Test Report

Prepared for: Icom Inc.

Model: IC-R8600

Serial Number: 00000001

Project No: p2450002

Test Results: Pass

To

FCC Part 15B Class B
and
IC ICES-003 Issue 7 (October 2020) Class B

Date of Issue: June 17, 2024

On the behalf of the applicant:	**Icom Inc.** **1-1-32 Kamiminami Hirano-ku** **Osaka Japan 547-0003**
Attention of:	**Tatsuo Yano, General Manager of QA Department** **Ph: +81 66793-5301, +81 66793-0013** **E-Mail: export@icom.co.jp**
Prepared By:	**Compliance Testing, LLC** **Mesa, AZ 85204** **(480) 926-3100 phone / (480) 926-3598 fax** **www.compliancetesting.com** **ANAB Cert#: AT-2901** **FCC Site Reg. #US2901** **ISED Site Reg. #2044A-2**

Reviewed / Authorized By:

Greg Corbin
Project Test Engineer

Test Results Summary

Test Date Range: May 29, 2024 to June 4, 2024

Specification		Test Name	Pass, Fail, N/A	Comments
FCC	**ICES**			
FCC 15.107	ICES-003 Section 3	DC Powerline Conducted Emissions	Pass	
FCC 15.109	ICES-003 Section 3	Radiated Emissions	Pass	
Method Deviations/Additions: No				

Statements of conformity are reported as:

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

References/Methods	Description
ANSI C63.4-2014	Method and Measurements of Radio-Noise Emissions from low-Voltage Electrical and Electronic Equipment in the range 9kHz to 40GHz.
ISO/IEC 17025:2017	General requirements for the Competence of Testing and Calibrations Laboratories

Table of Contents

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	6/17/2024	Greg Corbin	Original Document

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

EUT Description

Model:	R8600
Serial:	**00000003**
Firmware:	N/A
Software:	N/A
Description:	Communications Receiver
Additional Information:	Digital and Analog scanning receiver covering the frequency range of 30 MHz – 960 MHz. Capable of receiving AM, FM, WFM, FSK, CW, Digital. Refer to user manual for further details. The receiver was powered from a lab power supply set to 13.8 vdc. Highest Frequency Generated: 3000 MHz Usage: Table/Desktop
Receipt of Sample(s):	May 2, 2024
EUT Condition:	Visual Damage No State of Development Production/Production Equivalent

EUT PHOTO

Notifications
The applicant has been cautioned as to the following:

FCC

15.21 – Information to user

The user's manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) – Special Accessories

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in the part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer without an additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in §2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Industry Canada

Products subject to Industry Canada ICES-003 must be labeled in English and/or French (based on the intended market and any other applicable provincial or federal regulations) as follows:

CAN ICES-003 (B)/NMB-003(B*)*

Note: These notices are specific to the methods and standards related to the testing within this report. Customers should also consider and review additional legal regulations for import/export documentation and labeling for the countries and geographies under consideration by the manufacturer.

Test and Measurement Data

Subpart 2.1033(b)

All tests and measurement data shown were performed in accordance with FCC Rule Parts: 15.107, 15.109 (Unintentional Radiators).

All tests and measurement data shown are deemed satisfactory evidence of compliance with Industry Canada Interference-Causing Equipment Standard ICES-003.

Standard Engineering Practices

Unless otherwise indicated, the procedures contained in ANSI C63.4-2014 were observed during testing.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst case measurement.

Standard Test Conditions and Engineering Practices

Unless otherwise indicated in the specific measurement results, the ambient temperature was maintained within the range of 10º to 40ºC (50º to 104ºF) and the relative humidity levels were in the range of 10% to 90%.

Environmental Conditions		
Temperature (ºC)	**Humidity (%)**	**Barometric Pressure (mbar)**
25.2 – 29.7	22.7 – 26.1	969.0 – 962.1

Test Setup and Modes of Operation

EUT Operation during Tests
The receiver was operated in the non-scanning mode for Part 15B radiated and conducted emissions.

EUT:				
Qty	**Description**	**Manufacturer**	**Model**	**S/N**
1	Communications Receiver	Icom	IC-R8600	00000003

Accessories: None				
Qty	**Description**	**Manufacturer**	**Model**	**S/N**

Cables:						
Qty	**Description**	**Length (M)**	**Ferrites (Y/N)**	**Shielding Y/N**	**Shielded Hood Y/N**	**Termination / Connection**
1	Dc Power, 2 wire	2	N	N	N	Power Supply to EUT

	Modifications to EUT: None

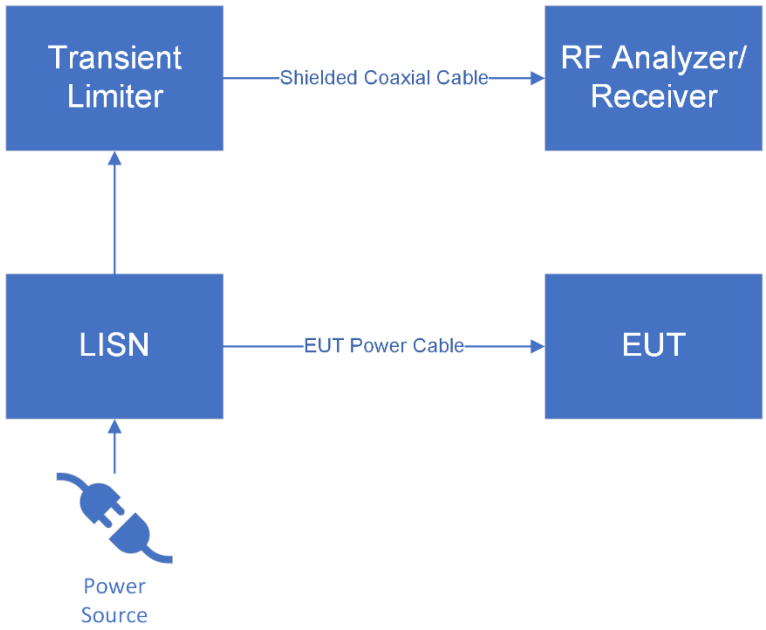
15.107 DC Powerline Conducted Emissions

Engineer: Greg Corbin
Test Date: 5-29-24

Test Procedure

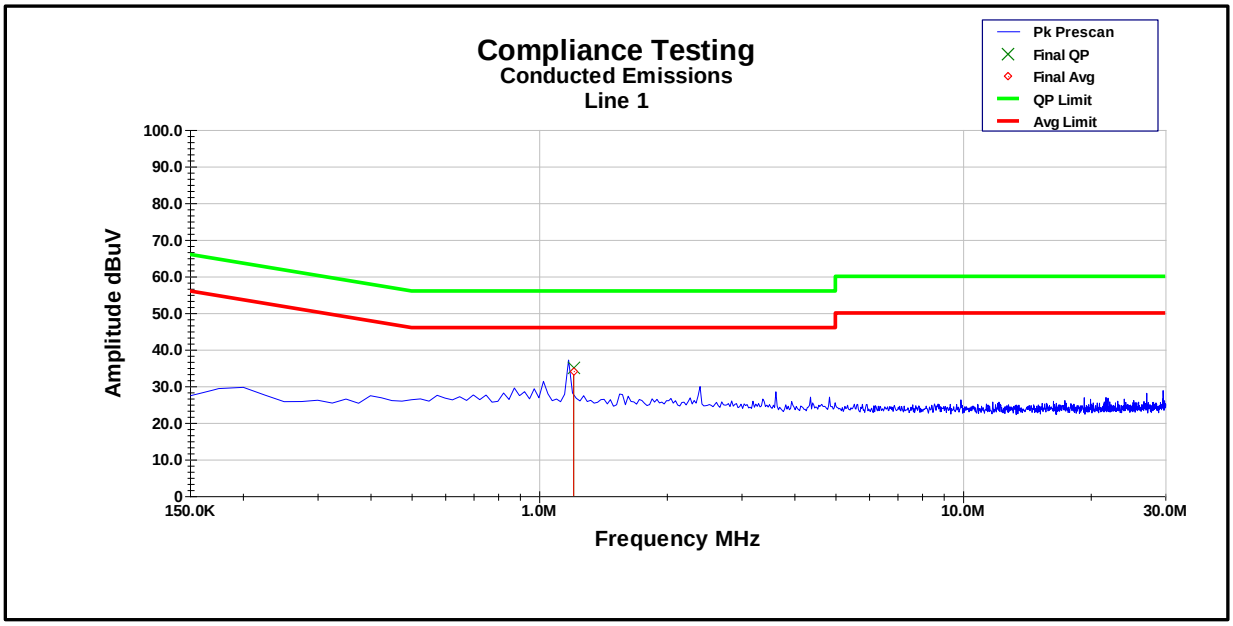
The EUT power cable was connected to a LISN and the monitored output of the LISN was connected to a transient limiter, which then connected directly to a spectrum analyzer. The conducted emissions from 150 kHz to 30 MHz were measured and compared to the specification limits.
The power source was 13.8 vdc supplied by a lab power supply

Basic Test Setup



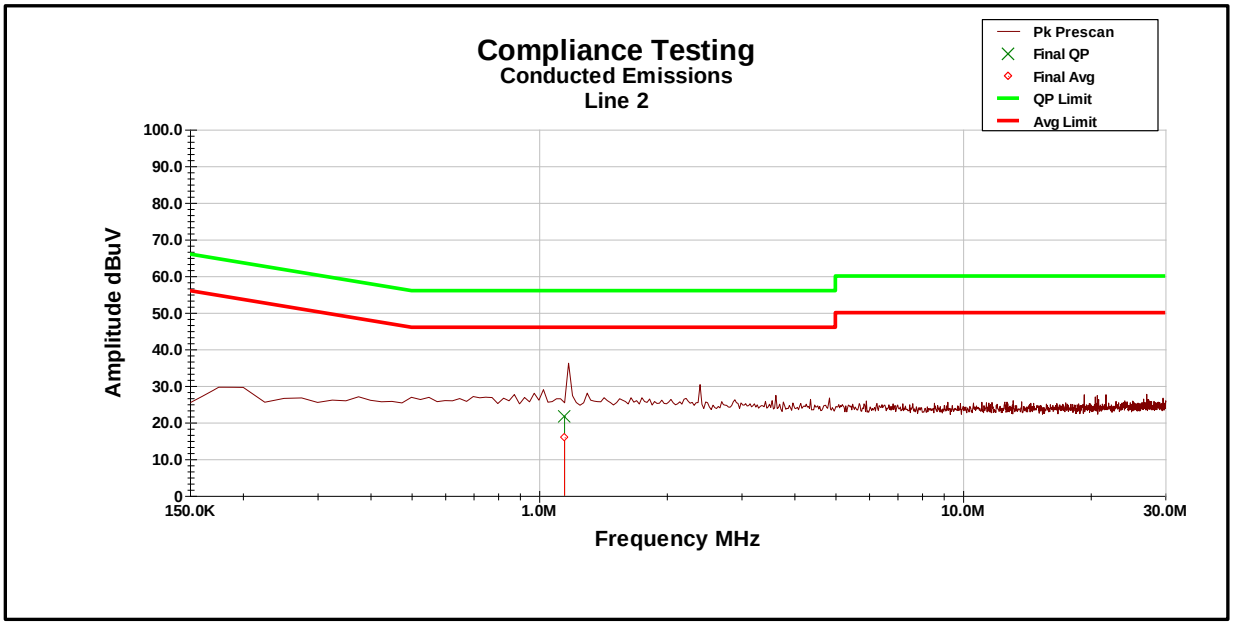
DC Conducted Emissions Test Results

Line 1_ Peak Plot
(DC +)



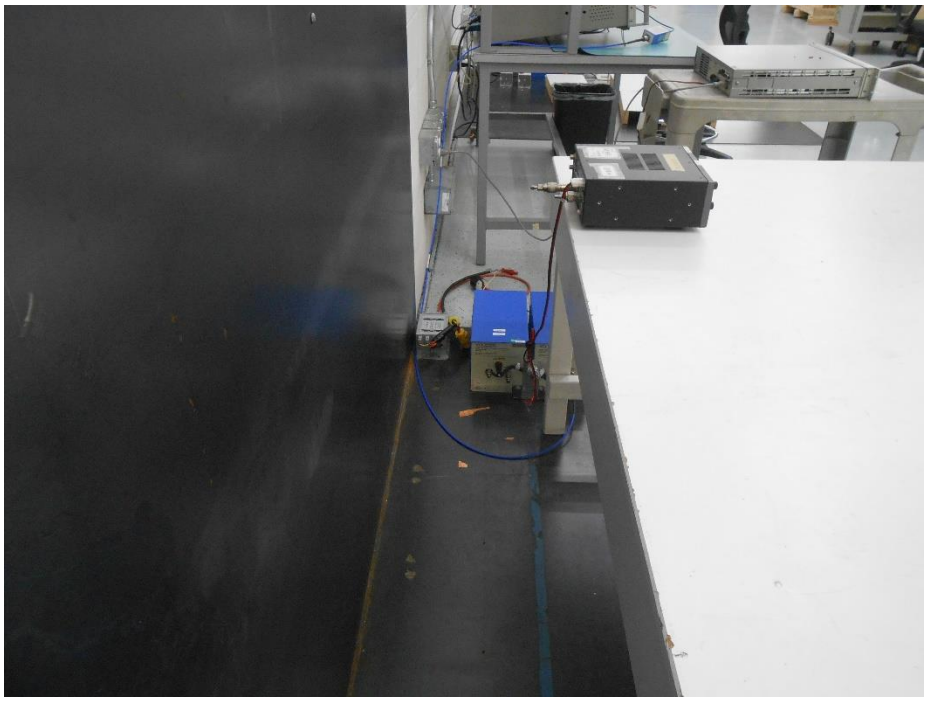
Frequency	Raw QP	Raw Avg	Path Loss	Final QP	Final Avg	QP Limit	QP Margin	Avg Limit	Avg Margin
(MHz)	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dB	dBuV	dB
1.2064 MHz	25.00	24.00	10.10	35.10	34.10	56.00	-20.90	46.00	-11.90
Final = Raw + Path Loss									
Margin = Final - Limit									

Line 2 _Peak Plot
(DC -)



Frequency	Raw QP	Raw Avg	Path Loss	Final QP	Final Avg	QP Limit	QP Margin	Avg Limit	Avg Margin
(MHz)	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dB	dBuV	dB
1.1483 MHz	11.65	5.90	10.10	21.70	16.00	56.00	-34.30	46.00	-30.00
Final = Raw + Path Loss									
Margin = Final - Limit									

DC Conducted Emissions Test Setup Photo



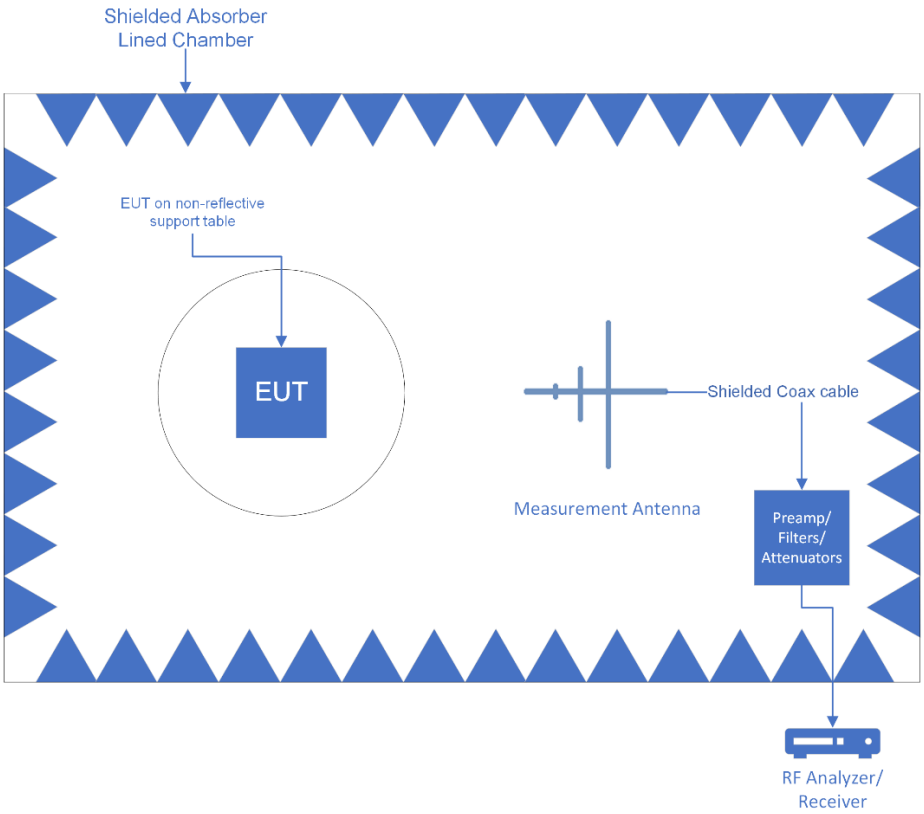
15.109 Radiated Emissions

Engineer: Greg Corbin
Test Date: 6/4/2024

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 1 GHz were examined.

Basic Test Setup



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

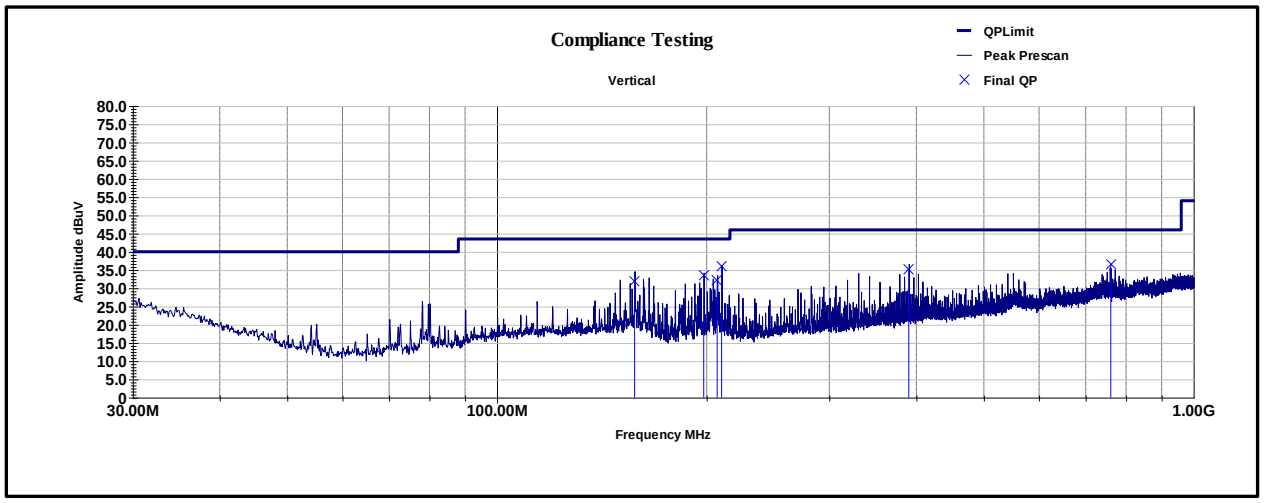
Sample Calculations

Corrected Value = Measured Value + Correction factor

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

Radiated Emissions 30-1000MHz

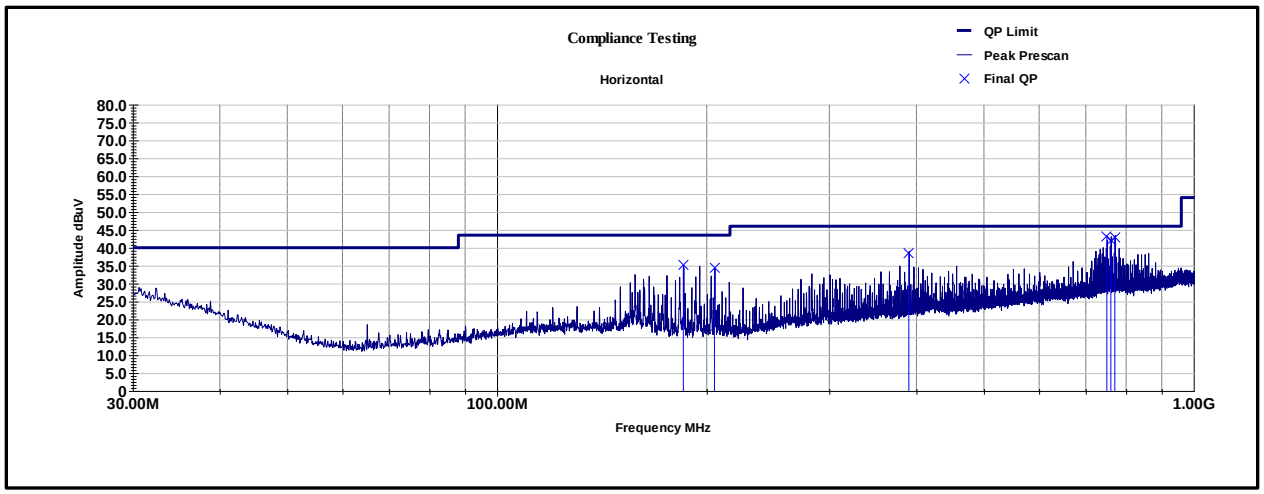
Vertical



Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
157.589	243.00	125.00	54.94	-23.01	31.90	43.50	-11.60
198.049	124.00	105.00	57.90	-24.30	33.60	43.50	-9.90
207.06	117.00	100.00	56.33	-24.13	32.20	43.50	-11.30
210.072	117.00	100.00	59.97	-23.90	36.10	43.50	-7.40
390.098	305.00	100.00	52.96	-17.70	35.30	46.00	-10.70
760.462	336.00	128.00	46.31	-9.79	36.50	46.00	-9.50
Final = Raw + Path Loss							
Margin = Final - Limit							

30 – 1000 MHz

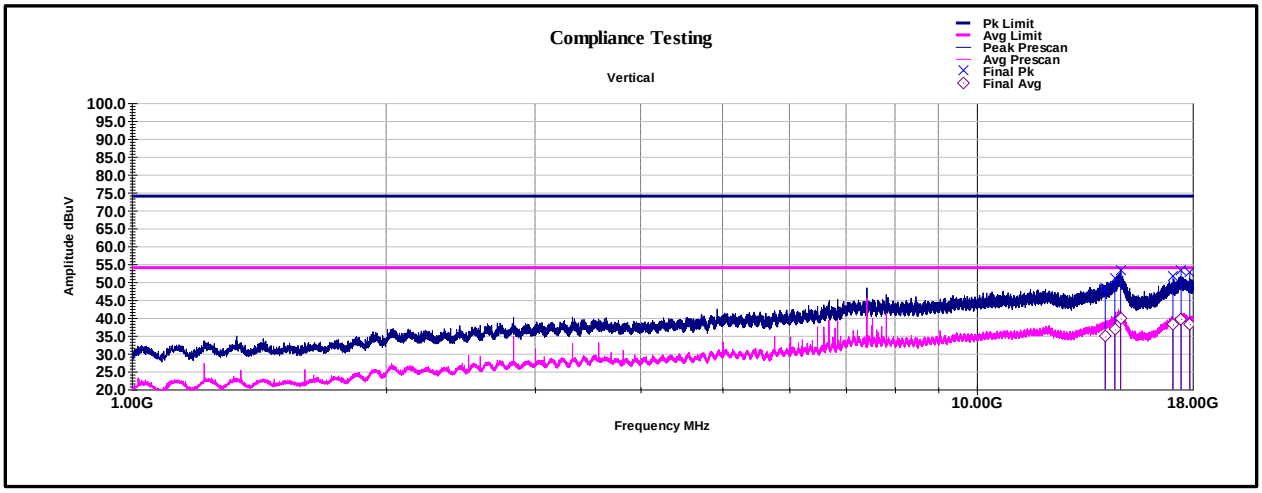
Horizontal



Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
185.108	159.00	209.00	60.25	-25.11	35.10	43.50	-8.40
205.126	147.00	175.00	58.55	-24.15	34.40	43.50	-9.10
390.091	202.00	175.00	55.81	-17.20	38.60	46.00	-7.40
750.439	234.00	100.00	53.10	-10.03	43.10	46.00	-2.90
760.449	261.00	100.00	51.92	-9.89	42.00	46.00	-4.00
770.465	234.00	100.00	52.80	-9.86	42.90	46.00	-3.10
Final = Raw + Path Loss							
Margin = Final - Limit							

1 – 18 GHz

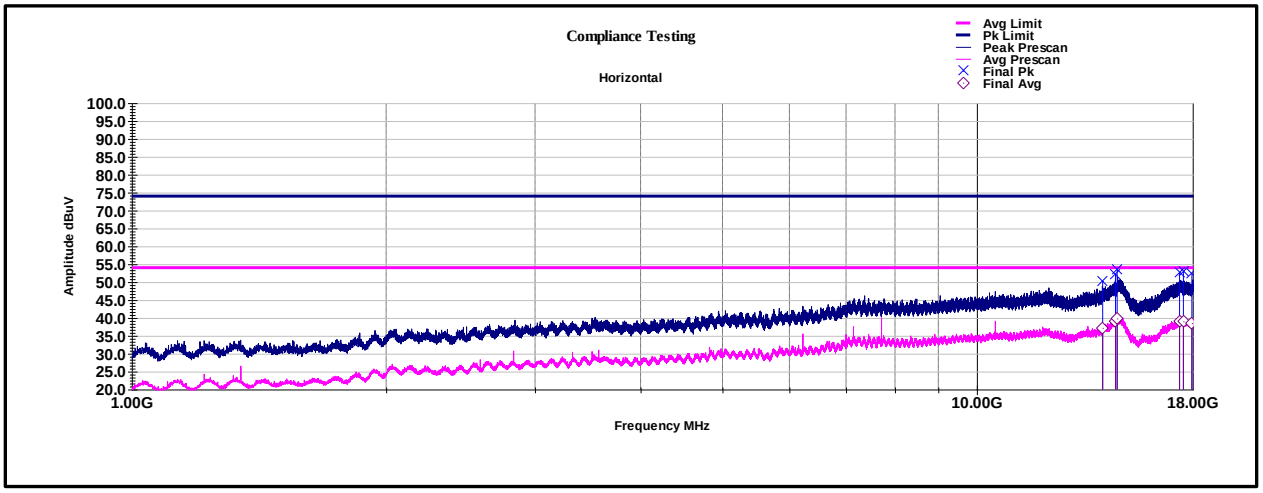
Vertical



Frequency	Azimuth	Height	Raw Pk	Raw Avg	Correction	Final Pk	Pk Limit	Pk Margin	Final Avg	Avg Limit	Avg Margin
MHz	deg	cm	dBuV	dBuV	dB	dBuV/m	dBuV/m	dB	dBuV/m	dBuV/m	dB
14186216750	139.00	113.00	45.36	31.70	3.12	48.48	74.00	-25.52	34.82	54	-19.18
14559612250	109.00	136.00	45.70	31.38	5.36	51.06	74.00	-22.94	36.74	54	-17.26
14789714000	227.00	121.00	47.31	33.86	5.94	53.25	74.00	-20.75	39.80	54	-14.20
17059858500	109.00	175.00	45.43	31.86	6.28	51.71	74.00	-22.29	38.14	54	-15.86
17439968750	261.00	140.00	45.32	31.81	7.92	53.23	74.00	-20.77	39.72	54	-14.28
17861767000	0.00	148.00	45.56	31.05	7.18	52.73	74.00	-21.27	38.23	54	-15.77
Final = Raw + Path Loss											
Margin = Final - Limit											

1 – 15 GHz

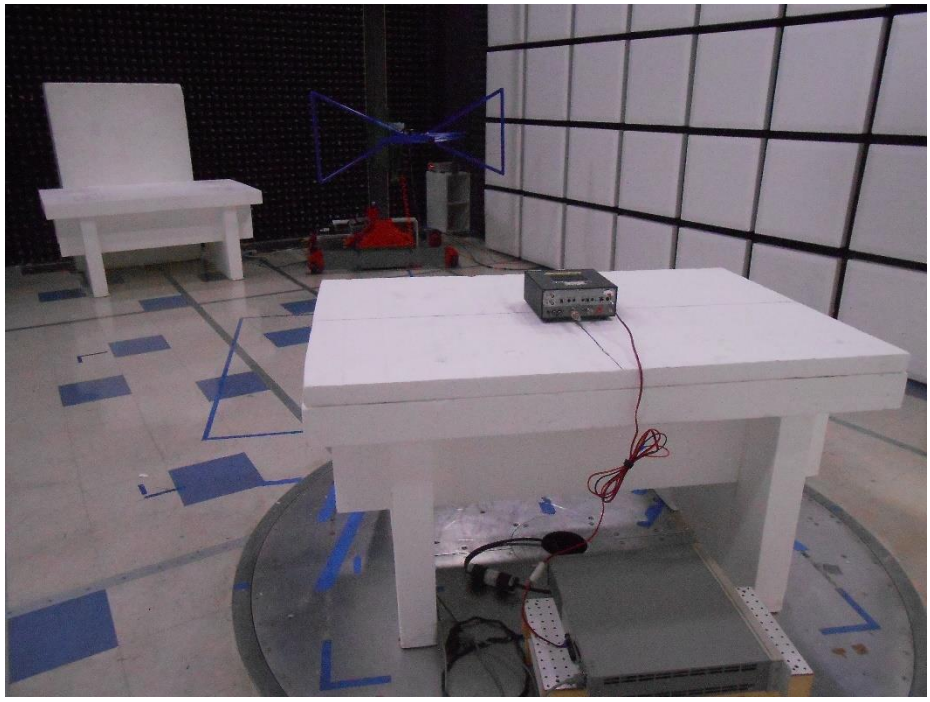
Horizontal



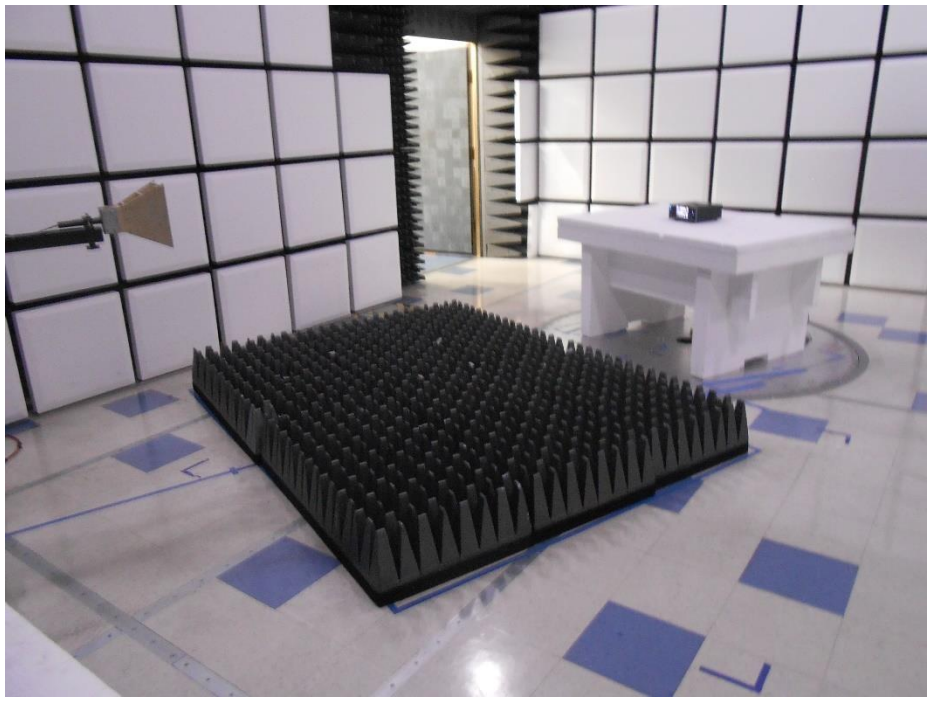
Frequency	Azimuth	Height	Raw Pk	Raw Avg	Correction	Final Pk	Pk Limit	Pk Margin	Final Avg	Avg Limit	Avg Margin
MHz	deg	cm	dBuV	dBuV	dB	dBuV/m	dBuV/m	dB	dBuV/m	dBuV/m	dB
14084282000	193.00	400.00	47.63	34.50	2.70	50.33	74.00	-23.67	37.20	54	-16.80
14587170250	194.00	132.00	46.57	33.26	5.71	52.28	74.00	-21.72	38.96	54	-15.04
14651518250	299.00	159.00	46.99	33.39	6.47	53.46	74.00	-20.54	39.86	54	-14.14
17367706500	282.00	222.00	45.28	31.46	7.57	52.86	74.00	-21.14	39.04	54	-14.97
17550860250	17.00	260.00	44.89	30.95	8.07	52.97	74.00	-21.04	39.02	54	-14.98
17960732250	194.00	189.00	44.87	31.05	7.47	52.34	74.00	-21.66	38.52	54	-15.48
Final = Raw + Path Loss											
Margin = Final - Limit											

Radiated Emissions Test Setup Photos

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



Test Equipment Utilized

Test Equipment Utilized

Description	Manufacturer	Model Number	CT Asset Number	Last Cal Date	Cal Due Date
EMI Receiver	Hewlett Packard	85462A	i00033	6/21/23	6/21/24
Transient Limiter	Com-Power	LIT-153	i00123	Verified on: 5/29/24	
Horn Antenna	ARA	DRG-118/A	i00271	8/11/22	8/11/24
Bi-Log Antenna	Schaffner	CBL 6111D	i00349	2/7/23	2/7/25
3 Meter Semi-Anechoic Chamber	Panashield	3 Meter Semi-Anechoic Chamber	i00428	6/27/23	6/27/24
LISN	COM-Power	LI-125A	i00446	3/18/24	3/18/26
LISN	COM-Power	LI-125A	i00448	3/18/24	3/18/26
Voltmeter	Fluke	179	i00488	6/19/23	6/19/24
DC Power Supply	Hewlett Packard	6642A	I00493	Verified on: 5/29/24	
MXE EMI receiver	Keysight	N9038A	i00552	3/1/24	3/1/25
Preamplifier	RF Lambda	RLNA00M45GA	i00555	Verified on: 2/19/24	
Temp./humidity/pressure monitor	Omega Engineering	iBTHX-W-5	i00686	1/25/24	1/25/25
Preamplifier	Eravant	SBB-0115034019-2F2F-E3	i00722	Verified on: 2/7/24	

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

Measurement Uncertainty

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

Measurement	U_{lab}
Conducted Emissions	± 3.27 dB
Radiated Emissions 30-1000MHz	± 3.29 dB
Radiated Emissions 1GHz-6GHz	± 3.71 dB
Radiated Emissions 6GHz-18GHz	± 3.91 dB

The reported expanded uncertainty +/- U_{lab}(dB) has been estimated at a 95% confidence level (k=2)

U_{lab} is less than or equal to U_{CISPR} therefore,

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

END OF TEST REPORT