	9.21 Mhz (8.0-10.0)	9.19 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	190.05 MHz (188.0-192.0)	189.74 Mhz (188.0-192.0)	189.43 MHz (188.0-192.0)
{10} ADD {7} AND {8} ÷ 2 =	104.26 MHz (105.0 NOM)	104.08 MHz (105.0 NOM)	103.91 Mhz (105.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-13.4 °C (-15.0 TO -10.0)	+15.1 °C (12.5 TO 17.5)	+43.4 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

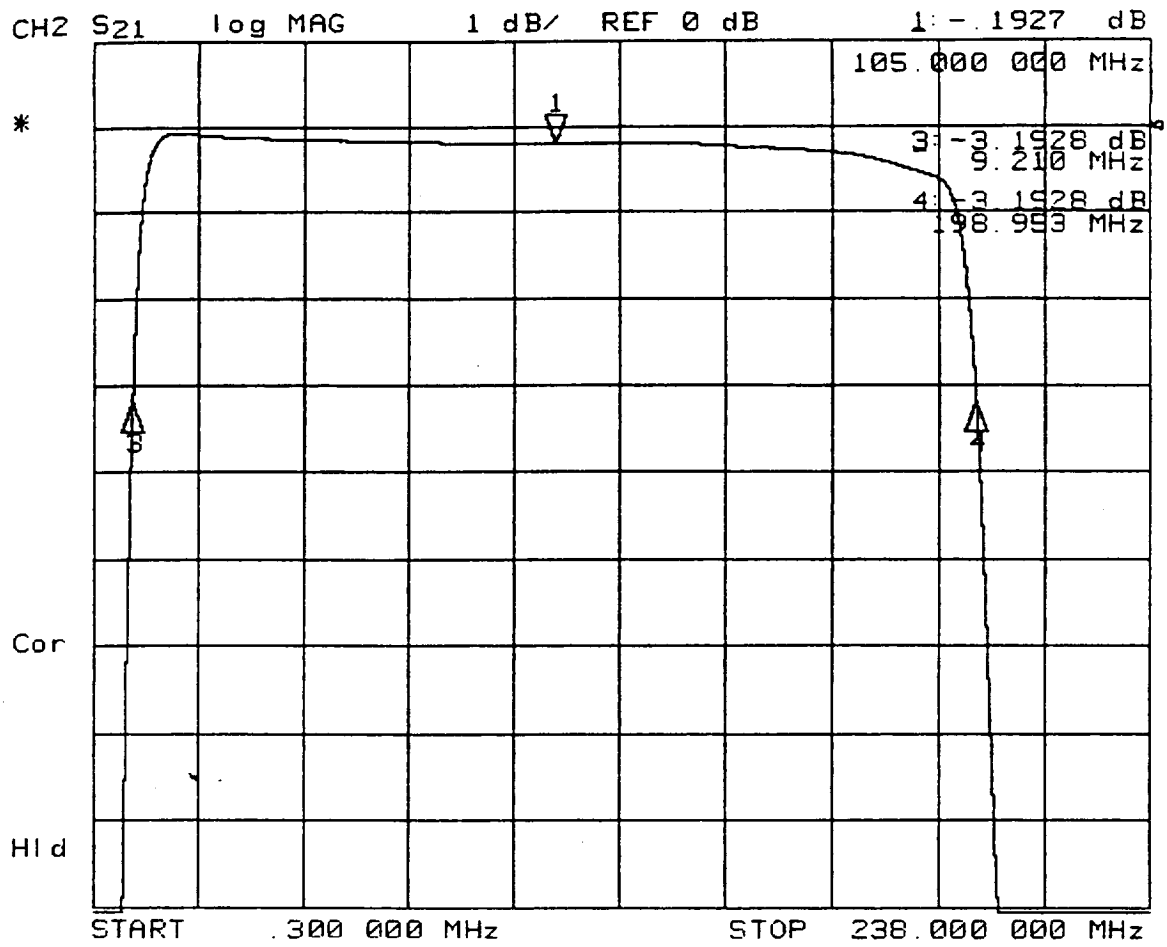
PASSBAND RIPPLE

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	19.32 MHz	19.91 Mhz	19.92 MHz
MIN INSERTION LOSS PERFORMANCE	-0.07 dB	-0.07 dB	-0.08 dB
{11b} 75% BW LOWER BANDEDGE FREQ	14.17 MHz	14.02 Mhz	13.86 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.24 dB	-0.26 dB	-0.28 dB
{11c} 75% BW UPPER BANDEDGE FREQ	156.67 MHz	156.52 Mhz	156.36 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.24 dB	-0.26 dB	-0.28 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.17 dB	-0.19 dB	0.20 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.17 dB	-0.19 dB	0.20 dB



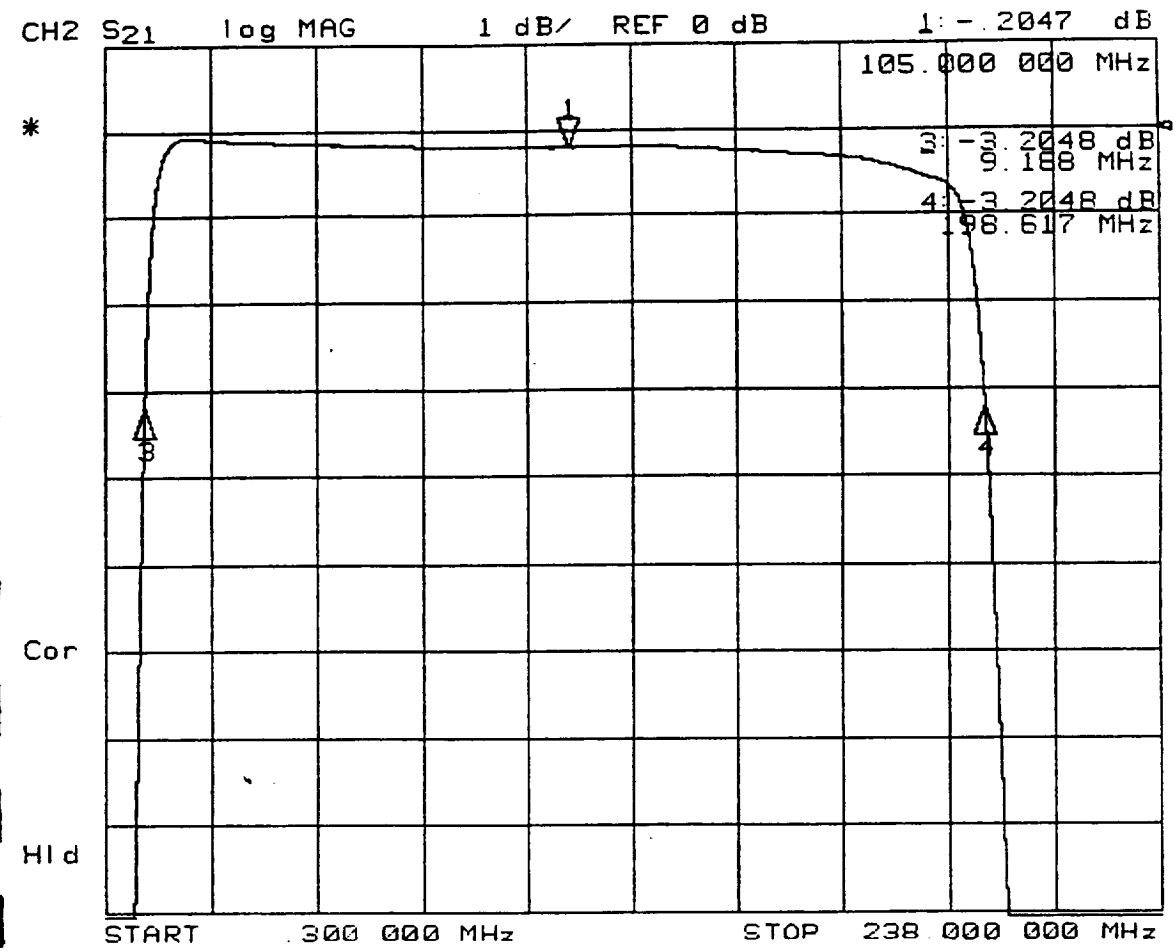
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-003
-10C DATA
OPR: R. HOGGATT DATE DEC 27 1996 annel 2

MARKER PARAMET		
MARKER 1	19.500000 MHz OFF	105.000000 MHz -.1839 dB
MARKER 2	190.500000 MHz OFF	104.258272 MHz OFF
MARKER 3	33.750000 MHz OFF	9.220079 MHz -3.1839 dB
MARKER 4	176.250000 MHz OFF	199.296466 MHz -3.1839 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-003
+15C DATA
MARKER PARAMET OPR: R. HOGGATT DATE DEC 27 1996 annel 2

MARKER 1	19.500000 MHz OFF	105.000000 MHz -.1927 dB
MARKER 2	190.500000 MHz OFF	104.081955 MHz OFF
MARKER 3	33.750000 MHz OFF	9.210773 MHz -3.1928 dB
MARKER 4	176.250000 MHz OFF	198.953138 MHz -3.1928 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-003
+40C DATA
OPR: R. HOGGATT DATE DEC 27 1996 Channel 2

MARKER PARAMET		
MARKER 1	19.500000 MHz OFF	105.000000 MHz -.2047 dB
MARKER 2	190.500000 MHz OFF	103.903114 MHz OFF
MARKER 3	33.750000 MHz OFF	9.188325 MHz -3.2048 dB
MARKER 4	176.250000 MHz OFF	198.617903 MHz -3.2048 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX B QUALIFICATION TEST REPORT

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-003
AEROJET 1331559-2 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	(PASS)/FAIL	(PASS)/FAIL	(PASS)/FAIL
{11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.5 Fc=105.0 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	-59.4 dB (40.0 dB MIN)	-59.3 dB (40.0 dB MIN)	-59.3 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 228.5 MHz TO 1000.0 MHz	-41.4 dB (40.0 dB MIN)	-41.4 dB (40.0 dB MIN)	-41.5 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-13.3 °C (-15.0 TO -10.0)	+15.1 °C (12.5 TO 17.5)	+43.2 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

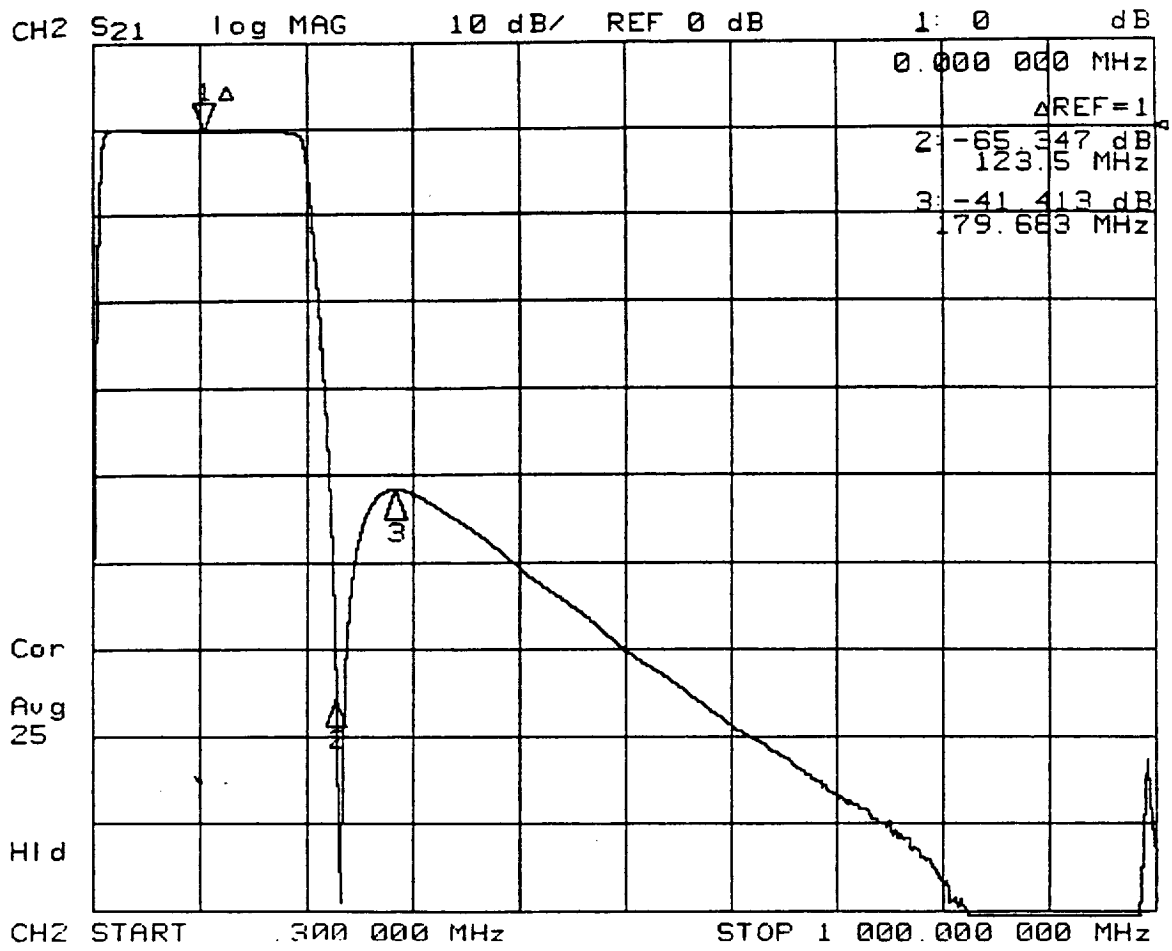
TEST PERFORMED BY R. HOGGATH DATE 12/27/96

NOTE IF TEST WITNESSED BY AESD: _____ GSI: Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.500
MOUNTING HOLE CENTER	0.125 ± .010	0.127
BETWEEN UPPER MOUNTING HOLES	3.250	3.250
BETWEEN LOWER MOUNTING HOLES	3.250	3.250

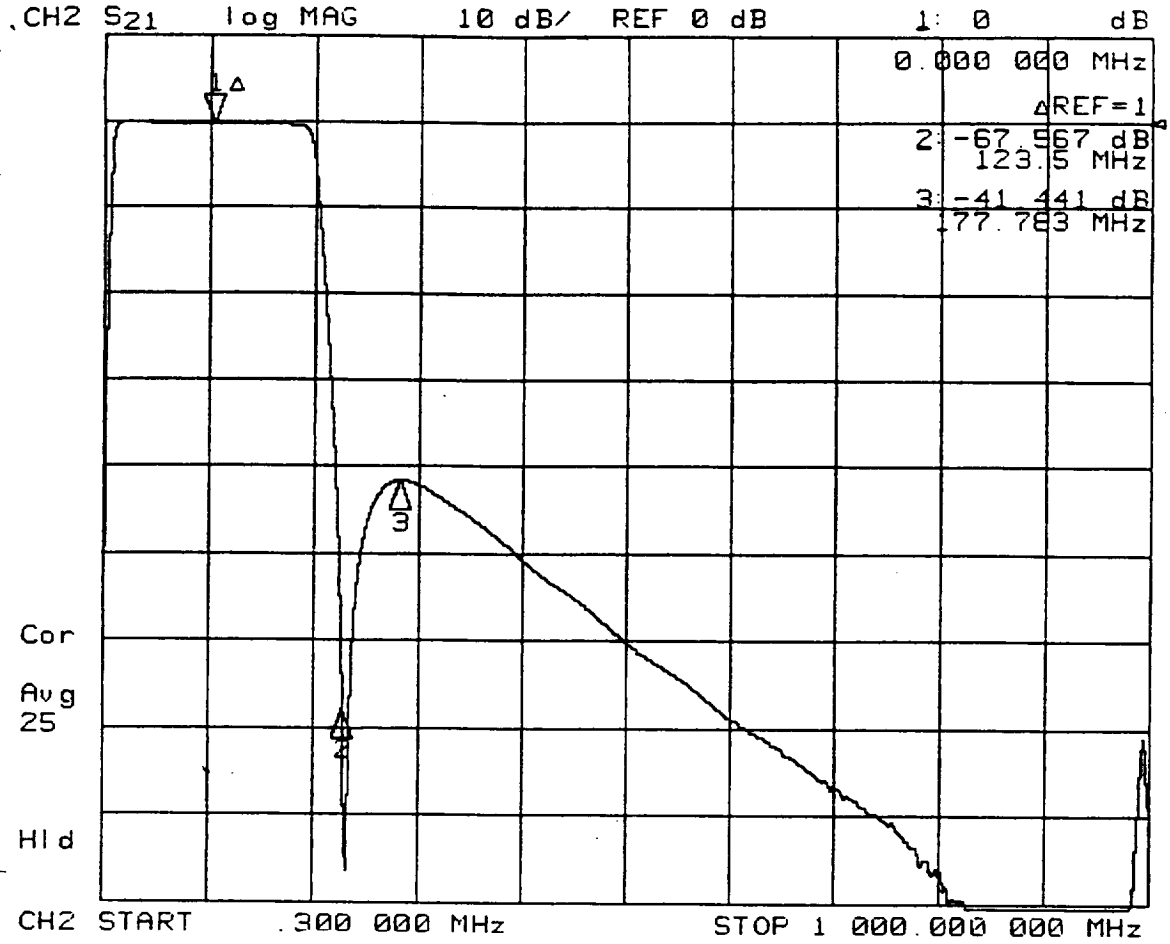


FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-003
-10C DATA
OPR: R. HOGGATT DATE DEC 27 1996

MARKER PARAMET annel 2

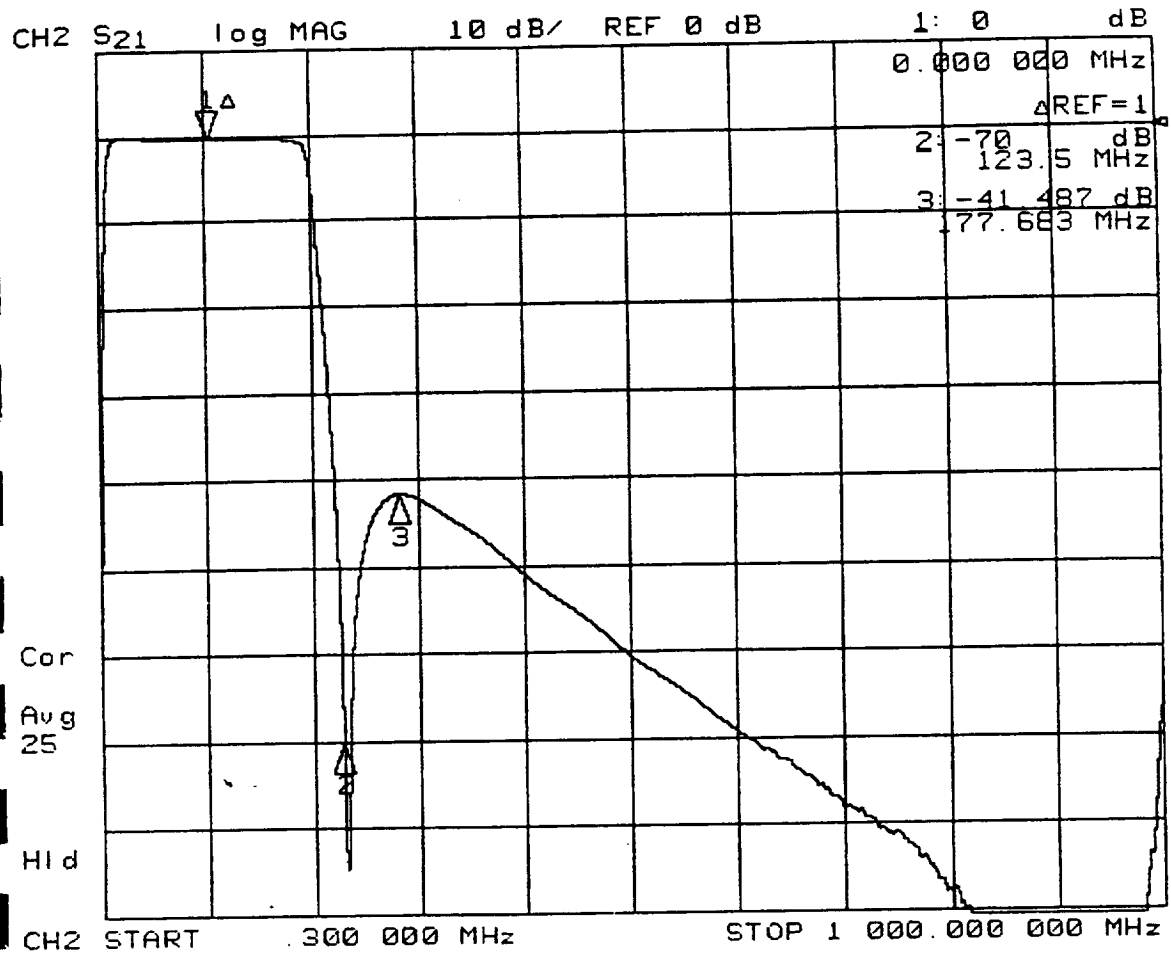
MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -65.347 dB
MARKER 3	5.000000 MHz OFF	284.683142 MHz -41.413 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB

REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-003
+15C DATA
OPR: R. HOGGATT DATE DEC 27 1996 annel 2

MARKER PARAMET		
MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -67.567 dB
MARKER 3	5.000000 MHz OFF	282.783712 MHz -41.441 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-003
+40C DATA
OPR: R. HOGGATT DATE DEC 27 1996 annel 2

MARKER PARAMET		
MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -70 dB
MARKER 3	5.000000 MHz OFF	282.683742 MHz -41.487 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-003
AEROJET 1331559-2 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER QTP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +22.7 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-83.0 dB	F11	(*) 130.0	MHz	-0.26 dB
F2	1.0	MHz	-66.5 dB	F12	(*) 150.0	MHz	-0.26 dB
F3	5.0	MHz	-17.9 dB	F13	180.0	MHz	-0.44 dB
F4	7.5	MHz	-7.52 dB	F14	190.0	MHz	-0.62 dB
F5	10.0	MHz	-1.86 dB	F15	200.0	MHz	-4.28 dB
F6	20.0	MHz	-0.07 dB	F16	250.0	MHz	-47.1 dB
F7	40.0	MHz	-0.10 dB	F17	300.0	MHz	-42.2 dB
F8	(*) 60.0	MHz	-0.16 dB	F18	400.0	MHz	-50.8 dB
F9	(*) 80.0	MHz	-0.19 dB	F19	500.0	MHz	-60.3 dB
F10	105.0	MHz	-0.26 dB	F20	1000.0	MHz	-71.4 dB

DA 5

TEST PERFORMED BY: R. HOGGATT DATE 12/27/96

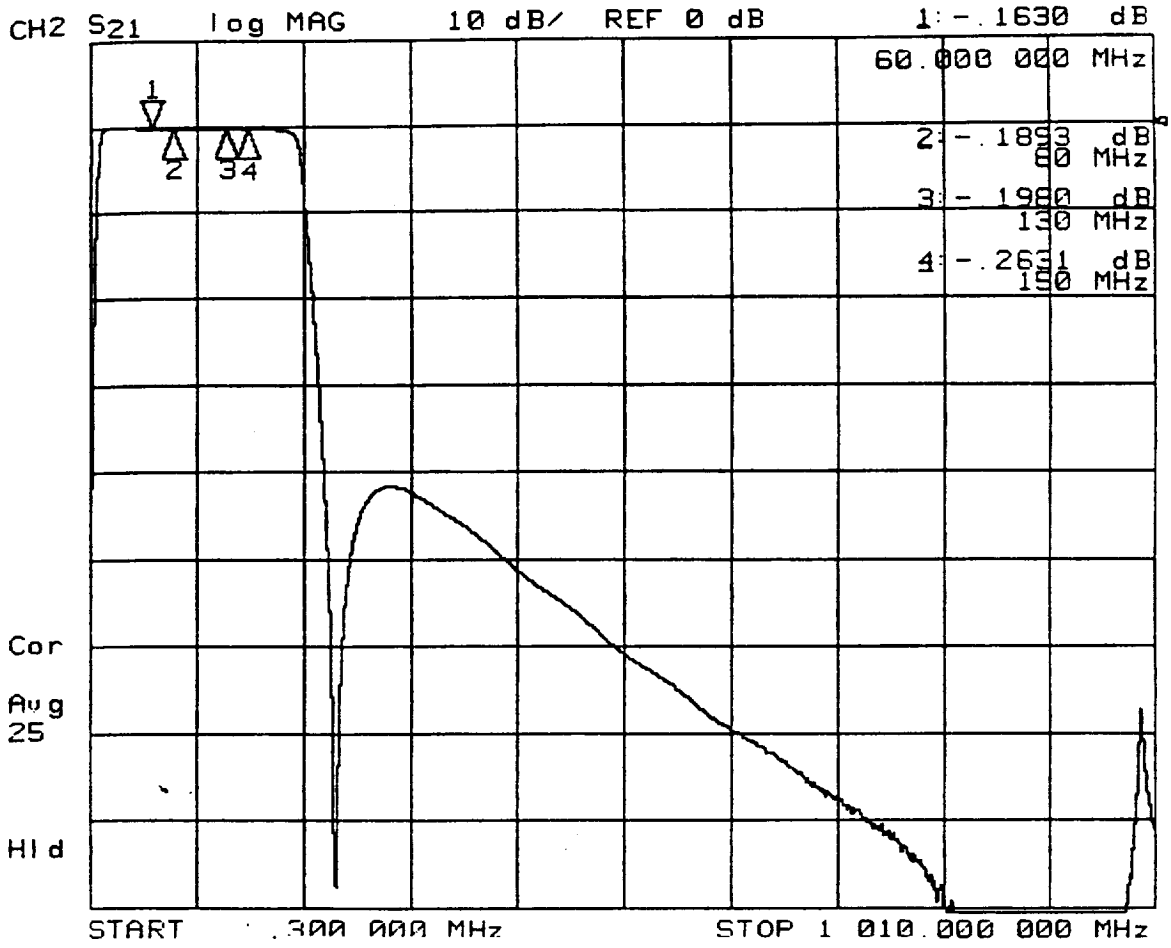
NOTE IF TEST WITNESSED BY AESD _____ GSI _ Not witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
QUALIFICATION TEST PROCEDURE
63-0005-010 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX B PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER QTP PARA 4.5.1.
b.) INSERTION LOSS PER QTP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER QTP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER QTP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER QTP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER QTP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER QTP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P228-003
AMBIENT

MARKER PARAME OPR: R. HOGGATT DATE DEC 27 1996 Channel 2

MARKER 1	17.750000 MHz	60.000000 MHz
	OFF	-.1630 dB
MARKER 2	157.250000 MHz	80.000000 MHz
	OFF	-.1893 dB
MARKER 3	29.375000 MHz	130.000000 MHz
	OFF	-.1980 dB
MARKER 4	145.625000 MHz	150.000000 MHz
	OFF	-.2631 dB
MKR STIMULUS OFFSET	0.000000 MHz	89.425802 MHz
	0 dB	-3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Channel 5 Bandpass Filter

IF Filter (S/N: 1331559-5, S/N: P231-002)

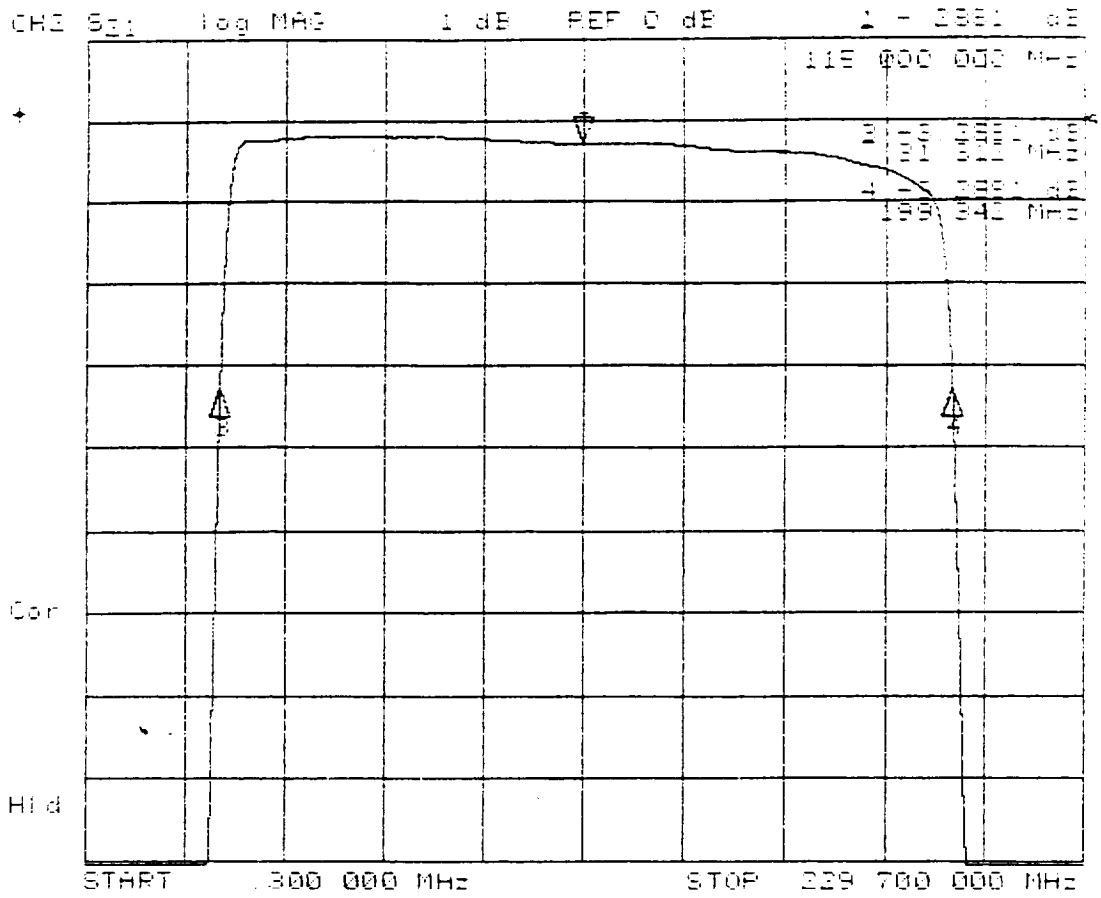
BANDPASS FILTER MODEL HL115-170-10SS1 S/N P231-002
AEROJET 1331559-5 REV. E

3.0 dB BANDWIDTH

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	199.34 MHz (198.0-200.0)	199.01 Mhz (198.0-200.0)	198.75 MHz (198.0-200.0)
{8} LOWER 3.0 dB BANDEDGE	31.31 MHz (30.0-32.0)	31.25 Mhz (30.0-32.0)	31.20 MHz (30.0-32.0)
{9} 3.0 dB RELATIVE BANDWIDTH	168.03 MHz (166.0-170.0)	167.76 Mhz (166.0-170.0)	167.55 MHz (166.0-170.0)
{10} ADD {7} AND {8} ÷ 2 =	115.33 MHz (115.0 NOM)	115.13 MHz (115.0 NOM)	115.98 Mhz (115.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-13.3 °C (-15.0 TO -10.0)	+16.0 °C (12.5 TO 17.5)	+42.7 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

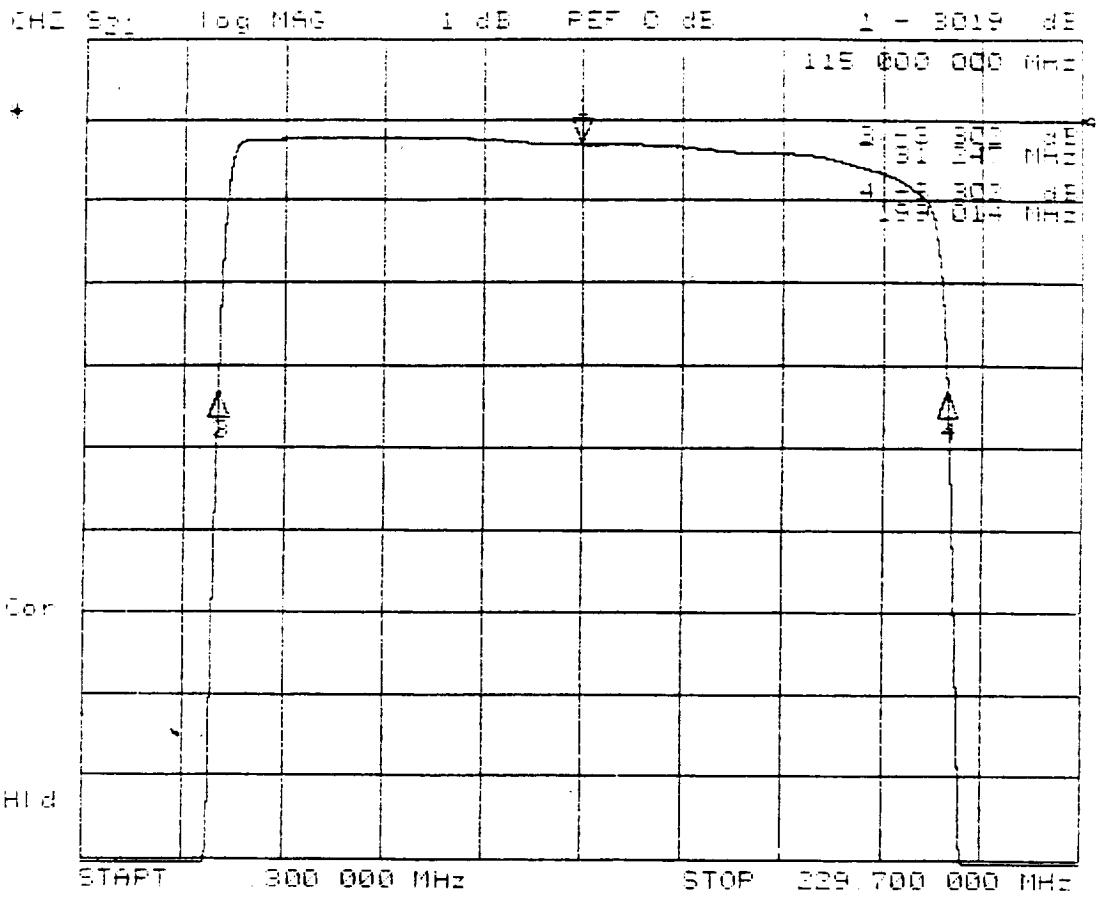
PASSBAND RIPPLE

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	55.36 MHz	57.08 Mhz	55.36 MHz
MIN INSERTION LOSS PERFORMANCE	-0.20 dB	-0.21 dB	-0.22 dB
{11b} 75% BW LOWER BANDEDGE FREQ	35.01 MHz	34.84 Mhz	34.71 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.40 dB	-0.42 dB	-0.25 dB
{11c} 75% BW UPPER BANDEDGE FREQ	162.51 MHz	162.34 Mhz	162.21 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.40 dB	-0.42 dB	-0.25 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.20 dB	0.21 dB	0.22 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.20 dB	0.21 dB	0.23 dB



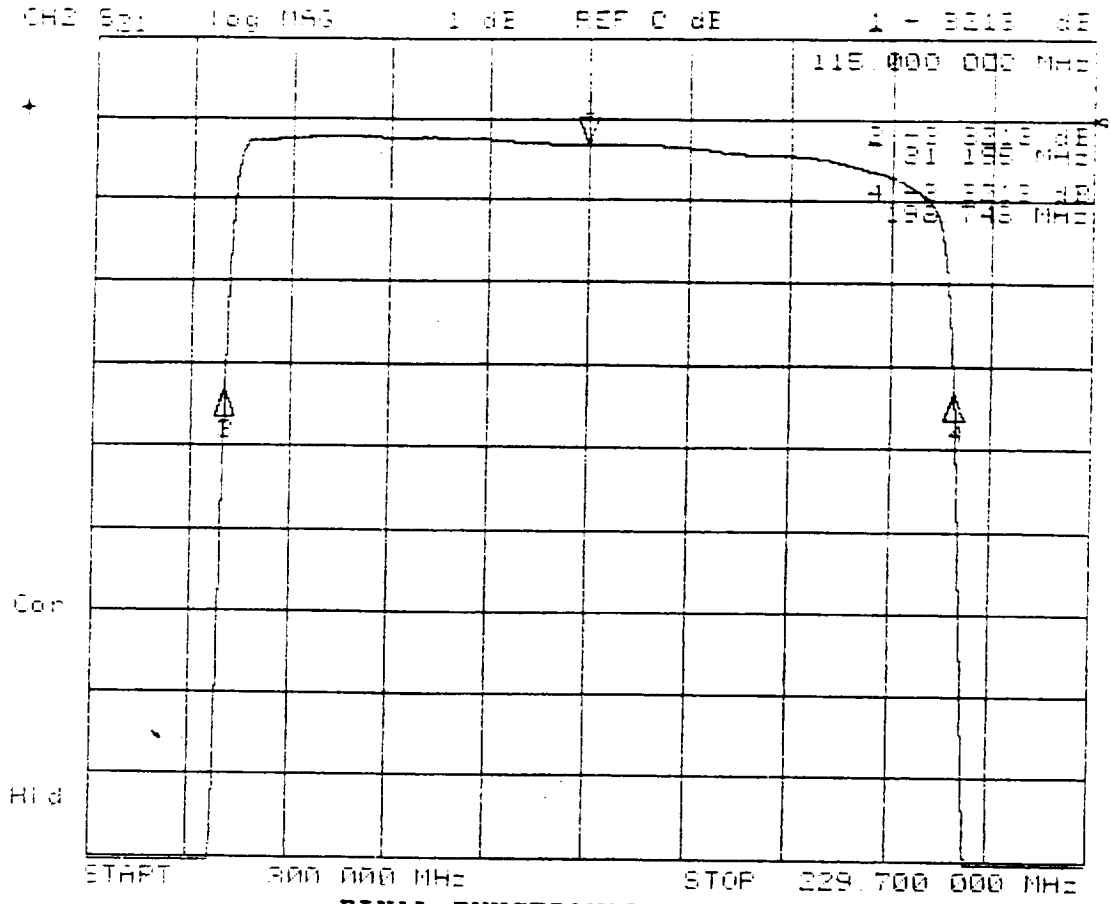
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P231-002
-10C DATA
OPR: R. HOGGATT DATE 12/11/96

MARKER PARAME...	...annel 1	...annel 2
MARKER 1	38.500000 MHz OFF	115.000000 MHz -.2881 dB
MARKER 2	131.500000 MHz OFF	115.327611 MHz OFF
MARKER 3	51.250000 MHz OFF	31.312833 MHz -3.2881 dB
MARKER 4	178.750000 MHz OFF	199.342389 MHz -3.2881 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425803 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P231-002
+15C DATA
OPR: R. HOGGATT DATE 12/11/96

MARKER PARAME...	...nnel 1	...nnel 2
MARKER 1	38.500000 MHz OFF	115.000000 MHz - 3019 dB
MARKER 2	191.500000 MHz OFF	115.130748 MHz OFF
MARKER 3	51.250000 MHz OFF	31.247283 MHz -3.302 dB
MARKER 4	178.750000 MHz OFF	199.014214 MHz -3.302 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P231-002
+40C DATA
OPR: R. HOGGATT DATE 12/4/96

MARKER PARAME...	...annel 2	...annel 3
MARKER 1	38.500000 MHz OFF	115.000000 MHz -.3213 dB
MARKER 2	191.500000 MHz OFF	114.972154 MHz OFF
MARKER 3	51.250000 MHz OFF	31.195837 MHz -3.3213 dB
MARKER 4	172.750000 MHz OFF	198.748472 MHz -3.3213 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

BANDPASS FILTER MODEL HL115-170-10SS1 S/N P231-002
AEROJET 1331559-5 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	(PASS)/FAIL	(PASS)/FAIL	(PASS)/FAIL
{11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.5 Fc=115.0 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 4.5 MHz	>90 dB (40.0 dB MIN)	>90 dB (40.0 dB MIN)	>90 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 225.5 MHz TO 1000.0 MHz	-63.9 dB (40.0 dB MIN)	-65.1 dB (40.0 dB MIN)	-66.2 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-13.3 °C (-15.0 TO -10.0)	+15.8 °C (12.5 TO 17.5)	+42.5 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

TEST PERFORMED BY R. Hoggatt (In 5) DATE 12/11/96

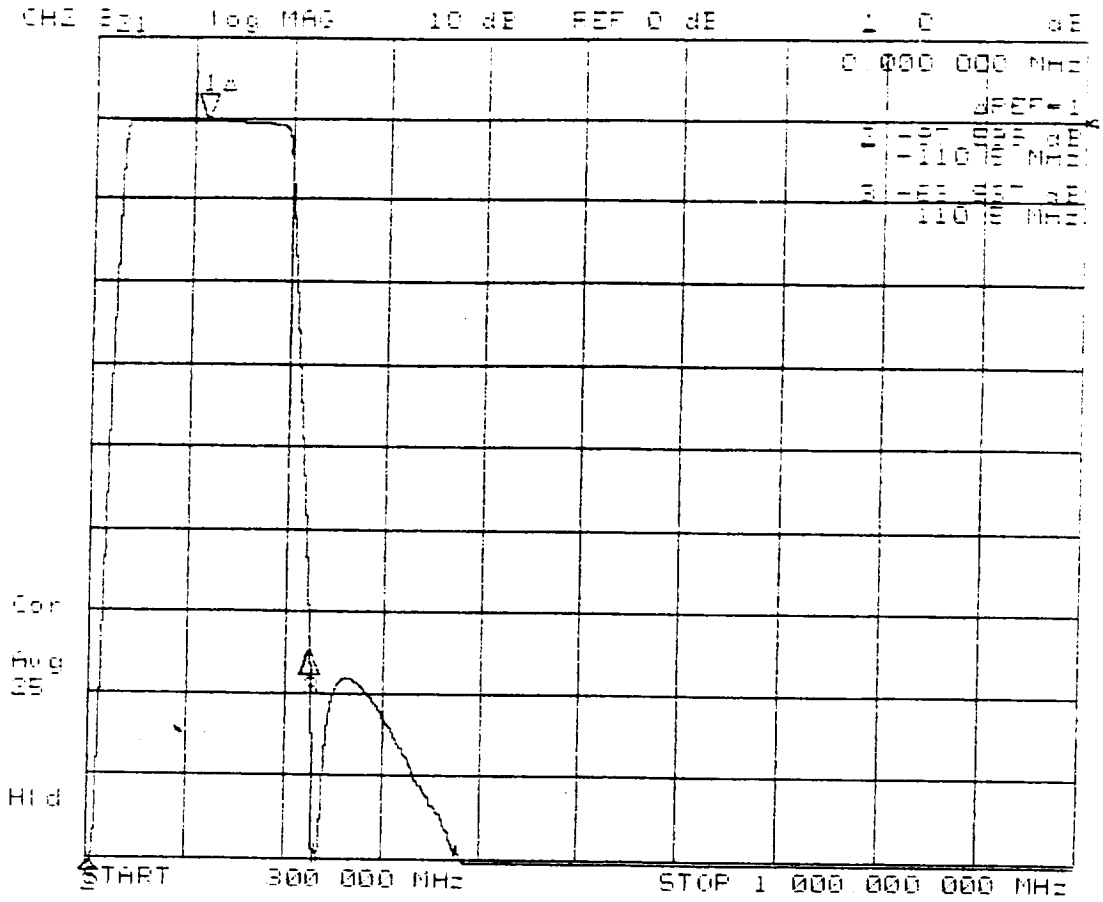
NOTE IF TEST WITNESSED BY AESD: _____ GSI: Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

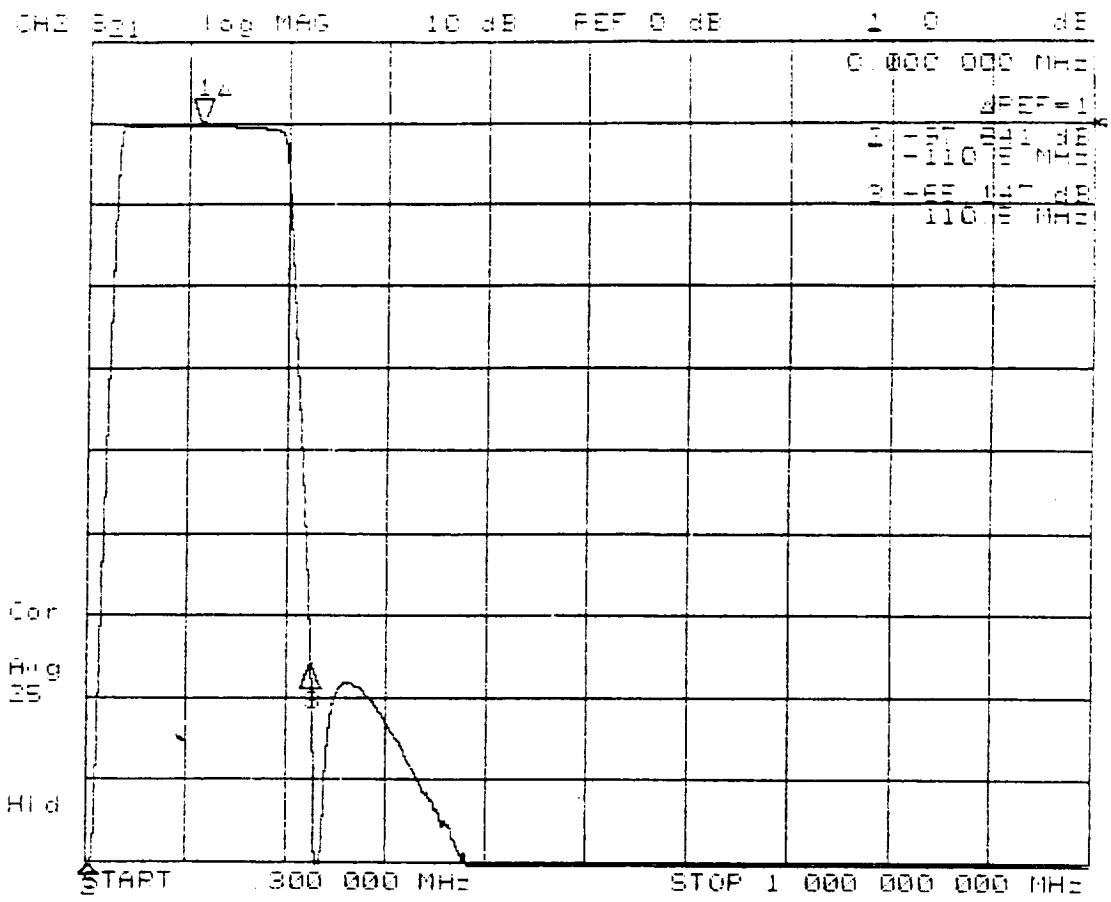
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.499
MOUNTING HOLE CENTER	0.125 ± .010	0.123
BETWEEN UPPER MOUNTING HOLES	3.250	3.251
BETWEEN LOWER MOUNTING HOLES	3.250	3.251



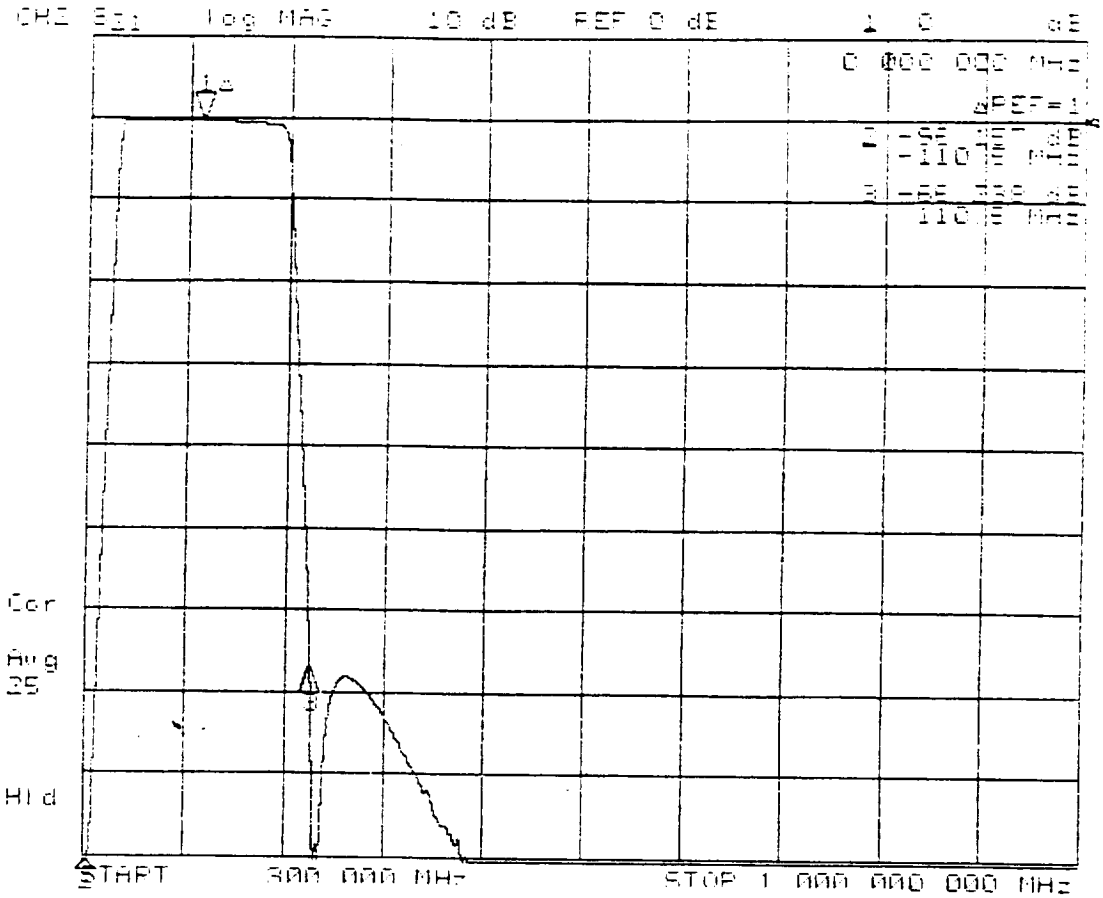
FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P231-002
-10C DATA
OPR: R. HOGGATT DATE 12/11/96

MARKER PARAME...	...annel 2	
MARKER 1	1000.000000 MHz OFF	115.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	4.500000 MHz -97.599 dB
MARKER 3	1000.000000 MHz OFF	225.500000 MHz -63.937 dB
MARKER 4	1000.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P231-002
+15C DATA
OPR: R. HOGGATT DATE 12/11/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	1000.000000 MHz OFF	115.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	4.500000 MHz -97.641 dB
MARKER 3	1000.000000 MHz OFF	225.500000 MHz -65.147 dB
MARKER 4	1000.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P231-002
+40C DATA
OPR: R. HOGGATT DATE 12/11/96

MARKER PARAME...	...annel 1	...annel 2
MARKER 1	1000.000000 MHz OFF	115.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	4.500000 MHz -96.157 dB
MARKER 3	1000.000000 MHz OFF	225.500000 MHz -66.238 dB
MARKER 4	1000.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX E **QUALIFICATION TEST REPORT**

BANDPASS FILTER MODEL HL115-170-10SS1 S/N P231-002
AEROJET 1331559-5 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER QTP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE: +23.3 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-103.4 dB	F11	(*) 130.0	MHz	-0.31 dB
F2	1.0	MHz	-102.2 dB	F12	(*) 155.0	MHz	-0.46 dB
F3	10.0	MHz	-78.2 dB	F13	180.0	MHz	-0.65 dB
F4	20.0	MHz	-38.4 dB	F14	190.0	MHz	-0.84 dB
F5	30.0	MHz	-6.30 dB	F15	200.0	MHz	-4.85 dB
F6	40.0	MHz	-0.26 dB	F16	210.0	MHz	-26.8 dB
F7	50.0	MHz	-0.22 dB	F17	300.0	MHz	-72.8 dB
F8	(*) 75.0	MHz	-0.24 dB	F18	400.0	MHz	-95.5 dB
F9	(*) 100.0	MHz	-0.29 dB	F19	500.0	MHz	-105.8 dB
F10	115.0	MHz	-0.32 dB	F20	1000.0	MHz	-101.6 dB

TEST PERFORMED BY: R. Hoggatt DA 5 DATE 12/11/96

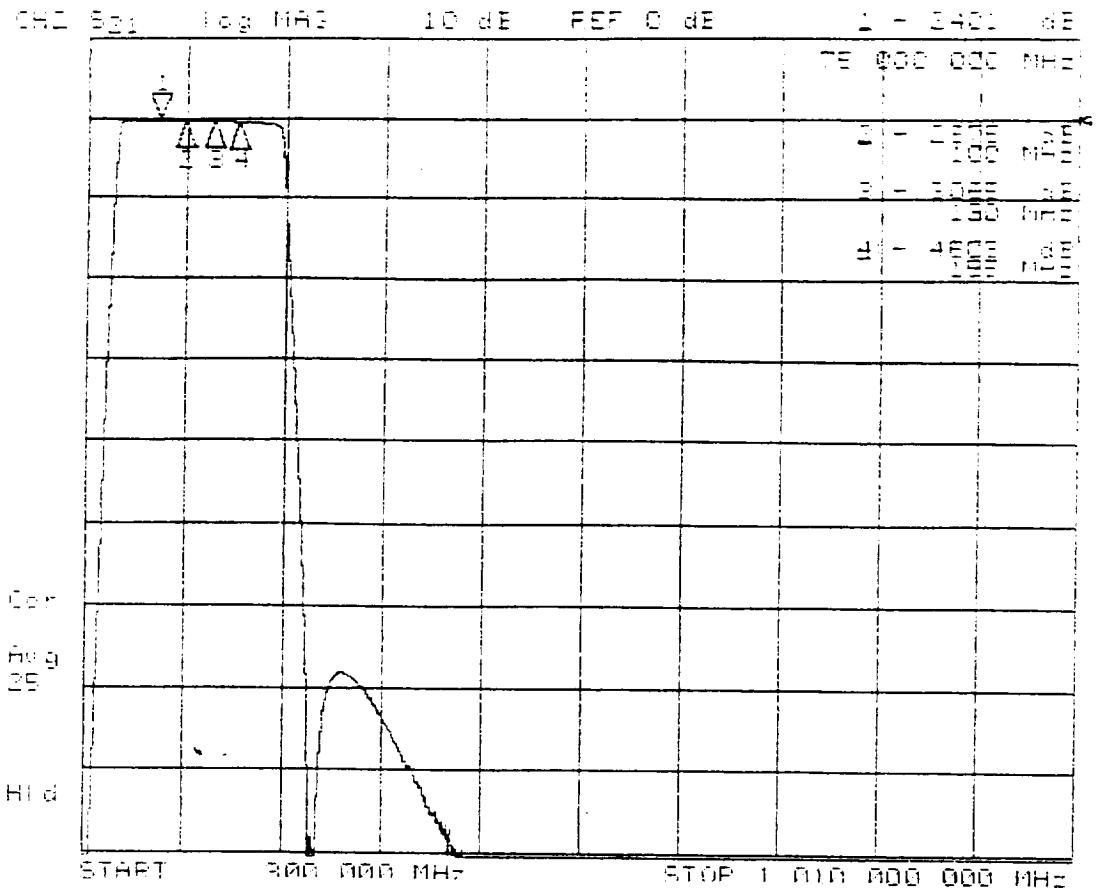
NOTE IF TEST WITNESSED BY AESD _____ GSI - Not witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
QUALIFICATION TEST PROCEDURE
63-0005-010 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX E PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER QTP PARA 4.5.1.
b.) INSERTION LOSS PER QTP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER QTP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER QTP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER QTP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER QTP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER QTP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P231-002
AMBIENT
OPR: R. HOGGATT DATE 12/11/96

MARKER PARAMETERS	Channel 1	Channel 2
MARKER 1	75.000000 MHz OFF	75.000000 MHz -.2401 dB
MARKER 2	100.000000 MHz OFF	100.000000 MHz -.2875 dB
MARKER 3	130.000000 MHz OFF	130.000000 MHz -.3065 dB
MARKER 4	155.000000 MHz OFF	155.000000 MHz -.4603 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Channel 6 Bandpass Filter

IF Filter (S/N: 1331559-2, S/N: P228-014)

APPENDIX B **ACCEPTANCE TEST REPORT**

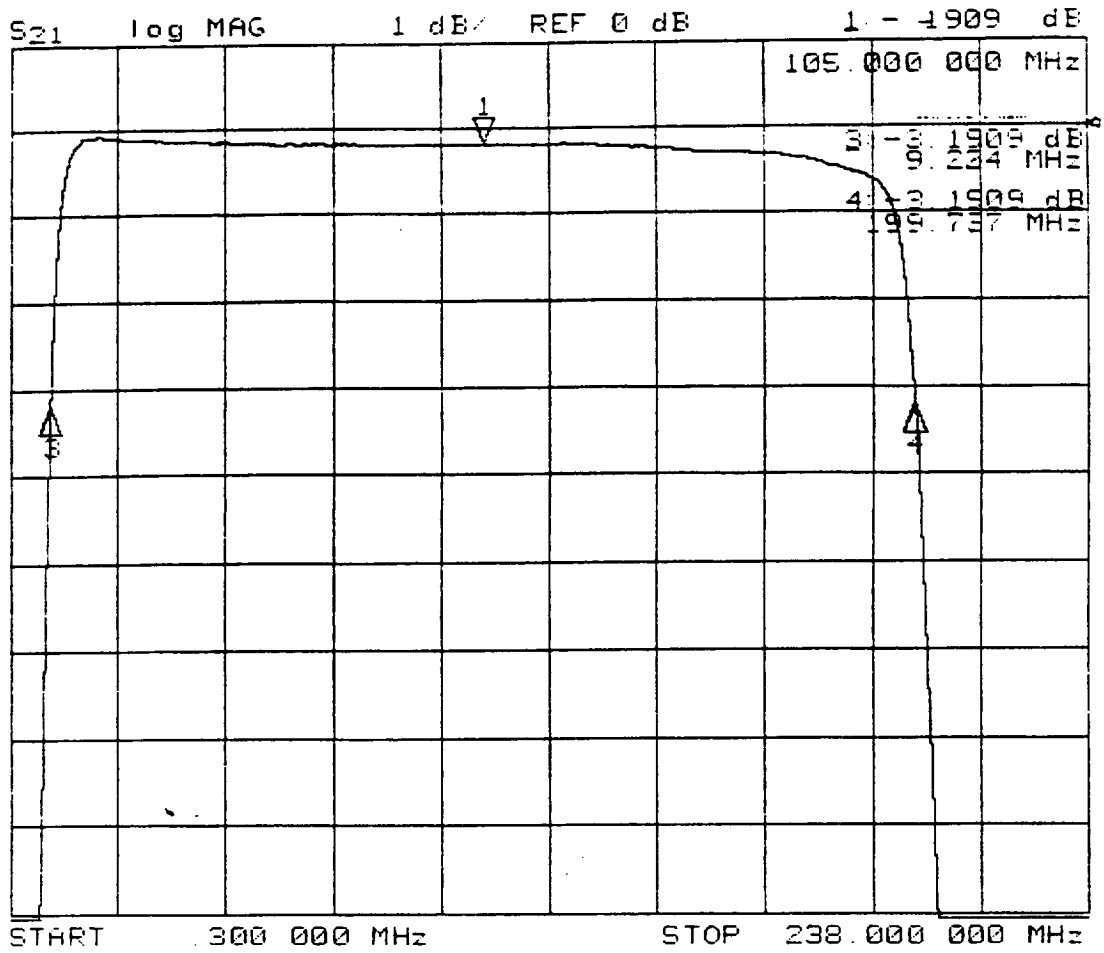
BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-014
AEROJET 1331559-2 REV. E

3.0 dB BANDWIDTH

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	199.77 MHz (198.0-200.0)	199.42 Mhz (198.0-200.0)	199.05 MHz (1480.01500.0)
{8} LOWER 3.0 dB BANDEDGE	9.22 MHz (8.0-10.0)	9.21 Mhz (8.0-10.0)	9.20 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	190.55 MHz (188.0-192.0)	190.21 Mhz (188.0-192.0)	189.85 MHz (188.0-192.0)
{10} ADD {7} AND {8} ÷ 2 =	104.49 MHz (105.0 NOM)	104.32 MHz (105.0 NOM)	104.13 Mhz (105.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-11.8 °C (-15.0 TO -10.0)	+14.7 °C (12.5 TO 17.5)	+43.8 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

PASSBAND RIPPLE

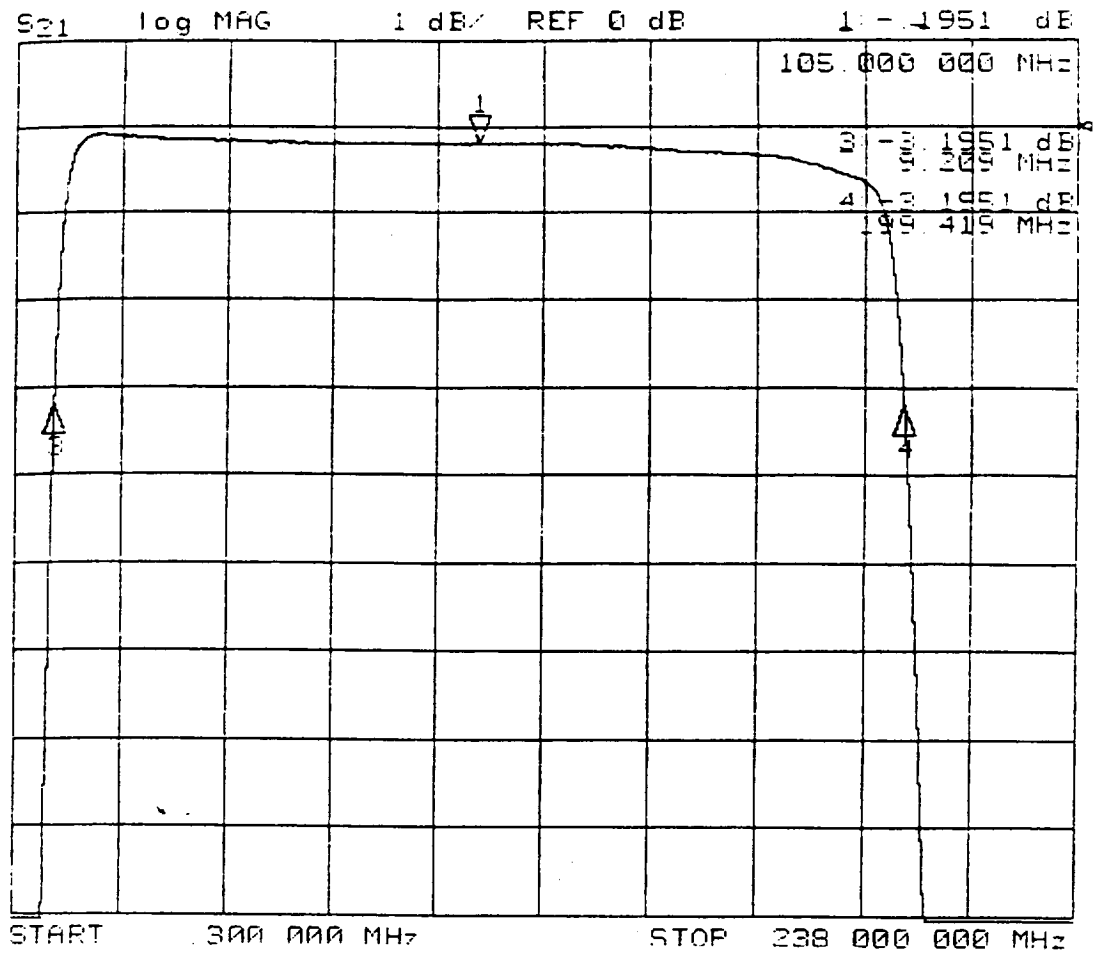
ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	19.91 MHz	19.91 Mhz	19.32 MHz
MIN INSERTION LOSS PERFORMANCE	-0.08 dB	-0.08 dB	-0.08 dB
{11b} 75% BW LOWER BANDEDGE FREQ	13.87 MHz	13.85 Mhz	13.73 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.28 dB	-0.29 dB	-0.30 dB
{11c} 75% BW UPPER BANDEDGE FREQ	156.37 MHz	156.35 Mhz	156.23 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.28 dB	-0.29 dB	-0.30 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.20 dB	0.21 dB	0.22 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.20 dB	0.21 dB	0.22 dB



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-014
-10C DATA
OPR: R. HOGGATT DATE DEC 30 1996

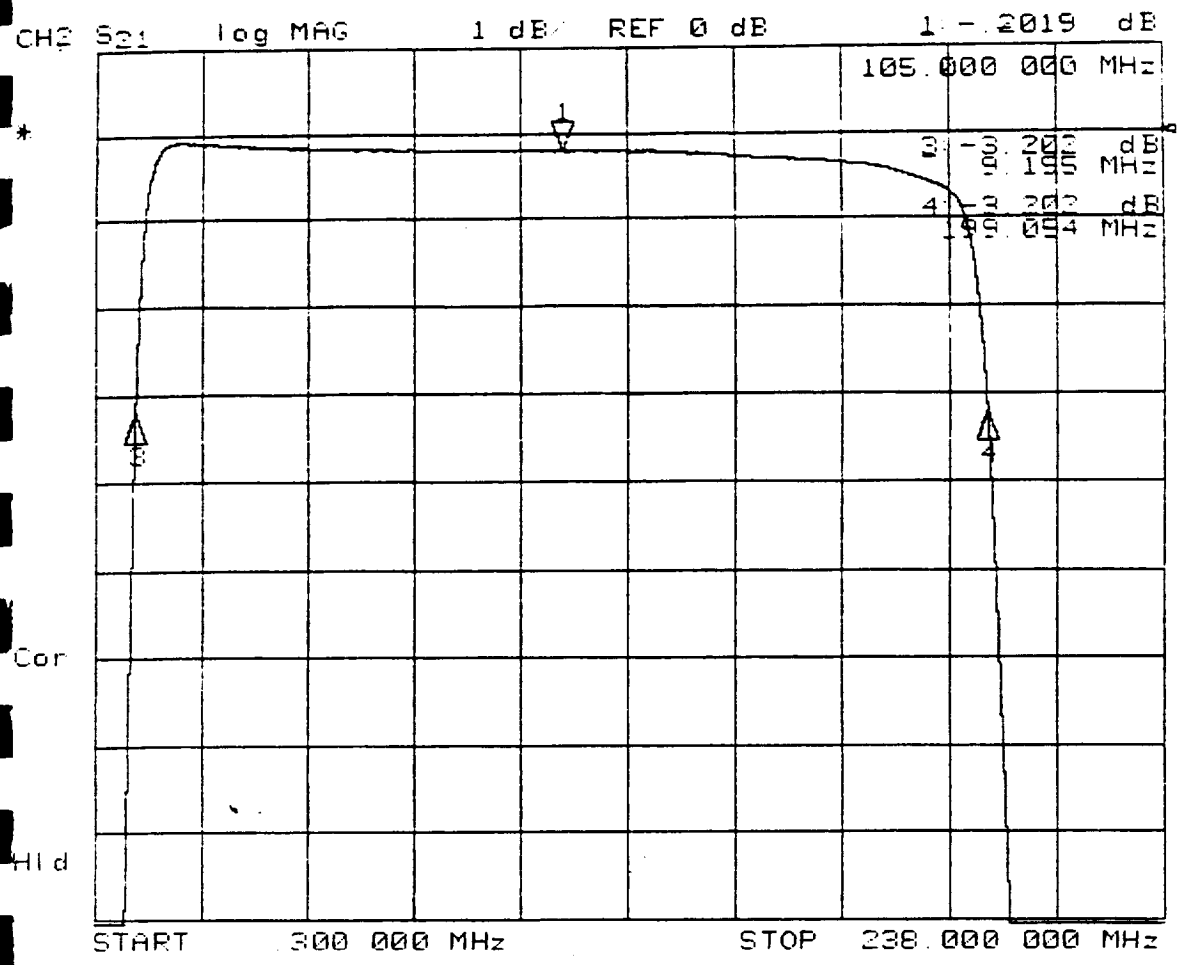
annel 2

MARKER 1	19.500000 MHz OFF	105.000000 MHz -.1909 dB
MARKER 2	190.500000 MHz OFF	104.480829 MHz OFF
MARKER 3	33.750000 MHz OFF	9.224099 MHz -3.1909 dB
MARKER 4	176.250000 MHz OFF	199.737559 MHz -3.1909 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-014
+15C DATA
OPR: R. HOGGATT DATE DEC 30 1996 Channel 2

MARKER PARAMET		
MARKER 1	19.500000 MHz OFF	105.000000 MHz -.1951 dB
MARKER 2	190.500000 MHz OFF	104.314510 MHz OFF
MARKER 3	33.750000 MHz OFF	9.209636 MHz -3.1951 dB
MARKER 4	176.250000 MHz OFF	199.419384 MHz -3.1951 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-014
+40C DATA
OPR: R. HOGGATT DATE DEC 30 1996 annel 2

MARKER PARAMET		
MARKER 1	19.500000 MHz OFF	105.000000 MHz -.2019 dB
MARKER 2	190.500000 MHz OFF	104.125434 MHz OFF
MARKER 3	33.750000 MHz OFF	9.195926 MHz -3.202 dB
MARKER 4	176.250000 MHz OFF	199.054942 MHz -3.202 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX B **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-014
AEROJET 1331559-2 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	(PASS)/FAIL	(PASS)/FAIL	(PASS)/FAIL
{11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5 Fc=105.0 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	-59.3 dB (40.0 dB MIN)	-59.4 dB (40.0 dB MIN)	-59.3 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 228.5 MHz TO 1000.0 MHz	-42.8 dB (40.0 dB MIN)	-42.8 dB (40.0 dB MIN)	-42.8 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-11.8 °C (-15.0 TO -10.0)	+14.5 °C (12.5 TO 17.5)	+44.0 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

DA 5

TEST PERFORMED BY R. Hoggatt DATE 12/30/96

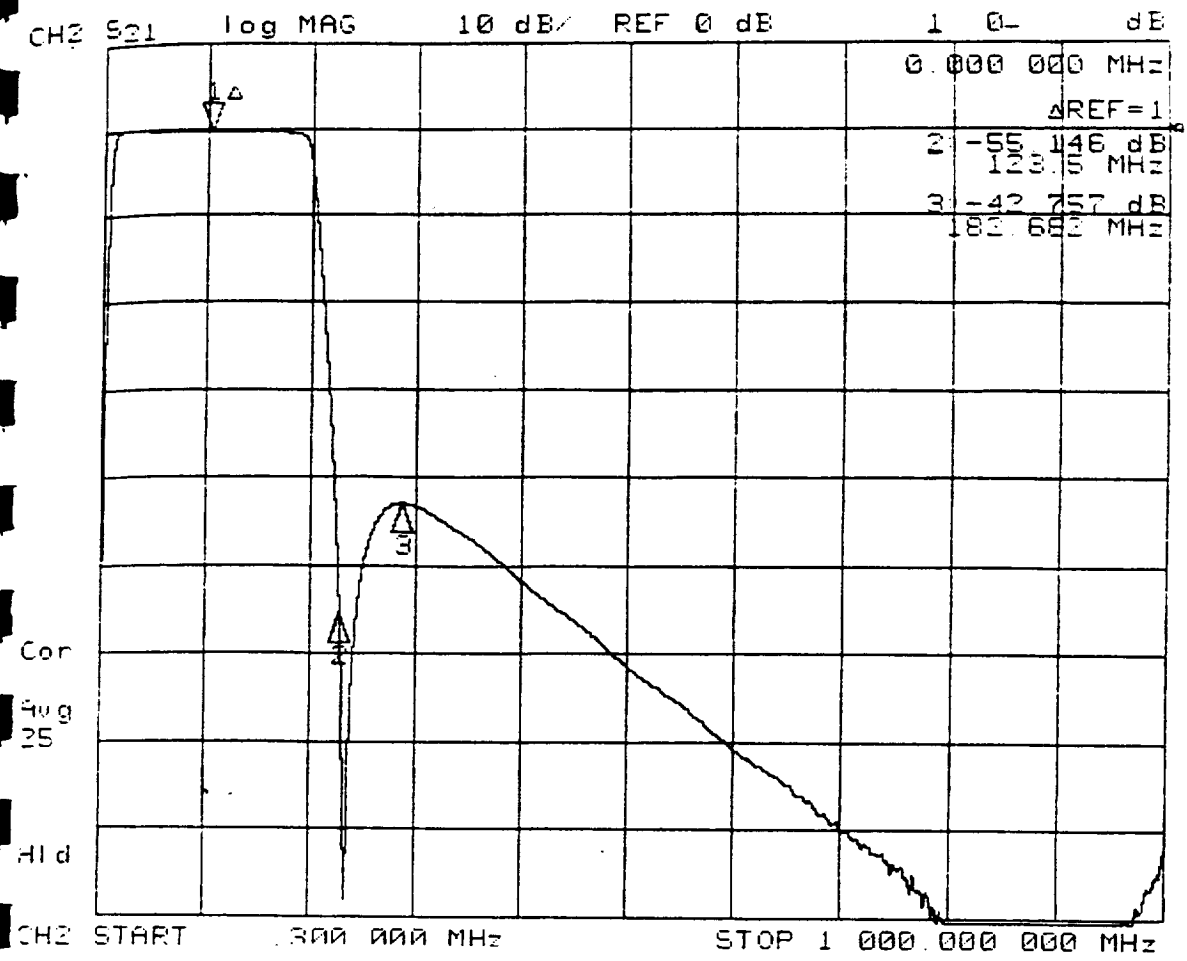
NOTE IF TEST WITNESSED BY AESD: _____ GSI: _ Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST *****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

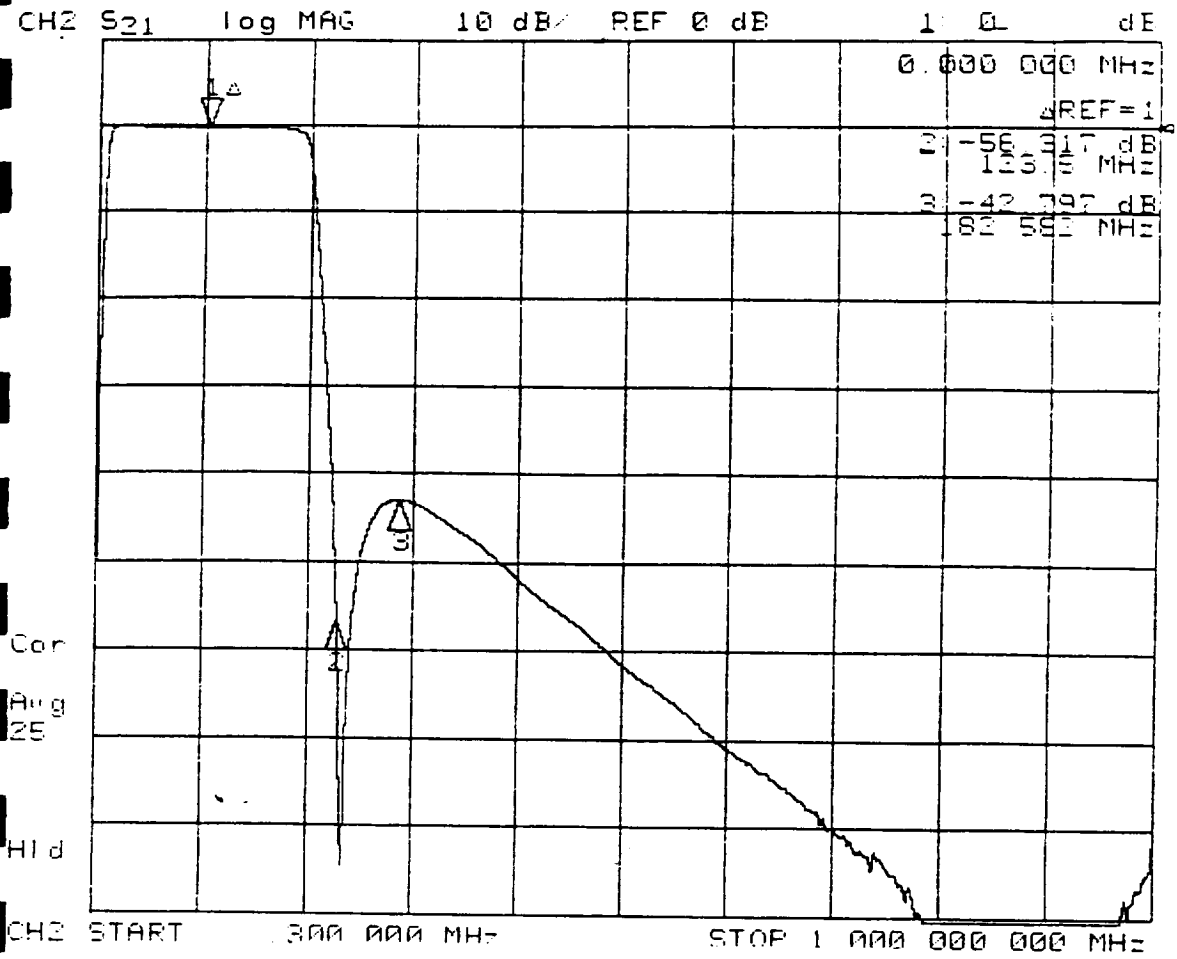
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.500
MOUNTING HOLE CENTER	0.125 ± .010	0.126
BETWEEN UPPER MOUNTING HOLES	3.250	3.250
BETWEEN LOWER MOUNTING HOLES	3.250	3.250



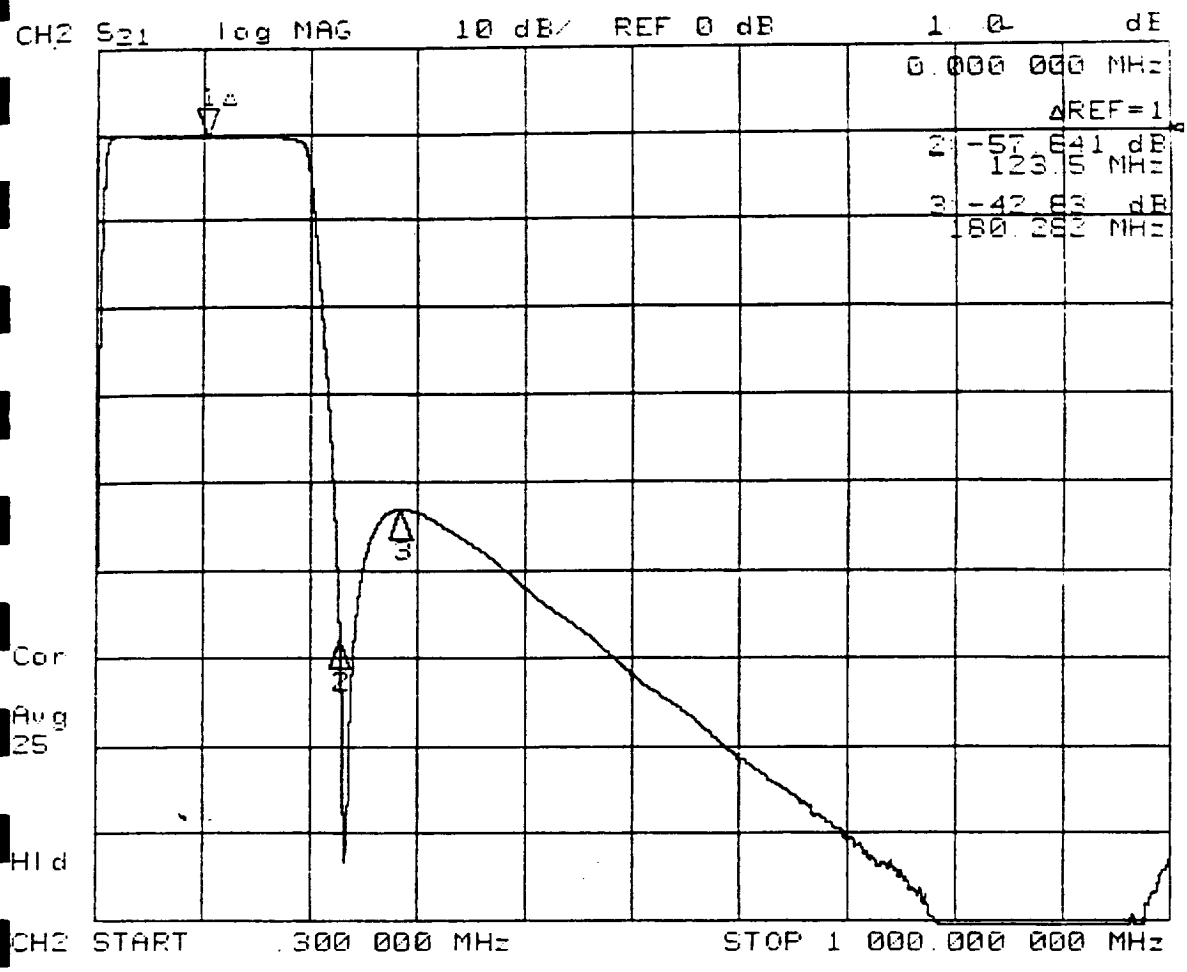
FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-014
-10C DATA
OPR: R. HOGGATT DATE DEC 30 1996 annel 2

MARKER PARAME		
MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -55.146 dB
MARKER 3	5.000000 MHz OFF	287.682242 MHz -42.757 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-014
+15C DATA
OPR: R. HOGGATT DATE DEC 30 1996 annel 2

MARKER PARAMET		
MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -56.317 dB
MARKER 3	5.000000 MHz OFF	287.582272 MHz -42.797 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-014
+40C DATA
OPR: R. HOGGATT DATE DEC 30 1996 annel 2

MARKER PARAME

MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -57.641 dB
MARKER 3	5.000000 MHz OFF	285.282962 MHz -42.83 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX B

ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P225-014
AEROJET 1331559-2 REV. F

BANDPASS CHARACTERISTICS MEASUREMENT

PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE +22.9 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-84.1 dB
F2	1.0	MHz	-67.0 dB
F3	5.0	MHz	-17.9 dB
F4	7.5	MHz	-7.52 dB
F5	10.0	MHz	-1.87 dB
F6	20.0	MHz	-0.08 dB
F7	40.0	MHz	-0.11 dB
F8	(*) 60.0	MHz	-0.17 dB
F9	(*) 80.0	MHz	-0.20 dB
F10	105.0	MHz	-0.20 dB

REF	FREQ	UNIT	VALUE
F11	(*) 130.0	MHz	-0.19 dB
F12	(*) 150.0	MHz	-0.29 dB
F13	180.0	MHz	-0.45 dB
F14	190.0	MHz	-0.65 dB
F15	200.0	MHz	-3.81 dB
F16	250.0	MHz	-50.0 dB
F17	300.0	MHz	-43.3 dB
F18	400.0	MHz	-51.5 dB
F19	500.0	MHz	-61.6 dB
F20	1000.0	MHz	-83.4 dB

TEST PERFORMED BY: R. HOGGATT DATE 12/27/96

NOTE IF TEST WITNESSED BY AESD _____ GSI _ Not witnessed this time. DLD

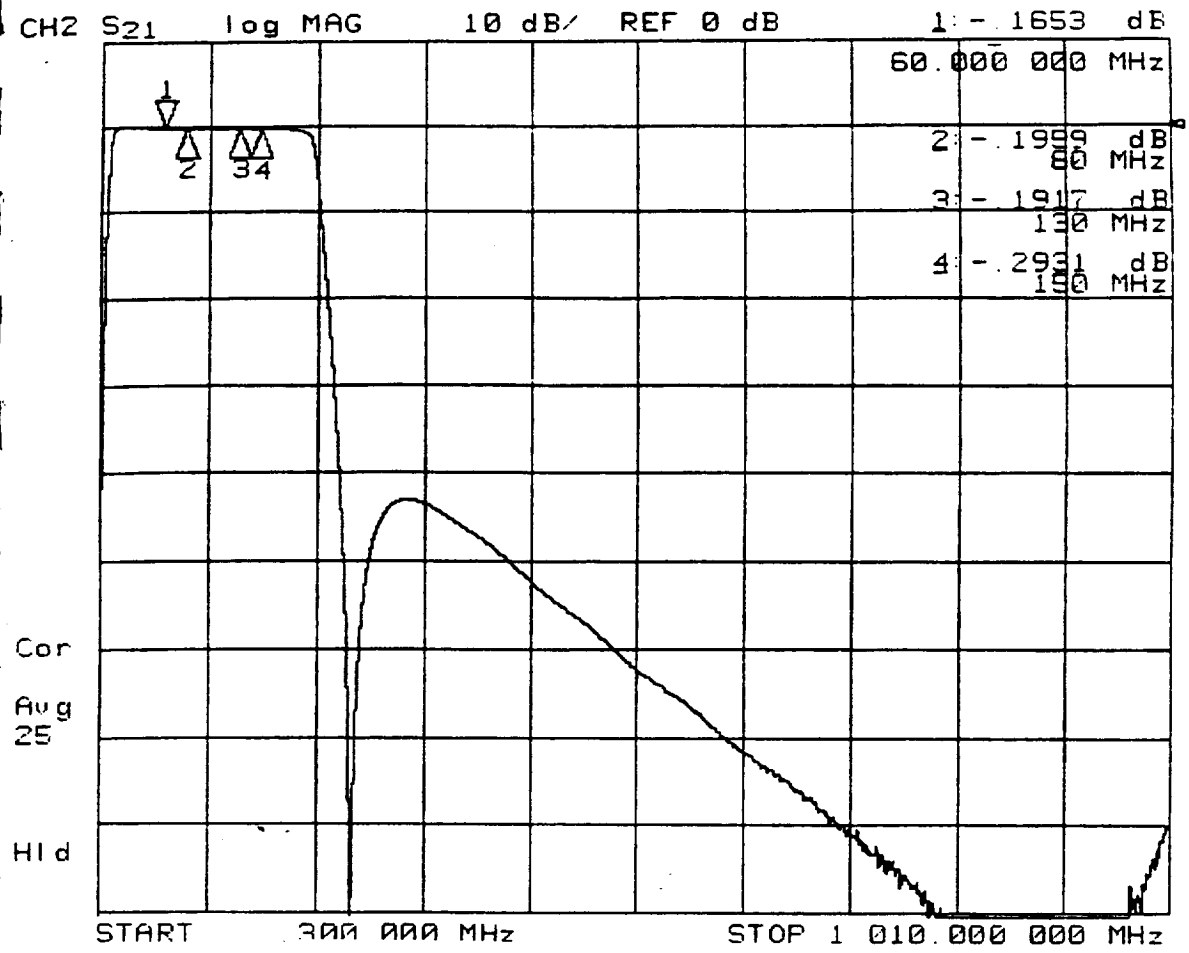
***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST

ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX B PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P228-014
AMBIENT
OPR: R. HOGGATT DATE DEC 17 1996 Channel 2

MARKER PARAME		
MARKER 1	17.750000 MHz OFF	60.000000 MHz -.1653 dB
MARKER 2	157.250000 MHz OFF	80.000000 MHz -.1959 dB
MARKER 3	29.375000 MHz OFF	130.000000 MHz -.1917 dB
MARKER 4	145.625000 MHz OFF	150.000000 MHz -.2931 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Channel 7 Bandpass Filter

IF Filter (S/N: 1331559-2, S/N: P228-015)

APPENDIX B **ACCEPTANCE TEST REPORT**

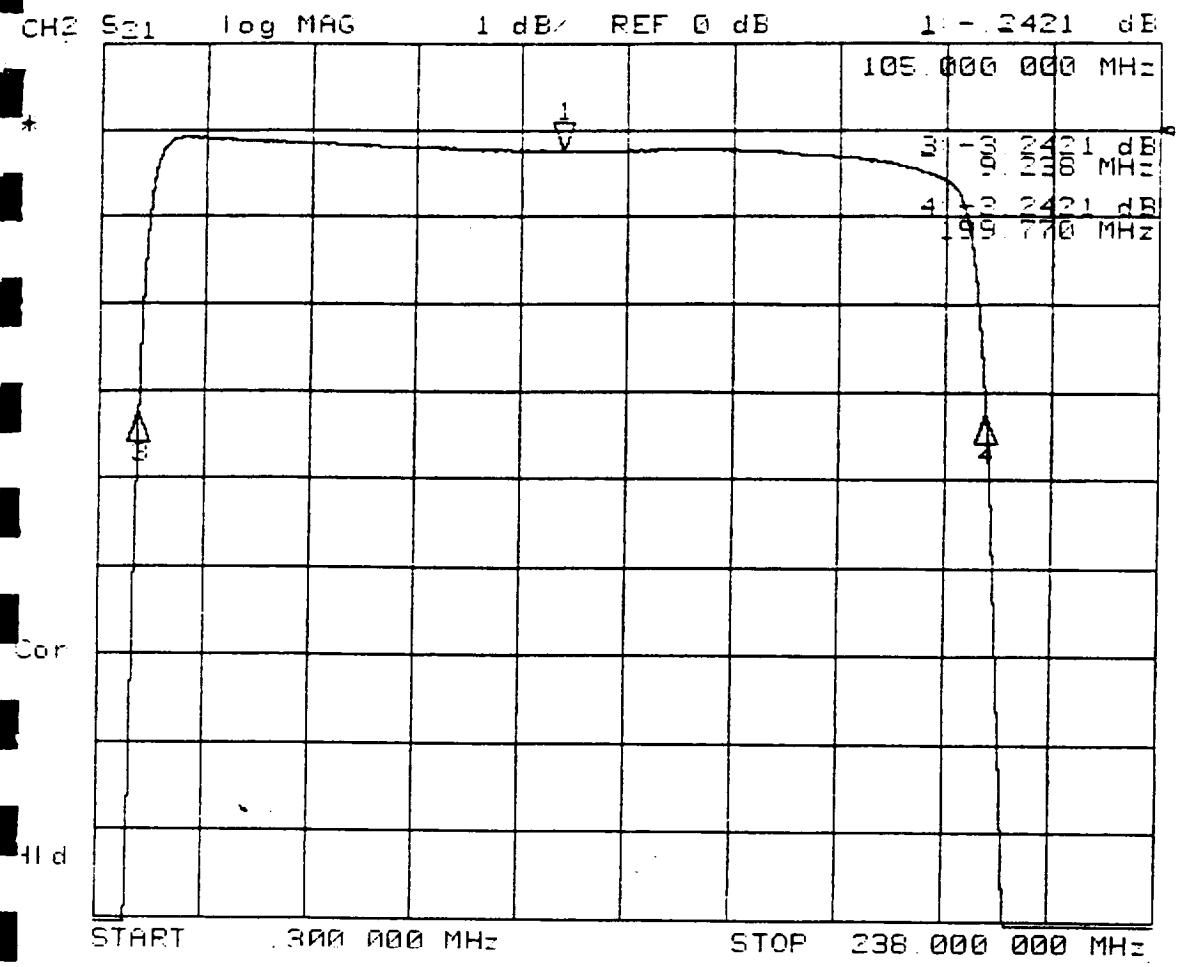
BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-015
AEROJET 1331559-2 REV. F

3.0 dB BANDWIDTH

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	199.77 MHz (198.0-200.0)	199.46 Mhz (198.0-200.0)	199.12 MHz (1480.01500.0)
{8} LOWER 3.0 dB BANDEDGE	9.24 MHz (8.0-10.0)	9.22 Mhz (8.0-10.0)	9.21 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	190.53 MHz (188.0-192.0)	190.24 Mhz (188.0-192.0)	189.91 MHz (188.0-192.0)
{10} ADD {7} AND {8} ÷ 2 =	104.51 MHz (105.0 NOM)	104.34 MHz (105.0 NOM)	104.17 Mhz (105.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-11.7 °C (-15.0 TO -10.0)	+14.5 °C (12.5 TO 17.5)	+44.0 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

PASSBAND RIPPLE

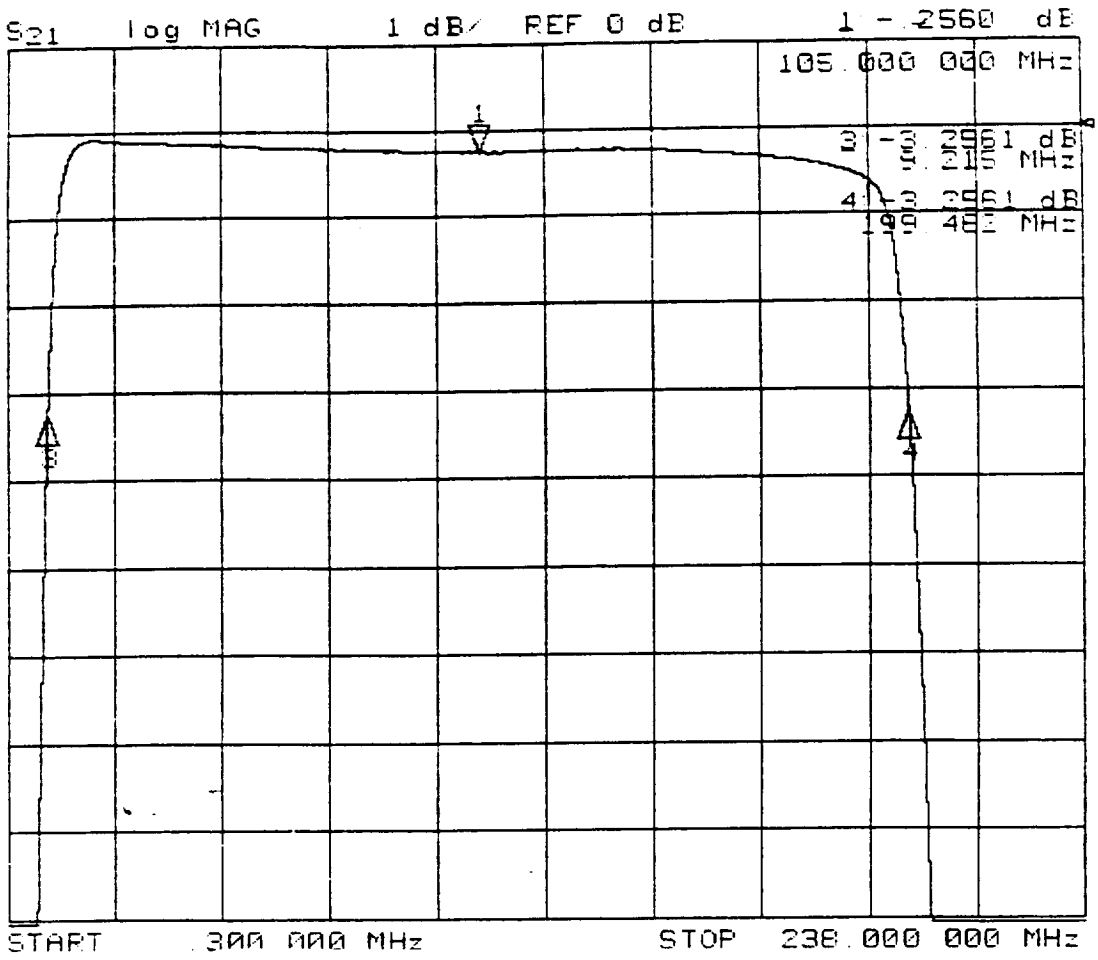
ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	19.91 MHz	20.50 Mhz	19.91 MHz
MIN INSERTION LOSS PERFORMANCE	-0.08 dB	-0.08 dB	-0.08 dB
{11b} 75% BW LOWER BANDEDGE FREQ	14.15 MHz	14.06 Mhz	13.96 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.27 dB	-0.28 dB	-0.29 dB
{11c} 75% BW UPPER BANDEDGE FREQ	156.65 MHz	156.56 Mhz	156.46 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.27 dB	-0.28 dB	-0.29 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.19 dB	0.20 dB	0.21 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.19 dB	0.20 dB	0.21 dB



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-015
-10C DATA
OPR: R. HOGGATT DATE DEC 30 1996

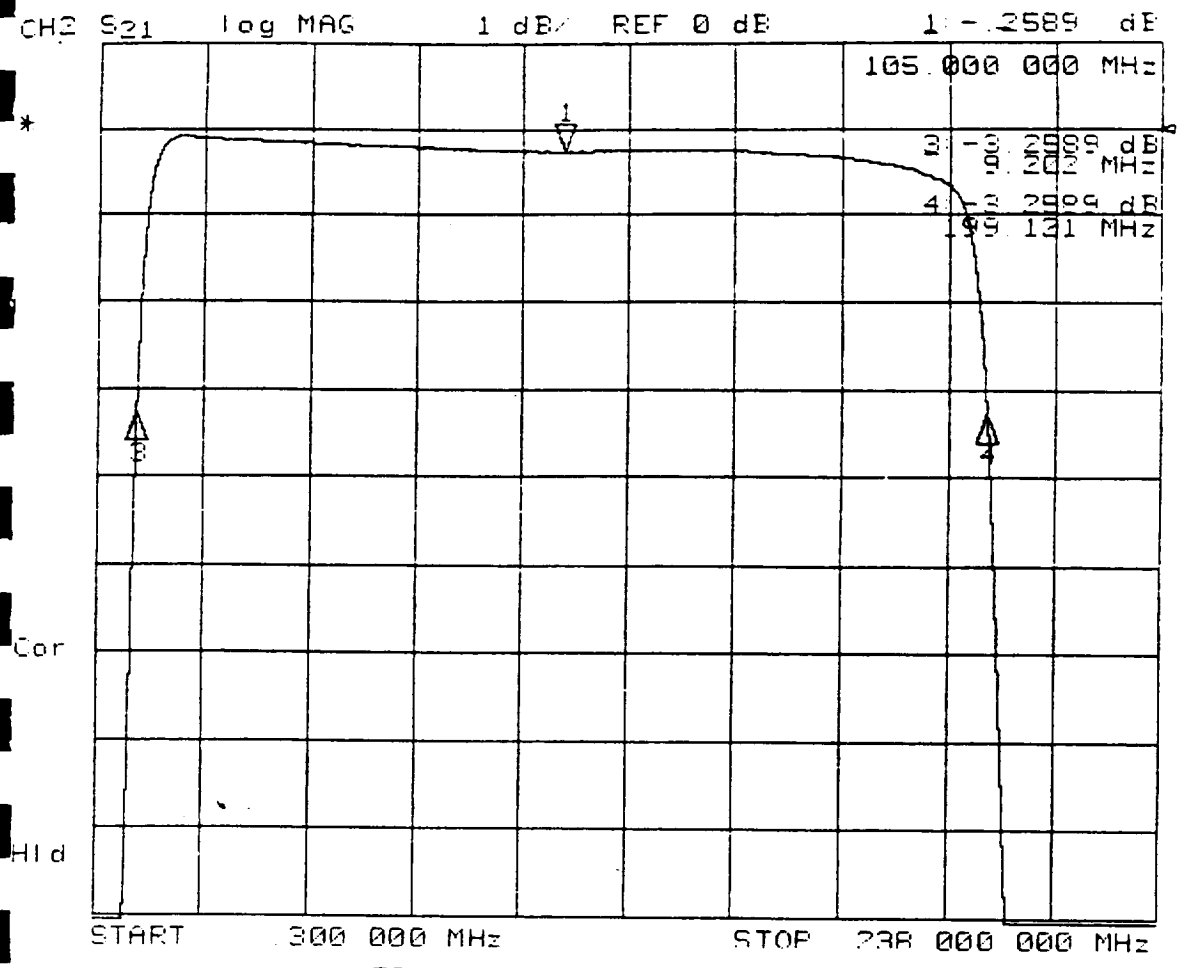
annel 2

MARKER PARAMET		
MARKER 1	19.500000 MHz OFF	105.000000 MHz -.2421 dB
MARKER 2	190.500000 MHz OFF	104.504578 MHz OFF
MARKER 3	33.750000 MHz OFF	9.238843 MHz -3.2421 dB
MARKER 4	176.250000 MHz OFF	199.770313 MHz -3.2421 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-015
+15C DATA
OPR: R. HOGGATT DATE DEC 30 1996 annel 2

MARKER PARAMET		
MARKER 1	19.500000 MHz OFF	105.000000 MHz -.2560 dB
MARKER 2	190.500000 MHz OFF	104.338593 MHz OFF
MARKER 3	33.750000 MHz OFF	9.215012 MHz -3.2561 dB
MARKER 4	176.250000 MHz OFF	199.462174 MHz -3.2561 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P228-015
+40C DATA
OPR: R. HOGGATT DATE DEC 30 1996 annel 2

MARKER PARAMET		
MARKER 1	19.500000 MHz OFF	105.000000 MHz -.2589 dB
MARKER 2	190.500000 MHz OFF	104.162185 MHz OFF
MARKER 3	33.750000 MHz OFF	9.202529 MHz -3.2589 dB
MARKER 4	176.250000 MHz OFF	199.121842 MHz -3.2589 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX B **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P226-015
AEROJET 1331559-2 REV. F

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	(PASS)/FAIL	(PASS)/FAIL	(PASS)/FAIL
{11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5
Fc=105.0 MHz.
REF {5A} FOR INSERTION LOSS @ Fc

	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	-59.4 dB (40.0 dB MIN)	-59.3 dB (40.0 dB MIN)	-59.3 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 228.5 MHz TO 1000.0 MHz	-42.6 dB (40.0 dB MIN)	-42.6 dB (40.0 dB MIN)	-42.7 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-11.6 °C (-15.0 TO -10.0)	+14.4 °C (12.5 TO 17.5)	+44.0 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

QA

TEST PERFORMED BY R. Hoggatt DATE 12/30/96

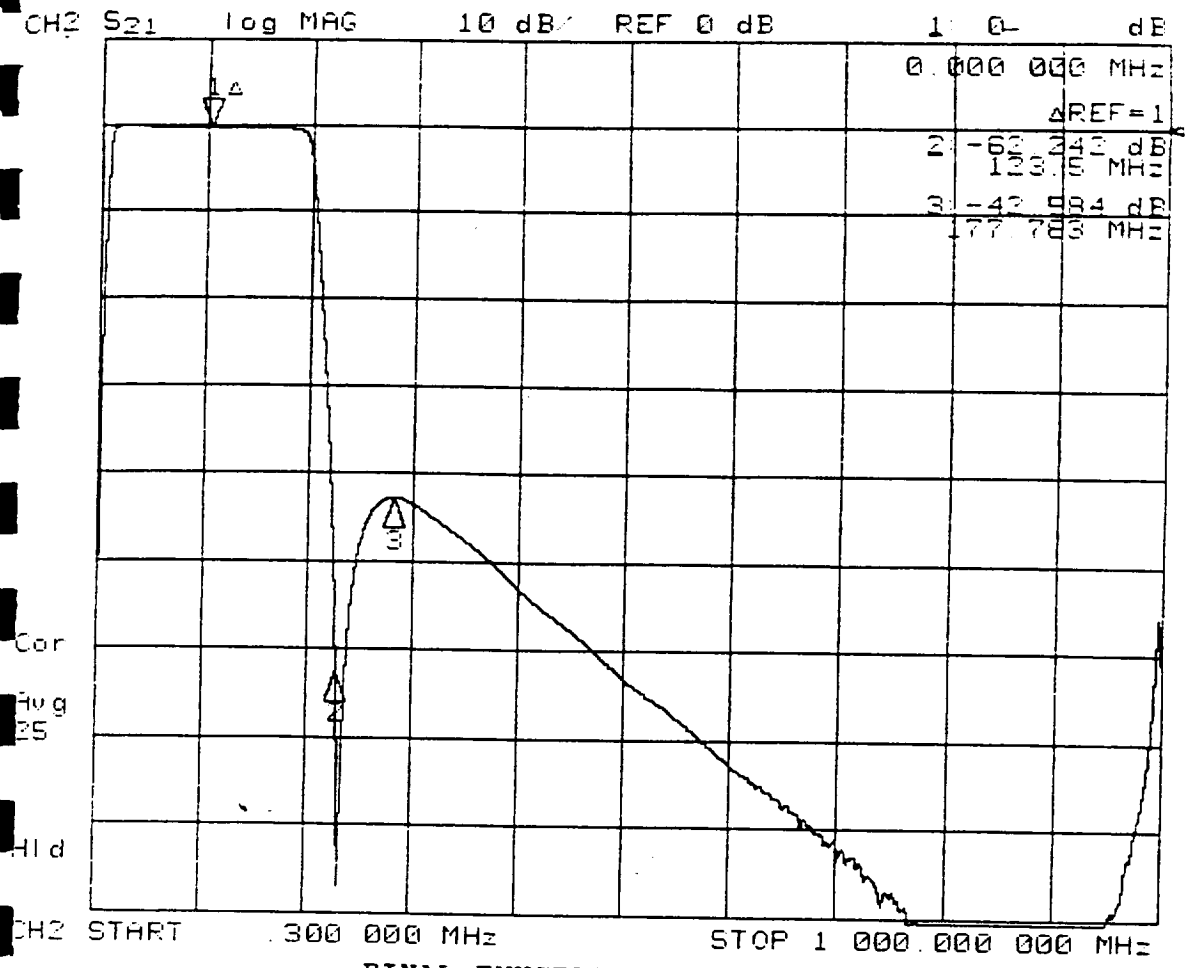
NOTE IF TEST WITNESSED BY AESD: _____ GSI: Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

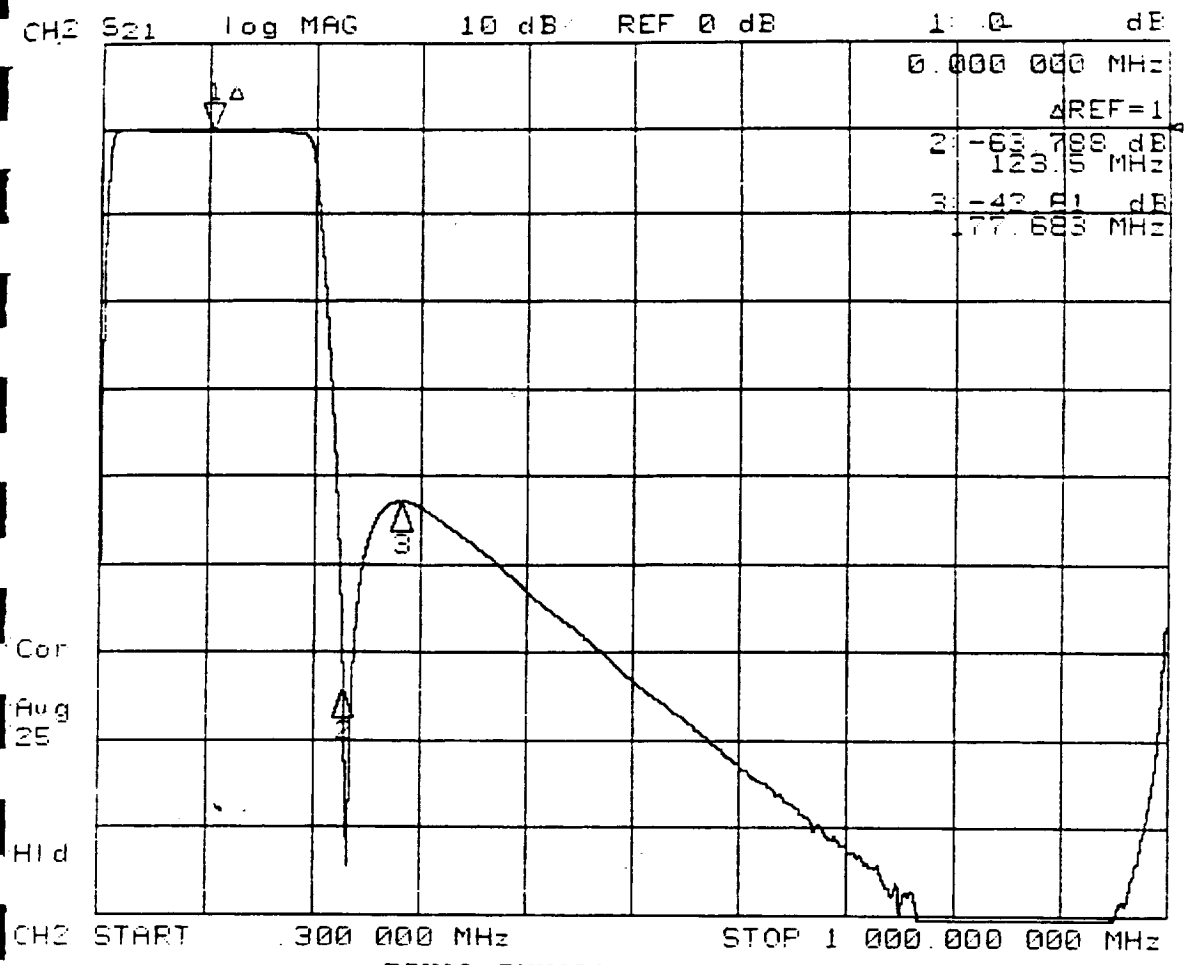
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.500
MOUNTING HOLE CENTER	0.125 ± .010	0.126
BETWEEN UPPER MOUNTING HOLES	3.250	3.250
BETWEEN LOWER MOUNTING HOLES	3.250	3.250



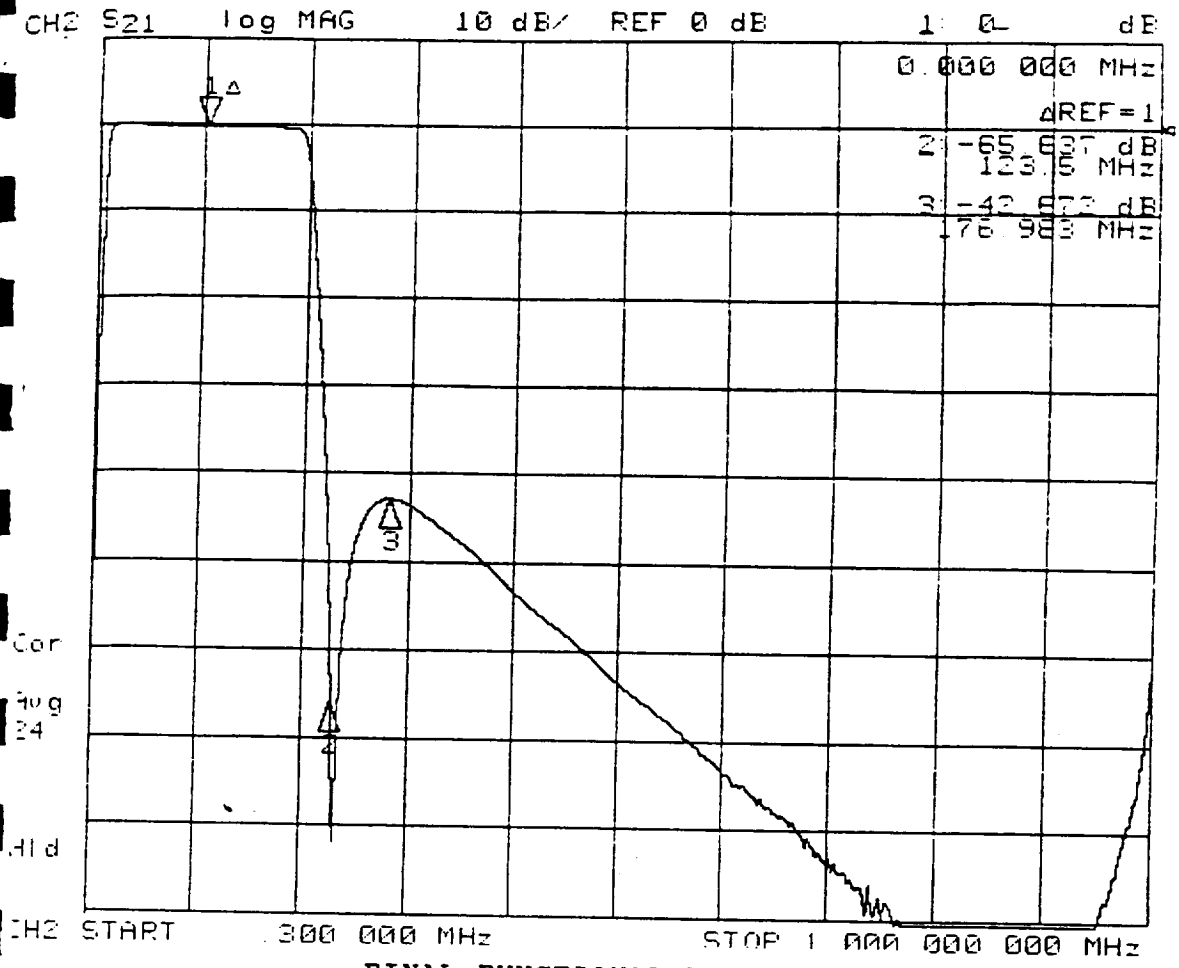
FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-015
-10C DATA
OPR: R. HOGGATT DATE DEC 30 1996 annel 2

MARKER PARAME		
MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -62.342 dB
MARKER 3	5.000000 MHz OFF	282.783712 MHz -42.584 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-015
+15C DATA
OPR: R. HOGGATT DATE DEC 30 1996 annel 2

MARKER PARAMET		
MARKER 1	1.000000 MHz OFF	105.000000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	228.500000 MHz -63.788 dB
MARKER 3	5.000000 MHz OFF	282.683742 MHz -42.61 dB
MARKER 4	5.000000 MHz OFF	.300000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALU	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P228-015
+40C DATA
OPR: R. HOGGATT DATE DEC 30 1996

MARKER PARAMET		annel 2
MARKER 1	1.000000 MHz	105.000000 MHz
	OFF	0 dB
MARKER 2	5.000000 MHz	228.500000 MHz
	OFF	-65.637 dB
MARKER 3	5.000000 MHz	281.983952 MHz
	OFF	-43.672 dB
MARKER 4	5.000000 MHz	.300000 MHz
	OFF	OFF
MKR STIMULUS OFFSET	0.000000 MHz	0.000000 MHz
	0 dB	0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF	OFF
	OFF	OFF

BANDPASS FILTER MODEL HL105-190-10SS1 S/N P228-015
AEROJET 1331559-2 REV. T

BANDPASS CHARACTERISTICS MEASUREMENT
PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +22.7 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-83.3 dB	F11	(*) 130.0	MHz	-0.24 dB
F2	1.0	MHz	-66.6 dB	F12	(*) 150.0	MHz	-0.26 dB
F3	5.0	MHz	-17.9 dB	F13	180.0	MHz	-0.42 dB
F4	7.5	MHz	-7.59 dB	F14	190.0	MHz	-0.60 dB
F5	10.0	MHz	-1.92 dB	F15	200.0	MHz	-3.85 dB
F6	20.0	MHz	-0.08 dB	F16	250.0	MHz	-48.0 dB
F7	40.0	MHz	-0.10 dB	F17	300.0	MHz	-43.6 dB
F8	(*) 60.0	MHz	-0.17 dB	F18	400.0	MHz	-53.1 dB
F9	(*) 80.0	MHz	-0.23 dB	F19	500.0	MHz	-63.3 dB
F10	105.0	MHz	-0.25 dB	F20	1000.0	MHz	-58.8 dB

DA 5

TEST PERFORMED BY: R. HOGGATT DATE 12/27/96

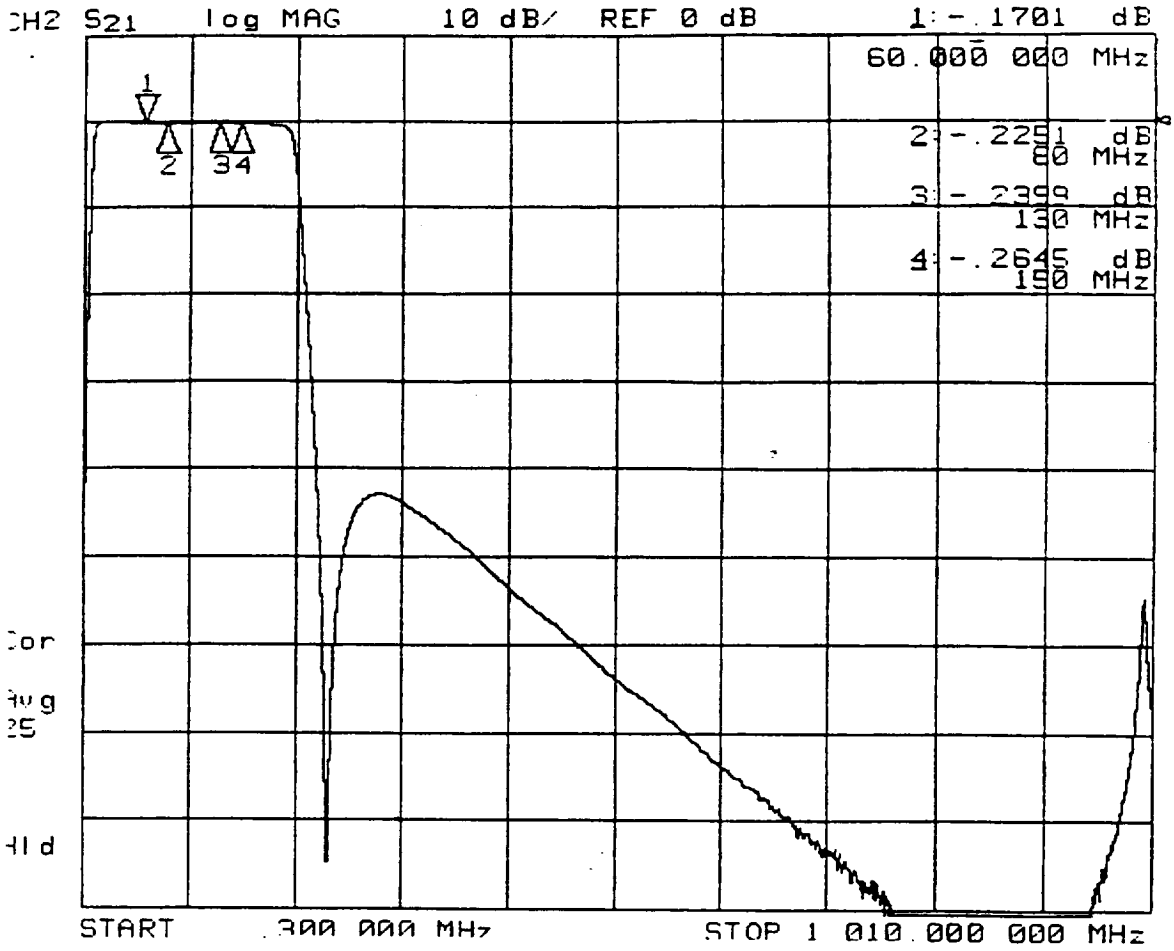
NOTE IF TEST WITNESSED BY AESD _____ GSI _ Not witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX B PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P228-015
AMBIENT
OPR: R. HOGGATT DATE DEC 27 1996

MARKER PARAME	annel 2	
MARKER 1	17.750000 MHz OFF	60.000000 MHz -.1701 dB
MARKER 2	157.250000 MHz OFF	80.000000 MHz -.2251 dB
MARKER 3	29.375000 MHz OFF	130.000000 MHz -.2399 dB
MARKER 4	145.625000 MHz OFF	150.000000 MHz -.2645 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Channel 8 Bandpass Filter

IF Filter (S/N: 1331559-4, S/N: P230-004)

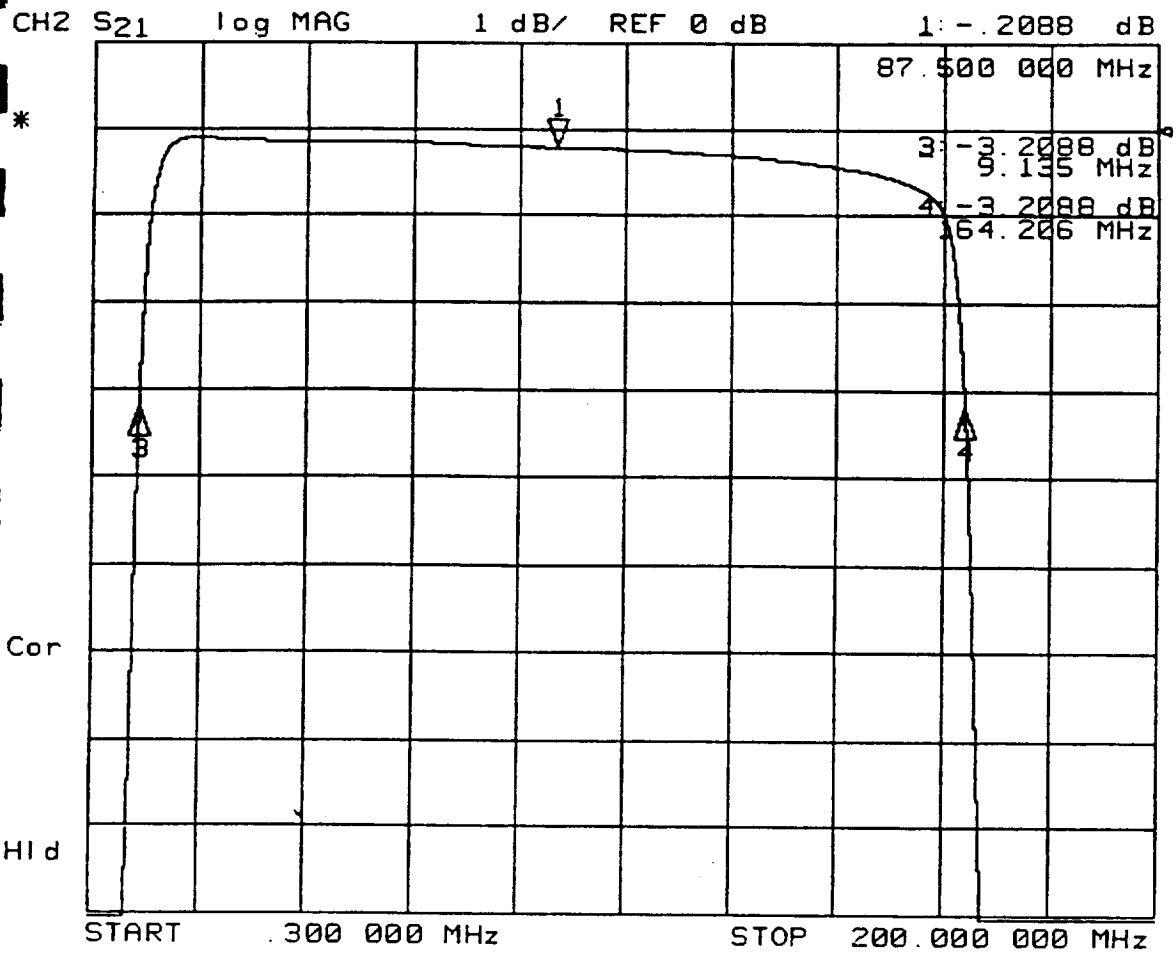
BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-004
AEROJET 13[illegible]59-4 REV. E

3.0 dB BANDWIDTH

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	164.21 MHz (163.0-165.0)	163.96 Mhz (163.0-165.0)	163.67 MHz (163.0-165.0)
{8} LOWER 3.0 dB BANDEDGE	9.14 MHz (8.0-10.0)	9.12 Mhz (8.0-10.0)	9.11 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	155.07 MHz (153.0-157.0)	154.84 Mhz (153.0-157.0)	154.56 MHz (153.0-157.0)
{10} ADD {7} AND {8} ÷ 2 =	86.68 MHz (87.5 NOM)	86.54 MHz (87.5 NOM)	86.39 Mhz (87.5 NOM)
{10a} RECORD MEASURED TEMPERATURE	-11.4 °C (-15.0 TO -10.0)	+13.9 °C (12.5 TO 17.5)	+42.9 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

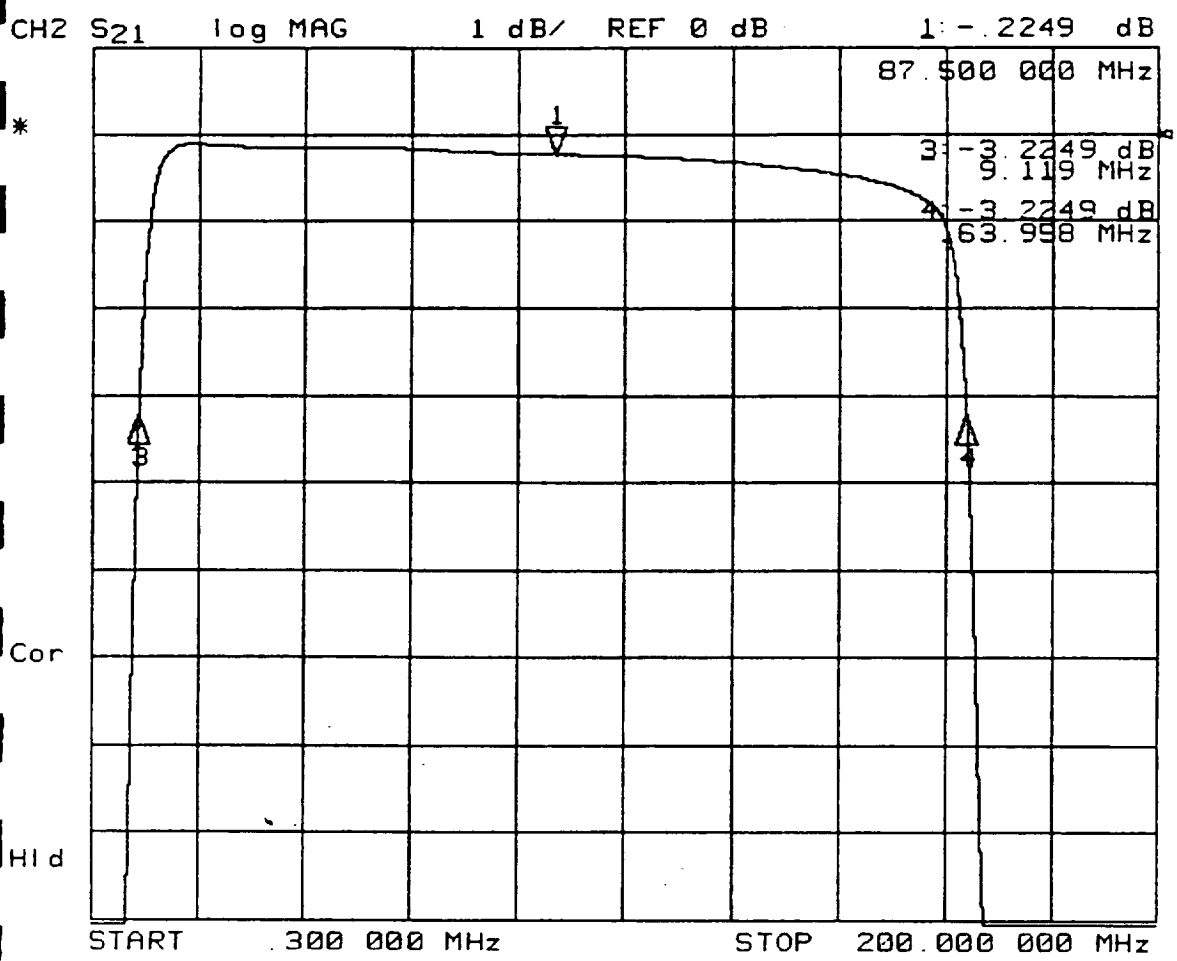
PASSBAND RIPPLE

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	19.27 MHz	19.27 Mhz	19.27 MHz
MIN INSERTION LOSS PERFORMANCE	-0.10 dB	-0.10 dB	-0.10 dB
{11b} 75% BW LOWER BANDEDGE FREQ	13.14 MHz	13.03 Mhz	12.92 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.35 dB	-0.38 dB	-0.40 dB
{11c} 75% BW UPPER BANDEDGE FREQ	129.39 MHz	129.28 Mhz	129.17 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.35 dB	-0.38 dB	-0.40 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.25 dB	0.28 dB	0.30 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.25 dB	0.28 dB	0.30 dB



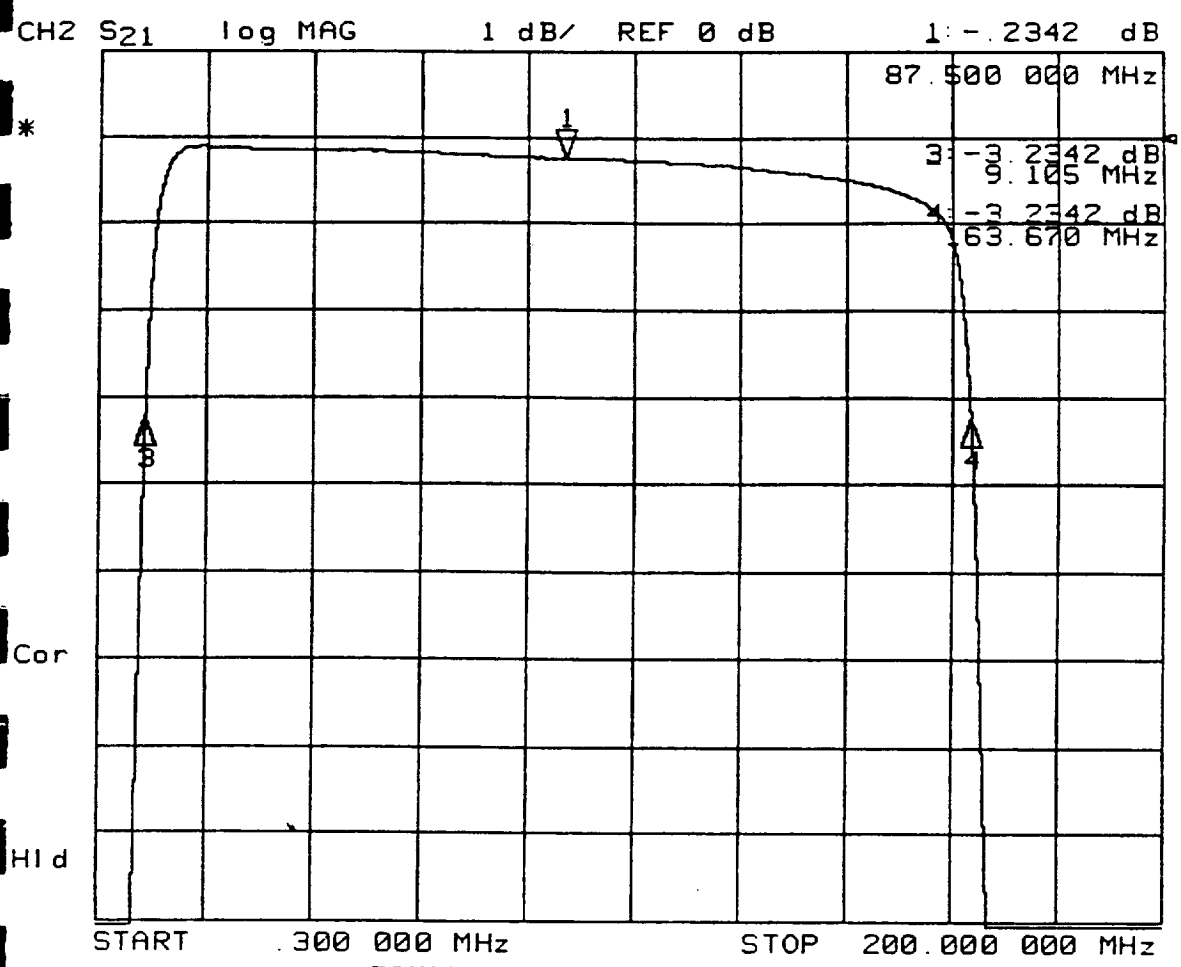
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-004
-10C DATA
OPR: R. HOGGATT DATE DEC 20 1996

MARKER PARAME		annel 2
MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2088 dB
MARKER 2	157.250000 MHz OFF	86.671134 MHz OFF
MARKER 3	29.375000 MHz OFF	9.135826 MHz -3.2088 dB
MARKER 4	145.625000 MHz OFF	164.206443 MHz -3.2088 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-004
+15C DATA
OPR: R. HOGGATT DATE DEC 20 1996

MARKER PARAME	annel 2	
MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2249 dB
MARKER 2	157.250000 MHz OFF	86.539222 MHz OFF
MARKER 3	29.375000 MHz OFF	9.119596 MHz -3.2249 dB
MARKER 4	145.625000 MHz OFF	163.958849 MHz -3.2249 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-004
+40C DATA
OPR: R. HOGGATT DATE DEC 20 1996

MARKER PARAME	annel 2	
MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2342 dB
MARKER 2	157.250000 MHz OFF	86.387984 MHz OFF
MARKER 3	29.375000 MHz OFF	9.105547 MHz -3.2342 dB
MARKER 4	145.625000 MHz OFF	163.670422 MHz -3.2342 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX D **QUALIFICATION TEST REPORT**

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-004
AEROJET 1331559-4 REV E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	(PASS)/FAIL	(PASS)/FAIL	(PASS)/FAIL
{11g} ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.5 Fc=87.5 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	-60.5 dB (40.0 dB MIN)	-60.4 dB (40.0 dB MIN)	-60.4 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 188.25 MHz TO 1000.0 MHz	-61.8 dB (40.0 dB MIN)	-62.7 dB (40.0 dB MIN)	-63.7 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-11.6 °C (-15.0 TO -10.0)	+13.7 °C (12.5 TO 17.5)	+42.9 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT'S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

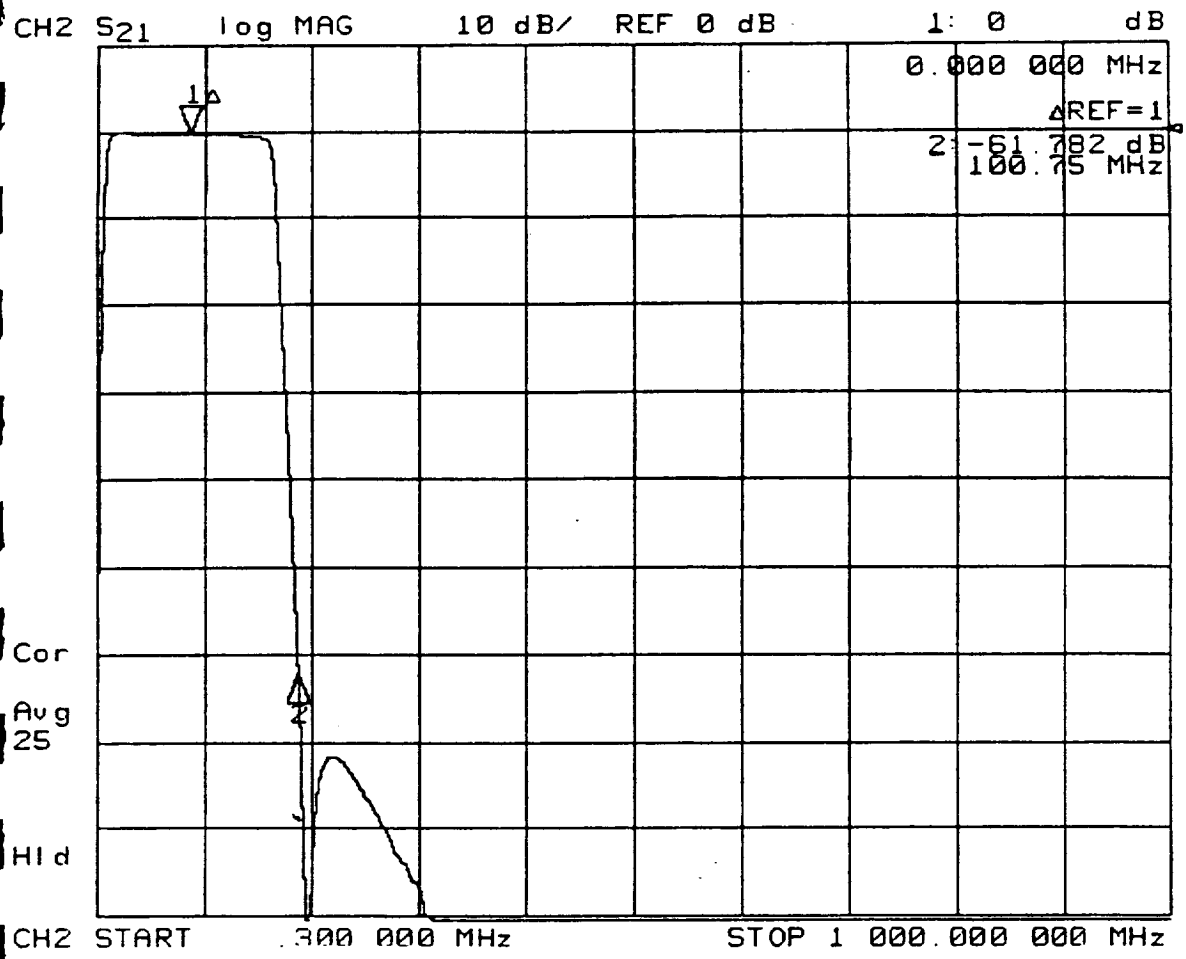
TEST PERFORMED BY R. Hoggatt DATE 12/20/96

NOTE IF TEST WITNESSED BY AESD: _____ GSI: Not witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST *****

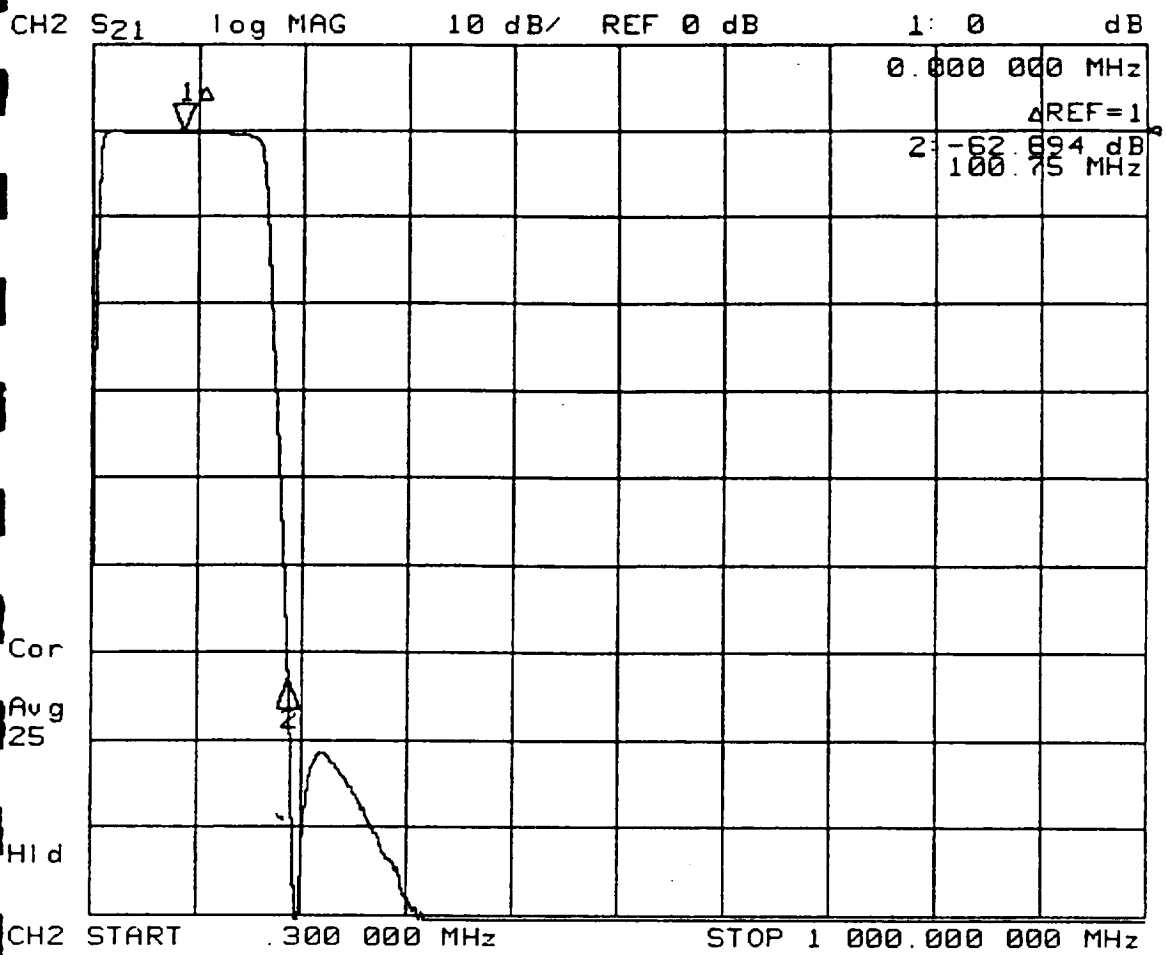
OUTLINE AND MOUNTING DIMENSIONS VERIFICATION
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.501
MOUNTING HOLE CENTER	0.125 ± .010	0.125
BETWEEN UPPER MOUNTING HOLES	3.250	3.250
BETWEEN LOWER MOUNTING HOLES	3.250	3.250



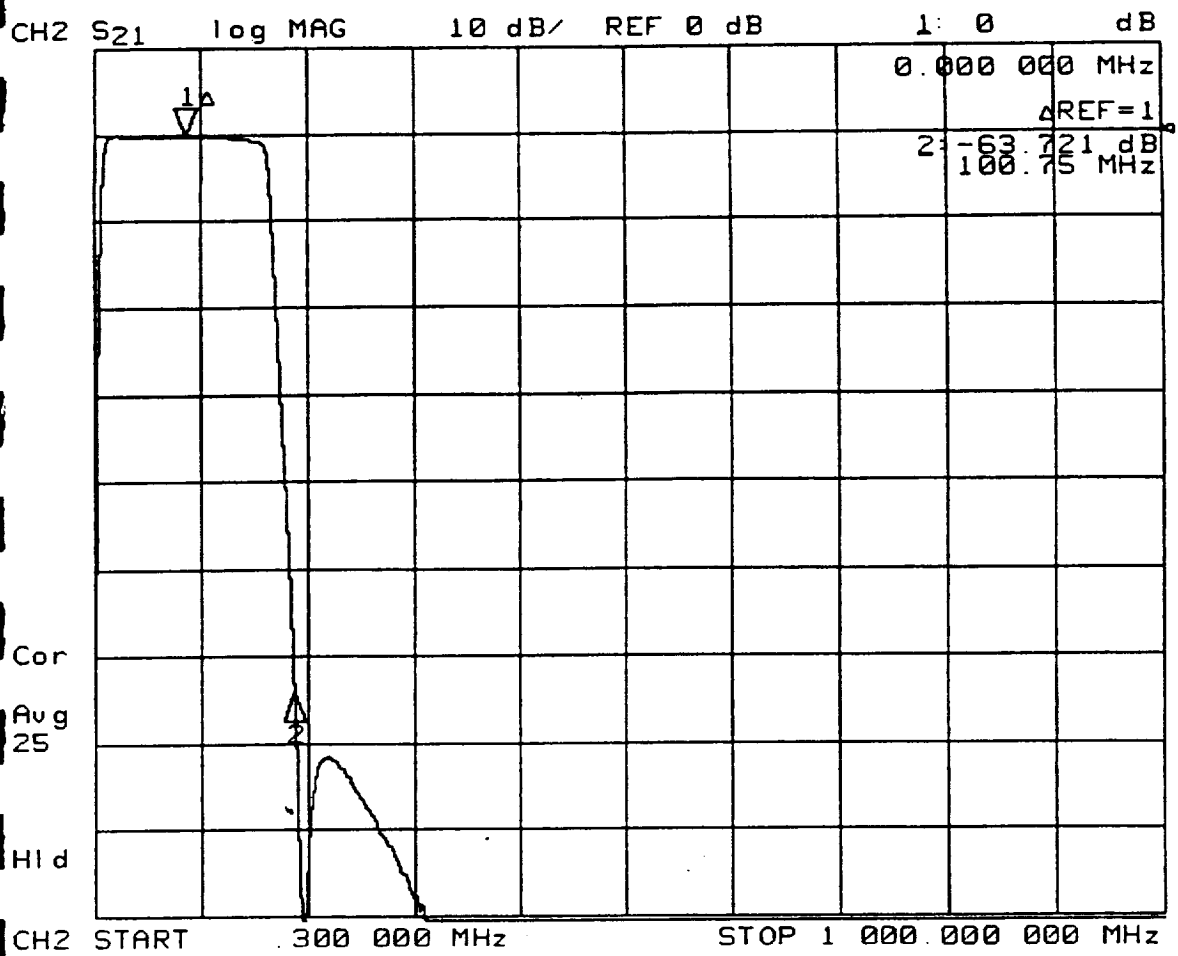
FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P230-004
-10C DATA
OPR: R. HOGGATT DATE DEC 20 1996

MARKER PARAME	annel 2	
MARKER 1	1.000000 MHz	87.500000 MHz
	OFF	0 dB
MARKER 2	5.000000 MHz	188.250000 MHz
	OFF	-61.782 dB
MARKER 3	5.000000 MHz	188.250000 MHz
	OFF	OFF
MARKER 4	5.000000 MHz	1000.000000 MHz
	OFF	OFF
MKR STIMULUS OFFSET	0.000000 MHz	0.000000 MHz
	0 dB	0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P230-004
+15C DATA
OPR: R. HOGGATT DATE DEC 20 1996 annel 2

MARKER PARAME		
MARKER 1	1.000000 MHz	87.500000 MHz
	OFF	0 dB
MARKER 2	5.000000 MHz	188.250000 MHz
	OFF	-62.694 dB
MARKER 3	5.000000 MHz	188.250000 MHz
	OFF	OFF
MARKER 4	5.000000 MHz	1000.000000 MHz
	OFF	OFF
MKR STIMULUS OFFSET	0.000000 MHz	0.000000 MHz
	0 dB	0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P230-004
+40C DATA
OPR: R. HOGGATT DATE DEC 20 1996

MARKER PARAME	annel 2	
MARKER 1	1.000000 MHz OFF	87.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	188.250000 MHz -63.721 dB
MARKER 3	5.000000 MHz OFF	188.250000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX D

QUALIFICATION TEST REPORT

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-004
AEROJET 1331559-4 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER QTP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE +22.9 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	0.5	MHz	-84.2 dB	F11	(*) 100.0	MHz	-0.24 dB
F2	1.0	MHz	-67.6 dB	F12	(*) 125.0	MHz	-0.34 dB
F3	5.0	MHz	-18.5 dB	F13	150.0	MHz	-0.60 dB
F4	7.5	MHz	-7.57 dB	F14	160.0	MHz	-1.09 dB
F5	10.0	MHz	-1.76 dB	F15	165.0	MHz	-4.72 dB
F6	15.0	MHz	-0.21 dB	F16	170.0	MHz	-15.92 dB
F7	25.0	MHz	-0.11 dB	F17	200.0	MHz	-86.4 dB
F8	(*) 50.0	MHz	-0.16 dB	F18	300.0	MHz	-88.3 dB
F9	(*) 75.0	MHz	-0.21 dB	F19	500.0	MHz	-106.0 dB
F10	87.5	MHz	-0.26 dB	F20	1000.0	MHz	-124.9 dB

TEST PERFORMED BY: R. Hoggatt (DA δ) DATE 12/20/96

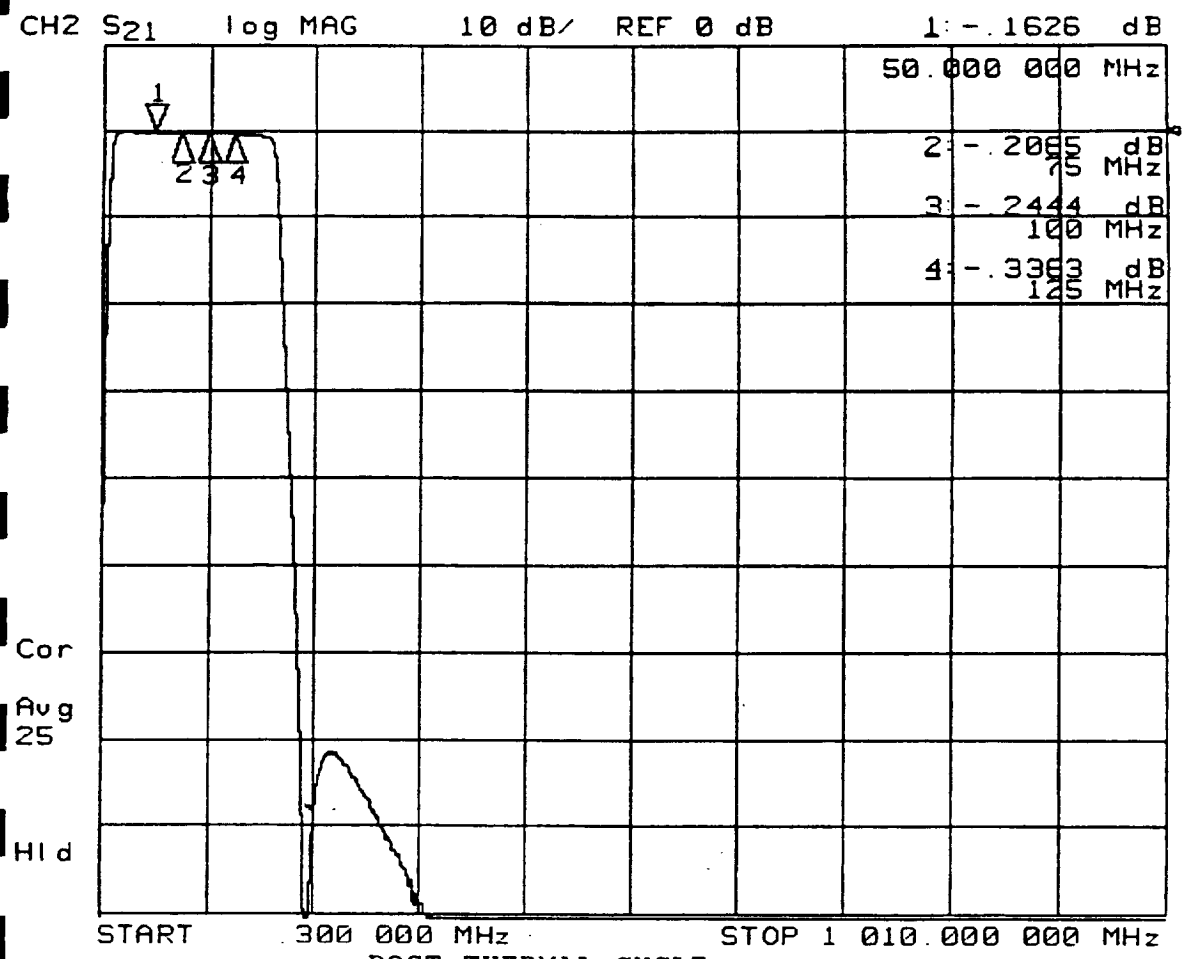
NOTE IF TEST WITNESSED BY AESD _____ GSI - Not witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
QUALIFICATION TEST PROCEDURE
63-0005-010 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX D PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) CENTER FREQUENCY (fc) PER QTP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
b.) 3.0 dB BANDWIDTH PER QTP PARA 4.5.3.
c.) OUT-OF-BAND REJECTION PER QTP PARA 4.5.5.
d) INSERTION LOSS PER QTP PARA 4.5.2
e) INSERTION LOSS VS TEMPERATURE PER QTP PARA 4.5.6.
f.) PASSBAND RIPPLE PER QTP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) VSWR PER QTP PARA 4.5.1.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P230-004
AMBIENT
MARKER PARAME OPR: R. HOGGATT DATE DEC 20 1996 annel 2

MARKER 1	17.750000 MHz OFF	50.000000 MHz -.1626 dB
MARKER 2	157.250000 MHz OFF	75.000000 MHz -.2065 dB
MARKER 3	29.375000 MHz OFF	100.000000 MHz -.2444 dB
MARKER 4	145.625000 MHz OFF	125.000000 MHz -.3363 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Channel 9 Bandpass Filter

IF Filter (S/N: 1331559-4, S/N: P230-003)

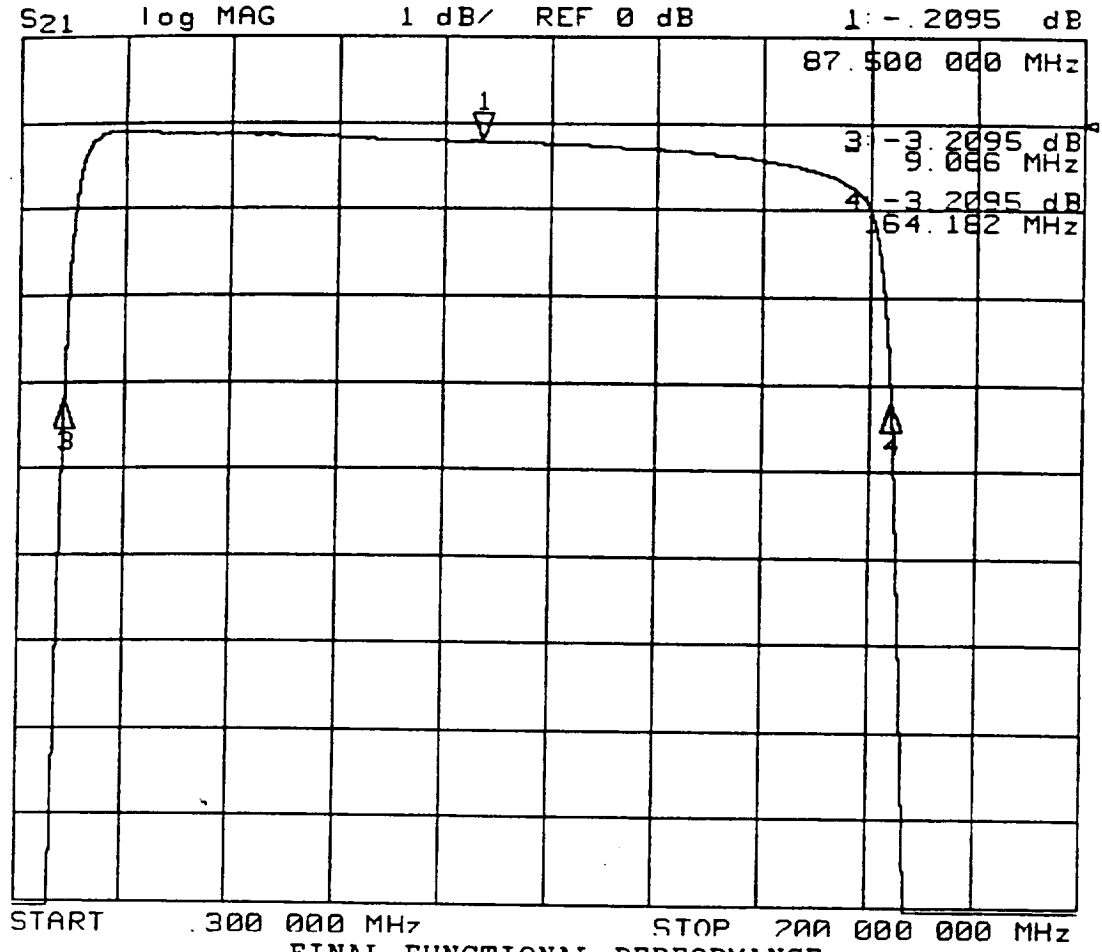
BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-003
AEROJET 13[illegible]59-4 REV E

3.0 dB BANDWIDTH

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	164.18 MHz (163.0-165.0)	163.95 Mhz (163.0-165.0)	163.72 MHz (163.0-165.0)
{8} LOWER 3.0 dB BANDEDGE	9.07 MHz (8.0-10.0)	9.05 Mhz (8.0-10.0)	9.04 MHz (8.0-10.0)
{9} 3.0 dB RELATIVE BANDWIDTH	155.11 MHz (153.0-157.0)	154.90 Mhz (153.0-157.0)	154.68 MHz (153.0-157.0)
{10} ADD {7} AND {8} ÷ 2 =	86.63 MHz (87.5 NOM)	86.50 MHz (87.5 NOM)	86.38 Mhz (87.5 NOM)
{10a} RECORD MEASURED TEMPERATURE	-11.0 °C (-15.0 TO -10.0)	+13.9 °C (12.5 TO 17.5)	+41.8 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

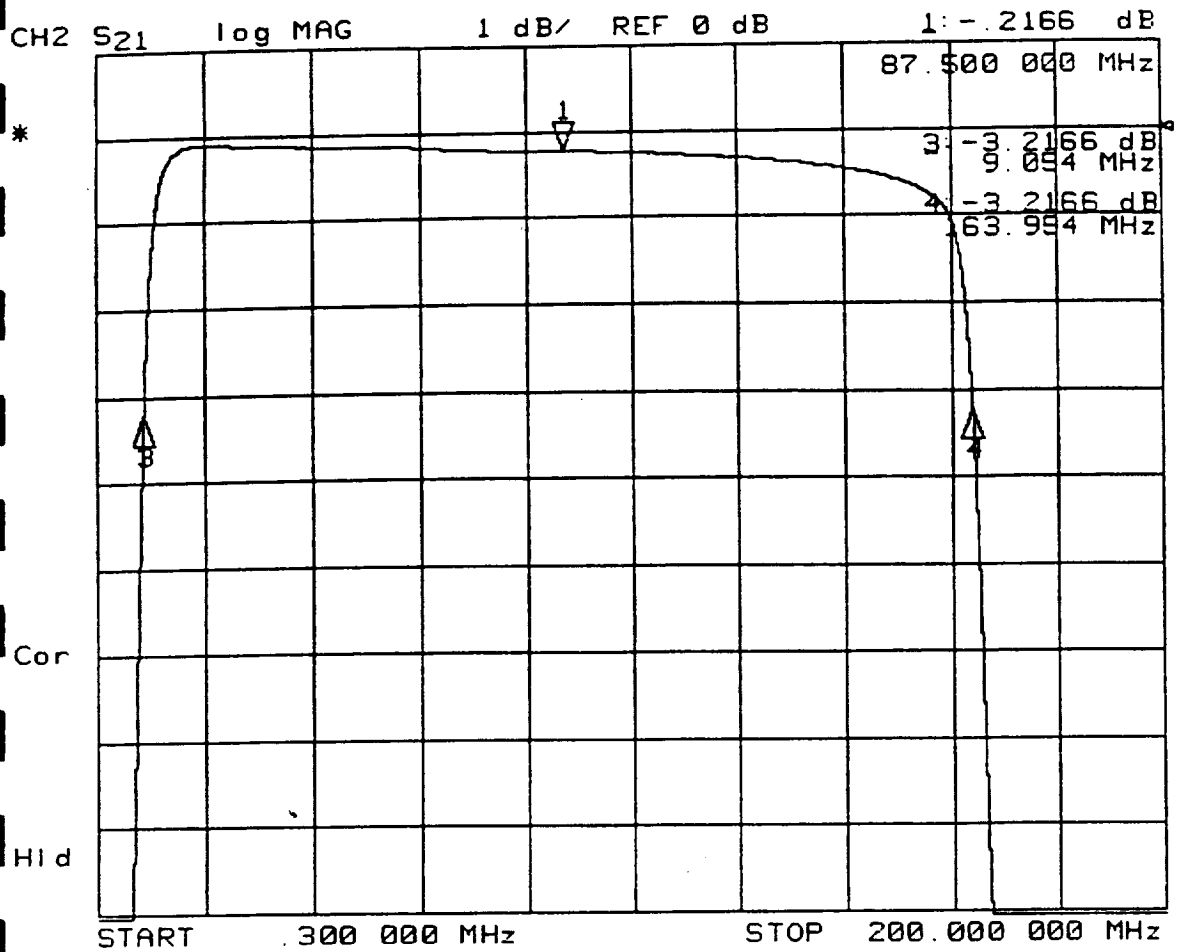
PASSBAND RIPPLE

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	20.77 MHz	20.77 Mhz	20.77 MHz
MIN INSERTION LOSS PERFORMANCE	-0.10 dB	-0.10 dB	-0.10 dB
{11b} 75% BW LOWER BANDEDGE FREQ	13.19 MHz	13.09 Mhz	12.97 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.34 dB	-0.36 dB	-0.38 dB
{11c} 75% BW UPPER BANDEDGE FREQ	129.44 MHz	129.34 Mhz	129.22 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.34 dB	-0.36 dB	-0.38 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.24 dB	0.26 dB	0.28 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.24 dB	0.26 dB	0.28 dB



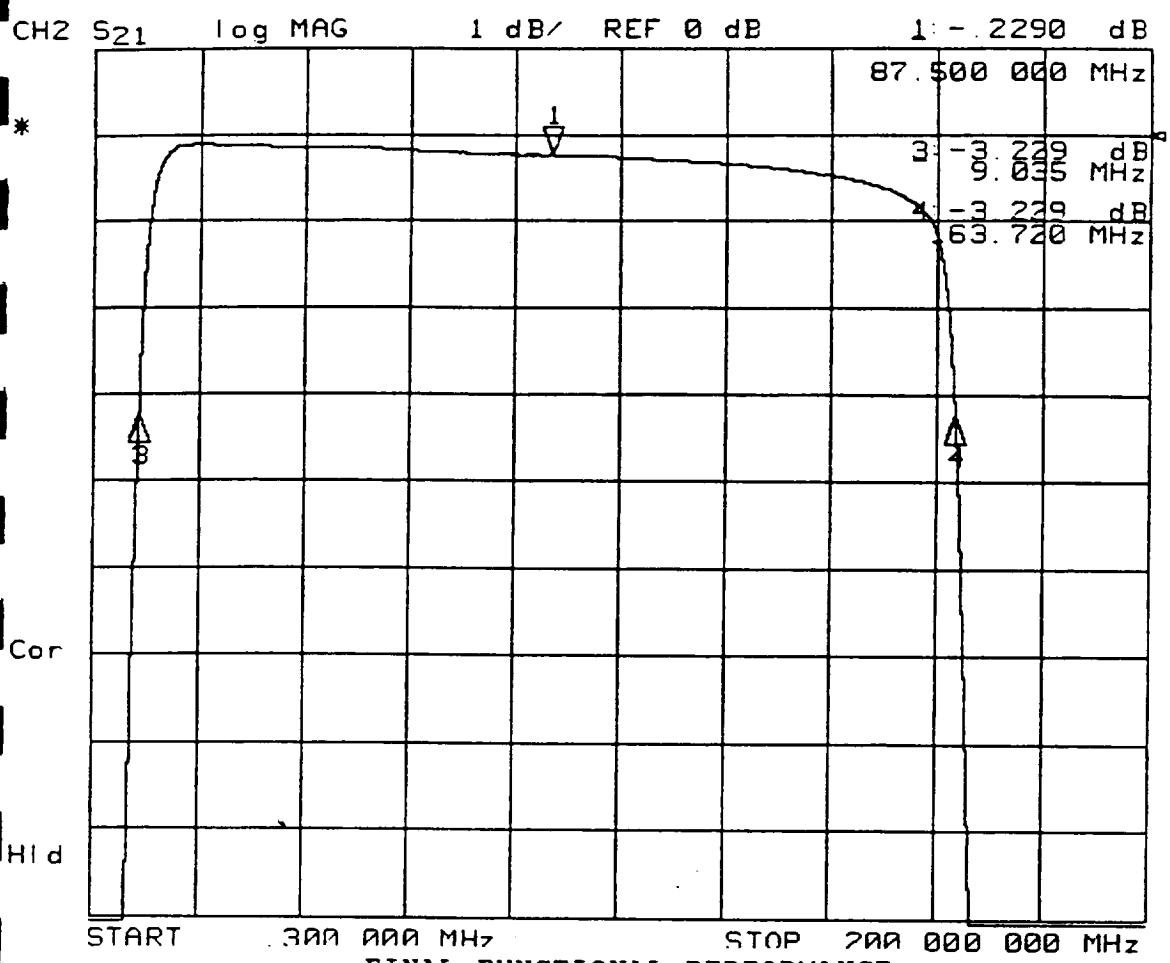
FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-003
-10C DATA
OPR: R. HOGGATT DATE DEC 20 1996

MARKER PARAMET	annel 2	
MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2095 dB
MARKER 2	157.250000 MHz OFF	86.624580 MHz OFF
MARKER 3	29.375000 MHz OFF	9.066500 MHz -3.2095 dB
MARKER 4	145.625000 MHz OFF	164.182660 MHz -3.2095 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-003
+15C DATA
OPR: R. HOGGATT DATE DEC 20 1996 annel 2

MARKER PARAME		
MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2166 dB
MARKER 2	157.250000 MHz OFF	86.504401 MHz OFF
MARKER 3	29.375000 MHz OFF	9.054042 MHz -3.2166 dB
MARKER 4	145.625000 MHz OFF	163.954760 MHz -3.2166 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P230-003
+40C DATA
OPR: R. HOGGATT DATE DEC 20 1996

annel 2

MARKER PARAMET		
MARKER 1	17.750000 MHz OFF	87.500000 MHz -.2290 dB
MARKER 2	157.250000 MHz OFF	86.377678 MHz OFF
MARKER 3	29.375000 MHz OFF	9.035066 MHz -3.229 dB
MARKER 4	145.625000 MHz OFF	163.720290 MHz -3.229 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF

APPENDIX D QUALIFICATION TEST REPORT

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-003
AEROJET 1331559-4 REV E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	(PASS)/FAIL	(PASS)/FAIL	(PASS)/FAIL
{11g} ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

QUALIFICATION TEST PROCEDURE 63-0005-010 PARA 4.5.5
Fc=87.5 MHz.
REF {5A} FOR INSERTION LOSS @ Fc

	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 1.0 MHz	-60.4 dB (40.0 dB MIN)	-60.3 dB (40.0 dB MIN)	-60.3 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 188.25 MHz TO 1000.0 MHz	-60.9 dB (40.0 dB MIN)	-61.6 dB (40.0 dB MIN)	-62.5 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-11.2 °C (-15.0 TO -10.0)	+13.9 °C (12.5 TO 17.5)	+42.0 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√) ✓ (√)	✓ (√) ✓ (√)	✓ (√) ✓ (√)

TEST PERFORMED BY R. HOGGATT DATE 12/20/96

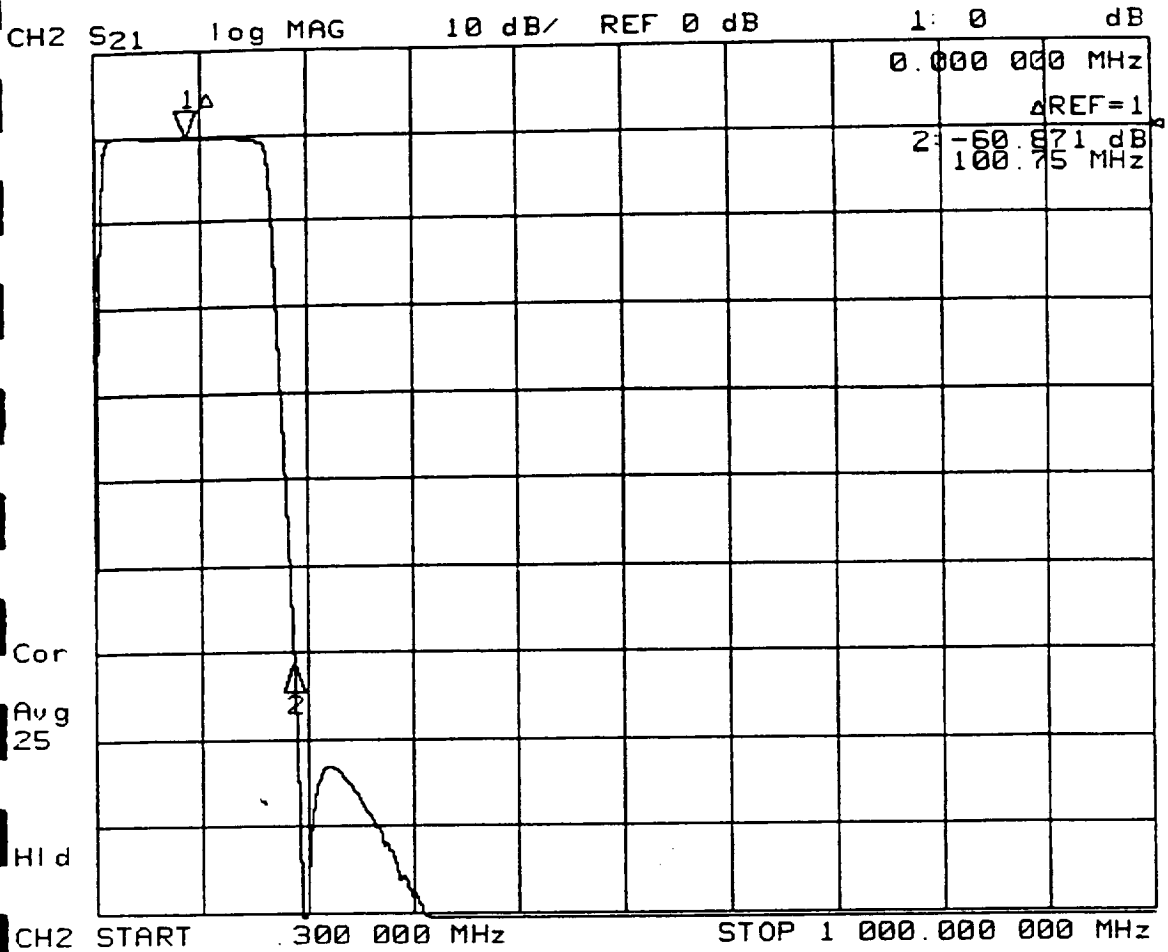
NOTE IF TEST WITNESSED BY AESD: _____ GSI: _____

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

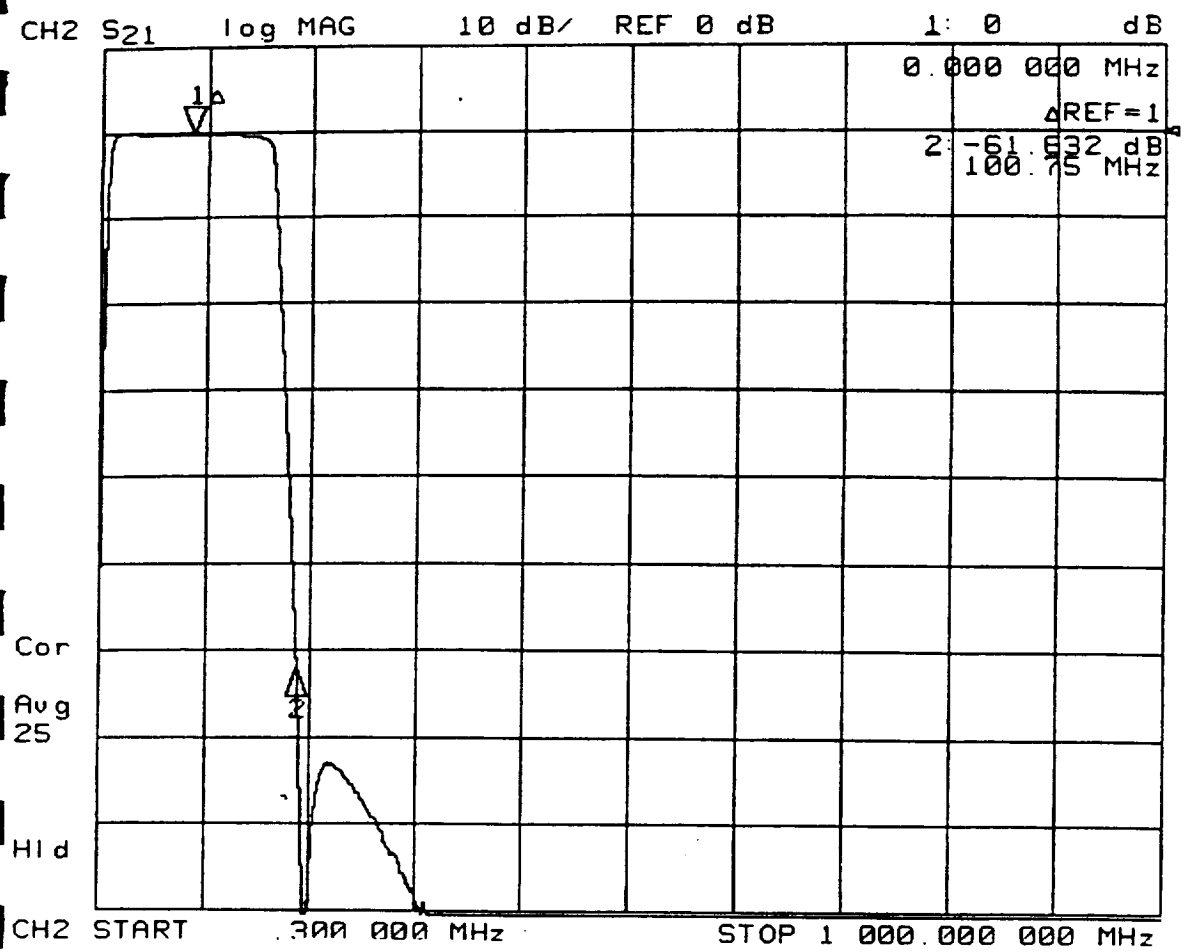
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.499
MOUNTING HOLE CENTER	0.125 ± .010	0.126
BETWEEN UPPER MOUNTING HOLES	3.250	3.250
BETWEEN LOWER MOUNTING HOLES	3.250	3.250



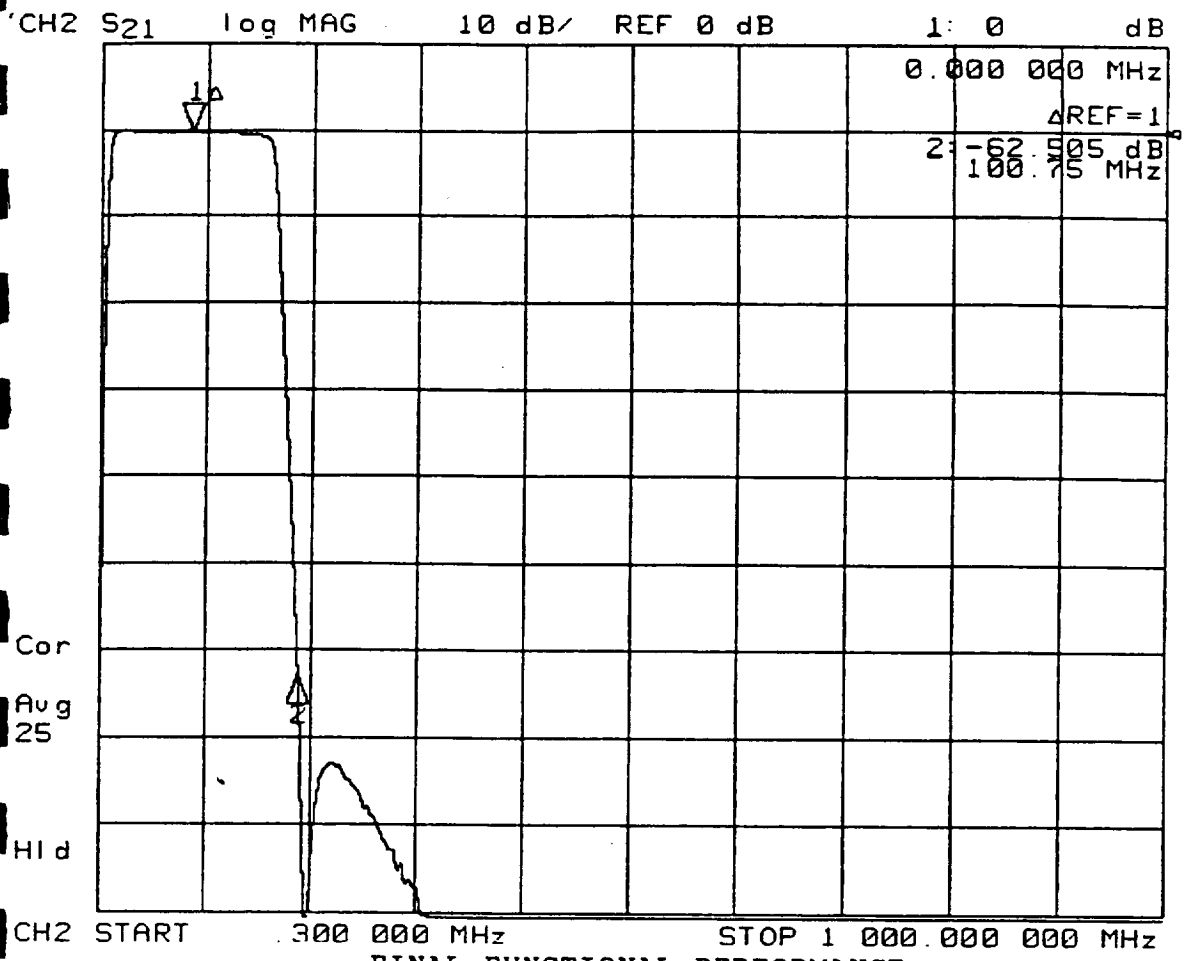
FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P230-003
-10C DATA
OPR: R. HOGGATT DATE DEC 20 1996

MARKER PARAMET	annel 2	
MARKER 1	1.000000 MHz OFF	87.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	188.250000 MHz -60.871 dB
MARKER 3	5.000000 MHz OFF	188.250000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P230-003
+15C DATA
OPR: R. HOGGATT DATE DEC 20 1996 annel 2

MARKER PARAMET		
MARKER 1	1.000000 MHz OFF	87.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	188.250000 MHz -61.632 dB
MARKER 3	5.000000 MHz OFF	188.250000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P230-003
+40C DATA
OPR: R. HOGGATT DATE DEC 20 1996

MARKER PARAME annel 2

MARKER 1	1.000000 MHz OFF	87.500000 MHz 0 dB
MARKER 2	5.000000 MHz OFF	188.250000 MHz -62.505 dB
MARKER 3	5.000000 MHz OFF	188.250000 MHz OFF
MARKER 4	5.000000 MHz OFF	1000.000000 MHz OFF
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF

BANDPASS FILTER MODEL HL87.5-155-10SS1 S/N P230-003
AEROJET 1331559-4 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER QTP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE +23.3 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	75	MHz	-83.1 dB	F11	(*) 100.0	MHz	-0.25 dB
F2	1.0	MHz	-67.0 dB	F12	(*) 125.0	MHz	-0.32 dB
F3	50	MHz	-18.4 dB	F13	150.0	MHz	-0.60 dB
F4	75	MHz	-7.39 dB	F14	160.0	MHz	-1.08 dB
F5	00	MHz	-1.69 dB	F15	165.0	MHz	-4.80 dB
F6	50	MHz	-0.21 dB	F16	170.0	MHz	-16.1 dB
F7	50	MHz	-0.11 dB	F17	200.0	MHz	-87.8 dB
F8	(*) 50	MHz	-0.15 dB	F18	300.0	MHz	-88.2 dB
F9	(*) 75.0	MHz	-0.22 dB	F19	500.0	MHz	-104.7 dB
F10	87.5	MHz	-0.25 dB	F20	1000.0	MHz	-110.2 dB

DA 5

TEST PERFORMED BY: R. HOGGATT DATE 12/20/96

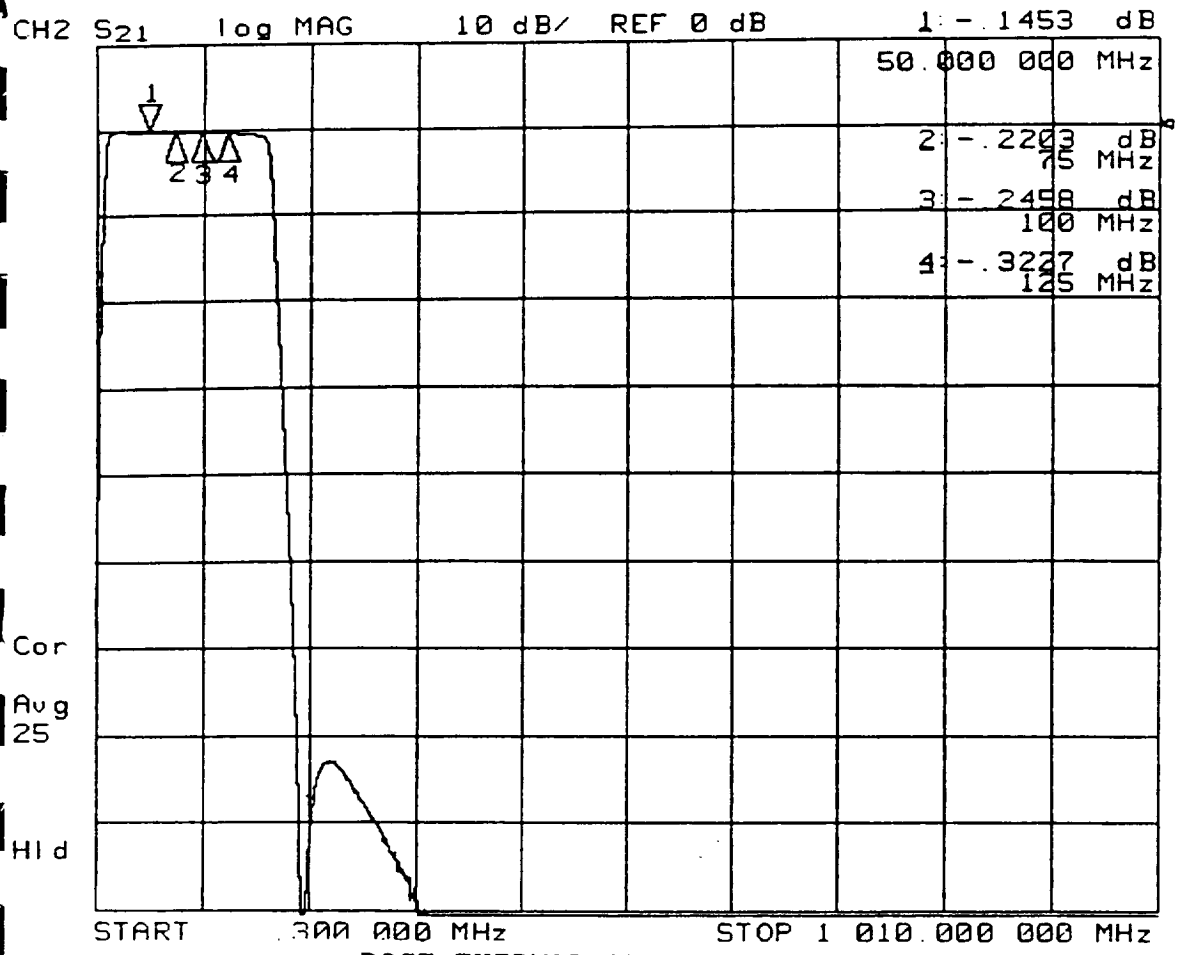
NOTE IF TEST WITNESSED BY AESD _____ GSI _____

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
QUALIFICATION TEST PROCEDURE
63-0005-010 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX D PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) CENTER FREQUENCY (fc) PER QTP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
b.) 3.0 dB BANDWIDTH PER QTP PARA 4.5.3.
c.) OUT-OF-BAND REJECTION PER QTP PARA 4.5.5.
d) INSERTION LOSS PER QTP PARA 4.5.2
e) INSERTION LOSS VS TEMPERATURE PER QTP PARA 4.5.6.
f.) PASSBAND RIPPLE PER QTP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) VSWR PER QTP PARA 4.5.1.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P230-003
AMBIENT
MARKER PARAME OPR: R. HOGGATT DATE DEC 20 1996 Channel 2

MARKER 1	17.750000 MHz	50.000000 MHz
	OFF	-.1453 dB
MARKER 2	157.250000 MHz	75.000000 MHz
	OFF	-.2203 dB
MARKER 3	29.375000 MHz	100.000000 MHz
	OFF	-.2458 dB
MARKER 4	145.625000 MHz	125.000000 MHz
	OFF	-.3227 dB
MKR STIMULUS OFFSET	0.000000 MHz	89.425802 MHz
	0 dB	-3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Channel 10 Bandpass Filter

IF Filter (S/N: 1331559-7, S/N: P233-005)

APPENDIX G

ACCEPTANCE TEST REPORT

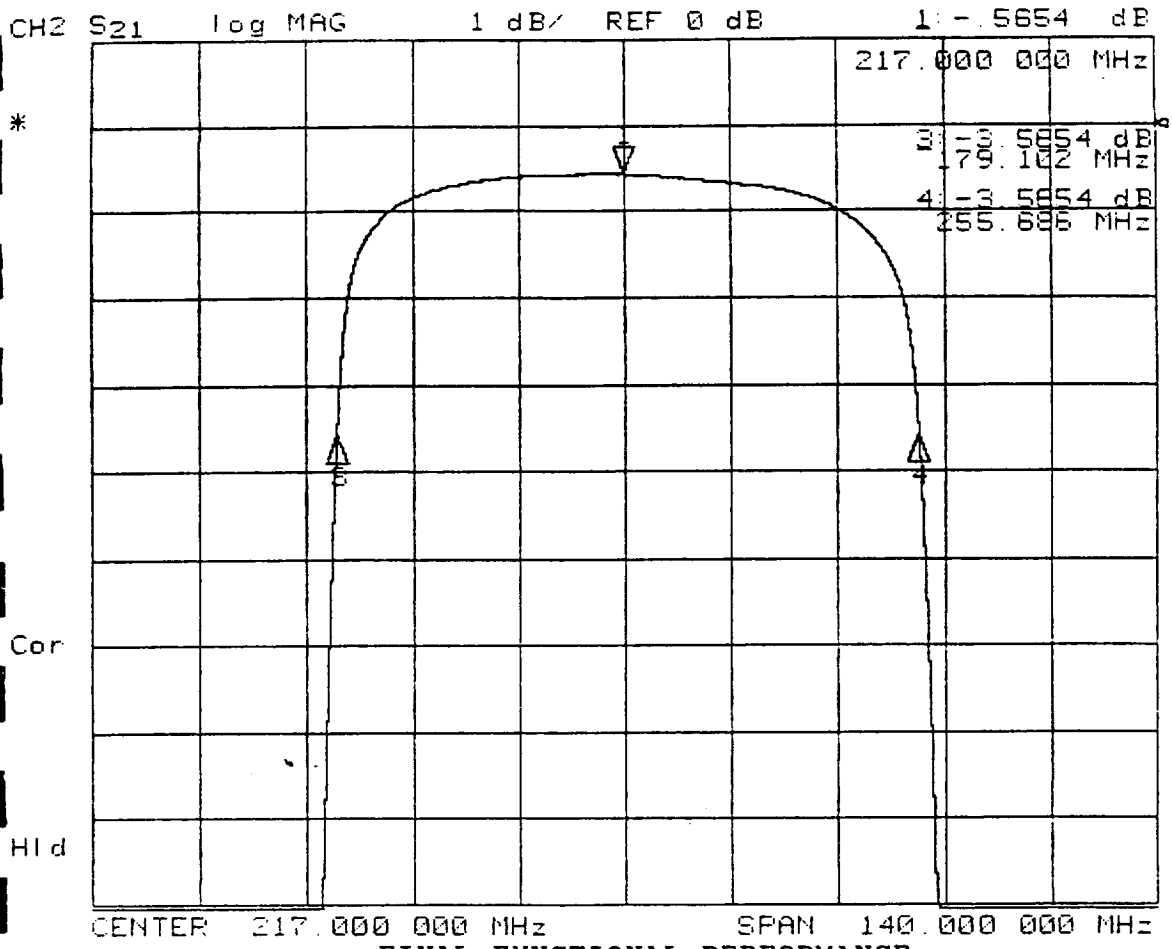
BANDPASS FILTER MODEL FX217-78-10SS1 S/N P233-005
AEROJET 1331559-7 REV E

3.0 dB BANDWIDTH

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	255.69 MHz (254.0-256.0)	255.41 Mhz (254.0-256.0)	255.05 MHz (254.0-256.0)
{8} LOWER 3.0 dB BANDEDGE	179.10 MHz (178.0-180.0)	178.92 Mhz (178.0-180.0)	178.72 MHz (178.0-180.0)
{9} 3.0 dB RELATIVE BANDWIDTH	76.59 MHz (74.0-78.0)	76.49 Mhz (74.0-78.0)	76.33 MHz (74.0-78.0)
{10} ADD {7} AND {8} / 2 =	217.40 MHz (217.0 NOM)	217.17 MHz (217.0 NOM)	216.89 Mhz (217.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-12.0 °C (-15.0 TO -10.0)	+14.4 °C (12.5 TO 17.5)	+43.3 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

PASSBAND RIPPLE

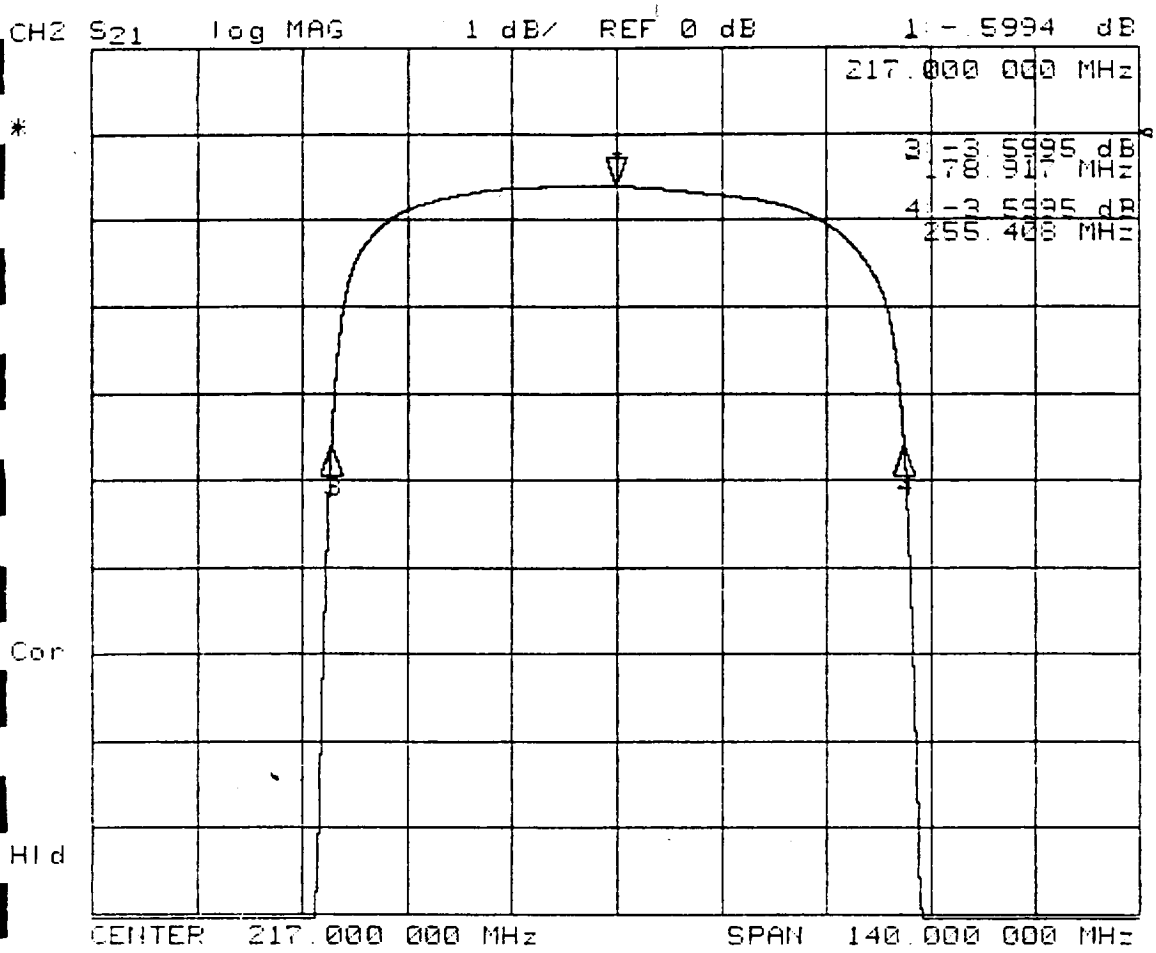
ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	213.55 MHz	214.55 Mhz	213.85 MHz
MIN INSERTION LOSS PERFORMANCE	-0.56 dB	-0.60 dB	-0.64 dB
{11b} 75% BW LOWER BANDEDGE FREQ	186.38 MHz	186.19 Mhz	185.99 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.97 dB	-1.02 dB	-1.08 dB
{11c} 75% BW UPPER BANDEDGE FREQ	244.88 MHz	244.69 Mhz	244.49 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.97 dB	-1.02 dB	-1.08 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.41 dB	0.42 dB	0.44 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.41 dB	0.42 dB	0.44 dB



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P233-005
-10C DATA
OPR: R. HOGGATT DATE JAN 31 1997

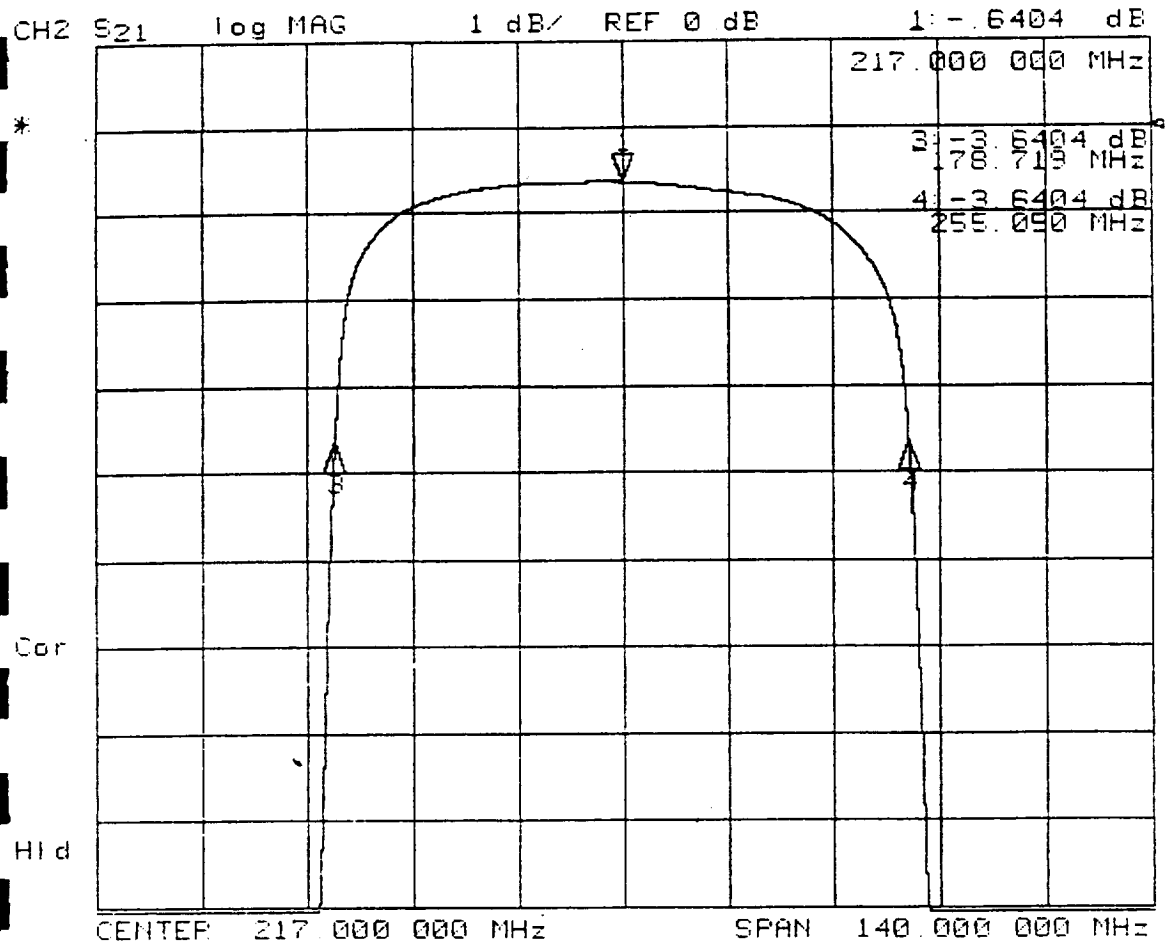
annel 2

MARKER PARAMET		
MARKER 1	181.900000 MHz OFF	217.000000 MHz -.5654 dB
MARKER 2	252.100000 MHz OFF	217.394129 MHz OFF
MARKER 3	187.750000 MHz OFF	179.102101 MHz -3.5654 dB
MARKER 4	246.250000 MHz OFF	255.686157 MHz -3.5654 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P233-005
+15C DATA
OPR: R. HOGGATT DATE JUN 3 1 1997

MARKER PARAMET	annel 2	
MARKER 1	181.900000 MHz OFF	217.000000 MHz -.5994 dB
MARKER 2	252.100000 MHz OFF	317.162781 MHz OFF
MARKER 3	187.750000 MHz OFF	178.917138 MHz -3.5995 dB
MARKER 4	246.250000 MHz OFF	255.408385 MHz -3.5995 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
EFERENCE MARKER	OFF	OFF
LACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB OFF	-3 dB OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P233-005
+40C DATA

MARKER PARAME OPR: R. HOGGATT DATE JAN 3 1 1997 annel 2

MARKER 1	181.900000 MHz OFF	217.000000 MHz -.6404 dB
MARKER 2	252.100000 MHz OFF	216.885061 MHz OFF
MARKER 3	187.750000 MHz OFF	178.719967 MHz -3.6404 dB
MARKER 4	246.250000 MHz OFF	255.050156 MHz -3.6404 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	89.425802 MHz -3.2342 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-14 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX G

ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL FX217-78-10SS1 S/N P233-005
AEROJET 1331559-7 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.7 dB MAX)	(PASS)/FAIL	(PASS)/FAIL	(PASS)/FAIL
{11g} ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5
Fc=217.0 MHz
REF {5A} FOR INSERTION LOSS @ Fc

	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 166.3 MHz	-43.1 dB (40.0 dB MIN)	-43.1 dB (40.0 dB MIN)	-43.4 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 267.7 MHz TO 1000.0 MHz	-45.0 dB (40.0 dB MIN)	-45.5 dB (40.0 dB MIN)	-45.7 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-12.1 °C (-13.0 TO -10.0)	+14.4 °C (12.5 TO 17.5)	+43.4 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOTS	✓ (√)	✓ (√)	✓ (√)

TEST PERFORMED BY R. HOGAN DATE 1/31/97 DA 5

NOTE IF TEST WITNESSED BY AESD: _____ GSI: _____

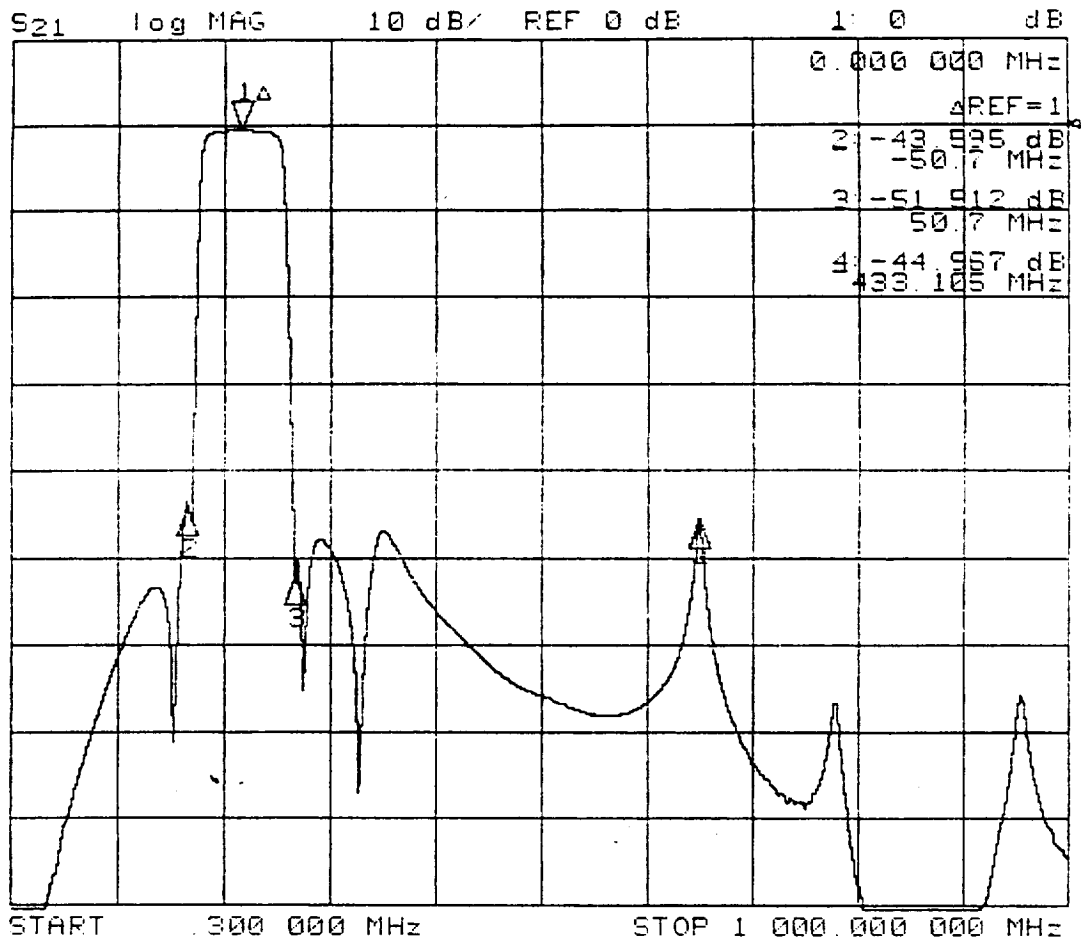
***** END OF FUNCTIONAL PERFORMANCE TEST ****

Not Witnessed this time. DLD

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	5.50 ± .03	5.502
MOUNTING HOLE CENTER	0.125 ± .010	.125
BETWEEN UPPER MOUNTING HOLES	5.250	5.251
BETWEEN LOWER MOUNTING HOLES	5.250	5.251

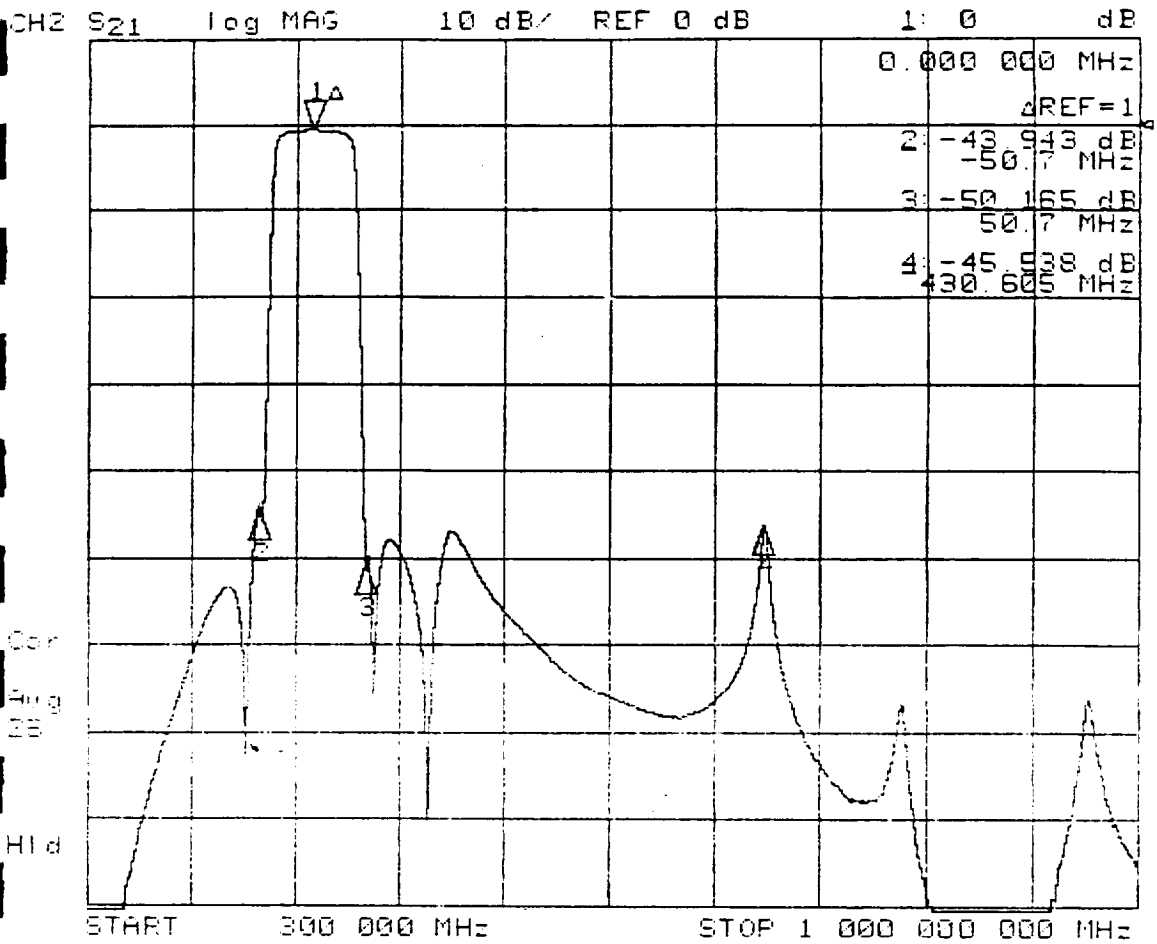


FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P233-005
-10C DATA

MARKER PARAMET OPR: R. HOGGATT DATE JAN 31 1997 Channel 2

MARKER 1	1000.000000 MHz OFF	217.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	166.300000 MHz -43.595 dB
MARKER 3	1000.000000 MHz OFF	267.700000 MHz -51.512 dB
MARKER 4	1000.000000 MHz OFF	650.105055 MHz -44.967 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB

REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

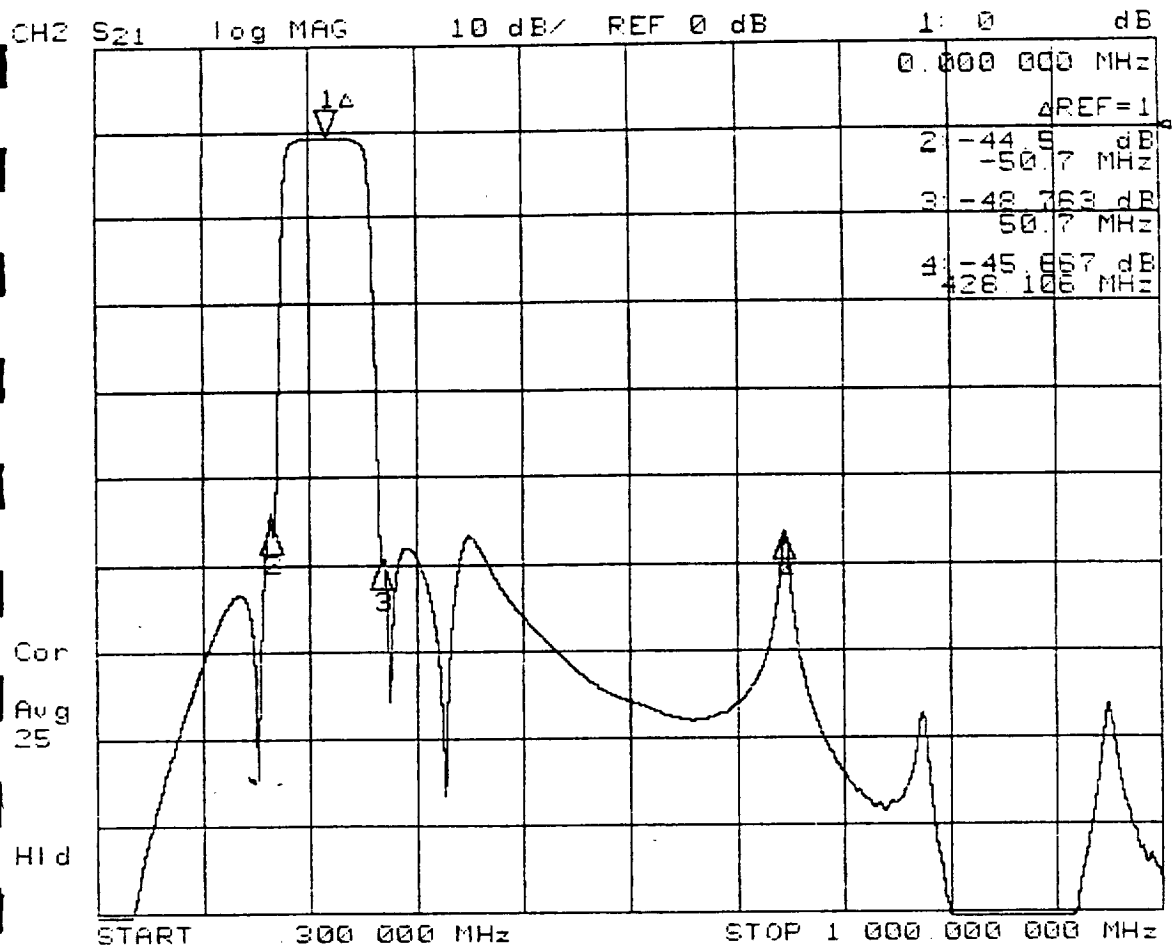


FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P233-005
+15C DATA
OPR: R. HOGGATT DATE JAN 31 1997

MARKER PARAMET — Channel 2

MARKER 1	1000.000000 MHz OFF	217.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	166.300000 MHz -43.943 dB
MARKER 3	1000.000000 MHz OFF	267.700000 MHz -50.165 dB
MARKER 4	1000.000000 MHz OFF	647.605805 MHz -45.538 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB

REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P233-005
+40C DATA

MARKER PARAMET OPR: R. HOGGATT DATE JAN 31 1997 nnel 2

MARKER 1	1000.000000 MHz OFF	217.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	166.300000 MHz -44.5 dB
MARKER 3	1000.000000 MHz OFF	267.700000 MHz -48.763 dB
MARKER 4	1000.000000 MHz OFF	645.106553 MHz -45.667 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

APPENDIX G

ACCEPTANCE TEST REPORT

BANDPASS FILTER MODEL FX217-78-10SS1 S/N P233-005
AEROJET 1331559-7 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE +21.4 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF	FREQ	UNIT	VALUE	REF	FREQ	UNIT	VALUE
F1	1.0	MHz	-103.5 dB	F11	217.0	MHz	-0.59 dB
F2	10.0	MHz	-104.4 dB	F12	(*) 224.0	MHz	-0.63 dB
F3	100.0	MHz	-61.6 dB	F13	(*) 230.0	MHz	-0.67 dB
F4	150.0	MHz	-61.5 dB	F14	240.0	MHz	-0.54 dB
F5	170.0	MHz	-45.2 dB	F15	250.0	MHz	-1.48 dB
F6	178.0	MHz	-6.29 dB	F16	256.0	MHz	-5.57 dB
F7	184.0	MHz	-1.30 dB	F17	264.0	MHz	-37.1 dB
F8	194.0	MHz	-0.76 dB	F18	300.0	MHz	-49.1 dB
F9	(*) 204.0	MHz	-0.64 dB	F19	500.0	MHz	-65.6 dB
F10	(*) 210.0	MHz	-0.60 dB	F20	1000.0	MHz	-86.5 dB

TEST PERFORMED BY: R. Hoggatt DATE 1/31/97 (DA 5)

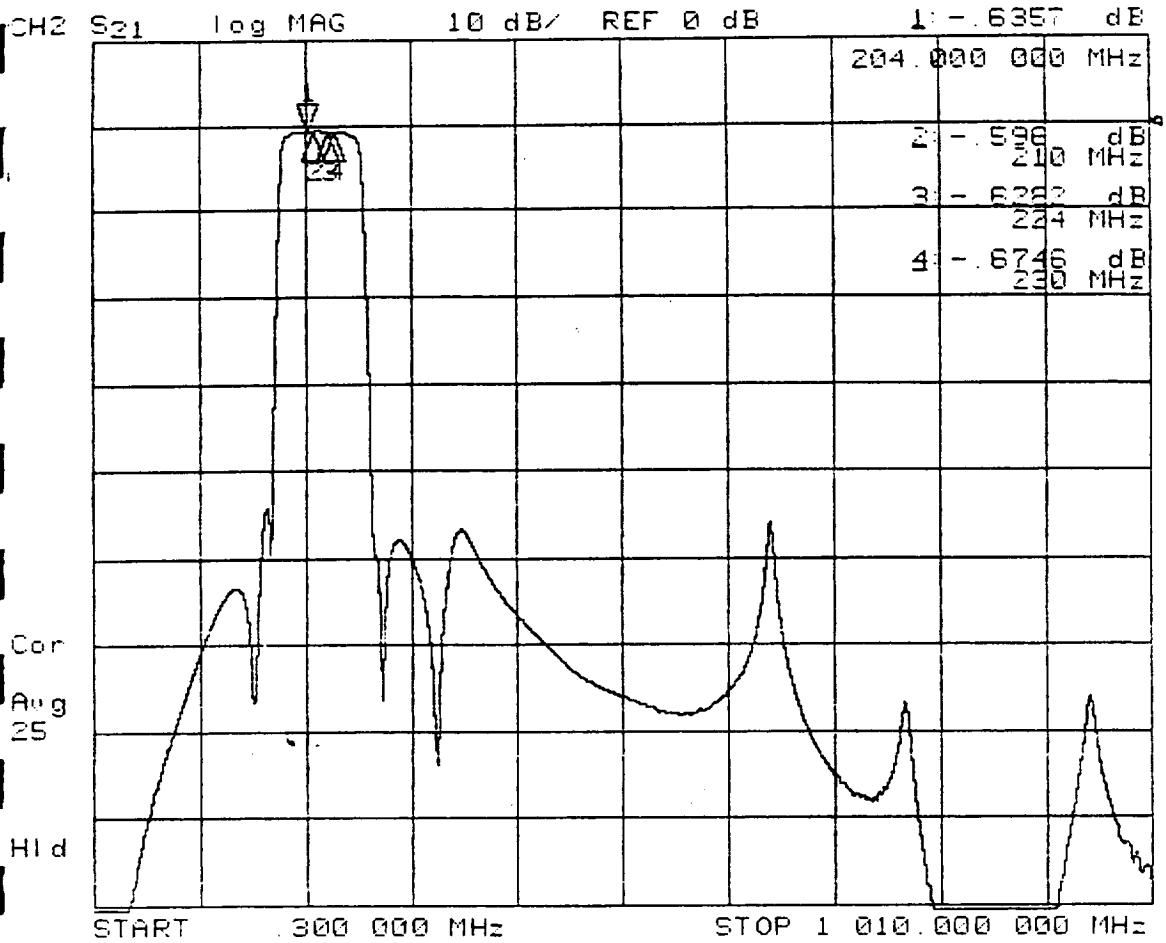
NOTE IF TEST WITNESSED BY AESD _____ GSI _____ Not Witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX G PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P233-005
AMBIENT
MARKER PARAMET OPR: R. HOGGATT DATE JAN 31 1997 annel 2

MARKER 1	1000.000000 MHz OFF	204.000000 MHz -.6357 dB
MARKER 2	1000.000000 MHz OFF	210.000000 MHz -.596 dB
MARKER 3	1000.000000 MHz OFF	224.000000 MHz -.6282 dB
MARKER 4	1000.000000 MHz OFF	230.000000 MHz -.6746 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF

Channel 11 Bandpass Filter

SAW Filter (S/N: 1331576-1, S/N: B01)

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-1 PHONON PART: 100823 SERIAL: 001
TESTED BY: DAG H TITLE: Mech DATE: 6/24/97 TIME: 10:00 AM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A07382 CAL DUE: 10/12/97
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/8/97

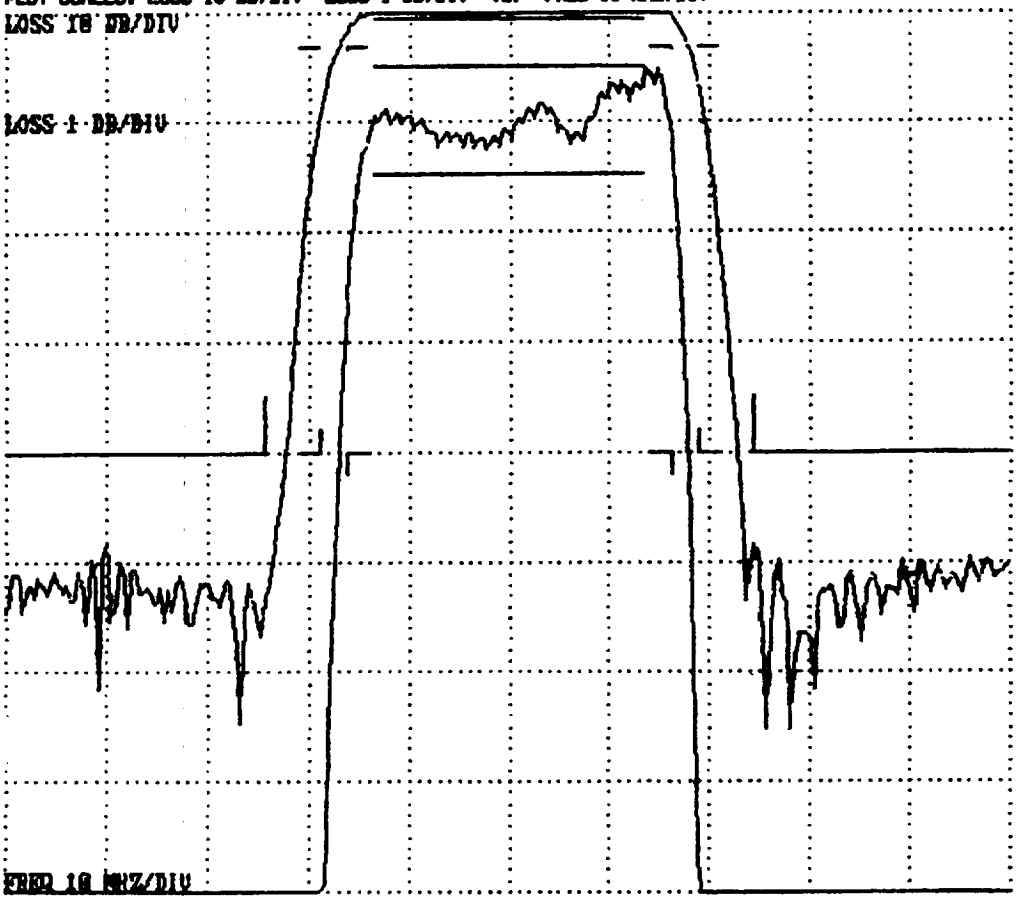
PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	-4.7	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 273.335/275.865 MHz	274.534	MHz	P
		HI: 369.335/371.865 MHz	370.745	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 34/36 MHz	34.842	MHz	P
		HI: 34/36 MHz	35.137	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.3	dB	P
		HI: /0.5 dB	0.0	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		268.7-287.7 MHz: /1.0 dB	0.6	dB	P
		356.7-383.7 MHz: /1.0 dB	0.7	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.0/38.2 dB	29.4	dB	P
		HI: 27.0/38.2 dB	29.6	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	-0.1	dB	P
		HI: -0.4/0.4 dB	0.0	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.2	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-225,420-1000 MHz:	42.1	0.000	
		DUAL: 225.000-249.935, 298.465-345.935, 394.465-420.00 MHz:	41.4	0.000	
		PEAK: 35.0/ dB	41.4	dB	P
		WIDTH: /7.2 MHz		0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.29	Unitless	P
		HI: /1.30 Unitless	1.27	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		268.7-287.7,356.7-383.7 MHz			
		DUAL S11: 7.5/ dB	7.7	dB	P
		DUAL S22: 7.5/ dB	9.4	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.2/0.2 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.72/0.72 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P (DP)		

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-8211
FAX: 203-651-8618

PHONON CORPORATION

FILE=1AC8B01A.DAT 11:51:48 05-28-1998
PN_100828_823 FINAL_FUNCTIONAL TEMP:C PROTOFLIGHT /N DUAL_SIX
06-23-1997 MP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 274.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27
DIFFERENCES: LOSS(DB)= 29.38699 PHASE(DEG)= 3886.015 DELAY(US)= 0 SLOPE(NS/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1691122 PHASE(DEG)= 1174.348
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



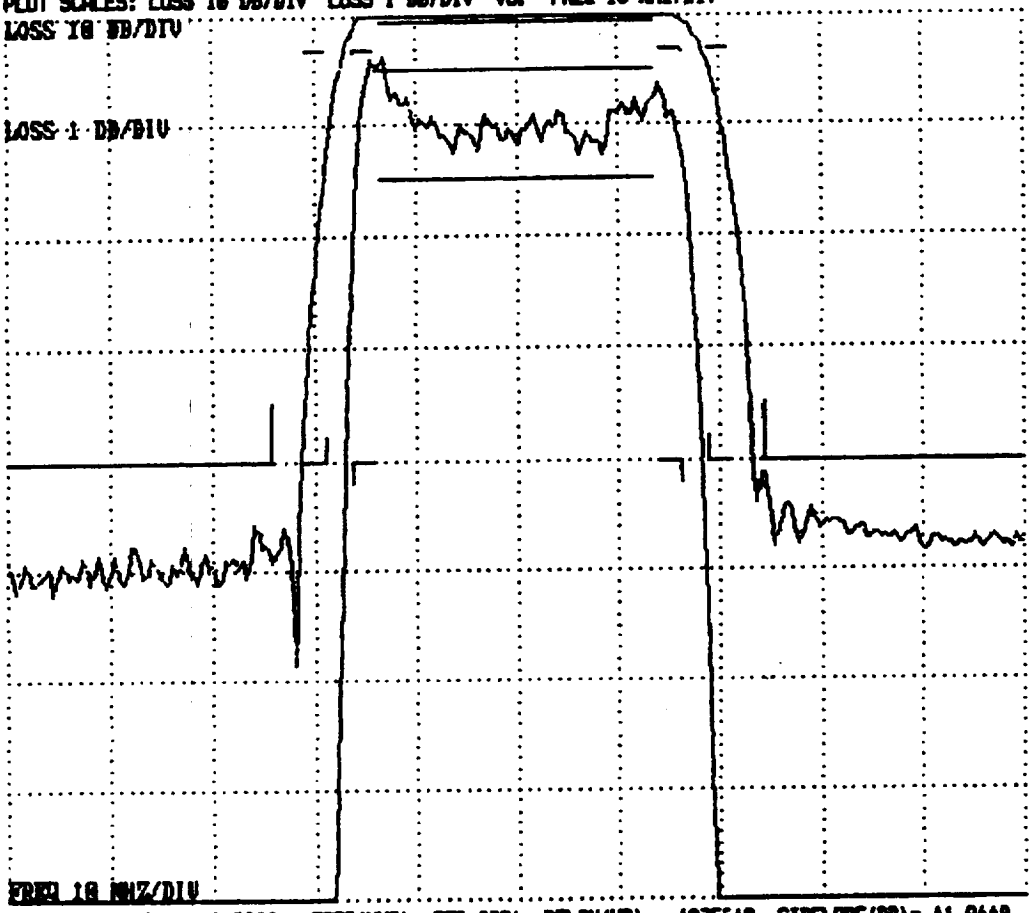
PEAK: LEVEL(DB)= 28.88334 FREQ(MHZ)= 287.9386 DELAY(US)=-.4287314 SIDELOBE(DB)=-48.53478
ENERGY: LEVEL(DB)= 29.54026 CENTER(MHZ)= 274.7936 WIDTH(MHZ)= 36.43295 SKEW(MHZ)=-.4393604

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.50	287.93857	287.93857	287.93857	0.00000	287.93857	0.00000	0.00	287.93857	287.93857
0.50	259.12256	290.62320	274.87286	31.50064	275.23694	31.74088	-13.03	259.12256	290.62320
1.00	258.49085	290.95621	274.72314	32.46616	274.89532	32.41492	-13.92	258.49085	290.95621
2.00	257.69284	291.55854	274.62170	33.85770	274.89661	33.56348	-16.17	257.69284	291.55854
3.00	257.11252	291.95459	274.53357	34.84207	274.89100	34.01827	-17.52	257.11252	291.95459
4.00	256.68225	292.29752	274.48987	35.61526	274.87796	34.37143	-19.09	256.68225	292.29752
5.00	256.32919	292.59188	274.46051	36.26269	274.79745	34.52347	-19.97	256.32919	292.59188
6.00	256.03478	292.82727	274.43097	36.79257	274.80838	34.76382	-21.95	256.03478	292.82727
10.00	255.16455	293.62323	274.39389	38.45868	274.79984	35.03694	-26.69	255.16455	293.62323
20.00	253.78989	294.97397	274.34152	41.26488	274.79198	35.15987	-37.86	253.78989	294.97397
30.00	252.78462	295.93668	274.36066	43.15285	274.79358	35.16855	-47.59	252.78462	295.93668
40.00	251.95183	296.94354	274.44769	44.99171	274.79355	35.16914	-51.29	251.95183	296.94354

BAND(MHZ) 268.700 287.700
LMIN(DB) -0.36
LMAX(DB) 0.26
LDEL(DB) 0.62
PMIN(DEG) -2081.37
PMAX(DEG) 2081.27
PDEL(DEG) 4082.64
File: 1AC8B01A.DAT Passband Symmetry = 0.3 dB

PHONON CORPORATION

FILE=1CC0801A.DAT 11:51:51 05-28-1998
PN_100828_823 FINAL_FUNCTIONAL TEMP:C PROTOFLIGHT /N DUAL_SIX
06-23-1997 HP8753,SSCF,SSFFIX,SBREF
FREQUENCY(MHZ): CENTER= 370.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27
REFERENCES: LOSS(DB)= 29.59872 PHASE(DEG)=-3362.898 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1623449 PHASE(DEG)= 1130.15
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



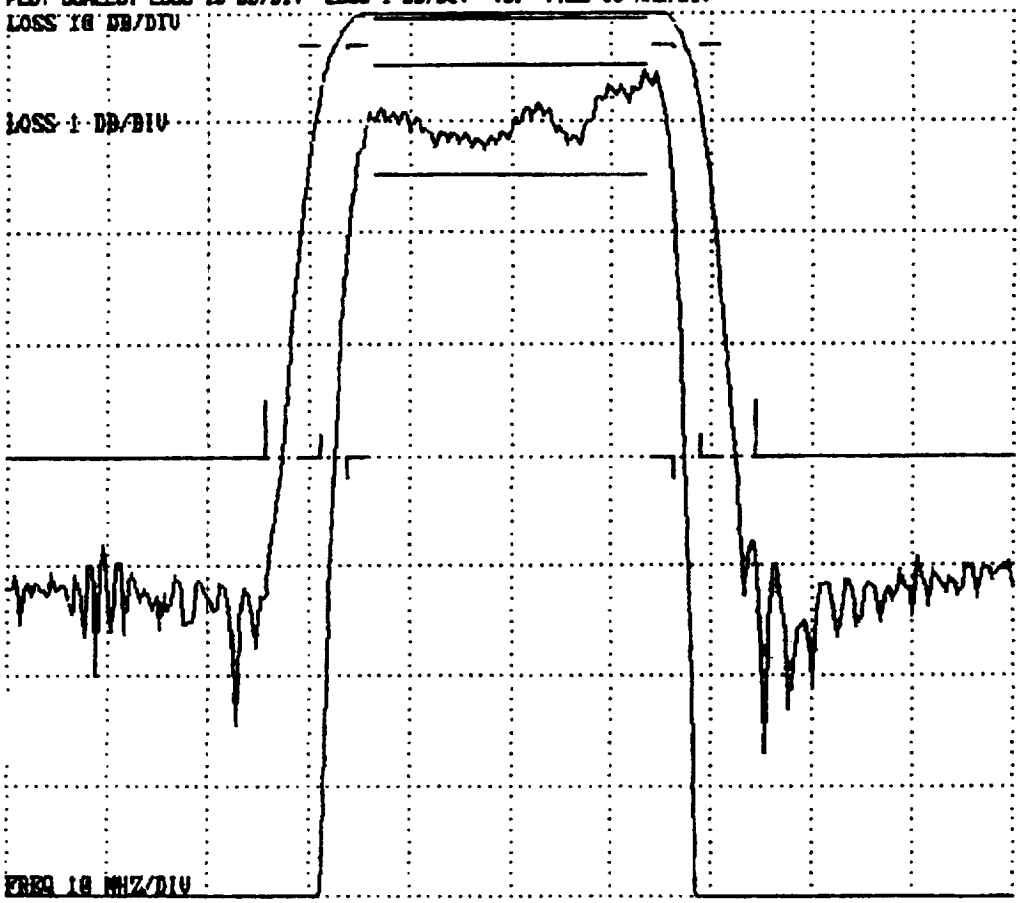
PEAK: LEVEL(DB)= 28.96824 FREQ(MHZ)= 356.8894 DELAY(US)=-.4835649 SIDELOBE(DB)=-41.9448
ENERGY: LEVEL(DB)= 29.71339 CENTER(MHZ)= 370.6586 WIDTH(MHZ)= 36.67304 SKEW(MHZ)= .1780324

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.63	356.88937	356.88937	356.88937	0.00000	356.88937	0.00000	0.00	356.88937	356.88937
0.50	354.28204	386.76691	370.52448	32.48486	370.46170	32.69881	-13.51	354.28204	386.76691
1.00	354.02222	387.18726	370.60474	33.16504	370.46885	33.37503	-14.58	354.02222	387.18726
2.00	353.55845	387.84891	370.69568	34.29046	370.59897	34.21479	-16.43	353.55845	387.84891
3.00	353.17682	388.31418	370.74548	35.13736	370.59274	34.66121	-17.91	353.17682	388.31418
4.00	352.87711	388.70792	370.79251	35.83081	370.59149	35.00644	-19.58	352.87711	388.70792
5.00	352.61929	389.09598	370.85764	36.47668	370.66150	35.14000	-20.44	352.61929	389.09598
6.00	352.38995	389.42783	370.90851	37.03788	370.65283	35.36757	-22.57	352.38995	389.42783
10.00	351.69666	390.31915	371.00790	38.62250	370.65854	35.61554	-27.79	351.69666	390.31915
20.00	350.48871	391.88884	371.14078	41.32013	370.65860	35.71007	-39.05	350.48871	391.88884
30.00	349.47486	392.79791	371.13599	43.32305	370.65842	35.71664	-45.55	349.47486	392.79791
40.00	348.82856	393.38984	371.06519	44.48929	370.65829	35.71725	-47.52	348.82856	393.38984

BAND(MHZ) 356.700 383.700
LMIN(DB) -0.62
LMAX(DB) 0.28
LDEL(DB) 0.90
PMIN(DEG) -1932.79
PMAX(DEG) 1922.99
PDEL(DEG) 3855.78
File: 1CC0801A.DAT Passband Symmetry = 0.0 dB

PHONON CORPORATION

FILE=1ARAB01A.DAT 11:52:01 05-28-1998
PN_100028_823 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
-23-1997 HP8753,SSCF,SSFFIX,SSREF
UENCY(MHZ): CENTER= 274.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27
ERENCES: LOSS(DB)= 29.52982 PHASE(DEG)= 3824.559 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1678936 PHASE(DEG)= 1176.121
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



PEAK: LEVEL(DB)= 29.86731 FREQ(MHZ)= 287.3014 DELAY(US)=-.4212485 SIDELOBE(DB)=-47.98545
ENERGY: LEVEL(DB)= 29.69407 CENTER(MHZ)= 274.3331 WIDTH(MHZ)= 36.40004 SKEW(MHZ)=-.3811682

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.46	287.50137	287.50137	287.50137	0.00000	287.50137	0.00000	0.00	287.50137	287.50137
0.50	258.71057	298.14474	274.42767	31.43417	274.62213	31.38329	-12.66	258.71057	298.14474
1.00	258.87864	298.50043	274.28955	32.42178	274.45267	32.32973	-13.99	258.87864	298.50043
2.00	257.29385	291.10048	274.19714	33.80655	274.44931	33.46672	-16.26	257.29385	291.10048
3.00	256.78789	291.51144	274.14968	34.72356	274.44078	33.98676	-17.62	256.78789	291.51144
4.00	256.28091	291.84784	274.06439	35.56693	274.42498	34.26242	-19.28	256.28091	291.84784
5.00	255.92957	292.14362	274.03659	36.21405	274.34433	34.41453	-20.09	255.92957	292.14362
6.00	255.63787	292.38062	274.00885	36.74355	274.34500	34.64961	-22.09	255.63787	292.38062
10.00	254.76830	293.16919	273.96875	38.40089	274.34061	34.91582	-26.87	254.76830	293.16919
20.00	253.31447	294.52972	273.92209	41.21526	274.33170	35.03354	-38.14	253.31447	294.52972
30.00	252.38968	295.49216	273.94092	43.10248	274.33310	35.04163	-47.66	252.38968	295.49216
40.00	251.52971	296.51575	274.02274	44.98604	274.33307	35.04219	-51.16	251.52971	296.51575

BAND(MHZ)	260.700	287.700
LMIN(DB)	-0.45	
LMAX(DB)	0.27	
LDEL(DB)	0.72	
PMIN(DEG)	-2003.57	
PMAX(DEG)	2006.00	
PDEL(DEG)	4009.58	

: 1ARABB01A.DAT Passband Symmetry = 0.3 dB

ELECTRICAL TEST DATA SHEET

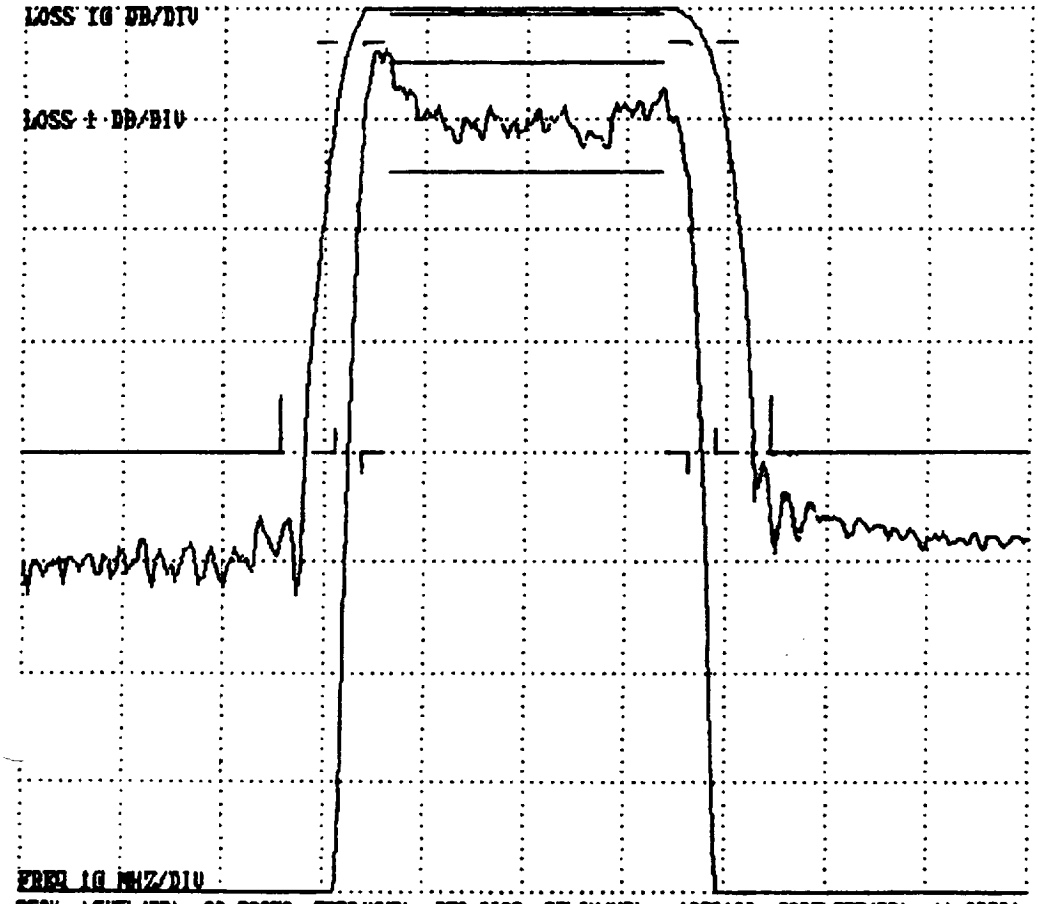
AEROJET PART: 1331576-1 PHONON PART: 100823 SERIAL: 001
TESTED BY: Porch TITLE: MCP DATE: 6/29/97 TIME: 10:00 AM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410007982 CAL DUE: 10/12/97
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/8/97

PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	15.0	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 273.335/275.065 MHz	274.110	MHz	P
		HI: 369.335/371.065 MHz	370.150	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 34/36 MHz	34.884	MHz	P
		HI: 34/36 MHz	35.089	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.3	dB	P
		HI: /0.5 dB	0.1	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		268.7-287.7 MHz: /1.0 dB	0.6	dB	P
		356.7-383.7 MHz: /1.0 dB	0.6	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	29.5	dB	P
		HI: 27.8/30.2 dB	29.6	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.0	dB	P
		HI: -0.4/0.4 dB	0.0	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.0	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-225,420-1000 MHz:	42.1	0.000	
		DUAL: 225.000-249.935,			
		298.465-345.935,			
		394.465-420.00 MHz:	42.7	0.000	
		PEAK: 35.0/ dB	42.1	dB	P
		WIDTH: /7.2 MHz		0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.29	Unitless	P
		HI: /1.30 Unitless	1.27	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		268.7-287.7,356.7-383.7 MHz			
		DUAL S11: 7.5/ dB	7.6	dB	P
		DUAL S22: 7.5/ dB	9.6	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			P
		CENTER FREQUENCY: -0.2/0.2 MHz	+0.017	MHz	P
		3 dB BANDWIDTH: -0.72/0.72 MHz	+0.015	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P (101)		

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6YB58
TEL: 203-651-8211
FAX: 203-651-8618

PHONON CORPORATION
FILE=1CR8B01A.DAT 11:52:05 05-29-1998
PN_100828_823 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SIX
-23-1997 HP8753,SSCF,SSFFIX,SSREF
QUENCY(MHZ): CENTER= 370.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27
EFERENCES: LOSS(DB)= 29.55719 PHASE(DEG)=-3440.879 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1382874 PHASE(DEB)= 1132.072
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



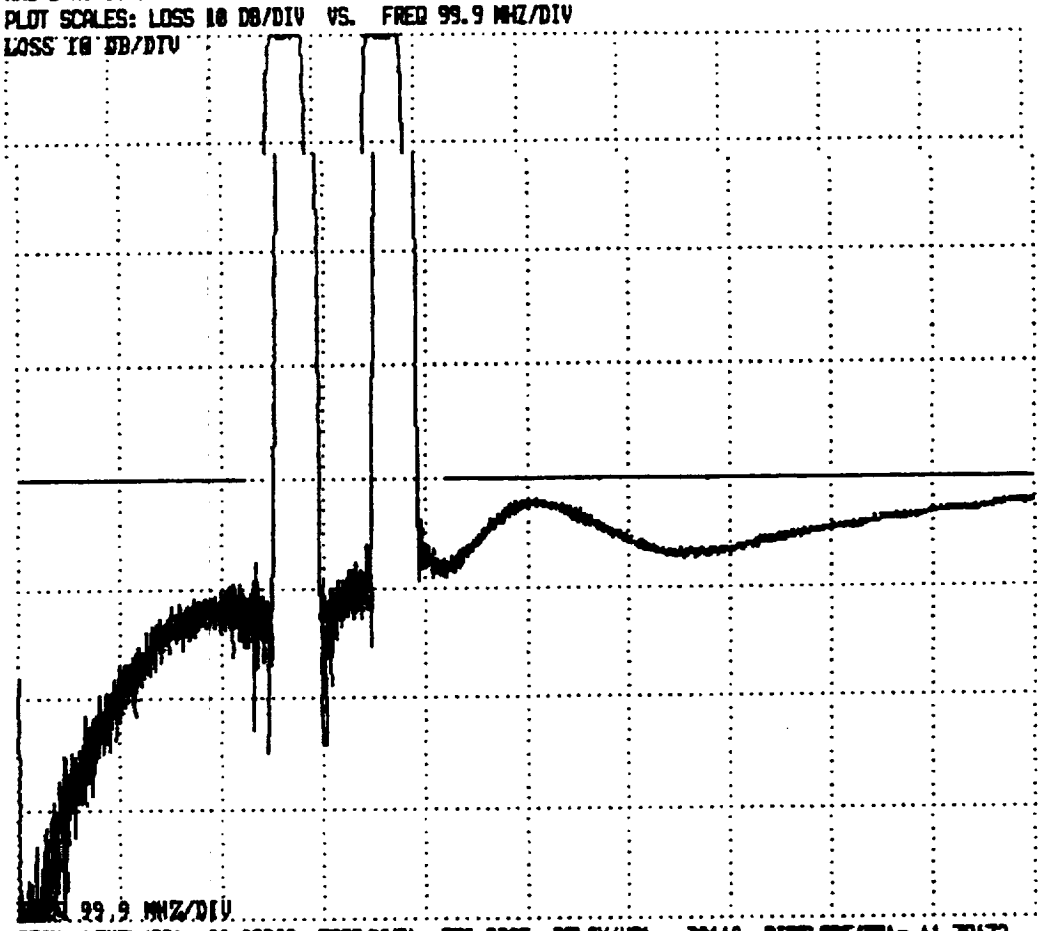
PEAK: LEVEL(DB)= 28.92852 FREQ(MHZ)= 356.2629 DELAY(US)=-.4036162 RIPPLE(DB)=41.66381
ENERGY: LEVEL(DB)= 29.67636 CENTER(MHZ)= 370.0882 WIDTH(MHZ)= 36.62452 SMSH(MHZ)= .2679408

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.63	356.26291	356.26291	356.26291	0.00000	356.26291	0.00000	0.00	356.26291	356.26291
0.50	353.69876	386.06607	369.88242	32.36731	369.62225	32.70240	-13.58	353.69876	386.06607
1.00	353.44592	386.53946	369.99268	33.09354	369.79764	33.05211	-14.08	353.44592	386.53946
2.00	352.97479	387.22382	370.09891	34.24823	369.81342	34.28435	-16.51	352.97479	387.22382
3.00	352.68510	387.69431	370.14972	35.00920	369.93341	34.43936	-17.20	352.68510	387.69431
4.00	352.32089	388.09543	370.20816	35.77454	369.93112	34.88945	-18.79	352.32089	388.09543
5.00	352.05579	388.48743	370.27161	36.43164	369.93616	35.12259	-20.58	352.05579	388.48743
6.00	351.82783	388.81998	370.32349	36.99295	369.99847	35.24021	-21.56	351.82783	388.81998
10.00	351.14059	389.72519	370.43289	38.58459	369.99609	35.54321	-26.47	351.14059	389.72519
20.00	349.92432	391.21164	370.56799	41.28732	370.00003	35.67198	-37.48	349.92432	391.21164
30.00	348.92001	392.20972	370.56488	43.28970	370.00003	35.68138	-46.94	348.92001	392.20972
40.00	348.25568	392.76431	370.51001	44.50864	370.00797	35.68154	-47.83	348.25568	392.76431

BAND(MHZ)	356.700	383.700
LMIN(DB)	-0.31	
LMAX(DB)	0.27	
LBEL(DB)	0.58	
PMIN(DEG)	-1936.00	
PMAX(DEG)	1926.99	
PBEL(DEG)	3863.07	

: 1CR8B01A.DAT Passband Symmetry = 0.1 dB

FILE=1ERBB01A.DAT 13:57:37 05-28-1998
PN 100828_823 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N WIDE_S21
06-23-1997 HP8753,SSREF,SSREF
FREQUENCY(MHZ): CENTER= 500.5 WIDTH= 999 INCR.= .200125 SYSTEM BANDWIDTH= 999
REFERENCES: LOSS(DB)= 29.54311 PHASE(DEG)= 1848.559 DELAY(US)= 5.239233E-02 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 15.78511 PHASE(DEG)= 4267.842
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 99.9 MHZ/DIV



PEAK: LEVEL(DB)= 28.09969 FREQ(MHZ)= 356.3325 DELAY(US)=-.38148 SIDELOBE(DB)=-41.79472
ENERGY: LEVEL(DB)= 29.68258 CENTER(MHZ)= 322.5812 WIDTH(MHZ)= 73.87124 SKEW(MHZ)= 12.31584

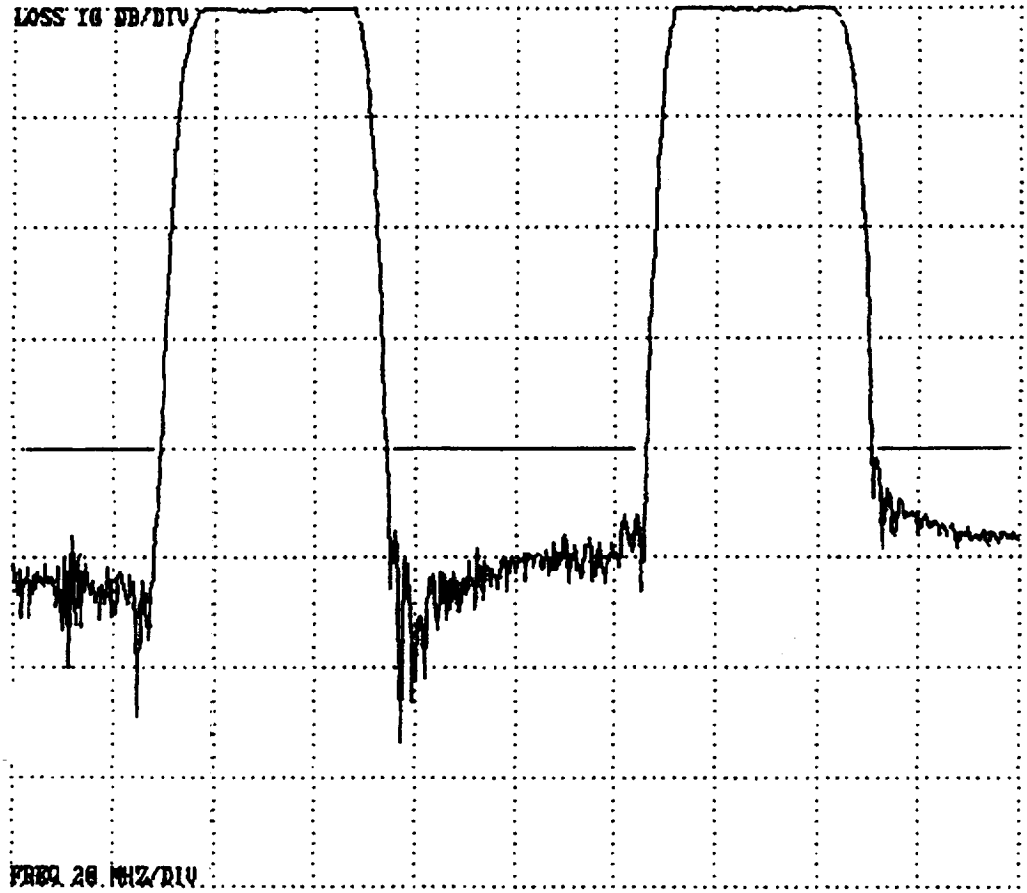
L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.64	356.33252	356.33252	356.33252	0.00000	356.33252	0.00000	0.00	356.33252	356.33252
0.50	353.69864	386.05667	369.87766	32.35803	369.71176	32.67136	-14.05	258.67365	386.05667
1.00	353.45114	386.53308	369.99213	33.08194	369.80225	33.19586	-14.10	258.85710	386.53308
2.00	352.97018	387.21625	370.09320	34.24606	369.87881	33.94183	-14.18	257.28452	387.21625
3.00	352.68983	387.69394	370.15189	35.00411	369.88324	34.42915	-14.24	256.70881	387.69394
4.00	352.31644	388.08530	370.20087	35.76886	369.93558	34.72335	-14.27	256.26788	388.08530
5.00	352.05847	388.47852	370.26049	36.42004	369.93915	35.02882	-14.30	255.92581	388.47852
6.00	351.82990	388.81500	370.32245	36.98511	369.97360	35.28420	-14.32	255.63283	388.81500
10.00	351.13516	389.72714	370.43115	38.59198	369.99686	35.45383	-14.35	254.75798	389.72714
20.00	349.92639	391.28752	370.56696	41.28113	370.00488	35.57143	-14.35	253.30463	391.28752
30.00	348.92163	392.21204	370.56683	43.29041	370.00568	35.58864	-14.34	252.38383	392.21204
40.00	348.26822	392.74753	370.50388	44.48730	370.00571	35.58116	-14.34	251.51762	392.74753

BAND(MHZ)	1.000	225.000	420.000	1000.000
LMIN(DB)	49.49	-0.64	42.05	
LMAX(DB)	93.58	64.76	48.87	
LDEL(DB)	44.09	65.40	6.80	
PMIN(DEG)	3706.72	-3851.27	-3339.10	
PMAX(DEG)	7318.21	7751.52	7495.02	
PDEL(DEG)	3611.49	11602.79	10834.12	

FILE: 1ERBB01A.DAT Out-of-band Rejection: PEAK= 42.1 dB WIDTH= 0.000 MHz

PHONON CORPORATION

FILE=1FR8801A.DAT 11:52:08 05-28-1998
PN_100828_823 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SIX
23-1997 HP8753,SSREF,SSREF,SSREF,SSREF
JUENCY(MHZ): CENTER= 322.2 WIDTH= 200 INCR.= .4 SYSTEM BANDWIDTH= 200
FERENCES: LOSS(DB)= 29.54311 PHASE(DEG)= 77.57081 DELAY(US)= .2250519 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 24.07656 PHASE(DEG)= 944.0335
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 20 MHZ/DIV



PEAK: LEVEL(DB)= 28.92852 FREQ(MHZ)= 356.2629 DELAY(US)= 4.648593E-02 SIDELOBE(DB)=-41.66381
ENERGY: LEVEL(DB)= 29.68213 CENTER(MHZ)= 322.4483 WIDTH(MHZ)= 73.82485 SKEW(MHZ)=-.4518743

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.61	356.26291	356.26291	356.26291	0.00000	356.26291	0.00000	0.00	356.26291	356.26291
0.50	353.70587	386.03265	369.86926	32.32678	369.62225	32.59635	-6.44	258.68939	386.03265
1.00	353.45303	386.52798	369.99051	33.07495	369.79764	32.94513	-6.46	258.85997	386.52798
2.00	352.98659	387.21402	370.09729	34.23343	369.81342	34.09363	-6.57	257.28543	387.21402
3.00	352.68965	387.68829	370.14899	35.07864	369.93341	34.32788	-6.57	256.70038	387.68829
4.00	352.32489	388.08990	370.20740	35.76501	369.93115	34.71572	-6.60	256.27518	388.08990
5.00	352.05923	388.48215	370.27069	36.42291	369.93619	35.00890	-6.62	255.92513	388.48215
6.00	351.83002	388.81570	370.32286	36.98569	369.99047	35.12614	-6.62	255.63321	388.81570
10.00	351.14270	389.72250	370.43262	38.57980	369.99612	35.42817	-6.61	254.76564	389.72250
20.00	349.92587	391.20972	370.56781	41.28384	370.00003	35.55644	-6.56	253.31297	391.20972
30.00	348.92120	392.20892	370.56506	43.28772	370.00003	35.56582	-6.58	252.38858	392.20892
40.00	348.25635	392.76358	370.50995	44.50723	370.00000	35.56685	-6.47	251.52789	392.76358

BAND(MHZ)	260.700	287.700	356.700	383.700
LMIN(DB)	-0.47	-0.61	-0.29	
LMAX(DB)	0.25	66.81	0.28	
LBEL(DB)	0.72	67.43	0.58	
PMIN(DEG)	-1076.84	-1959.11	-496.19	
PMAX(DEG)	794.65	1884.45	1227.99	
PBEL(DEG)	1870.68	3843.56	1724.18	

1FR8801A.DAT Out-of-band Rejection: PEAK= 42.7 dB WIDTH= 0.000 MHz

PHONON CORPORATION
FILE: 1FR8801A.DAT (+SSCF)
PN_100828_823 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSREF,SSREF,SSREF,SSREF,SSCF
REFERENCES: LOSS(DB)= 29.54311 PHASE(DEG)= 77.57081
DELAY(US)= .2258519 SLOPE(US/MHZ)= 0

BANDPASS CHARACTERISTICS MEASUREMENT

FREQUENCY(MHZ)	LOSS(DB)	PHASE(DEG)
240.600	52.54	701.17
248.760	56.14	1335.77
256.920	2.62	1876.09
265.080	-0.02	586.67
273.240	0.07	-74.62
281.400	0.04	-654.05
289.560	-0.02	-1225.27
297.720	49.82	-1907.21
305.880	51.86	-1372.44
314.040	53.97	-711.24
322.200	51.24	-77.57
330.360	49.97	568.76
338.520	49.80	1240.47
346.680	46.39	1874.84
354.840	-0.48	1366.77
363.000	0.21	839.88
371.160	-0.06	304.90
379.320	-0.07	-226.58
387.480	2.49	-750.93
395.640	44.63	-1043.74
403.800	46.53	-485.56

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-1 PHONON PART: 100823 SERIAL: 001
TESTED BY: PORCH TITLE: MGR DATE: 6/24/97 TIME: 10:00 AM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A07382 CAL DUE: 10/12/97
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/8/97

PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	35.6	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 273.335/275.865 MHz	273.687	MHz	P
		HI: 369.335/371.865 MHz	369.569	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 34/36 MHz	34.755	MHz	P
		HI: 34/36 MHz	35.832	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.2	dB	P
		HI: /0.5 dB	0.1	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		268.7-287.7 MHz: /1.0 dB	0.6	dB	P
		356.7-383.7 MHz: /1.0 dB	0.6	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	29.7	dB	P
		HI: 27.8/30.2 dB	29.6	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.2	dB	P
		HI: -0.4/0.4 dB	-0.0	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.1	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			

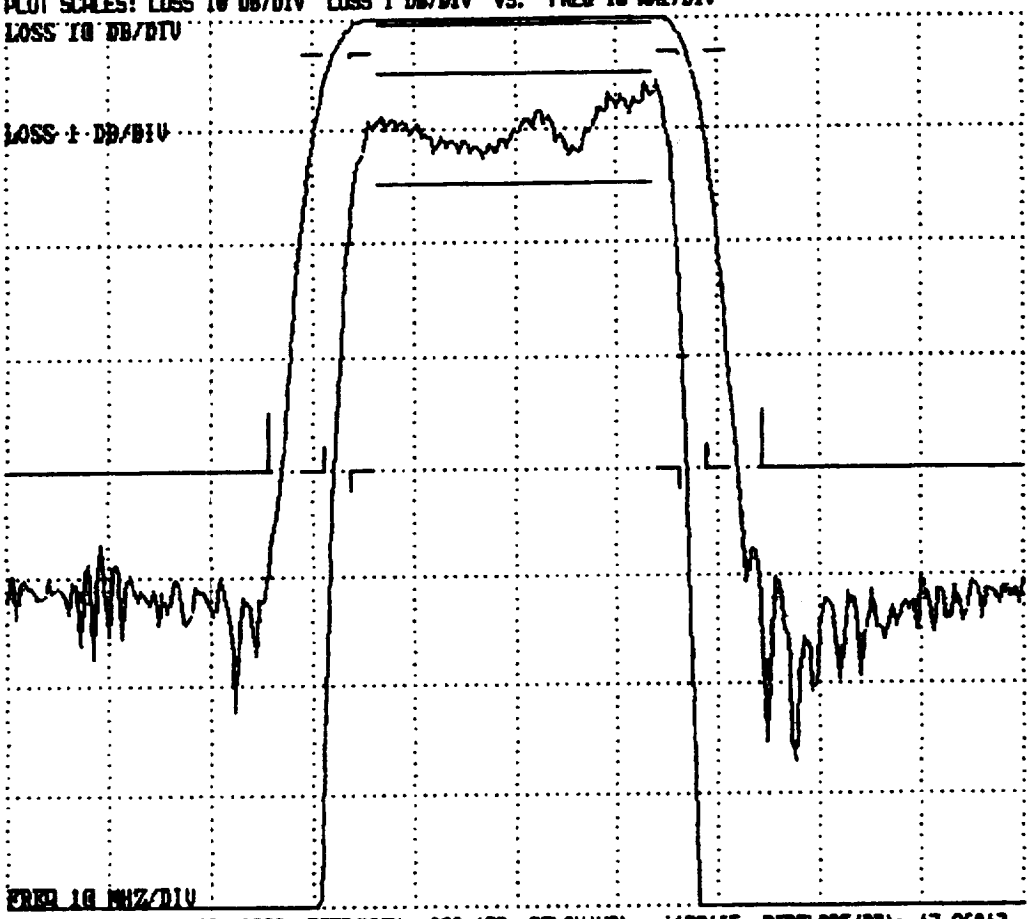
BAND	PEAK(dB)	WIDTH(MHz)
WIDE: 1-225,420-1000 MHz:	41.7	0.000
DUAL: 225.000-249.935, 298.465-345.935, 394.465-420.00 MHz:	44.1	0.000

PEAK: 35.0/ dB	41.7	dB		P
WIDTH: /7.2 MHz			0.000 MHz	P
3.2.1.12 5.2.11 SHAPE FACTOR				
LO: /1.30 Unitless		1.29	Unitless	P
HI: /1.30 Unitless		1.27	Unitless	P
3.2.1.14 5.2.12 VSWR (RETURN LOSS)				
268.7-287.7,356.7-383.7 MHz				
DUAL S11: 7.5/ dB		7.5	dB	P
DUAL S22: 7.5/ dB		9.6	dB	P
4.8.2 5.2.14 LIMITED FUNCTIONAL TESTS				P
CENTER FREQUENCY: -0.2/0.2 MHz		0	MHz	P
3 dB BANDWIDTH: -0.72/0.72 MHz		0	MHz	P
INSERTION LOSS: -0.5/0.5 dB		0	dB	P
NONE 5.2.15 DATA SHEET SUMMARY (PASS/FAIL)		P		(P)

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-0618

PHONON CORPORATION
FILE=1AN8B01A.DAT 11:52:15 05-28-1998
PN_100828_823 FINAL_FUNCTIONAL TEMP:H PROTOFLIGHT /N DUAL_SIX
06-23-1997 MP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 274.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27
REFERENCES: LOSS(DB)= 29.68584 PHASE(DEG)= 3756.221 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1689383 PHASE(DEG)= 1177.843
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



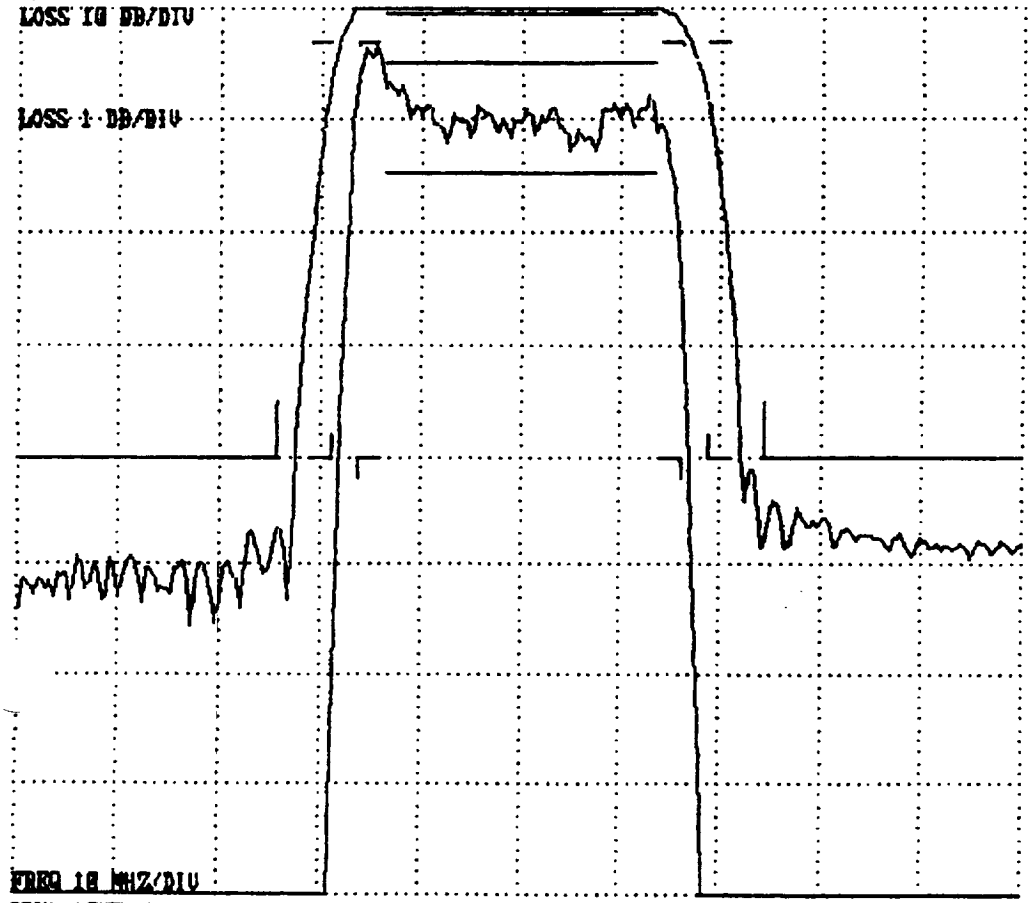
PEAK: LEVEL(DB)= 29.26966 FREQ(MHZ)= 288.159 DELAY(US)=-.4199465 SIDELOBE(DB)=-47.26843
ENERGY: LEVEL(DB)= 29.8592 CENTER(MHZ)= 273.8792 WIDTH(MHZ)= 36.36391 SKEW(MHZ)=-.3276848

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.42	288.15897	288.15897	288.15897	0.00000	288.15897	0.00000	0.00	288.15897	288.15897
0.50	258.31223	289.67938	273.99579	31.36716	274.16561	31.24885	-12.72	258.31223	289.67938
1.00	257.67862	290.04486	273.86176	32.36624	274.01370	32.26871	-14.06	257.67862	290.04486
2.00	256.89392	290.65775	273.77582	33.76382	274.00616	33.39431	-16.34	256.89392	290.65775
3.00	256.30994	291.06464	273.68729	34.75470	273.99586	33.82830	-17.71	256.30994	291.06464
4.00	255.88515	291.40274	273.64395	35.51759	273.97711	34.17842	-19.30	255.88515	291.40274
5.00	255.53421	291.69577	273.61499	36.16156	273.89679	34.33812	-20.22	255.53421	291.69577
6.00	255.24222	291.93625	273.58923	36.69403	273.89542	34.55976	-22.23	255.24222	291.93625
10.00	254.37387	292.72818	273.55183	38.35431	273.88837	34.81885	-27.03	254.37387	292.72818
20.00	252.92145	294.07861	273.50003	41.15717	273.87888	34.93242	-38.43	252.92145	294.07861
30.00	251.99628	295.06036	273.52832	43.06409	273.87924	34.93998	-47.84	251.99628	295.06036
40.00	251.16469	296.05444	273.60956	44.88976	273.87921	34.94051	-51.26	251.16469	296.05444

BAND(MHZ) 268.700 287.700
LMIN(DB) -0.41
LMAX(DB) 0.25
LDEL(DB) 0.67
PMIN(DEG) -2006.45
PMAX(DEG) 2009.20
PDEL(DEG) 4015.66
File: 1AN8B01A.DAT Passband Symmetry = 0.2 dB

PHONON CORPORATION

FILE=1CH8801A.DAT 11:52:18 05-28-1998
100828_823 FINAL_FUNCTIONAL TEMP:H PROTOFLIGHT /N DUAL_SIX
../23-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 370.2 WIDTH= 100 INCR.= .4 SYSTEM BANDWIDTH= 27
REFERENCES: LOSS(DB)= 29.55832 PHASE(DEG)=-3526.649 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1384345 PHASE(DEG)= 1133.931
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 10 MHZ/DIV



PEAK: LEVEL(DB)= 28.87544 FREQ(MHZ)= 355.7528 DELAY(US)=-.4048581 SIDELOBE(DB)=-41.8984
ENERGY: LEVEL(DB)= 29.66413 CENTER(MHZ)= 369.3611 WIDTH(MHZ)= 36.56918 SKEW(MHZ)= .3615043

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.67	355.75284	355.75284	355.75284	0.00000	355.75284	0.00000	0.00	355.75284	355.75284
0.50	353.13931	385.29868	369.21500	32.15137	368.95923	32.34863	-13.18	353.13931	385.29868
1.00	352.87076	385.89523	369.38300	33.02448	369.13733	33.35743	-14.73	352.87076	385.89523
2.00	352.40613	386.59555	369.50085	34.18942	369.14590	33.92386	-15.91	352.40613	386.59555
3.00	352.05298	387.08469	369.56885	35.03171	369.27286	34.61012	-18.18	352.05298	387.08469
4.00	351.75852	387.48132	369.61591	35.73080	369.27563	34.94299	-19.78	351.75852	387.48132
5.00	351.49542	387.87198	369.68372	36.37656	369.34546	35.07524	-20.68	351.49542	387.87198
6.00	351.27237	388.21561	369.74399	36.94324	369.34131	35.29190	-22.82	351.27237	388.21561
10.00	350.58270	389.13318	369.85794	38.55048	369.34766	35.52617	-28.04	350.58270	389.13318
20.00	349.37244	390.62000	369.99622	41.24756	369.36857	35.61662	-39.48	349.37244	390.62000
30.00	348.38397	391.63919	370.01160	43.25522	369.36084	35.62192	-46.22	348.38397	391.63919
40.00	347.70895	392.18845	369.94870	44.47949	369.36081	35.62245	-48.25	347.70895	392.18845

BAND(MHZ)	356.700	383.700
LMIN(DB)	-0.33	
LMAX(DB)	0.29	
LBEL(DB)	0.62	
PMIN(DEG)	-1939.27	
Y(DEG)	1931.24	
.(DEG)	3870.51	

..e: 1CH8801A.DAT Passband Symmetry = 0.1 dB

Channel 12 Bandpass Filter

SAW Filter (S/N: 1331576-2, S/N: B01)

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-2 PHONON PART: 100824 SERIAL: 001
TESTED BY: PORGA TITLE: MGR DATE: 6/24/97 TIME: 10:00 AM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A07982 CAL DUE: 10/12/97
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/8/97

PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	-4.7	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 299.335/301.065 MHz	300.449	MHz	P
		HI: 343.335/345.065 MHz	344.329	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 15/16 MHz	15.436	MHz	P
		HI: 15/16 MHz	15.480	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.1	dB	P
		HI: /0.5 dB	0.1	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		294.2-306.2 MHz: /1.0 dB	0.4	dB	P
		338.2-350.2 MHz: /1.0 dB	0.4	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	29.4	dB	P
		HI: 27.8/30.2 dB	29.7	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	-0.1	dB	P
		HI: -0.4/0.4 dB	0.1	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.3	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-286,359-1000 MHz:	39.8	0.018	
		DUAL: 286.000-288.935, 311.465-332.935, 355.465-359.00 MHz:	42.9	0.000	
		PEAK: 35.0/ dB	39.8 dB		P
		WIDTH: /3.2 MHz		0.018 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.28	Unitless	P
		HI: /1.30 Unitless	1.30	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		294.2-306.2,338.2-350.2 MHz			
		DUAL S11: 7.5/ dB	8.9	dB	P
		DUAL S22: 7.5/ dB	8.6	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.2/0.2 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.32/0.32 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P DP		

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION

FILE=2AC8B01A.DAT 15:37:45 06-23-1997

PN_100830_824 FINAL_FUNCTIONAL TEMP:C PROTOFLIGHT /N DUAL_SXX

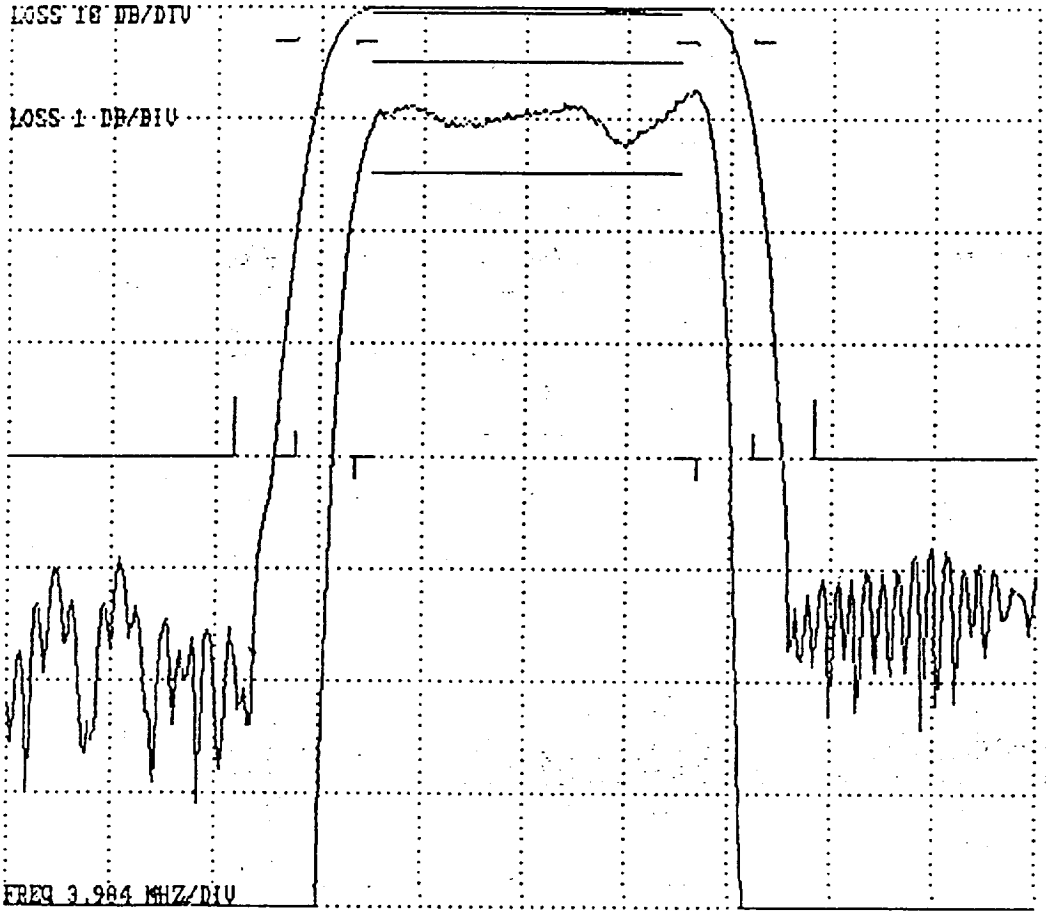
06-23-1997 HP8753,SSCF,SSFFIX,SSREF

FREQUENCY(MHZ): CENTER= 300.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12

REFERENCES: LOSS(DB)= 29.4215 PHASE(DEG)= 5401.561 DELAY(US)= 0 SLOPE(US/MHZ)= 0

RMS ERRORS: LOSS(DB)= 9.114293E-02 PHASE(DEG)= 1736.308

PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV



PEAK: LEVEL(DB)= 29.15234 FREQ(MHZ)= 306.7387 DELAY(US)=-1.378225 SIDELOBE(DB)=-48.24611

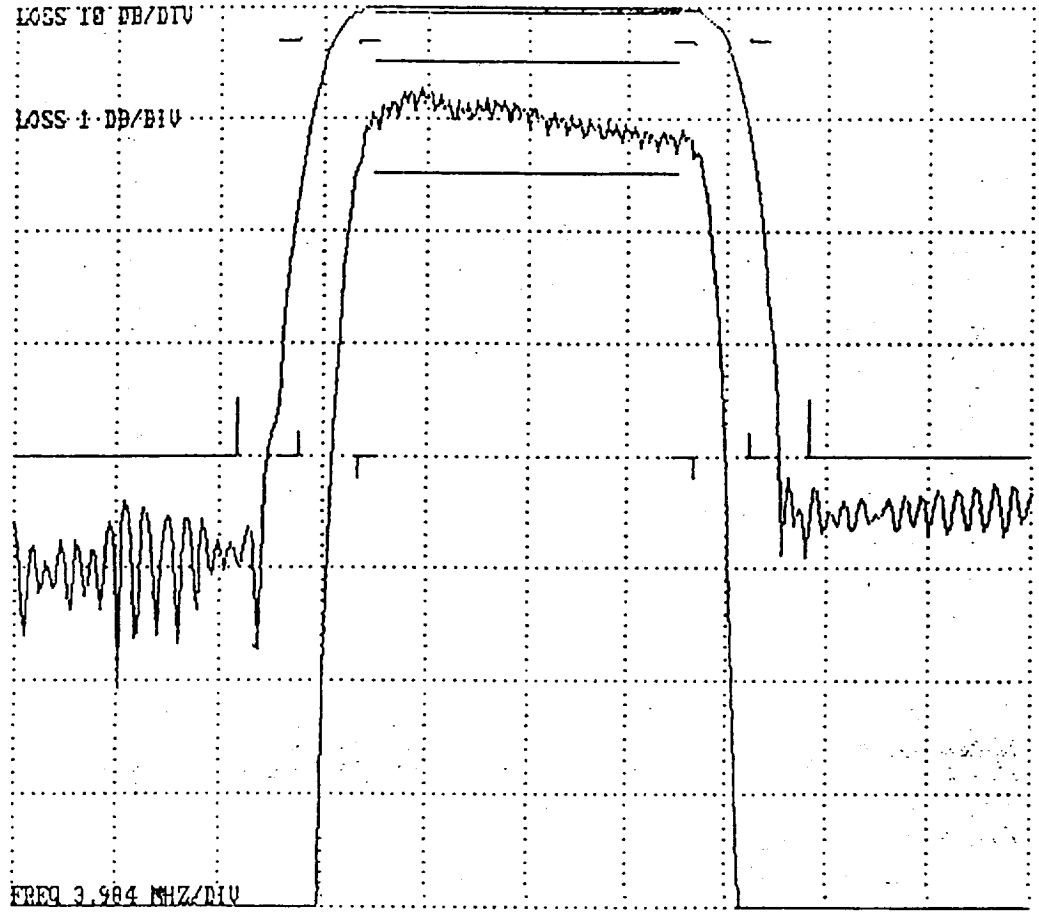
ENERGY: LEVEL(DB)= 29.59846 CENTER(MHZ)= 300.4727 WIDTH(MHZ)= 16.1445 SKEW(MHZ)=-1.292435E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.27	306.73868	306.73868	306.73868	0.00000	306.73868	0.00000	0.00	306.73868	306.73868
0.50	293.59897	307.53558	300.56726	13.93661	300.57224	14.02696	-12.47	293.59897	307.53558
1.00	293.27795	307.71842	300.49420	14.43246	300.52118	14.32786	-13.38	293.27795	307.71842
2.00	292.93640	307.96658	300.45148	15.03018	300.47717	14.76325	-15.29	292.93640	307.96658
3.00	292.73138	308.16708	300.44922	15.43570	300.47803	15.03417	-17.21	292.73138	308.16708
4.00	292.56427	308.31799	300.44113	15.75372	300.47624	15.14179	-18.30	292.56427	308.31799
5.00	292.42438	308.44891	300.43665	16.02454	300.47000	15.23099	-19.49	292.42438	308.44891
6.00	292.29888	308.56218	300.43045	16.26331	300.47748	15.30314	-20.81	292.29888	308.56218
10.00	291.92276	308.93188	300.42731	17.00912	300.47528	15.43575	-25.54	291.92276	308.93188
20.00	291.30795	309.52463	300.41629	18.21667	300.47238	15.49629	-37.79	291.30795	309.52463
30.00	290.84385	309.98573	300.37781	19.05588	300.47269	15.49942	-46.33	290.84385	309.98573
40.00	290.44342	310.22372	300.33356	19.78030	300.47266	15.49981	-53.10	290.44342	310.22372

BAND(MHZ)	294.200	306.200
LMIN(DB)	-0.17	
LMAX(DB)	0.25	
LDEL(DB)	0.42	
PMIN(DEG)	-2975.99	
PMAX(DEG)	2980.49	
PDEL(DEG)	5956.48	

File: 2AC8B01A.DAT Passband Symmetry = 0.1 dB

PHONON CORPORATION
FILE=2CC8B01A.DAT 15:38:33 06-23-1997
PN_100830_824 FINAL_FUNCTIONAL TEMP:C PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 344.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12
REFERENCES: LOSS(DB)= 29.71766 PHASE(DEG)=-5634.118 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1311423 PHASE(DEG)= 1713.754
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV



PEAK: LEVEL(DB)= 29.44712 FREQ(MHZ)= 339.9867 DELAY(US)=-1.378759 SIDELOBE(DB)=-42.30323
ENERGY: LEVEL(DB)= 29.93619 CENTER(MHZ)= 344.2584 WIDTH(MHZ)= 16.24665 SKEW(MHZ)= .1569817

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.27	339.98669	339.98669	339.98669	0.00000	339.98669	0.00000	0.00	339.98669	339.98669
0.50	337.38386	351.15134	344.26721	13.76828	344.17712	13.61221	-11.54	337.38386	351.15134
1.00	337.14566	351.46109	344.30339	14.31543	344.23267	14.12671	-12.88	337.14566	351.46109
2.00	336.83749	351.83725	344.33737	14.99976	344.23450	14.64639	-14.93	336.83749	351.83725
3.00	336.58932	352.06949	344.32341	15.48016	344.23749	14.91914	-16.64	336.58932	352.06949
4.00	336.40839	352.23688	344.32263	15.82849	344.23877	15.03039	-17.61	336.40839	352.23688
5.00	336.26553	352.39838	344.33197	16.13284	344.24242	15.20487	-19.89	336.26553	352.39838
6.00	336.14999	352.54013	344.34506	16.39014	344.24225	15.26926	-21.17	336.14999	352.54013
10.00	335.74673	352.92813	344.33743	17.18140	344.24677	15.38877	-25.75	335.74673	352.92813
20.00	335.12354	353.57065	344.34711	18.44711	344.25867	15.44525	-37.17	335.12354	353.57065
33.00	334.68948	354.05893	344.37421	19.36945	344.25824	15.44869	-44.79	334.68948	354.05893
40.00	334.08075	354.26572	344.17322	20.18497	344.25818	15.44898	-46.18	334.08075	354.26572

BAND(MHZ)	338.200	350.200
LMIN(DB)	-0.27	
LMAX(DB)	0.30	
LDEL(DB)	0.57	
PMIN(DEG)	-2936.34	
PMAX(DEG)	2940.95	
PDEL(DEG)	5877.29	

File: 2CC8B01A.DAT Passband Symmetry = 0.1 dB

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-2 PHONON PART: 100824, SERIAL: B01
TESTED BY: PORCA TITLE: MGR DATE: 6/24/97 TIME: 10:00 AM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3419A07982 CAL DUE: 10/12/97
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/8/97

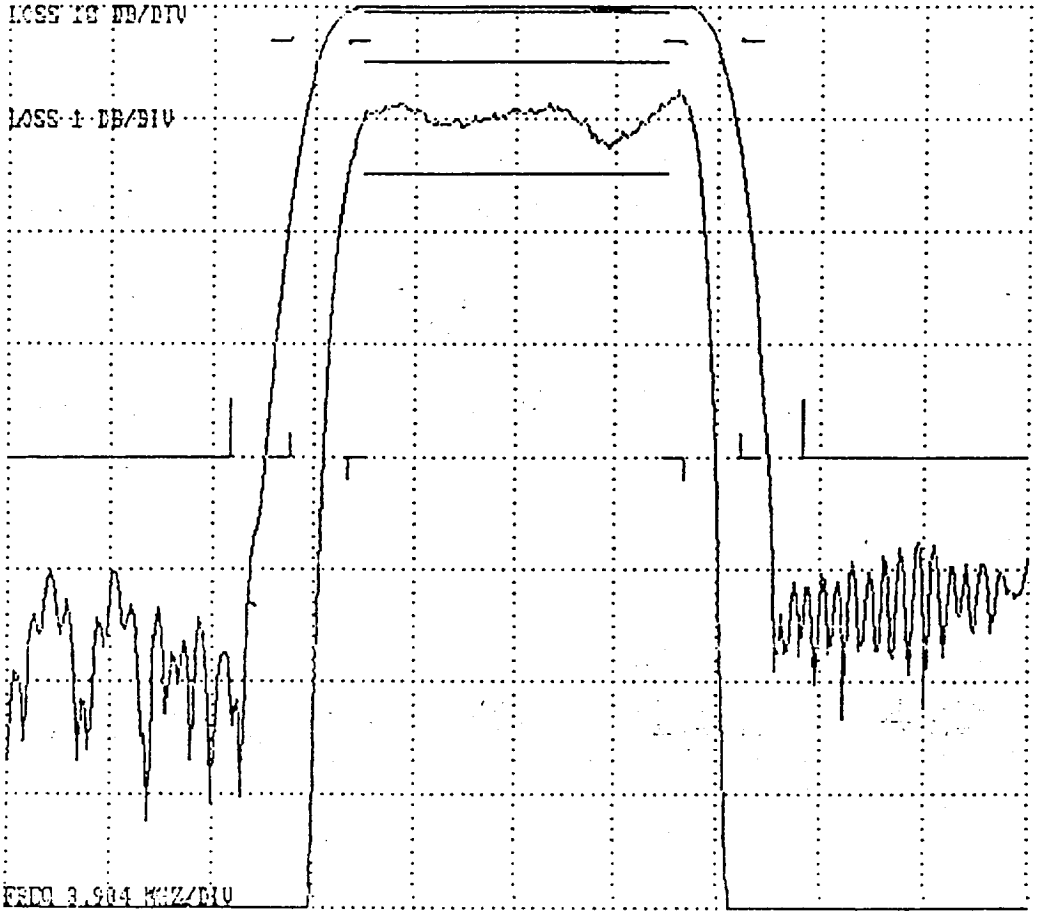
PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	15.8	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 299.335/301.065 MHz	300.330	MHz	P
		HI: 343.335/345.065 MHz	344.204	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 15/16 MHz	15.429	MHz	P
		HI: 15/16 MHz	15.469	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.1	dB	P
		HI: /0.5 dB	0.1	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		294.2-306.2 MHz: /1.0 dB	0.4	dB	P
		338.2-350.2 MHz: /1.0 dB	0.4	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	29.6	dB	P
		HI: 27.8/30.2 dB	29.6	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.0	dB	P
		HI: -0.4/0.4 dB	0.0	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.1	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-286,359-1000 MHz:	40.1	0.000	
		DUAL: 286.000-288.935, 311.465-332.935, 355.465-359.00 MHz:	43.1	0.000	
		PEAK: 35.0/ dB	40.1 dB		P
		WIDTH: /3.2 MHz		0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.28	Unitless	P
		HI: /1.30 Unitless	1.31	Unitless	F ✓
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		294.2-306.2,338.2-350.2 MHz			
		DUAL S11: 7.5/ dB	8.7	dB	P
		DUAL S22: 7.5/ dB	8.6	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.2/0.2 MHz	-0.005	MHz	? (DP)
		3 dB BANDWIDTH: -0.32/0.32 MHz	-0.004	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	F (DP)		

U-A-I PER SDAR (970201) 97-034 (C)

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION
FILE=2AR8B01A.DAT 15:50:56 06-23-1997
PN_100833_824 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 300.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12
REFERENCES: LOSS(DB)= 29.55832 PHASE(DEG)= 4992.366 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 9.354083E-02 PHASE(DEG)= 1737.079
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV



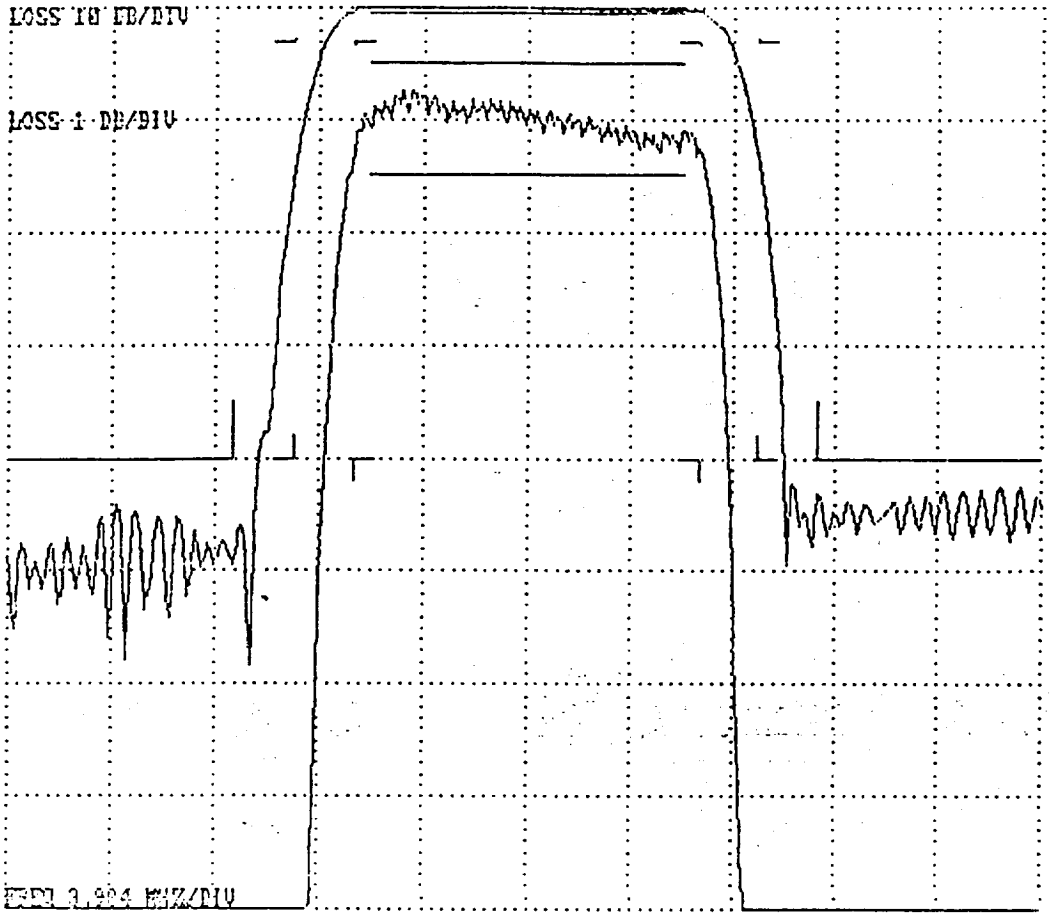
PEAK: LEVEL(DB)= 29.38934 FREQ(MHZ)= 306.612 DELAY(US)=-1.379663 SIDELOBE(DB)=-47.85617
ENERGY: LEVEL(DB)= 29.73903 CENTER(MHZ)= 300.3415 WIDTH(MHZ)= 16.13654 SKEW(MHZ)= 7.358888E-03

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.25	306.61283	306.61283	306.61283	0.00000	306.61283	0.00000	0.00	306.61283	306.61283
0.50	293.47699	307.48494	300.48096	13.92795	302.42978	14.81482	-12.50	293.47699	307.48494
1.00	293.16241	307.58366	300.37152	14.41824	302.28658	14.31412	-13.41	293.16241	307.58366
2.00	292.82474	307.84239	300.33356	15.01764	302.34454	14.74786	-15.33	292.82474	307.84239
3.00	292.61517	308.04446	300.32983	15.42929	302.34583	15.01770	-17.26	292.61517	308.04446
4.00	292.45035	308.19373	300.32222	15.74338	302.34616	15.12464	-18.35	292.45035	308.19373
5.00	292.31171	308.32465	300.31818	16.01294	302.34607	15.21301	-19.55	292.31171	308.32465
6.00	292.18546	308.43611	300.31177	16.25066	302.34570	15.28441	-20.85	292.18546	308.43611
10.00	291.80917	308.80884	300.30922	16.99966	302.34384	15.41554	-25.61	291.80917	308.80884
20.00	291.19211	309.48512	300.29661	18.21381	302.34119	15.47511	-37.86	291.19211	309.48512
30.00	290.73025	309.76104	300.25954	19.04279	302.34143	15.47018	-46.28	290.73025	309.76104
40.00	290.31467	310.12796	300.22131	19.81329	302.34146	15.47857	-52.78	290.31467	310.12796

BAND(MHZ)	294.200	306.200
LMIN(DB)	-0.17	
LMAX(DB)	0.25	
LDEL(DB)	0.42	
PMIN(DEG)	-2977.23	
PMAX(DEG)	2961.65	
PDEL(DEG)	5938.12	

File: 2AR8B01A.DAT Passband Symmetry = 0.1 dB

PHONON CORPORATION
FILE=2CR8R01A.DAT 15:51:51 06-23-1997
PN_103838_824 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 344.2 WIDTH= 39.64 INCR.= .12 SYSTEM BANDWIDTH= 12
REFERENCES: LOSS(DB)= 23.6303 PHASE(DEG)=-4970.631 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1223927 PHASE(DEG)= 1714.589
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.964 MHZ/DIV



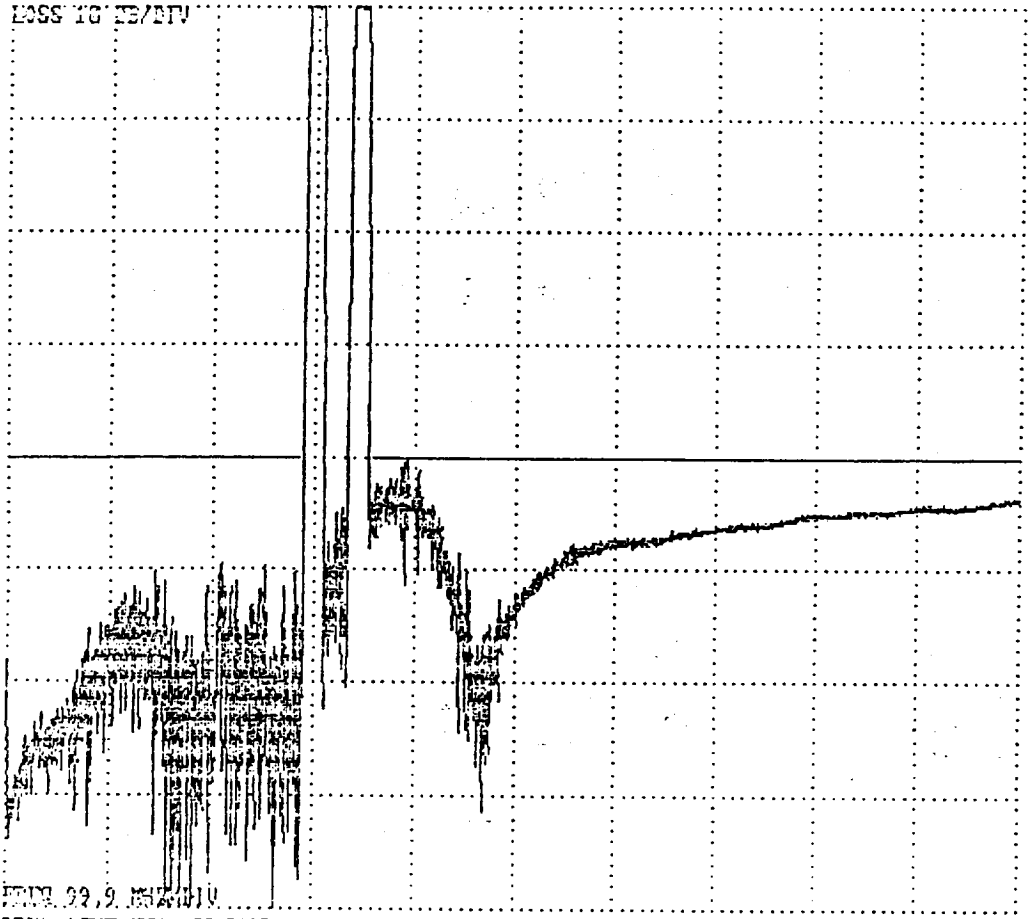
PEAK: LEVEL(DB)= 29.36111 FREQ(MHZ)= 339.8394 DELAY(US)=-1.367148 SIDELOBE(DB)=-42.58253
ENERGY: LEVEL(DB)= 29.84749 CENTER(MHZ)= 344.1272 WIDTH(MHZ)= 16.23951 SKEW(MHZ)= .1545455

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LCX(MHZ)	HIX(MHZ)
-0.27	339.83942	339.83942	339.83942	0.00000	339.83942	0.00000	0.00	339.83942	339.83942
0.50	337.36111	351.03169	344.19641	13.67056	344.11145	13.58933	-11.32	337.36111	351.03169
1.00	337.03918	351.33178	344.18548	14.29251	344.11398	14.18331	-12.93	337.03918	351.33178
2.00	336.71603	351.71146	344.21375	14.99542	344.11575	14.84943	-14.95	336.71603	351.71146
3.00	336.46978	351.93875	344.20422	15.46896	344.11847	14.92855	-16.67	336.46978	351.93875
4.00	336.28769	352.10520	344.19696	15.81851	344.11920	15.03167	-17.64	336.28769	352.10520
5.00	336.14130	352.27209	344.20670	16.13080	344.12012	15.20484	-19.92	336.14130	352.27209
6.00	336.02435	352.41040	344.21738	16.38605	344.12152	15.26916	-21.22	336.02435	352.41040
10.00	335.62207	352.79425	344.20816	17.17218	344.12476	15.38723	-25.79	335.62207	352.79425
20.00	334.99844	353.43326	344.21555	18.43481	344.12666	15.44201	-36.04	334.99844	353.43326
30.00	334.55435	353.92563	344.23999	19.37128	344.12704	15.44647	-44.65	334.55435	353.92563
40.00	333.91367	354.12003	344.01685	20.20635	344.12693	15.44697	-45.94	333.91367	354.12003

BAND(MHZ)	338.200	350.200
LMIN(DB)	-0.26	
LMAX(DB)	0.28	
LDEL(DB)	0.54	
PMIN(DEG)	-2733.11	
PMAX(DEG)	2943.11	
PDEL(DEG)	5676.54	

File: 2CR8R01A.DAT Passband Symmetry = 0.1 dB

PHONON CORPORATION
FILE=2ER6B01A.DAT 15:52:43 06-23-1997
PN_100830_624 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N WIDE_S21
06-23-1997 HP8753,SSREF,SSREF
FREQUENCY(MHZ): CENTER= 500.5 WIDTH= 999 INCR.= .238125 SYSTEM BANDWIDTH= 999
REFERENCES: LOSS(DB)= 29.59431 PHASE(DEG)= 2782.118 DELAY(US)= .1414662 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 12.2367 PHASE(DEG)= 12191.33
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 99.9 MHZ/DIV



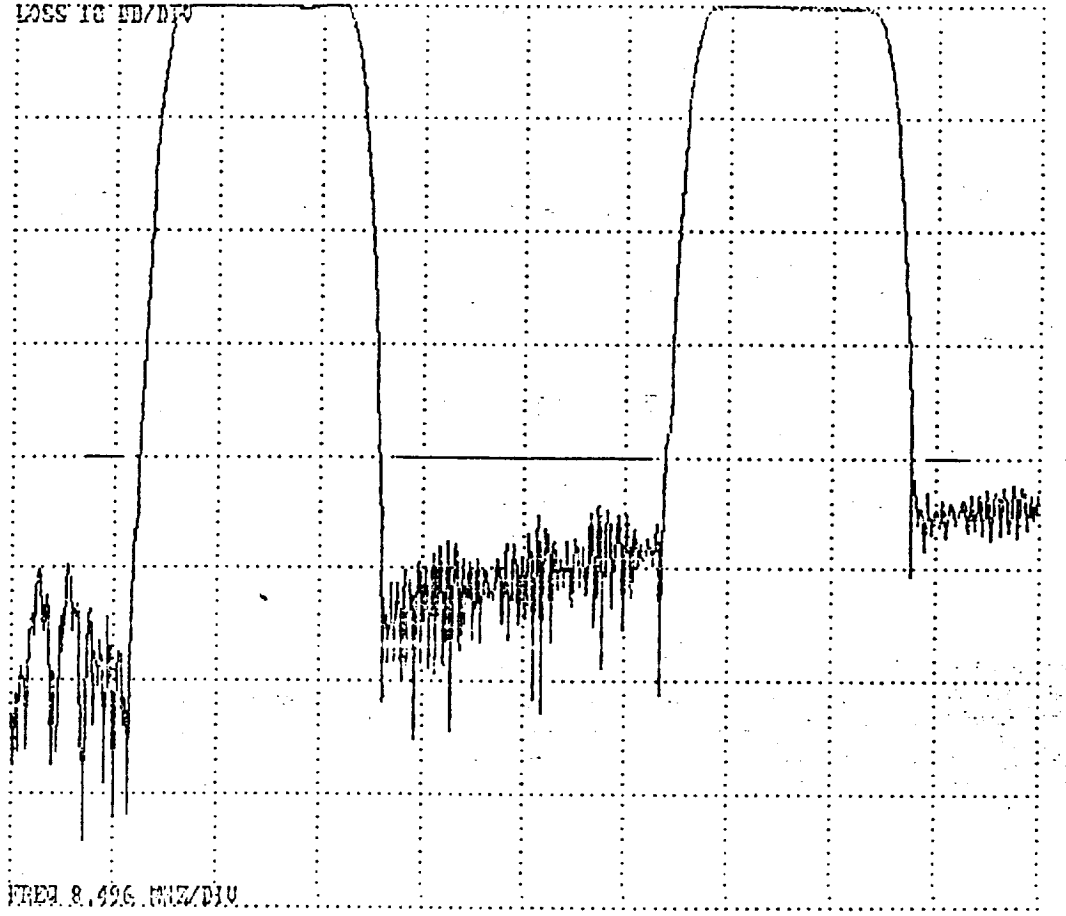
PEAK: LEVEL(DB)= 29.31631 FREQ(MHZ)= 339.845 DELAY(US)=-1.876621 SIDELOBE(DB)=-48.34791
ENERGY: LEVEL(DB)= 29.79297 CENTER(MHZ)= 322.2325 WIDTH(MHZ)= 32.40118 SKEW(MHZ)= 92.1697

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.28	339.84581	339.84581	339.84581	0.00000	339.84581	0.00000	0.00	339.84581	339.84581
0.50	337.35971	351.00311	344.18140	13.64340	344.18369	13.37683	-17.49	293.47250	351.00311
1.00	337.93049	351.32611	344.17828	14.29562	344.11243	14.00334	-17.66	293.15131	351.32611
2.00	336.73175	351.70532	344.21054	14.97357	344.18112	14.52269	-17.77	292.68972	351.70532
3.00	336.47386	351.92853	344.20128	15.45465	344.11752	14.86719	-17.85	292.61157	351.92853
4.00	336.69550	352.09735	344.19641	15.80185	344.11752	14.86719	-17.86	292.44571	352.09735
5.00	336.14719	352.26944	344.20831	16.12225	344.11816	15.03118	-17.91	292.38508	352.26944
6.00	336.02878	352.40741	344.21808	16.37863	344.12833	15.15104	-17.94	292.18297	352.40741
10.00	335.62561	352.79368	344.20813	17.16507	344.12402	15.27768	-17.97	291.80945	352.79368
20.00	335.93113	353.42972	344.21542	18.42859	344.12616	15.32250	-17.98	291.19333	353.42972
30.00	334.55716	353.93288	344.24588	19.37564	344.12619	15.32534	-17.97	290.73558	353.93288
40.00	333.91326	354.18883	344.01093	20.19577	344.12622	15.32561	-17.97	290.31368	354.18883

BAND(MHZ)	1.000	286.000	359.000	1000.000
LMIN(DB)	49.43	-0.26	40.07	
LMAX(DB)	87.79	77.49	71.33	
LDEL(DB)	38.35	77.77	31.26	
PMIN(DEG)	7912.22	-8660.64	-8442.52	
PMAX(DEG)	9999.00	8318.53	9999.00	
PDEL(DEG)	8086.77	16978.13	18439.52	

FILE: 2ER6B01A.DAT Out-of-Band Rejection: PEAK= 40.1 dB WIDTH= 0.000 MHz

PHONON CORPORATION
FILE=2FR6B01A.DAT 15:53:05 06-23-1997
PN_100830_824 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSREF,SSREF
FREQUENCY(MHZ): CENTER= 322.2 WIDTH= 84.96 INCR.= .12 SYSTEM BANDWIDTH= 85
REFERENCES: LOSS(DB)= 29.59431 PHASE(DEG)=-138.6753 DELAY(US)= .7261289 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 24.74445 PHASE(DEG)= 1572.838
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 8.496 MHZ/DIV



PEAK: LEVEL(DB)= 29.2958 FREQ(MHZ)= 336.6145 DELAY(US)= 7.362938E-02 SIDELOBE(DB)=-42.34831
ENERGY: LEVEL(DB)= 29.79215 CENTER(MHZ)= 322.0312 WIDTH(MHZ)= 32.36959 SKEW(MHZ)= .3923889

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.30	306.61453	306.61453	306.61453	0.00000	306.61453	0.00000	0.00	306.61453	306.61453
0.50	293.45941	307.41647	302.43793	13.95705	308.42188	14.02486	-6.24	293.45941	350.99902
1.00	293.14554	307.59998	302.36774	14.44437	308.37256	14.52631	-6.34	293.14554	351.31345
2.00	292.81180	307.85916	302.33899	15.03336	308.37057	14.97089	-6.40	292.81180	351.72151
3.00	292.60864	308.05872	302.32968	15.44209	308.36578	15.14217	-6.45	292.60864	351.93451
4.00	292.44452	308.19354	302.32172	15.75443	308.36381	15.24969	-6.46	292.44452	352.09955
5.00	292.30615	308.32864	302.31738	16.02249	308.33968	15.37751	-6.47	292.30515	352.26767
6.00	292.18130	308.44223	302.31177	16.26093	308.34036	15.44180	-6.48	292.18130	352.40631
10.00	291.80718	308.81161	302.30936	17.00452	308.34149	15.55632	-6.46	291.80710	352.73117
20.00	291.19131	309.40543	302.29809	18.21512	308.34161	15.62403	-6.40	291.19131	353.43152
30.00	290.73657	309.78259	302.25958	19.04602	308.34145	15.68716	-6.34	290.73657	353.92477
40.00	290.31256	310.12822	302.21939	19.81566	308.34143	15.65742	-6.29	290.31256	354.13248

BAND(MHZ)	294.200	306.200	338.200	350.200
LMIN(DB)	-0.19	-0.30	-0.27	
LMAX(DB)	0.21	65.12	0.34	
LDEL(DB)	0.40	65.41	0.61	
PMIN(DEG)	-2091.43	-3014.84	-431.95	
PMAX(DEG)	753.95	3825.75	3836.99	
PDEL(DEG)	2765.36	6839.99	2738.94	

FILE: 2FR6B01A.DAT Out-of-band Rejection: PEAK= 42.1 dB WIDTH= 0.000 MHz

PHONON CORPORATION
FILE: 2FR8B01A.DAT (+SSCF)
PN_100830_824 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
05-23-1997 HP8753,SSREF,SSREF,SSCF
REFERENCES: LOSS(DB)= 29.59431 PHASE(DEG)= -138.6753
DELAY(US)= .7281289 SLOPE(US/MHZ)= 0

BANDPASS CHARACTERISTICS MEASUREMENT

FREQUENCY(MHZ)	LOSS(DB)	PHASE(DEG)
285.400	62.85	1256.44
289.080	64.00	1553.03
292.760	2.23	1110.18
296.440	-0.10	246.03
300.120	-0.12	-616.69
303.800	0.18	-1479.31
307.480	0.67	-2348.89
311.160	51.28	-2745.52
314.840	57.00	-1823.03
318.520	50.40	-825.64
322.200	49.79	138.68
325.880	47.67	1114.91
329.560	53.43	2060.05
333.240	45.93	3029.93
336.920	1.27	2594.71
340.600	-0.17	1755.13
344.280	-0.05	916.21
347.960	0.11	76.71
351.640	1.75	-758.50
355.320	46.08	-1264.82
359.000	43.69	-318.81

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-2 PHONON PART: 100824 SERIAL: 001
TESTED BY: PORGA TITLE: MGR DATE: 6/24/97 TIME: 10:00 AM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A07982 CAL DUE: 10/12/97
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/8/97

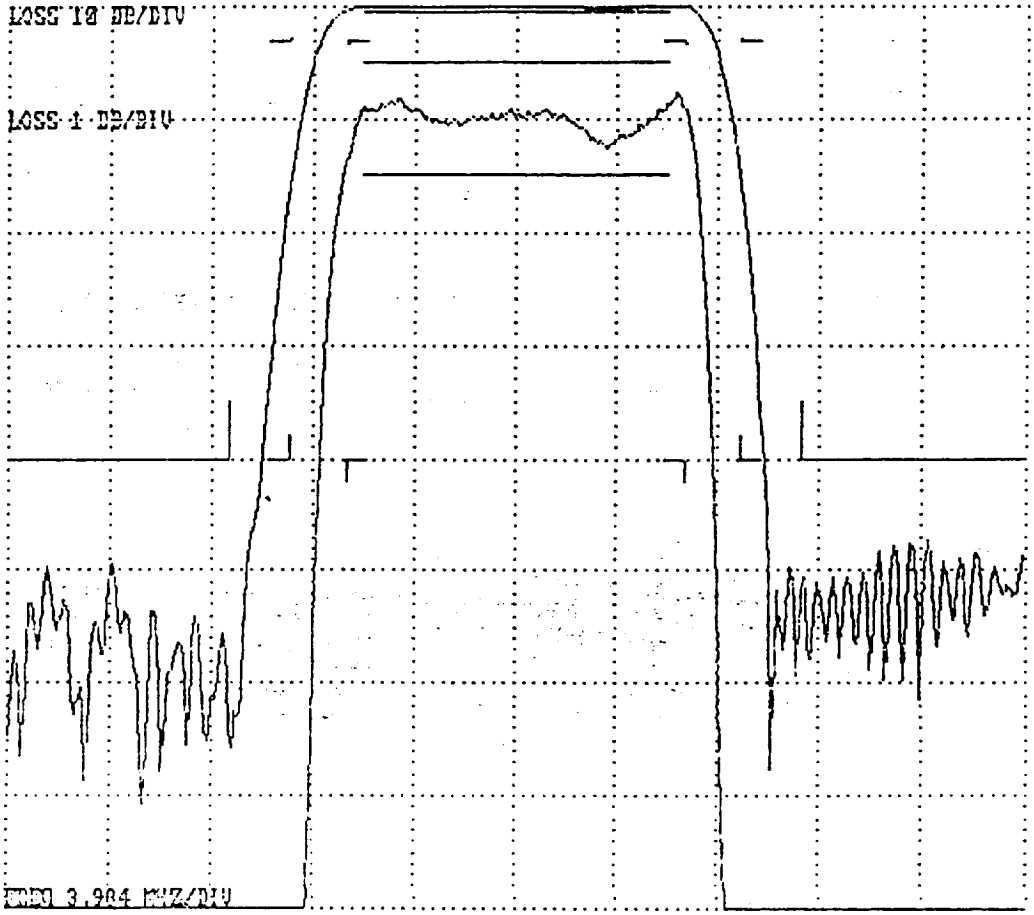
PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	35.6	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 299.335/301.065 MHz	300.217	MHz	P
		HI: 343.335/345.065 MHz	344.087	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 15/16 MHz	15.422	MHz	P
		HI: 15/16 MHz	15.454	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.0	dB	P
		HI: /0.5 dB	0.1	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		294.2-306.2 MHz: /1.0 dB	0.4	dB	P
		338.2-350.2 MHz: /1.0 dB	0.4	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	29.8	dB	P
		HI: 27.8/30.2 dB	29.6	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.2	dB	P
		HI: -0.4/0.4 dB	-0.0	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.1	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-286,359-1000 MHz:	39.7	0.064	
		DUAL: 286.000-288.935, 311.465-332.935, 355.465-359.00 MHz:	42.8	0.000	
		PEAK: 35.0/ dB	33.7 dB		P
		WIDTH: /3.2 MHz		0.064 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.28	Unitless	P
		HI: /1.30 Unitless	1.31	Unitless	F
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		294.2-306.2,338.2-350.2 MHz			
		DUAL S11: 7.5/ dB	8.6	dB	P
		DUAL S22: 7.5/ dB	8.7	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.2/0.2 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.32/0.32 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	F (DP)		

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

U-A-I PER SDAR (97-02-01)
97-034
EE

PHONON CORPORATION
FILE=2AH5831A.DAT 16:04:38 06-23-1997
PN 100830-824 FINAL FUNCTIONAL TEST FOR PROTOFLIGHT /N DUP _SXX
06-23-1997 MASK3,SSOF,SSFFIX,SSMAT
FREQUENCY(MHZ): CENTER= 302.2 WIDTH= 22.24 INCR.= .12 SYSTEM BANDWIDTH= 12
REFERENCES: LOSS(DB)= 29.75653 PHASE(DEG)= 4939 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 9.703089E-02 PHASE(DEG)= 1737.823
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV

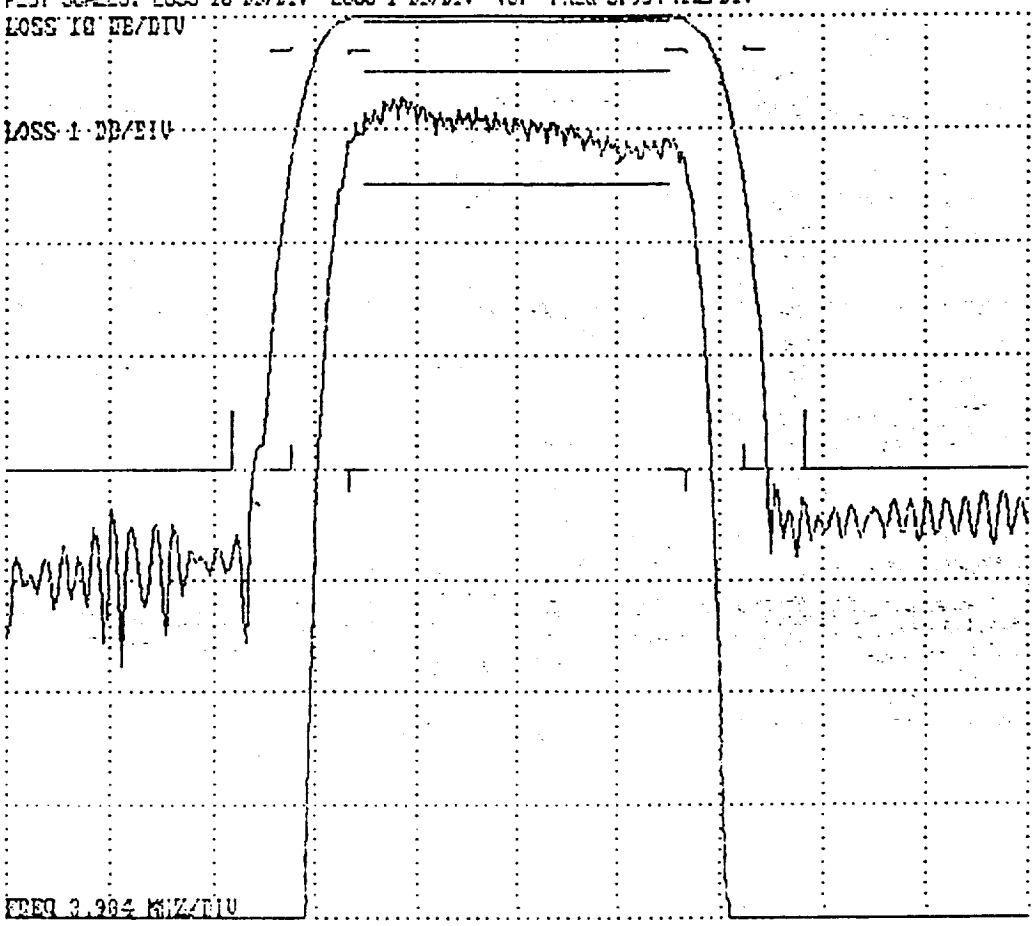


PEAK: LEVEL(DB)= 29.52263 FREQ(MHZ)= 305.4863 DELAY(US)=-1.381085 SIDELOBE(DB)=-47.67892
ENERGY: LEVEL(DB)= 29.93823 CENTER(MHZ)= 309.2111 WIDTH(MHZ)= 16.12952 SKEW(MHZ)= 3.975699E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.23	300.48638	316.48638	308.48638	0.00000	305.48638	0.00000	0.00	316.48638	316.48638
0.50	293.35300	307.28436	300.31868	13.93137	300.30396	14.00961	-12.51	293.35300	307.28436
1.00	293.04807	307.46216	300.25513	14.41409	300.25027	14.30961	-13.43	293.04807	307.46216
2.00	292.70877	307.72705	300.21790	15.01828	300.20779	14.74258	-15.36	292.70877	307.72705
3.00	292.50547	307.92841	300.21744	15.42194	300.21020	15.01175	-17.30	292.50547	307.92841
4.00	292.34235	308.07825	300.21030	15.73598	300.21140	15.11813	-18.39	292.34235	308.07825
5.00	292.20468	308.20941	300.20703	16.00473	300.21201	15.20601	-19.60	292.20468	308.20941
6.00	292.07947	308.32300	300.20123	16.24353	300.21231	15.27692	-20.92	292.07947	308.32300
10.00	291.78297	308.69402	300.19349	16.99103	300.21219	15.40671	-25.69	291.78297	308.69402
20.00	291.03459	309.28898	300.13074	18.22428	300.21136	15.46488	-36.67	291.03459	309.28898
30.00	290.62744	309.65979	300.14362	19.03235	300.21183	15.46827	-46.35	290.62744	309.65979
40.00	290.28166	310.01443	300.14803	19.81277	300.21183	15.46865	-52.78	290.28166	310.01443
[illegible]	[illegible]	[illegible]							
[illegible]		-0.11							
[illegible]		0.00							
[illegible]		5.43							
PMIN(DEG)		-2976.74							
[illegible]		5111.33							
[illegible]		5911.77							

File: 2AH5831A.DAT Passband Symmetry = 0.0 dB

PHONON CORPORATION
FILE=2CH8331A.DAT 16:25:26 06-23-1997
PN_102338_824 FINAL_FUNCTIONAL TEMP:H PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 344.2 WIDTH= 39.84 INCR.= .12 SYSTEM BANDWIDTH= 12
REFERENCES: LOSS(DB)= 29.61641 PHASE(DEG)=-2932.848 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .135779 PHASE(DEG)= 1715.36
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 3.984 MHZ/DIV



PEAK: LEVEL(DB)= 29.33262 FREQ(MHZ)= 339.6675 DELAY(US)=-1.374599 SIDELOBE(DB)=-41.71743
ENERGY: LEVEL(DB)= 29.82158 CENTER(MHZ)= 344.0112 WIDTH(MHZ)= 16.22971 SKEW(MHZ)= .1536863

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.29	339.68753	339.68753	339.68753	0.00000	339.68753	0.00000	0.00	339.68753	339.68753
0.59	337.26810	350.92456	344.09631	13.65646	344.04626	13.62214	-11.59	337.26810	350.92456
1.00	336.93271	351.21298	344.07285	14.28027	343.99579	14.13539	-12.92	336.93271	351.21298
2.00	336.68349	351.59113	344.09729	14.90764	343.99918	14.65359	-14.99	336.68349	351.59113
3.00	336.35950	351.81372	344.08661	15.45422	344.00256	14.92311	-16.72	336.35950	351.81372
4.00	336.17670	351.98309	344.07990	15.80640	344.00339	15.03339	-17.68	336.17670	351.98309
5.00	336.02600	352.15870	344.08835	16.12469	344.02453	15.22533	-19.97	336.02600	352.15870
6.00	335.90382	352.28598	344.09698	16.37795	344.03595	15.26919	-21.27	335.90382	352.28598
10.00	335.58571	352.66782	344.09676	17.16211	344.02998	15.32573	-25.84	335.58571	352.66782
20.00	334.88065	353.39518	344.09299	18.42452	344.01092	15.42982	-36.86	334.88065	353.39518
33.00	334.42715	353.79999	344.11359	19.37283	344.01099	15.44435	-43.82	334.42715	353.79999
40.00	333.77640	353.99374	343.88507	20.21735	344.01099	15.44467	-45.64	332.77640	353.99374
BAND(MHZ)	338.888	350.888							
LMIN(DB)	-0.07								
LMAX(DB)	0.27								
LDEL(DB)	0.36								
PMIN(DEG)	-2938.74								
PMAX(DEG)	2944.54								
PDEL(DEG)	5883.28								

File: 2CH8331A.DAT Passband Symmetry = 0.1 dB

Channel 13 Bandpass Filter

SAW Filter (S/N: 1331576-3, S/N: B01)

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331575-3 PHAMON PART: 122605 SERIAL: 221
TESTED BY: Pam TITLE: Prod Mgr DATE: 2/3/97 TIME: 1:30 PM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8752D SERIAL: 3416087982 CAL DUE: 10/12/97
HP 3478A SERIAL: 2136023127 CAL DUE: 7/8/97

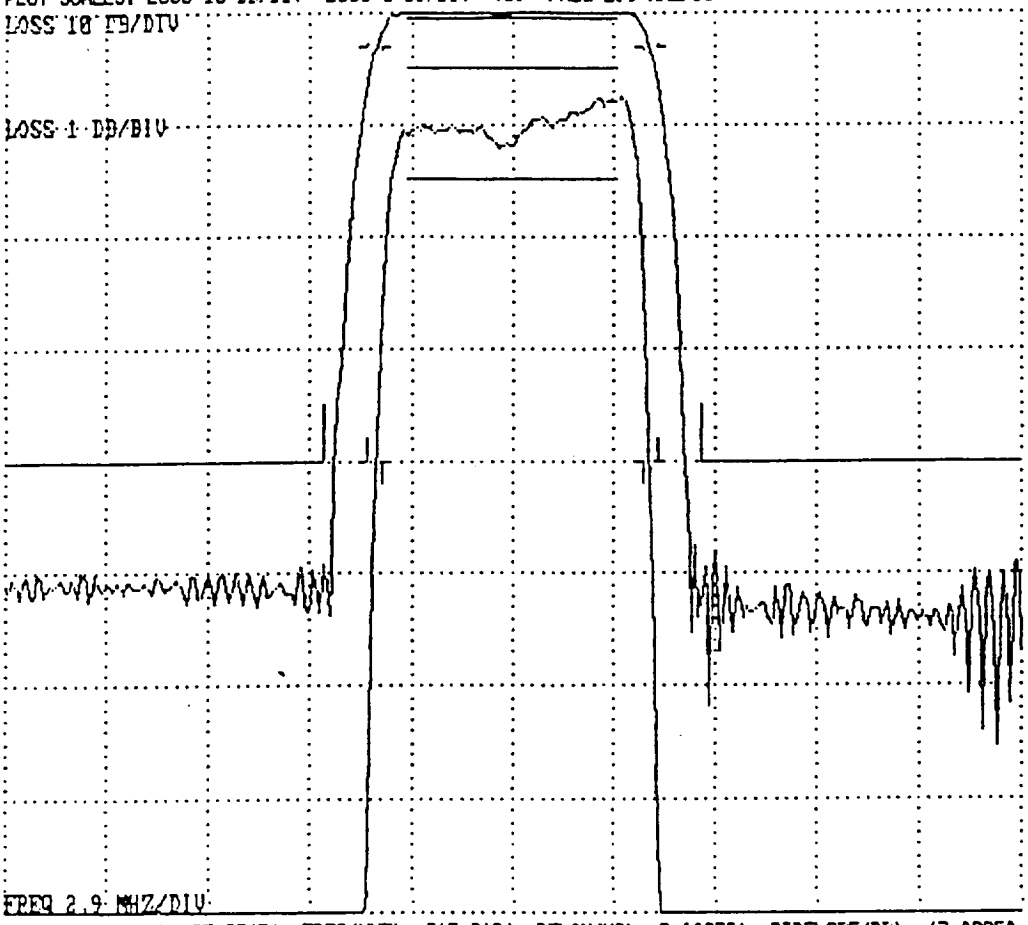
PARAGRAPH REQ.	PARAGRAPH G/GTP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	-5.1	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 312.035/312.365 MHz	312.193	MHz	P
		HI: 332.035/332.365 MHz	332.189	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 7.8/8.0 MHz	7.832	MHz	P
		HI: 7.8/8.0 MHz	7.886	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.2	dB	P
		HI: /0.5 dB	0.2	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		309.2-315.2 MHz: /1.0 dB	0.4	dB	P
		329.2-335.2 MHz: /1.0 dB	0.3	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/32.2 dB	28.2	dB	P
		HI: 27.8/32.2 dB	27.9	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	-0.2	dB	P
		HI: -0.4/0.4 dB	-0.3	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	2.4	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-303,342-1000 MHz:	40.6	0.000	
		DUAL: 302.000-305.635, 317.565-326.635, 327.565-342.02 MHz:	40.0	0.000	
		PEAK: 25.0/ dB	40.6 dB	.	P
		WIDTH: /1.5 MHz		0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.28	Unitless	P
		HI: /1.30 Unitless	1.27	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		309.2-315.2, 329.2-335.2 MHz			
		DUAL S11: 7.5/ dB	18.3	dB	P
		DUAL S22: 7.5/ dB	7.8	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.1/0.1 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.16/0.16 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P		P (DP)

DP

PHAMON CORPORATION
7 VETERAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y658
TEL: 203-651-8211
FAX: 203-651-8918

PHONON CORPORATION
FILE=3AC8K018.DAT 10:21:48 03-04-1997
PN_100832_825 FINAL_FUNCTIONAL TEMP:C PROTOFLIGHT /N DUAL_SXX
03-03-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 312.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 28.23768 PHASE(DEG)= 5249.265 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1102923 PHASE(DEG)= 1647.864
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV

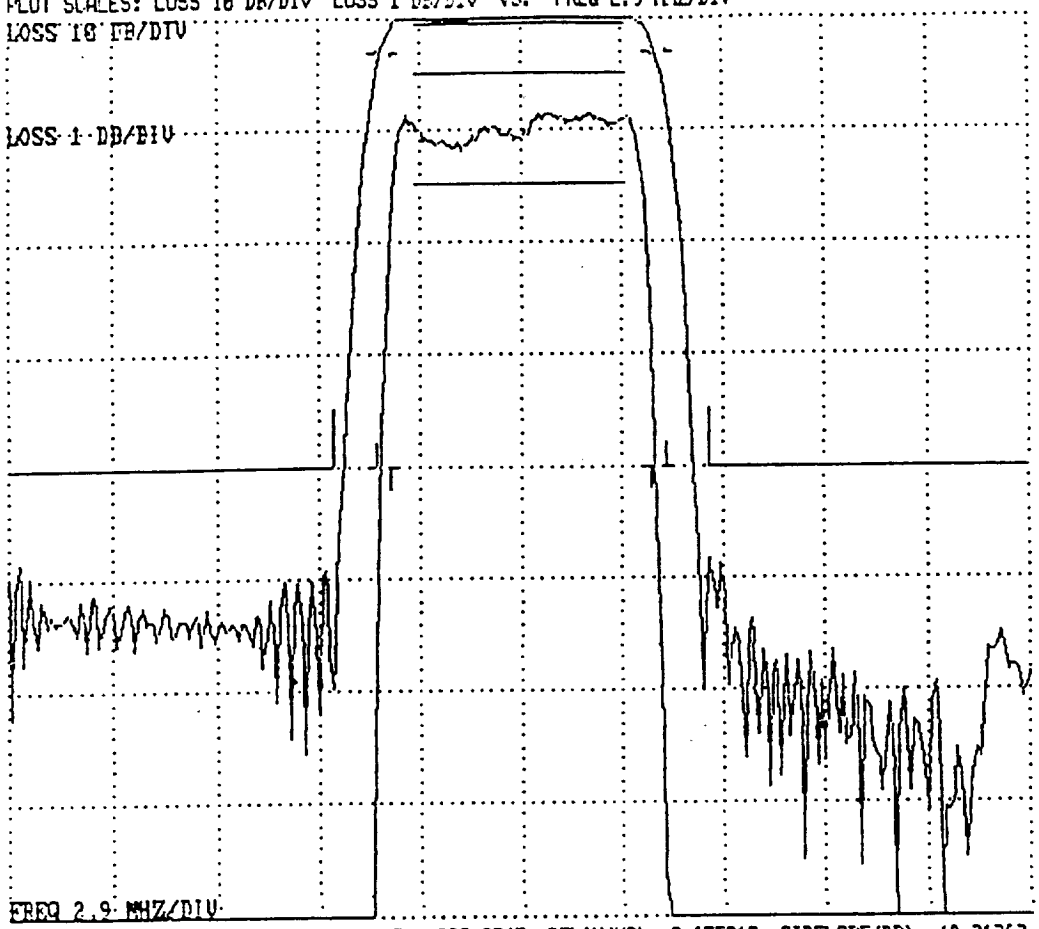


PEAK: LEVEL(DB)= 27.97474 FREQ(MHZ)= 315.3104 DELAY(US)=-2.689501 SIDELOBE(DB)=-47.89858
ENERGY: LEVEL(DB)= 28.42208 CENTER(MHZ)= 312.2286 WIDTH(MHZ)= 8.28275 SKEW(MHZ)=-6.799255E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.26	315.31042	315.31042	315.31042	0.00000	315.31042	0.00000	0.00	315.31042	315.31042
0.50	308.69965	315.76862	312.23413	7.06897	312.24326	7.08859	-14.55	308.69965	315.76862
1.00	308.56216	315.86163	312.21191	7.29947	312.24393	7.25783	-15.57	308.56216	315.86163
2.00	308.38684	316.00438	312.19556	7.61746	312.24258	7.53538	-18.18	308.38684	316.00438
3.00	308.27374	316.10617	312.18994	7.83243	312.24066	7.63987	-19.82	308.27374	316.10617
4.00	308.18631	316.18518	312.18573	7.99887	312.21878	7.68146	-20.68	308.18631	316.18518
5.00	308.11417	316.24915	312.18164	8.13498	312.23834	7.71939	-21.68	308.11417	316.24915
6.00	308.04724	316.31055	312.17889	8.26331	312.23593	7.77581	-23.85	308.04724	316.31055
10.00	307.84818	316.50394	312.17686	8.65576	312.23187	7.83758	-29.27	307.84818	316.50394
20.00	307.51965	316.80493	312.16229	9.28528	312.22916	7.85993	-40.39	307.51965	316.80493
30.00	307.31522	316.98309	312.14917	9.66788	312.22870	7.86140	-47.47	307.31522	316.98309
40.00	307.10034	317.11783	312.10987	10.01749	312.22867	7.86161	-51.33	307.10034	317.11783

BAND(MHZ) 309.200 315.200
LMIN(DB) -0.24
LMAX(DB) 0.21
LDEL(DB) 0.45
PMIN(DEG) -2866.73
PMAX(DEG) 2934.20
PDEL(DEG) 5710.93
File: 3AC8PB18.DAT Passband Symmetry = 0.2 dB

PHONON CORPORATION
FILE=3CC8K010.DAT 10:22:36 03-04-1997
PN_100832_825 FINAL_FUNCTIONAL TEMP:C PROTOFLIGHT /N DUAL_SXX
03-03-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 332.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 27.87648 PHASE(DEG)=-6084.089 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 9.399569E-02 PHASE(DEG)= 1628.18
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV



PEAK: LEVEL(DB)= 27.72747 FREQ(MHZ)= 332.9545 DELAY(US)=-2.655912 SIDELOBE(DB)=-48.31363
ENERGY: LEVEL(DB)= 28.05185 CENTER(MHZ)= 332.129 WIDTH(MHZ)= 8.243107 SKEW(MHZ)=-.0455194

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.15	332.95447	332.95447	332.95447	0.00000	332.95447	0.00000	0.00	332.95447	332.95447
0.50	328.50349	335.68970	332.09961	7.18021	332.12277	7.09915	-14.28	328.50349	335.68970
1.00	328.41077	335.79150	332.10114	7.38074	332.12219	7.27591	-15.30	328.41077	335.79150
2.00	328.26715	335.94351	332.10535	7.67636	332.12222	7.56869	-17.89	328.26715	335.94351
3.00	328.16492	336.05127	332.10809	7.88635	332.12286	7.67992	-19.52	328.16492	336.05127
4.00	328.08557	336.13952	332.10889	8.04504	332.12378	7.76557	-21.43	328.08557	336.13952
5.00	328.01987	336.20139	332.11063	8.18152	332.14041	7.79735	-22.43	328.01987	336.20139
6.00	327.96487	336.26309	332.11398	8.29822	332.12491	7.82664	-23.63	327.96487	336.26309
10.00	327.77777	336.45432	332.11603	8.67654	332.12729	7.89201	-29.14	327.77777	336.45432
20.00	327.48041	336.75992	332.12018	9.27951	332.12885	7.91522	-40.76	327.48041	336.75992
30.00	327.27280	336.95255	332.11267	9.67975	332.12980	7.91672	-50.77	327.27280	336.95255
40.00	327.11581	337.11526	332.11554	9.99945	332.12980	7.91682	-54.64	327.11581	337.11526

BAND(MHZ)	329.200	335.200
LMIN(DB)	-0.15	
LMAX(DB)	0.20	
LDEL(DB)	0.35	
PMIN(DEG)	-2773.68	
PMAX(DEG)	2868.30	
PDEL(DEG)	5641.98	

File: 3CC8K010.DAT Passband Symmetry = 0.2 DB

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1321576-3 PHONON PART: 130825 SERIAL: 321

TESTED BY: [illegible] TITLE: [illegible] DATE: 3/3/97 TIME: 1:30 PM

TEST: FINAL FUNCTIONAL

EQUIPMENT: HP 8753D SERIAL: 3410A07982 CAL DUE: 10/12/97

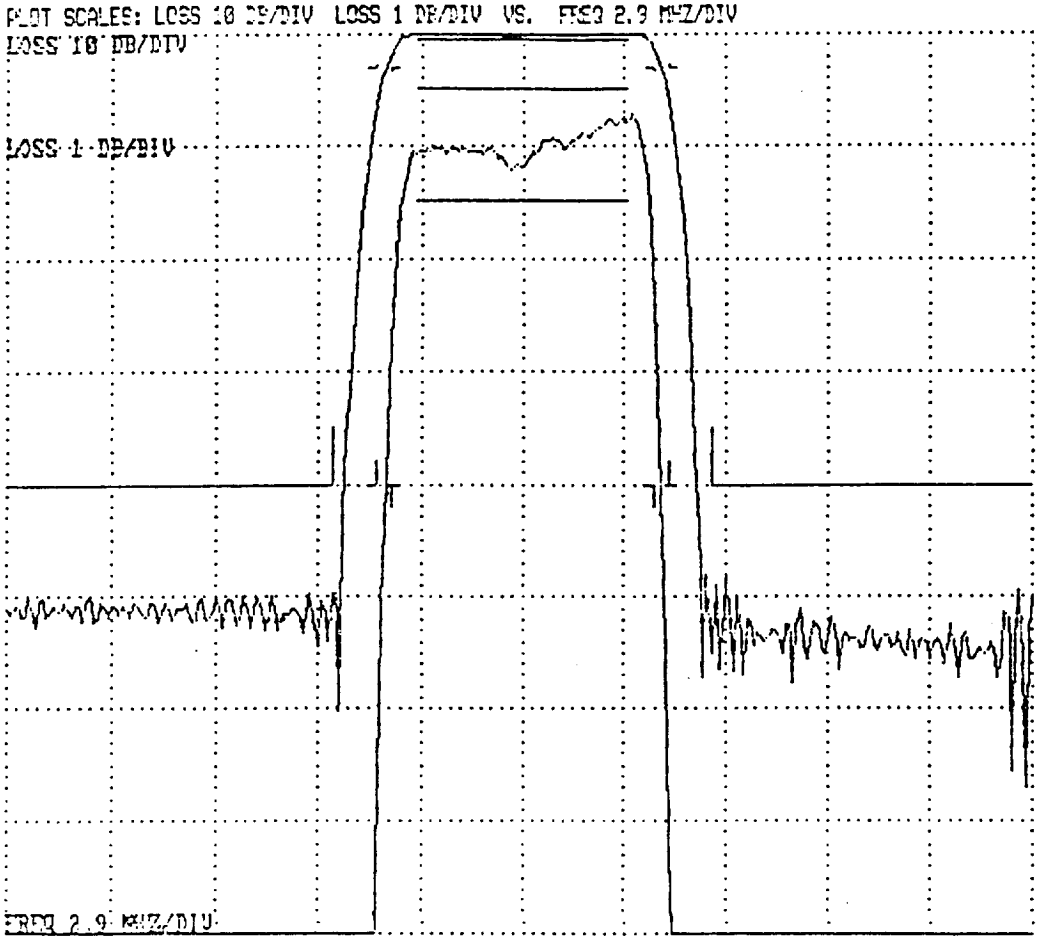
HP 2479A SERIAL: 2136A02127 CAL DUE: 7/8/97

PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	15.2	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 312.835/312.365 MHz	312.285	MHz	P
		HI: 332.835/332.365 MHz	332.126	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 7.8/8.8 MHz	7.833	MHz	P
		HI: 7.8/8.8 MHz	7.988	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /2.5 dB	0.3	dB	P
		HI: /2.5 dB	0.3	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		303.2-315.2 MHz: /1.8 dB	0.4	dB	P
		329.2-335.2 MHz: /1.8 dB	0.3	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/38.2 dB	28.4	dB	P
		HI: 27.8/38.2 dB	28.2	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.0	dB	P
		HI: -0.4/0.4 dB	0.0	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.2	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-303,342-1800 MHz:	48.1	0.033	
		DUAL: 322.800-306.835, 317.565-329.835, 337.565-342.80 MHz:	48.2	0.030	
		PEAK: 35.0/ dB	48.1 dB		P
		WIDTH: /1.5 MHz		0.033 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.28	Unitless	P
		HI: /1.30 Unitless	1.27	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		303.2-315.2,329.2-335.2 MHz			
		DUAL S11: 7.5/ dB	10.4	dB	P
		DUAL S22: 7.5/ dB	7.2	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.1/0.1 MHz	.005	MHz	P
		3 dB BANDWIDTH: -0.16/0.16 MHz	.002	MHz	P (DP)
		INSERTION LOSS: -0.5/0.5 dB	-.01	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P (DP)		

PHONON CORPORATION
7 MERCER DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0211
FAX: 203-651-8618

PHONON CORPORATION
FILE=3AR88010.DAT 10:31:55 03-04-1997
PN_100832_825 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
03-03-1997 MP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 312.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 28.48862 PHASE(DEG)= 5638.888 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1295485 PHASE(DEG)= 1547.72
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV



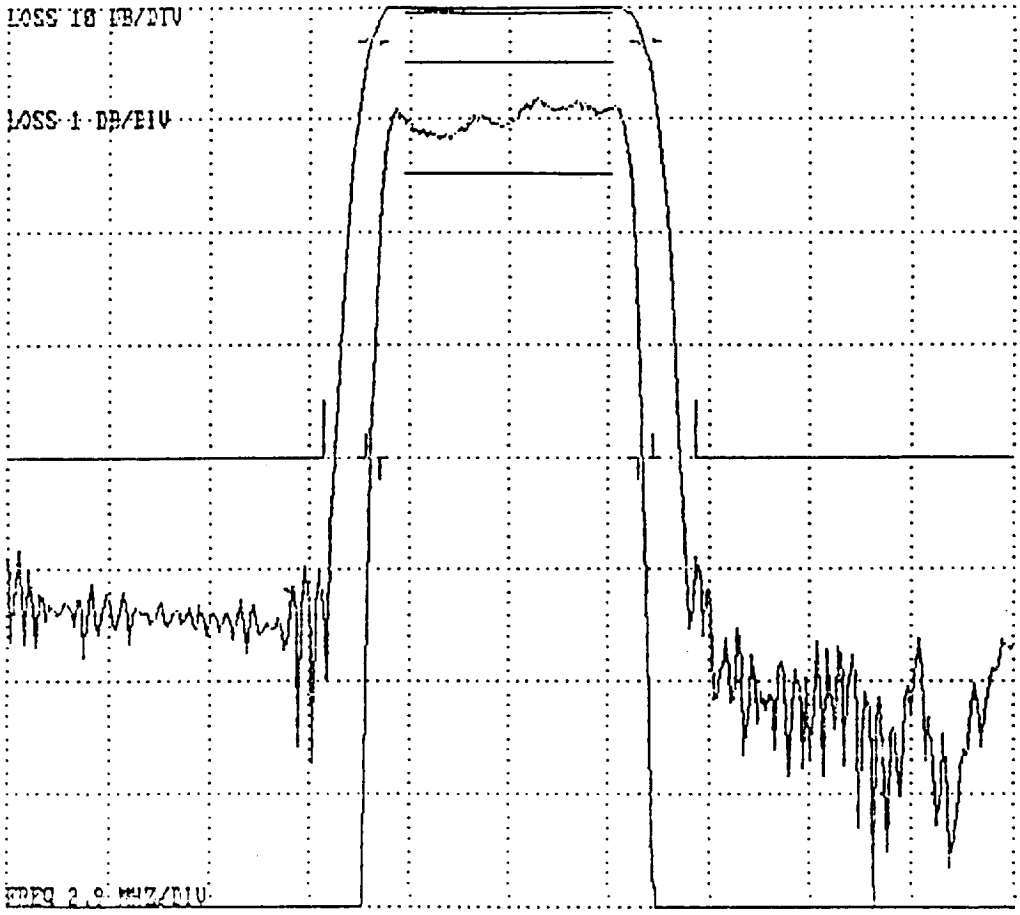
PEAK: LEVEL(DB)= 28.14181 FREQ(MHZ)= 315.3076 DELAY(US)=-2.698708 SIDELOBE(DB)=-48.23971
ENERGY: LEVEL(DB)= 28.59187 CENTER(MHZ)= 312.2442 WIDTH(MHZ)= 8.282431 SKEW(MHZ)=-6.742391E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.27	315.30759	315.30759	315.30759	0.00000	315.30759	0.00000	0.00	315.30759	315.30759
0.50	308.71329	315.78403	312.24866	7.07074	312.28937	7.00136	-14.07	308.71329	315.78403
1.00	308.57705	315.87875	312.22791	7.30170	312.24658	7.25938	-15.57	308.57705	315.87875
2.00	308.40158	316.01944	312.21051	7.61786	312.28894	7.47448	-17.42	308.40158	316.01944
3.00	308.28894	316.12173	312.20532	7.83279	312.24957	7.64188	-19.62	308.28894	316.12173
4.00	308.20160	316.20126	312.20142	7.99966	312.26913	7.66187	-20.65	308.20160	316.20126
5.00	308.13068	316.26529	312.19800	8.13461	312.24823	7.72152	-21.69	308.13068	316.26529
6.00	308.06332	316.32681	312.19507	8.26349	312.24753	7.77804	-23.87	308.06332	316.32681
10.00	307.86414	316.52011	312.19214	8.65598	312.24589	7.83966	-29.33	307.86414	316.52011
20.00	307.53632	316.82816	312.17822	9.28384	312.24454	7.86181	-40.63	307.53632	316.82816
30.00	307.32834	317.03269	312.16553	9.67435	312.24429	7.86328	-49.03	307.32834	317.03269
40.00	307.11392	317.13587	312.12451	10.02115	312.24423	7.86348	-51.86	307.11392	317.13587

BAND(MHZ)	309.200	315.200
LMIN(DB)	-0.24	
LMAX(DB)	0.21	
LDEL(DB)	0.45	
PMIN(DEG)	-2861.35	
PMAX(DEG)	2834.83	
PDEL(DEG)	5710.37	

File: 3AR85010.DAT Passband Symmetry = 0.3 dB

PHONON CORPORATION
FILE=3CR8B010.DAT 10:32:58 03-04-1997
PN_106832_625 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
03-03-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 332.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 28.23785 PHASE(DEG)=-6055.444 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1061475 PHASE(DEG)= 1627.946
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV

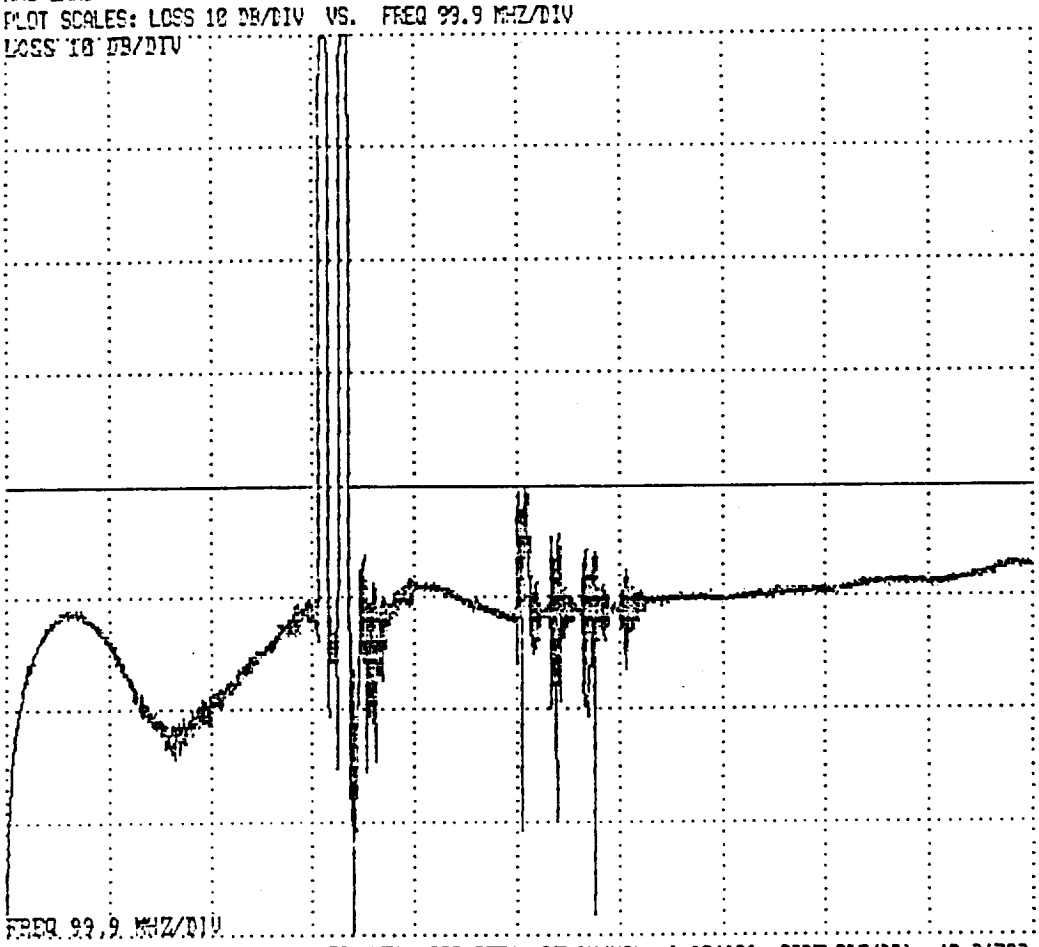


PEAK: LEVEL(DB)= 28.02748 FREQ(MHZ)= 333.0759 DELAY(US)=-2.656775 SIDELOBE(DB)=-48.4758
ENERGY: LEVEL(DB)= 28.30607 CENTER(MHZ)= 332.1534 WIDTH(MHZ)= 8.237537 SKEW(MHZ)=-5.681407E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.18	333.07593	333.07593	333.07593	0.00000	333.07593	0.00000	0.00	333.07593	333.07593
0.50	328.54291	335.70413	332.12354	7.16122	332.17598	7.18376	-14.82	328.54291	335.70413
1.00	328.43146	335.60862	332.12003	7.17717	332.17261	7.34998	-15.91	328.43146	335.60862
2.00	328.29114	335.95776	332.12445	7.66663	332.13641	7.56835	-17.92	328.29114	335.95776
3.00	328.18607	336.06622	332.12616	7.88016	332.13921	7.67084	-19.55	328.18607	336.06622
4.00	328.10614	336.14493	332.12555	8.03879	332.13254	7.71678	-20.45	328.10614	336.14493
5.00	328.03925	336.21619	332.12772	8.17694	332.13948	7.78928	-22.52	328.03925	336.21619
6.00	327.98288	336.27792	332.13048	8.29504	332.14585	7.81641	-23.64	327.98288	336.27792
10.00	327.79626	336.46915	332.13269	8.67289	332.15805	7.88145	-29.14	327.79626	336.46915
20.00	327.49962	336.77347	332.13666	9.27385	332.15308	7.98467	-40.77	327.49962	336.77347
30.00	327.29431	336.96579	332.13307	9.67148	332.15338	7.98618	-51.03	327.29431	336.96579
40.00	327.14235	337.12076	332.13156	9.97829	332.15344	7.98528	-55.38	327.14235	337.12076

BAND(MHZ) 329.200 335.200
LMIN(DB) -0.18
LMAX(DB) 0.19
LDEL(DB) 0.36
PMIN(DEG) -3773.16
PMAX(DEG) 2667.95
PDEL(DEG) 5641.11
File: 3CR8B010.DAT Passband Symmetry = 0.3 dB

PHONON CORPORATION
FILE=3ER8B010.DAT 10:33:42 03-04-1997
PN_100832_825 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N WIDE_S21
03-03-1997 HP8753,SSREF,SSREF
FREQUENCY(MHZ): CENTER= 500.5 WIDTH= 999 INCR.= .266125 SYSTEM BANDWIDTH= 999
REFERENCES: LOSS(DB)= 28.28824 PHASE(DEG)=-5961.067 DELAY(US)= 4.745625 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 0.167185 PHASE(DEG)= 6962.302
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 99.9 MHZ/DIV



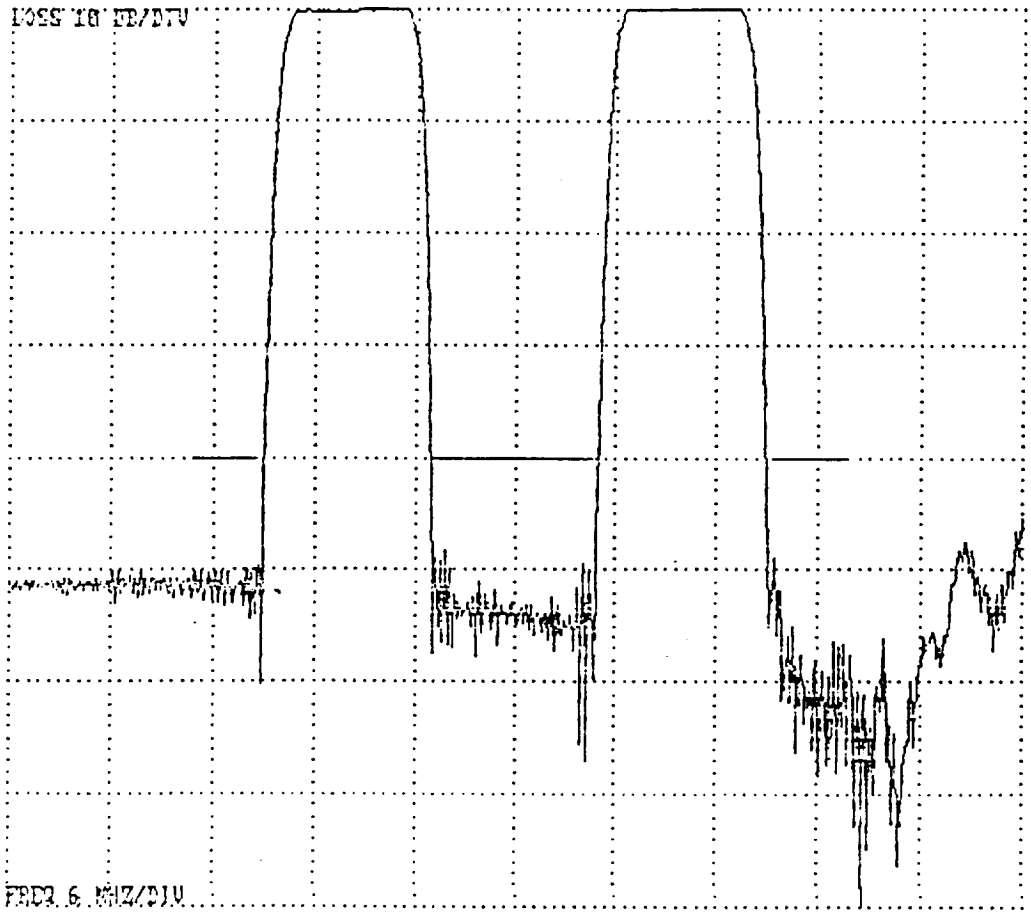
PEAK: LEVEL(DB)= 28.05211 FREQ(MHZ)= 332.9554 DELAY(US)= 6.034606 SIDELOBE(DB)=-40.34793
ENERGY: LEVEL(DB)= 28.48795 CENTER(MHZ)= 332.6288 WIDTH(MHZ)= 16.45074 SKEW(MHZ)= 237.688

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.25	332.95535	332.95535	332.95535	0.00000	332.95535	0.00000	0.00	332.95535	332.95535
0.50	328.51358	335.72726	332.12042	7.21368	332.15498	7.42785	-20.75	308.76236	335.72726
1.00	328.41162	335.83167	332.12164	7.42004	332.15488	7.42785	-20.74	308.59570	335.83167
2.00	328.27282	335.97397	332.12338	7.70117	332.15365	7.74171	-20.91	308.41461	335.97397
3.00	328.17419	336.07648	332.12534	7.90228	332.15365	7.74171	-20.91	308.29954	336.07648
4.00	328.09908	336.15628	332.12720	8.05820	332.15155	7.94852	-21.02	308.20981	336.15628
5.00	328.03308	336.22443	332.12875	8.19135	332.15155	7.94852	-21.02	308.13379	336.22443
6.00	327.97697	336.28369	332.12989	8.30762	332.15155	7.94852	-21.02	308.06650	336.28369
10.00	327.79135	336.47309	332.13220	8.68173	332.15192	8.04927	-21.07	307.87704	336.47309
20.00	327.49683	336.77332	332.13507	9.27649	332.15283	8.09116	-21.10	307.54404	336.77332
30.00	327.29642	336.96552	332.13098	9.66910	332.15283	8.09201	-21.09	307.33038	336.96552
40.00	327.14458	337.12256	332.13254	9.97686	332.15283	8.09283	-21.09	307.12433	337.12256

BAND(MHZ)	1.000	303.000	342.000	1000.000
LMIN(DB)	50.07	-0.25	40.09	
LMAX(DB)	77.92	78.26	88.24	
LDEL(DB)	27.85	78.52	48.15	
PMIN(DEG)	-9999.02	-9999.83	-9999.03	
PMAX(DEG)	-5178.76	3843.89	8635.95	
PDEL(DEG)	4828.24	13842.89	18634.96	

FILE: 3ER8B010.DAT Out-of-band Rejection: PEAK= 40.1 dB WIDTH= 0.000 MHz

PHONON CORPORATION
FILE=3FR8B010.DAT 10:34:04 03-04-1997
PN_100832_825 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
03-03-1997 HP8753,SSREF,SSREF
FREQUENCY(MHZ): CENTER= 322.2 WIDTH= 60 INCR.= .1 SYSTEM BANDWIDTH= 60
REFERENCES: LOSS(DB)= 28.30824 PHASE(DEG)= 280.2339 DELAY(US)= 1.529393 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 24.92244 PHASE(DEG)= 2563.591
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 6 MHZ/DIV



PEAK: LEVEL(DB)= 28.02748 FREQ(MHZ)= 333.0759 DELAY(US)= .4831586 SIDELOBE(DB)=-46.99373
ENERGY: LEVEL(DB)= 28.49511 CENTER(MHZ)= 322.4559 WIDTH(MHZ)= 16.43093 SKEW(MHZ)=-.4882236

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.28	333.87593	333.87593	333.87593	0.00000	333.87593	0.00000	0.00	333.87593	333.87593
0.50	328.51593	335.72531	332.12061	7.20938	332.17590	7.35175	-7.98	308.75668	335.72531
1.00	328.41394	335.82767	332.12079	7.41373	332.17261	7.52167	-8.05	308.59653	335.82767
2.00	328.27898	335.97012	332.12451	7.69122	332.13641	7.73715	-8.14	308.41589	335.97012
3.00	328.17684	336.07538	332.12671	7.89734	332.13301	7.85322	-8.19	308.29778	336.07538
4.00	328.09836	336.15225	332.12531	8.05389	332.14206	7.92718	-8.22	308.21036	336.15225
5.00	328.03388	336.22272	332.12790	8.18964	332.15948	7.97143	-8.23	308.13779	336.22272
6.00	327.97772	336.28372	332.13074	8.30600	332.14585	7.99320	-8.24	308.06973	336.28372
10.00	327.79236	336.47311	332.13275	8.68076	332.15085	8.05575	-8.24	307.85087	336.47311
22.00	327.49731	336.77591	332.13660	9.27859	332.15389	8.09952	-8.28	307.53982	336.77591
32.00	327.29291	336.96741	332.13516	9.67450	332.15336	8.09107	-8.17	307.33838	336.96741
40.00	327.14044	337.12234	332.13141	9.98190	332.15341	8.09117	-8.14	307.11499	337.12234

BAND(MHZ)	309.200	315.200	329.200	335.200
LMIN(DB)		-8.14	-8.19	-8.28
LMAX(DB)		8.31	67.83	8.89
LDEL(DB)		8.45	67.82	8.36
PMIN(DEG)		-5119.61	-8989.11	-1645.33
PMAX(DEG)		342.34	1844.26	746.35
PDEL(DEG)		2461.95	4833.37	2392.68

FILE: 3FR8B010.DAT Out-of-band Rejection: PEAK= 48.2 dB WIDTH= 0.000 MHz

PHONON CORPORATION
FILE: 3FR03010.DAT (+SSCF)
PN_100832_025 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DL
03-03-1997 HP8753,SSREF,SSREF,SSCF
REFERENCES: LOSS(DB)= 20.38824 PHASE(DEG)= 280.2329
DELAY(US)= 1.529393 SLOPE(US/MHZ)= 0

BANDPASS CHARACTERISTICS MEASUREMENT

FREQUENCY(MHZ)	LOSS(DB)	PHASE(DEG)
304.600	51.04	165.89
306.360	54.00	1121.30
308.120	5.23	837.05
309.880	0.12	99.46
311.640	0.22	-634.73
313.400	0.12	-1367.64
315.160	-0.12	-2102.79
316.920	24.76	-2840.97
318.680	52.19	-2209.31
320.440	53.05	-1224.19
322.200	54.47	-282.23
323.960	53.89	696.72
325.720	57.22	1668.87
327.480	20.70	1451.61
329.240	-0.05	738.13
331.000	-0.05	16.28
332.760	-0.21	-696.51
334.520	-0.20	-1418.93
336.280	5.94	-2123.73
338.040	55.39	-2796.88
339.800	60.93	-2518.22

ELECTRICAL TEST DATA SHEET

DEFOTET PART: 1321576-3 PHONON PART: 180885 SERIAL: 321

TESTED BY: [illegible] TITLE: Prog Mgr DATE: 3/3/97 TIME: 1:30 PM

TEST: FINAL FUNCTIONAL

EQUIPMENT: HP 8753D SERIAL: 3410A07988 CAL DUE: 10/12/97

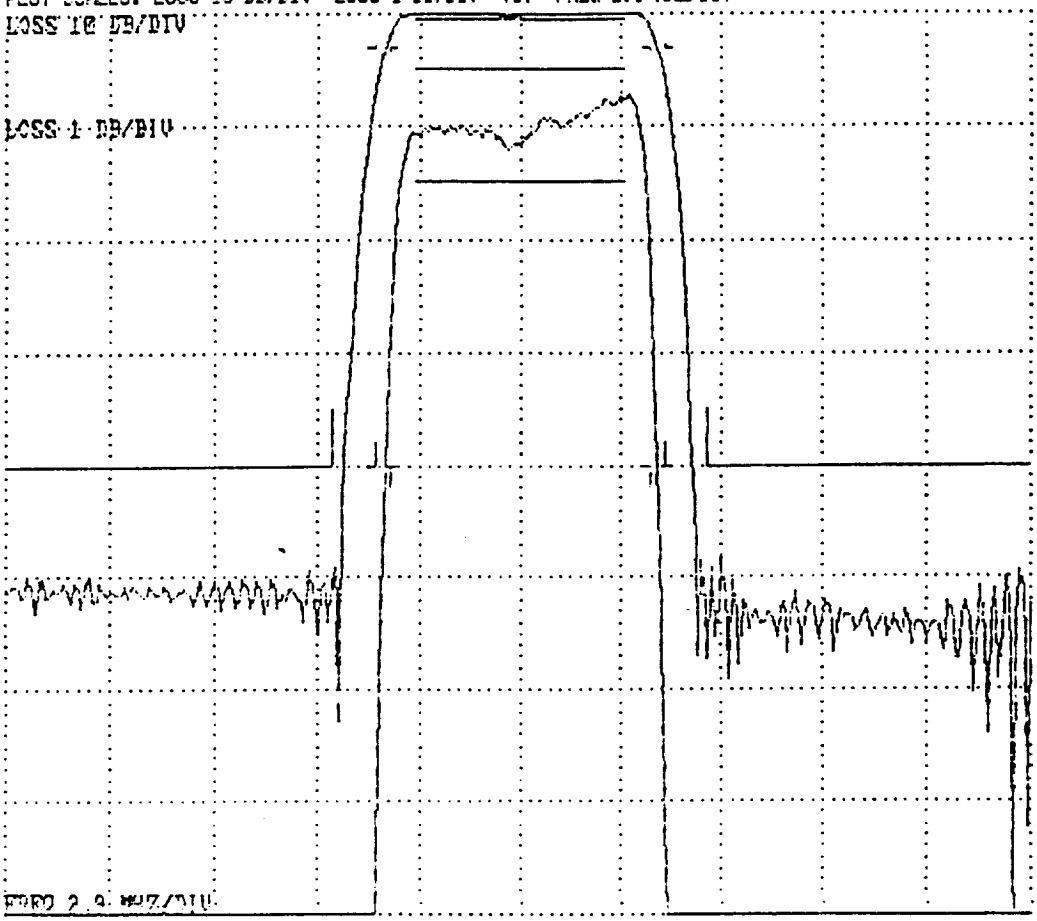
HP 34720A SERIAL: 2136A03127 CAL DUE: 7/8/97

PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	25.5	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 312.835/312.365 MHz	312.212	MHz	P
		HI: 332.835/332.365 MHz	332.132	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 7.8/8.8 MHz	7.833	MHz	P
		HI: 7.8/8.8 MHz	7.875	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /2.5 dB	0.3	dB	P
		HI: /2.5 dB	0.3	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		309.2-315.2 MHz: /1.0 dB	0.4	dB	P
		329.2-335.2 MHz: /1.0 dB	0.3	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	28.6	dB	P
		HI: 27.8/30.2 dB	28.6	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.2	dB	P
		HI: -0.4/0.4 dB	0.4	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.0	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-323,342-1000 MHz:	39.7	0.060	
		DUAL: 303.000-306.835,			
		317.565-326.835,			
		337.565-342.00 MHz:	48.1	0.000	
		PEAK: 35.0/ dB	39.7 dB		P
		WIDTH: /1.5 MHz		0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.29	Unitless	P
		HI: /1.30 Unitless	1.25	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		309.2-315.2,329.2-335.2 MHz			
		DUAL S11: 7.5/ dB	10.5	dB	P
		DUAL S22: 7.5/ dB	7.8	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.1/0.1 MHz	0	MHz	P P (DP)
		3 dB BANDWIDTH: -0.16/0.16 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P (DP)		

PHONON CORPORATION
7 MERCAN DRIVE
SHERBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-0311
FAX: 203-651-0318

PHONON CORPORATION
FILE=3AH98010.DAT 10:42:08 03-04-1997
PN_100832_025 FINAL_FUNCTIONAL TEMP:H PHOTOFLIGHT /N DUAL_SYX
03-03-1997 HP8753,SSCF,SSFFIX,SSPEF
FREQUENCY(MHZ): CENTER= 312.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 28.56753 PHASE(DEG)= 5645.836 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1110082 PHASE(DEG)= 1647.528
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV



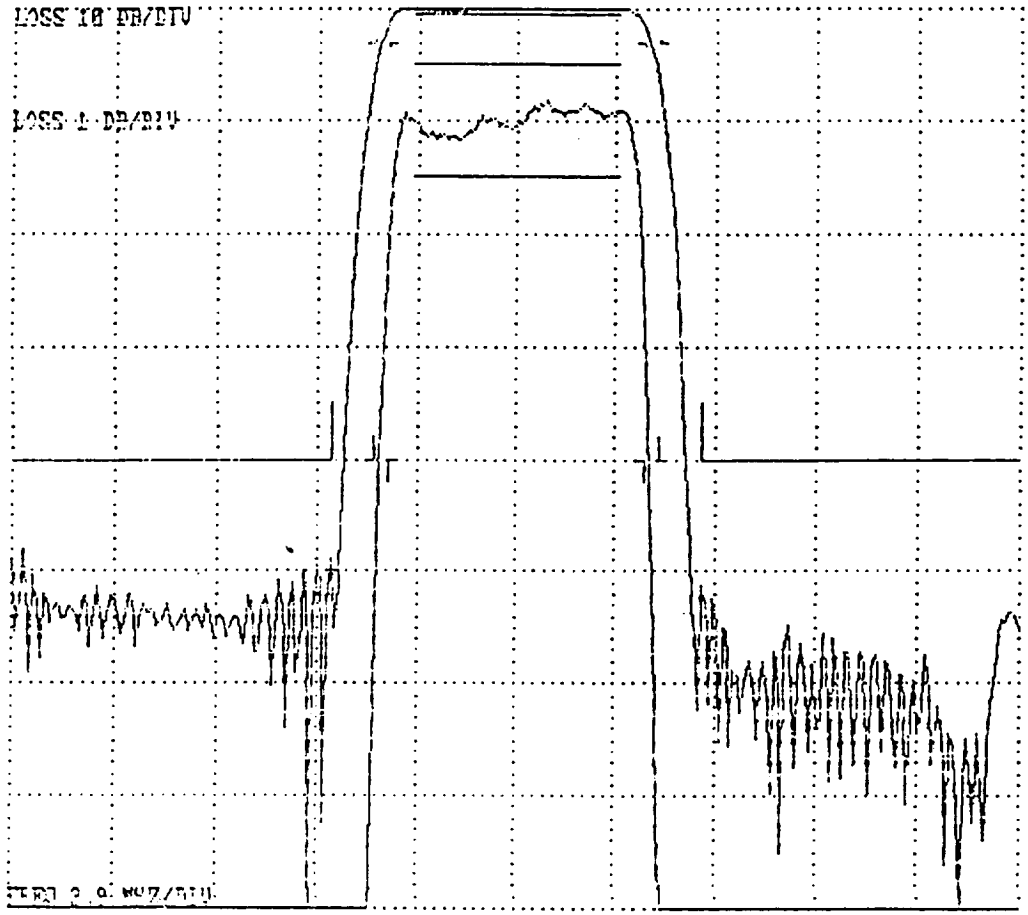
PEAK: LEVEL(DB)= 28.30339 FREQ(MHZ)= 315.2105 DELAY(US)=-2.69125 SIDELOBE(DB)=-40.38364
ENERGY: LEVEL(DB)= 28.74995 CENTER(MHZ)= 312.2564 WIDTH(MHZ)= 8.201669 SKEW(MHZ)=-6.932507E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.27	315.21055	315.31055	315.31055	0.09999	315.21055	0.09999	0.00	315.31055	315.21055
0.50	308.71997	315.78838	312.25415	7.06833	312.23123	7.00261	-14.03	308.71997	315.78838
1.00	308.58386	315.89005	312.23694	7.30619	312.24018	7.25984	-15.57	308.58386	315.89005
2.00	308.48986	316.02686	312.21756	7.53700	312.23473	7.47627	-17.43	308.48986	316.02686
3.00	308.29529	316.12020	312.21172	7.82292	312.25351	7.64234	-19.82	308.29529	316.12020
4.00	308.21022	316.23737	312.20868	7.99734	312.27451	7.66301	-23.67	308.21022	316.23737
5.00	308.13785	316.27224	312.20529	8.13449	312.25486	7.72256	-21.69	308.13785	316.27224
6.00	308.07028	316.33365	312.20197	8.26337	312.25485	7.77917	-23.88	308.07028	316.33365
10.00	307.87119	316.52670	312.19894	8.65552	312.25345	7.94859	-29.34	307.87119	316.52670
20.00	307.54382	316.82569	312.18524	9.28187	312.25369	7.96279	-40.69	307.54382	316.82569
30.00	307.33321	317.00906	312.17120	9.67575	312.25258	7.85424	-49.06	307.33321	317.00906
40.00	307.12109	317.14368	312.13239	10.02258	312.25247	7.85436	-51.03	307.12109	317.14368

BAND(MHZ)	309.200	315.200
LMIN(DB)	-0.24	
LMAX(DB)	0.21	
LDEL(DB)	0.45	
PMIN(DEG)	-2896.16	
PMAX(DEG)	2983.93	
PDEL(DEG)	5710.09	

File: 3AH98010.DAT Passband Symmetry = 0.3 dB

PHONON CORPORATION
FILE=3CH9831B.DAT 10:42:57 03-04-1997
PN_103032_825 FINAL_FUNCTIONAL TEMP:H PROTOFLIGHT .N DUAL_SYX
03-03-1997 HP8753,SSCE,SSFFIX,SSTSF
FREQUENCY(MHZ): CENTER= 332.2 WIDTH= 29 INCR.= .1 SYSTEM BANDWIDTH= 6
REFERENCES: LOSS(DB)= 28.56627 PHASE(DEG)=-1248.616 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1026925 PHASE(DEG)= 1627.883
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ 2.9 MHZ/DIV



PEAK: LEVEL(DB)= 28.30867 FREQ(MHZ)= 333.077 DELAY(US)=-2.655552 SIDELOBE(DB)=-48.29525
ENERGY: LEVEL(DB)= 28.74752 CENTER(MHZ)= 332.1585 WIDTH(MHZ)= 8.232287 SKEW(MHZ)=-5.3497995E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.19	332.97703	333.97703	333.97703	0.99999	333.97703	0.99999	0.00	333.97703	333.97703
0.50	328.55914	335.78418	332.17166	7.14496	332.17517	7.17919	-14.86	328.55914	335.78418
1.00	328.44269	335.81155	332.12714	7.36887	332.17255	7.34435	-15.96	328.44269	335.81155
2.00	328.30157	335.96442	332.13300	7.66284	332.16986	7.40992	-17.23	328.30157	335.96442
3.00	328.19492	336.07001	332.13245	7.87509	332.14111	7.66249	-19.59	328.19492	336.07001
4.00	328.11627	336.14828	332.13332	8.03219	332.16469	7.78981	-22.52	328.11627	336.14828
5.00	328.04813	336.21964	332.13389	8.17151	332.16263	7.78064	-22.59	328.04813	336.21964
6.00	327.99294	336.29128	332.12611	8.29834	332.14868	7.83581	-23.69	327.99294	336.29128
10.00	327.80453	336.47268	332.13955	8.66896	332.16993	7.86151	-27.75	327.80453	336.47268
20.00	327.51831	336.77648	332.14219	9.25829	332.15866	7.89328	-38.95	327.51831	336.77648
33.00	327.30713	336.96509	332.13611	9.65796	332.15854	7.89557	-49.31	327.30713	336.96509
40.00	327.18024	337.11389	332.14706	9.93365	332.15854	7.89575	-55.68	327.18024	337.11389

BAND(MHZ)	329.230	335.202
LMIN(DB)	-3.17	
LMAX(DB)	0.19	
LDEL(DB)	0.35	
PMIN(DEG)	-2773.12	
PMAX(DEG)	2867.54	
PDEL(DEG)	5640.66	

File: 3CH9831B.DAT Passband Symmetry = 0.3 dB

Channel 14 Bandpass Filter

SAW Filter (S/N: 1331576-4, S/N: B02)

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-4 PHONON PART: 100826 SERIAL: 002
TESTED BY: PORTER TITLE: TECH DATE: 6/24/98 TIME: 10:20 AM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 87530 SERIAL: 3410A07982 CAL DUE: 10/12/97
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/8/97

PARAGRAPH REQ.	PARAGRAPH D/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	-4.7	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 317.535/317.865 MHz	317.716	MHz	P
		HI: 326.535/326.865 MHz	326.755	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 2.8/3.0 MHz	2.918	MHz	P
		HI: 2.8/3.0 MHz	2.955	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.0	dB	P
		HI: /0.5 dB	0.0	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		316.575-318.825 MHz: /1.0 dB	0.3	dB	P
		325.575-327.825 MHz: /1.0 dB	0.5	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	29.0	dB	P
		HI: 27.8/30.2 dB	28.7	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	-0.1	dB	P
		HI: -0.4/0.4 dB	-0.1	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.3	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			

BAND	PEAK(dB)	WIDTH(MHz)		
WIDE: 1-313,331-1000 MHz:	46.1	0.000		
DUAL: 313.000-315.585, 319.815-324.585, 328.815-331.0 MHz:	41.2	0.000		
PEAK: 35.0/ dB	41.2	dB		P
WIDTH: /0.6 MHz		0.000	MHz	P

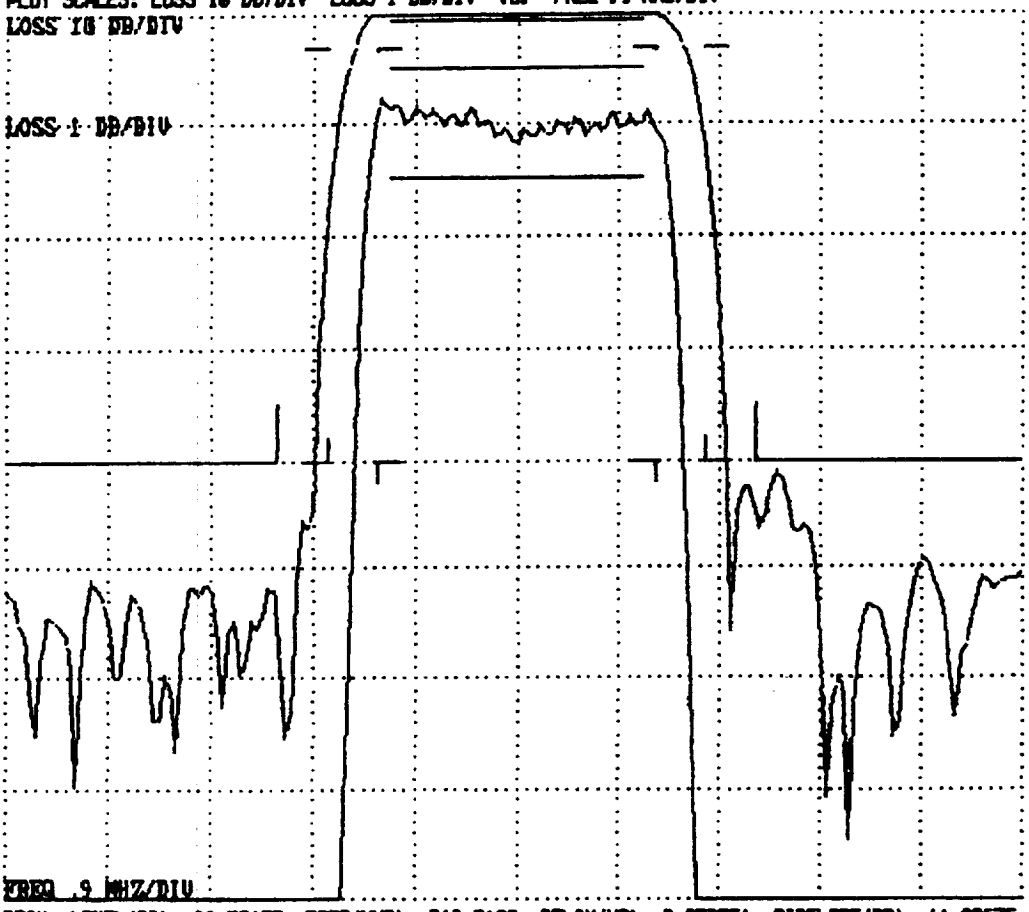
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.25	Unitless	P
		HI: /1.30 Unitless	1.24	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		316.575-318.825,325.575-327.825 MHz			
		DUAL S11: 7.5/ dB	9.8	dB	P
		DUAL S22: 7.5/ dB	8.4	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.1/0.1 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.06/0.06 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P		(SP)

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-8211
FAX: 203-651-8618

PHONON CORPORATION

FILE=4AC8B02A.DAT 14:03:52 05-28-1998
PN_100034_826 FINAL_FUNCTIONAL TEMP:C PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 317.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25
REFERENCES: LOSS(DB)= 28.97637 PHASE(DEG)= 4437.35 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 8.392516E-02 PHASE(DEG)= 743.5385
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV



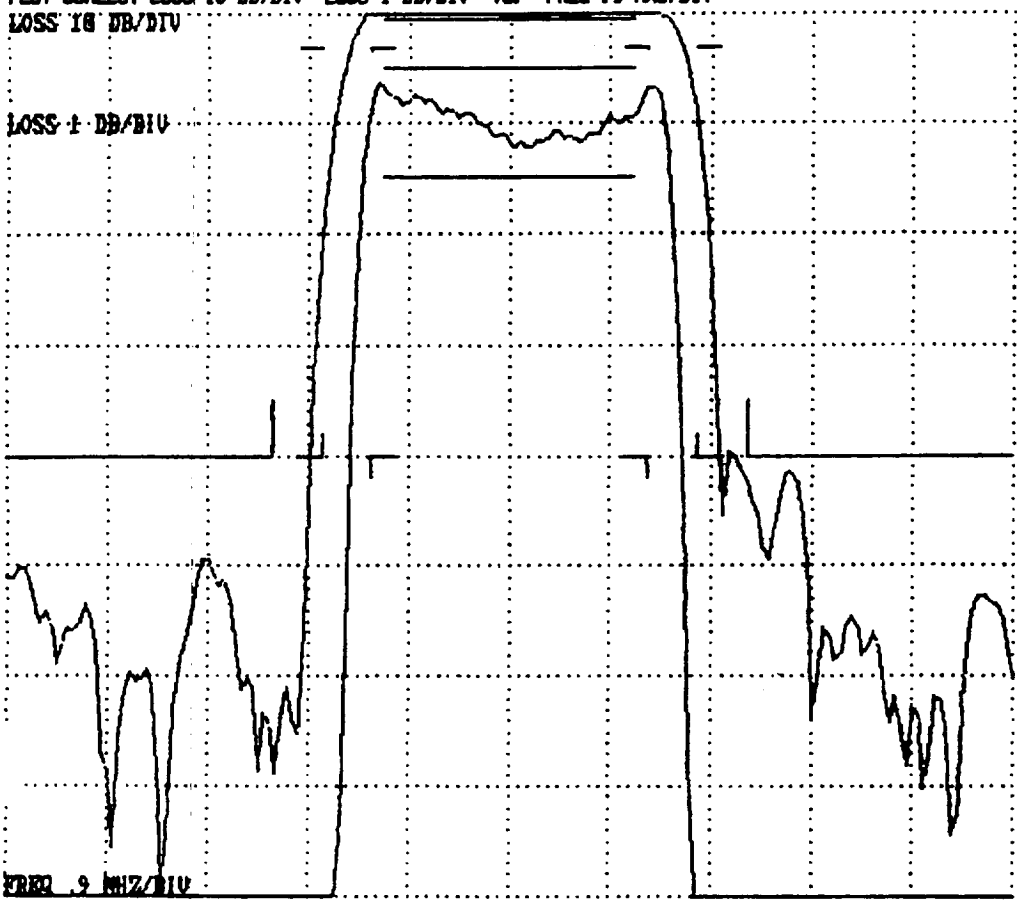
PEAK: LEVEL(DB)= 28.73477 FREQ(MHZ)= 316.5109 DELAY(US)=-3.873554 SIDELOBE(DB)=-41.29675
ENERGY: LEVEL(DB)= 29.14792 CENTER(MHZ)= 317.7896 WIDTH(MHZ)= 3.053399 SKEW(MHZ)= 1.324691E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.24	316.51089	316.51089	316.51089	0.00000	316.51089	0.00000	0.00	316.51089	316.51089
0.50	316.37842	319.03329	317.70587	2.65488	317.69366	2.64985	-13.51	316.37842	319.03329
1.00	316.33725	319.07783	317.70715	2.73978	317.69458	2.73435	-14.97	316.33725	319.07783
2.00	316.29114	319.13751	317.71432	2.84637	317.69632	2.80452	-16.77	316.29114	319.13751
3.00	316.25674	319.17488	317.71576	2.91886	317.71149	2.83413	-17.83	316.25674	319.17488
4.00	316.22748	319.20767	317.71759	2.98019	317.71027	2.87923	-20.36	316.22748	319.20767
5.00	316.20322	319.23438	317.71881	3.03116	317.71027	2.87923	-20.32	316.20322	319.23438
6.00	316.18240	319.25778	317.72009	3.07538	317.70953	2.90812	-23.45	316.18240	319.25778
10.00	316.11746	319.33090	317.72418	3.21344	317.70932	2.92409	-27.23	316.11746	319.33090
20.00	316.01315	319.44400	317.72858	3.43085	317.70944	2.93419	-37.74	316.01315	319.44400
30.00	315.94980	319.51120	317.73050	3.56140	317.70953	2.93508	-49.85	315.94980	319.51120
40.00	315.91479	319.55298	317.73389	3.63818	317.70953	2.93508	-58.30	315.91479	319.55298

BAND(MHZ)	316.575	318.825
LMIN(DB)	-0.17	
LMAX(DB)	0.17	
LDEL(DB)	0.34	
PMIN(DEG)	-1262.34	
PMAX(DEG)	1255.89	
PDEL(DEG)	2518.22	

File: 4AC8B02A.DAT Passband Symmetry = 0.0 dB

PHONON CORPORATION
FILE=4CC8B02A.DAT 14:03:56 05-28-1998
PN_100834_826 FINAL_FUNCTIONAL TEMP:C PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 326.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25
DIFFERENCES: LOSS(DB)= 28.65714 PHASE(DEG)=-2932.698 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1462517 PHASE(DEG)= 742.2654
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV



PEAK: LEVEL(DB)= 28.2887 FREQ(MHZ)= 325.5515 DELAY(US)=-3.164168 SIDELOBE(DB)=-40.00201
ENERGY: LEVEL(DB)= 28.77118 CENTER(MHZ)= 326.7459 WIDTH(MHZ)= 3.075341 SKEW(MHZ)= 1.869928E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.38	325.55145	325.55145	325.55145	0.00000	325.55145	0.00000	0.00	325.55145	325.55145
0.50	325.38800	328.12500	326.75650	2.73700	326.74164	2.76899	-14.45	325.38800	328.12500
1.00	325.35657	328.15524	326.75592	2.79868	326.76199	2.80960	-15.26	325.35657	328.15524
2.00	325.31149	328.19983	326.75568	2.88834	326.74286	2.84819	-16.21	325.31149	328.19983
3.00	325.27725	328.23254	326.75488	2.95529	326.74408	2.90986	-18.48	325.27725	328.23254
4.00	325.24911	328.25925	326.75418	3.01013	326.74496	2.95878	-21.29	325.24911	328.25925
5.00	325.22513	328.28235	326.75372	3.05722	326.74496	2.95878	-21.26	325.22513	328.28235
6.00	325.20407	328.30264	326.75336	3.09857	326.75177	2.96374	-22.71	325.20407	328.30264
10.00	325.13000	328.36697	326.75250	3.22897	326.74582	2.98636	-29.03	325.13000	328.36697
20.00	325.03186	328.46741	326.74963	3.43555	326.74594	2.99520	-41.12	325.03186	328.46741
30.00	324.96353	328.52866	326.74210	3.55713	326.74591	2.99555	-47.97	324.96353	328.52866
40.00	324.91748	328.56729	326.74237	3.64981	326.74591	2.99559	-50.32	324.91748	328.68329

BAND(MHZ)	325.575	327.825
LMIN(DB)	-0.38	
LMAX(DB)	0.21	
LDEL(DB)	0.51	
PMIN(DEG)	-1256.34	
PMAX(DEG)	1258.34	
PDEL(DEG)	2514.69	

File: 4CC8B02A.DAT Passband Symmetry = 0.0 dB

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-4 PHONON PART: 100826 SERIAL: 002
TESTED BY: PORCH TITLE: TECH DATE: 4/24/97 TIME: 10:00 AM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410A07982 CAL DUE: 10/12/97
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/8/97

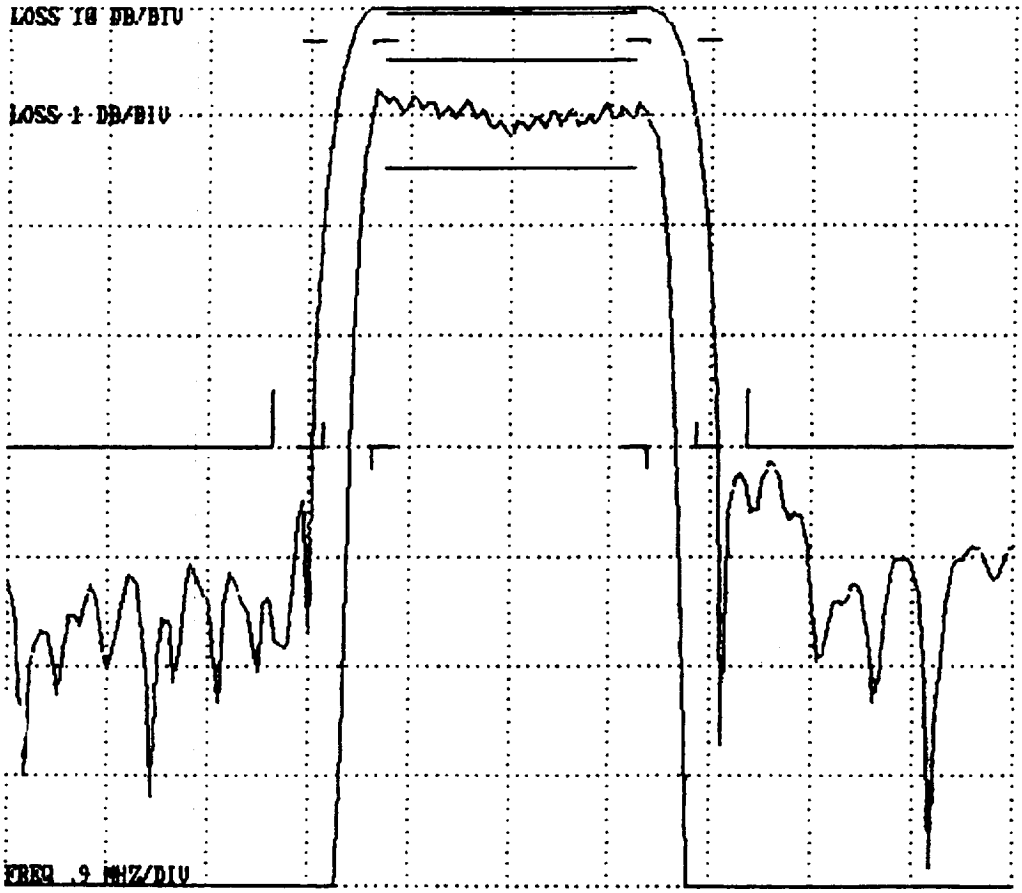
PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	15.8	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 317.535/317.865 MHz	317.725	MHz	P
		HI: 326.535/326.865 MHz	326.767	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 2.8/3.8 MHz	2.919	MHz	P
		HI: 2.8/3.8 MHz	2.935	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.0	dB	P
		HI: /0.5 dB	0.1	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		316.575-318.825 MHz: /1.0 dB	0.3	dB	P
		325.575-327.825 MHz: /1.0 dB	0.5	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/38.2 dB	29.1	dB	P
		HI: 27.8/38.2 dB	29.8	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.0	dB	P
		HI: -0.4/0.4 dB	0.0	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.3	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-313,331-1000 MHz:	46.2	0.000	
		DUAL: 313.000-315.585, 319.815-324.585, 328.815-331.0 MHz:	41.4	0.000	
		PEAK: 35.0/ dB	41.4	dB	P
		WIDTH: /0.6 MHz		0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.24	Unitless	P
		HI: /1.30 Unitless	1.23	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		316.575-318.825, 325.575-327.825 MHz			
		DUAL S11: 7.5/ dB	9.4	dB	P
		DUAL S22: 7.5/ dB	8.5	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.1/0.1 MHz	+0.001	MHz	
		3 dB BANDWIDTH: -0.05/0.05 MHz	0	MHz	
		INSERTION LOSS: -0.5/0.5 dB	+0.1	dB	
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P (DP)		

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-8211
FAX: 203-651-8618

PHONON CORPORATION

FILE=4AR8802A.DAT 14:04:09 05-28-1998
PN_100834_826 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 317.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25
REFERENCES: LOSS(DB)= 29.07385 PHASE(DEG)= 3781.215 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 0.576339E-02 PHASE(DEG)= 743.5031
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV



PEAK: LEVEL(DB)= 28.83942 FREQ(MHZ)= 316.5176 DELAY(US)=-3.069631 SIDELOBE(DB)=-41.67301
ENERGY: LEVEL(DB)= 29.24436 CENTER(MHZ)= 317.7191 WIDTH(MHZ)= 3.053117 SKEW(MHZ)= 1.385556E-02

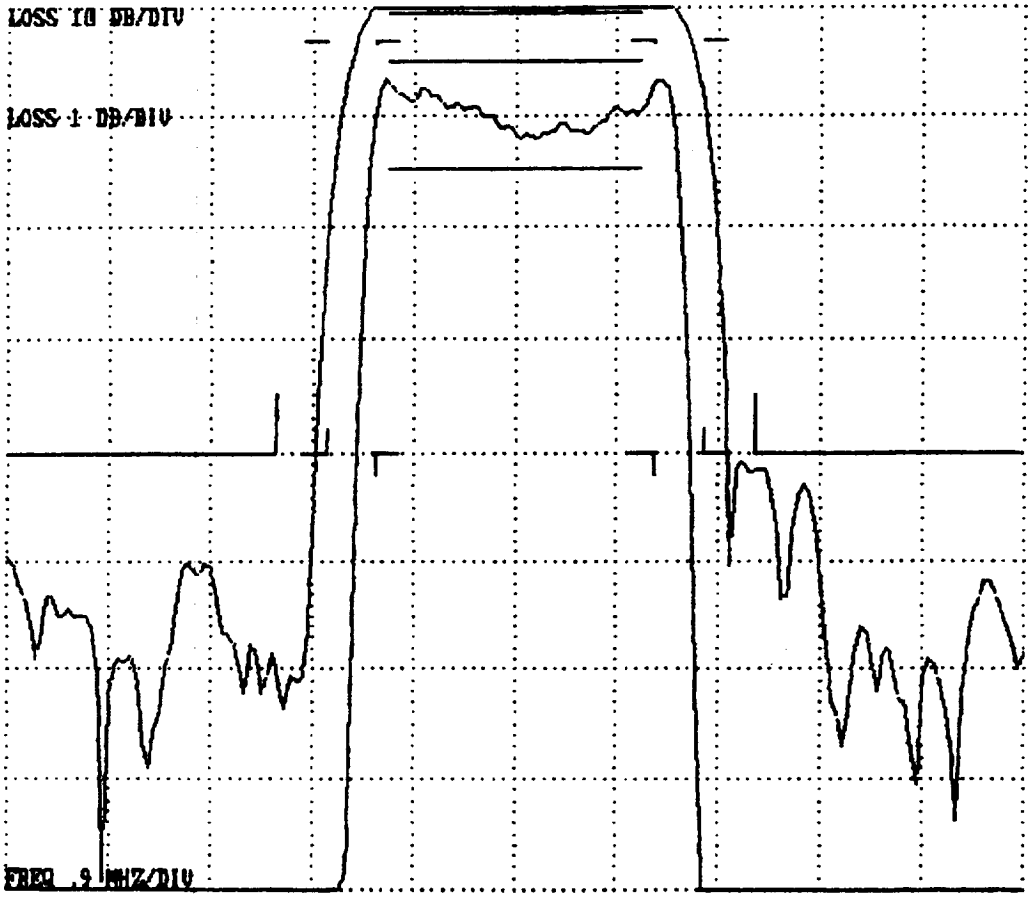
L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.24	316.51764	316.51764	316.51764	0.00000	316.51764	0.00000	0.00	316.51764	316.51764
0.50	316.38715	319.04407	317.71561	2.65692	317.69485	2.64947	-13.50	316.38715	319.04407
1.00	316.34659	319.08368	317.71515	2.73709	317.69684	2.73394	-14.97	316.34659	319.08368
2.00	316.29916	319.14630	317.72272	2.84714	317.69992	2.80348	-16.73	316.29916	319.14630
3.00	316.26486	319.18423	317.72455	2.91937	317.71579	2.83438	-17.85	316.26486	319.18423
4.00	316.23685	319.21567	317.72626	2.97882	317.71616	2.87938	-20.38	316.23685	319.21567
5.00	316.21262	319.24289	317.72775	3.03027	317.71616	2.87938	-20.34	316.21262	319.24289
6.00	316.19189	319.26718	317.72955	3.07529	317.71680	2.90886	-23.46	316.19189	319.26718
10.00	316.12735	319.34045	317.73389	3.21310	317.71768	2.92392	-27.20	316.12735	319.34045
20.00	316.02390	319.45364	317.73877	3.42975	317.71915	2.93459	-41.04	316.02390	319.45364
30.00	315.95914	319.52792	317.74353	3.56879	317.71989	2.93494	-47.82	315.95914	319.52792
40.00	315.93463	319.55649	317.74554	3.62186	317.71989	2.93498	-50.33	315.93463	319.55649

BAND(MHZ)	316.575	318.825
LMIN(DB)	-0.17	
LMAX(DB)	0.19	
LDEL(DB)	0.36	
PMIN(DEG)	-1262.38	
PMAX(DEG)	1255.48	
PDEL(DEG)	2517.77	

File: 4AR8802A.DAT Passband Symmetry = 0.0 dB

PHONON CORPORATION

FILE=4CR8B02A.DAT 14:04:13 05-28-1998
PN_100834_826 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 326.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25
REFERENCES: LOSS(DB)= 28.78273 PHASE(DEG)=-3228.638 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1415508 PHASE(DEG)= 742.3314
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV



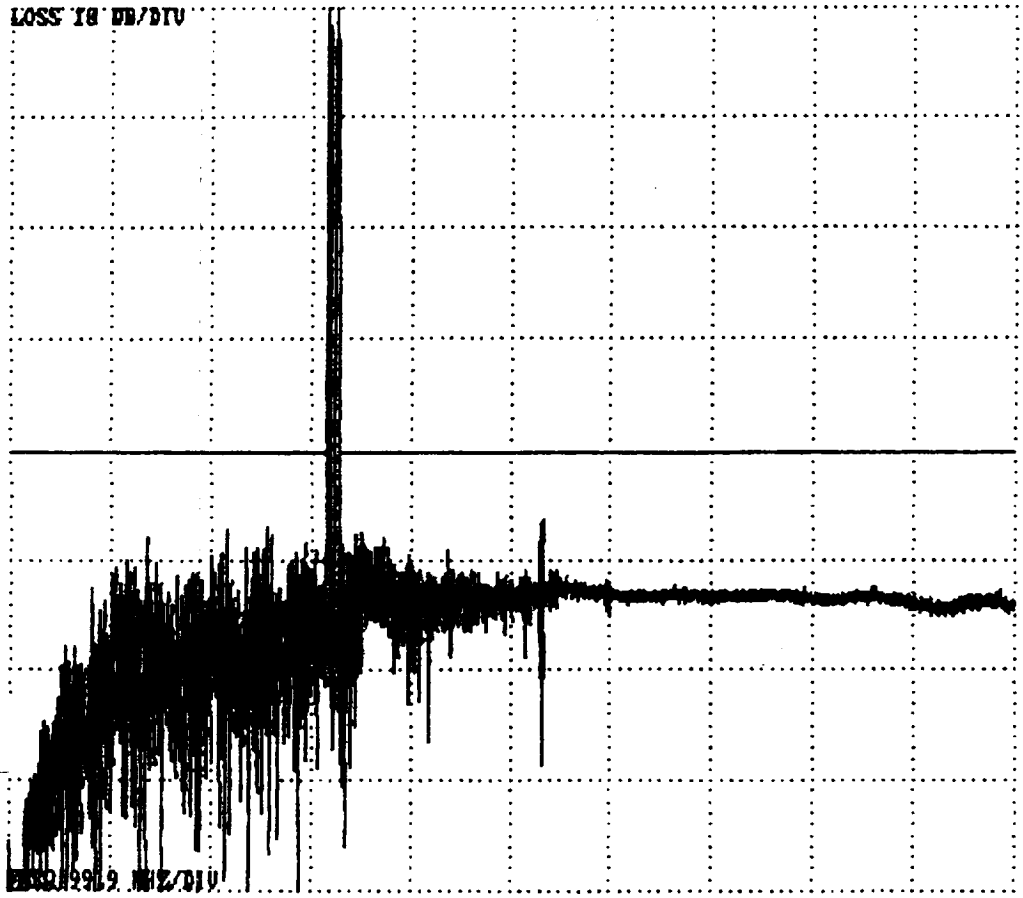
PEAK: LEVEL(DB)= 28.42048 FREQ(MHZ)= 325.5613 DELAY(US)=-3.155596 SIDELOBE(DB)=-41.16482
ENERGY: LEVEL(DB)= 28.89982 CENTER(MHZ)= 326.7595 WIDTH(MHZ)= 3.073975 SMEN(MHZ)= 1.597321E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.36	325.56131	325.56131	325.56131	0.00000	325.56131	0.00000	0.00	325.56131	325.56131
0.50	325.40873	328.13492	326.76782	2.73419	326.76678	2.72208	-13.66	325.40873	328.13492
1.00	325.37198	328.16742	326.76971	2.79544	326.76614	2.80913	-15.29	325.37198	328.16742
2.00	325.32370	328.21176	326.76773	2.88806	326.76511	2.87932	-17.38	325.32370	328.21176
3.00	325.28922	328.24457	326.76691	2.95535	326.75143	2.90641	-18.42	325.28922	328.24457
4.00	325.26093	328.27124	326.76608	3.01031	326.76370	2.93039	-19.76	325.26093	328.27124
5.00	325.23703	328.29422	326.76563	3.05719	326.75449	2.94838	-21.17	325.23703	328.29422
6.00	325.21594	328.31458	326.76526	3.09863	326.76221	2.96322	-22.84	325.21594	328.31458
10.00	325.14963	328.37912	326.76437	3.22949	326.75827	2.98649	-28.88	325.14963	328.37912
20.00	325.04321	328.48083	326.76282	3.43762	326.75937	2.99366	-40.68	325.04321	328.48083
30.00	324.97461	328.54126	326.75793	3.56665	326.75943	2.99486	-47.69	324.97461	328.54126
40.00	324.92731	328.57147	326.74939	3.64417	326.75946	2.99411	-50.78	324.92731	328.57147

BAND(MHZ)	325.575	327.825
LMIN(DB)	-0.31	
LMAX(DB)	0.21	
LDEL(DB)	0.53	
PMIN(DEG)	-1256.42	
PMAX(DEG)	1258.41	
PDEL(DEG)	2514.83	

File: 4CR8B02A.DAT Passband Symmetry = 0.1 dB

PHONON CORPORATION
FILE=4ER8B02A.DAT 14:04:17 05-28-1998
PN_100834_826 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N WIDE_S21
06-23-1997 HP8753;SSREF,SSREF,SSREF
EQUENCY(MHZ): CENTER= 500.5 WIDTH= 999 INCR.= .200125 SYSTEM BANDWIDTH= 999
FERENCES: LOSS(DB)= 28.92789 PHASE(DEG)= 1373.017 DELAY(US)= 4.732862 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 7.888999 PHASE(DEG)= 10193.56
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 99.9 MHZ/DIV
LOSS 10 DB/DIV



FREQ 99.9 MHZ/DIV
PEAK: LEVEL(DB)= 28.36957 FREQ(MHZ)= 327.8936 DELAY(US)= 6.336682 SIDELOBE(DB)=-42.15535
ENERGY: LEVEL(DB)= 29.06486 CENTER(MHZ)= 322.5975 WIDTH(MHZ)= 6.128643 SKEW(MHZ)= 381.532

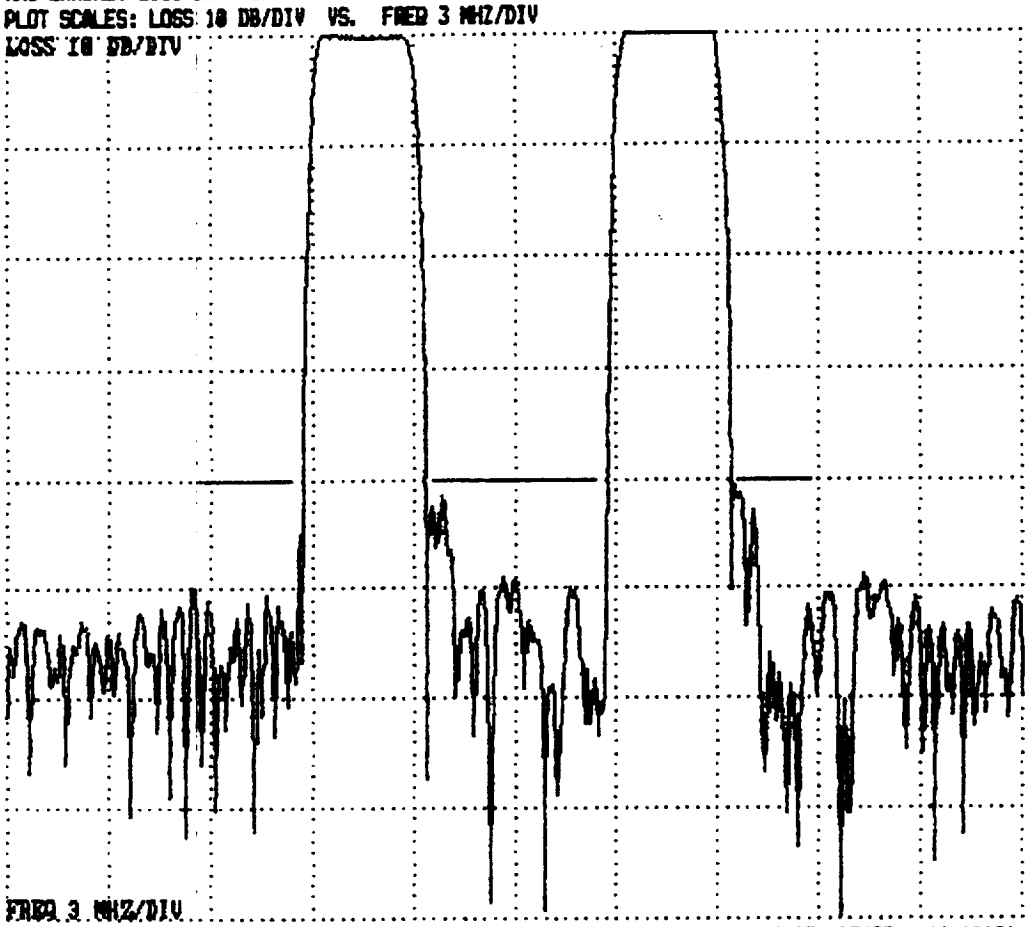
L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.56	327.89355	327.89355	327.89355	0.00000	327.89355	0.00000	0.00	327.89355	327.89355
0.50	325.39484	328.15189	326.77338	2.75705	326.78996	2.82016	-25.04	316.38080	327.89355
1.00	325.35867	328.17441	326.76654	2.81573	326.79178	2.98729	-25.28	316.34634	328.17441
2.00	325.31238	328.22250	326.76746	2.91013	326.79178	2.98729	-25.28	316.30518	328.22250
3.00	325.28137	328.26651	326.77393	2.98514	326.79178	2.98729	-25.28	316.25500	328.26651
4.00	325.25748	328.29685	326.77676	3.03857	326.74985	3.07126	-25.41	316.20813	328.29685
5.00	325.23566	328.31741	326.77655	3.08176	326.74985	3.07126	-25.41	316.18161	328.31741
6.00	325.21429	328.33429	326.77429	3.12000	326.74985	3.07126	-25.41	316.16333	328.33429
10.00	325.14365	328.38083	326.76224	3.23718	326.76893	3.09223	-25.44	316.11887	328.38083
20.00	325.04514	328.43866	326.74188	3.39352	326.75946	3.09487	-25.44	316.06812	328.43866
30.00	324.99197	328.49646	326.74420	3.50449	326.75946	3.09487	-25.44	316.02573	328.49646
40.00	324.93884	328.55429	326.74658	3.61545	326.75946	3.09487	-25.44	315.98337	328.55429

BAND(MHZ)	1.000	313.000	331.000	1000.000
LMIN(DB)	46.90	-0.46	46.21	
LMAX(DB)	108.00	68.28	76.12	
LDEL(DB)	61.10	68.74	29.91	
PMIN(DEG)	-9999.00	722.48	-9999.00	
PMAX(DEG)	2682.26	4116.51	3797.99	
PDEL(DEG)	12681.26	3394.03	13796.99	

FILE: 4ER8B02A.DAT Out-of-band Rejection: PEAK= 46.2 dB WIDTH= 0.000 MHz

PHONON CORPORATION

FILE=4FR8B02A.DAT 14:04:19 05-28-1998
PN_100834_826 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSREF,SSREF,SSREF
FREQUENCY(MHZ): CENTER= 322.2 WIDTH= 30 INCR.= .05 SYSTEM BANDWIDTH= 30
REFERENCES: LOSS(DB)= 28.92789 PHASE(DEG)= 291.5657 DELAY(US)= 1.872925 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= 23.53657 PHASE(DEG)= 1183.948
PLOT SCALES: LOSS 10 DB/DIV VS. FREQ 3 MHZ/DIV



PEAK: LEVEL(DB)= 28.42049 FREQ(MHZ)= 325.5613 DELAY(US)= .5982491 SIDELOBE(DB)=-41.16481
ENERGY: LEVEL(DB)= 29.06124 CENTER(MHZ)= 322.4353 WIDTH(MHZ)= 6.119556 SKEW(MHZ)=-.3693376

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.51	325.56128	325.56128	325.56128	0.00000	325.56128	0.00000	0.00	325.56128	325.56128
0.50	325.39227	328.14600	326.76913	2.75372	326.74484	2.86058	-9.48	316.48356	328.14600
1.00	325.36368	328.17585	326.76935	2.81137	326.76611	2.90461	-9.54	316.35483	328.17585
2.00	325.31812	328.21701	326.76758	2.89890	326.76511	2.97719	-9.63	316.30585	328.21701
3.00	325.28479	328.24869	326.76672	2.96390	326.75143	3.00520	-9.66	316.26938	328.24869
4.00	325.25720	328.27475	326.76599	3.01755	326.76378	3.02999	-9.69	316.24866	328.27475
5.00	325.23388	328.29730	326.76556	3.06351	326.75446	3.04860	-9.71	316.21588	328.29730
6.00	325.21307	328.31738	326.76523	3.10431	326.76221	3.06394	-9.73	316.19473	328.31738
10.00	325.14761	328.38110	326.76434	3.23349	326.75827	3.08000	-9.74	316.12933	328.38110
20.00	325.04282	328.48193	326.76196	3.43991	326.75937	3.09542	-9.72	316.02585	328.48193
30.00	324.97379	328.54190	326.75784	3.56812	326.75943	3.09583	-9.70	315.95969	328.54190
40.00	324.92667	328.57187	326.74927	3.64520	326.75943	3.09586	-9.69	315.93494	328.57187

BAND(MHZ)	316.575	318.825	325.575	327.825
LMIN(DB)	-0.82	-0.50	-0.46	
LMAX(DB)	0.34	79.21	0.07	
LDEL(DB)	0.36	79.72	0.53	
PMIN(DEG)	-65.11	-667.33	-1000.81	
PMAX(DEG)	969.31	433.51	30.66	
PDEL(DEG)	1034.41	1100.84	1031.47	

FILE: 4FR8B02A.DAT Out-of-band Rejection: PEAK= 41.4 dB WIDTH= 0.000 MHz

PHONON CORPORATION
FILE: 4FR8802A.DAT (+SSCF)
PN_100834_826 FINAL_FUNCTIONAL TEMP:R PROTOFLIGHT /N DUAL_SXX
06-23-1997 HP8753,SSREF,SSMEF,SGMEF,SSCF
FERENCES: LOSS(DB)= 28.92789 PHASE(DEG)= 291.5657
DELAY(US)= 1.872925 SLOPE(US/MHZ)= 0

BANDPASS CHARACTERISTICS MEASUREMENT

FREQUENCY(MHZ)	LOSS(DB)	PHASE(DEG)
315.000	53.69	983.12
315.720	57.12	1083.93
316.440	0.24	1037.64
317.160	0.09	788.94
317.880	0.23	370.87
318.600	0.14	29.48
319.320	0.07	-389.85
320.040	41.47	-385.93
320.760	52.00	-597.91
321.480	70.94	-448.66
322.200	49.30	-291.57
322.920	55.00	62.14
323.640	58.00	-19.46
324.360	57.21	301.78
325.080	15.70	265.40
325.800	-0.29	-63.36
326.520	-0.10	-401.53
327.240	-0.00	-738.70
327.960	-0.46	-1074.74
328.680	40.47	-1210.52
329.400	52.03	-1563.22

ELECTRICAL TEST DATA SHEET

AEROJET PART: 1331576-4 PHONON PART: 100826 SERIAL: 002
TESTED BY: DORGU TITLE: MGR DATE: 6/24/97 TIME: 10:00AM
TEST: FINAL FUNCTIONAL
EQUIPMENT: HP 8753D SERIAL: 3410087982 CAL DUE: 10/12/97
HP 3478A SERIAL: 2136A03127 CAL DUE: 7/8/97

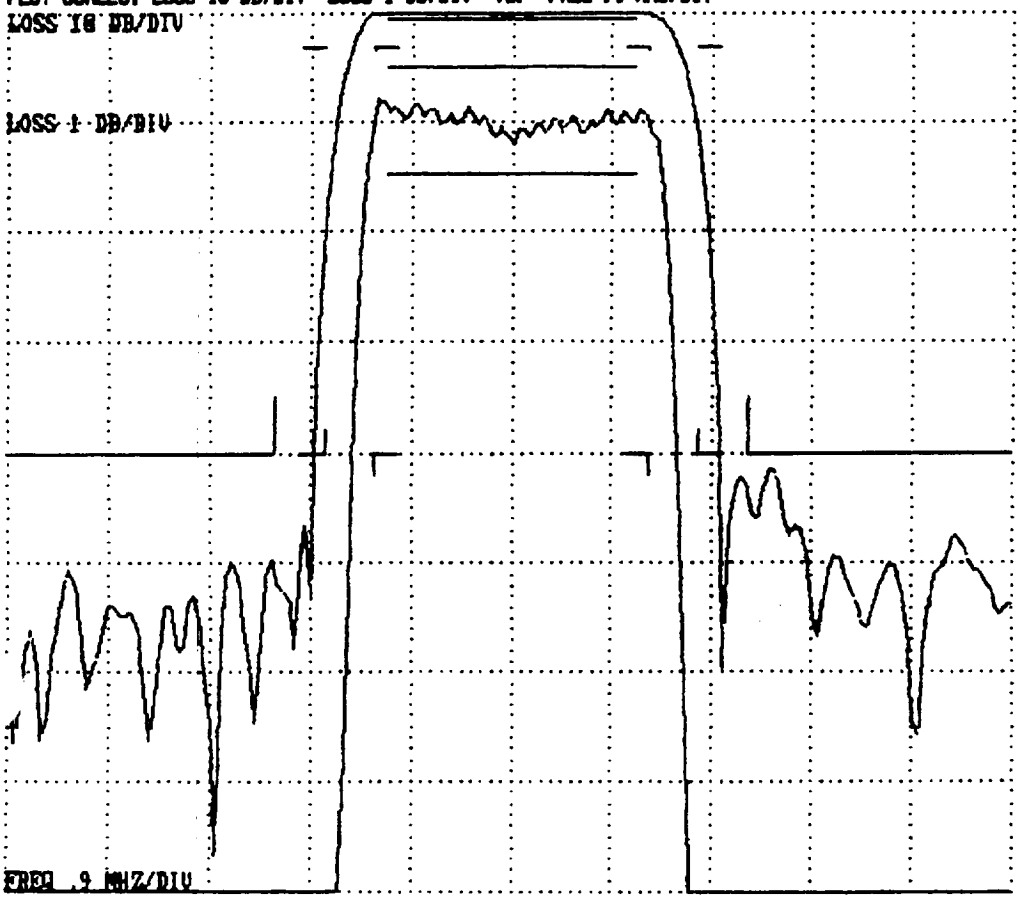
PARAGRAPH REQ.	PARAGRAPH Q/ATP	REQUIREMENT TITLE	DATA		P/F
3.2.1.1	5.2.1	OPERATING TEMPERATURE	35.6	C	P
3.2.1.3	5.2.3	CENTER FREQUENCY &			
3.2.1.4		CENTER FREQUENCY STABILITY			
		LO: 317.535/317.865 MHz	317.786	MHz	P
		HI: 326.535/326.865 MHz	326.769	MHz	P
3.2.1.5	5.2.4	3 dB BANDWIDTH:			
		LO: 2.8/3.8 MHz	2.918	MHz	P
		HI: 2.8/3.8 MHz	2.953	MHz	P
3.2.1.6	5.2.5	PASSBAND SYMMETRY			
		LO: /0.5 dB	0.1	dB	P
		HI: /0.5 dB	0.1	dB	P
3.2.1.7	5.2.6	PASSBAND RIPPLE			
		316.575-318.825 MHz: /1.0 dB	0.3	dB	P
		325.575-327.825 MHz: /1.0 dB	0.5	dB	P
3.2.1.8	5.2.7	INSERTION LOSS			
		LO: 27.8/30.2 dB	29.2	dB	P
		HI: 27.8/30.2 dB	28.9	dB	P
3.2.1.9	5.2.8	INSERTION LOSS VARIATION			
		LO: -0.4/0.4 dB	0.1	dB	P
		HI: -0.4/0.4 dB	0.1	dB	P
3.2.1.10	5.2.9	AMPLITUDE BALANCE			
		LO,HI: /0.5 dB	0.3	dB	P
3.2.1.11	5.2.10	OUT-OF-BAND REJECTION			
		BAND	PEAK(dB)	WIDTH(MHz)	
		WIDE: 1-313,331-1000 MHz:	45.9	0.000	
		DUAL: 313.000-315.585, 319.015-324.585, 328.015-331.0 MHz:	48.1	0.000	
		PEAK: 35.0/ dB	48.1 dB		P
		WIDTH: /0.6 MHz		0.000 MHz	P
3.2.1.12	5.2.11	SHAPE FACTOR			
		LO: /1.30 Unitless	1.24	Unitless	P
		HI: /1.30 Unitless	1.23	Unitless	P
3.2.1.14	5.2.12	VSWR (RETURN LOSS)			
		316.575-318.825, 325.575-327.825 MHz			
		DUAL S11: 7.5/ dB	9.6	dB	P
		DUAL S22: 7.5/ dB	8.5	dB	P
4.8.2	5.2.14	LIMITED FUNCTIONAL TESTS			
		CENTER FREQUENCY: -0.1/0.1 MHz	0	MHz	P
		3 dB BANDWIDTH: -0.06/0.06 MHz	0	MHz	P
		INSERTION LOSS: -0.5/0.5 dB	0	dB	P
NONE	5.2.15	DATA SHEET SUMMARY (PASS/FAIL)	P	DP	

PHONON CORPORATION
7 HERMAN DRIVE
SIMSBURY, CT 06070

CAGE: 6Y858
TEL: 203-651-8211
FAX: 203-651-8618

PHONON CORPORATION

FILE=4AH8B02A.DAT 14:04:26 05-28-1998
N_100034_826 FINAL_FUNCTIONAL TEMP:H PROTOFLIGHT /N DUAL_SXX
6-23-1997 HP8753;SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 317.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25
REFERENCES: LOSS(DB)= 29.19852 PHASE(DEG)= 4185.612 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .0843787 PHASE(DEG)= 743.5253
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV

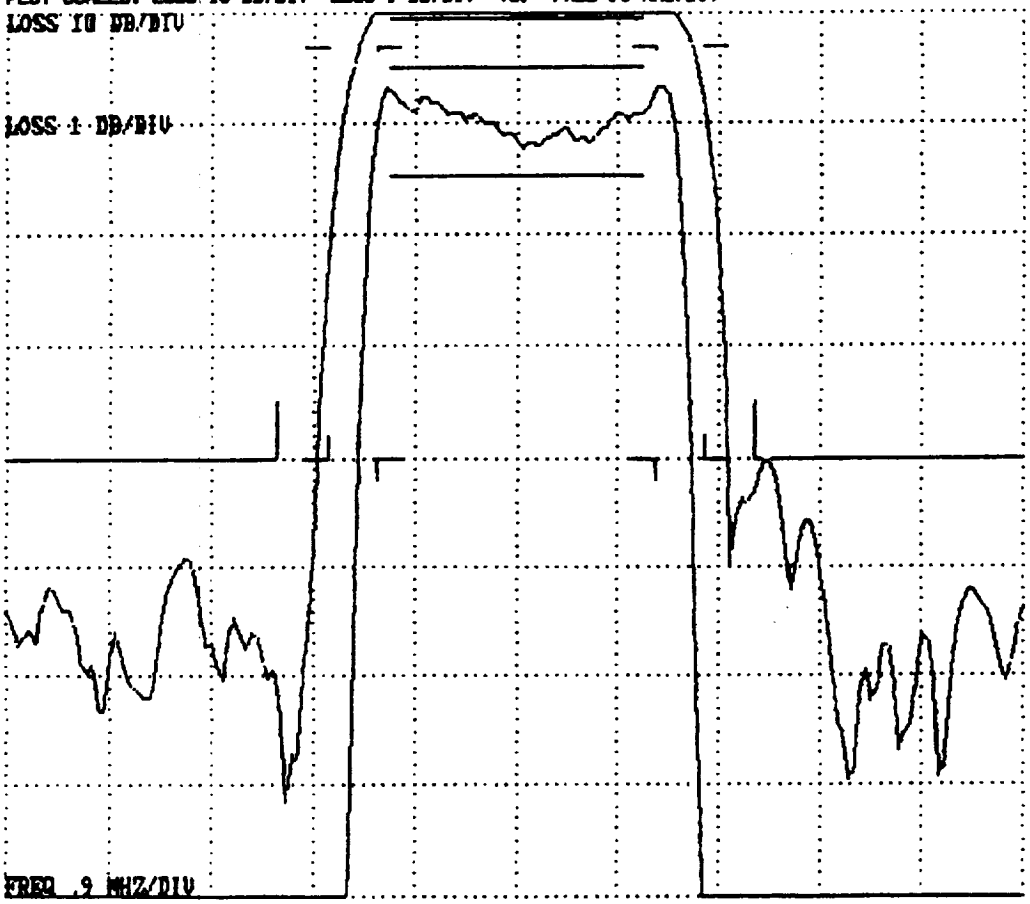


PEAK: LEVEL(DB)= 28.96238 FREQ(MHZ)= 316.5211 DELAY(US)=-3.865264 SIDELOBE(DB)=-41.7466
ENERGY: LEVEL(DB)= 29.36138 CENTER(MHZ)= 317.7214 WIDTH(MHZ)= 3.051783 SKEW(MHZ)= 1.129812E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.23	316.52186	316.52186	316.52186	0.00000	316.52186	0.00000	0.00	316.52186	316.52186
0.50	316.38791	319.04599	317.71695	2.65808	317.69617	2.64953	-13.52	316.38791	319.04599
1.00	316.34760	319.08432	317.71594	2.73672	317.69830	2.73397	-14.99	316.34760	319.08432
2.00	316.30148	319.14670	317.72409	2.84521	317.71741	2.77178	-15.82	316.30148	319.14670
3.00	316.26672	319.18478	317.72577	2.91806	317.71744	2.83413	-17.88	316.26672	319.18478
4.00	316.23871	319.21619	317.72745	2.97748	317.71802	2.87858	-20.42	316.23871	319.21619
5.00	316.21457	319.24358	317.72903	3.02893	317.71802	2.87858	-20.38	316.21457	319.24358
6.00	316.19388	319.26773	317.73080	3.07385	317.71884	2.90736	-23.58	316.19388	319.26773
10.00	316.12939	319.34097	317.73517	3.21158	317.71985	2.92385	-27.25	316.12939	319.34097
20.00	316.02585	319.45432	317.74008	3.42847	317.72144	2.93362	-41.14	316.02585	319.45432
30.00	315.96133	319.52649	317.74398	3.56516	317.72137	2.93396	-47.85	315.96133	319.52649
40.00	315.93256	319.55928	317.74588	3.62665	317.72137	2.93408	-58.29	315.93256	319.55928

BAND(MHZ) 316.575 318.825
LMIN(DB) -0.16
LMAX(DB) 0.20
LDEL(DB) 0.36
PMIN(DEG) -1262.45
PMAX(DEG) 1255.49
EL(DEG) 2517.94
le: 4AH8B02A.DAT Passband Symmetry = 0.1 dB

PHONON CORPORATION
FILE=4CH8B02A.DAT 14:04:30 05-28-1998
PN_100834_826 FINAL_FUNCTIONAL TEMP:H PROTOFLIGHT /N DUAL_SXX
05-23-1997 HP8753;SSCF,SSFFIX,SSREF
FREQUENCY(MHZ): CENTER= 326.7 WIDTH= 9 INCR.= .05 SYSTEM BANDWIDTH= 2.25
REFERENCES: LOSS(DB)= 28.91658 PHASE(DEG)=-2024.175 DELAY(US)= 0 SLOPE(US/MHZ)= 0
RMS ERRORS: LOSS(DB)= .1389234 PHASE(DEG)= 742.4118
PLOT SCALES: LOSS 10 DB/DIV LOSS 1 DB/DIV VS. FREQ .9 MHZ/DIV



PEAK: LEVEL(DB)= 28.57363 FREQ(MHZ)= 325.5639 DELAY(US)=-3.151983 SIDELOBE(DB)=-40.59039
ENERGY: LEVEL(DB)= 29.03484 CENTER(MHZ)= 326.7638 WIDTH(MHZ)= 3.074134 SHEW(MHZ)= 1.338215E-02

L(DB)	LO(MHZ)	HI(MHZ)	CTR(MHZ)	WID(MHZ)	AV-CTR(MHZ)	AV-WID(MHZ)	AV-SL(DB)	LOX(MHZ)	HIX(MHZ)
-0.34	325.56390	325.56390	325.56390	0.00000	325.56390	0.00000	0.00	325.56390	325.56390
0.50	325.40564	328.13666	326.77115	2.73102	326.76889	2.72172	-13.70	325.40564	328.13666
1.00	325.37640	328.16882	326.77261	2.79242	326.76859	2.80833	-15.33	325.37640	328.16882
2.00	325.32779	328.21298	326.77039	2.88519	326.76801	2.87881	-17.35	325.32779	328.21298
3.00	325.29300	328.24585	326.76941	2.95285	326.75467	2.90438	-18.45	325.29300	328.24585
4.00	325.26434	328.27258	326.76846	3.00824	326.76783	2.92861	-19.82	325.26434	328.27258
5.00	325.24030	328.29559	326.76794	3.05530	326.75886	2.94604	-21.20	325.24030	328.29559
6.00	325.21915	328.31681	326.76758	3.09686	326.76590	2.96111	-22.91	325.21915	328.31681
10.00	325.15265	328.38865	326.76666	3.22800	326.76498	2.97910	-26.70	325.15265	328.38865
20.00	325.04590	328.48260	326.76425	3.43671	326.76364	2.99106	-40.51	325.04590	328.48260
30.00	324.97699	328.54468	326.76083	3.56769	326.76373	2.99146	-47.62	324.97699	328.54468
40.00	324.93045	328.57315	326.75180	3.64270	326.76373	2.99151	-50.98	324.93045	328.57315

BAND(MHZ)	325.575	327.825
LMIN(DB)	-0.38	
LMAX(DB)	0.23	
LDEL(DB)	0.52	
PMIN(DEG)	-1256.41	
PMAX(DEG)	1258.42	
PDEL(DEG)	2514.83	

File: 4CH8B02A.DAT Passband Symmetry - 0.1 dB

Channel 15 Bandpass Filter

IF Filter (S/N: 1331559-1, S/N: 227-005)

APPENDIX A **ACCEPTANCE TEST REPORT**

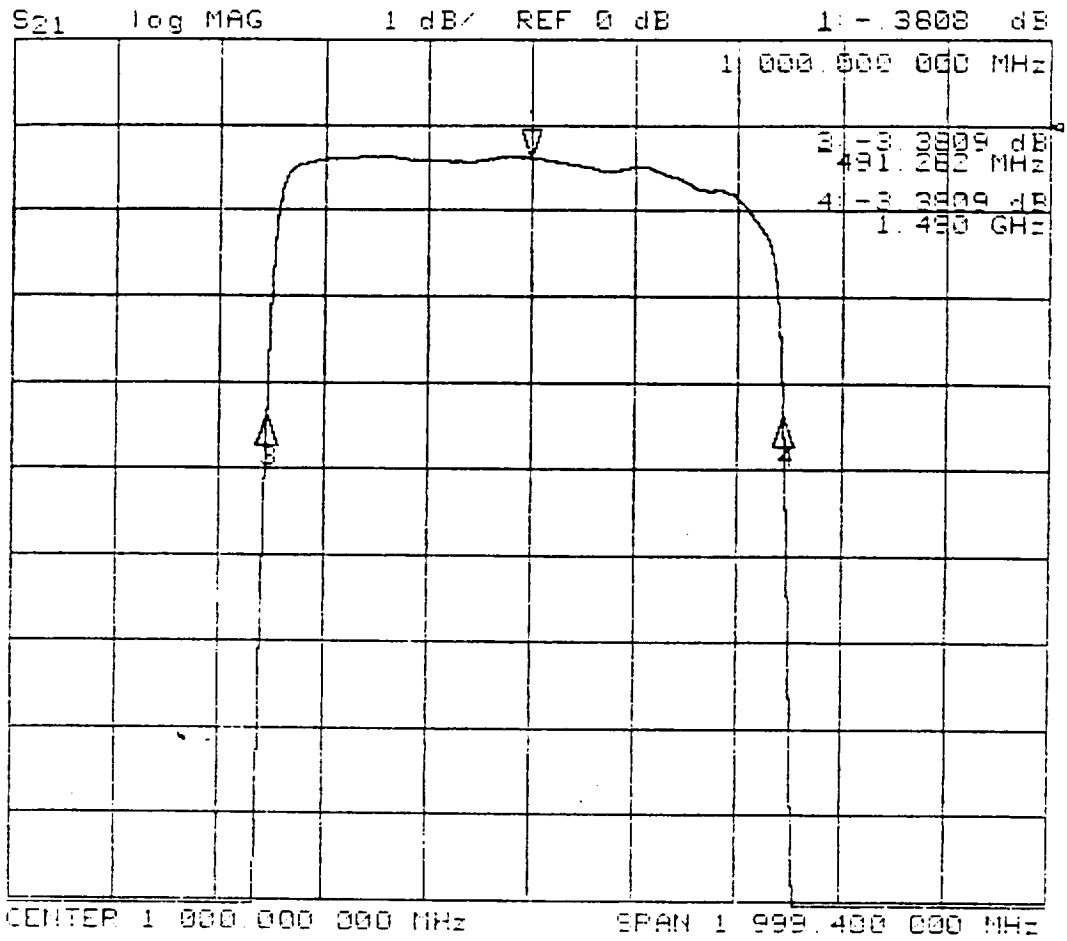
BANDPASS FILTER MODEL HL1000-1000-10SS1 S/N P227-005
AEROJET 1331559-1 REV. E

3.0 dB BANDWIDTH

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.3	-10°C	+15°C	+40°C
{7} UPPER 3.0 dB BANDEDGE	1490.04 MHz (1480.0-1500.0)	1488.57 Mhz (1480.0-1500.0)	1487.40 MHz (1480.01500.0)
{8} LOWER 3.0 dB BANDEDGE	491.26 MHz (480.0-500.0)	490.51 Mhz (480.0-500.0)	489.89 MHz (480.0-500.0)
{9} 3.0 dB RELATIVE BANDWIDTH	998.78 MHz (980.0-1020.0)	995.03 Mhz (980.0-1020.0)	997.51 MHz (980.0-1020.0)
{10} ADD {7} AND {8} ÷ 2 =	990.65 MHz (1000.0 NOM)	989.56 MHz (1000.0 NOM)	988.65 Mhz (1000.0 NOM)
{10a} RECORD MEASURED TEMPERATURE	-11.6 °C (-15.0 TO -10.0)	+15.8 °C (12.5 TO 17.5)	+40.6 °C (40.0 TO 45.0)
{6} ATTACH TRANSMISSION LOSS PERFORMANCE X-Y PLOT	✓ (√)	✓ (√)	✓ (√)

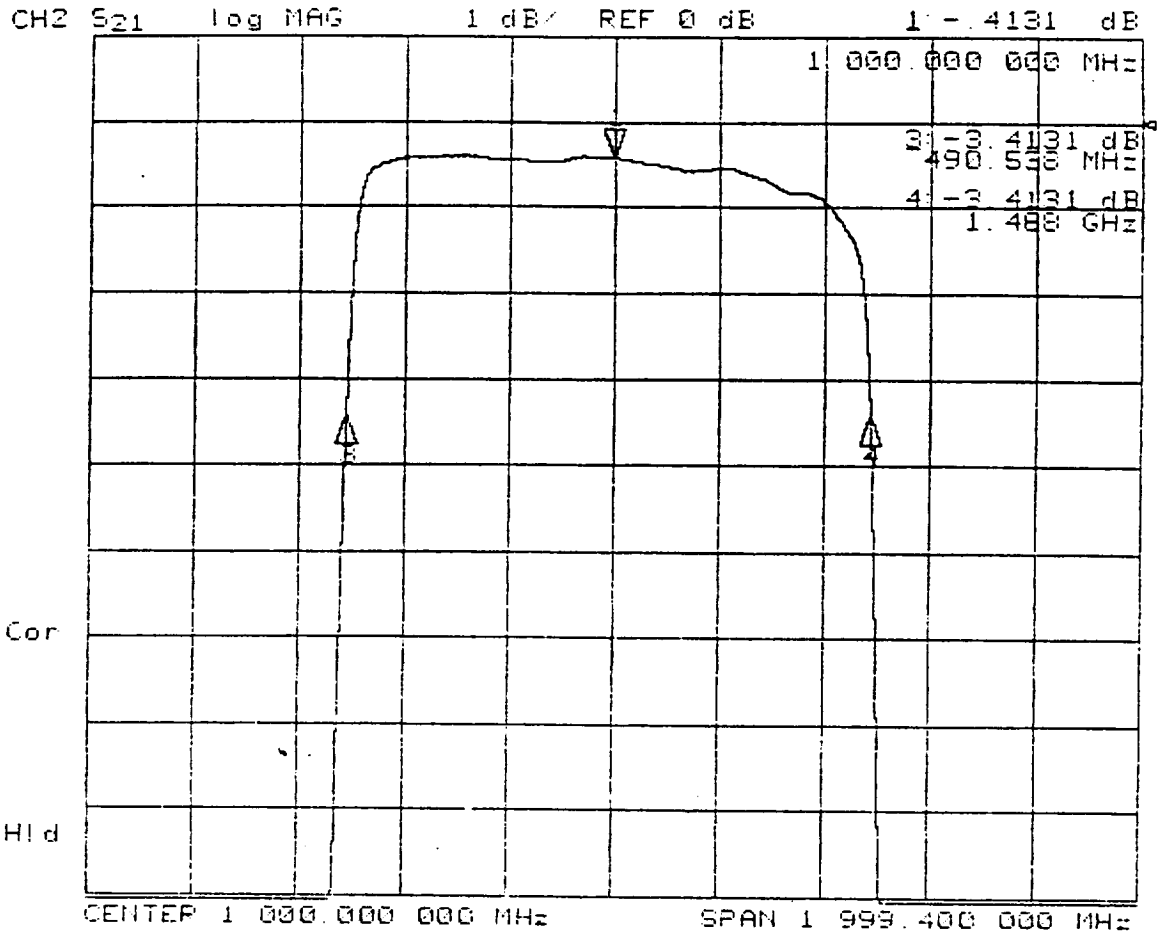
PASSBAND RIPPLE

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.4	-10°C	+15°C	+40°C
{11a} MIN INSERTION LOSS FREQ	695.09 MHz	675.16 Mhz	675.10 MHz
MIN INSERTION LOSS PERFORMANCE	-0.36 dB	-0.39 dB	-0.41 dB
{11b} 75% BW LOWER BANDEDGE FREQ	527.79 MHz	526.69 Mhz	524.78 MHz
75% BW LOWER BANDEDGE I.L. PERF	-0.60 dB	0.65 dB	-0.69 dB
{11c} 75% BW UPPER BANDEDGE FREQ	1277.79 MHz	1276.69 Mhz	1274.78 MHz
75% BW UPPER BANDEDGE I.L. PERF	-0.66 dB	-0.65 dB	-0.69 dB
{11d} PERFORMANCE DELTA (I.L. @ {11b} - I.L. @ {11a})	0.24 dB	0.26 dB	0.28 dB
{11e} PERFORMANCE DELTA (I.L. @ {11c} - I.L. @ {11a})	0.24 dB	0.26 dB	0.28 dB



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P227-005
-10C DATA
OPR: R. HOGGATT DATE FEB 03 1997 Channel 2

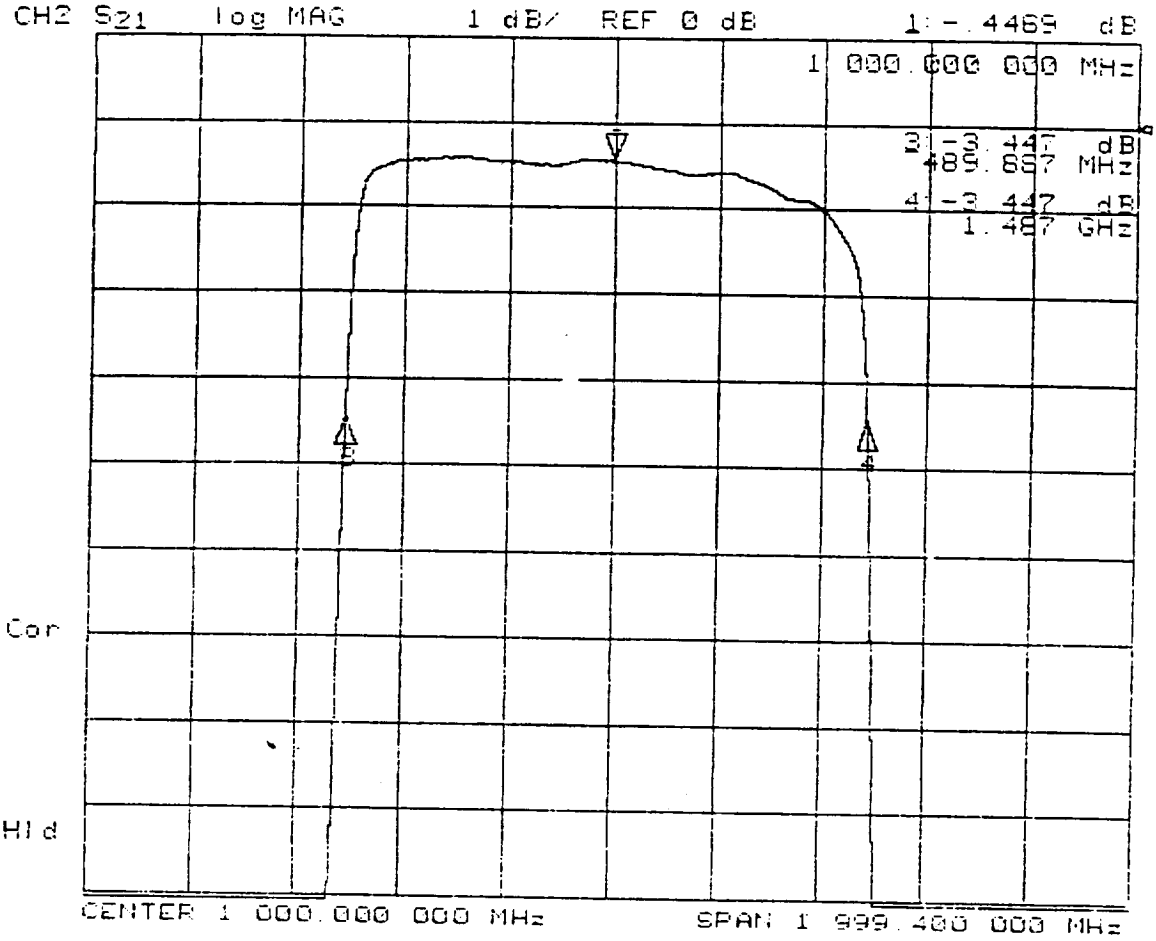
MARKER PARAMET		
MARKER 1	550.000000 MHz OFF	1000.000000 MHz -.3808 dB
MARKER 2	1450 000000 MHz OFF	990 653385 MHz OFF
MARKER 3	635.000000 MHz OFF	491.262205 MHz -3.3809 dB
MARKER 4	1375.000000 MHz OFF	1490.044565 MHz -3.3809 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P227-005
+15C DATA
OPR: R. HOGGATT DATE FEB 03 1997

MARKER PARAMET annel 2

MARKER 1	550.000000 MHz OFF	1000.000000 MHz -.4131 dB
MARKER 2	1450.000000 MHz OFF	989.555293 MHz OFF
MARKER 3	825.000000 MHz OFF	490.538694 MHz -3.4131 dB
MARKER 4	1375.000000 MHz OFF	1488.571893 MHz -3.4131 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
	OFF	OFF
MARKER TRACKING	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
TRANSMISSION LOSS
SERIAL NO. P227-005
+40C DATA
OPR: R. HOGGATT DATE FEB 03 1997 Channel 2

MARKER PARAMET		
MARKER 1	550.000000 MHz OFF	1000.000000 MHz -.4469 dB
MARKER 2	1450.000000 MHz OFF	998.644081 MHz OFF
MARKER 3	635.000000 MHz OFF	489.887565 MHz -3.447 dB
MARKER 4	1375.000000 MHz OFF	1487.400598 MHz -3.447 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF

APPENDIX A **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL1000-1000-10SS1 S/N P227-005
AEROJET 1331559-1 REV. E

PASSBAND RIPPLE (CON'T)

{11f} RECORD PASS/FAIL (0.5 dB MAX)	(PASS)/FAIL	(PASS)/FAIL	(PASS)/FAIL
{11g) ATTACH PASSBAND RIPPLE PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

OUT-OF-BAND REJECTION

ACCEPTANCE TEST PROCEDURE 63-0005-02 PARA 4.5.5 Fc=1000.0 MHz. REF {5A} FOR INSERTION LOSS @ Fc	-10°C	+15°C	+40°C
{12} WORST CASE REJECTION FROM 0.300 MHz TO 350.0 MHz	-64.0 dB (40.0 dB MIN)	-64.1 dB (40.0 dB MIN)	-64.2 dB (40.0 dB MIN)
{13a} WORST CASE REJECTION FROM 1650.0 MHz TO 3000.0 MHz	-60.1 dB (40.0 dB MIN)	-60.2 dB (40.0 dB MIN)	-60.5 dB (40.0 dB MIN)
{13b} WORST CASE REJECTION FROM 3000.0 MHz TO 8000.0 MHz	-45.5 dB (40.0 dB MIN)	-46.1 dB (40.0 dB MIN)	-47.4 dB (40.0 dB MIN)
{13c} RECORD MEASURED TEMPERATURE	-11.6 °C (-15.0 TO -10.0)	+15.8 °C (12.5 TO 17.5)	+40.6 °C (40.0 TO 45.0)
{14} ATTACH REJECTION PERFORMANCE X-Y PLOT(S)	✓ (√)	✓ (√)	✓ (√)

TEST PERFORMED BY R. Hoggatt DATE 2/3/97

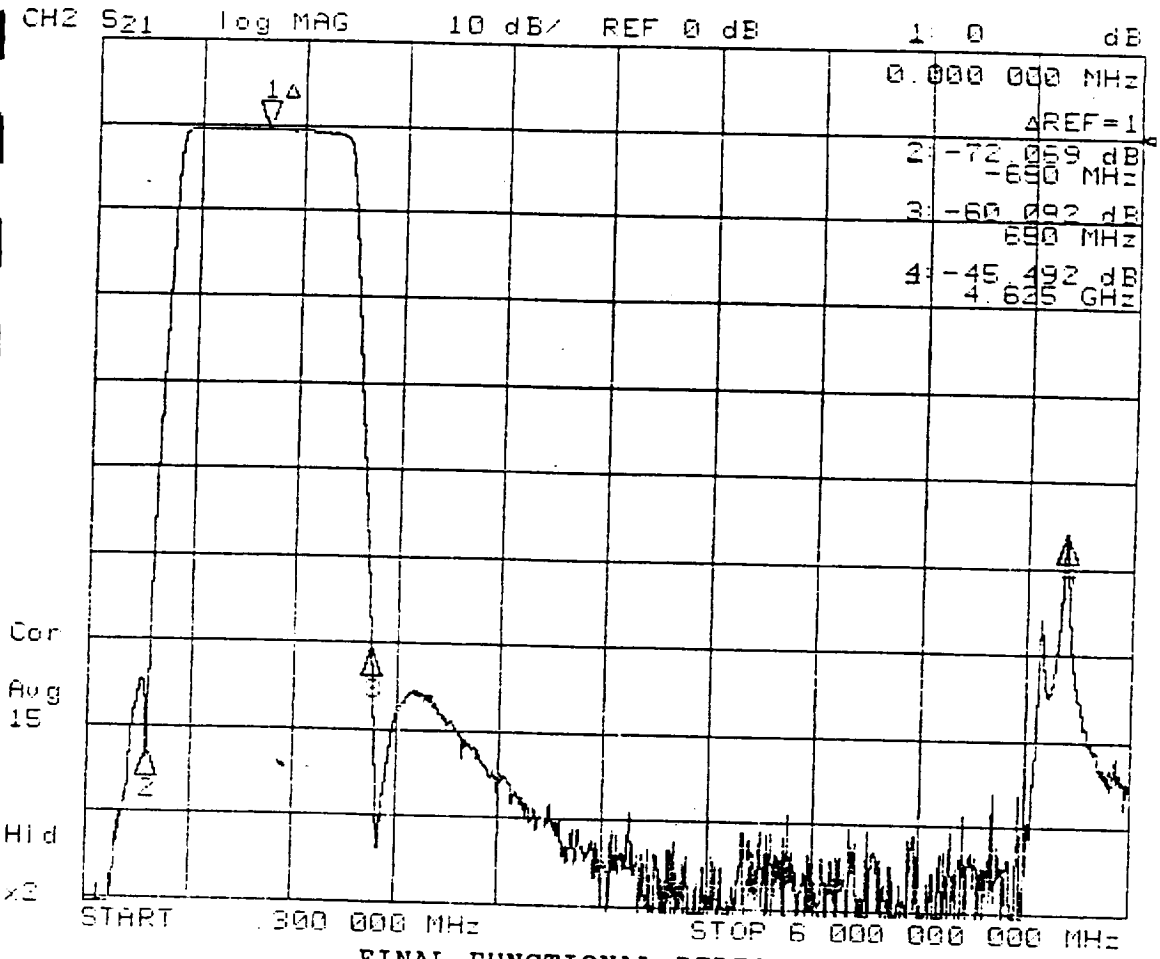
NOTE IF TEST WITNESSED BY AESD: _____ GSI: ___ Not Witnessed this time. DLD

***** END OF FUNCTIONAL PERFORMANCE TEST ****

OUTLINE AND MOUNTING DIMENSIONS VERIFICATION

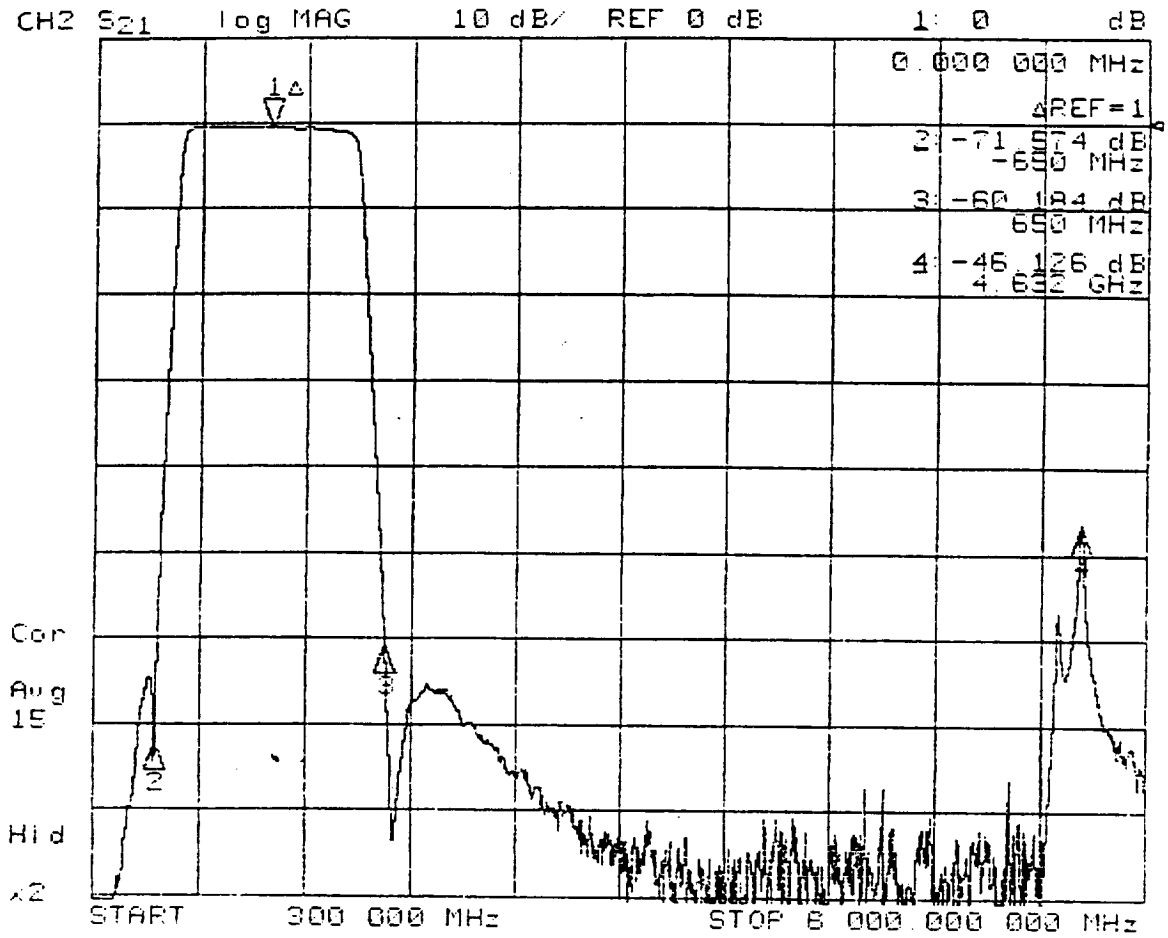
{16} REFERENCE CUSTOMER DRAWING 1331559

DESCRIPTION OF MEASUREMENT	DIMENSION AND TOLERANCE	ACTUAL MEASUREMENT
OVER ALL LENGTH	3.50 ± .03	3.501
MOUNTING HOLE CENTER	0.125 ± .010	.127
BETWEEN UPPER MOUNTING HOLES	3.250	3.246
BETWEEN LOWER MOUNTING HOLES	3.250	3.246



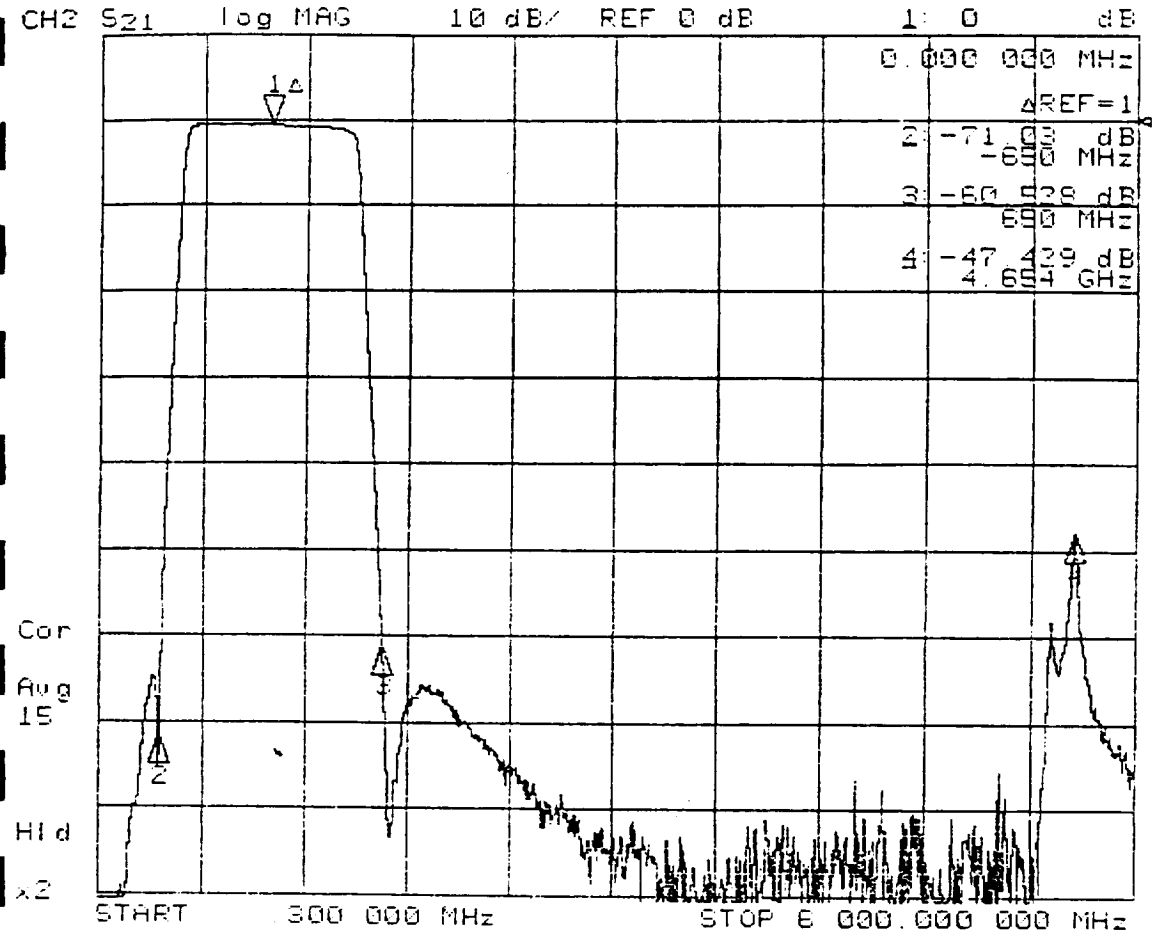
FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P227-005
-10C DATA
OPR: R. HOGGATT DATE FEB 03 1997 annel 2

MARKER PARAMET		
MARKER 1	1000.000000 MHz OFF	1000.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	350.000000 MHz -72.069 dB
MARKER 3	1000.000000 MHz OFF	1650.000000 MHz -60.092 dB
MARKER 4	1000.000000 MHz OFF	5625.018861 MHz -45.492 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF	OFF
	OFF	OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P227-005
+15C DATA
OPR: R. HOGGATT DATE FEB 03 1997

MARKER PARAMET	annel 2	
MARKER 1	1000.000000 MHz OFF	1000.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	350.000000 MHz -71.574 dB
MARKER 3	1000.000000 MHz OFF	1650.000000 MHz -60.184 dB
MARKER 4	1000.000000 MHz OFF	5632.752848 MHz -46.126 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF



FINAL FUNCTIONAL PERFORMANCE
REJECTION PERFORMANCE
SERIAL NO. P227-005
+40C DATA
OPR: R. HOGGATT DATE FEB 03 1997 annel 2

MARKER PARAMET		
MARKER 1	1000.000000 MHz OFF	1000.000000 MHz 0 dB
MARKER 2	1000.000000 MHz OFF	350.000000 MHz -71.03 dB
MARKER 3	1000.000000 MHz OFF	1650.000000 MHz -60.528 dB
MARKER 4	1000.000000 MHz OFF	5654.951771 MHz -47.429 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	MARKER 1
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF OFF	OFF OFF

APPENDIX A **ACCEPTANCE TEST REPORT**

BANDPASS FILTER MODEL HL1000-1000-10SS1 S/N P227-005
AEROJET 1331559-1 REV. E

BANDPASS CHARACTERISTICS MEASUREMENT
PER ATP PARA 4.6
(REF: AE-24687, PARA 4.8.2)

RECORD THE AMBIENT ROOM TEMPERATURE. +21.9 °C (+19°C TO +29.0°C)

{15} ATTACH PASSBAND PERFORMANCE X-Y PLOT ✓ (√)

{24} TEST POINT MATRIX

REF		FREQ	UNIT	VALUE	REF		FREQ	UNIT	VALUE
F1		1.0	MHz	-85.0 dB	F11		1000.0	MHz	-0.48 dB
F2		10.0	MHz	-93.3 dB	F12	(*)	1100.0	MHz	-0.58 dB
F3		100.0	MHz	-91.7 dB	F13	(*)	1200.0	MHz	-0.59 dB
F4		300.0	MHz	-66.0 dB	F14		1300.0	MHz	-0.79 dB
F5		400.0	MHz	-37.0 dB	F15		1400.0	MHz	-1.02 dB
F6		500.0	MHz	-2.01 dB	F16		1500.0	MHz	-6.22 dB
F7		600.0	MHz	-0.49 dB	F17		1600.0	MHz	-41.2 dB
F8		700.0	MHz	-0.45 dB	F18		1700.0	MHz	-83.6 dB
F9	(*)	800.0	MHz	-0.49 dB	F19		2000.0	MHz	-67.0 dB
F10	(*)	900.0	MHz	-0.52 dB	F20		5000.0	MHz	-89.6 dB

TEST PERFORMED BY: R. Hoggatt DATE 2/4/97

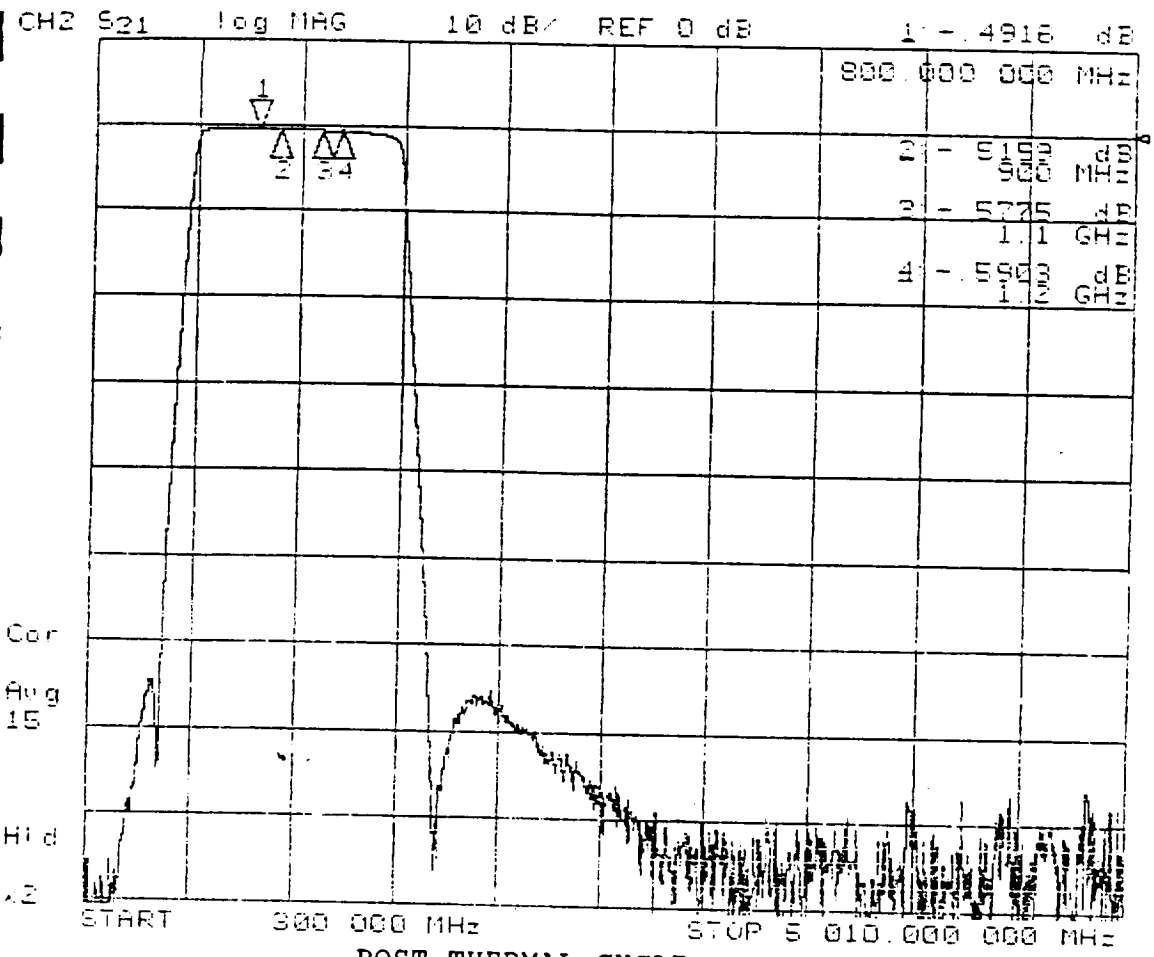
NOTE IF TEST WITNESSED BY AESD _____ GSI _____ Not Witnessed this time. DLD

***** END OF BANDPASS CHARACTERISTICS TEST *****

FUNCTIONAL PERFORMANCE TEST
ACCEPTANCE TEST PROCEDURE
63-0005-02 PARA 4.1

BRIEF TEST DESCRIPTION: THE TESTS DESCRIBED IN APPENDIX A PAGE 10 THRU PAGE 13 ARE PERFORMED TO DOCUMENT THE FUNCTIONAL PERFORMANCE OF THE UNIT AT THE CONCLUSION OF ALL ENVIRONMENTAL TESTING. THE TESTS ARE AS FOLLOWS AND IN ANY SEQUENCE:

a.) VSWR PER ATP PARA 4.5.1.
b.) INSERTION LOSS PER ATP PARA 4.5.2
c.) INSERTION LOSS VS TEMPERATURE PER ATP PARA 4.5.6.
d.) 3.0 dB BANDWIDTH PER ATP PARA 4.5.3.
e.) CENTER FREQUENCY (fc) PER ATP PARA 4.5.7 (PART OF 3.0 dB B/W TEST)
f.) PASSBAND RIPPLE PER ATP PARA 4.5.4 (PART OF INSERTION LOSS TEST).
g.) OUT-OF-BAND REJECTION PER ATP PARA 4.5.5.



POST THERMAL CYCLE
PASSBAND CHARACTERISTICS
SERIAL NO. P227-005
AMBIENT
OPR: R. HOGGATT DATE FEB 04 1997 annel 2

MARKER PARAMET		
MARKER 1	1000.000000 MHz OFF	800.000000 MHz -.4916 dB
MARKER 2	1000.000000 MHz OFF	900.000000 MHz -.5159 dB
MARKER 3	1000.000000 MHz OFF	1100.000000 MHz -.5775 dB
MARKER 4	1000.000000 MHz OFF	1200.000000 MHz -.5903 dB
MKR STIMULUS OFFSET	0.000000 MHz 0 dB	0.000000 MHz 0 dB
REFERENCE MARKER	OFF	OFF
PLACEMENT	CONTINUOUS	CONTINUOUS
MARKER SEARCH	OFF	OFF
TARGET VALUE	-3 dB	-3 dB
MARKER WIDTH VALUE	-3 dB	-3 dB
MARKER TRACKING	OFF	OFF
	OFF	OFF

GAIN STABILITY AND GAIN COMPRESSION

FOR

MIXER/AMPLIFIERS AND IF AMPLIFIERS

GAIN-TEMPERATURE SENSITIVITY FOR MIXER/AMPLIFIERS AND IF AMPLIFIERS

Channel No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Specification (+/-dB/°C)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.04	0.06	0.06	0.06	0.06	0.02
Measured (dB/°C)	-0.009	-0.015	-0.009	-0.013	-0.013	-0.017	-0.02	-0.011	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025	-0.017
									+0.005	+0.005	+0.005, -0.005	+0.005, -0.005	+0.005, -0.005	+0.005, -0.005	
											-0.014	-0.014	-0.01	-0.02	
Total	-0.009	-0.015	-0.009	-0.013	-0.013	-0.017	-0.02	-0.011	+0.005, -0.025	+0.005, -0.025	+0.005, -0.044	+0.005, -0.044	+0.005, -0.04	+0.005, -0.05	

Channel 1 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-11, S/N: 7A11)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.27	0.5	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
10.04	70.38	1.88	2.0	QA 1	
10.00	70.31				
9.96	70.23				
ΔGv =	0.15 dB				

	DATE	ACC	REJ
SPACEK QA	4-16-97	QA 1	

PART NO. 1331562-11E

SER NO. 7A11

TESTED BY: TJK

END DATE: 4-16-97

END TIME: 1630

TEST FAILURE: _____

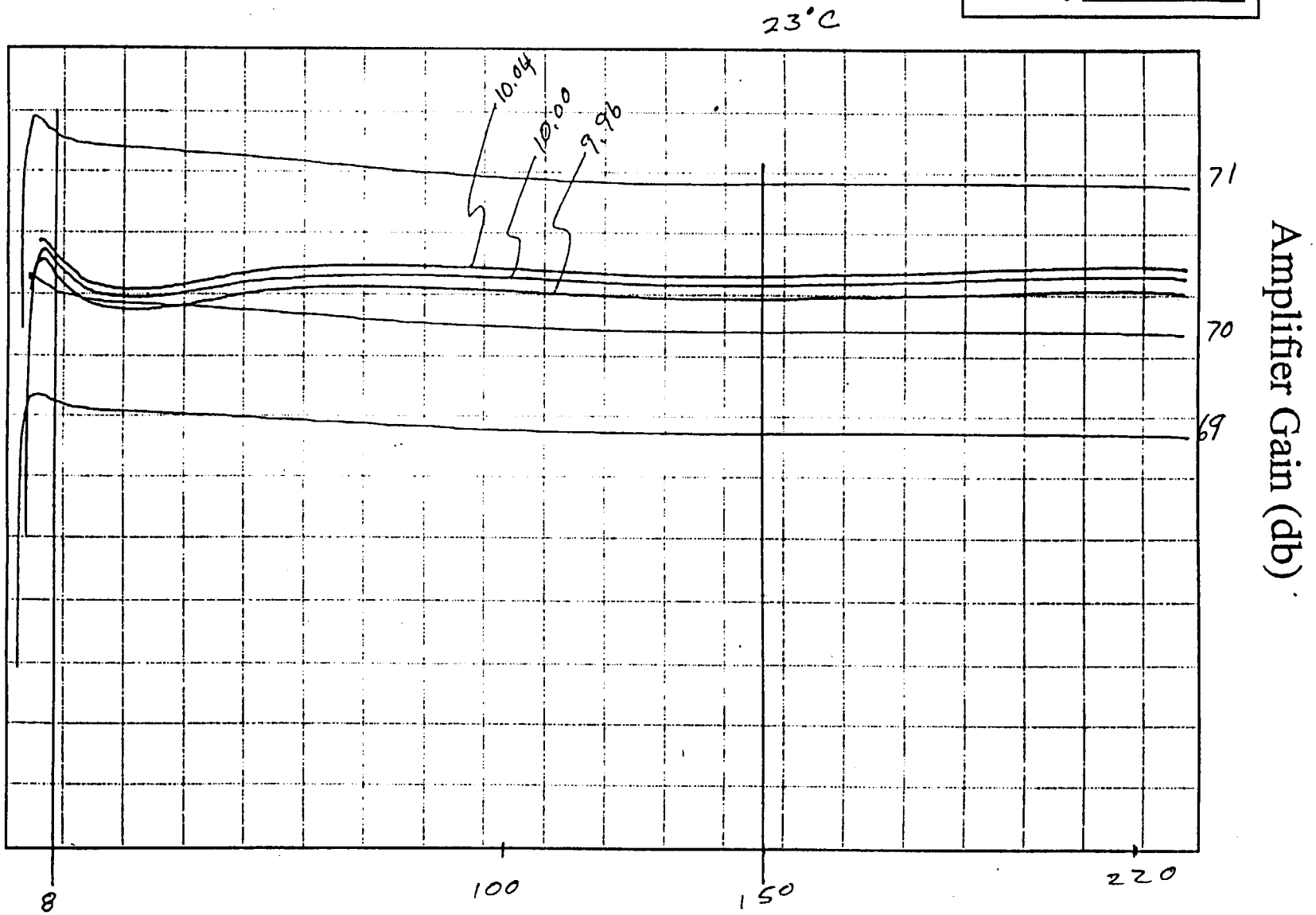
FAILURE ANALYSIS NO. _____

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Model No. 1331562-116
Serial No. 7A11
Date 4-16-97
Tested By TTT

Amplifier Gain



09

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 +40	G_{T1} 70.00				
		* -.021	0.035dB/°C	QA 1	
T2 +28	G_{T2} 70.25				
		* -.035	0.020dB/°C		QA 1
T3 +8	G_{T3} 70.95				
		* -.019	0.035dB/°C	QA 1	
T4 −6	G_{T4} 71.22				

• Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4 \qquad \Delta G_T = 1.25 \text{ dB}$$

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 =$ 1.77 dB Spec 1.4dB ACC____ REJ QA 1

	DATE	ACC	REJ
PART NO. 1331562-116	SPACEK QA	4-24-97	QA 1

SER NO. 7A11 TEST FAILURE: _____

TESTED BY: [signature] FAILURE ANALYSIS NO. _____

END DATE: 4-24-97

END TIME: 1600

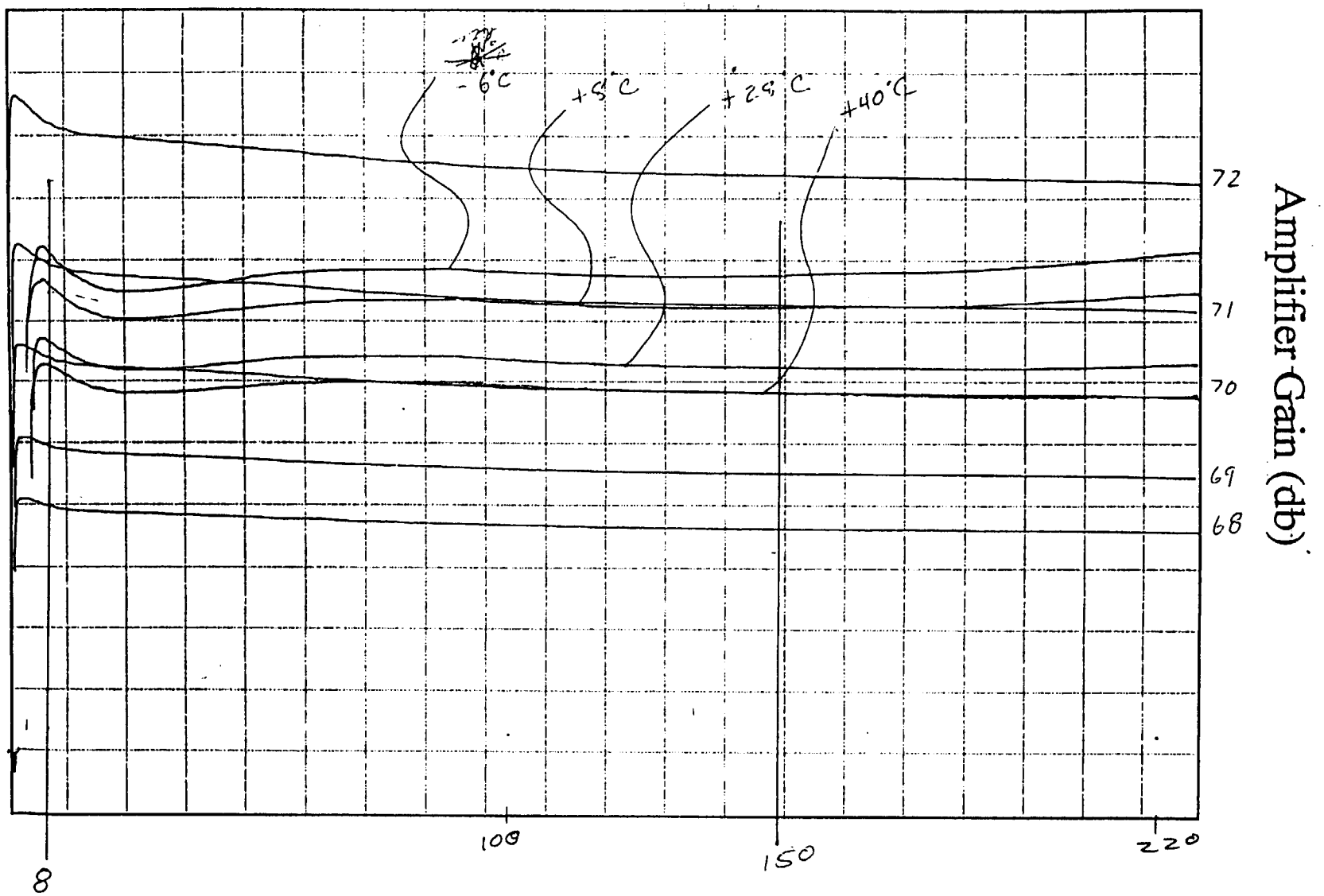
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 133562-11E
Serial No. 7A11
Date 4-24-97
Tested By [illegible]

Amb Temp +23°C



QA
1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	2.25	0.75	1.0	QA	
				X						20					
	X	X								50					
X	X	X	X	X	X	X	X			100	2.30	0.70	1.0	QA	
X										150	2.25	0.75	1.0	QA	
			X	X	X	X	X	X		200					
								X		400					
									X	500					
									X	1000					
									X	1500					

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 4-20-97 AMBIENT ROOM TEMPERATURE °C: 23

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-22.3	-25.7	3.4	1.36

Above data taken with Daden filter attached (except -19).

Intermediate test results for information only

DATE ACC REJ

PART NO. 1331562-11E SPACEK QA 4-20-97 QA

SER NO. 7A11 TEST FAILURE:

TESTED BY: TTV FAILURE ANALYSIS NO.

END DATE: 4-20-97

END TIME: 4:00 pm

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 1-5-98 AMBIENT ROOM TEMPERATURE °C: +22

UUT TEMP °C.	UUT CURRENT (mA)	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.3	-21.80	-23.60	1.80	3.45	3.5	QA 1	
+8	43.4	-21.90	-23.70	1.80	3.45	3.5	QA 1	
+28	43.5	-22.20	-24.00	1.80	3.45	3.5	QA 1	
+40	43.5	-22.40	-24.15	1.75	3.55	3.5		QA 1

Spec is .3dB peak to peak on -11 thru -19

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 1-19-98 Ambient Room Temperature °C: 23

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.068

Record Nps(K) 0.07 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC QA 1 REJ

	DATE	ACC	REJ
SPACEK QA	1-21-98	QA 1	

SDAR 98-000-23

PART NO. 1331562-116

SER NO. 7A11

TESTED BY: [illegible]

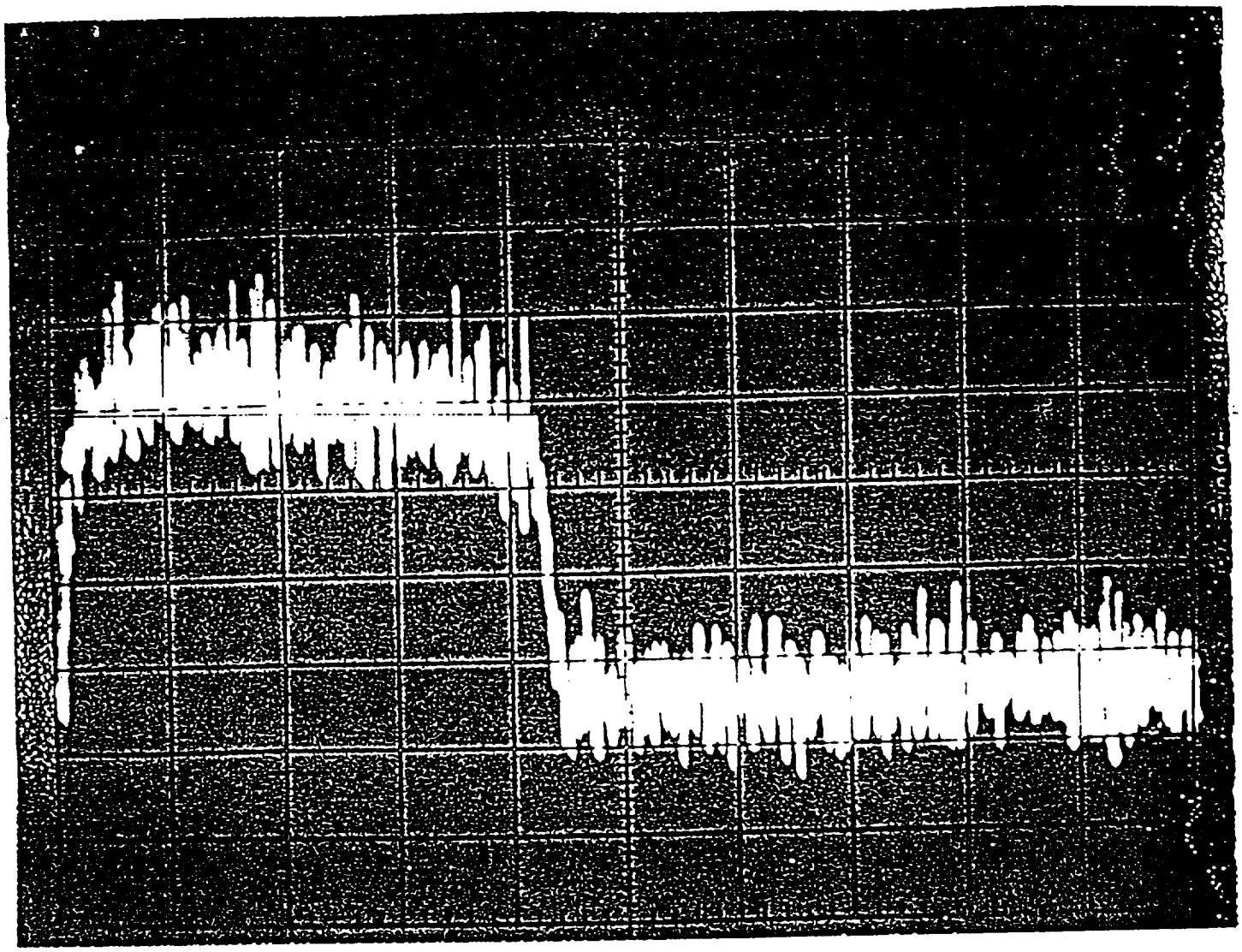
END DATE: 1-19-98

END TIME: 4:00 pm

TEST FAILURE:

FAILURE ANALYSIS NO.

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101



5.4.14 Noise Power Profile

Model No.: 1331562-11G
Serial No.: 7A11
Date: 1-21-98
Tested by: DB

Spectrum Analyzer Parameters

Vertical Scale: 2 dB/div.
Scan Width: 30 mhz/Div.
IF Band Width: 10 Khz
Scan Time: 3 sec/Div.
No video filter.

Channel 2 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-12, S/N: 7A02)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
.27	0.5	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
10.04	70.65	1.87	2.0	QA 1	
10.00	70.60				
9.96	70.50				
ΔGv =	0.15 dB				

	DATE	ACC	REJ
PART NO. 1331562-12F SPACEK QA	4-21-97	QA 1	

SER NO. 7A02 TEST FAILURE: _____

TESTED BY: [signature] FAILURE ANALYSIS NO. _____

END DATE: 4-21-97

END TIME: [signature] 4:00pm

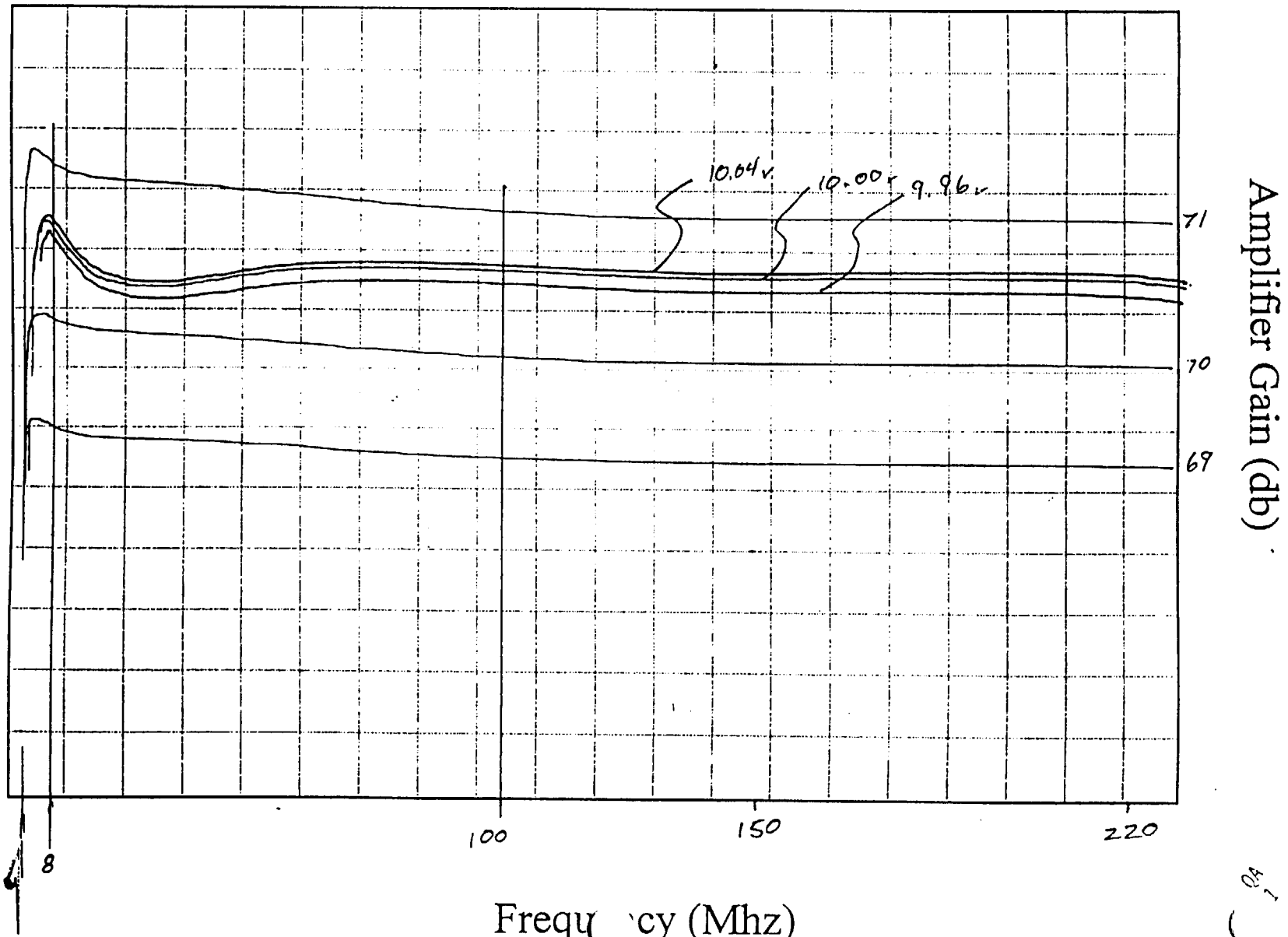
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Model No. 1331562-12F
Serial No. 7A02
Date 4-21-97
Tested By SJ

Amplifier Gain

+23°C



TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 +40	G_{T1} 70.50				
		* 0,015	0.035dB/°C	QA 1	
T2 +28	G_{T2} 70,68				
		* 0,026	0.020dB/°C		QA 1
T3 +8	G_{T3} 71.20				
		* 0,013	0.035dB/°C	QA 1	
T4 −6	G_{T4} 71,38				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4$$

ΔG_T = 0,88 dB

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4$ = 1,43 dB Spec 1.4dB ACC____ REJ QA 1

	DATE	ACC	REJ
PART NO. 1331562-12F	SPACEK QA	4-24-97	QA 1

SER NO. 7A02 TEST FAILURE: _____

TESTED BY: [signature] FAILURE ANALYSIS NO. _____

END DATE: 4-24-97

END TIME: 4:00PM

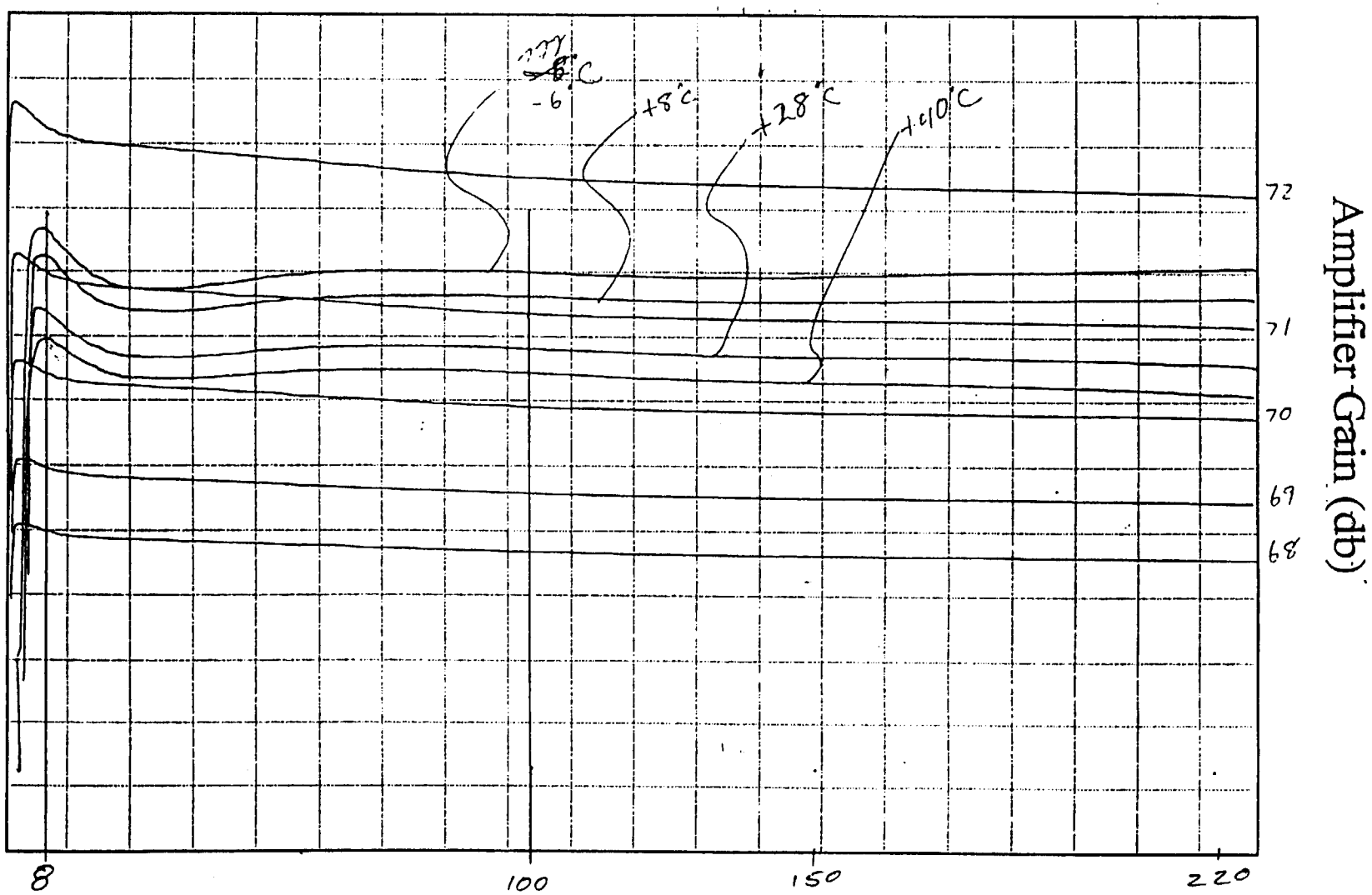
Spacek Labs, Inc.
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Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 133562 -12
Serial No. 7A02
Date 4-24-97
Tested By TT

Amb Temp +23°C



01
1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X	X	X	X	X	X	X	10	0.7	1.0	✓	
	X	X								50	0.6	1.0	✓	
X	X	X	X	X	X	X	X			100	0.6	1.0	✓	
X										150	—	—	—	—
			X	X	X	X	X	X		200	—	—	—	—
								X		400	—	—	—	—
									X	500	—	—	—	—
									X	1000	—	—	—	—
									X	1500	—	—	—	—

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 4/20/97 AMBIENT ROOM TEMPERATURE °C: 23

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-24.0	-27.7	3.7	1.1

Above data taken with Daden filter attached (except -19).

Intermediate test results for information only

		DATE	ACC	REJ
PART NO. 1331562-12F	SPACEK QA	4-20-97	✓	
SER NO. 7A02	TEST FAILURE:			
TESTED BY:	FAILURE ANALYSIS NO.			
END DATE: 4/20/97				
END TIME: 4:00PM				

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 7-2-97 AMBIENT ROOM TEMPERATURE °C: +22

UUT TEMP °C.	UUT CURRENT mA	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.0	-23.10	-25.15	2.05	3.0	3.2	QA	
+8	43.0	-23.30	-25.30	2.0	3.1	3.2	QA	
+28	43.1	-23.60	-25.60	2.0	3.1	3.2	QA	
+40	43.2	-23.80	-25.80	2.0	3.1	3.2	QA	

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC QA REJ _____

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 7-1-97 Ambient Room Temperature °C: +25

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.254

Record Nps(K) 0.07 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC	REJ
	QA

	DATE	ACC	REJ
SPACEK QA	7-2-97		QA

PART NO. 1331562-12F

SER NO. 7A02

TESTED BY: [signature]

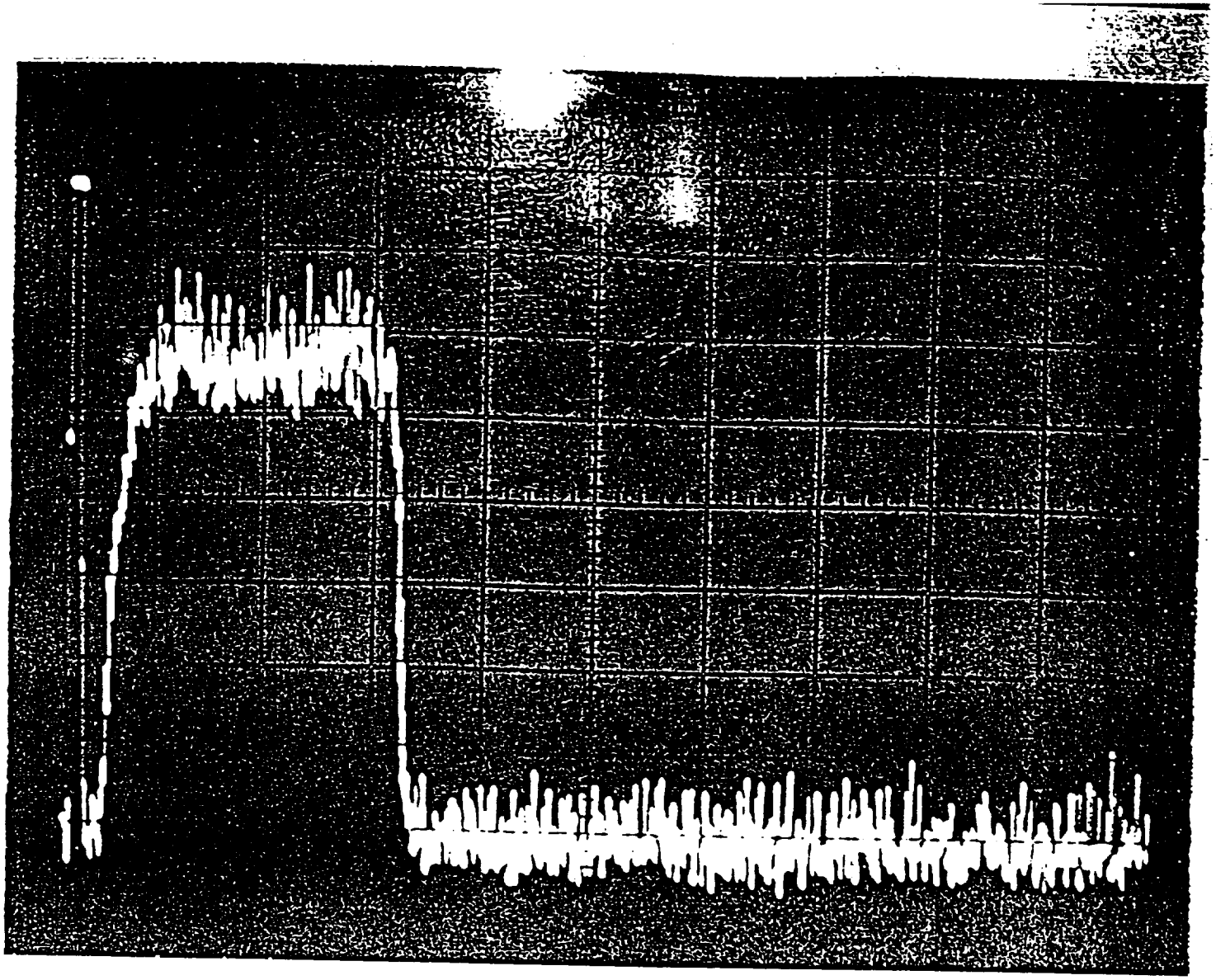
END DATE: 7-2-97

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101



5.4.14 Noise Power Profile

Model No.: 1331562-12F
Serial No.: 7A02
Date: 7-7-97
Tested by: DH

Spectrum Analyzer Parameters

Vertical Scale: 2 dB/div.
Scan Width: 30 mhz/Div.
IF Band Width: 10 Khz
Scan Time: 3 sec/Div.
No video filter.

Channel 3 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-13, S/N: 7A03)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.30	0.5	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
10.04	70.68	2.5	2.0	QA 1	
10.00	70.60				
9.96	70.48				
ΔGv =	0.2 dB				

	DATE	ACC	REJ
SPACEK QA	9-4-97	QA 1	

PART NO. 1331562-13F

SER NO. 7A03

TESTED BY: [signature]

END DATE: 8-7-97

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

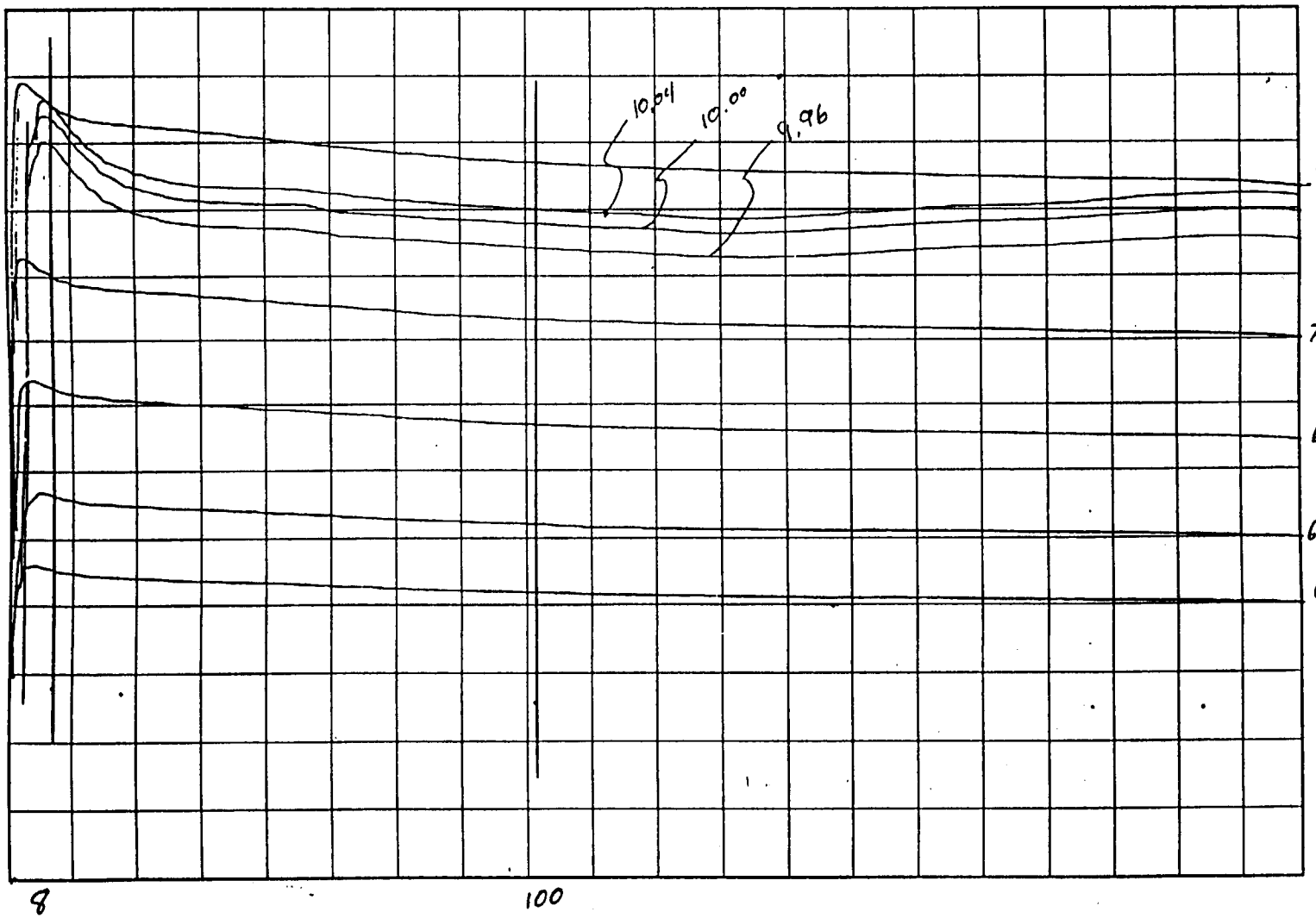
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-13F
Serial No. 7A03
Date 8-6-97
Tested By TH

Amb Temp 23°C



QA
1

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 +40	G_{T1} 70.35				
		* .019	0.035dB/°C	QA 1	
T2 +28	G_{T2} 70.58				
		* .027	0.020dB/°C		QA 1
T3 +8	G_{T3} 71.12				
		* .012	0.035dB/°C	QA 1	
T4 −6	G_{T4} 71.29				

• Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4 \qquad \Delta G_T = \underline{0.94}\ \text{dB}.$$

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 =$ 1.54 dB Spec 1.4dB ACC____ REJ QA 1

	DATE	ACC	REJ
PART NO. 1331562-13F	SPACEK QA	9-5-97	QA 1

SER NO. 7A03 TEST FAILURE: _____

TESTED BY: _____ FAILURE ANALYSIS NO. _____

END DATE: 8-7-97

END TIME: 1600

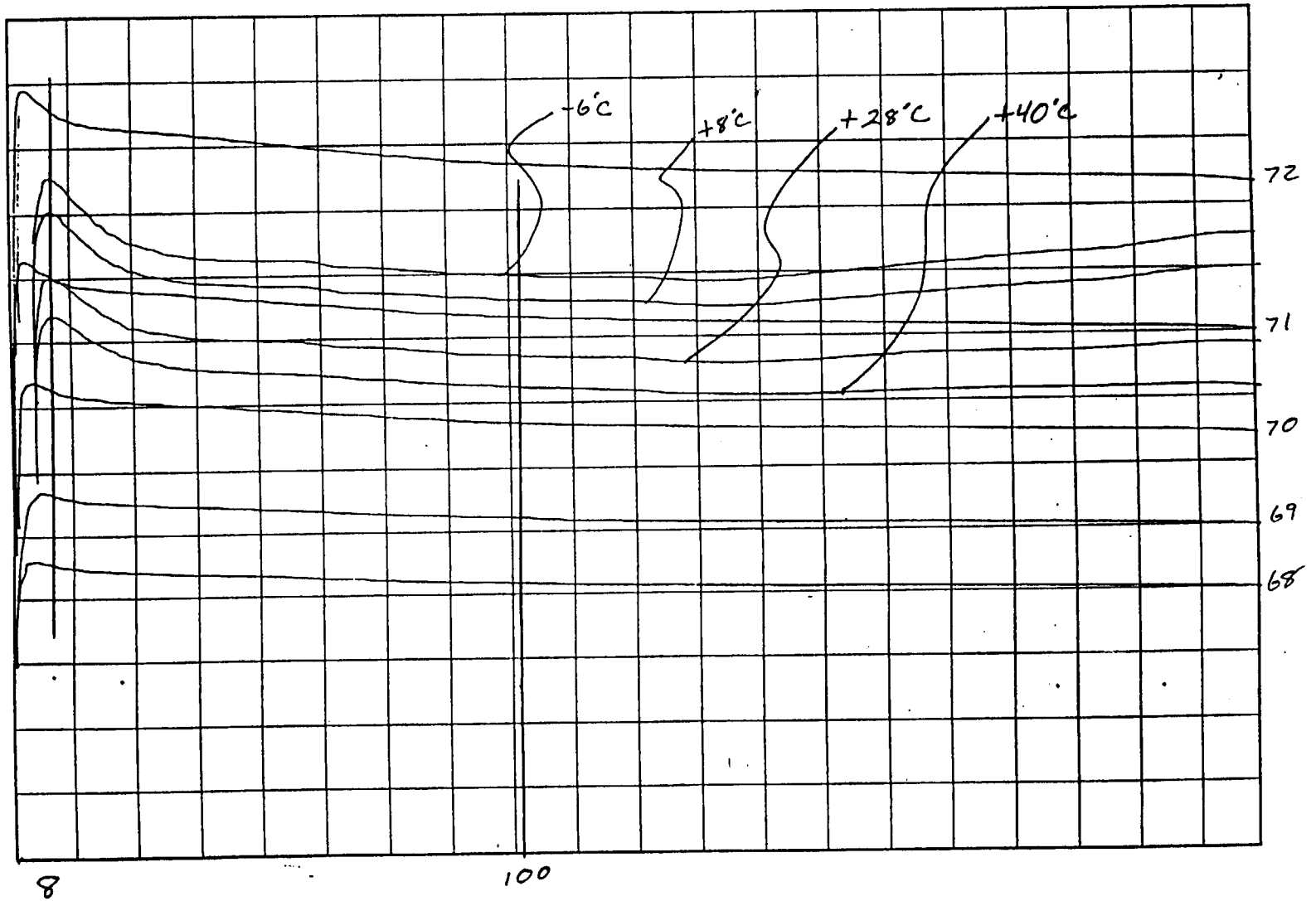
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-13F
Serial No. 7A03
Date 8-6-97
Tested By TTV

Amb Temp 24°C



QA

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	-2.2	0.8	1.0	QA	
				X						20	—	—	—		
	X	X								50	-2.5	0.5	1.0	QA	
X	X	X	X	X	X	X	X			100	-2.6	0.4	1.0	QA	
X										150	—	—	—		
			X	X	X	X	X	X		200	—	—	—		
								X		400	—	—	—		
									X	500	—	—	—		
									X	1000	—	—	—		
									X	1500	—	—	—		

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 8-7-97 AMBIENT ROOM TEMPERATURE °C: 21

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-24.2	-27.8	3.6	1.2

Above data taken with Daden filter attached (except -19) .

Intermediate test results for information only

		DATE	ACC	REJ
PART NO. 1331562-13F	SPACEK QA	8-8-97	QA	

SER NO. 7A03 TEST FAILURE: _____

TESTED BY: _____ FAILURE ANALYSIS NO. _____

END DATE: 8-7-97

END TIME: 1:30pm

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 8-31-97 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT (mA)	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.9	-22.90	-24.65	1.75	3.5	3.8	QA 1	
+8	44.0	-23.00	-24.75	1.75	3.5	3.8	QA 1	
+28	44.0	-23.15	-24.40	1.75	3.5	3.8	QA 1	
+40	44.1	-23.30	-25.05	1.75	3.5	3.8	QA 1	

Noise figure change 0 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 9/8/97 Ambient Room Temperature °C: 25

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.263

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC REJ QA 1

PART NO. 1331562-13F

SPACEK QA DATE 9-10-97 ACC REJ QA 1

SER NO. 7A03

TEST FAILURE:

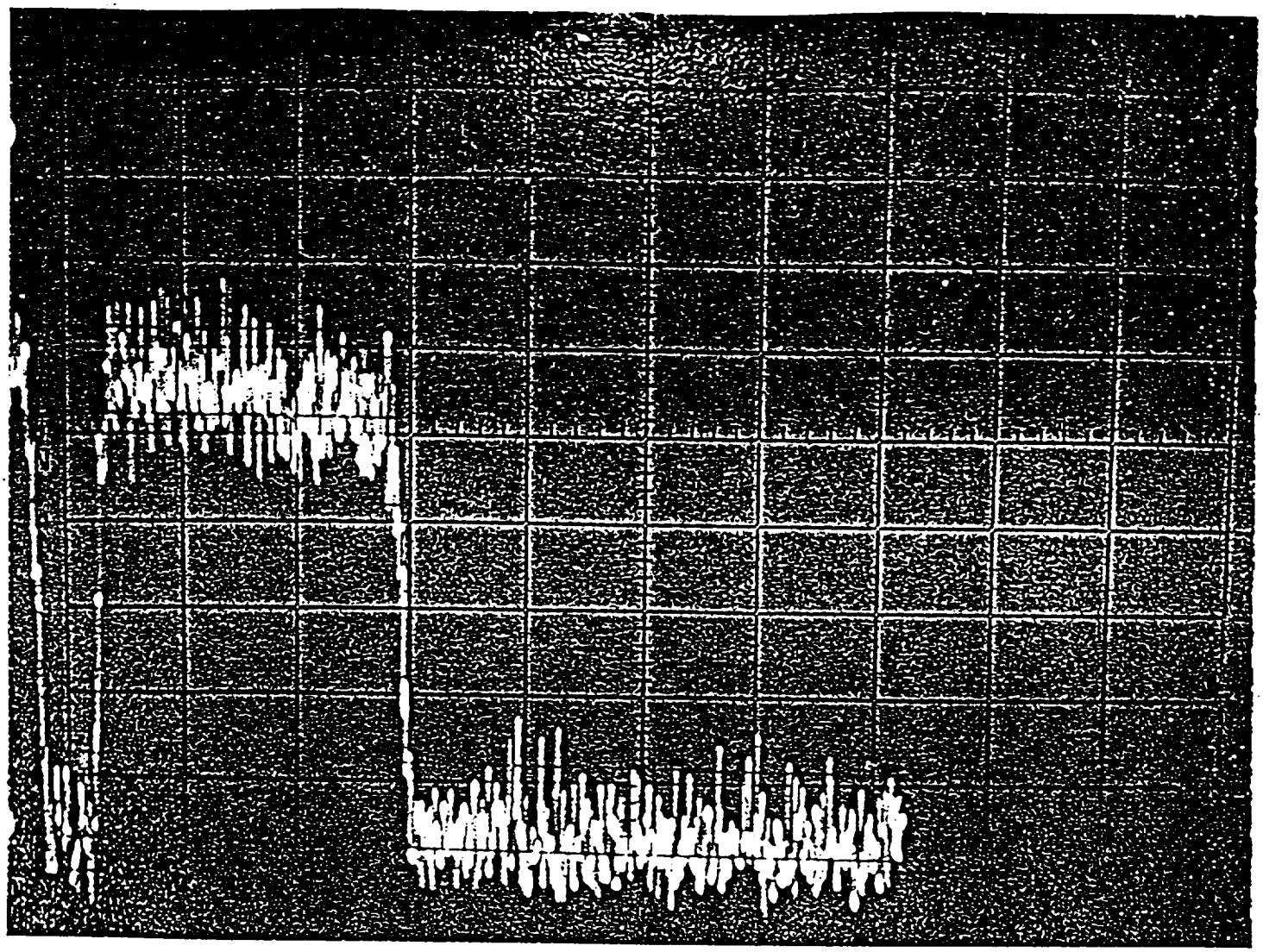
TESTED BY:

FAILURE ANALYSIS NO.

END DATE: 9/8/97

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101



5.4.14 Noise Power Profile

Model No.: 1331562-13F
Serial No.: 7A03
Date: 9-10-97
Tested by: DR

Spectrum Analyzer Parameters

Vertical Scale: 2 dB/div.
Scan Width: 30 mhz/Div.
IF Band Width: 10 Khz
Scan Time: 3 sec/Div.
No video filter.

QA
1

Channel 4 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-14, S/N: 7A04)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.37	0.5	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
10.04	71.00	3.12	2.0		QA 1
10.00	70.90				
9.96	70.75				
ΔGv =	0.25 dB				

	DATE	ACC	REJ
PART NO. 1331562-14F SPACEK QA	9-4-97	QA 1	

SER NO. 7A04 TEST FAILURE: _____

TESTED BY: _____ FAILURE ANALYSIS NO. _____

END DATE: 8-7-97

END TIME: 1600

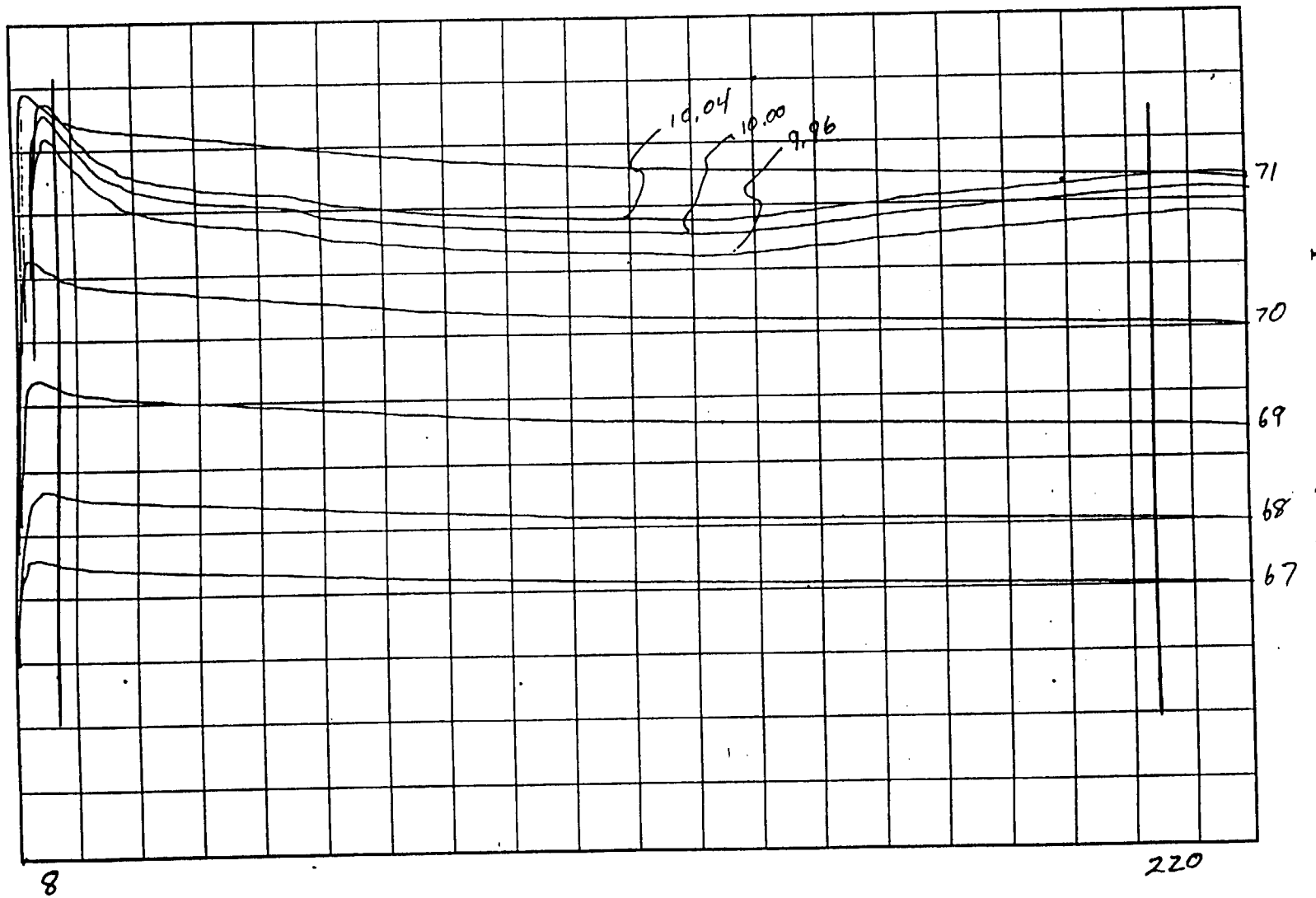
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-14F
Serial No. 7A04
Date 8-6-97
Tested By [illegible]

Amb Temp 24°C



Frequency (Mhz)

9A
1

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 +40	G_{T1} 70.57				
		* .024	0.035dB/°C	QA 1	
T2 +28	G_{T2} 70.86				
		* .030	0.020dB/°C		QA 1
T3 +8	G_{T3} 71.45				
		* .024	0.035dB/°C	QA 1	
T4 -6	G_{T4} 71.79				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4$$

ΔG_T = 1.22 dB.

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4$ = 1.87 dB Spec 1.4dB. ACC____ REJ QA 1

	DATE	ACC	REJ
PART NO. 1331562-14F	SPACEK QA 9-5-97		QA 1

SER NO. 7A04

TESTED BY: [signature]

END DATE: 8-7-97

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

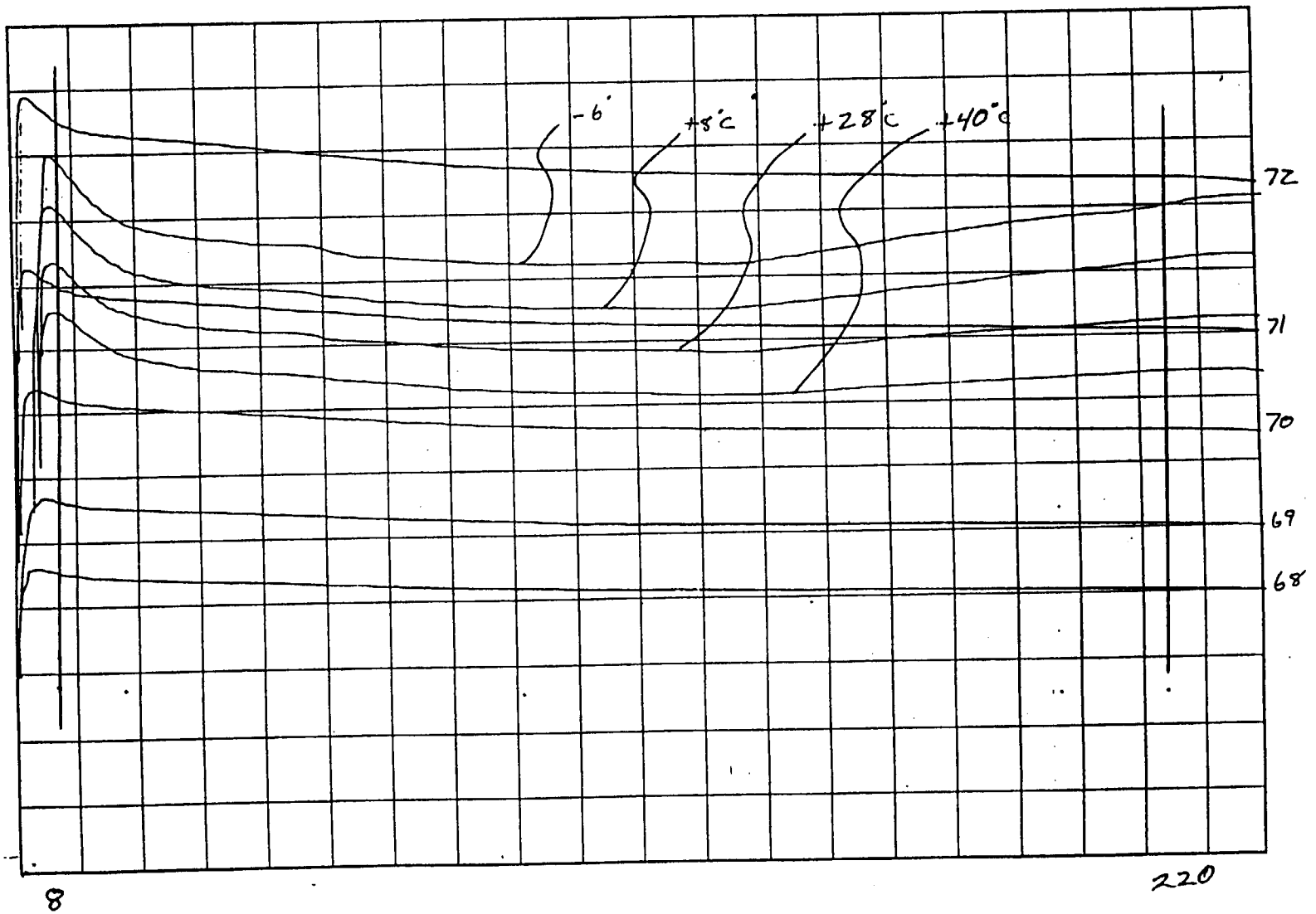
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-14F
Serial No. 7A04
Date 8-6-97
Tested By [illegible]

Amb Temp 24°C



QA
1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11 12 13 14 15 16 17 18 19 20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X X X X X X X X X X	10	-2.3	0.7	1.0	QA-1	
X	20	—	—	—		
X X	50	—	—	—		
X X X X X X X X X X	100	-2.6	0.4	1.0	QA-1	
X	150	—	—	—		
X X X X X X	200	-2.5	0.5	1.0	QA-1	
X	400	—	—	—		
X	500	—	—	—		
X	1000	—	—	—		
X	1500	—	—	—		

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 8-7-97 AMBIENT ROOM TEMPERATURE °C: 21

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-21.1	-23.3	3.2	1.53

Above data taken with Daden filter attached (except -19).

Intermediate test results for information only

PART NO. 1331562-141

SER NO. 7A04

TESTED BY: [signature]

END DATE: 8-7-97

END TIME: 1:30 pm

SPACEK QA — DATE 8-8-97 — ACC QA-1 — REJ

TEST FAILURE:

FAILURE ANALYSIS NO.

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 9-1-97 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.7	-19.10	-21.15	2.05	3.0	3.8	QA	
+8	43.8	-19.30	-21.35	2.05	3.0	3.8	QA	
+28	43.9	-19.60	-21.60	2.0	3.1	3.8	QA	
+40	44.0	-19.7	-21.70	2.0	3.1	3.8	QA	

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC QA REJ _____

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 9-8-97 Ambient Room Temperature °C: 24

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.168

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC _____ REJ QA

	DATE	ACC	REJ
SPACEK QA	9-10-97	_____	QA

PART NO. 1331562-14F

SER NO. 7A04

TESTED BY: [signature]

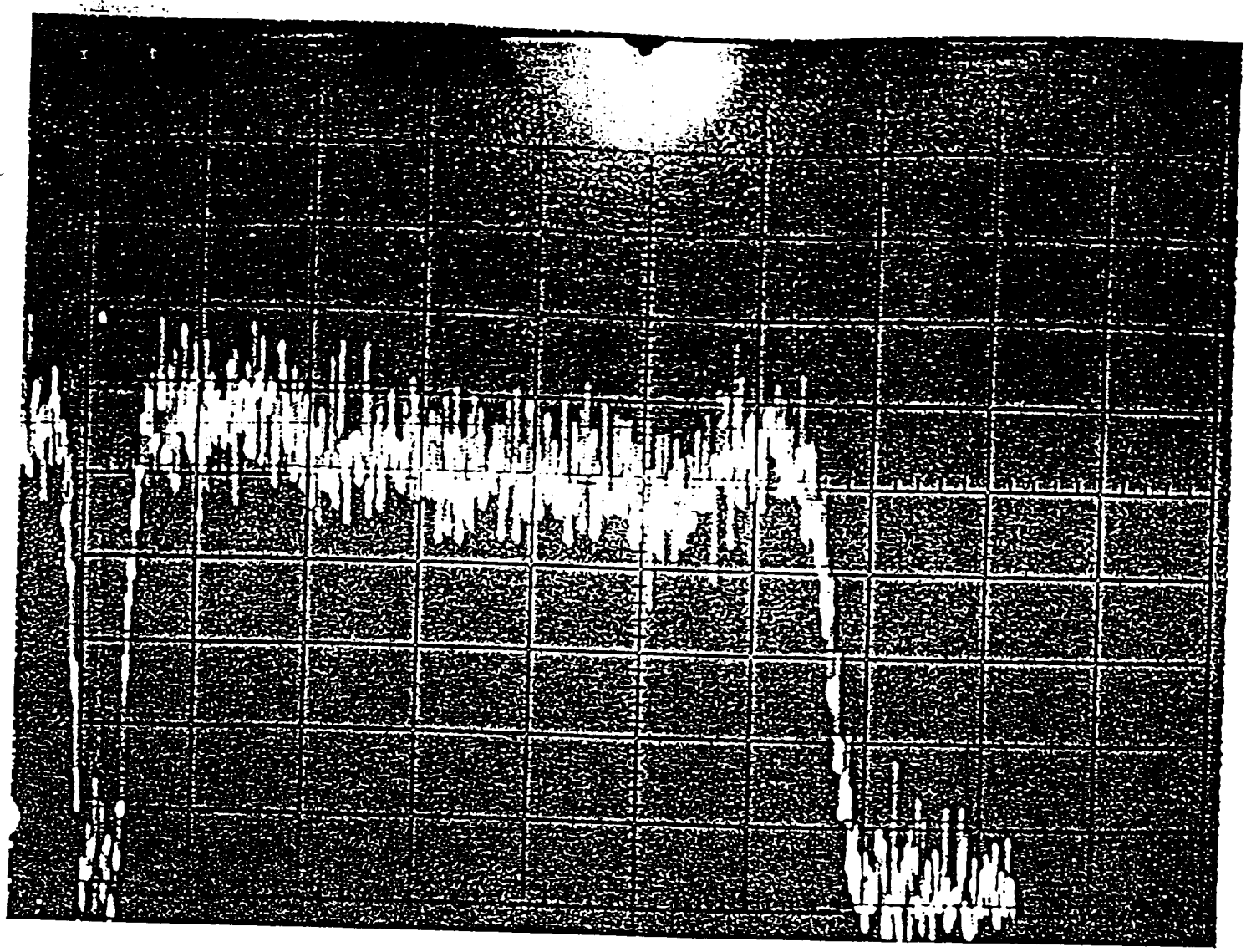
END DATE: 9-8-97

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101



5.4.14 Noise Power Profile

Model No.: 1331562-14F
Serial No.: 7A04
Date: 9-10-97
Tested by: DZ

Spectrum Analyzer Parameters

Vertical Scale: 2 dB/div.
Scan Width: 30 mhz/Div.
IF Band Width: 10 Khz
Scan Time: 3 sec/Div.
No video filter.

04 1

Channel 5 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-15, S/N: 7A05)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.16	0.5	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
10.04	70.96	3.25	2.0	QA 1	
10.00	70.88				
9.96	70.70				
ΔGv =	0.26 dB				

	DATE	ACC	REJ
SPACEK QA	9-4-97	QA 1	

PART NO. 1331562-15F

SER NO. 7A05

TESTED BY: [signature]

END DATE: 8-7-97

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

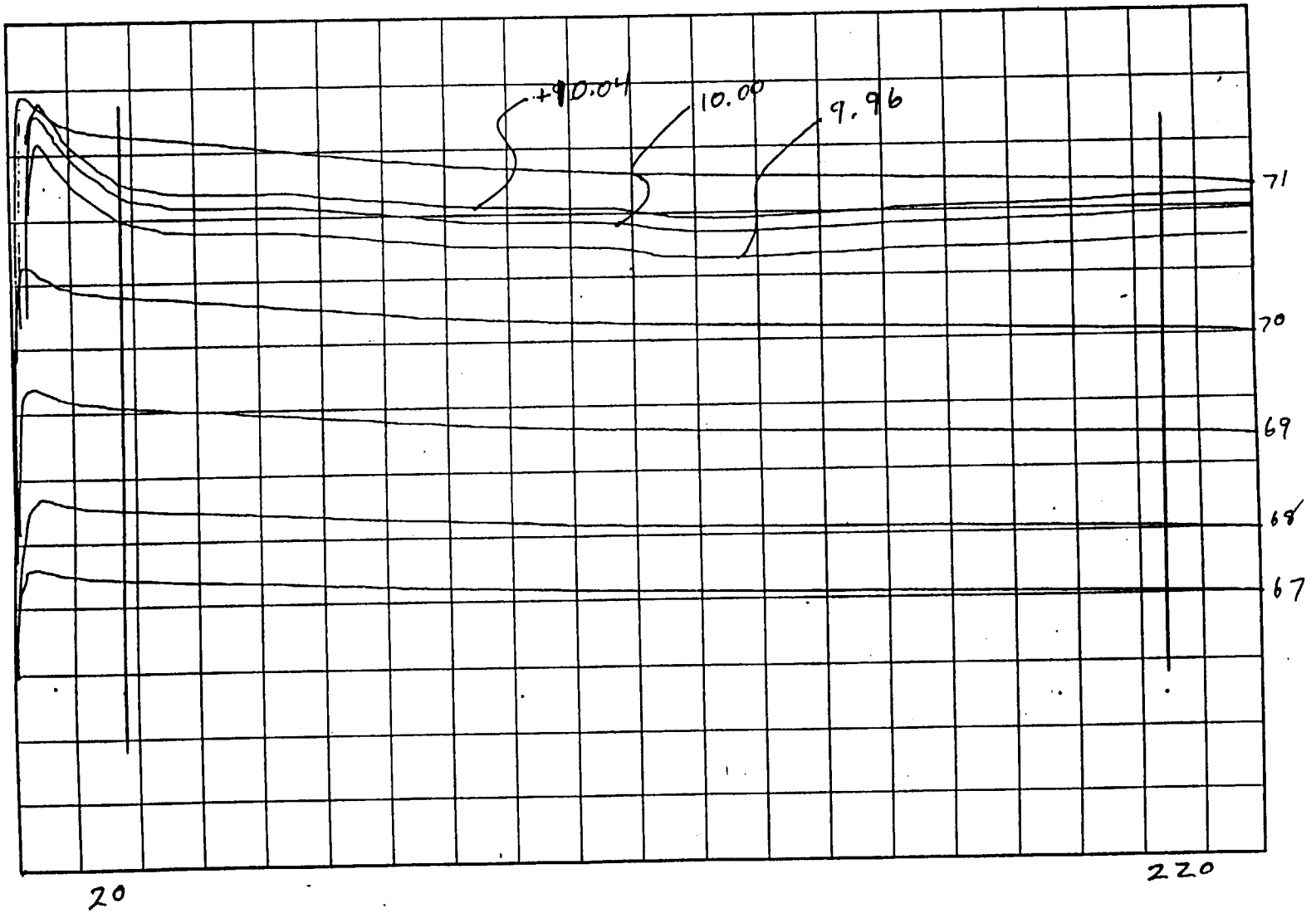
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-15F
Serial No. 7A05
Date 8-6-97
Tested By TTT

Amb Temp 23°C



Freq ncy (Mhz)

QA
1

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 +40	G_{T1} 70.70				
		* .013	0.035dB/°C	QA 1	
T2 +28	G_{T2} 70.86				
		* .026	0.020dB/°C		QA 1
T3 +8	G_{T3} 71.38				
		* .012	0.035dB/°C	QA 1	
T4 −6	G_{T4} 71.55				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4 \qquad \Delta G_T = 0.85 \text{ dB}$$

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 = 1.51$ dB Spec 1.4dB ACC____ REJ____ QA 1

	DATE	ACC	REJ
PART NO. 1331562-15F	SPACEK QA	9-10-97	QA 1

SER NO. 7A05 TEST FAILURE: _____

TESTED BY: _____ FAILURE ANALYSIS NO. _____

END DATE: 8-7-97

END TIME: 1600

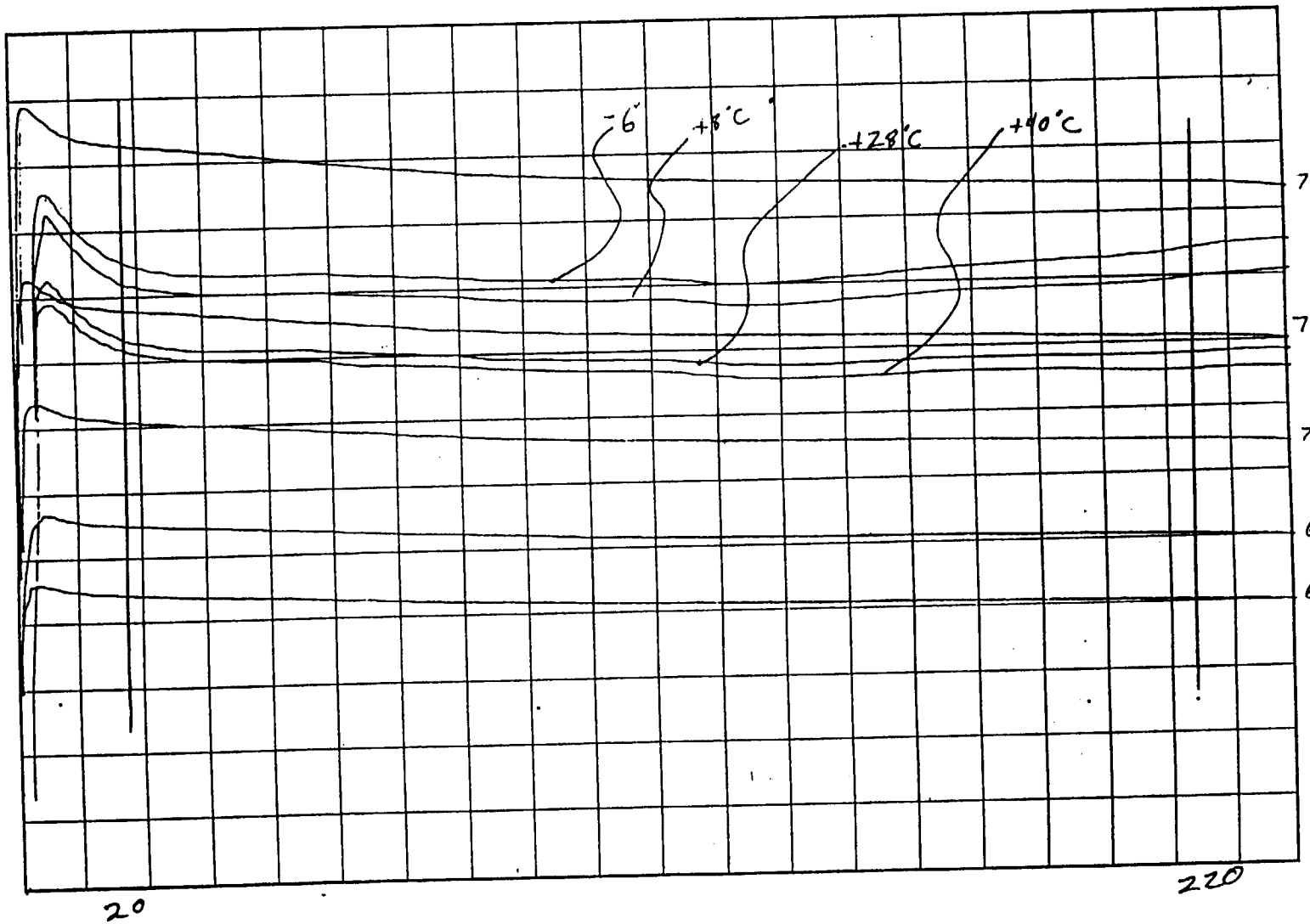
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-15F
Serial No. 7A05
Date 8-6-97
Tested By TH

Amb Temp 24°C



QA
1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

_____

11 12 13 14 15 16 17 18 19 20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X X X X X X X X X X	10	-2.3	0.7	1.0	S-	
X	20	—	—	—		
X X	50	—	—	—		
X X X X X X X X X X	100	-2.6	0.4	1.0	QA	
X	150	—	—	—		
X X X X X X	200	-2.3	0.7	1.0	QA	
X	400	—	—	—		
X	500	—	—	—		
X	1000	—	—	—		
X	1500	—	—	—		

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 8-7-97 AMBIENT ROOM TEMPERATURE °C: 21

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-21.0	-24.6	3.6	1.18

Above data taken with Daden filter attached (except -19).

Intermediate test results for information only

PART NO. 1331562-15F

SER NO. 7A05

TESTED BY: [signature]

END DATE: 8-7-97

END TIME: 1:30 pm

SPACEK QA — DATE 8-8-97 — ACC S- — REJ

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 8-31-97 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT (mA)	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.5	-19.60	-21.60	2.0	3.1	3.8	✓	
+8	43.5	-19.70	-21.65	1.95	3.2	3.8	✓	
+28	43.7	-20.00	-21.95	1.95	3.2	3.8	✓	
+40	43.8	-20.20	-22.15	1.95	3.2	3.8	✓	

Noise figure change 0.1 dB Spec is .5dB peak to peak on -20 ACC ✓ REJ _____

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 8-5-97 Ambient Room Temperature °C: 25

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.337

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II. Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC _____ REJ ✓

PART NO. 1331562-15F

SER NO. 7A05

TESTED BY: [signature]

END DATE: 8-5-97

END TIME: 1600

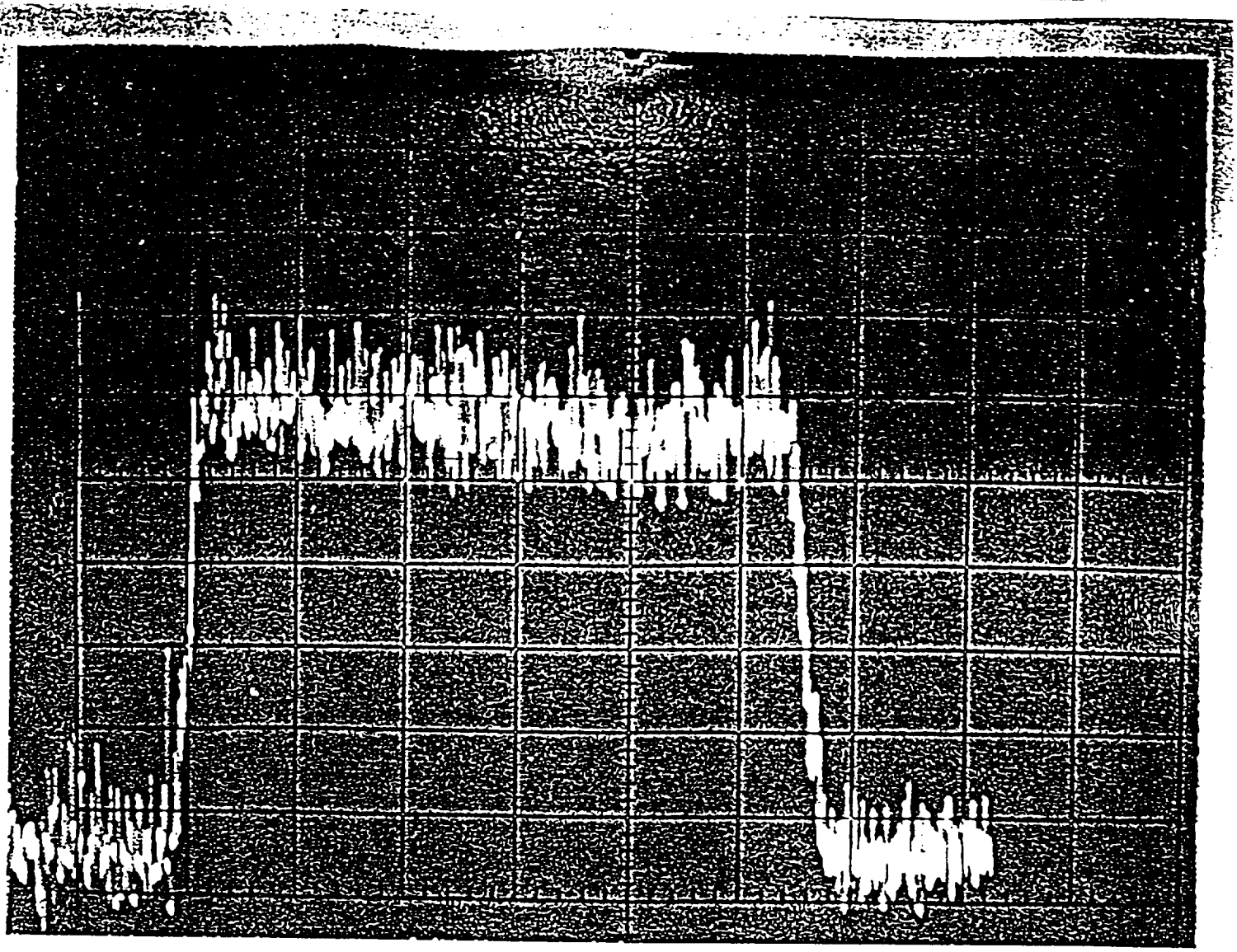
DATE ACC REJ

SPACEK QA 9-10-97 _____ ✓

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101



5.4.14 Noise Power Profile

Model No.: 1331562-15F
Serial No.: 7A05
Date: 9-10-97
Tested by: DL

Spectrum Analyzer Parameters

Vertical Scale: 2 dB/div.
Scan Width: 30 mhz/Div.
IF Band Width: 10 Khz
Scan Time: 3 sec/Div.
No video filter.

QA
1

Channel 6 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-16, S/N: 7A06)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.28	0.5	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
10.06	70.41	1.5	2.0	QA 1	
10.00	70.35				
9.96	70.29				
ΔGv =	0.12 dB				

	DATE	ACC	REJ
SPACEK QA	4-25-97	QA 1	

PART NO. 1331562-16F

SER NO. 7A06

TESTED BY: [signature]

END DATE: 4-25-97

END TIME: 4:00PM

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

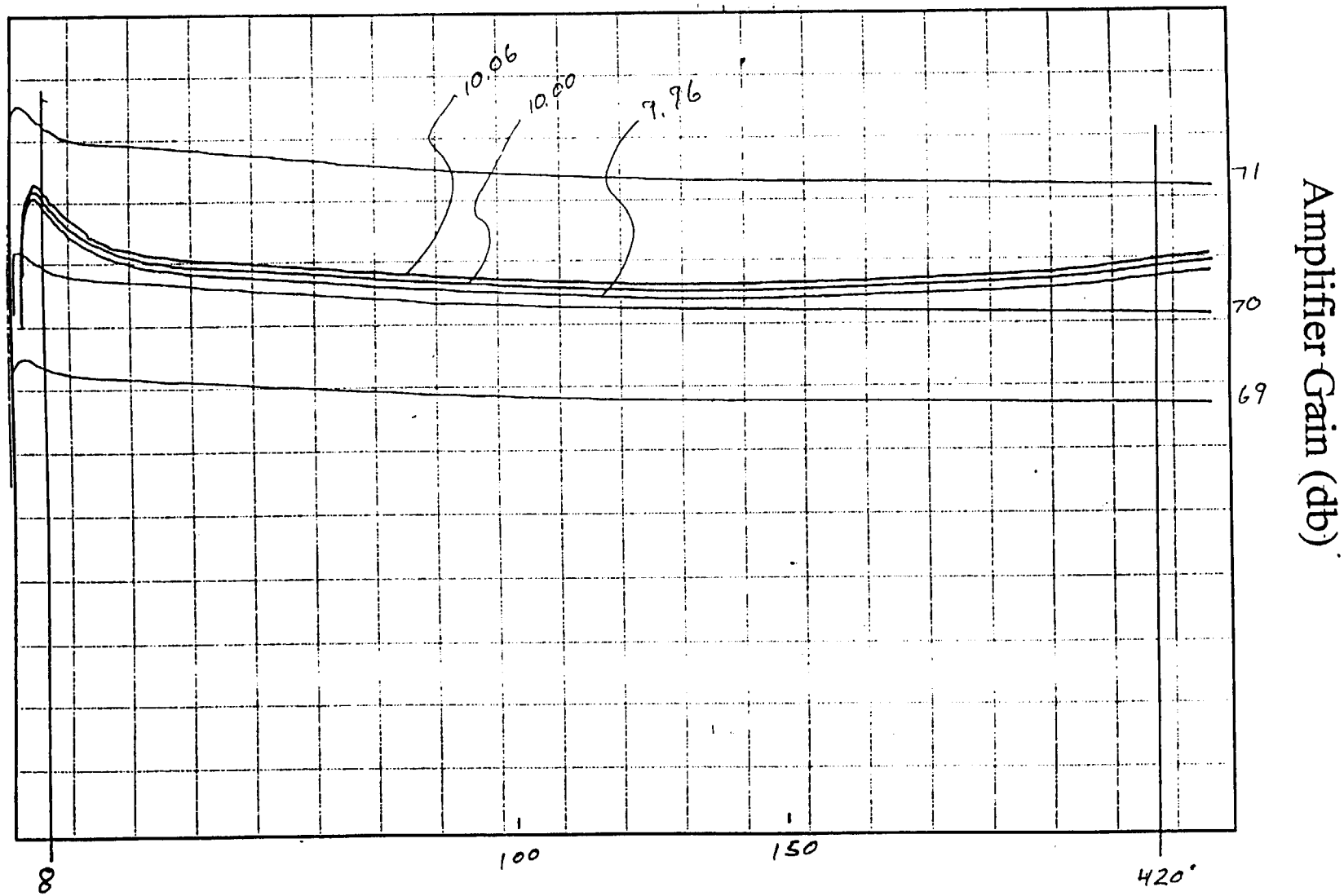
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562 -16F
Serial No. 7A06
Date 4-25-97
Tested By 777

Amb Temp 23c



TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 +40	G_{T1} 69.95				
		* 0.025	0.035dB/°C	QA 1	
T2 +28	G_{T2} 70.25				
		* 0.030	0.020dB/°C		QA 1
T3 +8	G_{T3} 70.85				
		* 0.024	0.035dB/°C	QA 1	
T4 −6	G_{T4} 71.18				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \qquad i = 1,2,3,4$$

ΔG_T = 1.23 dB

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4$ = 1.75 dB Spec 1.4dB ACC____ REJ QA-1

	DATE	ACC	REJ
PART NO. 1331562-16F	SPACEK QA 4-24-97	___	QA 1

SER NO. 7A06 TEST FAILURE: _____

TESTED BY: _____ FAILURE ANALYSIS NO. _____

END DATE: 4-24-97

END TIME: 4:00 pm

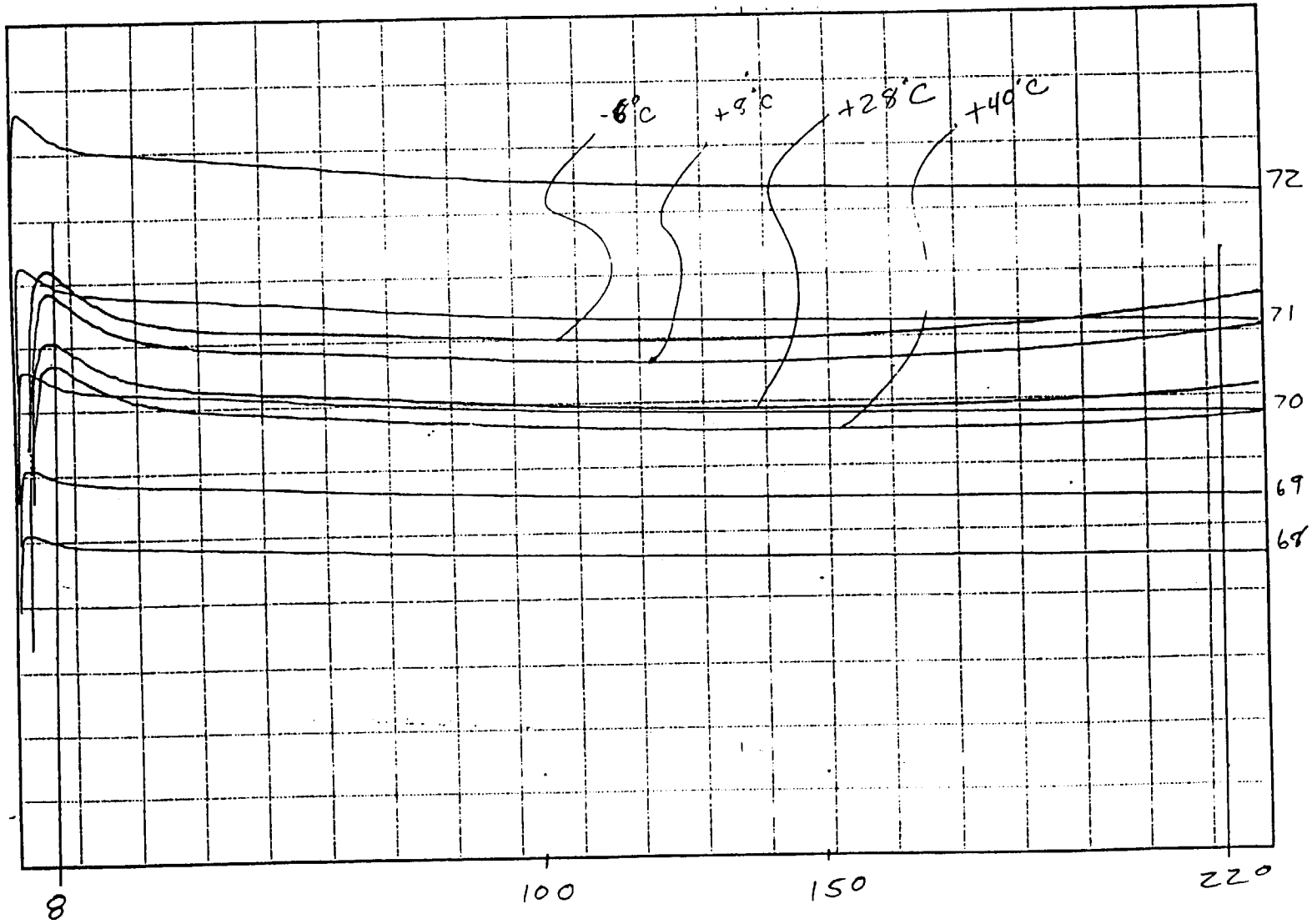
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562 -10F
Serial No. 7A06
Date 4-24-97
Tested By TTH

Amb Temp +23°C



TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X	X	X	X	X	X	X	10	0.6	1.0	S	
	X	X								50	-	-		
X	X	X	X	X	X	X	X	X		100	0.5	1.0	S	
X										150	-	-		
			X	X	X	X	X	X		200	0.7	1.0	S	
								X		400	-	-		
									X	500	-	-		
									X	1000	-	-		
									X	1500	-	-		

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 4/20/97 AMBIENT ROOM TEMPERATURE °C: +23

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-20.6	-24.2	3.6	1.17

Above data taken with Daden filter attached (except -19) .

Intermediate test results for information only

		DATE	ACC	REJ
PART NO. 1331562-16F	SPACEK QA	4-20-97	S	
SER NO. 7A06	TEST FAILURE:			
TESTED BY: [signature]	FAILURE ANALYSIS NO.			
END DATE: 4-20-97				
END TIME: 4:00pm				

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 7-2-97 AMBIENT ROOM TEMPERATURE °C: +22

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.4	-19.60	-21.65	2.05	3.0	3.8	✓	
+8	43.5	-19.70	-21.70	2.0	3.1	3.8	✓	
+28	43.6	-20.00	-22.00	2.0	3.1	3.8	✓	
+40	43.6	-20.40	-22.40	1.9	3.3	3.8	✓	

Noise figure change 0.3 dB Spec is .5dB peak to peak on -20 ACC ✓ REJ _____

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 7-1-97 Ambient Room Temperature °C: +25

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.203

Record Nps(K) 0.07 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC ✓ REJ _____

DATE ACC REJ

PART NO. 1331562-16F SPACEK QA 7-2-97 ✓ _____

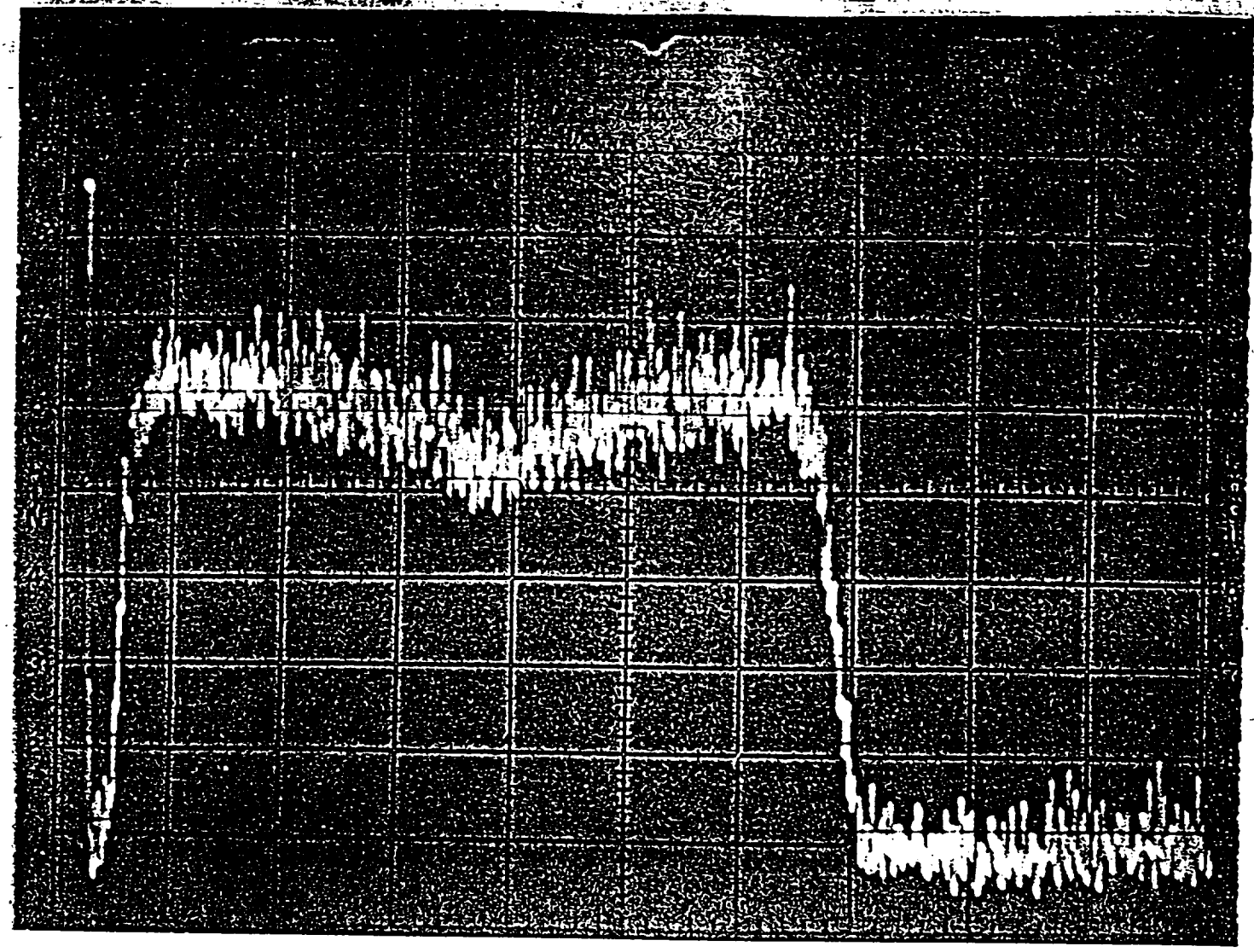
SER NO. 7A06 TEST FAILURE: _____

TESTED BY: [illegible] FAILURE ANALYSIS NO. _____

END DATE: 7-2-97

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101



5.4.14 Noise Power Profile

Model No.: 1331562-16F
Serial No.: 7A06
Date: 7-3-97
Tested by: DL

Spectrum Analyzer Parameters

Vertical Scale: 2 dB/div.
Scan Width: 30 mhz/Div.
IF Band Width: 10 Khz
Scan Time: 3 sec/Div.
No video filter.

Channel 7 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-17, S/N: 7A07)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.42	0.5	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
10.04	70.71	2.0	2.0	QA 1	
10.00	70.65				
9.96	70.55				
ΔGv =	0.16 dB				

	DATE	ACC	REJ
SPACEK QA	4-21-97	QA 1	

PART NO. 1331562-17F

SER NO. 7A07

TESTED BY: [signature]

END DATE: 4-21-97

END TIME: 4:00 Pm

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

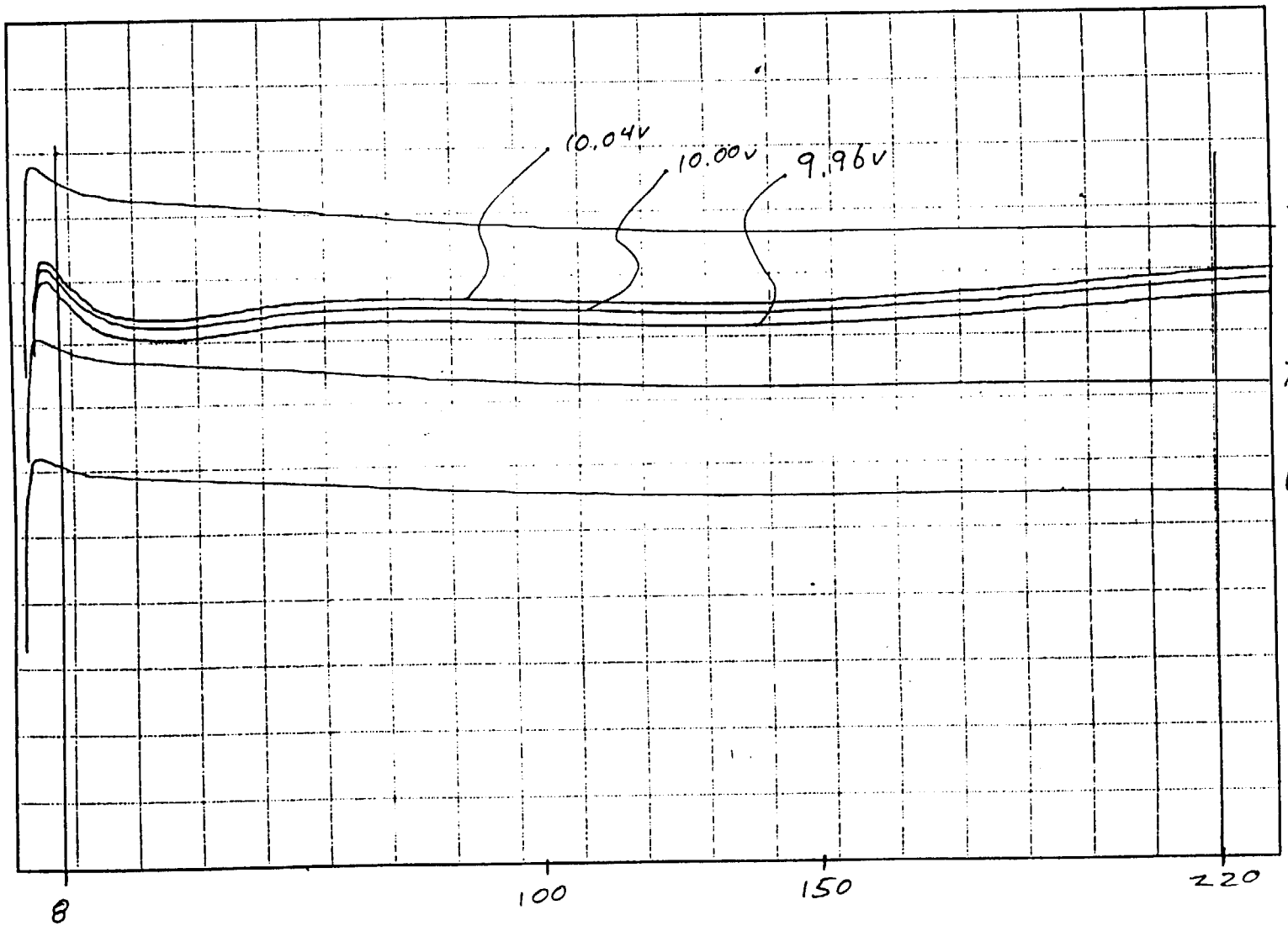
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Model No. 1331562-17F
Serial No. 7A07
Date 4-21-97
Tested By ZFT

Amplifier Gain

+23°C



TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 +40	G_{T1} 70.45				
		* 0.021	0.035dB/°C	QA 1	
T2 +28	G_{T2} 70.70				
		* 0.030	0.020dB/°C		QA 1
T3 +8	G_{T3} 71.30				
		* 0.018	0.035dB/°C	QA 1	
T4 −6	G_{T4} 71.55				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4 \qquad \Delta G_T = 1.10 \text{ dB}$$

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 = 1.66$ dB Spec 1.4dB ACC____ REJ QA 1

	DATE	ACC	REJ
PART NO. 1331562-17F	SPACEK QA	4-24-97	QA 1

SER NO. 7A07 TEST FAILURE: _____

TESTED BY: [signature] FAILURE ANALYSIS NO. _____

END DATE: 4-24-97

END TIME: 4:00PM

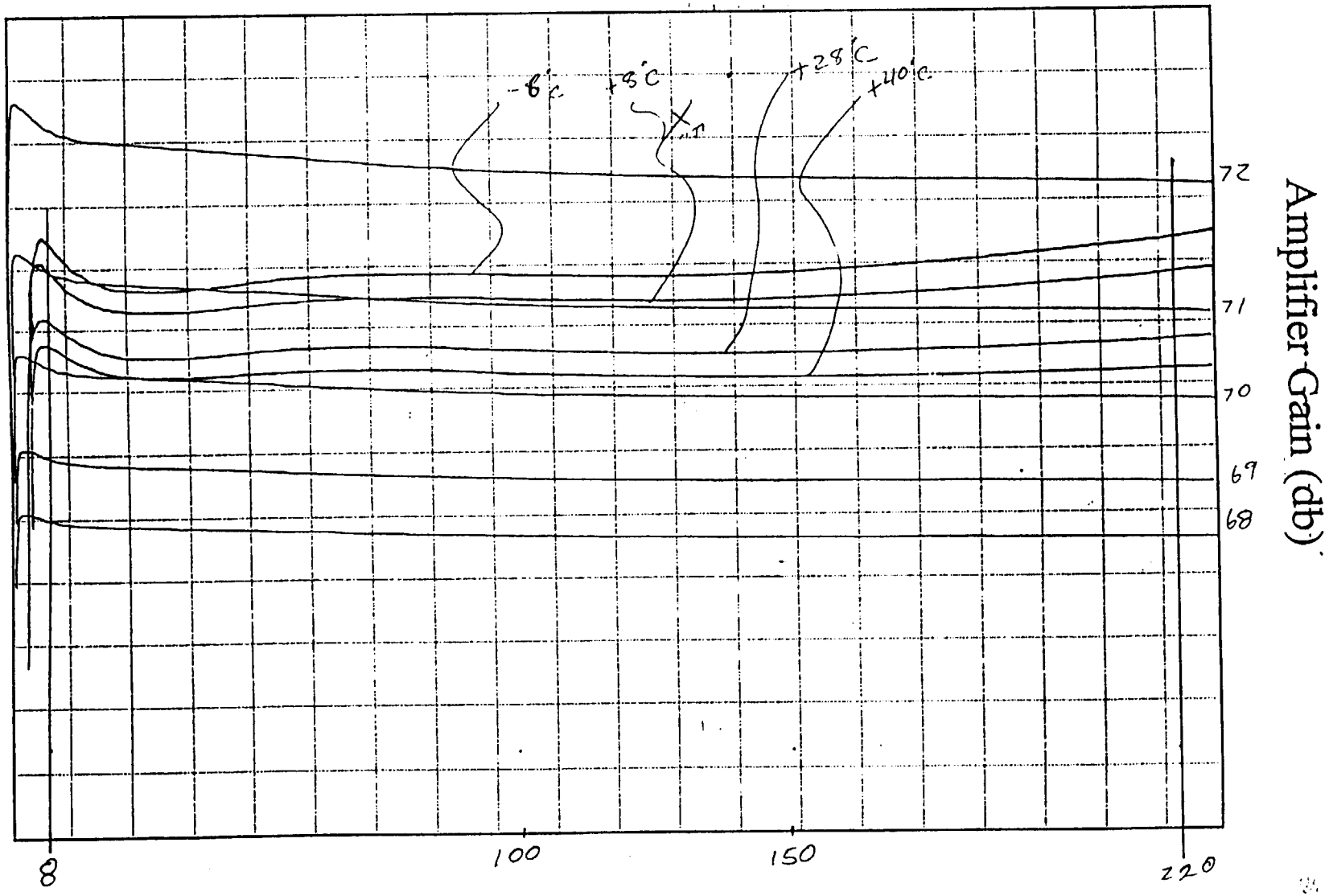
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 133562-17
Serial No. 7A07
Date 4-24-97
Tested By TTT

Amb Temp +23°C



TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X	X	X	X	X	X	X	10	0.70	1.0	SL	
	X	X								50	—	—		
X	X	X	X	X	X	X	X	X		100	0.55	1.0	SL	
X										150	—	—		
			X	X	X	X	X	X		200	0.60	1.0	SL	
								X		400	—	—		
									X	500	—	—		
									X	1000	—	—		
									X	1500	—	—		

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 4-20-97 AMBIENT ROOM TEMPERATURE °C: +23

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-20.1	-23.7	3.6	1.17

Above data taken with Daden filter attached (except -19).

Intermediate test results for information only

		DATE	ACC	REJ
PART NO. 1331562-17F	SPACEK QA	4-24-97	SL	

SER NO. 7A07

TEST FAILURE:

TESTED BY:

FAILURE ANALYSIS NO.

END DATE: 4-24-97

END TIME: 4:00 PM

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 7-3-97 AMBIENT ROOM TEMPERATURE °C: +22

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	42.8	-19.50	-21.80	2.30	2.6	3.8	QA 1	
+8	42.9	-19.60	-21.85	2.25	2.7	3.8	QA 1	
+28	43.0	-19.80	-22.00	2.20	2.8	3.8	QA 1	
+40	43.1	-20.40	-22.60	2.20	2.8	3.8	QA 1	

Noise figure change 0.2 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ _____

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 7-1-97 Ambient Room Temperature °C: +25

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.167

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC	REJ
____	[signature]

DATE	ACC	REJ
7-3-97	___	[signature]

PART NO. 1331562-17F

SER NO. 7A07

TESTED BY: [signature]

END DATE: 7-3-97

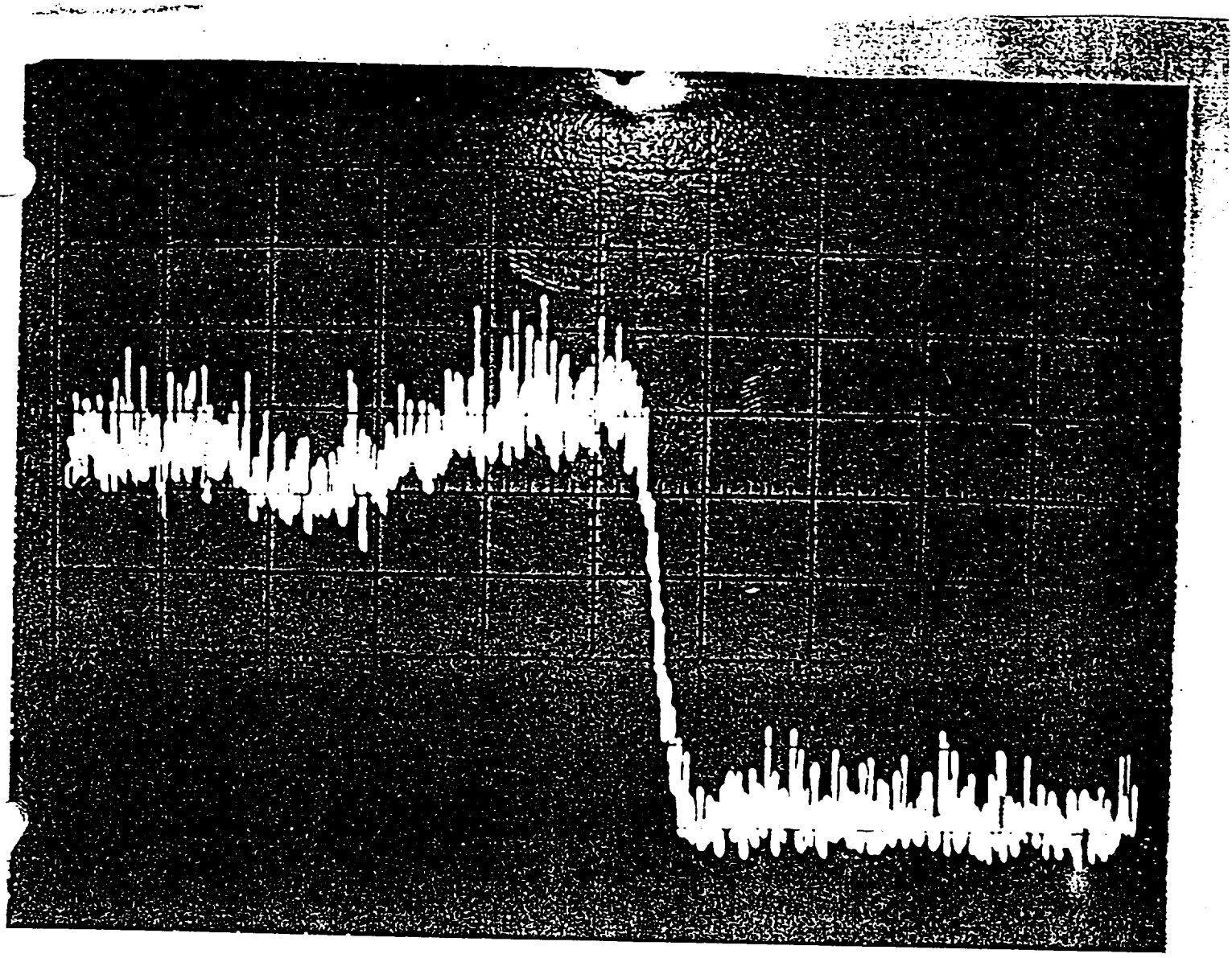
END TIME: 1600

SPACEK QA

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101



5.4.14 Noise Power Profile

Model No.: 1331562-171
Serial No.: 7A07
Date: 7-3-97
Tested by: DA

Spectrum Analyzer Parameters

Vertical Scale: 2 dB/div.
Scan Width: 30 mhz/Div.
IF Band Width: 10 Khz
Scan Time: 3 sec/Div.
No video filter.

Channel 8 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-18, S/N: 7A08)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.26	0.5	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
16.04	70.98	3.62	2.0		QA 1
10.00	70.88				
9.96	70.69				
ΔGv =	0.29 dB				

	DATE	ACC	REJ
PART NO. 1331562-18F	SPACEK QA 9-4-97	QA 1	

SER NO. 7A08

TESTED BY: [signature]

END DATE: 8-7-97

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

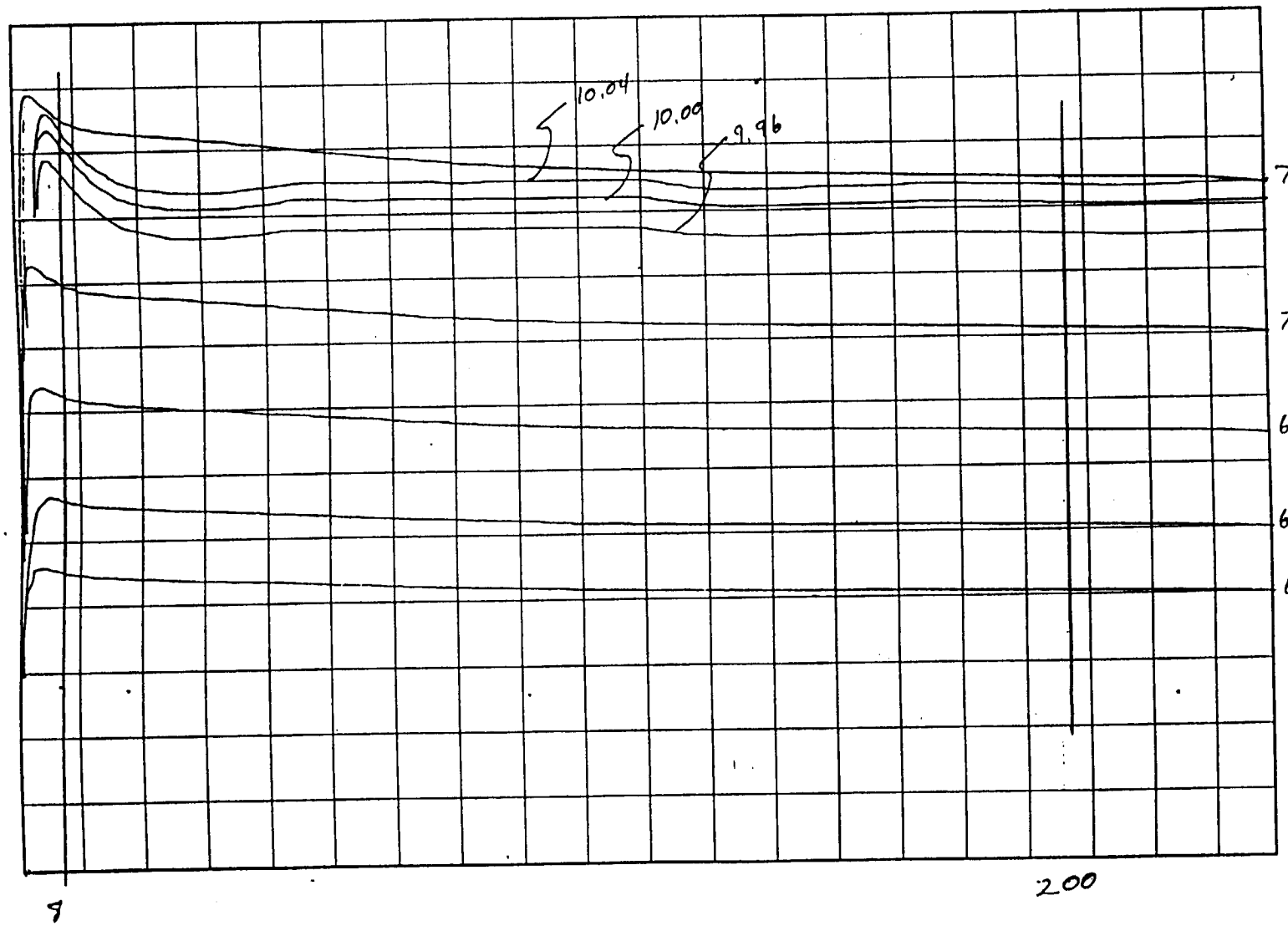
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-18F
Serial No. 7A08
Date 8-6-97
Tested By TT

Amb Temp 23°C



Freq(ncy (Mhz)

QA
1

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 +40	G_{T1} 70.65				
		* .017	0.035dB/°C	QA 1	
T2 +28	G_{T2} 70.85				
		* .022	0.020dB/°C		QA 1
T3 +8	G_{T3} 71.28				
		* .015	0.035dB/°C	QA 1	
T4 −6	G_{T4} 71.49				

• Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \qquad i = 1,2,3,4$$

ΔG_T = 0.84 dB

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4$ = 1.53 dB Spec 1.4dB ACC____ REJ QA 1

	DATE	ACC	REJ
SPACEK QA			QA 1

PART NO. 1331562-18F

SER NO. 7A08

TESTED BY: [signature]

END DATE: 8-7-97

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

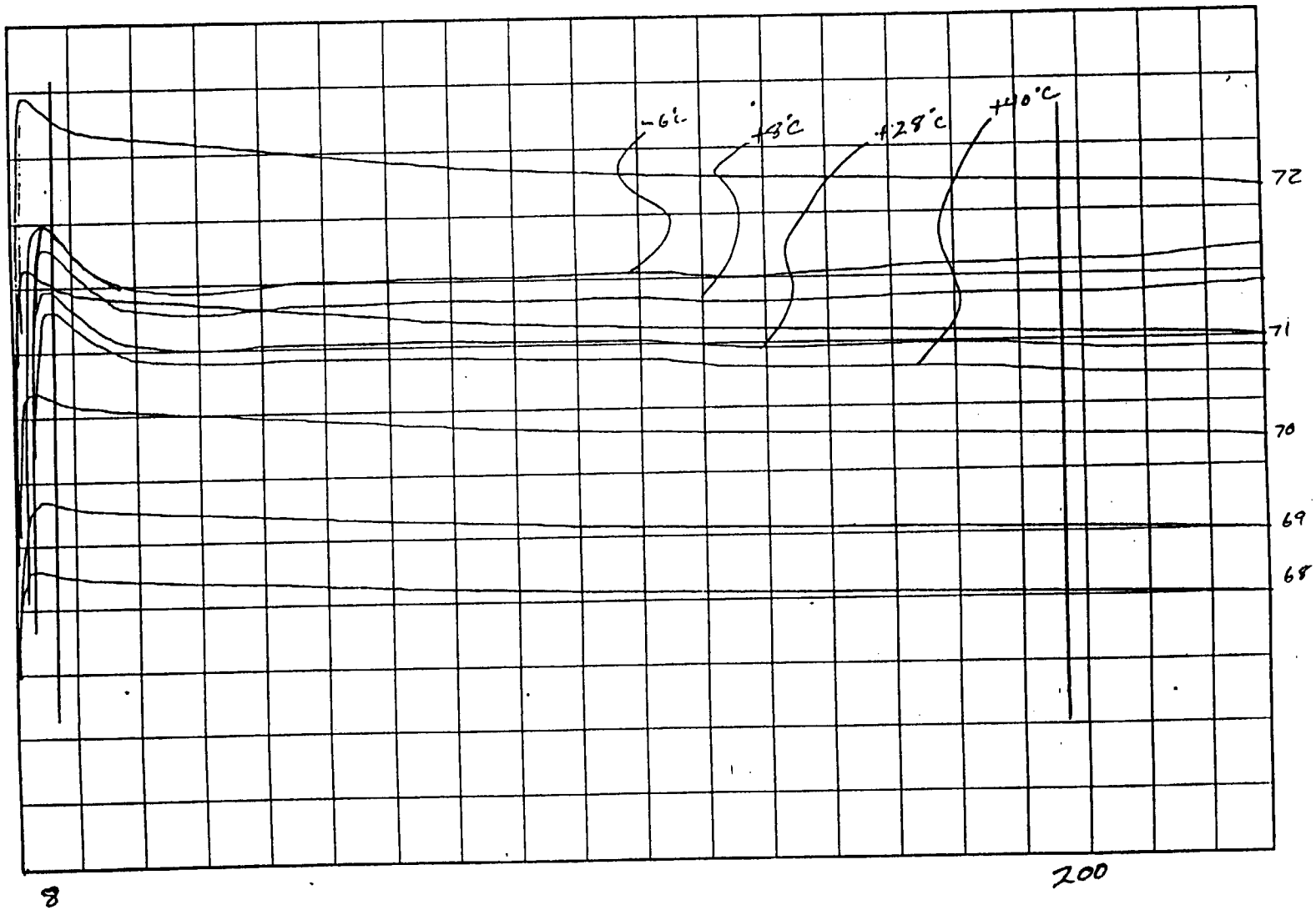
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-18F
Serial No. 7A08
Date 8-6-77
Tested By TTT

Amb Temp 24°C



QA
1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11 12 13 14 15 16 17 18 19 20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X X X X X X X X X X	10	-2.3	0.7	1.0	QA	
X	20	—	—	—		
X X	50	—	—	—		
X X X X X X X X X X	100	-2.6	0.4	1.0	QA	
X	150	—	—	—		
X X X X X X X	200	-2.3	0.7	1.0	QA	
X	400	—	—	—		
X	500	—	—	—		
X	1000	—	—	—		
X	1500	—	—	—		

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 8-7-97 AMBIENT ROOM TEMPERATURE °C: 21

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-20.2	-23.8	3.6	1.18

Above data taken with Daden filter attached (except -19).

Intermediate test results for information only

PART NO. 1331562-18F

SER NO. 7A08

TESTED BY: [signature]

END DATE: 8-7-97

END TIME: 1:30 pm

SPACEK QA — DATE 8-8-97 — ACC QA — REJ

TEST FAILURE:

FAILURE ANALYSIS NO.

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 8-31-97 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.5	-18.90	-21.00	2.10	2.90	3.8	QA 1	
+8	43.5	-18.90	-20.95	2.05	3.0	3.8	QA 1	
+28	43.7	-19.20	-21.25	2.05	3.0	3.8	QA 1	
+40	43.8	-19.40	-21.40	2.00	3.1	3.8	QA 1	

Noise figure change 0.2 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ _____

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 9-10-97 Ambient Room Temperature °C: 25

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.184

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC _____ REJ QA 1

PART NO. 1331562-18F

SER NO. 7A08

TESTED BY: [signature]

END DATE: 9-10-97

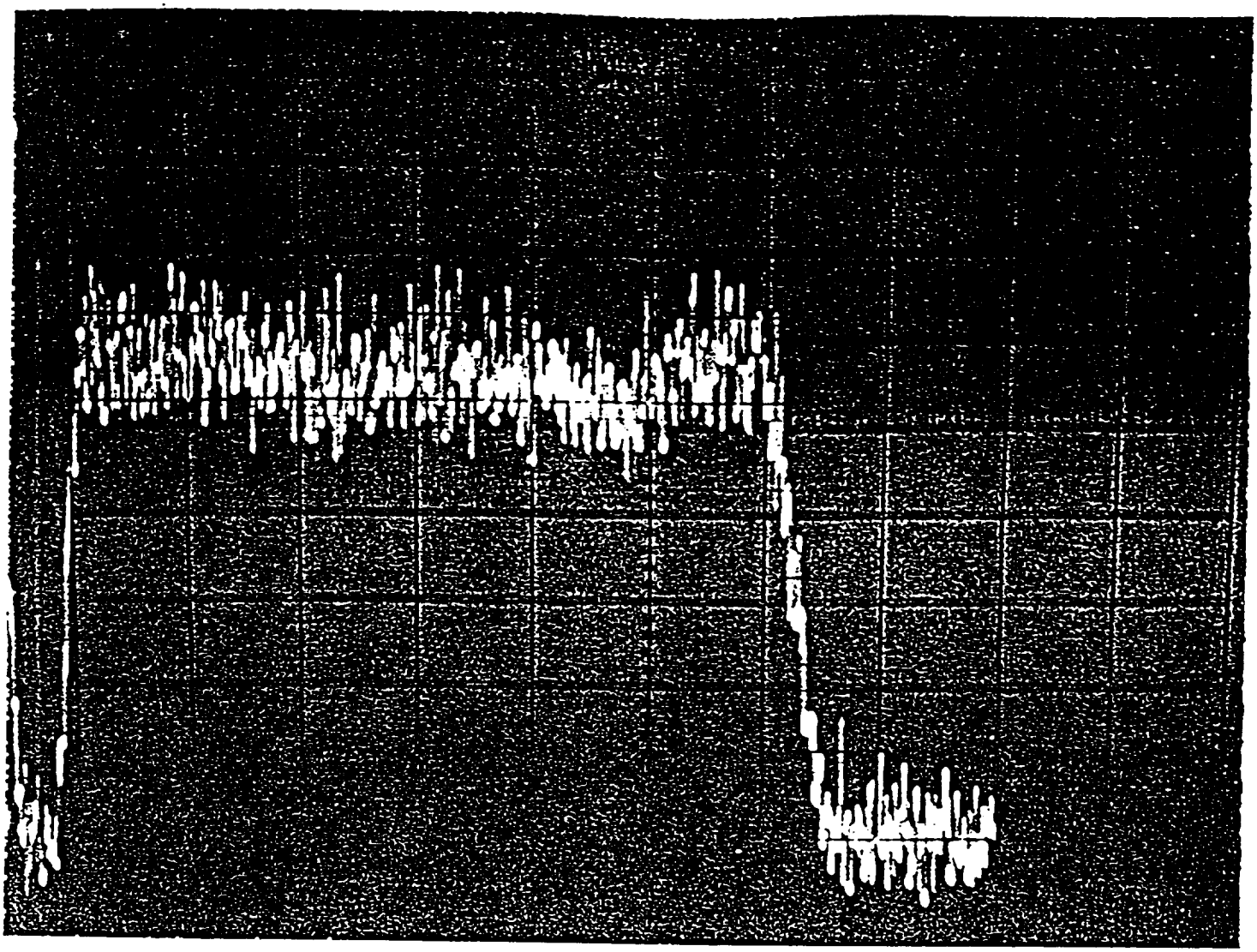
END TIME: 1600

SPACEK QA DATE 9-10-97 ACC ___ REJ QA 1

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101



5.4.14 Noise Power Profile

Model No.: 1331562-18F
Serial No.: 7A08
Date: 9-10-97
Tested by: DH

Spectrum Analyzer Parameters

Vertical Scale: 2 dB/div.
Scan Width: 30 mhz/Div.
IF Band Width: 10 Khz
Scan Time: 3 sec/Div.
No video filter.

QA 1

Channels 9-14 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-19, S/N: 7A09)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0.45	0.5	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
10.04	61.0	1.9	2.0	QA 1	
10.00	60.95				
9.96	60.85				
ΔGv =	.15 dB				

	DATE	ACC	REJ
PART NO. 1331562-19F	SPACEK QA 4-25-97	QA 1	

SER NO. 7A09

TESTED BY: [signature]

END DATE: 4-25-97

END TIME: 1610

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

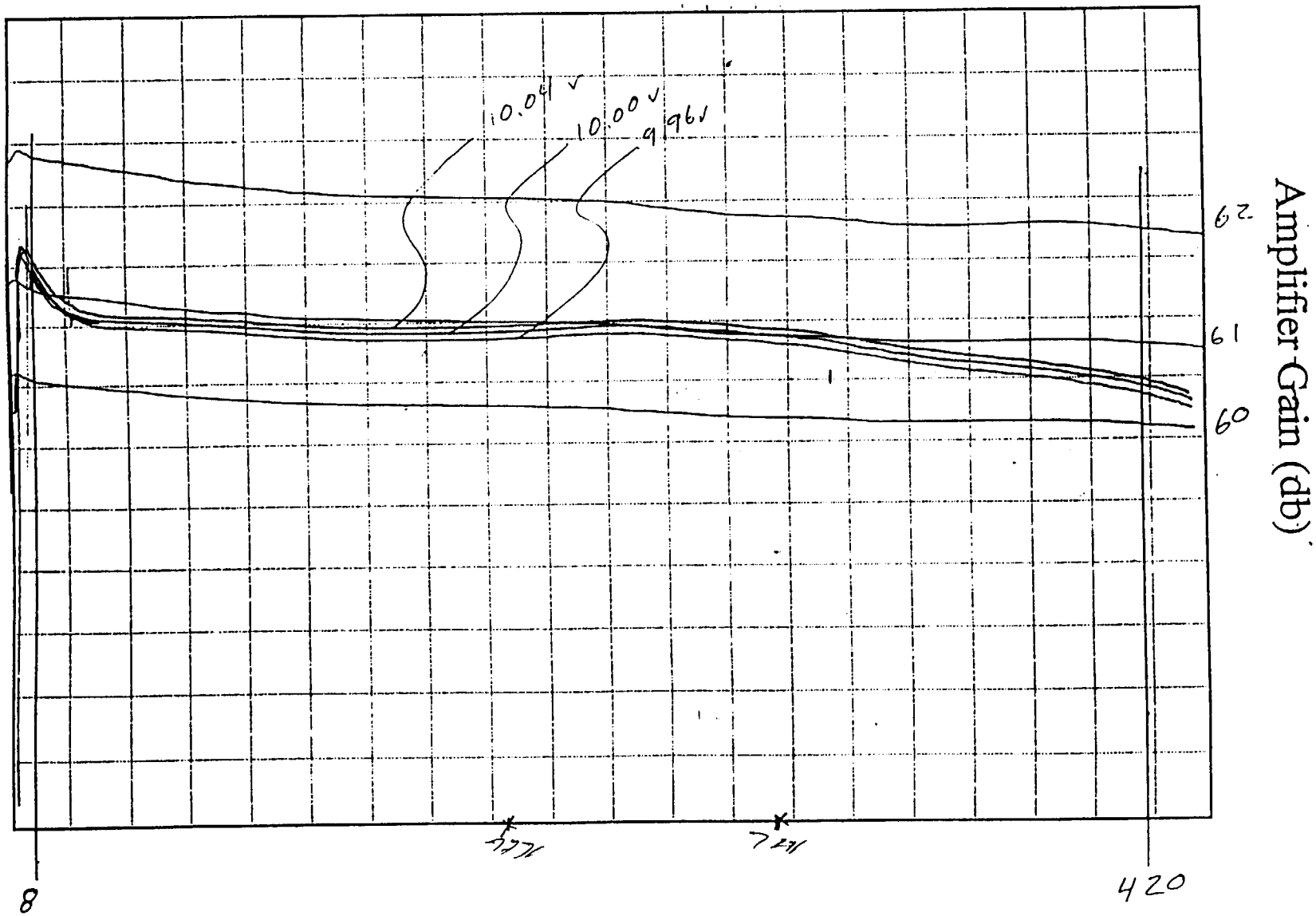
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-19f
Serial No. 7A09
Date 4-25-97
Tested By 777

Amb Temp 23°c



QA 1

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)	Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1 +40	G_{T1} 59.65				
		* .046	0.035dB/°C		QA 1
T2 +28	G_{T2} 60.2				
		* .048	0.020dB/°C		QA 1
T3 +8	G_{T3} 61.15				
		* .025	0.035dB/°C	QA 1	
T4 −6	G_{T4} 61.5				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \qquad i = 1,2,3,4$$

ΔG_T = 1.85 dB

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4$ = 2.4 dB Spec 1.4dB ACC____ REJ QA-1

	DATE	ACC	REJ
PART NO. 1331562-19F	SPACEK QA	5-5-97	QA 1

SER NO. 7A09

TESTED BY: [signature]

END DATE: 4-24-97

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

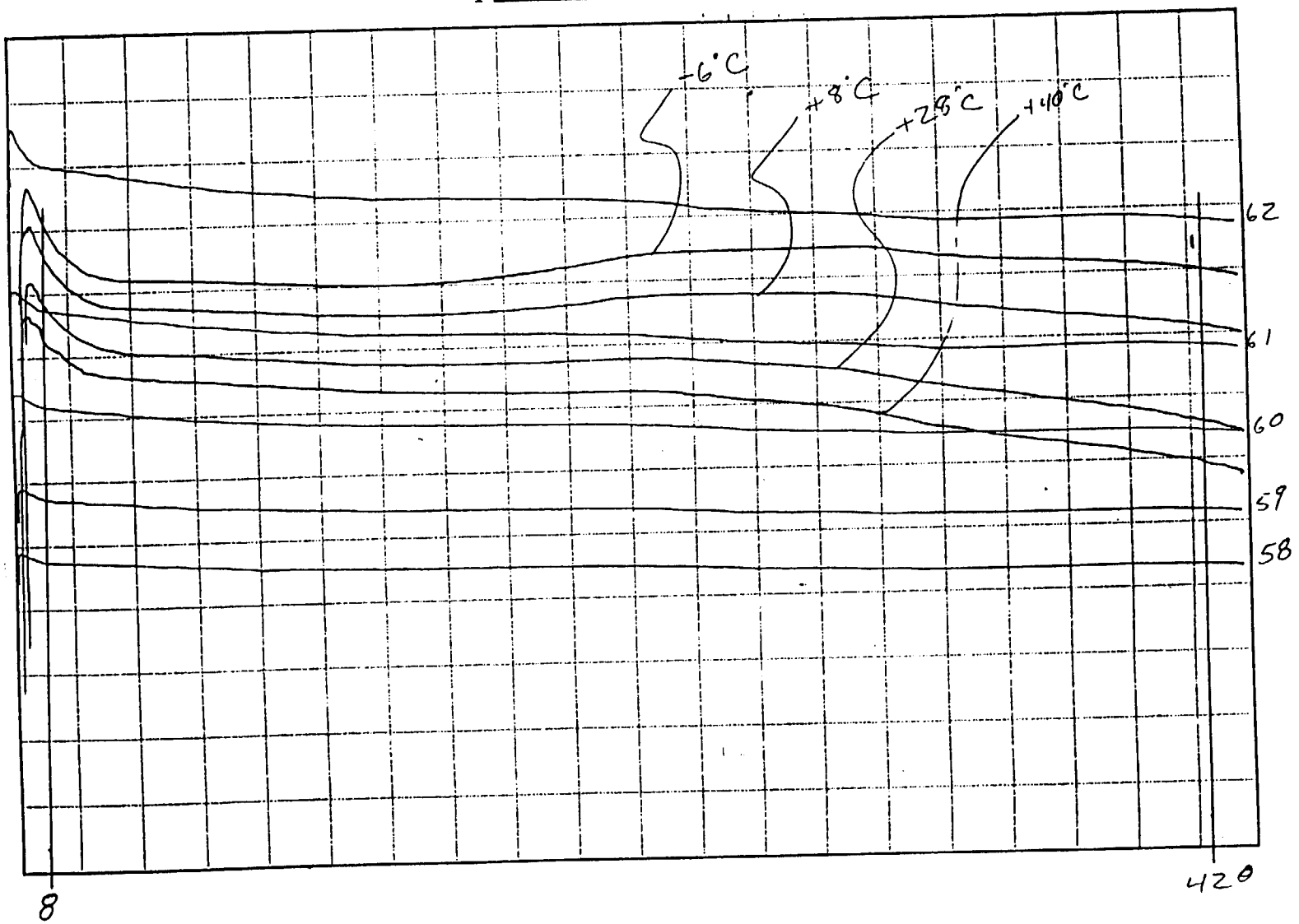
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 133562-19F
Serial No. 7A09
Date 4-24-97
Tested By TT

Amb Temp +23°C



TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X	X	X	X	X	X	X	10	0.7	1.0		QA-1
	X	X								50	—	—	—	—
X	X	X	X	X	X	X	X			100	—	—	—	—
X										150	—	—	—	—
			X	X	X	X	X	X		200	0.8	1.0		QA-1
								X		400	1.3	1.0	QA-1	
									X	500	—	—	—	—
									X	1000	—	—	—	—
									X	1500	—	—	—	—

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 4-20-97 AMBIENT ROOM TEMPERATURE °C: +23°C

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-25.0	-28.3	3.3	1.43

Above data taken with Daden filter attached (except -19).

Intermediate test results for information only

		DATE	ACC	REJ
PART NO. 1331562-19F	SPACEK QA	5-5-97		QA-1

SER NO. 7A09

TESTED BY: [signature]

END DATE: 4-20-97

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 7-7-97 AMBIENT ROOM TEMPERATURE °C: +22

UUT TEMP °C.	UUT CURRENT unit #	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	40.6	-24.10	-26.15	2.05	3.0	3.5	QA 1	
+8	40.7	-24.30	-26.30	2.0	3.1	3.5	QA 1	
+28	40.9	-24.80	-26.80	2.0	3.1	3.5	QA 1	
+40	41.0	-25.40	-27.30	1.9	3.3	3.5	QA 1	

Noise figure change 0.3 dB Spec is .5dB peak to peak on -20 ACC QA 1 REJ _____

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 7-1-97 Ambient Room Temperature °C: +25

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.104

Record Nps(K) 0.07 for dash number from Aerojet specification AE-24869, Table II. Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC REJ

_____ [signature]

DATE ACC REJ

PART NO. 1331562-19F SPACEK QA 7-3-97 _____ [signature]

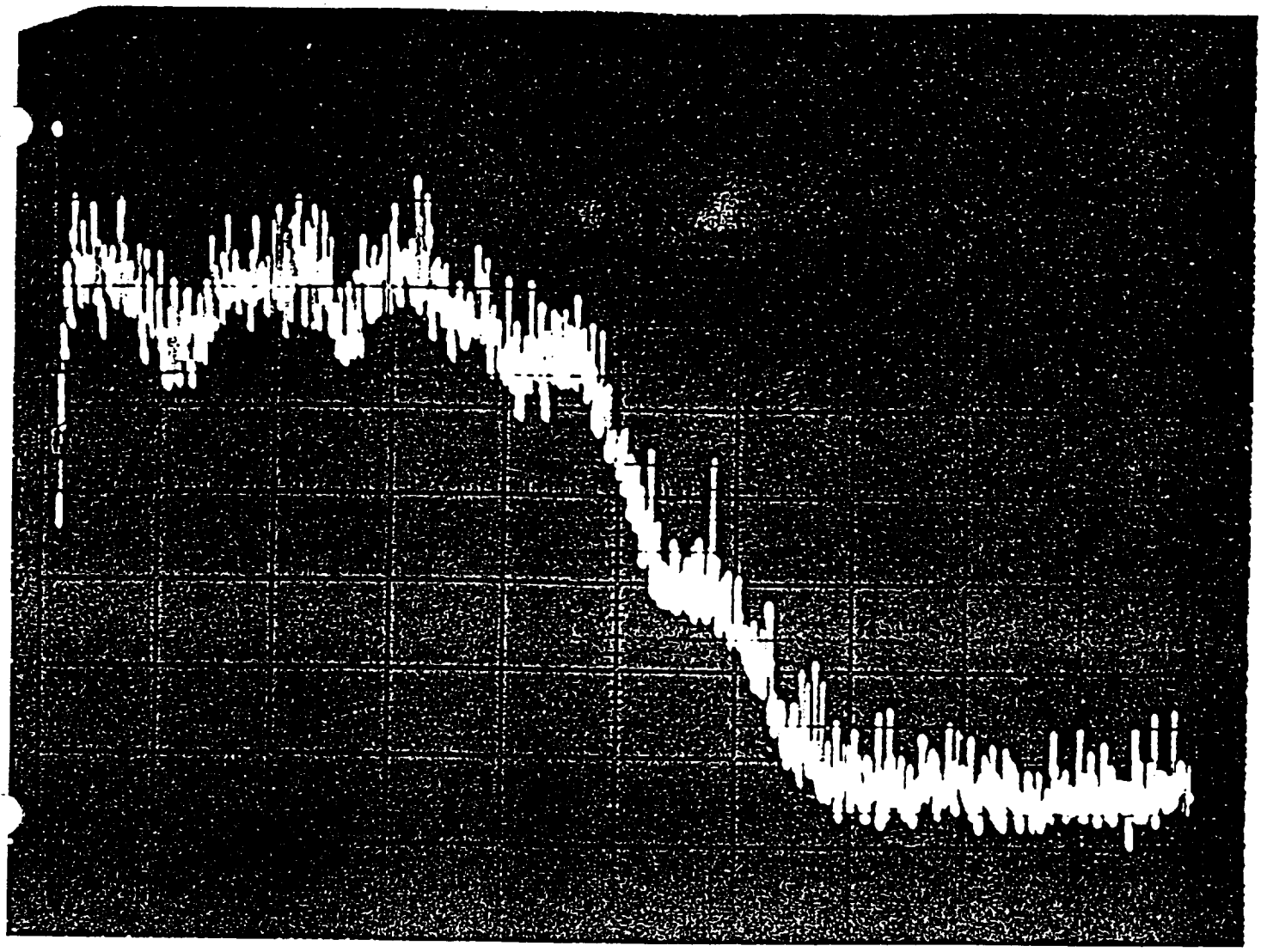
SER NO. 7A09 TEST FAILURE: _____

TESTED BY: [signature] FAILURE ANALYSIS NO. _____

END DATE: 7-3-97

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101



5.4.14 Noise Power Profile

Model No.: 1331562-19F
Serial No.: 7A09
Date: 7-3-97
Tested by: DS

Spectrum Analyzer Parameters

Vertical Scale: 2 dB/div.
Scan Width: 100 mhz/Div.
IF Band Width: 10 Khz
Scan Time: 3 sec/Div.
No video filter.

Channel 9 Amplifier

IF Amplifier (P/N:1331579-8, S/N: 107)

APPENDIX C
ATP1772 DATA SHEET
MODEL NUMBER VD722301
AEROJET P/N 1331579-8

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept ✓ Reject			2-10-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			
4.4	Electrical Test					N/A
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject			
	Short Open Protection	No Damage	Accept ✓ Reject			N/A
	Output Coupling	Output shall be AC coupled	Accept ✓ Reject			2-10-97
4.4.2	Gain vs. Freq. 5 MHz to 200 MHz	14.5dB Min., 15.5dB Max. -4°C to +40°C Attach x-y plot	Max 15.30 dB Min 15.12 dB Accept ✓ Reject	Max 15.24 dB Min 15.05 dB Accept ✓ Reject	Max 15.35 dB Min 15.17 dB Accept ✓ Reject	2-10-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept ✓ Reject 0.18 dB	Accept ✓ Reject 0.19 dB	Accept ✓ Reject 0.18 dB	2-10-97
	Gain Temp. Sensitivity	±.22 dB from -4°C to +40°C Worse Case	Accept ✓ Reject	Accept ✓ Reject 0.10 dB	Accept ✓ Reject 0.07 dB	2-10-97
4.4.3	Gain-Voltage Sensitivity	≤.5dB/v Worse Case ± .2dB for 7.6 to 8.4 Vdc	0.01 dB	0.02 dB	0.02 dB	
	Input Currents	40ma MAX. 7.6v 8.0v 8.4v	34.9 mA 35.7 mA 36.2 mA	33.1 mA 33.6 mA 34.1 mA	38.8 mA 38.1 mA 37.5 mA	
		Attach X-Y Plot	Accept ✓ Reject	Accept ✓ Reject	Accept ✓ Reject	2-10-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1772 DATA SHEET
MODEL NUMBER VD722301
AEROJET P/N 1331579-8

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject			
		5 MHz	0.35 dB	0.20 dB	0.20 dB	
		102.5 MHz	0.35 dB	0.20 dB	0.20 dB	
		200 MHz	0.25 dB	0.20 dB	0.25 dB	2-10-97
4.4.8	Stability	Stable with the input terminated into a 2.5:1 mismatch and the output at all impedance's.	Accept X Reject			2-10-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 45 mA	Accept X Reject			
		Maximum Current	~~36.5~~ 37.5 mA	37.5		2-10-97

NOTE: Review all recorded data and signify acceptance below.

Technician S Hoffman (T143) Date: 2-10-97

Quality Assurance Steve Luna Date: 2-18-97

CSI: Mike Trevino (176) Date: 2-19-97

GSI: Marjorie Thomas Date: 2-10-97

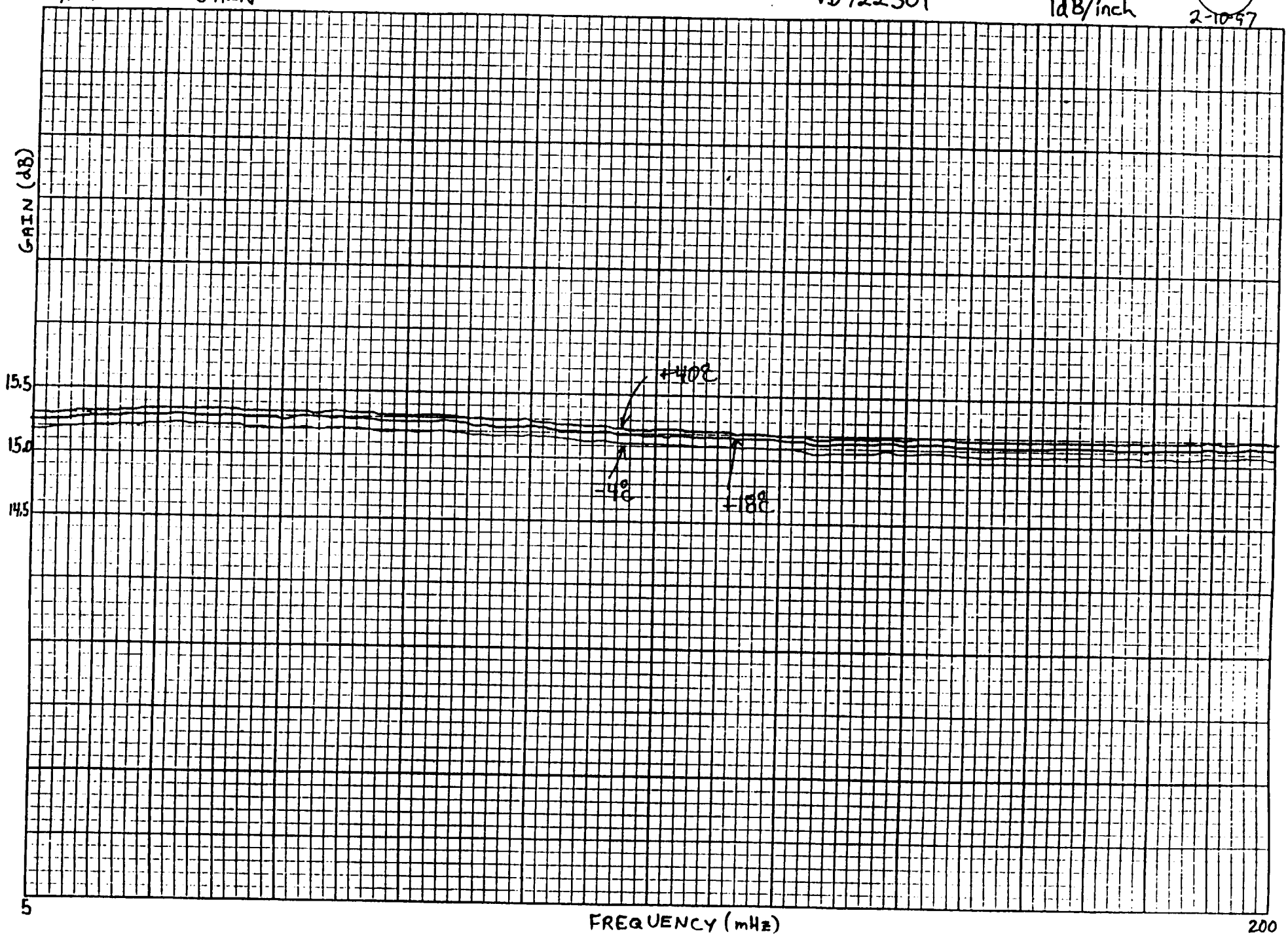
Amplica, Inc. Newbury Park, CA 91320	SIZE A	FSCM NO. 51025	ATP1772	REV.
DRAWN				
ISSUED	SCALE		SHEET 36 OF 38	

FORM 152

HEWLETT-PACKARD 9270-1007

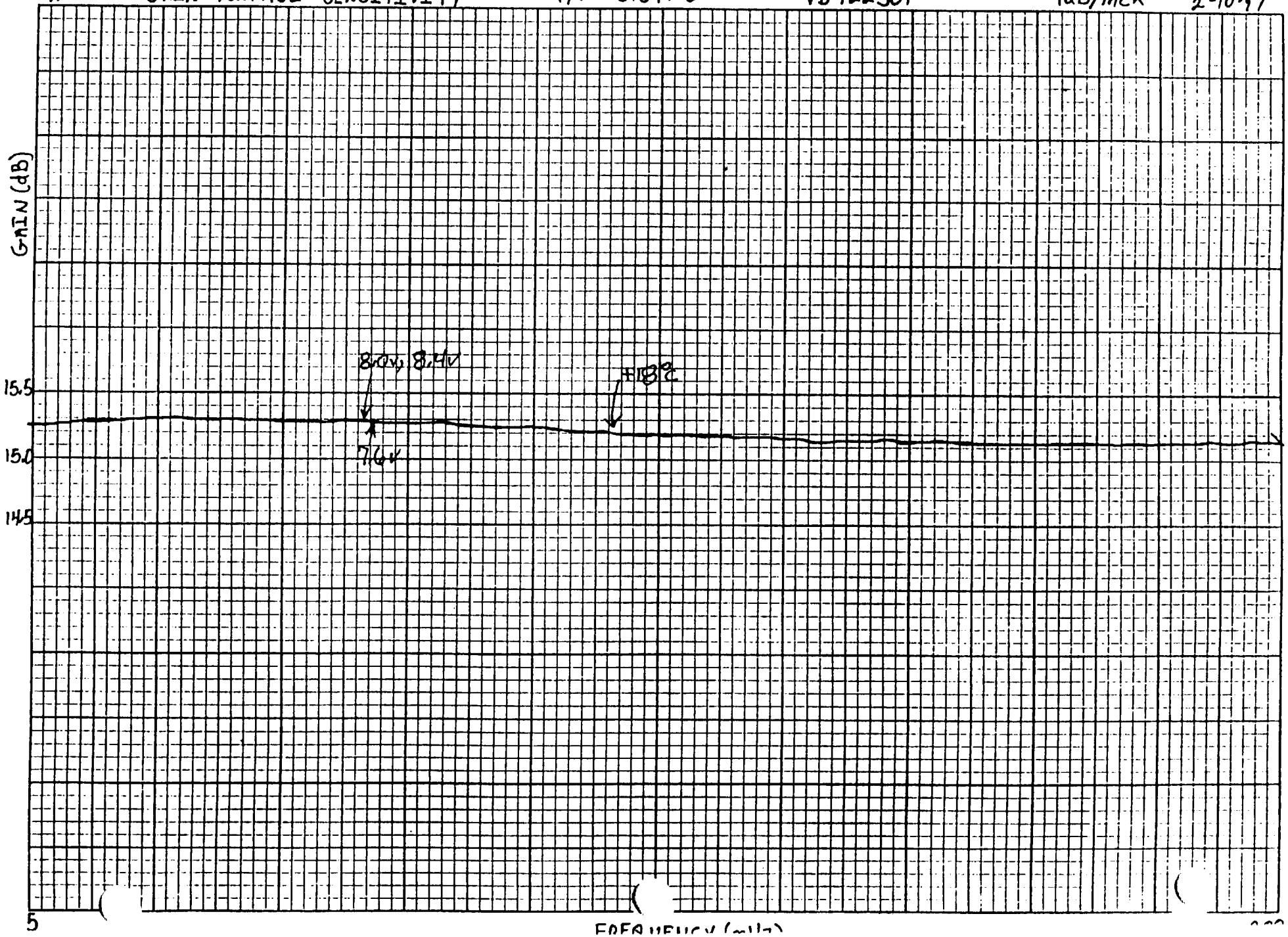
S/N 107 GAIN P/N 1331579-8 VD722301 1dB/inch 2-10-97

1143



T143

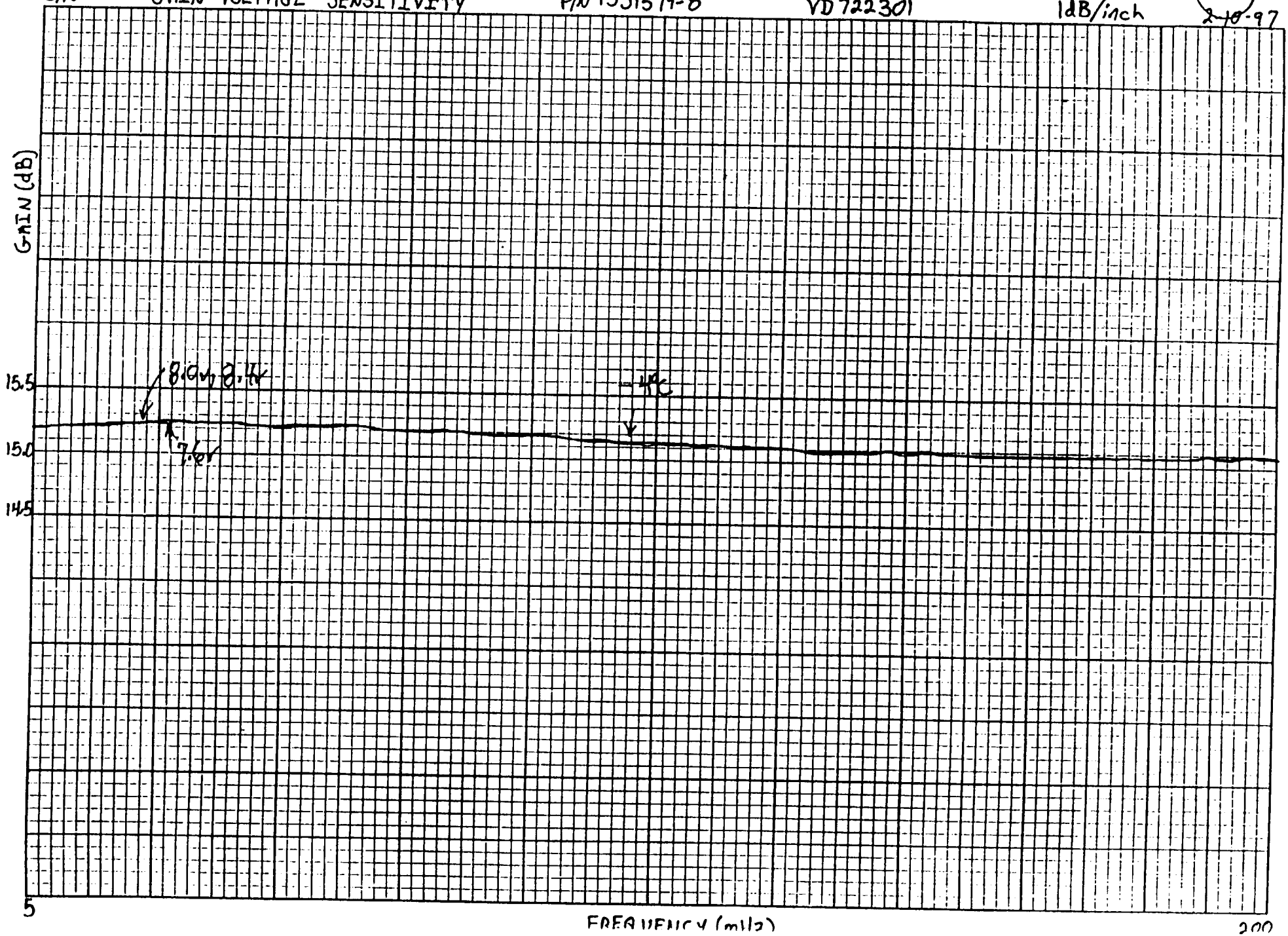
S/N 107 GAIN-VOLTAGE SENSITIVITY P/N 1331579-8 VD 722301 1dB/inch 2-10-97



HEWLETT-PACKARD 9270-1007

T143

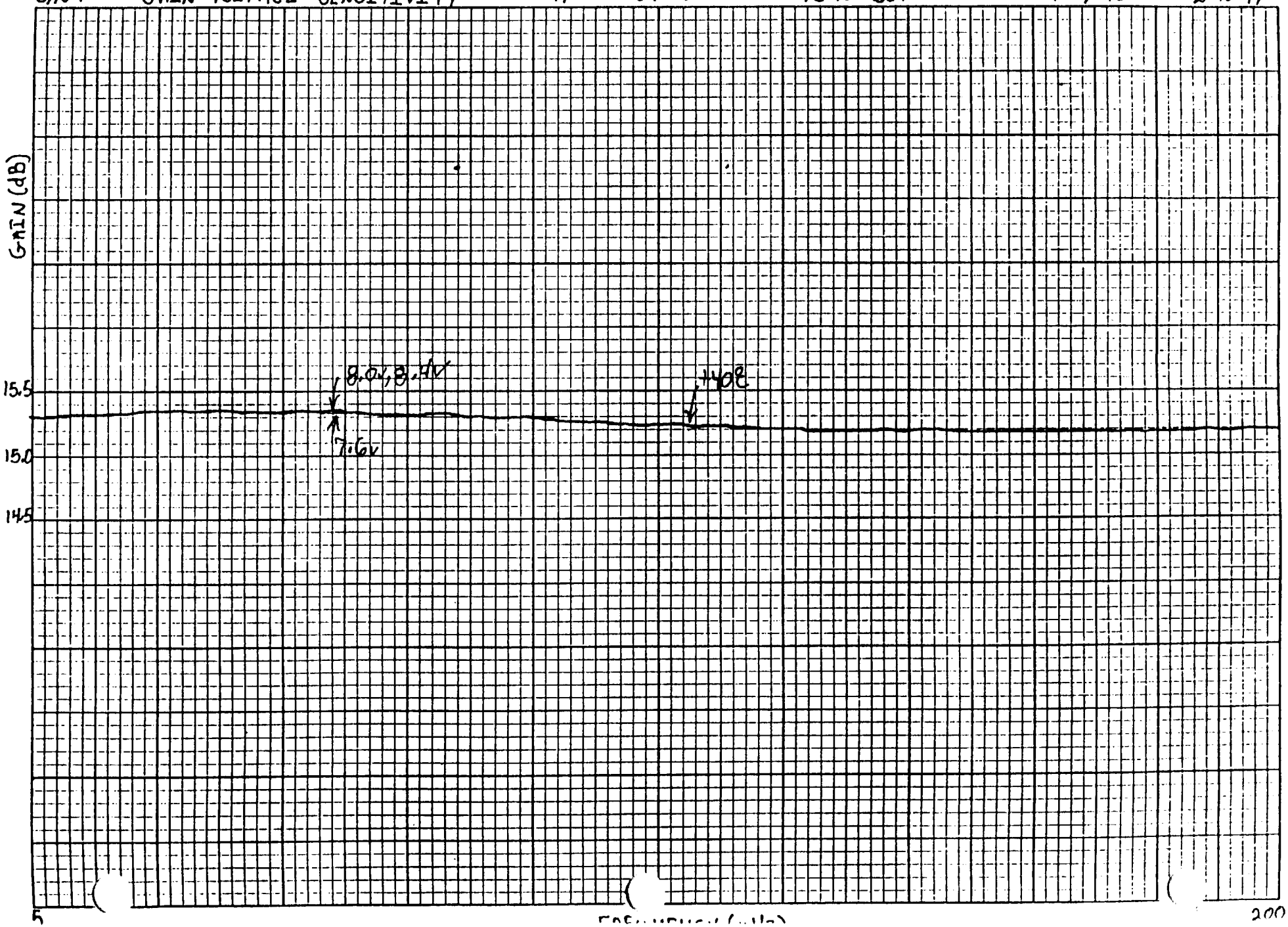
S/N 107 GAIN-VOLTAGE SENSITIVITY P/N 1331579-8 VD 722301 1dB/inch 2-10-97



HEWLETT-PACKARD 9270-1007

T143

S/N 107 GAIN-VOLTAGE SENSITIVITY P/N 1331579-8 VD 722301 1dB/inch 2-10-97



Channel 10 Amplifier

IF Amplifier (P/N:1331579-9, S/N: 107)

APPENDIX C
ATP1773 DATA SHEET
MODEL NUMBER VD622301
AEROJET P/N 1331579-9

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject			2-7-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			N/A
4.4	Electrical Test					
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject			N/A
	Short Open Protection	No Damage	Accept X Reject			2-7-97
	Output Coupling	Output shall be AC coupled	Accept X Reject			2-7-97
4.4.2	Gain vs. Freq. 150 MHz to 300 MHz	17.5dB Min., 18.5dB Max. -4°C to +40°C Attach x-y plot	Max 18.05 dB Min 17.87 dB Accept X Reject	Max 17.99 dB Min 17.83 dB Accept X Reject	Max 18.09 dB Min 17.88 dB Accept X Reject	2-7
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject 0.18 dB	Accept X Reject 0.16 dB	Accept X Reject 0.21 dB	2-7-97
	Gain Temp. Sensitivity	±.22 dB from -4°C to +40°C Worse Case	Accept X Reject	Accept X Reject 0.10 dB	Accept X Reject 0.06 dB	2-7-97
4.4.3	Gain-Voltage Sensitivity	≤.5dB/v Worse Case	.01 dB	.01 dB	.01 dB	
	Input Currents	+ .2dB for 7.6v 7.6 to 8.4 Vdc 8.0v 40ma MAX. 8.4v	34.4 mA 35.1 mA 35.7 mA	31.5 mA 32.3 mA 32.8 mA	36.8 mA 37.5 mA 38.1 mA	
		Attach X-Y Plot	Accept X Reject	Accept X Reject	Accept X Reject	2-7-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1773 DATA SHEET
MODEL NUMBER VD622301
AEROJET P/N 1331579-9

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject ____			
		150 MHz 225 MHz 300 MHz	0.40 dB 0.35 dB 0.25 dB	0.20 dB 0.20 dB 0.25 dB	0.20 dB 0.25 dB 0.30 dB	2-7-97
4.4.8	Stability	Stable with the input terminated into a 2.5:1 mismatch and the output at all impedance's.	Accept X Reject ____			2-7-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 45 mA	Accept X Reject ____			
		Maximum Current	39.0 mA			2-10-97

NOTE: Review all recorded data and signify acceptance below.

Technician Staffm (T14) Date: 2-10-97

Quality Assurance Irene Juma (A 34) Date: 2-18-97

CSI: Mike Thom (QC 176) Date: 2-19-97

GSI: Marjorie Thomas Date: 2-10-97

Amplica, Inc. Newbury Park, CA 91320	SIZE A	FSCM NO. 51025	ATP1773	REV.
DRAWN				
ISSUED	SCALE		SHEET 35 OF 38	

MODEL VD622301 S/N 107

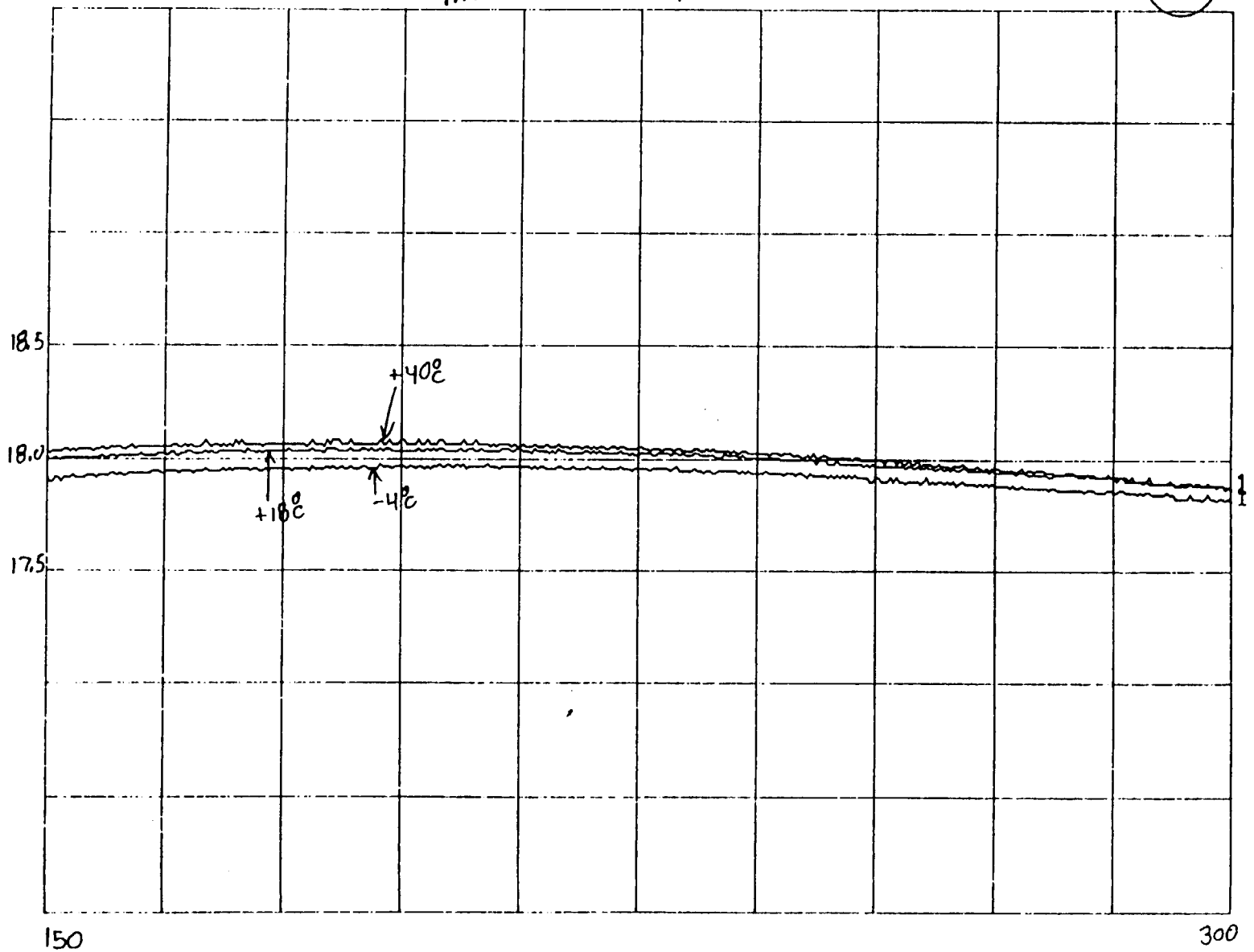
GAIN VS FREQUENCY

VERTICAL CALIBRATION .5 dB INCH

TEMPERATURE ~~AS NOTED~~ DEG.C.

TECH GMS 1143 DATE 2-1-97

P/N 1331579-9



MODEL VD 622301 S/N 107

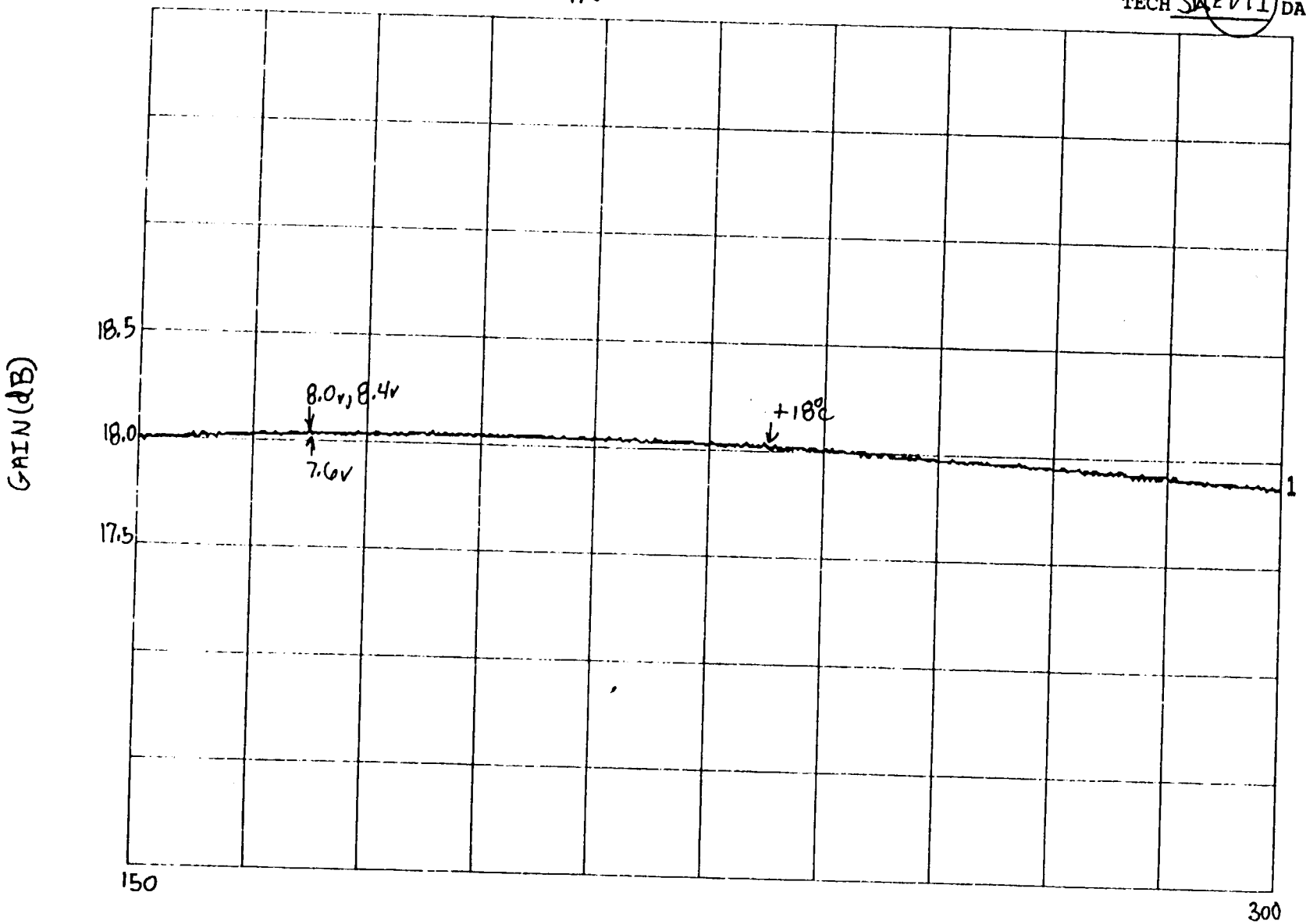
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SW 1143 DATE 2-7-97

P/N 1331579-9



MODEL VD622301 S/N 107

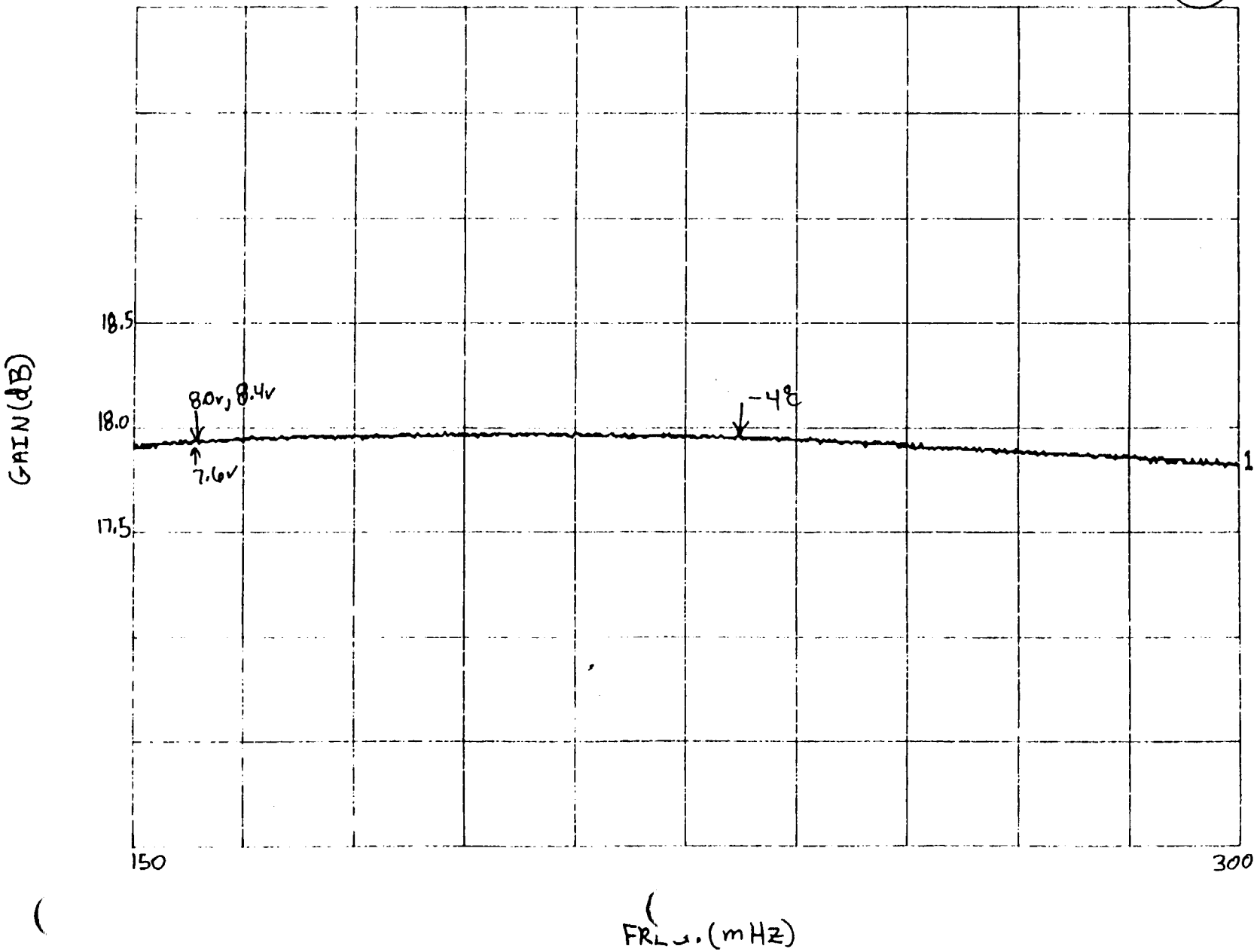
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SIA 1143 DATE 2-7-97

P/N 1331579-9



MODEL VD622301 S/N 107

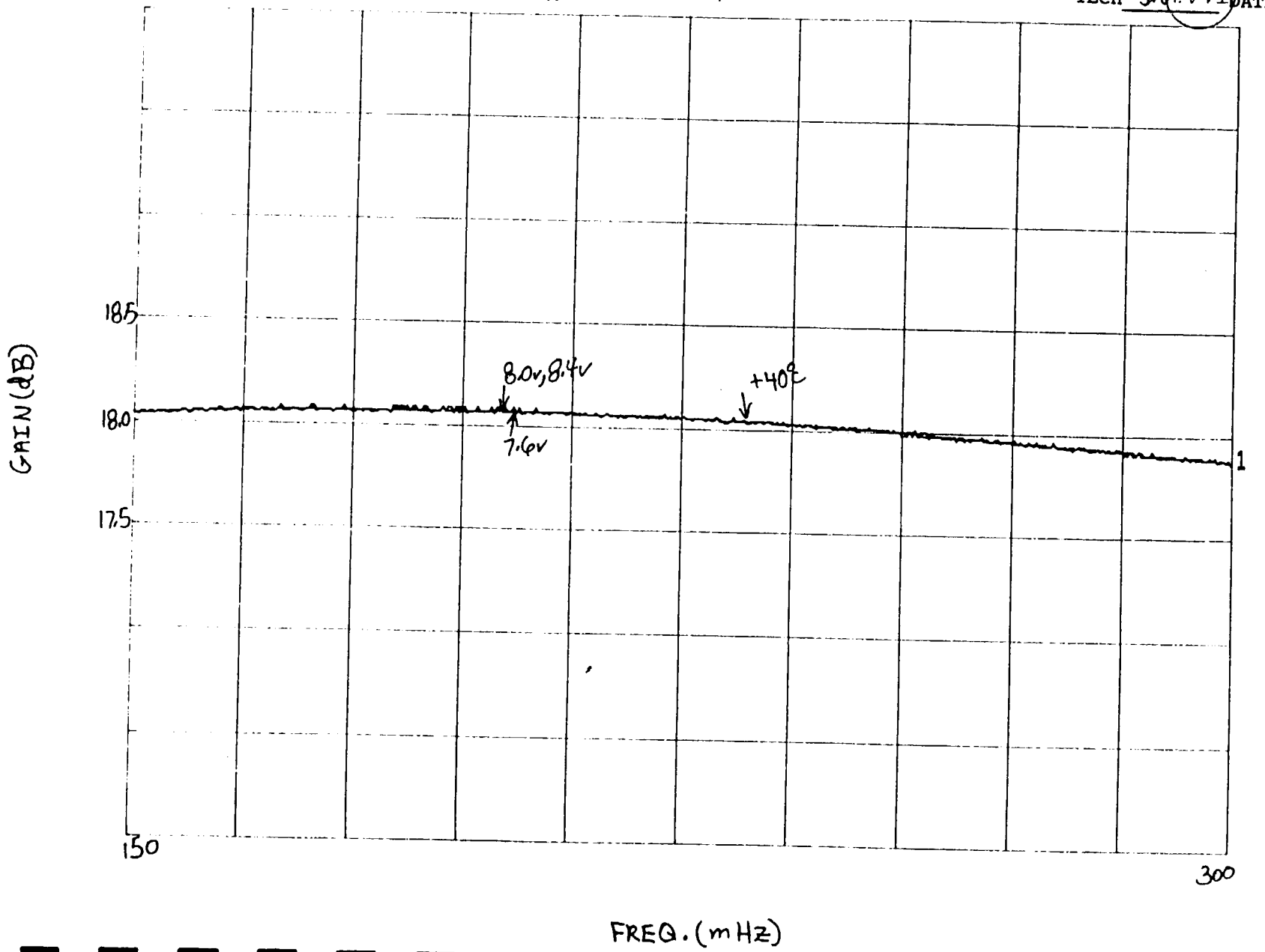
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SMC DATE 2-7-97

P/N 1331579-9



Channels 11-14 Amplifier

IF Amplifier (P/N:1331579-7, S/N: 107)

APPENDIX C
ATP1771 DATA SHEET
MODEL NUMBER UD122301
AEROJET P/N 1331579-7

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject			2-7-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			
4.4	Electrical Test					2-7-97
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject			
	Short Open Protection	No Damage	Accept X Reject			2-7-97
	Output Coupling	Output shall be AC coupled	Accept X Reject			2-7-97
4.4.2	Gain vs. Freq. 255 MHz to 390 MHz	14.5dB Min., 15.5dB Max. -4°C to +40°C Attach x-y plot	Max 15.15 dB Min 14.71 dB Accept X Reject	Max 15.10 dB Min 14.67 dB Accept X Reject	Max 15.15 dB Min 14.67 dB Accept X Reject	2-7-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject 0.44 dB	Accept X Reject 0.43 dB	Accept X Reject 0.48 dB	2-7-97
	Gain Temp. Sensitivity	±.22 dB from -4°C to +40°C Worse Case	Accept X Reject	Accept X Reject 0.10 dB	Accept X Reject 0.05 dB	2-7-97
4.4.3	Gain-Voltage Sensitivity	≤.5dB/v Worse Case ± .2dB for 7.6 to 8.4 Vdc	0.01 dB	0.01 dB	0.01 dB	
	Input Currents	40ma MAX. 7.6v 8.0v 8.4v	33.9 mA 34.6 mA 35.2 mA	30.6 mA 31.4 mA 31.7 mA	36.7 mA 37.4 mA 38.0 mA	
		Attach X-Y Plot	Accept X Reject	Accept X Reject	Accept X Reject	2-7-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1771 DATA SHEET
MODEL NUMBER UD122301
AEROJET P/N 1331579-7

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject			
		255 MHz	0.20 dB	0.35 dB	0.20 dB	
		322.5 MHz	0.20 dB	0.25 dB	0.20 dB	
		390 MHz	0.25 dB	0.45 dB	0.25 dB	2-7-97
4.4.8	Stability	Stable with the input terminated into a 2.5:1 mismatch and the output at all impedance's.	Accept X Reject			2-7-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 45 mA	Accept X Reject			
		Maximum Current	39.3 mA			2-10-97

NOTE: Review all recorded data and signify acceptance below.

Technician SHoffman (1143) Date: 2-10-97

Quality Assurance Irene Luna (A 34) Date: 2-18-97

CSI: Mike Ingram (QC 176) Date: 2-19-97

GSI: Maryjo Thomas Date: 2-10-97

Amplica, Inc. Newbury Park, CA 91320	SIZE A	FSCM NO. 51025	ATP1771	REV.
DRAWN				
ISSUED	SCALE		SHEET 37 OF 39	

FORM 452

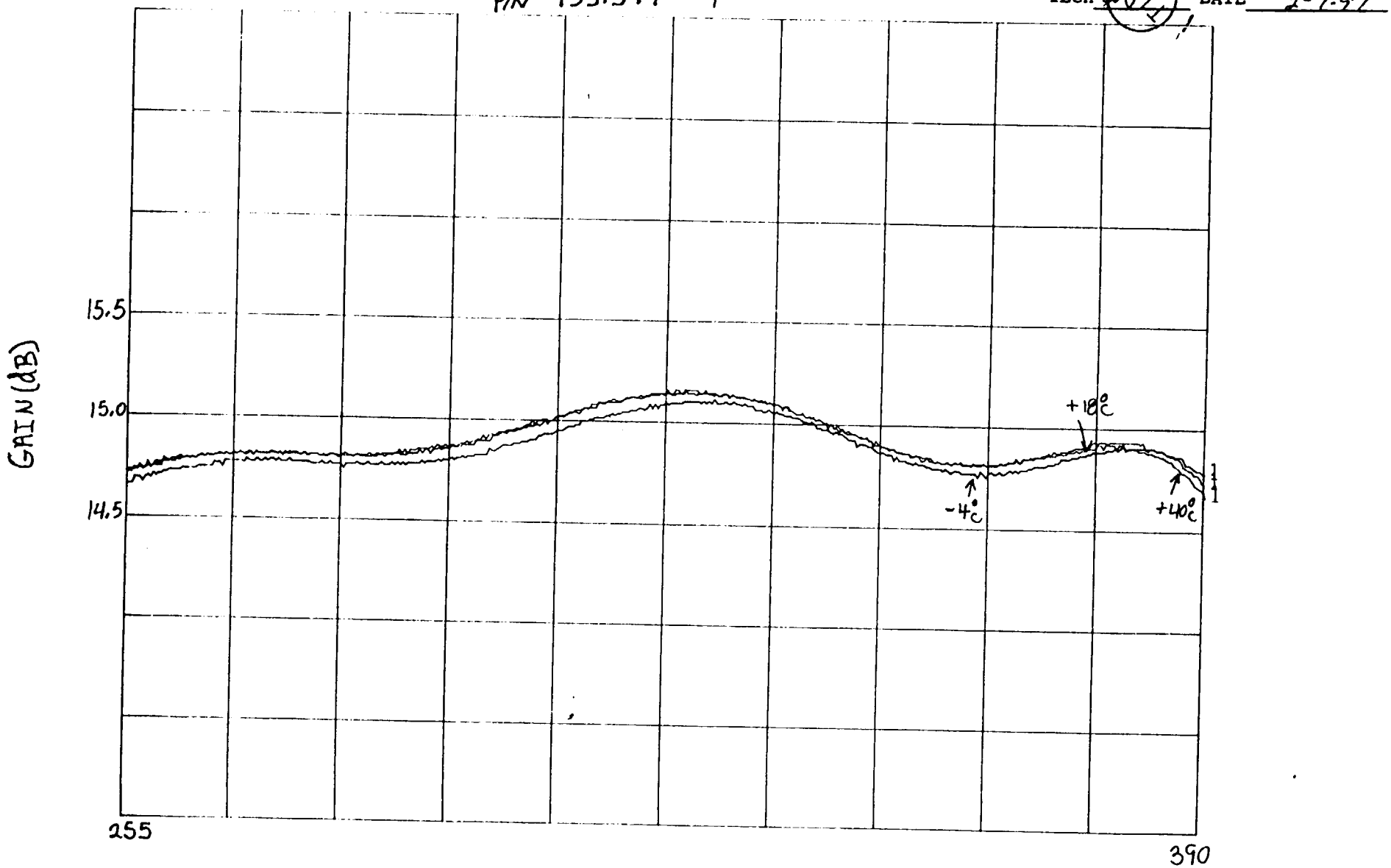
GAIN VS FREQUENCY

VERTICAL CALIBRATION .5 dB INCH

TEMPERATURE As Noted DEG.C.

TECH [illegible] DATE 2-7-97

P/N 1331579-7



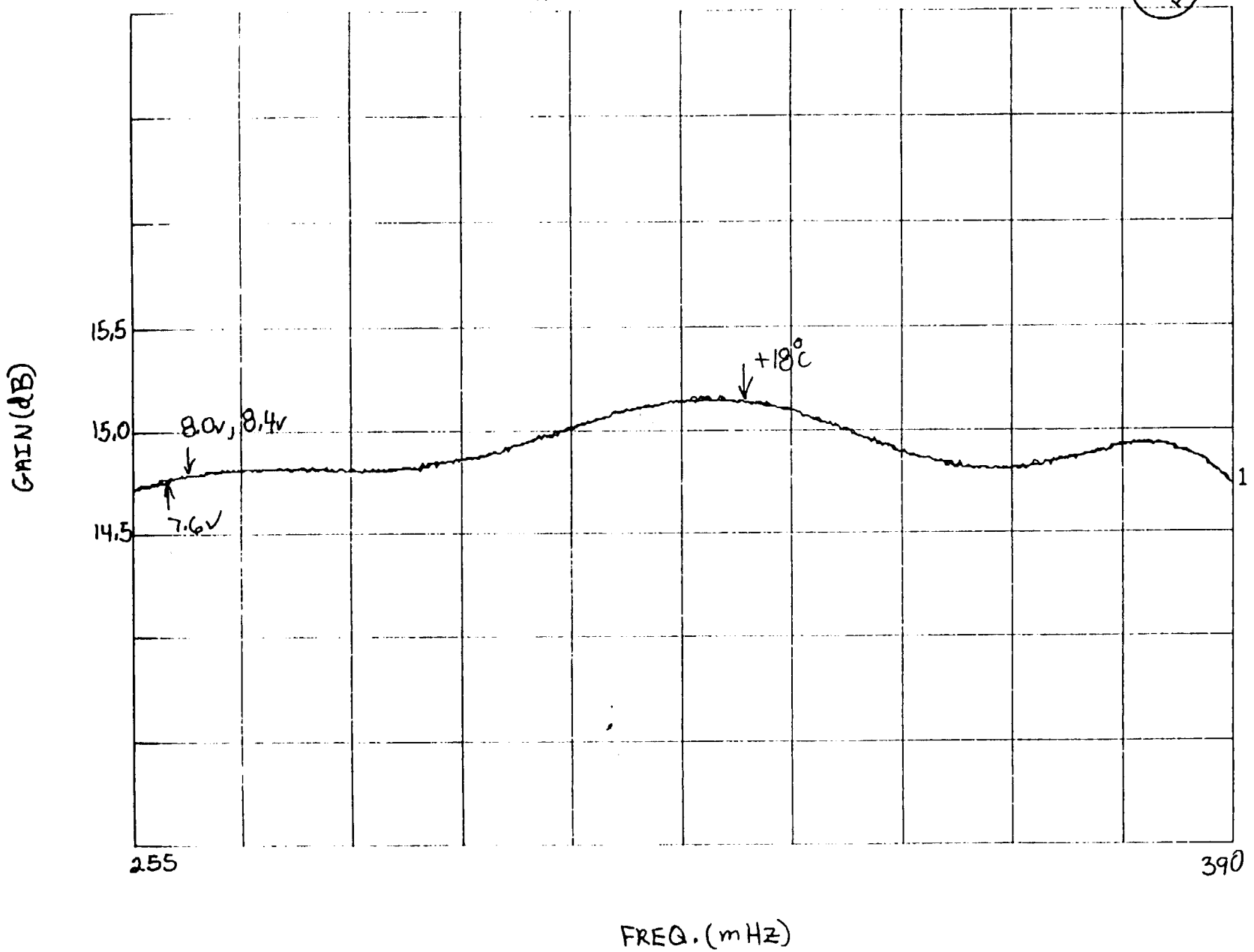
GAIN-VOLTAGE SENSITY VS. FREQ.

VERTICAL CALIBRATIO. 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH [illegible] DATE 2-7-97

P/N 1331579-7



MODEL UD122301 S/N 107

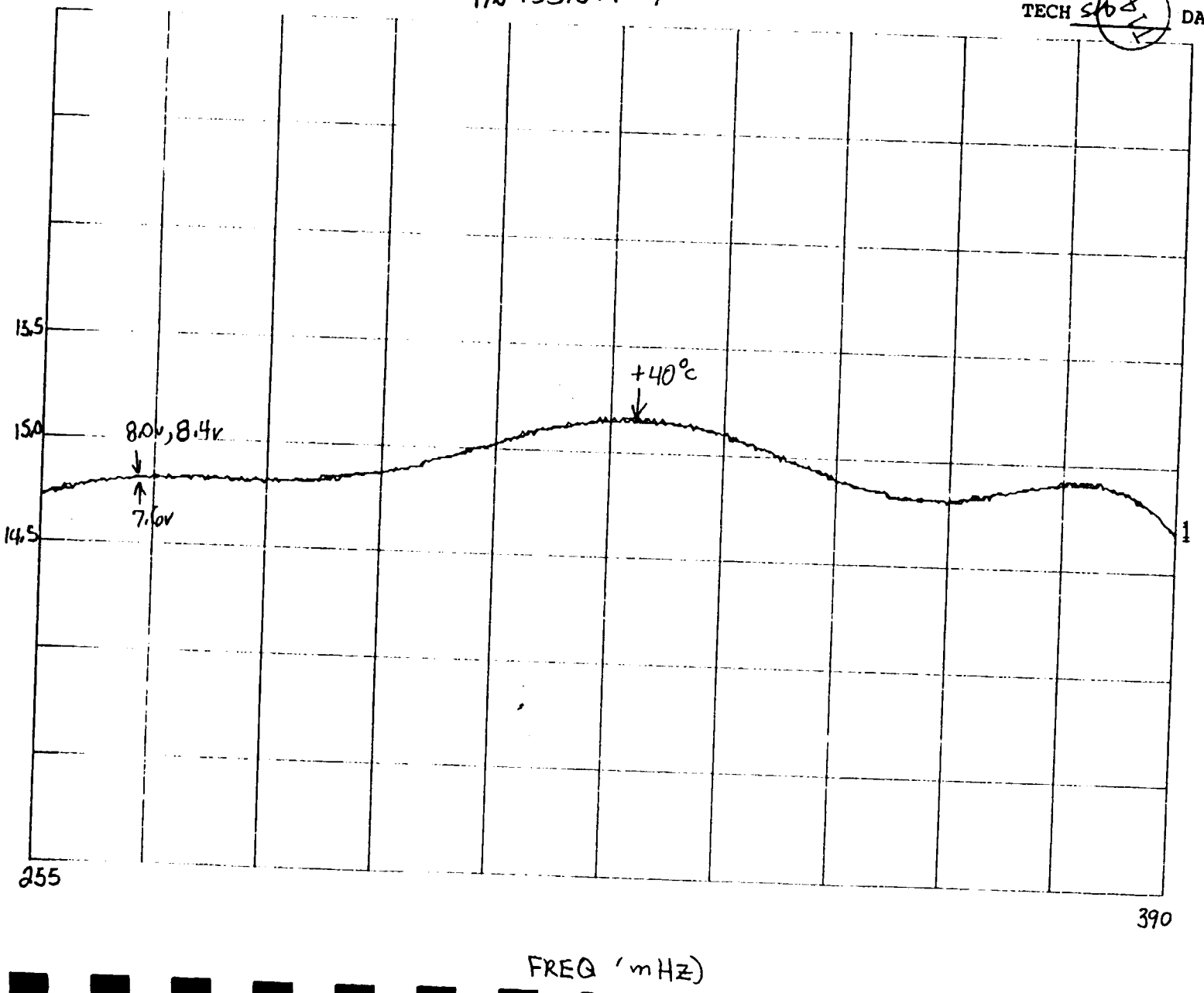
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SAS DATE 2-2-97

P/N 1331579-7



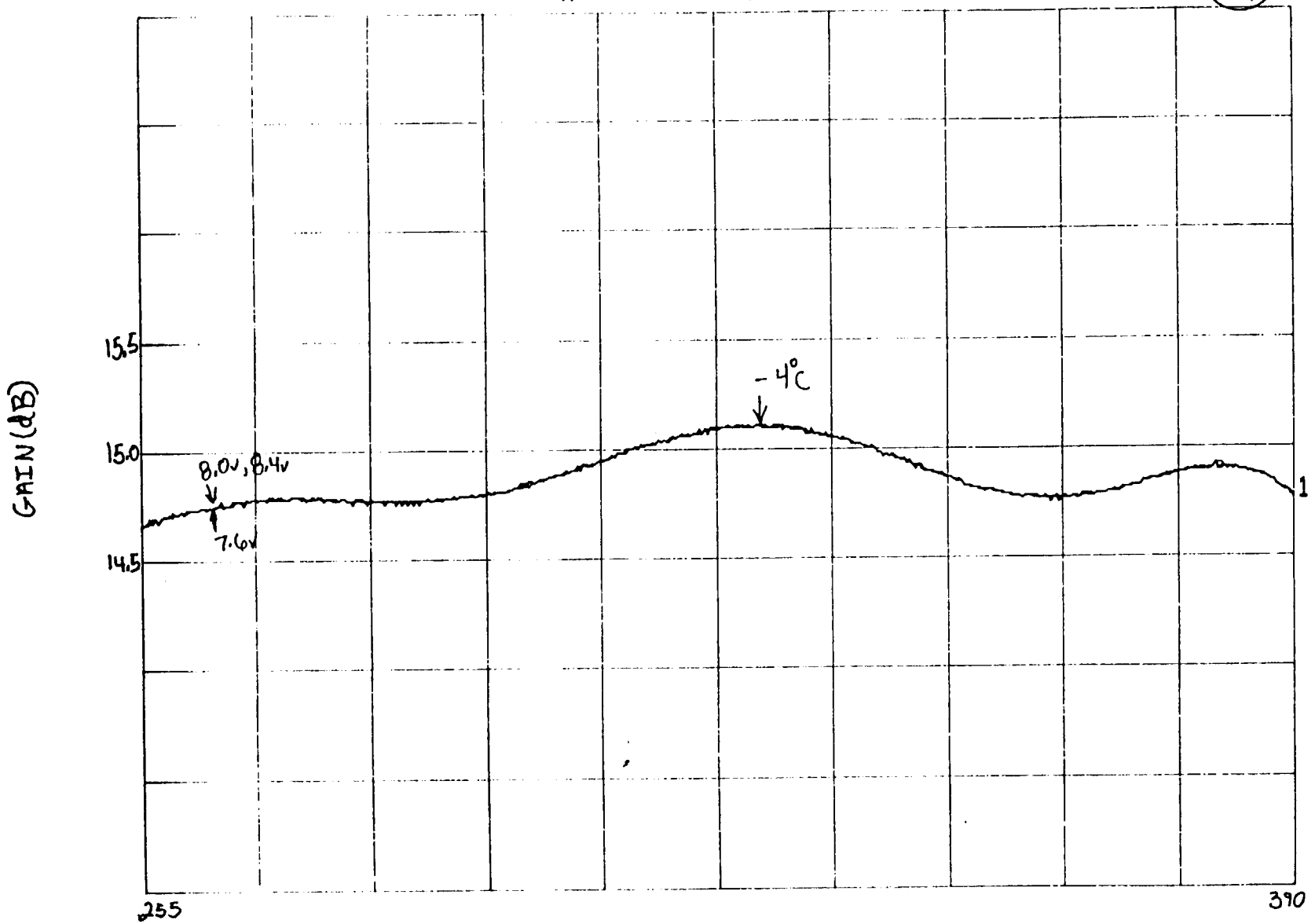
GAIN-VOLTAGE SENSI[illegible]TY VS. FREQ.

VERTICAL CALIBRATI[illegible] 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SW DATE 2-7-97

P/N 1331579-7



Channel 11 Amplifier

IF Amplifier (P/N:1331579-10, S/N: 107)

APPENDIX C
ATP1774 DATA SHEET
MODEL NUMBER UD114302
AEROJET P/N 1331579-10

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject			2-8-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			2-8-97
4.4	Electrical Test					
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject			N/A
	Short Open Protection	No Damage	Accept X Reject			2-8-97
	Output Coupling	Output shall be AC coupled	Accept X Reject			2-8-97
4.4.2	Gain vs. Freq. 255 MHz to 390 MHz	38.5dB Min., 39.5dB Max. -4°C to +40°C Attach x-y plot	Max 39.22 dB Min 38.85 dB Accept X Reject	Max 39.39 dB Min 39.09 dB Accept X Reject	Max 39.00 dB Min 38.55 dB Accept X Reject	2-8-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject 0.37 dB	Accept X Reject 0.30 dB	Accept X Reject 0.45 dB	2-8-97
	Gain Temp. Sensitivity	±.44 dB from -4°C to +40°C Worse Case	Accept X Reject	Accept X Reject 0.30 dB	Accept X Reject 0.34 dB	2-8-97
4.4.3	Gain-Voltage Sensitivity Input Currents	≤.5dB/v Worse Case ± .2dB for 7.6v 7.6 to 8.4 Vdc 8.0v 45ma MAX. 8.4v Attach X-Y Plot	0.02 dB 30.6 mA 39.3 mA 39.9 mA Accept X Reject	0.03 dB 37.4 mA 38.1 mA 38.7 mA Accept X Reject	0.02 dB 39.8 mA 40.5 mA 41.1 mA Accept X Reject	2-8-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1774 DATA SHEET
MODEL NUMBER UD114302
AEROJET P/N 1331579-10

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject ____			
		255 MHz 322.5 MHz 390 MHz	0.50 dB 0.45 dB 0.65 dB	0.70 dB 0.65 dB 0.80 dB	0.45 dB 0.45 dB 0.60 dB	2-8-97
4.4.8	Stability	Unconditionally Stable	Accept X Reject ____			2-8-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 50 mA	Accept X Reject ____			
		Maximum Current	41.2 mA			2-10-97

NOTE: Review all recorded data and signify acceptance below.

Technician [signature] (1143) Date: 2-10-97

Quality Assurance [signature] (A 34) Date: 2-18-97

CSI: [signature] (QC 176) Date: 2-19-97

GSI: [signature] Date: 2-10-97

Amplica, Inc. Newbury Park, CA 91320	SIZE A	FSCM NO. 51025	ATP1774	REV.
DRAWN				
ISSUED	SCALE		SHEET 37 OF 39	

MODEL UD114302 S/N 107

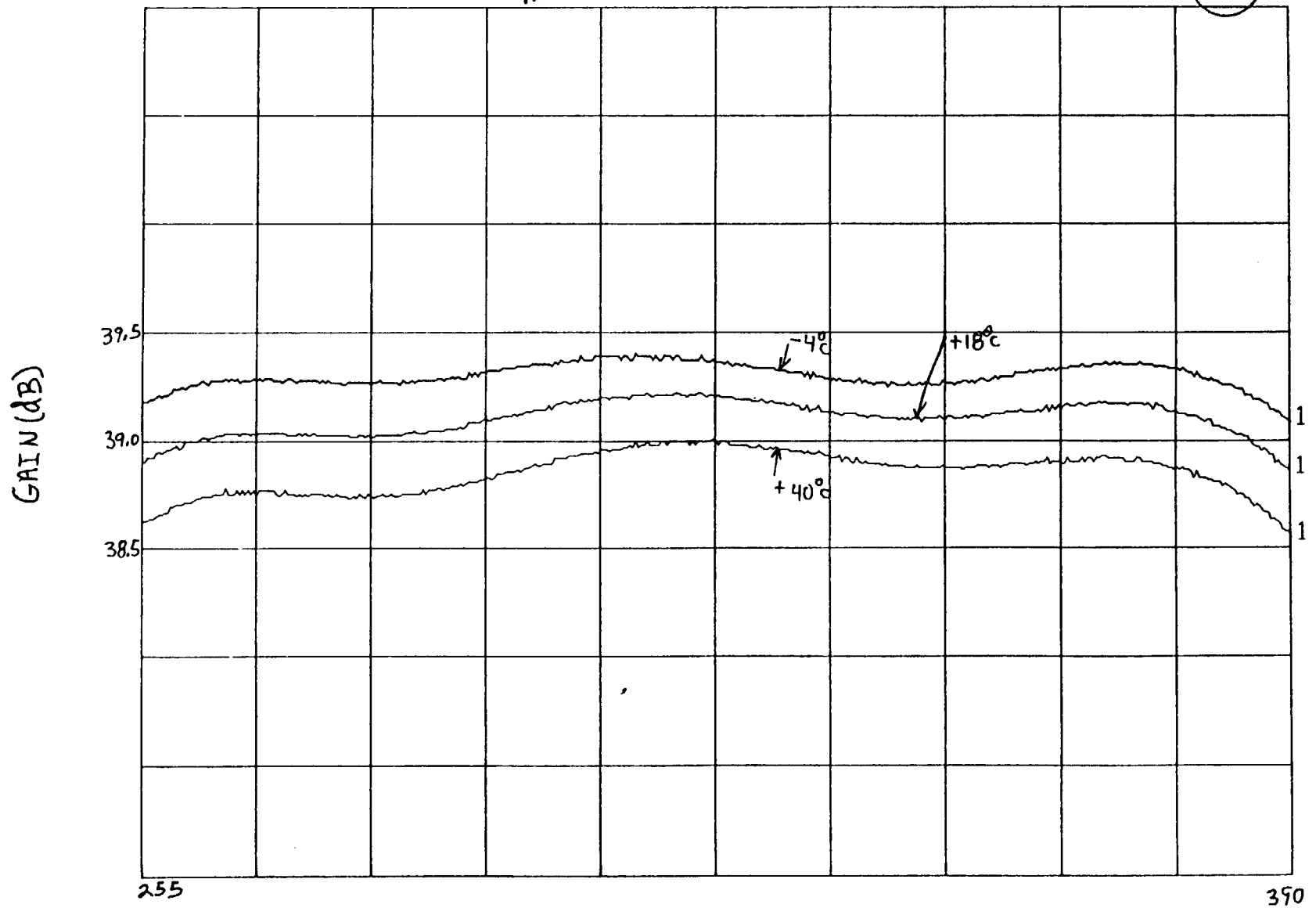
GAIN VS FREQUENCY

VERTICAL CALIBRATION .5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH [illegible] DATE 2-8-97

P/N 1331579-10



MODEL UD114302 S/N 107

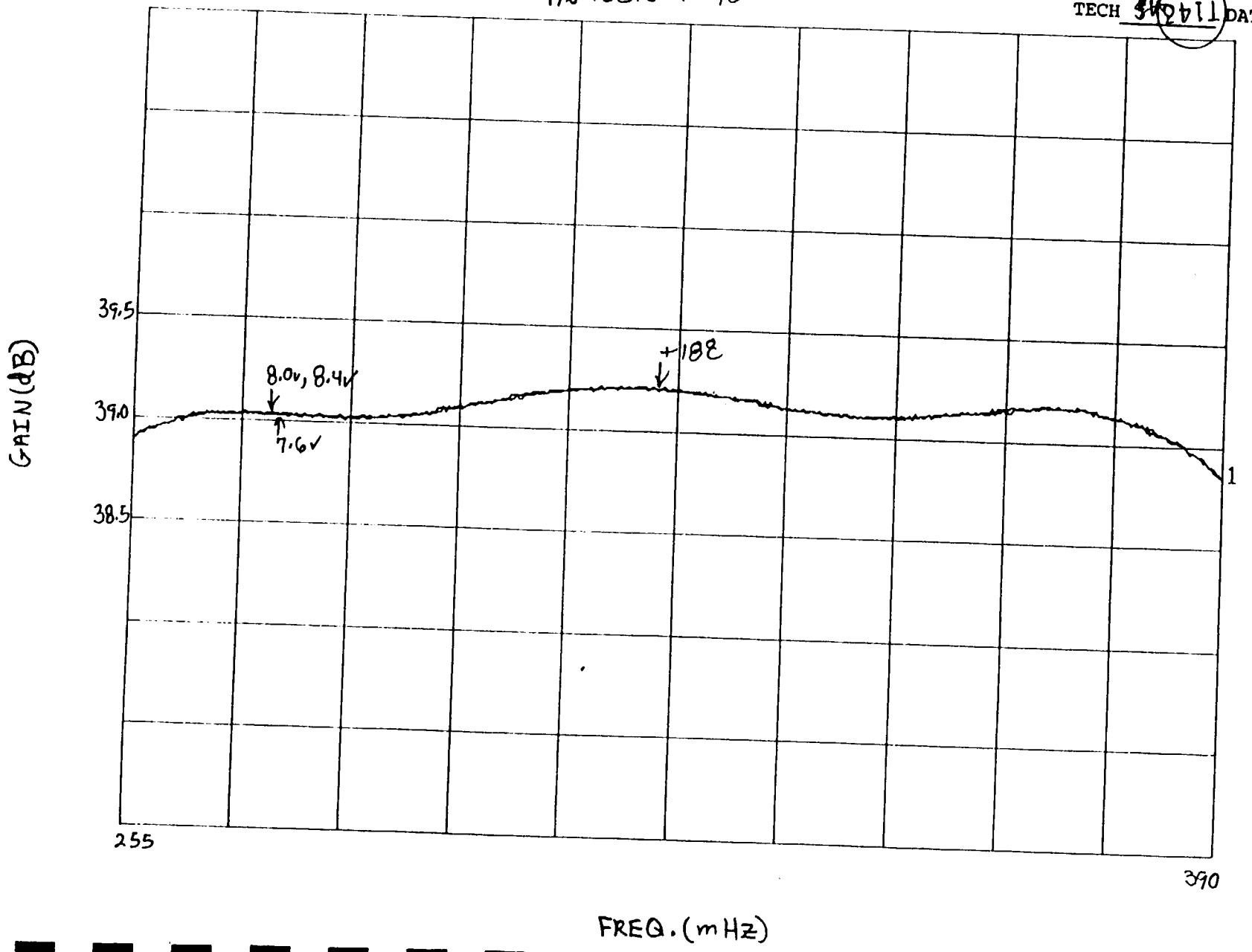
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH [illegible] DATE 2-8-97

P/N 1331579-10



MODEL UD 114302 S/N 107

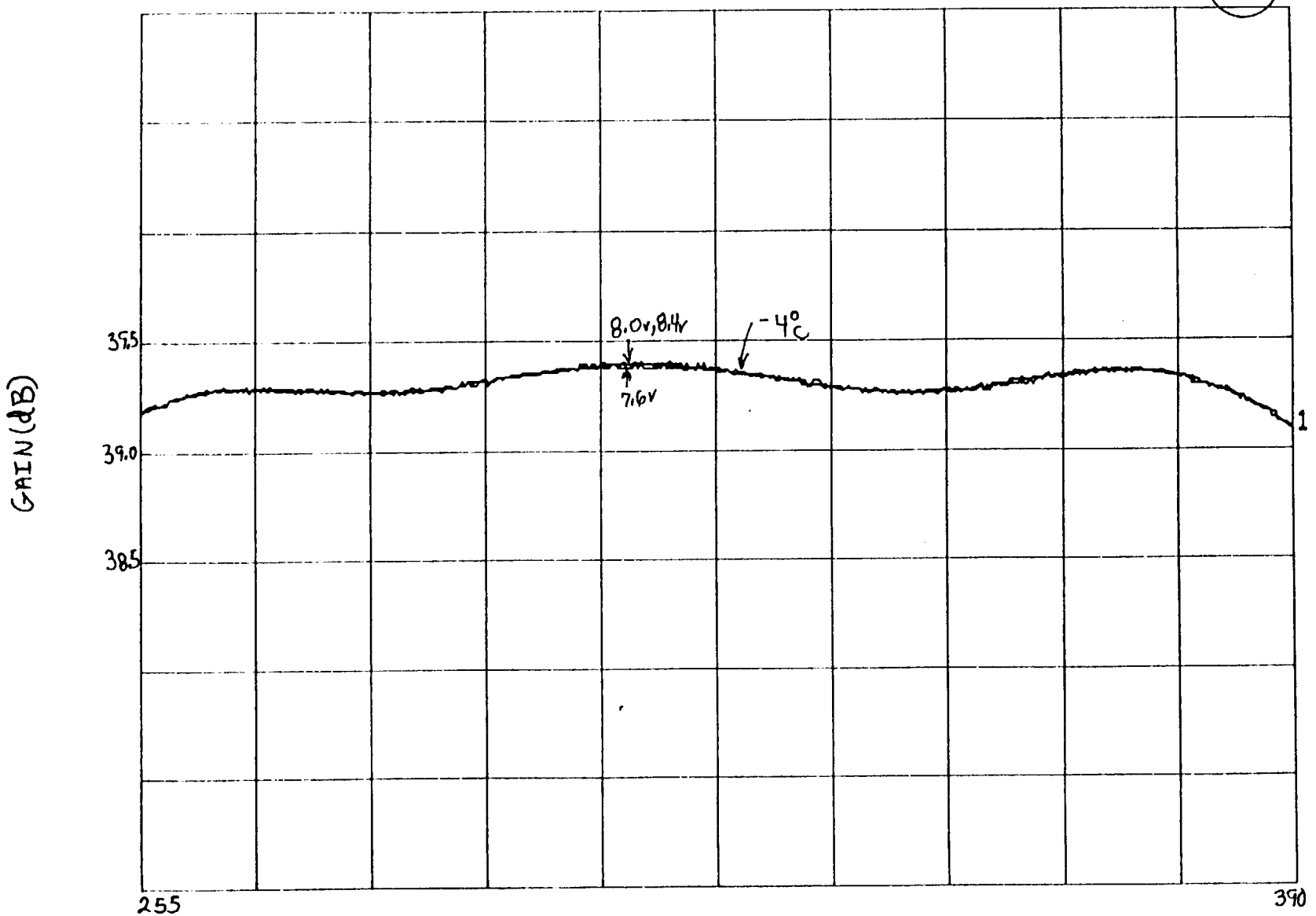
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SWT 11 DATE 2-8-97

P/N 1331579-10



MODEL UD 114302 S/N 107

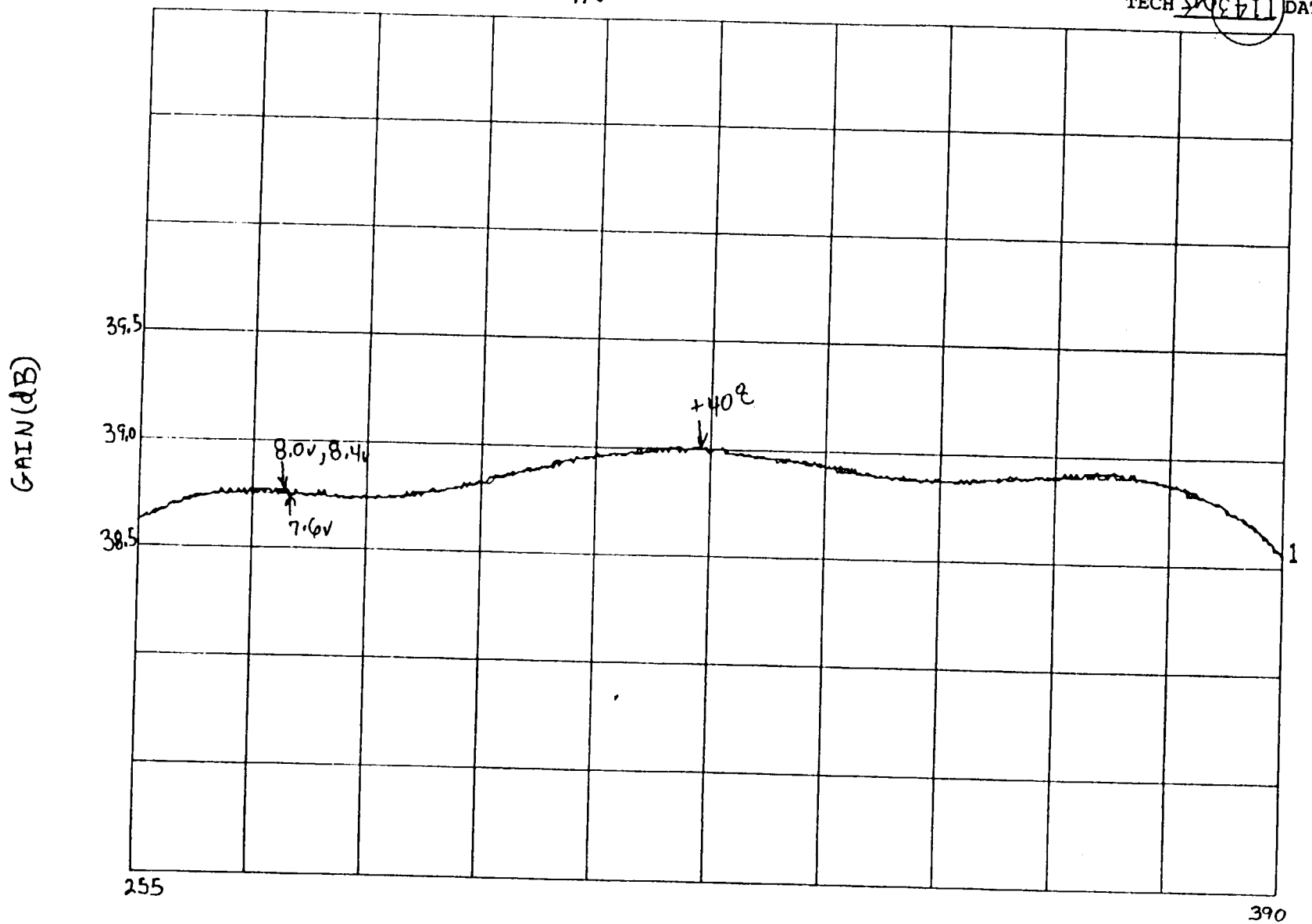
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH [illegible] DATE 2-8-97

P/N 1331579-10



Channel 12 Amplifier

IF Amplifier (P/N:1331579-11, S/N: 107)

APPENDIX C
ATP1775 DATA SHEET
MODEL NUMBER UD415301
AEROJET P/N 1331579-11

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject			
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			2-10-97
4.4	Electrical Test					N/A
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject			
	Short Open Protection	No Damage	Accept X Reject			N/A
	Output Coupling	Output shall be AC coupled	Accept X Reject			2-10-97
4.4.2	Gain vs. Freq. 290 MHz to 355 MHz	42.5dB Min., 43.5dB Max. -4°C to +40°C Attach x-y plot	Max 43.27 dB Min 43.11 dB Accept X Reject	Max 43.40 dB Min 43.21 dB Accept X Reject	Max 43.00 dB Min 42.86dB Accept X Reject	2-10-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject 0.16 dB	Accept X Reject 0.19 dB	Accept X Reject 0.19 dB	2-10-97
	Gain Temp. Sensitivity	±.44 dB from -4°C to +40°C Worse Case	Accept X Reject	Accept X Reject 0.18 dB	Accept X Reject 0.30 dB	2-10-97
4.4.3	Gain-Voltage Sensitivity	≤.5dB/v Worse Case	0.01 dB	0.02 dB	0.01 dB	
	Input Currents	± .2dB for 7.6 to 8.4 Vdc 50ma MAX. Attach X-Y Plot	7.6v 36.9 mA 8.0v 37.6 mA 8.4v 38.2 mA Accept X Reject	35.6 mA 36.4 mA 36.8 mA Accept X Reject	38.1 mA 38.7 mA 39.4 mA Accept X Reject	2-10-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1775 DATA SHEET
MODEL NUMBER UD415301
AEROJET P/N 1331579-11

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject			
		290 MHz	0.60 dB	0.45 dB	0.45 dB	
		322.5 MHz	0.60 dB	0.45 dB	0.45 dB	
		355 MHz	0.60 dB	0.50 dB	0.50 dB	2-10-97
4.4.8	Stability	Unconditionally Stable	Accept X Reject			2-10-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 55 mA	Accept X Reject			
		Maximum Current	39.6 mA			2-10-97

NOTE: Review all recorded data and signify acceptance below.

Technician S Hoffman (T143) Date: 2-10-97

Quality Assurance [signature] Date: 2-18-97

CSI: [signature] (QC 176) Date: 2-19-97

GSI: Marjorie Thomas Date: 2-10-97

Amplica, Inc. Newbury Park, CA 91320	SIZE A	FSCM NO. 51025	ATP1775	REV.
DRAWN				
ISSUED	SCALE		SHEET 37 OF 39	

MODEL VD415301 S/N 107

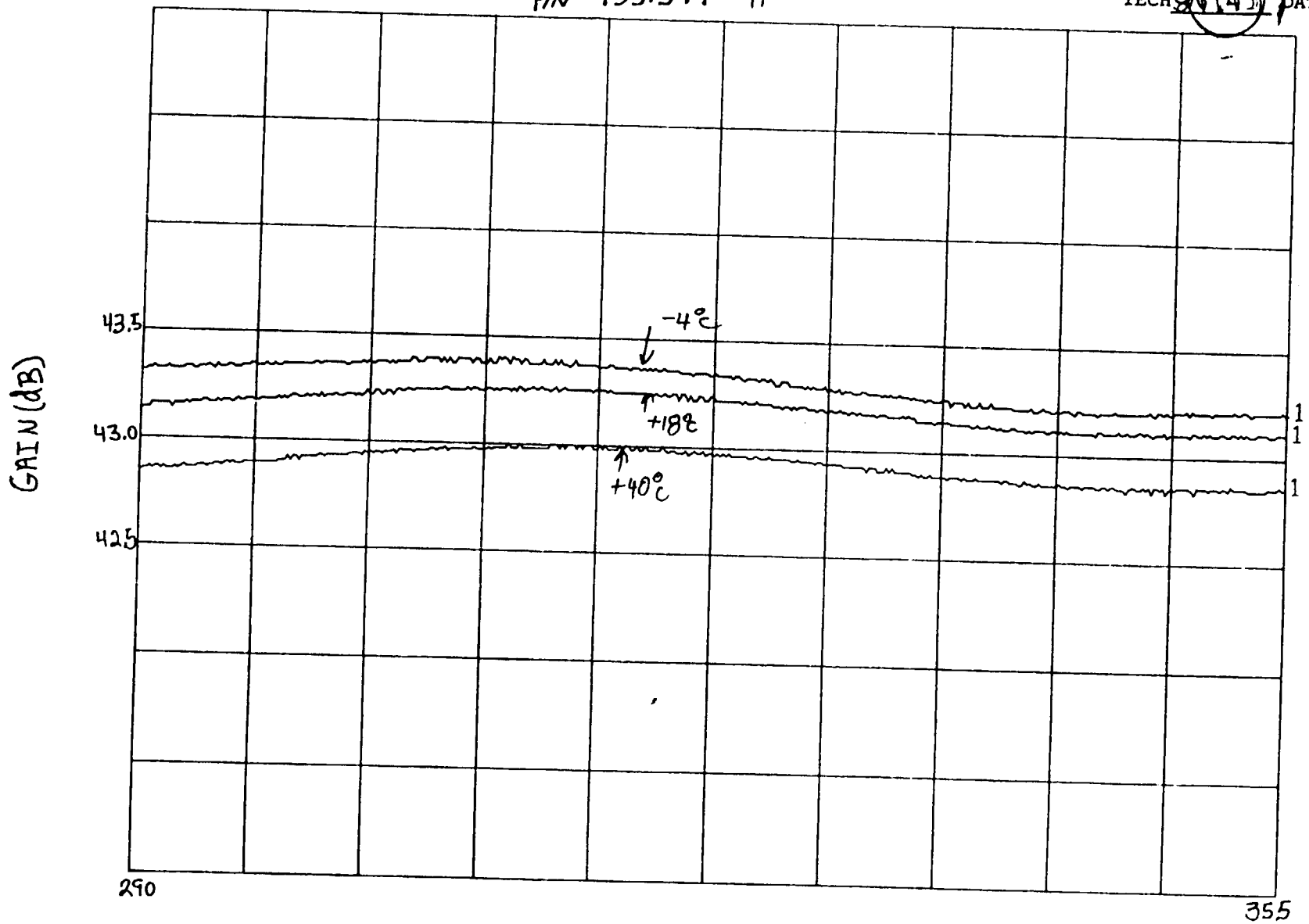
GAIN VS FREQUENCY

VERTICAL CALIBRATION .5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH [illegible] DATE 2-10-97

P/N 1331579-11



MODEL UD415301 S/N 107

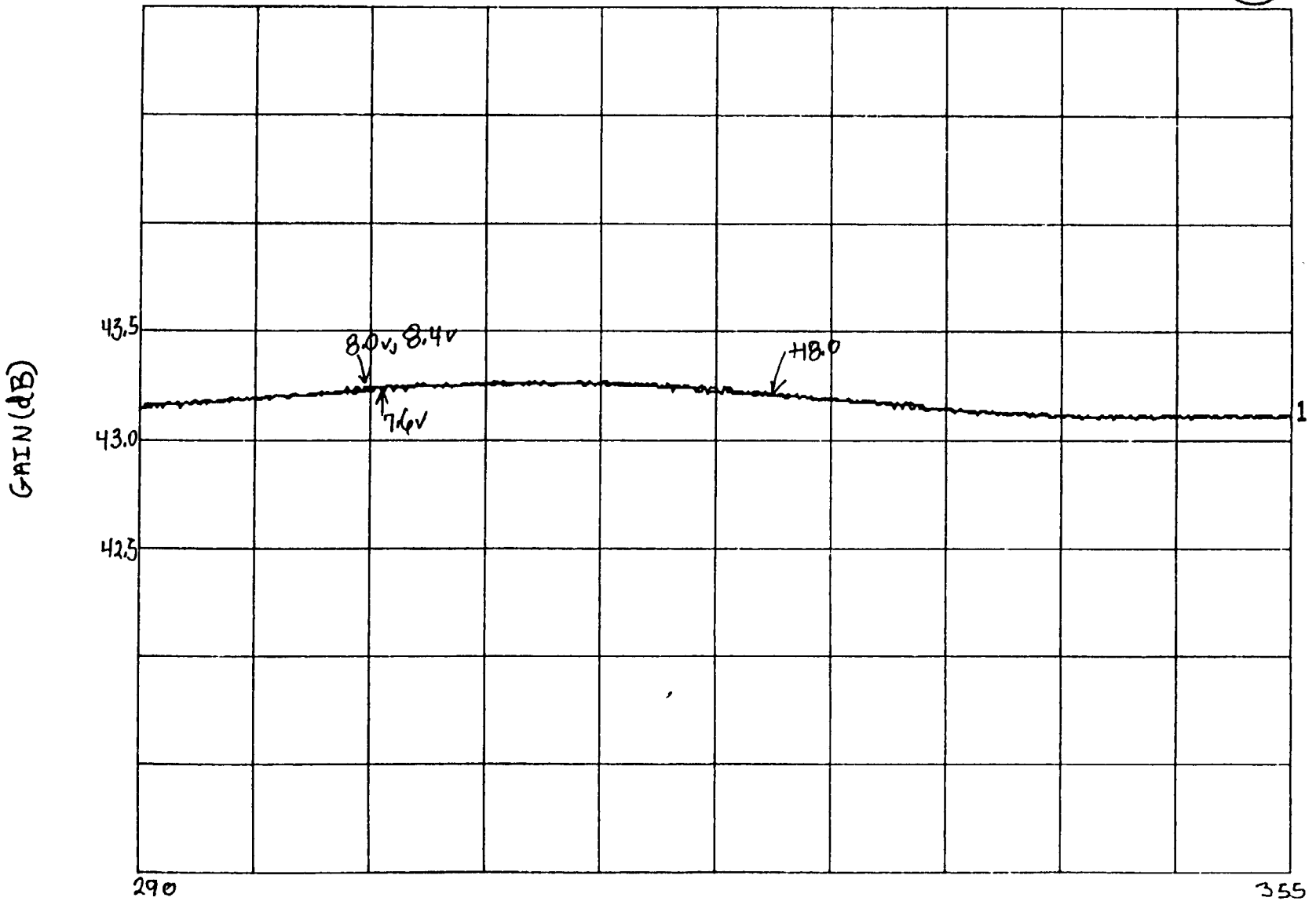
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SH T143 DATE 2-10-97

P/N 1331579-11



MODEL VD415301 S/N 107

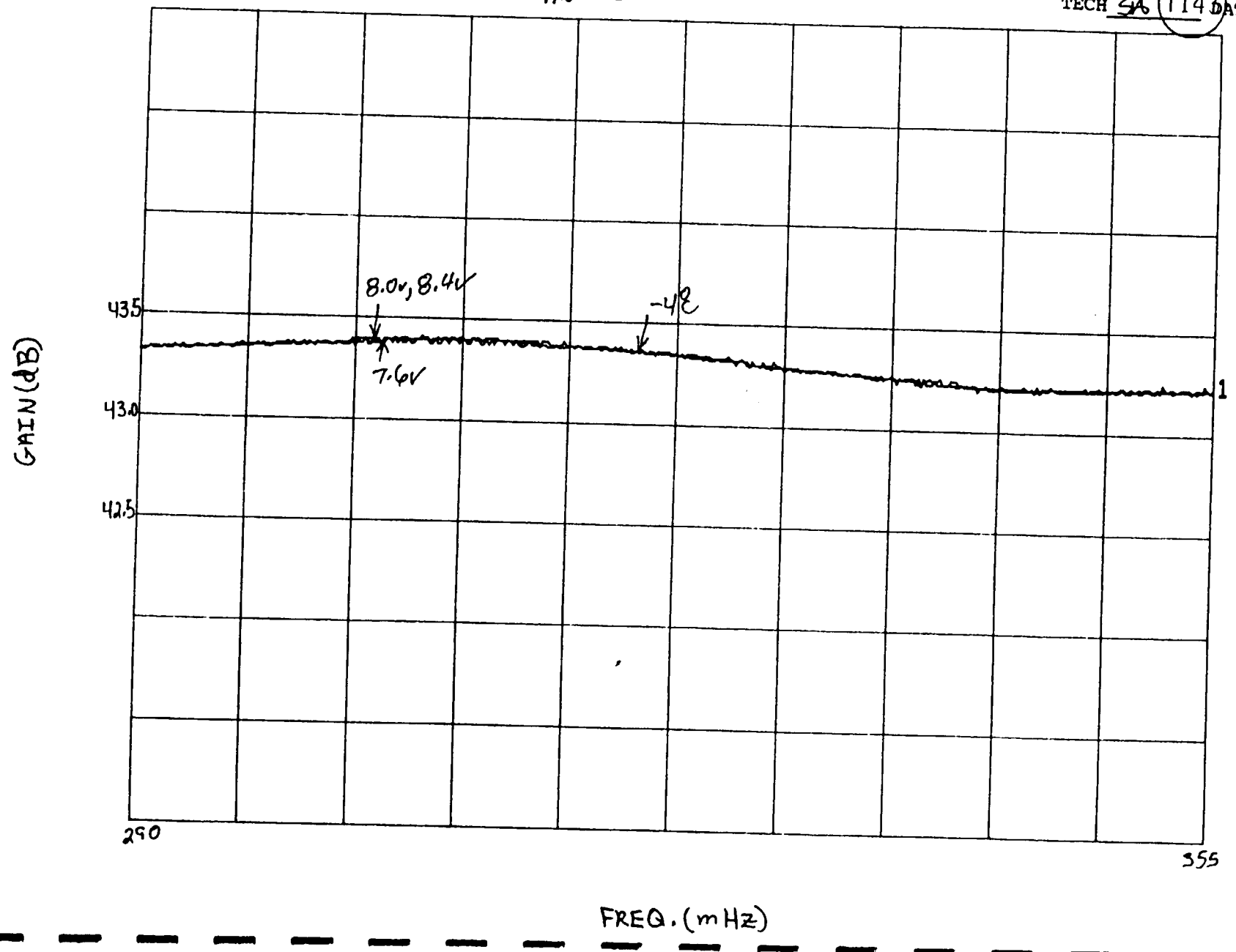
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SA (T143) DATE 2-10-97

P/N 1331579-11



MODEL UD4153O1 S/N 107

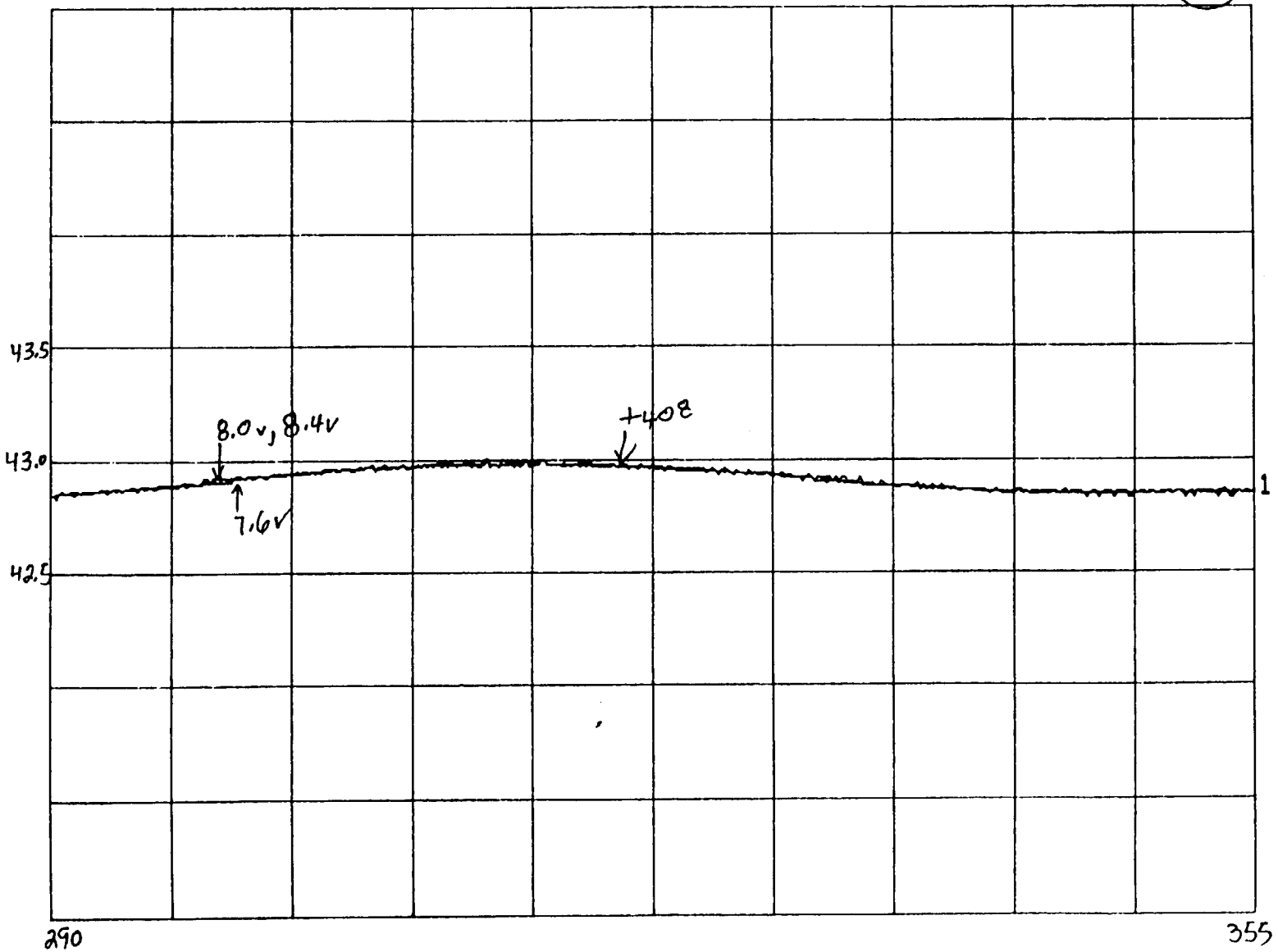
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SA T143 DATE 2-10-97

P/N 1331579-11



Channel 13 Amplifier

IF Amplifier (P/N:1331579-12, S/N: 107)

APPENDIX C
ATP1776 DATA SHEET
MODEL NUMBER UD315301
AEROJET P/N 1331579-12

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject			2-8-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			N/A
4.4	Electrical Test					
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept N/A Reject			N/A
	Short Open Protection	No Damage	Accept X Reject			2-8-97
	Output Coupling	Output shall be AC coupled	Accept X Reject			2-8-97
4.4.2	Gain vs. Freq. 305 MHz to 340 MHz	44.5dB Min., 45.5dB Max. -4°C to +40°C Attach x-y plot	Max 45.22 dB Min 44.90 dB Accept X Reject	Max 45.24 dB Min 44.95 dB Accept X Reject	Max 45.00 dB Min ~~44.87~~ dB Accept X Reject	44.70 2-8-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject 0.32 dB	Accept X Reject 0.29 dB	Accept X Reject 0.30 dB	2-8-97
	Gain Temp. Sensitivity	±.44 dB from -4°C to +40°C Worse Case	Accept X Reject	Accept X Reject 0.10 dB	Accept X Reject 0.25 dB	2-8-97
4.4.3	Gain-Voltage Sensitivity Input Currents	≤.5dB/v Worse Case ± .2dB for 7.6 to 8.4 Vdc 7.6v 50ma MAX. 8.0v 8.4v Attach X-Y Plot	0.02 dB 40.1 mA 40.8 mA 41.4 mA Accept X Reject	0.02 dB 38.7 mA 39.4 mA 40.0 mA Accept X Reject	0.02 dB 41.2 mA 41.9 mA 42.5 mA Accept X Reject	2-8-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1776 DATA SHEET
MODEL NUMBER UD315301
AEROJET P/N 1331579-12

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject ___			
		305 MHz 322.5 MHz 340 MHz	0.45 dB 0.40 dB 0.50 dB	0.55 dB 0.50 dB 0.55 dB	0.45 dB 0.40 dB 0.45 dB	2-8-97
4.4.8	Stability	Unconditionally Stable	Accept X Reject ___			2-8-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 55 mA	Accept X Reject ___			
		Maximum Current	42.7 mA			2-10-97

NOTE: Review all recorded data and signify acceptance below.

Technician S Hoffman (1143) Date: 2-10-97

Quality Assurance Steve Lima (A 34) Date: 2-18-97

CSI: Mike Lucas (QC 176) Date: 2-19-97

GSI: Marjorie Thomas (3367) Date: 2-10-97

MODEL UD 315301 S/N 107

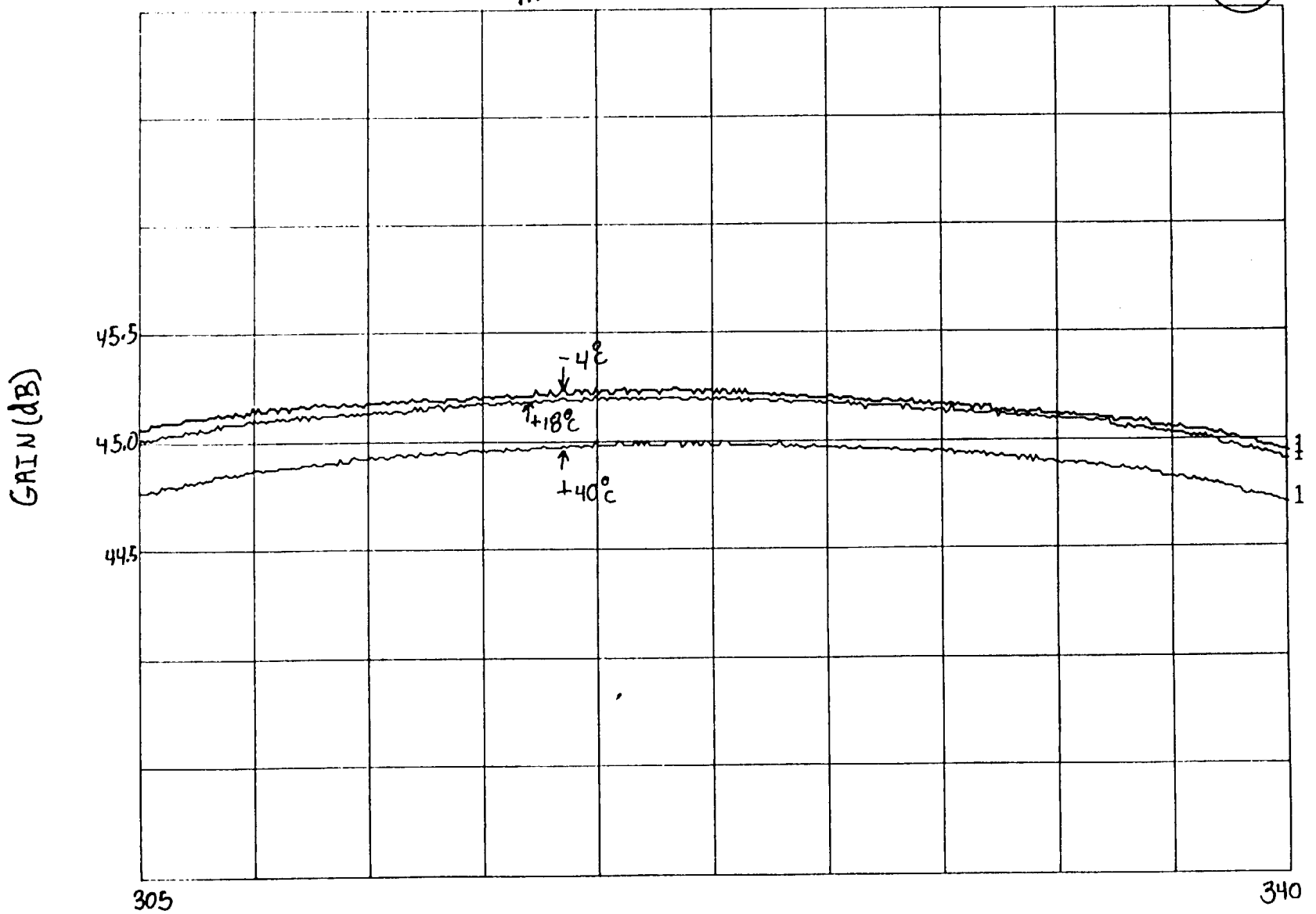
GAIN VS FREQUENCY

VERTICAL CALIBRATION .5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SM DATE 2-8-97

P/N 1331579-12



MODEL UD315301 S/N 107

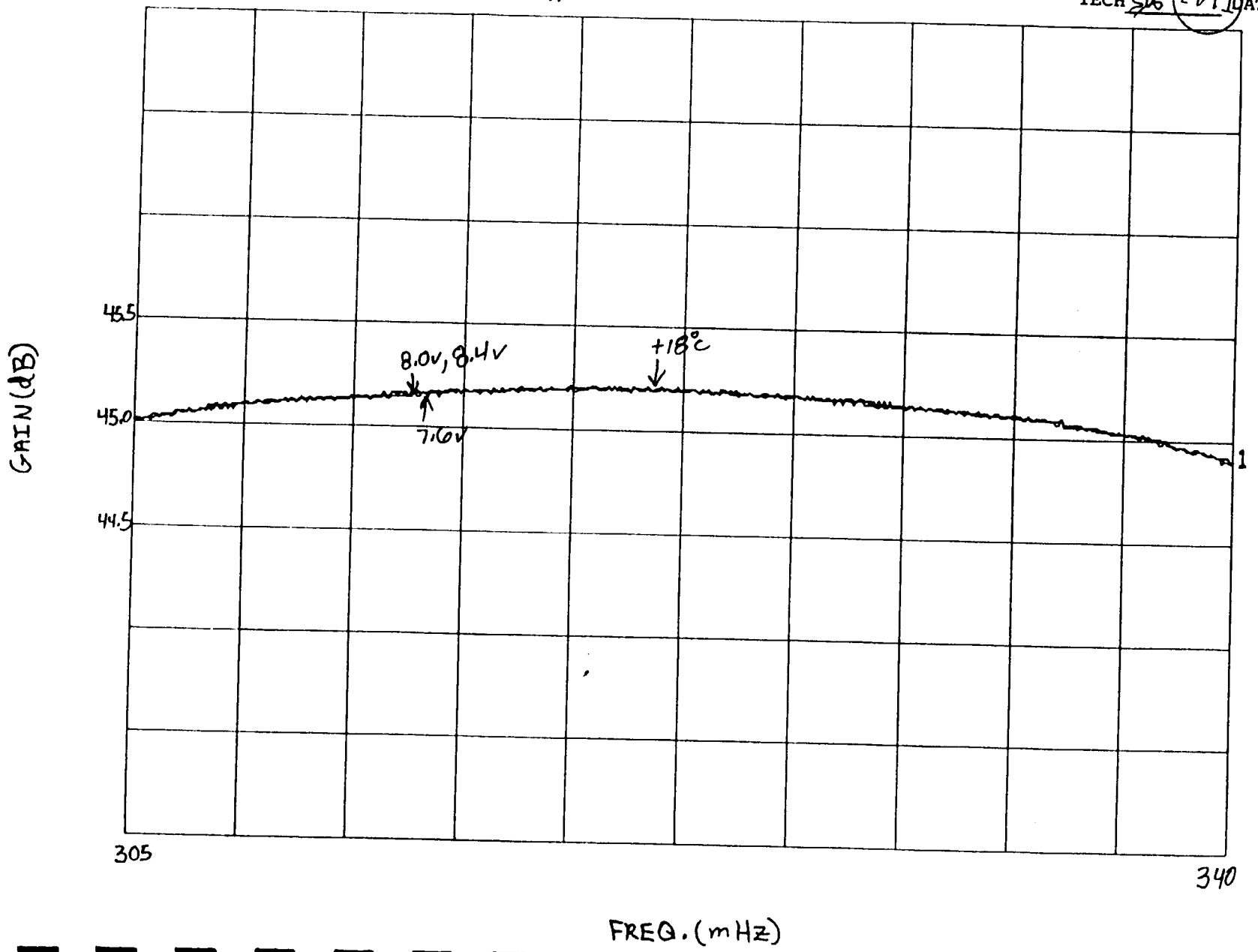
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SW 143 DATE 2-8-97

P/N 1331579-12



MODEL UD315301 S/N 107

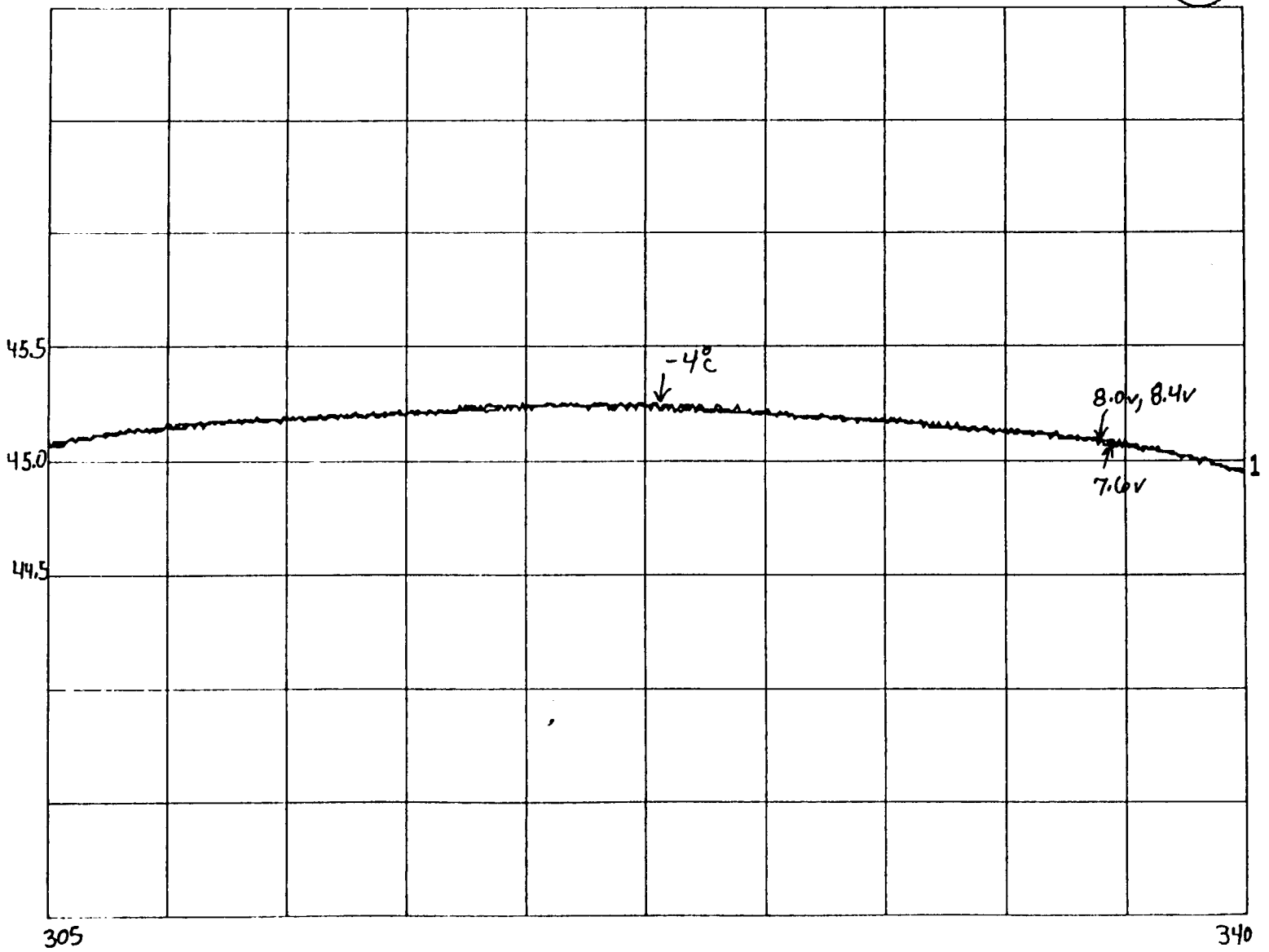
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SW 1143 DATE 2-8-97

P/N 1331579-12



MODEL UD315301 S/N 107

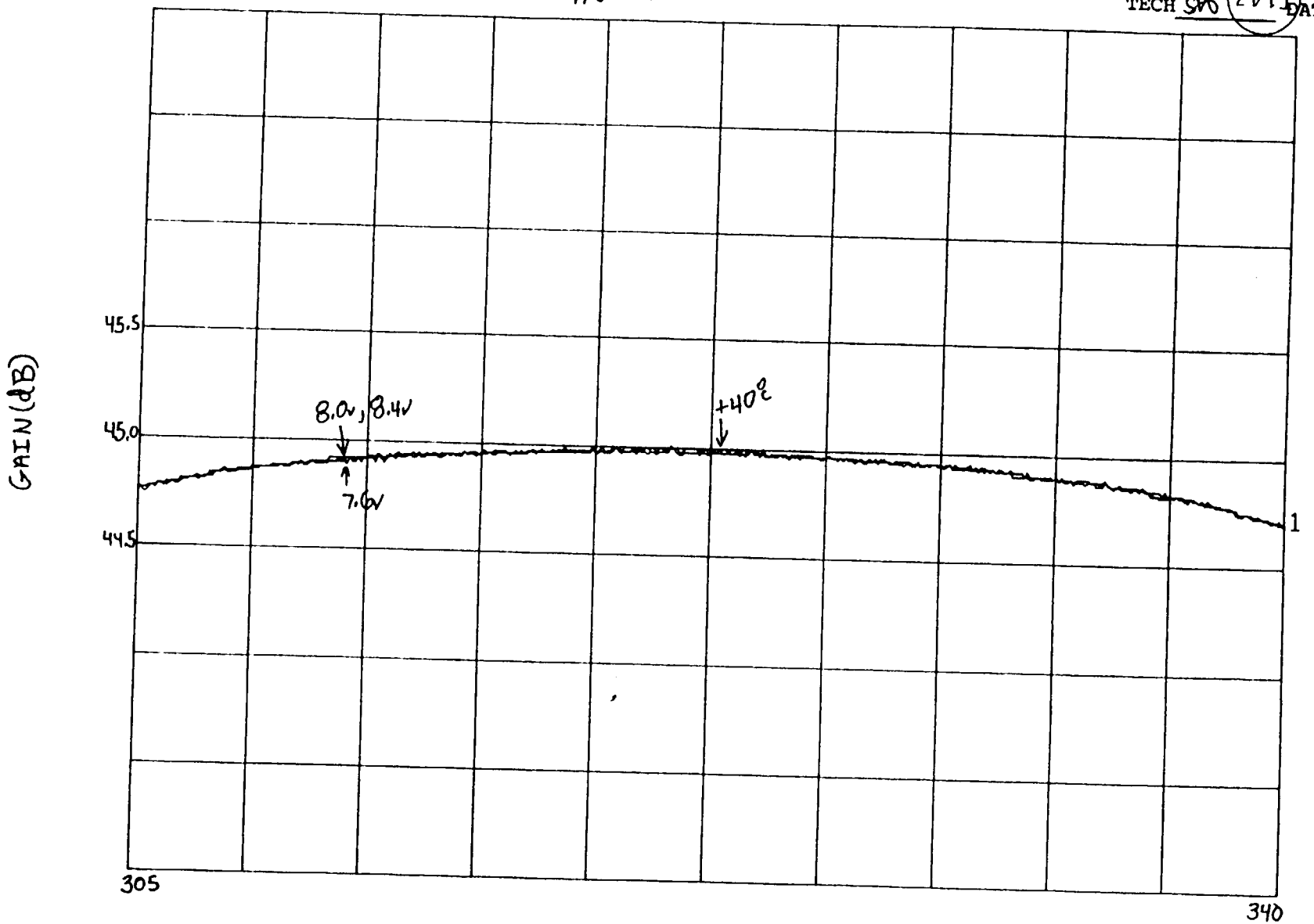
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SM (1143) DATE 2-8-97

P/N 1331579-12



Channel 14 Amplifier

IF Amplifier (P/N:1331579-13, S/N: 107)

APPENDIX C
ATP1777 DATA SHEET
MODEL NUMBER UD315302
AEROJET P/N 1331579-13

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.1.1	Examination of Product		Accept X Reject			2-8-97
4.2.2	* Current Limiting	200 mA maximum Reg. VOLTAGE= N/A VDC Total R= N/A ohm max. current draw =	N/A mA			N/A
4.4	Electrical Test					
4.4.1	* Polarity Reversal Protection	No Damage	Current N/A mA Accept Reject			N/A
	Short Open Protection	No Damage	Accept X Reject			2-8-97
	Output Coupling	Output shall be AC coupled	Accept X Reject			2-8-97
4.4.2	Gain vs. Freq. 315 MHz to 330 MHz	48.5dB Min., 49.5dB Max. -4°C to +40°C Attach x-y plot	Max 49.23 dB Min 49.19 dB Accept X Reject	Max 49.39 dB Min 49.34 dB Accept X Reject	Max 48.88 dB Min 48.80 dB Accept X Reject	2-8-97
	Gain Flatness	.5 dB Maximum Worse Case	Accept X Reject 0.04 dB	Accept X Reject 0.05 dB	Accept X Reject 0.08 dB	2-8-97
	Gain Temp. Sensitivity	±.44 dB from -4°C to +40°C Worse Case	Accept X Reject	Accept X Reject 0.18 dB	Accept X Reject 0.39 dB	2-8-97
4.4.3	Gain-Voltage Sensitivity	≤.5dB/v Worse Case	0.05 dB	0.05 dB	0.04 dB	
	Input Currents	± .2dB for 7.6 to 8.4 Vdc 55ma MAX. 7.6v 8.0v 8.4v Attach X-Y Plot	46.8 mA 46.2 mA 45.5 mA Accept X Reject	44.1 mA 44.8 mA 45.4 mA Accept X Reject	46.7 mA 47.4 mA 48.0 mA Accept X Reject	2-8-97

NOTE: * TEST REQUIRED ON PROTOFLIGHT UNIT ONLY

APPENDIX C
ATP1777 DATA SHEET
MODEL NUMBER UD315302
AEROJET P/N 1331579-13

S/N 107

PARA	TEST	SPECIFICATION	+18°C	-4°C	+40°C	DATE
4.4.7	Compression	1 dB maximum Compression AT +10 dBm Output Power	Accept X Reject ____			
		315 MHz	0.45 dB	0.45 dB	0.50 dB	
		322.5 MHz	0.50 dB	0.50 dB	0.50 dB	
		330 MHz	0.50 dB	0.50 dB	0.55 dB	2-8-97
4.4.8	Stability	Unconditionally Stable	Accept X Reject ____			2-8-97
4.4.9	Start-up	Capable of starting operation at -30°C and +60°C with a maximum current draw of 60 mA	Accept X Reject ____			
		Maximum Current	48.3mA			2-10-97

NOTE: Review all recorded data and signify acceptance below.

Technician [signature] (T143) Date: 2-10-97

Quality Assurance [signature] (A 34) Date: 2-18-97

CSI: [signature] (QC 176) Date: 2-19-97

GSI: [signature] Date: 2-10-97

Amplica, Inc. Newbury Park, CA 91320	SIZE A	FSCM NO. 51025	ATP1777	REV.
DRAWN				
ISSUED	SCALE		SHEET 37 OF 39	

MODEL UD315302 S/N 107

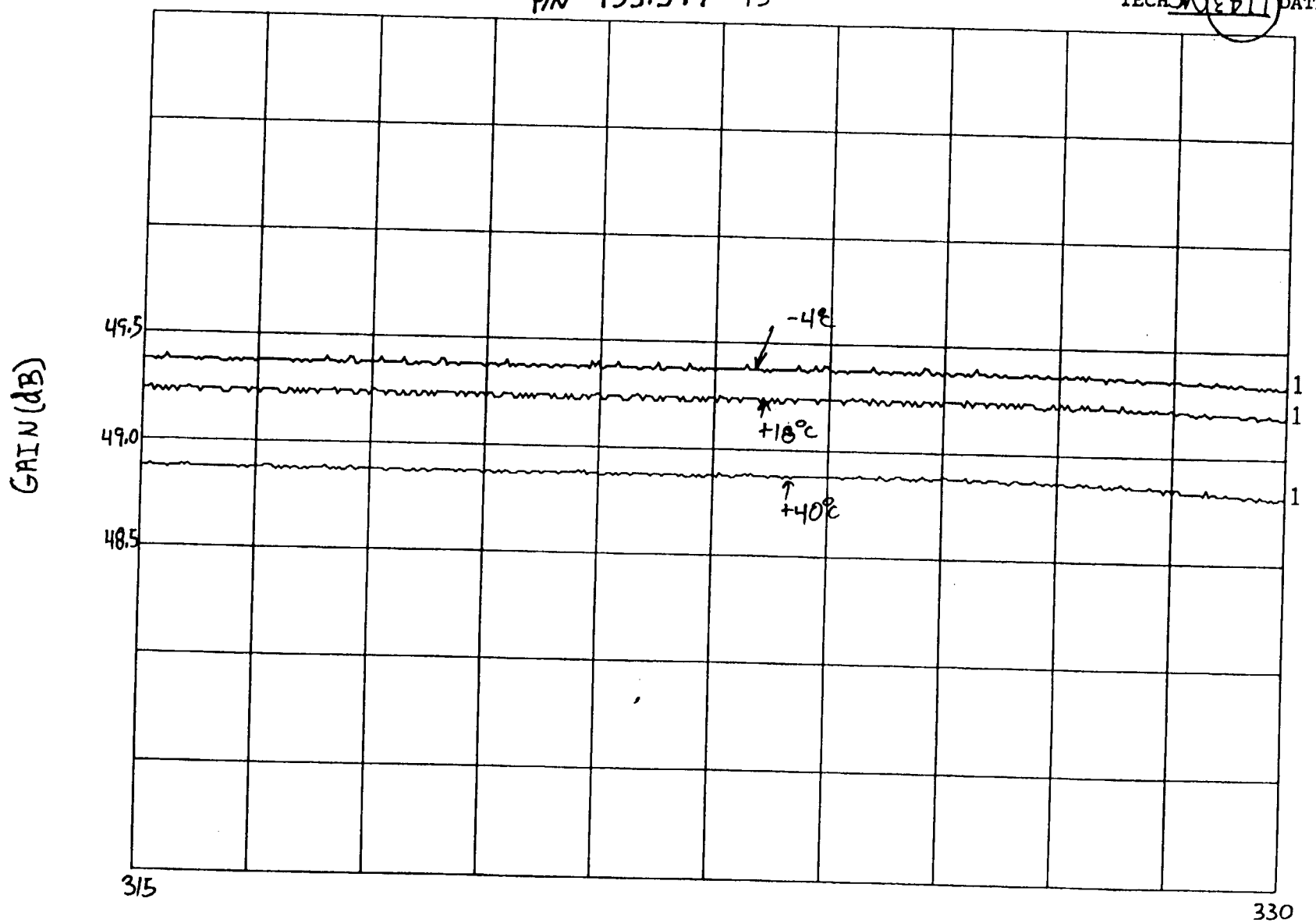
GAIN VS FREQUENCY

VERTICAL CALIBRATION .5 dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SW 1143 DATE 2-8-97

P/N 1331579-13



MODEL UD315302 S/N 107

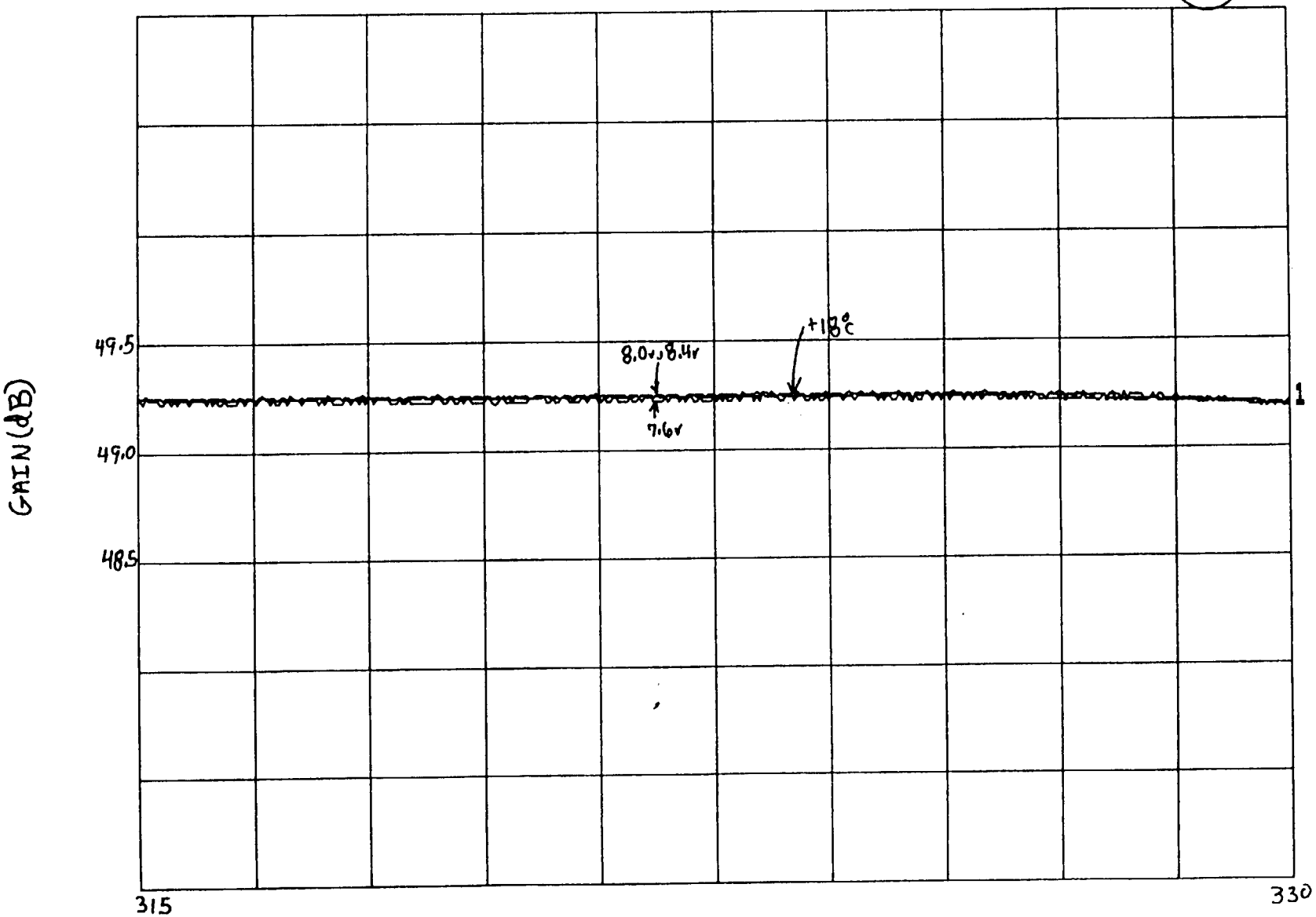
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH MJ 1143 DATE 2-8-57

P/N 1331579-13



MODEL UD315302 S/N 107

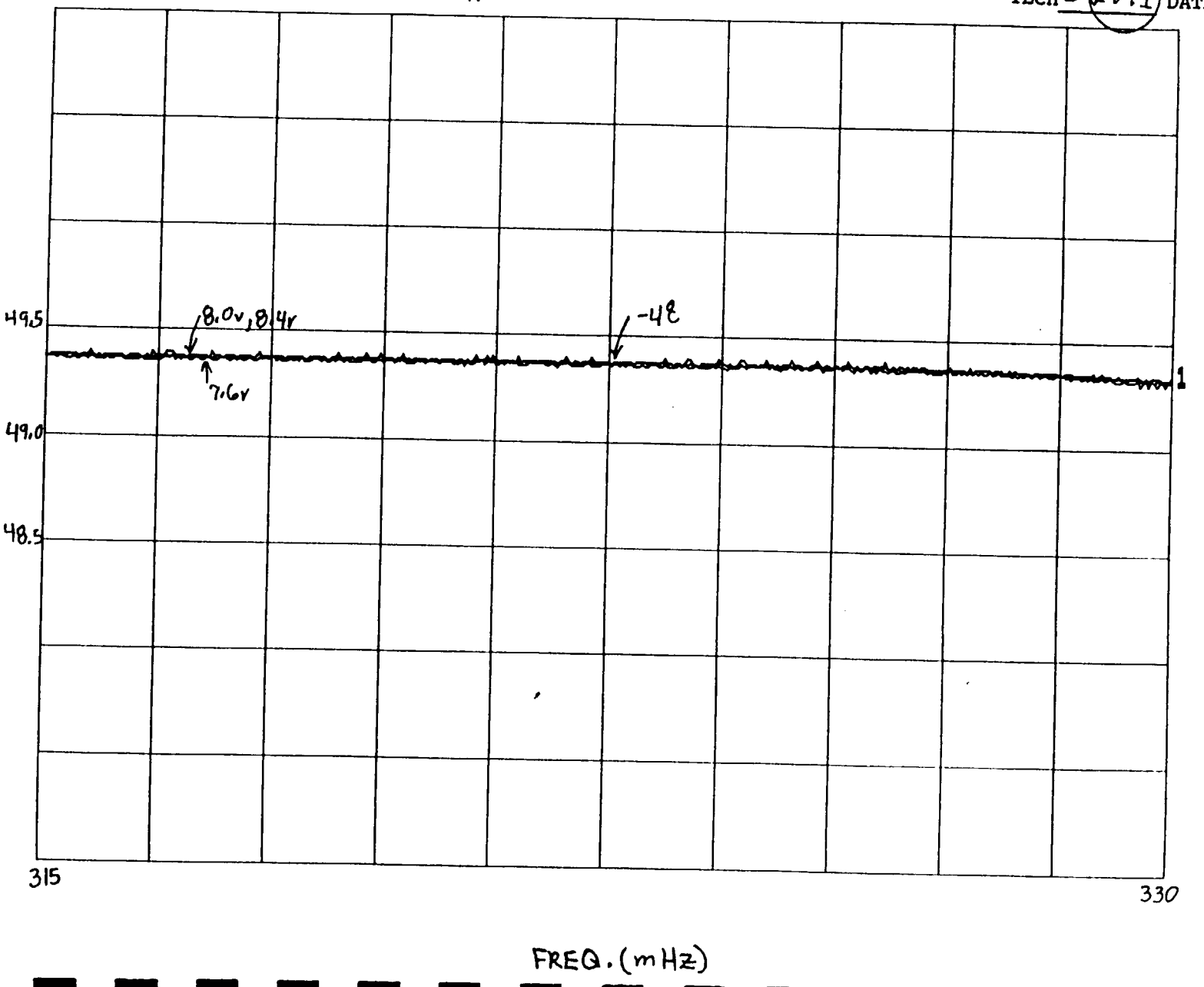
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH SWC (1143) DATE 2-8-97

P/N 1331579-13



MODEL UD315302 S/N 107

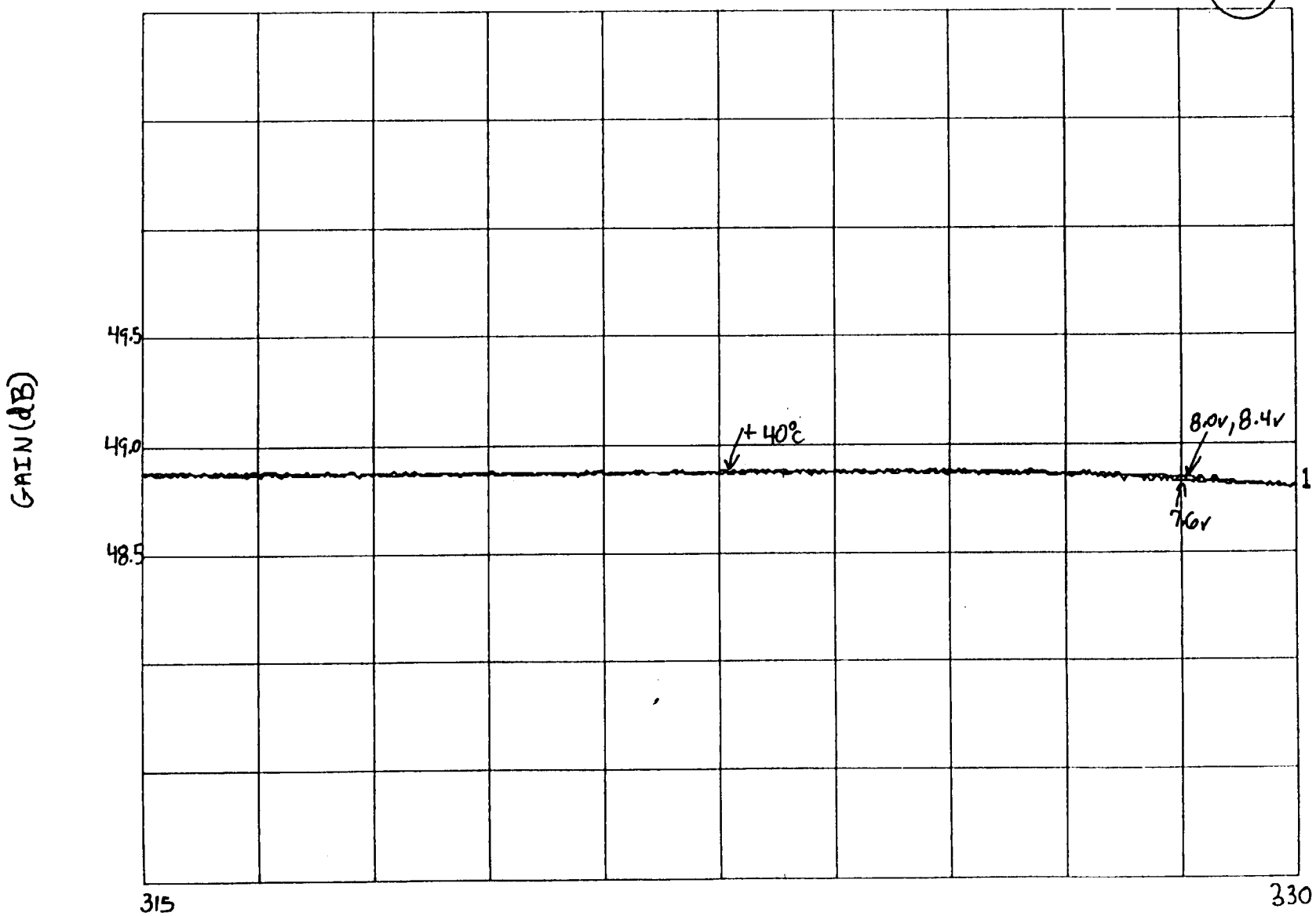
GAIN-VOLTAGE SENSITIVITY VS. FREQ.

VERTICAL CALIBRATION 0.5dB INCH

TEMPERATURE AS NOTED DEG.C.

TECH GAC 1143 DATE 2-8-97

P/N 1331579-13



Channel 15 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-20, S/N: 7A10)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
1.08	1.0		

QA 1

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
10.04	56.10	1.87	2.0	QA 1	
10.00	56.08				
9.96	55.95				
ΔGv =	0.15 dB				

	DATE	ACC	REJ
SPACEK QA	9-4-97	QA 1	

PART NO. 1331562-20F

SER NO. 7A10

TESTED BY: [signature]

END DATE: 8-8-97

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

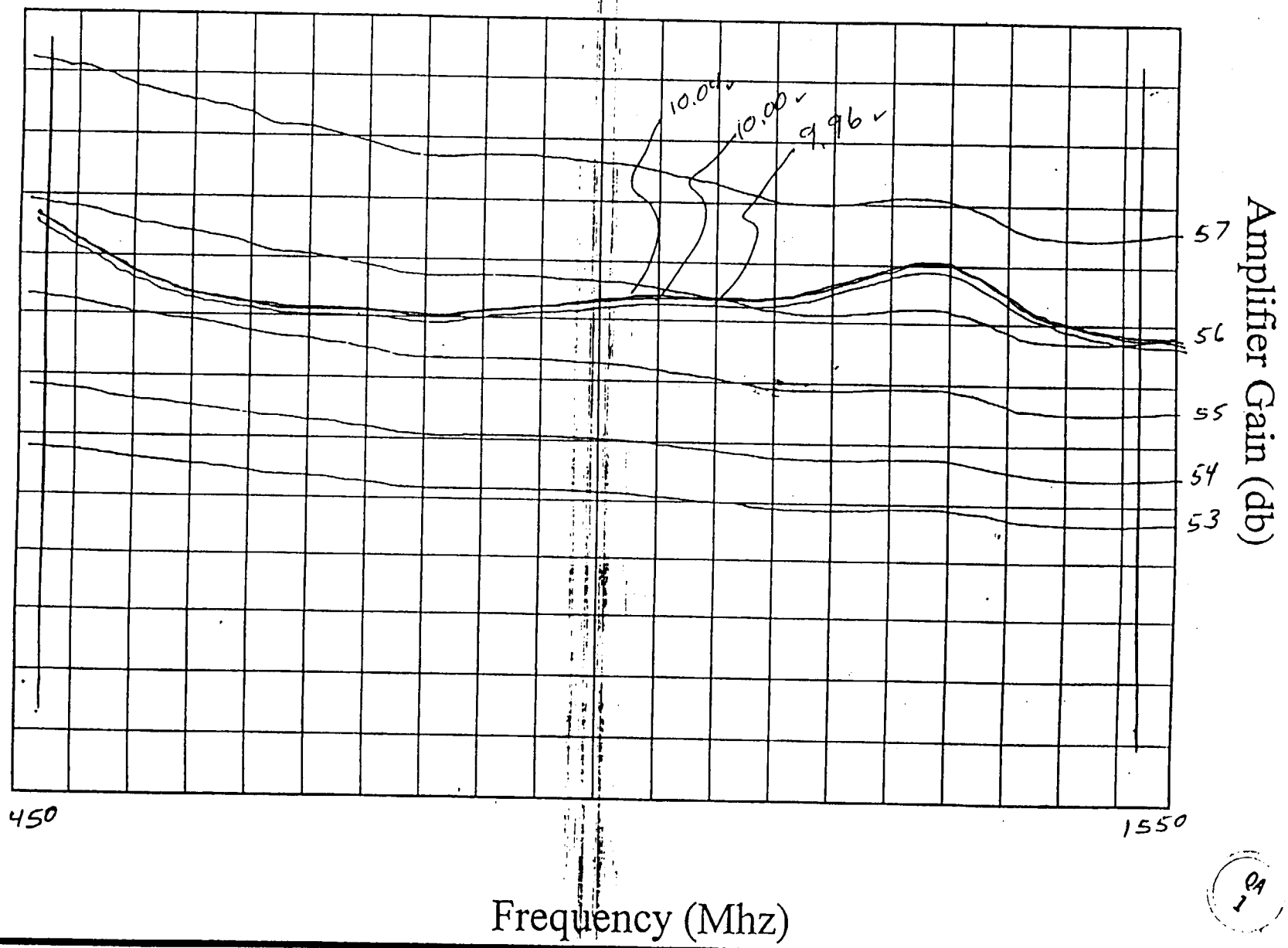
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-20F
Serial No. 7A10
Date 8-7-97
Tested By TTK

Amb Temp 24°C



04
1

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)		Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1	+40	G_{T1} 55.88				
			* .014	0.035dB/°C	QA 1	
T2	+28	G_{T2} 56.05				
			* .015	0.020dB/°C	QA 1	
T3	+ 8	G_{T3} 56.35				
			* .021	0.035dB/°C	QA 1	
T4	− 6	G_{T4} 56.65				

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \qquad i = 1,2,3,4$$

ΔG_T = 0.77 dB

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4$ = 1.32 dB Spec 1.4dB ACC QA 1 REJ _____

	DATE	ACC	REJ
		QA	

PART NO. 1331562-20F SPACEK QA 9-5-97 1

SER NO. 7A10 TEST FAILURE: _____

TESTED BY: _____ FAILURE ANALYSIS NO. _____

END DATE: 8-8-97

END TIME: 1600

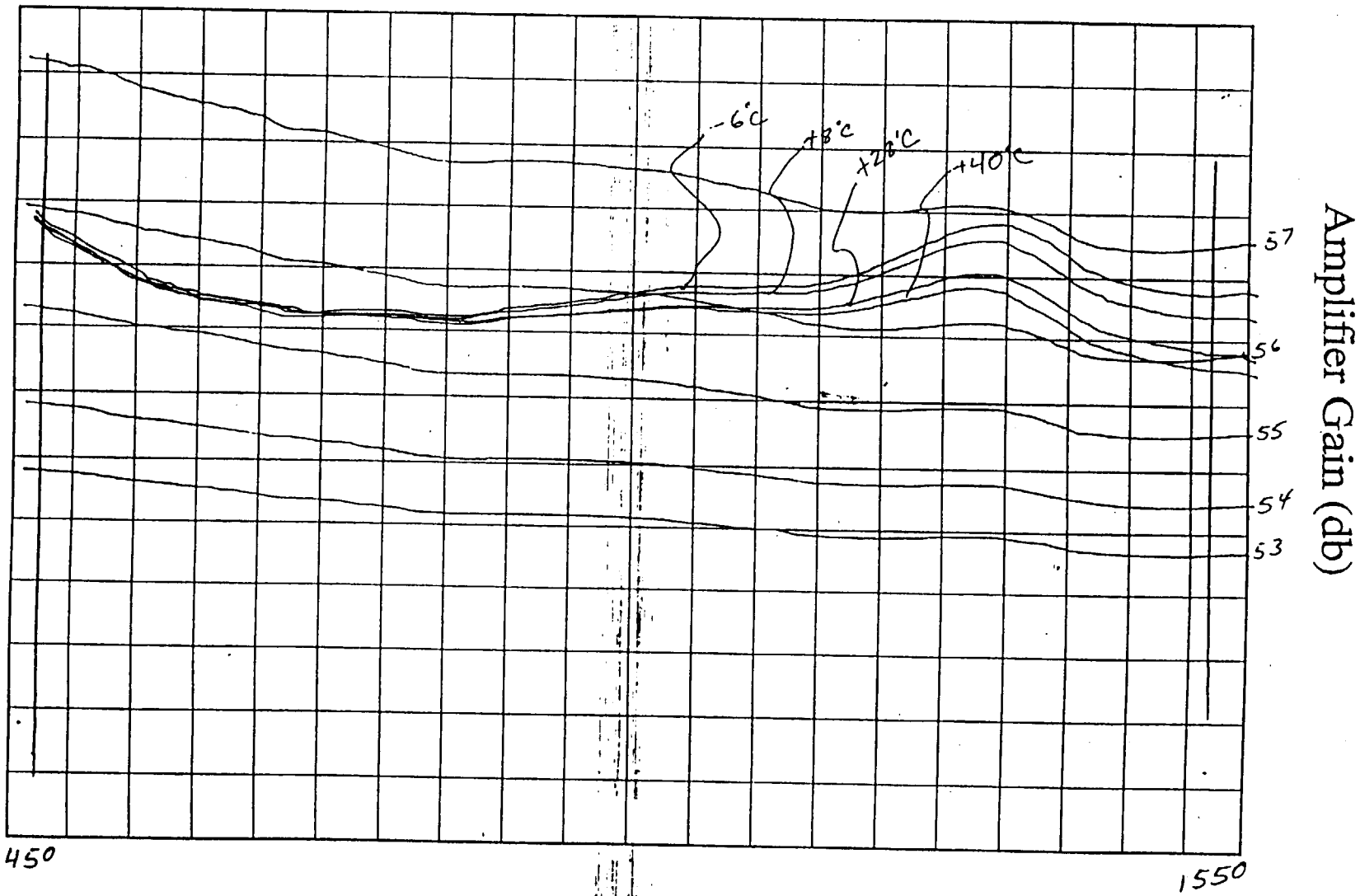
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-20F
Serial No. 7A10
Date 8-7-97
Tested By TT

Amb Temp 24°C



QA
1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	—	—	—	—	—
				X						20	—	—	—	—	—
		X	X							50	—	—	—	—	—
X	X	X	X	X	X	X	X			100	—	—	—	—	—
X										150	—	—	—	—	—
			X	X	X	X	X	X		200	—	—	—	—	—
								X		400	—	—	—	—	—
									X	500	-2.6	0.4	1.0	QA	—
									X	1000	-2.9	0.1	1.0	QA	—
									X	1500	-2.8	0.2	1.0	QA	—

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 8-7-97 AMBIENT ROOM TEMPERATURE °C: 21

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-27.5	-30.2	2.7	2.04

Above data taken with Daden filter attached (except -19) .

Intermediate test results for information only

PART NO. 1331562-20F

SER NO. 7A10

TESTED BY: [signature]

END DATE: 8-7-97

END TIME: 1:30 pm

	DATE	ACC	REJ
SPACEK QA	8-8-97	[signature]	

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 8-31-97 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	116	-27.00	-28.05	1.05	5.4	6.5	1	
+8	116	-27.10	-28.15	1.05	5.4	6.5	1	
+28	117	-27.20	-28.20	1.0	5.6	6.5	1	
+40	117	-27.50	-28.50	1.0	5.6	6.5	1	

Noise figure change 0.2 dB Spec is .5dB peak to peak on -20 ACC 1 REJ _____

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 9/9/97 Ambient Room Temperature °C: 25

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.211

Record Nps(K) 0.15 for dash number from Aerojet specification AE-24869, Table II.
Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC	REJ
	1

	DATE	ACC	REJ
SPACEK QA	9-10-97		1

PART NO. 1331562-20F

SER NO. 7A10

TESTED BY: [illegible]

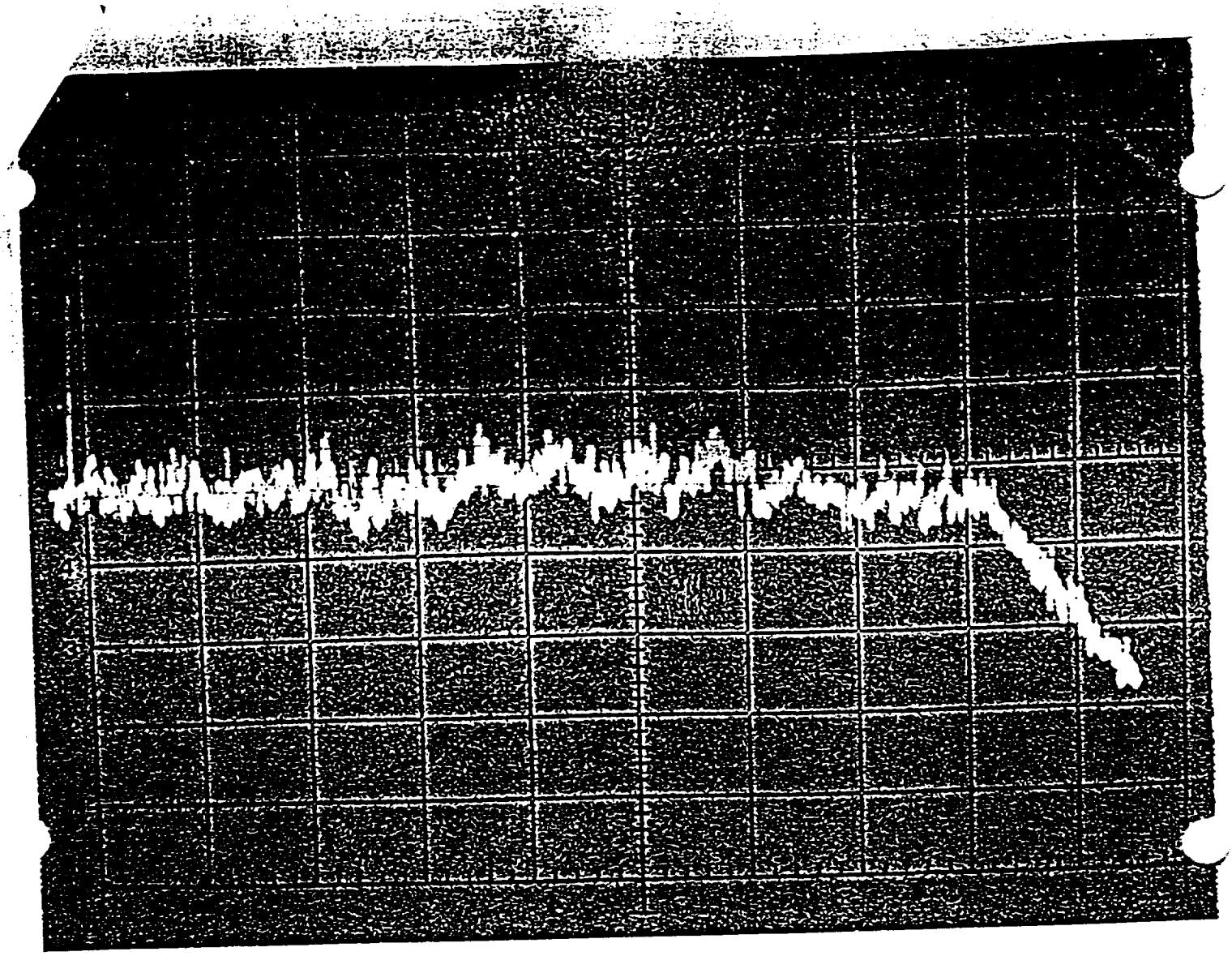
END DATE: 9-9-97

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101



5.4.14 Noise Power Profile

Model No.: 1331562-20F

Serial No.: 7A10

Date: 9-10-97

Tested by: DH

Spectrum Analyzer Parameters

Vertical Scale: 5 dB/div.

Scan Width: 100 mhz/Div.

IF Band Width: 10 Khz

Scan Time: 3 sec/Div.

No video filter.

QA 1

SUBSYSTEM-LEVEL TEST DATA

CENTER FREQUENCY OF LOs

Channel No.	1	2	3	4	5	6	7	8	9-14 ***	15
Specification (GHz) *	23.8	31.4	50.3	52.8	53.596	54.4	54.94	55.5	57.290344	89.0
Setting Accuracy (+/-GHz)	0.008	0.008	0.008	0.003	0.003	0.003	0.003	0.008	0.000086	0.08
Measured (GHz) **	23.798	31.400	50.301	52.799	53.597	54.400	54.940	55.501	57.290310 57.290322	88.983

* Specification in vacuum condition.

** Measured at ambient pressure (standard atmosphere).

*** Measured data for PLO No. 1 and No.2.

TEST DATA

FOR

AMSU-A2 (P/N: 1356441-1, S/N: F01)

TEST DATA SHEET 3

LO Frequency Test Data (Paragraph 3.5.1) (A2)

Test Setup Verified: A. Luna
Signature

Baseplate Temperature (T_B) 23.3 °C

Component	Channel No.	V_b(V)	I_b(mA)	P_{dc}(mW)			f_o(GHz)		
				Required (Max)	Measured	Pass/ Fail	Required	Measured	Pass/ Fail
LO	1	10.01	78.2	2,000	782.8	P	23.800 ± 0.008	23.798	P
	2	10.02	116.5	2,100	1167.3	P	31.400 ± 0.008	31.399	P
Mixer/ Amps	All	10.02	84.2	900	843.7				
TOTAL				5,000	2793.8				

Pass = P, Fail = F

Part No.: 1356441-1

Serial No.: F01

Test Engineer: Tony Luna

Quality Assurance: TA 268 MAR 6 '98

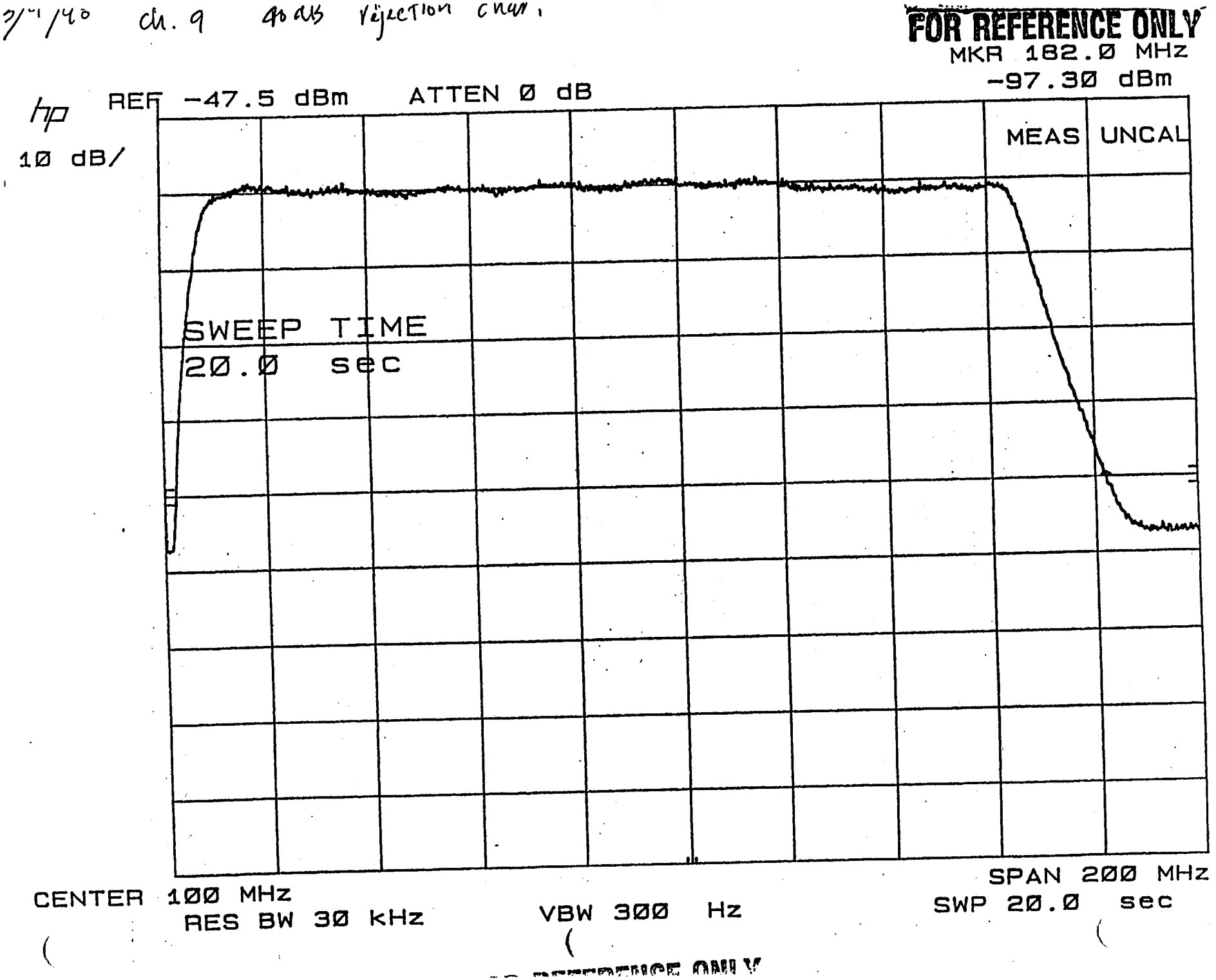
Date: 3/6/98

Test Data with Spectrum Analyzer with Uncalibrated Message

Some of the AMSU-A receiver test data for the out-of -band rejection are plotted with UNCAL message on the Spectrum Analyzer screen but do not compromise the adequacy and accuracy of the data. This is assured by comparing the two attached data plots: one with calibrated (without UNCAL message) and the other with uncalibrated (with UNCAL message). The UNCAL message on the Spectrum Analyzer is a result of reduced sweep-time to reduce test time.

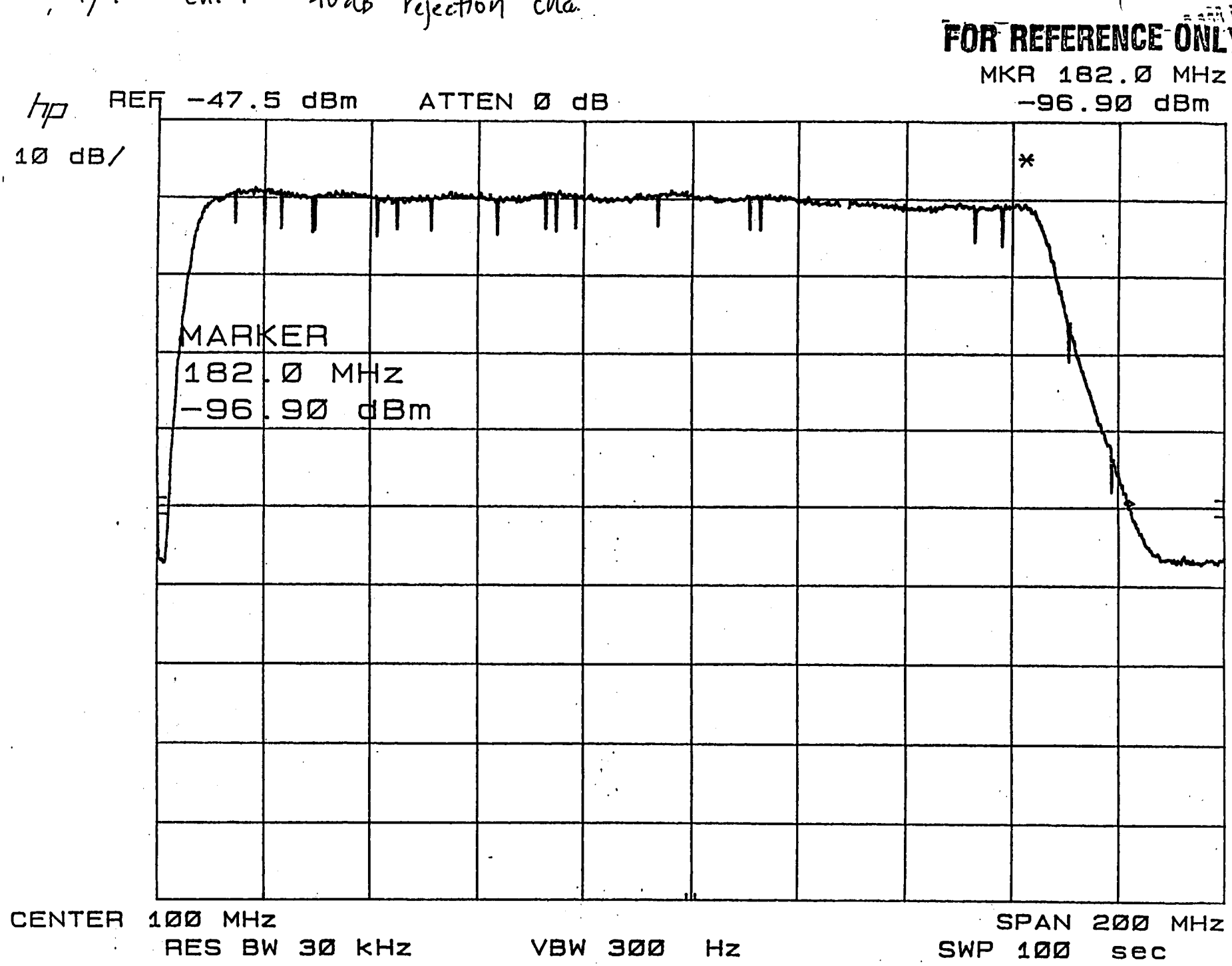
The IF bandwidth (RBW) of the Spectrum Analyze(HP 8566B) is an analog filter, so it consists R, L, C's that need some time to charge. The minimum sweep-time in the Spectrum Analyzer to show the calibrated display (without UNCAL message) is the minimum sweep-time for the IF filter to get charged by a sinewave signal. In the case where the stimulus signal is broadband noise as in our case or a signal that changes its amplitude slowly, like the response of a low-Q filter (a filter with a rise and fall-time much slower than those of the Spectrum Analyzer RBW filter) the sweep-time can be shorter. Therefore, the minimum sweep-time to get an accurate response can be decreased until there is a change in the display. If we test bandpass filters with similar characteristics, we can assume that the same minimum sweep-time can be used to test all of them. However, if the sweep-time is reduced too far beyond the limit, a change in the display will be observed.

3/1/40 ch. 9 40 dB rejection char.



1/90 ch. 4 40 dB rejection cha.

FOR REFERENCE ONLY

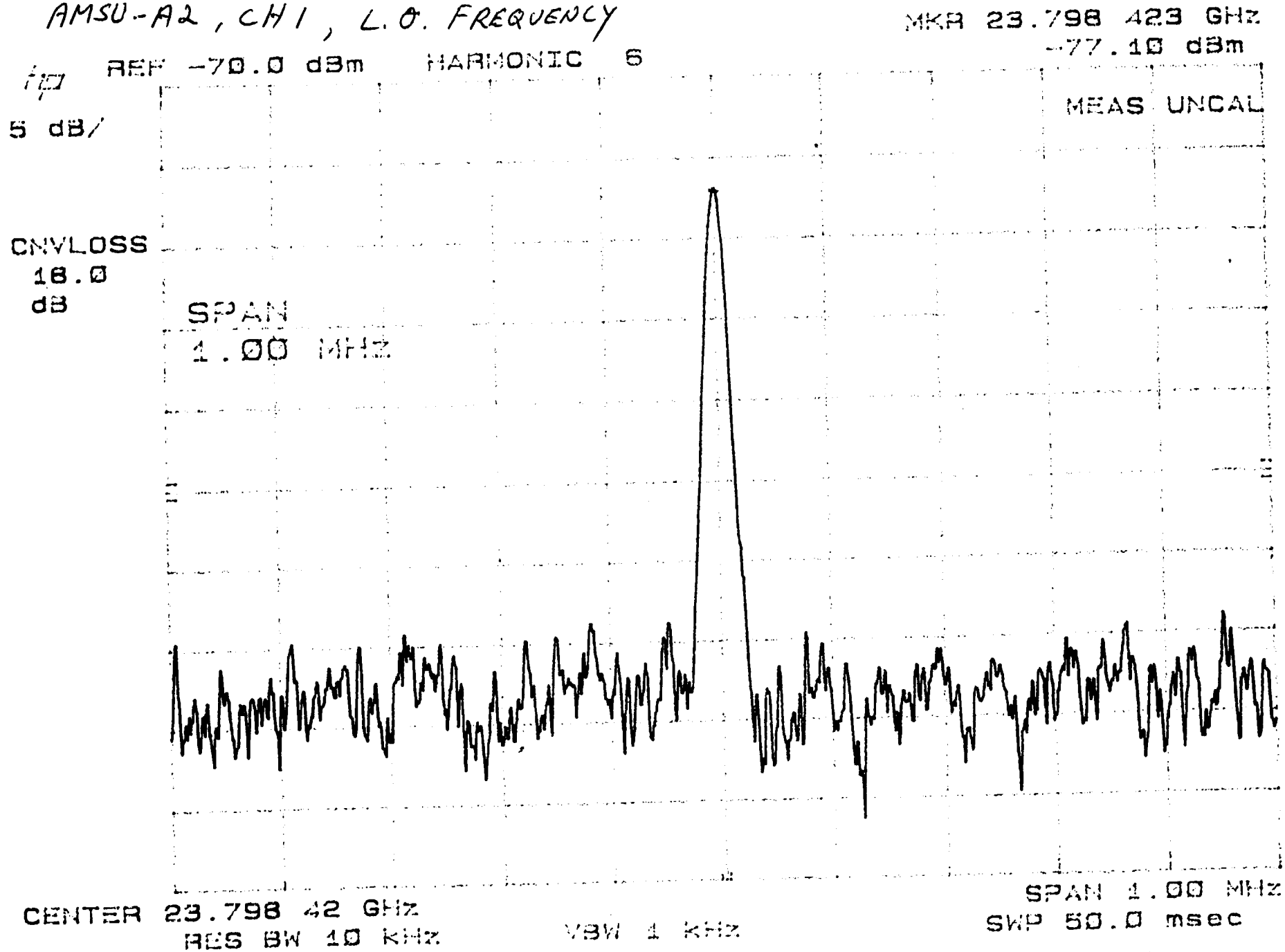


FOR REFERENCE ONLY

7-7-10

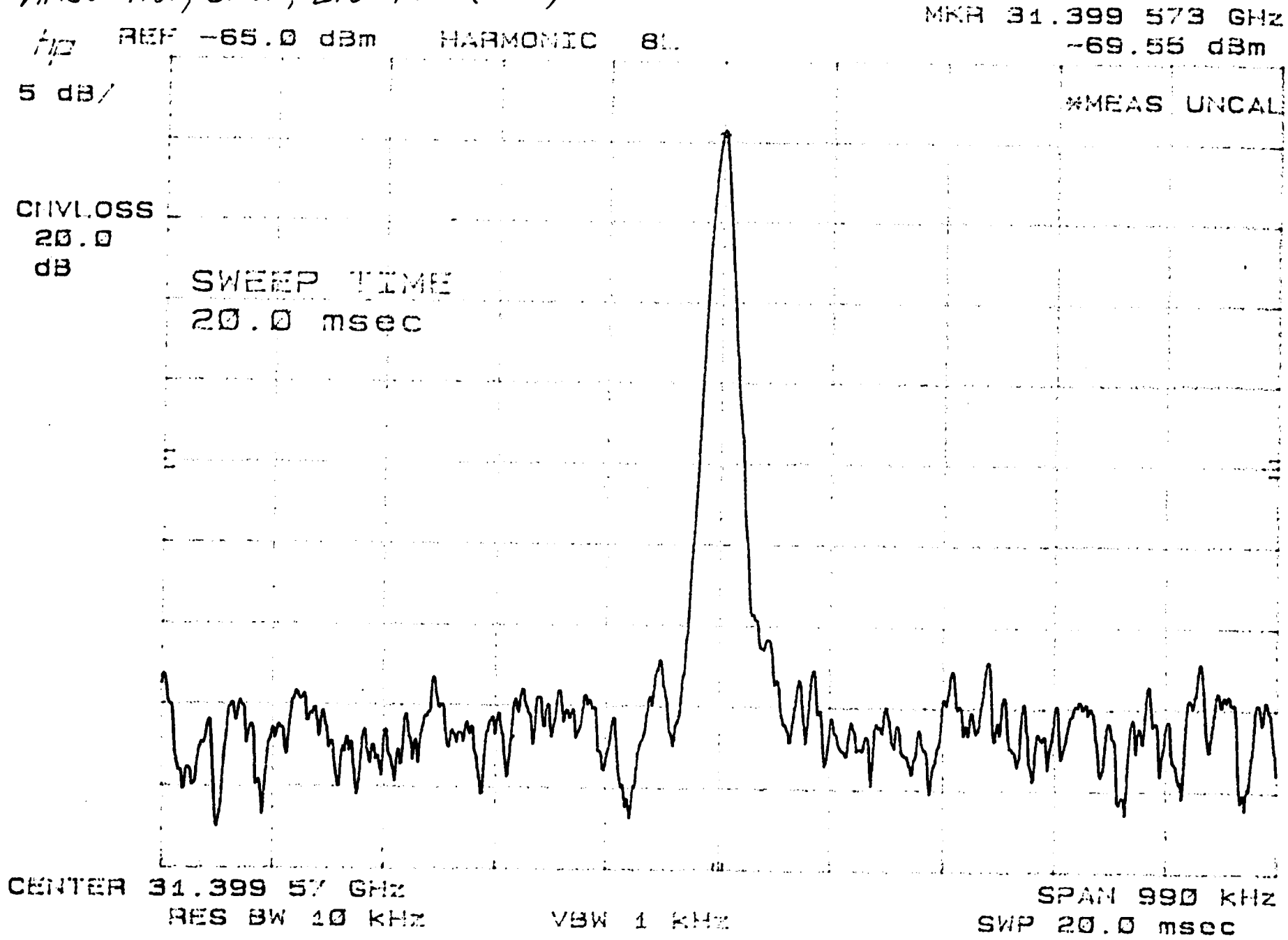
FOR REFERENCE ONLY

AMSU-A2, CH1, L.O. FREQUENCY



AMSU-A2, CH2, L.O. FREQUENCY

FOR REFERENCE ONLY



TEST DATA SHEET 6

IF Output Test Data (Paragraph 3.5.2) (A2)

Test Setup Verified: J Luna (Signature) Baseplate Temperature (T_B) 24.1 °C

Compo-nent	Channel No.	V_b(V)	I_b(mA)	P_o(dBm)	Atten (dB)	P_o(dBm)		
						Required	Measured	Pass/ Fail
LO	1	10.01	78.2	J LUNA ~~-27.10~~ -22.02	5.0	-27.0 ± 1.0	J LUNA ~~-22.02~~ -27.10	P
	2	10.02	116.5	-23.45	3.0	-27.0 ± 1.0	~~-23.45~~ J LUNA ~~-26.41~~ -26.31	P
Mixer/ Amps	All	10.02	84.2					

Pass = P, Fail = F

Part No.: 1356441-1

Serial No.: F01

Test Engineer: Jony Luna

Quality Assurance: QA 269 MAR 9 '98

Date: 3/6/98

TEST DATA SHEET 9

Bandpass Characteristics Test Data (Paragraph 3.5.3) (A2)

Test Setup Verified: _____ Signature Baseplate Temperature (T_B) 23.5 °C

Component	Channel No.	V_b(V)	I_b(mA)	3 dB BW Frequency (MHz)		3 dB BW Frequency (MHz)		Pass/ Fail
				Lower	Higher	Required MAX.	Measured	
LO	1	10.02	78.2	9.1	134.5	270	125.4	P
	2	10.02	116.6	9.4	88.9	180	79.5	P
Mixer/ Amps	All	10.01	84.2	[redacted]				

Component	Channel No.	V_b(V)	I_b(mA)	40 dB BW Frequency (MHz)		40 dB BW Frequency (MHz)		Pass/ Fail
				Lower	Higher	Required MAX.	Measured	
LO	1	10.02	78.2	3.8	146.8	351	143.0	P
	2	10.02	116.6	3.8	99.9	234	96.1	P
Mixer/ Amps	All	10.01	84.2	[redacted]				

Part No.: 1356441-1

Serial No.: F01

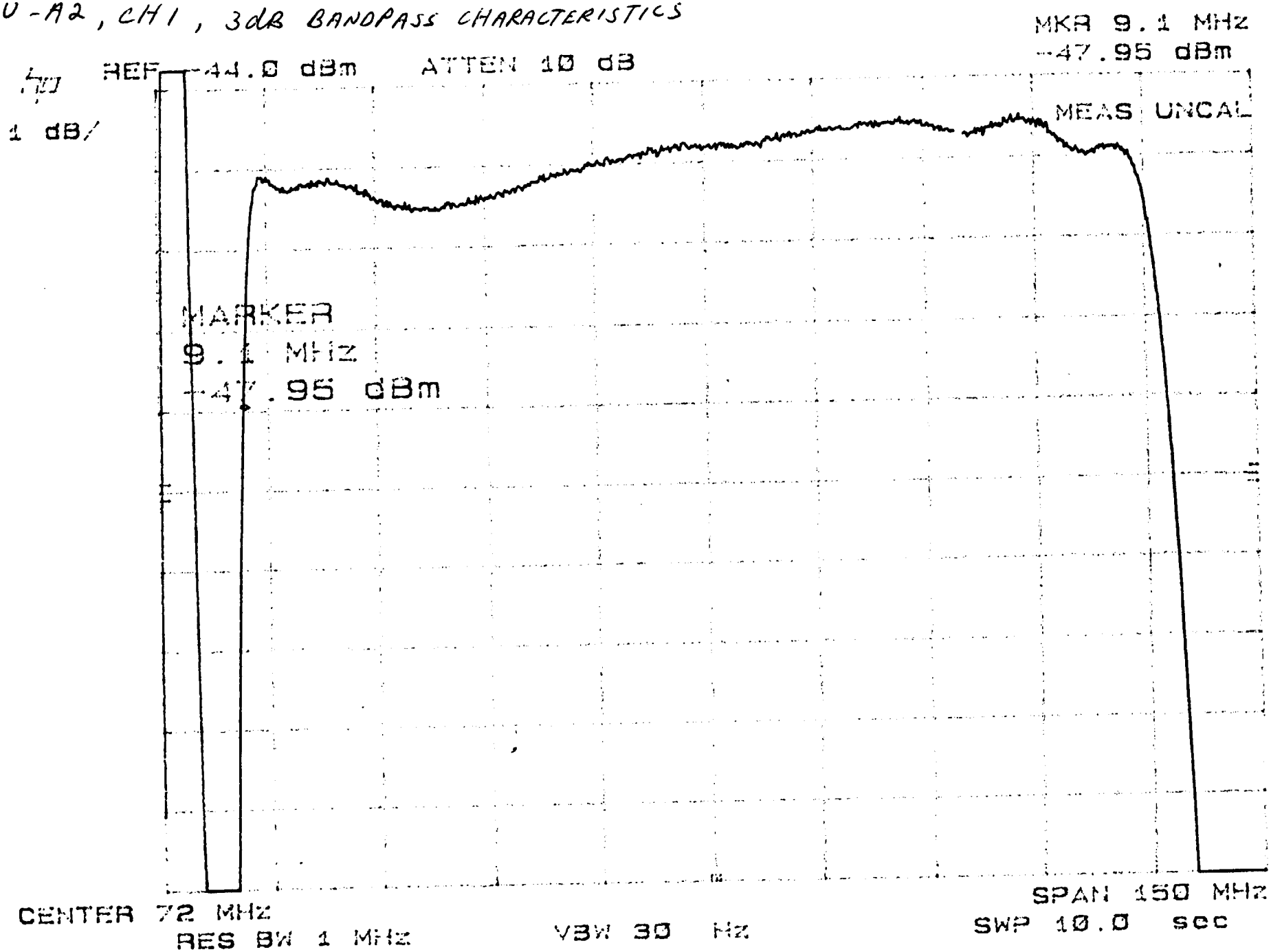
Test Engineer: _____

Quality Assurance: 7A 268 MAR 9 '98

Date: 3/6/98

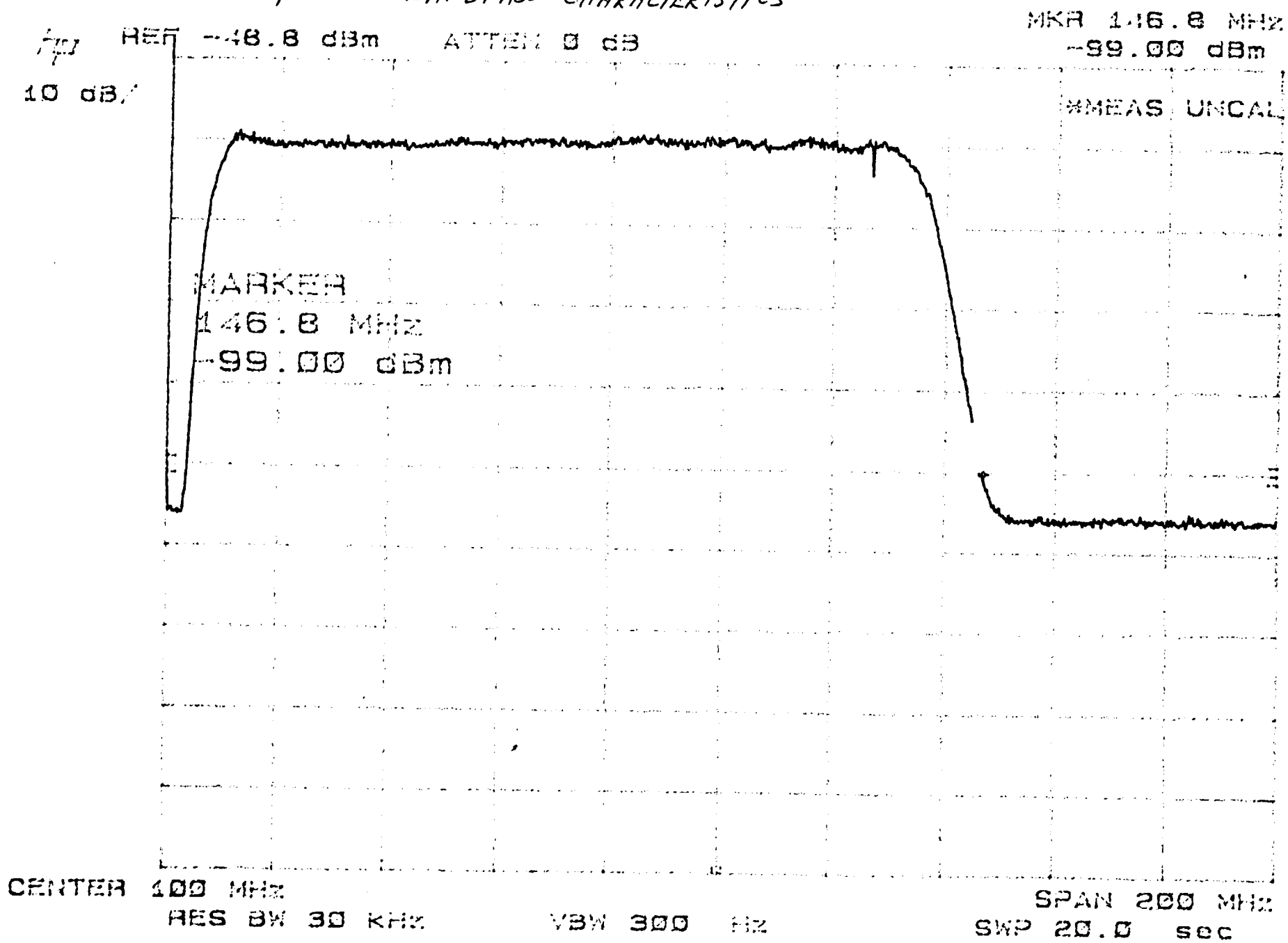
FOR REFERENCE ONLY

AMSU-A2, CH1, 3dB BANDPASS CHARACTERISTICS



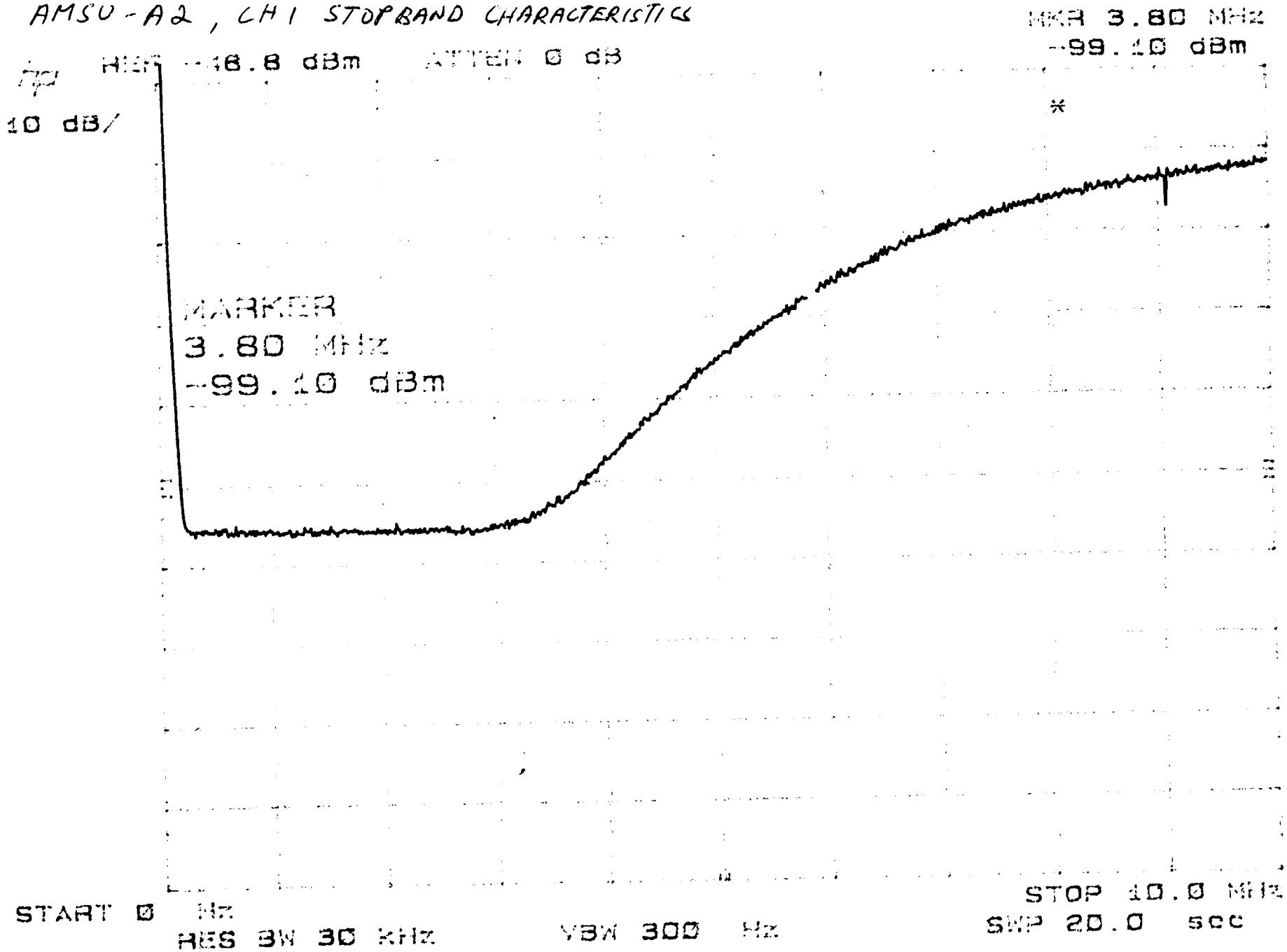
FOR REFERENCE ONLY

AMSU-A2, CH1, 40dB BANDPASS CHARACTERISTICS



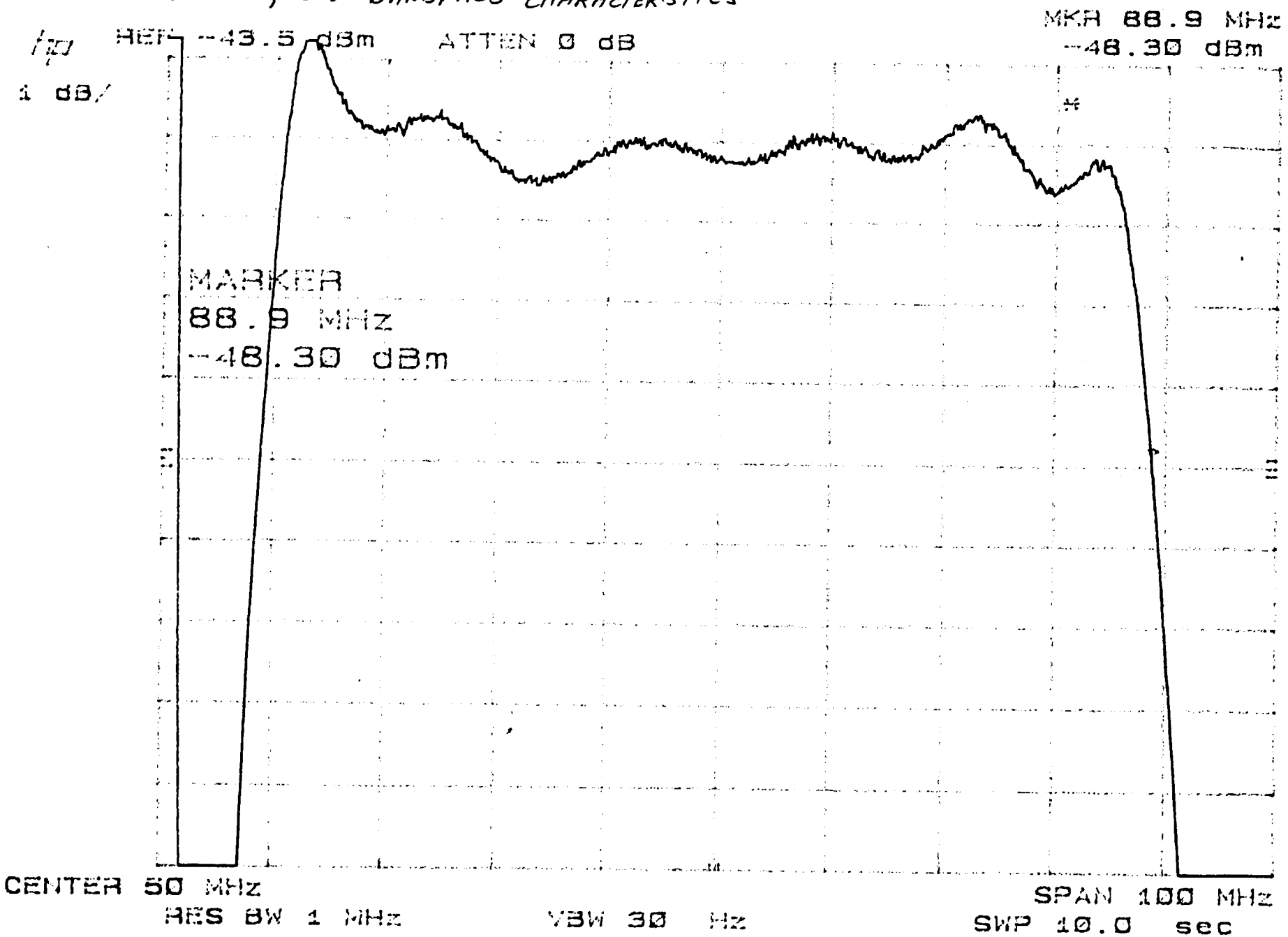
FOR REFERENCE ONLY

AMSU-A2, CH1 STOPBAND CHARACTERISTICS



FOR REFERENCE ONLY

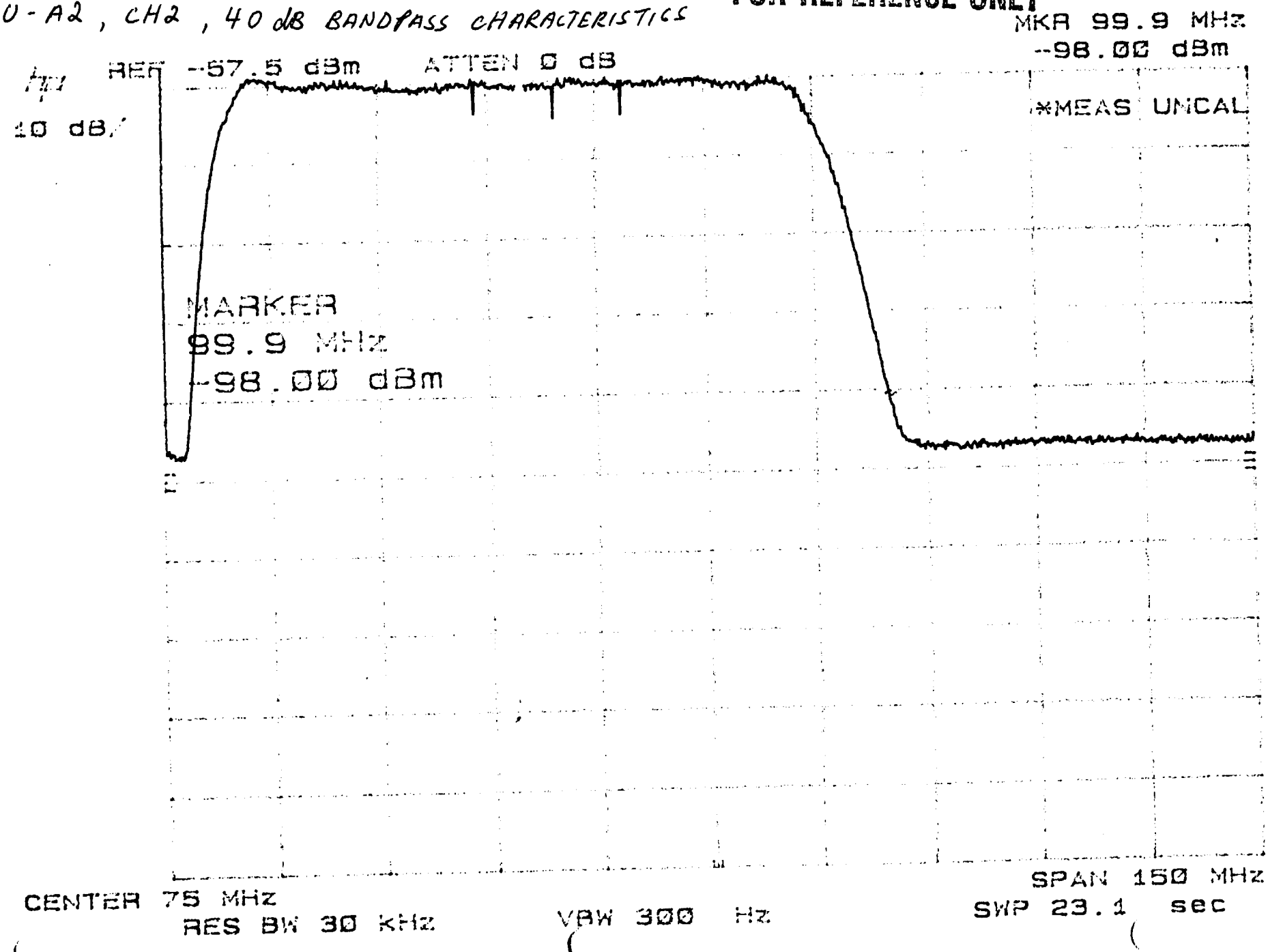
AMSU - A2 , CH2 , 3dB BANDPASS CHARACTERISTICS



3/6/98

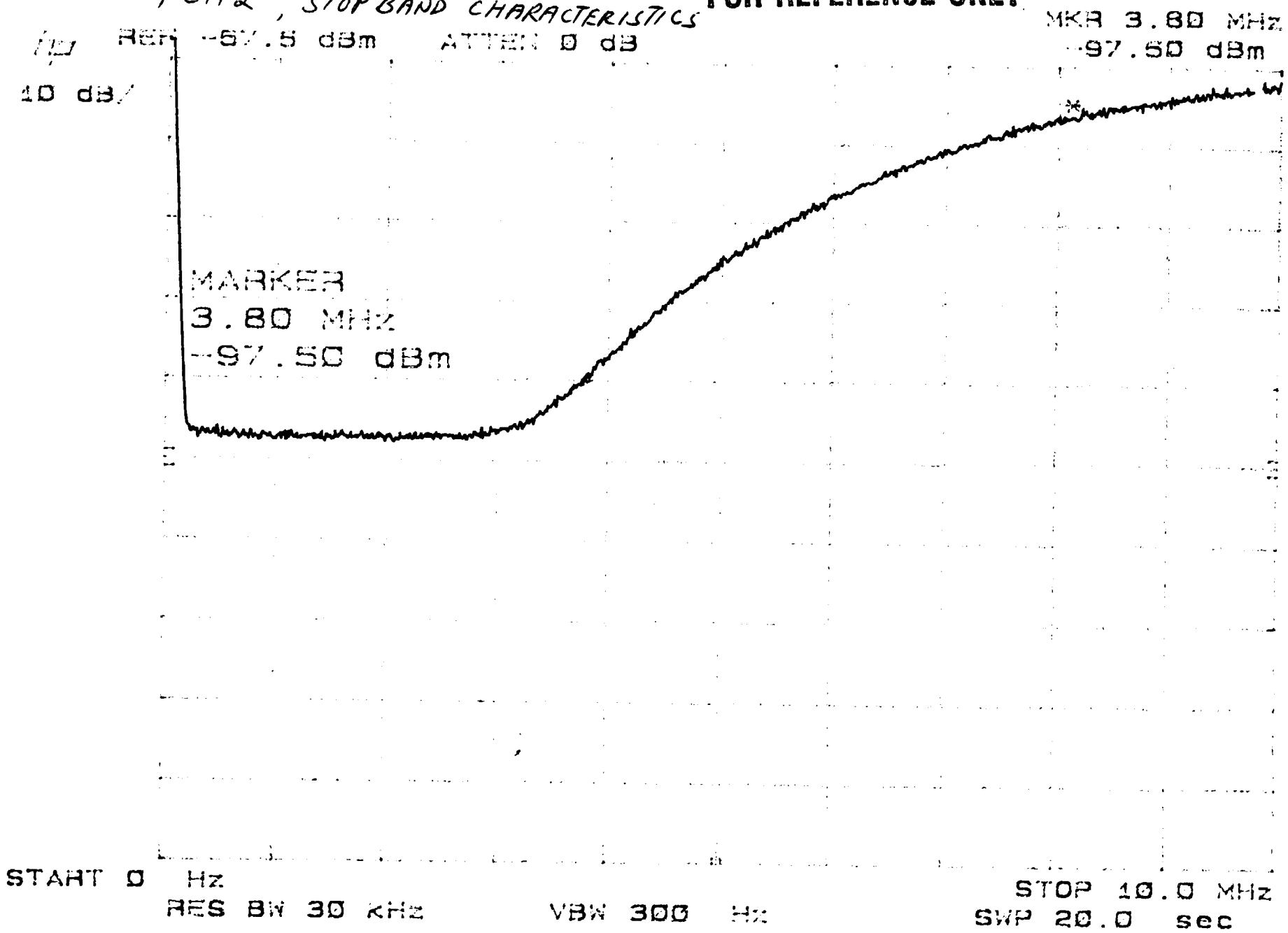
FOR REFERENCE ONLY

AMSU-A2, CH2, 40 dB BANDPASS CHARACTERISTICS



AMSU-A2, CH2, STOP BAND CHARACTERISTICS

FOR REFERENCE ONLY



TEST DATA SHEET 12 (Sheet 1 of 3)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A2)

Test Setup Verified: _____ Signature Baseplate Temperature (T_B) 25.2 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	1	10.02	73.2	24.2	-.92316	.00020	-193.9	-.63541	.00023
				24.2	-.92326	.00021	-193.9	-.63639	.00019
				24.2	-.92316	.00020	-193.9	-.63663	.00017
				24.2	-.92313	.00021	-193.9	-.63653	.00017
				24.2	-.92297	.00021	-193.9	-.63748	.00020
				24.2	-.92304	.00021	-193.9	-.63682	.00018
				24.2	-.92274	.00019	-193.9	-.63750	.00023
				24.2	-.92273	.00022	-193.9	-.63773	.00019
				24.2	-.92266	.00020	-193.9	-.63753	.00015
				24.2	-.92266	.00020	-193.9	-.63781	.00017
Mixer/ Amps	All	10.01	84.2	[redacted]					

Part No.: 1356441-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____ MAR 9 '98

Date: 3/6/98

TEST DATA SHEET 12 (Sheet ~~2~~ 3 of ~~3~~ 4)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A2)

Test Setup Verified: _____ Baseplate Temperature (T_B) 25.2°C
Signature

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
1	~~2.85~~ 4.55	3.78			0.09	0.04			
		3.79			0.09	0.00			
		3.80			0.09	0.04			
		3.80			0.09	0.00			
		3.81			0.09	0.02			
		3.80			0.09	0.04			
		3.82			0.09	0.07			
		3.82			0.09	0.05			
		3.82			0.09	0.04			
		3.82			0.09	0.04			
	4.55		3.81	P	0.09		0.04	0.07	P

Pass = P, Fail = F

Part No.: 1356441-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 3/6/98

FOR REFERENCE ONLY

AMSU-A TEST S/N F01

AMSU-A2, CH1, NOISE FIGURE AND NOISE POWER STABILITY TEST DATA 3/6/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	297.35	-.92315710	.00019991		
2	COLD TEST	79.25	-.63541378	.00022970	3.77942007	.04185551
3	WARM TEST	297.35	-.92325990	.00020744		
4	COLD TEST	79.25	-.63639213	.00019298	3.79328398	.00210158
5	WARM TEST	297.35	-.92315638	.00019899		
6	COLD TEST	79.25	-.63663971	.00017023	3.79816659	.04448093
7	WARM TEST	297.35	-.92312633	.00020738		
8	COLD TEST	79.25	-.63653154	.00017087	3.79682736	.00130553
9	WARM TEST	297.35	-.92297226	.00020545		
10	COLD TEST	79.25	-.63748460	.00019583	3.81308176	.02139291
11	WARM TEST	297.35	-.92303925	.00021444		
12	COLD TEST	79.25	-.63682991	.00017934	3.80231995	.04160816
13	WARM TEST	297.35	-.92274501	.00018722		
14	COLD TEST	79.25	-.63750398	.00022956	3.81579245	.06805419
15	WARM TEST	297.35	-.92273489	.00021665		
16	COLD TEST	79.25	-.63773451	.00018680	3.81945001	.04818275
17	WARM TEST	297.35	-.92265720	.00019917		
18	COLD TEST	79.25	-.63752721	.00014871	3.81708510	.04393011
19	WARM TEST	297.35	-.92266068	.00020129		
20	COLD TEST	79.25	-.63780795	.00017014	3.82137125	.03789137

CH. 1 ,125.4 MHz MHz

NOISE FIGURE AVERAGE (dB) = 3.80559955551

NOISE POWER STABILITY (K) = .0350806036513

NOISE POWER STABILITY DELTA (K) = .06674866662156

NPS_MAX (K) = .0680541919666 NPS_MIN (K) = .00130552575098

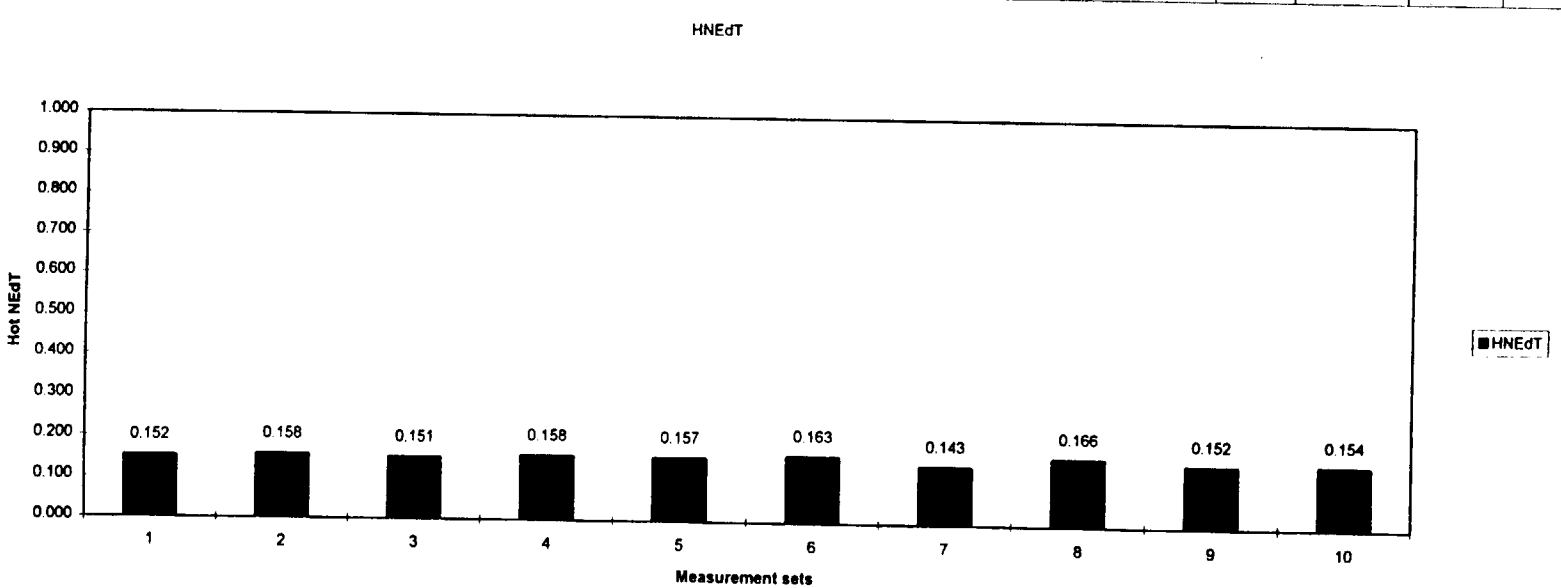
INTEGRATION TIME = .158

AMSU-A2, CH1, S/N F01, FLIGHT RECEIVER SHELF

(BPF 125.4 MHZ & LO FREQUENCY 23.7984 GHZ)

3/6/98

												To	290					
												Thot	297.35	BandW	1.25E+08			
												Tcold	79.25	IntTime	0.158	overall		
Data	Description	Number Of	V Hot	V Hot	V Cold	V Cold	Scale Fac	Hot	Cold			CHconst	6.1327E-06			expected		
		Samples	Mean	Std Dev	Mean	Std Dev	K/Volt	NEdT	NEdT	Y Fact	Log(Y)	Noise Fig	Tsys	dTrec	theory	test		
											dB	dB	(K)	(K)	dG/G	NEdT		
Data	Description	Samples	MeanVh	StdDevVh	MeanVc	StdDevVc	ScalFac	HNEdT	CNEdT	YFact	NPS	NFdB	Tsys	dTrec	theorydG/G	testNEdT	Wload	Cload
		100	-0.9231571	0.000199910	-0.63541378	0.000229700	757.9672049	0.152	0.174	1.452844003	0.042	3.779	699.7228068	0.157	0.150	0.217	297.35	79.25
		100	-0.9232599	0.000207440	-0.63639213	0.000192980	760.280599	0.158	0.147	1.450772026	0.002	3.793	701.9365898	0.158	0.151	0.218	297.35	79.25
		100	-0.9231564	0.000198990	-0.63663971	0.000170230	761.2122534	0.151	0.130	1.450045238	0.044	3.798	702.7179482	0.158	0.151	0.218	297.35	79.25
		100	-0.9231263	0.000207380	-0.63653154	0.000170870	761.0047622	0.158	0.130	1.450244445	0.001	3.797	702.5035332	0.158	0.151	0.218	297.35	79.25
		100	-0.9229723	0.000205450	-0.63748460	0.000195830	763.9559622	0.157	0.150	1.447834599	0.021	3.813	705.1101610	0.158	0.151	0.219	297.35	79.25
		100	-0.9230393	0.000214440	-0.63682991	0.000179340	762.0296389	0.163	0.137	1.449428231	0.042	3.802	703.3832663	0.158	0.151	0.219	297.35	79.25
		100	-0.9227450	0.000187220	-0.63750388	0.000229560	764.6162389	0.143	0.176	1.447434343	0.068	3.816	705.5458190	0.159	0.151	0.219	297.35	79.25
		100	-0.9227349	0.000216650	-0.63773451	0.000186800	765.2621375	0.166	0.143	1.446895025	0.048	3.819	706.1340743	0.159	0.152	0.219	297.35	79.25
		100	-0.9226572	0.000199170	-0.63752721	0.000148710	764.9142765	0.152	0.114	1.447243640	0.044	3.817	705.7536646	0.159	0.151	0.219	297.35	79.25
		100	-0.9226607	0.000201290	-0.63780795	0.000170140	765.658802	0.154	0.130	1.446612072	0.038	3.821	706.4432709	0.159	0.152	0.220	297.35	79.25
	AVERAGE		-0.9229509	0.000203794	-0.63698652	0.000187416	762.6901875	**0.155**	0.143	1.448935362	**0.035**	**3.806**	703.9251134	0.158	0.151	0.219	297.35	79.25



TEST DATA SHEET 12 (Sheet 1 of 3)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A2)

Test Setup Verified: _____ Signature Baseplate Temperature (T_B) 25.6 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	2	10.02	116.6	23.8	-1.029	0.00027	-193.9	-0.710	0.00021
				23.8	-1.029	0.00031	-193.9	-0.710	0.00024
				23.8	-1.029	0.00030	-193.9	-0.711	0.00026
				23.8	-1.029	0.00032	-193.9	-0.712	0.00019
				23.8	-1.029	0.00031	-193.9	-0.713	0.00021
				23.8	-1.029	0.00029	-193.9	-0.713	0.00020
				23.8	-1.029	0.00028	-193.9	-0.713	0.00022
				23.8	-1.029	0.00030	-193.9	-0.714	0.00020
				23.8	-1.029	0.00030	-193.9	-0.714	0.00021
				23.8	-1.029	0.00027	-193.9	-0.714	0.00023
Mixer/ Amps	All	10.01	84.2	[redacted]					

Part No.: 1356441-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____ 892 XL MAR 9 '98

Date: 3/7/98

TEST DATA SHEET 12 (Sheet 4 of 4)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A2)

Test Setup Verified: _____ Signature Baseplate Temperature (T_B) 25.5 °C

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
2	~~3.56~~ 4.20	3.80			0.09	0.08			
		3.80			0.09	0.08			
		3.81			0.09	0.04			
		3.82			0.09	0.09			
		3.84			0.09	0.07			
		3.84			0.09	0.03			
		3.85			0.09	0.04			
		3.85			0.09	0.05			
		3.85			0.09	0.05			
		3.86			0.09	0.08			
	4.20		3.83	P	0.09		0.06	0.06	P

Pass = P, Fail = F

Part No.: 1351441-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 2/07/98

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A2, CH2, S/N F01, NF & NPS TEST DATA 3/7/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.95	-1.02885625	.00026798		
2	COLD TEST	79.25	-.71010071	.00020873	3.80040508	.07623913
3	WARM TEST	296.95	-1.02897869	.00031355		
4	COLD TEST	79.25	-.71023358	.00023520	3.80107055	.08086814
5	WARM TEST	296.95	-1.02921730	.00028553		
6	COLD TEST	79.25	-.71135092	.00025834	3.81419655	.03628374
7	WARM TEST	296.95	-1.02904896	.00031965		
8	COLD TEST	79.25	-.71191248	.00018692	3.82356223	.09177226
9	WARM TEST	296.95	-1.02899225	.00030599		
10	COLD TEST	79.25	-.71299467	.00021361	3.83909995	.05656784
11	WARM TEST	296.95	-1.02917542	.00028773		
12	COLD TEST	79.25	-.71290952	.00019845	3.83615801	.02700339
13	WARM TEST	296.95	-1.02893985	.00028471		
14	COLD TEST	79.25	-.71346541	.00022013	3.84614360	.03920712
15	WARM TEST	296.95	-1.02900078	.00029763		
16	COLD TEST	79.25	-.71377054	.00019921	3.84979963	.04521704
17	WARM TEST	296.95	-1.02887872	.00030019		
18	COLD TEST	79.25	-.71377848	.00020827	3.85108843	.05279764
19	WARM TEST	296.95	-1.02876199	.00026691		
20	COLD TEST	79.25	-.71431203	.00023461	3.85965115	.07897914

CH. 2 ,79.5 MHz MHz

NOISE FIGURE AVERAGE (dB) = 3.83216419373

NOISE POWER STABILITY (K) = .0594934523171

NOISE POWER STABILITY DELTA (K) = .0647688752379

NPS_MAX (K) = .0917722641514 NPS_MIN (K) = .0270033889135

INTEGRATION TIME = .158

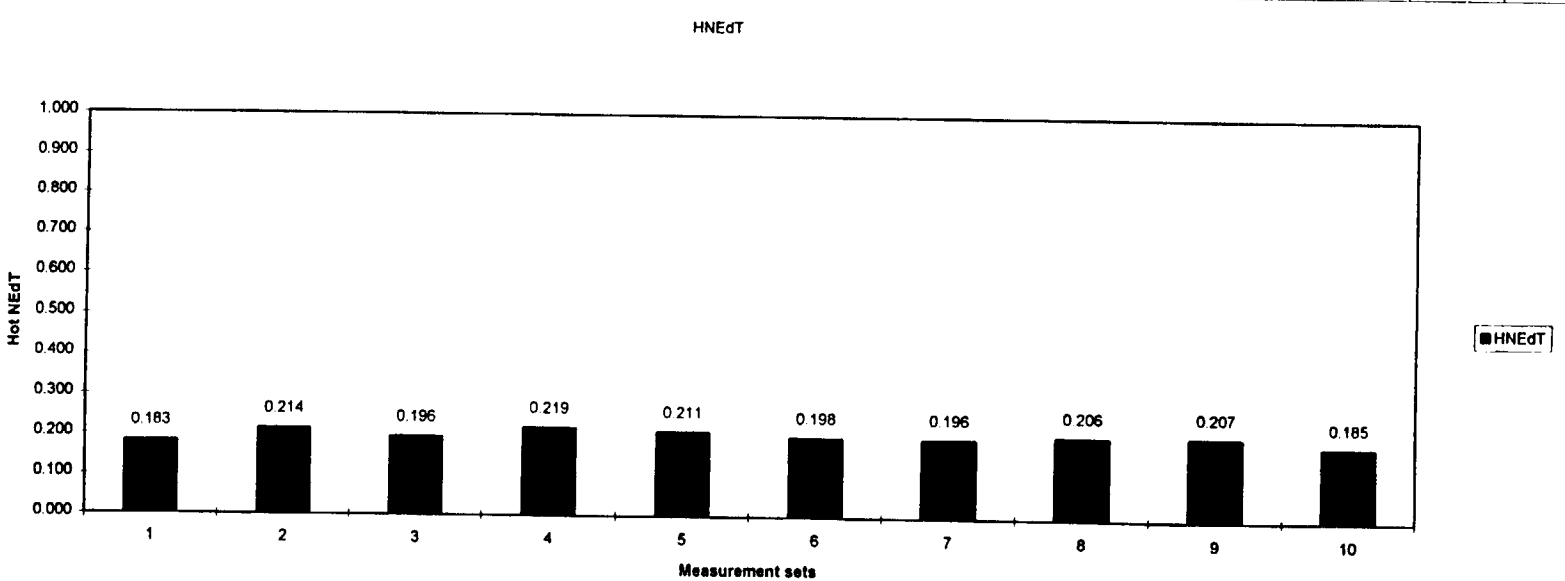
AMSU-A2, CH2, S/N F01, FLIGHT RECEIVER SHELF

(BPF 79.5 MHZ & LO FREQUENCY 31.3996 GHZ)

3/7/98

Data	Description	Number Of Samples	V Hot Mean	V Hot Std Dev	V Cold Mean	V Cold Std Dev	Scale Fac K/Volt	Hot NEdT	Cold NEdT	Y Fact	Log(Y) dB	CHconst Noise Fig dB	Tsys (K)	dTrec (K)	theory dG/G	overall expected test NEdT		
Data	Description	Samples	MeanVh	StdDevVh	MeanVc	StdDevVc	ScalFac	HNEdT	CNEdT	YFact	NPS	NFdB	Tsys	dTrec	theorydG/G	testNEdT	Wload	Cload
		100	-1.0288563	0.000267980	-0.71010071	0.000208730	682.9685219	0.183	0.143	1.448887792	0.076	3.800	702.6764323	0.198	0.151	0.249	296.95	79.25
		100	-1.0289787	0.000313550	-0.71023358	0.000235200	682.99087	0.214	0.161	1.448789129	0.081	3.801	702.7830507	0.198	0.151	0.249	296.95	79.25
		100	-1.0292173	0.000285530	-0.71135092	0.000258340	684.8789734	0.196	0.177	1.446848905	0.036	3.814	704.8892878	0.199	0.151	0.250	296.95	79.25
		100	-1.0290490	0.000319650	-0.71191248	0.000186920	686.4552448	0.219	0.128	1.445471162	0.092	3.824	706.3960557	0.199	0.152	0.250	296.95	79.25
		100	-1.0289923	0.000305990	-0.71299467	0.000213610	688.9293266	0.211	0.147	1.443197675	0.067	3.839	708.9029379	0.200	0.152	0.251	296.95	79.25
		100	-1.0291754	0.000287730	-0.71290952	0.000198450	688.3448389	0.198	0.137	1.443626984	0.027	3.836	708.4275887	0.200	0.152	0.251	296.95	79.25
		100	-1.0289399	0.000284710	-0.71346541	0.000220130	690.0717535	0.196	0.152	1.442172018	0.039	3.846	710.0423266	0.200	0.152	0.252	296.95	79.25
		100	-1.0290078	0.000297630	-0.71377054	0.000199210	690.5909536	0.206	0.138	1.441650702	0.045	3.850	710.6234779	0.201	0.153	0.252	296.95	79.25
		100	-1.0288787	0.000300190	-0.71377848	0.000208270	690.8912542	0.207	0.144	1.441453825	0.053	3.851	710.8433092	0.201	0.153	0.252	296.95	79.25
		100	-1.0287620	0.000266910	-0.71431203	0.000234610	692.3200117	0.185	0.162	1.440213726	0.079	3.860	712.2325130	0.201	0.153	0.252	296.95	79.25
	AVERAGE		-1.0289857	0.000292987	-0.71248283	0.000216347	687.8441749	**0.202**	0.149	1.444231192	**0.059**	**3.832**	707.7816980	0.200	0.152	0.251	296.95	79.25

To	290		
Thot	296.95	BandW	7.95E+07
Tcold	79.25	IntTime	0.158
CHconst	6.1327E-06		



AE-26002/6A
15 Sep 97

TPR 006245 Op.30

TEST DATA SHEET 15

Tunable Short Test Data (Paragraph 3.5.5) (A2)

Test Setup Verified: T Luna (Signature) Baseplate Temperature (T_B) 25.4 °C

Channel No.	Measured Value
1	T_H 24.2 °C V_H -923.1 mV T_C -193.9 °C V_C -635.4 mV
Voltage (mV)	921.9 921.5 921.4 921.2 921.4 929.3 929.4 929.4 929.2 929.2
Position (mil)	80 85 90 95 100 205 210 215 220 225
ΔT	6.38622 K RDK 6/16/98 QC 229 Required Value* 36.8 K max Pass/Fail P
2	T_H 23.8 °C V_H -1028.8 mV T_C -193.9 °C V_C -710.1 mV
Voltage (mV)	1024.3 1024.2 1023.5 1023.2 1023.6 1038.4 1039.2 1038.3 1038.3 1037.7
Position (mil)	10 15 20 25 30 140 145 150 155 160
ΔT	10.93 10.4 K RDK 6/16/98 QC 229 Required Value* 35.6 K max Pass/Fail P

* The required value will be calculated for each channel based on the measured return loss of the antenna. Use the following two equations to calculate the maximum required value:

Pass = P, Fail = F

Given $\overline{a_i}$ and $\overline{a_j}$ as antenna return loss measurements (from polar diagram)

and θ being the phase difference between $\overline{a_i}$ and $\overline{a_j}$, calculate return loss as:

$$b = \left(a_i^2 + a_j^2 - 2a_i a_j \cos\theta\right)^{1/2}$$

The maximum required value is equal to 1.2/b.

Part No.: 1356441-1

Serial No.: F01

Test Engineer: Tony Luna

Quality Assurance:

Date: 3/7/98

TEST DATA SHEET 18

Temperature Sensor and Thermistor Test Data (Paragraph 3.6.1) (A2)

Test Setup Verified: Tony Luna
Signature

Baseplate Temperature (T_B) 23.6 °C

Reference Designation	Specification	Measured Value		Pass/Fail
RT 12	2200 ± 100 Ω	2178	Ω	P
RT 19	2200 ± 100 Ω	2177	Ω	P
RT 20	2200 ± 100 Ω	2176	Ω	P
RT 13	2200 ± 100 Ω	2177	Ω	P
RT 14	2200 ± 100 Ω	2181	Ω	P
RT 17	2200 ± 100 Ω	2183	Ω	P
TB 58	3000 ± 100 Ω	2990	Ω	P
TB 59	3000 ± 100 Ω	2987	Ω	P
TB 53	4.1 – 4.6 V	4.36	V	P

Pass = P, Fail = F

Part No.: 1356441-1

Serial No.: F01

Test Engineer: Tony Luna

Quality Assurance: IA 268 MAR 9 '98

Date: 3/5/98

TEST DATA SHEET 22

Survival Heater and Thermal Switch Test Data (Paragraph 3.6.3) (A2)

Test Setup Verified: _____ Signature Baseplate Temperature (T_B) 23.7 °C

Reference Designation	Open Switch		Closed Switch		
	>10 MΩ	Pass/Fail	Specification	Measured Value	Pass/Fail
HR1/TS1	>100M	P	50 - 65 Ω	57.1	P
	>100M	P		57.0	P
HR2/TS2	>100M	P		57.7	P
	>100M	P		58.5	P

Pass = P, Fail = F

Part No.: 1356441-1

Serial No.: F01

Test Engineer: Tony Luna

Quality Assurance: 7A 268 MAR 9 '98

Date: 3/5/98

TEST DATA SHEET 23 (Sheet 3 of 3)
Bias Voltage Verification Test Data (Paragraph 3.6.4) (A2)

Test Setup Verified: A Luna
Signature

Baseplate Temperature (T_B) 23.7 °C

Reference Designation	Specification	Measured Value (V)	Pass/Fail
Mixer/IF AMP Ch 1, 2	+10 ±0.1	10.00	P
DRO Ch 1	+10 ±0.1	10.01	P
DRO Ch 2	+10 ±0.1	10.01	P

Part No.: 1356441-1

Serial No.: F01

Test Engineer: Tony Luna

Quality Assurance: 7A 268 MAR 9 '98

Date: 3/5/98

TEST DATA

FOR

AMSU-A1-2 (P/N: 1356409-1, S/N: F01)

TEST DATA SHEET 2

LO Frequency Test Data (Paragraph 3.5.1) (A1-2)

Test Setup Verified: _____ Signature Baseplate Temperature (T_B) 27.9 °C

Component	Channel No.	V_b(V)	I_b(mA)	P_{dc}(mW)			f_o(GHz)		
				Required (Max)	Measured	Pass/ Fail	Required	Measured	Pass/ Fail
LO	3	9.99	192.4	2,700	1,922.1	P	50.300 ± 0.008	50.301	P
	4	10.02	198.5	2,700	1,988.9	P	52.800 ± 0.003	52.799	P
	5	9.98	185.4	2,700	1,850.3	P	53.596 ± 0.003	53.597	P
	8	9.98	195.5	2,700	1,951.1	P	55.500 ± 0.008	55.501	P
Mixer/ Amps	All	9.98	175.4	1,800	1,750.5				
TOTAL				12,600	9,462.9				

Pass = P, Fail = F

Part No.: 1356409-1

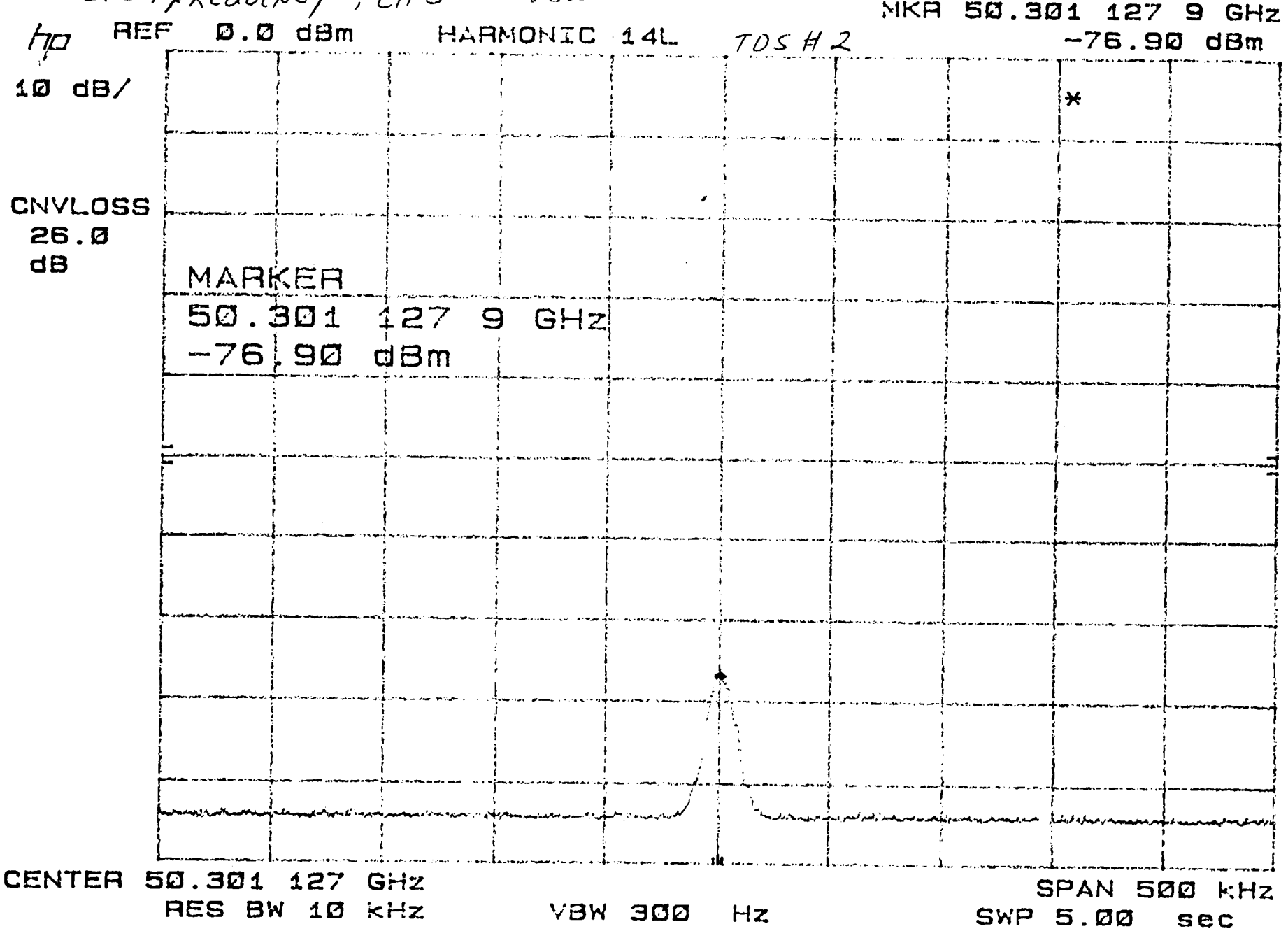
Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 4/7/98

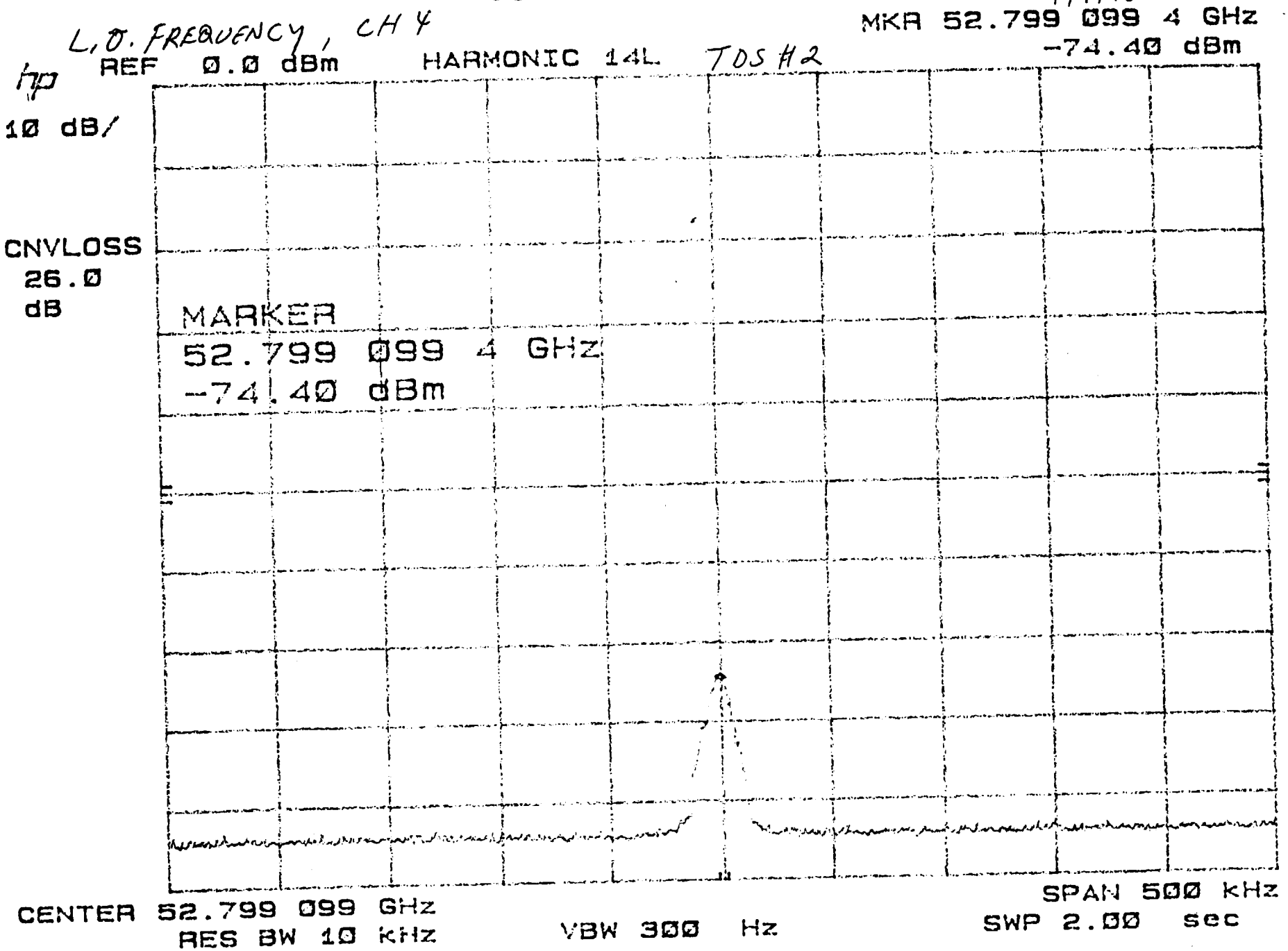
L.O. FREQUENCY, CH 3 FOR REFERENCE ONLY 4/7/90



FOR REFERENCE ONLY

4/7/98

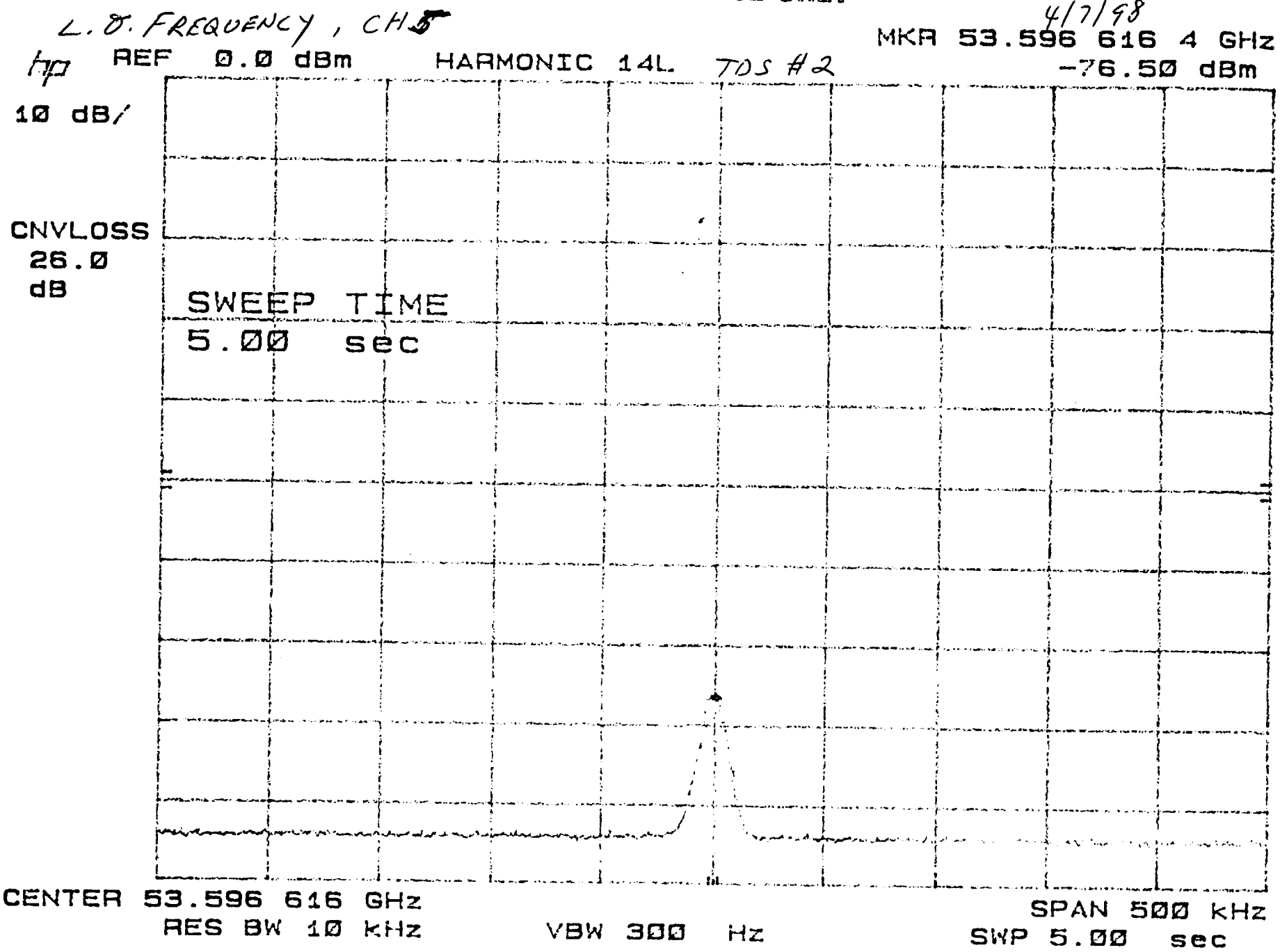
L.O. FREQUENCY, CH 4



FOR REFERENCE ONLY

L.O. FREQUENCY, CH 5

4/7/98



FOR REFERENCE ONLY

4/7/78

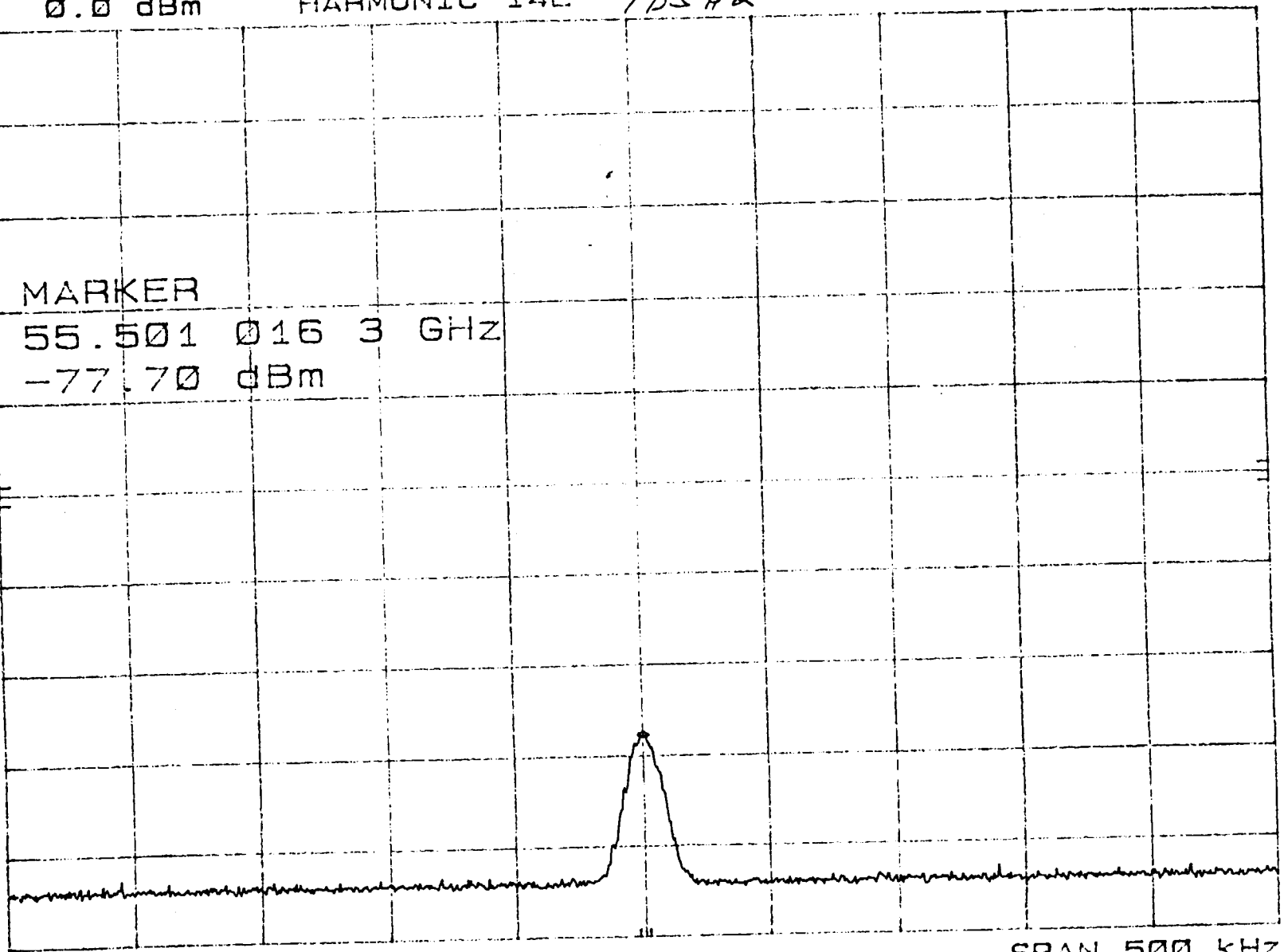
L.O. FREQUENCY, CH 8

MKR 55.501 016 3 GHz
-77.70 dBm

hp REF 0.0 dBm HARMONIC 14L TDS #2

10 dB/

CNVLOSS
26.0
dB



CENTER 55.501 016 GHz
RES BW 10 kHz

VBW 300 Hz

SPAN 500 kHz
SWP 5.00 sec

TEST DATA SHEET 5

IF Output Test Data (Paragraph 3.5.2) (A1-2)

Test Setup Verified: J. Tung (Signature) Baseplate Temperature (T_B) 28.2 °C

Component	Channel No.	V_b(V)	I_b(mA)	P_o(dBm)	Atten (dB)	P_o(dBm) Required	P_o(dBm) Measured	Pass/ Fail
LO	3	9.99	192.4	-22.84	4.07	-27.0 ± 1.0	-26.91	P
	4	10.02	198.5	-19.23	7.11	-27.0 ± 1.0	-26.34	P
	5	9.98	185.4	-19.16	7.12	-27.0 ± 1.0	-26.28	P
	8	9.98	195.5	-19.97	7.08	-27.0 ± 1.0	-27.05	P
Mixer/ Amps	All	9.98	175.4	[redacted]				

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: _____

Date: 4/7/98

TEST DATA SHEET 8 (Sheet 1 of 2)

Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-2)

Test Setup Verified: _____ Baseplate Temperature (T_B) 28.2 °C
Signature

Component	Channel No.	V_b(V)	I_b(mA)	3 dB BW Frequency (MHz)		3 dB BW Frequency (MHz)		Pass/ Fail
				Lower	Higher	Required Max.	Measured	
LO	3	9.99	192.4	9.0	89.6	~~180~~ 90	80.6	P
	4	10.02	198.5	7.8	199.2	~~180~~ 200	191.4	P
	5	9.98	185.4	31.6	201.2	170	169.6	P
	8	9.98	195.5	7.6	164.8	~~330~~ 165	157.2	P
Mixer/ Amps	All							

Part No.: 1356409-1
Serial No.: F01

Test Engineer: _____
Quality Assurance: _____
Date: 04/7/98

TEST DATA SHEET 8 (Sheet 2 of 2)
Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-2)

Test Setup Verified: 7.7 GHz Signature Baseplate Temperature (T_B) 28.3 °C QC 226 3/30/98 R. Kapoor

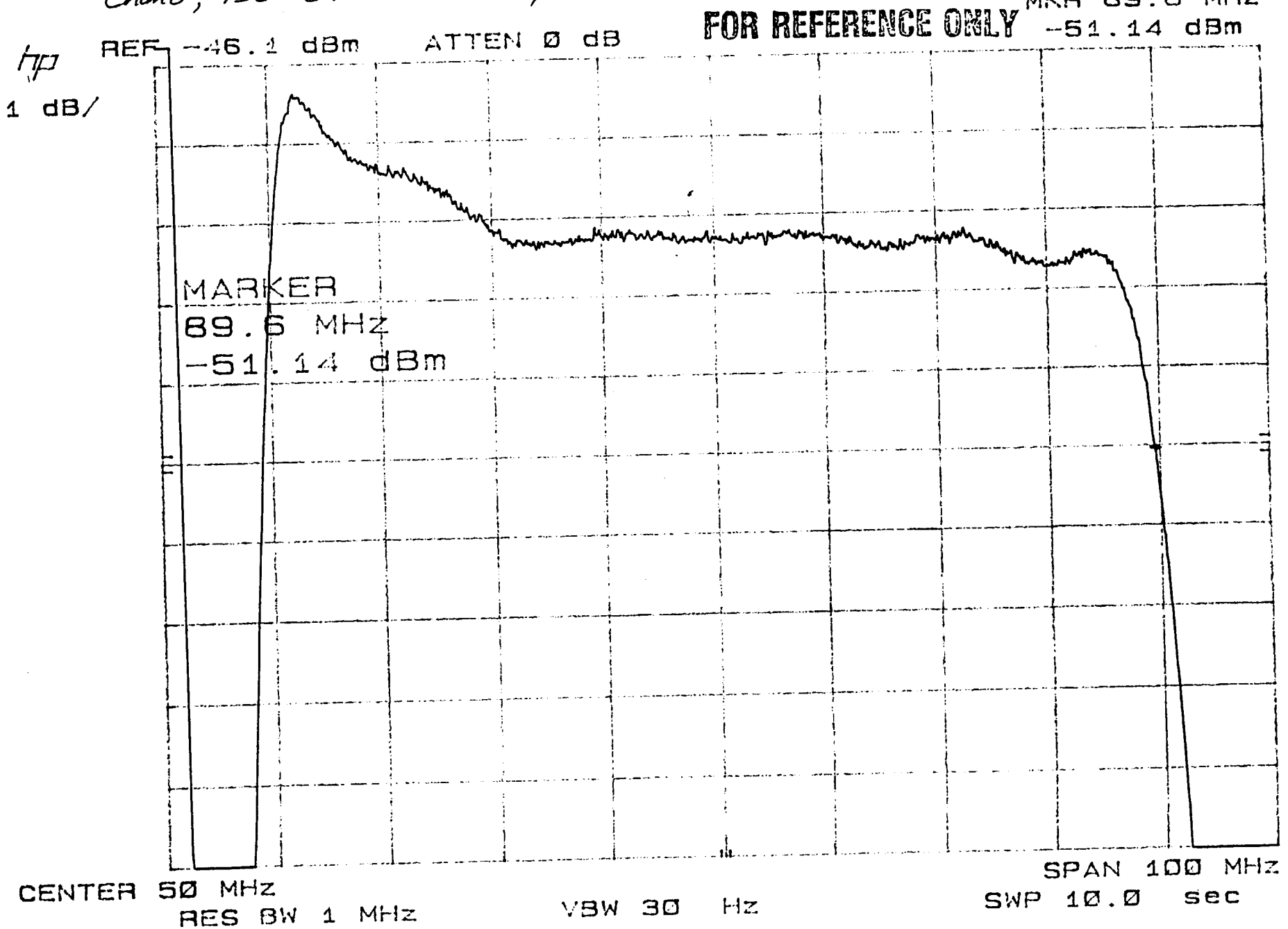
Component	Channel No.	V_b(V)	I_b(mA)	40 dB BW Frequency (MHz) Lower	40 dB BW Frequency (MHz) Higher	40 dB BW Frequency (MHz) (REF. ONLY) Required Max.	40 dB BW Frequency (MHz) (REF. ONLY) Measured	Pass/ Fail
LO	3	9.99	192.4	3.8 ~~2.4~~ *7.7 GHz	100.2 ~~222.3~~ 7.7 GHz	For Reference only ~~234~~	96.4 ~~219.8~~ 7.7 GHz	P ~~P~~
	4	10.02 ~~9.98~~ 7.7 GHz	198.5	2.5	222.3	~~234~~	219.8	P
	5	9.98	185.4	19.3	217.3	~~221~~	198.0	P
	8	9.98	195.5	2.4	181.0	~~429~~	178.6	P
Mixer/ Amps	All	9.98	175.4					

Part No.: 1356407-1
Serial No.: F01

Test Engineer:
Quality Assurance:
Date: 4/7/98

Chan 3, TDS #8. 3-dB Bandpass Measurement

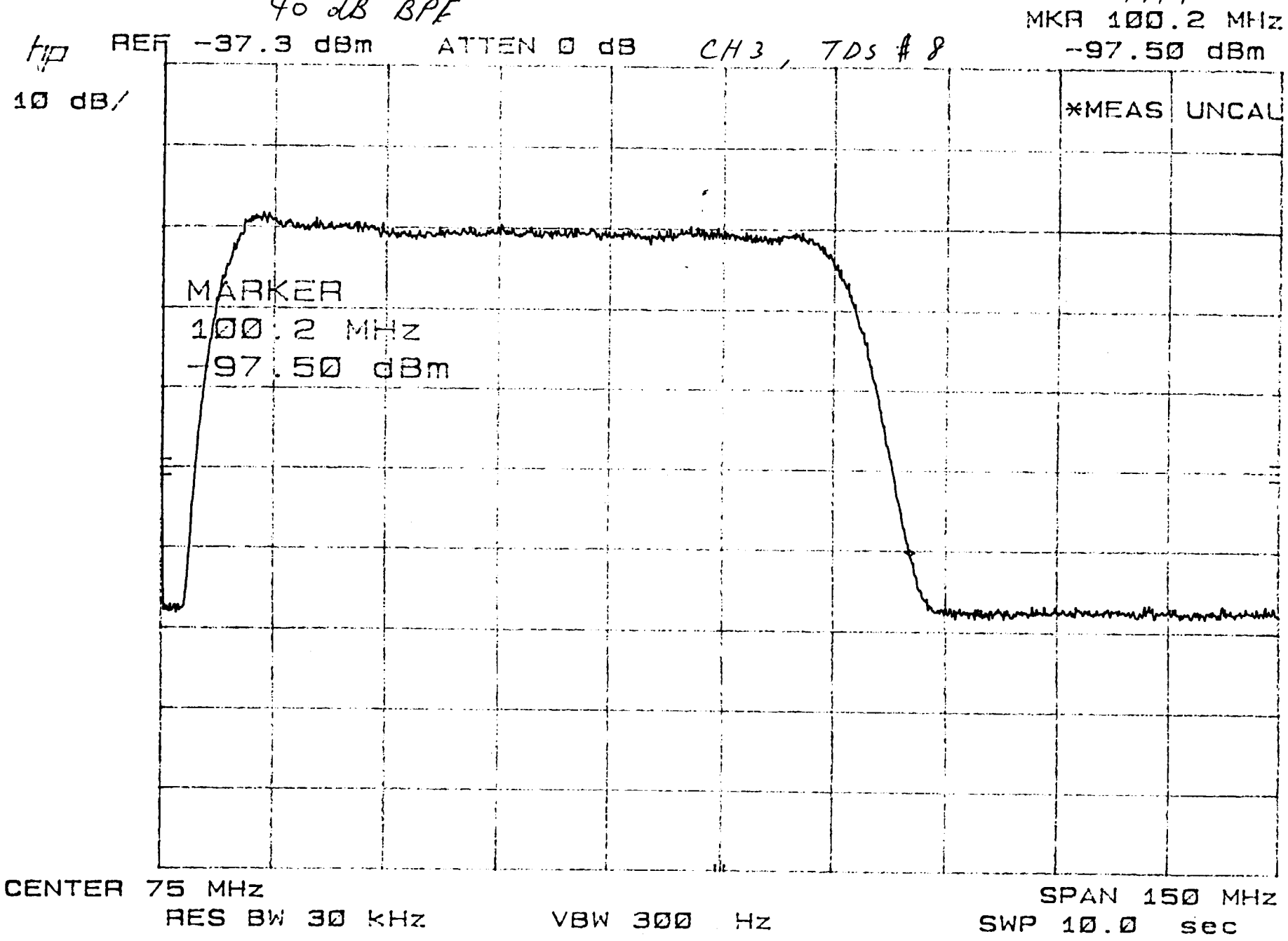
4/7/78



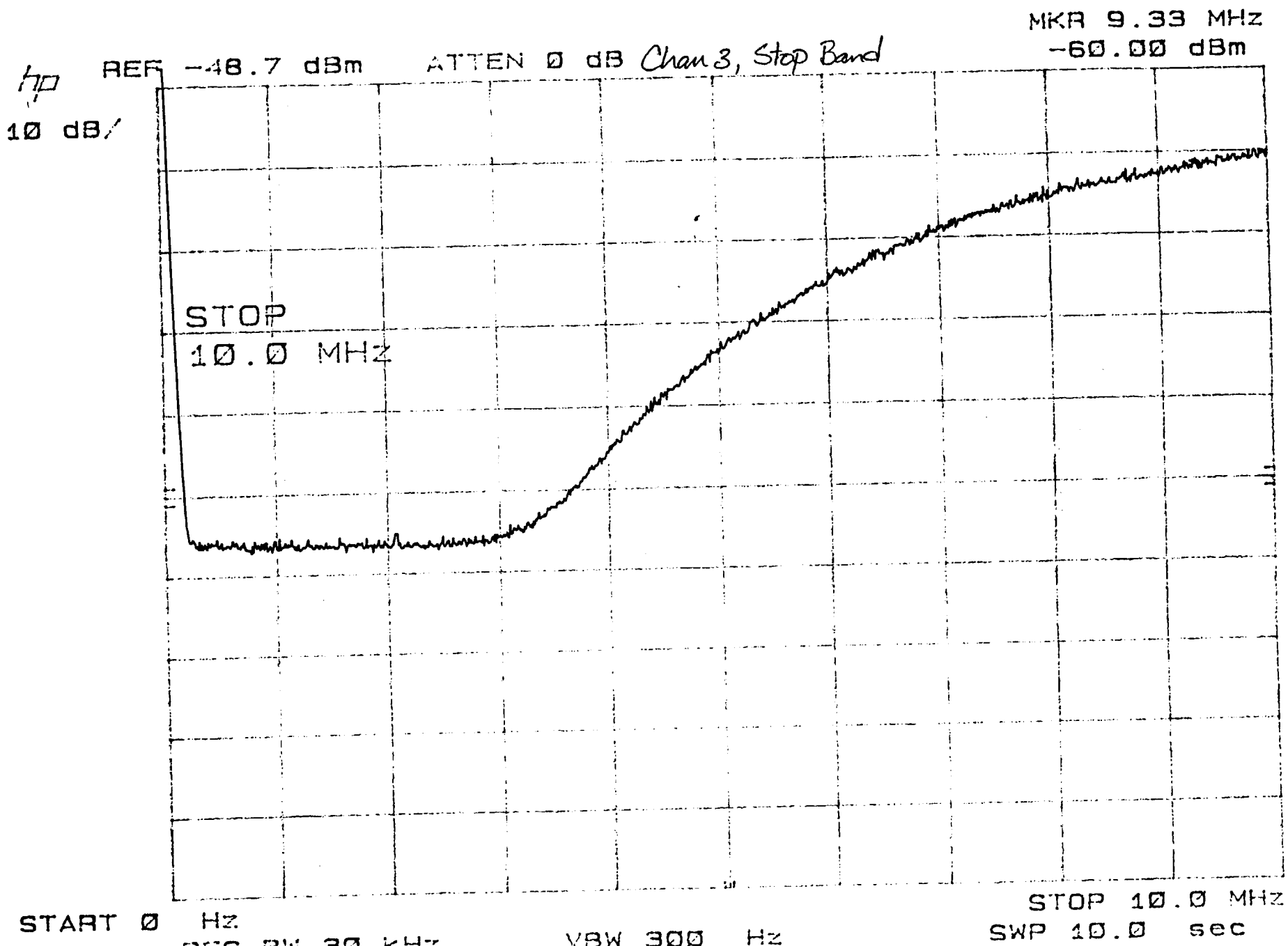
FOR REFERENCE ONLY

4/7/98

40 dB BPF



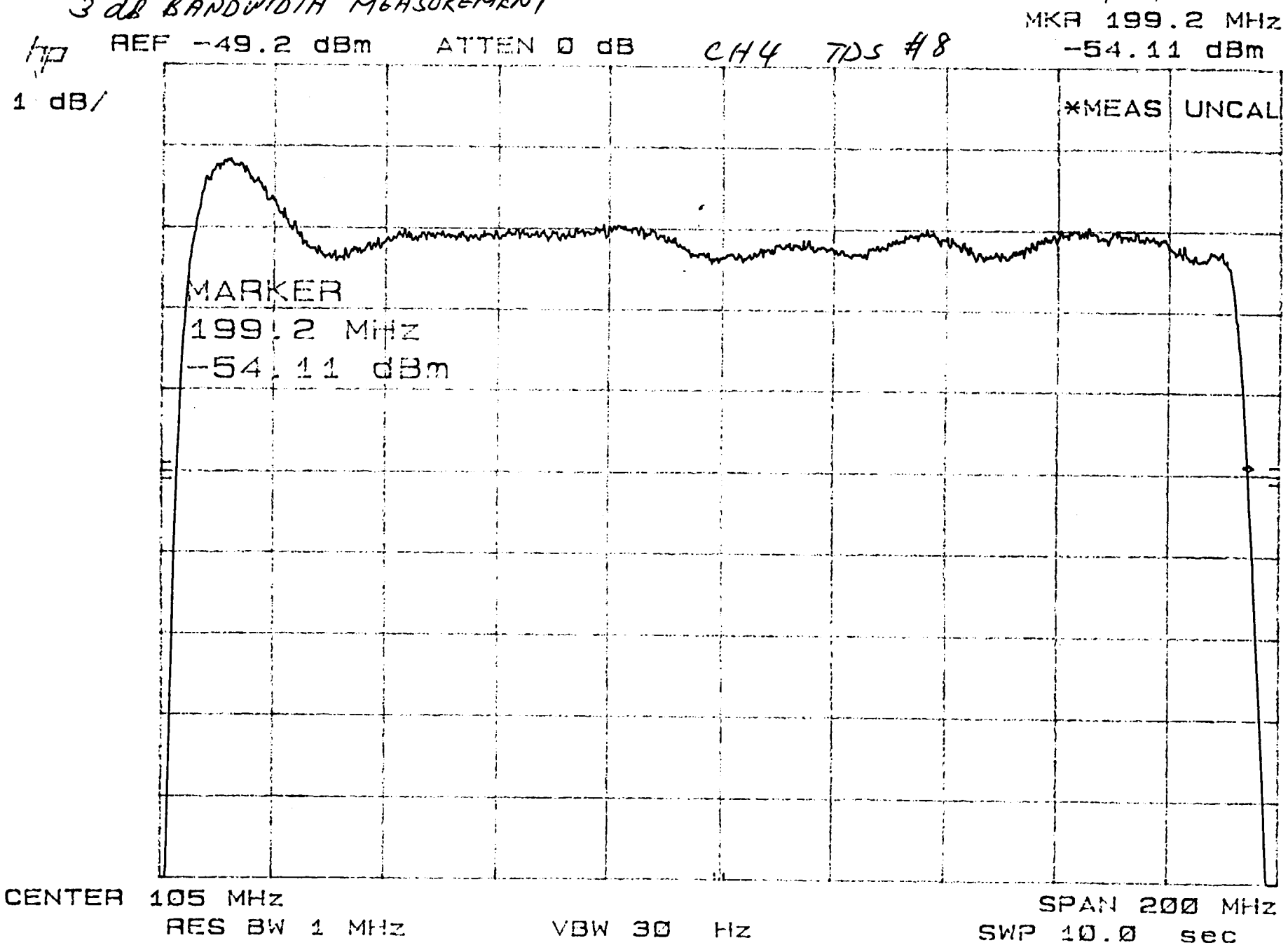
FOR REFERENCE ONLY 4/ 98



FOR REFERENCE ONLY

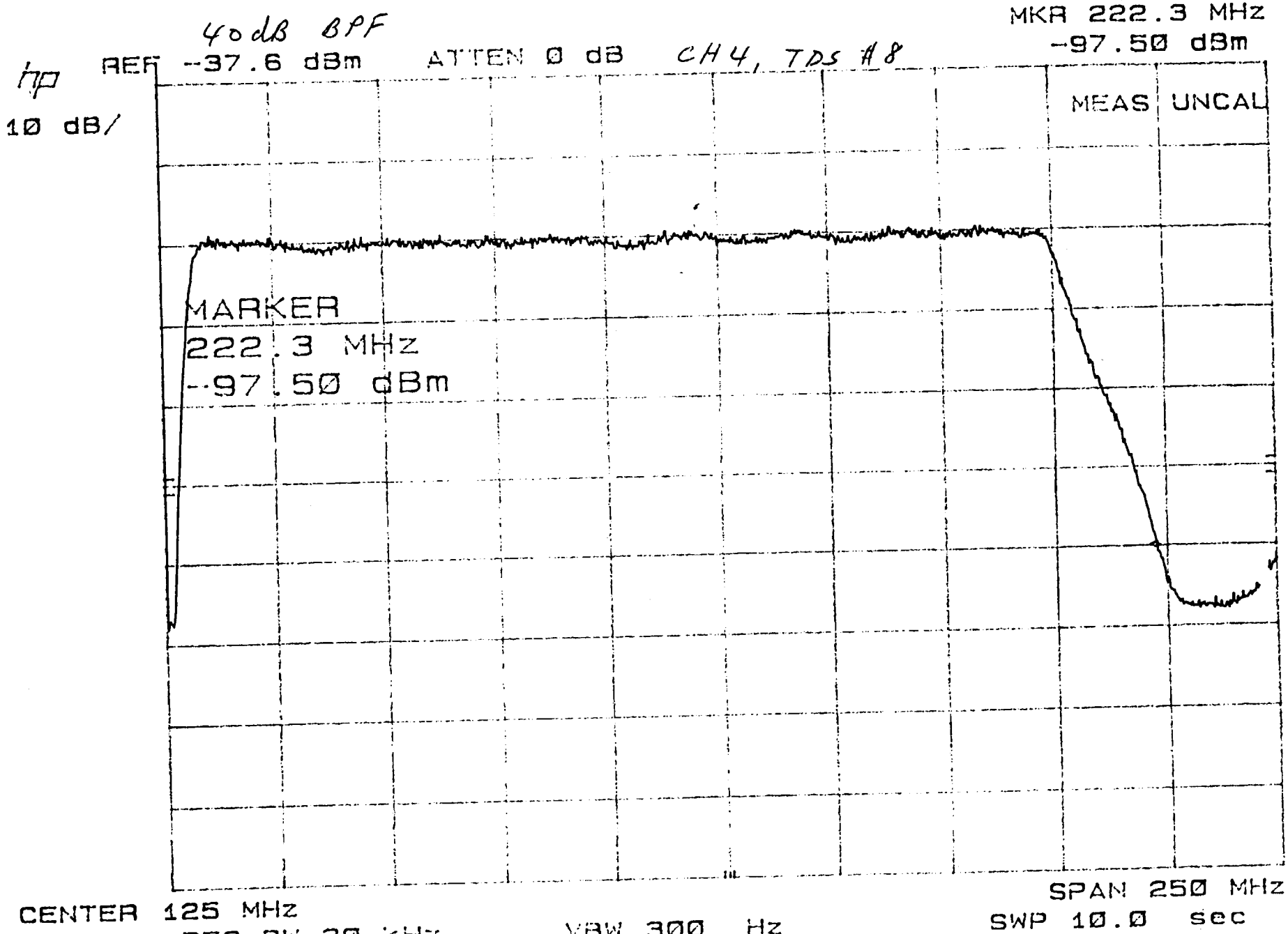
4/71.8

3 dB BANDWIDTH MEASUREMENT

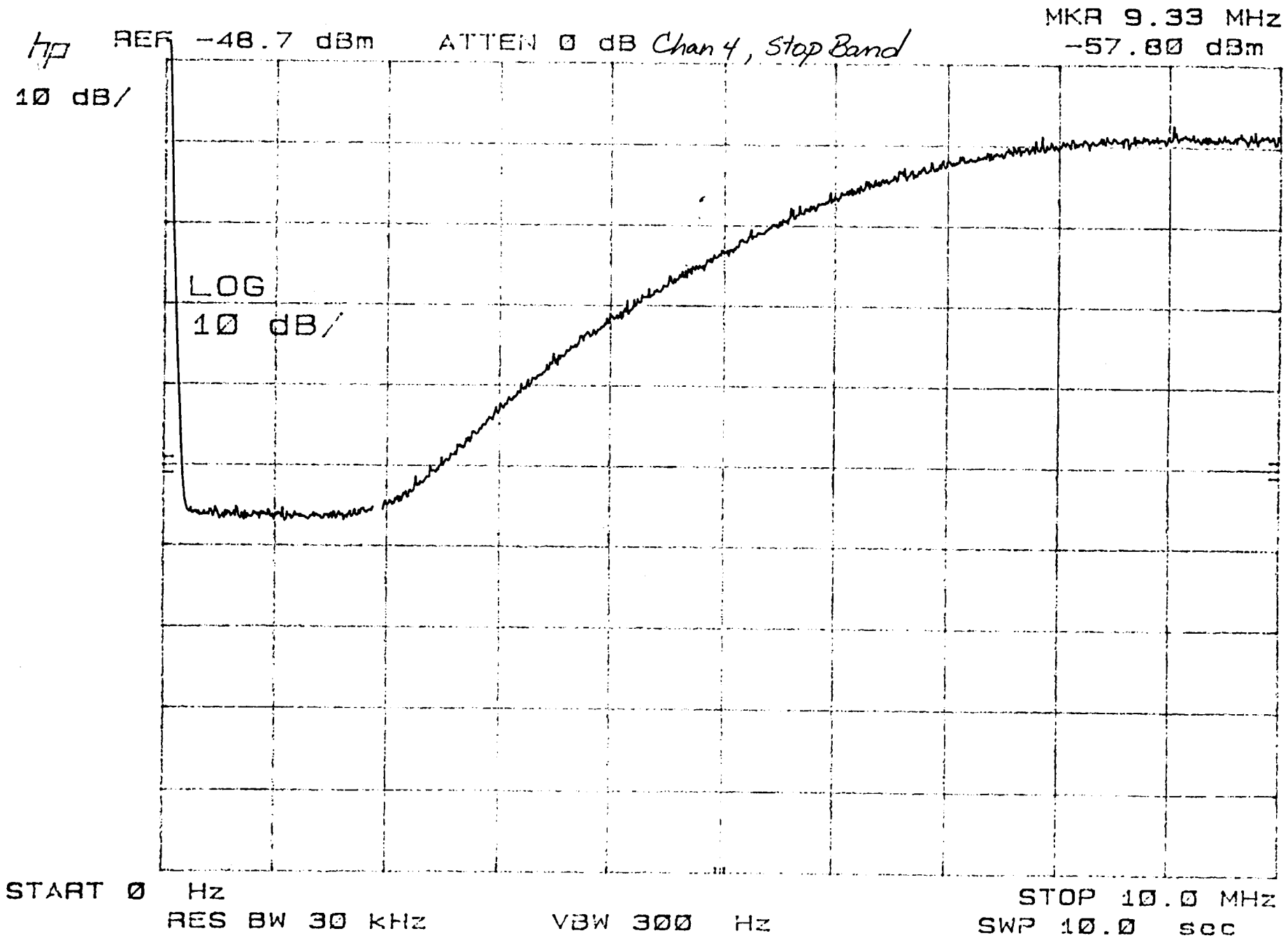


FOR REFERENCE ONLY

4/7/96



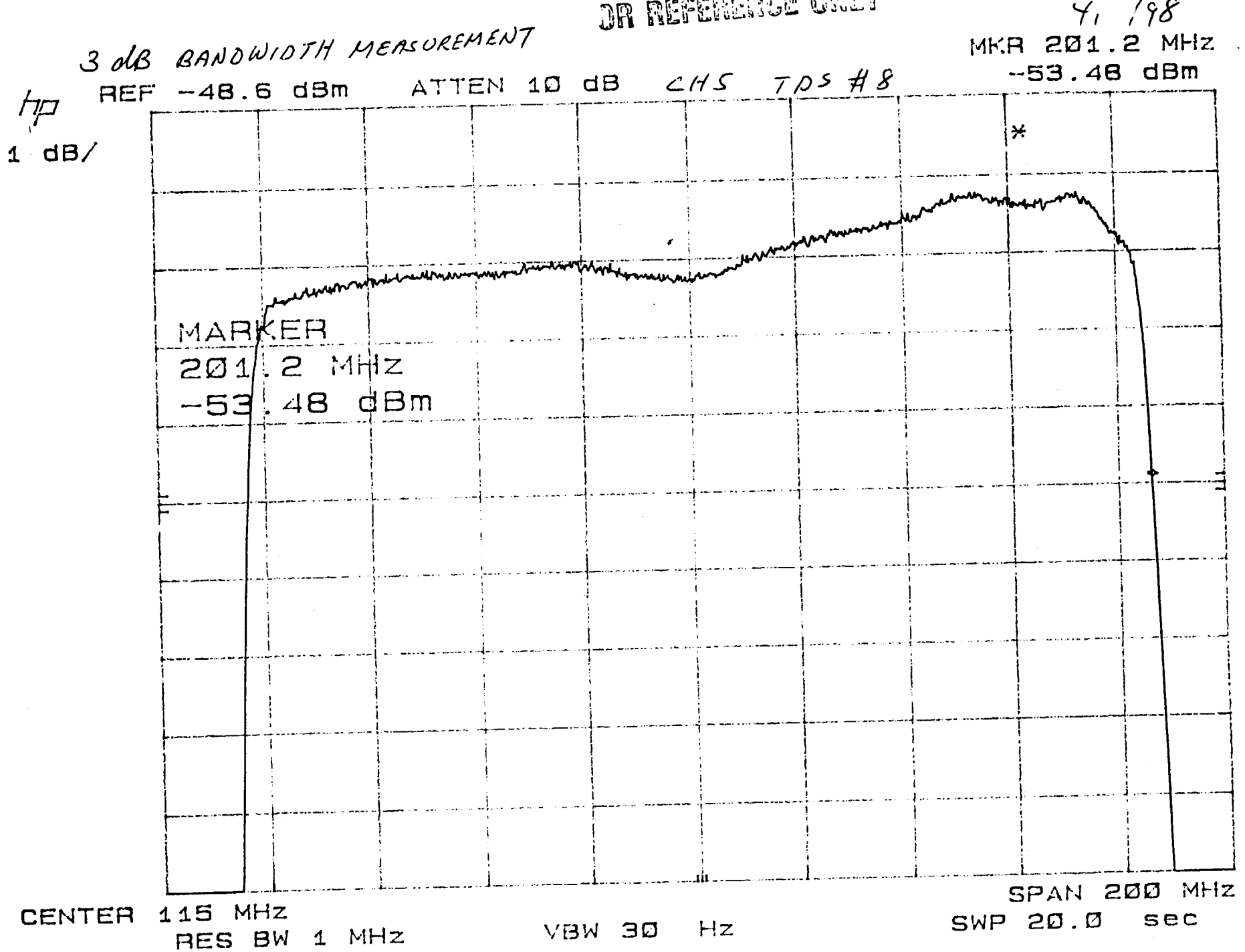
FOR REFERENCE ONLY 4/ 8



DR REFERENCE ONLY

4, 198

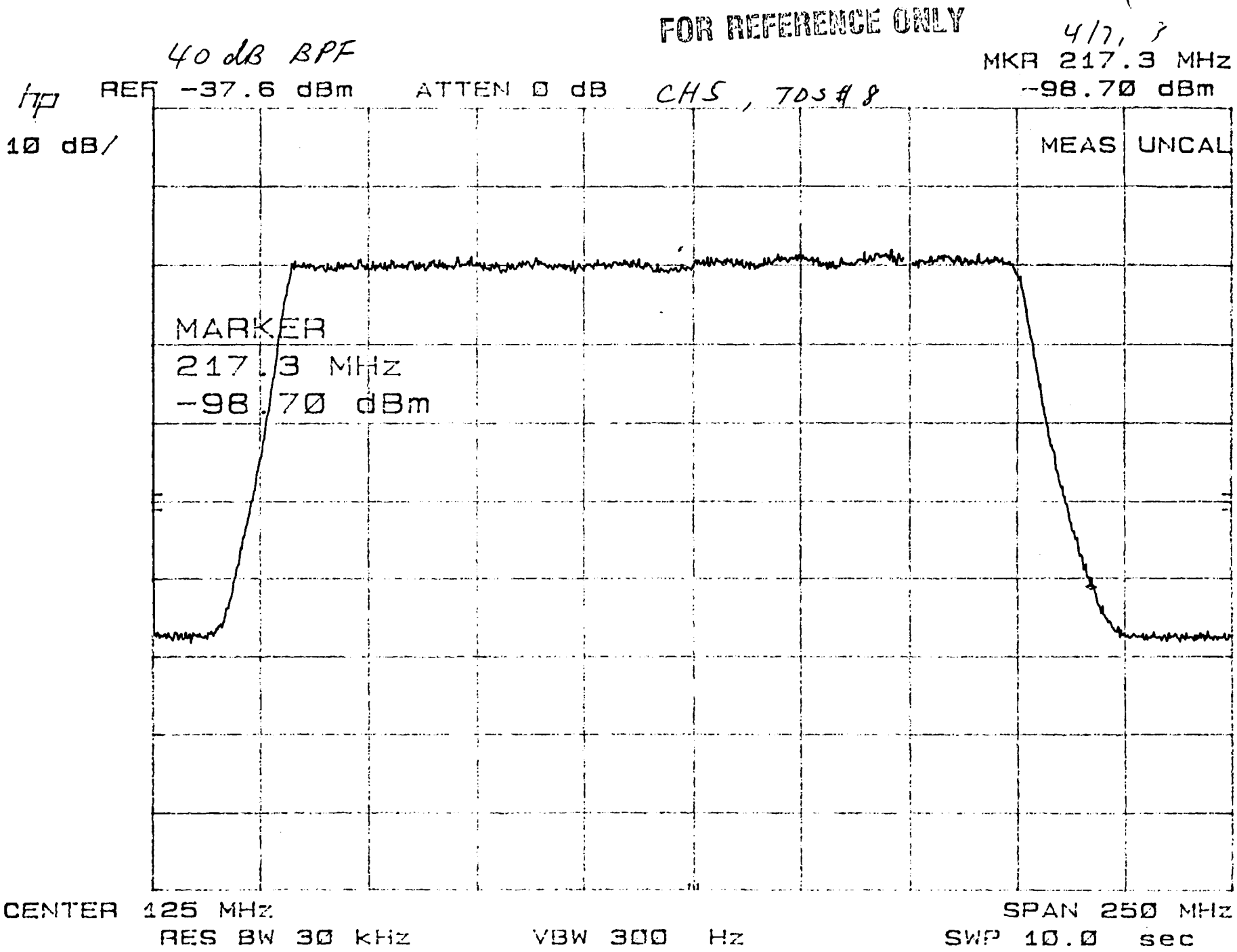
3 dB BANDWIDTH MEASUREMENT



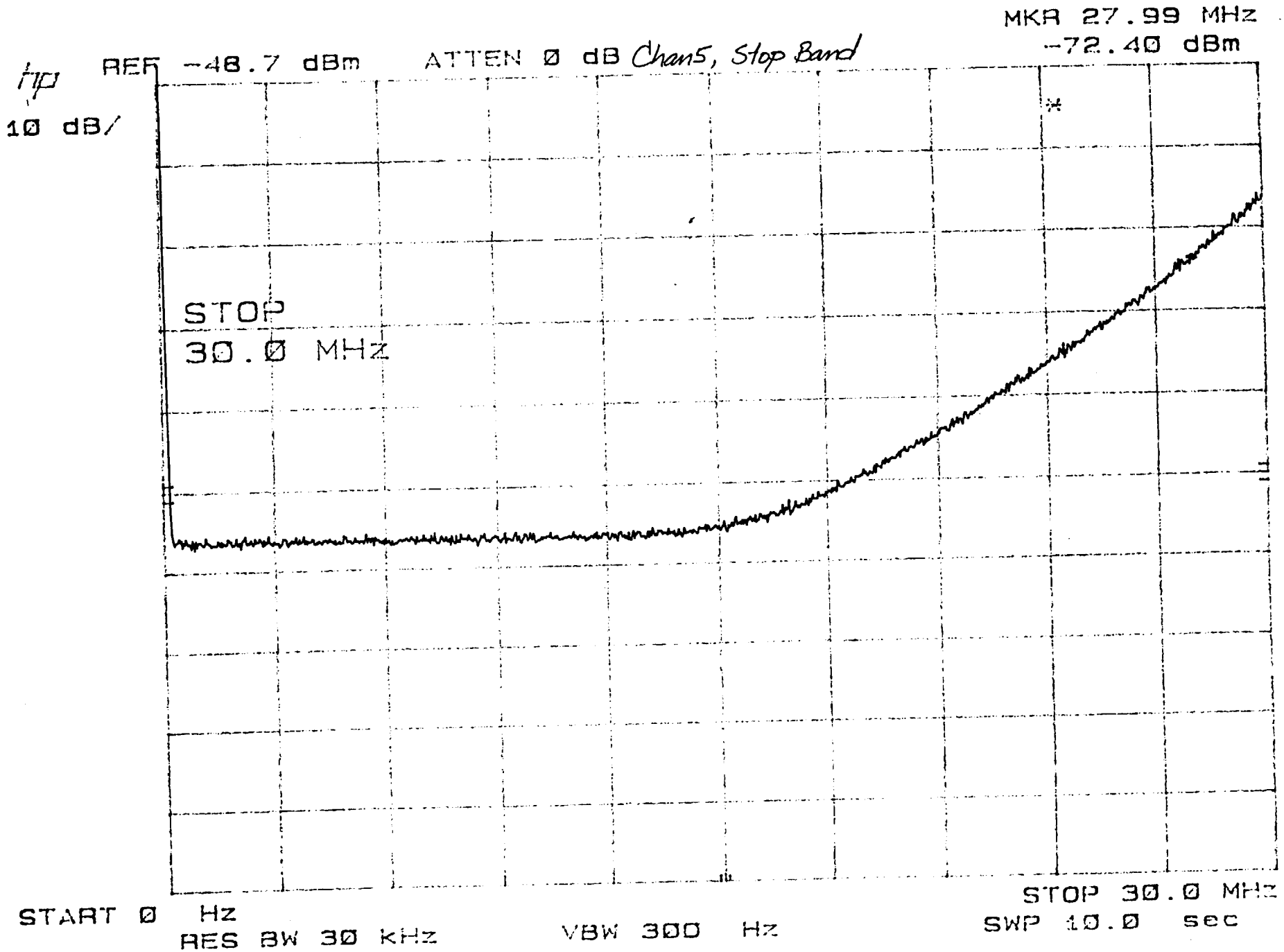
FOR REFERENCE ONLY

40 dB BPF

4/7, ?



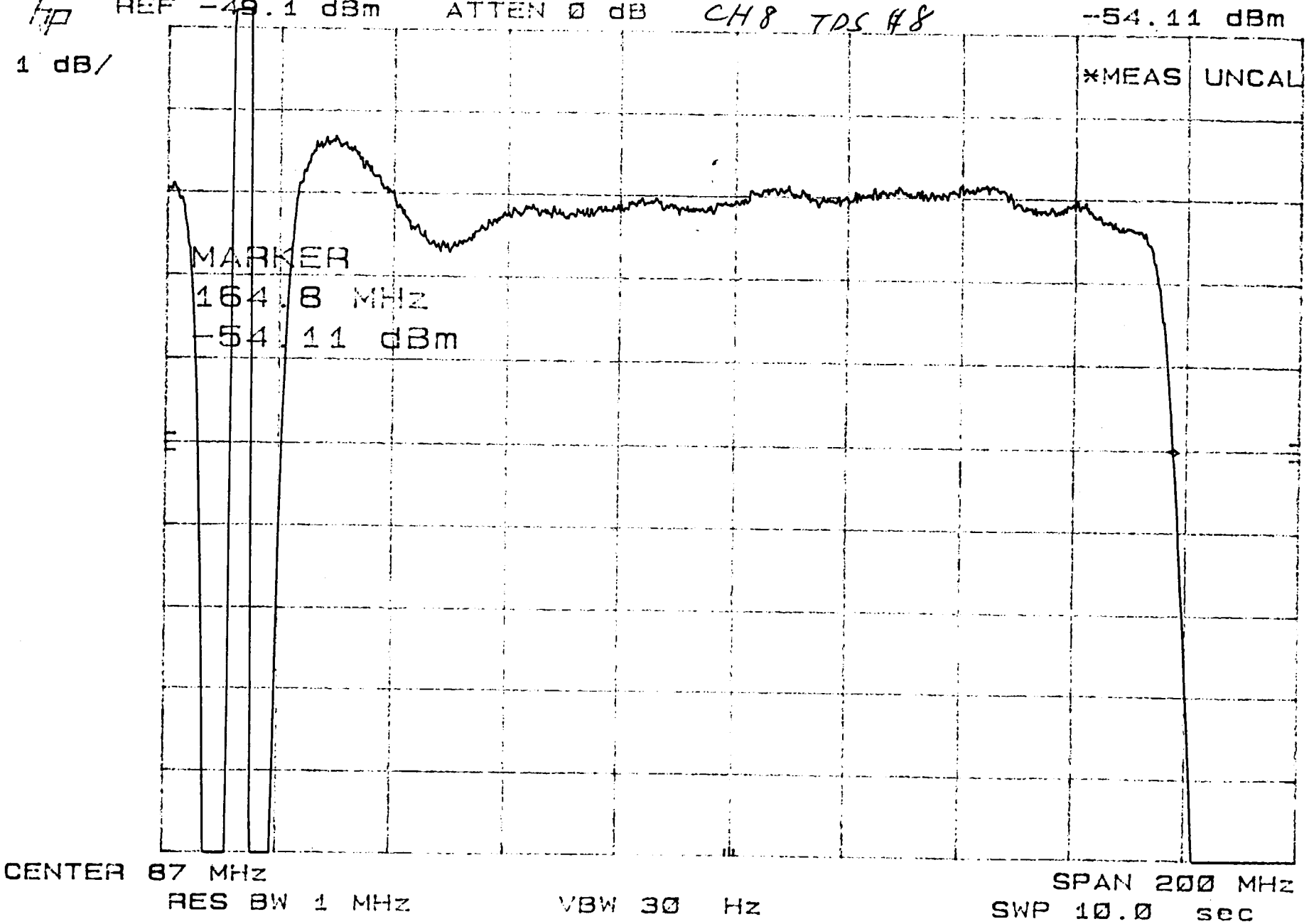
FOR REFERENCE ONLY /98



FOR REFERENCE ONLY

4/7/98

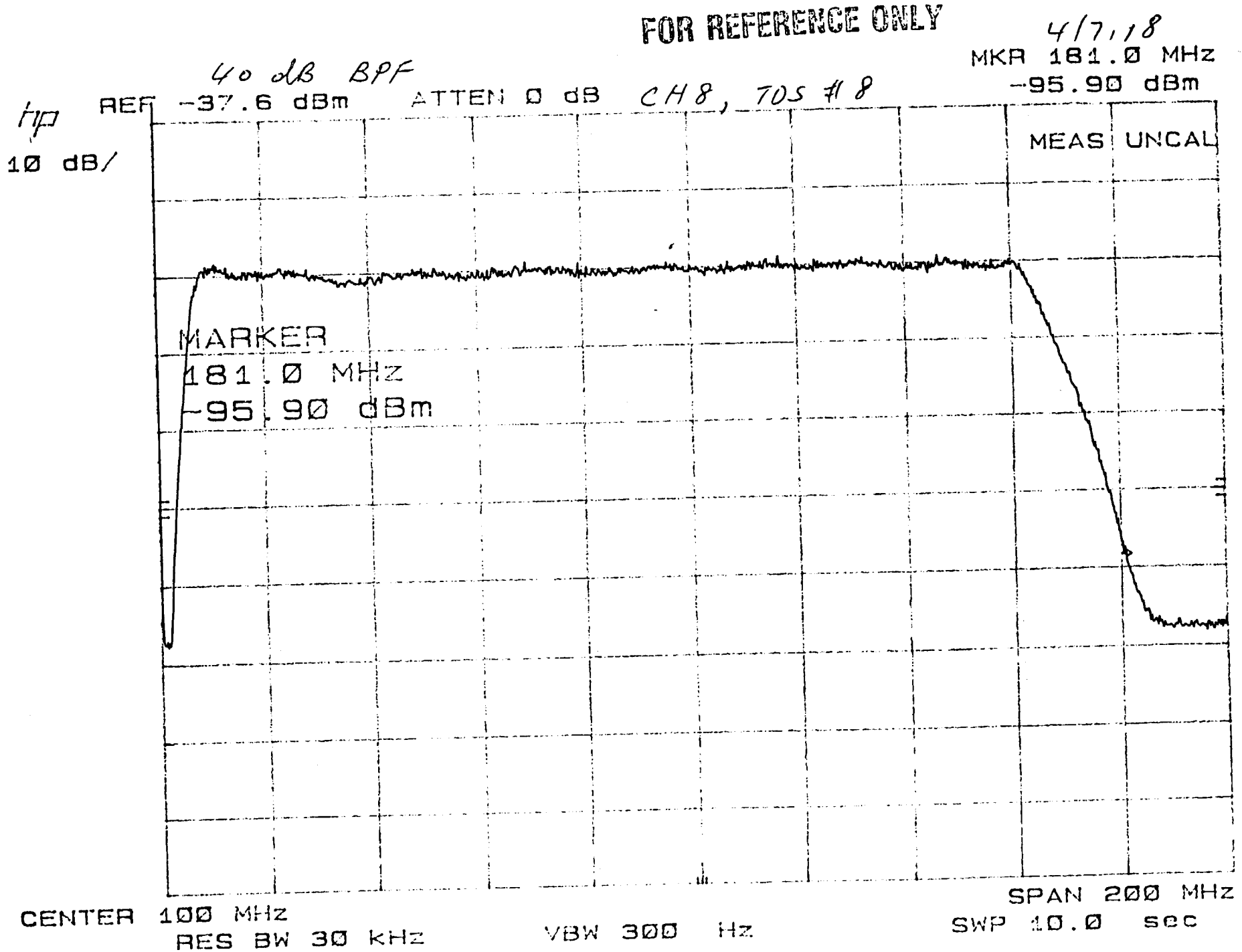
3 dB BANDWIDTH MEASUREMENT



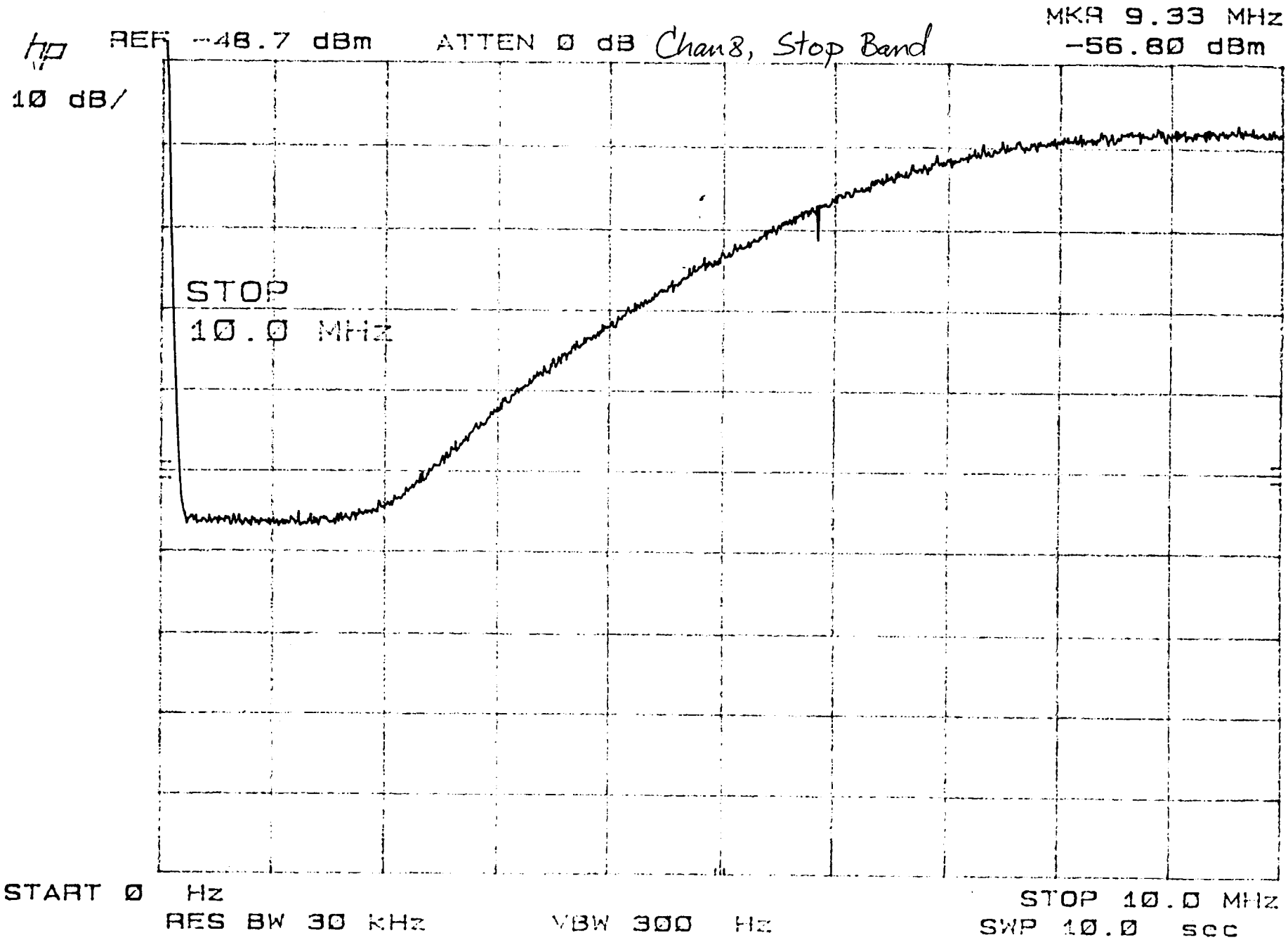
FOR REFERENCE ONLY

4/7/18

40 dB BPF



FOR REFERENCE ONLY 4/98



*B *2

TEST DATA SHEET 10 (Sheet 1 of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-~~1~~)

Test Setup Verified: _____ Signature

Baseplate Temperature (T_B) 28.3 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	*B B 3	9.99	192.4	23.0	-0.949	.00041	-194.0	-0.695	.00025
				23.0	-0.947	0.00035	-194.0	-0.693	.00024
				23.0	-0.947	0.00034	-194.0	-0.693	.00025
Mixer/ Amps	All	9.98	175.4						
IF Amps	All	N/A	N/A						

NF REQUIRES TO RUN ONLY THREE TIMES FOR THIS RECEIVER SHELF (A1-2).

Part No.: 1356409-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 4/7/98

*B 3

QC 226

R. Kapp

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TEST DATA SHEET 11 (Sheet ~~3~~ of ~~6~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: J. Zuny (Signature) Baseplate Temperature (T_B) 28.3 °C

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Meas	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
3	~~4.25~~	4.42			2				
		4.41							
		4.43							
	5.2		4.42	P	12				

NPS IS NOT REQUIRED PER PROGRAM MANAGER OFFICER. Pass = P, Fail = F
FOR THIS RECEIVER SHELF (A1-2), (PMO) AND NF
REQUIRES TO RUN ONLY THREE TIMES.

Part No.: 1356409-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance:

Date: 4/7/98

35
A45

QC 226 R. Kappel

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-2, CH3, S/N F01, NF & NPS TEST DATA 4/7/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.15	-.94888847	.00041257		
2	COLD TEST	79.15	-.69470506	.00024515	4.42820024	.27103242
3	WARM TEST	296.15	-.94716644	.00035019		
4	COLD TEST	79.15	-.69258614	.00024142	4.41342336	.19707730
5	WARM TEST	296.15	-.94679107	.00034530		
6	COLD TEST	79.15	-.69338616	.00025242	4.43194024	.19170404
7	WARM TEST	0.00	0.00000000	0.00000000		
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000		
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000		
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000		
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000		
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000		
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000		
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 3 ,78.6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.42452863676

NOISE POWER STABILITY (K) = .219937919368

NOISE POWER STABILITY DELTA (K) = .0793283796871

NPS_MAX (K) = .271032417347 NPS_MIN (K) = .19170403766

INTEGRATION TIME = .165

2 ~~1~~ 8 *

TEST DATA SHEET 10 (Sheet ~~1~~ of ~~10~~) 2.

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-~~1~~)

Test Setup Verified: J. Jung (Signature) Baseplate Temperature (T_B) 28.3 °C

Compo-nent	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	*4 B	10.02	198.5	23.0	-1.164	.00023	-194.0	-0.804	.00016
				23.0	-1.163	.00020	-194.0	-0.804	.00017
				23.0	-1.162	.00020	-194.0	-0.804	.00017
Mixer/ Amps	All	9.98	175.4						
IF Amps	All	N/A	N/A						

NF REQUIRES TO RUN ONLY THREE TIMES FOR THIS RECEIVER SHELF (A1-2).

Part No.: 1356409-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance:

Date: 4/7/98

* 32 A-15

QC 226 MAR 30 [signature]

AE-26002/6A
15 Sep 97

6 * 8

TEST DATA SHEET 11 (Sheet ~~4~~ of ~~6~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: _____ Signature Baseplate Temperature (T_B) 28.3 °C

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
4	4.25	3.80			0.08				
		3.80							
		3.81							
	5.13 *		3.80	P	.08 *				

NPS IS NOT REQUIRED PER (PMO) FOR THIS RECEIVER SHELF (A1-2) AND NF REQUIRES TO RUN ONLY THREE TIMES.

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 4/7/98

3 * 26 QC III QC 226 R. Kapper

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-2, CH4, S/N F01, NF & NPS TEST DATA 4/7/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.15	-1.16355405	.00022730	----------	---------
2	COLD TEST	79.15	-.80385109	.00015508	3.80082493	.05643589
3	WARM TEST	296.15	-1.16297236	.00020471	----------	---------
4	COLD TEST	79.15	-.80384988	.00017284	3.80571027	.01875957
5	WARM TEST	296.15	-1.16229681	.00020491	----------	---------
6	COLD TEST	79.15	-.80353729	.00016810	3.80759482	.01744914
7	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 4 ,191.2 MHz MHz

NOISE FIGURE AVERAGE (dB) = 3.80471 0945

NOISE POWER STABILITY (K) = .0308818990823

NOISE POWER STABILITY DELTA (K) = .0389877466588

NPS_MAX (K) = .0564358880512 NPS_MIN (K) = .0174491413924

INTEGRATION TIME = .165

3 ✱ 38

TEST DATA SHEET 10 (Sheet ~~1~~ of ~~10~~ 2)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-~~1~~)

Test Setup Verified: T. Tsung (Signature) Baseplate Temperature (T_B) 28.3 °C

Compo-nent	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	✱5	9.98	185.4	23.0	-1.192	.00025	-194.0	-0.865	.00020
				23.0	-1.192	.00023	-194.0	-0.864	.00026
				23.0	-1.191	.00023	-194.0	-0.864	.00027
Mixer/ Amps	All	9.98	175.4						
IF Amps	All	N/A	N/A						

NF REQUIRES TO RUN ONLY THREE TIMES FOR THIS RECEIVER SHELF (A1-2).

Part No.: 1356409-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance:

Date: 4/7/98

✱ 33 A-~~13~~ QC 226 [illegible] R. Kappa

*7 8

TEST DATA SHEET 11 (Sheet ~~5~~ of ~~5~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: T. Tsung (Signature) Baseplate Temperature (T_B) 28.3 °C

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
5	*~~4.25~~	4.32			*~~0.08~~				
		4.32							
		4.33							
	*5.2		4.32	P	*.08				

NPS IS NOT REQUIRED PER (PMO) FOR THIS RECEIVER SHELF (A1-2) AND NF REQUIRES TO RUN ONLY THREE TIMES.

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: _____

Date: 4/7/98

*3rd OC

A-21

QC 226

R. Kapper

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-2, CH5, S/N F01, NF & NPS TEST DATA 4/7/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.15	-1.19228008	.00024856		
2	COLD TEST	79.15	-.86490170	.00019625	4.31997157	.06947215
3	WARM TEST	296.15	-1.19177576	.00022671		
4	COLD TEST	79.15	-.86434009	.00025831	4.31735393	.01677624
5	WARM TEST	296.15	-1.19073567	.00022783		
6	COLD TEST	79.15	-.86438452	.00026985	4.32805367	.02341029
7	WARM TEST	0.00	0.00000000	0.00000000		
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000		
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000		
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000		
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000		
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000		
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000		
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 5 ,169.6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.32179544445

NOISE POWER STABILITY (K) = .0365528959143

NOISE POWER STABILITY DELTA (K) = .0526959163006

NPS_MAX (K) = .0694721549406 NPS_MIN (K) = .01677623864

INTEGRATION TIME = .165

4 of 8 2

TEST DATA SHEET 10 (Sheet 2 of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-~~1~~)

Test Setup Verified: _____ Signature Baseplate Temperature (T_B) 28.3 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	2 8 12	9.98	195.5	23.0	-.982	.00021	-194.0	-.691	.00023
				23.0	-.982	.00018	-194.0	-.692	.00027
				23.0	-.983	.00022	-194.0	-.692	.00023
Mixer/ Amps	All	9.98	175.4						
IF Amps	All	N/A	N/A						

NF REQUIRES TO RUN ONLY THREE TIMES FOR THIS RECEIVER SHELF (A1-2).

Part No.: 1356409-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 4/7/98

QC 226

AE-26002/6A
15 Sep 97

8 of 8

TEST DATA SHEET 11 (Sheet ~~6~~ of ~~6~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-2)

Test Setup Verified: T. Tang (Signature) Baseplate Temperature (T_B) 28.3 °C

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
8	~~4.25~~	4.00			~~0.08~~				
		4.00							
		3.99							
	5.13		4.00	P	.08				

NPS IS NOT REQUIRED PER (PMO) FOR THIS RECEIVER SHELF (A1-2) AND NF REQUIRES TO RUN ONLY THREE TIMES.

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance:

Date: 4/7/98

36 A-26

QC 226 MAR 30 '98

R. Kapper

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-2, CH8, S/N F01, NF & NPS TEST DATA 4/7/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.15	-.98177514	.00020662	----------	---------
2	COLD TEST	79.15	-.69144305	.00023293	3.99523560	.05436992
3	WARM TEST	296.15	-.98178351	.00017980	----------	---------
4	COLD TEST	79.15	-.69203966	.00027044	4.00415525	.05334157
5	WARM TEST	296.15	-.98277137	.00022187	----------	---------
6	COLD TEST	79.15	-.69201334	.00023117	3.99325676	.08090377
7	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 8 ,156.2 MHz MHz

NOISE FIGURE AVERAGE (dB) = 3.99755179373

NOISE POWER STABILITY (K) = .0528717556138

NOISE POWER STABILITY DELTA (K) = .0275622014672

NPS_MAX (K) = .0809037731728 NPS_MIN (K) = .0533415717056

INTEGRATION TIME = .165

TEST DATA SHEET 17

Temperature Sensor and Thermistor Test Data (Paragraph 3.6.1) (A1-2)

Test Setup Verified: Y. Yrink (Signature) Baseplate Temperature (T_B) 26.0 °C

Reference Designation	Specification	Measured Value		Pass/Fail
RT 41	2200 ± 100 Ω	2173	Ω	Pass
RT 42	2200 ± 100 Ω	2173	Ω	Pass
RT 43	2200 ± 100 Ω	2176	Ω	Pass
RT 44	2200 ± 100 Ω	2171	Ω	Pass
RT 12	2200 ± 100 Ω	2170	Ω	Pass
RT 17	2200 ± 100 Ω	2171	Ω	Pass
RT 18	2200 ± 100 Ω	2176	Ω	Pass
RT 19	2200 ± 100 Ω	2173	Ω	Pass
RT 22	2200 ± 100 Ω	2172	Ω	Pass
RT 33	2200 ± 100 Ω	2174	Ω	Pass
TB 58	3000 ± 100 Ω	2994	Ω	Pass
TB 59	3000 ± 100 Ω	2998	Ω	Pass
TB 54	4.1 – 4.6 V	4.35	V	Pass

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F01

Test Engineer: Y. Yrink

Quality Assurance:

Date: 04/8/98

MAR 30 '98 50 (2226) R. Kapper

TEST DATA SHEET 21

Survival Heater and Thermal Switch Test Data (Paragraph 3.6.3) (A1-2)

Test Setup Verified: Y. Yrink
Signature

Baseplate Temperature (T_B) 26.0 °C

Reference Designation	Open Switch		Closed Switch		
	>10 MΩ	Pass/Fail	Specification	Measured Value	Pass/Fail
HR1/TS1	> 100MΩ	Pass	40 - 48 Ω	44 Ω	Pass
	> 100MΩ	Pass		44.4 Ω	Pass
HR2/TS2	> 100MΩ	Pass		43.5 Ω	Pass
	> 100MΩ	Pass		43.5 Ω	Pass

Pass = P, Fail = F

Part No.: 1356409-1

Serial No.: F01

Test Engineer: Y. Yrink

Quality Assurance: _____

Date: 04/8/98

R. Kappy

TEST DATA SHEET 23 (Sheet 2 of 3)
Bias Voltage Verification Test Data (Paragraph 3.6.4) (A1-2)

Test Setup Verified: Y. Yrink
Signature

Baseplate Temperature (T_B) 26 °C

Reference Designation	Specification	Measured Value (V)	Pass/Fail
Mixer/IF AMP Ch 3, 4, 5, 8	+10 ±0.1	10.01	Pass
DRO Ch 5	+10 ±0.1	9.97	Pass
DRO Ch 4	+10 ±0.1	10.01	Pass
DRO Ch 3	+10 ±0.1	9.99	Pass
DRO Ch 8	+10 ±0.1	9.97	Pass

Part No.: 1356409-1

Serial No.: F01

Test Engineer: Y. Yrink

Quality Assurance:

Date: 04/8/98

MAR 30 '99 57 QC 226 R. Kappes

TEST DATA

FOR

AMSU-A1-1 (P/N: 1356429-1, S/N: F01)

TEST DATA SHEET 1

LO Frequency Test Data (Paragraph 3.5.1) (A1-1)

Test Setup Verified: R Funo
Signature

Baseplate Temperature (T_B) 27.7 °C

Component	Channel No.		V_b(V)	I_b(mA)	P_{dc}(mW) Required (Max)	P_{dc}(mW) Measured	P_{dc}(mW) Pass/Fail	f_o(GHz) Required	f_o(GHz) Measured	f_o(GHz) Pass/Fail
LO	6		9.97	179.8	2,700	1792.6	P	54.400 ± 0.003	54.400	P
	7		9.94	193.7	2,700	1925.6	P	54.940 ± 0.003	54.940	P
	LO No. 1	9	Positive		9,000 (13,500)*			57.290344 ± 0.000150 086		
		10								
		11								
		12	Negative		1,500					
		13								
		14								
	LO No. 2	9	Positive		9,000 (13,500)*			57.290344 ± 0.000150 086	57.290325	P
		10							N/A	
		11	15.13	514.8		7789	P		N/A	
		12	Negative		1,500				N/A	
		13							N/A	
		14	15.13	63.8		965	P		N/A	
	15		14.89	180.2	3500	2683.2	P	88.980 ± 0.080	88.983	P
Mixer/ Amps	All		9.94	242.1	2,550	2406.5				
IF Amps	All		9.95	226	5,500	2091.8				
TOTAL				Primary (LO #1)	24,510 (29,010)*					
				Redundancy (LO #2)	24,510 (29,010)*	1966.5				

* Indicates required values for the PLO specified in AE-26660.

Pass = P, Fail = F

PLO 1 Lock Detect ☐ PLO 2 Lock Detect ☐

Part No.: 1356429-1

Serial No.: F01

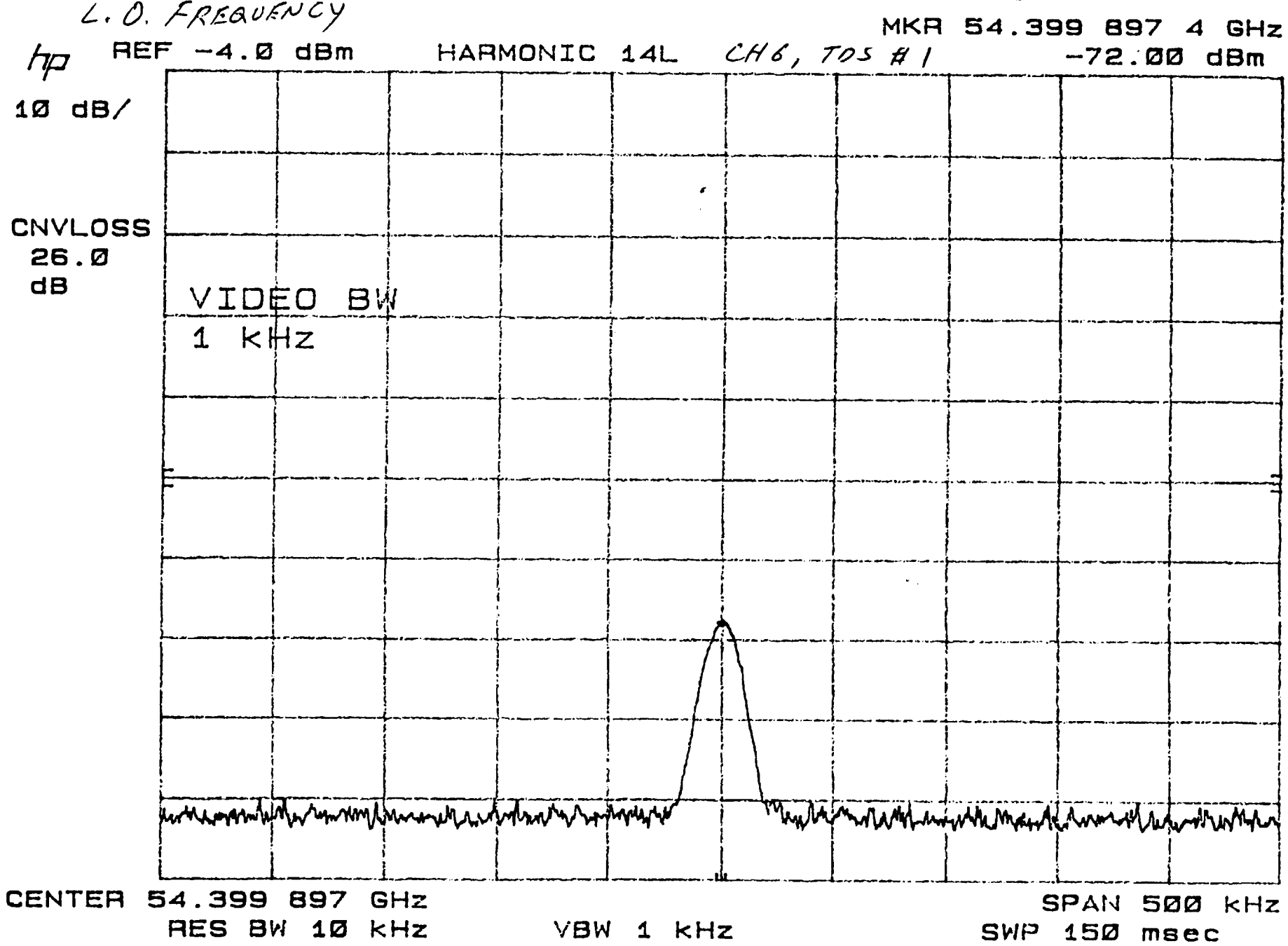
Test Engineer: [signature]

Quality Assurance: _____

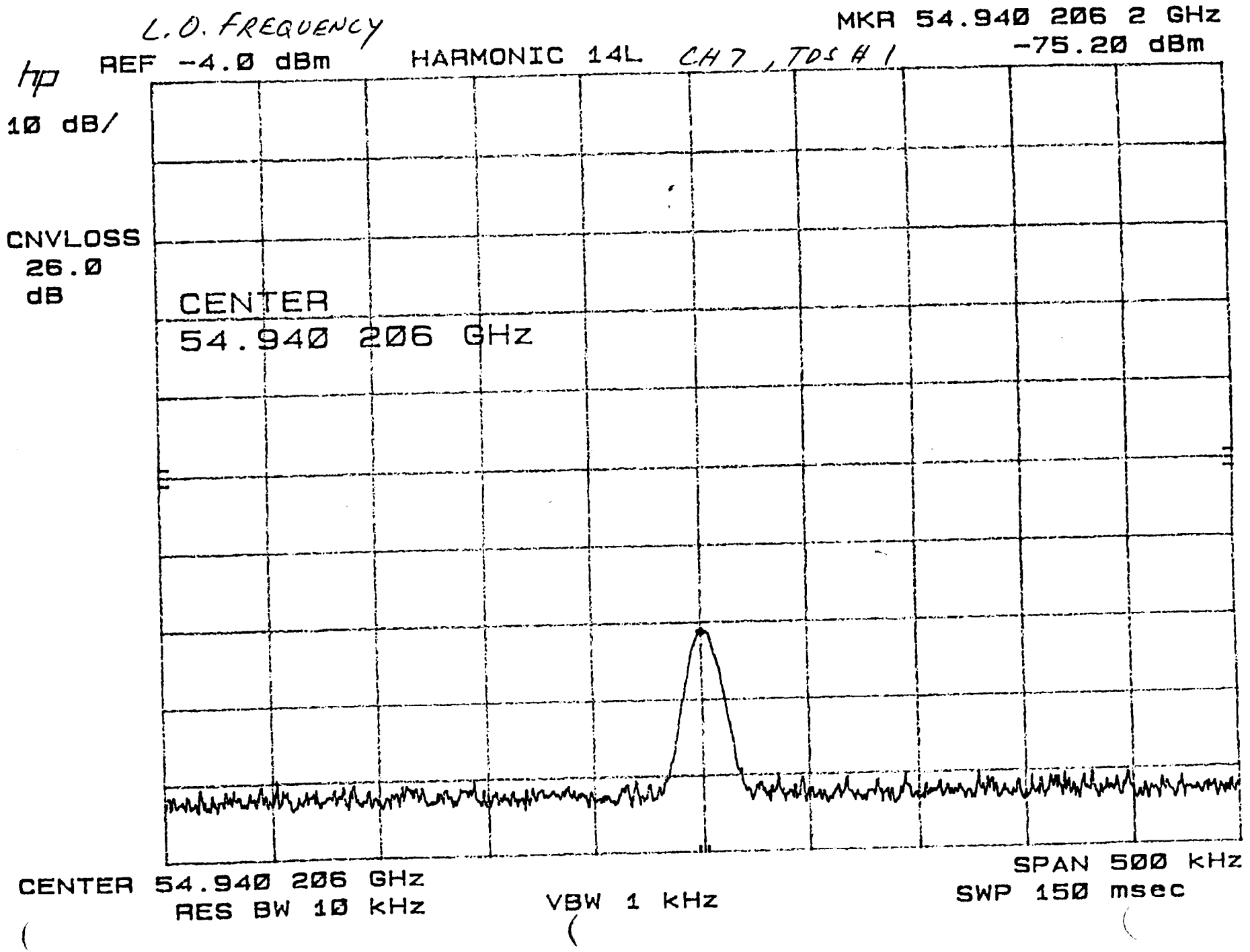
Date: 3/31/98

FOR REFERENCE ONLY 3/31/98

L.O. FREQUENCY



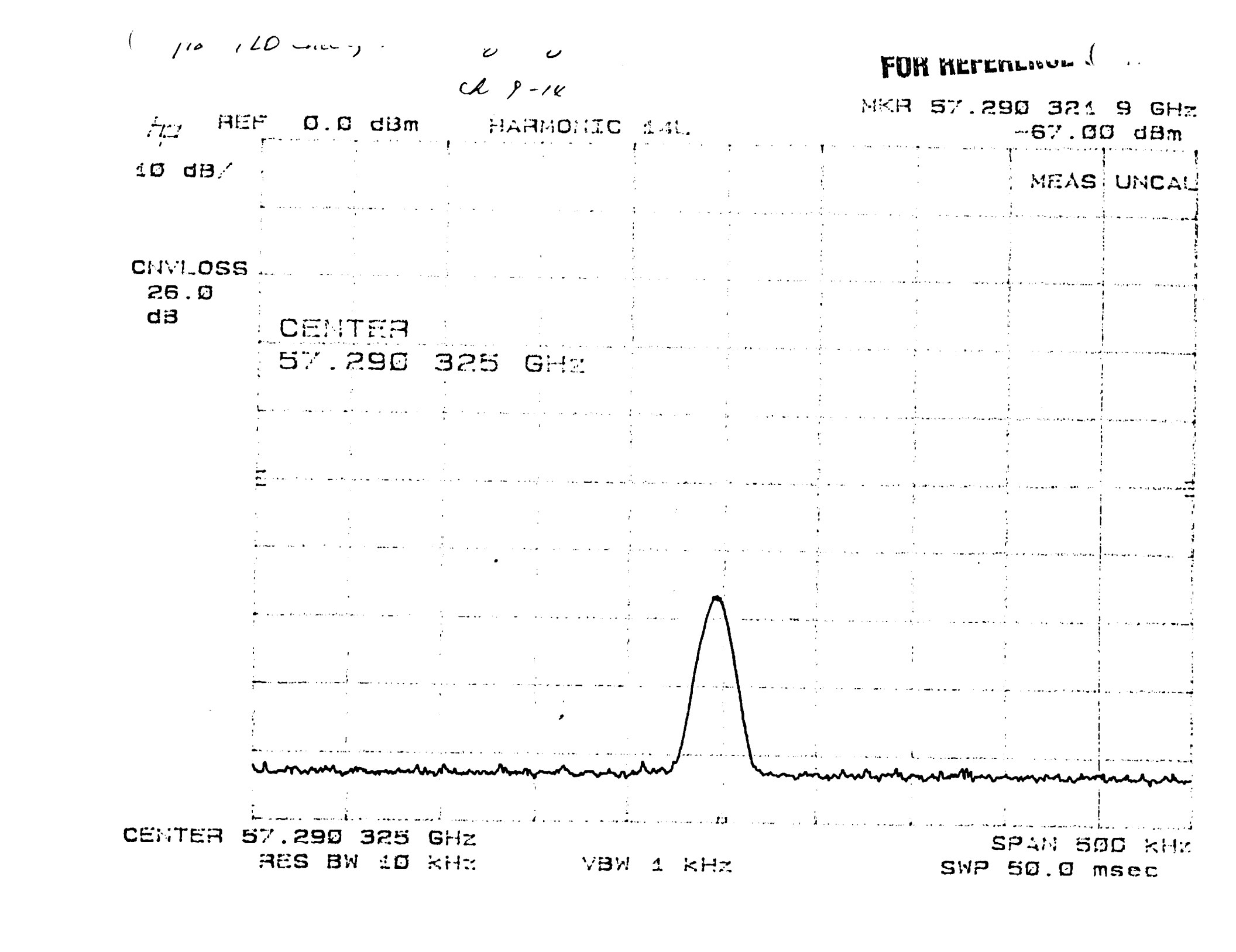
FOR REFERENCE ONLY 3/31/98



(no LO sig) - o o

ch 9-16

FOR REFERENCE (..

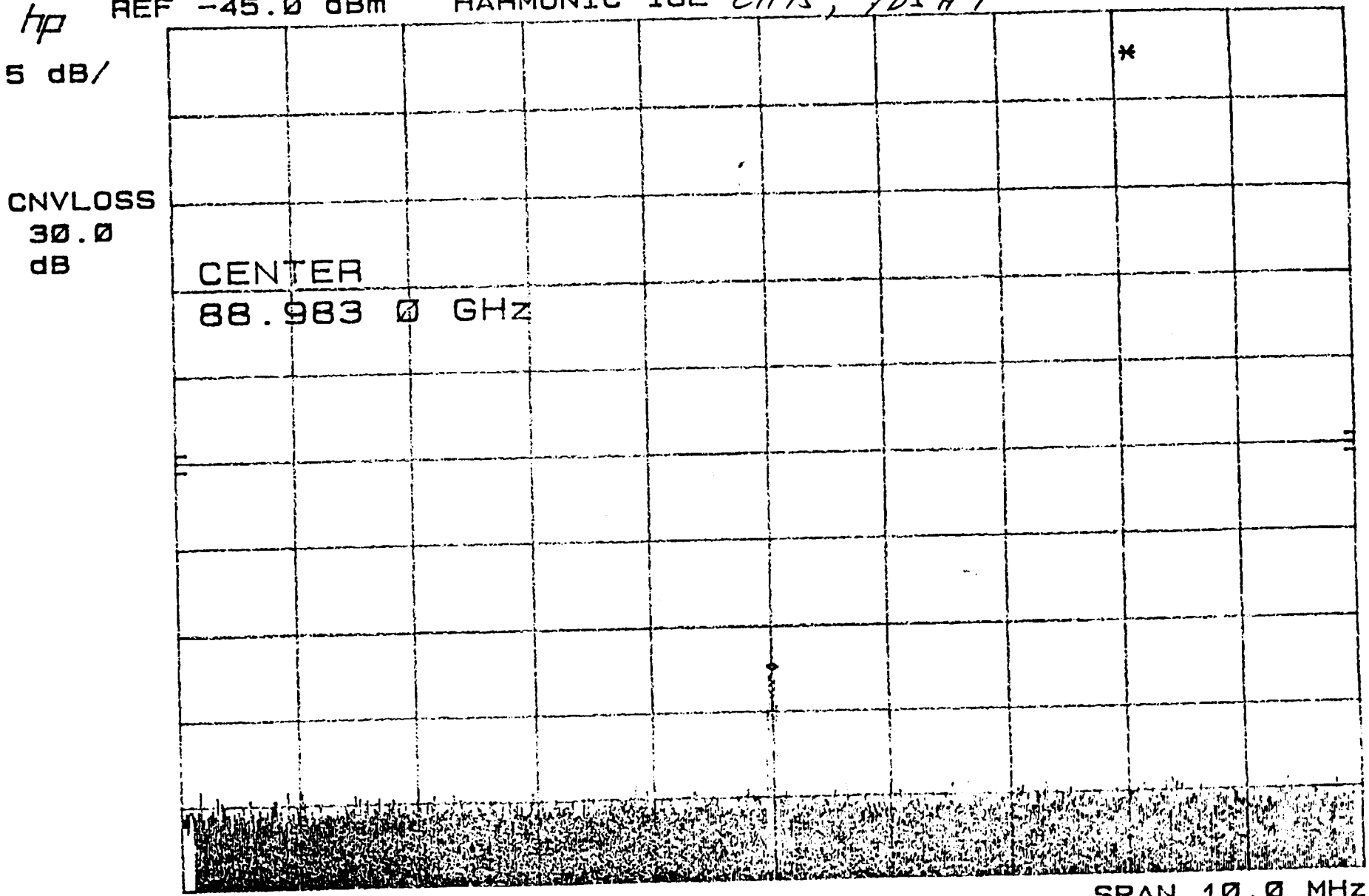


FOR REFERENCE ONLY 3/31/98

L.O. FREQUENCY

MKR 88.983 07 GHz
-82.35 dBm

REF -45.0 dBm HARMONIC 18L CH15, TOSH1



CENTER 88.983 0 GHz
RES BW 10 kHz

VBW 1 kHz

SPAN 10.0 MHz
SWP 100 sec

TEST DATA SHEET 4

IF Output Power Test Data (Paragraph 3.5.2) (A1-1)

Test Setup Verified: C. Funo (Signature) Baseplate Temperature (T_B) 28.7 °C

Component	Channel No.		V_b(V)	I_b(mA)	P_o(dBm)	Atten (dB)	P_o(dBm) Required	P_o(dBm) Measured	Pass/ Fail
LO	6		4.97	180	-18.28	9	-27.0 ± 1.0	-27.14	P
	7		9.94	194	-19.02	8	-27.0 ± 1.0	-26.94	P
	LO No. 1	9	Positive		N/A	n/a	-27.0 ± 1.0		
		10			N/A	n/a	-27.0 ± 1.0		
		11			n/a	n/a	-27.0 ± 1.0		
		12	Negative		n/a	n/a	-27.0 ± 1.0		
		13			n/a	n/a	-27.0 ± 1.0		
		14			n/a	n/a	-27.0 ± 1.0		
	LO No. 2	9	Positive		[redacted]		-27.0 ± 1.0	-27.44	P
		10					-27.0 ± 1.0	-26.94	P
		11	15.13	514.8			-27.0 ± 1.0	-27.18	P
		12	Negative				-27.0 ± 1.0	-26.67	P
		13					-27.0 ± 1.0	-27.47	P
		14	15.13	63.8			-27.0 ± 1.0	-26.67	P
	15		14.9	180	~~-18.05~~ -25.06	2	-27.0 ± 1.0	-26.73	P
Mixer/ Amps	All		9.96	40.4	[redacted]				
IF Amps	All		7.95	263.6					

Pass = P, Fail = F

Part No.: 1356429-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: _____

Date: 3/11/98

TEST DATA SHEET 7 (Sheet 1 of 2)

Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-1)

Test Setup Verified: _____ Signature Baseplate Temperature (T_B) 27.7 °C

Component	Channel No.	V_b(V)	I_b(mA)	3 dB BW Frequency (MHz)		3 dB BW Frequency (MHz)		Pass/Fail
				Lower	Higher	Required MAX	Measured	
LO	6					~~400~~ 200		
	7					~~400~~ 200		
LO No. 1	9	Positive				~~330~~ 165		
	10					78		
	11					~~36~~ 36		
	12	Negative				~~16~~ 16		
	13					~~8~~ 8		
	14					~~3~~ 3		
LO No. 2	9	Positive	n/a	8.1	164.7	~~330~~ 165	156.6	P
	10	15, 13	514.8	179.2	255.6	78	76.4	P
	11		n/a	~~256.1~~ 352.4	~~291.5~~ 386.9	~~36~~ 36	34.8	P
	12	Negative	n/a	~~292.5~~ 336.8	~~308.1~~ 351.8	~~16~~ 16	34.5	P
	13	15, 13	63.8	~~308.3~~ 326.15	~~316.2~~ 335.90	8	15.6	P
	14		n/a	~~316.32~~ 325.32	~~319.26~~ 328.24	~~3~~ 3	15.5	P
	15			493	1485	~~6000~~ 1000	7.9	P
							7.75	P
							2.94	P
							2.92	P
							992	P
Mixer/Amps	All	[redacted]						
IF Amps	All							

Part No.: 1351429-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 3/31/98

TEST DATA SHEET 7 (Sheet 2 of 2)

Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-1)

Test Setup Verified: A Fumo (Signature) Baseplate Temperature (T_B) 27.7 °C

Component	Channel No.	V_b(V)	I_b(mA)	40 dB BW Frequency (MHz)		40 dB BW Frequency (MHz)		Pass/Fail
				Lower	Higher	Required MAX (Ref Only)	Measured	
LO	6					520		
	7					520		
LO No. 1	9	Positive				429		
	10					101		
	11					47		
	12	Negative				21		
	13					10		
	14					4		
LO No. 2	9	Positive	n/a	2.2	182.0	429	179.8	P
	10	15.13	514.8	170.5	265.3	101	94.8	P
	11		n/a			47		
	12	Negative	n/a			21		
	13	15.13	63.8			10		
	14		n/a			4		
	15			n/a	n/a	7800		
Mixer/Amps	All	[redacted]						
IF Amps	All							

Part No.: 1356429-1

Serial No.: F01

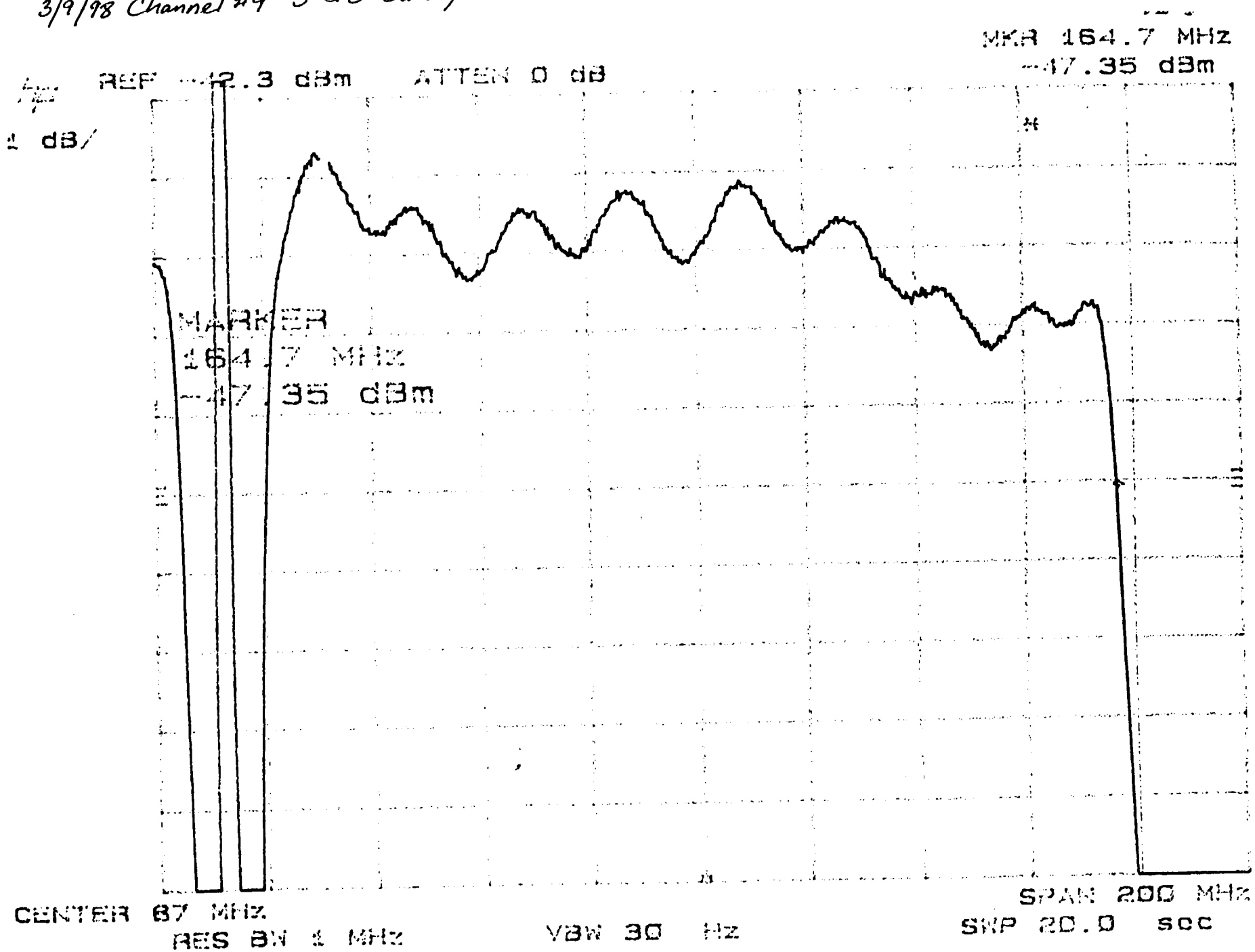
Test Engineer: [signature]

Quality Assurance: _____

Date: 3/11/98

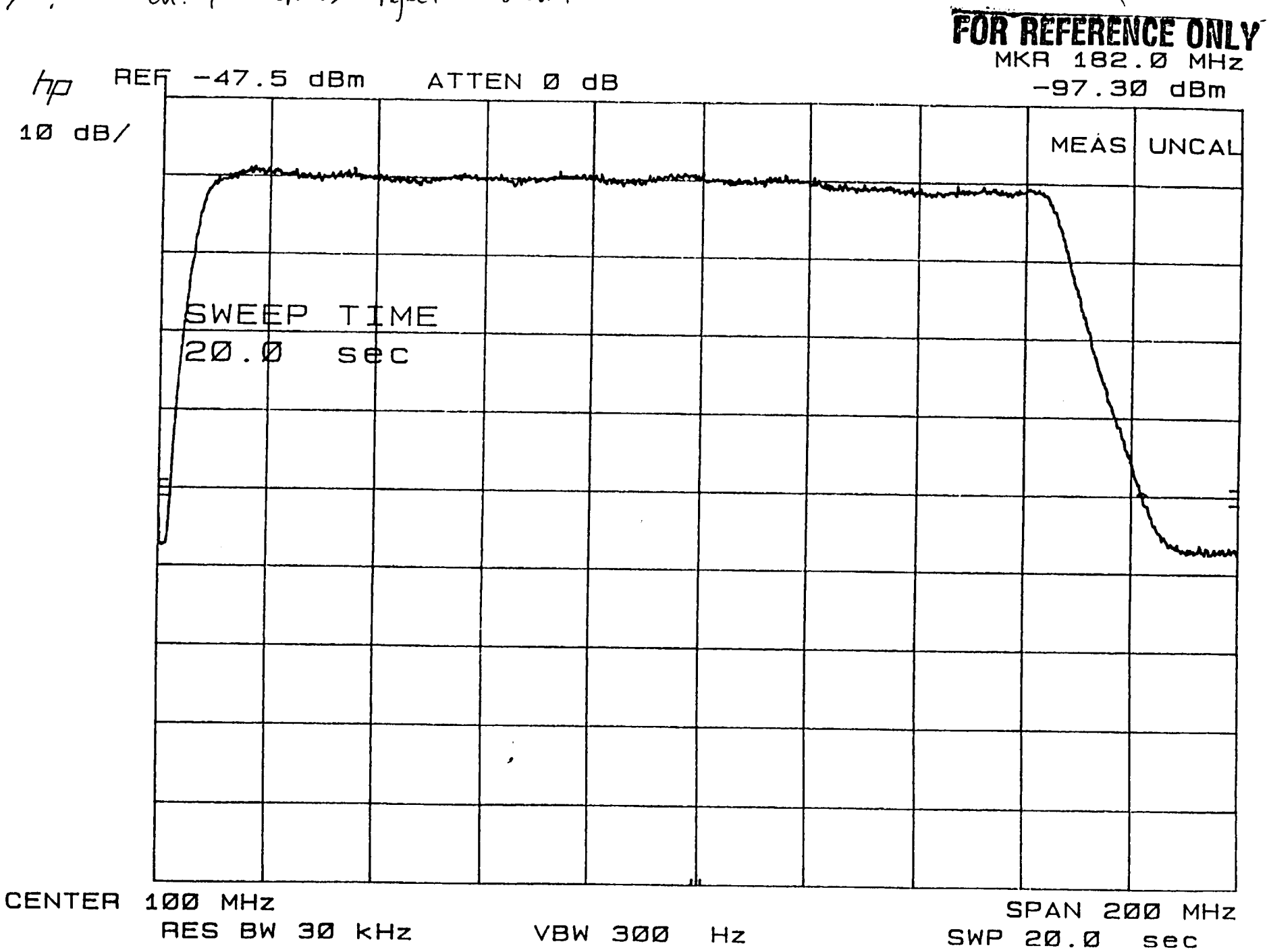
3/9/98 Channel #9 3-dB bandpass characteristics

FOR REFERENCE ONLY



1/ '98 ch. 9 40 dB rejection char.

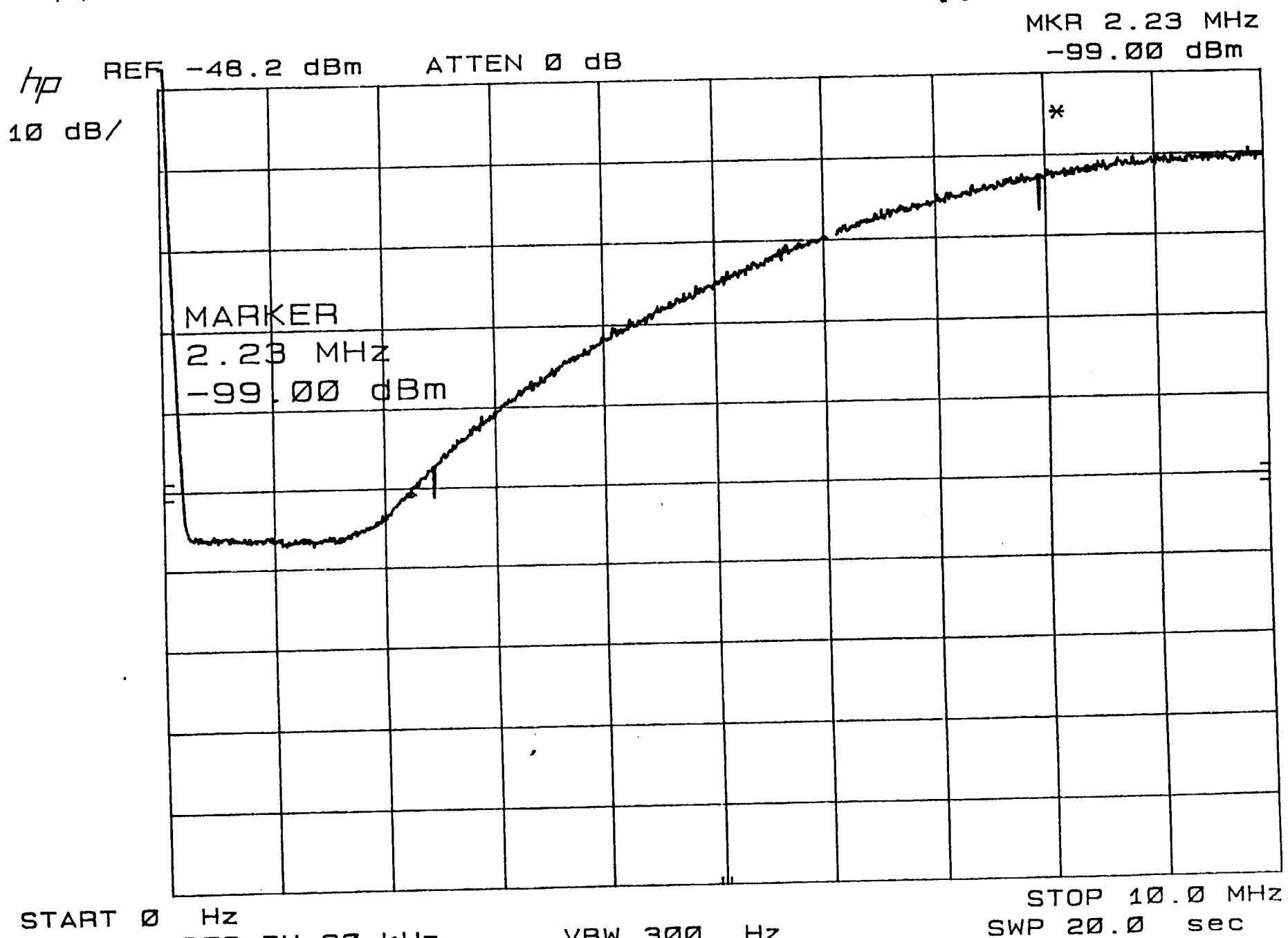
FOR REFERENCE ONLY



FOR REFERENCE ONLY

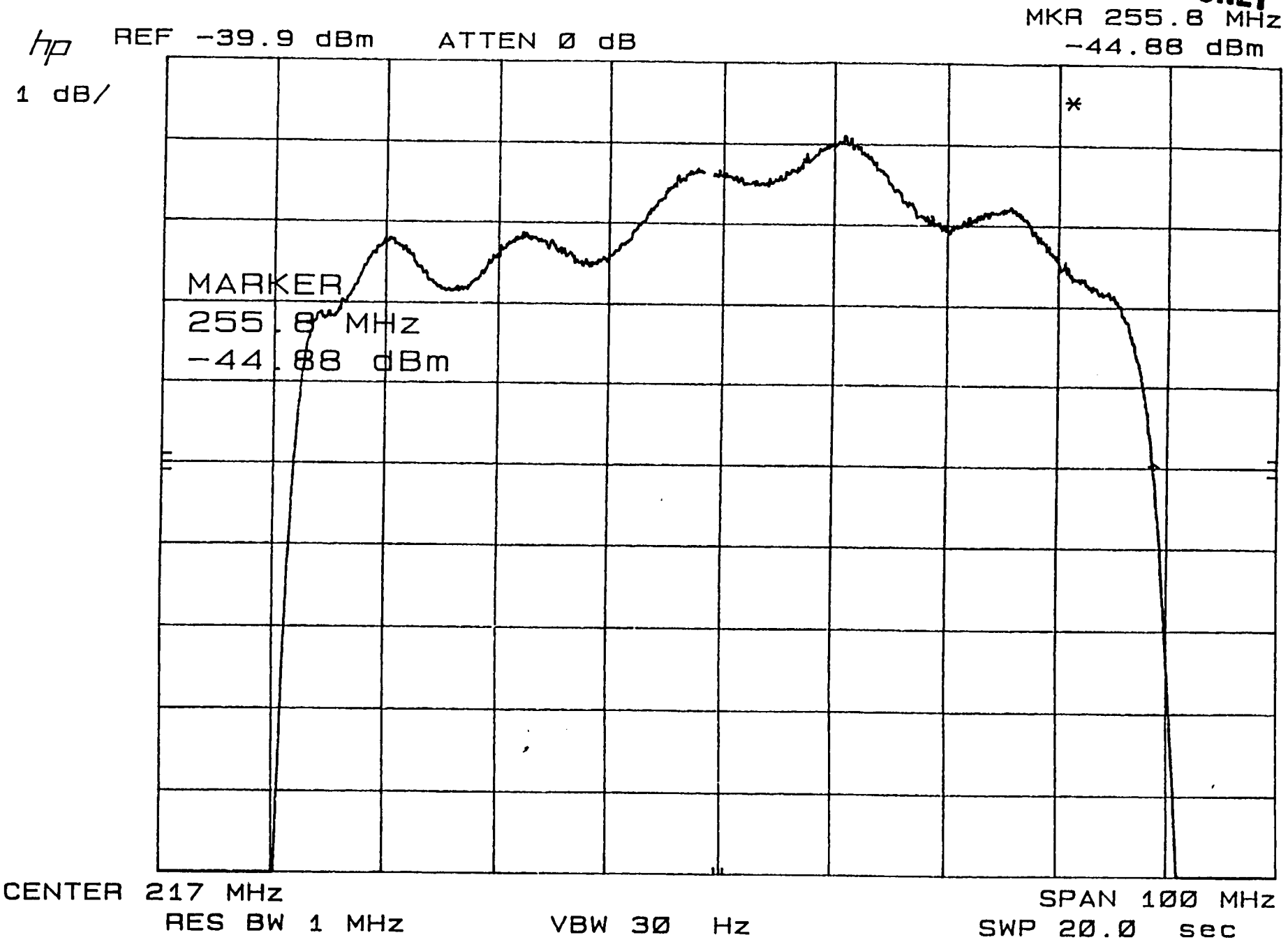
3/9/98 Chan 9. Stop Band Characteristics.

FOR REFERENCE ONLY



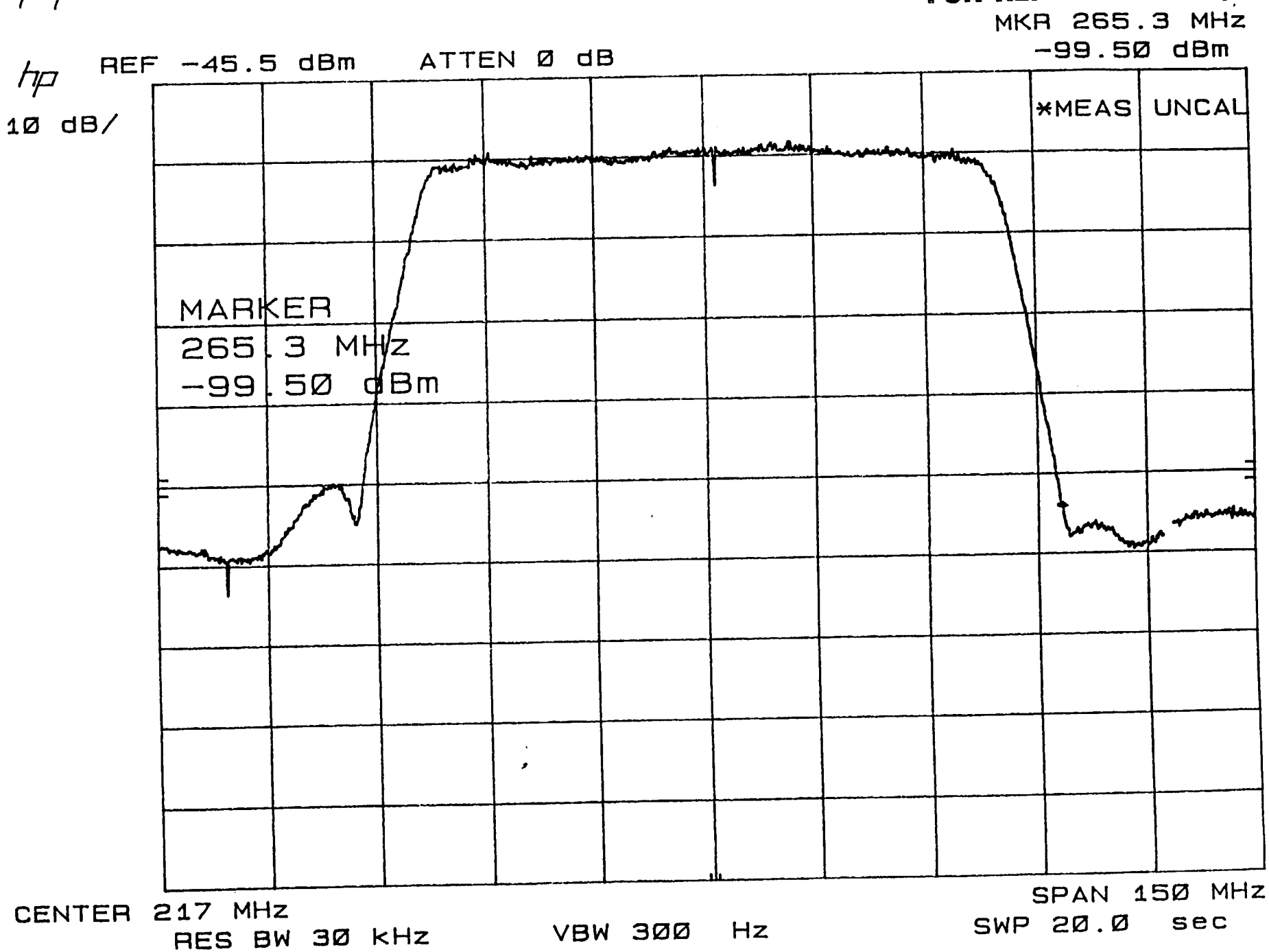
3/9/98 Ch. 10 3dB BPF

FOR REFERENCE ONLY



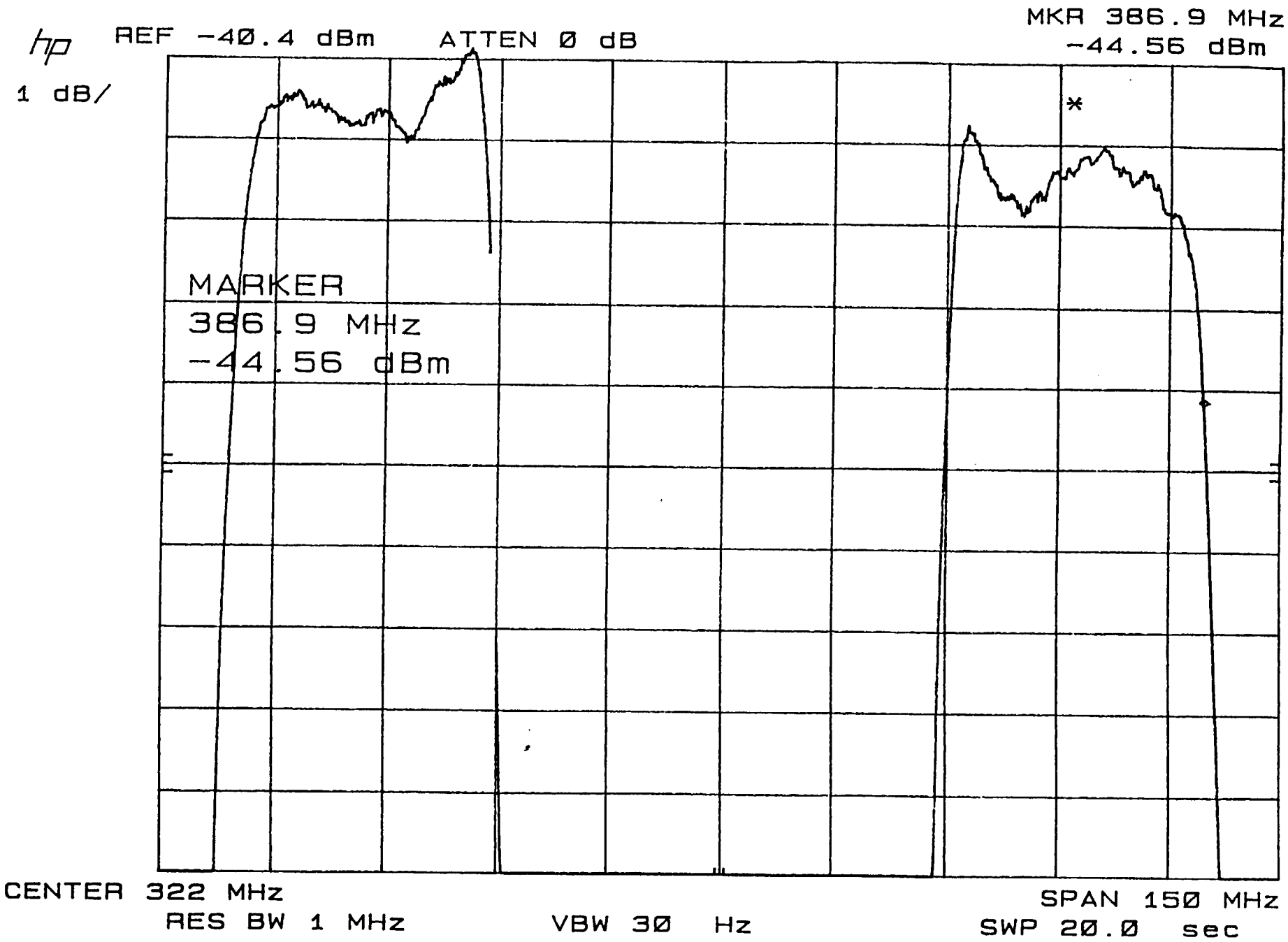
3/9/98 Ch. 10 40 dB BRF

FOR REFERENCE ONLY



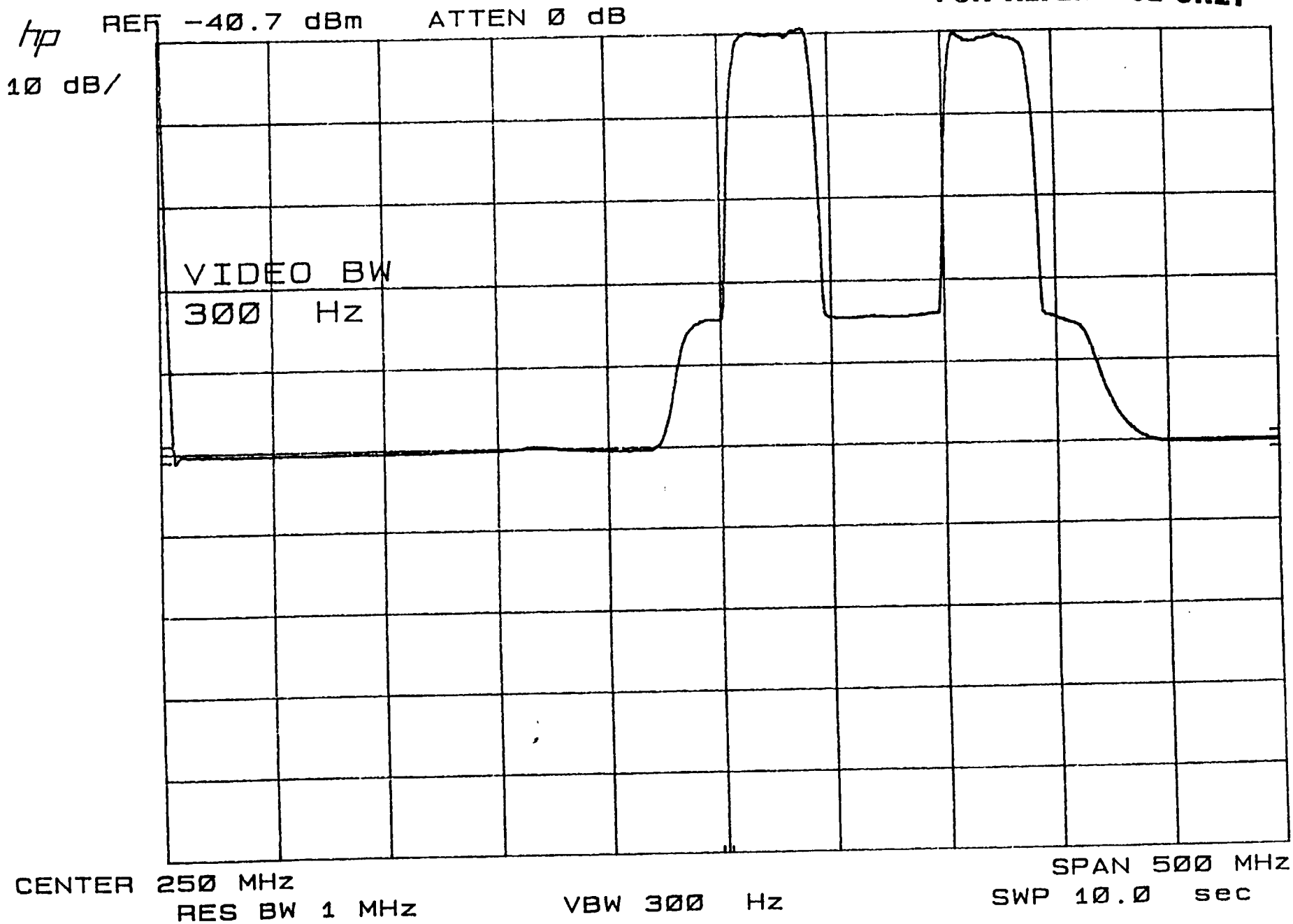
3/9/98 ch. 11 3-axis BR1

FOR REFERENCE ONLY



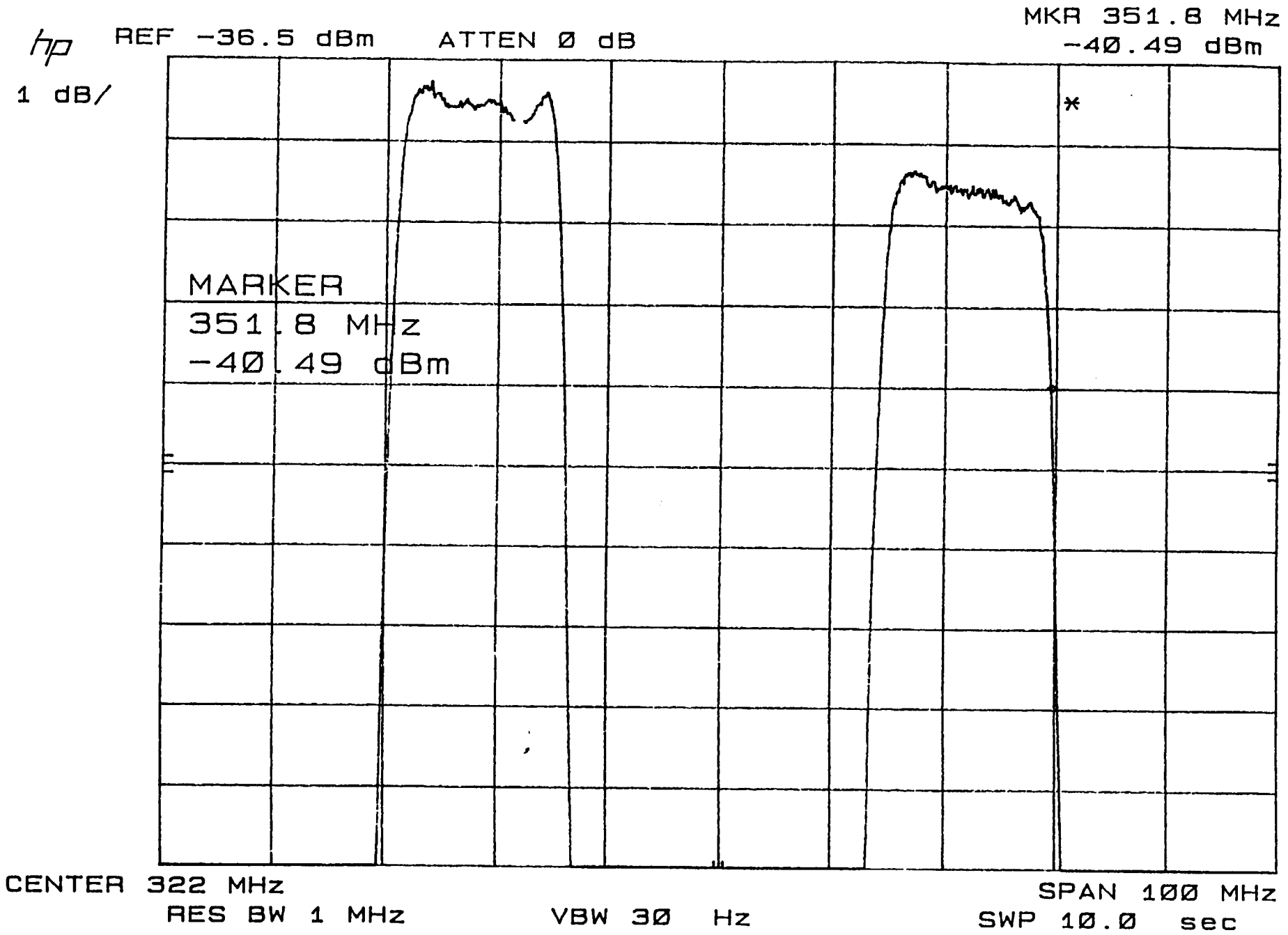
5/11/00 Ch 42 BPF 40dB

FOR REFERENCE ONLY



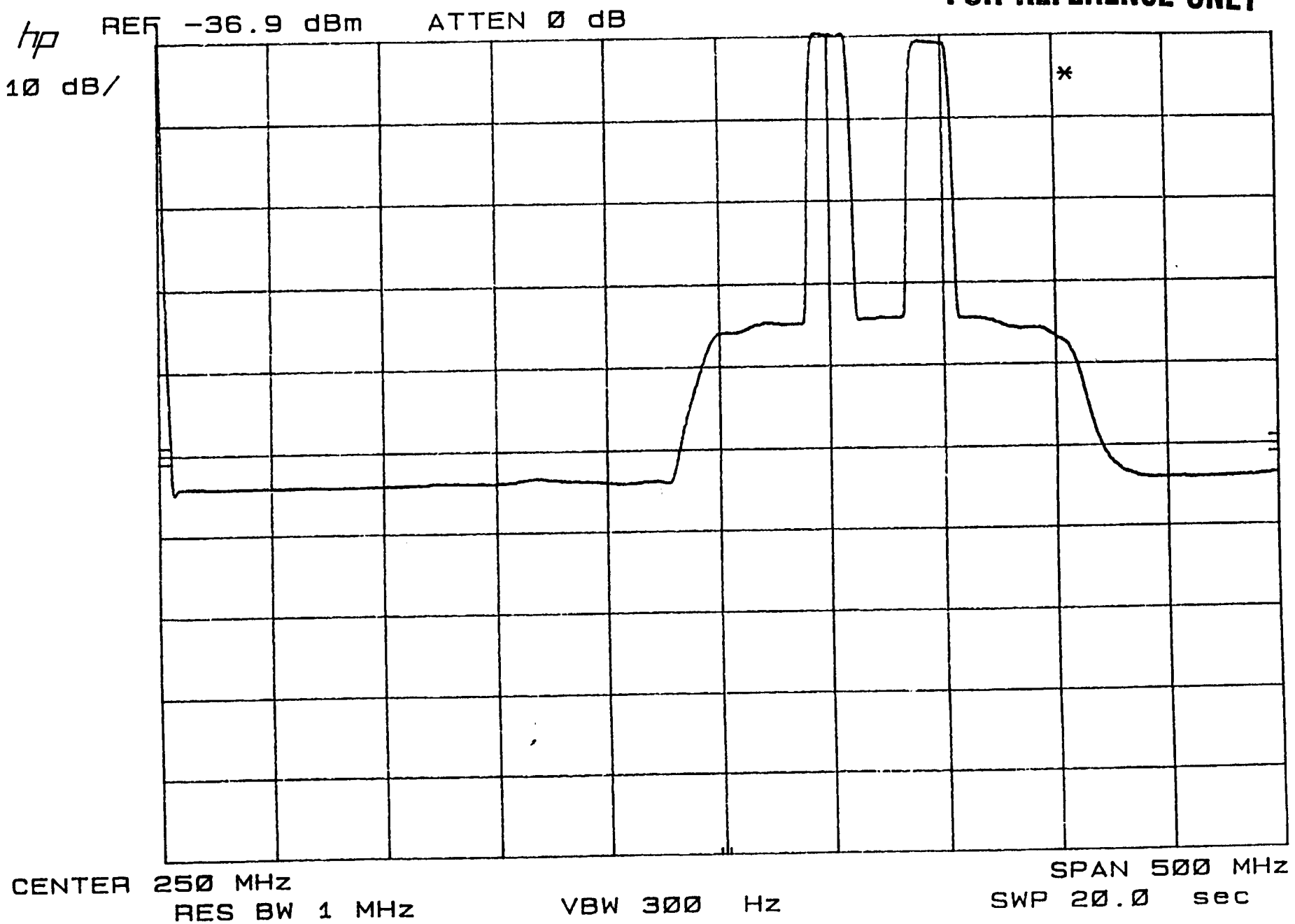
3/6, ch. 12 3-dB BW

FOR REFERENCE ONLY



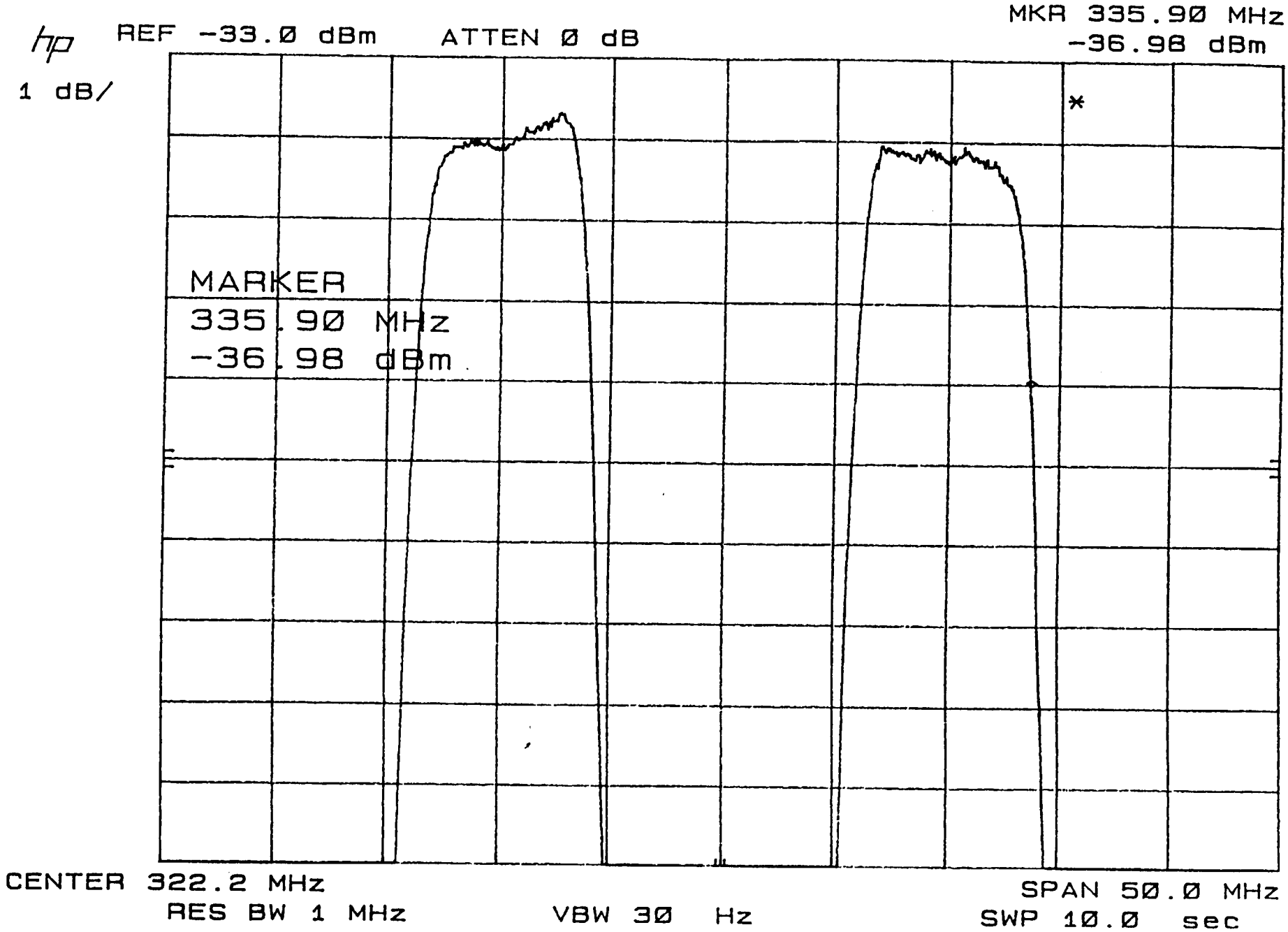
7/7/10 Ch. 12 V11

FOR REFERENCE ONLY



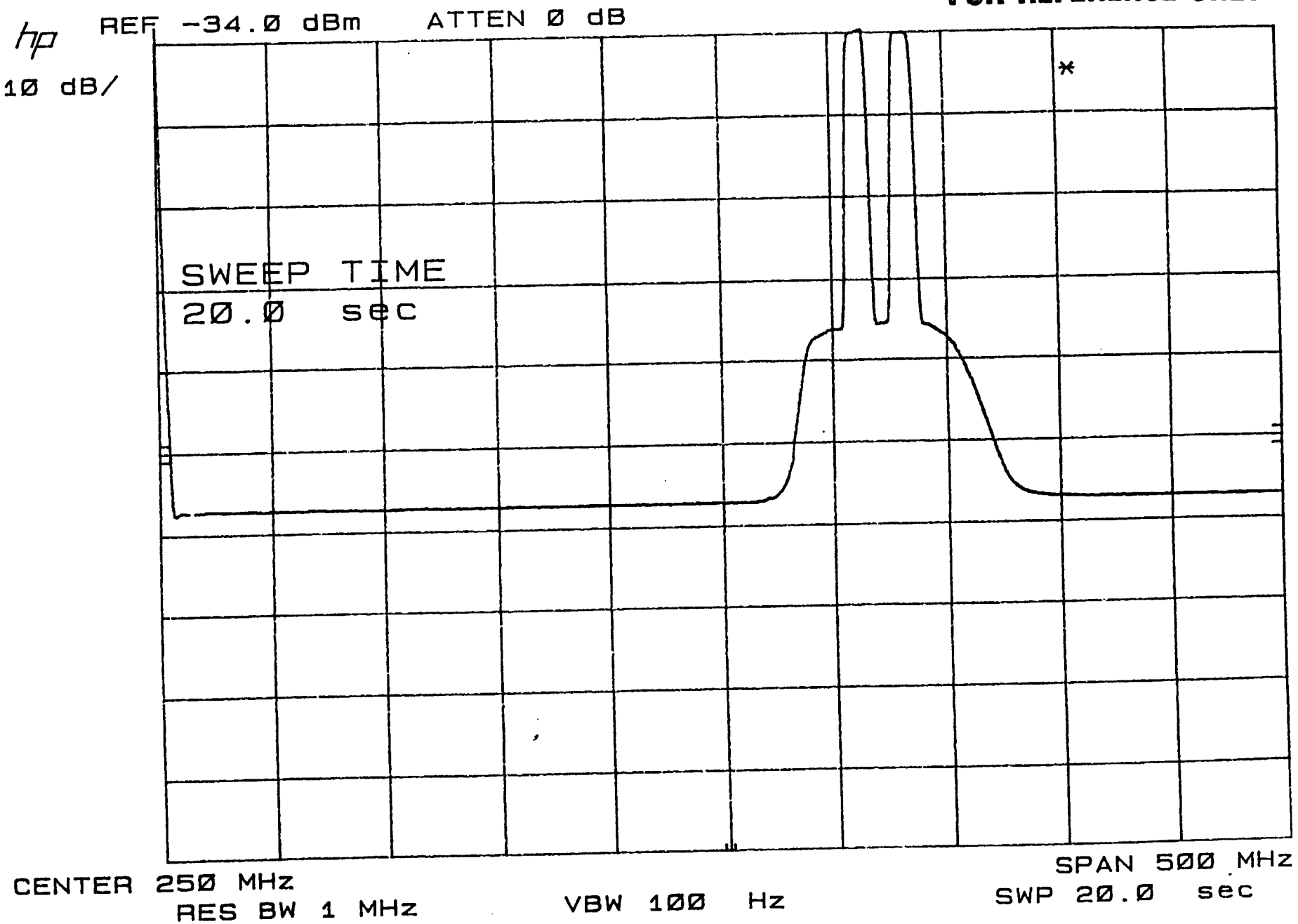
2/4/ ch. 13 3-dB BW

FOR REFERENCE ONLY



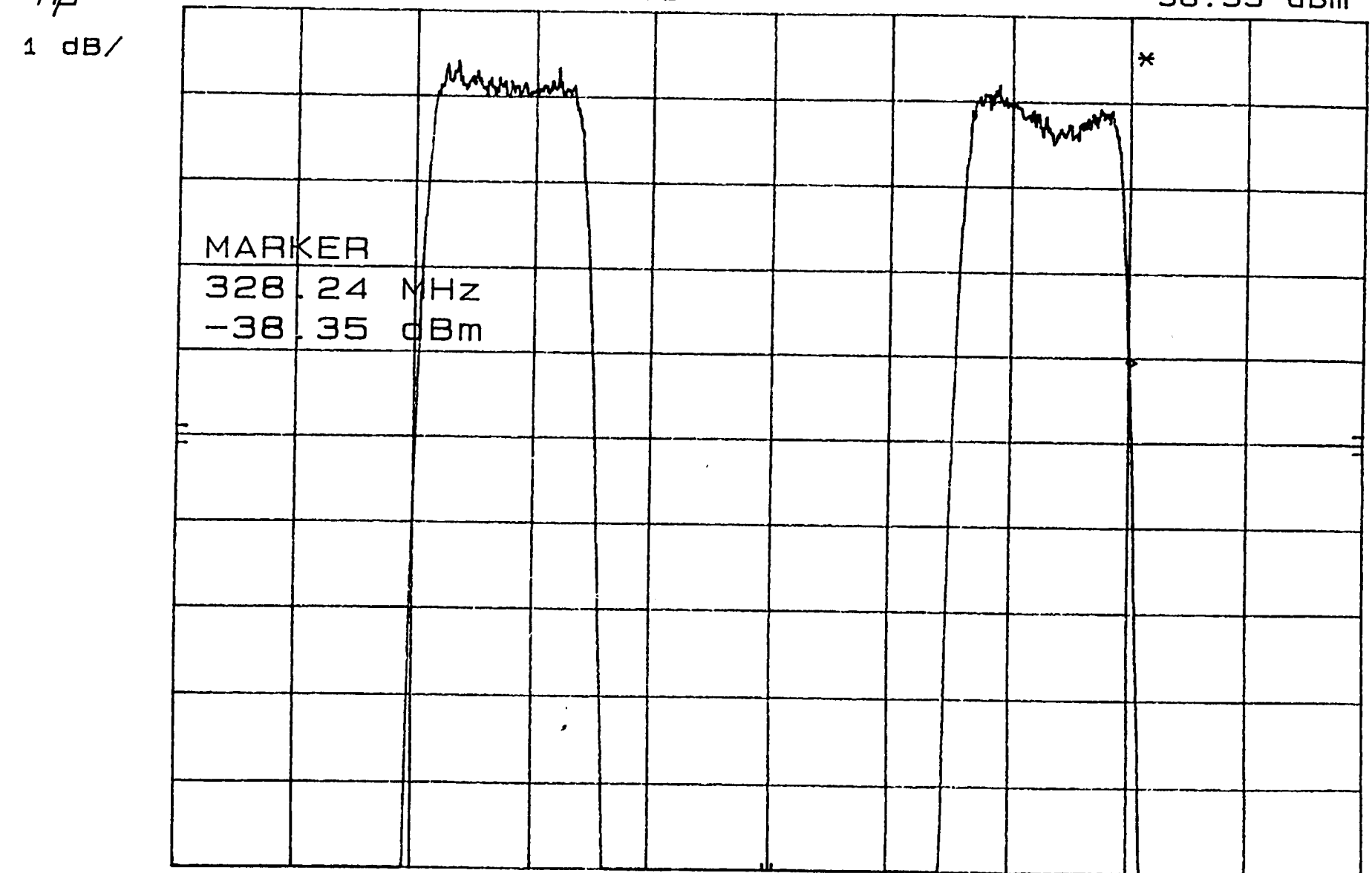
3/9/96 ch. 13 [illegible] dB att

FOR REFERENCE ONLY



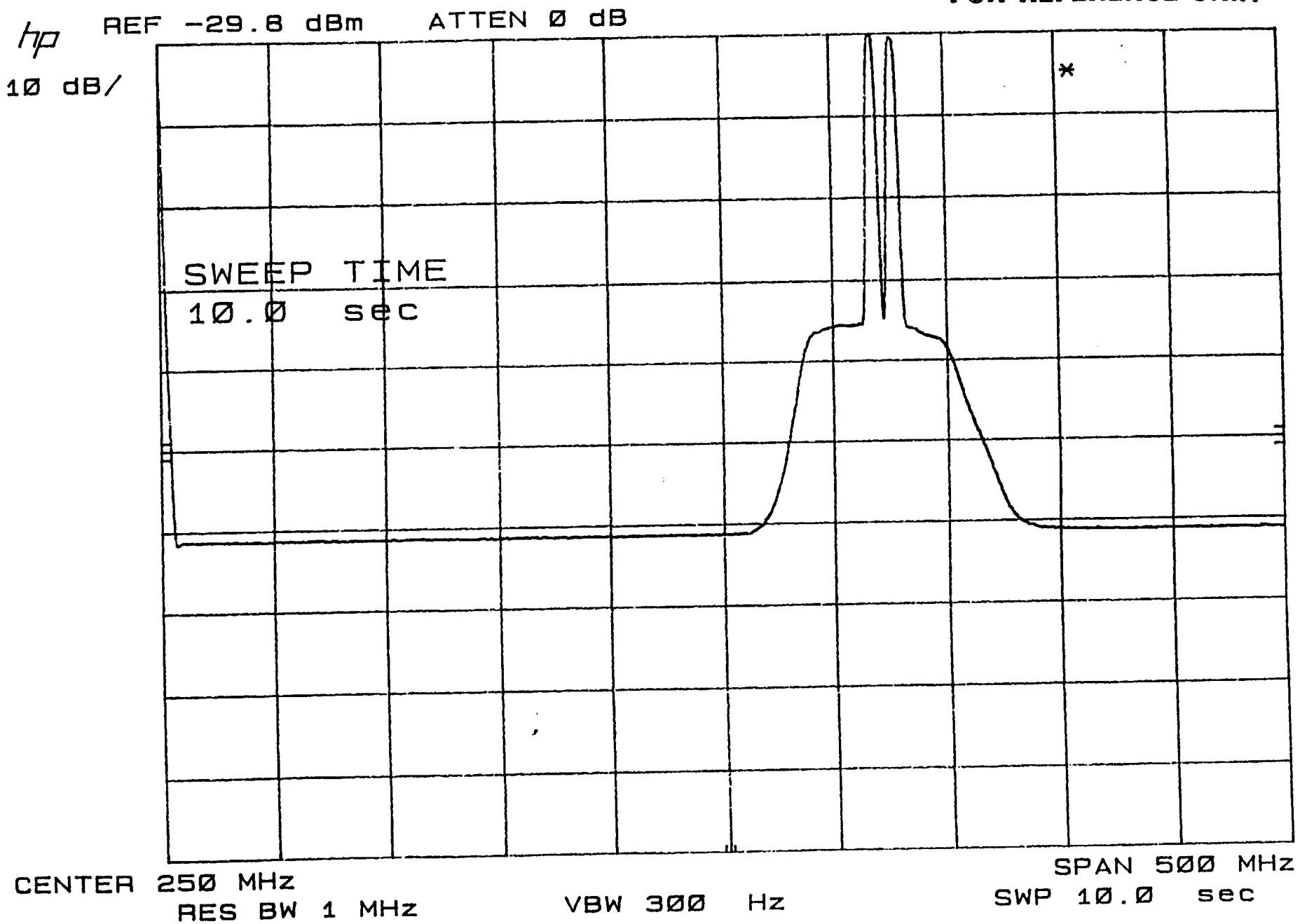
(9/98 ch. 14 3-dB BPF (

FOR REFERENCE ONLY



3/4/90 Ch. 14 DIF T...

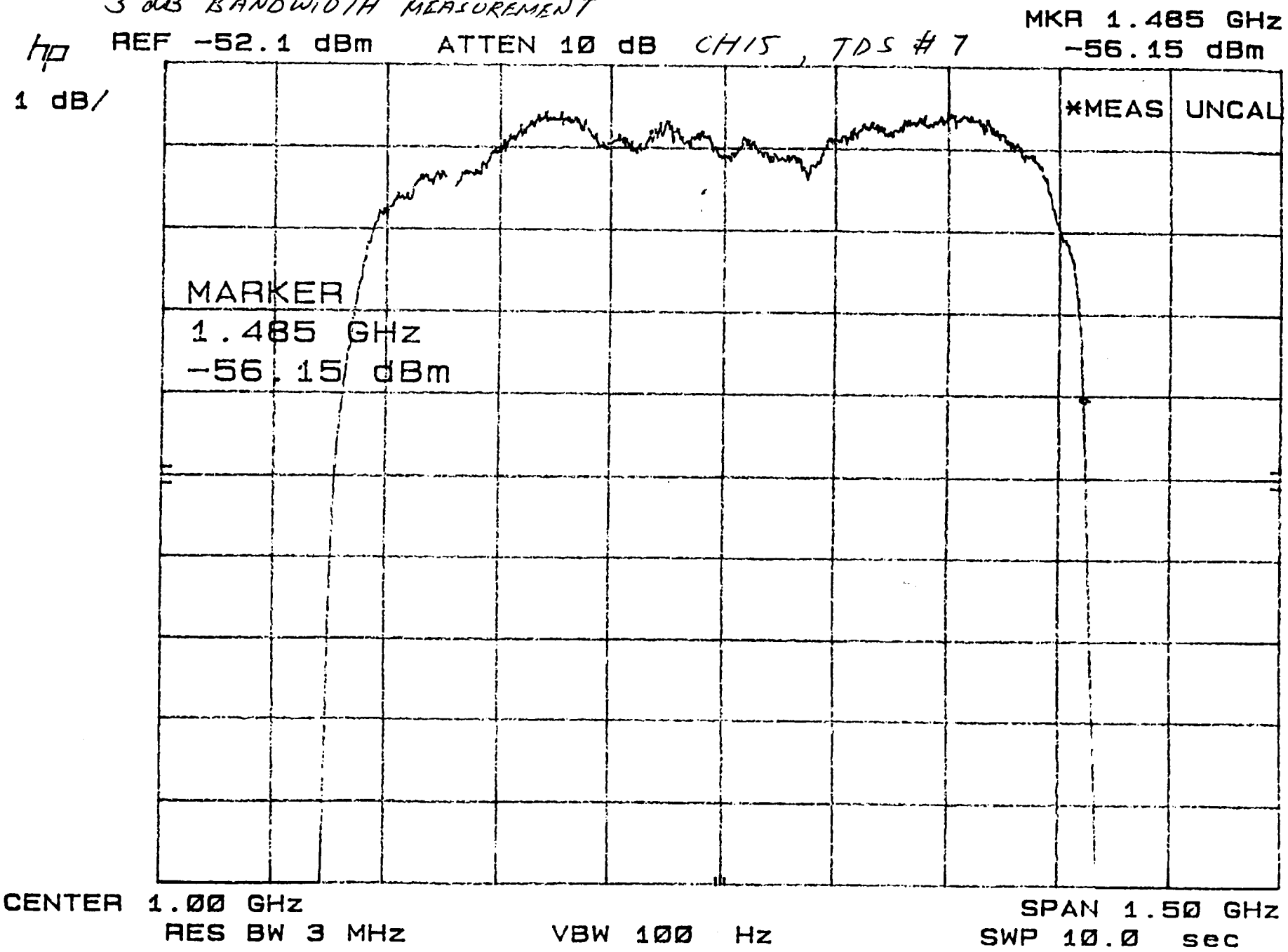
FOR REFERENCE ONLY



Mixer Part No. 1331562-20F/7A10
Isolator Part No. 1356680-8/05
3 dB BANDWIDTH MEASUREMENT

FOR REFERENCE ONLY

3/31/78



FOR REFERENCE ONLY

3/31/98

40 dB ~~STOP BAND~~ BANDWIDTH MEASUREMENT Mixer Part No. 1331562-20E/7A10
Isolator Part No. 1356680-8/05

T. Pan 3/31/98

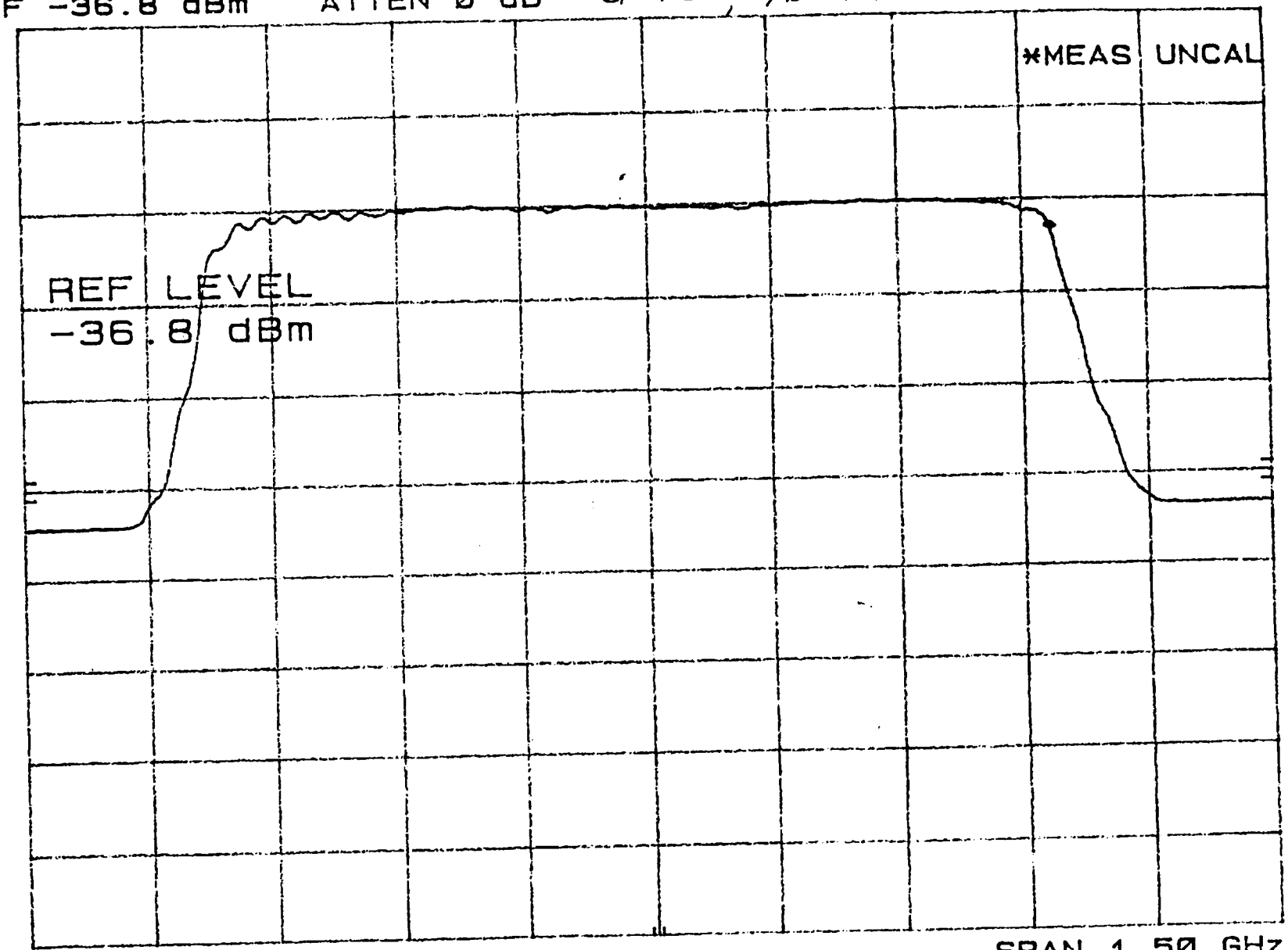
MKR 1.485 GHz
-59.70 dBm

REF -36.8 dBm ATTEN 0 dB CH 15, TDS # 7

hp

10 dB/

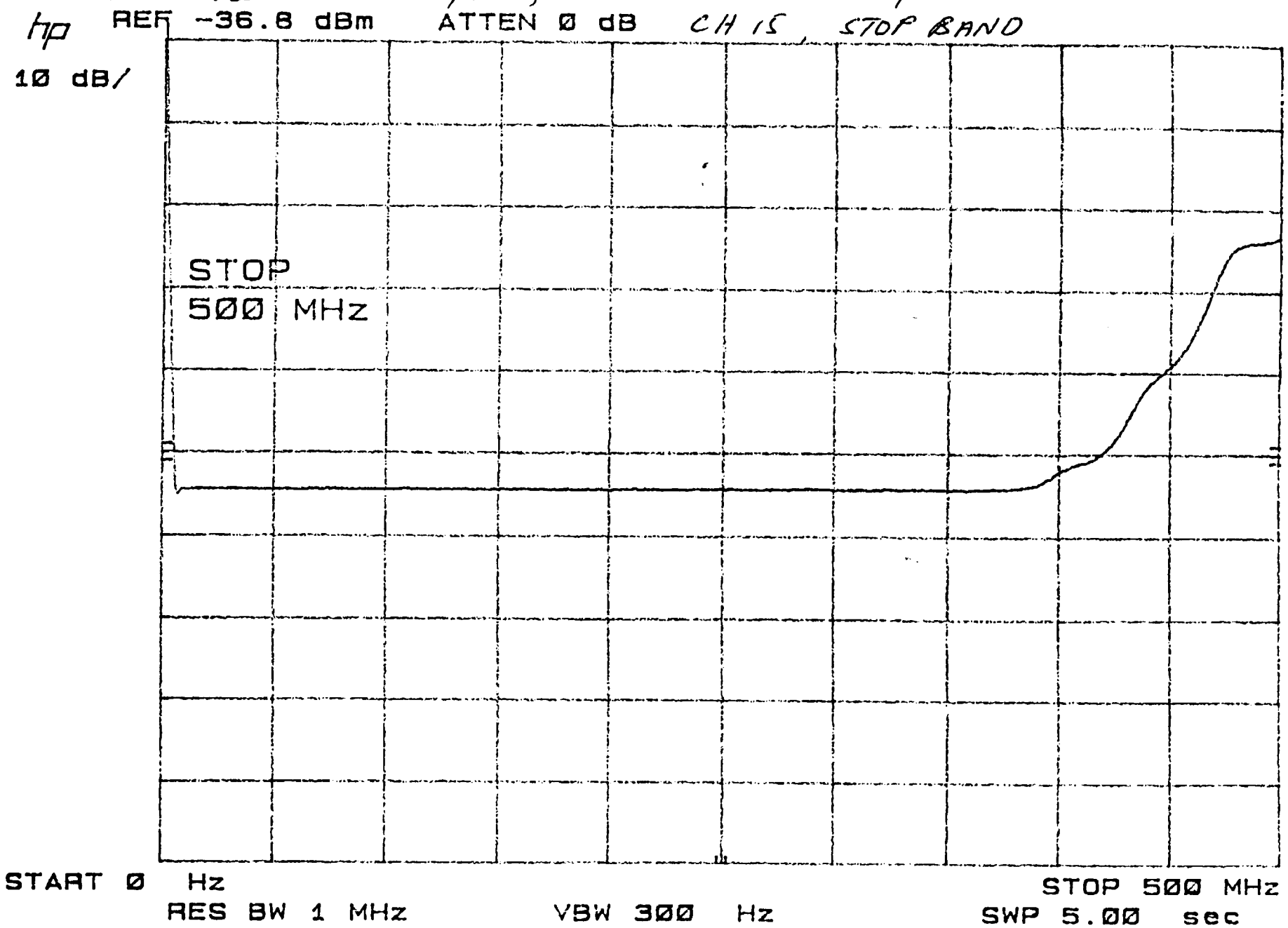
*MEAS UNCAL



CENTER 1.00 GHz
RES BW 1 MHz
VBW 300 Hz
SPAN 1.50 GHz
SWP 5.00 sec

FOR REFERENCE ONLY 3/31/98

Mixer Part No. 1331562-20F/7A10; Isolator Part No. 1356680-3/05



AMSU-A TEST

AMSU-A1-1, CH9, S/N F01, NF & NPS TEST DATA 3/10/98 (A1-2 HORN)

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.25	-.90111731	.00017686		
2	COLD TEST	79.35	-.63969649	.00017309	4.07656977	.01799079
3	WARM TEST	296.25	-.90145067	.00018567		
4	COLD TEST	79.35	-.63982171	.00016935	4.07470421	.04308342
5	WARM TEST	296.25	-.90183314	.00016710		
6	COLD TEST	79.35	-.64040712	.00014741	4.07996039	.05166987
7	WARM TEST	296.25	-.90175310	.00020683		
8	COLD TEST	79.35	-.64099639	.00016149	4.09079842	.08718101
9	WARM TEST	296.25	-.90163545	.00015815		
10	COLD TEST	79.35	-.64108868	.00017762	4.09375450	.06851781
11	WARM TEST	296.25	-.90163775	.00018403		
12	COLD TEST	79.35	-.64094411	.00014686	4.09129760	.03793818
13	WARM TEST	296.25	-.90158702	.00020246		
14	COLD TEST	79.35	-.64078857	.00016876	4.08929083	.07979472
15	WARM TEST	296.25	-.90156087	.00016873		
16	COLD TEST	79.35	-.64053818	.00016351	4.08539979	.04781021
17	WARM TEST	296.25	-.90144978	.00015468		
18	COLD TEST	79.35	-.64005300	.00018286	4.07858803	.07351372
19	WARM TEST	296.25	-.90127070	.00015401		
20	COLD TEST	79.35	-.64025288	.00015552	4.08407186	.07451265

CH. 9 ,155 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.08444825812

NOISE POWER STABILITY (K) = .0582012379421

NOISE POWER STABILITY DELTA (K) = .0691902228554

NPS_MAX (K) = .0871810133624 NPS_MIN (K) = .017990790507

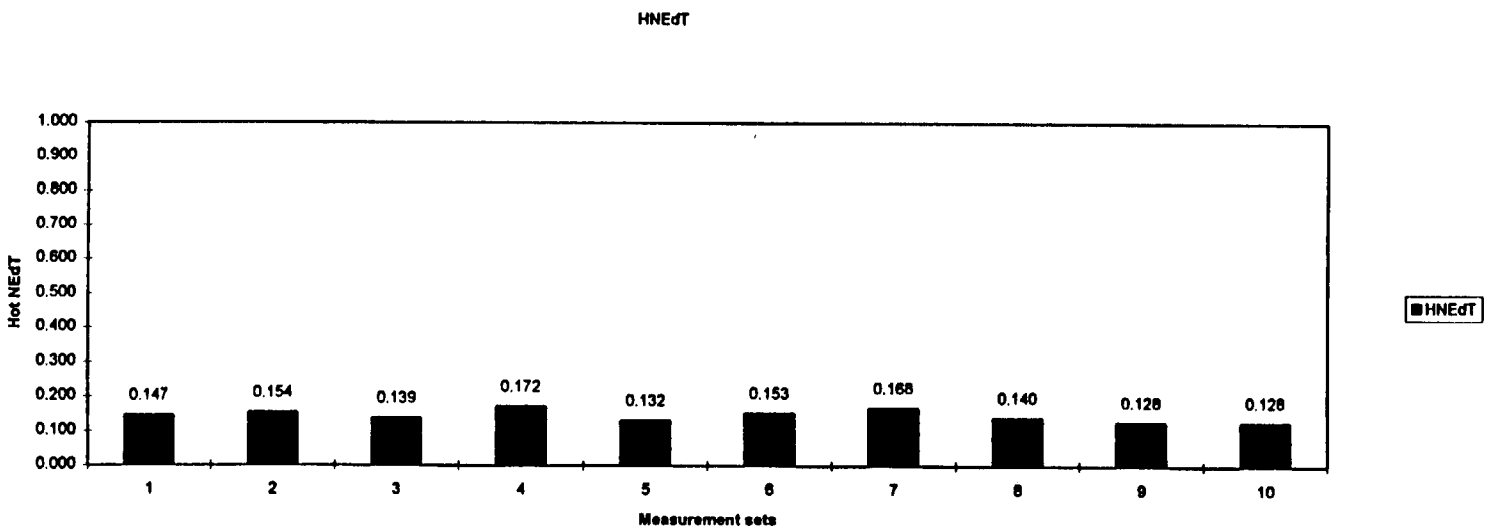
INTEGRATION TIME = .165

AMSU-A1-1, CH 9, S/N F01, FLIGHT RECEIVER SHELF (A1-2 HORN)

(BPF 155.0 MHZ & LO FREQUENCY 57.290321 GHZ)

3/10/98

												To	290						
												Thot	296.25	BandW	1.55E+08				
												Tcold	79.35	IntTime	0.165	overall			
												CHconst	6.1327E-06			expected			
Data	Description	Number Of	V Hot	V Hot	V Cold	V Cold	Scale Fac	Hot	Cold	Y Fact	Log(Y)	Noise Fig	Tsys	dTrec	theory	test			
		Samples	Mean	Std Dev	Mean	Std Dev	K/Volt	NEdT	NEdT		dB	dB	(K)	(K)	dG/G	NEdT			
Data	Description	Samples	MeanVh	StdDevVh	MeanVc	StdDevVc	ScalFac	HNEdT	CNEdT	YFact	NPS	NFdB	Tsys	dTrec	theorydG/G	testNEdT	Wload	Cload	
		100	-0.9011173	0.000176860	-0.63969649	0.000173090	829.6967319	0.147	0.144	1.408663834	0.018	4.077	747.6540871	0.148	0.160	0.218	296.25	79.35	
		100	-0.9014507	0.000185670	-0.63982171	0.000169350	829.0366632	0.154	0.140	1.408909163	0.043	4.075	747.3356555	0.148	0.160	0.218	296.25	79.35	
		100	-0.9018331	0.000167100	-0.64040712	0.000147410	829.6802285	0.139	0.122	1.408218478	0.052	4.080	748.2331256	0.148	0.161	0.218	296.25	79.35	
		100	-0.9017531	0.000206830	-0.64099639	0.000161490	831.8098506	0.172	0.134	1.406799030	0.087	4.091	750.0871114	0.148	0.161	0.219	296.25	79.35	
		100	-0.9016355	0.000158150	-0.64108868	0.000177620	832.4800956	0.132	0.148	1.406412994	0.069	4.094	750.5935656	0.148	0.161	0.219	296.25	79.35	
		100	-0.9016378	0.000184030	-0.64094411	0.000146860	832.0110916	0.153	0.122	1.406733810	0.038	4.091	750.1726086	0.148	0.161	0.219	296.25	79.35	
		100	-0.9015870	0.000202460	-0.64078857	0.000168760	831.676722	0.168	0.140	1.406996102	0.080	4.089	749.8289374	0.148	0.161	0.219	296.25	79.35	
		100	-0.9015609	0.000168730	-0.64053818	0.000163510	830.9622432	0.140	0.136	1.407505279	0.048	4.085	749.1630429	0.148	0.161	0.219	296.25	79.35	
		100	-0.9014498	0.000154680	-0.64005300	0.000182860	829.773037	0.128	0.152	1.408398648	0.074	4.079	747.9987216	0.148	0.161	0.218	296.25	79.35	
		100	-0.9012707	0.000154010	-0.64025288	0.000155520	830.977747	0.128	0.129	1.407679259	0.075	4.084	748.9358958	0.148	0.161	0.219	296.25	79.35	
	AVERAGE		-0.9015296	0.000175852	-0.64045871	0.000164647	830.8104411	0.146	0.137	1.407631660	0.058	4.084	749.0002752	0.148	0.161	0.219	296.25	79.35	



AMSU-A TEST

AMSU-A1-1, CH10, S/N F01, NF & NPS TEST DATA 3/10/98 (A1-2 HORN)

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.45	-.99445749	.00033265		
2	COLD TEST	79.25	-.70930953	.00021557	4.13263932	.14006357
3	WARM TEST	296.45	-.99330582	.00030027		
4	COLD TEST	79.25	-.70810714	.00022433	4.12678460	.08849221
5	WARM TEST	296.45	-.99259453	.00027892		
6	COLD TEST	79.25	-.70767305	.00021674	4.12790631	.02685942
7	WARM TEST	296.45	-.99207144	.00029285		
8	COLD TEST	79.25	-.70652569	.00021878	4.11601036	.07331307
9	WARM TEST	296.45	-.99160440	.00028858		
10	COLD TEST	79.25	-.70511391	.00021584	4.09947866	.06287410
11	WARM TEST	296.45	-.99120834	.00029896		
12	COLD TEST	79.25	-.70575587	.00024863	4.11362888	.08688015
13	WARM TEST	296.45	-.99105303	.00028717		
14	COLD TEST	79.25	-.70599088	.00024885	4.11893621	.05976745
15	WARM TEST	296.45	-.99086518	.00030805		
16	COLD TEST	79.25	-.70514462	.00023824	4.10800011	.10370172
17	WARM TEST	296.45	-.99073988	.00027177		
18	COLD TEST	79.25	-.70507142	.00024205	4.10824506	.03729737
19	WARM TEST	296.45	-.99070411	.00028269		
20	COLD TEST	79.25	-.70584894	.00024235	4.12057553	.04607434

CH. 10 ,78 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.11723146539

NOISE POWER STABILITY (K) = .0725323386736

NOISE POWER STABILITY DELTA (K) = .11320415061

NPS_MAX (K) = .140063567384 NPS_MIN (K) = .0268594167745

INTEGRATION TIME = .165

AMSU-A TEST

AMSU-A1-1,CH10,S/N F01, NF & NPS TEST DATA 3/10/98 (A1-2 HORN

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.45	-.99076401	.00023354	----------	---------
2	COLD TEST	79.25	-.70697757	.00023323	4.13730534	.11282369
3	WARM TEST	296.45	-.99053124	.00028750	----------	---------
4	COLD TEST	79.25	-.70738781	.00026661	4.14621213	.06145452
5	WARM TEST	296.45	-.99037493	.00027888	----------	---------
6	COLD TEST	79.25	-.70751807	.00020797	4.14995622	.03037386
7	WARM TEST	296.45	-.99027938	.00026465	----------	---------
8	COLD TEST	79.25	-.70660585	.00020771	4.13690524	.06009073
9	WARM TEST	296.45	-.99017142	.00026638	----------	---------
10	COLD TEST	79.25	-.70720311	.00023046	4.14733052	.05546003
11	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 10 ,78 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.14354524042

NOISE POWER STABILITY (K) = .0640405669145

NOISE POWER STABILITY DELTA (K) = .0824498309672

NPS_MAX (K) = .112823692061 NPS_MIN (K) = .0303738610938

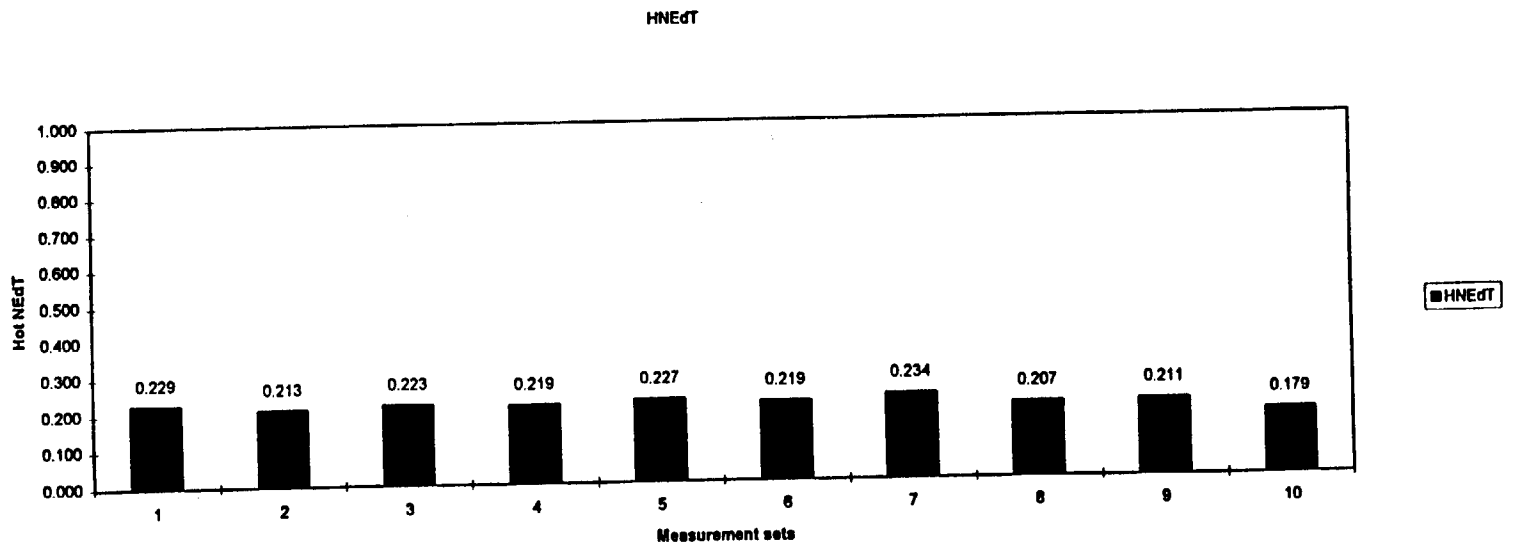
INTEGRATION TIME = .165

AMSU-A1-1, CH10, S/N F01, FLIGHT RECEIVER SHELF (A1-2 HORN)

(BPF 78.0 MHZ & LO FREQUENCY 57.290321 GHZ)

3/10/98

												To	290					
												Thot	296.45	BandW	7.80E+07			
												Tcold	79.25	IntTime	0.165	overall		
												CHconst	6.1327E-06			expected		
Data	Description	Number Of Samples	V Hot Mean	V Hot Std Dev	V Cold Mean	V Cold Std Dev	Scale Fac K/Volt	Hot NEdT	Cold NEdT	Y Fact	Log(Y) dB	Noise Fig dB	Tsys (K)	dTrec (K)	theory dG/G	test NEdT		
Data	Description	Samples	MeanVh	StdDevVh	MeanVc	StdDevVc	ScalFac	HNEdT	CNEdT	YFact	NPS	NFdB	Tsys	dTrec	theorydG/G	testNEdT	Wload	Cload
		100	-0.9933058	0.000300270	-0.70810714	0.000224330	761.5743523	0.229	0.171	1.402762045	0.088	4.127	756.4762365	0.211	0.162	0.266	296.45	79.25
		100	-0.9925945	0.000278920	-0.70767305	0.000216740	762.3152877	0.213	0.165	1.402617395	0.027	4.128	756.6699847	0.211	0.162	0.266	296.45	79.25
		100	-0.9920714	0.000292850	-0.70652569	0.000218780	760.6486876	0.223	0.166	1.404154802	0.073	4.116	754.6178389	0.210	0.162	0.265	296.45	79.25
		100	-0.9916044	0.000288580	-0.70511391	0.000215840	758.1403487	0.219	0.164	1.406303841	0.063	4.099	751.7753056	0.210	0.161	0.264	296.45	79.25
		100	-0.9912083	0.000298960	-0.70575587	0.000248630	760.897252	0.227	0.189	1.404463473	0.087	4.114	754.2077021	0.210	0.162	0.265	296.45	79.25
		100	-0.9910530	0.000287170	-0.70599088	0.000248850	761.939107	0.219	0.190	1.403775967	0.060	4.119	755.1220606	0.210	0.162	0.266	296.45	79.25
		100	-0.9908652	0.000308050	-0.70514462	0.000238240	760.1833064	0.234	0.181	1.405194271	0.104	4.108	753.2391687	0.210	0.162	0.265	296.45	79.25
		100	-0.9907399	0.000271770	-0.70507142	0.000242050	760.321948	0.207	0.184	1.405162444	0.037	4.108	753.2812756	0.210	0.162	0.265	296.45	79.25
		100	-0.9970411	0.000282690	-0.70584894	0.000243500	745.8992028	0.211	0.182	1.412541754	0.039	4.052	743.6921616	0.207	0.160	0.262	296.45	79.25
		100	-0.9907640	0.000233540	-0.70697757	0.000233230	765.3642648	0.179	0.179	1.401407982	0.113	4.137	758.2953681	0.211	0.163	0.267	296.45	79.25
	AVERAGE		-0.9921248	0.000284280	-0.70622091	0.000233019	759.7283757	0.216	0.177	1.404838397	0.069	4.111	753.7377102	0.210	0.162	0.265	296.45	79.25



AMSU-A TEST

AMSU-A1-1, CH11,S/N F01, NF & NPS TEST DATA 3/10/98 (A1-2 HORN)

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.65	-.95982244	.00030066	----------	---------
2	COLD TEST	79.15	-.70271250	.00019227	4.43561737	.09590036
3	WARM TEST	296.65	-.95919264	.00029540	----------	---------
4	COLD TEST	79.15	-.70155891	.00023797	4.42383142	.08365316
5	WARM TEST	296.65	-.95888688	.00027262	----------	---------
6	COLD TEST	79.15	-.70053917	.00022966	4.41031665	.04668540
7	WARM TEST	296.65	-.95862335	.00030513	----------	---------
8	COLD TEST	79.15	-.69931701	.00024528	4.39289405	.10527090
9	WARM TEST	296.65	-.95857590	.00028185	----------	---------
10	COLD TEST	79.15	-.69958556	.00021357	4.39801707	.03843619
11	WARM TEST	296.65	-.95842857	.00027084	----------	---------
12	COLD TEST	79.15	-.69959472	.00019922	4.39999081	.05293635
13	WARM TEST	296.65	-.95835245	.00030082	----------	---------
14	COLD TEST	79.15	-.70040673	.00024661	4.41469451	.09681991
15	WARM TEST	296.65	-.95855172	.00029418	----------	---------
16	COLD TEST	79.15	-.70135062	.00021151	4.42826400	.08112132
17	WARM TEST	296.65	-.95851784	.00026077	----------	---------
18	COLD TEST	79.15	-.70008852	.00025106	4.40724789	.08130895
19	WARM TEST	296.65	-.95847491	.00030336	----------	---------
20	COLD TEST	79.15	-.69973525	.00023149	4.40179625	.10191983

CH. 11 ,72 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.41128771706

NOISE POWER STABILITY (K) = .0784052374701

NOISE POWER STABILITY DELTA (K) = .0668347125602

NPS_MAX (K) = .105270903315 NPS_MIN (K) = .0384361907545

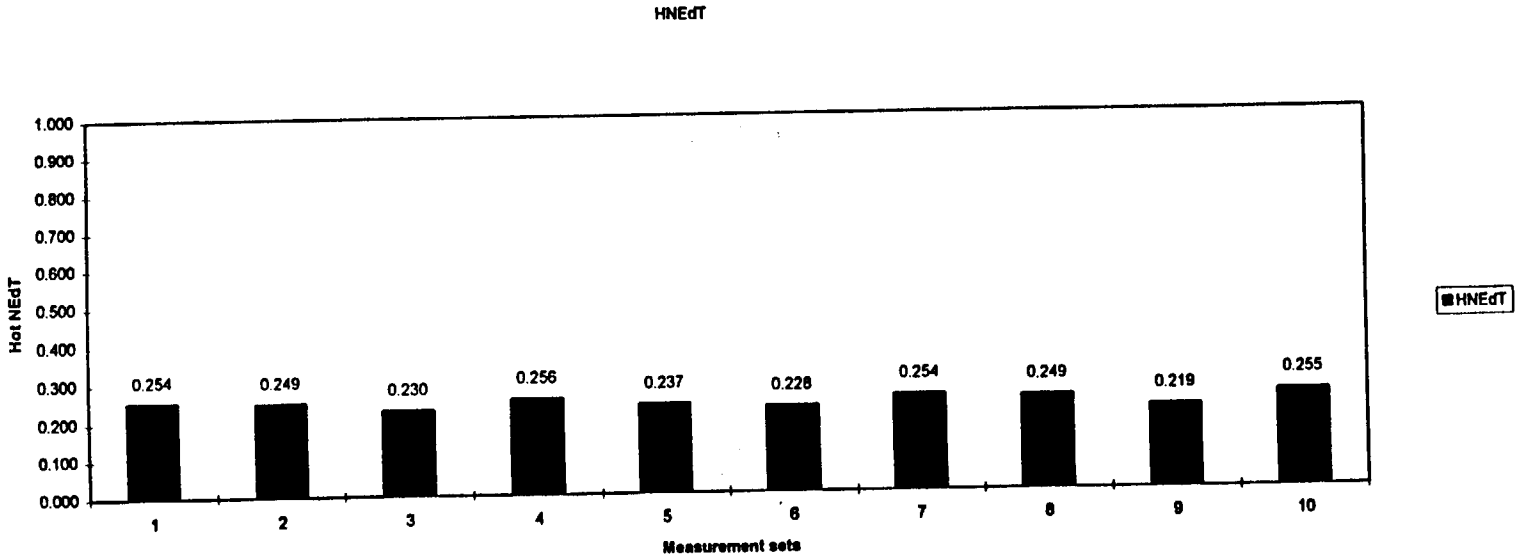
INTEGRATION TIME = .165

AMSU-A1-1, CH11, S/N F01, FLIGHT RECEIVER SHELF (A1-2 HORN)

(BPF 72.0 MHZ & LO FREQUENCY 57.290321 GHZ)

3/10/98

												To	290					
												Thot	296.65	BandW	7.20E+07			
												Tcold	79.15	IntTime	0.165	overall		
												CHconst	6.1327E-06			expected		
Data	Description	Number Of	V Hot	V Hot	V Cold	V Cold	Scale Fac	Hot	Cold	Y Fact	Log(Y)	Noise Fig	Tsys	dTrec	theory	test		
		Samples	Mean	Std Dev	Mean	Std Dev	K/Volt	NEdT	NEdT		dB	dB	(K)	(K)	dG/G	NEdT		
Data	Description	Samples	MeanVh	StdDevVh	MeanVc	StdDevVc	ScalFac	HNEdT	CNEdT	YFact	NPS	NFdB	Tsys	dTrec	theorydG/G	testNEdT	Wload	Cload
		100	-0.9598224	0.000300660	-0.70271250	0.000192270	845.9416233	0.254	0.163	1.365882121	0.096	4.436	811.9537529	0.236	0.174	0.293	296.65	79.15
		100	-0.9591926	0.000295400	-0.70155891	0.000237970	844.2217562	0.249	0.201	1.367230358	0.084	4.424	809.7712951	0.235	0.174	0.292	296.65	79.15
		100	-0.9588869	0.000272620	-0.70053917	0.000229660	841.8886314	0.230	0.193	1.368784104	0.047	4.410	807.2759631	0.234	0.173	0.291	296.65	79.15
		100	-0.9586234	0.000305130	-0.69931701	0.000245280	838.7762521	0.256	0.206	1.370799418	0.105	4.393	804.0705006	0.233	0.173	0.290	296.65	79.15
		100	-0.9585759	0.000281850	-0.69958556	0.000213570	839.799662	0.237	0.179	1.370205383	0.038	4.398	805.0117168	0.234	0.173	0.291	296.65	79.15
		100	-0.9584286	0.000270840	-0.69959472	0.000199220	840.3074018	0.228	0.167	1.369976849	0.053	4.400	805.3746215	0.234	0.173	0.291	296.65	79.15
		100	-0.9583525	0.000300820	-0.70040673	0.000246610	843.2003606	0.254	0.208	1.368280028	0.097	4.415	808.0832073	0.234	0.173	0.292	296.65	79.15
		100	-0.9585517	0.000294018	-0.70135062	0.000211510	845.6417955	0.249	0.179	1.366722567	0.081	4.428	810.5913975	0.235	0.174	0.293	296.65	79.15
		100	-0.9585178	0.000260770	-0.70008852	0.000251060	841.6227694	0.219	0.211	1.369138063	0.081	4.407	806.7104390	0.234	0.173	0.291	296.65	79.15
		100	-0.9584749	0.000303360	-0.69973525	0.000231490	840.6133022	0.255	0.195	1.369767937	0.102	4.402	805.7067592	0.234	0.173	0.291	296.65	79.15
	AVERAGE		-0.9587427	0.000288547	-0.70048890	0.000225864	842.2013554	0.243	0.190	1.368678683	0.078	4.411	807.4549653	0.234	0.173	0.291	296.65	79.15



AMSU-A TEST

AMSU-A1-1, CH12, S/N F01, NF & NPS TEST DATA 3/10/98 (A1-2 HORN)

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.65	-1.08756210	.00045309	----------	----------
2	COLD TEST	79.15	-.79466918	.00036845	4.41215619	.10160599
3	WARM TEST	296.65	-1.08664766	.00049166	----------	----------
4	COLD TEST	79.15	-.79337433	.00035905	4.40278882	.09975466
5	WARM TEST	296.65	-1.08591662	.00045848	----------	----------
6	COLD TEST	79.15	-.79237843	.00032726	4.39588882	.08492224
7	WARM TEST	296.65	-1.08552235	.00043182	----------	----------
8	COLD TEST	79.15	-.79369504	.00037664	4.41989636	.14279367
9	WARM TEST	296.65	-1.08554840	.00049563	----------	----------
10	COLD TEST	79.15	-.79294342	.00036605	4.40834772	.11141294
11	WARM TEST	296.65	-1.08551615	.00049647	----------	----------
12	COLD TEST	79.15	-.79311243	.00037958	4.41123057	.11356791
13	WARM TEST	296.65	-1.08553792	.00046453	----------	----------
14	COLD TEST	79.15	-.79330257	.00034695	4.41384062	.06398906
15	WARM TEST	296.65	-1.08553439	.00050193	----------	----------
16	COLD TEST	79.15	-.79288744	.00036198	4.40766317	.12603666
17	WARM TEST	296.65	-1.08547702	.00045562	----------	----------
18	COLD TEST	79.15	-.79401787	.00035084	4.42524129	.09310618
19	WARM TEST	296.65	-1.08560556	.00048661	----------	----------
20	COLD TEST	79.15	-.79296153	.00033754	4.40799394	.08660166

CH. 12 ,32 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.41051179495

NOISE POWER STABILITY (K) = .102379098062

NOISE POWER STABILITY DELTA (K) = .0788046106446

NPS_MAX (K) = .142793670174 NPS_MIN (K) = .0639890595291

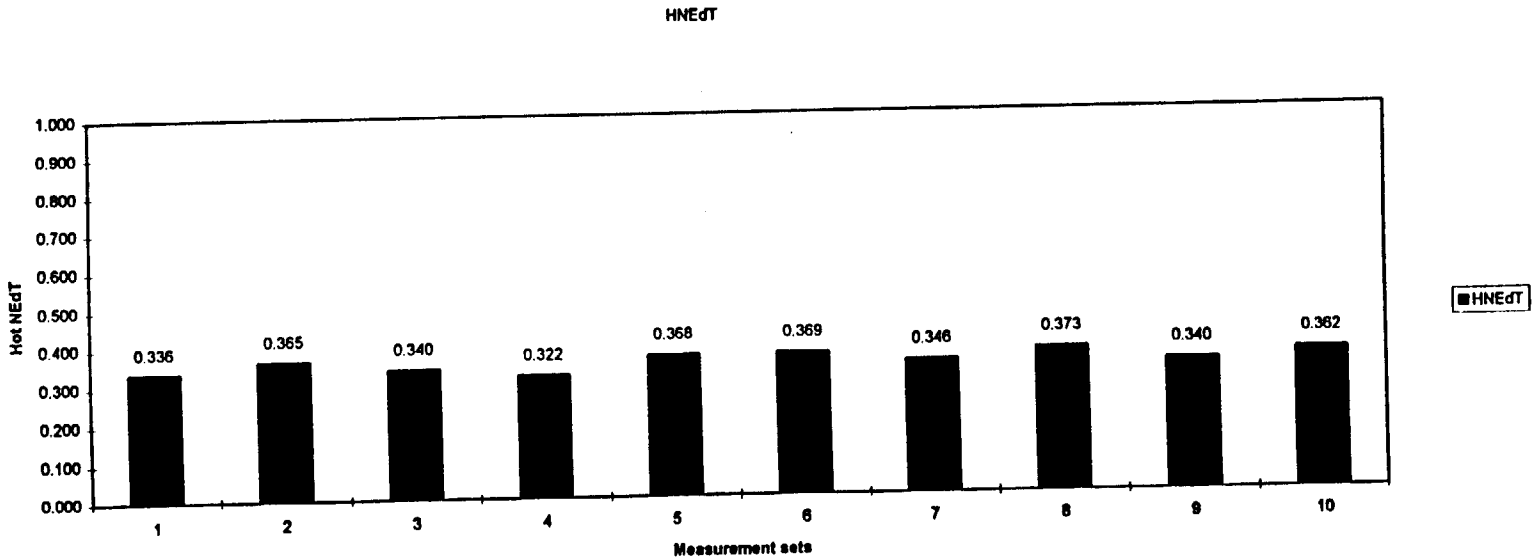
INTEGRATION TIME = .165

AMSU-A1-1, CH12, S/N F01, FLIGHT RECEIVER SHELF (A1-2 HORN)

(BPF 32.0 MHZ & LO FREQUENCY 57.290321 GHZ)

3/10/98

												To	290						
												Thot	296.65	BandW	3.20E+07				
												Tcold	79.15	IntTime	0.165	overall			
												CHconst	6.1327E-06			expected			
Data	Description	Number Of	V Hot	V Hot	V Cold	V Cold	Scale Fac	Hot	Cold	Y Fact	Log(Y)	Noise Fig	Tsys	dTrec	theory	test			
		Samples	Mean	Std Dev	Mean	Std Dev	K/Volt	NEdT	NEdT		dB	dB	(K)	(K)	dG/G	NEdT			
Data	Description	Samples	MeanVh	StdDevVh	MeanVc	StdDevVc	ScalFac	HNEdT	CNEdT	YFact	NPS	NFdB	Tsys	dTrec	theorydG/G	testNEdT	Wload	Cload	
		100	-1.0875621	0.000453090	-0.79466918	0.000368450	742.5922074	0.336	0.274	1.368572140	0.102	4.412	807.6151405	0.351	0.173	0.392	296.65	79.15	
		100	-1.0866477	0.000491660	-0.79337433	0.000359050	741.628978	0.365	0.266	1.369653162	0.100	4.403	805.8893935	0.351	0.173	0.391	296.65	79.15	
		100	-1.0859166	0.000458480	-0.79237843	0.000327260	740.9598049	0.340	0.242	1.370452020	0.085	4.396	804.6205669	0.350	0.173	0.390	296.65	79.15	
		100	-1.0855224	0.000431820	-0.79369504	0.000376640	745.3037894	0.322	0.281	1.367681912	0.143	4.420	809.0439210	0.352	0.174	0.393	296.65	79.15	
		100	-1.0855484	0.000495630	-0.79294342	0.000366050	743.3229605	0.368	0.272	1.369011171	0.111	4.408	806.9130505	0.351	0.173	0.392	296.65	79.15	
		100	-1.0855162	0.000496470	-0.79311243	0.000379580	743.834586	0.369	0.282	1.368678776	0.114	4.411	807.4444560	0.351	0.173	0.392	296.65	79.15	
		100	-1.0855379	0.000464530	-0.79330257	0.000346950	744.2631427	0.346	0.258	1.368378171	0.064	4.414	807.9258639	0.352	0.173	0.392	296.65	79.15	
		100	-1.0855344	0.000501930	-0.79288744	0.000361980	743.2163568	0.373	0.269	1.369090157	0.126	4.408	806.7869145	0.351	0.173	0.391	296.65	79.15	
		100	-1.0854770	0.000455620	-0.79401787	0.000350840	746.2452285	0.340	0.262	1.367068754	0.093	4.425	810.0320469	0.353	0.174	0.393	296.65	79.15	
		100	-1.0856056	0.000486610	-0.79296153	0.000337540	743.2237726	0.362	0.251	1.369051989	0.087	4.408	806.8478598	0.351	0.173	0.392	296.65	79.15	
	AVERAGE		-1.0858868	0.000473584	-0.79333422	0.000357434	743.4590827	0.352	0.266	1.368763825	0.102	4.411	807.3119213	0.351	0.173	0.392	296.65	79.15	



AMSU-A TEST

AMSU-A1-1, CH13, S/N F01, NF & NPS TEST DATA 3/10/98 (A1-2 HORN)

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.75	-.92768776	.00071508	----------	---------
2	COLD TEST	79.15	-.66797247	.00046465	4.24377145	.36070780
3	WARM TEST	296.75	-.92372051	.00064549	----------	---------
4	COLD TEST	79.15	-.66520216	.00041790	4.24523303	.25731037
5	WARM TEST	296.75	-.92141573	.00057935	----------	---------
6	COLD TEST	79.15	-.66407333	.00040632	4.25426211	.10021940
7	WARM TEST	296.75	-.92047467	.00058020	----------	---------
8	COLD TEST	79.15	-.66302951	.00039684	4.24803633	.10587082
9	WARM TEST	296.75	-.91959674	.00054820	----------	---------
10	COLD TEST	79.15	-.66236449	.00043247	4.24748049	.11902447
11	WARM TEST	296.75	-.91895377	.00059288	----------	---------
12	COLD TEST	79.15	-.66159332	.00046327	4.24223349	.15036116
13	WARM TEST	296.75	-.91829667	.00053095	----------	---------
14	COLD TEST	79.15	-.66177063	.00041632	4.25332659	.16429922
15	WARM TEST	296.75	-.91812094	.00049265	----------	---------
16	COLD TEST	79.15	-.66206864	.00041669	4.26058607	.23520187
17	WARM TEST	296.75	-.91779379	.00059799	----------	---------
18	COLD TEST	79.15	-.66136552	.00042096	4.25259692	.16655769
19	WARM TEST	296.75	-.91722845	.00055485	----------	---------
20	COLD TEST	79.15	-.66139749	.00037669	4.26011414	.08845515

CH. 13 ,16 MHz MHz

NOISE FIGURE AVERAGE (dB) = ~~4.250786839724~~

NOISE POWER STABILITY (K) = .174800795681

NOISE POWER STABILITY DELTA (K) = .272252651318

NPS_MAX (K) = .360707799604 NPS_MIN (K) = .0884551482855

INTEGRATION TIME = .165

AMSU-A TEST

AMSU-A1-1, CH13, S/N F01, NF & NPS TEST DATA 3/10/98 (A1-2 HORN)

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.75	-.91617547	.00061757		
2	COLD TEST	79.15	-.66143165	.00041942	4.27373759	.21516914
3	WARM TEST	296.75	-.91590515	.00060709		
4	COLD TEST	79.15	-.66146089	.00042646	4.27759935	.19275632
5	WARM TEST	296.75	-.91590638	.00053180		
6	COLD TEST	79.15	-.66161456	.00039323	4.28023055	.15995897
7	WARM TEST	296.75	-.91543412	.00053789		
8	COLD TEST	79.15	-.66099423	.00048259	4.27542116	.14337953
9	WARM TEST	296.75	-.91540365	.00053734		
10	COLD TEST	79.15	-.66087480	.00038465	4.27374388	.14478505
11	WARM TEST	0.00	0.00000000	0.00000000		
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000		
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000		
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000		
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000		
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 13 ,16 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.27614721751

NOISE POWER STABILITY (K) = .171209804086

NOISE POWER STABILITY DELTA (K) = .0717896137388

NPS_MAX (K) = .21516914305 NPS_MIN (K) = .143379529311

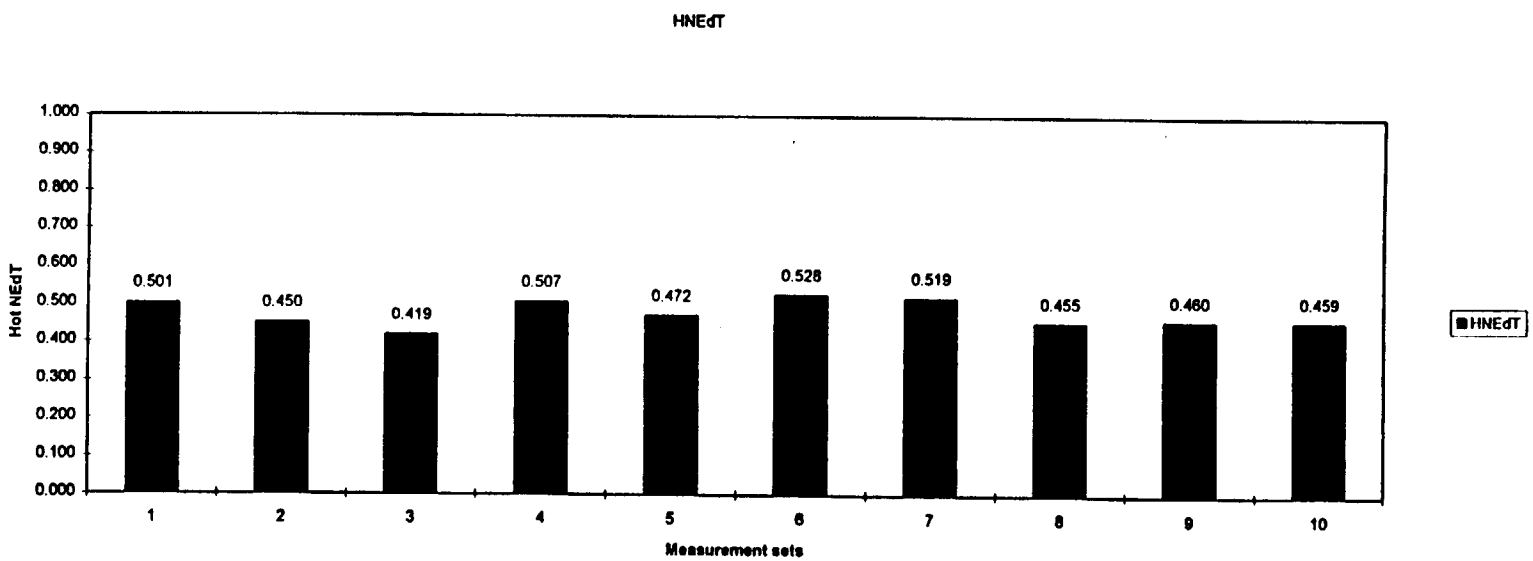
INTEGRATION TIME = .165

AMSU-A1-1, CH13, S/N F01, FLIGHT RECEIVER SHELF (A1-2 HORN)

(BPF 16.0 MHZ & LO FREQUENCY 57.290321 GHZ)

3/10/98

												To	290						
												Thot	296.75	BandW	1.60E+07				
												Tcold	79.15	IntTime	0.165	overall			
												CHconst	6.1327E-06			expected			
Data	Description	Number Of	V Hot	V Hot	V Cold	V Cold	Scale Fac	Hot	Cold	Y Fact	Log(Y)	Noise Fig	Tsys	dTrec	theory	test			
		Samples	Mean	Std Dev	Mean	Std Dev	K/Volt	NEdT	NEdT		dB	dB	(K)	(K)	dG/G	NEdT			
Data	Description	Samples	MeanVh	StdDevVh	MeanVc	StdDevVc	ScalFac	HNEdT	CNEdT	YFact	NPS	NFdB	Tsys	dTrec	theorydG/G	testNEdT	Wload	Cload	
		100	-0.9189538	0.000592880	-0.66159332	0.000463270	845.5067591	0.501	0.392	1.389000980	0.150	4.242	776.9816238	0.478	0.167	0.506	296.75	79.15	
		100	-0.9182967	0.000530950	-0.66177063	0.000416320	848.2569645	0.450	0.353	1.387635879	0.164	4.253	778.9515458	0.479	0.167	0.508	296.75	79.15	
		100	-0.9181209	0.000492650	-0.66206864	0.000416690	849.8263831	0.419	0.354	1.386745852	0.235	4.261	780.2433977	0.480	0.167	0.509	296.75	79.15	
		100	-0.9177938	0.000597990	-0.66135520	0.000420960	848.5462348	0.507	0.357	1.387747144	0.167	4.252	778.7904648	0.479	0.167	0.508	296.75	79.15	
		100	-0.9172285	0.000554850	-0.66139749	0.000376690	850.5616365	0.472	0.320	1.386803645	0.088	4.260	780.1593315	0.480	0.167	0.509	296.75	79.15	
		100	-0.9161755	0.000617570	-0.66143165	0.000419420	854.1914775	0.528	0.358	1.385140052	0.215	4.274	782.5892784	0.482	0.168	0.510	296.75	79.15	
		100	-0.9159052	0.000607090	-0.66146089	0.000426460	855.1971265	0.519	0.365	1.384670150	0.193	4.278	783.2794524	0.482	0.168	0.511	296.75	79.15	
		100	-0.9159064	0.000531800	-0.66161456	0.000393230	855.7097904	0.455	0.336	1.384350399	0.160	4.280	783.7500565	0.482	0.168	0.511	296.75	79.15	
		100	-0.9154341	0.000537890	-0.66099423	0.000482590	855.2118145	0.460	0.413	1.384935115	0.143	4.275	782.8900748	0.482	0.168	0.510	296.75	79.15	
		100	-0.9154037	0.000537340	-0.66087480	0.000384650	854.9129107	0.459	0.329	1.385139288	0.145	4.274	782.5903988	0.482	0.168	0.510	296.75	79.15	
	AVERAGE		-0.9169218	0.000560101	-0.66145614	0.000420028	851.7921098	0.477	0.358	1.386216850	0.166	4.265	781.0225625	0.481	0.168	0.509	296.75	79.15	



AMSU-A TEST

AMSU-A1-1, CH14, S/N F01, NF & NPS TEST DATA 3/10/98 (A1-2 HORN)

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.75	-1.08042225	.00207958		
2	COLD TEST	79.15	-.78384318	.00088476	4.33000007	1.30127150
3	WARM TEST	296.75	-1.09104681	.00120012		
4	COLD TEST	79.15	-.78764959	.00095823	4.27328733	.34979710
5	WARM TEST	296.75	-1.09326197	.00114411		
6	COLD TEST	79.15	-.78688507	.00078971	4.23937230	.22648041
7	WARM TEST	296.75	-1.09208777	.00114650		
8	COLD TEST	79.15	-.78796965	.00078703	4.26708270	.23706051
9	WARM TEST	296.75	-1.09537629	.00123861		
10	COLD TEST	79.15	-.78773720	.00084584	4.22982520	.40148168
11	WARM TEST	296.75	-1.09594490	.00109391		
12	COLD TEST	79.15	-.78742044	.00076218	4.21950811	.09082836
13	WARM TEST	296.75	-1.09543797	.00116951		
14	COLD TEST	79.15	-.78688259	.00078377	4.21704216	.27822600
15	WARM TEST	296.75	-1.09511164	.00125019		
16	COLD TEST	79.15	-.78668463	.00090548	4.21755777	.41833222
17	WARM TEST	296.75	-1.09448176	.00115750		
18	COLD TEST	79.15	-.78678302	.00076975	4.22539651	.25479739
19	WARM TEST	296.75	-1.09415670	.00108470		
20	COLD TEST	79.15	-.78644600	.00077403	4.22392484	.12785607

CH. 14 ,6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.24443587983

NOISE POWER STABILITY (K) = .36861312498

NOISE POWER STABILITY DELTA (K) = 1.21044312548

NPS_MAX (K) = 1.30127150167 NPS_MIN (K) = .0908283761833

INTEGRATION TIME = .165

AMSU-A TEST

AMSU-A1-1, CH14, S/N F01, NF & NPS TEST DATA 3/10/98 (A1-2 HORN)

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.75	-1.09281102	.00108703	----------	----------
2	COLD TEST	79.15	-.78717213	.00074613	4.24813067	.11179912
3	WARM TEST	296.75	-1.09203843	.00099430	----------	----------
4	COLD TEST	79.15	-.78577157	.00083641	4.23604027	.33017720
5	WARM TEST	296.75	-1.09164026	.00108657	----------	----------
6	COLD TEST	79.15	-.78412807	.00074156	4.21666420	.10750682
7	WARM TEST	296.75	-1.09123978	.00115185	----------	----------
8	COLD TEST	79.15	-.78456980	.00073860	4.22707215	.24978406
9	WARM TEST	296.75	-1.09060943	.00114915	----------	----------
10	COLD TEST	79.15	-.78448212	.00076343	4.23230022	.24530043
11	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 14 ,6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.23205384725

NOISE POWER STABILITY (K) = .208913524204

NOISE POWER STABILITY DELTA (K) = .222670376661

NPS_MAX (K) = .330177196446 NPS_MIN (K) = .107506819785

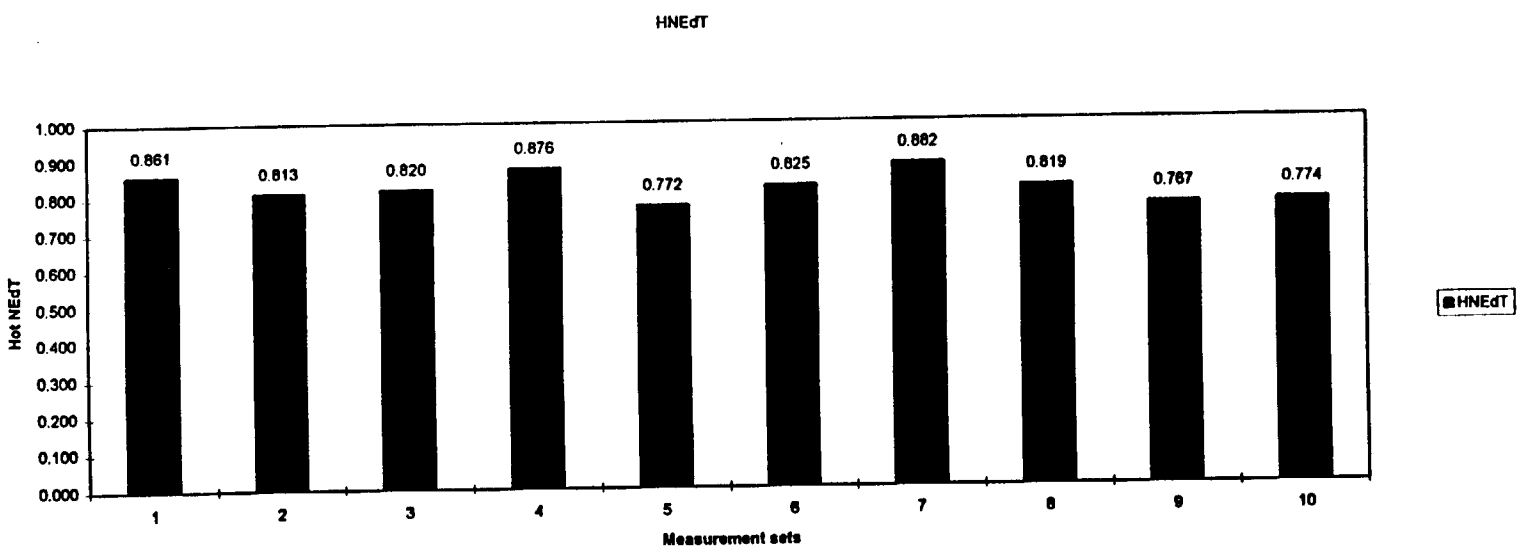
INTEGRATION TIME = .165

AMSU-A1-1, CH14, S/N F01, FLIGHT RECEIVER SHELF (A1-2 HORN)

(BPF 6.0 MHZ & LO FREQUENCY 57.290321 GHZ)

3/10/98

												To	290					
												Thot	296.75	BandW	6.00E+06			
												Tcold	79.15	IntTime	0.165	overall		
												CHconst	6.1327E-06			expected		
Data	Description	Number Of	V Hot	V Hot	V Cold	V Cold	Scale Fac	Hot	Cold	Y Fact	Log(Y)	Noise Fig	Tsys	dTrec	theory	test		
		Samples	Mean	Std Dev	Mean	Std Dev	K/Volt	NEdT	NEdT		dB	dB	(K)	(K)	dG/G	NEdT		
Data	Description	Samples	MeanVh	StdDevVh	MeanVc	StdDevVc	ScalFac	HNEdT	CNEdT	YFact	NPS	NFdB	Tsys	dTrec	theorydG/G	testNEdT	Wload	Cload
		100	-1.0910468	0.001200120	-0.78764859	0.000958230	717.2092176	0.861	0.687	1.385194900	0.350	4.273	782.5088290	0.786	0.168	0.804	296.75	79.15
		100	-1.0932620	0.001144110	-0.78688507	0.000789710	710.2363135	0.813	0.561	1.389354064	0.226	4.239	776.4743513	0.780	0.167	0.798	296.75	79.15
		100	-1.0920878	0.001146500	-0.78796965	0.000787030	715.5114598	0.820	0.563	1.385951566	0.237	4.267	781.4013146	0.785	0.168	0.803	296.75	79.15
		100	-1.0953763	0.001238610	-0.78773720	0.000845840	707.3223367	0.876	0.598	1.390535181	0.401	4.230	774.7841170	0.779	0.166	0.796	296.75	79.15
		100	-1.0959449	0.001093910	-0.78742044	0.000762180	705.2925399	0.772	0.538	1.391816677	0.091	4.220	772.9617621	0.777	0.166	0.794	296.75	79.15
		100	-1.0954380	0.001169510	-0.78688259	0.000783770	705.2218633	0.825	0.553	1.392123786	0.278	4.217	772.5268063	0.776	0.166	0.794	296.75	79.15
		100	-1.0951118	0.001250190	-0.78668463	0.000905480	705.5149252	0.882	0.639	1.392059535	0.418	4.218	772.6177479	0.777	0.166	0.794	296.75	79.15
		100	-1.0944818	0.001157500	-0.78678302	0.000769750	707.1852163	0.819	0.544	1.391084622	0.255	4.225	774.0013202	0.778	0.166	0.795	296.75	79.15
		100	-1.0941567	0.001084700	-0.78644600	0.000774030	707.1577296	0.767	0.547	1.391267423	0.128	4.224	773.7413678	0.778	0.166	0.795	296.75	79.15
		100	-1.0928110	0.001087030	-0.78717213	0.000746130	711.9512834	0.774	0.531	1.388274532	0.112	4.248	778.0282082	0.782	0.167	0.800		
	AVERAGE		-1.0939717	0.001157218	-0.78716293	0.000812215	709.2602885	**0.821**	0.576	1.389766228	**0.250**	**4.236**	775.9045824	0.780	0.167	0.797	296.75	79.15



3/12/... ...51 AM

AMSU-A TEST

AMSU-A1-1, CH15, S/N: F01, NF & NPS TEST DATA 3/31/92

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	295.25	-.00172976	.00000027	----------	----------
2	COLD TEST	79.15	-.00144221	.00000020	6.51459020	.17955338
3	WARM TEST	296.25	-.00172705	.00000018	----------	----------
4	COLD TEST	79.15	-.00144088	.00000022	6.52869114	.09425983
5	WARM TEST	296.25	-.00172617	.00000017	----------	----------
6	COLD TEST	79.15	-.00143992	.00000020	6.52523770	.08325838
7	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000	----------	----------

TEST DATA SHEET 1

LO Frequency Test Data (Paragraph 3.5.1) (A1-1)

Test Setup Verified: 7.7 Signature Baseplate Temperature (T_B) 30.3 °C

Component	Channel No.		V_b(V)	I_b(mA)	P_{dc}(mW) Required (Max)	P_{dc}(mW) Measured	P_{dc}(mW) Pass/Fail	f_o(GHz) Required	f_o(GHz) Measured	f_o(GHz) Pass/Fail
LO	6		9.97	180	2,700	1794.6	P	54.400 ± 0.003	54.400	P
	7		9.94	194	2,700	1928.4	P	54.940 ± 0.003	54.940	P
	LO No. 1	9	Positive		9,000 (13,500)*					
		10								
		11	15.1	515		7776.5	P	57.290344 ± 0.000~~150~~ CE 6	57290310	P
		12	Negative		1,500					
		13								
		14	15.1	64		966.4	P	57.290310		
	LO No. 2	9	Positive		9,000 (13,500)*					
		10								
		11						57.290344 ± 0.000150		
		12	Negative		1,500					
		13								
		14								
	15		~~14.89~~	~~787~~	3500			88.980 ± 0.080		
Mixer/ Amps	All		9.94	242	2,550	2,415				
IF Amps	All		7.95	264	5,500	2099				
TOTAL					Primary (LO #1) 24,510 (29,010)*					
					Redundancy (LO #2) 24,510 (29,010)*					

* Indicates required values for the PLO specified in AE-26660. Pass = P, Fail = F

PLO 1 Lock Detect ☐ PLO 2 Lock Detect ☐

Part No.: 1356429-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: _____

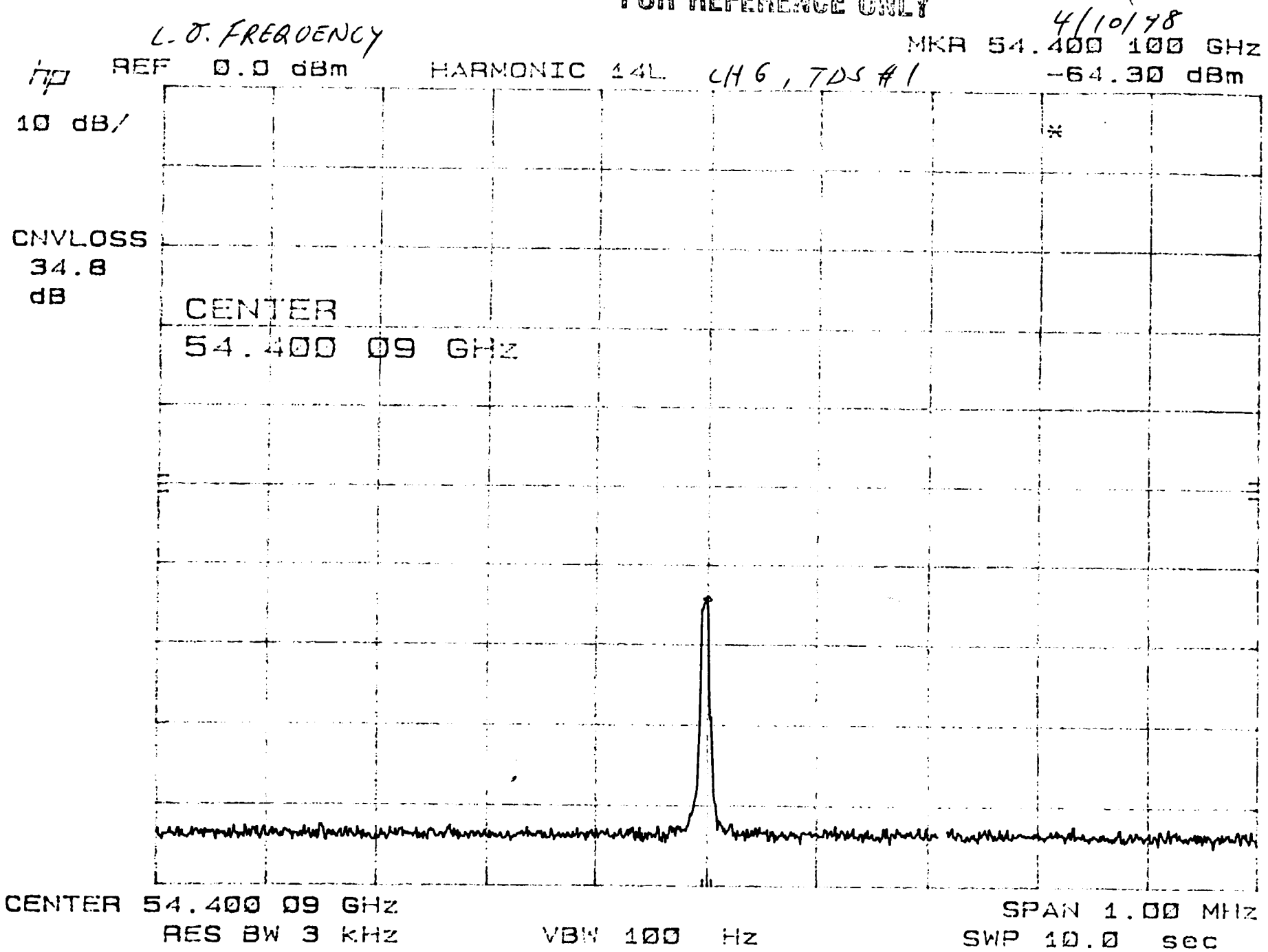
Date: 4/10/98

S. Kapp 3/30/98

FOR REFERENCE ONLY

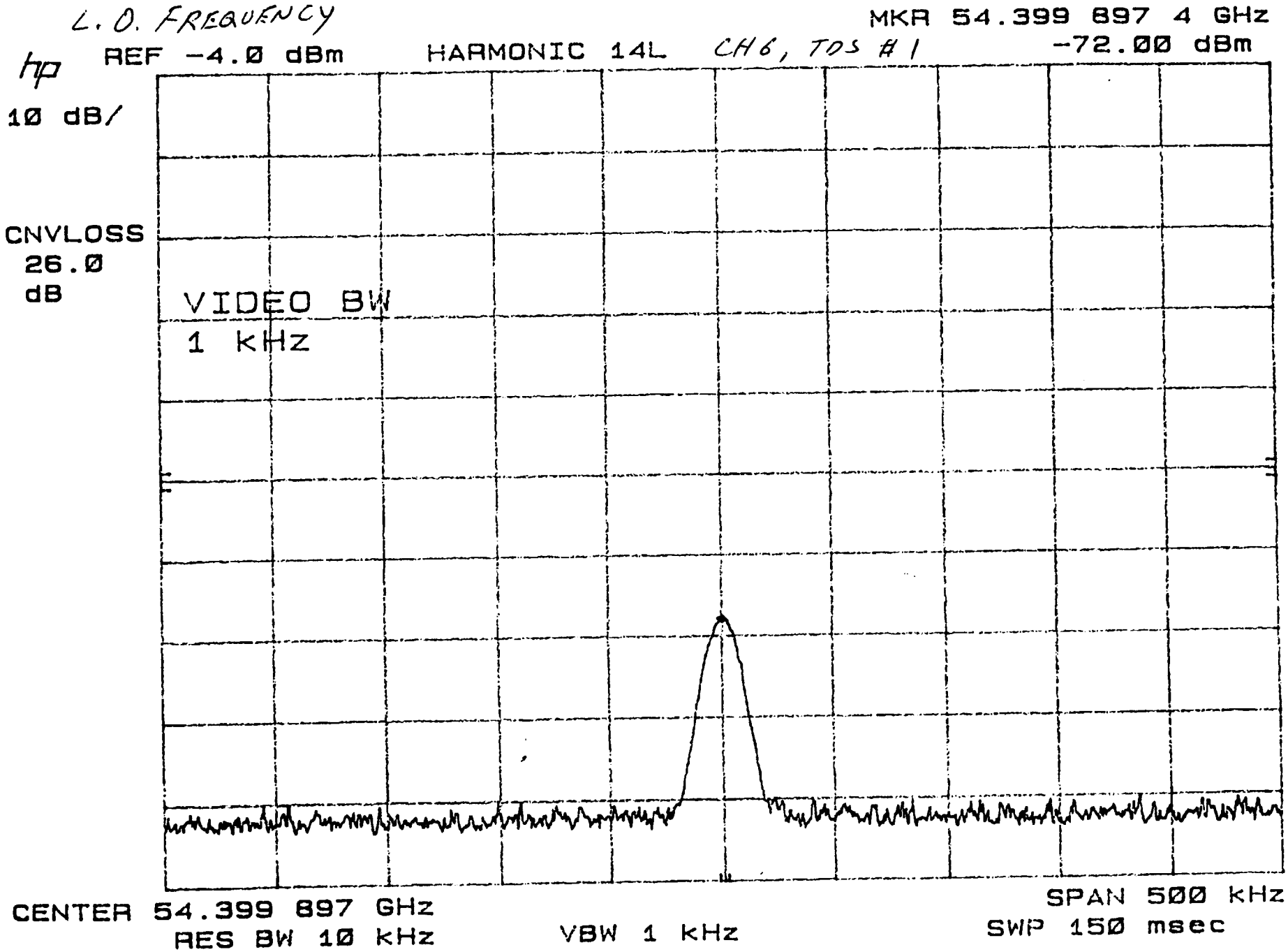
4/10/78

L.O. FREQUENCY

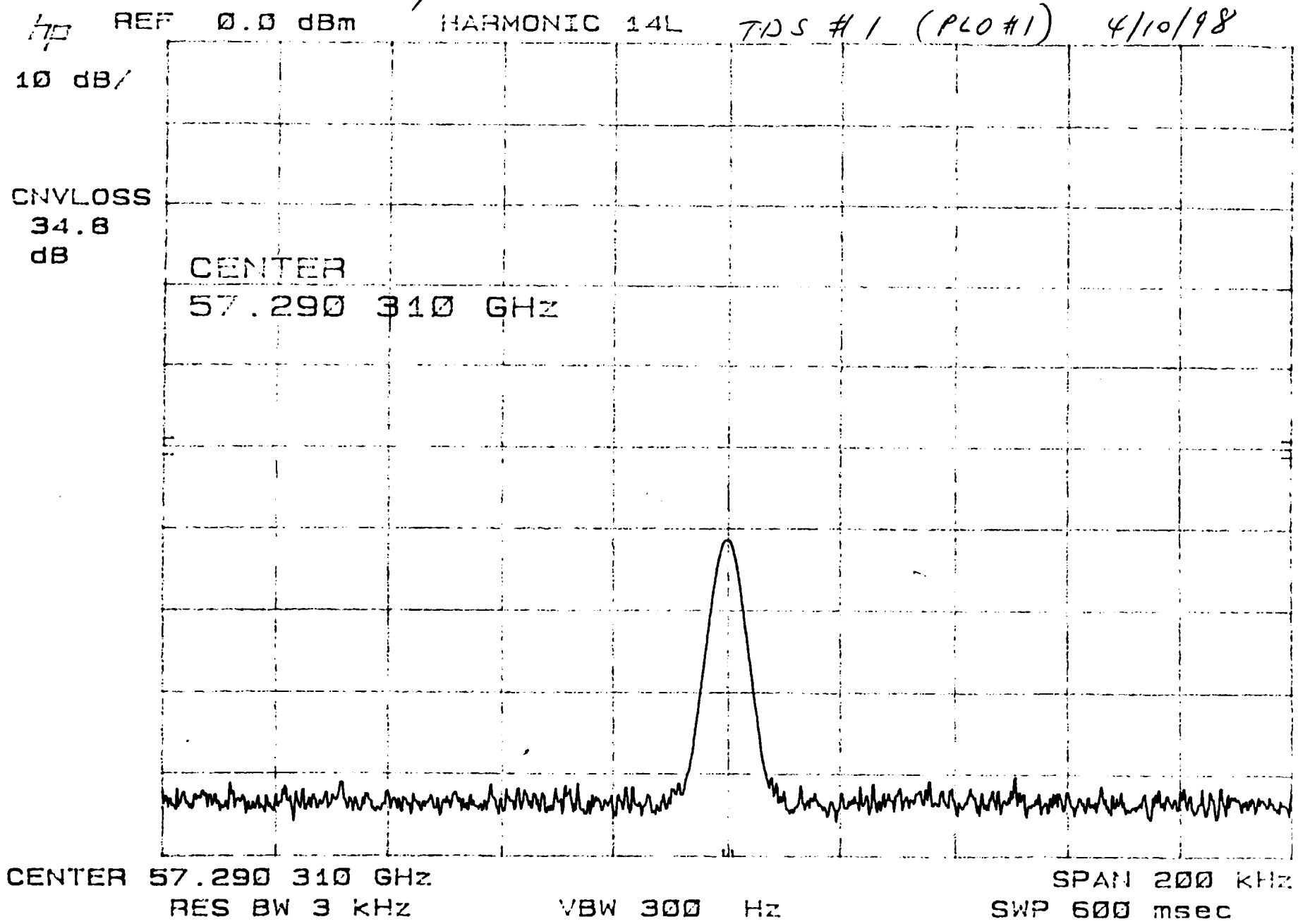


FOR REFERENCE ONLY 3/31/98

L.O. FREQUENCY



- L.O. FREQUENCY



TEST DATA SHEET 4

IF Output Power Test Data (Paragraph 3.5.2) (A1-1)

Test Setup Verified: J. Tung (Signature) Baseplate Temperature (T_B) 25.7 °C

Component	Channel No.		V_b(V)	I_b(mA)	P_o(dBm)	Atten (dB)	P_o(dBm) Required	P_o(dBm) Measured	Pass/ Fail	
LO	6		9.97	180	-20.11	7	-27.0 ± 1.0	-27.24	P	
	7		9.94	194	-19.02	8	-27.0 ± 1.0	-26.94	P	
	LO No. 1	9	Positive	515	-20.34	7	-27.0 ± 1.0	-27.40	P	25.7°
		10			~~-21.01~~ -20.38	6	-27.0 ± 1.0	-26.88	P	25.9°
		11	15.1		~~-21.26~~ -21.09	6	-27.0 ± 1.0	-27.04	P	26.8°
		12	Negative	64	-20.68	6	-27.0 ± 1.0	-26.54	P	26.9°
		13			-20.26	7	-27.0 ± 1.0	-27.31	P	27.0°
		14	15.1		-20.72	6	-27.0 ± 1.0	-26.55	P	27.2°
	LO No. 2	9	Positive		[redacted]		-27.0 ± 1.0			
		10					-27.0 ± 1.0			
		11					-27.0 ± 1.0			
		12	Negative				-27.0 ± 1.0			
		13					-27.0 ± 1.0			
		14					-27.0 ± 1.0			
	15						-27.0 ± 1.0			
Mixer/ Amps	All		9.94	242	[redacted]					
IF Amps	All		7.95	264						

Pass = P, Fail = F

Part No.: 1356429-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: _____

Date: 4/10/98

TEST DATA SHEET 7 (Sheet 1 of 2)

Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-1)

Test Setup Verified: J. Tsung (Signature) Baseplate Temperature (T_B) 30.3 °C

Component	Channel No.	V_b(V)	I_b(mA)	3 dB BW Frequency (MHz)		3 dB BW Frequency (MHz)		Pass/Fail
				Lower	Higher	Required MAX	Measured	
LO	6	9.97	180	7.4	201.6	~~400~~ 200	194.2	P
	7	9.94	194	5.8	200.0	~~400~~ 200	194.2	P
LO No. 1	9	Positive	X			~~35~~ 165		
	10					78		
	11		X			~~36~~ 36 36		
	12	Negative	X			~~16~~ 16 16		
	13					~~8~~ 8 8		
	14		X			~~3~~ 3 3		
LO No. 2	9	Positive				~~35~~ 165		
	10					78		
	11					~~36~~ 36 36		
	12	Negative				~~16~~ 16 16		
	13					~~8~~ 8 8		
	14					~~3~~ 3 3		
	15					~~6000~~ 1000		
Mixer/Amps	All							
IF Amps	All							

Part No.: 1356429-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: ___

Date: 4/10/98

TEST DATA SHEET 7 (Sheet 2 of 2)
Bandpass Characteristics Test Data (Paragraph 3.5.3) (A1-1)

Test Setup Verified: T. Tsui
Signature

Baseplate Temperature (T_B) 30.3 °C

Component		Channel No.	V_b(V)	I_b(mA)	40 dB BW Frequency (MHz)		40 dB BW Frequency (MHz)		Pass/Fail
					Lower	Higher	Required MAX (Ref Only)	Measured	
LO		6	9.97	180	2.3	224.8	~~520~~	222.5	P
		7	9.94	194	2.0	222.8	~~520~~	220.8	P
	LO No. 1	9	Positive				~~429~~		
		10					~~101~~		
		11					~~47~~		
		12	Negative				~~21~~		
		13					~~10~~		
		14					~~4~~		
	LO No. 2	9	Positive				~~429~~		
		10					~~101~~		
		11					~~47~~		
		12	Negative				~~21~~		
		13					~~10~~		
		14					~~4~~		
		15					~~7800~~		
Mixer/Amps		All							
IF Amps		All							

Do not change this column
Leave it as it. T. Tsui 4/8/98

Part No.: 1356429-1

Serial No.: F01

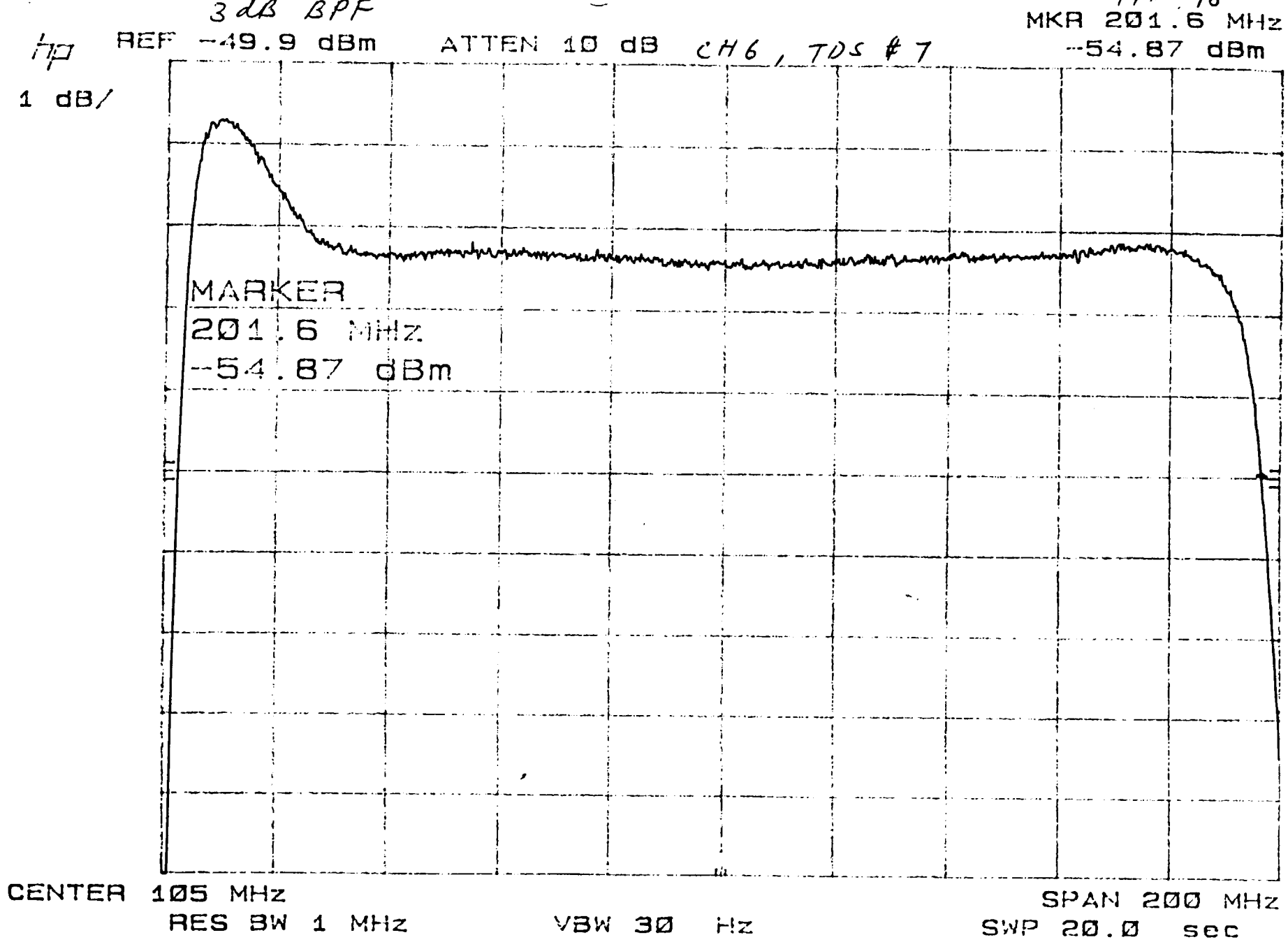
Test Engineer: T. Tsui

Quality Assurance: ____

Date: 4/10/98

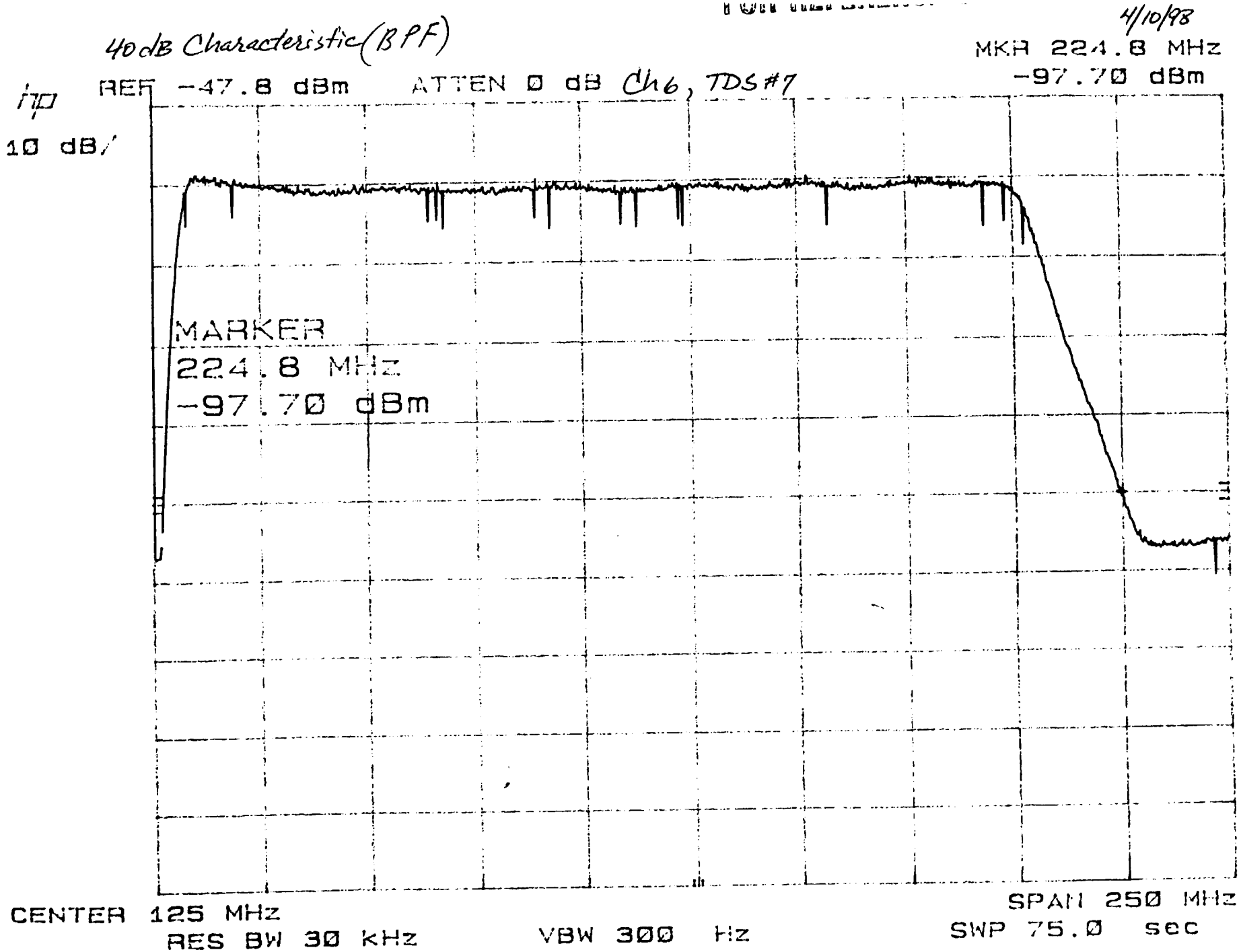
3 dB BPF

4/1 98

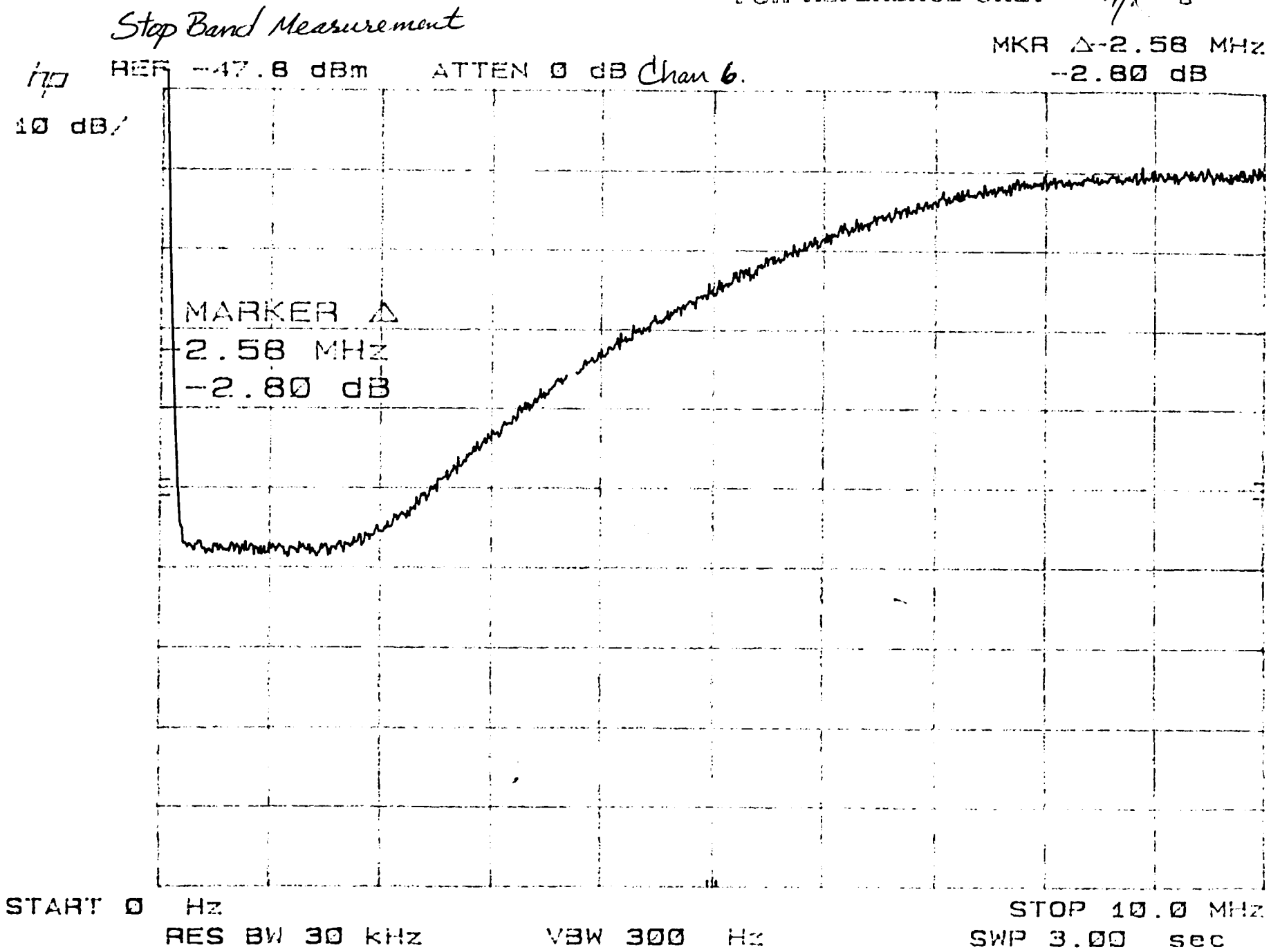

hp
REF -49.9 dBm
ATTEN 10 dB
CH6, TDS #7
MKR 201.6 MHz
-54.87 dBm
1 dB/
MARKER
201.6 MHz
-54.87 dBm
CENTER 105 MHz
SPAN 200 MHz
RES BW 1 MHz
VBW 30 Hz
SWP 20.0 sec

40 dB Characteristic (BPF)

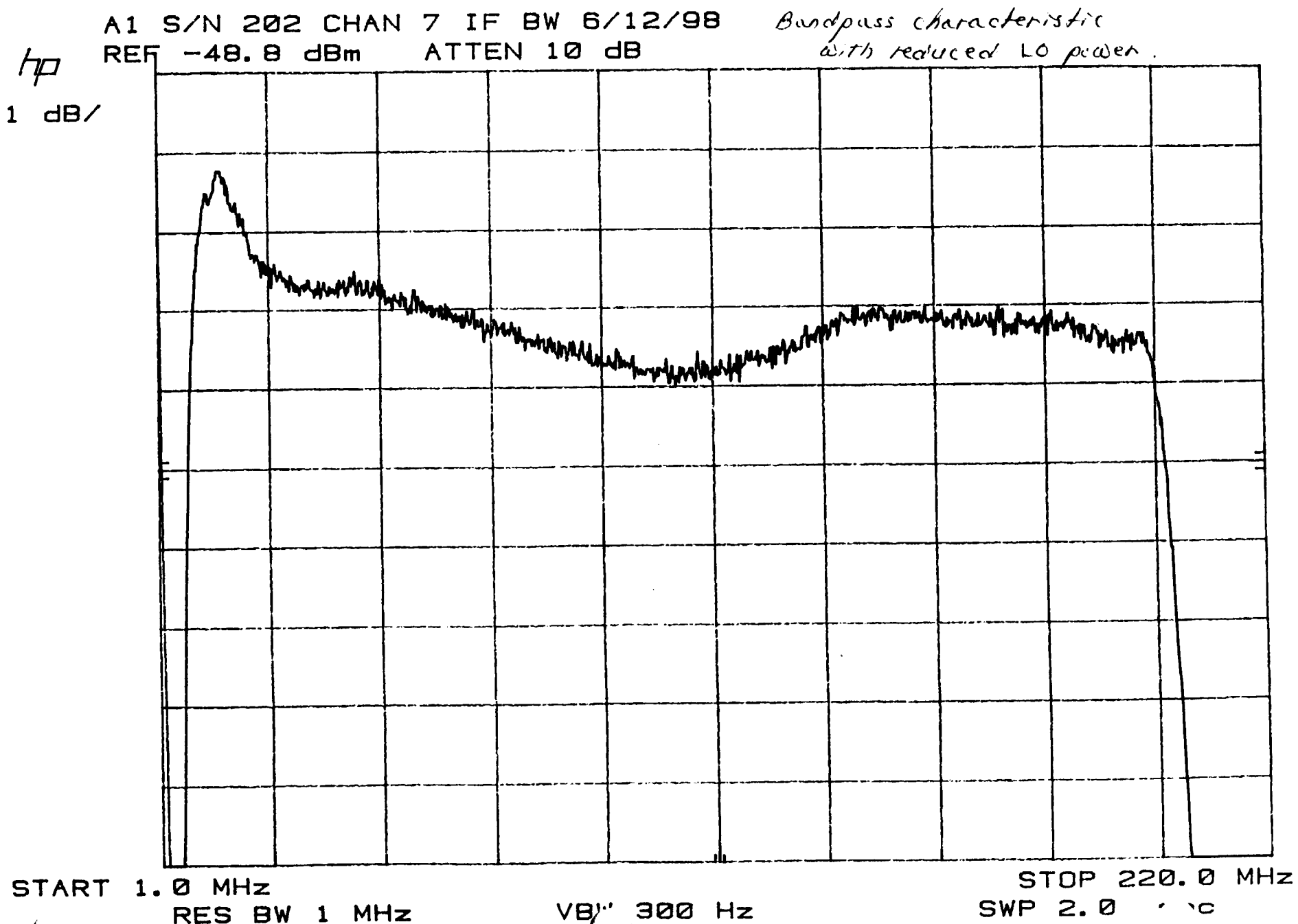
4/10/98



Stop Band Measurement



SUPPORT DATA FOR TDS 52



Bandpass characteristic with reduced LO power.

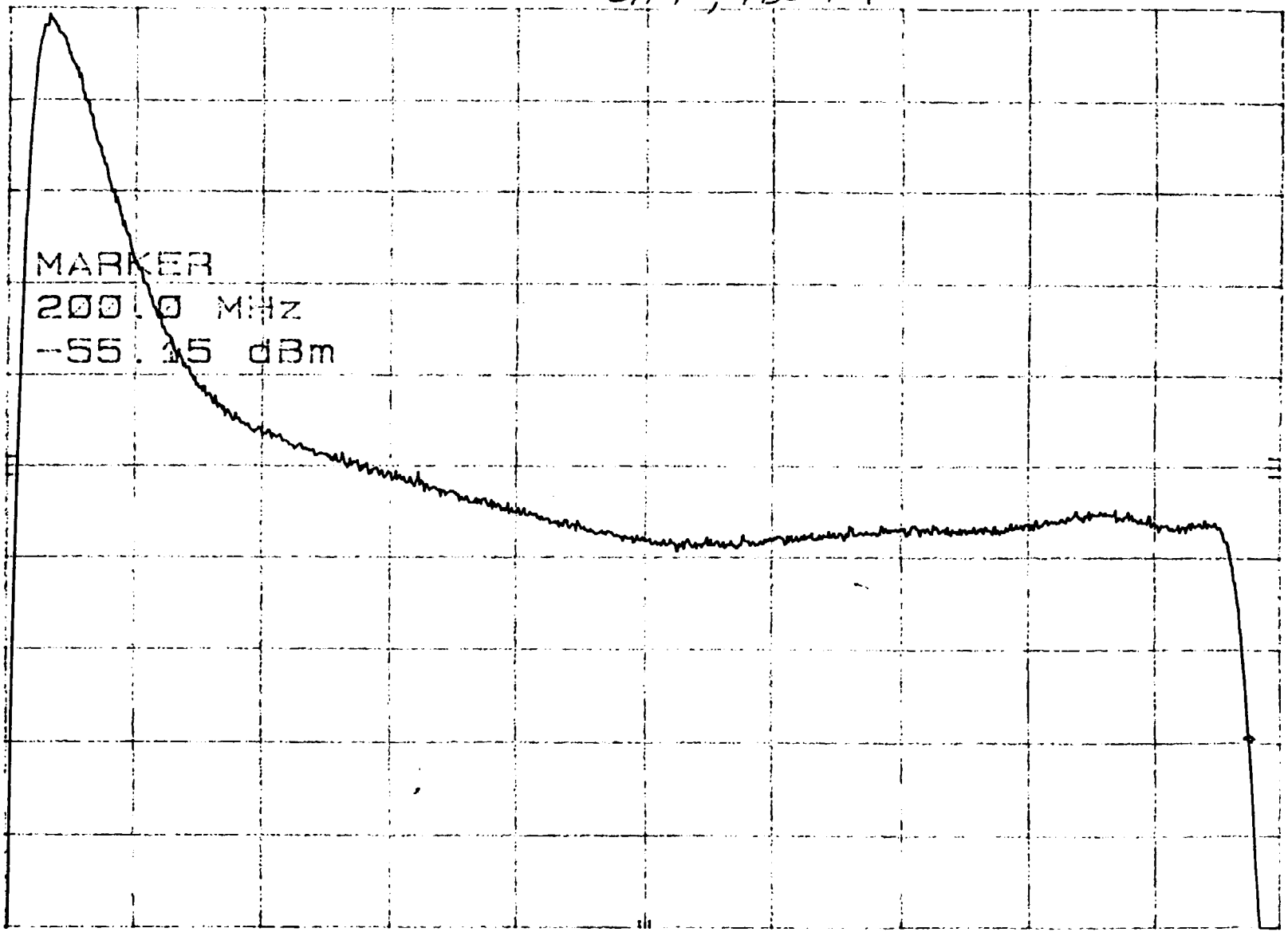
FOR REFERENCE ONLY

3 dB (BPF)

4/10/98

hp REF -47.2 dBm ATTEN 10 dB CH 7, TDS # 7 MKR 200.0 MHz -55.15 dBm

1 dB/



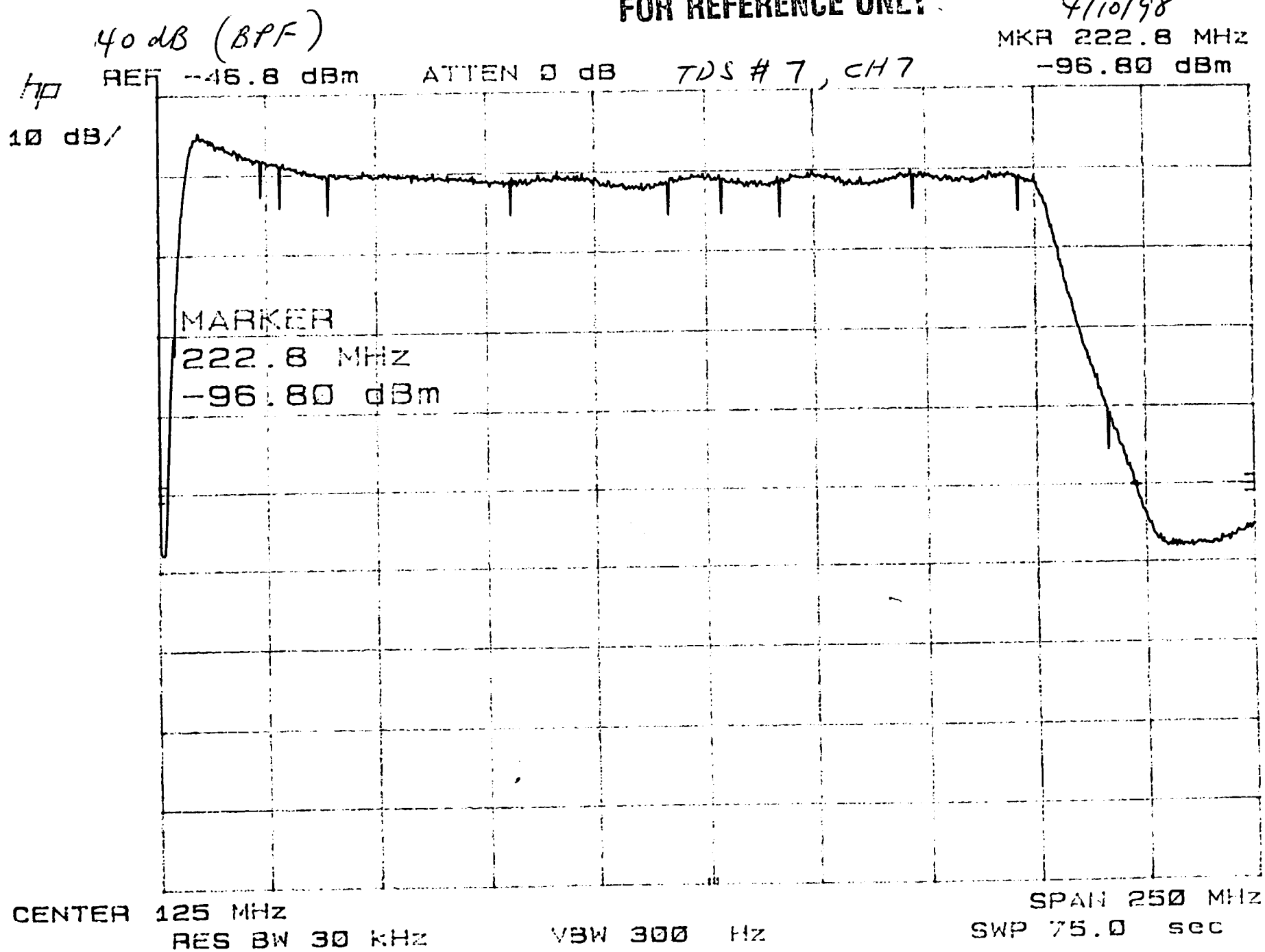
CENTER 105 MHz SPAN 200 MHz

RES BW 1 MHz VBW 30 Hz SWP 20.0 sec

FOR REFERENCE ONLY

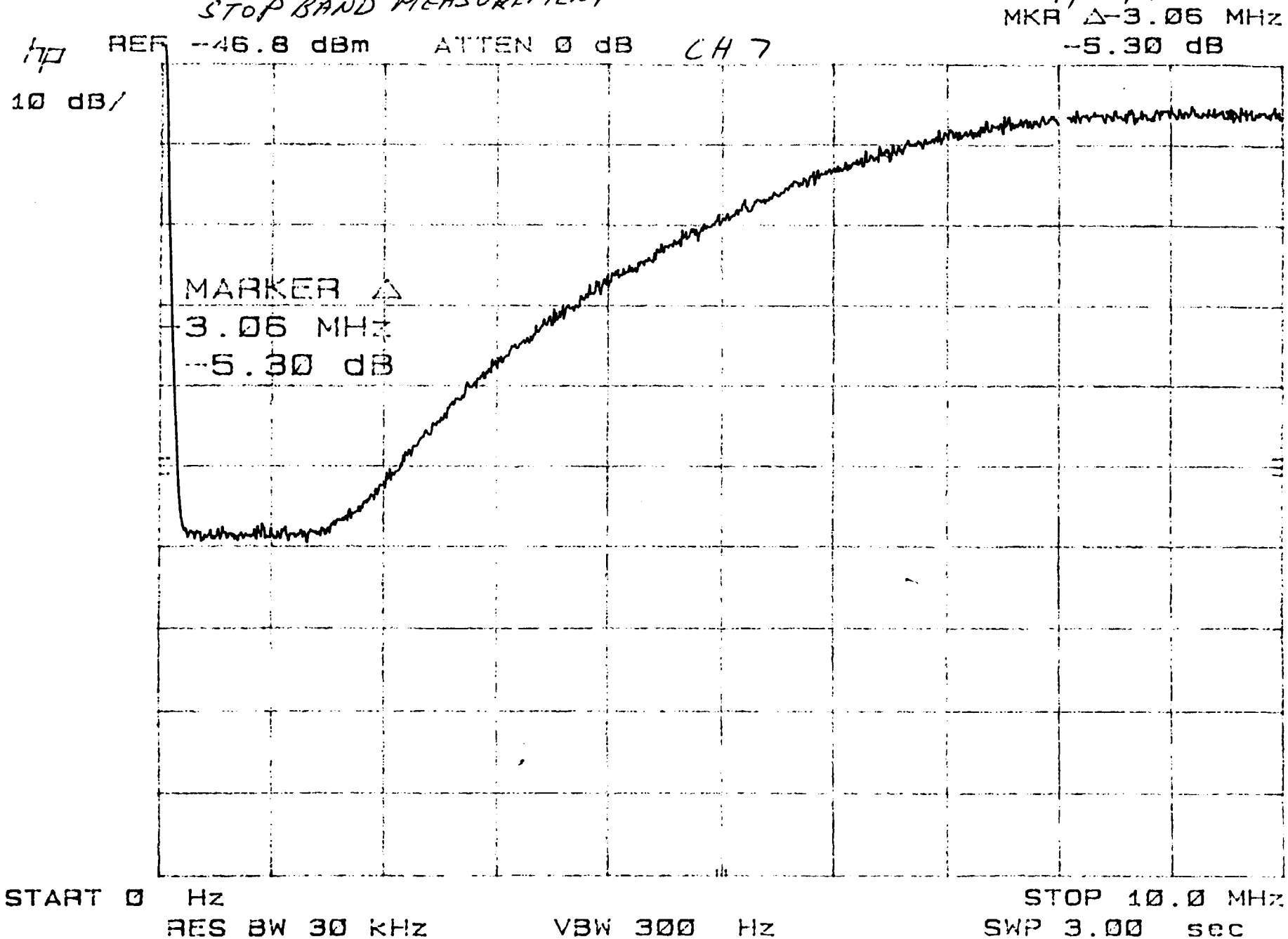
40 dB (BPF)

4/10/98



STOP BAND MEASUREMENT

FOR REFERENCE ONLY 4/10/98



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TEST DATA SHEET 10 (Sheet 1 of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: 7. Zuny (Signature) Baseplate Temperature (T_B) 30.3 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	E. 6	9.97	180	23.7	-.9652	.00046	-194.0	-.6829	.00021 *
				23.7	-.9620	.00023	-194.0	-.6813	.00017
				23.7	-.9609	.00021	-194.0	-.6809	.00020
Mixer/ Amps	All	9.94	242						
IF Amps	All	7.95	264						

* SEE PRINT OUT TEST DATA SHEET (NF & NPS).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: Z. Zuny

Quality Assurance:

Date: 4/10/98

~~3~~ 10 18

TEST DATA SHEET 10 (Sheet ~~3~~ of 18)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: _____ Baseplate Temperature (T_B) 30.3 °C
Signature

Channel No.	NF (dB) Required (Max)	Measured	Average	Pass/Fail	NPS (dB) Required (Max)	Measured	Average	Delta	Pass/Fail
6	~~4.25~~	4.05			~~0.08~~				
		4.06							
		4.07							
	5.25		4.06	P	.08				(*)

Pass = P, Fail = F

(*) NPS IS NOT REQUIRED FOR THIS RECEIVER SHELF (A1-1).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 4/10/98

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QC 226

R. Kapper

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-1, S/N F01, CH6, NF & NPS TEST DATA, PLO #1 4/10/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.85	-.96519120	.00046306	----------	----------
2	COLD TEST	79.15	-.68293507	.00021134	4.05415710	.33205442
3	WARM TEST	296.85	-.96198591	.00023166	----------	----------
4	COLD TEST	79.15	-.68127672	.00016698	4.05366555	.12209902
5	WARM TEST	296.85	-.96094337	.00021227	----------	----------
6	COLD TEST	79.15	-.68089632	.00020343	4.06926410	.09906953
7	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 6 ,194.2 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.06236872606

NOISE POWER STABILITY (K) = .184407656029

NOISE POWER STABILITY DELTA (K) = .232984893305

NPS_MAX (K) = .332054423003 NPS_MIN (K) = .099069529698

INTEGRATION TIME = .165

TEST DATA SHEET 10 (Sheet 2 of ~~10~~ 16)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: _____ Signature

Baseplate Temperature (T_B) 30.3 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	7	9.94	194						
Mixer/ Amps	All	9.94	242						
IF Amps	All	7.95	264						

Q. Kapper 3/30/98

* SEE PRINT OUT TEST DATA SHEET (NF & NPS).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 4/10/98

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TEST DATA SHEET 10 (Sheet ~~4~~ of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: _____ Signature Baseplate Temperature (T_B) 30.3 °C

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
7	~~4.25~~	5.19			~~8.08~~				
		5.12							
		5.13							
	5.20		5.15	P	.08				

Pass = P, Fail = F

(*) NPS IS NOT REQUIRED FOR THIS RECEIVER SHELF (A1-1).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 4/10/98

MAR 30 '98

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QC 226

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-1, S/N F01, CH7, NF & NPS TEST DATA, PLO #1 4/10/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.85	-1.02948297	.00039771	----------	----------
2	COLD TEST	79.15	-.79722153	.00058581	5.19008488	.33151222
3	WARM TEST	296.85	-1.03051066	.00045510	----------	----------
4	COLD TEST	79.15	-.79435370	.00050459	5.12169233	.38450239
5	WARM TEST	296.85	-1.03126437	.00056483	----------	----------
6	COLD TEST	79.15	-.79521768	.00051512	5.12693375	.49308406
7	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 7 ,194.2 MHz MHz

NOISE FIGURE AVERAGE (dB) = 5.14634837074

NOISE POWER STABILITY (K) = .403032892262

NOISE POWER STABILITY DELTA (K) = .16157183642

NPS_MAX (K) = .493084059144 NPS_MIN (K) = .331512222724

INTEGRATION TIME = .165

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TEST DATA SHEET 10 (Sheet ~~1~~ of ~~16~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: 7. Tung
Signature

Baseplate Temperature (T_B) 30.3 °C

Compo-nent	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	9	15.1	515						
Mixer/ Amps	All	9.94	242						
IF Amps	All	7.95	264						

9 Eckelmann 3/30/98 R. Kapper

* SEE PRINT OUT TEST DATA SHEET (NF & NPS).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: T. Kutten

Quality Assurance:

Date: 4/10/98

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TEST DATA SHEET 10 (Sheet ~~5~~ of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: Z. Zhang (Signature) Baseplate Temperature (T_B) 30.3 °C

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
9	~~3.95~~	3.99			~~0.08~~				
		3.99							
		3.99							
	5.20		3.99	P	.08				

Pass = P, Fail = F

(*) NPS IS NOT REQUIRED FOR THIS RECEIVER SHELF (A1-1).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: Z. Zhang

Quality Assurance:

Date: 4/10/98

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MAR 30 '98

QC 226

R. Kappa

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-1, S/N F01, CH9, NF & NPS TEST DATA, PLO #1 4/10/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.85	-.90468054	.00018266	----------	---------
2	COLD TEST	79.15	-.63643692	.00014013	3.99355441	.03336758
3	WARM TEST	296.85	-.90288809	.00024433	----------	---------
4	COLD TEST	79.15	-.63481614	.00015085	3.98766641	.13625313
5	WARM TEST	296.85	-.90147281	.00020702	----------	---------
6	COLD TEST	79.15	-.63422124	.00016061	3.99422579	.08699494
7	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 9 ,156.6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 3.99181653425

NOISE POWER STABILITY (K) = .0855385496072

NOISE POWER STABILITY DELTA (K) = .102885546323

NPS_MAX (K) = .13625312631 NPS_MIN (K) = .0333675799866

INTEGRATION TIME = .165

4 a/a 3/31/98
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TEST DATA SHEET 10 (Sheet ~~1~~ of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: 2 Tng
Signature

Baseplate Temperature (T_B) 30.3 °C

Compo-nent	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	10	15.1	515						
Mixer/ Amps	All	9.94	242						
IF Amps	All	7.95	264						

10 a/a 3/30/98 Q. Kapp

* SEE PRINT OUT TEST DATA SHEET (NF & NPS).

Part No.: 1356429-1

Serial No.: F01

Test Engineer:

Quality Assurance:

Date: 4/10/98

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TEST DATA SHEET 10 (Sheet ~~6~~ of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: J. Tung (Signature) Baseplate Temperature (T_B) 30.3 °C

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
10	~~3.95~~ *	4.06			~~0.12~~ *				
		4.05							
		4.05							
	5.20		4.05	P	0.12				*

Pass = P, Fail = F

* NPS IS NOT REQUIRED FOR THIS RECEIVER SHELF (A1-1).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: _____

Date: 4/10/98

#25 MAR 30 '98 (9226) R. Kappy

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-1, S/N F01, CH10, NF & NPS TEST DATA , PLO #1 4/10/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.85	-1.00213999	.00066615	----------	---------
2	COLD TEST	79.15	-.70932747	.00026312	4.05787910	.44861528
3	WARM TEST	296.85	-.99775224	.00030324	----------	---------
4	COLD TEST	79.15	-.70545125	.00023468	4.04630945	.08485841
5	WARM TEST	296.85	-.99626440	.00034084	----------	---------
6	COLD TEST	79.15	-.70490515	.00025656	4.05391318	.14457499
7	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 10 ,76.4 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.05270322917

NOISE POWER STABILITY (K) = .226016561076

NOISE POWER STABILITY DELTA (K) = .363757869456

NPS_MAX (K) = .448616282273 NPS_MIN (K) = .084858412817

INTEGRATION TIME = .165

5 18

TEST DATA SHEET 10 (Sheet ~~1~~ of ~~16~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: J. Zuniga (Signature) Baseplate Temperature (T_B) 30.3 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	11 ~~12~~	15.1	515						
Mixer/ Amps	All	9.94	242						
IF Amps	All	7.95	264						

* SEE PRINT OUT TEST DATA SHEET (NF & NPS).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: _____

Date: 4/10/98

14 (10)

TEST DATA SHEET 10 (Sheet ~~7~~ of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: _____ Baseplate Temperature (T_B) 30.3 °C
Signature

Channel No.	NF (dB) Required (Max)	Measured	Average	Pass/Fail	NPS (K) Required (Max)	Measured	Average	Delta	Pass/Fail
11	~~3.95~~	4.30			~~0.12~~				
		4.28							
		4.28							
	5.20		4.29	P	.12				

Pass = P, Fail = F

(*) NPS IS NOT REQUIRED FOR THIS RECEIVER SHELF (A1-1).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 4/10/98

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FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-1, S/N F01, CH11, NF & NPS TEST DATA, PLO #1 4/10/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.85	-.96030439	.00054056	----------	---------
2	COLD TEST	79.15	-.69506250	.00023202	4.30436318	.37750980
3	WARM TEST	296.85	-.95736057	.00033612	----------	---------
4	COLD TEST	79.15	-.69170998	.00024959	4.28416679	.14846571
5	WARM TEST	296.85	-.95627548	.00027749	----------	---------
6	COLD TEST	79.15	-.69071242	.00021317	4.28064198	.04471308
7	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 11 ,69.3 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.28973656129

NOISE POWER STABILITY (K) = .19022953099

NOISE POWER STABILITY DELTA (K) = .332796726093

NPS_MAX (K) = .377509803345 NPS_MIN (K) = .0447130772522

INTEGRATION TIME = .165

6 18

TEST DATA SHEET 10 (Sheet ~~1~~ of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: 7.7 [signature] Signature

Baseplate Temperature (T_B) 30.3 °C

Compo-nent	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V)		T_C(°C)	V_C (V)	
					Mean	Standard Deviation		Mean	Standard Deviation
LO	12-B2	15.1	515						
Mixer/ Amps	All	9.94	242						
IF Amps	All	7.95	264						

* SEE PRINT OUT TEST DATA SHEET (NF & NPS).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: _____

Date: 4/10/98

AE-26002/6A
15 Sep 97

15 * 18

TEST DATA SHEET 10 (Sheet ~~8~~ of ~~10~~)
Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: _____ Baseplate Temperature (T_B) 30.3 °C
Signature

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
12	~~3.95~~ *	4.27			~~0.18~~ *				
		4.29							
		4.33							
	5.20 *		4.30	P	0.18 *				*

Pass = P, Fail = F

* NPS IS NOT REQUIRED FOR THIS RECEIVER SHELF (A1-1).

Part No.: 1356429-1
Serial No.: F01

Test Engineer: _____
Quality Assurance: _____
Date: 4/10/98

* QC 226 R. Kapper

1 Sep 20 '99

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-1, S/N F01, CH12, NF & NPS TEST DATA, PLO #1 4/10/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.85	-1.08484892	.00066660	----------	---------
2	COLD TEST	79.15	-.78261112	.00037922	4.26657007	.33106705
3	WARM TEST	296.85	-1.08201259	.00046324	----------	---------
4	COLD TEST	79.15	-.78209622	.00039447	4.28888189	.09543434
5	WARM TEST	296.85	-1.08186547	.00047615	----------	---------
6	COLD TEST	79.15	-.78479355	.00038609	4.33003424	.05230684
7	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 12 ,30.6 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.29524167611

NOISE POWER STABILITY (K) = .159602740607

NOISE POWER STABILITY DELTA (K) = .278760209771

NPS_MAX (K) = .331067045916 NPS_MIN (K) = .0523068371446

INTEGRATION TIME = .165

*18

TEST DATA SHEET 10 (Sheet ~~1~~ of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: 2.7 Signature

Baseplate Temperature (T_B) 30.3 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	*13 &	16.1	515						
Mixer/ Amps	All	9.94	242						
IF Amps	All	7.95	264						

* SEE PRINT OUT TEST DATA SHEET (NF & NPS).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: _____

Date: 4/10/98

QC 226 MAR 30 '98

R. Kapper

16* 1E

TEST DATA SHEET 10 (Sheet ~~9~~ of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: 7. Tuy (Signature) Baseplate Temperature (T_B) 30.3 °C

Channel No.	NF (dB) Required (Max)	NF (dB) Measured	NF (dB) Average	NF (dB) Pass/Fail	NPS (K) Required (Max)	NPS (K) Measured	NPS (K) Average	NPS (K) Delta	NPS (K) Pass/Fail
*13 (~~15~~)	~~7.70~~	4.37			~~0.15~~				
		4.36							
		4.34							
	5.2		4.35	P	0.24				(*)

Pass = P, Fail = F

(*) NPS IS NOT REQUIRED FOR THIS RECEIVER SHELF (A1-1).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: _____

Date: 4/10/98

[signature] R. Kappos

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-1, S/N F01, CH13, NF & NPS TEST DATA, PLO #1 4/10/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.85	-.91764773	.00063447	----------	----------
2	COLD TEST	79.15	-.66779169	.00039226	4.36709789	.24253276
3	WARM TEST	296.85	-.91580314	.00047484	----------	----------
4	COLD TEST	79.15	-.66583840	.00035450	4.35637830	.27304120
5	WARM TEST	296.85	-.91518233	.00048498	----------	----------
6	COLD TEST	79.15	-.66440753	.00045507	4.33923444	.25768515
7	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	----------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 13 ,15.7 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.35425203408

NOISE POWER STABILITY (K) = .257753037118

NOISE POWER STABILITY DELTA (K) = .0305084369291

NPS_MAX (K) = .273041200889 NPS_MIN (K) = .24253276396

INTEGRATION TIME = .165

*8 18

TEST DATA SHEET 10 (Sheet 1 of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: 7. Tang (Signature) Baseplate Temperature (T_B) 30.3 °C

Component	Channel No.	V_b(V)	I_b(mA)	T_H(°C)	V_H (V) Mean	V_H (V) Standard Deviation	T_C(°C)	V_C (V) Mean	V_C (V) Standard Deviation
LO	*14	15.1	515						
Mixer/ Amps	All	9.94	242						
IF Amps	All	7.95	264						

* SEE PRINT OUT TEST DATA SHEET (NF & NPS).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: _____

Date: 4/10/98

*20 QC 226 R. Kapper

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15 Sep 97

* 17 18

TEST DATA SHEET 10 (Sheet ~~10~~ of ~~10~~)

Noise Figure and Noise Power Stability Test Data (Paragraph 3.5.4) (A1-1)

Test Setup Verified: _____ Baseplate Temperature (T_B) 30.3 °C
Signature

Channel No.	NF (dB)				NPS (K)				
	Required (Max)	Measured	Average	Pass/Fail	Required (Max)	Measured	Average	Delta	Pass/Fail
~~13~~ 14 *	~~3.95~~ *	4.35			~~0.24~~ *				
		4.37							
		4.32							
	5.2 *		4.35	P	.36 *				(*)

Pass = P, Fail = F

(*) NPS IS NOT REQUIRED FOR THIS RECEIVER SHELF (A1-1).

Part No.: 1356429-1

Serial No.: F01

Test Engineer: _____

Quality Assurance: _____

Date: 4/10/98

QC 226 * 9 A-22 MAR 30 '98 R. Kappy

FOR REFERENCE ONLY

AMSU-A TEST

AMSU-A1-1, S/N F01, CH14, NF & NPS TEST DATA, PLO #1 4/10/98

SEQ	TEMP_TEST	TEST TEMP	VOLTAGE	STD_DEV	NF (dB)	NPS(K)
1	WARM TEST	296.85	-1.08221498	.00136291	----------	---------
2	COLD TEST	79.15	-.78623337	.00084414	4.34755681	.59501618
3	WARM TEST	296.85	-1.07800028	.00105039	----------	---------
4	COLD TEST	79.15	-.78475781	.00079801	4.37119160	.22321948
5	WARM TEST	296.85	-1.07641260	.00108267	----------	---------
6	COLD TEST	79.15	-.77993727	.00080669	4.31670446	.09858354
7	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
8	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
9	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
10	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
11	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
12	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
13	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
14	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
15	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
16	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
17	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
18	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000
19	WARM TEST	0.00	0.00000000	0.00000000	----------	---------
20	COLD TEST	0.00	0.00000000	0.00000000	0.00000000	0.00000000

CH. 14 ,5.9 MHz MHz

NOISE FIGURE AVERAGE (dB) = 4.3452082378

NOISE POWER STABILITY (K) = .305606383341

NOISE POWER STABILITY DELTA (K) = .496432622252

NPS_MAX (K) = .595016157406 NPS_MIN (K) = .0985835351544

INTEGRATION TIME = .165

TEST DATA SHEET 16

Temperature Sensor and Thermistor Test Data (Paragraph 3.6.1) (A1-1)

Test Setup Verified: T. Trinh (Signature) Baseplate Temperature (T_B) 22.9 °C

Reference Designation	Specification	Measured Value		Pass/Fail
RT 40	2200 ± 100 Ω	2174	Ω	T. Trinh 5/20/98 ~~2174~~ Pass
RT 45	2200 ± 100 Ω	2173	Ω	Pass
RT 11	2200 ± 100 Ω	2172	Ω	Pass
RT 13	2200 ± 100 Ω	2174	Ω	Pass
RT 15	2200 ± 100 Ω	2175	Ω	Pass
RT 14	2200 ± 100 Ω	2175	Ω	Pass
RT 20	2200 ± 100 Ω	2173	Ω	Pass
RT 21	2200 ± 100 Ω	2172	Ω	Pass
RT 23	2200 ± 100 Ω	2172	Ω	Pass
RT 24	2200 ± 100 Ω	2172	Ω	Pass
RT 25	2200 ± 100 Ω	2173	Ω	Pass
RT 26	2200 ± 100 Ω	2174	Ω	Pass
RT 27	2200 ± 100 Ω	2175	Ω	Pass
RT 28	2200 ± 100 Ω	2175	Ω	Pass
RT 29	2200 ± 100 Ω	2177	Ω	Pass
RT 30	2200 ± 100 Ω	2173 T.Trinh	Ω	Pass
RT 31	2200 ± 100 Ω	2177	Ω	Pass
RT 34	2200 ± 100 Ω	2174	Ω	Pass
TB 56	3000 ± 100 Ω	2994	Ω	Pass
TB 57	3000 ± 100 Ω	2997	Ω	Pass
* TB 53	4.1 – 4.6 V	2.1 mV	V	Fail

Pass = P, Fail = F

* Re Test of TAR 003182 oper No. 3040
Measured Valued: 4.34 Volts / Pass
T. Trinh 05/21/98 (TA 197) 5/21/98

TAR 003182

Part No.: 1356429-1

Serial No.: F01

Test Engineer: (TA 197) 5/21/98

Quality Assurance:

Date: 5/20/98

(QA 226) MAR 30 '98 R. Kappes

TEST DATA SHEET 20

Survival Heater and Thermal Switch Test Data (Paragraph 3.6.3) (A1-1)

Test Setup Verified: Y. Trinh (Signature) Baseplate Temperature (T_B) 22.9 °C

	Open Switch		Closed Switch		
Reference Designation	>10 MΩ	Pass/Fail	Specification	Measured Value	Pass/Fail
HR1/TS1	>50MΩ	P	25 - 35 Ω	31.3Ω	P
	>50MΩ	P		31.2Ω	P
HR2/TS2	>50MΩ	P		31.1Ω	P
	>50MΩ	P		31.2Ω	P

Pass = P, Fail = F

Part No.: 1356429-1

Serial No.: F01

Test Engineer: [signature]

Quality Assurance: [signature] 7A 197

Date: 5/20/98

MAR 30 '98 53 A-42 226 R. Kapper

TEST DATA SHEET 23 (Sheet 1 of 3)
Bias Voltage Verification Test Data (Paragraph 3.6.4) (A1-1)

Test Setup Verified: T. Tung (Signature) Baseplate Temperature (T_B) 30.3 °C

Reference Designation	Specification	Measured Value (V)	Pass/Fail
Mixer/IF AMP Ch 6, 7, 15, 9-14	+10 ±0.1	9.94	P
DRO Ch 7	+10 ±0.1	9.94	P
DRO Ch 15	+15 ±0.15	14.89	P
PLO +15	+15 ±0.15	15.10	P
PLO -15	-15 ±0.15	15.10	P
IF AMP Ch 9-14	+8 ±0.08	7.95	P

Part No.: 1356429-1
Serial No.: F01
Test Engineer: T. Tung
Quality Assurance:
Date: 4/10/98

APR 30 '98 5600226 R. Kappy

ADDENDUM / AMENDMENT A

TO

REPORT 11155

AMENDMENT A

After vibration test on "Y" axis, an LPT was performed on instrument. Data review indicated Channel 7 radiometric counts were in the 8-9000 range. Normal range is 12,500-20,500. TAR #4316 was generated. Mixer-amplifier P/N 1331562-17 S/N 7A07 and DRO P/N 1336610-7, S/N 85022 were removed. Mixer-amplifier P/N 1331562-17 S/N 7A27 and DRO P/N 1336610-7 S/N 85021 were installed. Vibration tests were completed and instrument passed all testing. (FAR #133)

APPENDIX A

Channel 7 LO

DRO (P/N: 1336610-7, S/N: 85022)

S/N: 85022 Was Replaced With DRO (P/N: 1336610-7, S/N: 85021)

LITTON
Solid State

TEST DATA SHEET 7.2
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS € 9036 AJ /A AESD 1336610- 7
SERIAL NUMBER: 85021 QUAL TEST N/A ACCEPT TEST ✓

Basic Electrical Test; Ref. Test Para. 5.2.2

SPECIFICATION	MEASUREMENT AT Tnom ±1°C	LIMIT
Measurement at Vop=10 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10 VDC	10.0 ± 0.2 VDC
Input Current	184 mA	Table IIIB
Input Power, P_{diss}	1.84 W DC	P_{diss} max
Frequency, f_{Tnom}	54.94020 GHz	Table IIIB
RF Output Power, P_{Tnom}	12.0 dBm	12 to 17 dBm
Frequency Setting Accuracy, Δf_S (= f_{Tnom}-F_o)	.20 MHz	

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.3

Measurement at 9.5 VDC or at 9.5 VDC		
Temperature	22 °C	Table IIIB
ıut Voltage	9.5 VDC	9.5 VDC or Para. 5.2.3.2
,put Current	182 mA	Table IIIB
Frequency, f_{meas}	54.94018 GHz	Table IIIB
RF Output Power, P_{meas}	12.0 dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC		
Temperature	22 °C	Table IIIB
Input Voltage	10.5 VDC	10.5 VDC or Para. 5.2.3.3
Input Current	182 mA	Table IIIB
Frequency, f_{meas}	54.94017 GHz	Table IIIB
RF Output Power, P_{meas}	12.0 dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tnom}$

Δf_V at 9.5 VDC or at 9.5 VDC = −0.02 MHz
Δf_V at 10.5 VDC or at 10.5 VDC = −0.03 MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$

ΔP_V at 9.5 VDC or at 9.5 VDC = −0 dB
ΔP_V at 10.5 VDC or at 10.5 VDC = −0 dB

Accept ✓ Reject ____

:st Performed by SB Date 6-29-98
itton QA 03 in NODUT Date JUL 14 1998

LITTON
Solid State

TEST DATA SHEET 7.3
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036 AJ/A AESD 1336610- 7
SERIAL NUMBER: 85021 QUAL TEST N/A ACCEPT TEST ✓

Temperature Testing at T=10°C, Ref. Test Para. 5.2.5.1

SPECIFICATION	MEASUREMENT AT T=10° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	10	°C	10° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	184	mA	Table IIIB
Input Power, P_{diss}	1.84	W DC	Pdiss max
Frequency, $f_{10°C}$	54.94009	GHz	Table IIIB
RF Output Power, $P_{10°C}$	12.0	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.1

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	10	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
Input Current	181	mA	Table IIIB
Frequency, f_{meas}	54.94004	GHz	Table IIIB
RF Output Power, P_{meas}	12.0	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	10	°C	Table IIIB
Input Voltage	9.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	182	mA	Table IIIB
Frequency, f_{meas}	54.94004	GHz	Table IIIB
RF Output Power, P_{meas}	12.0	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{10°C}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	-0.05	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	-0.05	MHz
Δf_T at 10.0 VDC (=$f_{10°C} - f_{Tnom}$)	=	-0.11	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{10°C}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	-0-	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	-0-	dB
ΔP_T at 10.0 VDC (=$P_{10°C} - P_{Tnom}$)	=	-0-	dB

Accept ✓ Reject _____

Test Performed by [signature] Date 6-29-98
Litton Q.A. [signature] Date JUL 14 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 39 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.4
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E9036 AJ/A AESD 1336610- 7
SERIAL NUMBER: 85021 QUAL TEST N/A ACCEPT TEST ✓

Temperature Extreme Testing at Tmin, Ref. Test Para. 5.2.5.2

SPECIFICATION	MEASUREMENT AT Tmin ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	183	mA	Table IIIB
Input Power, P_{diss}	1.83	W DC	Pdiss max
Frequency, f_{Tmin}	54.94013	GHz	Table IIIB
RF Output Power, P_{Tmin}	12.1	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.2

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
Input Current	181	mA	Table IIIB
Frequency, f_{meas}	54.94010	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	-1	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	182	mA	Table IIIB
Frequency, f_{meas}	54.94010	GHz	Table IIIB
RF Output Power, P_{meas}	12.1	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmin}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	-0.03	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	-0.03	MHz
Δf_T at 10.0 VDC (=f_{Tmin} -f_{Tnom})		-0.07	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tmin}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	0	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	0	dB
ΔP_T at 10.0 VDC (=P_{Tmin} -P_{Tnom})	=	0.1	dB

Accept ✓ Reject _____

Test Performed by SB Date 6-29-98
Litton Q.A. [signature] Date JUL 14 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 40 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.5
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LSE 9036AJ/A
SERIAL NUMBER: 85021 QUAL TEST N/A

AESD 1336610- 7
ACCEPT TEST ✓

Temperature Testing at T=30°C, Ref. Test Para. 5.2.5.3

SPECIFICATION	MEASUREMENT AT T=30° ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	30	°C	30° ± 1°C
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	184	mA	Table IIIB
Input Power, P_{diss}	1.84	W DC	Pdiss max
Frequency, $f_{30°C}$	54.94031	GHz	Table IIIB
RF Output Power, $P_{30°C}$	12.0	dBm	12 to 17 dBm
Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.3			
Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	30	°C	Table IIIB
put Voltage	9.5	VDC	9.5 VDC or Para. 5.2.3.2
ıput Current	182	mA	Table IIIB
Frequency, f_{meas}	54.94029	GHz	Table IIIB
RF Output Power, P_{meas}	12.0	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	30	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para. 5.2.3.3
Input Current	183	mA	Table IIIB
Frequency, f_{meas}	54.94028	GHz	Table IIIB
RF Output Power, P_{meas}	12.0	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{30°C}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	-0.02	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	-0.03	MHz
Δf_T at 10.0 VDC (=$f_{30°C}$ - f_{Tnom})	=	0.11	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{30°C}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	-0-	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	-0-	dB
ΔP_T at 10.0 VDC (=$P_{30°C}$ - P_{Tnom})	=	-0-	dB

Accept ✓ Reject _____

Test Performed by _____ Date 6-29-98
Litton Q.A. _____ Date JUL 14 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 41 OF 68
56348	A	1300823	B3	

LITTON
Solid State

TEST DATA SHEET 7.6
FUNCTIONAL PERFORMANCE TESTS
INITIAL DATA SET N/A FINAL DATA SET ✓

LITTON TYPE LS E9036AJ/A AESD 1336610- 7
SERIAL NUMBER: 85021 QUAL TEST N/A ACCEPT TEST ✓

Temperature Extreme Testing at Tmax, Ref. Test Para. 5.2.5.4

SPECIFICATION	MEASUREMENT AT Tmax ±1°C		LIMIT
Measurement at Vop=10 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10	VDC	10.0 ± 0.2 VDC
Input Current	184	mA	Table IIIB
Input Power, P_{diss}	1.84	W DC	Pdiss max
Frequency, f_{Tmax}	54.94092	GHz	Table IIIB
RF Output Power, P_{Tmax}	12.0	dBm	12 to 17 dBm

Frequency and RF Output Power Variation With Voltage, Ref. Test Para 5.2.5.4

Measurement at 9.5 VDC or at 9.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	9.5	VDC	9.5 VDC or Para 5.2.3.2
put Current	182	mA	Table IIIB
requency, f_{meas}	54.94090	GHz	Table IIIB
RF Output Power, P_{meas}	12.0	dBm	12 to 17 dBm
Measurement at 10.5 VDC or at 10.5 VDC			
Temperature	44	°C	Table IIIB
Input Voltage	10.5	VDC	10.5 VDC or Para 5.2.3.3
Input Current	183	mA	Table IIIB
Frequency, f_{meas}	54.94089	GHz	Table IIIB
RF Output Power, P_{meas}	12.0	dBm	12 to 17 dBm

Calculate Frequency Variation, $\Delta f_V = f_{meas} - f_{Tmax}$:

Δf_V at 9.5 VDC or at 9.5	VDC =	-0.02	MHz
Δf_V at 10.5 VDC or at 10.5	VDC =	-0.03	MHz
Δf_T at 10.0V (=f_{Tmax} -f_{Tnom})	=	0.72	MHz

Calculate RF Output Power Variation, $\Delta P_V = P_{meas} - P_{Tnom}$:

ΔP_V at 9.5 VDC or at 9.5	VDC =	-0-	dB
ΔP_V at 10.5 VDC or at 10.5	VDC =	-0-	dB
ΔP_T at 10.0 VDC (=P_{Tmax}-P_{Tnom})	=	-0-	dB

Accept ✓ Reject ____

Test Performed by SB Date 6-29-95
Litton Q.A. LITTON Date JUL 14 1998

CODE IDENT NO.	SIZE	NUMBER	REV	SHEET 42 OF 68
56348	A	1300823	B3	

APPENDIX A

Channel 7 Mixer/Amplifier

Mixer/Amplifier (P/N: 1331562-17, S/N: 7A07)

S/N: 7A07 Was Replaced With Mixer/Amplifier (P/N: 1331562-17, S/N: 7A27)

TEST DATA SHEET NO. 6. AMPLIFIER TESTS

GAIN FLATNESS TEST: ATP PARAGRAPH 5.1.3

GAIN FLATNESS (dB)ppK	SPEC. GAIN FLATNESS (dB)ppK	ACC	REJ
0,50	0,50	QA 1	

GAIN VERSUS VOLTAGE SENSITIVITY TEST: ATP PARAGRAPH 5.1.4

AMPLIFIER VOLTAGE	GAIN READING (dBm)	ΔG/ΔV	SPEC. ΔG/ΔV	ACC	REJ
9.96	70.94	2.25	2.0		QA 1
10.00	71.03				
10.04	71.12				
ΔGv =	0.18 dB				

ECN CAMSO-1352

	DATE	ACC	REJ
		QA 1	

PART NO. 1331562-175 SPACEK QA 6-27-98

SER NO. 7A27 TEST FAILURE:

TESTED BY: 977 FAILURE ANALYSIS NO.

END DATE: 6-5-98

END TIME: 1600

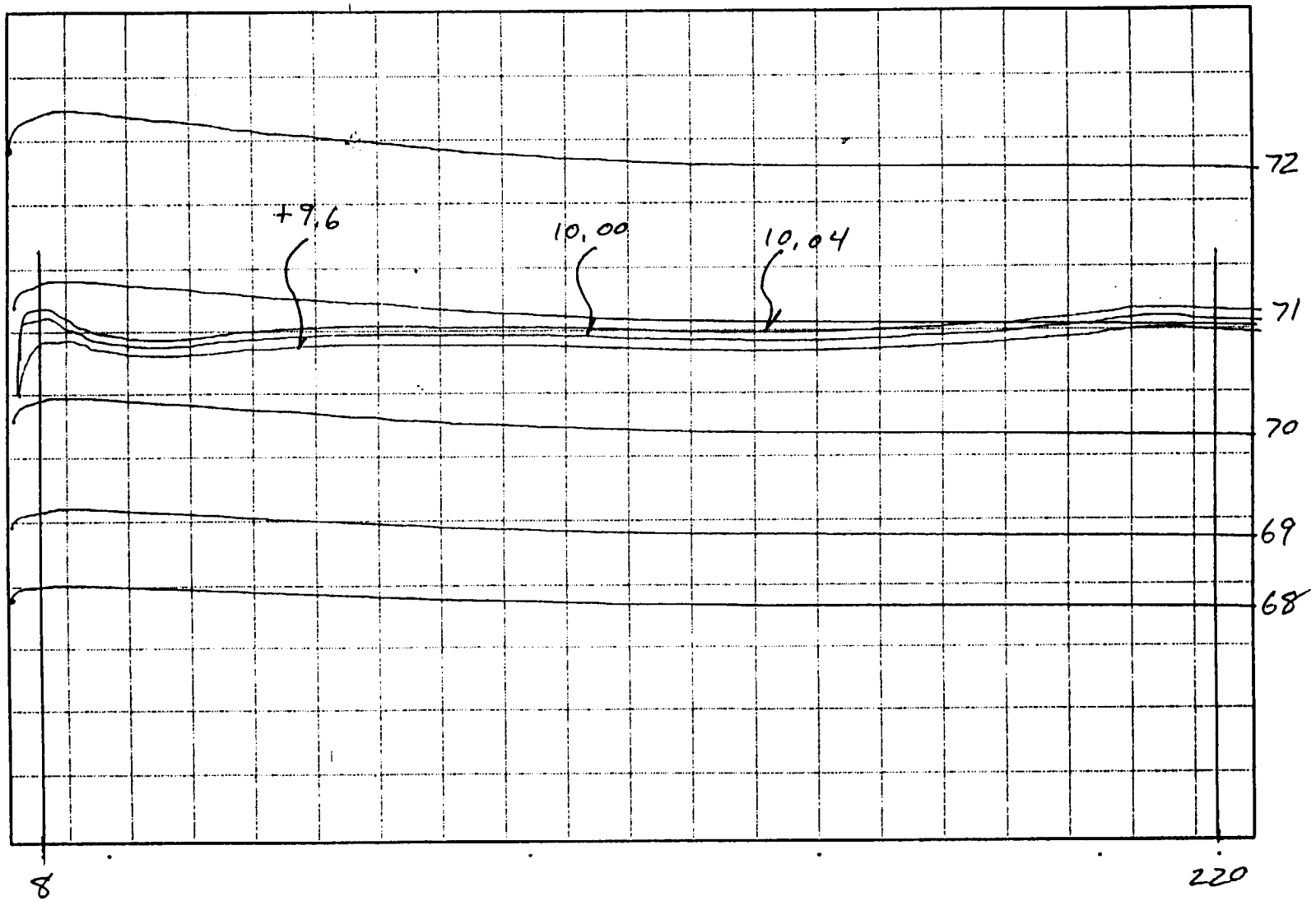
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-176
Serial No. 7A27
Date 6-6-98
Tested By 7FK

Amb Temp 23°C



4
1

TEST DATA SHEET NO. 7. AMPLIFIER TESTS

GAIN VERSUS TEMPERATURE SENSITIVITY TEST: ATP PARAGRAPH 5.1.5

Nominal Temperature (°C)		Relative Gain	ΔG/ΔT	SPEC	ACC	REJ
T1	-6	G_{T1} 71.83				
			* 0.024	0.035dB/°C	QA 1	
T2	+8	G_{T2} 71.50				QA 1
			* 0.024	0.020dB/°C		
T3	+28	G_{T3} 71.02				
			* 0.020	0.035dB/°C	QA 1	
T4	+40	G_{T4} 70.78				

ECN CAMSU-1352

* Perform the following calculations and record on the TDS

$$\Delta G/\Delta T = \frac{G_{Ti} - G_{Ti+1}}{T_i - T_{i+1}} \quad i = 1,2,3,4 \qquad \Delta G_T = 1.05 \text{ dB}$$

$\Delta G_{TOTAL} = \Delta G_V + \Delta G_T + 0.4 = 1.63$ dB Spec 1.4dB ACC____ REJ____ QA 1

ECN CAMSU-1352

	DATE	ACC	~~REJ~~
SPACEK QA	6-9-98		QA 1

PART NO. 1331562-175

SER NO. 7A27

TESTED BY: 777

END DATE: 6-5-98

END TIME: 1600

TEST FAILURE: _____

FAILURE ANALYSIS NO. _____

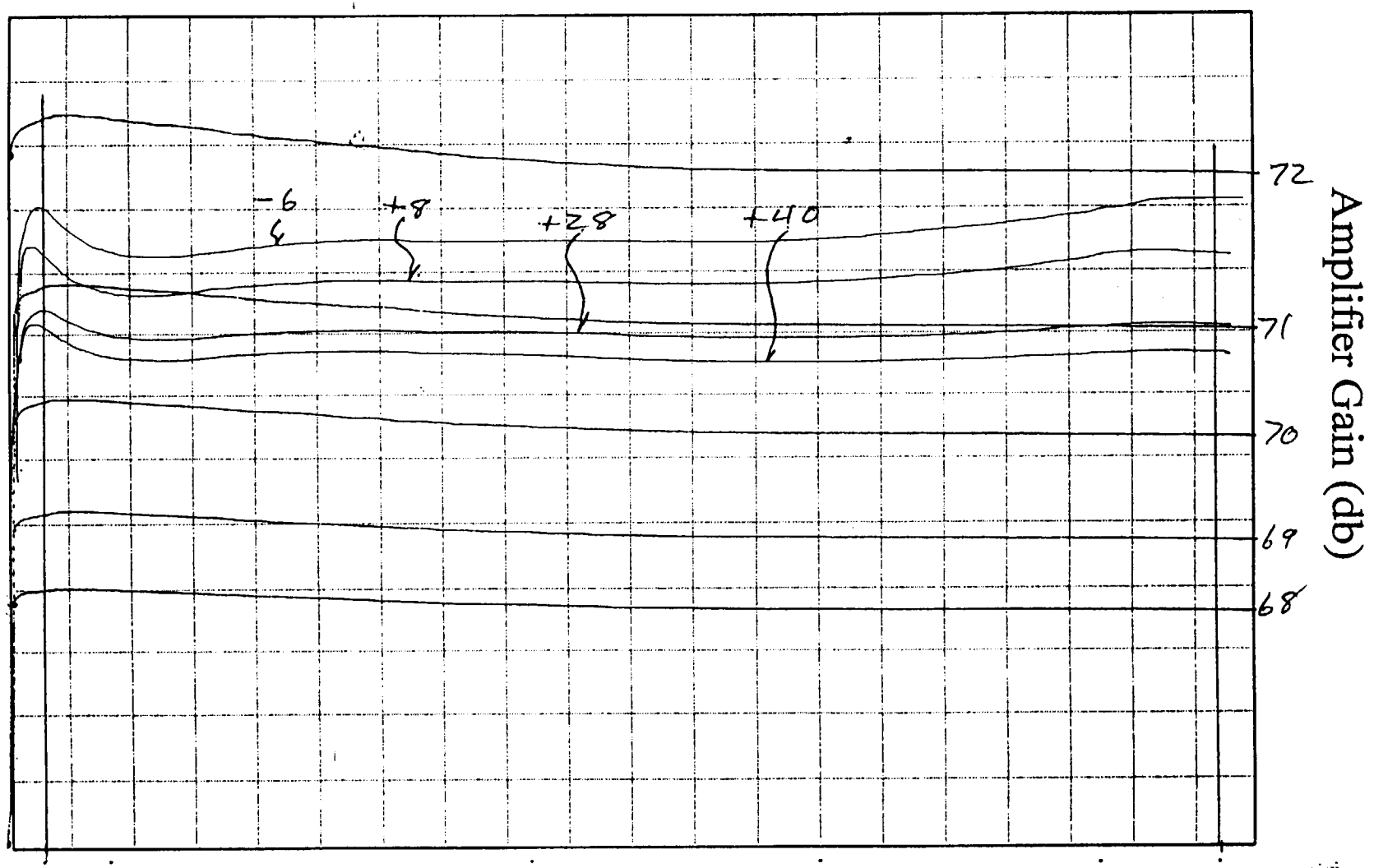
Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

SPACEK LABS, INC.
MM-WAVE TECHNOLOGY

Amplifier Gain

Model No. 1331562-176
Serial No. 7A27
Date 6-6-98
Tested By ZH

Amb Temp 23°C



QA 1

TEST DATA SHEET NO. 8. AMPLIFIER TESTS

OUTPUT 1.0 dB COMPRESSION POINT TEST: ATP PARAGRAPH 5.1.6

DASH #

11	12	13	14	15	16	17	18	19	20	FREQ. (MHz)	P2 COMP (dBm)	OUTPUT COMP. at+10(dBm)	SPEC. COMP. PT.(dBm)	ACC	REJ
X	X	X	X		X	X	X	X		10	-2.6	0.4	1.0	SA	
				X						20					
	X	X								50					
X	X	X	X	X	X	X	X			100	-2.7	0.3	1.0	SA	
X										150					
			X	X	X	X	X	X		200	-2.6	0.4	1.0	SA	
								X		400					
									X	500					
									X	1000					
									X	1500					

AMPLIFIER NOISE FIGURE AND TOTAL POWER TEST: ATP PARAGRAPH 5.1.7

DATE: 6-5-98 AMBIENT ROOM TEMPERATURE °C: 23°C

AMPLIFIER OUTPUT POWER AMBIENT (dBm)	AMPLIFIER OUTPUT POWER (-77 K)(dBm)	Y FACTOR (dB)	AMPLIFIER NOISE FIGURE (dB)
-20.4	-24.0	3.6	1.19

Above data taken with Daden filter attached (except -19) .

Intermediate test results for information only

		DATE	ACC	REJ
PART NO. 1331562-17G	SPACEK QA	6-29-98	SA	

SER NO. 7A27 TEST FAILURE: _____

TESTED BY: 777 FAILURE ANALYSIS NO. _____

END DATE: 5-6-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

TEST DATA SHEET NO. 13. MIXER-AMPLIFIER ASSEMBLY TESTS

NOISE FIGURE, TOTAL POWER AND CURRENT VS. TEMPERATURE TEST: ATP PARA 5.4.8.

DATE: 6-24-98 AMBIENT ROOM TEMPERATURE °C: +21

UUT TEMP °C.	UUT CURRENT	MIXER-AMP. OUTPUT POWER (AMBIENT) (dBm)	MIXER-AMP. OUTPUT POWER (77 DEG K) (dBm)	Y FACTOR (dB)	MIXER-AMP. NOISE FIGURE (dB)	SPEC. MIXER-AMP. NOISE FIGURE (dB)	ACC	REJ
-6	43.4	-19.30	-21.40	2.10	2.9	3.8	QA 1	
+8	43.4	-19.40	-21.50	2.10	2.9	3.8	QA 1	
+28	43.6	-19.70	-21.80	2.10	2.9	3.8	QA 1	
+40	43.6	-20.00	-22.00	2.00	3.1	~~3.8~~ 3.9	QA 1	

Noise figure change 0.2 dB Spec is .5dB peak to peak on -20 ACC ___ REJ ___

NOTE: *Above data to be taken with the Daden filter, except on the -19 unit.*

NEΔT-NOISE POWER STABILITY TEST: ATP PARAGRAPH 5.4.9

Date: 6-21-98 Ambient Room Temperature °C: 23

Attach computer generated *NEΔT* spreadsheet to this test data sheet.

Record the calculated Nps(K) from spreadsheet data: 0.046

Record Nps(K) 0.08 for dash number from Aerojet specification AE-24869, Table II. Accept units if calculated Nps(K) is less than or equal to specified Nps(K), otherwise reject.

ACC QA 1 REJ ___

DATE ACC REJ

PART NO. 1331562-175 SPACEK QA 6-29-98 QA 1 ___

SER NO. 7A27 TEST FAILURE: ___

TESTED BY: [illegible] FAILURE ANALYSIS NO. ___

END DATE: 6-25-98

END TIME: 1600

Spacek Labs, Inc.
212 E. Gutierrez St.
Santa Barbara,CA,93101

APPENDIX A

CENTER FREQUENCY OF LOs

Channel No.	3	4	5	6	7	8	9-14 *	15
Specification (GHz)	50.3	52.8	53.596	54.4	54.94	55.5	57.290344	89.0
Setting Accuracy (+/-GHz)	0.002	0.001	0.001	0.001	0.001	0.002	0.000086	0.03
Measured (GHz)	50.30038	52.80022	**53.59677**	**54.40008**	54.93996	**55.50077**	57.290340 57.290329	88.987

- Measured for PLO No. 1 and No. 2.

APPENDIX A

GAIN STABILITY AND GAIN COMPRESSION

FOR

MIXER/AMPLIFIERS AND IF AMPLIFIERS

APPENDIX A

GAIN-TEMPERATURE SENSITIVITY FOR MIXER/AMPLIFIERS AND IF AMPLIFIERS

Channel No.	3	4	5	6	7	8	9	10	11	12	13	14	15
Specification (+/-dB/°C)	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.04	0.06	0.06	0.06	0.06	0.02
Measured (dB/°C)	-0.009	-0.013	**-0.013**	-0.017	-0.020	-0.011	-0.025 +0.005	-0.025 +0.005	-0.025 +0.005, -0.005 -0.014	-0.025 +0.005, -0.005 -0.014	-0.025 +0.005, -0.005 -0.01	-0.025 +0.005, -0.005 -0.02	-0.017
Total (dB/°C)	-0.009	-0.013	**-0.013**	-0.017	-0.020	-0.011	+0.005, -0.025	+0.005, -0.025	+0.005, -0.044	+0.005, -0.044	+0.005, -0.04	+0.005, -0.05	

NASA
National Aeronautics and Space Administration

Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
---	---	---

4. Title and Subtitle	5. Report Date
Integrated Advanced Microwave Sounding Unit-A (AMSU-A), Performance Verification Report	September 2000
	6. Performing Organization Code: ---
7. Author(s): R. Haigh	8. Performing Organization Report No.: 11155A
	10. Work Unit No.: ---
9. Performing Organization Name and Address: Aerojet, 1100 W. Hollyvale, Azusa, CA 91702	11. Contract or Grant No.: NAS 5-32314
12. Sponsoring Agency Name and Address: NASA, Goddard Space Flight Center, Greenbelt, Maryland 20771	13. Type of Report and Period Covered: Final
	14. Sponsoring Agency Code: ---

15. Supplementary Notes: ---

16. ABSTRACT (*Maximum 200 words*)

This is the Performance Verification Report, AMSU-A1 and AMSU-A2 Receiver Assemblies, for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).

17. Key Words (Suggested by Author(s))	18. Distribution Statement
EOS Microwave System	Unclassified --- Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of pages	22. Price
Unclassified	Unclassified		---

NASA FORM 1626 OCT 86

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4. TITLE AND SUBTITLE
Integrated Advanced Microwave Sounding Unit-A (AMSU-A), Performance Verification Report

5. FUNDING NUMBERS
NAS 5-32314

6. AUTHOR(S)
R. Haigh

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Aerojet
1100 W. Hollyvale
Azusa, CA 91702

8. PERFORMING ORGANIZATION REPORT NUMBER
11155A
September 2000

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
NASA
Goddard Space Flight Center
Greenbelt, Maryland 20771

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
---

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

12b. DISTRIBUTION CODE
---

13. ABSTRACT (*Maximum 200 words*)

This is the Performance Verification Report, AMSU-A1 and AMSU-A2 Receiver Assemblies, for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).

14. SUBJECT TERMS
EOS
Microwave System

15. NUMBER OF PAGES

16. PRICE CODE
---

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	SAR

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std 239-18
298-102

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