Test Report

Prepared for: Bodidata

Model: Kora

Serial Number: N/A

Project No: p2380001

Test Results: Pass

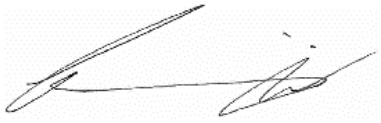
To

FCC Part 15.255
and
RSS-210: Issue 10 (December 2019)

Date of Issue: January 23, 2024

On the behalf of the applicant:	**Bodidata** **4905 34th St S,** **Unit 296** **St. Petersburg, FL, 33711**
Attention of:	**Albert Charpentier, Chief Architect** **Ph: (610)724-4770** **E-Mail: Albert@bodidata.com**
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:



John Michalowicz, Test Engineer

Test Results Summary

Specification		Test Name	Pass, Fail, N/A	Comments
15.255 (e)	RSS-210 Annex J	Output Power	Pass	
15.255 (e)	RSS-GEN 4.6.1	Occupied Bandwidth	Pass	
15.255 (c)	RSS-210 Annex J	Radiated Spurious`	Pass	
15.255 (f)	RSS-210 Annex J	Frequency Stability	Pass	
15.207	RSS-GEN 7.1.4	AC Powerline Conducted Emission	N/A	The EUT does not connect to the AC mains while in operation

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
558074 D01 15.247 Meas Guidance v05r02	Guidance for Compliance Measurements on DTS, FHSS, and Hybrid System Devices Operating Under Section 15.247 of the FCC Rules
ISO/IEC 17025:2017	General requirements for the Competence of Testing and Calibrations Laboratories

Standard Engineering Practices

Unless otherwise indicated, the procedures contained in ANSI C63.10 and ANSI C63.4 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)**
21.2 – 22.7	27.1 – 32.5	961 - 972

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	January 23, 2024	John Michalowicz	Original Document

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ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer 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.

Testing Certificate Number: **2152.01**

FCC Site Reg. #349717

IC Site Reg. #2044A-2

Non-accredited tests contained in this report:

N/A

The applicant has been cautioned as to the following

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 marked 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 this 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.

Authorization Requirements

Intentional Radios may require authorization covered under the following rule parts or standards:

-47 CFR Part 2 Subpart J

-RSS-Gen — General Requirements for Compliance of Radio Apparatus

EUT Description

Model:	Kora
Serial:	N/A
Firmware:	0.3.00
Software:	Kora Scanner
Description:	Handheld device used to scan body giving 3d image for clothing.
Additional Information:	The largest dimension of the antenna is 2.08 mm far-field boundary distance is 2D2/λ. Which equals 0.0018 m
Receipt of Sample(s):	October 16, 2023
EUT Condition:	**Visual Damage** No **State of Development** Engineering Sample/Prototype

15.203: Antenna Requirement:

X	The antenna is permanently attached to the EUT
	The antenna uses a unique coupling
	The EUT must be professionally installed
	The antenna requirement does not apply

Test Setup and Modes of Operation

EUT Operation during Tests

The EUT was set into low, mid and high channels and highest possible output power using manufacturer supplied test modes.

Accessories:

Qty	Description	Manufacturer	Model	S/N
1	iPad	Apple		N/A
1	Tablet	Microsoft	Surface Pro 1866	N/A
1	AC to USB-C Adaptor	Apple	A2305	N/A

Cables:

Qty	Description	Length (M)	Ferrites (Y/N)	Shielding Y/N	Shielded Hood Y/N	Termination / Connection
1	USB-C	<3m	N	N	N	AC Adaptor

Modifications to EUT(s) (Y/N): N

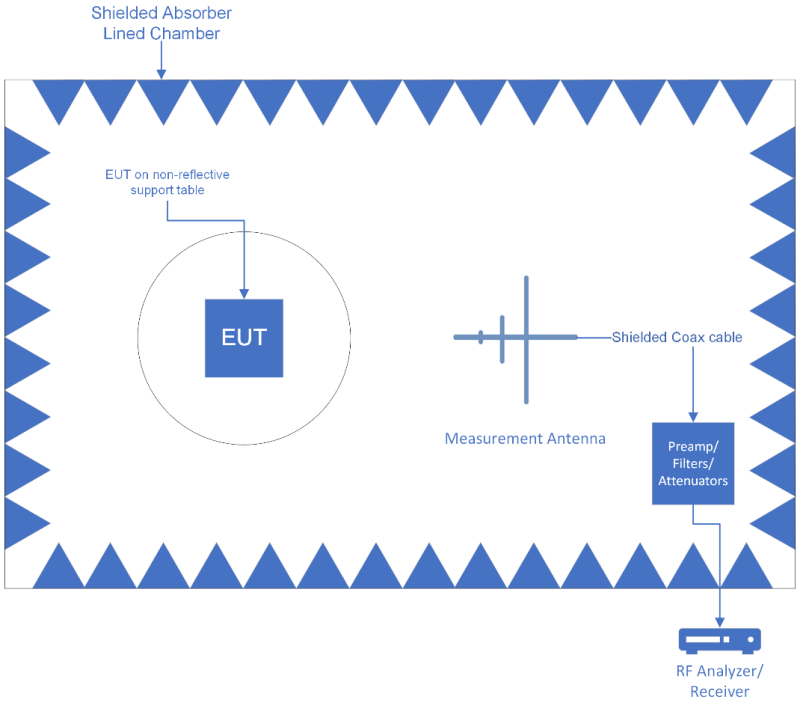
Radiated Output Power
Engineer: John Michalowicz
Test Date: 11/17/2023

Test Procedure

Radiated Output Power was measured using the procedures outlined in ANSI C63.10:2013 section 9.
The EUT was set far enough away from the receive antenna to measure the far-field.
High, mid and low channels were measured with a peak detector and compared to the limit.
A measurement distance of 1.57 m was utilized for all radiated measurements.

Duty cycle correction = 10log(Ton/T)
On time = 13.1 * 3 = 39.3 ms
39.3/230 = 0.17087
10*Log (0.17087) = 7.67dB

Test Setup

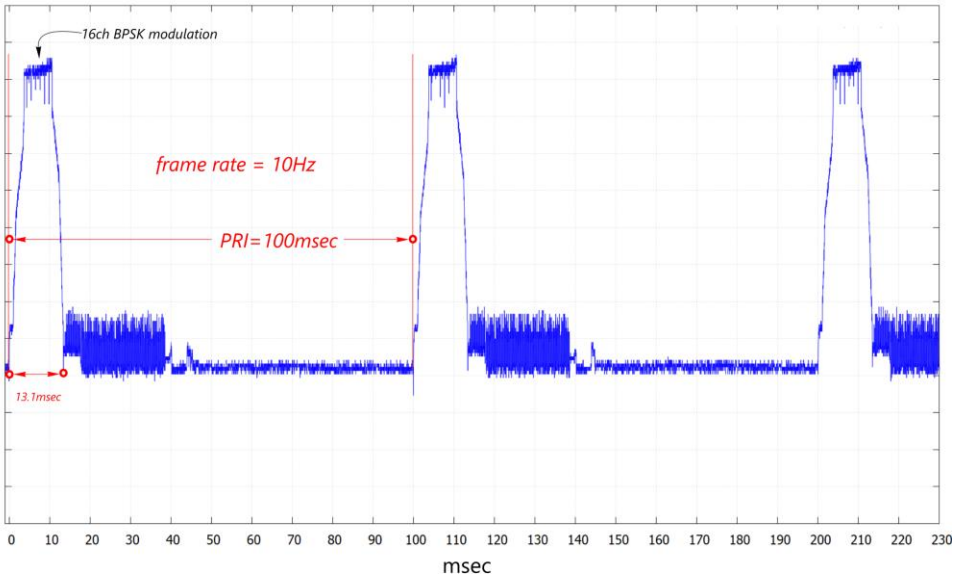


Test Results

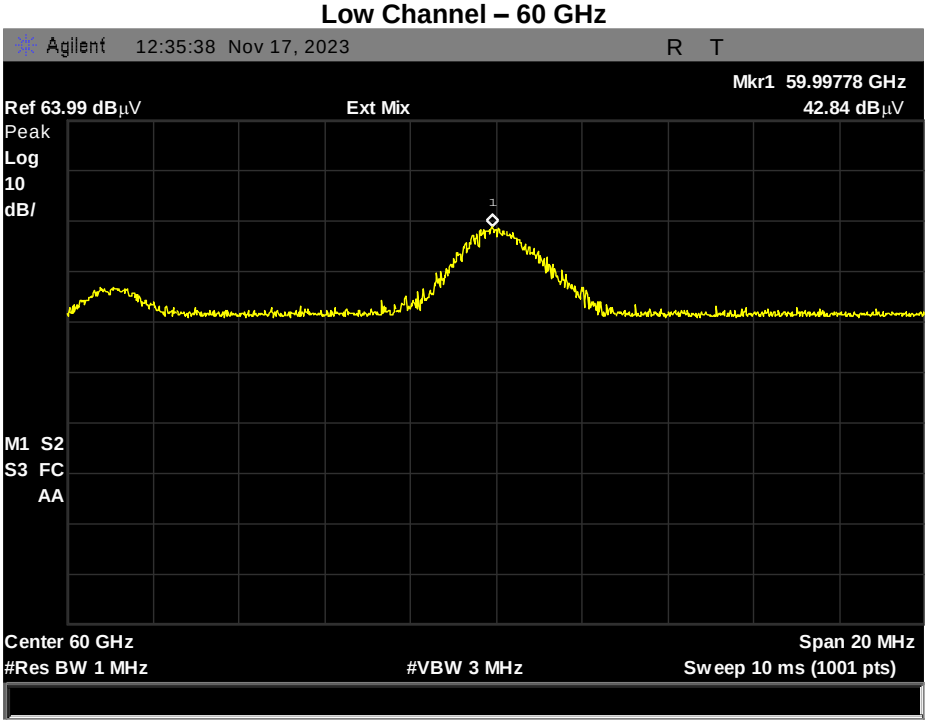
Frequency (GHz)	Measured Amplitude (dBuV)	Distance Correction (dBm)	*Test Setup Corrections (dB)	Peak Radiated Field (dBuV)	EIRP=dBuV-104.77 (dBm)
59.997	42.84	3.92	41.34	88.1	-16.67
61.997	62.26	3.92	41.34	107.52	2.75
63.988	68.54	3.92	41.34	113.8	9.03

*Test Setup Correction = Cable Loss + Mixer correction Factor + RX Antenna Factor – Amplifier
The peak EIRP is below the limit of 10 dBm/MHz

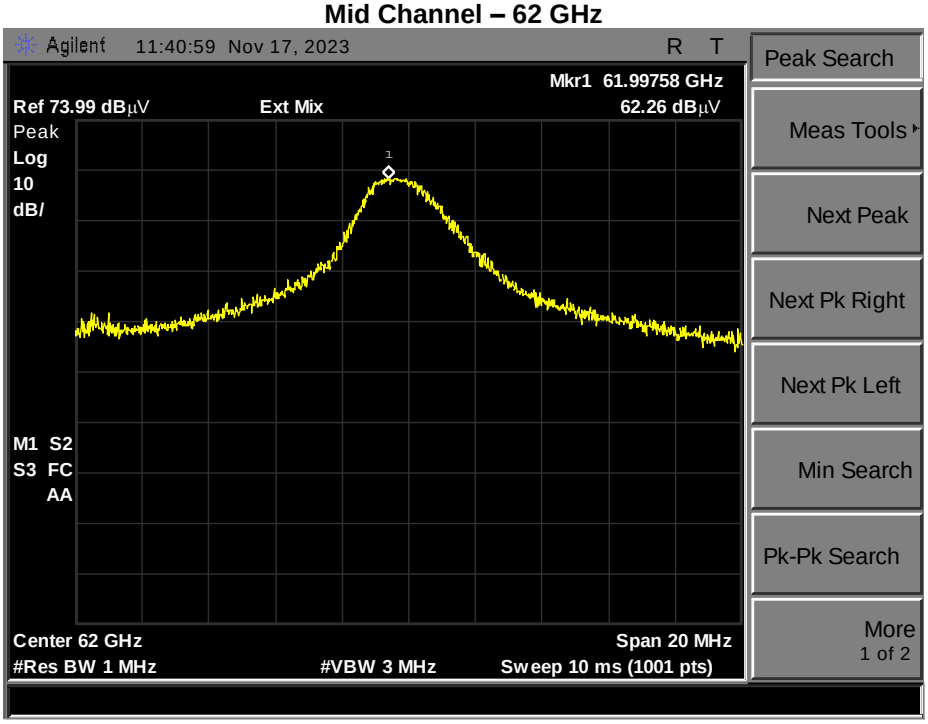
The plot below shows the EUT pulse train.



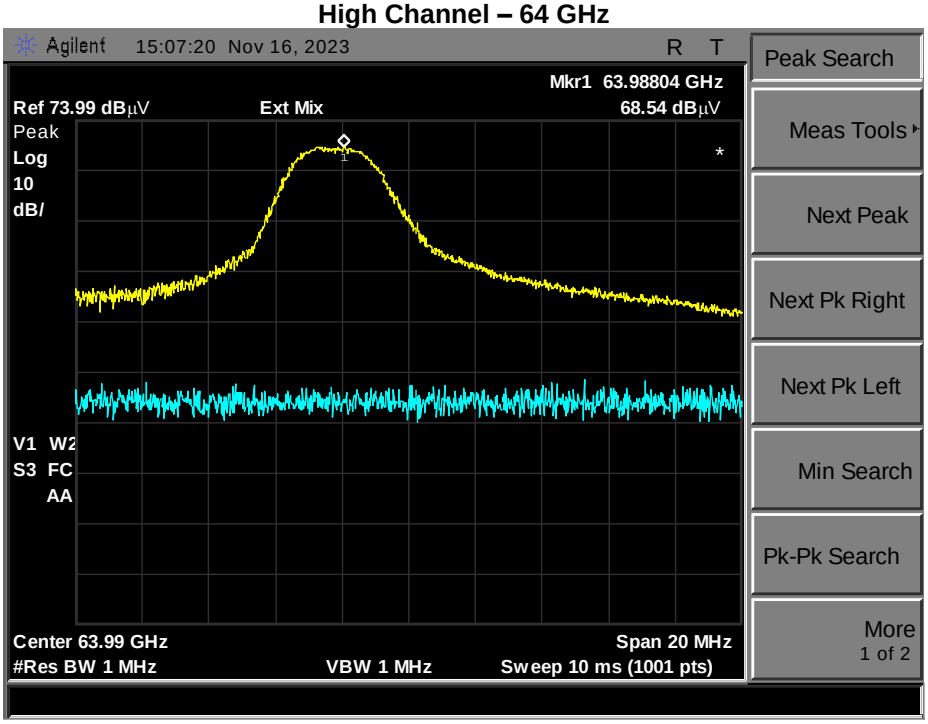
Low Channel – 60 GHz



Mid Channel – 62 GHz



High Channel – 64 GHz



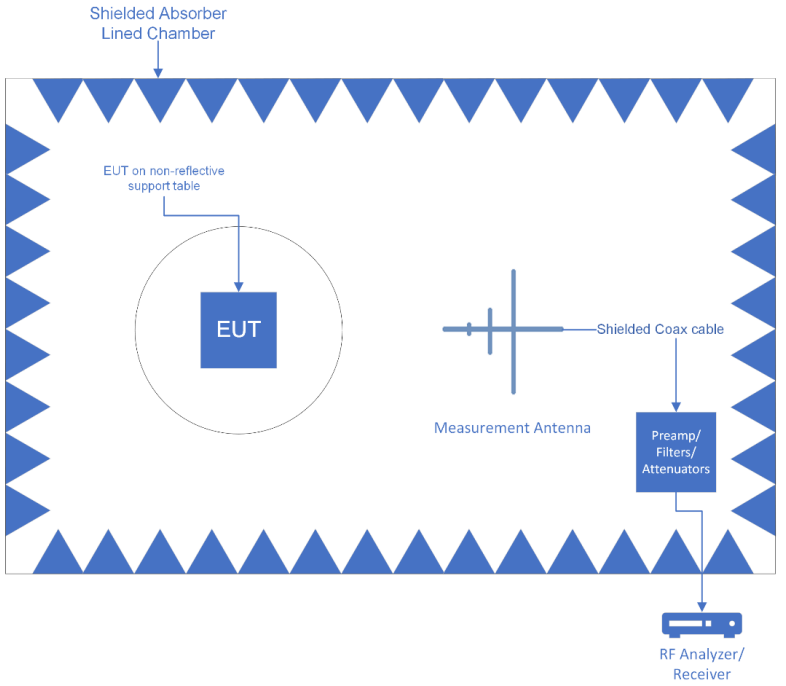
Occupied Bandwidth

Engineer: John Michalowicz
Test Date: 1/20/24

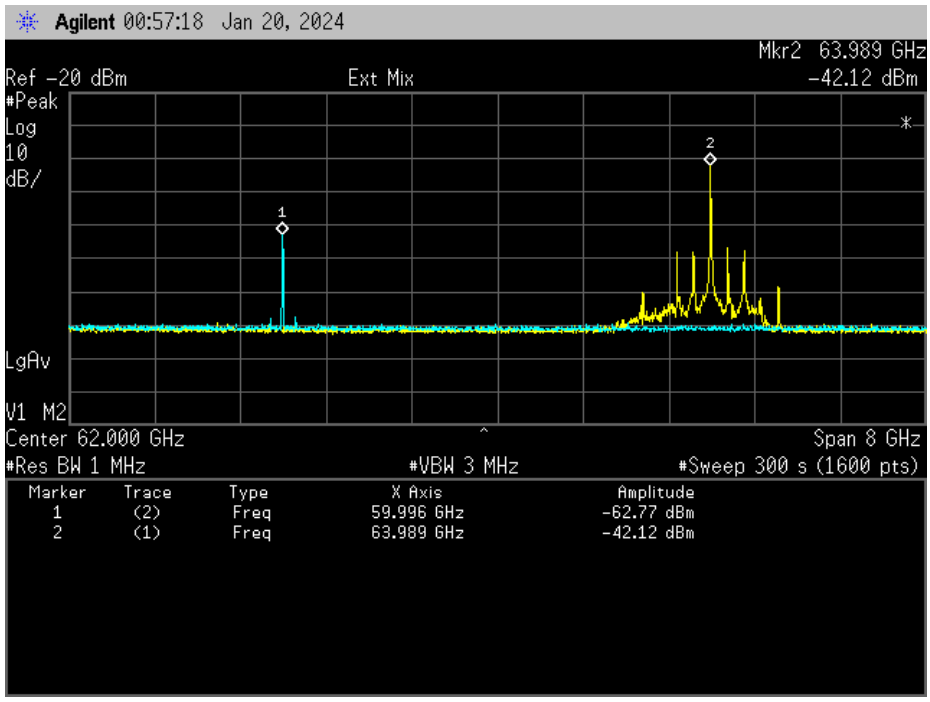
Occupied Bandwidth Test Procedure

The EUT was tested at a distance of 1.5 meter from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for occupied bandwidth. The markers in this plot indicate the edges of the modulation bandwidth. The nature of the test equipment and EUT make it impossible to provide a plot displaying the entire spectrum. The instantaneous bandwidth of the spectrum analyzer and the "scan on scan" nature of the test equipment vs. modulation scheme will not allow the data to be fully captured.

Test Setup



Measured Occupied Bandwidth = 3.993 GHz



Note:

Radiated Spurious Emissions

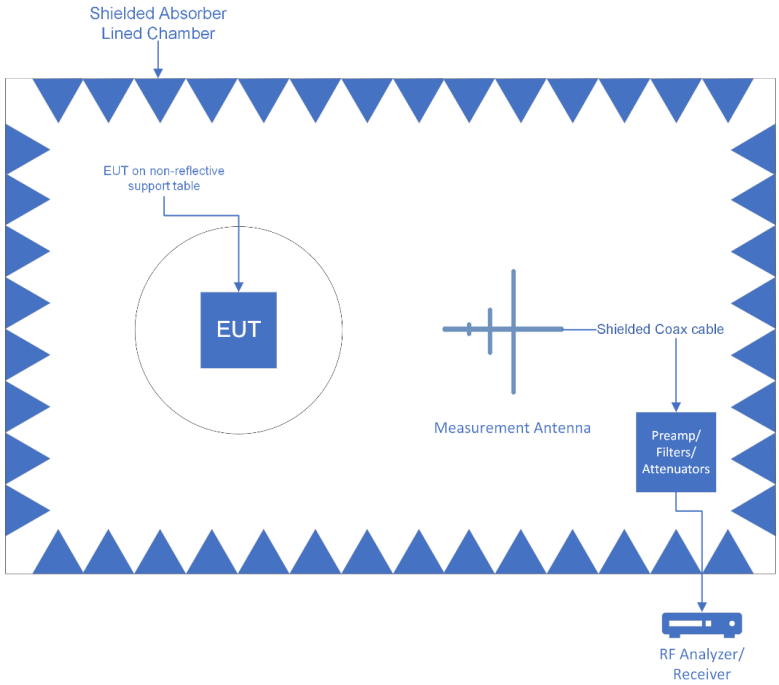
Engineer: John Michalowicz

Test Date: 12/27/2023

40 – 200 GHz Test Procedure

The EUT was tested in an anechoic chamber at a distance of 1.57 meter from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Radiated Spurious Emissions. The following table indicates the highest emission in each of the indicated bands. Results are peak unless otherwise noted
90 pW/cm2 = 85.32 dBuV/m

Test Setup



40 – 220 GHz Measurement Results

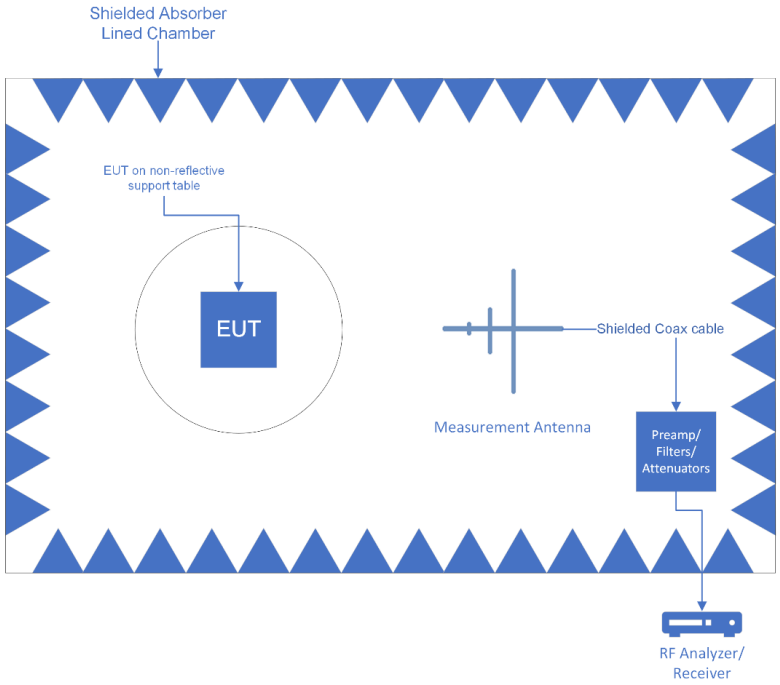
Frequency Range (GHz)	Measured Frequency (GHz)	Measured Field Strength (dBuv/m)	*Corrected Field Strength (dBuv/m)	Field Strength Limit (dBuv/m)	Result
40 – 50	45.6	**5.13	66.89	85.32	Pass
50 - 75	60.0	19.00	54.72	85.32	Pass
75 - 110	97.92	19.80	56.37	85.32	Pass
110 - 170	110.98	**16.47	76.76	85.32	Pass
170 - 220	171.29	**15.20	78.33	85.32	Pass

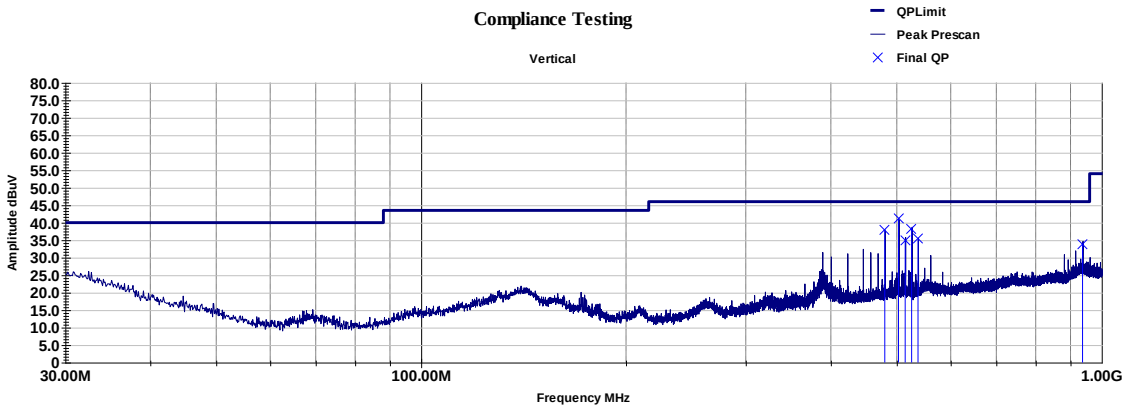
*Test Setup Correction = Cable Loss + Mixer correction Factor + RX Antenna Factor – Amplifier
** Measured with Average Detector

30 MHz – 40 GHz Test Procedure

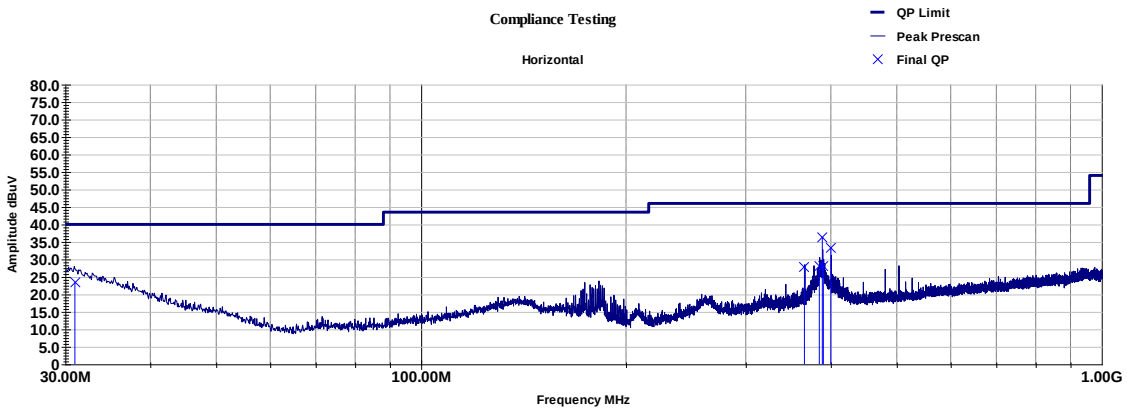
The EUT was tested in an anechoic chamber at a distance set 3m from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Radiated Emissions. The EUT was tested by rotating it 360 degrees with the antennas in both the vertical and horizontal orientation while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

Test Setup

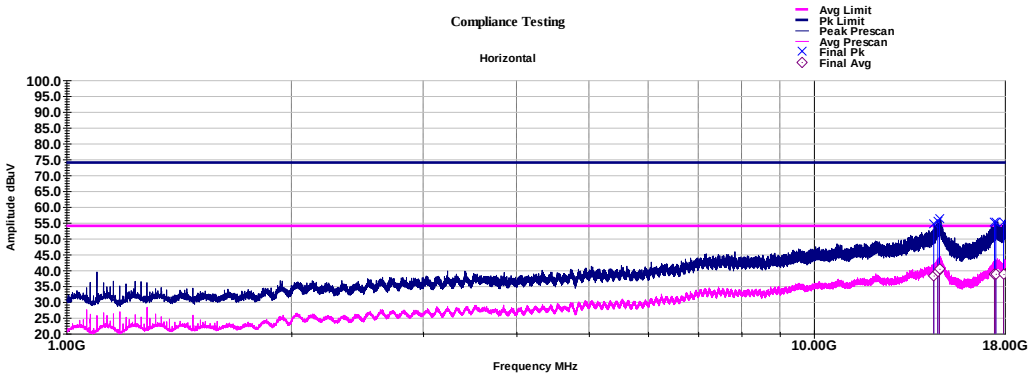


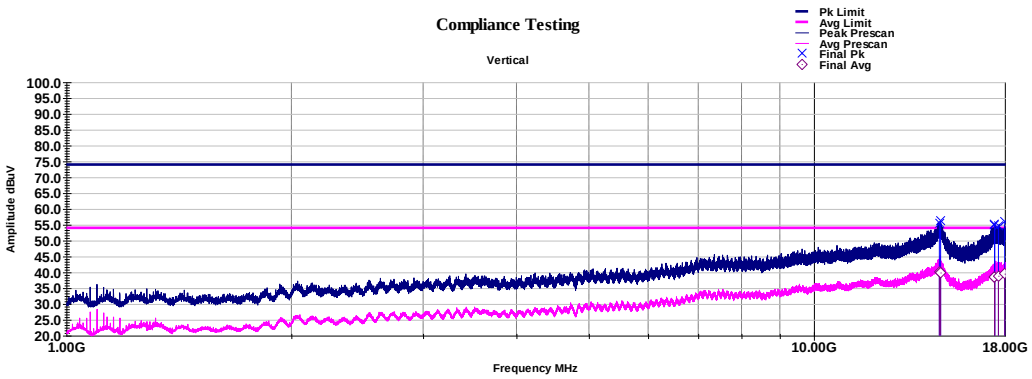


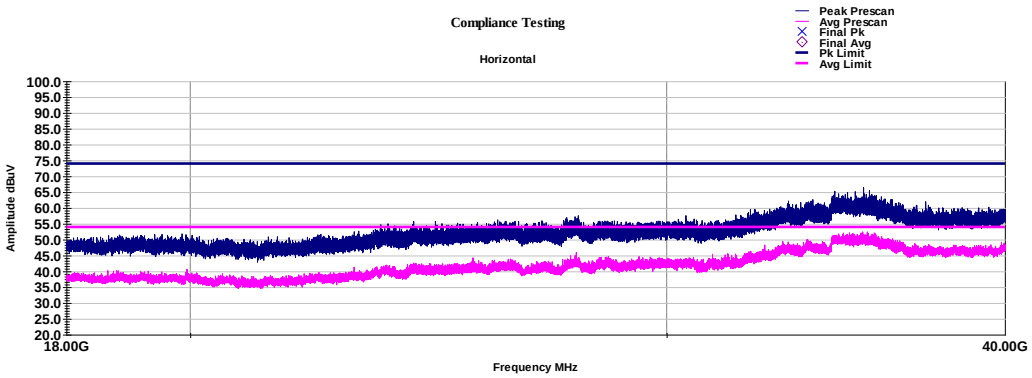
Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
480.001	346.00	100.00	63.30	-25.32	38.00	46.00	-8.00
502.855	297.00	100.00	65.86	-24.62	41.20	46.00	-4.80
514.291	332.00	100.00	59.58	-24.58	35.00	46.00	-11.00
525.713	313.00	100.00	62.68	-24.44	38.20	46.00	-7.80
537.153	3.00	105.00	59.30	-23.88	35.40	46.00	-10.60
937.173	210.00	109.00	50.66	-16.89	33.80	46.00	-12.20
Final = Raw + Path Loss							
Margin = Final - Limit							

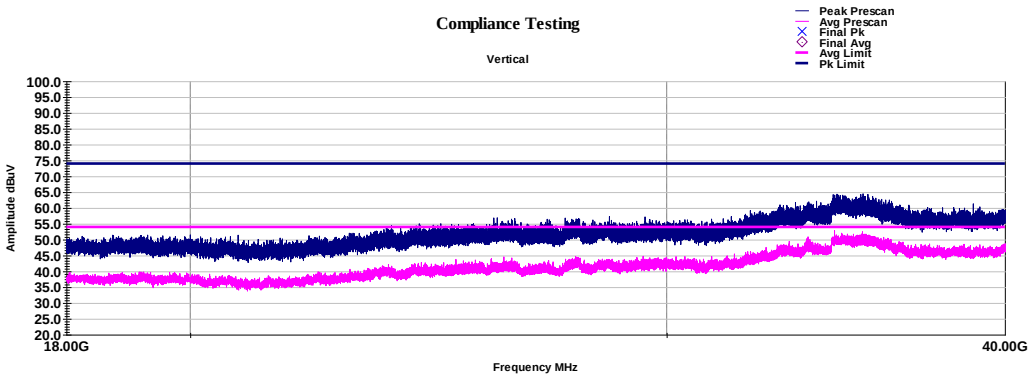


Frequency	Azimuth	Height	Raw QP	Correction	Final QP	Limit	QP Margin
MHz	deg	cm	dBuV	dB	dBuV/m	dBuV/m	dB
30.997	197.00	105.00	54.05	-30.61	23.40	40.00	-16.60
365.723	263.00	239.00	55.77	-27.87	27.90	46.00	-18.10
384.715	62.00	192.00	55.34	-27.36	28.00	46.00	-18.00
388.563	80.00	192.00	63.61	-27.24	36.40	46.00	-9.60
389.996	262.00	171.00	55.14	-27.13	28.00	46.00	-18.00
400.007	253.00	179.00	60.15	-26.78	33.40	46.00	-12.60
Final = Raw + Path Loss							
Margin = Final - Limit							









Note:
There were no detectable emissions from 1 GHz to 40 GHz which were above the system noise floor.

Frequency Stability

Engineer: John Michalowicz

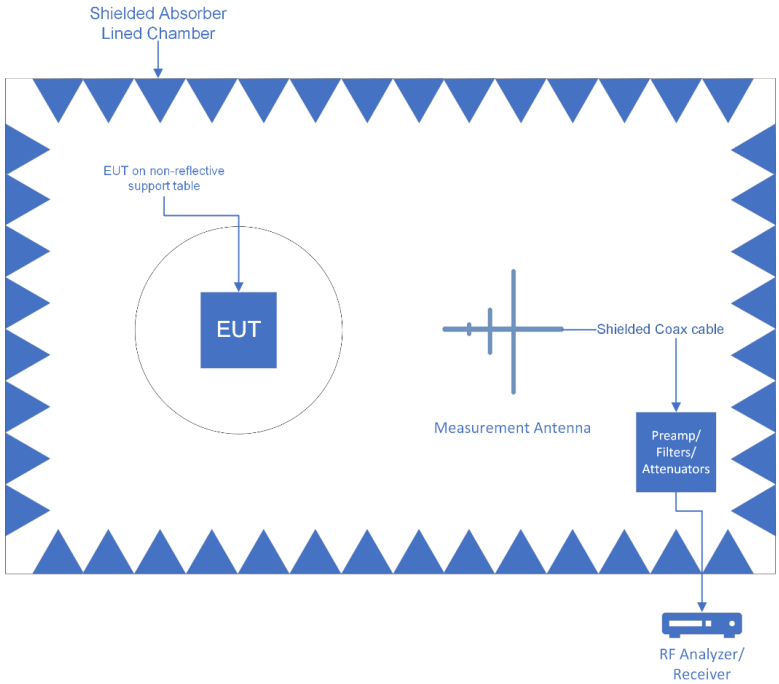
Test Date: 1/23/2024

Test Procedure

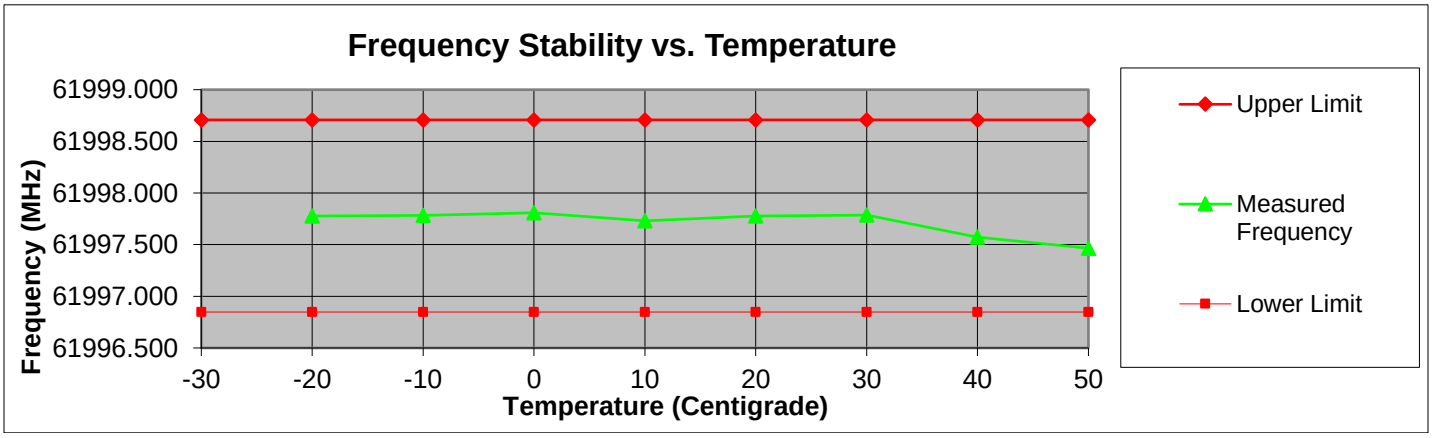
The EUT was tested in an environmental chamber with the transmitting antenna pointing directly out of an access port. A spectrum analyzer was used to measure the frequency stability. There is no specified limit, only a requirement that the frequency stability must ensure that the EUT operate in the band over the temperature range of -20º C to 50º C. For the ease of reporting a set of limit lines at 15 PPM was applied. The EUT operated completely within the band of 57 – 64 GHz in all temperature conditions.

Frequency stability with voltage variation was not measured as this device has an internal voltage monitor preventing operation when the voltage drops below a minimum required level which is higher than 15%. As the EUT cannot operate from the AC mains and only operates from a regulated battery system the supply voltage is never greater than the nominal voltage

Test Setup



Measurement Results



Test Equipment Utilized

Description	Manufacturer	Model #	CT Asset #	Last Cal Date	Cal Due Date
Temperature Chamber	Tenney	Tenney Jr	i00027	NR	
EMI Receiver	HP	8546A	i00033	6/21/23	6/21/24
Horn Antenna	EMCO	3115	i00103	2/15/23	2/15/25
Transient Limiter	Com-Power	LIT-153	i00123	Verified on: 1/23/24	
Horn Antenna	ARA	DRG-118/A	i00271	8/11/22	8/11/24
Data Logger	Fluke	Hydra Data Bucket	i00343	6/28/23	6/28/24
Bi-Log Antenna	Schaffner	CBL 6111D	i00349	2/7/23	2/7/25
AC Power Source	Behlman	BL 6000	i00362	Verified on: 1/23/24	
44GHz EMI receiver	Keysight	N9038A	i00552	2/23/23	2/23/24
3 Meter Semi-Anechoic Chamber	Panashield	3 Meter Semi-Anechoic Chamber	i00428	6/27/23	6/27/24
LISN	COM-Power	LI-125A	i00447	4/19/22	4/19/24
LISN	COM-Power	LI-125A	i00449	4/19/22	4/19/24
Harmonic Mixer	Hewlett Packard	11970V	00463	8/11/21	8/11/24
Harmonic Mixer	Hewlett Packard	11970W	00464	8/11/21	8/11/24
PSA Spectrum Analyzer	Agilent	E4445A	i00471	1/5/24	1/5/25
Horn Antenna standard gain	CMI	H06R	i00475	NR	NR
Horn Antenna, standard gain	CMI	H010R	i00476	NR	NR
Horn Antenna standard gain	CMI	Ho15R	i00477	NR	NR
Harmonic Mixer	OML	M06HWD	i00480	8/18/21	8/18/24
Harmonic Mixer	OML	M06HWD	i00480	8/18/21	8/18/24
Horn Antenna, standard gain	CMI	H022R	i00484	NR	NR
MXE EMI receiver	Keysight	N9038A	i00552	2/23/23	2/23/24
LNA	Eravant	SBL-7531143550-1010-E1	i00589	Verified on: 11/21/23	
Harmonic Mixer	Hewlett Packard	11970Q	i00621	8/10/21	8/10/24
Temp./humidity/pressure monitor (rad. immunity)	Omega Engineering	iBTHX-W-5	i00629	2/14/23	2/14/24
Preamplifier	Eravant	SBB-0115034018-2F2F-E3	i00646	Verified on: 11/21/23	
LNA	Eravant	SBL-1141743065-0606-E1	i00658	Verified on: 11/21/23	

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 for Compliance Testing is listed in the table below.

Measurement	U_{lab}
Radio Frequency	± 3.3 x 10^{-8}
RF Power, conducted	± 1.5 dB
RF Power Density, conducted	± 1.0 dB
Conducted Emissions	± 1.8 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 +/- U_{lab}(dB) has been estimated at a 95% confidence level (k=2)
U_{lab} is less than or equal to U_{EMC} 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