



**FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1**

**BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT**

FOR

BLUETOOTH HEADSET

MODEL NUMBER: WEARABLE CONCEPT 2

**FCC ID: AL8-WC2
IC: 457A-WC2**

**REPORT NUMBER: 15U20565-E2V4
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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	10/01/2015	Initial Issue	C. Pang
V2	11/19/2015	Address TCB's Questions	C. Pang
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V4	2/25/2016	Address TCB's Question	C. Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: PLANTRONICS INC.
345 ENCINAL STREET
SANTA CRUZ, CA 95060, U.S.A.

EUT DESCRIPTION: BLUETOOTH HEADSET

MODEL: Wearable Concept 2

SERIAL NUMBER: BLD2_COMP06 (CONDUCTED) & BLD2_COMP02 (RADIATED)

DATE TESTED: APRIL 09-15, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 Issue 1	Pass
INDUSTRY CANADA RSS-GEN Issue 4	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.

Approved & Released For
UL Verification Services Inc. By:



CHIN PANG
SENIOR ENGINEER
UL VERIFICATION SERVICES INC.

Tested By:



JOEY GOMEZ
EMC ENGINEER
UL VERIFICATION SERVICES INC.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 4, and RSS-247 Issue 1.

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
<input type="checkbox"/> Chamber A	<input type="checkbox"/> Chamber D
<input type="checkbox"/> Chamber B	<input type="checkbox"/> Chamber E
<input type="checkbox"/> Chamber C	<input type="checkbox"/> Chamber F
	<input type="checkbox"/> Chamber G
	<input checked="" type="checkbox"/> Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.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
Conducted Disturbance, 0.15 to 30 MHz	± 3.52 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.94 dB
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth headset.

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	7.065	5.09

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a monopole antenna with a maximum gain of -6.1dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 10400

The test utility software used during testing was BlueTest3 2.5.0

5.5. 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 and Z position, it was determined that X (Flatbed) orientation was the worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Dell	D400	45426167881	N/A
AC/DC Adapter	Dell	LA90PS0-00	0DF266-71615-67J-34B1	N/A

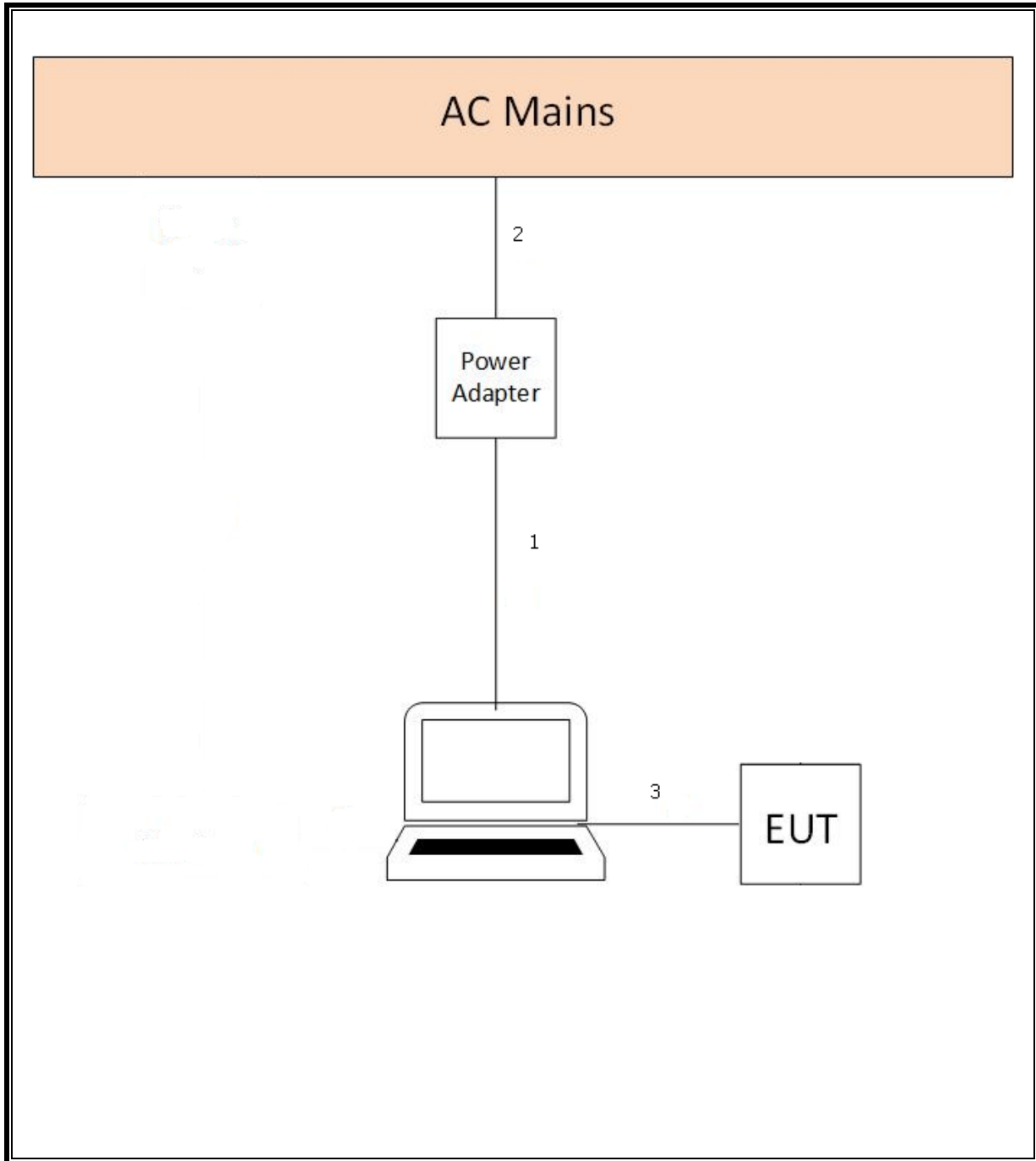
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	Barrel	Unshielded	1	N/A
2	AC	1	3-Prong	Unshielded	1	N/A
3	USB	1	USB	Unshielded	0.25	N/A

TEST SETUP

The EUT is connected to a host laptop via USB cable, test software exercises the radio.

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	T No.	Cal Date	Cal Due
Horn Antenna 1-18 GHz	ETS Lindgren	3117	863	01/07/15	01/07/16
Hybrid Antenna 30 - 2000MHz	Sunol Sciences	JB3	900	05/14/14	05/14/15
3GHz HPF	Micro-Tronics	HPM17543	897	05/13/14	05/13/15
Amplifier 1-18GHz	Miteq	AFS42-00101800-25-S-42	495	06/05/14	06/05/15
Power Sensor, Peak and average, 50 MHz to 18 GHz, 5 MHz BW	Keysight	8481A	1926A16917	10/10/14	10/10/15
Power Meter, P-series single channel	Keysight	N1912A	MY55196009	07/02/14	07/02/15
Amplifier 10kHz - 1GHz	Sonoma	310N	835	06/05/14	06/05/15
Spectrum Analyzer PXA 3Hz - 44GHz	Agilent	N9030A	906	05/07/14	05/07/15
Horn Antenna 18-26GHz	ARA	MWH-1826	89	12/17/14	12/17/15
Amplifier 1-26.5GHz	Agilent	8449B	404	06/05/14	06/05/15
Spectrum Analyzer 40GHz	Agilent	8564E	106	08/06/14	08/06/15
LISN	FCC	50/250-25-2	24	01/16/15	01/16/16
EMI Receiver	Rohde & Schwartz	ESC17	284	09/16/14	09/16/15
UL SOFTWARE					
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014		
Conducted Software	UL	UL EMC	Ver 2.2, March 31, 2015		
AC Line Conducted Software	UL	UL EMC	Ver 9.5, April 3, 2015		

7. ANTENNA PORT TEST RESULTS

7.1. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

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	0.395	0.648	0.610	60.96%	2.15	2.532

7.2. MEASUREMENT METHODS

6 dB BW: KDB 558074 D01 v03r02, Section 8.1.

Output Power: KDB 558074 D01 v03r02, Section 9.1.1.

Power Spectral Density: KDB 558074 D01 v03r02, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r02, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r02, Section 12.1.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r02, Section 12.2

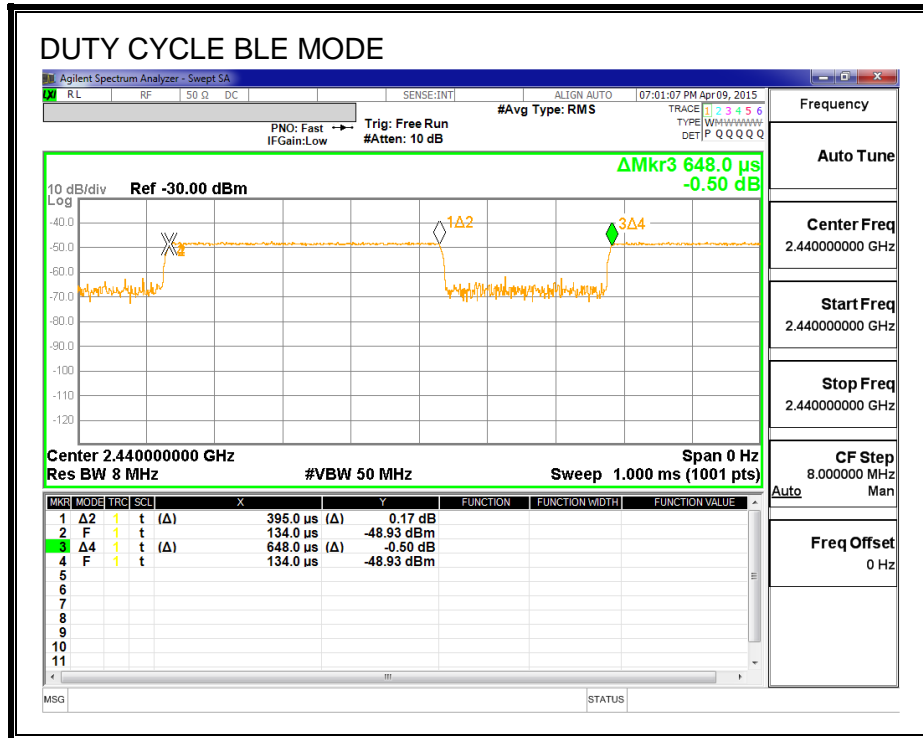
Band-edge: KDB 558074 D01 v03r02, Section 13.1.

Band-edge: KDB 558074 D01 v03r02, Section 13.3.1.

Band-edge: KDB 558074 D01 v03r02, Section 13.3.2.

Band-edge: KDB 558074 D01 v03r02, Section 13.3.3

DUTY CYCLE PLOTS



7.3. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

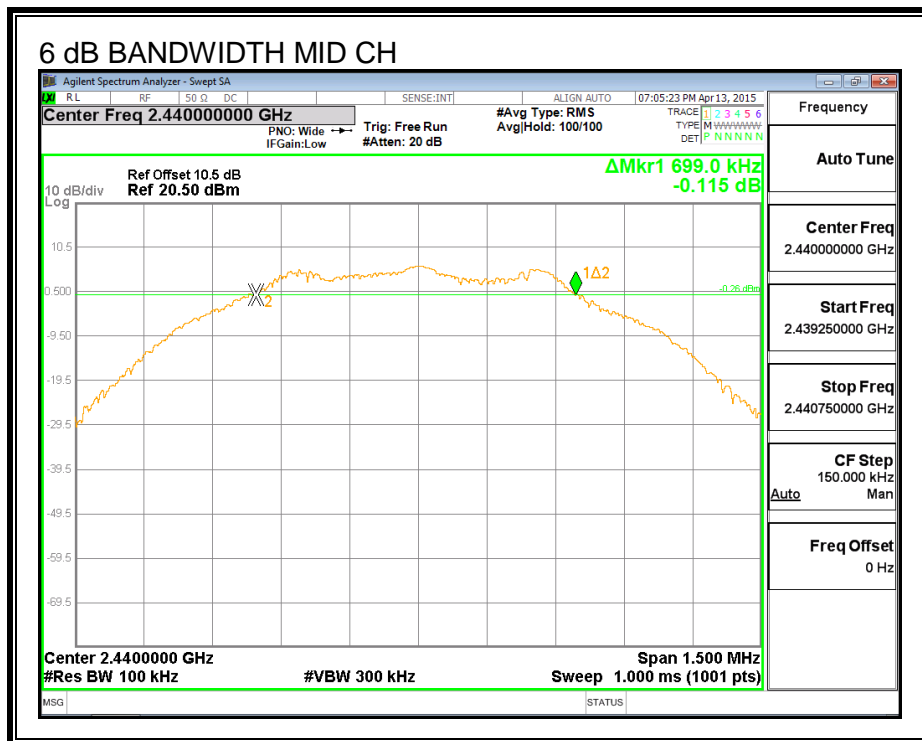
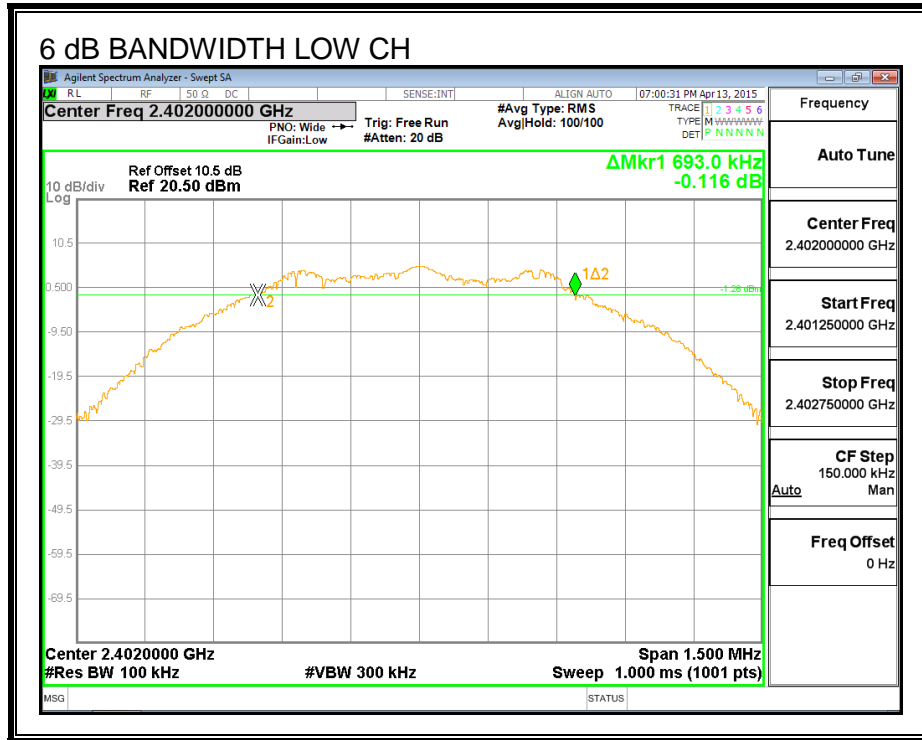
IC RSS-247 (5.2) (1)

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

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.6930	0.5
Middle	2440	0.6990	0.5
High	2480	0.7065	0.5

6 dB BANDWIDTH



7.4. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

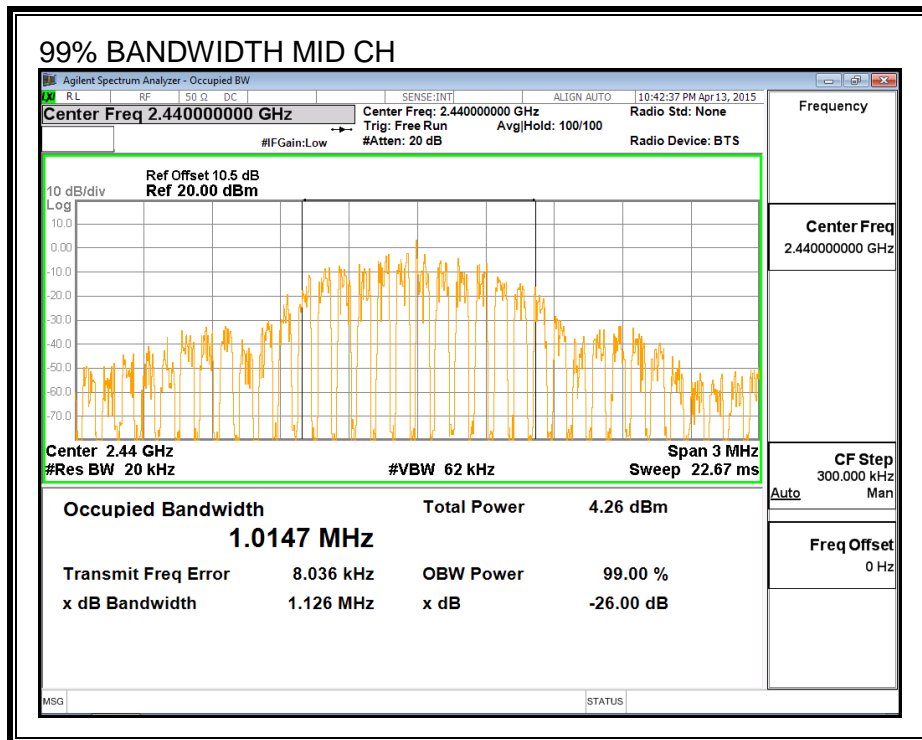
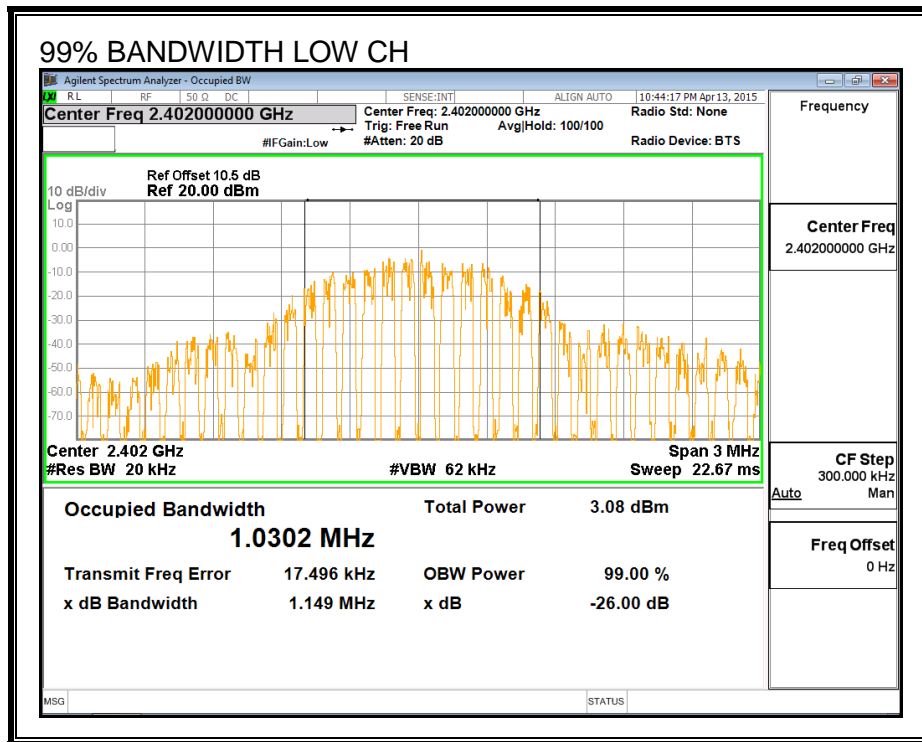
TEST PROCEDURE

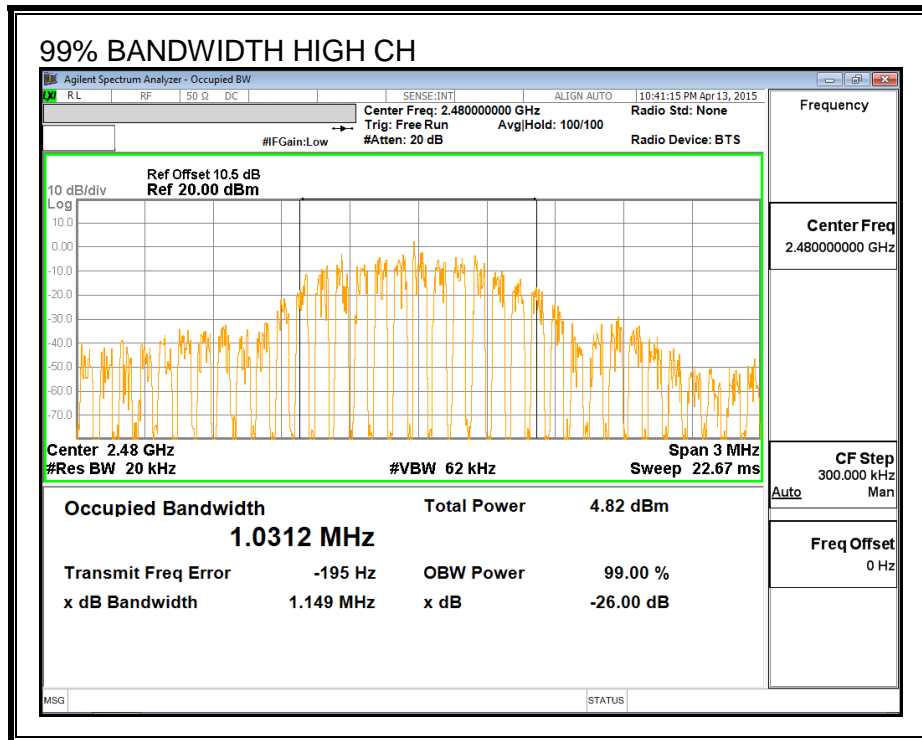
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0302
Middle	2440	1.0147
High	2480	1.0312

99% BANDWIDTH





7.5. OUTPUT POWER

LIMITS

FCC §15.247 (b)

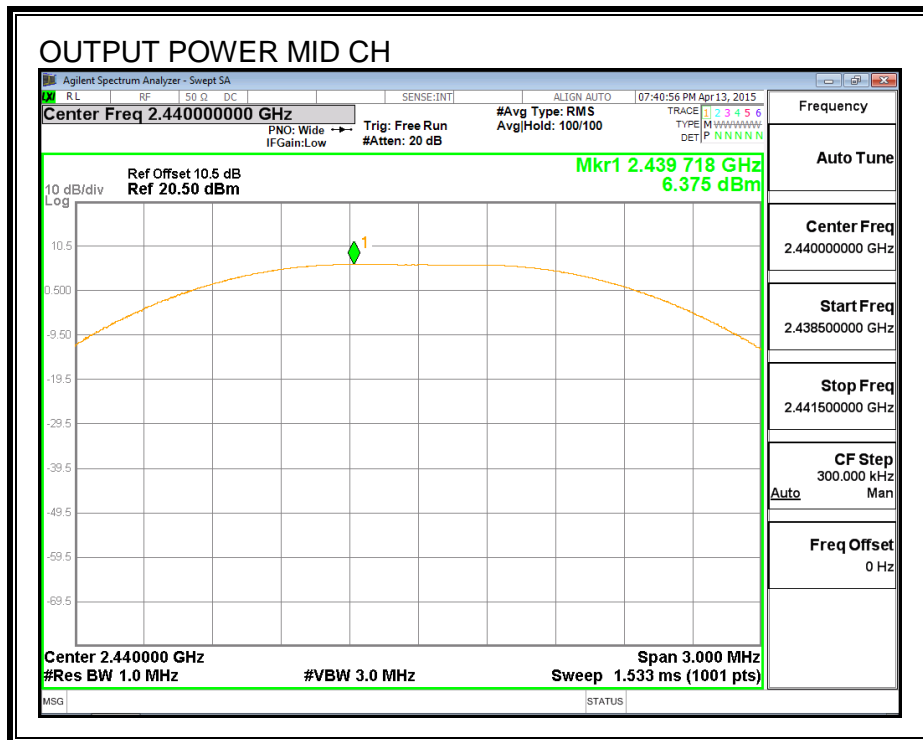
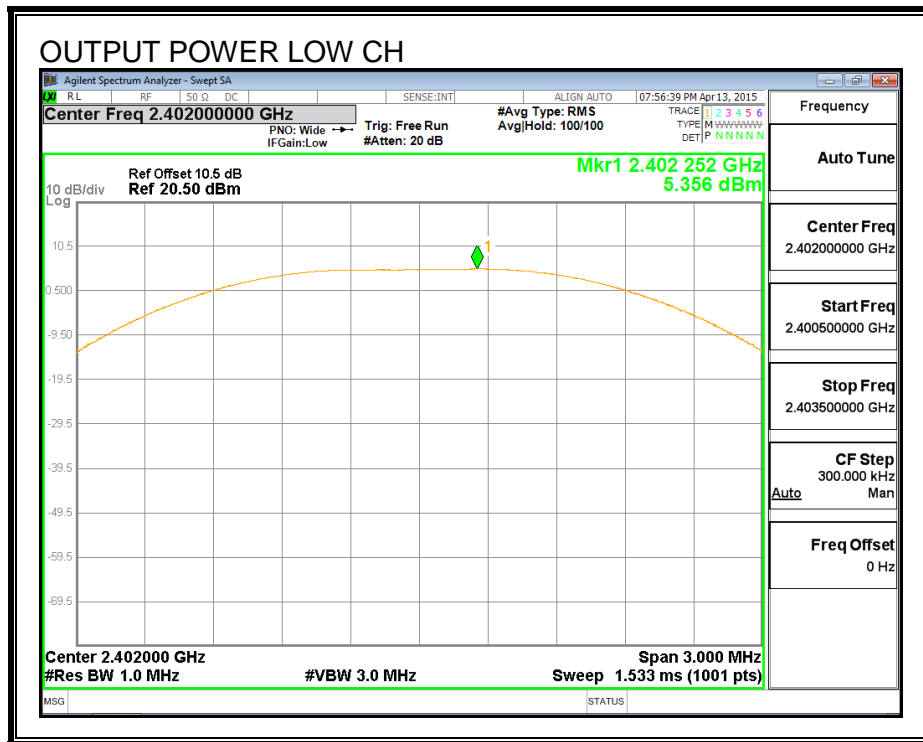
IC RSS-247 (5.4) (4)

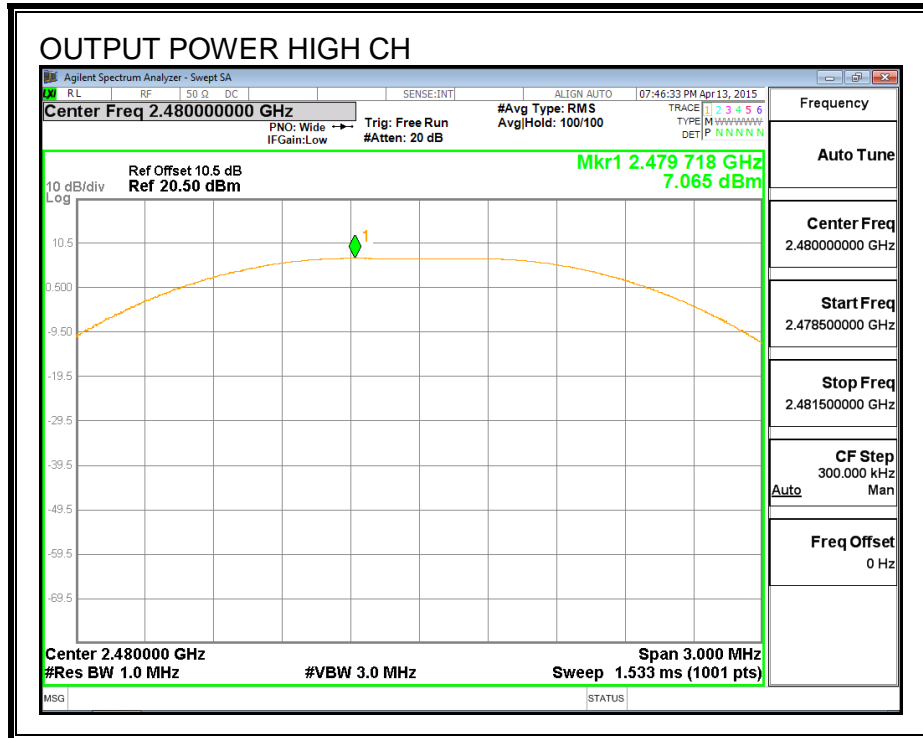
The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	5.356	30	-24.644
Middle	2440	6.375	30	-23.625
High	2480	7.065	30	-22.935

OUTPUT POWER





7.6. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a gated power meter.

RESULTS

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	2.92
Middle	2440	4.04
High	2480	4.81

7.7. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

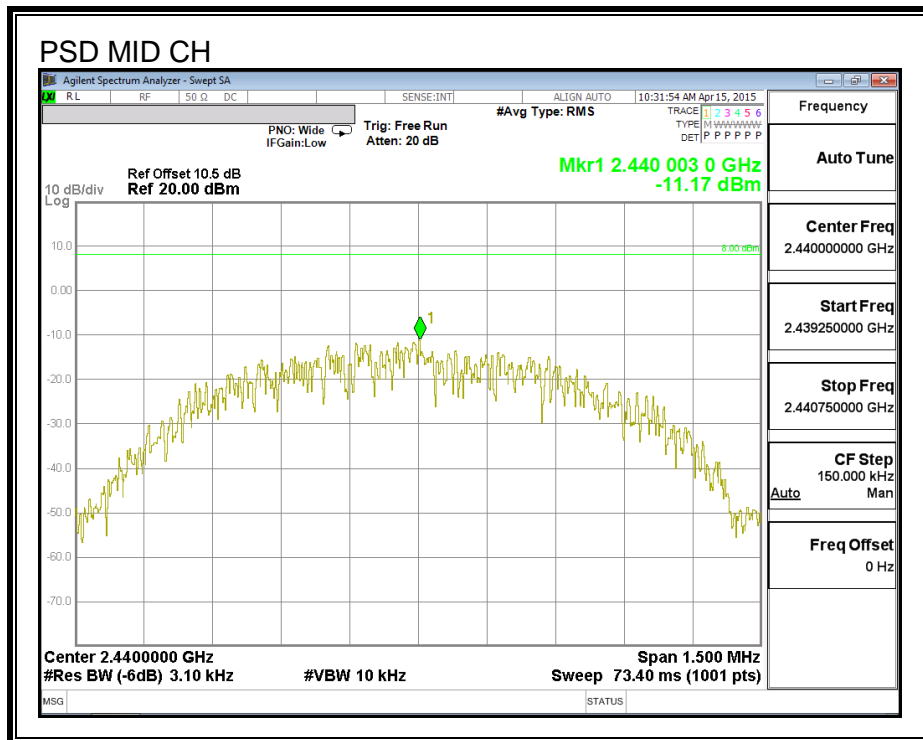
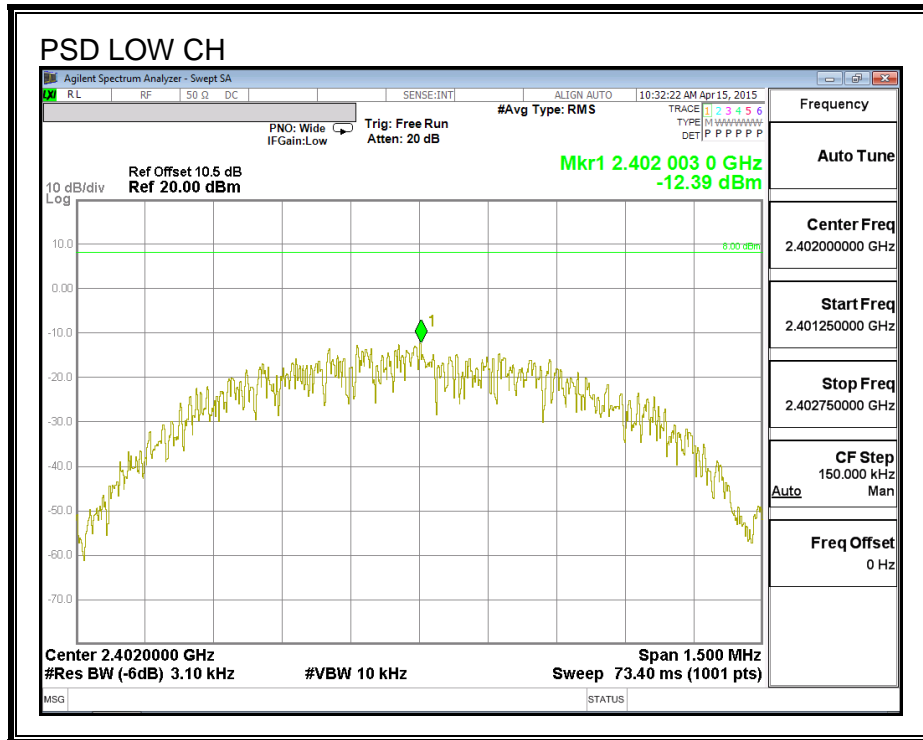
IC RSS-247 (5.2) (2)

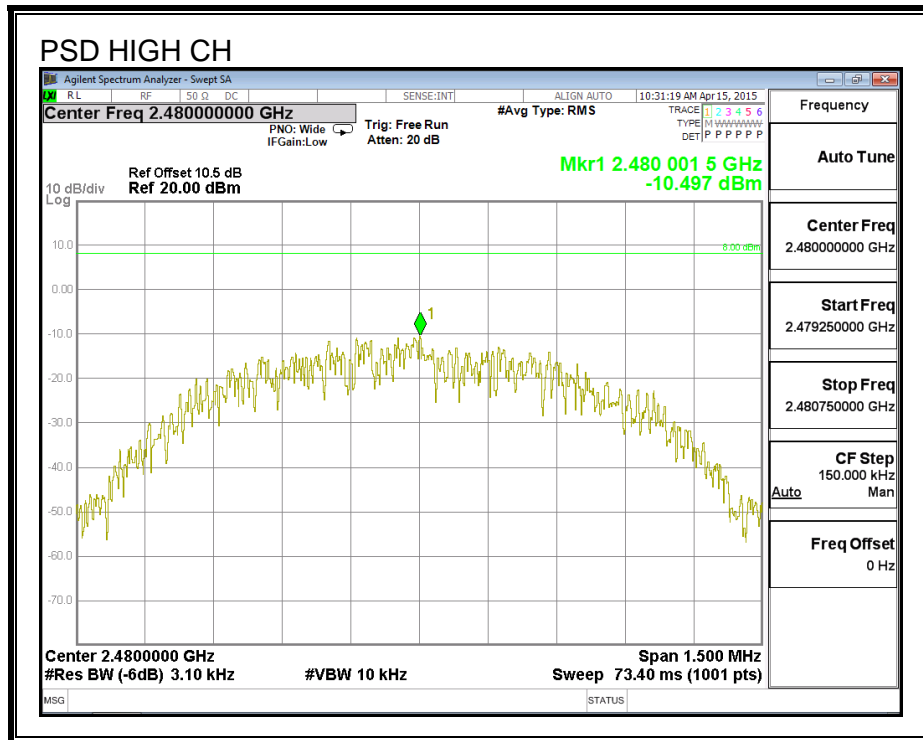
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-12.390	8	-20.39
Middle	2440	-11.170	8	-19.17
High	2480	-10.497	8	-18.50

POWER SPECTRAL DENSITY





7.8. CONDUCTED SPURIOUS EMISSIONS

LIMITS

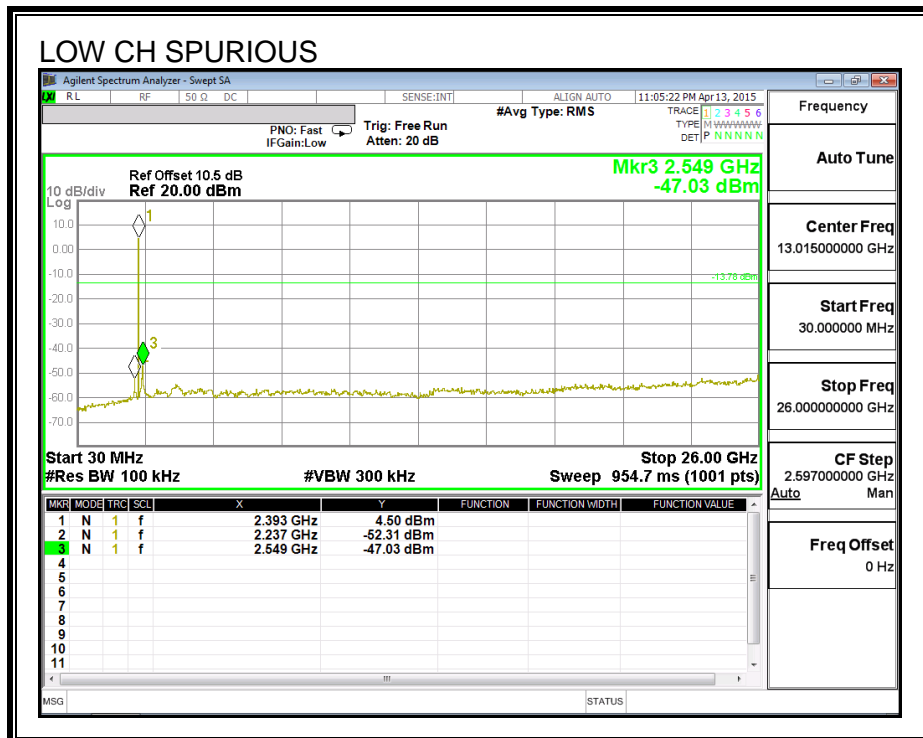
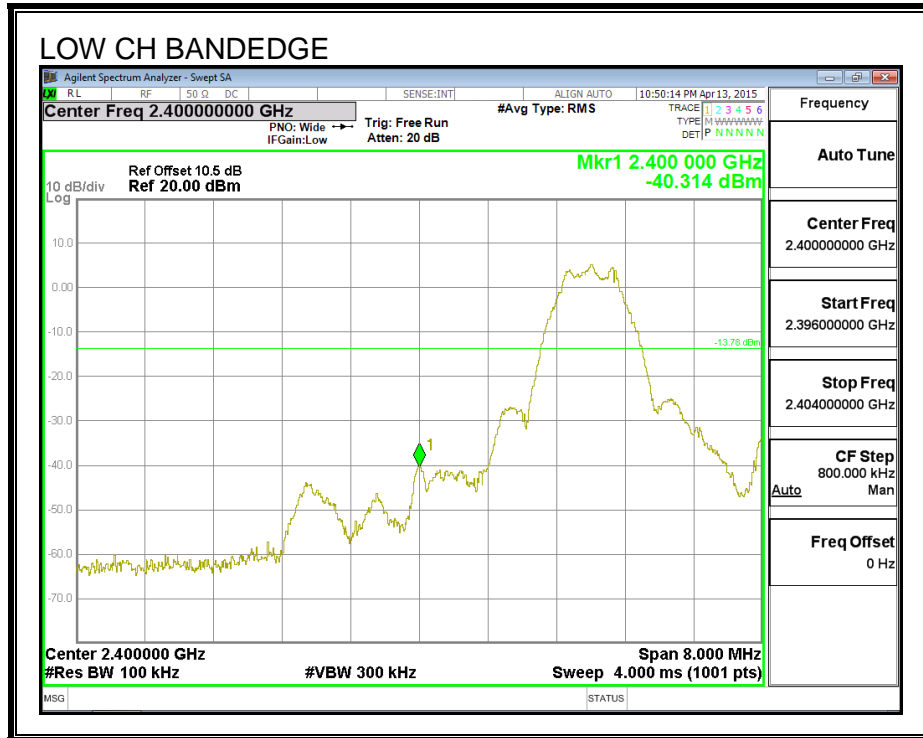
FCC §15.247 (d)

IC RSS-247 (5.5)

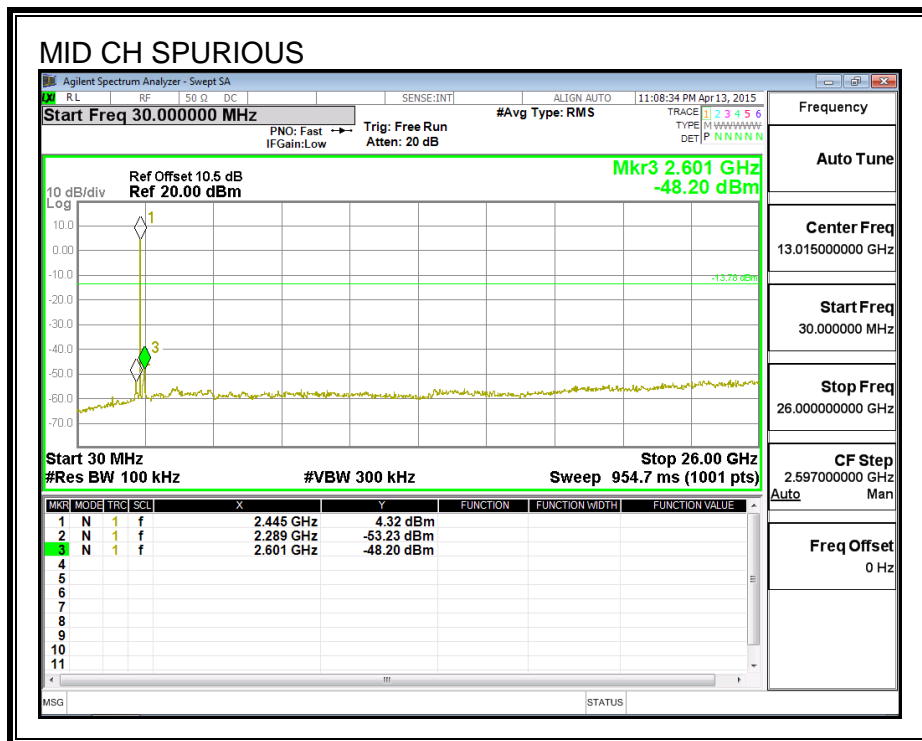
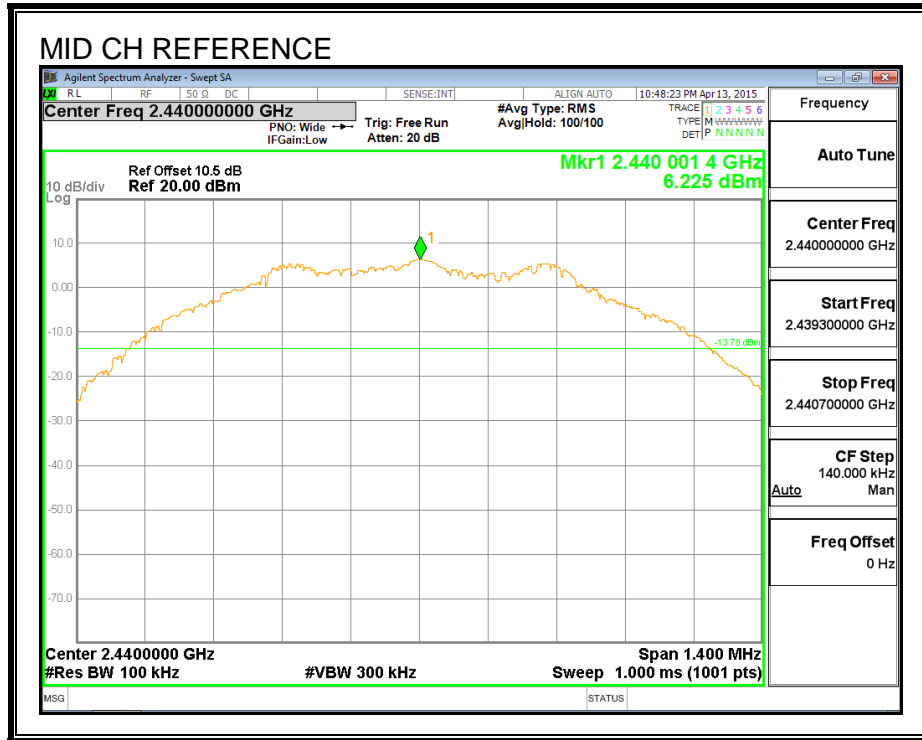
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

RESULTS

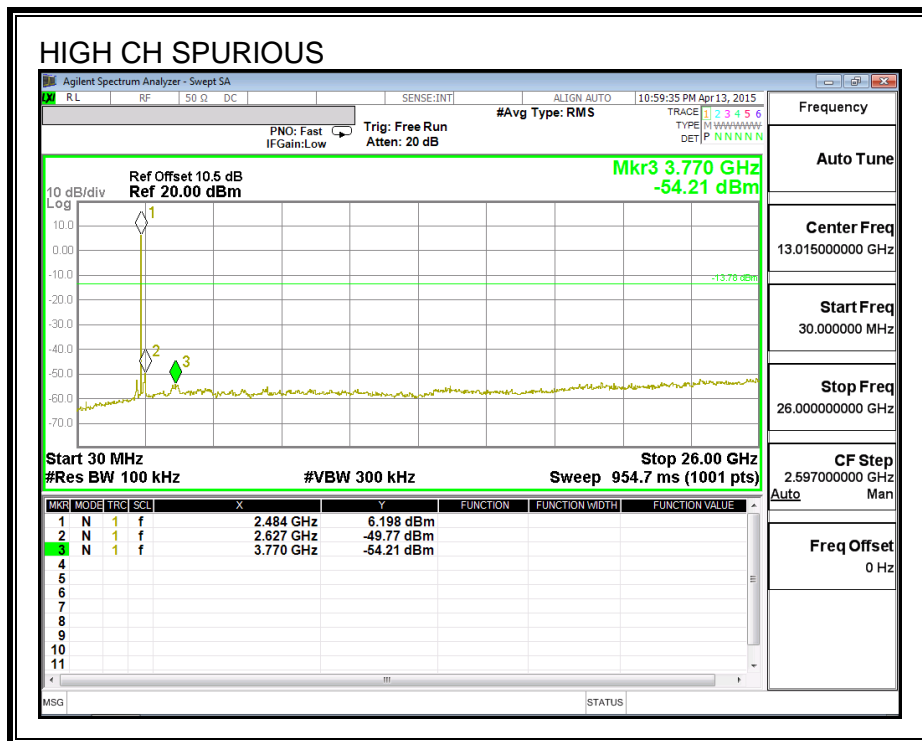
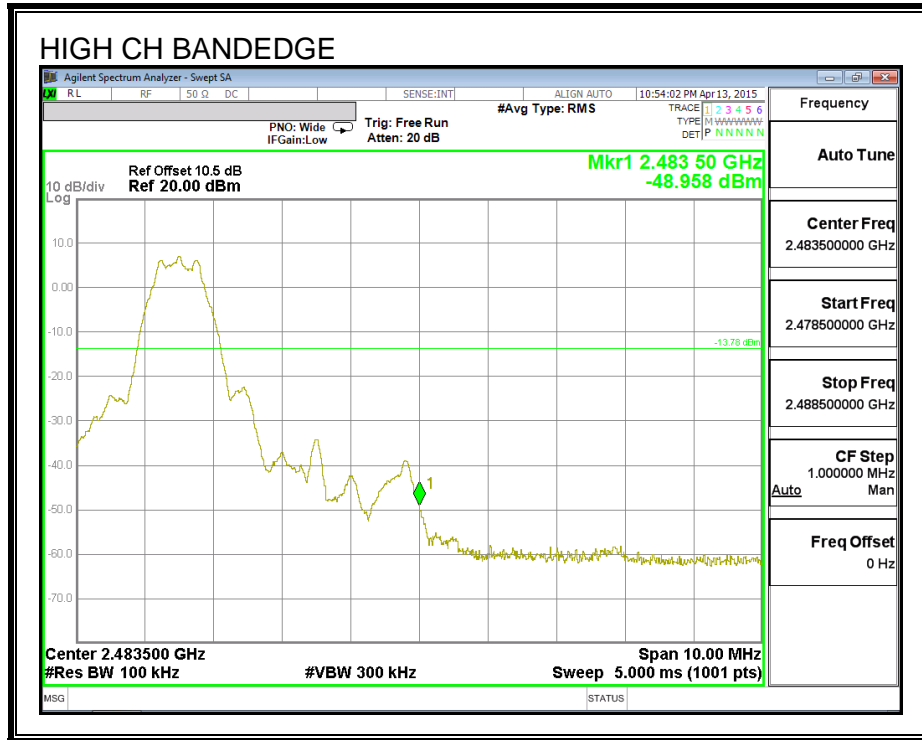
SPURIOUS EMISSIONS, LOW CHANNEL



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

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.

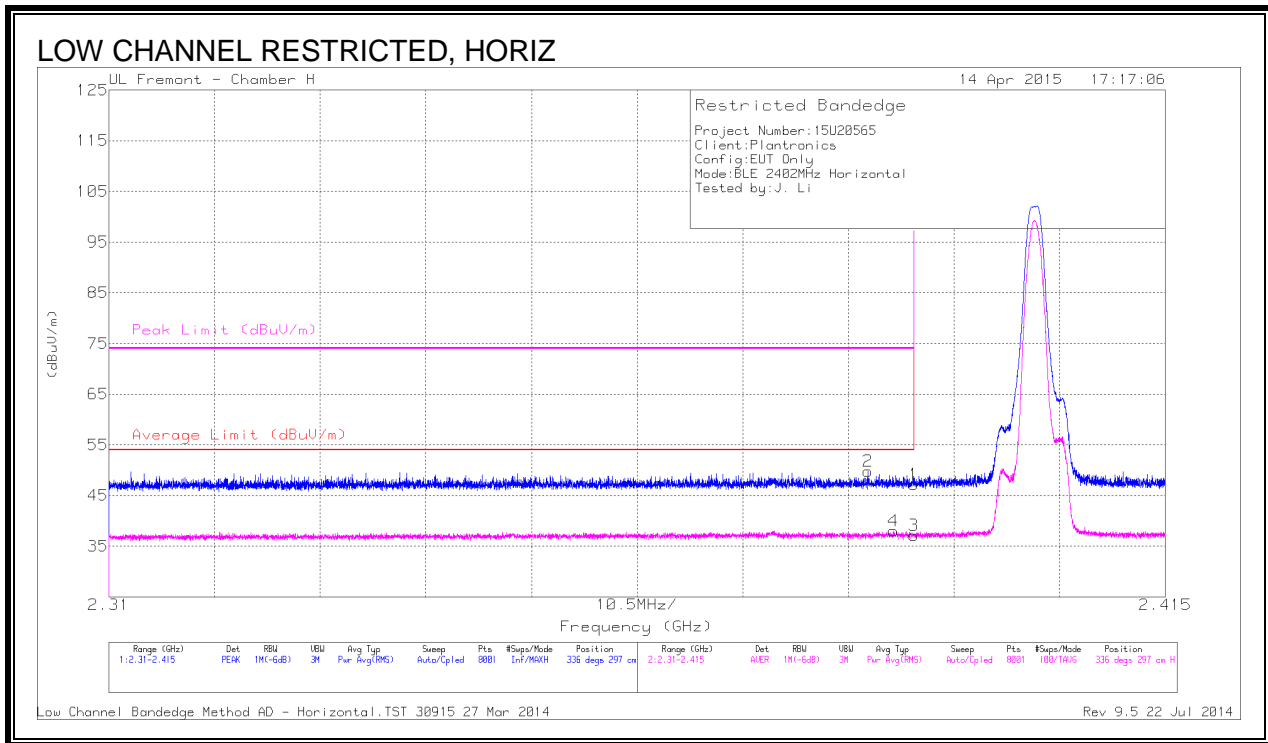
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 3MHz video bandwidth with average detector for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz 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.

8.2. TX ABOVE 1 GHz FOR BLUETOOTH LOW ENERGY MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL)



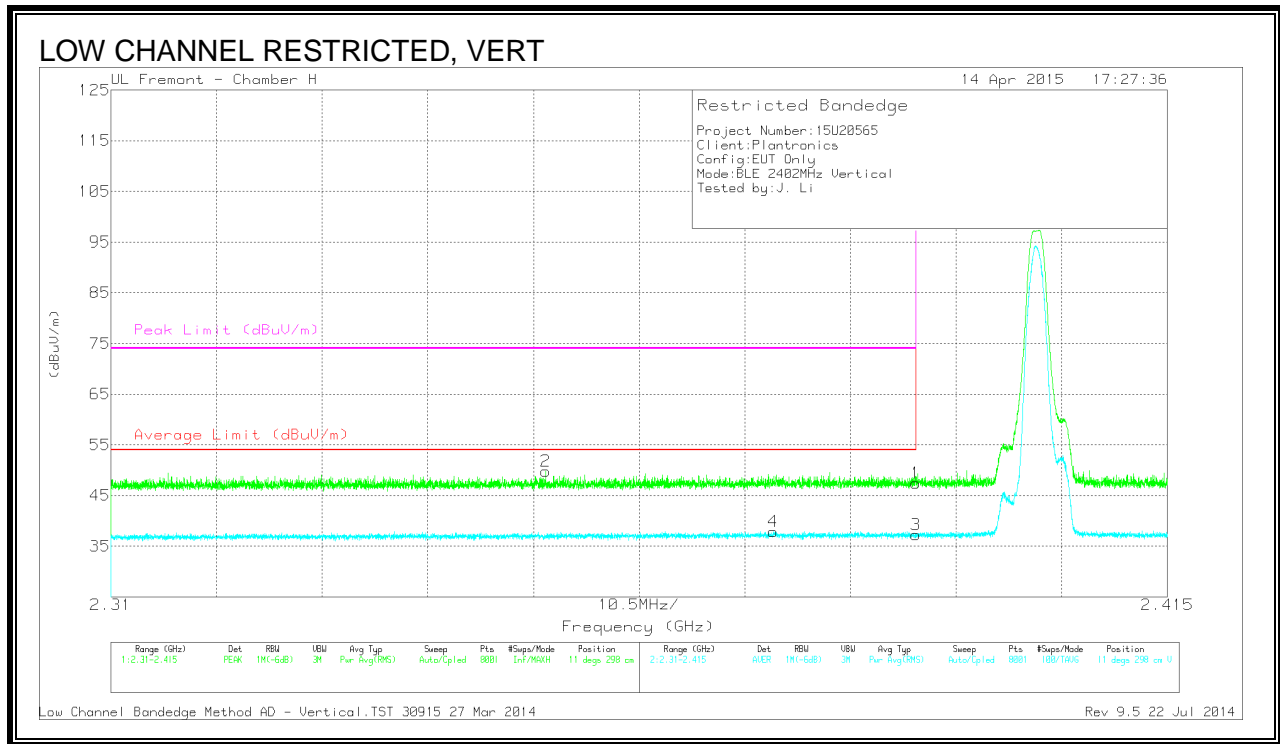
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	DC Corr (dB)	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	39.71	PK	32.1	0	-24.6	47.21	-	-	74	-26.79	336	297	H
2	* 2.385	42.27	PK	32.1	0	-24.6	49.77	-	-	74	-24.23	336	297	H
3	* 2.39	29.65	RMS	32.1	2.15	-24.6	39.3	54	-14.7	-	-	336	297	H
4	* 2.388	30.55	RMS	32.1	2.15	-24.6	40.2	54	-13.8	-	-	336	297	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection



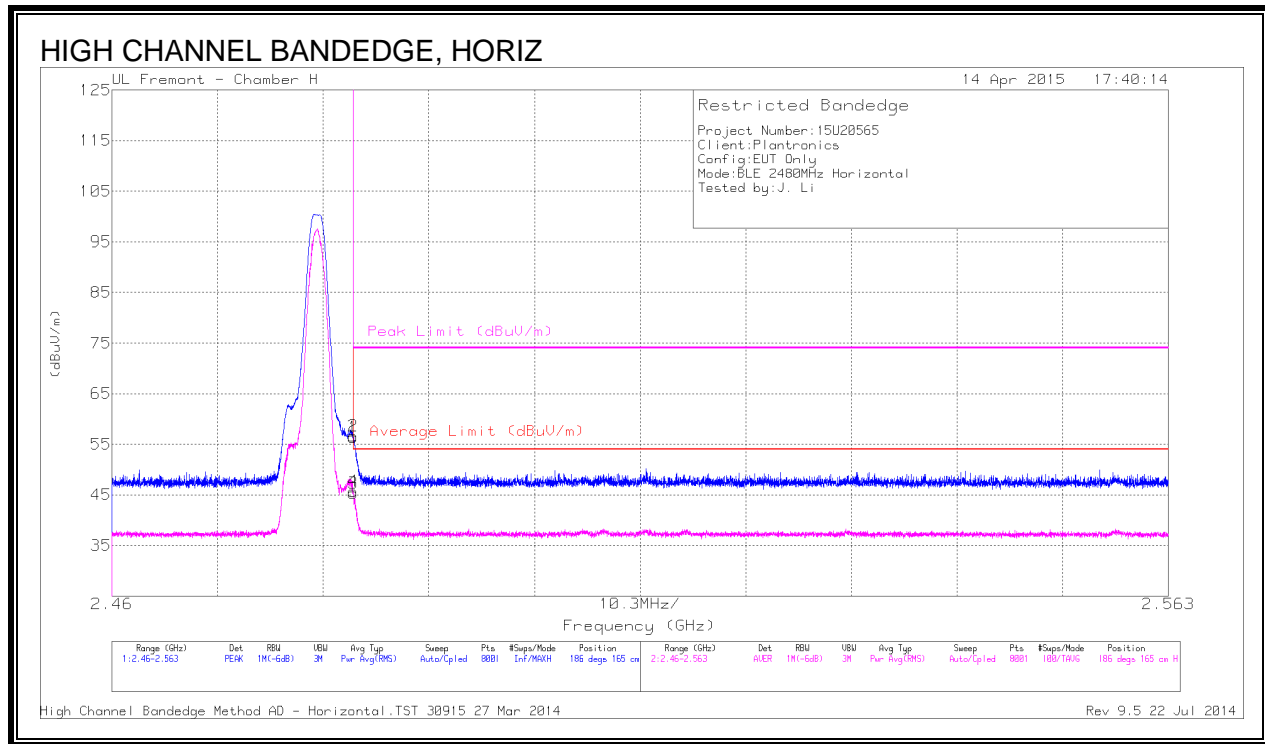
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	DC Corr (dB)	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	39.99	PK	32.1	0	-24.6	47.49	-	-	74	-26.51	11	298	V
2	* 2.353	42.24	PK	32	0	-24.5	49.74	-	-	74	-24.26	11	298	V
3	* 2.39	29.7	RMS	32.1	2.15	-24.6	39.35	54	-14.65	-	-	11	298	V
4	* 2.376	30.4	RMS	32.1	2.15	-24.6	40.05	54	-13.95	-	-	11	298	V

* - indicates frequency in CFR 47, Part 15 Restricted Band” and “Industry Canada RSS-Restricted Band

PK - Peak detector
 RMS - RMS detection

AUTHORIZED BANDEGE (HIGH CHANNEL)

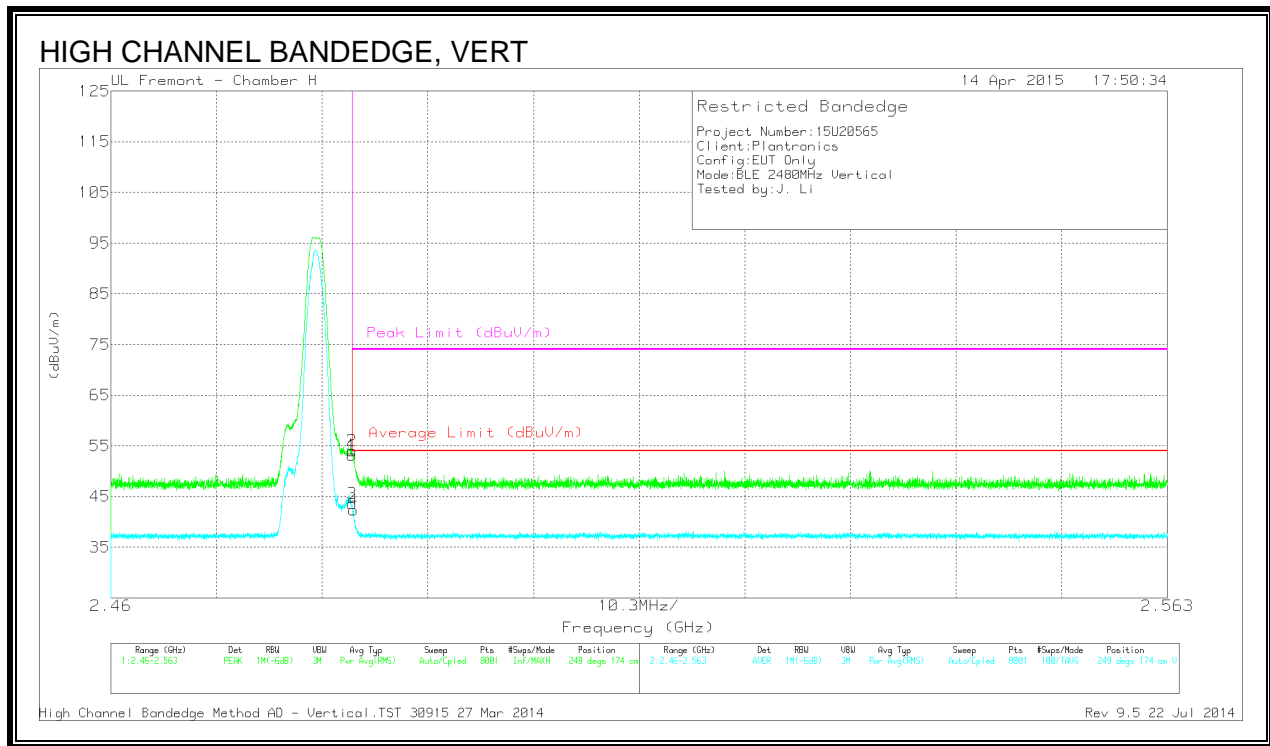


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	48.79	PK	32.1	-24.5	0	56.39	-	-	74	-17.61	186	165	H
2	* 2.484	48.98	PK	32.1	-24.5	0	56.58	-	-	74	-17.42	186	165	H
3	* 2.484	37.67	RMS	32.1	-24.5	2.15	47.42	54	-6.58	-	-	186	165	H
4	* 2.484	38.08	RMS	32.1	-24.5	2.15	47.83	54	-6.17	-	-	186	165	H

* - indicates frequency in CFR 47, Part 15 Restricted Band” and “Industry Canada RSS-Restricted Band

PK - Peak detector
 RMS - RMS detection



Trace Markers

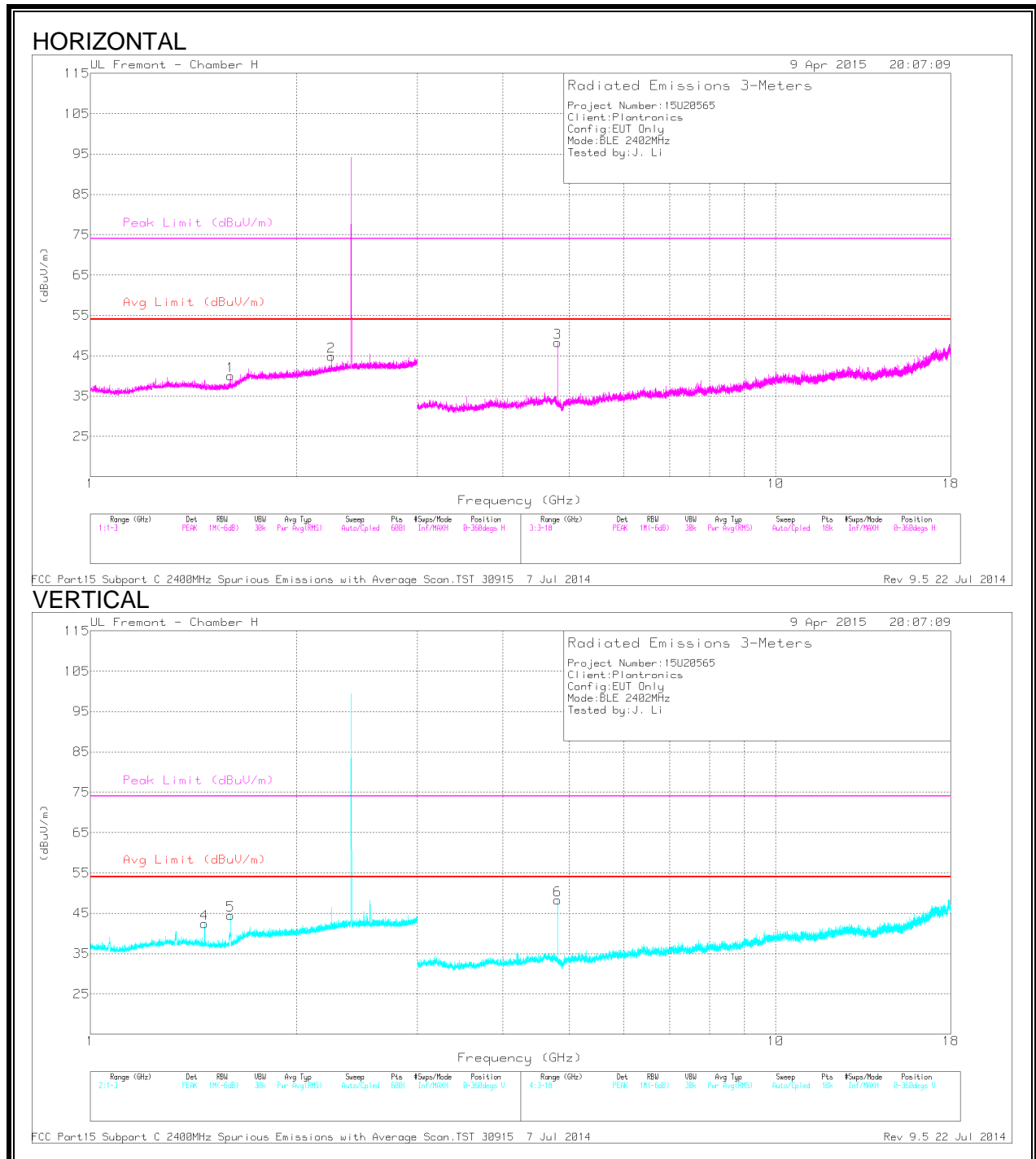
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	45.56	PK	32.1	-24.5	0	53.16	-	-	74	-20.84	249	174	V
2	* 2.484	46.46	PK	32.1	-24.5	0	54.06	-	-	74	-19.94	249	174	V
3	* 2.484	36.04	RMS	32.1	-24.5	2.15	45.79	54	-8.21	-	-	249	174	V
4	* 2.484	34.76	RMS	32.1	-24.5	2.15	44.51	54	-9.49	-	-	249	174	V

* - indicates frequency in CFR 47, Part 15 Restricted Band” and “Industry Canada RSS-Restricted Band

PK - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL



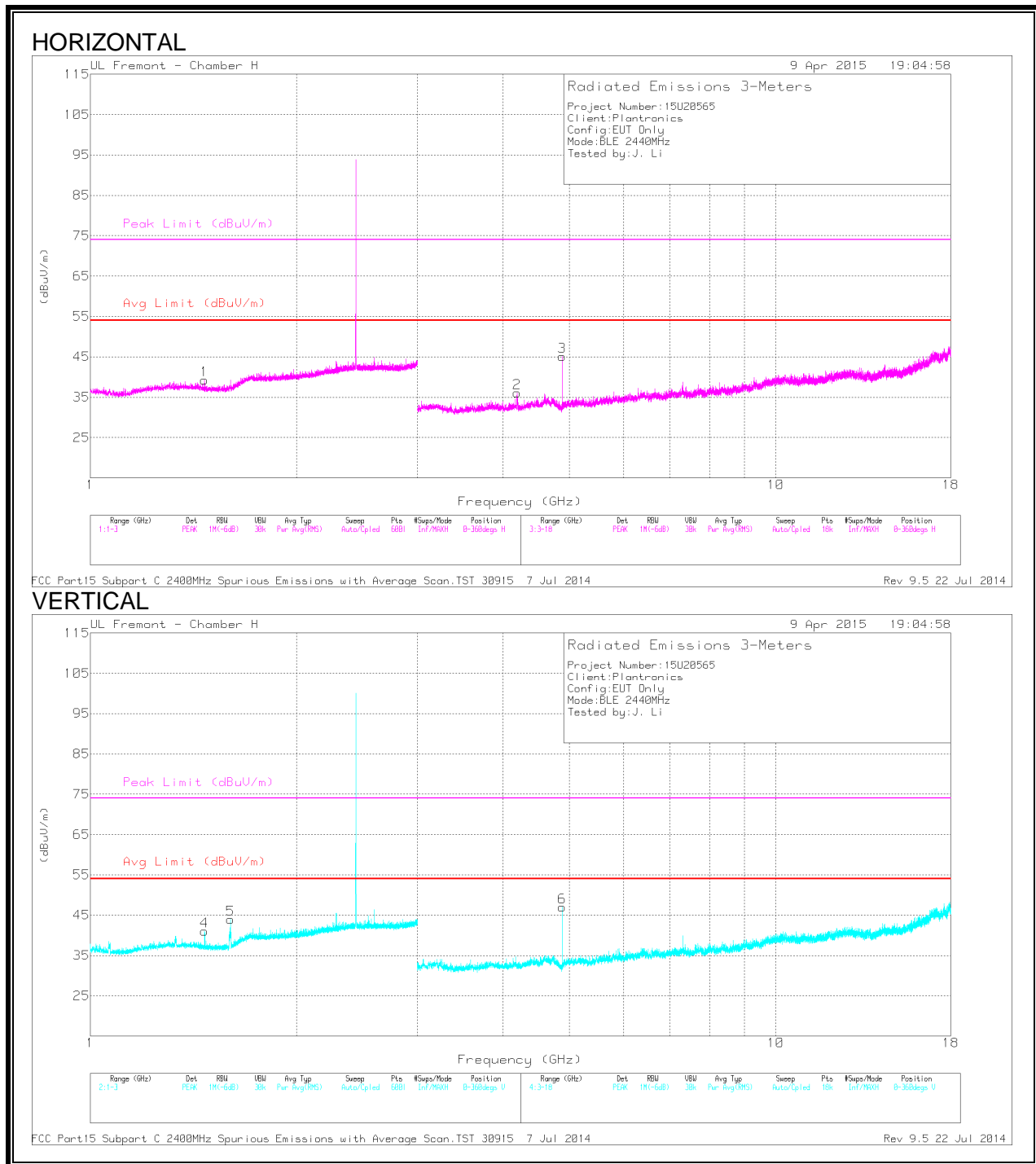
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.601	44.51	PK2	27.7	-25.1	0	47.11	-	-	74	-26.89	186	193	H
	* 1.601	35.44	MAv1	27.7	-25.1	2.15	40.19	54	-13.81	-	-	186	193	H
2	* 2.246	45.25	PK2	31.6	-24.6	0	52.25	-	-	74	-21.75	131	220	H
	* 2.246	34.6	MAv1	31.6	-24.6	2.15	43.75	54	-10.25	-	-	131	220	H
3	* 4.804	50.9	PK2	33.9	-32.5	0	52.3	-	-	74	-21.7	165	211	H
	* 4.804	45.36	MAv1	33.9	-32.5	2.15	48.91	54	-5.09	-	-	165	211	H
4	* 1.468	46.33	PK2	27.9	-25.5	0	48.73	-	-	74	-25.27	235	116	V
	* 1.468	37.16	MAv1	27.9	-25.5	2.15	41.71	54	-12.29	-	-	235	116	V
5	* 1.601	49.01	PK2	27.7	-25.1	0	51.61	-	-	74	-22.39	171	225	V
	* 1.601	39.75	MAv1	27.7	-25.1	2.15	44.5	54	-9.5	-	-	171	225	V
6	* 4.805	51.96	PK2	33.9	-32.5	0	53.36	-	-	74	-20.64	354	235	V
	* 4.804	46.64	MAv1	33.9	-32.5	2.15	50.19	54	-3.81	-	-	354	235	V

* - indicates frequency in CFR 47, Part 15 Restricted Band” and “Industry Canada RSS-Restricted Band

PK - Peak detector
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL



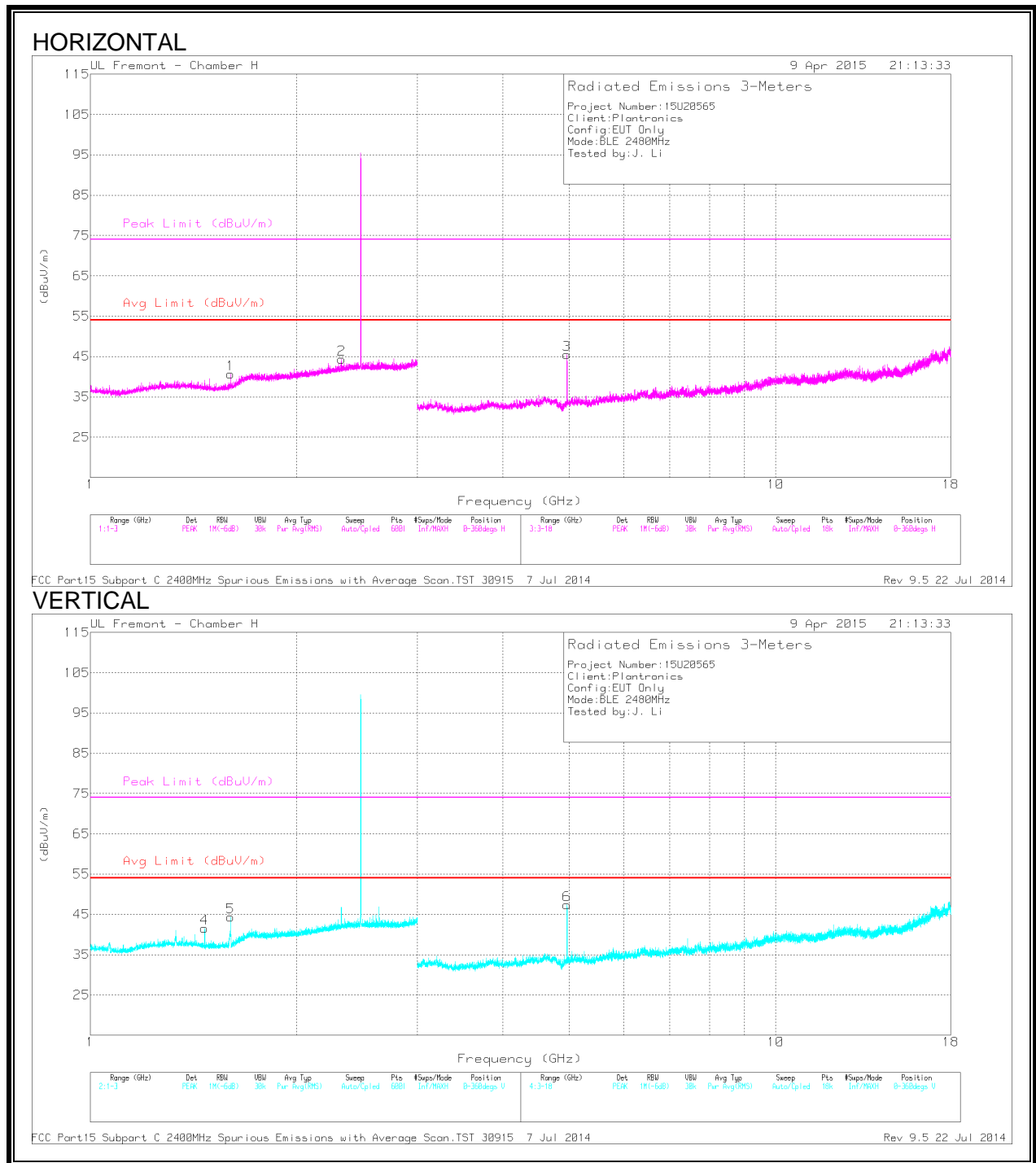
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.467	44.52	PK2	27.9	-25.5	0	46.92	-	-	74	-27.08	202	249	H
	* 1.468	33.11	MAv1	27.9	-25.5	2.15	37.66	54	-16.34	-	-	202	249	H
2	* 4.195	40.96	PK2	33.2	-32.8	0	41.36	-	-	74	-32.64	307	247	H
	* 4.195	28.03	MAv1	33.2	-32.8	2.15	30.58	54	-23.42	-	-	307	247	H
3	* 4.88	49.3	PK2	33.9	-32.2	0	51	-	-	74	-23	162	189	H
	* 4.88	41.41	MAv1	33.9	-32.1	2.15	45.36	54	-8.64	-	-	162	189	H
4	* 1.468	46.09	PK2	27.9	-25.5	0	48.49	-	-	74	-25.51	171	185	V
	* 1.468	37.8	MAv1	27.9	-25.5	2.15	42.35	54	-11.65	-	-	171	185	V
5	* 1.601	49.15	PK2	27.7	-25.1	0	51.75	-	-	74	-22.25	166	291	V
	* 1.601	38.91	MAv1	27.7	-25.1	2.15	43.66	54	-10.34	-	-	166	291	V
6	* 4.879	50.01	PK2	33.9	-32.2	0	51.71	-	-	74	-22.29	349	380	V
	* 4.88	42.03	MAv1	33.9	-32.1	2.15	45.98	54	-8.02	-	-	349	380	V

* - indicates frequency in CFR 47, Part 15 Restricted Band” and “Industry Canada RSS-Restricted Band

PK - Peak detector
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL



Trace Markers

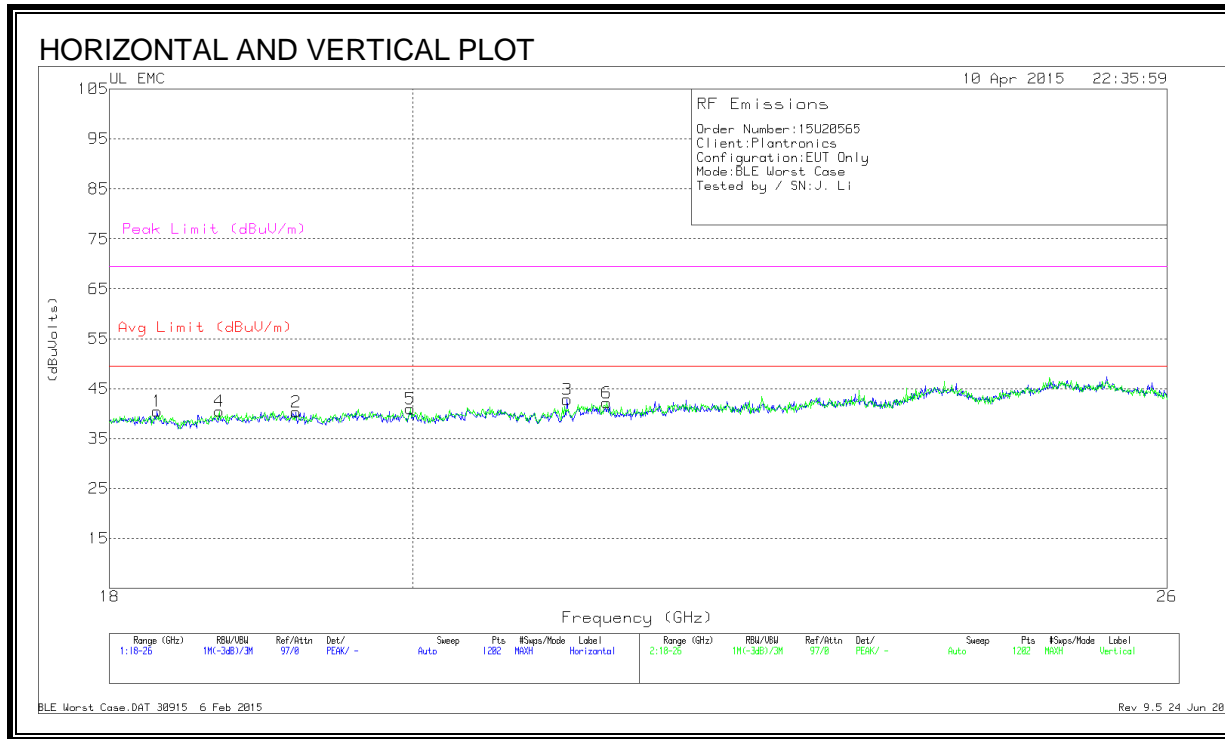
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.602	44.69	PK2	27.7	-25.1	0	47.29	-	-	74	-26.71	214	308	H
	* 1.601	36.03	MAv1	27.7	-25.1	2.15	40.78	54	-13.22	-	-	214	308	H
2	* 2.324	44.62	PK2	31.9	-24.6	0	51.92	-	-	74	-22.08	151	217	H
	* 2.324	34.48	MAv1	31.9	-24.6	2.15	43.93	54	-10.07	-	-	151	217	H
3	* 4.959	48.29	PK2	33.9	-31.8	0	50.39	-	-	74	-23.61	165	165	H
	* 4.96	42.06	MAv1	33.9	-31.8	2.15	46.31	54	-7.69	-	-	165	165	H
4	* 1.468	46.45	PK2	27.9	-25.5	0	48.85	-	-	74	-25.15	173	191	V
	* 1.468	38.43	MAv1	27.9	-25.5	2.15	42.98	54	-11.02	-	-	173	191	V
5	* 1.602	48.32	PK2	27.7	-25.1	0	50.92	-	-	74	-23.08	169	171	V
	* 1.601	40.11	MAv1	27.7	-25.1	2.15	44.86	54	-9.14	-	-	169	171	V
6	* 4.96	50.04	PK2	33.9	-31.8	0	52.14	-	-	74	-21.86	39	269	V
	* 4.96	44.5	MAv1	33.9	-31.8	2.15	48.75	54	-5.25	-	-	39	269	V

* - indicates frequency in CFR 47, Part 15 Restricted Band” and “Industry Canada RSS-Restricted Band

PK - Peak detector
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

8.3. WORST-CASE 18 to 26 GHz

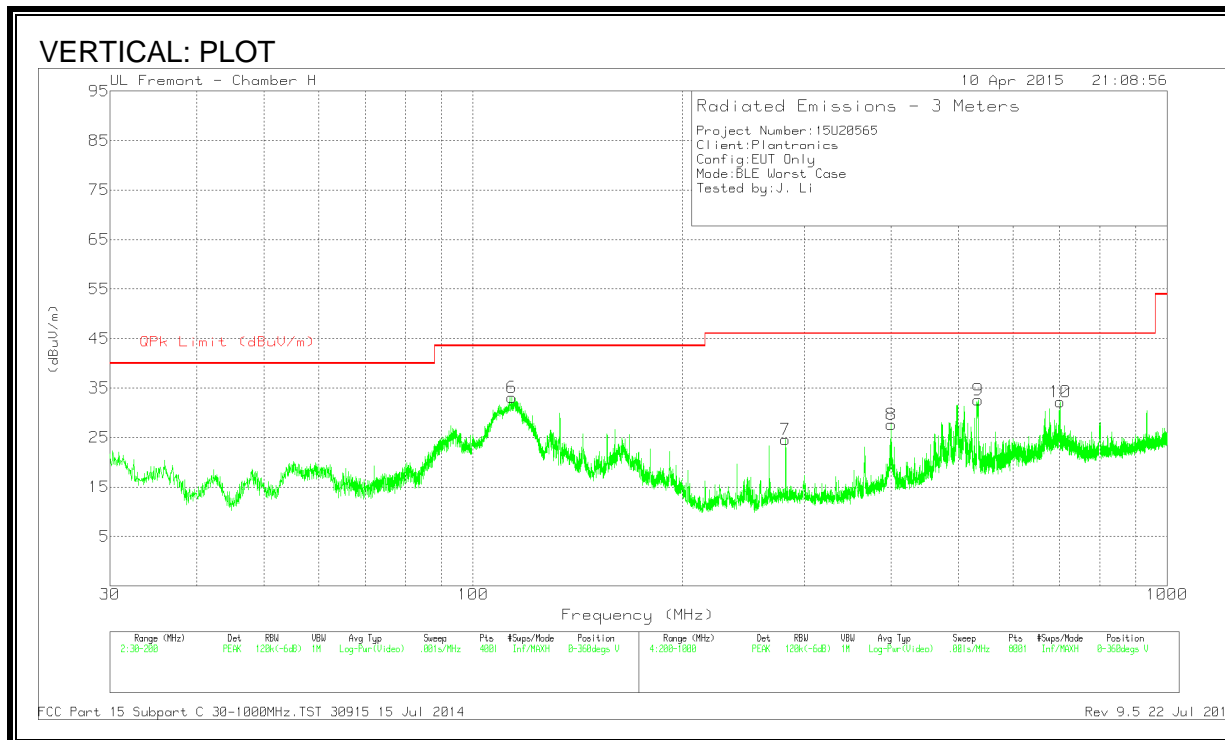
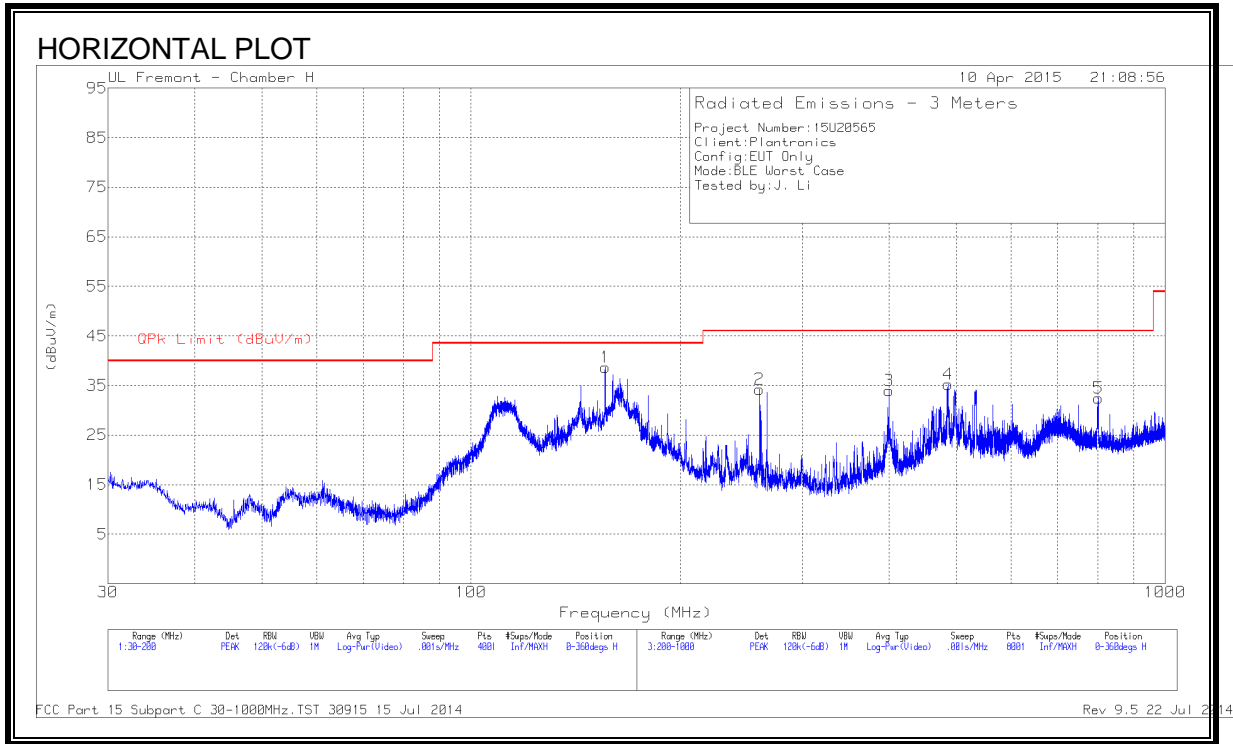
SPURIOUS EMISSIONS 18 to 26 GHz (WORST-CASE CONFIGURATION)



DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T89 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.3	42.1	Pk	32.5	-24.6	-9.5	40.5	49.5	-9	69.5	-29
2	19.206	40.83	Pk	32.8	-23.8	-9.5	40.33	49.5	-9.17	69.5	-29.17
3	21.104	42.53	Pk	33.3	-23.5	-9.5	42.83	49.5	-6.67	69.5	-26.67
4	18.699	41.7	Pk	32.7	-24.4	-9.5	40.5	49.5	-9	69.5	-29
5	19.985	41.5	Pk	33.1	-24.1	-9.5	41	49.5	-8.5	69.5	-28.5
6	21.397	42.07	Pk	33.3	-23.7	-9.5	42.17	49.5	-7.33	69.5	-27.33

8.4. WORST-CASE BELOW 1 GHz

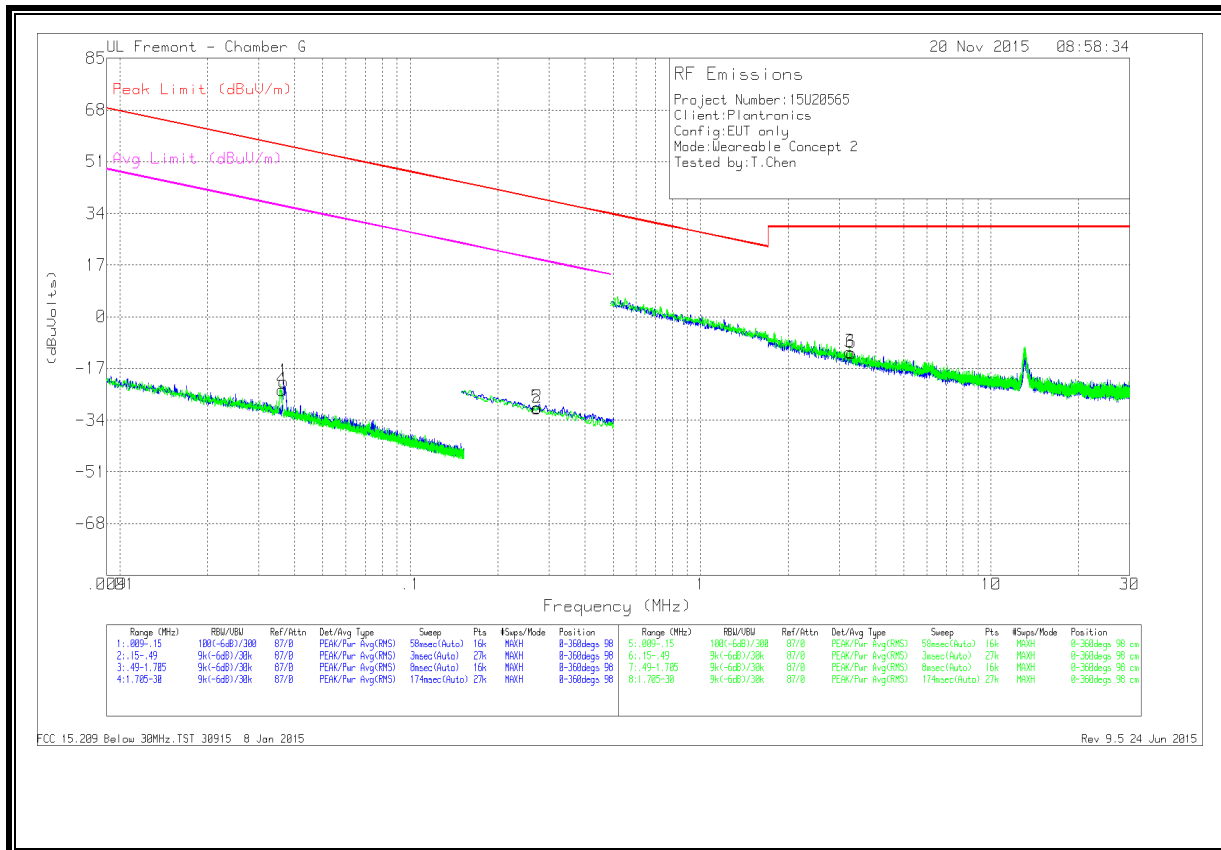


DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AFT477 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6	* 113.6825	50.27	PK	13.2	-30.4	33.07	43.52	-10.45	0-360	100	V
2	* 260.6	51.38	PK	12.2	-29.3	34.28	46.02	-11.74	0-360	100	H
3	* 400	47.03	PK	15.5	-28.6	33.93	46.02	-12.09	0-360	100	H
7	* 282	40.54	PK	13.3	-29.2	24.64	46.02	-21.38	0-360	201	V
8	* 400.5	40.76	PK	15.5	-28.6	27.66	46.02	-18.36	0-360	100	V
1	156.0035	54.04	QP	12.4	-30	36.44	43.52	-7.08	275	264	H
4	486.6	45.92	PK	17.7	-28.4	35.22	46.02	-10.8	0-360	100	H
9	534.1	42.7	PK	18.1	-28.2	32.6	46.02	-13.42	0-360	201	V
10	701.1	39.75	PK	20.2	-27.7	32.25	46.02	-13.77	0-360	100	V
5	800.7	38.4	PK	21.4	-27.3	32.5	46.02	-13.52	0-360	100	H

* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.
 PK - Peak detector
 QP - Quasi-Peak detector

8.5. TX SPURIOUS FROM 0.15 TO 30 MHz



DATA

Marker	Frequen- cy (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
FACE ON												
1	.0366	44.99	Pk	13.6	.1	-80	-21.31	56.33	-77.64	36.33	-57.64	0-360
2	.2734	39.61	Pk	10.3	.1	-80	-29.99	38.87	-68.86	18.87	-48.86	0-360
3	3.257 09	17.62	Pk	10.4	.3	-40	-11.68	29.54	-41.22	-	-	0-360
FACE OFF												
4	.0361	42.34	Pk	13.6	.1	-80	-23.96	56.45	-80.41	36.45	-60.41	0-360
5	.2722 3	39.57	Pk	10.3	.1	-80	-30.03	38.91	-68.94	18.91	-48.94	0-360
6	3.301 1	17.41	Pk	10.4	.3	-40	-11.89	29.54	-41.43	-	-	0-360

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

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

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

RESULTS

6 WORST EMISSIONS

Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
1	.1905	44.68	Qp	1	0	45.68	-	-	54.01	-8.33
2	.1905	33.62	Ca	1	0	34.62	-	-	54.01	-19.39
3	.5055	35.57	Qp	.3	0	35.87	-	-	46	-10.13
4	.5055	28.46	Ca	.3	0	28.76	-	-	46	-17.24
5	1.0635	37.76	Pk	.2	0	37.96	-	-	46	-8.04
6	1.0635	26.73	Av	.2	0	26.93	56	-29.07	46	-19.07

Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
7	.2715	40.82	Pk	.7	0	41.52	-	-	51.07	-9.55
8	.2715	37.34	Av	.7	0	38.04	61.07	-23.03	51.07	-13.03
9	.6585	37.19	Pk	.3	0	37.49	-	-	46	-8.51
10	.6315	27.9	Av	.3	0	28.2	56	-27.8	46	-17.8
11	.87	37.35	Pk	.3	0	37.65	-	-	46	-8.35
12	.8655	29	Av	.3	0	29.3	56	-26.7	46	-16.7

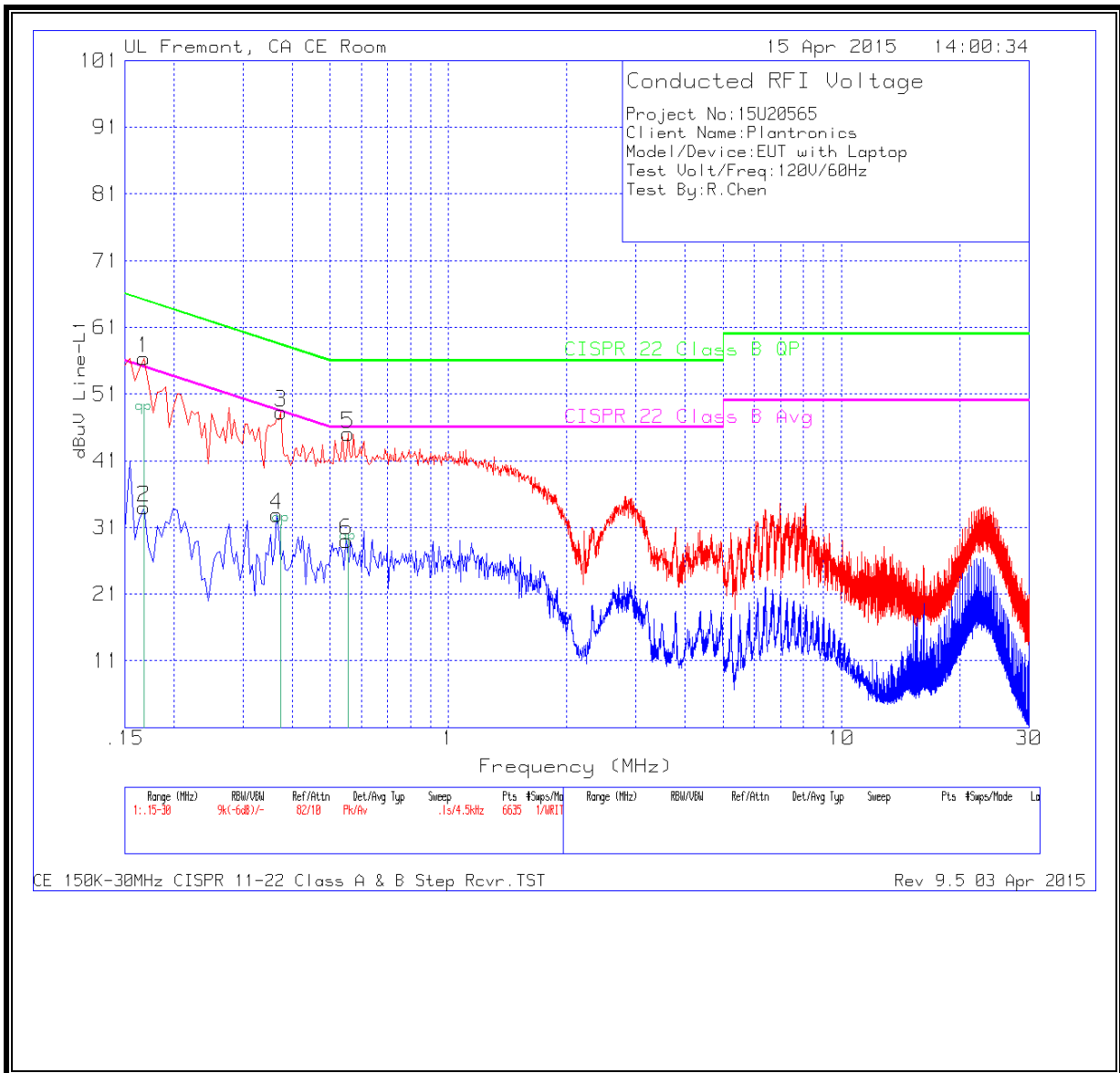
Pk - Peak detector

Av - Average detection

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 1 RESULTS



LINE 2 RESULTS

