



CERTIFICATION TEST REPORT

Report Number. : 4789793179-E4V3

Applicant : SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 16677, KOREA

Model : SM-A125U, SM-S127DL, SM-A125U1/DS, SM-A125U1

FCC ID : A3LSMA125U

EUT Description : GSM/CDMA/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and
NFC

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C

Date Of Issue:

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	03/02/21	Initial issue	Hyunsik Yun
V2	03/08/21	Updated to address TCB's question	Hyunsik Yun
V3	03/23/21	Added SM-A125U1 model	Hyunsik Yun

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: GSM/CDMA/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC

MODEL: SM-A125U, SM-S127DL, SM-A125U1/DS

SERIAL NUMBER: R38R100SMVZ (CONDUCTED);
R37R100SNBW, R38R100SPAF (RADIATED);

DATE TESTED: FEB 10, 2021 – FEB 26, 2021;

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	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:



Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:



Hyunsik Yun
Suwon Lab Engineer
UL Korea, Ltd.

2. TEST METHODOLOGY

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. KDB 558074 D01 15.247 Meas Guidance v05r02.
4. 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	
<input checked="" type="checkbox"/>	Chamber 1
<input checked="" type="checkbox"/>	Chamber 2
<input type="checkbox"/>	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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 28.9 \text{ dBuV/m} &= 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} \end{aligned}$$

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	3.01 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.26 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.90 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 GSM/CDMA/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC. This test report addresses the DTS (BLE) operational mode.

This report covers the Samsung models SM-A125U, SM-A125U1/DS, SM-A125U1 and SM-S127DL.

These models are identical in hardware except SM-A125U1/DS has dual SIM tray, SM-A125U1 has single SIM tray and SM-S127DL is not supported CDMA.

With some pre-scan, model SM-A125U was set for final test.

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	125kbps	Peak	5.854	3.849
		Average	5.828	3.827
	2Mbps	Peak	5.865	3.859
		Average	5.421	3.484

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 antennas, with maximum gain of -4.26 dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1GHz and power line conducted emission were 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 X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

Note : All radiated and power line conducted tests were performed attached with travel adapter and earphone for the worst case condition mode.

Power verification

The Output Power of all data rate are all investigated, the 125 kbps(37 pkt) and 2 Mbps(255 pkt) power is the worst case for symbol rate. All tests were performed in these two modes.

Symbol Rate [Ms/s]	Mode	Frequency [MHz]	Conducted Burst Avg [dBm]	Symbol Rate [Ms/s]	Mode	Frequency [MHz]	Conducted Burst Avg [dBm]
1	1Mbps (37 pkt)	2402	4.776	2	2Mbps (37 pkt)	2402	4.423
		2440	5.769			2440	5.412
		2480	3.982			2480	3.694
	1Mbps (255 pkt)	2402	4.809		2Mbps (255 pkt)	2402	4.440
		2440	5.780			2440	5.421
		2480	3.995			2480	3.690
1	125 kbps (37 pkt)	2402	4.857				
		2440	5.828				
		2480	4.077				
	125 kbps (255 pkt)	2402	4.830				
		2440	5.800				
		2480	4.040				
	500 kbps (37 pkt)	2402	4.567				
		2440	5.546				
		2480	3.808				
	500 kbps (255 pkt)	2402	4.560				
		2440	5.531				
		2480	3.779				

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA200	R37NBH409C3SE3	N/A
Data Cable	SAMSUNG	EP-DR140AWE	N/A	N/A
Earphone	SAMSUNG	EHS64AVFWE	N/A	N/A

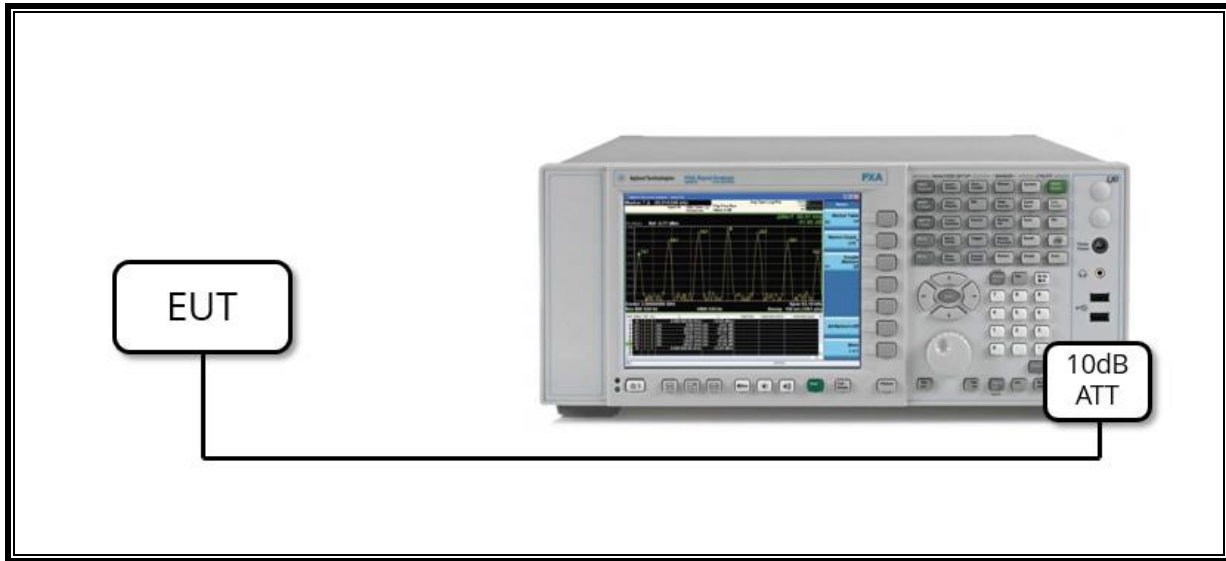
I/O CABLE

I/O Cable List						
Cable No.	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C Type	Shielded	1.0 m	N/A
2	Audio	2	AUX	Unshielded	1.1 m	N/A

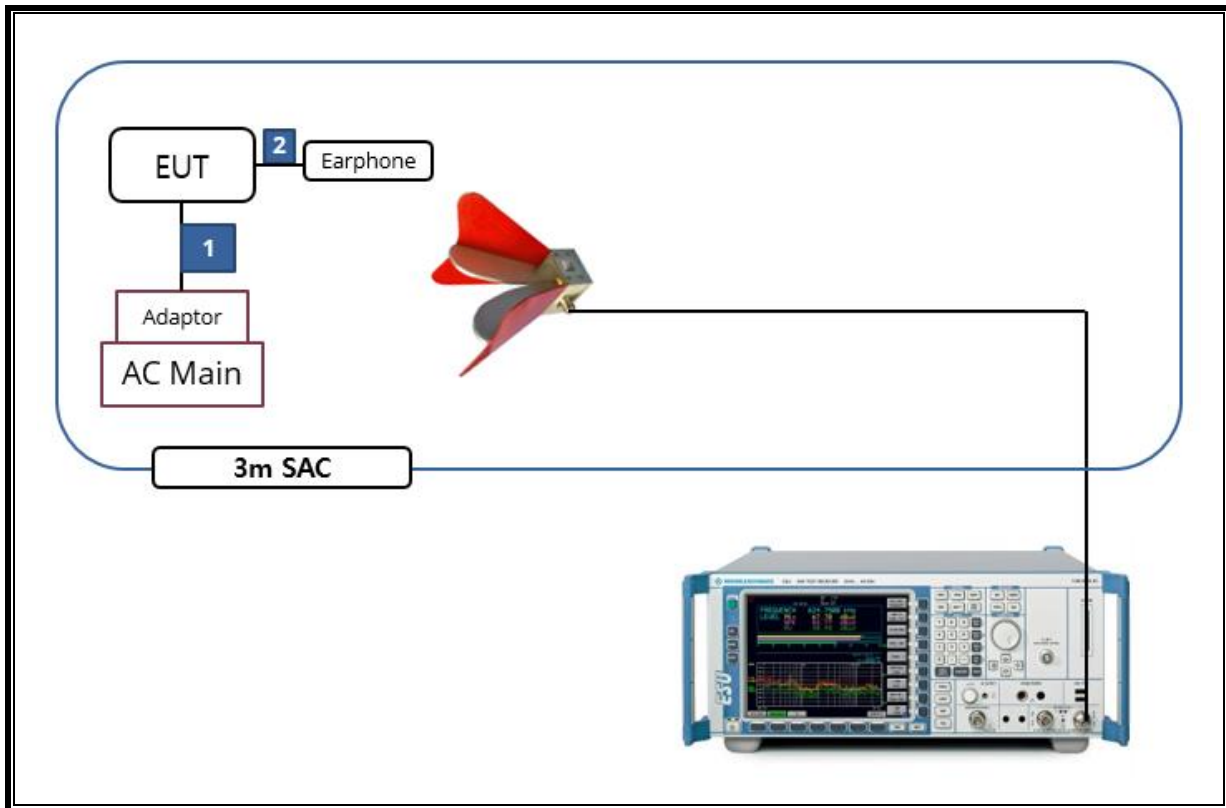
TEST SETUP

The EUT is a stand-alone unit during the tests.
 Test software in hidden menu exercised the EUT to enable BLE mode.

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED 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	08-19-22
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	08-13-22
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	08-13-22
Antenna, Horn, 18 GHz	ETS	3115	00167211	07-27-22
Antenna, Horn, 18 GHz	ETS	3115	00161451	08-15-22
Antenna, Horn, 18 GHz	ETS	3117	00168724	07-27-22
Antenna, Horn, 18 GHz	ETS	3117	00168717	08-15-22
Antenna, Horn, 40 GHz	ETS	3116C	00166155	08-04-22
Antenna, Horn, 40 GHz	ETS	3116C	00168645	10-02-21
Preamplifier	ETS	3116C-PA	00168841	08-06-21
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-03-21
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-03-21
Preamplifier, 1000 MHz	Sonoma	310N	370599	08-06-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-03-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-03-21
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	08-04-21
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-05-21
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-05-21
Spectrum Analyzer, 43.5 GHz	R&S	FSW43	104089	08-06-21
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-05-21
Attenuator	PASTERNAK	PE7087-10	A001	08-03-21
Attenuator	PASTERNAK	PE7087-10	A008	08-03-21
Attenuator	PASTERNAK	PE7004-10	2	08-04-21
Attenuator	PASTERNAK	PE7087-10	A009	08-03-21
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-03-21
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-03-21
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-03-21
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-03-21
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-03-21
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	08-04-21
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-03-21
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-03-21
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	08-04-21
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	08-03-21
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	08-03-21
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	08-04-21
LISN	R&S	ENV-216	101837	08-06-21
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	10-02-21
UL Software				
Description	Manufacturer	Model	Version	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

8. TEST RESULTS SUMMARY

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
15.247 (a)(2)	Occupied Bandwidth(6dB)	> 500kHz	Conducted	PASS
2.1051, 15.247(d)	Band Edge / Conducted Spurious Emission	-20 dBc		PASS
15.247 (b)(3)	TX conducted output power	< 30 dBm		PASS
15.247(e)	PSD	< 8 dBm/3kHz		PASS
15.207(a)	AC Power Line conducted emissions	Section 11	Power Line conducted	PASS
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m(Av)	Radiated	PASS

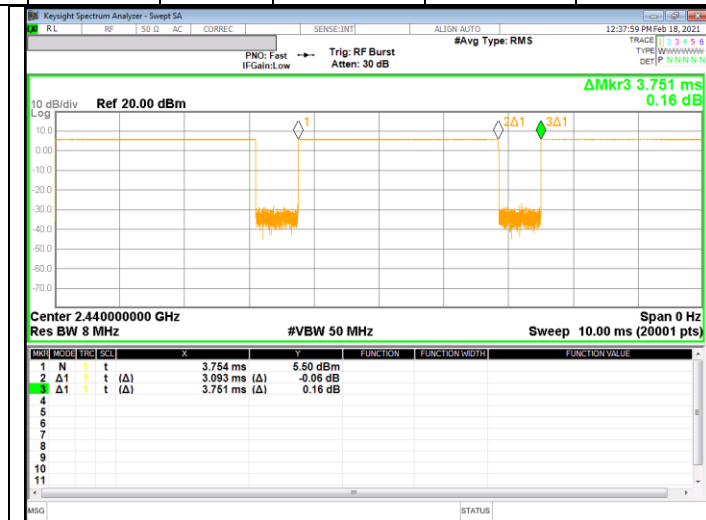
9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

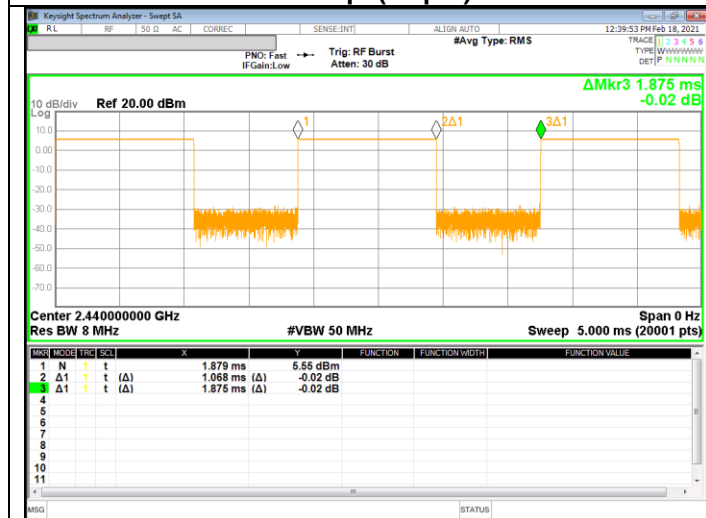
LIMITS

None; for reporting purposes only.

Mode	On time [msec]	Period [msec]	Duty cycle x [Linear]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum CBW [kHz]
2 400 ~ 2 483.5 MHz Bands						
125 kbps [37pkt]	3.093	3.751	0.825	82.458	0.84	0.323
2 Mbps [255pkt]	1.068	1.875	0.570	56.960	2.44	0.936



125 kbps(37 pkt)



2 Mbps(255 pkt)

9.2. 6 dB & 99% BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

RSS-247 5.2 (a)

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

RESULTS

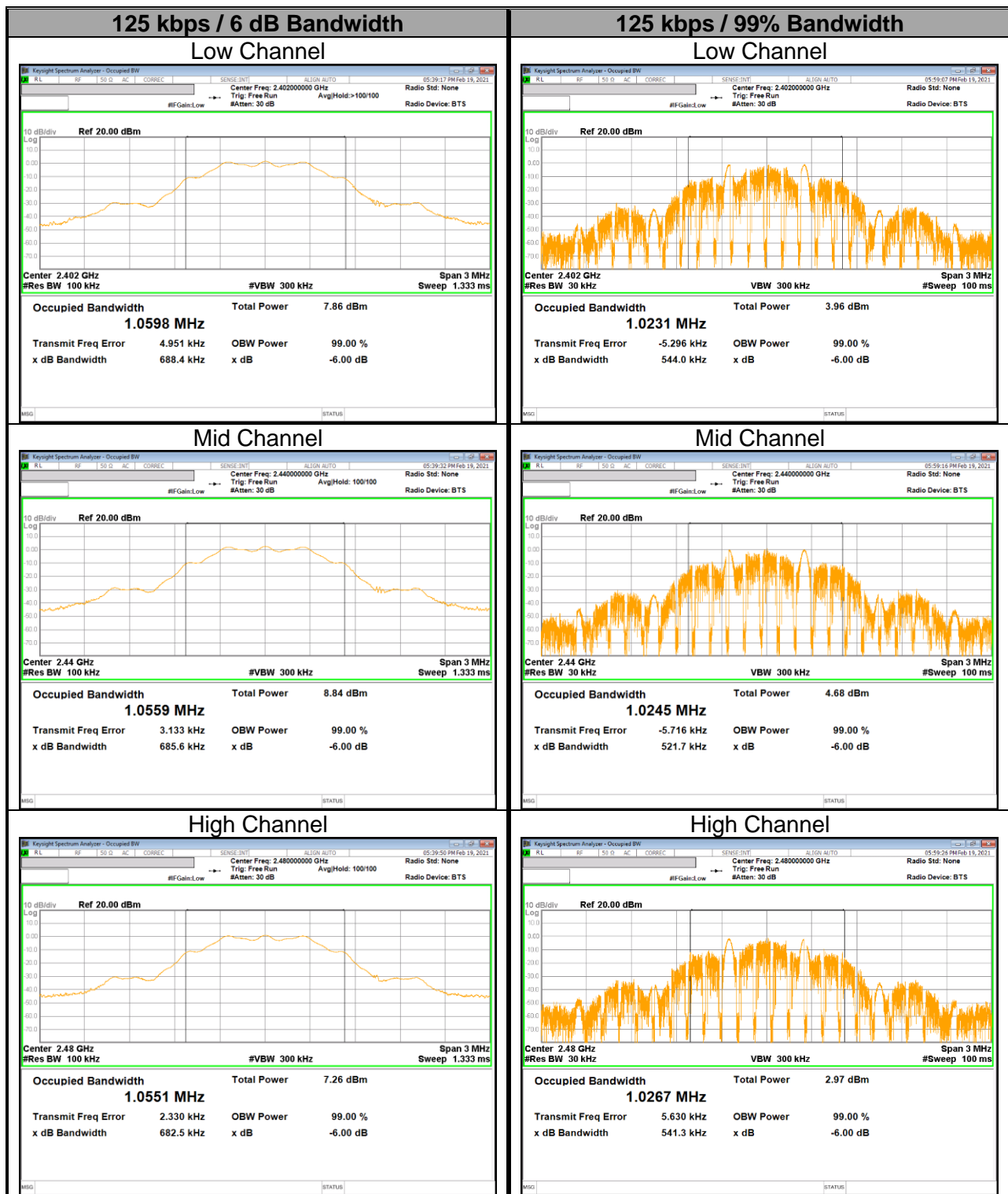
9.2.1. 125 kbps

Channel	Frequency [MHz]	6 dB Bandwidth [kHz]	Minimum Limit [kHz]	99% Bandwidth [kHz]
Low	2 402	688.4	500.0	1 023.1
Mid	2 440	685.6	500.0	1 024.5
High	2 480	682.5	500.0	1 026.7

9.2.2. 2 Mbps

Channel	Frequency [MHz]	6 dB Bandwidth [kHz]	Minimum Limit [kHz]	99% Bandwidth [kHz]
Low	2 402	1 169.0	500.00	2 108.8
Mid	2 440	1 172.0	500.00	2 068.0
High	2 480	1 173.0	500.00	2 066.0

9.2.3. 6 dB & 99% BANDWIDTH PLOTS





9.3. 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

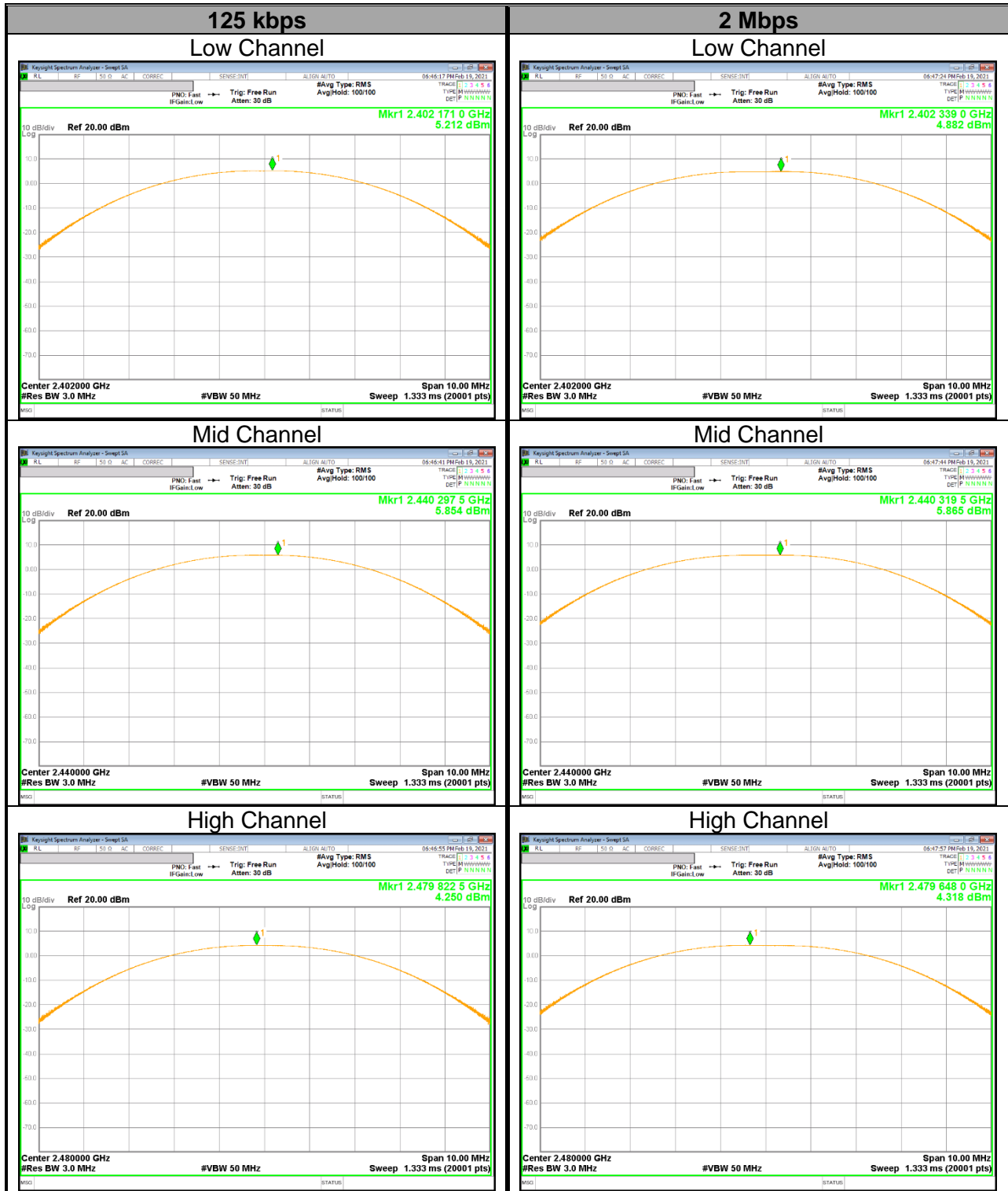
9.3.1. 125 kbps

Channel	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin [dB]
Low	2402	5.212	30.000	-24.788
Mid	2440	5.854	30.000	-24.146
High	2480	4.250	30.000	-25.750
Worst		5.854	30.000	-24.146

9.3.2. 2 Mbps

Channel	Frequency [MHz]	Peak Power [dBm]	Limit [dBm]	Margin [dB]
Low	2402	4.882	30.000	-25.118
Mid	2440	5.865	30.000	-24.135
High	2480	4.318	30.000	-25.682
Worst		5.865	30.000	-24.135

9.3.3. PEAK POWER PLOTS



9.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Measurements perform using a wideband RF frame average power sensor. The cable assembly insertion loss and duty cycle correction factor were entered as an offset in the power meter to allow for direct reading of power.

RESULTS

9.4.1. 125 kbps

Channel	Frequency [MHz]	AV Power [dBm]	AV Power [mW]
Low	2402	4.857	3.060
Mid	2440	5.828	3.827
High	2480	4.077	2.557

9.4.2. 2 Mbps

Channel	Frequency [MHz]	AV Power [dBm]	AV Power [mW]
Low	2402	4.440	2.780
Mid	2440	5.421	3.484
High	2480	3.690	2.339

9.5. 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

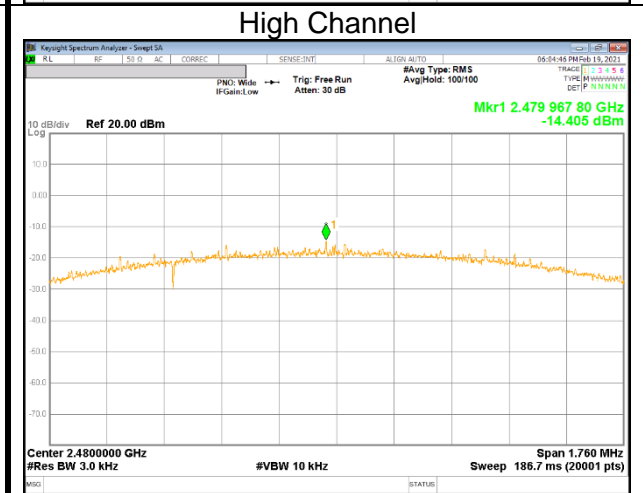
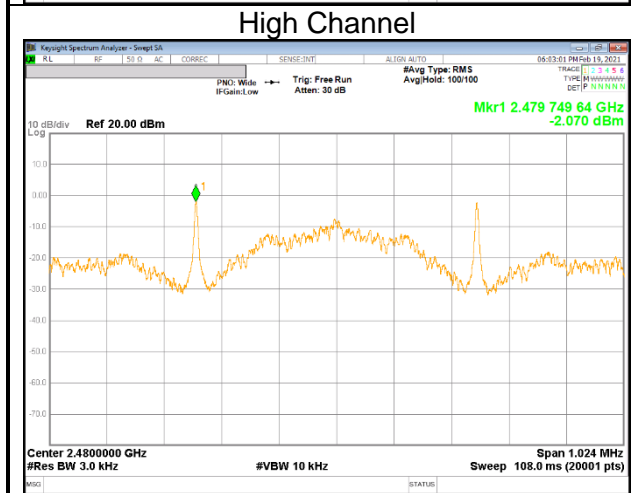
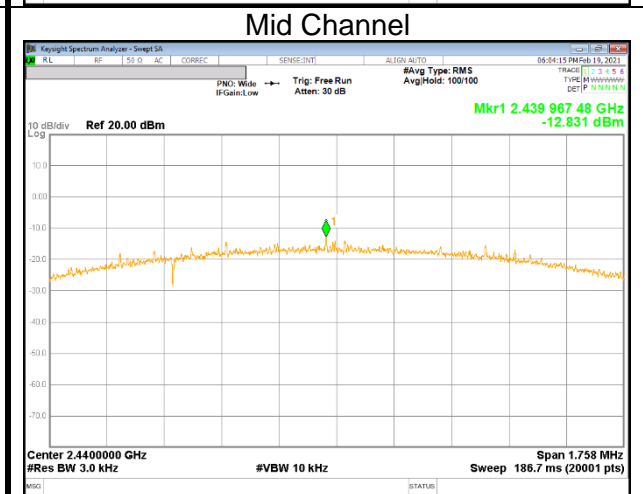
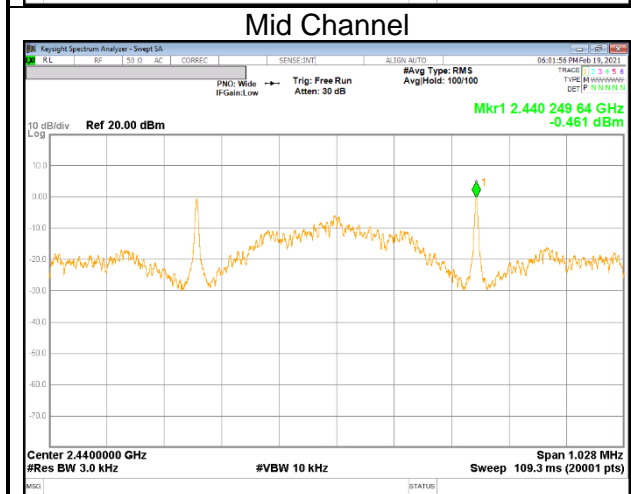
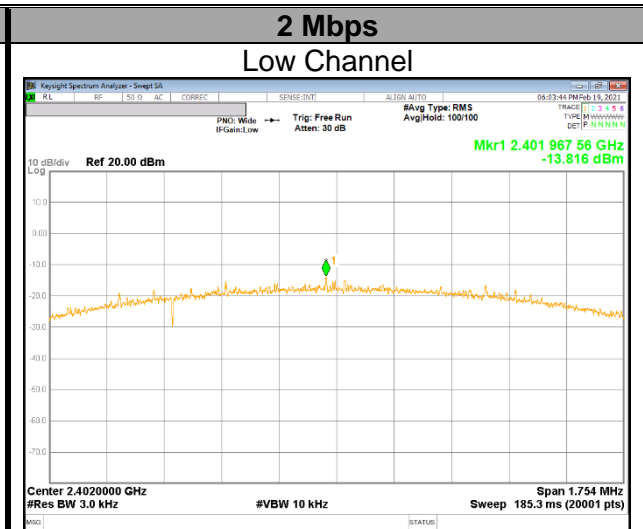
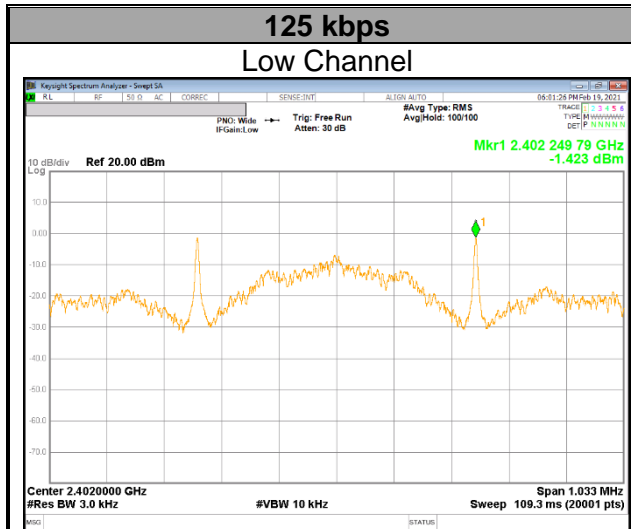
9.5.1. 125 kbps

Channel	Frequency [MHz]	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Margin [dB]
Low	2402	-1.423	8.000	-9.423
Mid	2440	-0.461	8.000	-8.461
High	2480	-2.070	8.000	-10.070

9.5.2. 2Mbps

Channel	Frequency [MHz]	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Margin [dB]
Low	2402	-13.816	8.000	-21.816
Mid	2440	-12.831	8.000	-20.831
High	2480	-14.405	8.000	-22.405

9.5.3. PSD TEST PLOTS



9.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

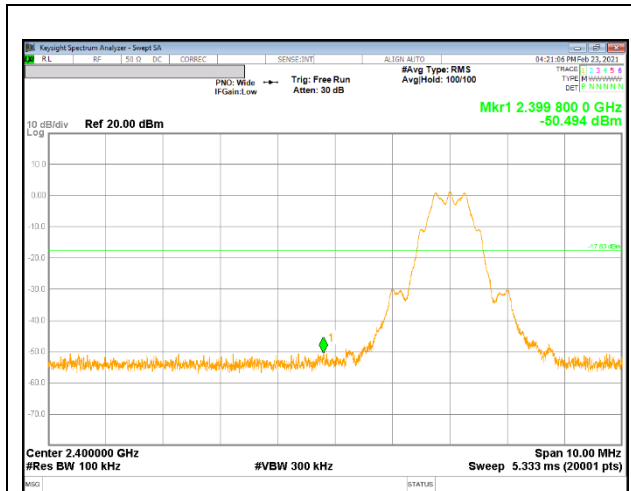
FCC §15.247 (d)

RSS-247 5.5

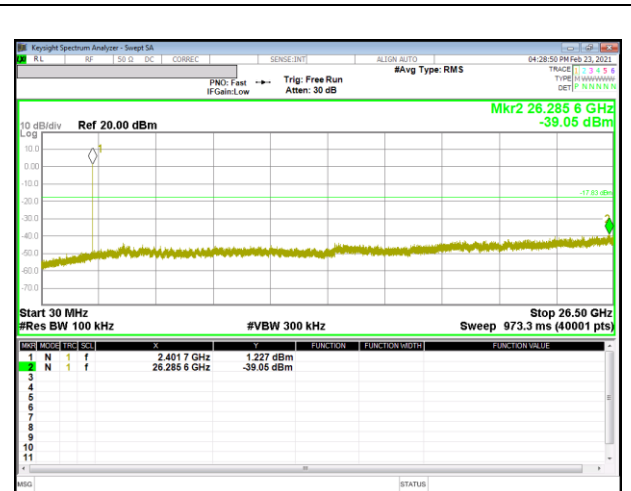
Output power was measured based on the use of a peak measurement.
Therefore, spurious emissions are required to be 20 dBc.

RESULTS

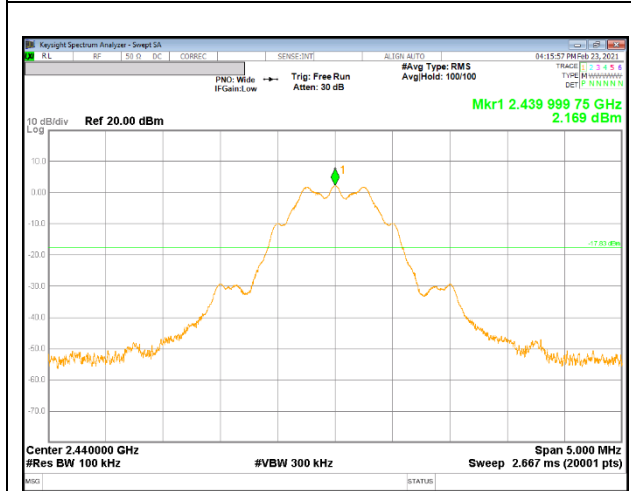
9.6.1. 125 kbps



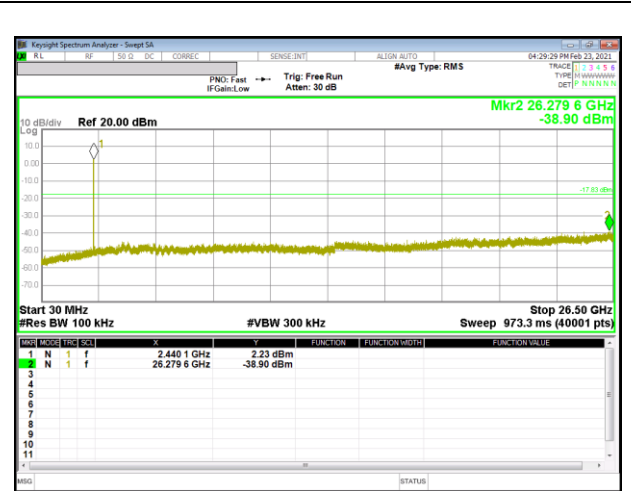
LOW CHANNEL BANDEDGE



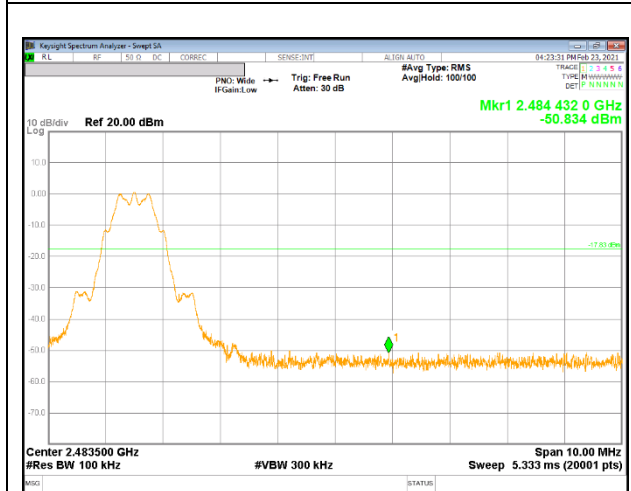
OUT-OF-BAND LOW CHANNEL



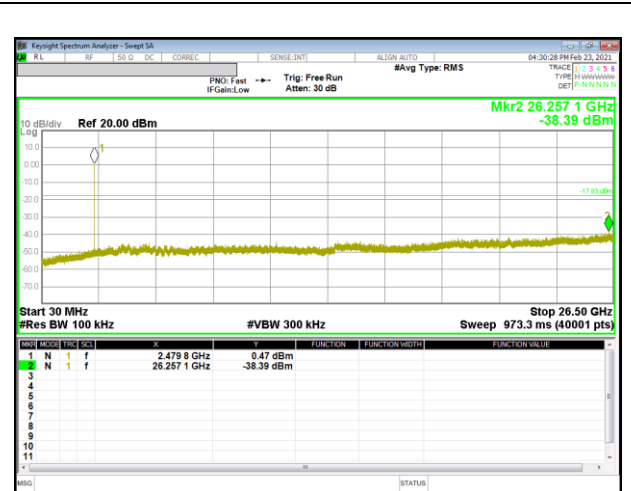
IN-BAND REFERENCE LEVEL



OUT-OF-BAND MID CHANNEL

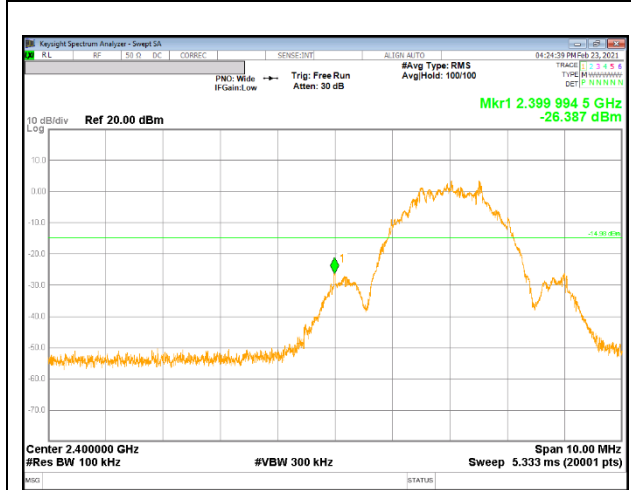


HIGH CHANNEL BANDEDGE

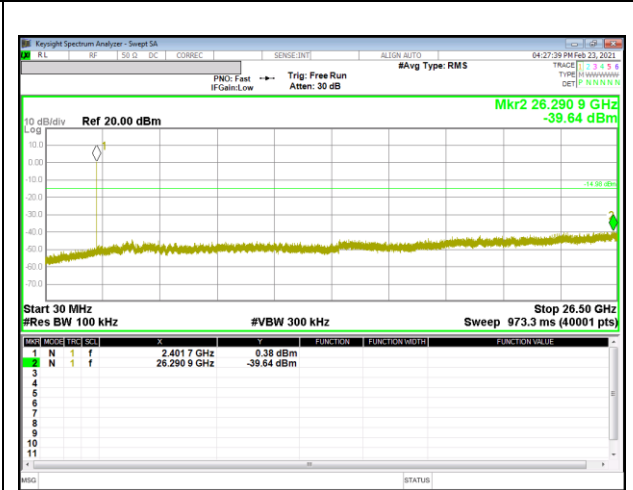


OUT-OF-BAND HIGH CHANNEL

9.6.2. 2Mbps



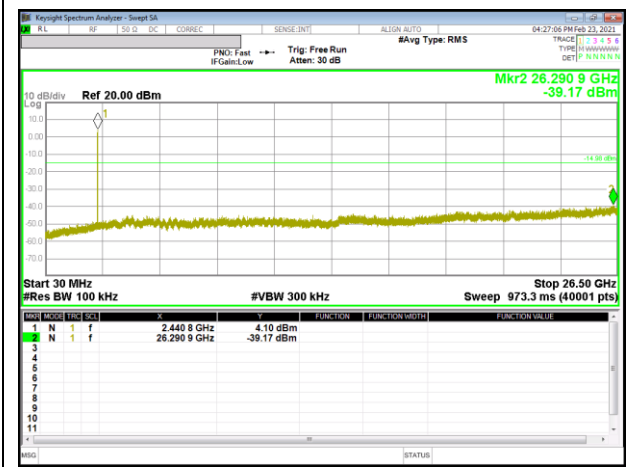
LOW CHANNEL BANDEDGE



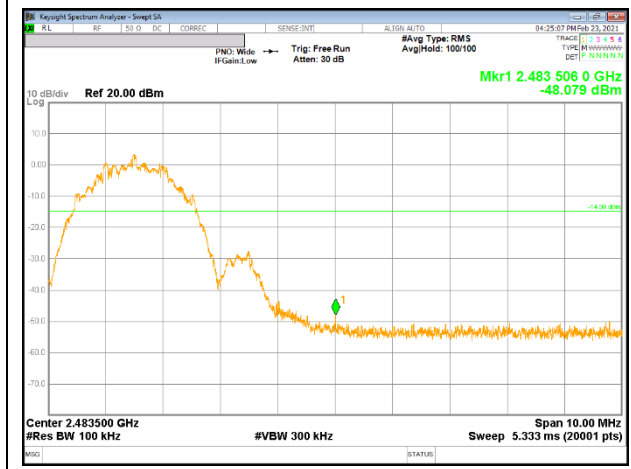
OUT-OF-BAND LOW CHANNEL



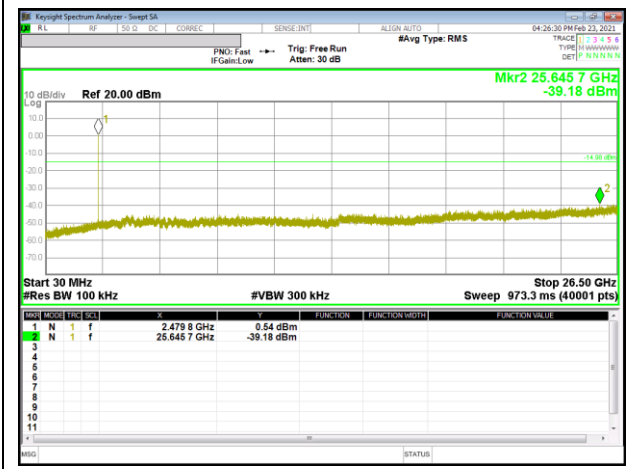
IN-BAND REFERENCE LEVEL



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 ($\mu\text{V/m}$)	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.

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. (Restricted bandedge, Final detection of spurious harmonic emissions) Duty cycle factor = $10 \log(1/x)$. For this sample: For 125 kbps, DCF = $10 \log(1/0.825) = 0.838$ dB (Spectrum Analyzer round it up to 0.84 dB) and for 2 Mbps, DCF = $10 \log(1/0.570) = 2.444$ dB (Spectrum Analyzer round it up to 2.44 dB)

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.

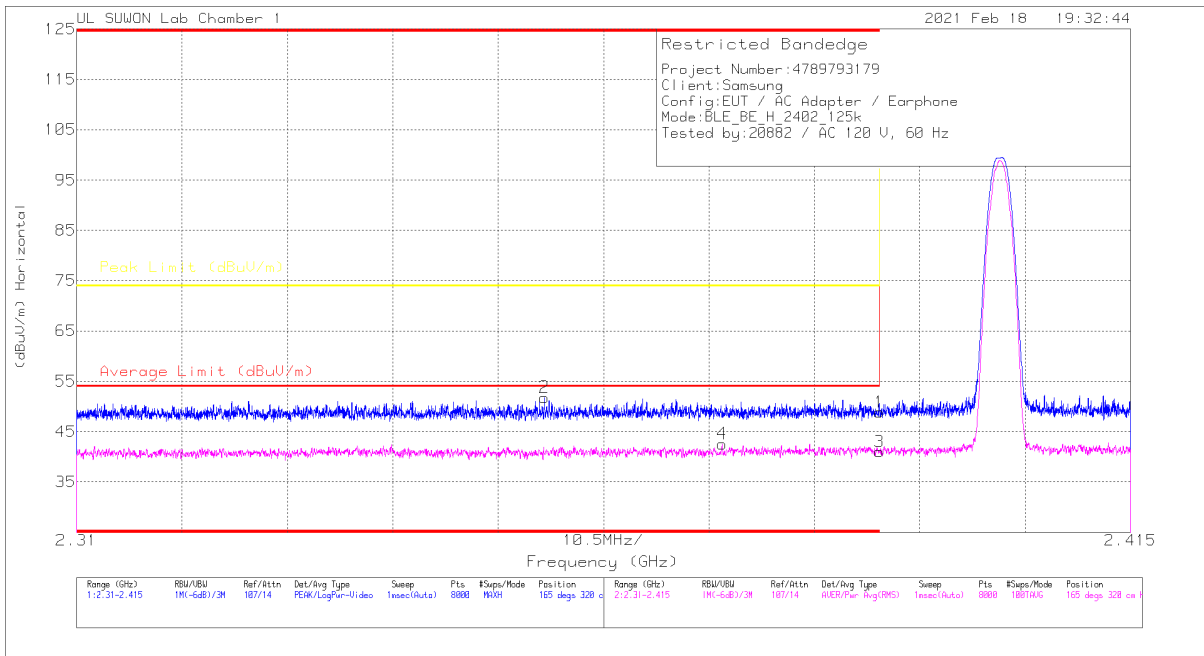
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field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

10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. 125 kbps

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT

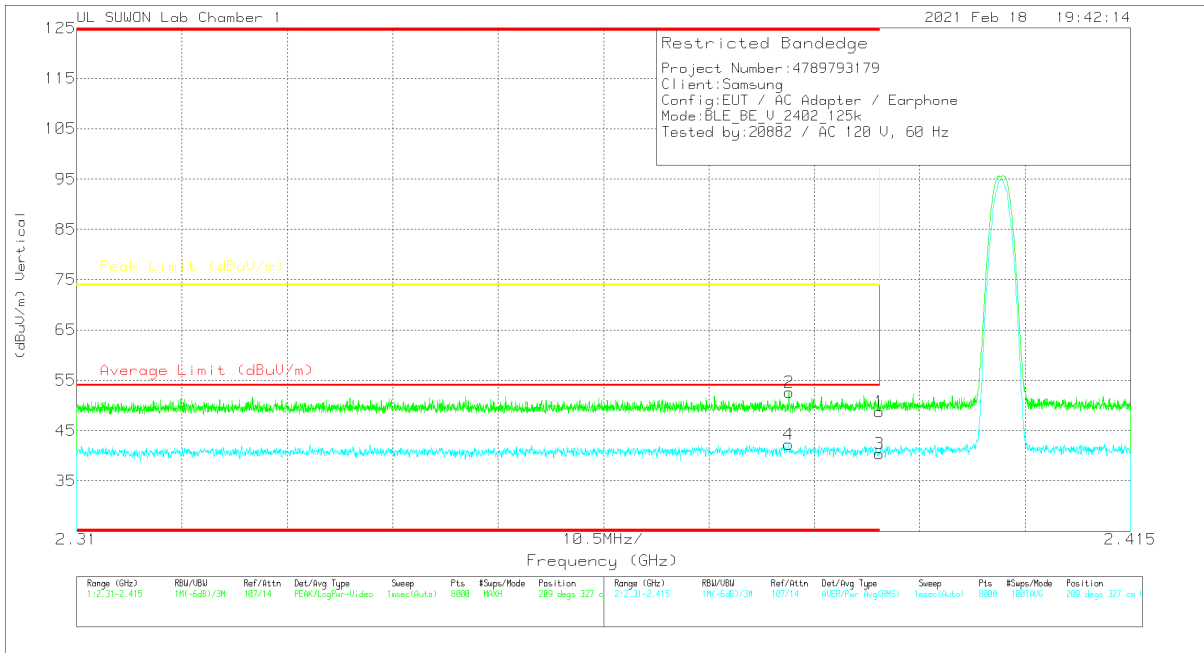


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	10dB_ATT[dB]	DC Cor (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	42.64	Pk	31.8	-25.6	0	48.84	-	-	74	-25.16	165	320	H
2	* 2.3566	45.81	Pk	31.7	-25.7	0	51.81	-	-	74	-22.19	165	320	H
3	* 2.39	33.98	RMS	31.8	-25.6	.84	41.02	54	-12.98	-	-	165	320	H
4	* 2.37432	35.65	RMS	31.7	-25.6	.84	42.59	54	-11.41	-	-	165	320	H

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

VERTICAL RESULT



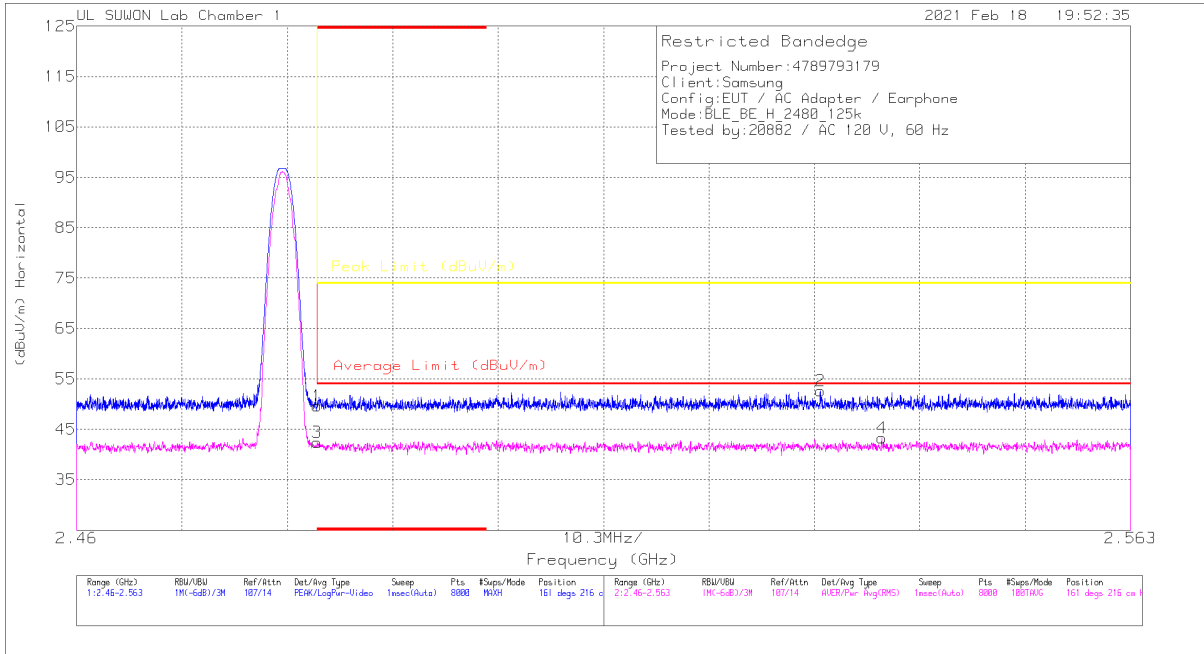
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	10dB_ATT[dB]	DC Cor (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	42.55	Pk	31.8	-25.6	0	48.75	-	-	74	-25.25	209	327	V
2	* 2.38096	46.41	Pk	31.8	-25.6	0	52.61	-	-	74	-21.39	209	327	V
3	* 2.39	33.38	RMS	31.8	-25.6	.84	40.42	54	-13.58	-	-	209	327	V
4	* 2.38093	35.19	RMS	31.8	-25.6	.84	42.23	54	-11.77	-	-	209	327	V

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

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT

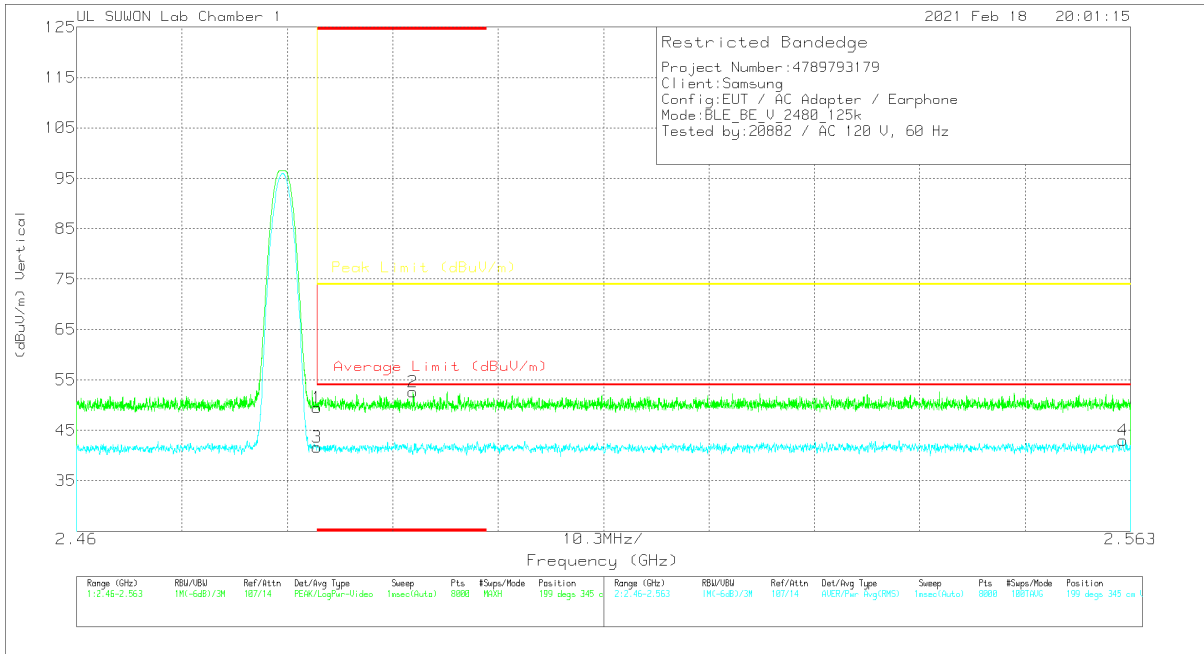


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	10dB_ATT[dB]	DC Corr (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	42.93	PK	32	-25.3	0	49.63	-	-	74	-24.37	161	216	H
2	2.53268	45.72	PK	32	-25.1	0	52.62	-	-	74	-21.38	161	216	H
3	* 2.4835	34.87	RMS	32	-25.3	.84	42.41	54	-11.59	-	-	161	216	H
4	2.53869	35.59	RMS	32	-25.1	.84	43.33	54	-10.67	-	-	161	216	H

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

VERTICAL RESULT



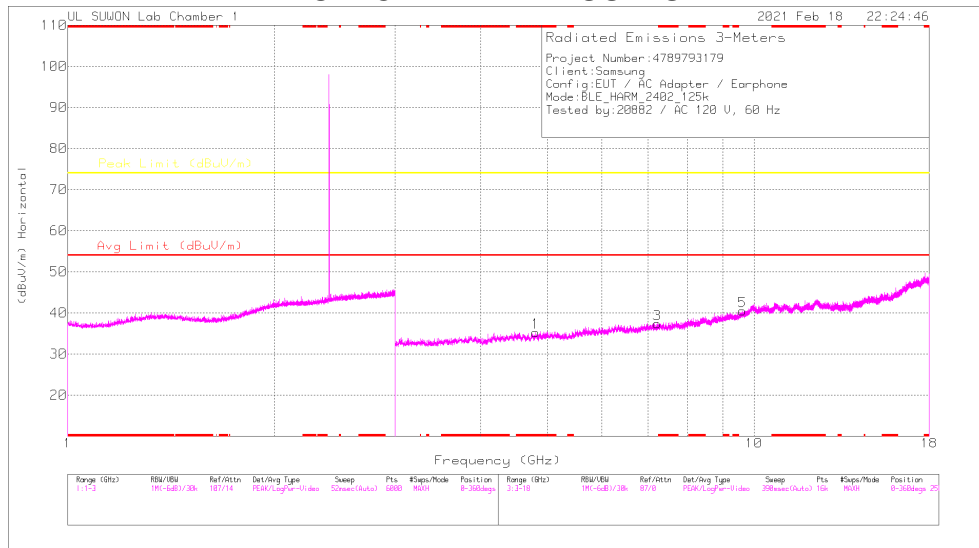
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	10dB_ATT[dB]	DC Corr (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	42.84	PK	32	-25.3	0	49.54	-	-	74	-24.46	199	345	V
2	* 2.49288	45.85	PK	32	-25.2	0	52.65	-	-	74	-21.35	199	345	V
3	* 2.4835	34.13	RMS	32	-25.3	.84	41.67	54	-12.33	-	-	199	345	V
4	2.56224	35.17	RMS	32.1	-25.1	.84	43.01	54	-10.99	-	-	199	345	V

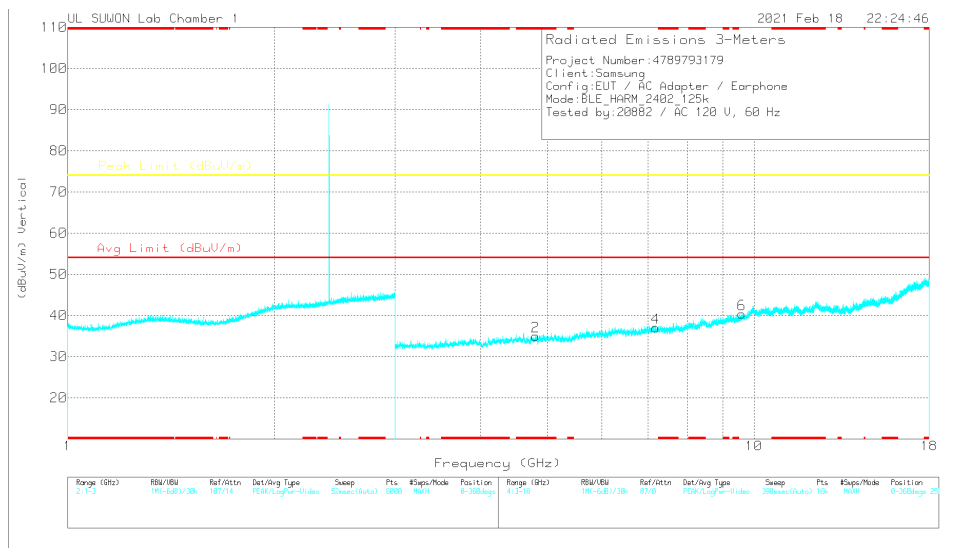
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

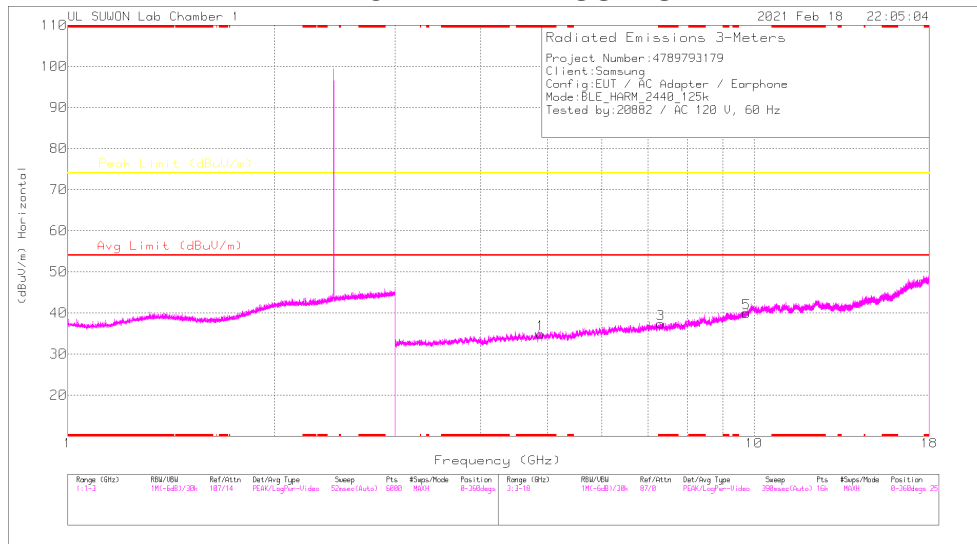
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

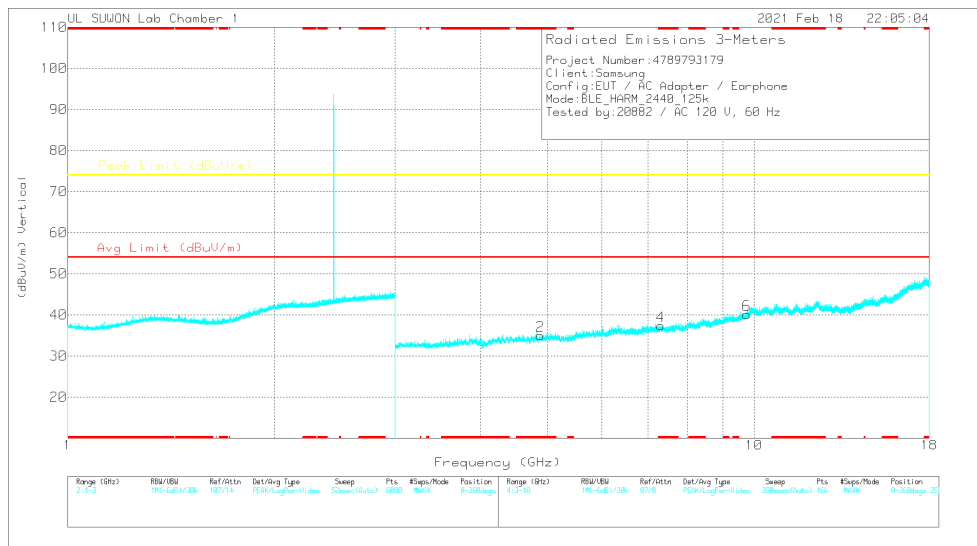
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	3GHz_HPI(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.80485	40.74	PK2	34.1	-31.4	0	43.44	-	-	74	-30.56	360	100	H
* 4.80579	40.92	PK2	34.1	-31.4	0	43.62	-	-	74	-30.38	360	100	V
7.22259	37.56	PK2	35.9	-27.5	0	45.96	-	-	74	-28.04	360	100	H
7.19447	37.83	PK2	35.9	-27.7	0	46.03	-	-	74	-27.97	360	100	V
9.62357	36.48	PK2	37.2	-23	0	50.68	-	-	74	-23.32	360	100	H
9.62274	35.5	PK2	37.2	-23.1	0	49.6	-	-	74	-24.4	360	100	V

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

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

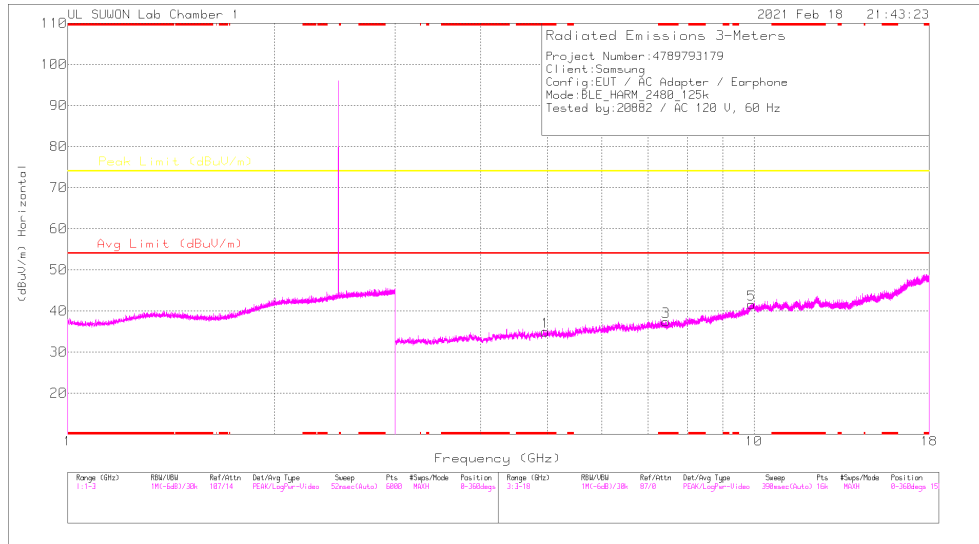
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

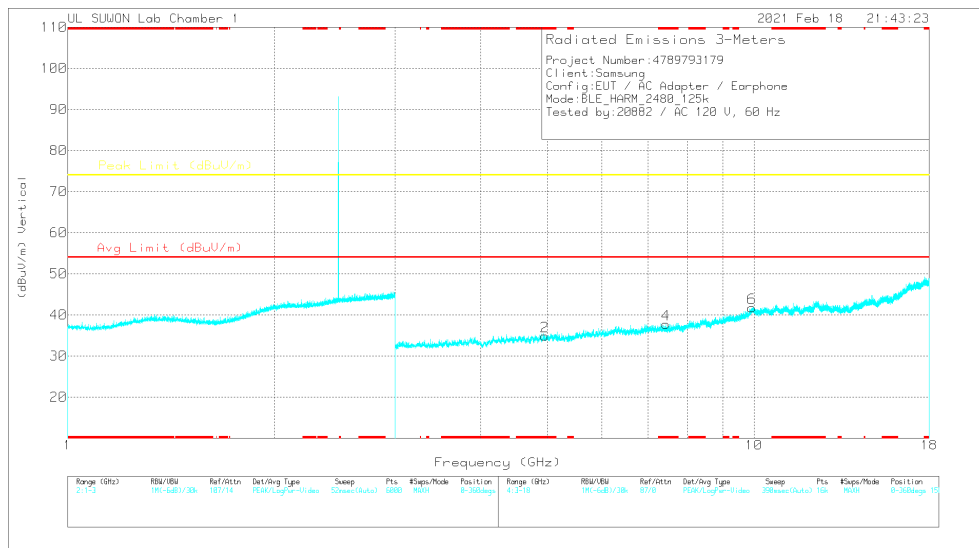
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	3GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.88591	41.01	PK2	34.1	-31.4	0	43.71	-	-	74	-30.29	360	100	H
* 4.87658	41.61	PK2	34.1	-31.4	0	44.31	-	-	74	-29.69	360	100	V
* 7.31955	38.52	PK2	35.8	-27.2	0	47.12	-	-	74	-26.88	360	100	H
* 7.31767	37.88	PK2	35.8	-27.4	0	46.28	-	-	74	-27.72	360	100	V
9.76063	35.58	PK2	37.4	-23.7	0	49.28	-	-	74	-24.72	360	100	H
9.76028	36.26	PK2	37.4	-23.7	0	49.96	-	-	74	-24.04	360	100	V

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

HIGH CHANNEL RESULTS



HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

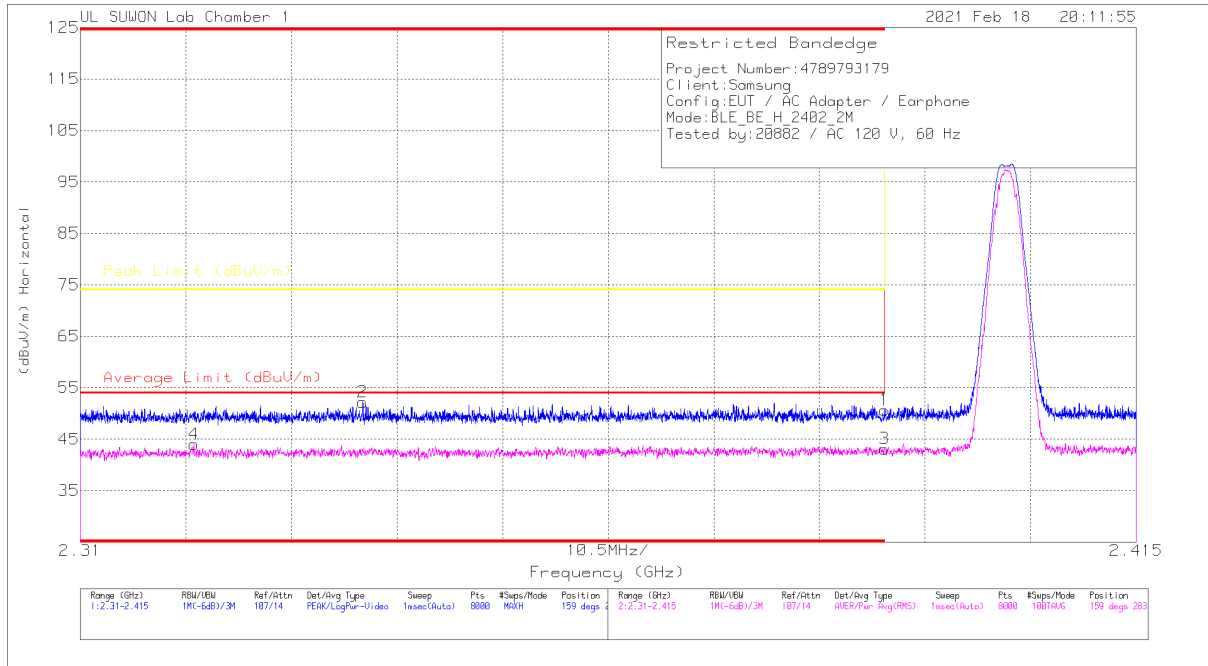
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	3GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.96205	40.77	PK2	34.1	-31.4	0	43.47	-	-	74	-30.53	360	100	H
* 4.96393	40.81	PK2	34.1	-31.4	0	43.51	-	-	74	-30.49	360	100	V
* 7.43827	37.79	PK2	35.8	-26.8	0	46.79	-	-	74	-27.21	360	100	H
* 7.43966	37.06	PK2	35.8	-26.8	0	46.06	-	-	74	-27.94	360	100	V
9.92135	35.23	PK2	37.7	-21.5	0	51.43	-	-	74	-22.57	360	100	H
9.92081	35.06	PK2	37.7	-21.6	0	51.16	-	-	74	-22.84	360	100	V

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

10.2.2. 2Mbps

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT

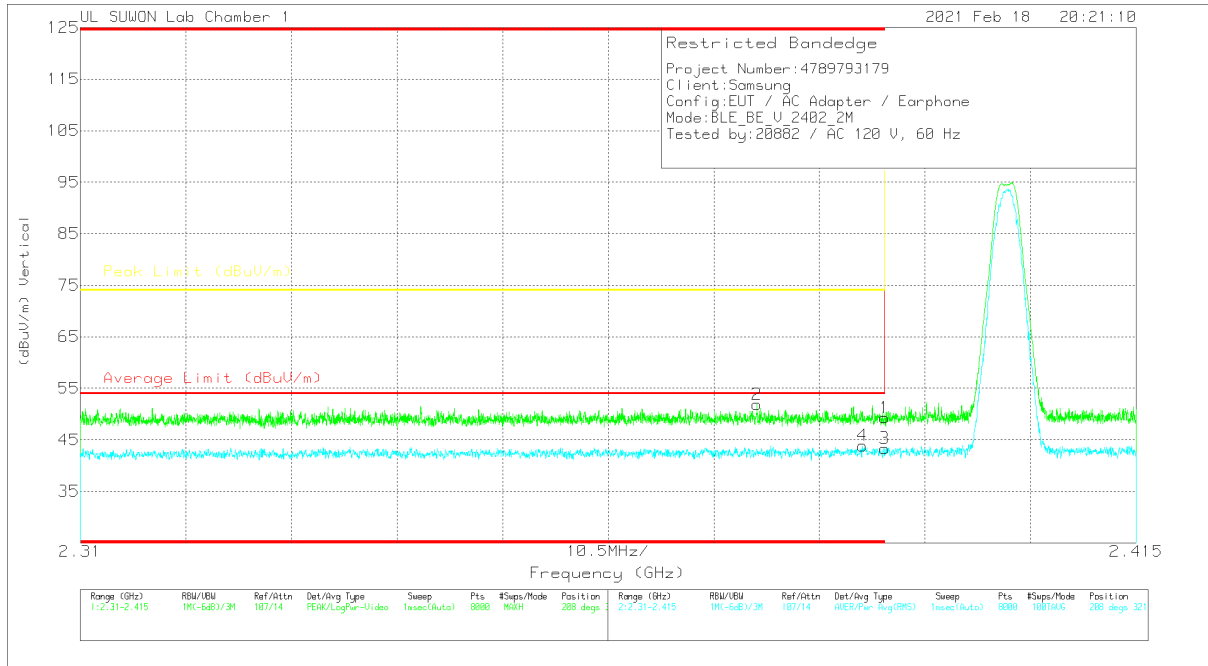


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	10dB_ATT[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Asimuth (Degs)	Height (cm)	Polarity
1	* 2.39	44.49	Pk	31.8	-25.6	0	50.69	-	-	74	-23.31	159	283	H
2	* 2.33809	46.09	Pk	31.7	-25.6	0	52.19	-	-	74	-21.81	159	283	H
3	* 2.39	34.49	RMS	31.8	-25.6	2.44	43.13	54	-10.87	-	-	159	283	H
4	* 2.32129	35.66	RMS	31.6	-25.7	2.44	44	54	-10	-	-	159	283	H

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

VERTICAL RESULT



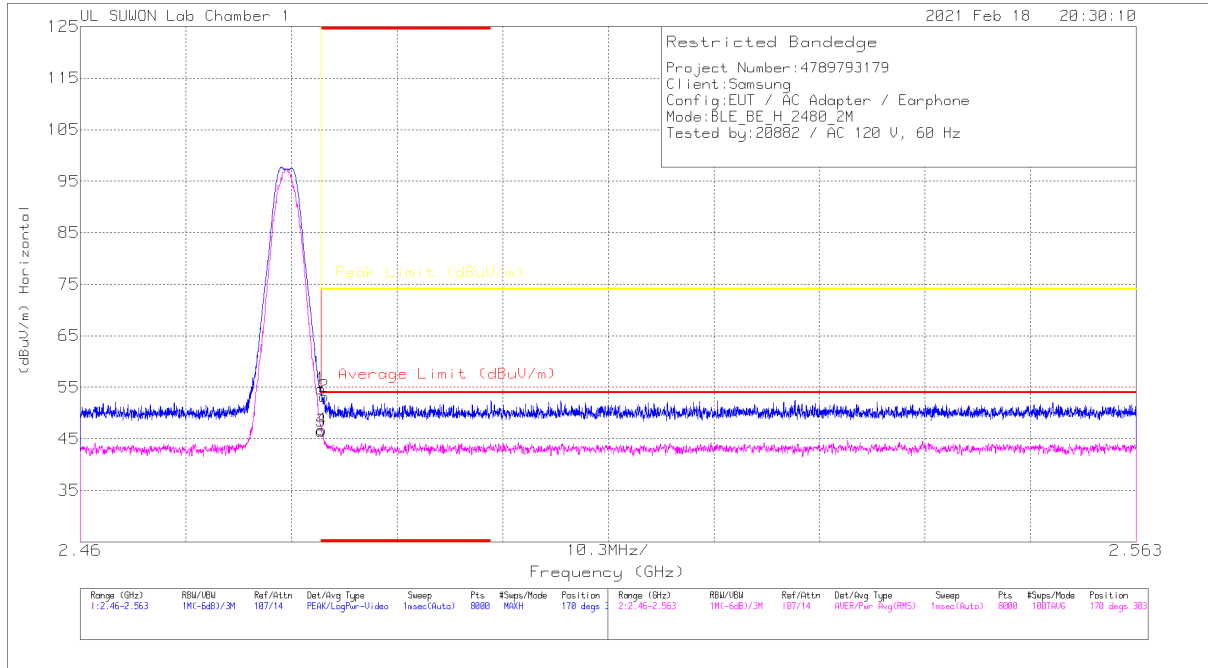
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	10dB_ATT[dB]	DC Cor (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	43.08	Pk	31.8	-25.6	0	49.28	-	-	74	-24.72	208	321	V
2	* 2.37728	45.57	Pk	31.8	-25.5	0	51.87	-	-	74	-22.13	208	321	V
3	* 2.39	34.68	RMS	31.8	-25.6	2.44	43.32	54	-10.68	-	-	208	321	V
4	* 2.38778	35.13	RMS	31.8	-25.5	2.44	43.87	54	-10.13	-	-	208	321	V

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

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT

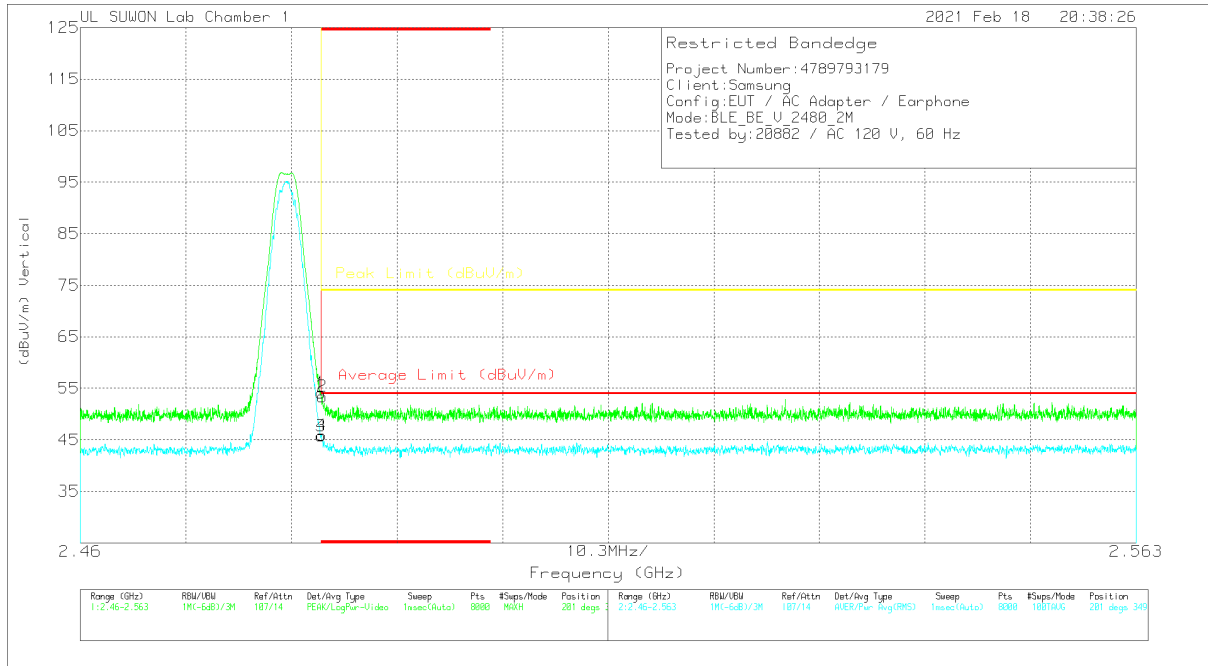


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	10dB_ATT(dB)	DC Cor (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	48.01	PK	32	-25.3	0	54.71	-	-	74	-19.29	170	303	H
2	* 2.48377	46.56	PK	32	-25.3	0	53.26	-	-	74	-20.74	170	303	H
3	* 2.4835	37.4	RMS	32	-25.3	2.44	46.54	54	-7.46	-	-	170	303	H
4	* 2.48354	37.63	RMS	32	-25.3	2.44	46.77	54	-7.23	-	-	170	303	H

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

VERTICAL RESULT



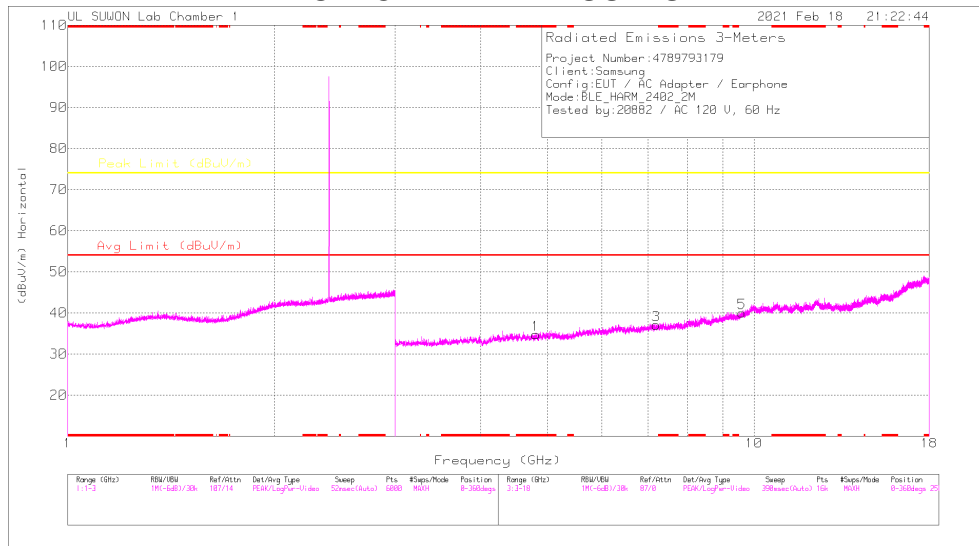
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	10dB_ATT[dB]	DC Cor (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	47.38	Pk	32	-25.3	0	54.08	-	-	74	-19.92	201	349	V
2	* 2.48359	46.72	Pk	32	-25.3	0	53.42	-	-	74	-20.58	201	349	V
3	* 2.4835	36.62	RMS	32	-25.3	2.44	45.76	54	-8.24	-	-	201	349	V
4	* 2.48354	36.73	RMS	32	-25.3	2.44	45.87	54	-8.13	-	-	201	349	V

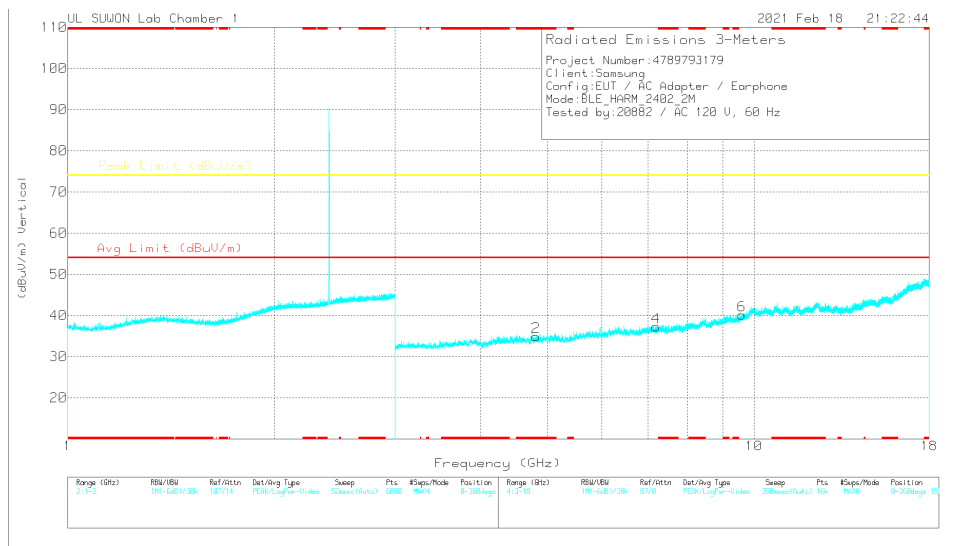
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

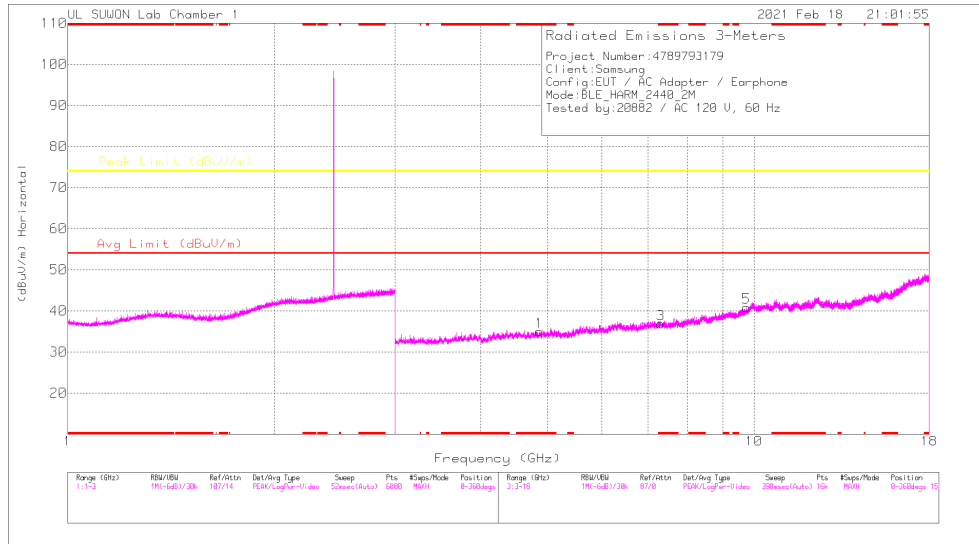
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

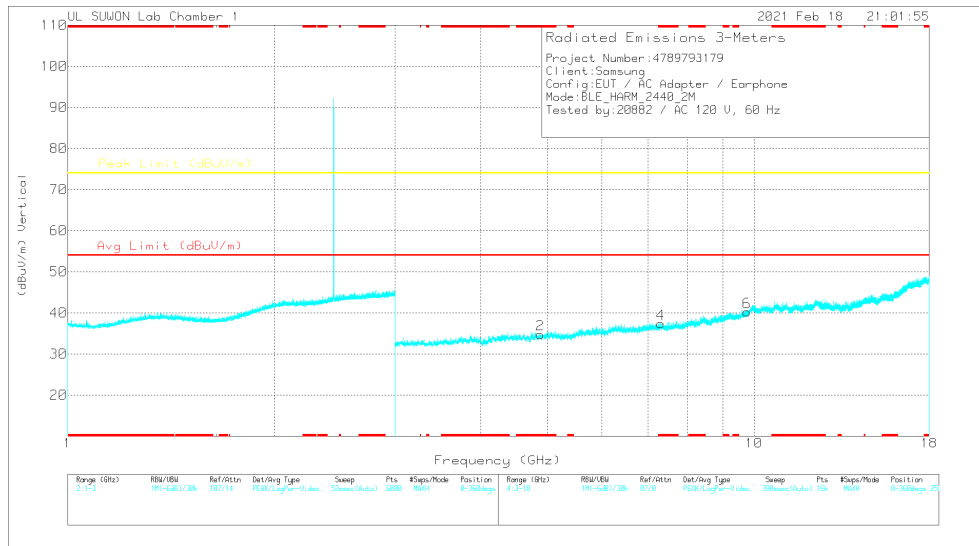
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	3GHz_HPI(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.81039	40.84	PK2	34.1	-31.5	0	43.44	-	-	74	-30.56	360	100	H
* 4.80849	42	PK2	34.1	-31.4	0	44.7	-	-	74	-29.3	360	100	V
7.20626	38.27	PK2	35.9	-27.5	0	46.67	-	-	74	-27.33	360	100	H
7.20689	37.81	PK2	35.9	-27.6	0	46.11	-	-	74	-27.89	360	100	V
9.60756	34.85	PK2	37.1	-23	0	48.95	-	-	74	-25.05	360	100	H
9.6094	34.99	PK2	37.1	-23	0	49.09	-	-	74	-24.91	360	100	V

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

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

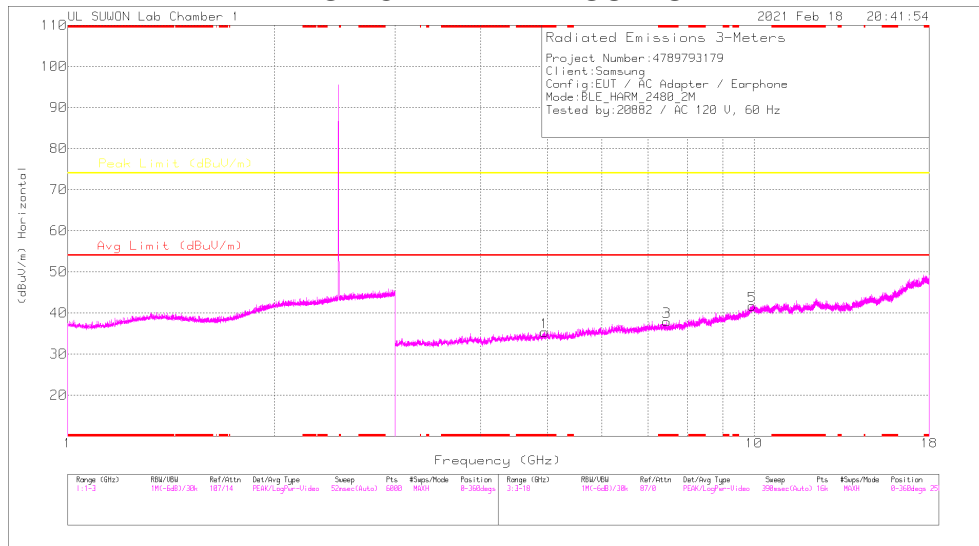
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

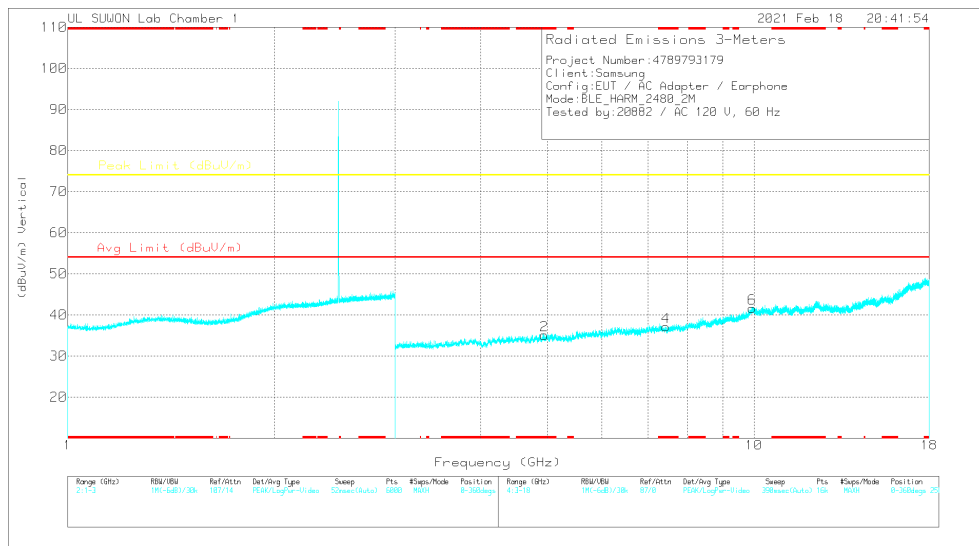
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	3GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.86644	41.88	PK2	34.1	-31.4	0	44.58	-	-	74	-29.42	360	100	H
* 4.87807	40.31	PK2	34.1	-31.4	0	43.01	-	-	74	-30.99	360	100	V
* 7.31672	38.13	PK2	35.8	-27.4	0	46.53	-	-	74	-27.47	360	100	H
* 7.31539	37.76	PK2	35.8	-27.4	0	46.16	-	-	74	-27.84	360	100	V
9.75549	35.47	PK2	37.4	-23.7	0	49.17	-	-	74	-24.83	360	100	H
9.75319	36.36	PK2	37.4	-23.7	0	50.06	-	-	74	-23.94	360	100	V

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

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

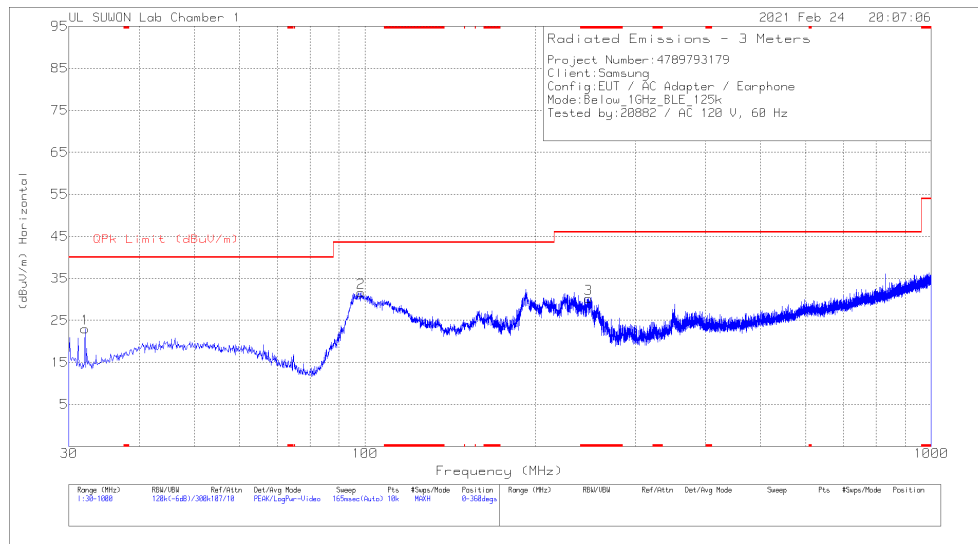
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168717	3GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.95381	41.42	PK2	34.1	-31.5	0	44.02	-	-	74	-29.98	360	100	H
* 4.95382	42.08	PK2	34.1	-31.5	0	44.68	-	-	74	-29.32	360	100	V
* 7.45744	37.16	PK2	35.8	-26.8	0	46.16	-	-	74	-27.84	360	100	H
* 7.45889	37.77	PK2	35.8	-26.9	0	46.67	-	-	74	-27.33	360	100	V
9.9318	34.15	PK2	37.7	-21.5	0	50.35	-	-	74	-23.65	360	100	H
9.93254	33.92	PK2	37.7	-21.5	0	50.12	-	-	74	-23.88	360	100	V

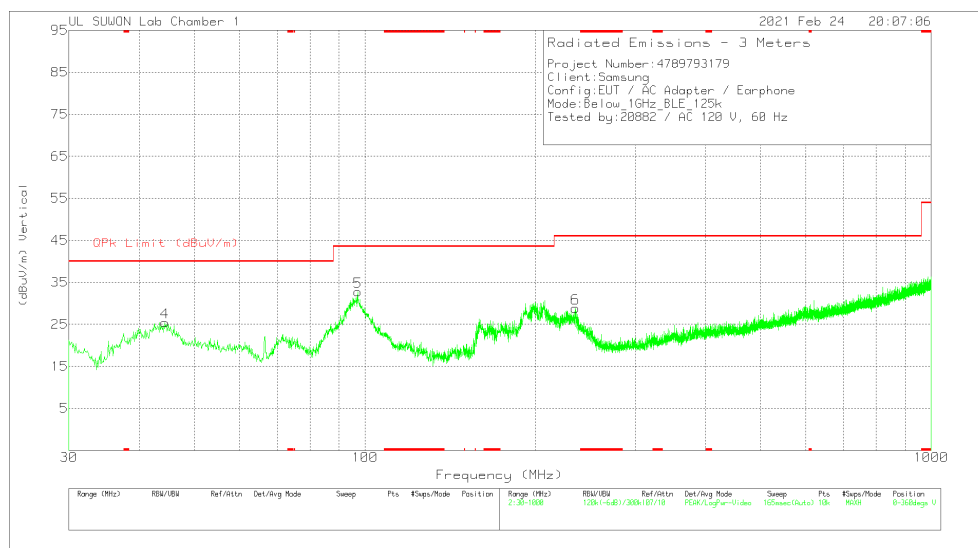
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK2 - KDB558074 Method: Maximum Peak

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_750	Below_1G[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	32.037	38.33	Pk	15.6	-30.9	0	23.03	40	-16.97	0-360	400	H
2	98.482	44.03	Pk	17.3	-29.7	0	31.63	43.52	-11.89	0-360	300	H
3	* 248.444	39.76	Pk	18.5	-28.1	0	30.16	46.02	-15.86	0-360	100	H
4	44.356	36.48	Pk	19.6	-30.6	0	25.48	40	-14.52	0-360	100	V
5	97.124	45.37	Pk	17.1	-29.7	0	32.77	43.52	-10.75	0-360	100	V
6	235.349	38.97	Pk	17.9	-28	0	28.87	46.02	-17.15	0-360	100	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 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.

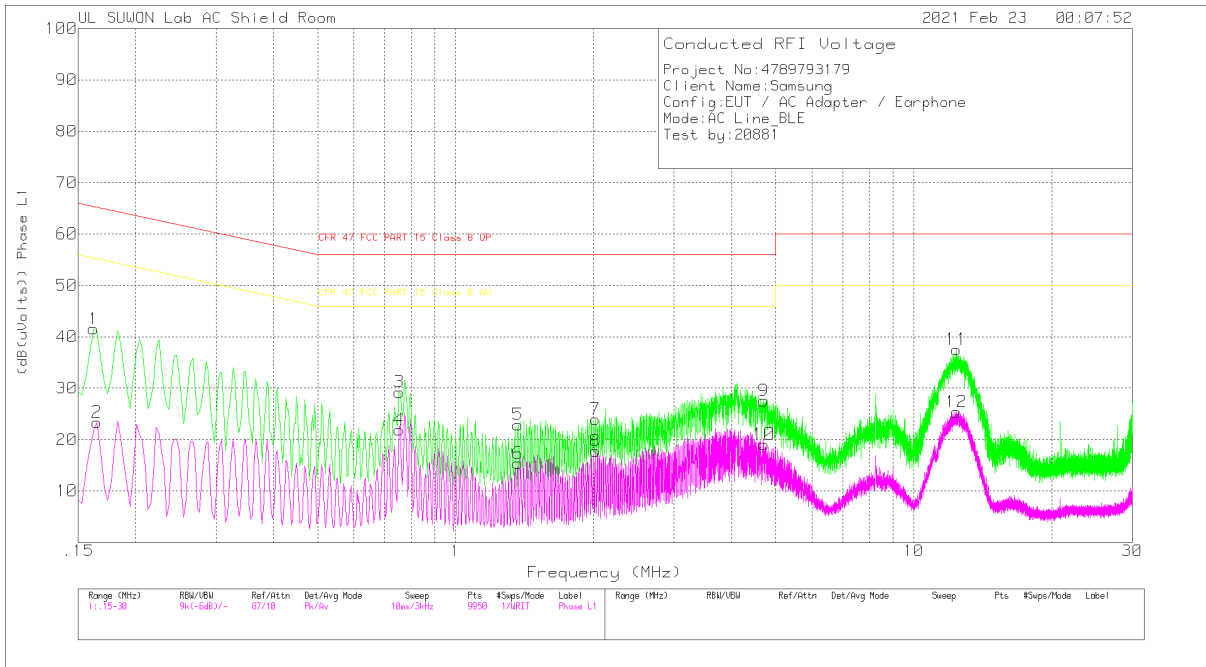
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

11.1.1. AC Power Line

LINE 1 RESULTS



Trace Markers

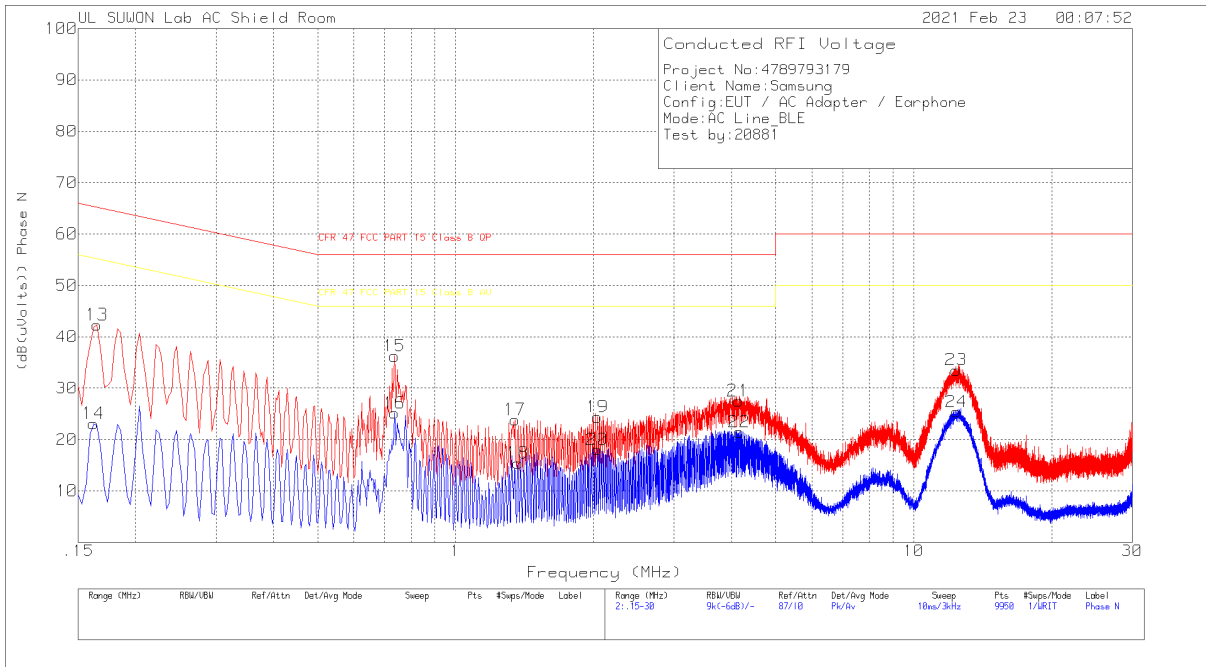
Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_L1[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
1	.162	31.53	Pk	9.9	.1	41.53	65.36	-23.83	-	-
2	.165	13.25	Av	10	.1	23.35	-	-	55.21	-31.86
3	.753	19.15	Pk	9.9	.2	29.25	56	-26.75	-	-
4	.753	11.81	Av	9.9	.2	21.91	-	-	46	-24.09
5	1.368	12.8	Pk	9.8	.3	22.9	56	-33.1	-	-
6	1.368	5.29	Av	9.8	.3	15.39	-	-	46	-30.61
7	2.019	13.96	Pk	9.7	.3	23.96	56	-32.04	-	-
8	2.019	7.79	Av	9.7	.3	17.79	-	-	46	-28.21
9	4.707	17.46	Pk	9.8	.3	27.56	56	-28.44	-	-
10	4.71	8.96	Av	9.8	.3	19.06	-	-	46	-26.94
11	12.387	27.24	Pk	10	.3	37.54	60	-22.46	-	-
12	12.387	15.06	Av	10	.3	25.36	-	-	50	-24.64

Pk - Peak detector

Av - Average detection

LINE 2 RESULTS



Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_N[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
13	.165	32.21	Pk	10	.1	42.31	65.21	-22.9	-	-
14	.162	13.01	Av	10	.1	23.11	-	-	55.36	-32.25
15	.735	26.15	Pk	9.9	.2	36.25	56	-19.75	-	-
16	.735	15.04	Av	9.9	.2	25.14	-	-	46	-20.86
17	1.347	13.74	Pk	9.8	.3	23.84	56	-32.16	-	-
18	1.368	5.33	Av	9.8	.3	15.43	-	-	46	-30.57
19	2.04	14.29	Pk	9.8	.3	24.39	56	-31.61	-	-
20	2.037	7.97	Av	9.8	.3	18.07	-	-	46	-27.93
21	4.14	17.41	Pk	9.8	.3	27.51	56	-28.49	-	-
22	4.161	11.35	Av	9.8	.3	21.45	-	-	46	-24.55
23	12.378	23.23	Pk	10	.3	33.53	60	-26.47	-	-
24	12.393	15.08	Av	10	.3	25.38	-	-	50	-24.62

Pk - Peak detector

Av - Average detection

END OF TEST REPORT