



TEST REPORT

Report Number: 13156692-E1V5

Applicant : EVERACTIVE
2986 OAKMEAD VILLAGE CT
SANTA CLARA, CA 95051 U.S.A.

Model : 830-00001

FCC ID : 2AO7C-83000001

ISED ID : 23743-83000001

EUT Description : 915MHz Transmitter

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

Date Of Issue:

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	05/08/2020	Initial Issue	---
V2	05/18/2020	Report revised based on reviewer's comments.	Bobby Bayani
V3	05/22/2020	Section 2, revised RSS-GEN issue number	Grace Rincand
V4	05/28/2020	Report revised based on reviewer's comments. Sec. 8.2 updated.	Bobby Bayani
V5	06/23/2020	Report revised based on reviewer's comments. Additional testing performed for Mode 2.	Bobby Bayani

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: EVERACTIVE
2986 OAKMEAD VILLAGE CT
SANTA CLARA, CA 95051
U.S.A.

EUT DESCRIPTION: 915MHz Transmitter

MODEL: 830-00001

SERIAL NUMBER: FCC-REV3-0001

DATE TESTED: APRIL 13 – APRIL 16, 2020; JUNE 4 – JUNE 18, 2020

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

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.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the following:

- ANSI C63.10:2013
- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- RSS-GEN Issue 5
- RSS-247 Issue 2
- KDB 558074 D01 15.247 Meas Guidance v05r02

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. 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 Road
☐ Chamber A	☐ Chamber D	☐ Chamber I
☐ Chamber B	☐ Chamber E	☐ Chamber J
☐ Chamber C	☐ Chamber F	☒ Chamber K
	☐ Chamber G	☒ Chamber L
	☐ Chamber H	☒ 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 _{Lab}
Conducted Disturbance, 9KHz to 0.15 MHz	3.39 dB
Conducted Disturbance, 0.15 to 30 MHz	3.07 dB
Radiated Disturbance, 9KHz to 30 MHz	2.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.88 dB
Radiated Disturbance, 1000 to 18000 MHz	4.24 dB
Radiated Disturbance, 18000 to 26000 MHz	4.37 dB
Radiated Disturbance, 26000 to 40000 MHz	5.17 dB
Occupied Channel Bandwidth	±0.39 %
Temperature	±0.9 °C
Supply voltages	±0.45 %
Time	±0.02 %

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

4.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

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

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + 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 915MHz Transmitter.

5.2. MAXIMUM OUTPUT POWER

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

MODE 1 – OOK

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
902-928	Normal	29.69	931.11

MODE 2 – FSK

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
902-928	Normal	29.87	970.51

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a panel antenna with a maximum gain of 2 dBi for Configuration 1, and a dipole antenna with a maximum gain of 2 dBi for Configuration 2.

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was fcc_V0.0.2.

5.5. WORST-CASE CONFIGURATION AND MODE

For below 30MHz testing, investigation was done on three antenna orientations: Rx antenna Face-on, Face-off and horizontal (parallel to ground). The worst-case configurations were determined on Rx antenna Face-on and Face-off; therefore, all final tests were performed using these two orientations.

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

Radiated emissions below 30MHz 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 emissions from 30MHz to 1GHz were performed with the EUT set to transmit at low middle and high channels.

Band edge and radiated emissions between 30MHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

The EUT was investigated in two configurations and two modes, Configuration 1 using the panel antenna and Configuration 2 using the dipole antenna. MODE 1 = OOK and MODE 2 = FSK.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	ThinkPad X1 Carbon	PK2HBBX	PD962205ANSU
Laptop adapter	Lenovo	ADLX65NDC2A	-	-
Mouse	Amazonbasics	MSU0939	6H148C2905B	-
Earphones	-	-	-	-
USB extension cable	-	-	-	-

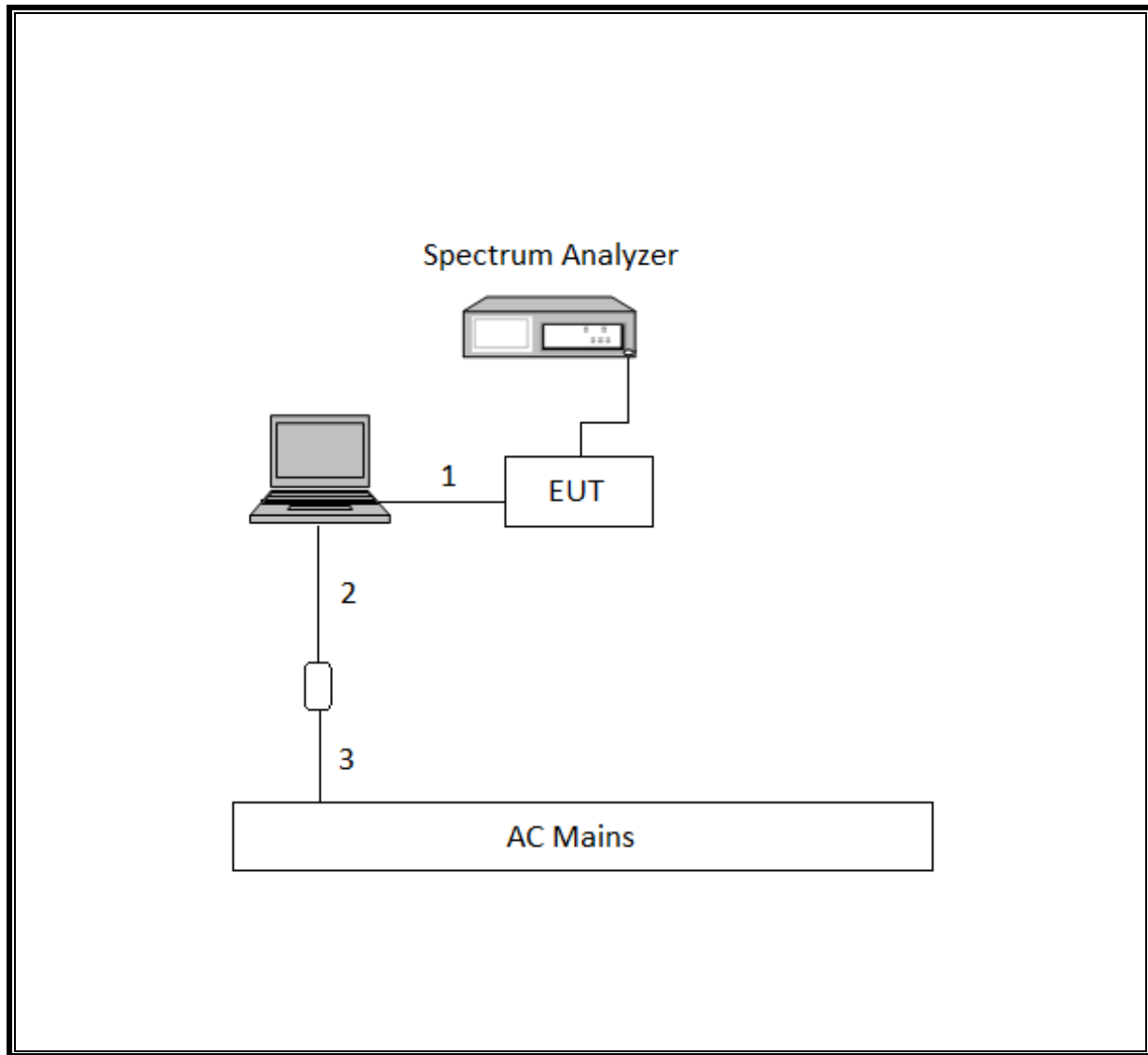
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Un-shielded	1	
2	DC	1	DC	Shielded	2	
3	AC	1	2-prong	Un-shielded	1	
4	SMA	1	SMA	Un-shielded	0.5	
5	USB	1	USB	Un-shielded	2	
6	Earphones	1	3.5mm	Un-shielded	1.6	

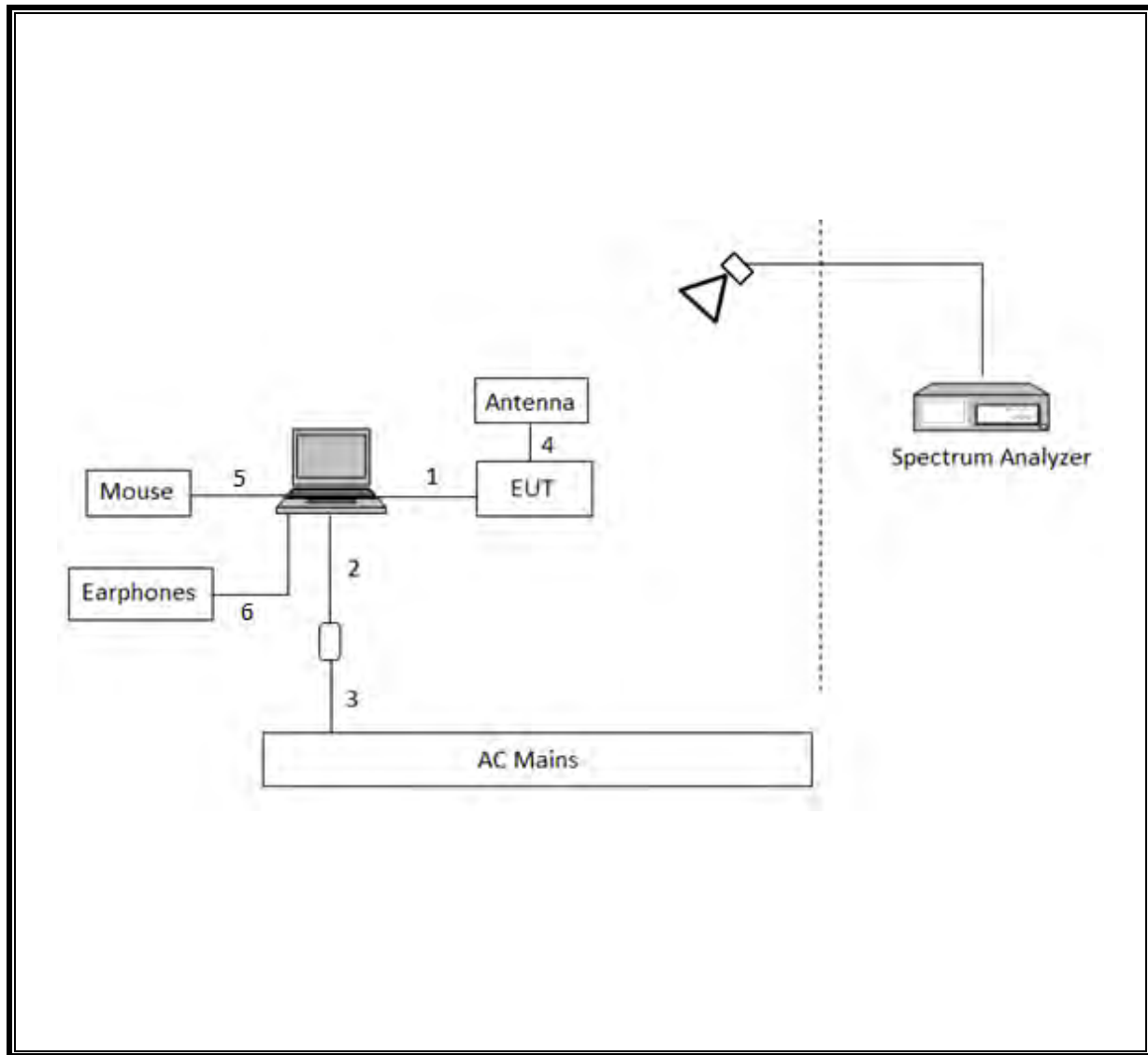
TEST SETUP

The EUT is connected to a test laptop during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS



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	ID Num	Cal Due	Last Cal
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0203383	2/18/2021	2/18/2020
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	PRE0100034	6/14/2020	6/14/2019
Antenna, Hybrid 30MHz-3GHz	Sunol Sciences Corp.	JB3	PRE0181574	10/14/2020	10/14/2019
Amplifier, 1-18GHz, 35dB	Amplicol	AMP1G18-35	T1569	1/30/2021	1/30/2020
Amplifier, 9KHz-1GHz, 32dB	Sonoma Instrument	310	PRE0186650	1/23/2021	1/23/2020
Band Reject Filter, 902-928 MHz	MICRO-TRONICS	BRC50722	T1846	9/14/2020	9/14/2019
Highpass Filter, 1.5GHz	MICRO-TRONICS	HPM50114	T1853	11/30/2020	11/30/2019
Antenna, Passive Loop 30Hz-1MHz	ELECTRO METRICS	EM-6871	PRE0179466	5/31/2020	5/31/2019
Antenna, Passive Loop 100KHz-30MHz	ELECTRO METRICS	EM-6872	PRE0179468	5/31/2020	5/31/2019
EMI RECEIVER	Rohde & Schwarz	ESR	T1436	2/20/2021	2/20/2020
L.I.S.N.	FCC INC.	FCC LISN 50/250	PRE0186446	1/21/2021	1/21/2020
Spectrum Analyzer, PXA 3Hz-44GHz	Keysight Technologies	N9030A	T908	1/23/2021	1/23/2020
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179367	2/26/2021	2/26/2020
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T344	5/26/2021	5/26/2020
Antenna, Hybrid 30MHz-3GHz	Sunol Sciences Corp.	JB3	PRE0184971	2/5/2021	2/5/2020
Amplifier, 1-18GHz	MITEQ	AFS42-00101800-25-S-42	PRE0154496	4/14/2021	4/14/2020
Amplifier, 9KHz-1GHz, 32dB	Sonoma Instrument	310	PRE0080221	1/23/2021	1/23/2020
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179375	2/24/2021	2/24/2020
Amplifier, 9KHz-1GHz, 32dB	Sonoma Instrument	310	PRE0180177	4/16/2021	4/16/2020
Antenna, Passive Loop 30Hz-1MHz	ELECTRO METRICS	EM-6871	PRE0179466	5/27/2021	5/27/2020
Antenna, Passive Loop 100KHz-30MHz	ELECTRO METRICS	EM-6872	PRE0179468	5/27/2021	5/27/2020

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Ver 9.5, April 30, 2020
Antenna Port Software	UL	UL RF	Ver 2020.1.8

7. MEASUREMENT METHODS

On Time and Duty Cycle: ANSI C63.10-2013 Section 11.6

Occupied BW (20dB): ANSI C63.10-2013 Section 6.9.2

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

Number of Hopping Frequencies: ANSI C63.10-2013 Section 7.8.3

Time of Occupancy (Dwell Time): ANSI C63.10-2013 Section 7.8.4

Peak Output Power: ANSI C63.10-2013 Section 7.8.5

Conducted Spurious Emissions: ANSI C63.10-2013 Section 7.8.8

Conducted Band-Edge: ANSI C63.10-2013 Section 6.10.4

Radiated Spurious Emissions 30-1000MHz: ANSI C63.10-2013 Section 6.3 and 6.5

Radiated Spurious Emissions above 1GHz: ANSI C63.10-2013 Section 6.3 and 6.6

Radiated Band-edge: ANSI C63.10-2013 Section 6.10.5

AC Power-line conducted emissions: ANSI C63.10-2013, Section 6.2.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

8.1.1. MODE 1 - OOK

LIMITS

None; for reporting purposes only.

ON TIME AND DUTY CYCLE RESULTS

One Period (ms)	Pulse Numbers in 100ms	Short Pulse Width (ms)	# of Short Pulses	Long Pulse Width (ms)	# of Long Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	1	0.1902	134	0.3713	70	0.514778	-5.7676

DUTY CYCLE PLOTS



8.1.2. MODE 2 - FSK

LIMITS

None; for reporting purposes only.

ON TIME AND DUTY CYCLE RESULTS

One Period (ms)	Pulse Numbers in 100ms	Pulse Width (ms)	# of Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	1	40.8	1	0.408	-7.7868

DUTY CYCLE PLOTS



8.2. 20 dB AND 99% BANDWIDTH

LIMITS

FCC §15.247 (a) (1)(i)

RSS-247 (5.1) (c)

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

TEST PROCEDURE

MODE 1 – OOK

The transmitter output is connected to the spectrum analyzer. The RBW is set to 10kHz. The VBW is set to 3 times the RBW. The sweep time is coupled.

Note: Because the measured signal is CW or CW-like, adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

MODE 2 – FSK

The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.

RESULTS

8.2.1. 99% OCCUPIED BANDWIDTH

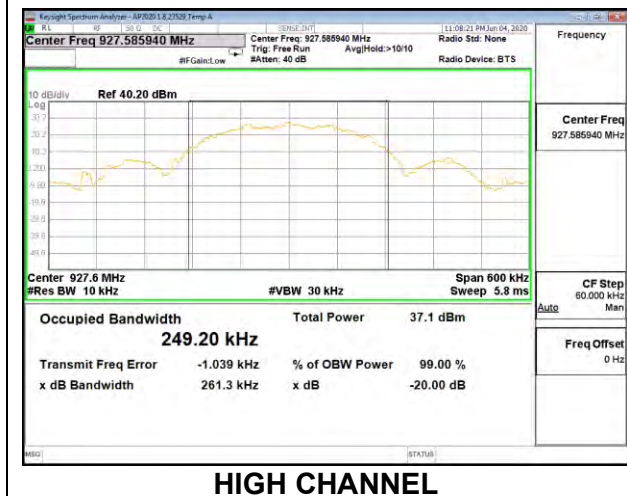
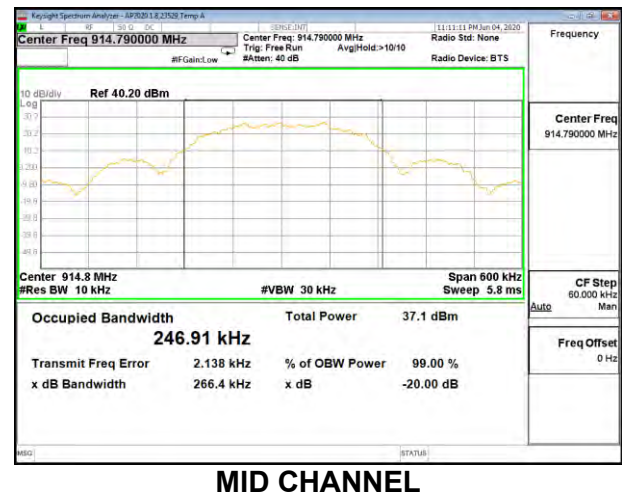
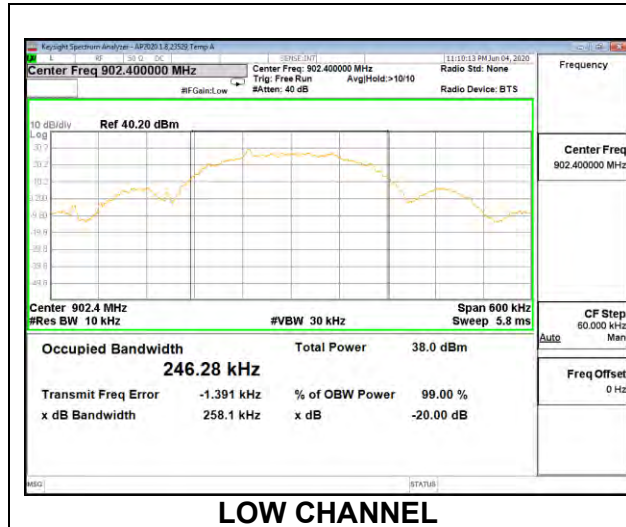
8.2.1.1. MODE 1 - OOK

Channel	Frequency (MHz)	99% Bandwidth (kHz)
Low	902.75	49.82
Mid	914.76	52.46
High	927.27	57.12



8.2.1.1. MODE 2 - FSK

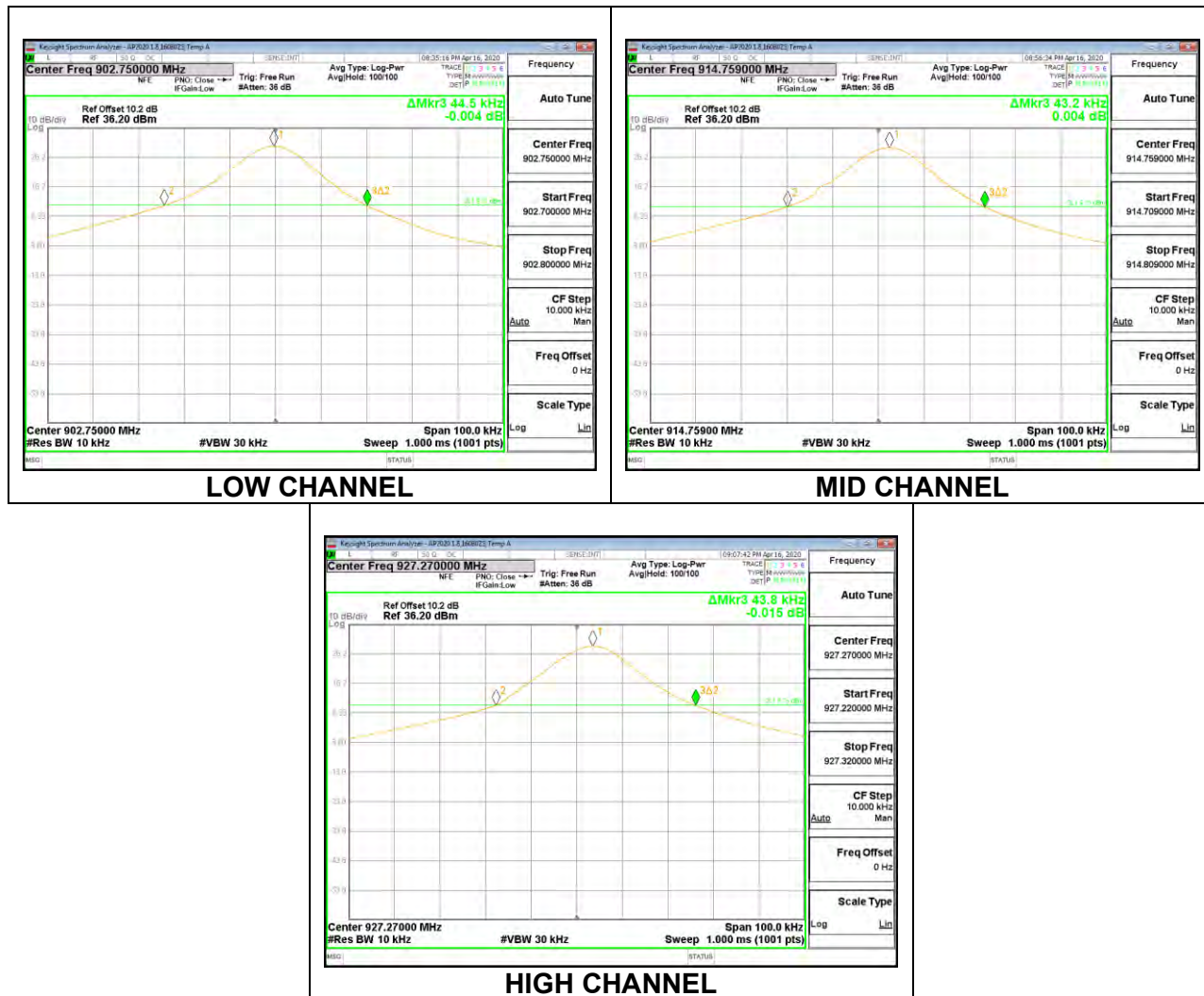
Channel	Frequency (MHz)	99% Bandwidth (kHz)
Low	902.4	246.28
Mid	914.8	246.91
High	927.6	249.20



8.2.2. 20dB BANDWIDTH

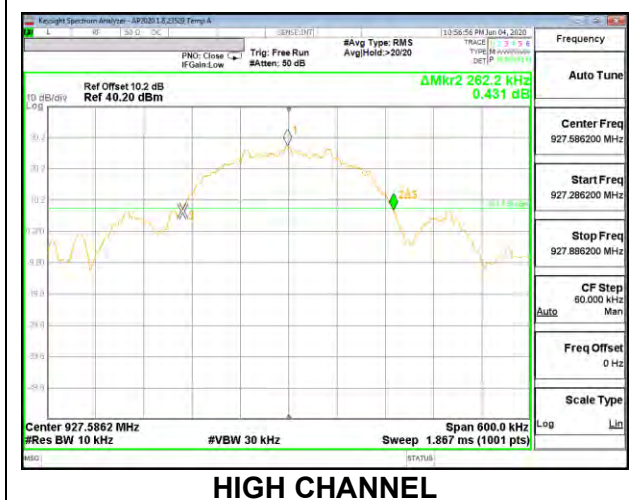
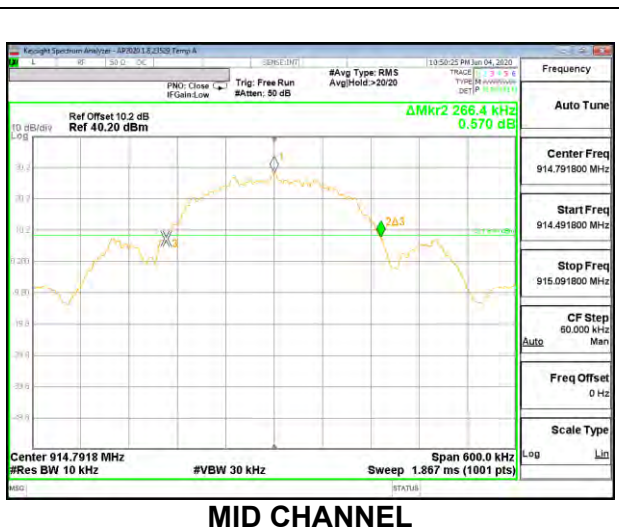
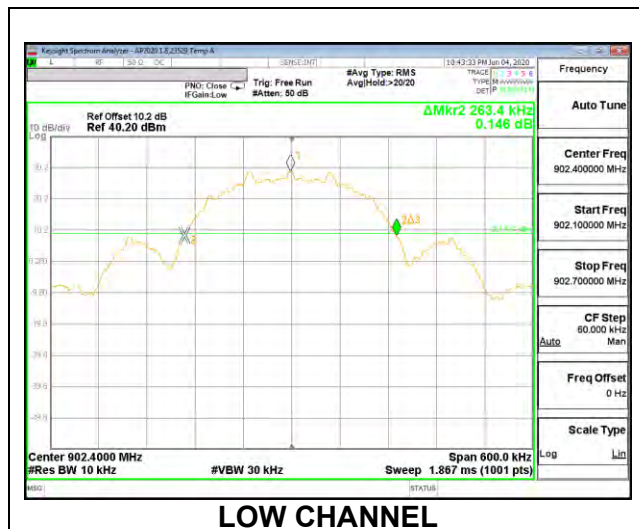
8.2.2.1. MODE 1 - OOK

Channel	Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)
Low	902.75	44.5	500
Mid	914.76	43.2	500
High	927.27	43.8	500



8.2.2.1. MODE 2 - FSK

Channel	Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)
Low	902.4	263.4	500
Mid	914.8	266.4	500
High	927.6	262.2	500



8.3. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

RSS-247 (5.1) (c)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

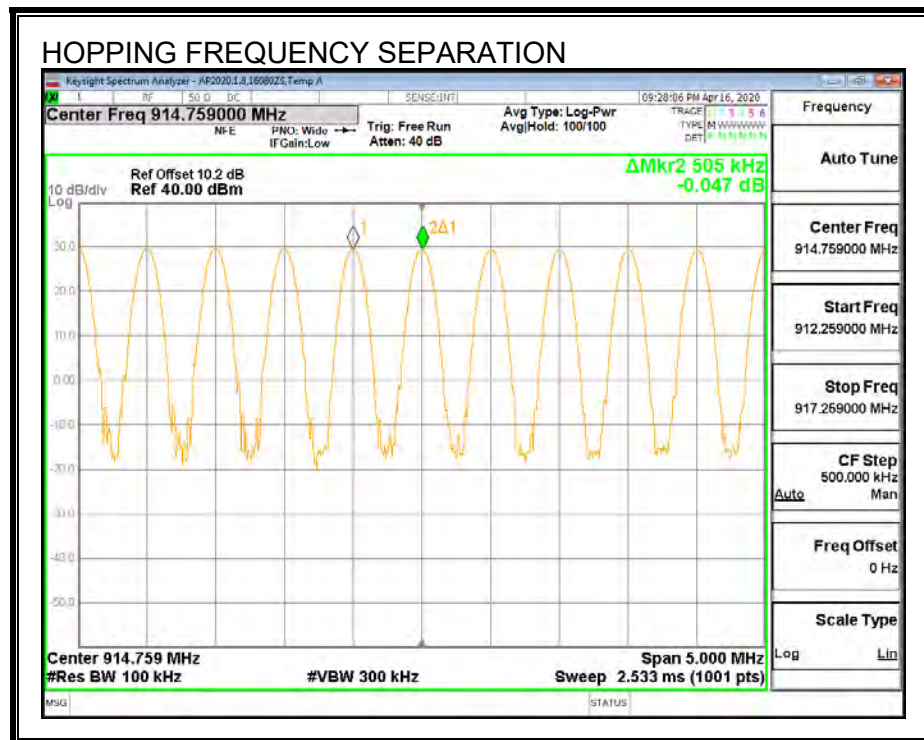
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

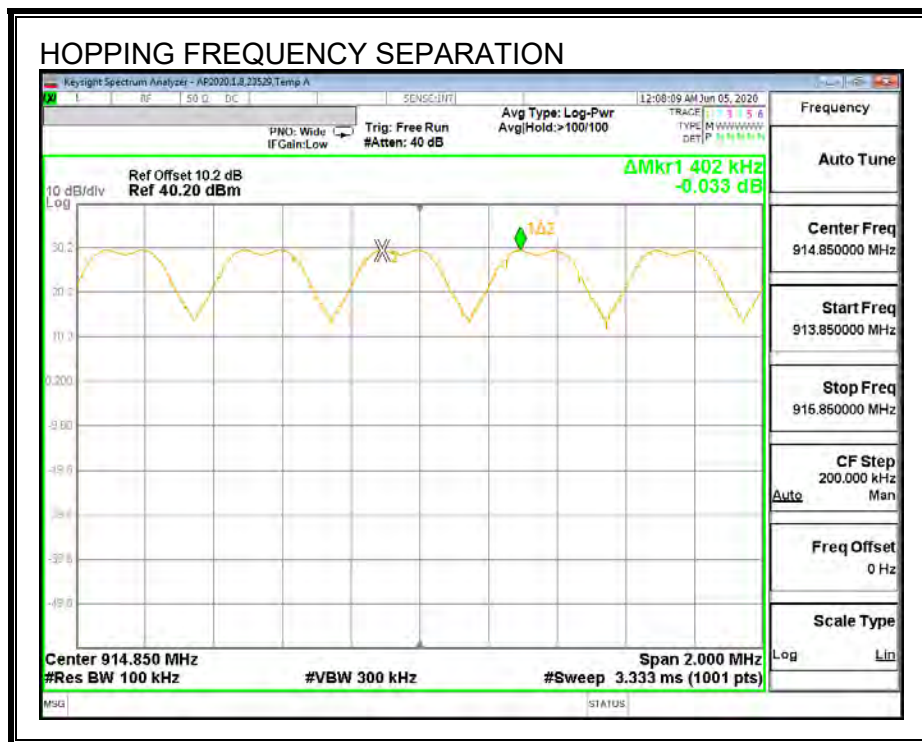
RESULTS

HOPPING FREQUENCY SEPARATION

MODE 1 – OOK



MODE 2 – FSK



8.4. NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (i)

RSS-247 (5.1) (c)

MODE 1 – OOK

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

MODE 2 – FSK

If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

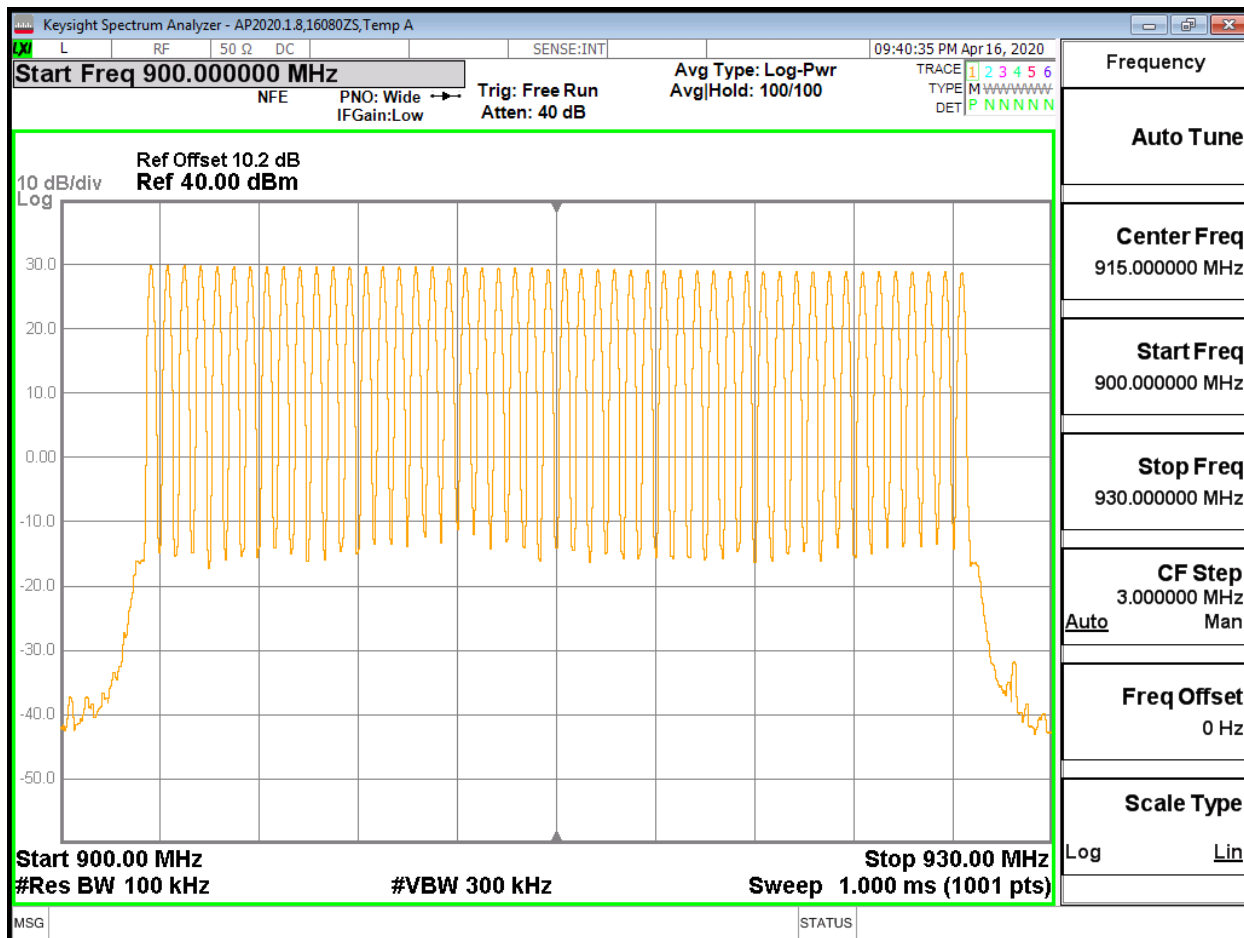
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

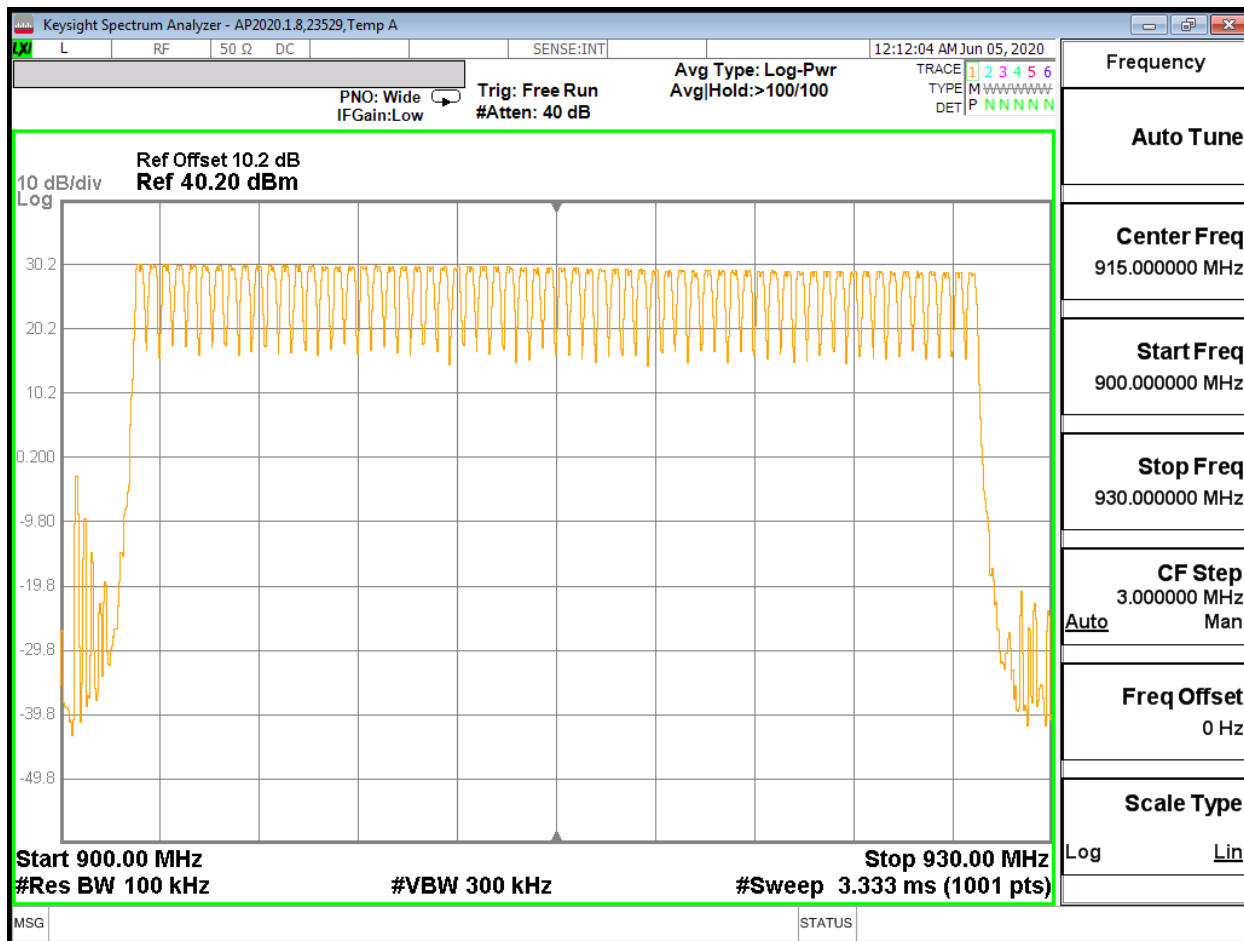
MODE 1 - OOK

Normal Mode: 50 Channels observed.



MODE 2 - FSK

Normal Mode: 64 Channels observed.



8.5. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (i)

RSS-247 (5.1) (c)

MODE 1 - OOK

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

MODE 2 - FSK

If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

TEST PROCEDURE

MODE 1 – OOK

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 20 second scan, to enable resolution of each occurrence.

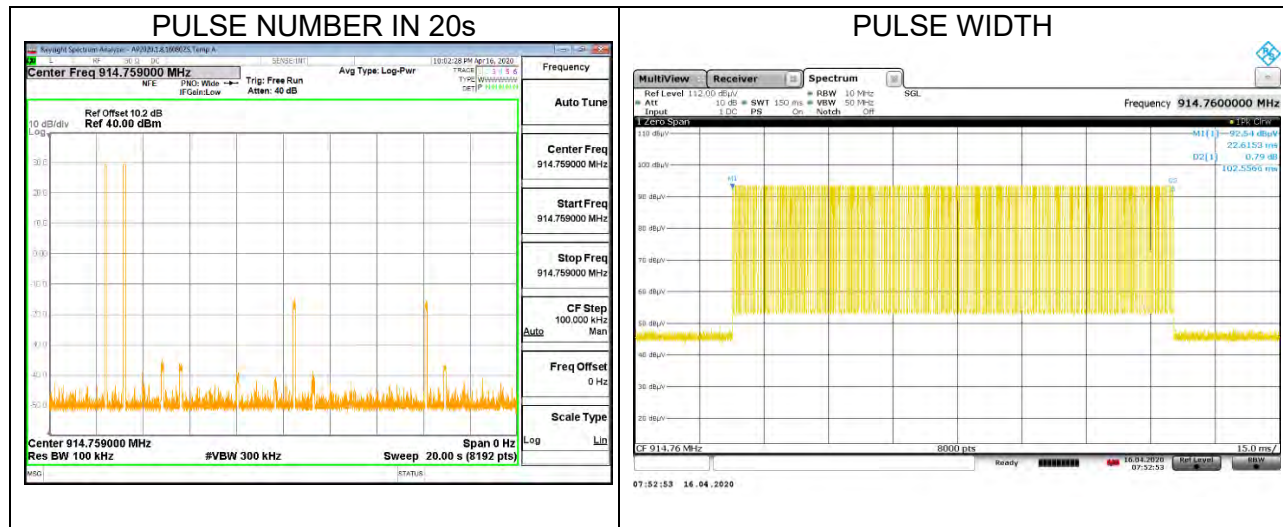
MODE 2 – FSK

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 10 second scan, to enable resolution of each occurrence.

RESULTS

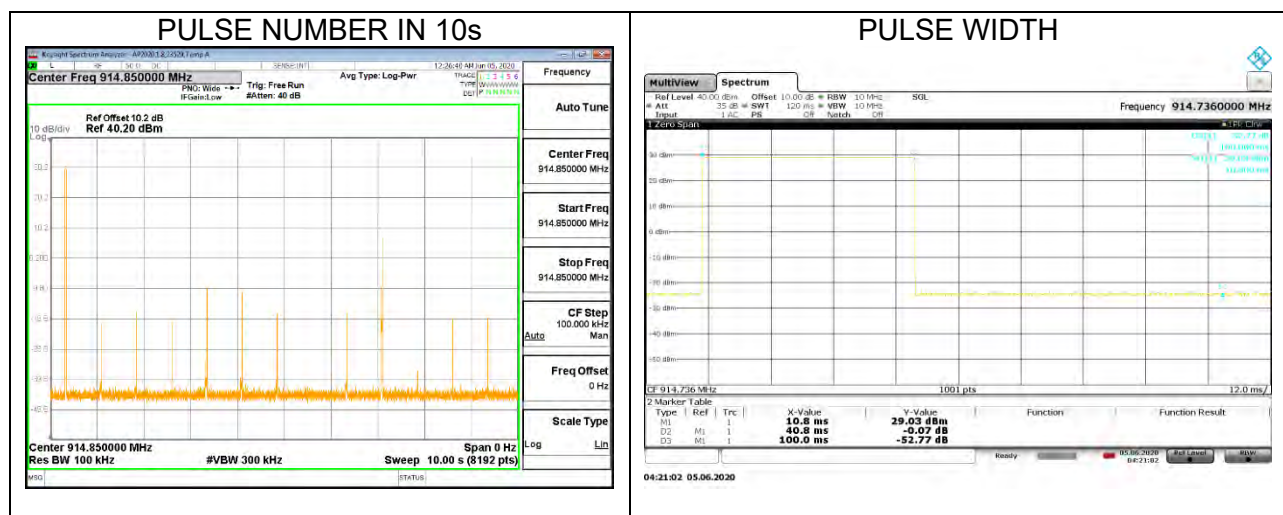
MODE 1 – OOK

DH Packet	Pulse Width (msec)	Number of Pulses in 20 seconds	Average Time of Occupancy in 20 seconds (sec)	Limit (sec)	Margin (sec)
Normal	52.79388143	2	0.1056	0.4	-0.2944



MODE 2 - FSK

DH Packet	Pulse Width (msec)	Number of Pulses in 10 seconds	Average Time of Occupancy in 10 seconds (sec)	Limit (sec)	Margin (sec)
Normal	40.8	1	0.0408	0.4	-0.3592



8.6. OUTPUT POWER

LIMITS

§15.247 (b) (2)

RSS-247 (5.4) (a)

(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels as permitted under paragraph (a)(1)(i) of this section.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 1 MHz, and the VBW is set to 3 MHz. The detector is peak and max hold.

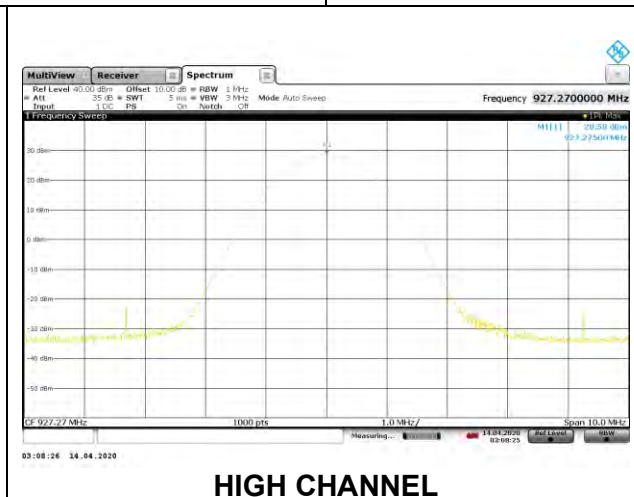
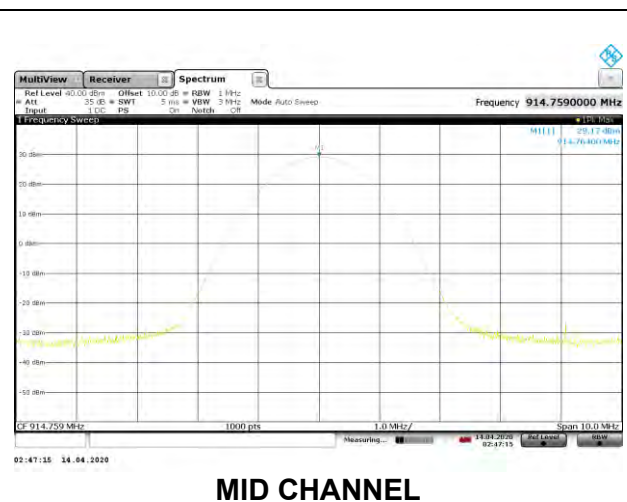
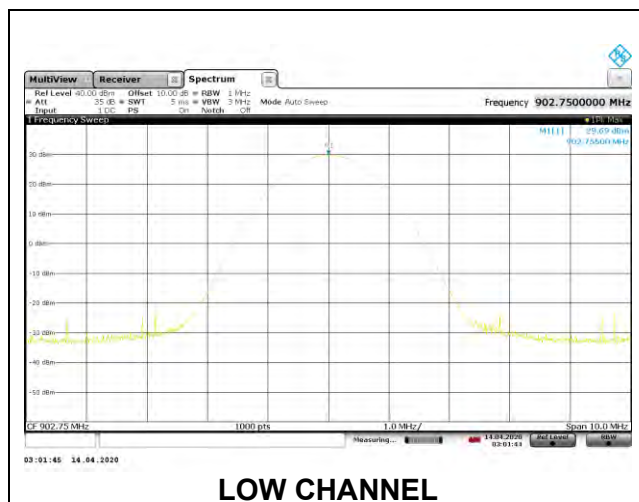
The cable assembly insertion loss of 10 dB was entered as an offset in the spectrum analyzer to allow for a peak reading of power.

RESULTS

MODE 1 - OOK

Tested By:	19480
Date:	4/13/2020

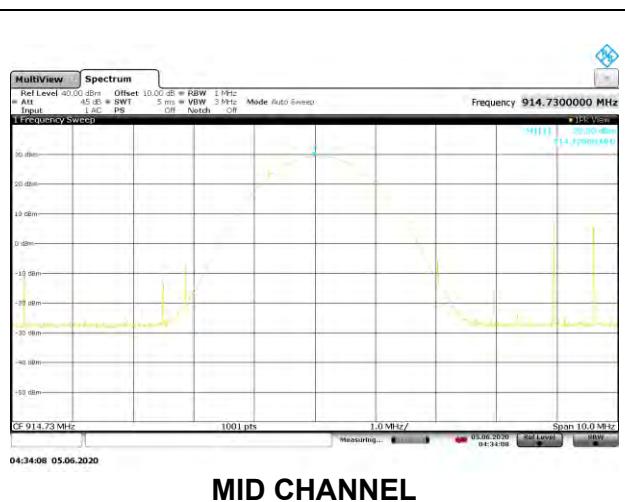
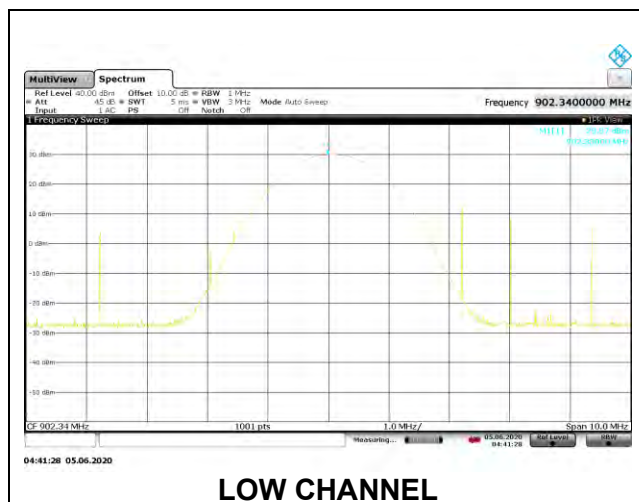
Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	902.75	29.69	30	-0.31
Middle	914.76	29.17	30	-0.83
High	927.27	28.58	30	-1.42



MODE 2 – FSK

Tested By:	23529
Date:	6/5/2020

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	902.4	29.87	30	-0.13
Middle	914.8	29.3	30	-0.7
High	927.6	28.73	30	-1.27



8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 5.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

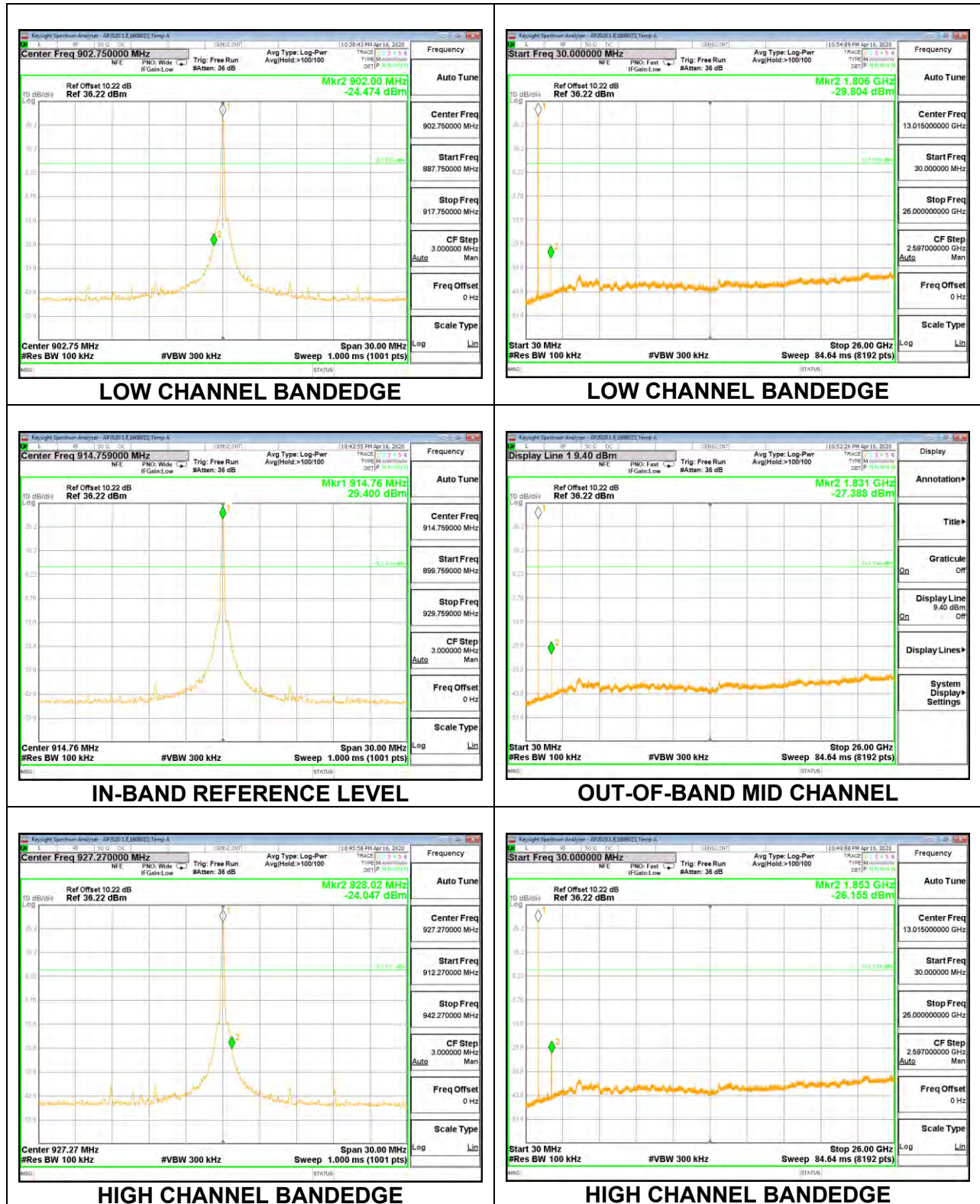
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 902MHz and 928MHz are investigated with the transmitter set to the normal hopping mode.

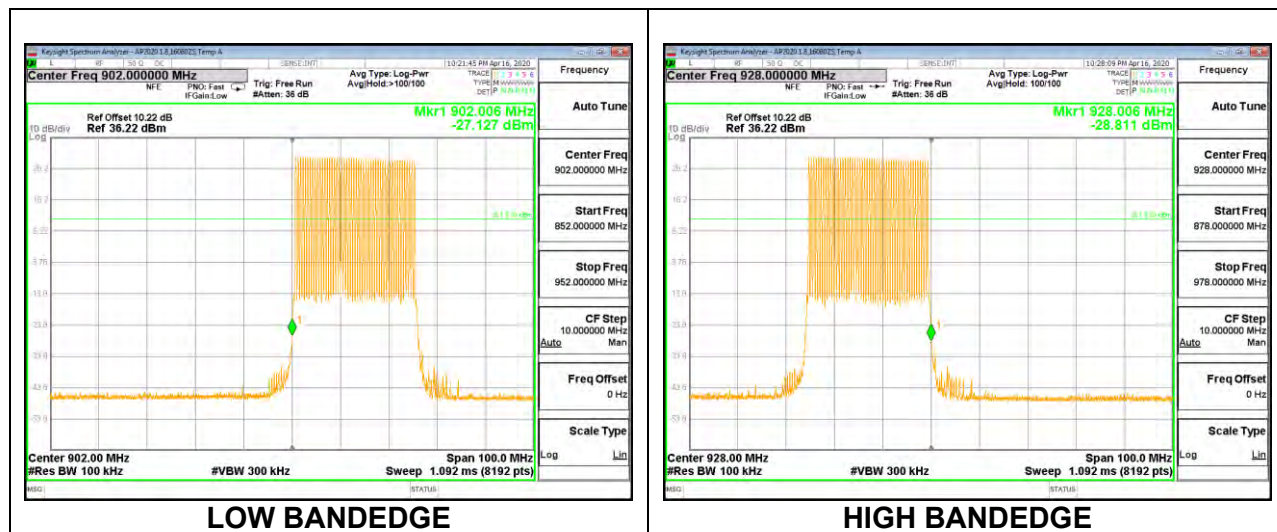
RESULTS

MODE 1 - OOK

SPURIOUS EMISSIONS, NON-HOPPING

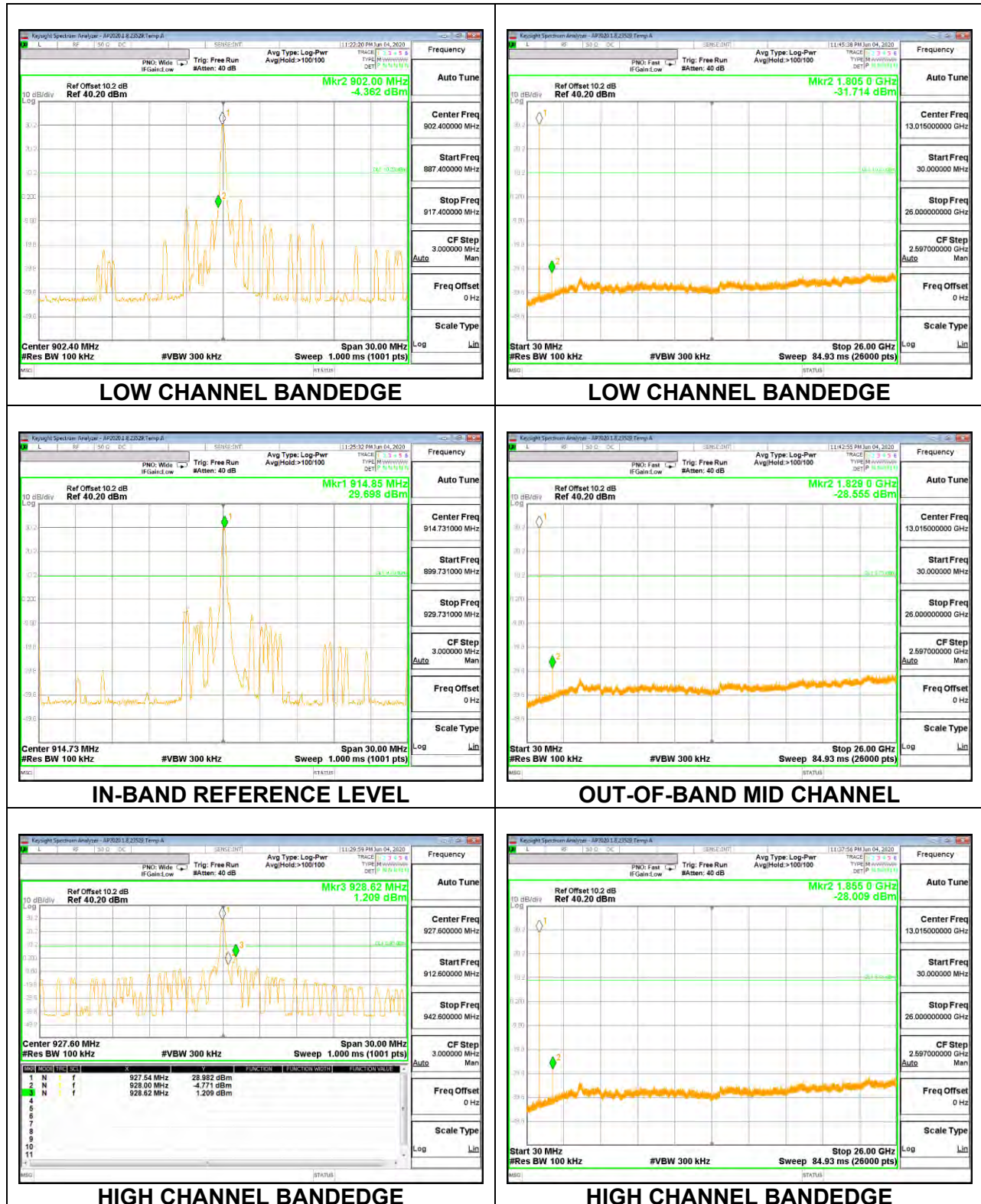


SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

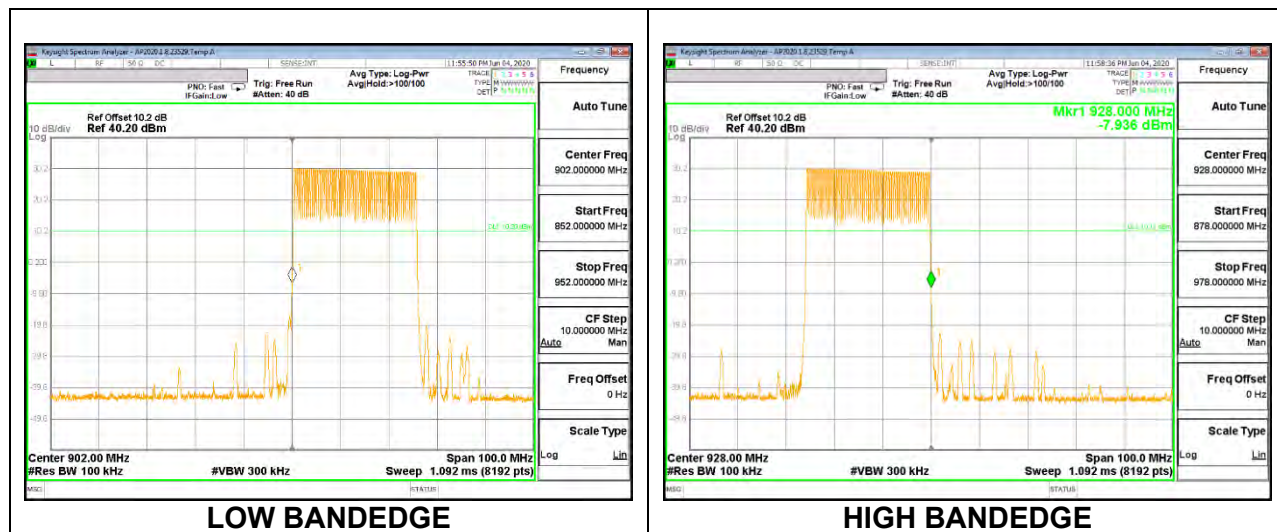


MODE 2 – FSK

SPURIOUS EMISSIONS, NON-HOPPING



SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



9. RADIATED TEST RESULTS

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.

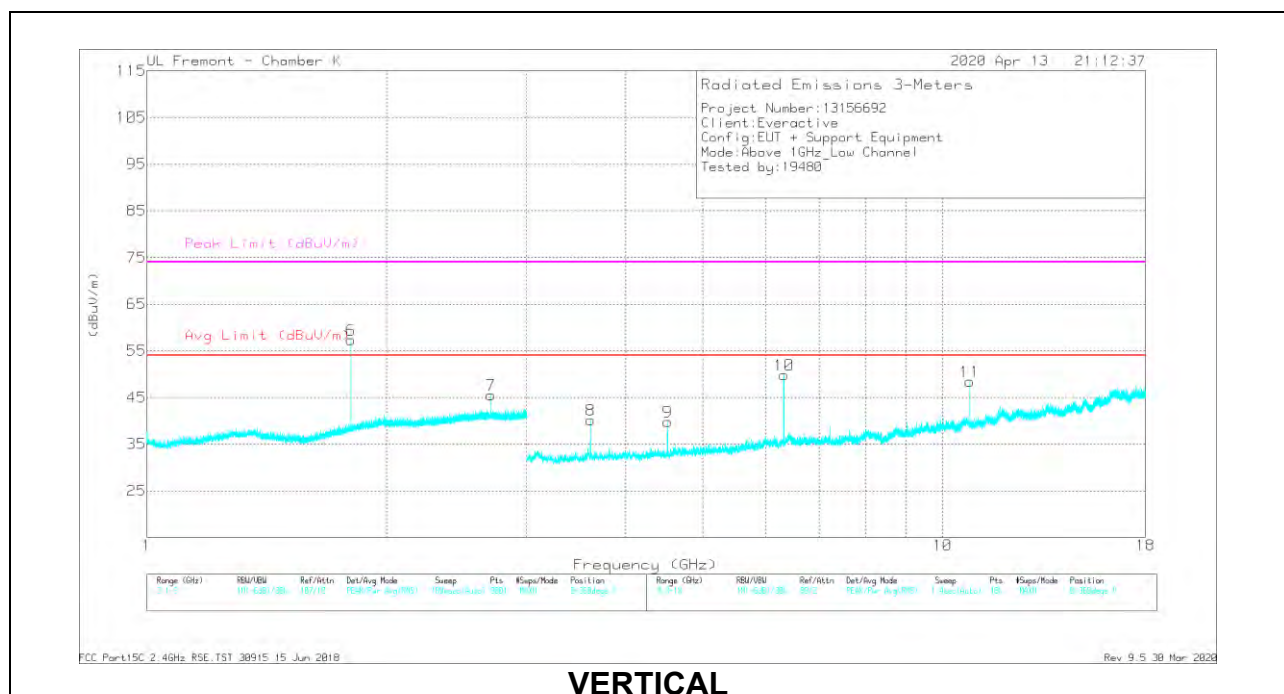
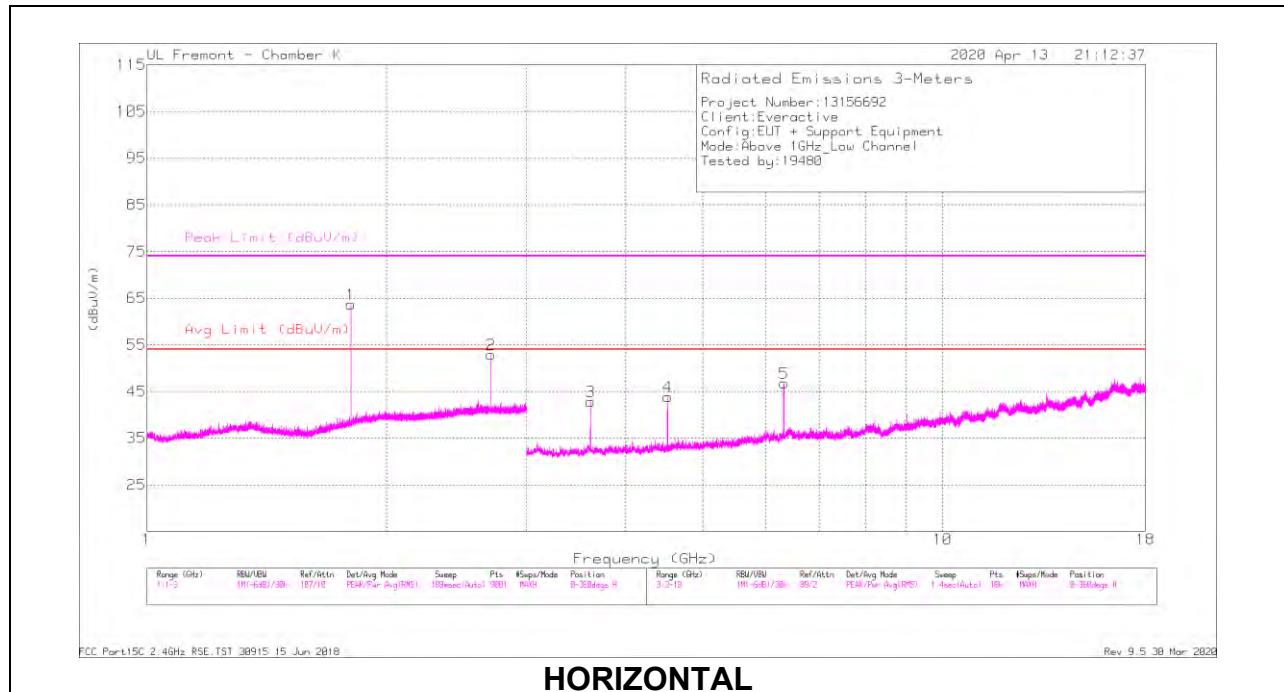
9.1. TRANSMITTER ABOVE 1 GHz

9.1.1. CONFIGURATION 1: PANEL ANTENNA

9.1.1.1. MODE 1 - OOK

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.80549	61.77	PK2	30.3	-24.8	1	68.27	-	-	-	-	72	239	H
2	* 2.70825	49.19	PK2	32.7	-24.4	1	58.49	-	-	74	-15.51	305	179	H
			Avg				52.72	54	-1.28					
6	1.8055	54.5	PK2	30.3	-24.8	1	61	-	-	-	-	357	388	V
7	* 2.70824	47.4	PK2	32.7	-24.4	1	56.7	-	-	74	-17.3	343	344	V
			Avg				50.93	54	-3.07					
3	* 3.61099	45.55	PK2	33.3	-31.3	1	48.55	-	-	74	-25.45	115	123	H
			Avg				42.78	54	-11.22					
4	* 4.51342	39.72	Pk	33.7	-29.6	1	44.82	-	-	74	-29.18	0-360	200	H
5	6.31935	37.82	Pk	35.7	-26.7	1	47.82	-	-	-	-	0-360	100	H
8	* 3.61087	38.2	Pk	33.3	-31.3	1	41.2	-	-	74	-32.8	0-360	200	V
9	* 4.51342	35.74	Pk	33.7	-29.6	1	40.84	-	-	74	-33.16	0-360	100	V
10	6.31935	40.82	Pk	35.7	-26.7	1	50.82	-	-	-	-	0-360	100	V
11	* 10.83296	34.15	PK2	38	-21.2	1	51.95	-	-	74	-22.05	219	98	V
			Avg				46.18	54	-7.82					

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

Pk - Peak detector

Avg – Average detector

* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -5.77dB

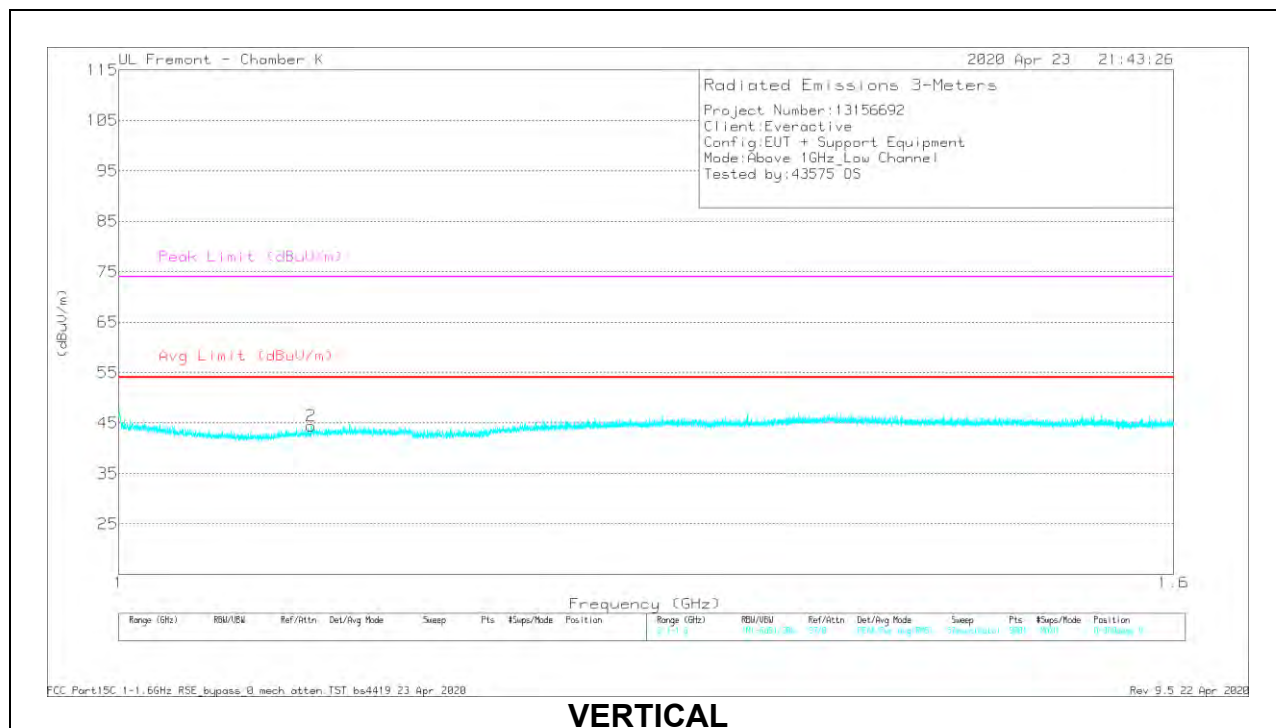
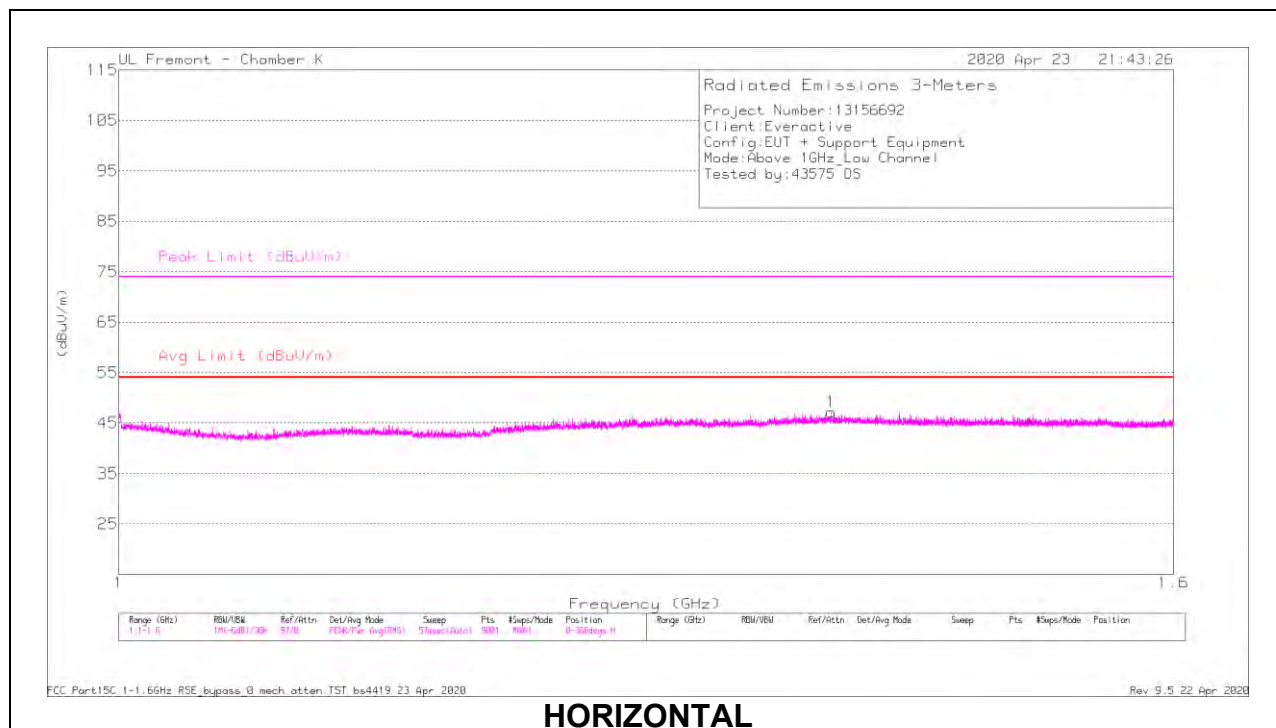
Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1 for duty cycle factor calculation (-5.77dB)

Note: Frequency Range 1G – 1.6GHz were investigated since High Pass Filter 1.5 GHz was used for above 1 GHz testing. Refer to the following test result below.

1 GHz to 1.6 GHz without 1.5 GHz HPF and without amplifier

Note: Frequency Range 1 GHz – 1.6 GHz was investigated since High Pass Filter 1.5 GHz was used for Above 1 GHz testing. Refer to the following test result below.



Radiated Emissions

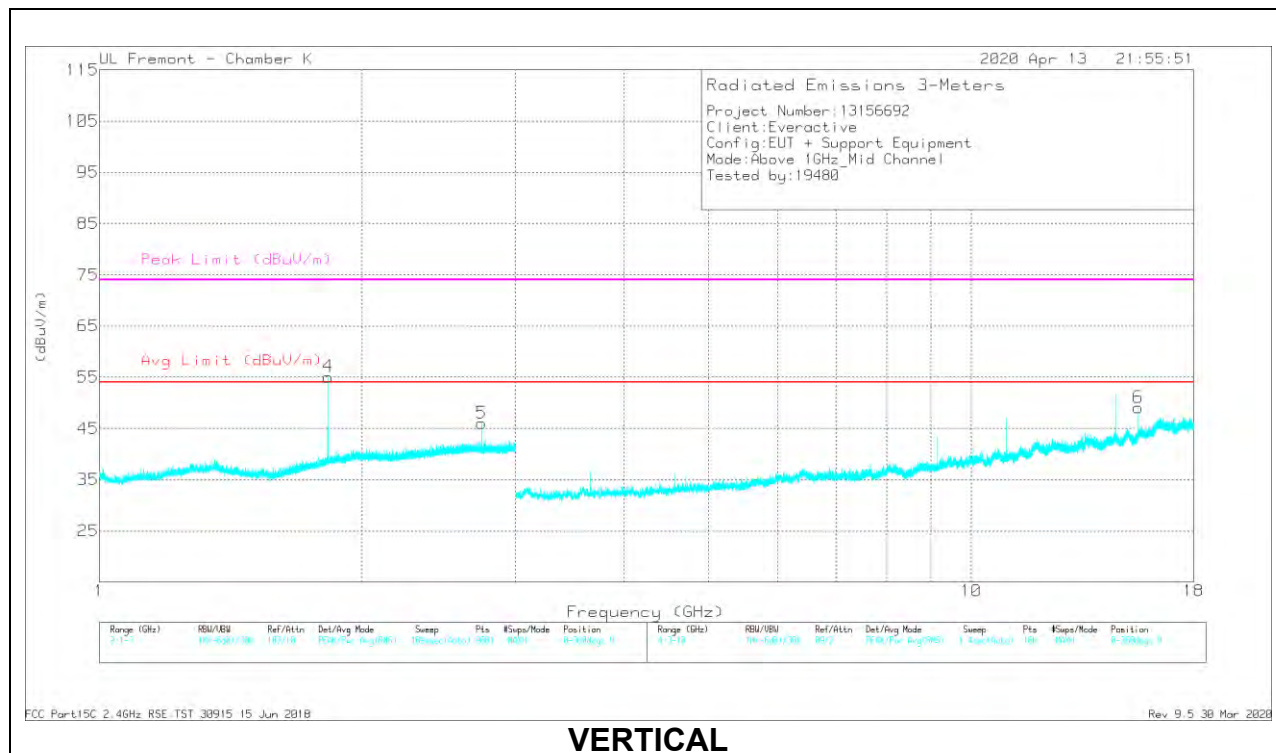
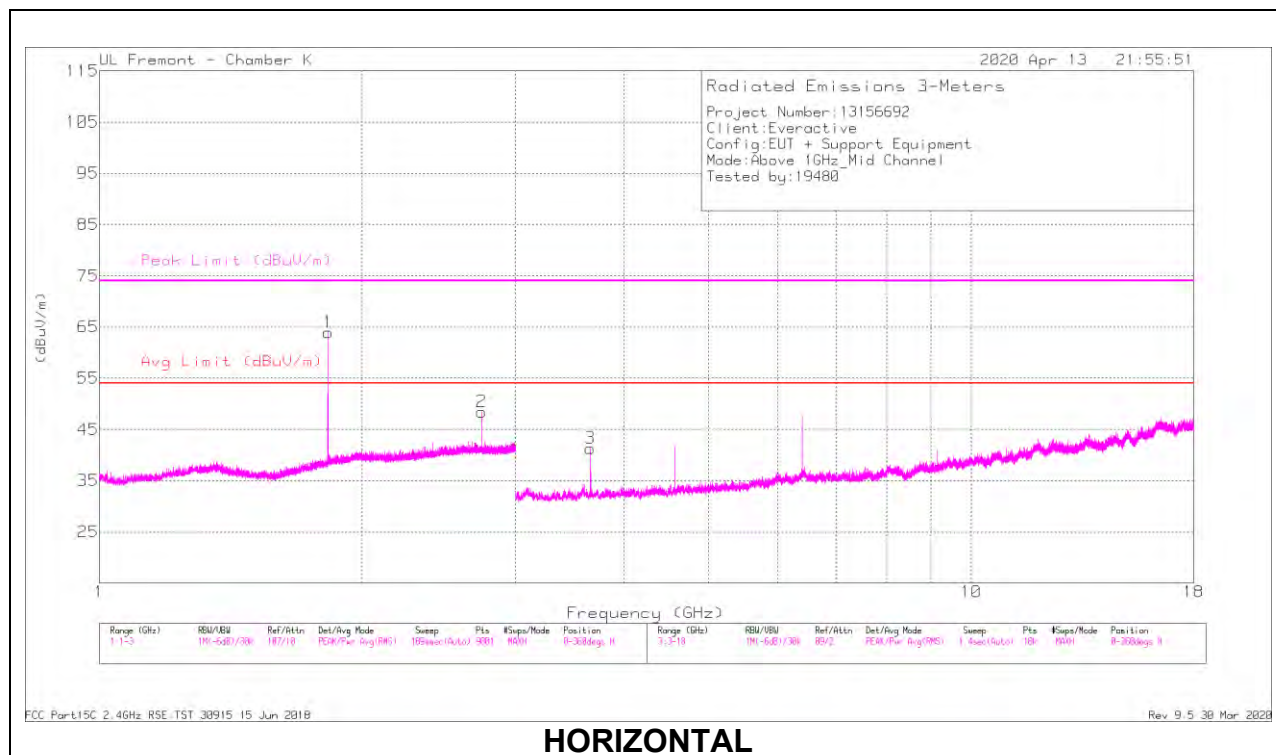
Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Bypass (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.37533	16.9	PK2	29.3	5.9	52.1	-	-	74	-21.9	82	350	H
	* 1.37208	5.85	MAv1	29.5	5.9	41.25	54	-12.75	-	-	82	350	H
2	* 1.08791	17.04	PK2	27.4	5.2	49.64	-	-	74	-24.36	114	392	V
	* 1.09157	6.05	MAv1	27.5	5.2	38.75	54	-15.25	-	-	114	392	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



Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.82952	61.1	PK2	30.5	-24.8	1	67.8	-	-	-	-	77	323	H
2	* 2.74427	45.33	PK2	32.5	-24.3	1	54.53	-	-	74	-19.47	309	197	H
			Avg				48.76	54	-5.24					
4	1.82957	45.68	PK2	30.5	-24.8	1	52.38	-	-	-	-	78	182	V
5	* 2.74423	44.1	PK2	32.5	-24.3	1	53.3	-	-	74	-20.7	171	323	V
			Avg				47.53	54	-6.47					
3	* 3.65904	43.68	PK2	32.9	-31.1	1	46.48	-	-	74	-27.52	114	102	H
			Avg				40.71	54	-13.29					
6	* 15.55101	35.03	PK2	40.1	-17.7	1	58.43	-	-	74	-15.57	202	108	V
			Avg				52.66	54	-1.34					

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

PK - Peak detector

Avg – Average detector

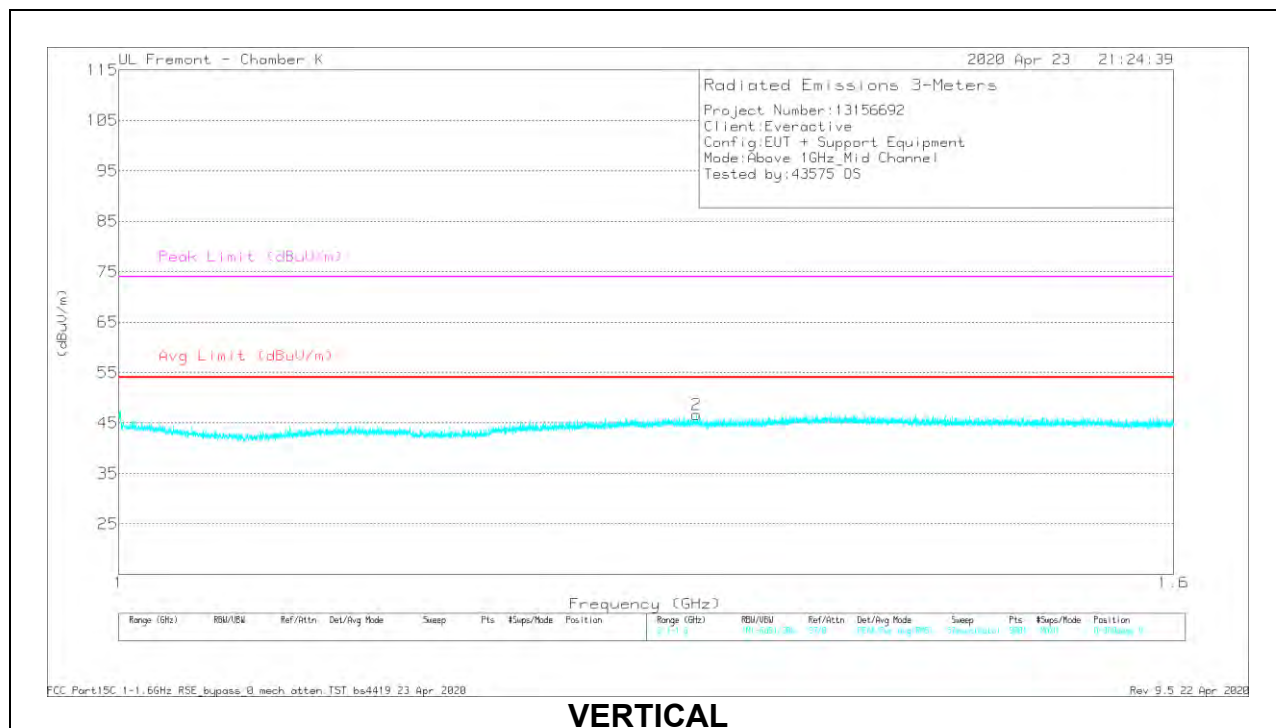
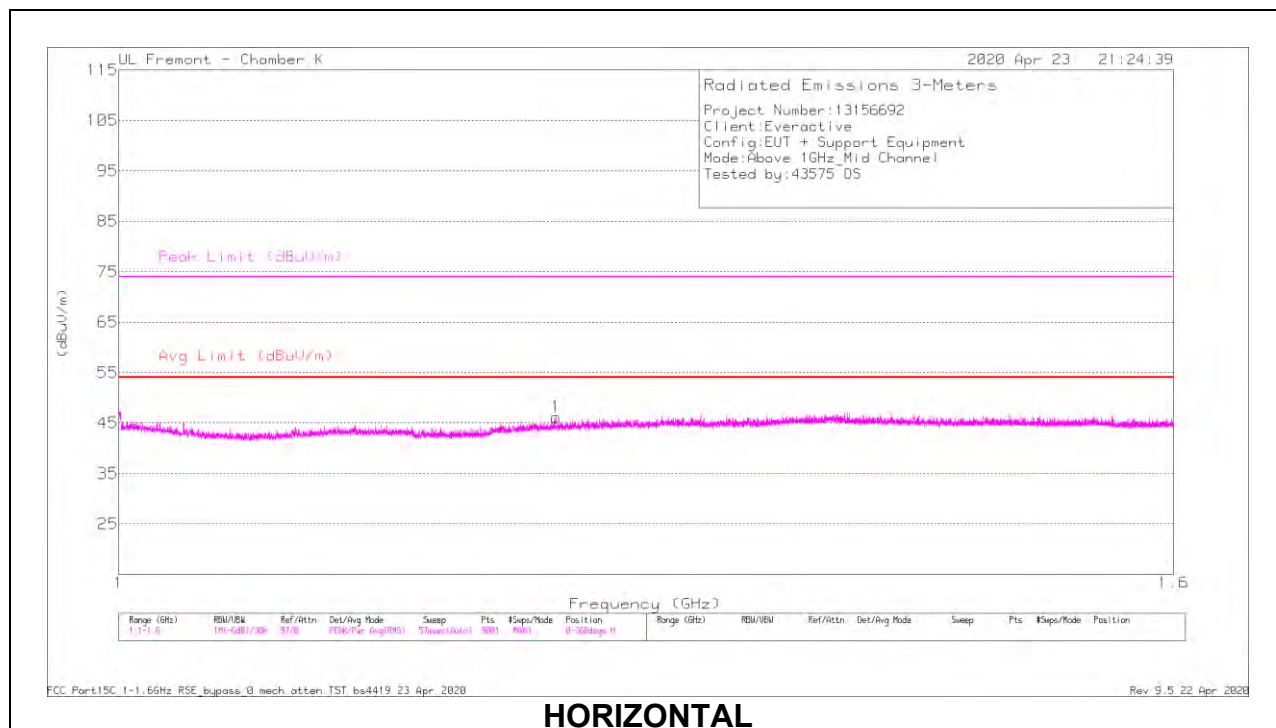
* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -5.77dB

Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1 for duty cycle factor calculation (-5.77dB)

1 GHz to 1.6 GHz without 1.5 GHz HPF and without amplifier

Note: Frequency Range 1 GHz – 1.6 GHz was investigated since High Pass Filter 1.5 GHz was used for Above 1 GHz testing. Refer to the following test result below.



Radiated Emissions

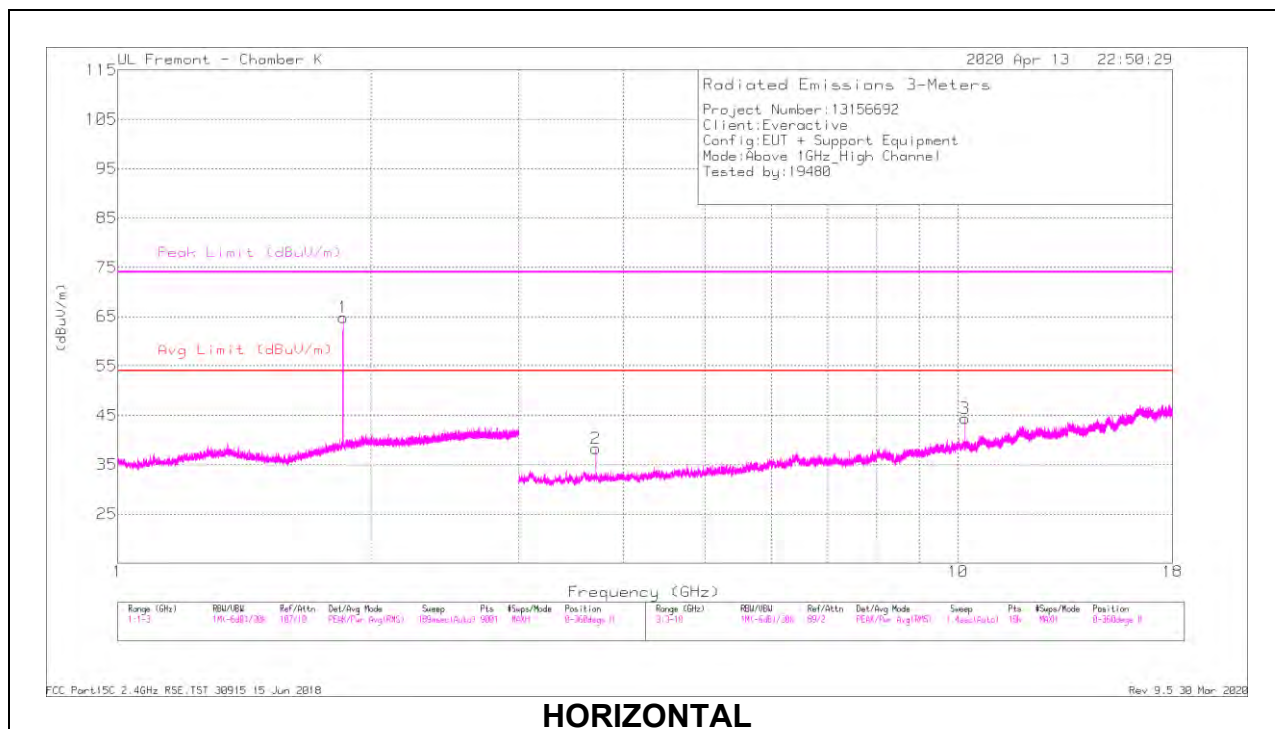
Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Bypass (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.21547	16.84	PK2	28.7	5.5	51.04	-	-	74	-22.96	230	363	H
	* 1.21616	5.28	MAv1	28.7	5.5	39.48	54	-14.52	-	-	230	363	H
2	* 1.29454	16.41	PK2	29.3	5.7	51.41	-	-	74	-22.59	18	263	V
	* 1.29374	6.31	MAv1	29.3	5.7	41.31	54	-12.69	-	-	18	263	V

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

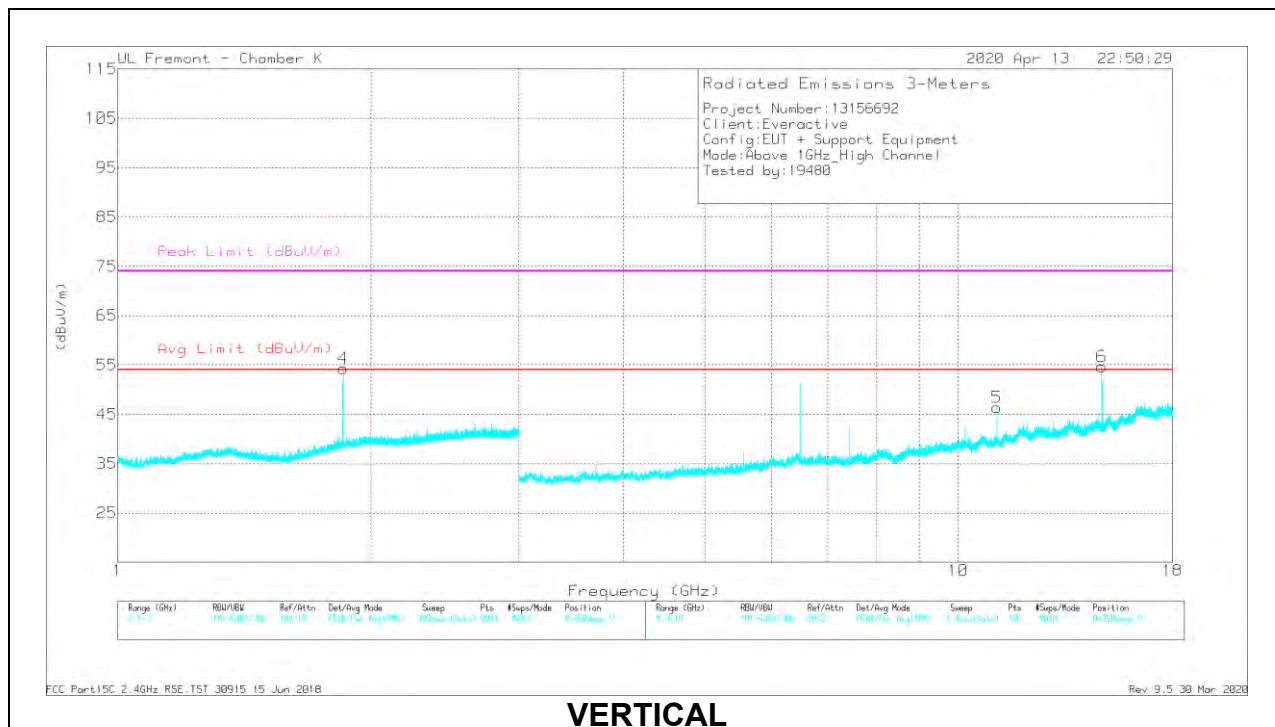
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.85455	61.36	PK2	30.9	-24.8	1	68.46	-	-	-	-	67	224	H
4	1.85452	49.77	PK2	30.9	-24.8	1	56.87	-	-	-	-	73	96	V
2	* 3.70908	39.19	PK2	33.1	-30.8	1	42.49	-	-	74	-31.51	110	103	H
			Avg				36.72	54	-17.28					
3	10.19997	34.71	PK2	37.2	-22.1	1	50.81	-	-	-	-	195	107	H
5	* 11.1272	33.93	PK2	38	-20.3	1	52.63	-	-	74	-21.37	274	153	V
			Avg				46.86	54	-7.14					
6	14.83627	34.22	PK2	39.9	-17.9	1	57.22	-	-	-	-	220	364	V

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

Pk - Peak detector

Avg – Average detector

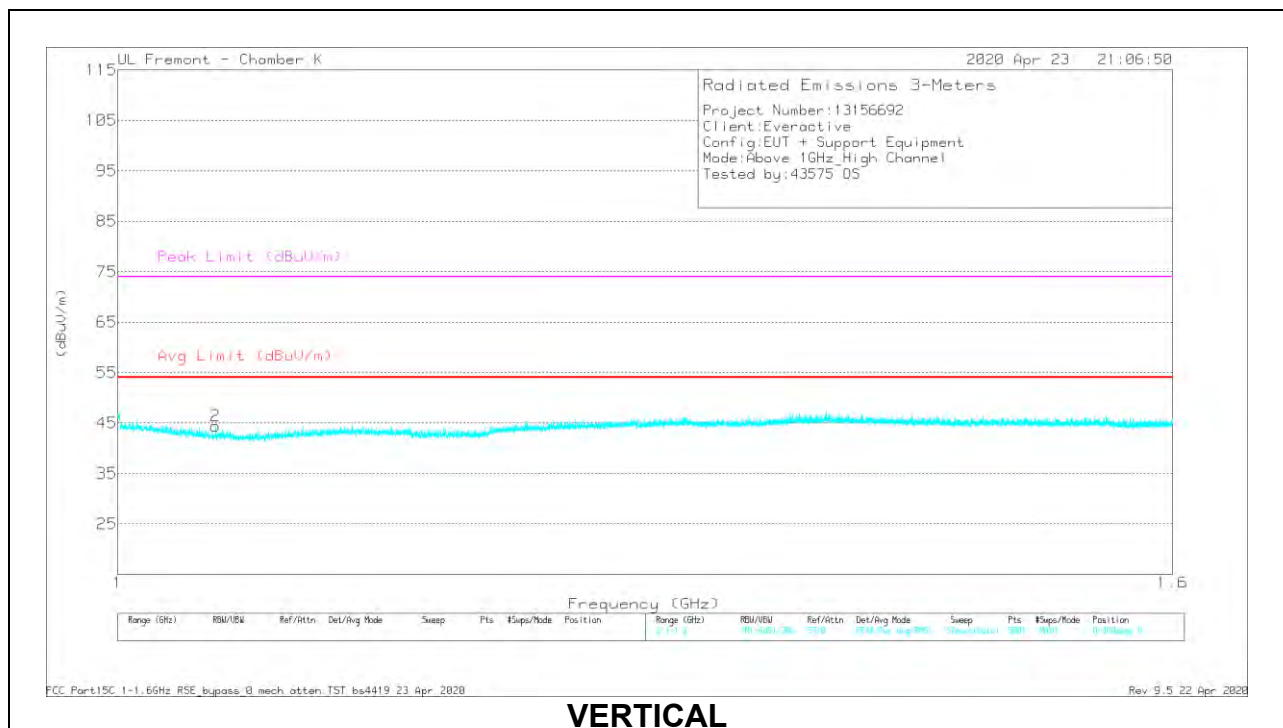
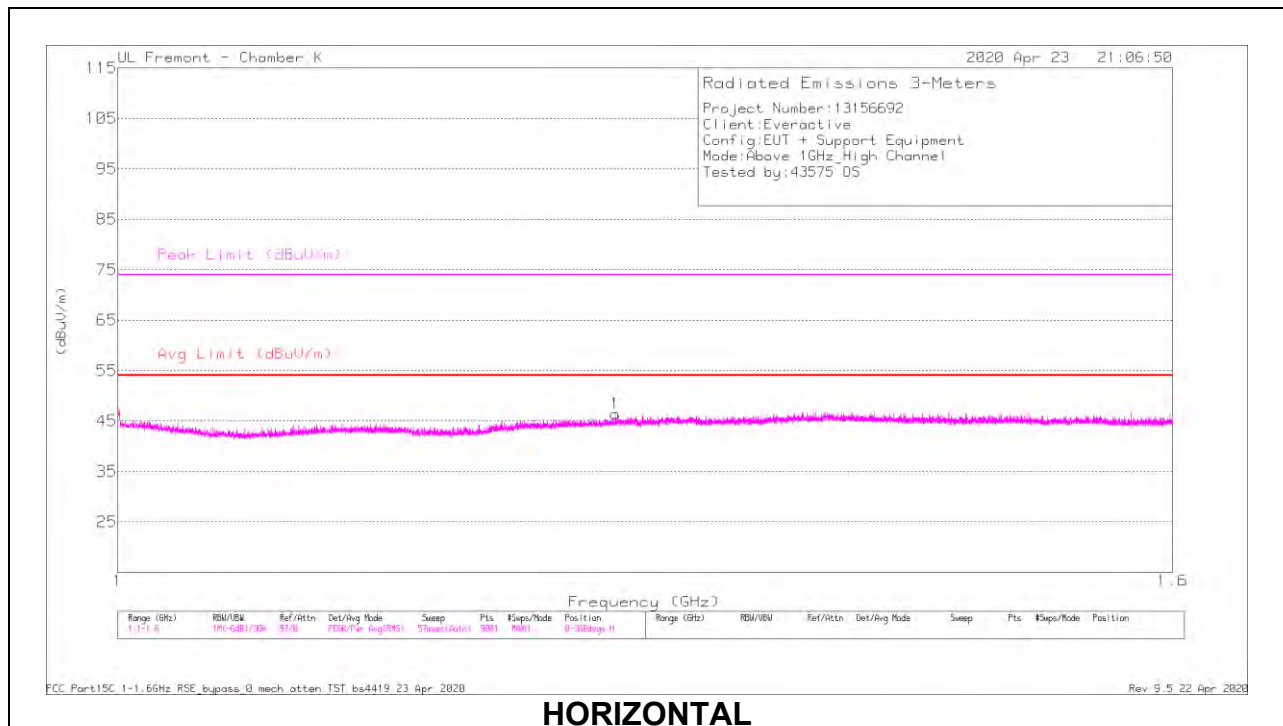
* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -5.77dB

Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1 for duty cycle factor calculation (-5.77dB)

1 GHz to 1.6 GHz without 1.5 GHz HPF and without amplifier

Note: Frequency Range 1 GHz – 1.6 GHz was investigated since High Pass Filter 1.5 GHz was used for Above 1 GHz testing. Refer to the following test result below.



Radiated Emissions

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Bypass (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.24764	17.12	PK2	28.7	5.6	51.42	-	-	74	-22.58	165	352	H
	* 1.24713	6.04	MAv1	28.7	5.6	40.34	54	-13.66	-	-	165	352	H
2	* 1.04537	17.46	PK2	26.9	5.1	49.46	-	-	74	-24.54	299	147	V
	* 1.04267	6.24	MAv1	26.9	5.1	38.24	54	-15.76	-	-	299	147	V

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

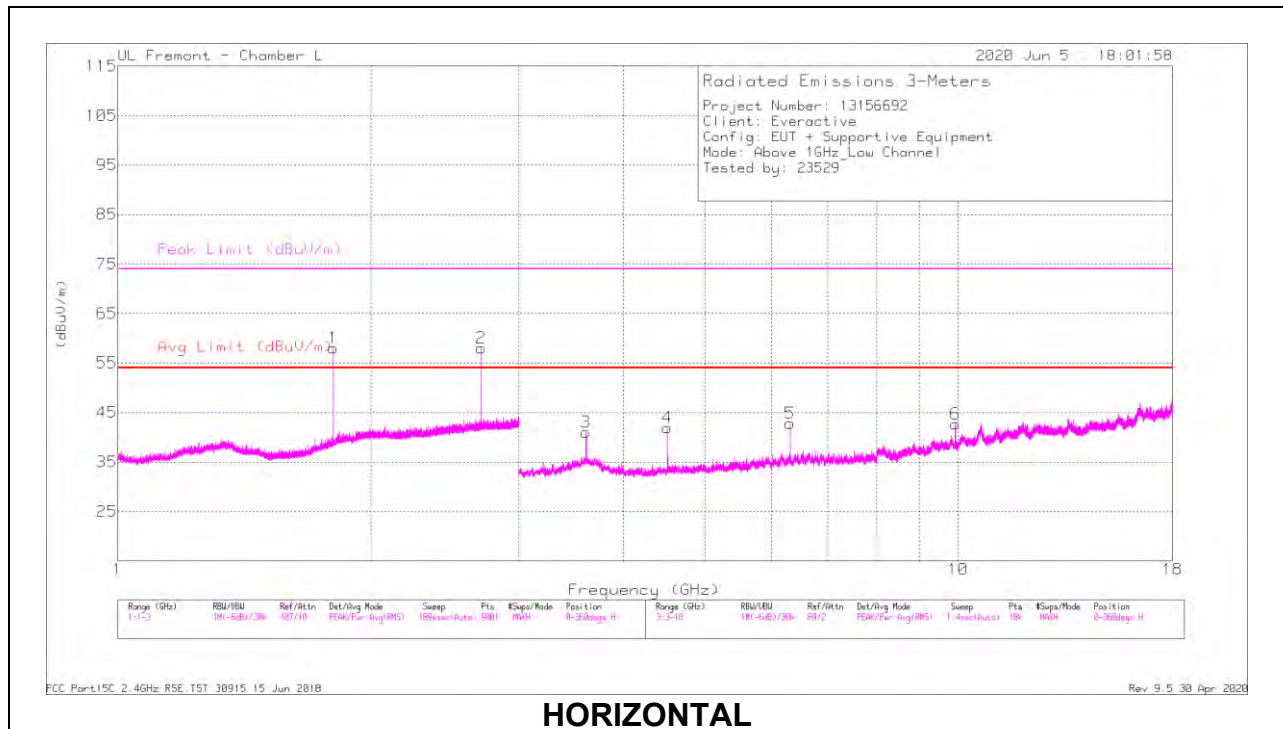
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

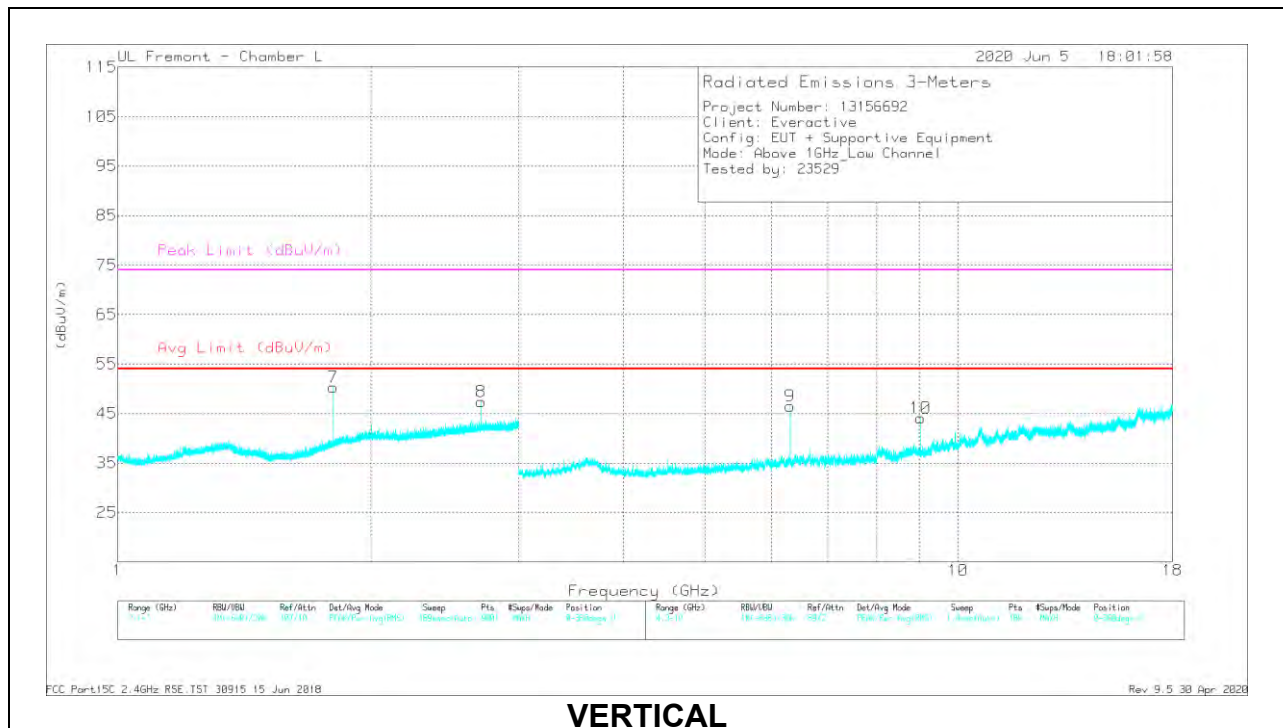
9.1.1.2. MODE 2 - FSK

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading	Det	AFT120 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Filter (dB)	Corrected Reading	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin	Azimuth (Degs)	Height (cm)	Polarity
--------	-----------------	---------------	-----	---------------	------------------------	-------------	-------------------	--------------------	-------------	---------------------	-----------	----------------	-------------	----------

		(dBuV)					(dBuV/m)				(dB)			
1	1.8049	52.35	PK2	30.4	-22.4	1	61.35	-	-	-	-	201	280	H
2	* 2.707	41.53	PK2	32.9	-20.5	1	54.93	-	-	74	-19.07	121	200	H
			Avg				47.14	54	-6.86					
7	1.80471	43	PK2	30.4	-22.4	1	52	-	-	-	-	4	131	V
8	* 2.70718	39.37	PK2	32.9	-20.5	1	52.77	-	-	74	-21.23	324	309	V
			Avg				44.98	54	-9.02					
3	* 3.6092	33.74	Pk	35.9	-28.6	1	42.04	-	-	74	-31.96	0-360	101	H
4	* 4.51176	39.38	PK2	34	-27.7	1	46.68	-	-	74	-27.32	352	106	H
			Avg				38.89	54	-15.11					
5	6.31685	32.63	Pk	35.6	-25.4	1	43.83	-	-	-	-	0-360	101	H
6	9.92705	25.71	Pk	37	-20	1	43.71	-	-	-	-	0-360	101	H
9	6.31685	36.24	Pk	35.6	-25.4	1	47.44	-	-	-	-	0-360	101	V
10	* 9.02452	33.59	PK2	36.1	-20.9	1	49.79	-	-	74	-24.21	117	117	V
			Avg				42.00	54	-12.00					

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

Pk - Peak detector

Avg – Average detector

* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -7.79dB

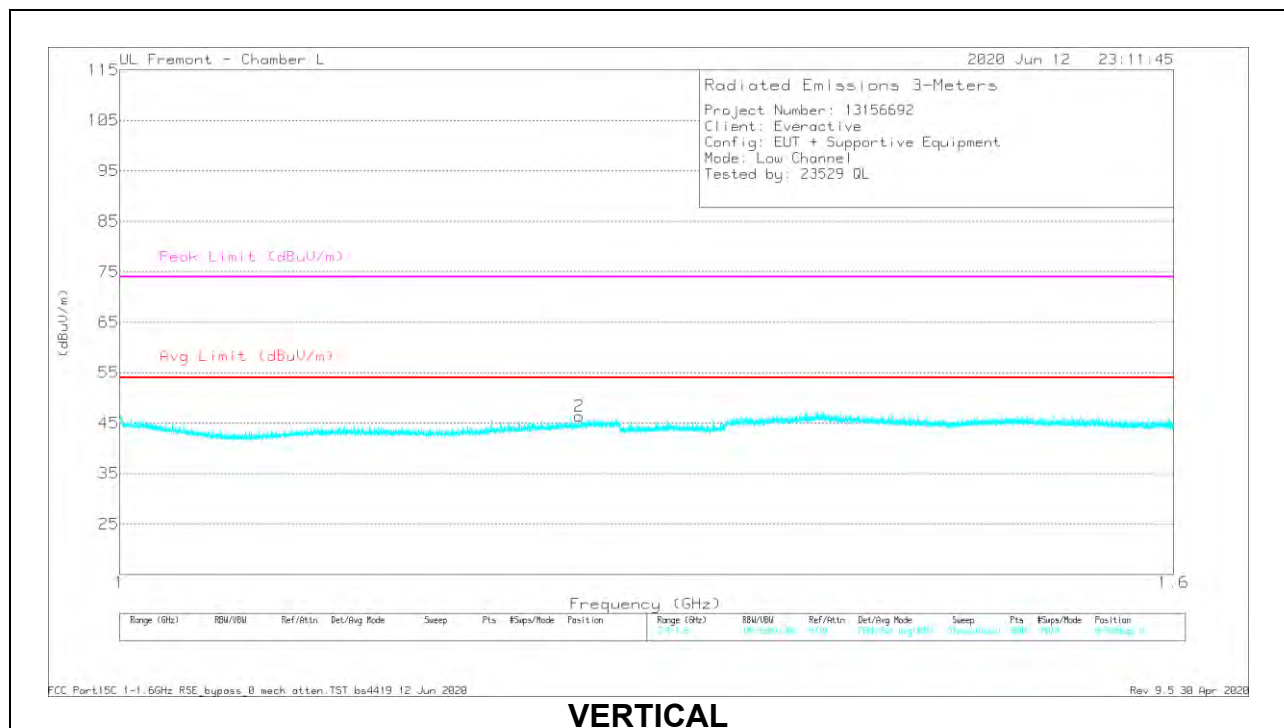
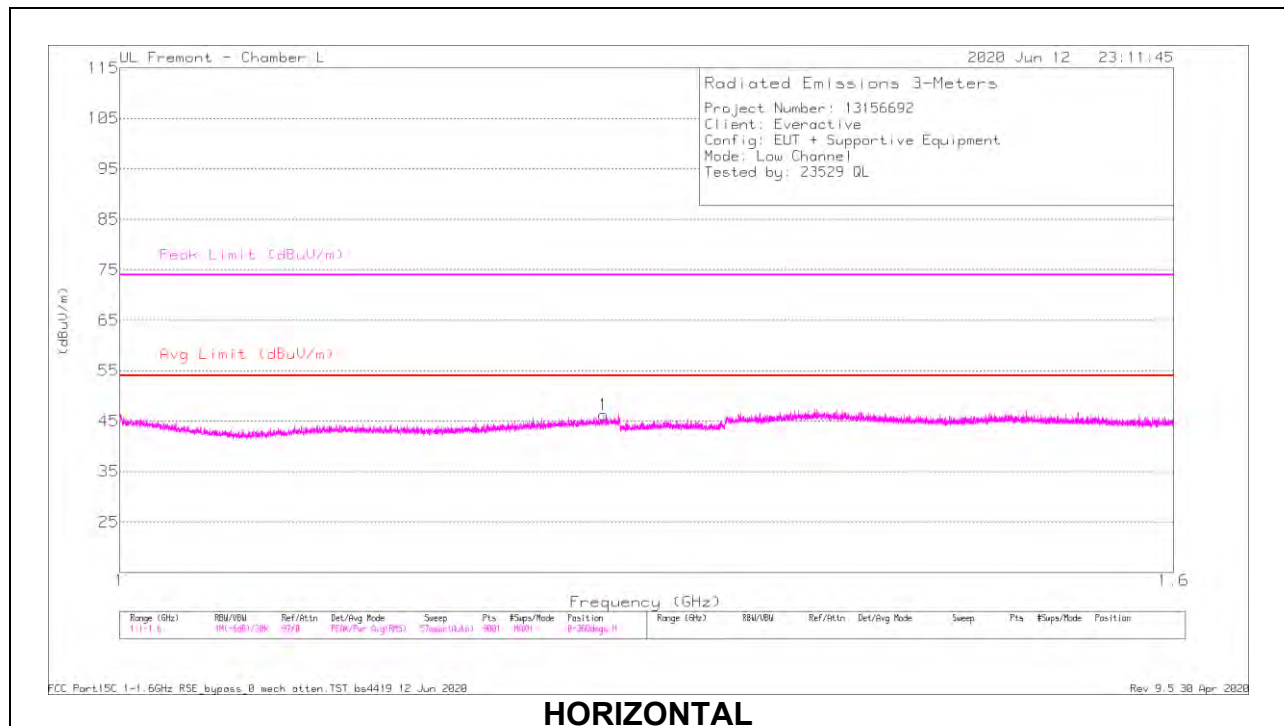
Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1.2 for duty cycle factor calculation (-7.79dB)

Note: Frequency Range 1G – 1.6GHz were investigated since High Pass Filter 1.5 GHz was used for above 1 GHz testing. Refer to the following test result below.

1 GHz to 1.6 GHz without 1.5 GHz HPF and without amplifier

Note: Frequency Range 1 GHz – 1.6 GHz was investigated since High Pass Filter 1.5 GHz was used for Above 1 GHz testing. Refer to the following test result below.

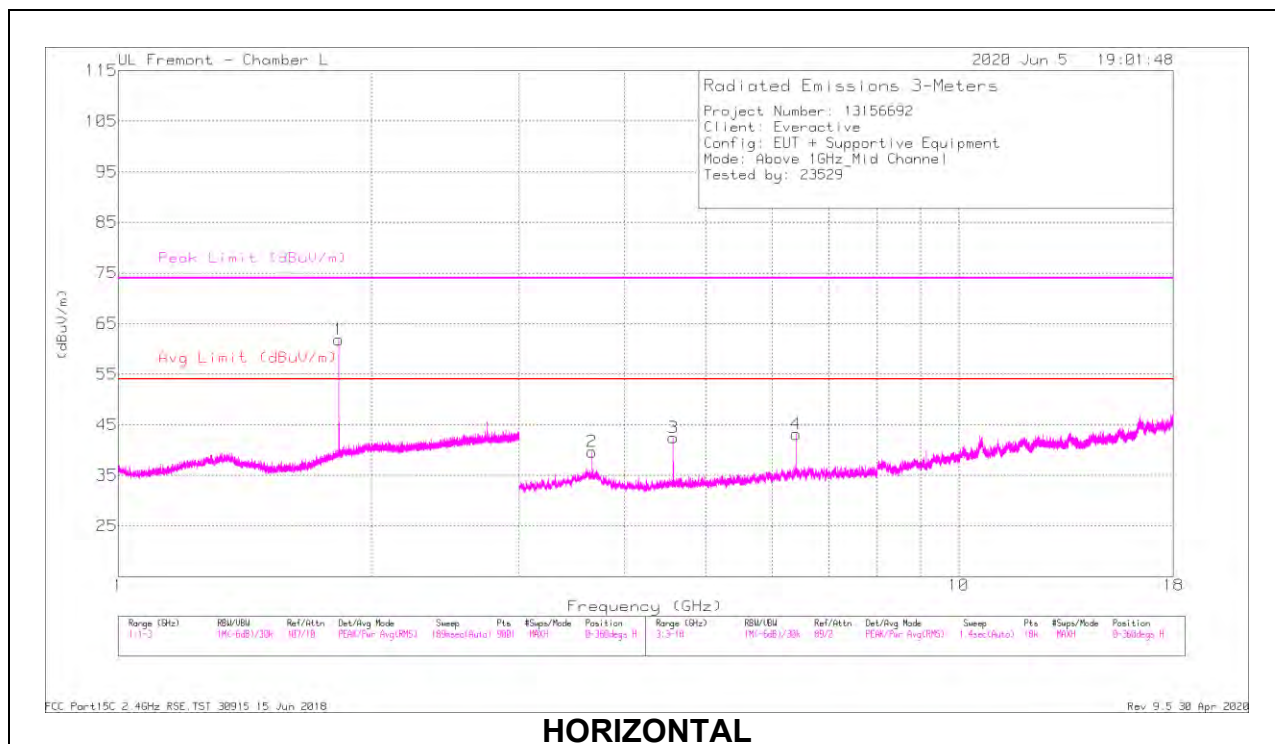


Radiated Emissions

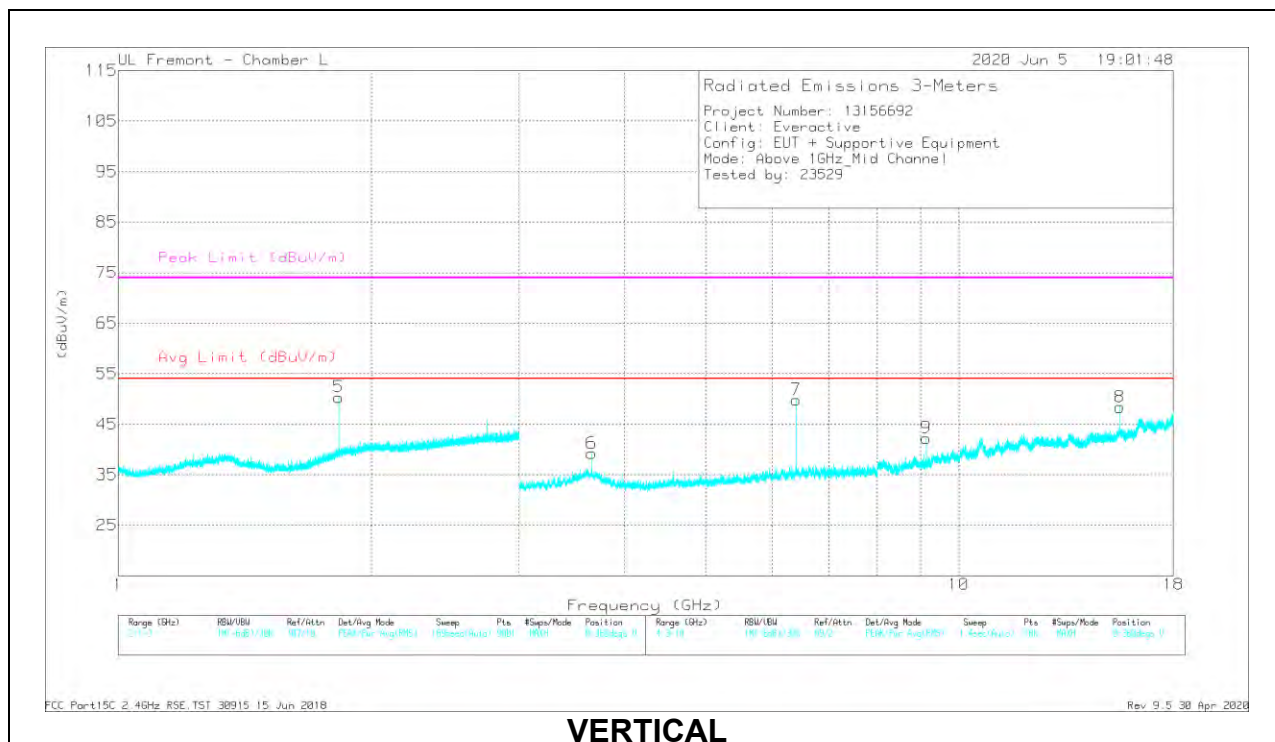
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Cbl (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.24192	17.2	PK2	28.5	5.2	50.9	-	-	74	-23.1	130	121	H
	* 1.24273	7.02	MAv1	28.5	5.2	40.72	54	-13.28	-	-	130	121	H
2	* 1.22893	17.2	PK2	28.5	5.2	50.9	-	-	74	-23.1	166	233	V
	* 1.22874	6.86	MAv1	28.5	5.2	40.56	54	-13.44	-	-	166	233	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 T120 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.82947	55.77	PK2	30.7	-22.3	1	65.17	-	-	-	-	67	374	H
5	1.82959	47.89	PK2	30.7	-22.3	1	57.29	-	-	-	-	156	367	V
2	* 3.65914	38.31	PK2	35.8	-28.3	1	46.81	-	-	74	-27.19	36	130	H
			Avg				39.02	54	-14.98					
3	* 4.57425	39.67	PK2	34.1	-27.7	1	47.07	-	-	74	-26.93	301	110	H
			Avg				39.28	54	-14.72					
4	6.40352	32.47	Pk	35.7	-25	1	44.17	-	-	-	-	0-360	101	H
6	* 3.65837	31.76	Pk	35.8	-28.3	1	40.26	-	-	74	-33.74	0-360	101	V
7	6.40312	44.79	PK2	35.7	-25	1	56.49	-	-	-	-	334	332	V
8	* 15.5526	31.49	PK2	40.5	-18.1	1	54.89	-	-	74	-19.11	120	110	V
			Avg				47.10	54	-6.90					
9	* 9.14701	26.57	Pk	36.2	-20.5	1	43.27	-	-	74	-30.73	0-360	101	V

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

Pk - Peak detector

Avg – Average detector

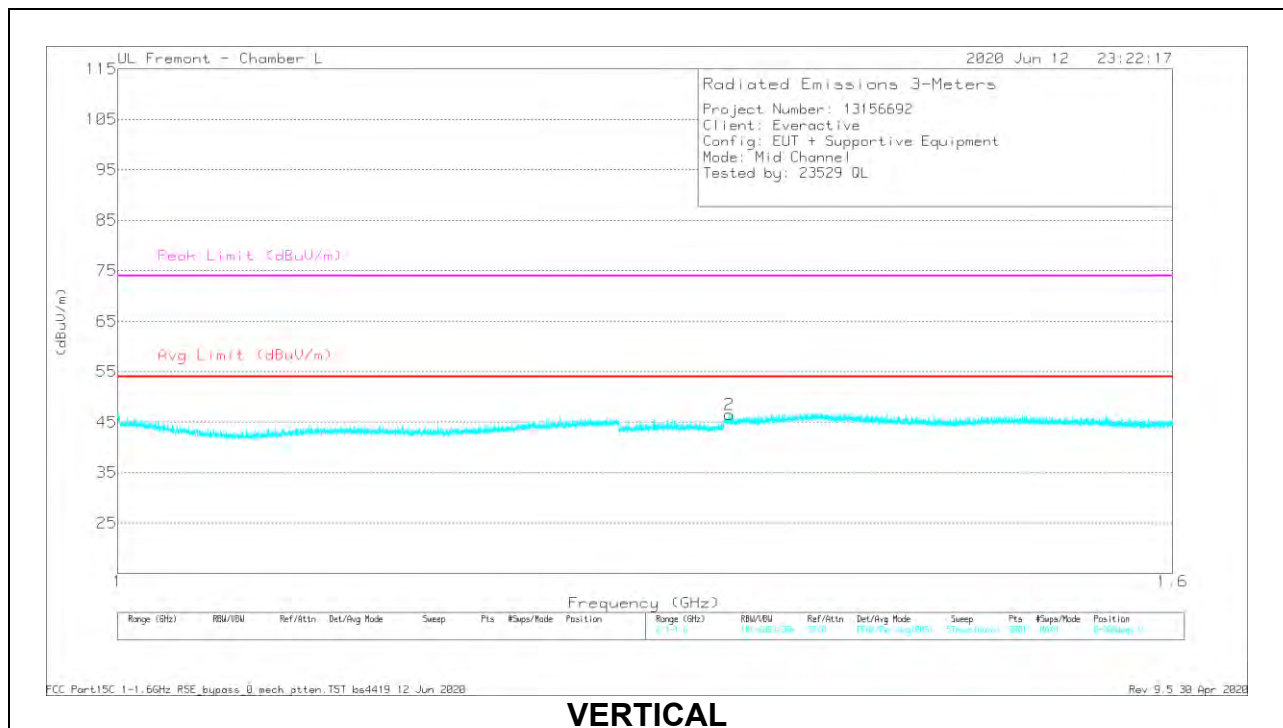
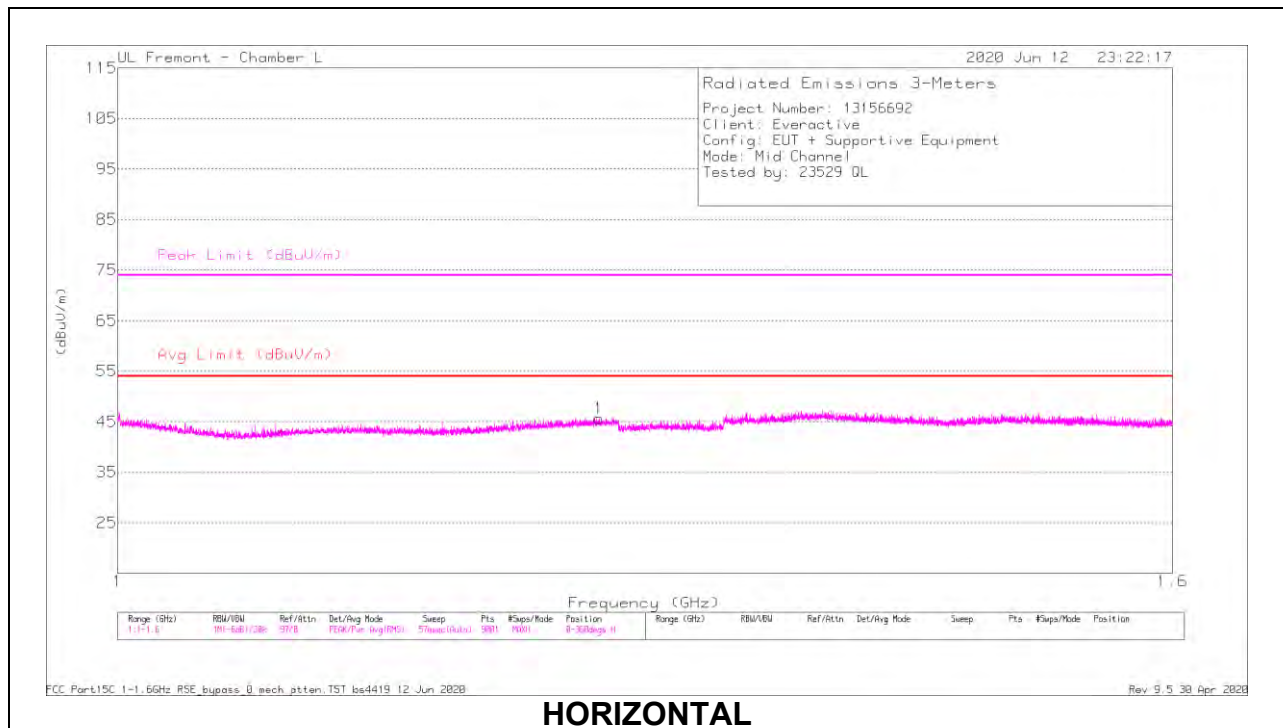
* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -7.79dB

Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1.2 for duty cycle factor calculation (-7.79dB)

1 GHz to 1.6 GHz without 1.5 GHz HPF and without amplifier

Note: Frequency Range 1 GHz – 1.6 GHz was investigated since High Pass Filter 1.5 GHz was used for Above 1 GHz testing. Refer to the following test result below.



Radiated Emissions

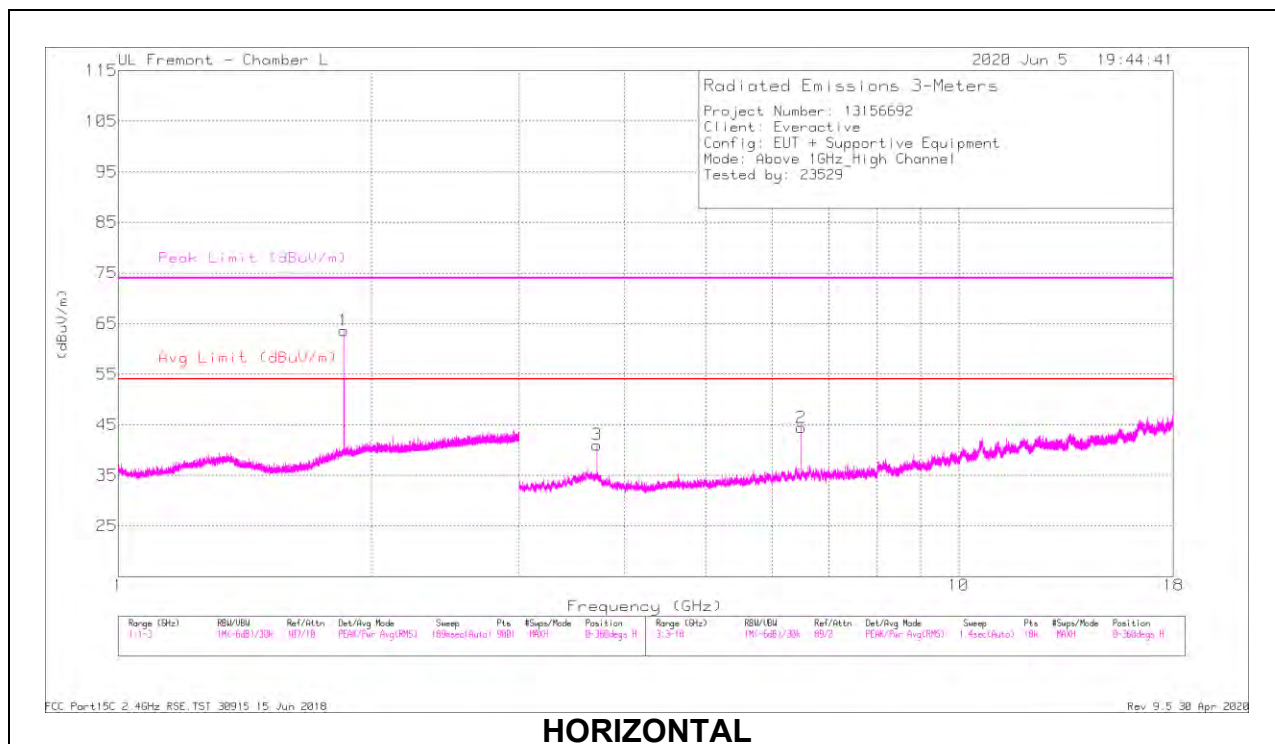
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Cbl (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.2408	17.22	PK2	28.5	5.2	50.92	-	-	74	-23.08	321	141	H
	* 1.23751	6.75	MAv1	28.6	5.2	40.55	54	-13.45	-	-	321	141	H
2	* 1.31402	17.54	PK2	28.7	5.4	51.64	-	-	74	-22.36	261	211	V
	* 1.31497	7.46	MAv1	28.7	5.4	41.56	54	-12.44	-	-	261	211	V

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

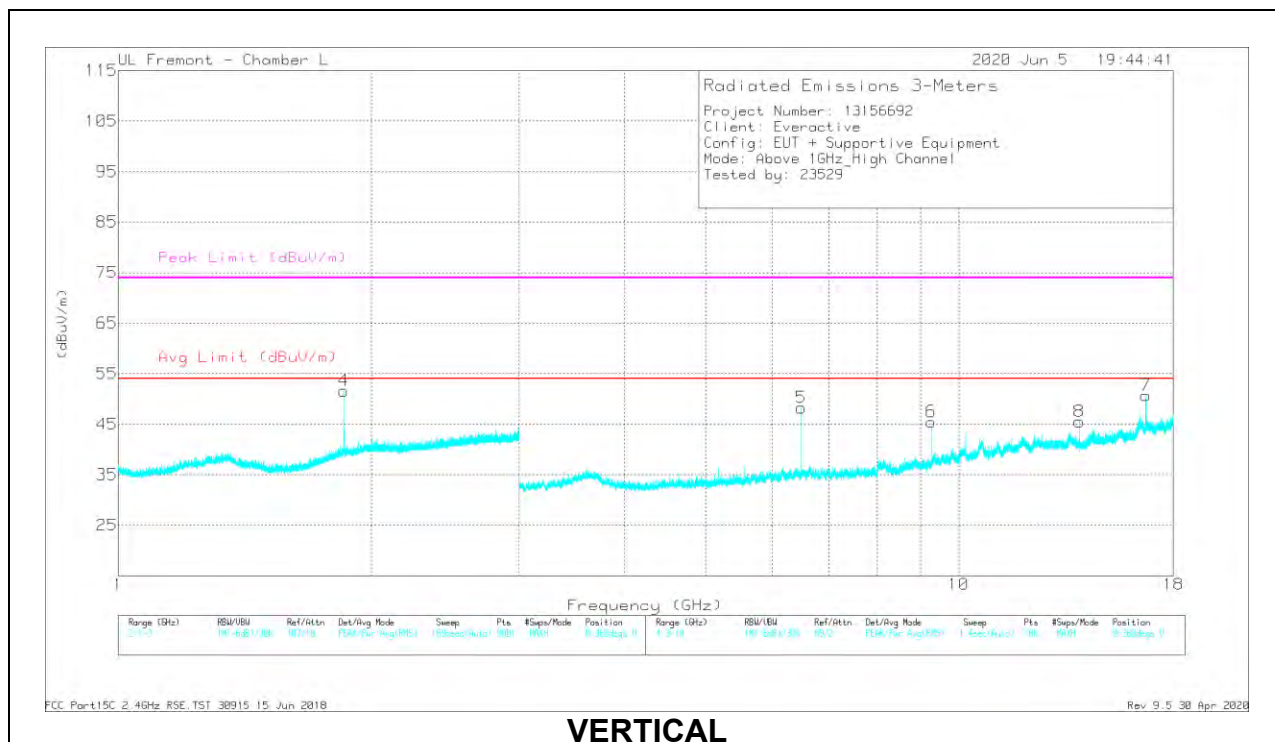
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.85506	56.67	PK2	31.1	-22.3	1	66.47	-	-	-	-	242	359	H
4	1.85526	44.8	PK2	31.1	-22.2	1	54.7	-	-	-	-	219	291	V
2	6.4927	39.97	PK2	35.7	-24.8	1	51.87	-	-	-	-	152	107	H
3	* 3.70998	38.45	PK2	35.4	-27.9	1	46.95	-	-	74	-27.05	210	125	H
			Avg				39.16	54	-14.84					
5	6.49345	43.54	PK2	35.7	-24.8	1	55.44	-	-	-	-	183	116	V
6	9.27618	29.89	Pk	36.3	-20.7	1	46.49	-	-	-	-	0-360	199	V
7	16.69738	32.45	PK2	41.3	-17.3	1	57.45	-	-	-	-	155	102	V
8	13.91478	26.12	Pk	38.8	-19.4	1	46.52	-	-	-	-	0-360	199	V

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

Pk - Peak detector

Avg – Average detector

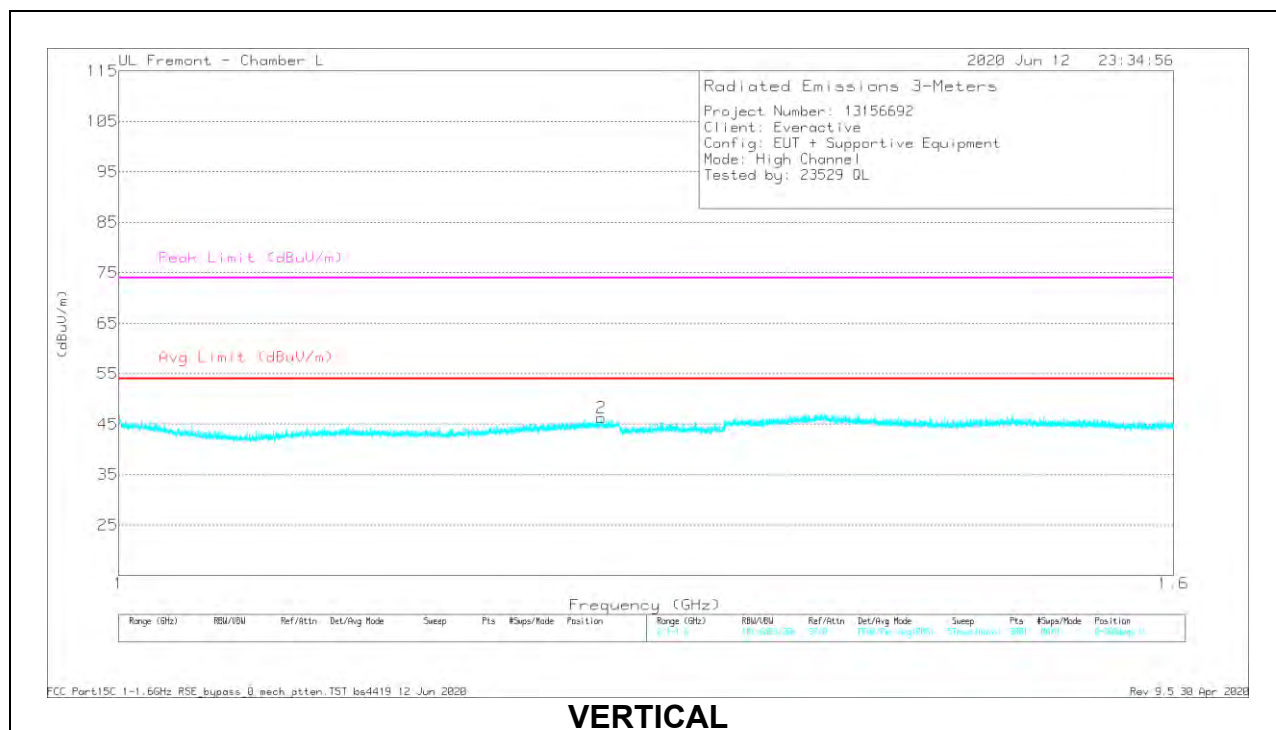
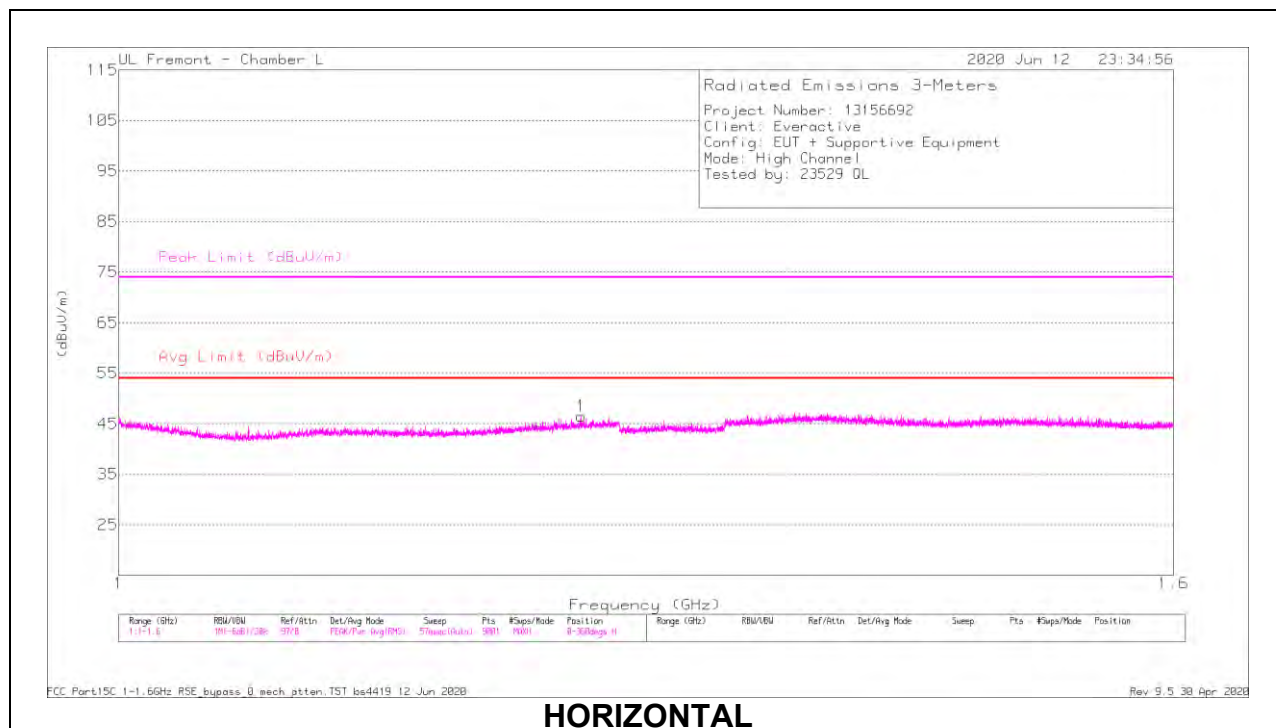
* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -7.79dB

Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1.2 for duty cycle factor calculation (-7.79dB)

1 GHz to 1.6 GHz without 1.5 GHz HPF and without amplifier

Note: Frequency Range 1 GHz – 1.6 GHz was investigated since High Pass Filter 1.5 GHz was used for Above 1 GHz testing. Refer to the following test result below.



Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Cbl (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.2284	17.45	PK2	28.5	5.2	51.15	-	-	74	-22.85	115	111	H
	* 1.22926	7.01	MAv1	28.5	5.2	40.71	54	-13.29	-	-	115	111	H
2	* 1.23949	17.96	PK2	28.5	5.2	51.66	-	-	74	-22.34	287	185	V
	* 1.24083	7.23	MAv1	28.5	5.2	40.93	54	-13.07	-	-	287	185	V

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

PK2 - KDB558074 Method: Maximum Peak

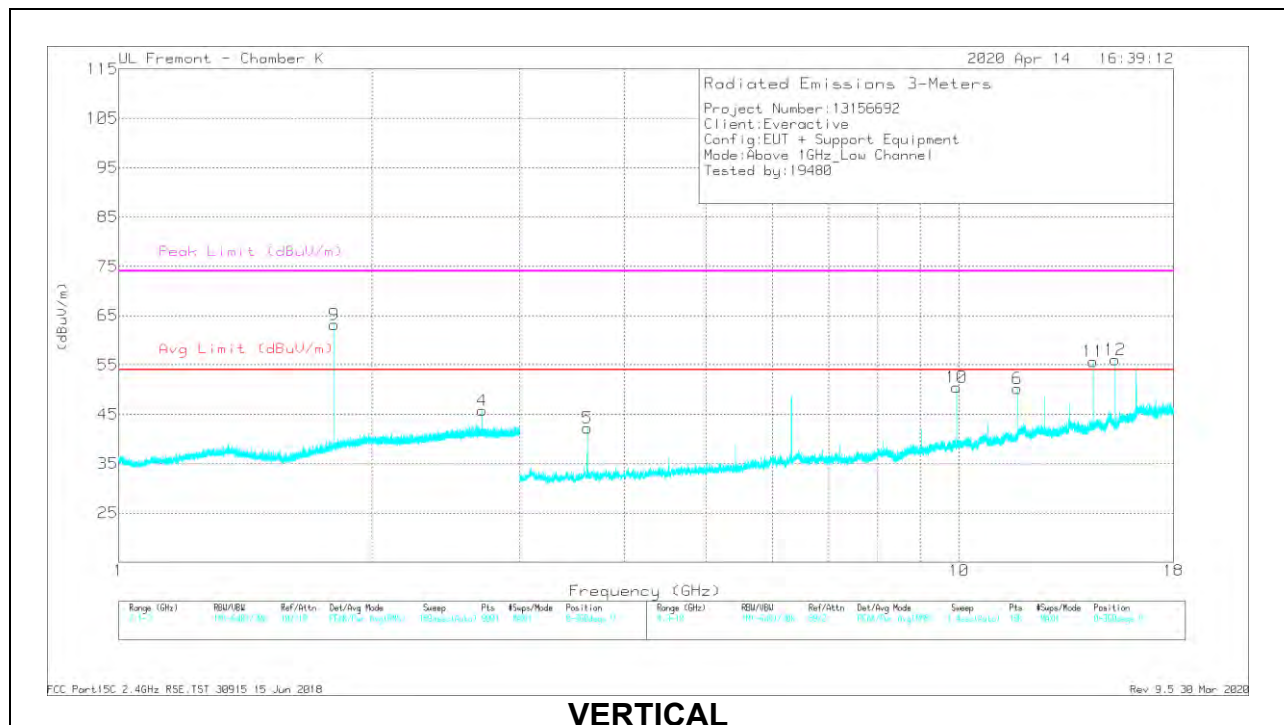
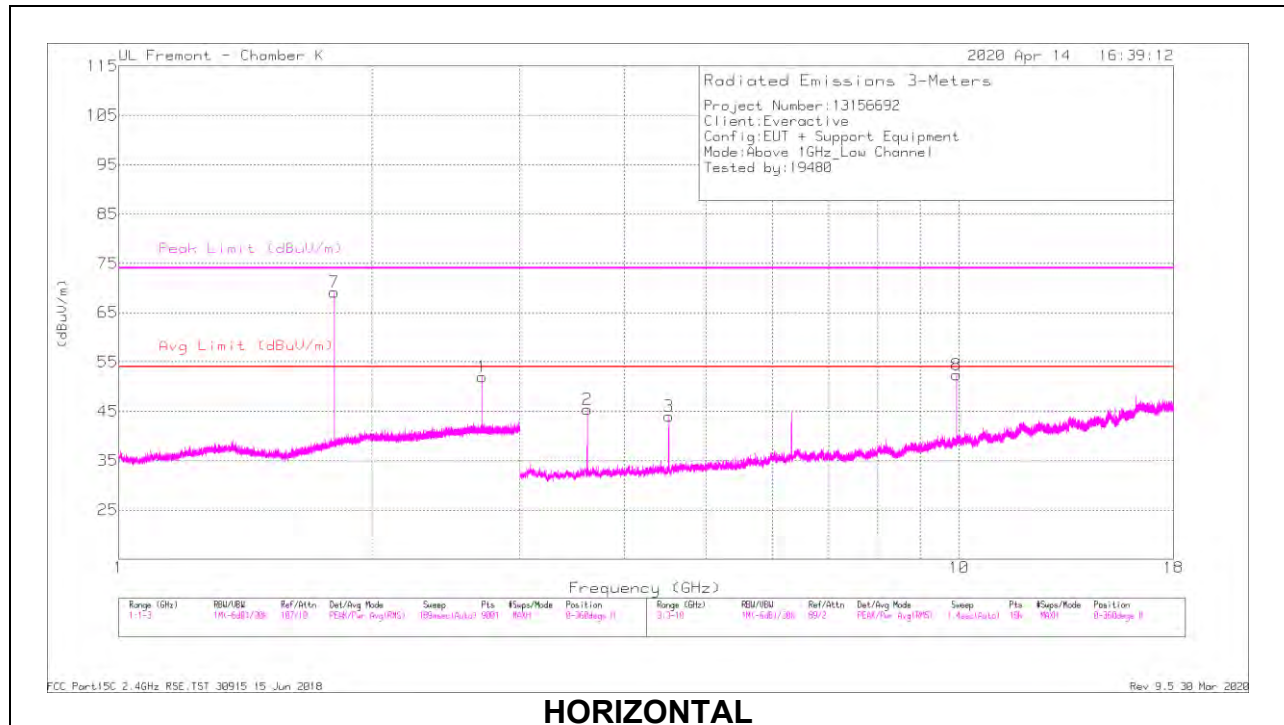
MAv1 - KDB558074 Option 1 Maximum RMS Average

9.1.2. CONFIGURATION 2: DIPOLE ANTENNA

9.1.2.1. MODE 1 - OOK

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.70825	43.99	PK2	32.7	-24.4	1	53.29	-	-	74	-20.71	358	161	H
			Avg				47.52	54	-6.48					
7	1.80555	63.69	Pk	30.3	-24.8	1	70.19	-	-	-	-	0-360	100	H
4	* 2.70829	46.61	PK2	32.7	-24.4	1	55.91	-	-	74	-18.09	328	332	V
			Avg				50.14	54	-3.86					
9	1.80533	57.74	Pk	30.3	-24.8	1	64.24	-	-	-	-	0-360	200	V
2	* 3.611	48.93	PK2	33.3	-31.3	1	51.93	-	-	74	-22.07	218	146	H
			Avg				46.16	54	-7.84					
3	* 4.51371	41.03	PK2	33.7	-29.6	1	46.13	-	-	74	-27.87	230	134	H
			Avg				40.36	54	-13.64					
8	9.93039	37.54	Pk	37	-22.2	1	53.34	-	-	-	-	0-360	100	H
5	* 3.61097	46.19	PK2	33.3	-31.3	1	49.19	-	-	74	-24.81	13	397	V
			Avg				43.42	54	-10.58					
6	* 11.73578	31.71	PK2	38.6	-19.3	1	52.01	-	-	74	-21.99	341	215	V
			Avg				46.24	54	-7.76					
10	9.93039	35.67	Pk	37	-22.2	1	51.47	-	-	-	-	0-360	100	V
11	14.44397	33.99	Pk	39.4	-17.7	1	56.69	-	-	-	-	0-360	200	V
12	15.34736	33.83	Pk	40	-17.8	1	57.03	-	-	-	-	0-360	100	V

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

Pk - Peak detector

Avg – Average detector

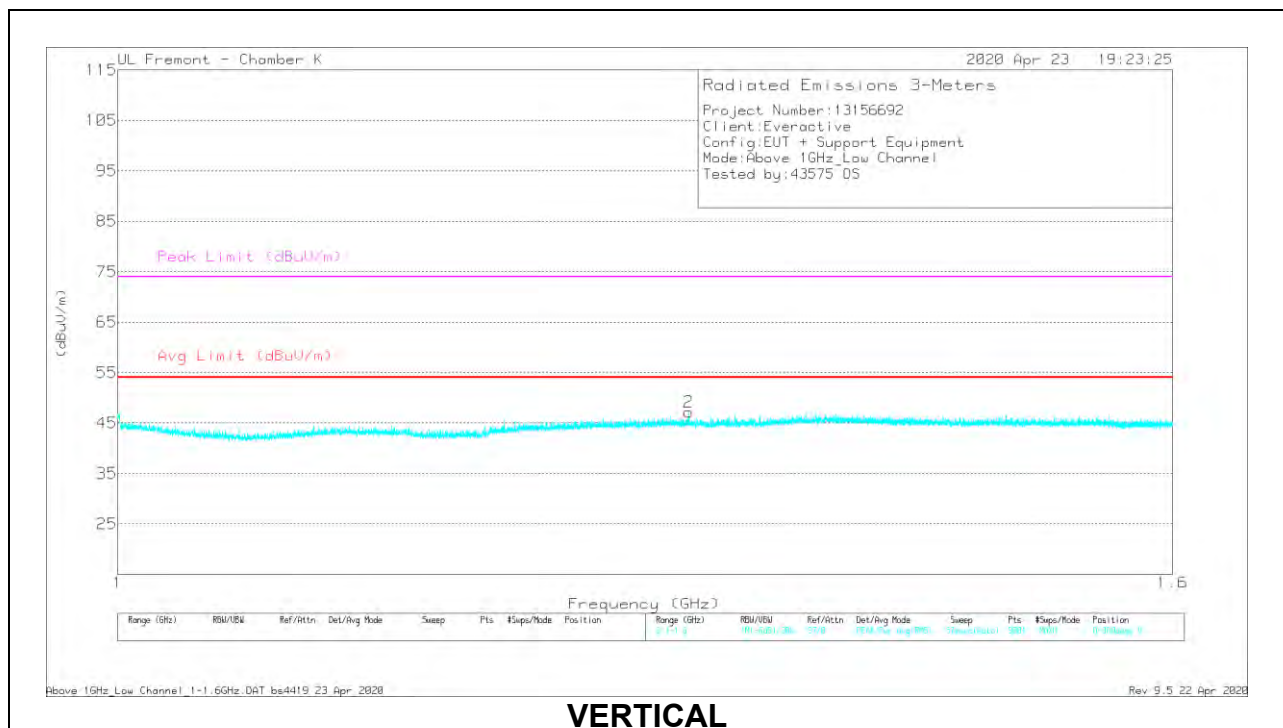
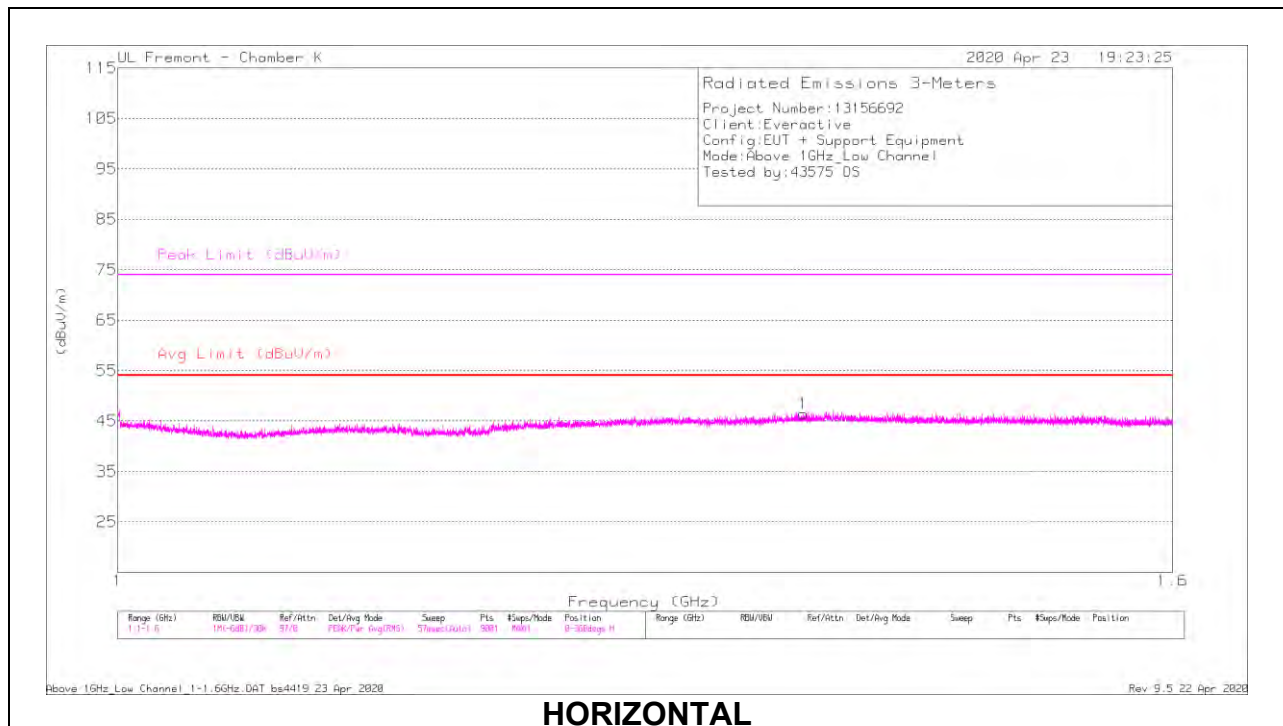
* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -5.77dB

Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1 for duty cycle factor calculation (-5.77dB)

1 GHz to 1.6 GHz without 1.5 GHz HPF and without amplifier

Note: Frequency Range 1 GHz – 1.6 GHz was investigated since High Pass Filter 1.5 GHz was used for Above 1 GHz testing. Refer to the following test result below.



Radiated Emissions

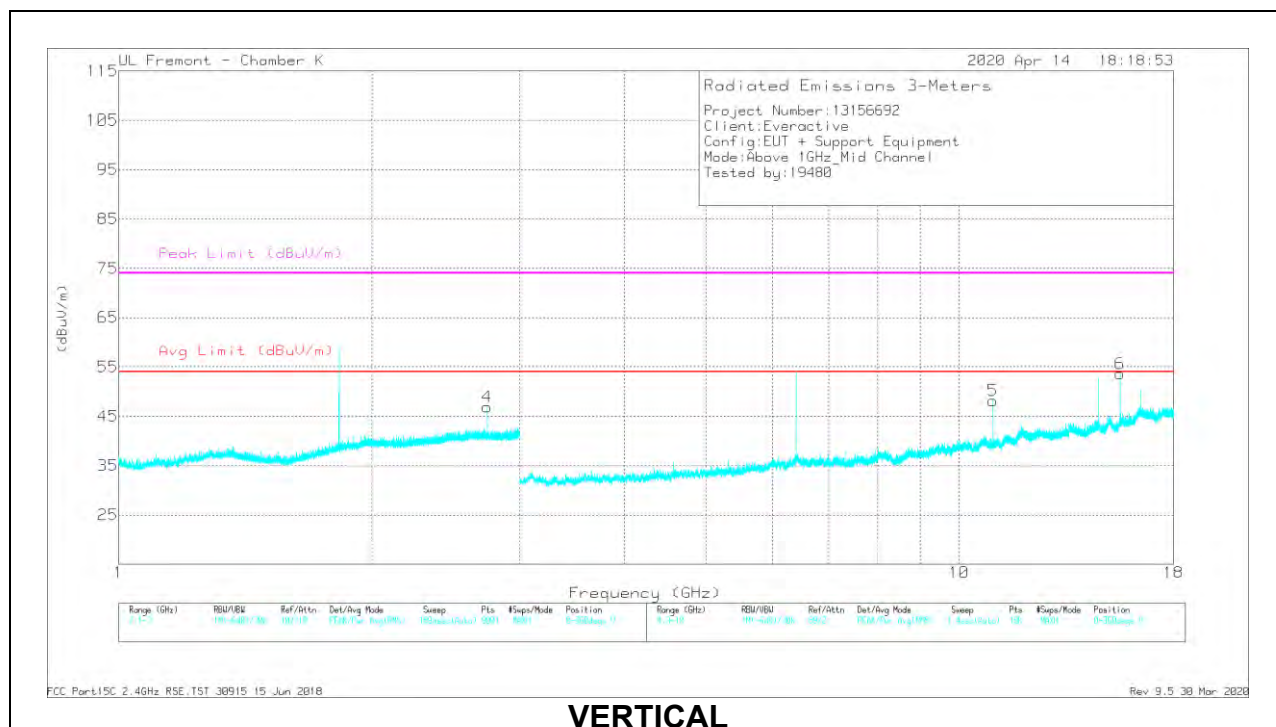
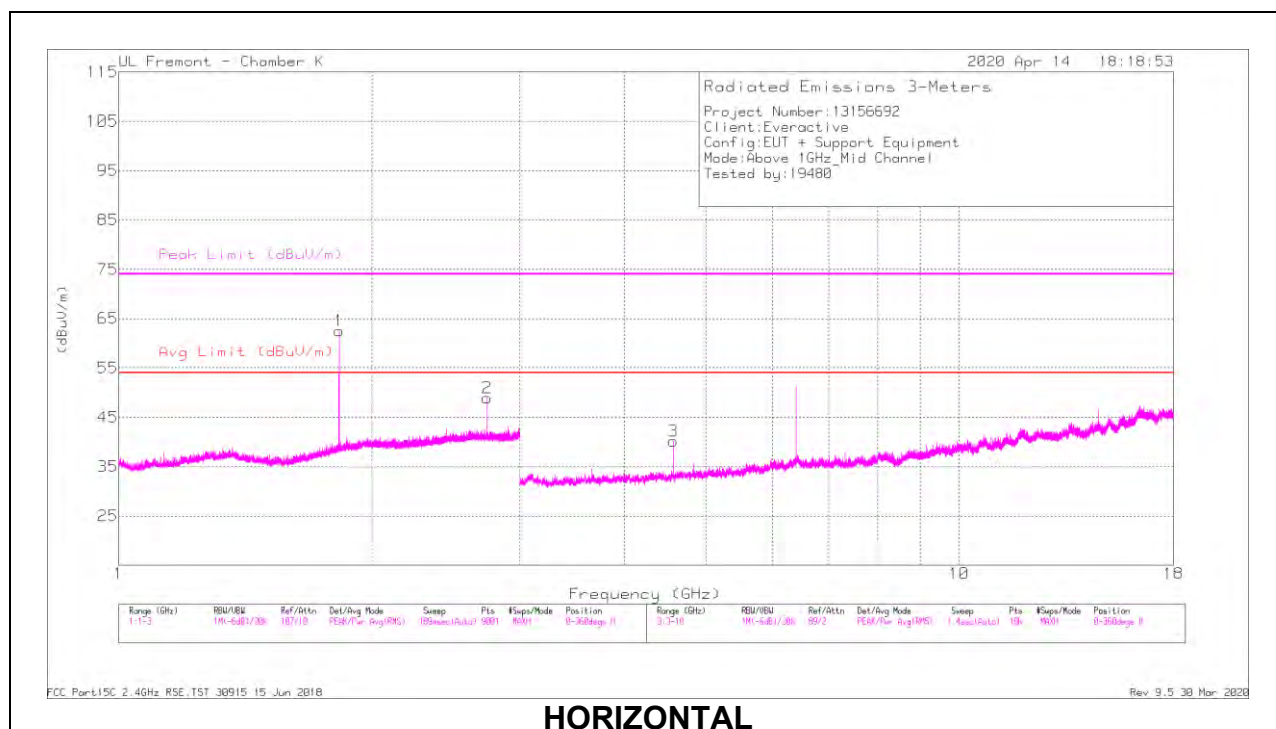
Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Bypass (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.3587	16.52	PK2	29.6	5.9	52.02	-	-	74	-21.98	29	295	H
	* 1.35564	6.39	MAv1	29.6	5.9	41.89	54	-12.11	-	-	29	295	H
2	* 1.28956	17.16	PK2	29.3	5.7	52.16	-	-	74	-21.84	73	235	V
	* 1.28965	6.13	MAv1	29.3	5.7	41.13	54	-12.87	-	-	73	235	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



Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.74434	44.85	PK2	32.5	-24.3	1	54.05	-	-	74	-19.95	243	385	H
			Avg				48.28	54	-5.72					
1	1.82953	60.24	PK2	30.5	-24.8	1	66.94	-	-	-	-	267	105	H
4	* 2.74433	46.98	PK2	32.5	-24.3	1	56.18	-	-	74	-17.82	358	380	V
			Avg				50.41	54	-3.59					
3	* 4.57385	40.04	PK2	33.9	-29.9	1	45.04	-	-	74	-28.96	278	116	H
			Avg				39.27	54	-14.73					
6	* 15.55099	33.45	PK2	40.1	-17.7	1	56.85	-	-	74	-17.15	211	103	V
			Avg				51.08	54	-2.92					
5	* 10.97724	36.01	PK2	37.9	-20.7	1	54.21	-	-	74	-19.79	279	182	V
			Avg				48.44	54	-5.56					

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

Pk - Peak detector

Avg – Average detector

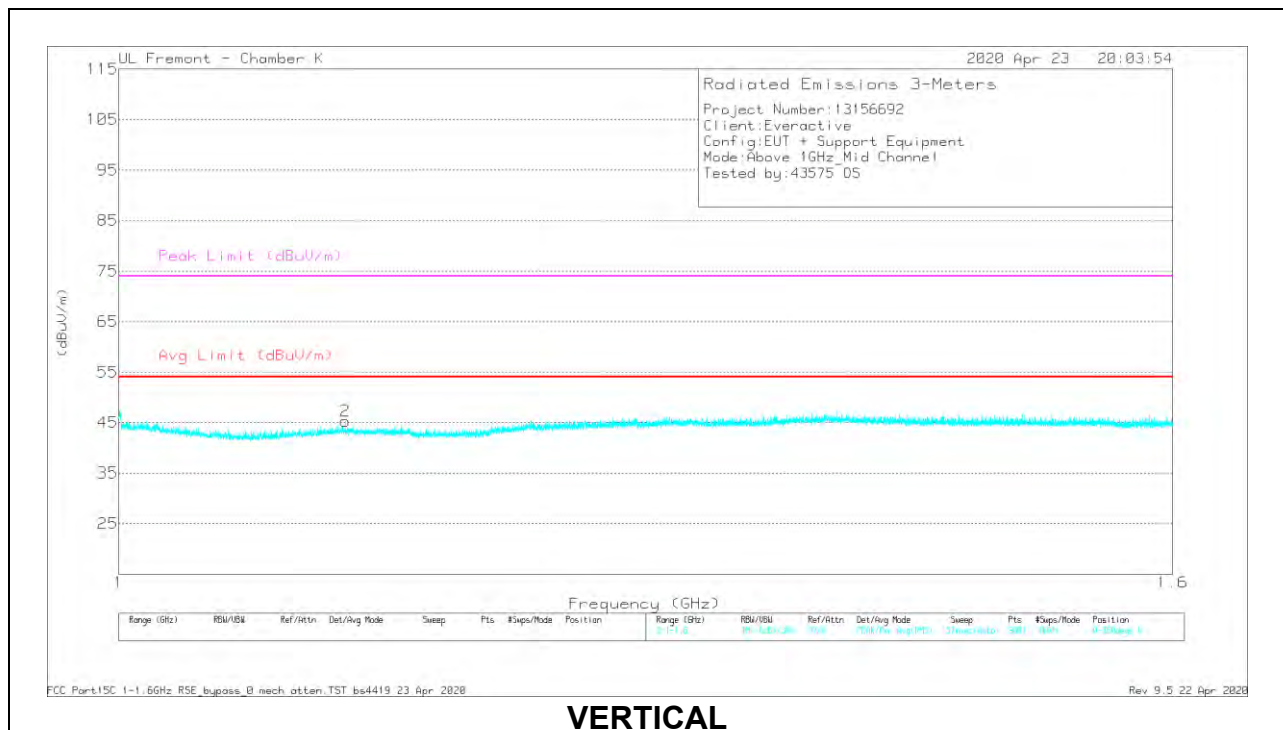
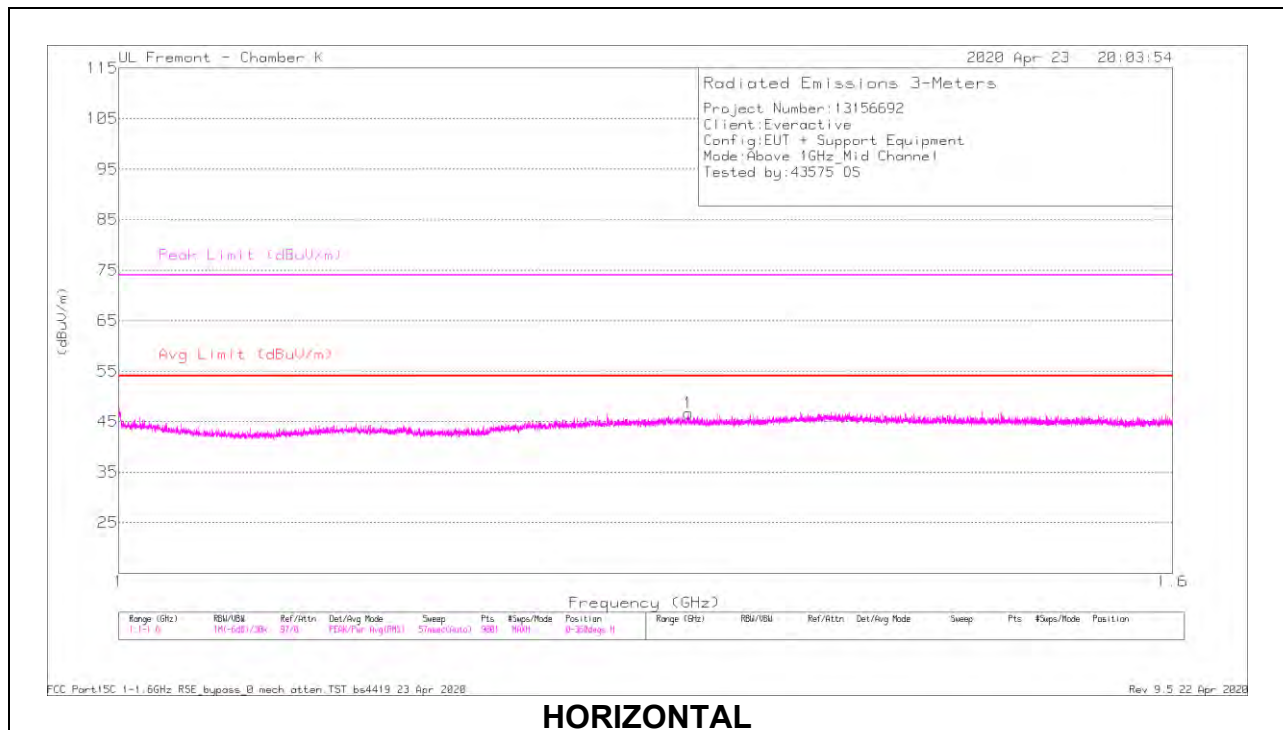
* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -5.77dB

Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1 for duty cycle factor calculation (-5.77dB)

1 GHz to 1.6 GHz without 1.5 GHz HPF and without amplifier

Note: Frequency Range 1 GHz – 1.6 GHz was investigated since High Pass Filter 1.5 GHz was used for Above 1 GHz testing. Refer to the following test result below.



Radiated Emissions

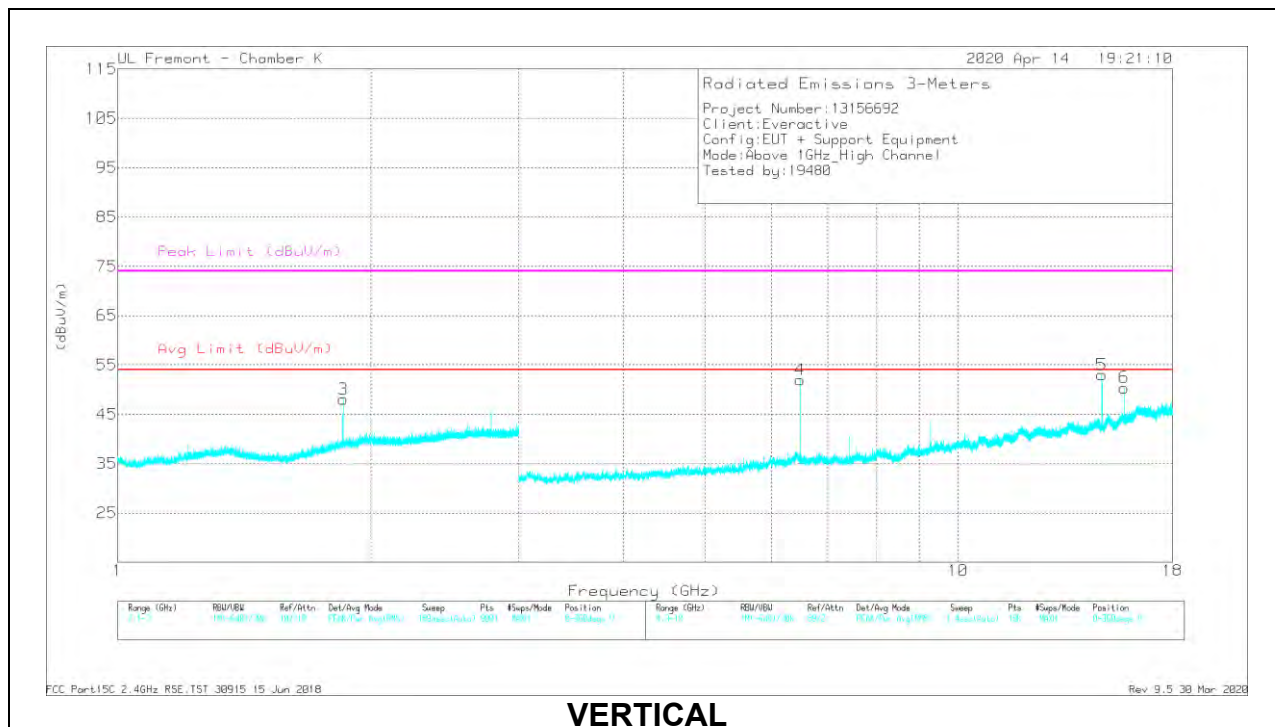
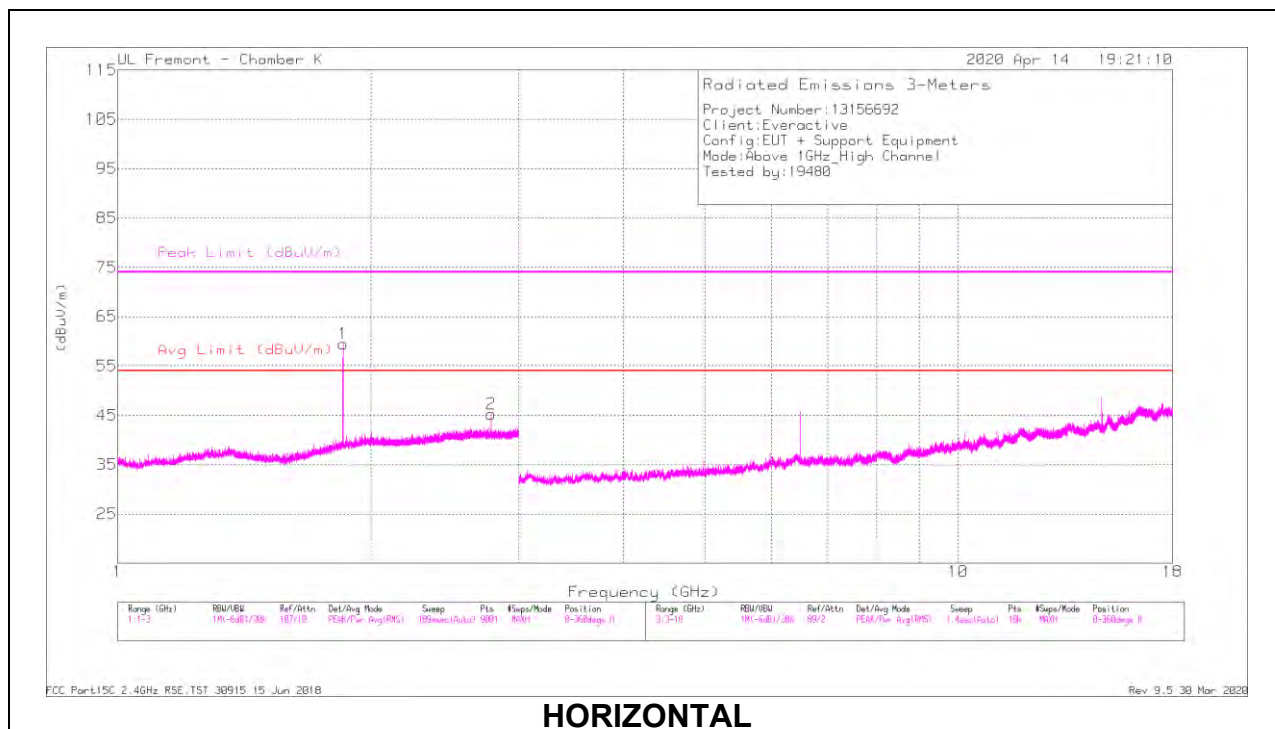
Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Bypass (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.2912	17.15	PK2	29.3	5.7	52.15	-	-	74	-21.85	8	250	H
	* 1.2912	6.15	MAv1	29.3	5.7	41.15	54	-12.85	-	-	8	250	H
2	* 1.10617	16.49	PK2	27.7	5.3	49.49	-	-	74	-24.51	325	109	V
	* 1.1046	5.67	MAv1	27.6	5.3	38.57	54	-15.43	-	-	325	109	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



Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Filtr/P ad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.78187	43.13	PK2	32.4	-24.2	1	52.33	-	-	74	-21.67	246	198	H
			Avg				46.56	54	-7.44					
1	1.85454	55.56	PK2	30.9	-24.8	1	62.66	-	-	-	-	271	135	H
3	1.85455	57.01	PK2	30.9	-24.8	1	64.11	-	-	-	-	189	310	V
6	* 15.76364	31.88	PK2	40	-16.7	1	56.18	-	-	74	-17.82	211	98	V
			Avg				50.41	54	-3.59					
4	6.49092	44.5	PK2	35.7	-25.5	1	55.7	-	-	-	-	28	227	V
5	14.83637	34.75	PK2	39.9	-17.9	1	57.75	-	-	-	-	185	99	V

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

Pk - Peak detector

Avg – Average detector

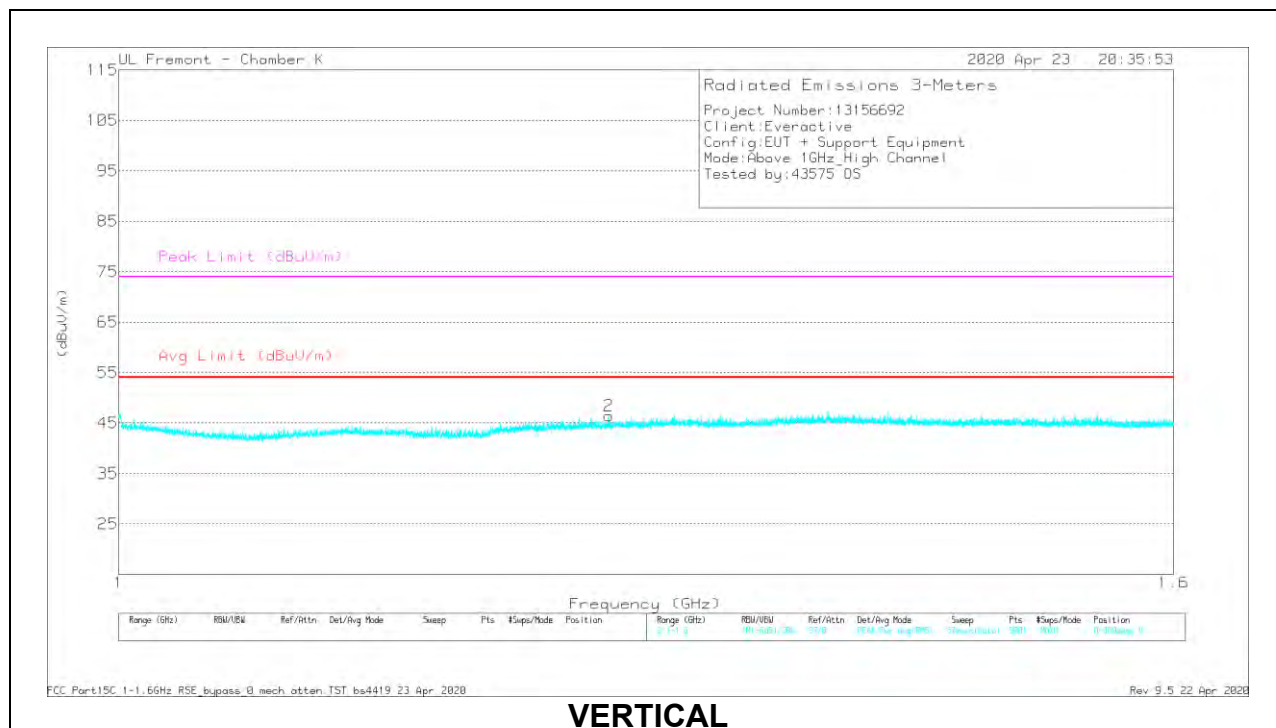
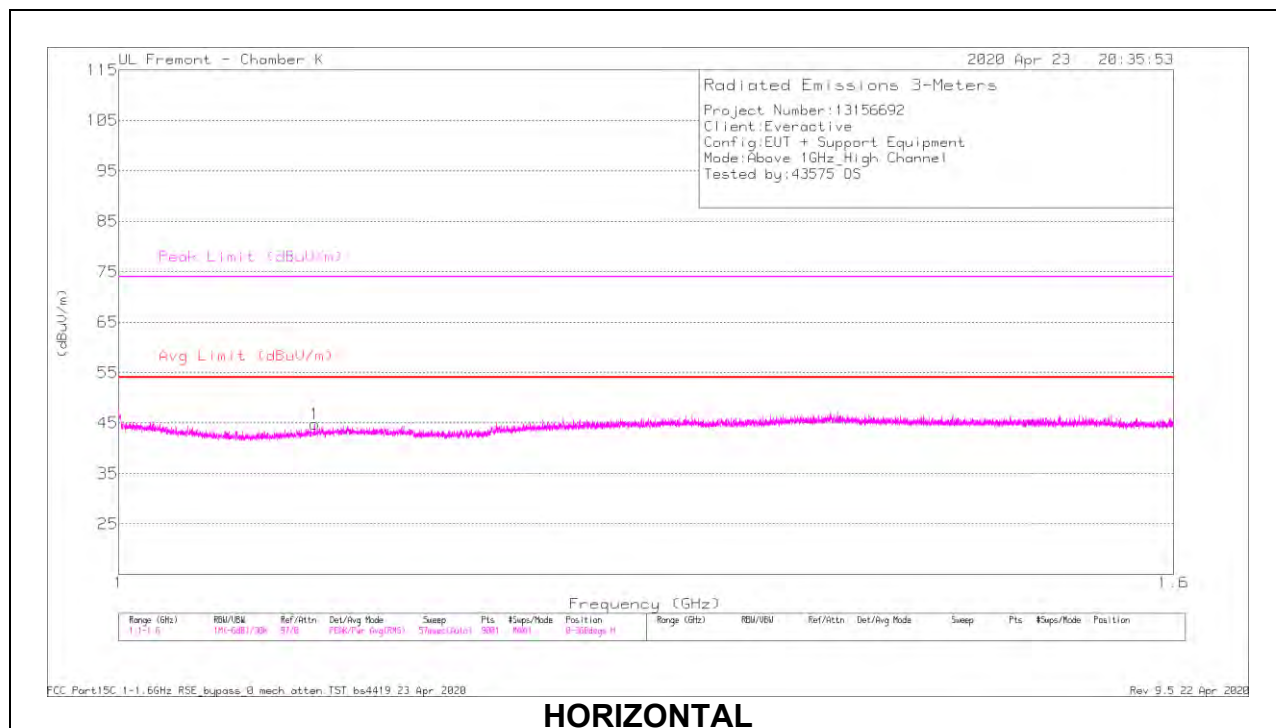
* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -5.77dB

Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1 for duty cycle factor calculation (-5.77dB)

1 GHz to 1.6 GHz without 1.5 GHz HPF and without amplifier

Note: Frequency Range 1 GHz – 1.6 GHz was investigated since High Pass Filter 1.5 GHz was used for Above 1 GHz testing. Refer to the following test result below.



Radiated Emissions

Markers	Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Bypass (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.09153	17.96	PK2	27.5	5.2	50.66	-	-	74	-23.34	261	327	H
	* 1.0905	5.69	MAv1	27.4	5.2	38.29	54	-15.71	-	-	261	327	H
2	* 1.24311	18.3	PK2	28.6	5.6	52.5	-	-	74	-21.5	16	154	V
	* 1.24525	5.82	MAv1	28.7	5.6	40.12	54	-13.88	-	-	16	154	V

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

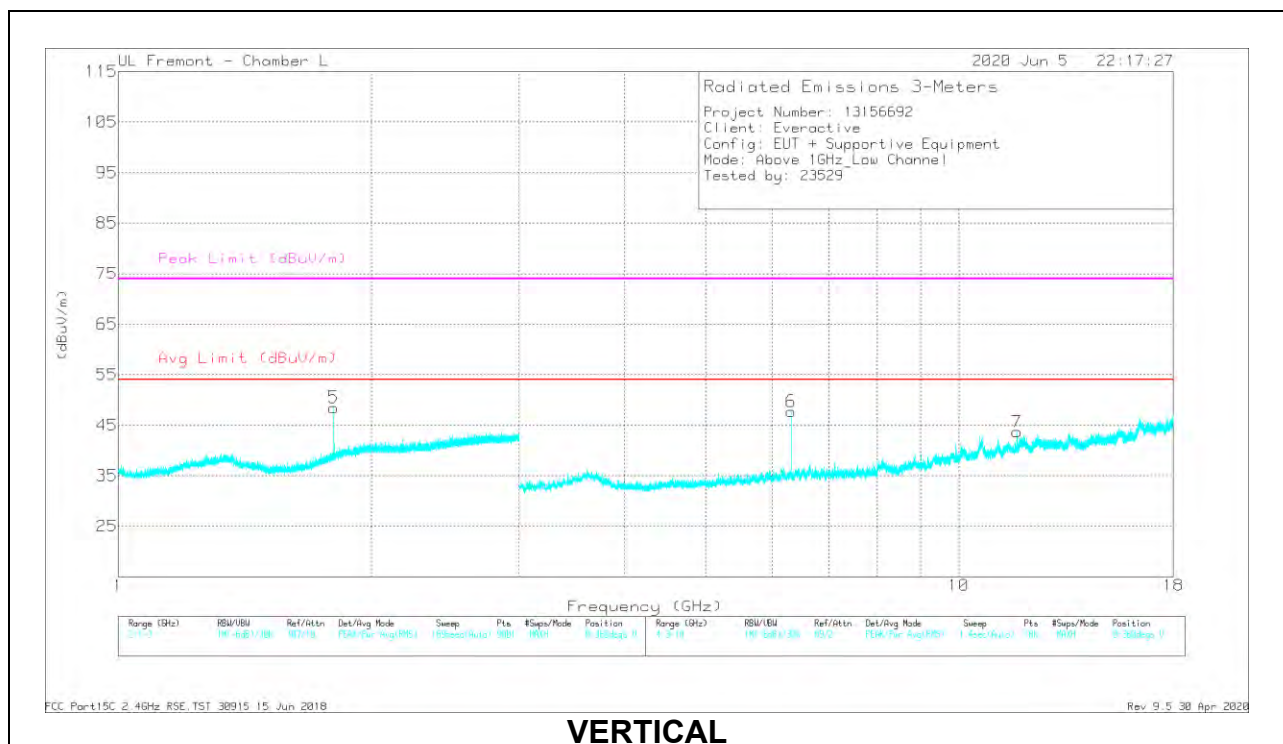
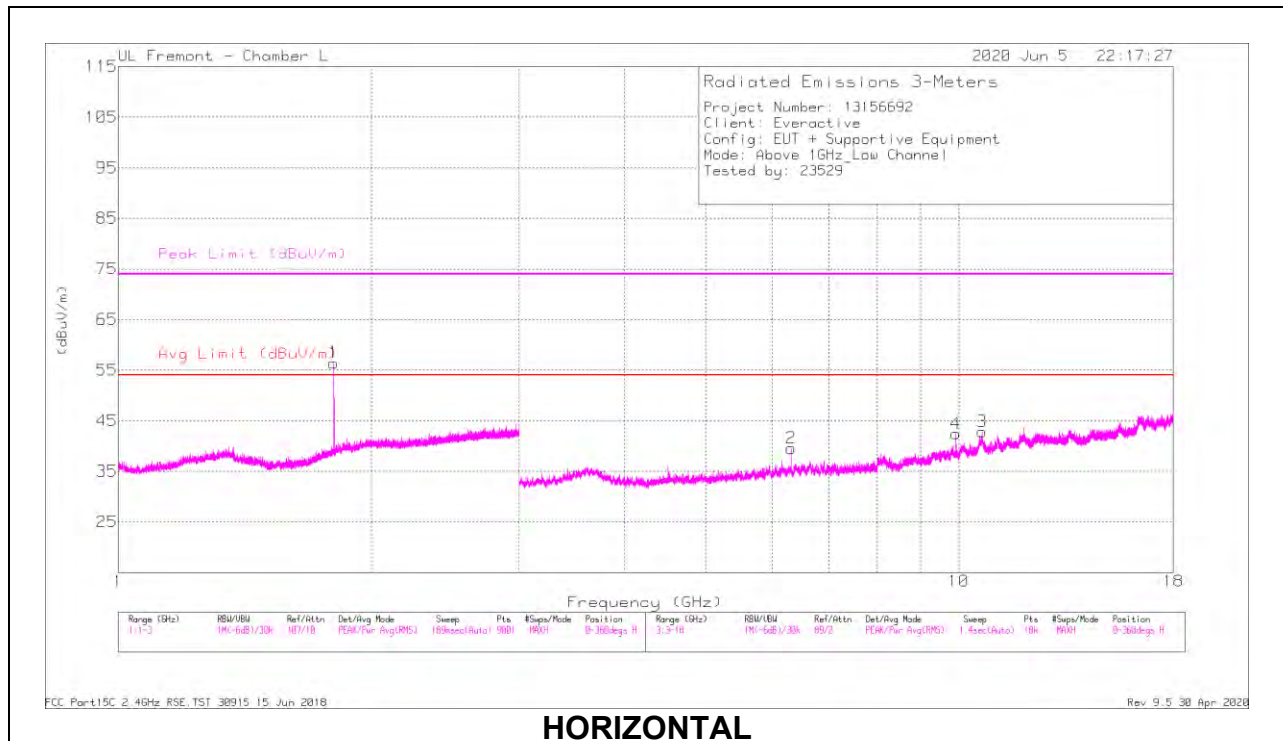
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

9.1.2.2. MODE 2 - FSK

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.80491	51.55	PK2	30.4	-22.4	1	60.55	-	-	-	-	247	282	H
5	1.80487	48.13	PK2	30.4	-22.4	1	57.13	-	-	-	-	132	377	V
2	6.31648	38.86	PK2	35.6	-25.4	1	50.06	-	-	-	-	249	102	H
3	* 10.66043	22.14	Pk	38	-17.3	1	41.84	-	-	74	-32.16	175	101	H
							34.05	54	-19.95					
4	9.92714	30.99	PK2	37	-20	1	48.99	-	-	-	-	131	114	H
6	6.31722	42.7	PK2	35.6	-25.4	1	53.9	-	-	-	-	317	350	V
7	* 11.73067	30.21	PK2	38.8	-19.2	1	50.81	-	-	74	-23.19	188	113	V
			Avg				43.02	54	-10.98					

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

Pk - Peak detector

Avg – Average detector

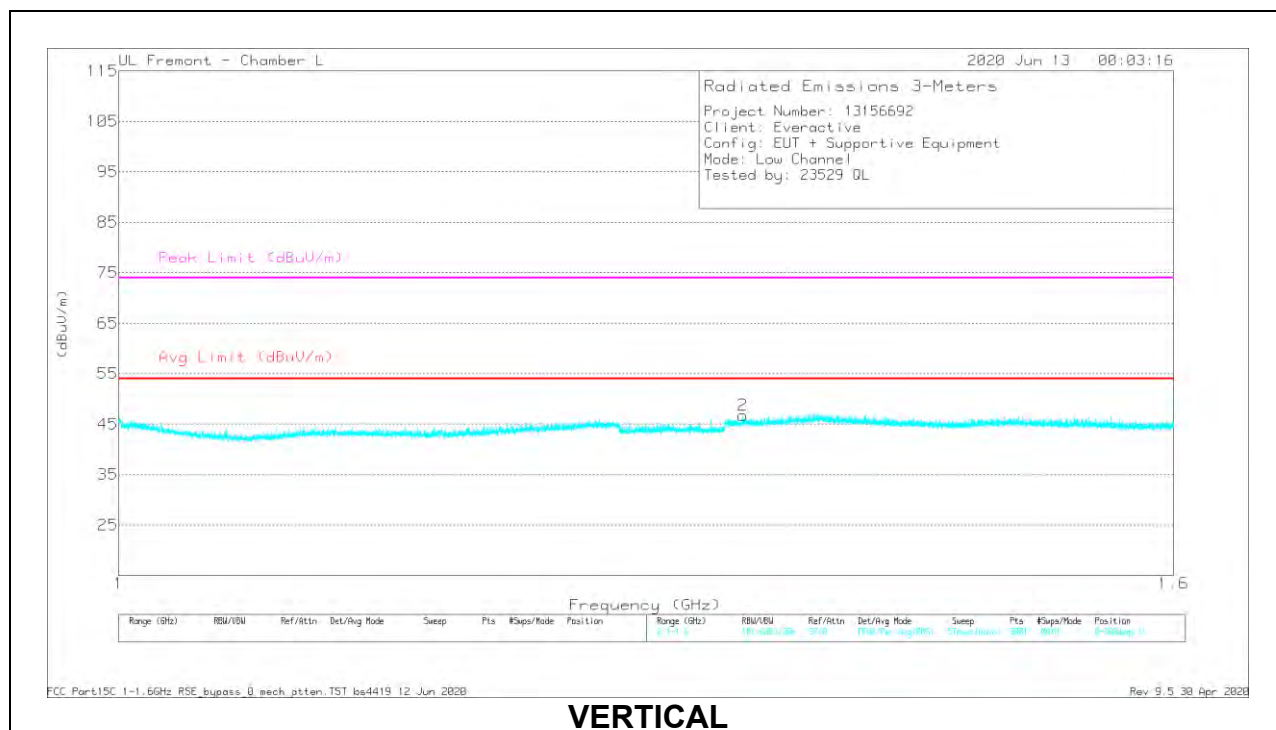
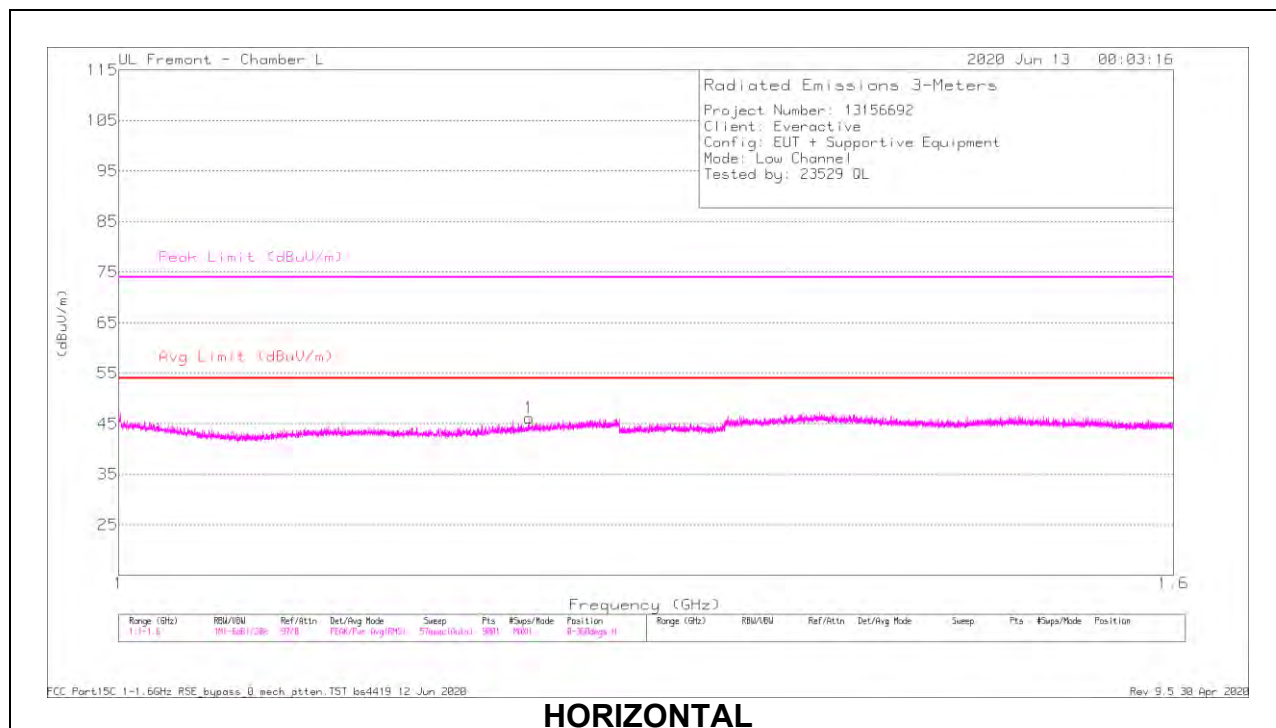
* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -7.79dB

Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1.2 for duty cycle factor calculation (-7.79dB)

1 GHz to 1.6 GHz without 1.5 GHz HPF and without amplifier

Note: Frequency Range 1 GHz – 1.6 GHz was investigated since High Pass Filter 1.5 GHz was used for Above 1 GHz testing. Refer to the following test result below.



Radiated Emissions

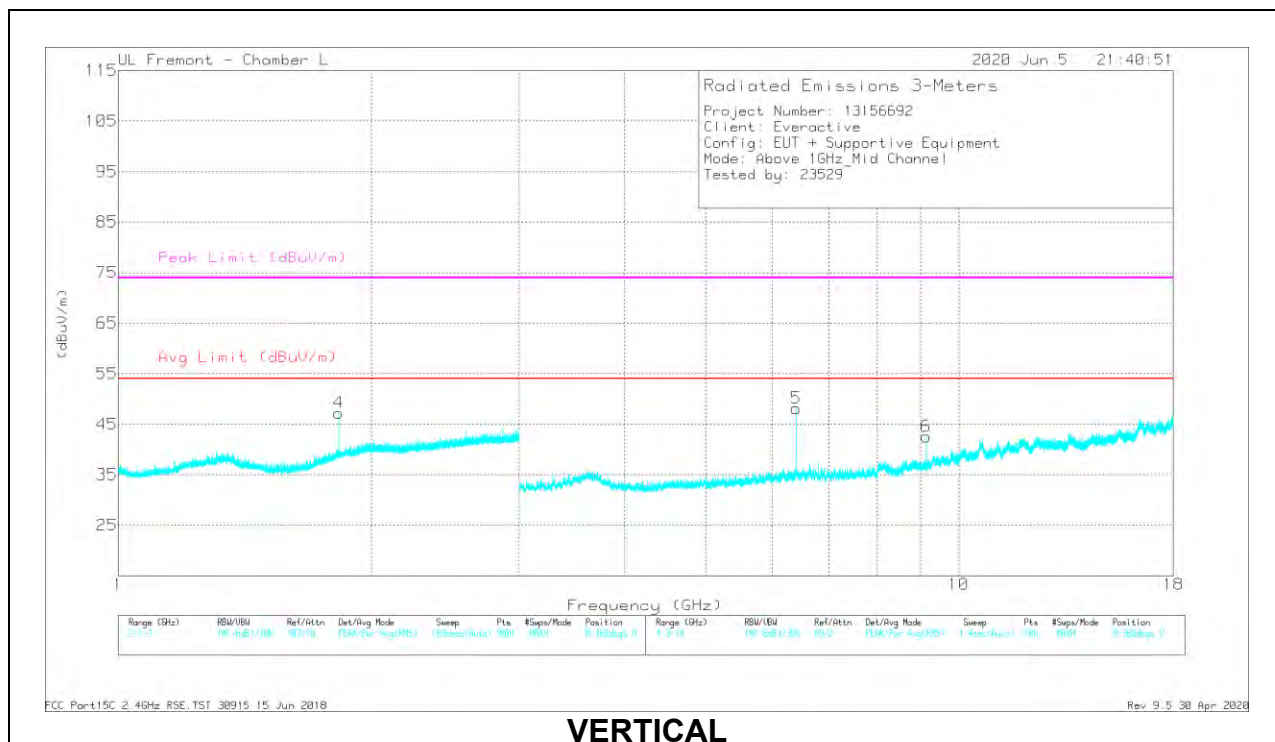
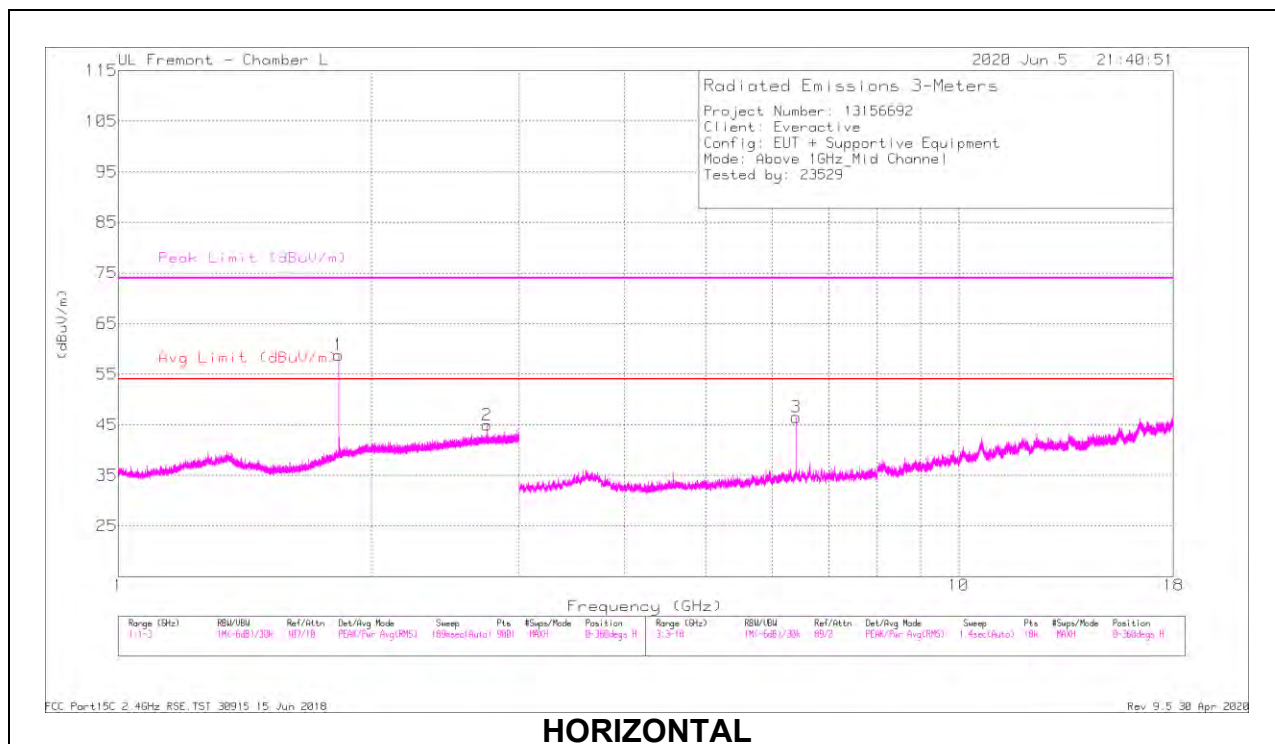
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Cbl (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.2026	16.83	PK2	28.3	5.1	50.23	-	-	74	-23.77	298	142	H
	* 1.20108	7.08	MAv1	28.3	5.1	40.48	54	-13.52	-	-	298	142	H
2	* 1.32187	17.21	PK2	28.8	5.4	51.41	-	-	74	-22.59	347	171	V
	* 1.32205	7.11	MAv1	28.8	5.4	41.31	54	-12.69	-	-	347	171	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



Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.82974	50.47	PK2	30.7	-22.3	1	59.87	-	-	-	-	73	205	H
2	* 2.74644	38.8	PK2	32.9	-20.4	1	52.3	-	-	74	-21.7	257	376	H
			Avg				44.51	54	-9.49					
4	1.82943	46.27	PK2	30.7	-22.3	1	55.67	-	-	-	-	156	369	V
3	6.40388	38.79	PK2	35.7	-25	1	50.49	-	-	-	-	251	117	H
5	6.40316	42.13	PK2	35.7	-25	1	53.83	-	-	-	-	324	258	V
6	* 9.14728	33.76	PK2	36.2	-20.5	1	49.46	-	-	74	-24.54	131	119	V
			Avg				41.67	54	-12.33					

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

Pk - Peak detector

Avg – Average detector

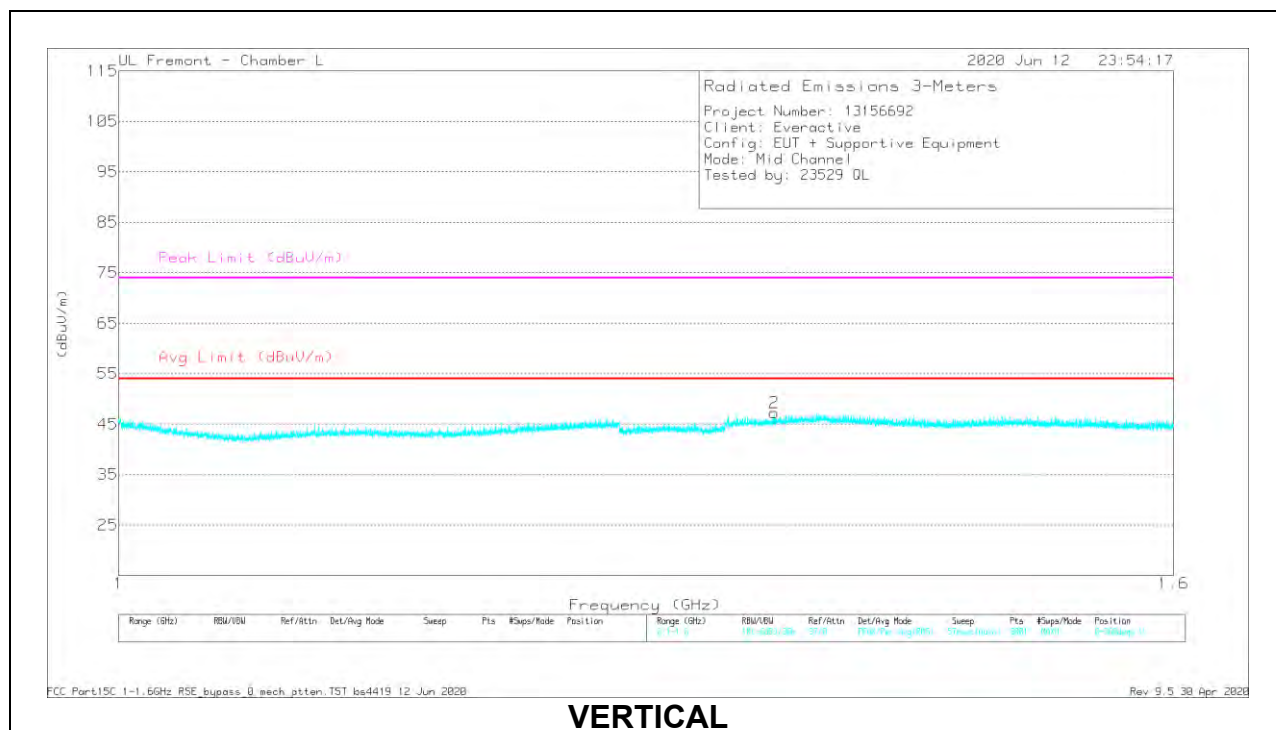
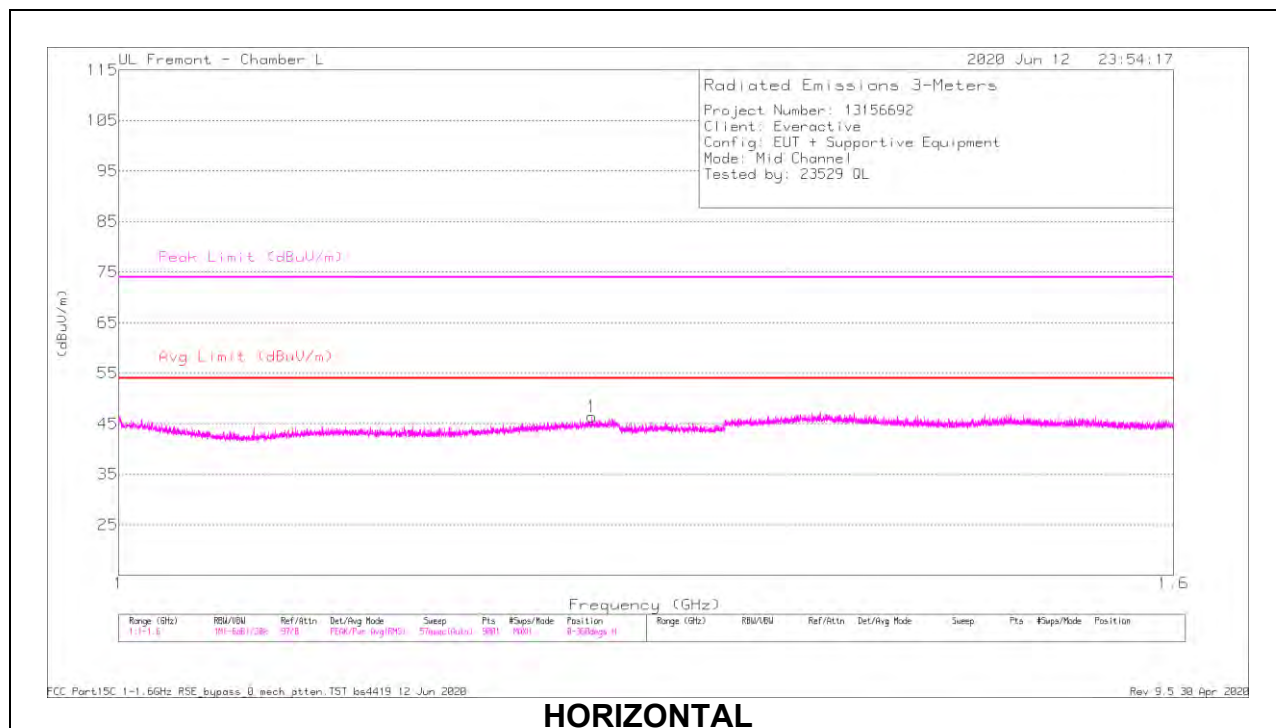
* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -7.79dB

Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1.2 for duty cycle factor calculation (-7.79dB)

1 GHz to 1.6 GHz without 1.5 GHz HPF and without amplifier

Note: Frequency Range 1 GHz – 1.6 GHz was investigated since High Pass Filter 1.5 GHz was used for Above 1 GHz testing. Refer to the following test result below.



Radiated Emissions

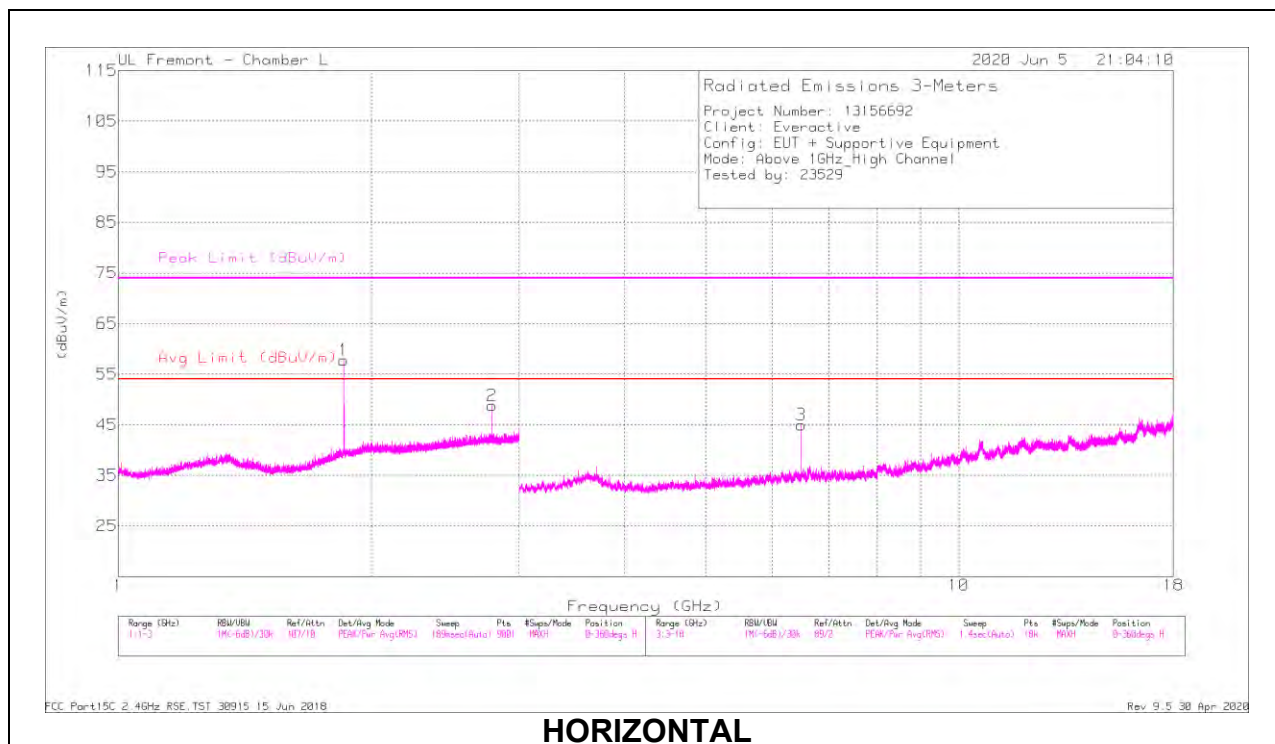
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (dB/m)	Cbl (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.23595	17.83	PK2	28.6	5.2	51.63	-	-	74	-22.37	312	111	H
	* 1.23264	6.52	MAv1	28.6	5.2	40.32	54	-13.68	-	-	312	111	H
2	* 1.33871	18.93	PK2	29	5.4	53.33	-	-	74	-20.67	260	207	V
	* 1.33828	6.63	MAv1	29	5.4	41.03	54	-12.97	-	-	260	107	V

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

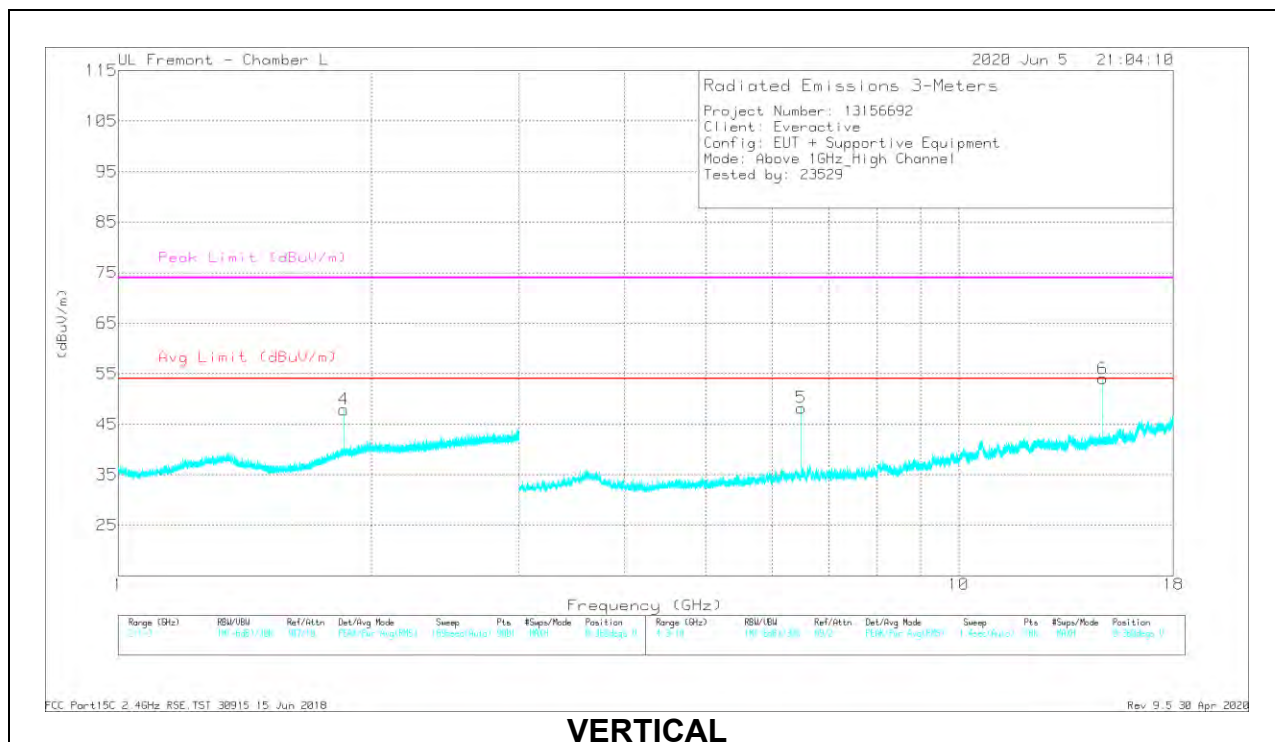
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Filter (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	1.85509	49.8	PK2	31.1	-22.2	1	59.7	-	-	-	-	247	270	H
2	* 2.78271	38.8	PK2	32.9	-20.4	1	52.3	-	-	74	-21.7	203	160	H
			Avg				44.51	54	-9.49					
4	1.85525	42.03	PK2	31.1	-22.2	1	51.93	-	-	-	-	218	266	V
3	6.49265	39.65	PK2	35.7	-24.8	1	51.55	-	-	-	-	149	102	H
5	6.49274	41	PK2	35.7	-24.8	1	52.9	-	-	-	-	166	106	V
6	14.84059	35.56	PK2	40.1	-18.5	1	58.16	-	-	-	-	148	110	V

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

Pk - Peak detector

Avg – Average detector

* Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is -7.79dB

Pulse number in 100ms * ((# of short pulses * short pulse width) + (# of long pulses * long pulse width)) / 100 or T

Refer to section 8.1.2 for duty cycle factor calculation (-7.79dB)

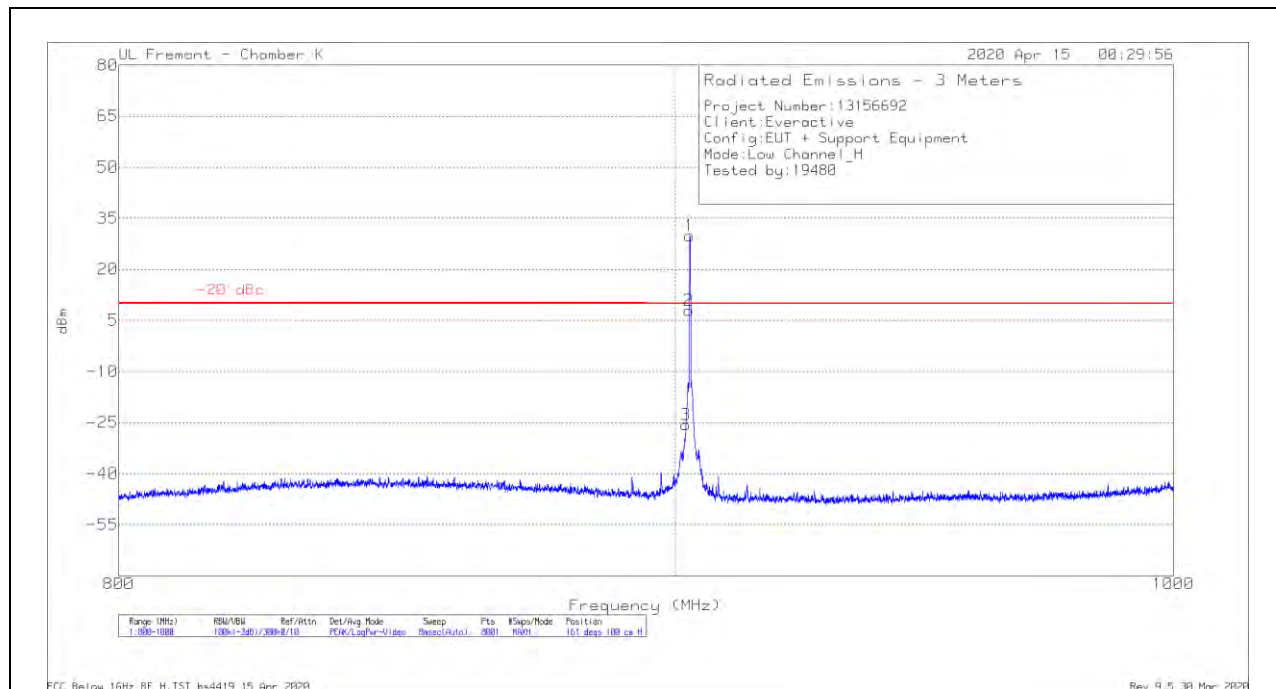
9.2. TRANSMITTER BELOW 1 GHz

9.2.1. CONFIGURATION 1: PANEL ANTENNA

9.2.1.1. MODE 1 - OOK

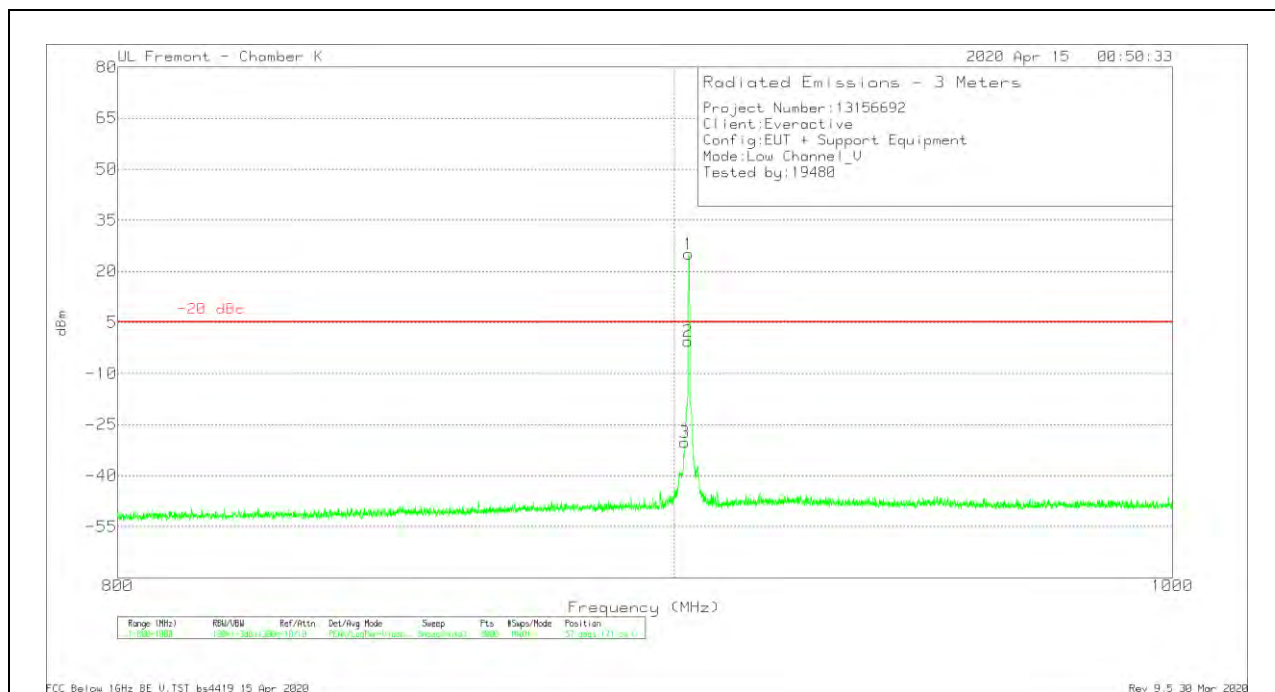
-20 dBc BANDEDGE WITHOUT NOTCH FILTER AND PRE-AMPLIFIER (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0181574 (dB/m)	Bypass (dB)	Amp/Cbl (dB)	Corrected Reading dBm	-20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	902.75	-7.85	Pk	28	4	5.8	29.95	-	-	161	100	H
2	902.6	-29.84	Pk	28	4	5.8	7.96	9.95	-1.99	161	100	H
3	902	-63.45	Pk	27.9	4	5.9	-25.65	9.95	-35.6	161	100	H

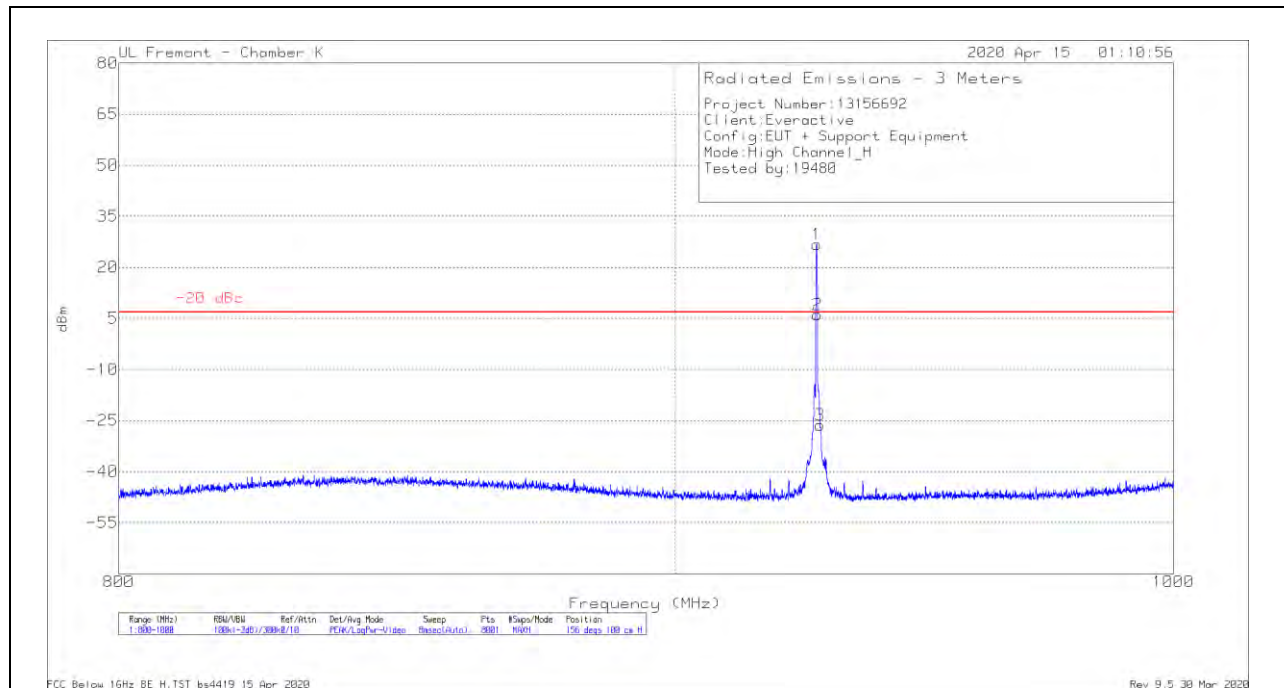
VERTICAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0181574 (dB/m)	Bypass (dB)	Amp/Cbl (dB)	Corrected Reading dBm	-20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	902.7623	-14.8	Pk	28	4	7.9	25.1	-	-	57	171	V
2	902.5873	-40.27	Pk	28	4	7.8	-47	5.1	-5.57	57	171	V
3	902.0122	-70.01	Pk	27.9	4	7.8	-30.31	5.1	-35.41	57	171	V

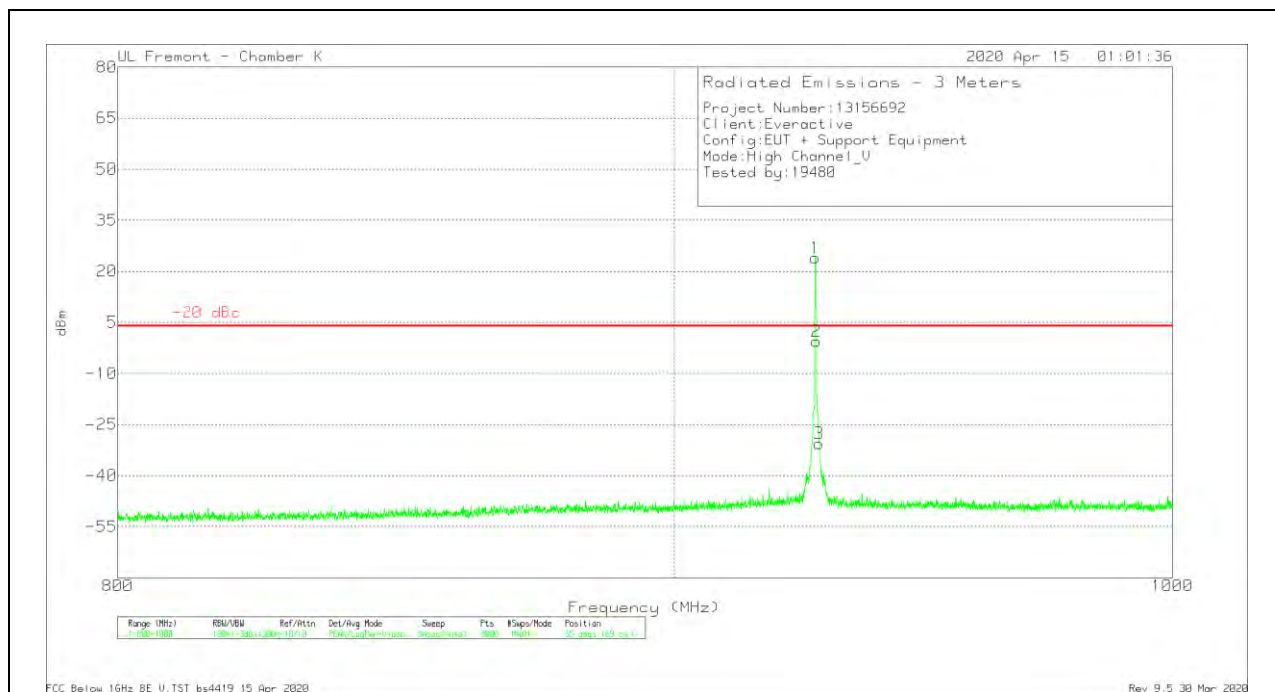
-20 dBc BANDEDGE WITHOUT NOTCH FILTER AND PRE-AMPLIFIER (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0181574 (dB/m)	Bypass (dB)	Amp/Cbl (dB)	Corrected Reading dBm	-20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	927.275	-9.91	Pk	28.5	4.1	4.1	26.79	-	-	156	100	H
2	927.425	-30.54	Pk	28.5	4.1	4.1	6.16	6.79	-63	156	100	H
3	928	-62.95	Pk	28.4	4.1	4.1	-26.35	6.79	-33.14	156	100	H

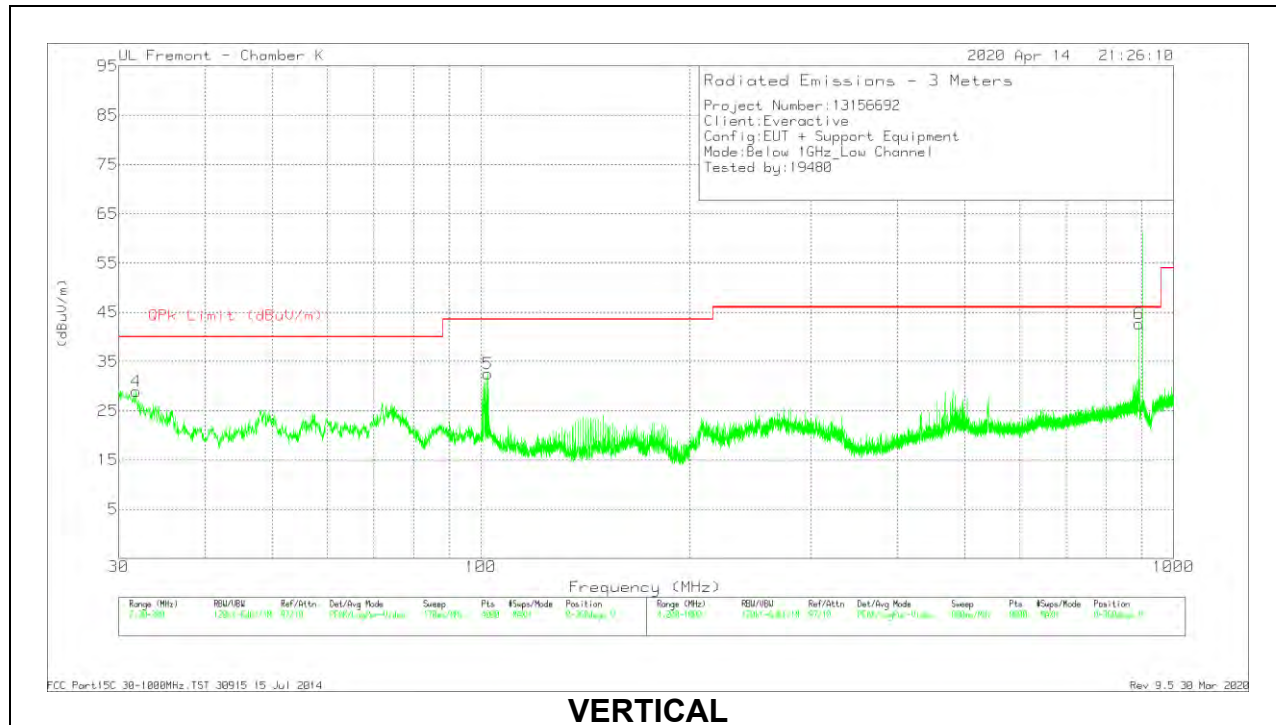
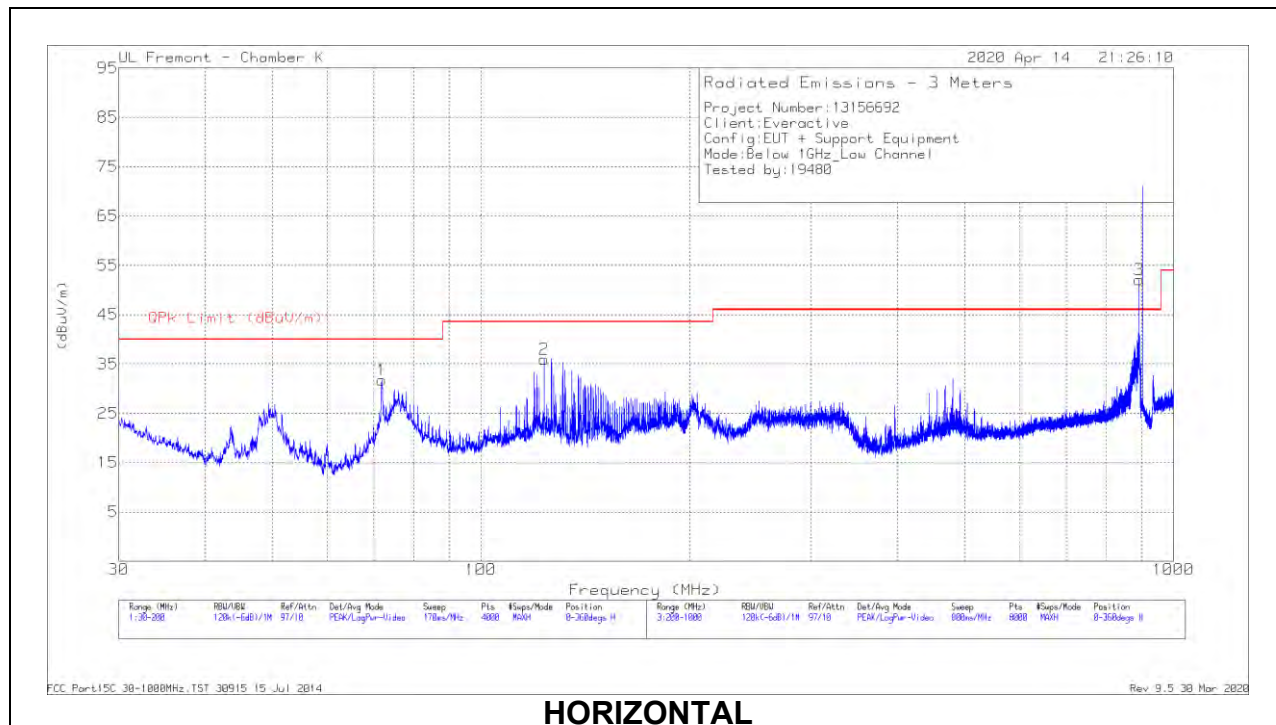
VERTICAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0181574 (dB/m)	Bypass (dB)	Amp/Cbl (dB)	Corrected Reading dBm	-20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	927.2653	-16.48	Pk	28.5	4.1	7.8	23.92	-	-	65	169	V
2	927.4403	-40.98	Pk	28.5	4.1	7.8	-.58	3.92	-4.5	65	169	V
3	927.9904	-70.81	Pk	28.4	4.1	7.8	-30.51	3.92	-34.43	65	169	V

HARMONICS AND SPURIOUS EMISSIONS WITH A NOTCH FILTER

LOW CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181574 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	71.9584	48.82	Pk	14.1	-31.2	.19	31.91	40	-8.09	0-360	201	H
2	* 123.4392	46.89	Pk	19.9	-30.8	.29	36.28	43.52	-7.24	0-360	201	H
4	31.7855	34.79	Pk	25.7	-31.5	.07	29.06	40	-10.94	0-360	95	V
5	102.3537	46.55	Pk	16.9	-30.9	.28	32.83	43.52	-10.69	0-360	95	V
3	** 891.7439	53.48	Pk	27.7	-27.2	2.6	56.58	-	-	2	105	H
	** 891.7439	48.48	Qp	27.7	-27.2	2.6	51.58	-	-	2	105	H
6	** 891.7396	45.83	Pk	27.7	-27.2	2.6	48.93	-	-	54	174	V
	** 891.7396	41.09	Qp	27.7	-27.2	2.6	44.19	-	-	54	174	V

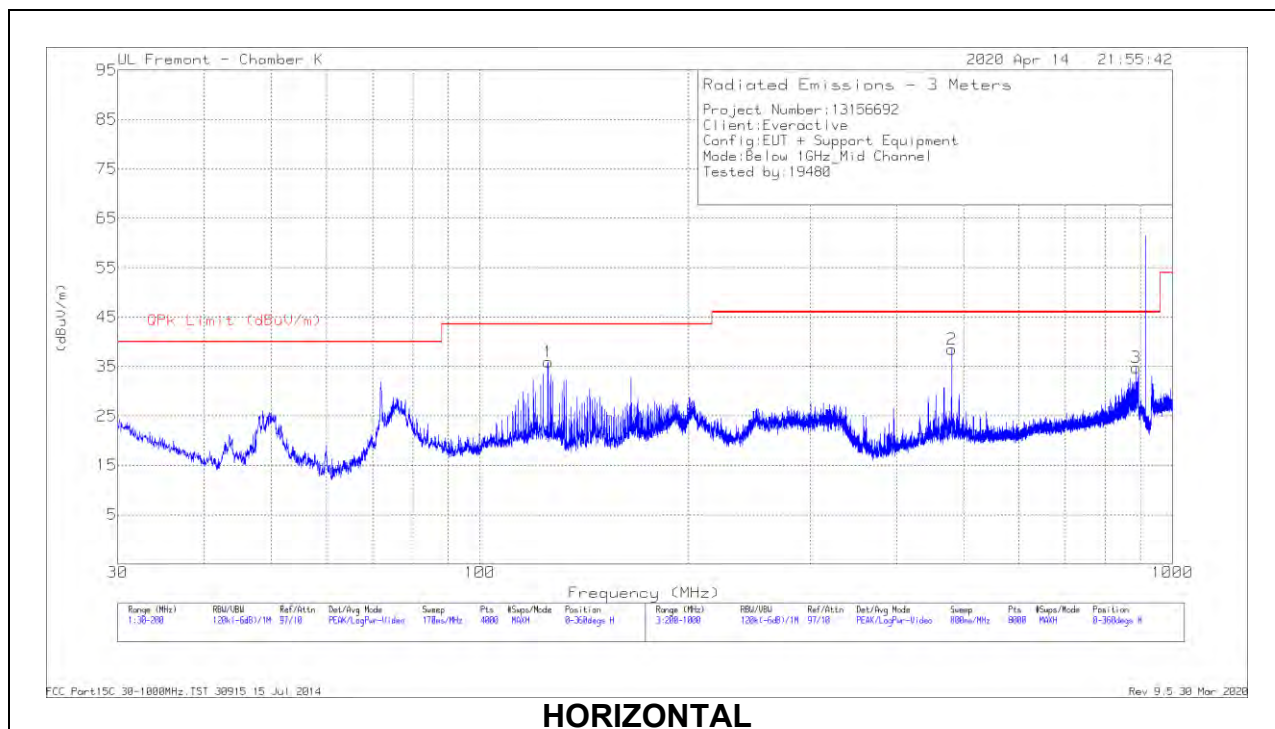
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

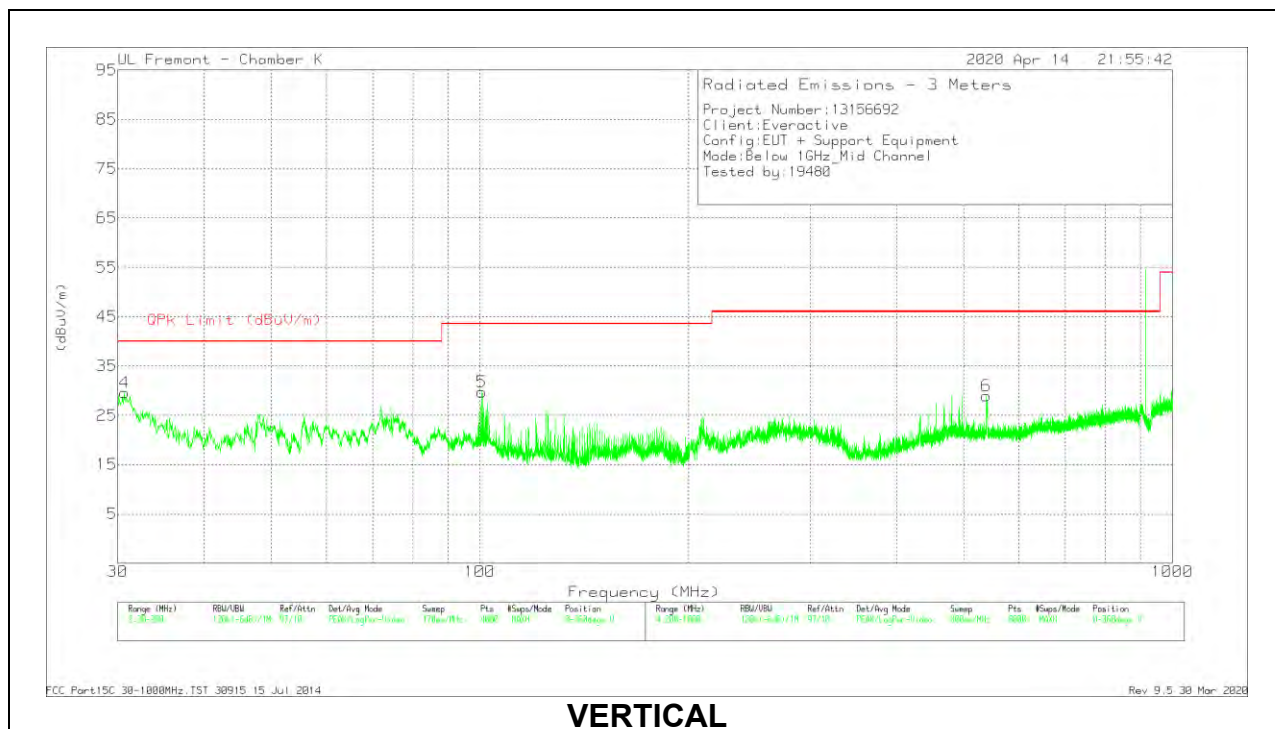
Qp - Quasi-Peak detector

** Spurious emission of fundamental 902.75MHz

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

Radiated Emissions

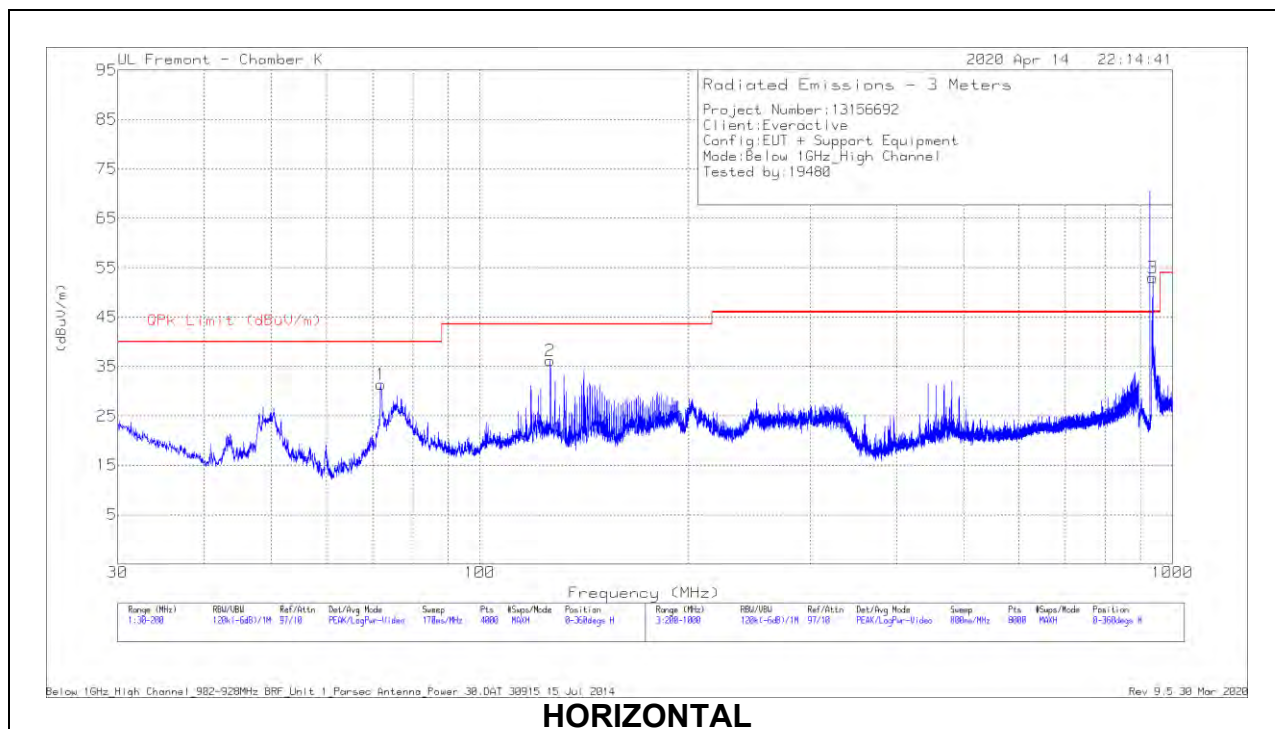
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181574 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 125.4372	46.74	Pk	19.9	-30.7	.29	36.23	43.52	-7.29	0-360	300	H
4	30.6802	34.67	Pk	26.5	-31.6	.06	29.63	40	-10.37	0-360	95	V
5	100.6958	44.21	Pk	16.4	-30.9	.28	29.99	43.52	-13.53	0-360	95	V
2	479.9364	44.13	Pk	23.6	-29.2	.23	38.76	46.02	-7.26	0-360	200	H
3	885.2891	34.21	Pk	27.8	-27.2	1.24	36.05	46.02	-9.97	0-360	99	H
6	538.744	33.92	Pk	24.1	-29.1	.34	29.26	46.02	-16.76	0-360	201	V

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

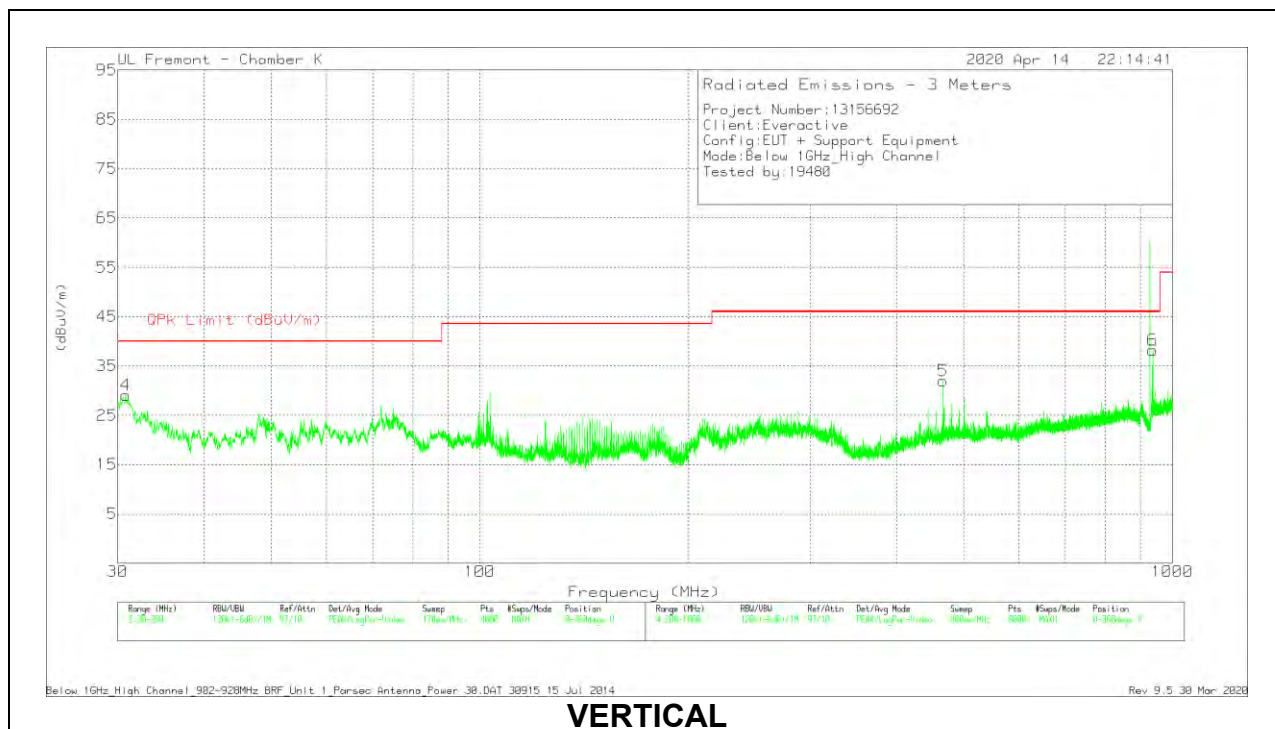
Pk - Peak detector

Qp - Quasi-Peak detector

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181574 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	71.9158	48.45	Pk	14.1	-31.2	.19	31.54	40	-8.46	0-360	301	H
2	* 126.4149	46.97	Pk	19.9	-30.7	.29	36.46	43.52	-7.06	0-360	200	H
4	30.8077	34.2	Pk	26.5	-31.6	.07	29.17	40	-10.83	0-360	95	V
3	** 936.3329	54.06	Pk	28.4	-26.9	2.44	58	-	-	166	96	H
	** 936.3329	47.9	Qp	28.4	-26.9	2.44	51.84	-	-	166	96	H
5	466.7347	38.05	Pk	23.2	-29.2	.22	32.27	46.02	-13.75	0-360	99	V
6	** 936.3727	44.28	Pk	28.4	-26.9	2.44	48.22	-	-	296	183	V
	** 936.3727	40.18	Qp	28.4	-26.9	2.44	44.12	-	-	296	183	V

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

Pk - Peak detector

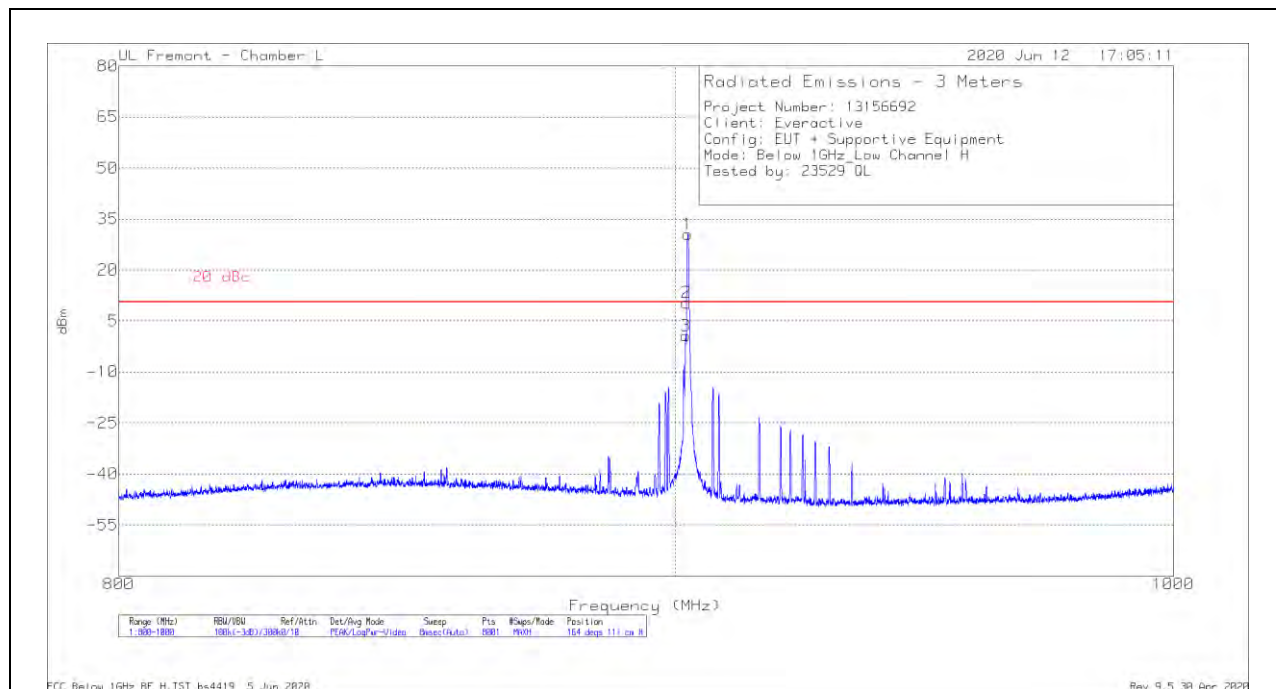
Qp - Quasi-Peak detector

** Spurious emission of fundamental 927.27MHz

9.2.1.2. MODE 2 - FSK

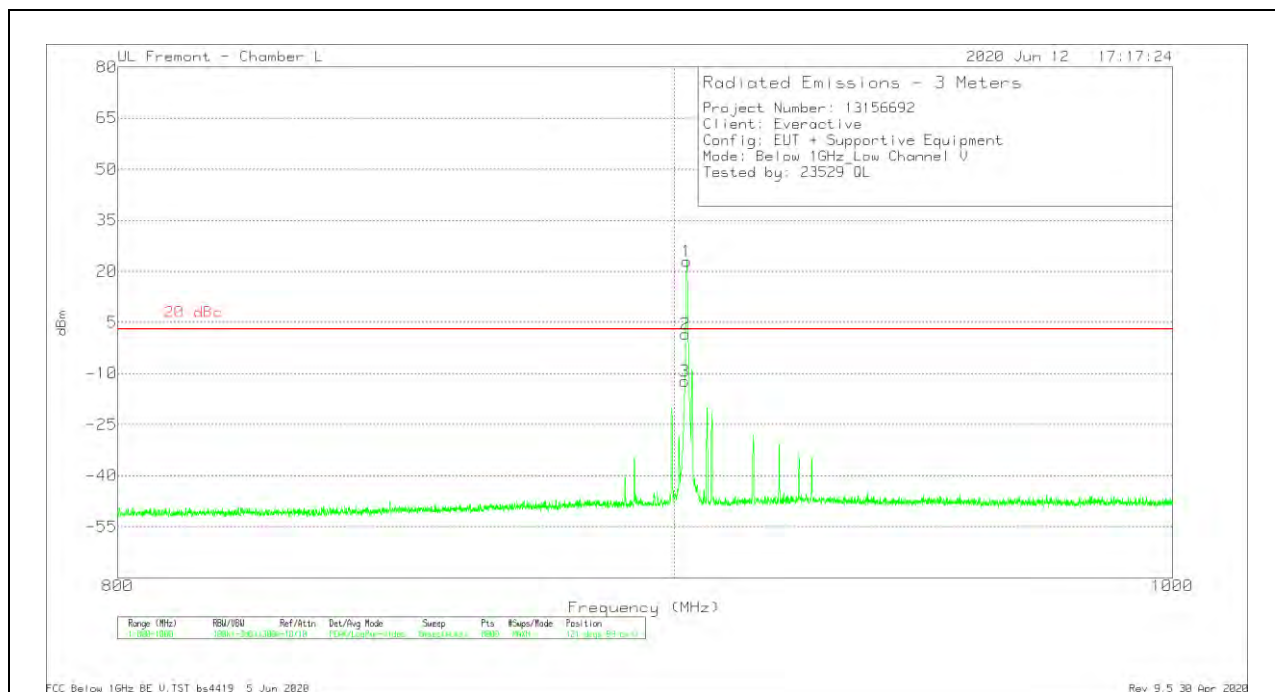
-20 dBc BANDEDGE WITHOUT NOTCH FILTER AND PRE-AMPLIFIER (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0184971 (dB/m)	Cbl (dB)	Amp/Cbl (dB)	Corrected Reading dBm	20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	902.35	-7.24	Pk	28	4	5.8	30.56	-	-	164	111	H
2	902.15	-27.47	Pk	28	4	5.8	10.33	10.56	-23	164	111	H
3	902	-37.24	Pk	28	4	5.9	.66	10.56	-9.9	164	111	H

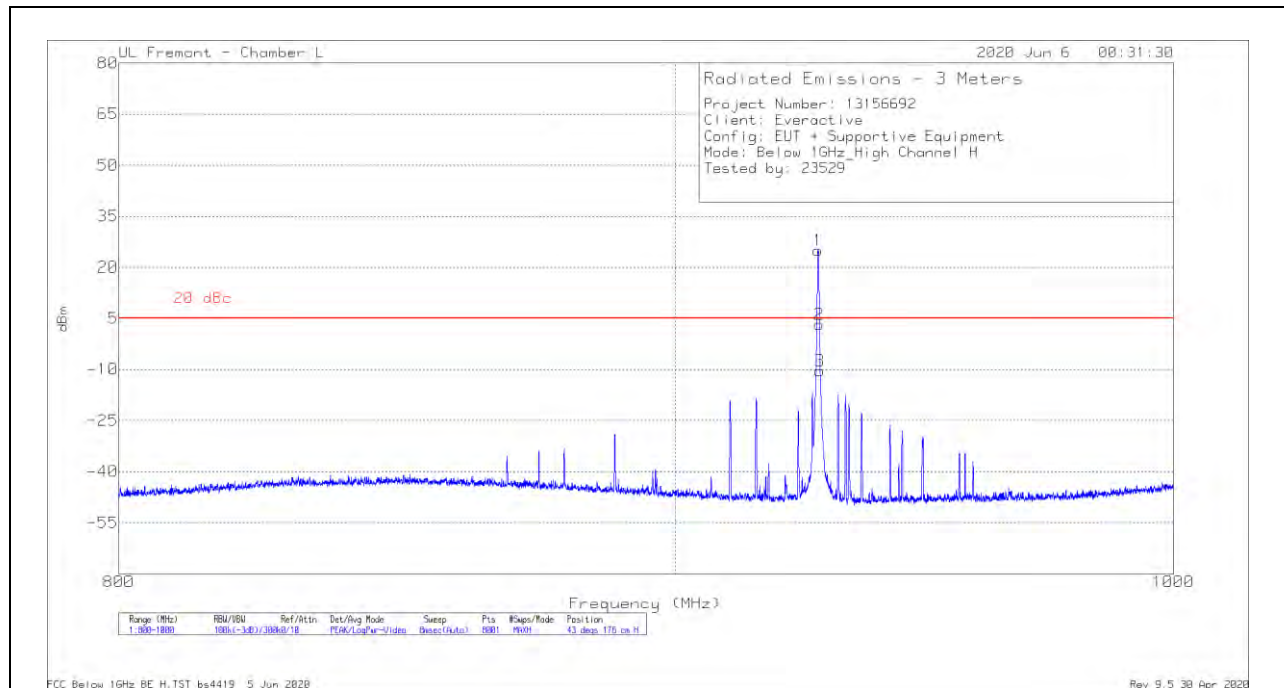
VERTICAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0184971 (dB/m)	Cbl (dB)	Amp/Cbl (dB)	Corrected Reading dBm	20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	902.3123	-16.84	Pk	28	4	7.8	22.96	-	-	121	99	V
2	902.1373	-38.15	Pk	28	4	7.8	1.65	2.96	-1.31	121	99	V
3	901.9872	-52.08	Pk	28	4	7.8	-12.28	2.96	-15.24	121	99	V

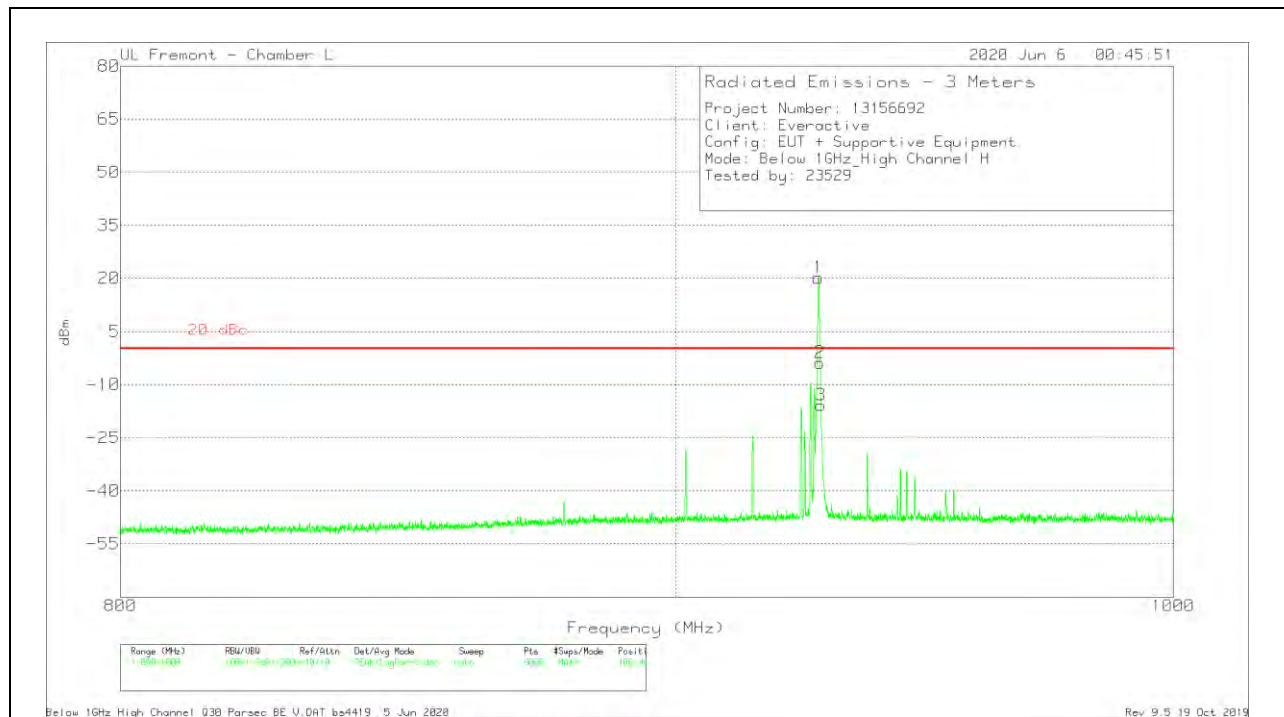
-20 dBc BANDEDGE WITHOUT NOTCH FILTER AND PRE-AMPLIFIER (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0184971 (dB/m)	Cbl (dB)	Amp/Cbl (dB)	Corrected Reading dBm	20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	927.525	-11.56	Pk	28.3	4.1	4.1	24.94	-	-	43	176	H
2	927.825	-33.23	Pk	28.3	4.1	4.1	3.27	4.99	-1.72	43	176	H
3	928	-46.98	Pk	28.3	4.1	4.1	-10.48	4.99	-15.47	43	176	H

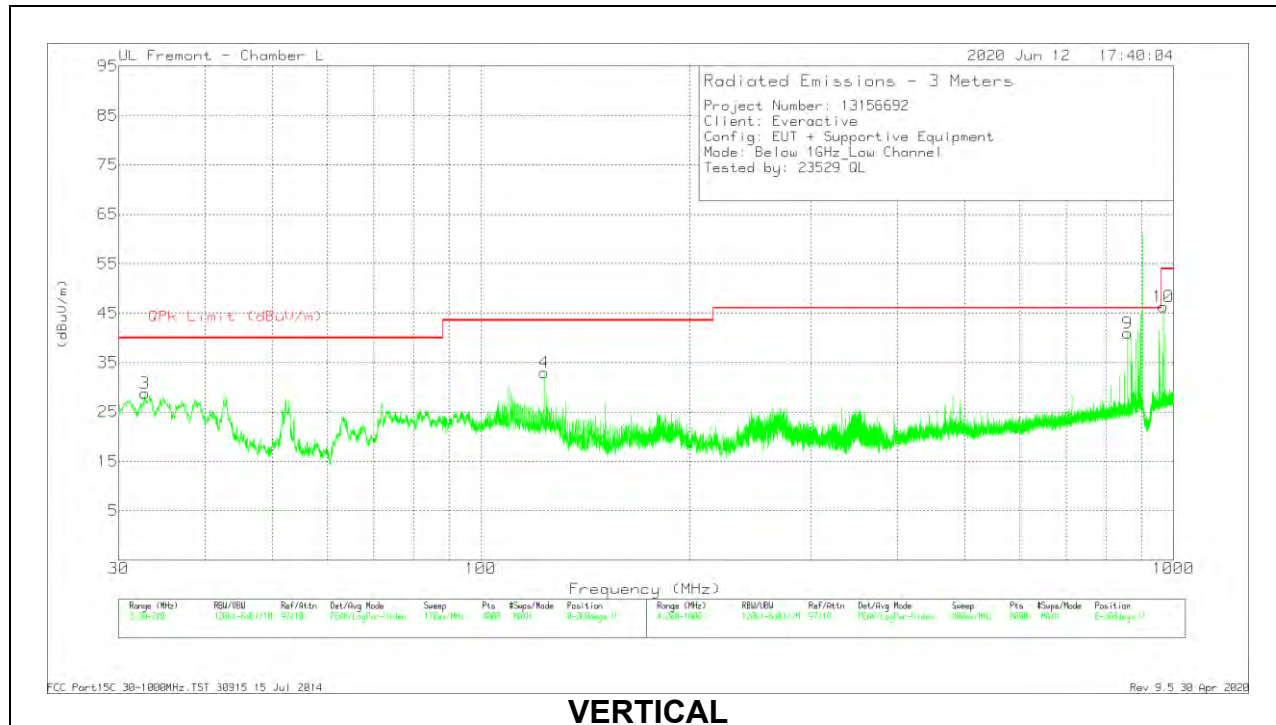
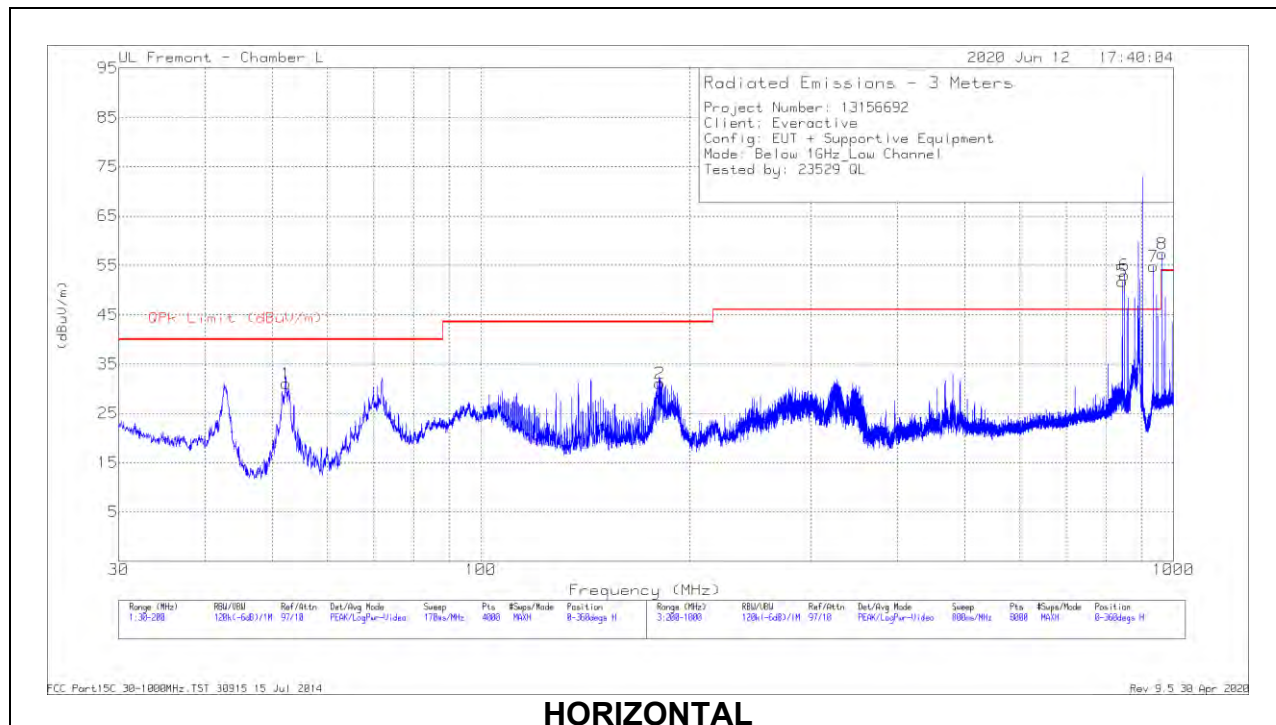
VERTICAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0184971 (dB/m)	Cbl (dB)	Amp/Cbl (dB)	Corrected Reading dBm	20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	927.5153	-20.02	Pk	28.3	4.1	7.8	20.18	-	-	106	101	V
2	927.8403	-44.04	Pk	28.3	4.1	7.8	-3.84	.18	-4.02	106	101	V
3	928.0154	-56.01	Pk	28.3	4.1	7.8	-15.81	.18	-15.99	106	101	V

HARMONICS AND SPURIOUS EMISSIONS WITH A NOTCH FILTER

LOW CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184971 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	52.3183	49.27	Pk	13	-31.2	.13	31.2	40	-8.8	0-360	399	H
2	181.2966	44.41	Pk	16.9	-30.2	.24	31.35	43.52	-12.17	0-360	99	H
3	32.7207	35.29	Pk	24.9	-31.4	.07	28.86	40	-11.14	0-360	101	V
4	* 123.3967	43.95	Pk	19.6	-30.6	.29	33.24	43.52	-10.28	0-360	101	V
5	** 844.491	52.66	Pk	27.7	-27.7	.53	53.19	-	-	151	109	H
	** 844.4699	25.77	Qp	27.7	-27.7	.53	26.3	-	-	151	109	H
6	** 850.6115	54.12	Pk	27.6	-27.8	.58	54.5	-	-	162	109	H
	** 850.4005	25.85	Qp	27.6	-27.8	.58	26.23	-	-	162	109	H
7	** 934.8508	61.25	Pk	28.4	-27.3	3.58	65.93	-	-	289	154	H
	** 934.8508	24.49	Qp	28.4	-27.3	3.58	29.17	-	-	289	154	H
8	* 962.9606	56.77	Pk	28.8	-27.1	.47	58.94	54	4.94	359	169	H
	* 962.9606	24.2	Qp	28.8	-27.1	.47	26.37	54	-27.63	359	169	H
9	** 858.5856	41	Pk	27.6	-27.6	.68	41.68	-	-	0-360	199	V
10	* 966.1996	44.59	Pk	28.8	-27.1	.44	46.73	54	-7.27	0-360	299	V

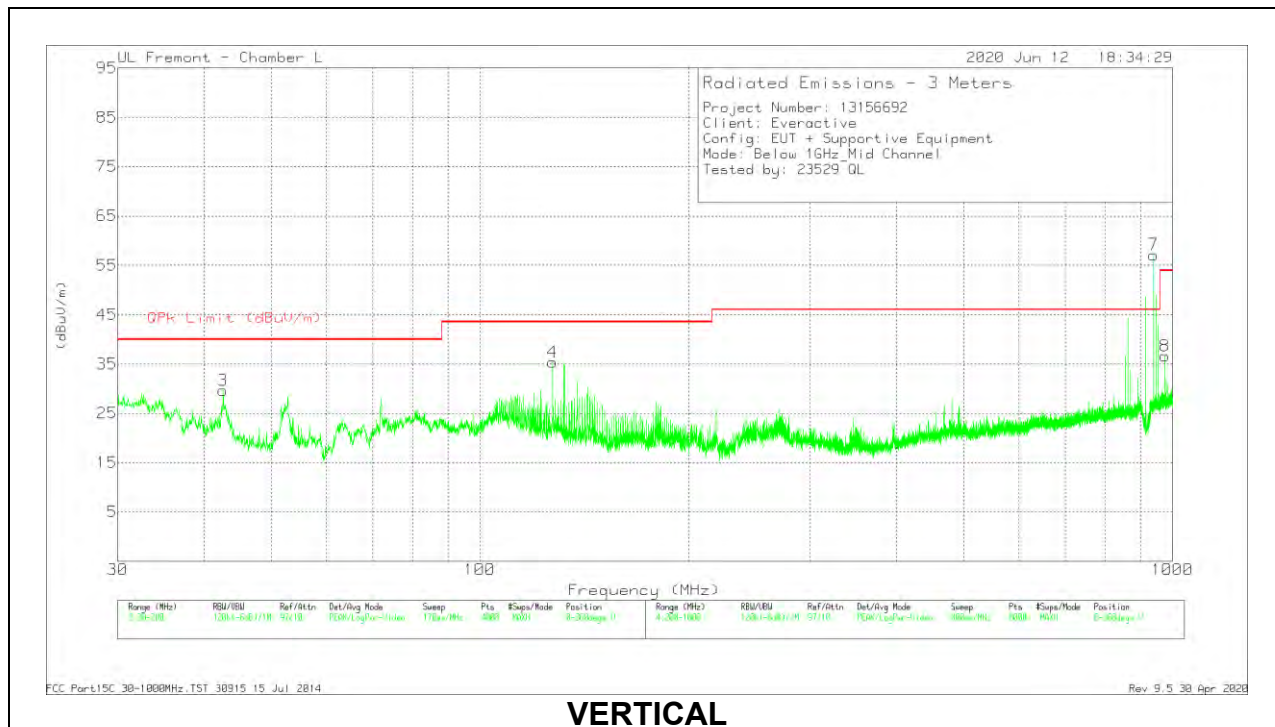
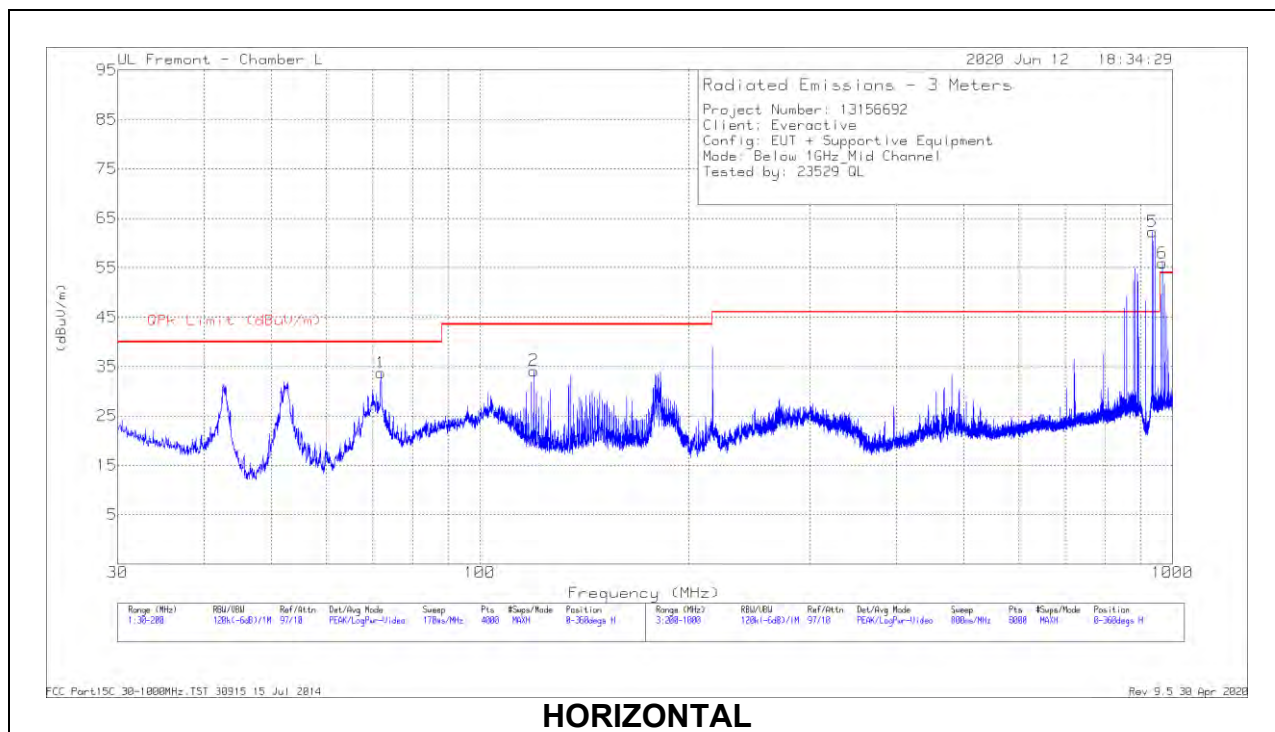
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

Qp - Quasi-Peak detector

** Spurious emission of fundamental 902.4MHz

MID CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184971 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	71.9584	50.79	Pk	13.9	-31	.19	33.88	40	-6.12	0-360	199	H
2	* 119.6557	45.27	Pk	19.5	-30.6	.29	34.46	43.52	-9.06	0-360	199	H
3	42.5833	43.01	Pk	17.9	-31.3	0.1	29.71	40	-10.29	0-360	101	V
4	* 127.3927	46.35	Pk	19.6	-30.6	.29	35.64	43.52	-7.88	0-360	101	V
5	** 935.4606	69.01	Pk	28.4	-27.3	3.01	70.11	-	-	346	102	H
	** 935.4606	29.69	Qp	28.4	-27.3	3.01	30.79	-	-	346	102	H
6	* 965.9548	54.22	Pk	28.8	-27.1	0.44	55.92	54	1.92	357	172	H
	* 965.9548	22.41	Qp	28.8	-27.1	0.44	24.11	54	-29.89	357	172	H
7	** 939.147	58.98	Pk	28.5	-27.3	1.43	60.18	-	-	266	180	V
	** 939.147	24.73	Qp	28.5	-27.3	1.43	25.93	-	-	266	180	V
8	* 976.0009	34.44	Pk	29	-26.8	.39	37.03	54	-16.97	0-360	199	V

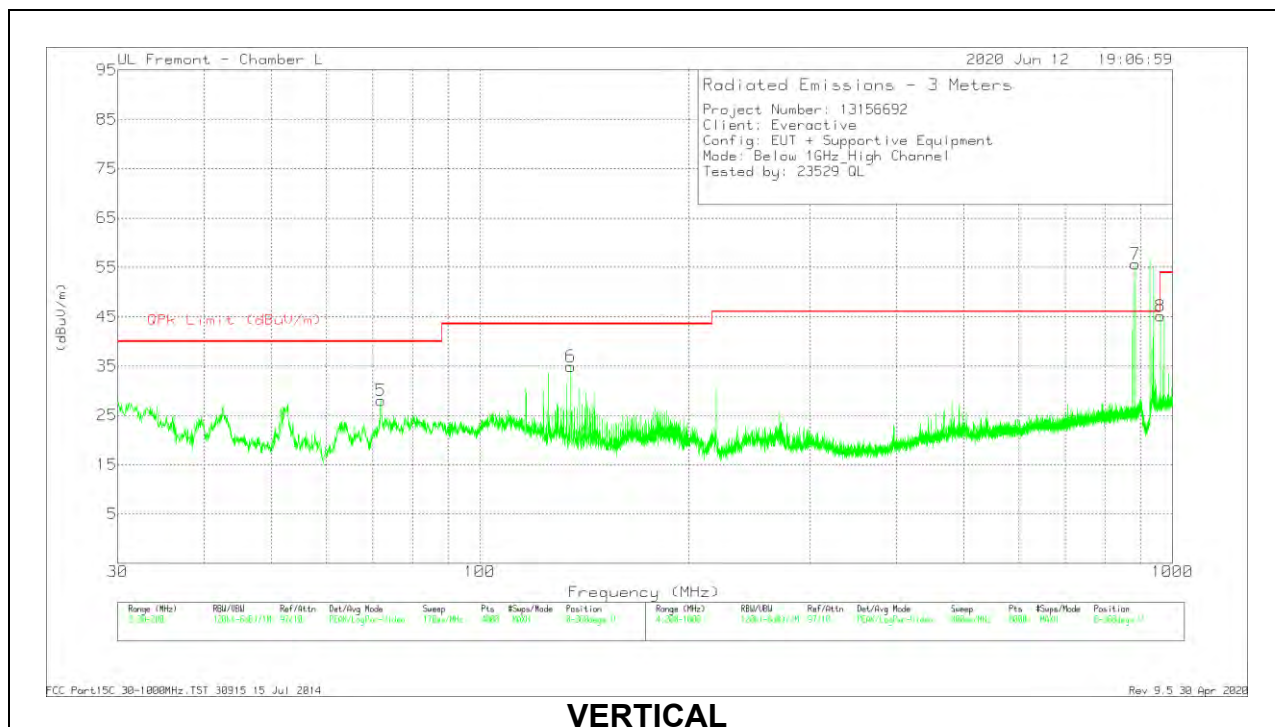
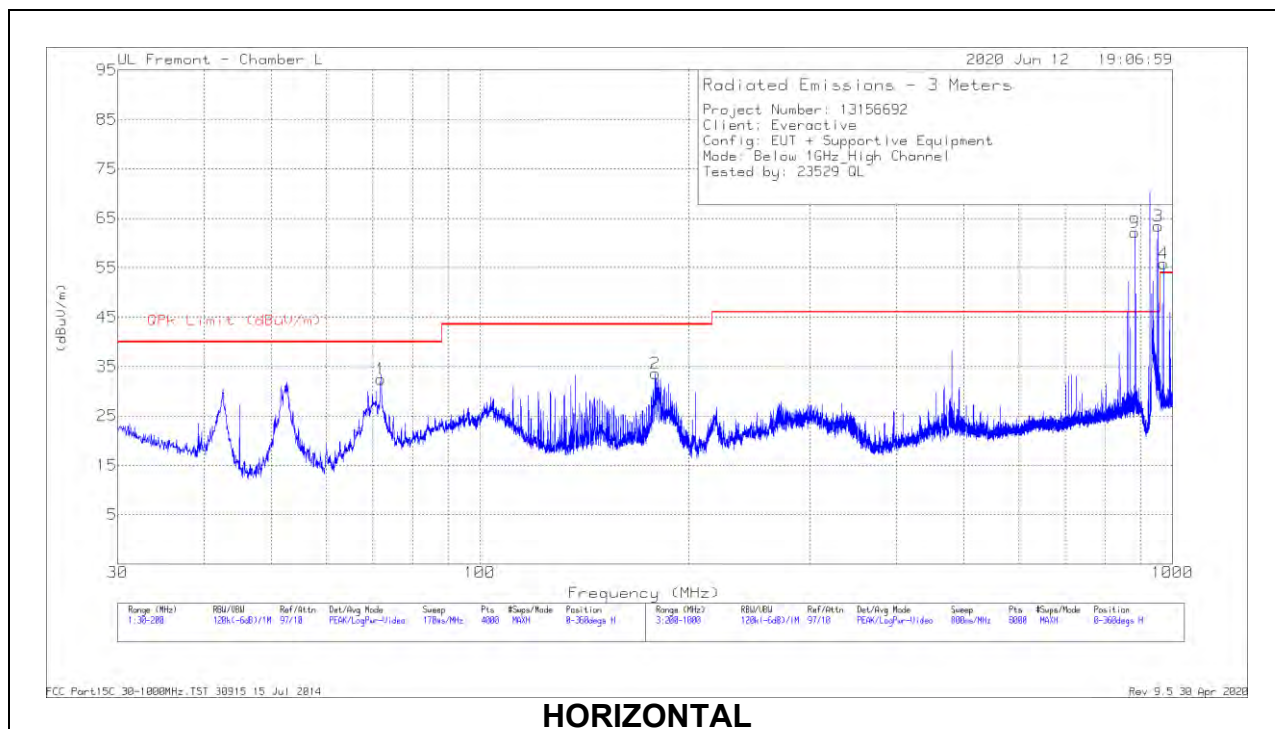
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

Qp - Quasi-Peak detector

** Spurious emission of fundamental 914.8MHz

HIGH CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184971 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	72.0009	49.53	Pk	13.9	-31	.19	32.62	40	-7.38	0-360	299	H
2	179.2136	46.88	Pk	16.9	-30.2	.25	33.83	43.52	-9.69	0-360	199	H
5	72.0009	45.12	Pk	13.9	-31	.19	28.21	40	-11.79	0-360	101	V
6	* 135.2997	46.33	Pk	19.1	-30.5	.29	35.22	43.52	-8.3	0-360	101	V
3	** 953.5106	62.2	Pk	28.6	-27.1	.57	64.27	-	-	0	253	H
	** 953.5106	26.38	Qp	28.6	-27.1	.57	28.45	-	-	0	253	H
4	* 970.6703	54.93	Pk	28.8	-26.9	.41	57.24	54	3.24	143	167	H
	* 970.6703	23.68	Qp	28.8	-26.9	.41	25.99	54	-28.01	143	167	H
9	** 883.1322	65.19	Pk	27.9	-27.4	1.08	66.77	-	-	176	109	H
	** 883.1322	27.87	Qp	27.9	-27.4	1.08	29.45	-	-	176	109	H
7	** 885.136	57.98	Pk	27.9	-27.5	1.22	59.6	-	-	121	106	V
	** 885.136	22.33	Qp	27.9	-27.5	1.22	23.95	-	-	121	106	V
8	* 961.599	43.54	Pk	28.7	-27.1	.48	45.62	54	-8.38	0-360	101	V

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

Pk - Peak detector

Qp - Quasi-Peak detector

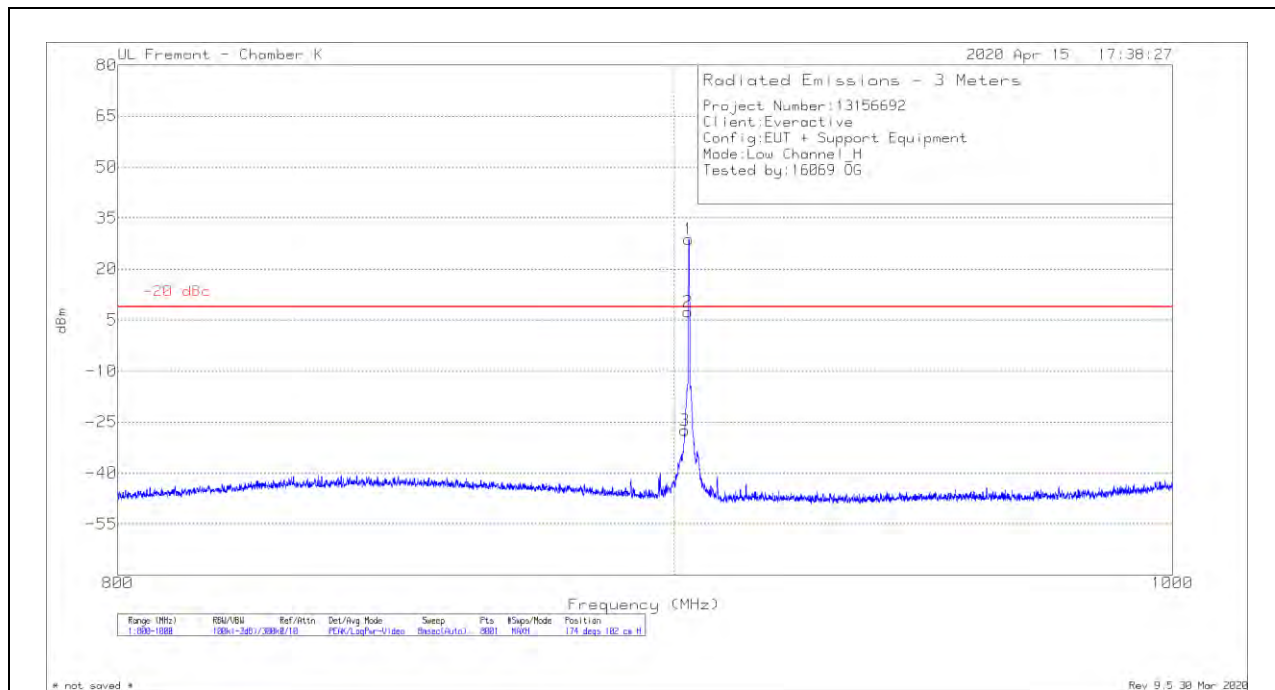
** Spurious emission of fundamental 927.6MHz

9.2.1. CONFIGURATION 2: DIPOLE ANTENNA

9.2.1.1. MODE 1 - OOK

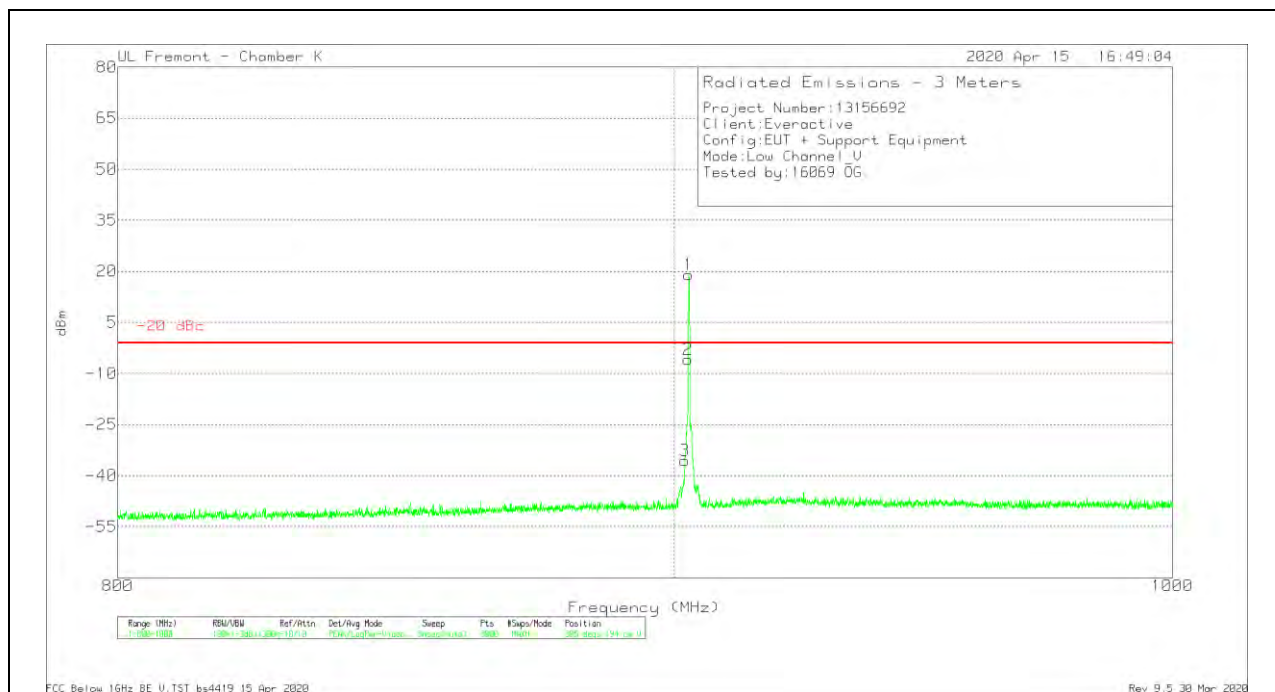
-20 dBc BANDEDGE WITHOUT NOTCH FILTER AND PRE-AMPLIFIER (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0181574 (dB/m)	Bypass (dB)	Amp/Cbl (dB)	Corrected Reading dBm	-20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	902.75	-9.01	Pk	28	4	5.8	28.79	-	-	174	102	H
2	902.6	-30.37	Pk	28	4	5.8	7.43	8.79	-1.36	174	102	H
3	902	-65.27	Pk	27.9	4	5.9	-27.47	8.79	-36.26	174	102	H

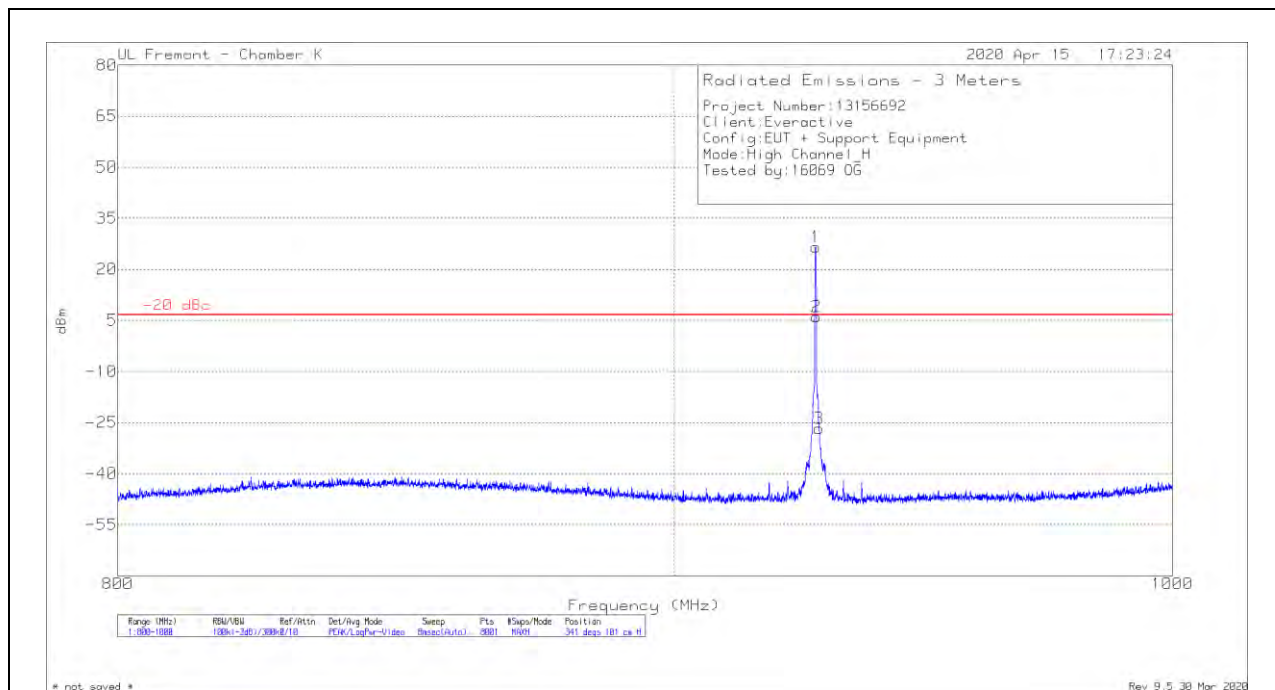
VERTICAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0181574 (dB/m)	Bypass (dB)	Amp/Cbl (dB)	Corrected Reading dBm	-20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	902.7373	-20.92	Pk	28	4	7.9	18.98	-	-	305	194	V
2	902.5873	-45.64	Pk	28	4	7.8	-5.84	-1.02	-4.82	305	194	V
3	902.0122	-75.34	Pk	27.9	4	7.8	-35.64	-1.02	-34.62	305	194	V

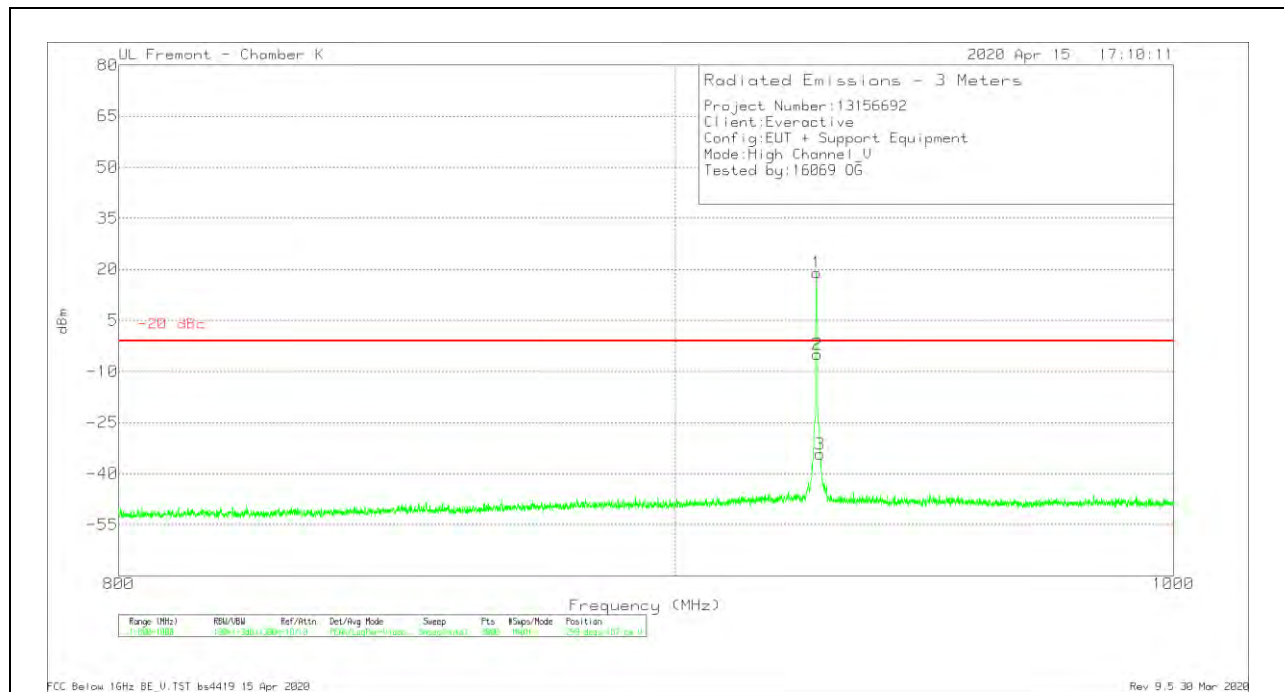
-20 dBc BANDEDGE WITHOUT NOTCH FILTER AND PRE-AMPLIFIER (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0181574 (dB/m)	Bypass (dB)	Amp/Cbl (dB)	Corrected Reading dBm	-20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	927.275	-10.1	Pk	28.5	4.1	4.1	26.6	-	-	341	101	H
2	927.425	-30.56	Pk	28.5	4.1	4.1	6.14	6.6	-46	341	101	H
3	928	-63.37	Pk	28.4	4.1	4.1	-26.77	6.6	-33.37	341	101	H

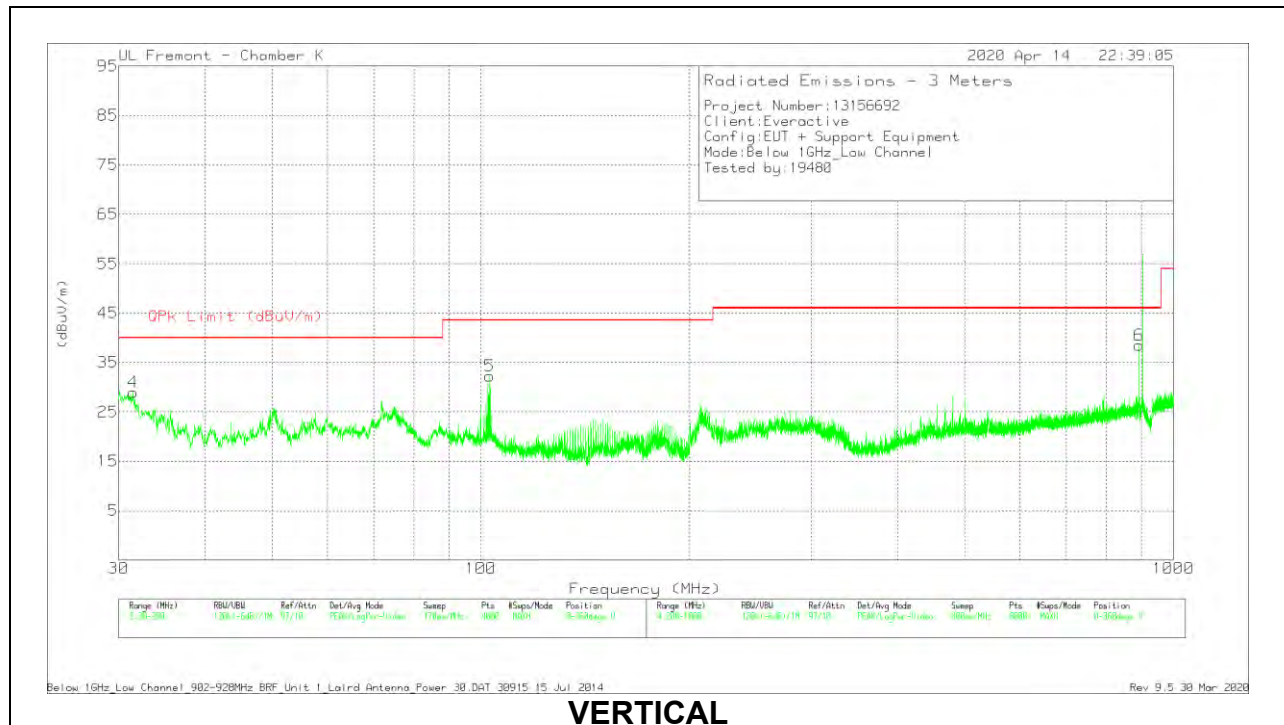
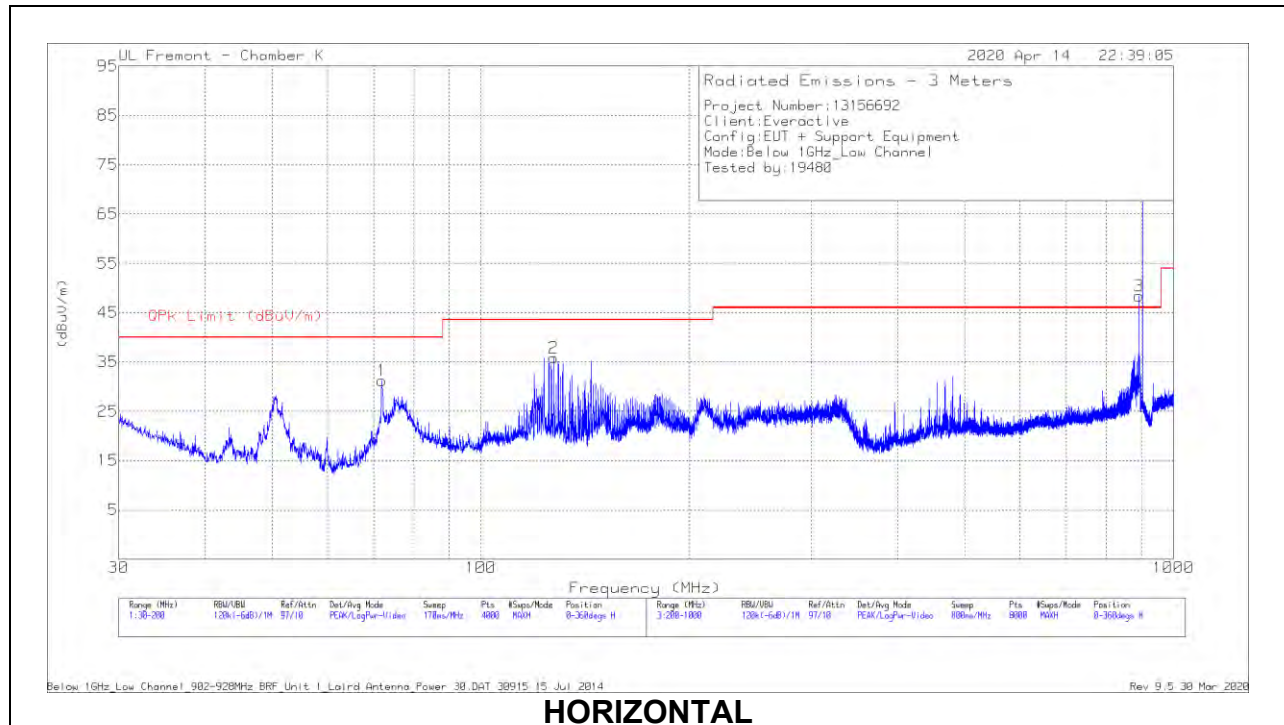
VERTICAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0181574 (dB/m)	Bypass (dB)	Amp/Cbl (dB)	Corrected Reading dBm	-20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	927.2903	-21.47	Pk	28.5	4.1	7.8	18.93	-	-	299	187	V
2	927.4403	-45.35	Pk	28.5	4.1	7.8	-4.95	-1.07	-3.88	299	187	V
3	927.9904	-74.65	Pk	28.4	4.1	7.8	-34.35	-1.07	-33.28	299	187	V

HARMONICS AND SPURIOUS EMISSIONS WITH A NOTCH FILTER

LOW CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181574 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	71.9584	48.32	Pk	14.1	-31.2	.19	31.41	40	-8.59	0-360	201	H
2	* 127.3927	46.77	Pk	19.8	-30.7	.29	36.16	43.52	-7.36	0-360	201	H
4	31.4454	34.46	Pk	26	-31.5	.07	29.03	40	-10.97	0-360	95	V
5	102.9914	46.22	Pk	17	-30.9	.28	32.6	43.52	-10.92	0-360	95	V
3	** 891.7678	54.37	Pk	27.7	-27.2	2.6	57.47	-	-	179	96	H
	** 891.7678	47.59	Qp	27.7	-27.2	2.6	50.69	-	-	179	96	H
6	** 891.7587	39.91	Pk	27.7	-27.2	2.6	43.01	-	-	296	105	V
	** 891.7587	34.7	Qp	27.7	-27.2	2.6	37.8	-	-	296	105	V

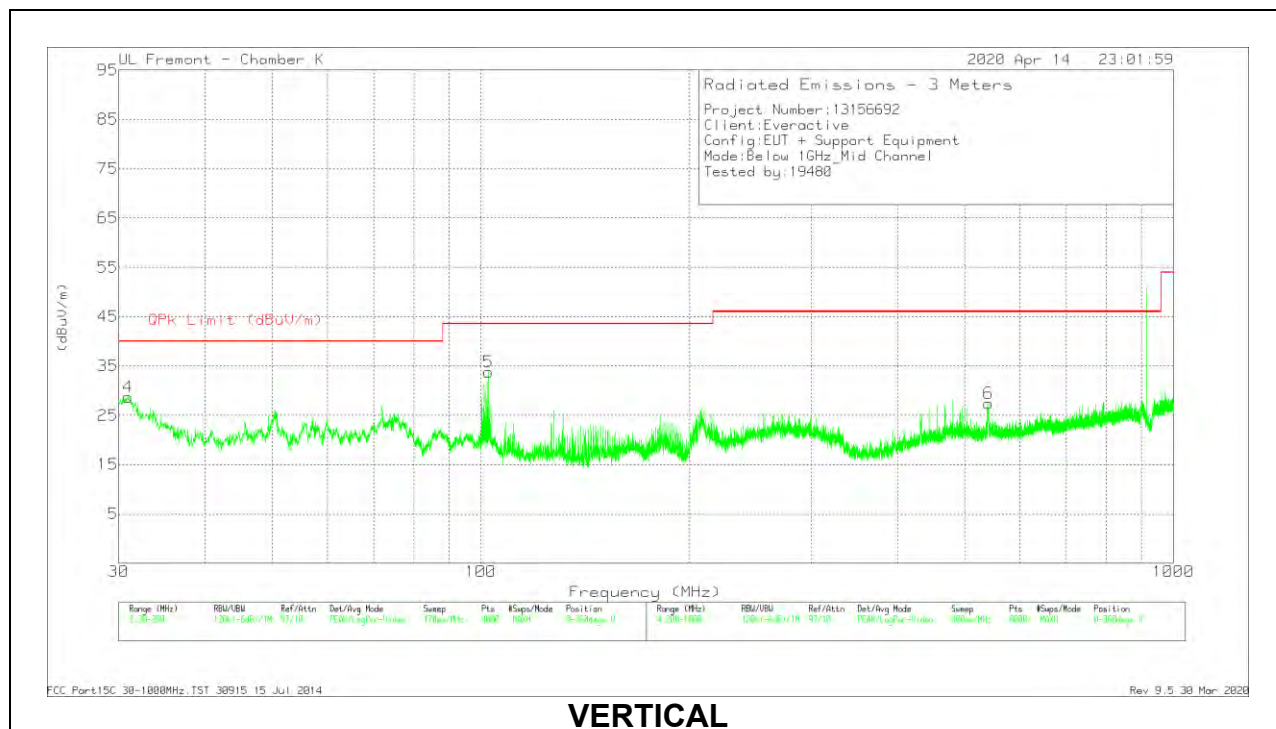
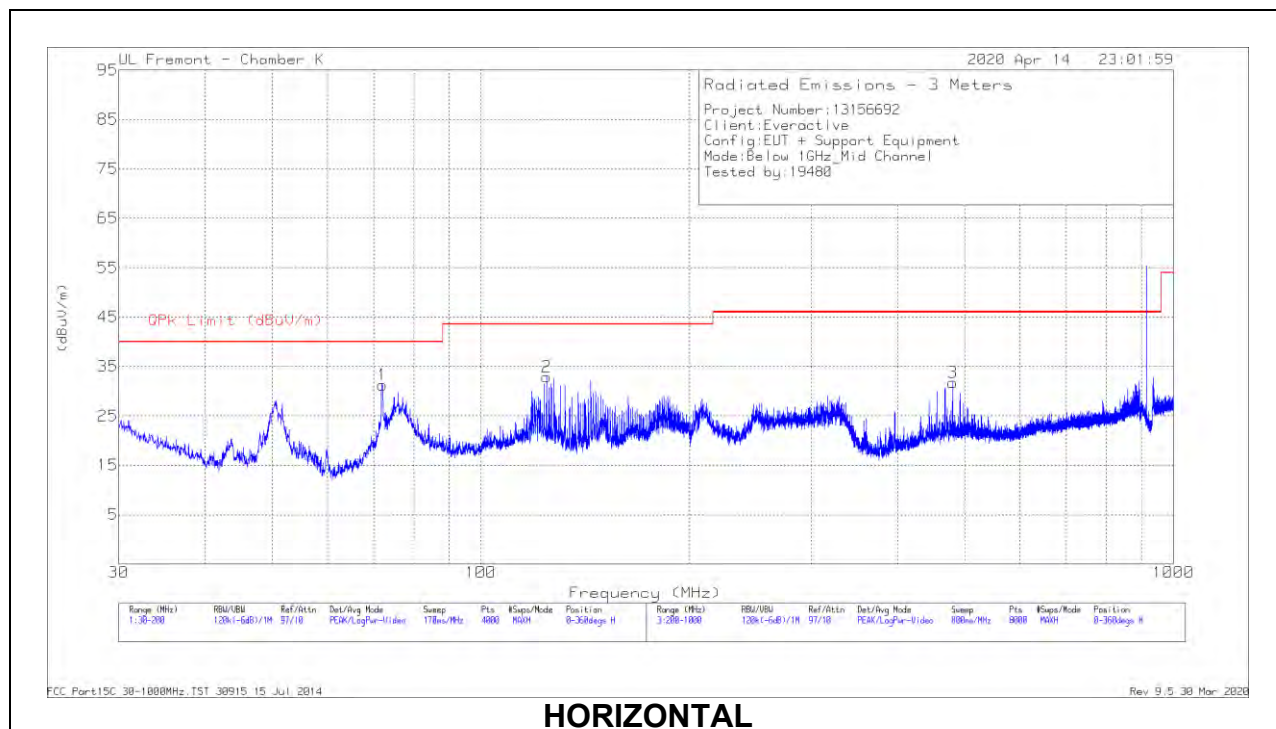
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

Qp - Quasi-Peak detector

** Spurious emission of fundamental 902.75MHz

MID CHANNEL RESULTS



Radiated Emissions

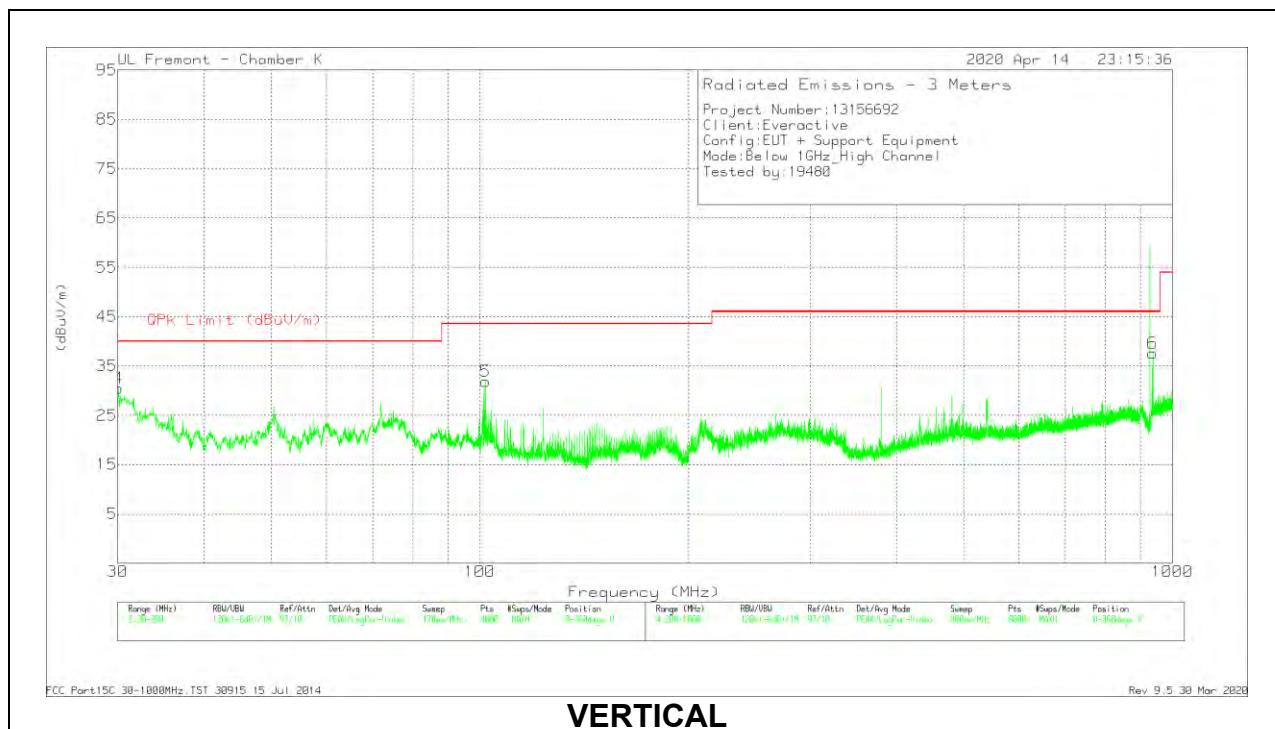
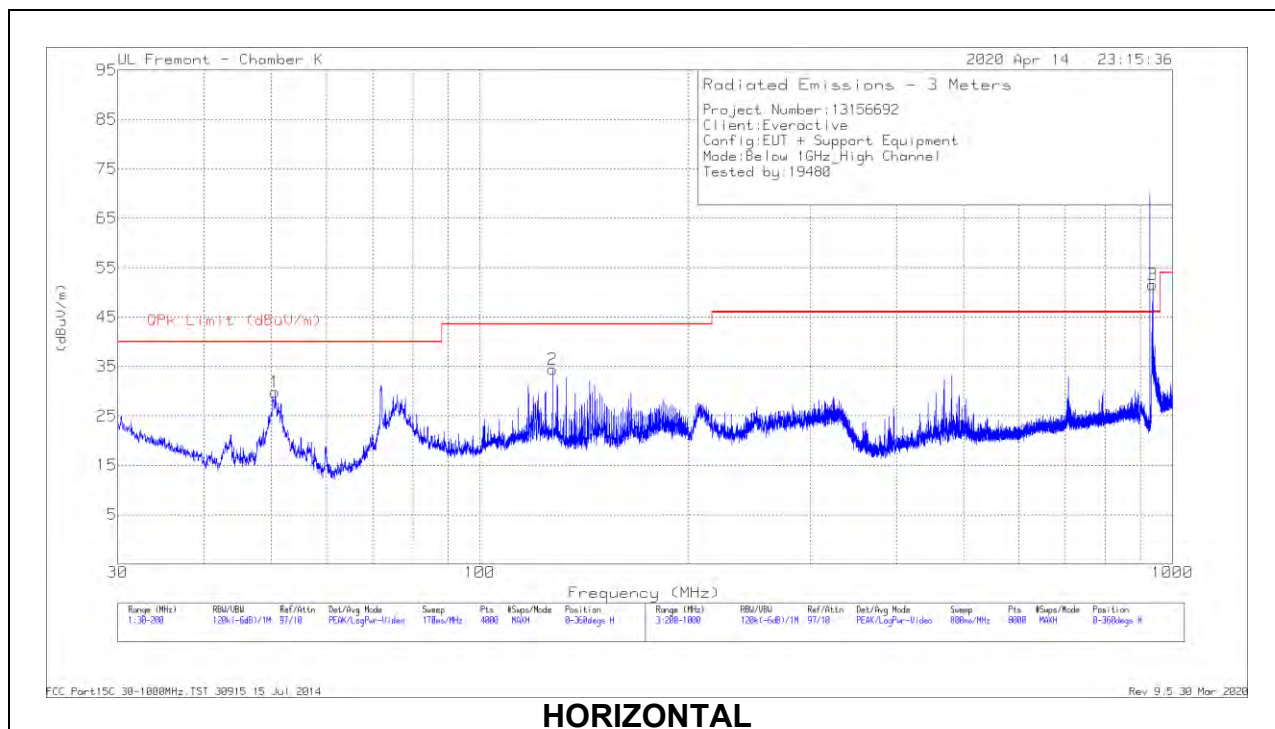
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181574 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	72.0859	48.3	Pk	14.1	-31.2	.19	31.39	40	-8.61	0-360	301	H
2	* 124.4594	43.76	Pk	19.9	-30.8	.29	33.15	43.52	-10.37	0-360	102	H
4	30.9778	33.82	Pk	26.4	-31.5	.07	28.79	40	-11.21	0-360	95	V
5	102.4813	47.83	Pk	16.9	-30.9	.28	34.11	43.52	-9.41	0-360	95	V
3	480.0364	37.32	Pk	23.6	-29.2	.23	31.95	46.02	-14.07	0-360	201	H
6	540.8443	32.31	Pk	24.2	-29.1	.34	27.75	46.02	-18.27	0-360	99	V

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

Pk - Peak detector

Qp - Quasi-Peak detector

HIGH CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181574 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	50.6603	47.5	Pk	13.7	-31.3	.12	30.02	40	-9.98	0-360	401	H
2	* 127.4352	45.35	Pk	19.8	-30.7	.29	34.74	43.52	-8.78	0-360	401	H
4	30.085	35.26	Pk	26.8	-31.6	.06	30.52	40	-9.48	0-360	95	V
5	101.8436	45.98	Pk	16.8	-30.9	.28	32.16	43.52	-11.36	0-360	95	V
3	** 936.3631	52.99	Pk	28.4	-26.9	2.44	56.93	-	-	163	95	H
	** 936.3631	48.83	Qp	28.4	-26.9	2.44	52.77	-	-	163	95	H
6	** 936.4	44.65	Pk	28.4	-26.9	2.44	48.59	-	-	293	188	V
	** 936.4	37.21	Qp	28.4	-26.9	2.44	41.15	-	-	293	188	V

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

Pk - Peak detector

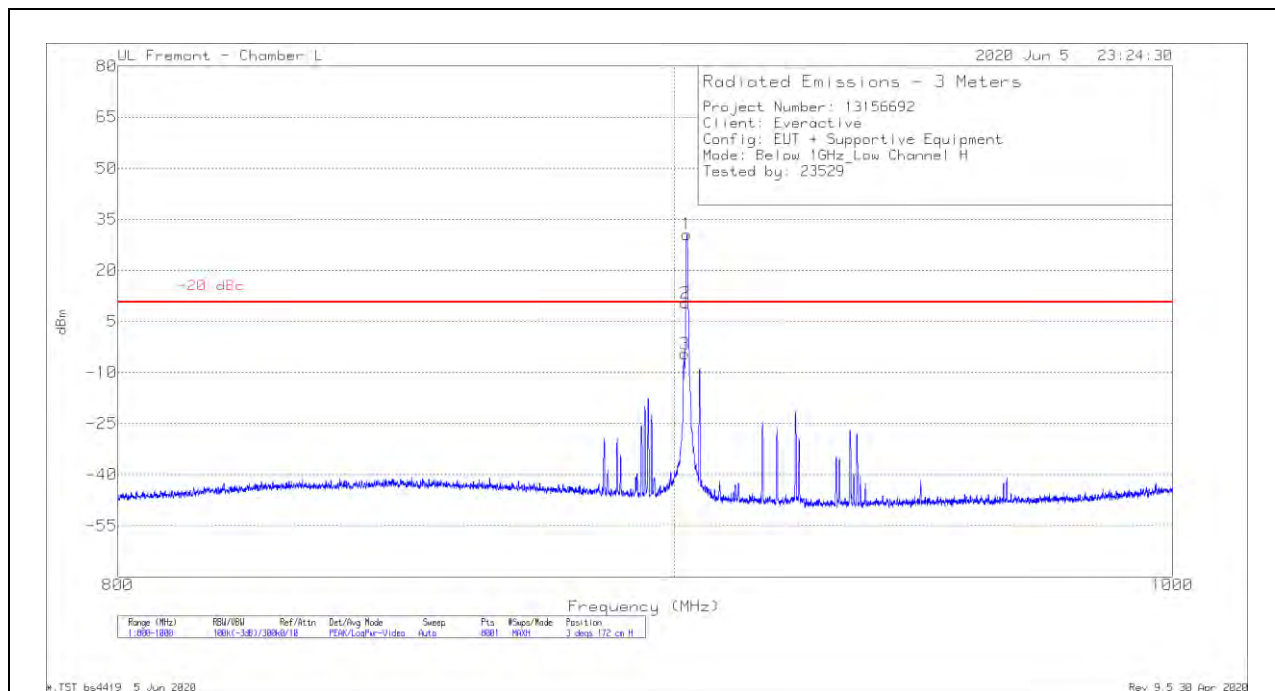
Qp - Quasi-Peak detector

** Spurious emission of fundamental 927.27MHz

9.2.1.2. MODE 2 - FSK

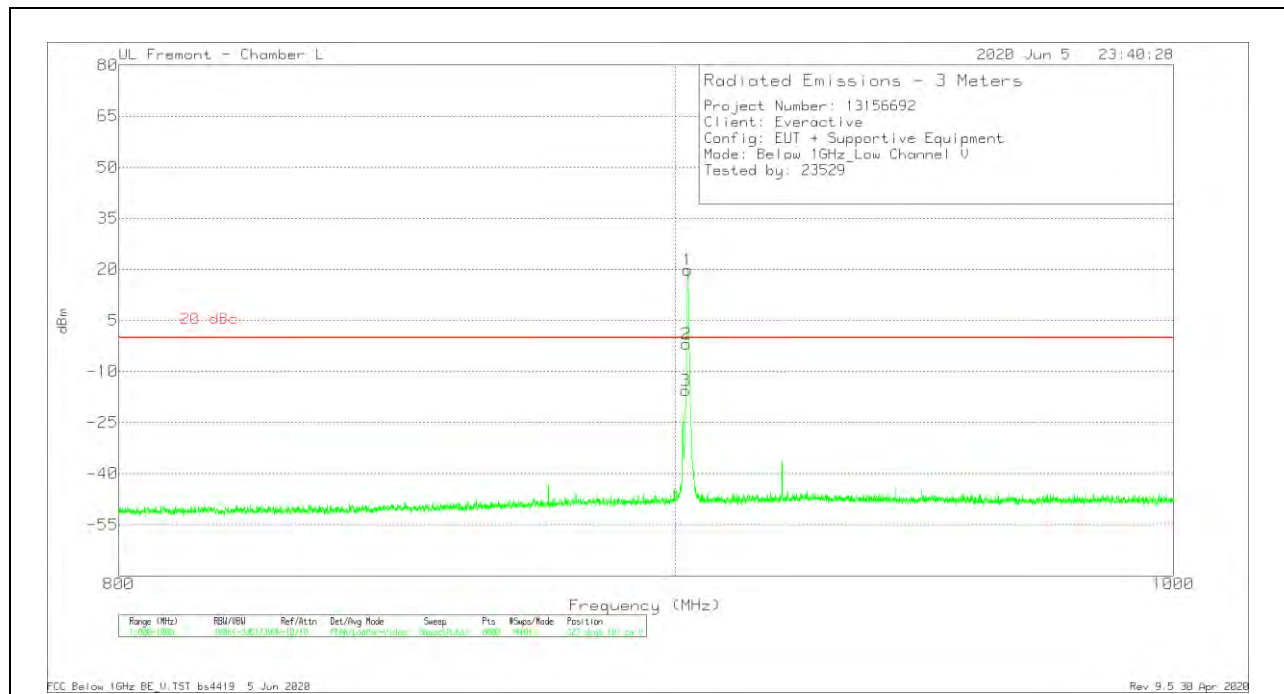
-20 dBc BANDEDGE WITHOUT NOTCH FILTER AND PRE-AMPLIFIER (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0184971 (dB/m)	Cbl (dB)	Amp/Cbl (dB)	Corrected Reading dBm	-20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	902.35	-7.21	Pk	28	4	5.8	30.59	-	-	3	172	H
2	902.15	-27.44	Pk	28	4	5.8	10.36	10.59	-23	3	172	H
3	902	-42.37	Pk	28	4	5.9	-4.47	10.59	-15.06	3	172	H

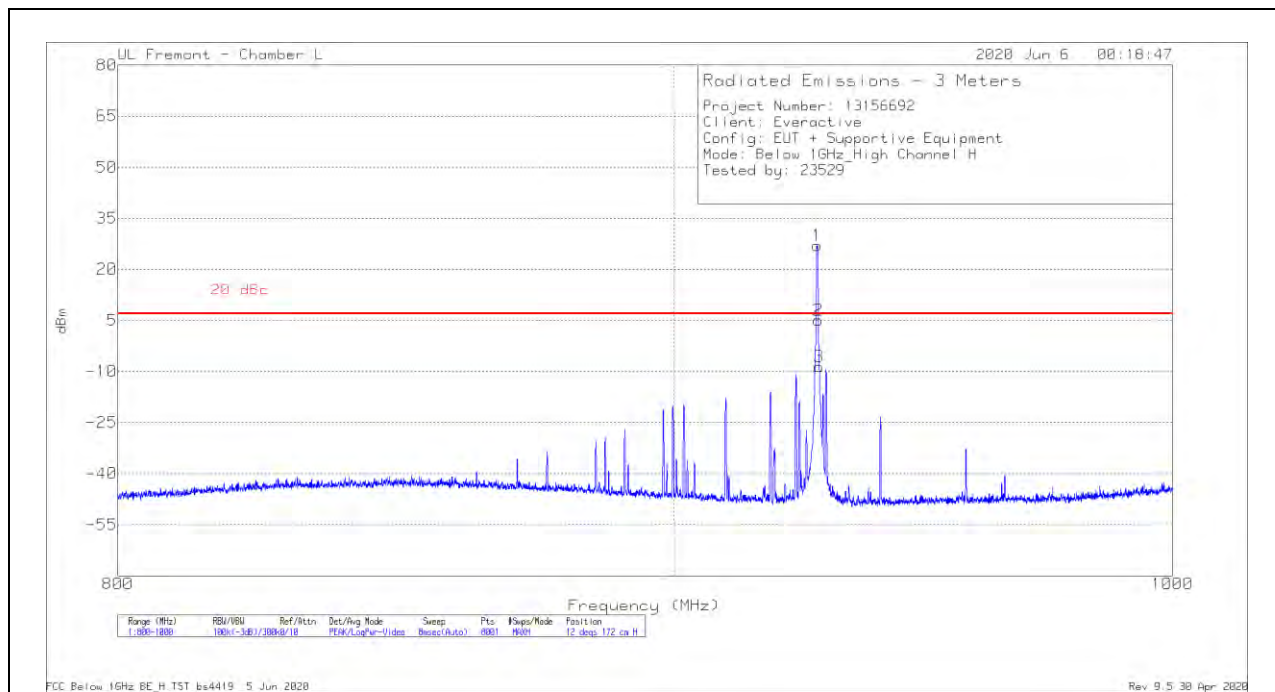
VERTICAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0184971 (dB/m)	Cbl (dB)	Amp/Cbl (dB)	Corrected Reading dBm	20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	902.3373	-19.97	Pk	28	4	7.8	19.83	-	-	327	101	V
2	902.1373	-41.68	Pk	28	4	7.8	-1.88	-17	-1.71	327	101	V
3	901.9872	-55.43	Pk	28	4	7.8	-15.63	-17	-15.46	327	101	V

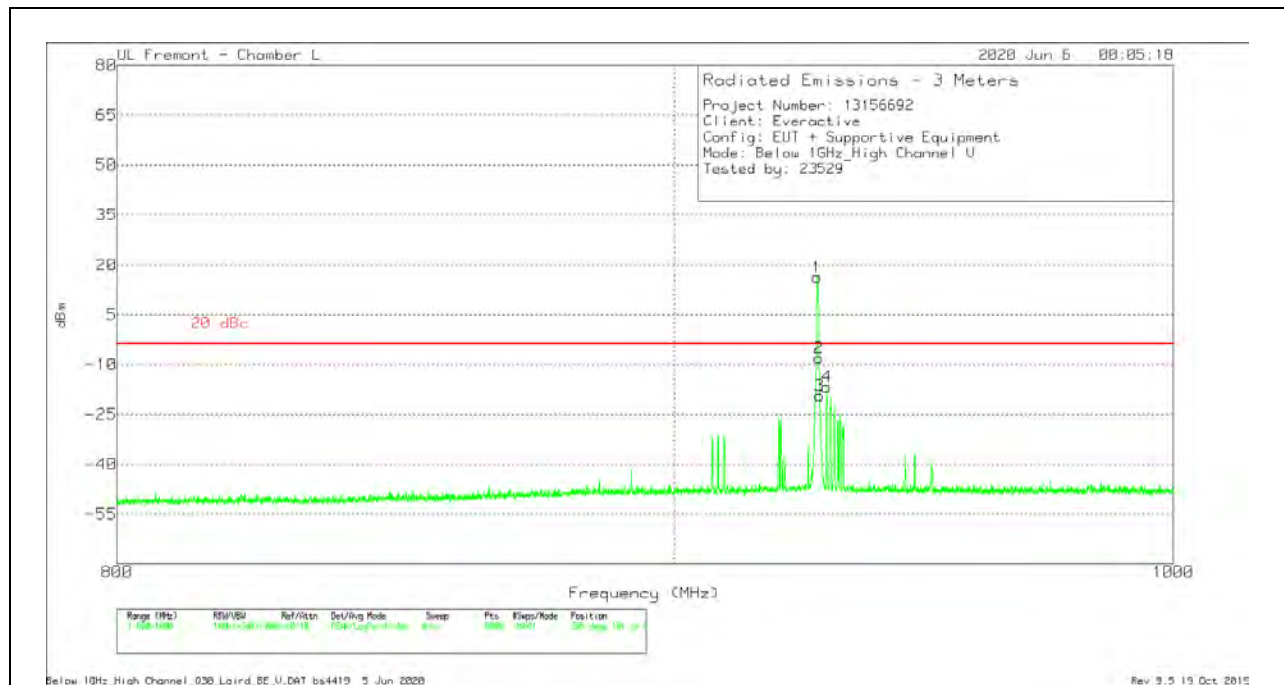
-20 dBc BANDEDGE WITHOUT NOTCH FILTER AND PRE-AMPLIFIER (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0184971 (dB/m)	Cbl (dB)	Amp/Cbl (dB)	Corrected Reading dBm	20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	927.525	-9.51	Pk	28.3	4.1	4.1	26.99	-	-	12	172	H
2	927.825	-31.48	Pk	28.3	4.1	4.1	5.02	6.99	-1.97	12	172	H
3	928	-45.08	Pk	28.3	4.1	4.1	-8.58	6.99	-15.57	12	172	H

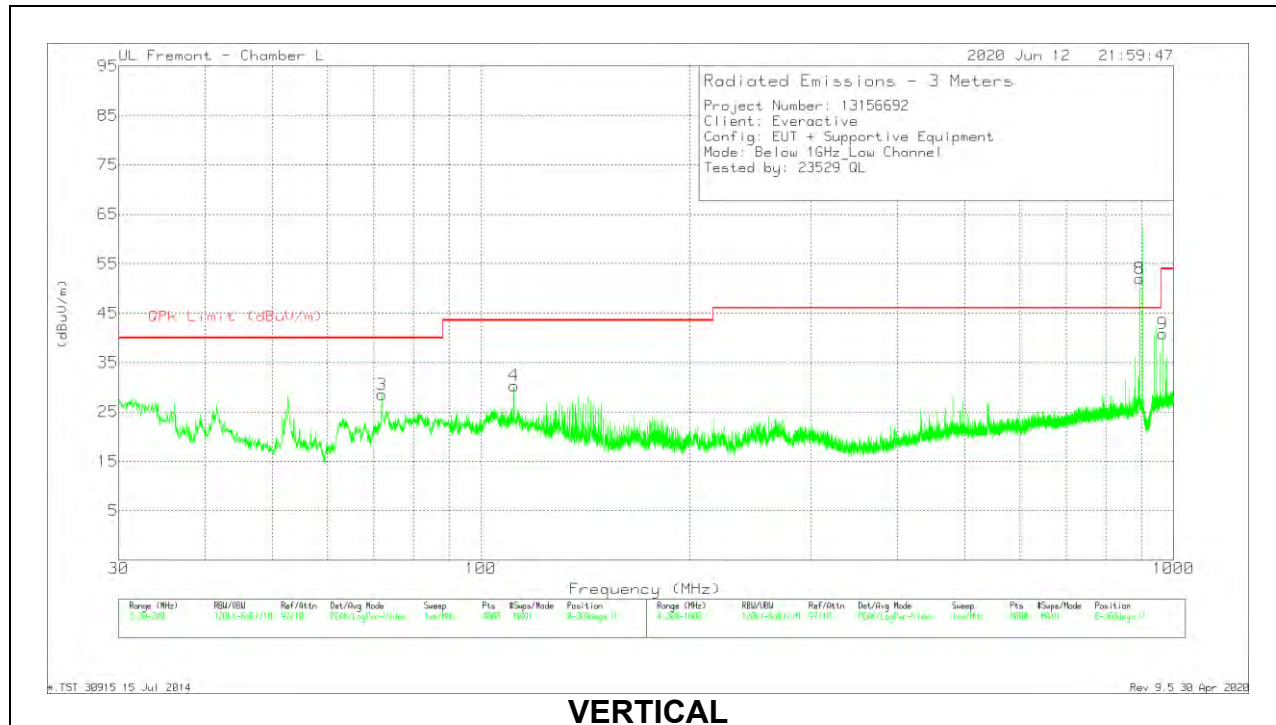
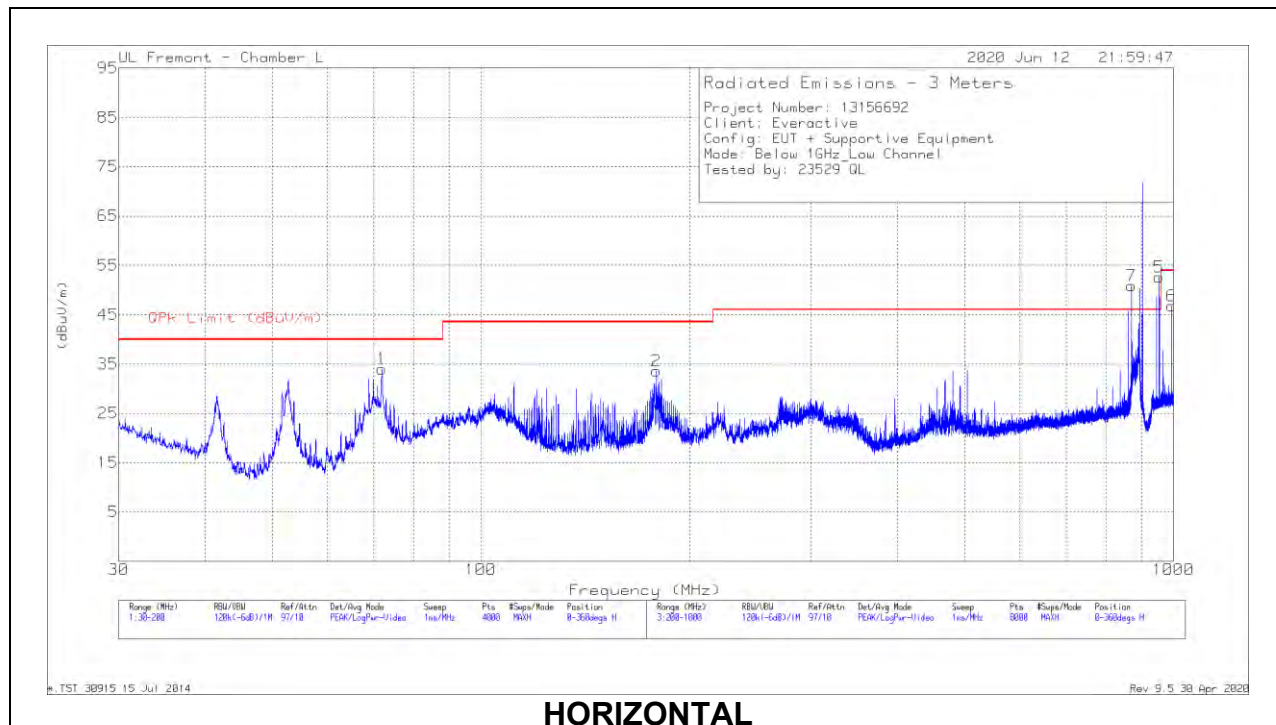
VERTICAL RESULT



Marker	Frequency (MHz)	Meter Reading (dBm)	Det	AF PRE0184971 (dB/m)	Cbl (dB)	Amp/Cbl (dB)	Corrected Reading dBm	20 dBc	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	927.5153	-23.93	Pk	28.3	4.1	7.8	16.27	-	-	305	101	V
2	927.8403	-48.16	Pk	28.3	4.1	7.8	-7.96	-3.73	-4.23	305	101	V
3	927.9904	-59.42	Pk	28.3	4.1	7.8	-19.22	-3.73	-15.49	305	101	V
4	929.3905	-56.75	Pk	28.3	4.1	7.7	-16.65	-3.73	-12.92	305	101	V

HARMONICS AND SPURIOUS EMISSIONS WITH A NOTCH FILTER

LOW CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184971 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	72.0009	51.08	Pk	13.9	-31	.19	34.17	40	-5.83	0-360	399	H
2	179.2561	46.92	Pk	16.9	-30.2	.25	33.87	43.52	-9.65	0-360	199	H
3	71.9584	45.63	Pk	13.9	-31	.19	28.72	40	-11.28	0-360	101	V
4	* 111.5999	42.36	Pk	18.7	-30.7	.29	30.65	43.52	-12.87	0-360	101	V
5	** 952.8381	59.68	Pk	28.7	-27.2	.58	61.76	-	-	4	175	H
	** 952.8381	22.25	Qp	28.7	-27.2	.58	24.33	-	-	4	175	H
6	* 994.2032	44.14	Pk	29.2	-26.5	.37	47.21	54	-6.79	0-360	101	H
7	** 869.7871	50.75	Pk	27.7	-27.6	.77	51.62	-	-	0-360	299	H
8	** 893.2839	59.2	Pk	28	-27.6	4.61	64.21	-	-	52	173	V
	** 893.2839	25.49	Qp	28	-27.6	3.61	29.5	-	-	52	173	V
9	* 965.2995	39.12	Pk	28.8	-27.1	.45	41.27	54	-12.73	0-360	101	V

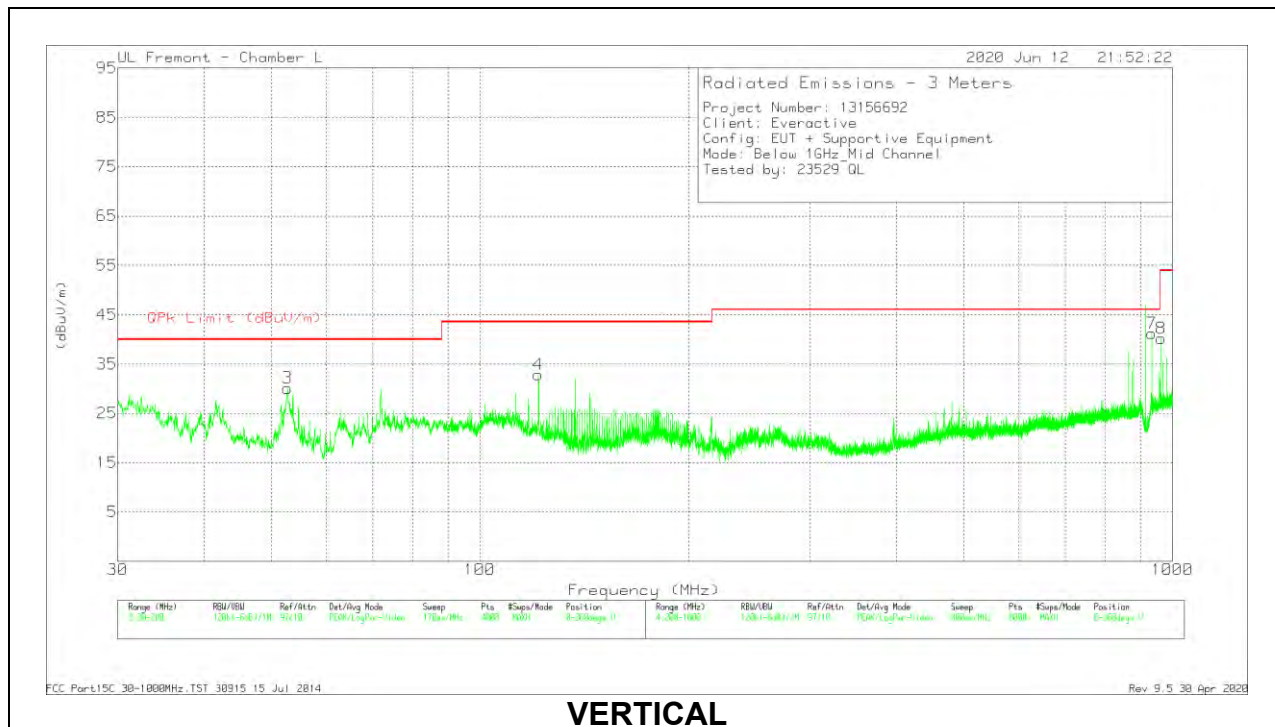
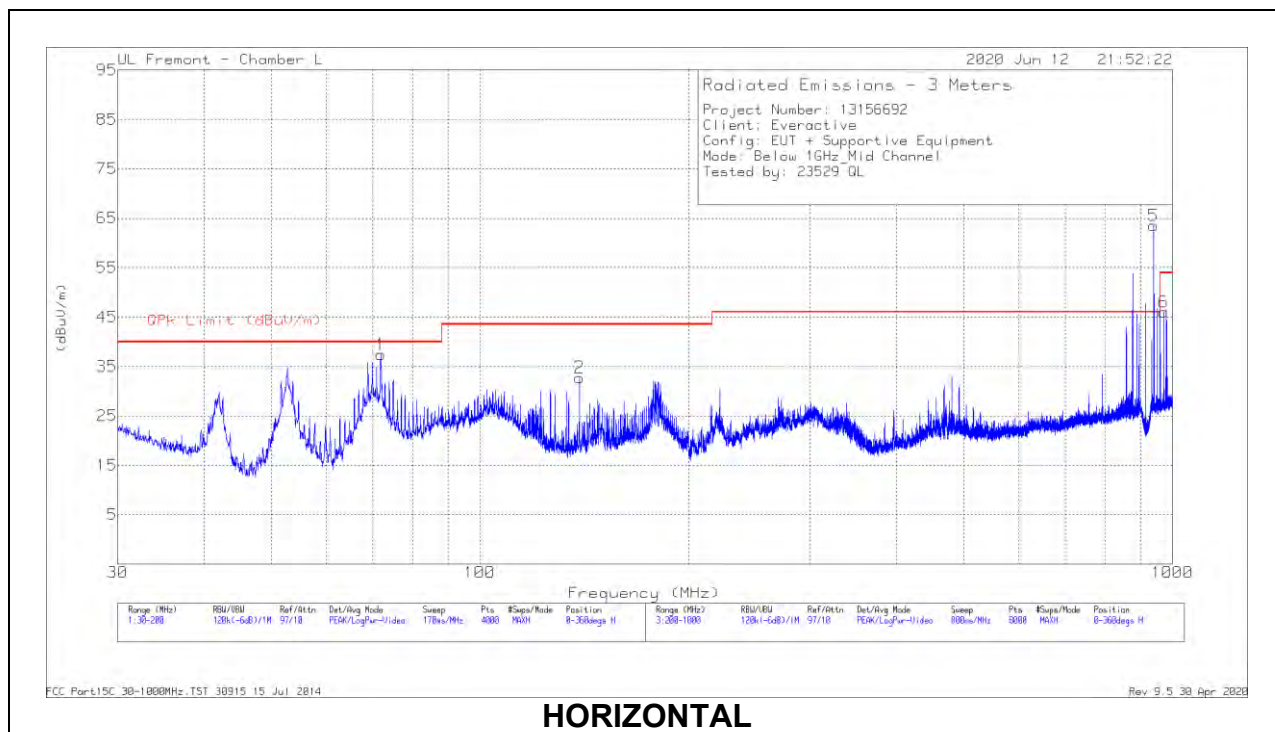
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

Qp - Quasi-Peak detector

** Spurious emission of fundamental 902.4MHz

MID CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184971 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	71.9908	55.89	Pk	13.9	-31	.19	38.98	40	-1.02	304	249	H
	71.9908	51.58	Qp	13.9	-31	.19	34.67	40	-5.33	304	249	H
2	139.2533	44.37	Pk	18.9	-30.5	.29	33.06	43.52	-10.46	0-360	199	H
3	52.7434	48.41	Pk	12.9	-31.2	.13	30.24	40	-9.76	0-360	101	V
4	* 121.4837	43.78	Pk	19.6	-30.6	.29	33.07	43.52	-10.45	0-360	101	V
5	** 939.0406	67	Pk	28.5	-27.2	1.45	69.75	-	-	146	105	H
	** 939.0406	27.51	Qp	28.5	-27.2	1.45	30.26	-	-	146	104	H
6	* 971.6003	44.07	Pk	28.9	-26.9	0.4	46.47	54	-7.53	0-360	101	H
7	** 933.2502	55.35	Pk	28.4	-27.3	7.79	64.24	-	-	118	174	V
	** 933.2502	21.61	Qp	28.4	-27.3	7.79	30.5	-	-	118	174	V
8	* 962.4991	38.63	Pk	28.7	-27.1	.47	40.7	54	-13.3	0-360	299	V

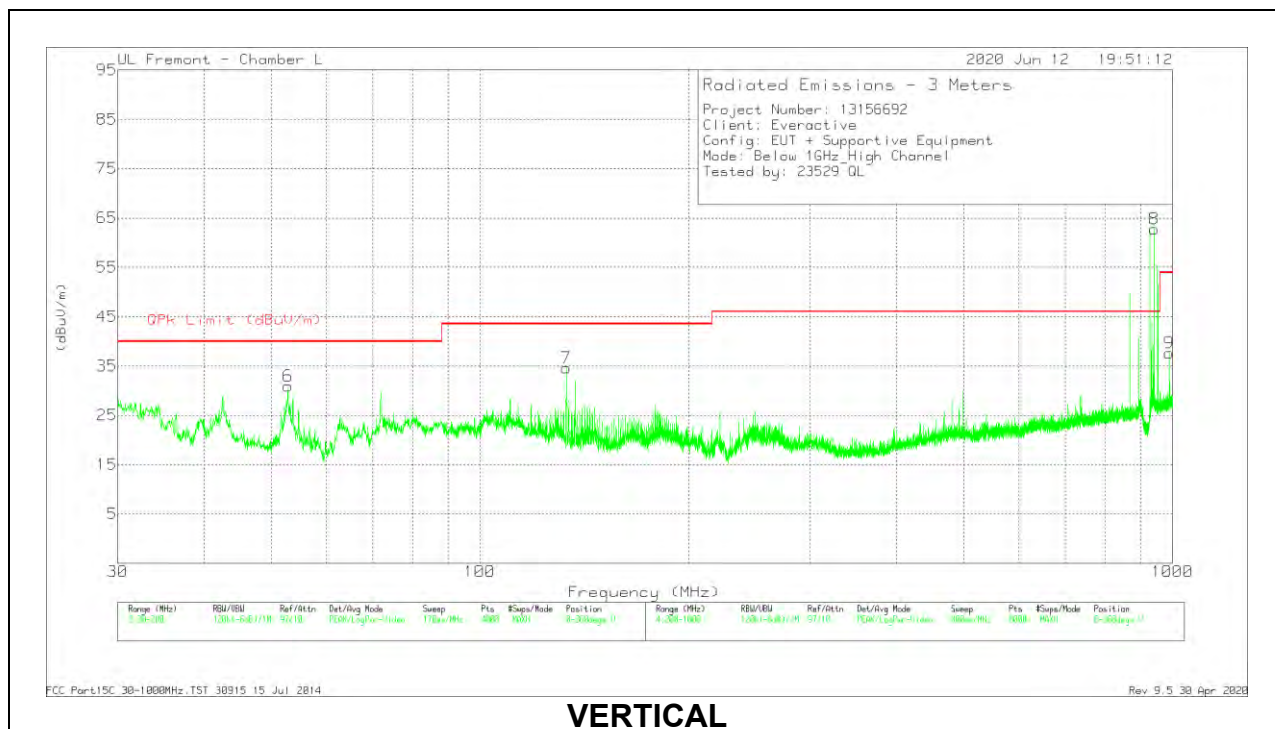
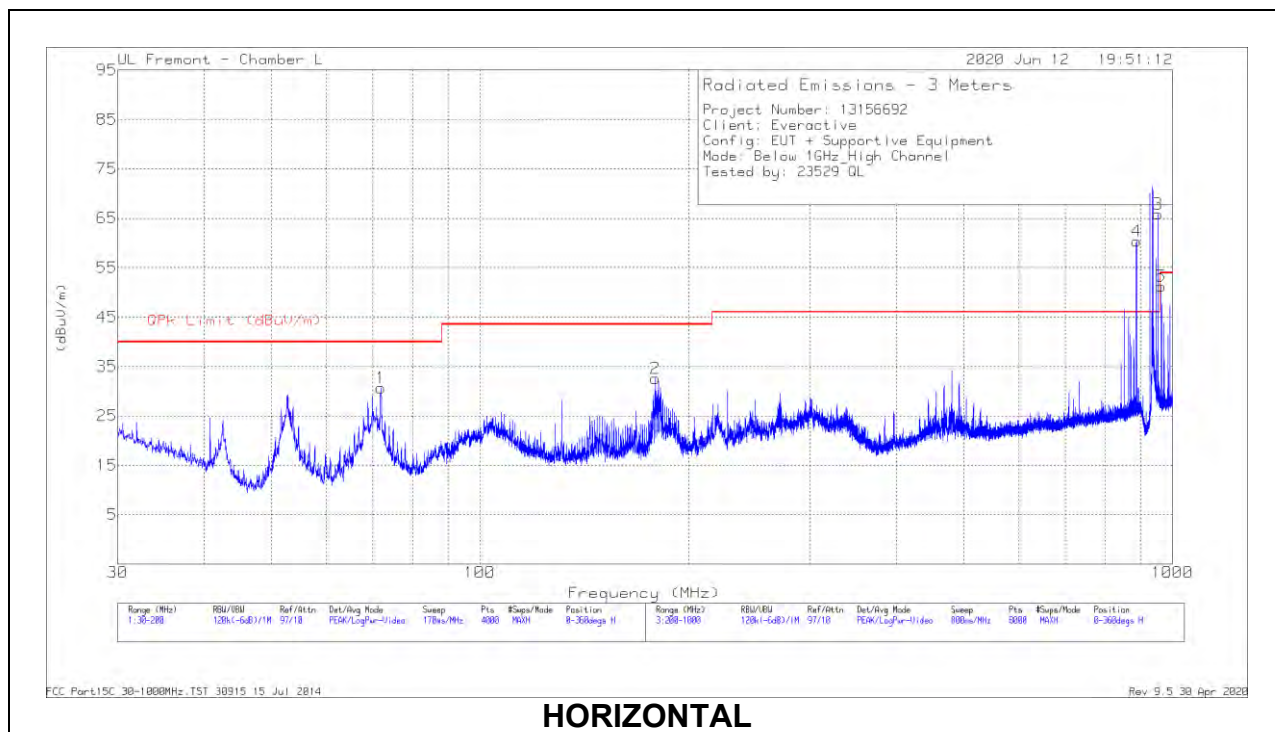
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

Qp - Quasi-Peak detector

** Spurious emission of fundamental 914.8MHz

HIGH CHANNEL RESULTS



Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184971 (dB/m)	Amp/Cbl (dB)	Filter (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	71.9584	47.75	Pk	13.9	-31	.19	30.84	40	-9.16	0-360	99	H
2	179.2561	45.93	Pk	16.9	-30.2	.25	32.88	43.52	-10.64	0-360	99	H
6	52.8284	49.18	Pk	12.9	-31.2	.13	31.01	40	-8.99	0-360	101	V
7	* 133.3442	45.81	Pk	19.3	-30.5	.29	34.9	43.52	-8.62	0-360	101	V
3	** 951.7147	63.18	Pk	28.7	-27.2	.6	65.28	-	-	137	107	H
	** 951.7147	28.78	Qp	28.7	-27.2	.6	30.88	-	-	137	107	H
4	** 889.2338	66.66	Pk	27.9	-27.6	1.75	68.71	-	-	344	112	H
	** 889.2338	27.81	Qp	27.9	-27.6	1.75	29.86	-	-	344	112	H
5	* 961.8879	58.45	Pk	28.7	-27.1	.48	60.53	54	6.53	20	159	H
	* 961.8879	24.35	Qp	28.7	-27.1	.48	26.43	54	-27.57	20	159	H
8	** 941.4629	63.72	Pk	28.5	-27.3	1.09	66.01	-	-	244	273	V
	** 941.4629	27.29	Qp	28.5	-27.3	1.09	29.58	-	-	244	273	V
9	* 989.9027	35.18	Pk	29.1	-26.6	0.37	38.05	54	-15.95	0-360	199	V

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

Pk - Peak detector

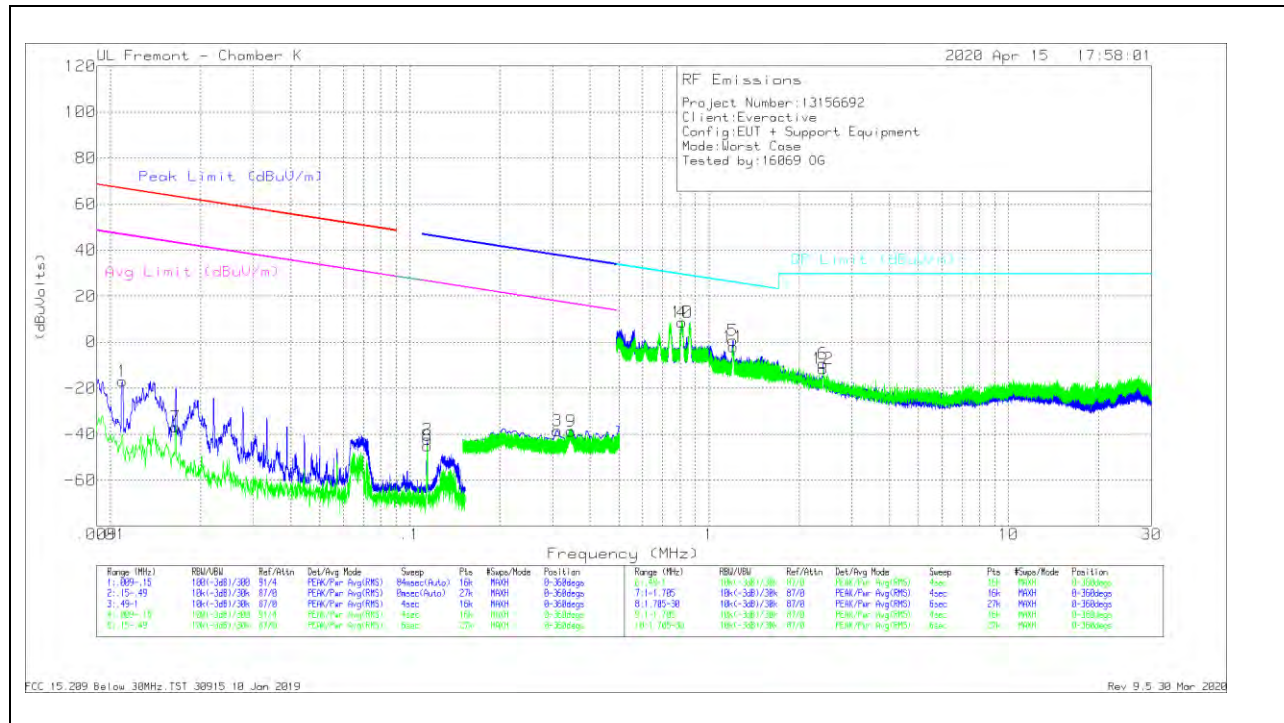
Qp - Quasi-Peak detector

** Spurious emission of fundamental 927.6MHz

9.3. WORST CASE BELOW 30 MHz

9.3.1. MODE 1 - OOK

9.3.1.1. SPURIOUS EMISSIONS 9 kHz TO 30 MHz (WORST-CASE CONFIGURATION)



Below 30MHz Data

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0186650	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	.01096	34.66	Pk	60.1	-31.8	-80	-17.04	66.79	-83.83	46.79	-63.83	-	-	-	-	0-360
2	.11443	14.39	Pk	55.5	-32.2	-80	-42.31	-	-	-	-	46.46	-88.77	26.46	-68.77	0-360
3	.31092	17.62	Pk	56.1	-32.1	-80	-38.38	-	-	-	-	37.76	-76.14	17.76	-56.14	0-360
7	.01653	15.77	Pk	59.3	-31.9	-80	-36.83	63.22	-	43.22	-80.05	-	-	-	-	0-360
8	.11444	11.57	Pk	55.5	-32.2	-80	-45.13	-	-	-	-	46.46	-91.59	26.46	-71.59	0-360
9	.3453	17.3	Pk	56.1	-32.1	-80	-38.7	-	-	-	-	36.85	-75.55	16.85	-55.55	0-360

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0186650	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
4	.81109	24.62	Pk	56.1	-32.1	-40	8.62	29.43	-20.81	0-360
10	.80962	24.74	Pk	56.1	-32.1	-40	8.74	29.45	-20.71	0-360
5	1.20007	27.15	Pk	45.8	-32.1	-40	.85	26.04	-25.19	0-360
6	2.40087	22.25	Pk	40.5	-32	-40	-9.25	29.5	-38.75	0-360
11	1.20236	24.5	Pk	45.7	-32.1	-40	-1.9	26.03	-27.93	0-360
12	2.39878	20.11	Pk	40.5	-32	-40	-11.39	29.5	-40.89	0-360

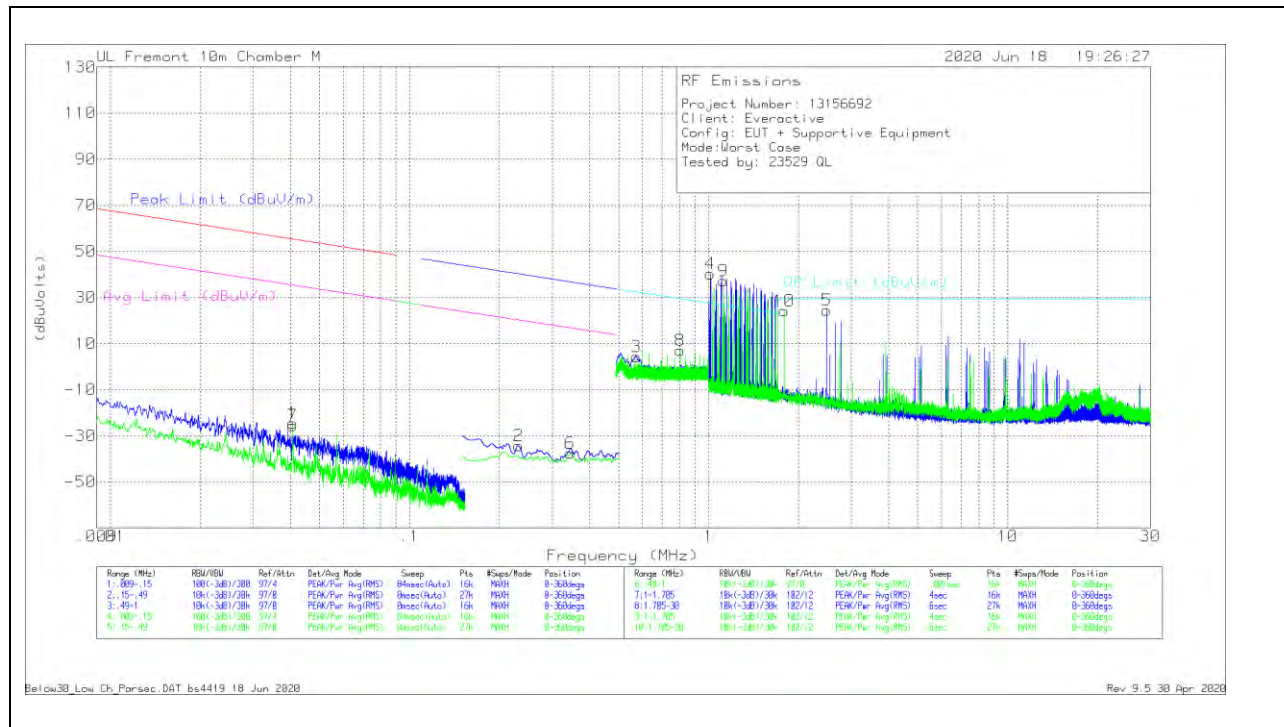
Pk - Peak detector

Note: The limits in CFR 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 report in the table) using 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.

9.3.2. MODE 2 – FSK

9.3.2.1. SPURIOUS EMISSIONS 9 kHz TO 30 MHz (WORST-CASE CONFIGURATION)



Below 30MHz Data

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (E ACF)	Cables with PRE0180177 (dB)	Dist Corr 30m	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	.04065	28.49	Pk	57.2	-30.2	-80	-24.51	55.4	-79.91	35.4	-59.91	-	-	-	-	0-360
2	.23185	19.49	Pk	56.3	-30.2	-80	-34.41	-	-	-	-	40.31	-74.72	20.31	-54.72	0-360
7	.04065	27.4	Pk	57.2	-30.2	-80	-25.6	55.4	-81	35.4	-61	-	-	-	-	0-360
6	.34462	16.52	Pk	56.2	-30.2	-80	-37.48	-	-	-	-	36.86	-74.34	16.86	-54.34	0-360

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (E ACF)	Cables with PRE0180177 (dB)	Dist Corr 30m	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
3	.57467	18.27	Pk	56.2	-30.2	-40	4.27	32.42	-28.15	0-360
8	.80318	20.95	Pk	56.3	-30.2	-40	7.05	29.52	-22.47	0-360
4	1.00069	59.92	Pk	46.9	-30.1	-40	36.72	27.62	9.1	230
	1.00069	31.19	Qp	46.9	-30.1	-40	7.99	27.62	-19.63	230
5	2.44687	54.79	Pk	40.3	-30	-40	25.09	29.5	-4.41	348
	2.44687	25.11	Qp	40.3	-30	-40	-4.59	29.5	-34.09	348
9	1.12823	57.96	Pk	46.2	-30.1	-40	34.06	26.58	7.48	93
	1.12823	29.03	Qp	46.2	-30.1	-40	5.13	26.58	-21.45	93
10	1.79906	52.8	Pk	42.7	-30.1	-40	25.4	29.5	-4.1	88
	1.79906	23.52	Qp	42.7	-30.1	-40	-3.88	29.5	-33.38	88

Pk - Peak detector

Note: The limits in CFR 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 report in the table) using 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.

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	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.

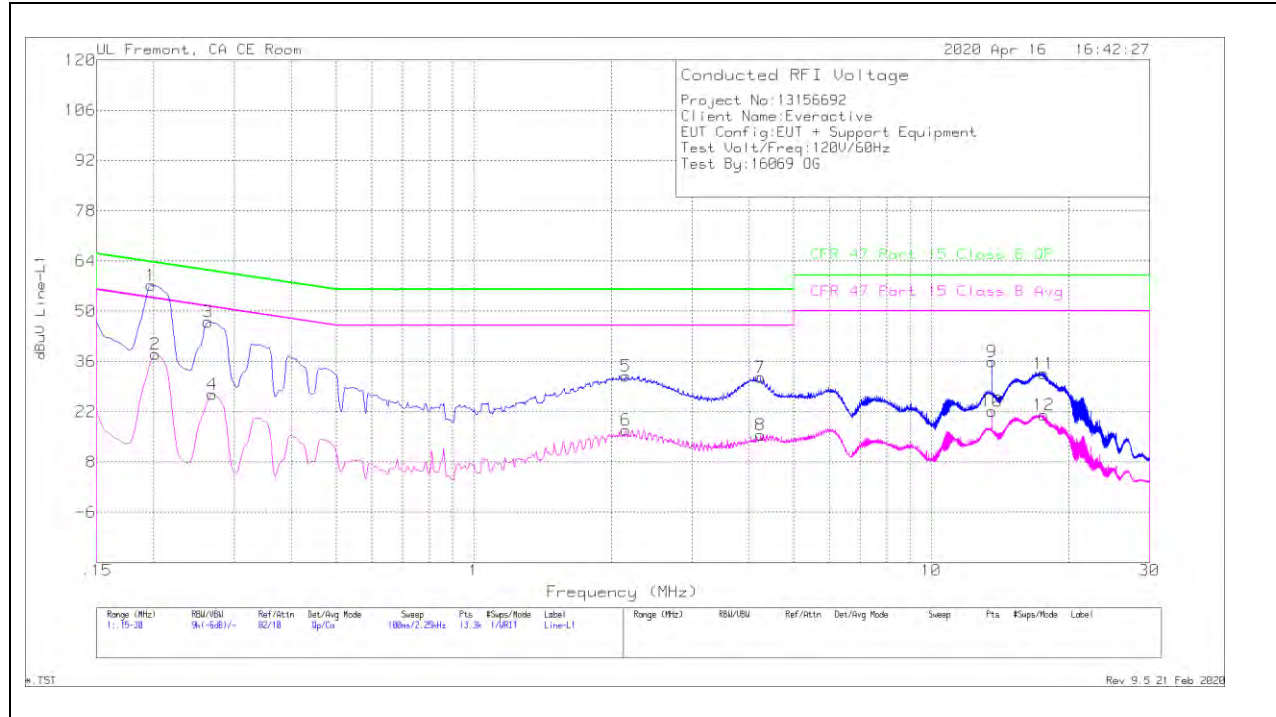
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

MODE 1 – OOK

LINE 1 RESULTS

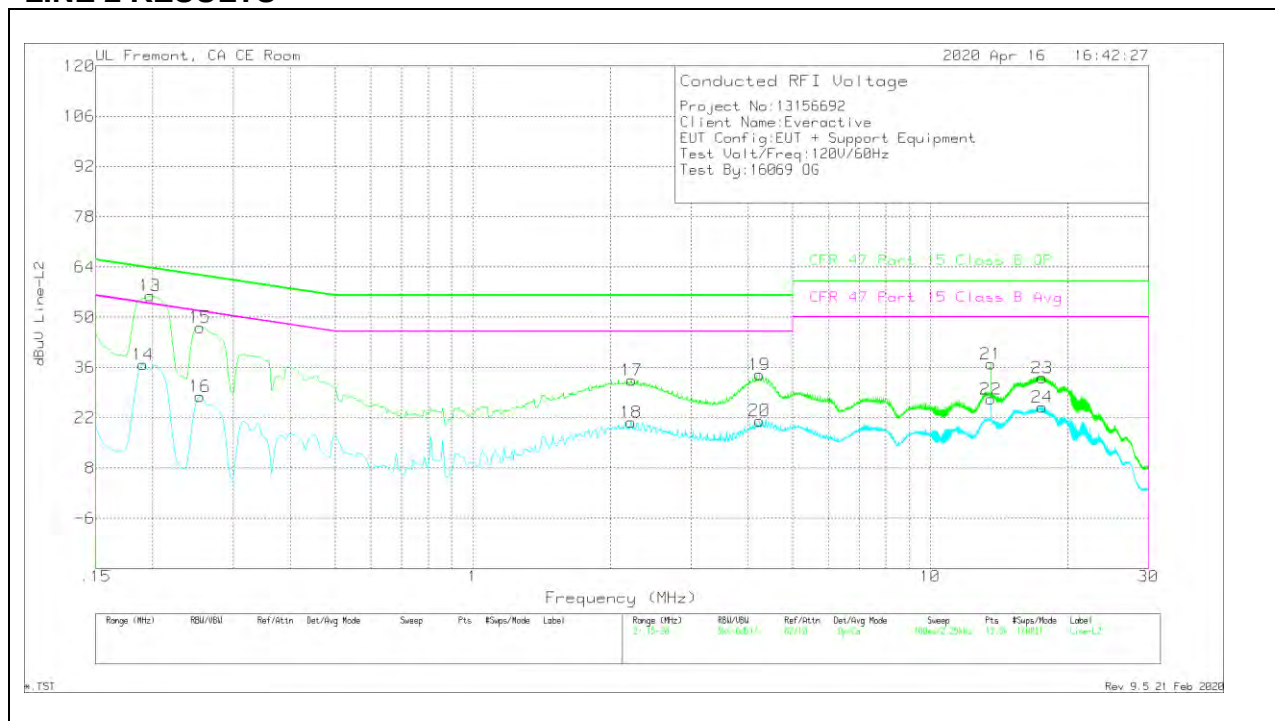


Trace Markers

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1 (dB)	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 PART 15 CLASS B QP	Margin (dB)	CFR 47 PART 15 CLASS B AVG	Margin (dB)
1	.19725	47.2	Qp	0	0	10	57.2	63.73	-6.53	-	-
2	.20175	28	Ca	0	0	10	38	-	-	53.54	-15.54
3	.2625	37.03	Qp	0	0	10	47.03	61.35	-14.32	-	-
4	.26813	16.8	Ca	0	0	10	26.8	-	-	51.18	-24.38
5	2.1525	21.89	Qp	0	.1	10	31.99	56	-24.01	-	-
6	2.1525	6.78	Ca	0	.1	10	16.88	-	-	46	-29.12
7	4.23375	21.38	Qp	0	.1	10.1	31.58	56	-24.42	-	-
8	4.23375	5.31	Ca	0	.1	10.1	15.51	-	-	46	-30.49
9	13.56	25.51	Qp	.1	.2	10.1	35.91	60	-24.09	-	-
10	13.56	11.83	Ca	.1	.2	10.1	22.23	-	-	50	-27.77
11	17.619	22.09	Qp	0	.3	10.2	32.59	60	-27.41	-	-
12	17.619	10.65	Ca	0	.3	10.2	21.15	-	-	50	-28.85

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS



Trace Markers

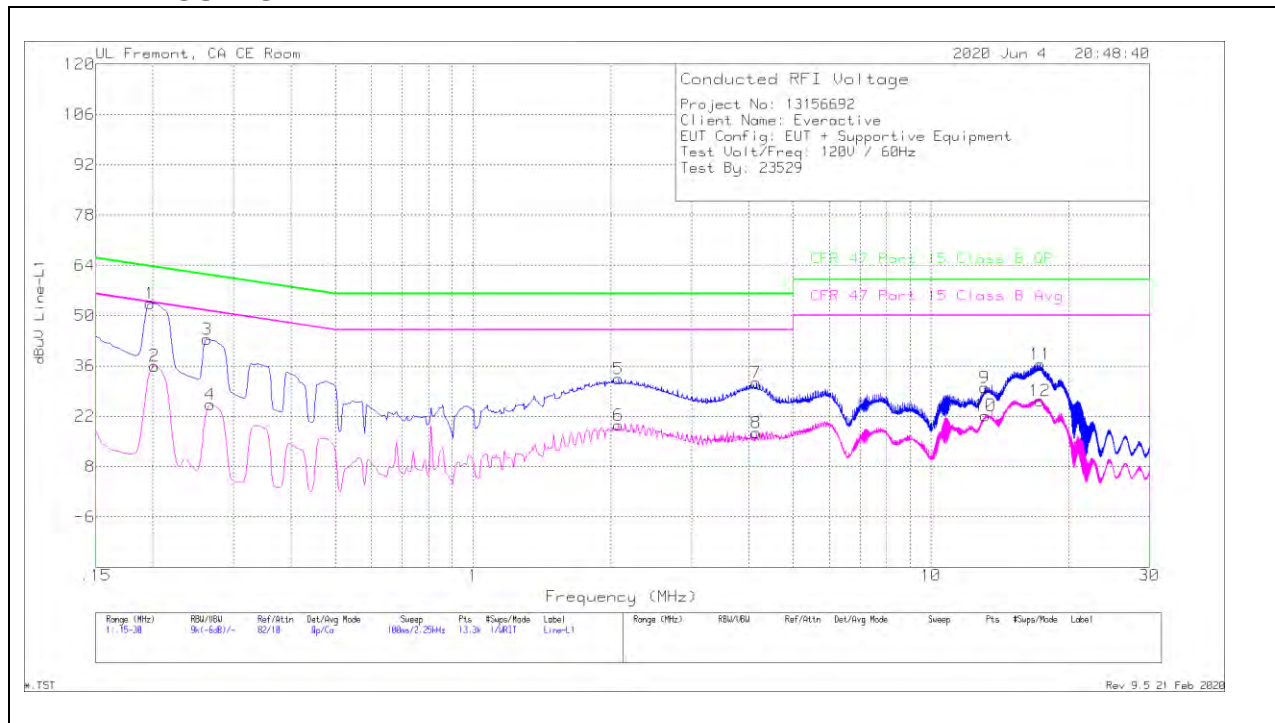
Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1 (dB)	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 PART 15 CLASS B QP	Margin (dB)	CFR 47 PART 15 CLASS B AVG	Margin (dB)
13	.19725	45.95	Qp	0	0	10	55.95	63.73	-7.78	-	-
14	.1905	26.83	Ca	0	0	10	36.83	-	-	54.01	-17.18
15	.2535	37.2	Qp	0	0	10	47.2	61.64	-14.44	-	-
16	.2535	17.99	Ca	0	0	10	27.99	-	-	51.64	-23.65
17	2.2245	22.33	Qp	0	.1	10	32.43	56	-23.57	-	-
18	2.22225	10.62	Ca	0	.1	10	20.72	-	-	46	-25.28
19	4.23375	23.75	Qp	0	.1	10.1	33.95	56	-22.05	-	-
20	4.23375	11	Ca	0	.1	10.1	21.2	-	-	46	-24.8
21	13.56	26.63	Qp	.1	.2	10.1	37.03	60	-22.97	-	-
22	13.56	16.81	Ca	.1	.2	10.1	27.21	-	-	50	-22.79
23	17.5425	22.65	Qp	0	.3	10.2	33.15	60	-26.85	-	-
24	17.5425	14.42	Ca	0	.3	10.2	24.92	-	-	50	-25.08

Qp - Quasi-Peak detector

Ca - CISPR average detection

MODE 2 – FSK

LINE 1 RESULTS

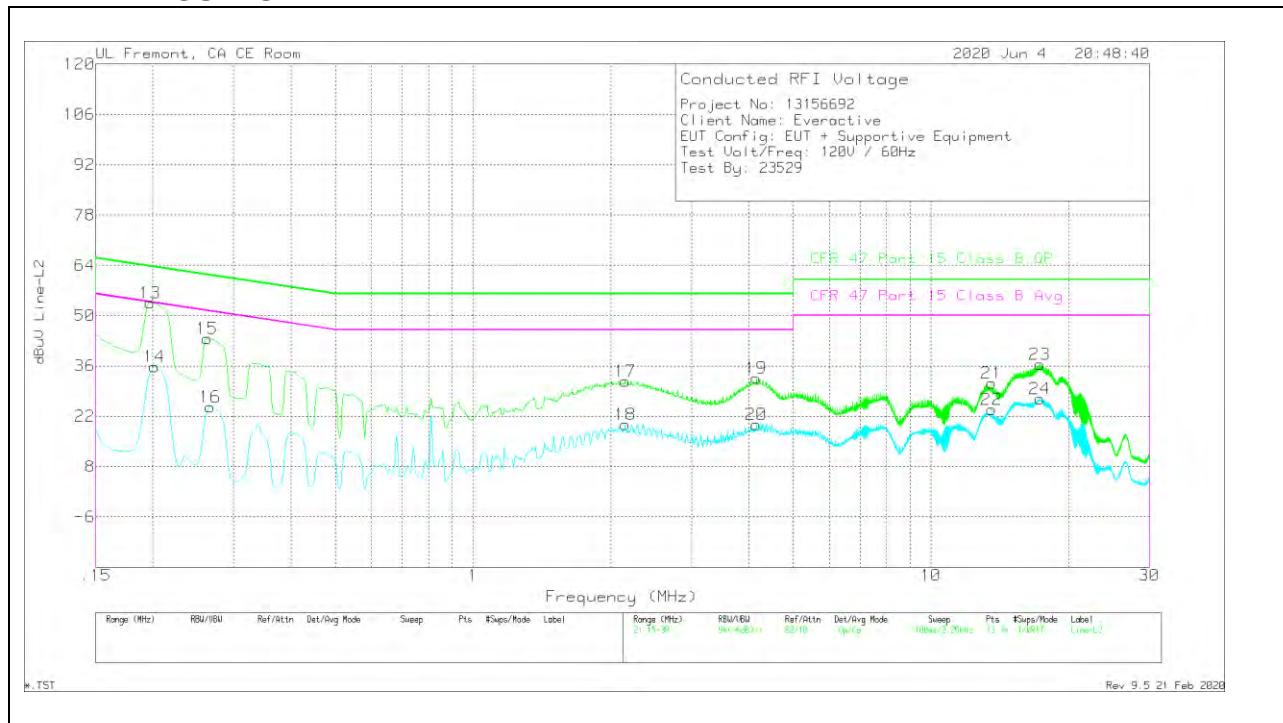


Trace Markers

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1 (dB)	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 PART 15 CLASS B QP	Margin (dB)	CFR 47 PART 15 CLASS B AVG	Margin (dB)
1	.19725	43.47	Qp	0	0	10	53.47	63.73	-10.26	-	-
2	.20175	26.03	Ca	0	0	10	36.03	-	-	53.54	-17.51
3	.2625	33.4	Qp	0	0	10	43.4	61.35	-17.95	-	-
4	.267	15.31	Ca	0	0	10	25.31	-	-	51.21	-25.9
5	2.07825	22.3	Qp	0	.1	10	32.4	56	-23.6	-	-
6	2.0805	9.43	Ca	0	.1	10	19.53	-	-	46	-26.47
7	4.1595	21.2	Qp	0	.1	10.1	31.4	56	-24.6	-	-
8	4.15275	7.18	Ca	0	.1	10.1	17.38	-	-	46	-28.62
9	13.12575	19.68	Qp	.1	.2	10.1	30.08	60	-29.92	-	-
10	13.128	11.85	Ca	.1	.2	10.1	22.25	-	-	50	-27.75
11	17.35575	25.98	Qp	0	.3	10.2	36.48	60	-23.52	-	-
12	17.304	15.9	Ca	0	.3	10.2	26.4	-	-	50	-23.6

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS



Trace Markers

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1 (dB)	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 PART 15 CLASS B QP	Margin (dB)	CFR 47 PART 15 CLASS B AVG	Margin (dB)
13	.19725	43.55	Qp	0	0	10	53.55	63.73	-10.18	-	-
14	.20175	25.73	Ca	0	0	10	35.73	-	-	53.54	-17.81
15	.2625	33.6	Qp	0	0	10	43.6	61.35	-17.75	-	-
16	.267	14.67	Ca	0	0	10	24.67	-	-	51.21	-26.54
17	2.15025	21.73	Qp	0	.1	10	31.83	56	-24.17	-	-
18	2.148	9.63	Ca	0	.1	10	19.73	-	-	46	-26.27
19	4.1595	22.42	Qp	0	.1	10.1	32.62	56	-23.38	-	-
20	4.15275	9.57	Ca	0	.1	10.1	19.77	-	-	46	-26.23
21	13.56	20.84	Qp	.1	.2	10.1	31.24	60	-28.76	-	-
22	13.56	13.5	Ca	.1	.2	10.1	23.9	-	-	50	-26.1
23	17.28375	26.01	Qp	0	.3	10.2	36.51	60	-23.49	-	-
24	17.28263	16.42	Ca	0	.3	10.2	26.92	-	-	50	-23.08

Qp - Quasi-Peak detector
Ca - CISPR average detection