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FCC ISED RF Test Report

Test Report Number	PLI-21033041-LC-FCC-IC-RF-WLAN
FCC ID	U6YRDAA8190
ISED ID	216P-RDAA8190
Applicant	Panasonic Avionics Corporation
Applicant Address	26200 Enterprise Way, Lake Forest, CA 92630
Product Name	Enhanced Cell Modem
Model (s)	RD-AA8190-01
Date of Receipt	02/25/2021
Date of Test	04/05/2021-04/23/2021
Report Issue Date	04/23/2021
Test Standards	47 CFR Part 15.247 47 CFR Part 15.407 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

Daniel Bruno (Test Technician)

David Zhang (Technical Manager)

REVISION HISTORY

Report Number	Version	Description	Issued Date
PLI-21033041-LC-FCC-IC-RF-WLAN	01	Initial report	04/23/2021

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1 Test Summary

Test Item	Test Requirement	Test Method	Result
Radiated Spurious Emissions into Restricted Frequency Bands	47 CFR Part 15.247 RSS-247 Issue 2, Feb 2017	ANSI C63.10: 2013 KDB 558074 D01 15.247 Meas Guidance v05r02	Pass

2 General Information

2.1 Applicant

Applicant	Panasonic
Applicant address	26200 Enterprise Way, Lake Forest, CA 92630
Manufacturer	Panasonic
Manufacturer Address	26200 Enterprise Way, Lake Forest, CA 92630

2.2 Product information

Product Name	Enhanced Cell Modem
Model Number	RD-AA8190-01
Family Models	N/A
Serial Number	CAG 1UL05 (Panasonic Asset No.: 0089717)
Frequency Band	802.11b/g/n:2412MHz-2462MHz 802.11a/n/ac:5180MHz-5240MHz, 5260MHz-5320MHz, 5500MHz-5720MHz, 5745MHz-5825MHz WCDMA B2, B5, B4 LTE B2, B4, B5, B7, B12, B13, B25, B26, B30 and B41
Type of modulation	802.11b: DSSS(DBPSK/DQPSK/ CCK) 802.1111a/g/n/ac: OFDM(BPSK/QPSK/16QAM/64QAM/ 256QAM) WCDMA: QPSK LTE CAT-M1: QPSK, 16QAM LTE NB-IOT: BPSK, QPSK
Equipment Class	DTS, PCB
Antenna Information	Wi-Fi antennas: - 3 x External dipole antennas, 3 dBi gain for 2.4GHz, 5 dBi gain for 5GHz Cellular antenna: - 2 x External antenna, 1 dBi gain over supported frequency range
Clock Frequencies	N/A
Input Power	28VDC or 110/220VAC
Power Adapter Manufacturer/Model	N/A
Power Adapter SN	N/A
Hardware version	N/A
Software version	N/A
Simultaneous Transmission	Cellular module and transmit simultaneously with Wi-Fi
Additional Info	Cellular module integrated: Sierra EM7455 Radio Module Wi-Fi module integrated: Panasonic M120000015

2.3 Test standard and method

Test standard	47 CFR Part 15.247 47 CFR Part 15.407 RSS-247 Issue 2, Feb 2017
Test method	ANSI C63.10: 2013 KDB 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 has the option to be powered by an external 28VDC power source, or a 220VAC power source. Testing was performed under both input power configuration.
The CMW500 communication tester was used to establish WCDMA/LTE links. A test laptop is used to establish Ethernet communication with EUT.
Test software was provided by applicant and used to exercise the Wi-Fi operation.
Testing was completed with worst case radio configuration.

The following software was used to monitor EUT performance

Software	Description
EMISOFT Vasona	EMC/RF Spurious emission test software used during testing
eCM test tools	RF test software to exercise the Wi-Fi (2.4/5GHz)

5.2 Supporting Equipment

Description	Manufacturer	Model #	Serial #
-	-	-	-

6 Uncertainty of Measurement

Test item	Measurement Uncertainty (dB)
RF Conducted Measurement (30MHz – 18GHz)	±1.5 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

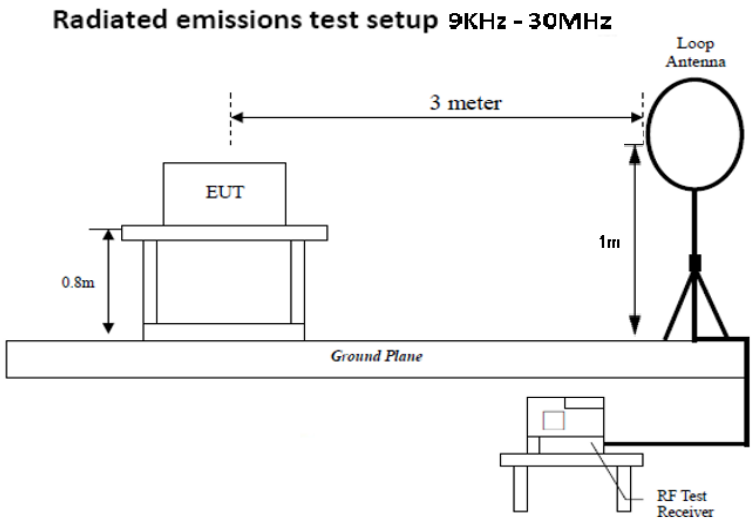
Per § 15.247 (d), RSS-247

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.

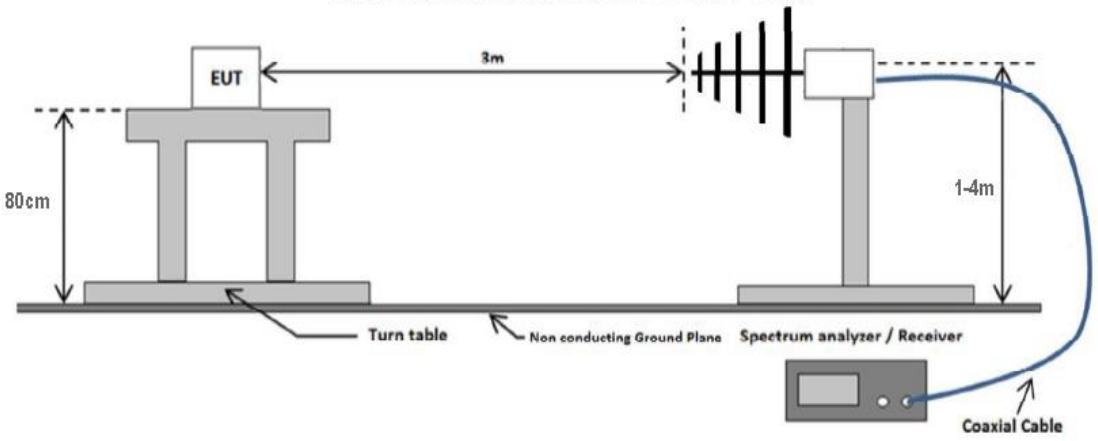
Attenuation below the general limits specified in §15.209(a) and RSS-Gen is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

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

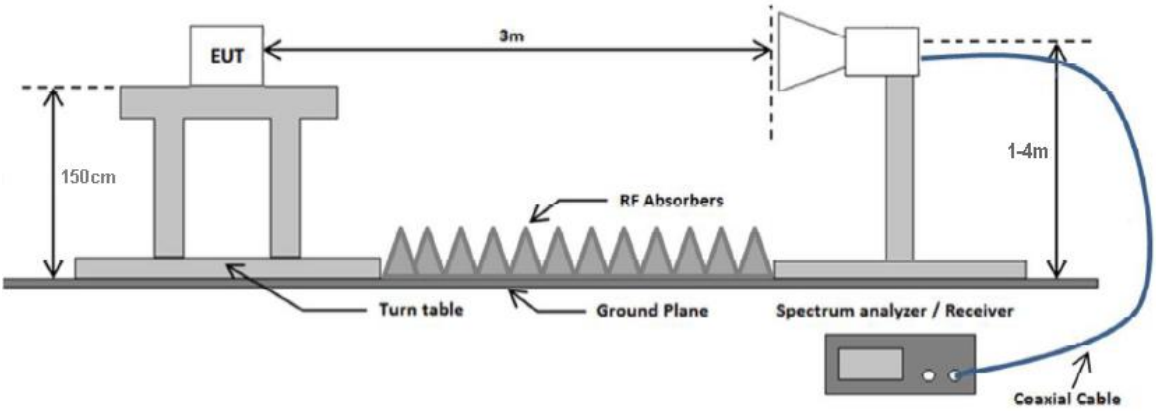
7.1.2 Test setup



Radiated emissions test setup 30 MHz - 1 GHz



Radiated emissions test setup above 1 GHz



7.1.3 Test Procedure

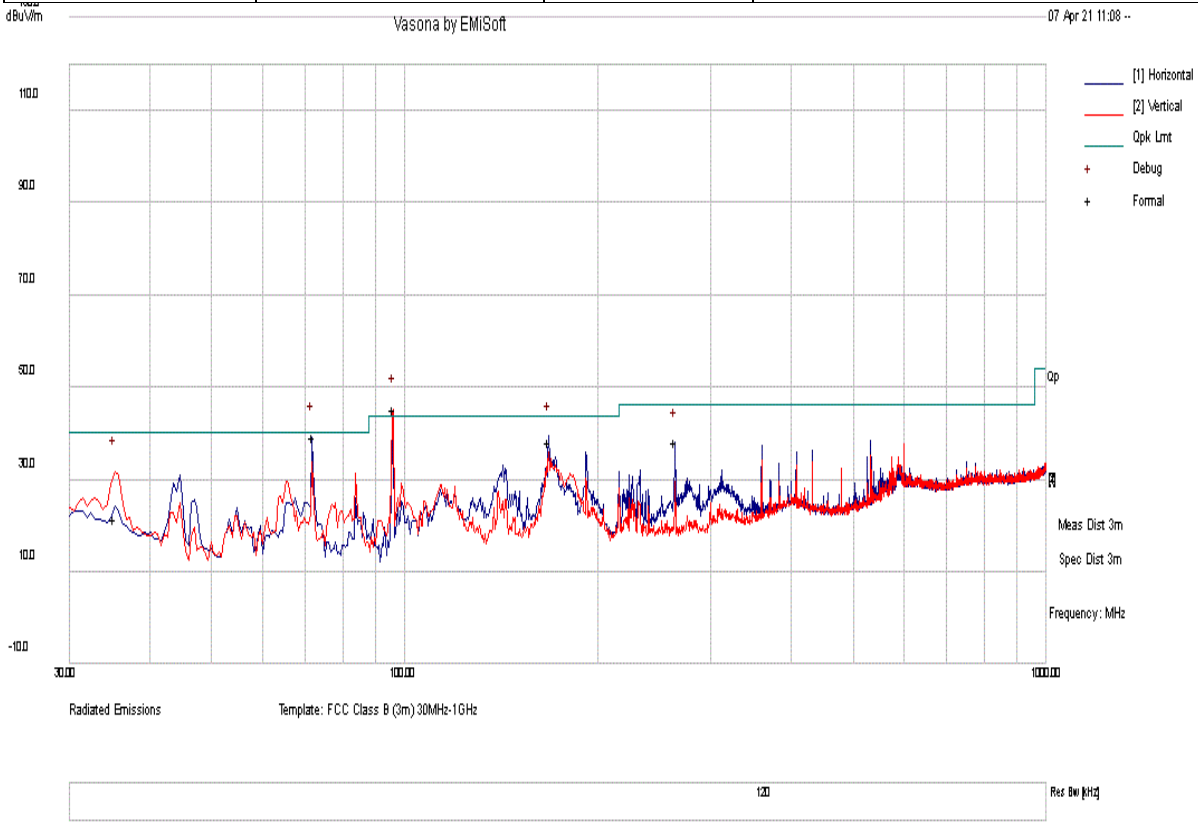
According to section 8.6 in KDB 558074 D01 DTS Meas Guidance v05r01 and subclause 11.12.2.7 Radiated spurious emission measurements in ANSI C63.10-2013 as well as the procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 was followed. Boresight antenna mast was 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 EMISSIONS BELOW 1 GHZ

Test Standard:	15.247, RSS-247	Mode:	2.4G 11b mid + WCDMA B2
Frequency Range:	30 MHz - 1 GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	Simultaneous TX	Test Result:	Pass

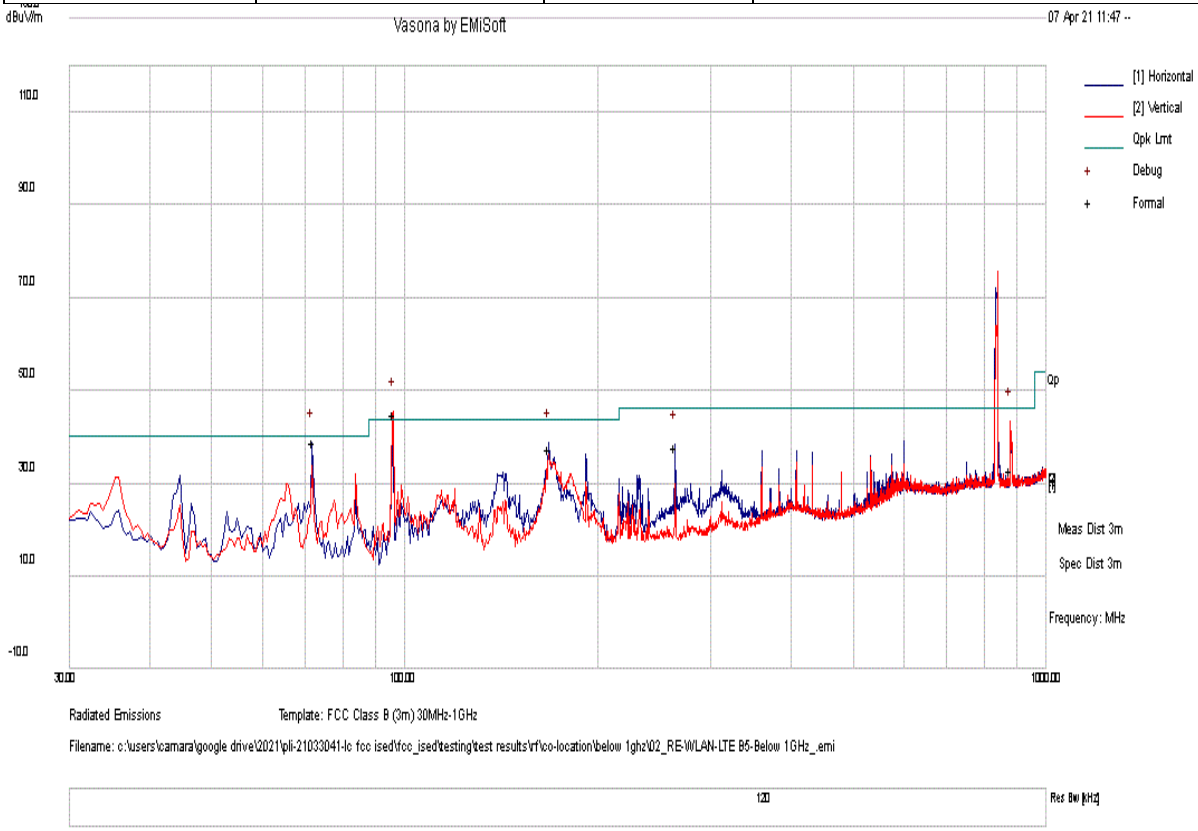


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
71.956	56.2	3.2	-20.1	39.3	Quasi Max	H	278	348	40	-0.7	Pass
167.895	51.2	4.4	-17.5	38.2	Quasi Max	H	174	7	43.5	-5.3	Pass
263.819	47.3	5.4	-14.5	38.2	Quasi Max	H	136	192	46	-7.8	Pass
35.246	33.4	2.4	-14.4	21.4	Quasi Max	V	209	49	40	-18.6	Pass

Note: Frequency at around 95.939 MHz is confirmed from the USB to serial adapter, not from EUT. Also, this frequency is not in the restricted band.

RADIATED EMISSIONS BELOW 1 GHZ

Test Standard:	15.407, RSS-247	Mode:	5G 11a 5500+LTE B5
Frequency Range:	30 MHz - 1 GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Bi-Log/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	N/A	Test Result:	Pass



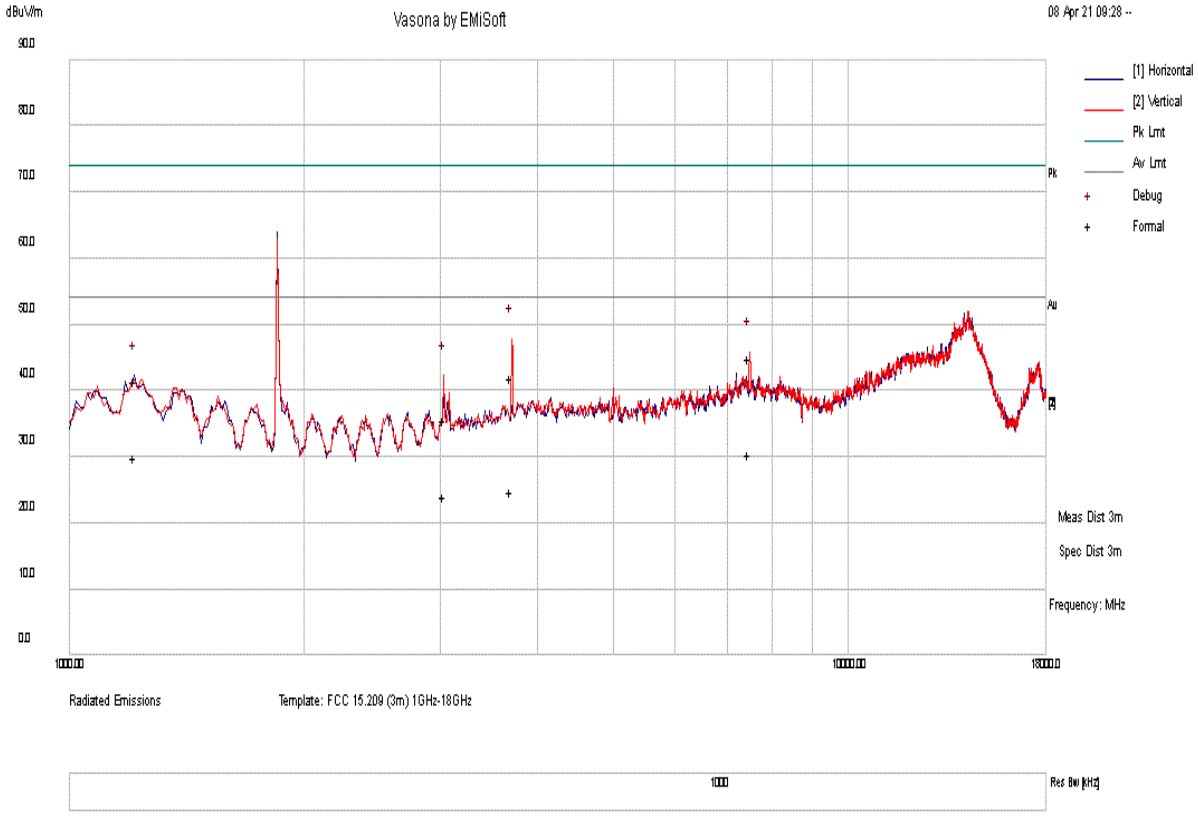
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
71.946	55.7	3.2	-20.1	38.8	Quasi Max	H	268	340	40	-1.2	Pass
877.752	29.2	7.5	-3.8	32.9	Quasi Max	V	112	206	46	-13.1	Pass
167.915	50.7	4.4	-17.5	37.6	Quasi Max	H	195	22	43.5	-5.9	Pass
263.821	47.1	5.4	-14.5	38	Quasi Max	H	120	184	46	-8	Pass

Note:

1. Frequency at around 835MHz is EUT fundamental emission.
2. Frequency at around 95.939 MHz is confirmed from the USB to serial adapter, not from EUT. Also, this frequency is not in the restricted band.

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	15.247, RSS-247	Mode:	2.4G 11b mid + WCDMA B2
Frequency Range:	1 GHz – 18GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	N/A	Test Result:	Pass

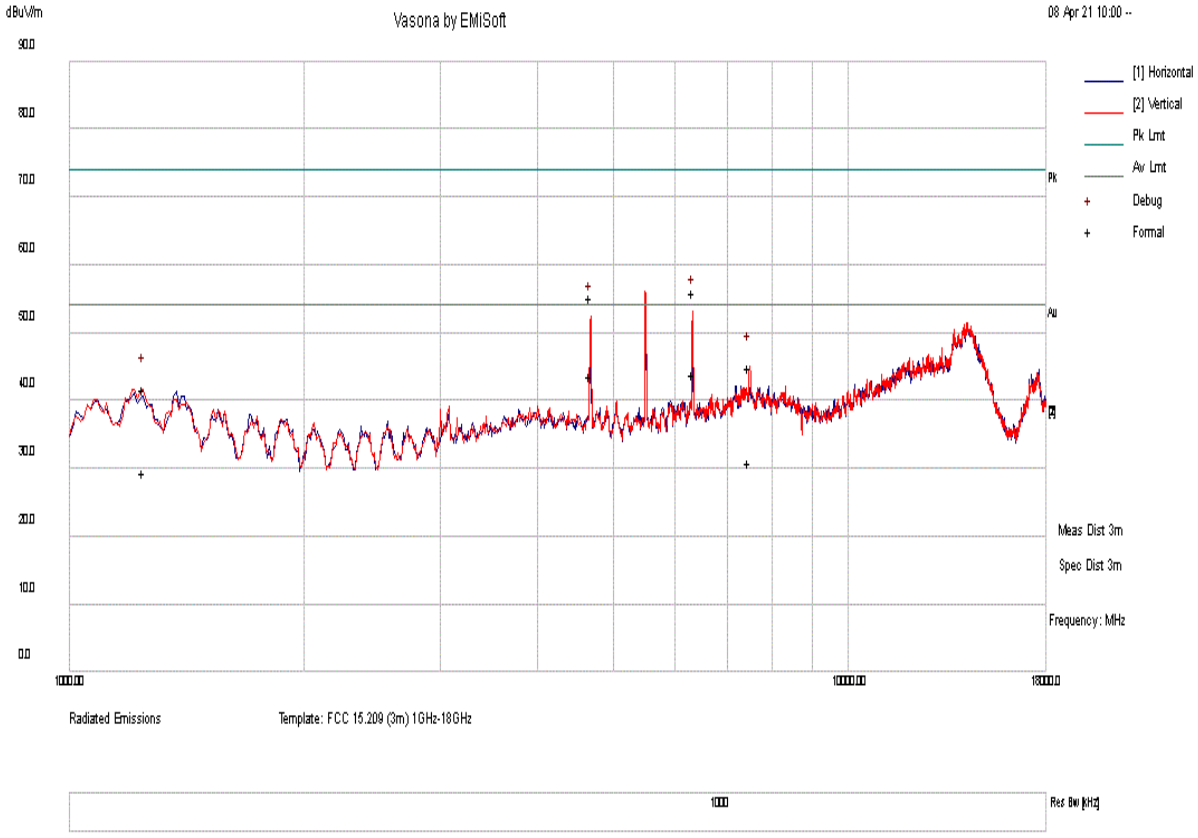


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
3700.46	30.3	16.2	-4.6	41.9	Peak Max	V	211	199	74	-32.1	Pass
7480.143	23.1	21	0.9	45	Peak Max	V	272	171	74	-29	Pass
3030.328	27.3	15.4	-6.9	35.7	Peak Max	V	182	65	74	-38.3	Pass
1213.048	32.6	14.3	-5.4	41.6	Peak Max	H	332	168	74	-32.4	Pass
3700.46	13.2	16.2	-4.6	24.8	Average Max	V	211	199	54	-29.2	Pass
7480.143	8.5	21	0.9	30.4	Average Max	V	272	171	54	-23.6	Pass
3030.328	15.5	15.4	-6.9	24	Average Max	V	182	65	54	-30	Pass
1213.048	20.9	14.3	-5.4	29.9	Average Max	H	332	168	54	-24.1	Pass

Note: Frequency at around 1900MHz is EUT fundamental emission.

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	15.407, RSS-247	Mode:	5G 11a 5500+WCDMA B5
Frequency Range:	1 GHz – 18GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	N/A	Test Result:	Pass

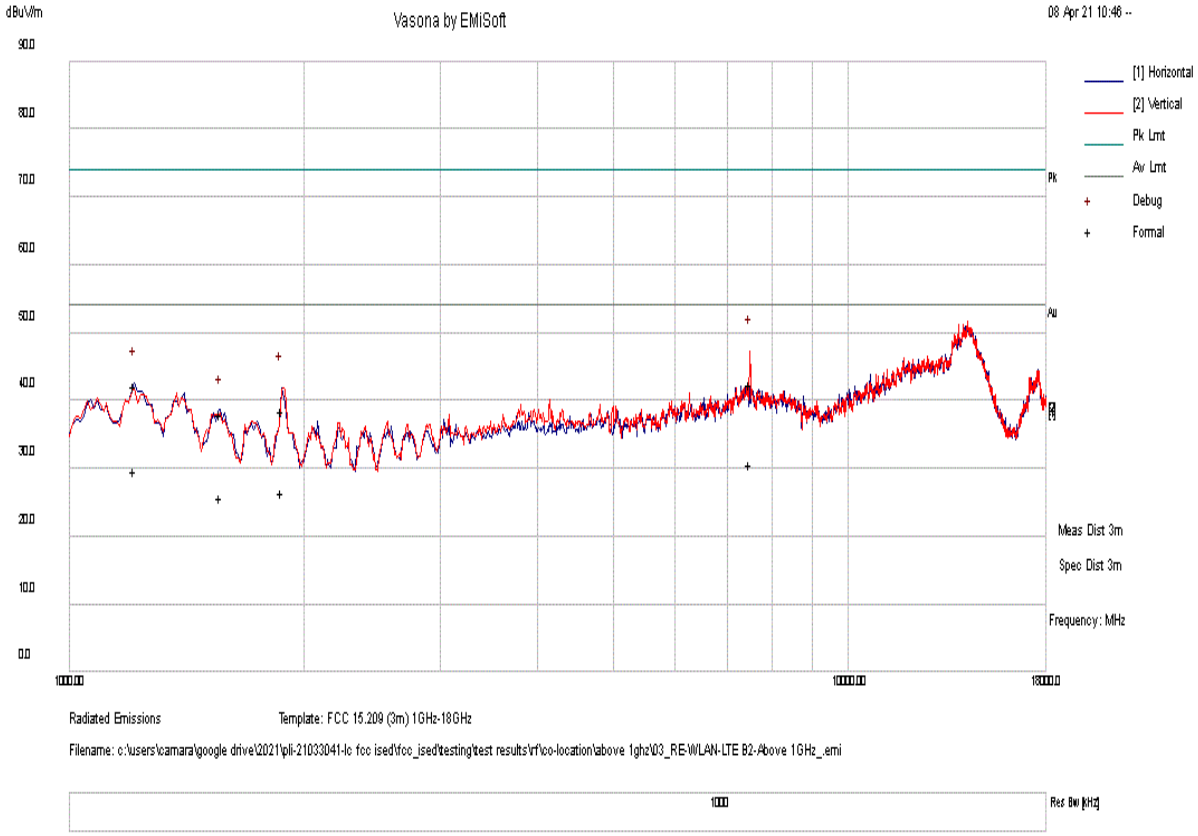


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
6323.168	36.5	19	0.6	56	Peak Max	V	196	31	74	-18	Pass
4675.988	40.6	17.3	-2.7	55.2	Peak Max	V	136	253	74	-18.8	Pass
7480.615	23	21	0.9	44.8	Peak Max	V	100	149	74	-29.2	Pass
1246.12	33	14.4	-5.7	41.7	Peak Max	V	280	360	74	-32.3	Pass
6323.168	24.5	19	0.6	44.1	Average Max	V	196	31	54	-9.9	Pass
4675.988	29.2	17.3	-2.7	43.7	Average Max	V	136	253	54	-10.3	Pass
7480.615	9	21	0.9	30.9	Average Max	V	100	149	54	-23.1	Pass
1246.12	20.8	14.4	-5.7	29.6	Average Max	V	280	360	54	-24.4	Pass

Note: Frequency at around 5500MHz is EUT fundamental emission.

RADIATED EMISSIONS 1 - 18 GHZ

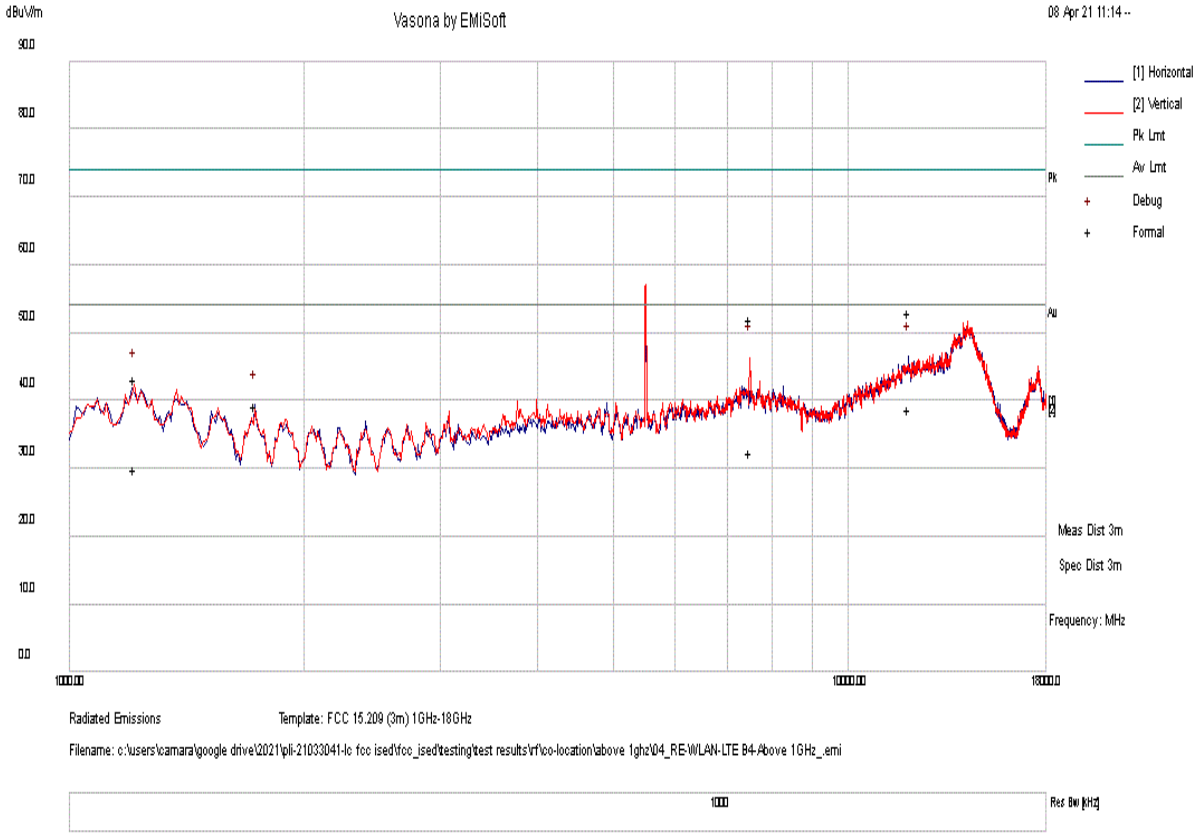
Test Standard:	15.247, RSS-247	Mode:	2.4G 11b mid + LTE B2
Frequency Range:	1 GHz – 18GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
7493.305	20.7	21	0.9	42.6	Peak Max	V	178	326	74	-31.4	Pass
1211.16	33.2	14.3	-5.3	42.2	Peak Max	H	100	347	74	-31.8	Pass
1873.138	33	14.4	-8.8	38.6	Peak Max	H	263	302	74	-35.4	Pass
1561.878	32	14.8	-8.9	37.9	Peak Max	H	349	103	74	-36.1	Pass
7493.305	8.8	21	0.9	30.7	Average Max	V	178	326	54	-23.3	Pass
1211.16	20.8	14.3	-5.3	29.7	Average Max	H	100	347	54	-24.3	Pass
1873.138	20.9	14.4	-8.8	26.5	Average Max	H	263	302	54	-27.5	Pass
1561.878	19.8	14.8	-8.9	25.7	Average Max	H	349	103	54	-28.3	Pass

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	15.407, RSS-247	Mode:	5G 11a 5500+LTE B4
Frequency Range:	1 GHz – 18GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	N/A	Test Result:	Pass

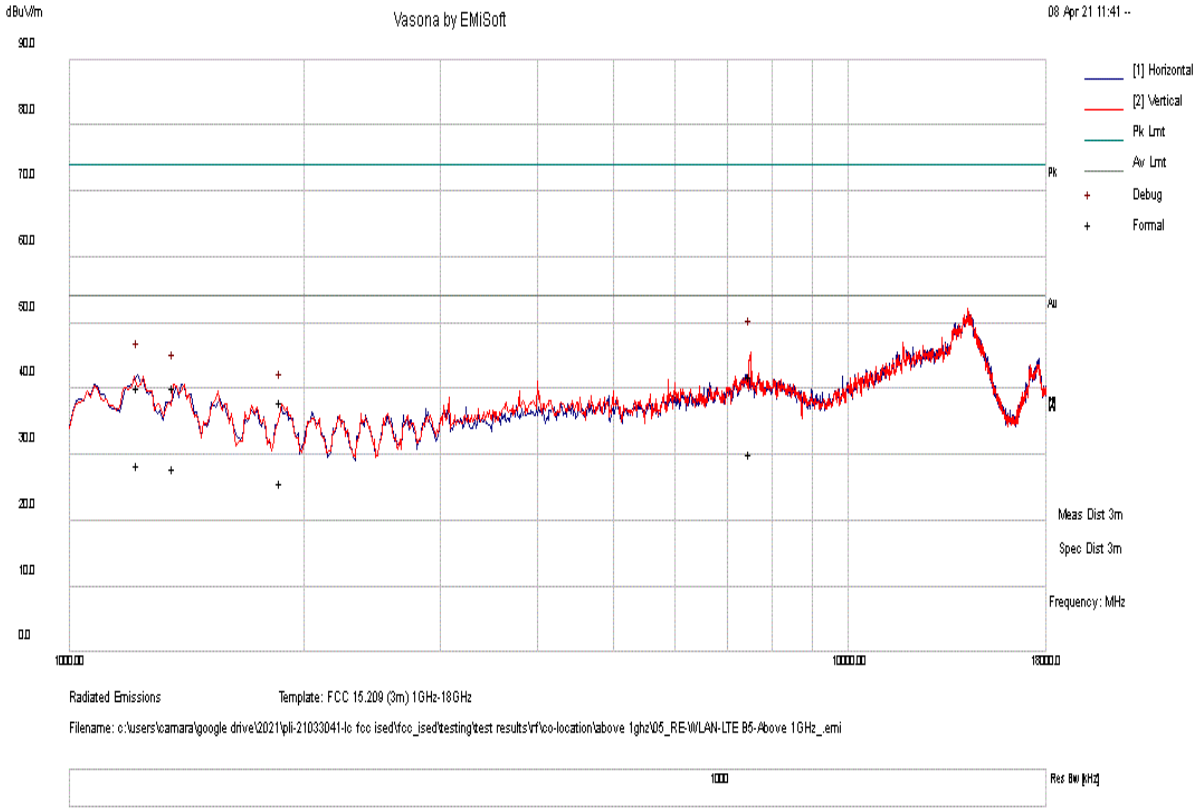


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
7493.213	30.2	21	0.9	52.1	Peak Max	V	105	180	74	-21.9	Pass
11975.329	23.4	25.6	4.1	53	Peak Max	H	208	184	74	-21	Pass
1213.893	34.2	14.3	-5.4	43.1	Peak Max	V	306	0	74	-30.9	Pass
1734.315	34.3	14.6	-9.5	39.4	Peak Max	H	294	165	74	-34.6	Pass
7493.213	10.5	21	0.9	32.4	Average Max	V	105	180	54	-21.6	Pass
11975.329	9.2	25.6	4.1	38.8	Average Max	H	208	184	54	-15.2	Pass
1213.893	21	14.3	-5.4	30	Average Max	V	306	0	54	-24	Pass

Note: Frequency at around 5500MHz is EUT fundamental emission.

RADIATED EMISSIONS 1 - 18 GHZ

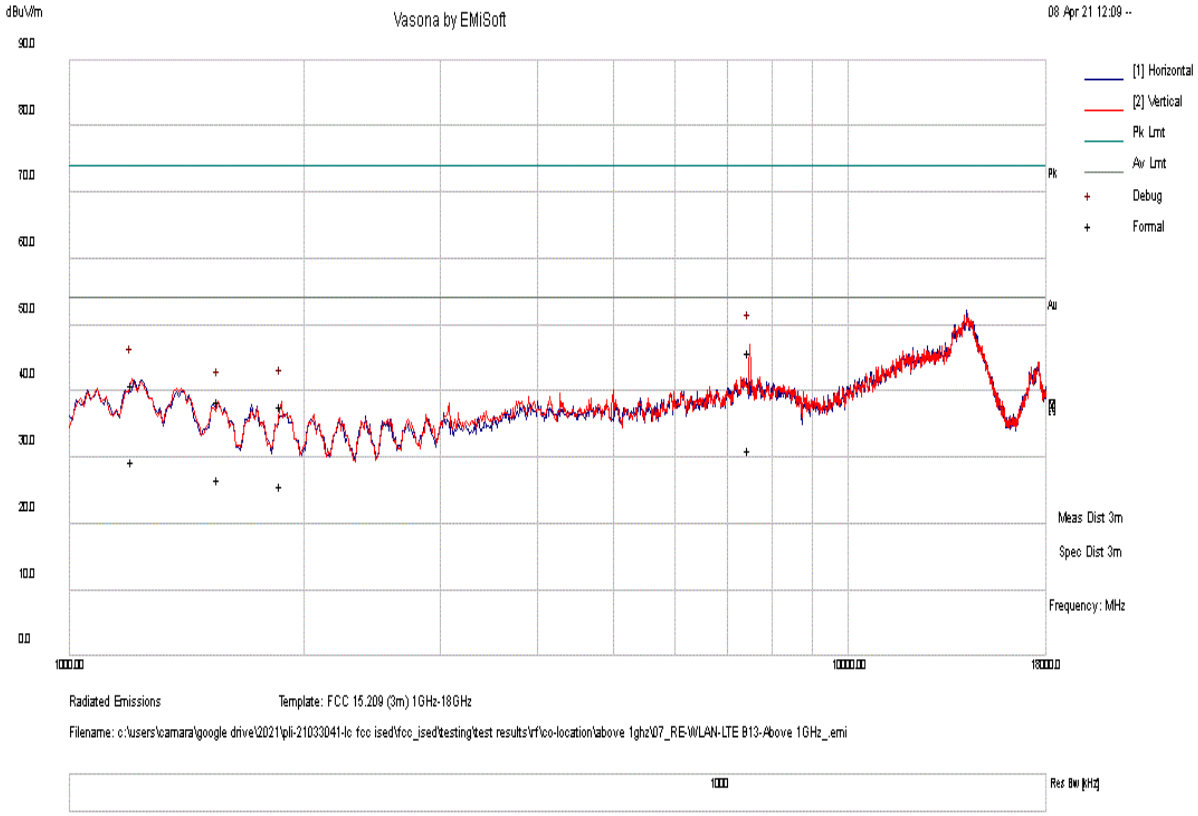
Test Standard:	15.247, RSS-247	Mode:	2.4G 11b +LTE B5
Frequency Range:	1 GHz – 18GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
7502.003	20.2	21	0.8	42	Peak Max	V	0	360	74	-32	Pass
1224.613	31.3	14.4	-5.5	40.2	Peak Max	H	190	88	74	-33.8	Pass
1362.583	32.5	14.6	-6.9	40.2	Peak Max	V	341	34	74	-33.8	Pass
1869.328	32.5	14.4	-8.8	38.2	Peak Max	V	128	1	74	-35.9	Pass
7502.003	8.5	21	0.8	30.3	Average Max	V	0	360	54	-23.7	Pass
1224.613	19.7	14.4	-5.5	28.6	Average Max	H	190	88	54	-25.4	Pass
1362.583	20.3	14.6	-6.9	28	Average Max	V	341	34	54	-26	Pass
1869.328	20.1	14.4	-8.8	25.7	Average Max	V	128	1	54	-28.3	Pass

RADIATED EMISSIONS 1 - 18 GHZ

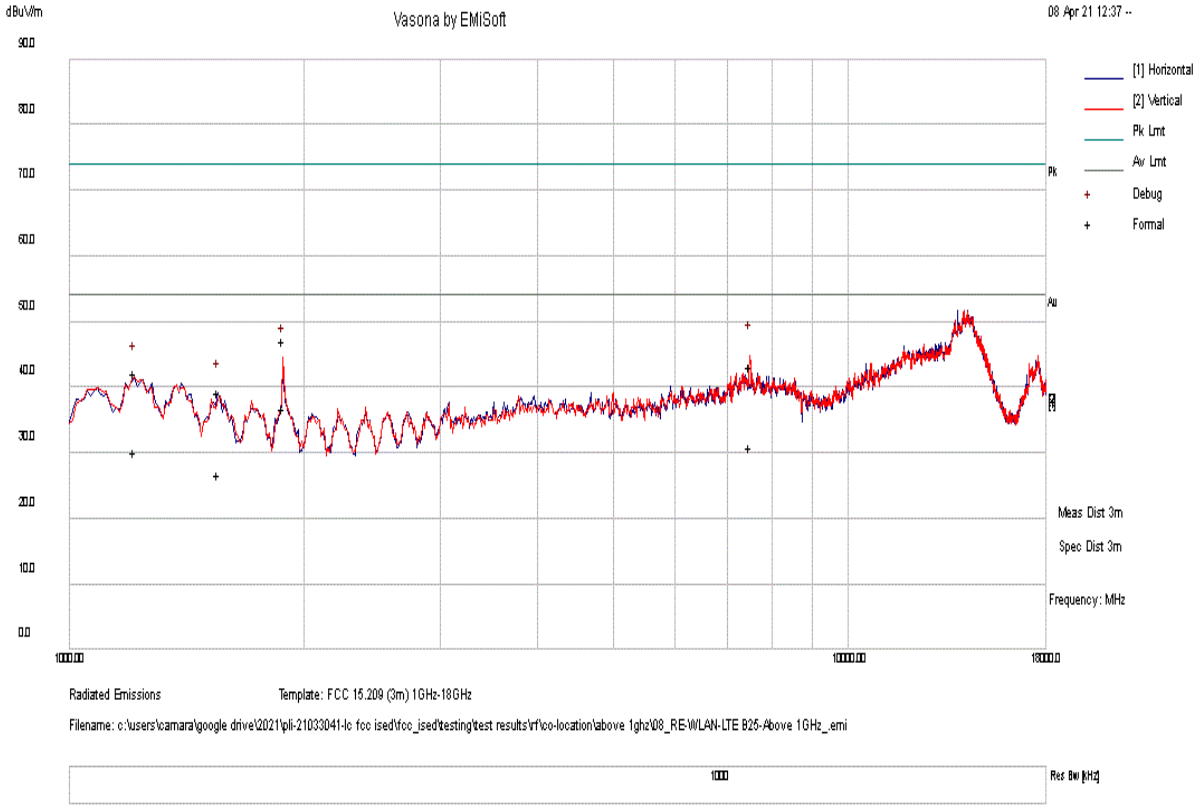
Test Standard:	15.407, RSS-247	Mode:	5G 11a 5500+LTE B13
Frequency Range:	1 GHz – 18GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
7480.468	24	21	0.9	45.9	Peak Max	V	134	0	74	-28.1	Pass
1203.605	31.9	14.3	-5.3	40.9	Peak Max	V	179	310	74	-33.1	Pass
1869.783	32.2	14.4	-8.8	37.8	Peak Max	V	278	209	74	-36.2	Pass
1553.245	32.7	14.8	-8.9	38.6	Peak Max	V	338	18	74	-35.4	Pass
7480.468	9.4	21	0.9	31.3	Average Max	V	134	0	54	-22.7	Pass
1203.605	20.4	14.3	-5.3	29.4	Average Max	V	179	310	54	-24.6	Pass
1869.783	20.1	14.4	-8.8	25.8	Average Max	V	278	209	54	-28.2	Pass

RADIATED EMISSIONS 1 - 18 GHZ

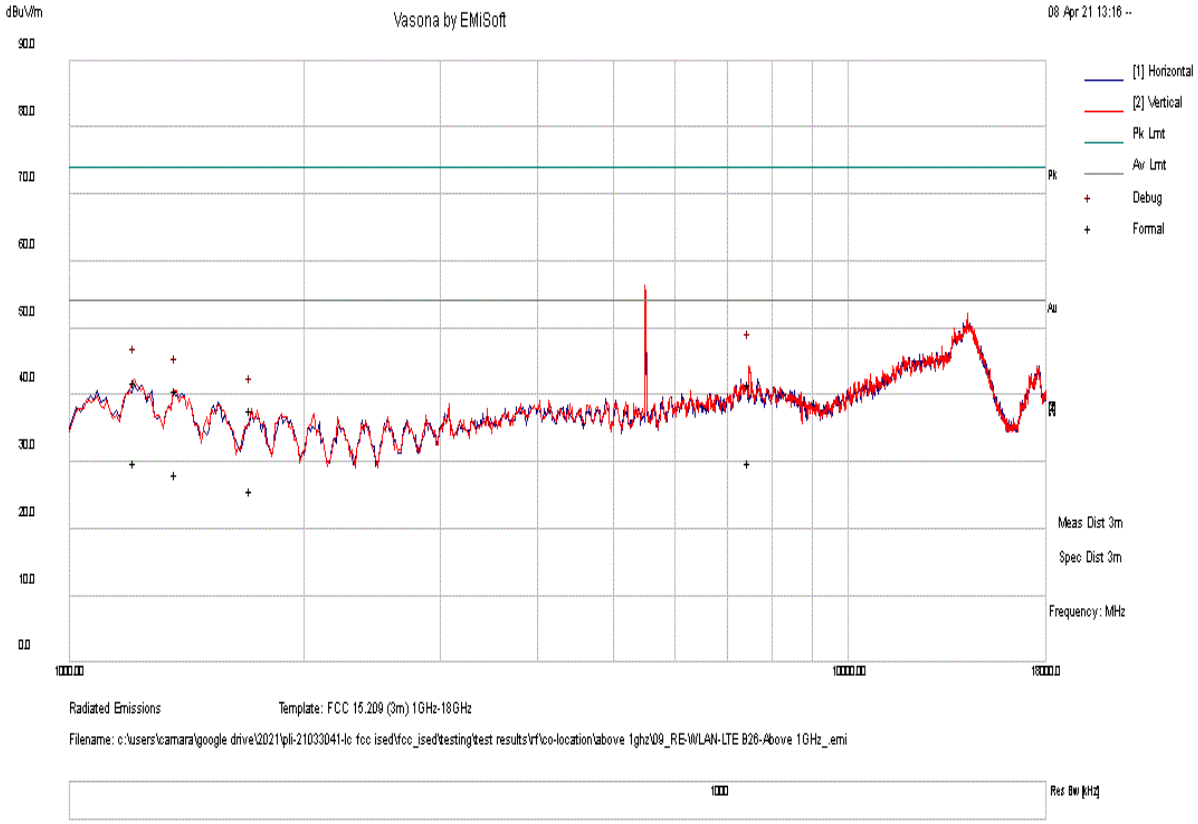
Test Standard:	15.247, RSS-247	Mode:	2.4G 11b +LTE B25
Frequency Range:	1 GHz – 18GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
7490.098	21.3	21	0.9	43.2	Peak Max	V	160	25	74	-30.8	Pass
1880.36	41.6	14.4	-8.9	47.1	Peak Max	V	108	124	74	-26.9	Pass
1214.263	33.3	14.3	-5.4	42.3	Peak Max	V	181	70	74	-31.7	Pass
1553.563	33.4	14.8	-8.9	39.4	Peak Max	H	218	0	74	-34.6	Pass
7490.098	9.1	21	0.9	31	Average Max	V	160	25	54	-23	Pass
1880.36	31.2	14.4	-8.9	36.8	Average Max	V	108	124	54	-17.2	Pass
1214.263	21.1	14.3	-5.4	30.1	Average Max	V	181	70	54	-23.9	Pass
1553.563	20.8	14.8	-8.9	26.8	Average Max	H	218	0	54	-27.2	Pass

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	15.407, RSS-247	Mode:	5G 11a 5500+LTE B26
Frequency Range:	1 GHz – 18GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	N/A	Test Result:	Pass

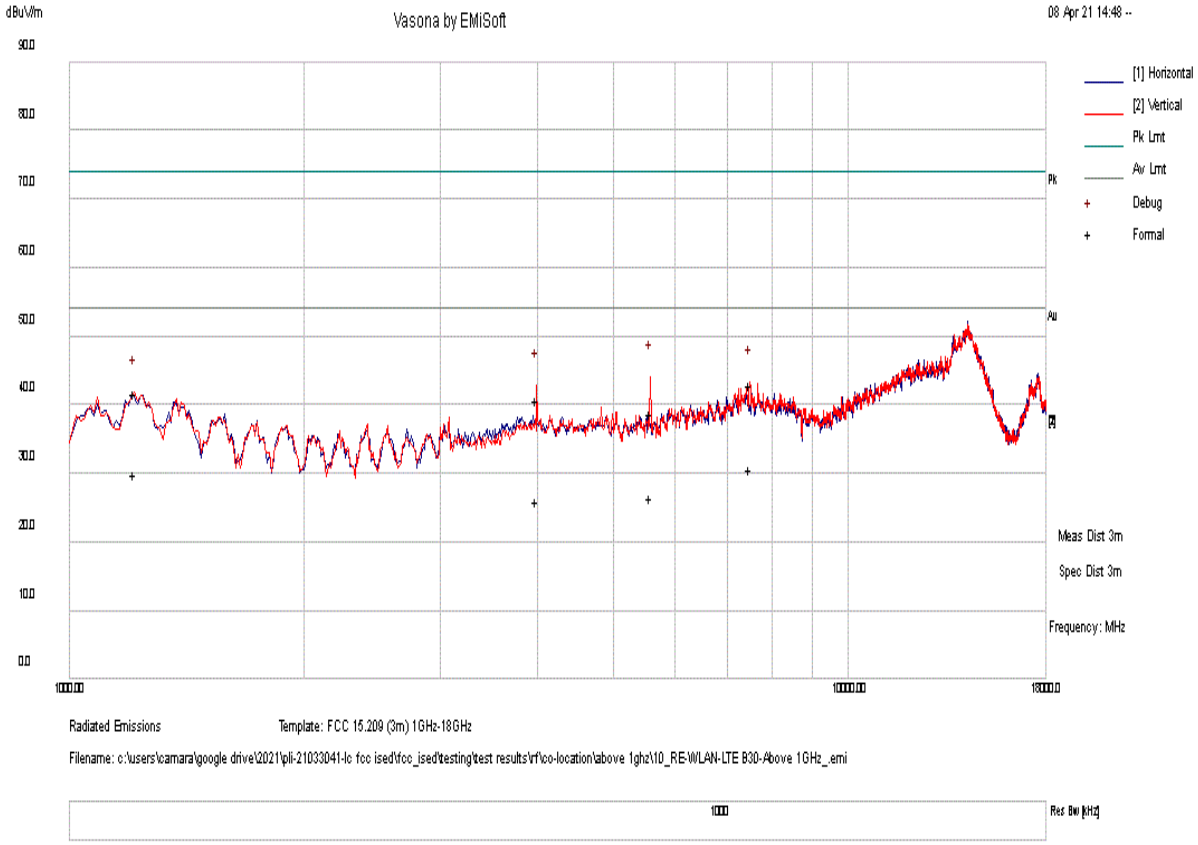


Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
7471.73	19.9	21	0.9	41.8	Peak Max	V	212	0	74	-32.2	Pass
1214.005	33	14.3	-5.4	42	Peak Max	V	334	62	74	-32	Pass
1371.283	33.2	14.6	-7	40.8	Peak Max	V	314	78	74	-33.2	Pass
1710.998	32.9	14.6	-9.6	37.9	Peak Max	V	390	0	74	-36.1	Pass
7471.73	8.1	21	0.9	30	Average Max	V	212	0	54	-24	Pass
1214.005	21	14.3	-5.4	30	Average Max	V	334	62	54	-24	Pass
1371.283	20.5	14.6	-7	28.2	Average Max	V	314	78	54	-25.8	Pass

Note: Frequency at around 5500MHz is EUT fundamental emission.

RADIATED EMISSIONS 1 - 18 GHZ

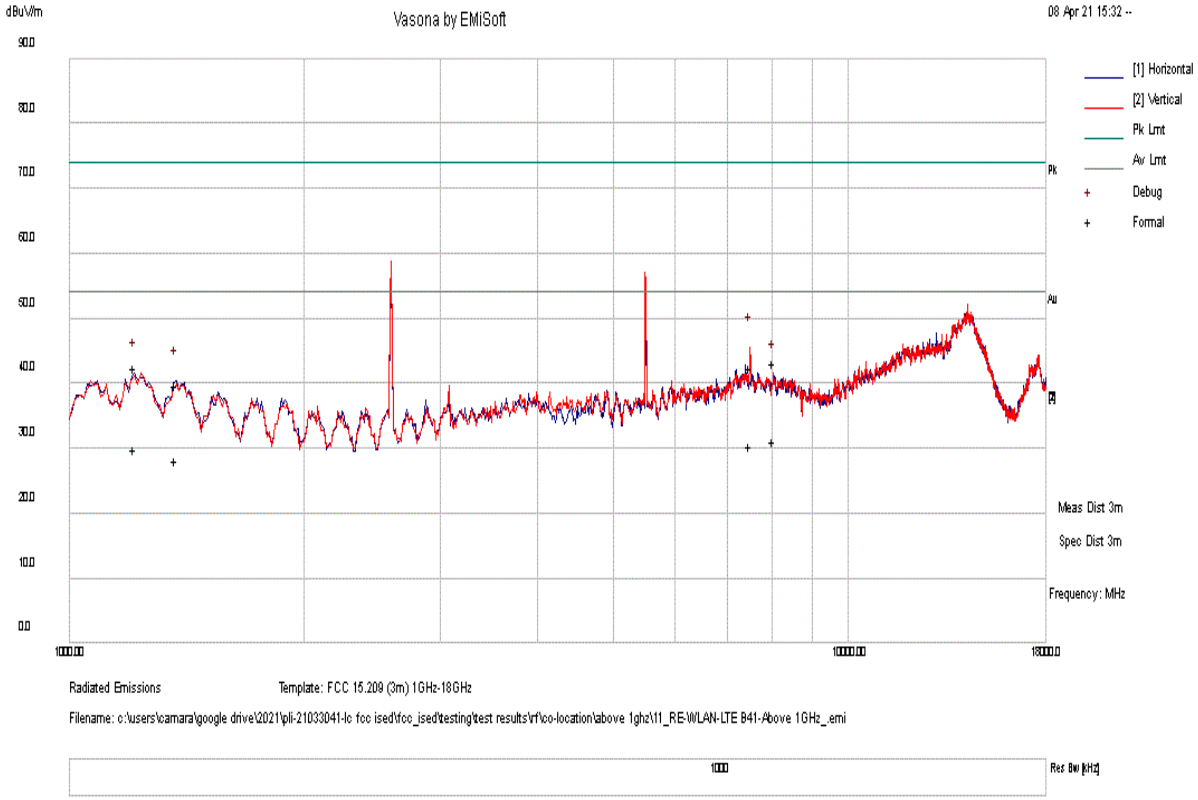
Test Standard:	15.247, RSS-247	Mode:	2.4G 11b +LTE B30
Frequency Range:	1 GHz – 18GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
5581.098	21.5	17.8	-0.4	38.8	Peak Max	V	240	76	74	-35.2	Pass
7489.938	21	21	0.9	42.9	Peak Max	V	242	344	74	-31.1	Pass
3984.29	27.8	16.7	-3.8	40.7	Peak Max	V	147	1	74	-33.3	Pass
1212.905	32.7	14.3	-5.4	41.6	Peak Max	V	123	302	74	-32.4	Pass
5581.098	9.2	17.8	-0.4	26.6	Average Max	V	240	76	54	-27.4	Pass
7489.938	8.9	21	0.9	30.8	Average Max	V	242	344	54	-23.2	Pass
3984.29	13.1	16.7	-3.8	26	Average Max	V	147	1	54	-28	Pass
1212.905	20.9	14.3	-5.4	29.9	Average Max	V	123	302	54	-24.1	Pass

RADIATED EMISSIONS 1 - 18 GHZ

Test Standard:	15.407, RSS-247	Mode:	5G 11a 5500+LTE B41
Frequency Range:	1 GHz – 18GHz	Test Date:	04/05/2021-04/23/2021
Antenna Type/Polarity:	Horn/Hor & Ver	Test Personnel:	Daniel Bruno
Remark:	N/A	Test Result:	Pass



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass/Fail
7471.73	19.9	21	0.9	41.8	Peak Max	V	212	0	74	-32.2	Pass
1214.005	33	14.3	-5.4	42	Peak Max	V	334	62	74	-32	Pass
1371.283	33.2	14.6	-7	40.8	Peak Max	V	314	78	74	-33.2	Pass
1710.998	32.9	14.6	-9.6	37.9	Peak Max	V	390	0	74	-36.1	Pass
7471.73	8.1	21	0.9	30	Average Max	V	212	0	54	-24	Pass
1214.005	21	14.3	-5.4	30	Average Max	V	334	62	54	-24	Pass
1371.283	20.5	14.6	-7	28.2	Average Max	V	314	78	54	-25.8	Pass

Note: Frequency at around 5500MHz is EUT WLAN fundamental emission and the 2600MHz is EUT cellular fundamental emission.

18GHz – 40 GHz 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	10/18/19	10/18/21
Shielding Control Room	ETS-Lindgren	Series 81	VL006	N/A	N/A
Spectrum Analyzer	Keysight	N9020A	MY50110074	6/17/20	6/17/21
EMC Test Receiver	R&S	ESL6	100230	6/14/20	6/14/21
LISN (9KHz – 30MHz)	EMCO	3816/2	9705-1066	5/4/20	5/4/21
LISN (9KHz – 30MHz)	Com-Power	LI-550C	20140050	01/29/2021	01/29/2022
LISN (9KHz – 30MHz)	Com-Power	LI-550C	20140051	01/29/2021	01/29/2022
Bi-Log Antenna	ETS-Lindgren	3142E	217921	11/15/2020	11/15/2021
Horn Antenna (1-18GHz)	Electro-Metrics	EM-6961	6292	5/14/2020	5/14/2021
Horn Antenna (18-40GHz)	Com-Power	AH-840	101109	6/24/20	6/24/21
Preamplifier	RF Bay, Inc.	LPA-10-20	11180621	7/16/2020	7/16/2021
True RMS Multi-meter	UNI-T	UT181A	C173014829	5/5/2020	5/5/2021
Temp / Humidity / Pressure Meter	PCE Instruments	PCE-THB 40	R062028	5/15/2020	5/15/2021
RF Attenuator	Pasternack	PE7005-3	VL061	7/16/2020	7/16/2021
Preamplifier 100KHz - 40GHz	Aeroflex	33711-392-77150-11	064	7/16/2020	7/16/2021
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	5/16/20	5/16/21
RE test cable(below 6GHz)	Vista	RE-6GHz-01	RE-6GHz-01	7/16/2020	7/16/2021
RE test cable (1-18GHz)	PhaseTrack	II-240	RE-18GHz-01	7/16/2020	7/16/2021
RE test cable (>18GHz)	Sucoflex	104	344903/4	7/16/2020	7/16/2021
Pulse limiter	Com-Power	LIT-930A	531727	7/16/2020	7/16/2021
CE test cable #1	FIRST RF	FRF-C-1002-001	CE-6GHz-01	7/16/2020	7/16/2021
CE test cable#2	FIRST RF	FRF-C-1002-001	CE-6GHz-02	7/16/2020	7/16/2021
Vector Signal Generator	Keysight	N5182A	US47080548	6/17/20	6/17/21
RF Power Amplifier (80-1000MHz)	Ophir	5226FE	1013/1815	N/A	N/A
RF Power Amplifier (700-6000MHz)	Ophir	5293FE	1063/1815	N/A	N/A
Horn Antenna (1-18GHz)	FT-RF	HA-07M18G-NF	180010HA	N/A	N/A
Wideband Communication	R&S	CMW500	147508	5/8/2020	5/8/2021