

Test Report

Prepared for: Envision Technology, LLC.

Model: MARS

Serial Number: 002099

Project No: p2550008

Test Results: Pass

To

FCC Part 15.247: 2025
and
RSS-247: Issue 3 (August 2023)

Date of Issue: August 13, 2025

On the behalf of the applicant:

Envision Technology, LLC.
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Attention of:

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FCC Site Reg. #750616
ISED Site Reg. #2044A-2

Reviewed / Authorized By:



John Michalowicz, TestEngineer

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Test Results Summary

Test Date Range: July 29th 2025 – July 30th 2025

Specification		Test Name	Pass, Fail, N/A	Comments
FCC	RSS			
15.247(b)	Section 5.4(d)	Output Power	Pass	
15.247(d)	Section 5.5	Conducted Spurious Emissions	N/A	EUT does not have a conducted RF port
15.247(d), 15.209(a), 15.205	Section 5.5 / RSS-GEN Section 8.9	Radiated Spurious Emissions	Pass	
15.247(d), 15.209(a), 15.205	Section 5.5	Emissions At Band Edges	Pass	
15.247(a)(2)	Sections 5.2(a)	Occupied Bandwidth	Pass	
15.247(e)	Section 5.2(b)	Transmitter Power Spectral Density	Pass	
15.247(a)	Section 5.1 (c)	Dwell Time	N/A	
15.247(a)	Section 5.1 (c)	Number of Hopping Channels	N/A	
15.247(a)	Section 5.1 (b)	Channel Separation	N/A	
15.207	RSS-GEN Section 8.8	A/C Powerline Conducted Emissions	N/A	The device is powered via replaceable battery
Method Deviations/Additions: No				

Statements of conformity are reported as:

- Pass - the measured value is below the acceptance limit, *acceptance limit = test limit*.
- Fail - the measured value is above the acceptance limit, *acceptance limit = test limit*.

References/Methods	Description
ANSI C63.4-2014	Method and Measurements of Radio-Noise Emissions from low-Voltage Electrical and Electronic Equipment in the range 9kHz to 40GHz.
ANSI C63.10:2020	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
558074 D01 15.247 Meas Guidance v05r02	Guidance for Compliance Measurements on DTS, FHSS, and Hybrid System Devices Operating Under Section 15.247 of the FCC Rules
ISO/IEC 17025:2017	General requirements for the Competence of Testing and Calibrations Laboratories

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Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	August 13, 2025	John Michalowicz	Original Document
2.0	September 19, 2025	John Michalowicz	Updated the antenna gain. Removed duplicate description on page 34 Fixed typo on page 39

Current revision of the test report replaces any prior versions. Only the current version of the test report is valid.

EUT Description

Model:	MARS
Serial:	002099
Firmware:	62:48
Software:	2.10.1
Description:	Miniature Advanced Rangefinder System with BT
Additional Information:	Radio Frequency Range and Operational Info: 2402 – 2480 MHz BLE 1 Mbit and 2 Mbit Usage: Portable
Receipt of Sample(s):	June 30th 2025
EUT Condition:	Visual Damage No State of Development Production/Production Equivalent

The applicant has been cautioned as to the following

15.21 - Information to User

The user's manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) - Special Accessories

Equipment marked to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer without an additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Authorization Requirements

Intentional Radios may require authorization covered under the following rule parts or standards:

-47 CFR Part 2 Subpart J

-RSS-Gen — General Requirements for Compliance of Radio Apparatus

Note: These notices are specific to the methods and standards related to the testing within this report. Customers should also consider and review additional legal regulations for import/export documentation and labeling for the countries and geographies under consideration by the manufacturer.

Test and Measurement Data

Subpart 2.1033(b)

All tests and measurement data shown were performed in accordance with FCC Rule Parts: 15.247.

All tests and measurement data shown are deemed satisfactory evidence of compliance with Industry Canada Radio Standards Specification RSS-Gen and RSS-247.

Standard Engineering Practices

Unless otherwise indicated, the procedures contained in ANSI C63.10 and ANSI C63.4 were observed during testing.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing. Measurement results, unless otherwise noted, are worst case measurement.

Standard Test Conditions and Engineering Practices

Unless otherwise indicated in the specific measurement results, the ambient temperature was maintained within the range of 10° to 40°C (50° to 104°F) and the relative humidity levels were in the range of 10% to 90%.

Environmental Conditions		
Temperature (°C)	Humidity (%)	Barometric Pressure (mbar)
25.7 – 28.8	34.4 - 58.5	969 - 972

Test Setup and Modes of Operation

EUT Operation during Tests

The EUT was set to transmit simultaneously using a command prompt structure with commands provided by the manufacturer. A PuTTY terminal was used. A DC power supply set to 3 VDC and 250mA was used to power the device.

Accessories:

Qty	Description	Manufacturer	Model	S/N
1	Laptop	Dell	NA	NA

Cables:

Qty	Description	Length (M)	Ferrites (Y/N)	Shielding Y/N	Shielded Hood Y/N	Termination / Connection
1	USB to 7 pin connector	<3m	N	N	N	NA

Modifications to EUT(s) (Y/N): N

15.203: Antenna Requirement:

- ☒ The antenna is permanently attached to the EUT
- ☐ The antenna uses a unique coupling
- ☐ The EUT must be professionally installed
- ☐ The antenna requirement does not apply

The antenna gain stated by the manufacturer is 3.4 dBi

Output Power

Engineer: John Michalowicz

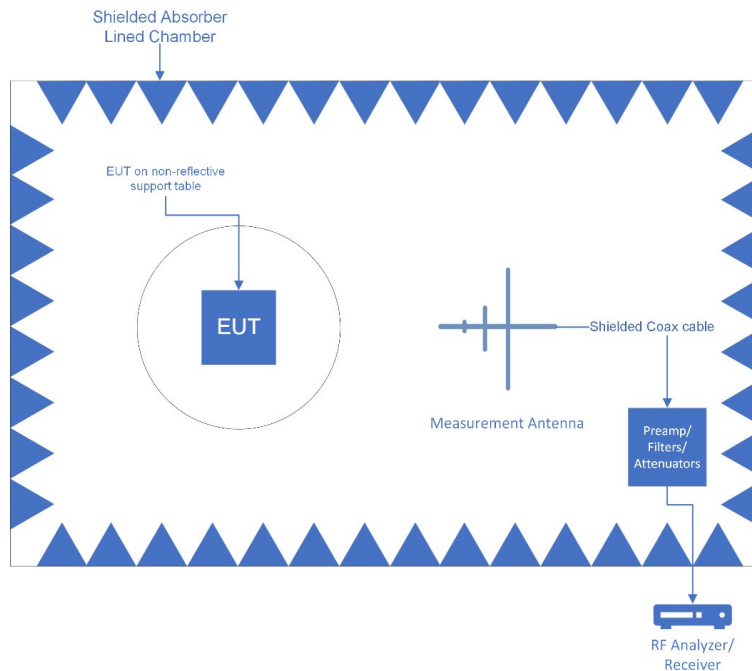
Test Date: 7/29/25

Test Procedure

RADIATED METHOD

The EUT was setup in a semi-anechoic test chamber set 3m from the receiving antenna. The EUT was set to transmit on the lowest, middle and highest frequency of operation at the maximum power level. The EUT was tested, in 3 orthogonal axis, by rotating it 360° with the receive antenna in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure the TX signal levels were maximized. A spectrum analyzer was used to verify that the EUT met the requirements for Output Power.

Test Setup



The Spectrum Analyzer was set to the following:

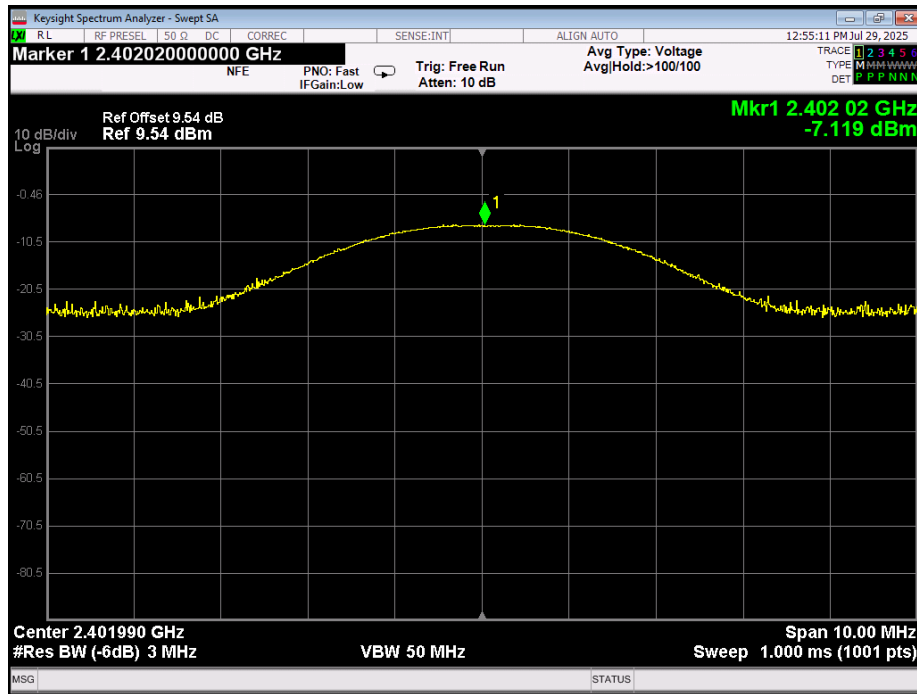
RBW $\geq$ DTS Bandwidth
 VBW $\geq$ 3 x RBW
 Span $\geq$ 3 x RBW
 Sweep time = auto couple
 Detector = peak
 Trace Mode = max hold

The RF output power was measured using the spectrum analyzer's marker peak function

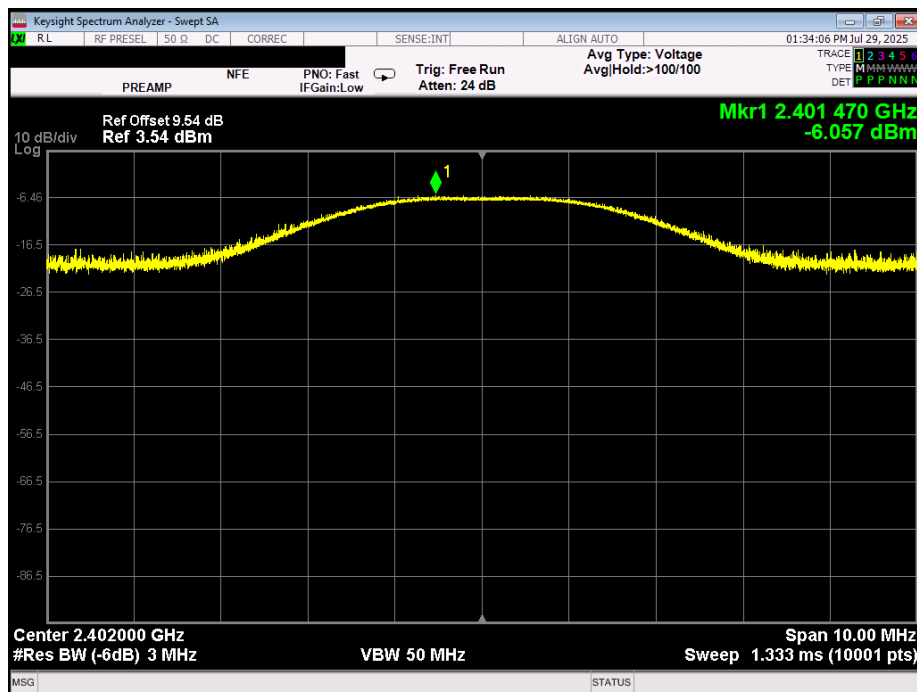
Transmitter Output Power Summary Table

Tuned Frequency (MHz)	Mode of Operation	Measured Value (dBm)	Specification Limit	Result
2402	1 Mbit	-7.119	1 W (30 dBm)	Pass
	2 Mbit	-6.057	1 W (30 dBm)	Pass
2440	1 Mbit	-6.975	1 W (30 dBm)	Pass
	2 Mbit	-7.176	1 W (30 dBm)	Pass
2480	1 Mbit	-11.790	1 W (30 dBm)	Pass
	2 Mbit	-11.808	1 W (30 dBm)	Pass

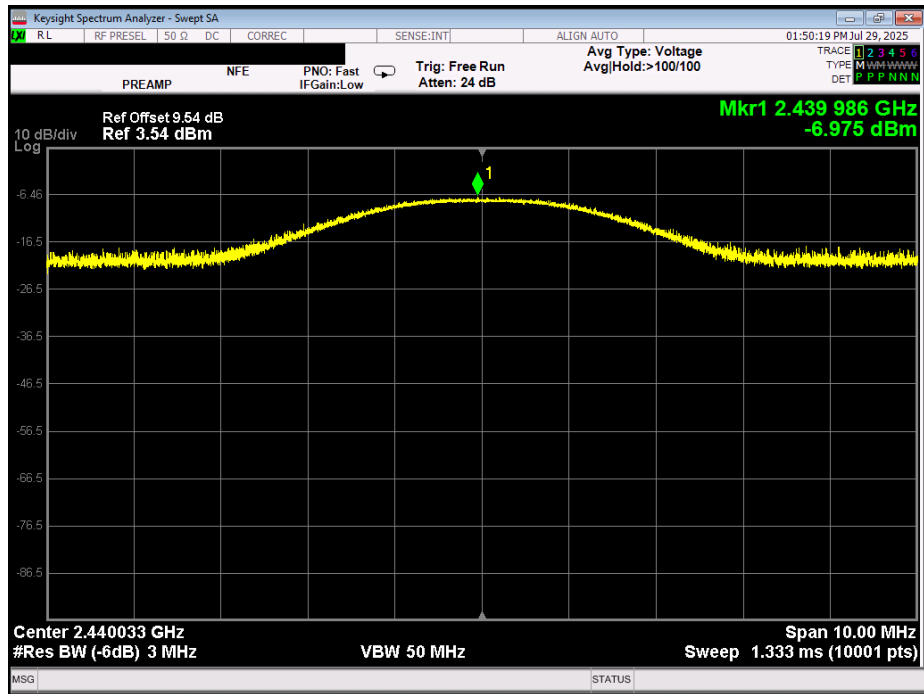
Output Power Plots



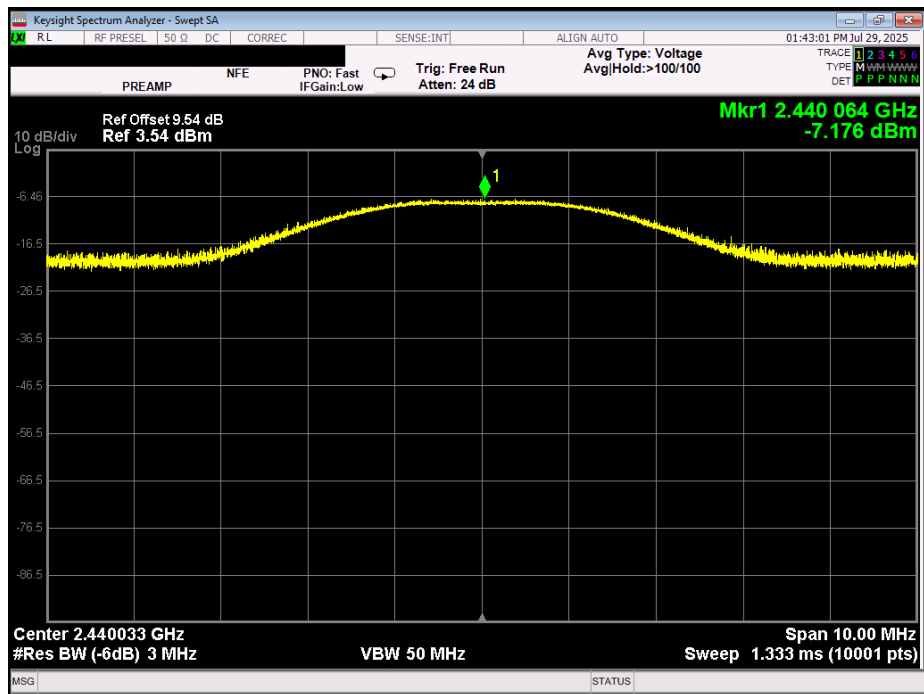
Low Channel 1M



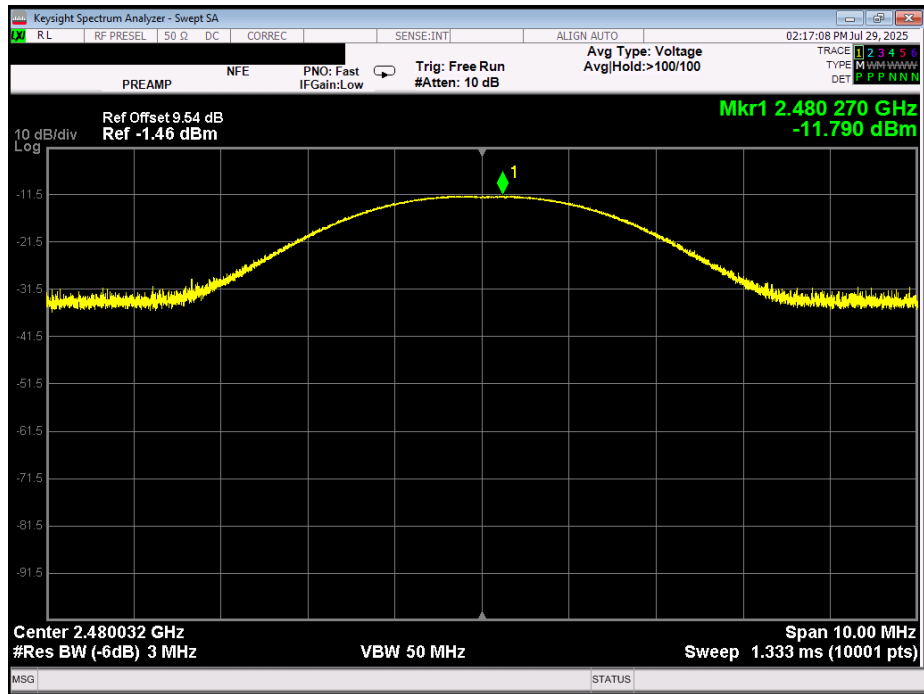
Low Channel 2M



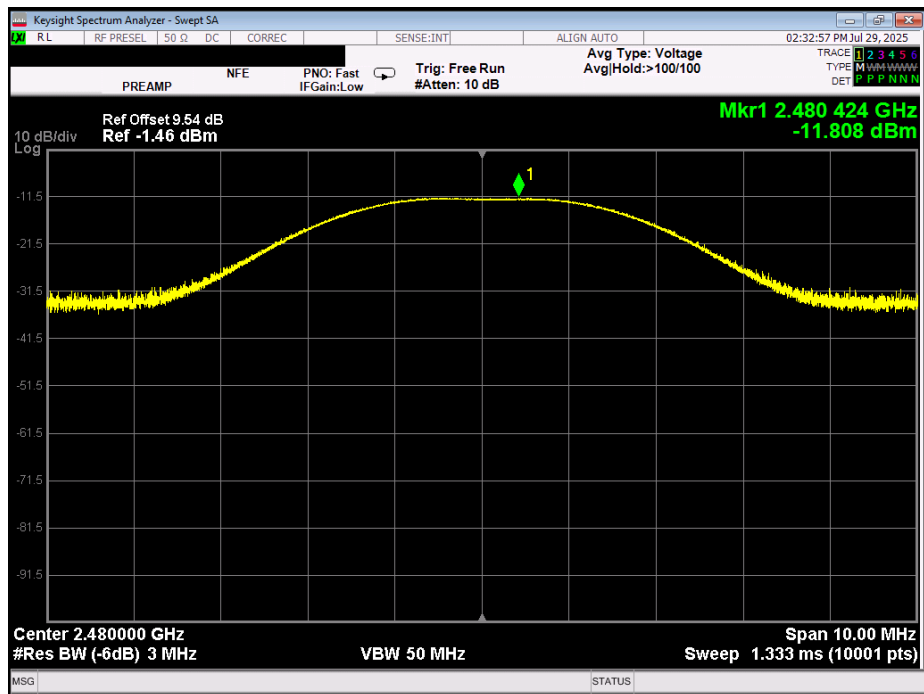
Mid Channel 1M



Mid Channel 2M



High Channel 1M



High Channel 2M

Radiated Spurious Emissions

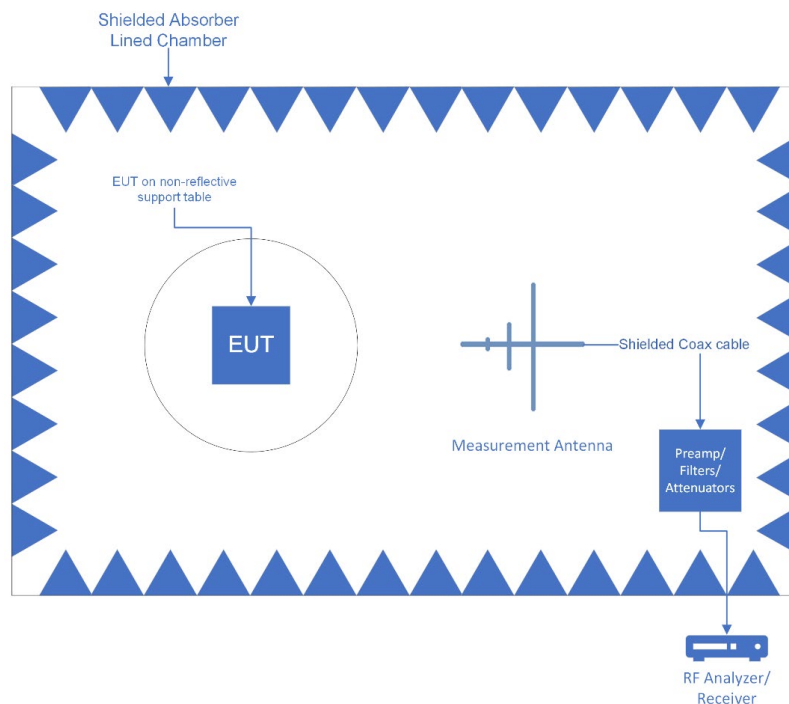
Engineer: John Michalowicz

Test Date: 7/30/25

Test Procedure Radiated Spurious Emissions: 30 – 1000 MHz and Above 1GHz

The EUT was setup in a semi-anechoic test chamber set 3m from the receiving antenna. The EUT was set to transmit on the lowest, middle and highest frequency of operation at the maximum power level. The EUT was tested, in 3 orthogonal axis, by rotating it 360° with the receive antenna in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure the TX signal levels were maximized. A spectrum analyzer was used to verify that the EUT met the requirements for Radiated Spurious Emissions. All emissions across the required range were evaluated. The emissions that exceed the limit in the 2.4 GHz are the fundamental emission and the limit does not apply.

Basic Test Setup



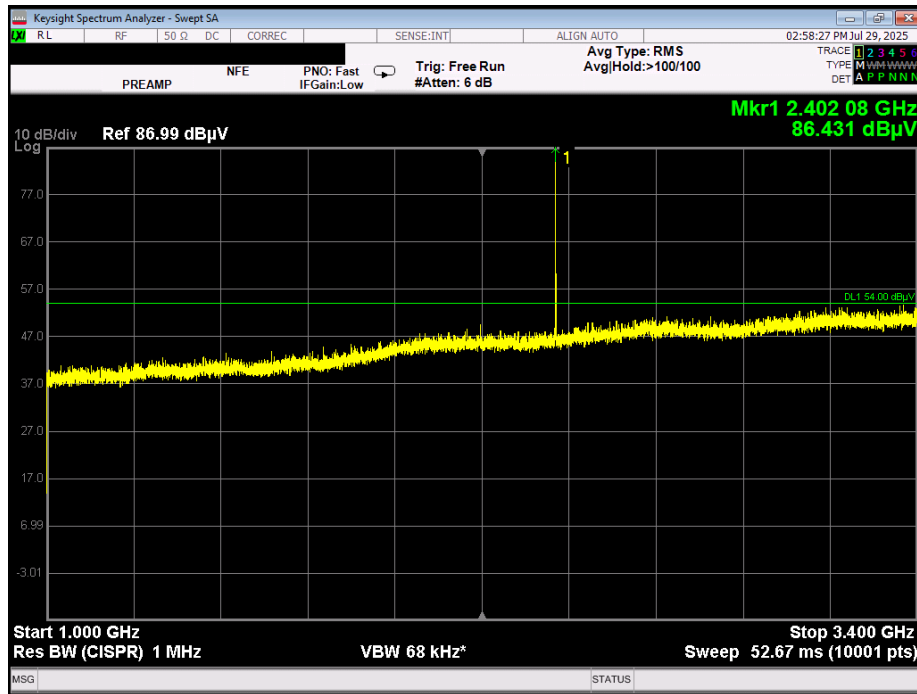
	Settings Below 1GHz	Settings Above 1GHz
RBW	120 kHz	1 MHz
VBW	300 kHz	3 MHz
Detector	Quasi Peak	Peak / Average

Sample Calculations

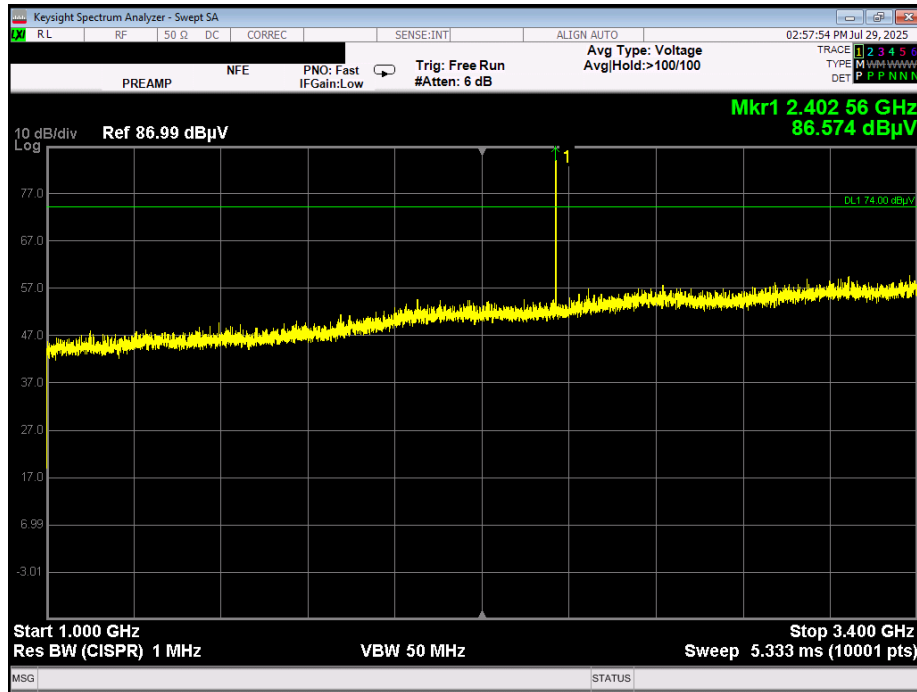
Corrected Value = Measured Value + Correction factor

Correction factor = Antenna Correction Factor + Cable loss + Preamp/Attenuator Factor

Radiated Emissions Low Channel

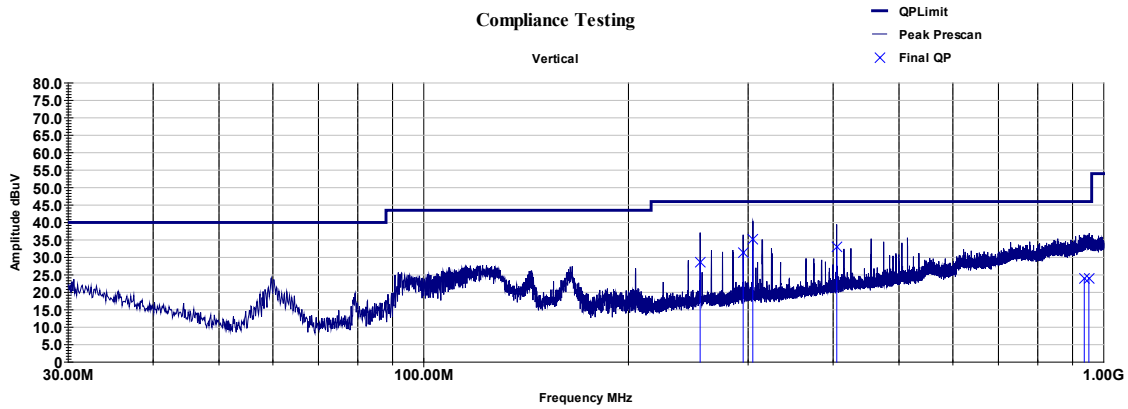


Low Channel AVG_15.205

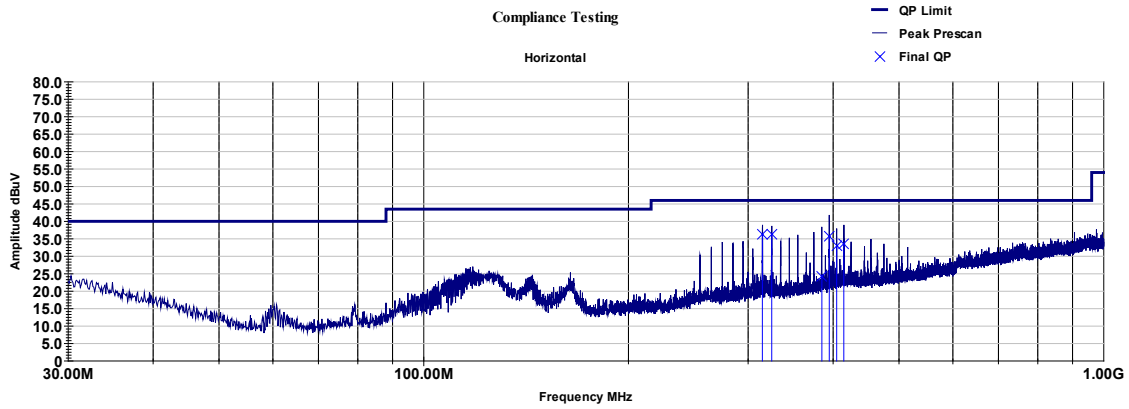


Low Channel Peak_15.205

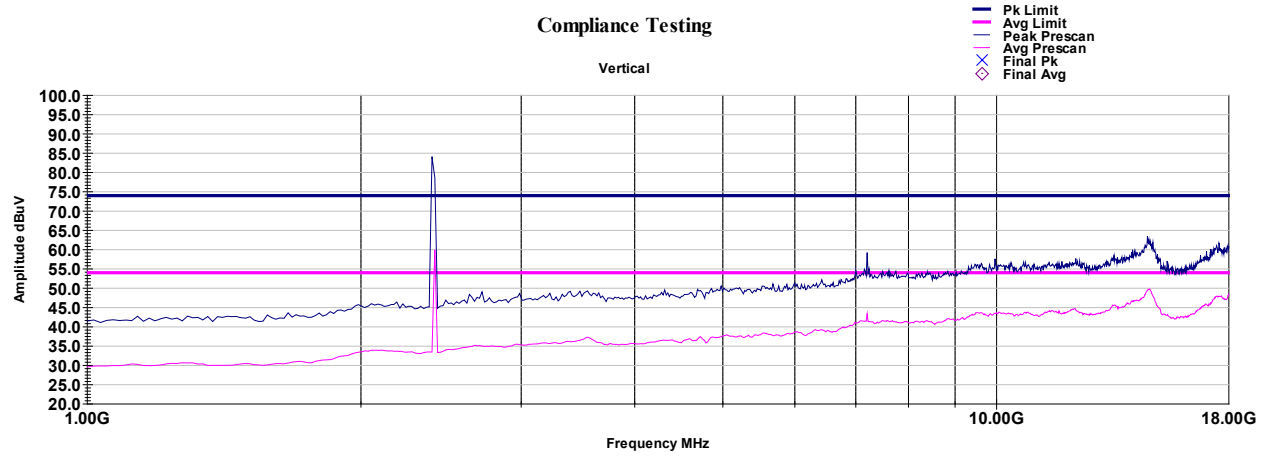
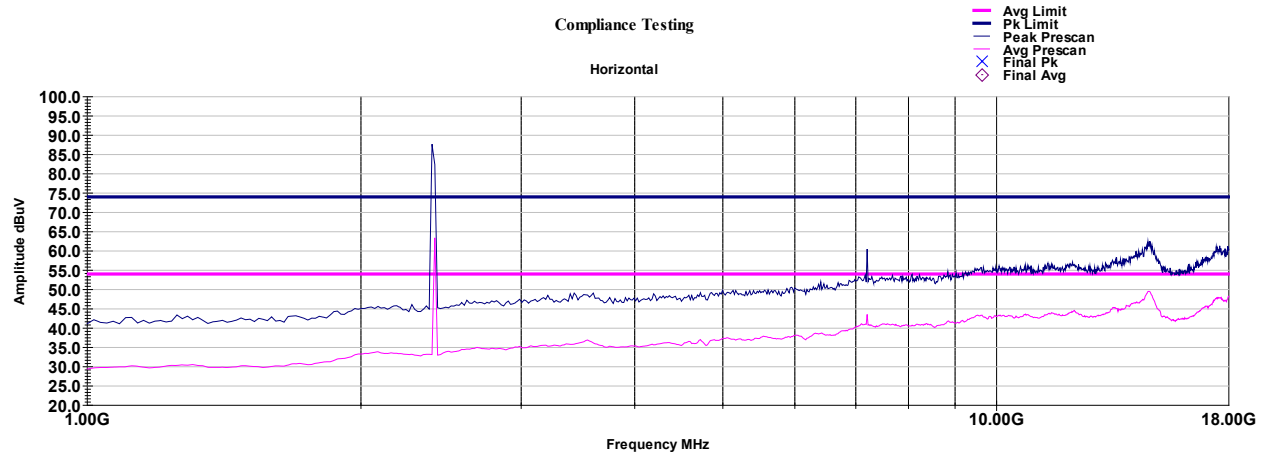
Low Channel_30 - 1000 MHz

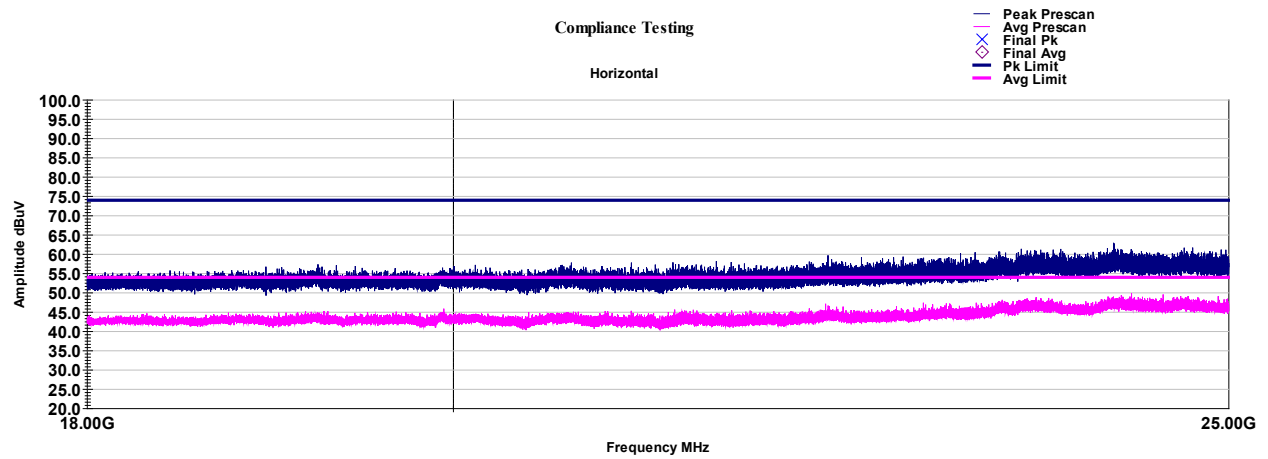
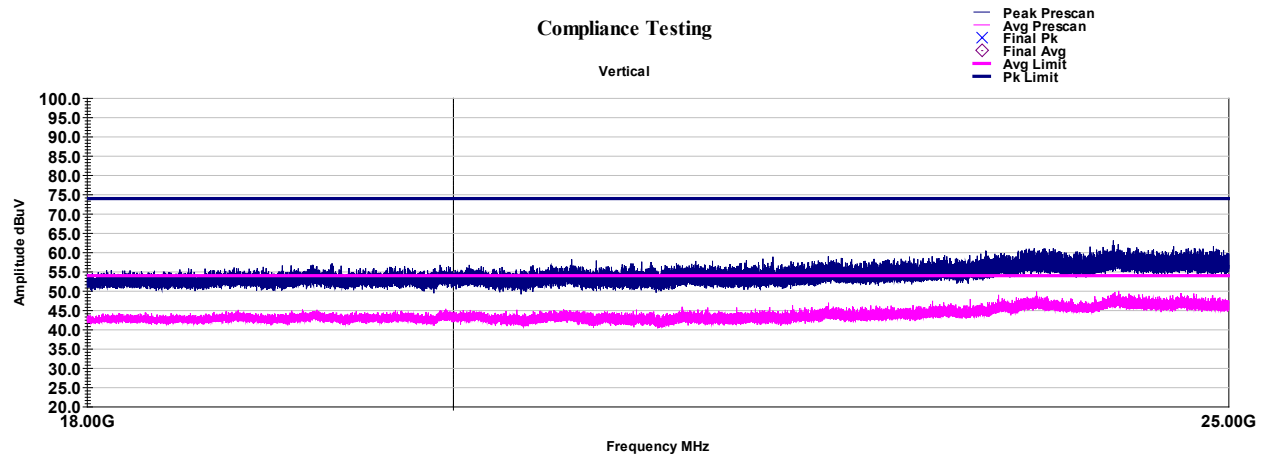


Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
254.962	308.00	129.00	45.99	-17.31	28.70	46.00	-17.30
294.962	33.00	100.00	48.26	-16.85	31.40	46.00	-14.60
304.747	192.00	100.00	51.66	-16.58	35.10	46.00	-10.90
404.955	221.00	100.00	46.20	-13.32	32.90	46.00	-13.10
936.228	280.00	175.00	25.07	-1.11	24.00	46.00	-22.00
950.843	100.00	325.00	25.00	-0.93	24.10	46.00	-21.90
Final = Raw + Path Loss							
Margin = Final - Limit							

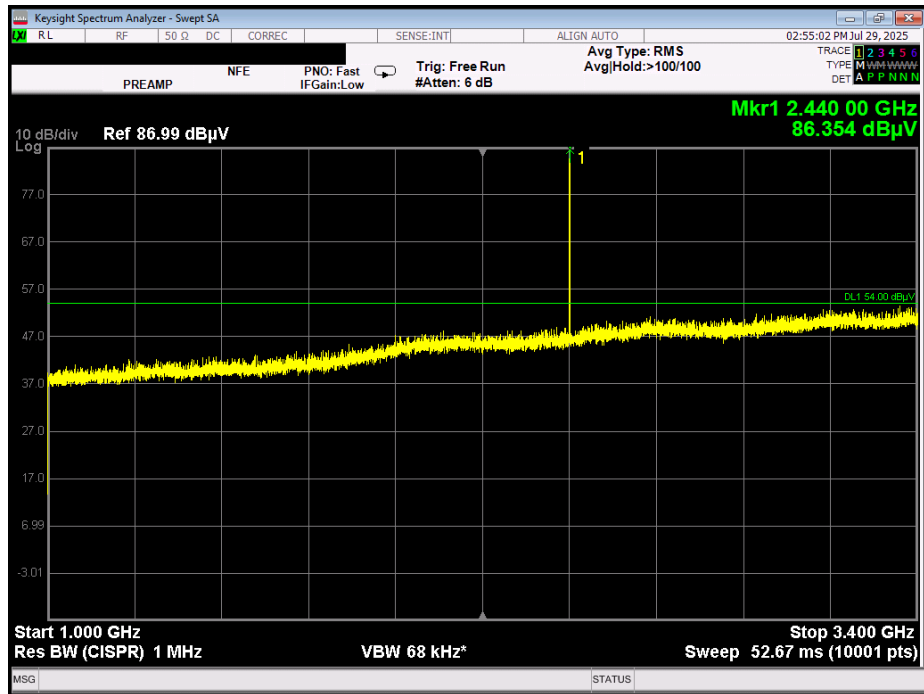


Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
314.792	167.00	100.00	51.96	-15.81	36.20	46.00	-9.80
324.931	145.00	100.00	51.82	-15.43	36.40	46.00	-9.60
385.093	149.00	105.00	37.66	-13.34	24.30	46.00	-21.70
394.765	228.00	105.00	48.65	-13.00	35.60	46.00	-10.40
404.851	51.00	325.00	45.60	-12.64	33.00	46.00	-13.00
414.674	101.00	106.00	45.64	-12.19	33.40	46.00	-12.60
Final = Raw + Path Loss							
Margin = Final - Limit							

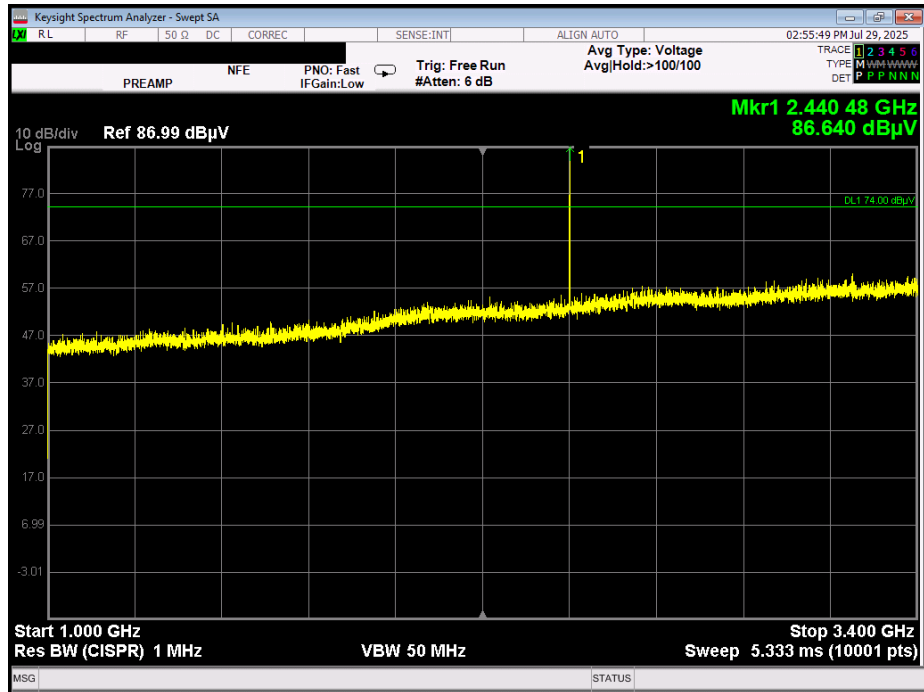




Radiated Emissions Mid Channel

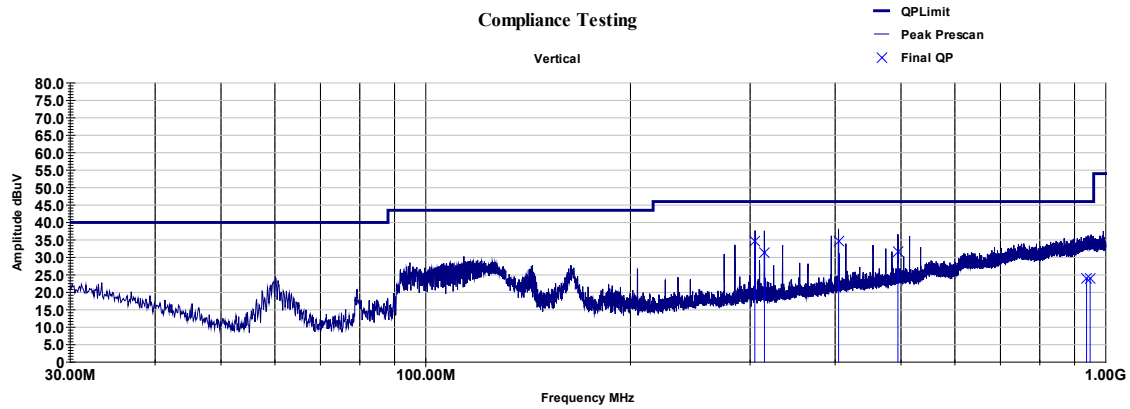


Mid Channel AVG_15.205

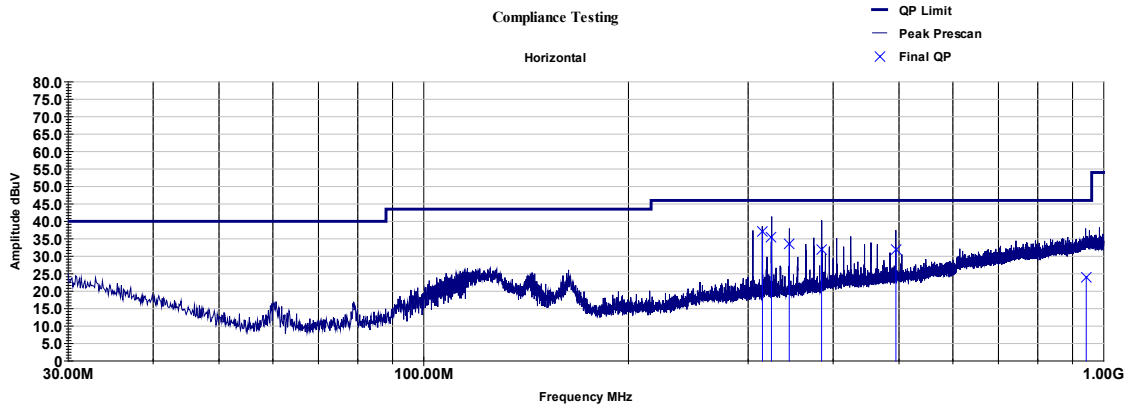


Mid Channel Peak_15.205

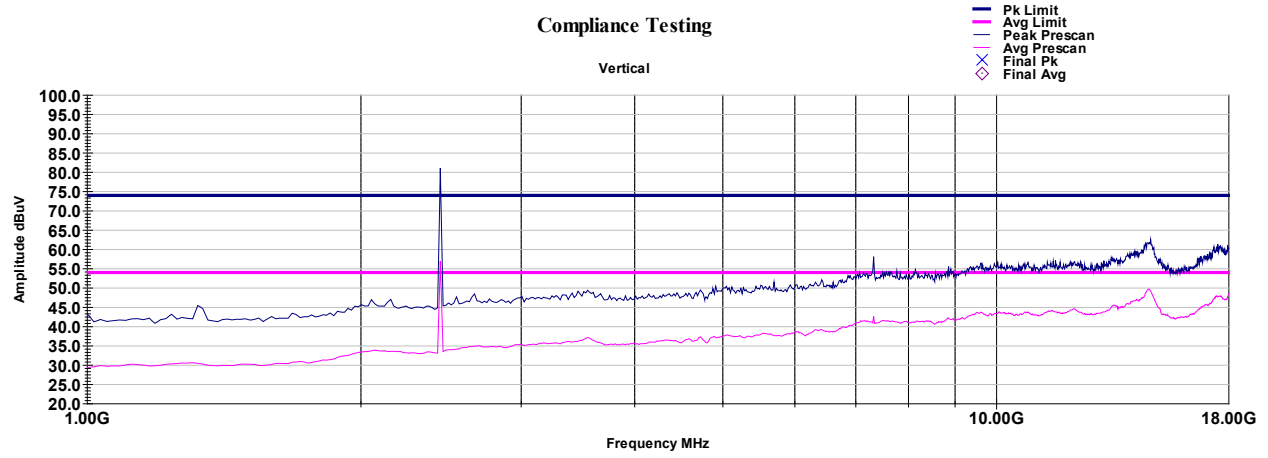
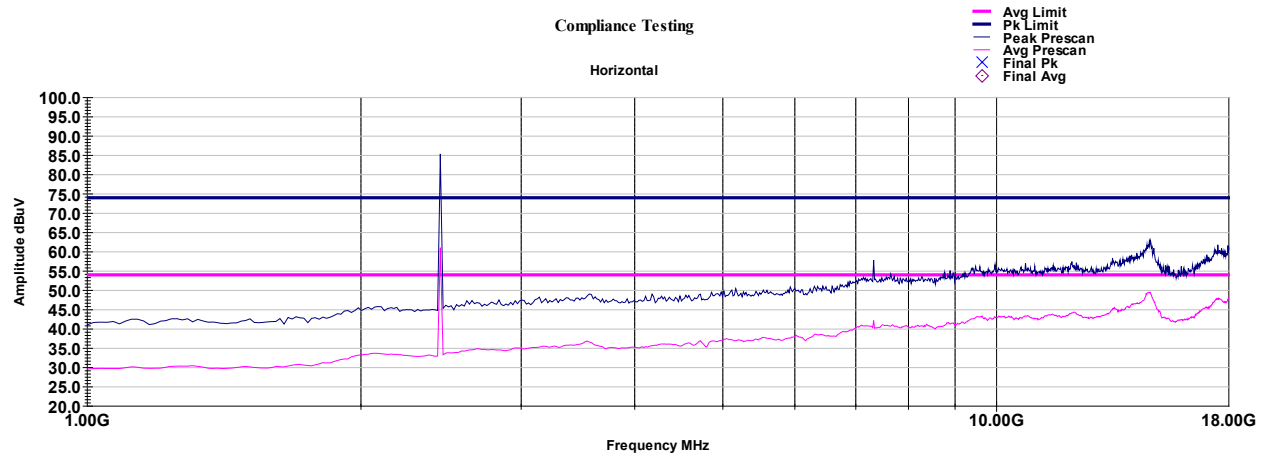
Mid Channel_30 - 1000 MHz

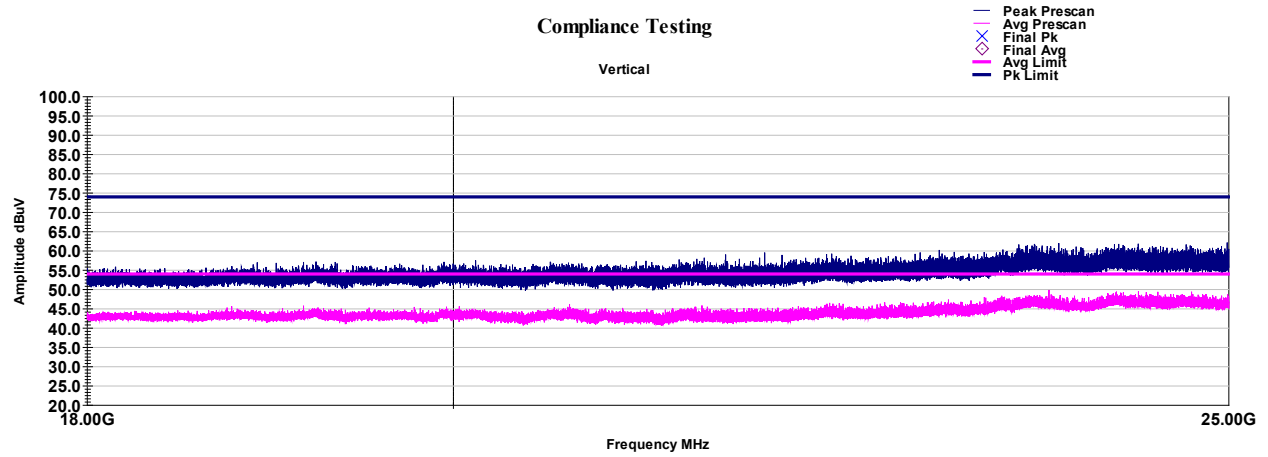
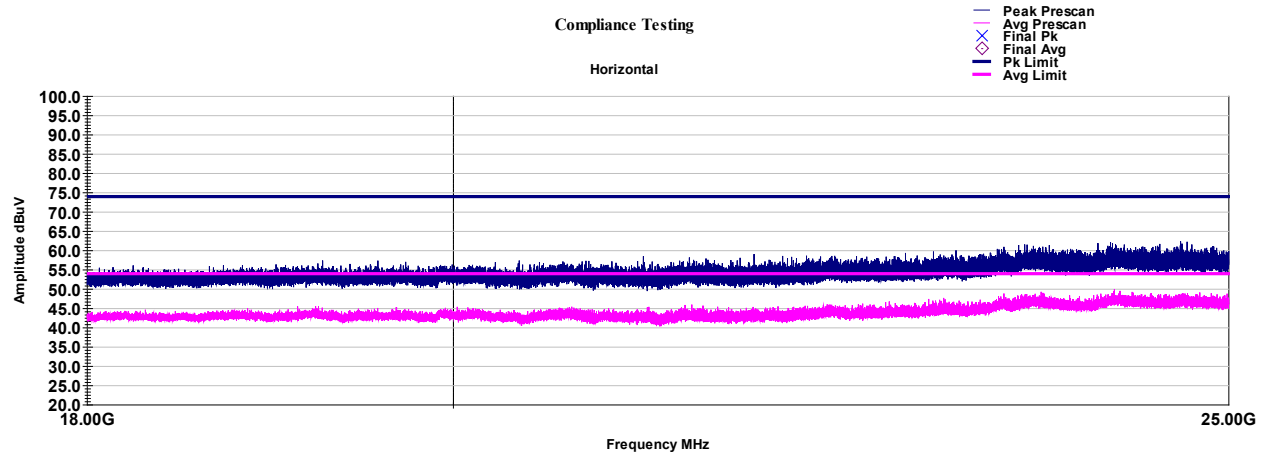


Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
304.721	205.00	100.00	51.21	-16.58	34.60	46.00	-11.40
314.868	200.00	105.00	47.44	-16.12	31.30	46.00	-14.70
404.686	145.00	221.00	47.98	-13.33	34.70	46.00	-11.30
494.803	128.00	100.00	42.68	-10.99	31.70	46.00	-14.30
937.308	323.00	233.00	25.10	-1.11	24.00	46.00	-22.00
948.55	223.00	338.00	25.03	-0.94	24.10	46.00	-21.90
Final = Raw + Path Loss							
Margin = Final - Limit							

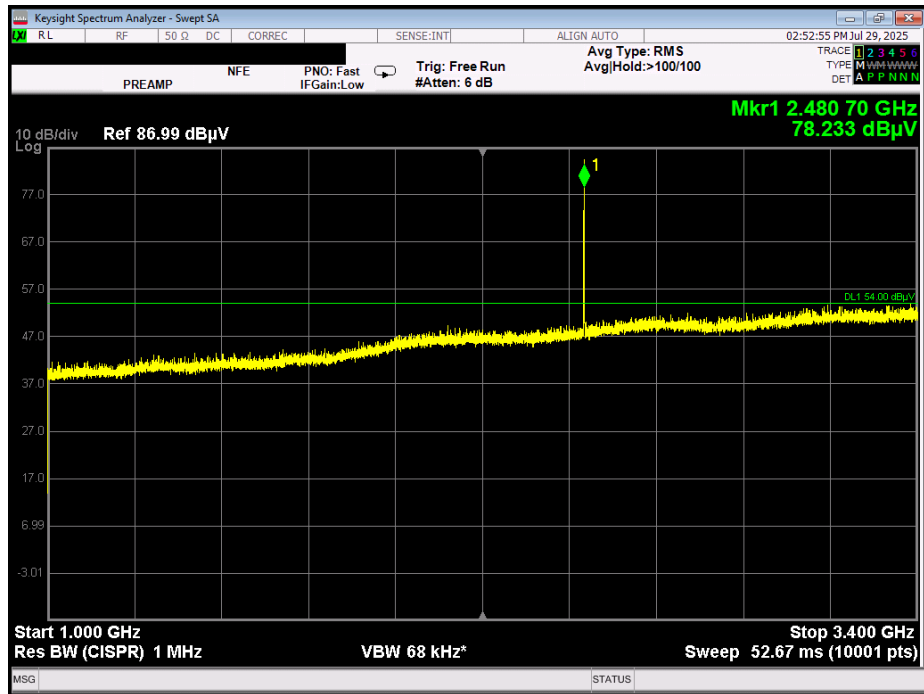


Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
314.875	309.00	121.00	53.04	-15.81	37.20	46.00	-8.80
324.637	127.00	100.00	50.91	-15.43	35.50	46.00	-10.50
344.798	44.00	105.00	48.21	-14.62	33.60	46.00	-12.40
384.703	244.00	100.00	45.28	-13.35	31.90	46.00	-14.10
494.788	223.00	175.00	42.86	-10.87	32.00	46.00	-14.00
942.631	196.00	168.00	25.21	-1.18	24.00	46.00	-22.00
Final = Raw + Path Loss							
Margin = Final - Limit							

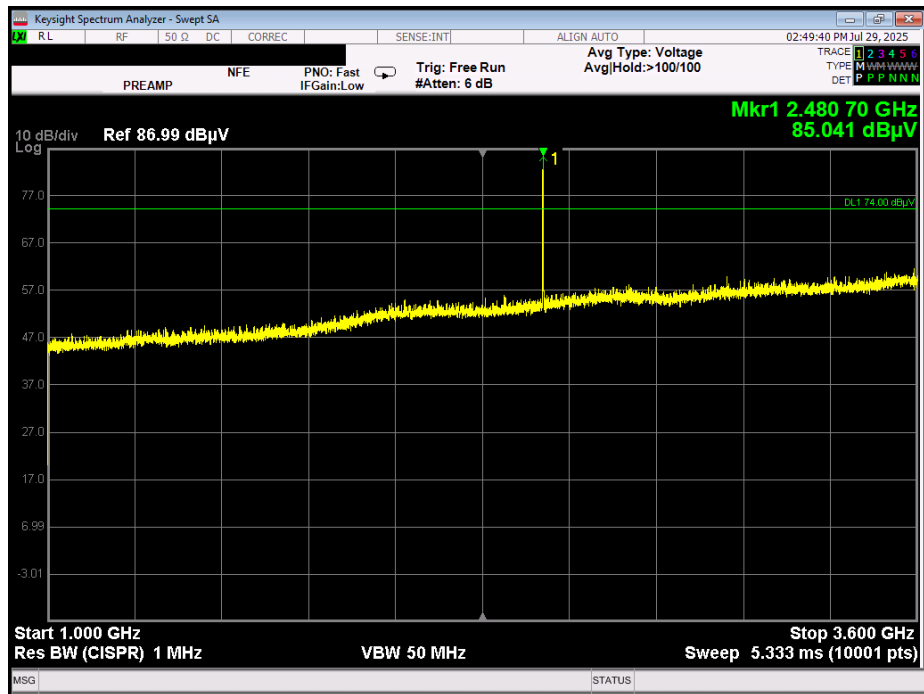




Radiated Emissions High Channel

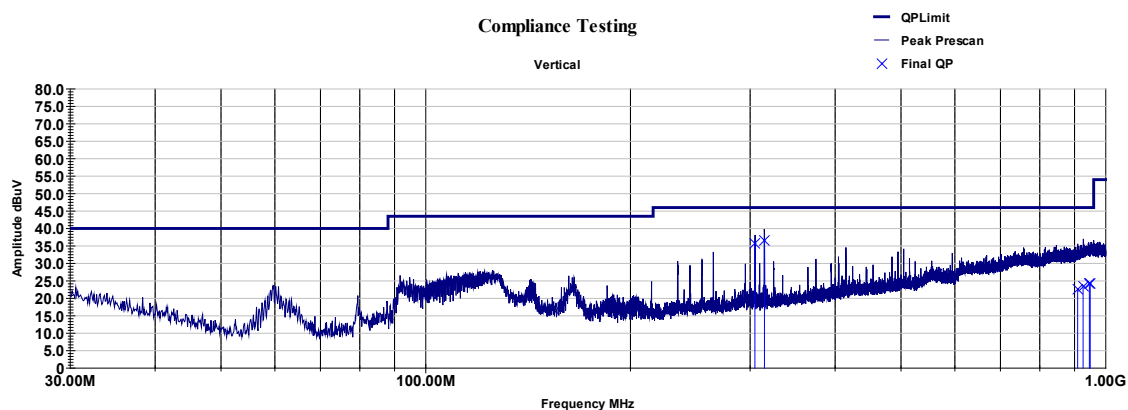


High Channel AVG_15.205

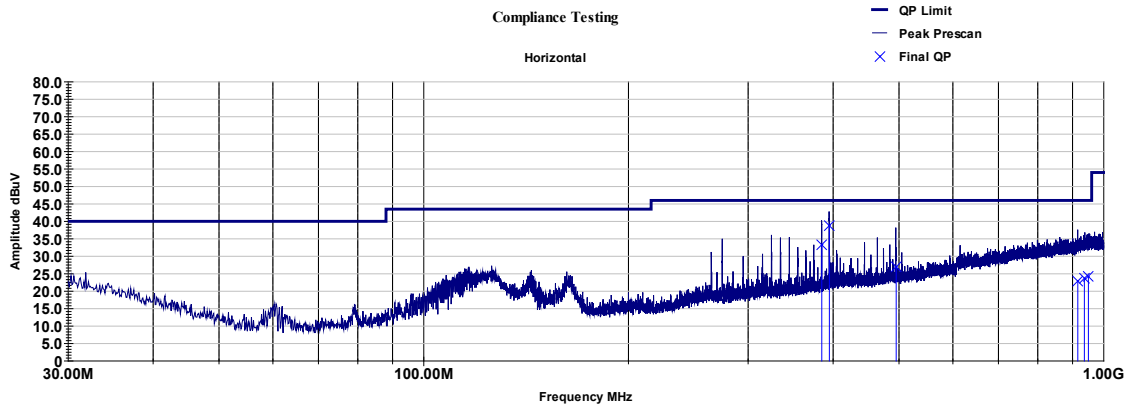


High Channel Peak_15.205

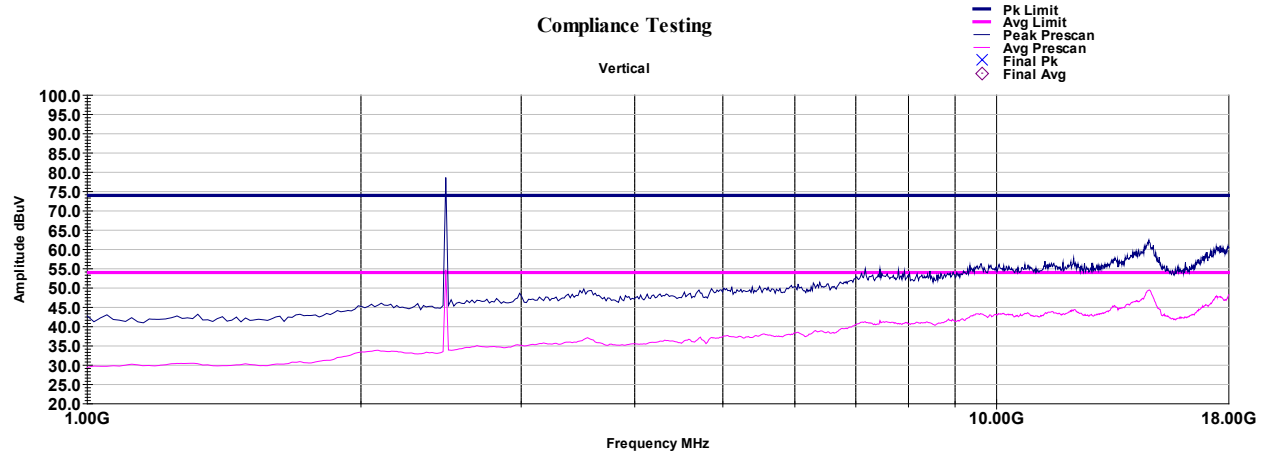
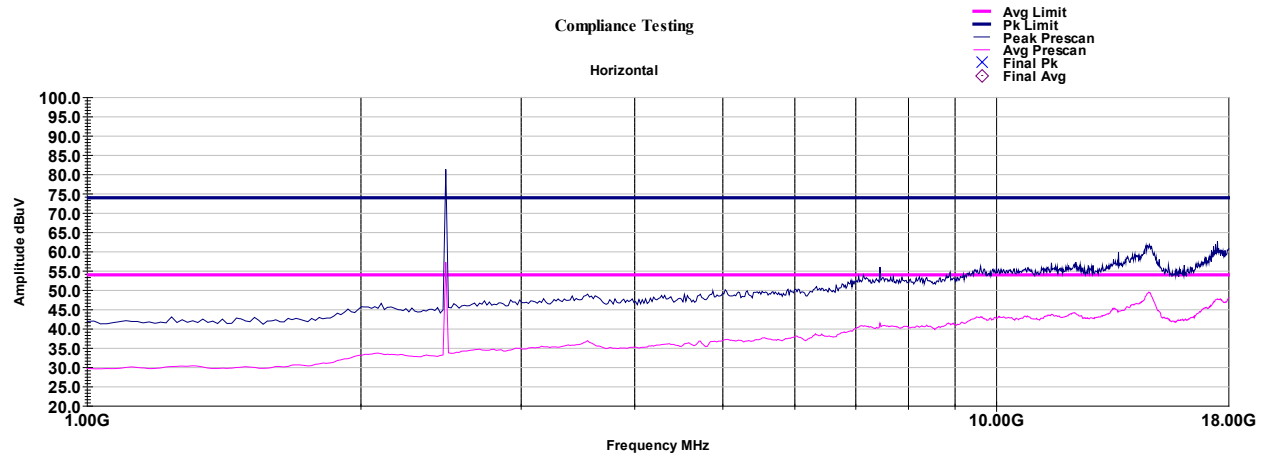
High Channel_30 - 1000 MHz

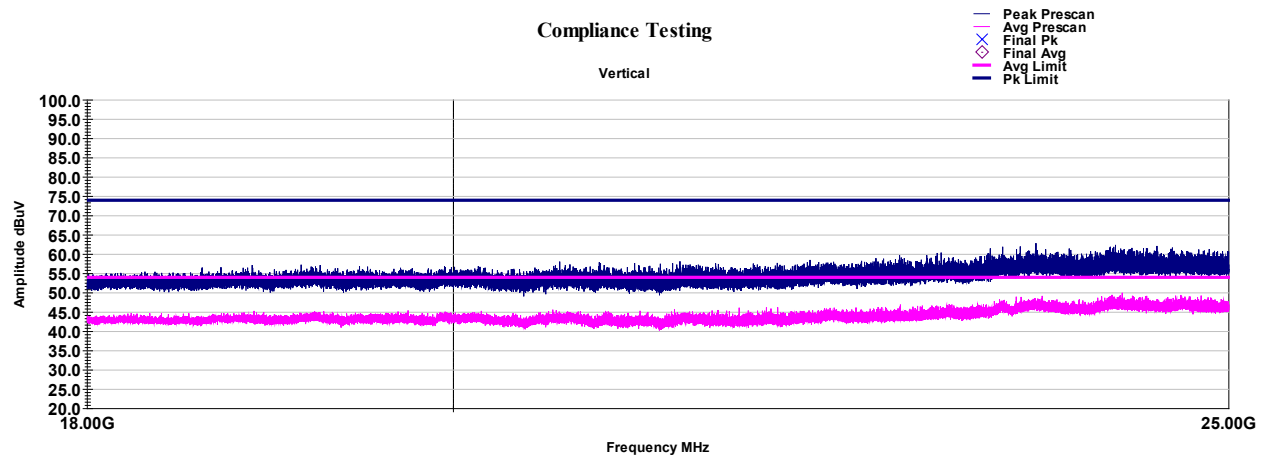
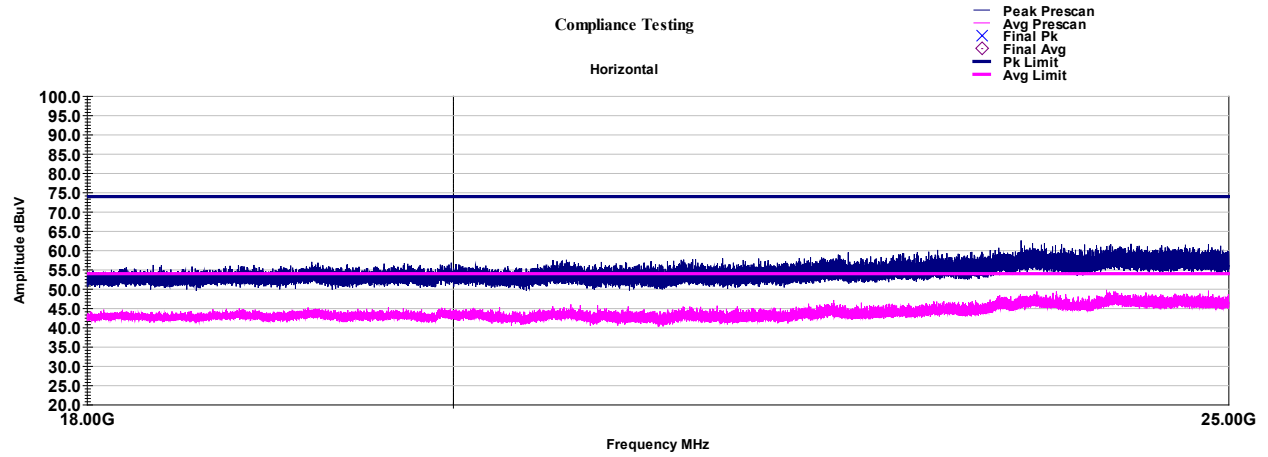


Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
304.839	230.00	100.00	52.34	-16.58	35.80	46.00	-10.20
314.857	145.00	100.00	52.83	-16.12	36.70	46.00	-9.30
909.465	292.00	175.00	25.12	-2.50	22.60	46.00	-23.40
926.235	182.00	175.00	25.15	-1.65	23.50	46.00	-22.50
946.134	308.00	175.00	25.20	-0.96	24.20	46.00	-21.80
948.83	97.00	338.00	25.07	-0.94	24.10	46.00	-21.90
Final = Raw + Path Loss							
Margin = Final - Limit							



Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
384.937	39.00	109.00	46.70	-13.34	33.40	46.00	-12.60
394.91	210.00	100.00	51.85	-12.99	38.90	46.00	-7.10
495.157	149.00	100.00	37.90	-10.85	27.10	46.00	-18.90
915.999	166.00	113.00	25.29	-2.35	22.90	46.00	-23.10
936.658	157.00	325.00	25.12	-1.51	23.60	46.00	-22.40
949.558	77.00	242.00	25.15	-1.03	24.10	46.00	-21.90
Final = Raw + Path Loss							
Margin = Final - Limit							





Emissions at Band Edges

Engineer: John Michalowicz

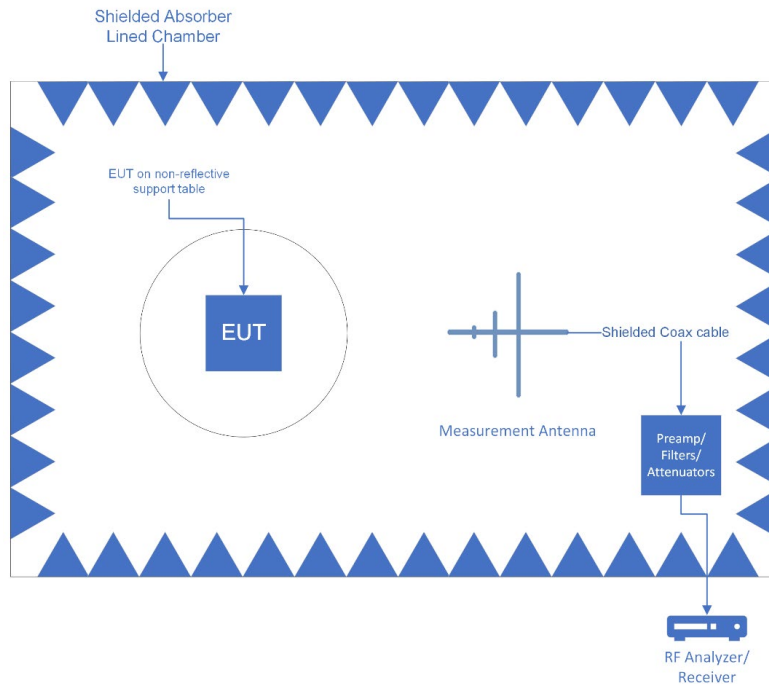
Test Date: 7/29/25

Test Procedure

RADIATED METHOD

The EUT was setup in a semi-anechoic test chamber set 3m from the receiving antenna. The EUT was set to transmit on the lowest and highest frequency of operation at the maximum power level. The EUT was tested, in 3 orthogonal axis, by rotating it 360° with the receive antenna in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure the TX signal levels were maximized. A spectrum analyzer was used to verify that the EUT met the requirements for band edges.

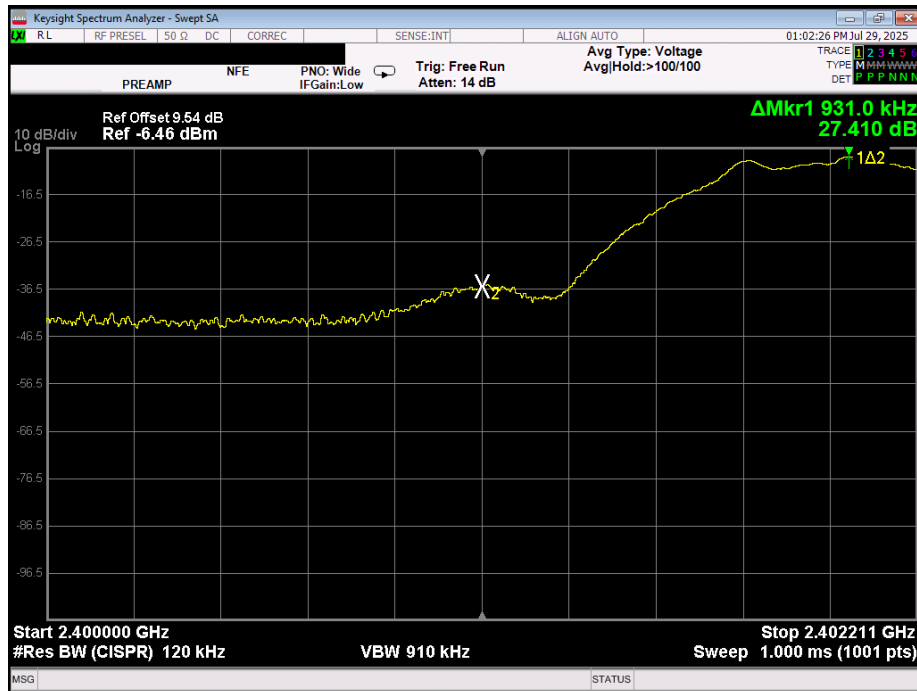
Test Setup



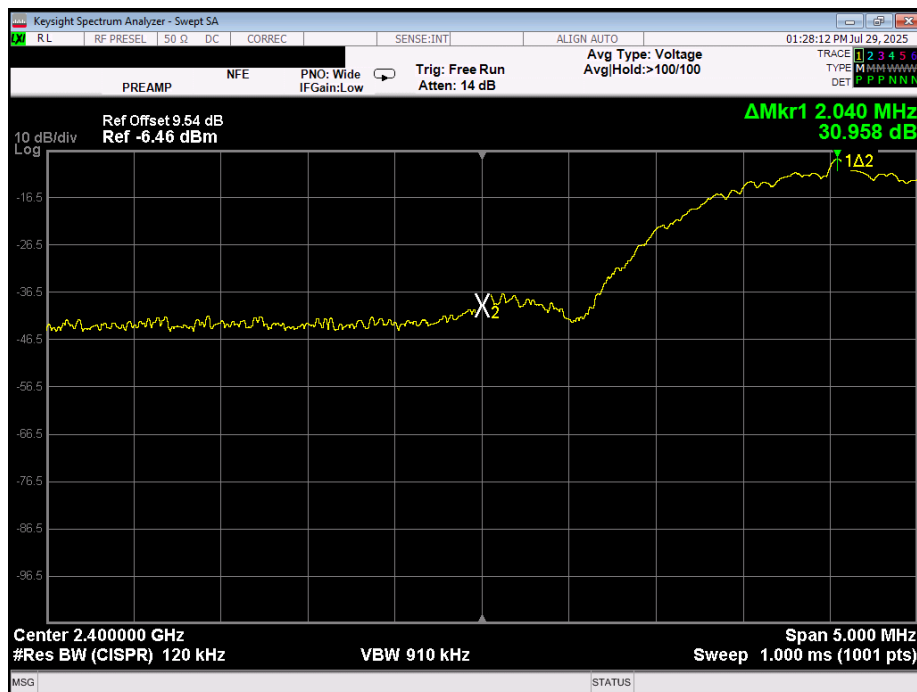
Band Edge Emissions Summary

Tuned Frequency (MHz)	Emission Frequency (MHz)	Monitored Level	Detector	Limit	Result
2402	2400	-27.41	Peak	-20 dBc	Pass
2480	2483.5	-34.38	Peak	-20 dBc	Pass

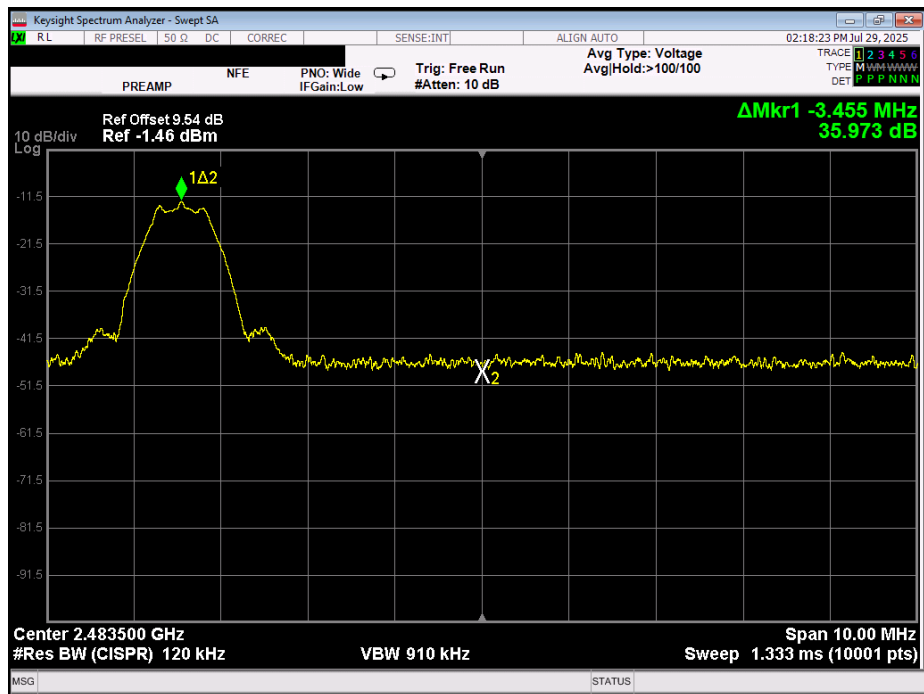
Band Edge Plots



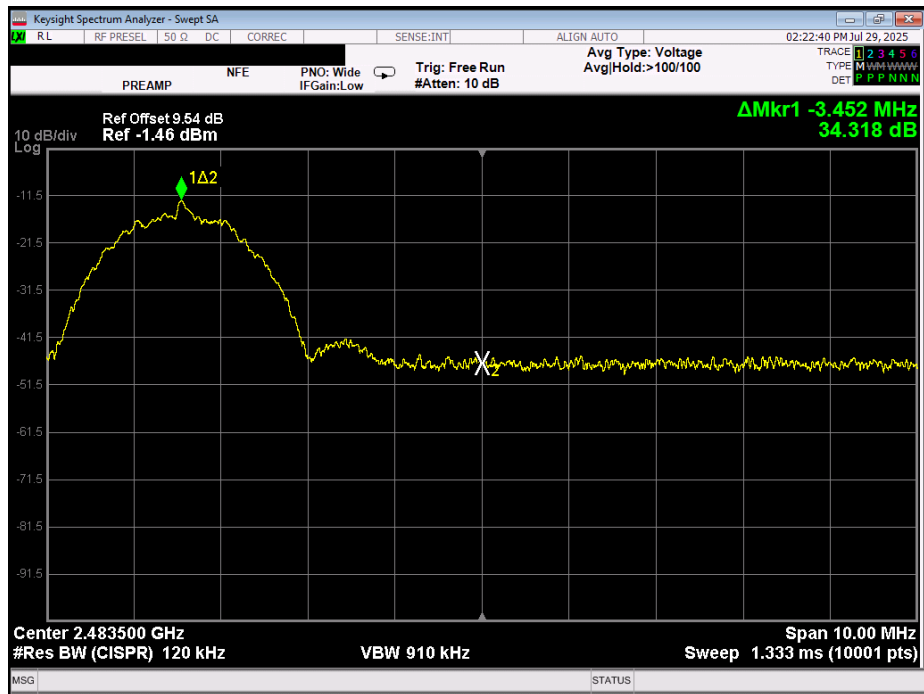
Low Channel 1M



Low Channel 2M



High Channel 1M



High Channel 2M

DTS Bandwidth

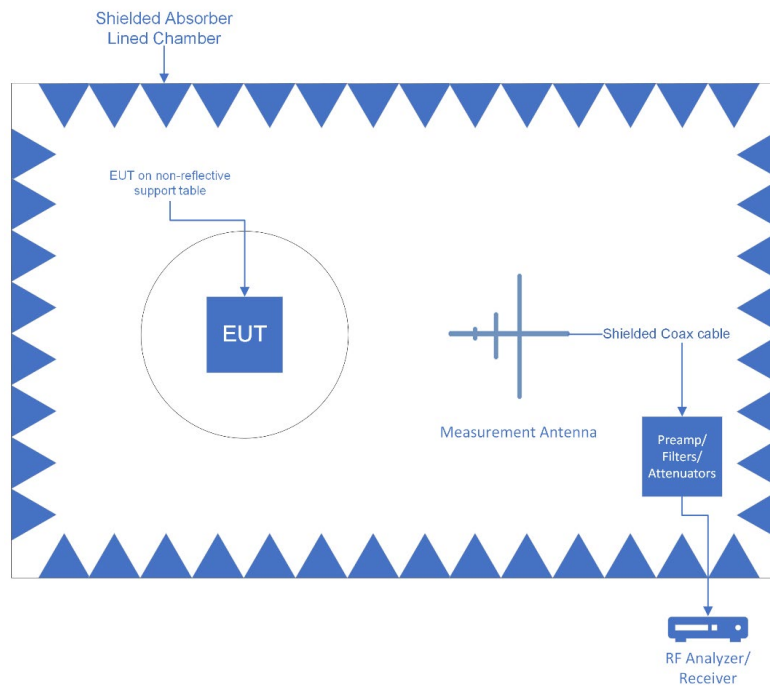
Engineer: John Michalowicz

Test Date: 7/29/25

RADIATED METHOD

The EUT was setup in a semi-anechoic test chamber set 3m from the receiving antenna. The EUT was set to transmit on the lowest, middle and highest frequency of operation at the maximum power level. The EUT was tested, in 3 orthogonal axis, by rotating it 360° with the receive antenna in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure the TX signal levels were maximized. A spectrum analyzer was used to verify that the EUT met the Bandwidth requirements.

Test Setup



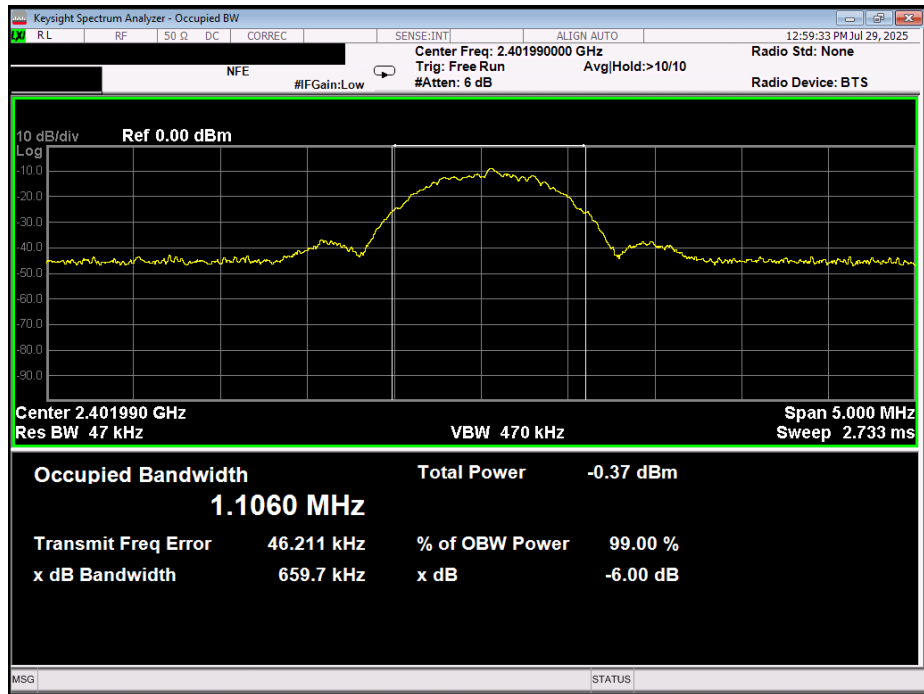
6 dB Occupied Bandwidth Summary

Frequency (MHz)	Mode of Operation	Measured Bandwidth (kHz)	Specification Limit (kHz)	Result
2402	1 Mbit	659.7	≥ 500	Pass
	2 Mbit	1107	≥ 500	Pass
2440	1 Mbit	653.6	≥ 500	Pass
	2 Mbit	1144	≥ 500	Pass
2480	1 Mbit	635.8	≥ 500	Pass
	2 Mbit	1164	≥ 500	Pass

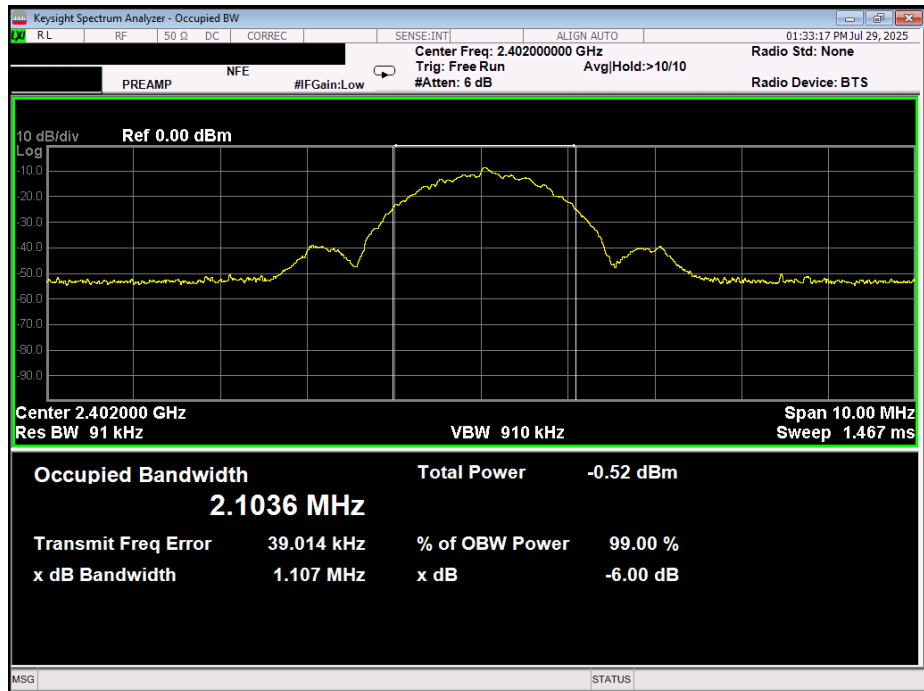
99% Bandwidth Summary

Frequency (MHz)	Mode of Operation	Measured Bandwidth (kHz)	Result
2402	1 Mbit	1.11	Pass
	2 Mbit	2.10	Pass
2440	1 Mbit	1.06	Pass
	2 Mbit	2.11	Pass
2480	1 Mbit	1.09	Pass
	2 Mbit	2.24	Pass

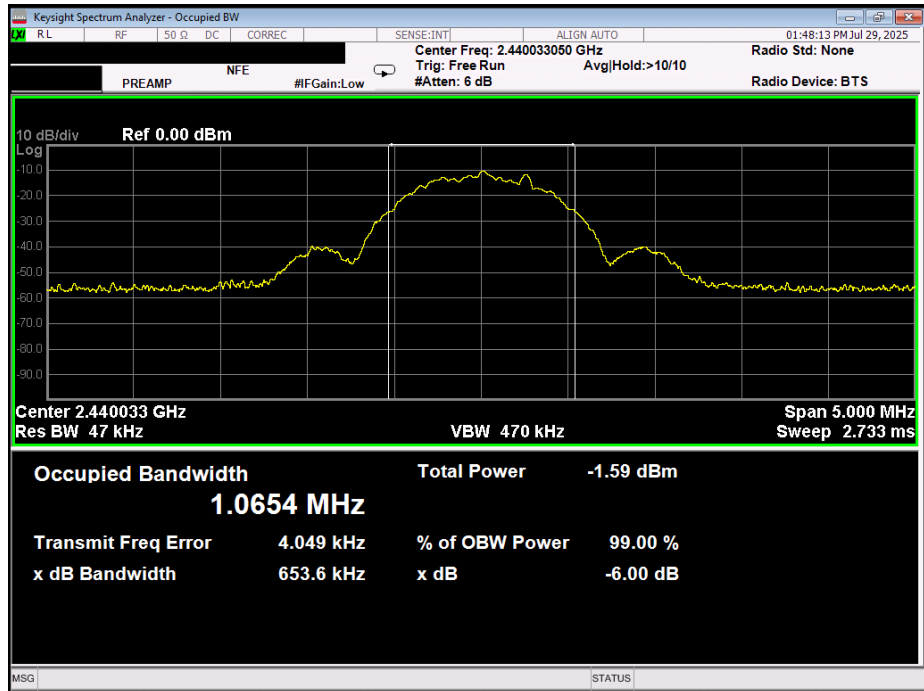
6 dB and 99% Bandwidth Plots



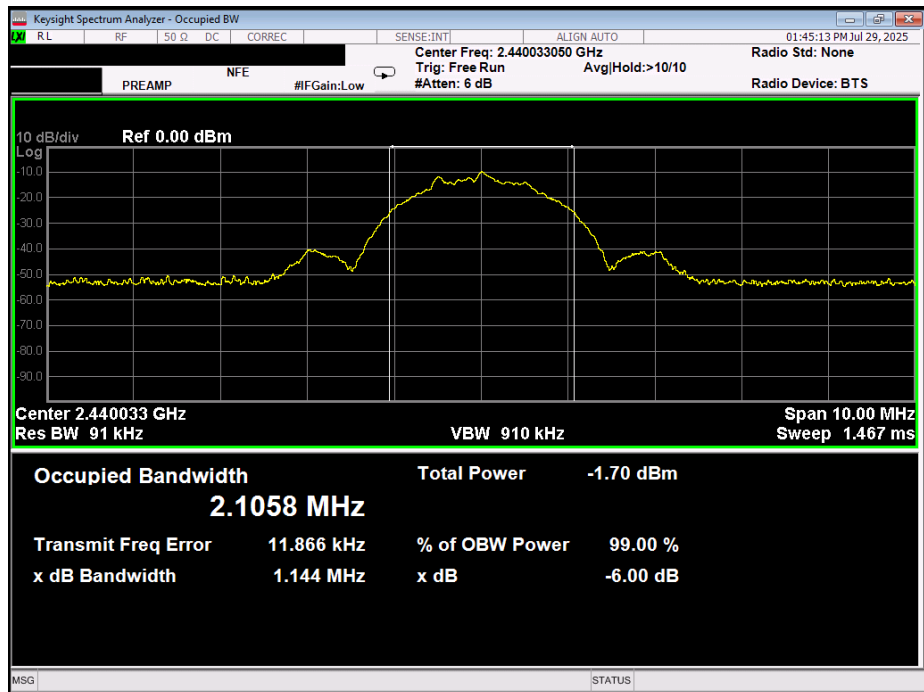
Low Channel 1M



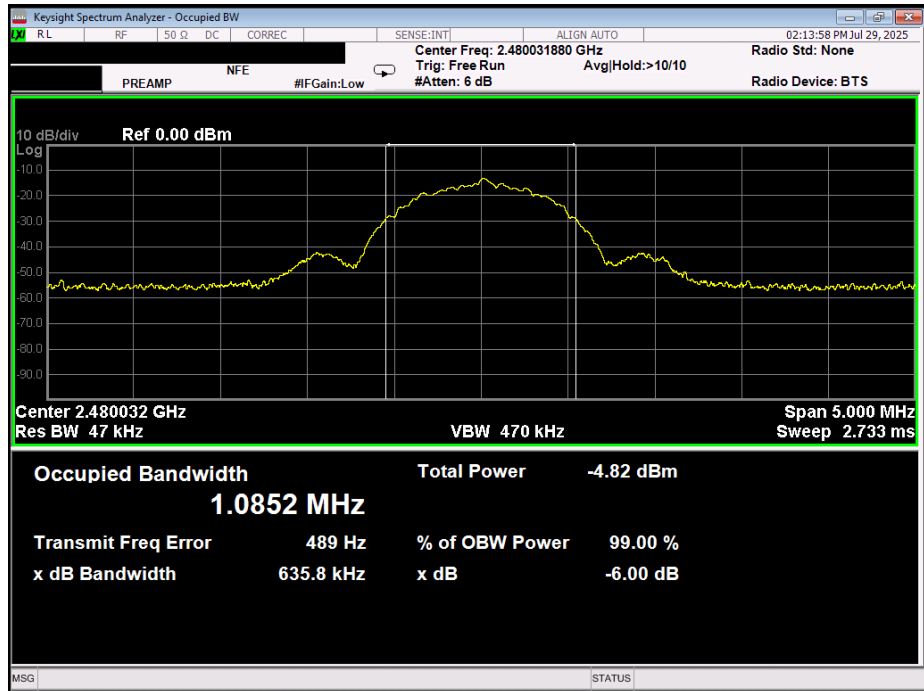
Low Channel 2M



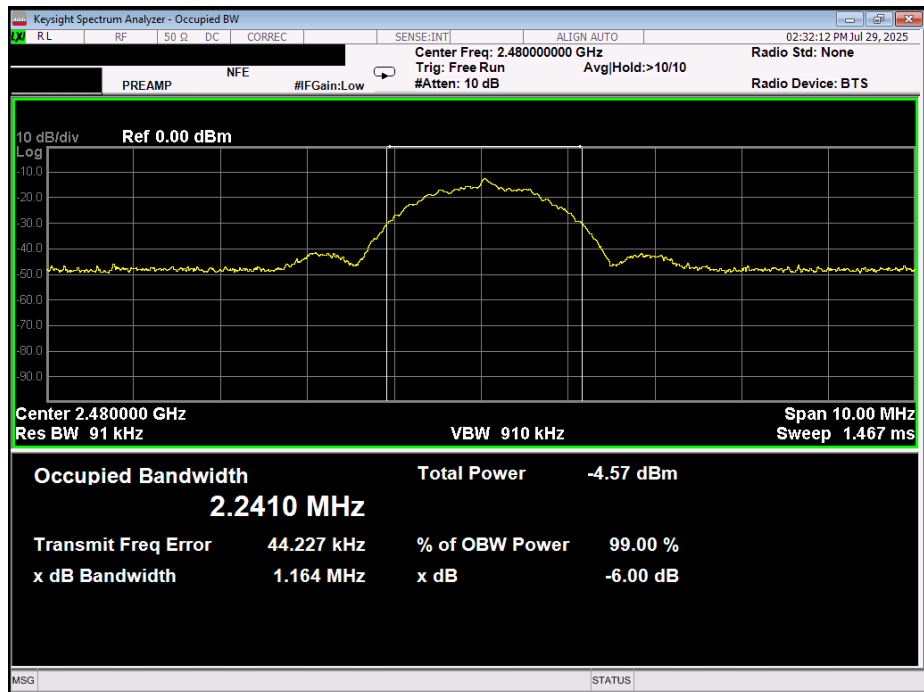
Mid Channel 1M



Mid Channel 2M



High Channel 1M



High Channel 2M

Transmitter Power Spectral Density (PSD)

Engineer: John Michalowicz

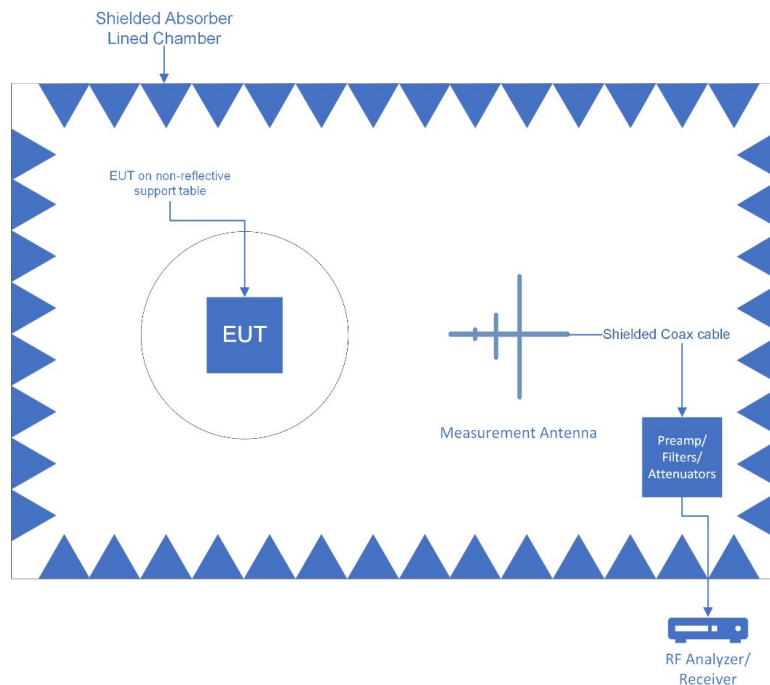
Test Date: 7/29/25

Test Procedure

RADIATED METHOD

The EUT was setup in a semi-anechoic test chamber set 3m from the receiving antenna. The EUT was set to transmit on the lowest, middle and highest frequency of operation at the maximum power level. The EUT was tested, in 3 orthogonal axis, by rotating it 360° with the receive antenna in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure the TX signal levels were maximized. A spectrum analyzer was used to verify that the EUT met the power spectral density requirements.

Test Setup



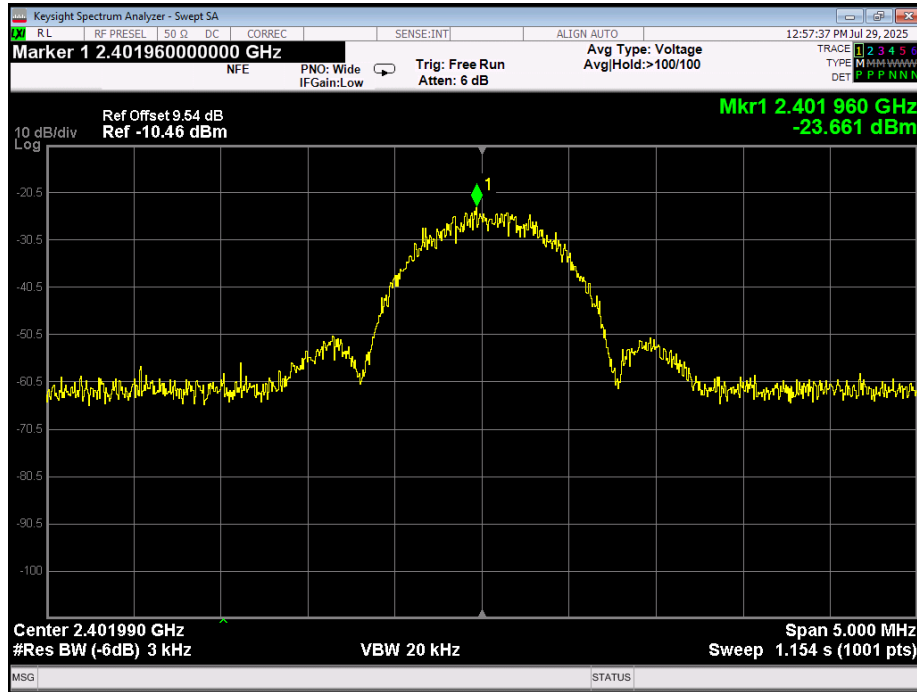
The Spectrum Analyzer was set to the following:

DTS channel center frequency
Span 1.5 x DTS bandwidth
 $RBW = 3 \text{ kHz} \leq RBW \leq 100 \text{ kHz}$
 $VBW \geq 3 \times RBW$
Peak Detector
Sweep time = auto couple
Trace mode = max hold

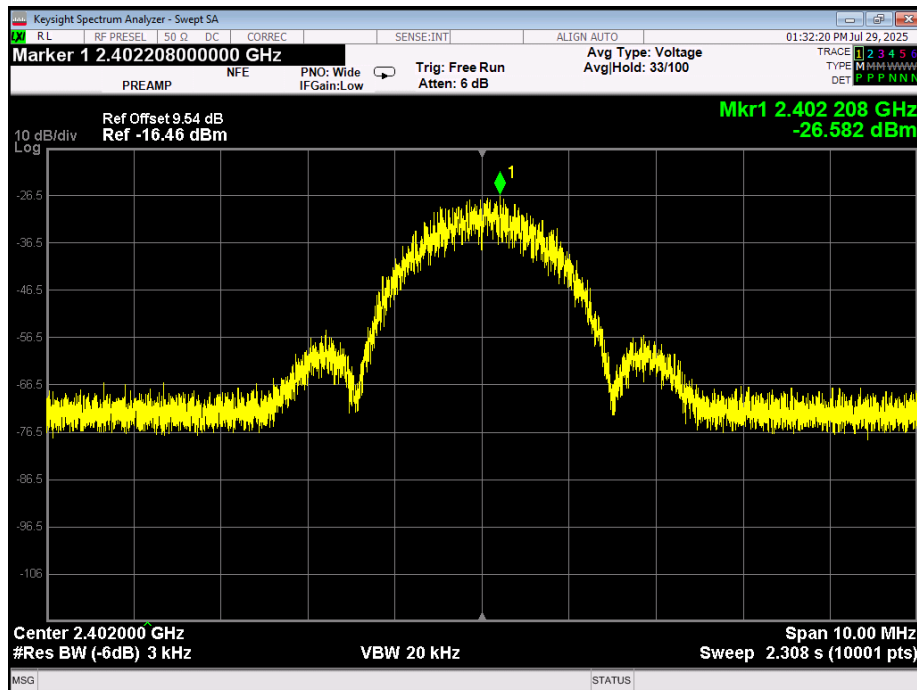
PSD Summary

Frequency (MHz)	Mode of Operation	Measured Data (dBm)	Specification Limit (dBm)	Result
2402	1 Mbit	-23.66	8	Pass
	2 Mbit	-26.58	8	Pass
2440	1 Mbit	-23.16	8	Pass
	2 Mbit	-26.01	8	Pass
2480	1 Mbit	-27.90	8	Pass
	2 Mbit	-29.39	8	Pass

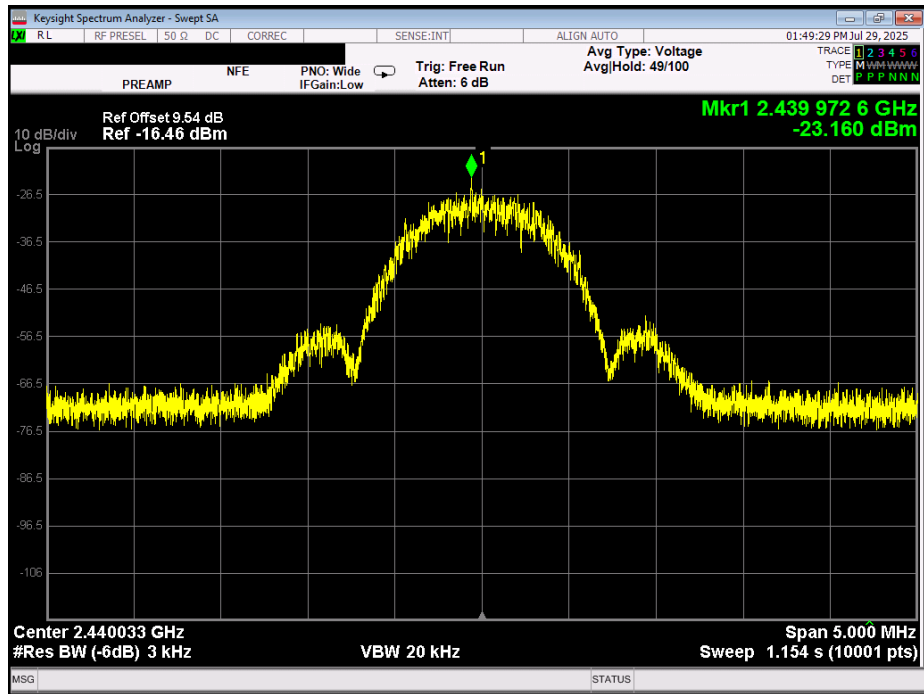
PSD Plots



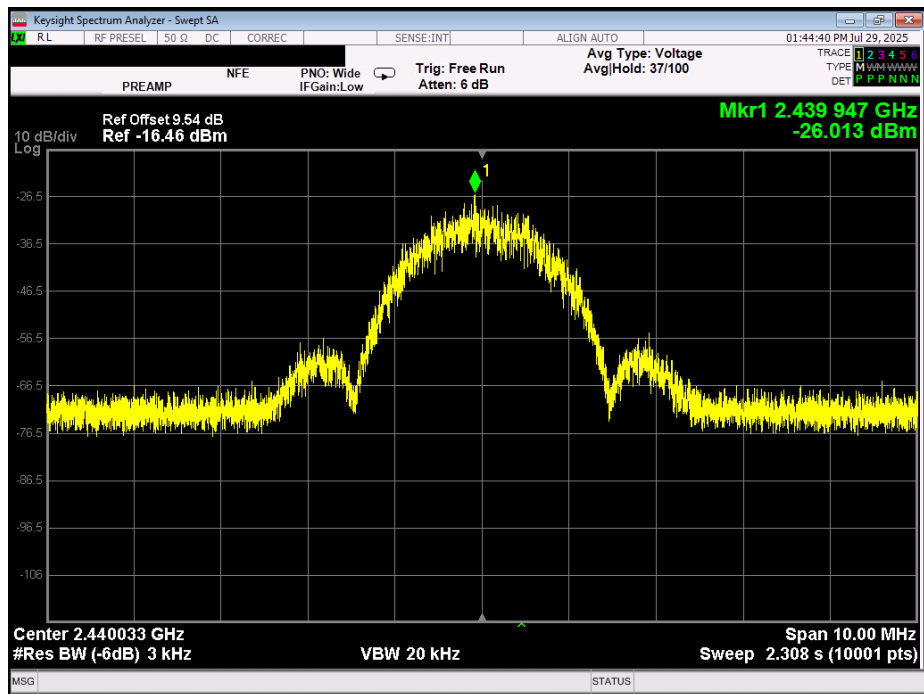
Low Channel 1M



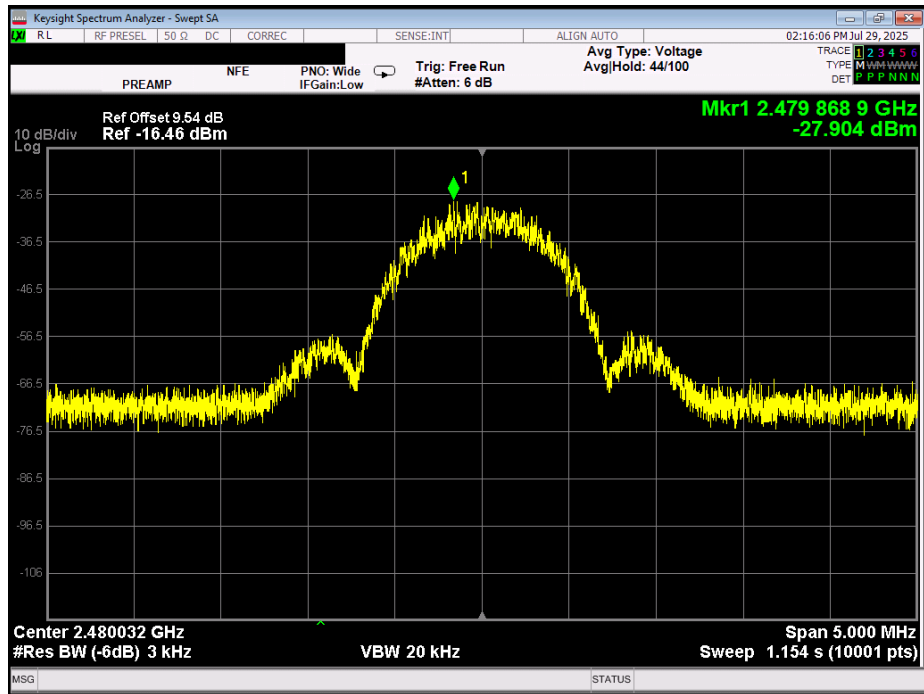
Low Channel 2M



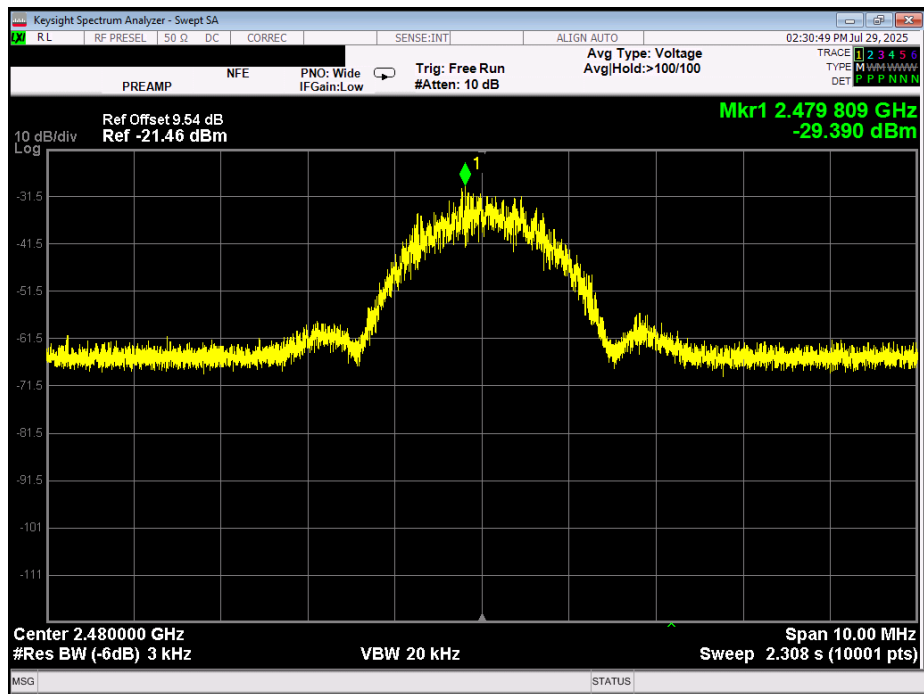
Mid Channel 1M



Mid Channel 2M



High Channel 1M



High Channel 2M

Test Equipment Utilized

Description	Manufacturer	Model #	CT Asset #	Last Cal Date	Cal Due Date
Temp./humidity/pressure monitor (Main Lab)	Omega Engineering	iBTHX-W-5	i00686	1/25/25	1/25/26
3 Meter Semi-Anechoic Chamber	Panashield	3 Meter Semi-Anechoic Chamber	i00428	7/13/23	7/13/26
44GHz EMI receiver	Keysight	N9038A	i00552	3/17/25	3/17/26
Bi-Log antenna	Chase	CBL6111C	i00267	3/5/24	3/5/26
Horn Antenna (1-18GHz)	EMCO	3115	i00271	2/24/25	2/24/27
Horn Antenna (18-40GHz)	EMCO	3116	i00085	3/18/25	3/18/27
Preamplifier	COM-Power	PAM-103	i00734	Verified on: 6/27/24	
Preamplifier	Eravant	SBB-0115034019-2F2F-E3	i00722	Verified on: 12/4/24	
EMI Receiver	HP	85462A	i00033	6/25/25	6/25/26

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

Measurement Uncertainty

Measurement Uncertainty for Compliance Testing is listed in the table below.

Measurement	U_{lab}
Radio Frequency	$\pm 3.3 \times 10^{-8}$
RF Power, conducted	$\pm .54$ dB
RF Power Density, conducted	± 1.0 dB
Conducted Emissions	± 0.94 dB
Radiated Emissions 9kHz-30MHz	± 2.76 dB
Radiated Emissions 30MHz-1000MHz	± 4.25 dB
Radiated Emissions – 1GHz-18GHz	± 4.49 dB
Temperature	± 1.5 deg C
Humidity	± 4.3 %
DC voltage	± 0.20 VDC
AC Voltage	± 1.2 VAC

The reported expanded uncertainty $\pm U_{lab}$ (dB) has been estimated at a 95% confidence level ($k=2$) U_{lab} is less than or equal to U_{EMC} therefore;

- Compliance is deemed to occur if no measured disturbance exceeds the disturbance limit.
- Non-Compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.

END OF TEST REPORT