



CERTIFICATION TEST REPORT

Report Number. : 12132753-E3V2

Applicant : SONY MOBILE COMMUNICATIONS, INC.
4-12-3 HIGASHI-SHINAGAWA,
SHINAGAWA -KU, TOKYO, 140-0002, JAPAN

FCC ID : PY7-04685Z

EUT Description : GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac &
NFC

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

Date Of Issue:

May 18, 2018

Prepared by:

UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	05/15/18	Initial Issue	--
V2	05/18/18	Updated Section 2, 8 & Added Section 6.3	Kiya Kedida

TABLE OF CONTENTS

REPORT REVISION HISTORY	2
TABLE OF CONTENTS	3
1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. CALIBRATION AND UNCERTAINTY	7
4.1. MEASURING INSTRUMENT CALIBRATION	7
4.2. SAMPLE CALCULATION	7
4.3. MEASUREMENT UNCERTAINTY.....	7
5. EQUIPMENT UNDER TEST	8
5.1. EUT DESCRIPTION	8
6. REUSE OF TEST DATA.....	9
6.1. INTRODUCTION	9
6.2. DEVICES DIFFERENCES	9
6.3. REFERENCE DETAIL	9
6.4. DESCRIPTION OF AVAILABLE ANTENNAS	9
6.5. SOFTWARE AND FIRMWARE.....	9
6.6. WORST-CASE CONFIGURATION AND MODE.....	10
6.7. DESCRIPTION OF TEST SETUP.....	11
7. MEASUREMENT METHOD.....	13
8. TEST AND MEASUREMENT EQUIPMENT	14
9. RADIATED TEST RESULTS.....	15
9.1. LIMITS AND PROCEDURE	15
9.2. TRANSMITTER ABOVE 1 GHz	16
9.2.1. BLE (1Mbps).....	16
9.2.2. BLE (2Mbps).....	26
9.3. SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION).....	36
9.4. Worst Case Below 1 GHz	37
9.5. Worst Case 18-26 GHz.....	39

10. SETUP PHOTOS	41
-------------------------------	-----------

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SONY MOBILE COMMUNICATIONS, INC.
4-12-3 HIGASHI-SHINAGAWA,
SHINAGAWA -KU, TOKYO, 140-0002, JAPAN

EUT DESCRIPTION: GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac &
NFC

SERIAL NUMBER: CB512FP0E0, CB512FP0ZK (RADIATED)

DATE TESTED: MAY 3-7, 2018

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:



Dan Corona
CONSUMER TECHNOLOGY DIVISION
Operations Leader
UL Verification Services Inc.

Reviewed By:



Kiya Kedida
CONSUMER TECHNOLOGY DIVISION
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, KDB 558074 D01 v04, ANSI C63.10-2013 and KDB 484596 D01 Referencing Test Data v01.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, 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
☒ Chamber A (ISED:2324B-1)	☐ Chamber D (ISED:22541-1)
☒ Chamber B (ISED:2324B-2)	☐ Chamber E (ISED:22541-2)
☐ Chamber C (ISED:2324B-3)	☐ Chamber F (ISED:22541-3)
	☐ Chamber G (ISED:22541-4)
	☐ Chamber H (ISED:22541-5)

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through C are covered under ISED company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under ISED Canada company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://nist.gov/standards/scopes/2000650.htm>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac & NFC.

6. REUSE OF TEST DATA

6.1. INTRODUCTION

According to the manufacturer, the WLAN/Bluetooth conducted and NFC hardware of PY7-04685Z are HW identical to PY7-68553C. In addition PY7-04685Z digital circuit is identical to PY7-68553C. Therefore the following report/data of PY7-04685Z may be represented from PY7-68553C.

- WLAN/Bluetooth conducted
- NFC
- 15B

6.2. DEVICES DIFFERENCES

Difference between PY7-04685Z and PY7-68553C:

Sony Mobile Communications Inc. hereby declares that the difference between PY7-04685Z and PY7-68553C is related only to the cellular part and WLAN/Bluetooth Antenna Gain. Therefore the WLAN/Bluetooth conducted and NFC report/data of PY7-68553C may represent for PY7-04685Z.

6.3. REFERENCE DETAIL

Equipment Class	Reference FCC ID	Report Title/Section
DTS (BLE)	PY7-68553C	12132731-E3V1 FCC Report BLE

This report covers radiated emissions portion. For antenna port data refer to report number 12132731-E3V1 FCC Report BLE. FCC ID: PY7-68553C and PY7-04685Z has same output power values. Output power was confirmed before making radiated spurious measurements.

6.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes Loop Type antenna, with the following maximum gain:

Frequency Band (GHz)	Antenna Gain (dBi)
2402-2480	-0.60

6.5. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was s_atp_XXX_0_00403_A_9.
The test utility software used during testing was Tera Term Ver 4.79.

6.6. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 30MHz, below 1GHz and above 18GHz emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

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

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

6.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

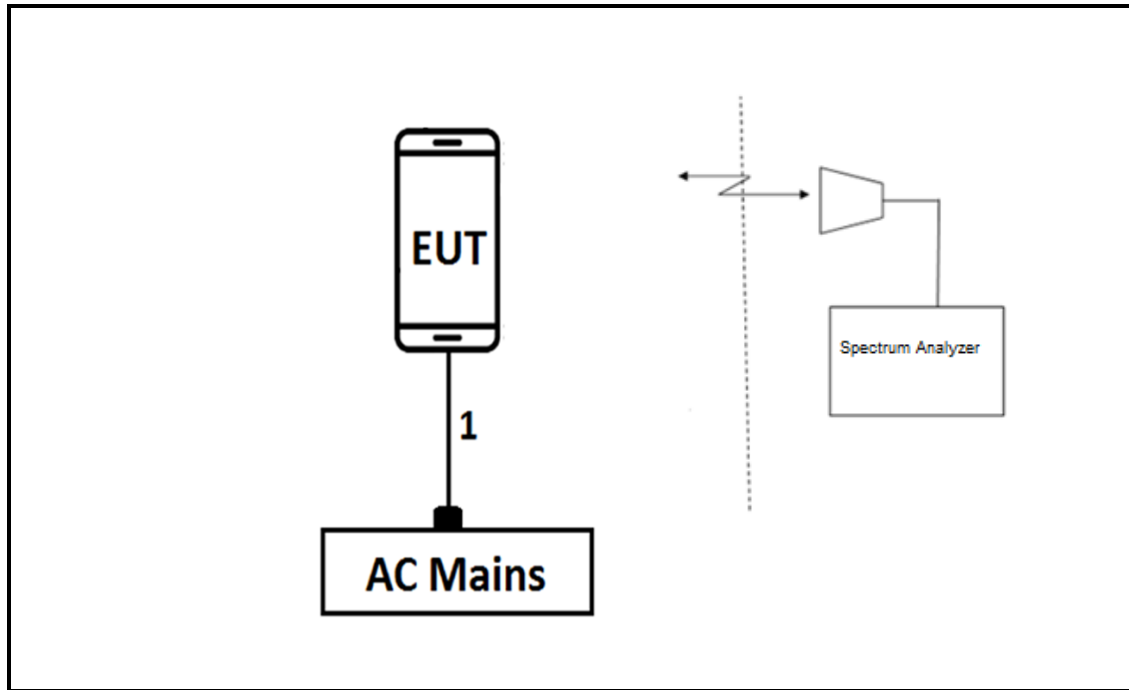
Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	20B7S0A200	PC015REW	NA
AC Adapter	SONY	UCH12	4016W40310044	NA
DC Power Supply	Ametek	XT 15-4	T463	N/A

I/O CABLES (RADIATED AND CONDUCTED EMISSIONS)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Shielded	3	N/A

TEST SETUP

RADIATED EMISSIONS SETUP DIAGRAM



7. MEASUREMENT METHOD

Out-of-band emissions in restricted bands: KDB 558074 D01 v04, Section 12.1.

Band-edge: KDB 558074 D01 v04, Section 12.1.

8. 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
Amplifier, 10KHz to 1GHz, 32dB	Agilent (Keysight) Technologies	8447D	T15	08/14/2018
Amplifier, 1 - 18GHz	MITEQ	AFS42-00101800-25-S-42	T931	09/20/2018
Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T493	04/03/2019
RF Preamplifier, 1 - 26GHz	Agilent	8449B	T404	07/23/2018
Antenna, Active Loop 9kHz-30MHz	Com-Power Corp.	AL-130R	T1866	10/10/2018
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	T130	06/15/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T862	06/09/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T863	06/09/2018
Antenna Horn, 18 to 26GHz	ARA	MWH-1826	T89	01/18/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1466	04/16/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1454	01/08/2019
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, Dec 01, 2016	

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.

9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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 30MHz, below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

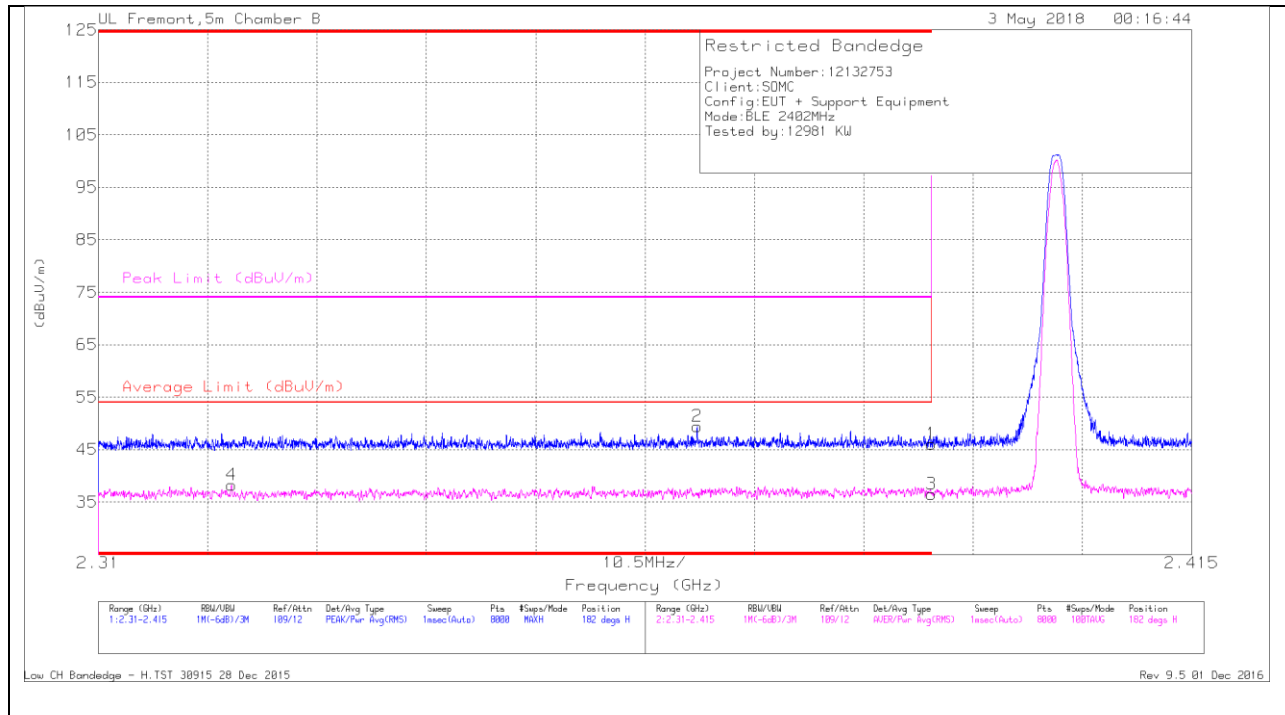
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

9.2. TRANSMITTER ABOVE 1 GHz

9.2.1. BLE (1Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Trace Markers

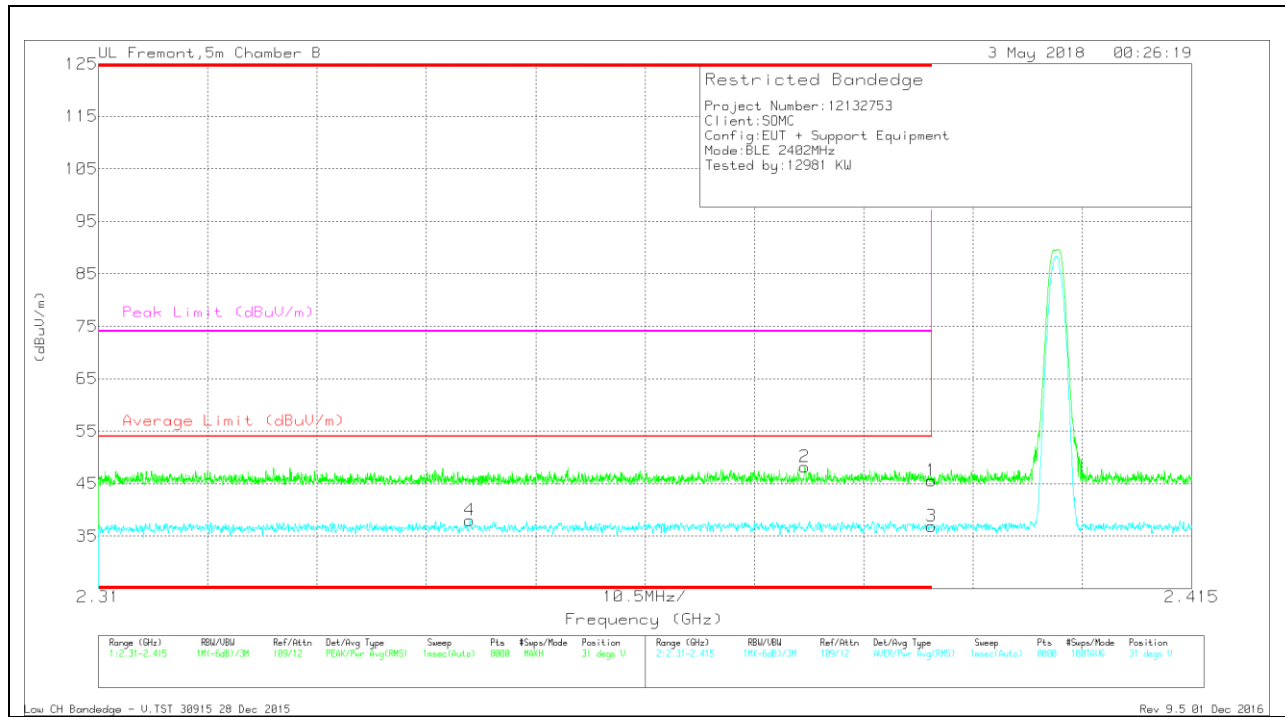
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Ch/Filt/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	35.59	Pk	32	-21.5	0	46.09	-	-	74	-27.91	182	131	H
2	* 2.368	38.96	Pk	31.9	-21.4	0	49.46	-	-	74	-24.54	182	131	H
3	* 2.39	25.28	RMS	32	-21.5	.69	36.47	54	-17.53	-	-	182	131	H
4	* 2.323	27.23	RMS	31.9	-21.6	.69	38.22	54	-15.78	-	-	182	131	H

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF1863 (dB/m)	Amp/Ch/Flt/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.346	26.89	RMS	31.9	-21.5	.69	37.98	54	-16.02	-	-	31	350	V
2	* 2.378	37.74	Pk	31.9	-21.5	0	48.14	-	-	74	-25.86	31	350	V
1	* 2.39	35.04	Pk	32	-21.5	0	45.54	-	-	74	-28.46	31	350	V
3	* 2.39	25.69	RMS	32	-21.5	.69	36.88	54	-17.12	-	-	31	350	V

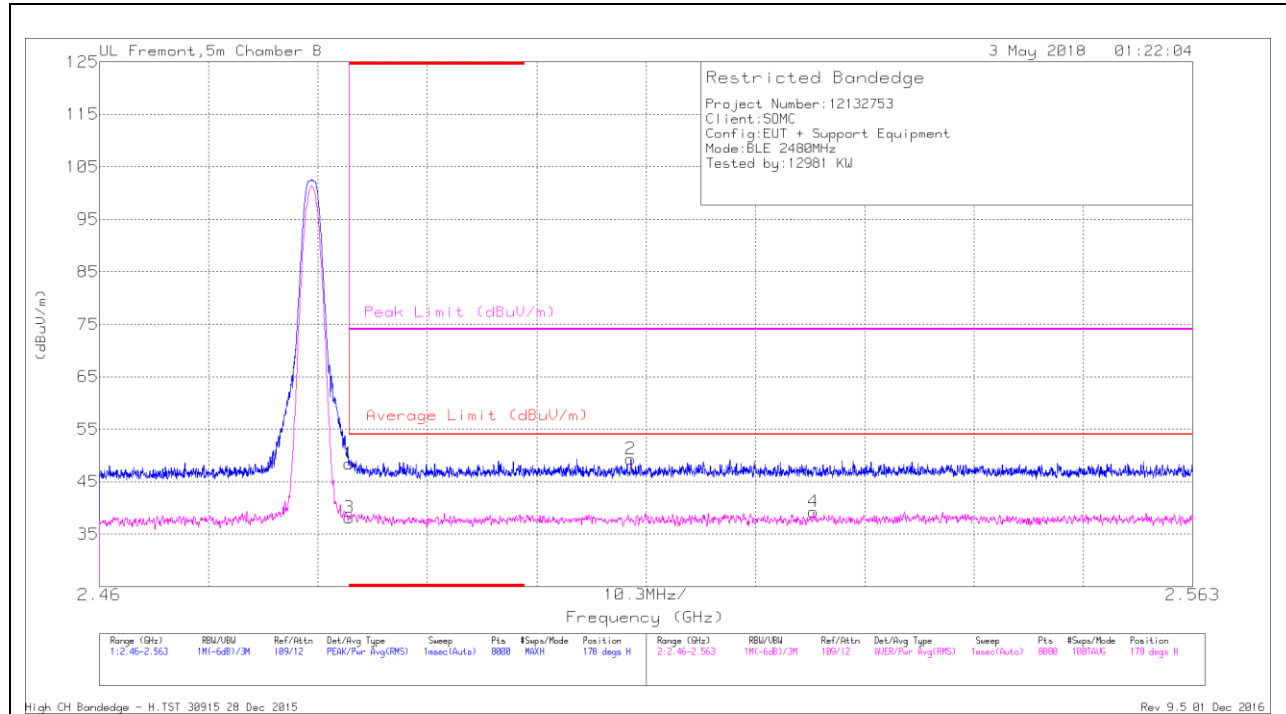
* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Trace Markers

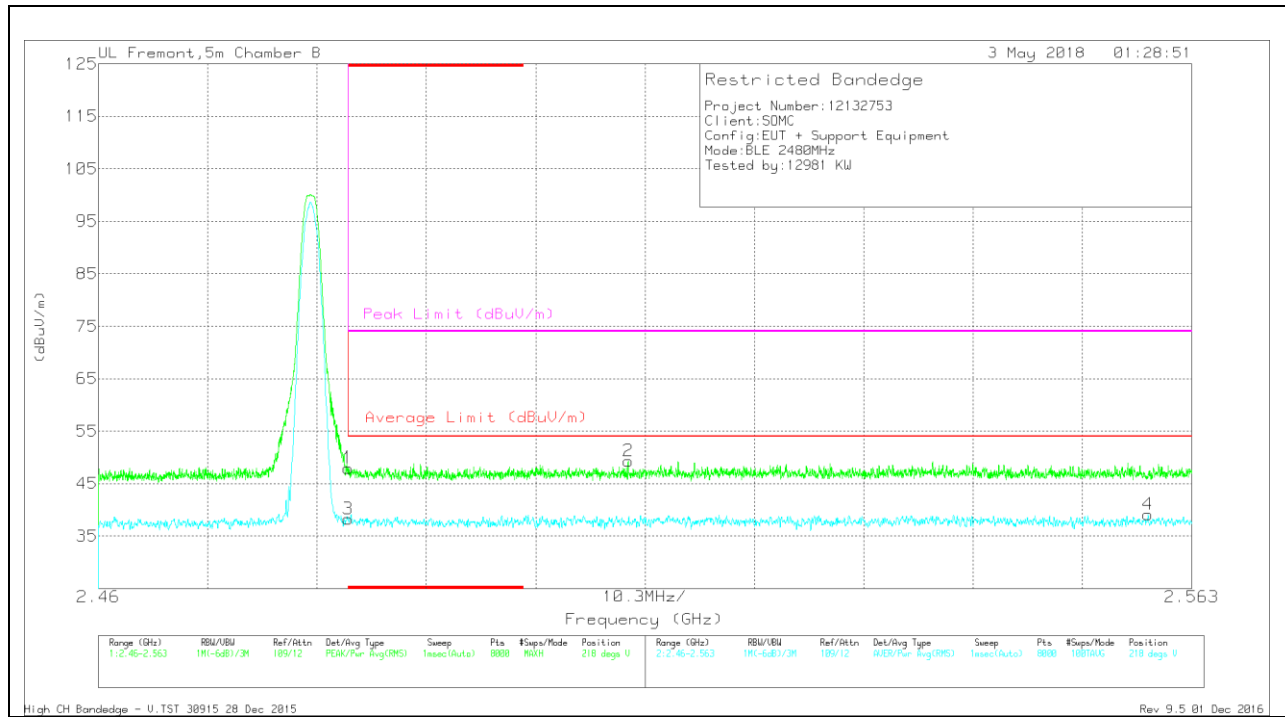
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AFTB63 (dB/m)	Amp/Ch/Plr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	37.46	Pk	32.5	-21.5	0	48.46	-	-	74	-25.54	178	125	H
3	* 2.484	26.41	RMS	32.5	-21.5	.69	38.1	54	-15.9	-	-	178	125	H
2	2.51	38.06	Pk	32.6	-21.4	0	49.26	-	-	74	-24.74	178	125	H
4	2.527	27.48	RMS	32.5	-21.4	.69	39.27	54	-14.73	-	-	178	125	H

* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF1863 (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	36.99	Pk	32.5	-21.5	0	47.99	-	-	74	-26.01	218	394	V
3	* 2.484	26.55	RMS	32.5	-21.5	.69	38.24	54	-15.76	-	-	218	394	V
2	2.51	38.13	Pk	32.6	-21.4	0	49.33	-	-	74	-24.67	218	394	V
4	2.559	27.28	RMS	32.5	-21.3	.69	39.17	54	-14.83	-	-	218	394	V

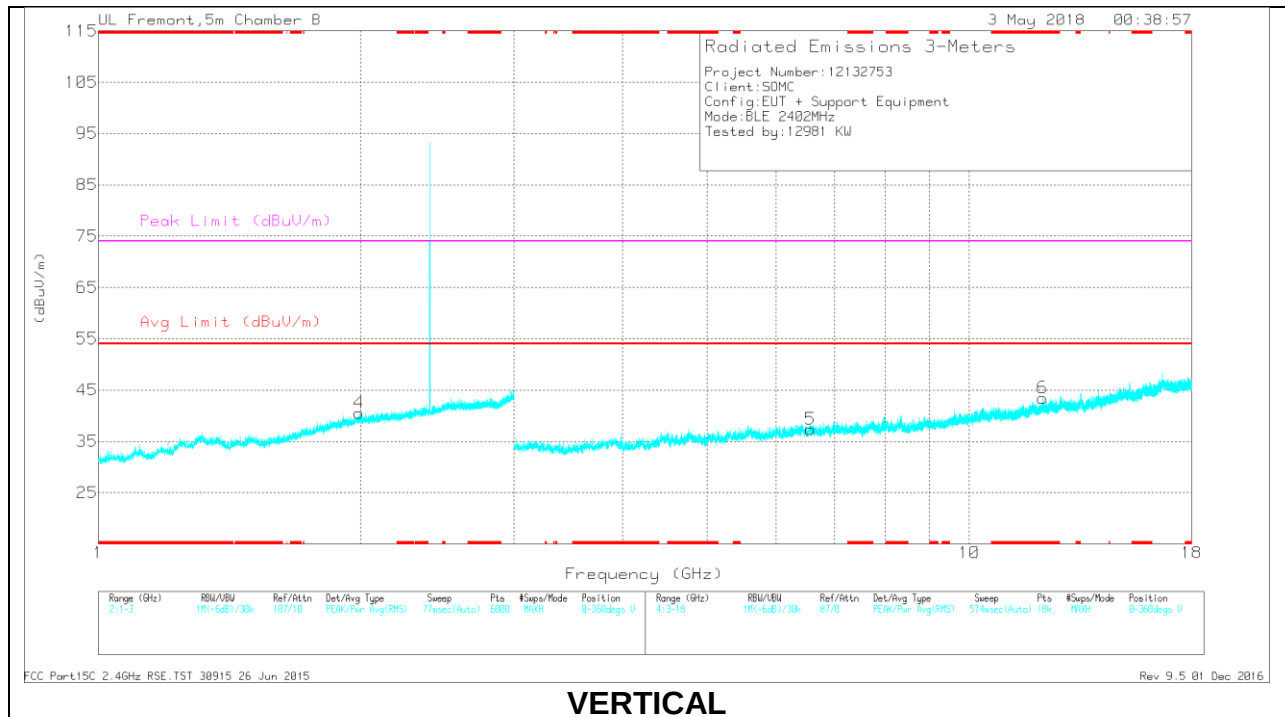
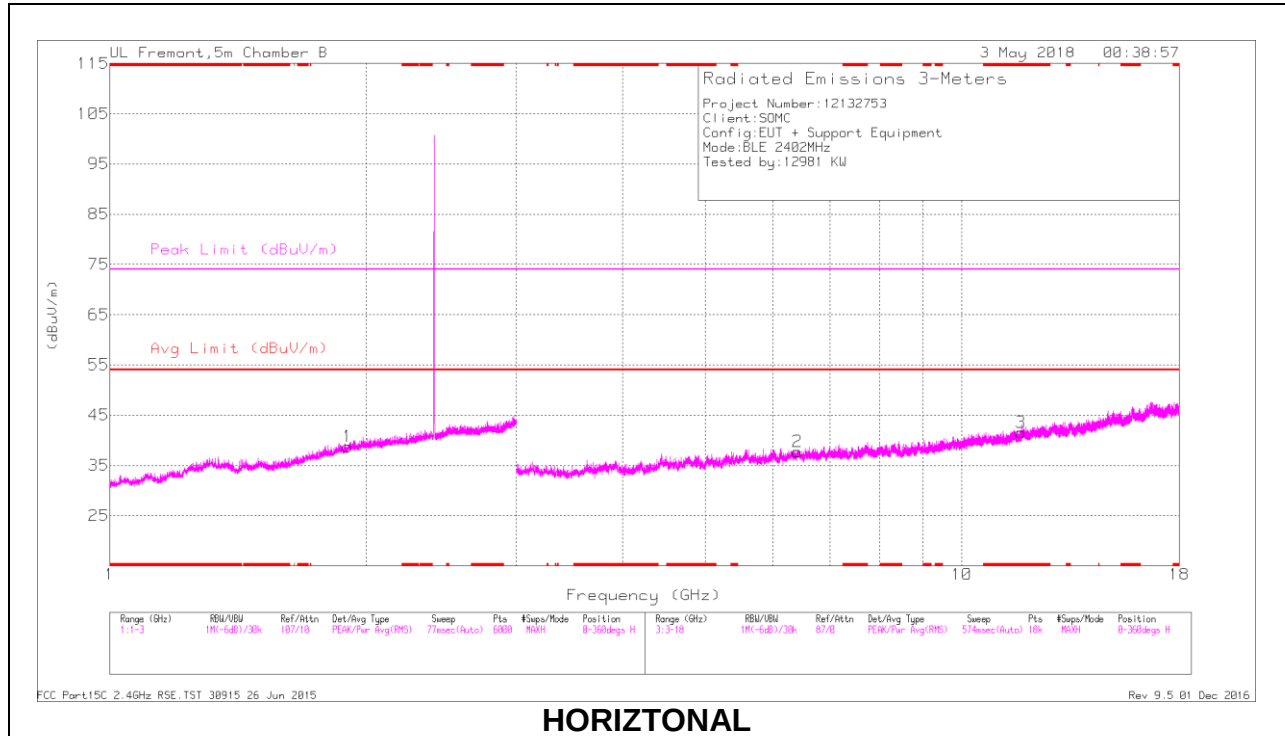
* - indicates frequency in CFR47 Pt 15 Restricted Band

Pk - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Ftr/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
3	* 11.726	27.19	Pk	38.5	-24.2	0	41.49	-	-	74	-32.51	0-360	102	H
6	* 12.135	28.06	Pk	39	-23.6	0	43.46	-	-	74	-30.54	0-360	102	V
1	1.9	29.22	Pk	30.9	-21.4	0	38.72	-	-	-	-	0-360	199	H
4	1.992	30.65	Pk	31.3	-21.4	0	40.55	-	-	-	-	0-360	102	V
2	6.414	31.85	Pk	35.7	-29.8	0	37.75	-	-	-	-	0-360	102	H
5	6.572	30.8	Pk	35.7	-29.1	0	37.4	-	-	-	-	0-360	102	V

* - indicates frequency in CFR47 Pt 15

Pk - Peak detector

Radiated Emissions

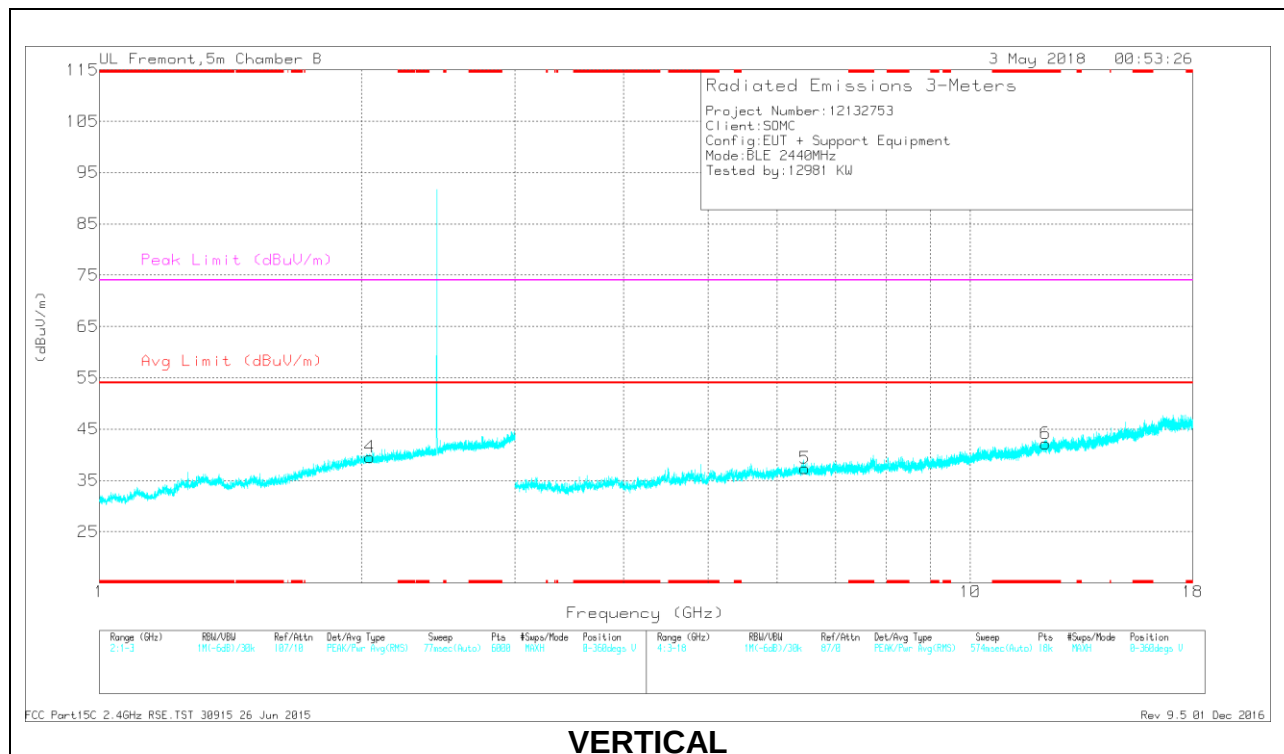
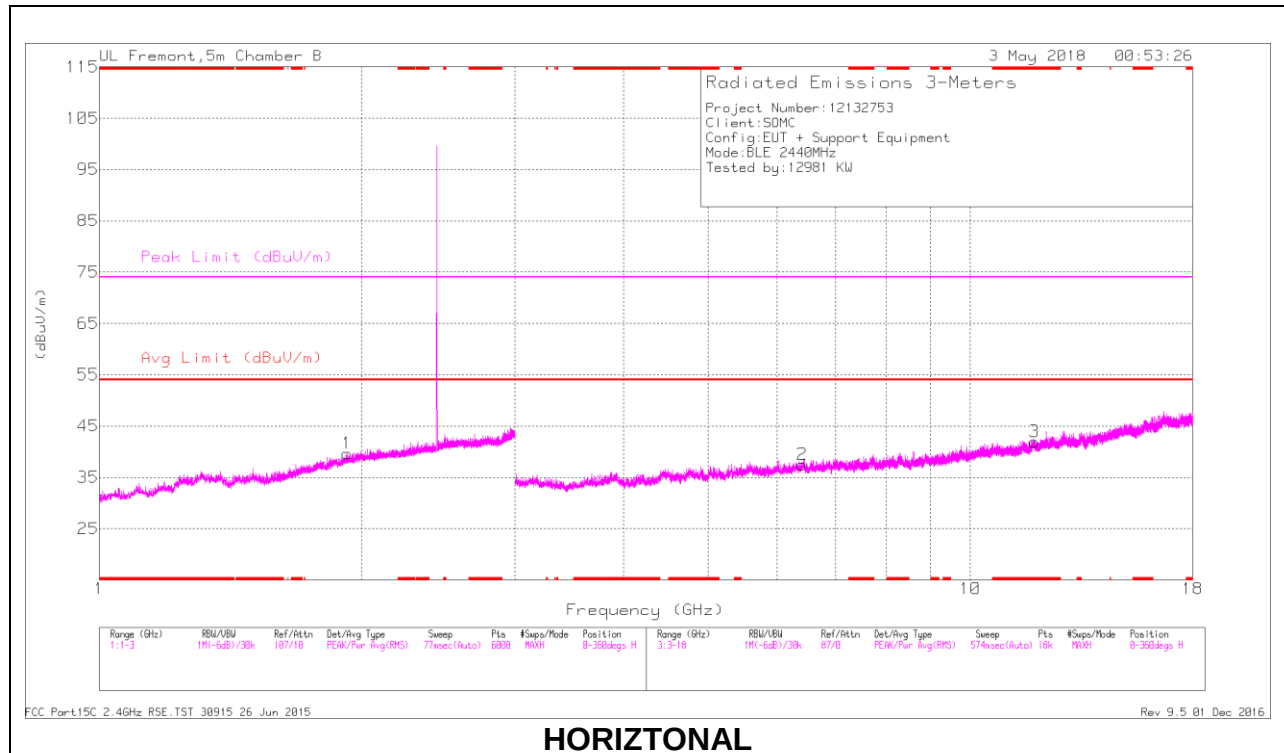
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 11.727	34.1	PK2	38.5	-24.2	0	48.4	-	-	74	-25.6	226	172	H
* 11.725	22.92	MAv1	38.5	-24.2	.69	37.91	54	-16.09	-	-	226	172	H
* 12.137	33.47	PK2	39	-23.7	0	48.77	-	-	74	-25.23	135	156	V
* 12.133	22.53	MAv1	39	-23.6	.69	38.62	54	-15.38	-	-	135	156	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL RESULTS



RADIATED EMISSIONS

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Ftr/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
3	* 11.853	26.98	Pk	38.6	-23.7	0	41.88	-	-	74	-32.12	0-360	199	H
6	* 12.201	27.05	Pk	39.1	-24	0	42.15	-	-	74	-31.85	0-360	200	V
1	1.923	29.8	Pk	31	-21.2	0	39.6	-	-	-	-	0-360	102	H
4	2.044	29.59	Pk	31.4	-21.5	0	39.49	-	-	-	-	0-360	199	V
2	6.411	31.58	Pk	35.7	-29.8	0	37.48	-	-	-	-	0-360	199	H
5	6.455	30.68	Pk	35.7	-29	0	37.38	-	-	-	-	0-360	200	V

* - indicates frequency in CFR47 Pt 15

Pk - Peak detector

Radiated Emissions

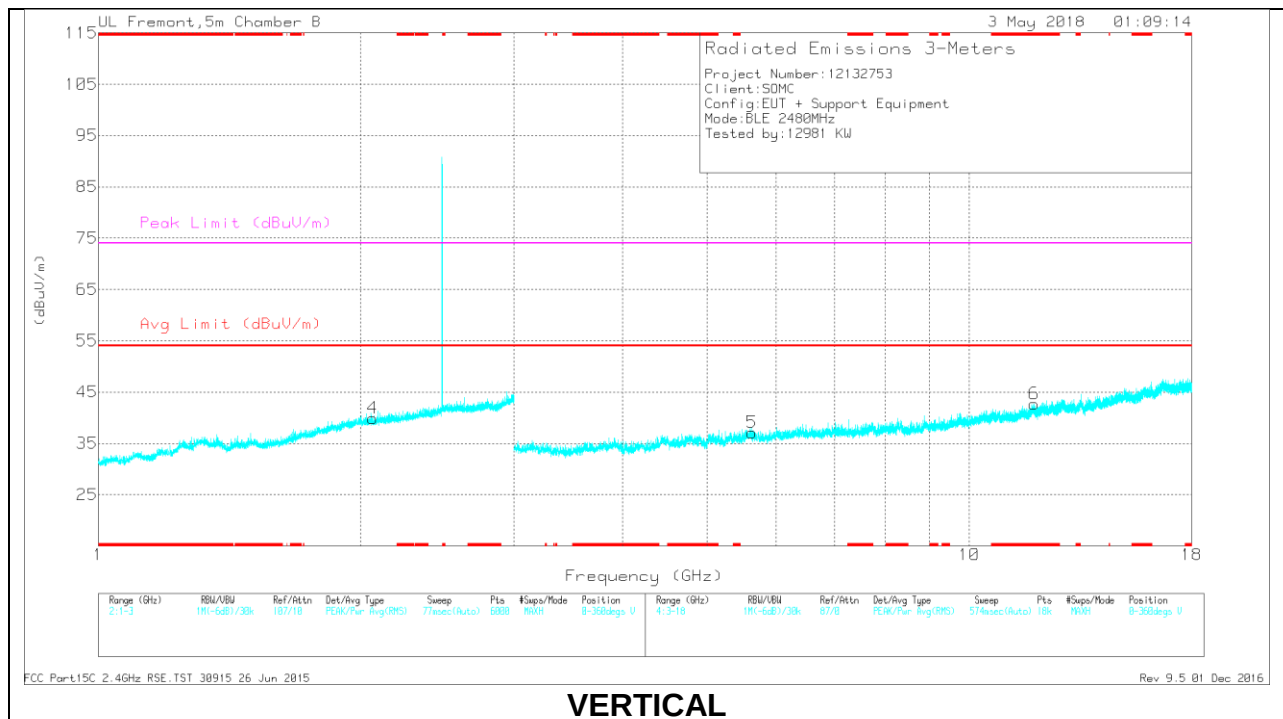
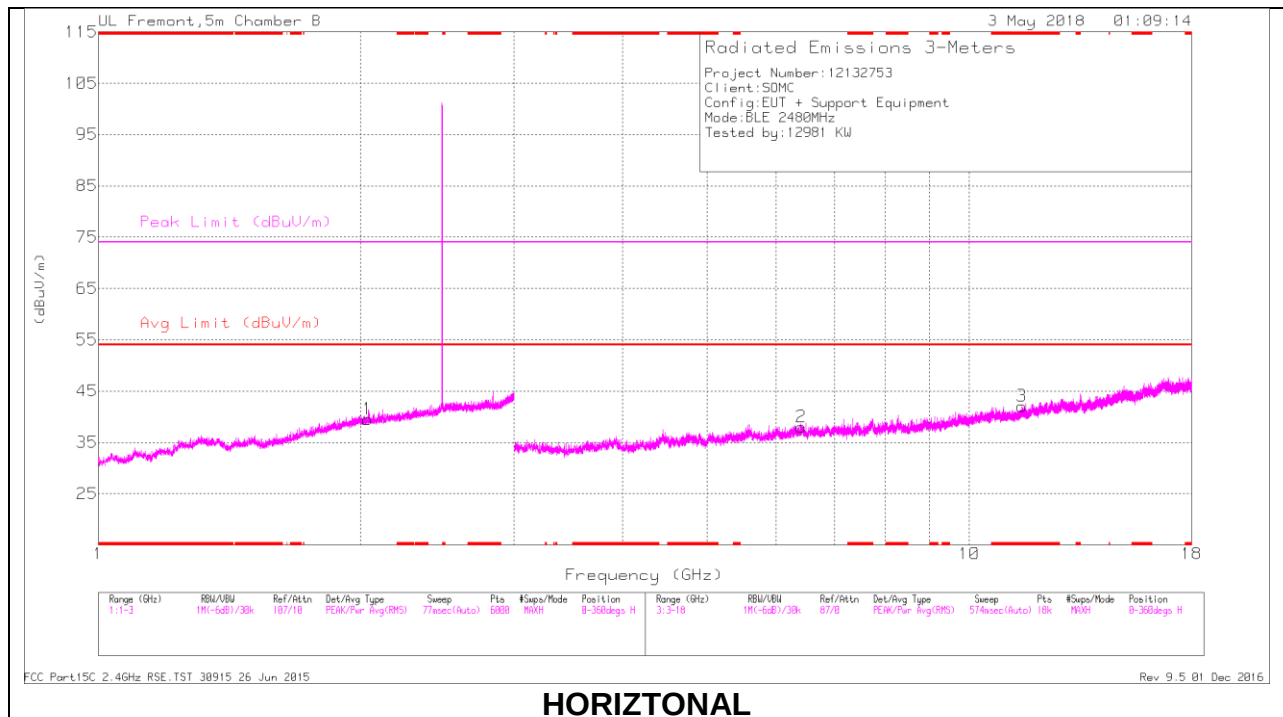
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 11.852	33.14	PK2	38.6	-23.7	0	48.04	-	-	74	-25.96	77	127	H
* 11.854	22.52	MAV1	38.6	-23.7	.69	38.11	54	-15.89	-	-	77	127	H
* 12.2	33.5	PK2	39.1	-23.9	0	48.7	-	-	74	-25.3	188	136	V
* 12.2	22.76	MAV1	39.1	-23.9	.69	38.65	54	-15.35	-	-	188	136	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filt/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
3	* 11.485	27.61	Pk	38.1	-23.7	0	42.01	-	-	74	-31.99	0-360	102	H
6	* 11.869	27.85	Pk	38.7	-23.9	0	42.65	-	-	74	-31.35	0-360	102	V
1	2.037	29.7	Pk	31.4	-21.6	0	39.5	-	-	-	-	0-360	102	H
4	2.067	30.08	Pk	31.4	-21.6	0	39.88	-	-	-	-	0-360	199	V
5	5.625	31.83	Pk	35.3	-30	0	37.13	-	-	-	-	0-360	102	V
2	6.41	32.06	Pk	35.7	-29.8	0	37.96	-	-	-	-	0-360	102	H

* - indicates frequency in CFR47 Pt 15

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Filt/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
* 11.486	33.43	PK2	38.1	-23.7	0	47.83	-	-	74	-26.17	0	129	H
* 11.485	22.84	MAV1	38.1	-23.7	.69	37.93	54	-16.07	-	-	0	129	H
* 11.868	33.41	PK2	38.7	-23.9	0	48.21	-	-	74	-25.79	0	116	V
* 11.868	22.79	MAV1	38.7	-23.9	.69	38.28	54	-15.72	-	-	0	116	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

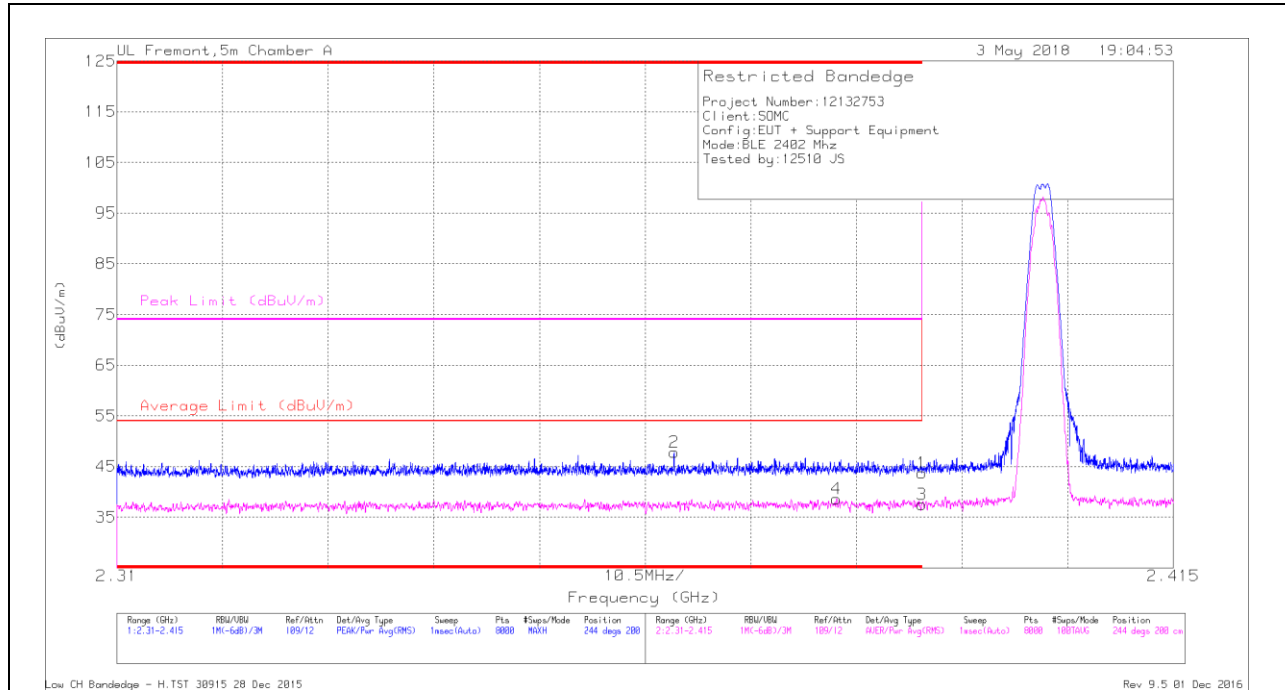
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

9.2.2. BLE (2Mbps)

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



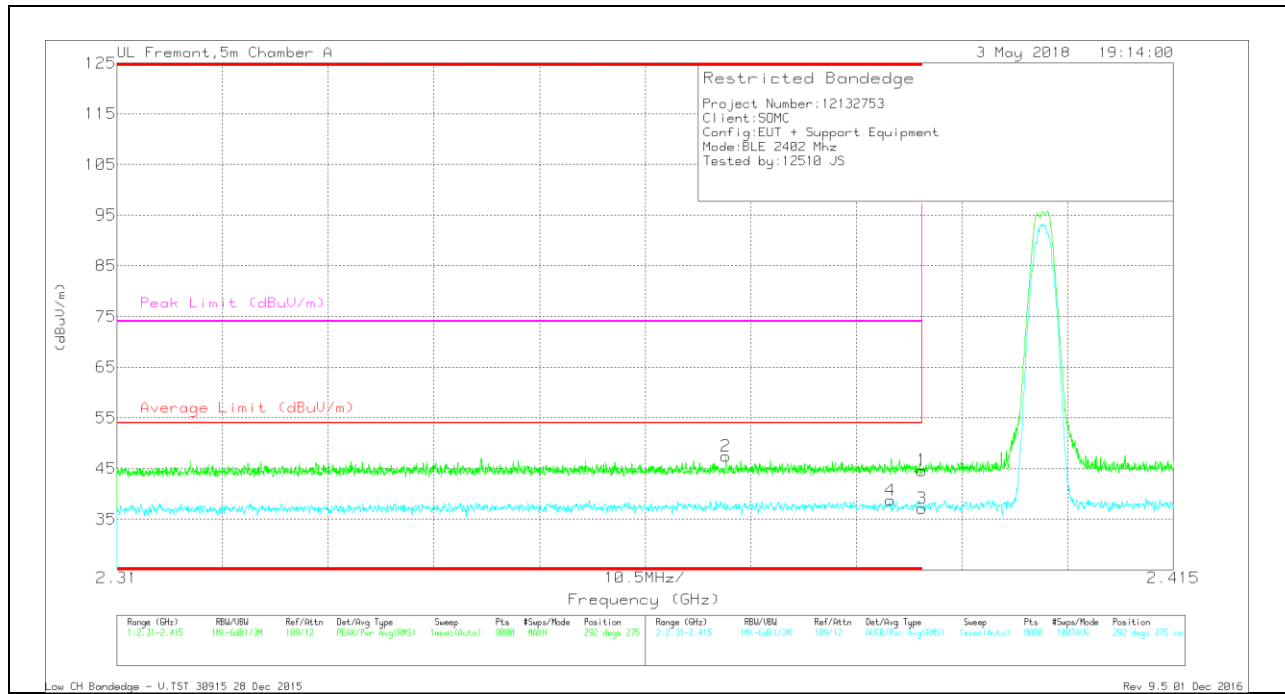
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF TB62 (dB/m)	Amp/Cbl/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	* 2.39	35.31	Pk	31.8	-23.4	0	43.71	-	-	74	-30.29	244	200	H
2	* 2.365	39.61	Pk	31.6	-23.4	0	47.81	-	-	74	-26.19	244	200	H
3	* 2.39	26.67	RMS	31.8	-23.4	2.41	37.48	54	-16.52	-	-	244	200	H
4	* 2.382	27.89	RMS	31.7	-23.4	2.41	38.6	54	-15.4	-	-	244	200	H

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULT



Trace Markers

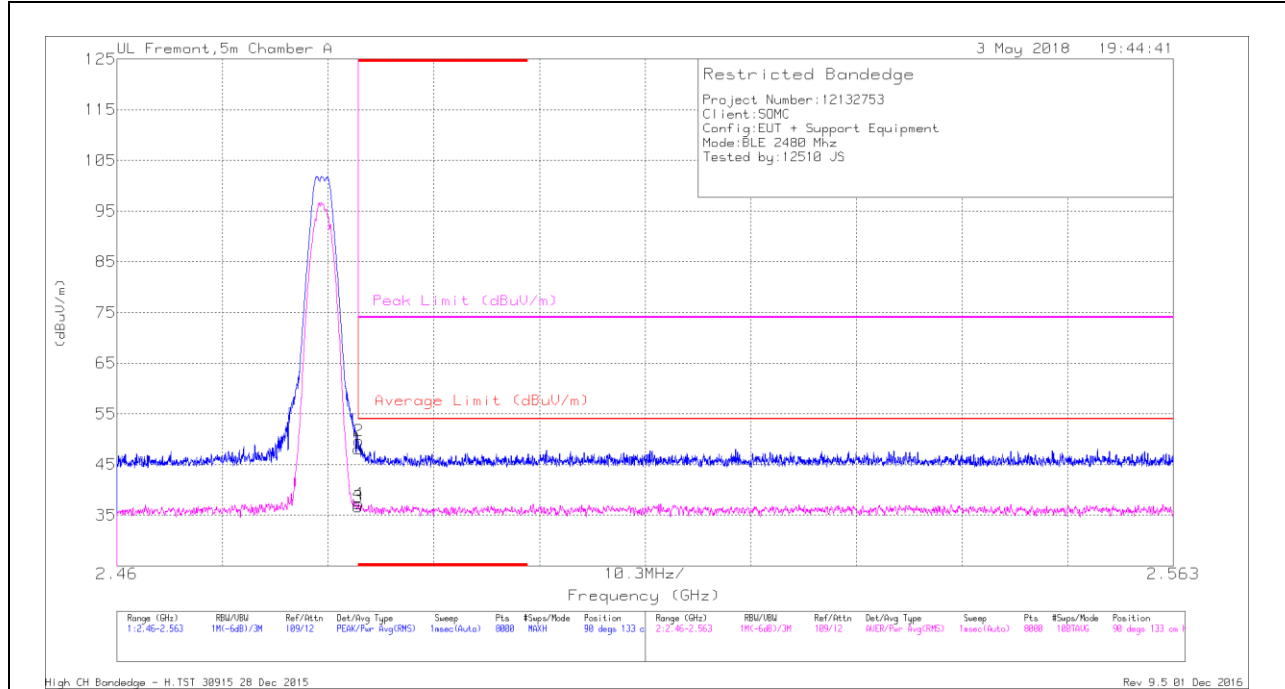
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF TB62 (dB/m)	Amp/Cb/Flt/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Asimuth (Degs)	Height (cm)	Polarity
1	* 2.39	36.24	Pk	31.8	-23.4	0	44.64	-	-	74	-29.36	292	275	V
2	* 2.371	39.11	Pk	31.7	-23.4	0	47.41	-	-	74	-26.59	292	275	V
3	* 2.39	26.35	RMS	31.8	-23.4	2.41	37.16	54	-16.84	-	-	292	275	V
4	* 2.387	27.88	RMS	31.8	-23.4	2.41	38.69	54	-15.31	-	-	292	275	V

Pk - Peak detector

RMS - RMS detection

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



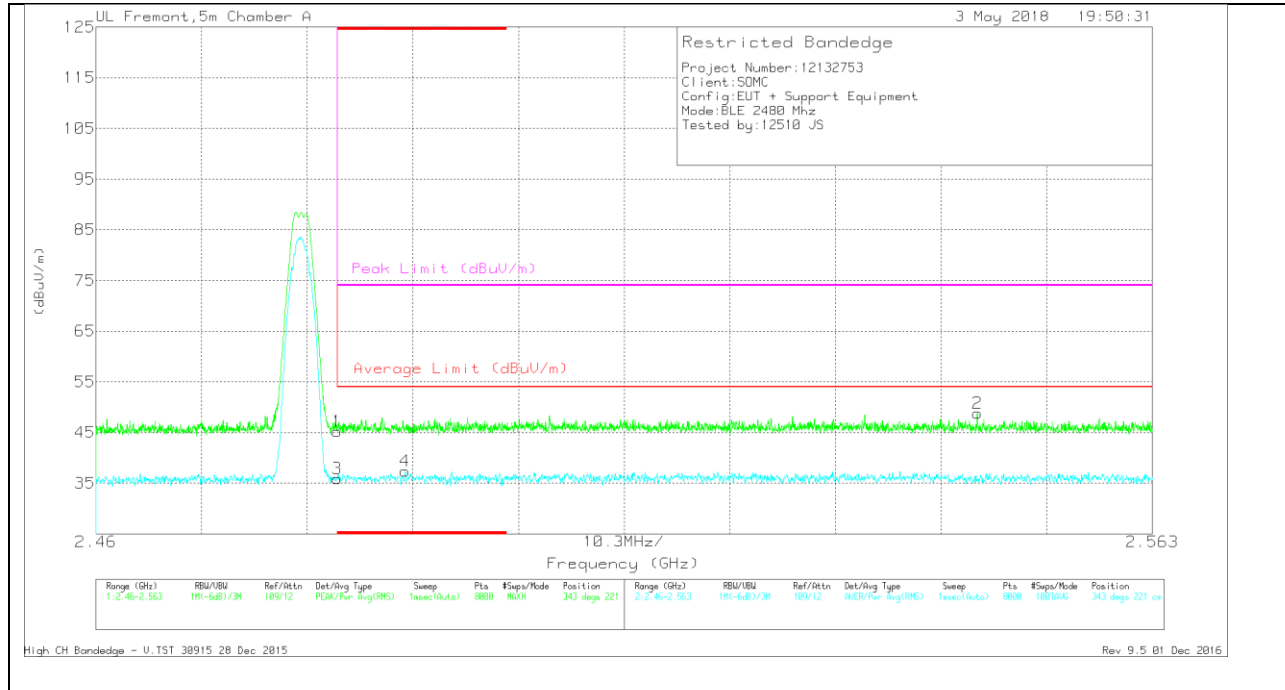
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cb/Fltr/Pa d (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	39	Pk	32.3	-23.3	0	48	-	-	74	-26	90	133	H
2	* 2.484	40.65	Pk	32.3	-23.3	0	49.65	-	-	74	-24.35	90	133	H
3	* 2.484	27.59	RMS	32.3	-23.3	2.41	39	54	-15	-	-	90	133	H
4	* 2.484	28.26	RMS	32.3	-23.3	2.41	39.67	54	-14.33	-	-	90	133	H

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULT



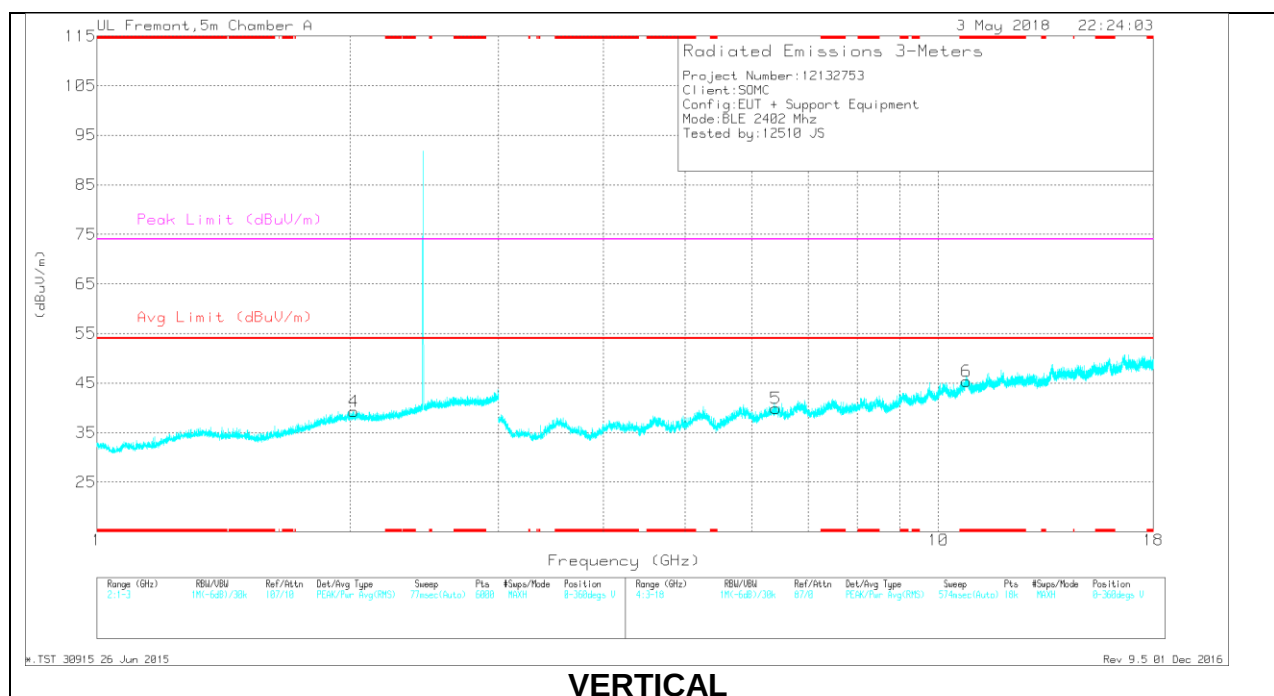
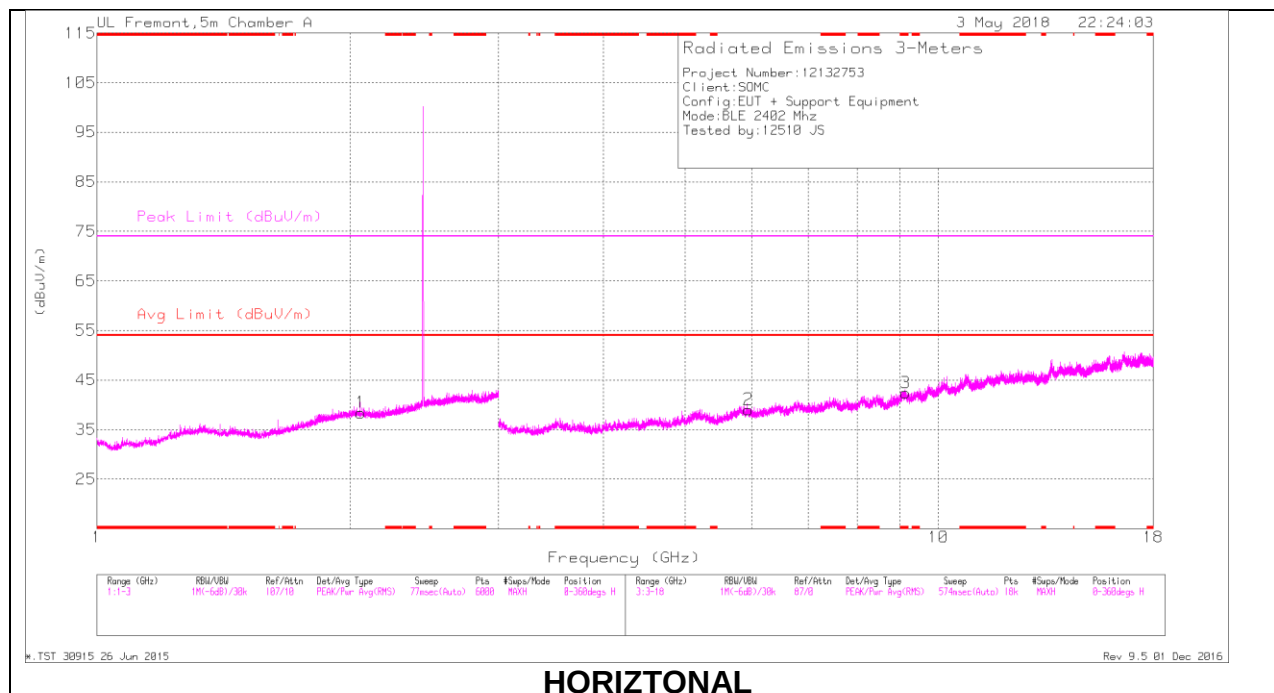
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/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	36.21	Pk	32.3	-23.3	0	45.21	-	-	74	-28.79	343	221	V
3	* 2.484	26.93	RMS	32.3	-23.3	2.41	38.34	54	-15.66	-	-	343	221	V
4	* 2.49	28.23	RMS	32.4	-23.3	2.41	39.74	54	-14.26	-	-	343	221	V
2	2.546	39.74	Pk	32.3	-23.2	0	48.84	-	-	74	-25.16	343	221	V

Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



RADIATED EMISSIONS

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 9.137	25.78	Pk	36.4	-19.7	0	42.48	-	-	74	-31.52	0-360	199	H
6	* 10.793	25.8	Pk	37.8	-18.2	0	45.4	-	-	74	-28.6	0-360	200	V
4	2.021	31.2	Pk	31.4	-23.3	0	39.3	-	-	-	-	0-360	200	V
1	2.059	30.43	Pk	31.4	-23.4	0	38.43	-	-	-	-	0-360	199	H
2	5.95	29.06	Pk	35.3	-25.3	0	39.06	-	-	-	-	0-360	199	H
5	6.409	28.09	Pk	35.8	-24	0	39.89	-	-	-	-	0-360	101	V

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

Pk - Peak detector

Radiated Emissions

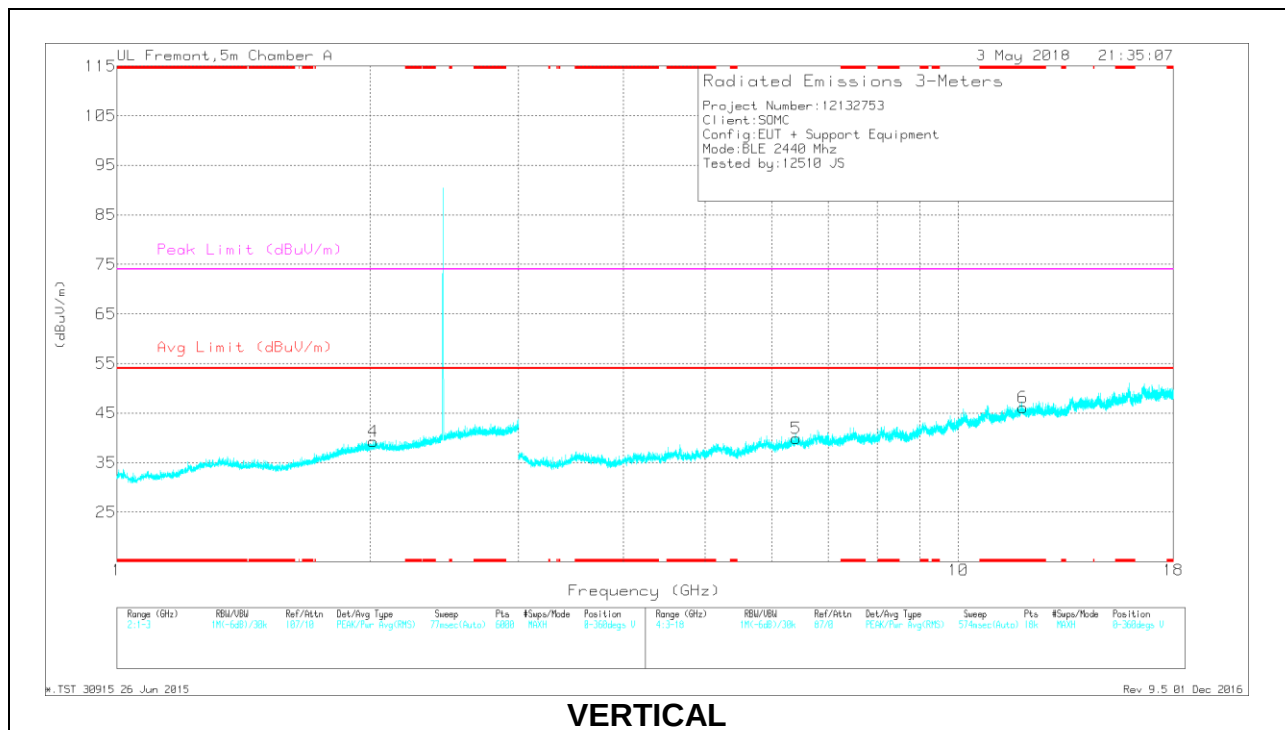
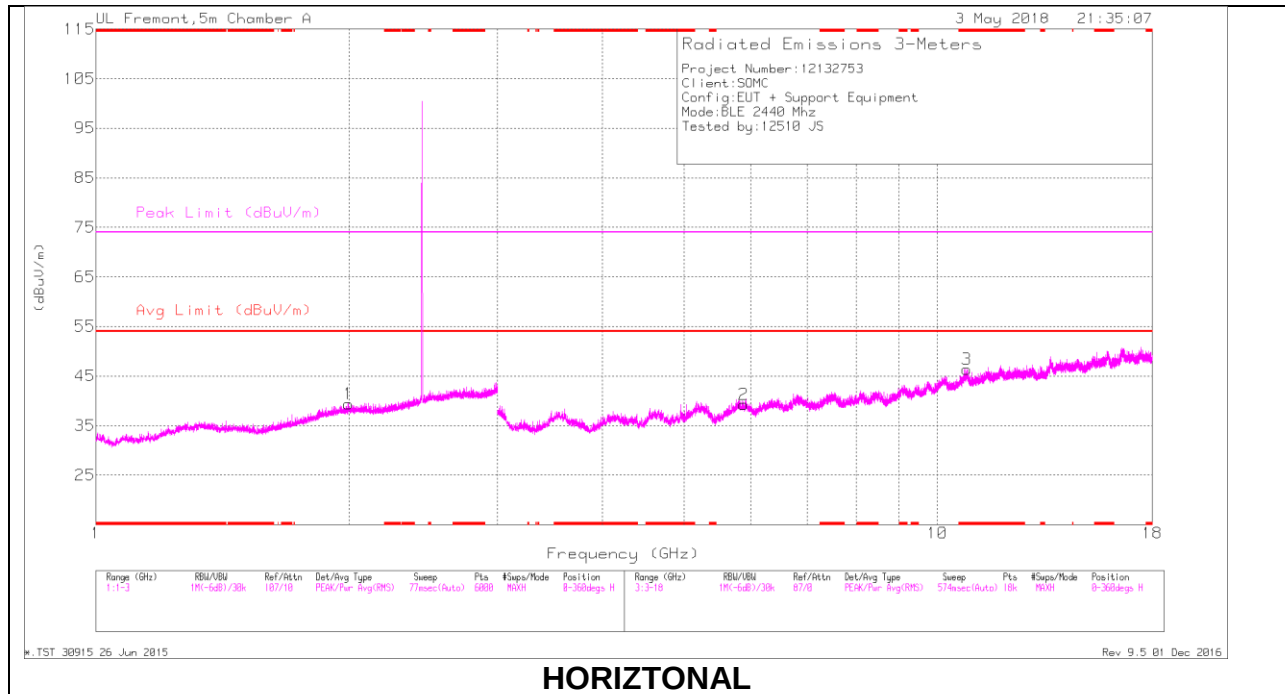
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 9.137	32.2	PK2	36.4	-19.7	0	48.9	-	-	74	-25.1	15	135	H
* 9.135	20.72	MAv1	36.4	-19.7	2.41	39.83	54	-14.17	-	-	15	135	H
* 10.793	32.11	PK2	37.8	-18.2	0	51.71	-	-	74	-22.29	83	129	V
* 10.793	20.32	MAv1	37.8	-18.2	2.41	42.33	54	-11.67	-	-	83	129	V
2.022	36.62	PK2	31.4	-23.3	0	44.72	-	-	-	-	147	302	V
2.057	36.72	PK2	31.4	-23.5	0	44.62	-	-	-	-	60	111	H
5.951	35.14	PK2	35.3	-25.3	0	45.14	-	-	-	-	208	262	H
6.409	34.54	PK2	35.8	-24	0	46.34	-	-	-	-	242	234	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL RESULTS



RADIATED EMISSIONS

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 10.833	26.04	Pk	37.9	-17.6	0	46.34	-	-	74	-27.66	0-360	101	H
6	* 11.926	25.56	Pk	38.8	-18.2	0	46.16	-	-	74	-27.84	0-360	200	V
1	1.996	31.24	Pk	31.4	-23.3	0	39.34	-	-	-	-	0-360	101	H
4	2.015	31.15	Pk	31.4	-23.3	0	39.25	-	-	-	-	0-360	200	V
2	5.883	28.44	Pk	35.2	-24.4	0	39.24	-	-	-	-	0-360	199	H
5	6.419	28.24	Pk	35.8	-24.1	0	39.94	-	-	-	-	0-360	101	V

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

Pk - Peak detector

Radiated Emissions

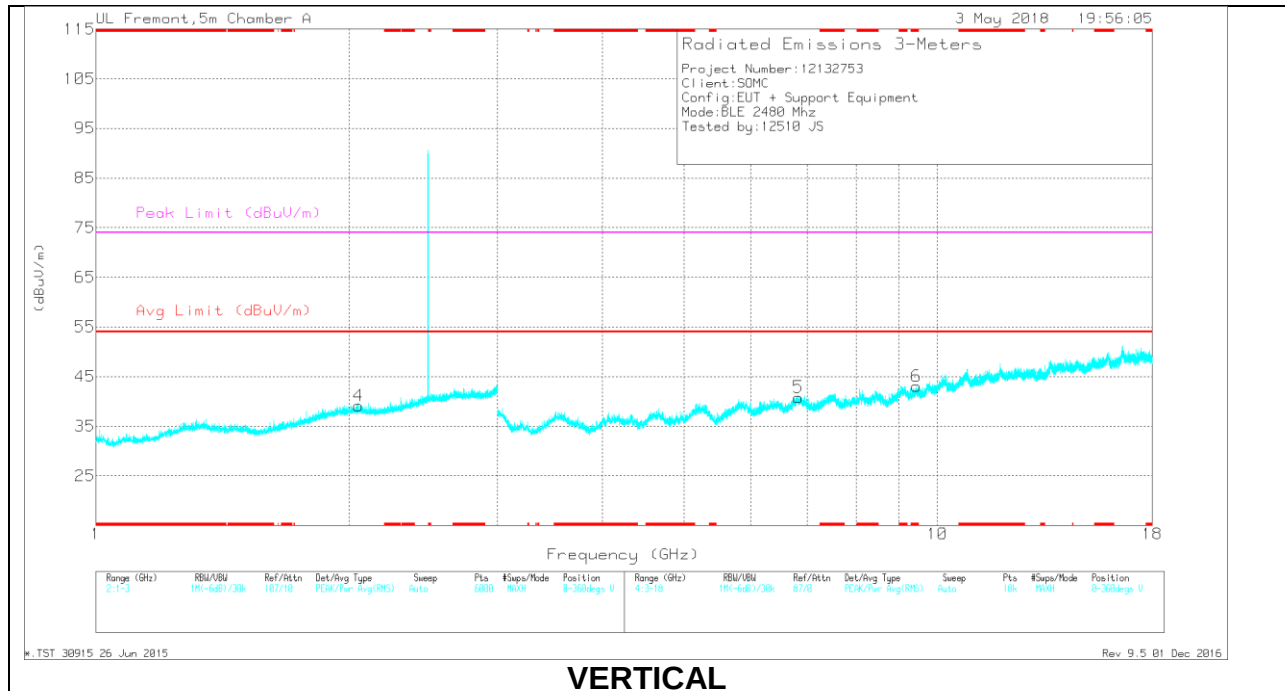
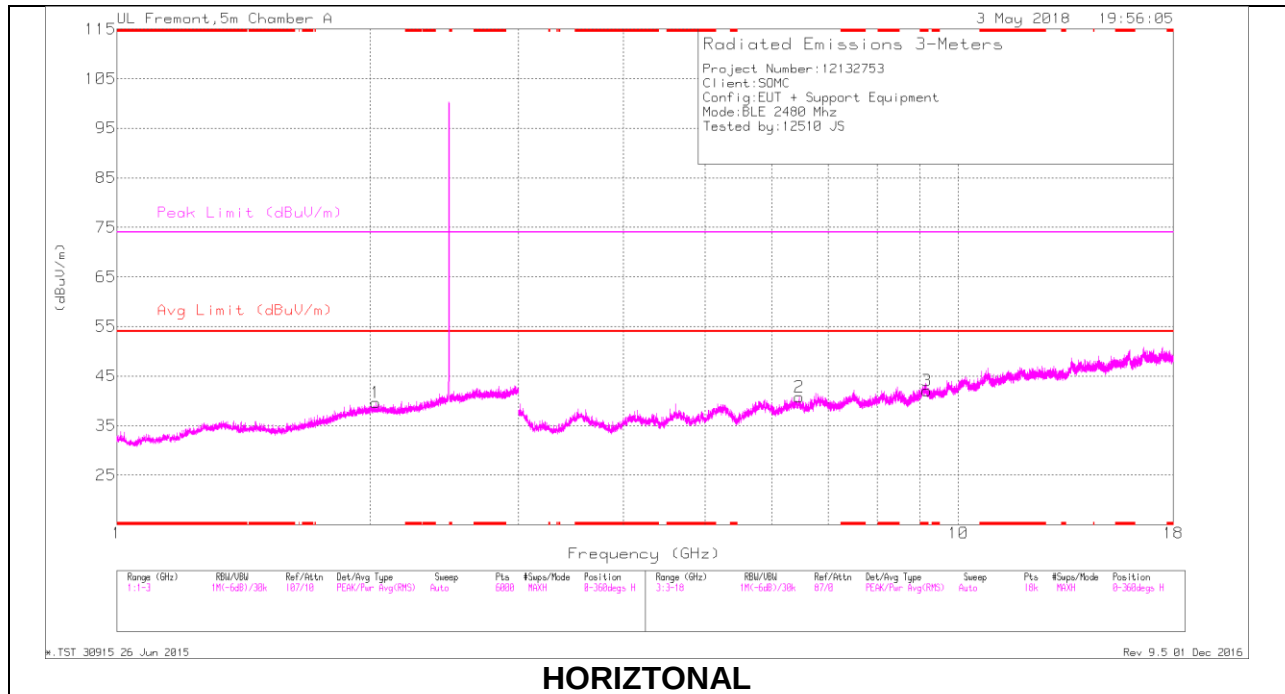
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 10.833	33.07	PK2	37.9	-17.5	0	53.47	-	-	74	-20.53	4	230	H
* 10.832	20.33	MAV1	37.8	-17.6	2.41	42.94	54	-11.06	-	-	4	230	H
* 11.925	31.31	PK2	38.8	-18.2	0	51.91	-	-	74	-22.09	100	142	V
* 11.925	20.22	MAV1	38.8	-18.2	2.41	43.23	54	-10.77	-	-	100	142	V
1.998	37.32	PK2	31.4	-23.3	0	45.42	-	-	-	-	150	353	H
2.016	36.7	PK2	31.4	-23.3	0	44.8	-	-	-	-	144	279	V
5.885	35.11	PK2	35.2	-24.5	0	45.81	-	-	-	-	6	400	H
6.419	34.5	PK2	35.8	-24.1	0	46.2	-	-	-	-	111	130	V

* - indicates frequency in CFR47 Pt 15 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL RESULTS



RADIATED EMISSIONS

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 9.166	26.2	Pk	36.4	-20.6	0	42	-	-	74	-32	0-360	199	H
6	* 9.44	26.77	Pk	36.7	-20.4	0	43.07	-	-	74	-30.93	0-360	200	V
1	2.032	31.63	Pk	31.4	-23.4	0	39.63	-	-	-	-	0-360	102	H
4	2.051	31.15	Pk	31.4	-23.4	0	39.15	-	-	-	-	0-360	200	V
2	6.47	28.67	Pk	35.7	-23.6	0	40.77	-	-	-	-	0-360	101	H
5	6.833	27.74	Pk	35.5	-22.4	0	40.84	-	-	-	-	0-360	101	V

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

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 9.167	33.19	PK2	36.4	-20.6	0	48.99	-	-	74	-25.01	224	200	H
* 9.168	21.2	MAv1	36.4	-20.7	2.41	39.31	54	-14.69	-	-	224	200	H
* 9.441	32.21	PK2	36.7	-20.4	0	48.51	-	-	74	-25.49	351	223	V
* 9.439	21.05	MAv1	36.7	-20.4	2.41	39.76	54	-14.24	-	-	351	223	V
2.033	37.32	PK2	31.4	-23.4	0	45.32	-	-	-	-	15	392	H
2.05	36.92	PK2	31.4	-23.4	0	44.92	-	-	-	-	7	376	V
6.469	34.23	PK2	35.7	-23.5	0	46.43	-	-	-	-	73	226	H
6.834	34.22	PK2	35.5	-22.4	0	47.32	-	-	-	-	210	386	V

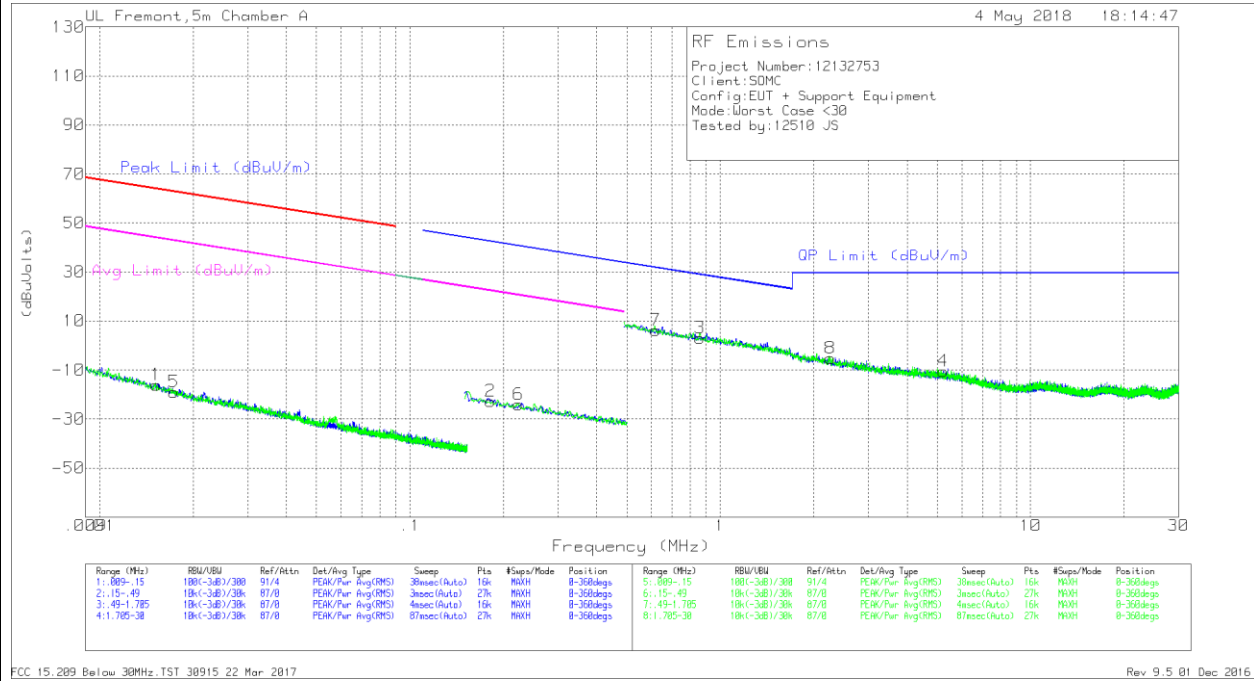
* - indicates frequency in CFR47 Pt 15 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

9.3. SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

HORIZONTAL AND VERTICAL PLOTS



NOTE: KDB 414788 OATS and Chamber Correlation Justification

- Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.
- OATs and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cli (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	.01522	47.36	Pk	16.4	.1	-80	-16.14	63.94	-80.08	43.94	-60.08	-	-	-	-	0-360
5	.01735	45.4	Pk	16.4	.1	-80	-19.1	62.8	-81.9	42.8	-61.9	-	-	-	-	0-360
2	.18189	46.19	Pk	11	.1	-80	-22.71	-	-	-	-	42.42	-65.13	22.42	-45.13	0-360
6	.22372	44.74	Pk	11	.1	-80	-24.16	-	-	-	-	40.62	-64.78	20.62	-44.78	0-360

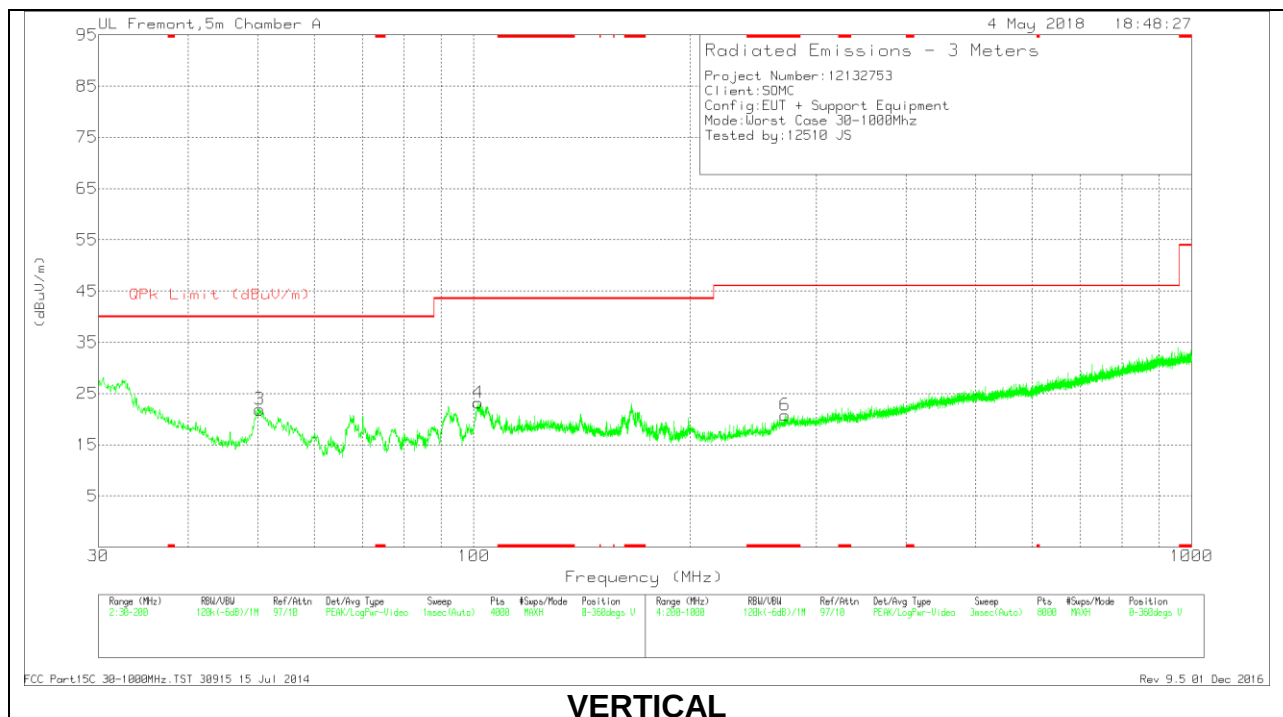
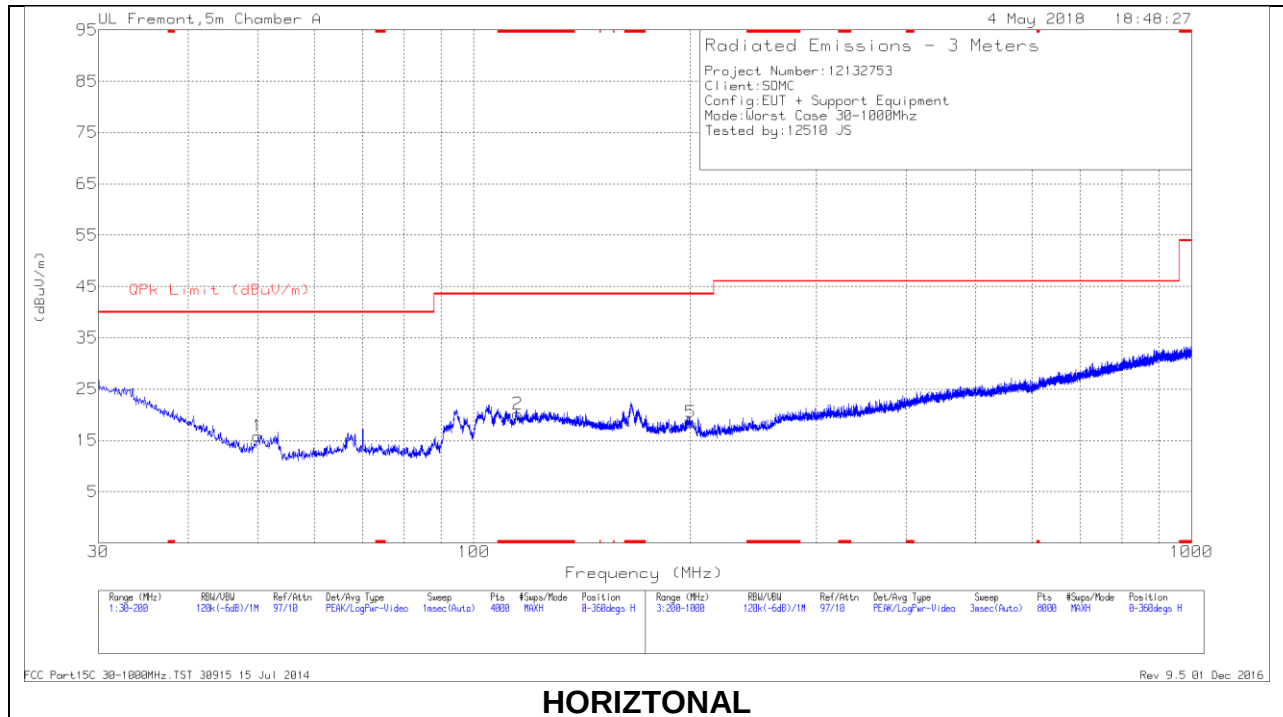
Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cli (dB)	Dist Corr 30m	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
7	.61897	35.03	Pk	11.1	.1	-40	6.23	31.78	-25.55	0-360
3	.85944	31.72	Pk	11.1	.1	-40	2.92	28.93	-26.01	0-360
8	2.26254	23.25	Pk	11.4	.2	-40	-5.15	29.5	-34.65	0-360
4	5.22052	18.07	Pk	11.2	.3	-40	-10.43	29.5	-39.93	0-360

Pk - Peak detector

9.4. Worst Case Below 1 GHz

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



Below 1GHz Data

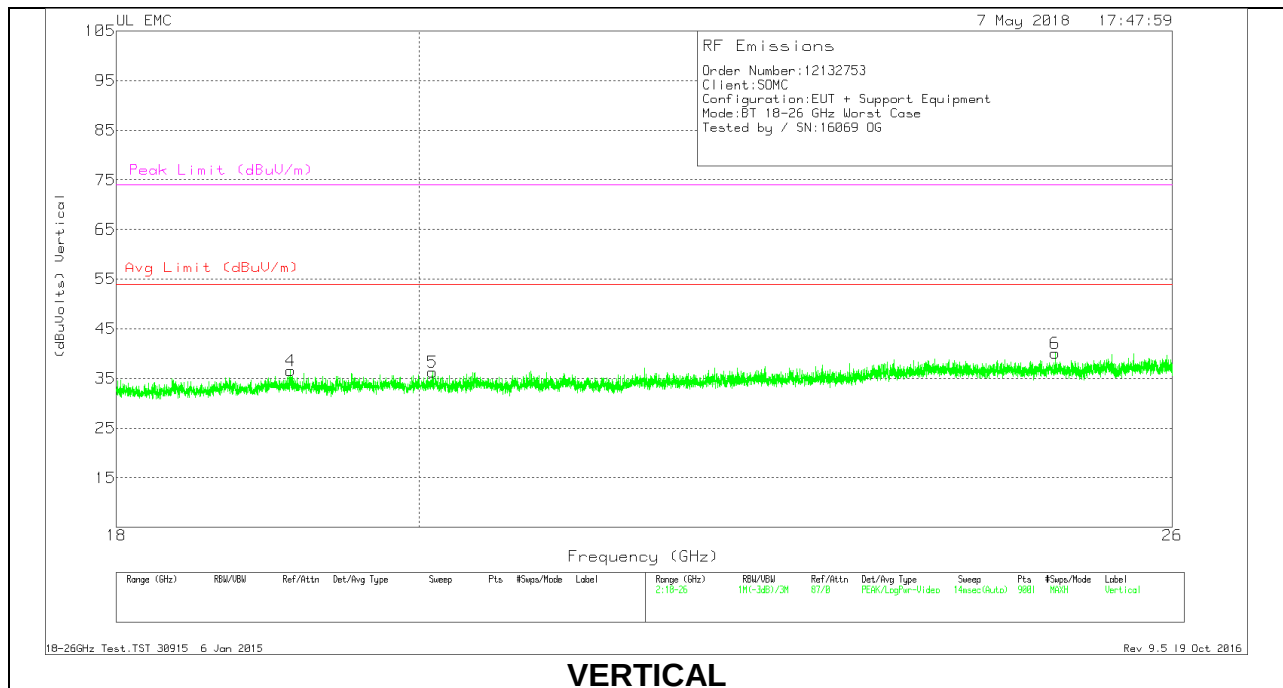
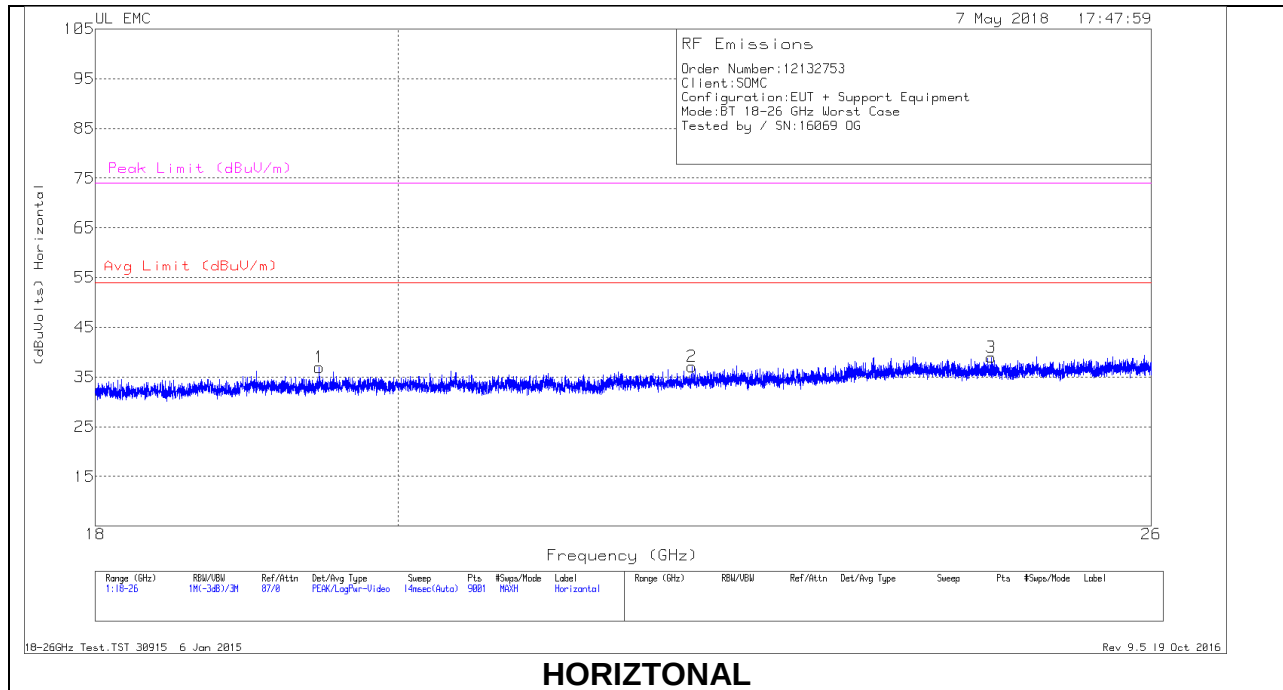
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 115.107	28.91	Pk	17.4	-26.2	20.11	43.52	-23.41	0-360	300	H
6	* 271.5093	28.21	Pk	17.3	-24.7	20.81	46.02	-25.21	0-360	200	V
1	50.0227	31.22	Pk	11.6	-27	15.82	40	-24.18	0-360	400	H
3	50.3203	37.36	Pk	11.5	-27	21.86	40	-18.14	0-360	100	V
4	101.376	34.97	Pk	14.6	-26.4	23.17	43.52	-20.35	0-360	100	V
5	200.5001	27.34	Pk	16.4	-25.3	18.44	43.52	-25.08	0-360	400	H

Pk - 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	T449 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	19.46	38.33	Pk	32.7	-24.6	-9.5	36.93	54	-17.07	74	-37.07
2	22.155	37.89	Pk	33.4	-24.7	-9.5	37.09	54	-16.91	74	-36.91
3	24.59	38.48	Pk	34.1	-24.1	-9.5	38.98	54	-15.02	74	-35.02
4	19.125	37.99	Pk	32.5	-24.4	-9.5	36.59	54	-17.41	74	-37.41
5	20.094	37.99	Pk	32.8	-25	-9.5	36.29	54	-17.71	74	-37.71
6	24.959	39.66	Pk	34.3	-24.4	-9.5	40.06	54	-13.94	74	-33.94

Pk - Peak detector