HEADQUARTERS: 914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230 • PHONE (410) 354-3300 • FAX (410) 354-3313

06/17/2026

GE Vernova MDS, LLC
175 Science Parkway
Rochester, NY 14620-4260
USA

Dear John Harmon,

Enclosed is the EMC test report for compliance testing of GE Vernova MDS, LLC, MDS Orbit SD4 Industrial Radio, tested to the requirements of:

- Title 47 of the CFR, Part 90 for Private Land Mobile Radio Services
- RSS-119 Issue 12 for Land Mobile and Fixed Equipment Operating in the Frequency Range of 27.41 – 960MHz

Thank you for using the services of Eurofins E&E North America. If you have any questions regarding these results or if we can be of further service to you, please feel free to contact me.

Sincerely,

Nancy LaBrecque
Documentation Department
Eurofins Electrical and Electronic Testing NA, Inc.

Reference: WIRA141757-FCCP90_RSS-119 – R1

FCC Part 90, RSS-119 Issue 12
Test Report

for the

GE Vernova MDS, LLC
MDS Orbit SD4 Industrial Radio (Model: SD4-1)

Tested under
the FCC Certification Rules
contained in
FCC Part 90, RSS-119 Issue 12
for Intentional Radiators

Bryan Taylor, Wireless Team Lead
Electromagnetic Compatibility Lab

Nancy LaBrecque
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

Matthew Hinojosa
EMC Manager, Austin Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	06/04/2026	Initial Issue.
1	06/17/2026	Editorial Updates

Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the GE Vernova MDS, LLC MDS Orbit SD4 Industrial Radio, with the requirements of FCC Part 90, RSS-119 Issue 12. The following data is presented in support of the Certification of the MDS Orbit SD4 Industrial Radio. GE Vernova MDS, LLC should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the MDS Orbit SD4 Industrial Radio, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 90, RSS-119 Issue 12, in accordance with GE Vernova MDS, LLC, under purchase order number 4501454327. All tests were conducted using measurement procedures ANSI C63.26 - 2015

FCC Reference	ISED Reference	Description	Compliance
90.205	RSS-119 (5.4)	Transmitter Output Power	**Compliant**
90.209	RSS-119 (5.5)	Occupied Bandwidth	**Compliant**
90.210	RSS-119 (5.5)	Emission Masks	**Compliant**
90.210	RSS-119 (5.8)	Spurious Emissions at Antenna Terminals	**Compliant**
90.210	RSS-119 (5.8)	Radiated Spurious Emissions	**Compliant**
90.214	RSS-119 (5.9)	Transient Frequency Behavior	**Compliant**
90.213	RSS-119 (5.3)	Transmitter Frequency Stability	**Compliant**

Table 1. Executive Summary

Equipment Configuration

A. Overview

Eurofins E&E North America was contracted by GE Vernova MDS, LLC to perform testing on the MDS Orbit SD4 Industrial Radio.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the GE Vernova MDS, LLC MDS Orbit SD4 Industrial Radio.

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

Product Name:	MDS Orbit SD4 Industrial Radio	
Model Number:	SD4-1	
Serial Number:	4197406	
FCCID:	E5MDS-SD4	
ICID:	101D-SD4	
Equipment Specifications:	Primary Power:	10 - 30VDC
	Type of Modulation(s):	FSK
	Conducted Output Power with Maximum Setting(measured)	37.32dBm (5.39W)
	Conducted Output Power with Minimum Setting (measured)	19.93dBm (0.09W)
	EUT Frequency Ranges:	406.1MHz – 450MHz
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35º C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Evaluated by:	Bryan Taylor and Sergio Gutierrez	
Test Date(s):	5/5/2026 to 6/1/2026	

Table 2. EUT Summary Table

B. References

CFR 47, Part 90	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 90
RSS-119, Issue 12	Licence-Exempt Radio Apparatus: Category I Equipment
ANSI C63.26:2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
ISO/IEC 17025:2017	General Requirements for the Competence of Testing and Calibration Laboratories

Table 3. References

C. Test Site

Eurofins MET Laboratories Inc. (Eurofins E&E North America) is part of the Eurofins Electrical & Electronics (E&E) global compliance network.

All testing was performed at Eurofins E&E North America, 13501 McCallen Pass, Austin, TX 78753. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 10 meter semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

Correlation between semi-anechoic chamber and OATS:

Two calibrated Loop antennas were used on an OATS. One antenna was driven by a signal generator with a known power. The receive antenna was initially placed 1m away from the transmit antenna. The two antennas were placed parallel to each other. The receive antenna was in turn connected to a calibrated spectrum analyzer. The emissions were swept from 9 kHz to 30 MHz. The receive antenna was then rotated 90 degrees and measurements re-taken. Additional measurements were taken when the receive antenna was placed at 3meters.
This same setup was taken to inside the semi-anechoic chamber and the measurements repeated.

The data was used to correlate the semi-anechoic chamber and OATS.

ISED Lab Info:
CAB Identifier: US0004
Company Number: 2043D

FCC Lab Info:
Designation Number: US1127

D. Measurement Uncertainty

Test Method	Typical Expanded Uncertainty	K	Confidence Level
Occupied Bandwidth Measurements	±4.52 Hz	2	95%
Conducted Power Measurements	±2.74 dB	2	95%
Power Spectral Density Measurements	±2.74 dB	2	95%
Conducted Spurious Emissions	±2.80 dB	2	95%
Conducted Emissions (Mains)	±2.97 dB	2	95%
Radiated Spurious Emissions (9kHz – 1GHz)	±2.95 dB	2	95%
Radiated Spurious Emissions (1GHz - 40GHz)	±3.54 dB	2	95%

Table 4. Uncertainty Calculations Summary

E. Description of Test Sample

The MDS Orbit SD4 Industrial Radio is designed to operate in point-to-multipoint environments, including utility automation/distribution systems, and other telemetry functions.

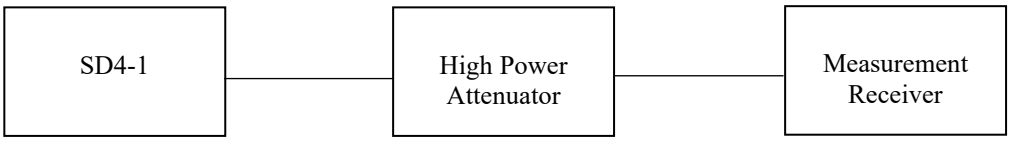


Figure 1. Block Diagram for Conducted Measurements

Figure 2. Block Diagram for Radiated Measurements

F. Equipment Configuration

Test Commands were provided by GE Vernova MDS, LLC that allowed for selecting of low, mid, or high channels, output power, and modem.

MODEM Type	OTA (bps)	Ch. BW (kHz)	Modulation	Test Frequencies
9600	9600	12.5	3-Level FSK	406.1MHz, 425MHz, 450MHz
4800F	4800	6.25	3-Level FSK	
19200	19200	25.00	3-Level FSK	

G. Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

Ref. ID	Name/Description	Manufacturer	Model Number	Customer Supplied Calibration Data
None	Laptop Computer	Lenovo	ThinkPad	None
None	DC Power Supply	HP	6012B	None

Table 5. Support Equipment

H. Ports and Cabling Information

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
P1	Antenna	Attenuator	1	N/A	N/A	Y	Spectrum Analyzer
P2	DC Power	2-pin DC Cable	1	2	2	N	DC Power Source
P3	COM1/COM2	RS-232/485 DB-9	2	N/A	N/A	Y	Support PC/Load
P4	Ethernet	RJ45 10/100BaseT	1	3	2	Y	Support PC

Table 6. Ports and Cabling Information

I. Mode of Operation

Test Commands were provided by GE Vernova MDS, LLC that allowed for selecting of low, mid, or high channels, output power, and modem. A maximum and minimum power setting of 37dBm and 22dBm was used. The terminal program "PuTTY Release 0.83" was used to send the commands to the test sample.

MODEM Type	OTA (bps)	Ch. BW (kHz)	Modulation	Test Frequencies
9600	9600	12.5	3-Level FSK	406.1MHz, 425MHz, 450MHz
4800F	4800	6.25	3-Level FSK	
19200	19200	25.00	3-Level FSK	

Table 7. Test Channels Utilized

J. Modifications

a) Modifications to EUT

No modifications were made to the EUT.

b) Modifications to Test Standard

No modifications were made to the test standard.

K. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to GE Vernova MDS, LLC upon completion of testing.

Output Power

§ 90.205 / RSS-119 (5.4)

Test Procedure: The transmitter was connected to a calibrated spectrum analyzer. The analyzer reference level was offset by cable loss connecting to the test sample. The power was measured on the low, mid and high channels of each band at the maximum and minimum power level settings. The antenna gain provided by the manufacturer was added to the measured conducted power to arrive at the EIRP.

Limit: The power limitation is determined based on specific license.

Results: The MDS Orbit SD4 Industrial Radio as evaluated, was compliant as the antenna was permanently attached.

Test Engineer(s): Bryan Taylor

Test Date(s): 5/15/2026

MODEM	Channel Bandwidth (kHz)	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Result
4800F	6.25	Low	406.1	36.99	16.5	53.49	Pass
		Middle	425.0	36.82	16.5	53.32	Pass
		High	450.0	37.10	16.5	53.6	Pass
9600	12.5	Low	406.1	36.66	16.5	53.16	Pass
		Middle	425.0	37.07	16.5	53.57	Pass
		High	450.0	37.19	16.5	53.69	Pass
19200	19200	Low	406.1	37.32	16.5	53.82	Pass
		Middle	425.0	37.32	16.5	53.82	Pass
		High	450.0	37.21	16.5	53.71	Pass

Table 8. Output Power and EIRP (High Power Setting)

MODEM	Channel Bandwidth (kHz)	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Result
4800F	6.25	Low	406.1	19.23	16.5	35.73	Pass
		Middle	425.0	19.53	16.5	36.03	Pass
		High	450.0	19.34	16.5	35.84	Pass
9600	12.5	Low	406.1	19.86	16.5	36.36	Pass
		Middle	425.0	19.82	16.5	36.32	Pass
		High	450.0	19.90	16.5	36.4	Pass
19200	19200	Low	406.1	19.88	16.5	36.38	Pass
		Middle	425.0	19.93	16.5	36.43	Pass
		High	450.0	19.60	16.5	36.1	Pass

Table 9. Output Power and EIRP (Low Power Setting)

Occupied Bandwidth Measurements

§ 90.209 / RSS-119 (5.5)

Test Requirement(s): The maximum authorized bandwidth allowed is as follows:

6.25kHz Channel: 6kHz
12.5kHz Channel: 11.25kHz
25kHz Channel: 20kHz

Test Procedure: The transmitter was on and transmitting at the highest output power. The bandwidth of the fundamental frequency was measured with the spectrum analyzer. The RBW was adjusted so it was between 1% and 5% of the occupied bandwidth. The 99% bandwidth function of the analyzer was used to measure the occupied bandwidth.

Test Results: The MDS Orbit SD4 Industrial Radio was compliant with this requirement. The Occupied Bandwidth is shown on the plots on the following pages.

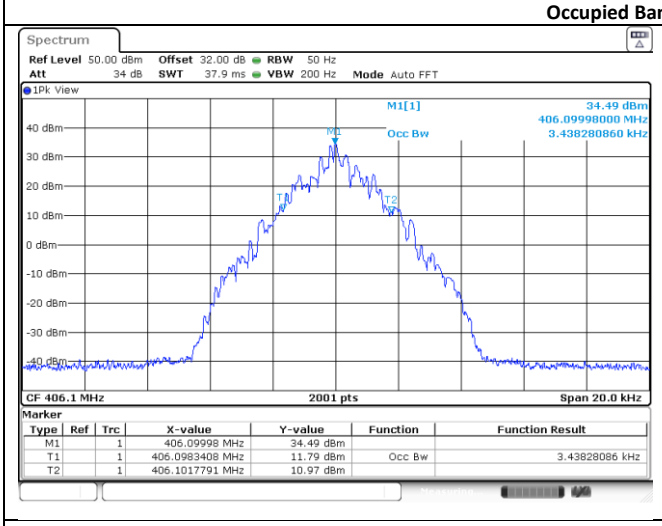
Test Engineer(s): Sergio Gutierrez

Test Date(s): 5/7/2026

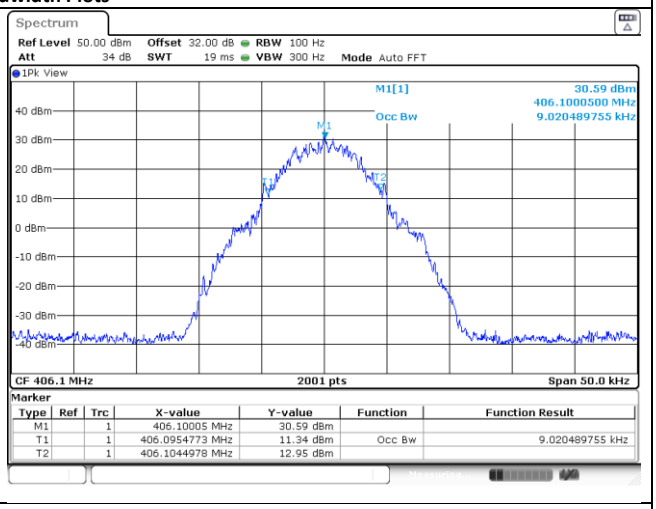
MODEM	Channel Bandwidth (kHz)	Channel	Frequency (MHz)	99% Bandwidth (kHz)	Authorized Bandwidth Limit (kHz)	Result
4800F	6.25	Low	406.1	3.438	6	Pass
		Middle	425.0	3.498	6	Pass
		High	450.0	3.488	6	Pass
9600	12.5	Low	406.1	9.020	11.25	Pass
		Middle	425.0	9.045	11.25	Pass
		High	450.0	9.045	11.25	Pass
19200	19200	Low	406.1	16.541	20	Pass
		Middle	425.0	16.491	20	Pass
		High	450.0	16.541	20	Pass

Table 10. Occupied Bandwidth Measurements

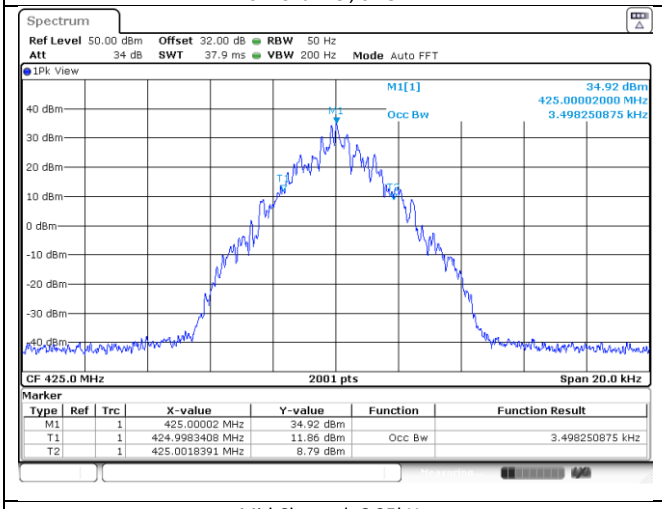
Occupied Bandwidth Plots



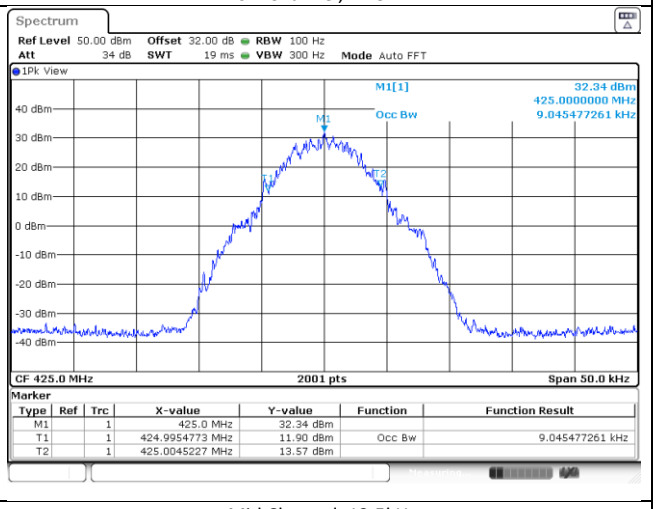
Low Channel, 6.25kHz



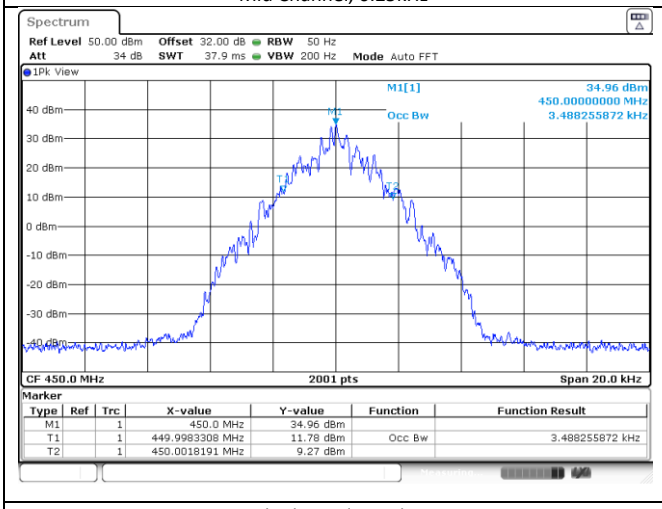
Low Channel, 12.5kHz



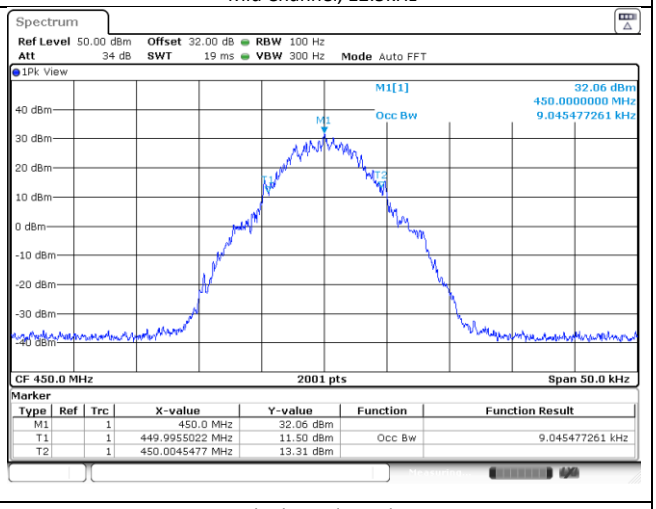
Mid Channel, 6.25kHz



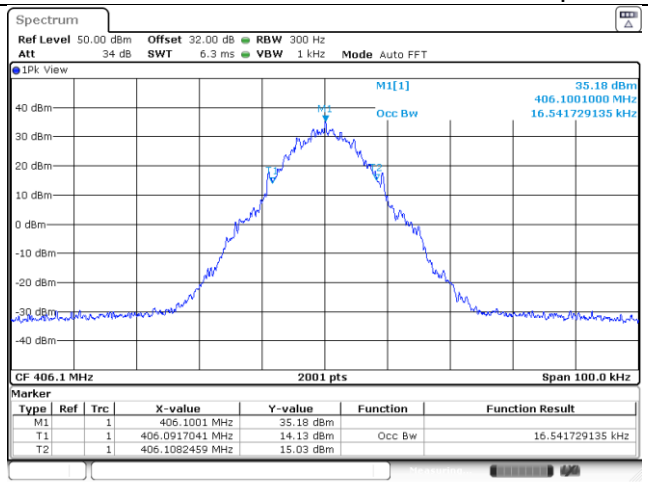
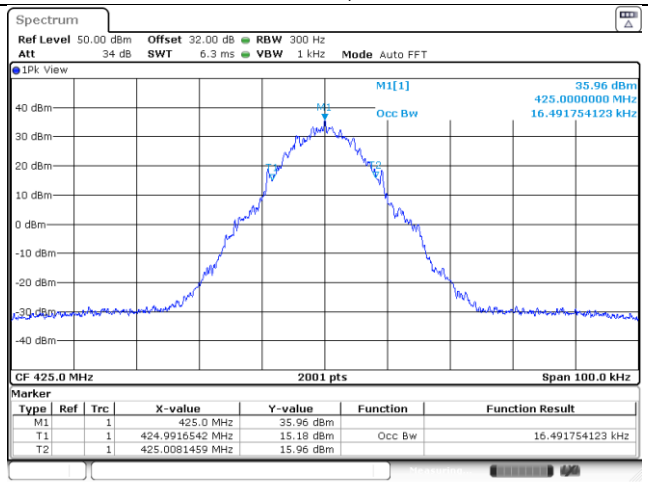
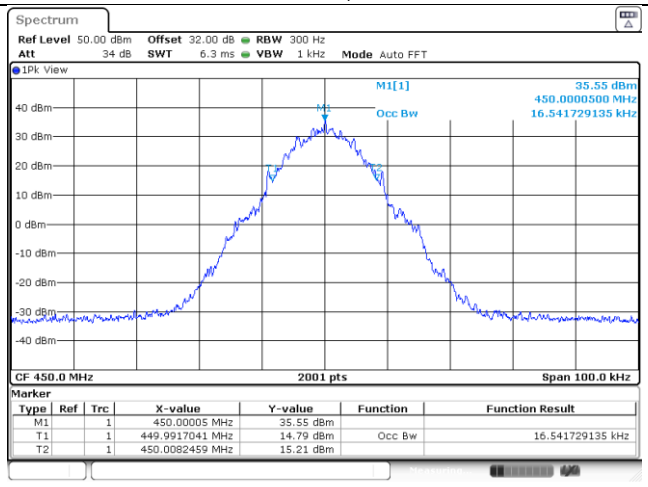
Mid Channel, 12.5kHz



High Channel, 6.25kHz



High Channel, 12.5kHz

Occupied Bandwidth Plots	
	
Low Channel, 25kHz	
	
Mid Channel, 25kHz	
	
High Channel, 25kHz	

Emission Mask Measurements

§ 90.210 / RSS-119 (5.5)

Test Requirement(s): The maximum authorized bandwidth allowed is as follows:

6.25kHz Channel: Emission Mask E
12.5kHz Channel: Emission Mask D
25kHz Channel: Emission Mask C

Test Procedure: The transmitter was connected to a spectrum analyzer with the appropriate emission mask limits defined. The emission was observed to determine if it met the emission mask.

Test Results: The MDS Orbit SD4 Industrial Radio was compliant with this requirement. The limits for each applicable emission mask were met.

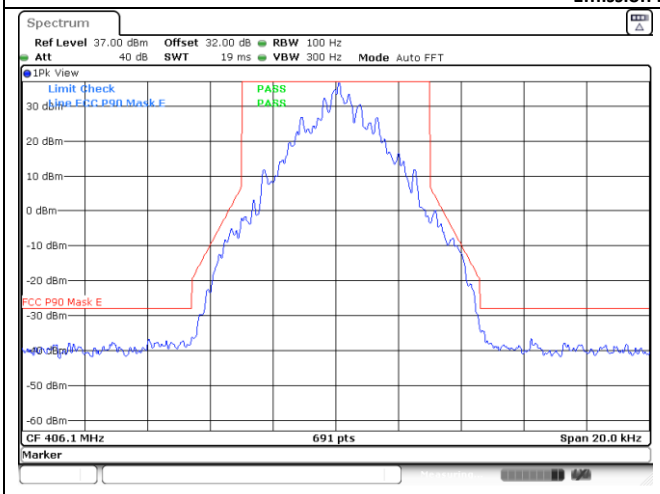
Test Engineer(s): Bryan Taylor

Test Date(s): 5/12/2026

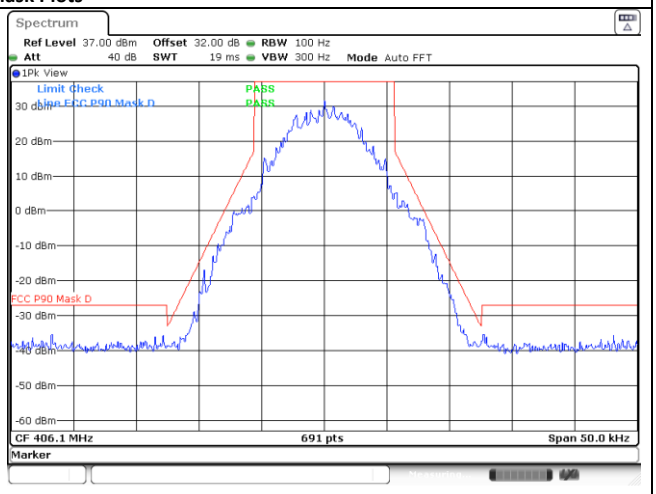
MODEM	Channel Bandwidth (kHz)	Channel	Frequency (MHz)	Emission Mask Applied	Result
4800F	6.25	Low	406.1	E	Pass
		Middle	425.0	E	Pass
		High	450.0	E	Pass
9600	12.5	Low	406.1	D	Pass
		Middle	425.0	D	Pass
		High	450.0	D	Pass
19200	19200	Low	406.1	C	Pass
		Middle	425.0	C	Pass
		High	450.0	C	Pass

Table 11. Emission Mask Measurements

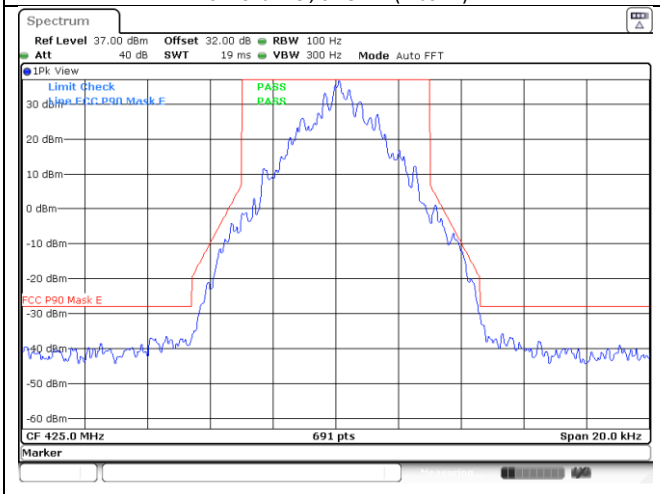
Emission Mask Plots



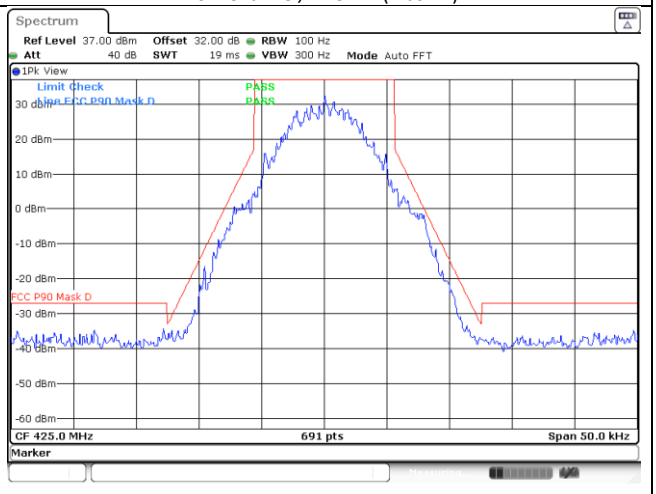
Low Channel, 6.25kHz (Mask E)



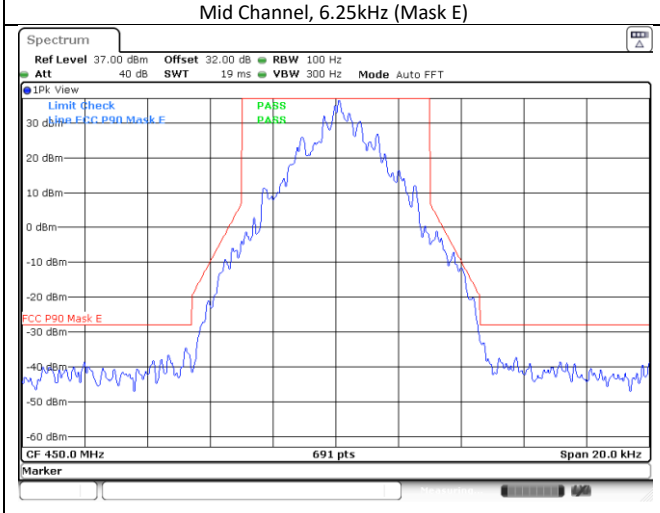
Low Channel, 12.5kHz (mask D)



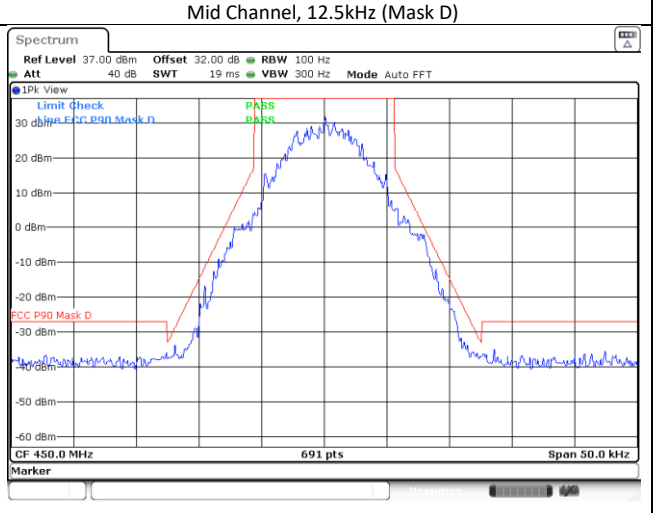
Mid Channel, 6.25kHz (Mask E)



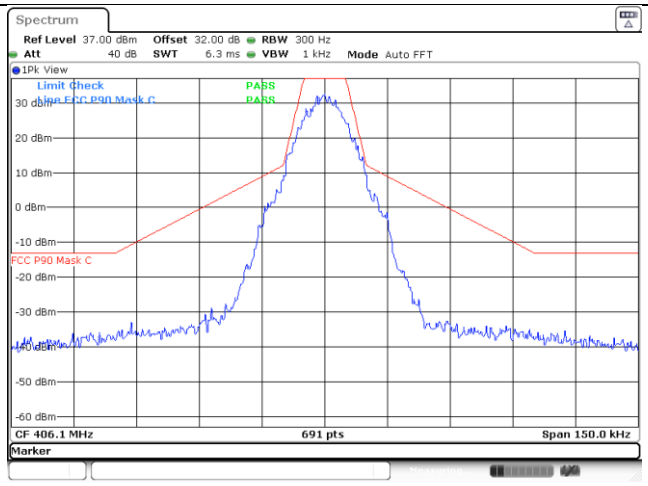
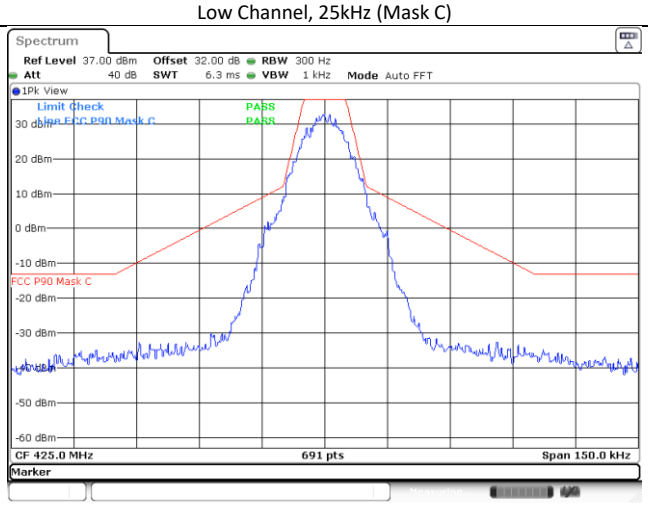
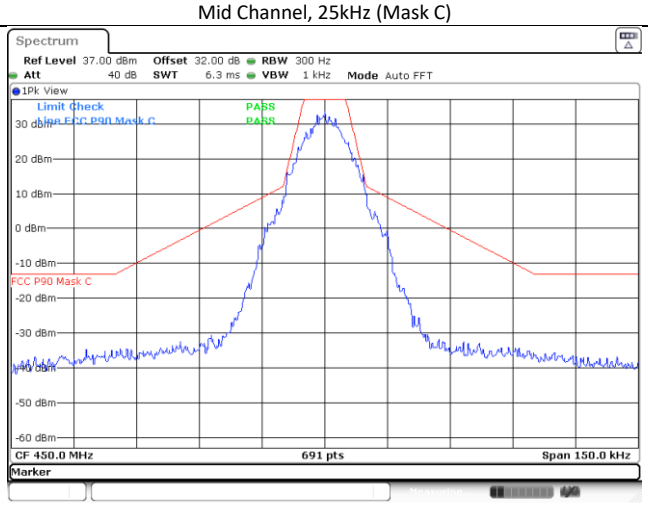
Mid Channel, 12.5kHz (Mask D)



High Channel, 6.25kHz (Mask E)



High Channel, 12.5kHz (Mask D)

Emission Mask Plots	
	
Low Channel, 25kHz (Mask C)	
	
Mid Channel, 25kHz (Mask C)	
	
High Channel, 25kHz (Mask C)	

Spurious Emissions at Antenna Terminals

§ 90.210 / RSS-119 (5.8)

Test Requirement(s): The maximum spurious Emissions are defined by the emission masks. The power of any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows

6.25kHz Channel:	Emission Mask E	43 + 10 log10(p)
12.5kHz Channel:	Emission Mask D	70 or 50 + 10 $\log_{10}$(p)
25kHz Channel:	Emission Mask C	57 or 55 + 10 $\log_{10}$(p)

Test Procedure: The transmitter was connected to a spectrum analyzer through appropriate attenuation. The analyzer was scanned from 9kHz to at least 10x the fundamental frequency. Emissions in the spurious domain were observed and compared against the limits as defined by the appropriate emission mask

Test Results: The MDS Orbit SD4 Industrial Radio was compliant with this requirement. The spurious emissions measured at the antenna terminals were all below the applicable limits.

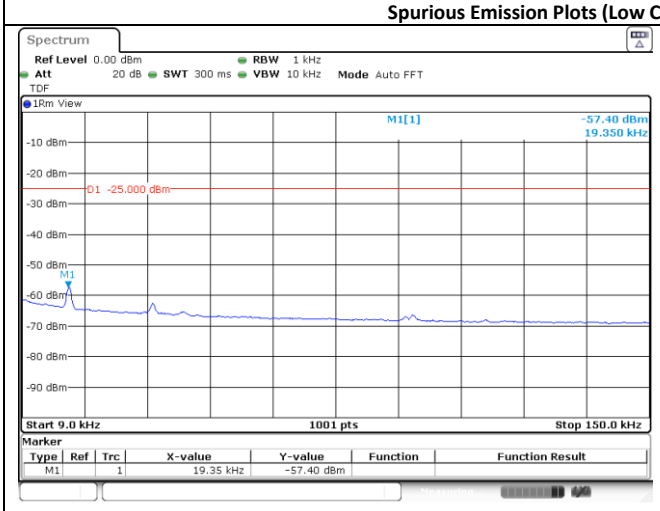
Test Engineer(s): Sergio Gutierrez

Test Date(s): 5/7/2026

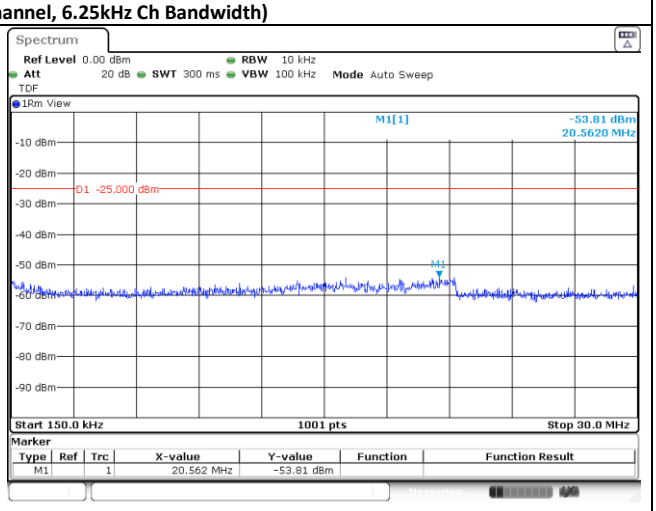
MODEM	Channel Bandwidth (kHz)	Channel	Frequency (MHz)	Emission Mask Applied	Spurious Emission Attenuation Below TX Power (P)	Spurious Emission Limit (dBm)	Result
4800F	6.25	Low	406.1	E	43 + 10 log10(p)	-13	Pass
		Middle	425.0	E	43 + 10 log10(p)	-13	Pass
		High	450.0	E	43 + 10 log10(p)	-13	Pass
9600	12.5	Low	406.1	D	70 or 50 + 10 $\log_{10}$(p)	-20	Pass
		Middle	425.0	D	70 or 50 + 10 $\log_{10}$(p)	-20	Pass
		High	450.0	D	70 or 50 + 10 $\log_{10}$(p)	-20	Pass
19200	19200	Low	406.1	C	57 or 55 + 10 $\log_{10}$(p)	-25	Pass
		Middle	425.0	C	57 or 55 + 10 $\log_{10}$(p)	-25	Pass
		High	450.0	C	57 or 55 + 10 $\log_{10}$(p)	-25	Pass

Table 12. Occupied Bandwidth Measurements

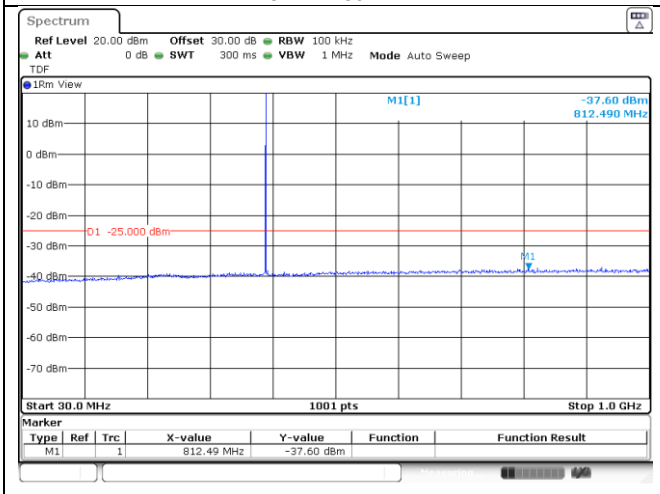
Spurious Emission Plots (Low Channel, 6.25kHz Ch Bandwidth)



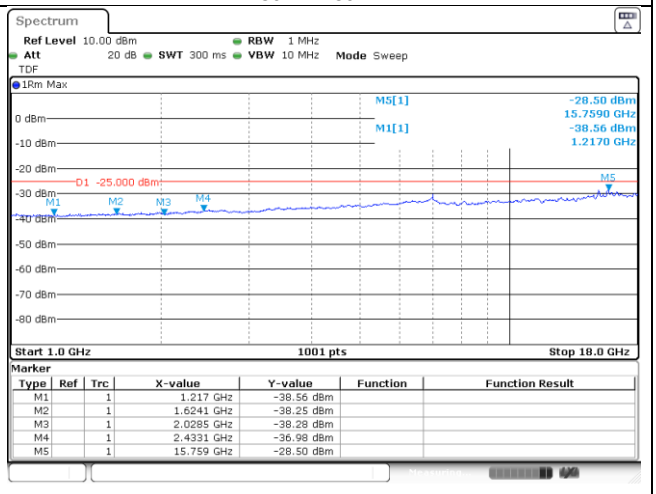
9kHz – 150kHz



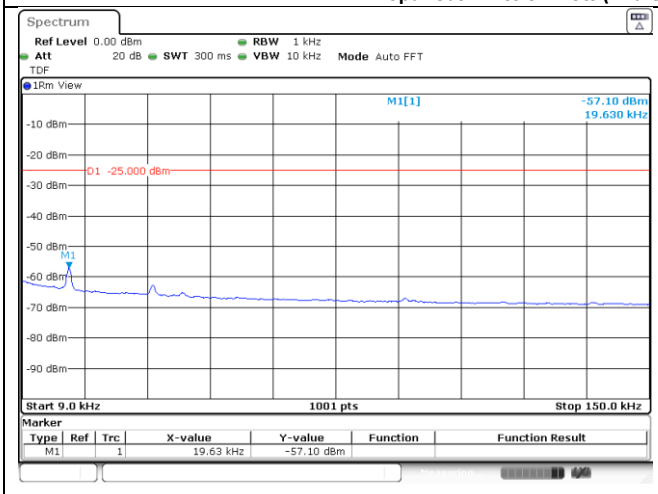
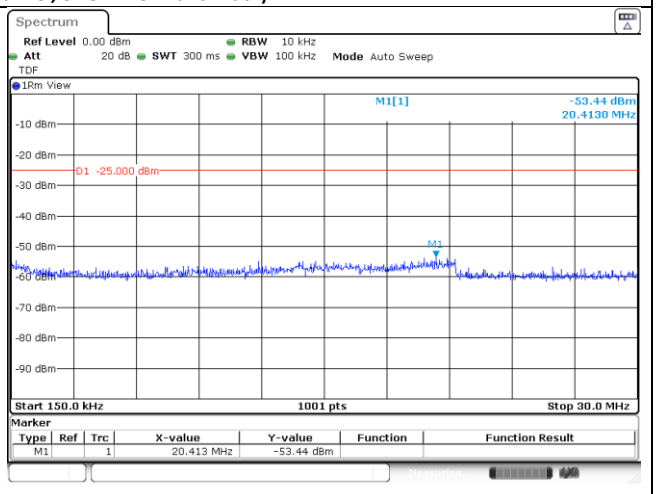
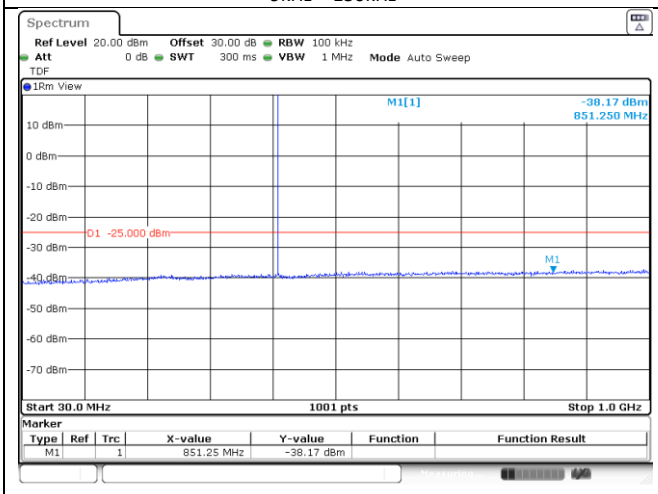
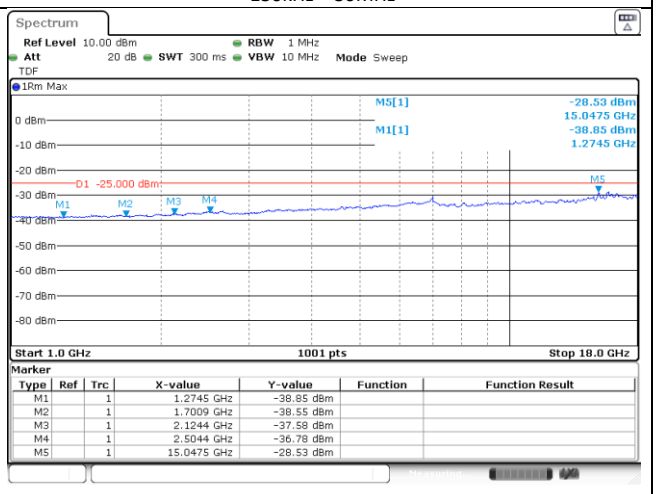
150kHz – 30MHz



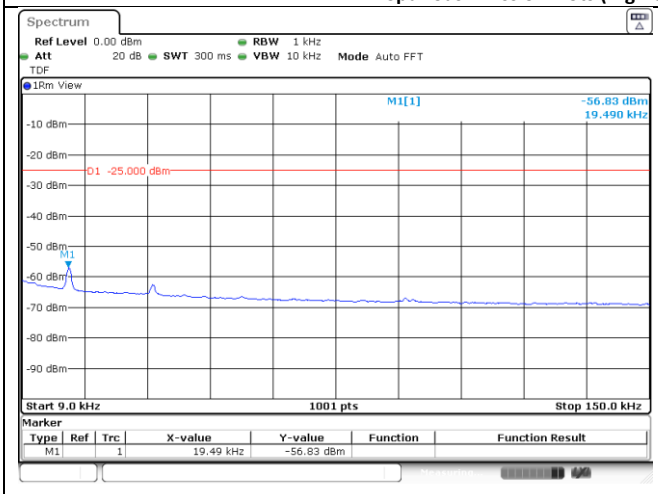
30MHz – 1GHz



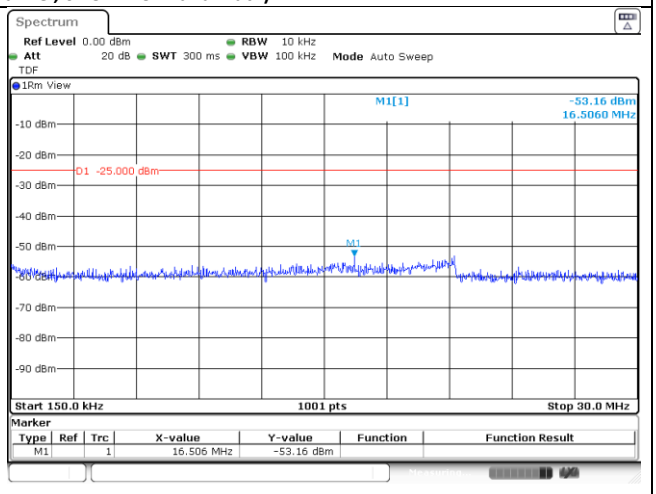
1GHz – 18GHz

Spurious Emission Plots (Mid Channel, 6.25kHz Ch Bandwidth)	
	
9kHz – 150kHz	150kHz – 30MHz
	
30MHz – 1GHz	1GHz – 18GHz

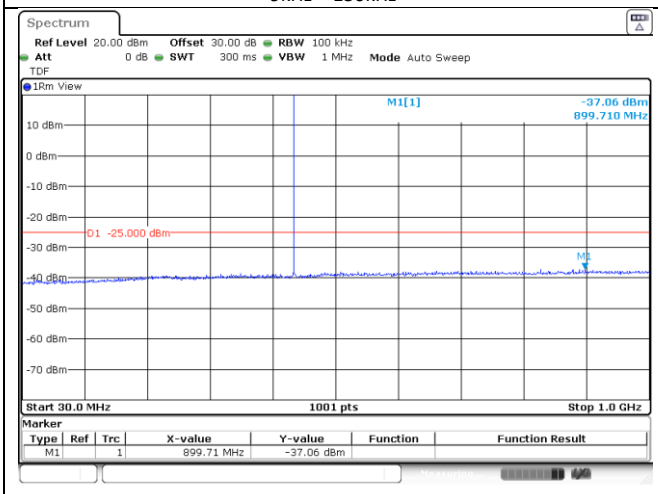
Spurious Emission Plots (High Channel, 6.25kHz Ch Bandwidth)



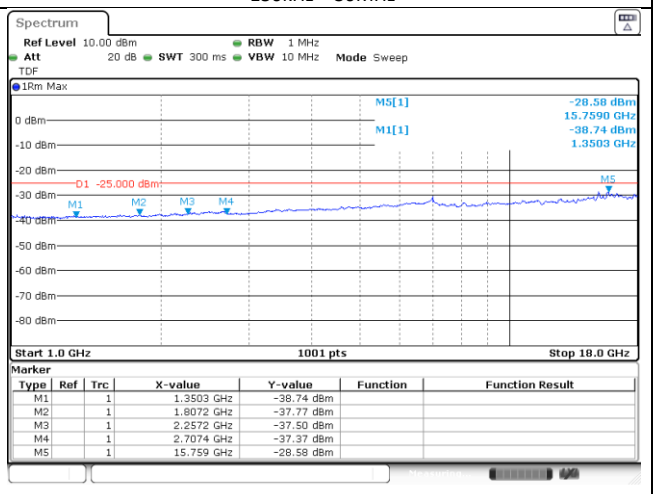
9kHz – 150kHz



150kHz – 30MHz

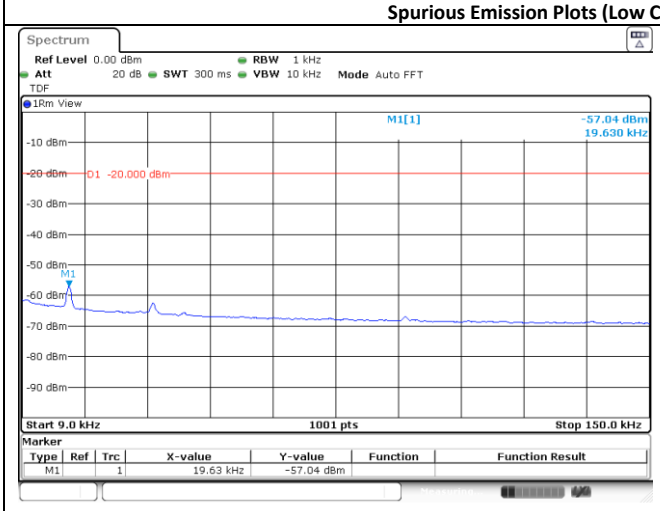


30MHz – 1GHz

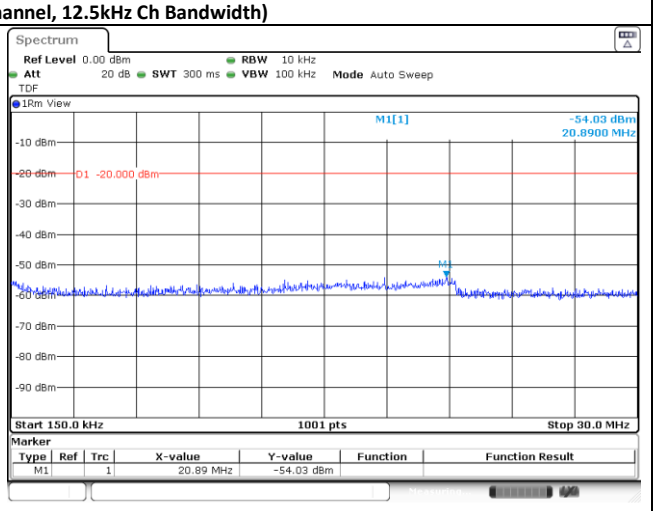


1GHz – 18GHz

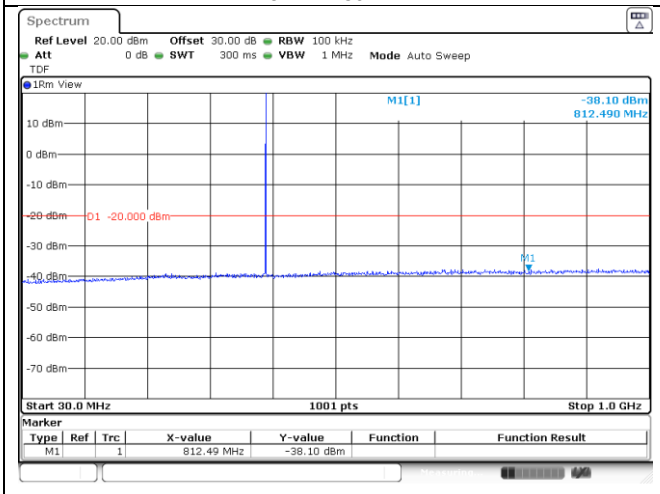
Spurious Emission Plots (Low Channel, 12.5kHz Ch Bandwidth)



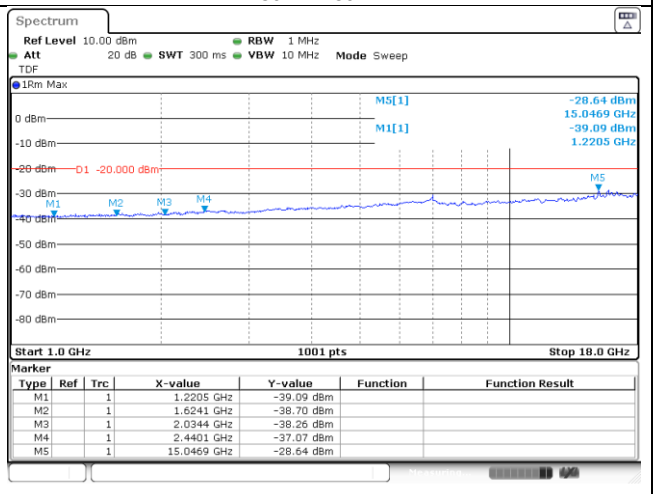
9kHz – 150kHz



150kHz – 30MHz

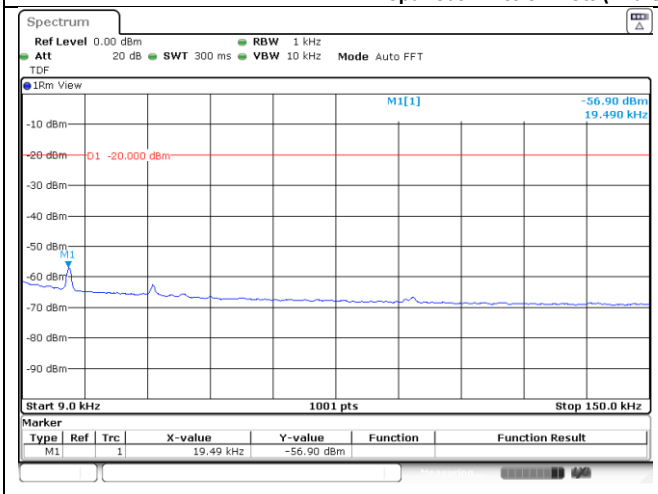


30MHz – 1GHz

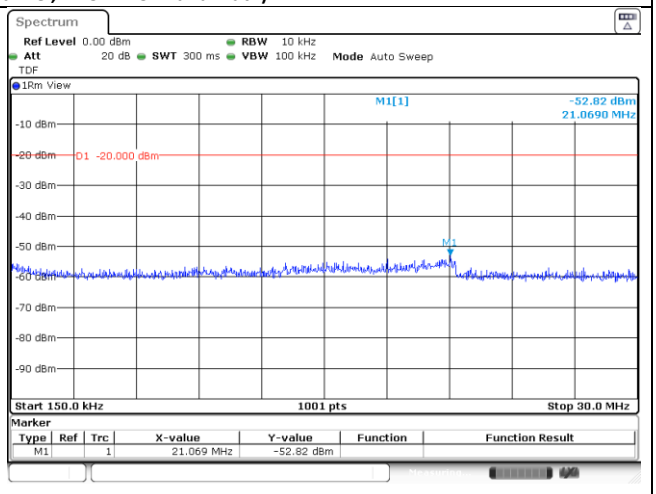


1GHz – 18GHz

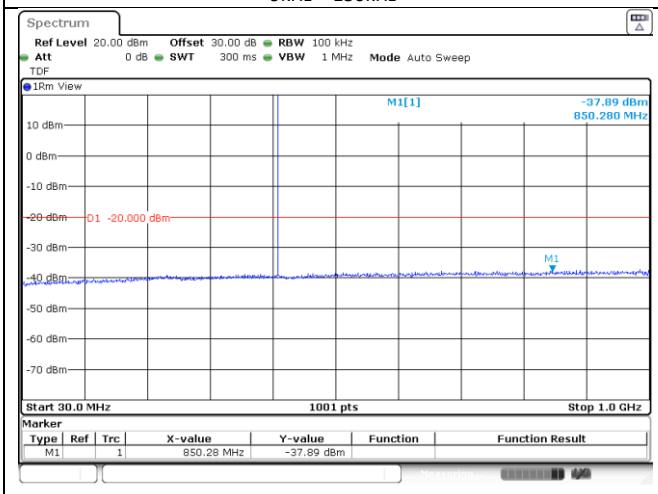
Spurious Emission Plots (Mid Channel, 12.5kHz Ch Bandwidth)



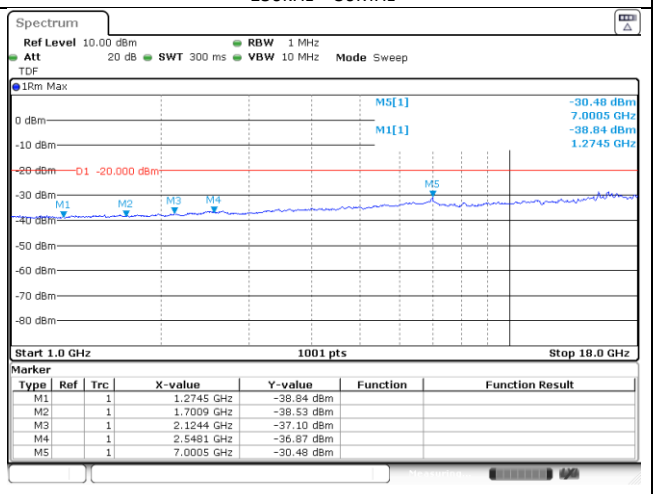
9kHz – 150kHz



150kHz – 30MHz

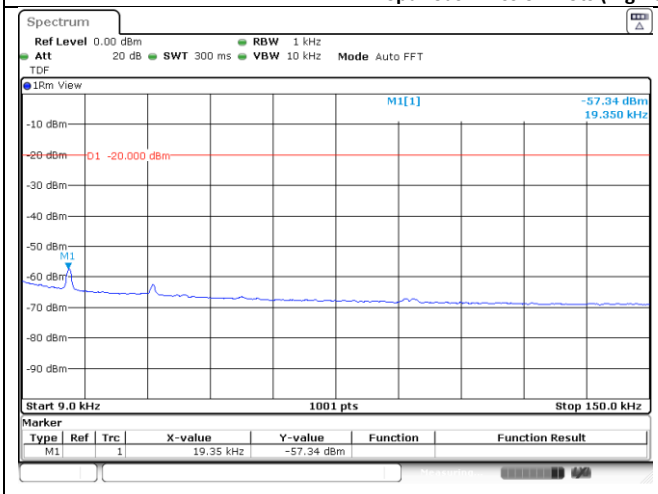


30MHz – 1GHz

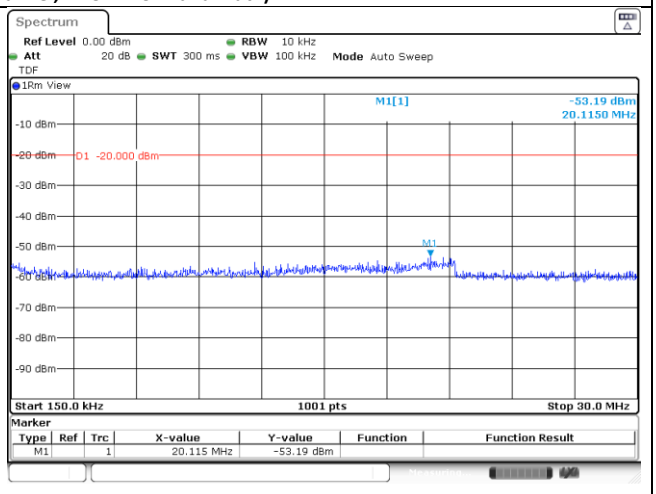


1GHz – 18GHz

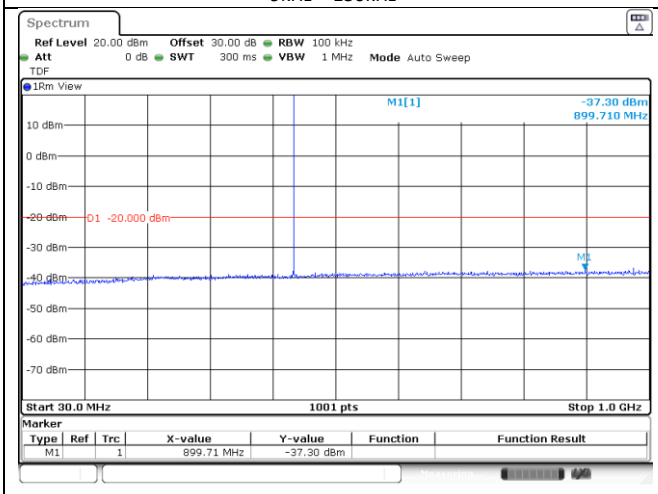
Spurious Emission Plots (High Channel, 12.5kHz Ch Bandwidth)



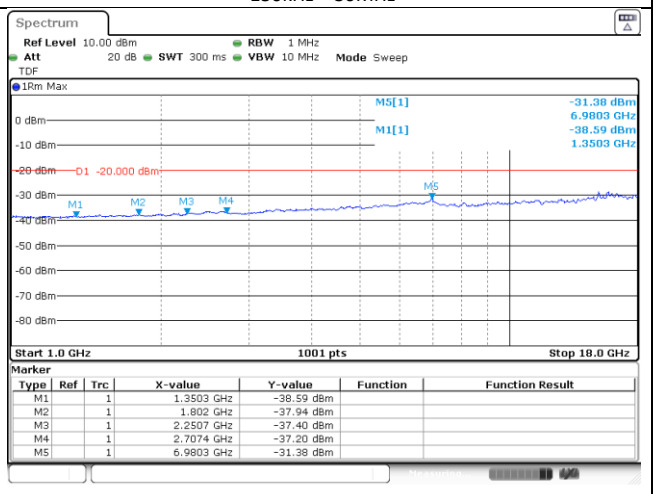
9kHz – 150kHz



150kHz – 30MHz

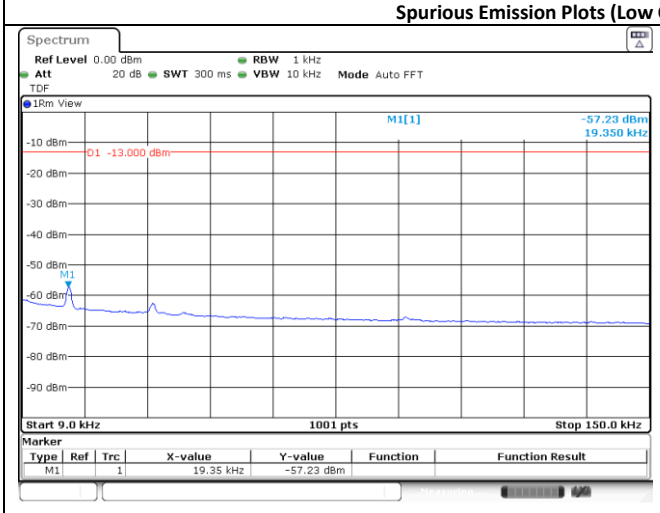


30MHz – 1GHz

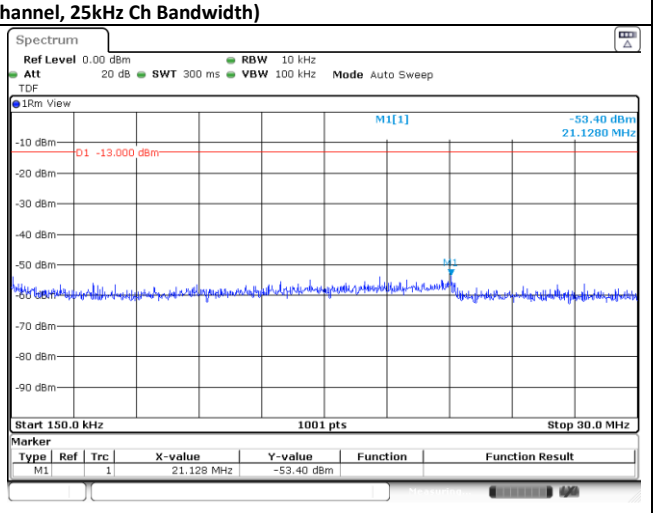


1GHz – 18GHz

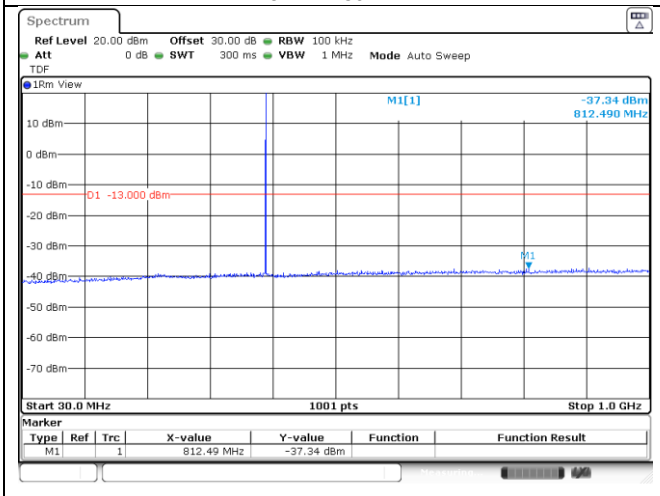
Spurious Emission Plots (Low Channel, 25kHz Ch Bandwidth)



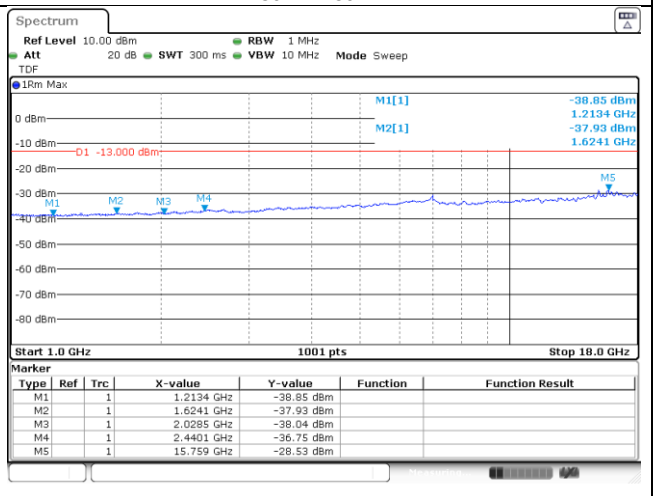
9kHz – 150kHz



150kHz – 30MHz

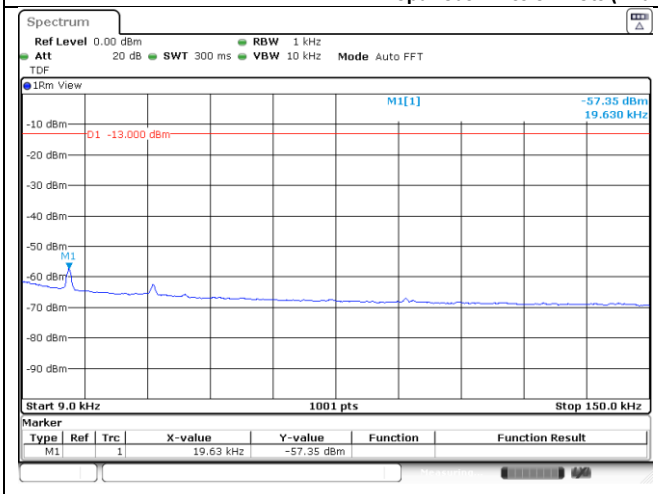


30MHz – 1GHz

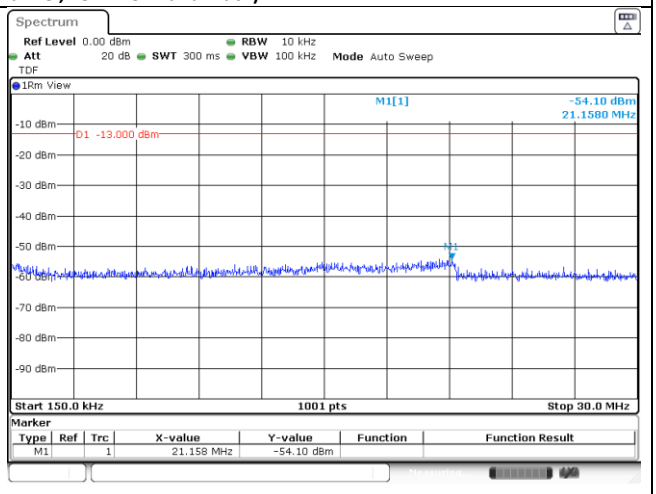


1GHz – 18GHz

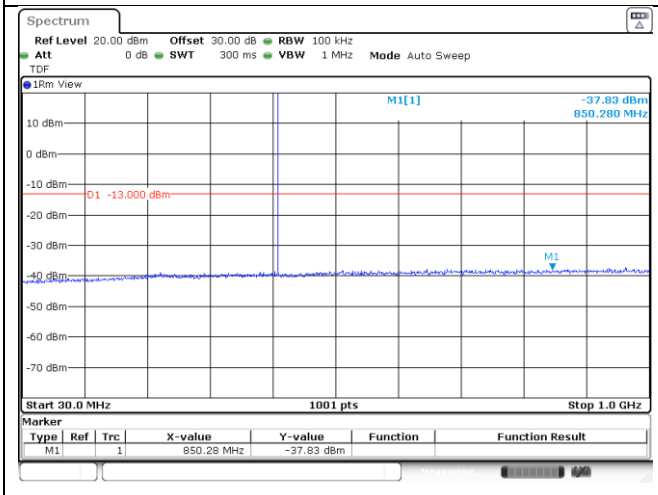
Spurious Emission Plots (Mid Channel, 25kHz Ch Bandwidth)



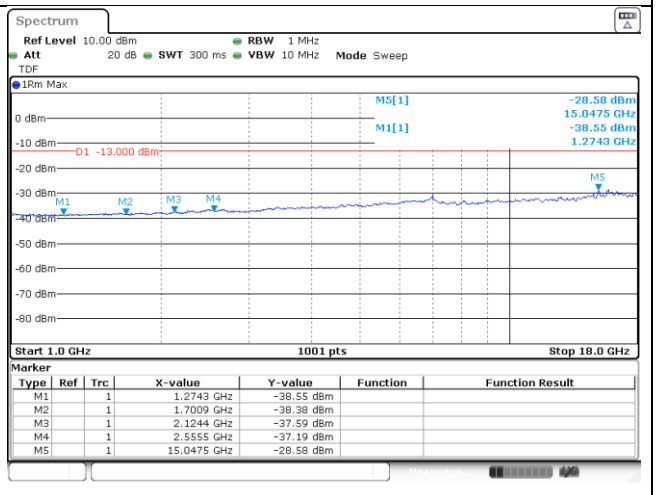
9kHz – 150kHz



150kHz – 30MHz

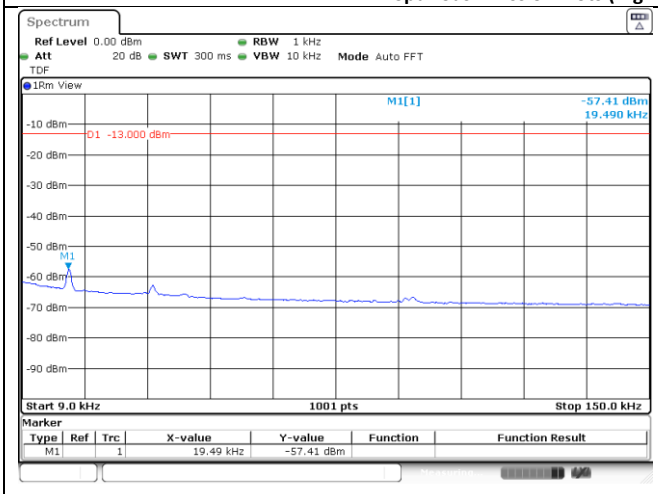


30MHz – 1GHz

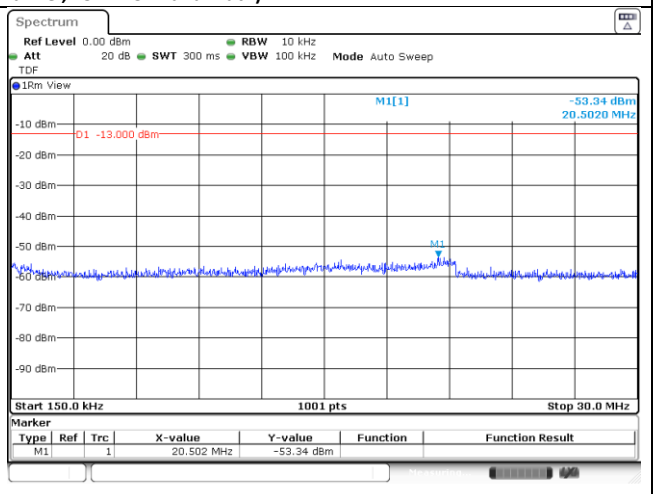


1GHz – 18GHz

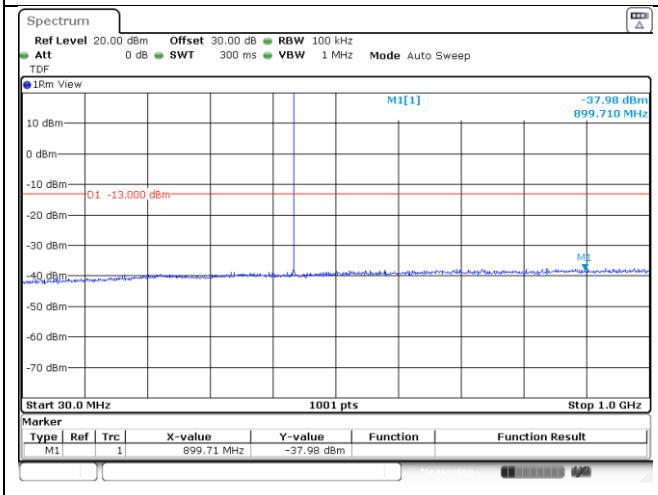
Spurious Emission Plots (High Channel, 25kHz Ch Bandwidth)



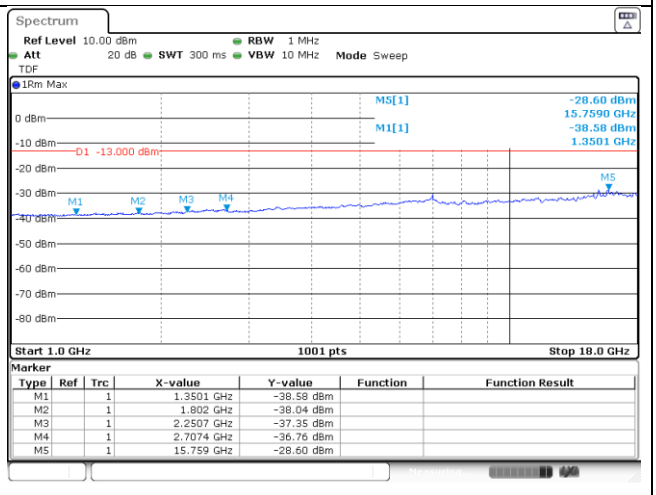
9kHz – 150kHz



150kHz – 30MHz



30MHz – 1GHz



1GHz – 18GHz

Radiated Spurious Emissions

§ 90.210 / RSS-119 (5.8)

Test Requirement(s): The maximum spurious Emissions are defined by the emission masks. The power of any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as shown below.

Channel Bandwidth	Emission Mask	Spurious Attenuation below Carrier Power	Spurious Limit (dBm)
6.25kHz	E	43 + 10 log10(p)	-13dBm
12.5kHz	D	70 or 50 + 10 $\log_{10}$(p)	-20dBm
25kHz	C	57 or 55 + 10 $\log_{10}$(p)	-25dBm

Test Procedure: The EUT was set to transmit and placed on a 0.8 m-high table inside a semi-anechoic chamber. The method of testing and test conditions of ANSI C63.26: 2015 were used. For measurements below 30 MHz a loop antenna placed 3m away from the unit was used. Measurements below 30 MHz were conducted with the loop antenna at coaxial (parallel) and planar (perpendicular) orientations. For measurements above 30 MHz a biconalog antenna placed 10 m away from the unit was used. Measurements above 30 MHz were conducted with the biconalog antenna in the vertical and horizontal polarizations. Measurements above 1GHz were performed with a horn antenna that was 3m away from the test sample.

A peak detector was used to perform a pre-scan from 9 kHz to 10 times the fundamental frequency. Spurious emissions within 20 dB of the applicable limit were measured using a quasi-peak or average detector as appropriate for the frequency range and recorded in the subsequent section.

ANSI C63.26 allows for conversion from EIRP in dBm to field strength in dBuV/m. The limit used was obtained by converting the EIRP limit to field strength via the formula form ANSI C63.26 Section 5.2.7 as follows:

$$E\ (dB\mu V/m) = EIRP\ (dBm) - 20\log(D) + 104.8;$$ where D is the measurement distance (in the farfield region) in m.

The 25kHz channel output power measurements produced the highest output power. The conducted spurious emissions were very similar between the 6.25kHz, 12.5kHz, and 25kHz samples. Since the 25kHz channel configuration had the highest output power and a lower spurious emission limit it was treated as worst case and all radiated spurious emission measurements were performed in this configuration. The field strength limits used are shown below:

Measurement Distance	EIRP Limit (dBm)	Calculated Field Strength Limit at Distance (dBuV/m)	Applies to
3m	-25	70.2	Below 30MHz Above 1GHz
10m	-25	59.8	30MHz – 1GHz

Test Results: The MDS Orbit SD4 Industrial Radio was compliant with the radiated spurious emission requirements.

Test Engineer(s): Sergio Gutierrez

Test Date(s): 5/6/2026 – 5/7/2026

Radiated Field Strength Test Results

Frequency [MHz]	Peak Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.012	60.84	70.2	9.36	15.37	H	161.6	1.00	0.200	Pass
0.019	53.61	70.2	16.59	13.67	V	125.8	1.00	0.200	Pass
0.024	51.35	70.2	18.85	12.69	H	92.7	1.00	0.200	Pass
0.028	51.46	70.2	18.74	11.93	V	268.3	1.00	0.200	Pass
0.537	44.48	70.2	25.72	10.19	H	201.5	1.00	9.000	Pass
0.731	42.35	70.2	27.85	10.25	V	57.8	1.00	9.000	Pass

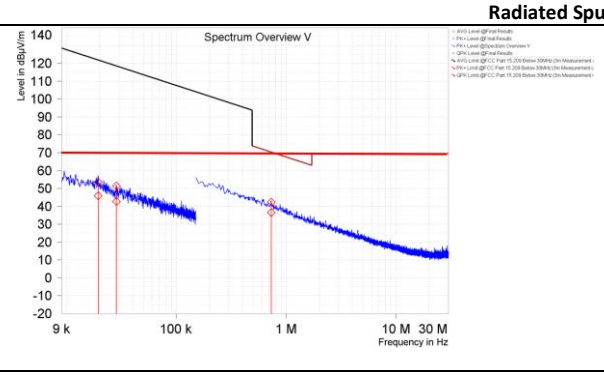
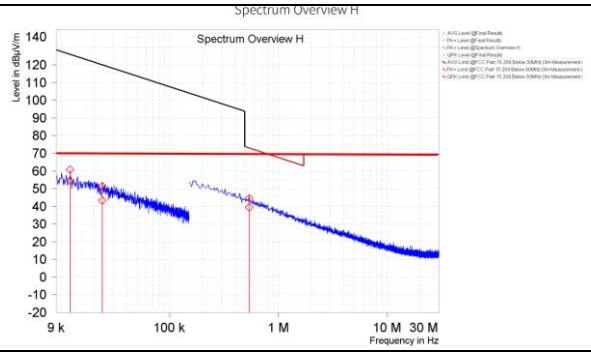
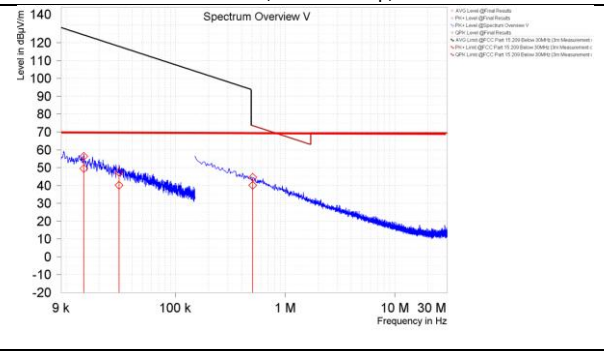
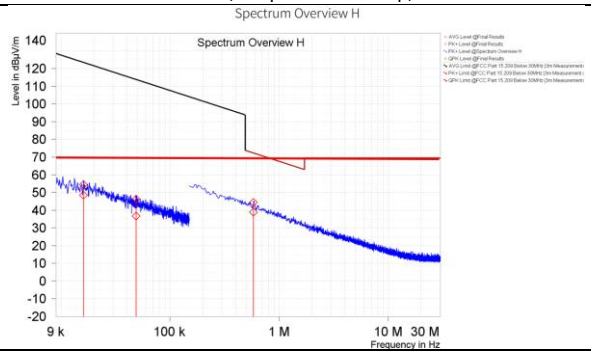
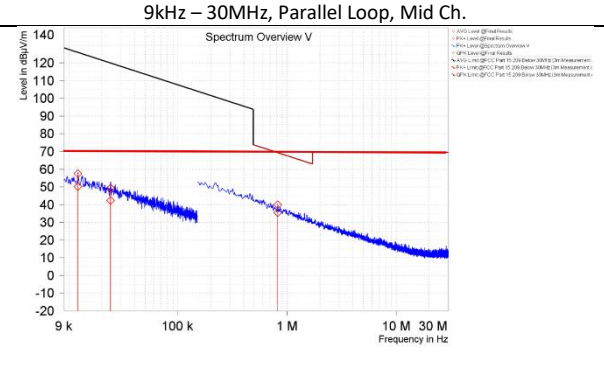
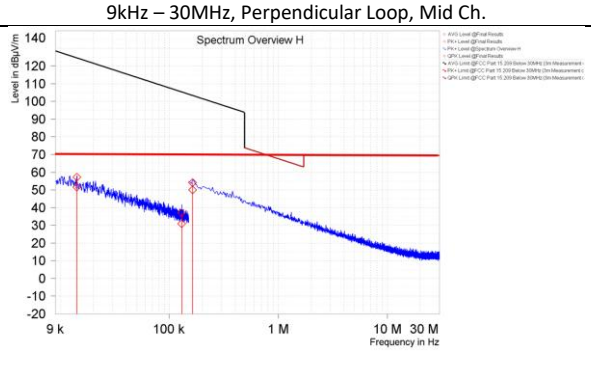
Figure 3. Worst Case Field Strength Below 30MHz (Low Channel)

Frequency [MHz]	Peak Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.015	56.30	70.2	13.9	14.68	V	310.8	1.00	0.200	Pass
0.016	54.41	70.2	15.79	14.38	H	293.9	1.00	0.200	Pass
0.031	47.32	70.2	22.88	11.71	V	138.5	1.00	0.200	Pass
0.049	46.23	70.2	23.97	10.63	H	17.9	1.00	0.200	Pass
0.506	44.48	70.2	25.72	10.18	V	251.8	1.00	9.000	Pass
0.582	44.31	70.2	25.89	10.19	H	273.8	1.00	9.000	Pass

Figure 4. Worst Case Field Strength Below 30MHz (Mid Channel)

Frequency [MHz]	Peak Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
0.012	57.48	70.2	12.72	15.37	V	233.4	1.00	0.200	Pass
0.014	57.24	70.2	12.96	14.76	H	151.5	1.00	0.200	Pass
0.024	49.29	70.2	20.91	12.65	V	256.3	1.00	0.200	Pass
0.130	36.99	70.2	33.21	10.31	H	248.8	1.00	0.200	Pass
0.164	54.10	70.2	16.1	10.27	H	201.5	1.00	9.000	Pass
0.821	39.98	70.2	30.22	10.27	V	179.2	1.00	9.000	Pass

Figure 5. Worst Case Field Strength Below 30MHz (High Channel)

Radiated Spurious Emission Plots	
	
9kHz – 30MHz, Parallel Loop, Low Ch.	9kHz – 30MHz, Perpendicular Loop, Low Ch.
	
9kHz – 30MHz, Parallel Loop, Mid Ch.	9kHz – 30MHz, Perpendicular Loop, Mid Ch.
	
9kHz – 30MHz, Parallel Loop, High Ch.	9kHz – 30MHz, Perpendicular Loop, High Ch.

Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
375.000	36.72	59.8	23.08	-2.85	V	156.1	1.49	120.000	Pass
500.010	23.23	59.8	36.57	0.00	V	69.6	3.78	120.000	Pass
624.990	31.15	59.8	28.65	1.84	H	32.1	1.45	120.000	Pass
625.020	26.69	59.8	33.11	2.14	V	332	3.58	120.000	Pass
812.190	38.99	59.8	20.81	3.57	H	343.8	1.11	120.000	Pass
812.190	39.05	59.8	20.75	4.55	V	302.7	2.21	120.000	Pass
874.980	28.53	59.8	31.27	5.61	V	57.8	3.99	120.000	Pass

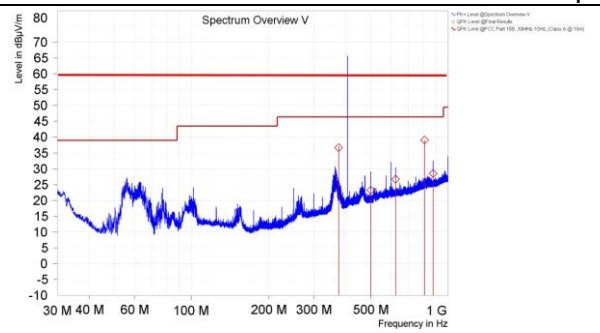
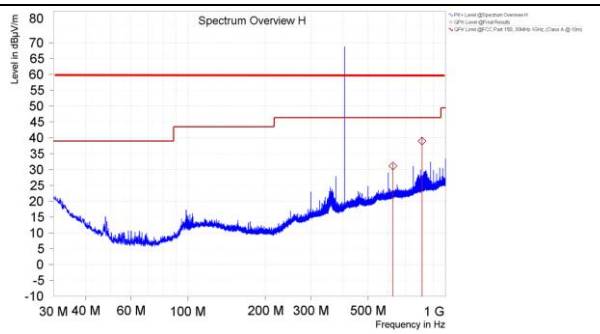
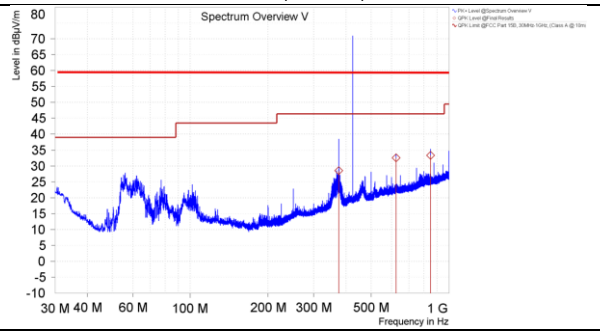
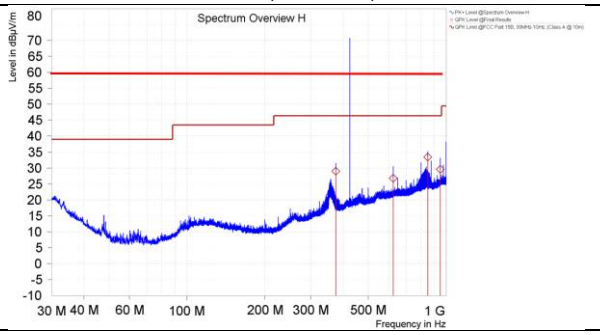
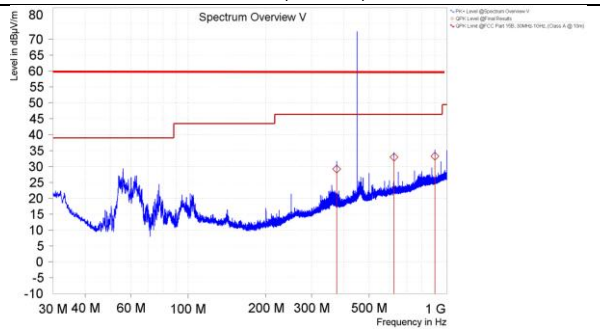
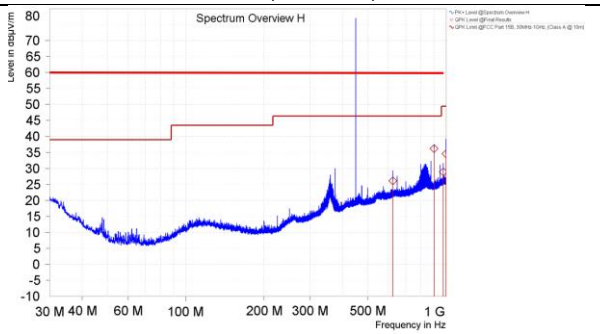
Figure 6. Worst Case Field Strength, 30MHz – 1GHz (Low Channel)

Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
249.990	13.64	59.8	46.16	-5.88	V	196.1	1.57	120.000	Pass
374.970	25.60	59.8	34.2	-2.85	V	-0.1	3.31	120.000	Pass
500.010	22.77	59.8	37.03	0.00	V	8.1	2.60	120.000	Pass
750.000	24.16	59.8	35.64	3.07	H	97.6	1.24	120.000	Pass
849.990	33.52	59.8	26.28	4.23	H	92.2	1.03	120.000	Pass
849.990	32.81	59.8	26.99	5.03	V	300.1	1.95	120.000	Pass
875.010	32.63	59.8	27.17	4.72	H	71.2	1.07	120.000	Pass

Figure 7. Worst Case Field Strength, 30MHz – 1GHz (Mid Channel)

Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
375.000	26.44	59.8	33.36	-3.25	H	92.5	3.10	120.000	Pass
375.000	27.87	59.8	31.93	-2.85	V	177.9	3.90	120.000	Pass
499.980	24.25	59.8	35.55	0.00	V	14	3.28	120.000	Pass
699.990	25.73	59.8	34.07	2.22	H	117.2	1.18	120.000	Pass
874.980	31.17	59.8	28.63	4.71	H	95.3	1.03	120.000	Pass
900.000	36.58	59.8	23.22	4.84	H	94.1	0.99	120.000	Pass
900.000	32.14	59.8	27.66	5.84	V	354.1	2.20	120.000	Pass

Figure 8. Worst Case Field Strength, 30MHz – 1GHz (High Channel)

Radiated Spurious Emission Plots	
	
30MHz – 1GHz, Vertical, Low Ch.	30MHz – 1GHz, Horizontal, Low Ch.
	
30MHz – 1GHz, Vertical, Mid Ch.	30MHz – 1GHz, Horizontal, Mid Ch.
	
30MHz – 1GHz, Vertical, High Ch.	30MHz – 1GHz, Horizontal, High Ch.

Frequency [MHz]	PK Level [dBµV/m]	PK Limit [dBµV/m]	PK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
1,218.500	48.53	70.2	21.67	0.24	H	63.7	1.36	1,000.000	Pass
1,218.500	49.13	70.2	21.07	0.26	V	360.2	3.97	1,000.000	Pass
1,375.000	40.81	70.2	29.39	-0.01	V	145.1	1.50	1,000.000	Pass
1,624.500	49.95	70.2	20.25	-2.98	V	156.4	3.08	1,000.000	Pass
2,030.500	45.51	70.2	24.69	-1.00	V	187.1	1.95	1,000.000	Pass
2,436.500	46.65	70.2	23.55	-2.06	H	83.8	2.93	1,000.000	Pass
2,436.500	44.53	70.2	25.67	-2.02	V	136.1	2.23	1,000.000	Pass
2,842.500	45.79	70.2	24.41	-3.09	H	180.7	2.09	1,000.000	Pass

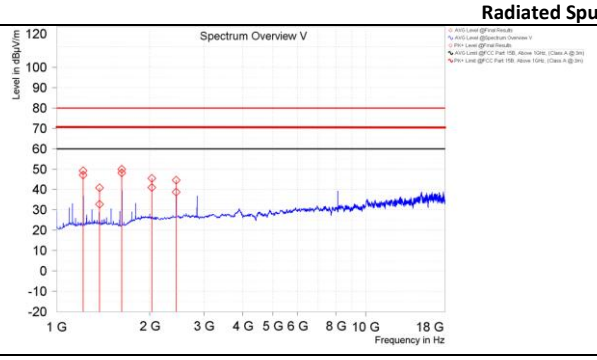
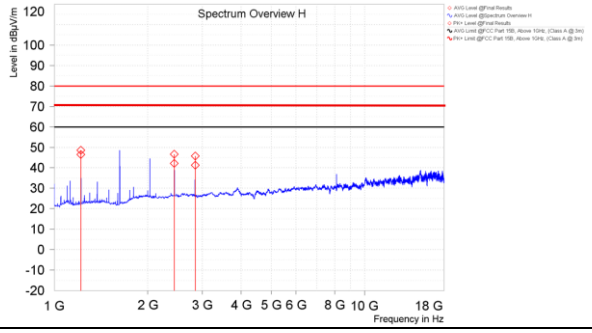
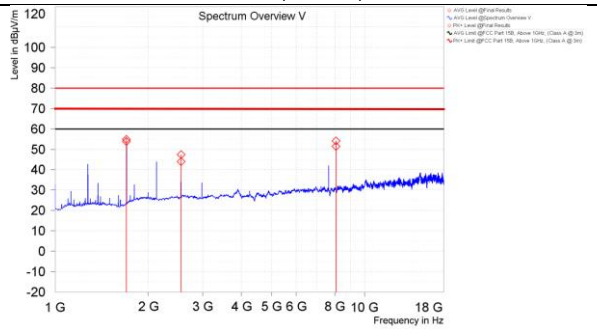
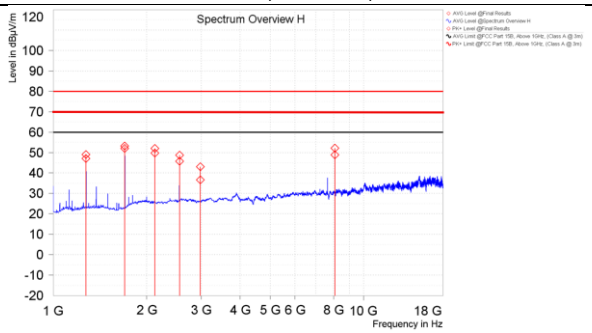
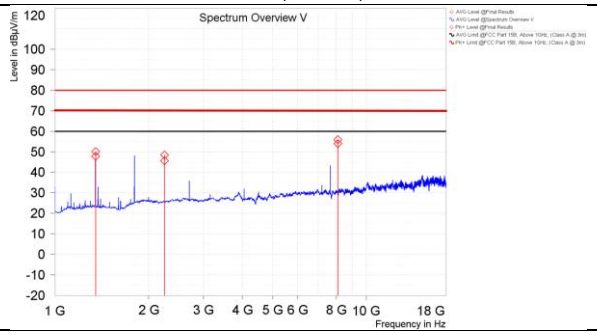
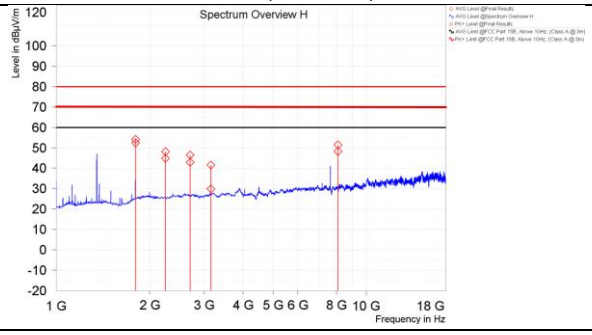
Figure 9. Worst Case Field Strength, 1GHz – 18GHz (Low Channel)

Frequency [MHz]	PK Level [dBµV/m]	PK Limit [dBµV/m]	PK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
1,275.000	49.03	70.2	21.17	0.49	H	51.4	1.49	1,000.000	Pass
1,700.000	53.16	70.2	17.04	-2.48	H	170.8	1.43	1,000.000	Pass
1,700.000	54.88	70.2	15.32	-2.18	V	176.1	2.96	1,000.000	Pass
2,125.000	52.01	70.2	18.19	-2.00	H	191.7	2.97	1,000.000	Pass
2,550.000	48.72	70.2	21.48	-2.34	H	199.3	1.61	1,000.000	Pass
2,550.000	47.45	70.2	22.75	-2.20	V	206.9	2.09	1,000.000	Pass
2,975.000	43.07	70.2	27.13	-3.40	H	202.9	3.71	1,000.000	Pass
8,075.000	52.15	70.2	18.05	-4.04	H	92.7	4.00	1,000.000	Pass
8,075.000	54.12	70.2	16.08	-4.02	V	160.8	1.66	1,000.000	Pass

Figure 10. Worst Case Field Strength, 1GHz – 18GHz (Mid Channel)

Frequency [MHz]	PK Level [dBµV/m]	PK Limit [dBµV/m]	PK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Result
1,350.000	50.02	70.2	20.18	0.33	V	360	3.67	1,000.000	Pass
1,800.000	54.08	70.2	16.12	-1.07	H	88.9	2.99	1,000.000	Pass
2,250.000	48.12	70.2	22.08	-2.80	H	191.9	2.50	1,000.000	Pass
2,250.000	48.44	70.2	21.76	-2.61	V	180.6	2.00	1,000.000	Pass
2,700.000	46.53	70.2	23.67	-2.39	H	190.2	2.25	1,000.000	Pass
3,150.000	41.54	70.2	28.66	-2.19	H	188	1.64	1,000.000	Pass
8,100.000	51.35	70.2	18.85	-4.21	H	118.5	2.99	1,000.000	Pass
8,100.000	55.87	70.2	14.33	-4.21	V	159.3	1.51	1,000.000	Pass

Figure 11. Worst Case Field Strength, 1GHz – 18GHz (High Channel)

Radiated Spurious Emission Plots	
	
1GHz – 18GHz, Vertical, Low Ch.	1GHz – 18GHz, Horizontal, Low Ch.
	
1GHz – 18GHz, Vertical, Mid Ch.	1GHz – 18GHz, Horizontal, Mid Ch.
	
1GHz – 18GHz, Vertical, High Ch.	1GHz – 18GHz, Horizontal, High Ch.

Frequency Stability

§ 90.213 / RSS-119 (5.3)

Test Requirement(s): Transmitters in the 406 – 512MHz band that support a 6.25kHz channel bandwidth must maintain a frequency stability of ±0.5ppm

Test Procedure: The EUT was placed in the Environmental Chamber and allowed to reach desired temperature. A spectrum analyzer was used to measure the frequency drift. The EUT was set to transmit in the operating frequency range. Frequency drift was investigated for the extreme temperatures and nominal temperature, until the unit is stabilized then recorded the reading in tabular format with the temperature range of -30º to 50ºC.

Test Results: The MDS Orbit SD4 Industrial Radio was compliant with the frequency stability requirements.

Test Engineer(s): Sergio Gutierrez

Test Date(s): 5/5/2026 – 5/6/2026

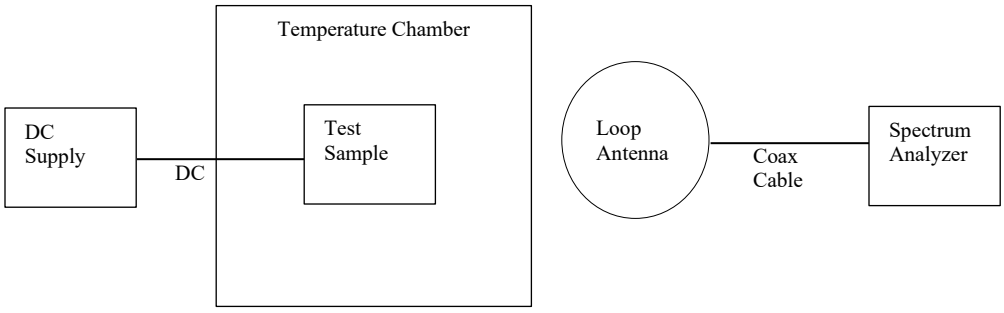


Figure 12. Temperature Stability Test Setup

Operating Freqeuncy:	406,100,000	Hz
Reference Voltage:	13.8	VDC
Deviation Limit:	0.5	ppm

Voltage %	Voltage (VDC)	Temp (°C)	Measured Frequency (Hz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
100%	13.8	-30	406,099,987	-13	-0.0320	0.50
100%	13.8	-20	406,100,003	3	0.0074	0.50
100%	13.8	-10	406,100,001	1	0.0025	0.50
100%	13.8	0	406,100,024	24	0.0591	0.50
100%	13.8	10	406,100,006	6	0.0148	0.50
100%	13.8	20	406,100,001	1	0.0025	0.50
100%	13.8	30	406,100,003	3	0.0074	0.50
100%	13.8	40	406,099,989	-11	-0.0271	0.50
100%	13.8	50	406,100,007	7	0.0172	0.50
Low	10	20	406,099,969	-31	-0.0763	0.50
High	30	20	406,100,001	1	0.0025	0.50

Figure 13. Frequency Stability Test Results (Low Channel)

Operating Freqeuncy:	425,000,000	Hz
Reference Voltage:	13.8	VDC
Deviation Limit:	0.5	ppm

Voltage %	Voltage (VDC)	Temp (°C)	Measured Frequency (Hz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
100%	13.8	-30	424,999,992	-8	-0.0188	0.50
100%	13.8	-20	425,000,002	2	0.0047	0.50
100%	13.8	-10	424,999,987	-13	-0.0306	0.50
100%	13.8	0	425,000,009	9	0.0212	0.50
100%	13.8	10	425,000,013	13	0.0306	0.50
100%	13.8	20	424,999,998	-2	-0.0047	0.50
100%	13.8	30	425,000,007	7	0.0165	0.50
100%	13.8	40	425,000,001	1	0.0024	0.50
100%	13.8	50	425,000,013	13	0.0306	0.50
Low	10	20	424,999,998	-2	-0.0047	0.50
High	30	20	424,999,991	-9	-0.0212	0.50

Figure 14. Frequency Stability Test Results (Mid Channel)

Operating Freqeuncy:	450,000,000		Hz			
Reference Voltage:	13.8		VDC			
Deviation Limit:	0.5		ppm			
Voltage %	**Voltage (VDC)**	**Temp (°C)**	**Measured Frequency (Hz)**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
100%	13.8	-30	449,999,990	-10	-0.0222	0.50
100%	13.8	-20	449,999,993	-7	-0.0156	0.50
100%	13.8	-10	450,000,003	3	0.0067	0.50
100%	13.8	0	450,000,012	12	0.0267	0.50
100%	13.8	10	450,000,006	6	0.0133	0.50
100%	13.8	20	450,000,014	14	0.0311	0.50
100%	13.8	30	450,000,008	8	0.0178	0.50
100%	13.8	40	449,999,995	-5	-0.0111	0.50
100%	13.8	50	450,000,012	12	0.0267	0.50
Low	10	20	450,000,005	5	0.0111	0.50
High	30	20	449,999,995	-5	-0.0111	0.50

Figure 15. Frequency Stability Test Results (High Channel)

Transient Frequency Behavior

§ 90.214 / RSS-119 (5.9)

Test Requirement(s): Transmitters designed to operate in the 150-174 MHz and 421-512 MHz frequency bands must maintain transient frequencies within the maximum frequency difference limits during the time intervals indicated:

Time intervals [1] [2]	Maximum frequency difference [3]	All equipment	
		150 to 174 MHz	421 to 512 MHz
Transient Frequency Behavior for Equipment Designed to Operate on 25 kHz Channels			
t_1 [4]	±25.0 kHz	5.0 ms	10.0 ms
t_2	±12.5 kHz	20.0 ms	25.0 ms
t_3 [4]	±25.0 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels			
t_1 [4]	±12.5 kHz	5.0 ms	10.0 ms
t_2	±6.25 kHz	20.0 ms	25.0 ms
t_3 [4]	±12.5 kHz	5.0 ms	10.0 ms
Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels			
t_1 [4]	±6.25 kHz	5.0 ms	10.0 ms
t_2	±3.125 kHz	20.0 ms	25.0 ms
t_3 [4]	±6.25 kHz	5.0 ms	10.0 ms

[1] t_{on} is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.

t_1 is the time period immediately following t_{on}.

t_2 is the time period immediately following t_1.

t_3 is the time period from the instant when the transmitter is turned off until t_{off}.

t_{off} is the instant when the 1 kHz test signal starts to rise.

Test Procedure: The procedure outlined in ANSI C63.26 Section 6.5.2.2 was followed for the tests. The test sample was configured to transmit an unmodulated CW signal which was connected to a spectrum analyzer via an RF combiner through appropriate attenuation. The other side of the RF combiner was connected to a signal generator that was set to transmit the same frequency as the test sample but with FM modulation modulated with a 1kHz tone. The analyzer was equipped with an analog demodulation analysis application which was used to display demodulated FM frequency vs time. The analyzer was configured to trigger on a modulation change (FM to CW) to indicate the instant that the transmitter had switched on. The trace was observed and the T1, T2 times were captured. T3 was then captured by switching the analyzer to trigger on the transition from CW to FM modulation.

Test Results: The MDS Orbit SD4 Industrial Radio was compliant with the requirements for transient frequency behavior.

Test Engineer(s): Bryan Taylor

Test Date(s): 5/29/2026 – 6/1/2026

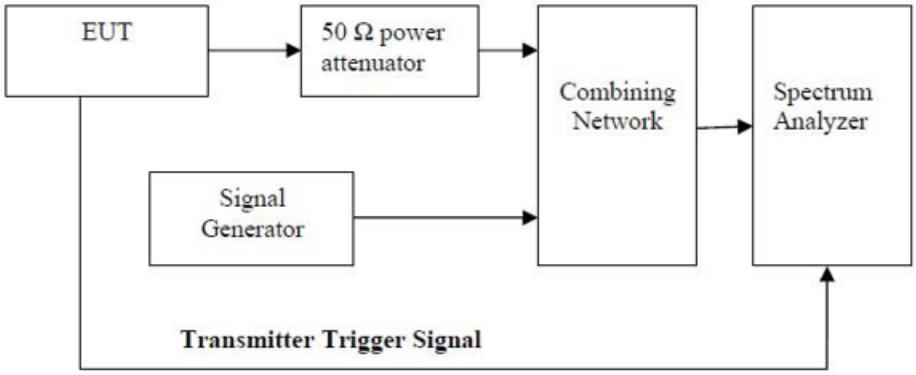


Figure 16. Transient Frequency Behavior Configuration

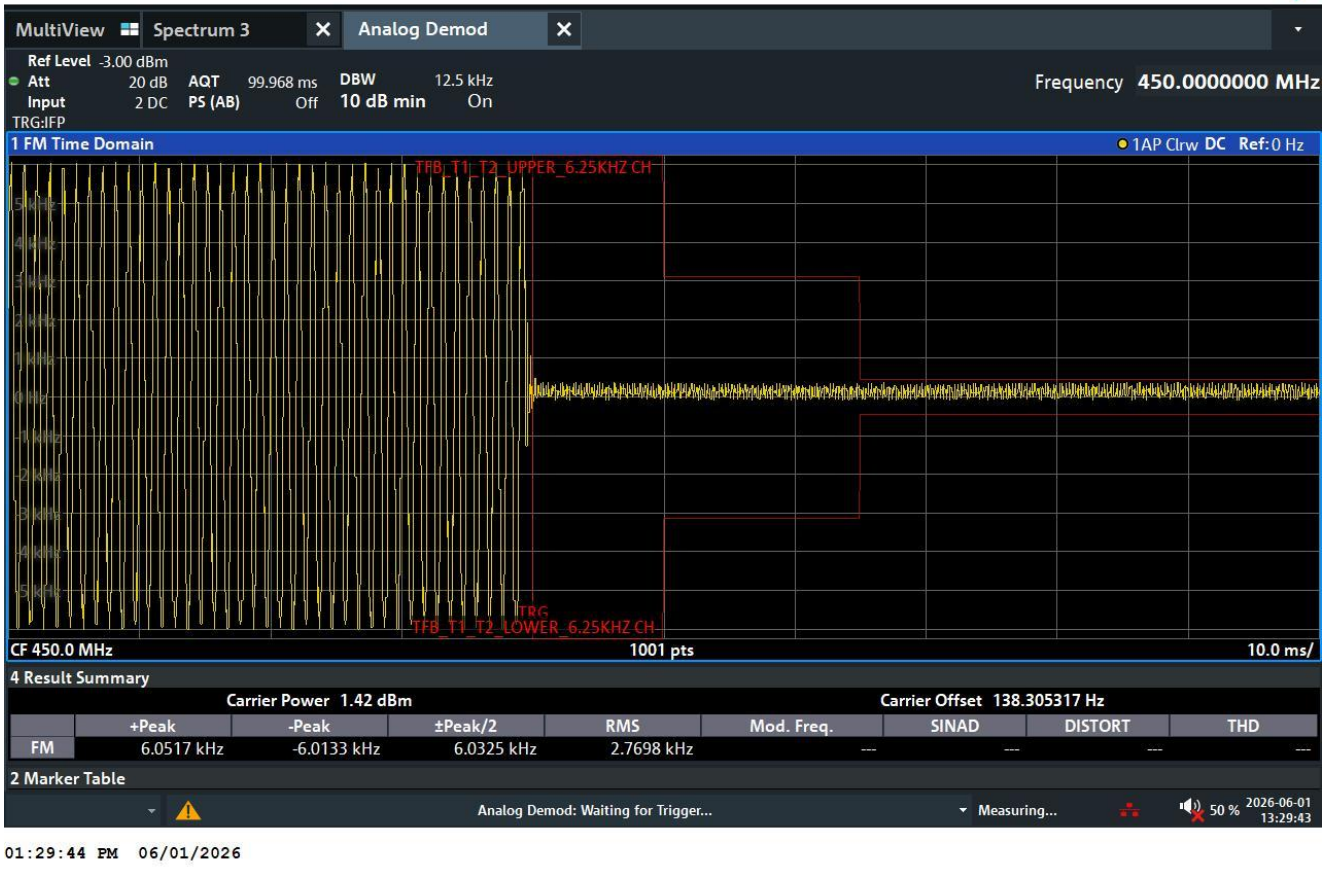


Figure 17. T1-T2, 6.25kHz Channel

Figure 18. T3, 6.25kHz Channel

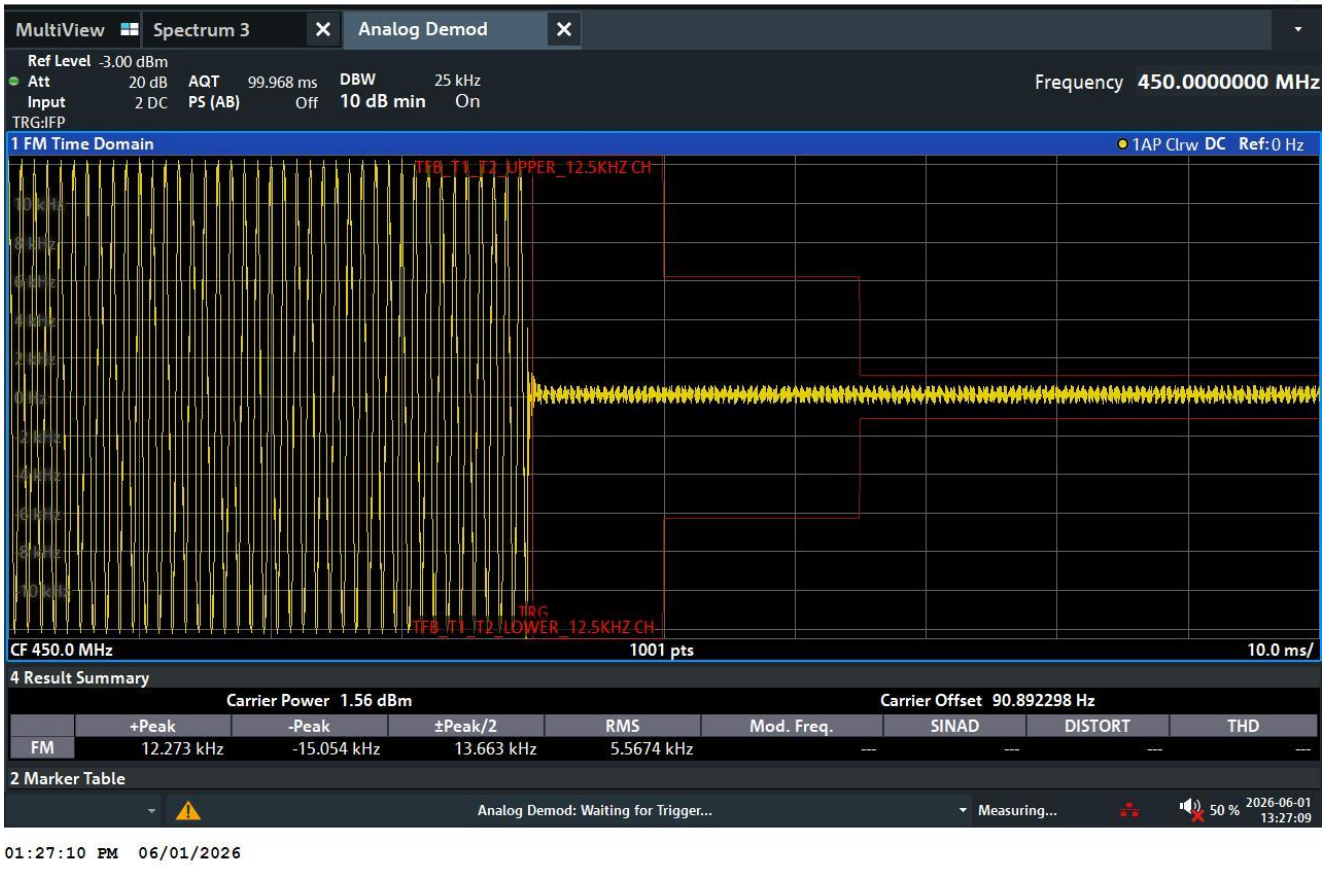
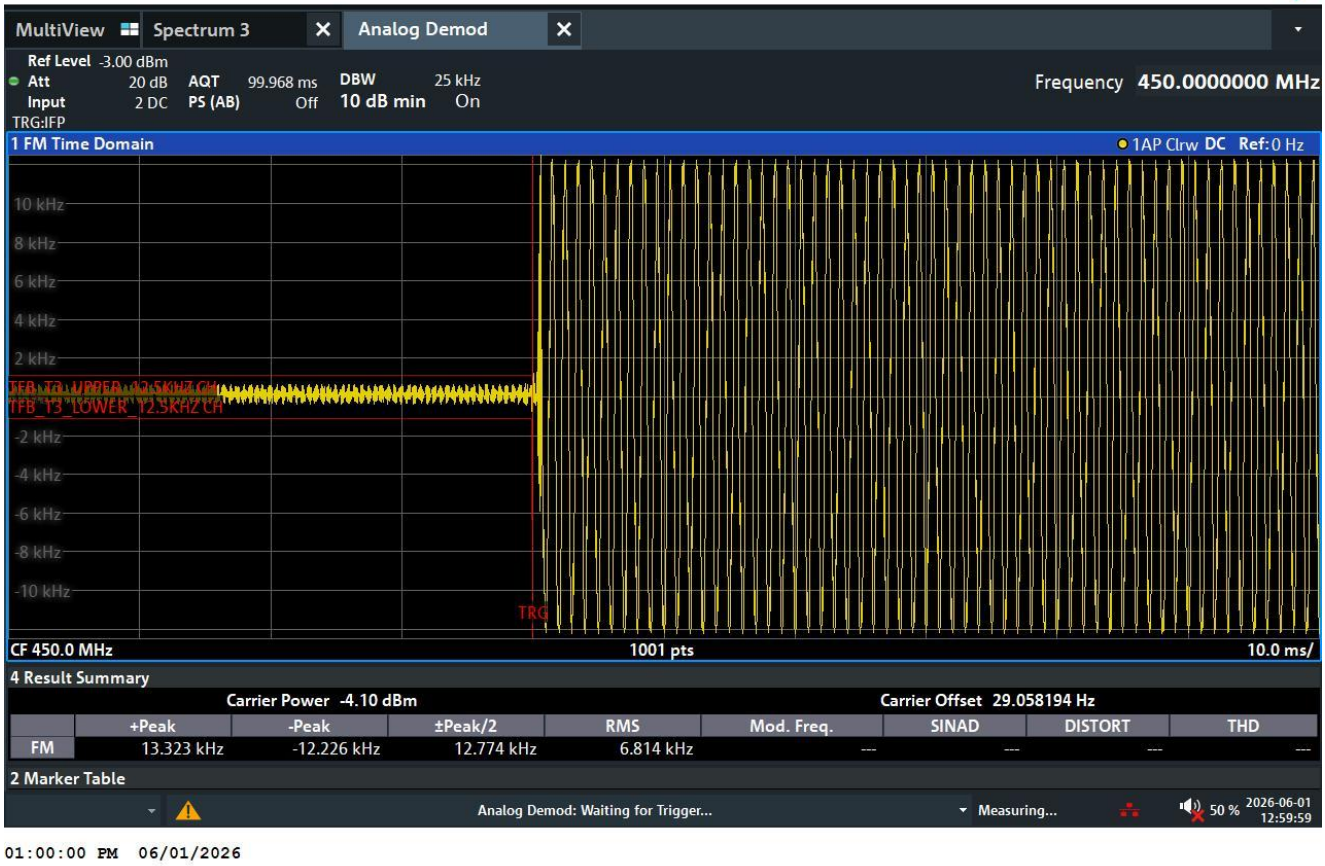


Figure 19. T1-T2, 12.5kHz Channel



01:00:00 PM 06/01/2026

Figure 20. T3, 12.5kHz Channel

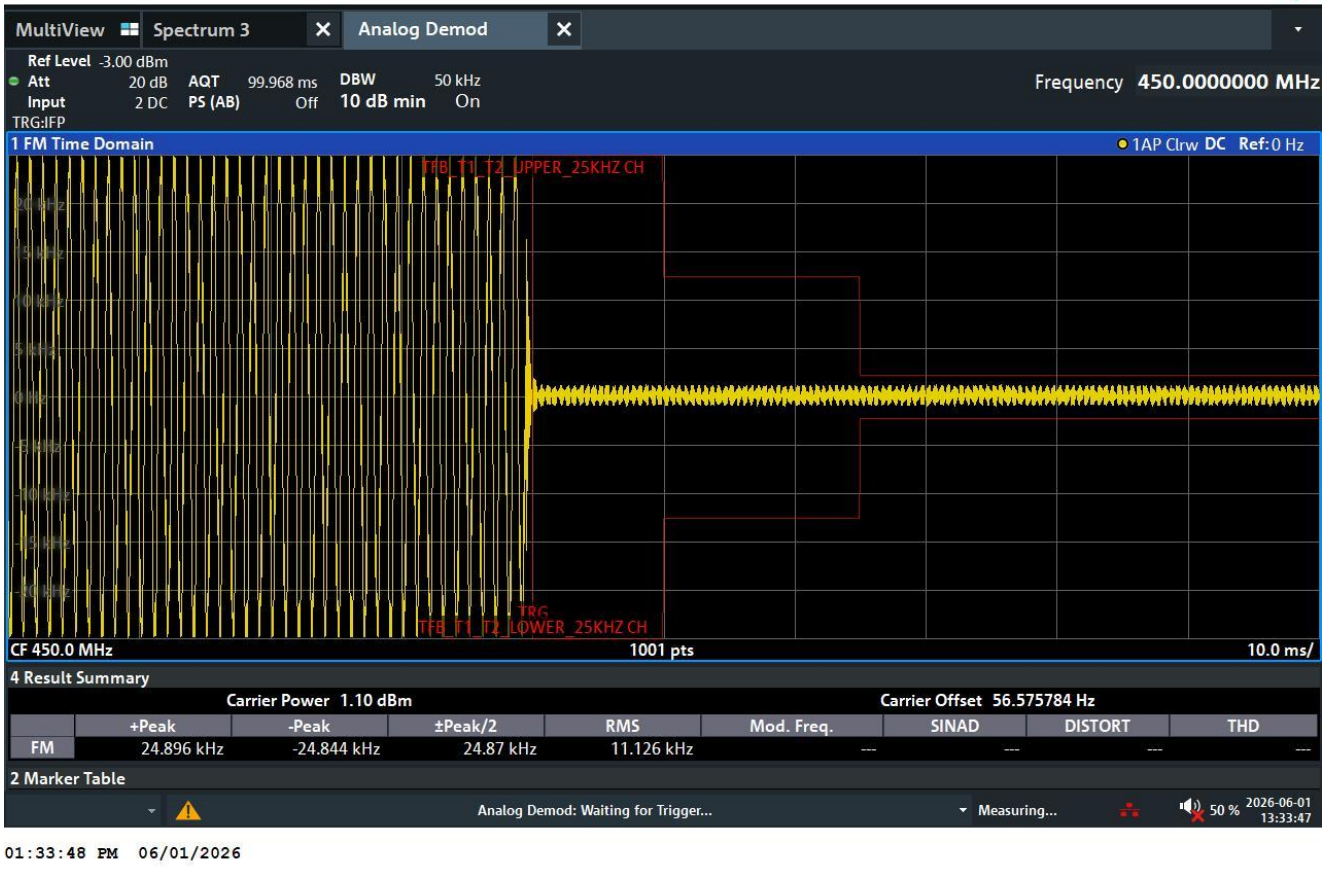


Figure 21. T1-T2, 25kHz Channel

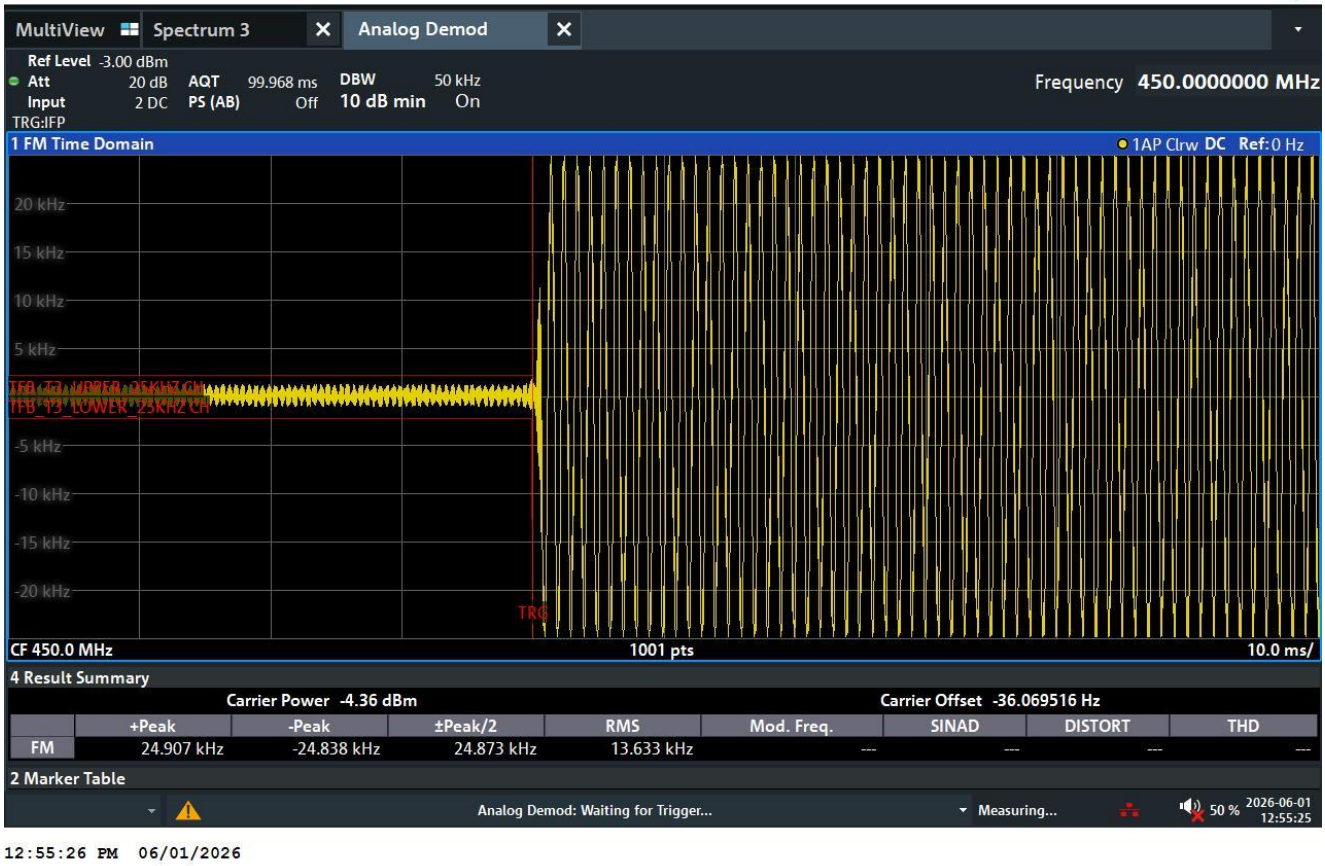


Figure 22. T3, 25kHz Channel

Test Equipment

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

MET Asset #	Description	Manufacturer	Model	Last Cal Date	Cal Due Date
1A1234	Signal Analyzer	Rohde & Schwarz	FSV40	03/13/2025	03/13/2027
1A1250	Receiver	Rohde & Schwarz	ESW44	04/03/2026	04/03/2027
140-1315006-C	Receiver	Rohde & Schwarz	EPL	12/16/2025	12/16/2026
1S3905	Signal Generator	Keysight	EXG	02/03/2025	02/03/2027
1A1176	Active Loop Antenna (9KHz-30MHz)	ETS-Lindgren	6502	8/22/2024	08/22/2026
1A1050	Bilog Antenna (30MHz – 1GHz)	Schaffner	CBL5112D	04/08/2026	04/08/2028
1A1047	Horn Antenna (1GHz – 18GHz)	ETS - Lindgren	3117	06/26/2024	06/26/2026
1A1161	Horn Antenna (18GHz – 40GHz)	ETS Lindgren	3116C	08/01/2024	08/01/2026
1A1117	Digital Multimeter	Fluke	87 III	12/19/2025	12/19/2026
1A1225	Environmental Chamber	Espec	EXP-2H/New	05/16/2025	05/16/2026
1A1099	Generator	Com-Power	CGO-51000	See Note	
1A1088	Preamplifier	Rohde & Schwarz	TS-PR1	See Note	
1A1044	Generator	Com-Power	CG-520	See Note	
1A1073	Multi Device Controller	ETS	2090	See Note	
1A1074	System Controller	Panasonic	WV-CU101	See Note	
1A1080	Multi-Device	ETS	2090	See Note	
1A1180	Preamplifier	Miteq	AMF-7D-01001800-22-10P	See Note	

Table 13. Test Equipment List

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.

End of Report