



CERTIFICATION TEST REPORT

Report Number. : 12672932-E1V3

Applicant : ALIVECOR
444 CASTRO STREET
MOUNTAIN VIEW, CA 94043, U.S.A.

Model : AC-019

FCC ID : 2ASFFAC019

EUT Description : ECG SYSTEM

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

Date Of Issue:
February 27, 2019

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888



REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2/11/2019	Initial Issue	--
V2	2/14/2019	Updated Section 5.3, 7	Tina Chu
V3	2/27/2019	Updated Section 9.1	Tina Chu

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. CALIBRATION AND UNCERTAINTY	7
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	<i>7</i>
4.2. <i>SAMPLE CALCULATION</i>	<i>7</i>
4.3. <i>MEASUREMENT UNCERTAINTY</i>	<i>7</i>
5. EQUIPMENT UNDER TEST	8
5.1. <i>EUT DESCRIPTION</i>	<i>8</i>
5.2. <i>MAXIMUM OUTPUT POWER.....</i>	<i>8</i>
5.3. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i>	<i>8</i>
5.4. <i>SOFTWARE AND FIRMWARE.....</i>	<i>8</i>
5.5. <i>WORST-CASE CONFIGURATION AND MODE.....</i>	<i>8</i>
5.6. <i>DESCRIPTION OF TEST SETUP.....</i>	<i>9</i>
6. MEASUREMENT METHOD.....	12
7. TEST AND MEASUREMENT EQUIPMENT	13
8. ANTENNA PORT TEST RESULTS	14
8.1. <i>ON TIME AND DUTY CYCLE.....</i>	<i>14</i>
8.2. <i>99% BANDWIDTH.....</i>	<i>15</i>
8.3. <i>6 dB BANDWIDTH.....</i>	<i>16</i>
8.4. <i>OUTPUT POWER.....</i>	<i>17</i>
8.5. <i>AVERAGE POWER.....</i>	<i>18</i>
8.6. <i>POWER SPECTRAL DENSITY</i>	<i>19</i>
8.7. <i>CONDUCTED SPURIOUS EMISSIONS.....</i>	<i>20</i>
9. RADIATED TEST RESULTS.....	22
9.1. <i>LIMITS AND PROCEDURE</i>	<i>22</i>
9.2. <i>TRANSMITTER ABOVE 1 GHz</i>	<i>24</i>
9.3. <i>WORST CASE BELOW 30MHz.....</i>	<i>34</i>
9.4. <i>WORST CASE BELOW 1 GHz.....</i>	<i>35</i>
9.5. <i>WORST CASE 18-26 GHz.....</i>	<i>37</i>
10. SETUP PHOTOS	39

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ALIVECOR
444 CASTRO STREET
MOUNTAIN VIEW, CA 94043, U.S.A.

EUT DESCRIPTION: ECG SYSTEM

MODEL: AC-019

SERIAL NUMBER: 19DVT527B (CONDUCTED)
19DVT519C (RADIATED)

DATE TESTED: JANUARY 29, 2019 TO FEBRUARY 05, 2019

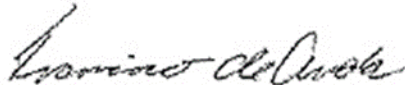
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Complies
ISED RSS-247 Issue 2	Complies
ISED RSS-GEN Issue 5	Complies

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

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

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:



FRANCISCO DE ANDA
PROJECT LEAD
UL Verification Services Inc.

Prepared By:



ERIC YU
TEST ENGINEER
UL Verification Services Inc.

Reviewed By:



TINA CHU
SENIOR PROJECT ENGINEER
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 v05, 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 (ISED:2324B-1)	<input type="checkbox"/> Chamber D (ISED:22541-1)	<input type="checkbox"/> Chamber I (ISED: 2324A-5)
<input type="checkbox"/> Chamber B (ISED:2324B-2)	<input type="checkbox"/> Chamber E (ISED:22541-2)	<input checked="" type="checkbox"/> Chamber J (ISED: 2324A-6)
<input type="checkbox"/> Chamber C (ISED:2324B-3)	<input type="checkbox"/> Chamber F (ISED:22541-3)	<input checked="" type="checkbox"/> Chamber K (ISED: 2324A-1)
	<input type="checkbox"/> Chamber G (ISED:22541-4)	<input type="checkbox"/> Chamber L (ISED: 2324A-3)
	<input type="checkbox"/> Chamber H (ISED:22541-5)	

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

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

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

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

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

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Final Voltage (dBuV)} &= \text{Measured Voltage (dBuV)} + \text{Cable Loss (dB)} + \text{Limiter Factor (dB)} + \\ &\text{LISN Insertion Loss.} \\ 36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} &= 46.6 \text{ dBuV} \end{aligned}$$

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	2.52 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	4.88 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.24 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.37 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.17 dB

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

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a handheld ECG system with BLE function, it is powered by a lithium coin cell battery.

5.2. MAXIMUM OUTPUT POWER

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

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402 - 2480	BLE	1.44	1.39

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a SMT Chip antenna with a maximum gain of -2 dBi.

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was Kardia Mobile 5.5.0
The firmware installed in the EUT during testing was Version 1.2.6

5.5. WORST-CASE CONFIGURATION AND MODE

Band edge and radiated emissions were performed with the EUT set to transmit at the channel with 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 Y-Landscape orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in Y-Landscape orientation.

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

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Description	Manufacturer	Model	Serial Number	FCC ID/DoC
Laptop	Lenovo	Type 20LT-S12D00	PF-1H0N1K	DoC
Laptop AC/DC adapter	Lenovo	ADLX65YCC2A	8SSA10M13947C1SG8BNGD0Y	DoC
DC power supply	Ametek	XT20-3	1318A00529	DoC
DC power box	AliveCor	-	-	DoC

Note: 30-1GHz testing, DC power box was used. Power box contains batteries. Above 1GHz testing the DC power supply was used.

I/O CABLES (CONDUCTED TEST)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length m	Remarks
1	AC	1	AC	Unshielded	1	AC Mains to AC/DC adapter
2	DC	1	DC	Unshielded	1.8	AC/DC adapter to laptop
3	USB	1	Serial ports	Shielded	1.9	Laptop to EUT
4	Antenna	1	SMA	Unshielded	0.22	To spectrum analyzer
5	AC	1	3-prong	Unshielded	1.5	
6	2-core DC power	1	Hook clips	Unshielded	0.8	DC power supply to EUT

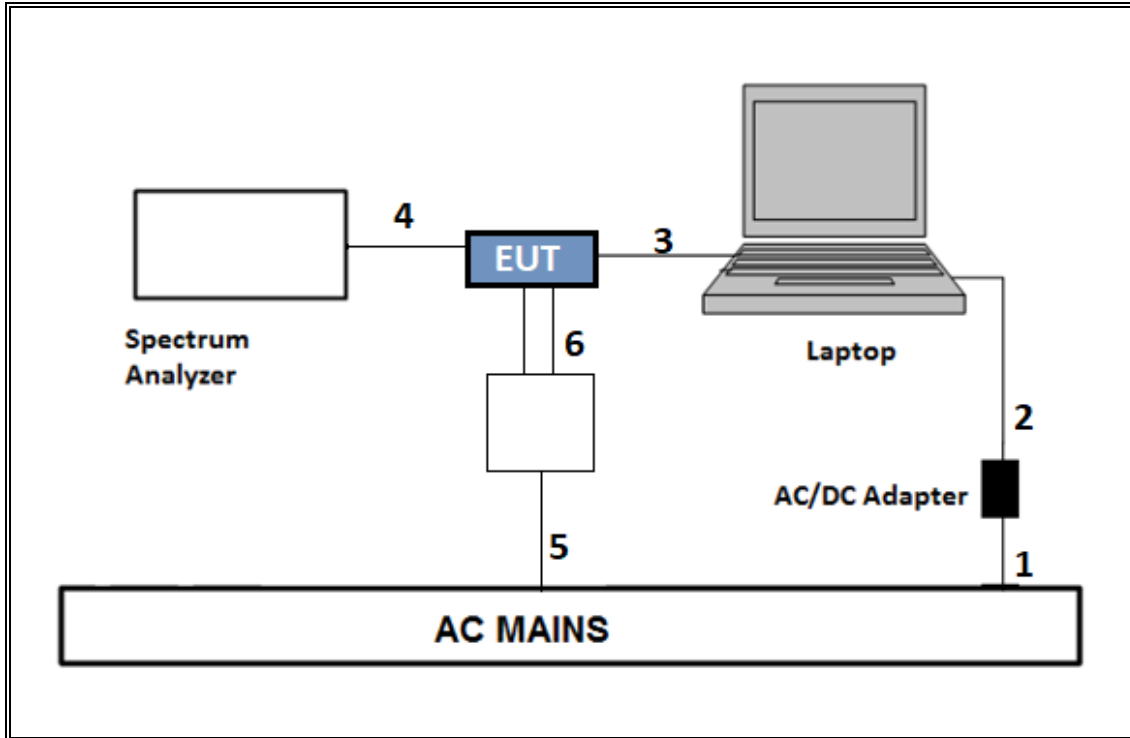
I/O CABLES (RADIATED TEST)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length m	Remarks
1	AC	1	3-prong	Unshielded	1.5	
2	2-core DC power	1	Banana ports	Unshielded	0.8	DC power supply to EUT
3	USB	1	Serial ports	Shielded	1.9	Laptop to EUT

TEST SETUP-CONDUCTED TEST

The EUT powered by DC power supply. Test software exercised the EUT.

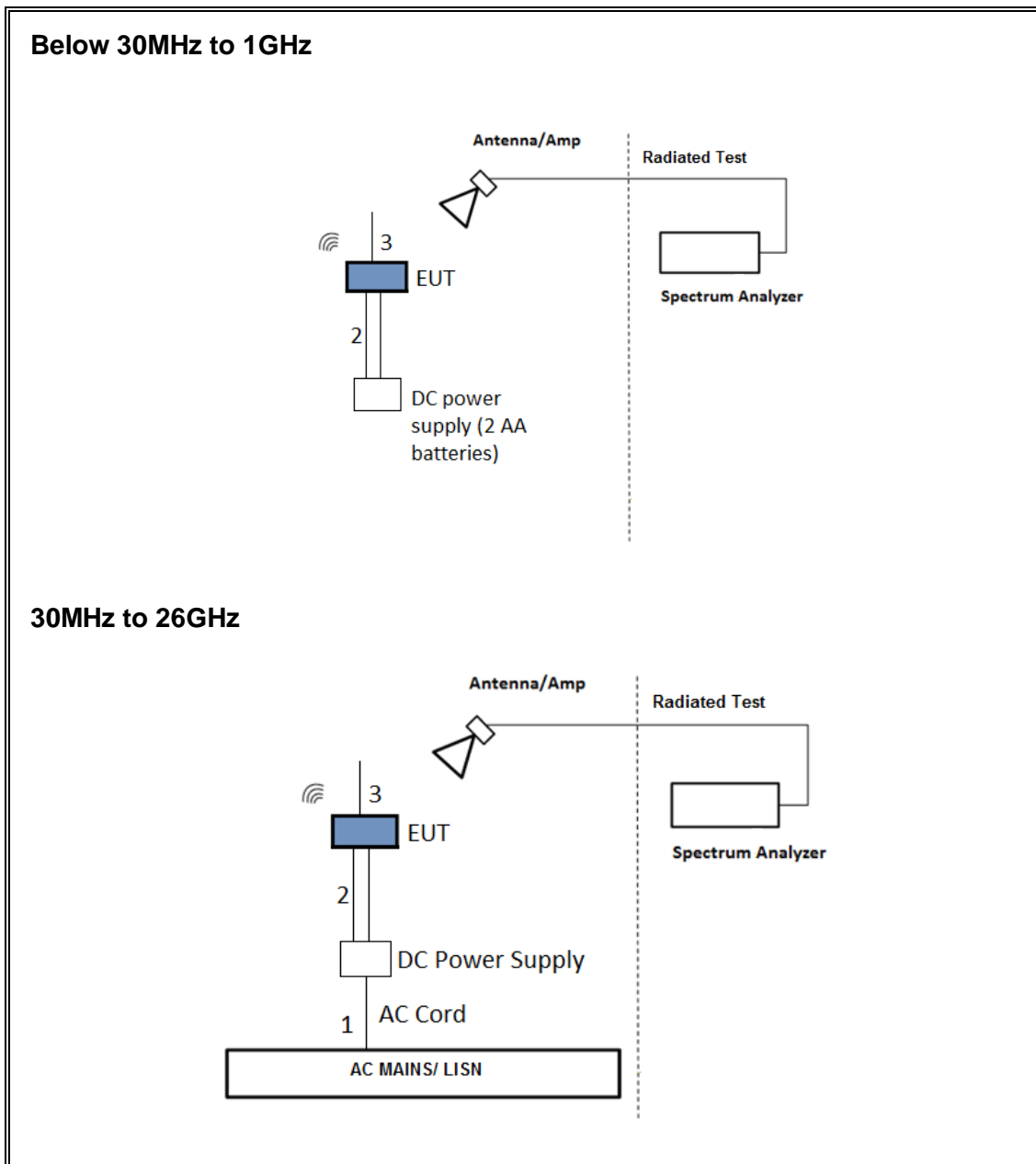
SETUP DIAGRAM



TEST SETUP- RADIATED TEST

The EUT powered by DC power supply. Test software exercised the EUT. Laptop was removed after test script was started.

SETUP DIAGRAM



6. MEASUREMENT METHOD

6 dB BW: ANSI C63.10 Subclause -11.8.1

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

Output Power: ANSI C63.10 Subclause-11.9.1.3 PKPM1 Peak power meter method

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

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

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

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

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

Band-edge: ANSI C63.10 Subclause -11.13.3.4 Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction

7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Antenna, Passive Loop 30Hz to 1MHz	ELETRO METRICS	EM-6871	PRE0179465	05/22/2019
Antenna, Passive Loop 100kHz to 30MHz	ELETRO METRICS	EM-6872	PRE0179467	05/22/2019
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	175953	12/13/2019
EMI TEST RECEIVER	Rohde&Schwarz	ESW44	PRE0179375	05/08/2019
Antenna, Horn 1-18GHz	ETS Lindgren	3117	AT0067	03/06/2019
Amplifier, 1 to 18GHz	Amplical	AMP1G18-35	T1571	07/30/2019
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB1	PRE0181575	08/01/2019
Amplifier, 10KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	PRE0180174	05/31/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	E4446A	T146	08/13/2019
Antenna Horn, 18 to 26.5GHz	ARA	MWH-1826/B	T448	03/13/2019
Pre-Amp 1-26.5 GHz	Agilent	8449B	T404	03/09/2019
EMI Test Receiver	Rohde&Schwarz	ESW44	PRE0179372	05/04/2019
EMI Test Receiver	Rohde&Schwarz	ESW44	PRE0179367	04/28/2019
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1271	07/17/2019
Power Sensor, P-series, 50MHz to 18GHz, Wideband	Agilent (Keysight) Technologies	N1921A	T1225	04/10/2019
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, Jan 11, 2019	
Radiated Software	UL	UL EMC	Ver 9.5, Jun 22, 2018	
Antenna Port Software	UL	UL RF	Ver 9.3.1, Dec 17, 2018	

NOTES:

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

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

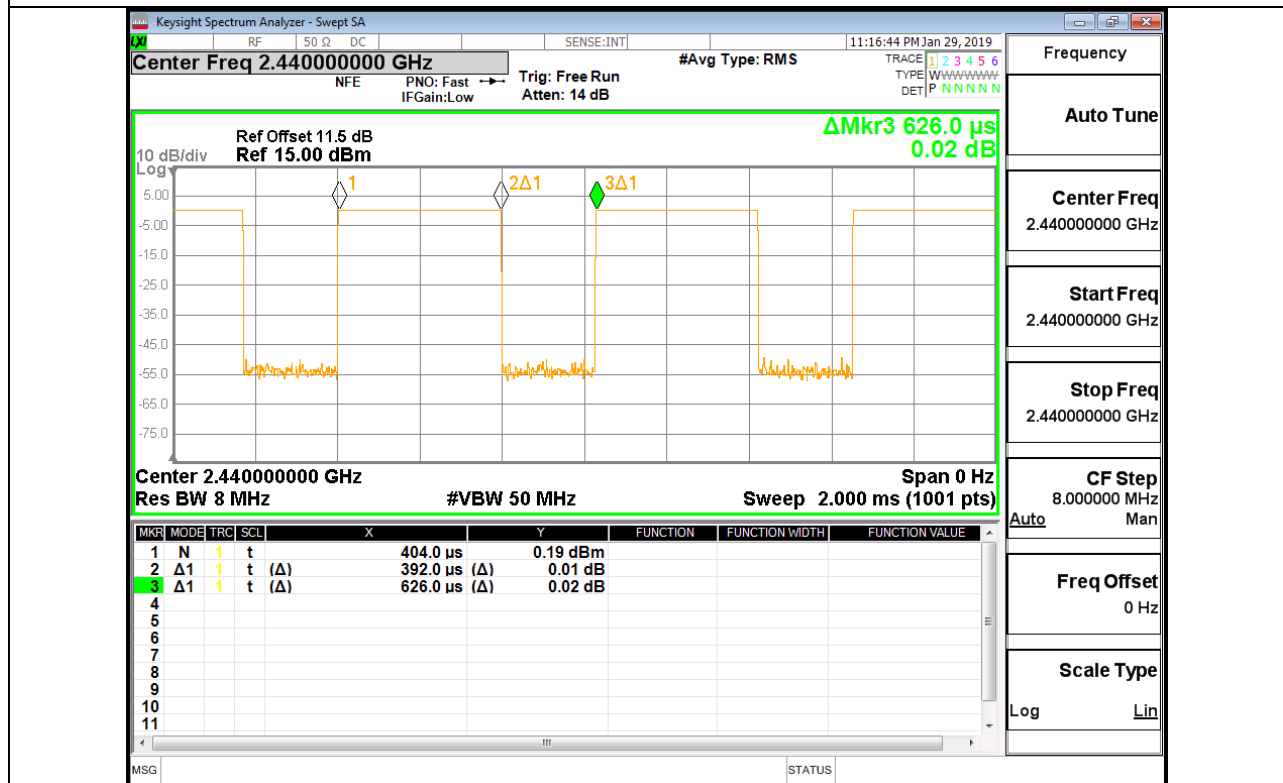
RESULTS

Date:	1/29/2019
Test Engineer:	10629 RL

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
BLE	0.392	0.626	0.626	62.62%	2.03	2.551

DUTY CYCLE PLOTS



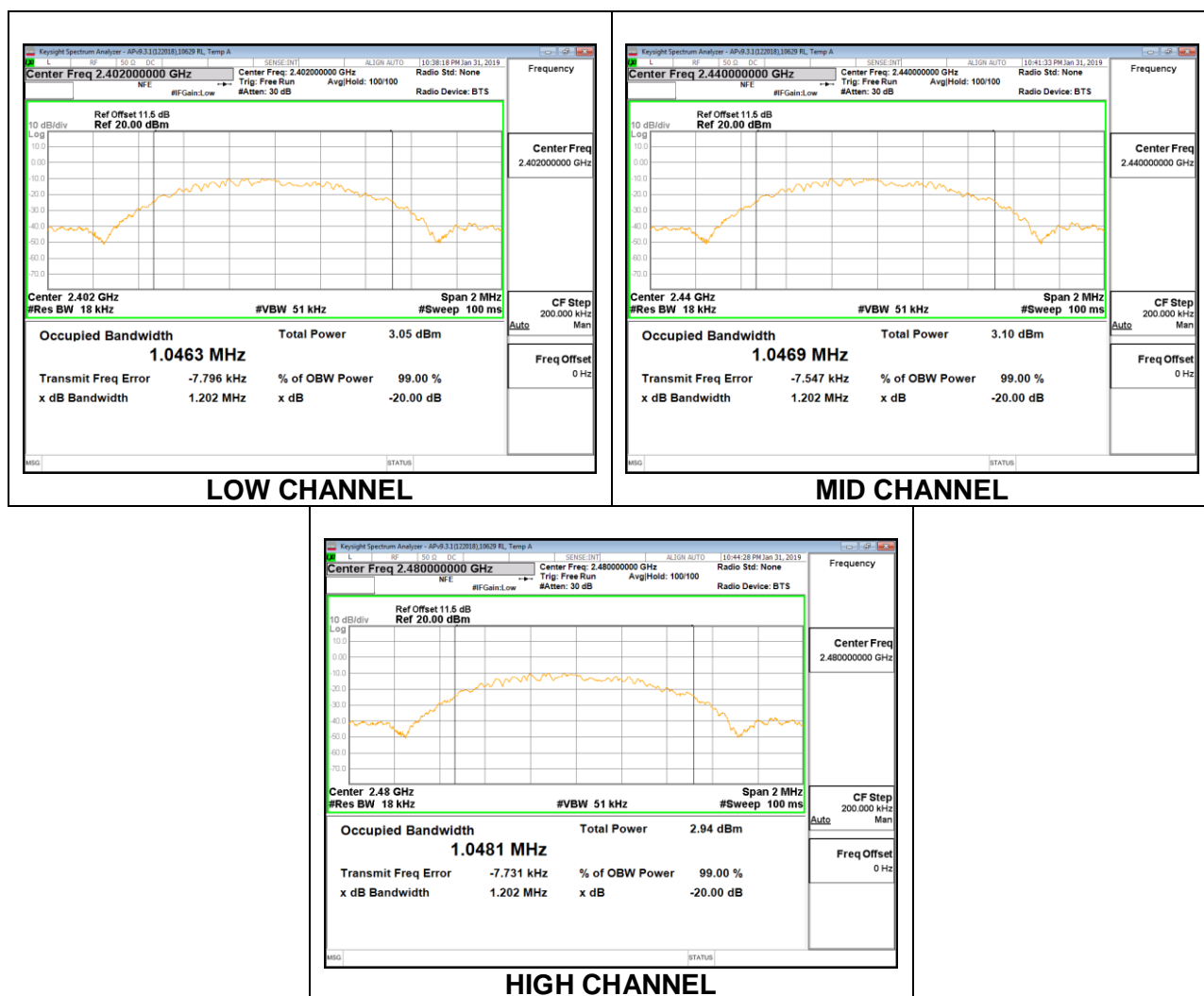
8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0463
Middle	2440	1.0469
High	2480	1.0481



8.3. 6 dB BANDWIDTH

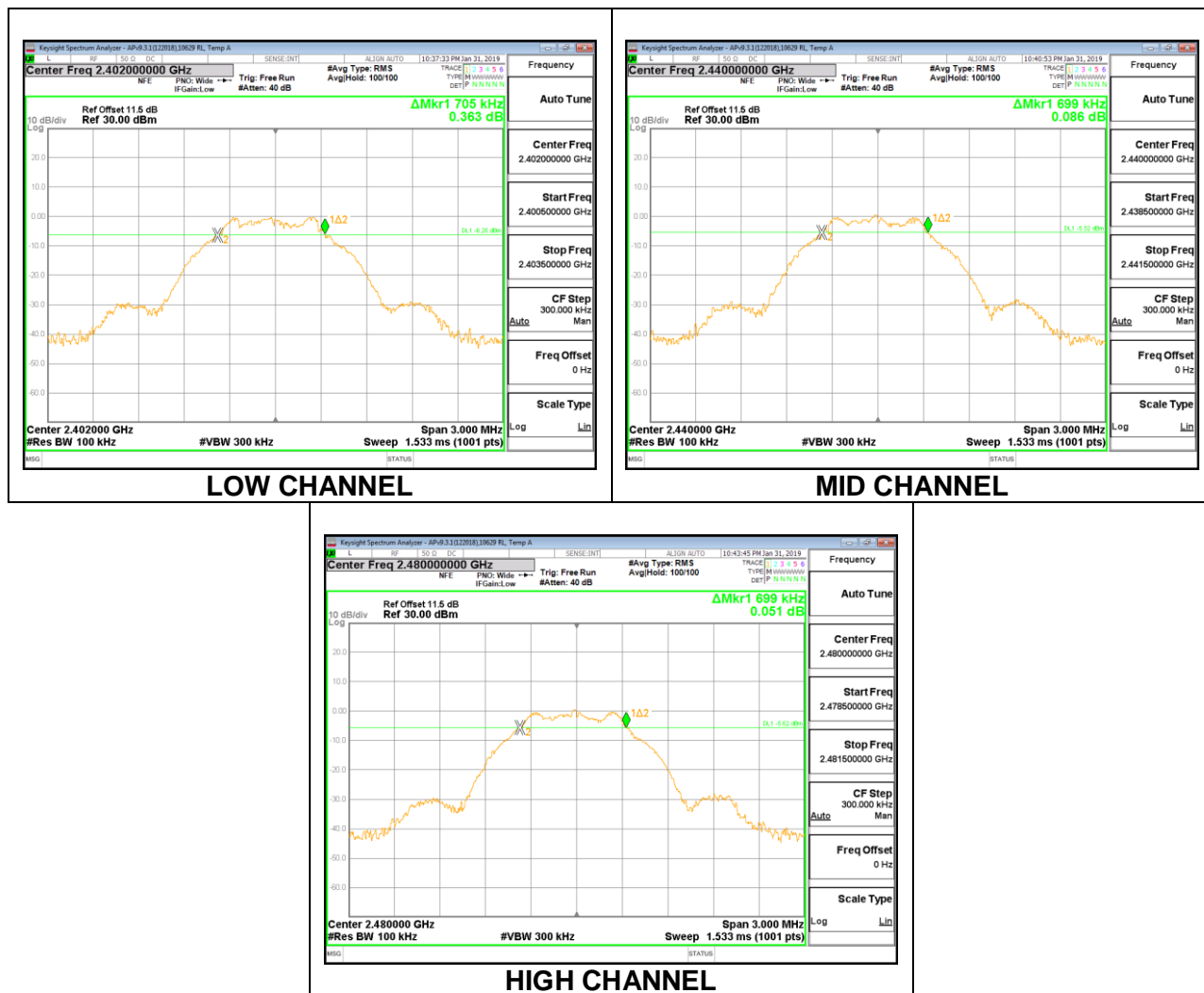
LIMITS

FCC §15.407 (e)
 RSS-247 5.2 (a)

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

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.705	0.5
Middle	2440	0.699	0.5
High	2480	0.699	0.5



8.4. OUTPUT POWER

LIMITS

FCC §15.247 (b) (3)
RSS-247 5.4 (d)

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

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for a gated peak reading of power.

RESULTS

Tested By:	10629 RL
Date:	1/29/2019

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	1.350	30	-28.650
Middle	2440	1.440	30	-28.560
High	2480	1.320	30	-28.680

8.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.5 dB (including 10 dB pad and 1.5 dB cable) was entered as an offset in the power meter to allow for a gated average reading of power.

RESULTS

Tested By:	10629 RL
Date:	1/29/2019

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	1.28
Middle	2440	1.37
High	2480	1.25

8.6. POWER SPECTRAL DENSITY

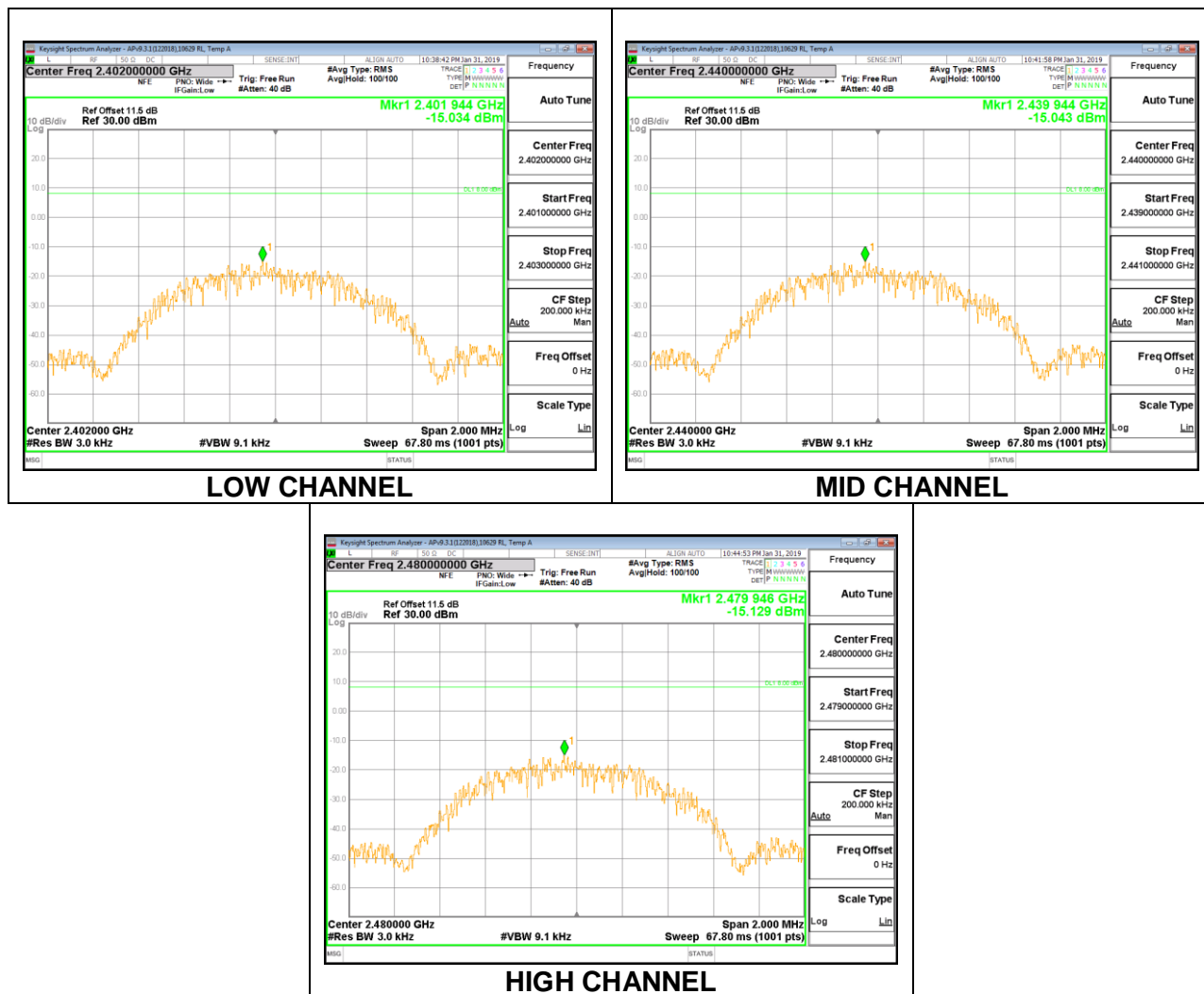
LIMITS

FCC §15.247 (e)
 RSS-247 (5.2) (b)

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

RESULTS

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Margin (dB)
Low	2402	-15.03	8	-23.03
Middle	2440	-15.04	8	-23.04
High	2480	-15.13	8	-23.13



8.7. CONDUCTED SPURIOUS EMISSIONS

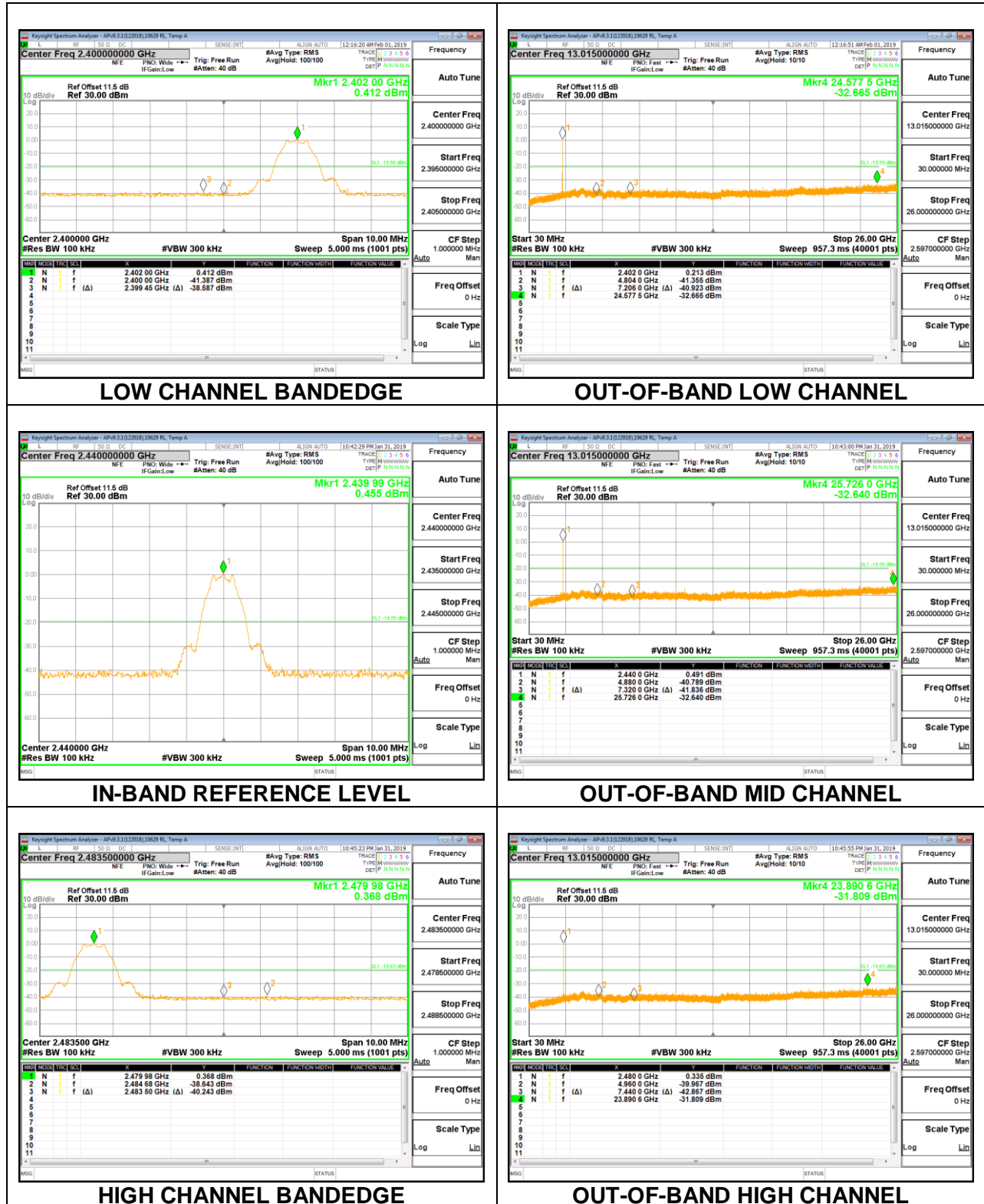
LIMITS

FCC §15.247 (d)

RSS-247 5.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

RESULTS



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209
RSS-GEN, Section 8.9 and 8.10.

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

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

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

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

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

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

KDB 414788 Open Field Test Site and Chamber Correlation Justification

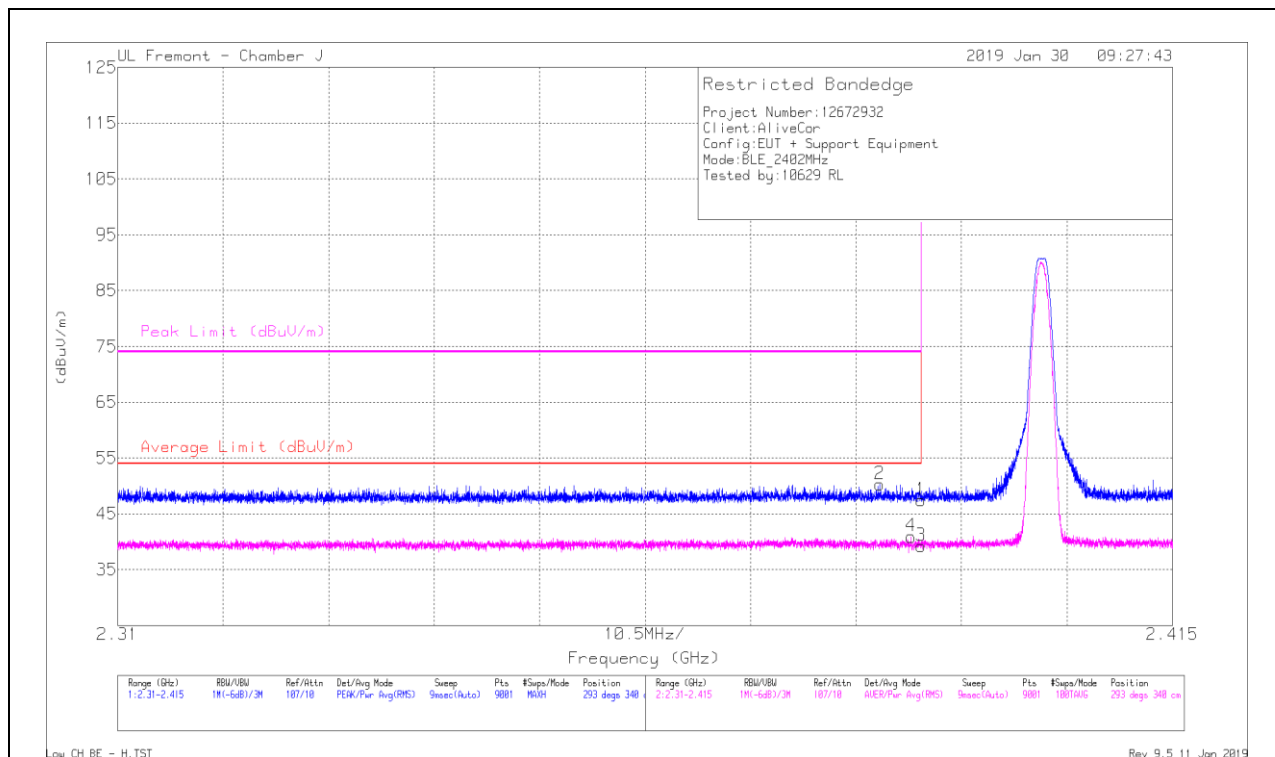
Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

Open field test site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

9.2. TRANSMITTER ABOVE 1 GHz

BANDEDGE (LOW CHANNEL)

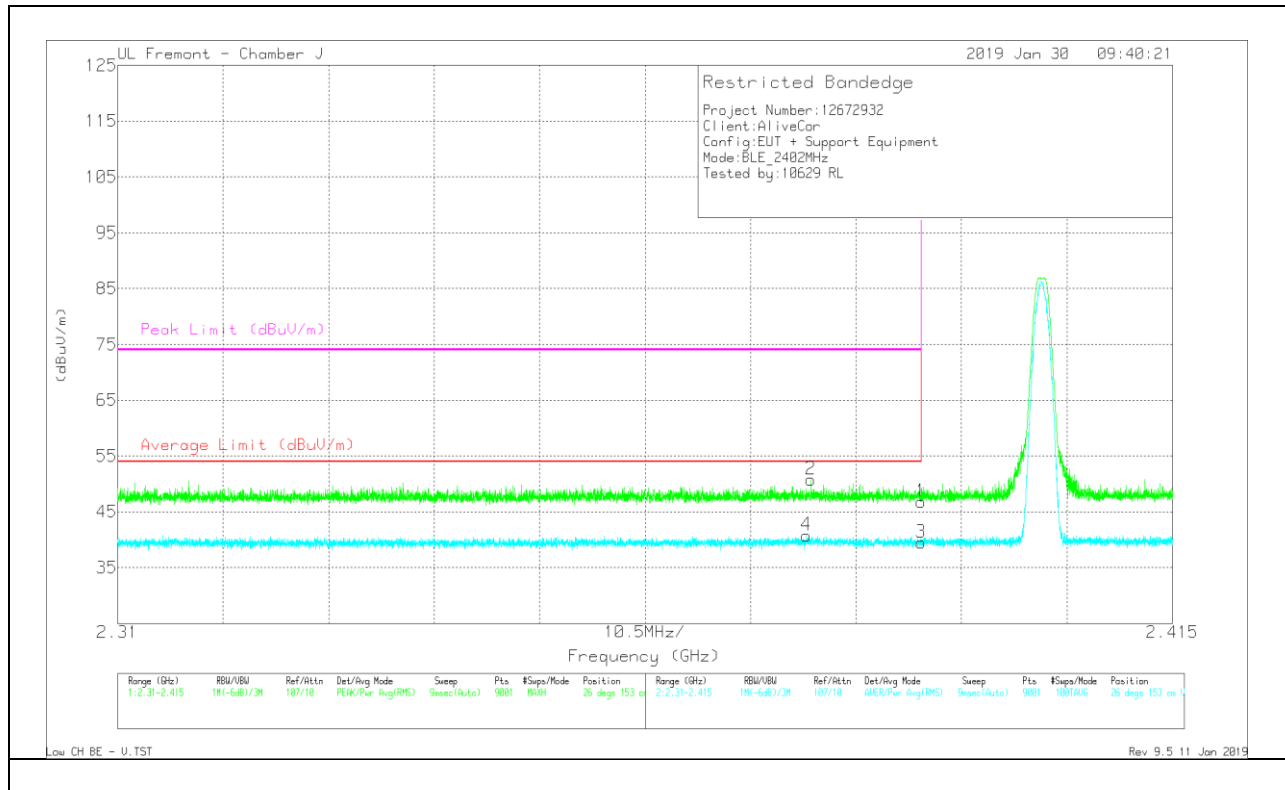
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (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	* 2.39	41.25	Pk	32	-25.8	0	47.45	-	-	74	-26.55	293	340	H
2	* 2.386	44.06	Pk	32	-25.8	0	50.26	-	-	74	-23.74	293	340	H
3	* 2.39	31.03	RMS	32	-25.8	2.03	39.26	54	-14.74	-	-	293	340	H
4	* 2.389	32.69	RMS	32	-25.8	2.03	40.92	54	-13.08	-	-	293	340	H

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

VERTICAL RESULT

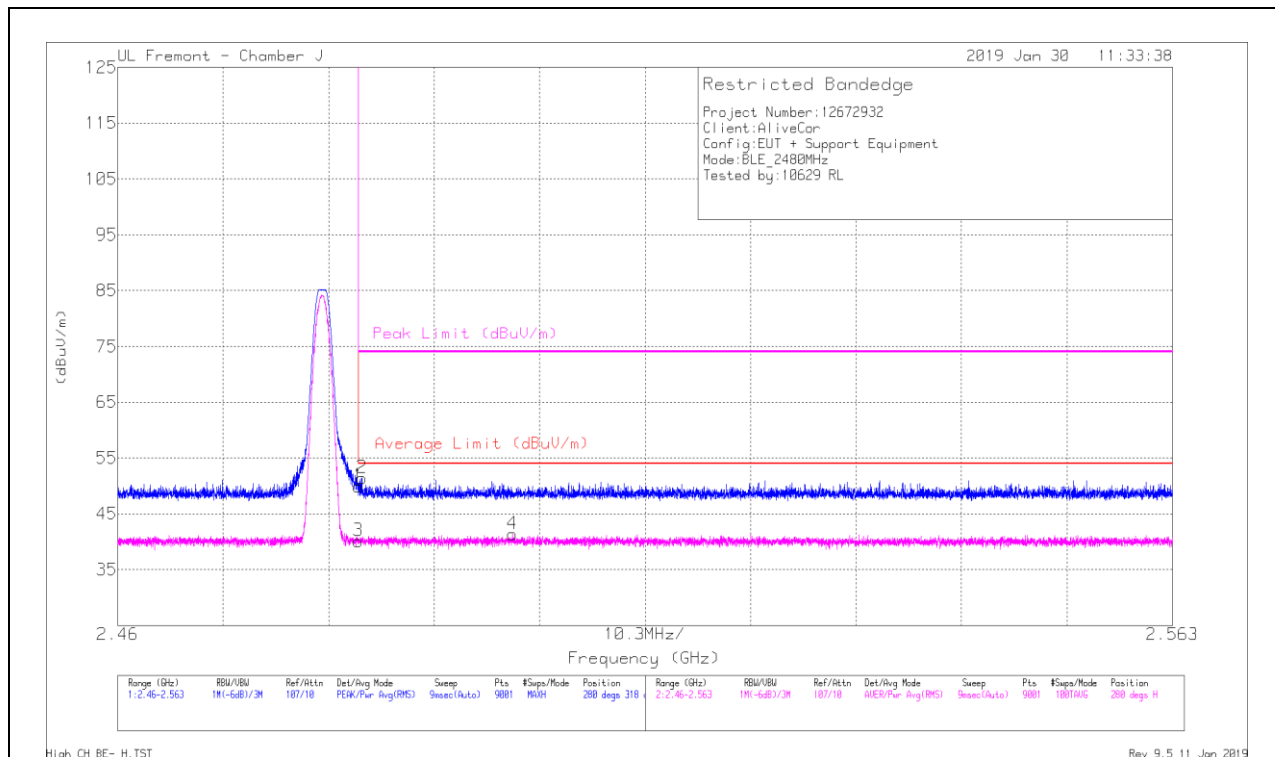


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.66	Pk	32	-25.8	0	46.86	-	-	74	-27.14	26	153	V
2	* 2.379	44.57	Pk	32	-25.8	0	50.77	-	-	74	-23.23	26	153	V
3	* 2.39	31.28	RMS	32	-25.8	2.03	39.51	54	-14.49	-	-	26	153	V
4	* 2.379	32.56	RMS	32	-25.8	2.03	40.79	54	-13.21	-	-	26	153	V

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

BANEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



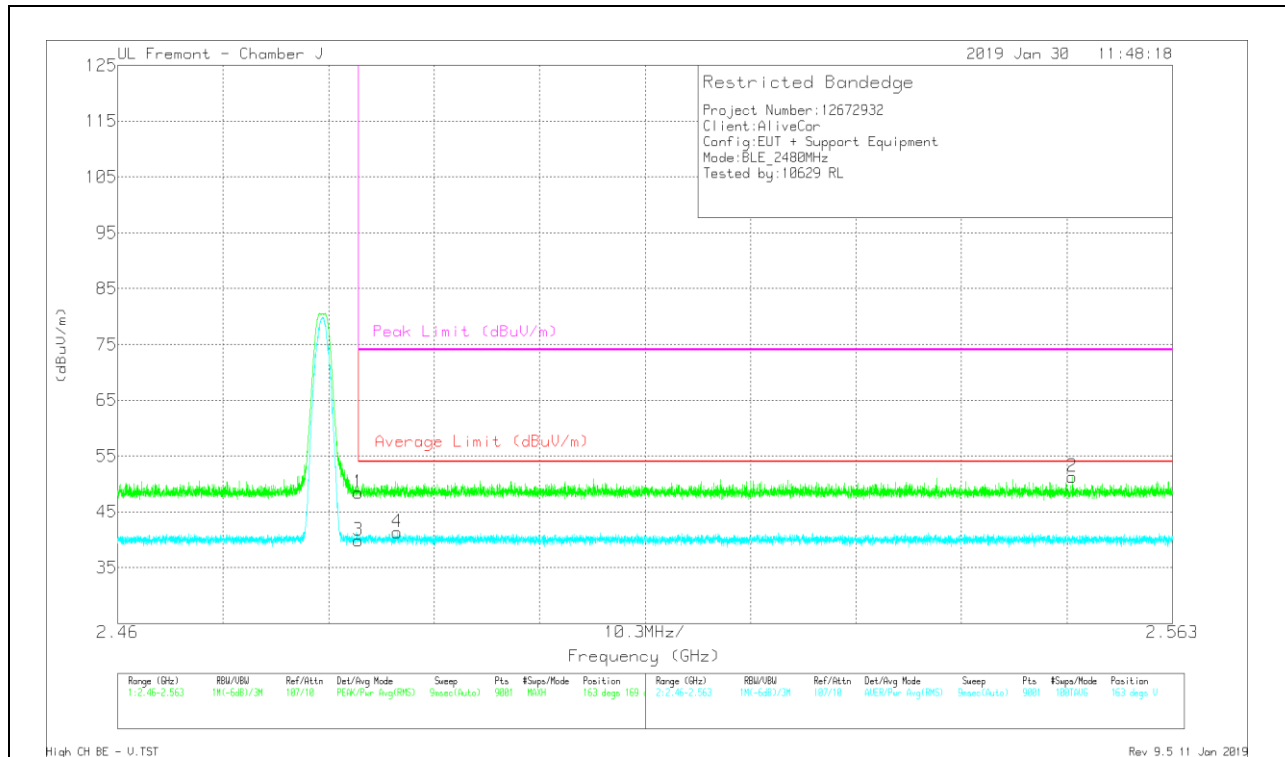
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (dB/m)	Amp/Cb/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	43.24	Pk	32.5	-25.8	0	49.94	-	-	74	-24.06	280	318	H
2	* 2.484	44.71	Pk	32.5	-25.8	0	51.41	-	-	74	-22.59	280	318	H
3	* 2.484	31.36	RMS	32.5	-25.8	2.03	40.09	54	-13.91	-	-	280	318	H
4	* 2.499	32.5	RMS	32.5	-25.7	2.03	41.33	54	-12.67	-	-	280	318	H

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

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULT

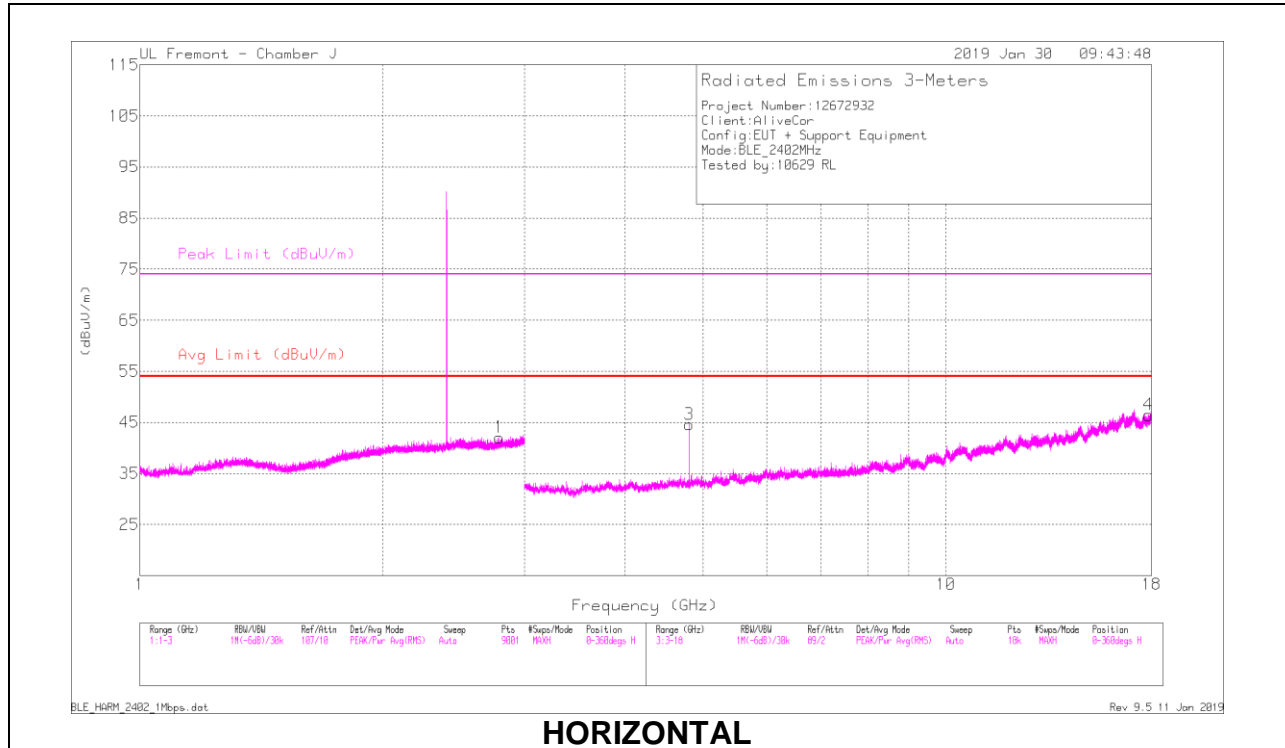


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT10067 (dB/m)	Amp/Cou/Filt/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.68	Pk	32.5	-25.8	0	48.38	-	-	74	-25.62	163	169	V
2	2.553	44.54	Pk	32.5	-25.7	0	51.34	-	-	74	-22.66	163	169	V
3	* 2.484	31.09	RMS	32.5	-25.8	2.03	39.82	54	-14.18	-	-	163	169	V
4	* 2.487	32.53	RMS	32.5	-25.7	2.03	41.36	54	-12.64	-	-	163	169	V

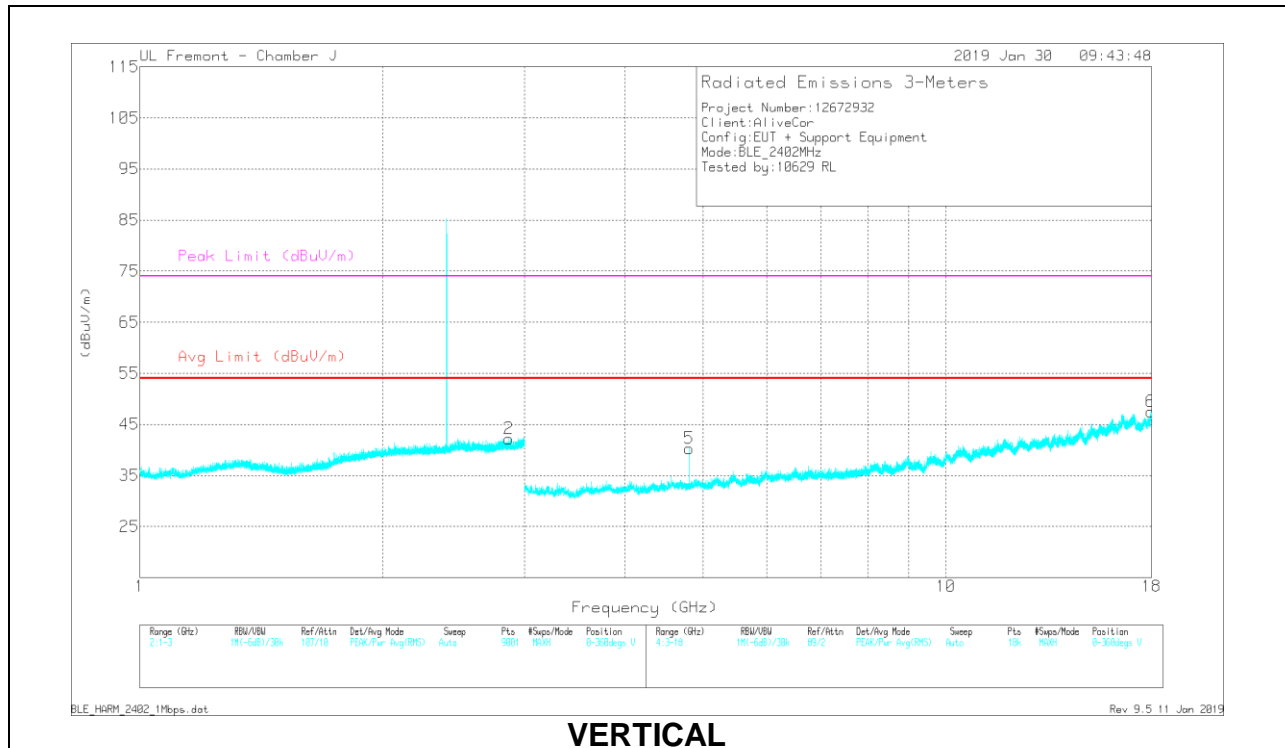
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



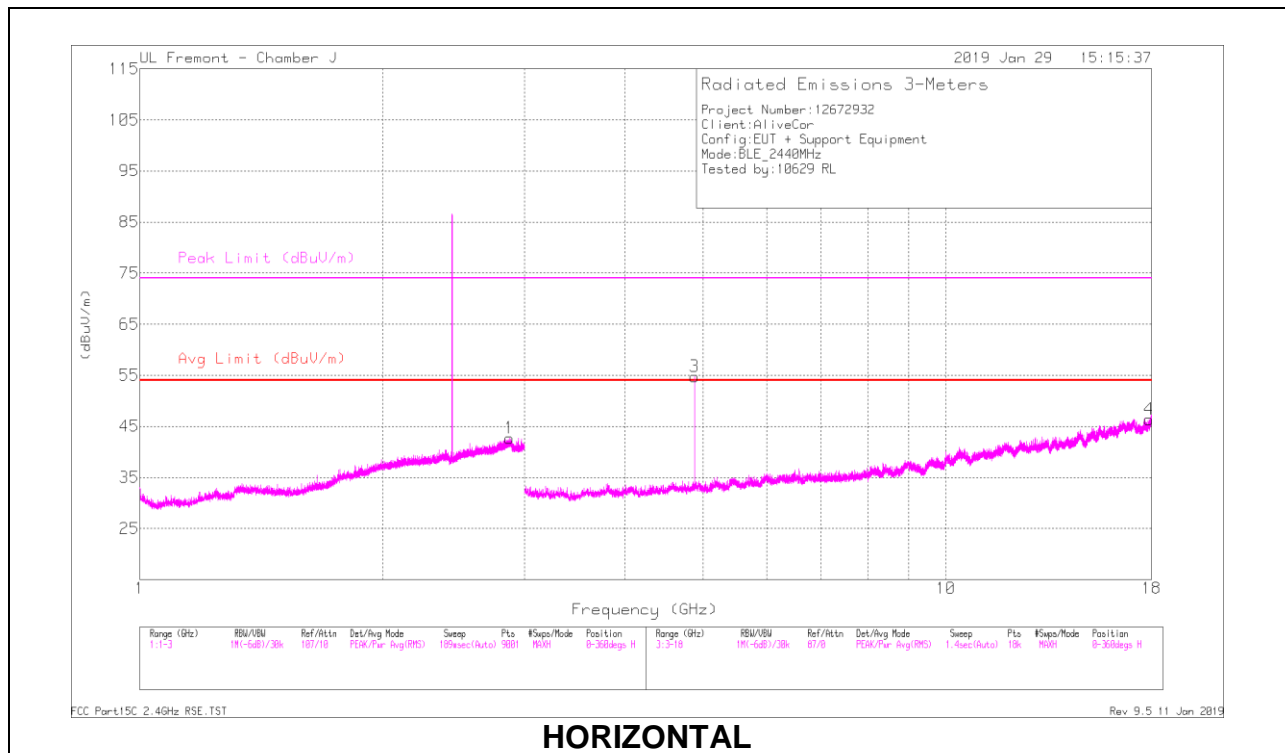
VERTICAL

RADIATED EMISSIONS

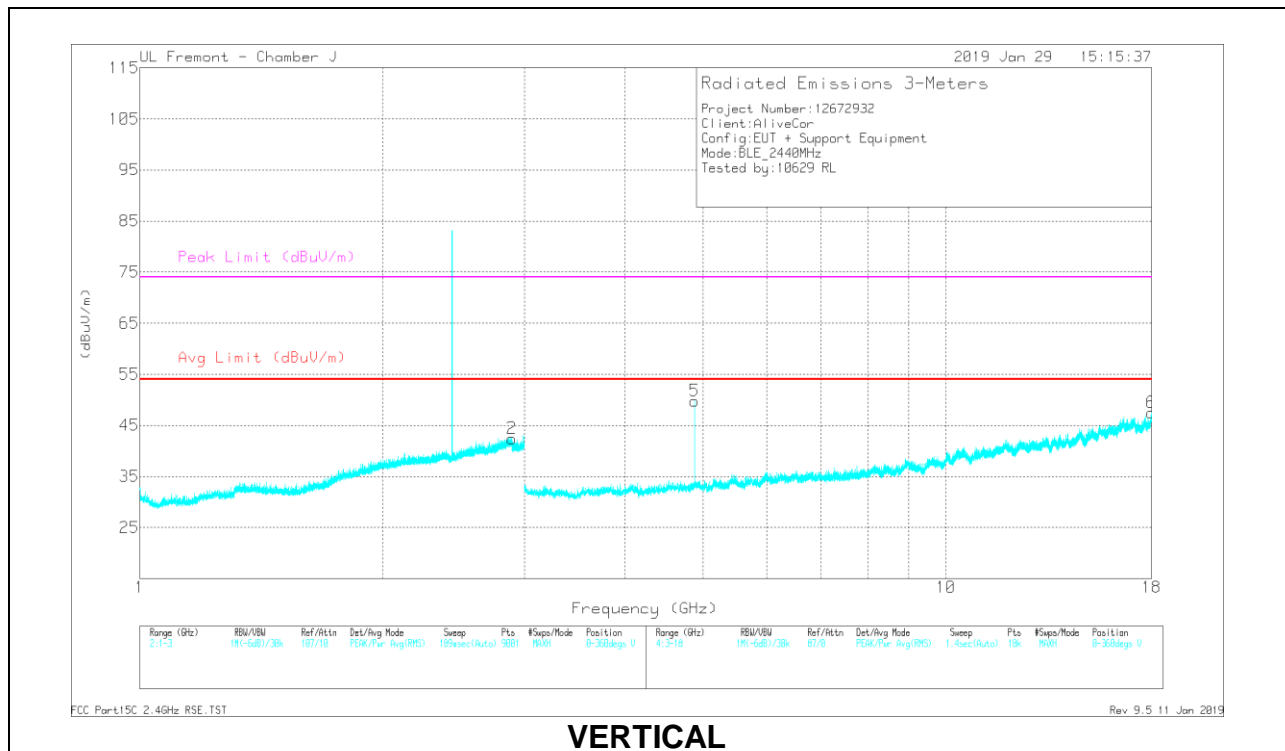
Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (dB/m)	Amp/Cbl/FI tr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.793	42.3	PK2	32.5	-25.5	0	49.3	-	-	74	-24.7	316	169	H
* 2.791	32.18	MAv1	32.4	-25.5	2.03	41.11	54	-12.89	-	-	316	169	H
* 2.866	41.17	PK2	32.5	-25.4	0	48.27	-	-	74	-25.73	211	361	V
* 2.868	31.86	MAv1	32.5	-25.4	2.03	40.99	54	-13.01	-	-	211	361	V
* 4.804	46.12	PK2	34.1	-31.3	0	48.92	-	-	74	-25.08	218	134	H
* 4.804	38.47	MAv1	34.1	-31.3	2.03	43.3	54	-10.7	-	-	218	134	H
* 17.849	29.89	PK2	40.7	-18.2	0	52.39	-	-	74	-21.61	258	133	H
* 17.848	20.87	MAv1	40.7	-18.2	2.03	45.4	54	-8.6	-	-	258	133	H
* 4.804	43.14	PK2	34.1	-31.3	0	45.94	-	-	74	-28.06	243	230	V
* 4.804	34.81	MAv1	34.1	-31.3	2.03	39.64	54	-14.36	-	-	243	230	V
* 17.963	30.41	PK2	40.7	-18.2	0	52.91	-	-	74	-21.09	38	147	V
* 17.963	21.36	MAv1	40.7	-18.2	2.03	45.89	54	-8.11	-	-	38	147	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



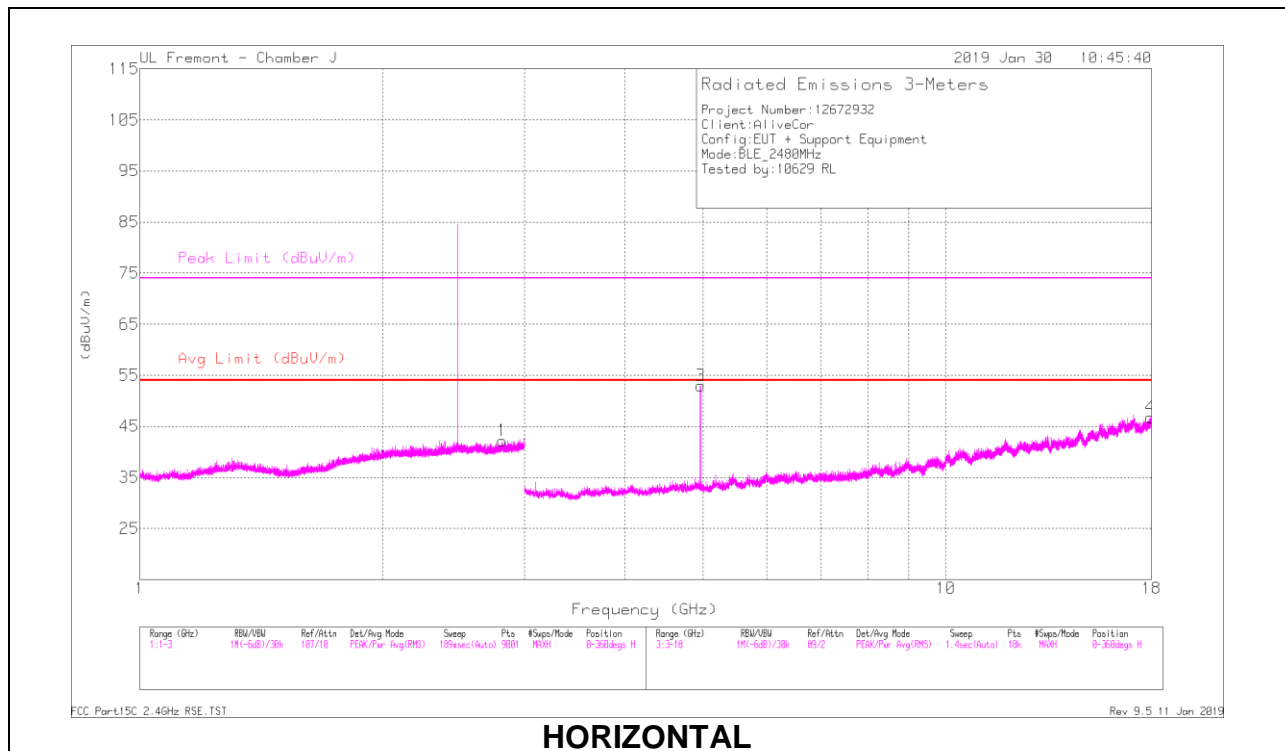
VERTICAL

RADIATED EMISSIONS

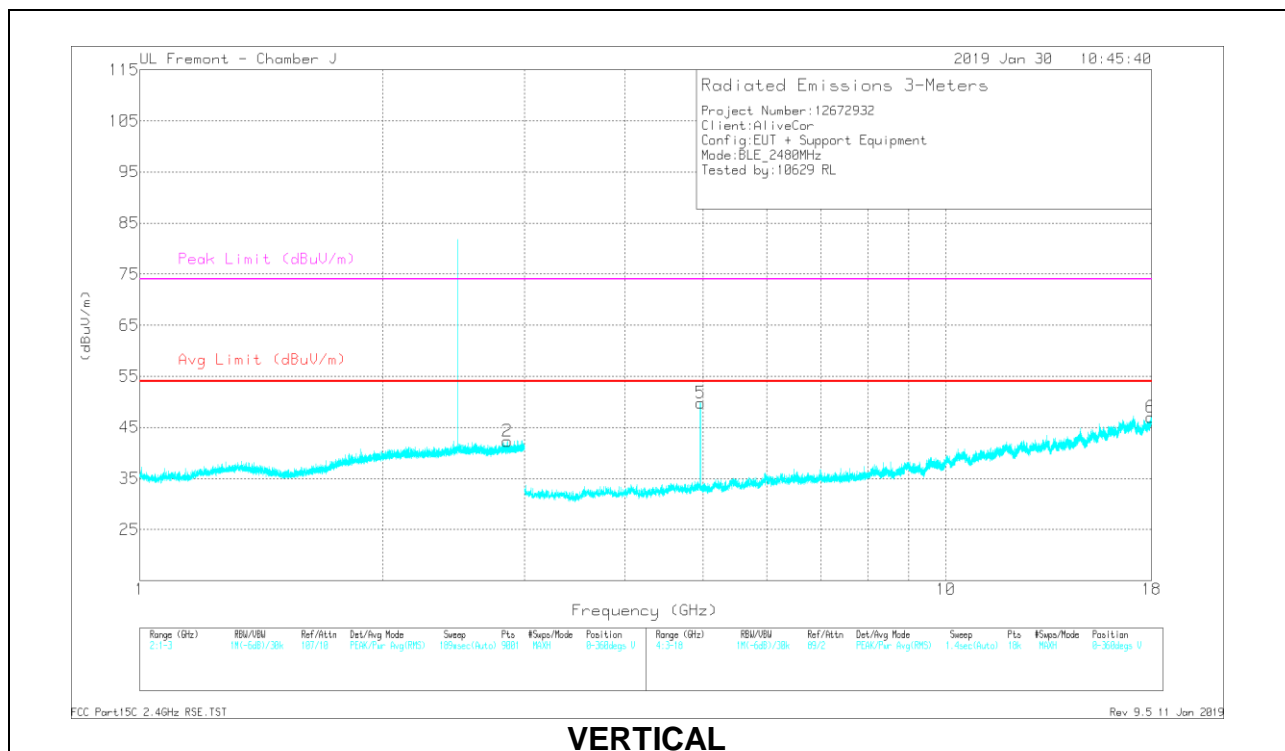
Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (dB/m)	Amp/Cb/FI tr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.873	28.59	PK2	32.5	-13.7	0	47.39	-	-	74	-26.61	270	109	H
* 2.875	19.37	MAv1	32.5	-13.7	2.03	40.2	54	-13.8	-	-	270	109	H
* 2.895	32.34	PK2	32.6	-13.6	0	51.34	-	-	74	-22.66	14	104	V
* 2.894	21.18	MAv1	32.6	-13.7	2.03	42.11	54	-11.89	-	-	14	104	V
* 4.879	54.02	PK2	34	-31.4	0	56.62	-	-	74	-17.38	173	133	H
* 4.88	44.39	MAv1	34	-31.4	2.03	49.02	54	-4.98	-	-	173	133	H
	30.46	PK2	40.7	-18.3	0	52.86	-	-	74	-21.14	14	389	H
* 17.867	20.98	MAv1	40.7	-18.2	2.03	45.51	54	-8.49	-	-	14	389	H
* 4.88	50.56	PK2	34	-31.4	0	53.16	-	-	74	-20.84	92	242	V
* 4.88	42.61	MAv1	34	-31.4	2.03	47.24	54	-6.76	-	-	92	242	V
* 17.985	30.63	PK2	40.7	-17.9	0	53.43	-	-	74	-20.57	287	201	V
* 17.984	21.06	MAv1	40.7	-17.9	2.03	45.89	54	-8.11	-	-	287	201	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

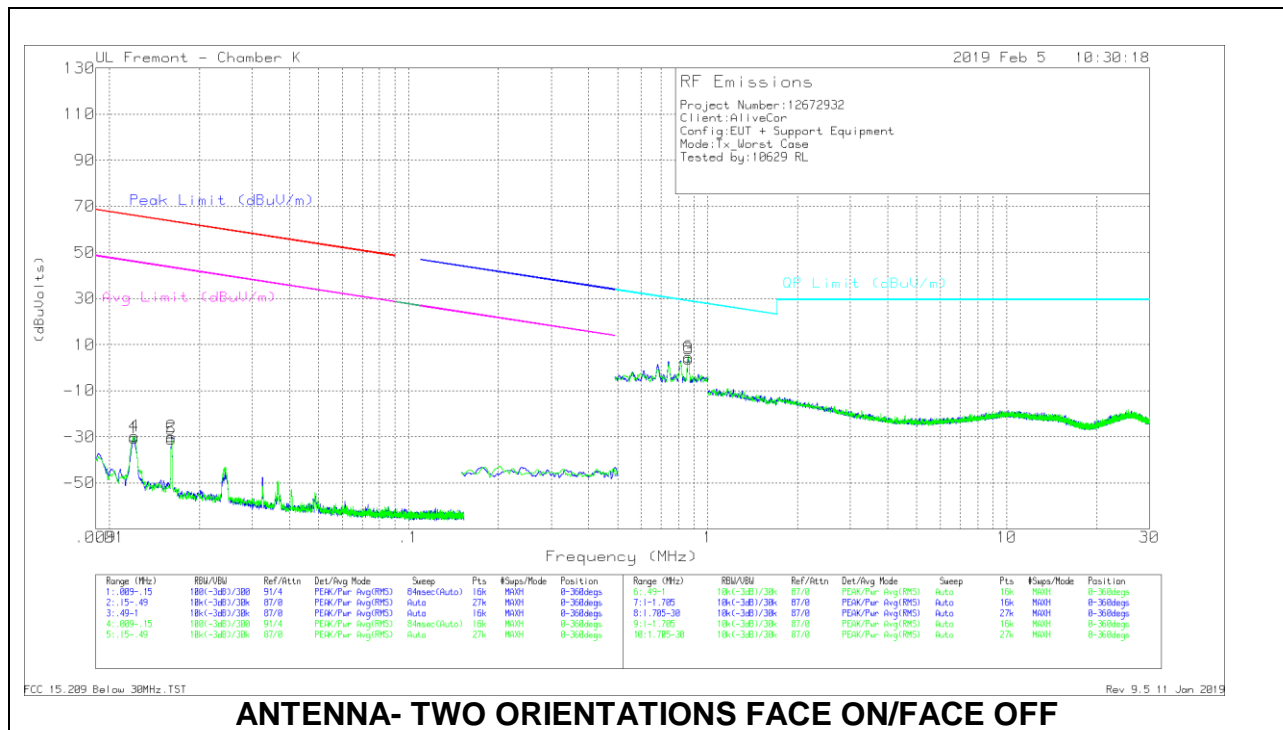
RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0067 (dB/m)	Amp/Cbl/FI tr/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
* 2.815	41.8	PK2	32.5	-25.5	0	48.8	-	-	74	-25.2	135	181	H
* 2.816	31.54	MAv1	32.5	-25.5	2.03	40.57	54	-13.43	-	-	135	181	H
* 2.859	42.02	PK2	32.5	-25.4	0	49.12	-	-	74	-24.88	340	217	V
* 2.858	32.66	MAv1	32.5	-25.4	2.03	41.79	54	-12.21	-	-	340	217	V
* 4.959	52.59	PK2	34	-30.4	0	56.19	-	-	74	-17.81	218	105	H
* 4.96	44.51	MAv1	34	-30.4	2.03	50.14	54	-3.86	-	-	218	105	H
* 17.949	30.33	PK2	40.7	-18.4	0	52.63	-	-	74	-21.37	125	246	H
* 17.952	21.25	MAv1	40.7	-18.4	2.03	45.58	54	-8.42	-	-	125	246	H
* 4.96	49.53	PK2	34	-30.4	0	53.13	-	-	74	-20.87	271	207	V
* 4.96	40.7	MAv1	34	-30.4	2.03	46.33	54	-7.67	-	-	271	207	V
* 17.982	30.81	PK2	40.7	-18	0	53.51	-	-	74	-20.49	281	266	V
* 17.979	20.88	MAv1	40.7	-18	2.03	45.61	54	-8.39	-	-	281	266	V

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

9.3. WORST CASE BELOW 30MHz

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)



ANTENNA- TWO ORIENTATIONS FACE ON/FACE OFF

Below 30MHz Data

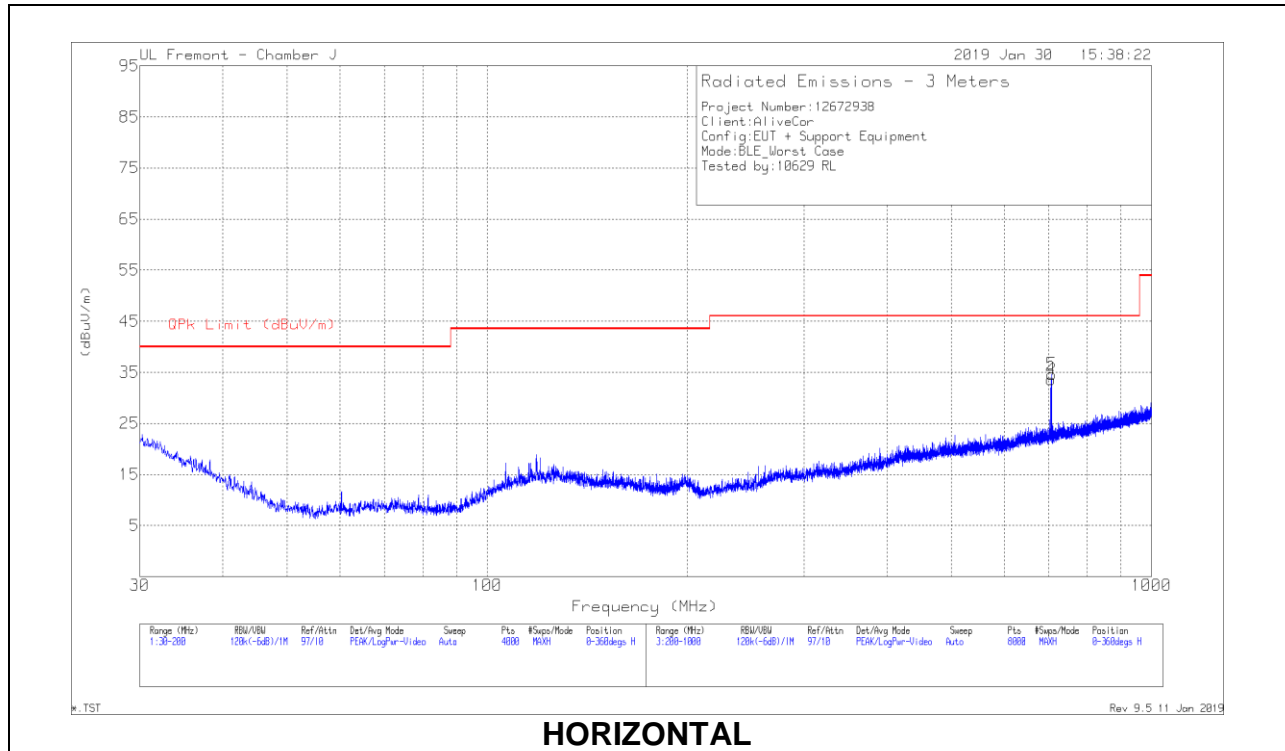
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0186650	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.01213	21.38	Pk	60	-31.8	-80	-30.42	65.91	-96.33	45.91	-76.33	0-360
2	.01614	22.56	Pk	59.5	-31.9	-80	-29.84	63.43	-93.27	43.43	-73.27	0-360
4	.01214	22.05	Pk	60	-31.8	-80	-29.75	65.9	-95.65	45.9	-75.65	0-360
5	.01615	21.46	Pk	59.5	-31.9	-80	-30.94	63.42	-94.36	43.42	-74.36	0-360

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0186650	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
3	.86472	19.68	Pk	56.3	-32.1	-40	3.88	28.88	-25	0-360
6	.86176	20.46	Pk	56.3	-32.1	-40	4.66	28.91	-24.25	0-360

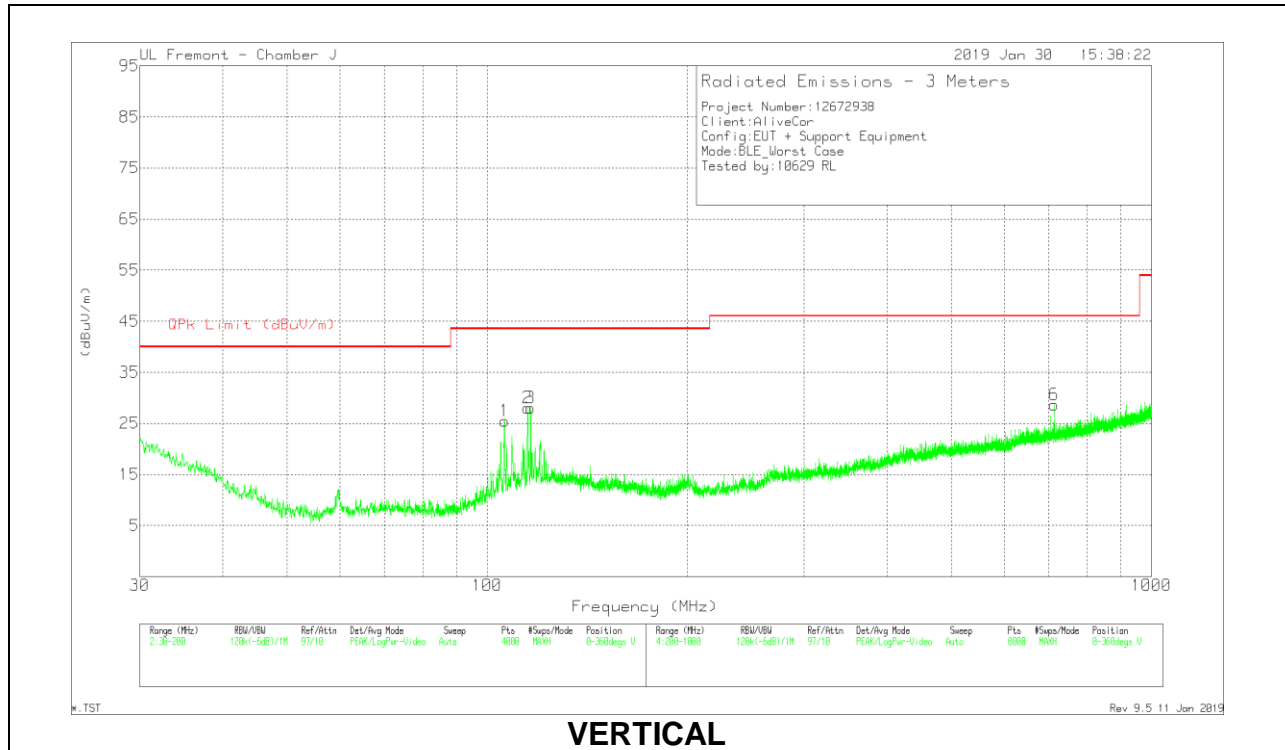
Pk - Peak detector

9.4. WORST CASE BELOW 1 GHz

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



HORIZONTAL



VERTICAL

Below 1GHz Data

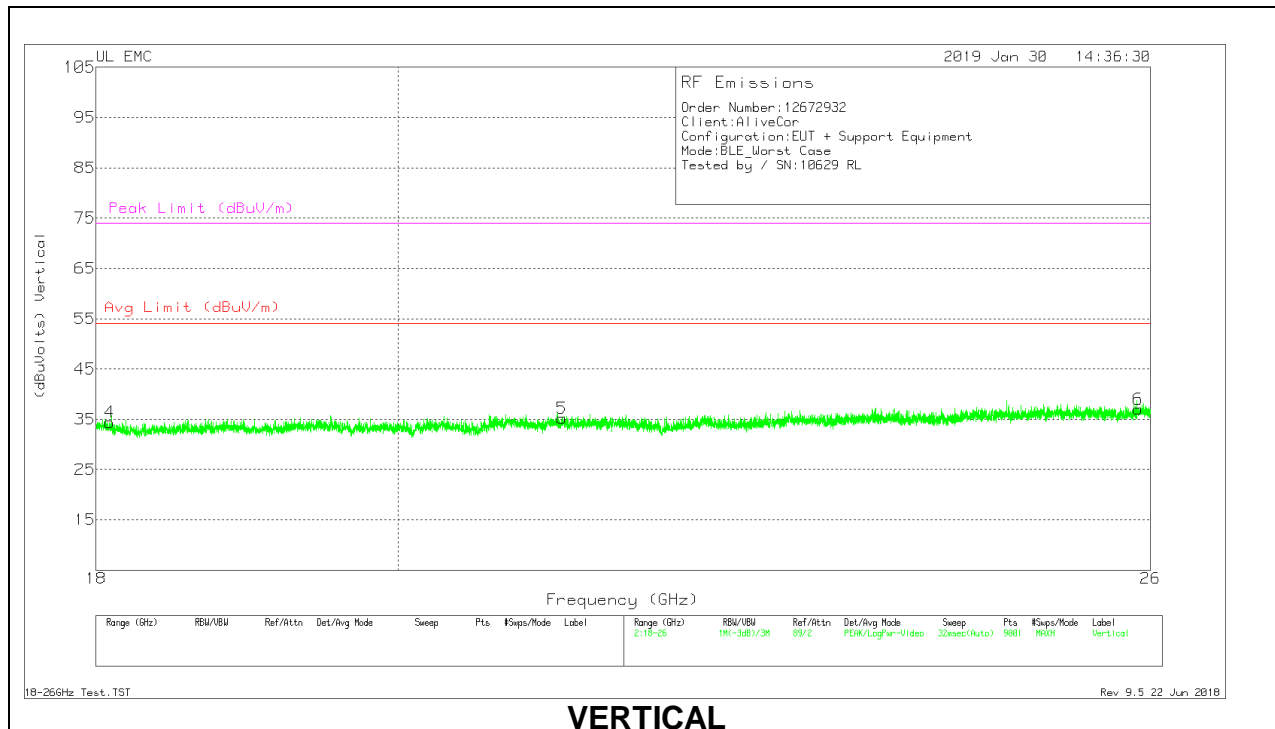
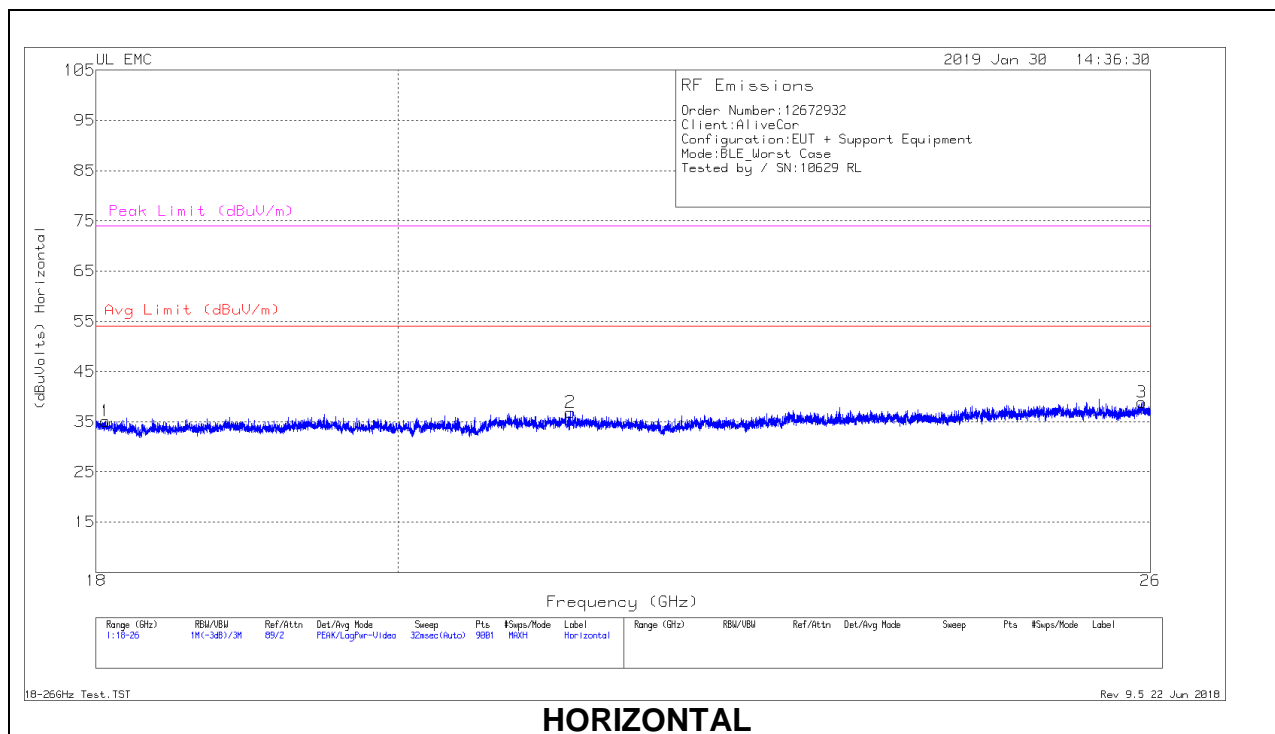
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0181575 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	106.1372	38.43	Pk	17.9	-30.9	25.43	43.52	-18.09	0-360	101	V
2	* 115.0645	39.62	Pk	19.3	-30.9	28.02	43.52	-15.5	0-360	101	V
3	* 116.2548	39.55	Pk	19.4	-30.9	28.05	43.52	-15.47	0-360	101	V
4	705.3657	36.24	Pk	26.2	-28.8	33.64	46.02	-12.38	0-360	198	H
5	707.466	37.21	Pk	26.2	-28.8	34.61	46.02	-11.41	0-360	198	H
	713.045	21.37	Qp	26.3	-28.9	18.77	46.02	-27.25	125	229	V
6	713.1667	31.27	Pk	26.3	-28.9	28.67	46.02	-17.35	0-360	101	V

Pk - Peak detector

Qp - Quasi-Peak detector

9.5. WORST CASE 18-26 GHz

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



18 – 26GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T448 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	18.06	72.13	Pk	32.4	-59.9	-9.5	35.13	54	-18.87	74	-38.87
2	21.239	70.09	Pk	33.1	-56.8	-9.5	36.89	54	-17.11	74	-37.11
3	25.921	68.79	Pk	34.7	-55.1	-9.5	38.89	54	-15.11	74	-35.11
4	18.085	71.57	Pk	32.3	-60	-9.5	34.37	54	-19.63	74	-39.63
5	21.176	68	Pk	33.2	-56.5	-9.5	35.2	54	-18.8	74	-38.8
6	25.889	67.12	Pk	34.7	-55.3	-9.5	37.02	54	-16.98	74	-36.98

Pk - Peak detector