



TEST REPORT

Report Number. : 12888721 -E2V2

Applicant : SRAM LLC
1000 W Fulton Market 4th Floor
Chicago, IL 60607 U.S.A

Model : 00030

FCC ID : C90-LSBB1

IC : 10161A-LSBB1

EUT Description : Left Extension with BLE and AIREA Radios

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

Date Of Issue:

November 12, 2019

Prepared by:

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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	10/29/19	Initial Issue	--
V2	11/12/19	Updated Model Number and Section 7	Steven Tran

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SRAM LLC
1000 W Fulton Market 4th Floor
Chicago, IL 60607 U.S.A

EUT DESCRIPTION: Left Extension with BLE and AIREA Radios

MODEL: 00030

SERIAL NUMBER: 3412909108 (Radiated)

DATE TESTED: August 9 – 23 , 2019

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. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. 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 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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UL Verification Services Inc

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, 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 are measured only at the 47173 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 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. The full scope of accreditation can be viewed at <http://nist.gov/standards/scopes/2000650.htm>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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:

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Left Extension with BLE and AIREA Radios, powered by CR2032 coin cell battery.

5.2. MAXIMUM OUTPUT POWER

Please refer to UL report # 12292105-E2V2.

The output powers were verified and measured at same or lower power setting compared to the original certification testing level.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a chip antenna type number W3008C, with a maximum gain of 2.2dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was A-1.0.

The test utility software used during testing was Lightblue v2.6.4

5.5. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under Class II Permissive Change application is: Changing enclosure and adding model 00030.

5.6. WORST-CASE CONFIGURATION AND MODE

Radiated band edge, harmonic, and spurious emissions from 1GHz to 18GHz were performed with the EUT was set to transmit at highest power on Low/Middle/High channels.

Radiated emissions below 30MHz, below 1GHz, 18-26GHz and power line conducted emissions were performed with the EUT transmits at the channel with the highest output power as worst-case scenario.

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

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List			
Description	Manufacturer	Model	Serial Number
Ipod Touch	Apple	MKJ02LL/A	CCQVRHY2GGNL
DC Power Supply	ABM	8185D	D021366

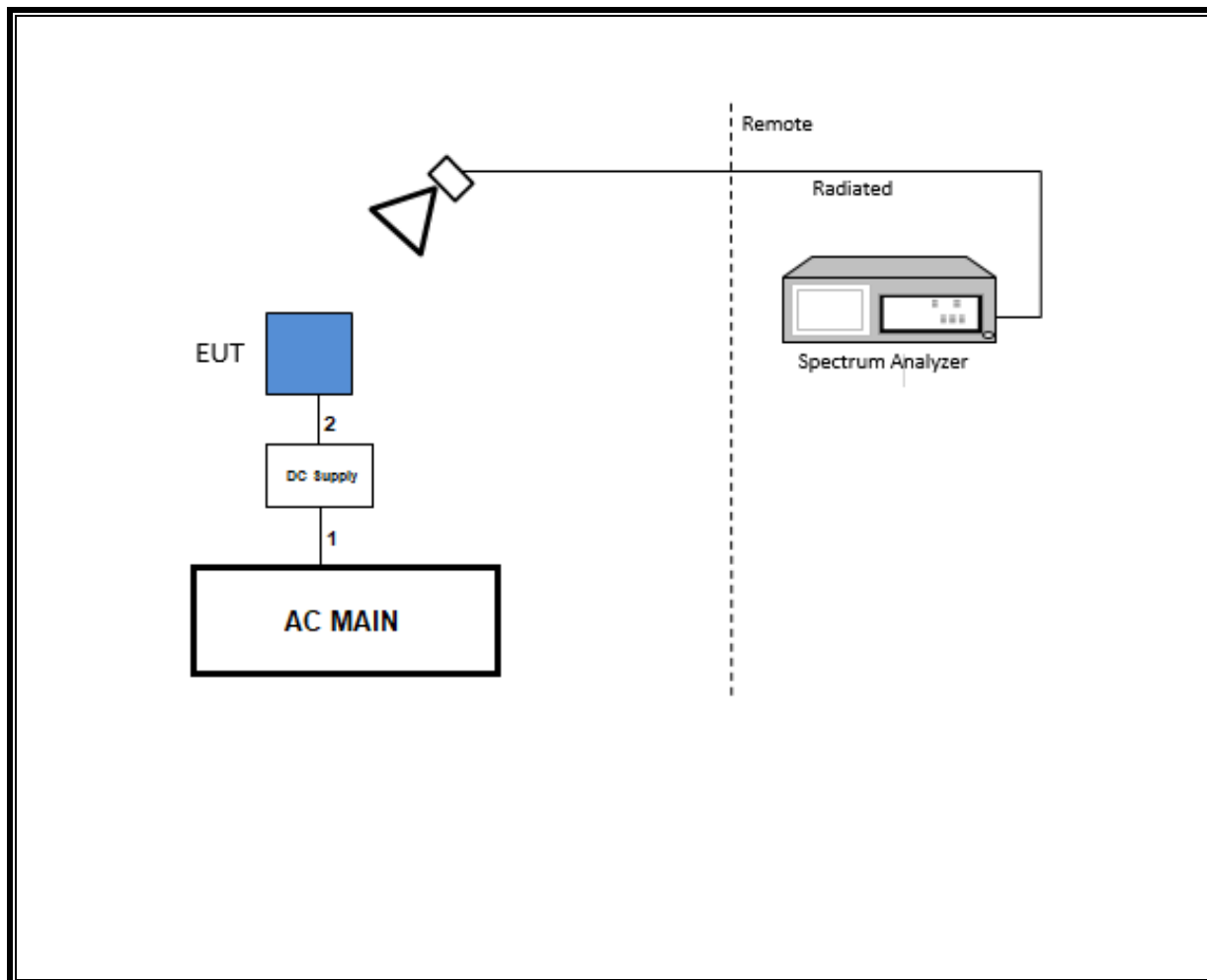
I/O CABLES (RADIATED EMISSIONS)

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 was powered by a 3V DC Power supply. The EUT is normally powered by a CR2032 coin cell battery. The iPod Touch wirelessly sends commands to the EUT.

SETUP DIAGRAM FOR RADIATED TESTS



6. MEASUREMENT METHOD

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

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

Band-edge: ANSI C63.10 Subclause -11.13.3.4 Integration method -Trace averaging across
ON and OFF times DC correction

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:

Test Equipment List					
Description	Manufacturer	Model	ID No.	Cal Date	Cal Due
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T862	6/6/2019	6/5/2020
Antenna, Horn 18-26.5GHz	ARA	MWH-1826/B	T449	08/13/2020	08/13/2019
Amplifier 1-8GHz 30dB gain	L3 Narda	AMF-4D-01000800-30-29P	167494	8/24/2019	8/24/2020
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179376	2/14/2019	2/14/2020
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	PRE0180175	5/30/2019	5/29/2020
RF Amplifier, 1-18GHz	MITEQ	AFS42-00101800-25-S-42	171460	8/24/2019	8/24/2020
Filter, HPF 3.0GHz	MICRO-TRONICS	HPM17543	171903	8/24/2019	8/24/2020
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	PRE0184971	11/13/2018	11/13/2019
Filter, HPF 3.0GHz	MICRO-TRONICS	HPM17543	T897	5/5/2019	5/4/2020
Amplifier, 1 to 18GHz, 35dB	AMPLICAL	AMP1G18-35	T1569	5/5/2019	5/4/2020
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179372	2/16/2019	2/16/2020
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	PRE0184052	10/24/2018	10/24/2019
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	175953	12/13/2018	12/13/2019
Antenna, Passive Loop 30Hz to 1MHz	ELETRO METRICS	EM-6871	PRE0179466	05/31/2019	05/31/2020
Antenna, Passive Loop 100KHz to 30MHz	ELETRO METRICS	EM-6872	PRE0179468	05/31/2019	05/31/2020

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Ver 9.5, Dec 01, 2016

8. RADIATED TEST RESULTS

8.1. 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.

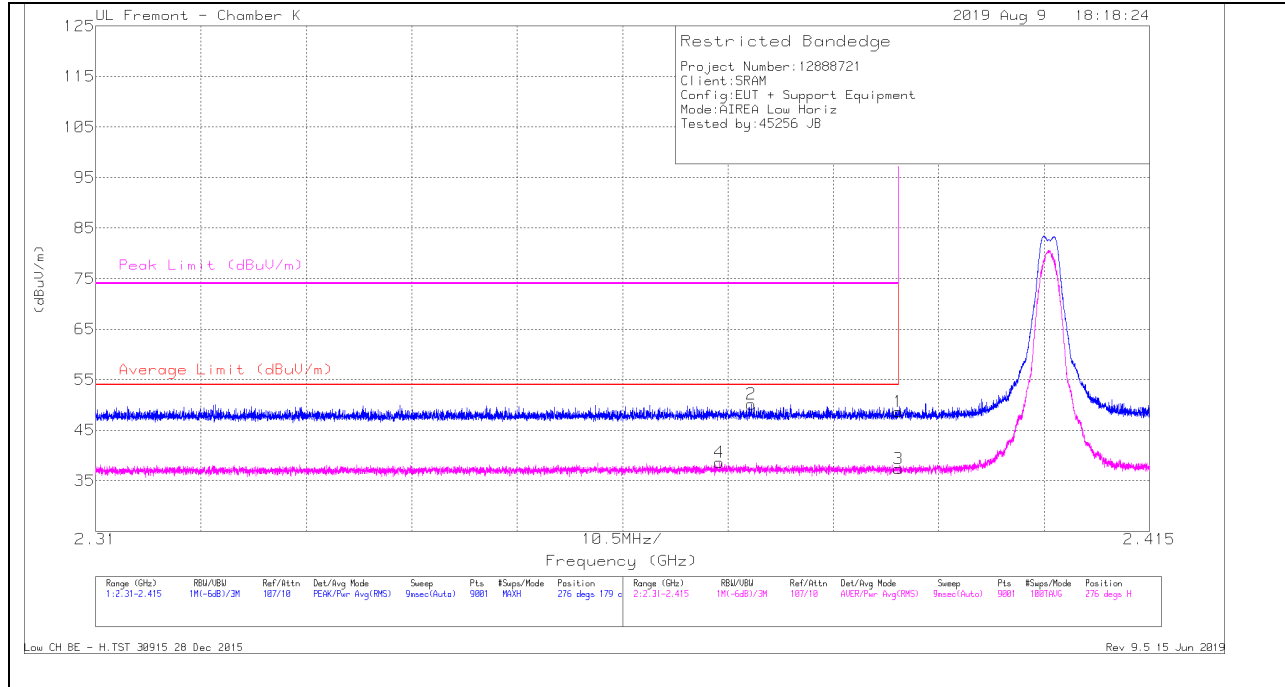
The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

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.

8.2. TRANSMITTER ABOVE 1 GHz

BANDEDGE (LOW CHANNEL, CH 11)

HORIZONTAL RESULT



Trace Markers

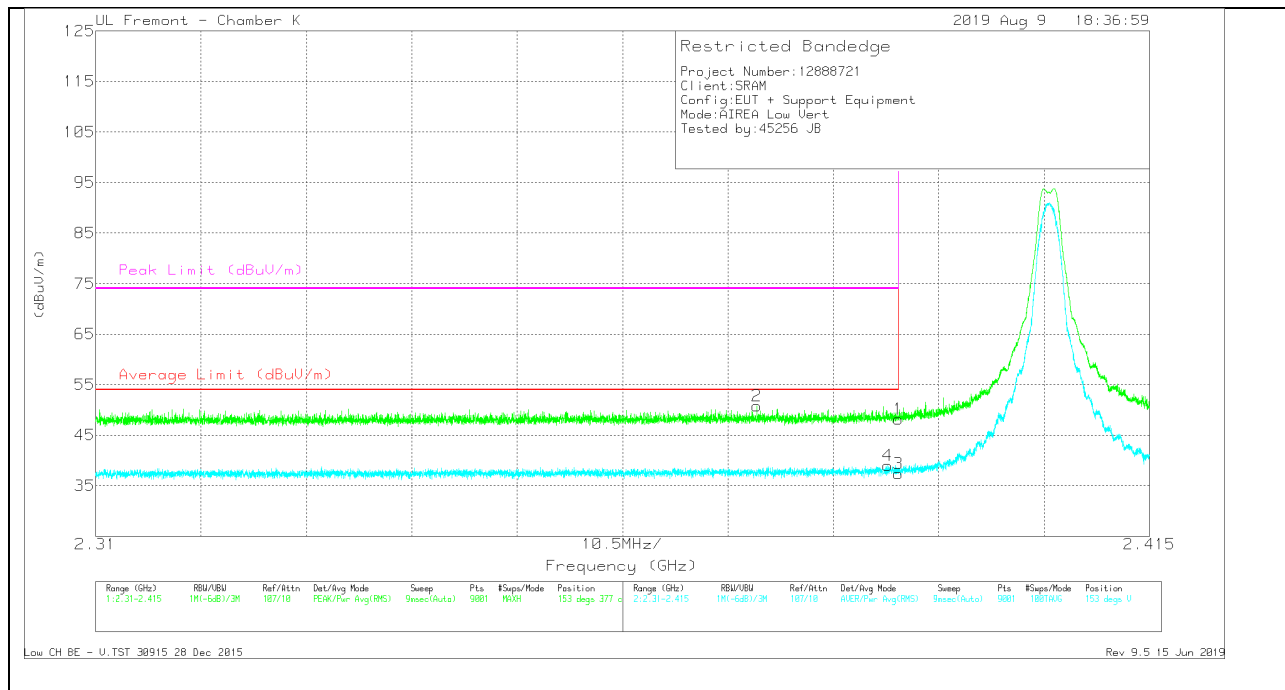
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cb/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	41.48	Pk	31.9	-24.7	0	48.68	-	-	74	-25.32	276	179	H
2	* 2.3753	42.85	Pk	31.9	-24.6	0	50.15	-	-	74	-23.85	276	179	H
3	* 2.38999	30.18	RMS	31.9	-24.7	0	37.38	54	-16.62	-	-	276	179	H
4	* 2.37215	31.28	RMS	31.9	-24.6	0	38.58	54	-15.42	-	-	276	179	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 T862 (dB/m)	Amp/Ch/Flt/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Altitude (Degs)	Height (cm)	Polarity
1	* 2.38999	40.94	Pk	31.9	-24.7	0	48.14	-	-	74	-25.86	153	377	V
2	* 2.3759	43.54	Pk	31.9	-24.7	0	50.74	-	-	74	-23.26	153	377	V
3	* 2.38999	30.23	RMS	31.9	-24.7	0	37.43	54	-16.57	-	-	153	377	V
4	* 2.38894	31.8	RMS	31.9	-24.7	0	39	54	-15	-	-	153	377	V

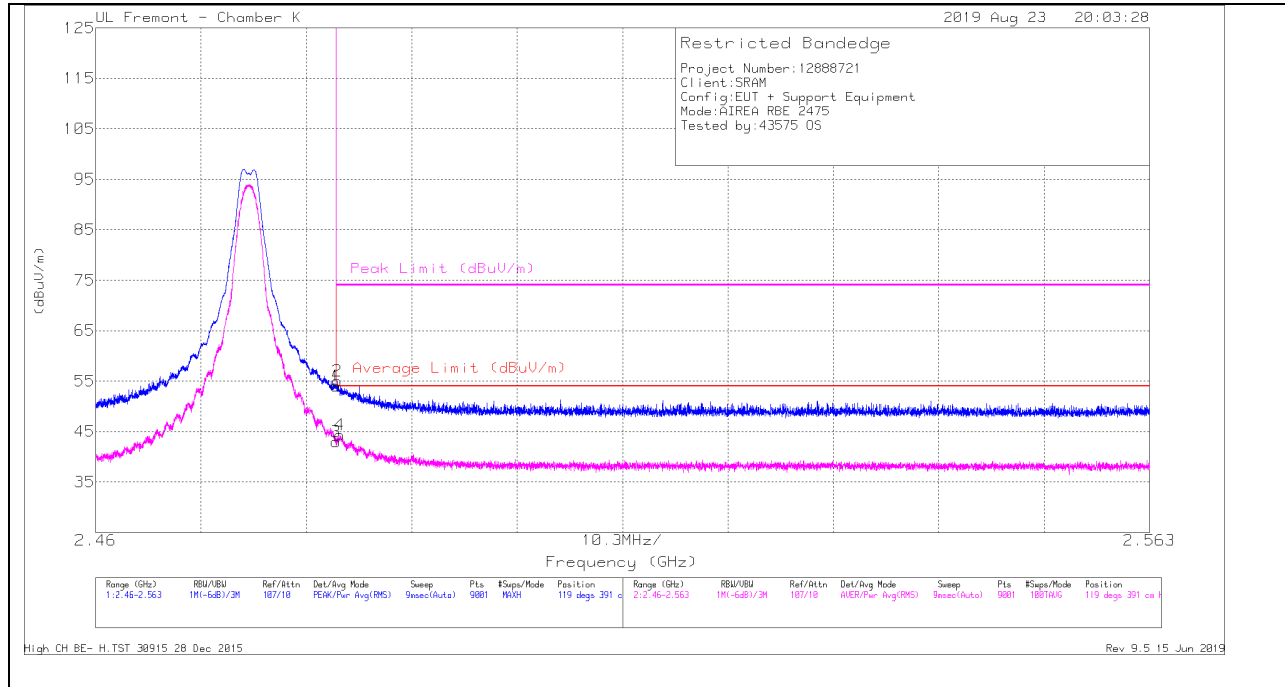
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

BANEDGE (HIGH CHANNEL, CH 25)

HORIZONTAL RESULT

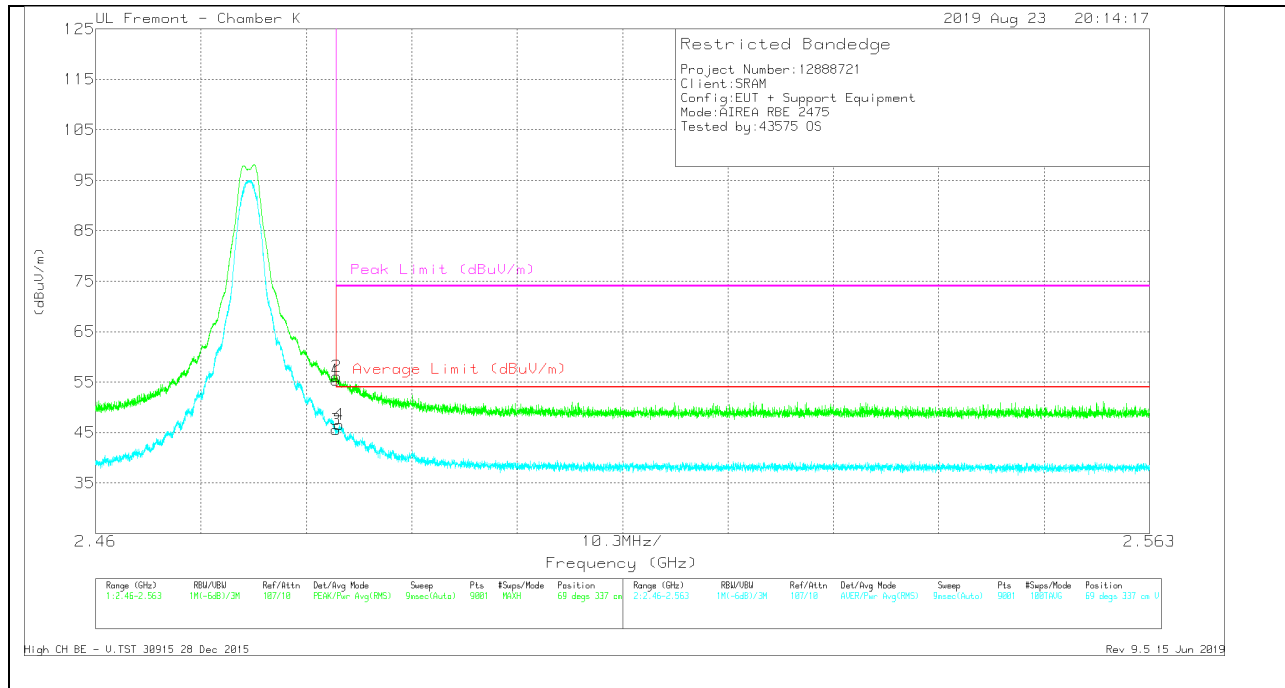


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC424 (dB/m)	Amp/Cb/Filt/Pa d (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	46.27	Pk	32.5	-24.8	0	53.97	-	-	74	-20.03	119	391	H
2	*2.48362	47.34	Pk	32.5	-24.8	0	55.04	-	-	74	-18.96	119	391	H
3	*2.48351	35.21	RMS	32.5	-24.8	0	42.91	54	-11.09	-	-	119	391	H
4	*2.48368	36.68	RMS	32.5	-24.8	0	44.38	54	-9.62	-	-	119	391	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 EMC4294 (dB/m)	Amp/Cbl/Fitr/Pad (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	47.66	Pk	32.5	-24.8	0	55.36	-	-	74	-18.64	69	337	V
2	* 2.48353	48.38	Pk	32.5	-24.8	0	56.08	-	-	74	-17.92	69	337	V
3	* 2.48351	37.85	RMS	32.5	-24.8	0	45.55	54	-8.45	-	-	69	337	V
4	* 2.48383	38.83	RMS	32.5	-24.8	0	46.53	54	-7.47	-	-	69	337	V

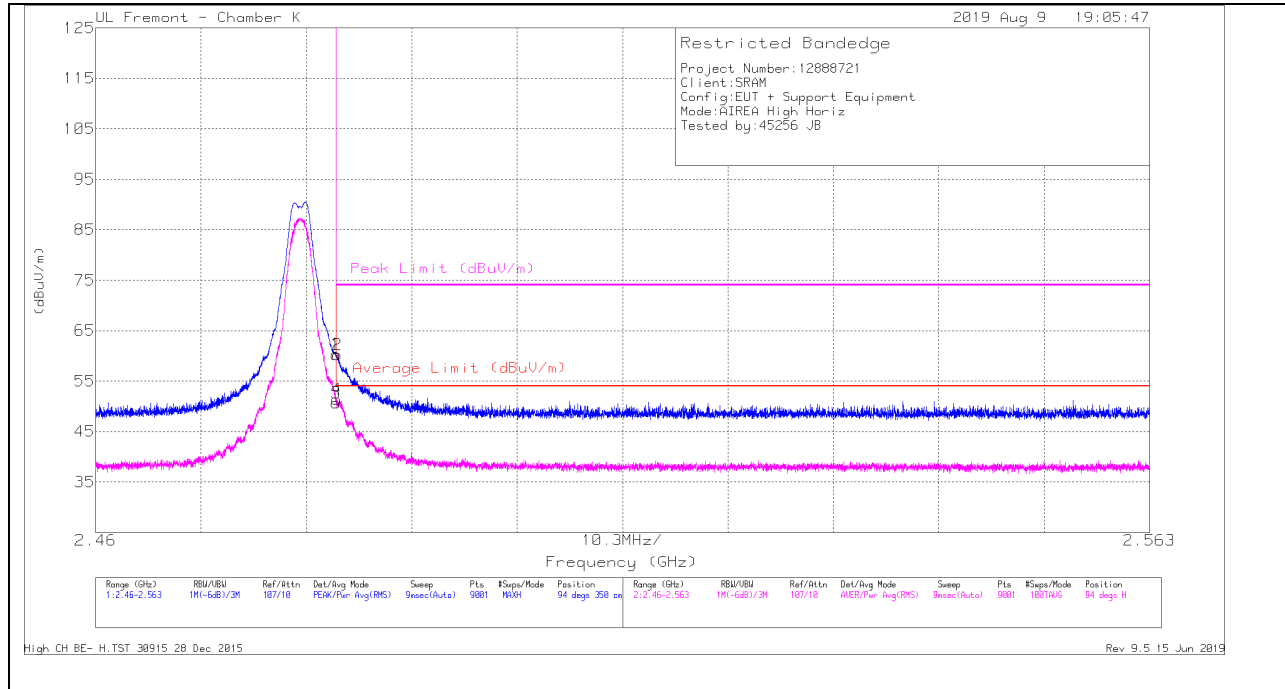
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

BANDEDGE (HIGH CHANNEL, CH 26)

HORIZONTAL RESULT

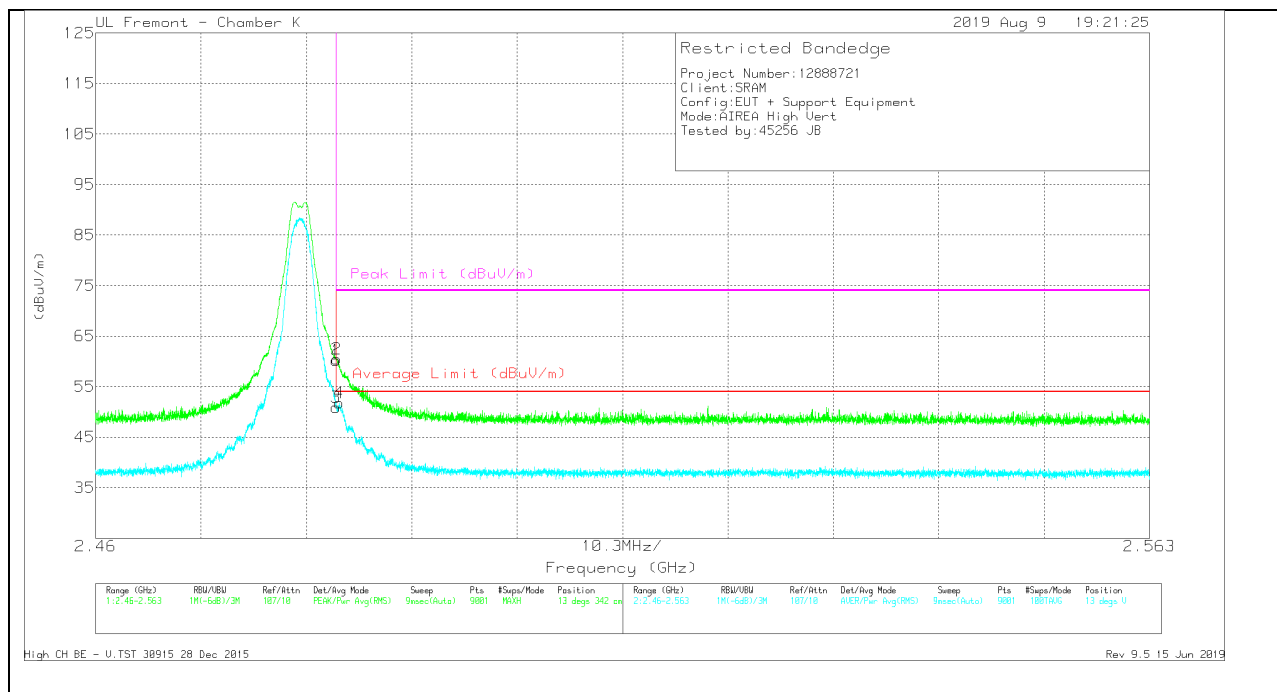


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AP T862 (dB/m)	Amp/Cbl/Fits/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Altitude (Deg)	Height (cm)	Polarity
1	* 2.48351	52.59	Pk	32.5	-24.8	0	60.29	-	-	74	-13.71	94	350	H
2	* 2.4836	52.48	Pk	32.5	-24.8	0	60.18	-	-	74	-13.82	94	350	H
3	* 2.48351	42.96	RMS	32.5	-24.8	0	50.66	54	-3.34	-	-	94	350	H
4	* 2.48356	43.68	RMS	32.5	-24.8	0	51.38	54	-2.62	-	-	94	350	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 1962 (dB/m)	Amp/Ch/Flt/Pad (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	52.5	Pk	32.5	-24.8	0	60.2	-	-	74	-13.8	13	342	V
2	* 2.48354	52.81	Pk	32.5	-24.8	0	60.51	-	-	74	-13.49	13	342	V
3	* 2.48351	43.25	RMS	32.5	-24.8	0	50.95	54	-3.05	-	-	13	342	V
4	* 2.48379	44.13	RMS	32.5	-24.8	0	51.83	54	-2.17	-	-	13	342	V

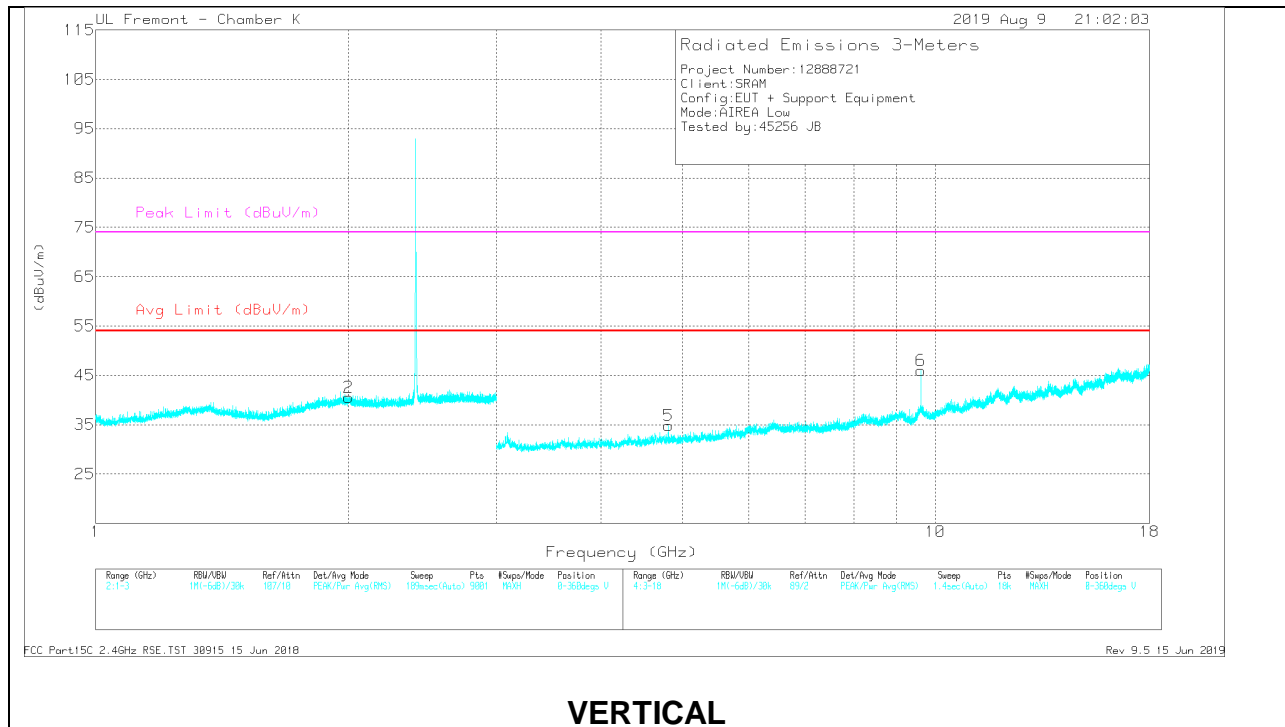
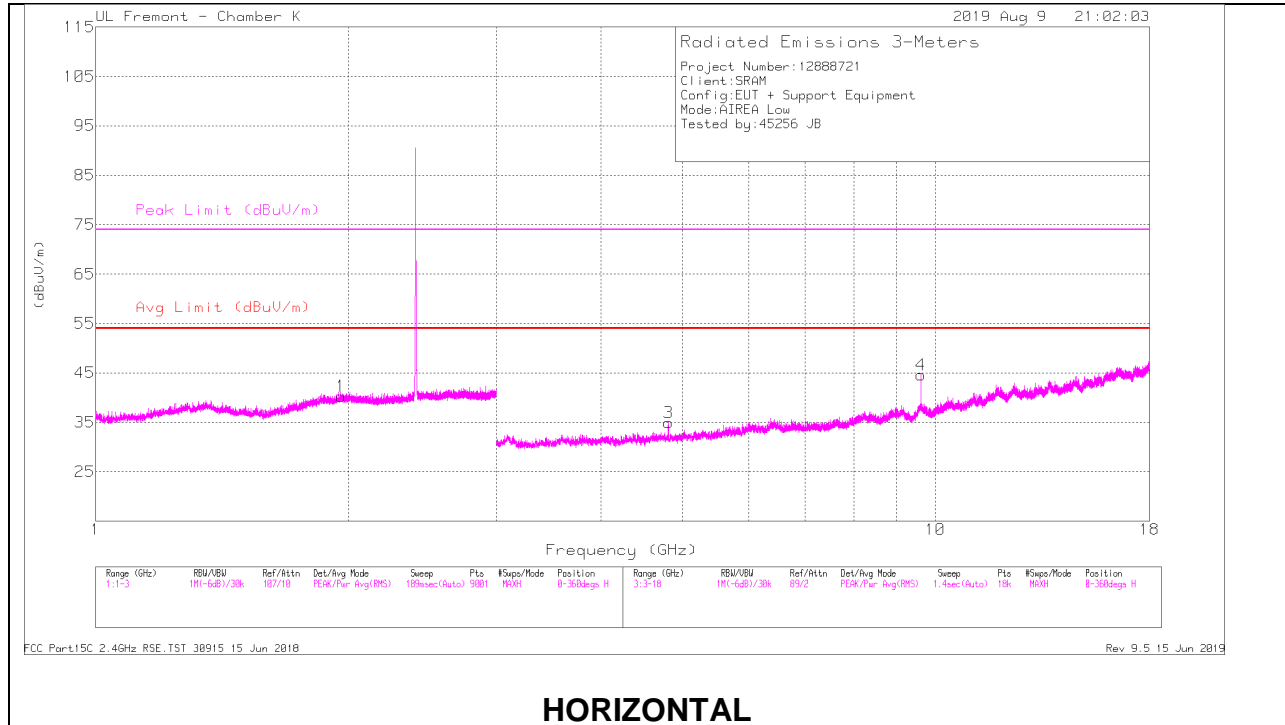
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL, CH 11 RESULTS



RADIATED EMISSIONS

Radiated Emissions

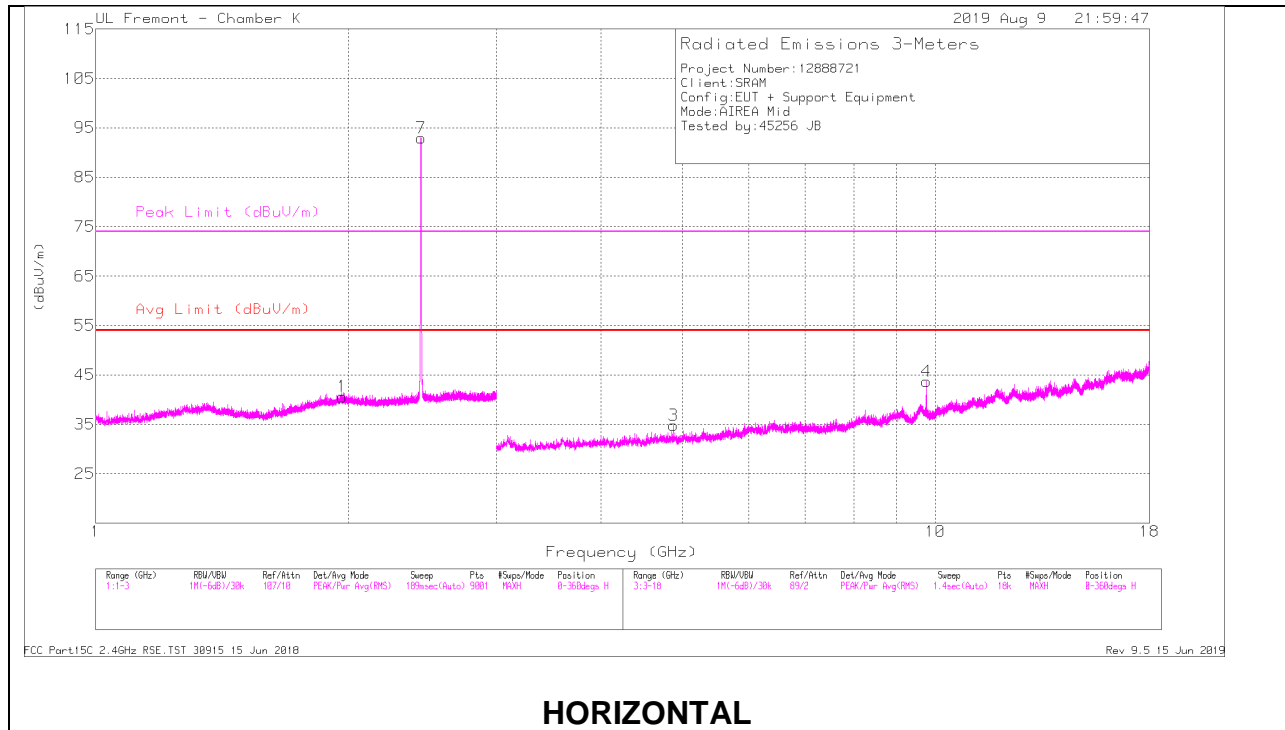
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/ Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.95933	33.04	Pk	31.5	-24.3	0	40.24	-	-	-	-	0-360	200	H
2	2.00156	33.48	Pk	31.4	-24.3	0	40.58	-	-	-	-	0-360	101	V
3	* 4.8109	39.29	PK2	34.1	-30.3	0	43.09	-	-	74	-30.91	351	254	H
	* 4.809	31.13	MAv1	34.2	-30.2	0	35.13	54	-18.87	-	-	351	254	H
4	9.61787	30.53	Pk	37.1	-23	0	44.63	-	-	-	-	0-360	200	H
5	* 4.81091	37.78	PK2	34.1	-30.3	0	41.58	-	-	74	-32.42	90	195	V
	* 4.81093	29.54	MAv1	34.1	-30.3	0	33.34	54	-20.66	-	-	90	195	V
6	9.61787	31.84	Pk	37.1	-23	0	45.94	-	-	-	-	0-360	200	V

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

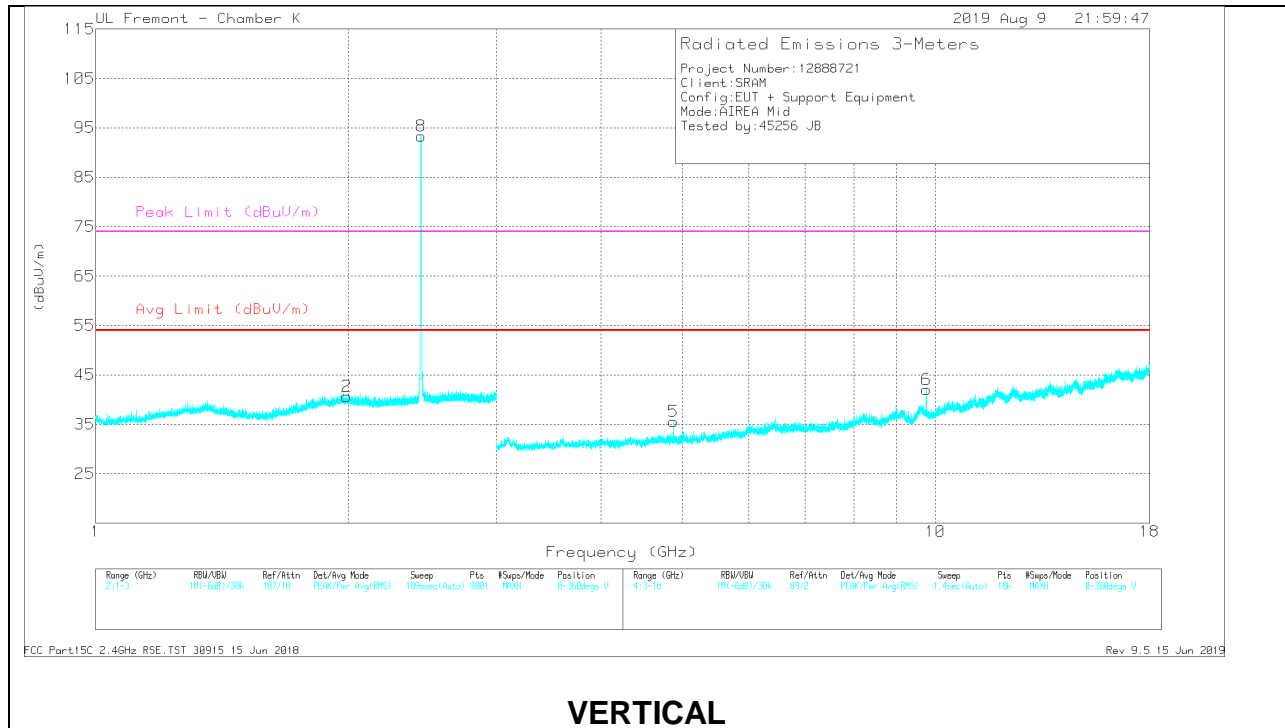
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL, CH 18 RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Radiated Emissions

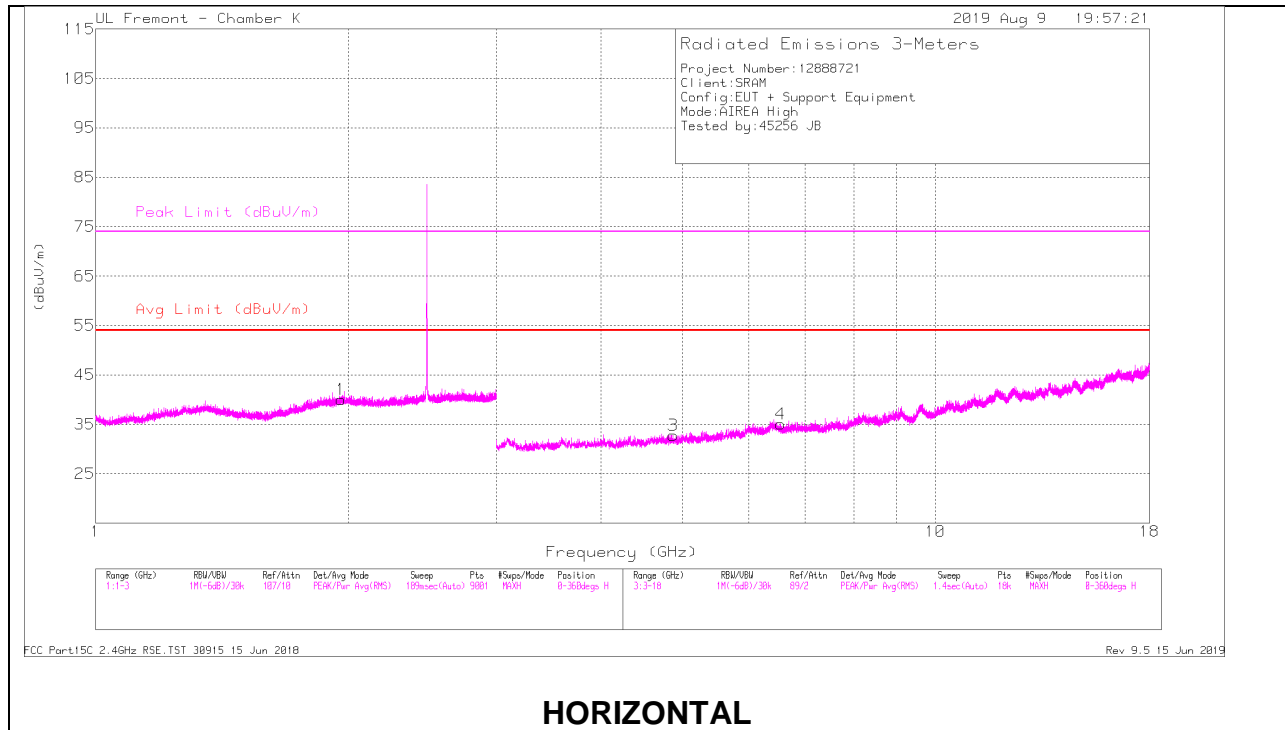
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/ Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.96667	33.49	Pk	31.5	-24.4	0	40.59	-	-	-	-	0-360	101	H
7	2.43946	89.55	PK2	32.3	-24.7	0	97.15	-	-	-	-	0	350	H
	2.43997	85.22	MAv1	32.3	-24.7	0	92.82	-	-	-	-	0	350	H
2	1.99067	33.39	Pk	31.6	-24.3	0	40.69	-	-	-	-	0-360	101	V
8	2.44049	89.37	PK2	32.3	-24.7	0	96.97	-	-	-	-	142	153	V
	2.44	85.33	MAv1	32.3	-24.7	0	92.93	-	-	-	-	142	153	V
3	* 4.87903	39.47	PK2	34.1	-30.5	0	43.07	-	-	74	-30.93	212	244	H
	* 4.87899	30.12	MAv1	34.1	-30.5	0	33.72	54	-20.28	-	-	212	244	H
4	9.76205	30.02	Pk	37.1	-23.4	0	43.72	-	-	-	-	0-360	200	H
5	* 4.881	39.16	PK2	34.1	-30.5	0	42.76	-	-	74	-31.24	98	164	V
	* 4.88089	31.13	MAv1	34.1	-30.5	0	34.73	54	-19.27	-	-	98	164	V
6	9.76205	28.29	Pk	37.1	-23.4	0	41.99	-	-	-	-	0-360	200	V

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

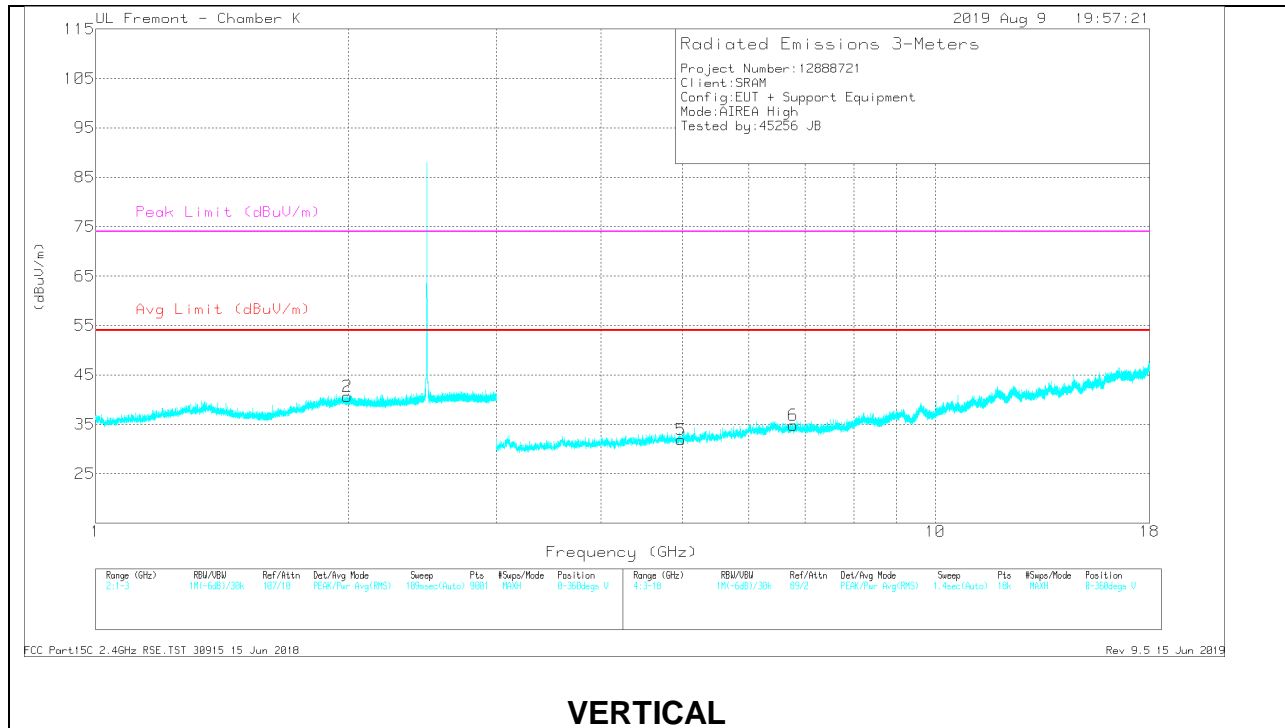
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL, CH 26 RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/ Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.96111	32.77	Pk	31.6	-24.3	0	40.07	-	-	-	-	0-360	200	H
2	1.99511	33.59	Pk	31.5	-24.4	0	40.69	-	-	-	-	0-360	200	V
3	* 4.87646	37.97	PK2	34.2	-30.5	0	41.67	-	-	74	-32.33	64	243	H
	* 4.87423	27.09	MAv1	34.2	-30.5	0	30.79	54	-23.21	-	-	64	243	H
4	6.54187	26.31	Pk	35.7	-26.9	0	35.11	-	-	-	-	0-360	100	H
5	* 4.9833	37.02	PK2	34.1	-30.4	0	40.72	-	-	74	-33.28	72	189	V
	* 4.98697	26.71	MAv1	34.1	-30.4	0	30.41	54	-23.59	-	-	72	189	V
6	6.77188	25.8	Pk	35.7	-26.7	0	34.8	-	-	-	-	0-360	200	V

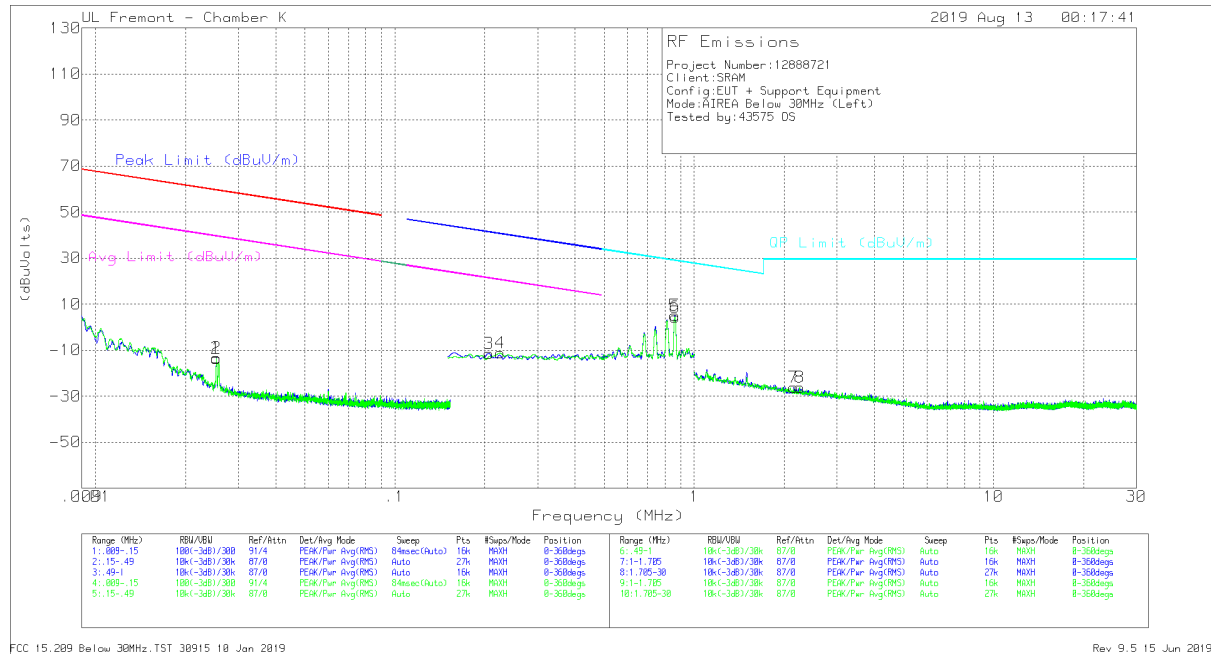
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

8.3. Worst Case Below 30MHz

FACE ON AND FACE OFF PLOTS



NOTE: KDB 414788 OATS and Chamber Correlation Justification

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

Below 30MHz DATA

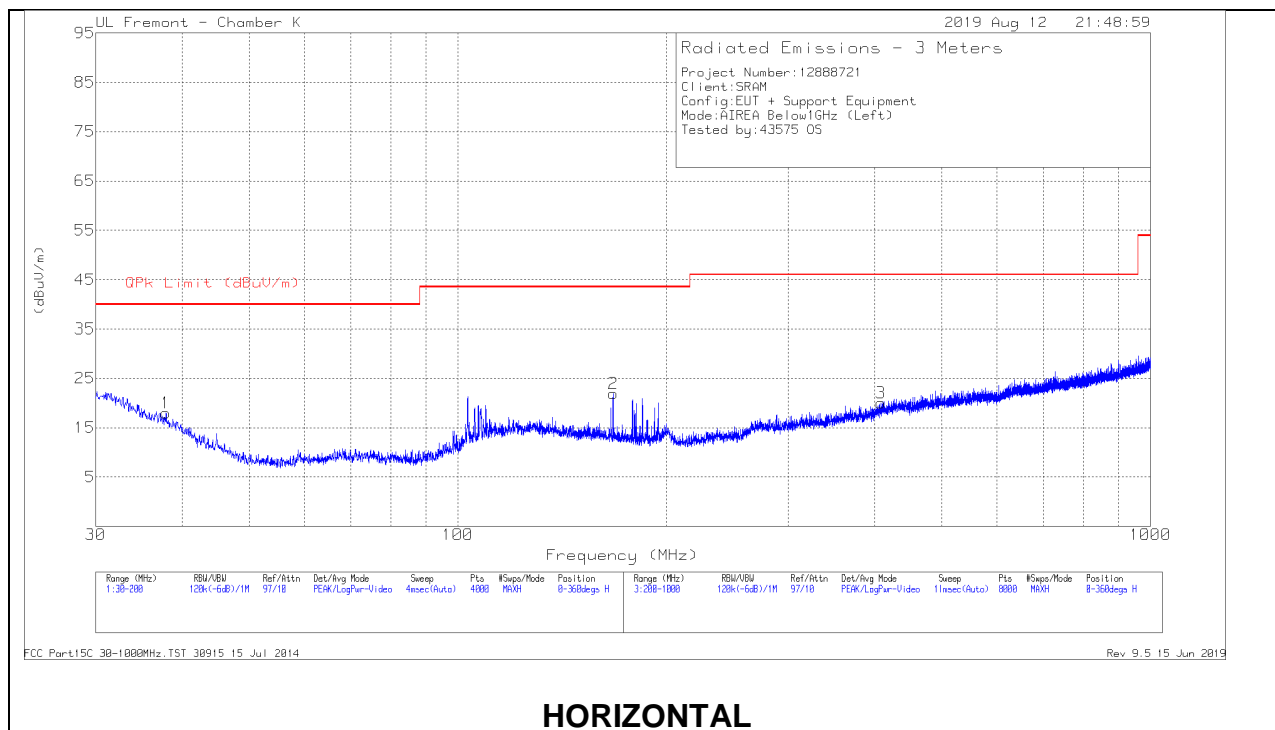
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.02536	.68	Pk	58.2	-32.2	-40	-13.32	59.5	-72.82	39.5	-52.82	-	-	-	-	0-360
3	.20621	4.55	Pk	56.1	-32.1	-40	-11.45	-	-	-	-	41.33	-52.78	21.33	-32.78	0-360
2	.02536	.52	Pk	58.2	-32.2	-40	-13.48	59.5	-72.98	39.5	-52.98	-	-	-	-	0-360
4	.22517	4.73	Pk	56.1	-32.1	-40	-11.27	-	-	-	-	40.57	-51.84	20.57	-31.84	0-360

Pk - Peak detector

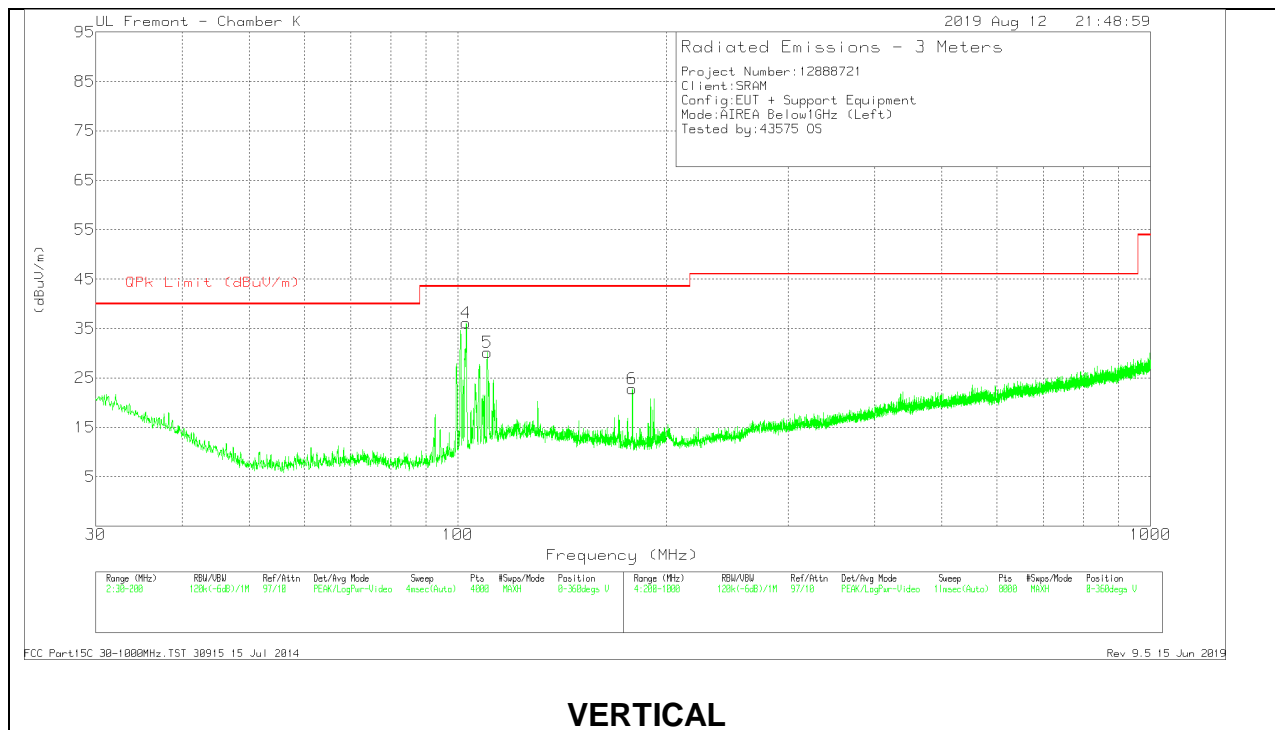
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 30m	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
5	.8617	21.04	Pk	56.1	-32.1	-40	5.04	28.91	-23.87	-	-	-	-	0-360
6	.86182	20.45	Pk	56.1	-32.1	-40	4.45	28.91	-24.46	-	-	-	-	0-360
7	2.1504	4.6	Pk	41.2	-32	-40	-26.2	29.5	-55.7	-	-	-	-	0-360
8	2.24996	5.02	Pk	40.9	-32	-40	-26.08	29.5	-55.58	-	-	-	-	0-360

Pk - Peak detector

8.4. Worst Case Below 1 GHz



HORIZONTAL



VERTICAL

Below 1GHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 37.907	28.27	Pk	21.2	-31.5	17.97	40	-22.03	0-360	199	H
2	167.5656	34.71	Pk	17.7	-30.5	21.91	43.52	-21.61	0-360	199	H
4	103.0601	29.18	Pk	17	-30.9	15.28	43.52	-28.24	0	137	V
	103.06011	21.85	Qp	17	-30.9	7.95	43.52	-35.57	0	137	V
5	* 110.3033	42.58	Pk	18.5	-30.9	30.18	43.52	-13.34	0-360	100	V
6	178.661	36.11	Pk	17.1	-30.4	22.81	43.52	-20.71	0-360	100	V
3	* 407.927	27.66	Pk	21.9	-29.5	20.06	46.02	-25.96	0-360	100	H

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

Pk - Peak detector

Qp - Quasi-Peak detector

8.5. Worst Case 18-26 GHz



18 – 26GHz DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T449 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	19.432	69.62	Pk	33.2	-57.2	-9.5	36.12	54	-17.88	74	-37.88
2	21.568	69.5	Pk	33.8	-57.2	-9.5	36.6	54	-17.4	74	-37.4
3	23.55911	69.54	Pk	34.4	-56.9	-9.5	37.54	54	-16.46	74	-36.46
4	19.91467	69.02	Pk	33.5	-57.1	-9.5	35.92	54	-18.08	74	-38.08
5	21.38222	70.36	Pk	33.6	-57.3	-9.5	37.16	54	-16.84	74	-36.84
6	23.168	69.4	Pk	34.3	-57.3	-9.5	36.9	54	-17.1	74	-37.1

Pk - Peak detector