



**FCC CFR47 PART 15 SUBPART C
C2PC CERTIFICATION TEST REPORT
FOR**

GSM/WCDMA/LTE Phone + Bluetooth & DTS b/g/n

MODEL NUMBER: LGL31L, L31L, LG-L31L

FCC ID: ZNFL31L

REPORT NUMBER: 14U17021-2

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Prepared for

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Revision History

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TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY	5
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	5
4.2. <i>SAMPLE CALCULATION</i>	5
4.3. <i>MEASUREMENT UNCERTAINTY</i>	5
5. EQUIPMENT UNDER TEST	6
5.1. <i>DESCRIPTION OF EUT</i>	6
5.2. <i>MAXIMUM OUTPUT POWER</i>	6
5.3. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i>	6
5.4. <i>WORST-CASE CONFIGURATION AND MODE</i>	7
5.5. <i>DESCRIPTION OF TEST SETUP</i>	8
6. TEST AND MEASUREMENT EQUIPMENT	10
7. MEASUREMENT METHODS	11
8. SUMMARY TABLE	12
9. RADIATED TEST RESULTS	13
9.1. <i>LIMITS AND PROCEDURE</i>	13
9.2. <i>TRANSMITTER ABOVE 1 GHz</i>	14
9.2.1. <i>TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND</i>	14
9.2.2. <i>TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND</i>	27
9.2.3. <i>TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND</i>	40
9.3. <i>WORST-CASE BELOW 1 GHz</i>	53
10. SETUP PHOTOS	56

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LG ELECTRONICS MOBILECOMM U.S.A., INC.
EUT DESCRIPTION: GSM/WCDMA/LTE Phone + Bluetooth & DTS b/g/n
MODEL: LGL31L, L31L, LG-L31L
SERIAL NUMBER: 1839205 (Radiated)
DATE TESTED: MARCH 21 - 31, 2014

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	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 any government.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.4-2009.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

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
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 18000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phone + Bluetooth & DTS b/g/n

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	18.03	63.53
2412 - 2462	802.11g	20.18	104.23
2412 - 2462	802.11n HT20	20.24	105.68

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of 0.1dBi.

5.4. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission 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 Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z orientation.

Based on the baseline scan, the worst-case data rates were:

802.11b mode: 1 Mbps

802.11g mode: 6 Mbps

802.11n HT20mode: MCS0

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	LG	LGL31L	N/A	N/A
Earphone	LG	N/A	N/A	N/A

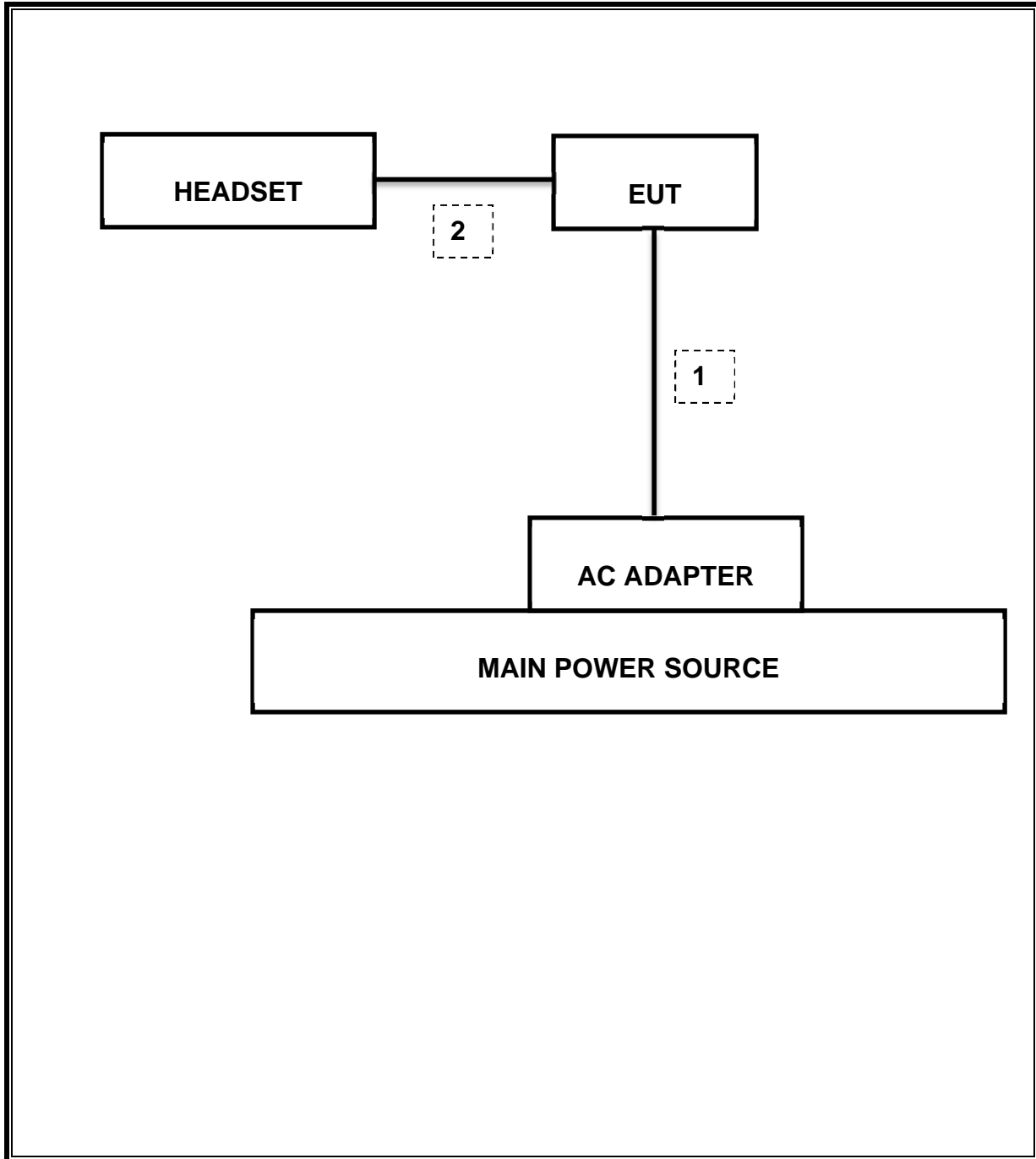
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A
2	Audio	1	Mini-Jack	Unshielded	1m	N/A

TEST SETUP

The EUT is a stand-alone unit during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR 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	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/14
Spectrum Analyzer, 9KHz-40GHz	HP	8564E	C00986	04/01/14
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	08/13/14
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/18/14
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/14
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/14
Antenna, Horn, 1-18 GHz	ETS	3117	C01022	02/21/15
Antenna, Horn, 18- 26 GHz	ARA	MWH-1826/B	C00946	11/12/14
Antenna, Horn, 26-40 GHz	ARA	MWH-2640	C00891	06/28/14
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	T243	03/06/15
RF Preamplifier, 100KHz -> 1300MHz	HP	TBD	C00825	06/01/14
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/15
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	F00351	06/27/14
AC Power Supply, 2,500VA 45-500Hz	Elgar-Ametek	CW2501M	F00013	CNR
RF Preamplifier, 1GHz - 40GHz	Miteq	NSP4000-SP2	C00990	08/20/14
Attenuator / Switch driver	HP	11713A	F00204	CNR
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	F00219	05/23/14
High Pass Filter 5GHz	Micro-Tronics	HPS17542	F00222	05/22/14
High Pass Filter 6GHz	Micro-Tronics	HPM17543	F00224	05/22/14

7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r01:Measurement Procedure PK2 is used for power and PKPSD is used for power spectral density.

Unwanted emissions within Restricted Bands are measured using traditional radiated procedures.

8. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	RSS-210 A8.2(a)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	See original
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	See original
15.247	RSS-210 A8.4	TX conducted output power	<30dBm		Pass	See original
15.247	RSS-210 A8.2	PSD	<8dBm		Pass	See original
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	See original
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	50.02dBuV/m

9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
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. The antenna to EUT distance is 3 meters.

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.

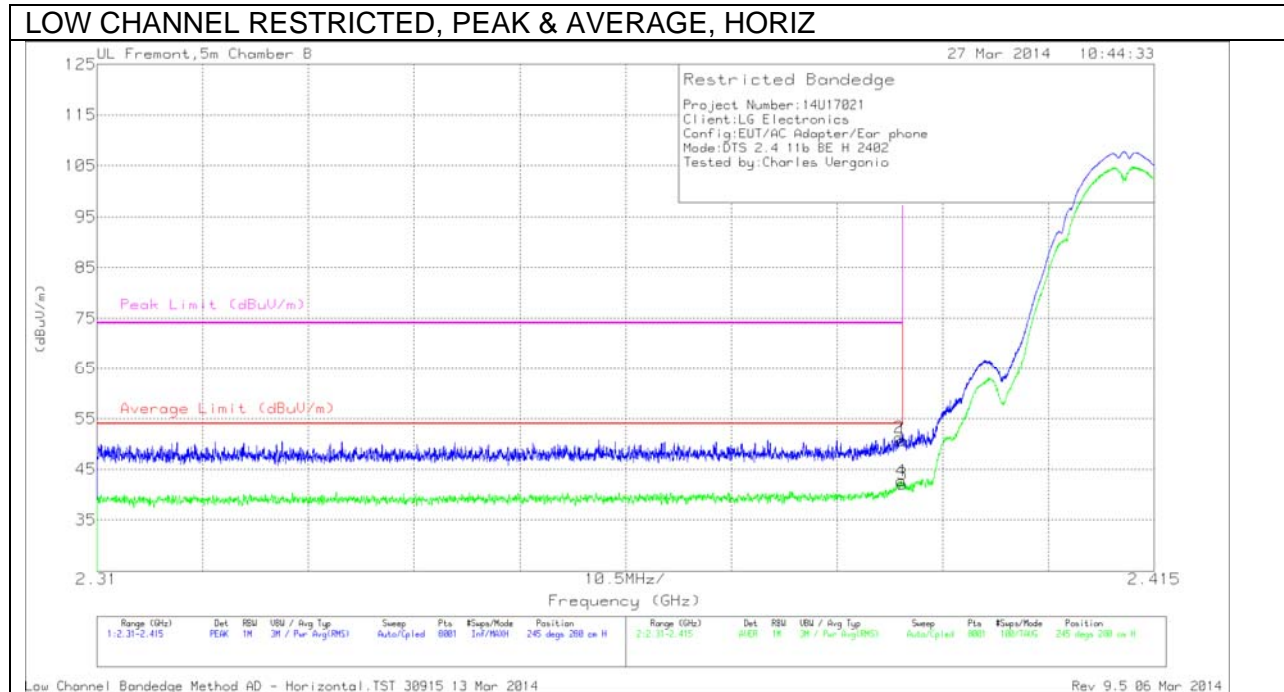
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor= $10\log(1/x)$ For this sample B mode = 0dB (duty cycle >98%); G mode = 0.21dB; N mode = 0.23dB.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)



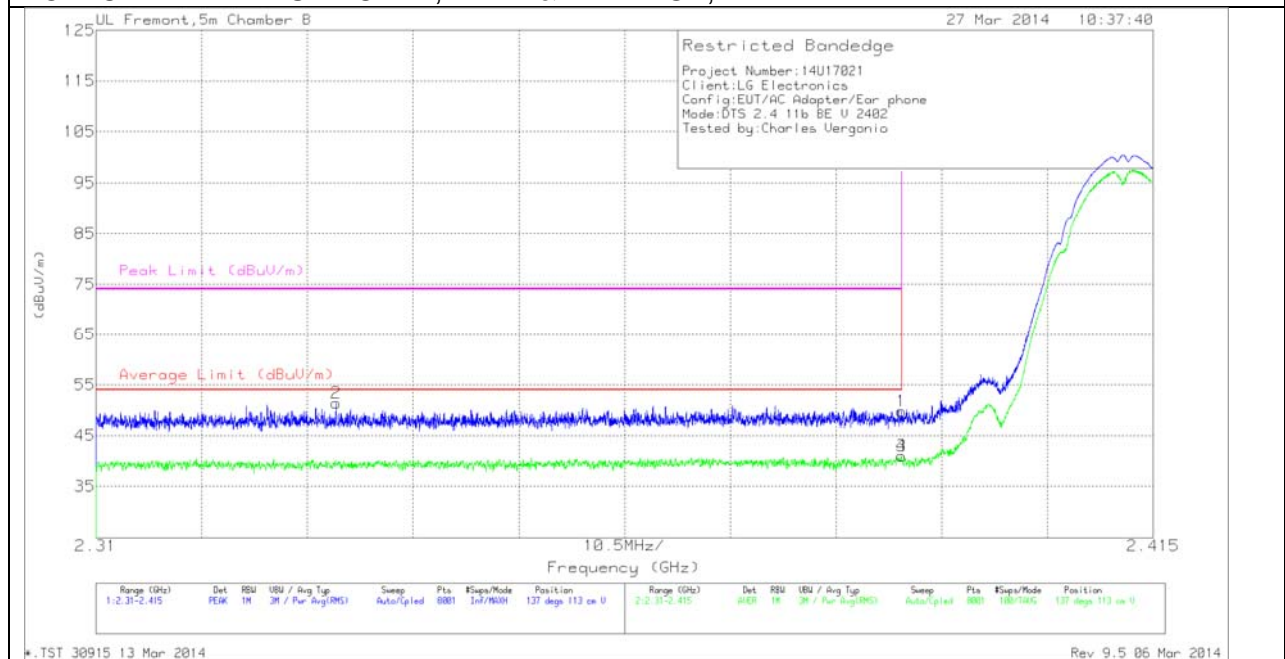
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.51	PK	32.1	-22.9	50.71	-	-	74	-23.29	245	280	H
2	* 2.39	42.13	PK	32.1	-22.9	51.33	-	-	74	-22.67	245	280	H
3	* 2.39	32.85	RMS	32.1	-22.9	42.05	54	-11.95	-	-	245	280	H
4	* 2.39	33.56	RMS	32.1	-22.9	42.76	54	-11.24	-	-	245	280	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

LOW CHANNEL RESTRICTED, PEAK & AVERAGE, VERT



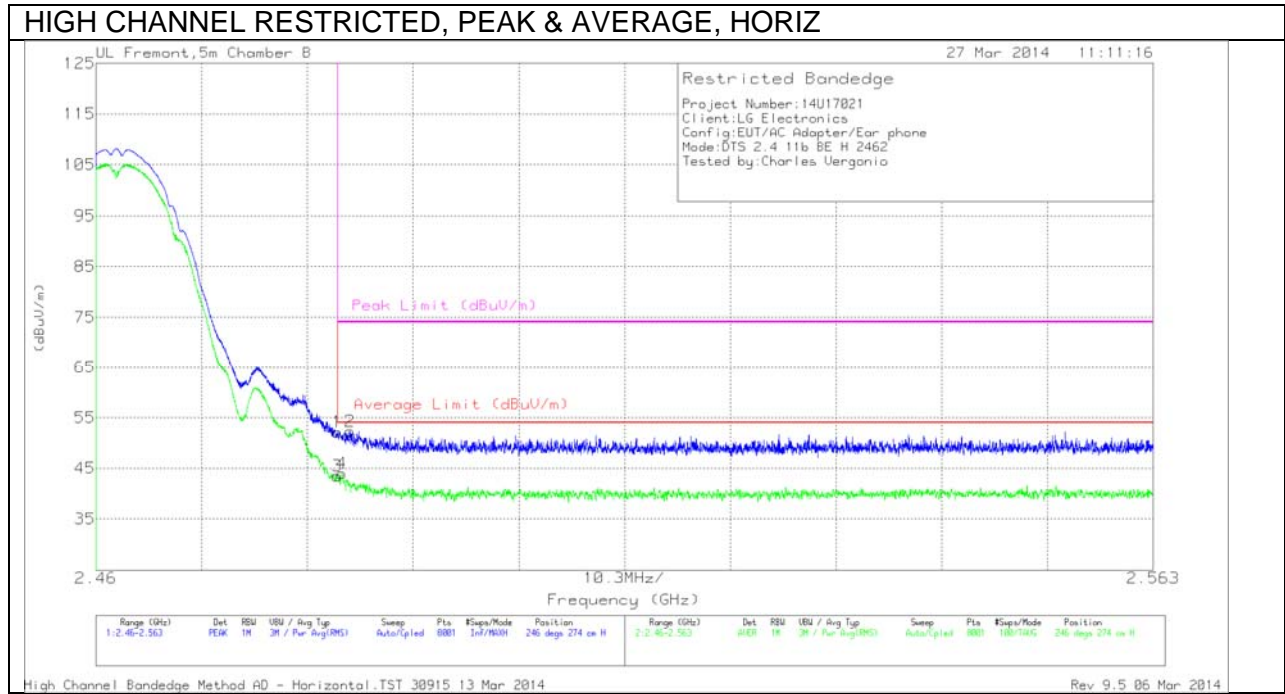
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.54	PK	32.1	-22.9	49.74	-	-	74	-24.26	137	113	V
2	* 2.334	42.72	PK	31.8	-23.1	51.42	-	-	74	-22.58	137	113	V
3	* 2.39	31.81	RMS	32.1	-22.9	41.01	54	-12.99	-	-	137	113	V
4	* 2.39	31.83	RMS	32.1	-22.9	41.03	54	-12.97	-	-	137	113	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)



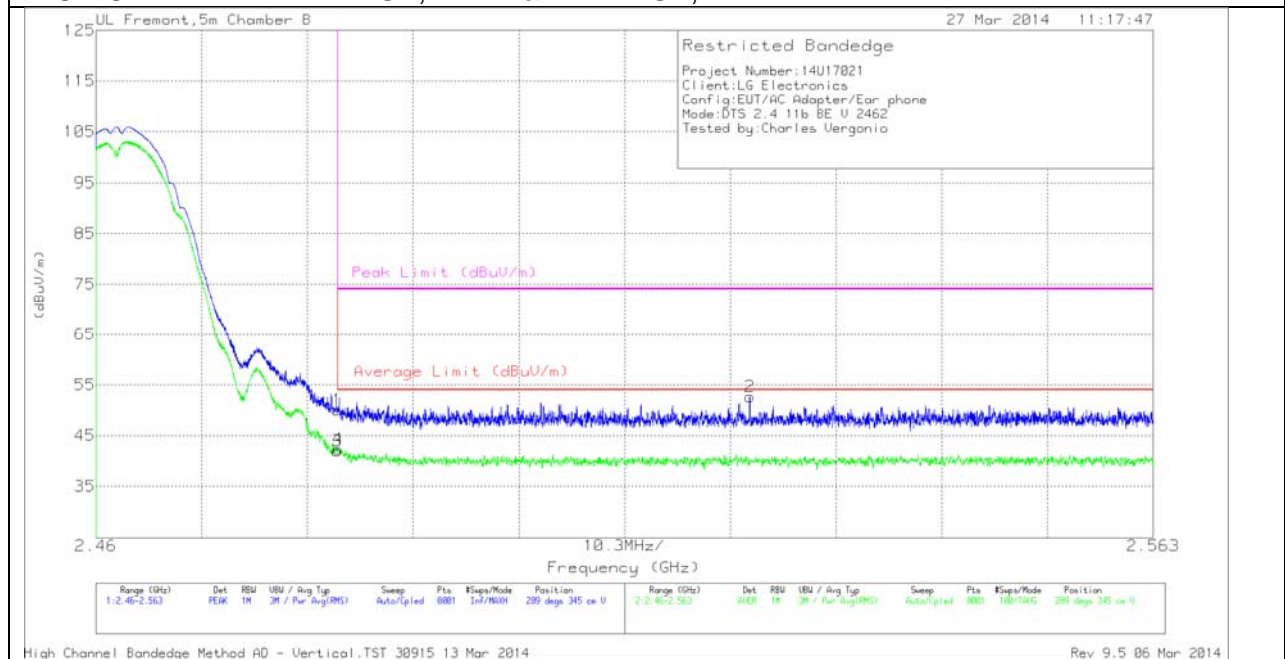
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	42.31	PK	32.4	-22.6	52.11	-	-	74	-21.89	246	274	H
2	* 2.485	42.49	PK	32.4	-22.6	52.29	-	-	74	-21.71	246	274	H
3	* 2.484	33.71	RMS	32.4	-22.6	43.51	54	-10.49	-	-	246	274	H
4	* 2.484	34.11	RMS	32.4	-22.6	43.91	54	-10.09	-	-	246	274	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL BANDEDGE, PEAK & AVERAGE, VERT



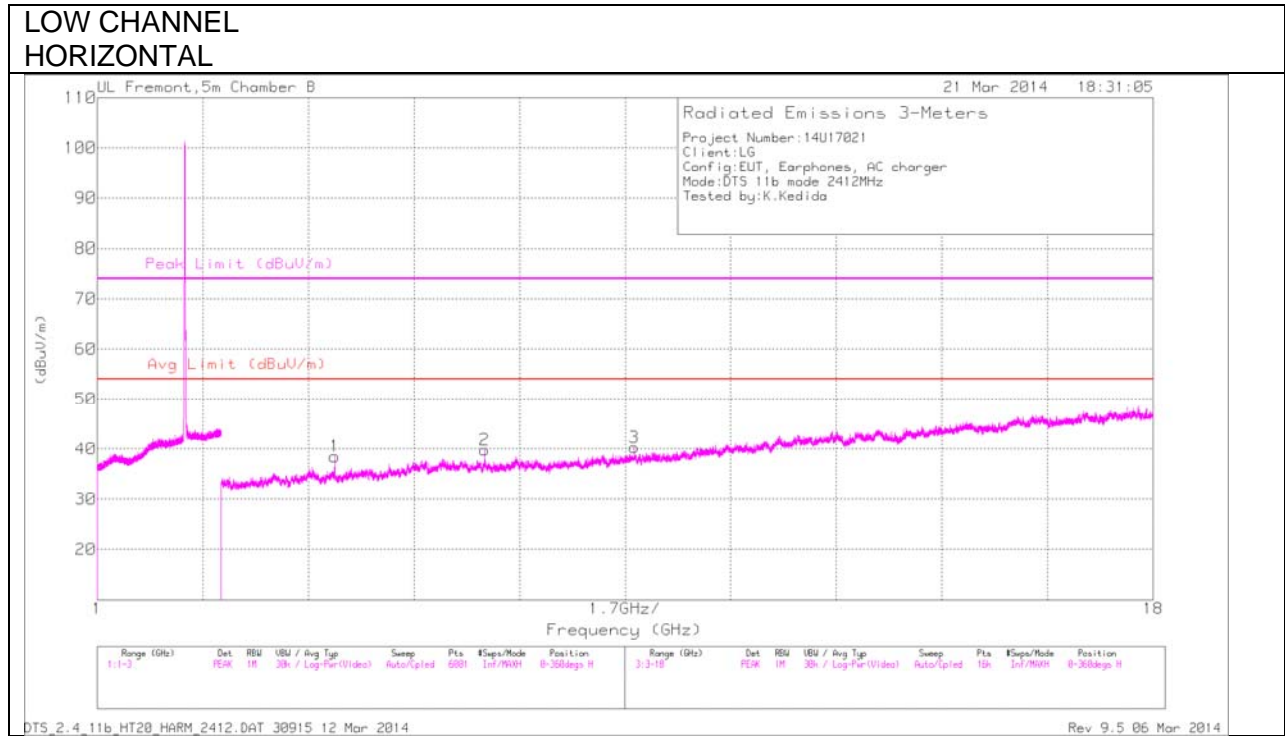
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.29	PK	32.4	-22.6	50.09	-	-	74	-23.91	289	345	V
3	* 2.484	32.2	RMS	32.4	-22.6	42	54	-12	-	-	289	345	V
4	* 2.484	32.6	RMS	32.4	-22.6	42.4	54	-11.6	-	-	289	345	V
2	2.524	42.98	PK	32.5	-22.8	52.68	-	-	74	-21.32	289	345	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

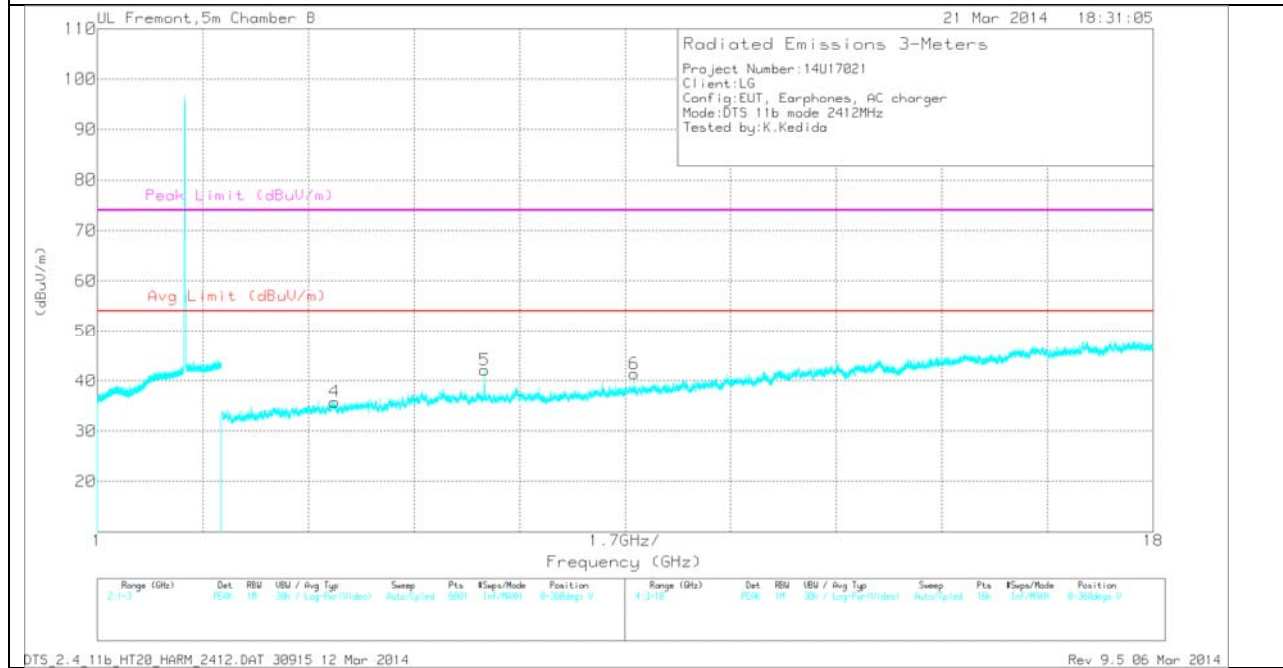
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL
 VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

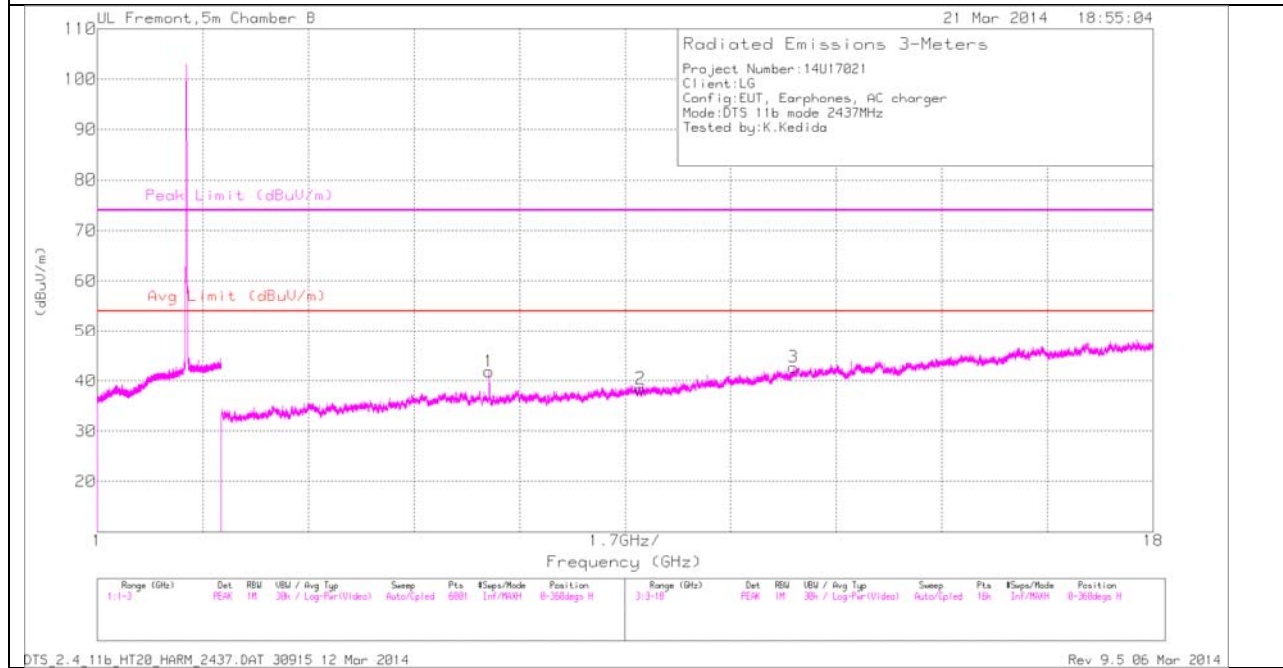
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.824	33.58	PK	34.2	-29.3	38.48	54	-15.52	74	-35.52	0-360	99	H
4	* 4.824	30.94	PK	34.2	-29.3	35.84	54	-18.16	74	-38.16	0-360	202	V
2	7.237	31.59	PK	35.6	-27.4	39.79	-	-	-	-	0-360	99	H
5	7.237	33.95	PK	35.6	-27.4	42.15	-	-	-	-	0-360	202	V
3	9.647	27.58	PK	36.8	-24.1	40.28	-	-	-	-	0-360	99	H
6	9.647	28.68	PK	36.8	-24.1	41.38	-	-	-	-	0-360	99	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.924	42.25	PK2	34.2	-30.7	45.75	54	-8.25	74	-28.25	83	153	H
* 4.924	34.63	MAV1	34.2	-30.7	38.13	54	-15.87	-	-	83	153	H
* 7.385	40.93	PK2	35.6	-27.4	49.13	54	-4.87	74	-24.87	89	266	H
* 7.385	33.3	MAV1	35.6	-27.4	41.5	54	-12.5	-	-	89	266	H
* 4.924	41.59	PK2	34.2	-30.7	45.09	54	-8.91	74	-28.91	234	201	V
* 4.924	32.84	MAV1	34.2	-30.7	36.34	54	-17.66	-	-	234	201	V
* 7.386	42.14	PK2	35.6	-27.4	50.34	54	-3.66	74	-23.66	38	286	V
* 7.387	33.9	MAV1	35.6	-27.4	42.1	54	-11.9	-	-	38	286	V

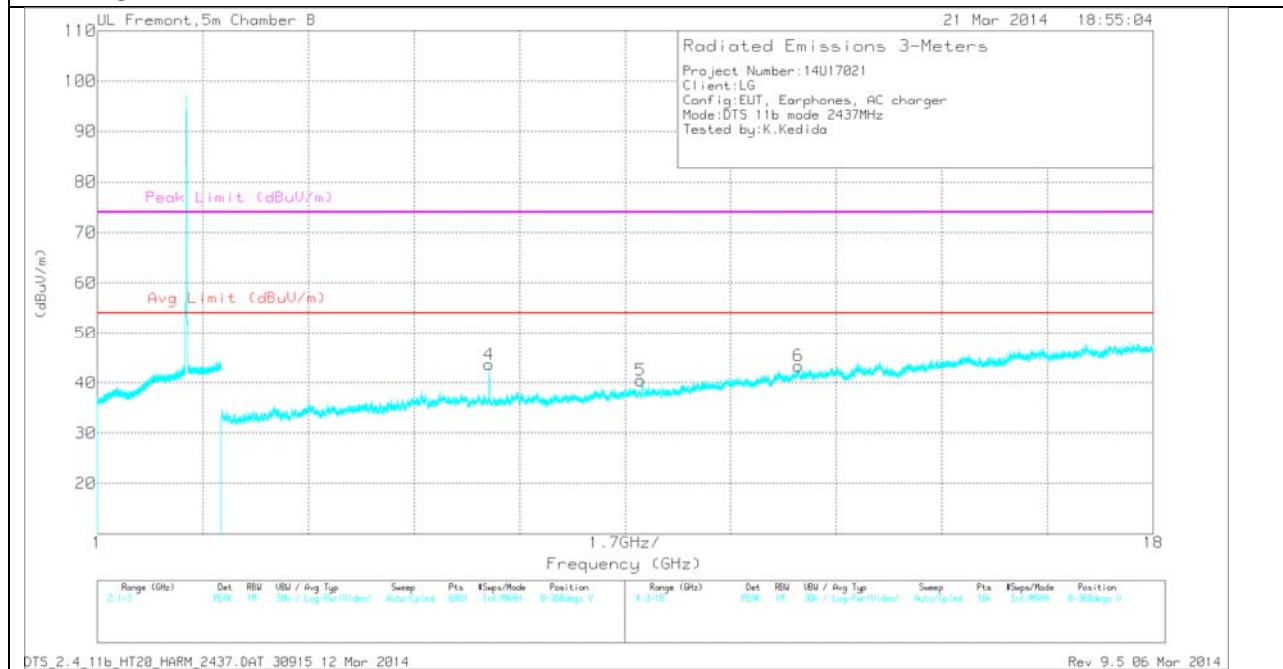
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

MID CHANNEL
 HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL
 VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

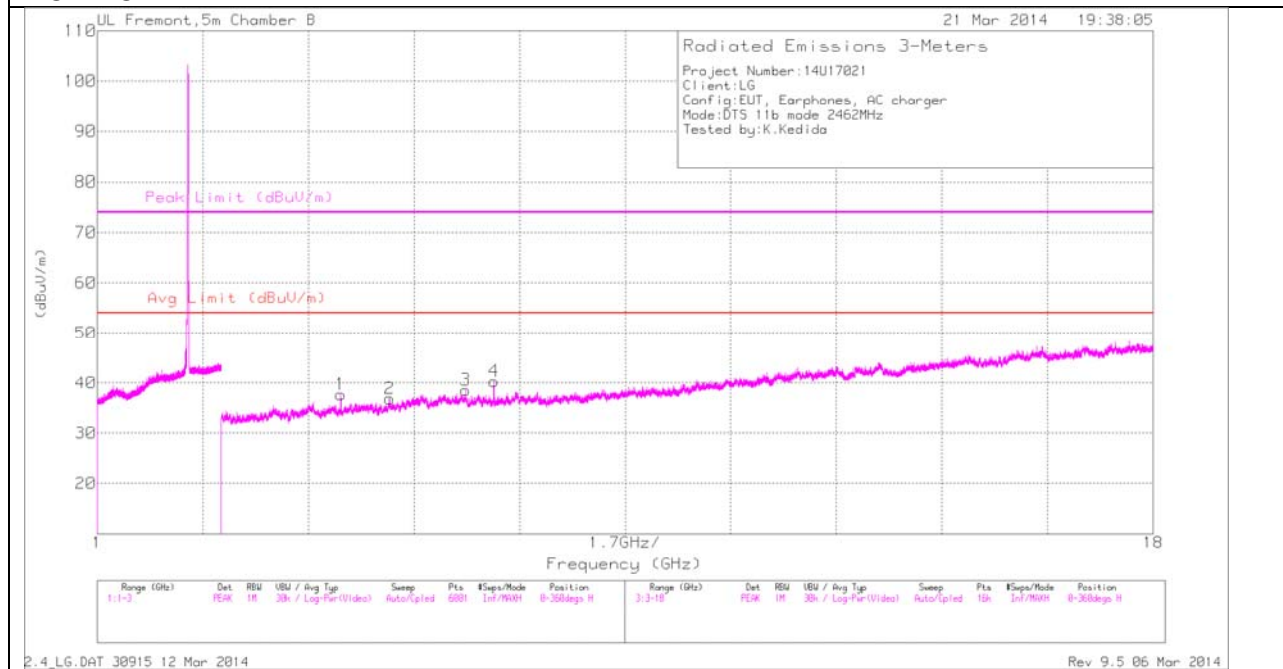
MID CHANNEL DATA
 Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 7.311	33.95	PK	35.6	-27.7	41.85	54	-12.15	74	-32.15	0-360	202	H
3	* 12.205	26.21	PK	38.9	-22.4	42.71	54	-11.29	74	-31.29	0-360	99	H
4	* 7.309	35.76	PK	35.6	-27.7	43.66	54	-10.34	74	-30.34	0-360	202	V
6	* 12.285	26.45	PK	39	-22.1	43.35	54	-10.65	74	-30.65	0-360	99	V
2	9.748	25.73	PK	36.9	-24.2	38.43	-	-	-	-	0-360	202	H
5	9.748	27.79	PK	36.9	-24.2	40.49	-	-	-	-	0-360	202	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/ Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.924	42.25	PK2	34.2	-30.7	45.75	54	-8.25	74	-28.25	83	153	H
* 4.924	34.63	MAV1	34.2	-30.7	38.13	54	-15.87	-	-	83	153	H
* 7.385	40.93	PK2	35.6	-27.4	49.13	54	-4.87	74	-24.87	89	266	H
* 7.385	33.3	MAV1	35.6	-27.4	41.5	54	-12.5	-	-	89	266	H
* 4.924	41.59	PK2	34.2	-30.7	45.09	54	-8.91	74	-28.91	234	201	V
* 4.924	32.84	MAV1	34.2	-30.7	36.34	54	-17.66	-	-	234	201	V
* 7.386	42.14	PK2	35.6	-27.4	50.34	54	-3.66	74	-23.66	38	286	V
* 7.387	33.9	MAV1	35.6	-27.4	42.1	54	-11.9	-	-	38	286	V

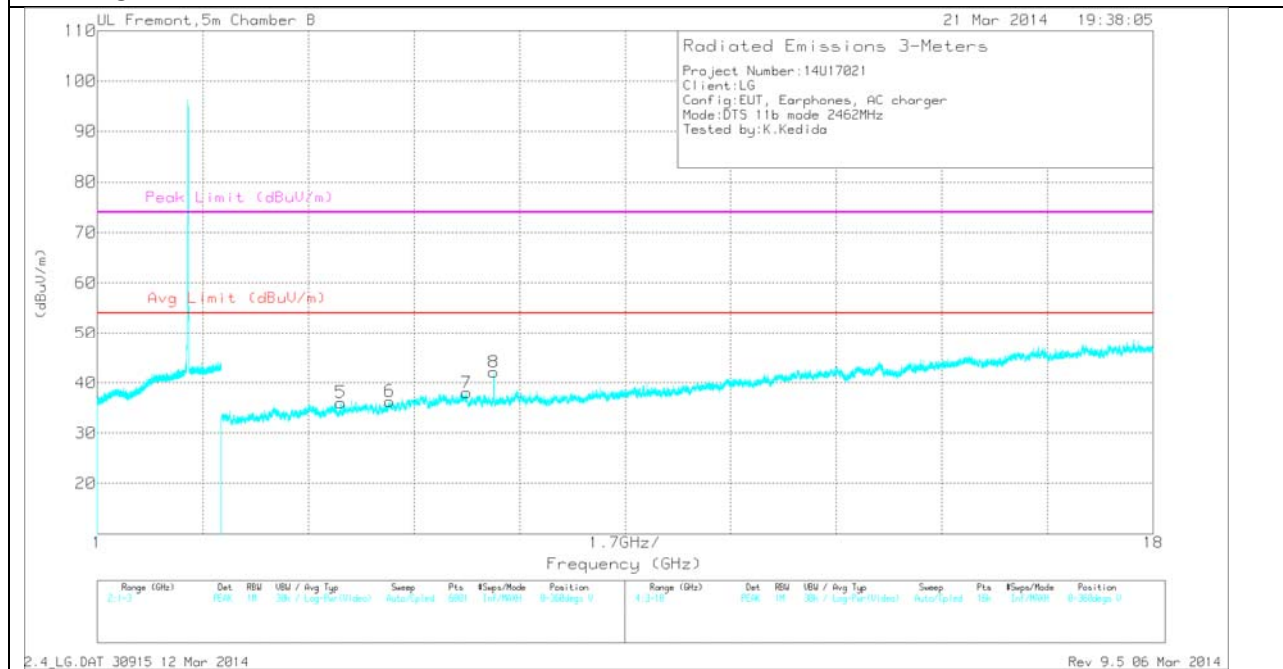
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

**HIGH CHANNEL
 HORIZONTAL**



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

**HIGH CHANNEL
 VERTICAL**



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

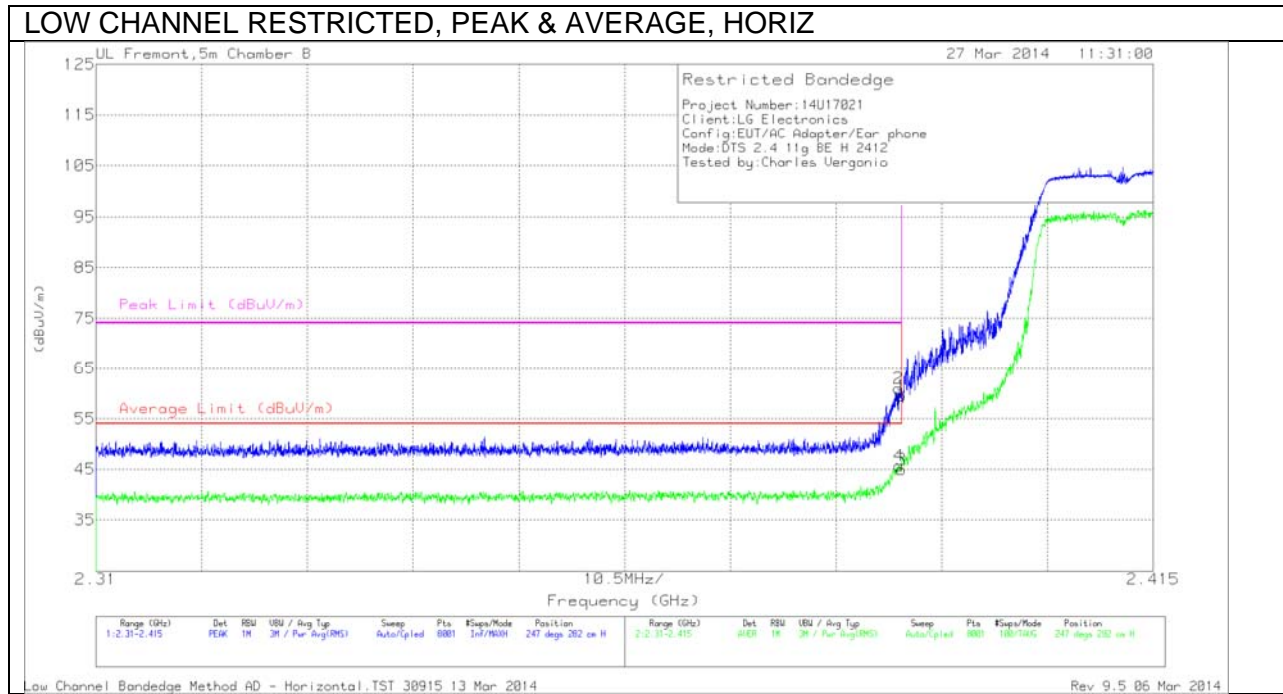
HIGH CHANNEL DATA
 Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/F ltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.924	34.19	PK	34.2	-30.7	37.69	54	-16.31	74	-36.31	0-360	99	H
4	* 7.387	32.13	PK	35.6	-27.4	40.33	54	-13.67	74	-33.67	0-360	201	H
5	* 4.924	32.58	PK	34.2	-30.7	36.08	54	-17.92	74	-37.92	0-360	99	V
8	* 7.385	33.95	PK	35.6	-27.4	42.15	54	-11.85	74	-31.85	0-360	202	V
2	5.707	31.36	PK	34.5	-29	36.86	-	-	-	-	0-360	201	H
6	5.711	30.93	PK	34.5	-29.1	36.33	-	-	-	-	0-360	202	V
3	6.934	30.86	PK	35.6	-27.9	38.56	-	-	-	-	0-360	99	H
7	6.949	30.33	PK	35.6	-27.9	38.03	-	-	-	-	0-360	99	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.924	42.25	PK2	34.2	-30.7	45.75	54	-8.25	74	-28.25	83	153	H
* 4.924	34.63	MAV1	34.2	-30.7	38.13	54	-15.87	-	-	83	153	H
* 7.385	40.93	PK2	35.6	-27.4	49.13	54	-4.87	74	-24.87	89	266	H
* 7.385	33.3	MAV1	35.6	-27.4	41.5	54	-12.5	-	-	89	266	H
* 4.924	41.59	PK2	34.2	-30.7	45.09	54	-8.91	74	-28.91	234	201	V
* 4.924	32.84	MAV1	34.2	-30.7	36.34	54	-17.66	-	-	234	201	V
* 7.386	42.14	PK2	35.6	-27.4	50.34	54	-3.66	74	-23.66	38	286	V
* 7.387	33.9	MAV1	35.6	-27.4	42.1	54	-11.9	-	-	38	286	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

9.2.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)



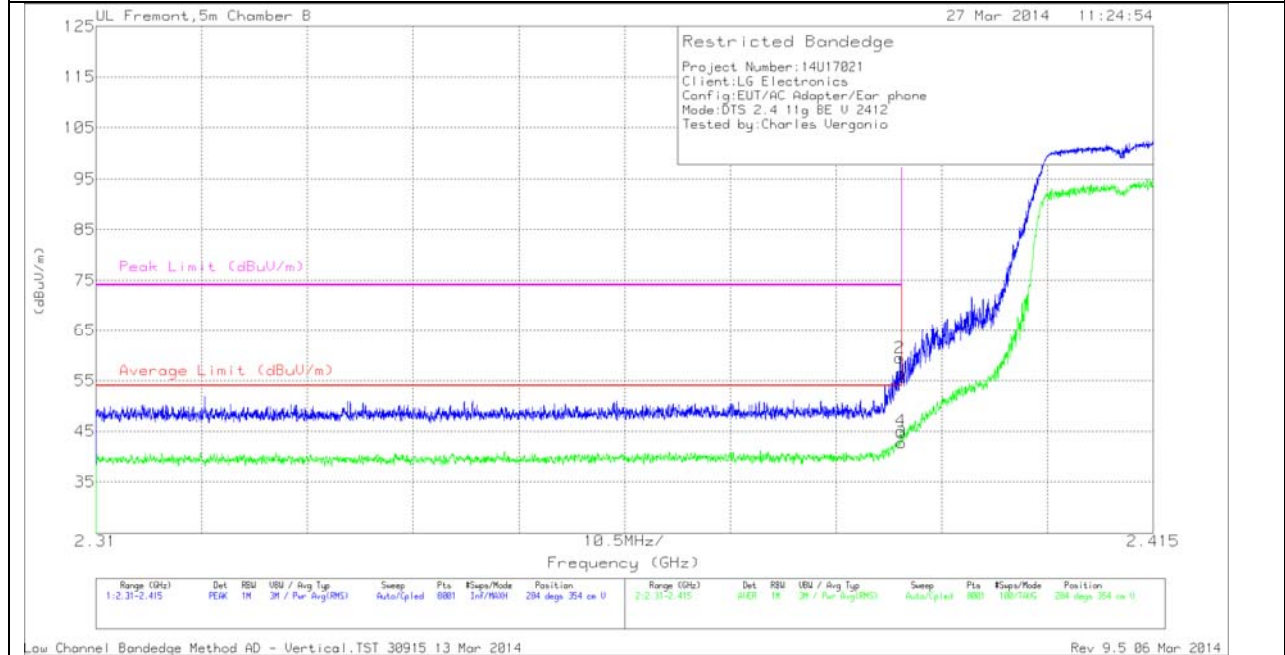
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	50.26	PK	32.1	-22.9	0	59.46	-	-	74	-14.54	247	282	H
2	* 2.39	51.8	PK	32.1	-22.9	0	61	-	-	74	-13	247	282	H
3	* 2.39	35.53	RMS	32.1	-22.9	.2	44.93	54	-9.07	-	-	247	282	H
4	* 2.39	36.35	RMS	32.1	-22.9	.2	45.75	54	-8.25	-	-	247	282	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

LOW CHANNEL RESTRICTED, PEAK & AVERAGE, VERT



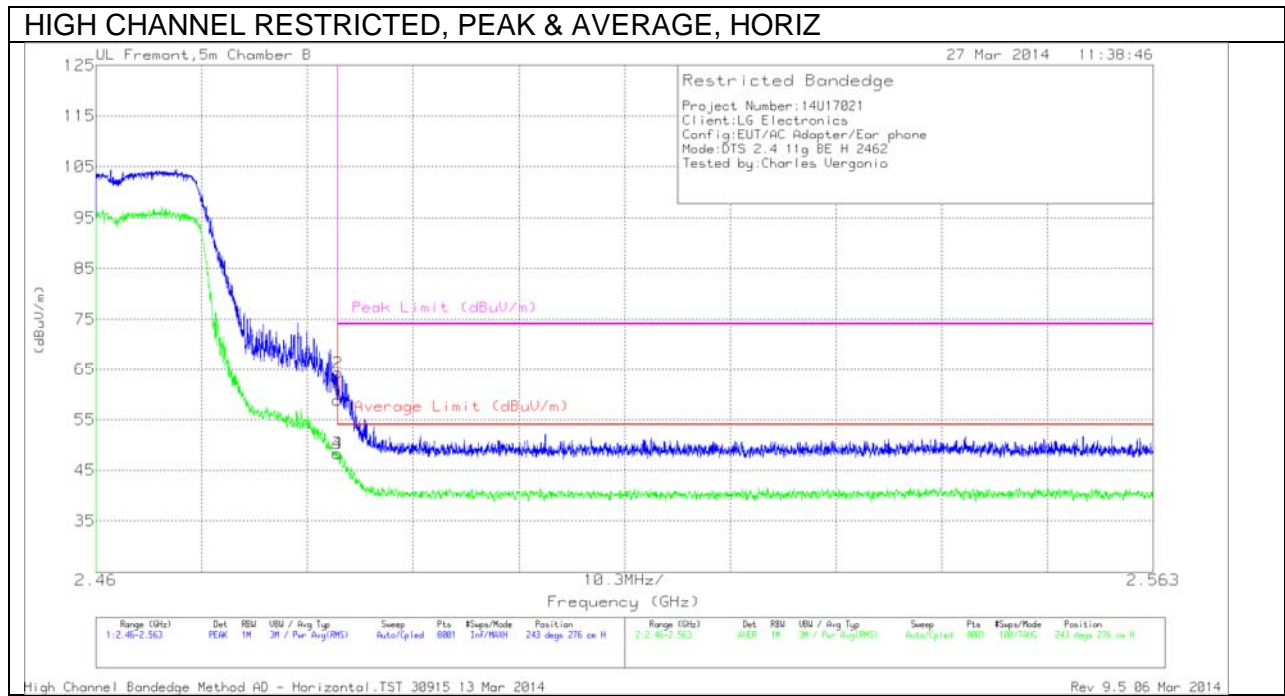
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fitter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	47.27	PK	32.1	-22.9	0	56.47	-	-	74	-17.53	284	354	V
2	* 2.39	50.33	PK	32.1	-22.9	0	59.53	-	-	74	-14.47	284	354	V
3	* 2.39	33.37	RMS	32.1	-22.9	.2	42.77	54	-11.23	-	-	284	354	V
4	* 2.39	35.64	RMS	32.1	-22.9	.2	45.04	54	-8.96	-	-	284	354	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)



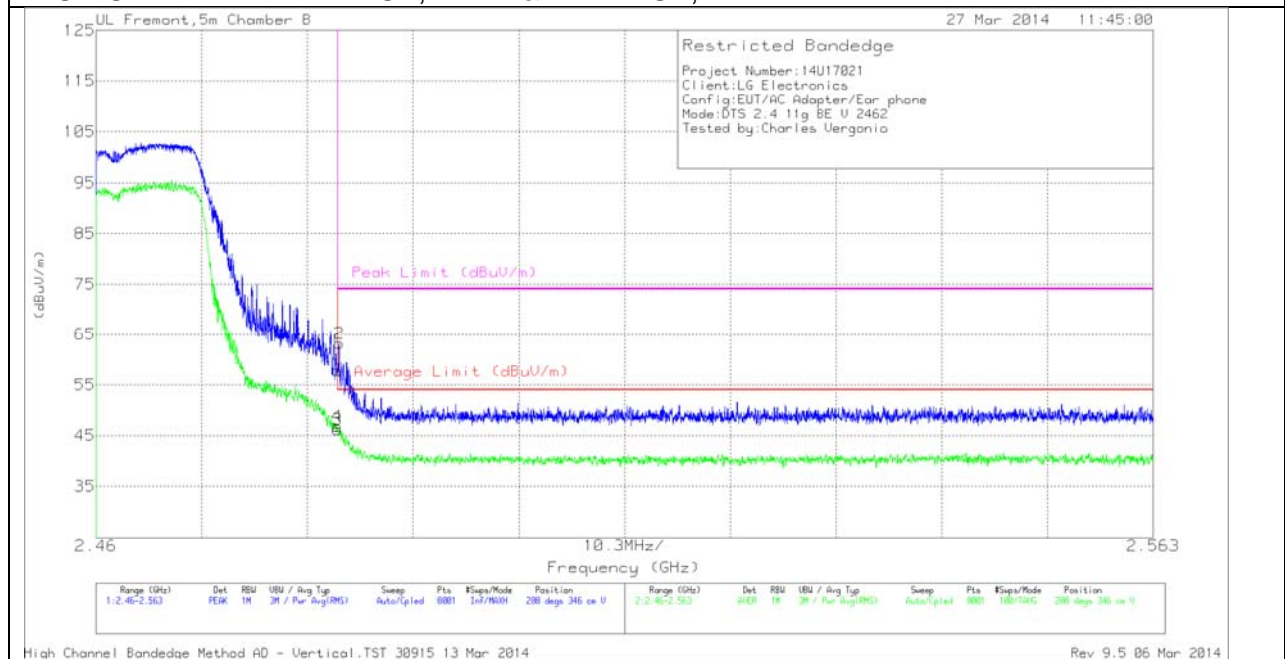
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	49.12	PK	32.4	-22.6	0	58.92	-	-	74	-15.08	243	276	H
2	* 2.484	54.5	PK	32.4	-22.6	0	64.3	-	-	74	-9.7	243	276	H
3	* 2.484	38.34	RMS	32.4	-22.6	.2	48.34	54	-5.66	-	-	243	276	H
4	* 2.484	38.34	RMS	32.4	-22.6	.2	48.34	54	-5.66	-	-	243	276	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

HIGH CHANNEL BANDEDGE, PEAK & AVERAGE, VERT



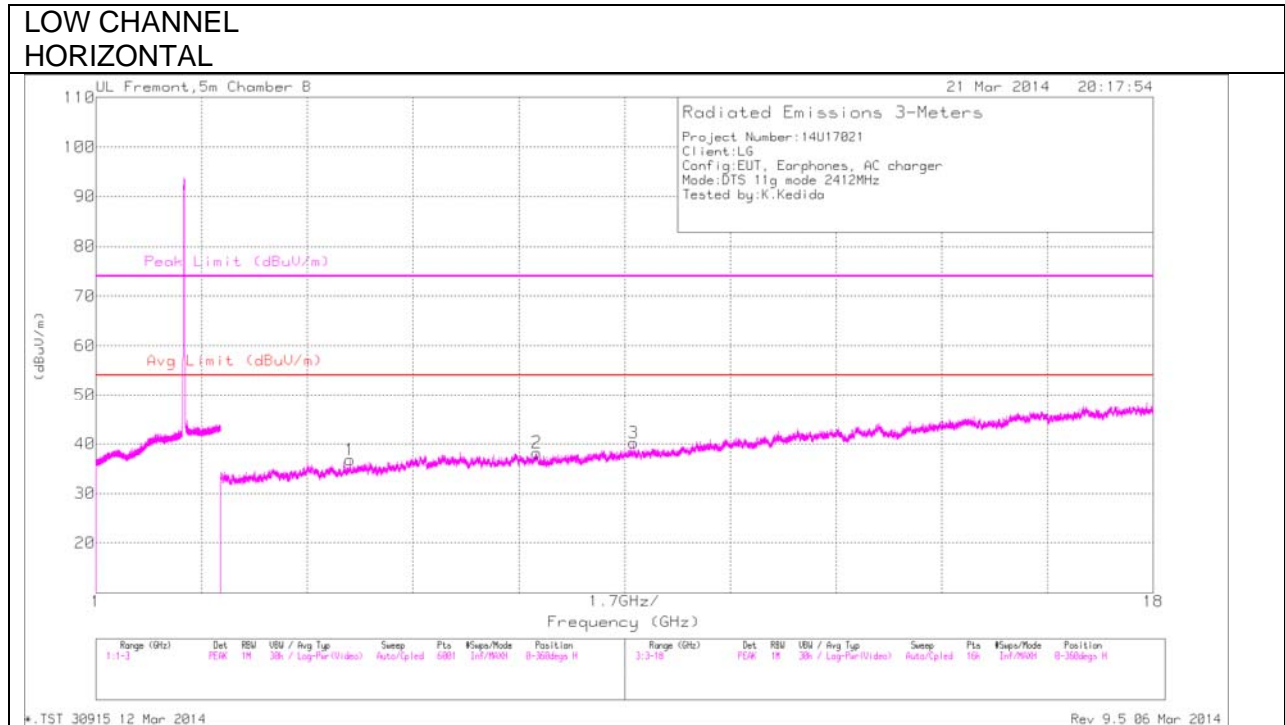
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fitter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	48.1	PK	32.4	-22.6	0	57.9	-	-	74	-16.1	288	346	V
2	* 2.484	53.39	PK	32.4	-22.6	0	63.19	-	-	74	-10.81	288	346	V
3	* 2.484	36.24	RMS	32.4	-22.6	.2	46.24	54	-7.76	-	-	288	346	V
4	* 2.484	36.76	RMS	32.4	-22.6	.2	46.76	54	-7.24	-	-	288	346	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

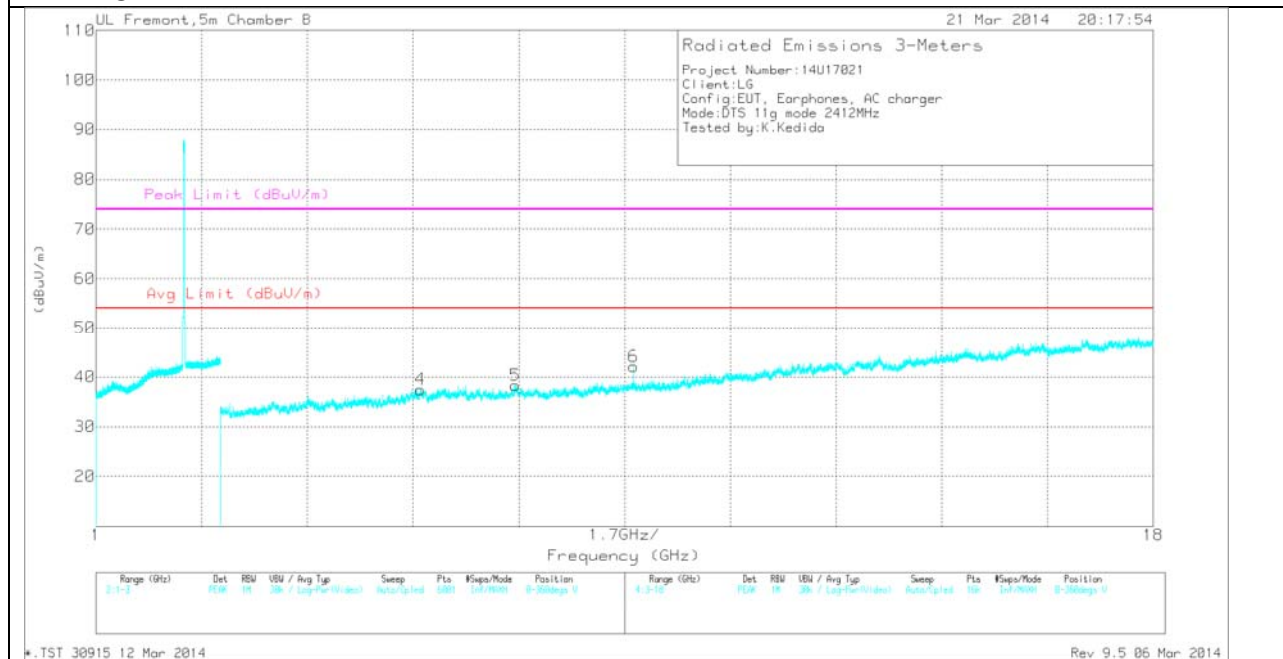
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL
 VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL DATA

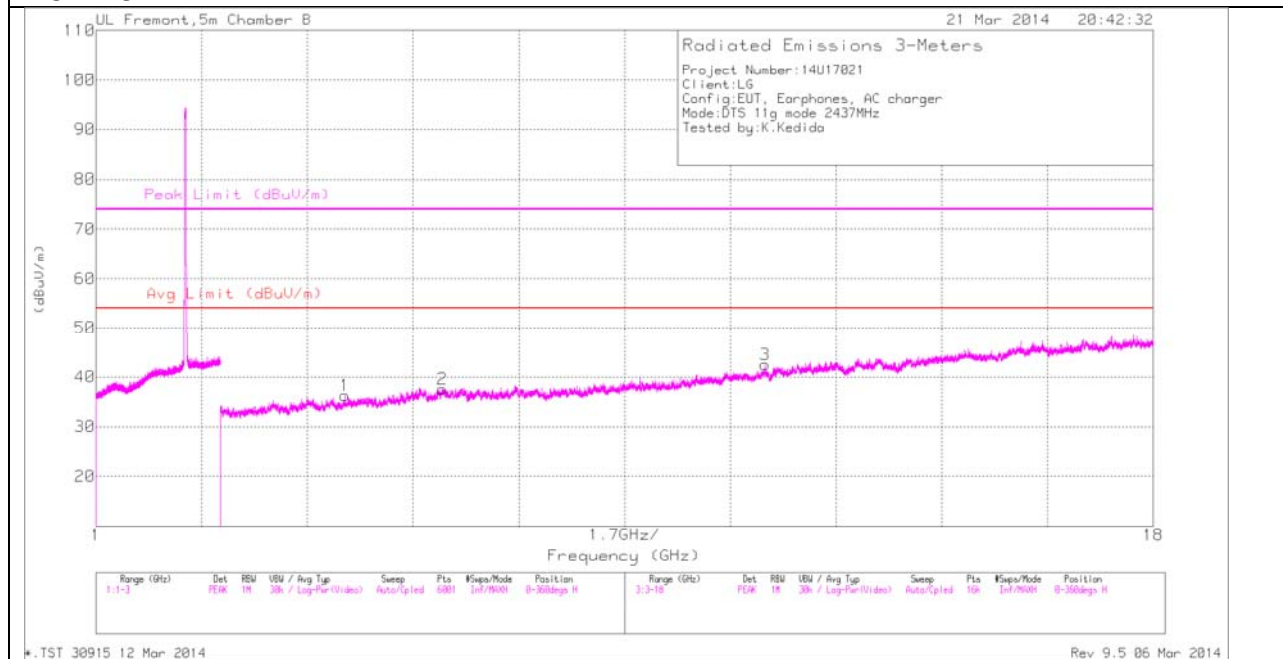
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.083	31.16	PK	34.2	-28.6	0	36.76	54	-17.24	74	-37.24	0-360	99	H
2	* 8.084	28.35	PK	35.7	-25.8	0	38.25	54	-15.75	74	-35.75	0-360	201	H
5	* 7.744	28.64	PK	35.7	-26	0	38.34	54	-15.66	74	-35.66	0-360	202	V
4	6.214	29.89	PK	35.4	-27.8	0	37.49	-	-	-	-	0-360	202	V
3	9.647	27.54	PK	36.8	-24.1	0	40.24	-	-	-	-	0-360	201	H
6	9.647	29.43	PK	36.8	-24.1	0	42.13	-	-	-	-	0-360	202	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/ Fitr/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
* 5.081	39.09	PK2	34.2	-28.7	0	44.59	54	-9.41	74	-29.41	1	100	H
* 8.084	37	PK2	35.7	-25.8	0	46.9	54	-7.1	74	-27.1	1	100	H
* 7.743	37.37	PK2	35.7	-26	0	47.07	54	-6.93	74	-26.93	1	100	V

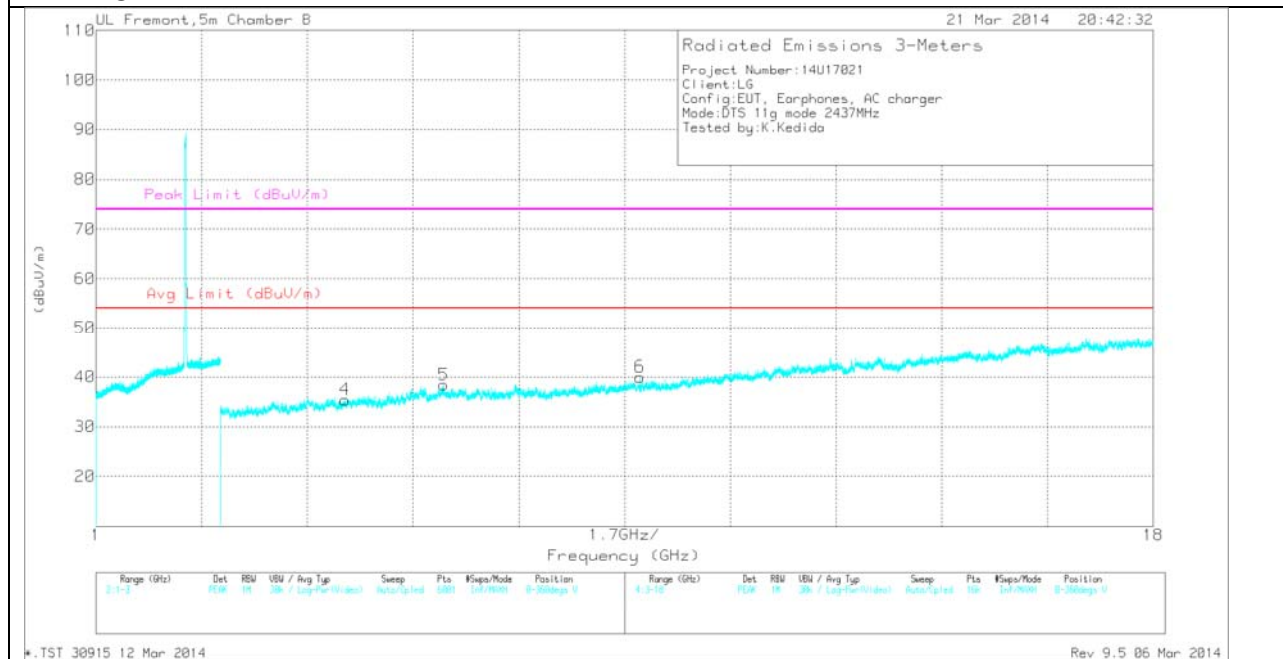
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

MID CHANNEL
 HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL
 VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

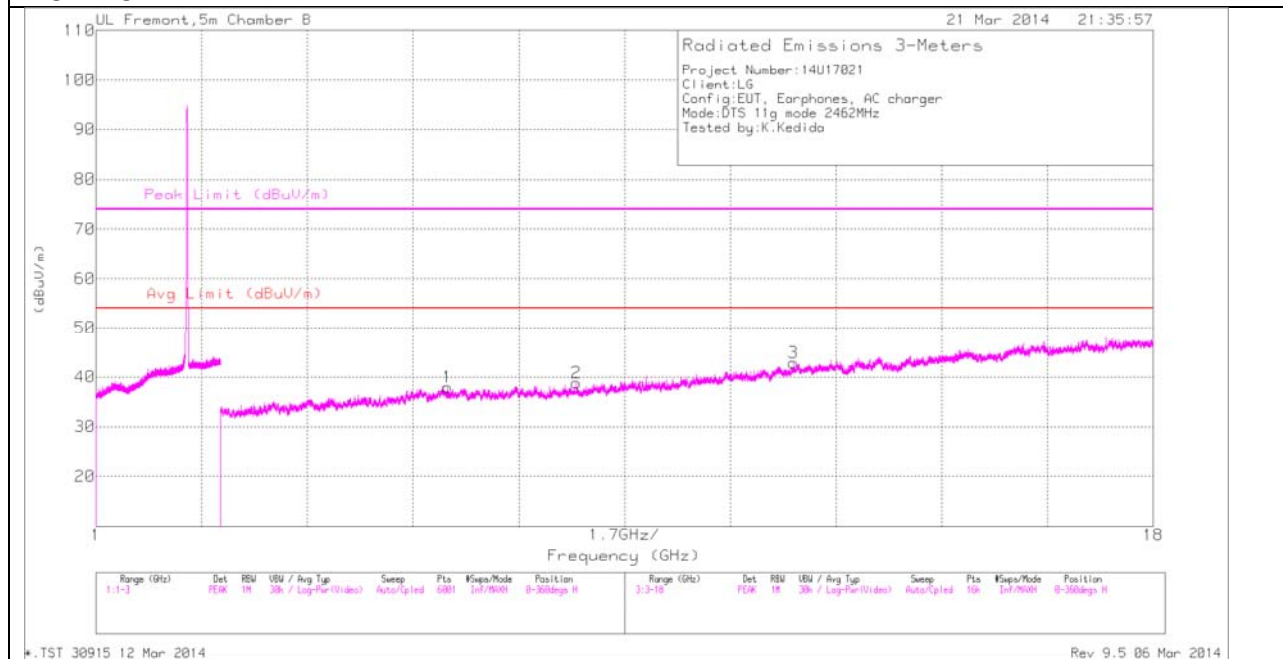
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.004	31.32	PK	34.2	-29.2	0	36.32	54	-17.68	74	-37.68	0-360	99	H
3	* 11.757	26.59	PK	38.3	-22.4	0	42.49	54	-11.51	74	-31.51	0-360	99	H
4	* 5.004	30.46	PK	34.2	-29.2	0	35.46	54	-18.54	74	-38.54	0-360	99	V
2	6.57	29.31	PK	35.7	-27.4	0	37.61	-	-	-	-	0-360	99	H
5	6.587	30.31	PK	35.7	-27.6	0	38.41	-	-	-	-	0-360	99	V
6	9.748	27.33	PK	36.9	-24.2	0	40.03	-	-	-	-	0-360	202	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/ Fitr/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
* 5.004	38.46	PK2	34.2	-29.2	0	43.46	54	-10.54	74	-30.54	1	100	H
* 11.757	33.97	PK2	38.3	-22.4	0	49.87	54	-4.13	74	-24.13	1	100	H
* 5.004	39.04	PK2	34.2	-29.2	0	44.04	54	-9.96	74	-29.96	1	100	V

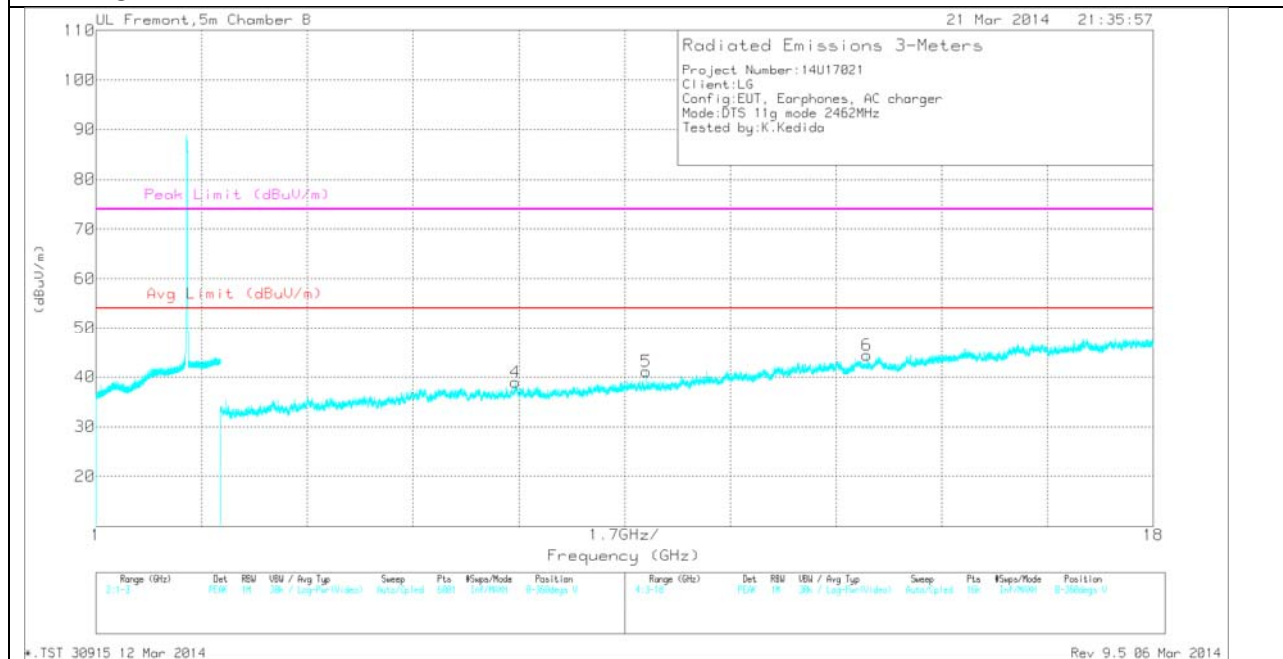
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

HIGH CHANNEL HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

**HIGH CHANNEL
 VERTICAL**



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

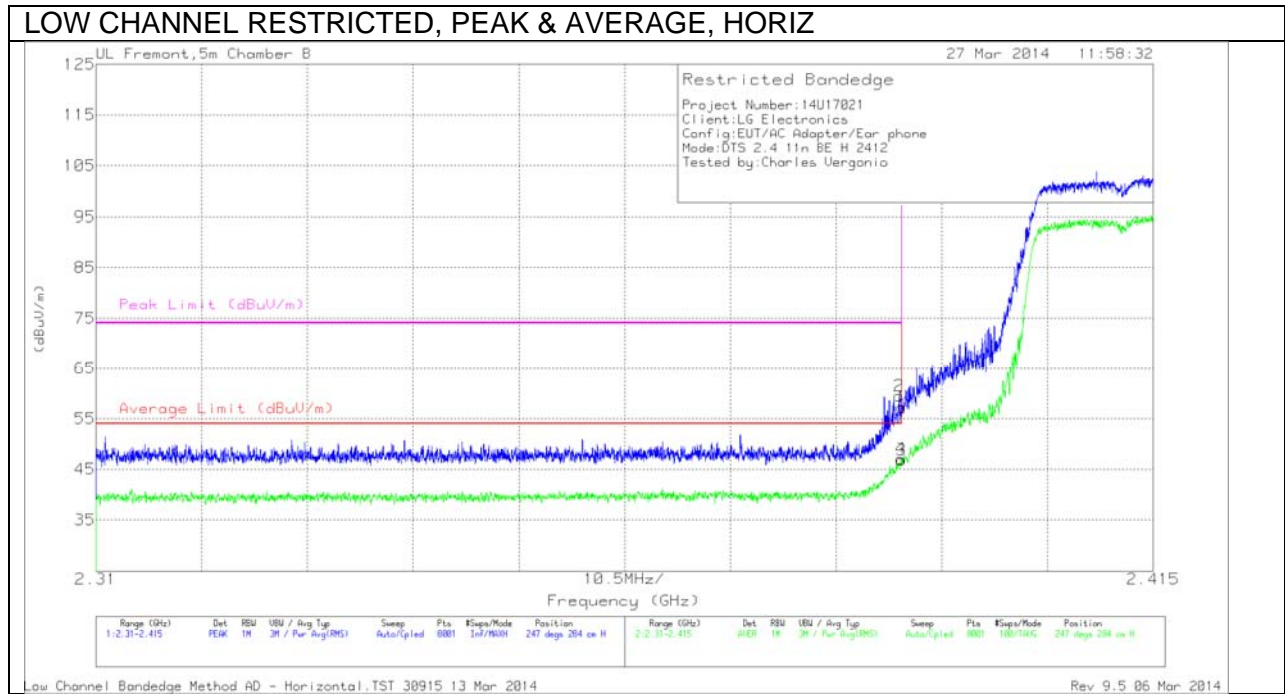
HIGH CHANNEL DATA
 Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/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	* 12.218	26.13	PK	38.9	-22.1	0	42.93	54	-11.07	74	-31.07	0-360	99	H
4	* 7.743	29.26	PK	35.7	-26	0	38.96	54	-15.04	74	-35.04	0-360	202	V
1	6.651	30.96	PK	35.7	-28.7	0	37.96	-	-	-	-	0-360	201	H
2	8.728	28.18	PK	35.9	-25.3	0	38.78	-	-	-	-	0-360	201	H
5	9.847	28.19	PK	37	-24.1	0	41.09	-	-	-	-	0-360	202	V
6	13.402	27.8	PK	39.2	-22.6	0	44.4	-	-	-	-	0-360	99	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/ 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
* 12.217	34.39	PK2	38.9	-22.2	0	51.09	54	-2.91	74	-22.91	2	100	H
* 7.743	37.1	PK2	35.7	-26	0	46.8	54	-7.2	74	-27.2	2	100	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

9.2.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND RESTRICTED BANDEDGE (LOW CHANNEL)

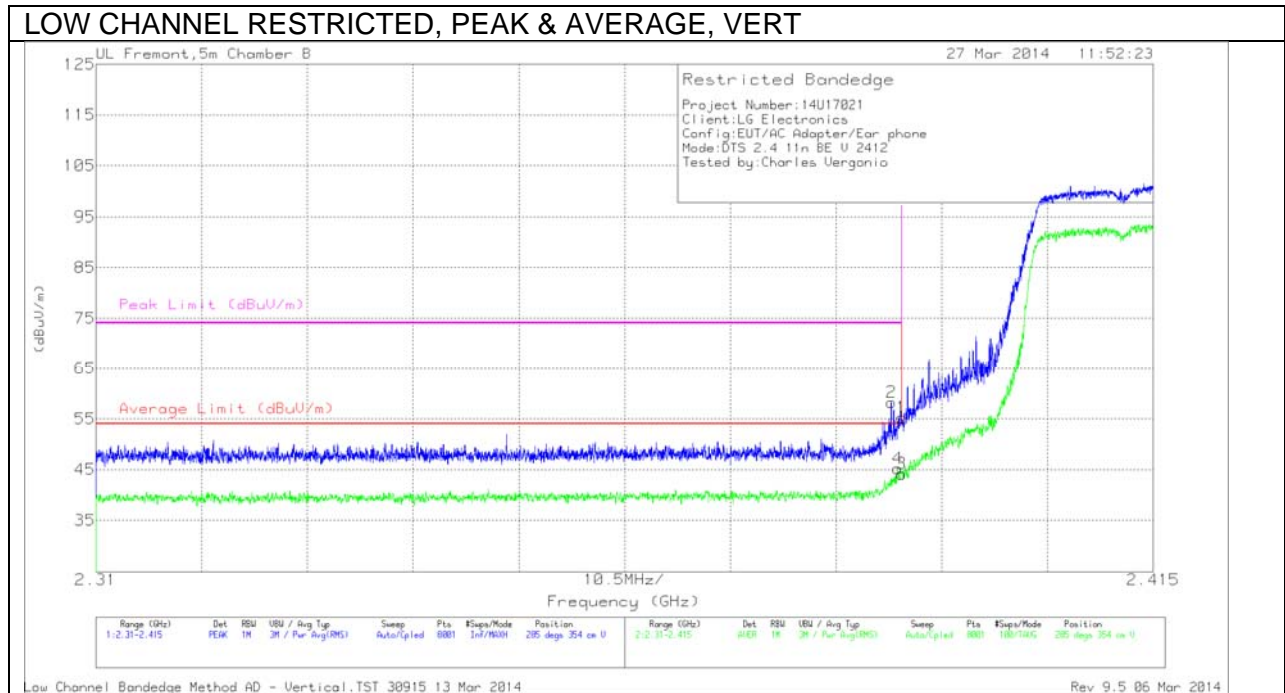


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	48.08	PK	32.1	-22.9	0	57.28	-	-	74	-16.72	247	284	H
2	* 2.39	50.24	PK	32.1	-22.9	0	59.44	-	-	74	-14.56	247	284	H
3	* 2.39	37.37	RMS	32.1	-22.9	.2	46.77	54	-7.23	-	-	247	284	H
4	* 2.39	37.67	RMS	32.1	-22.9	.2	47.07	54	-6.93	-	-	247	284	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection



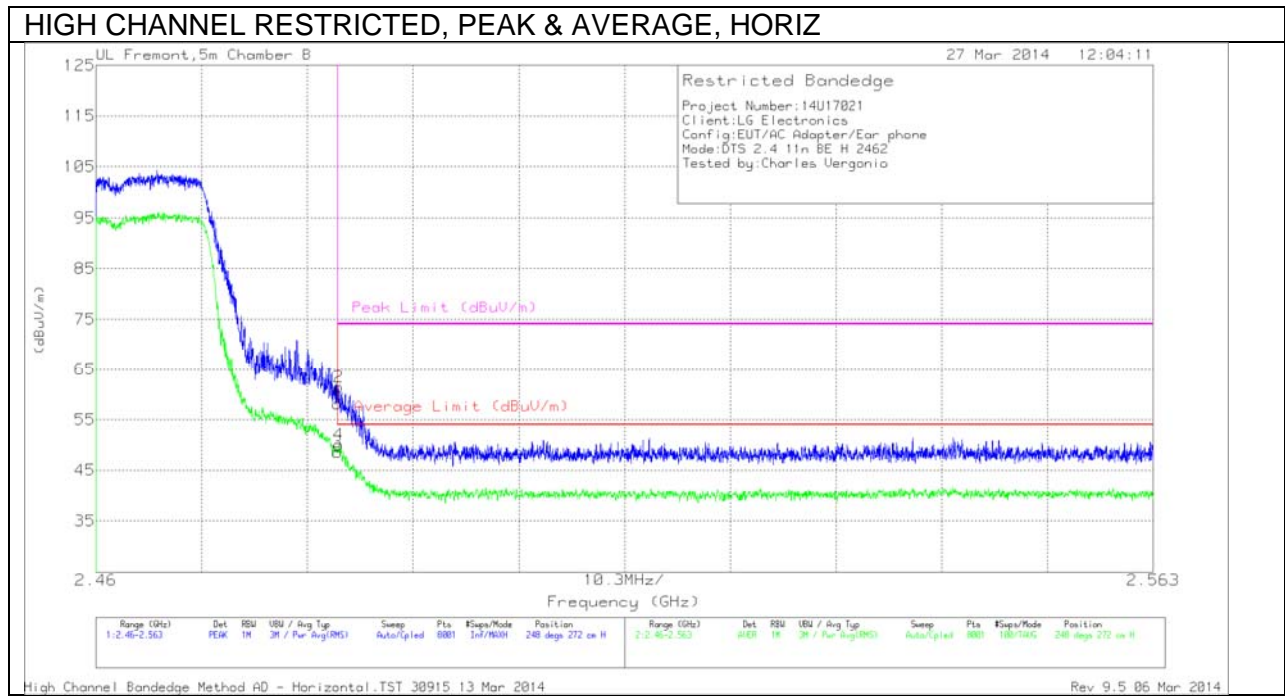
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fitter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	46	PK	32.1	-22.9	0	55.2	-	-	74	-18.8	285	354	V
2	* 2.389	49.08	PK	32.1	-22.9	0	58.28	-	-	74	-15.72	285	354	V
3	* 2.39	34.75	RMS	32.1	-22.9	.2	44.15	54	-9.85	-	-	285	354	V
4	* 2.39	35.81	RMS	32.1	-22.9	.2	45.21	54	-8.79	-	-	285	354	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

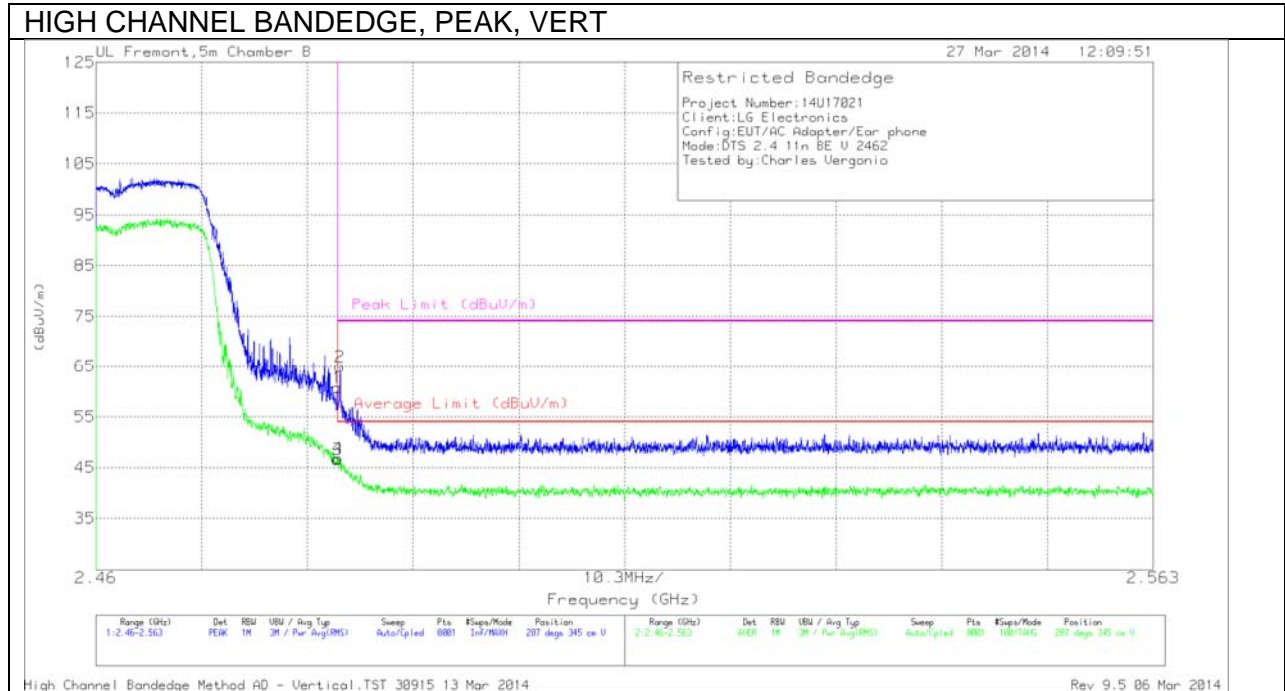


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	48.26	PK	32.4	-22.6	0	58.06	-	-	74	-15.94	248	272	H
2	* 2.484	51.65	PK	32.4	-22.6	0	61.45	-	-	74	-12.55	248	272	H
3	* 2.484	38.5	RMS	32.4	-22.6	.2	48.5	54	-5.5	-	-	248	272	H
4	* 2.484	40.02	RMS	32.4	-22.6	.2	50.02	54	-3.98	-	-	248	272	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection



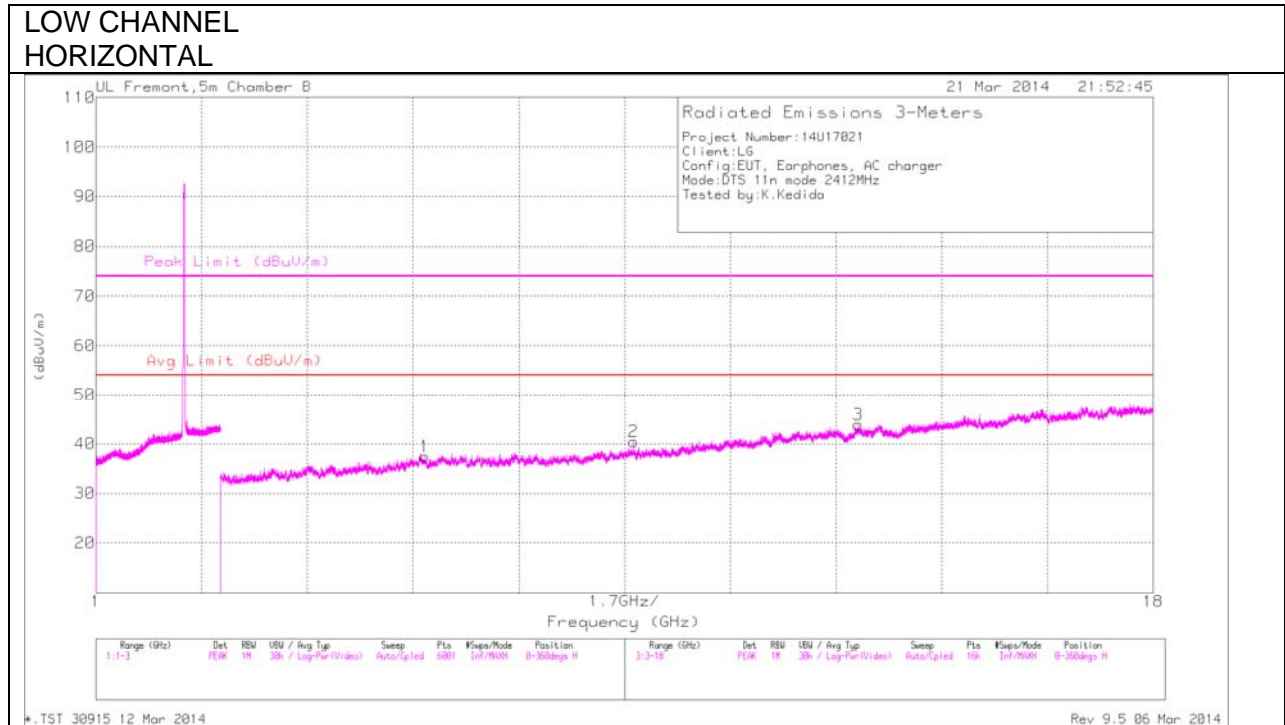
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fitter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	50.95	PK	32.4	-22.6	0	60.75	-	-	74	-13.25	287	345	V
2	* 2.484	55.09	PK	32.4	-22.6	0	64.89	-	-	74	-9.11	287	345	V
3	* 2.484	36.62	RMS	32.4	-22.6	.2	46.62	54	-7.38	-	-	287	345	V
4	* 2.484	36.86	RMS	32.4	-22.6	.2	46.86	54	-7.14	-	-	287	345	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

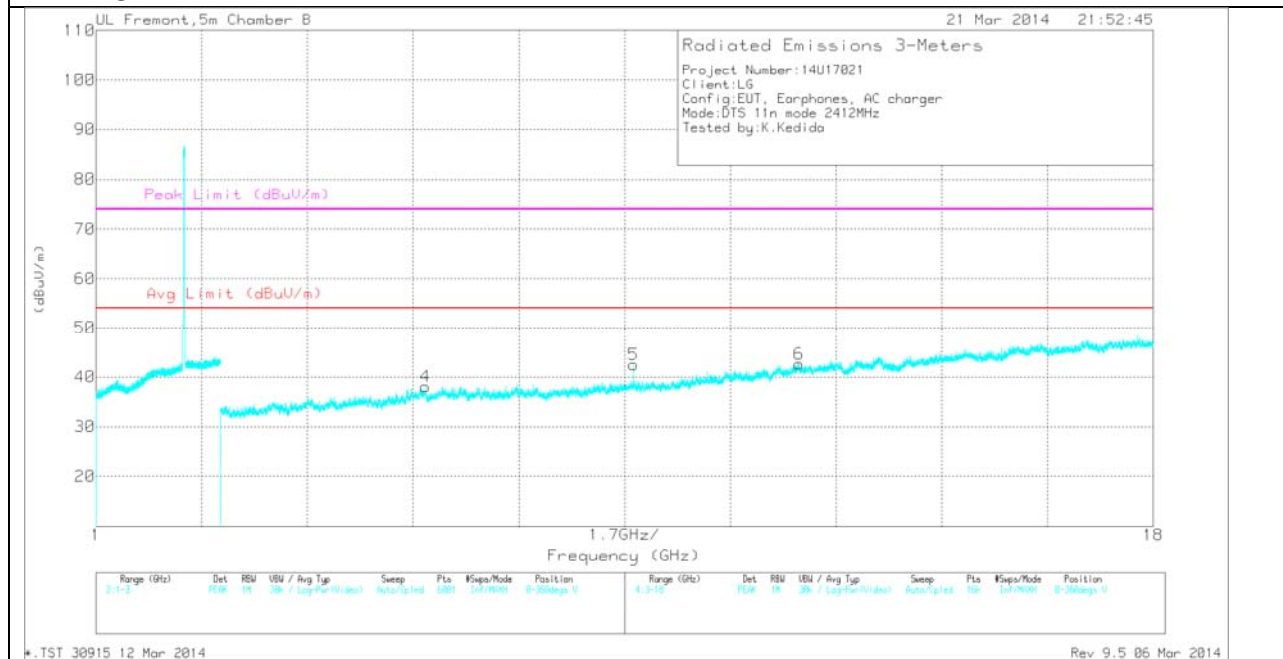
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

LOW CHANNEL
 VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

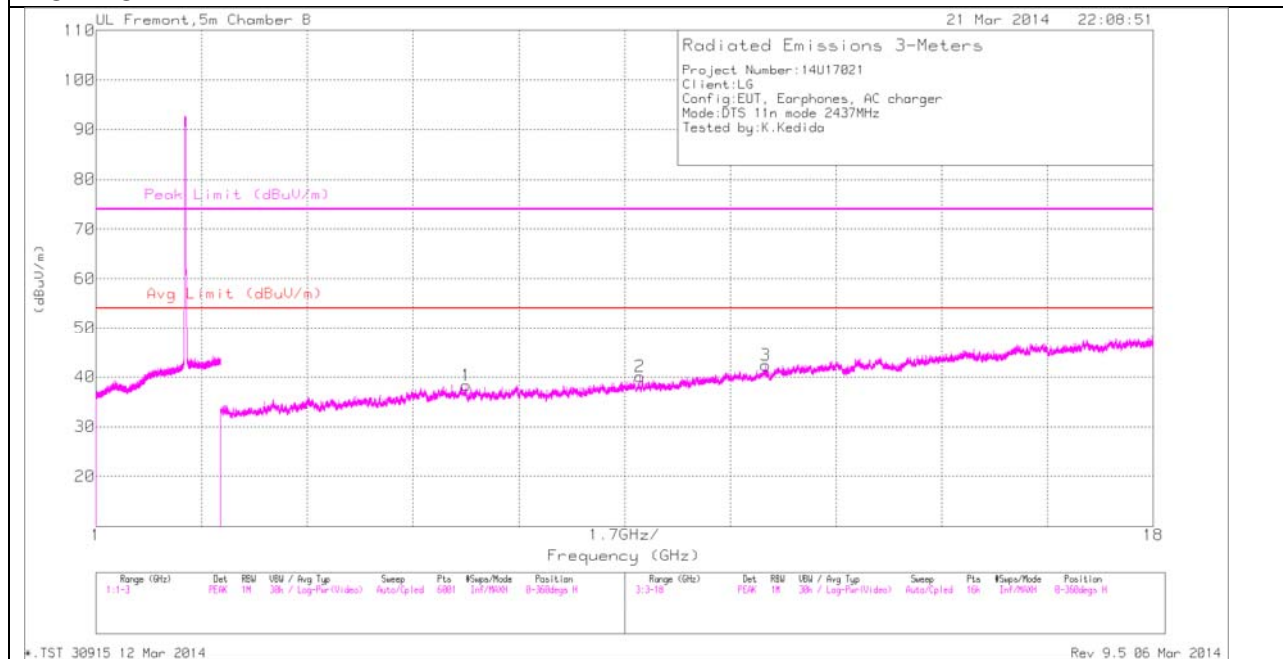
LOW CHANNEL DATA
 Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/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	* 13.26	27.09	PK	39.2	-22.4	0	43.89	54	-10.11	74	-30.11	0-360	201	H
6	* 12.303	25.72	PK	39	-22.1	0	42.62	54	-11.38	74	-31.38	0-360	99	V
1	6.291	29.86	PK	35.5	-27.9	0	37.46	-	-	-	-	0-360	201	H
4	6.302	30.75	PK	35.5	-28.2	0	38.05	-	-	-	-	0-360	99	V
2	9.647	27.76	PK	36.8	-24.1	0	40.46	-	-	-	-	0-360	201	H
5	9.647	29.82	PK	36.8	-24.1	0	42.52	-	-	-	-	0-360	202	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/ 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
* 13.261	35.62	PK2	39.2	-22.4	0	52.42	54	-1.58	74	-21.58	1	100	H
10.5	35.27	PK2	37.5	-23.4	0	49.37	-	-	-	-	1	100	V

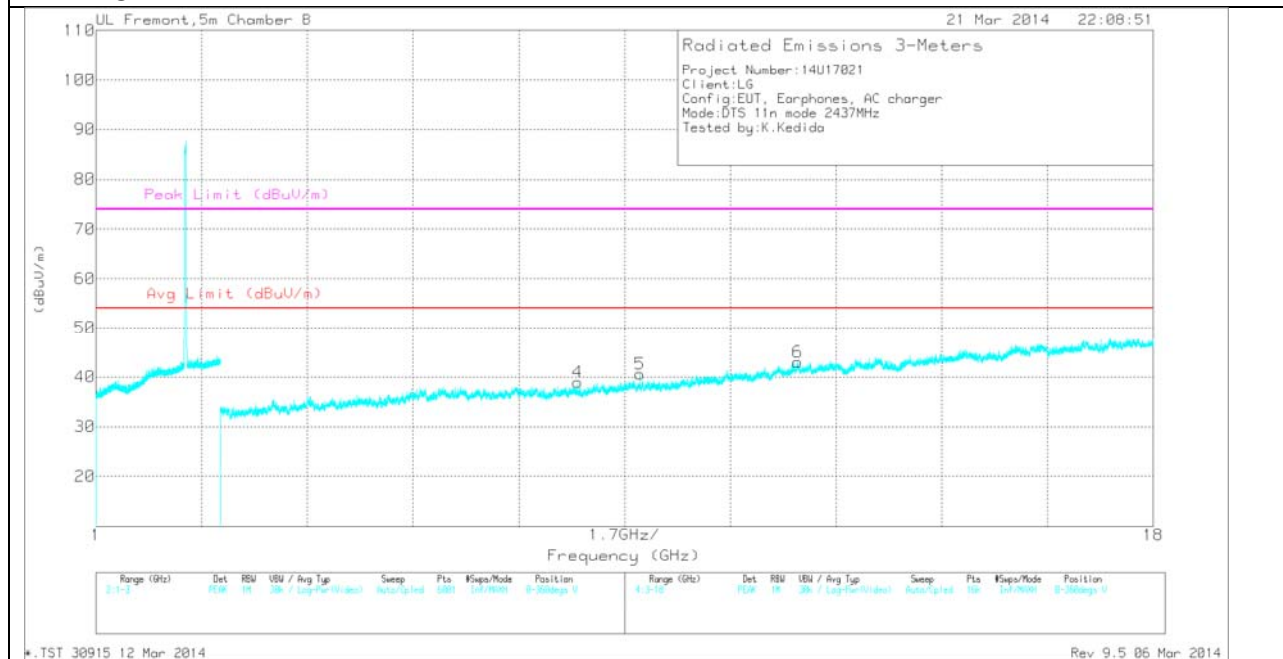
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

MID CHANNEL
 HORIZONTAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL
 VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

MID CHANNEL DATA

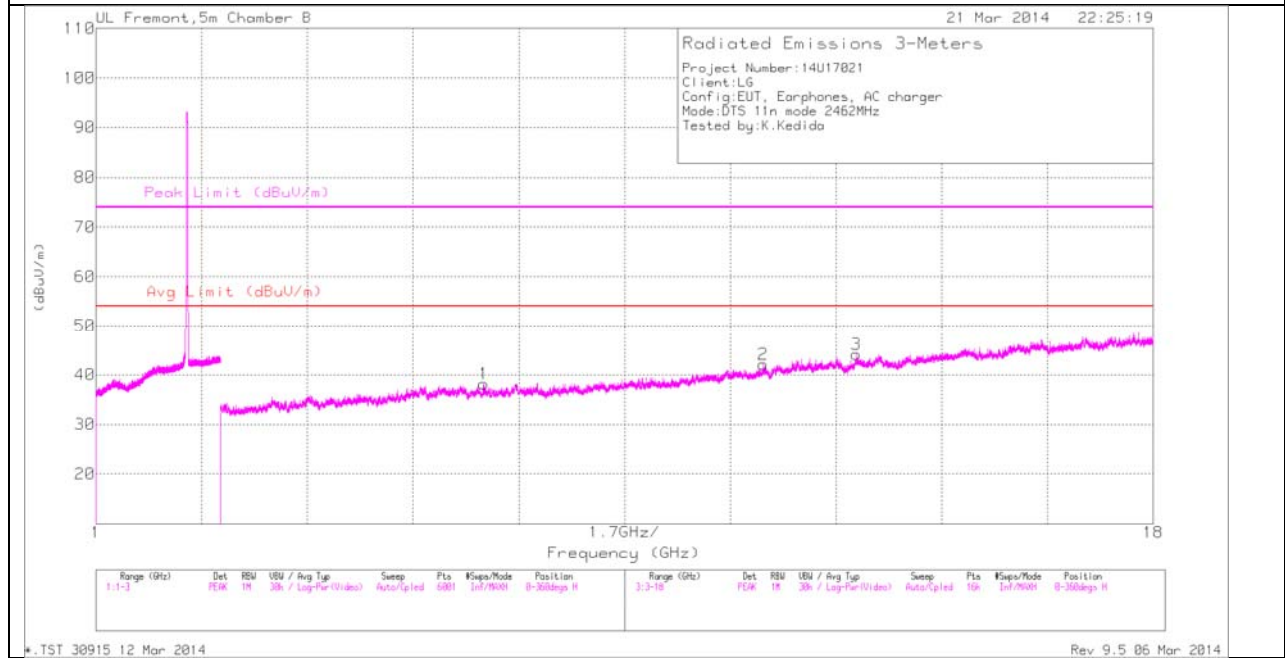
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /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	* 11.767	26.53	PK	38.3	-22.5	0	42.33	54	-11.67	74	-31.67	0-360	202	H
6	* 12.288	25.96	PK	39	-22	0	42.96	54	-11.04	74	-31.04	0-360	202	V
1	6.95	30.59	PK	35.6	-27.9	0	38.29	-	-	-	-	0-360	99	H
4	8.747	28.09	PK	35.9	-25	0	38.99	-	-	-	-	0-360	99	V
2	9.748	27.42	PK	36.9	-24.2	0	40.12	-	-	-	-	0-360	202	H
5	9.748	27.93	PK	36.9	-24.2	0	40.63	-	-	-	-	0-360	202	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/ Fitr/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
* 11.766	34.96	PK2	38.3	-22.5	0	50.76	54	-3.24	74	-23.24	1	100	H
* 12.189	34.29	PK2	38.9	-22.6	0	50.59	54	-3.41	74	-23.41	1	100	V

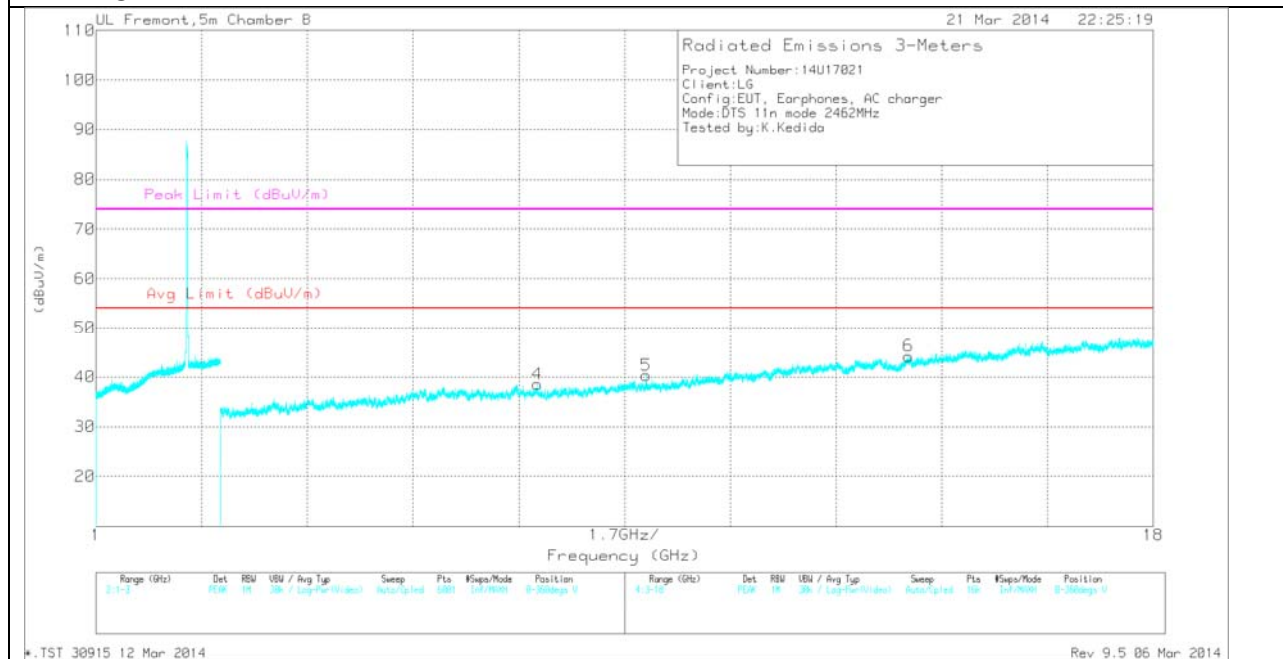
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

**HIGH CHANNEL
 HORIZONTAL**



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

**HIGH CHANNEL
 VERTICAL**



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

HIGH CHANNEL DATA

Trace Markers

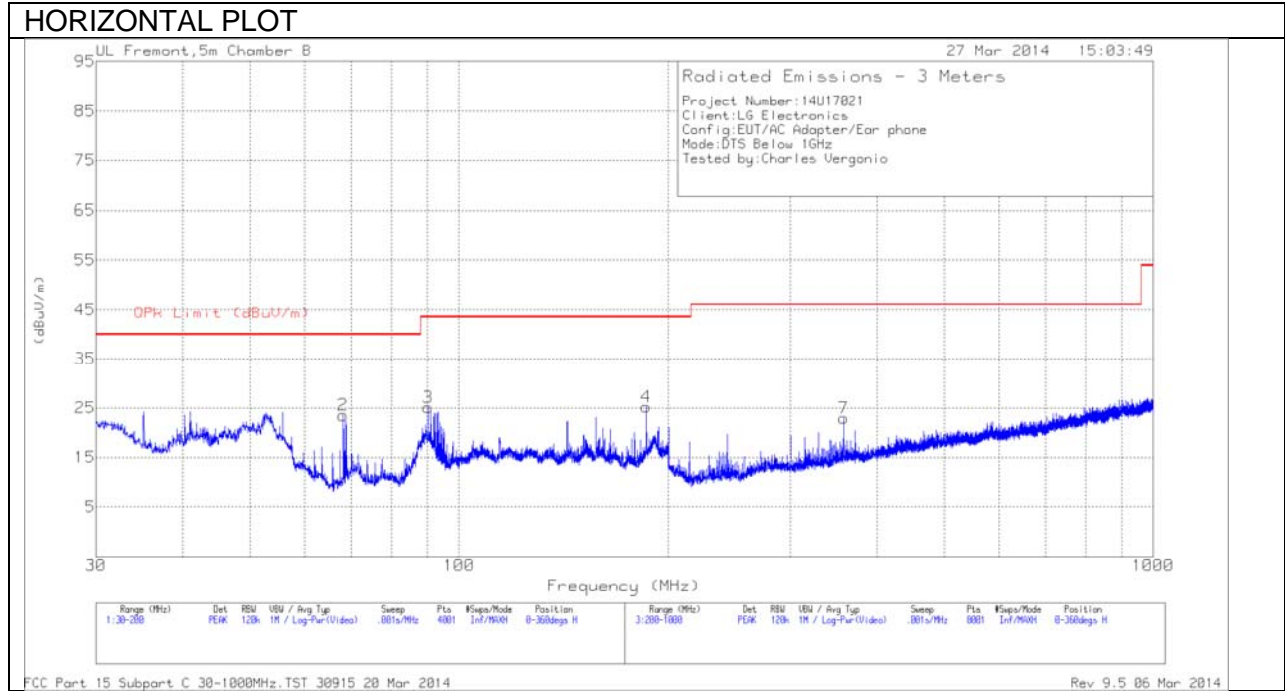
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 11.73	26.28	PK	38.2	-22.3	0	42.18	54	-11.82	74	-31.82	0-360	202	H
4	* 8.102	29.19	PK	35.7	-26.3	0	38.59	54	-15.41	74	-35.41	0-360	99	V
1	7.233	29.75	PK	35.6	-27.2	0	38.15	-	-	-	-	0-360	202	H
5	9.848	27.46	PK	37	-24.1	0	40.36	-	-	-	-	0-360	202	V
3	13.227	27.25	PK	39.2	-22.3	0	44.15	-	-	-	-	0-360	99	H
6	14.066	26.92	PK	38.6	-21.3	0	44.22	-	-	-	-	0-360	202	V

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cb/ Fitr/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
* 11.73	33.22	PK2	38.2	-22.3	0	49.12	54	-4.88	74	-24.88	1	100	H
* 8.102	36.55	PK2	35.7	-26.3	0	45.95	54	-8.05	74	-28.05	1	100	V

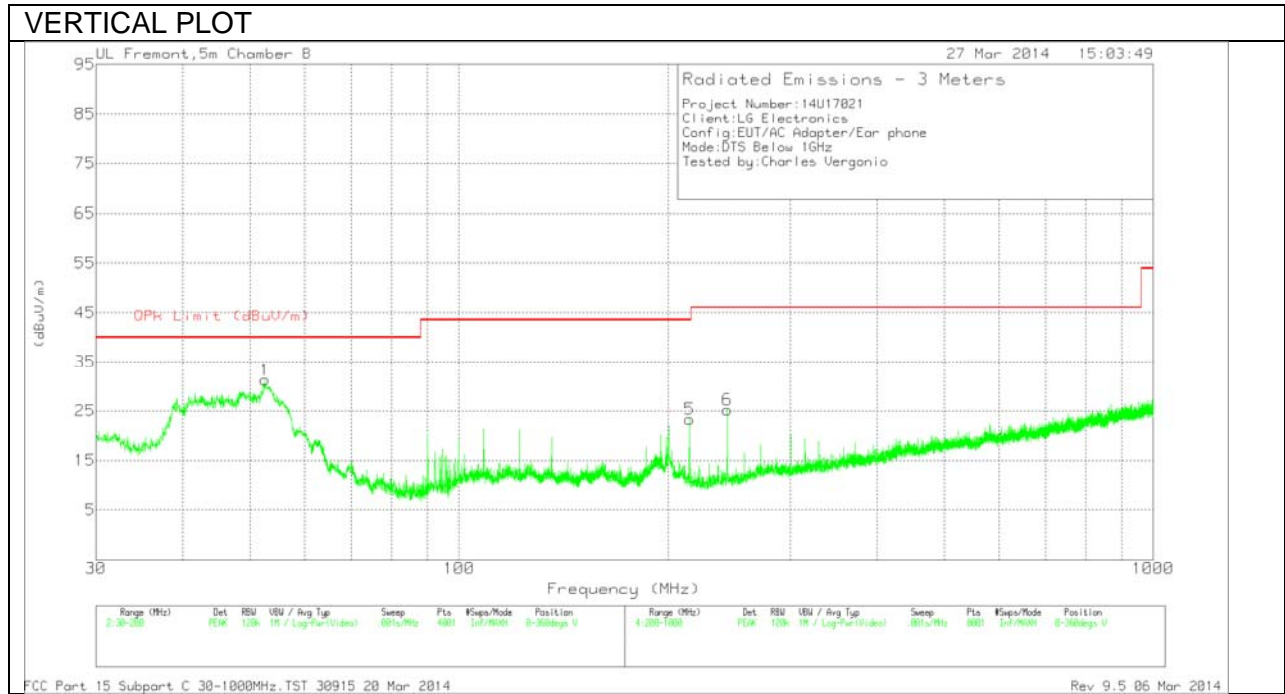
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

9.3. WORST-CASE BELOW 1 GHz

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



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



Below 1G Data

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T477 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6	* 243.4	40.17	PK	11.5	-26.5	25.17	46.02	-20.85	0-360	200	V
1	52.525	52.74	PK	7.2	-28.6	31.34	40	-8.66	0-360	101	V
2	68.1225	43.81	PK	8.1	-28.4	23.51	40	-16.49	0-360	400	H
3	90.265	45.31	PK	7.9	-28.1	25.11	43.52	-18.41	0-360	400	H
4	186.145	41.04	PK	11.3	-27.1	25.24	43.52	-18.28	0-360	100	H
5	214.8	39.69	PK	10.4	-26.8	23.29	43.52	-20.23	0-360	200	V
7	357.9	34.09	PK	14.7	-25.8	22.99	46.02	-23.03	0-360	200	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector