NVLAP TESTING
NVLAP Lab Code 200087-0

Rogers Labs, a division of The Compatibility Center LLC

7915 Nieman Rd.
Lenexa, KS 66214
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FCC Class 2 Permissive Change
ISED Class 3 Permissive Change
Test Report for Certification
Model: A04853

2402-2480 and 2412-2462 MHz Digital Transmission System (DTS)

FCC ID: IPH-04853 IC: 1792A-04853

Garmin International, Inc.

1200 East 151st Street
Olathe, KS 66062
Claire Fryman
Compliance Engineer 2

Test Report Number: 251009
Test Date: October 9, 2025 – October 27, 2025

Authorized Signatory:

Patrick Powell
Rogers Labs, a division of The Compatibility Center LLC
FCC Designation: US5305
FCC Test Firm Registration #: 315994
ISED Registration: 3041A

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Revisions

Revision 1 Issued November 8, 2025 – Initial Release

Revision 2 Issued November 13, 2025 – incorporated customer feedback.

Revision 3 Issued November 20, 2025 – added lab FCC registration number to cover page.

Executive Summary

The following information is submitted for consideration in processing Permissive Change (FCC Class 2 and ISED Class 3) of authorized equipment per CFR 2.1043 & RSP-100 Section 10.2. The model A04853, (FCC ID: IPH-04853 / ISED ID: 1792A-04853) has been granted authorization operating under 47CFR part 15C and Industry Canada RSS-247 operations in the 2402 - 2480 MHz frequency band. Via software changes only (no hardware), the manufacturer has enabled use of an ANT transmitter whose circuitry was included in the hardware of the originally granted device EUTs. This report will show that the ANT transmitter fits into the parameters of the original DTS grant.

Name of Applicant: Garmin International, Inc.
1200 East 151st Street
Olathe, KS 66062

Original Grant info:

Model: A04853 FCC I.D.: IPH-04853 / ISED ID: 1792A-04853

Relevant Frequency Range (DTS): 2402 - 2480 MHz

Relevant Operating Power (DTS): 0.005 W

Mode	Power (Watts)	99% OBW (kHz)	6-dB OBW (kHz)
Mode 16, ANT	0.001	1,044.8	558.0

This fits within confines of the original DTS grant.

Opinion / Interpretation of Results

Tests Performed	Margin (dB)	Results
Restricted Band Emissions 15.205, RSS-GEN, RSS-247	-8.8	Complies
AC Line Emissions as per 47CFR 15.207, RSS-GEN 8.8	N/A	Complies
Radiated Emissions 47 CFR 15.209, RSS-GEN 8.9	-9.2	Complies
Harmonic Emissions per 47CFR 15.247, RSS-247	-2.9	Complies
Power Spectral Density per 47CFR 15.247, RSS-247	-17.3	Complies

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Equipment Tested

Model: A04853

Garmin International, Inc.

1200 East 151st Street

Olathe, KS 66062

Equipment	Model / PN	Serial Number
EUT #1 Radiated	A04853	953000000
EUT #2 Antenna Port Conducted	A04853	3618445051
USB Cable	320-01545-00	N/A
USB Cable	320-01563-00	N/A
USB Cable	320-01563-10	N/A
CLA	013-00797-13	N/A
CLA	013-00970-00	N/A
CLA	013-00970-10	N/A
Laptop Computer	Latitude 7480	EFSPSN2
USB Printer	Dell 0N5819	5D1SL61

Test results in this report relate only to the items tested. Worst-case configuration data recorded in this report.

The design may operate one transmitter chain at a time and is not capable of simultaneous transmission on more than one port.

Software: v2.00; Antennas: 2.4 GHz PIFA (4.4 dBi), 5.1 GHz PIFA (6.0 dBi), 5.7 GHz PIFA (6.5 dBi)

Environmental Conditions

Ambient Temperature	22.1° C
Relative Humidity	46.0 %
Atmospheric Pressure	1012.7 mb

Equipment Function

The EUT is a GPS receiver, graphical display, and user interface unit providing GPS reception, graphical display of location, navigation, and other information for the user. The design offers use as a hand-held, transportation mounted or portable configuration for use in navigational applications. The design incorporates transmitter circuitry operating in the 2402-2480, 5150-5250, and 5725-5850 MHz frequency bands. The typical use configuration has the EUT attached to a magnetic power mount which provides connection to external power and other optional inputs/outputs. The design provides a Micro SD Card slot and USB-C interface port as presented below and wireless communications with compatible equipment. The EUT operates from direct current power provided external power or internal rechargeable battery. External power may be supplied through the magnetic power mount and installation vehicle, 12-V TA DC power cable, AC/DC power adapter, or compliant USB interface as documented in this report. The EUT was arranged as described by the manufacturer emulating typical user configurations for testing purposes. The EUT offers no other interface connections than those presented in the configuration options as described by the manufacturer and presented below. For testing purposes, the EUT received power from both internal and external power options and configurations. During testing, the test system was configured to operate in a manufacturer defined mode. The manufacturer provided test software for testing transmitter and equipment function. The software provided the ability to operate the transmitters at near 100% duty cycle for testing purposes. The testing mode of operation exceeds typical duty cycle operation of production equipment. As requested by the manufacturer the equipment was tested for emissions compliance using the available configurations with the worst-case data presented. Test results in this report relate only to the products described in this report.

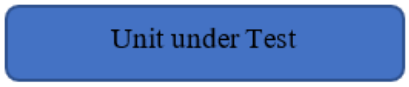
Equipment Operational Modes

Mode	Transmitter Operation
1	BT BR (GFSK)
2	BT (2EDR π/4 DQPSK)
3	BT (3EDR 8DPSK)
4	BT BLE (GMSK)
5	802.11b
6	802.11g
7	802.11n
8	U-NII-1 802.11a
9	U-NII-1 802.11n
10	U-NII-1 802.11n40
11	U-NII-1 802.11ac80
12	U-NII-3 802.11a
13	U-NII-3 802.11n
14	U-NII-3 802.11n40
15	U-NII-3 802.11ac80
16	**ANT**

Note: Mode 16 ANT is the subject of this C2PC report.

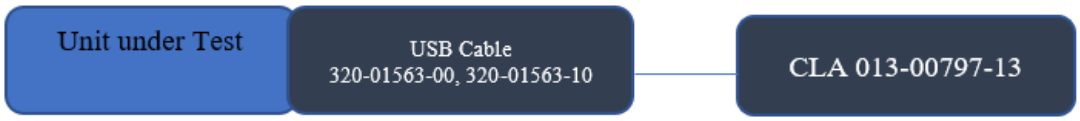
Equipment Configuration

1) EUT operating off internal battery



2) EUT connected to Computer USB port through cable assembly.

3) EUT connected to DC Through USB cable connected to CLA.



4) EUT connected to DC Through USB cables connected to CLA.

Test Software

Test Software List			
Description	Manufacturer	Model	Version
Automated EMC testing software system	ETS Lindgren	Tile!	7.9.1.1

The above software was used in acquiring some of the test data used in our report.

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Application for Certification

(1) Manufacturer: Garmin International, Inc.
1200 East 151st Street
Olathe, KS 66062

(2) Identification: Model: A04853
FCC ID: IPH-04853 IC: 1792A-04853

(3) Instruction Book:

Refer to Original Filing Exhibit for Instruction Manual.

(4) Description of Circuit Functions:

Refer to Original Filing Exhibit of Operational Description.

(5) Block Diagram with Frequencies:

Refer to Original Filing Exhibit of Operational Description.

(6) Report of Measurements:

Report of measurements follows in this Report.

(7) Photographs: Construction, Component Placement, etc.:

Refer to Original Filing Exhibit for photographs of equipment.

(8) List of Peripheral Equipment Necessary for operation. The equipment operates from direct current power. The host design provides USB-C interface port for power and communications as presented in this filing. The EUT offers no other connection ports than those presented in this filing.

(9) Transition Provisions of CFR47 15.37 are not requested.

(10) Not Applicable. The unit is not a scanning receiver.

(11) Not Applicable. The EUT does not operate in the 59 – 64 GHz frequency band.

(12) The equipment is not software defined and this section is not applicable.

(13) Applications for certification of U-NII devices in the 5.15-5.35 GHz and the 5.47-5.85 GHz bands must include a high-level operational description of the security procedures that control the radio frequency operating parameters and ensure that unauthorized modifications cannot be made. This requirement is not applicable to his DTS device.

(14) Contain at least one drawing or photograph showing the test set-up for each of the required types of tests applicable to the device for which certification is requested. These drawings or photographs must show enough detail to confirm other information contained in the test report. Any photographs used must be focused originals without glare or dark spots and must clearly show the test configuration used. This information is provided in this report and Test Setup Exhibits provided with the application filing.

Statement of Modifications and Deviations

No modifications to the EUT were required for the equipment to demonstrate compliance with the 47CFR Part 15C, Industry Canada RSS-247 Issue 4, and RSS-GEN Issue 5 emission requirements. There were no deviations to the specifications.

Applicable Standards & Test Procedures

The following information is submitted in accordance with the eCFR (electronic Title 47 Code of Federal Regulations) (47CFR), dated February 15, 2024: Part 2, Subpart J, paragraphs 2.932 and 2.1043, Part 15C Paragraph 15.247, RSS-247 Issue 4, and RSS-GEN Issue 5. Test procedures used are the established Methods of Measurement of Radio-Noise Emissions as described in ANSI C63.10-2020. This report documents compliance for the EUT operations as Digital Transmission Systems operation.

Test Site Locations

Conducted EMI	AC line conducted emissions testing performed in a shielded screen room located at Rogers Labs, a division of The Compatibility Center LLC, 7915 Nieman Rd., Lenexa, KS (or satellite location).
Antenna port	Antenna port conducted emissions testing was performed in a shielded screen room located at Rogers Labs, a division of The Compatibility Center LLC, 7915 Nieman Rd., Lenexa, KS (or satellite location).
Radiated EMI	The radiated emissions tests were performed at the 3 meters Semi-Anechoic Chamber (SAC) located at Rogers Labs, a division of The Compatibility Center LLC, 7915 Nieman Rd., Lenexa, KS.

Registered Site information: FCC Site: US5305, ISED: 3041A, CAB Identifier: US0096

NVLAP Accreditation Lab code 200087-0

Units of Measurements

Conducted EMI Data presented in dBµV; dB referenced to one microvolt

Antenna port Conducted Data is in dBm; dB referenced to one milliwatt

Radiated EMI Data presented in dBµV/m; dB referenced to one microvolt per meter

Note: The limit is expressed for a measurement in dBµV/m when the measurement is taken at a distance of 3 or 10 meters. Data taken for this report was taken at distance of 3 meters. Sample calculation demonstrates corrected field strength reading for Semi-Anechoic Chamber using the measurement reading and correcting for receive antenna factor, cable losses, and amplifier gains.

Sample Radiated Measurement Calculations:

RFS = Radiated Field Strength, FSM = Field Strength Measured

A.F. = Receive antenna factor, Losses = attenuators/cable losses, Gain = amplification gains

RFS (dBµV/m @ 3m) = FSM (dBµV) + A.F. (dB/m) + Losses (dB) - Gain (dB)

Frequency: 9 kHz-30 MHz	Frequency: 30 MHz- 1 GHZ	Frequency: Above 1 GHz
Loop Antenna	Broadband Biconilog	Horn
RBW = 9 kHz	RBW = 120 kHz	RBW = 1 MHz
VBW = 30 kHz	VBW = 500 kHz	VBW = 3 MHz
Sweep time = Auto	Sweep time = Auto	Sweep time = Auto
Detector = PK, QP	Detector = PK, QP	Detector = PK, AV
Antenna Height 1m	Antenna Height 1-4m	Antenna Height 1-4m

Sample Conducted Measurement calculations:

1. Q.P. and AV. Are abbreviations of quasi-peak and average
2. The emission levels or other frequencies were very low against the limit.
3. Margin value = Emission Level – Limit Value
4. Correction Factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

Note: The correction factors are already included in the measurements made by our spectrum analyzer / receivers.

Equipment Testing Procedures

AC Line Conducted Emission Test Procedure

Testing for the AC line-conducted emissions were performed as required in CFR47 15B, RSS-GEN, and directed in ANSI C63.4-2014. The test setup, including the EUT, was arranged in the test configurations as presented during testing. The test configuration was placed on a 1 x 1.5-meter bench, 0.8 meters high located in a screen room. The power lines of the system were isolated from the power source using a standard LISN with a 50-µHy choke. EMI was coupled to the spectrum analyzer through a 0.1 µF capacitor internal to the LISN. The LISN was positioned on the floor beneath the wooden bench supporting the EUT. The power lines and cables were draped over the back edge of the table. Refer to diagram one showing typical test arrangement and photographs in the test setup exhibit for EUT placement used during testing.

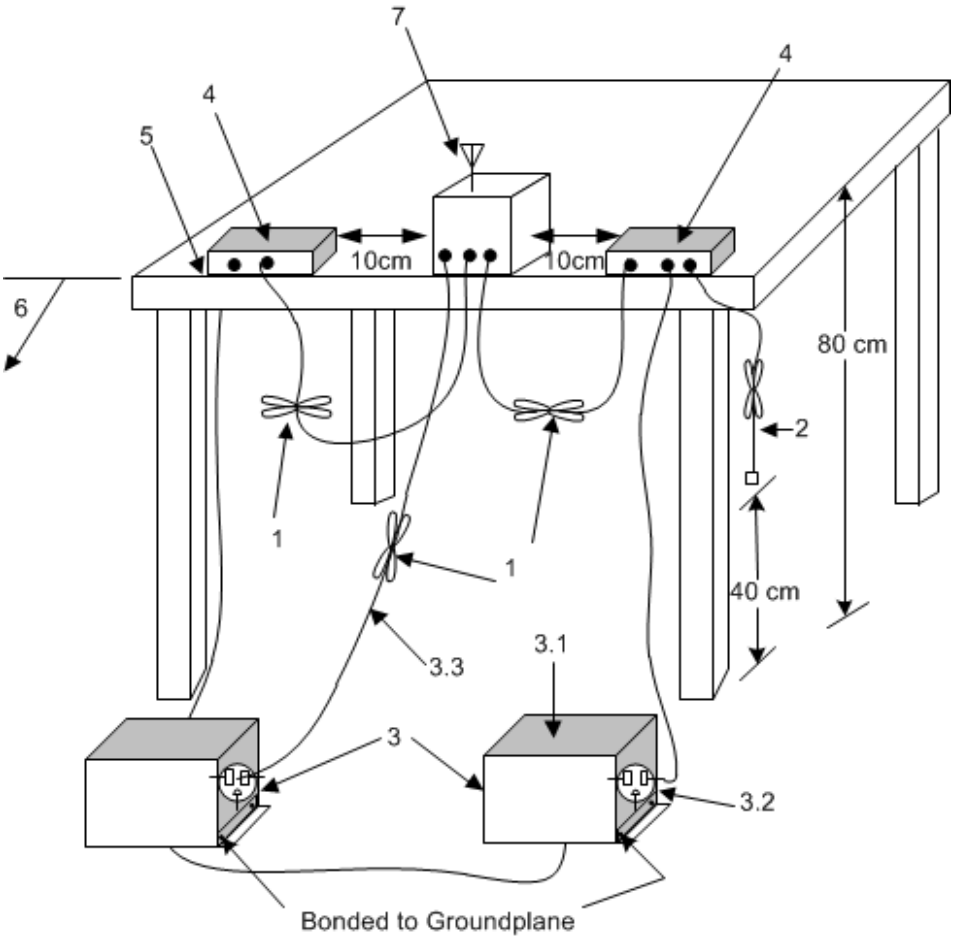
Radiated Emission Procedure

Radiated emissions testing was performed as required in 47CFR 15C, RSS-247 Issue 4, RSS-GEN and specified in ANSI C63.10-2020. The EUT was placed on a rotating 0.9 x 1.2-meter platform, elevated as required above the ground plane at a distance of 3 meters from the FSM antenna. EMI energy was maximized by equipment placement permitting orientation in three orthogonal axes, raising, and lowering the FSM antenna, changing the antenna polarization, and by rotating the turntable. Each emission was maximized before data was taken and recorded. The frequency spectrum from 9 kHz to 25,000 MHz was searched for emissions during preliminary investigation. Refer to diagrams two and three showing typical test setup. Refer to photographs in the test setup exhibits for specific EUT placement during testing.

Antenna Port Conducted Emission Test Procedure

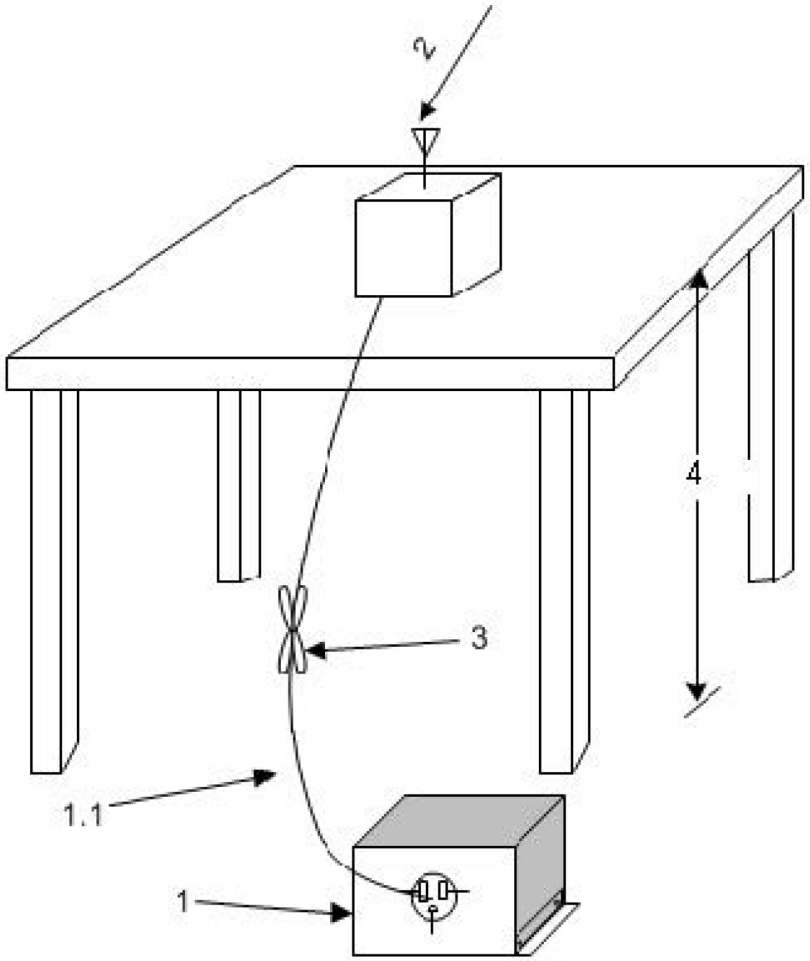
The EUT was assembled as required for operation placed on a benchtop. This configuration provided the ability to connect test equipment to the provided test antenna port Antenna Port conducted emissions testing was performed presented in the regulations and specified in ANSI C63.10-2020. Testing was completed on a laboratory bench in a shielded room. The active antenna port of the device was connected to appropriate attenuation and the spectrum analyzer. Refer to diagram 4 showing typical test arrangement and photographs in the test setup exhibits for specific EUT placement during testing.

Diagram 1 Test arrangement for power-line conducted emissions



1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long see (see 6.2.3.1).
2. I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m (see 6.2.2).
3. EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. LISN can be placed on top of, or immediately beneath, reference ground plane (see 6.2.2 and 6.2.3).
   3.1 All other equipment powered from additional LISN(s).
   3.2 Multiple-outlet strip can be used for multiple power cords of non-EUT equipment.
   3.3 LISN at least 80 cm from nearest part of EUT chassis.
4. Non-EUT components of EUT system being tested.
5. Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop (see 6.2.3.1).
6. Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane (see 6.2.2 for options).
7. Antenna may be integral or detachable. If detachable, the antenna shall be attached for this test

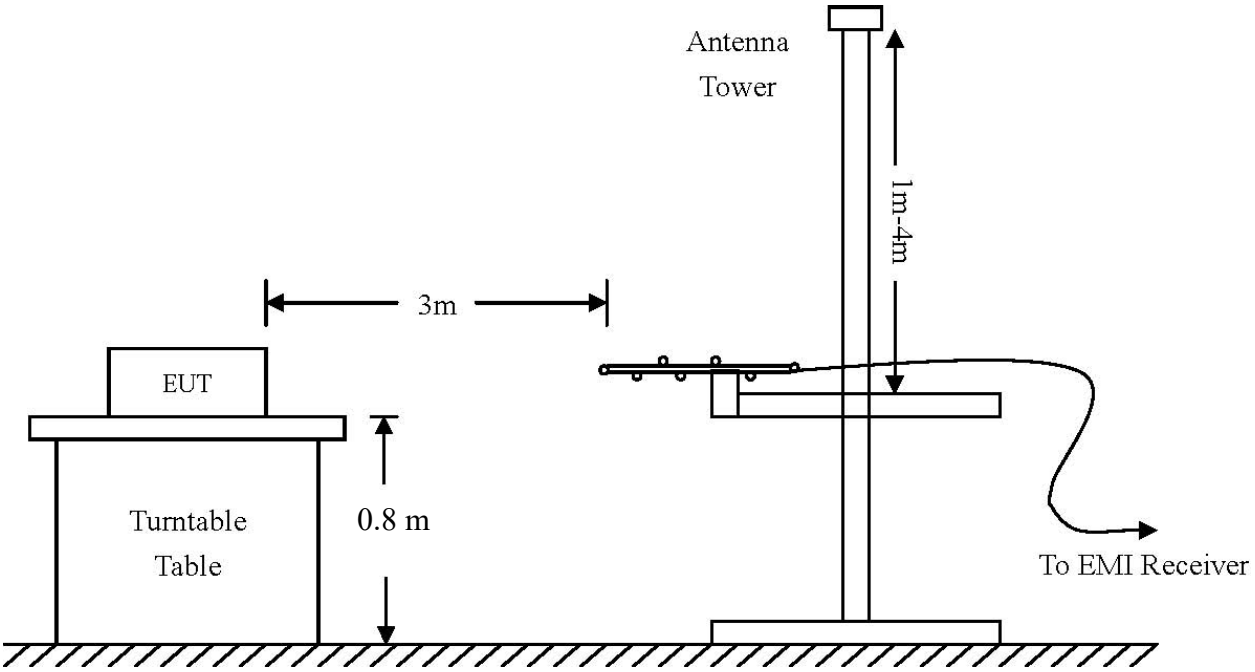
Diagram 2 Test arrangement for radiated emissions of tabletop equipment



1. A LISN is optional for radiated measurements between 30 MHz and 1000 MHz but not allowed for measurements below 30 MHz and above 1000 MHz (see 6.3.1). If used, then connect EUT to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. The LISN may be placed on top of, or immediately beneath, the reference ground plane (see 6.2.2 and 6.2.3.2).
   1.1. LISN spaced at least 80 cm from the nearest part of the EUT chassis.
2. Antenna can be integral or detachable, depending on the EUT (see 6.3.1).
3. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long (see 6.3.1).
4. For emission measurements at or below 1 GHz, the table height shall be 80 cm. For emission measurements above 1 GHz, the table height shall be 1.5 m for measurements, except as otherwise specified (see 6.3.1 and 6.6.3.1).

Diagram 3 Test arrangement for radiated emissions tested in Semi-Anechoic Chamber (SAC) and Outdoor Area Test Site (OATS)

Below 1 GHz



Above 1 GHz:

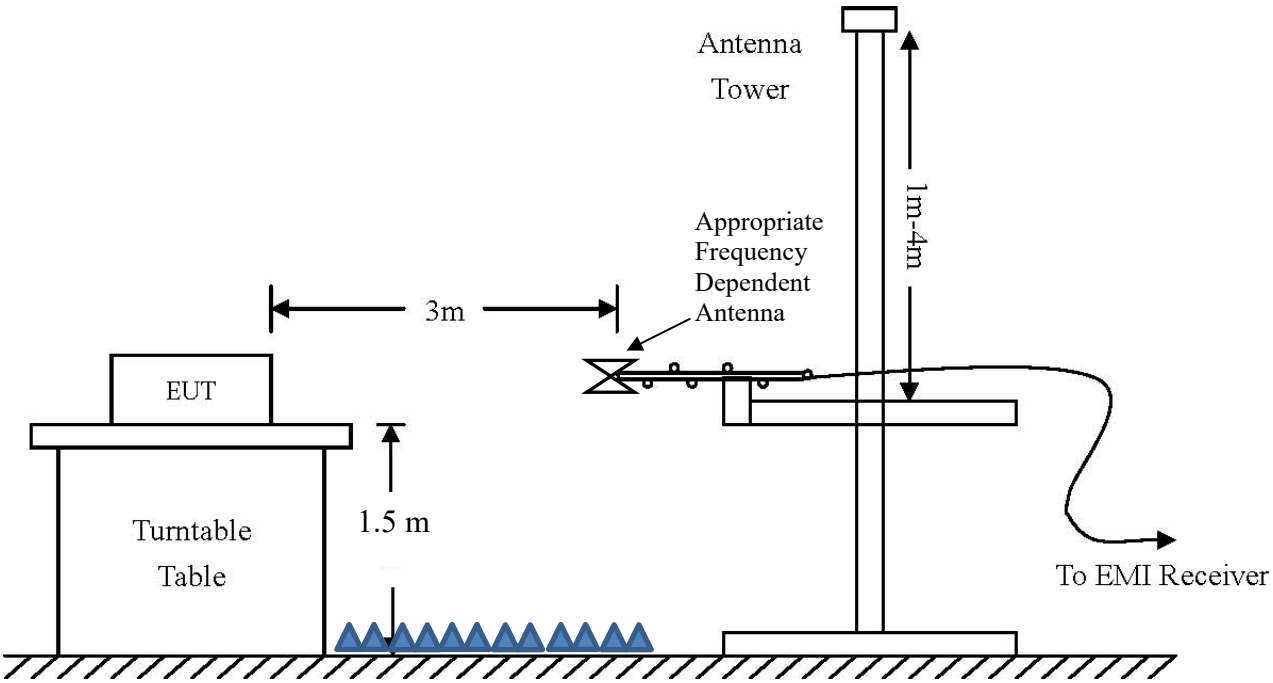
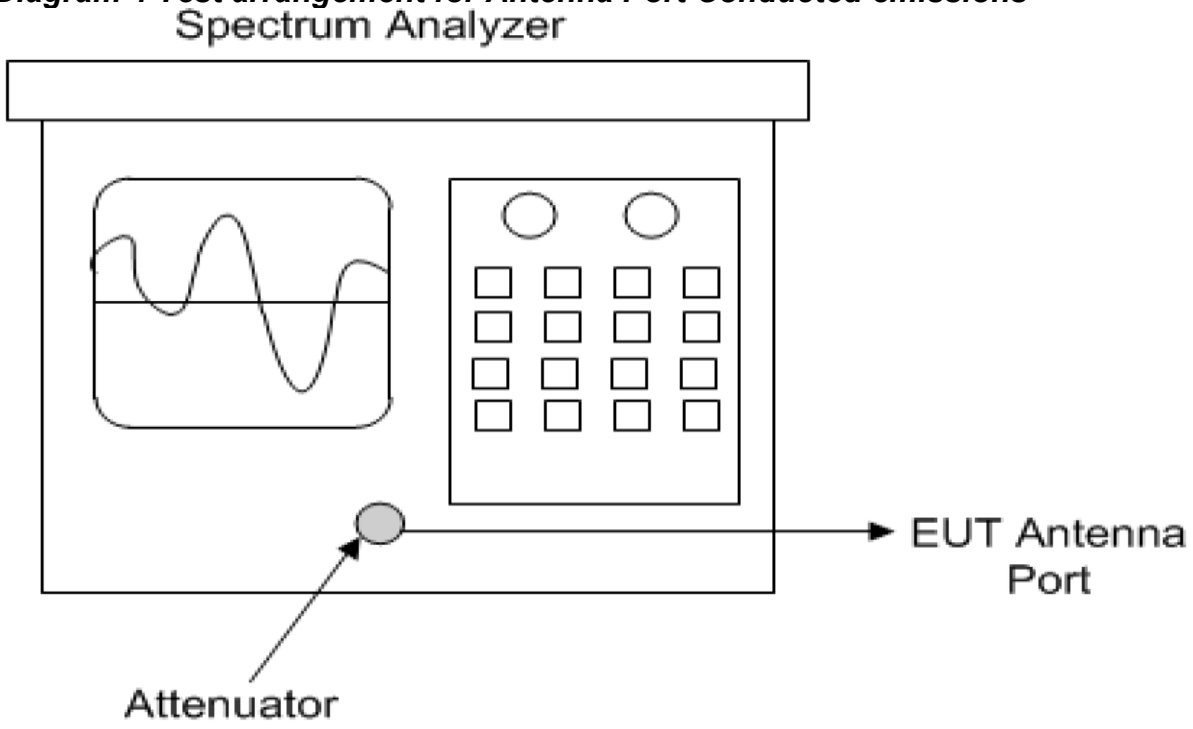


Diagram 4 Test arrangement for Antenna Port Conducted emissions



General Radiated EMI Testing Procedure

Radiated emissions testing was performed as required in 47 CFR 15C, RSS-210 Issue 11, and specified in ANSI C63.10-2020. The EUT was arranged in the test configuration emulating worst-case equipment configuration and operated through available modes. Preliminary testing was performed in a screen room with the EUT positioned one meter from the FSM. Investigations were performed to identify the frequencies, which produced the highest radiated emissions. Radiated emission investigations were performed from 9 kHz to 25,000 MHz with the EUT oriented in the manufacturer defined orientation. The EUT was placed in a semi-anechoic chamber on a rotating 0.9 x 1.2-meter platform, elevated as required above the ground plane at a distance of 3 meters from the FSM antenna. EMI energy was maximized by equipment placement permitting orientation in three orthogonal axes, raising, and lowering the FSM antenna, changing the antenna polarization, and by rotating the turntable. Antennas used

were Loop from 0.009 to 30 MHz, Broadband Biconical from 30 MHz to 200 MHz, Log Periodic from 200 MHz to 1 GHz, and/or Biconilog from 30 MHz to 1000 MHz, and above 1 GHz, Double Ridge or Pyramidal Horns, notch filters and appropriate amplifiers and mixers were utilized. Each emission was maximized before data was taken and recorded. Per above requirements, the frequency spectrum from 9 kHz to 25,000 MHz was searched for emissions and all significant results reported. All other unreported findings were at least 20 dB below limits. Refer to diagrams two and three showing typical test setup. Refer to photographs in the test setup exhibits for specific EUT placement during testing.

Table 1 General Radiated Emissions Data – Worst Case (Horizontal Polarization)

Frequency (MHz)	Peak (dBµV/m)	Quasi-Peak (dBµV/m)	Limit @ 3m (dBµV/m)	Margin (dBm)
30.1	34.2	26.0	40	-14.0
107.7	30.7	25.4	40	-14.7
378.7	33.4	26.7	47	-20.3
444.2	35.9	28.6	47	-18.4
498.8	35.9	29.3	47	-17.7
992.9	43.2	34.2	47	-12.8

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded for frequency range above 1000 MHz.

Figure 1 General Radiated Emissions Plot – Worst Case (Vertical Polarization)

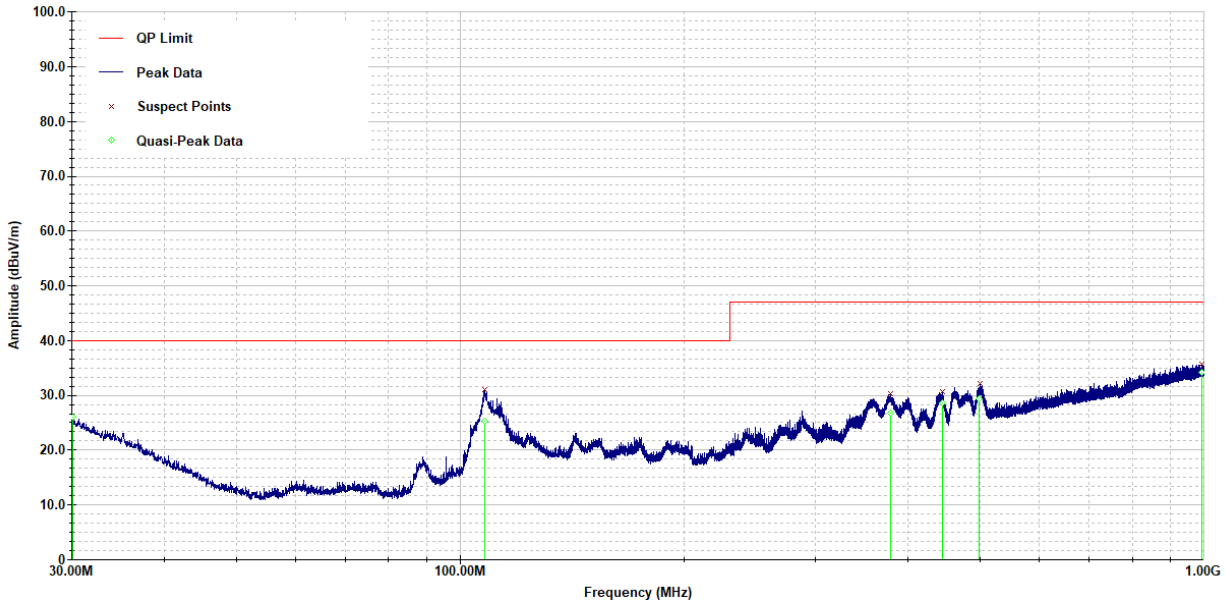


Table 2 General Radiated Emissions Data – Worst Case (Vertical Polarization)

Frequency (MHz)	Peak (dBµV/m)	Quasi-Peak (dBµV/m)	Limit @ 3m (dBµV/m)	Margin (dBm)
34.4	25.0	19.5	40	-20.5
58.9	23.0	18.3	40	-21.7
95.7	26.9	24.6	40	-15.4
108.2	34.7	30.8	40	-9.2
154.7	24.5	19.7	40	-20.3
974.6	32.0	24.1	47	-22.9

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded for frequency range below 1000 MHz. Peak and Average amplitude emissions are recorded for frequency range above 1000 MHz.

Figure 2 General Radiated Emissions Plot – Worst Case (Vertical Polarization)

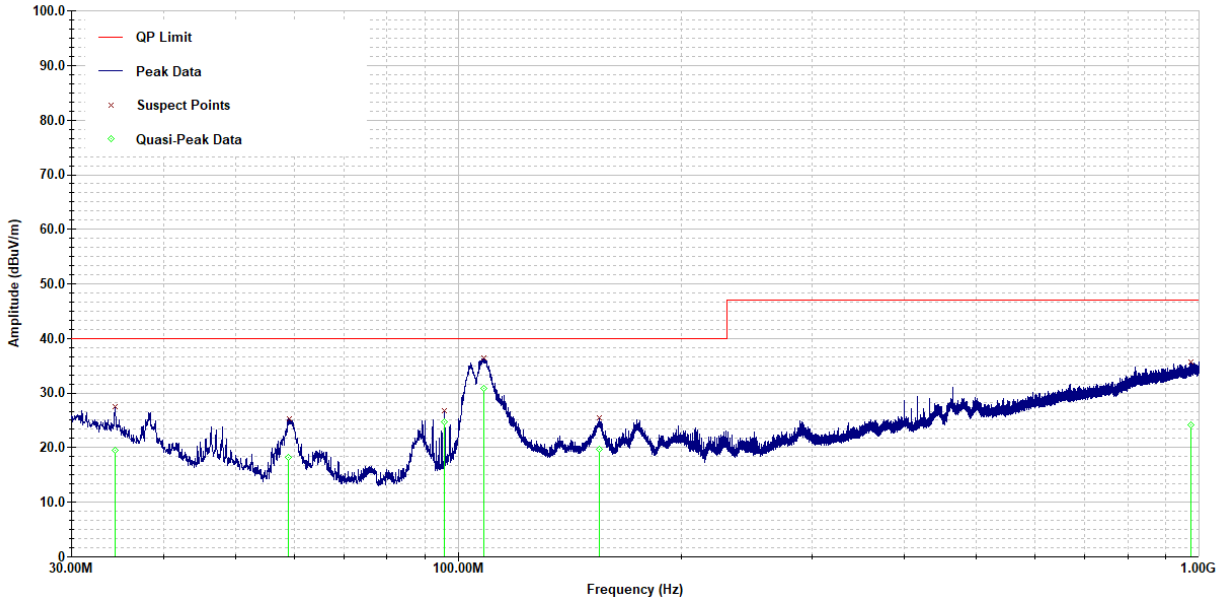


Figure 3 Plot of General Radiated Emissions (1 GHz – 3 GHz)

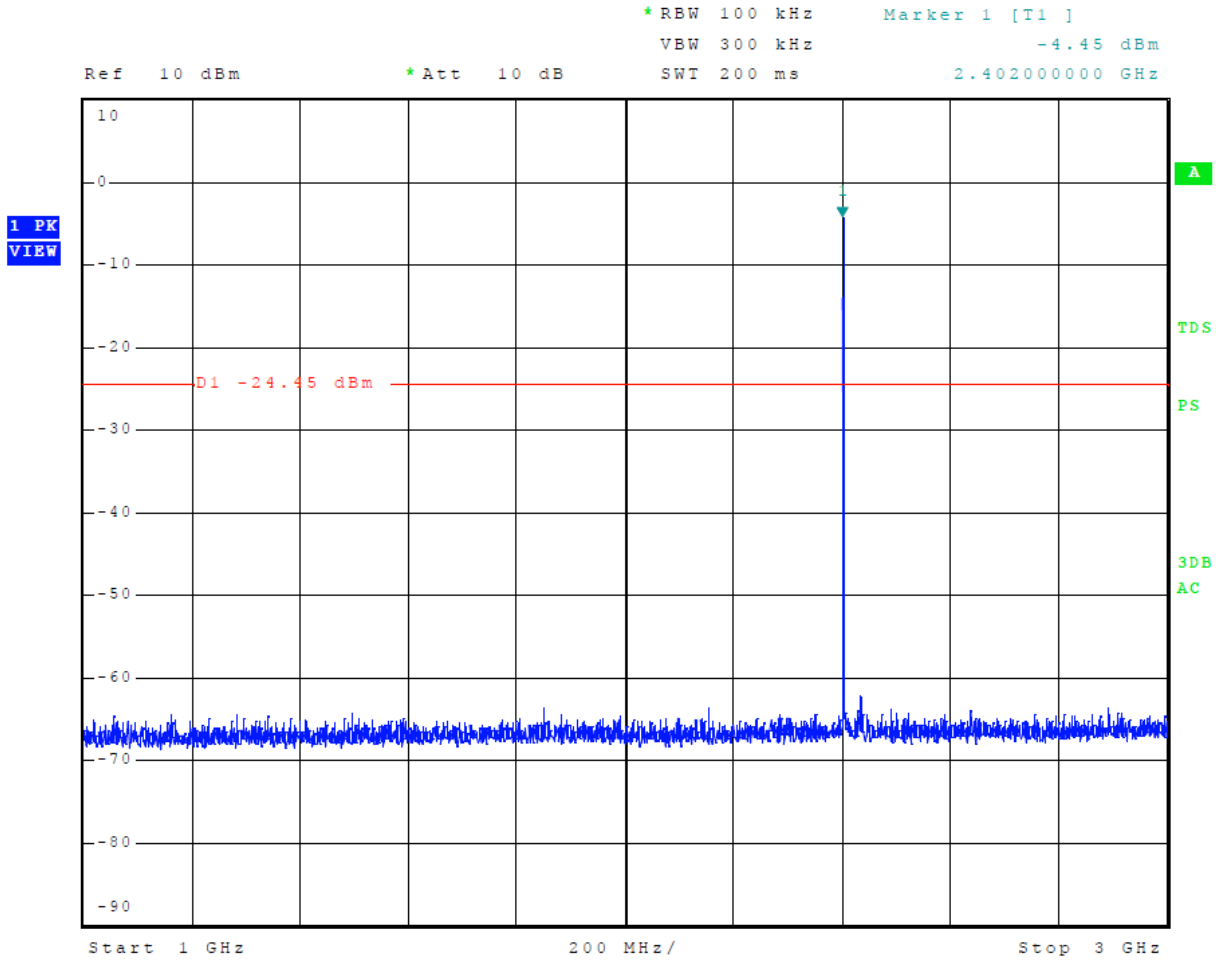


Figure 4 Plot of General Radiated Emissions (3 GHz – 6 GHz)

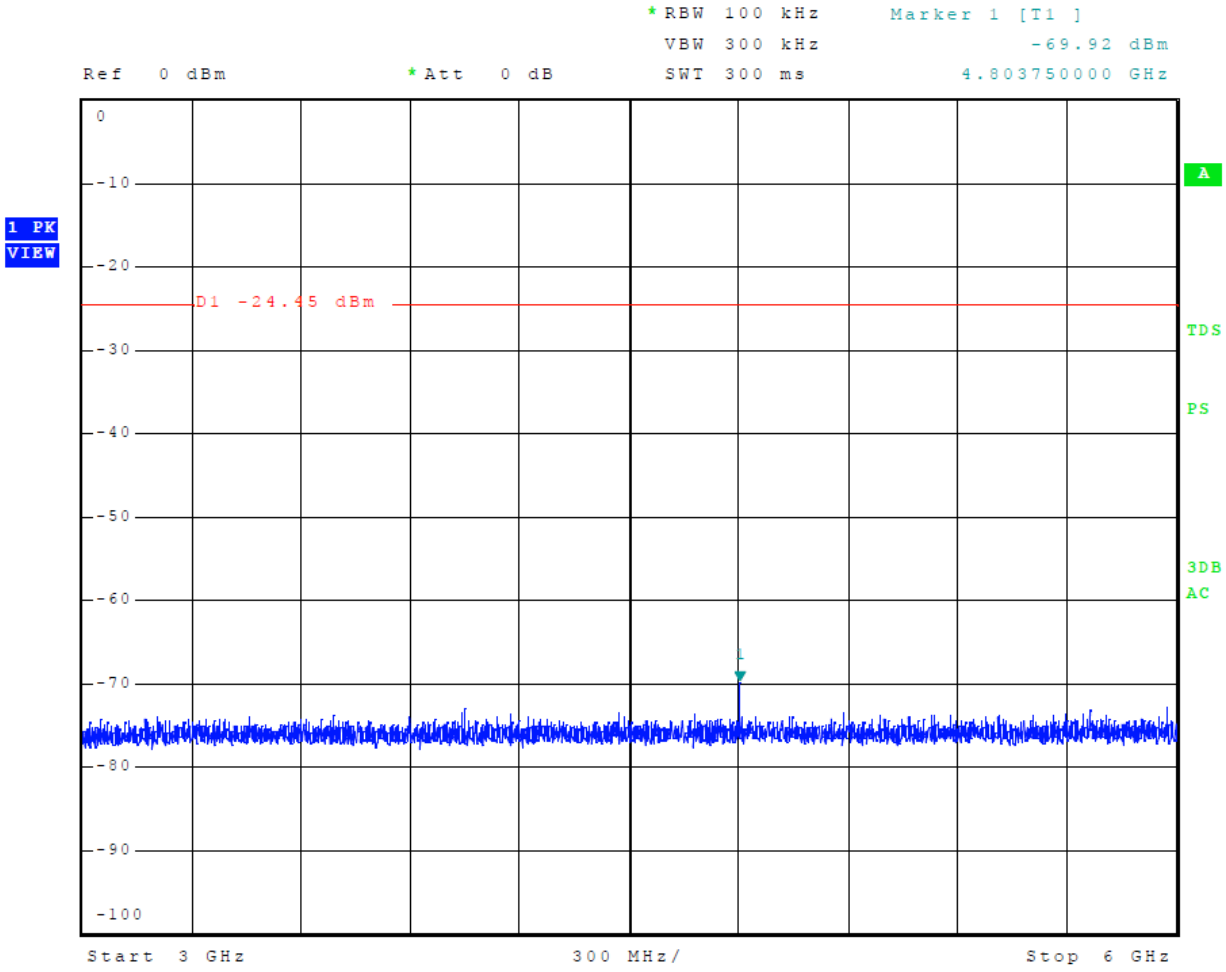


Figure 5 Plot of General Radiated Emissions (6 GHz – 12 GHz)

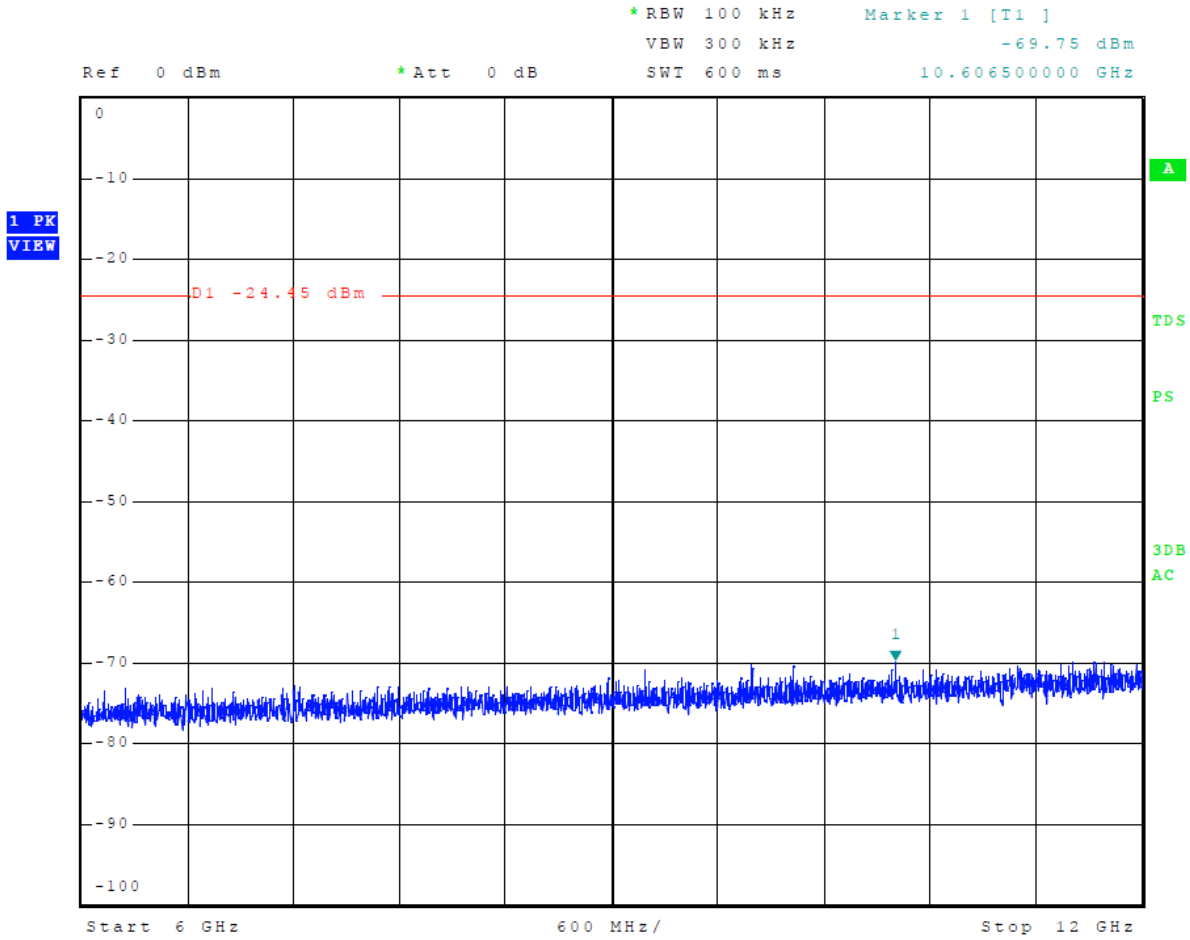


Figure 6 Plot of General Radiated Emissions (12 GHz – 18 GHz)

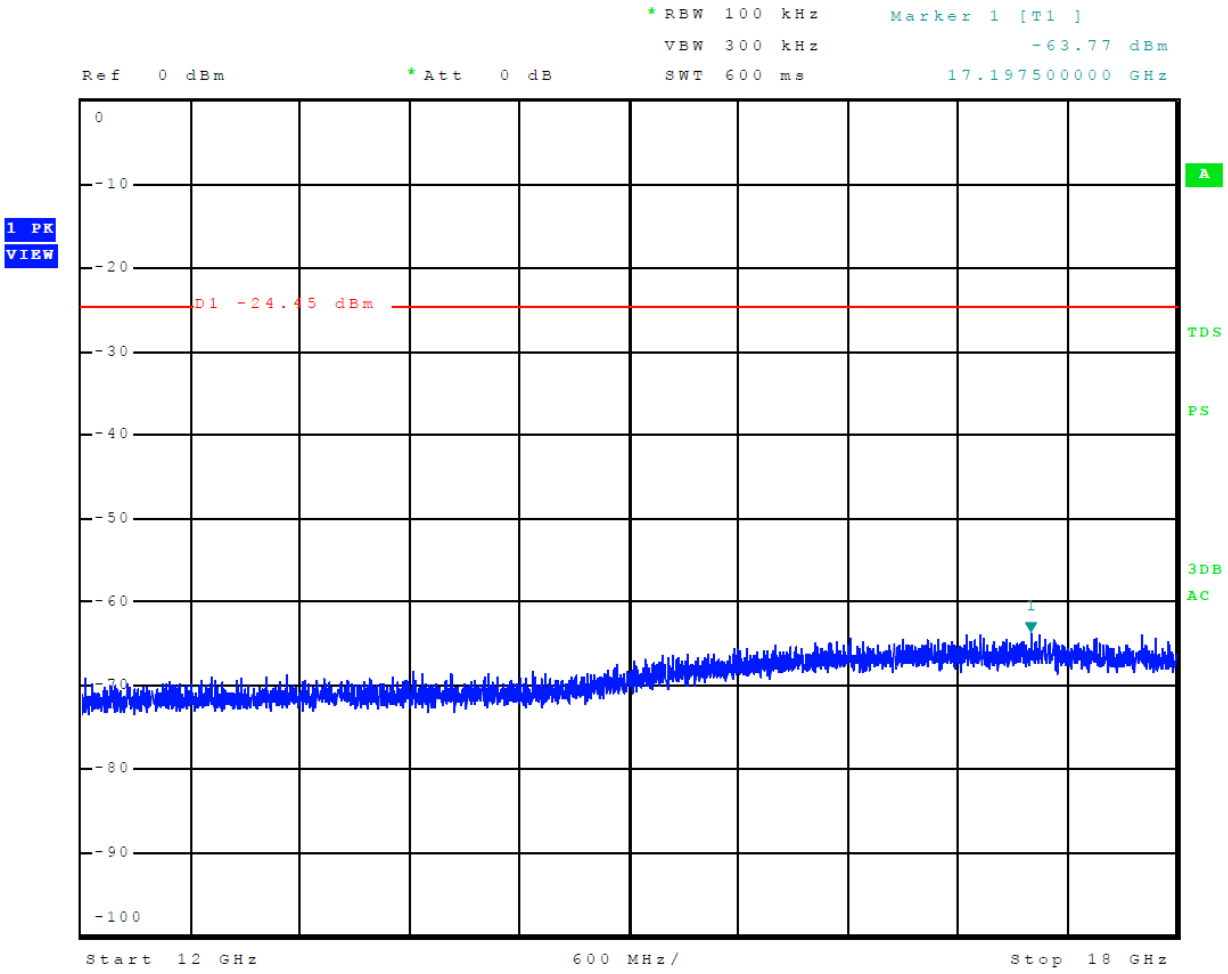
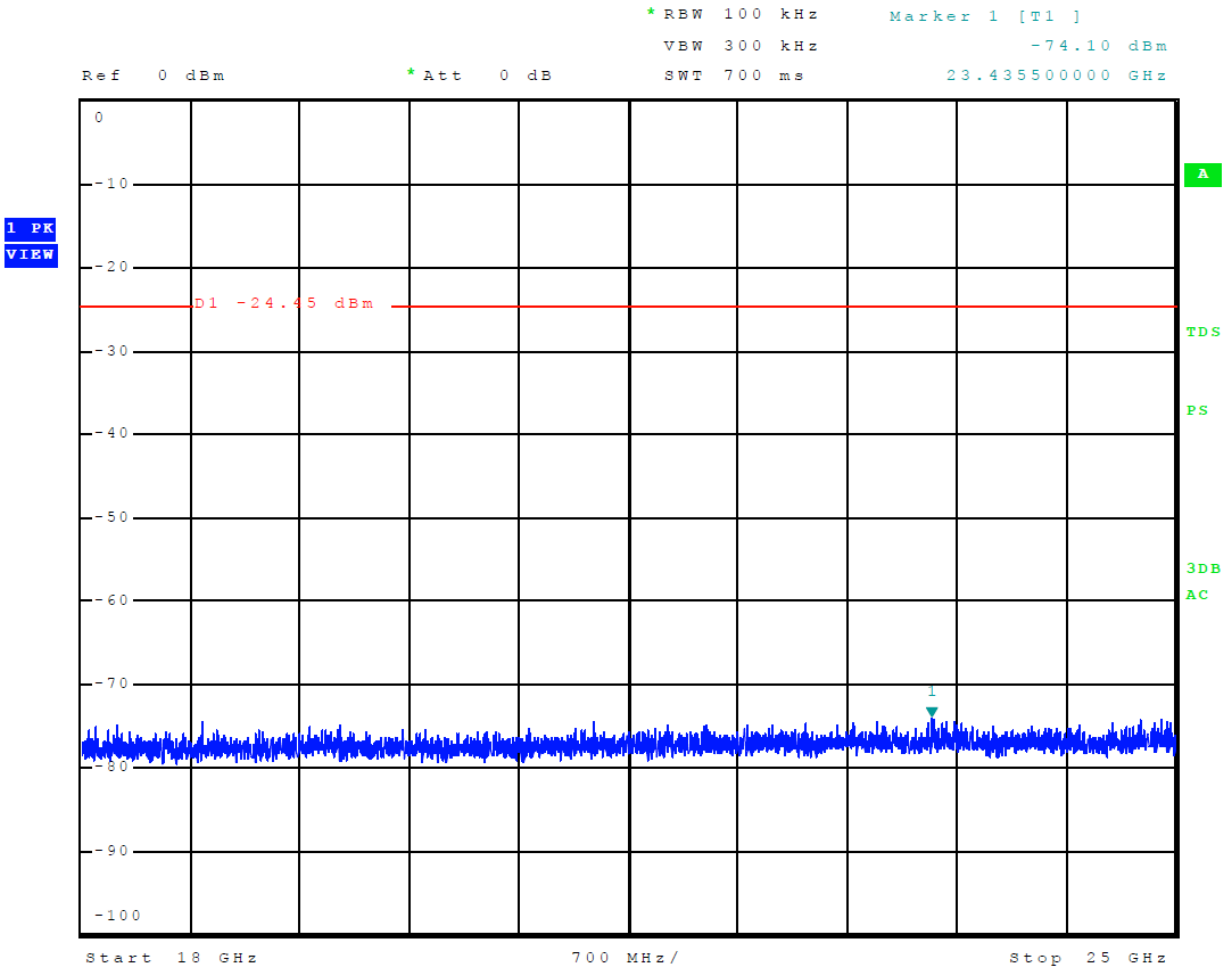


Figure 7 Plot of General Radiated Emissions (18 GHz – 25 GHz)



Summary of Results for General Radiated Emissions

The EUT demonstrated compliance with the radiated emissions The EUT demonstrated a minimum margin of -9.2 dB below general unintentional radiator equipment radiated emissions requirements. There are no other significantly measurable emissions in the restricted bands other than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the requirements.

AC Line Conducted EMI Procedure

AC Line testing was not repeated for this permissive change report due to following reasons:

1. AC Line testing passed in the original grant test with 13.53dB of margin,
2. ANT circuitry was all in place in original grant EUTs and receiving power,
3. ANT is lower power than any of the existing, granted, transmitters

Restricted Bands of Operation

Spurious emissions falling in the restricted frequency bands of operation were measured at the SAC. The EUT utilizes frequency, determining circuitry, which generates harmonics falling in the restricted bands. Emissions were investigated at the SAC, using appropriate antennas or pyramidal horns, amplification stages, and a spectrum analyzer. Peak and average amplitudes of frequencies above 1000 MHz were compared to the required limits with worst-case data presented below. Test procedures of ANSI C63.10-2020 were used during testing. No other significant emission was observed which fell into the restricted bands of operation. Computed emission values consider the received radiated field strength, receive antenna correction factor, amplifier gain stage, and test system cable losses.

Table 3 Radiated Emissions in Restricted Frequency Bands Data Mode 16, ANT

Frequency in MHz	Horizontal Peak (dBµV/m)	Horizontal Average (dBµV/m)	Vertical Peak (dBµV/m)	Vertical Average (dBµV/m)	Limit @ 3m (dBµV/m)	Horizontal Margin (dB)	Vertical Margin (dB)
2390.0	44.0	30.4	43.1	30.3	54.0	-23.6	-23.7
2483.5	45.3	31.4	44.5	30.7	54.0	-22.6	-23.3
4804.0	47.9	34.4	47.7	34.4	54.0	-19.6	-19.6
4914.0	48.1	34.8	47.9	34.7	54.0	-19.2	-19.3
4960.0	48.2	34.6	47.7	34.6	54.0	-19.4	-19.4
7206.0	51.3	37.8	50.8	37.8	54.0	-16.2	-16.2
7371.0	50.7	37.9	51.0	37.9	54.0	-16.1	-16.1
7440.0	51.3	37.8	50.5	37.8	54.0	-16.2	-16.2
12010.0	56.4	43.4	56.5	43.4	54.0	-10.6	-10.6
12285.0	57.8	45.2	58.1	45.1	54.0	-8.8	-8.9
12400.0	57.9	44.6	57.8	44.7	54.0	-9.4	-9.3

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded for frequency below 1000 MHz. Peak and Average amplitude emissions are recorded for frequency range above 1000 MHz.

Summary of Results for Radiated Emissions in Restricted Bands

The ANT transmitter being added to the EUT demonstrated compliance with the radiated emissions requirements of 47CFR Part 15C and RSS-247 Issue 4 Intentional Radiator requirements. The EUT demonstrated a worst-case minimum margin of -8.8 dB below the emissions requirements in restricted frequency bands. Peak, Quasi-peak, and average amplitudes were checked for compliance with the regulations. Worst-case emissions are reported with other emissions found in the restricted frequency bands at least 20 dB below the requirements.

Operation in the Band 2400 – 2483.5 MHz (New Mode 16 – ANT)

This transmitter testing was only performed on the new mode 16 ANT. Test procedures of ANSI C63.10-2020 paragraph 6, and KDB 558074 were used during transmitter testing. Test sample EUT Antenna Port Conducted was provided for testing antenna port conducted emissions. This sample was modified by replacing the internal antenna with a 50 ohm antenna port connector and attenuator for testing purposes. The transmitter peak and average power was measured at the antenna port using a wideband RF power meter as described in KDB 558074 and ANSI C63.10-2020. Average power measured did not include any time intervals during which the transmitter was off or transmitting at a reduced power level. The peak Power Spectral Density (PKPSD) was measured as defined in KDB 558074 and ANSI C63.10-2020. DTS Emission bandwidth was measured as described in KDB 558074 and ANSI C63.10-2020. The amplitude of each harmonic and general radiated emission was measured on the SAC at distance of 3 meters from the FSM antenna (radiated emission testing was performed on Radiated EUT representative of production equipment with integral antenna). The EUT was positioned on supporting turntable elevated as required above the ground plane, at a distance of 3 meters from the FSM antenna. Radiated emission investigations were performed from 9 kHz to 25,000 MHz. Each radiated emission was maximized by varying the FSM antenna height and polarization, and by rotating the turntable. The worst-case amplitude of each emission was then recorded from the analyzer display. The peak and quasi-peak amplitude of frequencies below 1000 MHz were measured using a spectrum analyzer. The peak and average amplitude of frequencies above 1000 MHZ were measured using a spectrum analyzer. A Loop antenna was used for measuring emissions from 0.009 to 30 MHz, Biconilog Antenna for 30 to 1000 MHz, Double-Ridge, and/or Pyramidal Horn Antennas from 1 GHz to 25 GHz. Radiated Emissions were measured in dBµV/m @ 3 meters. Plots were taken of transmitter performance (using Antenna Port Conducted EUT) for reference in this and other documentation. These are shown in figures eight through thirteen.

Figure 8 Plot of Transmitter Operation in 2402-2480 MHz Mode 16, ANT

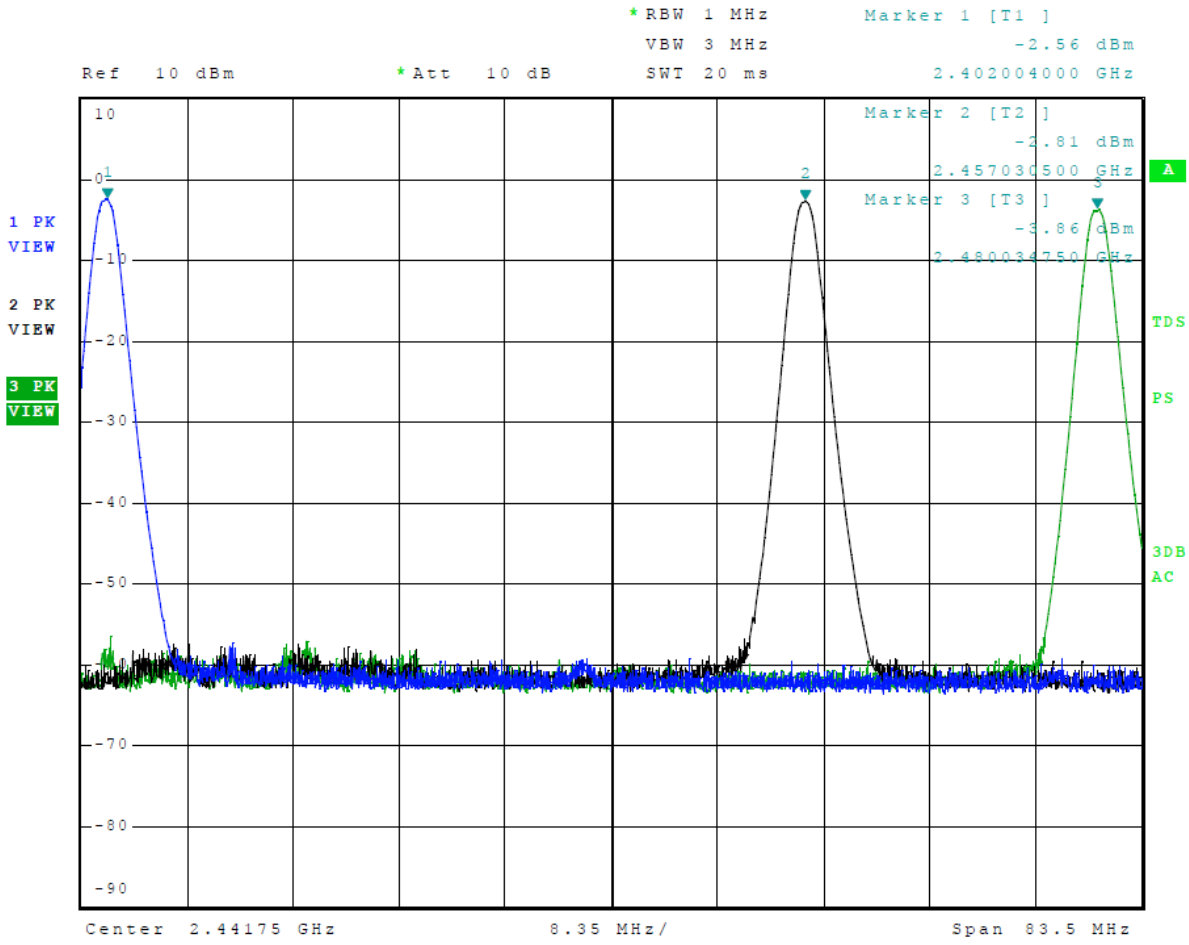


Figure 9 Plot of Emissions Low Band Edge Mode 16, ANT

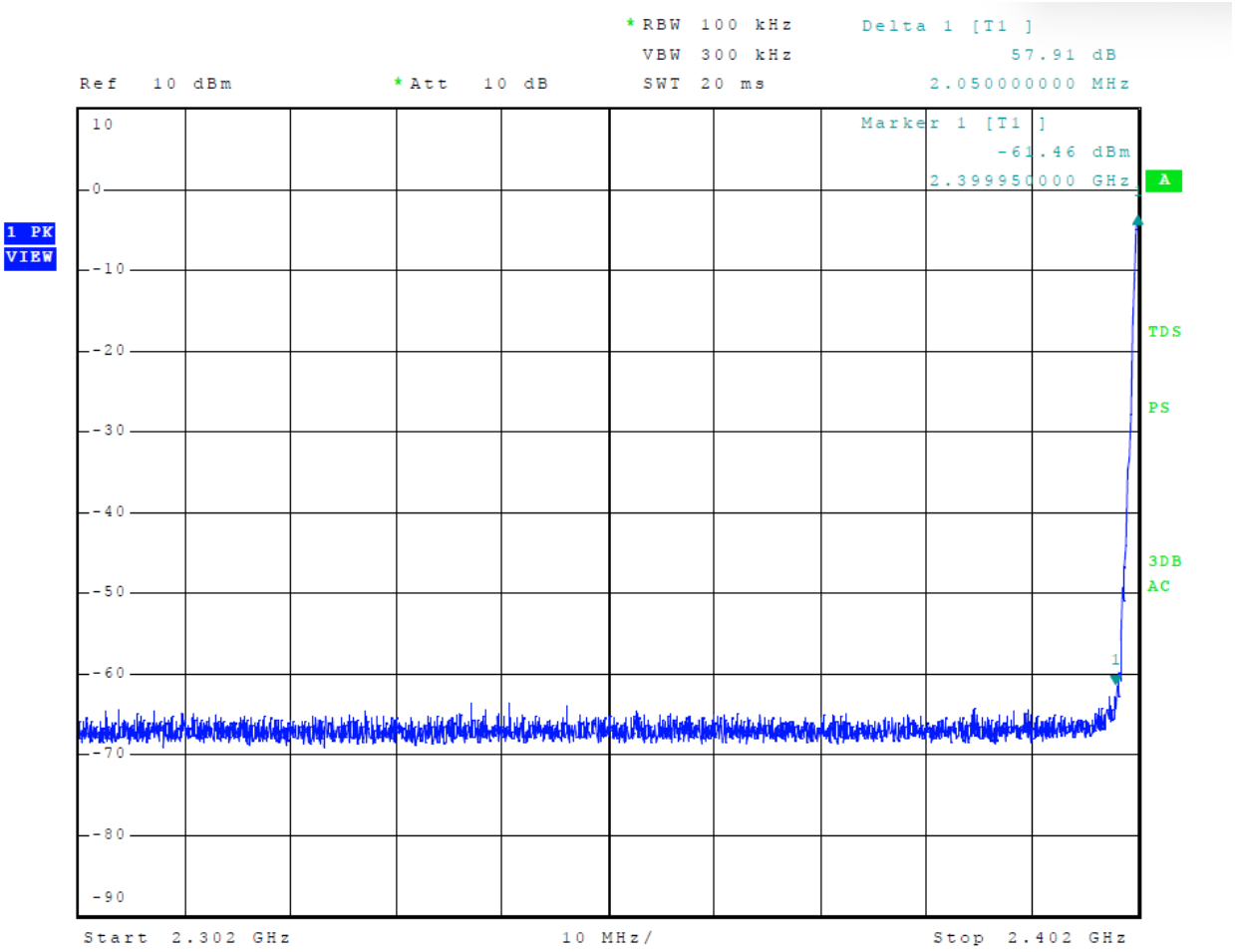


Figure 10 Plot of Transmitter Emissions High Band Edge Mode 16, ANT

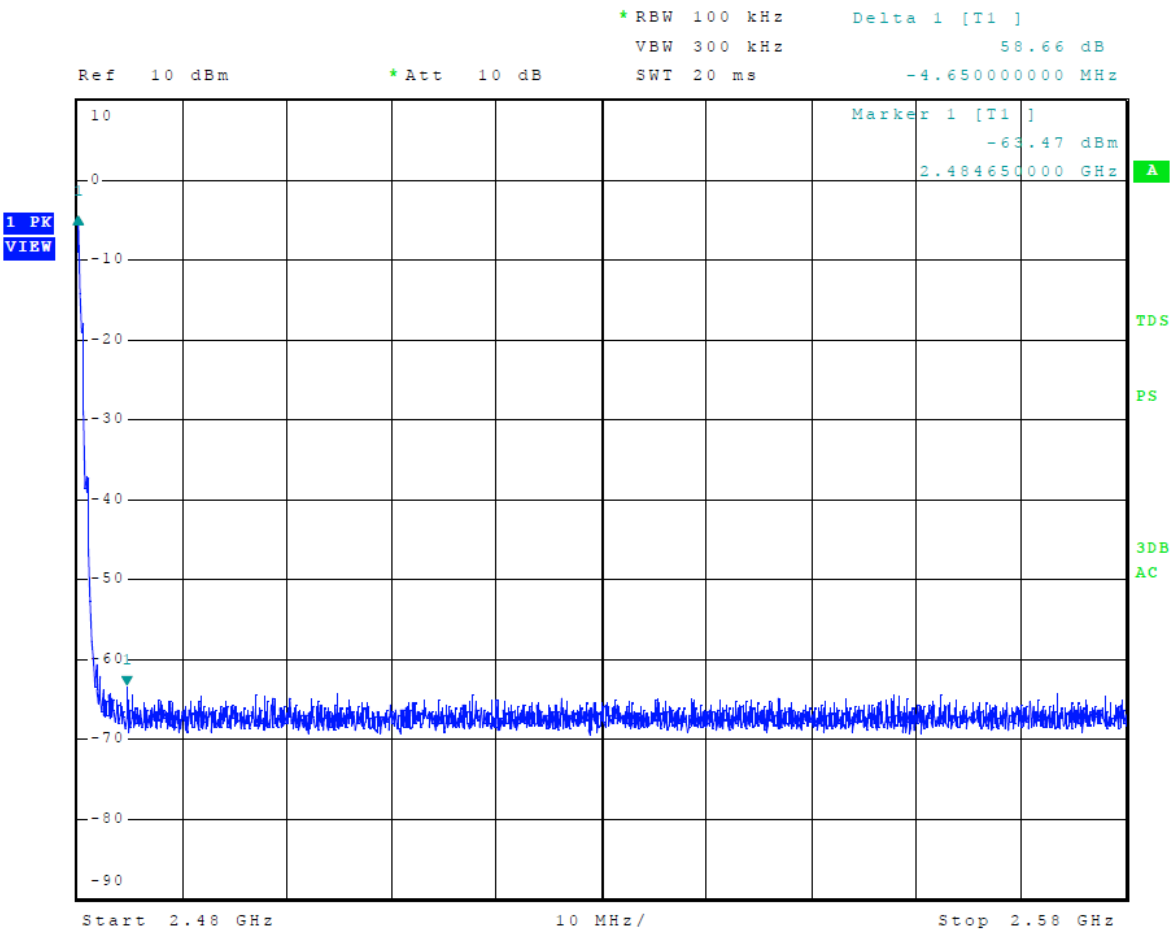


Figure 11 Plot of 6-dB Occupied Bandwidth Mode 16, ANT

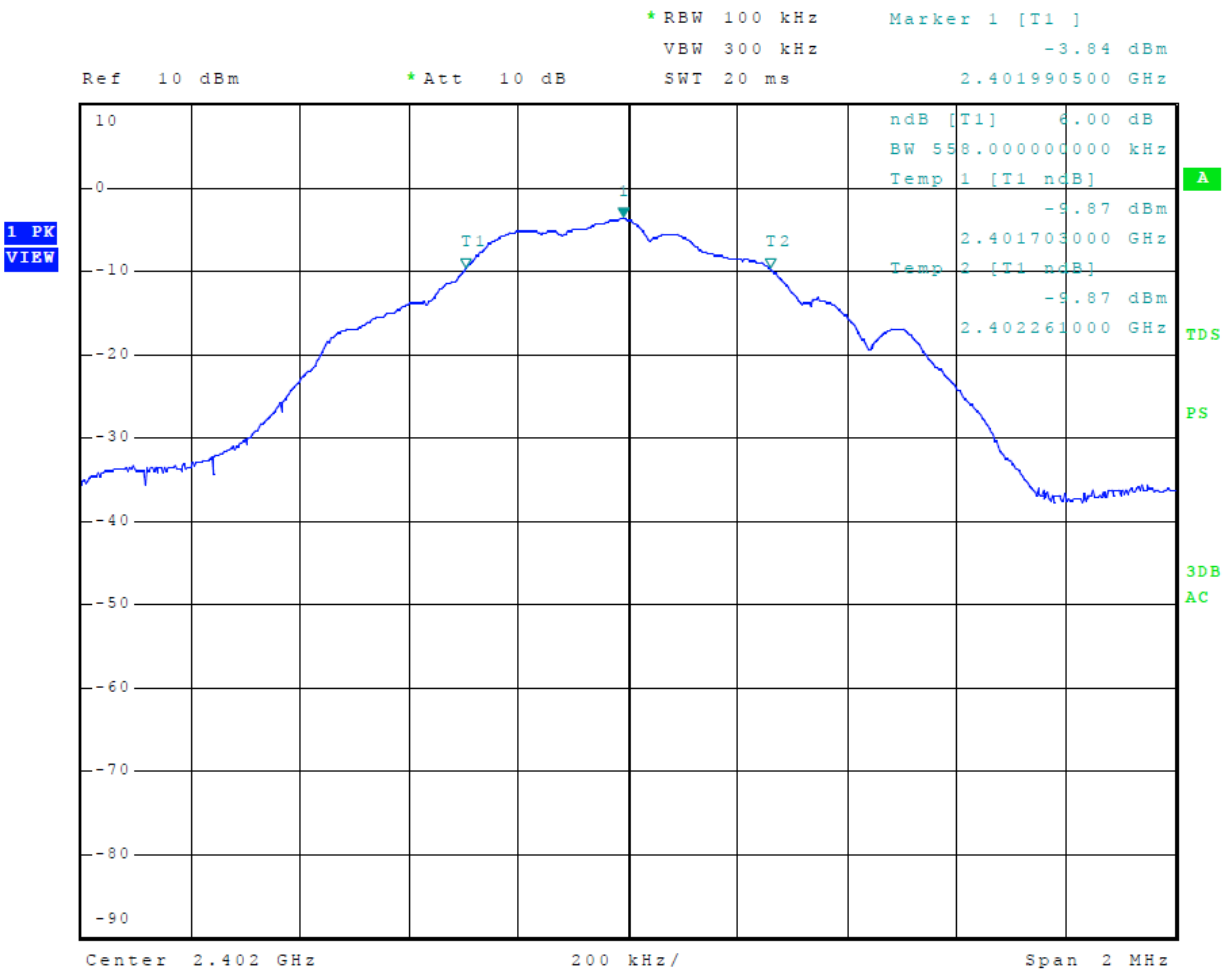


Figure 12 Plot of 99% Occupied Bandwidth Mode 16, ANT

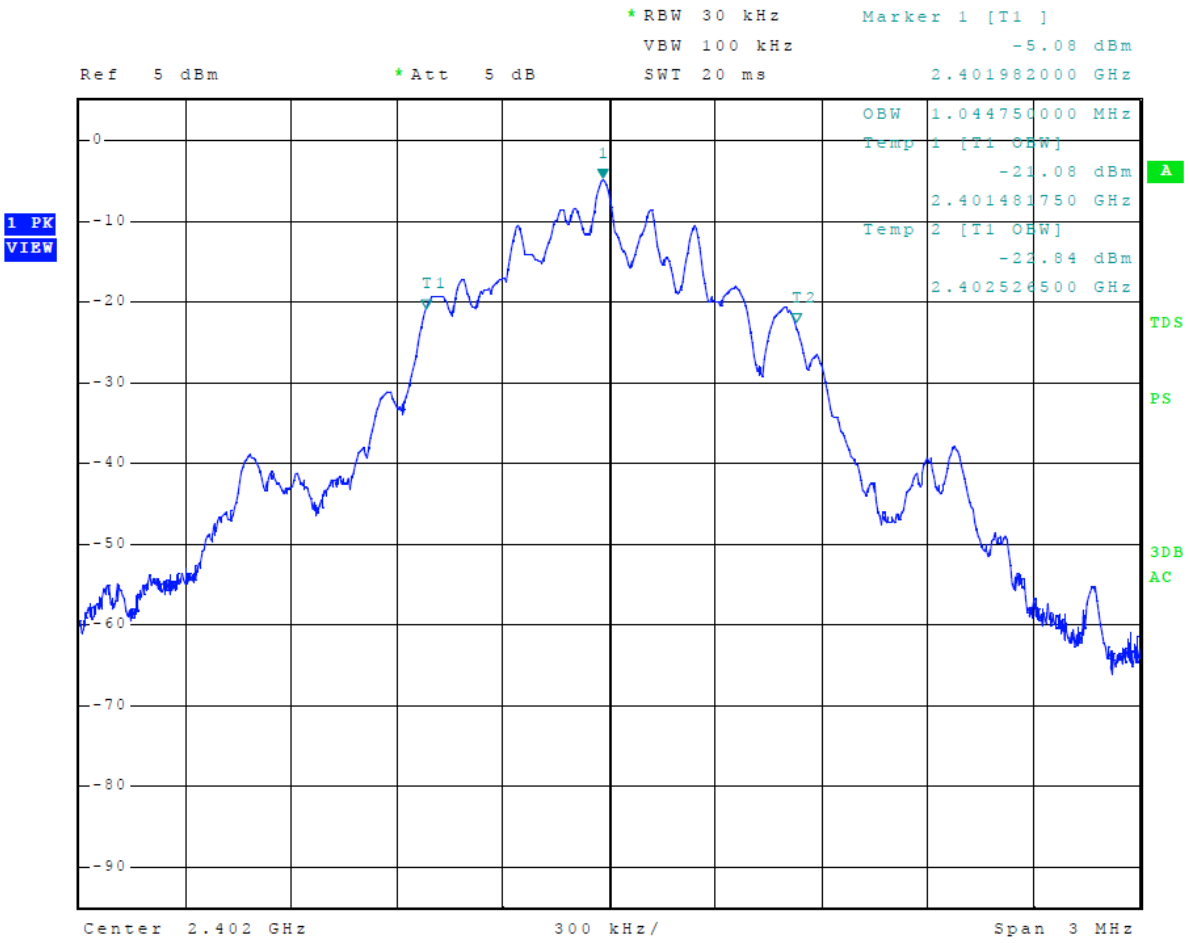
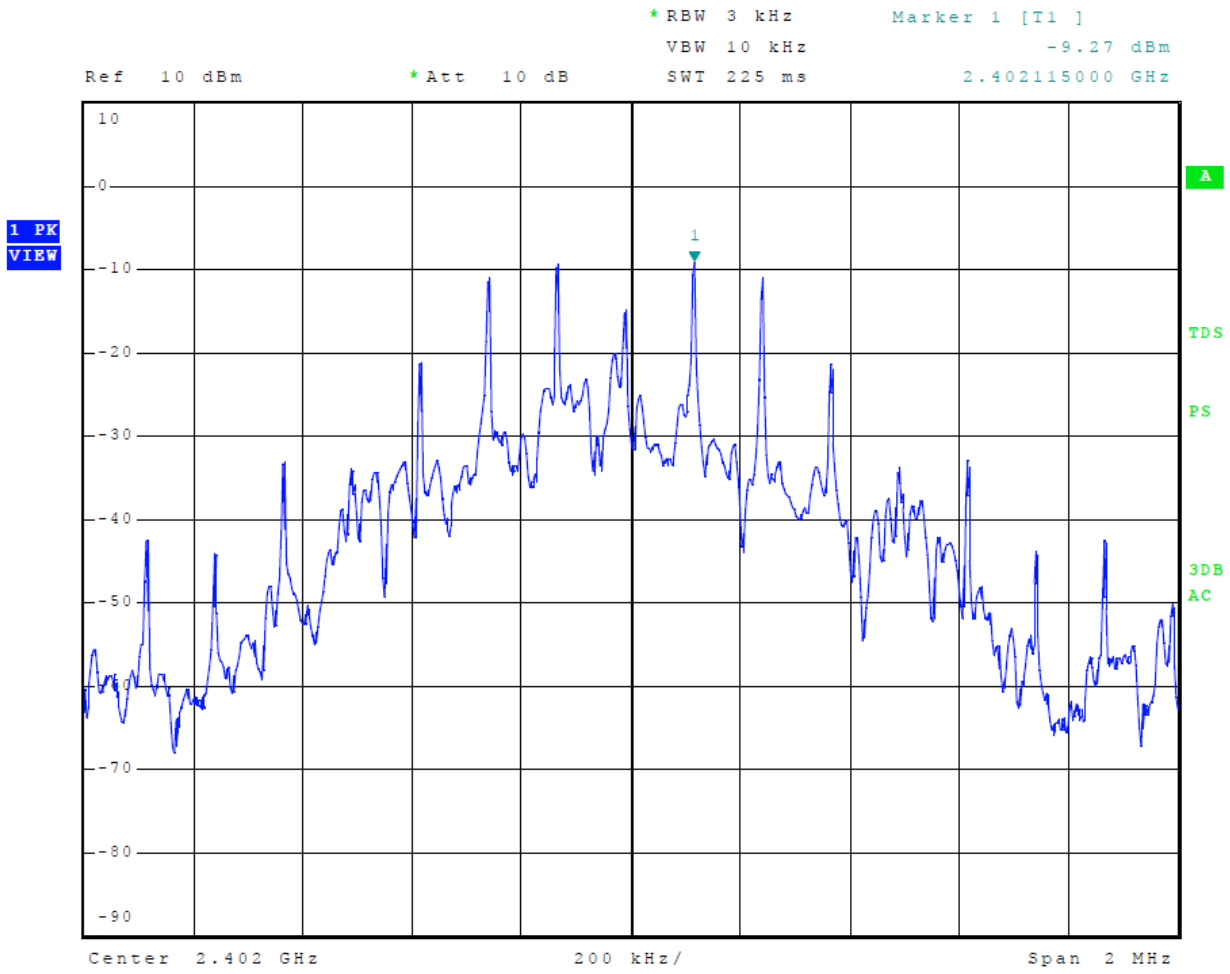


Figure 13 Plot of Transmitter Power Spectral Density Mode 16, ANT



Transmitter Emissions Data

Table 4 Transmitter Radiated Emissions Mode 16, ANT

Frequency in MHz	Horizontal Peak (dBµV/m)	Horizontal Average (dBµV/m)	Vertical Peak (dBµV/m)	Vertical Average (dBµV/m)	Limit @ 3m (dBµV/m)	Horizontal Margin (dB)	Vertical Margin (dB)
2402.0	--	--	--	--	--	--	--
4804.0	47.9	34.4	47.7	34.4	54.0	-19.6	-19.6
7206.0	51.3	37.8	50.8	37.8	54.0	-16.2	-16.2
9608.0	53.8	41.2	54.0	41.2	54.0	-12.8	-12.8
12010.0	56.4	43.4	56.5	43.4	54.0	-10.6	-10.6
14412.0	59.1	45.9	59.2	45.9	54.0	-8.1	-8.1
16814.0	64.2	51.1	64.2	51.1	54.0	-2.9	-2.9
2440.0	--	--	--	--	--	--	--
4880.0	48.1	34.8	47.9	34.7	54.0	-19.2	-19.3
7320.0	50.7	37.9	51.0	37.9	54.0	-16.1	-16.1
9760.0	55.1	41.7	54.9	41.7	54.0	-12.3	-12.3
12200.0	57.8	45.2	58.1	45.1	54.0	-8.8	-8.9
14640.0	59.5	46.7	60.0	46.7	54.0	-7.3	-7.3
17080.0	63.3	50.0	63.6	49.9	54.0	-4.0	-4.1
2480.0	--	--	--	--	--	--	--
4960.0	48.2	34.6	47.7	34.6	54.0	-19.4	-19.4
7440.0	51.3	37.8	50.5	37.8	54.0	-16.2	-16.2
9920.0	54.6	41.6	54.7	41.7	54.0	-12.4	-12.3
12400.0	57.9	44.6	57.8	44.7	54.0	-9.4	-9.3
14880.0	60.2	46.9	60.2	47.0	54.0	-7.1	-7.0
17360.0	62.4	49.6	62.4	49.6	54.0	-4.4	-4.4

Other emissions present had amplitudes at least 20 dB below the limit. Peak and Quasi-Peak amplitude emissions are recorded for frequency below 1000 MHz. Peak and Average amplitude emissions are recorded for frequency range above 1000 MHz.

Table 5 Transmitter Antenna Port Conducted Data mode 16, ANT

Frequency MHz	Antenna Port Average Output Power (Watts)	99% Occupied Bandwidth (kHz)	6-dB Occupied Bandwidth (kHz)	Peak Power Spectral Density (dBm)
Mode 16, ANT				
2402	0.001	1,044.8	558.0	-9.3
2440	0.001	1,044.0	554.0	-9.5
2480	0.0004	1,044.8	557.5	-10.4

Summary of Results for Transmitter Radiated Emissions of Intentional Radiator

The EUT demonstrated compliance with the radiated and conducted emission requirements of 47CFR Subpart 15C Paragraph 15.247, RSS-247 Issue 4 and RSS-GEN Issue 5 emission requirements for Digital Transmission Systems. The highest average output power measured at the antenna port for new mode 16 ANT was 0.001 Watts. The highest peak power spectral density measured at the antenna port for mode 16 presented a minimum margin of -17.3 dB below the requirements. The EUT demonstrated a minimum margin of -2.9 dB below the harmonic emissions requirements. There were no other significantly measurable emissions in the restricted bands other than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the requirements. There were no other deviations or exceptions to the requirements.

Permissive Change Summary

The mode 16 ANT transmitter fits into the original grant's DTS transmitter constraints and has also not negatively impacted the spurious noise or restricted band performance. The change was accomplished with s/w changes only.

Annex

- Annex A Measurement Uncertainty Calculations
- Annex B Rogers Labs Test Equipment List
- Annex C Laboratory Certificate of Accreditation

Annex A Measurement Uncertainty Calculations

The measurement uncertainty was calculated for all measurements listed in this test report according To CISPR 16–4. Result of measurement uncertainty calculations are recorded below. Component and process variability of production devices similar to those tested may result in additional deviations. The manufacturer has the sole responsibility of continued compliance.

Measurement	Expanded Measurement Uncertainty $U_{(lab)}$
3 Meter Horizontal 0.009-1000 MHz Measurements	4.16
3 Meter Vertical 0.009-1000 MHz Measurements	4.33
3 Meter Measurements 1-18 GHz	5.46
3 Meter Measurements 18-40 GHz	5.16
10 Meter Horizontal Measurements 0.009-1000 MHz	4.15
10 Meter Vertical Measurements 0.009-1000 MHz	4.32
AC Line Conducted	1.75
Antenna Port Conducted power	1.17
Frequency Stability	1.00E-11
Temperature	1.6˚C
Humidity	3%

Annex B Test Equipment

Equipment	Manufacturer	Model (SN)	Band	Cal Date(m/d/y)	Due
☒ LISN	FCC	FCC-LISN-50-25-10(1PA) (160611)	.15-30MHz	3/20/2025	3/20/2026
☐ Cable	Huber & Suhner Inc.	Sucoflex102ea(L10M)(303073)	9kHz-40 GHz	9/9/2025	9/9/2026
☒ Cable	Huber & Suhner Inc.	Sucoflex102ea(1.5M)(303069)	9kHz-40 GHz	9/9/2025	9/9/2026
☒ Cable	Belden	RG-58 (L1-CAT3-11509)	9kHz-30 MHz	9/9/2025	9/9/2026
☒ Antenna	Com Power	AL-130 (121055)	.001-30 MHz	9/2/2025	9/2/2026
☐ Antenna:	EMCO	6509	.001-30 MHz	9/16/2024	9/16/2026
☒ Antenna	ARA	BCD-235-B (169)	20-350MHz	9/2/2025	9/2/2026
☒ Antenna	Sunol	JB-6 (A100709)	30-1000 MHz	9/2/2025	9/2/2026
☐ Antenna	ETS-Lindgren	3147 (40582)	200-1000MHz	9/16/2024	9/16/2026
☒ Antenna	ETS-Lindgren	3117 (200389)	1-18 GHz	3/17/2025	3/17/2027
☒ Antenna	Com Power	AH-118 (10110)	1-18 GHz	9/16/2024	9/16/2026
☒ Antenna	Com Power	AH-1840 (101046)	18-40 GHz	3/17/2025	3/17/2027
☒ Analyzer	Rohde & Schwarz	ESU40 (100108)	20Hz-40GHz	7/9/2025	7/9/2026
☒ Analyzer	Rohde & Schwarz	ESW44 (101534)	20Hz-44GHz	1/21/2025	1/21/2026
☐ Analyzer	Rohde & Schwarz	FS-Z60, 90, 140, and 220	40GHz-220GHz	12/22/2017	12/22/2027
☐ Amplifier	Com-Power	PA-010 (171003)	100Hz-30MHz	9/9/2025	9/9/2026
☐ Amplifier	Com-Power	CPPA-102 (01254)	1-1000 MHz	9/9/2025	9/9/2026
☒ Amplifier	Com-Power	PAM-118A (551014)	0.5-18 GHz	9/9/2025	9/9/2026
☒ Amplifier	Com-Power	PAM-840A (461328)	18-40 GHz	9/9/2025	9/9/2026
☒ Pwr Sensor	Rohde & Schwarz	NRP33T	0.05-33 GHz	9/9/2025	9/9/2026
☒ Generator	Rohde & Schwarz	SMBV100A6 (260771)	20Hz-6 GHz	3/19/2025	3/19/2026
☐ RF Filter	Micro-Tronics	BRC50722 (009).9G notch	30-18000 MHz	3/21/2025	3/21/2026
☐ RF Filter	Micro-Tronics	HPM50117 (063) 3G HPF	30-18000 MHz	3/21/2025	3/21/2026
☒ RF Filter	Micro-Tronics	BRM50702 (172) 2G notch	30-18000 MHz	3/21/2025	3/21/2026
☒ RF Filter	Micro-Tronics	BRC50703 (G102) 5G notch	30-18000 MHz	3/21/2025	3/21/2026
☒ RF Filter	Micro-Tronics	BRC50705 (024) 5G notch	30-18000 MHz	3/21/2025	3/21/2026
☐ Attenuator	Fairview	SA6NFNF100W-40 (1625)	30-18000 MHz	3/21/2025	3/21/2026
☒ Attenuator	Mini-Circuits	VAT-3W2+ (1445)	30-6000 MHz	3/21/2025	3/21/2026
☒ Attenuator	Mini-Circuits	VAT-3W2+ (1735)	30-6000 MHz	3/21/2025	3/21/2026
☒ Attenuator	Mini-Circuits	VAT-6W2+ (1438)	30-6000 MHz	3/21/2025	3/21/2026
☒ Weather station	Davis	6152 (A70927D44N)		11/4/2024	11/4/2025

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Equipment	Manufacturer	Model (SN)	Band	Cal Date(m/d/y)	Due
☒ Frequency Counter: Leader		LDC-825 (8060153)		3/19/2025	3/19/2026
☐ ISN	Com-Power	Model ISN T-8 (600111)		3/19/2025	3/19/2026
☒ LISN:	Com-Power	Model LI-220A		9/16/2024	9/16/2026
☐ LISN:	Com-Power	Model LI-550C		9/16/2024	9/16/2026
☒ Cable	Huber & Suhner Inc.	Sucoflex102ea(1.5M)(303072)	9kHz-40 GHz	9/9/2025	9/9/2026
☒ Cable	Huber & Suhner Inc.	Sucoflex102ea(L1M)(281183)	9kHz-40 GHz	9/9/2025	9/9/2026
☒ Cable	Huber & Suhner Inc.	Sucoflex102ea(4M)(281184)	9kHz-40 GHz	9/9/2025	9/9/2026
☒ Cable	Huber & Suhner Inc.	Sucoflex102ea(L10M)(317546)	9kHz-40 GHz	9/9/2025	9/9/2026
☒ Cable	Time Microwave	4M-750HF290-750 (L4M)	9kHz-24 GHz	9/9/2025	9/9/2026
☒ Cable	Mini-Circuits	KBL-2M-LOW+ (23090329)	9kHz-40 GHz	3/22/2025	3/22/2026
☒ Analyzer	HP	8562A (3051A05950)	9kHz-125GHz	3/20/2025	3/20/2026
☐ Antenna:	Solar	9229-1 & 9230-1		2/5/2025	2/5/2026
☐ CDN:	Com-Power	Model CDN M325E		9/16/2024	9/16/2026
☐ Oscilloscope Scope: Tektronix		MDO 4104		2/5/2025	2/5/2026
☐ EMC Transient Generator HVT		TR 3000		2/5/2025	2/5/2026
☐ AC Power Source (Ametech, California Instruments)				2/5/2025	2/5/2026
☒ Field Intensity Meter: EFM-018				2/5/2025	2/5/2026
☒ ESD Simulator: MZ-15				2/5/2025	2/5/2026
☐ Injection Clamp Luthi Model EM101				not required	
☐ R.F. Power Amp ACS 230-50W				not required	
☐ R.F. Power Amp EIN Model: A301				not required	
☐ R.F. Power Amp A.R. Model: 10W 1010M7				not required	
☐ R.F. Power Amp A.R. Model: 50U1000				not required	
☒ Temperature Chamber				not required	
☒ Shielded Room				not required	

NVLAP Lab Code 200087-0

Annex C Laboratory Certificate of Accreditation

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 200087-0

Rogers Labs, a division of The Compatibility Center LLC
Lenexa, KS

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique on ISO/IEC 17025).

2025-03-11 through 2026-03-31
Effective Dates

For the National Voluntary Laboratory Accreditation Program