INTEGRATED CIRCUIT IMMUNITY

DOD E³ Program Review
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THRESHOLD DEFINITION

Vout

High
2.0 v

Unk
0.8 v

Low

EMI
SIG

Vt1 Immunity Lvl

Vt2 Immunity Lvl
THRESHOLD DEFINITION

Vout

2.0 v

0.8 v

EMI
SIG
BIAS TEE CALIBRATION SET-UP

HP 8757C Scalar Network Analyzer
HP 8507B Sweep Osc
HP 83592A RF Plug-in OUT
HP 11664E Detector
HP 11664E Detector
Pwr Splitter
HP 11687A
HP 85027B Dir Bridge
Bias Tee ZBF1-6G
50 ohm Load
ZBFT-6G, S/N 1-20

GHz

dB Gain

Series 1
Series 2
Series 3
Series 4
Series 5
Series 6
Series 7
Series 8
Series 9
Series 10
Series 11
Series 12
Series 13
Series 14
Series 15
Series 16
Series 17
Series 18
Series 19
Series 20
EMI IMMUNITY LEVELS

Chart 1. EMI IMMUNITY LEVEL
7400 NAND GATES

![Graph showing EMI immunity levels for 7400 NAND gates with different Vo levels and 70's data.](image-url)
Chart 2. EMI IMMUNITY LEVEL
74ALS00 NAND GATES

Frequency [MHz]

Immune Level [dBm]

- Vo=V1
- Vo=V2
- 70's Data

30.0 25.0 20.0 15.0 10.0 5.0 0.0 -5.0 -10.0 -10.00 1,000 10,000
NAND vs. AND GATE IMMUNITY

Chart 1. EMI IMMUNITY LEVEL
7400 NAND GATES

Chart 2. EMI IMMUNITY LEVEL
74ALS00 NAND GATES

Chart 3. EMI IMMUNITY
74LS00 NAND GATES

Chart 4. EMI IMMUNITY LEVEL
7408 AND GATES
TTL vs. LS IMMUNITY LEVELS

Chart 6. EMI IMMUNITY LEVEL
74LS02 POS NOR GATES

Chart 7. EMI IMMUNITY LEVEL
7404 TOTEM POLE INVERTER

Chart 8. EMI IMMUNITY LEVEL
74LS04 TOTEM POLE INVERTER

J. Shute, Boeing Co.
A. Clark, NASA, MFSC

DOD E5 Program Review
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7805 VOLT REG IMMUNITY

Chart 11. EMI IMMUNITY LEVEL
7805 VOLTAGE REGULATOR

Immune Level [dBm]

30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0

Frequency [MHz]

10 100 1,000 10,000

- Vo=Vt1
- Vo=Vt2
- 70's Data
# SEVENTIES CHIP SET

<table>
<thead>
<tr>
<th>Category</th>
<th>Types</th>
<th>Count</th>
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<tbody>
<tr>
<td>TTL:</td>
<td>7400, 7402, 7404, 7405, 7408, 7432, 7450, 7473, &amp; 7479</td>
<td>9</td>
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<td>CMOS:</td>
<td>4011A, 4011B, 4007A, 4007B, 4001A, &amp; 4013A</td>
<td>6</td>
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<tr>
<td>Line driver/receiver:</td>
<td>8830/8820, 9614/9615, 55109/55107A, &amp; 55110</td>
<td>7</td>
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<tr>
<td>Voltage Reg:</td>
<td>(3-pin) 309, 320, 78M05, (8-pin) 300, &amp; 305</td>
<td>5</td>
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<tr>
<td>Comparators:</td>
<td>306, 311, 339, 360, 710, &amp; 760</td>
<td>6</td>
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**TOTAL NUMBER TYPES** | **38**