CERTIFICATION TEST REPORT

Report Number. : 4789522488-FR1V3

Applicant	:	NUC Electronics Co., Ltd 208 Nowon-ro, Bukgu, Daegu-City, 41548, Rep. of Korea
Model	:	BFA-1, BFA-2
FCC ID	:	2AWUK-BFA
IC	:	26374-BFA
EUT Description	:	Body Fat Analyzer
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C INDUSTRY CANADA RSS-247 Issue2

Date Of Issue:
August 18, 2020

Prepared by:
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IAS ACCREDITED
TL-637

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	08/14/20	Initial issue	Robby Lee
V2	08/18/20	Updated to address TCB's question	Robby Lee
V3	08/18/20	Updated to address TCB's question	Robby Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: NUC Electronics Co., Ltd

EUT DESCRIPTION: Body Fat Analyzer

MODEL: BFA-1, BFA-2

SERIAL NUMBER: Prototype (CONDUCTED);
Prototype (RADIATED)

DATE TESTED: JUN 17, 2020 – JUL 02, 2020 / AUG 18, 2020

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Complies
INDUSTRY CANADA RSS-247 Issue 2	Complies
INDUSTRY CANADA RSS-GEN Issue 5	Complies

UL Korea, Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Korea, Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Korea, Ltd. By:

CY Choi
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:

Robby Lee
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. IC RSS-247 Issue 2
4. IC RSS-GEN Issue 5
5. KDB 558074 D01 15.247 Meas Guidance v05r02.
6. ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

218 Maeyeong-ro
☐ Chamber 1
☐ Chamber 2
☒ Chamber 3

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf.

4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. METROLOGICAL TRACEABILITY

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

28.9 dBuV/m = 36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB

4.3. DECISION RULES

Decision rule for statement(s) of conformity is based on Procedure 1, Clause 4.4.2 in IEC Guide 115:2007.

4.4. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.35 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.49 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.82 dB
Radiated Disturbance, 18 GHz to 40 GHz	5.49 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a Body Fat Analyzer.
This test report addresses the BLE operational mode.

Variant model(BFA-2) is electrically identical as the basic model(BFA-1).
The only difference is on the enclosure shape. The case material is non-conductor, plastic.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range [MHz]	Mode	Power Mode	Output Power [dBm]	Output Power [mW]
2 402 ~ 2 480	1Mbps	Peak	-4.63	0.344
		Average	-6.39	0.230

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The internal antenna was Permanently attached.
Therefore this E.U.T Complies with the requirement of §15.203.

The radio utilizes an internal antenna, with a maximum gain of 0.5 dBi

5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz was performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Radiated emission above 1GHz was performed with the EUT set to transmit low/mid/high channels.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

Note: The two models(BFA-1, BFA-2) were investigated and tested with a little more worst model(BFA-1) due to similar results.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	Note
Test Jig	None	None	None	-
Notebook	LG	15UD490	001QCUK575510	-
Adaptor	CHICONY POWER TECNOLOGY	A12-065N2A	AG19034C140	For notebook
DC POWER SUPPLY	KEYSIGHT	N5747A	MY57300040	For AC Line test

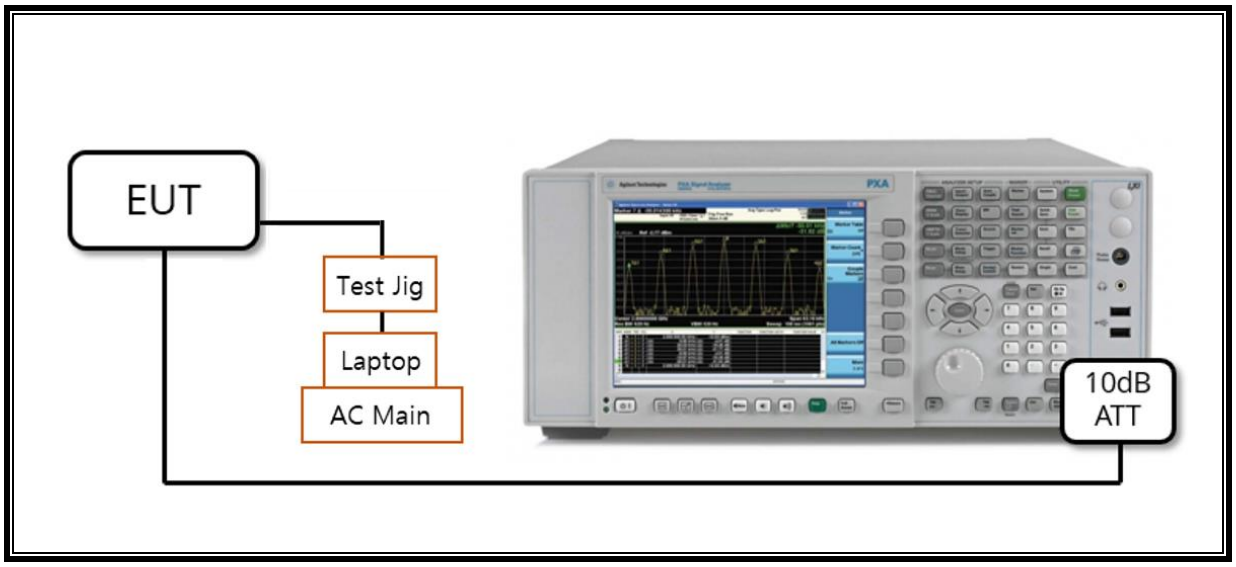
I/O CABLE

Cable No	Port	# of identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC & DATA	1	Pin type	Un-shielded	1.5 m	N/A

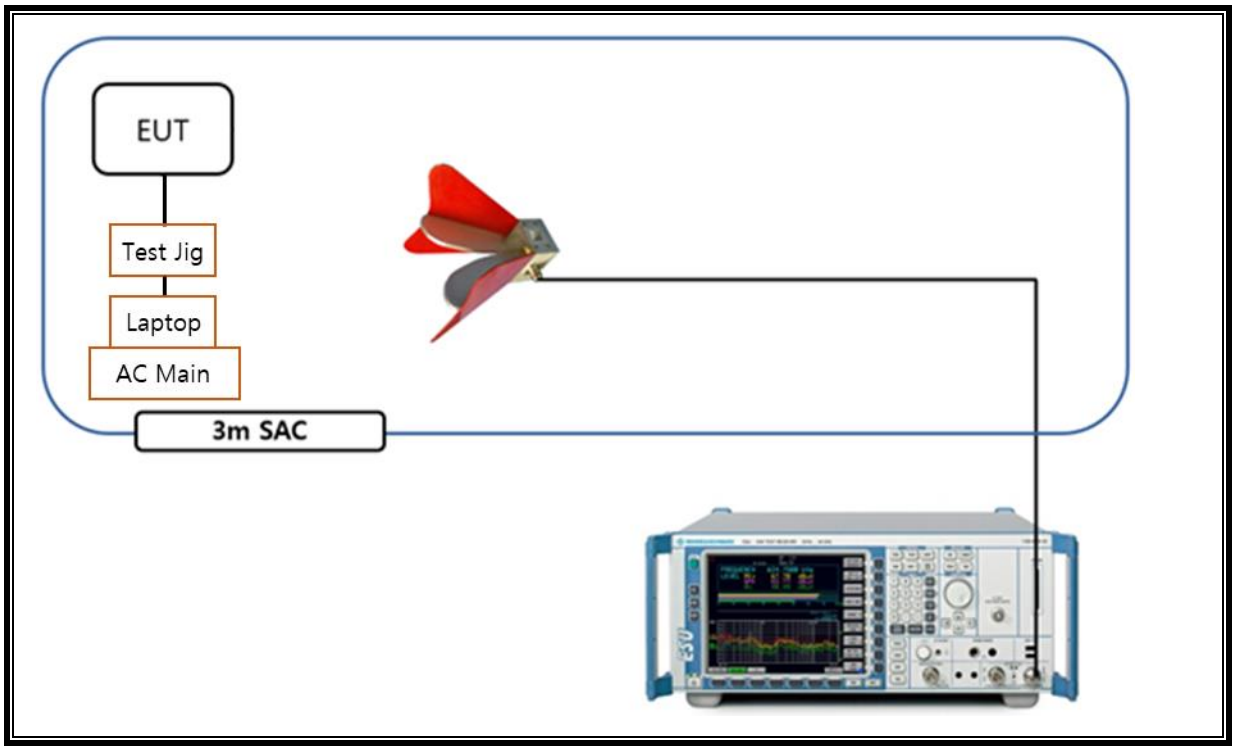
TEST SETUP

The EUT is a unit with test jig during the tests.
Test software in BLE menu exercised the EUT to enable BLE mode.

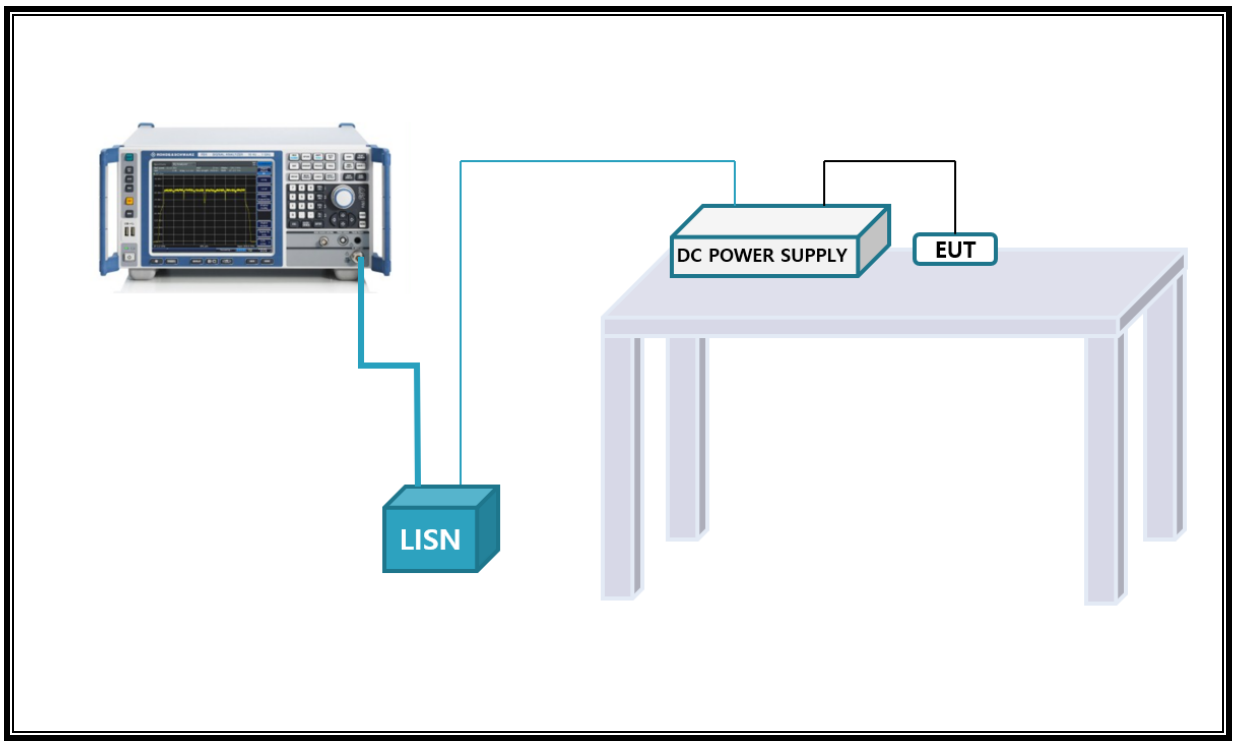
SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



SETUP DIAGRAM FOR TESTS (AC POWER LINE TEST SETUP)



6. MEASUREMENT METHOD

6 dB BW : KDB 558074 D01 v05r02, Section 8.2.

OUTPUT POWER : KDB 558074 D01 v05r02, Section 8.3.1.1

POWER SPECTRAL DENSITY : KDB 558074 D01 v05r02, Section 8.4.

Out-of-band Emissions (Conducted) : KDB 558074 D01 v05r02, Section 8.5.

Out-of-band Emissions in Non-restricted Bands: KDB 558074 D01 v05r02, Section 8.5.

Out-of-band Emissions in Restricted Bands : KDB 558074 D01 v05r02, Section 8.6.

AC Power Line Conducted Emission : ANSI C63.10-2013, Section 6.2

7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	08-04-20
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	08-04-20
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	08-04-20
Antenna, Horn, 18 GHz	ETS	3115	00167211	08-04-20
Antenna, Horn, 18 GHz	ETS	3115	00161451	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00168724	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00168717	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00205959	08-04-20
Antenna, Horn, 40 GHz	ETS	3116C	00166155	08-14-20
Antenna, Horn, 40 GHz	ETS	3116C	00168645	10-02-21
Preamplifier	ETS	3116C-PA	00168841	08-08-20
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-05-20
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-05-20
Preamplifier, 1000 MHz	Sonoma	310N	370599	08-05-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-06-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-06-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	08-06-20
Spectrum Analyzer, 44 GHz	Keysight	N9030B	MY57143652	01-20-21
Spectrum Analyzer, 43.5 GHz	R&S	FSW43	104089	08-06-20
DC Power supply	Keysight	N5747A	MY57300040(Note)	08-06-21
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-09-20
Attenuator	PASTERNACK	PE7087-10	A001	08-08-20
Attenuator	PASTERNACK	PE7087-10	A008	08-08-20
Attenuator	PASTERNACK	PE7004-10	2	08-06-20
Attenuator	PASTERNACK	PE7087-10	A009	08-08-20
Attenuator	WEINSCHEL	54A-10	74560	08-08-20
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-06-20
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-06-20
EMI Test Receive, 44 GHz	R&S	ESW44	101590	08-05-20
EMI Test Receive, 3 GHz	R&S	ESR3	102592(Note)	08-06-21
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-06-20
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-06-20
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	08-06-20
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-06-20
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-06-20
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	08-06-20
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	08-06-20
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	08-06-20
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	08-06-20
LISN	R&S	ENV216	102478(Note)	08-07-21
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100900	09-30-20
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	10-02-21
Bias Unit	R&S	IN600	100974	09-30-20
Software				
Description	**Manufacturer**	**Model**	**Version**	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	R&S	EMC32	10.50.40	

Note. This equipment only used for testing at August 18th

8. TEST RESULTS SUMMARY

FCC Part Section	IC Section	Test Description	Test Limit	Test Condition	Test Result
15.247 (a)(2)	RSS-247 5.2(a)	Occupied Band width (6dB)	>500KHz	Conducted	Pass
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass
15.247 (b)(3)	RSS-247 5.4(d)	TX conducted output power	<30dBm		Pass
15.247 (e)	RSS-247 5.2(b)	PSD	<8dBm		Pass
15.207 (a)	RSS-GEN Clause 8.8	AC Power Line conducted emissions	Section 10	Power Line conducted	Pass[Note1]
15.205, 15.209	RSS-GEN Clause 7 & 8.9	Radiated Spurious Emission	< 54dBuV/m(Av)	Radiated	Pass

Note 1: This test item was performed with DC power supply.

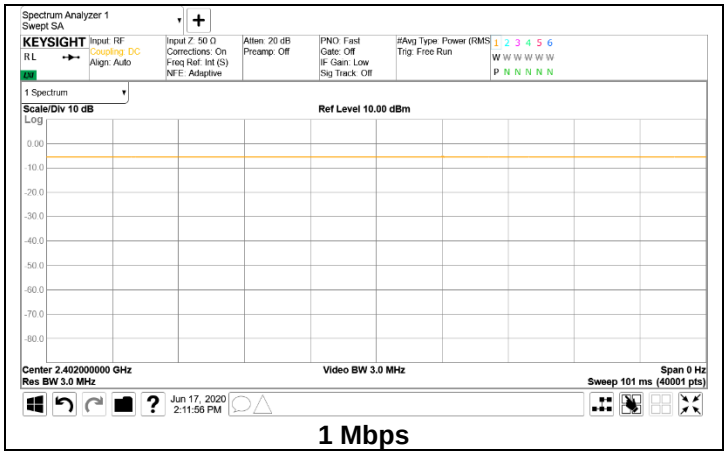
9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

Mode	ON Time B [msec]	Period [msec]	Duty Cycle x [linear]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
2400MHz Bands						
BLE 1 Mbps	100.000	100.000	1.000	100.0%	0.00	0.010



1 Mbps

9.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

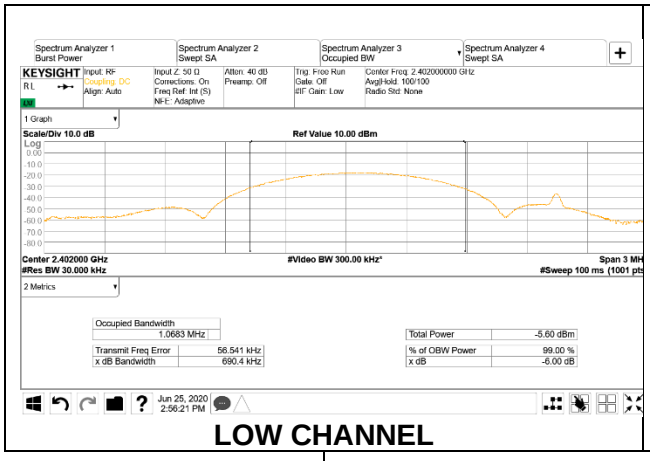
TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to >= 3 times the RBW.
The spectrum analyzer internal 99% bandwidth function is utilized.

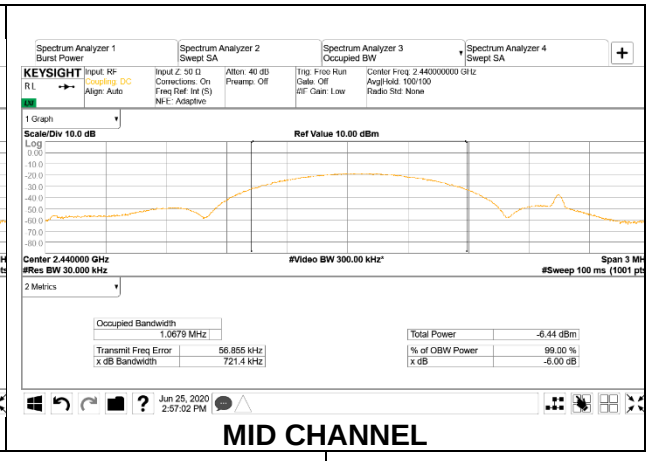
RESULTS

9.2.1. BLE (1Mbps)

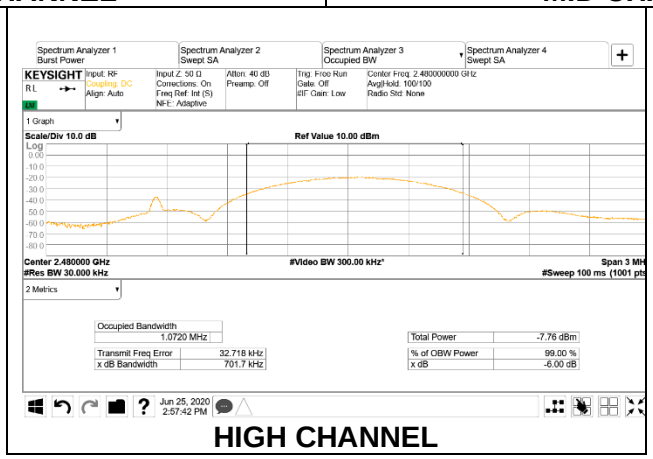
Channel	Frequency [MHz]	99% Bandwidth [MHz]
Low	2 402	1.0683
Mid	2 440	1.0679
High	2 480	1.0720
Worst		1.0720



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

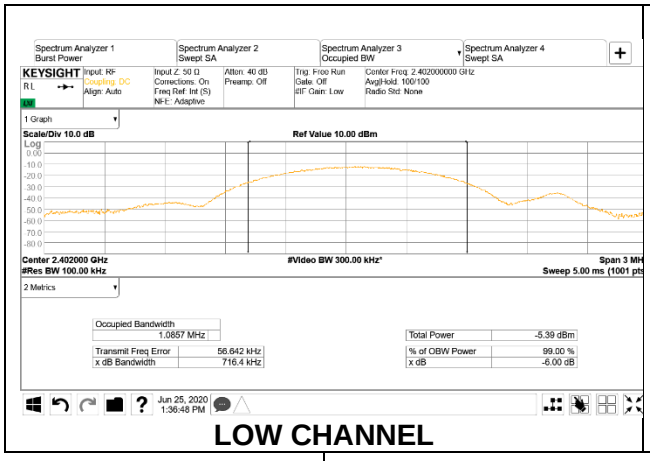
RSS-247 5.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

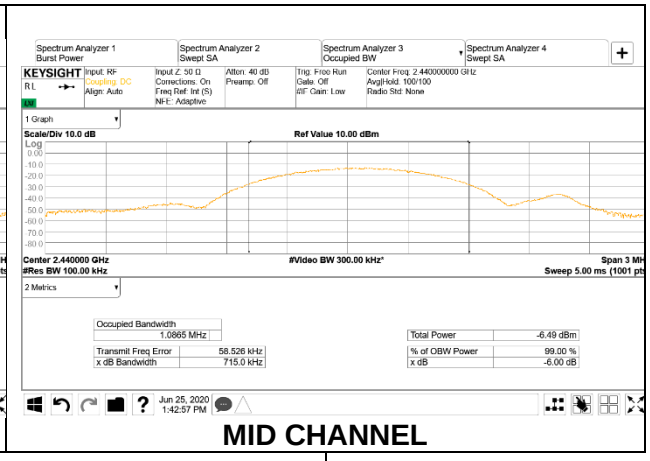
RESULTS

9.3.1. BLE (1Mbps)

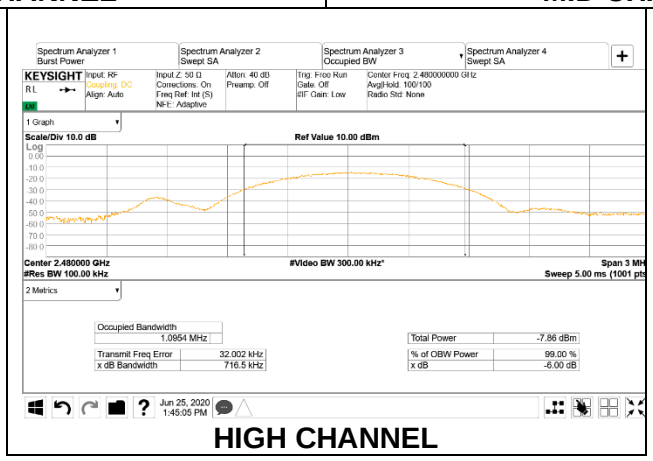
Channel	Frequency [MHz]	6 dB Bandwidth [kHz]	Minumun Limit [kHz]
Low	2 402	716.40	500.00
Mid	2 440	**715.00**	500.00
High	2 480	716.50	500.00
Worst		715.00	500.00



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

Peak power is measured using ANSI C63.10(2013) under section 11.9.1.1 utilizing spectrum analyzer.

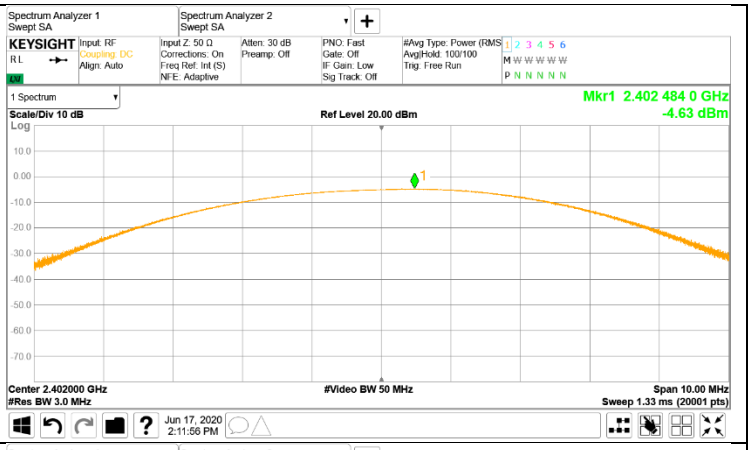
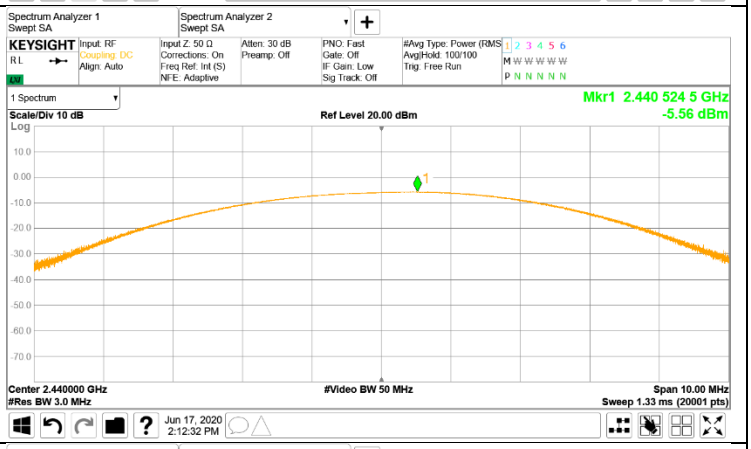
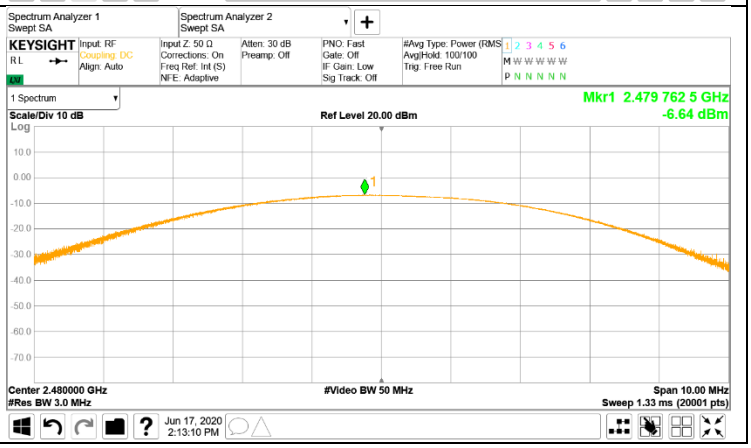
RESULTS

- 1 Mbps

Channel	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin [dB]
Low	2 402	**-4.63**	30.00	-34.63
Mid	2 440	-5.56	30.00	-35.56
High	2 480	-6.64	30.00	-36.64
Worst		-4.63	30.00	-34.63

9.4.1. BLE (1 Mbps)

PEAK OUTPUT POWER PLOTS

Low Ch.	
Middle Ch.	
High Ch.	

9.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss was entered as an offset in the power meter to allow for direct reading of power. The duty factor already has been added.

- 1 Mbps

Channel	Frequency [MHz]	AV Power [dBm]	AV Power [mW]
Low	2402	-6.39	0.230
Mid	2440	-6.89	0.205
High	2480	-8.17	0.152

9.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

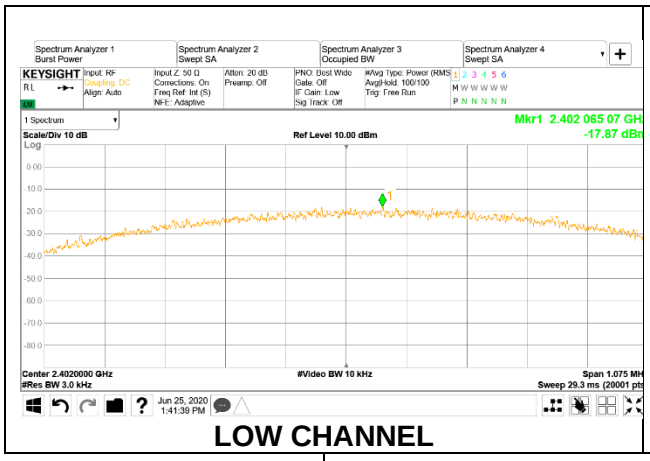
RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

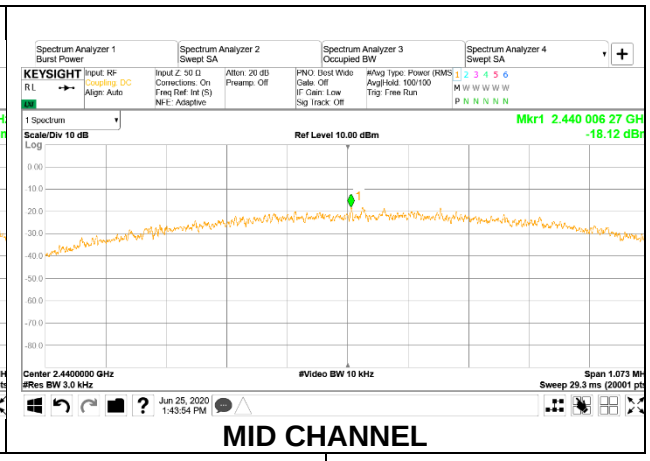
RESULTS

9.6.1. BLE (1Mbps)

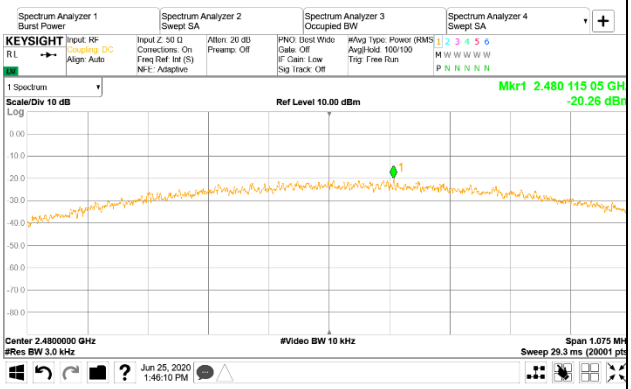
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	**-17.87**	8	-25.87
Middle	2440	-18.12	8	-26.12
High	2480	-20.26	8	-28.26



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

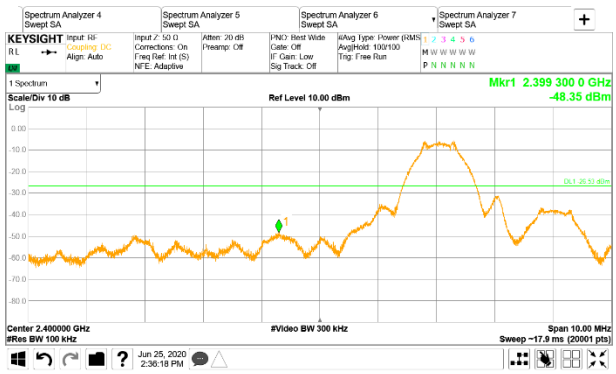
FCC §15.247 (d)

RSS-247 5.5

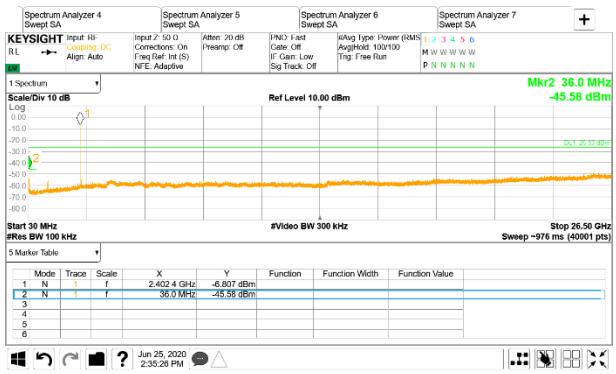
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

RESULTS

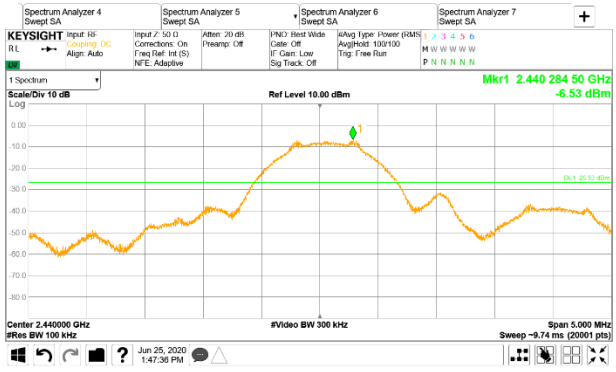
9.7.1. BLE (1Mbps)



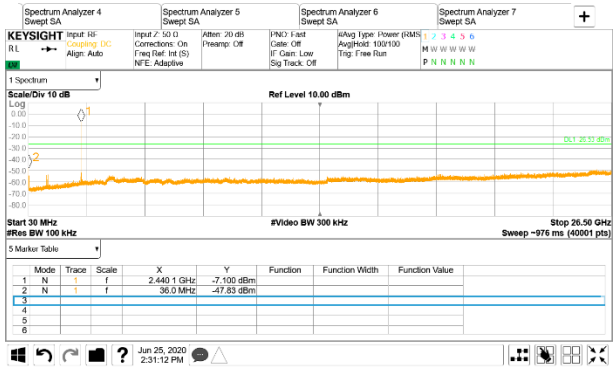
LOW CHANNEL BANDEDGE



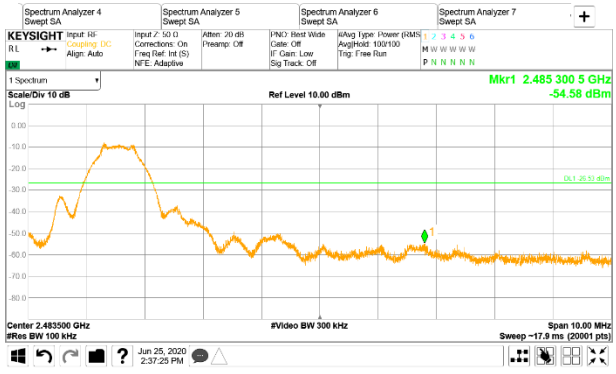
OUT-OF-BAND LOW CHANNEL



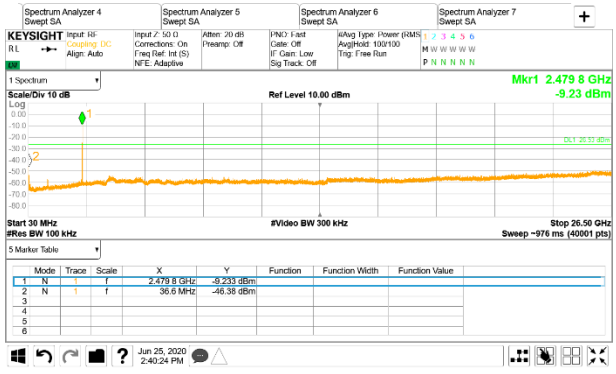
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE



OUT-OF-BAND HIGH CHANNEL

10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (μV/m)	Measurement Distance (m)
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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

Formula for converting the filed strength from uV/m to dBuV/m is:
Limit (dBuV/m) = 20 log limit (uV/m)

IC RSS-GEN Clause 8.9 and 8.10

The field strength of any emission shall not exceed the following limits:

Frequency (MHz)	Field strength (µV/m at 3 m)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

Frequency (MHz)	Magnetic field strength (H-Field) (µA/m)	Measurement Distance (m)
0.009–0.490 Note 1	6.37/F (F in kHz)	300
0.490–1.705	63.7/F (F in kHz)	30
1.705–30.0	0.08	30
Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.		

Note: The limits for spurious emissions below 30 MHz in RSS GEN Section 8.9 Table 6 are given in dBuA/m while the FCC Part 15.209(a) limits are expressed in dBuV/m. Using the free space impedance of 377Ω to convert between electric and magnetic field strength (a factor of 51.5dB in logarithmic units) the two sets of limits are equivalent and therefore a measured value of X dBuV/m shown in the plots and tables is equal to a magnetic field strength of (X - 51.5) dBuA/m and the margin of that emission relative to the RSS GEN limit (FCC 15.209 limit – 51.5) dBuA/m would be the same as the margin to the FCC limit detailed in those plots/tables.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150 cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. (Restriced band-edge, Final detection of spurious harmonic emissions)Duty cycle factor = 10 log (1/x). But this EUT operated on a duty cycle of over 98% during test. Therefore, duty cycle factor is not applied.

Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.

The spectrum from 1 GHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.
(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

Note : Emission was pre-scanned from 9kHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).
Per FCC part 15.31(o), test results were not reported.

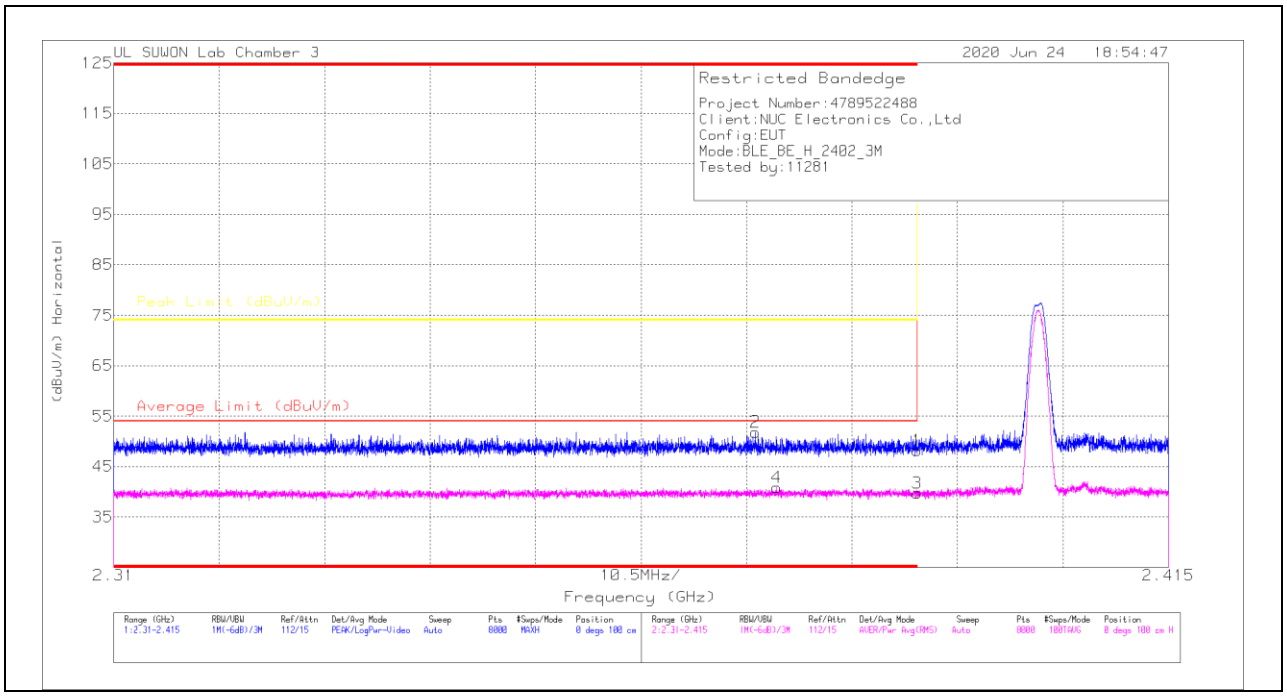
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field based on KDB 414788.

10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. BLE (1Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT

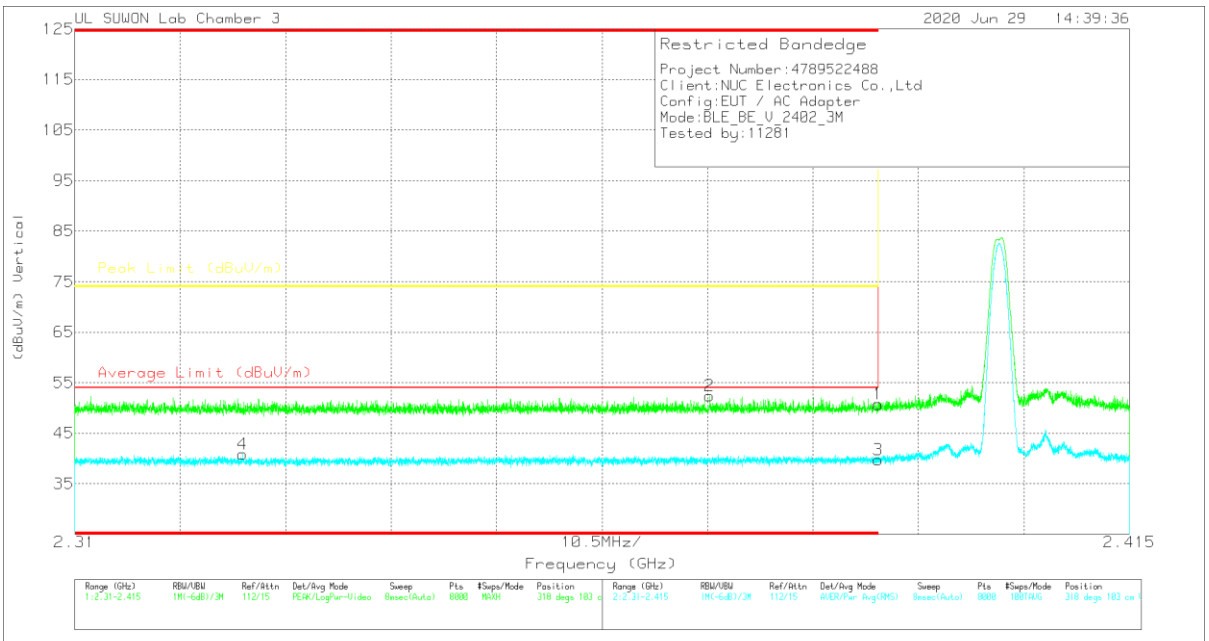


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	10dB_ATT[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.4	Pk	31.7	-22.9	48.2	-	-	74	-25.8	0	100	H
2	* 2.3739	43.14	Pk	31.6	-22.9	51.84	-	-	74	-22.16	0	100	H
3	* 2.39	30.92	RMS	31.7	-22.9	39.72	54	-14.28	-	-	0	100	H
4	* 2.376	32.14	RMS	31.6	-22.9	40.84	54	-13.16	-	-	0	100	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

VERTICAL RESULT



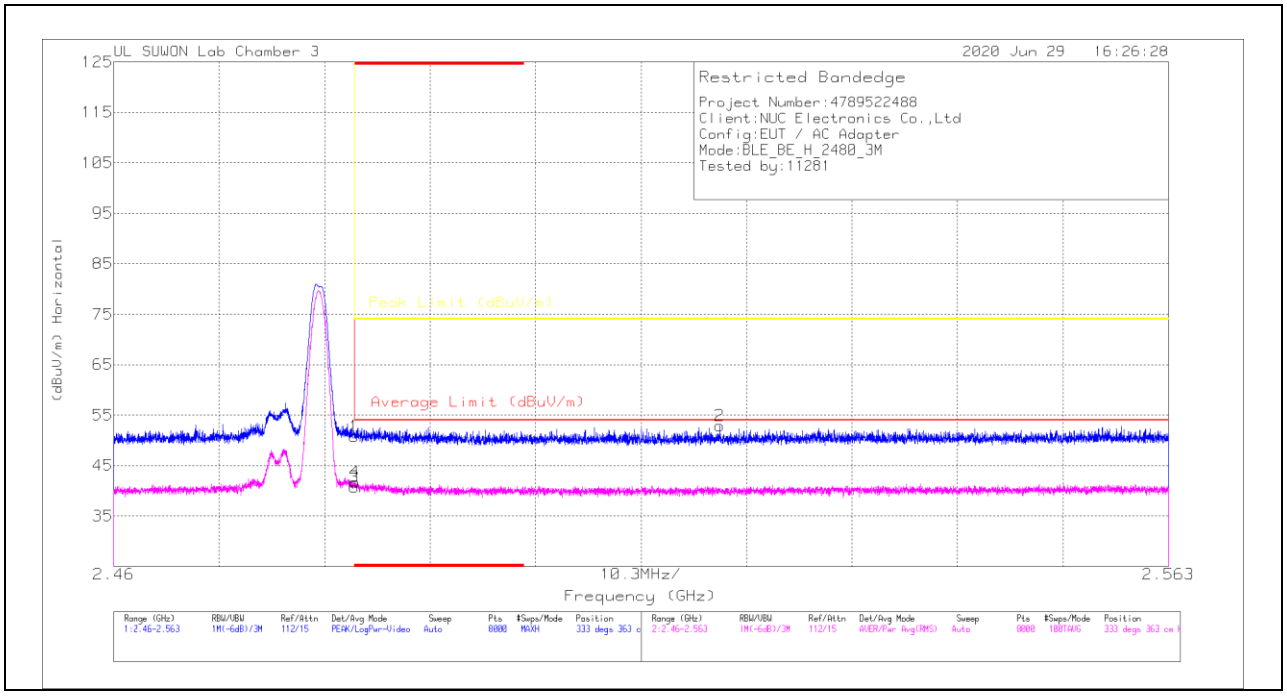
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	10dB_ATT[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.93	Pk	31.7	-22.9	50.73	-	-	74	-23.27	318	103	V
2	* 2.37321	43.8	Pk	31.6	-23	52.4	-	-	74	-21.6	318	103	V
3	* 2.39	30.99	RMS	31.7	-22.9	39.79	54	-14.21	-	-	318	103	V
4	* 2.32672	32.3	RMS	31.5	-22.9	40.9	54	-13.1	-	-	318	103	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT

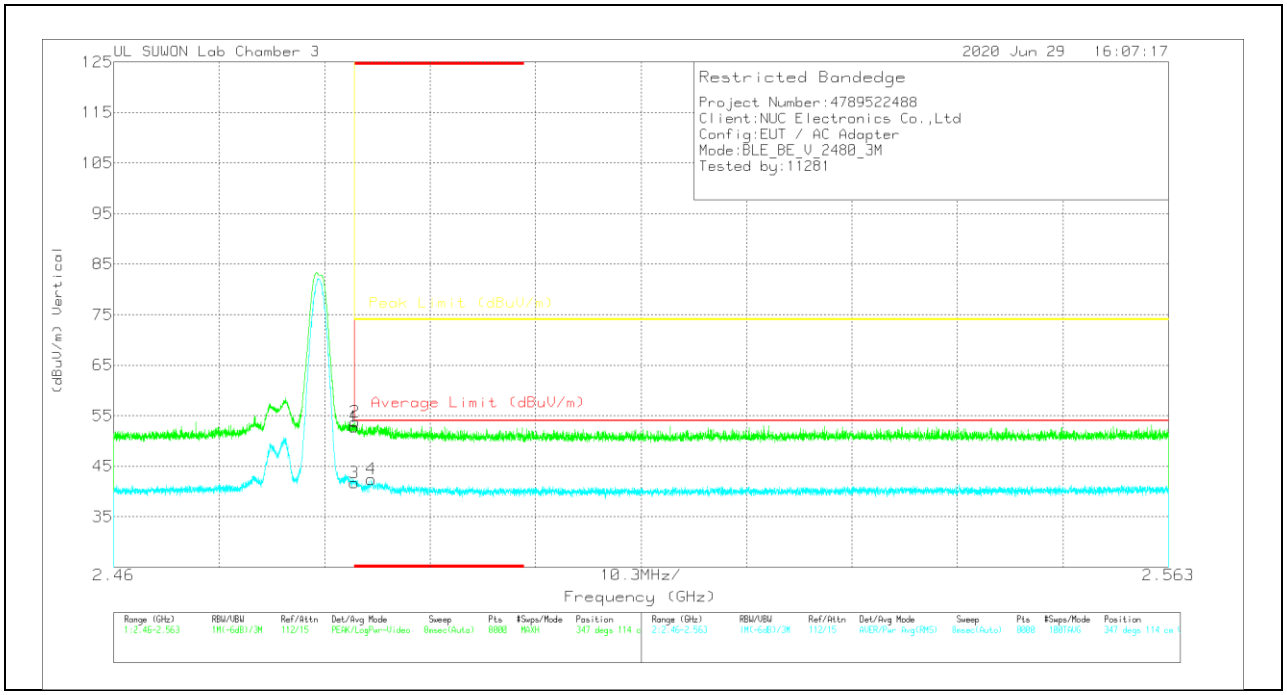


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	10dB_ATT[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	41.69	Pk	31.9	-22.8	50.79	-	-	74	-23.21	333	363	H
2	2.51918	43.56	Pk	32	-22.7	52.86	-	-	74	-21.14	333	363	H
3	* 2.4835	31.61	RMS	31.9	-22.8	40.71	54	-13.29	-	-	333	363	H
4	* 2.48356	32.65	RMS	31.9	-22.8	41.75	54	-12.25	-	-	333	363	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

VERTICAL RESULT



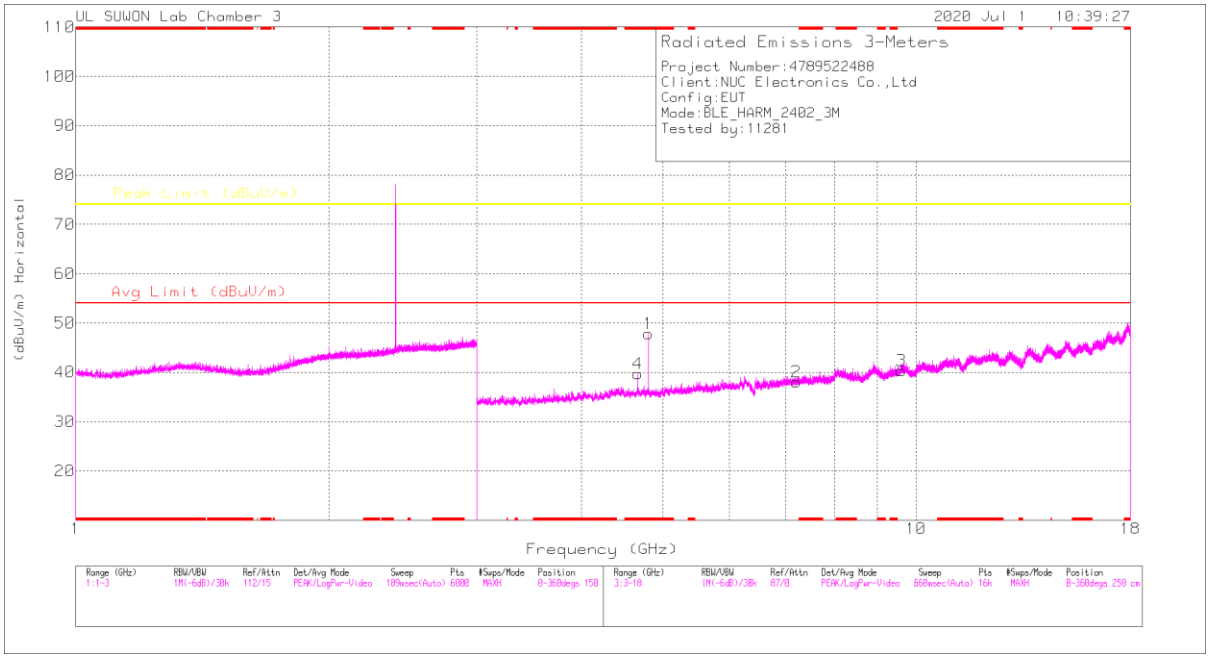
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	10dB_ATT[dB]	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.4835	43.71	Pk	31.9	-22.8	52.81	-	-	74	-21.19	347	114	V
2	* 2.48356	44.71	Pk	31.9	-22.8	53.81	-	-	74	-20.19	347	114	V
3	* 2.4835	32.64	RMS	31.9	-22.8	41.74	54	-12.26	-	-	347	114	V
4	* 2.48517	33.31	RMS	31.9	-22.8	42.41	54	-11.59	-	-	347	114	V

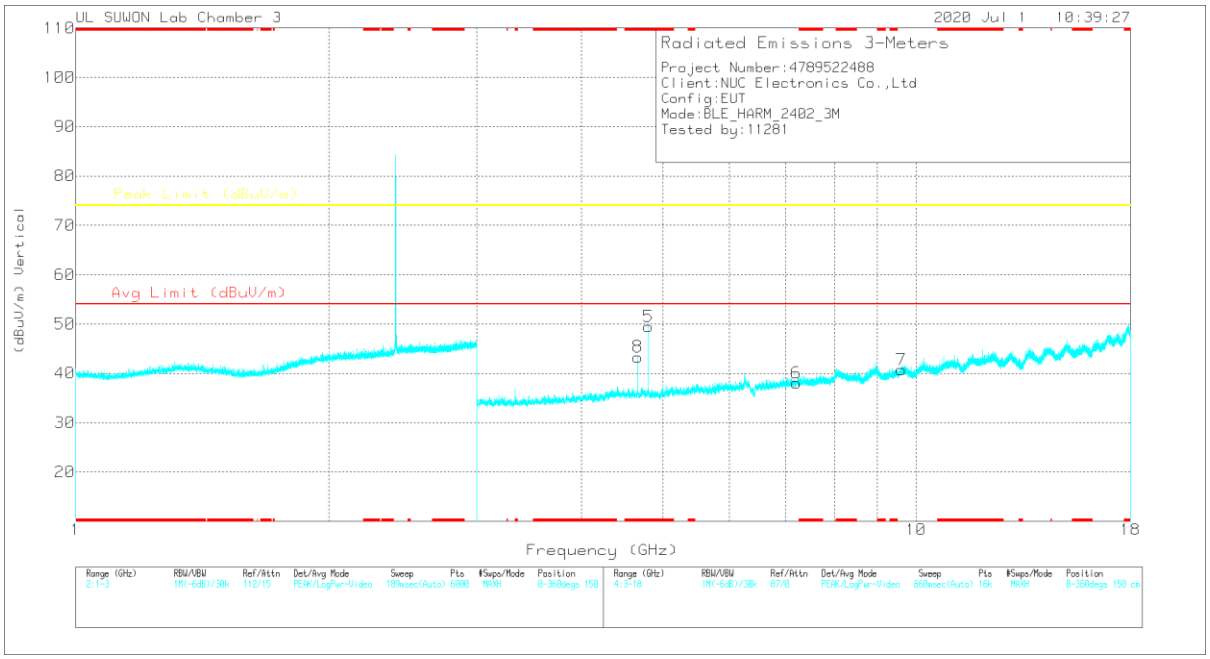
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



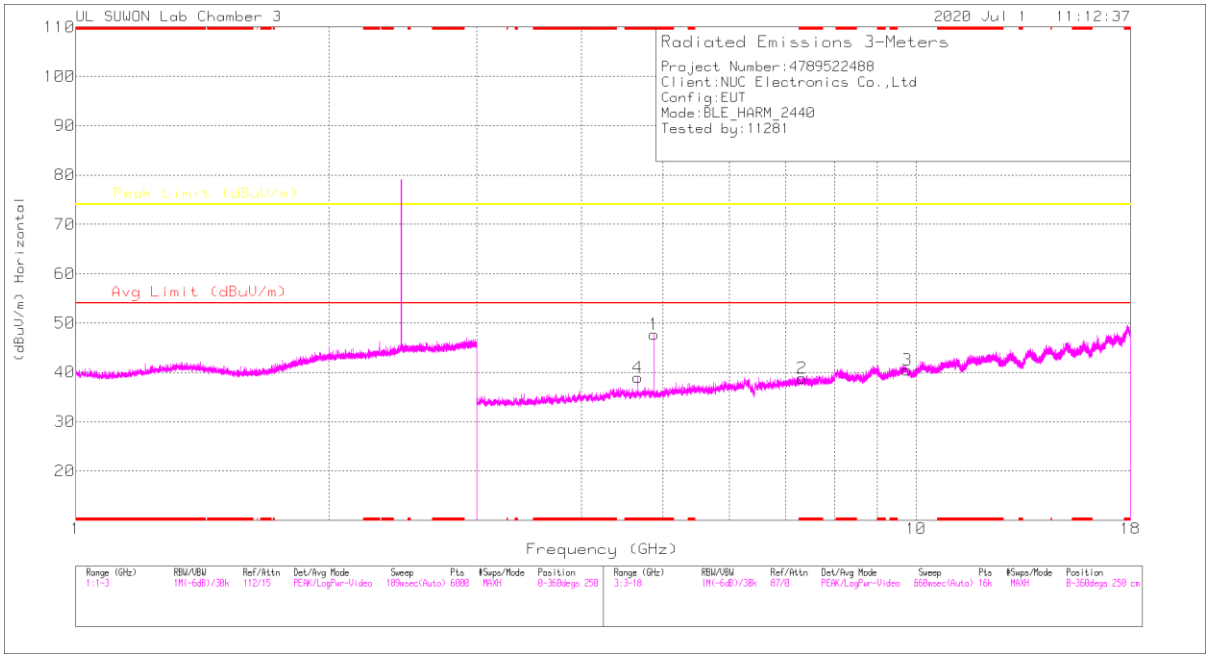
VERTICAL

RADIATED EMISSIONS

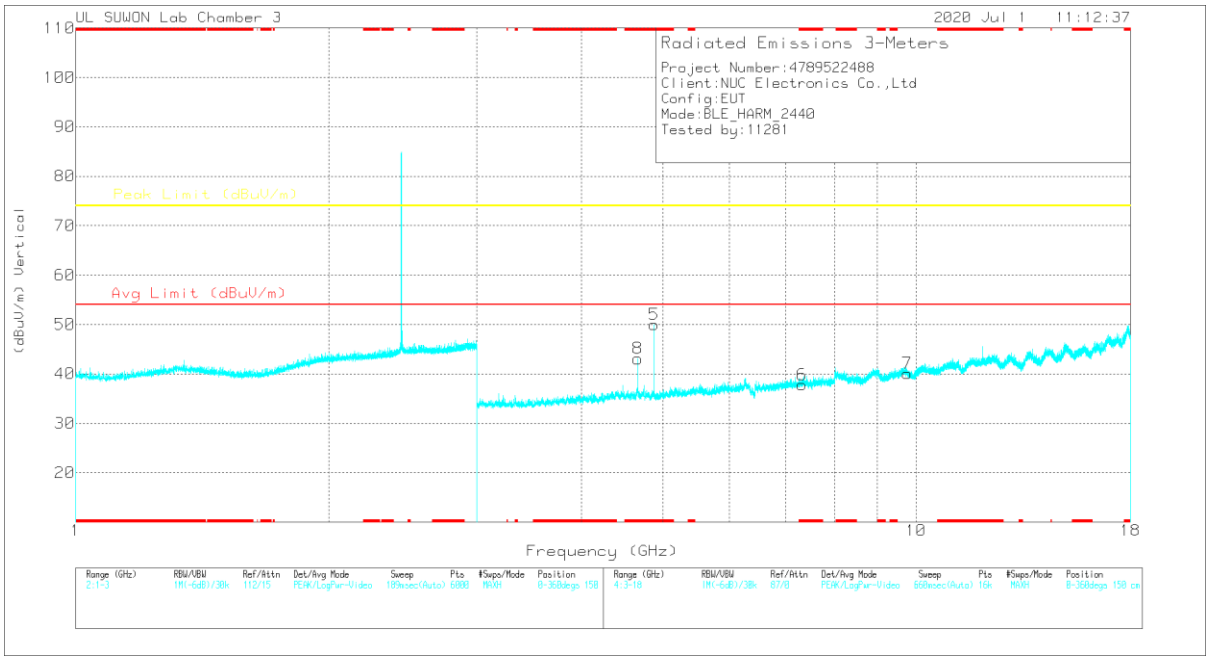
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.66636	44.72	PK2	34.2	-28	50.92	-	-	74	-23.08	95	255	V
* 4.6666	41.41	PK2	34.2	-28	47.61	-	-	74	-26.39	313	395	H
* 4.80585	45.15	PK2	34.2	-28	51.35	-	-	74	-22.65	293	133	H
* 4.80603	47.55	PK2	34.2	-28	53.75	-	-	74	-20.25	332	102	V
7.20746	36.04	PK2	35.8	-23.7	48.14	-	-	74	-25.86	332	100	V
7.21014	33.82	PK2	35.8	-23.7	45.92	-	-	74	-28.08	0	100	H
9.60722	30.94	PK2	37	-19.7	48.24	-	-	74	-25.76	0	100	H
9.61248	33.38	PK2	37	-19.7	50.68	-	-	74	-23.32	0	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak

MID CHANNEL RESULTS



HORIZONTAL



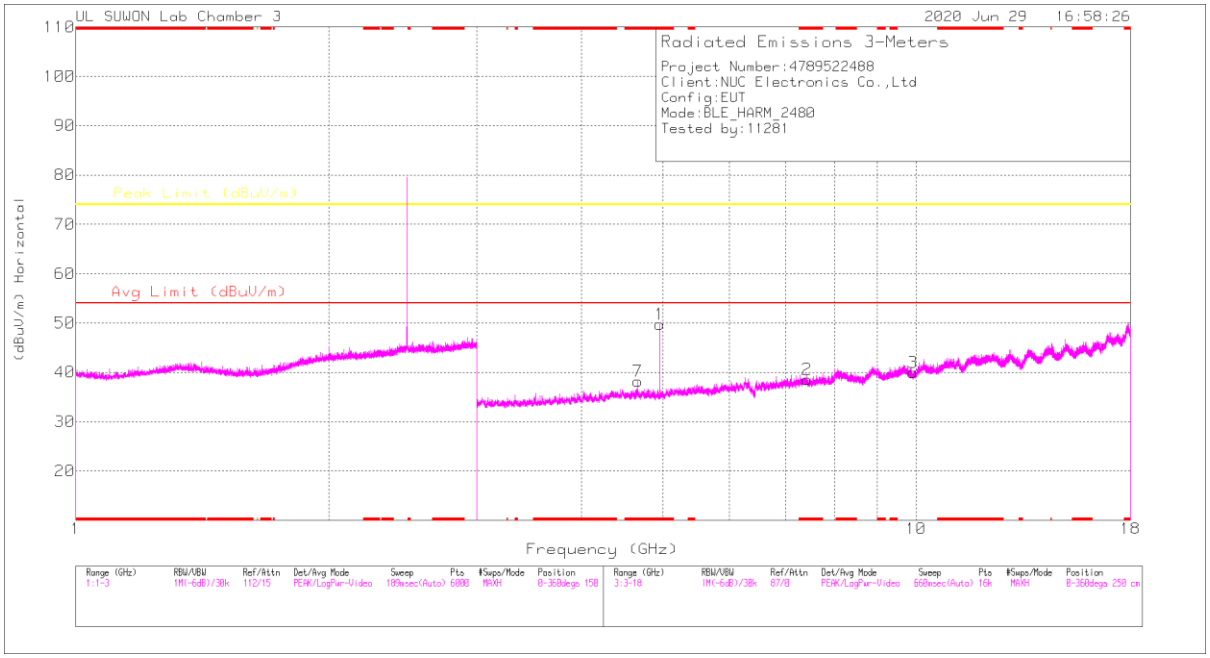
VERTICAL

RADIATED EMISSIONS

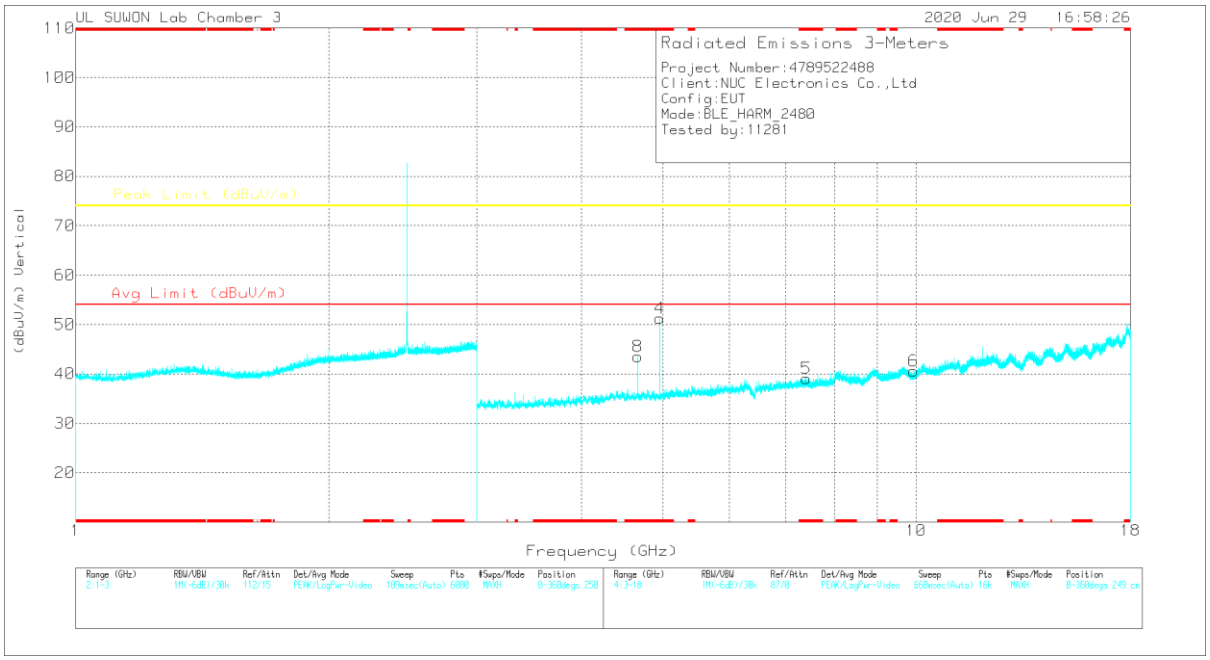
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.66629	41.33	PK2	34.2	-28	47.53	-	-	74	-26.47	314	393	H
* 4.66683	45.23	PK2	34.2	-28.1	51.33	-	-	74	-22.67	99	257	V
* 4.88197	46.67	PK2	34.2	-28.7	52.17	-	-	74	-21.83	25	109	H
* 4.88201	48.59	PK2	34.2	-28.7	54.09	-	-	74	-19.91	336	103	V
* 4.88206	45.43	MAv1	34.2	-28.7	50.93	54	-3.07	-	-	336	103	V
* 7.31656	35.64	PK2	35.8	-23.3	48.14	-	-	74	-25.86	19	100	V
* 7.32397	36.16	PK2	35.8	-23.1	48.86	-	-	74	-25.14	323	100	H
9.75597	29.79	PK2	37.2	-19.3	47.69	-	-	74	-26.31	323	100	H
9.76132	30.7	PK2	37.2	-19.3	48.6	-	-	74	-25.4	19	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

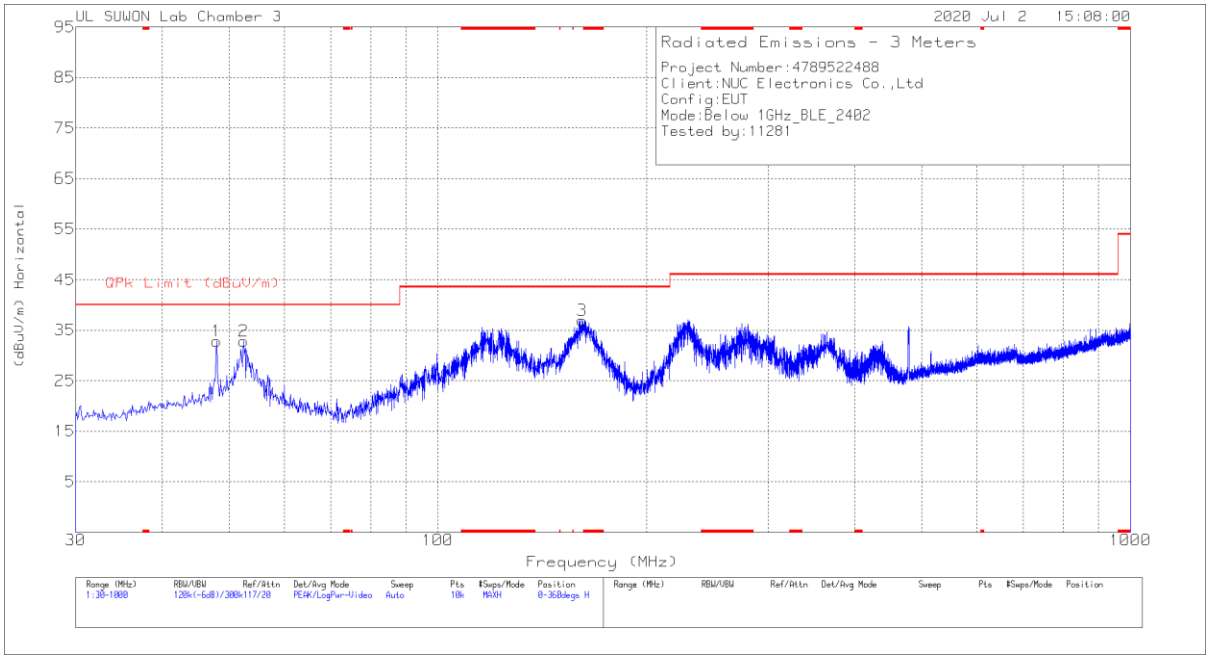
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00205959	3GHz_HP[dB]	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.66645	44.1	PK2	34.2	-28	50.3	-	-	74	-23.7	112	292	V
* 4.66657	41.86	PK2	34.2	-28	48.06	-	-	74	-25.94	313	395	H
* 4.95793	47.2	PK2	34.2	-28.5	52.9	-	-	74	-21.1	264	156	H
* 4.95798	48.46	PK2	34.2	-28.5	54.16	-	-	74	-19.84	332	110	V
* 4.95805	45.66	MAv1	34.2	-28.5	51.36	54	-2.64	-	-	332	110	V
* 7.40445	35.14	PK2	35.8	-22.7	48.24	-	-	74	-25.76	360	100	V
* 7.41571	35.58	PK2	35.8	-22.8	48.58	-	-	74	-25.42	15	233	H
9.9266	30.03	PK2	37.5	-19.5	48.03	-	-	74	-25.97	15	100	H
9.92717	29.32	PK2	37.5	-19.4	47.42	-	-	74	-26.58	360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

10.3. WORST CASE BELOW 1 GHZ

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



HORIZONTAL

VERTICAL

Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163-845	Below_1G[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	47.9469	44.74	Pk	20.1	-32	32.84	40	-7.16	0-360	400	H
2	52.4093	44.8	Pk	19.9	-31.9	32.8	40	-7.2	0-360	400	H
3	161.6426	53.49	Pk	14.8	-31.4	36.89	43.52	-6.63	0-360	200	H
4	47.9469	47.67	Pk	20.1	-32	35.77	40	-4.23	0-360	100	V
5	51.9243	48.14	Pk	19.9	-32.1	35.94	40	-4.06	0-360	100	V
6	* 166.4931	53.07	Pk	14.9	-31.3	36.67	43.52	-6.85	0-360	100	V

Pk - Peak detector

11. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

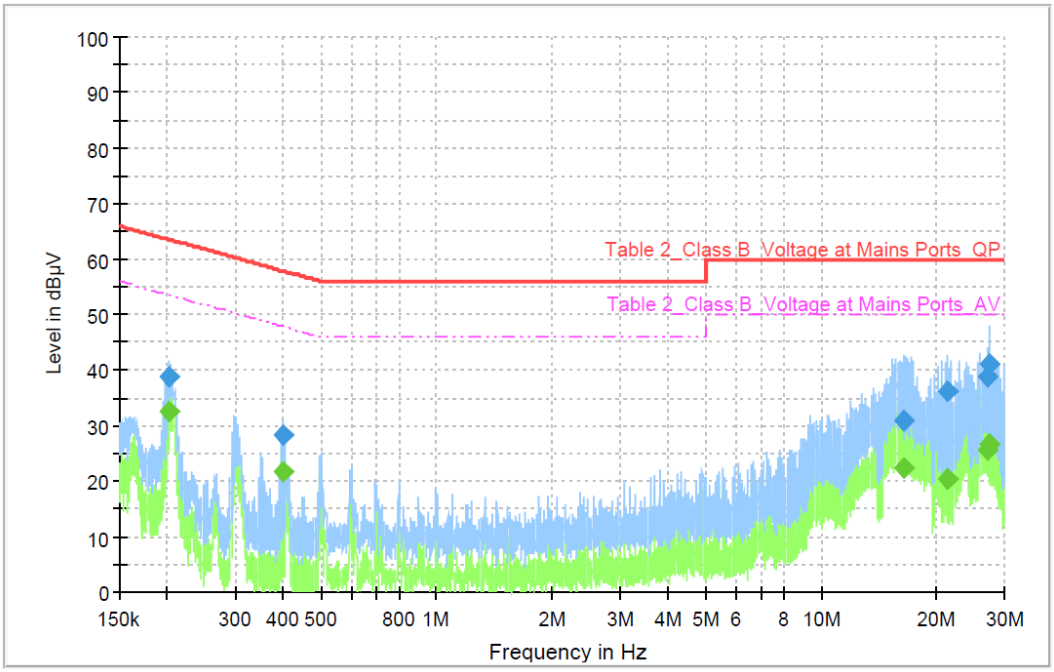
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

11.1.1. AC Power Line

LINE 1 RESULTS



Final_Result

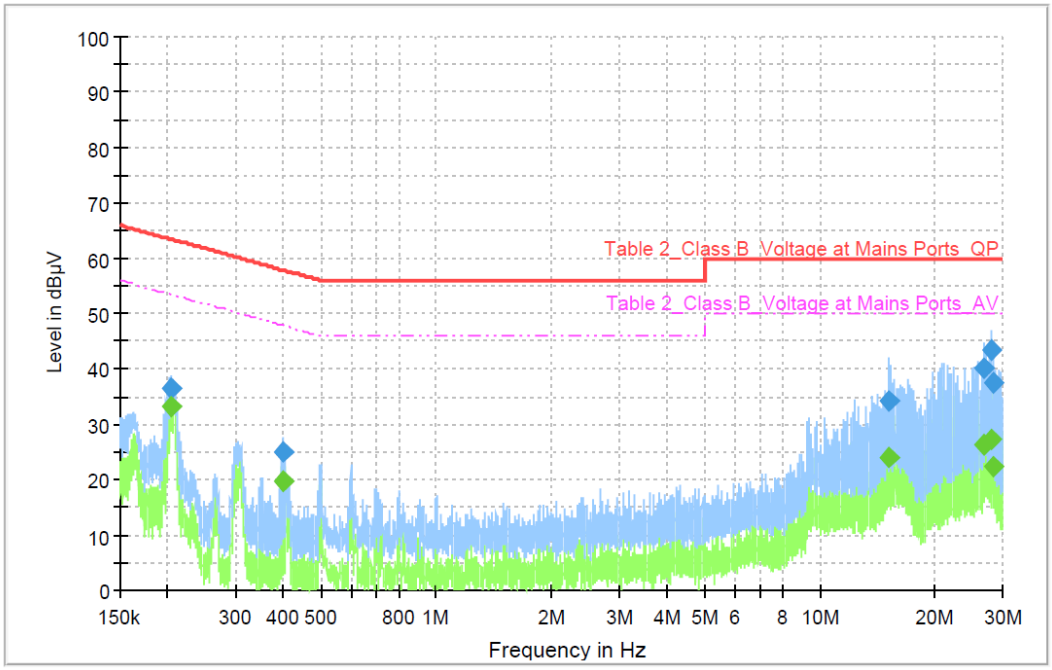
- Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.201882	38.83	63.53	24.70	L1	ON	9.8
0.400096	28.36	57.85	29.49	L1	ON	9.9
16.469118	30.76	60.00	29.24	L1	ON	10.1
21.400000	36.33	60.00	23.67	L1	ON	10.1
27.080882	38.96	60.00	21.04	L1	ON	10.1
27.517647	40.99	60.00	19.01	L1	ON	10.2

- Average

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.201882	32.73	53.53	20.81	L1	ON	9.8
0.400096	21.82	47.85	26.03	L1	ON	9.9
16.469118	22.28	50.00	27.72	L1	ON	10.1
21.400000	20.46	50.00	29.54	L1	ON	10.1
27.080882	25.64	50.00	24.36	L1	ON	10.1
27.517647	26.67	50.00	23.33	L1	ON	10.2

LINE 2 RESULTS



Final_Result

- Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.203529	36.46	63.47	27.00	N	ON	9.8
0.399735	24.98	57.86	32.88	N	ON	9.9
15.201471	34.35	60.00	25.65	N	ON	10.0
26.763235	40.26	60.00	19.74	N	ON	10.2
28.000000	43.58	60.00	16.42	N	ON	10.2
28.438235	37.64	60.00	22.36	N	ON	10.2

- Average

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.203529	33.39	53.47	20.08	N	ON	9.8
0.399735	19.71	47.86	28.15	N	ON	9.9
15.201471	23.86	50.00	26.14	N	ON	10.0
26.763235	26.46	50.00	23.54	N	ON	10.2
28.000000	27.28	50.00	22.72	N	ON	10.2
28.438235	22.39	50.00	27.61	N	ON	10.2

END OF TEST REPORT