



# TEST REPORT

**Report Number.:** 13431970-E1V3

**Applicant :** SRAM LLC  
1000 W Fulton Market 4<sup>th</sup> Floor  
Chicago, IL 60607, United States

**Model :** 65501

**FCC ID :** C9O-DUBPMB2

**IC :** 10161A-DUBPMB2

**EUT Description :** Bicycle Power Meter

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C  
ISED RSS-247 ISSUE 2  
ISED RSS-GEN ISSUE 5

**Date of Issue:**

November 02, 2020

**Prepared by:**

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## REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	10/20/2020	Initial Issue	
V2	10/29/2020	Updated Section 8.4, 8.5, and 8.7	Steven Tran
V3	11/2/2020	Updated Section 8.7	Steven Tran

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SRAM LLC  
1000 W Fulton Market 4<sup>th</sup> Floor  
Chicago, IL 60607, United States

**EUT DESCRIPTION:** Bicycle Power Meter

**MODEL:** 65501

**SERIAL NUMBER:** Conducted: AG047078  
Radiated: AG048750

**DATE TESTED:** SEPTEMBER 28 TO OCTOBER 07, 2020

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

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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 NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For  
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## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5, and RSS-247 Issue 2.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. Line conducted emissions were measured at 47658 Kato RD 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.

47173 Benicia Street	47266 Benicia Street	47658 Kato Rd
<input checked="" type="checkbox"/> Chamber A	<input type="checkbox"/> Chamber D	<input type="checkbox"/> Chamber I
<input type="checkbox"/> Chamber B	<input type="checkbox"/> Chamber E	<input type="checkbox"/> Chamber J
<input type="checkbox"/> Chamber C	<input type="checkbox"/> Chamber F	<input checked="" type="checkbox"/> Chamber K
	<input type="checkbox"/> Chamber G	<input type="checkbox"/> Chamber L
	<input type="checkbox"/> Chamber H	<input type="checkbox"/> Chamber M

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code: 2324A.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

## 4. DECISION RULES AND MEASUREMENT UNCERTAINTY

### 4.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

### 4.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

### 4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	U <sub>Lab</sub>
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.39 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.07 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.52 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	4.88 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.24 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.37 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.17 dB

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

### 4.4. SAMPLE CALCULATION

#### **RADIATED EMISSIONS**

Where relevant, the following sample calculation is provided:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

#### **MAINS CONDUCTED EMISSIONS**

Where relevant, the following sample calculation is provided:

$$\text{Final Voltage (dBuV)} = \text{Measured Voltage (dBuV)} + \text{Cable Loss (dB)} + \text{Limiter Factor (dB)} + \text{LISN Insertion Loss}$$

$$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$$



## 5. EQUIPMENT UNDER TEST

### 5.1. EUT DESCRIPTION

The EUT is a Bicycle Power Meter with BLE, AIREA, and ANT+ Radios.

### 5.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Peak		Average	
		Output Power (dBm)	Output Power (mW)	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE	7.88	6.14	7.72	5.92

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a ceramic chip antenna, with a maximum gain of 1.40 dBi.

### 5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version B-1.0.

The test utility software used during testing was nRF Connect version 3.3.0.

### 5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz and above 18GHz were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

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

Worst-case data rate as provided by the client was 1Mbps.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List			
Description	Manufacturer	Model	Serial Number
Laptop	Lenovo	T450s	PC044FTD
AC/DC Adapter	Lenovo	ADLX45NCC2A	N/A
USB Dongle	Segger	E204460	680435024
DC Power Supply	Kenwood Corporation	PA36-3A	7060074

### I/O CABLES (CONDUCTED EMISSIONS)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	AC	Unshielded	1.5	AC Main to DC Supply, to Analyzer
2	DC	1	DC	Unshielded	0.5	Power Supply to EUT
3	Antenna Port	1	SMA	Unshielded	0.5	EUT to Analyzer

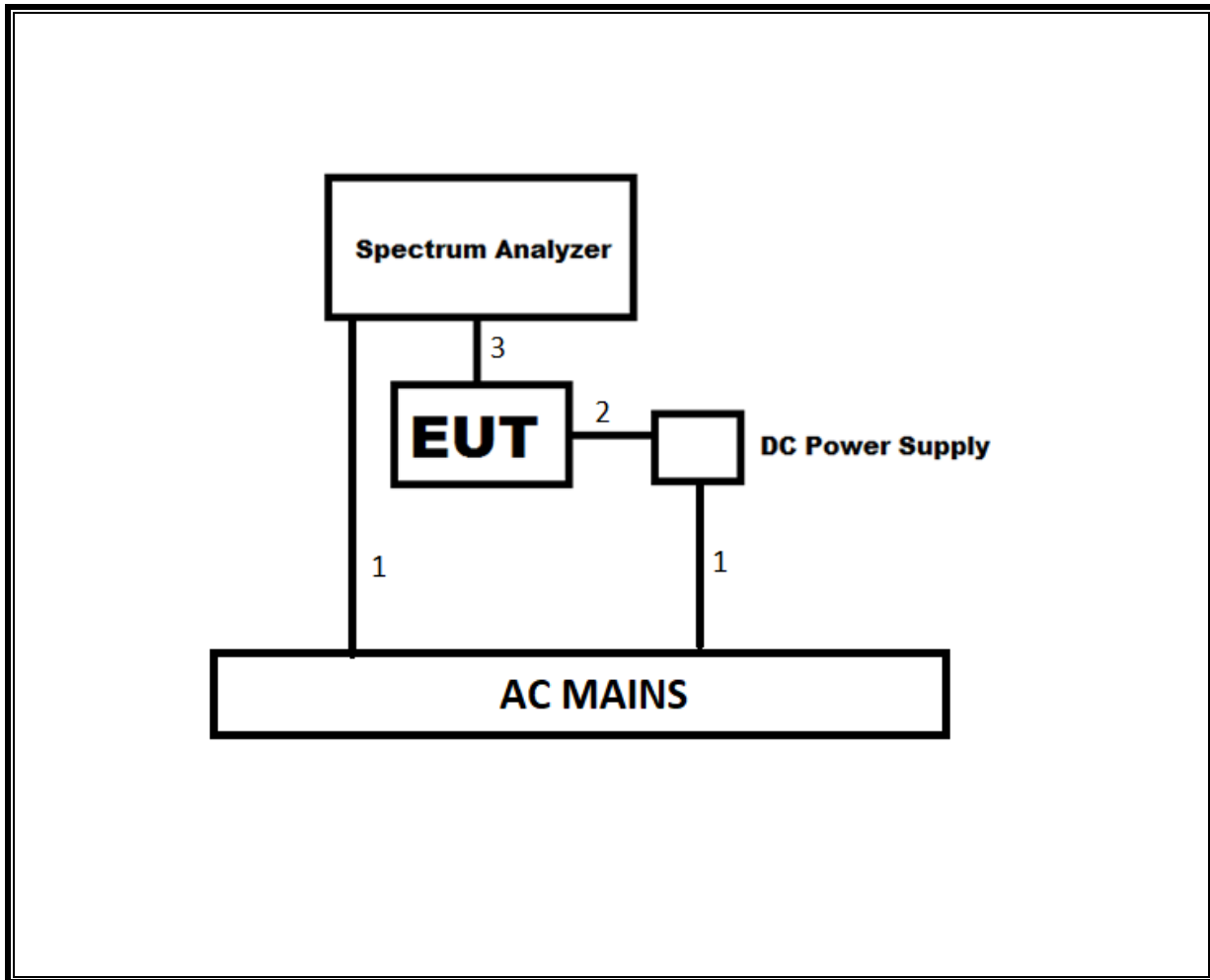
### I/O CABLES (RADIATED EMISSIONS)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	AC	Unshielded	1.5	AC Main to DC Supply
2	DC	1	DC	Unshielded	0.5	Power Supply to EUT

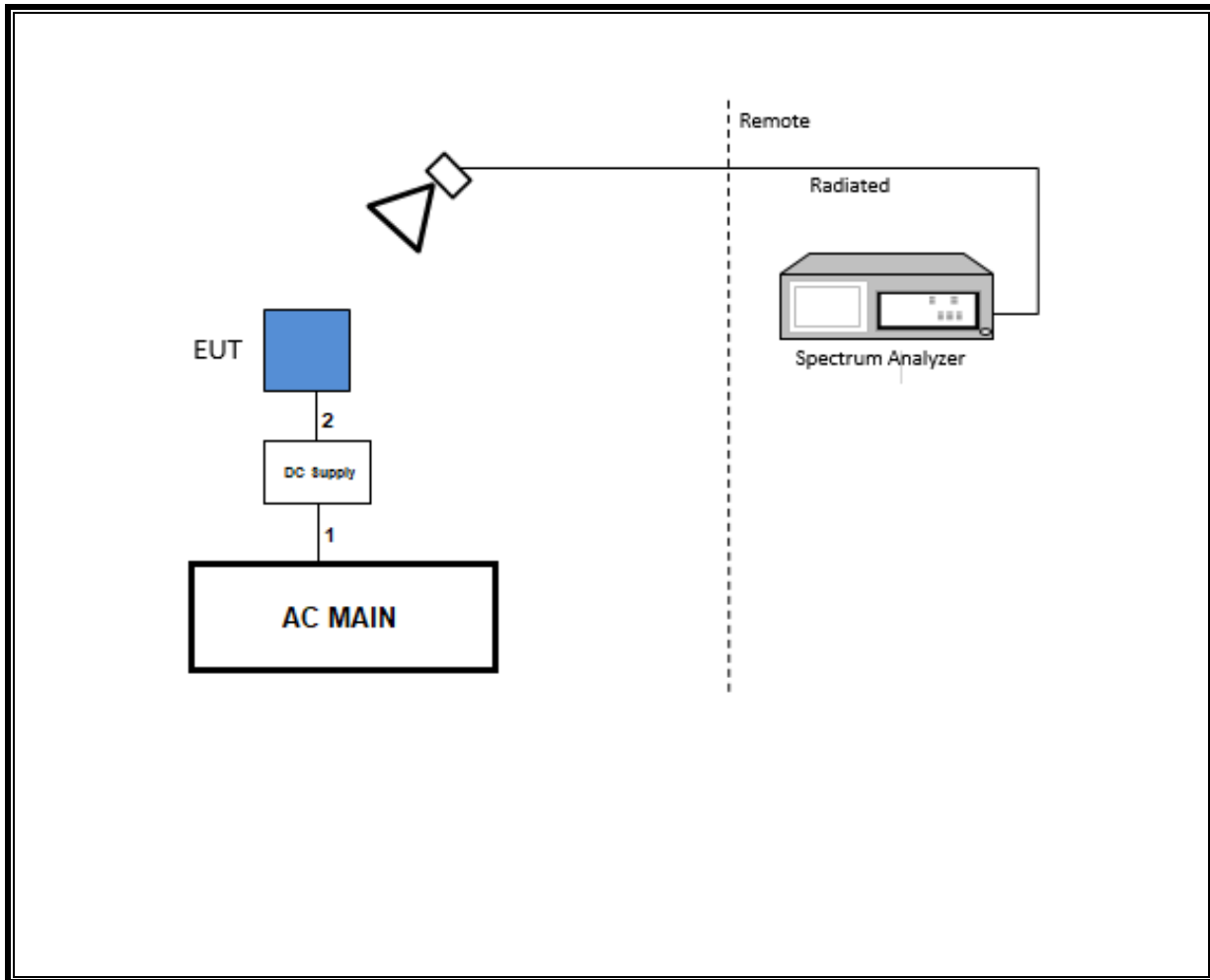
### TEST SETUP

For the purposes of testing, the EUT is connected to a 1.5V DC Power supply for radiated emissions above 1GHz. The EUT is normally powered by a AAA lithium battery at 1.5V. For radiated emissions below 1GHz, the EUT is battery powered.

**SETUP DIAGRAM FOR CONDUCTED TESTS**



**SETUP DIAGRAM FOR RADIATED TESTS**



## **6. MEASUREMENT METHOD**

On Time and Duty Cycle: ANSI C63.10 Section -11.6.

6 dB BW: ANSI C63.10 Section -11.8.1 RBW  $\geq$  DTS BW

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

Output Power: ANSI C63.10 Section -11.9.1.3 Method PKPM1 Peak-reading power meter

Output Power: ANSI C63.10 Section -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)

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

Radiated emissions non-restricted frequency bands: ANSI C63.10 Section -11.11

Radiated emissions restricted frequency bands: ANSI C63.10 Section -11.12.1

Conducted emissions in restricted frequency bands: ANSI C63.10 Section -11.12.2

Band-edge: ANSI C63.10 Section - 6.10

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

## 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	Asset	Cal Due
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179376	4/3/2021
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T863	8/31/2021
Antenna, BroadBand Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	PRE0181574	10/14/2020
Amplifier, 100MHz-18GHz	AMPLICAL	AMP0.1G18-47-20	PRE0197319	5/4/2021
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	175953	1/23/2021
Filter, HPF 3.0GHz	MICRO-TRONICS	HPM17543	175973	5/4/2021
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO METRICS	EM-6871	PRE0179466	5/27/2021
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO METRICS	EM-6872	PRE0179468	5/27/2021
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	T448	5/20/2021
Rf Amplifier, 18-26.5GHz, 60dB gain	AMPLICAL	AMP18G26.5-60	PRE0181238	6/7/2021
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight Technologies Inc	E4446A	T146	1/29/2021
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	T1268	1/22/2021
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	T413	2/26/2021
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, March 30, 2020	
Antenna Port Software	UL	UL RF	Ver 2020.9.18	

### NOTES:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

## 8. ANTENNA PORT TEST RESULTS

### 8.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

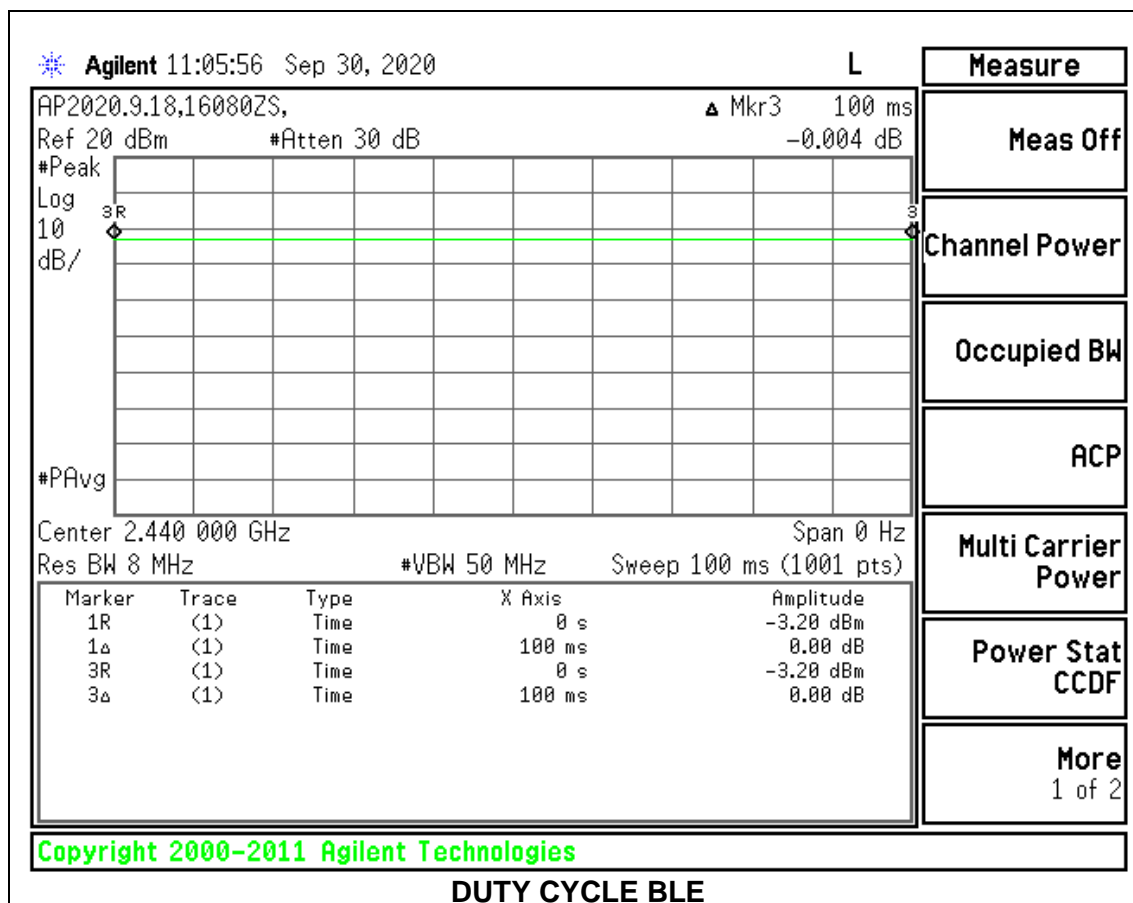
#### PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

#### ON TIME AND DUTY CYCLE RESULTS

	B (msec)	x (msec)	Cycle (%)	Correction Factor (dB)	Minimum VBW (kHz)
<b>2.4GHz Band</b>					
BLE	100.000	100.000	1.000	0.00	0.010

#### DUTY CYCLE PLOTS



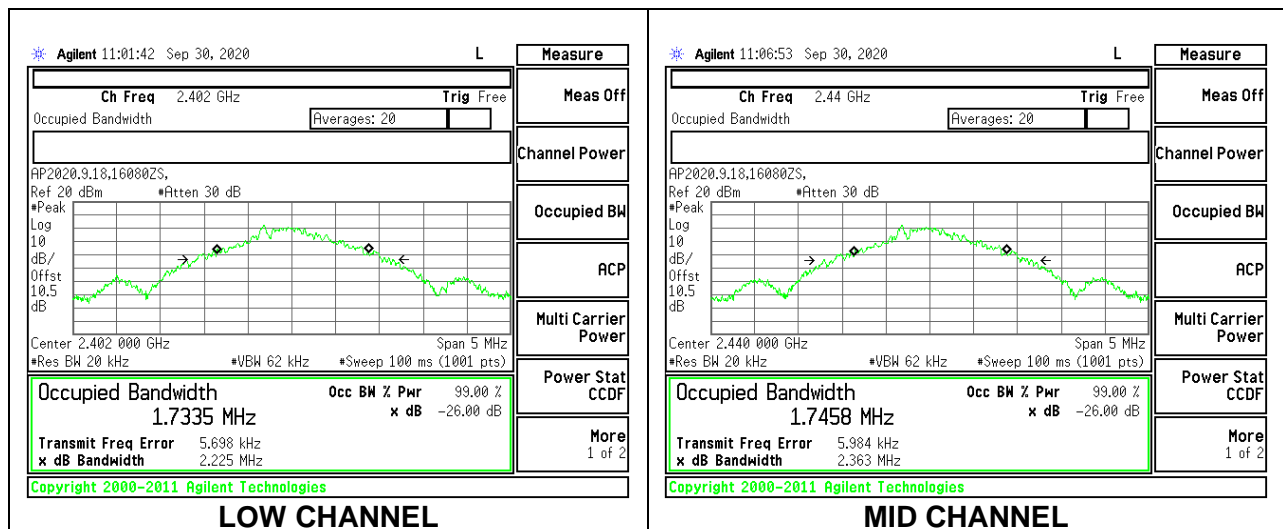
## 8.2. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

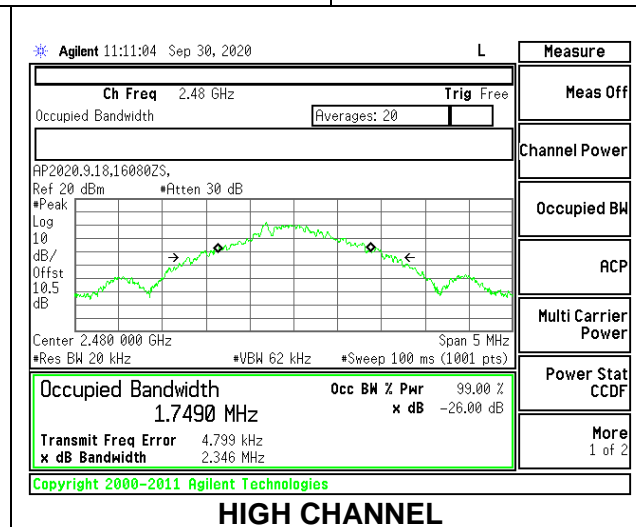
### RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.7335
Middle	2440	1.7458
High	2480	1.7490



**LOW CHANNEL**

**MID CHANNEL**



**HIGH CHANNEL**



### 8.3. 6 dB BANDWIDTH

#### LIMITS

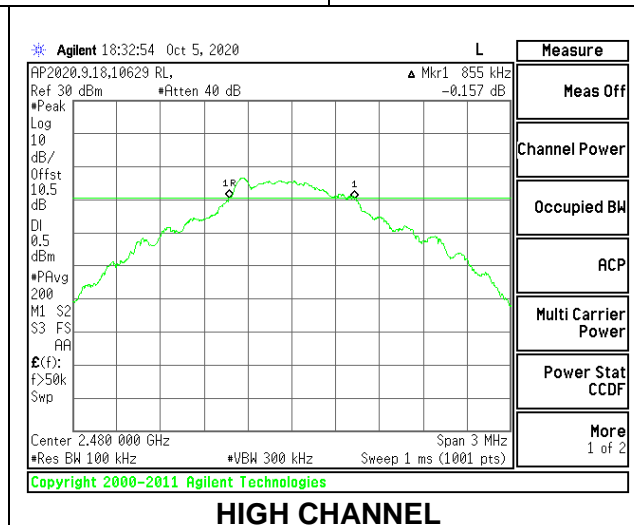
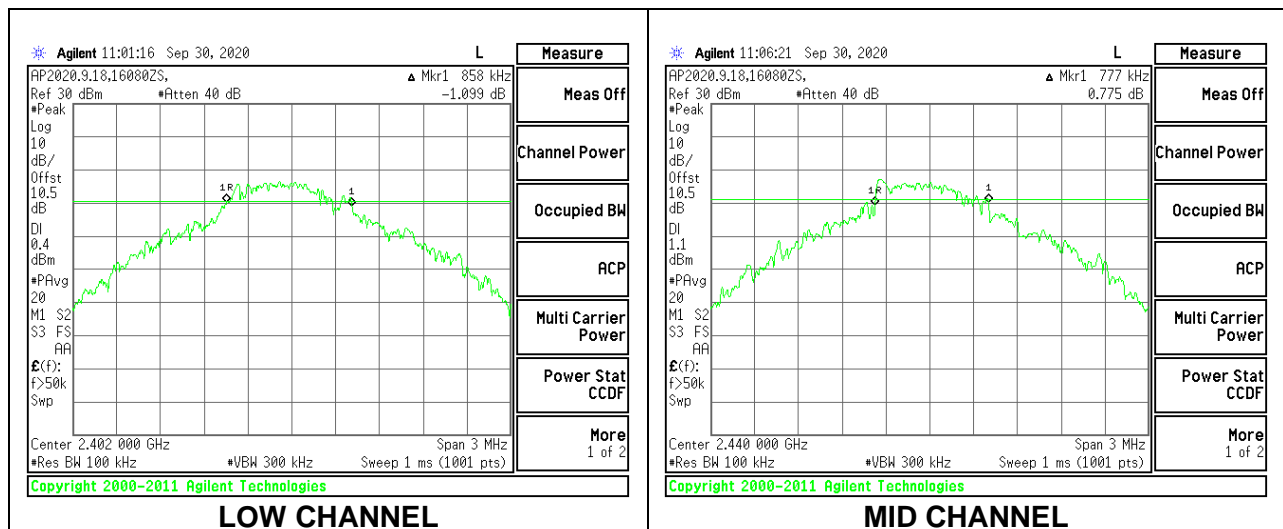
FCC §15.247 (a) (2)

RSS-247 5.2 (a)

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

#### RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.858	0.5
Middle	2440	0.777	0.5
High	2480	0.855	0.5



## 8.4. OUTPUT POWER

### LIMITS

FCC §15.247 (b) (3)

RSS-247 5.4 (d)

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

### TEST PROCEDURE

The transmitter output is connected to a power meter.

The power output measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband peak power sensor. Peak output power was read directly from power meter.

### RESULTS

<b>Tested By:</b>	10629 RL
<b>Date:</b>	9/30/2020

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>Peak Power Reading (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
Low	2402	7.88	30	-22.12
Middle	2440	7.79	30	-22.21
High	2480	7.64	30	-22.36

## 8.5. AVERAGE POWER

### LIMITS

None; for reporting purposes only.

### TEST PROCEDURE

The transmitter output is connected to a power meter.

The power output measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband peak power sensor. Average output power was read directly from power meter.

### RESULTS

<b>Tested By:</b>	10629 RL
<b>Date:</b>	9/30/2020

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>AV power (dBm)</b>
Low	2402	7.72
Middle	2440	7.65
High	2480	7.49

## 8.6. POWER SPECTRAL DENSITY

### LIMITS

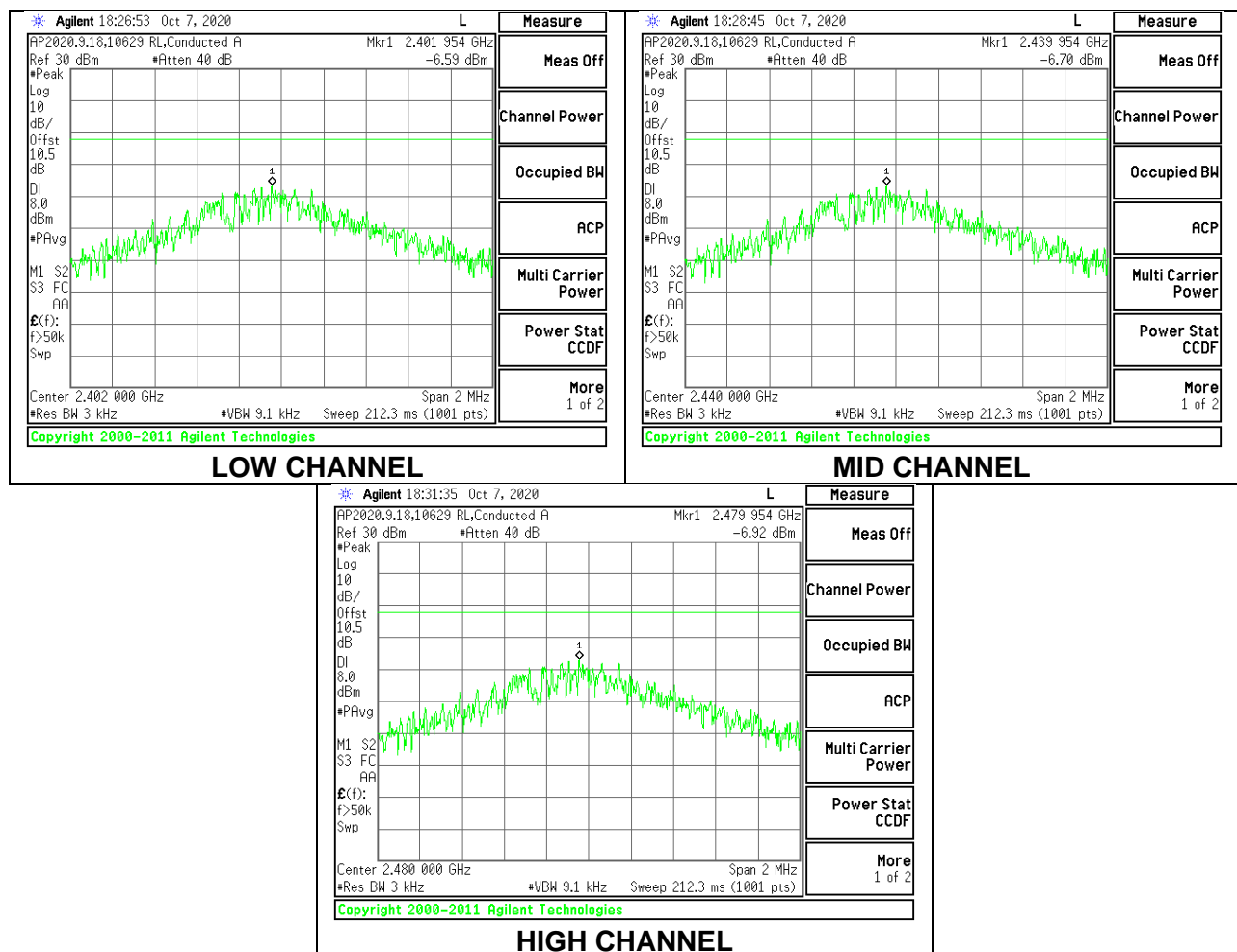
FCC §15.247 (e)

RSS-247 (5.2) (b)

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

### RESULTS

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-6.59	8	-14.59
Middle	2440	-6.70	8	-14.70
High	2480	-6.92	8	-14.92



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## **8.7. CONDUCTED SPURIOUS EMISSIONS**

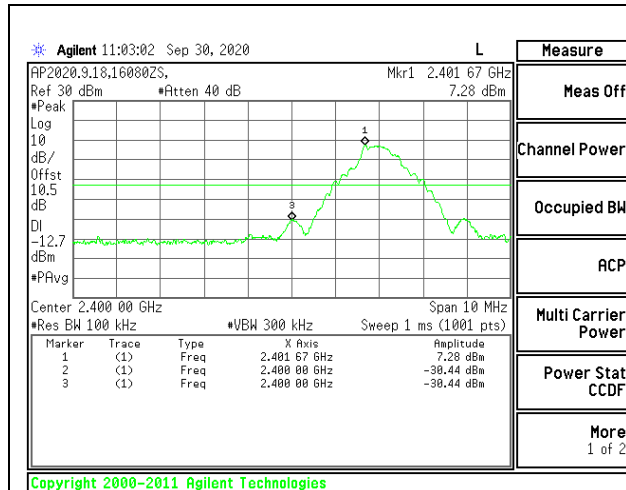
### **LIMITS**

FCC §15.247 (d)

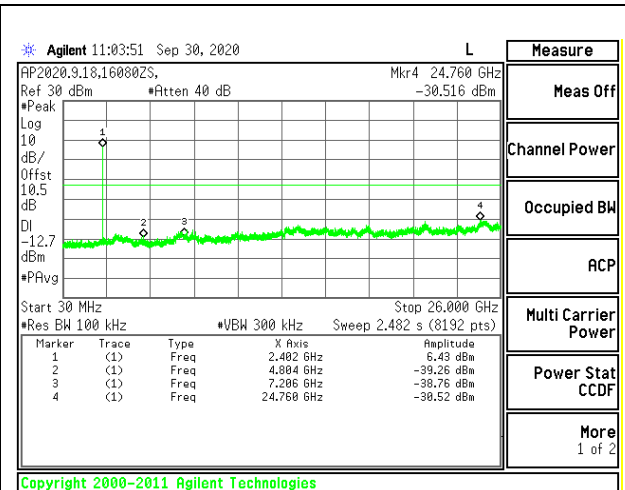
RSS-247 5.5

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

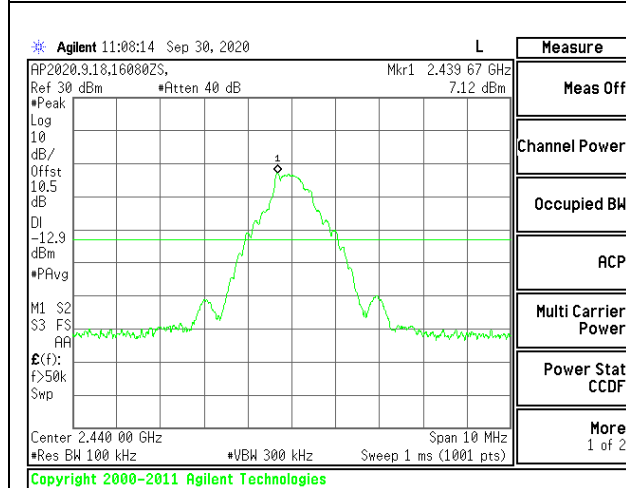
### **RESULTS**



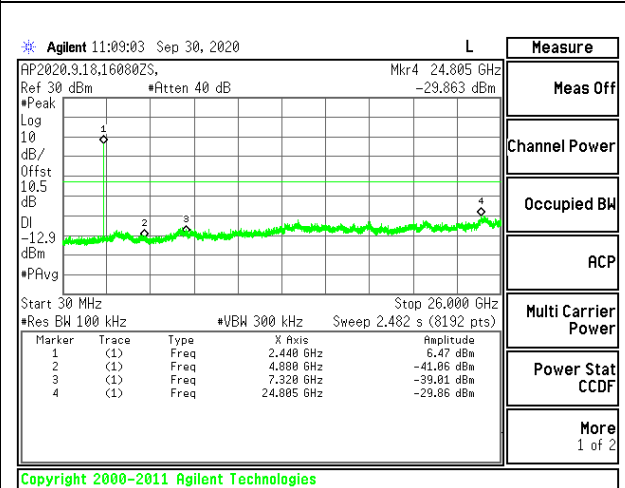
**LOW CHANNEL BANDEDGE**



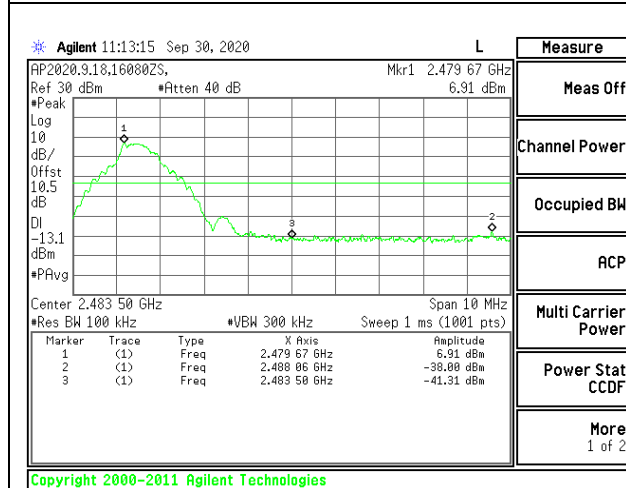
**OUT-OF-BAND LOW CHANNEL**



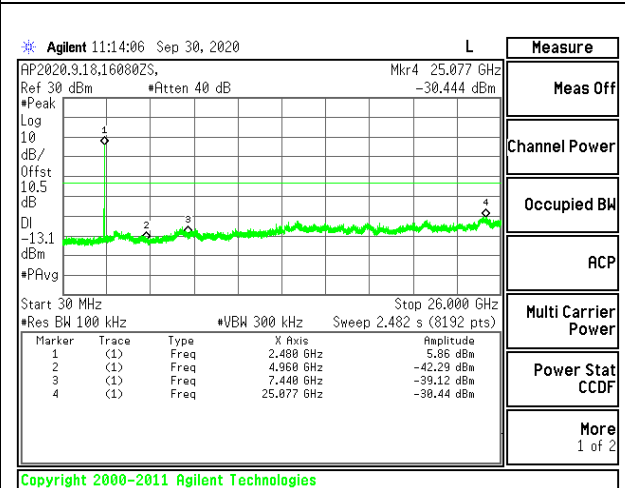
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**



**HIGH CHANNEL BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL**

## 9. RADIATED TEST RESULTS

### 9.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205 and §15.209

RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

#### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement 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 pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

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.

2D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.

**KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification**

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

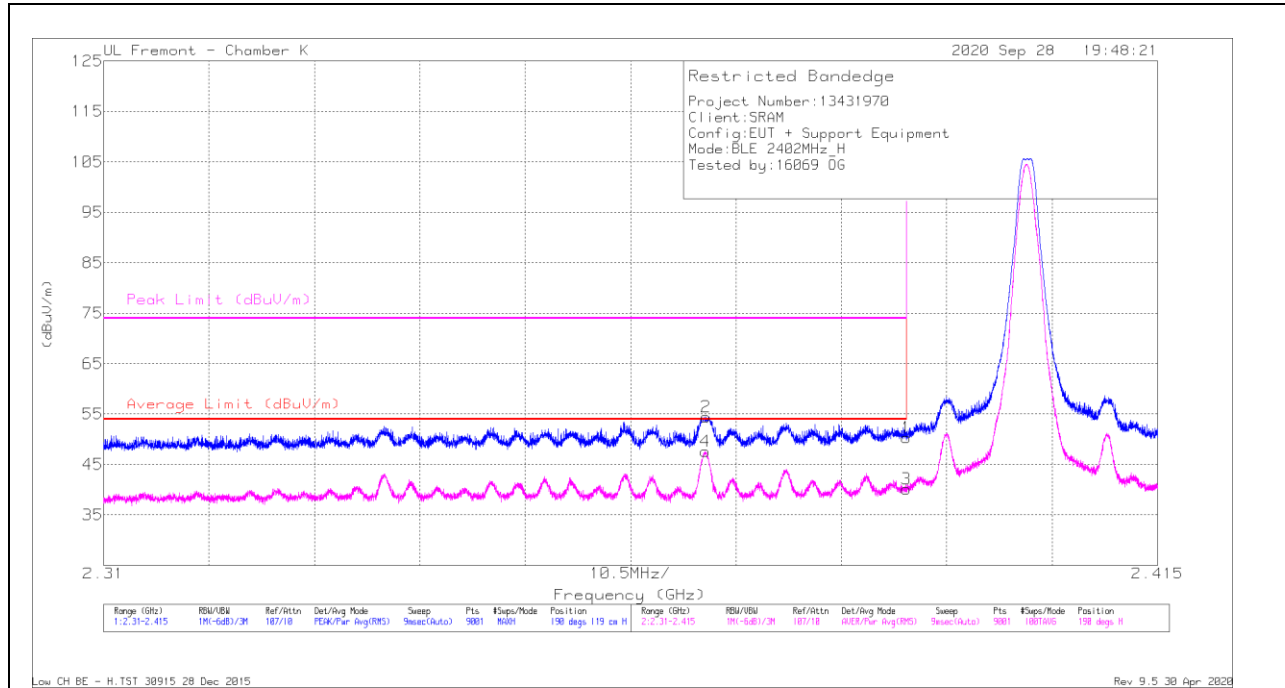
OFS and chamber correlation testing had been performed and chamber measured test result is the worst-case test result.



## 9.2. TRANSMITTER ABOVE 1 GHz

### BANDEDGE (LOW CHANNEL)

### HORIZONTAL RESULT

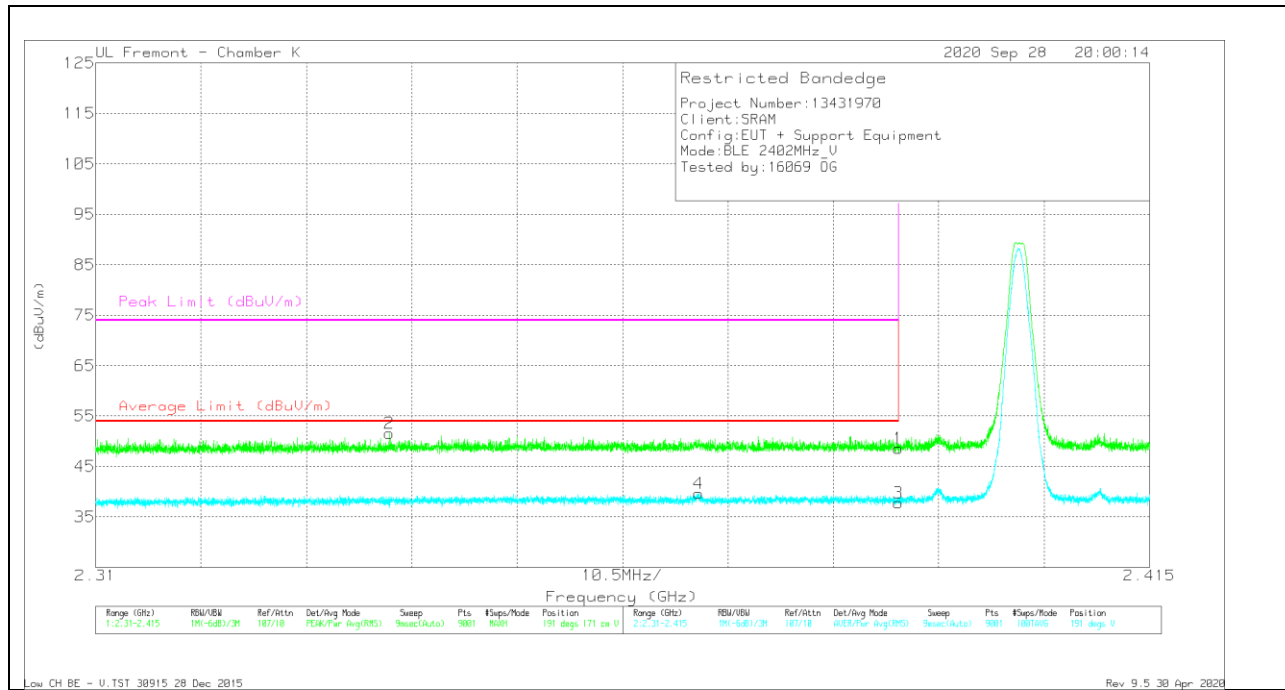


### Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	52.9	Pk	32.4	-35	50.3	-	-	74	-23.7	190	119	H
2	* 2.37	57.14	Pk	32.4	-35.1	54.44	-	-	74	-19.56	190	119	H
3	* 2.38999	42.69	RMS	32.4	-35	40.09	54	-13.91	-	-	190	119	H
4	* 2.36998	50.36	RMS	32.4	-35.1	47.66	54	-6.34	-	-	190	119	H

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

### VERTICAL RESULT



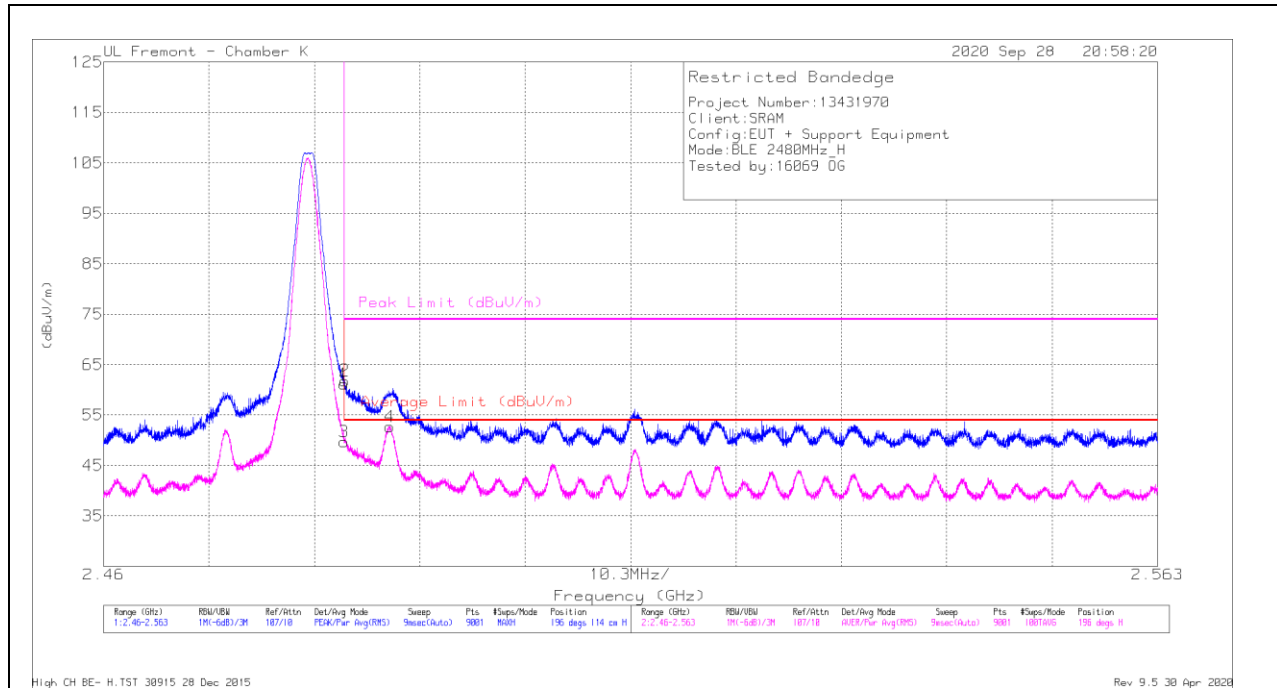
### Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	51.18	Pk	32.4	-35	48.58	-	-	74	-25.42	191	171	V
2	* 2.33925	54.58	Pk	32.2	-35.2	51.58	-	-	74	-22.42	191	171	V
3	* 2.38999	40.34	RMS	32.4	-35	37.74	54	-16.26	-	-	191	171	V
4	* 2.37011	42.39	RMS	32.4	-35.1	39.69	54	-14.31	-	-	191	171	V

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

**BANEDGE (HIGH CHANNEL)**

**HORIZONTAL RESULT**

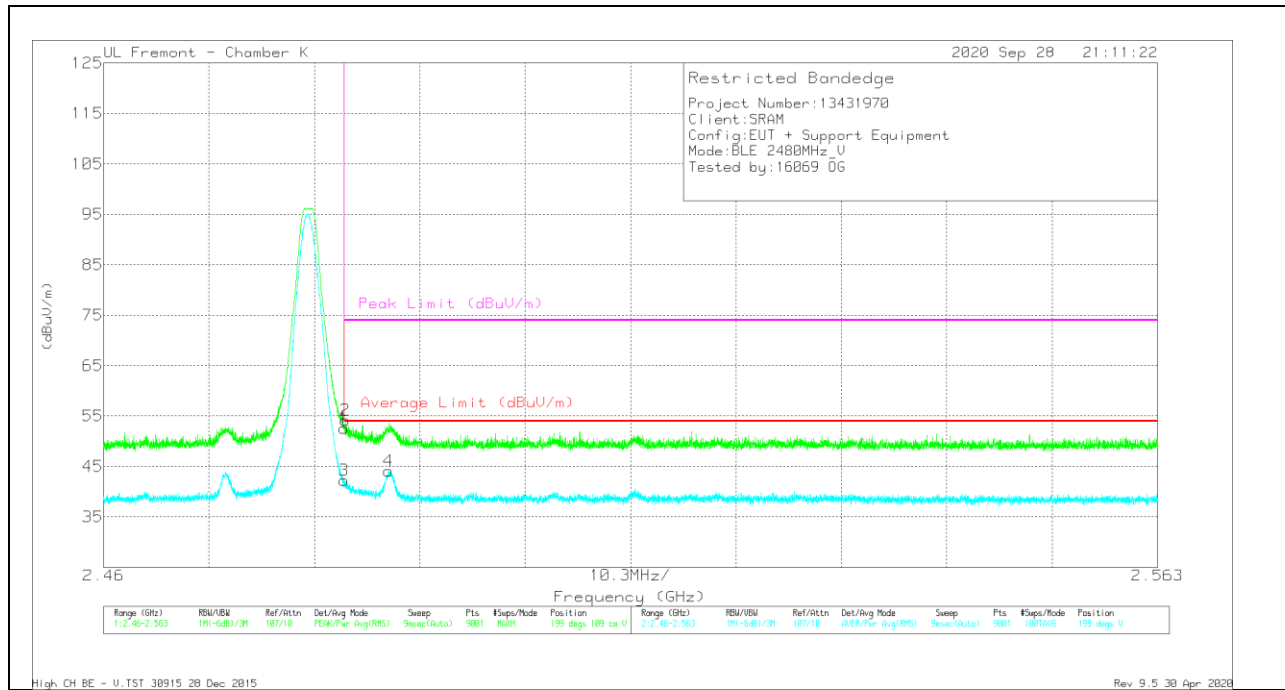


**Trace Markers**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (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	63.28	Pk	32.5	-34.6	61.18	-	-	74	-12.82	196	114	H
2	* 2.48355	63.93	Pk	32.5	-34.6	61.83	-	-	74	-12.17	196	114	H
3	* 2.48351	51.76	RMS	32.5	-34.6	49.66	54	-4.34	-	-	196	114	H
4	* 2.48795	54.83	RMS	32.5	-34.6	52.73	54	-1.27	-	-	196	114	H

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

### VERTICAL RESULT



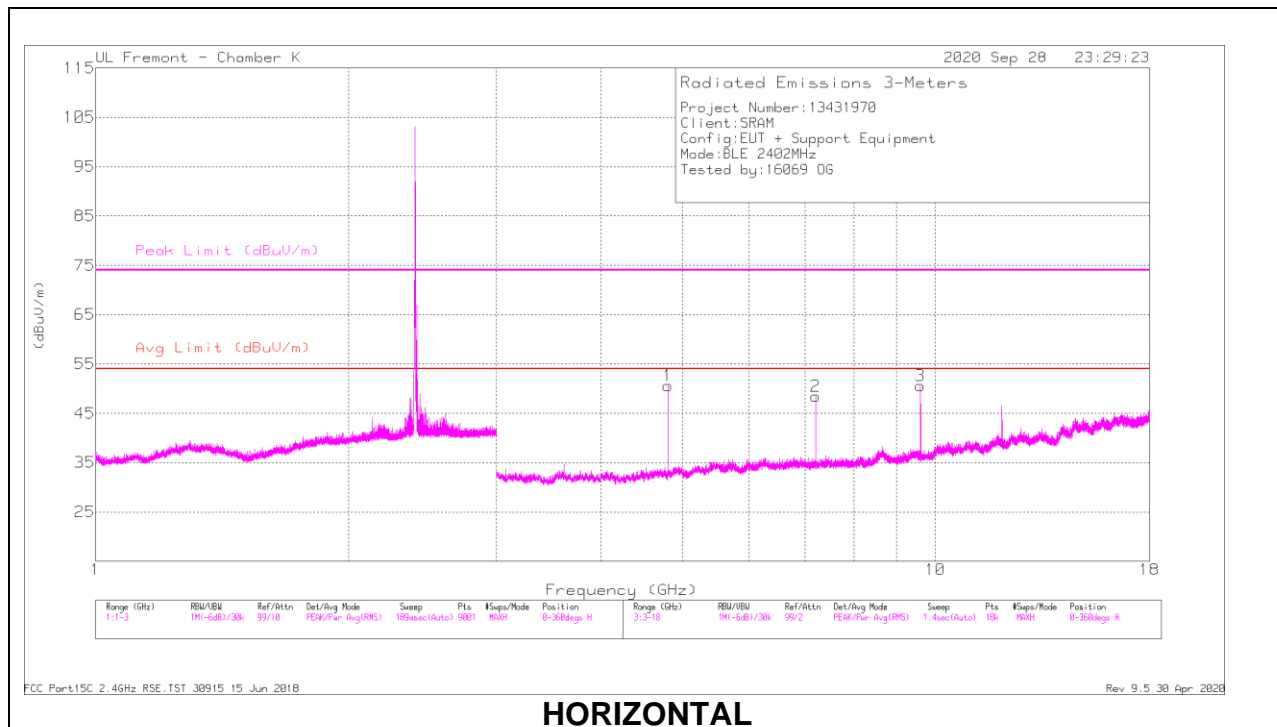
### Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (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	54.7	Pk	32.5	-34.6	52.6	-	-	74	-21.4	199	109	V
2	* 2.48361	56.27	Pk	32.5	-34.6	54.17	-	-	74	-19.83	199	109	V
3	* 2.48351	44.33	RMS	32.5	-34.6	42.23	54	-11.77	-	-	199	109	V
4	* 2.48785	46.17	RMS	32.5	-34.6	44.07	54	-9.93	-	-	199	109	V

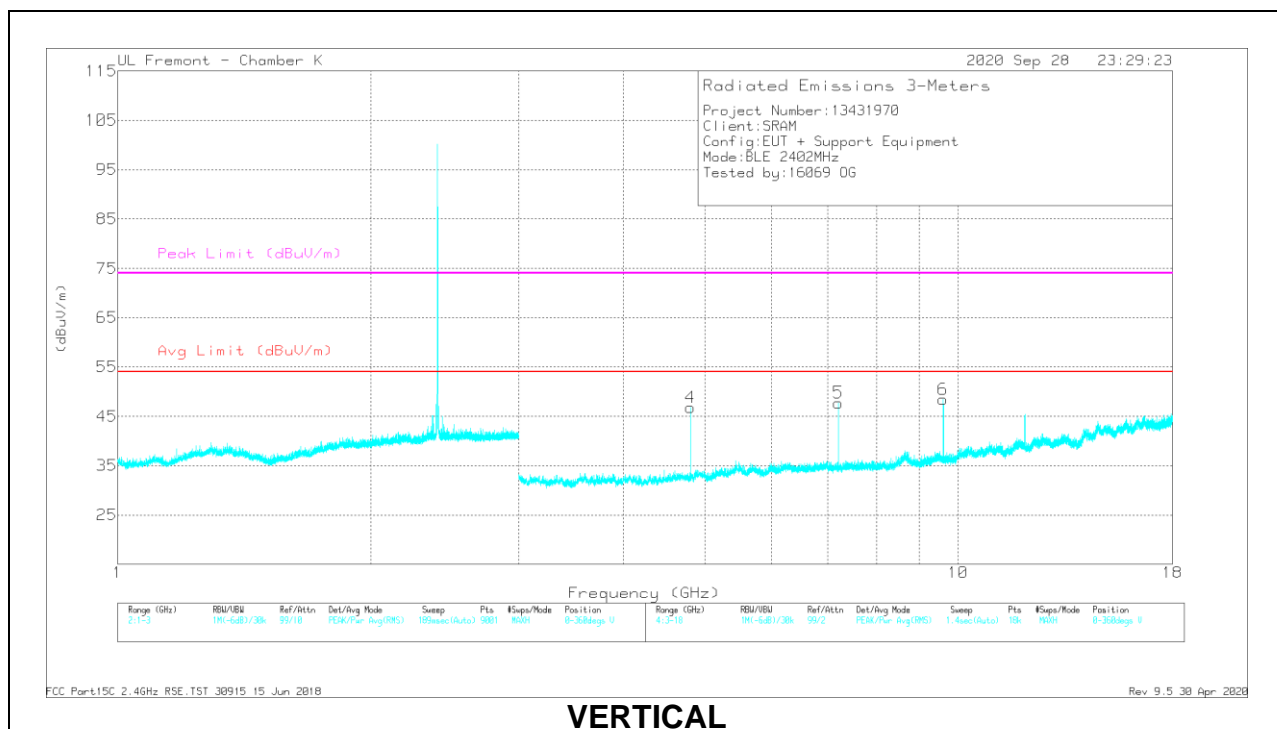
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector  
 RMS - RMS detection

**HARMONICS AND SPURIOUS EMISSIONS**

**LOW CHANNEL RESULTS**



**HORIZONTAL**



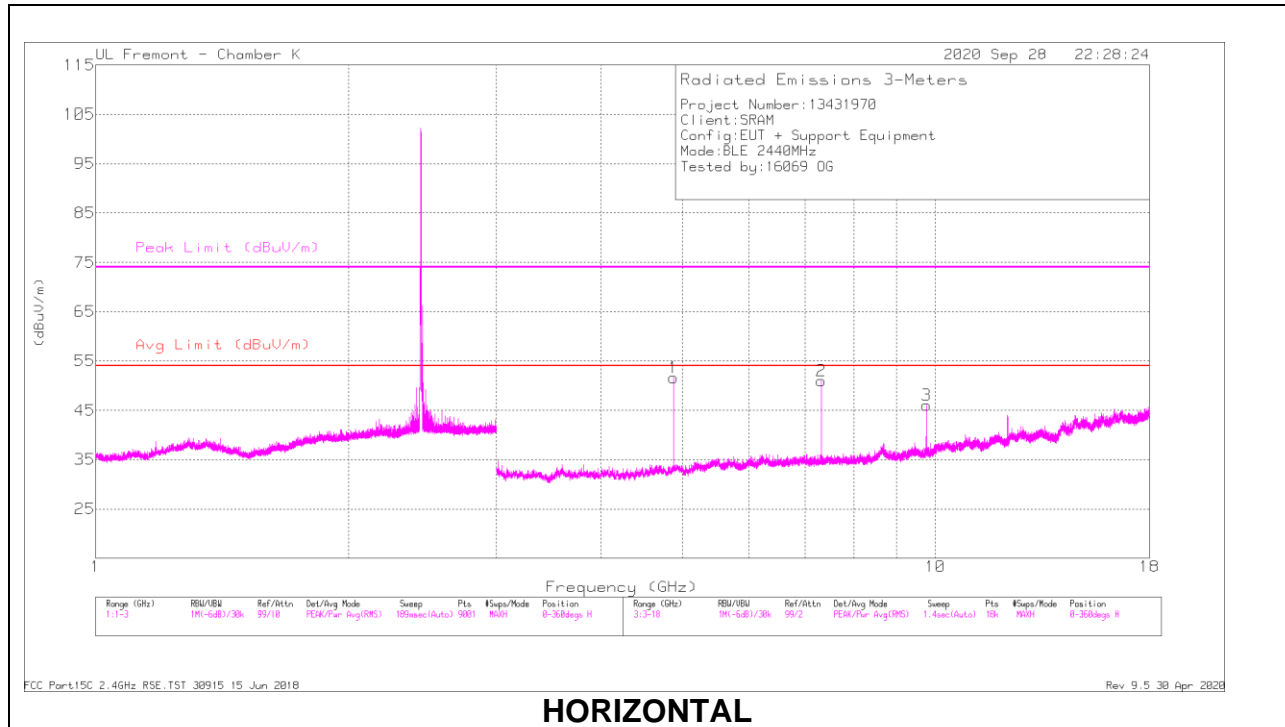
**VERTICAL**

**RADIATED EMISSIONS**

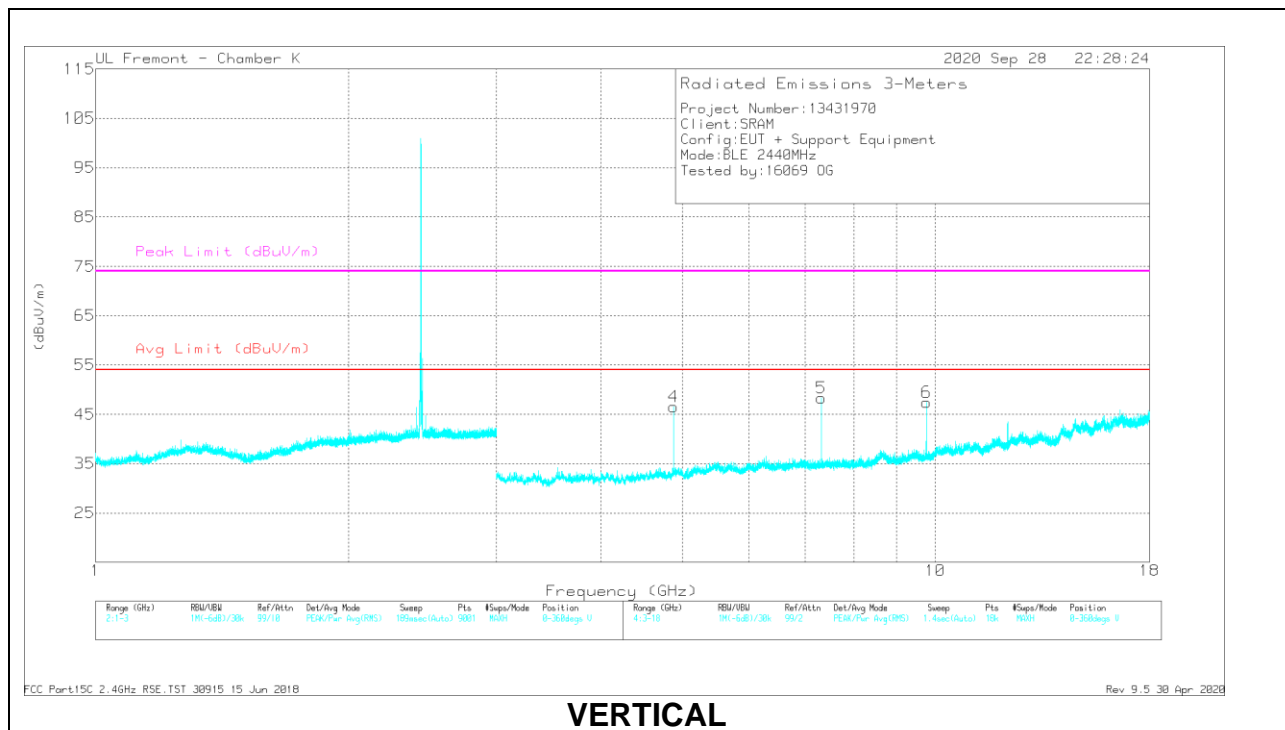
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cb/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.80335	61.5	PK2	34.4	-40.8	55.1	-	-	74	-18.9	8	214	H
	* 4.80375	56.02	MAV1	34.4	-40.8	49.62	54	-4.38	-	-	8	214	H
2	7.205	56.05	PK2	36	-38.6	53.45	-	-	-	-	82	99	H
3	9.60669	52.14	PK2	36.8	-36.7	52.24	-	-	-	-	130	103	H
4	* 4.80332	58.27	PK2	34.4	-40.8	51.87	-	-	74	-22.13	192	286	V
	* 4.80376	52.11	MAV1	34.4	-40.8	45.71	54	-8.29	-	-	192	286	V
5	7.20504	54.57	PK2	36	-38.6	51.97	-	-	-	-	215	97	V
6	9.60677	52.29	PK2	36.8	-36.7	52.39	-	-	-	-	13	115	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 PK2 - KDB558074 Method: Maximum Peak  
 MAV1 - KDB558074 Option 1 Maximum RMS Average

### MID CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**

**RADIATED EMISSIONS**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.87936	60.17	PK2	34.4	-40.6	53.97	-	-	74	-20.03	4	146	H
	* 4.87974	54.31	MAv1	34.4	-40.6	48.11	54	-5.89	-	-	4	146	H
2	* 7.31907	56.71	PK2	36	-38.2	54.51	-	-	74	-19.49	84	103	H
	* 7.31911	49.63	MAv1	36	-38.2	47.43	54	-6.57	-	-	84	103	H
3	9.7587	53.15	PK2	37	-36.7	53.45	-	-	-	-	143	147	H
4	* 4.87936	58	PK2	34.4	-40.6	51.8	-	-	74	-22.2	189	252	V
	* 4.8797	52	MAv1	34.4	-40.6	45.8	54	-8.2	-	-	189	252	V
5	* 7.31905	54.37	PK2	36	-38.2	52.17	-	-	74	-21.83	69	101	V
	* 7.31903	45.86	MAv1	36	-38.2	43.66	54	-10.34	-	-	69	101	V
6	9.7587	50.66	PK2	37	-36.7	50.96	-	-	-	-	203	176	V

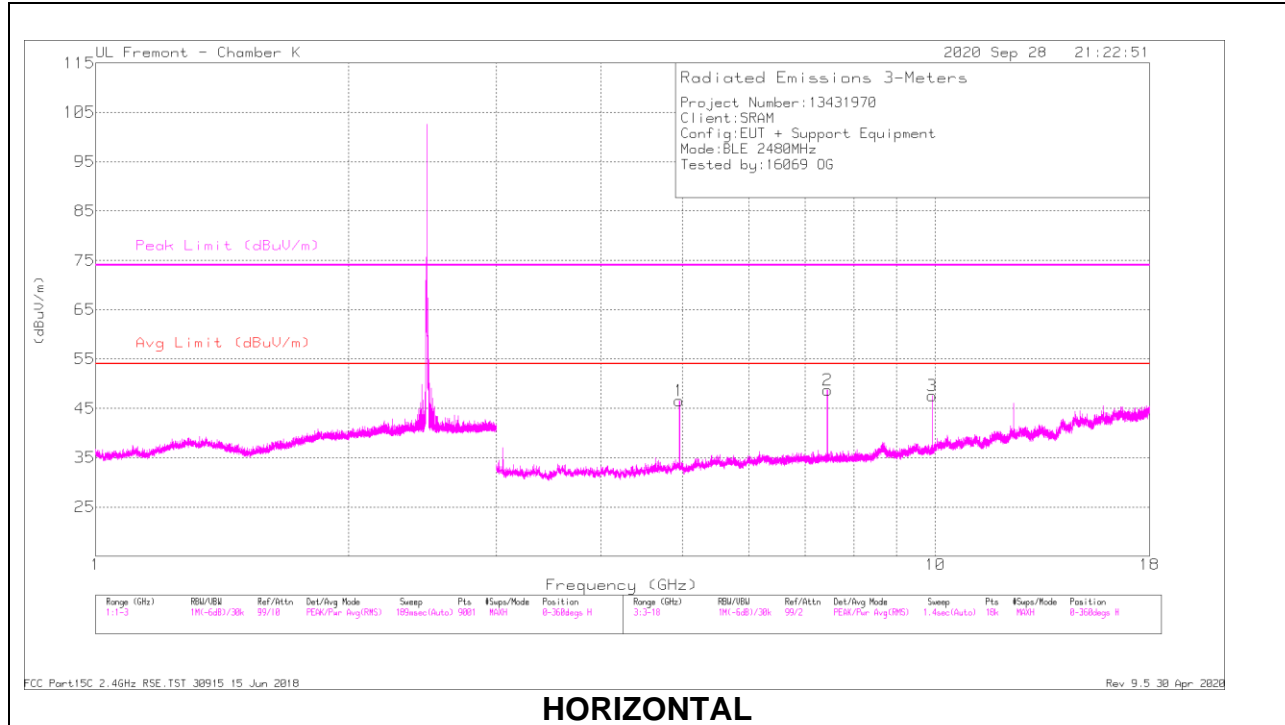
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

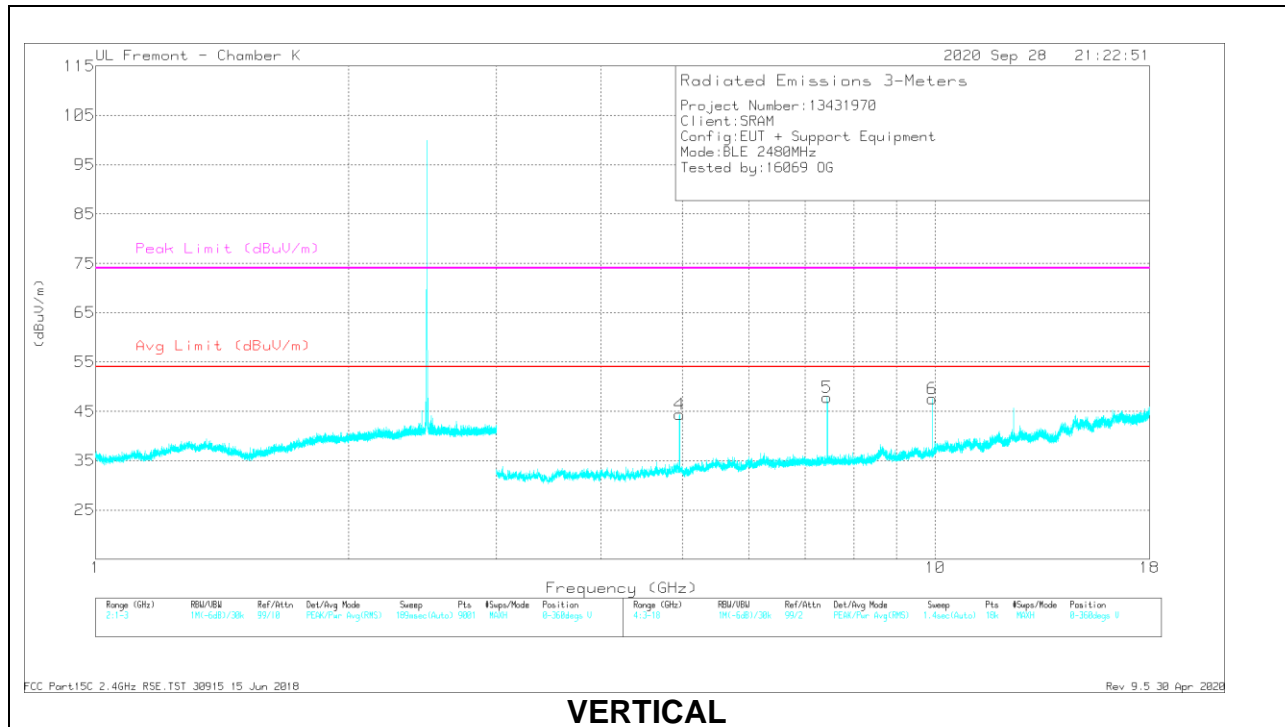
MAv1 - KDB558074 Option 1 Maximum RMS Average



### HIGH CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**

**RADIATED EMISSIONS**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.95938	58.44	PK2	34.3	-40.6	52.14	-	-	74	-21.86	4	104	H
	* 4.95976	52.42	MAv1	34.3	-40.6	46.12	54	-7.88	-	-	4	104	H
2	* 7.43905	55.51	PK2	36.1	-38	53.61	-	-	74	-20.39	93	97	H
	* 7.4391	46.88	MAv1	36.1	-38	44.98	54	-9.02	-	-	93	97	H
3	9.9187	51.89	PK2	37.1	-36.6	52.39	-	-	-	-	132	110	H
4	* 4.96062	55.01	PK2	34.3	-40.6	48.71	-	-	74	-25.29	194	314	V
	* 4.95977	48.05	MAv1	34.3	-40.6	41.75	54	-12.25	-	-	194	314	V
5	* 7.43903	55.21	PK2	36.1	-38	53.31	-	-	74	-20.69	17	235	V
	* 7.43911	47.69	MAv1	36.1	-38	45.79	54	-8.21	-	-	17	235	V
6	9.91866	52.81	PK2	37.1	-36.6	53.31	-	-	-	-	339	139	V

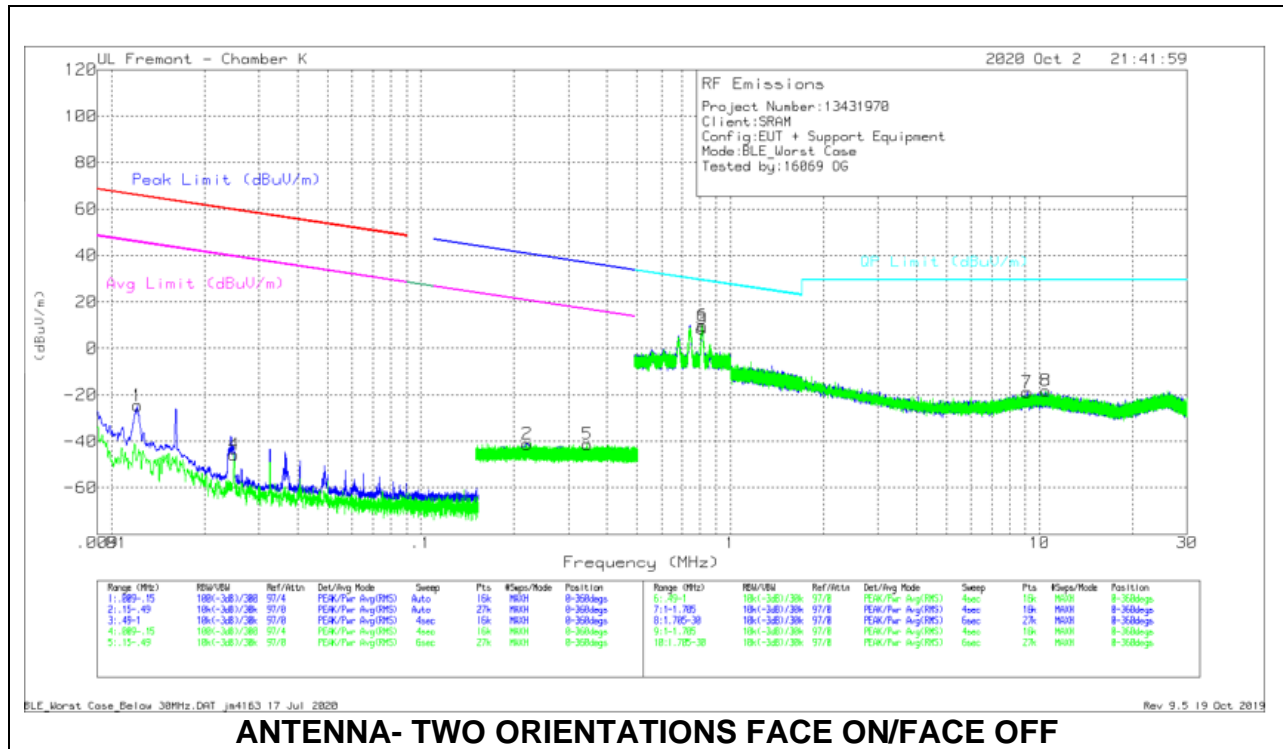
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

### 9.3. WORST CASE BELOW 30MHz

#### SPURIOUS EMISSIONS 9KHz TO 30 MHz (WORST-CASE CONFIGURATION)



#### ANTENNA- TWO ORIENTATIONS FACE ON/FACE OFF

#### Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (E ACF)	Amp/Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.01213	27.06	Pk	59.8	-31.5	-80	-24.64	65.91	-90.55	45.91	-70.55	-	-	-	-	0-360
2	.22065	15.12	Pk	56	-32.2	-80	-41.08	-	-	-	40.74	-81.82	-	20.74	-61.82	0-360
4	.02488	8.15	Pk	58.3	-32.1	-80	-45.65	59.67	-105.32	39.67	-85.32	-	-	-	-	0-360
5	.34562	15.09	Pk	55.9	-32.2	-80	-41.21	-	-	-	-	36.84	-78.05	16.84	-58.05	0-360

Pk - Peak detector

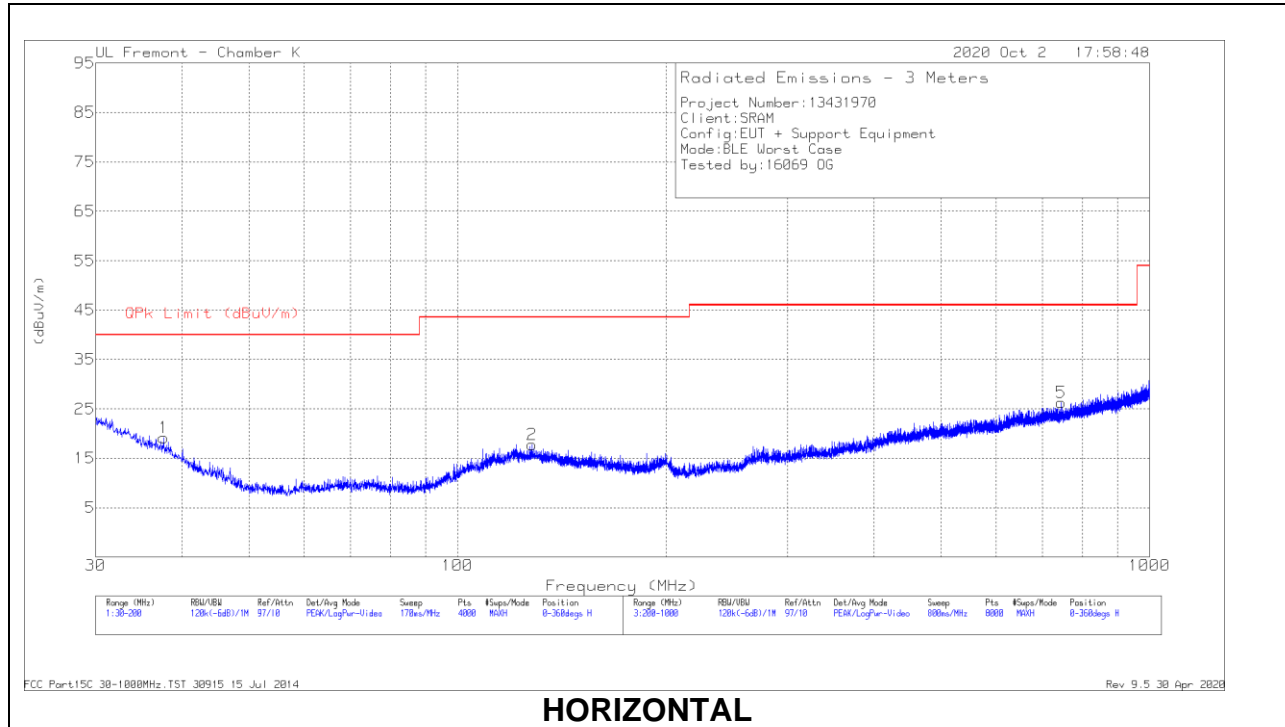
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (E ACF)	Amp/Cbl (dB)	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
3	.8116	24.77	Pk	56	-32.2	-40	8.57	29.43	-20.86	0-360
6	.8124	26.03	Pk	56	-32.2	-40	9.83	29.42	-19.59	0-360
7	9.12694	18.37	Pk	34.6	-31.8	-40	-18.83	29.5	-48.33	0-360
8	10.46314	18.93	Pk	34.7	-31.8	-40	-18.17	29.5	-47.67	0-360

Pk - Peak detector

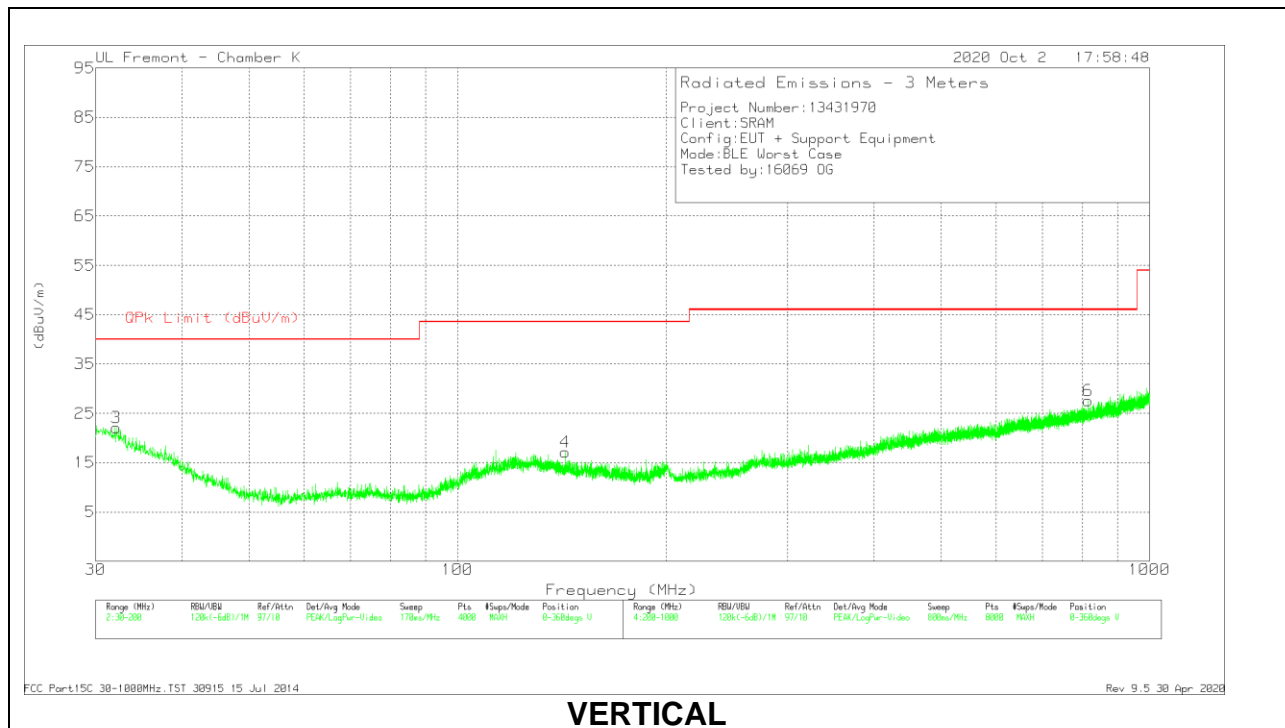
**Note:** The Limits in CRF 47, Part 15, Subpart C, Paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels ( as reported in the table) using the free space impedance of 377 Ohms. For example, the measurement at frequency X kHz resulted in a level of Y dBuV/m, which is equivalent to Y -51.5 = Z dBuA/m, which has the same margin, W dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

### 9.4. WORST CASE BELOW 1 GHz

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



**HORIZONTAL**



**VERTICAL**

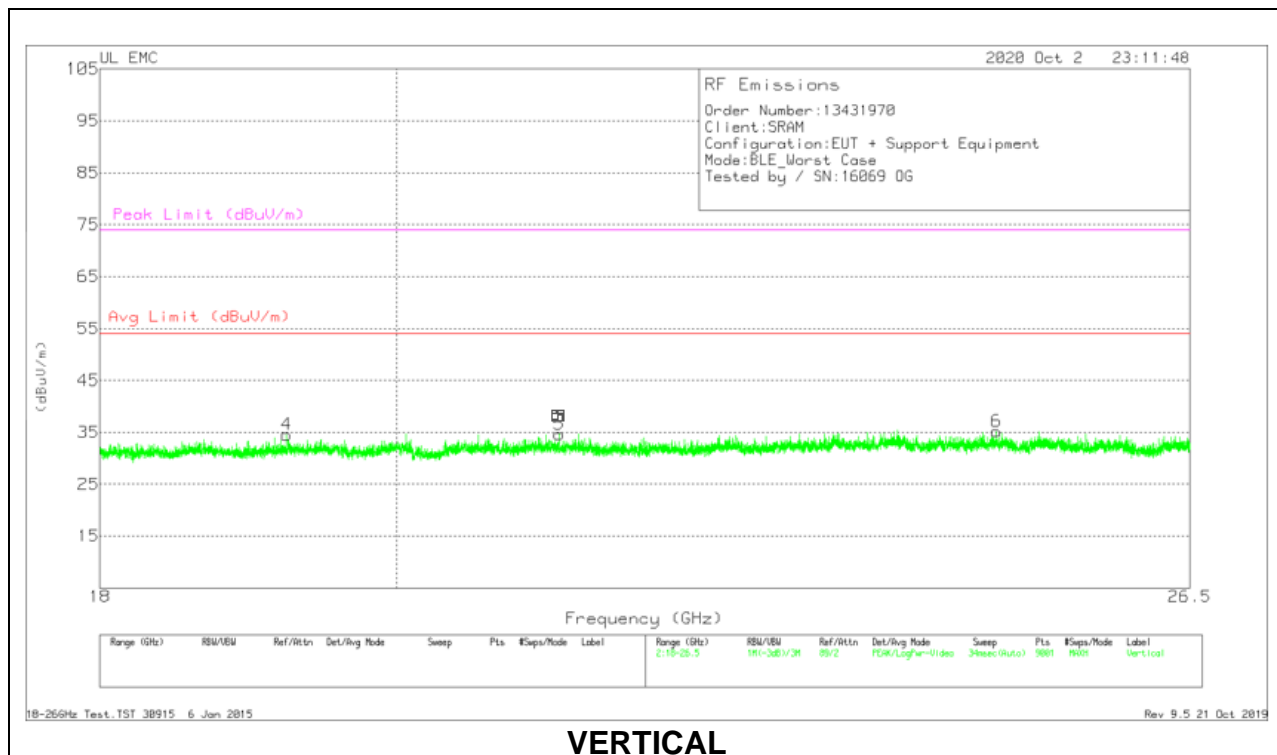
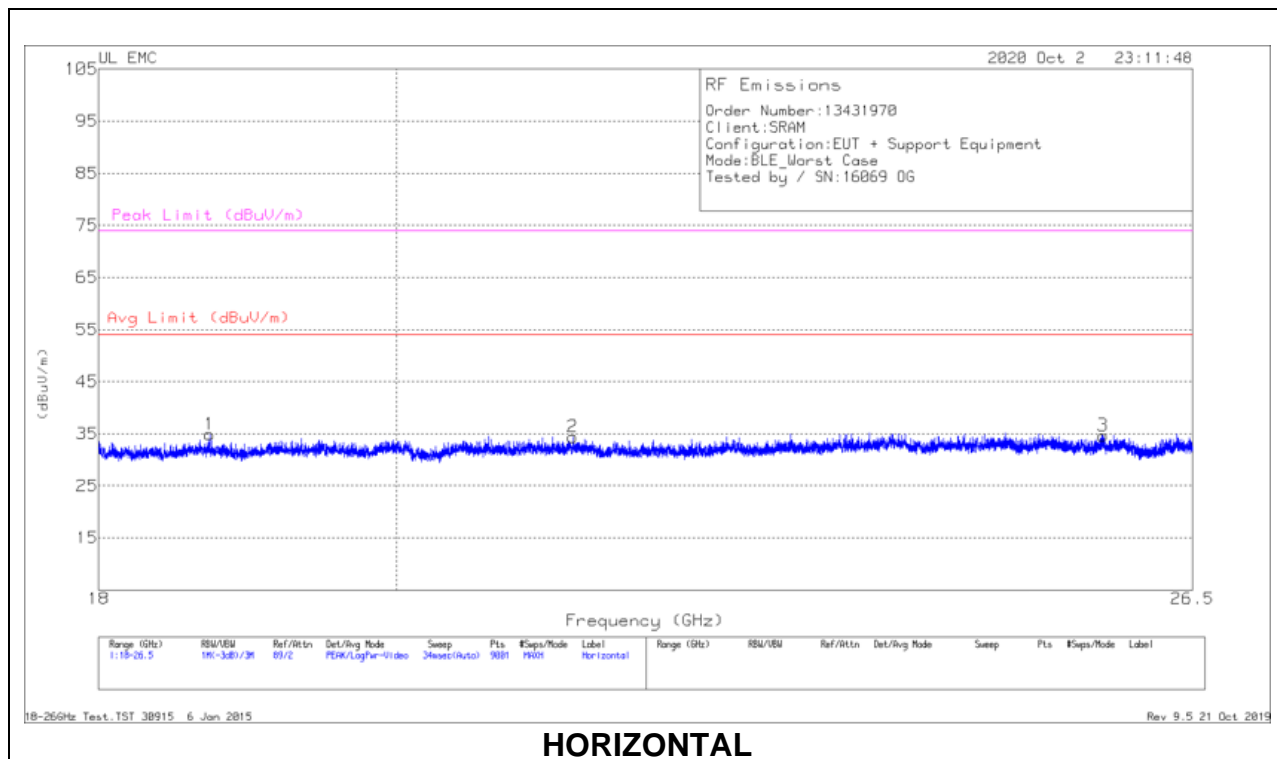
**Below 1GHz Data**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181574 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 37.6095	29.13	Pk	21.5	-31.5	19.13	40	-20.87	0-360	101	H
2	* 128.0729	28.69	Pk	19.8	-30.7	17.79	43.52	-25.73	0-360	301	H
3	32.1256	28.34	Pk	25.4	-31.6	22.14	40	-17.86	0-360	95	V
4	143.0367	29.03	Pk	18.7	-30.6	17.13	43.52	-26.39	0-360	95	V
5	745.6709	28.29	Pk	26.4	-28.4	26.29	46.02	-19.73	0-360	201	H
6	814.7809	27.75	Pk	27.4	-28	27.15	46.02	-18.87	274	385	V
	814.8197	20.43	Qp	27.4	-28	19.83	46.02	-26.19	274	385	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
 Pk - Peak detector  
 Qp - Quasi-Peak detector

### 9.5. WORST CASE 18-26 GHz

#### SPURIOUS EMISSIONS 18-26 GHz (WORST-CASE CONFIGURATION)



**18 – 26GHz DATA**

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T447 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.71967	70.46	Pk	32.4	-58.5	-9.5	34.86	54	-19.14	74	-39.14
2	21.28572	68.17	Pk	33.1	-57.4	-9.5	34.37	54	-19.63	74	-39.63
3	25.67266	64.44	Pk	34.4	-54.7	-9.5	34.64	54	-19.36	74	-39.36
4	19.23156	68.82	Pk	32.7	-57.5	-9.5	34.52	54	-19.48	74	-39.48
5	21.18655	68.13	Pk	33.1	-57.1	-9.5	34.63	54	-19.37	74	-39.37
6	24.74144	65.58	Pk	34.4	-55.3	-9.5	35.18	54	-18.82	74	-38.82

Pk - Peak detector