



**FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8**

**BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT**

FOR

802.11b/g/n/a/ac 3X3 WLAN + Bluetooth PCI-E Custom Combination Card

MODEL NUMBER: BCM943602CDP

**FCC ID: QDS-BRCM1089
IC: 4324A-BRCM1089**

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ISSUE DATE: MAY 13, 2015

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

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--	04/14/15	Initial Issue	H. Mustapha
--	05/13/15	Updated output power	H. Mustapha

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, U.S.A.

EUT DESCRIPTION: 802.11b/g/n/a/ac 3X3 WLAN + Bluetooth PCI-E Custom
Combination Card

MODEL: BCM943602CDP

SERIAL NUMBER: Conducted & Radiated: FC845220129GCY31A

DATE TESTED: MARCH 20 – MAY 13, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	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.

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UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

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

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 checked="" 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 an 802.11b/g/n/a/ac 3X3 WLAN + Bluetooth PCI-E Custom Combination Card.

The radio module is manufactured by Broadcom.

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	3.03	2.01

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The EUT utilizes an 802.11a/b/g/n/ac WLAN/BT antenna with a maximum gain of 6.56 dBi for BT.

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed in the Laptop equipment during testing was 5.6.0.9020.

The test utility software used during testing was Broadcom Bluetool 1.8.4.7.

5.5. WORST-CASE CONFIGURATION AND MODE

The EUT can only be setup in desktop orientation; therefore all radiated testing was performed with the EUT in desktop orientation.

Radiated emission below 1 GHz, 18 to 26 GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Chain J3 (WF1) was used for testing BLE mode.

Based on client's input, there is no colocation among different radios.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	HP	EliteBook 2730p	2CE8487Zmt	N/A
AC Adapter	HP	PPP014L-SA	W97950ELLVC685	N/A
Jig Board	Broadcom	BCM94331CSAD_3	1821985	N/A

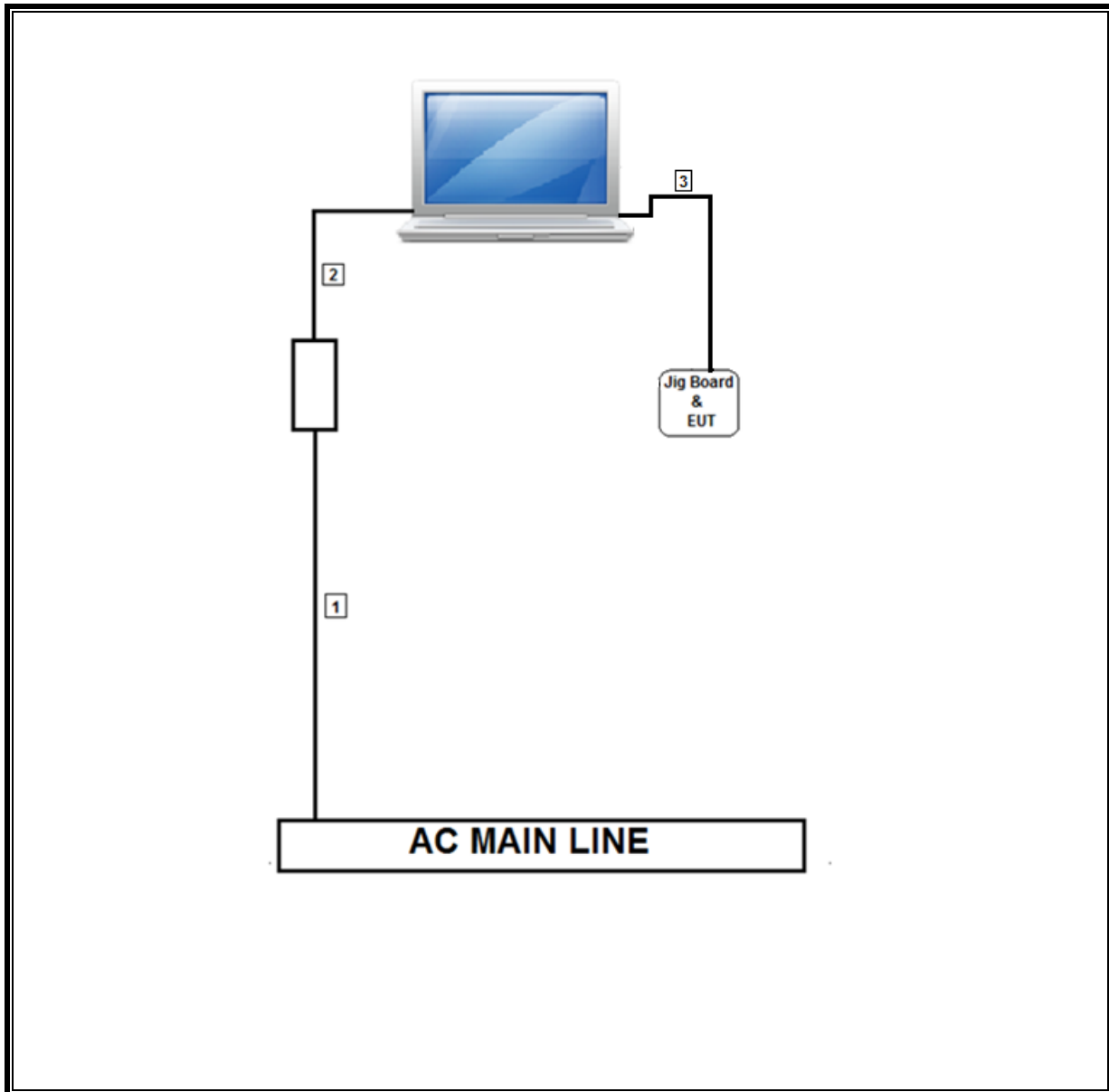
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US115V	Unshielded	1	
2	DC	1	19Vdc	Unshielded	1.5	
3	USB	1	USB	Unshielded	0.5	

TEST SETUP

The EUT is installed on a jig board and is connected to the laptop with a USB cable. 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	T No.	Cal Date	Cal Due
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014		
Line Conducted Software	UL	UL EMC	Ver 9.5, May 17, 2012		
Bilog Antenna 30-1000MHz	Sunol	JB1	130	09/10/14	09/10/15
Horn Antenna 1-18GHz	ETS	3117	136	03/03/15	03/03/16
Horn Antenna 18-26GHz	ARA	SWH-28	125	05/09/14	05/09/15
Preamp 10kHz-1000MHz	Sonoma	310	300	11/01/14	11/01/15
Preamp 1-8GHz	Miteq	AMF-4D-01000800-30-29P	782	11/18/14	11/18/15
Preamp 1-18GHz	Miteq	AFS42-00101800-25-2-42	492	08/09/14	08/09/15
Preamp 1-26.5GHz	Agilent	8449B	404	04/06/15	04/06/16
Spectrum Analyzer 3kHz - 44GHz	Agilent	N9030A	908	09/05/14	09/05/15
Spectrum Analyzer 9kHz - 40GHz	HP	8564E	106	08/06/14	08/06/15
Coaxial Switchbox	Agilent	SP6T	927	09/15/14	09/15/15
3GHz HPF	Micro-Tronics	HPM17543	486	11/18/14	11/18/15
EMI Test Receiver	Rohde & Schwarz	ECSI 7	212	08/14/14	08/14/15
Spectrum Analyzer 3Hz to 44GHz	Agilent	E4440A	123	10/28/14	10/28/15
Power Meter	Agilent	N1911A	377	06/30/14	06/30/15
Power Sensor	Agilent	E9323A	399	05/02/14	05/02/15
LISN for Conducted Emissions	FCC	50/250-25-2	24	01/16/15	01/16/16

7. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 558074, Section 6.0.

6 dB Bandwidth: KDB 558074 D01 v03r01, Section 8.1.

99% Bandwidth: ANSI C63.10-2013, Sections 6.9.3.

Peak Output Power: KDB 558074 D01 v03r01, Section 9.1.1.

Power Spectral Density: KDB 558074 D01 v03r01, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r01, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r01, Section 12.1.

Band-edge: KDB 558074 D01 v03r01, Section 13.3.2.

Conducted RX Spurious Emissions: ANSI C63.4-2014, Sections 12.2.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

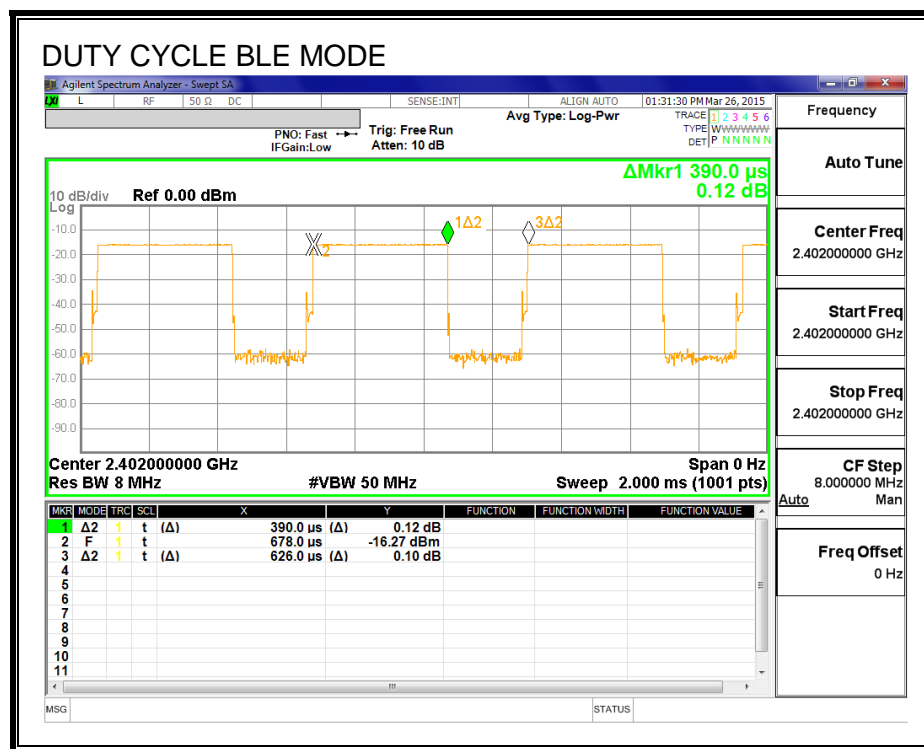
LIMITS

None; for reporting purposes only.

RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
BLE	0.390	0.626	0.623	62.30%	2.06

DUTY CYCLE PLOTS



8.2. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

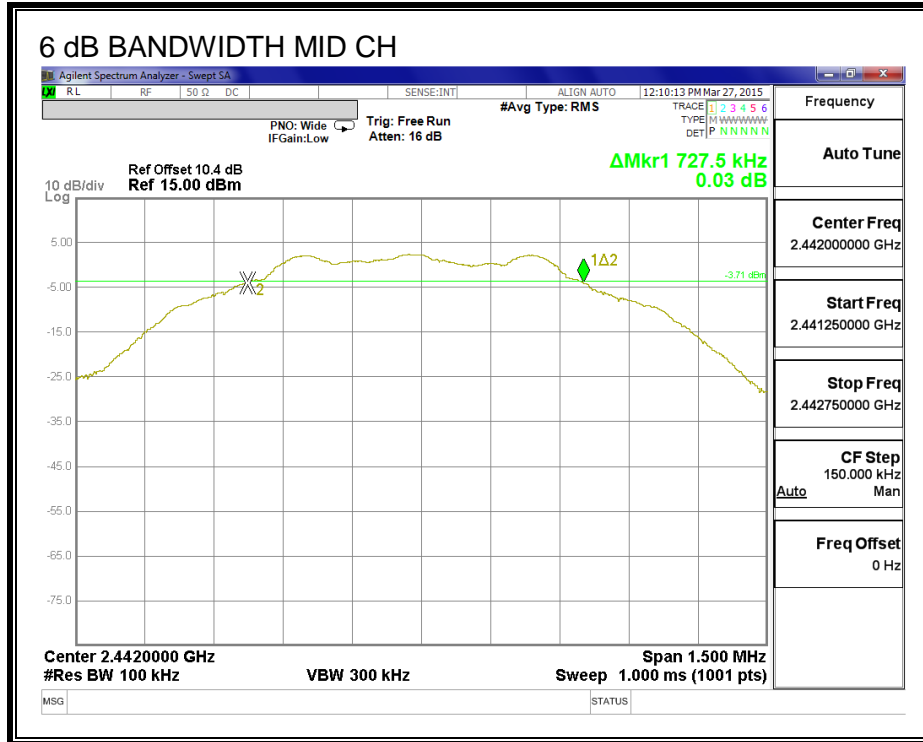
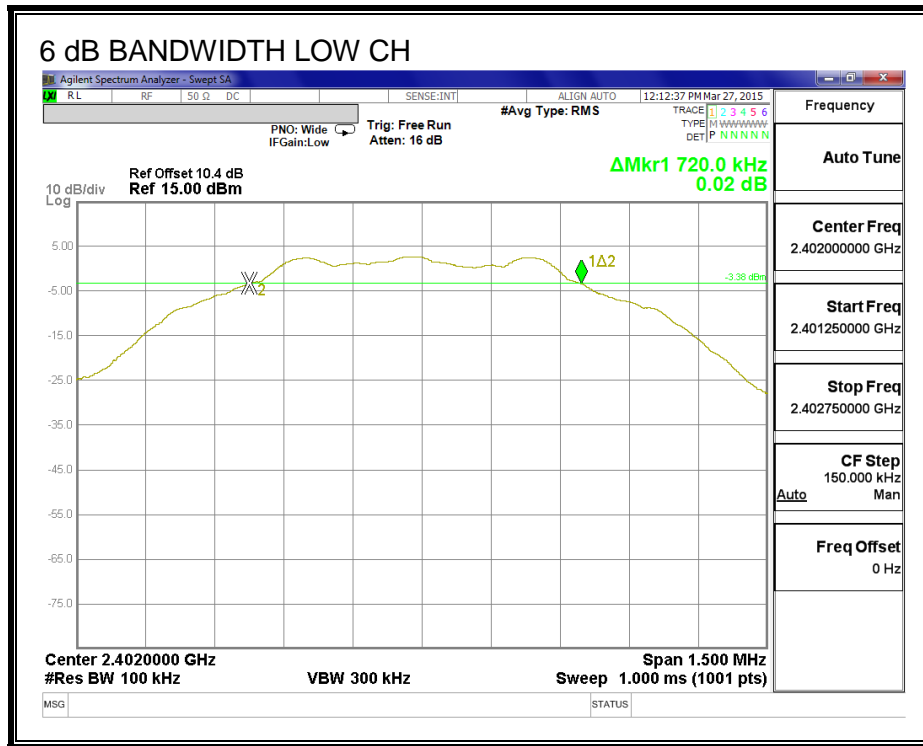
IC RSS-210 A8.2 (a)

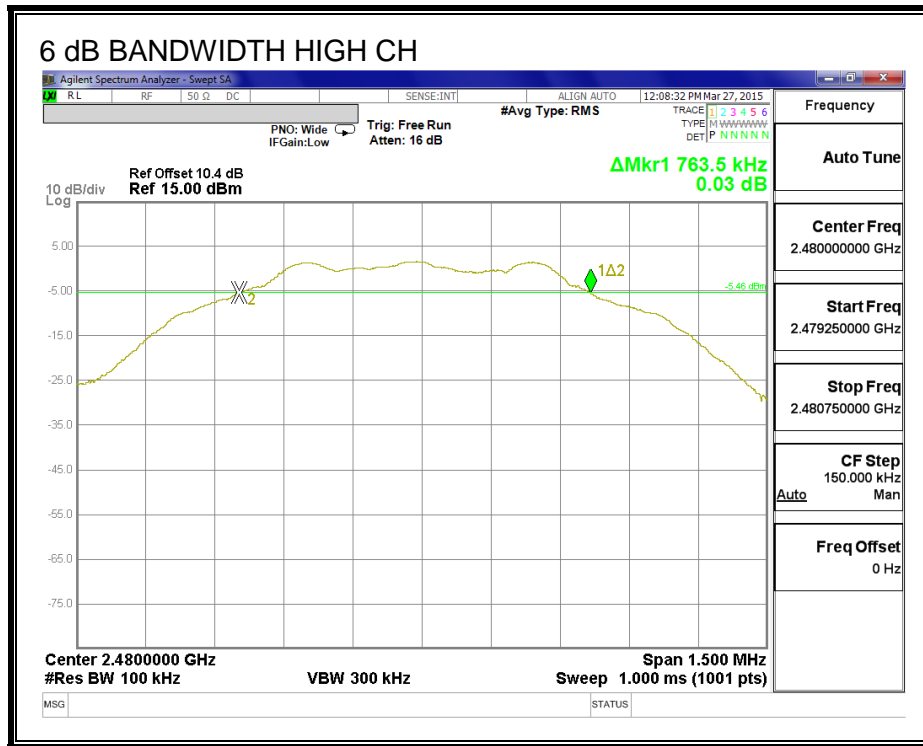
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.7200	0.5
Middle	2442	0.7275	0.5
High	2480	0.7635	0.5

6 dB BANDWIDTH





8.3. 99% BANDWIDTH

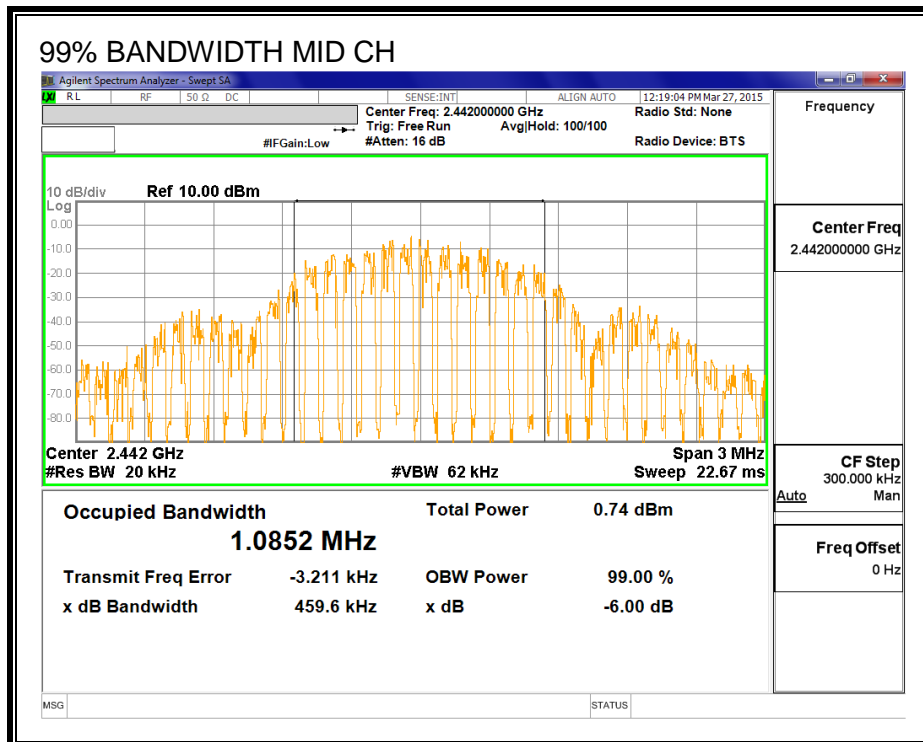
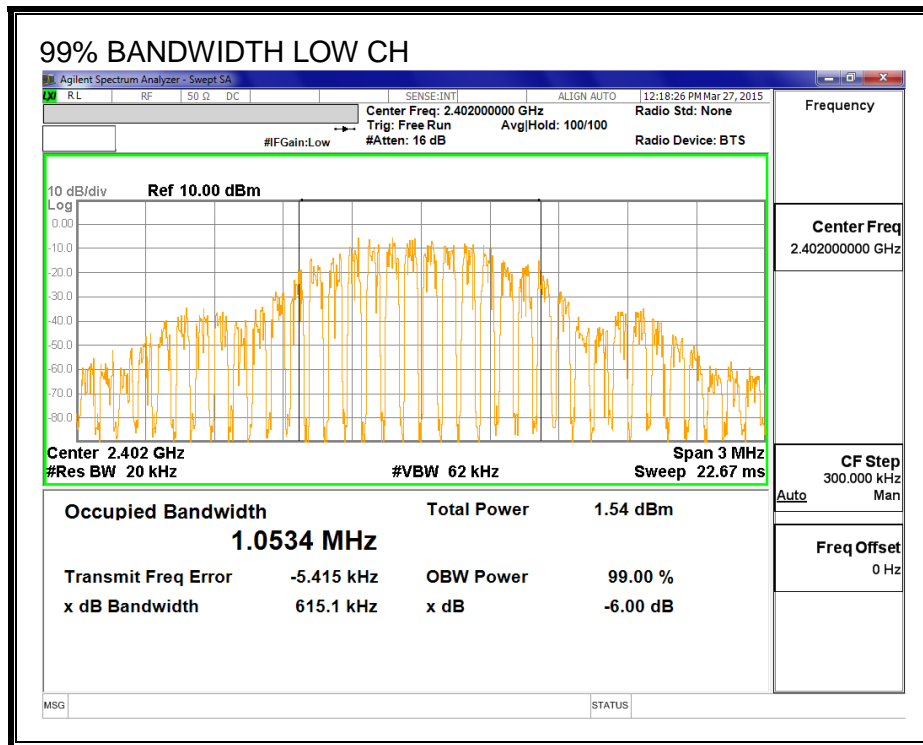
LIMITS

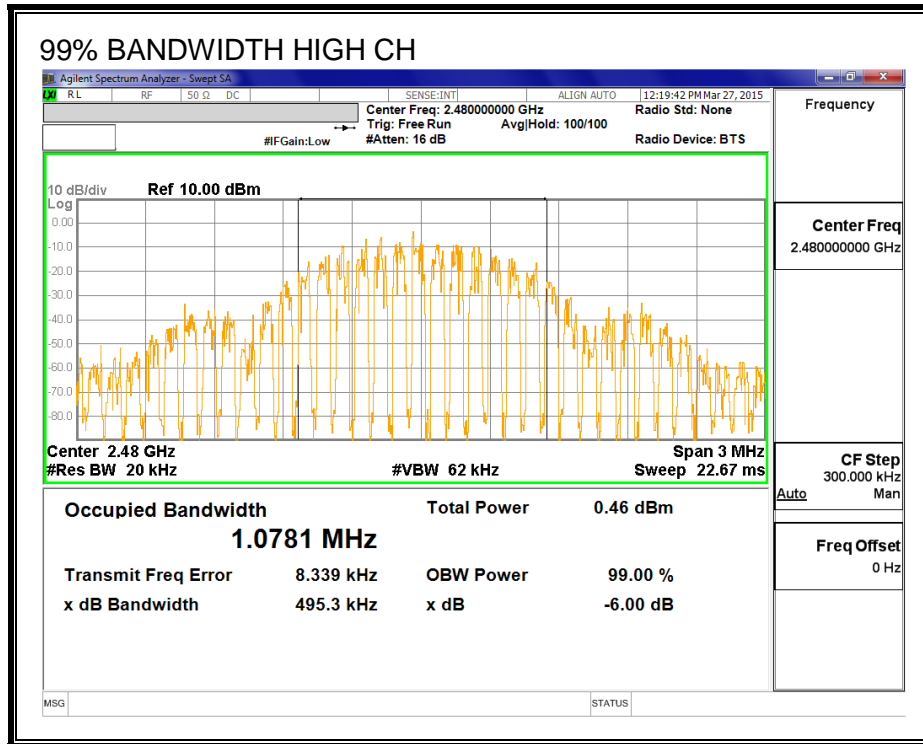
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0534
Middle	2442	1.0852
High	2480	1.0781

99% BANDWIDTH





8.4. PEAK OUTPUT POWER

LIMITS

FCC §15.247 (b)

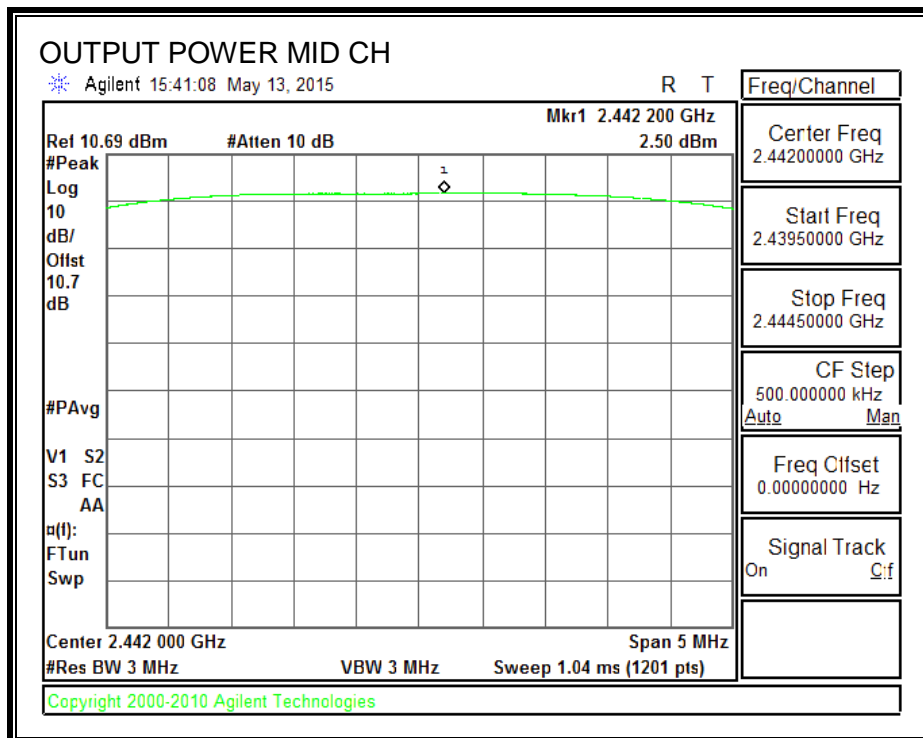
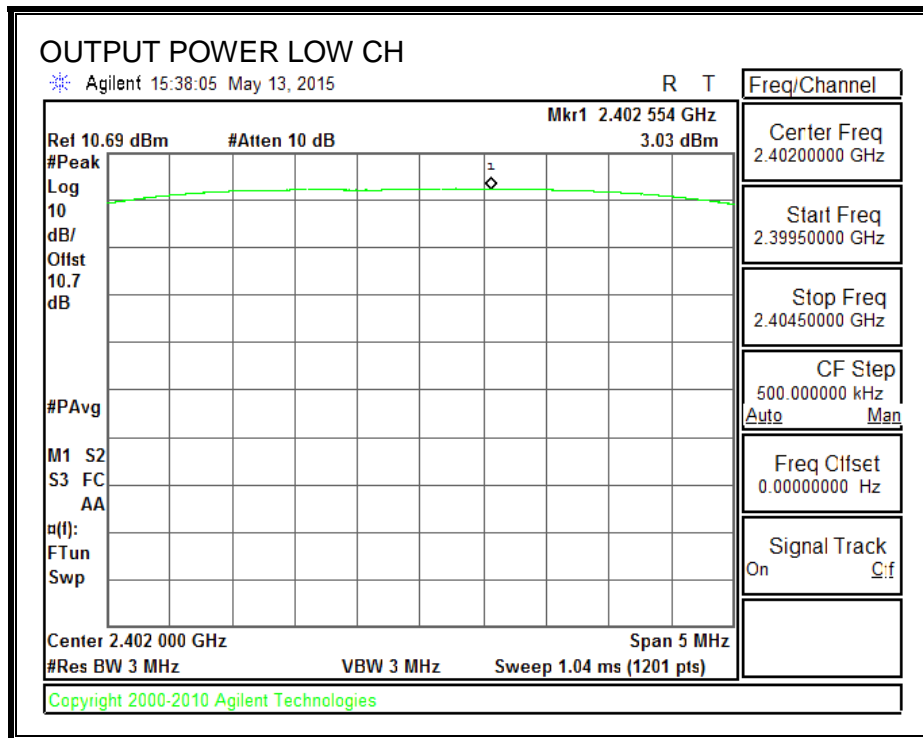
IC RSS-210 A8.4

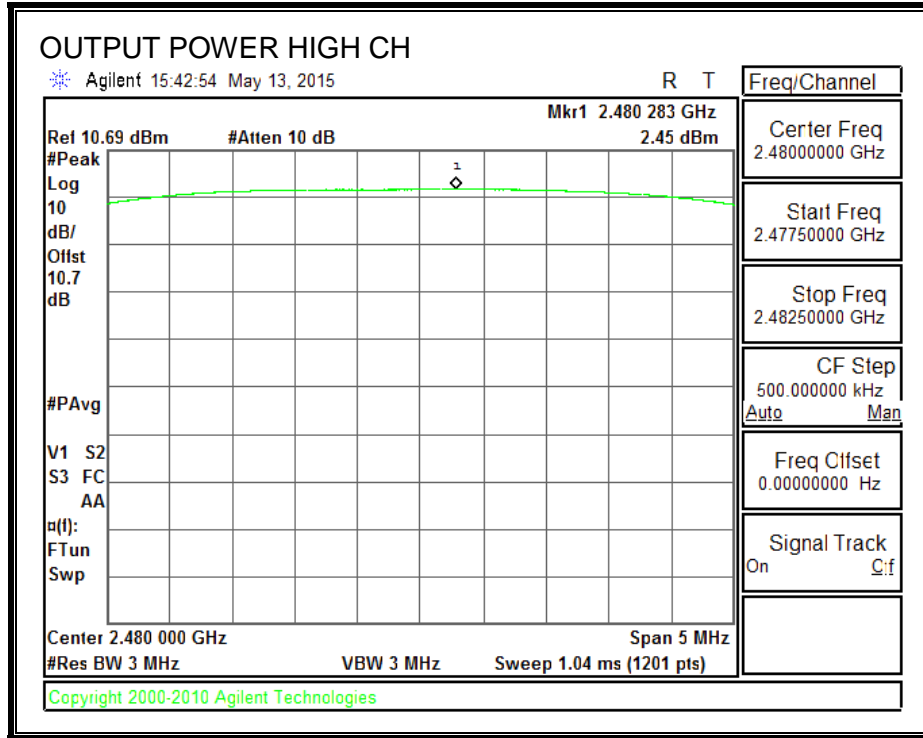
The maximum antenna gain is 6.56 dBi, therefore the limit is 29.44 dBm.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	3.03	29.44	-26.410
Middle	2442	2.50	29.44	-26.940
High	2480	2.45	29.44	-26.990

OUTPUT POWER





8.5. AVERAGE OUTPUT POWER

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	2.68
Middle	2442	2.07
High	2480	2.00

8.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

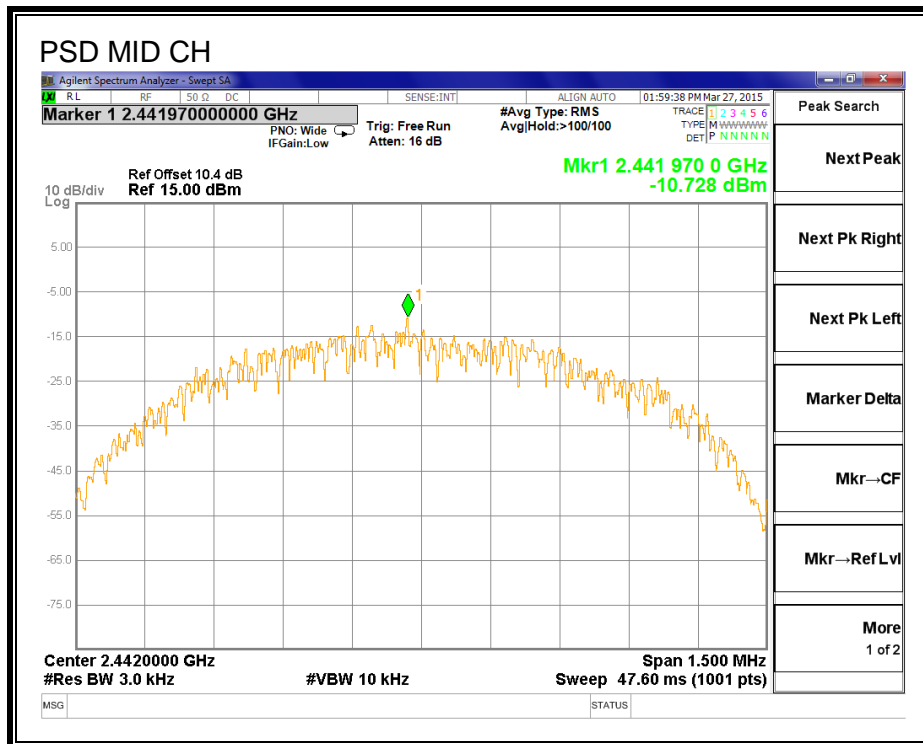
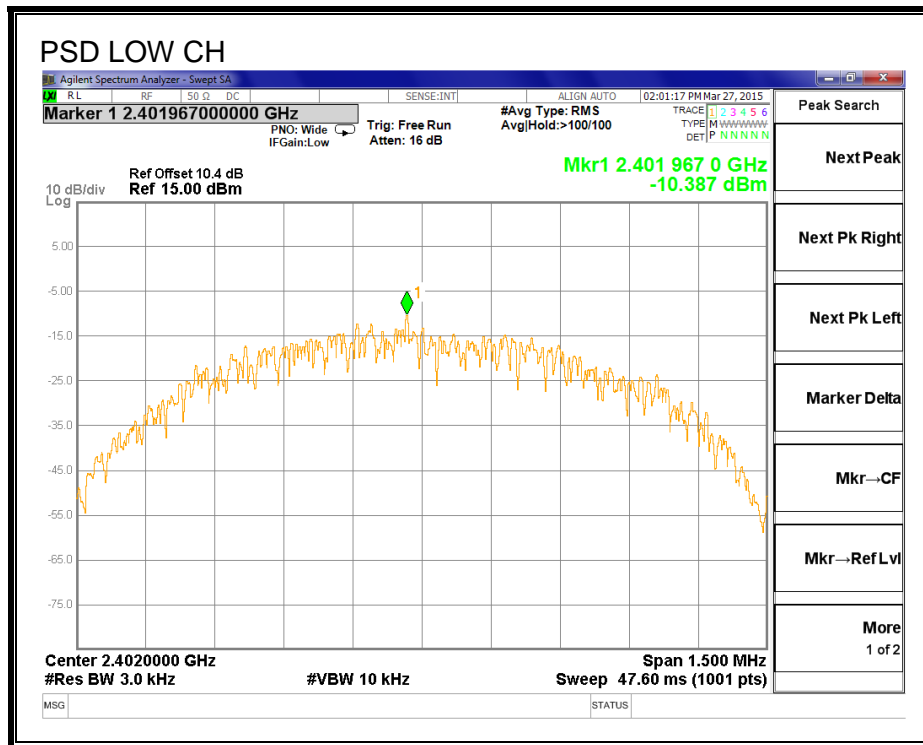
IC RSS-210 A8.2 (b)

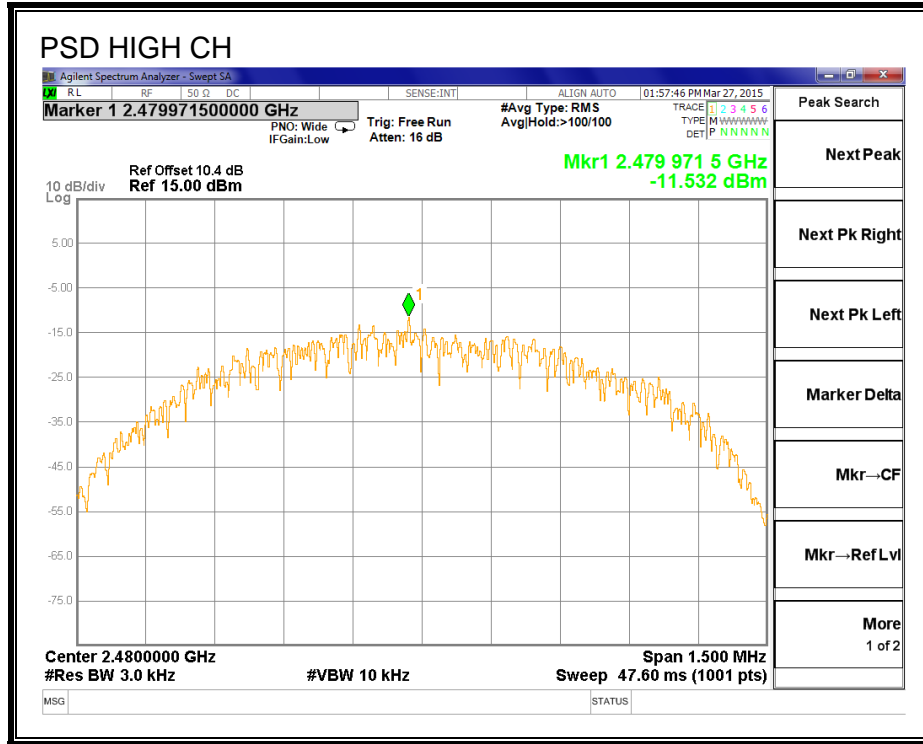
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-10.387	8	-18.39
Middle	2442	-10.728	8	-18.73
High	2480	-11.532	8	-19.53

POWER SPECTRAL DENSITY





8.7. CONDUCTED TX SPURIOUS EMISSIONS

LIMITS

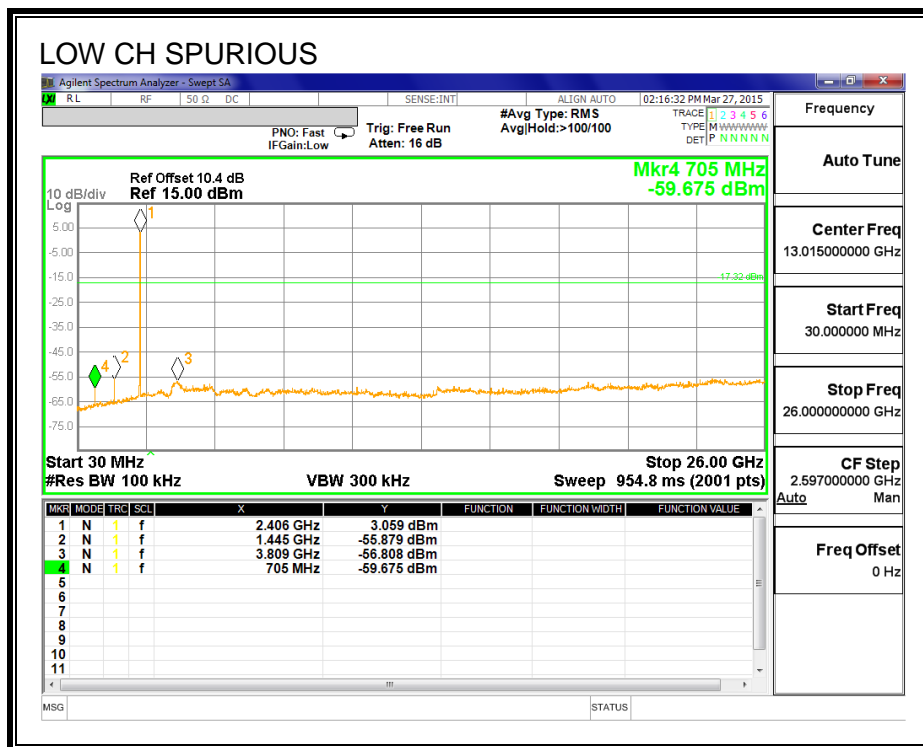
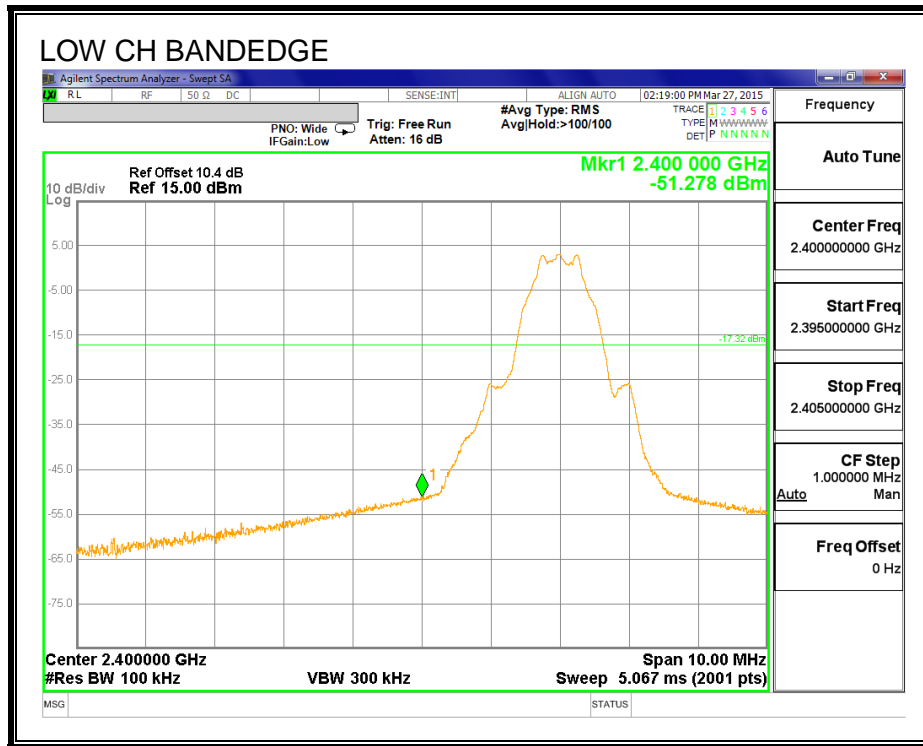
FCC §15.247 (d)

IC RSS-210 A8.5

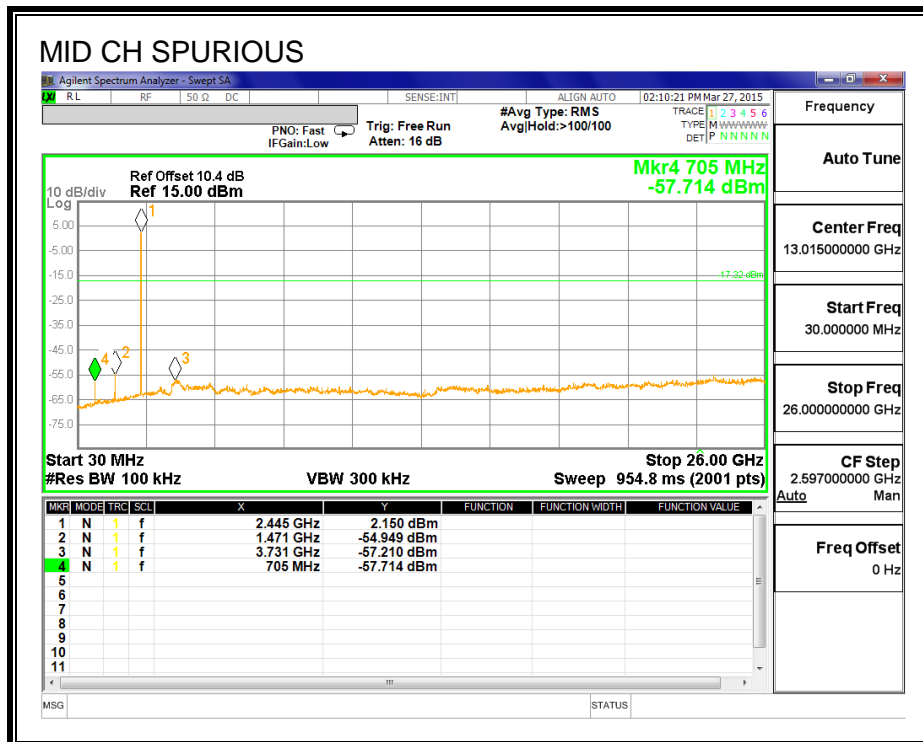
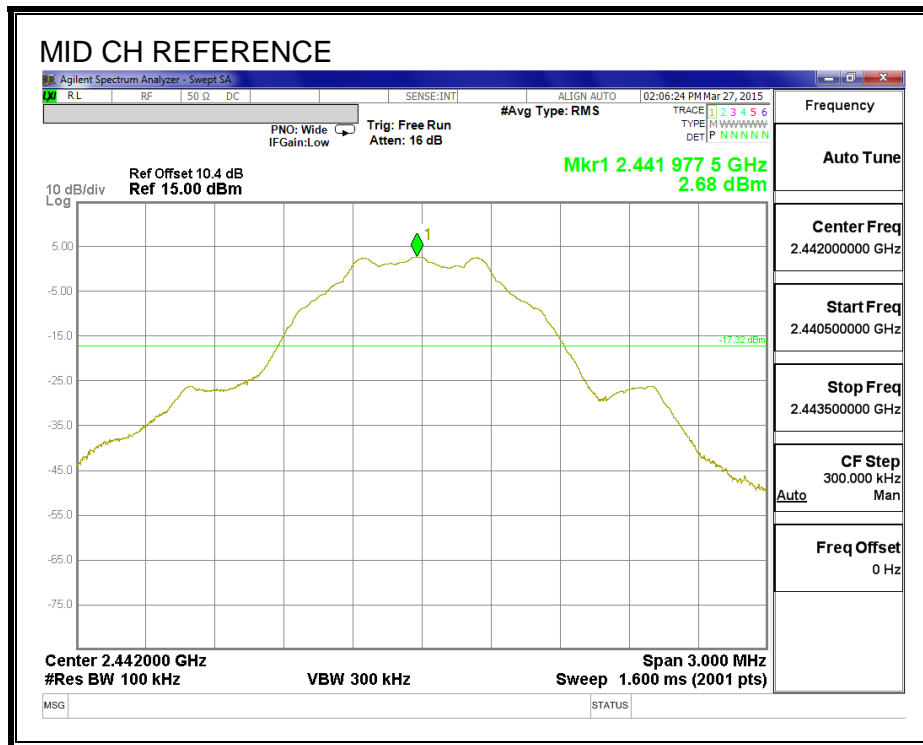
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

RESULTS

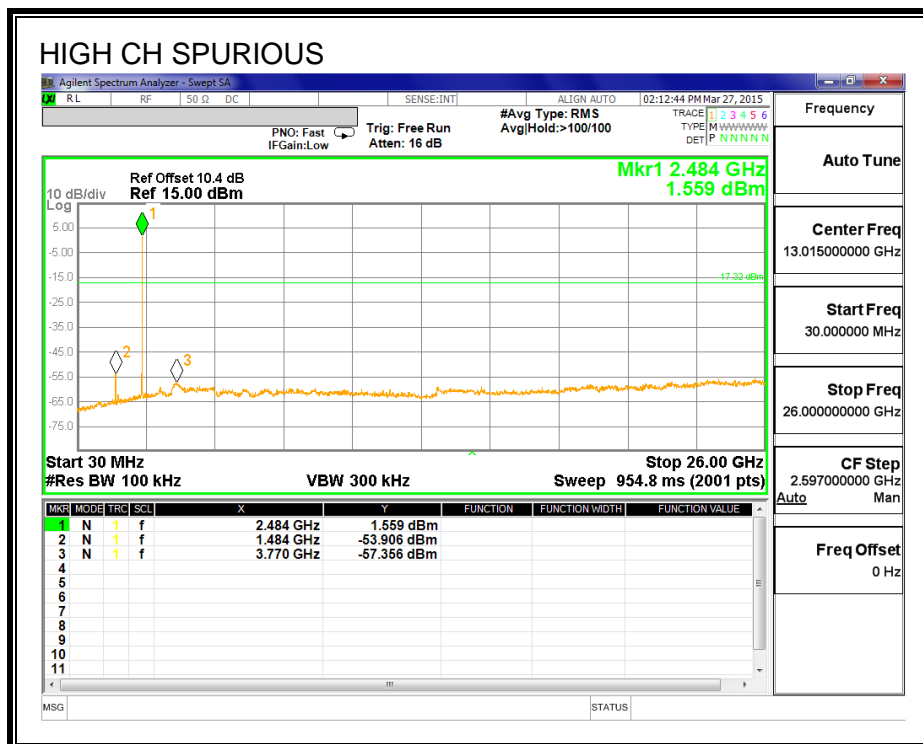
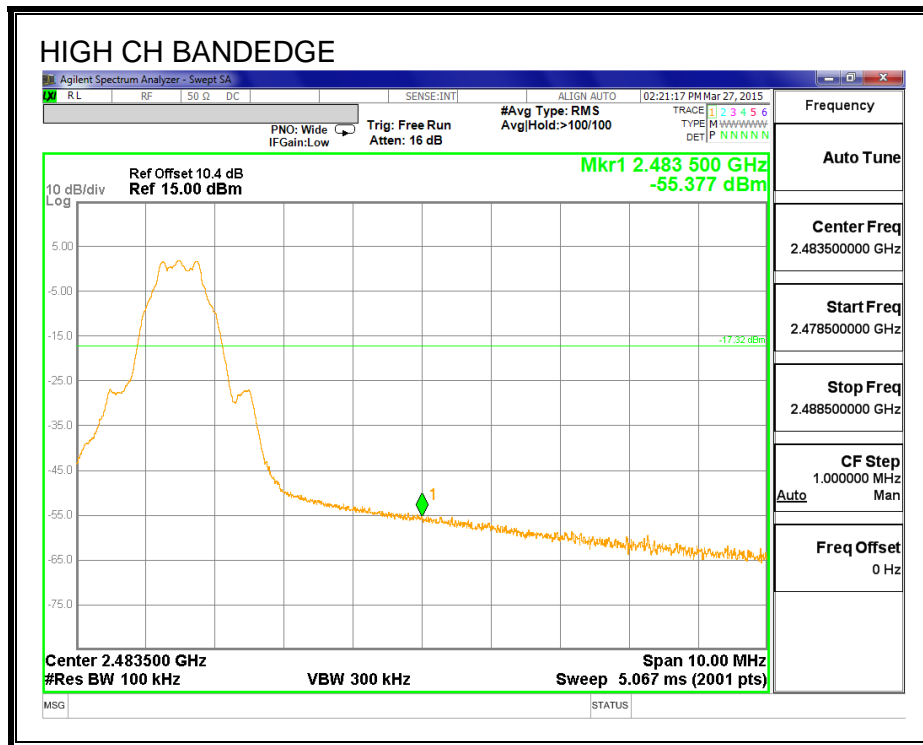
SPURIOUS EMISSIONS, LOW CHANNEL



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



8.8. CONDUCTED RX SPURIOUS EMISSIONS

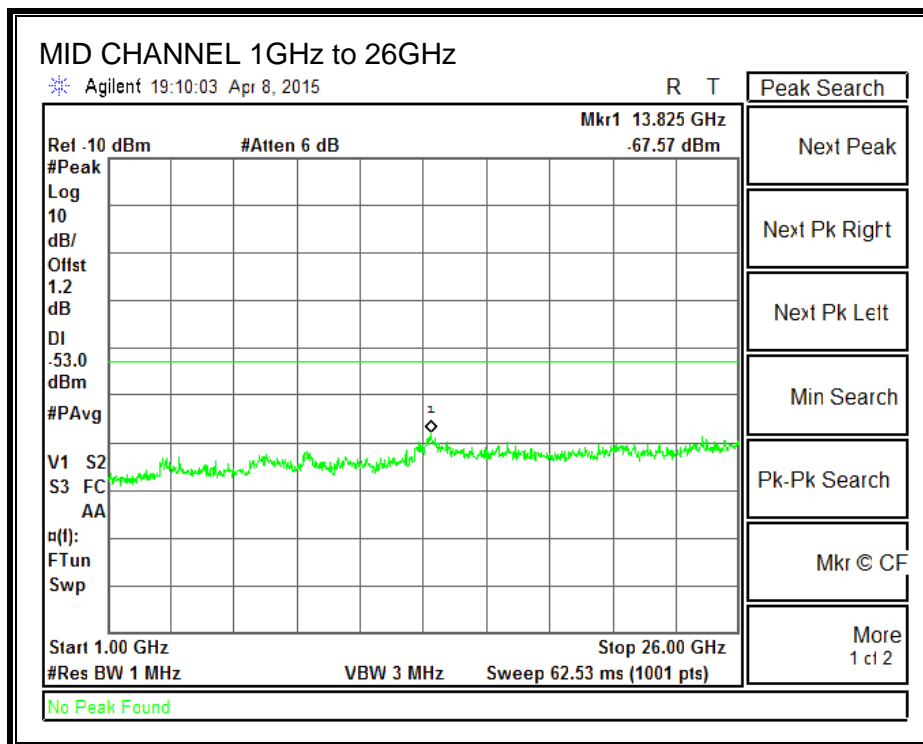
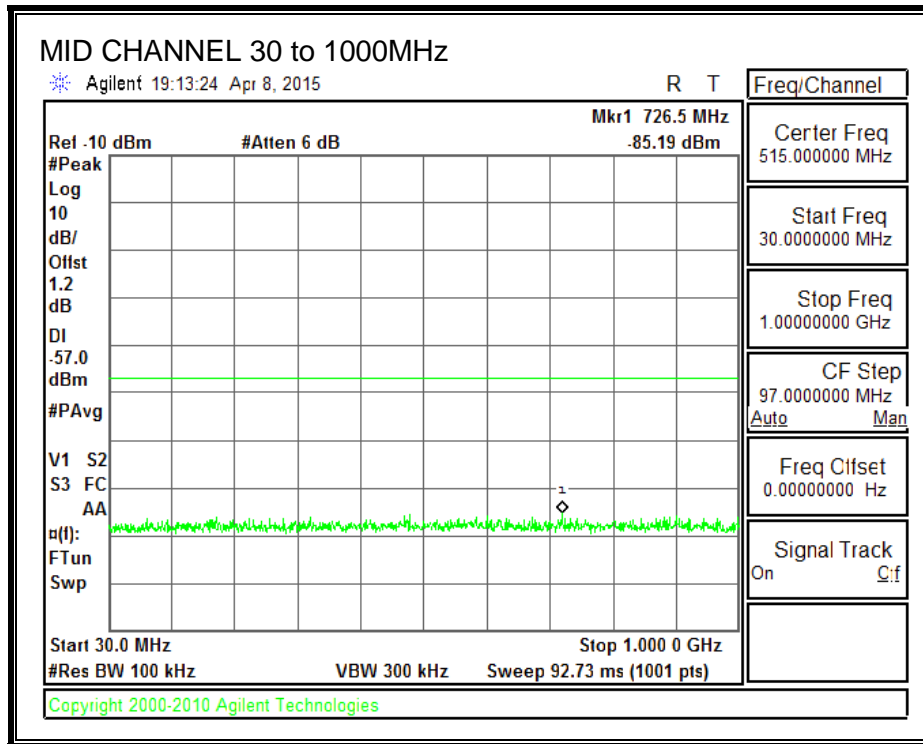
LIMITS

IC RSS GEN Issue 4, clause 7.1.3

Receiver-spurious emissions at any discrete frequency shall not exceed 2 nW in the band 30-1000 MHz, nor 5 nW above 1000MHz.

RESULTS

RX SPURIOUS EMISSIONS, MID CHANNEL



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

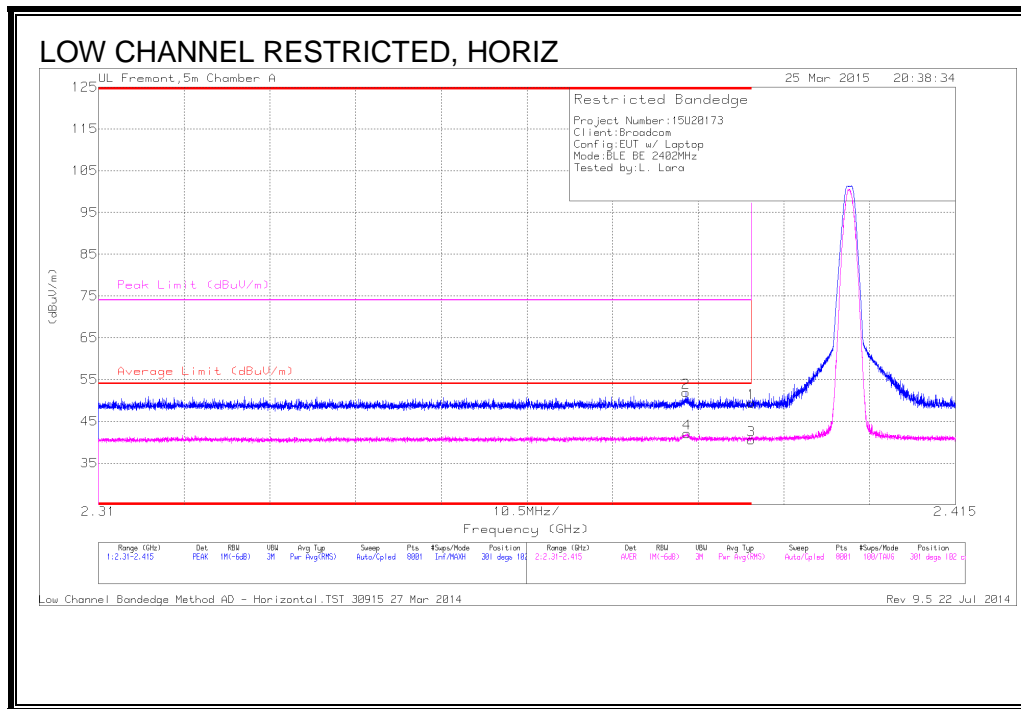
FCC §15.205 and §15.209

IC RSS-GEN Clause 8.9 (Transmitter)

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

9.2. BLUETOOTH LOW ENERGY MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



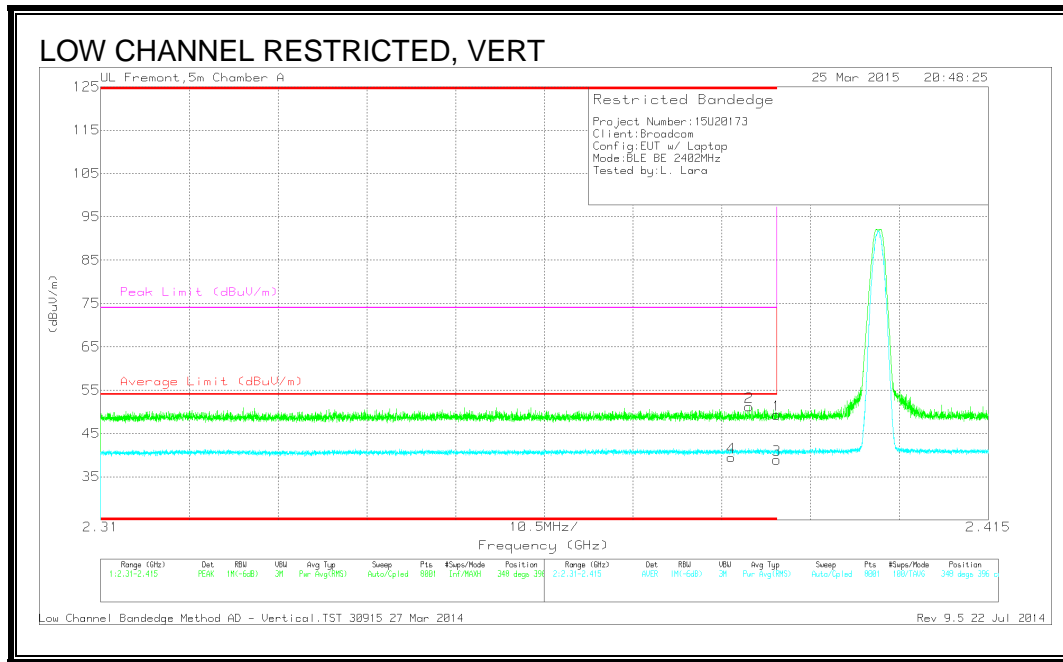
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Filter/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
2	* 2.382	42.3	PK	31.9	-22.3	0	51.9	-	-	74	-22.1	301	102	H
4	* 2.382	30.43	RMS	31.9	-22.3	2.06	42.09	54	-11.91	-	-	301	102	H
1	* 2.39	39.59	PK	32	-22.2	0	49.39	-	-	74	-24.61	301	102	H
3	* 2.39	28.68	RMS	32	-22.2	2.06	40.54	54	-13.46	-	-	301	102	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK - Peak detector
 RMS - RMS detection

RESTRICTED BANDEGE (LOW CHANNEL, VERTICAL)



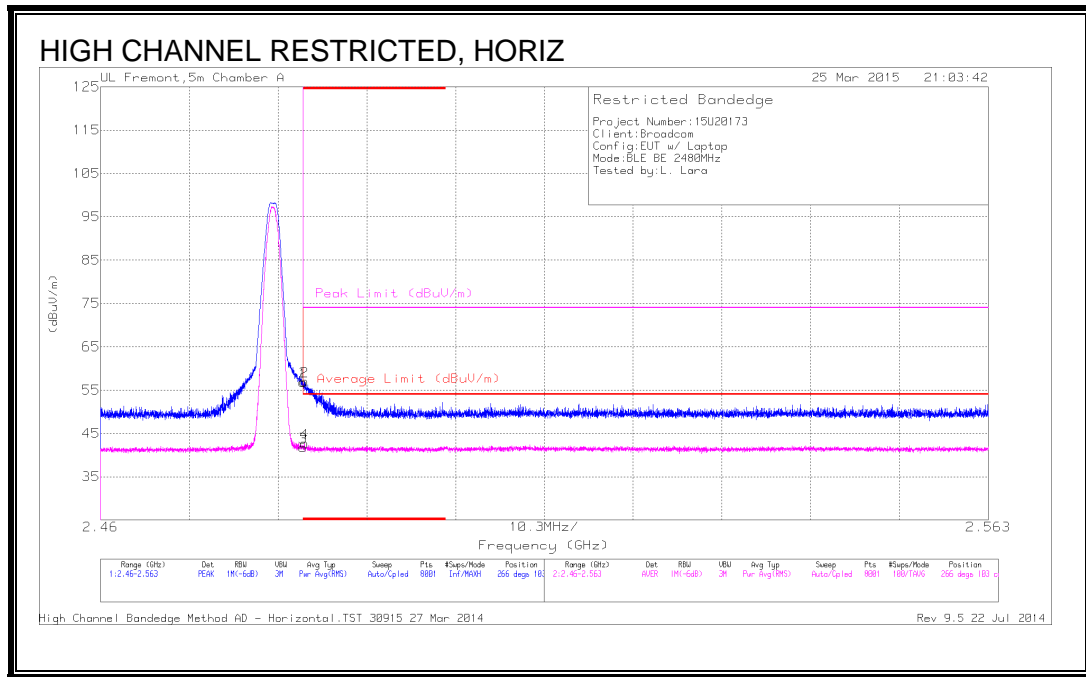
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Filter/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	* 2.385	29.77	RMS	31.9	-22.2	2.06	41.53	54	-12.47	-	-	348	396	V
2	* 2.387	41.37	PK	32	-22.2	0	51.17	-	-	74	-22.83	348	396	V
1	* 2.39	39.51	PK	32	-22.2	0	49.31	-	-	74	-24.69	348	396	V
3	* 2.39	29.12	RMS	32	-22.2	2.06	40.98	54	-13.02	-	-	348	396	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK - Peak detector
 RMS - RMS detection

RESTRICTED BANDEGE (HIGH CHANNEL, HORIZONTAL)



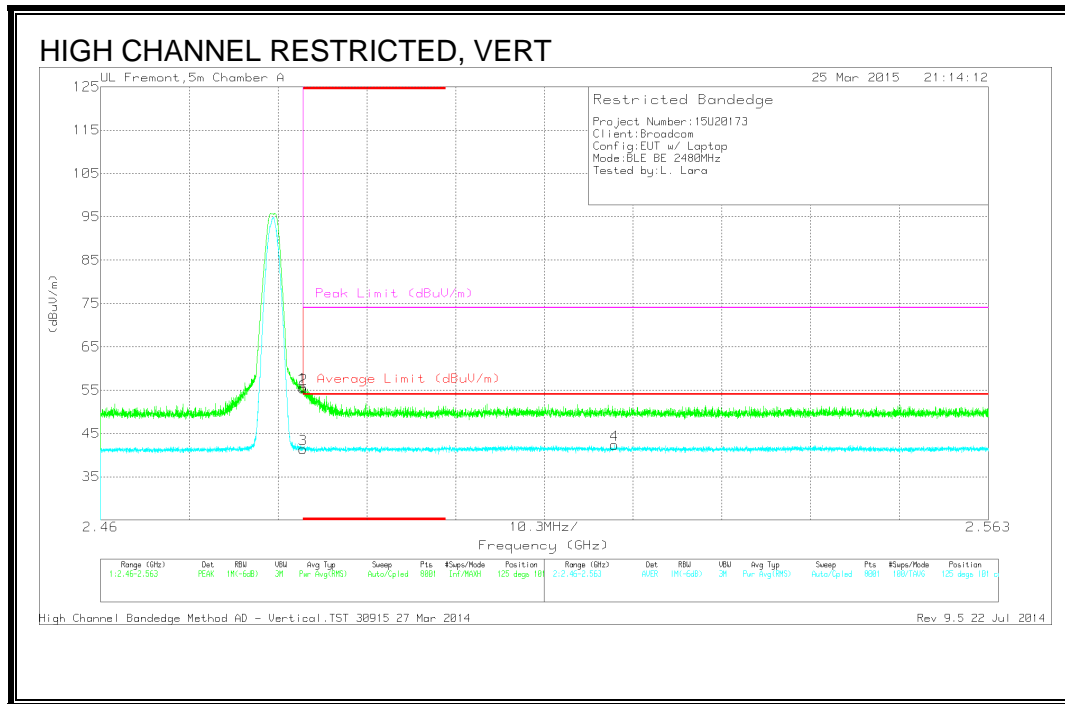
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/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	46.61	PK	32.1	-21.9	0	56.81	-	-	74	-17.19	266	103	H
2	* 2.484	46.79	PK	32.1	-21.9	0	56.99	-	-	74	-17.01	266	103	H
3	* 2.484	29.53	RMS	32.1	-21.9	2.06	41.79	54	-12.21	-	-	266	103	H
4	* 2.484	30.45	RMS	32.1	-21.9	2.06	42.71	54	-11.29	-	-	266	103	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK - Peak detector
 RMS - RMS detection

RESTRICTED BANDEGE (HIGH CHANNEL, VERTICAL)



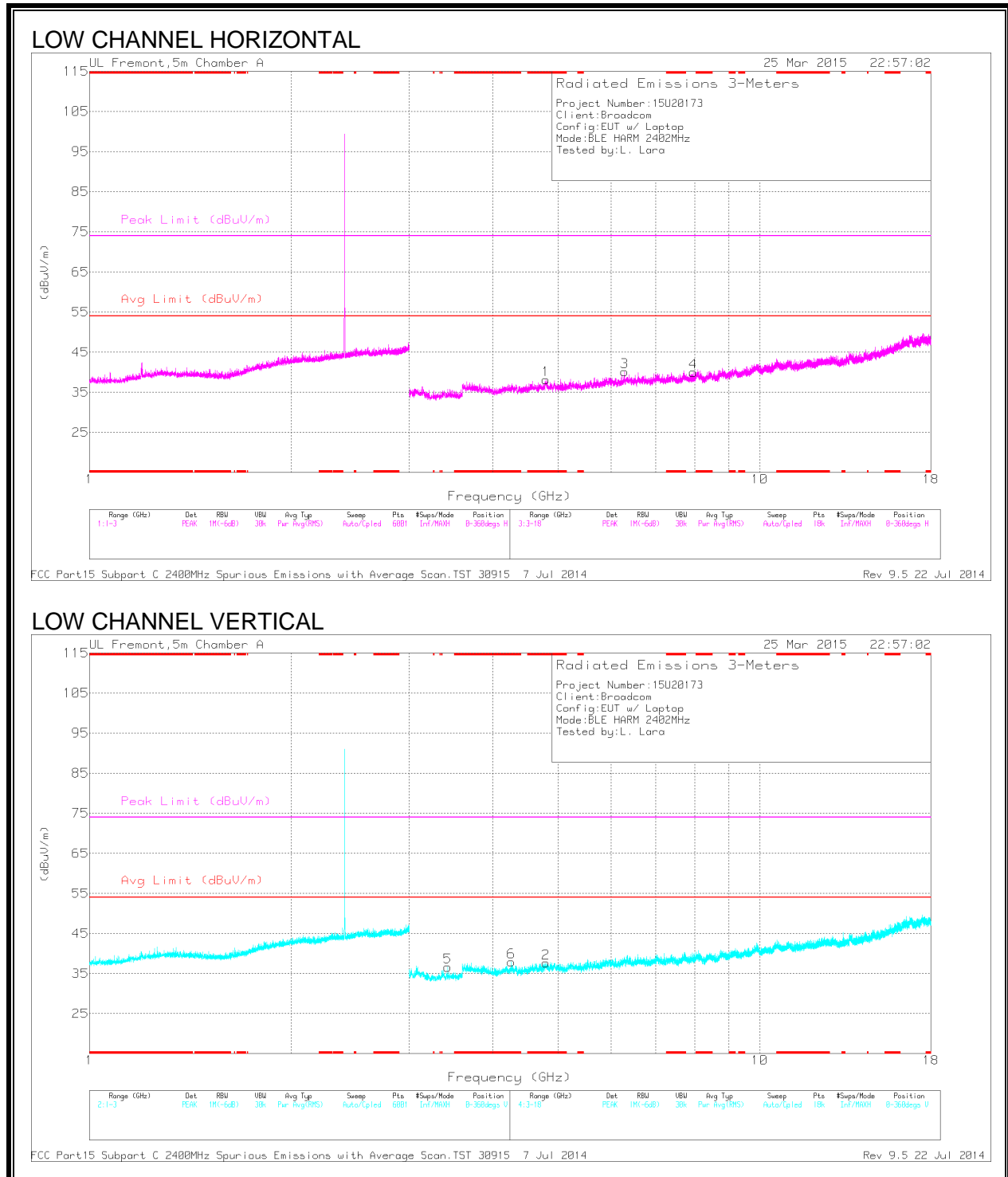
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Filter/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	45.5	PK	32.1	-21.9	0	55.7	-	-	74	-18.3	125	101	V
2	* 2.484	45.16	PK	32.1	-21.9	0	55.36	-	-	74	-18.64	125	101	V
3	* 2.484	29.11	RMS	32.1	-21.9	2.06	41.37	54	-12.63	-	-	125	101	V
4	2.52	30.09	RMS	32.1	-21.9	2.06	42.35	54	-11.65	-	-	125	101	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK - Peak detector
 RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS



LOW CHANNEL DATA

Radiated Emissions

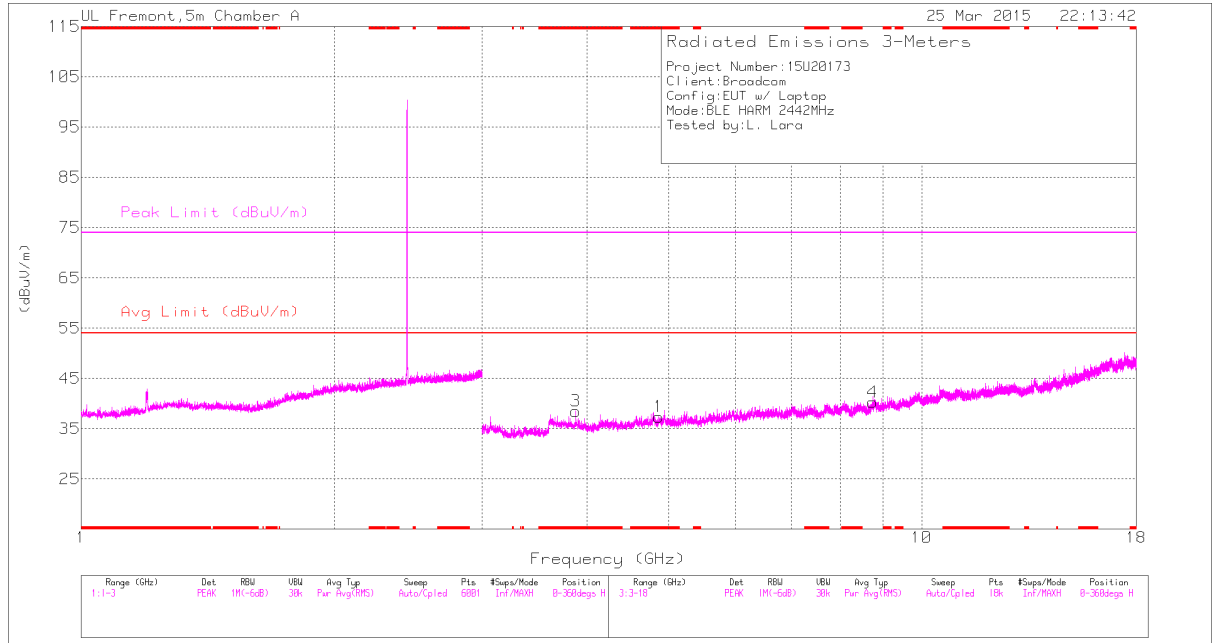
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.802	40.28	PK2	34	-28.4	0	45.88	-	-	74	-28.12	250	212	H
	* 4.802	28.97	MAv1	34	-28.4	2.06	36.63	54	-17.37	-	-	250	212	H
2	* 4.803	40.16	PK2	34	-28.4	0	45.76	-	-	74	-28.24	183	318	V
	* 4.803	28.96	MAv1	34	-28.4	2.06	36.62	54	-17.38	-	-	183	318	V
6	* 4.259	42.68	PK2	33.4	-28.9	0	47.18	-	-	74	-26.82	151	193	V
	* 4.261	28.89	MAv1	33.4	-29	2.06	35.35	54	-18.65	-	-	151	193	V
5	3.422	32.92	PK	33	-29.3	0	36.62	-	-	-	-	0-360	100	V
3	6.283	31.24	PK	35.5	-26.6	0	40.14	-	-	-	-	0-360	201	H
4	7.955	29.78	PK	35.7	-25.5	0	39.98	-	-	-	-	0-360	100	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

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

Note: Signals in non-restricted bands are covered by -20 dBc antenna port spurious testing.

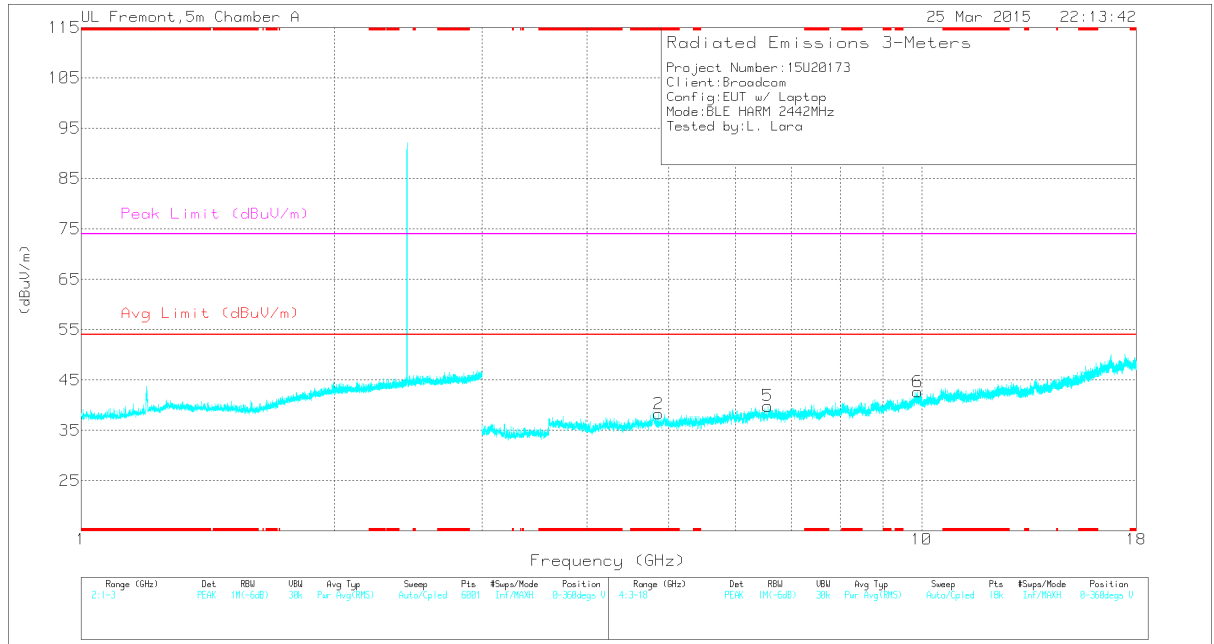
MID CHANNEL HORIZONTAL



FCC Part15 Subpart C 2400MHz Spurious Emissions with Average Scan.TST 30915 7 Jul 2014

Rev 9.5 22 Jul 2014

MID CHANNEL VERTICAL



FCC Part15 Subpart C 2400MHz Spurious Emissions with Average Scan.TST 30915 7 Jul 2014

Rev 9.5 22 Jul 2014

MID CHANNEL DATA

Radiated Emissions

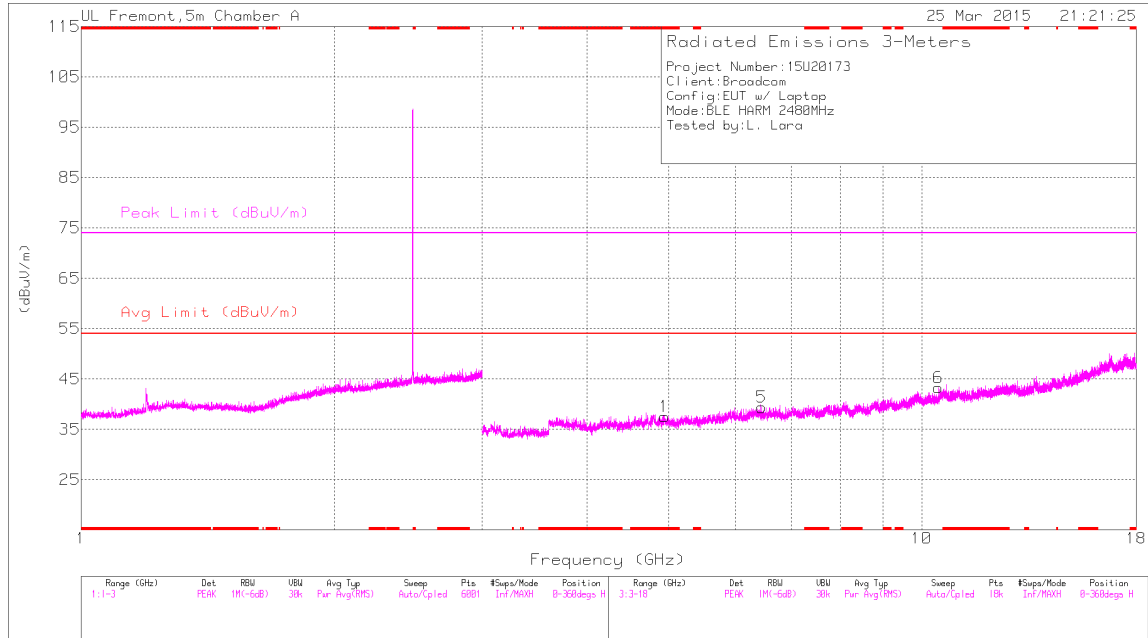
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.884	38.3	PK2	33.9	-27.7	0	44.5	-	-	74	-29.5	66	107	H
	* 4.884	27.61	MAv1	33.9	-27.7	2.06	35.87	54	-18.13	-	-	66	107	H
3	* 3.876	40.14	PK2	33.5	-29.2	0	44.44	-	-	74	-29.56	190	160	H
	* 3.876	28.96	MAv1	33.5	-29.2	2.06	35.32	54	-18.68	-	-	190	160	H
2	* 4.884	39.25	PK2	33.9	-27.7	0	45.45	-	-	74	-28.55	327	200	V
	* 4.884	27.48	MAv1	33.9	-27.7	2.06	35.74	54	-18.26	-	-	327	200	V
5	6.559	30.75	PK	35.6	-26.5	0	39.85	-	-	-	-	0-360	201	V
4	8.741	27.59	PK	36	-23.3	0	40.29	-	-	-	-	0-360	201	H
6	9.895	27.26	PK	37	-21.6	0	42.66	-	-	-	-	0-360	201	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

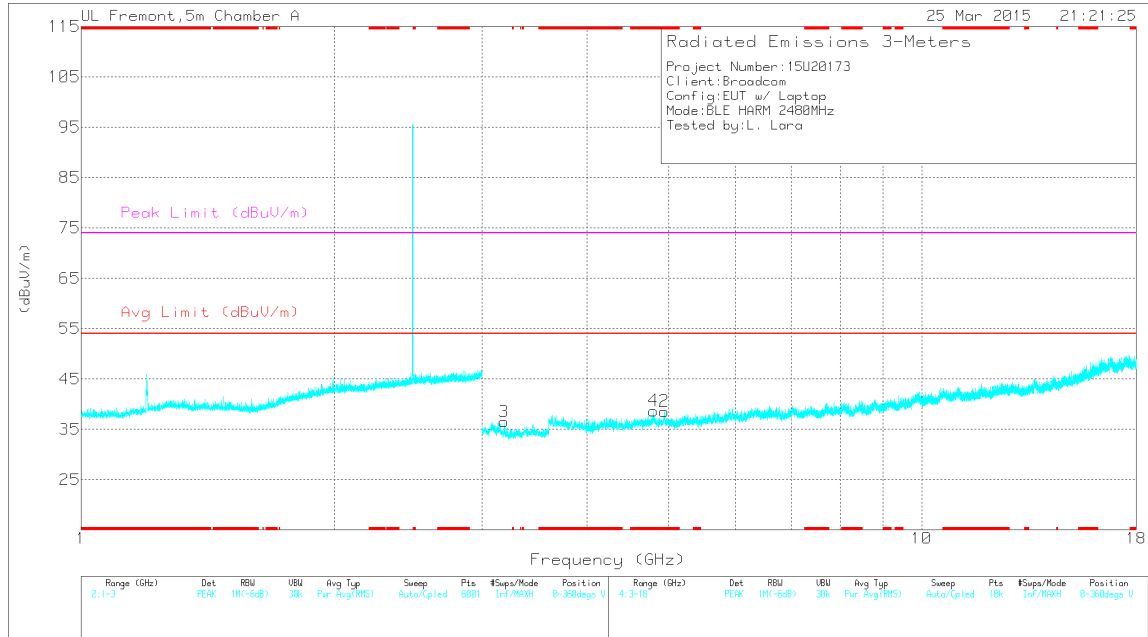
PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

Note: Signals in non-restricted bands are covered by -20 dBc antenna port spurious testing.

HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



HIGH CHANNEL DATA

Radiated Emissions

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/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
4	* 4.798	41.25	PK2	34	-28.4	0	46.85	-	-	74	-27.15	243	298	V
	* 4.799	29.23	MAv1	34	-28.4	2.06	36.89	54	-17.11	-	-	243	298	V
2	* 4.959	39.03	PK2	33.9	-28	0	44.93	-	-	74	-29.07	2	323	V
	* 4.96	27.32	MAv1	33.9	-28	2.06	35.28	54	-18.72	-	-	2	323	V
1	* 4.961	38.95	PK2	33.9	-28	0	44.85	-	-	74	-29.15	58	251	H
	* 4.96	27.49	MAv1	33.9	-28	2.06	35.45	54	-18.55	-	-	58	251	H
6	10.46	27.97	PK	37.5	-22.2	0	43.27	-	-	-	-	0-360	100	H
3	3.186	34.14	PK	32.7	-30.3	0	36.54	-	-	-	-	0-360	201	V
5	6.448	31.87	PK	35.5	-28	0	39.37	-	-	-	-	0-360	100	H

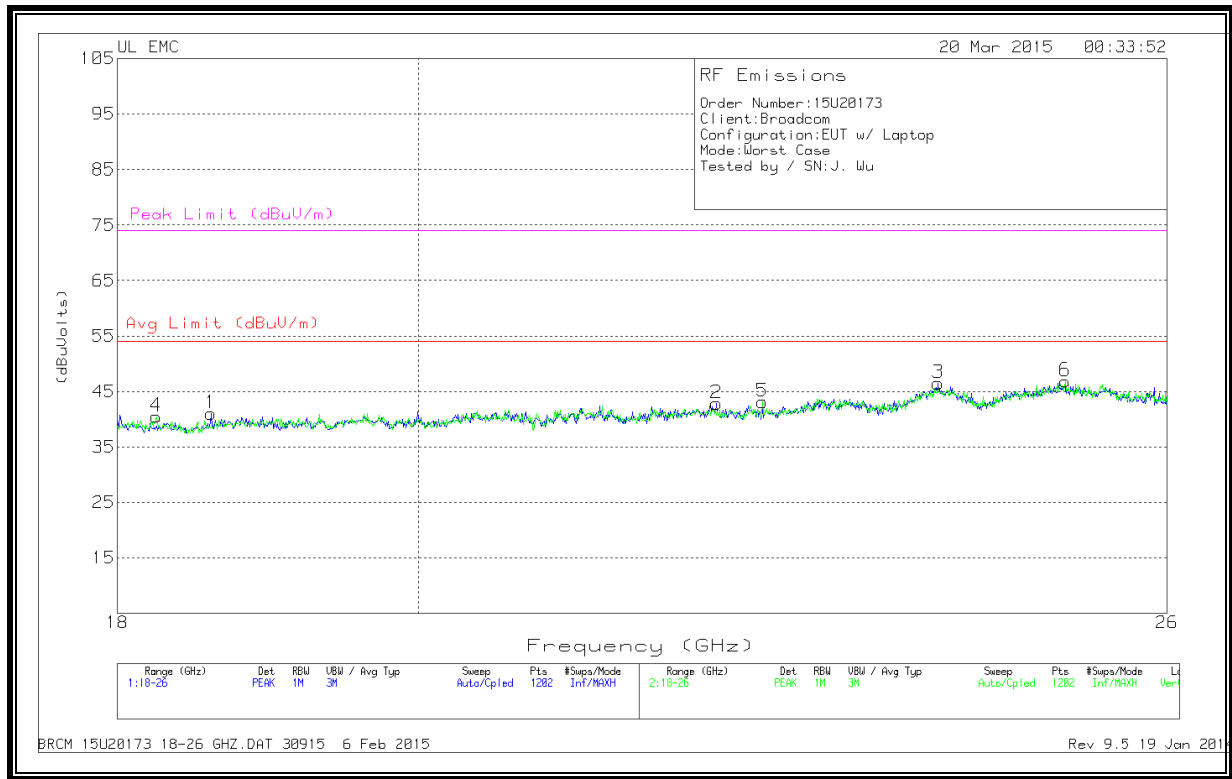
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

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

Note: Signals in non-restricted bands are covered by -20 dBc antenna port spurious testing.

9.3. WORST-CASE 18-26 GHz

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



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T89 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.6	42.4	PK	32.6	-24.5	-9.5	41	54	-13	74	-33
2	22.203	41.83	PK	33.7	-23.2	-9.5	42.83	54	-11.17	74	-31.17
3	23.995	44.5	PK	34.2	-22.7	-9.5	46.5	54	-7.5	74	-27.5
4	18.246	42	PK	32.6	-24.6	-9.5	40.5	54	-13.5	74	-33.5
5	22.563	42.47	PK	33.7	-23.5	-9.5	43.17	54	-10.83	74	-30.83
6	25.087	44.73	PK	34.5	-22.9	-9.5	46.83	54	-7.17	74	-27.177

PK - Peak detector

9.4. WORST-CASE BELOW 1 GHz

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

EMISSIONS 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
1	60.005	56.3	PK	7.6	-30.9	33	40	-7	0-360	400	H
4	60.0475	53.68	PK	7.6	-30.9	30.38	40	-9.62	0-360	101	V
5	173.31	45.58	PK	11.6	-30.1	27.08	43.52	-16.44	0-360	101	V
2	174.0325	50.41	PK	11.6	-30.1	31.91	43.52	-11.61	0-360	100	H
3	353.5	45.85	PK	14.3	-29.2	30.95	46.02	-15.07	0-360	101	H
6	486	38.49	PK	17.7	-28.6	27.59	46.02	-18.43	0-360	200	V

PK - Peak detector

QP - Quasi-Peak detector

9.5. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

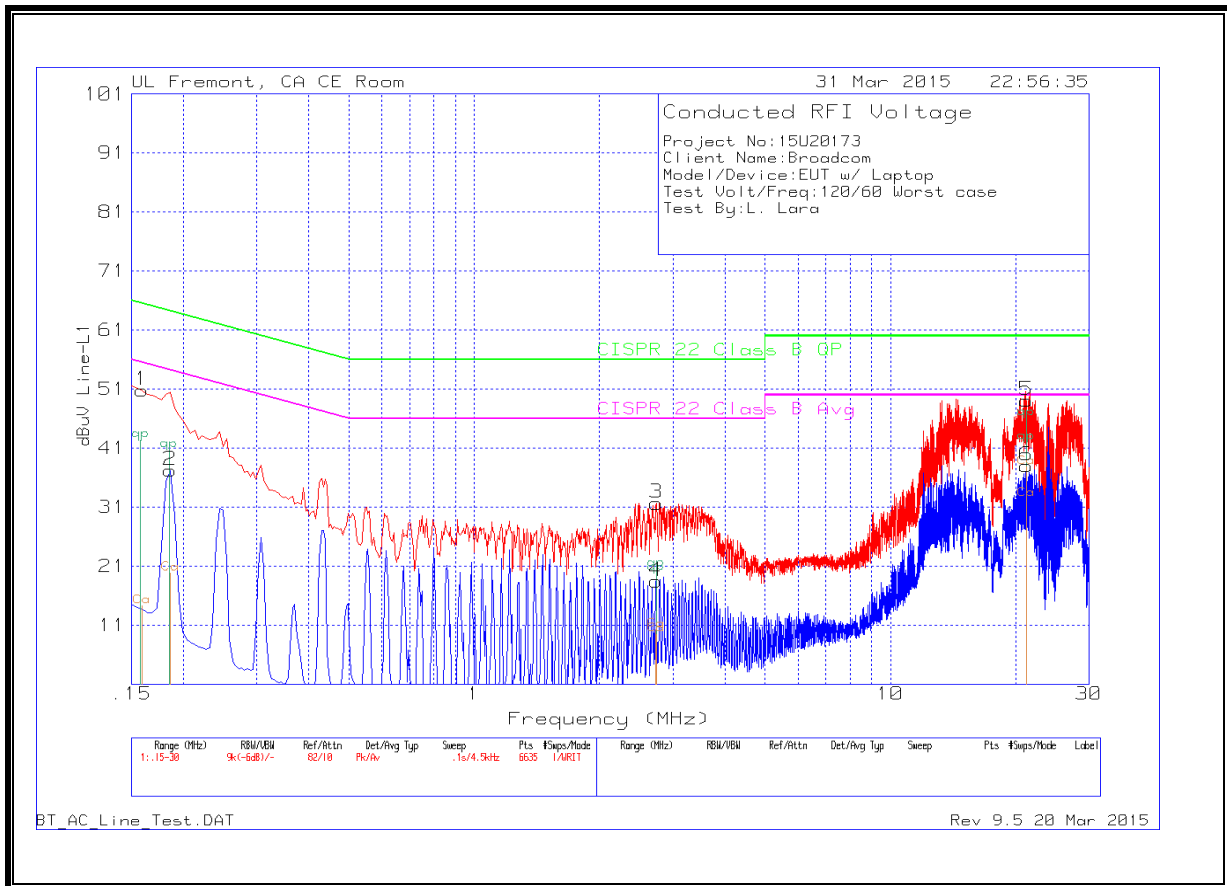
RSS-Gen Clause 8.8

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.

6 WORST EMISSIONS

LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz

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)
.15788	41.06	Qp	1.3	0	42.36	-	-	55.57	-13.21
.18488	39.72	Qp	1	0	40.72	-	-	54.26	-13.54
2.73863	19.51	Qp	.2	.1	19.81	-	-	46	-26.19
2.73413	20.24	Qp	.2	.1	20.54	-	-	46	-25.46
21.2201	41.51	Qp	.3	.2	42.01	-	-	50	-7.99
21.2089	45.61	Qp	.3	.2	46.11	-	-	50	-3.89

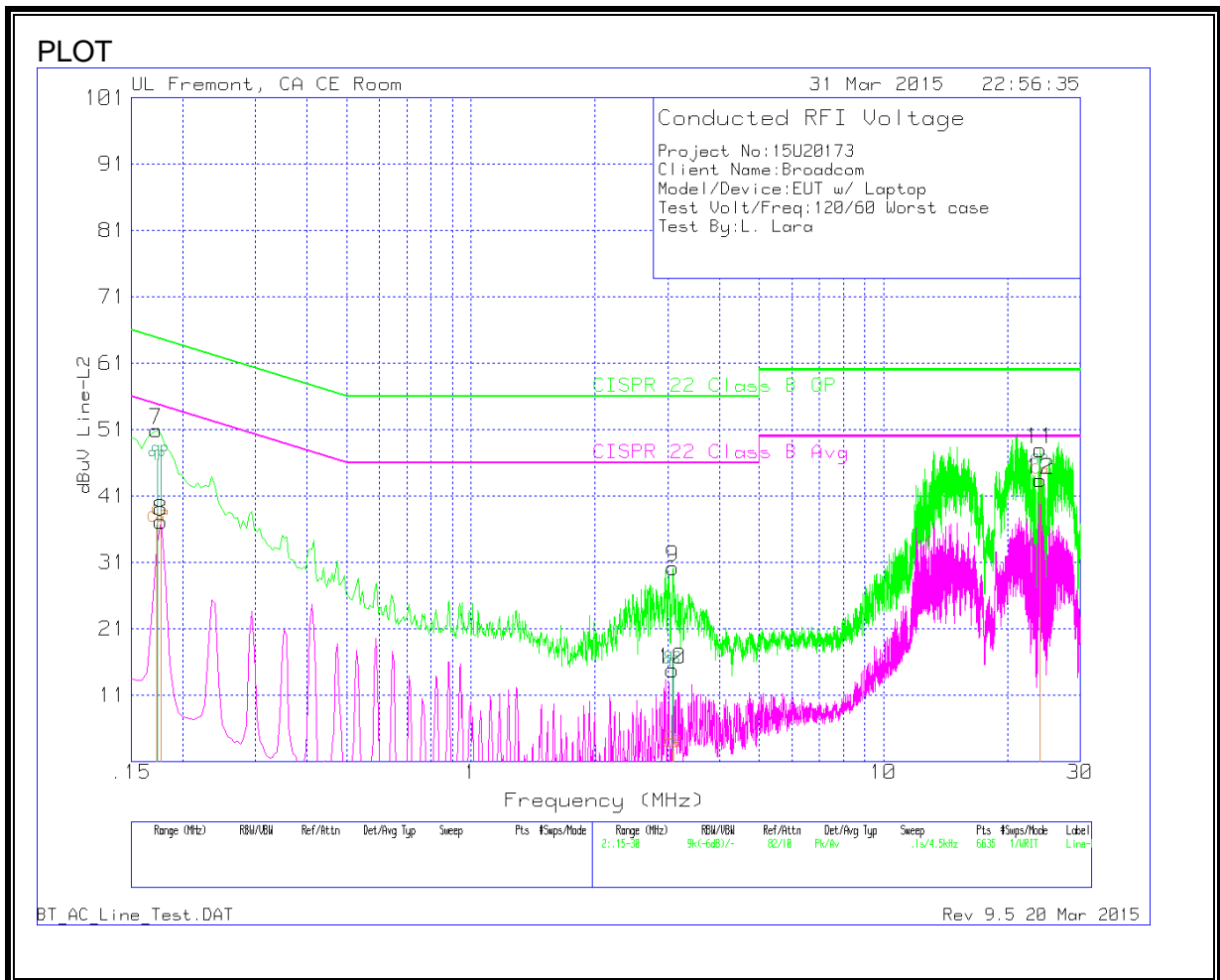
Qp - Quasi-Peak detector

Range 1: Line-L1 .15 - 30MHz

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)
.15788	12.93	Ca	1.3	0	14.23	-	-	55.57	-41.34
.18488	18.8	Ca	1	0	19.8	-	-	54.26	-34.46
2.73863	9.12	Ca	.2	.1	9.42	-	-	46	-36.58
2.73413	9.9	Ca	.2	.1	10.2	-	-	46	-35.8
21.2201	31.89	Ca	.3	.2	32.39	-	-	50	-17.61
21.2089	37.3	Ca	.3	.2	37.8	-	-	50	-12.2

Ca - CISPR average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz

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)
.17363	45.32	Qp	1.2	0	46.52	-	-	54.78	-8.26
.17678	46.08	Qp	1.2	0	47.28	-	-	54.64	-7.36
3.08918	15.98	Qp	.2	.1	16.28	-	-	46	-29.72
3.07928	14.99	Qp	.2	.1	15.29	-	-	46	-30.71
23.9989	45.52	Qp	.3	.2	46.02	-	-	50	-3.98

Qp - Quasi-Peak detector

Range 2: Line-L2 .15 - 30MHz

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)
.17363	35.43	Ca	1.2	0	36.63	-	-	54.78	-18.15
.17678	36.41	Ca	1.2	0	37.61	-	-	54.64	-17.03
3.08918	3.32	Ca	.2	.1	3.62	-	-	46	-42.38
3.07928	2.27	Ca	.2	.1	2.57	-	-	46	-43.43
23.9989	43.38	Ca	.3	.2	43.88	-	-	50	-6.12

Ca - CISPR average detection