



Test Report

Prepared for: ITERIS, Inc

Model: DENSO-BT-RSU-SPECTRA

Description: C-V2X Road Side Unit (RSU)

Project #: p2580009

Test Results: Pass

FCC ID: OVH-BTSPCV2X54940

To

FCC Part 90 & FCC 15.209
(Co-Location)

Date of Issue: November 5, 2025

On the behalf of the applicant:

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ISED Site Reg. #2044A-2

Reviewed / Authorized By:

Madhava Gooduru
EMC RF Test Engineer

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All results contained herein relate only to the sample tested.

Test Results Summary

Test Date Range: Oct 24, 2025 – Oct 25, 2025

Specification	Test Name	Pass, Fail, N/A	Comments
FCC			
15.209(a), 15.205 90.392	Radiated Spurious Emissions	Pass	As per KDB 996369 ⁽¹⁾

(1) Only Simultaneous Transmission Radiated Spurious Emissions test was performed

Statements of conformity are reported as:

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

References/Methods	Description
ANSI C63.4-2014	Method and Measurements of Radio-Noise Emissions from low-Voltage Electrical and Electronic Equipment in the range 9kHz to 40GHz.
ANSI C63.10:2020	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
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 Calibrations Laboratories

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Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	11/05/2025	Madhava Gooduru	Original Document

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

ANAB

Compliance Testing, LLC, has been 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 the joint ISO-ILAC-IAF Communiqué dated January 2009).

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to <http://www.compliancetesting.com/labscope.html> for current scope of accreditation.



Test and Measurement Data- Applicable standards

All tests and measurement data shown were performed in accordance with following FCC Rules and Regulations,

- 1) 47 CFR Part 2 Subpart J – Certification
- 2) 47 CFR Part 90 Subpart M -Intelligent Transportation Systems Radio Service
- 3) 47 CFR 15.209 - Radiated emission limits; general requirements

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing.

In accordance with ANSI/TIA 603C, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 20° to 35°C (68° to 95°F) unless the particular equipment requirements specified testing over a different temperature range. Also, unless otherwise indicated, the levels were in the range of 45% to 75% relative humidity and 860 hPa to 1060 hPa (860 mbar to 1060 mbar) Atmospheric Pressure..

Environmental Conditions		
Temp (°C)	Humidity (%)	Pressure (mbar)
25.5 – 31.2	33.5 – 51.8	962.3 – 971.3

Measurement results, unless otherwise noted, are worst-case measurements.

EUT Description

Model:	DENSO-BT-RSU-SPECTRA
Serial:	A00250840661
Firmware:	SPECTRA-1040__DENSO-0.3.03_rc2
Software:	DNA
HVIN	SPECTRA-HW04.00.06__DENSO-PCBA-HW5940.MP1.0
PMN	SPECTRA_DENSO5940_RSU
UPN	DNA
FVIN	SPECTRA-FW1040__DENSO-FWv0.3.03_rc2
Description:	Road Side Unit – Bluetooth Detector/CV2X
Additional Information:	The EUT is a Road Side Unit transmitting the 5905-5925 MHz frequency band using 10 MHz bandwidth per channel. It supports transmission and reception on 2 antennas simultaneously (Tx/Rx antenna diversity). Supported channels: 183
Antenna	6dBi external omni directional Antenna with N-Female connector
Power	48VDC thru POE
Receipt of Sample(s):	9/10/2025
EUT Condition:	Visual Damage No State of Development Production/Production Equivalent

Note:

1. The Bluetooth (BT) module (Brand: Feasycom Model: FSC-BT909C; FCC ID: 2AMWOFSC-BT909C, Antenna gain=2dBi, Antenna type= dipole) is co-located in this EUT.
2. The above EUT information is declared by manufacturer and for more detailed features, description, please refer to the manufacturer specifications or user's manual.

EUT Operation during Tests

The transmitter is powered by 48 vdc.

The EUT was commanded to transmit continuously on C-V2X channel 183 and in frequency-hopping mode for Bluetooth, with both radios set to their maximum transmit power.

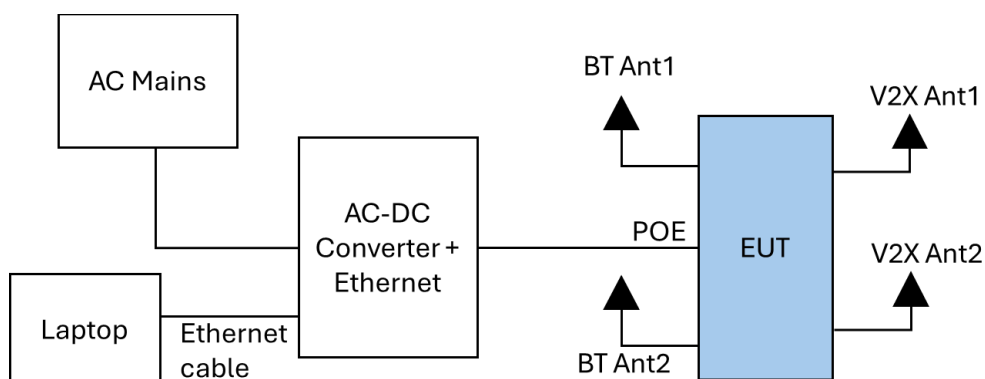
Table 1 – Frequency Range, Modulation Type and Emission Designators

Frequency Range (MHz)	Modulation	Data rate
5905 – 5925 MHz	QPSK/16QAM	10kbyte/sec
2402 -2480 MHz	$\pi/4$ -DQPSK and 8-DPSK	2 Mbps

Table 2 – C-V2X Test Frequencies

Test Frequency (MHz)	Channel No
5915	183
2402 – 2480	0 - 78

Configuration of System under test



Note:

- 1) Open the RSU GUI using the default IP address and port of the relevant radio and being configured

Accessories:					
Qty	Description	Length	Model	S/No	Comments
2	Omni directional antenna for CV2X	N/A	HGV-4958-06U	N/A	Mfg: L-com
2	Omni direction antenna for BT	N/A	HGV-2402U	N/A	Mfg: L-com
1	AC-DC Converter + Ethernet	N/A	NDR-120-48	N/A	Mfg: Meanwell
2	Ethernet cable	3 m	N/A	N/A	N/A
1	Laptop	N/A	Latitude 7490	PC19551	Mfg: Dell

Radiated Emissions

Engineer: Madhava Gooduru

Test Date: 10/25/25

Limit:

C-V2X Roadside Units (RSUs) must comply with the following out-of-band emissions limits.

(a) Conducted limits measured at the antenna input must not exceed:

- (1) -16 dBm/100 kHz within ± 1 megahertz of the band edges;
- (2) -13 dBm/MHz within ± 1 megahertz to ± 5 megahertz of the band edges;
- (3) -16 dBm/MHz within ± 5 megahertz to ± 30 megahertz of the band edges; and
- (4) -28 dBm/MHz beyond 30 megahertz from the band edges

BT: Except as provided elsewhere in this subpart, the emissions from **an intentional radiator** shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Procedure

The EUT was tested in a semi-anechoic chamber with the turntable set 3m from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Radiated Emissions. The EUT was tested by rotating it 360 degrees with the antennas in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure the signal levels were maximized. All emissions from 30 MHz to 40 GHz were examined.

BT and C-V2X radios were transmitted at maximum power in test cases from 30- 40000 MHz

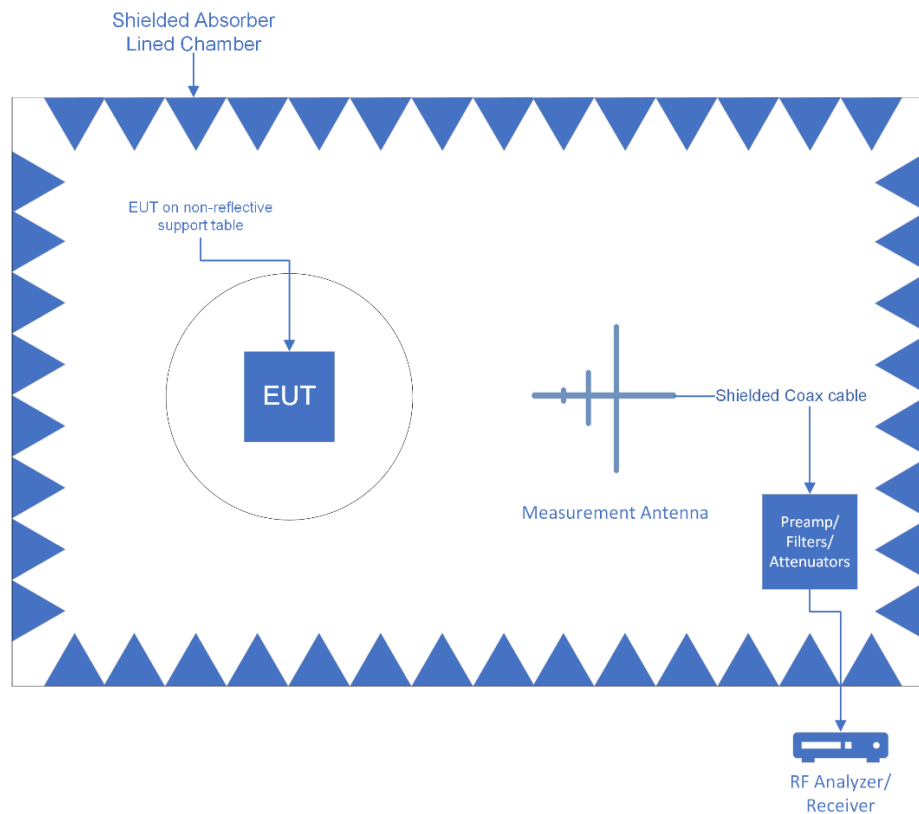
Low Pass Filter (LPF)-1.1GHz used in 30-1000MHz Radiated Emission Measurement.

High Pass Filter (HPF) - 4GHz used in 1-3.6 GHz Radiated Emission Measurement.

Notch Filter for 5.915 GHz used in 3.6 -18 GHz Radiated Emission Measurement

HPF -8GHz used in 18-40GHz Radiated Emission Measurement.

Basic Test Setup



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

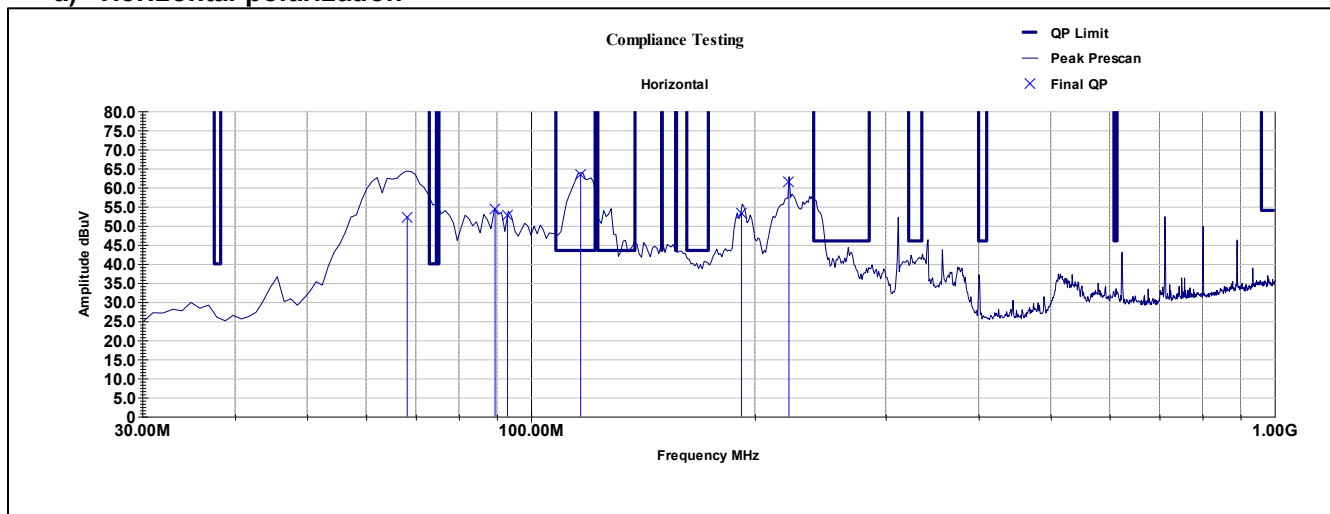
Sample Calculations

Corrected Value = Measured Value + Correction factor

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

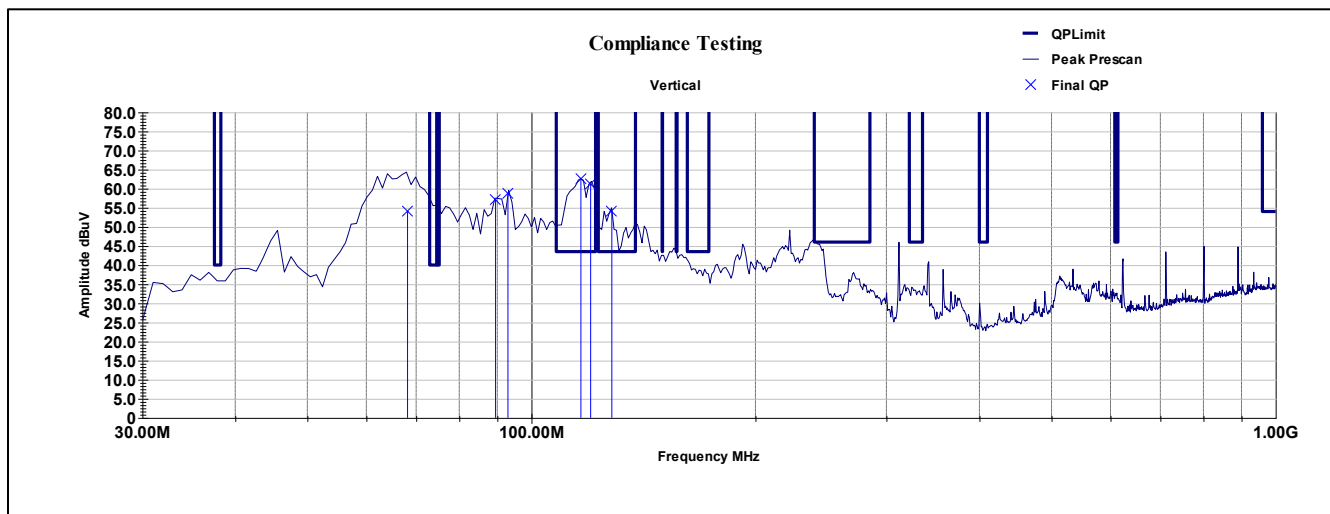
Radiated Emissions 30-1000 MHz

a) Horizontal polarization



Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
68.166	98	400	77.188	-24.889	52.3	120	-67.7
89.471	119	208	76.626	-22.254	54.4	120	-65.6
93.004	284	195	74.503	-21.734	52.8	120	-67.2
116.623	82	325	82.396	-19.114	63.3	43.5	19.8*
191.925	266	155	74.278	-20.94	53.3	120	-66.7
222.249	74	124	81.301	-19.852	61.4	120	-58.6

a) Vertical polarization

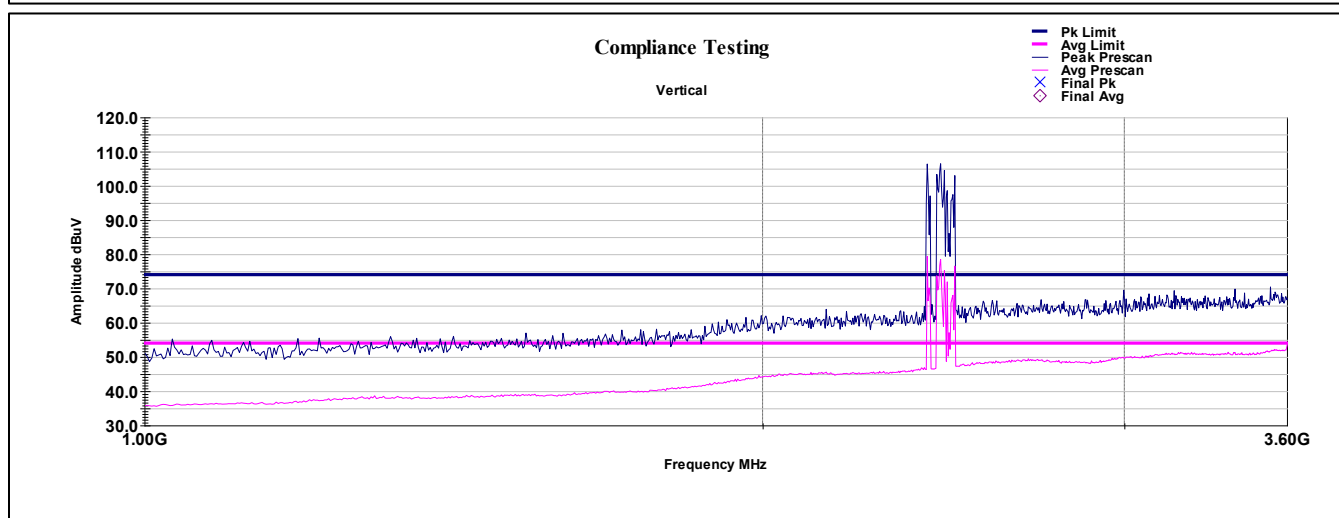
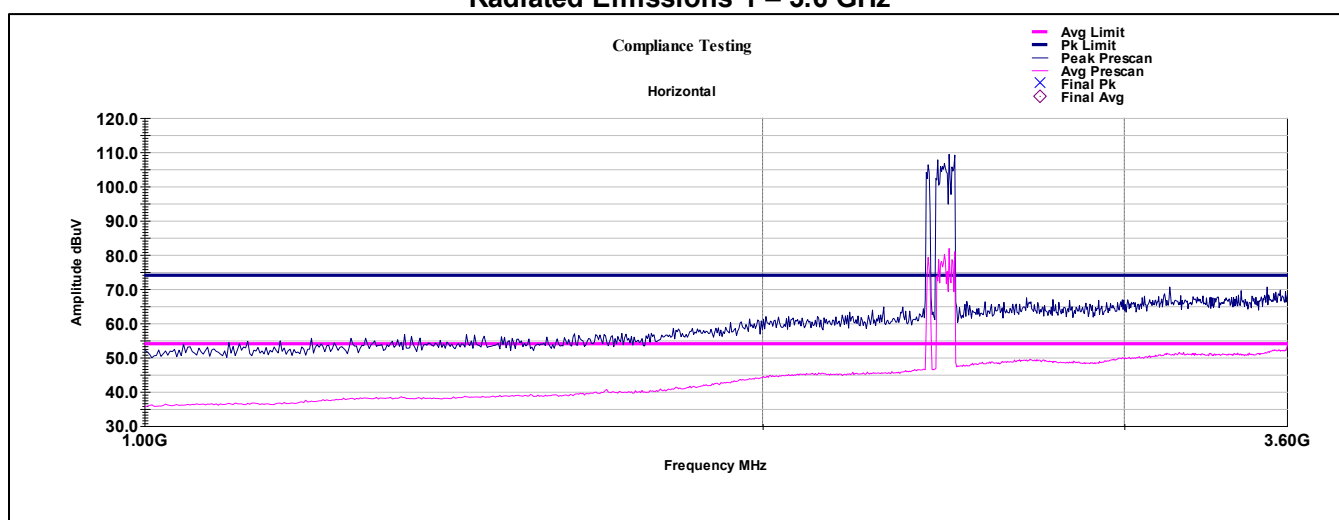


Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
68.164	203	100	78.927	-24.789	54.1	120	-65.9
89.493	288	117	78.989	-21.949	57	120	-63
92.999	298	105	79.844	-21.035	58.8	120	-61.2
116.558	160	105	81.115	-18.477	62.6	43.5	19.1*
120.11	159	100	79.477	-18.255	61.2	43.5	17.7*
128.273	149	105	71.909	-17.928	54	43.5	10.5*

* The emissions observed above the Part 15 limit were investigated by disabling all RF transmissions. The emission pattern and amplitude remained unchanged, confirming that the source is **non-RF** from the device's internal circuitry. Hence, the exceedances are **not the result of radio transmission** but rather the unintentional emissions of the electronics.

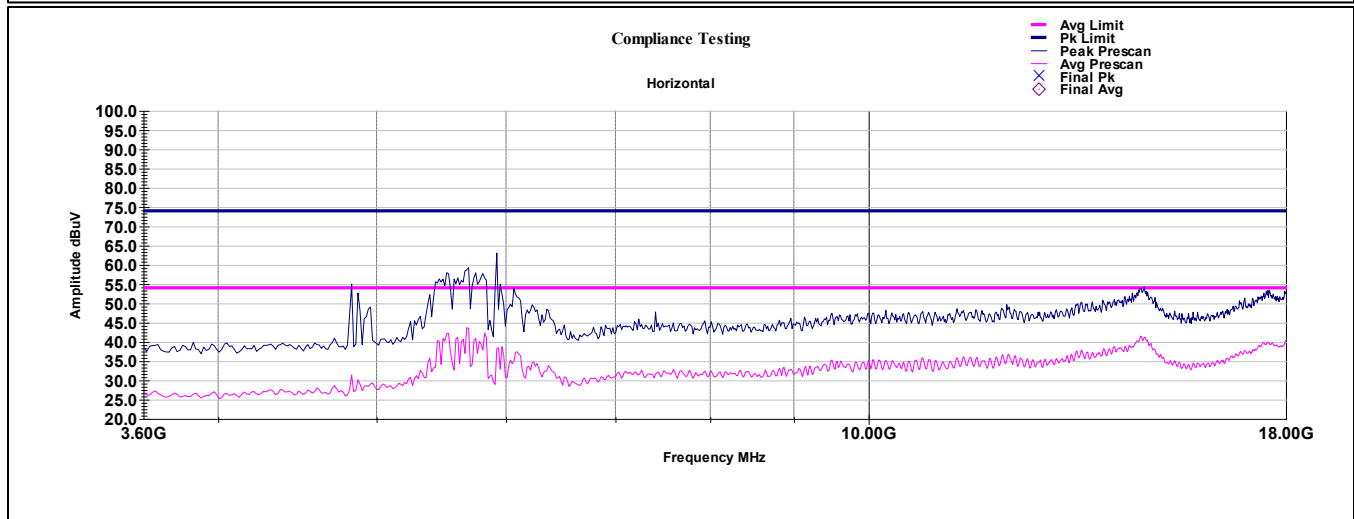
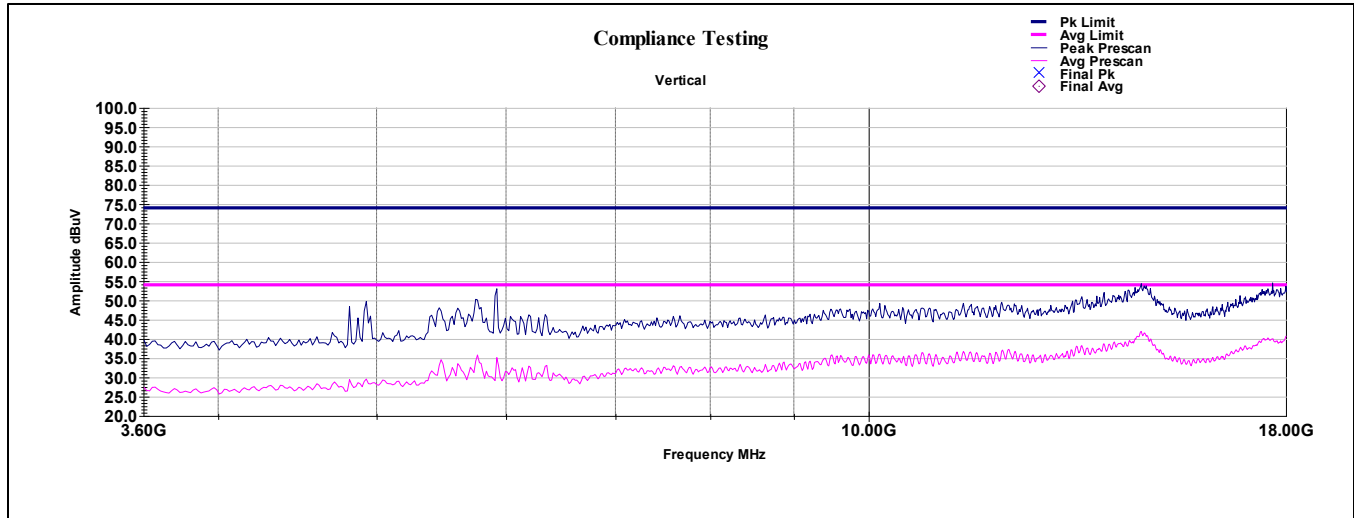
Refer to **Appendix A** for unintentional Radiated Emissions

Radiated Emissions 1 – 3.6 GHz

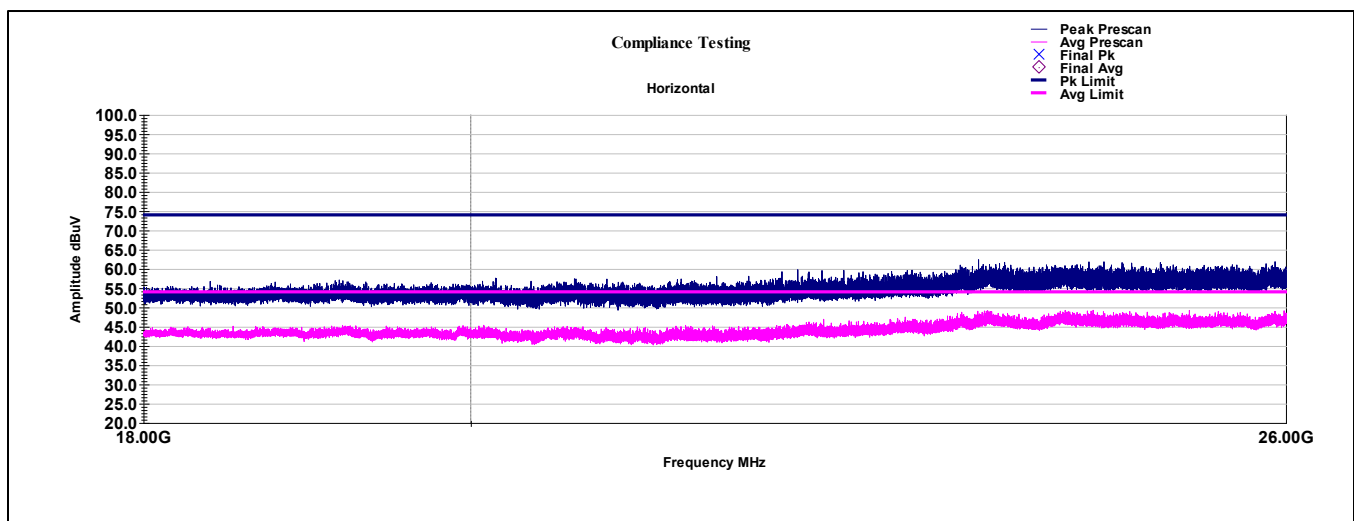


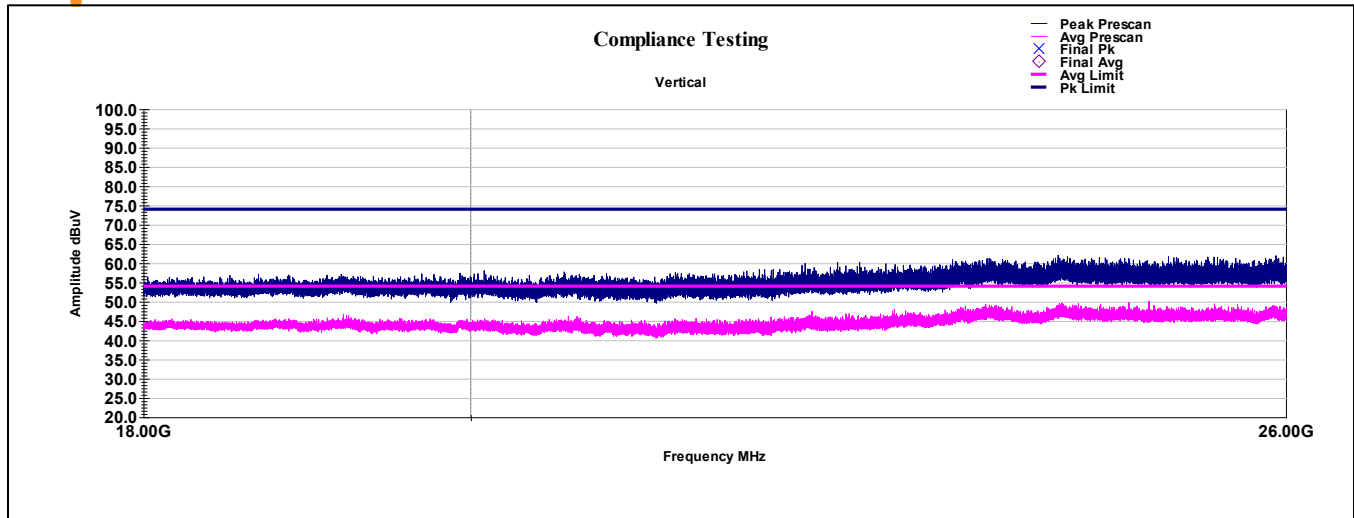
Note: The Bluetooth fundamental exceeds the limit and is not subject to spurious emission limits.

Radiated Emissions 3.6 - 18 GHz

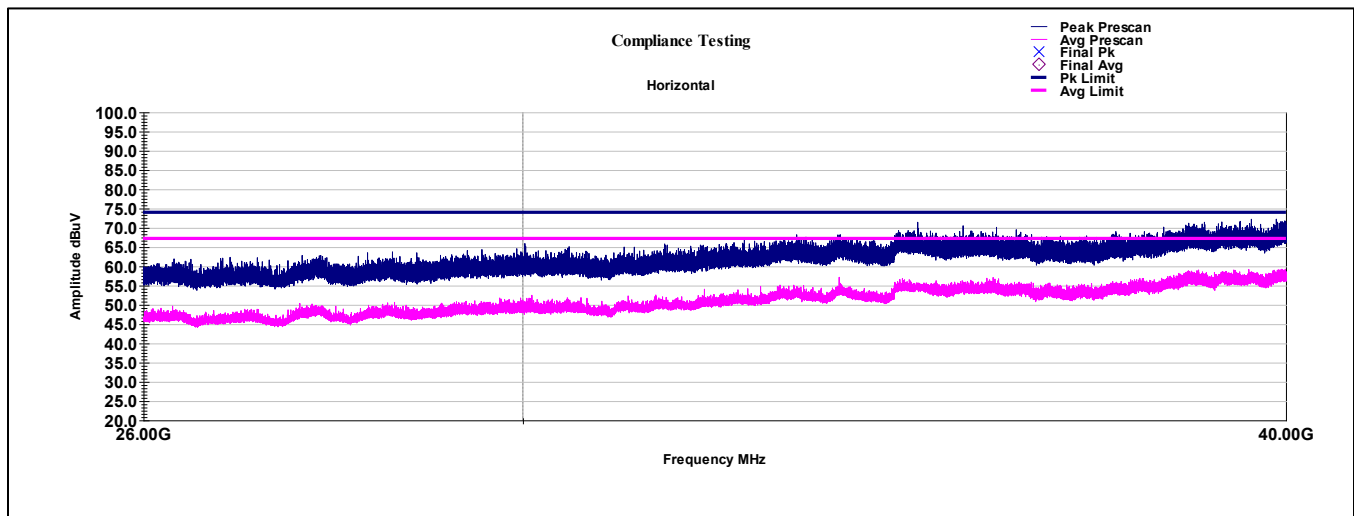
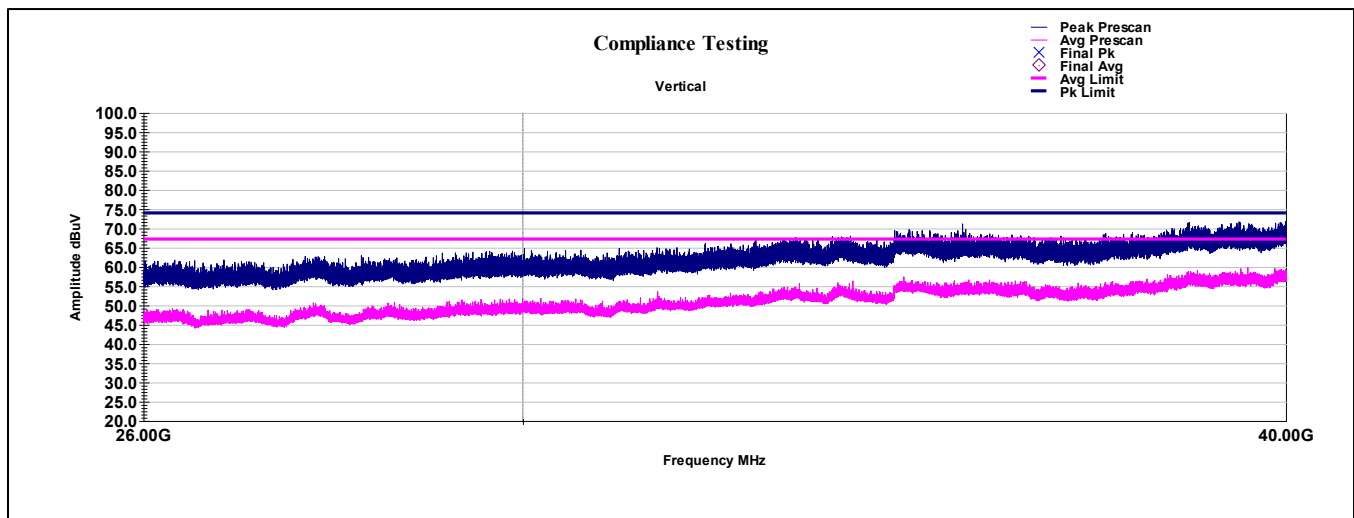


Radiated Emissions 18 -26 GHz





Radiated Emissions 26 - 40 GHz



Test Equipment Utilized

EMI/EMC Testing

Description	Manufacturer	Model #	CT Asset #	Last Cal Date	Cal Due Date
Horn Antenna	ARA	DRG-118/A	i00271	8/9/2024	8/9/2026
Bi-Log Antenna	Schaffner	CBL 6111D	i00349	2/27/25	2/27/27
3 Meter Semi-Anechoic Chamber	Panashield	3 Meter Semi-Anechoic Chamber	i00428	7/13/23	7/13/26
Multimeter	Fluke	179	i00488	6/25/25	6/25/26
MXE EMI receiver	Keysight	N9038A	i00552	3/17/2025	3/17/2026
Preamplifier	COM-Power	PAM-103	i00734	Verified on: 10/15/25	
Preamplifier	Eravant	SBB-0115034019-2F2F-E3	i00756	Verified on: 10/15/25	
low pass filter 1GHz	Lark	TB5L-5-1200-M/M	i00700	Verified on : 10/24/25	
low pass filter 0 – 4 GHz	K&L Microwave	13SS12-4600/U4800-0/0	i00694	Verified on : 10/24/25	
high pass filter 8.0-40GHz	Radiall	R439.630.200	i00696	Verified on : 10/24/25	
Tunable Band Reject Filter	Wainwright	WTRCJV8-5150-5900-40-160-50SSK	i00462	Verified on : 10/24/25	

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

Measurement Uncertainty

Measurement Uncertainty (U_{lab}) for Compliance Testing is listed in the table below.

Measurement	U_{lab}
Radio Frequency	$\pm 3.3 \times 10^{-8}$
RF Power, conducted	± 1.5 dB
RF Power Density, conducted	± 1.0 dB
Conducted Emissions	± 1.8 dB
Radiated Emissions 9kHz-30MHz	± 3.6 dB
Radiated Emissions 30MHz-1000MHz	± 4.25 dB
Radiated Emissions – 1GHz-18GHz	± 4.5 dB
Temperature	± 1.5 deg C
Humidity	± 4.3 %
DC voltage	± 0.20 VDC
AC Voltage	± 1.2 VAC

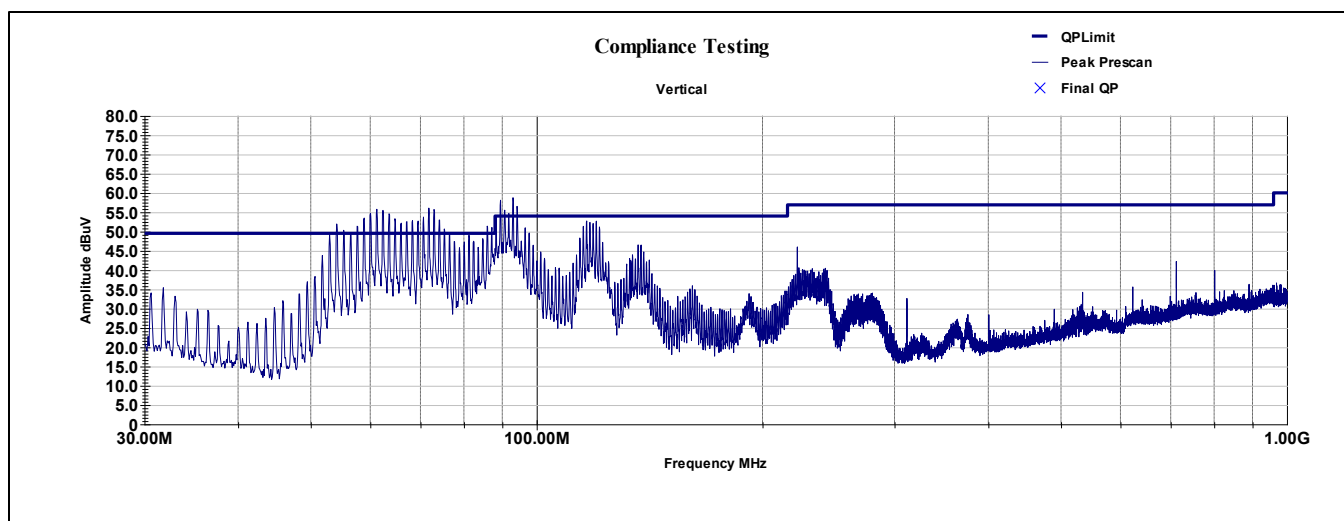
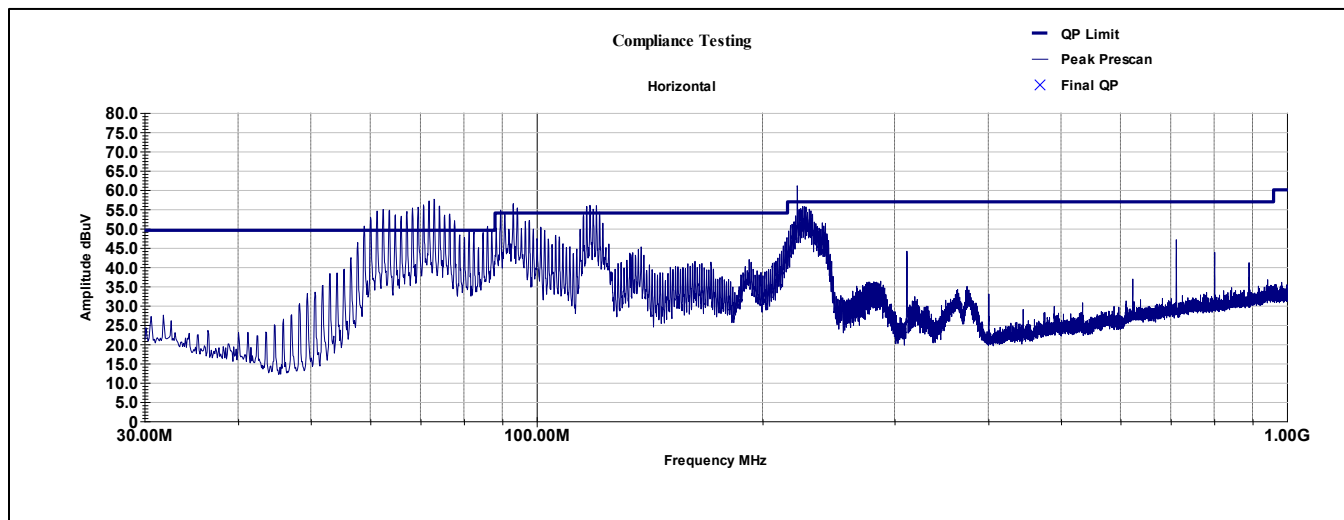
The reported expanded uncertainty $\pm U_{lab}$ (dB) has been estimated at a 95% confidence level ($k=2$)

U_{lab} is less than or equal to U_{ETSI} therefore

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

Appendix A

Radiated emissions from 30–1000 MHz were evaluated with the EUT in a powered-on state and with all intentional transmitters deactivated.



END OF TEST REPORT