

Test Report

Prepared for: Valley Forge & Bolt Manf

Model: SPC4-720R-01T

Serial Number: NA

Project No: p2510010

Test Results: Pass

To

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

Date of Issue: April 16, 2025

On the behalf of the applicant:

Valley Forge & Bolt Manf
4410 W Jefferson Street
Phoenix, AZ, 85043

Attention of:

Dirk Halley, Projects engineering Manager
Ph: (602) 269-5748
E-Mail: Dirk.halley@vfbolts.com

Prepared By:

Compliance Testing, LLC
Mesa, AZ 85204
(480) 926-3100 phone / (480) 926-3598 fax
www.compliancetesting.com
ANAB Cert#: AT-2901
FCC Site Reg. #US2901
ISED Site Reg. #2044A-2

Reviewed / Authorized By:



John Michalowicz, Test Engineer

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Test Results Summary

Test Date Range: April 10th, 2025 – April 12th, 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	Pass	
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	
15.207	RSS-GEN Section 8.8	A/C Powerline Conducted Emissions	N/A	The EUT is powered by a 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	04/16/25	John Michalowicz	Original Document

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

EUT Description

Model:	SPC4-720R-01T
Serial:	NA
Firmware:	Probe_CT_902.5Mhz-135FDEV_16dBm.hex Probe_CT_915Mhz-135FDEV_16dBm.hex Probe_CT_927.5Mhz-135FDEV_16dBm.hex
Software:	NA
Description:	SPC4® 915mhz Load Monitor
Additional Information:	Radio Frequency Range and Operational Info: 902 – 928 MHz, GFSK modulation with 130 kHz deviation. 55.5kbps Usage: Fixed-Use/Mobile
Receipt of Sample(s):	March 14 th , 2025
EUT Condition:	Visual Damage No State of Development Engineering Sample/Prototype

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)
25.4 – 27.6	25.1 – 27.5	967.4 – 976.8

Test Setup and Modes of Operation

EUT Operation during Tests

The EUT was set to a constant transmit mode using a manufacturer supplied test mode. The device was powered by a replaceable battery.

Accessories: NA

Cables: 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 dBi

Output Power

Engineer: John Michalowicz

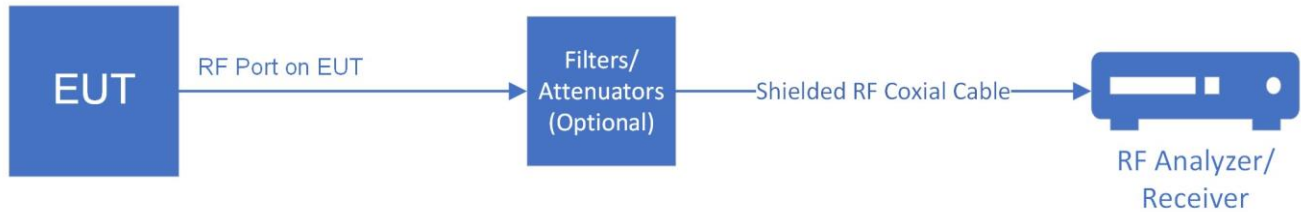
Test Date: 04/11/25

Test Procedure

CONDUCTED METHOD

A spectrum analyzer was directly connected to the EUT's RF port. The EUT was set to transmit on the lowest, middle and highest frequencies at the maximum power level. 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

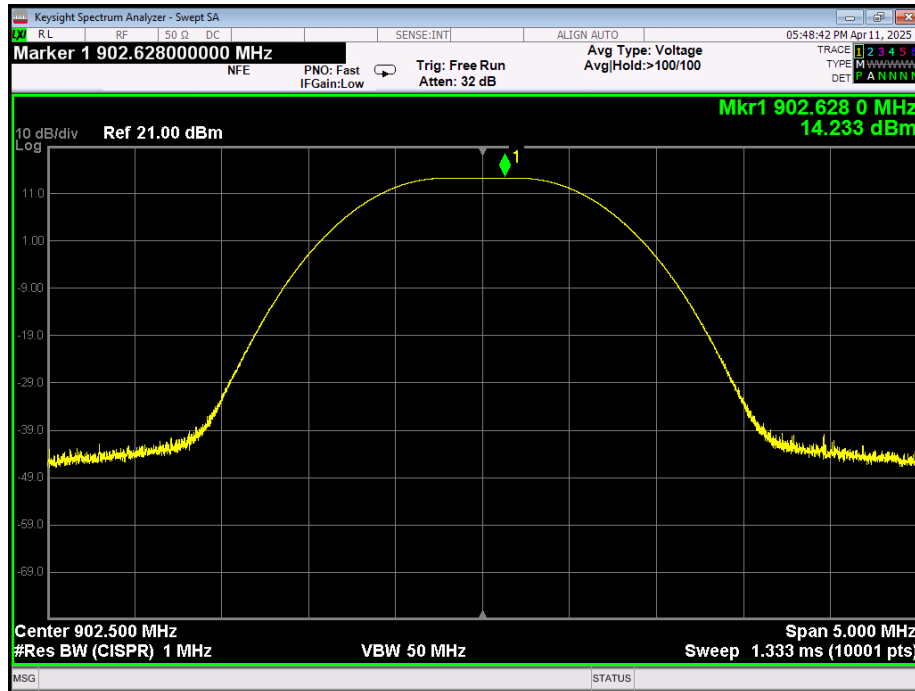
The RF output power was measured using the spectrum analyzer's marker peak function

Transmitter Output Power Summary Table

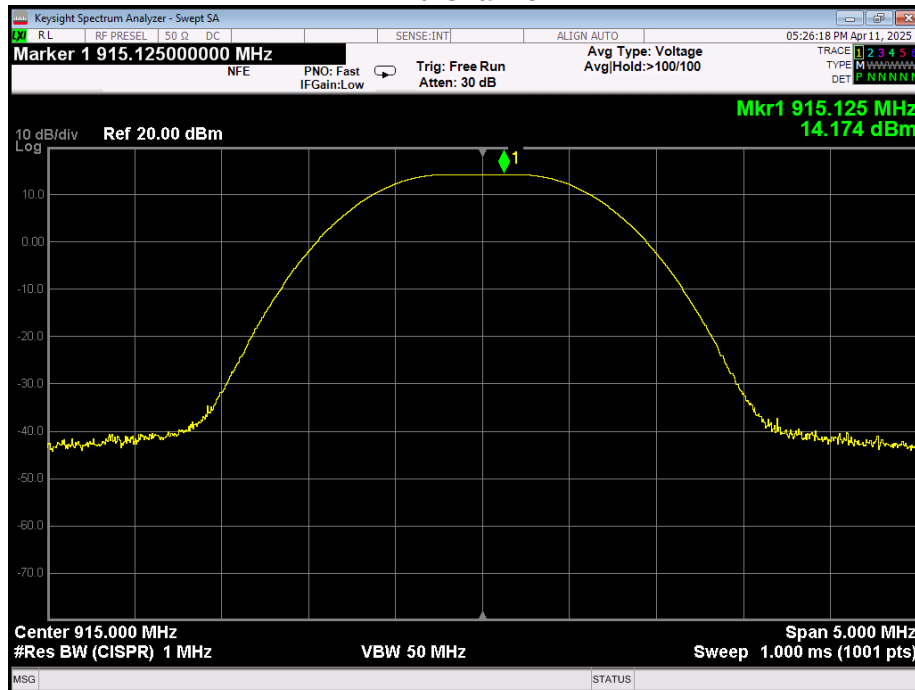
Tuned Frequency (MHz)	Measured Value (dBm)	Specification Limit	Result
902.5	14.23	1 W (30 dBm)	Pass
915.0	14.17	1 W (30 dBm)	Pass
927.5	14.43	1 W (30 dBm)	Pass

Output Power Plots

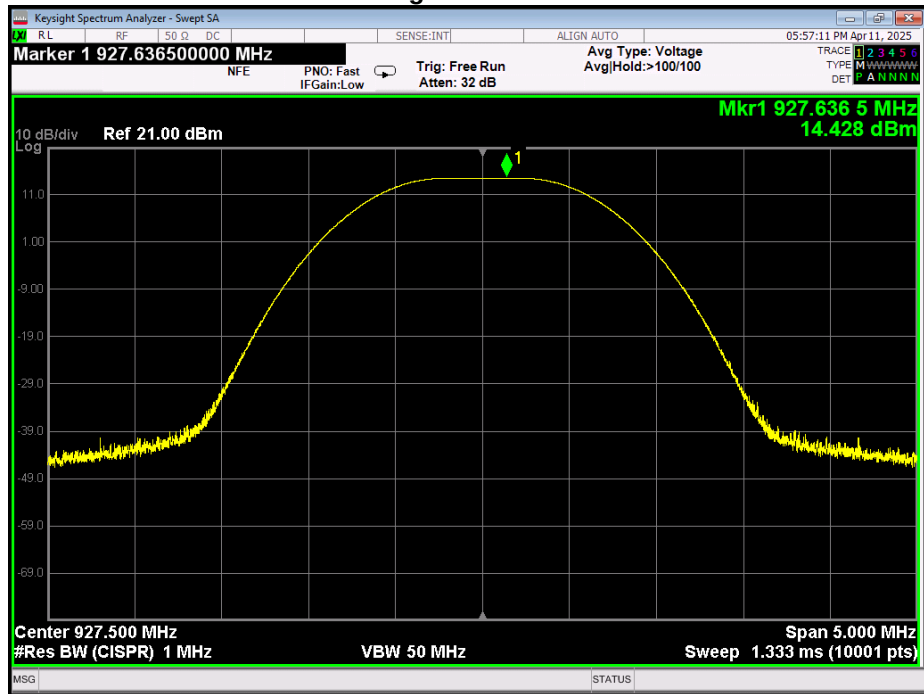
Low Channel



Mid Channel



High Channel



Radiated Spurious Emissions

Engineer: John Michalowicz

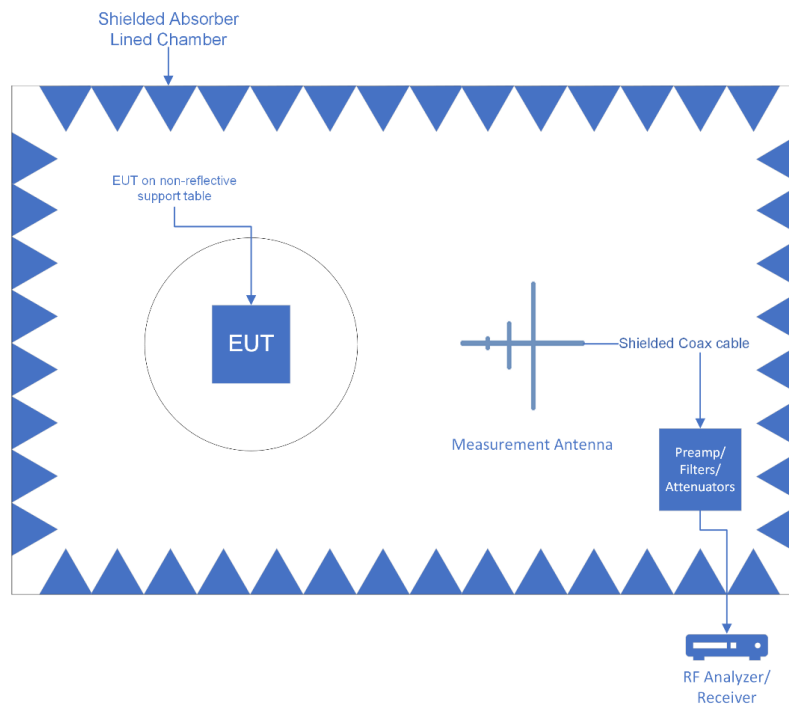
Test Date: 04/12/25

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 into a 50 ohm load. 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.

Basic Test Setup



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

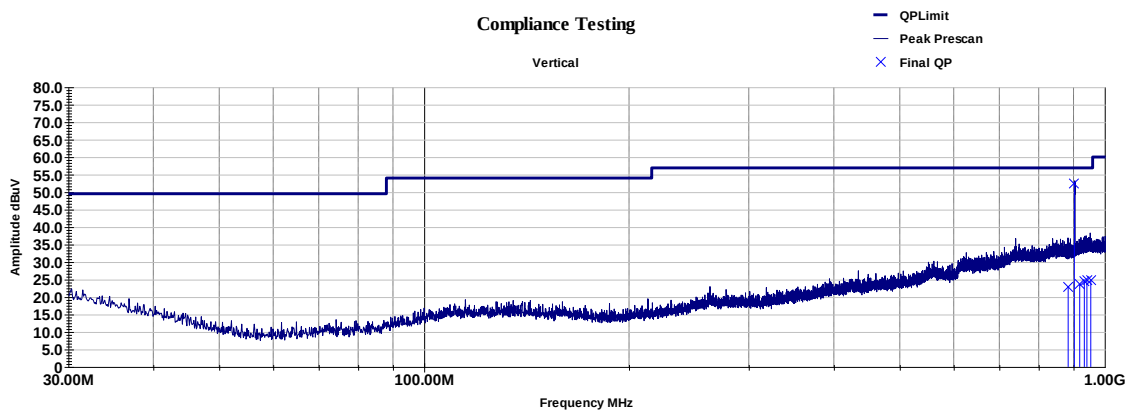
Sample Calculations

Corrected Value = Measured Value + Correction factor

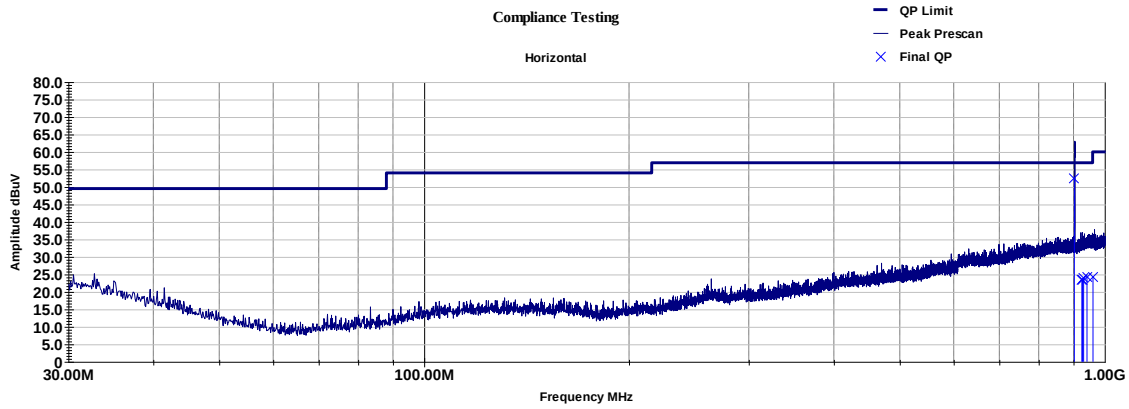
Correction factor = Antenna Correction Factor + Cable loss + Preamp/Attenuator Factor

Radiated Emissions 30-1000MHz

Low Channel_30 - 1000 MHz

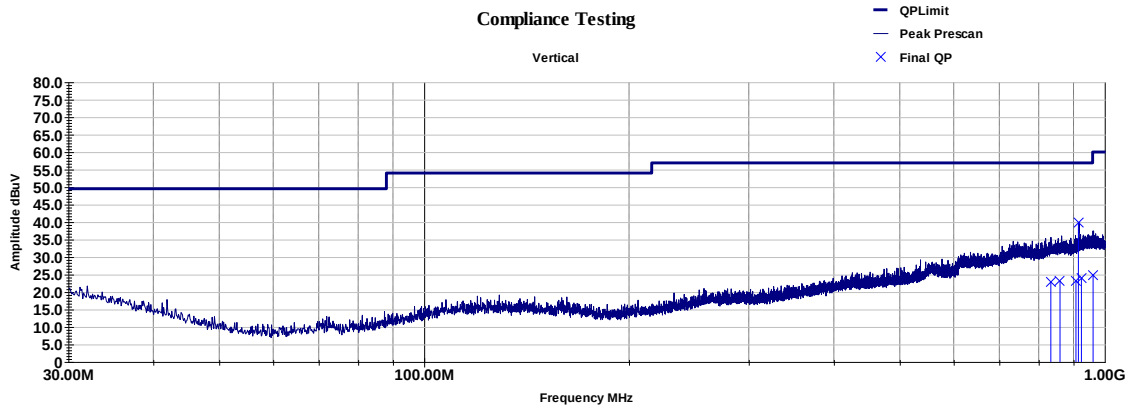


Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
883.698	294.00	325.00	25.08	-2.11	23.00	56.90	-33.90
902.358	128.00	175.00	54.12	-1.63	52.50	56.90	-4.40
918.932	323.00	325.00	24.82	-1.10	23.70	56.90	-33.20
933.282	193.00	237.00	24.99	-0.39	24.60	56.90	-32.30
941.689	34.00	354.00	24.93	-0.15	24.80	56.90	-32.10
953.931	157.00	121.00	24.86	-0.14	24.70	56.90	-32.20
Final = Raw + Path Loss							
Margin = Final - Limit							

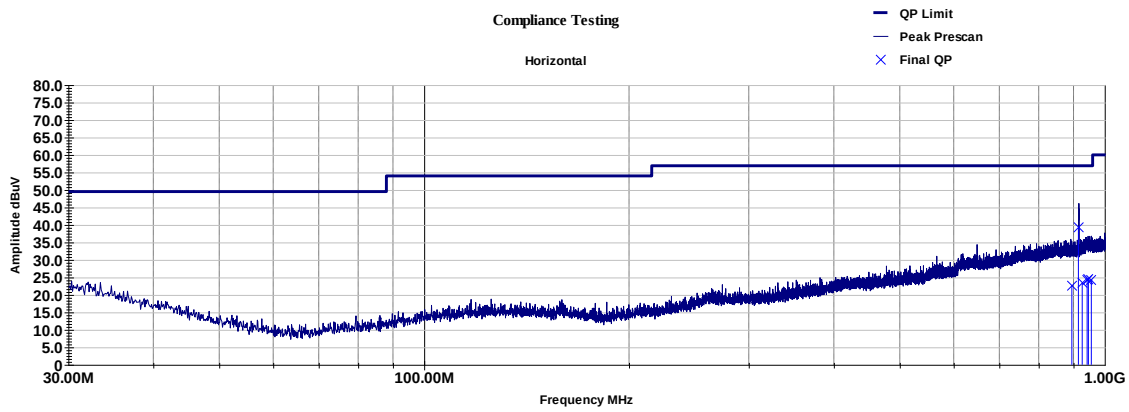


Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
902.358	169.00	157.00	54.67	-2.23	52.40	56.90	-4.50
925.718	192.00	319.00	24.94	-1.54	23.40	56.90	-33.50
927.62	53.00	368.00	24.94	-1.43	23.50	56.90	-33.40
931.336	51.00	325.00	25.02	-1.19	23.80	56.90	-33.10
941.932	180.00	100.00	24.97	-0.72	24.30	56.90	-32.60
961.332	307.00	400.00	24.84	-0.50	24.30	60.00	-35.70
Final = Raw + Path Loss							
Margin = Final - Limit							

Mid Channel_30 - 1000 MHz

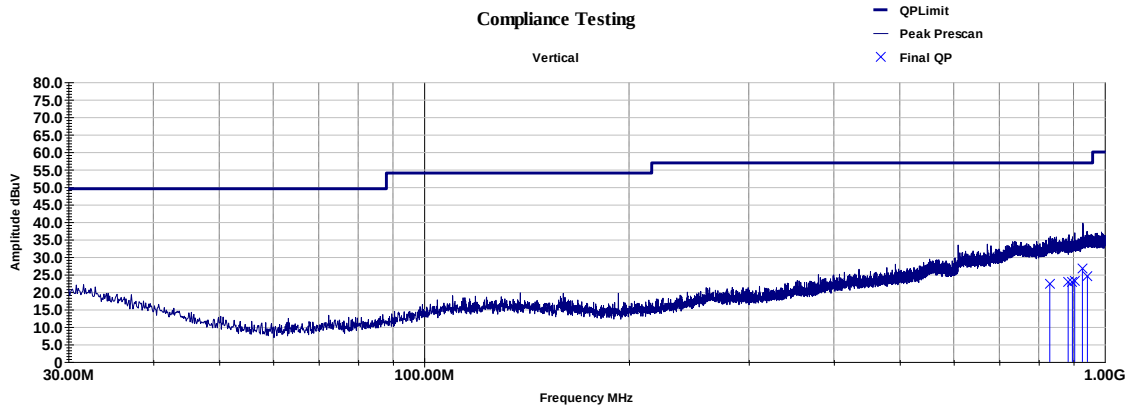


Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
833.351	77.00	160.00	25.02	-2.19	22.80	56.90	-34.10
859.689	158.00	175.00	25.18	-2.01	23.20	56.90	-33.70
907.328	69.00	251.00	24.79	-1.55	23.20	56.90	-33.70
914.833	113.00	175.00	41.00	-1.23	39.80	56.90	-17.10
924.194	277.00	253.00	24.93	-0.83	24.10	56.90	-32.80
961.629	117.00	325.00	24.80	-0.10	24.70	60.00	-35.30
Final = Raw + Path Loss							
Margin = Final - Limit							

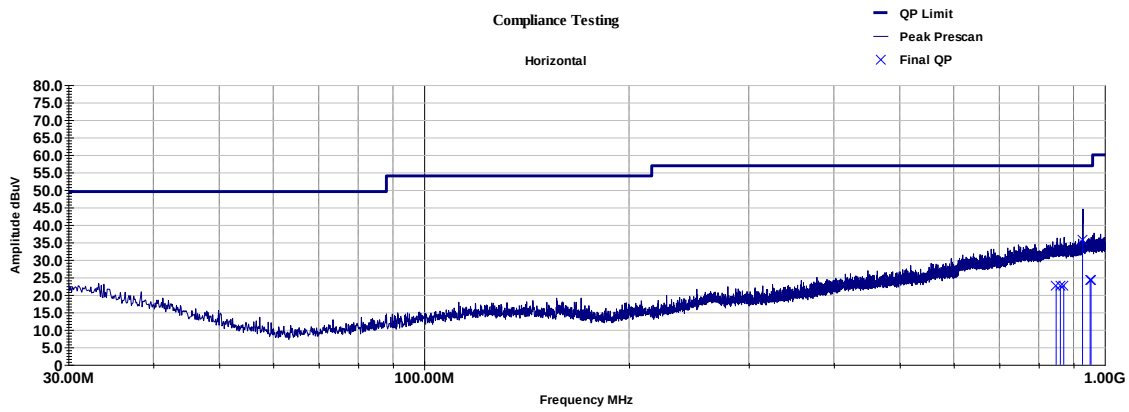


Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
894.607	97.00	148.00	25.04	-2.30	22.70	56.90	-34.20
914.846	7.00	325.00	41.14	-1.93	39.20	56.90	-17.70
926.893	169.00	105.00	24.93	-1.44	23.50	56.90	-33.40
942.2	114.00	302.00	24.93	-0.70	24.20	56.90	-32.70
946.281	101.00	325.00	24.94	-0.49	24.40	56.90	-32.50
955.91	224.00	100.00	24.86	-0.53	24.30	56.90	-32.60
Final = Raw + Path Loss							
Margin = Final - Limit							

High channel_30 - 1000 MHz



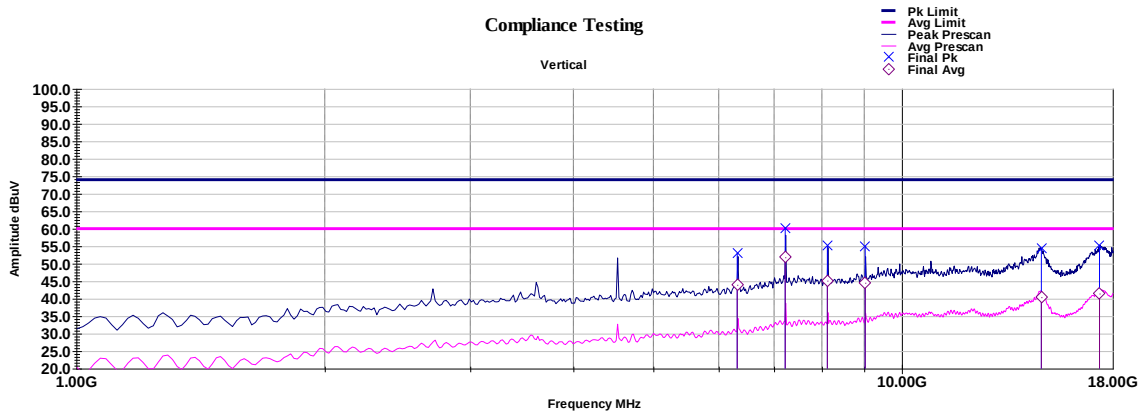
Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
830.453	151.00	325.00	24.81	-2.36	22.40	56.90	-34.50
883.797	240.00	325.00	24.94	-2.10	22.80	56.90	-34.10
896.368	205.00	144.00	24.75	-1.89	22.90	56.90	-34.00
903.554	156.00	381.00	24.65	-1.61	23.00	56.90	-33.90
927.35	344.00	325.00	27.35	-0.69	26.70	56.90	-30.20
943.19	42.00	395.00	24.78	-0.19	24.60	56.90	-32.30
Final = Raw + Path Loss							
Margin = Final - Limit							



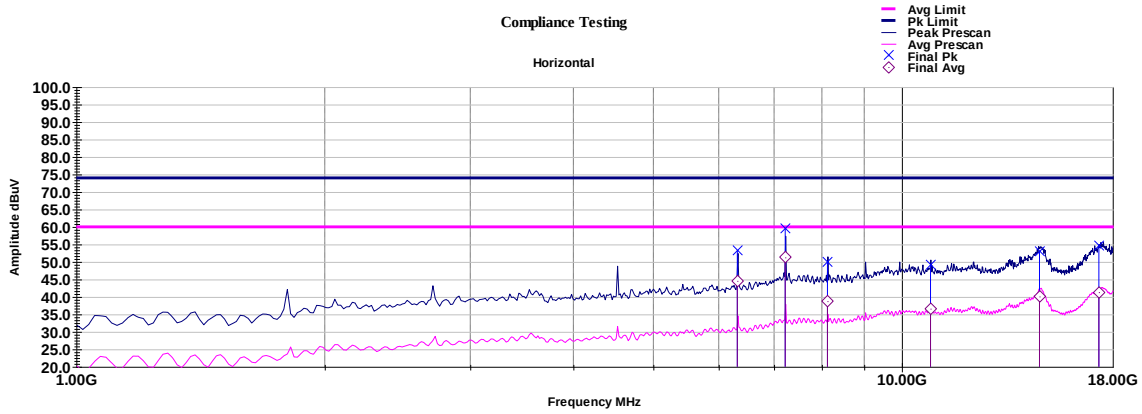
Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
848.468	359.00	109.00	24.99	-2.44	22.50	56.90	-34.40
860.831	93.00	105.00	25.07	-2.40	22.70	56.90	-34.20
870.75	129.00	343.00	25.06	-2.37	22.70	56.90	-34.20
927.669	12.00	325.00	37.29	-1.43	35.90	56.90	-21.00
951.945	350.00	100.00	24.81	-0.56	24.30	56.90	-32.60
955.015	228.00	325.00	24.75	-0.53	24.20	56.90	-32.70
Final = Raw + Path Loss							
Margin = Final - Limit							

Radiated Emissions Above 1000MHz

Low Channel_1 - 18 GHz

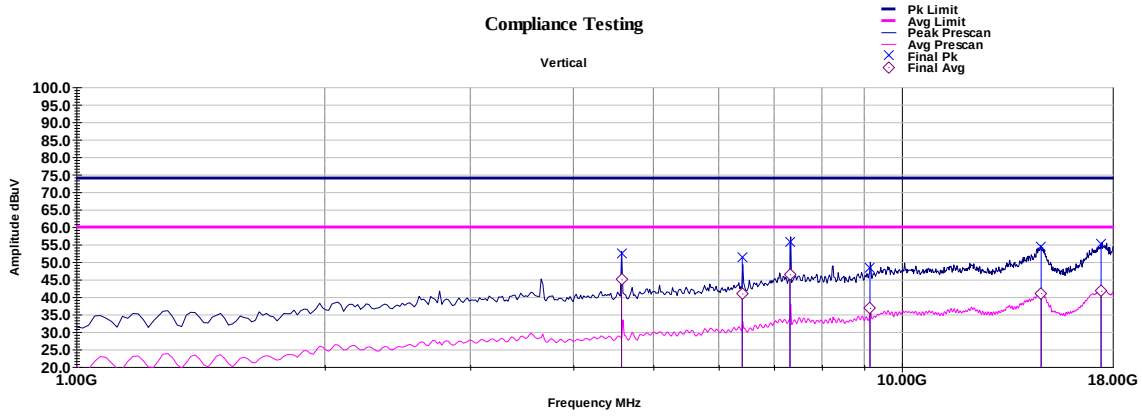


Frequency	Azimuth	Height	Raw Pk	Raw Avg	Correction	Final Pk	Pk Limit	Pk Margin	Final Avg	Avg Limit	Avg Margin
MHz	deg	cm	dBuV	dBuV	dB	dBuV/m	dBuV/m	dB	dBuV/m	dBuV/m	dB
6316435000	285.00	100.00	52.40	43.31	0.64	53.03	74.00	-20.97	43.95	60	-16.05
7220989000	305.00	100.00	56.90	48.45	3.35	60.25	74.00	-13.76	51.80	60	-8.20
8121117000	89.00	100.00	53.95	43.99	1.15	55.09	74.00	-18.91	45.13	60	-14.87
9026316000	52.00	100.00	53.30	42.92	1.62	54.92	74.00	-19.08	44.54	60	-15.46
14753120000	305.00	175.00	44.58	30.58	9.83	54.41	74.00	-19.59	40.40	60	-19.60
17350800000	41.00	113.00	42.50	28.75	12.70	55.20	74.00	-18.80	41.45	60	-18.55
Final = Raw + Path Loss											
Margin = Final - Limit											

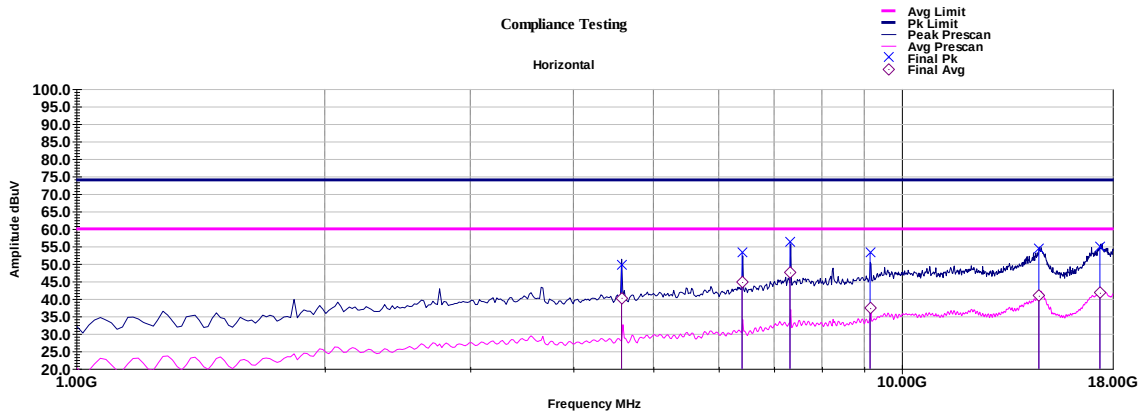


Frequency	Azimuth	Height	Raw Pk	Raw Avg	Correction	Final Pk	Pk Limit	Pk Margin	Final Avg	Avg Limit	Avg Margin
MHz	deg	cm	dBuV	dBuV	dB	dBuV/m	dBuV/m	dB	dBuV/m	dBuV/m	dB
6318486000	39.00	100.00	52.71	43.90	0.65	53.36	74.00	-20.64	44.55	60	-15.45
7221013000	6.00	211.00	56.28	47.91	3.35	59.62	74.00	-14.38	51.26	60	-8.74
8123604000	59.00	100.00	48.93	37.62	1.14	50.07	74.00	-23.93	38.76	60	-21.24
10828080000	323.00	100.00	45.94	33.45	3.16	49.10	74.00	-24.91	36.61	60	-23.39
14674990000	15.00	250.00	43.06	30.04	10.06	53.12	74.00	-20.88	40.10	60	-19.90
17320120000	131.00	129.00	42.03	28.84	12.50	54.53	74.00	-19.47	41.34	60	-18.66
Final = Raw + Path Loss											
Margin = Final - Limit											

Mid Channel_1 - 18 GHz

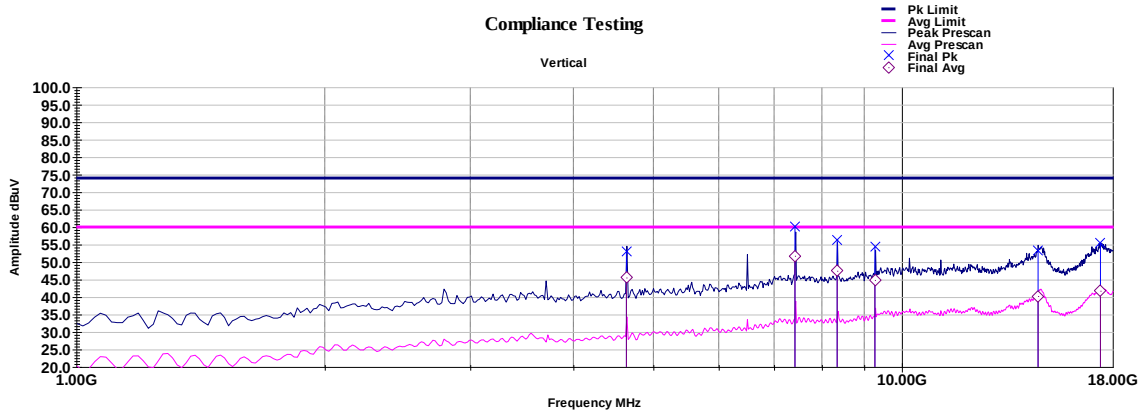


Frequency	Azimuth	Height	Raw Pk	Raw Avg	Correction	Final Pk	Pk Limit	Pk Margin	Final Avg	Avg Limit	Avg Margin
MHz	deg	cm	dBuV	dBuV	dB	dBuV/m	dBuV/m	dB	dBuV/m	dBuV/m	dB
4575757000	65.00	100.00	57.32	49.79	-4.80	52.52	74.00	-21.48	44.99	60	-15.01
6405866000	278.00	100.00	50.26	39.92	1.06	51.33	74.00	-22.68	40.98	60	-19.02
7318740000	161.00	100.00	52.81	43.55	2.93	55.75	74.00	-18.25	46.48	60	-13.52
9148457000	135.00	325.00	46.35	34.96	1.89	48.25	74.00	-25.75	36.86	60	-23.14
14746790000	304.00	100.00	44.51	31.23	9.87	54.38	74.00	-19.62	41.10	60	-18.90
17428980000	41.00	100.00	42.12	28.65	13.15	55.27	74.00	-18.73	41.80	60	-18.20
Final = Raw + Path Loss											
Margin = Final - Limit											

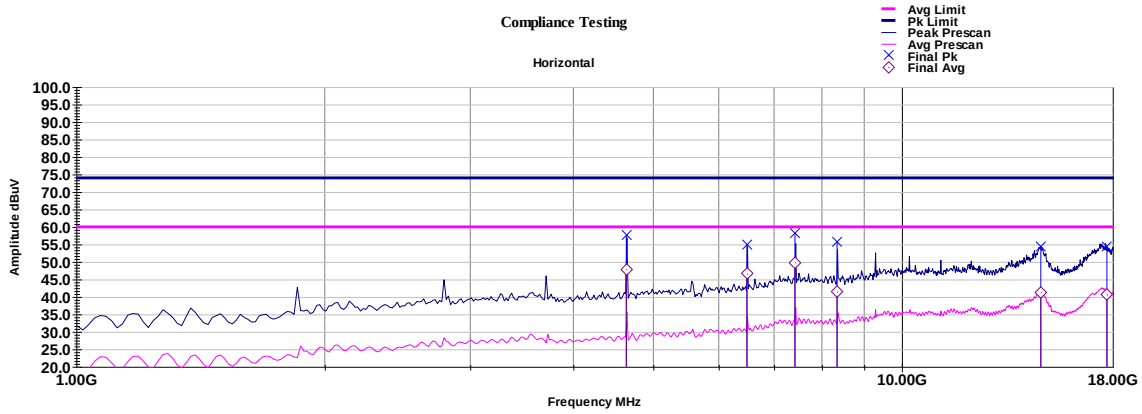


Frequency	Azimuth	Height	Raw Pk	Raw Avg	Correction	Final Pk	Pk Limit	Pk Margin	Final Avg	Avg Limit	Avg Margin
MHz	deg	cm	dBuV	dBuV	dB	dBuV/m	dBuV/m	dB	dBuV/m	dBuV/m	dB
4575657000	107.00	100.00	54.43	45.06	-4.80	49.63	74.00	-24.37	40.26	60	-19.74
6403836000	82.00	100.00	52.16	43.73	1.06	53.22	74.00	-20.78	44.79	60	-15.21
7318757000	41.00	223.00	53.33	44.58	2.93	56.26	74.00	-17.74	47.51	60	-12.49
9151483000	53.00	100.00	51.25	35.45	1.90	53.15	74.00	-20.85	37.35	60	-22.65
14650980000	155.00	100.00	44.24	30.82	10.05	54.28	74.00	-19.72	40.86	60	-19.14
17368660000	355.00	100.00	42.12	28.90	12.82	54.94	74.00	-19.06	41.71	60	-18.29
Final = Raw + Path Loss											
Margin = Final - Limit											

High Channel_1 - 18 GHz



Frequency	Azimuth	Height	Raw Pk	Raw Avg	Correction	Final Pk	Pk Limit	Pk Margin	Final Avg	Avg Limit	Avg Margin
MHz	deg	cm	dBuV	dBuV	dB	dBuV/m	dBuV/m	dB	dBuV/m	dBuV/m	dB
4638126000	65.00	106.00	57.55	50.13	-4.58	52.96	74.00	-21.04	45.54	60	-14.46
7420995000	47.00	100.00	57.62	49.34	2.40	60.02	74.00	-13.98	51.74	60	-8.26
8348659000	299.00	100.00	55.37	46.45	1.04	56.41	74.00	-17.59	47.49	60	-12.51
9273528000	54.00	100.00	52.21	42.65	2.21	54.42	74.00	-19.58	44.86	60	-15.15
14620450000	353.00	175.00	43.62	30.54	9.71	53.33	74.00	-20.67	40.26	60	-19.75
17397460000	250.00	194.00	42.52	28.76	13.02	55.54	74.00	-18.46	41.78	60	-18.22
Final = Raw + Path Loss											
Margin = Final - Limit											



Frequency	Azimuth	Height	Raw Pk	Raw Avg	Correction	Final Pk	Pk Limit	Pk Margin	Final Avg	Avg Limit	Avg Margin
MHz	deg	cm	dBuV	dBuV	dB	dBuV/m	dBuV/m	dB	dBuV/m	dBuV/m	dB
4636787000	65.00	100.00	62.20	52.47	-4.59	57.61	74.00	-16.39	47.88	60	-12.12
6491482000	89.00	100.00	53.52	45.13	1.48	55.00	74.00	-19.00	46.62	60	-13.39
7421061000	53.00	100.00	55.86	47.45	2.40	58.26	74.00	-15.74	49.85	60	-10.15
8346245000	77.00	100.00	54.60	40.44	1.04	55.64	74.00	-18.36	41.48	60	-18.52
14728960000	113.00	100.00	44.34	31.40	9.94	54.28	74.00	-19.72	41.34	60	-18.66
17713420000	65.00	232.00	41.63	28.03	12.63	54.26	74.00	-19.74	40.67	60	-19.33
Final = Raw + Path Loss											
Margin = Final - Limit											

Conducted RF Measurements (15.209)

Engineer: John Michalowicz

Test Date: 4/11/25

Test Procedure

Antenna-port conducted measurements were performed as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands for 15.209.

The following offsets were added to the measurements:

The maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level
A maximum ground reflection factor to the EIRP level, 6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz.

The following equations were used to determine the field strength from the conducted values.

$E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] - 20 \log(d[\text{meters}]) + 104.77$, where E = field strength and $d = 3\text{m}$

$E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2$, for $d = 3$ meters.

$-11.8 + 3 \text{ dBi} = -8.8\text{dB offset}$

The Spectrum Analyzer was set to the following:

The Spectrum Analyzer was set to the following for emissions > 1000 MHz:

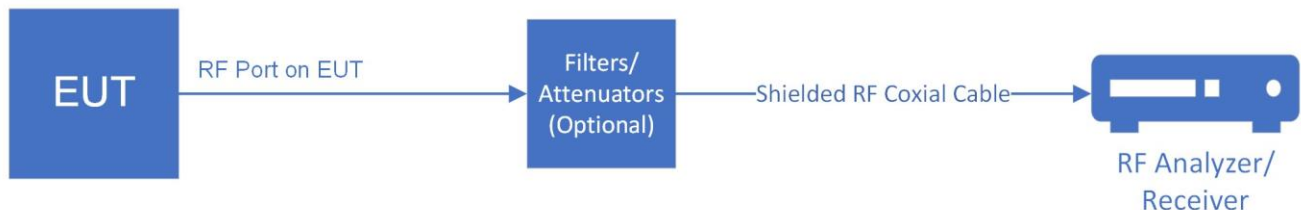
- a. RBW = 1 MHz
- b. VBW ≥ 3 MHz
- c. Detector = Peak.
- d. Sweep time = auto
- e. Trace mode = max hold
 1. Note: For emissions where the peak exceeded that of the average 15.209 emission limit the following was performed.
- f. RBW = 1 MHz
- g. VBW $\leq \text{RBW}/100$ (i.e., 10 kHz) but not less than 10 Hz

For emissions below 1000 MHz the Spectrum Analyzer settings were as follows:

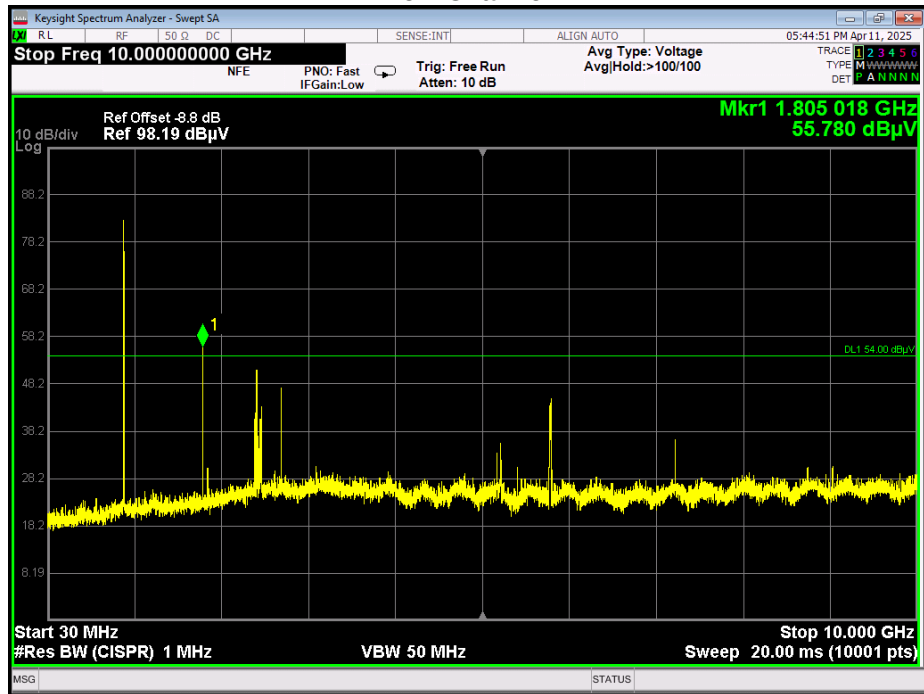
- a. RBW = 100 kHz
- b. VBW ≥ 300 kHz
- c. Detector = Peak
- d. Sweep time = auto
- e. Trace mode = max hold

The EUT was connected to a spectrum analyzer to verify that the EUT met the requirements for spurious emissions. The EUT was set to transmit on the lowest, middle and highest frequencies at the maximum power level. The frequency range from 30 MHz to the 10th harmonic of the fundamental transmitter was investigated. required range were evaluated.

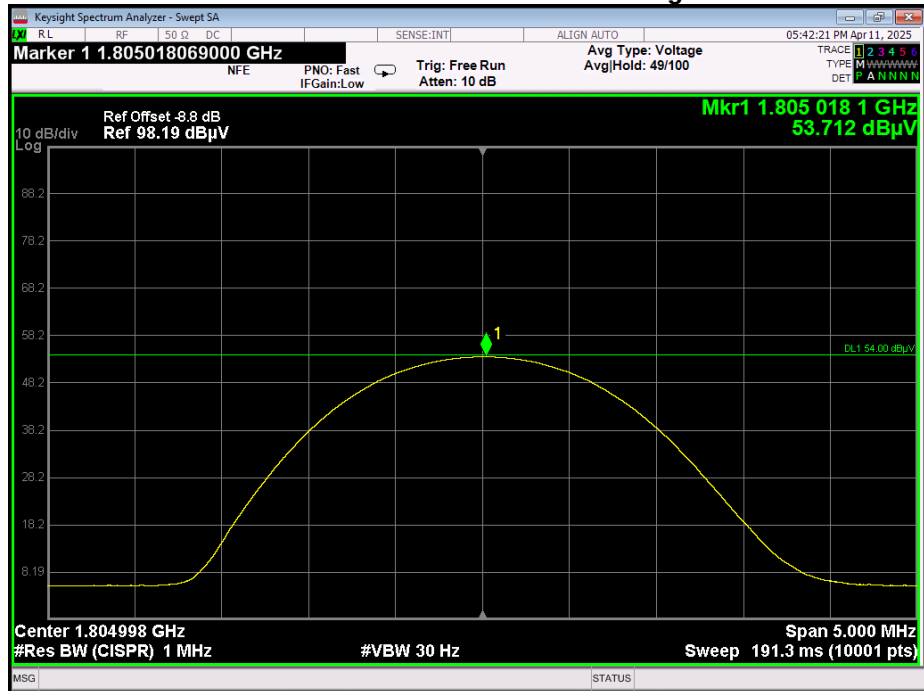
Basic Test Setup



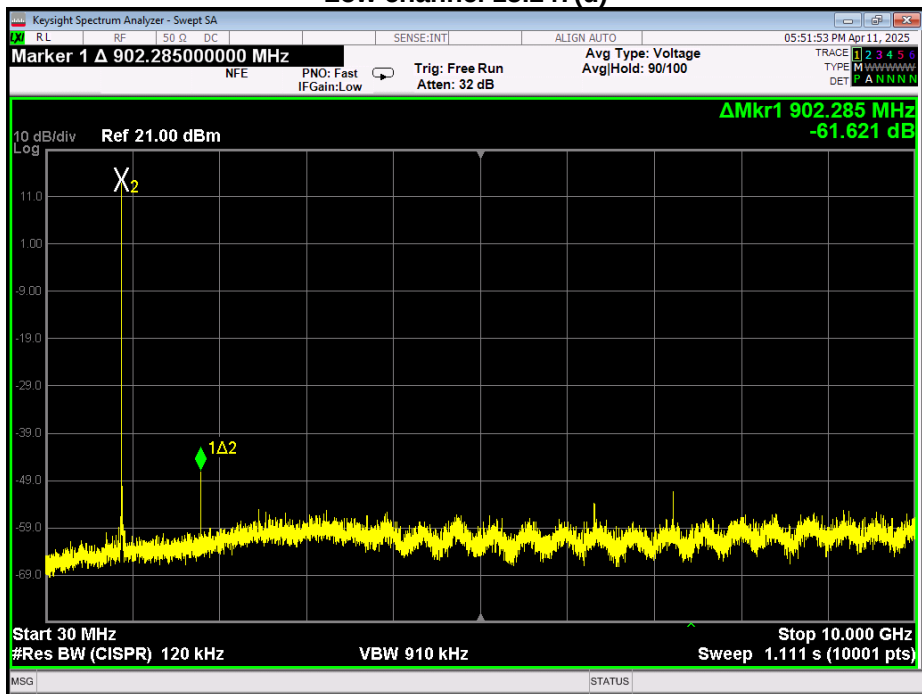
Low Channel



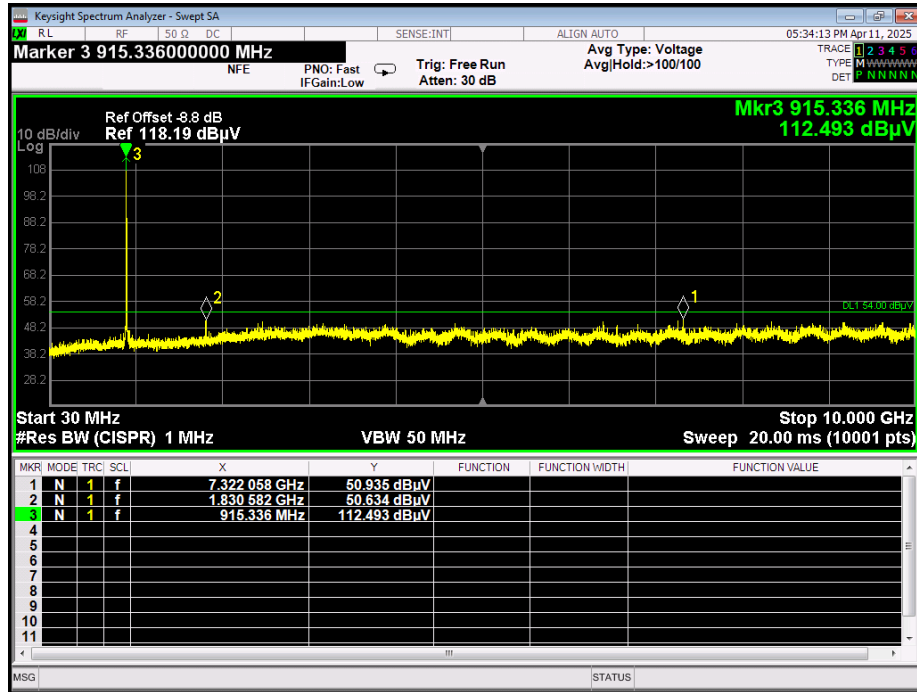
Low channel 2nd harmonic - Average



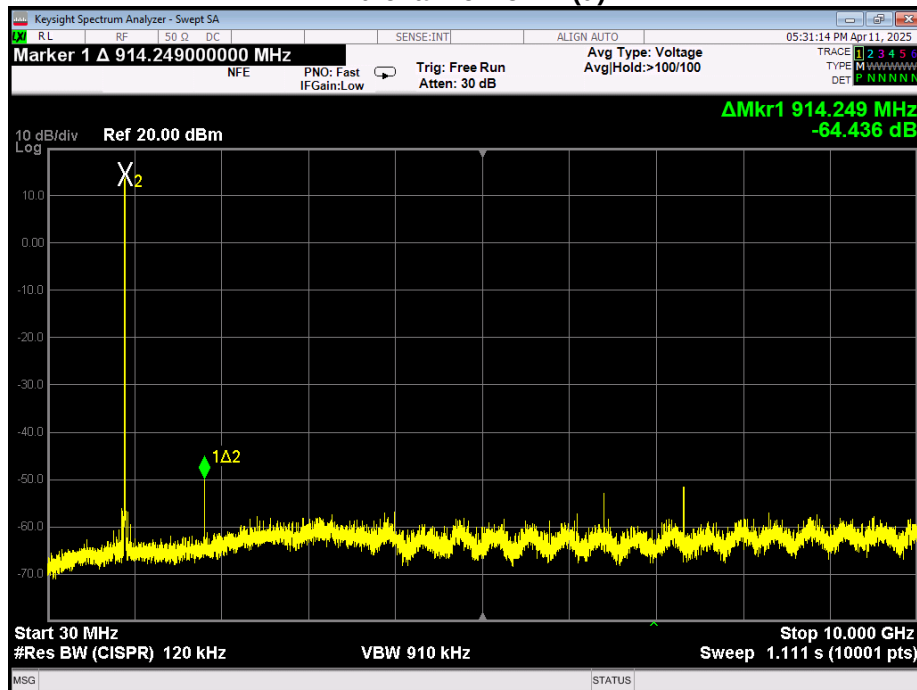
Low channel 15.247(d)



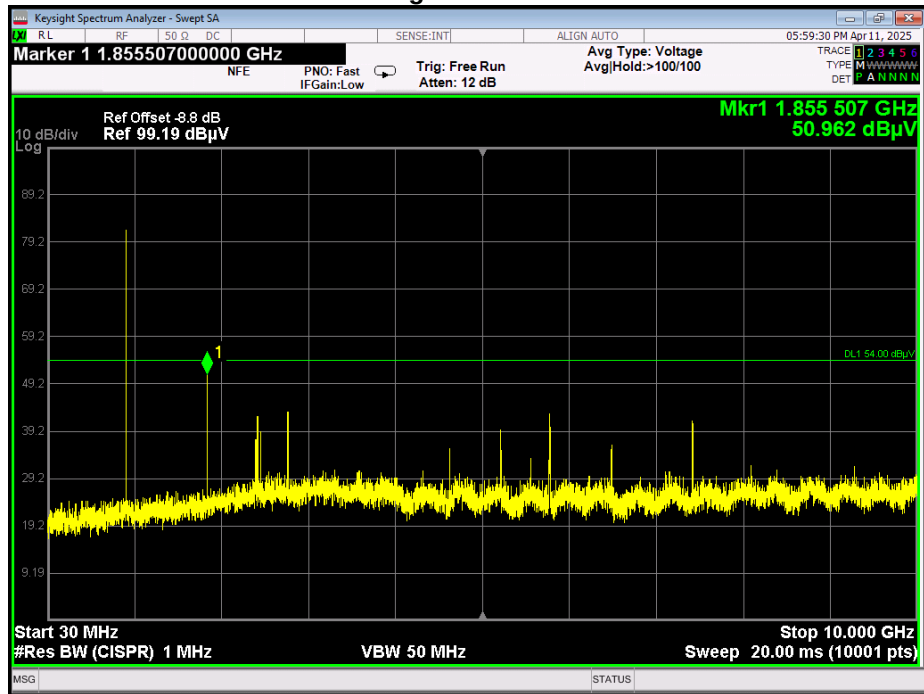
Mid Channel



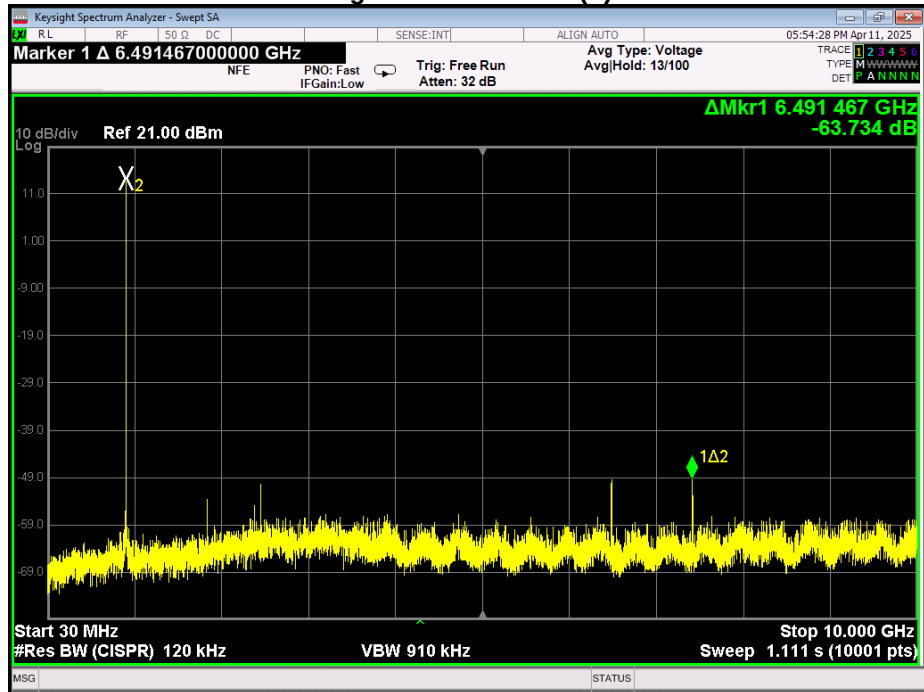
Mid channel 15.247(d)



High Channel



High channel 15.247(d)



Emissions at Band Edges

Engineer: John Michalowicz

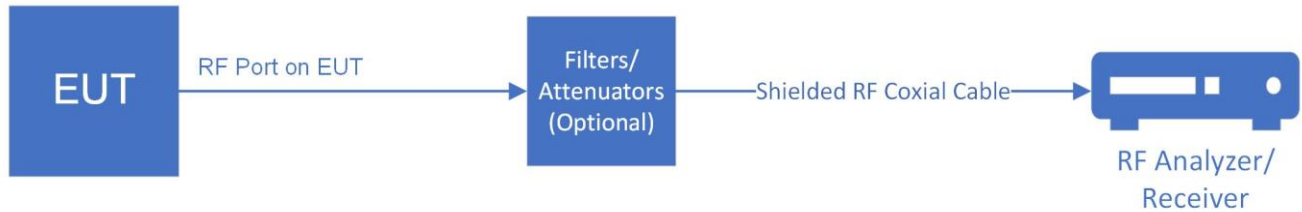
Test Date: 04/11/25

Test Procedure

CONDUCTED METHOD

A spectrum analyzer was directly connected to the EUT's RF port. The EUT was set to transmit on the lowest and highest frequencies at the maximum power level. A spectrum analyzer was used to verify that the EUT met the requirements for band edges.

Test Setup

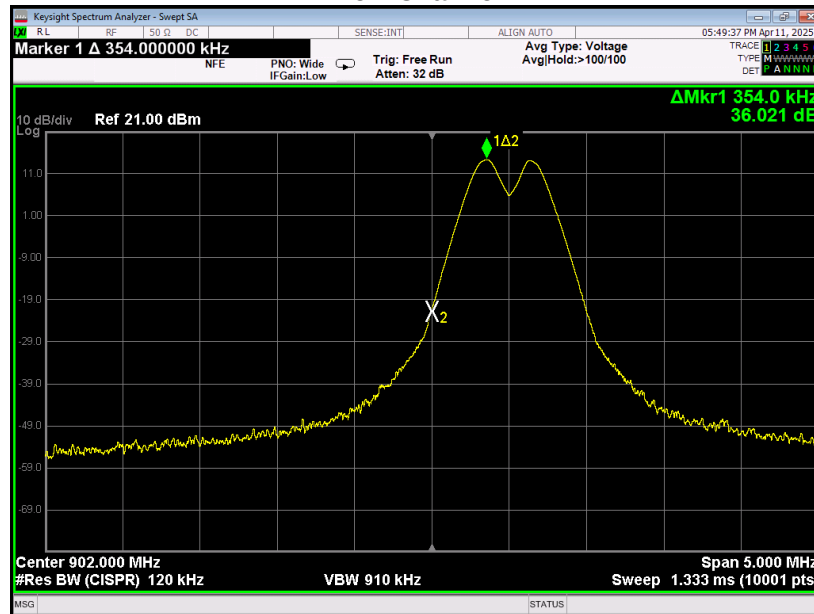


Band Edge Emissions Summary

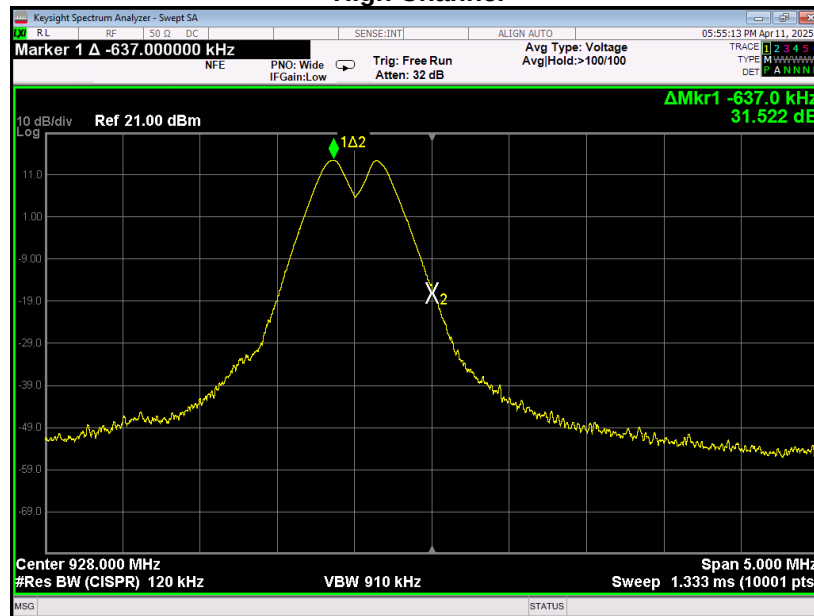
Tuned Frequency (MHz)	Emission Frequency (MHz)	Monitored Level	Detector	Limit	Result
902.5	902	-36	Peak	-20 dBc	Pass
927.5	928	-31	Peak	-20 dBc	Pass

Band Edge Plots

Low Channel



High Channel



DTS Bandwidth

Engineer: John Michalowicz

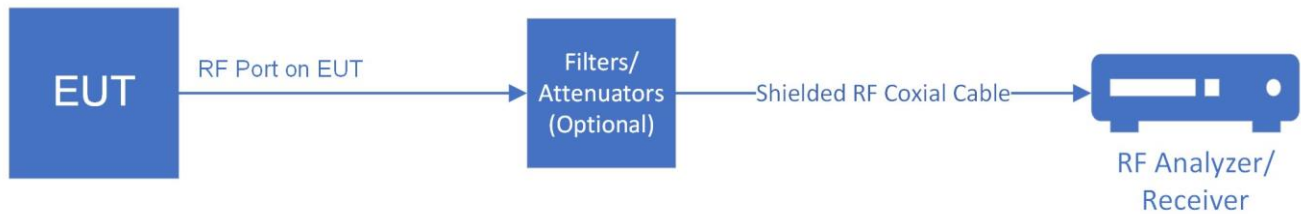
Test Date: 04/11/25

Test Procedure

CONDUCTED METHOD

A spectrum analyzer was directly connected to the EUT's RF port. The EUT was set to transmit on the low, mid and high frequencies at the maximum power level. A spectrum analyzer was used to verify that the EUT met the Bandwidth requirements.

Test Setup



The Spectrum Analyzer was set to the following:

RBW = 100 kHz

VBW $\geq 3 \times$ RBW

Peak Detector

Trace mode = max hold

Sweep = auto couple

Span = $1.5 \times$ EBW

6 dB Occupied Bandwidth Summary

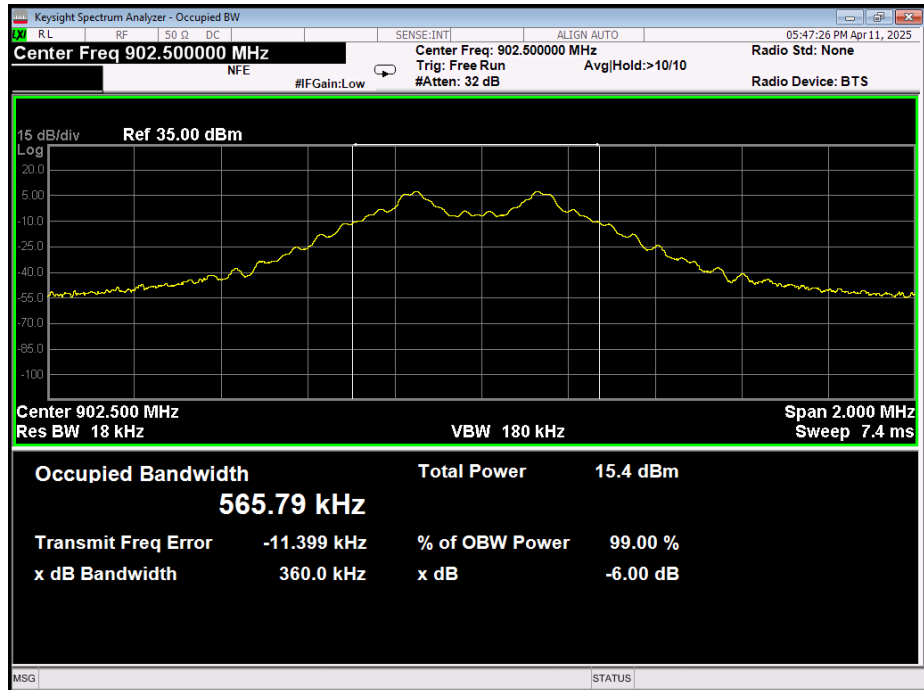
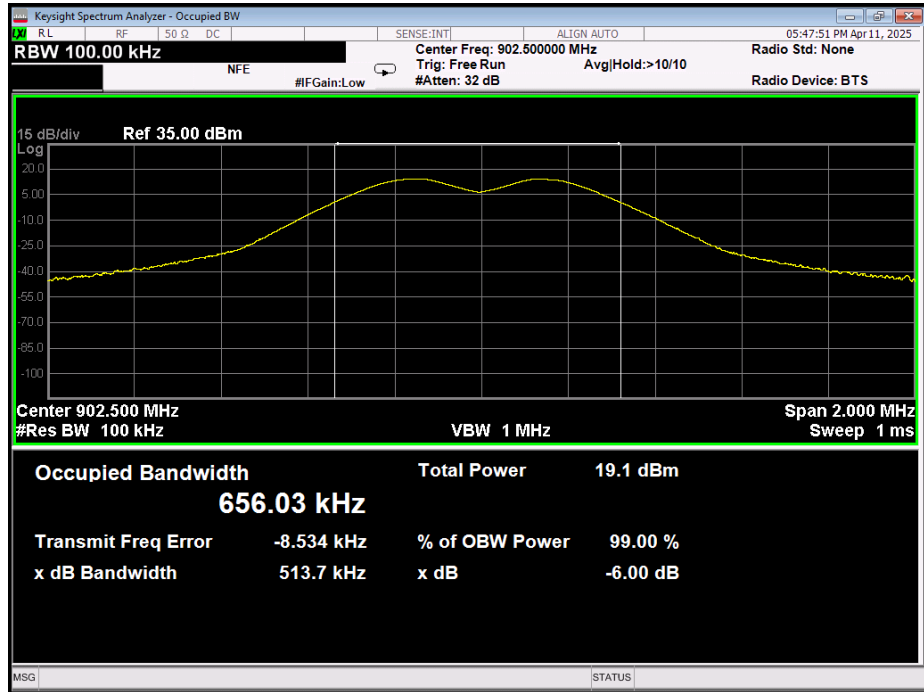
Frequency (MHz)	Measured Bandwidth (kHz)	Specification Limit (kHz)	Result
902.5	513.7	≥ 500	Pass
915	511.9	≥ 500	Pass
927.5	513.6	≥ 500	Pass

99% Bandwidth Summary

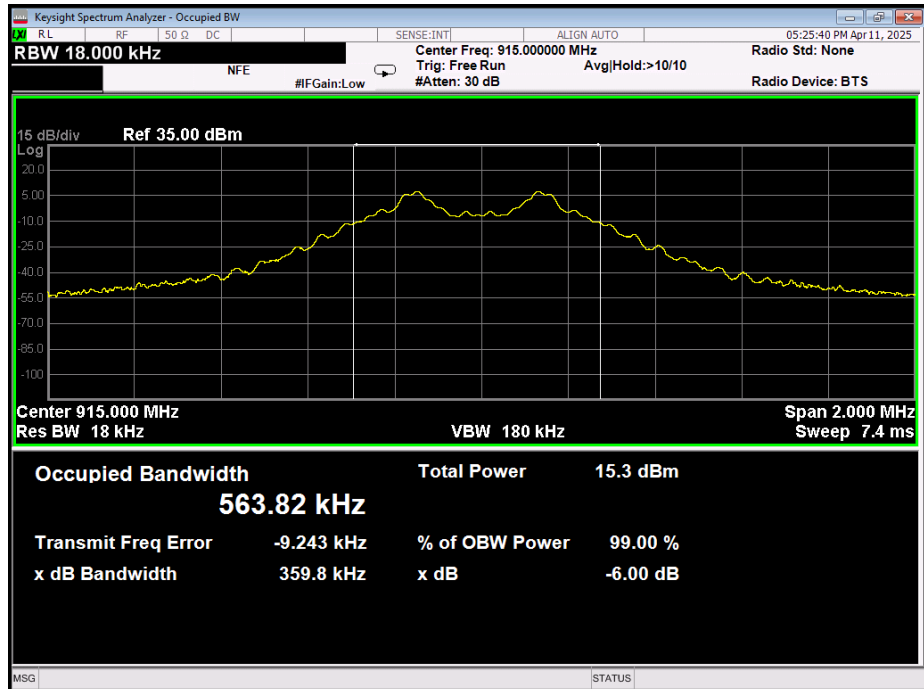
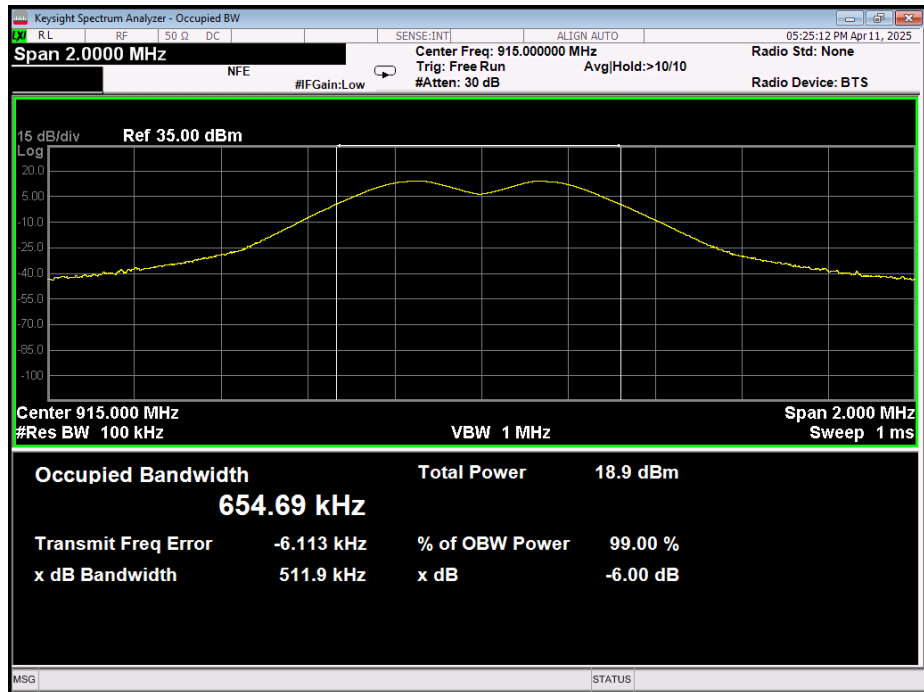
Frequency (MHz)	Measured Bandwidth (kHz)	Result
902.5	566	Pass
915	563	Pass
927.5	597	Pass

6 dB and 99% Bandwidth Plots

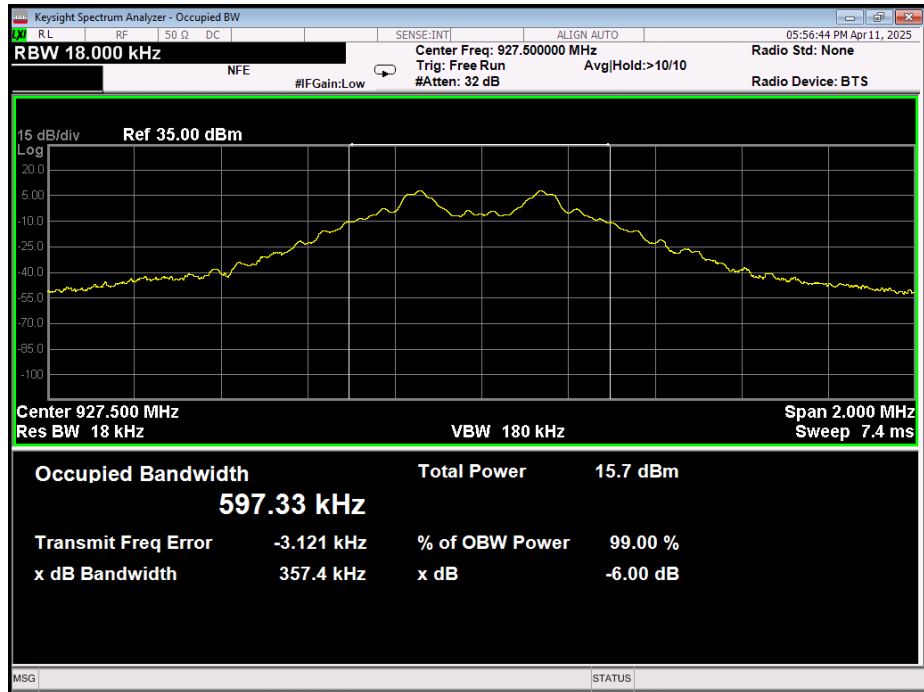
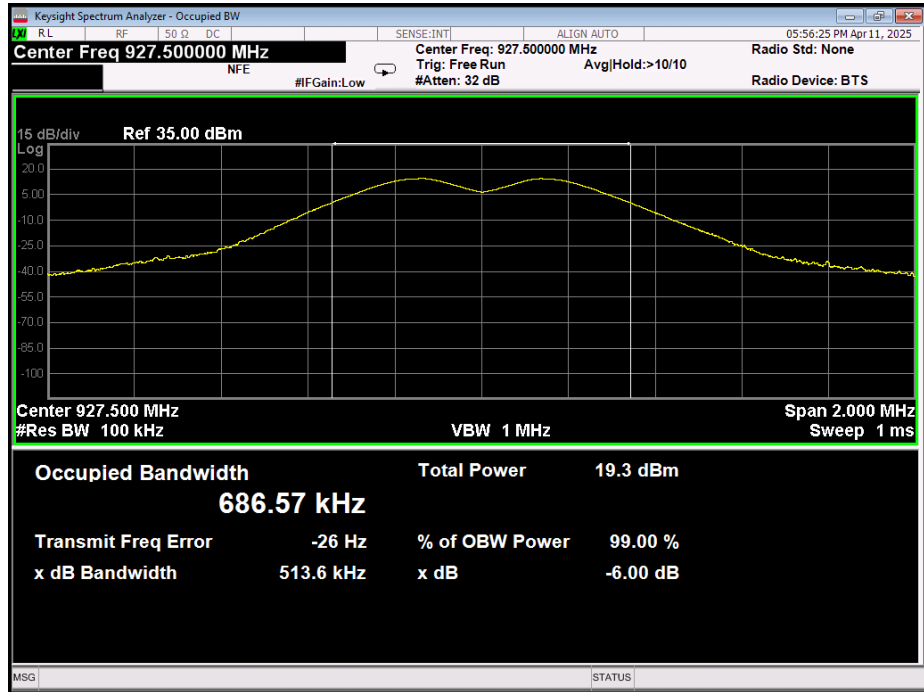
Low Channel



Mid Channel



High Channel



Transmitter Power Spectral Density (PSD)

Engineer: John Michalowicz

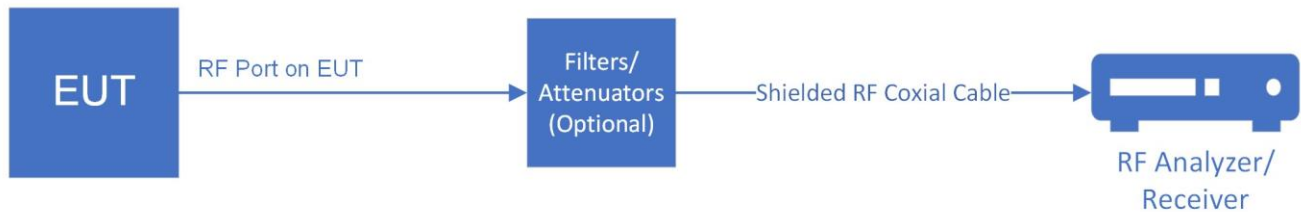
Test Date: 04/11/25

Test Procedure

CONDUCTED METHOD

A spectrum analyzer was directly connected to the EUT's RF port. The EUT was set to transmit on the lowest, middle and highest frequency of operation at the maximum power level. 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

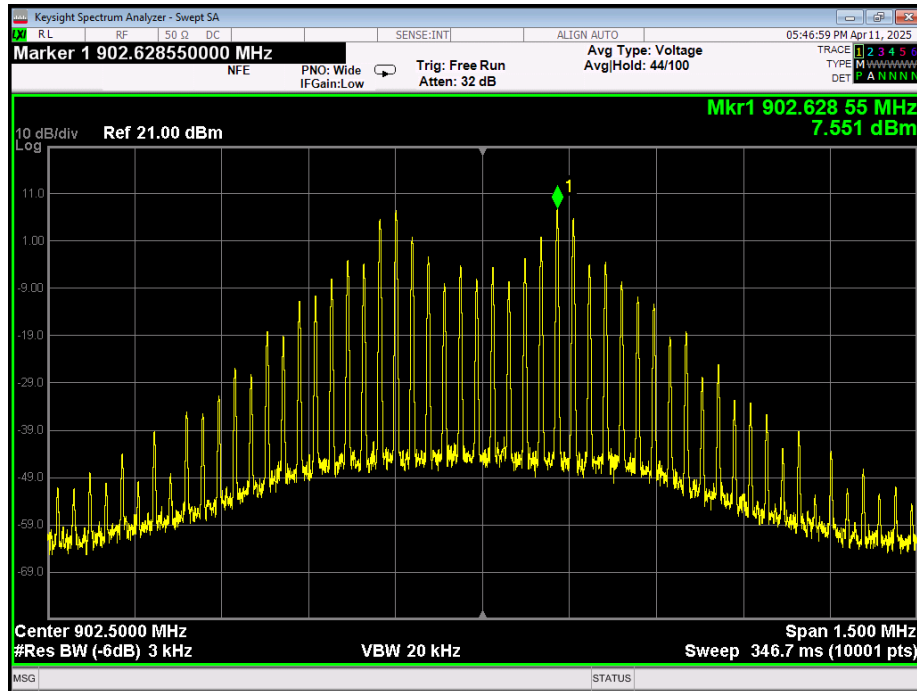
Once the trace has stabilized the peak marker was used to determine the power spectral density.

PSD Summary

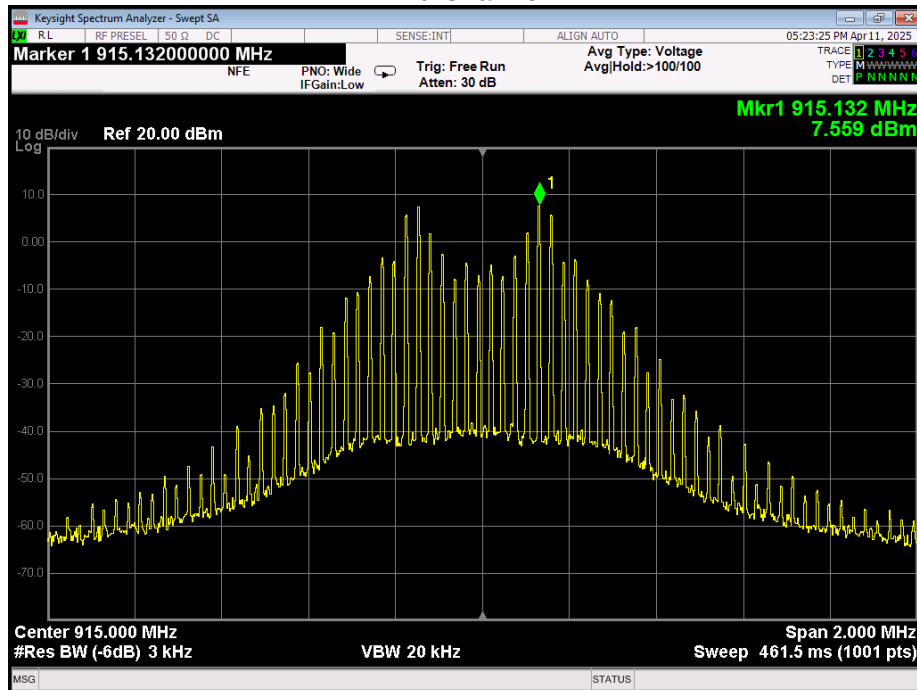
Frequency (MHz)	Measured Data (dBm)	Specification Limit (dBm)	Result
902.5	7.55	8	Pass
915	7.56	8	Pass
927.5	7.91	8	Pass

PSD Plots

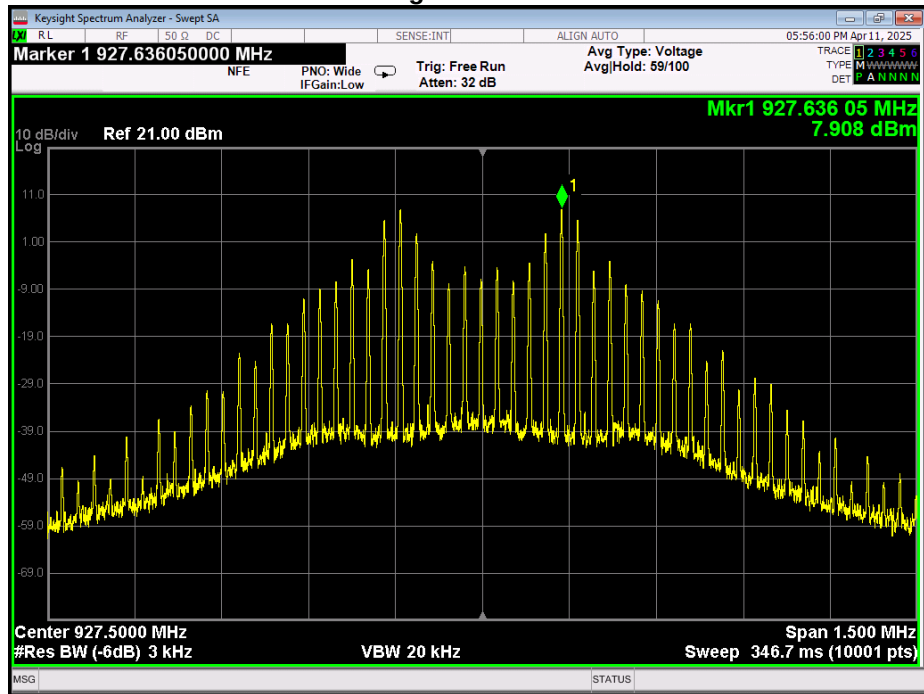
Low Channel



Mid Channel



High Channel



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)	ARA	DRG-118/A	i00271	8/9/24	8/9/26
Preamplifier	COM-Power	PAM-103	i00734	Verified on: 6/27/24	
Preamplifier	Eravant	SBB-0115034019-2F2F-E3	i00722	Verified on: 12/4/24	

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	± 1.5 dB
RF Power Density, conducted	± 1.0 dB
Conducted Emissions	± 1.8 dB
Radiated Emissions 9kHz-30MHz	± 3.6 dB
Radiated Emissions 30MHz-1000MHz	± 4.25 dB
Radiated Emissions – 1GHz-18GHz	± 4.5 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