CERTIFICATION TEST REPORT

Report Number. : 4790841155-E6V1

Applicant	:	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
Model	:	SM-X516B
FCC ID	:	A3LSMX516B
EUT Description	:	GSM/WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax, and Digitizer
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C

Date Of Issue:
2023-07-18

Prepared by:
UL KOREA LTD.
26th floor, 152, Teheran-ro, Gangnam-gu Seoul, 06236, Korea

Suwon Test Site: UL KOREA LTD. Suwon Laboratory
218 Maeyeong-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16675, Korea
TEL: (031) 337-9902
FAX: (031) 213-5433

ACCREDITED
Testing Laboratory
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-07-18	Initial issue	Yeonhee Lim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax, and Digitizer.
MODEL NUMBER:	SM-X516B
SERIAL NUMBER:	74134cec50397ece (CONDUCTED); 74b2c4c8e3397ece (RADIATED);
DATE TESTED:	2023-06-29 ~ 2023-07-17;

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:

Seokhwan Hong
Suwon Lab Engineer
UL KOREA LTD.

Tested By:

Yeonhee Lim
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
☒ Chamber 1(3m semi-anechoic chamber)
☐ Chamber 2(3m semi-anechoic chamber)
☒ Chamber 3(3m semi-anechoic chamber)
☐ Chamber 4(3m Full-anechoic chamber)
☐ Chamber 5(3m Full-anechoic chamber)

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

AC Corrected Reading (dBuV) = Measured Voltage (dBuV) + Extension Cord Loss (dB) + Cable Loss (dB)
44.72 dBuV = 34.72 dBuV + 9.9 dB + 0.1 dB

4.3. 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	2.80 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.92 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.06 dB
Radiated Disturbance, 18 GHz to 40 GHz	6.02 dB

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

4.4. DECISION RULES

Decision rule for statement(s) of conformity is based on Procedure 2, Clause 4.4.3 in IEC Guide 115:2021.

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE 5G NR Tablet + BT/BLE, DTS/UNII a/b/g/n/ac/ax, and Digitizer. This test report addresses the DTS (BLE) operational mode.

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	500 kbps (37 pkt)	Peak	14.290	26.853
		Average	14.045	25.380
	2 Mbps (37 pkt)	Peak	14.390	27.479
		Average	13.948	24.820

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 ANT1 maximum gain of -4.80 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.

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

Power verification

The Output Power of all data rate are all investigated, the 500 kbps (37 pkt) and 2 Mbps (37 pkt) power is the worst case for symbol rate. All tests were performed in these two modes.

Symbol Rate [Ms/s]	Mode	Freq. [MHz]	Conducted Burst Avg [dBm]	Symbol Rate [Ms/s]	Mode	Freq. [MHz]	Conducted Burst Avg [dBm]
1	1 Mbps 37 pkt	2 402	13.992	2	2 Mbps 37 pkt	**2 402**	**13.948**
		2 440	13.666			2 440	13.541
		2 480	10.787			2 480	10.669
	1 Mbps 255 pkt	2 402	13.935		2 Mbps 255 pkt	2 402	13.866
		2 440	13.647			2 440	13.577
		2 480	10.757			2 480	10.692
1 Coded S=8	125 kbps 37 pkt	2 402	13.903	2 Coded S=2	500 kbps 37 pkt	**2 402**	**14.045**
		2 440	13.635			2 440	13.752
		2 480	10.776			2 480	10.827
	125 kbps 255 pkt	2 402	13.858		500 kbps 255 pkt	2 402	13.920
		2 440	13.596			2 440	13.642
		2 480	10.693			2 480	10.715

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-TA800	R37M9KML7D2DK3	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02115A	N/A

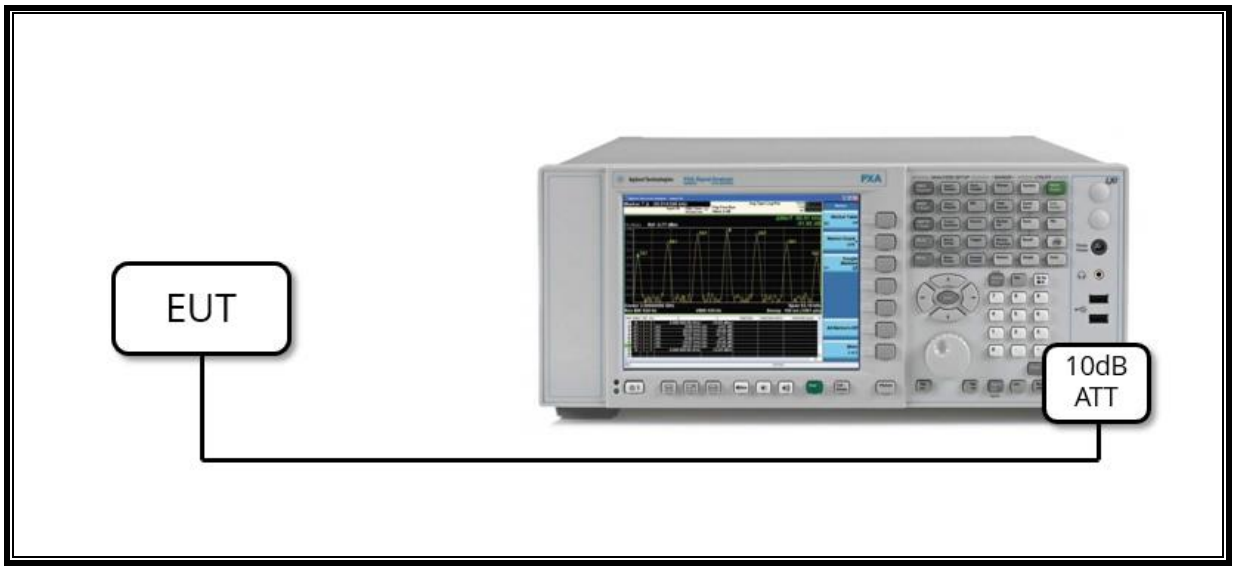
I/O CABLE

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

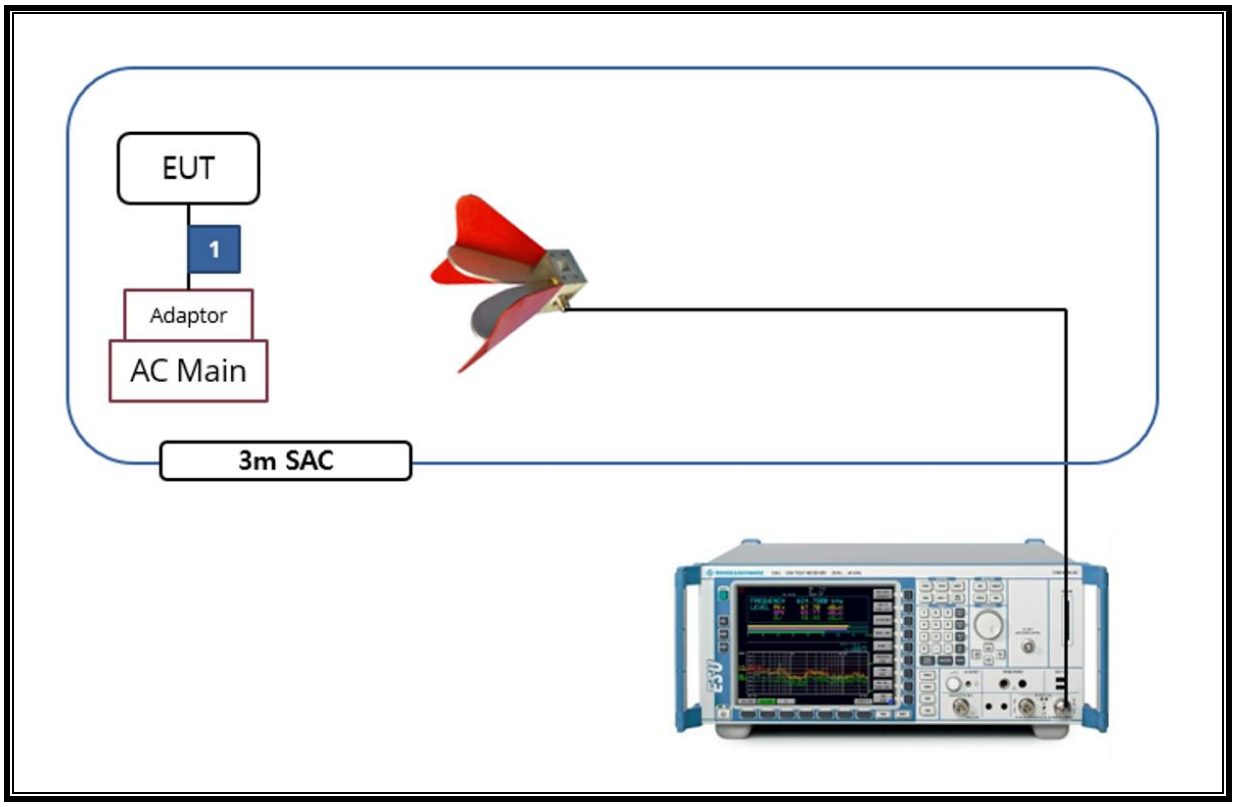
TEST SETUP

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 : ANSI C63.10-2013, Section 11.8.2 Option 2

OUTPUT POWER : ANSI C63.10-2013, Section 11.9.1.1 RBW ≥ DTS bandwidth

POWER SPECTRAL DENSITY : ANSI C63.10-2013, Section 11.10.2 Method PKPSD (peak PSD)

Out-of-band Emissions (Conducted) : ANSI C63.10-2013, Section 11.11 Emissions in nonrestricted frequency bands

Out-of-band Emissions in Non-restricted Bands: ANSI C63.10-2013, Section 11.11 Emissions in nonrestricted frequency bands

Out-of-band Emissions in Restricted Bands : ANSI C63.10-2013, Section 11.12 Emissions in restricted frequency bands

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	2024-08-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2024-08-15
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2024-08-15
Antenna, Horn, 18 GHz	ETS	3115	00167211	2024-08-04
Antenna, Horn, 18 GHz	ETS	3115	00161451	2024-08-21
Antenna, Horn, 18 GHz	ETS	3117	00168724	2024-08-04
Antenna, Horn, 18 GHz	ETS	3117	00168717	2024-08-21
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2024-08-02
Preamplifier	ETS	3115-PA	00167475	2023-08-04
Preamplifier	ETS	3116C-PA	00168841	2023-08-04
Preamplifier, 1000 MHz	Sonoma	310N	341282	2023-08-02
Preamplifier, 1000 MHz	Sonoma	310N	351741	2023-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2023-08-01
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	2023-08-01
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2023-08-03
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2023-08-01
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY60070693	2024-01-09
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9040B	MY60080268	2024-01-09
Average Power Sensor	Agilent / HP	U2000A	MY54270007	2023-08-03
Average Power Sensor	Agilent / HP	U2000A	MY54260010	2023-08-03
Attenuator	PASTERNACK	PE7087-10	A001	2023-08-03
Attenuator	PASTERNACK	PE7087-10	A008	2023-08-03
Attenuator	PASTERNACK	PE7004-10	2	2023-08-01
Attenuator	PASTERNACK	PE7087-10	A009	2023-08-03
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2023-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2023-07-29
EMI Test Receive, 3 GHz	R&S	ESR3	101832	2023-08-01
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2023-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	2023-08-01
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	2023-08-01
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2023-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	2023-08-01
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	2023-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	2023-08-01
LISN	R&S	ENV-216	101837	2023-08-04
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	2023-10-06

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	Complies
2.1051, 15.247(d)	Band Edge / Conducted Spurious Emission	-20 dBc		Complies
15.247 (b)(3)	TX conducted output power	< 30 dBm		Complies
15.247(e)	PSD	< 8 dBm/3kHz		Complies
15.207(a)	AC Power Line conducted emissions	Section 11	Power Line conducted	Complies
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m(Av)	Radiated	Complies

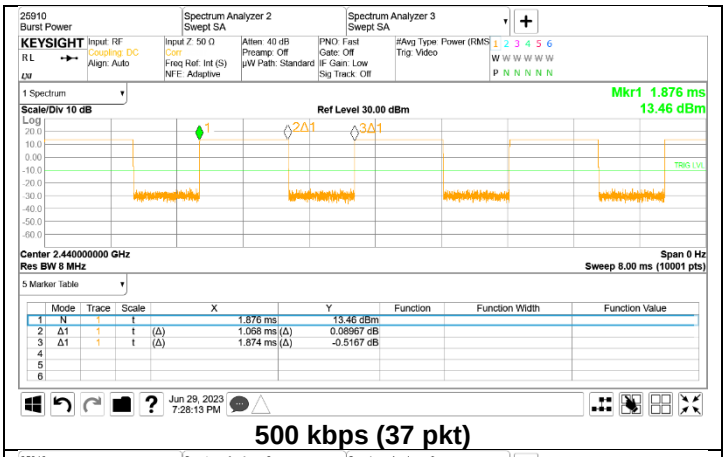
9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

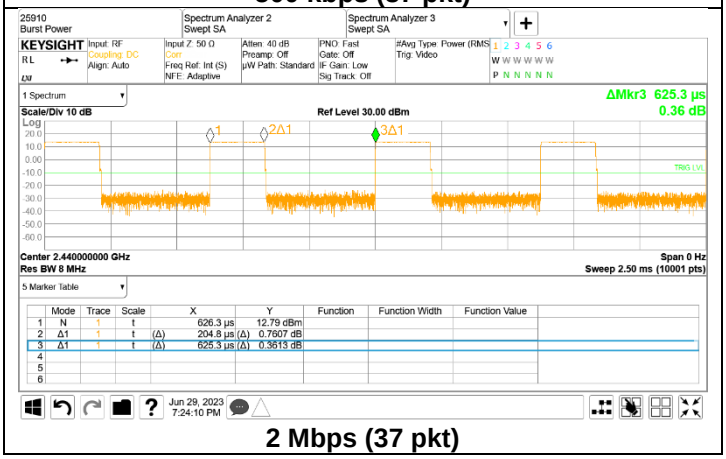
LIMITS

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 VBW [kHz]
2 400 ~ 2 483.5 MHz Bands						
500 kbps [37 pkt]	1.068	1.874	0.570	56.990	2.44	0.94
2 Mbps [37 pkt]	0.205	0.625	0.328	32.800	4.84	4.89



500 kbps (37 pkt)



2 Mbps (37 pkt)

9.2. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

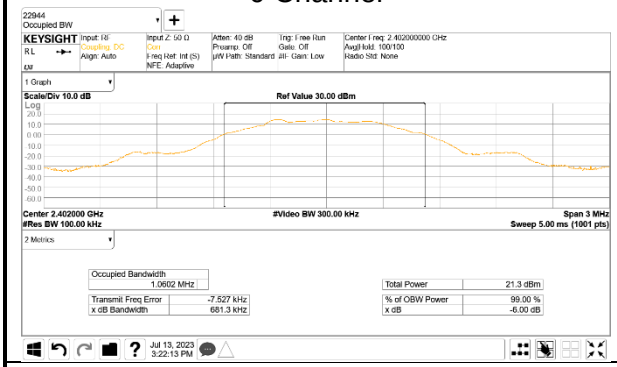
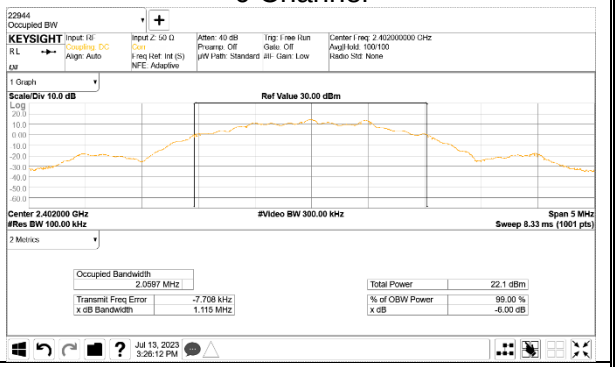
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

9.2.1. Test data

Mode	Channel	Frequency [MHz]	6 dB Bandwidth [kHz]	Minimum Limit [kHz]
500 kbps (37 pkt)	0	2 402	681.3	500.0
	19	2 440	663.7	
	39	2 480	**661.4**	
2 Mbps (37 pkt)	0	2 402	1115.0	
	19	2 440	1114.0	
	39	2 480	1121.0	
Worst			**673.1**	

9.2.2. 6 dB BANDWIDTH PLOTS

500 kbps	2 Mbps
0 Channel	0 Channel
	
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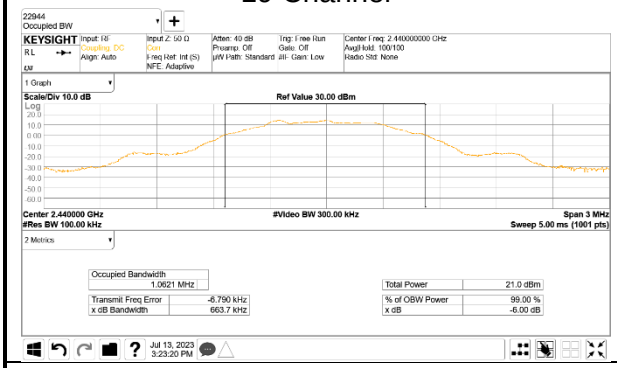
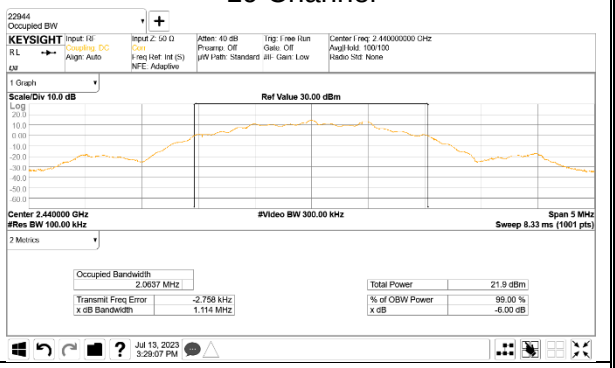
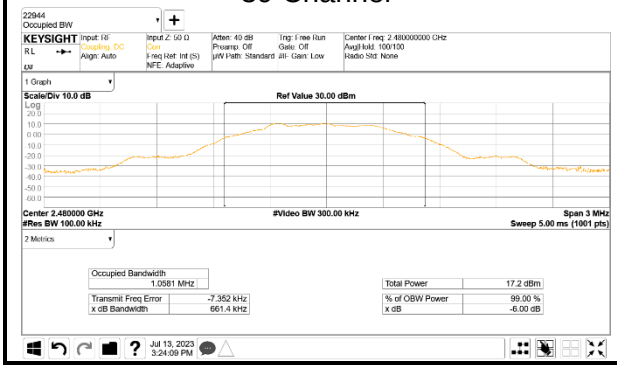
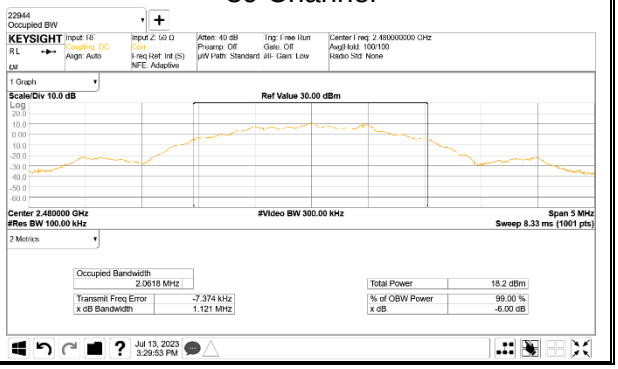
	
39 Channel	39 Channel
	

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

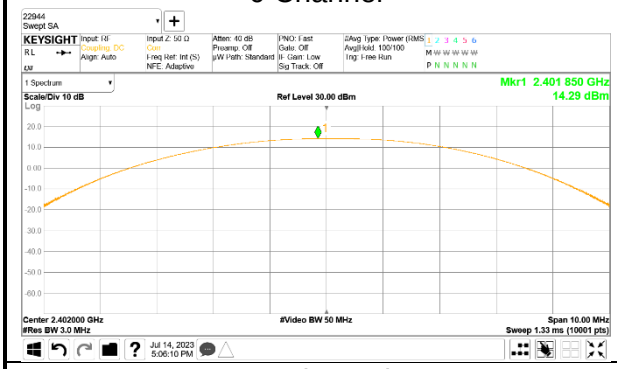
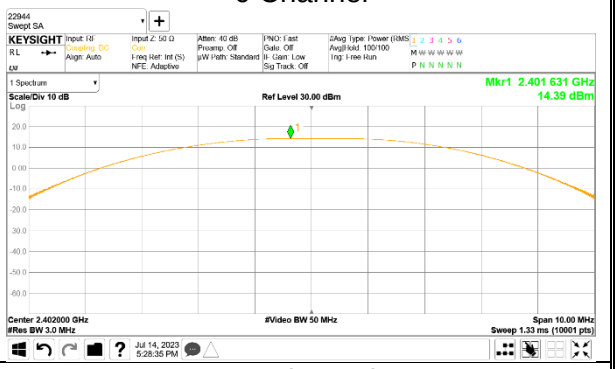
Peak power is measured using ANSI C63.10(2013) under section 11.9.1.1 utilizing spectrum analyzer(RBW ≧ DTS bandwidth).

RESULTS

9.3.1. Test data

Mode	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
500 kbps (37 pkt)	0	2 402	14.290	30.000	-15.710
	19	2 440	14.020		-15.980
	39	2 480	11.090		-18.910
2 Mbps (37 pkt)	0	2 402	**14.390**		**-15.610**
	19	2 440	14.060		-15.940
	39	2 480	11.200		-18.800
Worst			**14.390**		**-15.610**

9.3.2. PEAK POWER PLOTS

500 kbps	2 Mbps
0 Channel	0 Channel
	
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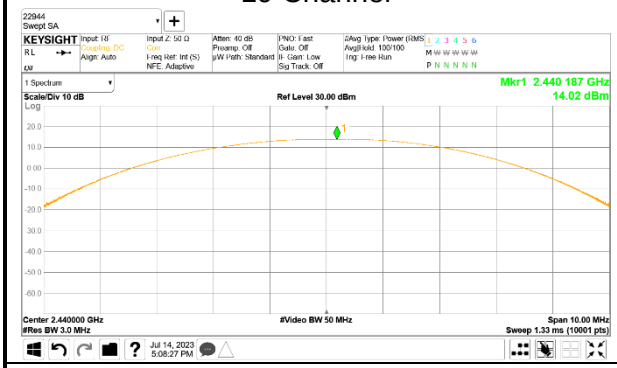	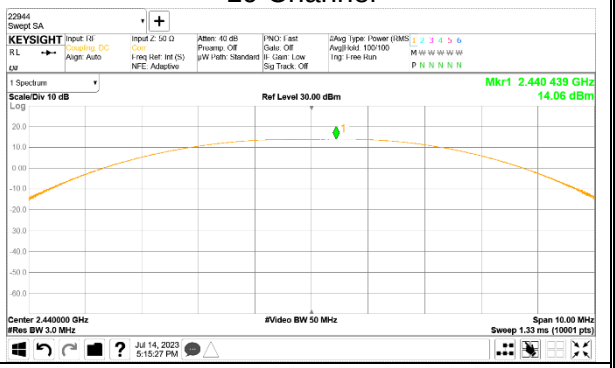
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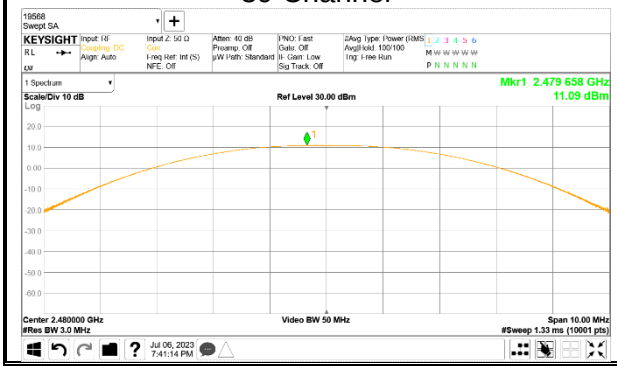
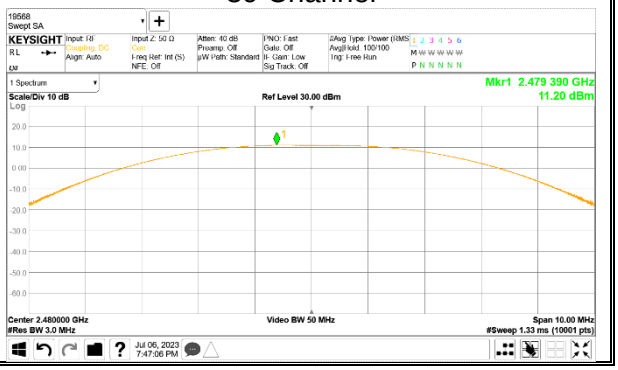
	

9.4. AVERAGE POWER

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. Test data

Mode	Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
500 kbps (37 pkt)	0	2 402	**14.045**	**25.380**
	19	2 440	13.752	23.725
	39	2 480	10.827	12.098
2 Mbps (37 pkt)	0	2 402	**13.948**	**24.820**
	19	2 440	13.541	22.600
	39	2 480	10.669	11.665

9.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

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.

TEST PROCEDURE

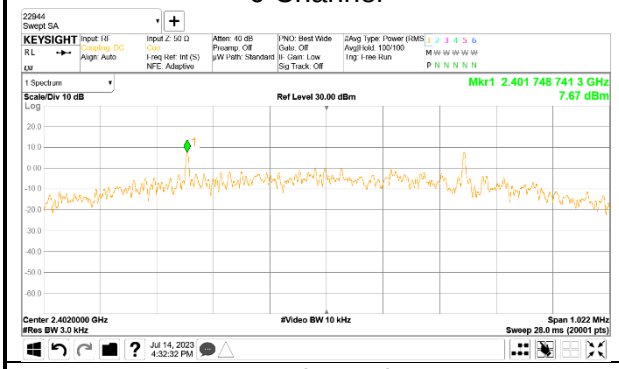
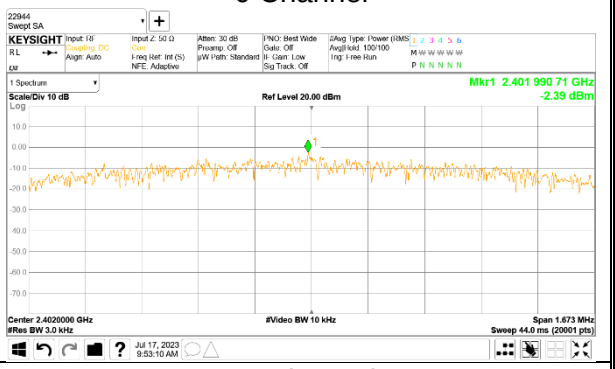
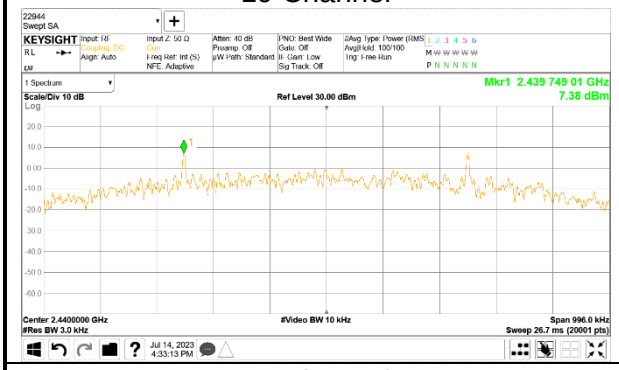
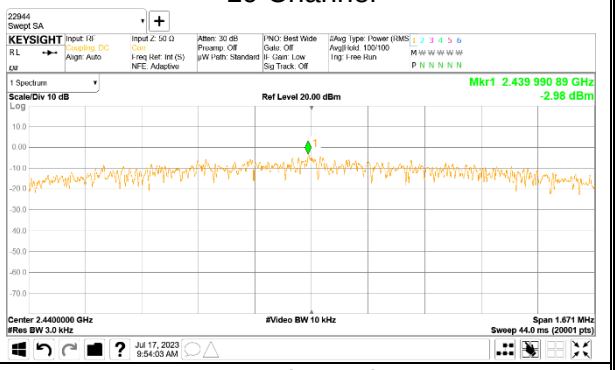
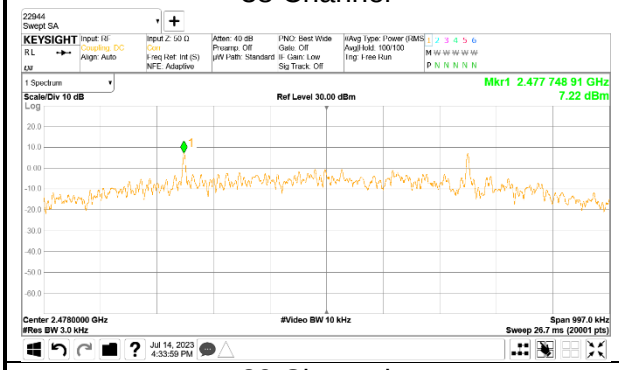
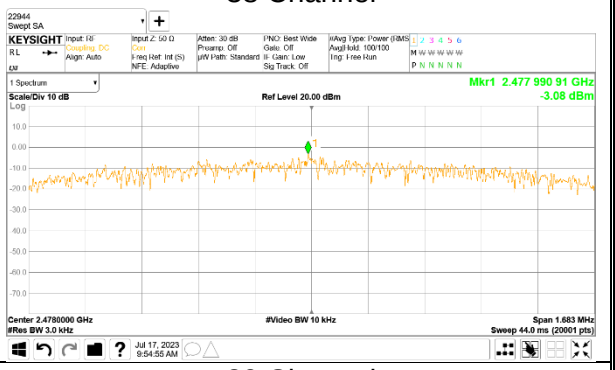
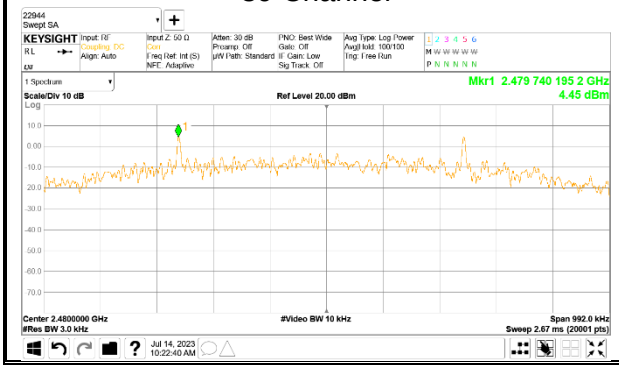
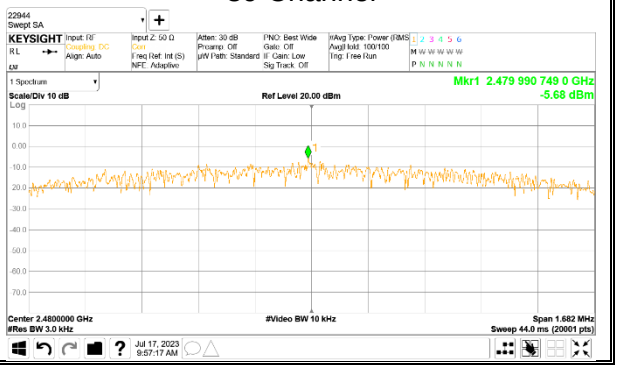
ANSI C63.10-2013, Section 11.10.2 Method PKPSD (peak PSD)

RESULTS

9.5.1. Test data

Mode	Channel	Frequency [MHz]	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Margin [dB]
500 kbps (37 pkt)	0	2 402	**7.67**	8.00	**-0.33**
	19	2 440	7.38		-0.62
	38	2 478	7.22		-0.78
	39	2 480	4.45		-3.55
2 Mbps (37 pkt)	0	2 402	-2.39		-10.39
	19	2 440	-2.98		-10.98
	38	2 478	-3.08		-11.08
	39	2 480	-5.68		-13.68
Worst			**7.67**		**-0.33**

9.5.2. PSD TEST PLOTS

500 kbps	2 Mbps
0 Channel	0 Channel
	
19 Channel	19 Channel
	
38 Channel	38 Channel
	
39 Channel	39 Channel
	

9.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

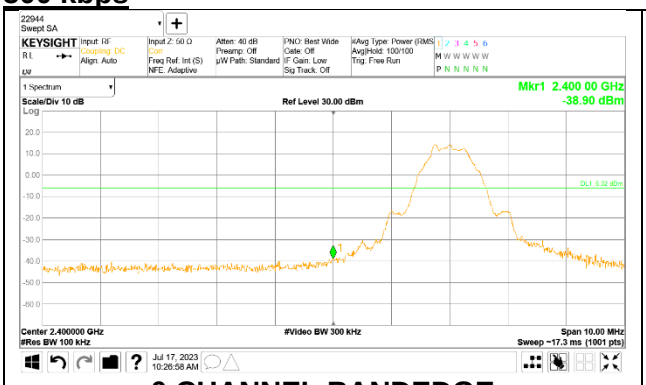
FCC §15.247 (d)

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

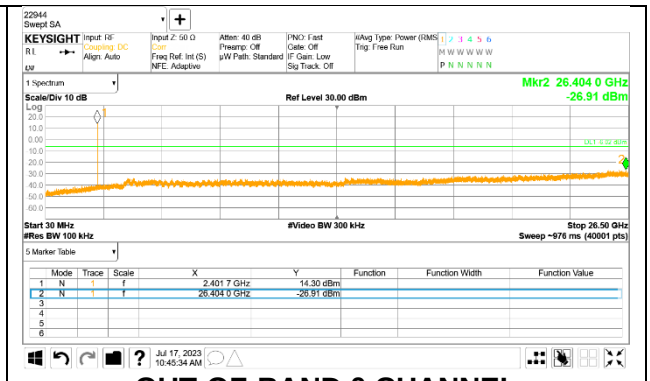
RESULTS

9.6.1. Test plot

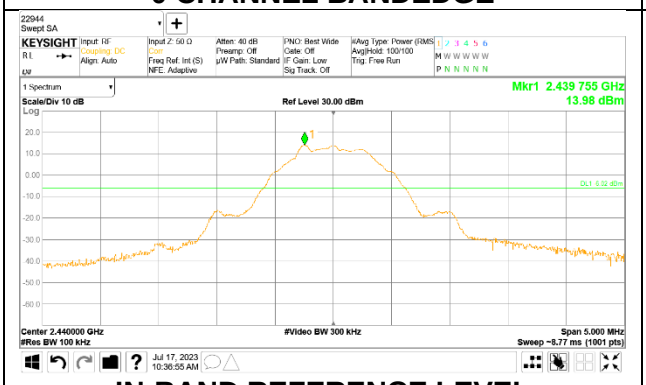
500 kbps



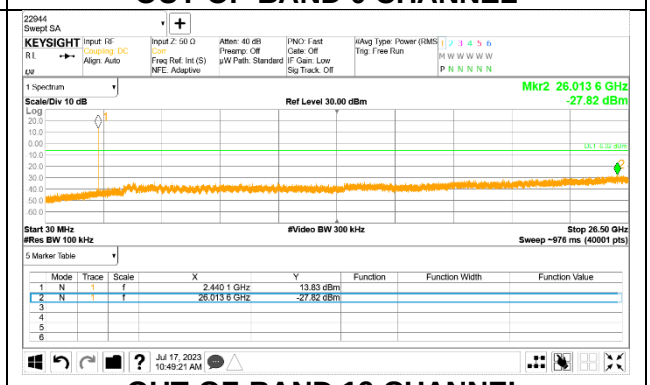
0 CHANNEL BANDEDGE



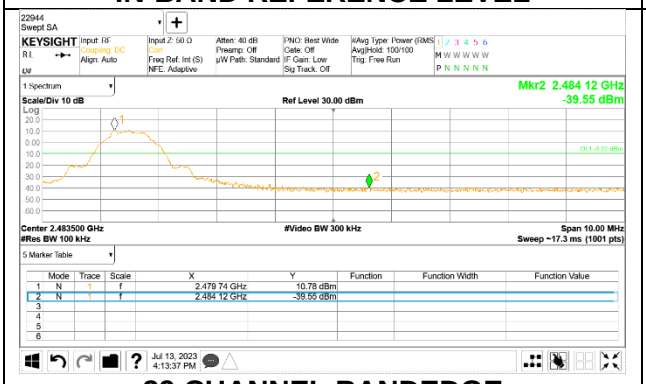
OUT-OF-BAND 0 CHANNEL



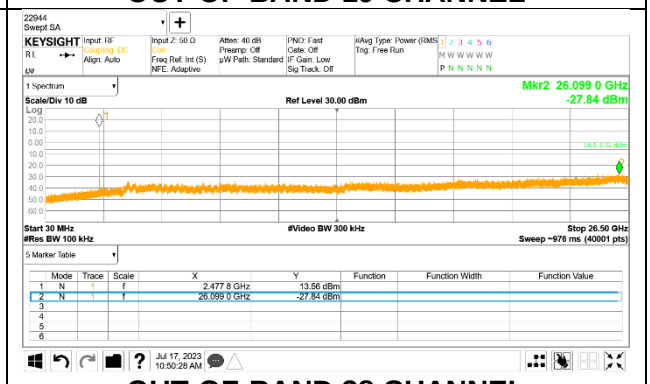
IN-BAND REFERENCE LEVEL



OUT-OF-BAND 19 CHANNEL

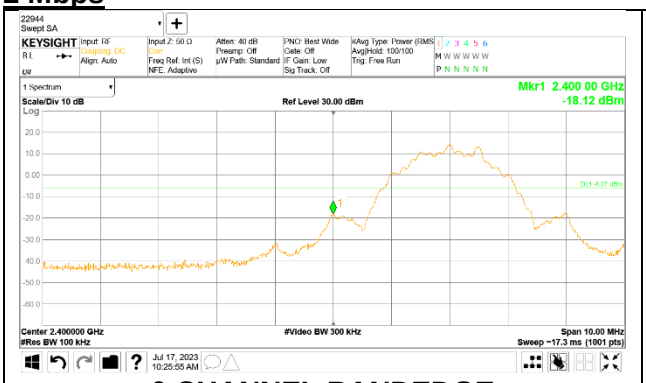


39 CHANNEL BANDEDGE

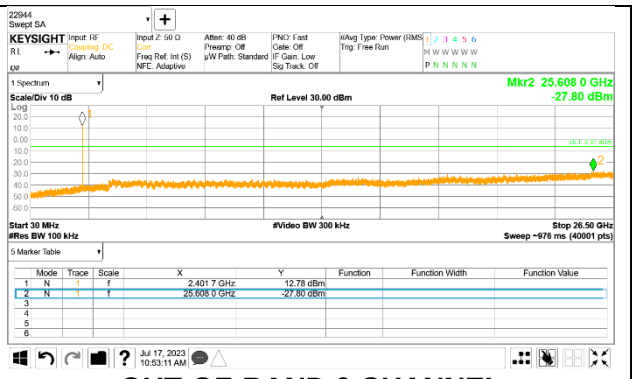


OUT-OF-BAND 38 CHANNEL

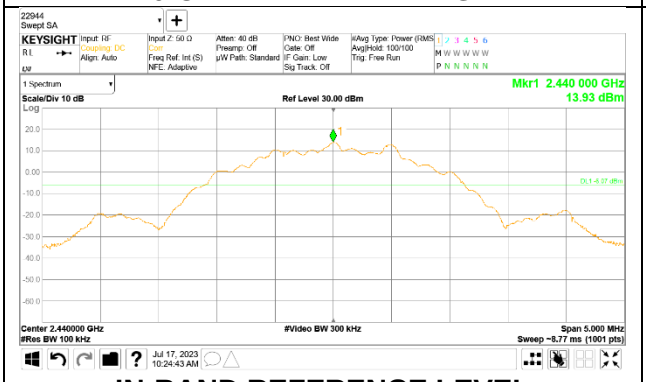
2 Mbps



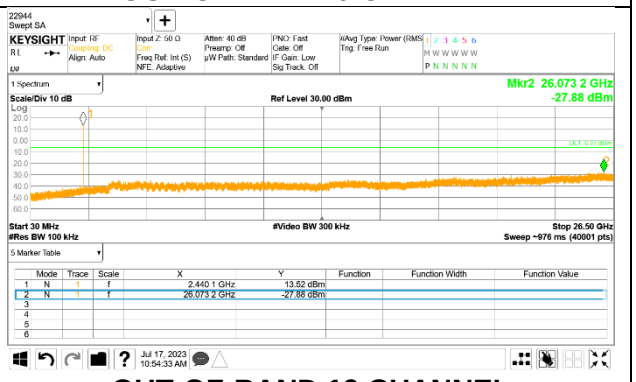
0 CHANNEL BANDEDGE



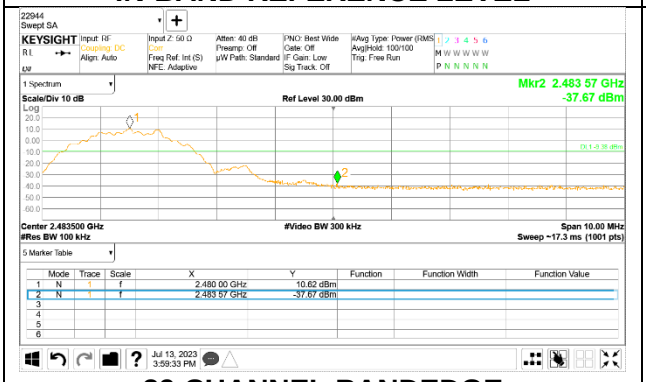
OUT-OF-BAND 0 CHANNEL



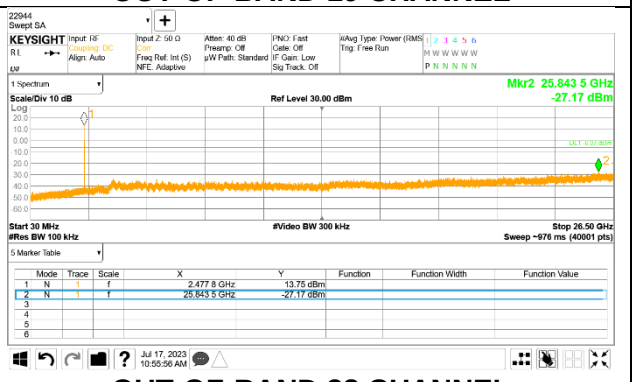
IN-BAND REFERENCE LEVEL



OUT-OF-BAND 19 CHANNEL



39 CHANNEL BANDEDGE



OUT-OF-BAND 38 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.

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 band-edge, Final detection of spurious harmonic emissions)
Duty cycle factor = 10 log (1/x). For this sample: For 500 kbps, DCF = 10log(1/0.570)=2.441 dB (Spectrum Analyzer round it up to 2.44 dB) and for 2 Mbps, DCF = 10log(1/0.328)=4.841 dB (Spectrum Analyzer round it up to 4.84 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.

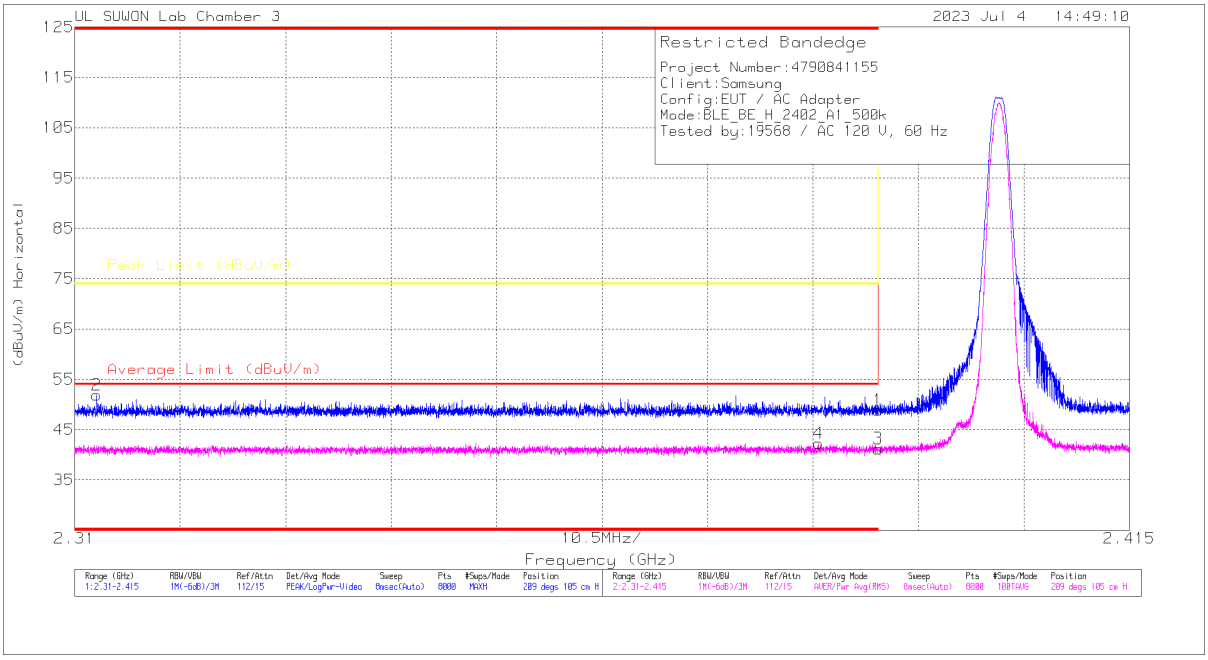
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field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

10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. 500 kbps

BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT

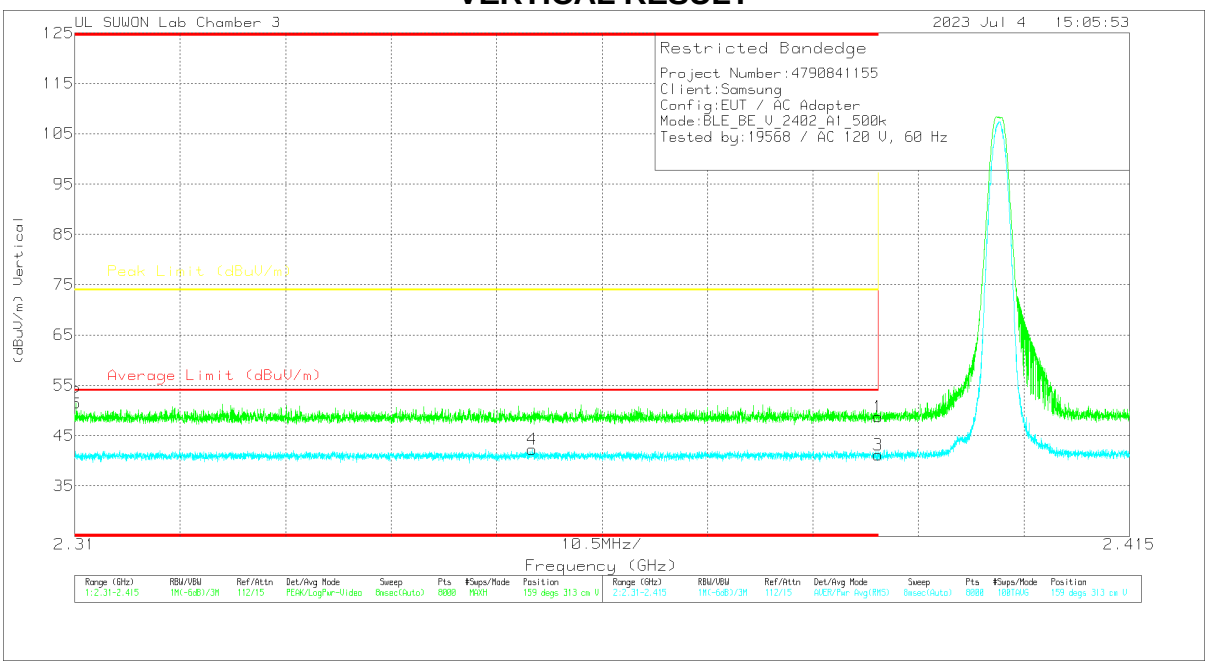


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	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	* 2.39	41.93	Pk	32.1	-25.1	0	48.93	-	-	74	-25.07	209	105	H
2	* 2.31219	45.13	Pk	31.8	-25.1	0	51.83	-	-	74	-22.17	209	105	H
3	* 2.39	31.78	RMS	32.1	-25.1	2.44	41.22	54	-12.78	-	-	209	105	H
4	* 2.38402	32.85	RMS	32.1	-25.1	2.44	42.29	54	-11.71	-	-	209	105	H

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

VERTICAL RESULT



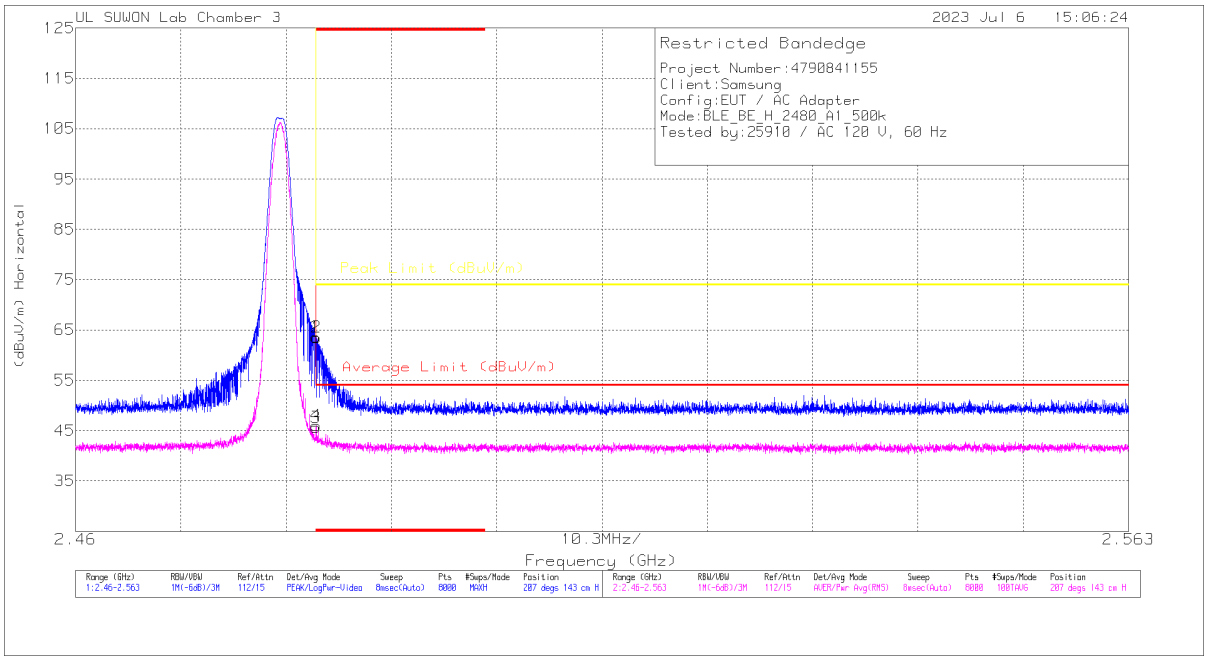
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	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	* 2.39	41.74	Pk	32.1	-25.1	0	48.74	-	-	74	-25.26	159	313	V
2	* 2.31014	44.77	Pk	31.8	-25.1	0	51.47	-	-	74	-22.53	159	313	V
3	* 2.39	31.72	RMS	32.1	-25.1	2.44	41.16	54	-12.84	-	-	159	313	V
4	* 2.35555	32.97	RMS	32	-25.1	2.44	42.31	54	-11.69	-	-	159	313	V

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

BANDEDGE (39 CHANNEL)

HORIZONTAL RESULT

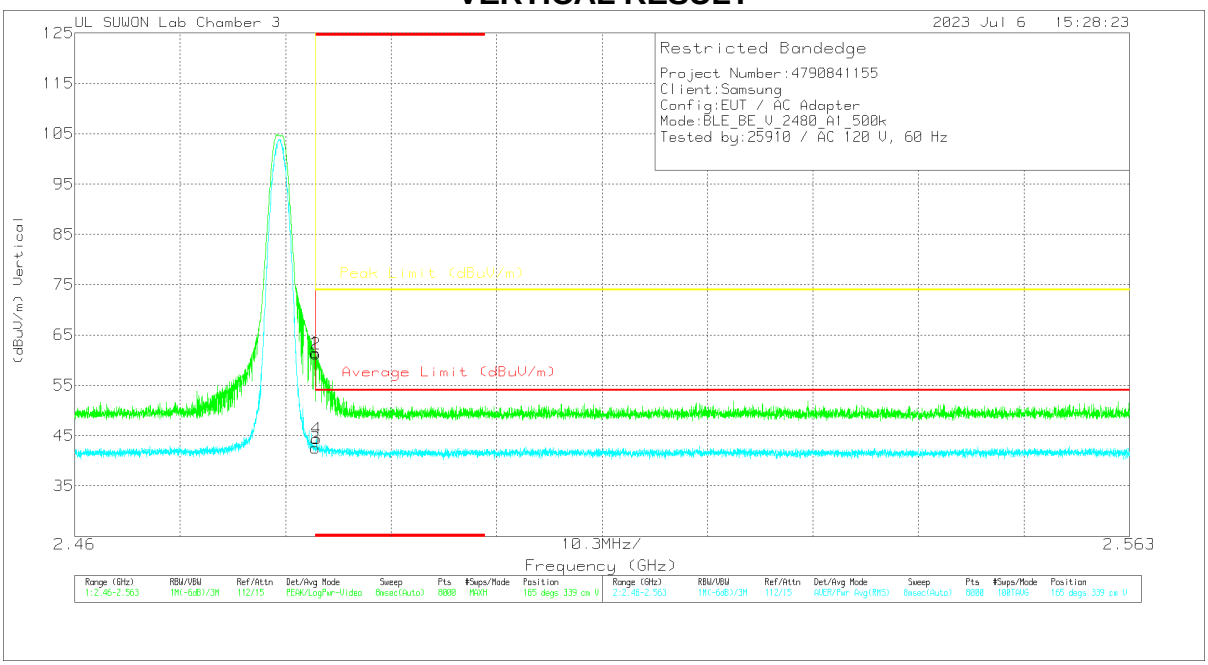


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	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	56.2	Pk	32.4	-25	0	63.6	-	-	74	-10.4	207	143	H
2	* 2.48358	56.13	Pk	32.4	-25	0	63.53	-	-	74	-10.47	207	143	H
3	* 2.4835	35.85	RMS	32.4	-25	2.44	45.69	54	-8.31	-	-	207	143	H
4	* 2.48353	36.14	RMS	32.4	-25	2.44	45.98	54	-8.02	-	-	207	143	H

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

VERTICAL RESULT



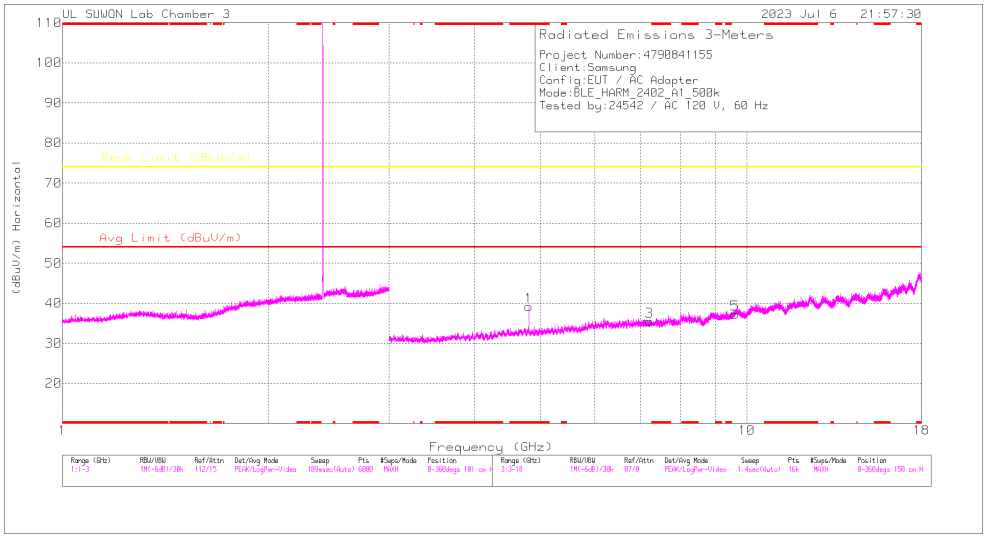
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	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	54.1	Pk	32.4	-25	0	61.5	-	-	74	-12.5	165	339	V
2	* 2.48354	53.87	Pk	32.4	-25	0	61.27	-	-	74	-12.73	165	339	V
3	* 2.4835	32.73	RMS	32.4	-25	2.44	42.57	54	-11.43	-	-	165	339	V
4	* 2.4836	34.53	RMS	32.4	-25	2.44	44.37	54	-9.63	-	-	165	339	V

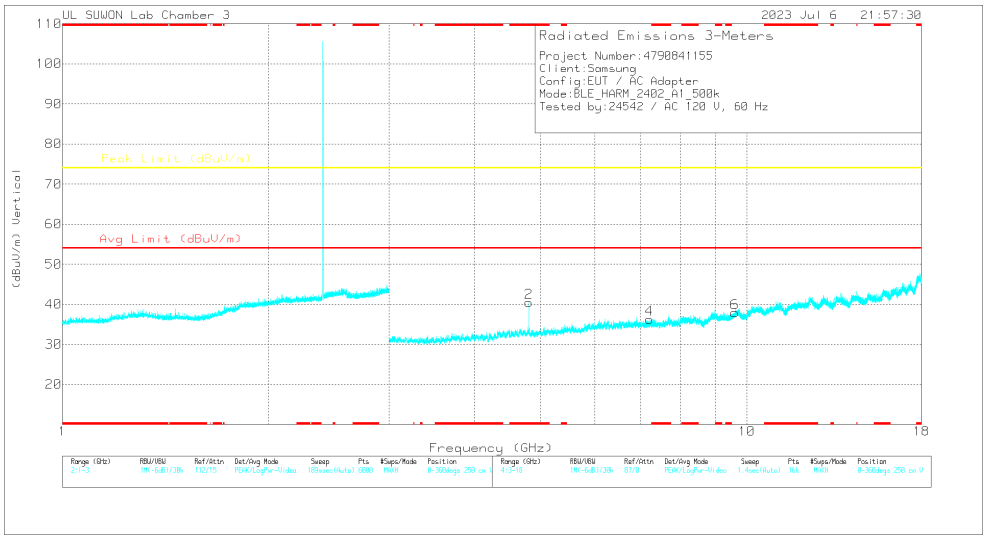
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

0 CHANNEL RESULTS



HORIZONTAL



VERTICAL

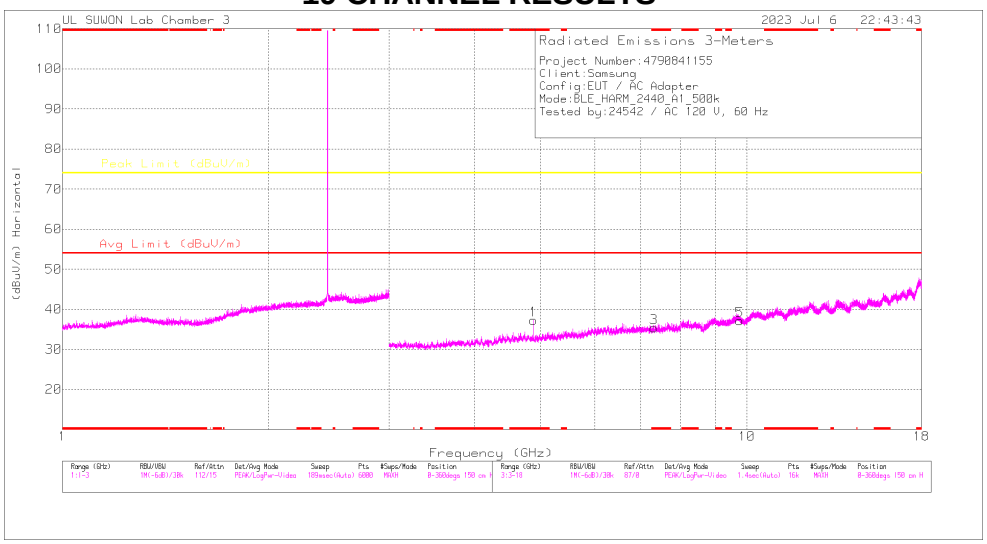
Note : Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

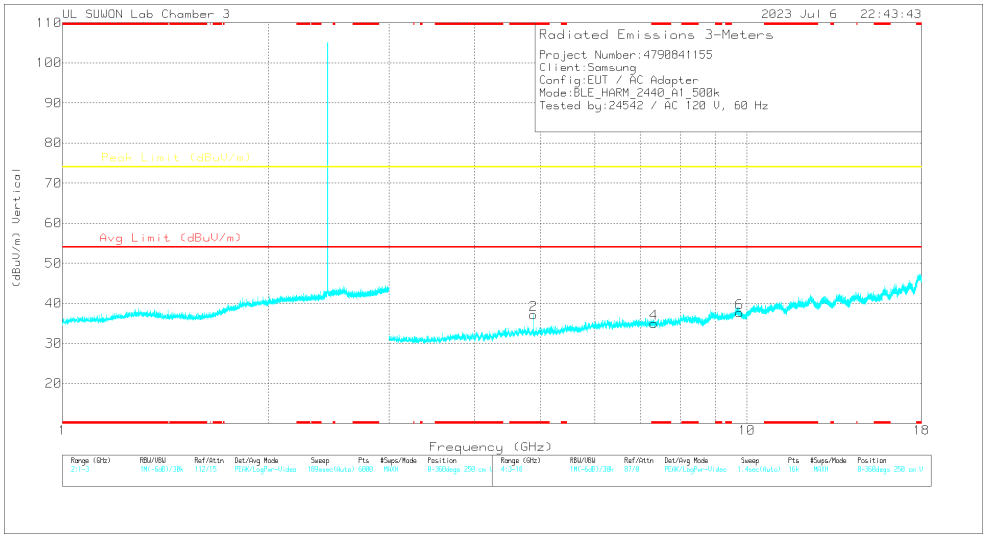
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0021895 7	3GHz_HP(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.80442	44.26	PK2	34.3	-30.1	0	48.46	-	-	74	-25.54	195	101	H
* 4.80374	35.74	MAv1	34.3	-30.1	2.44	42.38	54	-11.62	-	-	195	101	H
* 4.80344	41.62	PK2	34.3	-30.1	0	45.82	-	-	74	-28.18	157	100	V
* 4.80336	31.62	MAv1	34.3	-30.1	2.44	38.26	54	-15.74	-	-	157	100	V
7.20669	35.3	PK2	35.8	-25.8	0	45.3	-	-	74	-28.7	194	114	H
7.20555	35.49	PK2	35.8	-25.7	0	45.59	-	-	74	-28.41	322	105	V
9.60372	33.09	PK2	36.7	-21.7	0	48.09	-	-	74	-25.91	0	100	H
9.61463	32.42	PK2	36.7	-21.5	0	47.62	-	-	74	-26.38	0	100	V

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

19 CHANNEL RESULTS



HORIZONTAL



VERTICAL

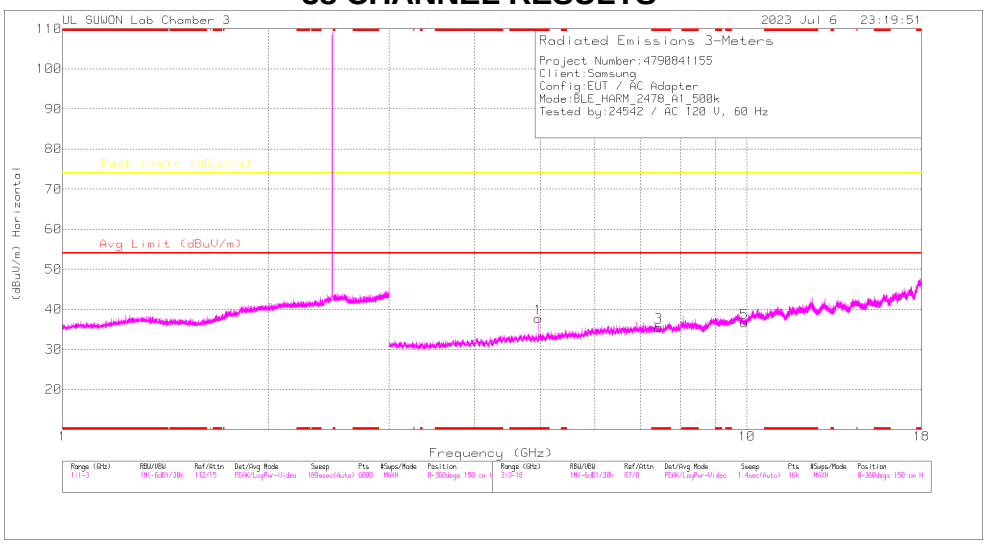
Note : Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

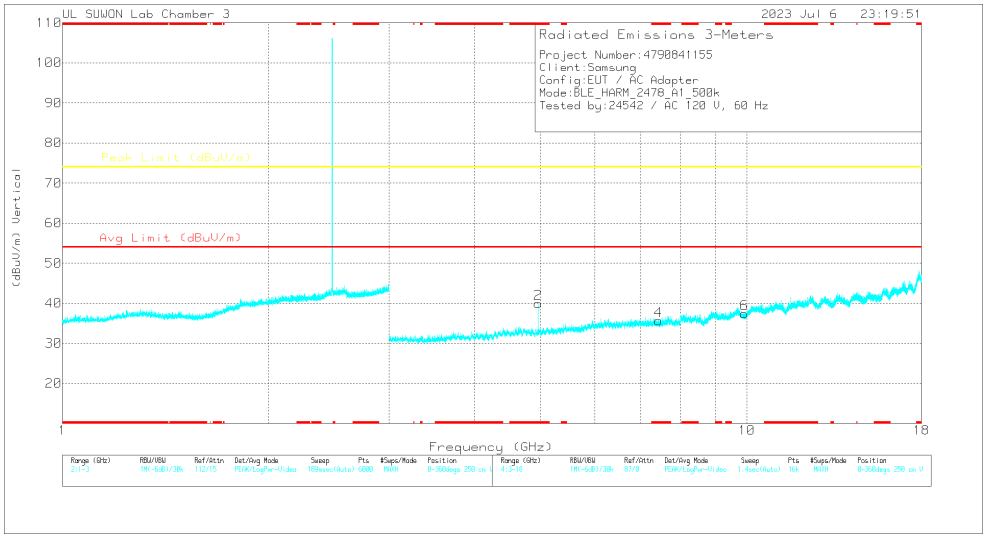
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0021895 7	3GHz_HP(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.87949	42.68	PK2	34.2	-30.8	0	46.08	-	-	74	-27.92	206	105	H
* 4.87999	32.86	MAv1	34.2	-30.9	2.44	38.6	54	-15.4	-	-	206	105	H
* 4.88052	40.47	PK2	34.2	-30.9	0	43.77	-	-	74	-30.23	156	101	V
* 4.87999	30.4	MAv1	34.2	-30.9	2.44	36.14	54	-17.86	-	-	156	101	V
* 7.3162	34.64	PK2	35.8	-25.4	0	45.04	-	-	74	-28.96	0	100	H
* 7.32231	35.39	PK2	35.8	-25.4	0	45.79	-	-	74	-28.21	0	100	V
9.75738	31.9	PK2	36.9	-21.1	0	47.7	-	-	74	-26.3	0	100	H
9.75449	31.78	PK2	36.9	-21.2	0	47.48	-	-	74	-26.52	0	100	V

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

38 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

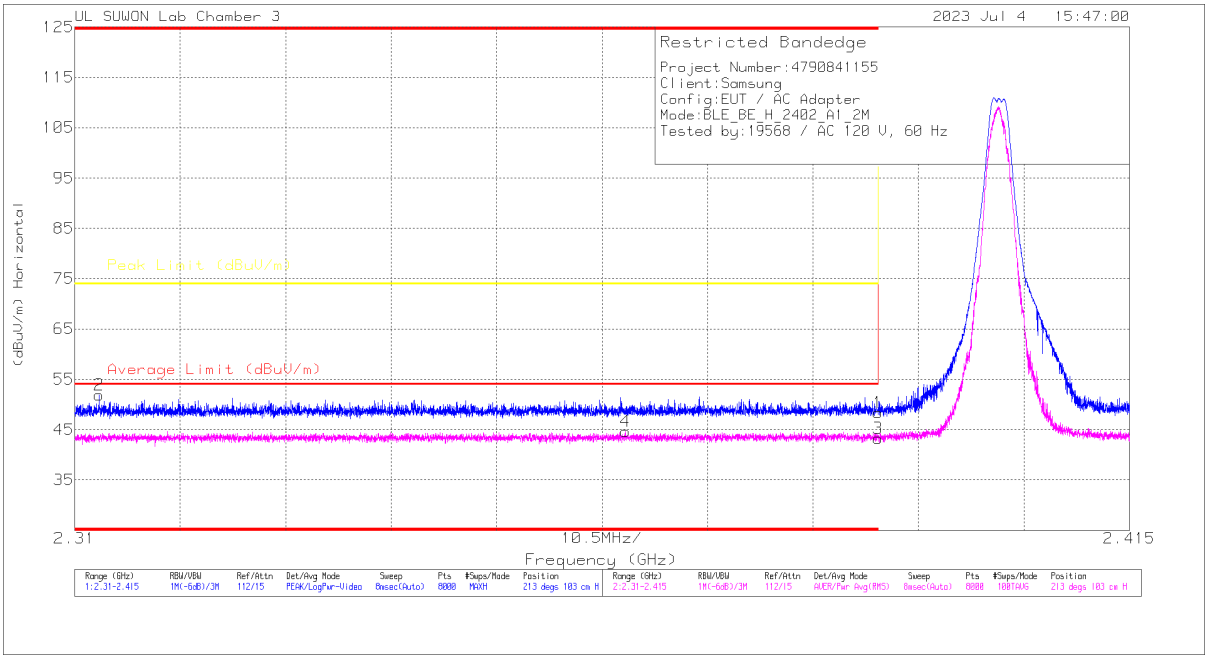
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0021895 7	3GHz_HP(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.95578	43.19	PK2	34.3	-30.6	0	46.89	-	-	74	-27.11	192	103	H
* 4.95614	34.07	MAv1	34.3	-30.6	2.44	40.21	54	-13.79	-	-	192	103	H
* 4.95548	41.15	PK2	34.3	-30.6	0	44.85	-	-	74	-29.15	154	100	V
* 4.95614	31.01	MAv1	34.3	-30.6	2.44	37.15	54	-16.85	-	-	154	100	V
* 7.44058	34.62	PK2	35.7	-25.1	0	45.22	-	-	74	-28.78	0	100	H
* 7.43983	35.35	PK2	35.7	-25.1	0	45.95	-	-	74	-28.05	0	100	V
9.90589	31.21	PK2	37.1	-21.3	0	47.01	-	-	74	-26.99	0	100	H
9.91624	31.14	PK2	37.1	-21.3	0	46.94	-	-	74	-27.06	0	100	V

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

10.2.2. 2 Mbps

BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT

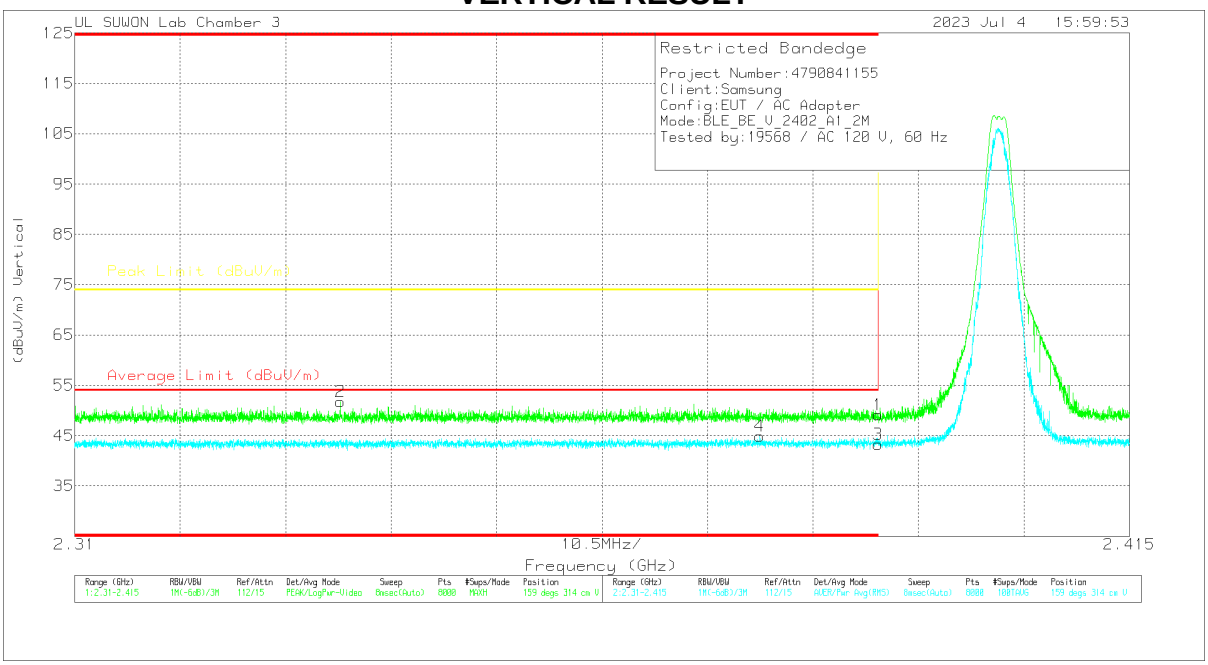


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	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	* 2.39	41.42	Pk	32.1	-25.1	0	48.42	-	-	74	-25.58	213	103	H
2	* 2.31242	45.21	Pk	31.8	-25.1	0	51.91	-	-	74	-22.09	213	103	H
3	* 2.39	31.38	RMS	32.1	-25.1	4.84	43.22	54	-10.78	-	-	213	103	H
4	* 2.36483	32.95	RMS	32	-25.1	4.84	44.69	54	-9.31	-	-	213	103	H

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

VERTICAL RESULT



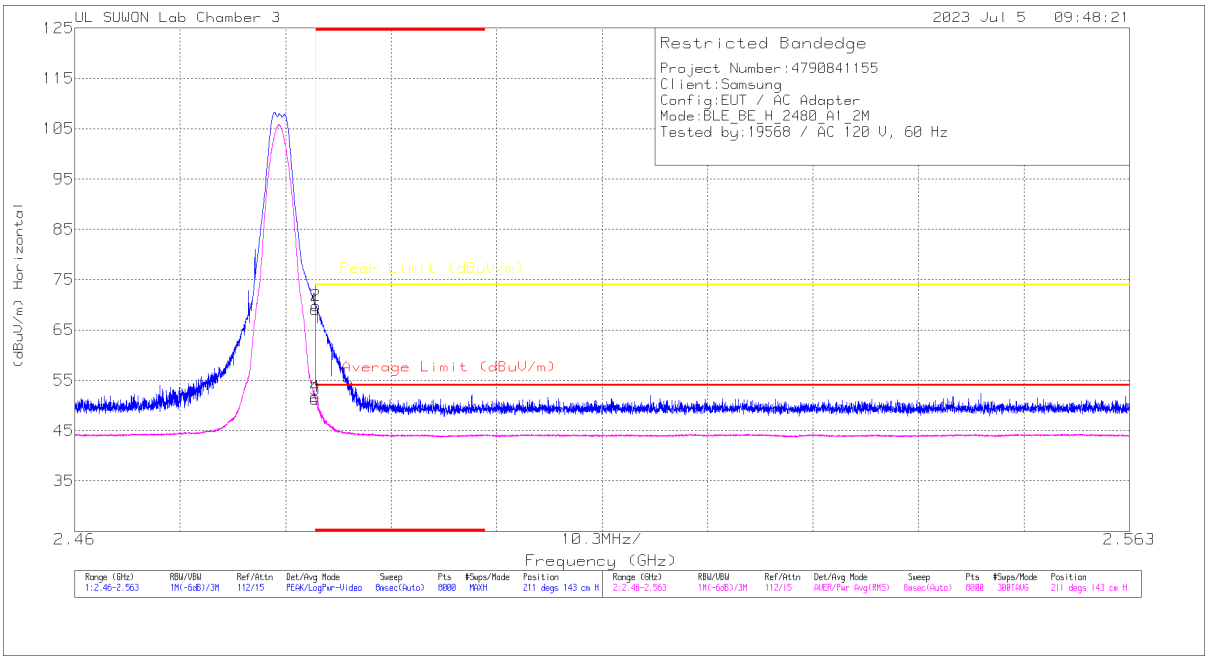
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	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	* 2.39	42.18	Pk	32.1	-25.1	0	49.18	-	-	74	-24.82	159	314	V
2	* 2.33642	44.99	Pk	31.9	-25.1	0	51.79	-	-	74	-22.21	159	314	V
3	* 2.39	31.42	RMS	32.1	-25.1	4.84	43.26	54	-10.74	-	-	159	314	V
4	* 2.37821	33.03	RMS	32.1	-25.1	4.84	44.87	54	-9.13	-	-	159	314	V

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

BANDEDGE (39 CHANNEL)

HORIZONTAL RESULT

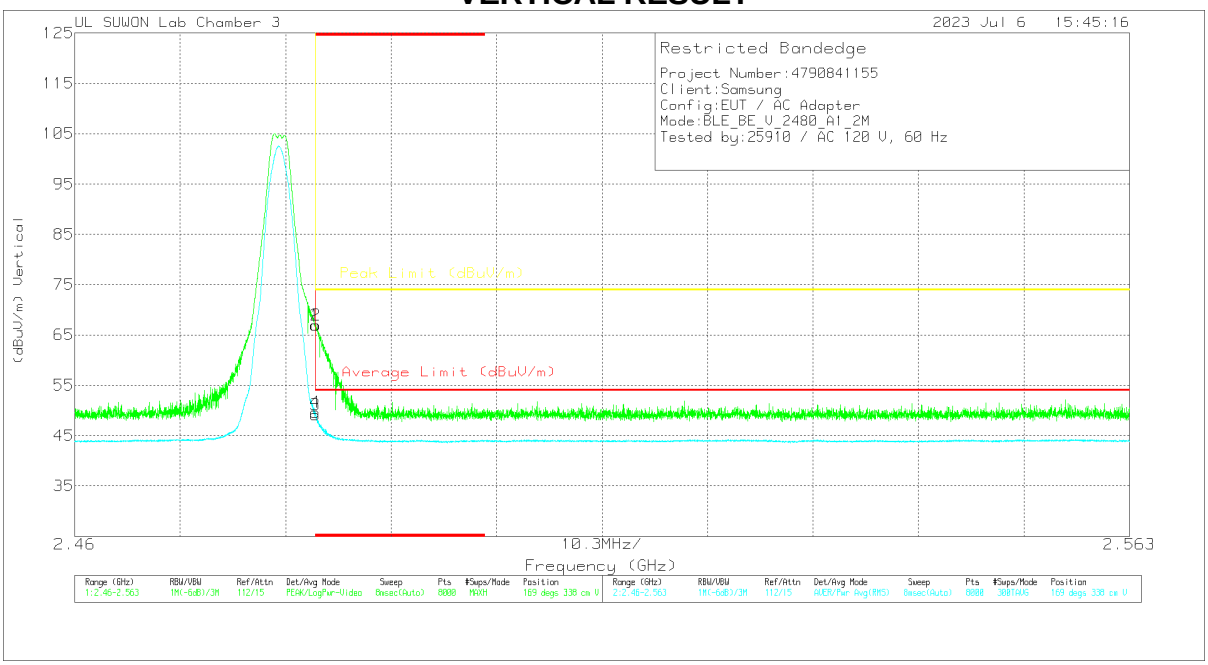


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	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	61.68	Pk	32.4	-25	0	69.08	-	-	74	-4.92	211	143	H
2	* 2.48355	62.37	Pk	32.4	-25	0	69.77	-	-	74	-4.23	211	143	H
3	* 2.4835	39.05	RMS	32.4	-25	4.84	51.29	54	-2.71	-	-	211	143	H
4	* 2.48351	39.55	RMS	32.4	-25	4.84	51.79	54	-2.21	-	-	211	143	H

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

VERTICAL RESULT



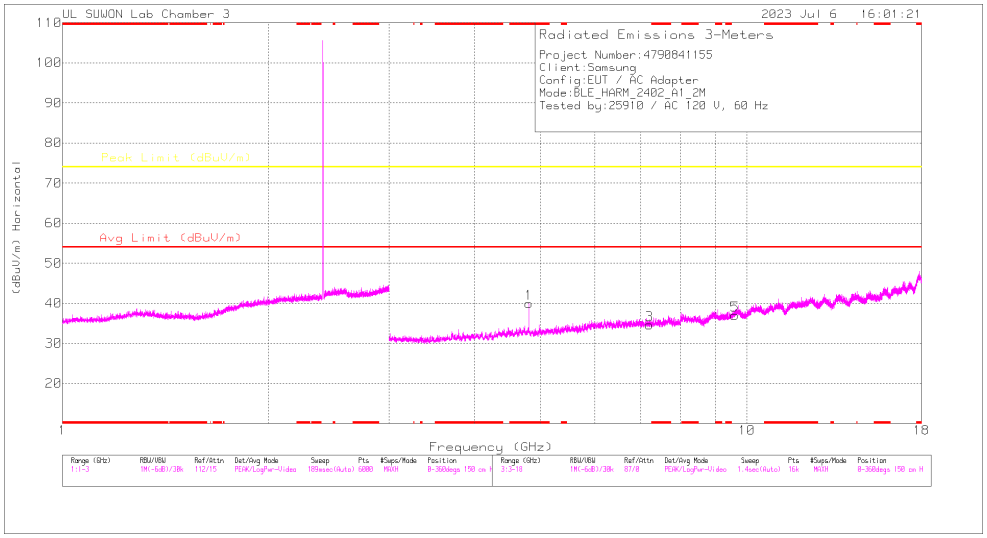
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00218957	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	59.6	Pk	32.4	-25	0	67	-	-	74	-7	169	338	V
2	* 2.48356	59.51	Pk	32.4	-25	0	66.91	-	-	74	-7.09	169	338	V
3	* 2.4835	36.94	RMS	32.4	-25	4.84	49.18	54	-4.82	-	-	169	338	V
4	* 2.48351	37.35	RMS	32.4	-25	4.84	49.59	54	-4.41	-	-	169	338	V

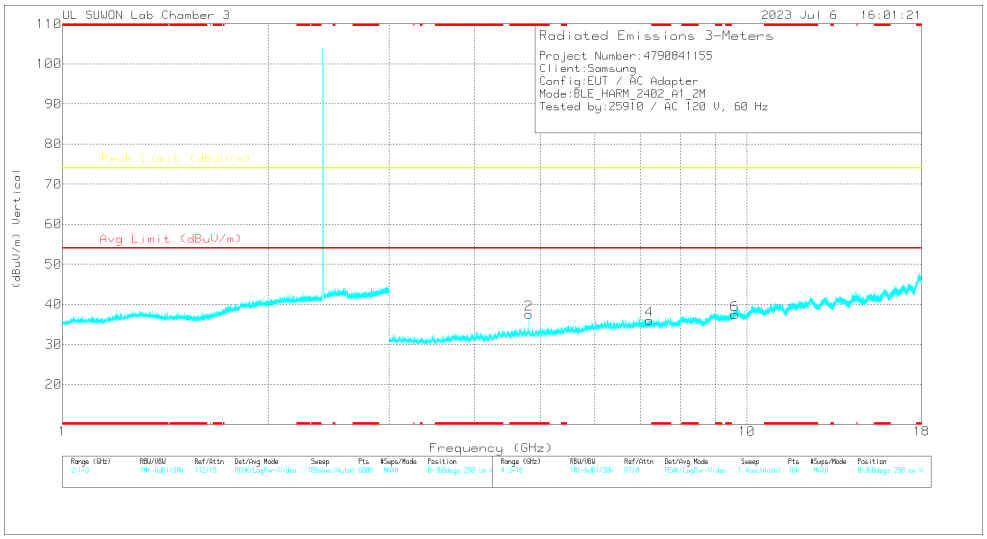
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

0 CHANNEL RESULTS



HORIZONTAL



VERTICAL

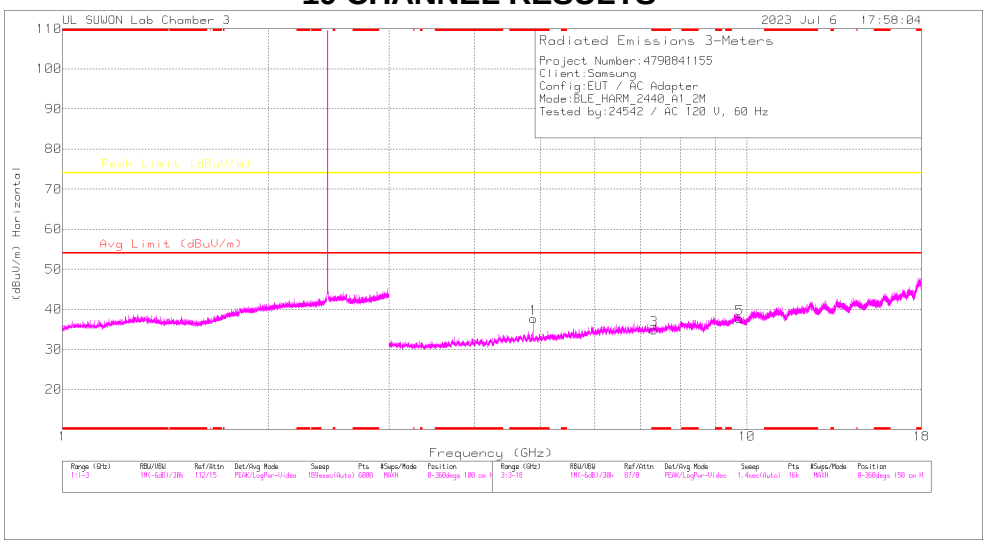
Note : Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

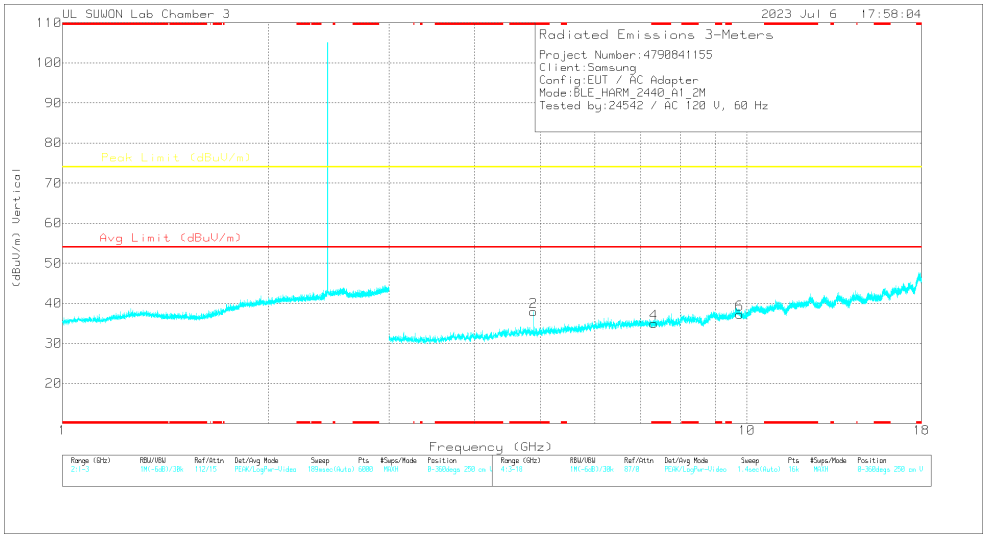
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0021895 7	3GHz_HP(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.80413	44.35	PK2	34.3	-30.1	0	48.55	-	-	74	-25.45	204	120	H
* 4.80392	32.35	MAv1	34.3	-30.1	4.84	41.39	54	-12.61	-	-	204	120	H
* 4.8042	41.83	PK2	34.3	-30.1	0	46.03	-	-	74	-27.97	156	100	V
* 4.80292	29.69	MAv1	34.3	-30.1	4.84	38.73	54	-15.27	-	-	156	100	V
7.20471	35.15	PK2	35.8	-25.8	0	45.15	-	-	74	-28.85	322	113	H
7.20443	35.64	PK2	35.8	-25.8	0	45.64	-	-	74	-28.36	322	107	V
9.60322	32.62	PK2	36.7	-21.7	0	47.62	-	-	74	-26.38	0	100	H
9.61365	32.1	PK2	36.7	-21.5	0	47.3	-	-	74	-26.7	0	100	V

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

19 CHANNEL RESULTS



HORIZONTAL



VERTICAL

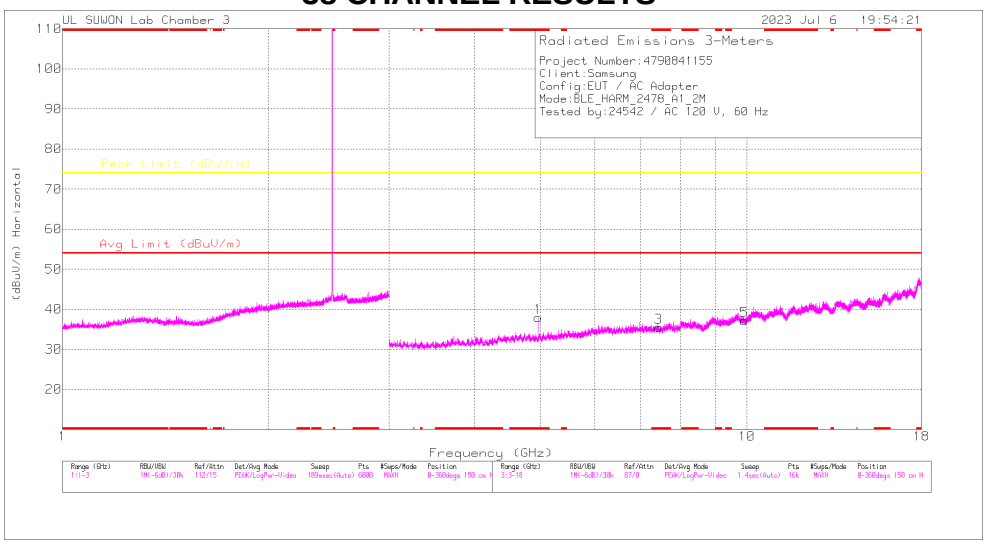
Note : Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Radiated Emissions

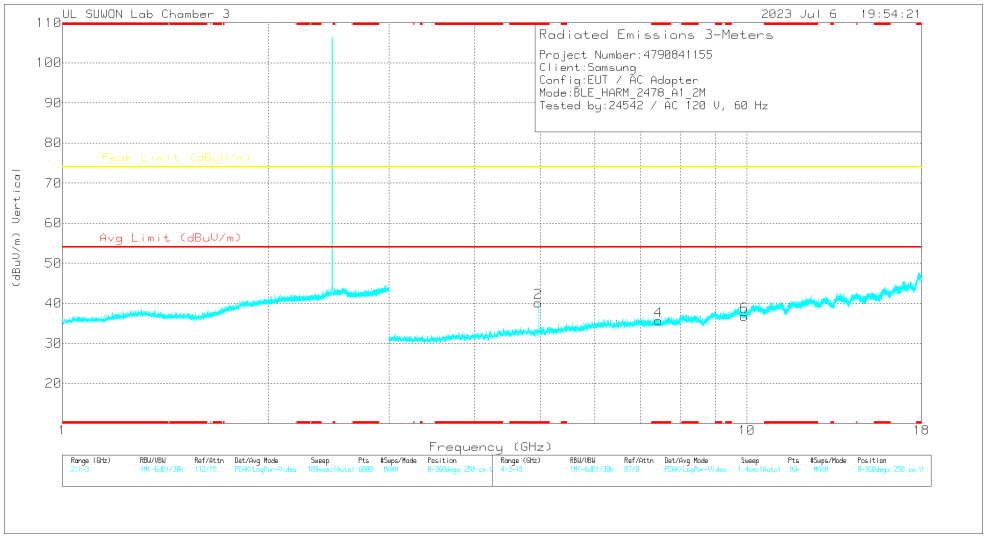
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0021895_7	3GHz_HP(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.88042	42.32	PK2	34.2	-30.9	0	45.62	-	-	74	-28.38	206	106	H
* 4.87981	32.96	MAv1	34.2	-30.9	4.84	41.1	54	-12.9	-	-	206	106	H
* 4.87949	40.65	PK2	34.2	-30.8	0	44.05	-	-	74	-29.95	157	103	V
* 4.87991	30.26	MAv1	34.2	-30.9	4.84	38.4	54	-15.6	-	-	157	103	V
* 7.32147	35.26	PK2	35.8	-25.4	0	45.66	-	-	74	-28.34	0	100	H
* 7.32009	35.13	PK2	35.8	-25.3	0	45.63	-	-	74	-28.37	0	100	V
9.76586	31.43	PK2	36.9	-21.1	0	47.23	-	-	74	-26.77	0	100	H
9.75449	31.91	PK2	36.9	-21.2	0	47.61	-	-	74	-26.39	0	100	V

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

38 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.

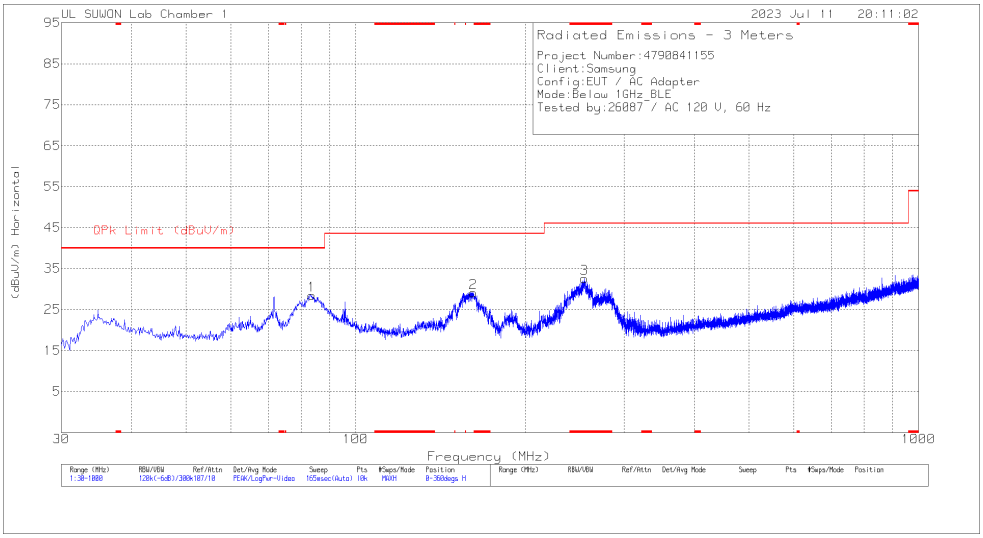
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0021895 7	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
* 4.95545	43.7	PK2	34.3	-30.6	0	47.4	-	-	74	-26.6	204	106	H
* 4.95585	34.74	MAv1	34.3	-30.6	4.84	43.28	54	-10.72	-	-	204	106	H
* 4.95589	41.82	PK2	34.3	-30.6	0	45.52	-	-	74	-28.48	156	101	V
* 4.95573	31.79	MAv1	34.3	-30.6	4.84	40.33	54	-13.67	-	-	156	101	V
* 7.43716	35.38	PK2	35.7	-25.1	0	45.98	-	-	74	-28.02	0	100	H
* 7.43451	34.86	PK2	35.7	-25.1	0	45.46	-	-	74	-28.54	0	100	V
9.9054	30.94	PK2	37.1	-21.3	0	46.74	-	-	74	-27.26	0	100	H
9.91686	31.05	PK2	37.1	-21.3	0	46.85	-	-	74	-27.15	0	100	V

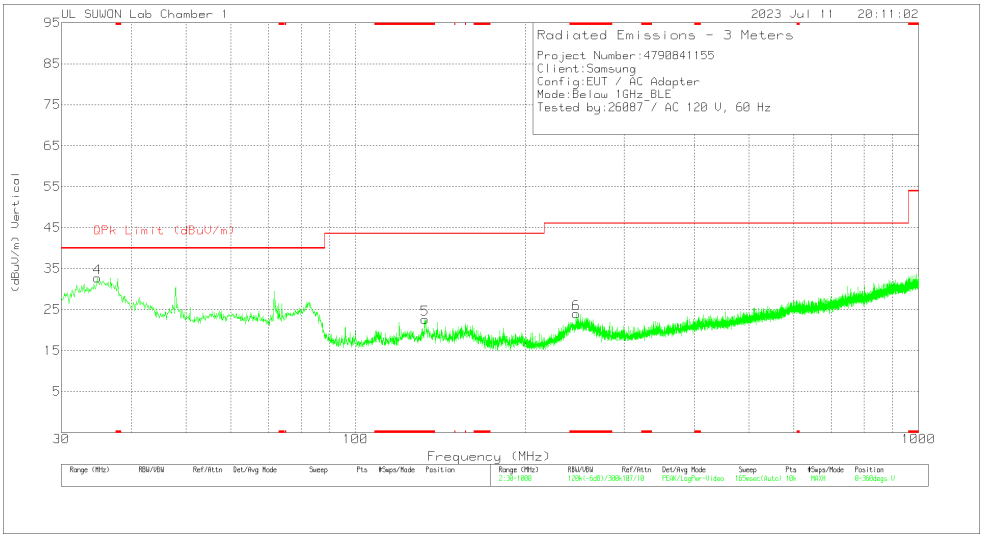
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

10.3. WORST CASE BELOW 1 GHz

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



HORIZONTAL



VERTICAL

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	83.544	45.19	Pk	13.7	-30.4	28.49	40	-11.51	0-360	300	H
2	161.92	44.51	Pk	14.3	-29.7	29.11	43.52	-14.41	0-360	100	H
3	* 254.846	43.34	Pk	18.1	-28.9	32.54	46.02	-13.48	0-360	100	H
4	34.753	47.61	Pk	16.4	-31.3	32.71	40	-7.29	0-360	200	V
5	* 132.723	38.29	Pk	14.1	-29.8	22.59	43.52	-20.93	0-360	200	V
6	* 246.407	35.11	Pk	17.9	-29	24.01	46.02	-22.01	0-360	200	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)

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.

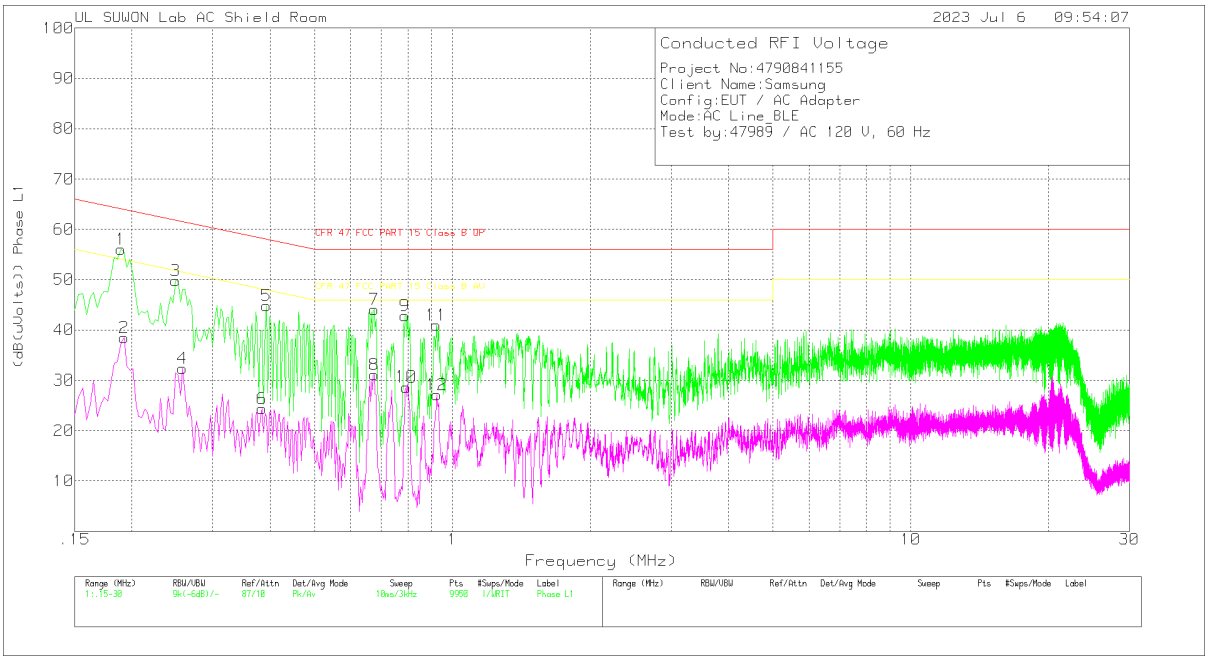
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

11.1. AC Power Line

LINE 1 RESULTS



Trace Markers

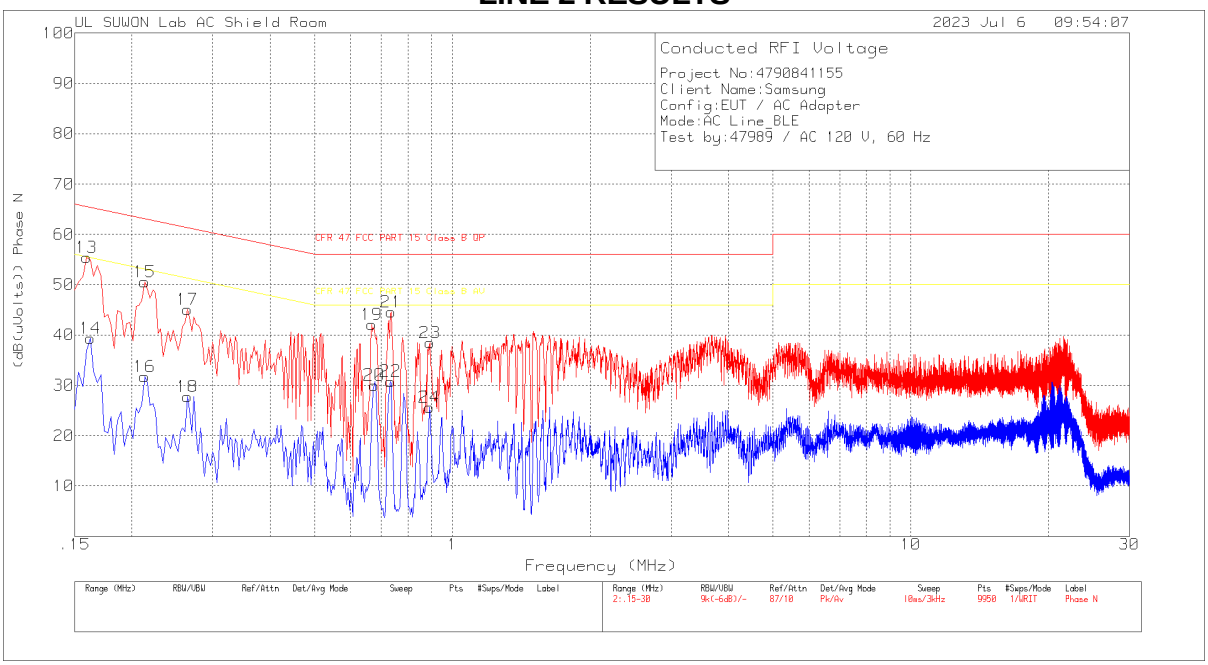
Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_AUTO_With EX_L1[dB]	CABLELOSS[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	.189	46.3	Pk	9.5	.2	56	64.08	-8.08	-	-
2	.192	28.79	Av	9.5	.2	38.49	-	-	53.95	-15.46
3	.249	40.15	Pk	9.5	.2	49.85	61.79	-11.94	-	-
4	.258	22.61	Av	9.5	.2	32.31	-	-	51.5	-19.19
5	.393	35.07	Pk	9.5	.2	44.77	58	-13.23	-	-
6	.384	14.7	Av	9.5	.2	24.4	-	-	48.19	-23.79
7	.675	34.31	Pk	9.6	.2	44.11	56	-11.89	-	-
8	.675	21.34	Av	9.6	.2	31.14	-	-	46	-14.86
9	.789	32.99	Pk	9.6	.2	42.79	56	-13.21	-	-
10	.792	18.88	Av	9.6	.2	28.68	-	-	46	-17.32
11	.921	31.11	Pk	9.6	.3	41.01	56	-14.99	-	-
12	.924	17.23	Av	9.6	.3	27.13	-	-	46	-18.87

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_AUTO_With EX_N[dB]	CABLELOSS[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	.159	45.87	Pk	9.5	.1	55.47	65.52	-10.05	-	-
14	.162	29.76	Av	9.5	.1	39.36	-	-	55.36	-16
15	.213	40.83	Pk	9.5	.2	50.53	63.09	-12.56	-	-
16	.213	22.02	Av	9.5	.2	31.72	-	-	53.09	-21.37
17	.264	35.32	Pk	9.5	.2	45.02	61.3	-16.28	-	-
18	.264	18.1	Av	9.5	.2	27.8	-	-	51.3	-23.5
19	.666	32.32	Pk	9.6	.2	42.12	56	-13.88	-	-
20	.675	20.25	Av	9.6	.2	30.05	-	-	46	-15.95
21	.735	34.79	Pk	9.6	.2	44.59	56	-11.41	-	-
22	.732	21	Av	9.6	.2	30.8	-	-	46	-15.2
23	.894	28.54	Pk	9.6	.3	38.44	56	-17.56	-	-
24	.891	15.71	Av	9.6	.3	25.61	-	-	46	-20.39

Pk - Peak detector

Av - Average detection

END OF TEST REPORT