

ENVIRONMENTAL TEST REPORT

ACCORDING TO: IPC-650

FOR:

**Nano Dimension
Technologies Ltd.**

EUT:

Dielectric 1092

Model: DEMO 2A

This report is in conformity with ISO/ IEC 17025. The test results relate only to the items tested. This test report shall not be reproduced in any form except in full with the written approval of Hermon Laboratories Ltd.

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1 Applicant information

Client name: Nano Dimension Technologies Ltd.
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Telephone: 050-402-9155
Fax: 073-7509421
E-mail: Yossi.Mor@nano-di.com
Contact name: Mr. Yossi Mor

2 Equipment under test attributes

Product name: Dielectric 1092
Product type: Industrial
Model: DEMO 2A
Hardware version: DragonFly IV
Software release: 1.40.40
Condition of equipment: Sample
Receipt date 11-Jan-23

3 Manufacturer information

Manufacturer name: Nano Dimension Technologies Ltd.
Address: 22 Ilan Ramon, Science park, Ness Ziona 7403635, Israel
Telephone: 050-402-9155
Fax: 073-7509421
E-Mail: Yossi.Mor@nano-di.com
Contact name: Mr. Yossi Mor

4 Test details

Project ID: 49560
Location: Hermon Laboratories Ltd. P.O. Box 23, Binyamina 3055001, Israel
Test started: 11-Jan-23
Test completed: 11-Jan-23
Test specification: IPC-650

5 EUT description

Note: The following data in this clause is provided by the customer and represents his sole responsibility.

5.1 General information

The Equipment Under Test (EUT) is The Equipment Under Test (EUT) consists of 8 Dielectric 1092,
Model: DEMO 2A.

5.2 EUT mechanical characteristics

The Equipment Under Test (EUT) measures (H) 2.40 inches by (W) 1.45 inches by (D) 0.06 inches.
The Equipment Under Test (EUT) weighs 6.5 g.

5.3 Acceptance criteria

The EUT shall not sustain any physical damage or deterioration when subjected to Sinusoidal vibration and Shock conditions expected in its application environment.

5.4 EUT visual inspection

Before and after Sinusoidal vibration and Shock test, the EUT was visually inspected by the HL engineers.

6 Tests summary

Test	Status
IPC-650, TM 2.6.9 Sinusoidal vibration (Variable Frequency) test	Pass
IPC-650, TM 2.6.9 Sinusoidal vibration (Dwell Resonance) test	Pass
IPC-650, TM 2.6.5 Shock test	Pass

	Name and Title	Date	Signatures
Tested by:	Mr. Sergey Prud, Environmental Test Engineer	22-Jan-23	
Compiled by:	Ms. Tal Alon, Environmental Technical Writer	22-Jan-23	
Reviewed and approved by:	Mr. Mihaeli Feldmann, Environmental Group Manager	22-Jan-23	



Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

6.1 Sinusoidal vibration (Variable Frequency) test procedure and results

6.1.1 Test purpose

The test was performed to determine the EUTs ability to withstand specified severities of the sinusoidal vibration in non-operational mode.

6.1.2 Test procedure

6.1.2.1 The non-operational EUT and the control accelerometer were installed on the vibration test system, as presented in Photographs 6.1.1.

6.1.2.2 The required vibration level was applied to the non-operational EUT along axis Z according to the requirements presented in Table 6.1.2.

6.1.2.1 The Paragraphs 6.1.2.1 and 6.1.2.2 were repeated along the X and Y axes, as presented in Photographs 6.1.2 and Photographs 6.1.3.

6.1.2.2 The control and monitor accelerometer signal are presented in Plots from 6.1.1 to 6.1.6.

6.1.2.3 A visual inspection was performed after the test.

6.1.3 Test results

Table 6.1.1 Test results

Observation	Verdict
No structural or mechanical damages were registered during the visual inspection.	Pass

Reference numbers of test equipment used:

HL 2190	HL 4888	HL 2131	HL 4020	HL 3460	HL 2133
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Full description is given in Appendix A.



Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Table 6.1.2 Sinusoidal vibration test profile for all axes

Frequency [Hz]	Acceleration [g] Peak	Velocity [m/s] Peak	Displacement [mm] Peak-Peak	Demand peak [g _n]	Duration per axis [min]
20.00	15.000	1.171	18.630	15	16
2000.00	15.000	0.012	0.002		

Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Photographs 6.1.1 Sinusoidal vibration test setup (Z axis)

Set #1



Set #2



Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Photographs 6.1.2 Sinusoidal vibration test setup (X axis)

Set #1



Set #2



Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Photographs 6.1.3 Sinusoidal vibration test setup (Y axis)

Set #1



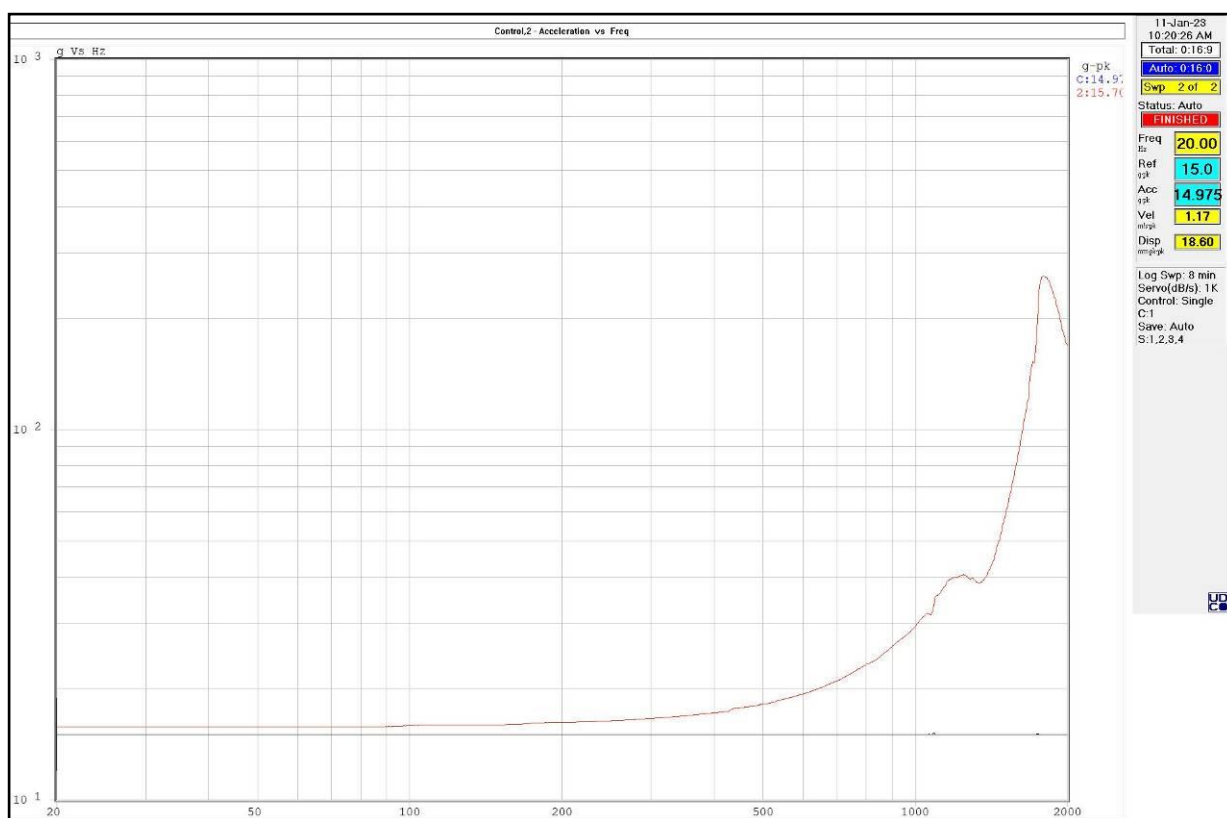
Set #2



Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.1.1 Sinusoidal vibration along Z axis

Set #1



Channel	Description
C	Control
2	EUT



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Report ID: NANENV_49560.doc
Date of Issue: 22-Jan-23

Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict: PASS	
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

List of Resonances

Chan	Freq(Hz)	g/g	CON (g)	CH (g)	Q	Phase
2	1791.912	17.29	15.0	259.2	7.93	161.05



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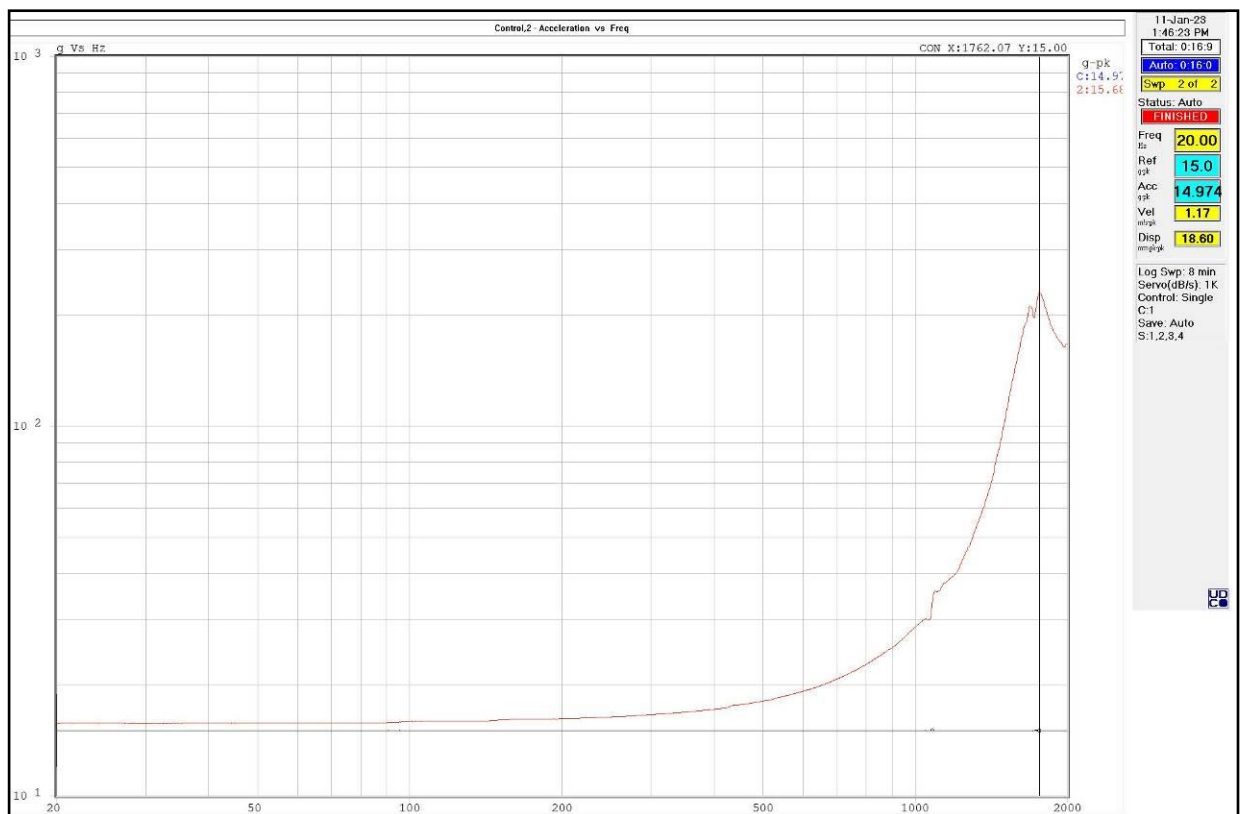
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Date of Issue: 22-Jan-23

Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.1.2 Sinusoidal vibration along Z axis

Set #2



Channel	Description
C	Control
2	EUT



HERMON LABORATORIES

Report ID: NANENV_49560.doc
Date of Issue: 22-Jan-23

Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

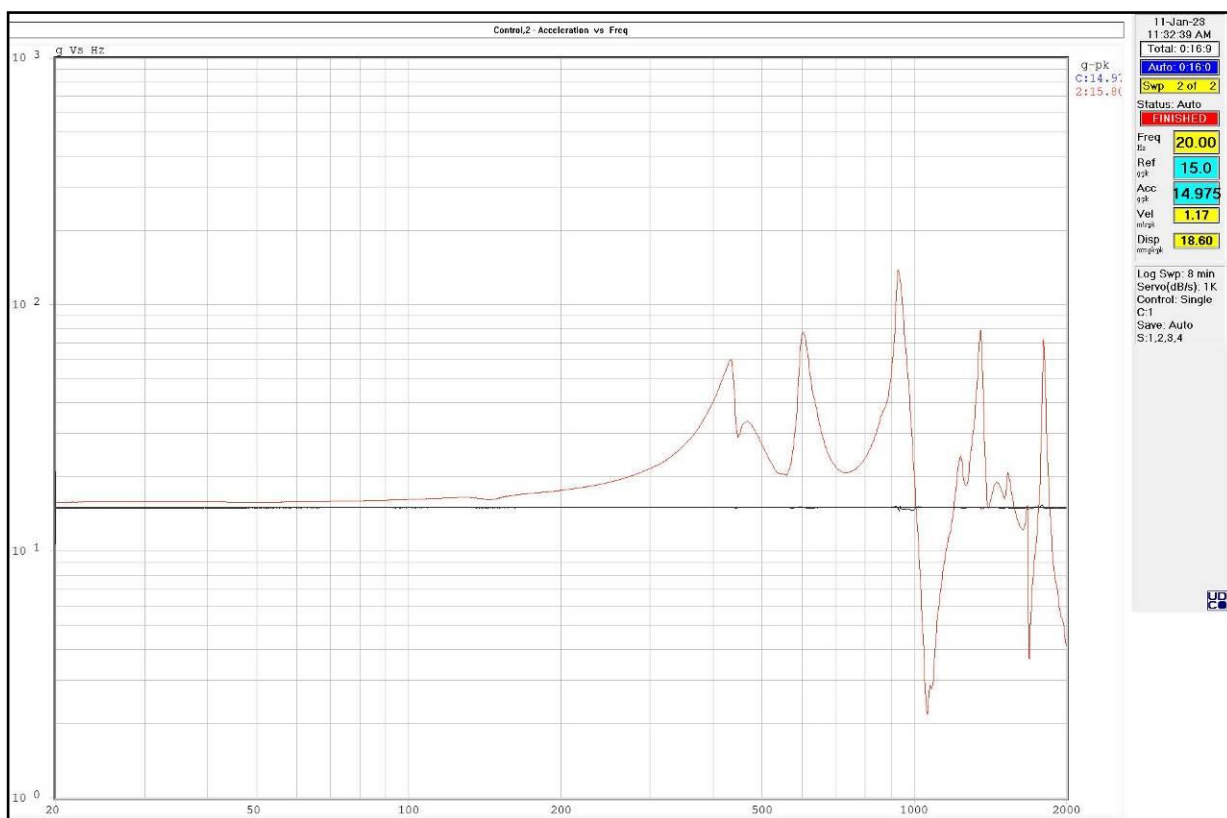
List of Resonances

Chan	Freq (Hz)	g/g	CON (g)	CH (g)	Q	Phase
2	1762.07	17.05	15.0	255.2	7.93	159.03

Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.1.3 Sinusoidal vibration along X axis

Set #1



Channel	Description
C	Control
2	EUT



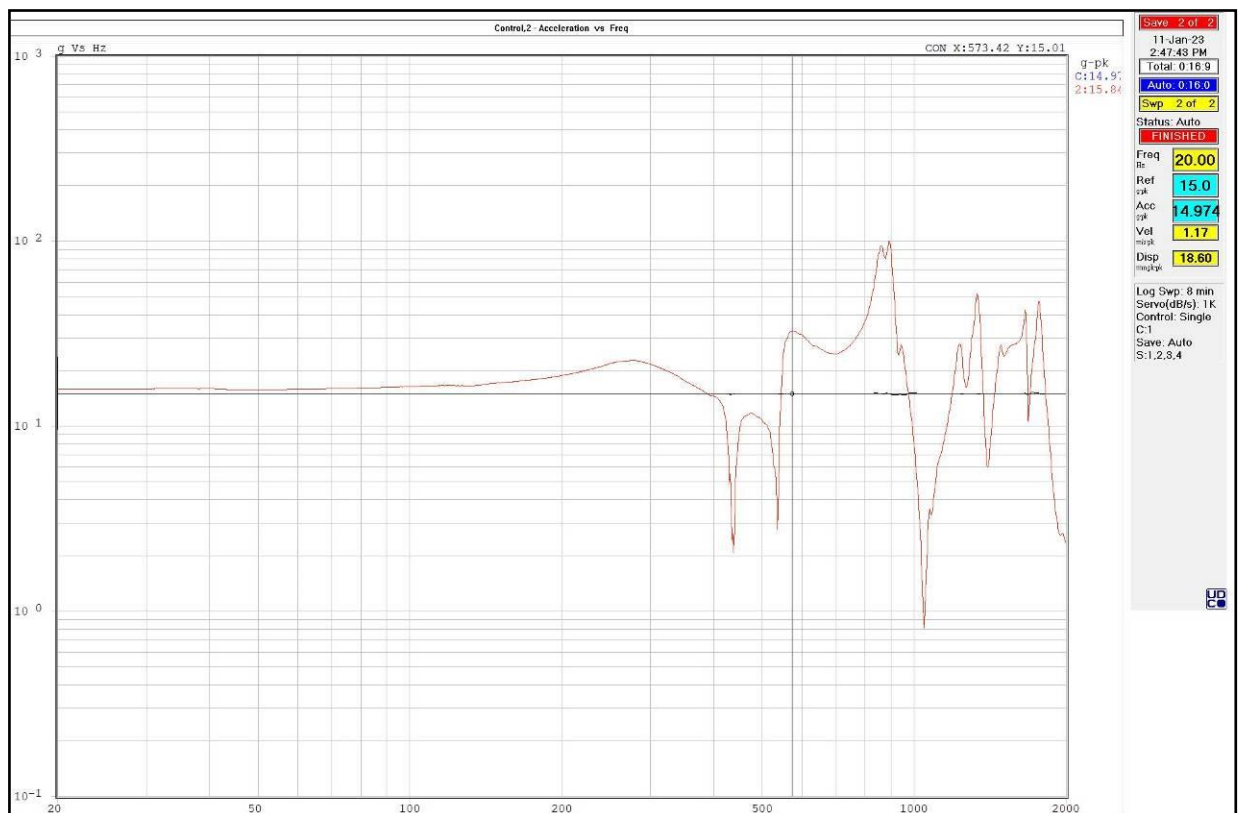
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Report ID: NANENV_49560.doc
Date of Issue: 22-Jan-23

Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

List of Resonances

Chan	Freq (Hz)	g/g	CON (g)	CH (g)	Q	Phase
2	433.098	3.98	15.0	59.8	11.55	-109.85
2	603.046	5.13	15.0	77.1	20.74	27.78
2	930.919	9.27	14.9	138.3	31.95	-84.95
2	1353.409	5.28	14.9	78.8	41.79	-165.60
2	1804.854	4.80	14.9	71.7	69.48	62.56

Set #2

Channel	Description
C	Control
2	EUT



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Report ID: NANENV_49560.doc
Date of Issue: 22-Jan-23

Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

List of Resonances

Chan	Freq(Hz)	g/g	CON (g)	CH (g)	Q	Phase
2	547.421	7.59	15.0	101.5	14.55	-88.56
2	893.721	6.69	15.0	100.5	13.75	-82.76
2	1334.069	3.48	14.9	52.1	34.74	-153.98
2	1663.496	2.82	15.1	42.5	34.99	57.78
2	1770.548	3.13	15.0	47.1	37.94	-1.12



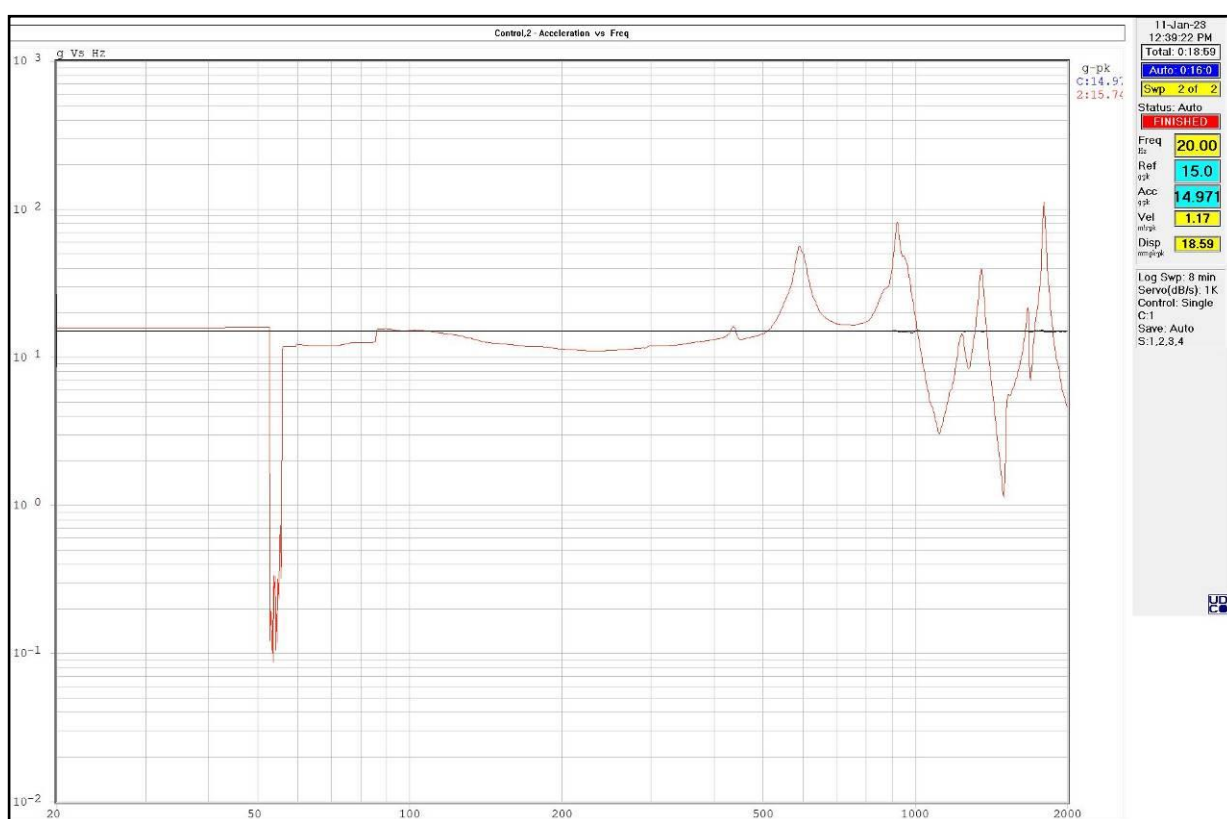
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Date of Issue: 22-Jan-23

Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.1.5 Sinusoidal vibration along Y axis

Set #1



Channel	Description
C	Control
2	EUT



HERMON LABORATORIES

Report ID: NANENV_49560.doc
Date of Issue: 22-Jan-23

Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

List of Resonances

Chan	Freq (Hz)	g/g	CON (g)	CH (g)	Q	Phase
2	590.167	3.71	15.1	56.1	17.28	-120.47
2	922.030	5.46	15.0	81.8	34.74	-83.44
2	1350.166	2.64	14.9	39.4	41.69	-169.55
2	1796.216	7.45	15.0	112.0	69.31	80.21



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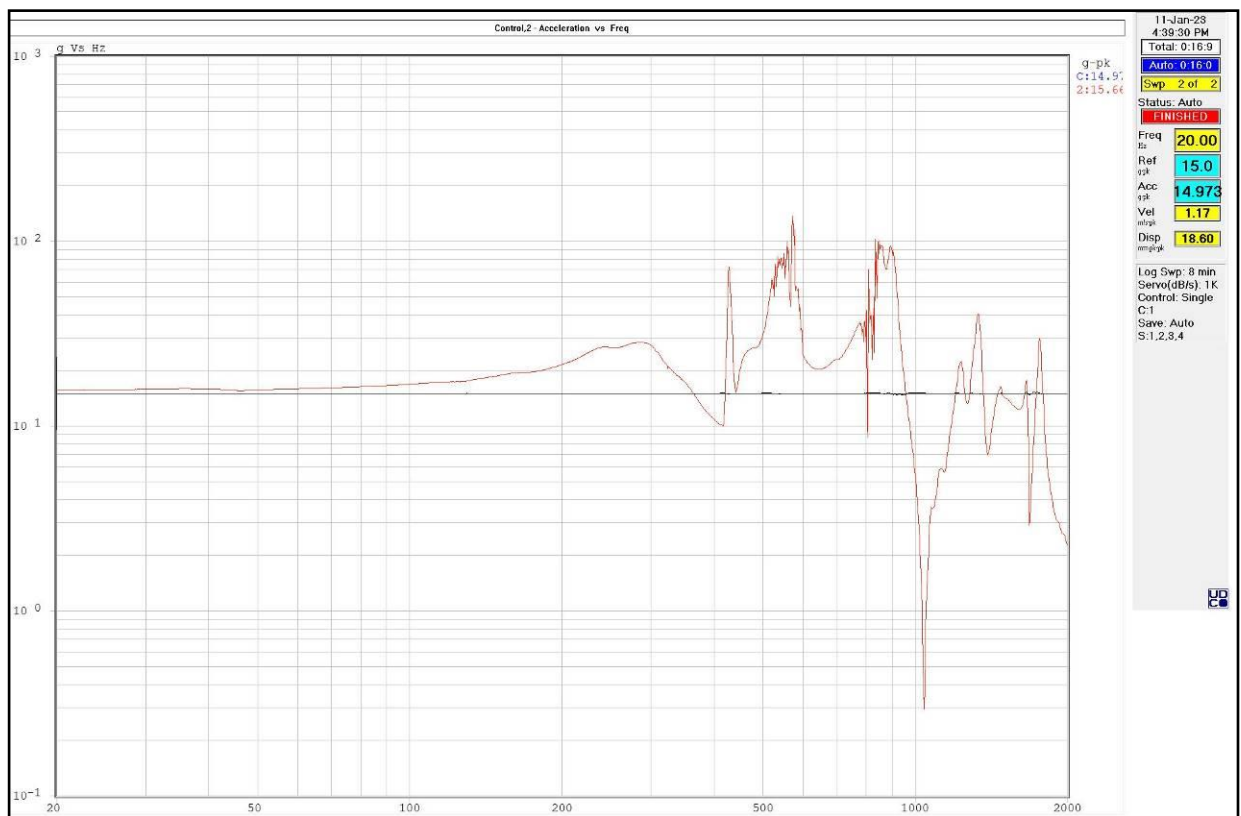
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Date of Issue: 22-Jan-23

Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.1.6 Sinusoidal vibration along Y axis

Set #2



Channel	Description
C	Control
2	EUT



HERMON LABORATORIES

Report ID: NANENV_49560.doc

Date of Issue: 22-Jan-23

Test specification:		Sinusoidal vibration (Variable Frequency) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

List of Resonances

Chan	Freq(Hz)	g/g	CON (g)	CH (g)	Q	Phase
2	427.934	4.87	14.9	72.5	69.31	164.75
2	558.488	6.62	15.0	99.4	59.63	13.84
2	570.676	9.07	15.0	136.2	69.31	-9.07
2	577.562	7.69	15.0	115.5	52.49	-13.10
2	581.734	3.76	15.0	56.4	6.89	-13.09
2	595.857	2.25	15.0	33.7	4.14	-13.57
2	802.273	2.80	15.0	42.0	139.13	-95.97
2	808.067	4.67	15.0	70.3	208.44	107.16
2	811.953	3.35	15.0	50.4	59.48	-168.59
2	827.685	2.87	15.1	43.2	139.13	-119.22
2	831.665	6.74	15.1	101.7	208.44	-140.51
2	837.672	5.77	15.1	87.1	139.13	-127.32
2	849.815	6.71	15.0	100.9	25.80	-99.54
2	893.721	6.31	14.9	94.2	11.80	-106.88
2	1334.069	2.70	14.9	40.2	34.82	-171.14



Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

6.2 Sinusoidal vibration (Dwell Resonance) test procedure and results

6.2.1 Test purpose

The test was performed to determine the EUT ability to withstand specified severities of the sinusoidal vibration.

6.2.2 Test procedure

6.2.2.1 The non-operational EUT, control and monitor accelerometers were installed on the vibration test system.

Note: The test setup is presented in Section 6.1.

6.2.2.2 The required vibration level was applied to the non-operational EUT according to the customer requirements presented in Table 6.2.2.

6.2.2.3 The Paragraphs 6.2.2.1 and 6.2.2.2 were repeated along the X and Y axes.

6.2.2.4 The control and monitor accelerometers signals are presented in Plots from 6.2.1 to 6.2.6.

6.2.2.5 A visual inspection was performed after the sinusoidal vibration test.

6.2.3 Test results

Table 6.2.1 Test results

Observation	Verdict
No structural or mechanical damages were registered during the visual inspection.	Pass

Reference numbers of test equipment used:

HL 2190	HL 4888	HL 2131	HL 4020	HL 3460	HL 3960
---------	---------	---------	---------	---------	---------

Full description is given in Appendix A.



Test specification: Sinusoidal vibration (Dwell Resonance) test			
Test procedure: STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration			
Test mode:	Compliance	Verdict: PASS	
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

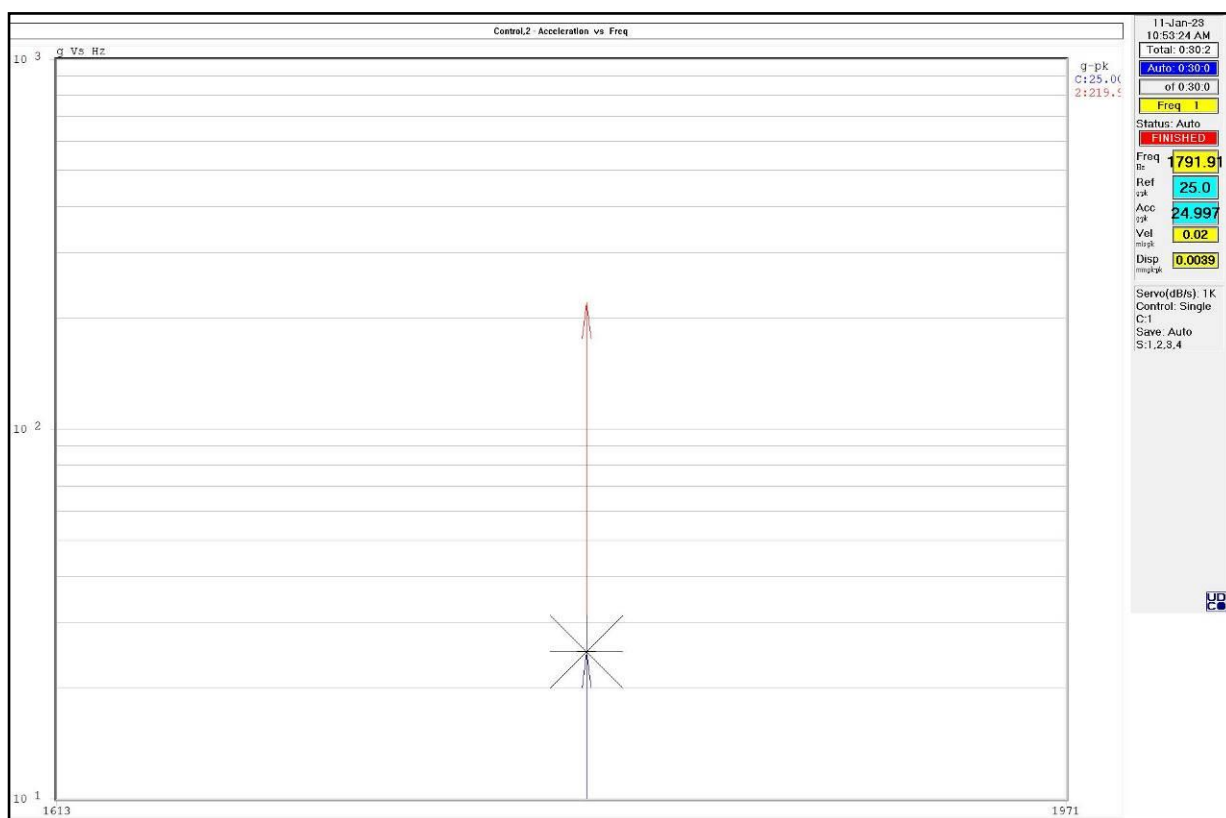
Table 6.2.2 Sinusoidal vibration test profile

Axes	Sets	Frequency [Hz]	Acceleration [g _r]	Duration per axis [min]
Z	Set #1	1791.91	25	30
	Set #2	1762.07		
X	Set #1	433.09	25	
	Set #2	573.42		
Y	Set #1	590.16	25	
	Set #2	427.93		

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.2.1 Sinusoidal vibration along Z axis

Set #1

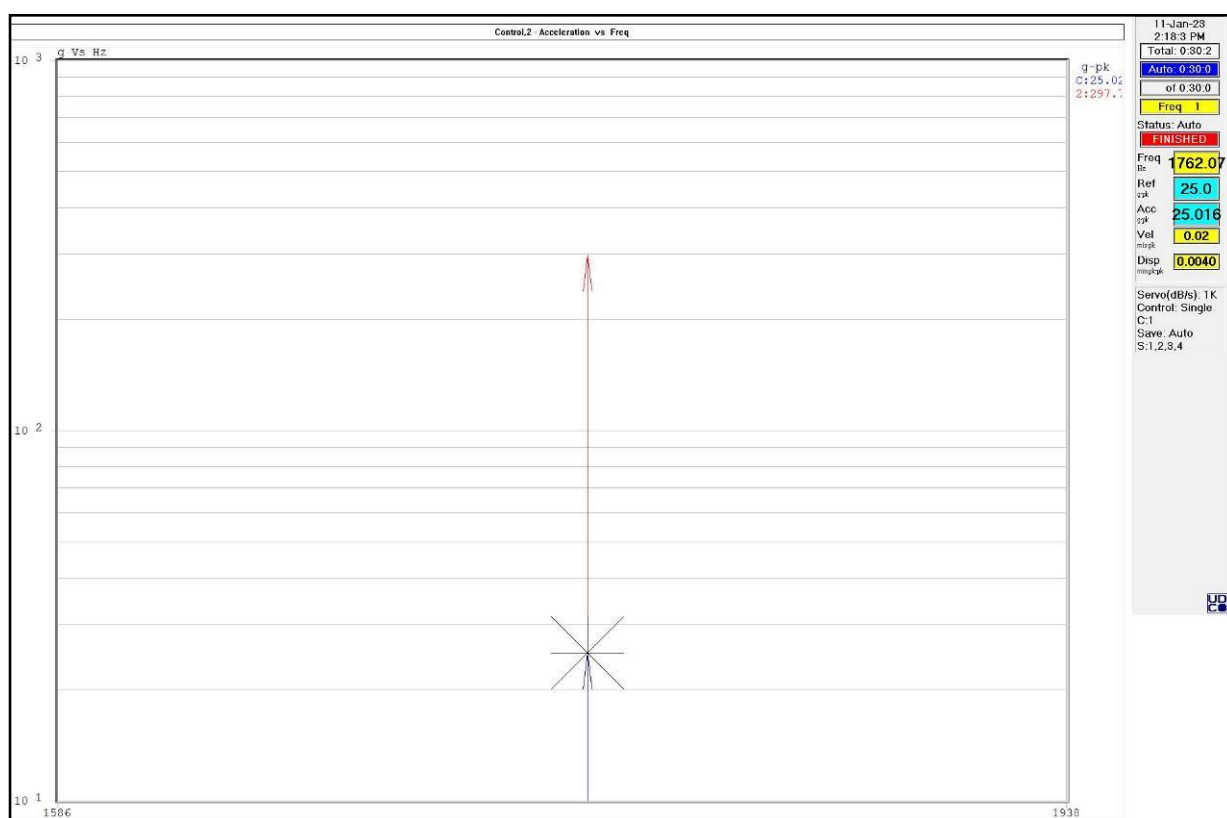


Channel	Description
C	Control
2	EUT

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.2.2 Sinusoidal vibration along Z axis

Set #2

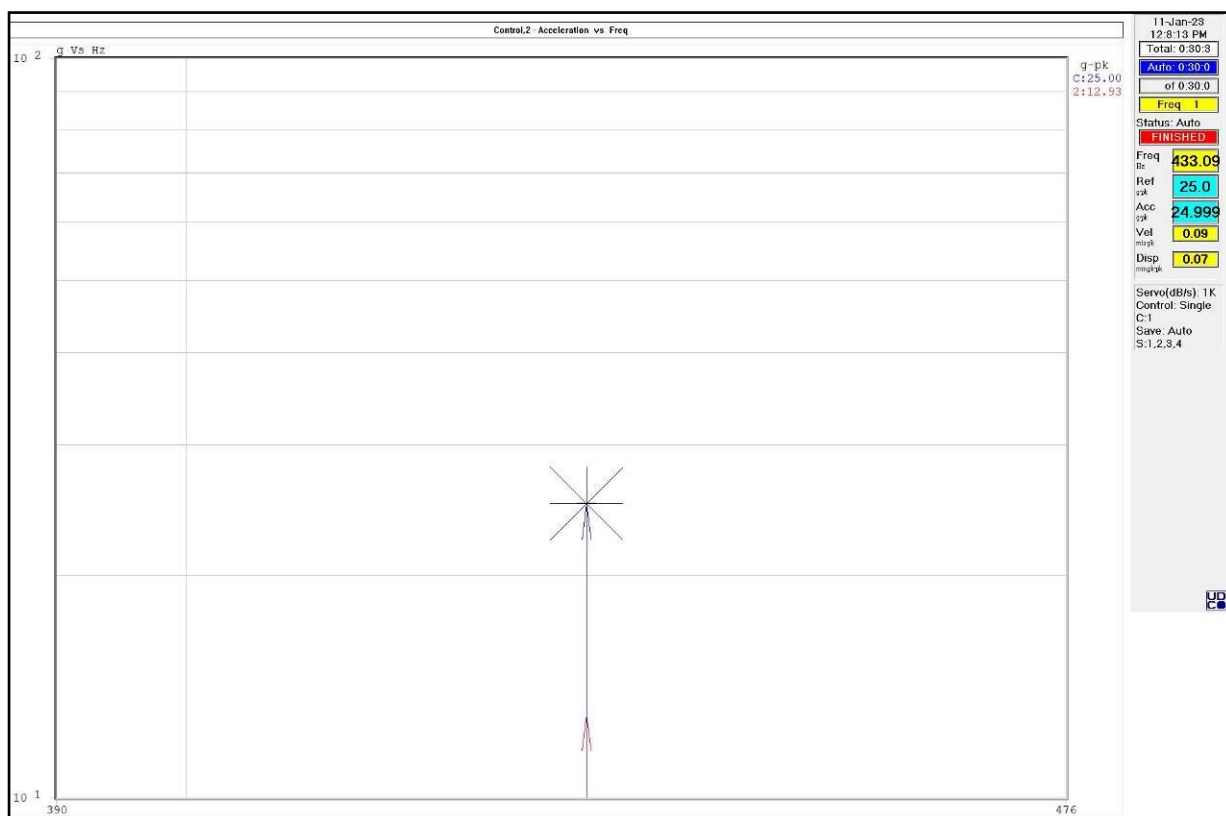


Channel	Description
C	Control
2	EUT

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.2.3 Sinusoidal vibration along X axis

Set #1

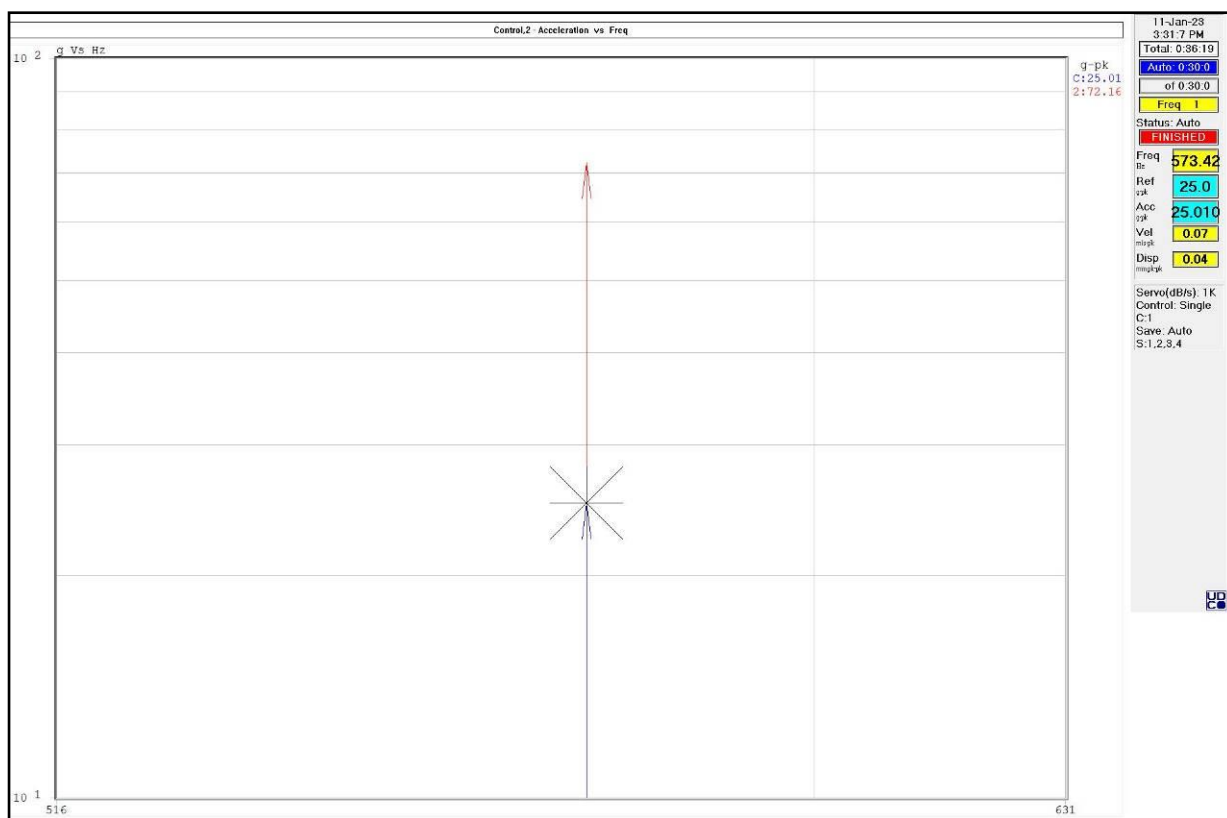


Channel	Description
C	Control
2	EUT

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.2.4 Sinusoidal vibration along X axis

Set #2

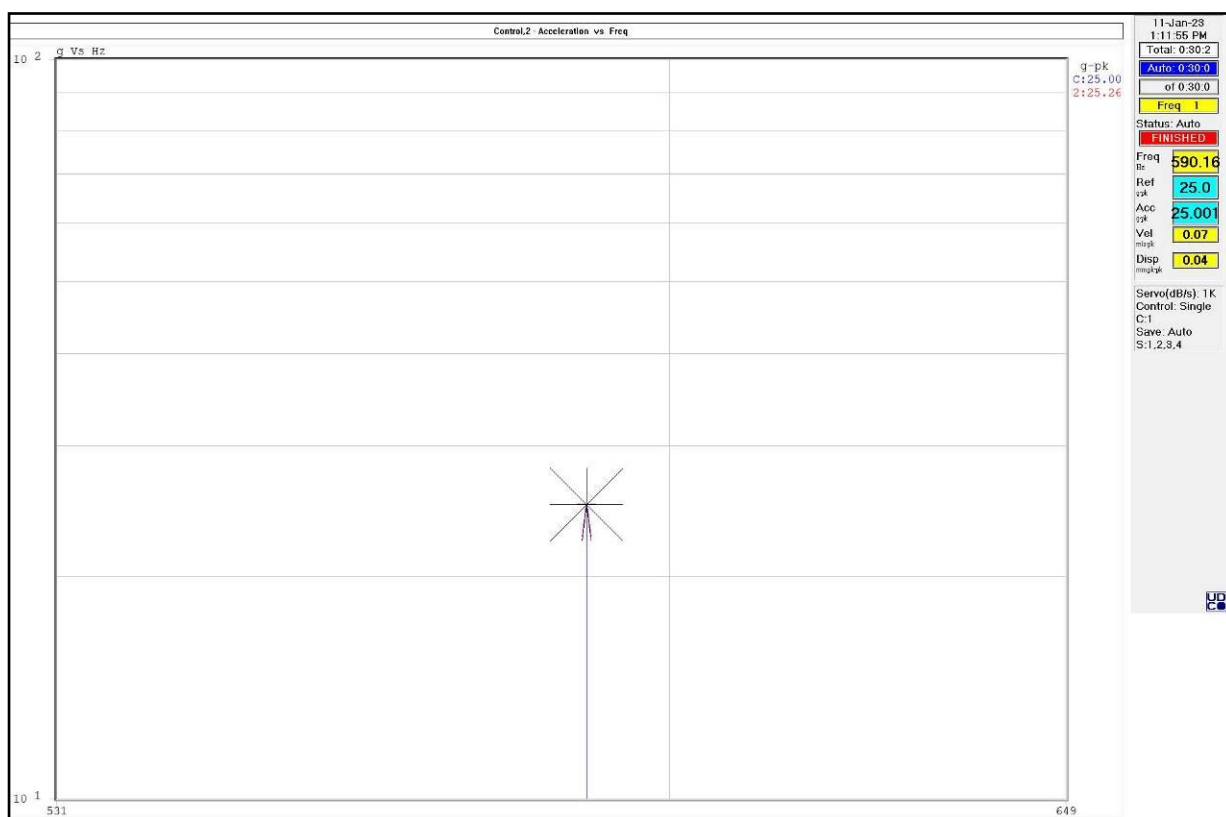


Channel	Description
C	Control
2	EUT

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.2.5 Sinusoidal vibration along Y axis

Set #1

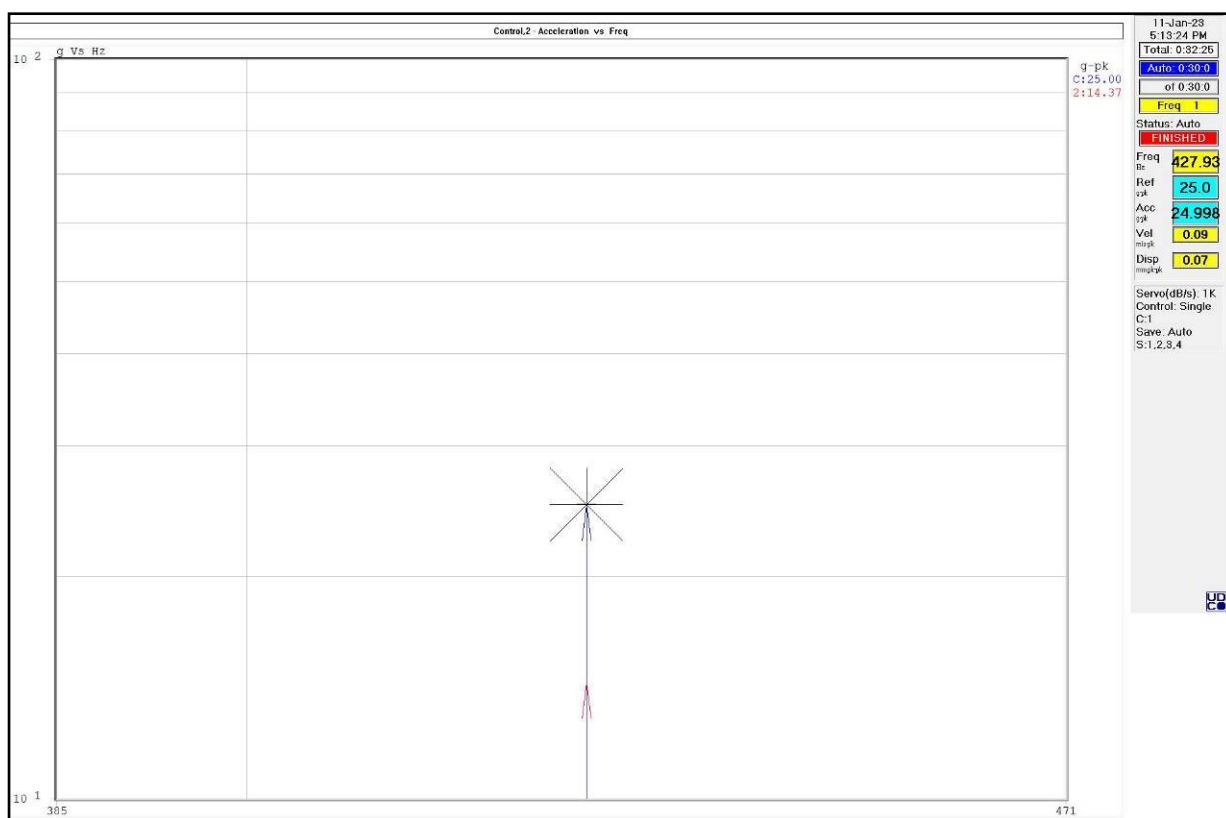


Channel	Description
C	Control
2	EUT

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.2.6 Sinusoidal vibration along Y axis

Set #2



Channel	Description
C	Control
2	EUT



Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

6.3 Shock test procedure and results

6.3.1 Test purpose

This test was performed to determine the EUT ability to withstand the dynamic shock stresses expected in its application environment.

6.3.2 Test procedure

6.3.2.1 The non-operational EUT, control and monitor accelerometer were installed on the vibration test system.

Note: The test setup is presented in Section 6.1.

6.3.2.2 The shocks were applied to the non-operational EUT along axis Z according to the requirements presented in Table 6.3.2.

6.3.2.3 The Paragraphs 6.3.2.1 and 6.3.2.2 were repeated along the X and Y axes.

6.3.2.4 The control and monitor accelerometer signals are presented in Plots from 6.3.1 to 6.3.6.

6.3.2.5 A visual inspection was performed after the test.

6.3.3 Test results

Table 6.3.1 Test results

Observation	Verdict
No structural or mechanical damages were registered during the visual inspection.	Pass

Reference numbers of test equipment used:

HL 2190	HL 4888	HL 2131	HL 4020	HL 3460	HL 3960
---------	---------	---------	---------	---------	---------

Full description is given in Appendix A.



Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

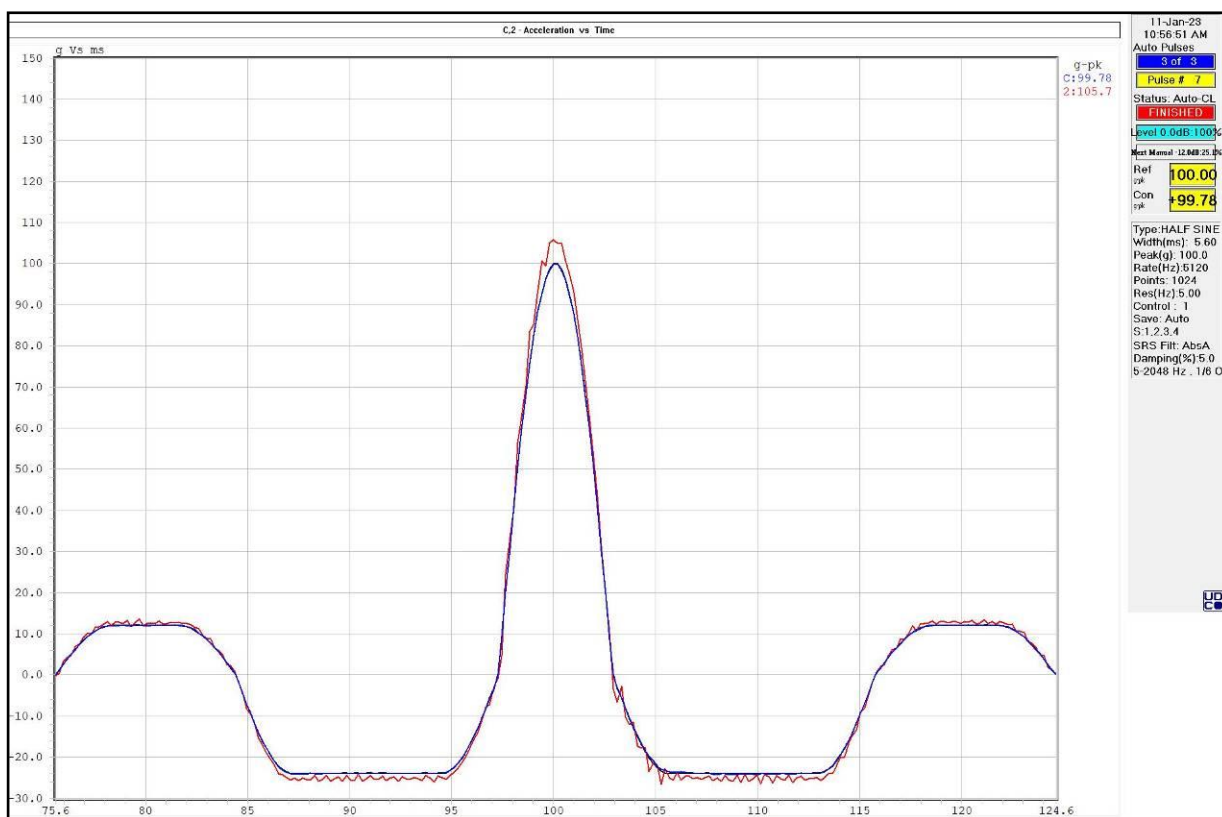
Table 6.3.2 Shock test specification

Parameter	Unit	Severity
Pulse type	N/A	Half-sine
Amplitude	g _n	100
Pulse duration	ms	5.6
Shock directions	+Z, +X, +Y	3
Number of pulses per direction	N/A	3
Total number of pulses	N/A	9

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.3.1 The positive shock pulse along Z axis

Set #1

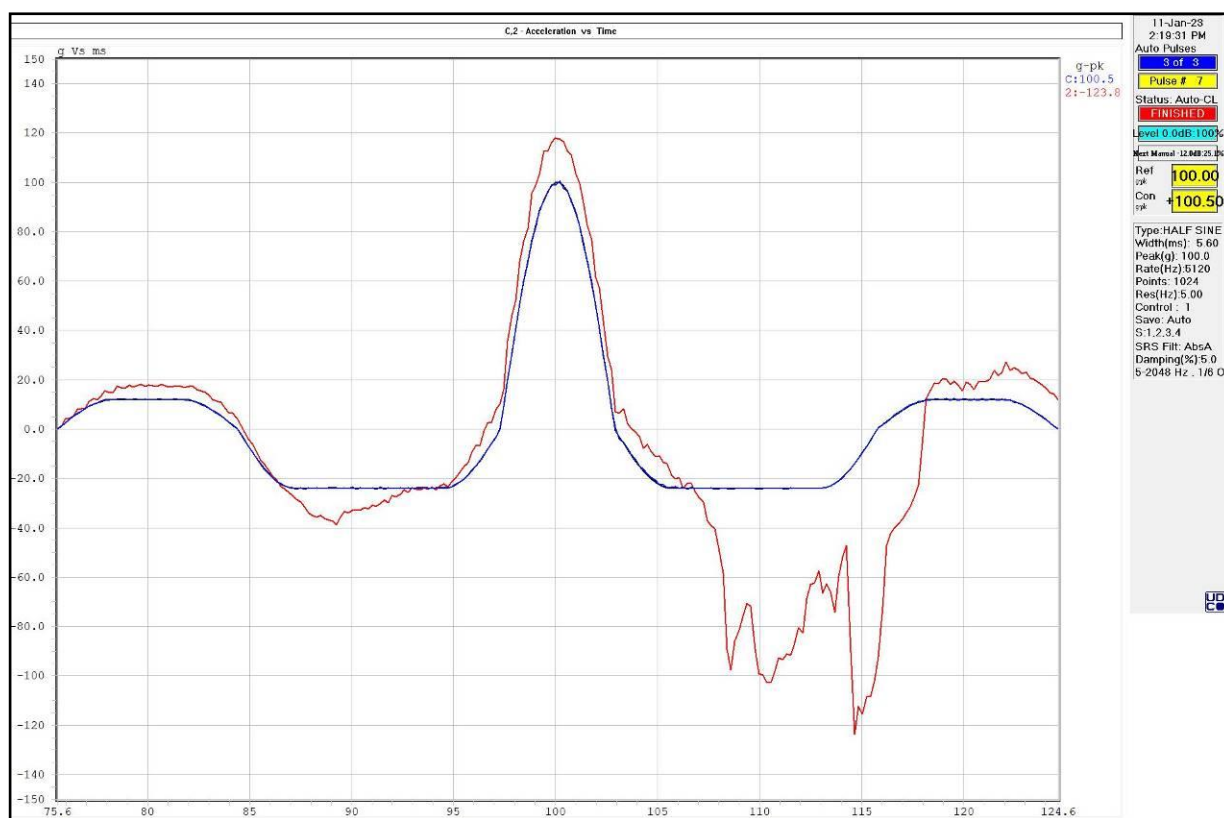


Channel	Description
C	Control
2	EUT

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.3.2 The positive shock pulse along Z axis

Set #2

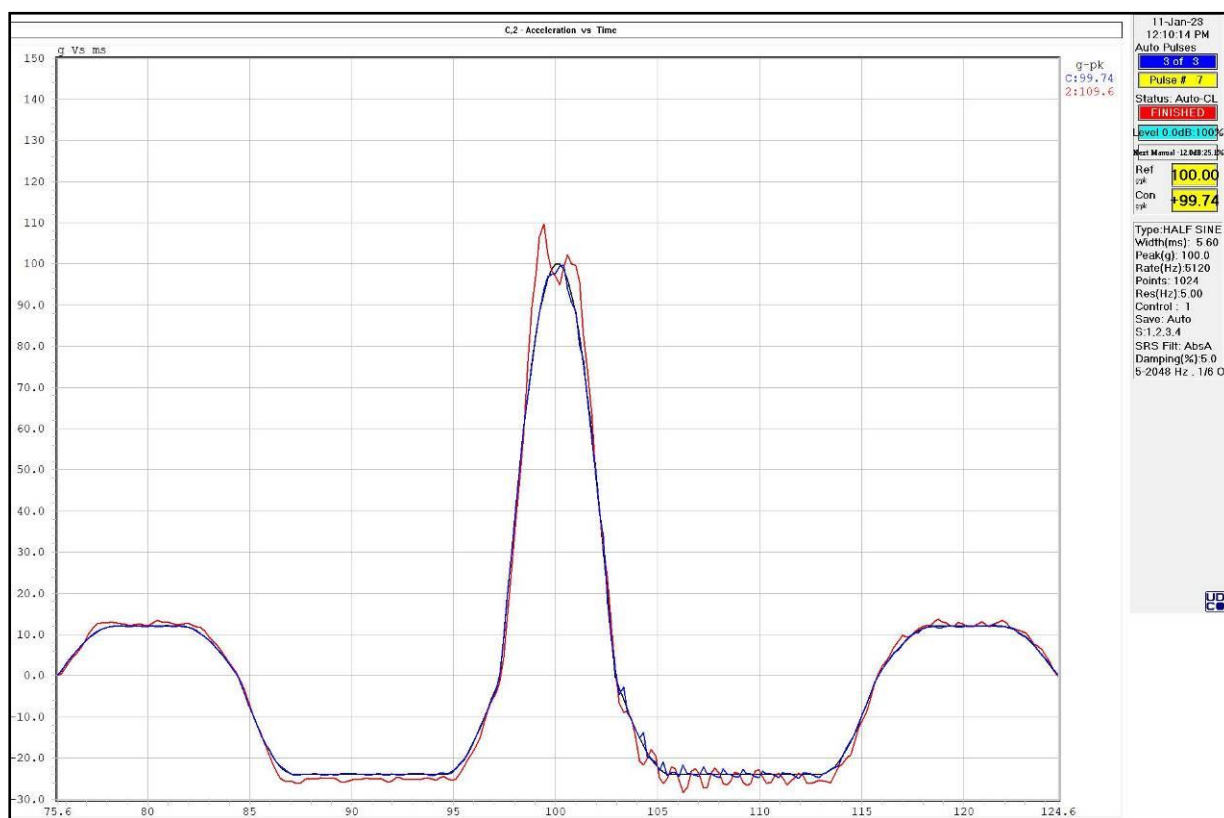


Channel	Description
C	Control
2	EUT

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.3.3 The positive shock pulse along X axis

Set #1

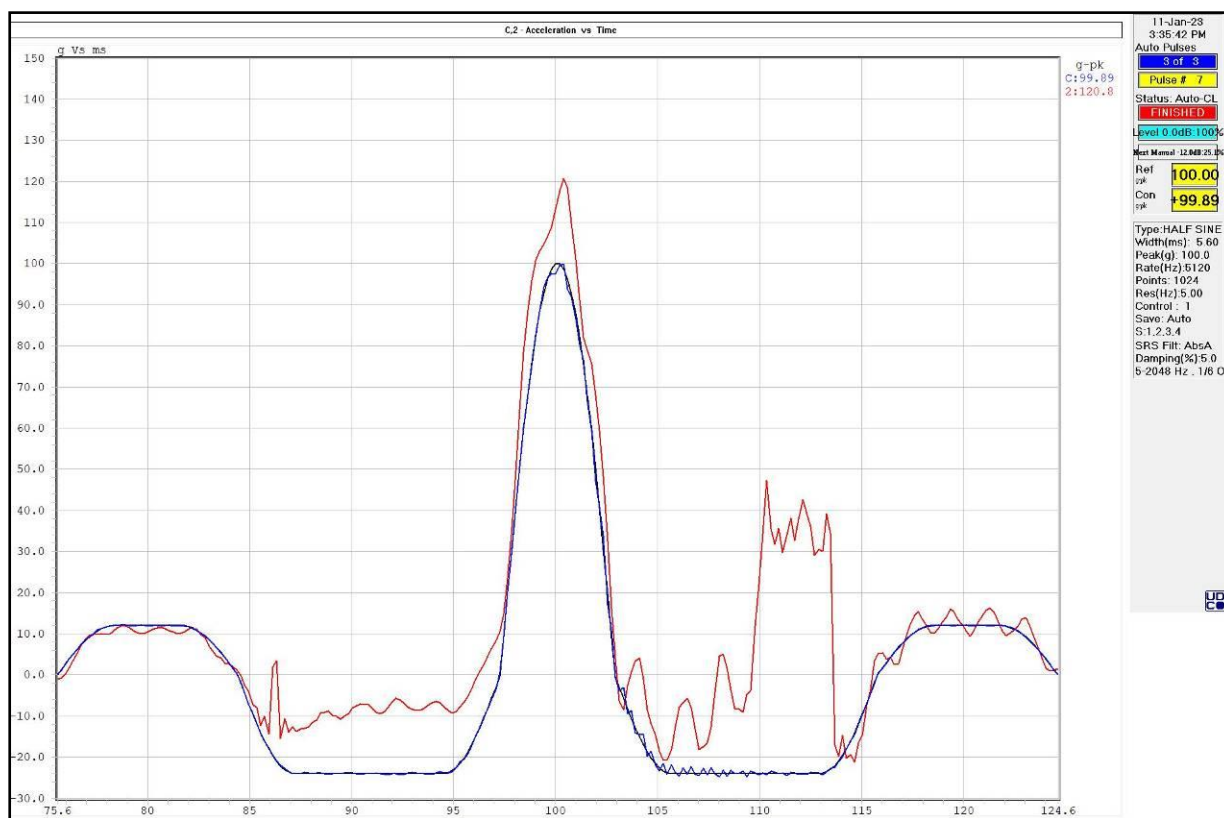


Channel	Description
C	Control
2	EUT

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.3.4 The positive shock pulse along X axis

Set #2

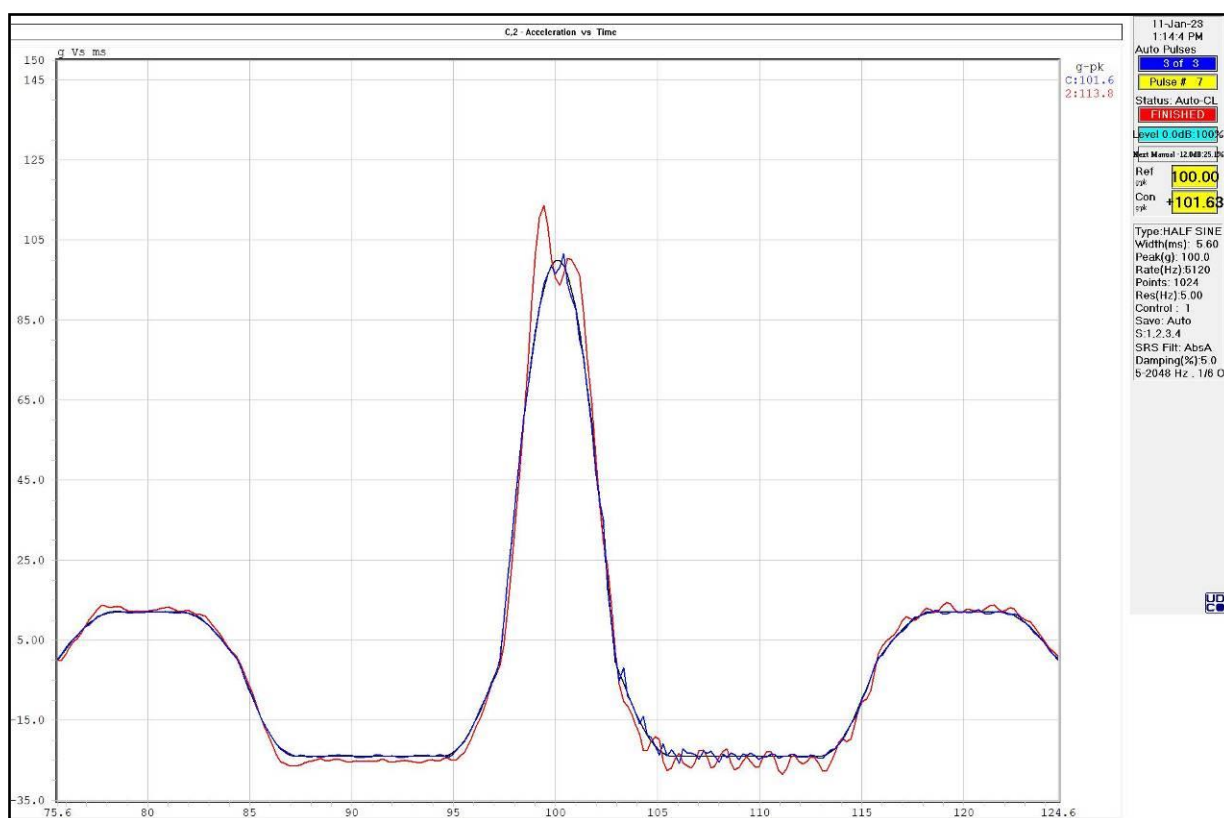


Channel	Description
C	Control
2	EUT

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.3.5 The positive shock pulse along Y axis

Set #1



Channel	Description
C	Control
2	EUT

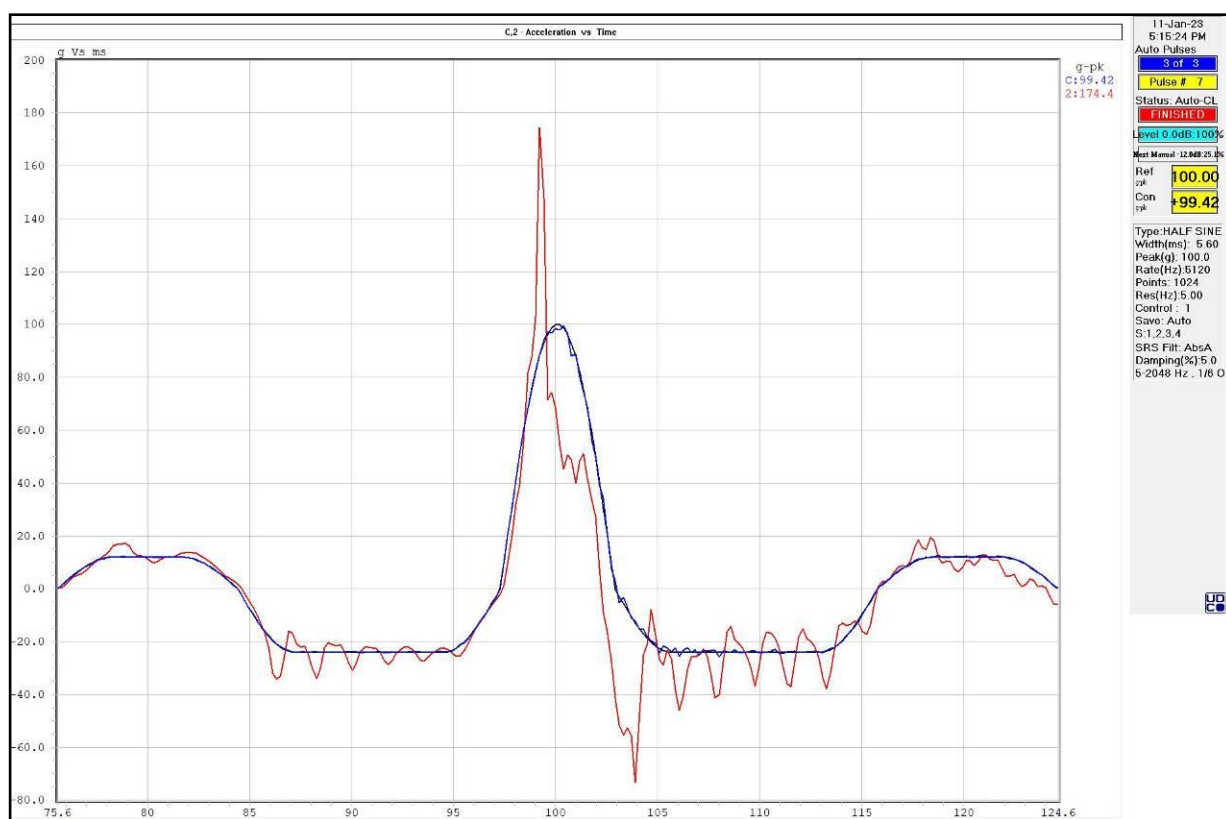


HERMON LABORATORIES

Test specification:		Sinusoidal vibration (Dwell Resonance) test	
Test procedure:		STANDARD: IPC-650 TEST METHOD: TM 2.6.9, Vibration	
Test mode:	Compliance	Verdict:	PASS
Test Date:	11-Jan-23		
Laboratory atmospheric conditions during the test:	Temperature: 24 °C	Air Pressure: 1020 hPa	Relative Humidity: 56 %
Remarks:			

Plot 6.3.6 The positive shock pulse along Y axis

Set #2



Channel	Description
C	Control
2	EUT

7 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./Check	Due Cal./Check
2131	Isotron Accelerometer 10 mV/g	Endevco	256-10	13058	08-Dec-22	08-Dec-23
2133	Isotron Accelerometer 10 mV/g	Endevco	256-10	13085	08-Dec-22	08-Dec-23
2190	Vibration Test System (Amplifier #SP6893-011/1, Remote Control Panel #SP6963-008/1, Vibrator #SP6893-005/1, Slip Table, Driver Bar, Pump, Fan, Head Expander)	Ling Dynamic Systems	V875	SP6963-005/1-011/1	08-May-22	08-May-23
3460	Precision Barometer, 870 - 1050 hPa	LUFFT Mess- und Regeltechnik GmbH	DKD-K-26701	100469	17-Jul-22	17-Jul-24
3960	Isotron Accelerometer 10.2 mV/g	Dytran Instruments Inc.	3049E1	711	08-Dec-22	08-Dec-23
4020	Temp. & Humidity Meter, (-50 - +70) deg, (20 - 99)% RH	Mad Electronics	HTC-1	NA	28-Aug-22	28-Aug-23
4888	APEX SL VIBRATION CONTROLLER	Unholtz-Dickie	Apex SL	1244	07-Jun-22	07-Jun-23

8 APPENDIX B Test laboratory description

The tests were performed at Hermon Laboratories Ltd., which is a fully independent, private Environmental, EMC, Radio, Product safety and telecommunication testing facility recognized through the entire world. The Laboratory is accredited by American Association for Laboratory Accreditation (A2LA, USA) for Environmental testing (Certificate No. 0839.04, Mechanical testing).

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Telephone: +972 4628 8001
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website: www.hermonlabs.com

Person for contact: Mr. Mihaeli Feldmann, Environmental Group Manager.

9 APPENDIX C Abbreviations and acronyms

°C	degree Celsius
cm	centimeter
dB	decibel
EUT	equipment under test
g_n	acceleration due to gravity
HL	Hermon Laboratories
hPa	hectopascal
Hz	Hertz
kg	kilogram
m	meter
min	minute
ms	millisecond
oct	octave
pH	acidity scale
RMS	root mean square
RH	relative humidity
s	second

10 APPENDIX D Tests specifications

1. IPC-650 Test Methods Manual
2. Vibration and shock TP-9_2019 Vibration And Shock Test Procedure according to MIL-STD – 810 B, C, D, E, F, G, MIL-STD-167 -1A, GR-63-CORE, IEC 60068-2-6, -27, -29, -55, -64, -75, RTCA DO-160D, E, F, G, ASTM D999, ASTM D4169, ASTM D4728, DEF STAN 00-35, IEC 61373, IEC 60601-1-11, ISO 11608-1, ISO 11608-4, IEC 61850-3, IEEE Std 1613 and ISTA 2A STANDARDS

11 APPENDIX E Measurement uncertainties

Parameter	Uncertainty estimation at 95% confidence	
	Calculated	Limit
Air pressure	± 1.16 mBar	± 4.1 mBar
Sine acceleration	+14.8/-13.8 %	+41/-30 %
Shock acceleration	+7.2/-8.2 %	± 20.0 %

END OF TEST REPORT