

RF Test Report

Test Report Number	STA-22050632-LCG-FCC-IC-RF-2.4G		
FCC ID	N6C-SXPCEAC2		
IC	4908A-SXPCEAC2		
Applicant	Silex Technology, Inc.		
Applicant Address	2-3-1 Hikaridai, Seika-cho, Soraku-gun, Kyoto, 619-0237 Japan		
Product Name	SX-PCEAC2		
Model (s)	SX-PCEAC2		
Date of Receipt	12/15/2022		
Date of Test	12/28/2022 – 02/27/2023		
Report Issue Date	02/27/2023		
Test Standards	47 CFR Part 15.247 RSS-247 Issue 2, Feb 2017		
Test Result	PASS		
		Issued by: Vista Compliance Laboratories 1261 Puerta Del Sol, San Clemente, CA 92673 USA www.vista-compliance.com	
			
Zach Peng (Test Technician)		David Zhang (Technical Manager)	
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REVISION HISTORY

Report Number	Version	Description	Issued Date
STA-22050632-LCG-FCC-IC-RF-2.4G	01	Initial report	02/27/2023

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1 Test Summary

Test Item	Test Requirement	Test Method	Result
Antenna Requirement	47 CFR Part 15.247 RSS-247 Issue 2, Feb 2017	N/A	N/A
DTS (6 dB) Channel Bandwidth	47 CFR Part 15.247 RSS-247 Issue 2, Feb 2017	ANSI C63.10 (2013)	N/A
Occupied Bandwidth	RSS-Gen Issue 5, Mar 2019	RSS-Gen Issue 5, Feb 2021	N/A
Conducted Maximum Output Power	47 CFR Part 15.247 RSS-247 Issue 2, Feb 2017	ANSI C63.10 (2013)	N/A
Power Spectral Density	47 CFR Part 15.247 RSS-247 Issue 2, Feb 2017	ANSI C63.10 (2013)	N/A
Conducted Band-Edge & Unwanted Emissions	47 CFR Part 15.247 RSS-247 Issue 2, Feb 2017	ANSI C63.10 (2013)	N/A
Radiated Emissions & Unwanted Emissions into Restricted Frequency Bands	47 CFR Part 15.247 RSS-247 Issue 2, Feb 2017	ANSI C63.10 (2013)	Pass
AC Power Line Conducted Emissions	47 CFR Part 15.247 RSS-247 Issue 2, Feb 2017	ANSI C63.10 (2013)	N/A

Note: N/A. The EUT is a certified BT and WLAN module, for more test details please see FCC ID: N6C-SXPCEAC2 and IC ID: 4908A-SXPCEAC2. Current report is additional evaluation due to adding new antenna.

2 General Information

2.1 Applicant

Applicant	Silex Technology, Inc.
Applicant Address	2-3-1 Hikaridai, Seika-cho, Soraku-gun, Kyoto, 619-0237 Japan
Manufacturer	Silex Technology, Inc.
Manufacturer Address	2-3-1 Hikaridai, Seika-cho, Soraku-gun, Kyoto, 619-0237 Japan

2.2 Product information

Product Name	SX-PCEAC2
Model Number	SX-PCEAC2
Serial Number	4253FAE794D
Frequency Band	BT BDR/EDR: 2402-2480MHz BT BLE: 2402-2480MHz WLAN: 2.4GHz/5GHz 11a/b/g/n/ac
Type of modulation	BT BDR/EDR: GFSK, $\pi/4$ DQPSK, 8DPSK BLE: GFSK 802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM) 802.11a/n/ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Equipment Class	DSS, DTS, NII
Antenna Information	Taoglass GW.05.0153 monopole antenna (Peak gain: 3.686 dBi in 2.4GHz band, 4.267 dBi in 5 GHz band)
Clock Frequencies	N/A
Input Power	+3.3VDC
Power Adapter Manufacturer/Model	N/A
Power Adapter SN	N/A
Hardware version	N/A
Software version	N/A
Simultaneous Transmission	N/A
Additional Info	This device is a certified Bluetooth and WLAN module. - Brand: Silex - Model: SX-PCEAC2 - FCC ID: N6C-SXPCEAC2 - IC ID: 4908A-SXPCEAC2

2.3 Test standard and method

Test standard	47 CFR Part 15.247 RSS-247 Issue 2, Feb 2017
Test method	ANSI C63.10-2013 558074 D01 15.247 Meas Guidance v05r02

3 Test Site Information

Lab performing tests	Vista Laboratories, Inc.
Lab Address	1261 Puerta Del Sol, San Clemente, CA 92673 USA
Phone Number	+1 (949) 393-1123
Website	www.vista-compliance.com

Test Condition	Temperature	Humidity	Atmospheric Pressure
RF Testing	23.5°C	58.2%	996 mbar
Radiated Emission Testing	23.5°C	58.2%	996 mbar

4 Modification of EUT / Deviations from Standards

N/A

5 Test Configuration and Operation

5.1 EUT Test Configuration

The EUT is an engineering test sample loaded with RF testing firmware specifically designed to support the RF TX/RX measurement in different aspects.

The following software was used for testing and to monitor EUT performance

Software	Description
EMISoft Vasona	EMC/RF Spurious emission test software used during testing
QRCT	Set WiFi of EUT into continuous TX and RX mode under different modulation, data rate and channel, etc.

5.2 Supporting Equipment

Description	Manufacturer	Model #	Serial #	Remark
Jetson Nano Developer Kit	Nvidia	P3450	1420621000784	-
AC adapter	SCEPTRE	ATS030-A050	PS2D-5050APL05	-
Laptop	DELL	PP30LA	24672796489	-
AC adapter	DELL	AA90PM111	CN-099H58-70163-31J-08EW-A01	-

6 Uncertainty of Measurement

Test item	Measurement Uncertainty (dB)
RF Output Power (Conducted)	±1.2 dB
Power Spectral Density	±0.9 dB
Unwanted Emission (conducted)	±2.6 dB
Occupied Channel Bandwidth	±5 %
Radiated Emission (9KHz-30MHz)	±3.5 dB
Radiated Emission (30MHz-1GHz)	±4.6 dB
Radiated Emission (1-18GHz)	±4.9 dB
Radiated Emission (18-40GHz)	±3.5 dB

7 Test Results

7.1 Radiated Spurious Emissions into Restricted Frequency Bands

7.1.1 Requirement

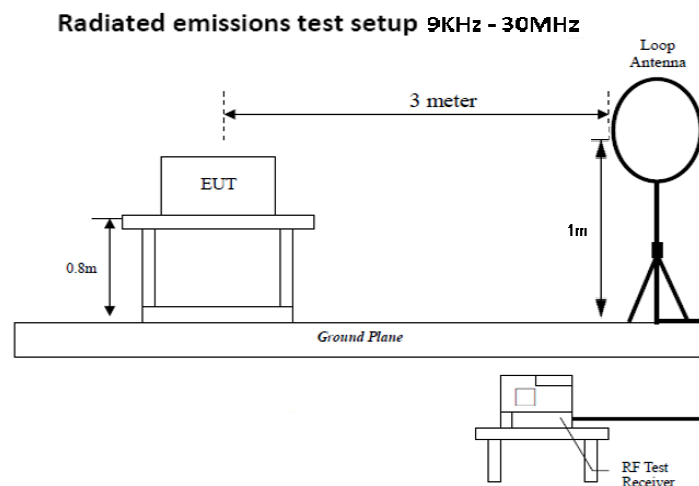
§ 15.247 (d)

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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

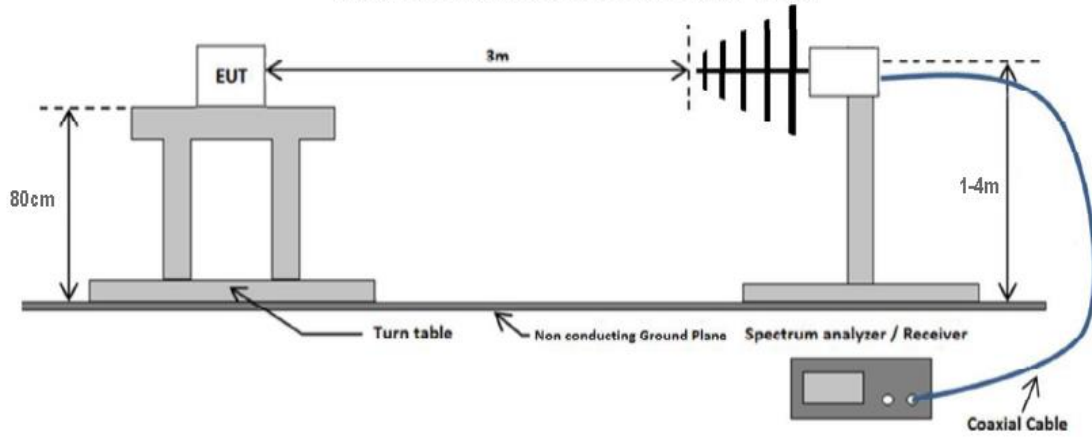
Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Frequency Range (MHZ)	Field Strength (µV/m)
0.009~0.490	2400/F(KHz)
0.490~1.705	24000/F(KHz)
1.705~30.0	30
30 – 88	100
88 – 216	150
216 960	200
Above 960	500

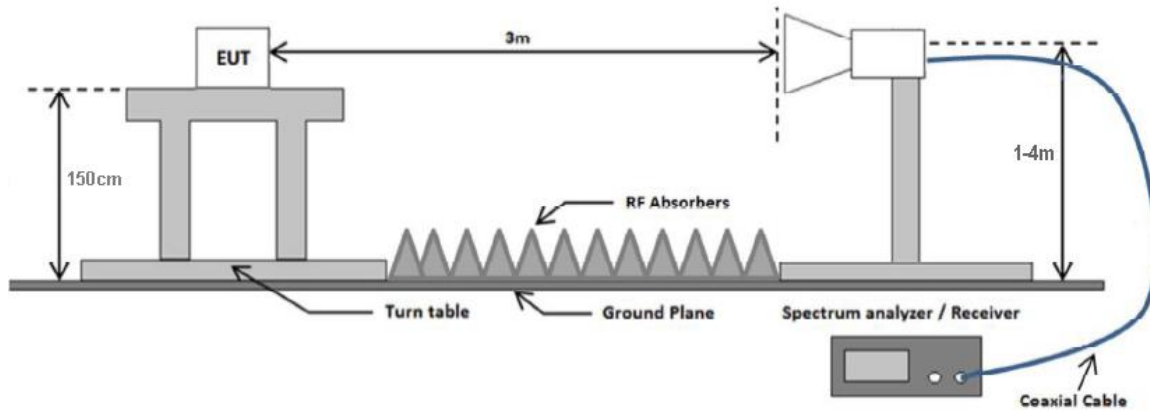
7.1.2 Test Setup



Radiated emissions test setup 30 MHz - 1 GHz



Radiated emissions test setup above 1 GHz



7.1.3 Test Procedure

According to section 8.6 in KDB 558074 D01 DTS Meas Guidance v05r02 and subclause 11.12.2.7 Radiated spurious emission measurements in ANSI C63.10-2013 as well as the procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 was followed. Boresight antenna mast was used during the scanning to point to EUT to maximize the emission. The process will be repeated in 3 EUT orientations.

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - a. Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - b. The EUT was then rotated to the direction that gave the maximum emission.
 - c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 300 Hz for frequency below 150KHz.
4. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 10 kHz for frequency between 150KHz – 30MHz.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-Peak detection at frequency between 30MHz - 1GHz.
6. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak and average measurement at frequency above 1GHz.
7. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.

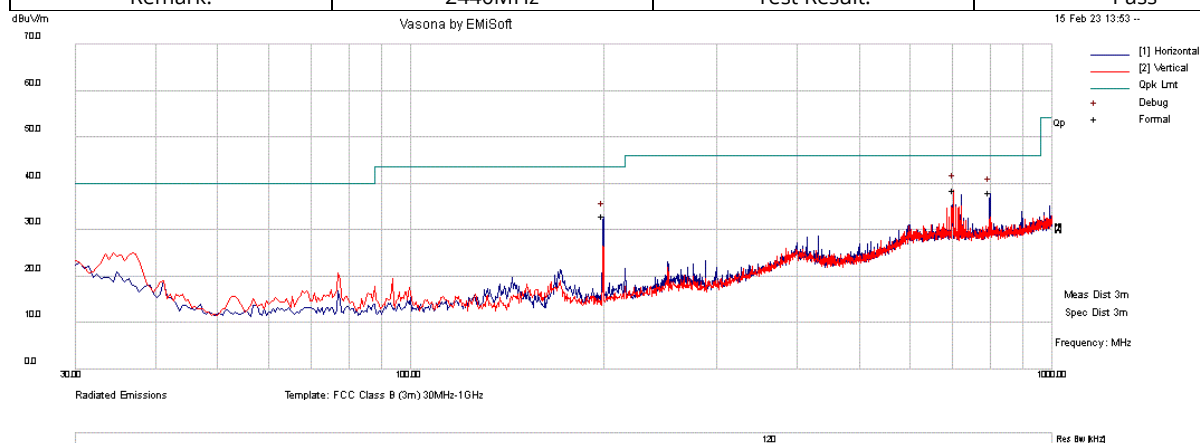
7.1.4 Test Result

Radiated Emission between 9KHz – 30MHz test result

Note: no substantial emission is found other than the noise floor. Different modes have been verified.

RADIATED EMISSIONS BELOW 1 GHZ

Test Standard:	FCC15.247, 15.209	Mode:	Bluetooth BLE
Frequency Range:	30 MHz - 1 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	Zach Peng
Remark:	2440MHz	Test Result:	Pass



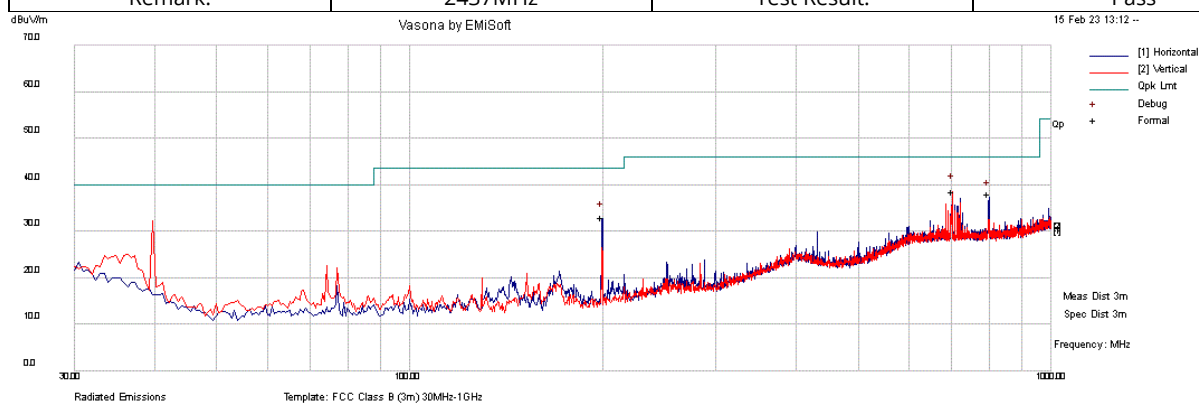
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	702.210	36.5	7.3	-5.4	38.5	Quasi Max	V	259	100	46.0	-7.5	Pass
2	800.180	34.7	7.2	-4.2	37.8	Quasi Max	H	107	143	46.0	-8.2	Pass
3	199.758	44.6	4.7	-17.0	32.3	Quasi Max	V	339	217	43.5	-11.2	Pass

Remarks:

1. Level (dBuV/m) = Raw (dBuV) + Cable loss(dB) + AF (dB/m).
2. AF (dB/m) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS BELOW 1 GHZ

Test Standard:	FCC15.247, 15.209	Mode:	802.11b Mode
Frequency Range:	30 MHz - 1 GHz	Test Date:	12/28/2022 - 02/27/2023
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	Zach Peng
Remark:	2437MHz	Test Result:	Pass



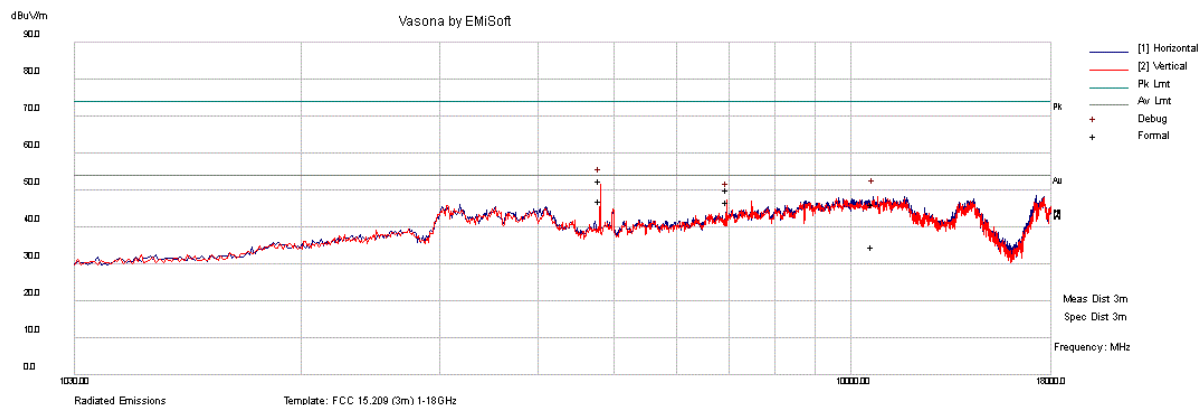
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	702.015	36.8	7.3	-5.4	38.7	Quasi Max	V	100	360	46.0	-7.3	Pass
2	800.146	35.1	7.2	-4.2	38.1	Quasi Max	V	100	360	46.0	-7.9	Pass
3	199.263	45.3	4.7	-17.0	33.0	Quasi Max	V	100	360	43.5	-10.5	Pass

Remarks:

1. Level (dBuV/m) = Raw (dBuV) + Cable loss(dB) + AF (dB/m).
2. AF (dB/m) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	BT BDR
Frequency Range:	1 GHz – 18 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Low Channel	Test Result:	Pass



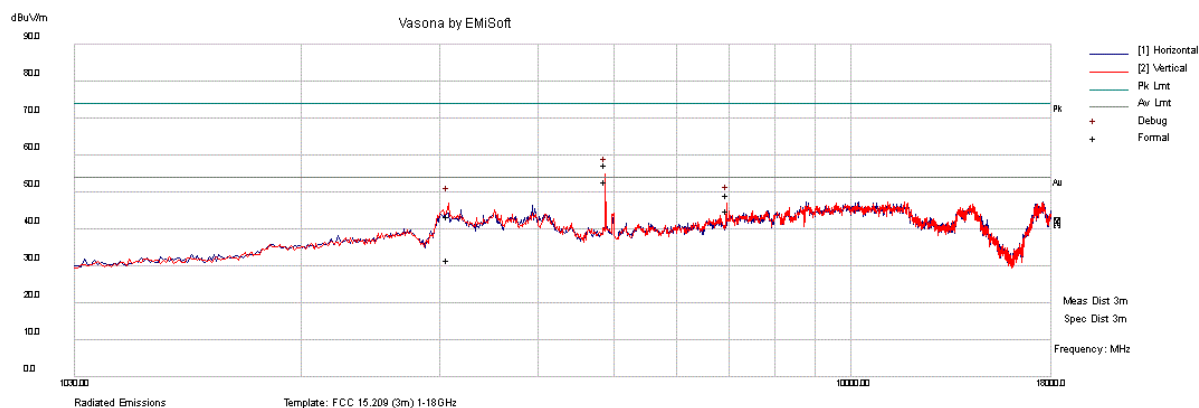
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	4804.013	48	9.1	-4.5	52.7	Peak Max	V	228	169	74	-21.3	Pass
2	10680.286	34.2	17.2	-5.3	46.2	Peak Max	H	204	0	74	-27.8	Pass
3	6960	44	12.5	-6.4	50.1	Peak Max	V	100	34	74	-23.9	Pass
4	4804.013	42.5	9.1	-4.5	47.2	Average Max	V	228	169	54	-6.8	Pass
5	10680.286	22.6	17.2	-5.3	34.5	Average Max	H	204	0	54	-19.5	Pass
6	6960	40.6	12.5	-6.4	46.7	Average Max	V	100	34	54	-7.3	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	BT BDR
Frequency Range:	1 GHz – 18 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Mid Channel	Test Result:	Pass



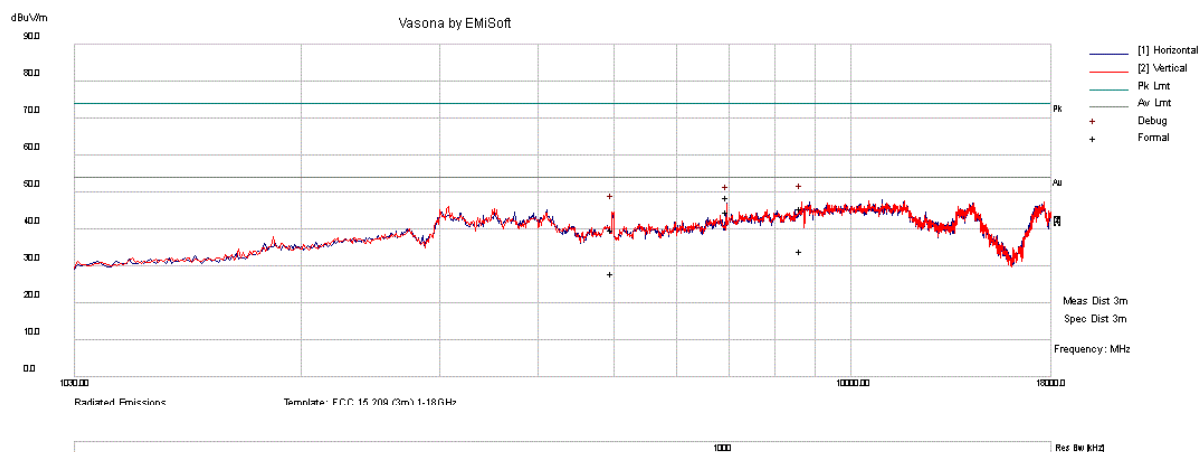
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	4881.926	53.7	9.3	-5.5	57.5	Peak Max	V	208	172	74	-16.5	Pass
2	6960.174	43.1	12.5	-6.4	49.2	Peak Max	V	113	0	74	-24.8	Pass
3	3075.134	35.3	7.7	0.6	43.5	Peak Max	V	178	345	74	-30.5	Pass
4	4881.926	49.1	9.3	-5.5	52.9	Average Max	V	208	172	54	-1.1	Pass
5	6960.174	39	12.5	-6.4	45.1	Average Max	V	113	0	54	-8.9	Pass
6	3075.134	23.4	7.7	0.6	31.7	Average Max	V	178	345	54	-22.3	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	BT BDR
Frequency Range:	1 GHz - 18 GHz	Test Date:	12/28/2022 - 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	High Channel	Test Result:	Pass



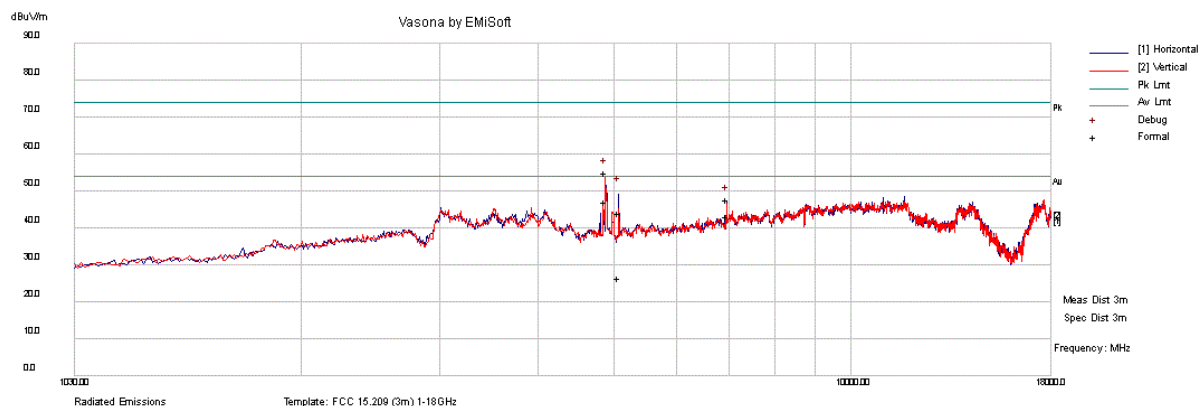
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8655.736	35.4	15.8	-5.7	45.5	Peak Max	V	164	11	74	-28.5	Pass
2	6960.289	42.4	12.5	-6.4	48.5	Peak Max	H	226	0	74	-25.5	Pass
3	4974.778	37.1	9.5	-6.8	39.8	Peak Max	V	314	32	74	-34.2	Pass
4	8655.736	23.8	15.8	-5.7	34	Average Max	V	164	11	54	-20	Pass
5	6960.289	38.5	12.5	-6.4	44.6	Average Max	H	226	0	54	-9.4	Pass
6	4974.778	25.4	9.5	-6.8	28.1	Average Max	V	314	32	54	-25.9	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	BLE
Frequency Range:	1 GHz - 18 GHz	Test Date:	12/28/2022 - 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Low Channel	Test Result:	Pass



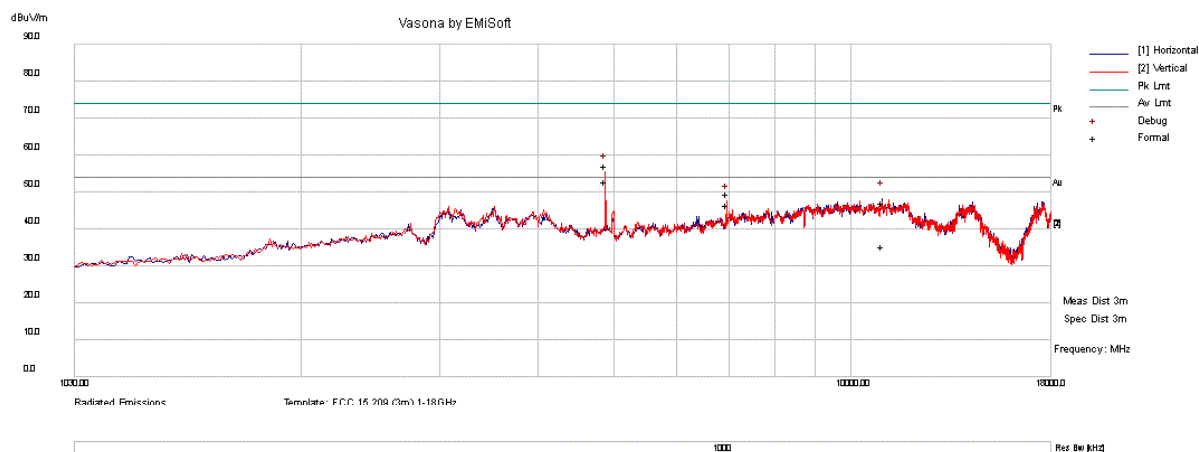
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	4879.849	51	9.3	-5.5	54.8	Peak Max	V	228	186	74	-19.2	Pass
2	5072.079	41.9	9.7	-7.5	44	Peak Max	H	180	70	74	-30	Pass
3	6959.932	41.5	12.5	-6.4	47.6	Peak Max	H	133	61	74	-26.4	Pass
4	4879.849	43.2	9.3	-5.5	47.1	Average Max	V	228	186	54	-6.9	Pass
5	5072.079	24.3	9.7	-7.5	26.5	Average Max	H	180	70	54	-27.5	Pass
6	6959.932	37	12.5	-6.4	43.1	Average Max	H	133	61	54	-10.9	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS-247	Mode:	BLE
Frequency Range:	1 GHz – 18 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Mid Channel	Test Result:	Pass



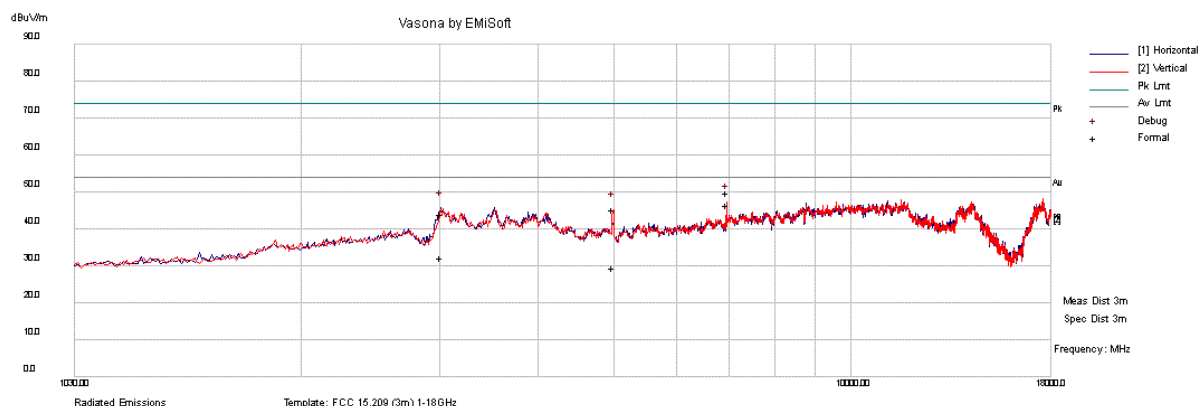
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	4881.929	53.1	9.3	-5.5	56.9	Peak Max	V	221	161	74	-17.1	Pass
2	10966.469	34.4	17.2	-4.6	47	Peak Max	H	316	46	74	-27	Pass
3	6960.034	43.3	12.5	-6.4	49.5	Peak Max	V	256	247	74	-24.5	Pass
4	4881.929	49	9.3	-5.5	52.8	Average Max	V	221	161	54	-1.2	Pass
5	10966.469	22.6	17.2	-4.6	35.2	Average Max	H	316	46	54	-18.8	Pass
6	6960.034	40.2	12.5	-6.4	46.3	Average Max	V	256	247	54	-7.7	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

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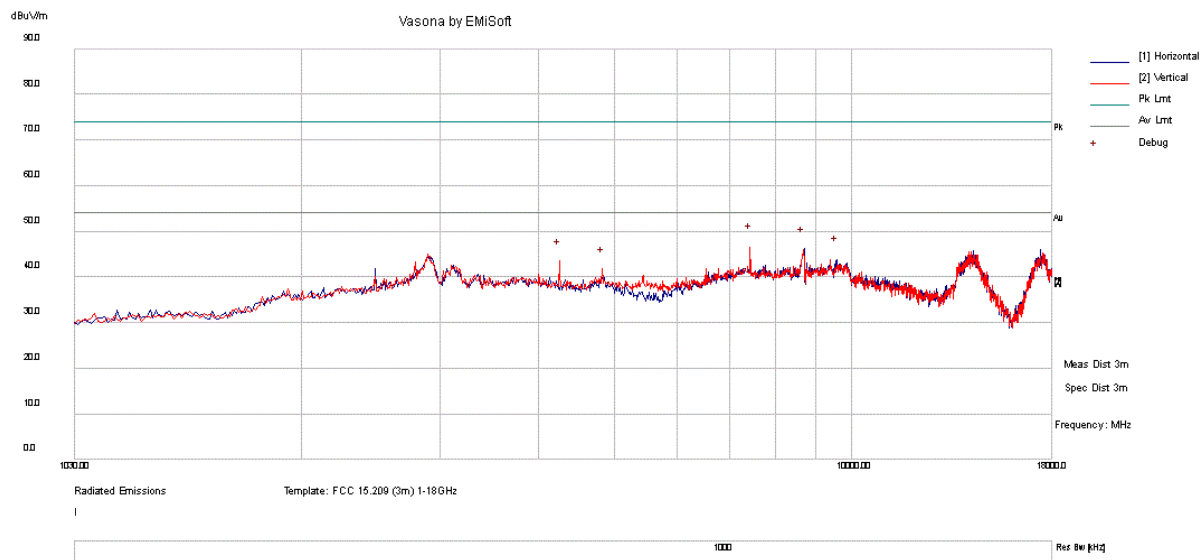
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	6960.024	43.6	12.5	-6.4	49.7	Peak Max	V	100	244	74	-24.3	Pass
2	3015.166	33	7.6	3.6	44.2	Peak Max	H	290	311	74	-29.8	Pass
3	4997.118	42.6	9.5	-7	45.1	Peak Max	V	117	254	74	-28.9	Pass
4	6960.024	40.4	12.5	-6.4	46.5	Average Max	V	100	244	54	-7.5	Pass
5	3015.166	21.1	7.6	3.6	32.2	Average Max	H	290	311	54	-21.8	Pass
6	4997.118	26.9	9.5	-7	29.4	Average Max	V	117	254	54	-24.6	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11b Mode
Frequency Range:	1 GHz - 18 GHz	Test Date:	12/28/2022 - 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Low Channel	Test Result:	Pass



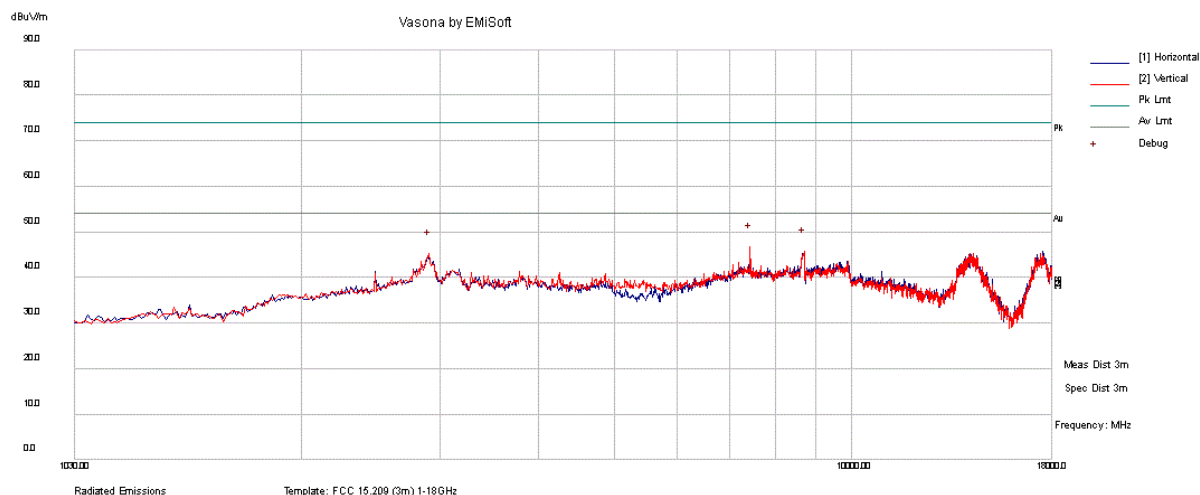
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	7436.175	40.1	11.9	-5.6	46.5	Peak Max	V	100	44	54	-7.5	Pass
2	9578.638	34.9	14	-5.2	43.7	Peak Max	H	200	244	54	-10.3	Pass
3	4254.994	32.6	8.3	2.4	43.2	Peak Max	V	101	13	54	-10.8	Pass
4	8689.422	34.1	17.5	-5.7	45.8	Peak Max	V	101	223	54	-8.2	Pass
5	4828.412	37.1	9.1	-4.8	41.5	Peak Max	V	101	100	54	-12.5	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11b Mode
Frequency Range:	1 GHz – 18 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Mid Channel	Test Result:	Pass



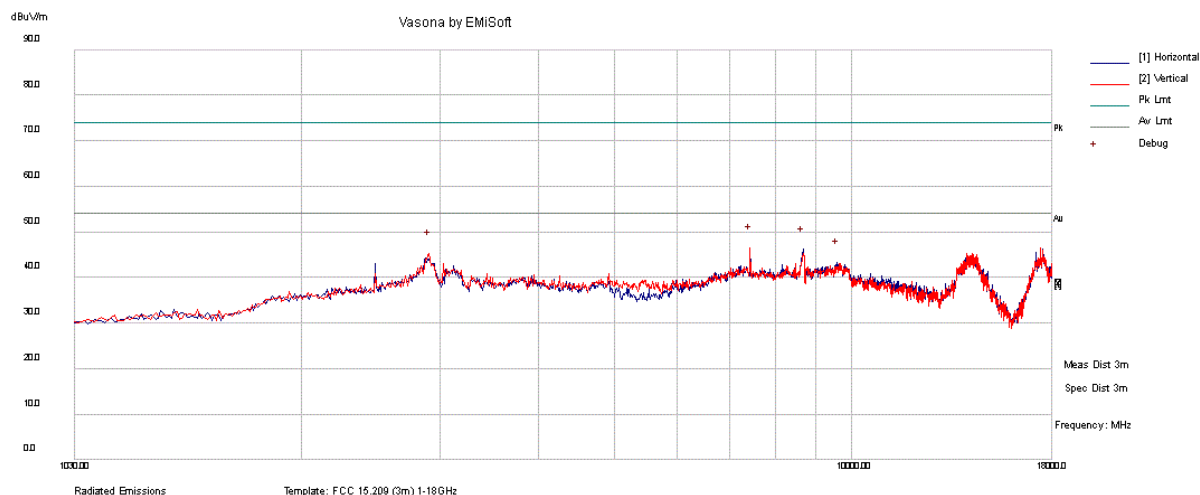
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	7436.175	40.4	11.9	-5.6	46.8	Peak Max	V	207	326	54	-7.2	Pass
2	8708.925	33.9	17.6	-5.7	45.7	Peak Max	V	313	128	54	-8.3	Pass
3	2907.306	20.7	20.8	3.9	45.3	Peak Max	V	226	332	54	-8.7	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11b Mode
Frequency Range:	1 GHz - 18 GHz	Test Date:	12/28/2022 - 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	High Channel	Test Result:	Pass



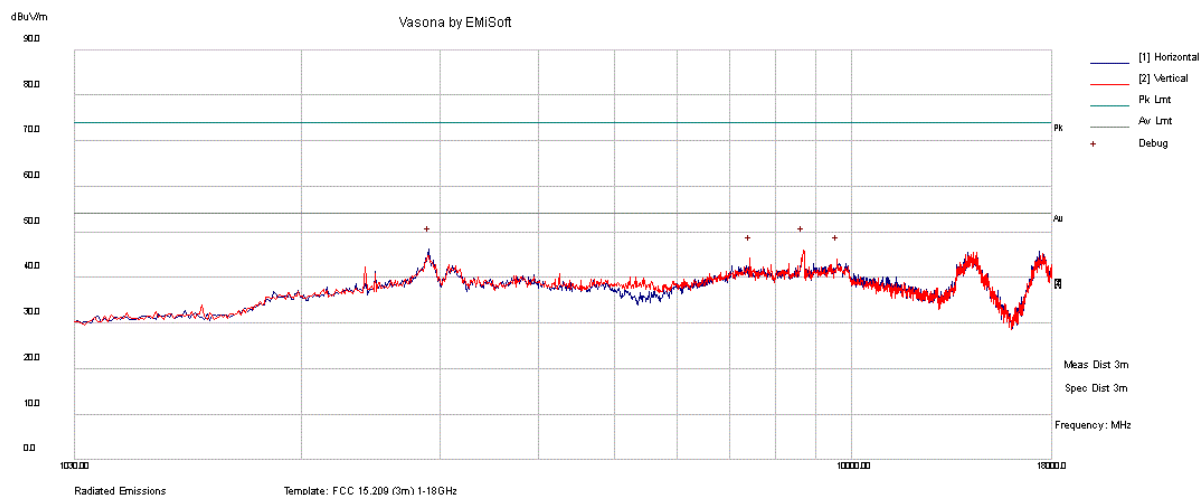
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	7436.175	40.2	11.9	-5.6	46.6	Peak Max	V	107	0	54	-7.4	Pass
2	8687.713	34.5	17.4	-5.7	46.2	Peak Max	H	264	322	54	-7.8	Pass
3	2907.306	20.7	20.8	3.9	45.4	Peak Max	V	243	222	54	-8.6	Pass
4	9599.85	34.4	14.1	-5.2	43.3	Peak Max	H	113	33	54	-10.7	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11g Mode
Frequency Range:	1 GHz – 18 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Low Channel	Test Result:	Pass



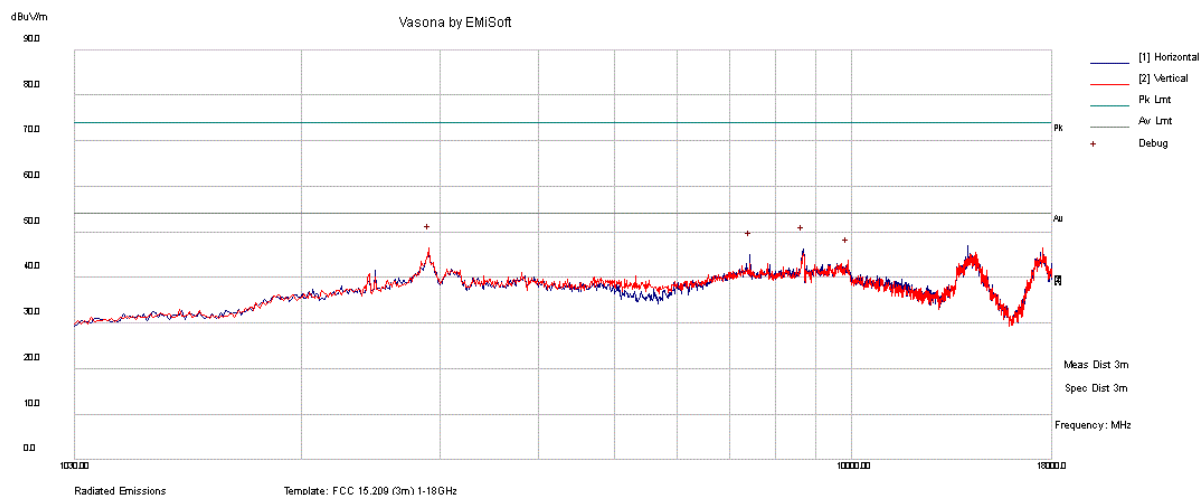
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	2907.306	21.5	20.8	3.9	46.1	Peak Max	H	335	252	54	-7.9	Pass
2	8687.713	34.4	17.4	-5.7	46.1	Peak Max	V	195	293	54	-7.9	Pass
3	9599.85	35.1	14.1	-5.2	44	Peak Max	V	286	146	54	-10	Pass
4	7436.43	37.9	11.9	-5.6	44.2	Peak Max	V	101	360	54	-9.8	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11g Mode
Frequency Range:	1 GHz – 18 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Mid Channel	Test Result:	Pass



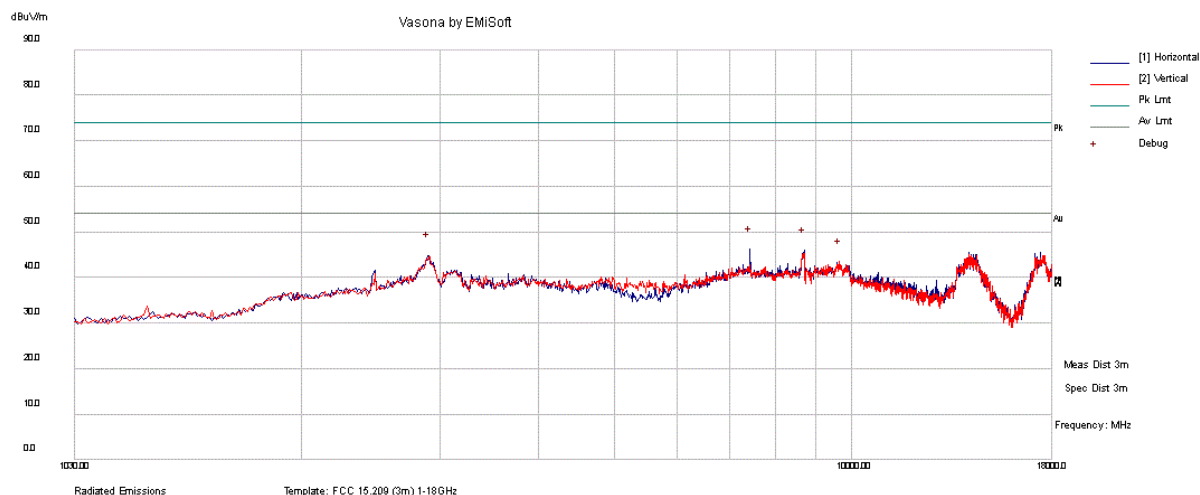
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	2907.306	21.9	20.8	3.9	46.5	Peak Max	V	254	22	54	-7.5	Pass
2	8687.713	34.6	17.4	-5.7	46.3	Peak Max	H	118	0	54	-7.7	Pass
3	9896.825	34.3	14.6	-5.2	43.7	Peak Max	V	264	46	54	-10.4	Pass
4	7436.208	38.7	11.9	-5.6	45	Peak Max	H	332	324	54	-9	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11g Mode
Frequency Range:	1 GHz – 18 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	High Channel	Test Result:	Pass



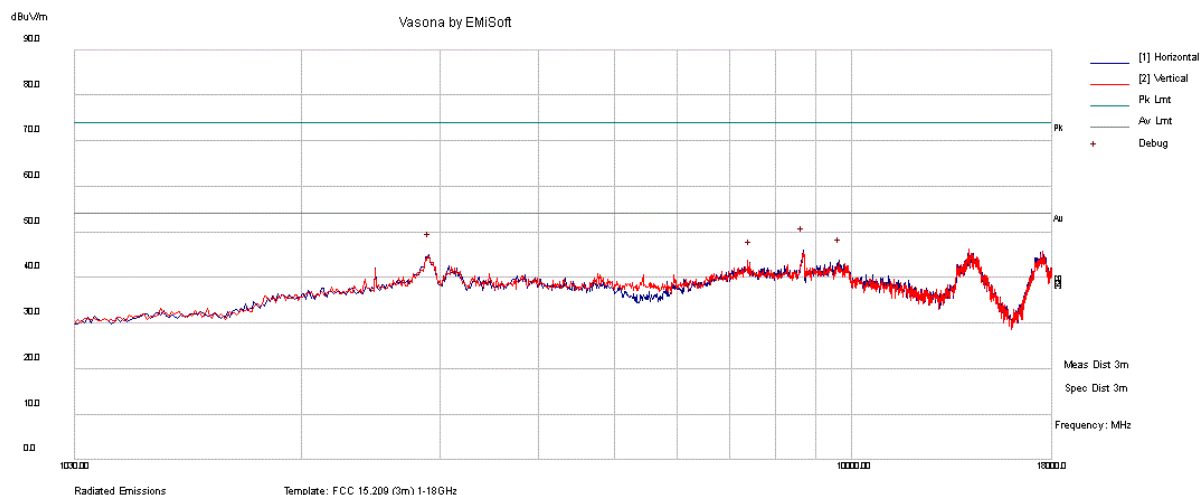
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	7436.175	39.8	11.9	-5.6	46.1	Peak Max	H	244	166	54	-7.9	Pass
2	8708.925	34.1	17.6	-5.7	45.9	Peak Max	H	104	256	54	-8.1	Pass
3	2896.7	19.1	21.9	3.8	44.8	Peak Max	H	270	23	54	-9.2	Pass
4	9663.488	34.2	14.5	-5.2	43.5	Peak Max	V	100	334	54	-10.5	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11n20 Mode
Frequency Range:	1 GHz – 18 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Low Channel	Test Result:	Pass



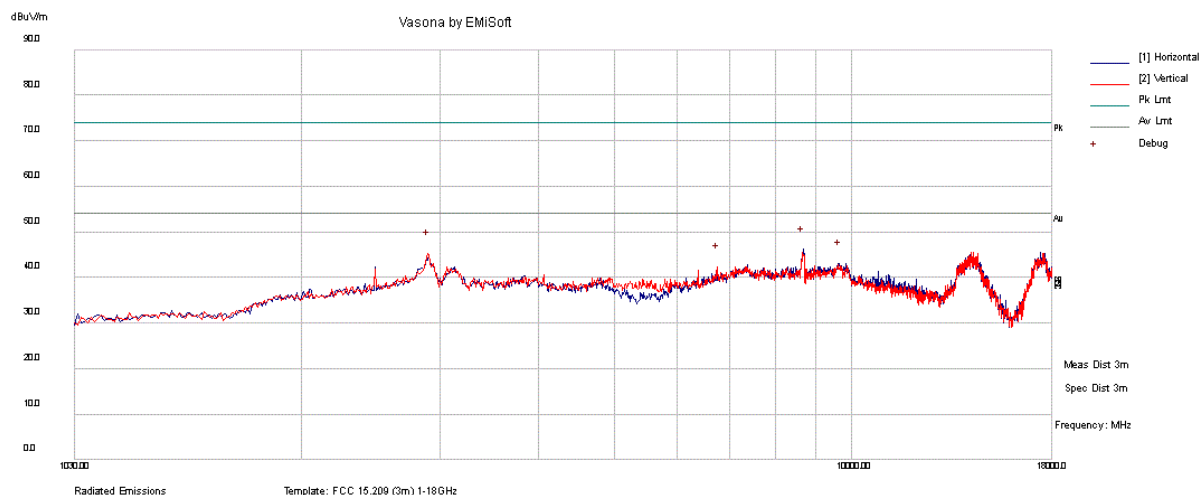
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8687.713	34.4	17.4	-5.7	46.1	Peak Max	H	102	92	54	-7.9	Pass
2	2907.306	20.3	20.8	3.9	44.9	Peak Max	H	333	154	54	-9.1	Pass
3	9663.488	34.4	14.5	-5.2	43.7	Peak Max	H	244	297	54	-10.3	Pass
4	7436.449	36.8	11.9	-5.6	43.1	Peak Max	V	22	360	54	-10.9	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11n20 Mode
Frequency Range:	1 GHz – 18 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Mid Channel	Test Result:	Pass



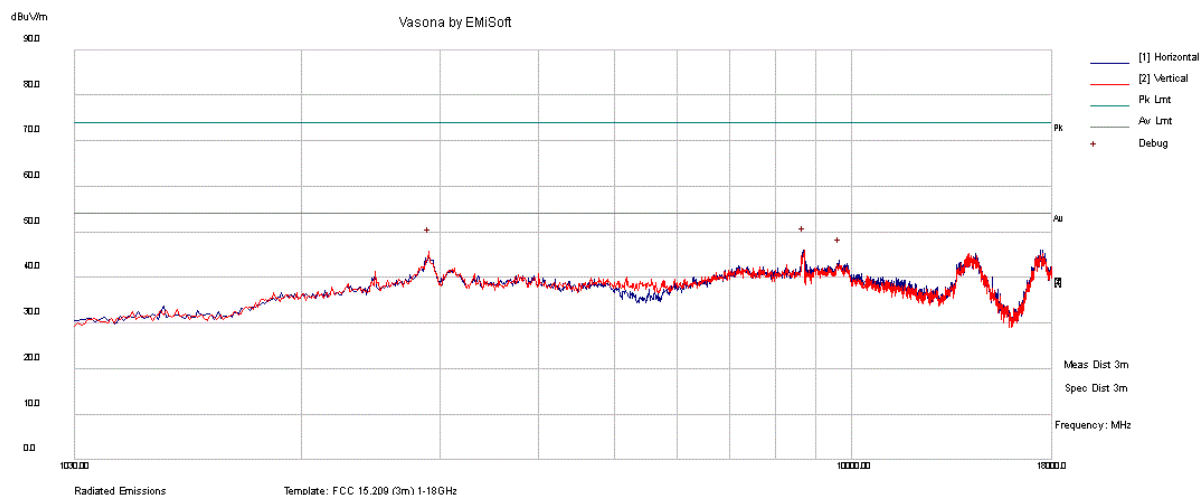
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8687.713	34.5	17.4	-5.7	46.2	Peak Max	H	268	288	54	-7.8	Pass
2	2896.7	19.5	21.9	3.8	45.2	Peak Max	V	179	0	54	-8.8	Pass
3	9663.488	33.8	14.5	-5.2	43.1	Peak Max	H	378	19	54	-10.9	Pass
4	6757.292	38.1	11.2	-7	42.3	Peak Max	V	102	36	54	-11.7	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11n20 Mode
Frequency Range:	1 GHz - 18 GHz	Test Date:	12/28/2022 - 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	High Channel	Test Result:	Pass



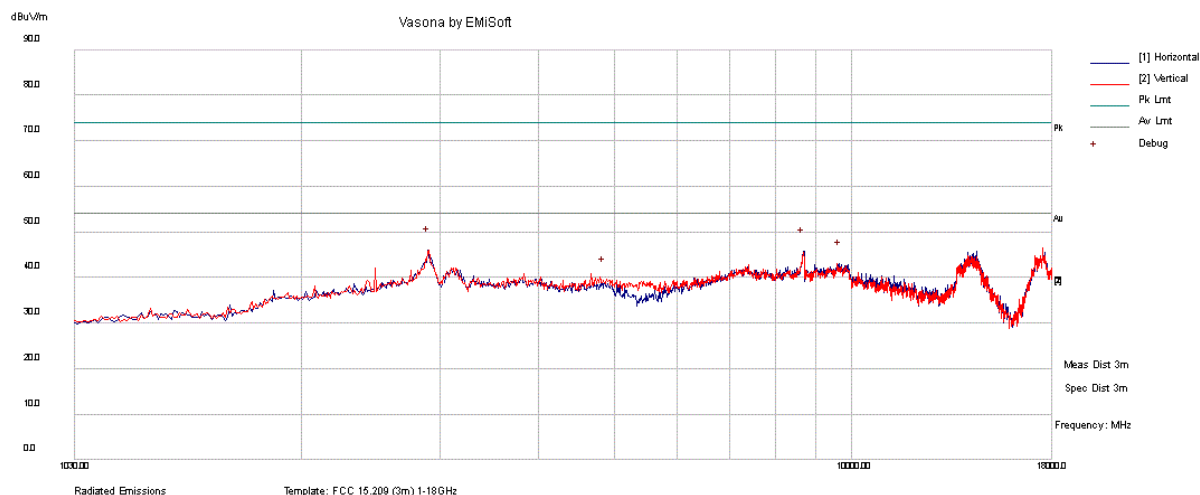
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8708.925	34.2	17.6	-5.7	46	Peak Max	V	237	0	54	-8	Pass
2	2907.306	21.1	20.8	3.9	45.7	Peak Max	V	152	255	54	-8.3	Pass
3	9652.881	34.5	14.4	-5.2	43.7	Peak Max	H	295	248	54	-10.3	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11n40 Mode
Frequency Range:	1 GHz – 18 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Low Channel	Test Result:	Pass



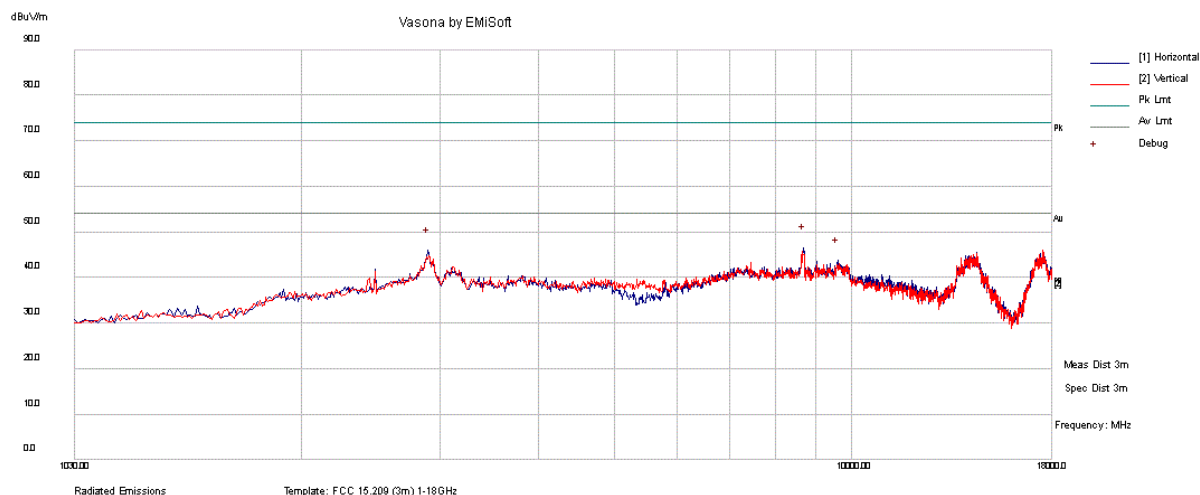
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	2896.7	20.3	21.9	3.8	46	Peak Max	H	162	40	54	-8	Pass
2	8687.713	34	17.4	-5.7	45.7	Peak Max	H	113	303	54	-8.3	Pass
3	9652.881	33.9	14.4	-5.2	43.1	Peak Max	H	118	311	54	-10.9	Pass
4	4844.561	35.2	9.1	-5	39.3	Peak Max	V	101	360	54	-14.7	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11n40 Mode
Frequency Range:	1 GHz – 18 GHz	Test Date:	12/28/2022 – 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	Mid Channel	Test Result:	Pass



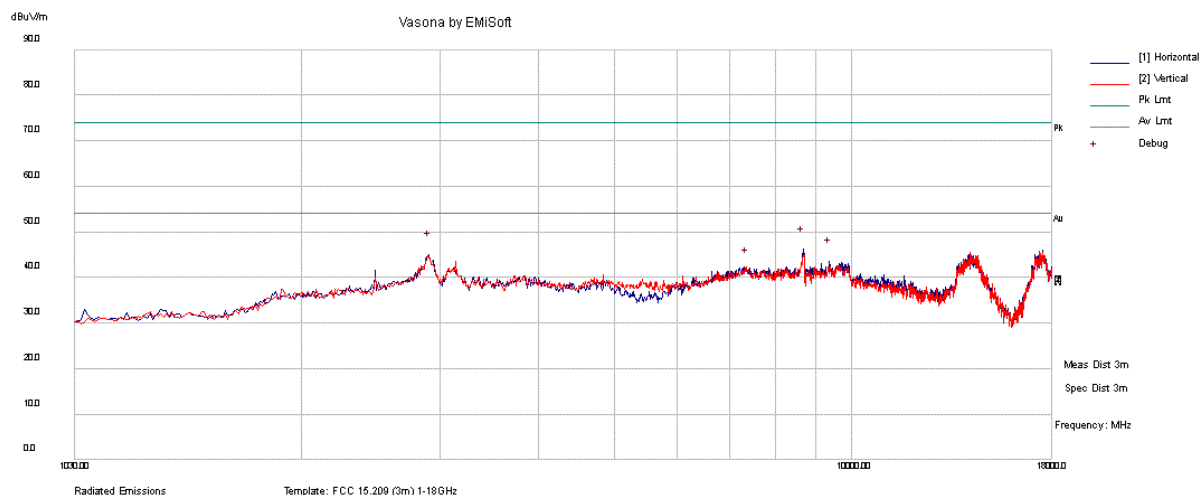
No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8698.319	34.3	17.9	-5.7	46.5	Peak Max	H	122	48	54	-7.5	Pass
2	2896.7	20.2	21.9	3.8	45.9	Peak Max	H	104	0	54	-8.1	Pass
3	9610.456	34.7	14.1	-5.2	43.7	Peak Max	H	370	123	54	-10.3	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) – Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	FCC15.247, 15.209, RSS 247	Mode:	802.11n40 Mode
Frequency Range:	1 GHz - 18 GHz	Test Date:	12/28/2022 - 02/27/2023
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Zach Peng
Remark:	High Channel	Test Result:	Pass



No.	Frequency MHz	Raw dBuV	Cable Loss	AF dB/m	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
1	8687.713	34.4	17.4	-5.7	46.1	Peak Max	H	223	90	54	-7.9	Pass
2	2907.306	20.4	20.8	3.9	45.1	Peak Max	H	102	32	54	-8.9	Pass
3	9387.725	34.2	14.6	-5.2	43.6	Peak Max	H	221	34	54	-10.4	Pass
4	7362.266	35	11.9	-5.5	41.5	Peak Max	V	101	162	54	-12.5	Pass

Remarks:

1. Level (dBuV) = Raw (dBuV) + Cable loss(dB) + AF (dB).
2. AF(dB/m) = Antenna Factor (dB) - Preamplifier Gain (dB)
3. Margin = Level (dBuV/m) - Limit value(dBuV/m)
4. Final average measurement is not necessary since peak level is below average limit

Radiated Emission between 18GHz - 40GHz test result

Note: no substantial emission is found other than the noise floor. Different modes have been verified.

Radiated Emission between 18GHz – 40GHz test result

Note: no substantial emission is found other than the noise floor. Different modes have been verified.

8 EUT and Test Setup Photos

See FCC exhibits

9 Test Instrument List

Equipment	Manufacturer	Model	Instrument Number	Cal. Date	Cal. Due
Semi-Anechoic Chamber	ETS-Lindgren	10M	VL001	10/18/2022	10/18/2023
Shielding Control Room	ETS-Lindgren	Series 81	VL006	N/A	N/A
Spectrum Analyzer	Keysight	N9020A	MY50110074	06/09/2022	06/09/2023
EMC Test Receiver	R&S	ESL6	100230	06/07/2022	06/07/2023
LISN (9KHz – 30MHz)	EMCO	3816/2	9705-1066	07/12/2022	07/12/2023
Bi-Log Antenna	ETS-Lindgren	3142E	217921	07/19/2022	07/19/2023
Horn Antenna (1-18GHz)	Electro-Metrics	EM-6961	6292	07/21/2022	07/21/2023
Horn Antenna (18-40GHz)	Com-Power	AH-840	101109	07/21/2022	07/21/2023
Preamplifier	RF Bay, Inc.	LPA-10-20	11180621	07/16/2022	07/16/2023
True RMS Multi-meter	UNI-T	UT181A	C173014829	06/07/2022	06/07/2023
Temp / Humidity / Pressure Meter	PCE Instruments	PCE-THB 40	R062028	06/07/2022	06/07/2023
RF Attenuator	Pasternack	PE7005-3	VL061	07/16/2022	07/16/2023
Preamplifier 100KHz - 40GHz	Aeroflex	33711-392-77150-11	064	07/16/2022	07/16/2023
EM Center Control	ETS-Lindgren	7006-001	160136	N/A	N/A
Turn Table	ETS-Lindgren	2181-3.03	VL002	N/A	N/A
Boresight Antenna Tower	ETS-Lindgren	2171B	VL003	N/A	N/A
Loop Antenna (9k-30MHz)	Com-Power	AL-130	121012	06/10/2022	06/10/2023
RE test cable(below 6GHz)	Vista	RE-6GHz-01	RE-6GHz-01	07/16/2022	07/16/2023
RE test cable (1-18GHz)	PhaseTrack	II-240	RE-18GHz-01	07/16/2022	07/16/2023
RE test cable (>18GHz)	Sucoflex	104	344903/4	07/16/2022	07/16/2023
Pulse limiter	Com-Power	LIT-930A	531727	07/16/2022	07/16/2023
CE test cable #1	FIRST RF	FRF-C-1002-001	CE-6GHz-01	07/16/2022	07/16/2023
CE test cable#2	FIRST RF	FRF-C-1002-001	CE-6GHz-02	07/16/2022	07/16/2023

Note:

- 1) This equipment is not for measurement purpose and only require functional verification. Calibration is not required.

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