

Rogers Labs, a division of The Compatibility Center LLC

7915 Nieman Rd.
Lenexa, KS 66214
Phone / Fax (913) 660-0666

47CFR, PART 15C - Intentional Radiators
47CFR Paragraph 15.247 and
Industry Canada RSS-247 Issue 3 and RSS-GEN Issue 5
Application For Grant of Certification
Model / HVIN: MACH2
2402-2480 and 2412-2462 MHz Digital Transmission System (DTS)

FCC ID: 2A6QA-MACH2FSS

IC: 28505-MACH2FSS

Foresight Sports

9955 Black Mountain Rd
San Diego, CA 92126

Dan Jagers
Project Manager

Test Report Number: 241017

Test Date: October 17, 2024 – November 26, 2024

Authorized Signatory: 

Patrick Powell

Rogers Labs, a division of The Compatibility Center LLC

FCC Designation: US5305

ISED Registration: 3041A

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Revision 1

File: Foresight MACH2 DTS TstRpt 241017 r1

Foresight Sports

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SN's: 0001, 0002

Date: February 17, 2025

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Revisions

Revision 1 Issued January 30, 2025

Executive Summary

The following information is submitted for consideration in obtaining Grant of Certification for License Exempt Digital Transmission System Intentional Radiator operating under Code of Federal Regulations Title 47 (47CFR) Part 15C paragraph 15.247, Industry Canada RSS-247 Issue 3, and RSS-GEN Issue 5, operation in the 2400 – 2483.5 MHz band.

Name of Applicant: Foresight Sports
 9955 Black Mountain Rd
 San Diego, CA 92126

HVIN/PMN: MACH2

FCC ID: 2A6QA-MACH2FSS

IC: 28505-MACH2FSS

Operating Frequency Range: 2402-2480 MHz

MACH2 was chosen for transmitter configuration testing and used for final measurements.

Operational communication mode 1:

Mode	Power (Watts)	99% OBW (kHz)	6-dB OBW (kHz)
Mode 1, BT BLE (GMSK)	0.002	1,070.3	732.5

This report addresses EUT Operations as Digital Transmission System using transmitter modulations in mode 1. Note, the production device utilizes a non-user accessible integral antenna system with 1.44 dBi gain.

Opinion / Interpretation of Results

Tests Performed	Margin (dB)	Results
Restricted Band Emissions 15.205, RSS-GEN, RSS-247	-15.0	Complies
AC Line Emissions as per 47CFR 15.207, RSS-GEN 8.8	N/A	N/A
Radiated Emissions 47 CFR 15.209, RSS-GEN 8.9	-0.95	Complies
Harmonic Emissions per 47CFR 15.247, RSS-247	-9.3	Complies
Power Spectral Density per 47CFR 15.247, RSS-247	-10.7	Complies

Tests performed include:

47CFR 15.247

(a) (2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one-Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the *maximum conducted output power* is the highest total transmit power occurring in any mode.

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the

restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

RSS-247 Issue 3

5.2 Digital transmission systems

DTS's include systems that employ digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to the bands 902-928 MHz and 2400-2483.5 MHz

- a) The minimum 6 dB bandwidth shall be 500 kHz.
- b) The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of section 5.4(d), (i.e., the power spectral density shall be determined using the same method as is used to determine the conducted output power).

5.4 Transmitter output power and equivalent isotropically radiated power (e.i.r.p.) requirements

Devices shall comply with the following requirements, where applicable:

- d) For DTS's employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

5.5 Unwanted emissions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Equipment Tested

Model: MACH2

Foresight Sports
 9955 Black Mountain Rd
 San Diego, CA 92126

<u>Equipment</u>	<u>Model / PN</u>	<u>Serial Number</u>
EUT #1 Radiated	MACH2	0001
EUT #2 Antenna Port Conducted	MACH2	0002

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

The design is capable of simultaneously transmitting BLE and 24GHz

Software (FVIN): 0.0.9 or higher; Antennas: 2.4 GHz inverted F PCB (1.443 dBi), 24 GHz array of resonant structures (18.65 dBi)

Equipment Operational Modes

Mode	Transmitter Operation
1	BT BLE (GMSK)
2	24.125GHz FDS

Environmental Conditions

Ambient Temperature	25.7° C
Relative Humidity	45.2 %
Atmospheric Pressure	1017.4 mb

Equipment Function

The MACH2 is a portable radar-based speed measuring device designed to typically measure baseball pitch speed. The design of the device incorporates a 24 GHz transceiver for radar, and transmitter circuitry operating in the 2402-2480 MHz range for wireless communication over a Bluetooth connection. 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 transmitter 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 Configuration

- 1) EUT operating off internal battery.

Unit under Test

Application for Certification

- (1) Manufacturer: Foresight Sports
9955 Black Mountain Rd
San Diego, CA 92126
- (2) Identification: HVIN: MACH2
FCC ID: 2A6QA-MACH2FSS IC: 28505-MACH2FSS
- (3) Instruction Book:
Refer to Exhibit for Instruction Manual.
- (4) Description of Circuit Functions:
Refer to Exhibit of Operational Description.
- (5) Block Diagram with Frequencies:
Refer to Exhibit of Operational Description.
- (6) Report of Measurements:
Report of measurements follows in this Report.
- (7) Photographs: Construction, Component Placement, etc.:
Refer to Exhibit for photographs of equipment.
- (8) List of Peripheral Equipment Necessary for operation. The EUT receives power only from replaceable internal batteries. The EUT offers no other connection ports than those presented in this filing.
- (9) Transition Provisions of 47CFR 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.

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 or at the 3 meters Outdoor Area Test Site (OATS) in the satellite location.

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 dB μ V; dB referenced to one microvolt

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

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

Note: The limit is expressed for a measurement in dB μ V/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 Calculation:

RFS = Radiated Field Strength, FSM = Field Strength Measured

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

$RFS (dB\mu V/m @ 3m) = FSM (dB\mu V) + A.F. (dB/m) + Losses (dB) - Gain (dB)$

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

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 3, and RSS-GEN Issue 5 emission requirements. There were no deviations to the specifications.

Applicable Standards

The following information is submitted in accordance with the eCFR (electronic Title 47 Code of Federal Regulations) (47CFR), dated November 18, 2024: Part 2, Subpart J, Part 15C Paragraph 15.247, RSS-247 Issue 3, and RSS-GEN Issue 5. Test procedures used are the established Methods of Measurement of Radio-Noise Emissions as described in ANSI C63.10-2013. This report documents compliance for the EUT operations as Digital Transmission Systems operation.

Intentional Radiators

The following information is submitted supporting compliance with the requirements of 47CFR, Subpart C, paragraph 15.247, Industry Canada RSS-247 Issue 3, and RSS-GEN Issue 5.

Antenna Requirements

The EUT incorporates integral non-user accessible system. Production equipment offers no provision for connection to alternate antenna system. The antenna connection point complies with the unique antenna connection requirements. There are no deviations or exceptions to the specification.

Test Procedures

AC Line Conducted Emission Test Procedure

The EUT operates from battery power only. The design offers no provision for connection to the public utility power system and is therefore exempt from AC Line Conducted emissions testing.

Radiated Emission Procedure

Radiated emissions testing was performed as required in 47CFR 15C, RSS-247 Issue 3, RSS-GEN and specified in ANSI C63.10-2013. 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

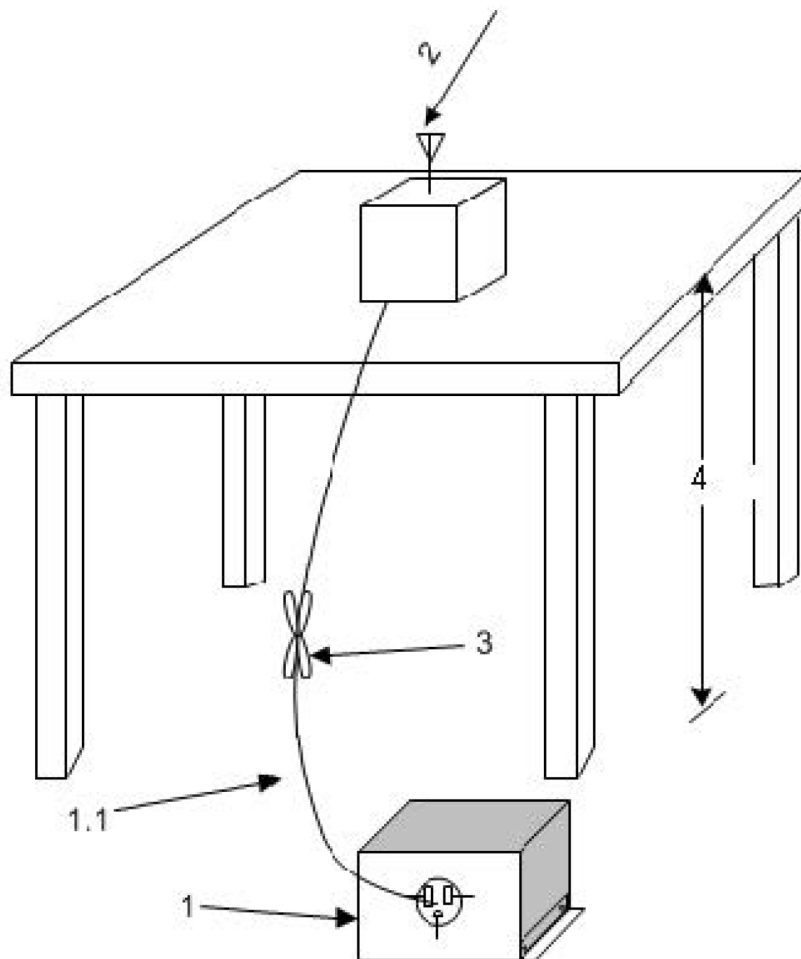
The EUT was assembled as required for operation placed on a benchtop. This configuration provided the ability to connect test equipment to the provided test antenna port. Antenna Port conducted emissions testing was performed presented in the regulations and specified in ANSI C63.10-2013. Testing was 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.

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- Rogers Labs, a division of The Compatibility Center LLC
7915 Nieman Road FCC ID: 2A6QA-MACH2FSS
Lenexa, KS 66214 Test: 241017 HVIN/PMN: MACH2
Phone/Fax: (913) 660-0666 Test to: 47CFR 15C, RSS-Gen RSS-247
Revision 1 File: Foresight MACH2 DTS TstRpt 241017 r1

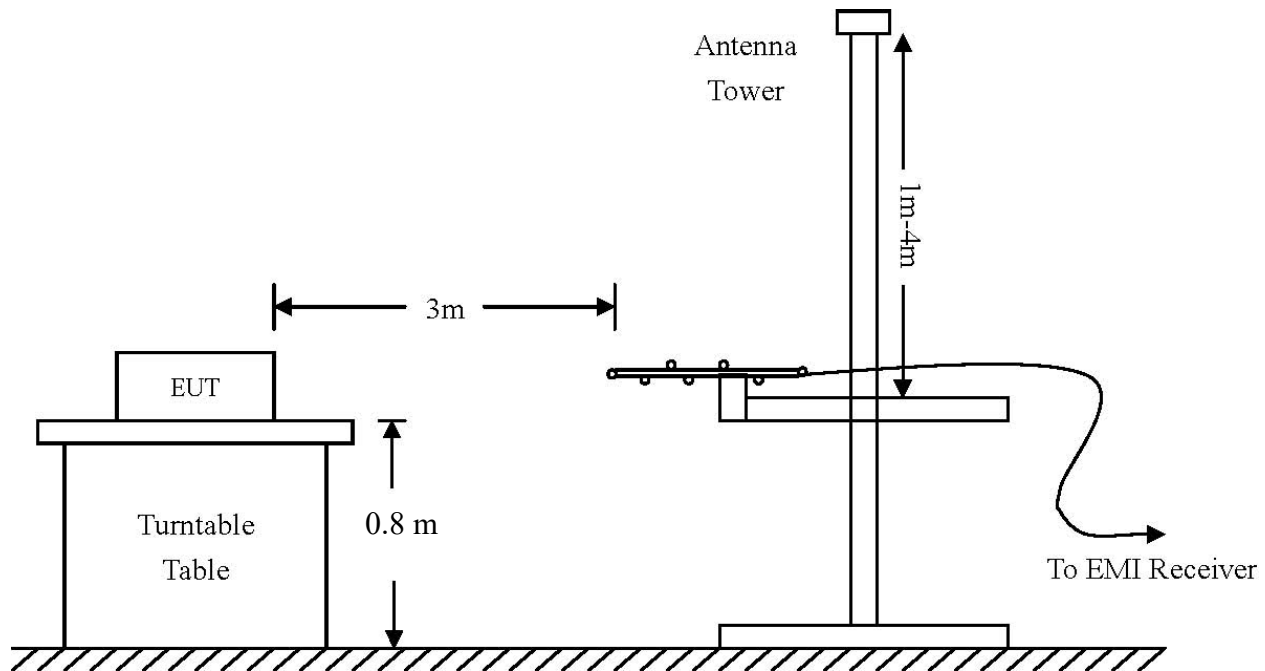
Diagram 2 Test arrangement for radiated emissions of tabletop equipment



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:

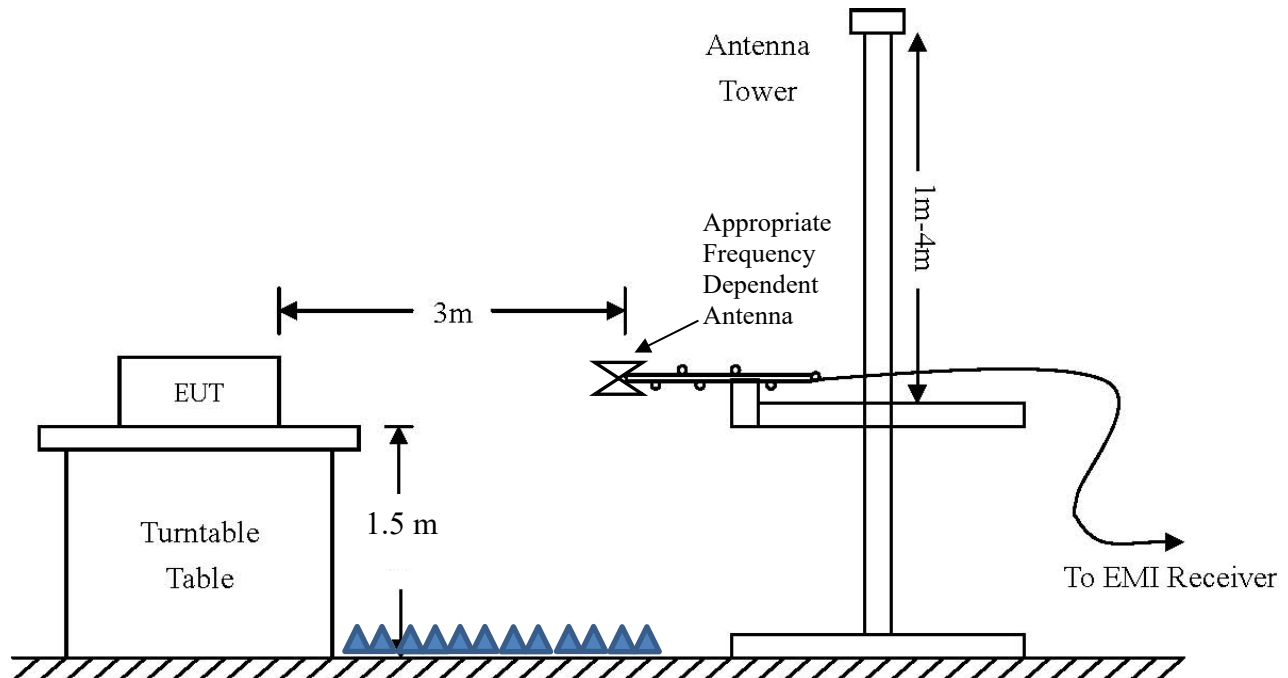
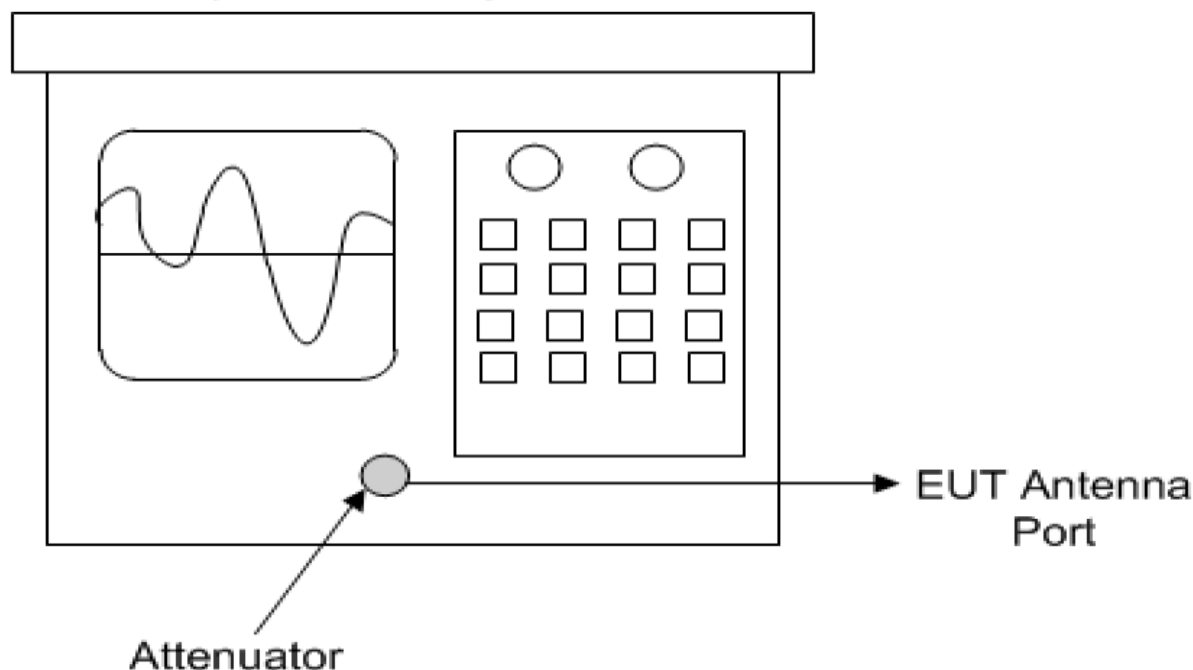


Diagram 4 Test arrangement for Antenna Port Conducted emissions
Spectrum Analyzer



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 C63.10-2013 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 1 Radiated Emissions in Restricted Frequency Bands Data Mode 1, BT BLE

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	51.2	37.9	51.6	38.0	54.0	-16.1	-16.0
2483.5	52.3	38.6	52.3	39.0	54.0	-15.4	-15.0
4804.0	42.4	31.6	43.4	32.3	54.0	-22.4	-21.7
4880.0	41.4	29.3	39.9	27.7	54.0	-24.7	-26.3
4960.0	40.9	28.3	43.2	33.3	54.0	-25.7	-20.7
7206.0	45.1	33.1	43.6	31.5	54.0	-20.9	-22.5
7320.0	45.7	33.0	45.5	33.2	54.0	-21.0	-20.8
7440.0	45.3	32.9	43.8	31.4	54.0	-21.1	-22.6
12010.0	50.3	37.3	49.8	37.6	54.0	-16.7	-16.4
12200.0	51.5	39.0	51.2	38.9	54.0	-15.0	-15.1
12400.0	51.0	38.6	51.1	38.5	54.0	-15.4	-15.5

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 EUT demonstrated compliance with the radiated emissions requirements of 47CFR Part 15C and RSS-247 Issue 3 Intentional Radiator requirements. The EUT demonstrated a worst-case minimum margin of -15.0 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.

General Radiated Emissions Procedure

Testing for the radiated emissions were performed as specified in CFR47 15B, RSS-GEN, and directed in ANSI C63.4-2014. For testing purposes, the EUT was arranged as presented in the applicable configuration diagrams above and operated through all modes as presented.

Exploratory radiated emissions measurements were performed in the SAC chamber or screen room, finding maximized emissions over frequency, EUT orientation, antenna height and polarity. This data is then used to focus the final radiated emissions measurements on these maximized points.

Final radiated emissions data were taken with the EUT located in the OATS or SAC at distance of 3 meters between the EUT and the receiving antenna. The frequency spectrum from 9 kHz to 6,000 MHz was searched for radiated emissions. Measured emission levels were maximized by EUT placement on the table, changing cable location, rotating the turntable through 360 degrees, varying the antenna height between 1 and 4 meters above the ground plane and changing antenna position between horizontal and vertical polarization. Antennas used were Loop, Biconical, Broadband Biconilog, Log Periodic, and Double Ridge or Pyramidal Horns and mixers above 1 GHz.

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

Frequency (MHz)	Peak (dB μ V/m)	Quasi-Peak (dB μ V/m)	Limit @ 3m (dB μ V/m)	Margin (dBm)
166.67	28.953	23.53	40	-16.47
249.98	40.457	37.68	47	-9.32
333.77	48.041	42.48	47	-4.52
417.47	32.722	25.38	47	-21.62
500.63	41.60	39.70	47	-7.30
834.38	40.919	34.76	47	-12.24

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.

Table 3 General Radiated Emissions Data – Worst Case (Vertical Polarization)

Frequency (MHz)	Peak (dBμV/m)	Quasi-Peak (dBμV/m)	Limit @ 3m (dBμV/m)	Margin (dBm)
249.98	42.465	40.29	47	-6.71
291.86	30.167	26.21	47	-20.79
333.77	48.404	46.05	47	-0.95
500.63	41.425	39.59	47	-7.41
750.95	29.656	22.36	47	-24.64
917.99	31.532	24	47	-23

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.

Summary of Results for General Radiated Emissions

The EUT demonstrated compliance with the radiated emissions requirements of 47CFR Part 15C paragraph 15.209, RSS-247 Issue 3, and RSS-GEN Issue 5 Intentional Radiators. The EUT configuration demonstrated a minimum margin of -0.95 dB below the requirements. Other emissions were present with amplitudes at least 20 dB below the Limits.

Operation in the Band 2400 – 2483.5 MHz

Test procedures of ANSI C63.10-2013 paragraph 6, and KDB 558074 were used during transmitter testing. Test sample EUT Antenna Port Conducted #2 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 C63.10-2013. 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 C63.10-2013. DTS Emission bandwidth was measured as described in KDB 558074 and ANSI C63.10-2013. 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 EUT Tx Radiated #1 representative of production equipment with integral antenna). The EUT was positioned on the 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 dB μ V/m @ 3 meters. Plots were taken of transmitter performance (using EUT Antenna Port Conducted #2) for reference in this and other documentation. These are shown in figures one through six.

Figure 1 Plot of Transmitter Operation in 2402-2480 MHz Mode 1, BT BLE

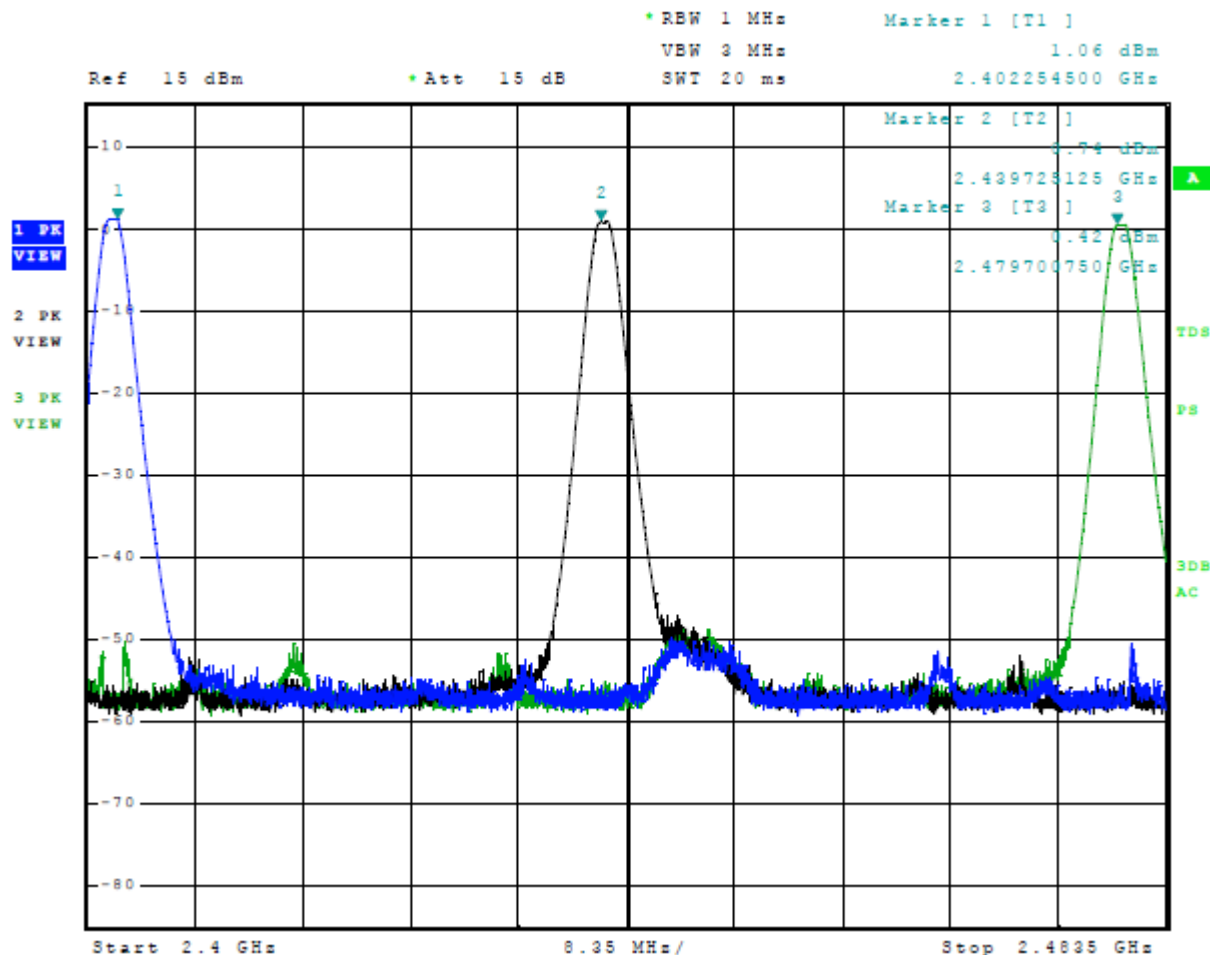


Figure 2 Plot of Emissions Low Band Edge Mode 1, BT BLE

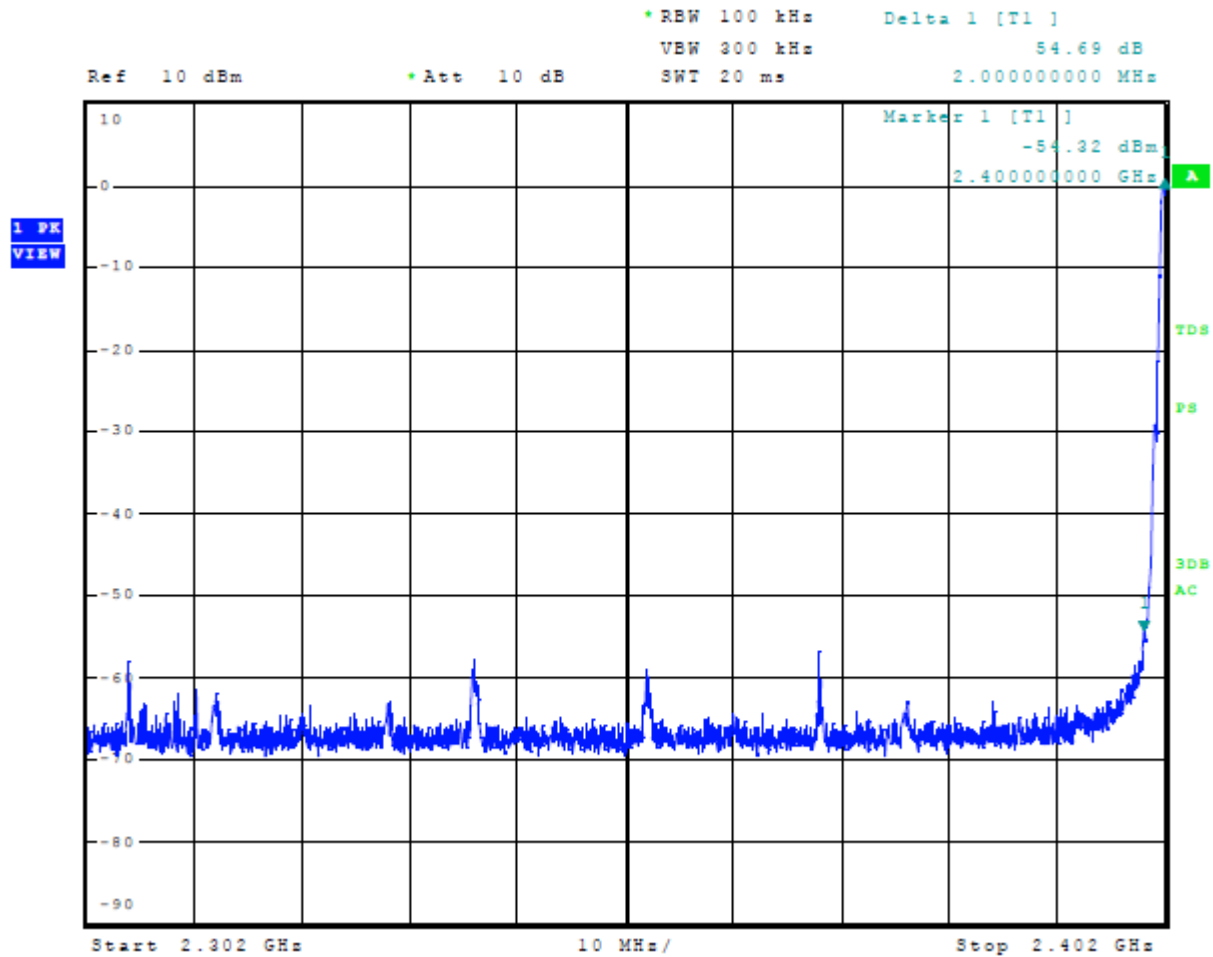


Figure 3 Plot of Transmitter Emissions High Band Edge Mode 1, BT BLE

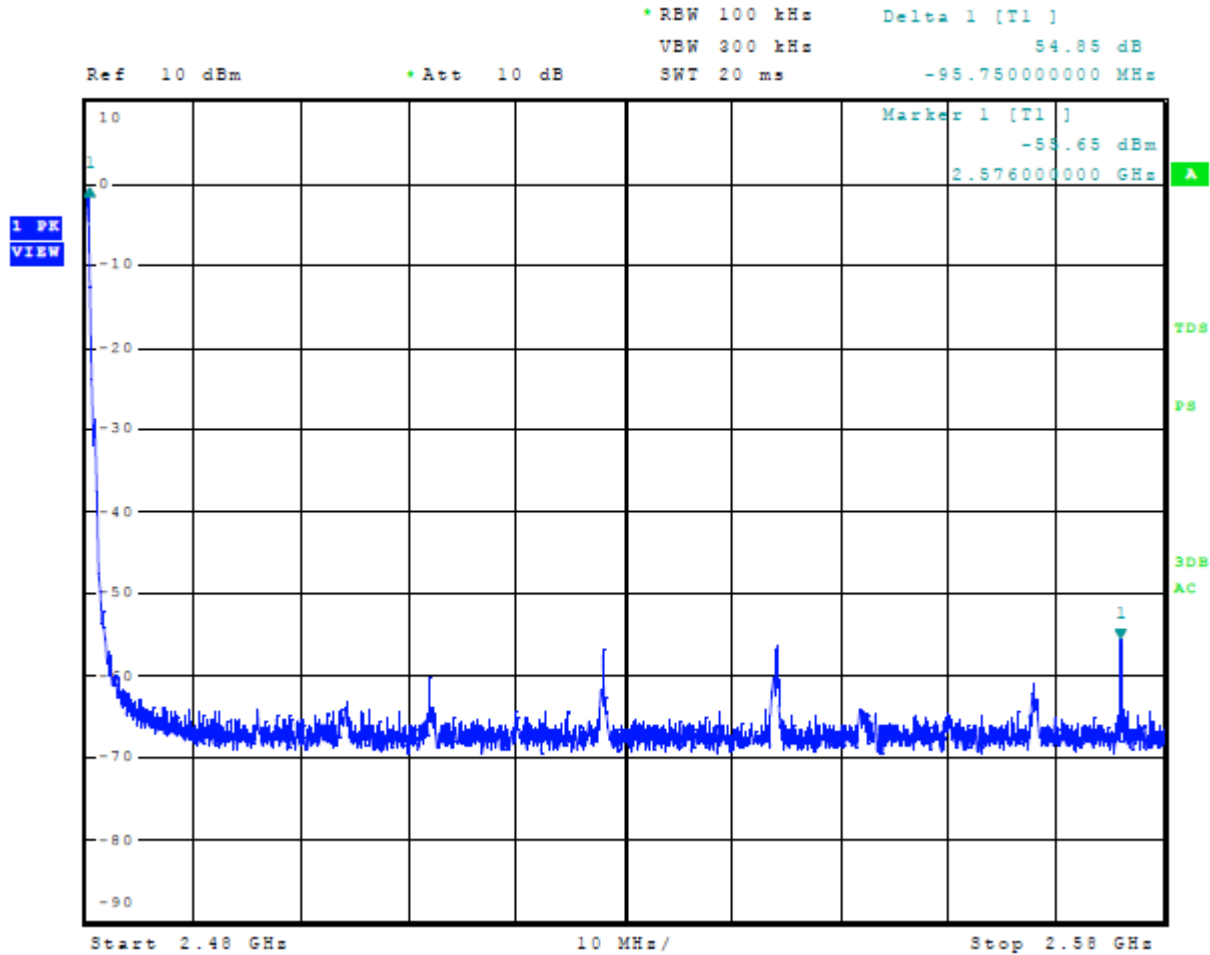


Figure 4 Plot of 6-dB Occupied Bandwidth Mode 1, BT BLE

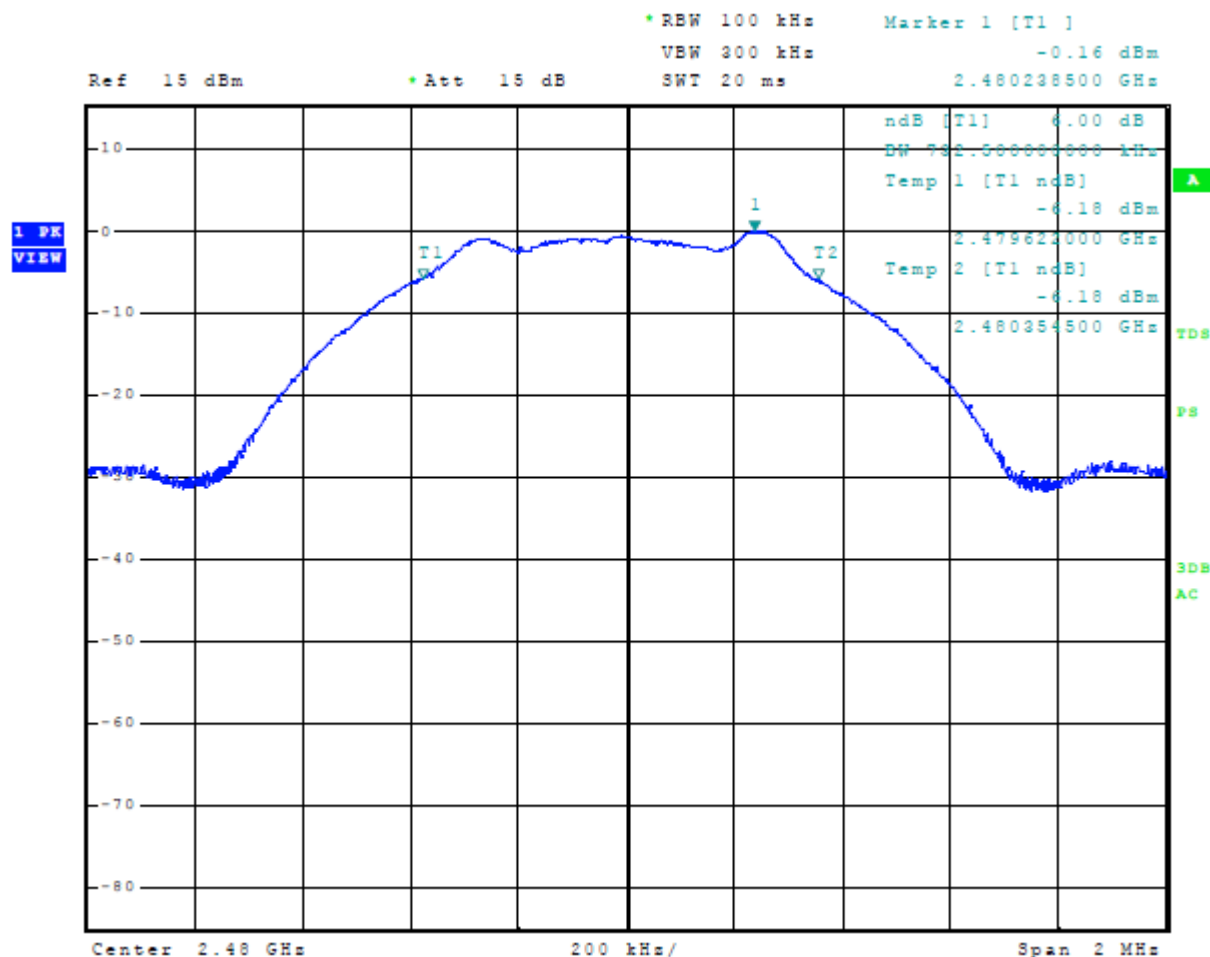


Figure 5 Plot of 99% Occupied Bandwidth Mode 1, BT BLE

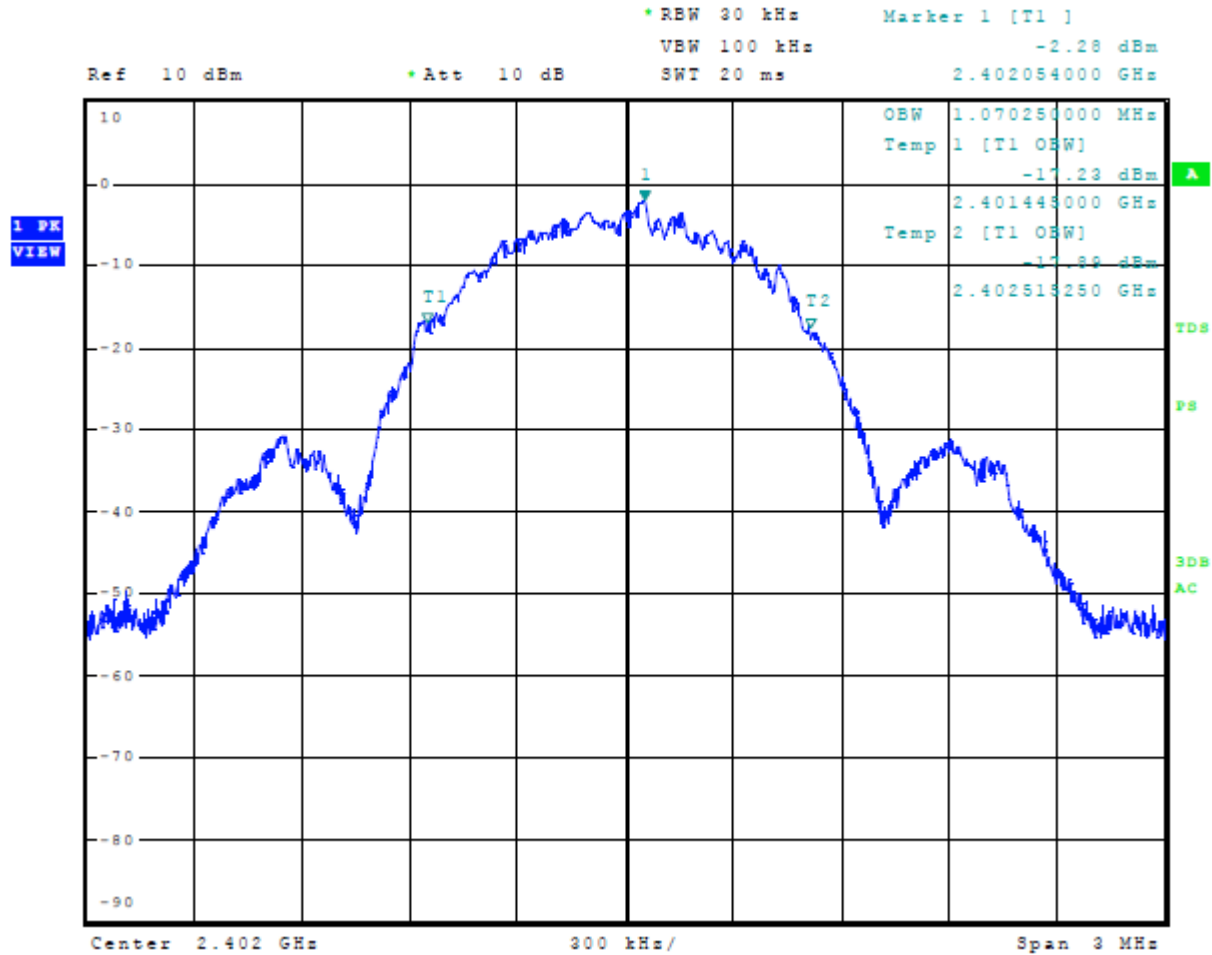
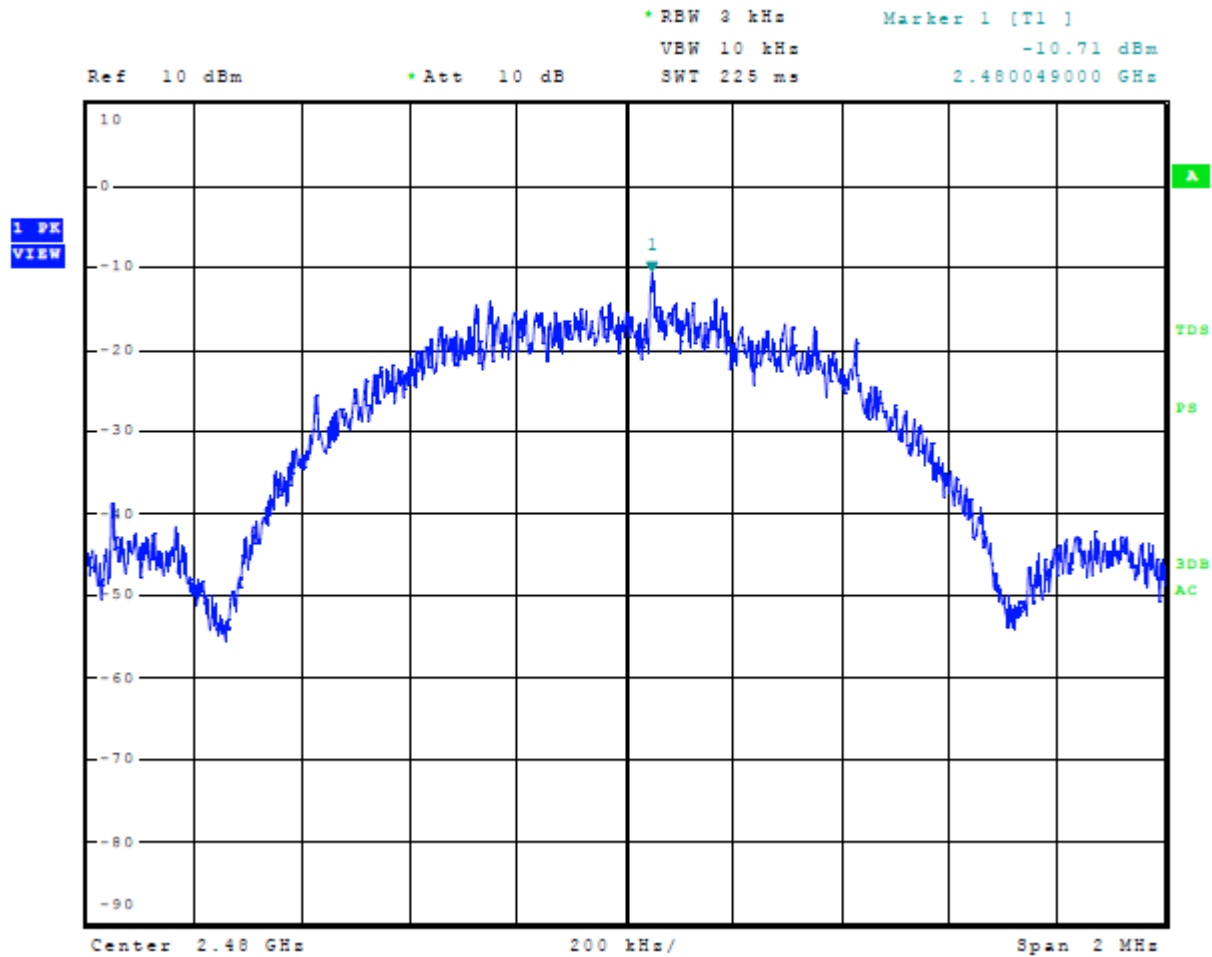


Figure 6 Plot of Transmitter Power Spectral Density Mode 1, BT BLE



Transmitter Emissions Data

Table 3 Transmitter Radiated Emissions Mode 1, BT BLE

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	42.4	31.6	43.4	32.3	54.0	-22.4	-21.7
7206.0	45.1	33.1	43.6	31.5	54.0	-20.9	-22.5
9608.0	47.3	35.0	47.7	35.1	54.0	-19.0	-18.9
12010.0	50.3	37.3	49.8	37.6	54.0	-16.7	-16.4
14412.0	52.5	39.8	52.2	40.0	54.0	-14.2	-14.0
16814.0	57.1	44.3	57.4	44.7	54.0	-9.7	-9.3
2440.0	--	--	--	--	--	--	--
4880.0	41.4	29.3	39.9	27.7	54.0	-24.7	-26.3
7320.0	45.7	33.0	45.5	33.2	54.0	-21.0	-20.8
9760.0	47.2	34.8	46.8	34.8	54.0	-19.2	-19.2
12200.0	51.5	39.0	51.2	38.9	54.0	-15.0	-15.1
14640.0	52.9	40.5	52.9	40.4	54.0	-13.5	-13.6
17080.0	56.3	44.4	56.7	44.4	54.0	-9.6	-9.6
2480.0	--	--	--	--	--	--	--
4960.0	40.9	28.3	43.2	33.3	54.0	-25.7	-20.7
7440.0	45.3	32.9	43.8	31.4	54.0	-21.1	-22.6
9920.0	47.8	35.4	47.5	35.4	54.0	-18.6	-18.6
12400.0	51.0	38.6	51.1	38.5	54.0	-15.4	-15.5
14880.0	53.0	40.9	53.3	40.9	54.0	-13.1	-13.1
17360.0	56.7	44.1	56.2	44.0	54.0	-9.9	-10.0

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 4 Transmitter Antenna Port Conducted Data mode 1

Frequency MHz	Antenna Port Average Output Power (Watts)	99% Occupied Bandwidth (kHz)	6-dB Occupied Bandwidth (kHz)	Peak Power Spectral Density (dBm)
Mode 1, BT BLE				
2402	0.002	1,070.3	725.0	-10.9
2440	0.002	1,059.8	725.0	-13.2
2480	0.002	1,065.8	732.5	-10.7

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 3 and RSS-GEN Issue 5 emission requirements for Digital Transmission Systems. The highest average output power measured at the antenna port for mode 1 was 0.002 Watts. The highest peak power spectral density measured at the antenna port for mode 1 presented a minimum margin of -10.7 dB below the requirements. The EUT demonstrated a minimum margin of -9.3 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.

Annex

- Annex A Measurement Uncertainty Calculations
- Annex B Test Equipment
- 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. Results 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
<input checked="" type="checkbox"/> LISN	FCC	FCC-LISN-50-25-10(1PA) (160611)	.15-30MHz	3/25/2024	3/25/2025
<input type="checkbox"/> LISN: Fischer Custom Communications Model:		FCC-LISN-50-16-2-08		3/25/2024	3/25/2025
<input checked="" type="checkbox"/> Cable	Huber & Suhner Inc.	Sucoflex102ea(L10M)(303073)	9kHz-40 GHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Cable	Huber & Suhner Inc.	Sucoflex102ea(1.5M)(303069)	9kHz-40 GHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Cable	Huber & Suhner Inc.	Sucoflex102ea(1.5M)(303070)	9kHz-40 GHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Cable	Belden	RG-58 (L1-CAT3-11509)	9kHz-30 MHz	9/16/2024	9/16/2025
<input type="checkbox"/> Cable	Belden	RG-58 (L2-CAT3-11509)	9kHz-30 MHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Antenna	Com Power	AL-130 (121055)	.001-30 MHz	9/16/2024	9/16/2025
<input type="checkbox"/> Antenna:	EMCO	6509	.001-30 MHz	9/16/2024	9/16/2026
<input checked="" type="checkbox"/> Antenna	ARA	BCD-235-B (169)	20-350MHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Antenna	Sunol	JB-6 (A100709)	30-1000 MHz	9/16/2024	9/16/2025
<input type="checkbox"/> Antenna	ETS-Lindgren	3147 (40582)	200-1000MHz	9/16/2024	9/16/2026
<input checked="" type="checkbox"/> Antenna	ETS-Lindgren	3117 (200389)	1-18 GHz	3/25/2024	3/25/2026
<input checked="" type="checkbox"/> Antenna	Com Power	AH-118 (10110)	1-18 GHz	9/16/2024	9/16/2026
<input checked="" type="checkbox"/> Antenna	Com Power	AH-1840 (101046)	18-40 GHz	3/27/2023	3/27/2025
<input checked="" type="checkbox"/> Analyzer	Rohde & Schwarz	ESU40 (100108)	20Hz-40GHz	7/8/2024	7/8/2025
<input checked="" type="checkbox"/> Analyzer	Rohde & Schwarz	ESW44 (101534)	20Hz-44GHz	1/26/2024	1/26/2025
<input type="checkbox"/> Analyzer	Rohde & Schwarz	FS-Z60, 90, 140, and 220	40GHz-220GHz	12/22/2017	12/22/2027
<input type="checkbox"/> Amplifier	Com-Power	PA-010 (171003)	100Hz-30MHz	9/16/2024	9/16/2025
<input type="checkbox"/> Amplifier	Com-Power	CPPA-102 (01254)	1-1000 MHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Amplifier	Com-Power	PAM-118A (551014)	0.5-18 GHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Amplifier	Com-Power	PAM-840A (461328)	18-40 GHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Pwr Sensor	Rohde & Schwarz	NRP33T	0.05-33 GHz	9/26/2023	9/26/2025
<input checked="" type="checkbox"/> Power meter	Agilent	N1911A with N1921A	0.05-40 GHz	3/25/2024	3/25/2025
<input checked="" type="checkbox"/> Generator	Rohde & Schwarz	SMB100A6 (100150)	20Hz-6 GHz	3/25/2024	3/25/2025
<input checked="" type="checkbox"/> Generator	Rohde & Schwarz	SMBV100A6 (260771)	20Hz-6 GHz	3/25/2024	3/25/2025
<input type="checkbox"/> RF Filter	Micro-Tronics	BRC50722 (009).9G notch	30-18000 MHz	3/25/2024	3/25/2025
<input type="checkbox"/> RF Filter	Micro-Tronics	HPM50114 (017)1.5G HPF	30-18000 MHz	3/25/2024	3/25/2025
<input type="checkbox"/> RF Filter	Micro-Tronics	HPM50117 (063) 3G HPF	30-18000 MHz	3/25/2024	3/25/2025
<input type="checkbox"/> RF Filter	Micro-Tronics	HPM50105 (059) 6G HPF	30-18000 MHz	3/25/2024	3/25/2025
<input checked="" type="checkbox"/> RF Filter	Micro-Tronics	BRM50702 (172) 2G notch	30-18000 MHz	3/25/2024	3/25/2025
<input type="checkbox"/> RF Filter	Micro-Tronics	BRC50703 (G102) 5G notch	30-18000 MHz	3/25/2024	3/25/2025
<input type="checkbox"/> RF Filter	Micro-Tronics	BRC50705 (024) 5G notch	30-18000 MHz	3/25/2024	3/25/2025
<input type="checkbox"/> Attenuator	Fairview	SA6NFFNF100W-40 (1625)	30-18000 MHz	3/25/2024	3/25/2025
<input checked="" type="checkbox"/> Attenuator	Mini-Circuits	VAT-3W2+ (1436)	30-6000 MHz	3/25/2024	3/25/2025
<input checked="" type="checkbox"/> Attenuator	Mini-Circuits	VAT-3W2+ (1445)	30-6000 MHz	3/25/2024	3/25/2025
<input checked="" type="checkbox"/> Attenuator	Mini-Circuits	VAT-3W2+ (1735)	30-6000 MHz	3/25/2024	3/25/2025
<input checked="" type="checkbox"/> Attenuator	Mini-Circuits	VAT-6W2+ (1438)	30-6000 MHz	3/25/2024	3/25/2025
<input type="checkbox"/> Attenuator	Mini-Circuits	VAT-6W2+ (1736)	30-6000 MHz	3/25/2024	3/25/2025

Rogers Labs, a division of The Compatibility Center LLC

7915 Nieman Road FCC ID: 2A6QA-MACH2FSS

Lenexa, KS 66214 Test: 241017 HVIN/PMN: MACH2

Phone/Fax: (913) 660-0666 Test to: 47CFR 15C, RSS-Gen RSS-247

Revision 1

File: Foresight MACH2 DTS TstRpt 241017 r1

Foresight Sports

IC: 28505-MACH2FSS

SN's: 0001, 0002

Date: February 17, 2025

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<u>Equipment</u>	<u>Manufacturer</u>	<u>Model (SN)</u>	<u>Band</u>	<u>Cal Date(m/d/y)</u>	<u>Due</u>
<input type="checkbox"/> Frequency Counter: Leader		LDC-825 (8060153)		3/28/2023	3/28/2025
<input type="checkbox"/> ISN	Com-Power	Model ISN T-8 (600111)		3/25/2024	3/25/2025
<input type="checkbox"/> LISN	Compliance Design	FCC-LISN-2.Mod.cd,(126)	.15-30MHz	9/16/2024	9/16/2025
<input type="checkbox"/> LISN:	Com-Power	Model LI-220A		9/16/2024	9/16/2026
<input type="checkbox"/> LISN:	Com-Power	Model LI-550C		9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Cable	Huber & Suhner Inc.	Sucoflex102ea(1.5M)(303072)	9kHz-40 GHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Cable	Huber & Suhner Inc.	Sucoflex102ea(L1M)(281183)	9kHz-40 GHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Cable	Huber & Suhner Inc.	Sucoflex102ea(L4M)(281184)	9kHz-40 GHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Cable	Huber & Suhner Inc.	Sucoflex102ea(L10M)(317546)	9kHz-40 GHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Cable	Time Microwave	4M-750HF290-750 (L4M)	9kHz-24 GHz	9/16/2024	9/16/2025
<input checked="" type="checkbox"/> Cable	Mini-Circuits	KBL-2M-LOW+ (23090329)	9kHz-40 GHz	3/25/2024	3/25/2025
<input type="checkbox"/> RF Filter	Micro-Tronics	BRC17663 (001)	9.3-9.5 notch 30-1800 MHz	3/28/2023	3/28/2025
<input type="checkbox"/> RF Filter	Micro-Tronics	BRC19565 (001)	9.2-9.6 notch 30-1800 MHz	3/28/2023	3/28/2025
<input checked="" type="checkbox"/> Analyzer	HP	8562A (3051A05950)	9kHz-125GHz	3/25/2024	3/25/2025
<input type="checkbox"/> Wave Form Generator Keysight		33500B (MY57400128)		3/25/2024	3/25/2025
<input type="checkbox"/> Antenna: Solar		9229-1 & 9230-1		2/10/2024	2/10/2025
<input type="checkbox"/> CDN: Com-Power		Model CDN325E		10/11/2022	10/11/2024
<input type="checkbox"/> Oscilloscope Scope: Tektronix		MDO 4104		2/10/2024	2/10/2025
<input type="checkbox"/> EMC Transient Generator HVT		TR 3000		2/10/2024	2/10/2025
<input type="checkbox"/> AC Power Source (Ametech, California Instruments)				2/10/2024	2/10/2025
<input checked="" type="checkbox"/> Field Intensity Meter: EFM-018				2/10/2024	2/10/2025
<input type="checkbox"/> ESD Simulator: MZ-15				2/10/2024	2/10/2025
<input checked="" type="checkbox"/> Weather station Davis		6152 (A70927D44N)		7/11/2024	7/11/2025
<input type="checkbox"/> Injection Clamp Luthi Model EM101				not required	
<input type="checkbox"/> R.F. Power Amp ACS 230-50W				not required	
<input type="checkbox"/> R.F. Power Amp EIN Model: A301				not required	
<input type="checkbox"/> R.F. Power Amp A.R. Model: 10W 1010M7				not required	
<input type="checkbox"/> R.F. Power Amp A.R. Model: 50U1000				not required	
<input checked="" type="checkbox"/> Temperature Chamber				not required	
<input checked="" type="checkbox"/> Shielded Room				not required	

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

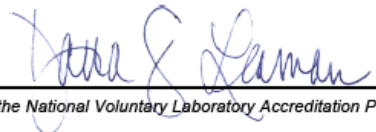
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listed on the Scope of Accreditation, for:*

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 dated January 2009).*

2024-03-18 through 2025-03-31
Effective Dates




For the National Voluntary Laboratory Accreditation Program