



CERTIFICATION TEST REPORT

Report Number. : 4790357232-E4V2

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

Model : SM-F721B

FCC ID : A3LSMF721B

EUT Description : GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax,
NFC and WPT

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

Date Of Issue:

2022-06-22

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	2022-06-14	Initial issue	Dexter(Hyunsik) Yun
V2	2022-06-22	Updated to address TCB's question	Dexter(Hyunsik) Yun

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC and WPT
MODEL NUMBER: SM-F721B
SERIAL NUMBER: 98f3222ac (CONDUCTED);
R3CT40SS6FB, R3CT504WY2D (RADIATED);
DATE TESTED: 2022-04-27 ~ 2022-06-14

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
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Seokhwan Hong
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:



Dexter(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 checked="" 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. 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	3.02 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.05 dB
Radiated Disturbance, 1 GHz to 18 GHz	5.78 dB
Radiated Disturbance, 18 GHz to 40 GHz	5.58 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 115:2007.

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, NFC and WPT. 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	1Mbps	Peak	16.000	39.811
		Average	15.734	37.446
	2Mbps	Peak	16.504	44.710
		Average	15.873	38.663

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 ANT 1's maximum gain of -5.1 dBi and ANT 2's maximum gain of -7.0 dBi.

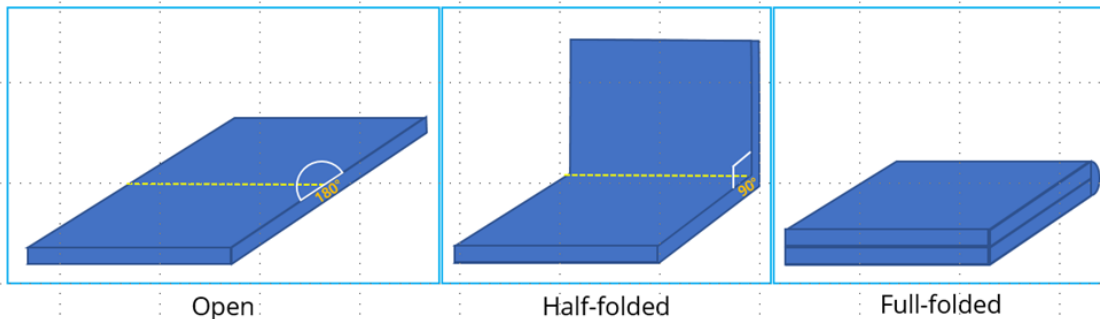
5.4. WORST-CASE CONFIGURATION AND MODE

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.

- Worst condition

Axis & Foldable condition	ANT1	ANT2
Axis	X	X
Foldable condition	Open	Open



- Supported PA modes:

Power \ ANT.	ANT1	ANT2	BLE-Dual
High(1M,2M)	○	○	
Low(1M, 125k, 500k, 2M)	○	○	

Since the target High power(1M, 2M) is higher than the target power of Low power(1M, 125k,500k, 2M), the test was performed in high power mode.

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 1 Mbps(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]	ANT.	Mode	Freq. [MHz]	Conducted Burst Avg [dBm]	Symbol Rate [Ms/s]	ANT.	Mode	Freq. [MHz]	Conducted Burst Avg [dBm]
1	ANT1	1Mbps 37pkt (High)	2402	15.734	2	ANT1	2Mbps 37pkt (High)	2402	15.873
			2440	14.467				2440	14.600
			2480	12.688				2480	12.974
	ANT2		2402	14.202		ANT2		2402	14.496
			2440	13.961				2440	14.423
			2480	12.054				2480	12.477
	ANT1	1Mbps 255pkt (High)	2402	15.363		ANT1	2Mbps 255pkt (High)	2402	15.558
			2440	14.205				2440	14.359
			2480	12.279				2480	12.553
	ANT2		2402	13.679		ANT2		2402	14.135
			2440	13.513				2440	14.022
			2480	11.545				2480	12.081
1 Coded S=8	ANT1	125kbps 37pkt (Low)	2402	10.103	1 Coded S=2	ANT1	500kbps 37pkt (Low)	2402	10.134
			2440	9.130				2440	9.167
			2480	9.164				2480	9.233
	ANT2		2402	9.501		ANT2		2402	9.552
			2440	9.941				2440	9.978
			2480	8.626				2480	8.621
	ANT1	125kbps 255pkt (Low)	2402	10.080		ANT1	500kbps 255pkt (Low)	2402	10.101
			2440	9.105				2440	9.138
			2480	9.141				2480	9.160
	ANT2		2402	9.474		ANT2		2402	9.510
			2440	9.895				2440	9.934
			2480	8.575				2480	8.606

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37R38J49R8SE3	N/A
Data Cable	SAMSUNG	EP-DN980	N/A	N/A

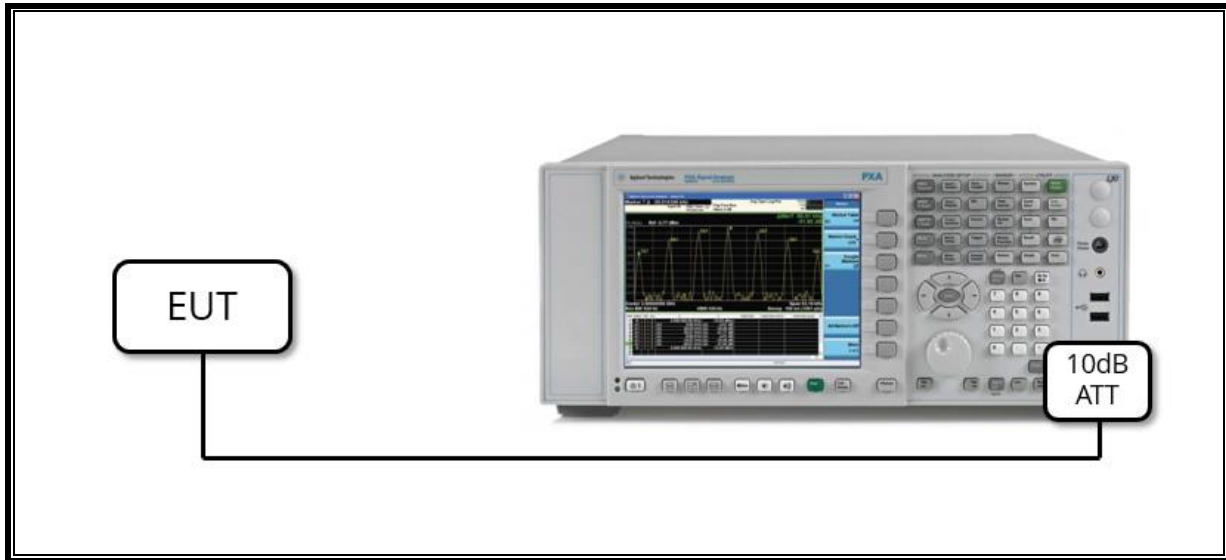
I/O CABLE

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

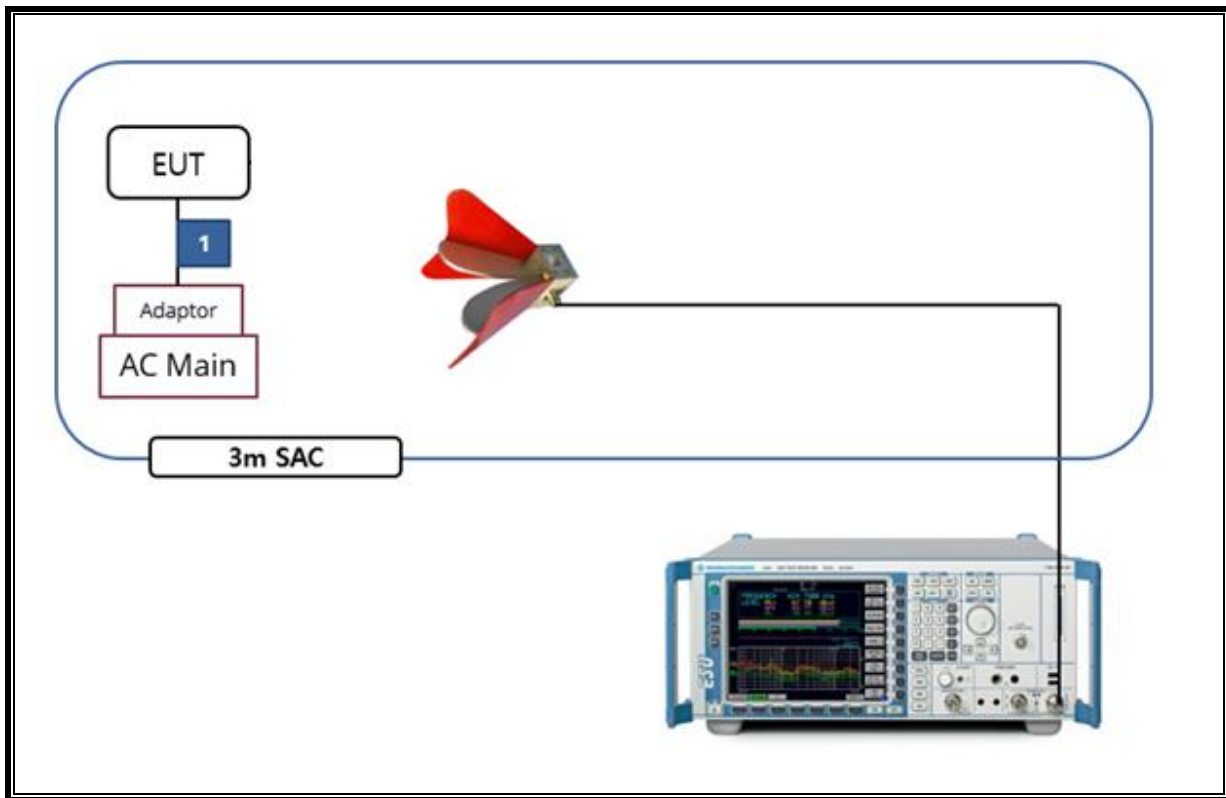
TEST SETUP

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. 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	2022-08-19
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	2022-08-13
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	2022-08-13
Antenna, Horn, 18 GHz	ETS	3115	00167211	2022-07-27
Antenna, Horn, 18 GHz	ETS	3115	00161451	2022-08-15
Antenna, Horn, 18 GHz	ETS	3117	00168724	2022-07-27
Antenna, Horn, 18 GHz	ETS	3117	00168717	2022-08-15
Antenna, Horn, 40 GHz	ETS	3116C	00166155	2022-08-04
Preamplifier	ETS	3116C-PA	00168841	2022-08-04
Preamplifier, 1000 MHz	Sonoma	310N	341282	2022-08-02
Preamplifier, 1000 MHz	Sonoma	310N	351741	2022-08-02
Preamplifier, 1000 MHz	Sonoma	310N	370599	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	2022-08-02
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029168	2022-08-02
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	2022-08-04
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	2022-08-04
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030B	MY60070693	2023-01-18
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9040B	MY60080268	2023-01-19
Average Power Sensor	Agilent / HP	U2000	MY54270007	2022-08-04
Average Power Sensor	Agilent / HP	U2000	MY54260010	2022-08-04
Attenuator	PASTERNAK	PE7087-10	A001	2022-08-03
Attenuator	PASTERNAK	PE7087-10	A008	2022-08-03
Attenuator	PASTERNAK	PE7004-10	2	2022-08-02
Attenuator	PASTERNAK	PE7087-10	A009	2022-08-03
EMI Test Receive, 40 GHz	R&S	ESU40	100439	2022-08-02
EMI Test Receive, 40 GHz	R&S	ESU40	100457	2022-08-02
EMI Test Receive, 3 GHz	R&S	ESR3	101832	2022-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	2022-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	2022-08-02
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	019	2022-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	2022-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	2022-08-02
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	2022-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	2022-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	2022-08-02
High Pass Filter 6GHz	Micro-Tronics	HPS17542	020	2022-08-02
LISN	R&S	ENV-216	101837	2022-08-05
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	

7. 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

8. 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 \geq 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

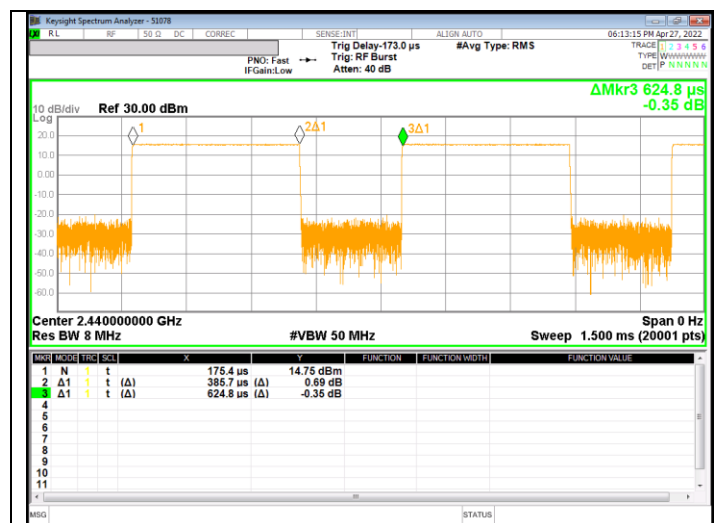
9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

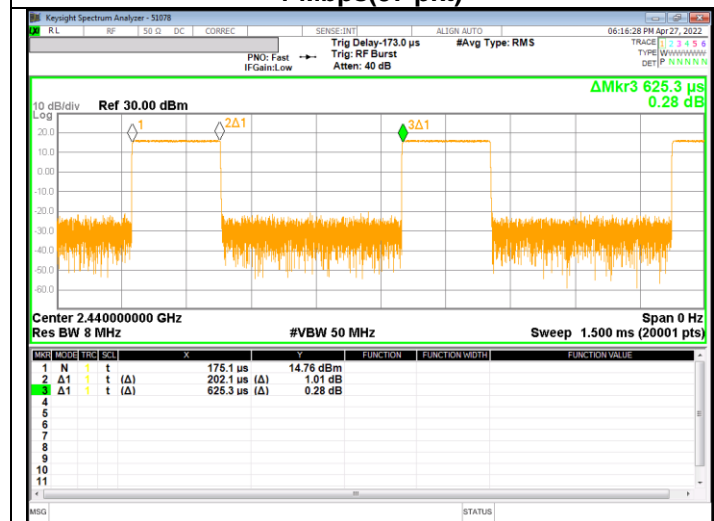
LIMITS

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						
1 Mbps [37pkt]	0.386	0.625	0.617	61.732	2.09	2.59
2 Mbps [37pkt]	0.202	0.625	0.323	32.320	4.91	4.95



1 Mbps(37 pkt)



2 Mbps(37 pkt)

9.2. 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

9.2.1. 1 Mbps

Ant.	Channel	Frequency [MHz]	6 dB Bandwidth [kHz]	Minimum Limit [kHz]
ANT1	0	2 402	667.1	500.0
	19	2 440	670.9	500.0
	39	2 480	663.8	500.0
ANT2	0	2 402	669.3	500.0
	19	2 440	665.8	500.0
	39	2 480	668.1	500.0
Worst			663.8	500.0

9.2.2. 2 Mbps

Ant.	Channel	Frequency [MHz]	6 dB Bandwidth [kHz]	Minimum Limit [kHz]
ANT1	0	2 402	1131.0	500.0
	19	2 440	1101.0	500.0
	39	2 480	1119.0	500.0
ANT2	0	2 402	1136.0	500.0
	19	2 440	1119.0	500.0
	39	2 480	1132.0	500.0
Worst			1101.0	500.0

9.2.3. 6 dB 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

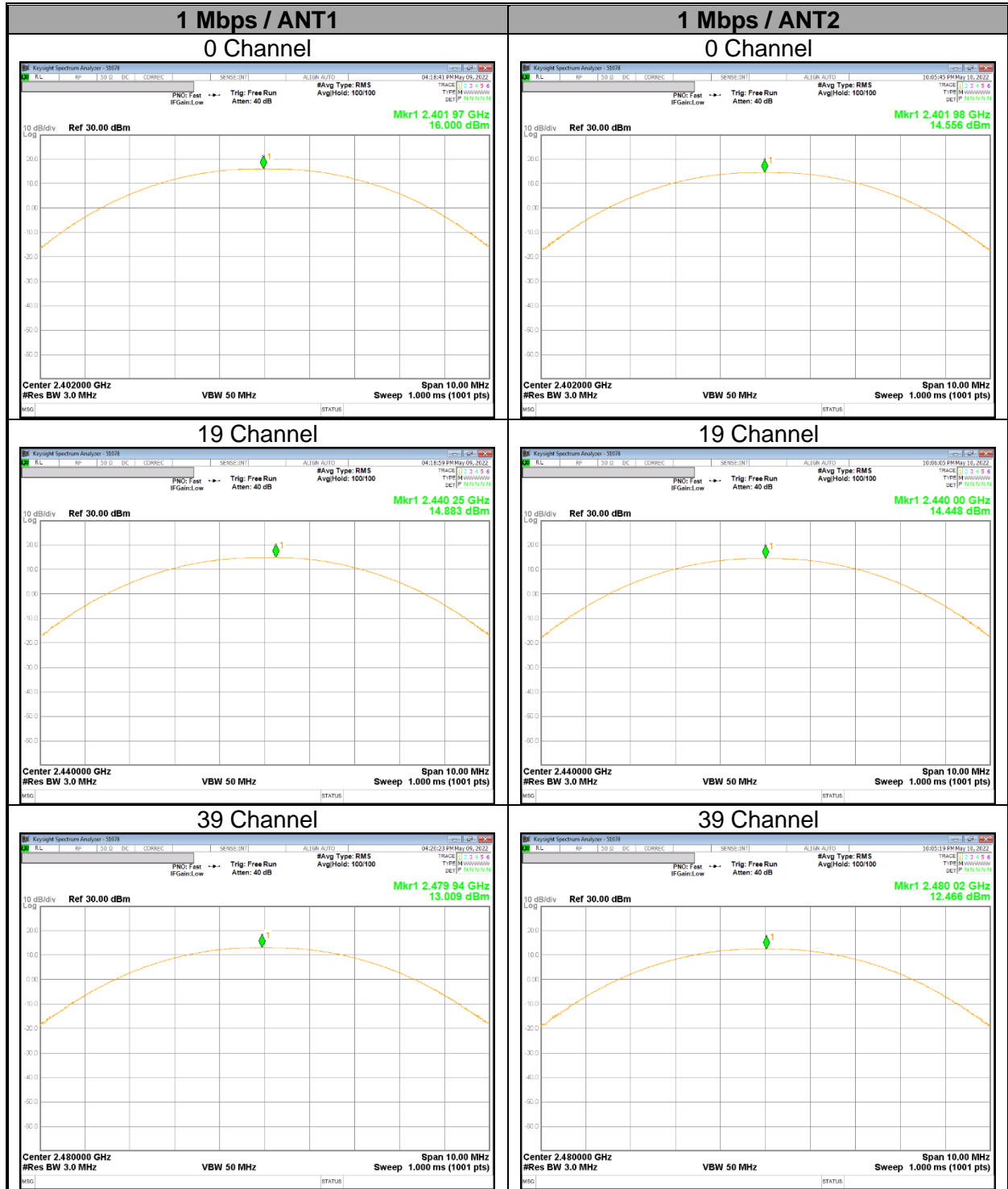
9.3.1. 1 Mbps

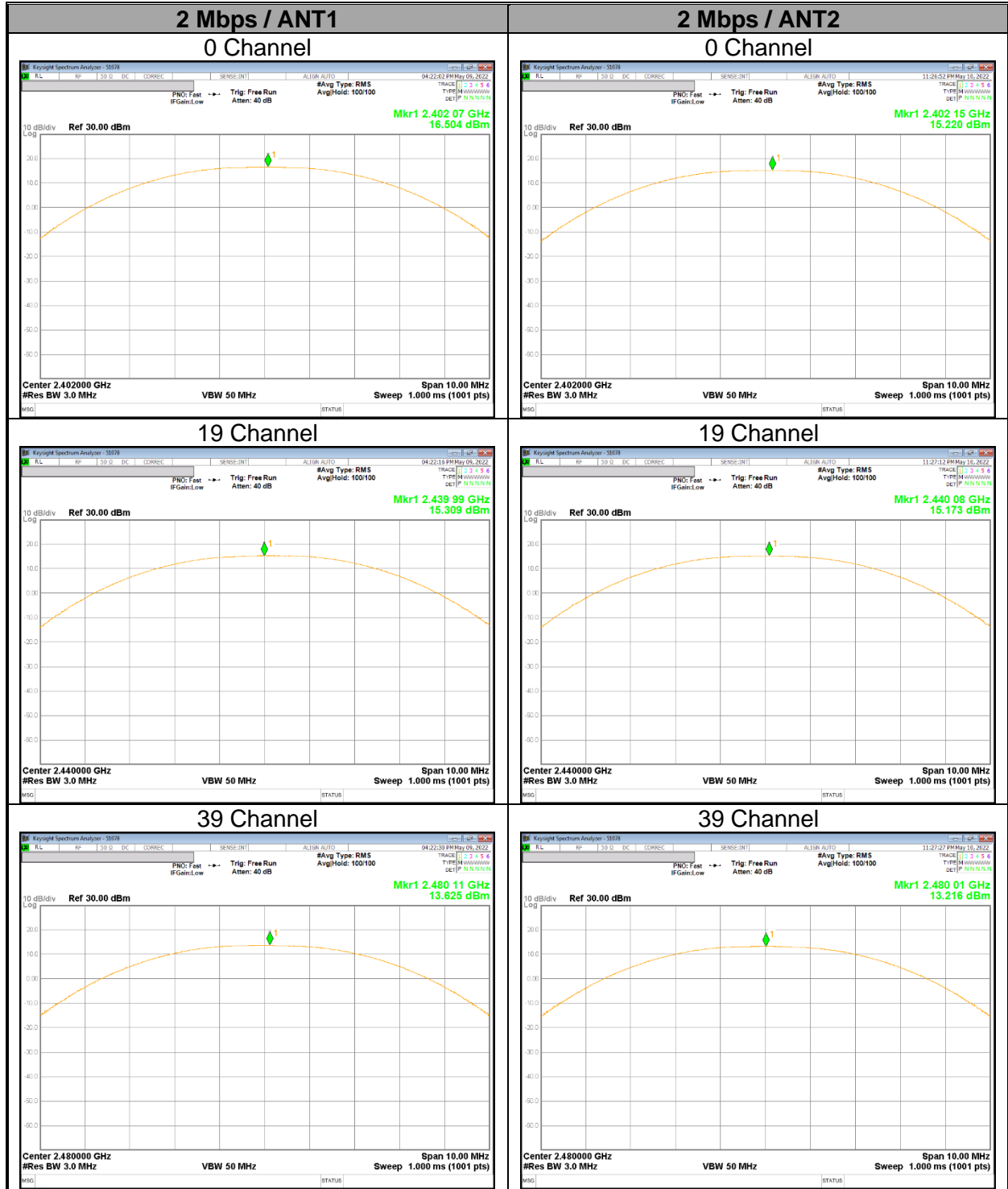
Antenna	Power Mode	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
ANT1	High	0	2 402	16.000	30.000	-14.000
		19	2 440	14.883		-15.117
		39	2 480	13.009		-16.991
ANT2		0	2 402	14.556		-15.444
		19	2 440	14.448		-15.552
		39	2 480	12.466		-17.534
Worst				16.000		-14.000

9.3.2. 2 Mbps

Antenna	PA.	Channel	Frequency [MHz]	Peak Output Power [dBm]	Limit [dBm]	Margin [dB]
ANT1	High	0	2 402	16.504	30.000	-13.496
		19	2 440	15.309		-14.691
		39	2 480	13.625		-16.375
ANT2		0	2 402	15.220		-14.780
		19	2 440	15.173		-14.827
		39	2 480	13.216		-16.784
Worst				16.504		-13.496

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. 1 Mbps

Antenna	Power Mode	Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
ANT1	High	0	2 402	15.734	37.446
		19	2 440	14.467	27.970
		39	2 480	12.688	18.569
ANT2		0	2 402	14.202	26.315
		19	2 440	13.961	24.894
		39	2 480	12.054	16.047

9.4.2. 2 Mbps

Antenna	Power Mode	Channel	Frequency [MHz]	Average Output Power [dBm]	Average Output Power [mW]
ANT1	High	0	2 402	15.873	38.663
		19	2 440	14.600	28.840
		39	2 480	12.974	19.834
ANT2		0	2 402	14.496	28.158
		19	2 440	14.423	27.689
		39	2 480	12.477	17.689

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

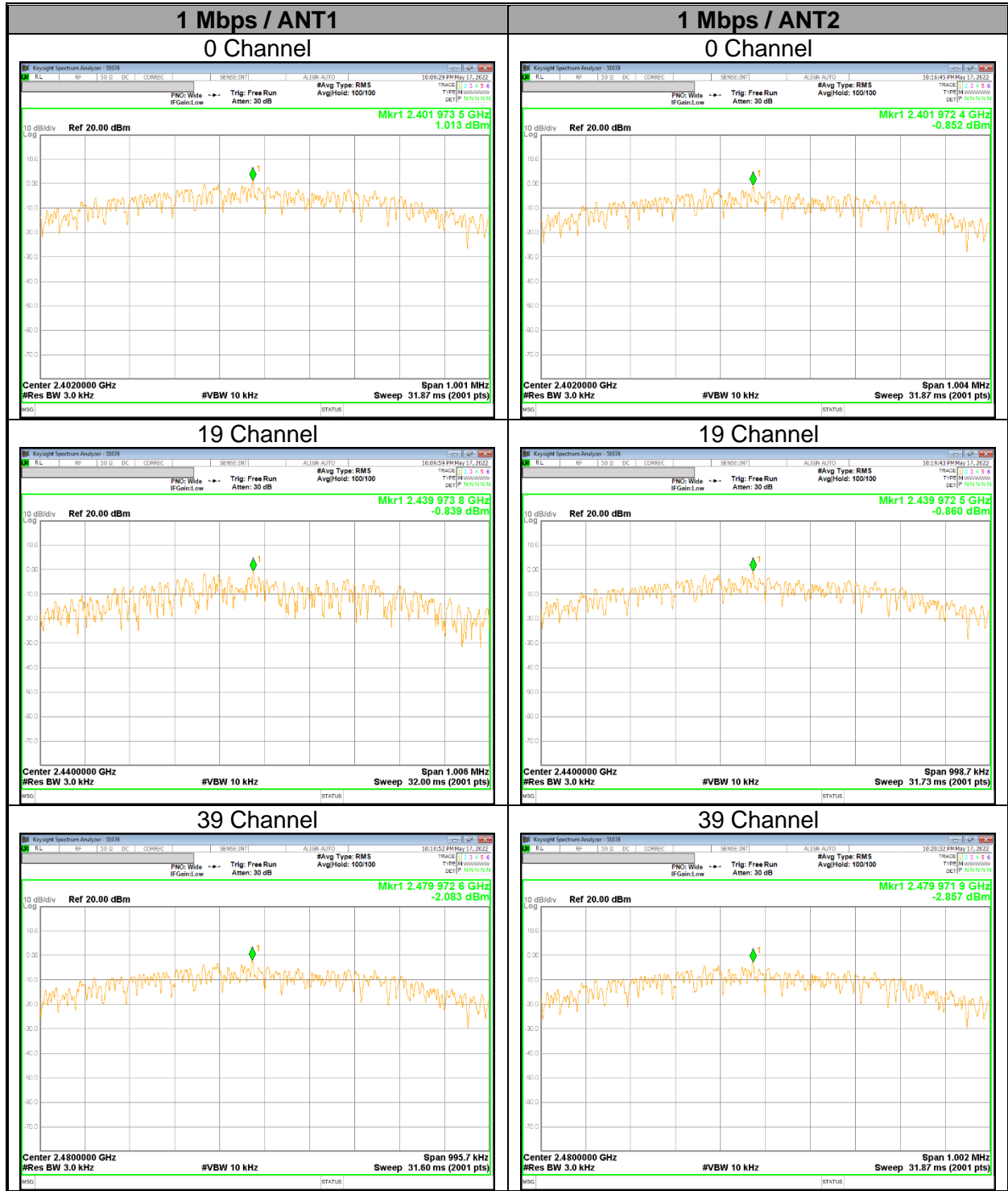
9.5.1. 1 Mbps

Antenna	Power Mode	Channel	Frequency [MHz]	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Margin [dB]
ANT1	High	0	2 402	1.003	8.00	-6.997
		19	2 440	-0.839		-8.839
		39	2 480	-2.083		-10.083
ANT2		0	2 402	-0.852		-8.852
		19	2 440	-0.860		-8.860
		39	2 480	-2.857		-10.857
Worst				1.003		-6.997

9.5.2. 2 Mbps

Antenna	Power Mode	Channel	Frequency [MHz]	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Margin [dB]
ANT1	High	0	2 402	-1.521	8.00	-9.521
		19	2 440	-2.819		-10.819
		39	2 480	-4.476		-12.476
ANT2		0	2 402	-3.310		-11.310
		19	2 440	-3.318		-11.318
		39	2 480	-5.217		-13.217
Worst				-1.521		-9.521

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.

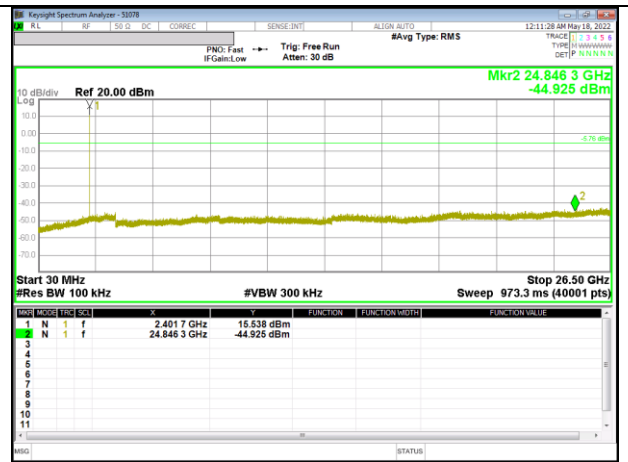
RESULTS

9.6.1. 1 Mbps

ANT1



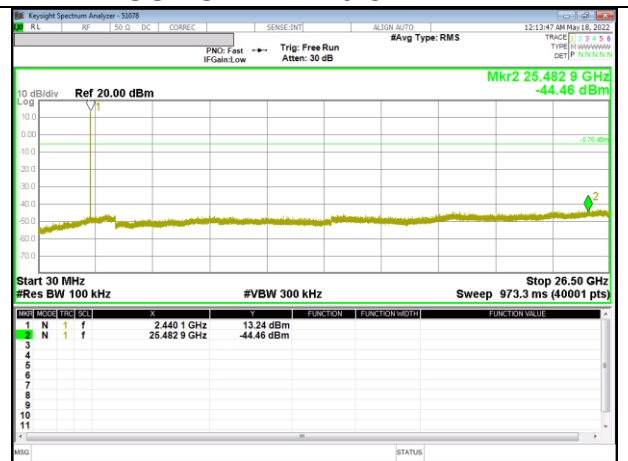
0 CHANNEL BANDEDGE



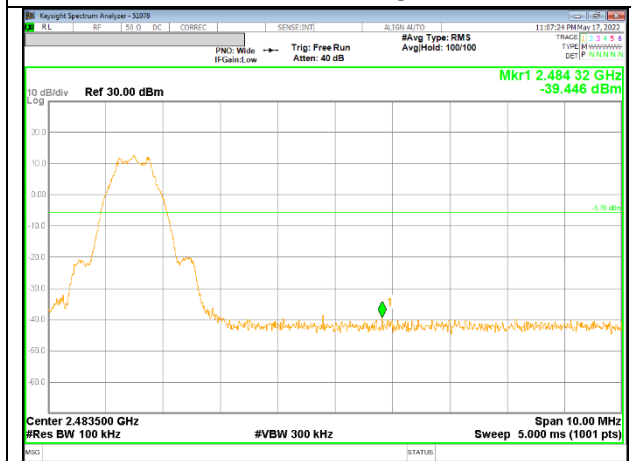
OUT-OF-BAND 0 CHANNEL



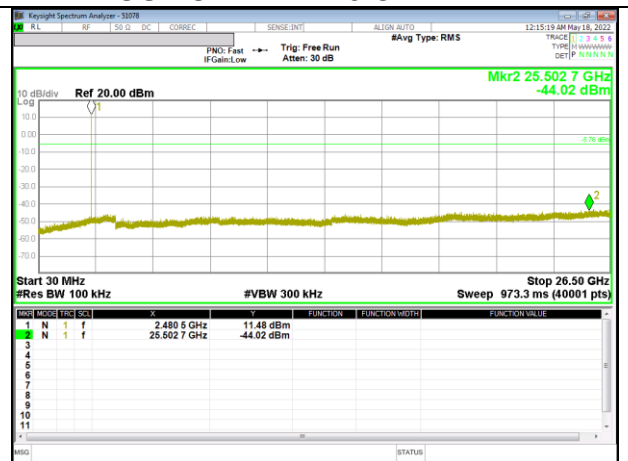
IN-BAND REFERENCE LEVEL



OUT-OF-BAND 19 CHANNEL

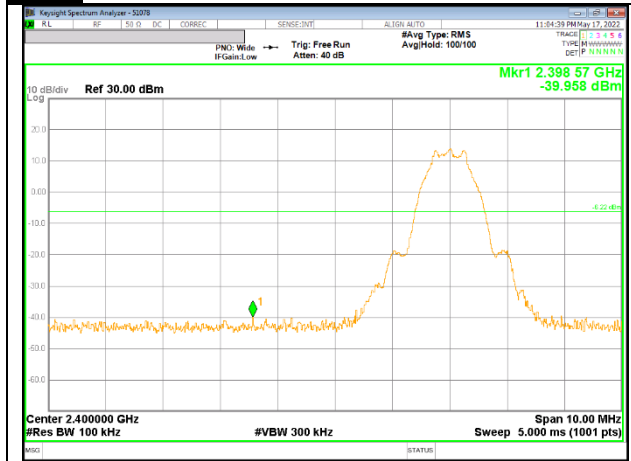


39 CHANNEL BANDEDGE

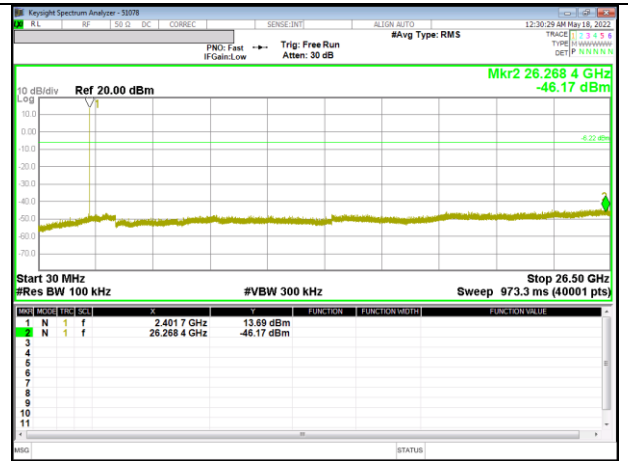


OUT-OF-BAND 39 CHANNEL

ANT2



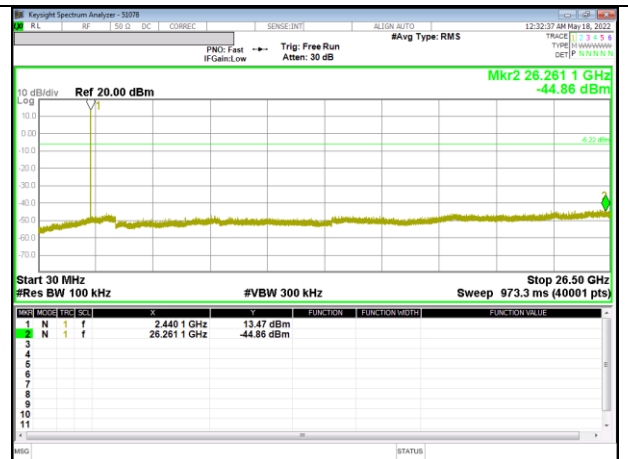
0 CHANNEL BANDEDGE



OUT-OF-BAND 0 CHANNEL



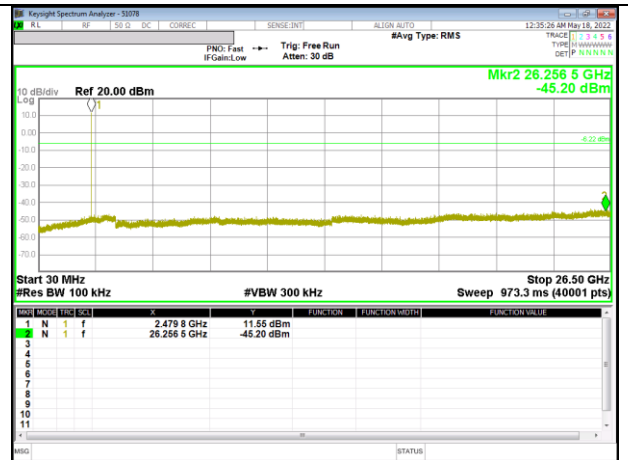
IN-BAND REFERENCE LEVEL



OUT-OF-BAND 19 CHANNEL



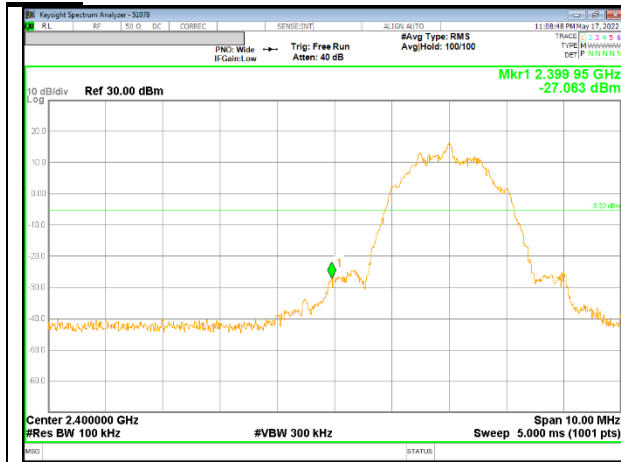
39 CHANNEL BANDEDGE



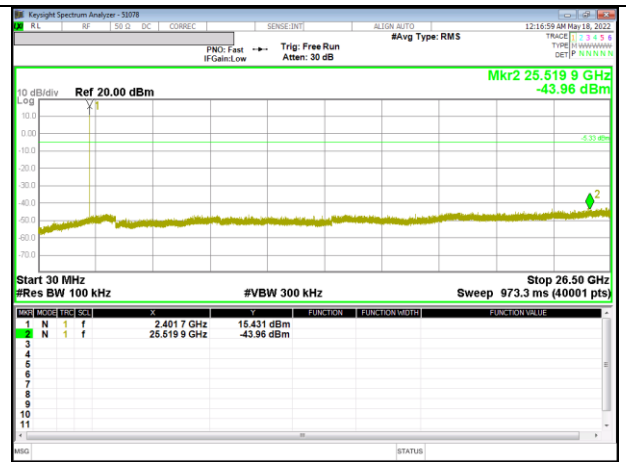
OUT-OF-BAND 39 CHANNEL

9.6.2. 2 Mbps

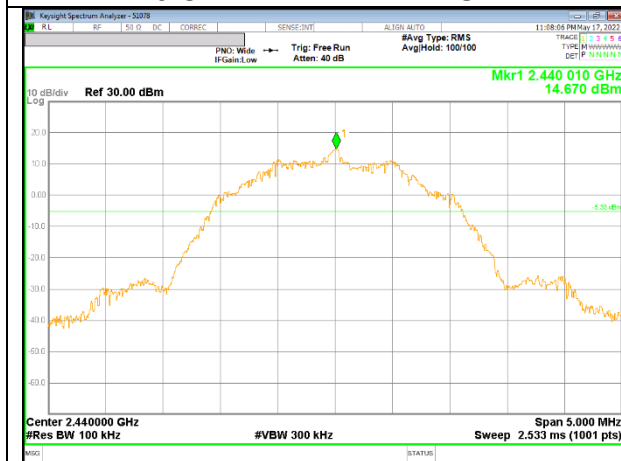
ANT1



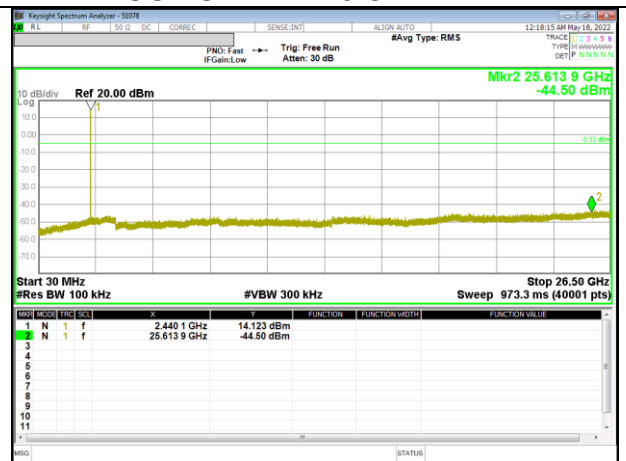
0 CHANNEL BANDEDGE



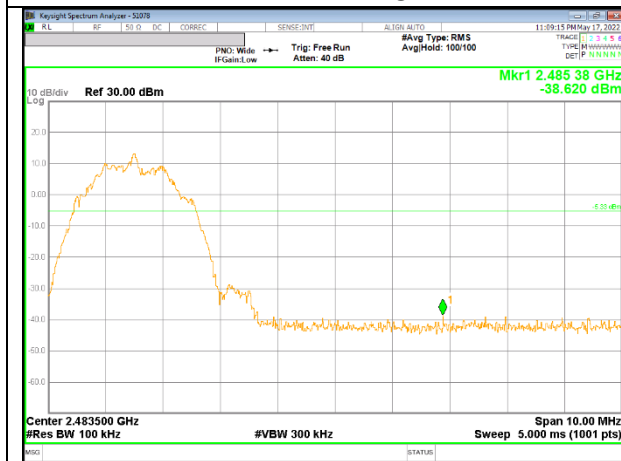
OUT-OF-BAND 0 CHANNEL



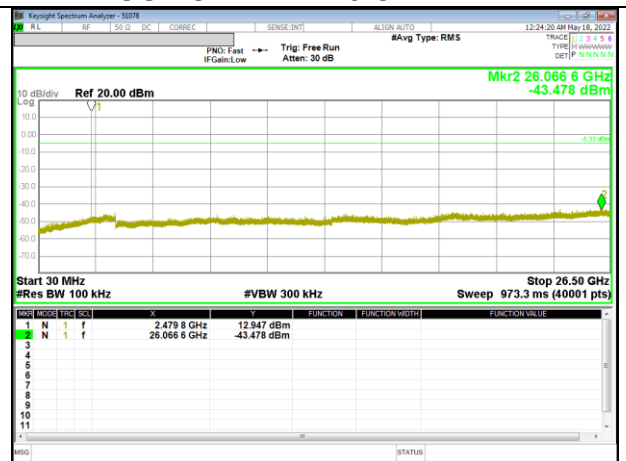
IN-BAND REFERENCE LEVEL



OUT-OF-BAND 19 CHANNEL

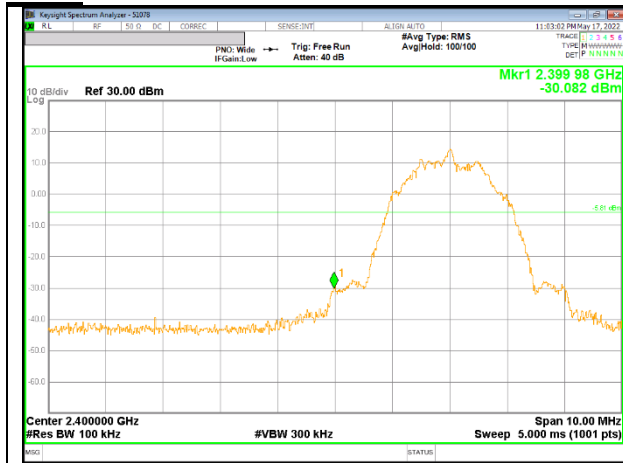


39 CHANNEL BANDEDGE

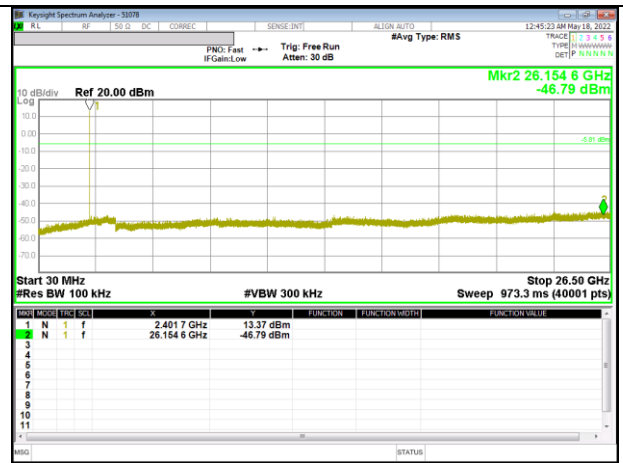


OUT-OF-BAND 39 CHANNEL

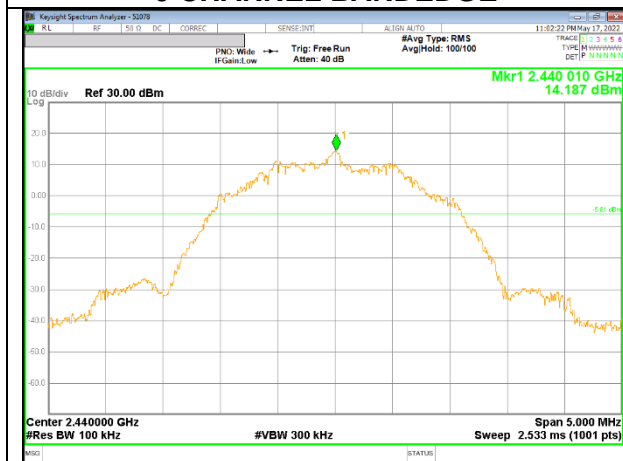
ANT2



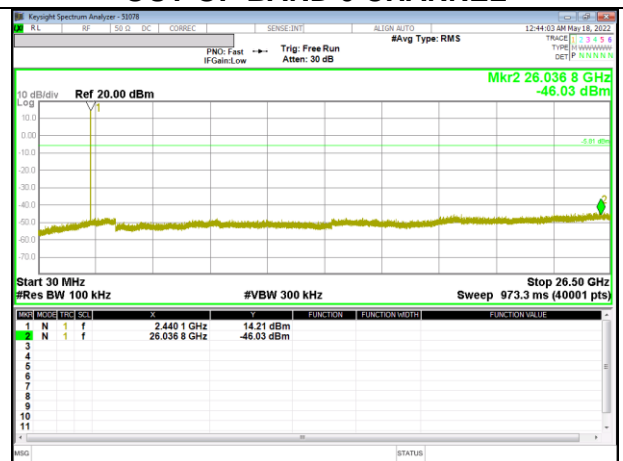
0 CHANNEL BANDEDGE



OUT-OF-BAND 0 CHANNEL



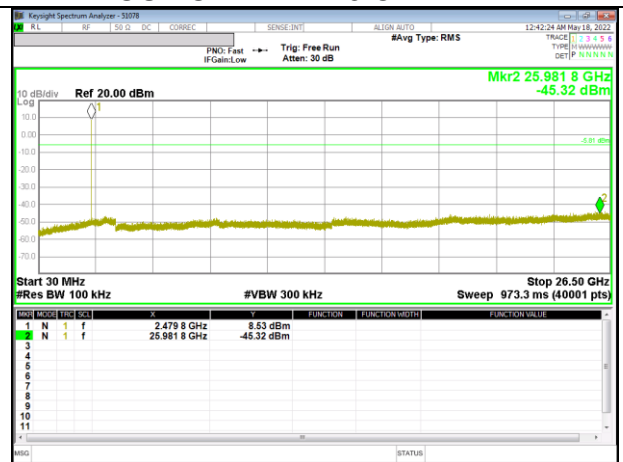
IN-BAND REFERENCE LEVEL



OUT-OF-BAND 19 CHANNEL



39 CHANNEL BANDEDGE



OUT-OF-BAND 39 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 ($\mu\text{V}/\text{m}$)	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 1 Mbps, DCF = $10\log(1/0.6173)=2.0949$ dB (Spectrum Analyzer round it up to 2.09 dB) and for 2 Mbps, DCF = $10\log(1/0.3232)=4.9052$ dB (Spectrum Analyzer round it up to 4.91 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.

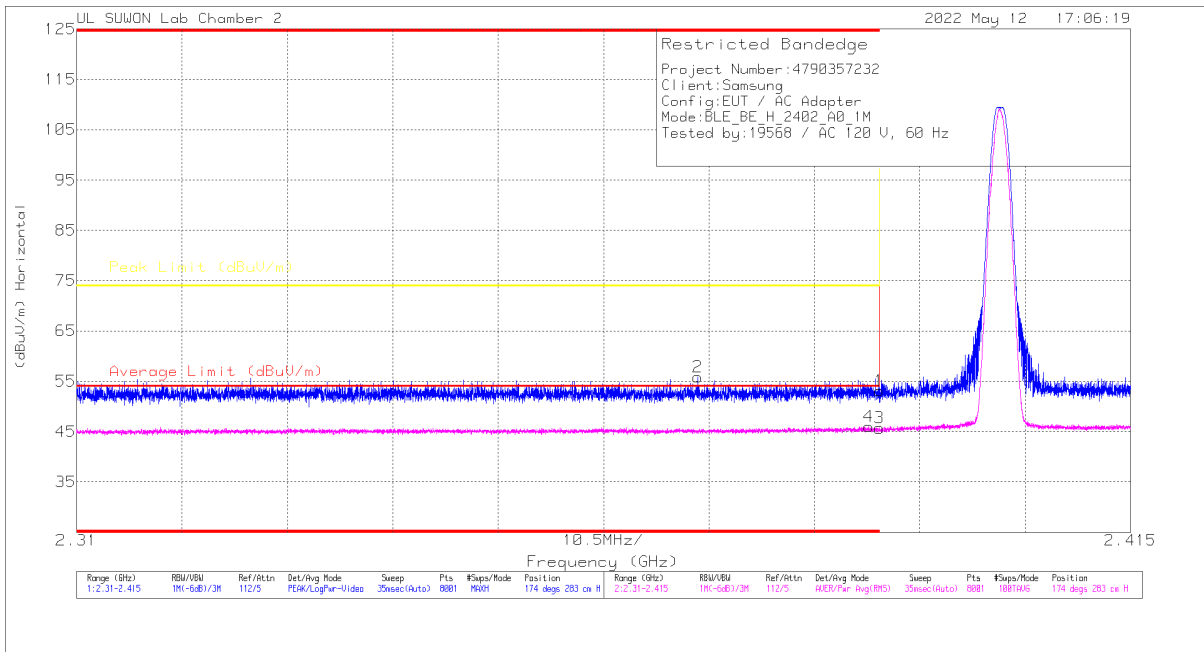
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the one of tests made in an open field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

10.2. TRANSMITTER ABOVE 1 GHz

10.2.1. 1 Mbps

ANT1 BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT

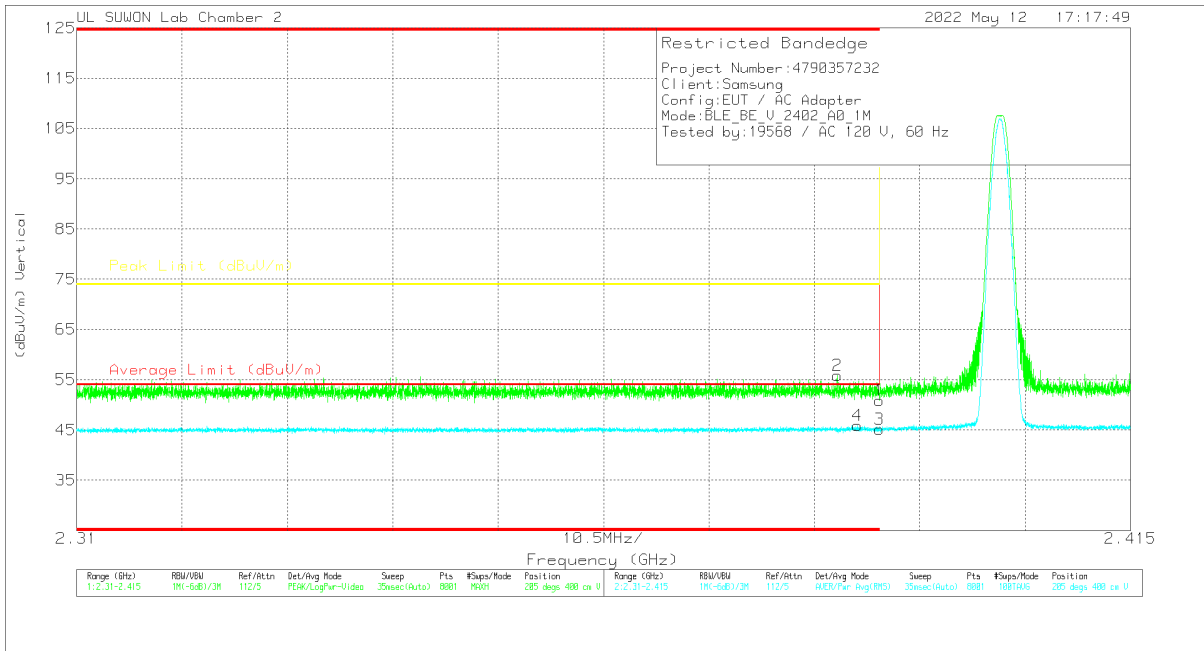


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	40.93	PK	31.9	-19.7	0	53.13	-	-	74	-20.87	174	283	H
2	* 2.37191	43.61	PK	31.8	-19.6	0	55.81	-	-	74	-18.19	174	283	H
3	* 2.39	31.42	RMS	31.9	-19.7	2.09	45.71	54	-8.29	-	-	174	283	H
4	* 2.38891	31.58	RMS	31.9	-19.6	2.09	45.97	54	-8.03	-	-	174	283	H

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

VERTICAL RESULT



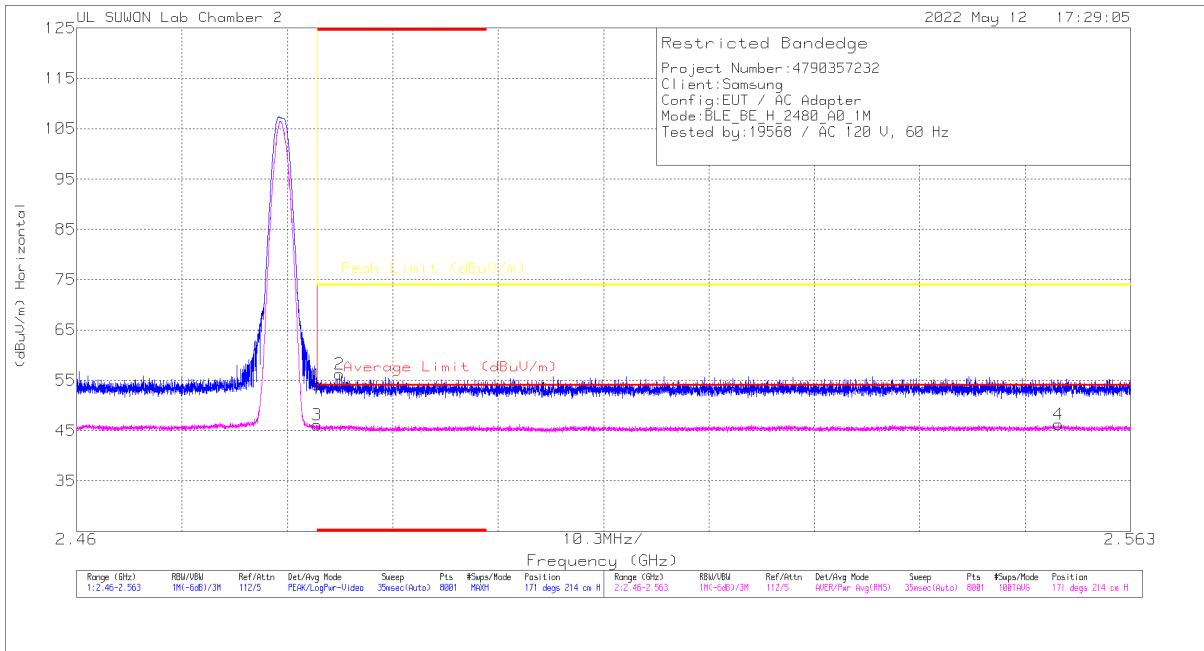
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	10dB_ATT[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Acimuth (Degs)	Height (cm)	Polarity
1	* 2.39	38.67	Pk	31.9	-19.7	0	50.87	-	-	74	-23.13	205	400	V
2	* 2.38581	43.51	Pk	31.9	-19.6	0	55.81	-	-	74	-18.19	205	400	V
3	* 2.39	30.83	RMS	31.9	-19.7	2.09	45.12	54	-8.88	-	-	205	400	V
4	* 2.38777	31.41	RMS	31.9	-19.5	2.09	45.9	54	-6.1	-	-	205	400	V

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

BANDEDGE (39 CHANNEL)

HORIZONTAL RESULT

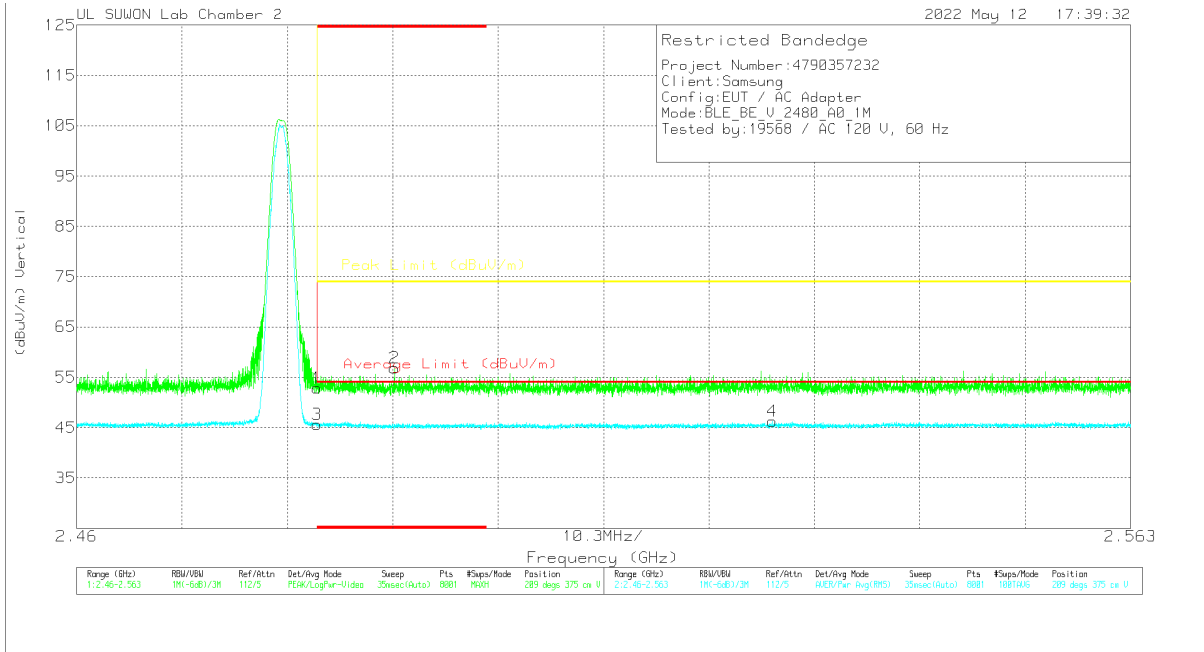


Trace Markers

Marker	Frequency (GHz)	Meas Reading (dBuV)	Det	3117_00168724	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	* 2.48351	41.74	Pk	32	-19.6	0	24.14	-	-	74	-19.86	171	214	H
2	* 2.4857	43.85	Pk	32	-19.6	0	56.25	-	-	74	-17.75	171	214	H
3	* 2.48351	31.6	RMS	32	-19.6	2.09	46.09	54	-7.91	-	-	171	214	H
4	2.55597	31.26	RMS	32.2	-19.3	2.09	46.25	54	-7.75	-	-	171	214	H

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

VERTICAL RESULT



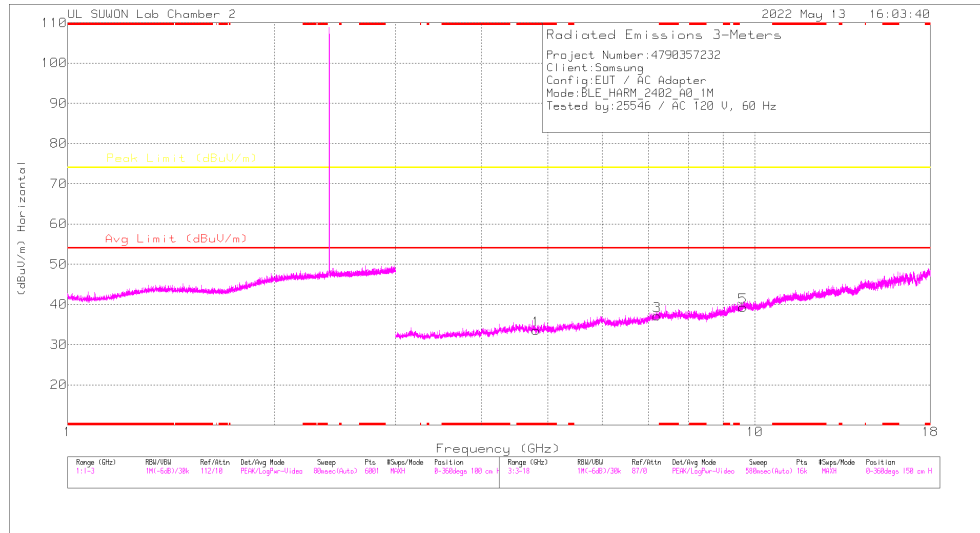
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	* 2.48351	40.46	Pk	32	-19.6	0	52.86	-	-	74	-21.14	209	375	V
2	* 2.49105	44.32	Pk	32.1	-19.6	0	56.82	-	-	74	-17.18	209	375	V
3	* 2.48351	31.14	RMS	32	-19.6	2.09	45.63	54	-8.37	-	-	209	375	V
4	2.52801	31.54	RMS	32.1	-19.5	2.09	46.23	54	-7.77	-	-	209	375	V

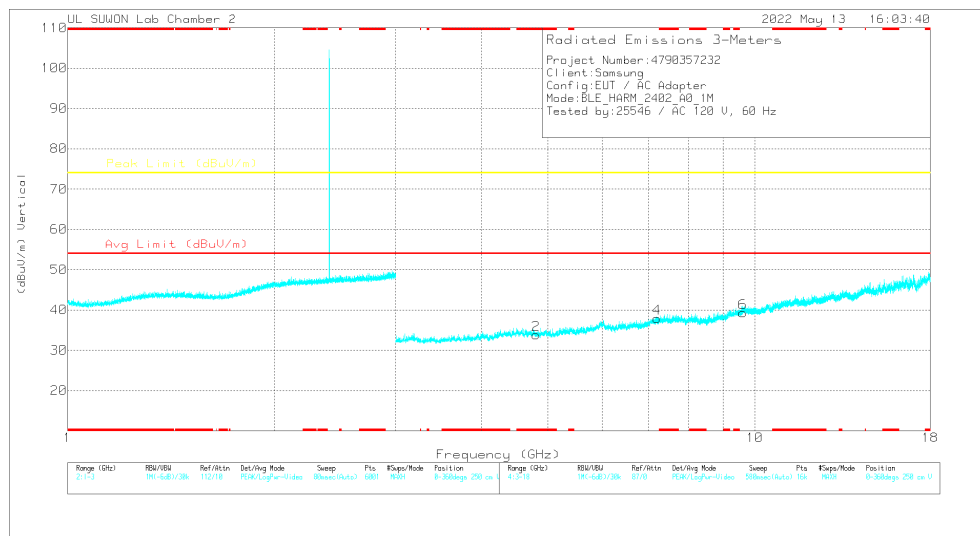
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

0 CHANNEL RESULTS



HORIZONTAL



VERTICAL

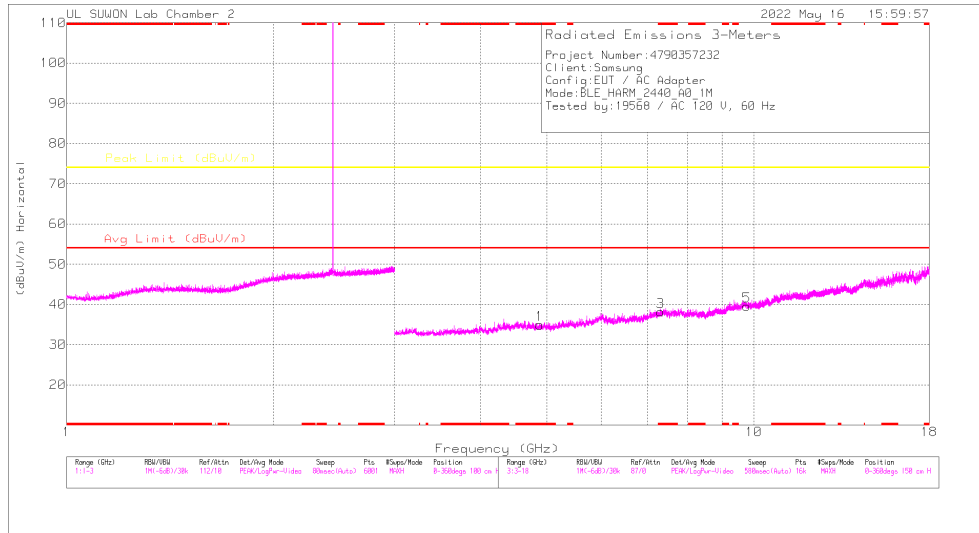
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

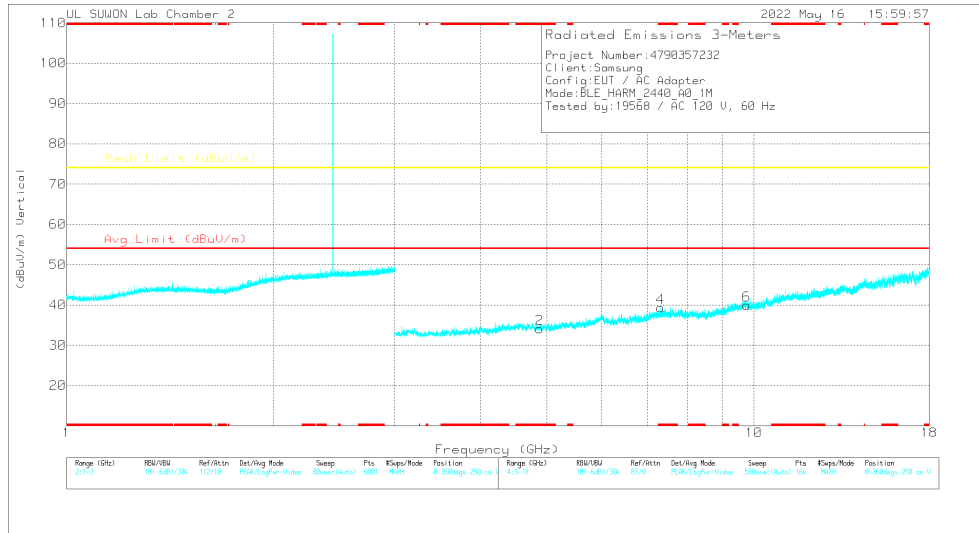
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.80405	37.31	PK2	34.1	-27.7	0	43.71	-	-	74	-30.29	360	100	H
* 4.81373	36.56	PK2	34.1	-27.8	0	42.86	-	-	74	-31.14	360	100	V
7.20952	34.94	PK2	36.2	-25.1	0	46.04	-	-	74	-27.96	360	100	H
7.21529	35.34	PK2	36.2	-25.1	0	46.44	-	-	74	-27.56	360	100	V
9.60927	32.19	PK2	37	-21.2	0	47.99	-	-	74	-26.01	360	100	H
9.60976	32.27	PK2	37	-21.2	0	48.07	-	-	74	-25.93	360	100	V

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

19 CHANNEL RESULTS



HORIZONTAL



VERTICAL

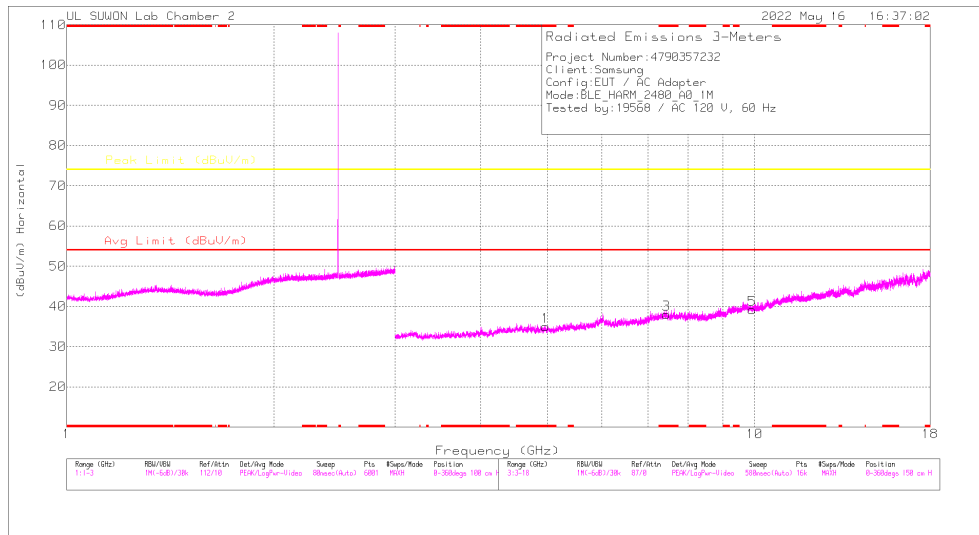
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

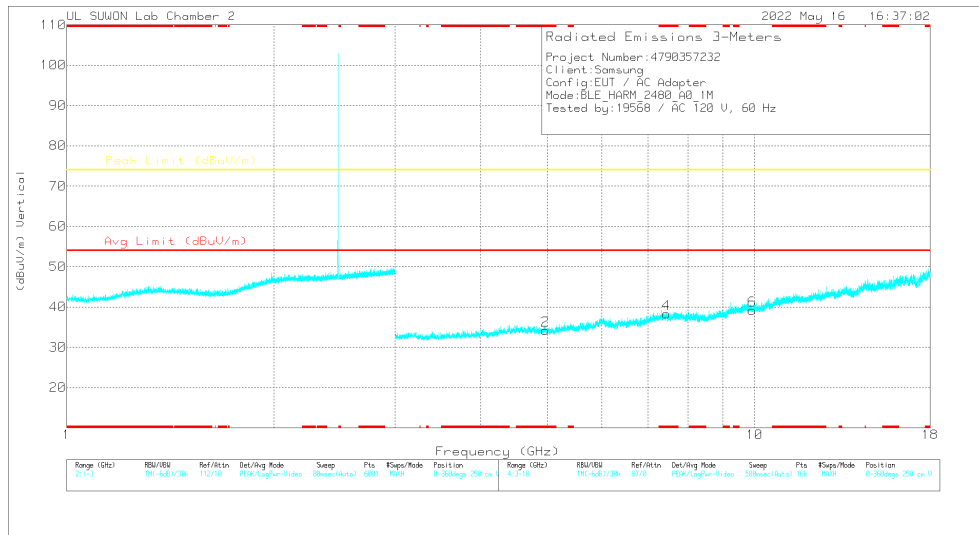
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HPI(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.87908	37.07	PK2	34.1	-27.7	0	43.47	-	-	74	-30.53	0	100	H
* 4.88957	37.32	PK2	34.1	-27.5	0	43.92	-	-	74	-30.08	0	100	V
* 7.31344	35.77	PK2	36.1	-24.6	0	47.27	-	-	74	-26.73	0	100	H
* 7.31449	35.49	PK2	36.1	-24.6	0	46.99	-	-	74	-27.01	0	100	V
9.75106	32.54	PK2	37.2	-20.9	0	48.84	-	-	74	-25.16	0	100	H
9.75611	32.77	PK2	37.2	-20.9	0	49.07	-	-	74	-24.93	0	100	V

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

39 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.

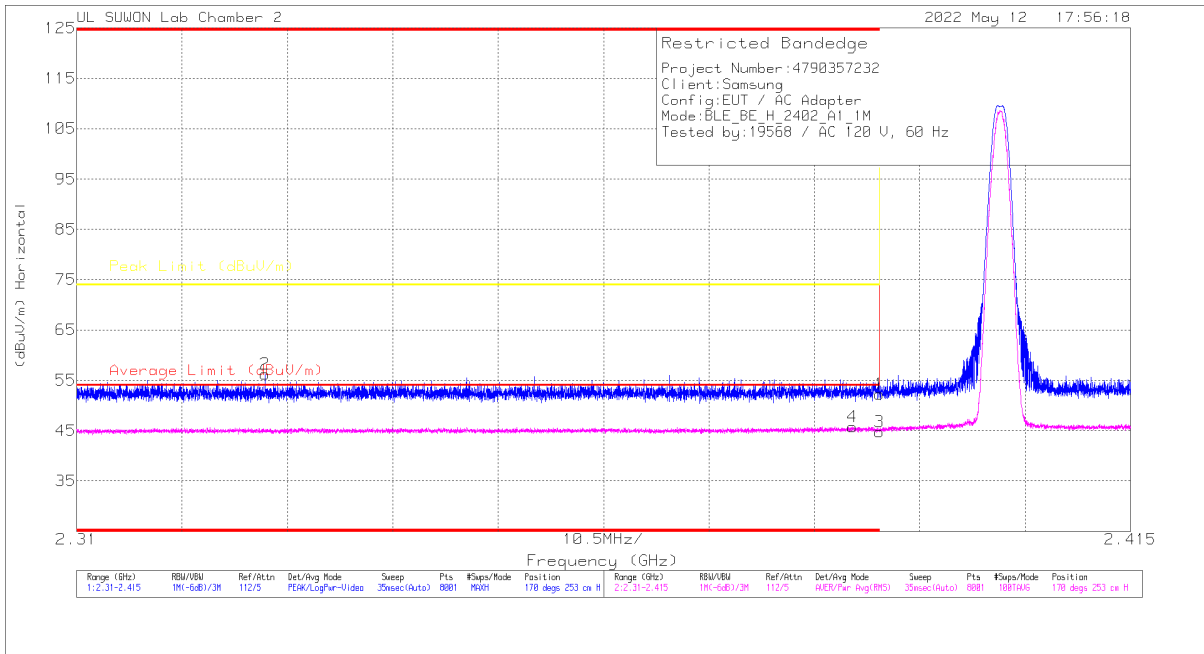
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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
* 4.95273	36.16	PK2	34.1	-27	0	43.26	-	-	74	-30.74	0	100	H
* 4.9531	36.5	PK2	34.1	-27	0	43.6	-	-	74	-30.4	0	100	V
* 7.43372	35.15	PK2	36	-23.7	0	47.45	-	-	74	-26.55	0	100	H
* 7.4441	34.69	PK2	36	-23.7	0	46.99	-	-	74	-27.01	0	100	V
9.91478	32.31	PK2	37.4	-21.1	0	48.61	-	-	74	-25.39	0	100	H
9.91615	32.12	PK2	37.4	-21.1	0	48.42	-	-	74	-25.58	0	100	V

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

ANT2
BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	* 2.389	40.02	PK	31.9	-19.7	0	52.22	-	-	74	-21.78	170	253	H
2	* 2.38777	44.03	PK	31.8	-19.6	0	56.23	-	-	74	-17.77	170	253	H
3	* 2.389	30.53	RMS	31.9	-19.7	2.09	44.82	54	-9.18	-	-	170	253	H
4	* 2.38732	31.38	RMS	31.9	-19.6	2.09	45.77	54	-8.23	-	-	170	253	H

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

VERTICAL RESULT



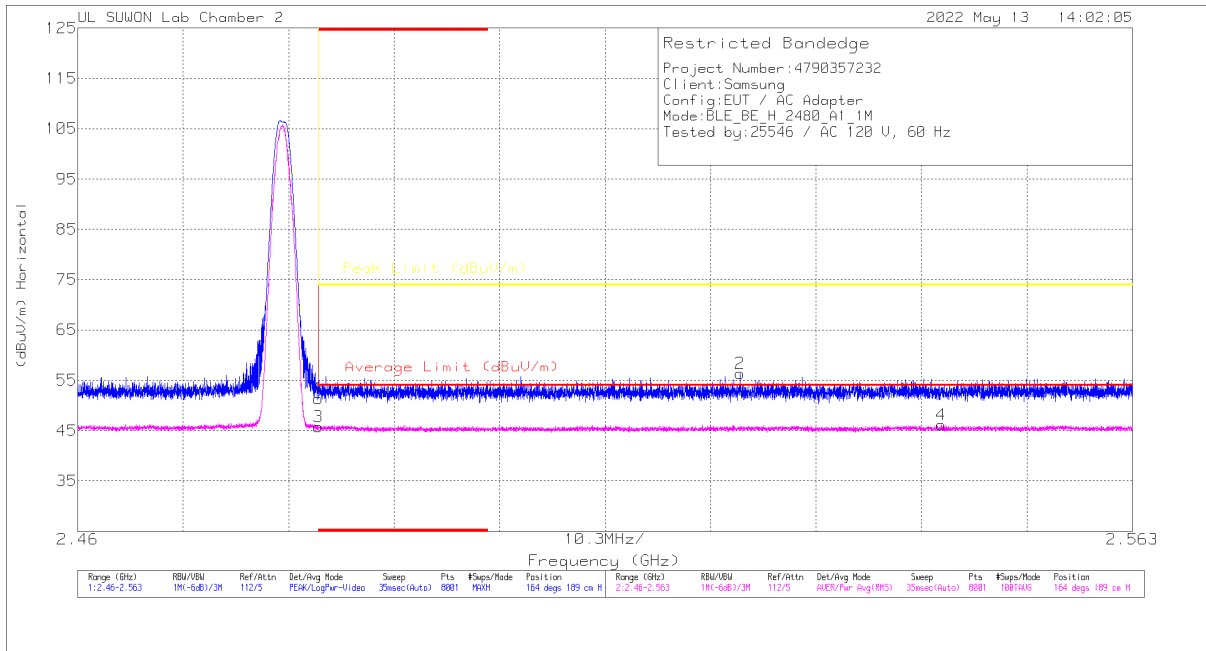
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	41.77	Pk	31.9	-19.7	0	53.97	-	-	74	-20.03	202	356	V
2	* 2.32009	43.68	Pk	31.8	-19.6	0	55.88	-	-	74	-18.12	202	356	V
3	* 2.39	30.84	RMS	31.9	-19.7	2.09	45.13	54	-8.87	-	-	202	356	V
4	* 2.3853	31.55	RMS	31.9	-19.6	2.09	45.94	54	-8.06	-	-	202	356	V

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

BANDEDGE (39 CHANNEL)

HORIZONTAL RESULT

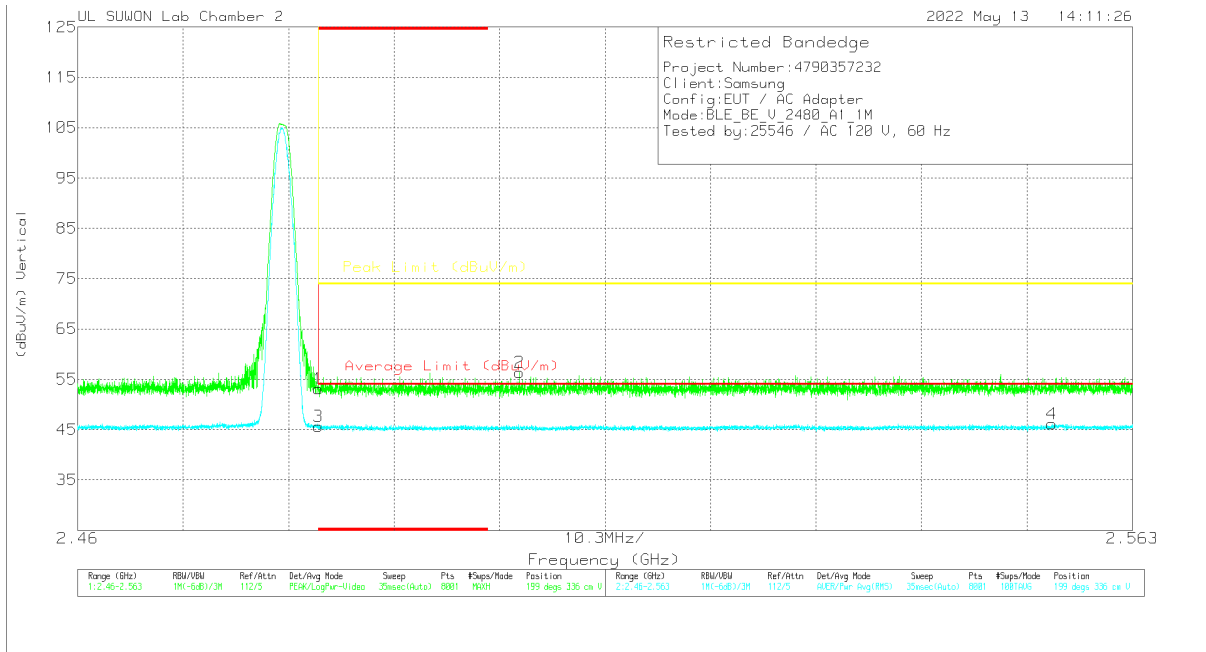


Trace Markers

Marker	Frequency (GHz)	Meas Reading (dBuV)	Det	3117_00168724	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	* 2.48351	39.02	Pk	-32	-19.6	0	51.42	-	-	74	-22.58	164	189	H
2	2.52467	43.88	Pk	-32.1	-19.4	0	56.38	-	-	74	-17.62	164	189	H
3	* 2.48351	31.23	RMS	-32	-19.6	2.09	45.72	54	-8.28	-	-	164	189	H
4	2.54432	31.41	RMS	-32.1	-19.5	2.09	46.1	54	-7.9	-	-	164	189	H

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

VERTICAL RESULT



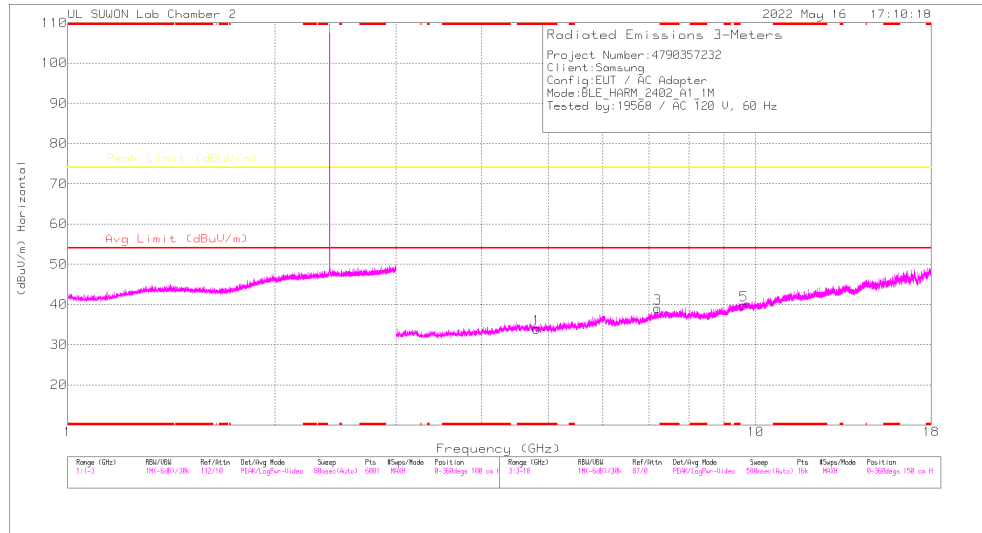
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	10dB_ATT[dB]	DC Cor (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Pk Margin (dB)	Acimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	40.74	Pk	32	-19.6	0	53.14	-	-	74	-20.86	199	336	V
2	2.50316	43.78	Pk	32.1	-19.5	0	56.38	-	-	74	-17.62	199	336	V
3	* 2.48351	31.1	RMS	32	-19.6	2.09	45.99	54	-8.41	-	-	199	336	V
4	2.55513	31.27	RMS	32.2	-19.4	2.09	46.16	54	-7.84	-	-	199	336	V

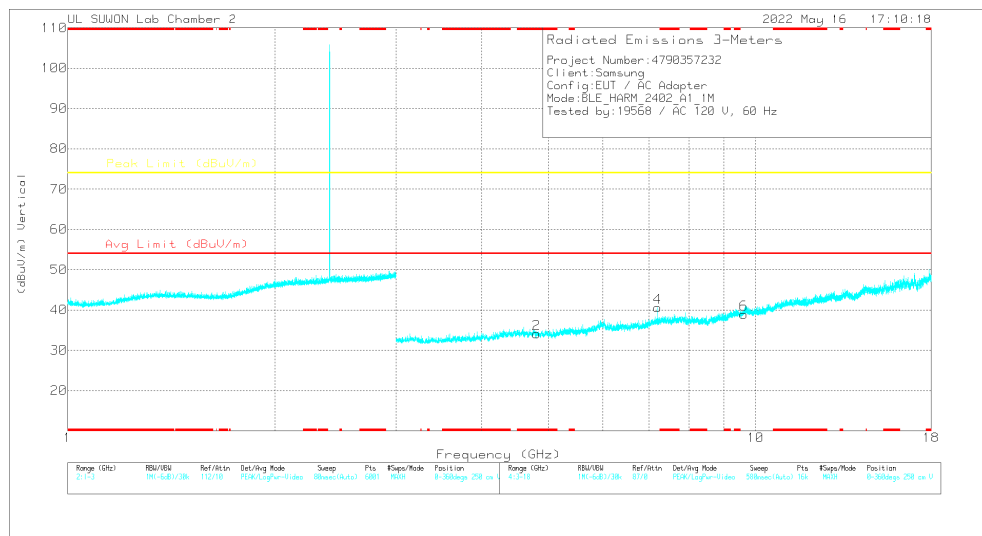
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

0 CHANNEL RESULTS



HORIZONTAL



VERTICAL

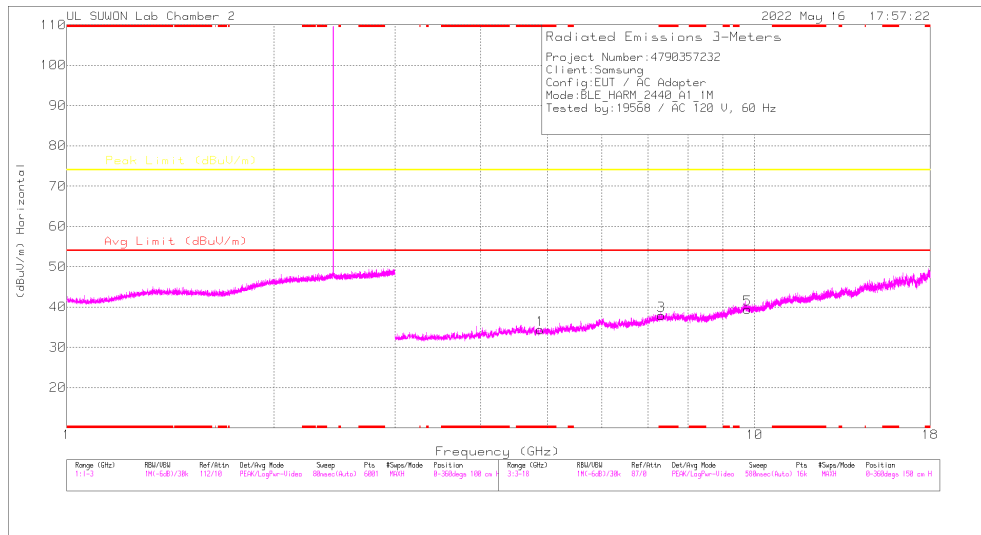
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

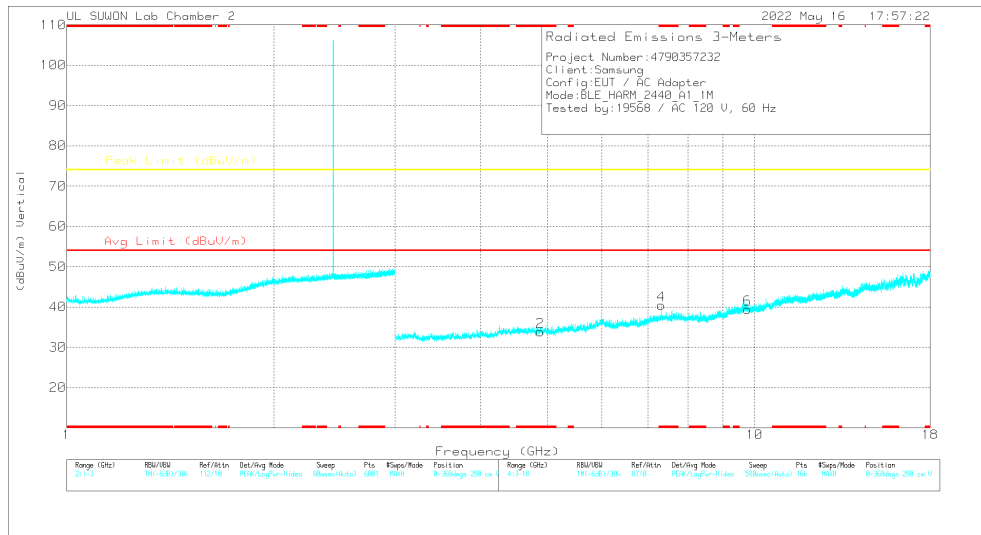
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.81434	36.59	PK2	34.1	-27.8	0	42.89	-	-	74	-31.11	0	100	H
* 4.80628	36.75	PK2	34.1	-27.7	0	43.15	-	-	74	-30.85	0	100	V
7.20672	36.43	PK2	36.2	-25	0	47.63	-	-	74	-26.37	155	100	H
7.2052	37.6	PK2	36.2	-25	0	48.8	-	-	74	-25.2	242	103	V
9.60889	33.16	PK2	37	-21.3	0	48.86	-	-	74	-25.14	0	100	H
9.60537	33.31	PK2	37	-21.3	0	49.01	-	-	74	-24.99	360	100	V

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

19 CHANNEL RESULTS



HORIZONTAL



VERTICAL

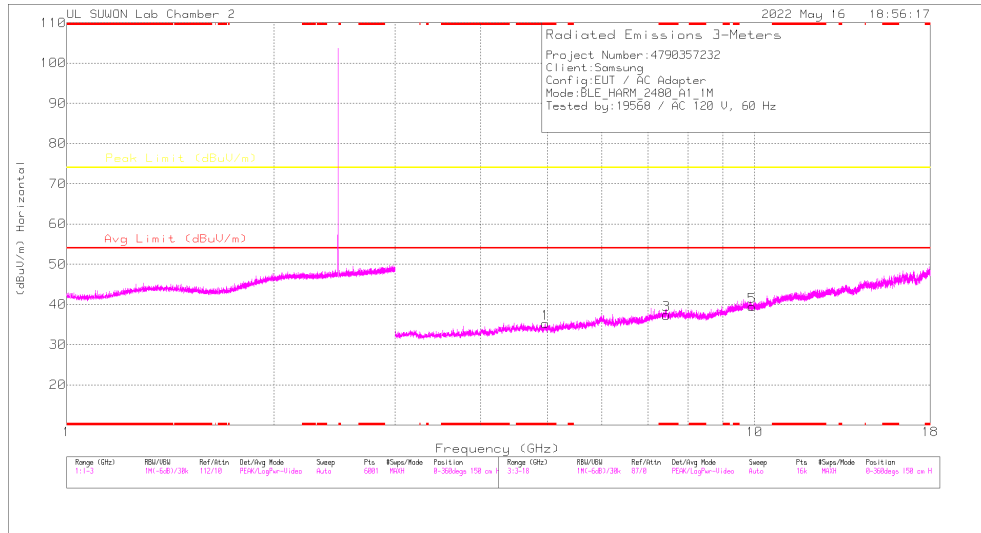
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

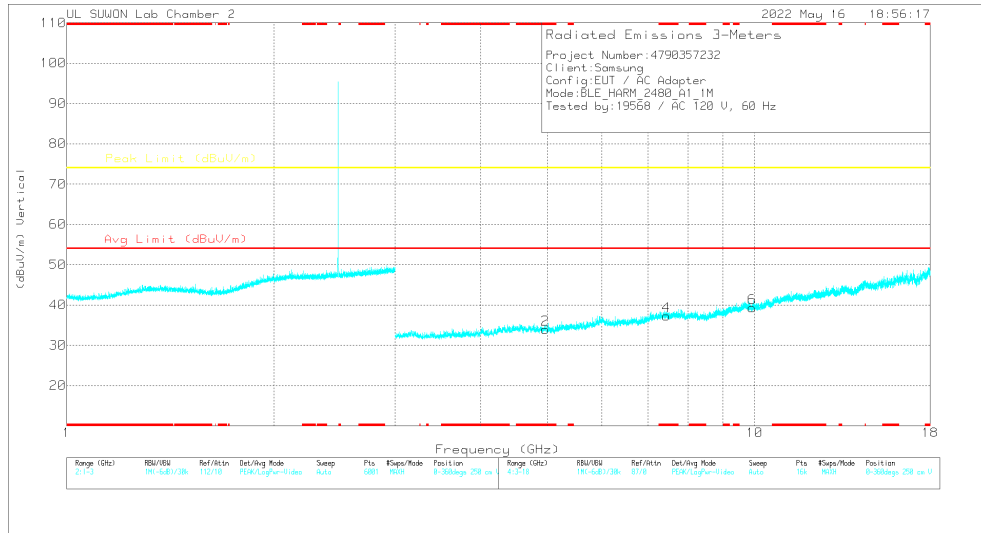
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0016872 4	3GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.88273	36.95	PK2	34.1	-27.6	0	43.45	-	-	74	-30.55	360	100	H
* 4.87562	36.6	PK2	34.1	-27.8	0	42.9	-	-	74	-31.1	360	100	V
* 7.32055	36.78	PK2	36.1	-24.5	0	48.38	-	-	74	-25.62	41	106	H
* 7.31927	24.85	MAV1	36.1	-24.6	2.09	38.44	54	-15.56	-	-	41	106	H
* 7.31993	35.67	PK2	36.1	-24.6	0	47.17	-	-	74	-26.83	251	221	V
* 7.31933	24.38	MAV1	36.1	-24.6	2.09	37.97	54	-16.03	-	-	251	221	V
9.7665	32.63	PK2	37.2	-21	0	48.83	-	-	74	-25.17	360	100	H
9.75725	32.28	PK2	37.2	-20.9	0	48.58	-	-	74	-25.42	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

39 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

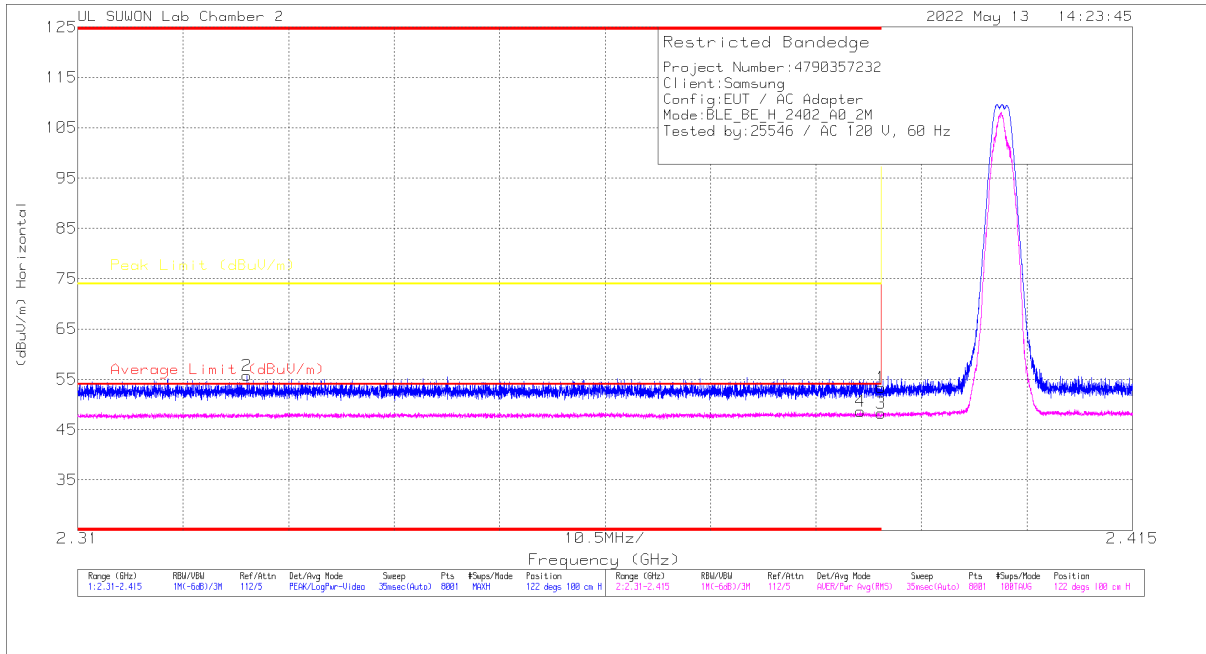
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.95204	36.25	PK2	34.1	-27.1	0	43.25	-	-	74	-30.75	360	100	H
* 4.95594	36.03	PK2	34.1	-27.1	0	43.03	-	-	74	-30.97	360	100	V
* 7.4422	34.13	PK2	36	-23.7	0	46.43	-	-	74	-27.57	360	100	H
* 7.43365	34.32	PK2	36	-23.7	0	46.62	-	-	74	-27.38	360	100	V
9.92474	32.11	PK2	37.4	-21	0	48.51	-	-	74	-25.49	360	100	H
9.9131	32.19	PK2	37.4	-21.1	0	48.49	-	-	74	-25.51	360	100	V

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

10.2.2. 2 Mbps

ANT1
BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT

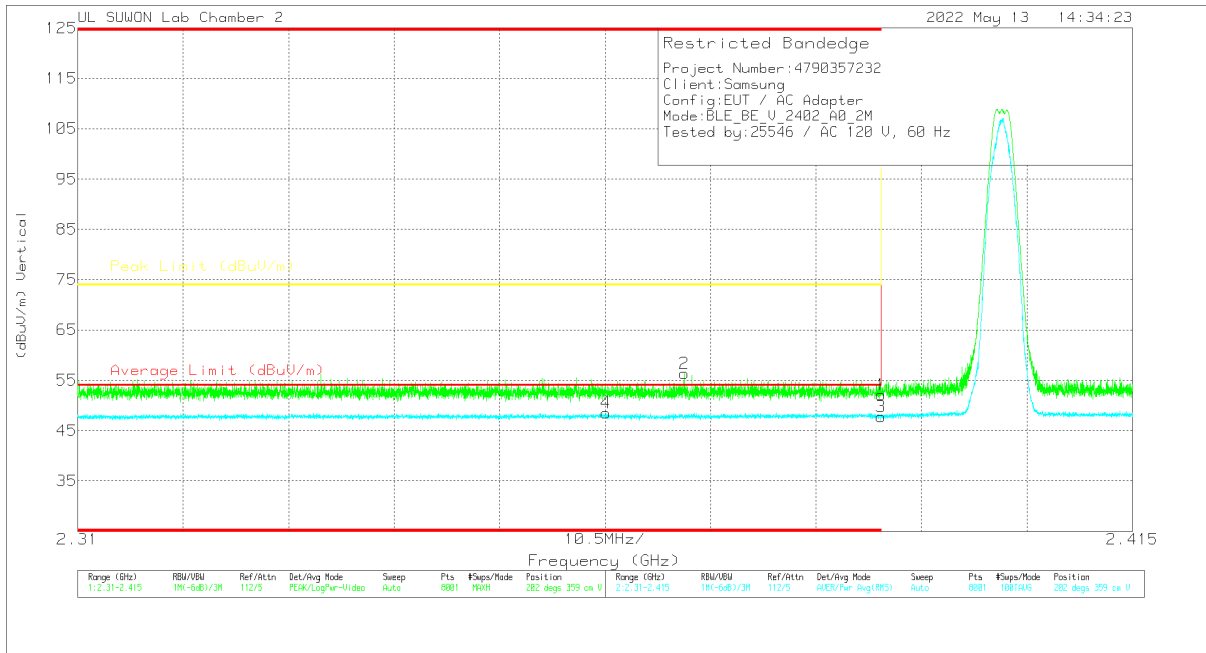


Trace Markers

Marker	Frequency (GHz)	Meas Reading (dBuV)	Det	3117_00168724	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	41.12	Pk	31.9	-19.7	0	53.32	-	-	74	-20.68	122	100	H
2	* 2.32687	43.56	Pk	31.8	-19.6	0	55.76	-	-	74	-18.24	122	100	H
3	* 2.39	31.15	RMS	31.9	-19.7	4.91	-48.26	54	-5.74	-	-	122	100	H
4	* 2.38792	31.27	RMS	31.9	-19.5	4.91	-48.58	54	-5.42	-	-	122	100	H

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

VERTICAL RESULT



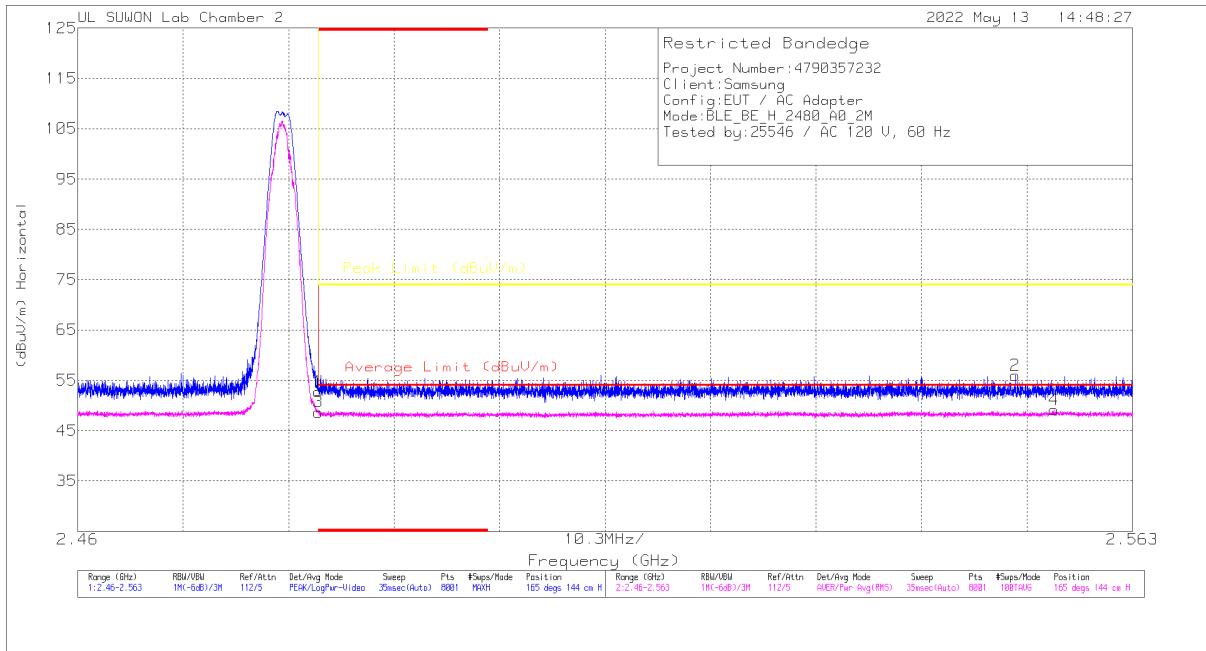
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	10dB_ATT(dB)	DC Corr (dB)	Corrected Reading (dBu/m)	Average Limit (dBu/m)	Margin (dB)	Peak Limit (dBu/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.9	Pk		-19.7	0	52.1	-	-	74	-21.9	202	359	V
2	* 2.37036	44.2	Pk		-19.6	0	56.4	-	-	74	-17.6	202	359	V
3	* 2.39	30.61	RMS		-19.7	4.91	47.72	54	-6.28	-	-	202	359	V
4	* 2.36257	31.36	RMS		-19.5	4.91	48.57	54	-5.43	-	-	202	359	V

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

BANDEDGE (39 CHANNEL)

HORIZONTAL RESULT

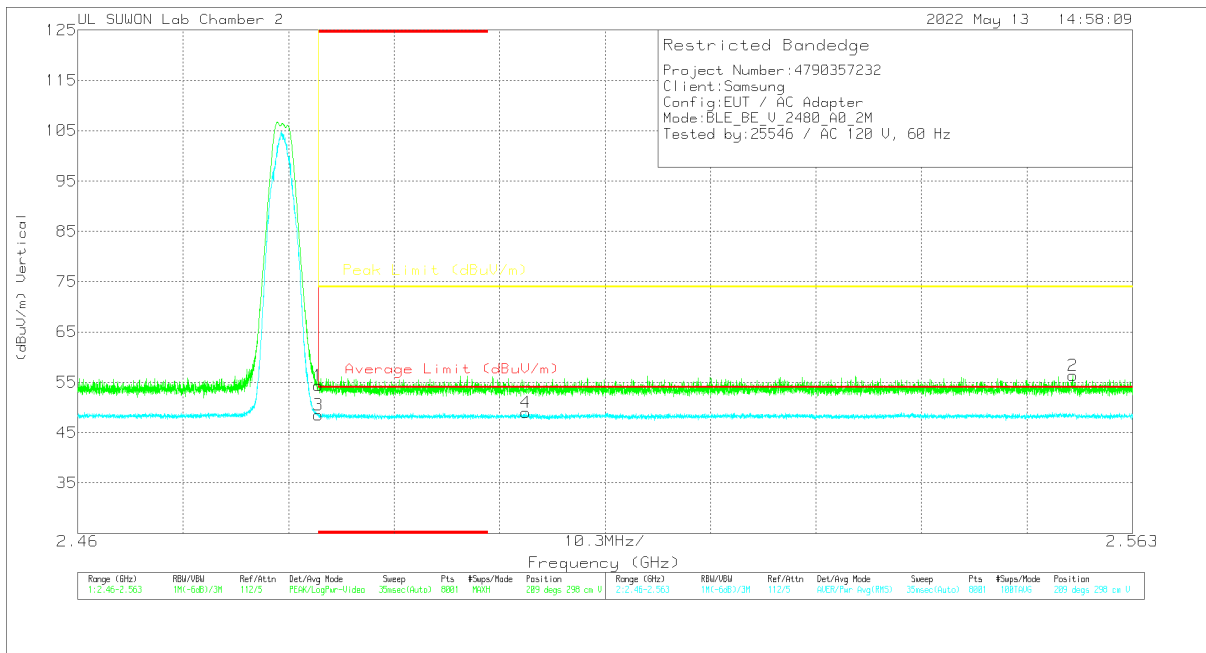


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	* 2.48351	40.32	Pk	-32	-19.6	0	52.72	-	-	74	-21.28	165	144	H
2	2.55155	43.29	Pk	-32.2	-19.5	0	55.99	-	-	74	-18.01	165	144	H
3	* 2.48351	31.39	RMS	-32	-19.6	4.91	48.7	54	-5.3	-	-	165	144	H
4	2.55533	31.3	RMS	-32.2	-19.3	4.91	49.11	54	-4.89	-	-	165	144	H

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

VERTICAL RESULT



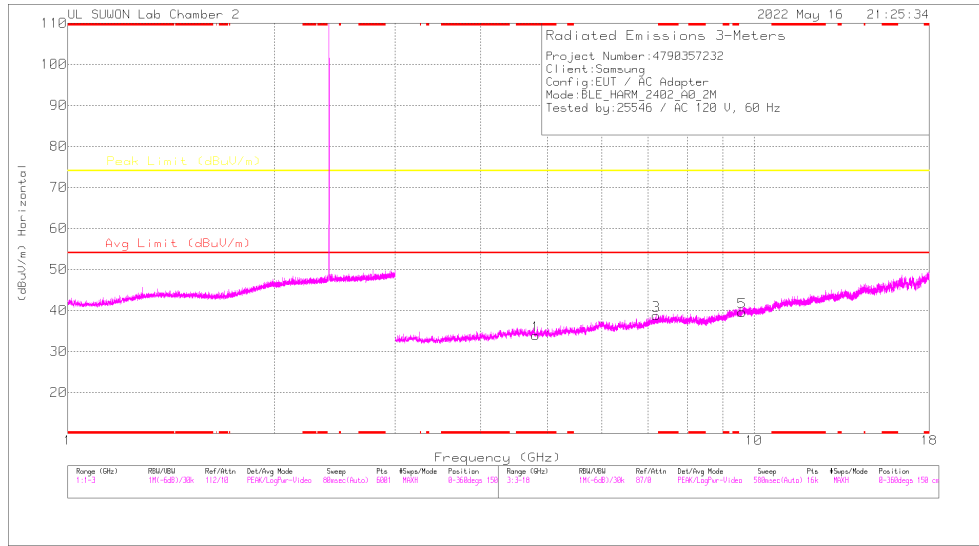
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	* 2.48351	41.98	Pk	32	-19.6	0	54.38	-	-	74	-19.62	209	298	V
2	2.55715	43.51	Pk	32.2	-19.4	0	56.31	-	-	74	-17.69	209	298	V
3	* 2.48351	31.17	RMS	32	-19.6	4.91	48.48	54	-5.52	-	-	209	298	V
4	2.50376	31.53	RMS	32.1	-19.5	4.91	49.04	54	-4.96	-	-	209	298	V

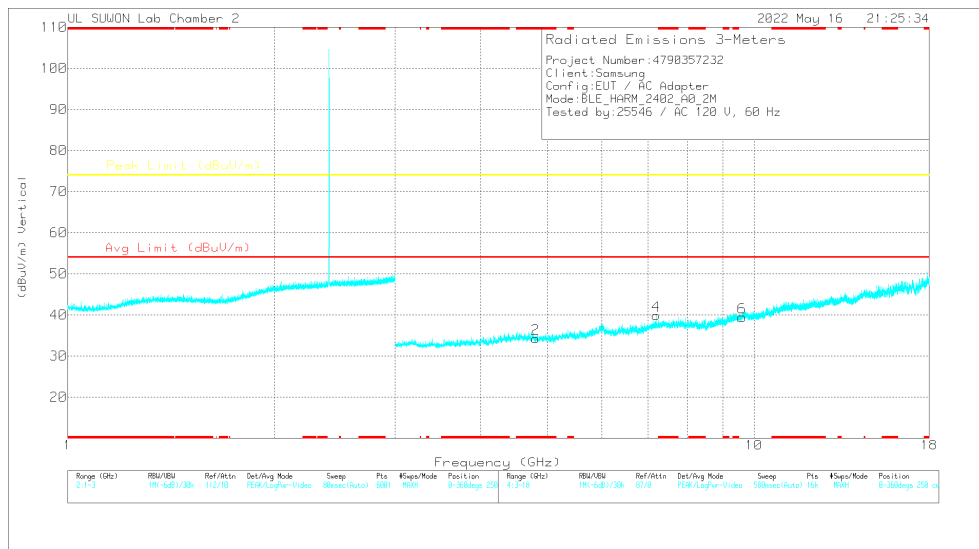
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

0 CHANNEL RESULTS



HORIZONTAL



VERTICAL

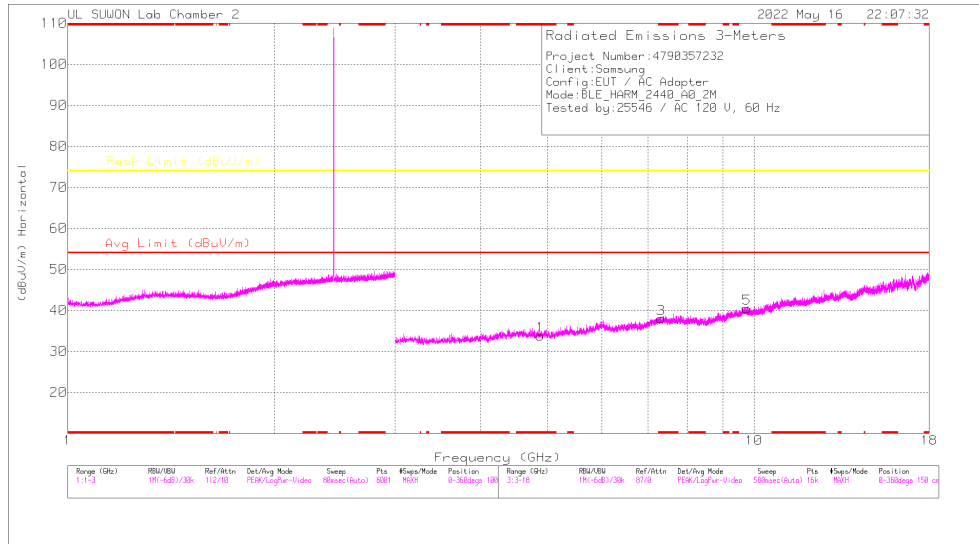
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

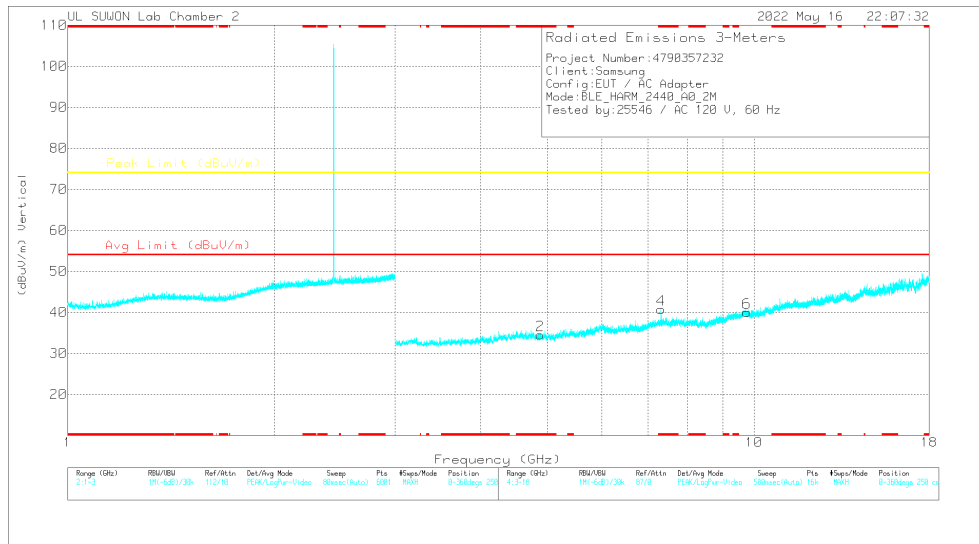
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.80359	36.85	PK2	34.1	-27.7	0	43.25	-	-	74	-30.75	360	100	H
* 4.81095	36.94	PK2	34.1	-27.7	0	43.34	-	-	74	-30.66	0	100	V
7.2075	37.85	PK2	36.2	-25.1	0	48.95	-	-	74	-25.05	156	104	H
7.20604	38.53	PK2	36.2	-25	0	49.73	-	-	74	-24.27	240	101	V
9.60054	33.14	PK2	37	-21.4	0	48.74	-	-	74	-25.26	0	100	H
9.6102	33.65	PK2	37	-21.2	0	49.45	-	-	74	-24.55	0	100	V

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

19 CHANNEL RESULTS



HORIZONTAL



VERTICAL

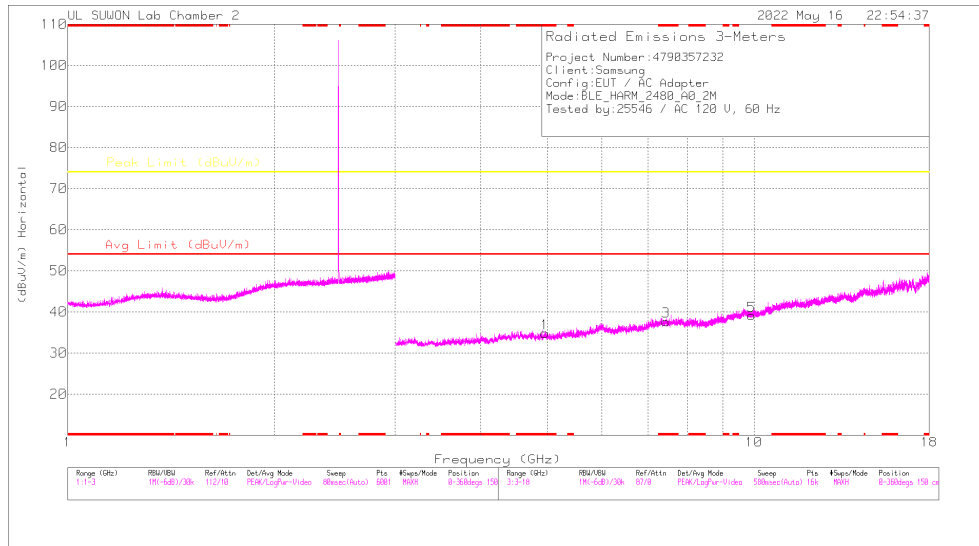
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

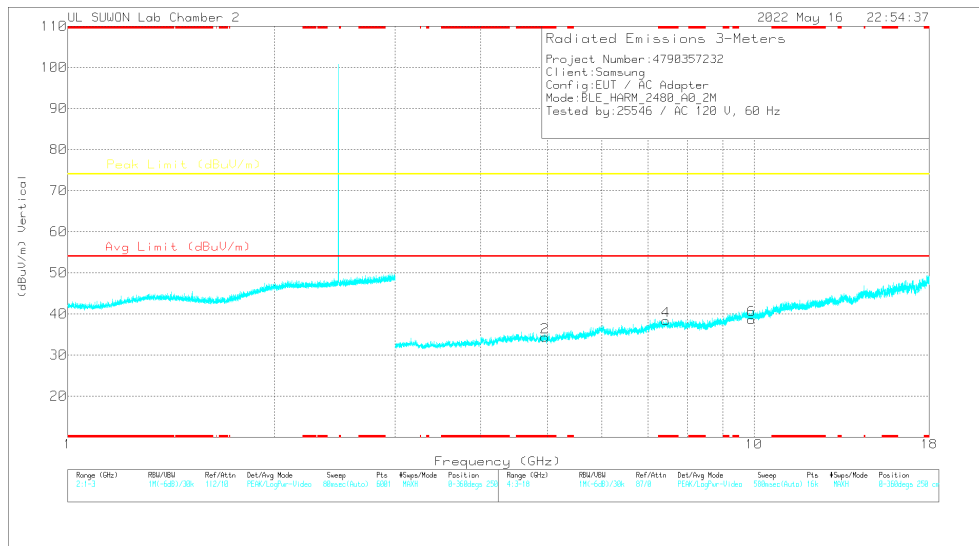
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_0016872 4	3GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.87852	36.56	PK2	34.1	-27.7	0	42.96	-	-	74	-31.04	360	100	H
* 4.87865	36.81	PK2	34.1	-27.7	0	43.21	-	-	74	-30.79	360	100	V
* 7.32162	35.25	PK2	36.1	-24.5	0	46.85	-	-	74	-27.15	360	100	H
* 7.32167	37.9	PK2	36.1	-24.5	0	49.5	-	-	74	-24.5	245	104	V
* 7.31857	25.64	MAV1	36.1	-24.6	4.91	42.05	54	-11.95	-	-	245	104	V
9.76211	32.66	PK2	37.2	-21	0	48.86	-	-	74	-25.14	360	100	H
9.76151	32.18	PK2	37.2	-21	0	48.38	-	-	74	-25.62	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

39 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.

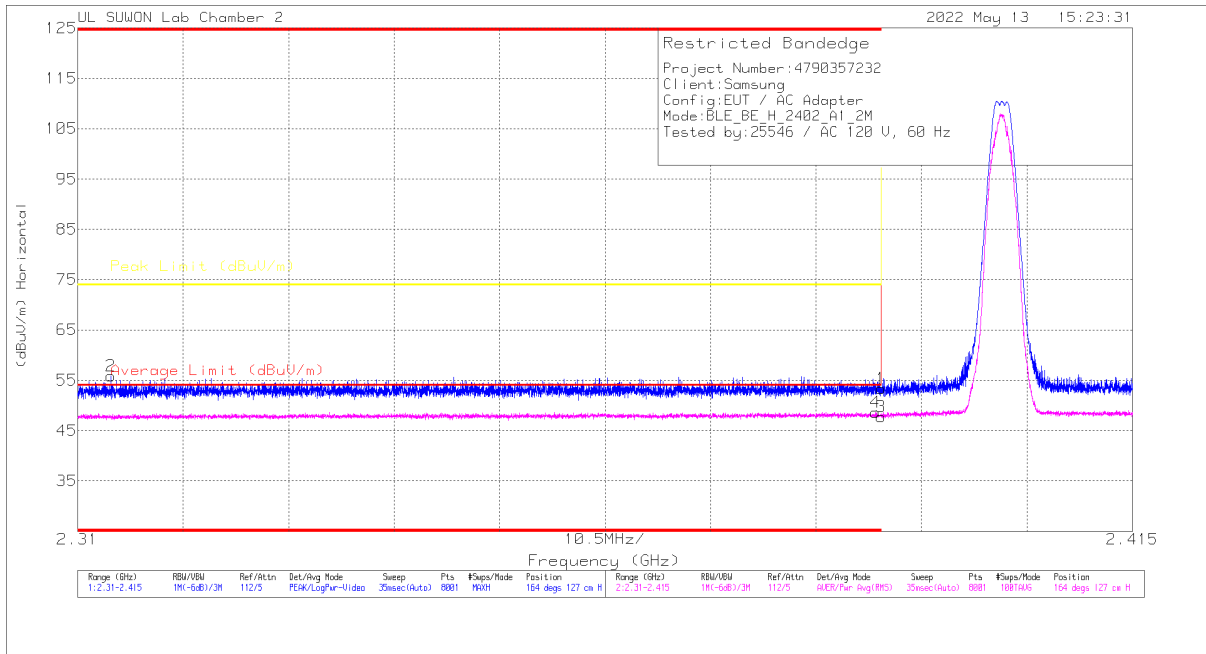
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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
* 4.95914	37.03	PK2	34.1	-27	0	44.13	-	-	74	-29.87	360	100	H
* 4.96012	36.48	PK2	34.1	-27	0	43.58	-	-	74	-30.42	360	100	V
* 7.43875	35.31	PK2	36	-23.7	0	47.61	-	-	74	-26.39	360	100	H
* 7.44167	34.5	PK2	36	-23.7	0	46.8	-	-	74	-27.2	360	100	V
9.92154	32.83	PK2	37.4	-21.1	0	49.13	-	-	74	-24.87	360	100	H
9.91825	32.28	PK2	37.4	-21	0	48.68	-	-	74	-25.32	360	100	V

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

ANT2
BANDEDGE (0 CHANNEL)

HORIZONTAL RESULT

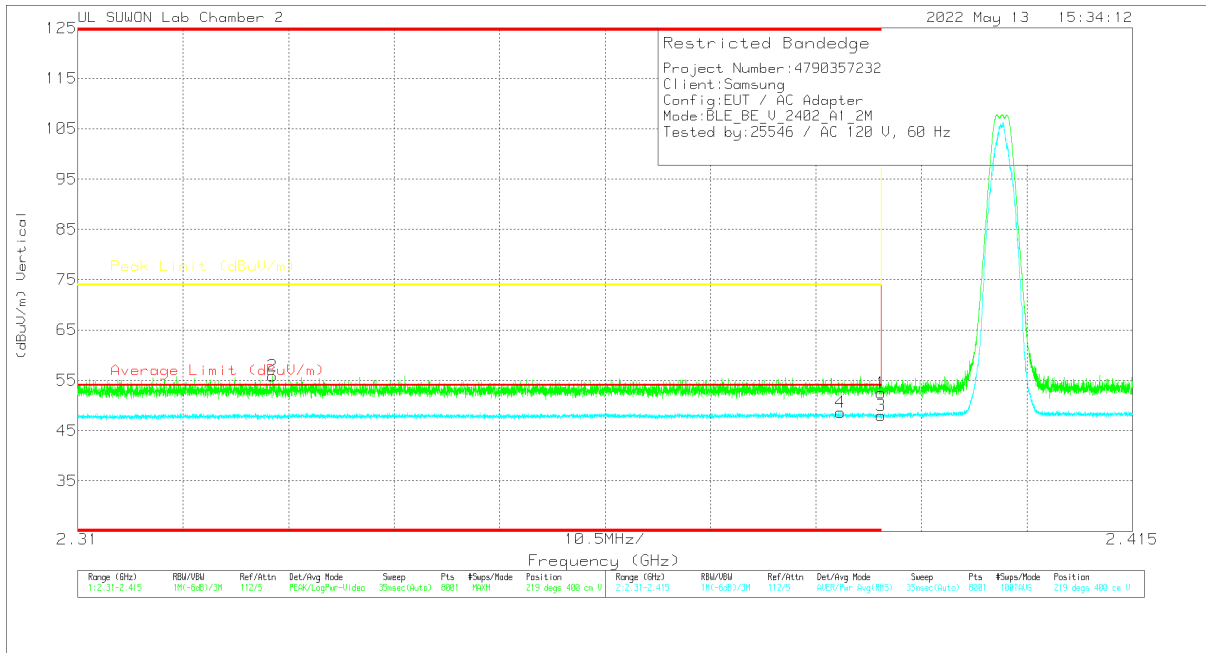


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	41.2	Pk	31.9	-19.7	0	53.4	-	-	74	-20.6	164	127	H
2	* 2.31332	43.8	Pk	31.7	-19.6	0	55.9	-	-	74	-18.1	164	127	H
3	* 2.39	30.61	RMS	31.9	-19.7	4.91	47.72	54	-6.28	-	-	164	127	H
4	* 2.38945	31.56	RMS	31.9	-19.7	4.91	48.67	54	-5.33	-	-	164	127	H

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

VERTICAL RESULT



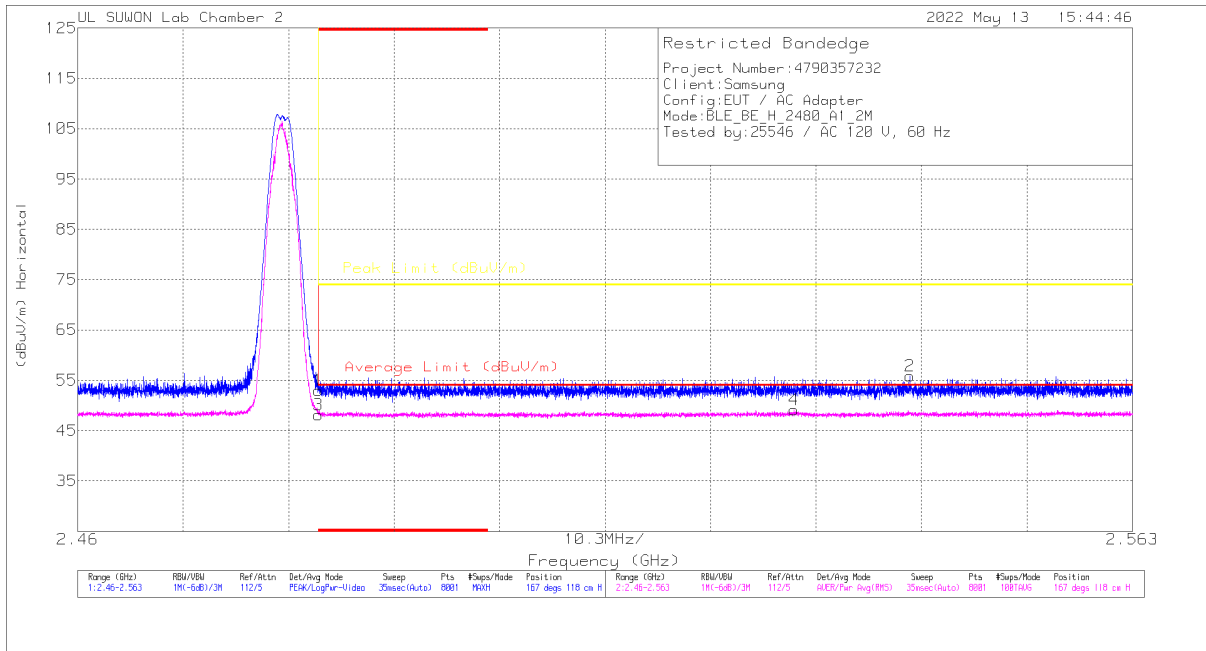
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	10dB_ATT[dB]	DC Corr (dB)	Corrected Reading (dBu/m)	Average Limit (dBu/m)	Margin (dB)	Peak Limit (dBu/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.27	Pk	31.9	-19.7	0	52.47	-	-	74	-21.53	219	400	V
2	* 2.32943	43.7	Pk	31.8	-19.6	0	55.9	-	-	74	-18.1	219	400	V
3	* 2.39	30.88	RMS	31.9	-19.7	4.91	47.99	54	-6.01	-	-	219	400	V
4	* 2.38593	31.47	RMS	31.9	-19.6	4.91	48.68	54	-5.32	-	-	219	400	V

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

BANDEDGE (39 CHANNEL)

HORIZONTAL RESULT

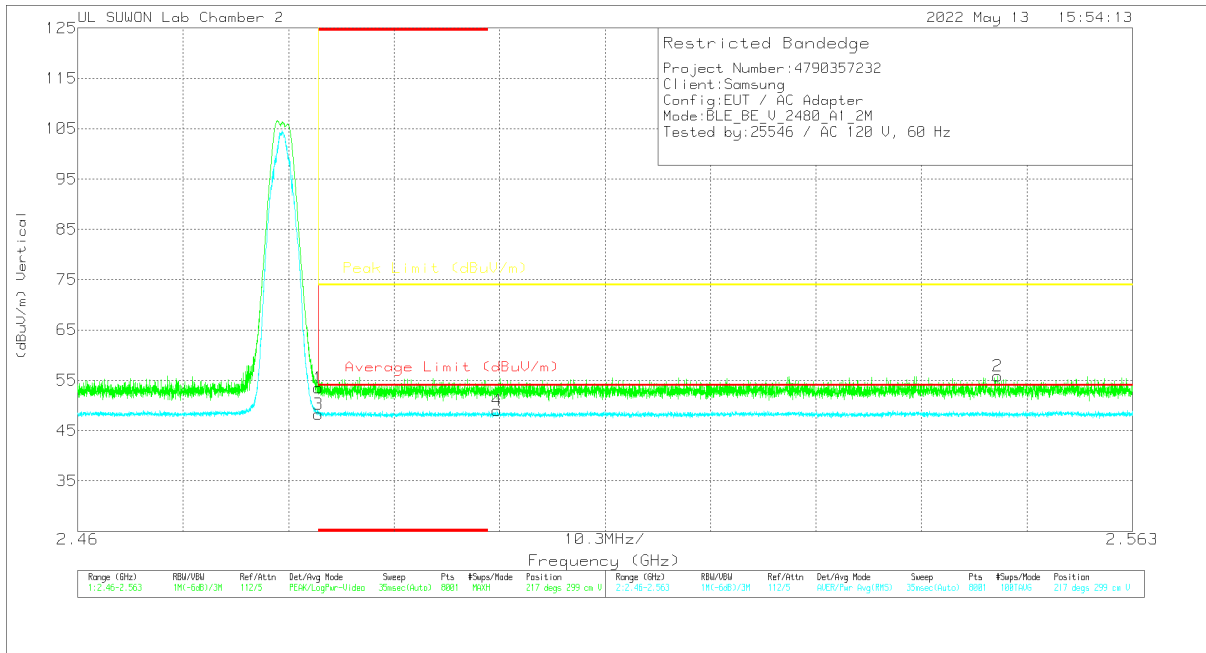


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	* 2.48351	40.61	Pk	32	-19.6	0	53.01	-	-	74	-20.99	167	118	H
2	2.54125	43.16	Pk	32.1	-19.4	0	55.86	-	-	74	-18.14	167	118	H
3	* 2.48351	30.79	RMS	32	-19.6	4.91	48.1	54	-5.9	-	-	167	118	H
4	2.52994	31.37	RMS	32.1	-19.3	4.91	49.08	54	-4.92	-	-	167	118	H

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

VERTICAL RESULT



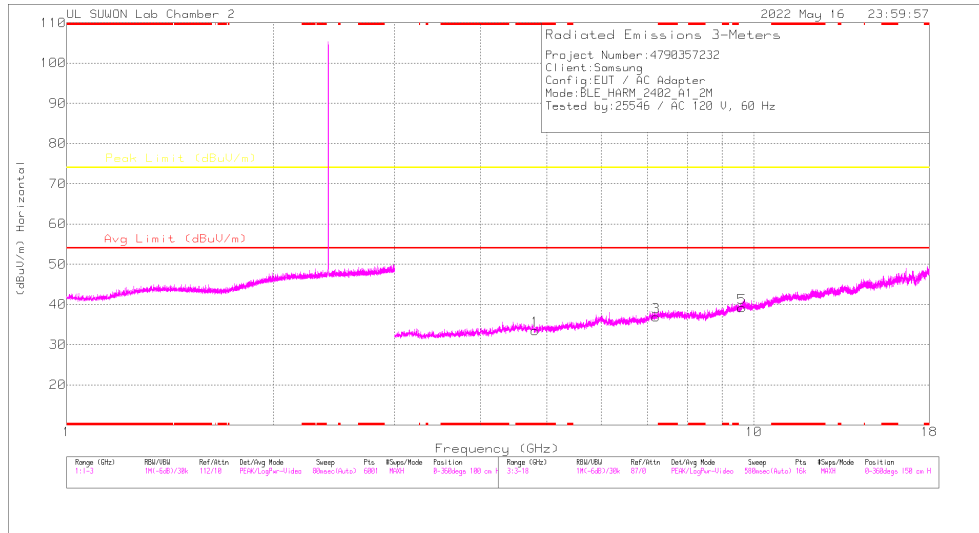
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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	* 2.48351	41.07	Pk	32	-19.6	0	53.47	-	-	74	-20.53	217	299	V
2	2.54984	43.28	Pk	32.1	-19.5	0	55.88	-	-	74	-18.12	217	299	V
3	* 2.48351	30.99	RMS	32	-19.6	4.91	48.3	54	-5.7	-	-	217	299	V
4	2.50094	31.52	RMS	32.1	-19.5	4.91	49.03	54	-4.97	-	-	217	299	V

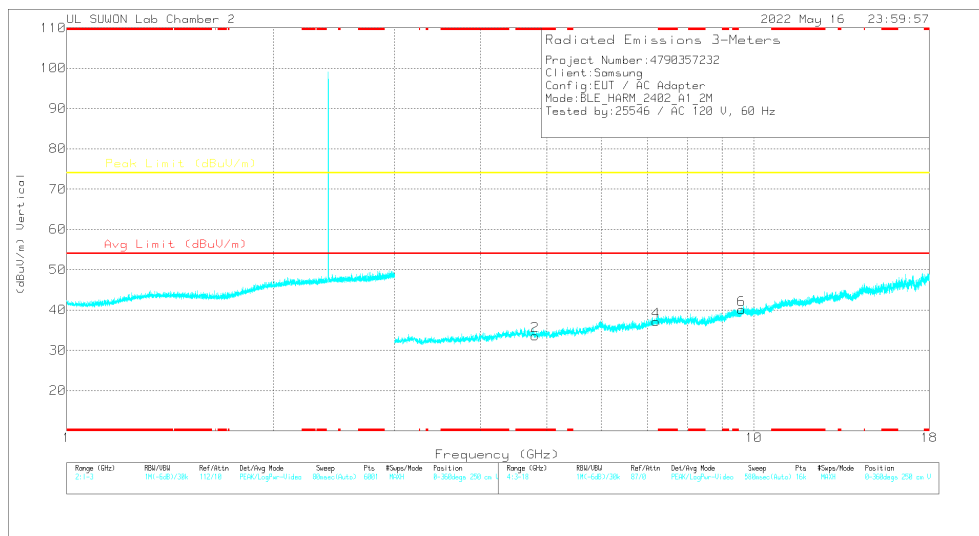
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

0 CHANNEL RESULTS



HORIZONTAL



VERTICAL

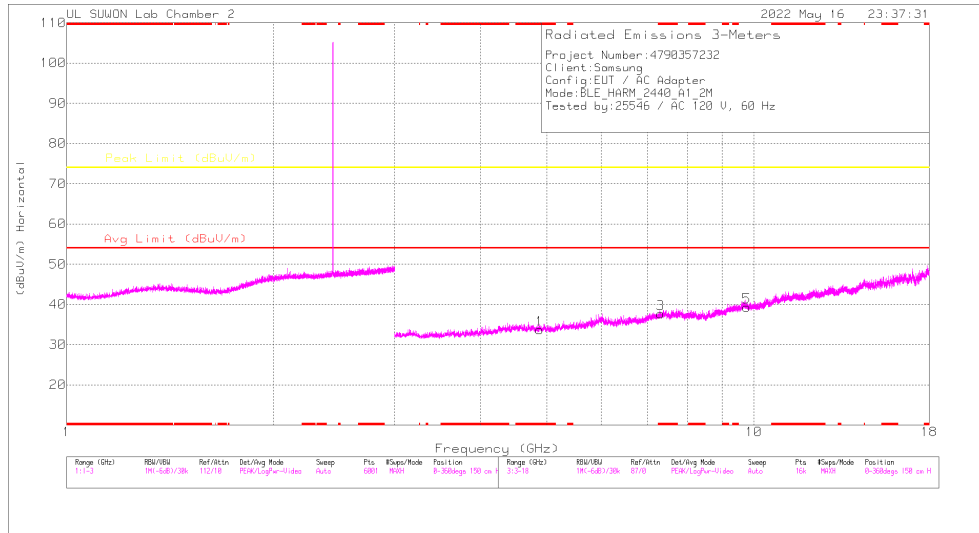
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

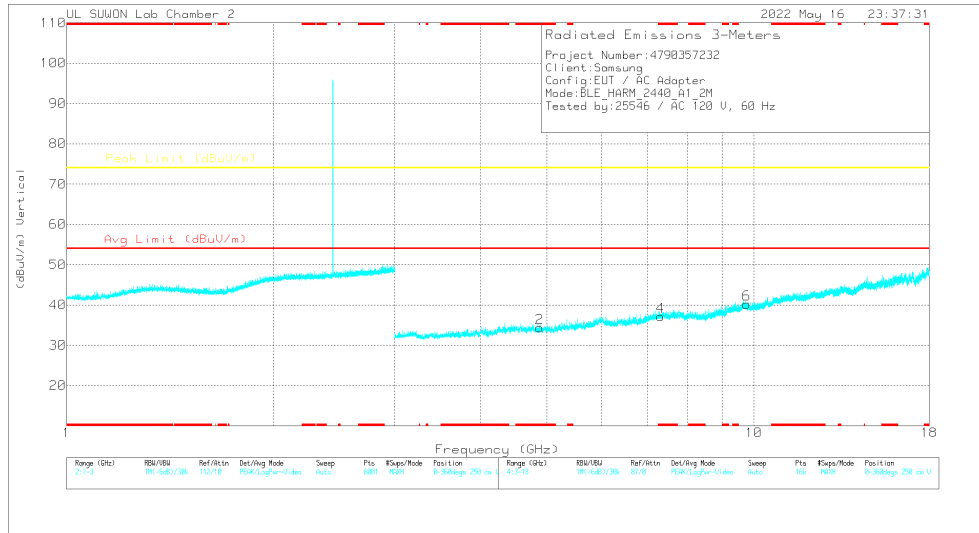
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HP[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.80364	37.02	PK2	34.1	-27.7	0	43.42	-	-	74	-30.58	360	100	H
* 4.80469	36.57	PK2	34.1	-27.7	0	42.97	-	-	74	-31.03	360	100	V
7.20622	35.57	PK2	36.2	-25	0	46.77	-	-	74	-27.23	360	100	H
7.20592	35.6	PK2	36.2	-25	0	46.8	-	-	74	-27.2	360	100	V
9.60668	32.76	PK2	37	-21.3	0	48.46	-	-	74	-25.54	360	100	H
9.60675	32.75	PK2	37	-21.3	0	48.45	-	-	74	-25.55	360	100	V

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

19 CHANNEL RESULTS



HORIZONTAL



VERTICAL

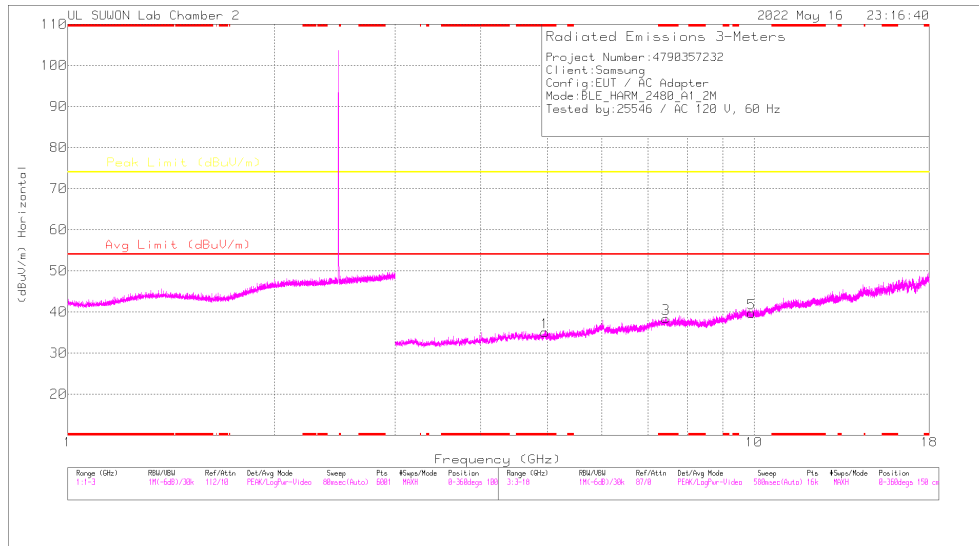
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

RADIATED EMISSIONS

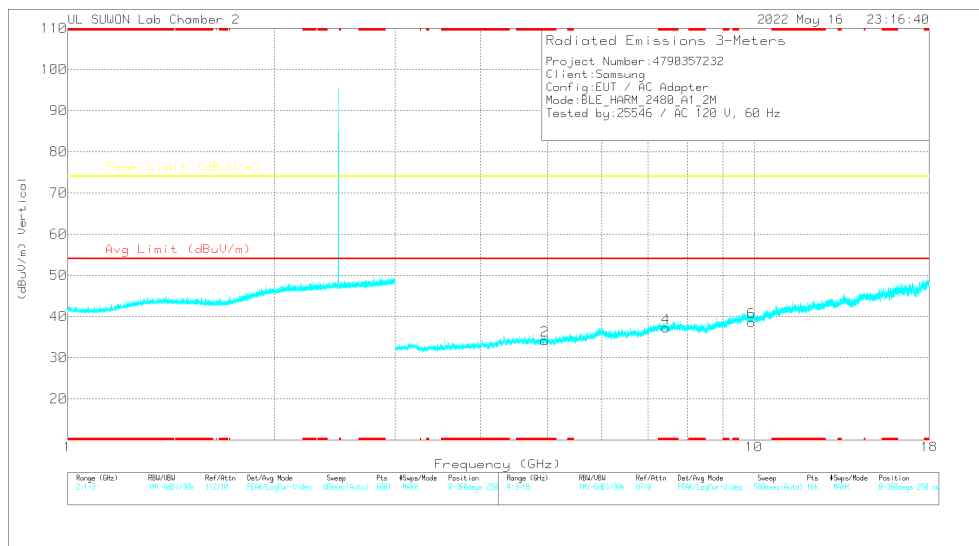
Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	3GHz_HPI(dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.8819	37.26	PK2	34.1	-27.6	0	43.76	-	-	74	-30.24	360	100	H
* 4.88067	37.05	PK2	34.1	-27.6	0	43.55	-	-	74	-30.45	360	100	V
* 7.31935	35.15	PK2	36.1	-24.6	0	46.65	-	-	74	-27.35	360	100	H
* 7.31958	35.16	PK2	36.1	-24.6	0	46.66	-	-	74	-27.34	360	100	V
9.76271	32.61	PK2	37.2	-21	0	48.81	-	-	74	-25.19	360	100	H
9.76036	32.75	PK2	37.2	-21	0	48.95	-	-	74	-25.05	360	100	V

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

39 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.

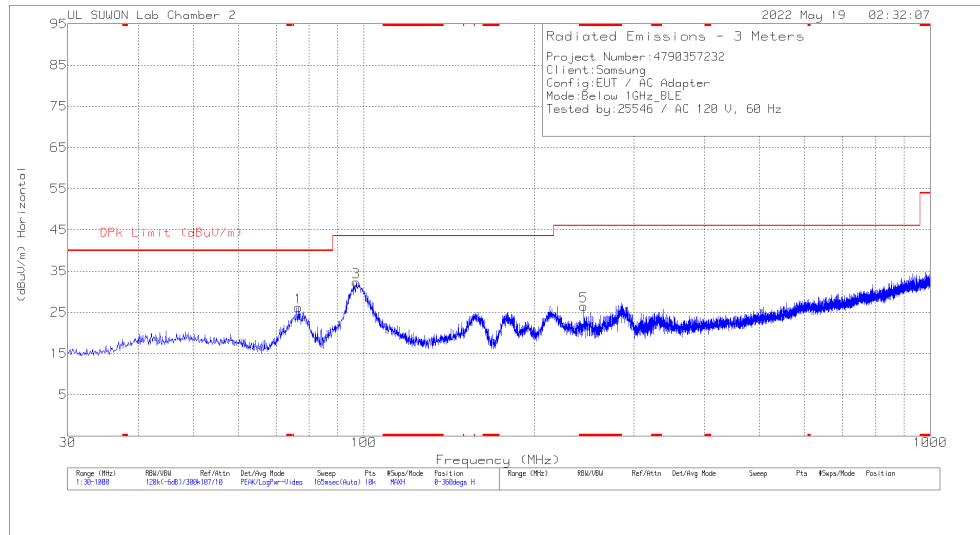
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	3117_00168724	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
* 4.96214	36.29	PK2	34.1	-27	0	43.39	-	-	74	-30.61	360	100	H
* 4.95833	36.62	PK2	34.1	-27	0	43.72	-	-	74	-30.28	360	100	V
* 7.43968	34.6	PK2	36	-23.7	0	46.9	-	-	74	-27.1	360	100	H
* 7.43687	34.9	PK2	36	-23.7	0	47.2	-	-	74	-26.8	360	100	V
9.92031	32.07	PK2	37.4	-21.1	0	48.37	-	-	74	-25.63	360	100	H
9.91994	31.95	PK2	37.4	-21.1	0	48.25	-	-	74	-25.75	360	100	V

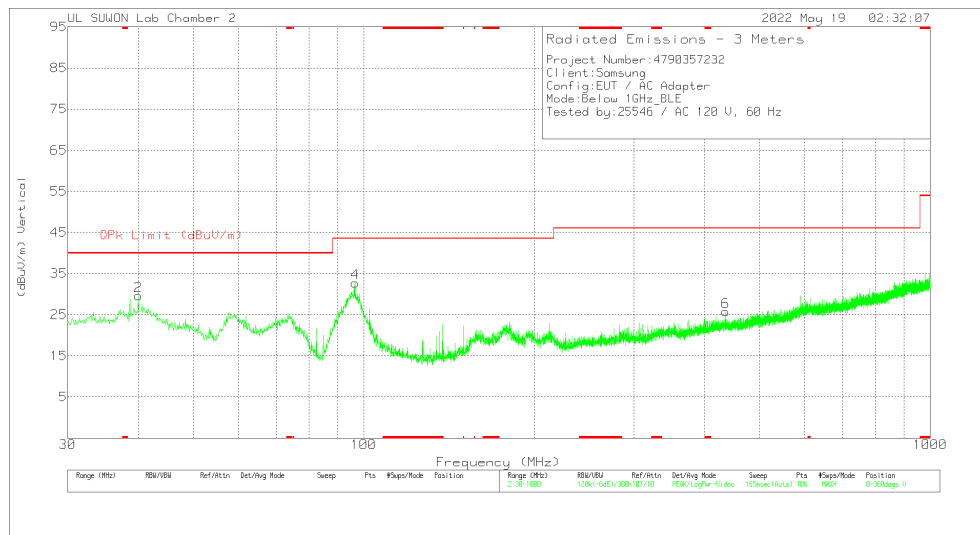
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK2 - KDB558074 Method: Maximum Peak

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_749	Below 1G[dB]	DC Corr (dB)	Corrected Reading (dBuV/m)	OPK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	76.657	44.28	Pk	12.7	-30.8	0	26.18	40	-13.82	0-360	100	H
3	97.027	46.07	Pk	17	-30.7	0	32.37	43.52	-11.15	0-360	200	H
5	* 244.37	37.46	Pk	18.4	-29.4	0	26.46	46.02	-19.56	0-360	100	H
2	39.991	42.35	Pk	18.6	-31.4	0	29.55	40	-10.45	0-360	100	V
4	96.445	46.47	Pk	16.9	-30.6	0	32.77	43.52	-10.75	0-360	100	V
6	435.072	31.93	Pk	22.1	-28.3	0	25.73	46.02	-20.29	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.

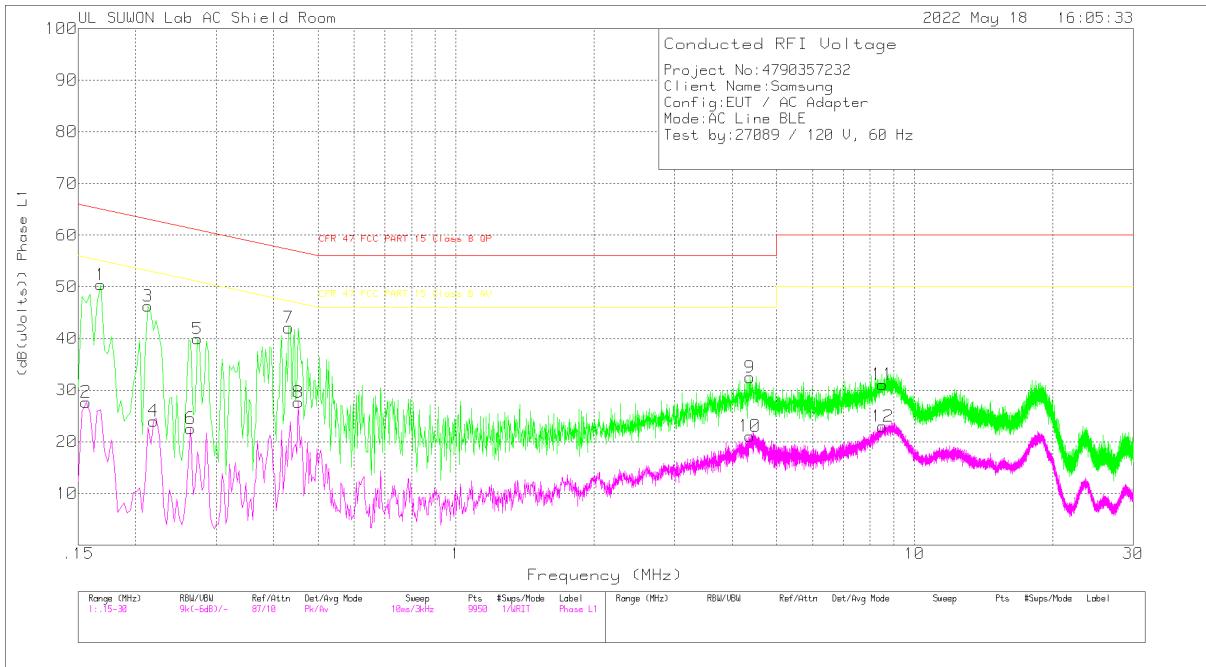
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

11.1.1. AC Power Line

LINE 1 RESULTS



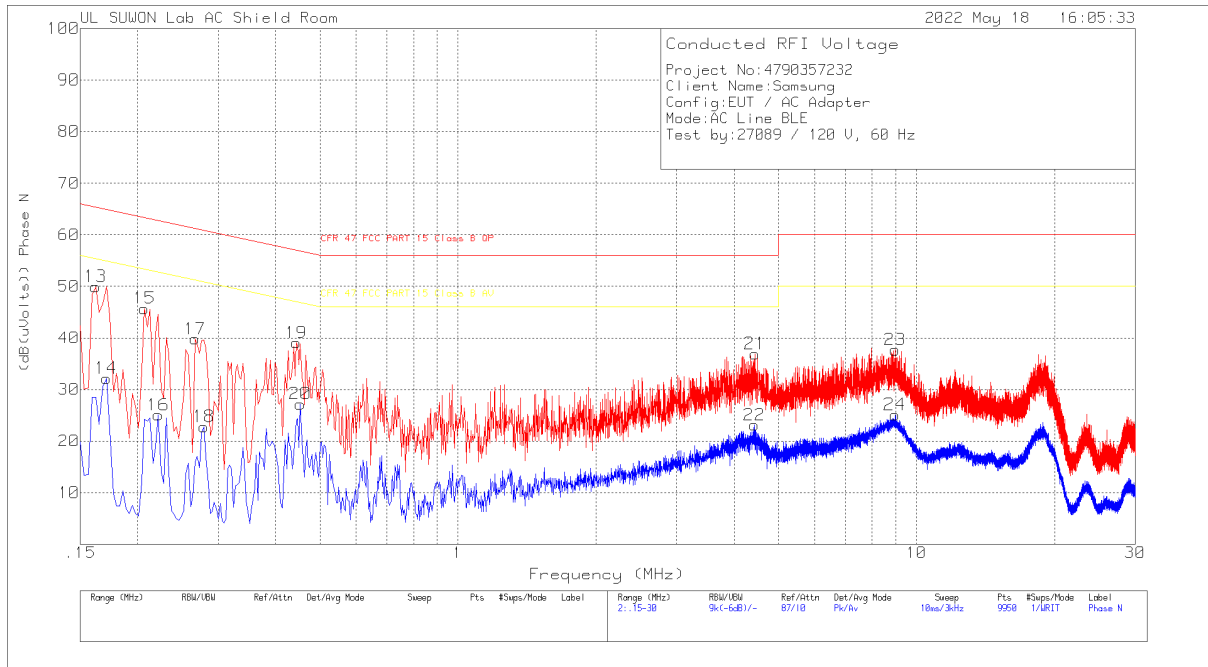
Trace Markers

Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_L1[dB]	CABLELOSS 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	.168	40.29	Pk	10	.1	50.39	65.06	-14.67	-	-
2	.156	17.78	Av	9.8	.1	27.68	-	-	55.67	-27.99
3	.213	36.27	Pk	9.8	.2	46.27	63.09	-16.82	-	-
4	.219	14.12	Av	9.7	.2	24.02	-	-	52.86	-28.84
5	.273	30.13	Pk	9.6	.2	39.93	61.03	-21.1	-	-
6	.264	12.75	Av	9.6	.2	22.55	-	-	51.3	-28.75
7	.432	32.09	Pk	9.8	.2	42.09	57.21	-15.12	-	-
8	.453	17.54	Av	9.9	.2	27.64	-	-	46.82	-19.18
9	4.374	22.46	Pk	9.7	.3	32.46	56	-23.54	-	-
10	4.374	11.07	Av	9.7	.3	21.07	-	-	46	-24.93
11	8.52	20.99	Pk	9.8	.3	31.09	60	-28.91	-	-
12	8.523	12.85	Av	9.8	.3	22.95	-	-	50	-27.05

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	.162	39.96	Pk	9.9	.1	49.96	65.36	-15.4	-	-
14	.171	21.97	Av	10	.2	32.17	-	-	54.91	-22.74
15	.207	35.72	Pk	9.8	.2	45.72	63.32	-17.6	-	-
16	.222	15.17	Av	9.7	.2	25.07	-	-	52.74	-27.67
17	.267	30	Pk	9.6	.2	39.8	61.21	-21.41	-	-
18	.279	12.89	Av	9.7	.2	22.79	-	-	50.85	-28.06
19	.444	28.96	Pk	9.9	.2	39.06	56.99	-17.93	-	-
20	.453	17.11	Av	9.9	.2	27.21	-	-	46.82	-19.61
21	4.443	26.92	Pk	9.7	.3	36.92	56	-19.08	-	-
22	4.431	13.13	Av	9.7	.3	23.13	-	-	46	-22.87
23	8.985	27.51	Pk	9.8	.4	37.71	60	-22.29	-	-
24	8.976	14.91	Av	9.8	.4	25.11	-	-	50	-24.89

Pk - Peak detector
 Av - Average detection

END OF TEST REPORT