June 22, 2023

Dakota Ultrasonics
Jason Treon
1500 Green Hills Road #107
Scotts Valley, CA 95066

Dear Jason Treon,

Enclosed is the Electromagnetic Compatibility for the Dakota Ultrasonics, Multimax, tested to the requirements of:

- EN/IEC 61326-1:2020
- FCC Part 15 Subpart B (per ANSI C63.4: 2014)
- Innovation, Science, and Economic Development (ISED) Canada ICES-003 Issue 7

Thank you for using the services of Eurofins Electrical and Electronic Testing NA, Inc. Please contact me if you have any questions regarding these results or if Eurofins E&E can be of further service to you.

Sincerely,

Rheine Nguyen

Documentation Department
Eurofins Electrical and Electronic Testing NA, Inc.

Reference: EMCS126753-EN 61326-1

A2LA ACCREDITED TESTING CERT #0591.02

Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	June 22, 2023	Initial Issue.

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1.0 Testing Summary

The Dakota Ultrasonics, Multimax was found to be compliant to the following specification(s).

- EN/IEC 61326-1:2020
- FCC Part 15 Subpart B (per ANSI C63.4: 2014)
- Innovation, Science, and Economic Development (ISED) Canada ICES-003 Issue 7

Christopher Martin
EMC Laboratory Engineer

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements.

Dan Phan
EMC Laboratory Manager, California

2.0 Overview

Eurofins Electrical and Electronic Testing NA, Inc. was contracted by Dakota Ultrasonics to perform testing on the Multimax, under purchase order number 0420.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of Dakota Ultrasonics, Multimax.

The results obtained relate only to the item(s) tested.

Model(s) Tested:	Multimax
Equipment Emissions Class:	A

2.1 Test Site

All testing was performed at Eurofins Electrical and Electronic Testing NA, Inc., 3162 Belick St. Santa Clara, CA 95054. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology. Eurofins Electrical and Electronic Testing NA, Inc. has been accredited by the American Association for Laboratory Accreditation (A2LA) (Certificate #: 0591.02) in accordance with ISO/IEC 17025:2017.

2.2 Measurement Uncertainty

Measurement uncertainty calculated as per NIST Technical Note (TN) 1297 and ANSI / NCSL Z540-2, as equivalent to EN 55016-4-2 / IEC CISPR 16-4-2.

Test Method	Typical Expanded Uncertainty (dB)	K	Confidence Level
Radiated Emissions, (30 MHz – 1 GHz)	±3.24	2	95%
Radiated Emissions, (1 GHz – 6 GHz)	±3.92	2	95%
Conducted Emission Voltage	±2.44	2	95%
Conducted Emission Telecom	±3.53	2	95%

Measurement Uncertainty

2.3 Overall Immunity Performance Criteria

In accordance with EN 55035, the EUT was evaluated according to the following performance criteria where specified:

Performance Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance Criterion B: After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance Criterion C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a batter backup, shall not be lost.

2.4 Equipment Overview and Test Configuration

Name of EUT/Model:	**Multimax**
Description of EUT and its intended use:	USB peripheral device that monitors length of four bolts via ultrasonic transducers and reports results back to a PC over USB.
Selected Operation Mode(s):	This section describes how the EUT is simulating normal operation.
	The test scrip continually exercises all four channels measuring the length of the metal, along with temperature compensation. This simulates the user measuring 4 metal bolts. The results are displayed on the screen of the operators computer.
Rationale for the selection of the Operation Mode(s):	This section describes how the manufacture determined the selection of representative operation modes, taking into account that not all functions, but only the most typical functions of the electronic equipment can be tested.
	Purpose of the device is to measure the length of a piece of metal via ultrasonics.
Monitoring Method(s):	What is the measurable, physical or electrical indication that the EUT is (#1) and is not (#2) performing its intended function(s) consistent with the intended mode of operation defined above?
	If device is failing then the monitor would display either no reading (-------) or a value wildly different from the previous reading (more than 0.05 inches different).
EUT Power Requirement:	Voltage: 5v USB AC or DC: DC Frequency: DC Number of phases: 1 Amperage: 0.5A Uses an external AC/DC adapter: USB power from PC Additional comments: USB power supplied by PC Mean Well Model:
Physical Description: (If the EUT has multiple possible orientations, specify the orientation to be tested.)	EUT Arrangement (table top, floor standing or both): Table top. Wired connections to 5 probes. USB connection to PC System w/Multiple Chassis? (Yes/No): No Size: (HxWxD): 1.5x3x6.5 in Weight: 16.2oz
Other info:	Highest frequency used in device: 96MHz EUT Software (internal to EUT): firmware 3.06F Support Software (used by support PC to exercise EUT): Test script

Equipment List

Ref. ID	Slot #	Name / Description	Model Number	Part Number	Serial Number	Rev. #
--	--	MultiMax	1	--	1003	1

Support Equipment List

Ref. ID	Name / Description	Manufacturer	Model Number	*Customer Supplied Calibration Data
1	Industrial PC	Kingdel	NA	NA
2	Transducers (x4)	Dakota	T-702-2405	NA
3	Temp Probe	Dakota	A-205-8001	NA
4	Test Block	McMaster	NA	NA
5	Couplant	Echo	V-000-0001	NA
6	Industrial PC	Kingdel	NA	NA
7	Monitor	ASUS	--	NA
8	Keyboard	Microsoft	--	NA

The 'Customer Supplied Calibration Data' column will be marked as either not applicable, not available, or will contain the calibration date supplied by the customer.

Ports and Cabling

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty	Length as tested (m)	Max Length (m)	Shielded? (Y/N)	Termination Box ID & Port Name
--	Transducer	RG174 Lemo 00	4	3	3	Y	Transducer Microdot
--	Temp Probe	Lemo 5 pin UTP	1	3	3	N	Temp Probe
--	USB-C	USB A/C	1	3	3	Y	USB

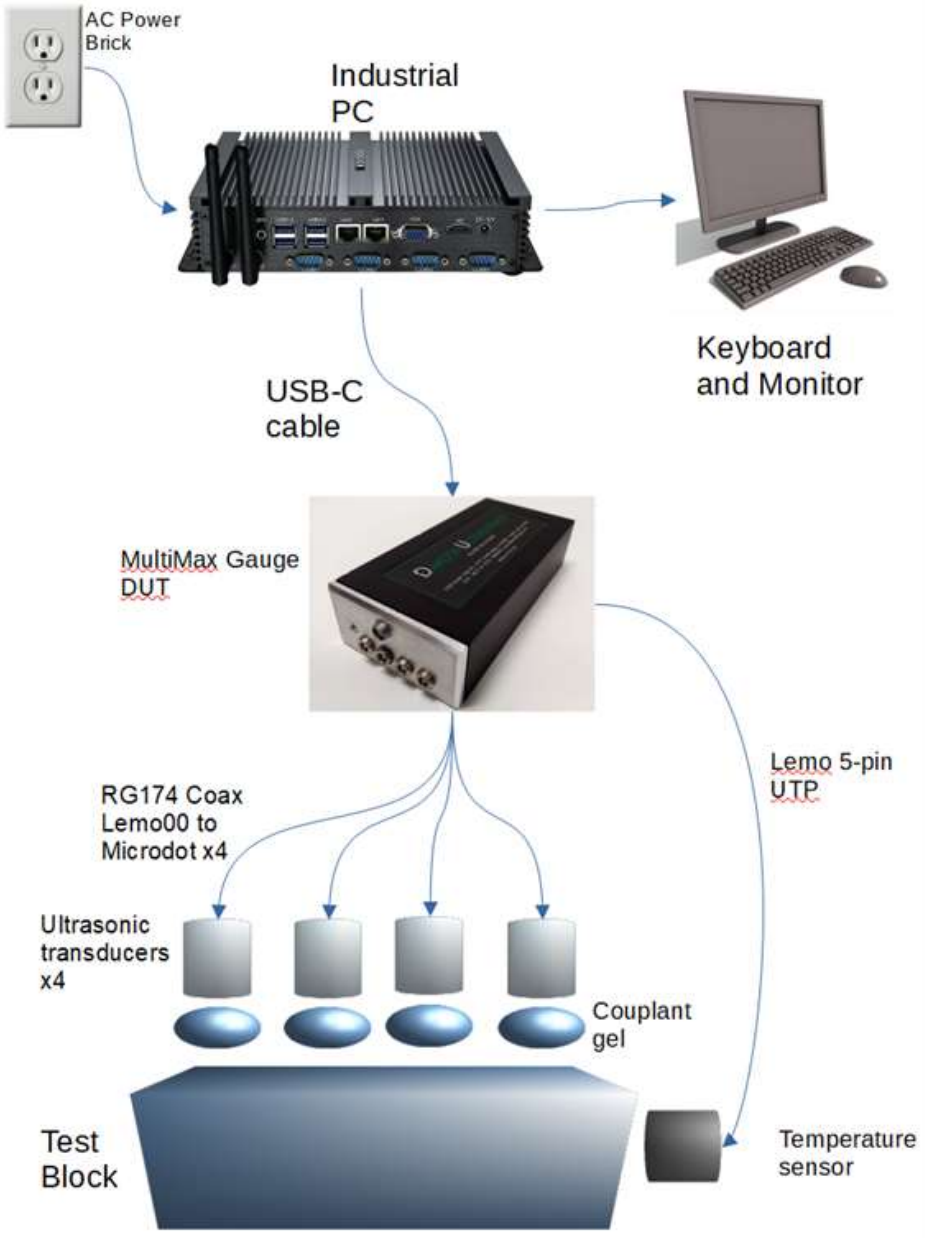


Figure 1. Block Diagram

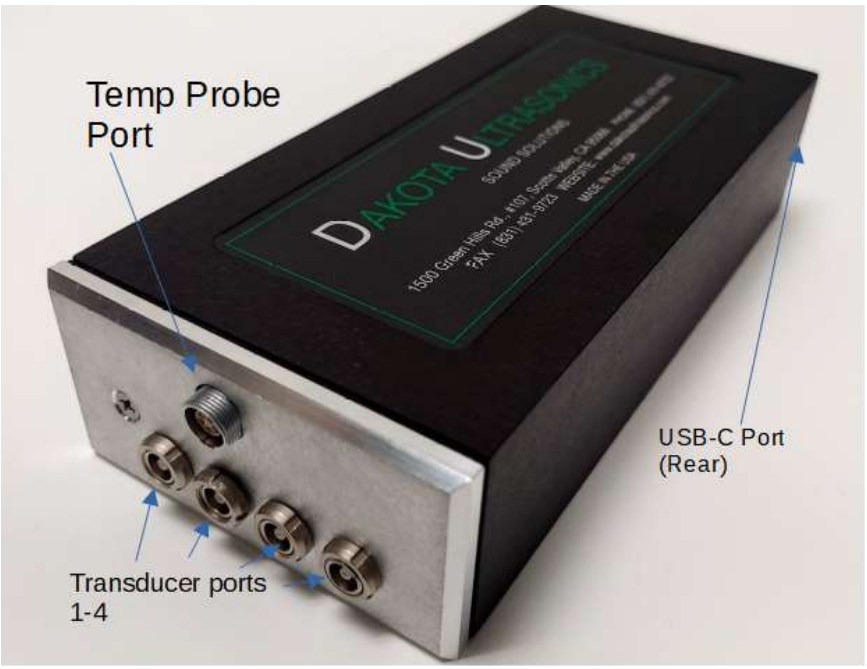


Figure 2. EUT Ports

2.5 Modifications to the EUT

No modifications were made to the EUT.

2.6 Modifications to the Standard

No modifications were made to the Test Standard.

2.7 Disposition of EUT

The test sample including all support equipment (if any), submitted to the Electromagnetic Compatibility Lab for testing was returned to Dakota Ultrasonics upon completion of testing.

3.0 Electromagnetic Compatibility Emission Criteria

3.1 Radiated Emissions: Limits of Electromagnetic Radiation Disturbance

Test Method: CISPR 11 and ANSI 63.4: 2014

Test Requirement(s): The following standards specified below are covered in the scope of this section of the test report:

- EN 61326-1:2020
- FCC Part 15 Subpart B (per ANSI C63.4: 2014)
- Innovation, Science, and Economic Development (ISED) Canada ICES-003 Issue 7

For radiated emission in the frequency range 30 MHz – 1000 MHz, the EUT shall meet the Class A limits shown in the following table.

Table Clause	Frequency Range (MHz)	Measurement		Limits (dBµV/m)
		Distance m	Detector type/ bandwidth	
A2.1	30 – 230	10	Quasi Peak / 120 kHz	40
	230 to 1000			47
A2.2	30 – 230	3		50
	230 to 1000			57

Requirements for radiated emissions at frequencies up to 1 GHz for Class A equipment

Sample Calculation for Distance Correction factor (DCF) measurement:

$F_d = 20*LOG_{10}(D_m/D_s)$

where:

F_d = Distance Factor in dB
D_m = Measurement Distance in meters
D_s = Specification Distance in meters

Sample formula for calculating the Corrected Data for the Radiated Emissions Measurements:

Frequency (MHz)	Antenna Polarity	EUT Azimuth (Degrees)	Antenna Height (cm)	Uncorrected Amplitude (dBµV)	ACF (dB/m) (+)	Pre Amp Gain (dB)(-)	CBL (dB) (+)	DCF (dB) (+)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
249.99	V	359.9	240.7	55.46	11.4	28.335	0	0	***38.505***	47	-8.495

Corrected Amplitude (dBµV/m) = Uncorrected Amplitude (dBµV) +ACF (dB/m) - Preamp Gain (dB) + CBL (dB) +DCF (dB) = 55.46 + 11.4 - 28.335 + 0 + 0 = ***38.505***

Test Procedure: The EUT was placed on a non-metallic table, 80 cm above the ground plane isolated from the ground plane up to 150 mm of thin insulating material inside a semi-anechoic chamber. The method of testing, test conditions, and test procedures of CISPR 11 and ANSI C63.4 were used. Any measured frequency that exhibits a margin of compliance that is less than 3 dB below the specification limit is marked. Eurofins E&E recommends that every

emission measured, has at least a 3 dB margin to allow for deviations in the emission characteristics that may occur during the production process.

For emissions between 30 MHz and 1000 MHz, a biconilog antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. Unless otherwise specified, measurements were made using a quasi-peak detector with a 120 kHz resolution bandwidth.

Test Software Used: Jamila RE Rev 4.0 was used to perform this test.

Test Results:

Test Standard:	EN 61326-1:2020 FCC Part 15 Subpart B (per ANSI C63.4: 2014) Innovation, Science, and Economic Development (ISED) Canada ICES-003 Issue 7 Class A
Test Name	Radiated Emissions
Test Dates:	05/19/2023
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Christopher Martin
Test Results:	Compliant

Test Summary

Radiated Emissions				
Frequency Range	**Specification**	**Measurement (MHz)**	**Margin (dB)**	**Compliance**
150 kHz – 30 MHz	CISPR 11	11.895899	-26.169	**Pass**
30 MHz - 1 GHz	CISPR 11	192	-21.761	**Pass**

FCC ICES

Radiated Emissions				
Frequency Range	**Specification**	**Measurement (MHz)**	**Margin (dB)**	**Compliance**
30 MHz - 1 GHz	ANSI C63.4	39.18	-7.626	**Pass**

Test Data

Final source: QuasiPeak (PASS)

Frequency	SR #	Quasi-Peak (dBµA/m)	QP Limit (dBµA/m)	Margin (dB)	Height (m)	Azimuth (°)	Pol.	RBW (Hz)	Meas.Time (s)	Correction (dB)
8.923199 MHz	1	-32.352	36.562	-68.914	1	222	Y Axis Position	9 kHz	0.001	-43.611
11.891399 MHz	1	-22.678	28.5	-51.178	1	173	Y Axis Position	9 kHz	0.001	-44.247
18.7548 MHz	1	-31.111	28.5	-59.611	1	92	Y Axis Position	9 kHz	0.001	-44.69

Table 1. Radiated Emissions (150 kHz – 30 MHz, Y axis), Test Results

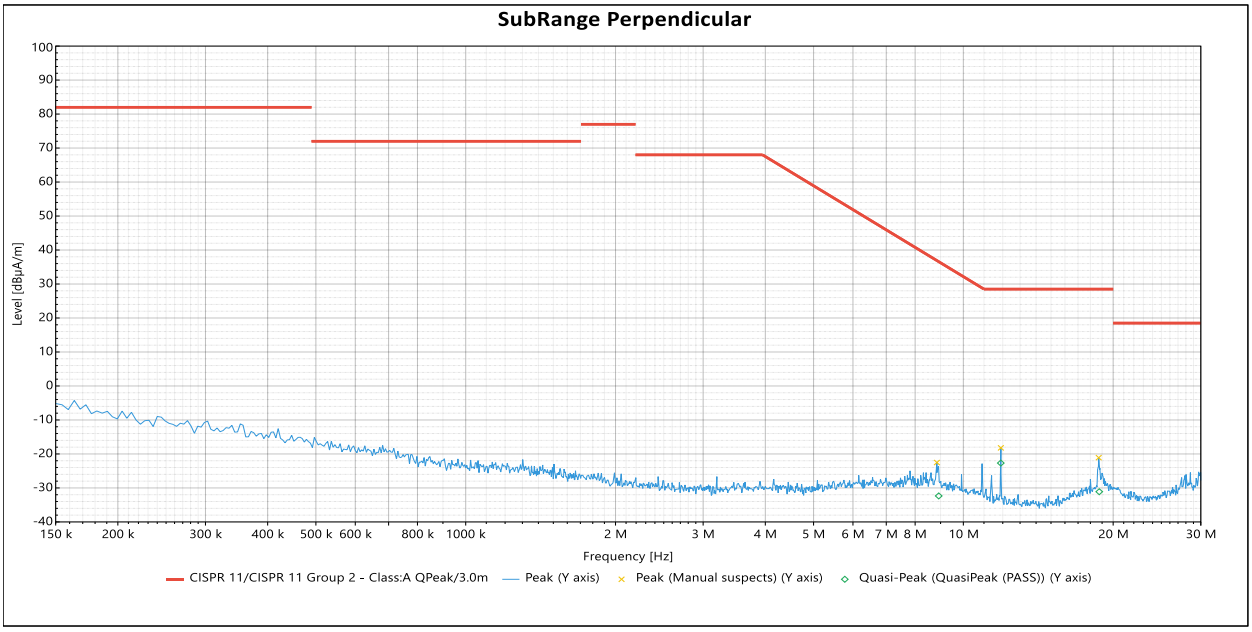


Figure 3. Radiated Emissions, (150 kHz – 30 MHz, Y axis), Plot

Final source: QuasiPeak (PASS)

Frequency	SR #	Quasi-Peak (dBµA/m)	QP Limit (dBµA/m)	Margin (dB)	Height (m)	Azimuth (°)	Pol.	RBW (Hz)	Meas.Time (s)	Correction (dB)
7.818899 MHz	2	-12.987	41.669	-54.656	1	142	X Axis Position	9 kHz	0.001	-42.908
10.906799 MHz	2	-2.108	28.835	-30.943	1	192	X Axis Position	9 kHz	0.001	-43.947
11.895899 MHz	2	2.331	28.5	-26.169	1	84	X Axis Position	9 kHz	0.001	-44.249
28.4055 MHz	2	-20.854	18.5	-39.354	1	23	X Axis Position	9 kHz	0.001	-44.634

Table 2. Radiated Emissions (150 kHz – 30 MHz, X axis), Test Results

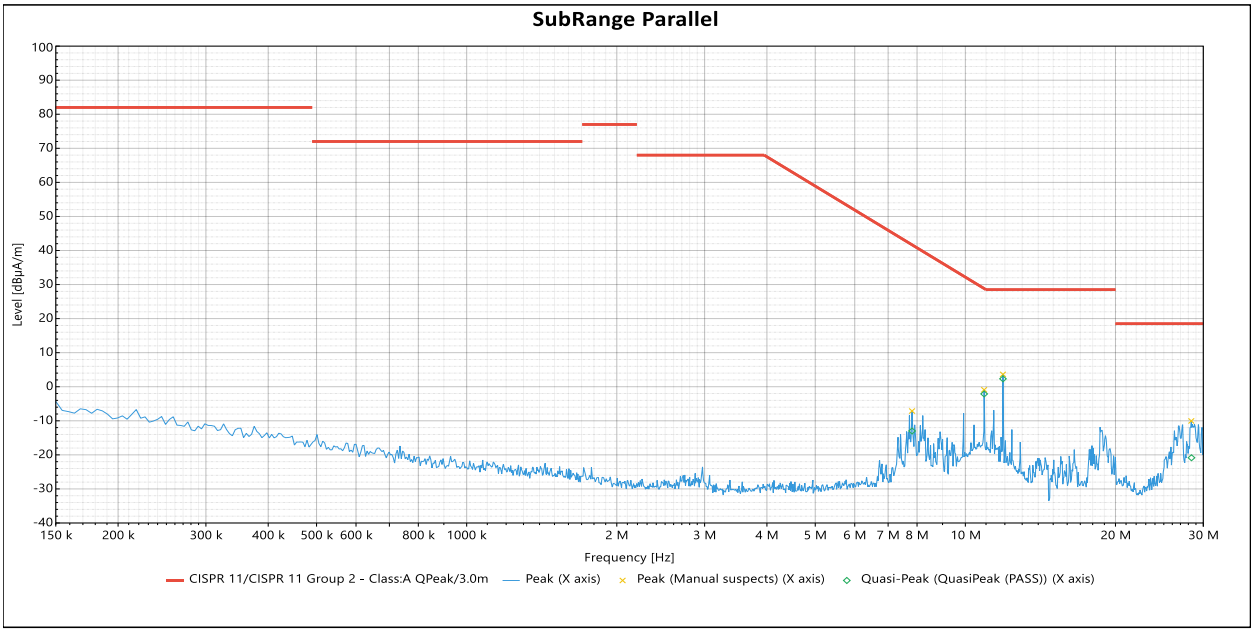


Figure 4. Radiated Emissions (150 kHz – 30 MHz, X axis), Plot

Final source: QuasiPeak (PASS)

Frequency	SR #	Level (dBµV/m)	Limit (dBuV/m) (dBµV/m)	Margin (dB)	Height (m)	Azimuth (°)	Pol.	RBW (Hz)	Meas.Time (s)	Correction (dB)
39.18 MHz	1	41.934	78	-36.066	1.053	334	Vertical	120 kHz	0	21.128
104.112 MHz	1	38.452	70	-31.548	1.379	255	Vertical	120 kHz	0	21.074
480 MHz	1	43.325	70	-26.675	1.077	0	Vertical	120 kHz	0	28.05

Table 3. Radiated Emissions (30 MHz – 1 GHz, Vertical), Test Results

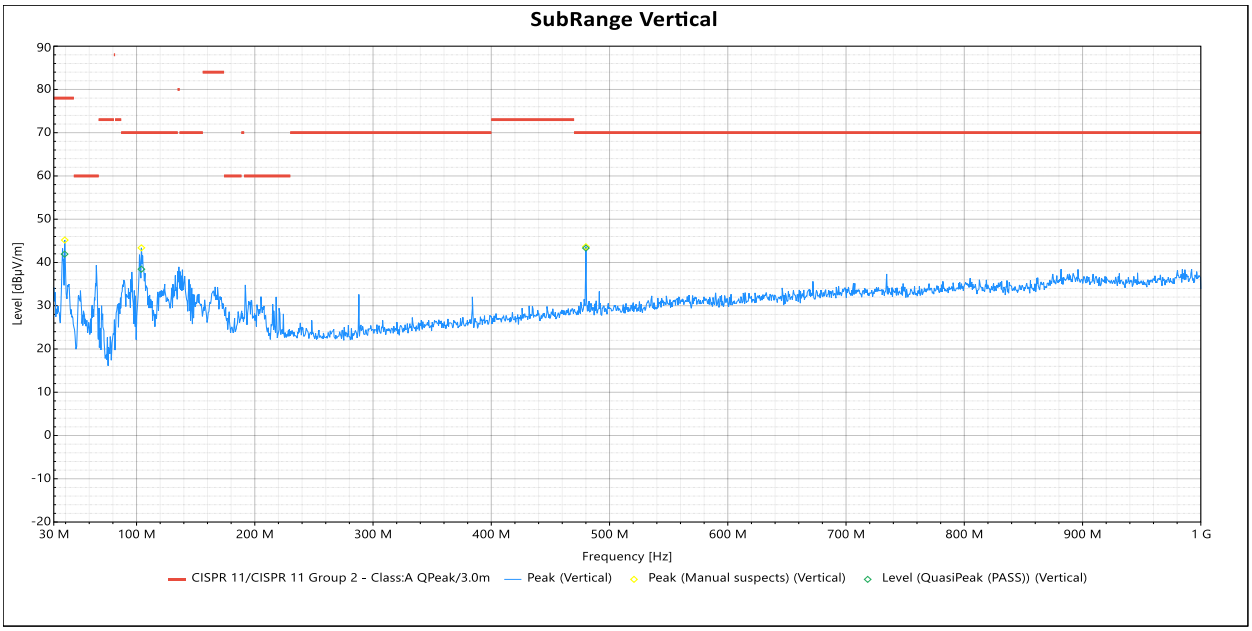


Figure 5. Radiated Emissions (30 MHz – 1 GHz, Vertical), Plot

Final source: QuasiPeak (PASS)

Frequency	SR #	Level (dBµV/m)	Limit (dBuV/m) (dBµV/m)	Margin (dB)	Height (m)	Azimuth (°)	Pol.	RBW (Hz)	Meas.Time (s)	Correction (dB)
122.012 MHz	2	30.961	70	-39.039	3.746	174	Horizontal	120 kHz	0	22.848
192 MHz	2	38.239	60	-21.761	1.084	141	Horizontal	120 kHz	0	22.146
479.988 MHz	2	44.816	70	-25.184	1.074	275	Horizontal	120 kHz	0	28.16

Table 4. Radiated Emissions (30 MHz – 1 GHz, Horizontal), Test Results

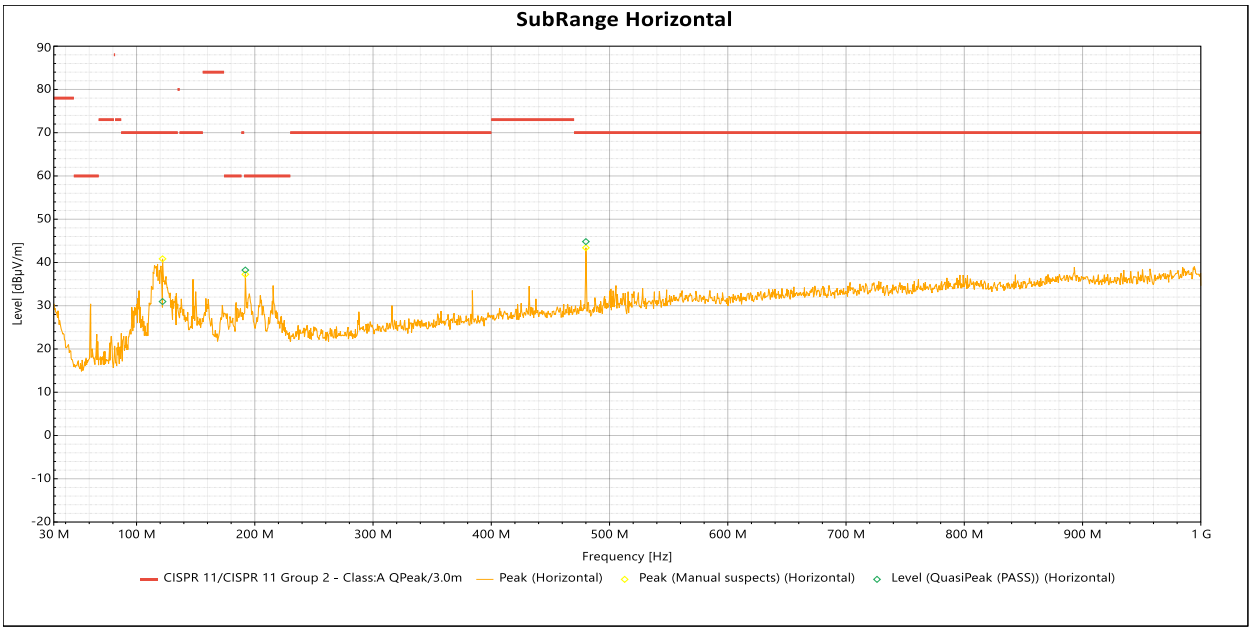


Figure 6. Radiated Emissions (30 MHz – 1 GHz, Horizontal), Plot

Final source: QuasiPeak (PASS)

Frequency	SR #	Level (dBµV/m)	Limit (dBuV/m) (dBµV/m)	Margin (dB)	Height (m)	Azimuth (°)	Pol.	RBW (Hz)	Meas.Time (s)	Correction (dB)
39.18 MHz	1	41.934	49.56	-7.626	1.053	334	Vertical	120 kHz	0	21.128
104.112 MHz	1	38.452	53.96	-15.508	1.379	255	Vertical	120 kHz	0	21.074
480 MHz	1	43.325	56.86	-13.535	1.077	0	Vertical	120 kHz	0	28.05

Table 5. Radiated Emissions, (30 MHz – 1 GHz, Vertical), FCC | ICES-003 Test Results

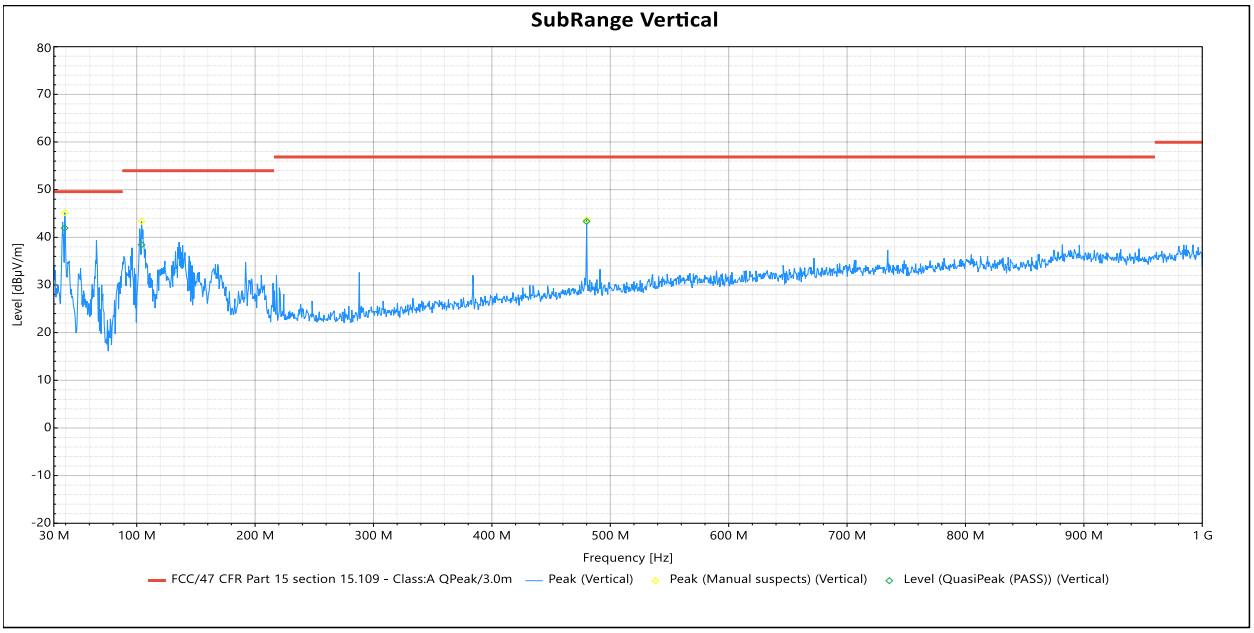


Figure 7. Radiated Emissions, (30 MHz – 1 GHz, Vertical), FCC | ICES-003 Plot

Final source: QuasiPeak (PASS)

Frequency	SR #	Level (dBµV/m)	Limit (dBuV/m) (dBµV/m)	Margin (dB)	Height (m)	Azimuth (°)	Pol.	RBW (Hz)	Meas.Time (s)	Correction (dB)
122.012 MHz	2	30.961	53.96	-22.999	3.746	174	Horizontal	120 kHz	0	22.848
192 MHz	2	38.239	53.96	-15.721	1.084	141	Horizontal	120 kHz	0	22.146
479.988 MHz	2	44.816	56.86	-12.044	1.074	275	Horizontal	120 kHz	0	28.16

Table 6. Radiated Emissions, (30 MHz – 1 GHz, Horizontal), FCC | ICES-003 Test Results

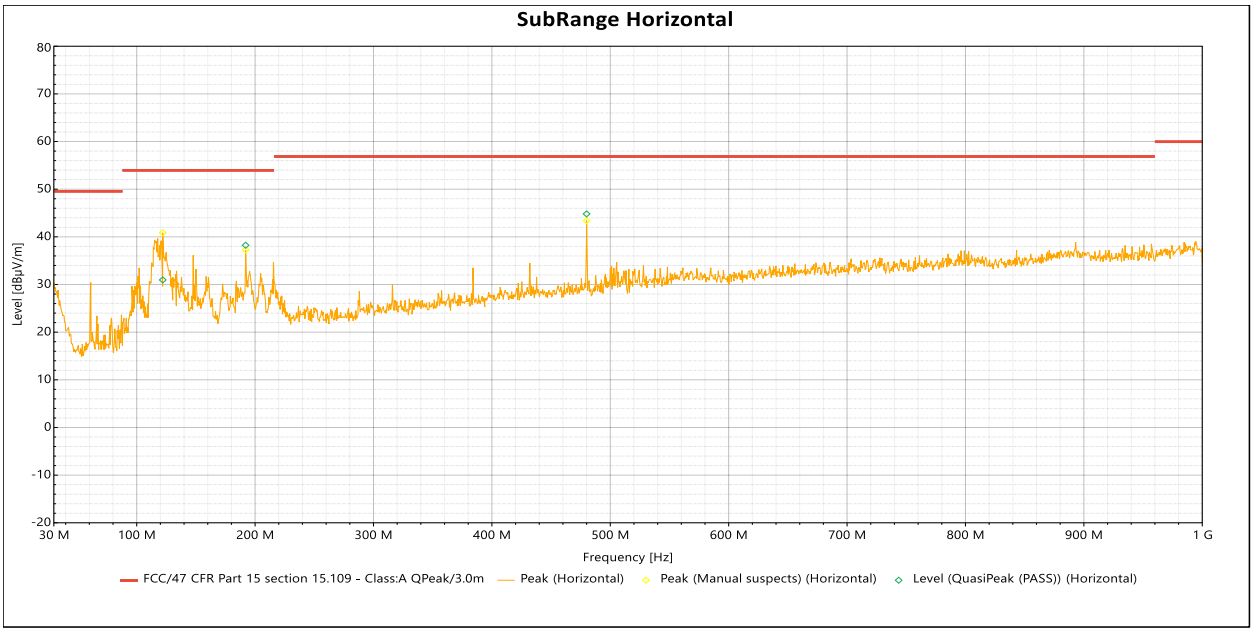


Figure 8. Radiated Emissions, (30 MHz – 1 GHz, Horizontal), FCC | ICES-003 Plot

Figure 9. Radiated Emissions, (125 kHz – 30MHz, Y) Test Setup

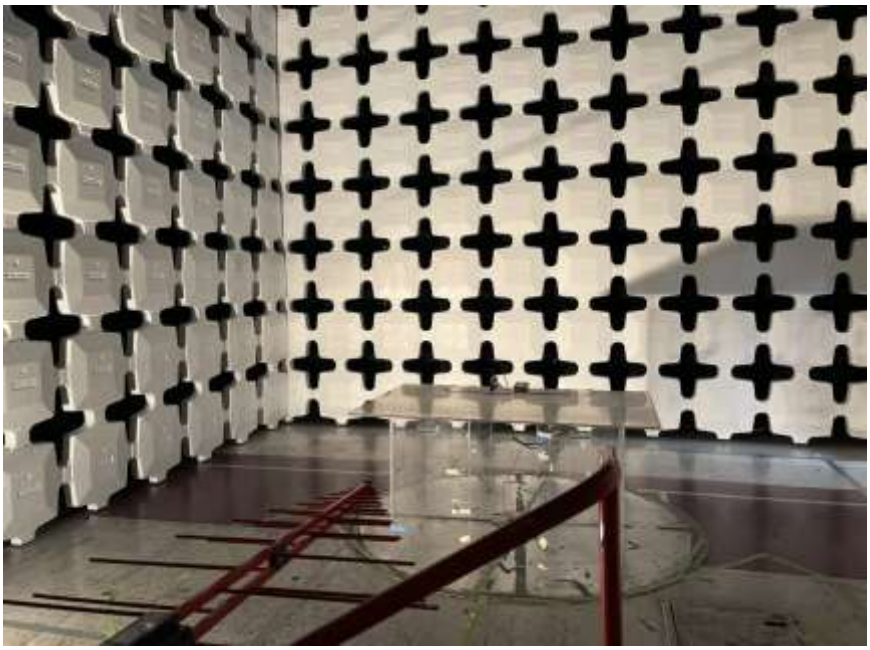


Figure 10. Radiated Emissions, (30 MHz – 1GHz, Horizontal) Test Setup

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO 17025:2017.

Test Name: RE			**Test Date(s):** 5/19/2023		
MET Asset #	**Equipment**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1S2482	5 Meter Chamber (NSA)	Panashield	5 Meter Semi-Anechoic Chamber	Not Required	Not Required
1S2486	5 Meter Chamber Control Room	Panashield	5 Meter Control Room	Not Required	Not Required
1S3928	EMI Tester Receiver	Rohde & Schwarz	ESR26	11/22/2022	11/22/2023
1S3926	1MHz step, 1GHz combo generator	Com-power Corp	CGO-501	Func Verify	Func Verify
1S2746	Bilog Antenna	Sunol Science	JB3	4/11/2023	4/11/2025
1S3983	Loop Antenna	ETS-LINDGREN	6512	10/14/2021	10/14/2023
1S2668	Sonoma Amplifier	Sonoma Instruments	310 N	7/11/2022	7/11/2023
Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.					

Table 7. Radiated Emissions, Test Equipment

4.0 Electromagnetic Compatibility Immunity Criteria

4.1 Electrostatic Discharge

Test Method: **EN 61000-4-2:2009**
Electrostatic Discharge Immunity Test

Test Requirement: The following standards specified below are covered in the scope of this section of the test report:

- EN 61326-1:2020

The EUT shall be tested with air discharges of up to ±8 kV applied to non-conductive surfaces, and to contact discharges of up to ±4 kV, applied to conductive surfaces of the EUT, HCP and the VCP.

Test Procedure: The EUT was placed on a table, 80 cm above the ground plane. The measurements were performed using normal operation of the equipment and in accordance with EN 61000-4-2. Air discharges of up to ±8 kV were applied to non-conductive surfaces. Contact discharges of ±4 kV were applied to conductive surfaces of the EUT and the HCP and VCP. Discharges were applied at least ten times to each selected discharge point at each polarity with a minimum time between discharges of 1s. The functionality of the EUT was determined during and after each discharge. Photographs of the test equipment are provided below.

Test Results:

Test Standard:	EN 61326-1:2020 Class A
Test Name	Electrostatic Discharge
Test Dates:	05/31/2023
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Jonathan Vasquez
Test Results:	Compliant

Test Summary

EN 61326-1						
Port	**Test Description**	**Specification**	**Test Level Required**	**Test Level Achieved**	**Performance Criteria Achieved**	**Compliance**
Enclosure	ESD	IEC 61000-4-2:	±4 kV Contact ±8 kV Air	±4 kV Contact ±8 kV Air	B	Compliant

Test Data

EN 61326-1								
Discharge Type	**Test Voltage (±kV)**	**Results**						**Anomalies**
		Front	**Rear**	**Left**	**Right**	**Top**	**Bottom**	
Contact Discharge	2	Pass	Pass	Pass	Pass	Pass	Pass	None
	4	Pass	Pass	Pass	Pass	Pass	Pass	None
Air Discharge	2	Pass	Pass	N/A	N/A	N/A	N/A	None
	4	Pass	Pass	N/A	N/A	N/A	N/A	None
	6	Pass	Pass	N/A	N/A	N/A	N/A	None
	8	Pass	Pass	N/A	N/A	N/A	N/A	None
Detailed List of Anomalies: No anomalies observed.								

Table 8. Electrostatic Discharge, Test Results

Figure 11. Electrostatic Discharge, Front of EUT

X = Contact Discharge Test Points
O = Air Discharge Test Points

Figure 12. Electrostatic Discharge, Rear of EUT

Figure 13. Electrostatic Discharge, Left of EUT

Figure 14. Electrostatic Discharge, Right of EUT

X = Contact Discharge Test Points
O = Air Discharge Test Points

Figure 15. Electrostatic Discharge, Top of EUT

Figure 16. Electrostatic Discharge, Bottom of EUT

X = Contact Discharge Test Points
O = Air Discharge Test Points

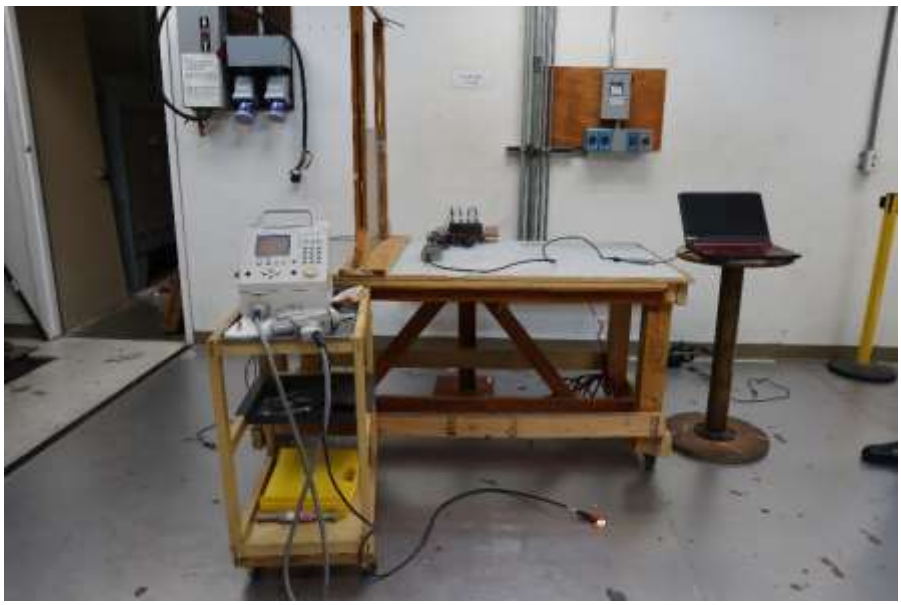


Figure 17. Electrostatic Discharge, Test Setup

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO 17025:2017.

Test Name: ESD			**Test Date(s):** 5/31/2023		
MET Asset #	**Equipment**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1U0175	Electrostatic Discharge Simulator	Noise Ken	ESS-2000	01/17/2023	01/17/2024
1U0176	Electrostatic Discharge Gun	Noise Ken	TC-815R	01/17/2023	01/17/2024
1U0156	Digital Oscilloscope	Tektronix	TDS 5104	10/17/2022	04/17/2024
1S4816	Digital Barometer	Traceable	68000-49	05/04/2022	05/04/2024
1S2490	Ground Plane 2	MetLabs	N/A	Not Required	Not Required
Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.					

Table 9. Electrostatic Discharge, Test Equipment

4.2 Radio Frequency Electromagnetic Field

Test Method: **EN 61000-4-3:2013 +A1:2008 +A2:2010**
Radiated, Radio-Frequency, Electromagnetic Field Immunity Test

Test Requirement: The following standards specified below are covered in the scope of this section of the test report:

- EN 61326-1:2020

The EUT must not be susceptible to a radiated electromagnetic field of 10 V/m in the swept frequency range 80 MHz to 1 GHz. As well as, a radiated electromagnetic field of 3 V/m in the swept frequency range 1.4 MHz to 2 GHz and 1 V/m in the swept frequency range 2 MHz to 2.7 GHz

Test Procedure: Testing was performed in a semi-anechoic chamber as recommended by EN 61000-4-3. The EUT was placed on a non-metallic table, 80 cm above the ground plane in the area of field uniformity. The radiating biconilog antenna was placed 2m in front of the EUT from 80MHz-1GHz. For the range 1 GHz to 2.7 GHz a radiating horn antenna was placed 1m in front of the EUT. Support equipment for the EUT was located outside of the test room. The amplitude, frequency, and dwell time of the radiated interference was controlled by an automated, computer-controlled system.

The signal source was stepped through the applicable frequency range at a rate no faster than 1% of the fundamental. The signal was amplitude modulated 80% over the frequency range 80 MHz to 2.7 GHz for the swept frequency test. The dwell time was set at 1 s. Field presence was monitored during testing via a field probe placed in close proximity to the EUT. Throughout testing, the EUT was closely monitored for signs of susceptibility. The test was performed with the antennae oriented in both a horizontal and vertical polarization. Photographs of test setup are presented below.

Test Results:

Test Standard:	EN 61326-1:2020 Class A
Test Name	Radiated Immunity
Test Dates:	05/09/2023
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Alex Chen & Richard Dollente
Test Results:	Compliant

Test Summary

EN 61326-1						
Port	**Test Description**	**Specification**	**Test Level Required**	**Test Level Achieved**	**Performance Criteria Achieved**	**Compliance**
Enclosure	RI	EN 61000-4-3: 2006 +A1:2008 +A2:2010/ KN 61000-4-3	80-1000 MHz at 10 V/m 1400-2000 MHz at 3 V/m 2000-2700 MHz at 1 V/m	80-1000 MHz at 10 V/m 1400-2000 MHz at 3 V/m 2000-2700 MHz at 1 V/m	A	**Compliant**

Test Data

EN 61326-1								
Start Frequency (MHz)	**Stop Frequency (MHz)**	**Severity (V/m)**	**Polarity (H/V)**	**Modulation (Freq & Type)**	**Results**			
					Front	**Back**	**Left**	**Right**
80	1000	10	V	1 kHz, 80%AM	Pass	Pass	Pass	Pass
80	1000	10	H	1 kHz, 80%AM	Pass	Pass	Pass	Pass
1400	2000	3	V	1 kHz, 80%AM	Pass	Pass	Pass	Pass
1400	2000	3	H	1 kHz, 80%AM	Pass	Pass	Pass	Pass
2000	2700	1	V	1 kHz, 80%AM	Pass	Pass	Pass	Pass
2000	2700	1	H	1 kHz, 80%AM	Pass	Pass	Pass	Pass

Table 10. Radiated Immunity, Test Results

Figure 18. Radiated Immunity, (80 MHz – 1 GHz) Test Setup

Figure 19. Radiated Immunity, (Above 1 GHz) Test Setup

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO 17025:2017.

Test Name: RI (EN 61326-1)			**Test Date(s): 05/10/2023**		
Asset #	**Equipment**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1S2780	EMC Hardened Camera and Power Supply Module	Pontis EMC Products	HDCam 70301 V4.0	See Note	See Note
1S2781	Camera Controller	Pontis EMC Products	HDCon4101	See Note	See Note
1S3824	Signal Generator	Rohde & Schwarz	SMA100B	08/30/2022	08/30/2023
1S3873	Amplifier	Amplifier Research	1000W1000E	See Note	See Note
1S2771	Directional Coupler	Werlatone	C3908-714	See Note	See Note
1U0040	Antenna, Biconilog	Schaffner	CBL6140A	See Note	See Note
1S2430	Power Meter	Anritsu	ML2488A	04/11/2023	04/11/2024
1S3912	Power Monitor Sensor WCDMA	Anritsu	MA2491A	04/07/2022	04/07/2024
1U3927	Microwave Signal Generator	Rohde & Schwarz	SMF100A	08/08/2023	08/08/2024
1S4819	Digital Barometer	Control Company	6530. 68000-49	05/04/2022	05/04/2024
1S2264	Radiated Immunity Chamber	Lindgren	N/A	Not Required	Not Required
1S3872	Amplifier	Amplifier Research	80/20S1G8	See Note	See Note
1U0007	Antenna, Horn	EMCO	3115	Not Required	Not Required
1S2034	Directional Coupler (1-20GHz)	Krytar	101020020	See Note	See Note
Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.					

Table 11. Radiated Immunity, Test Equipment

4.3 Fast Transients

Test Method: **EN 61000-4-4: 2004**
Electrical Fast Transient/Burst Immunity Test

Test Requirement: The following standards specified below are covered in the scope of this section of the test report:

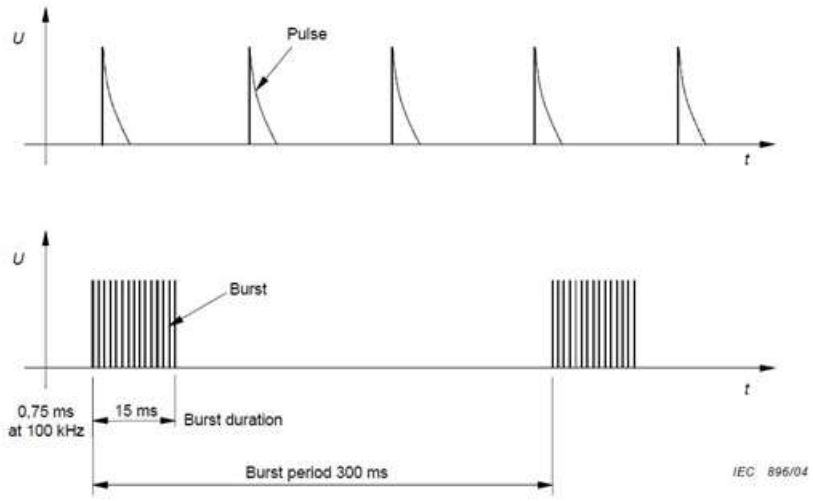
- EN 61326-1:2020

The EUT shall be tested with the electrical fast transients shown in the test waveform figure, having an amplitude of up to ±2 kV applied to AC power ports and ±2 kV applied to DC power ports and signal ports. This is applicable to ports interfacing with cables whose total length according to the manufacturer's functional specification may exceed 3 m. The test setup, test methods, required test equipment, and the test limits of EN 61000-4-4 are to be used.

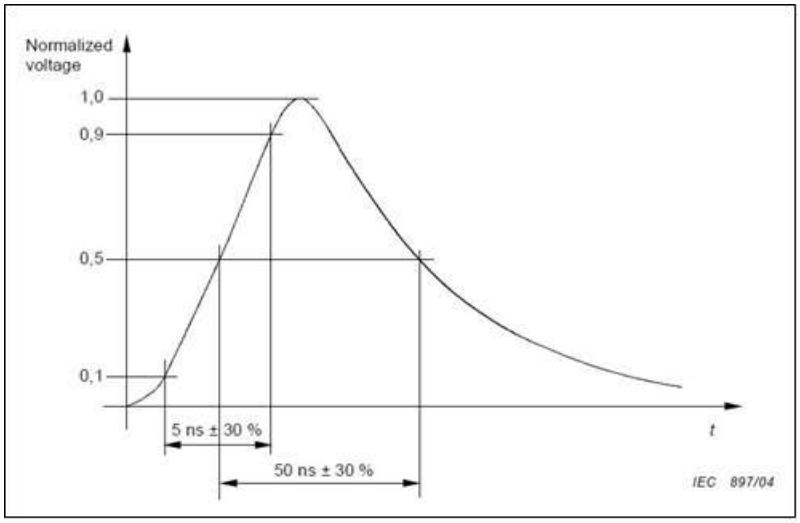
Test Procedure: The Electrical Fast Transient/Burst (EFT/B) generator and the coupling clamp were mounted to the ground plane. For application of the fast transients to the power lines, power was supplied to the EUT through the EFT/B generator. For application of the fast transients to I/O, data and control lines, the cables were individually placed in the coupling clamp, which was also connected to the EFT/B generator.

The EFT/B generator was operated to couple the required transient bursts to each line of the power input in common mode. Transient bursts were applied for a period not less than one minute with both positive transients and negative transients.

Throughout testing, the EUT was monitored closely for signs of susceptibility.
Photographs of test setup are presented below.



EN 61000-4-4 EFT/B Test Waveform



Test Results:

Test Standard:	EN 61326-1:2020 Class A
Test Name	Fast Transients
Test Dates:	05/31/2023
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Jonathan Vasquez
Test Results:	Compliant

Test Summary

EN 61326-1						
Port	**Test Description**	**Specification**	**Test Level Required**	**Test Level Achieved**	**Performance Criteria Achieved**	**Compliance**
USB-C	EFT/B	IEC 61000-4-4:2012	±1 kV	±1 kV	B	**Compliant**
Not Applicable = The EUT is AC powered.						

Test Data

EN 61326-1					
Port Name	**Cable Ref. ID**	**Test Level**	**Coupling Method**	**Result**	**Anomalies**
DC Power & IO Cables (Indoor & Outdoor)					
USB-C	N/A	±1 kV	CCC	Pass	None

Table 12. Fast Transients, Test Results

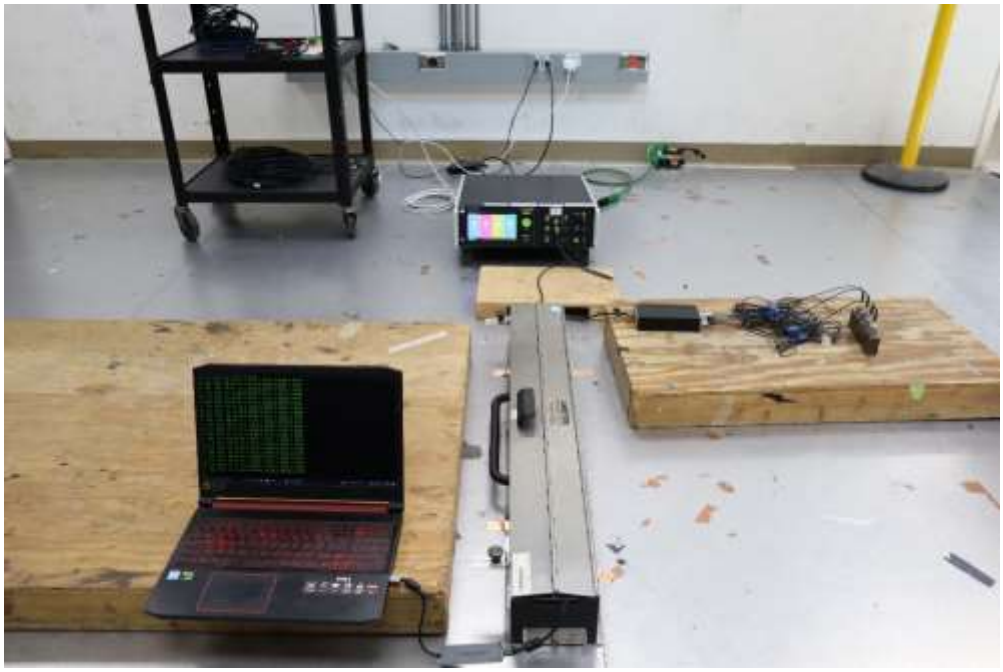


Figure 20. Fast Transients, (USB-C) Test Setup

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO 17025:2017.

Test Name: EFT/B			**Test Date(s):**5/31/2023		
Asset #	**Equipment**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1S2490	Ground Plane 2	MET Labs	N/A	Not Required	Not Required
1S4819	Digital Barometer	Control Company	6530, 68000-49	05/04/2022	05/04/2024
1S4826	Compact NX5 Surge Generator	Ametek CTS	BSP-1-300-16	10/24/2022	10/24/2023
1S2815	Capacitive Coupling Clamp	AMETEK CTS	CCI	10/24/2022	10/24/2023
Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.					

Table 13. Fast Transients, Test Equipment

4.4 Radio Frequency, Conducted Continuous

Test Method: **EN 61000-4-6:2009**
Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields

Test Requirement: The following standards specified below are covered in the scope of this section of the test report:

- EN 61326-1:2020

Test Procedure: The EUT was installed 10 cm above a reference ground plane. For power line cables, a Coupling Decoupling Network (CDN) was used for injection. For I/O cables, a CDN or BCI Probe or EM Clamp was used for injection.

Test Results:

Test Standard:	EN 61326-1:2020 Class A
Test Name	Conducted Immunity
Test Dates:	05/31/2023
Laboratory	Eurofins Electrical and Electronic Testing NA, Inc.
Test Engineer:	Jonathan Vasquez
Test Results:	Compliant

Test Summary

EN 61326-1						
Port	**Test Description**	**Specification**	**Test Level Required**	**Test Level Achieved**	**Performance Criteria Achieved**	**Compliance**
USB-C	CI	IEC 61000-4-6	0.15–10 MHz, 3Vrms 10- 30MHz, 3-1Vrms 30-80MHz, 1Vrms 80% AM 1 kHz	0.15–80 MHz, at 3 Vrms 80% AM 1 kHz	A	**Compliant**
Not Applicable = The EUT is AC powered.						

Test Data

EN 61326-1						
Cable Ref. ID	**Port Name On EUT**	**Severity (Vrms)**	**Modulation**	**Coupling Method**	**Results**	**Anomalies**
Power Cables						
N/A	USB-C	3	1 kHz, 80%AM	Direct Injection	Pass	None
Detailed List of Anomalies: No anomalies observed.						

Table 14. Conducted Immunity, Test Results

Figure 21. Conducted Immunity, (USB-C) Test Setup

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO 17025:2017.

Test Name: CI			**Test Date(s):** 5/31/2023		
Asset #	**Equipment**	**Manufacturer**	**Model**	**Last Cal Date**	**Cal Due Date**
1S2490	Ground Plane 2	MET LABS	N/A	Not Required	Not Required
1S4819	Digital Barometer	Control Company	6530, 68000-49	05/04/2022	05/04/2024
1S4796	Test System for Radiated Immunity	Teseq	NSG 4070C-110	04/11/2023	04/11/2024
1S4786	Directional Coupler	Werlatone	C6047-10	Not Required	Not Required
1U0105	R.F Current Probe	Solar Electronics Company	6741-1	11/11/2022	11/11/2023
1S4078	Attenuator, High Power (6 dB)	JFW	50FH-006-300	Not Required	Not Required
Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.					

Table 15. Conducted Immunity, Test Equipment

END OF REPORT