

Alternate Shock Pulse Width Study Preliminary Data Review

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- 1. Task Group Composition**
- 2. Initial PIND Samples Sent to NSWCR Crane**
 1. First Group of Packages
 2. Second Group of Packages
 3. Third Group of Packages
- 3. Sample Package Test Status**
- 4. Future plans**

PIND Task Group Members

- PIND Task Group Work participant members represent the manufacturers, industry, and government agencies, and international partners:
 - Manufacturers: Microchip, Texas Instruments, IR Hi Rel/Infineon, VPT Components, Semicoa, Teledyne Microwave Solutions, Micropac Industries Inc.
 - Industry Test Laboratories—Hi Rel Labs, ORS Labs, Golden Altos
 - Government Agencies and their contractors—NASA, NSWC Crane Division, US Air Force, US Army, Aerospace Corporation, DLA Land and Maritime,
 - International Partners –ESA, NASAM, TESAT/DLR

Initial Samples PIND Tested by NSWCC Crane

- First group of 39 sample packages tested.

Package Type	Quantity
121 PGA	2
8 pin cerdip	2
8 pin side braze	2
20 pin LCC	2
31 PGA	1
32 pin CQFP	2
TO-5 4 Id	2
14 pin FP	2
DO-13	5
TO-18	5
UB	4
UA	4
TO-39	3
UMC	3
Total Sample Count	39

Initial Samples To Be PIND Tested By NSWCR Crane

- Testing of second group of 62 sample packages sent to NSWCR Crane has been completed.

Package type	quantity
TO-254	20
UB	12
16 pin flat pack	7
7 pin flat pack	3
total sample count	62

Initial Samples To Be PIND Tested By NSWC Crane

- Third group of 23 TO-5 sample packages sent to NSWC Crane to be PIND tested. Testing completed.

Package type	quantity
TO-5	23
total sample count	23



NSWC Crane Standard Shock Pulse Width PIND Test Results All Test Runs

Table 2. Test Facility PIND detection results for standard shock pulse width (~40 uS)

Test Facility NSWC CRANE Standard PIND Test Results

PIND Equipment Manufacturer B&W

PIND Equipment Model number BW-LPD-DAQ4000 SN 6083

Lot number (Traveler number)	Device Part Number - optional	Package Type	Serial number	Pulse Width in uS	Shock pulse in g's	Vibration detection					Pass/Fail
						Run #	Vib 1	Vib 2	Vib 3	Vib 4	
JDC042SPT	PKG TYPE - 7-pin FP	7-pin FP	AL 1	40	1000	1					?
JDC042SPT	PKG TYPE - 7-pin FP	7-pin FP	AL 1	40	1000	2					?
JDC042SPT	PKG TYPE - 7-pin FP	7-pin FP	AL 2	40	1000	1					?
JDC042SPT	PKG TYPE - 7-pin FP	7-pin FP	AL 2	40	1000	2	X	X	X	X	Fail
JDC042SPT	PKG TYPE - 7-pin FP	7-pin FP	AL 3	40	1000	1	X	X	X	X	Fail
JDC042SPT	PKG TYPE - 7-pin FP	7-pin FP	AL 3	40	1000	2	X	X	X	X	Fail
JDC043SPT	PKG TYPE - 16-pin FP	16-pin FP	AL 4	40	1000	1	X	X	X	X	Fail
JDC043SPT	PKG TYPE - 16-pin FP	16-pin FP	AL 4	40	1000	2	X	X	X	X	Fail
JDC043SPT	PKG TYPE - 16-pin FP	16-pin FP	AL 5	40	1000	1	X	X	X	X	Fail
JDC043SPT	PKG TYPE - 16-pin FP	16-pin FP	AL 5	40	1000	2	X	X	X	X	Fail
JDC043SPT-02	PKG TYPE - 16-pin FP	16-pin FP	SI 1	40	1000	1	X	X	X	X	Fail
JDC043SPT-02	PKG TYPE - 16-pin FP	16-pin FP	SI 1	40	1000	2	X	X	X	X	Fail
JDC043SPT-02	PKG TYPE - 16-pin FP	16-pin FP	SI 2	40	1000	1	X	X	X	X	Fail
JDC043SPT-02	PKG TYPE - 16-pin FP	16-pin FP	SI 2	40	1000	2	X	X	X	X	Fail
JDC043SPT-03	PKG TYPE - 16-pin FP	16-pin FP	SI 1	40	1000	1		X	X	X	Fail
JDC043SPT-03	PKG TYPE - 16-pin FP	16-pin FP	SI 1	40	1000	2	X	X	X	X	Fail
JDC043SPT-03	PKG TYPE - 16-pin FP	16-pin FP	SI 2	40	1000	1	X	X	X	X	Fail
JDC043SPT-03	PKG TYPE - 16-pin FP	16-pin FP	SI 2	40	1000	2	X	X	X	X	Fail
JDC043SPT-04	PKG TYPE - 16-pin FP	16-pin FP	SI 3	40	1000	1	X	X	X	X	Fail
JDC043SPT-04	PKG TYPE - 16-pin FP	16-pin FP	SI 3	40	1000	2	X	X	X	X	Fail

NSWC Crane Standard Shock Pulse Width PIND Test Results All Test Runs

Table 2. Test Facility PIND detection results for standard shock pulse width (~40 uS)

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PIND Equipment Manufacturer B&W

PIND Equipment Model number BW-LPD-DAQ4000 SN 6083

Lot number (Traveler number)	Device Part Number - optional	Package Type	Serial number	Pulse Width in uS	Shock pulse in g's	Vibration detection					Pass/Fail
						Run #	Vib 1	Vib 2	Vib 3	Vib 4	
JDC102SPT-02	PKG TYPE - TO-5	TO-5	4	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	4	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 01	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 01	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 02	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 02	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 03	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 03	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 05	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 05	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 06	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 06	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 07	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 07	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 08	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 08	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 09	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 09	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 10	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 10	40	1000	2					Pass

NSWC Crane Standard Shock Pulse Width PIND Test Results All Test Runs

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PIND Equipment Model number BW-LPD-DAQ4000 SN 6083

Lot number (Traveler number)	Device Part Number - optional	Package Type	Serial number	Pulse Width in uS	Shock pulse in g's	Vibration detection					Pass/Fail
						Run #	Vib 1	Vib 2	Vib 3	Vib 4	
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 11	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 11	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 12	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 12	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 13	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 13	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 14	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 14	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 15	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 15	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 16	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 16	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 17	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 17	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 18	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 18	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 19	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 19	40	1000	2					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 20	40	1000	1					Pass
JDC102SPT-02	PKG TYPE - TO-5	TO-5	P 20	40	1000	2					Pass

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PIND Equipment Manufacturer B&W

PIND Equipment Model number BW-LPD-DAQ4000 SN 6083

Lot number (Traveler number)	Device Part Number - optional	Package Type	Serial number	Pulse Width in uS	Shock pulse in g's	Vibration detection					Pass/Fail
						Run #	Vib 1	Vib 2	Vib 3	Vib 4	
JDC102SPT-02	PKG TYPE - TO-5	TO-5	S 04	40	1000	1	X	X	X	X	Fail
JDC102SPT-02	PKG TYPE - TO-5	TO-5	S 04	40	1000	2	X	X	X	X	Fail
JDC102SPT-02	PKG TYPE - TO-5	TO-5	S 05	40	1000	1	X	X	X	X	Fail
JDC102SPT-02	PKG TYPE - TO-5	TO-5	S 05	40	1000	2	X	X	X	X	Fail
JDC102SPT-02	PKG TYPE - TO-5	TO-5	S 08	40	1000	1					?
JDC102SPT-02	PKG TYPE - TO-5	TO-5	S 08	40	1000	2					?
JDC102SPT-02	PKG TYPE - TO-5	TO-5	S 11	40	1000	1					?
JDC102SPT-02	PKG TYPE - TO-5	TO-5	S 11	40	1000	2					?
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	111	40	1000	1	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	111	40	1000	2	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	112	40	1000	1					?
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	112	40	1000	2					?
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	113	40	1000	1	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	113	40	1000	2			X		Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	114	40	1000	1					Pass ?
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	114	40	1000	2					Pass ?
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	115	40	1000	1	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	115	40	1000	2	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	116	40	1000	1					Pass ?
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	116	40	1000	2					Pass ?

NSWC Crane Standard Shock Pulse Width PIND Test Results All Test Runs

Table 2. Test Facility PIND detection results for standard shock pulse width (~40 uS)

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PIND Equipment Manufacturer B&W

PIND Equipment Model number BW-LPD-DAQ4000 SN 6083

Lot number (Traveler number)	Device Part Number - optional	Package Type	Serial number	Pulse Width in uS	Shock pulse in g's	Vibration detection					Pass/Fail
						Run #	Vib 1	Vib 2	Vib 3	Vib 4	
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	117	40	1000	1					Fail?
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	117	40	1000	2	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	118	40	1000	1	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	118	40	1000	2	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	119	40	1000	1	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	119	40	1000	2	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	120	40	1000	1	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	120	40	1000	2	X	X	X	X	Fail
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	211	40	1000	1					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	211	40	1000	2					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	212	40	1000	1					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	212	40	1000	2					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	213	40	1000	1					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	213	40	1000	2					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	214	40	1000	1					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	214	40	1000	2					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	215	40	1000	1					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	215	40	1000	2					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	216	40	1000	1					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	216	40	1000	2					Pass

NSWC Crane Standard Shock Pulse Width PIND Test Results All Test Runs

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PIND Equipment Manufacturer B&W

PIND Equipment Model number BW-LPD-DAQ4000 SN 6083

Lot number (Traveler number)	Device Part Number - optional	Package Type	Serial number	Pulse Width in uS	Shock pulse in g's	Vibration detection					Pass/Fail
						Run #	Vib 1	Vib 2	Vib 3	Vib 4	
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	217	40	1000	1					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	217	40	1000	2					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	218	40	1000	1					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	218	40	1000	2					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	219	40	1000	1					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	219	40	1000	2					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	220	40	1000	1					Pass
JDC103SPT	PKG TYPE - SMD 0.5	SMD 0.5	220	40	1000	2					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	101	40	1000	1	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	101	40	1000	2	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	102	40	1000	1	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	102	40	1000	2	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	103	40	1000	1	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	103	40	1000	2	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	104	40	1000	1	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	104	40	1000	2	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	105	40	1000	1	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	105	40	1000	2	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	106	40	1000	1	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	106	40	1000	2	X	X	X	X	Fail

NSWC Crane Standard Shock Pulse Width PIND Test Results All Test Runs

Table 2. Test Facility PIND detection results for standard shock pulse width (~40 uS)

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PIND Equipment Manufacturer B&W

PIND Equipment Model number BW-LPD-DAQ4000 SN 6083

Lot number (Traveler number)	Device Part Number - optional	Package Type	Serial number	Pulse Width in uS	Shock pulse in g's	Vibration detection					Pass/Fail
						Run #	Vib 1	Vib 2	Vib 3	Vib 4	
JDC104SPT	PKG TYPE - TO-254	TO-254	107	40	1000	1	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	107	40	1000	2	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	108	40	1000	1	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	108	40	1000	2	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	109	40	1000	1					Pass?
JDC104SPT	PKG TYPE - TO-254	TO-254	109	40	1000	2					Pass?
JDC104SPT	PKG TYPE - TO-254	TO-254	110	40	1000	1	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	110	40	1000	2	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	201	40	1000	1					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	201	40	1000	2					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	202	40	1000	1					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	202	40	1000	2					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	203	40	1000	1					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	203	40	1000	2					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	204	40	1000	1	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	204	40	1000	2	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	205	40	1000	1	X	X	X	X	Fail
JDC104SPT	PKG TYPE - TO-254	TO-254	205	40	1000	2					Fail?
JDC104SPT	PKG TYPE - TO-254	TO-254	206	40	1000	1					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	206	40	1000	2					Pass

NSWC Crane Standard Shock Pulse Width PIND Test Results All Test Runs

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PIND Equipment Manufacturer B&W

PIND Equipment Model number BW-LPD-DAQ4000 SN 6083

Lot number (Traveler number)	Device Part Number - optional	Package Type	Serial number	Pulse Width in uS	Shock pulse in g's	Vibration detection					Pass/Fail
						Run #	Vib 1	Vib 2	Vib 3	Vib 4	
JDC104SPT	PKG TYPE - TO-254	TO-254	207	40	1000	1					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	207	40	1000	2					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	208	40	1000	1					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	208	40	1000	2					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	209	40	1000	1					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	209	40	1000	2					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	210	40	1000	1					Pass
JDC104SPT	PKG TYPE - TO-254	TO-254	210	40	1000	2					Pass
JDC154SPT	JANSR2N7626UB	UB	1	40	1000	1					Pass
JDC154SPT	JANSR2N7626UB	UB	1	40	1000	2					Pass
JDC154SPT	JANSR2N7626UB	UB	9	40	1000	1					Pass
JDC154SPT	JANSR2N7626UB	UB	9	40	1000	2					Pass
JDC154SPT	JANSR2N7626UB	UB	18	40	1000	1					Pass
JDC154SPT	JANSR2N7626UB	UB	18	40	1000	2					Pass
JDC154SPT	JANSR2N7626UB	UB	23	40	1000	1	X	X	X	X	Fail
JDC154SPT	JANSR2N7626UB	UB	23	40	1000	2	X	X	X	X	Fail
JDC154SPT	JANSR2N7626UB	UB	132	40	1000	1	X	X	X	X	Fail
JDC154SPT	JANSR2N7626UB	UB	132	40	1000	2			X	X	Fail?
JDC154SPT	JANSR2N7626UB	UB	185	40	1000	1					Pass
JDC154SPT	JANSR2N7626UB	UB	185	40	1000	2					Pass

NSWC Crane Standard Shock Pulse Width PIND Test Results All Test Runs

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PIND Equipment Manufacturer B&W

PIND Equipment Model number BW-LPD-DAQ4000 SN 6083

Lot number (Traveler number)	Device Part Number - optional	Package Type	Serial number	Pulse Width in uS	Shock pulse in g's	Vibration detection					Pass/Fail
						Run #	Vib 1	Vib 2	Vib 3	Vib 4	
JDC154SPT	JANSR2N7626UB	UB	190	40	1000	1					Pass
JDC154SPT	JANSR2N7626UB	UB	190	40	1000	2					Pass
JDC154SPT	JANSR2N7626UB	UB	214	40	1000	1					Pass
JDC154SPT	JANSR2N7626UB	UB	214	40	1000	2					Pass
JDC154SPT	JANSR2N7626UB	UB	447	40	1000	1	X	X	X	X	Fail
JDC154SPT	JANSR2N7626UB	UB	447	40	1000	2	X	X	X	X	Fail
JDC154SPT	JANSR2N7626UB	UB	467	40	1000	1	X	X	X	X	Fail
JDC154SPT	JANSR2N7626UB	UB	467	40	1000	2	X	X	X	X	Fail
JDC155SPT	JANSR2N7616UB	UB	253	40	1000	1	X	X	X	X	Fail
JDC155SPT	JANSR2N7616UB	UB	253	40	1000	2					?
JDC155SPT	JANSR2N7616UB	UB	334	40	1000	1	X	X	X	X	Fail
JDC155SPT	JANSR2N7616UB	UB	334	40	1000	2					?

Sample Package Test Status

- 7 pin flat pack package serial number AI1 – no particle detection observed during either test run.
- 7 pin flat pack package serial number AI2 – no particle detection observed during first test run. Particle detection was observed during second test run during each vibration sequence.
- TO-5 pin package serial numbers S08, S11– no particle detection observed during either test run.
- UB packages serial numbers 253, 334– no particle detection observed during second test run after failing the first run.

Sample Package Test Status

- SMD 0.5 package serial numbers 112, 114, and 116—no particle detection when they should have failed.
- SMD 0.5 packageserial number 113 – particle detection observed during third vibration of second test run.
- SMD 0.5 package serial number 117—no particle detection observed during first test run. Particle detection was observed during second test run during each vibration sequence.

Sample Package Test Status

- Testing complete on the first group of 39 sample packages at NSWC Crane. Results discussed during the May 2022 JEDEC meeting.
- Second group of 62 sample packages sent to NSWC Crane for PIND testing was completed as of November 2022.
- Third group of 23 sample packages sent to NSWC Crane for PIND testing completed as of November 2022.
- Testing has been completed on the second and third group of package samples sent to NSWC Crane for initial PIND testing. Total sample package count in second and third groups is 85.

Longer Shock Pulse Width Task Proposal Future Plans

- Perform X-ray and FOD check on the packages with anomalies from the three groups of packages tested. Perform PIND test again on those devices to determine whether detection occurs.
- Then send samples to MSFC for testing.

Thank you!

- We would like to express our appreciation to the task group members, NASA NEPAG and SLS programs, Government Working Group, and NSWC Crane for their continued support of this effort.
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Acronyms

- DLA – Defense Logistics Agency
 - DLR – German Aerospace Center
 - DPA – Destructive Physical Analysis
 - ESA – European Space Agency
 - ESD – Electrostatic Discharge
 - FOD – Foreign Object Debris
 - JEDEC – JEDEC Solid State Technology Association
 - NASA – National Aeronautics and Space Administration
 - MSFG – Marshall Space Flight Center
 - NSWC Crane – Naval Surface Warfare Center, Crane Division
 - PIND – Particle Impact Noise Detection
 - STU – Sensitivity Test Unit
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