



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

CERTIFICATION TEST REPORT

FOR

802.11b/g/n/a/ac WLAN + Bluetooth PCI-E NGFF 2230 Card

MODEL NUMBER: BCM94350ZAE

FCC ID: QDS-BRCM1087

IC ID: 4324A-BRCM1087

REPORT NUMBER: 15U20284-E7 Revision A

ISSUE DATE: JULY 9, 2015

Prepared for
**BROADCOM CORPORATION
190 MATHILDA PLACE
SUNNYVALE, CA 94086, U.S.A.**

Prepared by
**UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888**



NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	6/26/15	Initial Issue	H. Mustapha
A	7/9/15	Updated deviation statement in section 2 to indicate "ANSI 63.10-2013" Updated the duty cycle correction factor in section 9.2	H. Mustapha

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	7
3. FACILITIES AND ACCREDITATION	7
4. CALIBRATION AND UNCERTAINTY	7
4.1. MEASURING INSTRUMENT CALIBRATION	7
4.2. SAMPLE CALCULATION	7
4.3. MEASUREMENT UNCERTAINTY	8
5. EQUIPMENT UNDER TEST	9
5.1. DESCRIPTION OF EUT	9
5.2. MAXIMUM OUTPUT POWER.....	9
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	9
5.4. SOFTWARE AND DRIVER.....	9
5.5. WORST-CASE CONFIGURATION AND MODE	9
5.6. DESCRIPTION OF TEST SETUP.....	10
6. TEST AND MEASUREMENT EQUIPMENT	12
7. MEASUREMENT METHODS	13
8. ANTENNA PORT TEST RESULTS	14
8.1. ON TIME AND DUTY CYCLE	14
8.2. 6 dB BANDWIDTH.....	15
8.3. 99% BANDWIDTH.....	18
8.4. OUTPUT POWER.....	21
8.5. AVERAGE POWER	24
8.6. POWER SPECTRAL DENSITY	25
8.7. CONDUCTED SPURIOUS EMISSIONS.....	28
9. RADIATED TEST RESULTS.....	32
9.1. LIMITS AND PROCEDURE	32
9.2. BLUETOOTH LOW ENERGY MODE IN THE 2.4 GHz BAND	33
9.3. WORST-CASE 18-26 GHz	43
9.4. WORST-CASE BELOW 1 GHz.....	44
10. AC POWER LINE CONDUCTED EMISSIONS	45

11.	SETUP PHOTOS	50
11.1.	ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP	50
11.2.	RADIATED RF MEASUREMENT SETUP	51
11.3.	POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP	53

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 WLAN + Bluetooth PCI-E NGFF 2230 Card

MODEL: BCM94350ZAE

SERIAL NUMBER: P215 SN: 398 (Radiated Sample) and SN: 397 (Conducted Sample)

DATE TESTED: MAY 22 - MAY 28, 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:

Tested By:

Huda Mustapha



HUDA MUSTAPHA
PROJECT LEAD
UL Verification Services Inc.

Danny Vu
EMC ENGINEER
UL Verification Services Inc.



FRANK IBRAHIM
PROGRAM MANAGER
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-247 Issue 1.

Deviation from the above cited ANSI C63.10-2013 standard: the EUT was test at 0.8 m height for all radiated testing.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☒ Chamber A	☐ Chamber D
☐ Chamber B	☐ Chamber E
☐ Chamber C	☐ Chamber F

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 WLAN + Bluetooth PCI-E NGFF 2230 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	5.07	3.21

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The EUT utilizes an 802.11a/b/g/n/ac WLAN/BT antenna with a maximum gain of 3.60 dBi for BLE.

5.4. SOFTWARE AND DRIVER

The EUT driver software installed during testing was Broadcom, Ver. 5.6.0.9020.

The test utility software used during testing was Broadcom Bluetooth, Ver. 1.9.0.8.

5.5. WORST-CASE CONFIGURATION AND MODE

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

Radiated emission below 1GHz, above 18GHz, 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 J0 (WiFi 1) is used for testing BT.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	G560	CB06123814	DoC
AC Adapter	Lenovo	PA1650-56LC	36001651	DoC
Catalyst PCIe. Board	Enterprises Inc.	NA	NA	N/A
Laptop	Dell	Latitude E6400	6MYFMJ1	DoC
AC Adapter	Dell	PA2 /CF745	CN-OCF745-48661	DoC

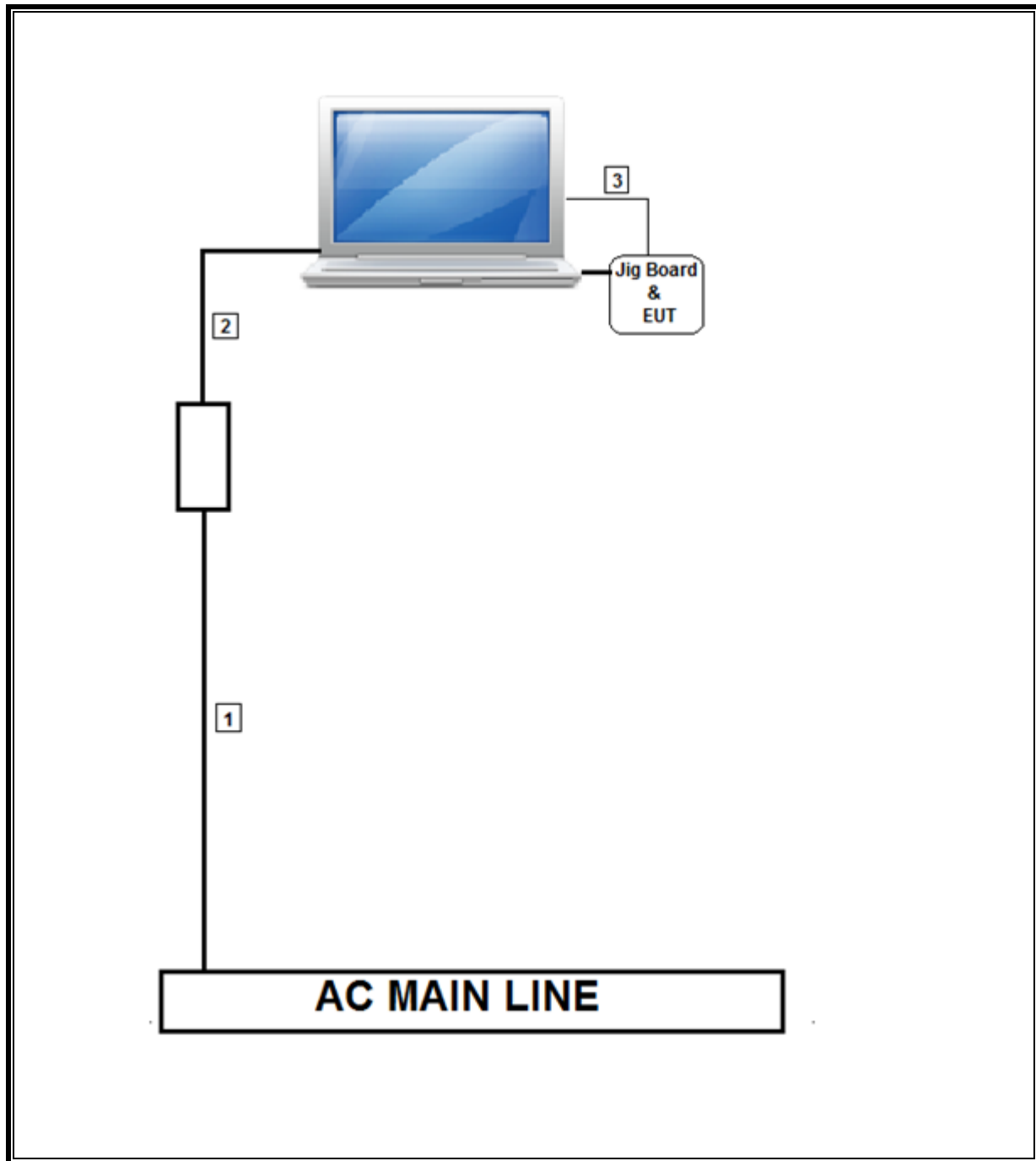
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US 115V	Unshielded	1	
2	DC	1	DC	Unshielded	0.8	
3	USB	1	USB	Unshielded	0.8	

TEST SETUP

The EUT was installed on a jig board and was 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	Asset	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	136	09/10/14	09/10/15
Horn Antenna 1-18GHz	ETS	3117	345	03/03/15	03/03/16
Preamp 1-26.5GHz	Agilent	8449B	404	04/13/15	04/03/16
Preamp 10kHz-1000MHz	Sonoma	310	300	11/01/14	11/01/15
Preamp 1-18GHz	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	284	09/16/14	09/16/15
Spectrum Analyzer 3Hz to 44Ghz	Agilent	E4440A	123	10/18/14	10/18/15
Power Meter	Agilent	N1911A	377	06/30/14	06/30/15
Power Sensor	Agilent	E9327A	117	03/09/15	03/09/16
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.

AC Power-line conducted emissions: ANSI C63.10-2009 and C63.10-2013, Section 6.2.

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

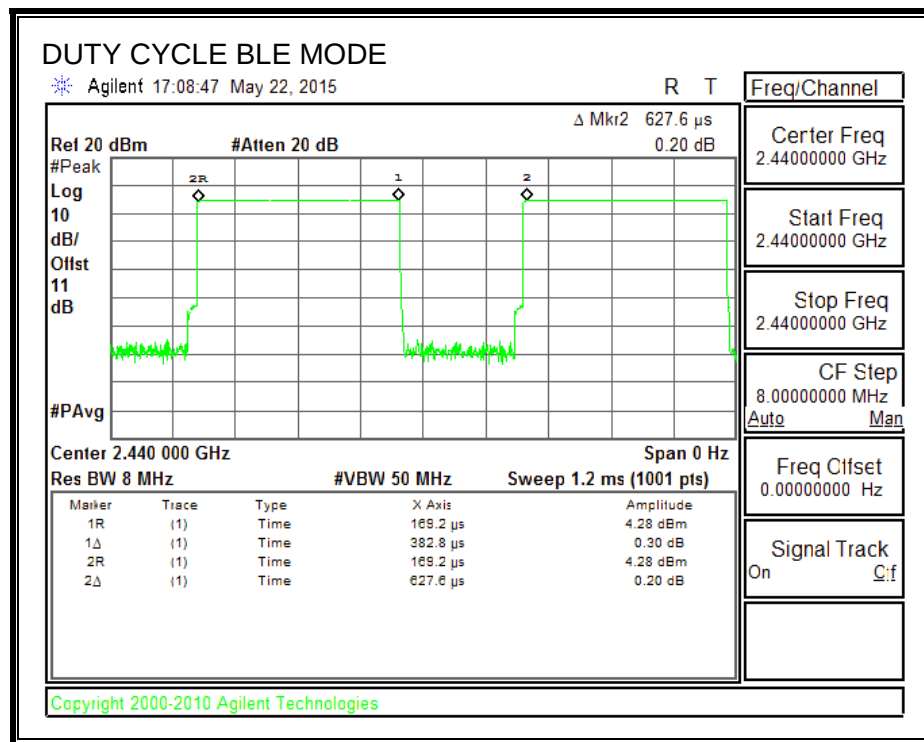
LIMITS

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	0.3828	0.6276	0.610	60.99%	2.15

DUTY CYCLE PLOT



8.2. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

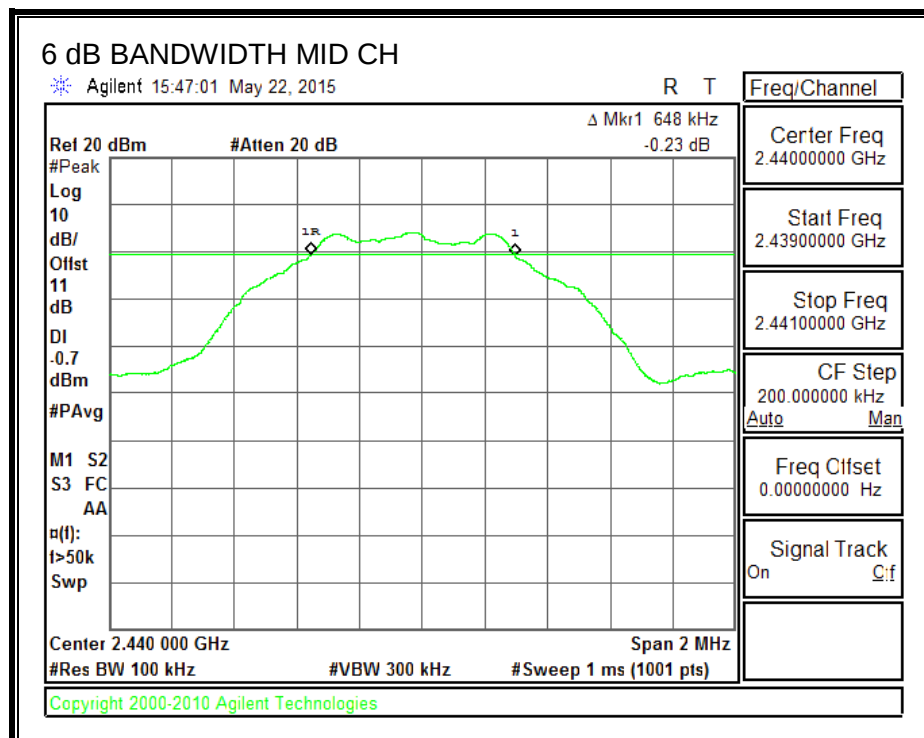
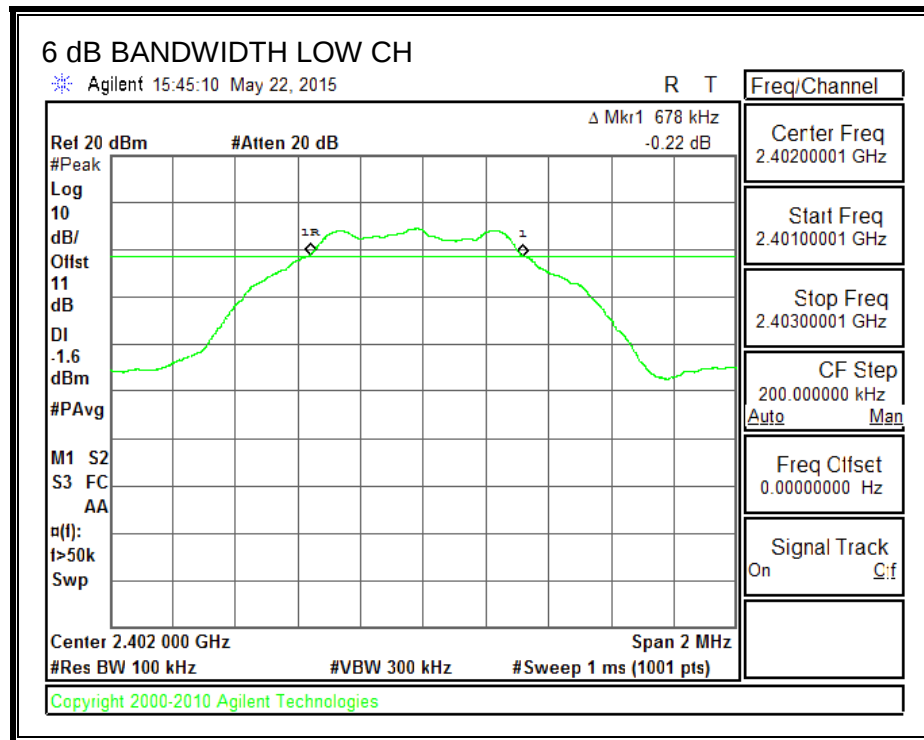
IC RSS-247 5.2 (1)

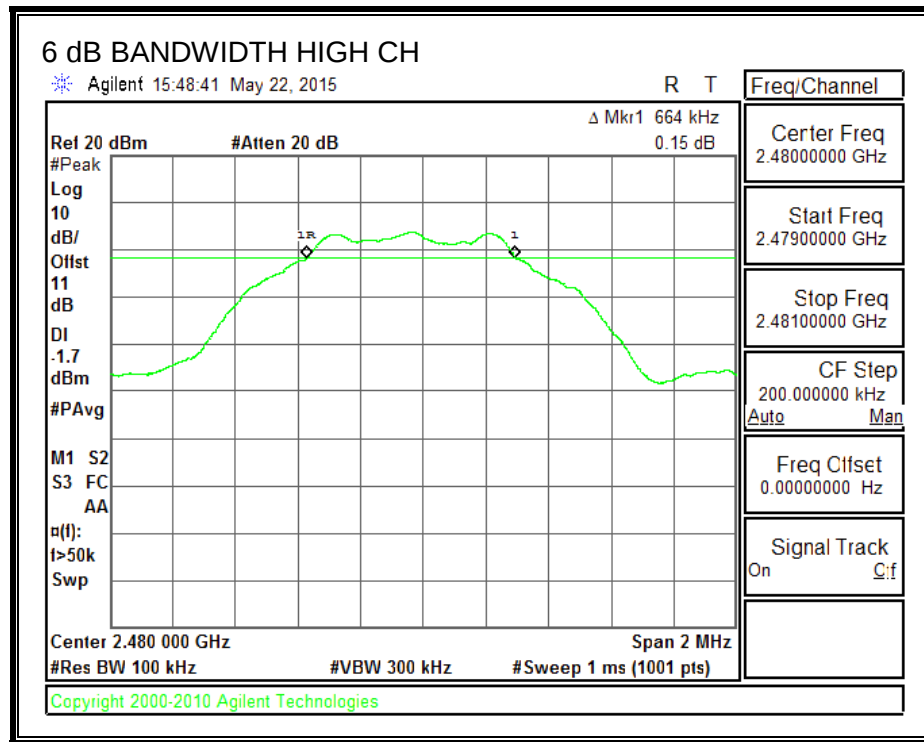
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.678	0.5
Middle	2440	0.648	0.5
High	2480	0.664	0.5

6 dB BANDWIDTH





8.3. 99% BANDWIDTH

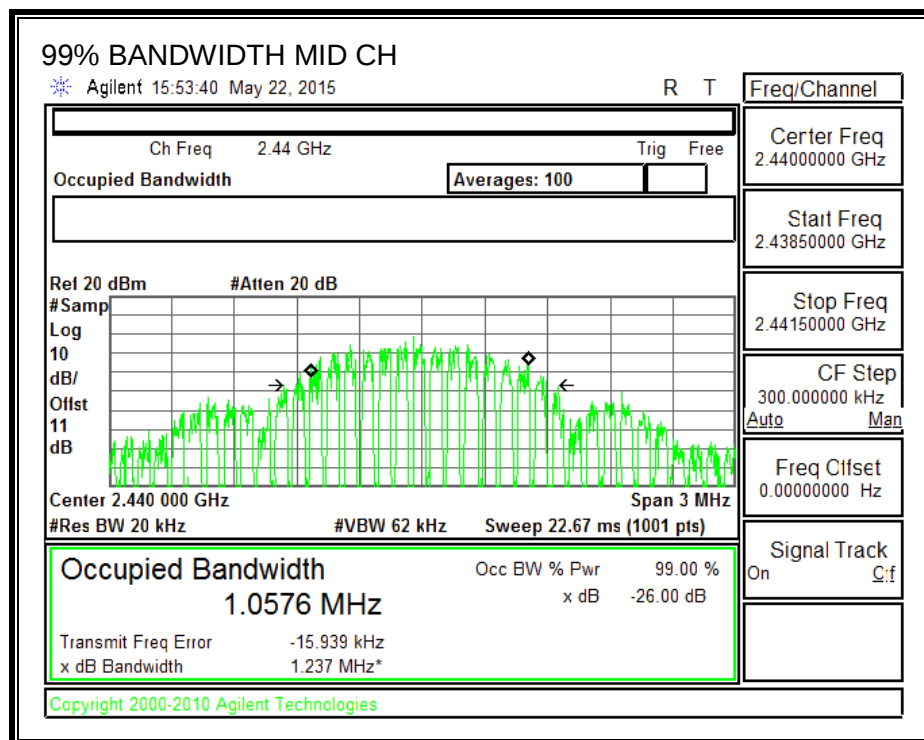
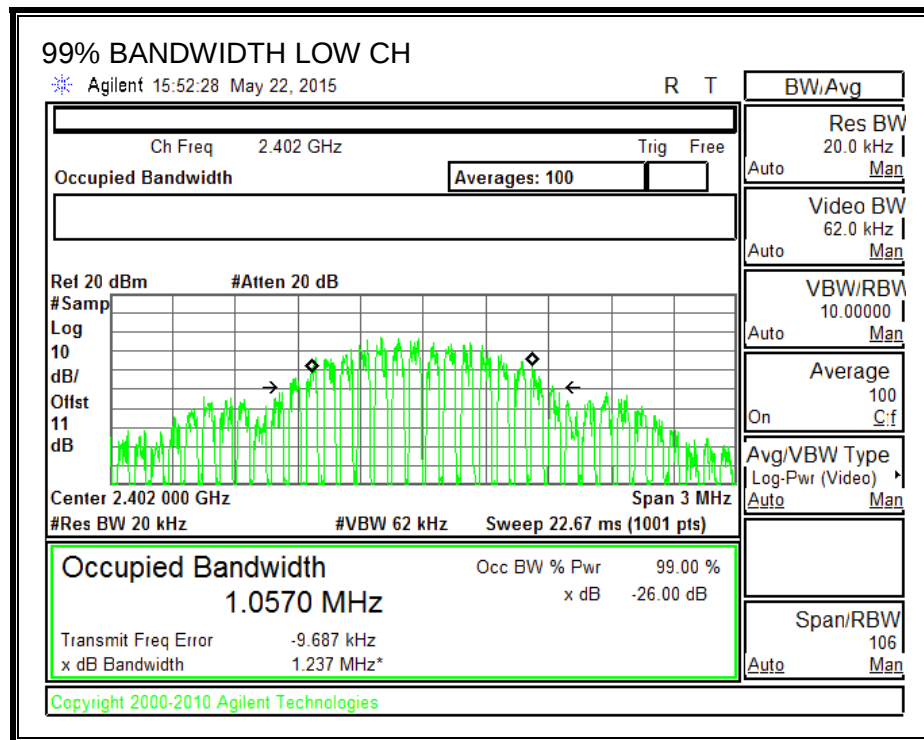
LIMITS

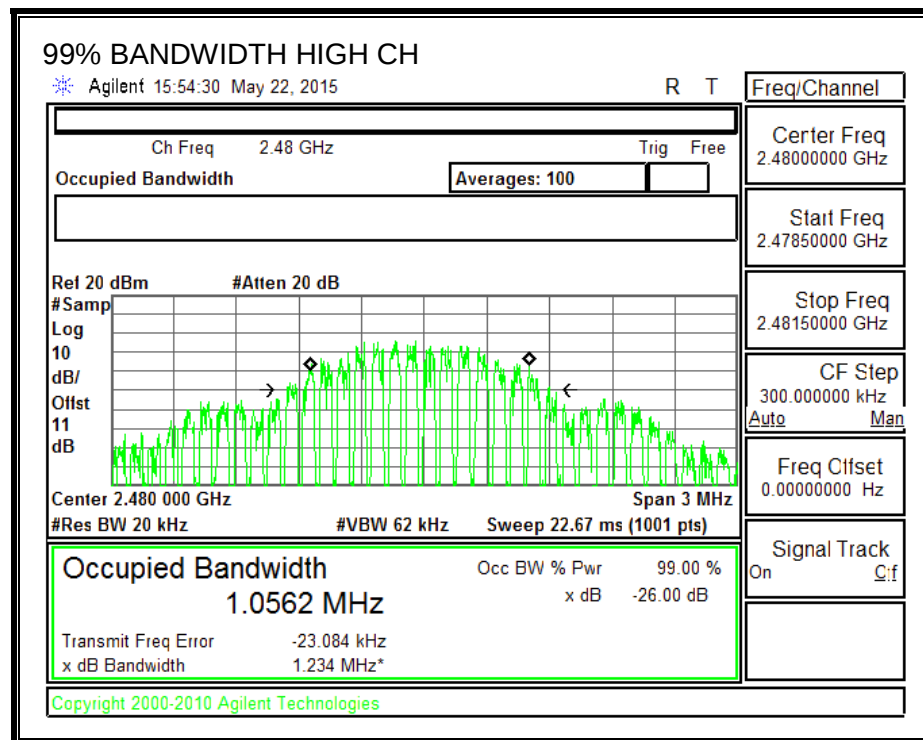
None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0570
Middle	2440	1.0576
High	2480	1.0562

99% BANDWIDTH





8.4. PEAK OUTPUT POWER

LIMITS

FCC §15.247 (b)

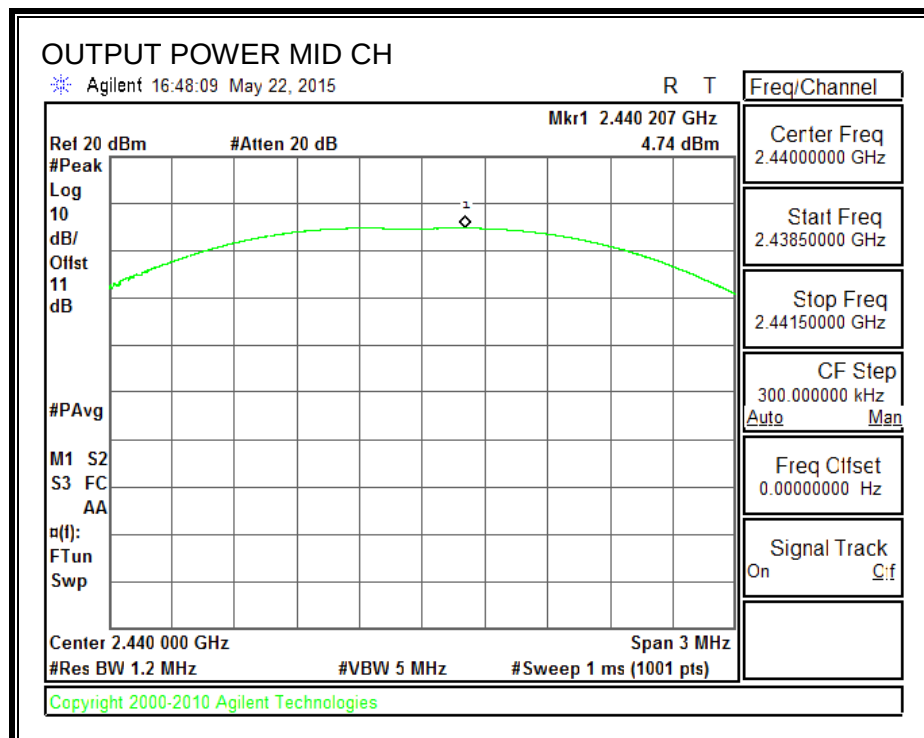
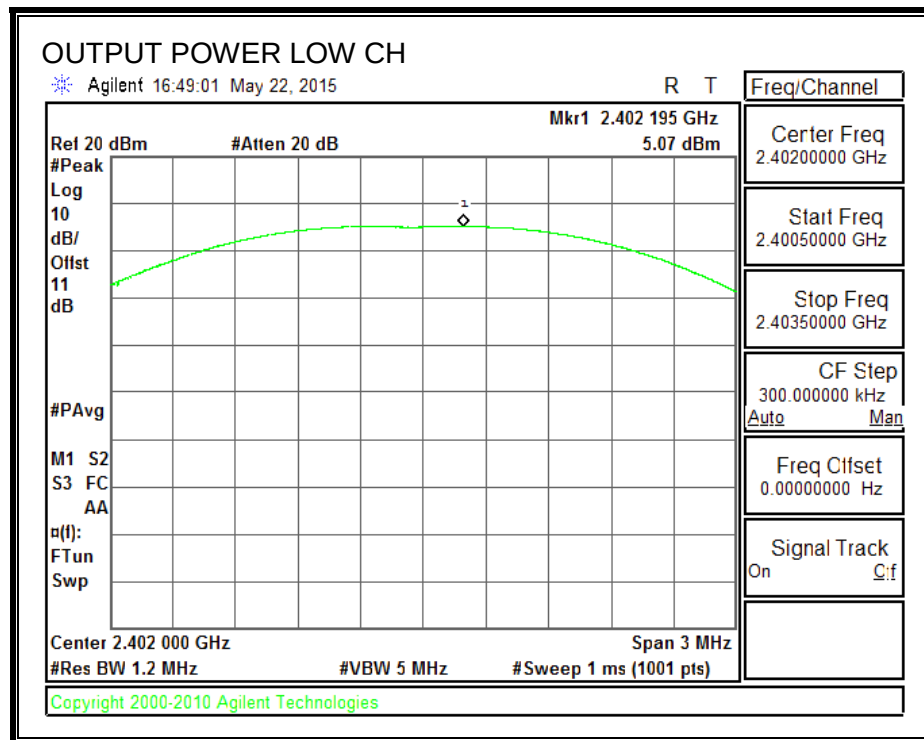
IC RSS-247 5.4 (4)

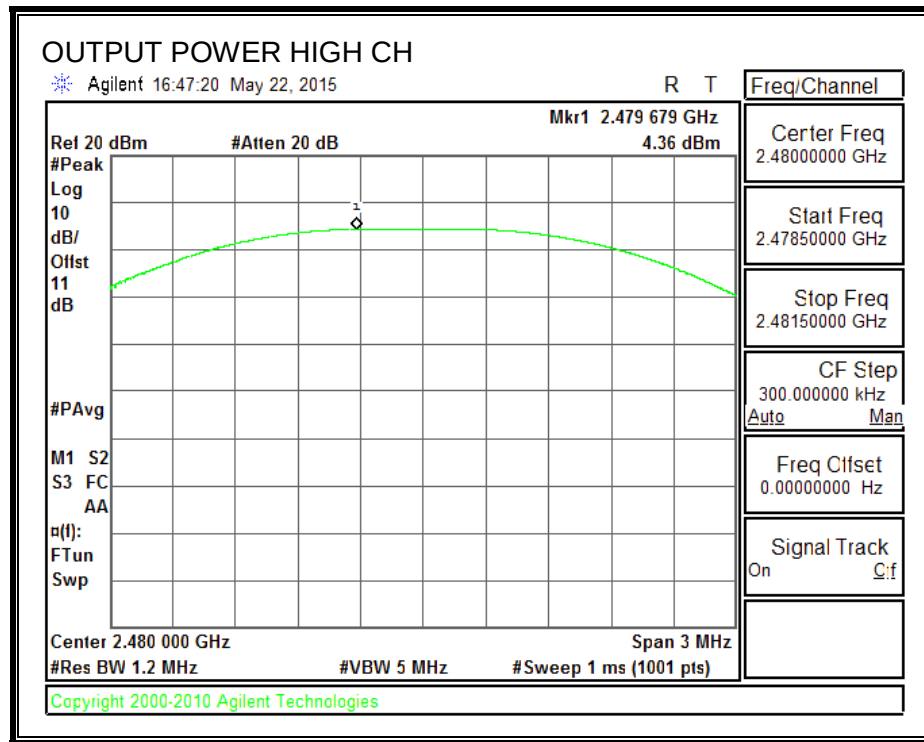
The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	5.07	30	-24.930
Middle	2440	4.74	30	-25.260
High	2480	4.36	30	-25.640

OUTPUT POWER





8.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	3.85
Middle	2440	3.26
High	2480	2.67

8.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

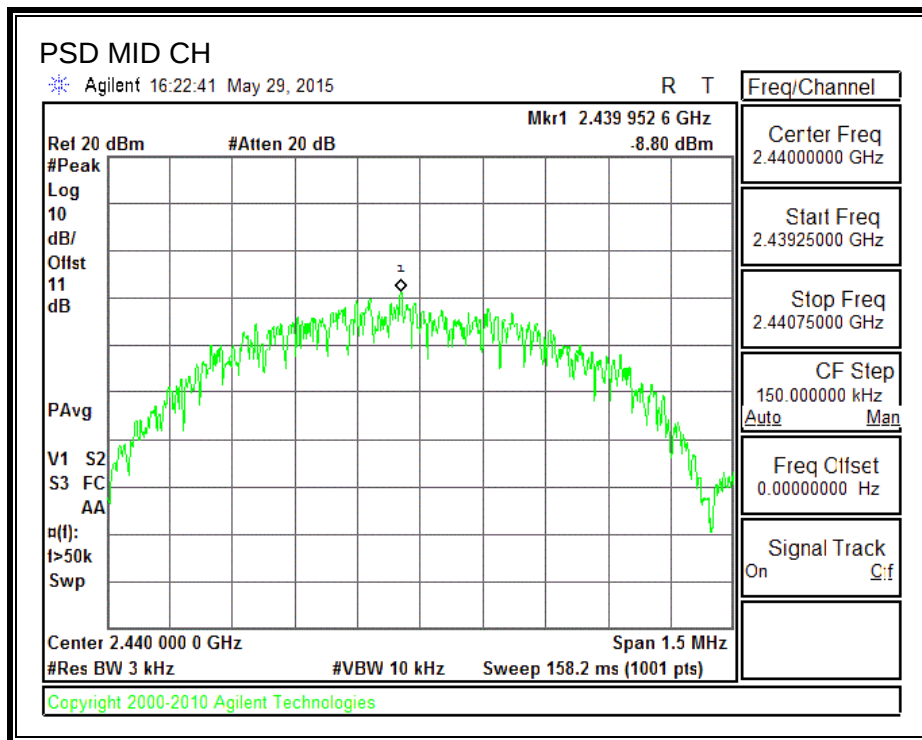
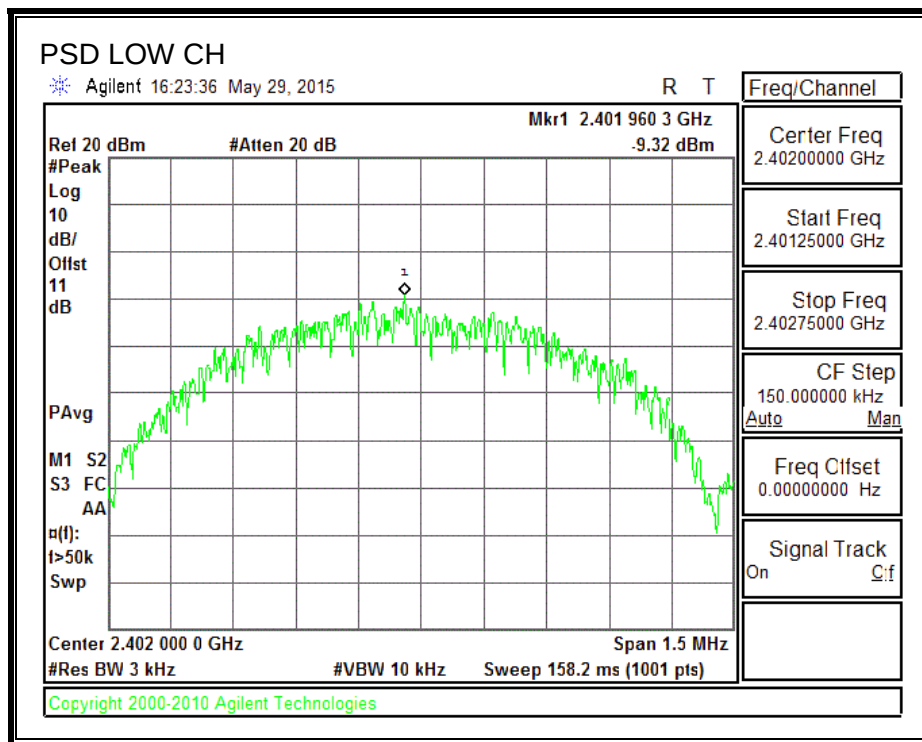
IC RSS-247 5.2 (2)

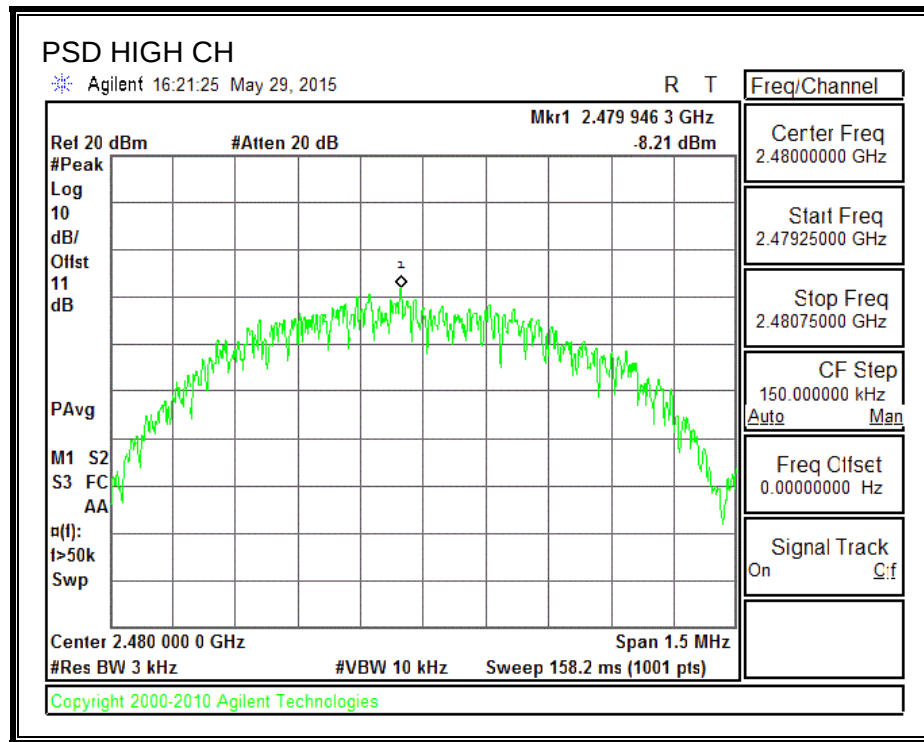
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-9.320	8	-17.32
Middle	2440	-8.800	8	-16.80
High	2480	-8.210	8	-16.21

POWER SPECTRAL DENSITY





8.7. CONDUCTED SPURIOUS EMISSIONS

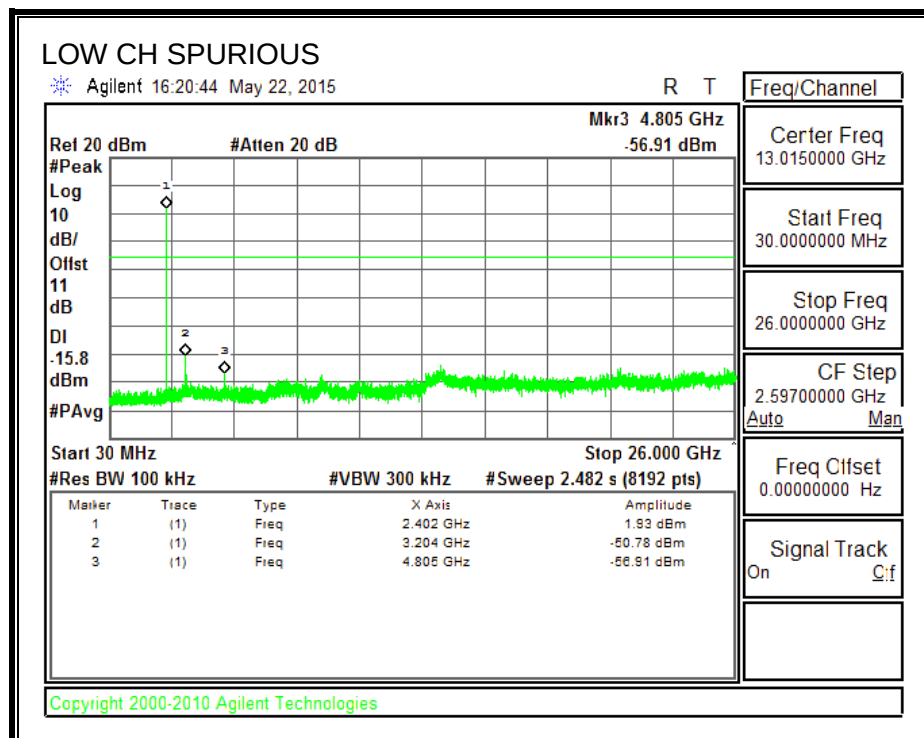
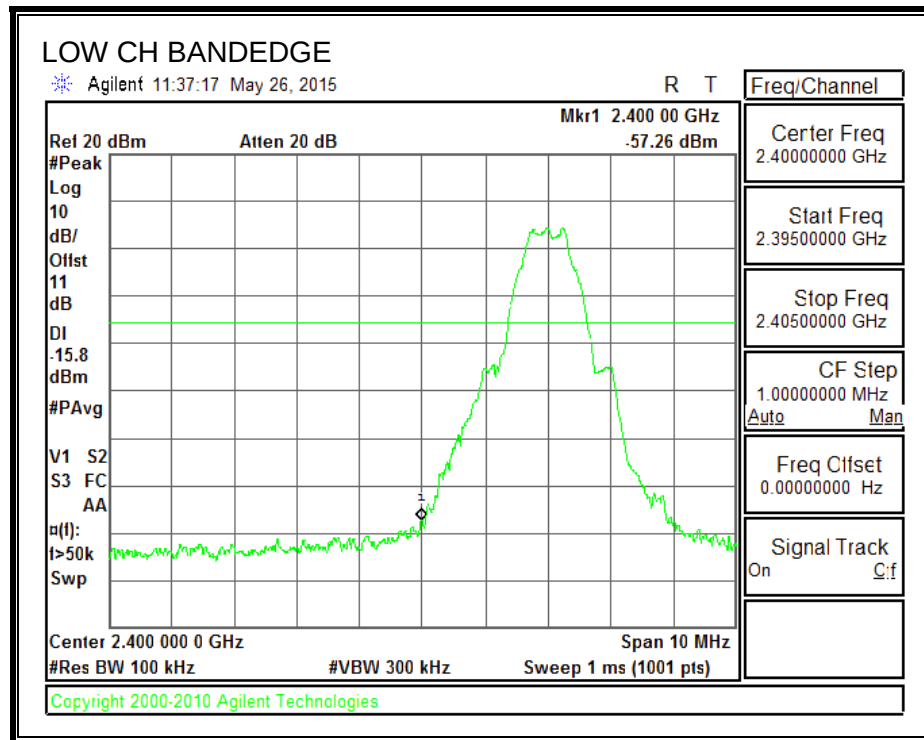
LIMITS

FCC §15.247 (d)

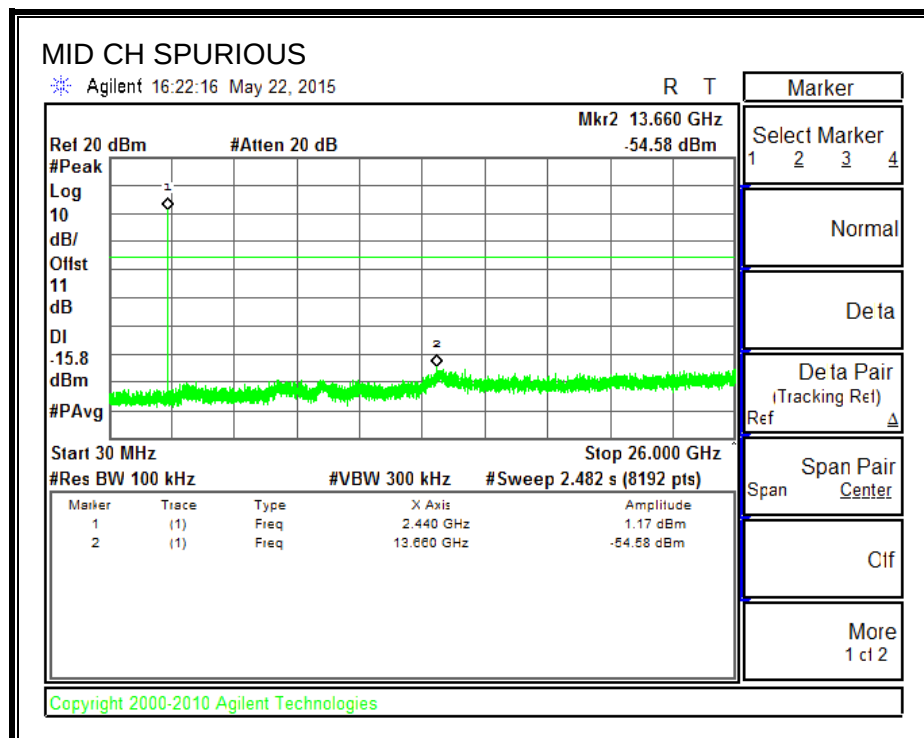
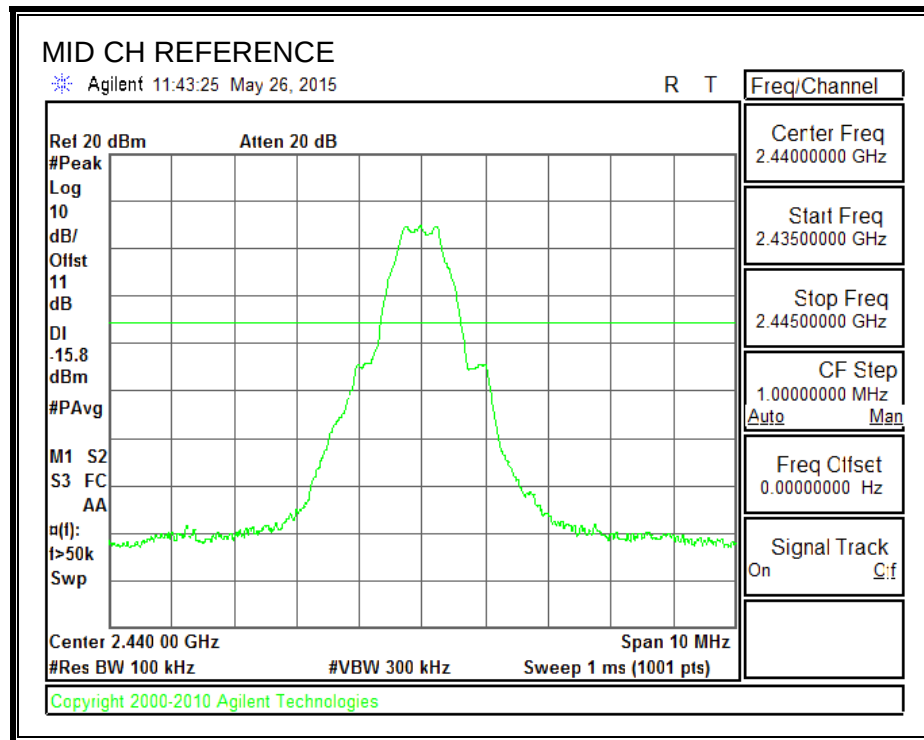
IC RSS-247 5.5

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

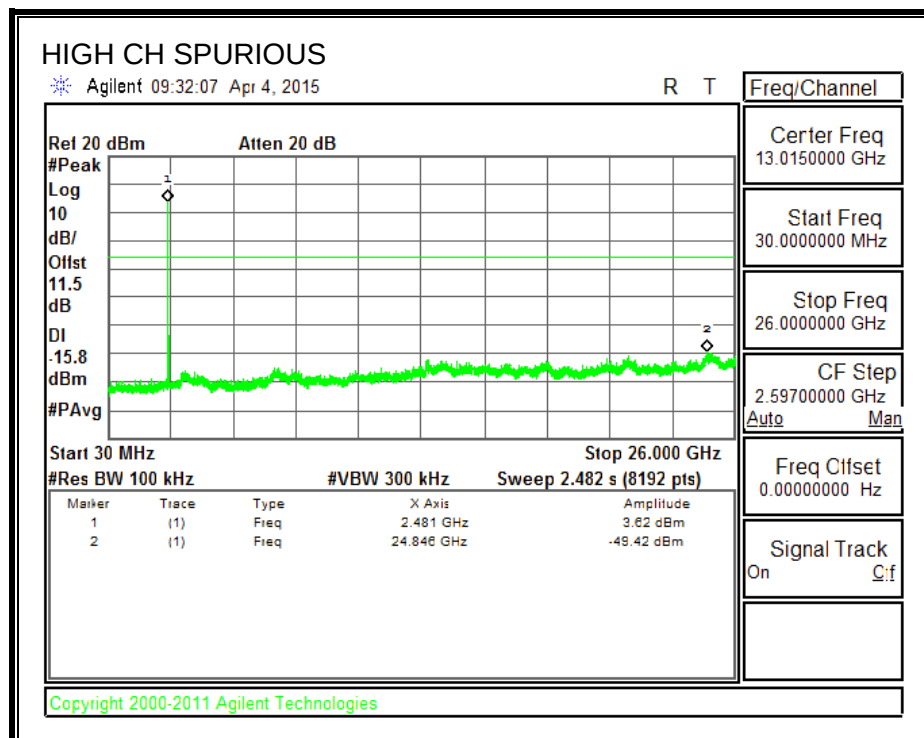
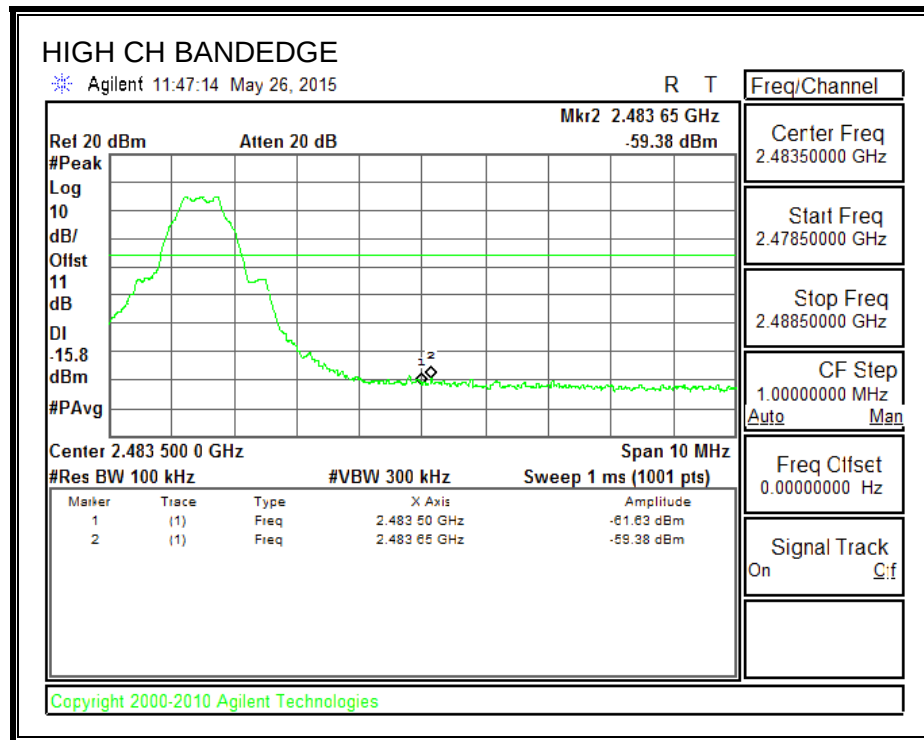
SPURIOUS EMISSIONS, LOW CHANNEL



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



9. RADIATED TEST RESULTS

9.1. LIMITS

LIMITS

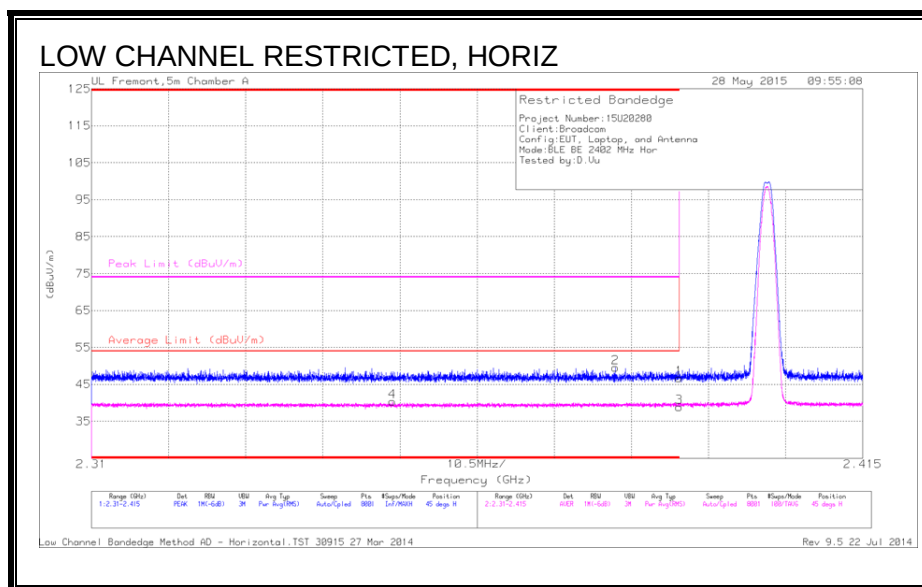
FCC §15.205 and §15.209

IC RSS-GEN Clause 8.9 (Transmitter)

Frequency Range (MHz)	Field Strength Limit ($\mu\text{V/m}$) at 3 m	Field Strength Limit (dB $\mu\text{V/m}$) 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/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	39.61	PK	32	-24.9	0	46.71	-	-	74	-27.29	45	272	H
2	* 2.381	42.51	PK	31.9	-24.9	0	49.51	-	-	74	-24.49	45	272	H
3	* 2.39	29.68	RMS	32	-24.9	2.15	38.93	54	-15.07	-	-	45	272	H
4	* 2.351	31.26	RMS	31.9	-24.9	2.15	40.41	54	-13.59	-	-	45	272	H

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

PK - Peak detector

RMS - RMS detection

LOW CHANNEL RESTRICTED, VERT

UL Fremont, 5m Chamber A

28 May 2015 10:03:06

Restricted Bandedge

Project Number: 15U28288
Client: Broadcom
Config: EUT, Laptop, and Antenna
Note: BLE BE 2482 MHz Ver
Tested by: D.Wu

Peak Limit (dBu/m)

Average Limit (dBu/m)

2.31 2.415

10.5MHz/

Frequency (GHz)

Range (GHz)	Det	RBW	VBW	Avg Type	Sweep	Flux	Edge Mode	Position
1.2-31.2-415	Peak	100-GHz	3K	Pre-Avg (RMS)	Auto/10dB	dBm	dBm/Hz	71 steps 0

Range (GHz)	Det	RBW	VBW	Avg Type	Sweep	Flux	Edge Mode	Position
2.2-31.2-415	dBm	100-GHz	3K	Pre-Avg (RMS)	Auto/10dB	dBm	dBm/Hz	71 steps 0

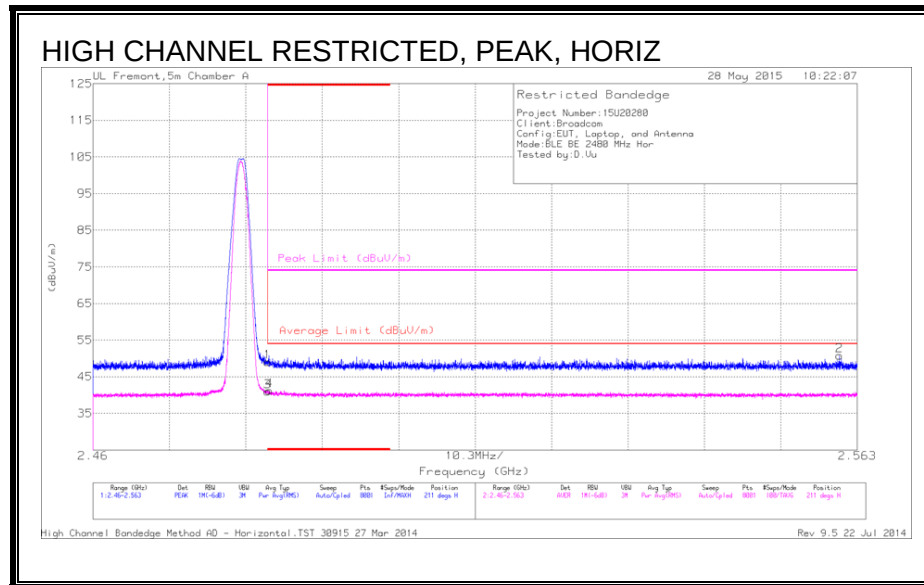
Low Channel Bandedge Method RD - Vertical.TST 30915 27 Mar 2014

Rev 9.5.22 Jul 2014

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
2	* 2.367	42.52	PK	31.9	-25	0	49.42	-	-	74	-24.58	71	274	V
4	* 2.386	31.12	RMS	32	-24.9	2.15	40.37	54	-13.63	-	-	71	274	V
1	* 2.39	39.22	PK	32	-24.9	0	46.32	-	-	74	-27.68	71	274	V
3	* 2.39	30.73	RMS	32	-24.9	2.15	39.98	54	-14.02	-	-	71	274	V

RMS - RMS detection

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



Trace Markers

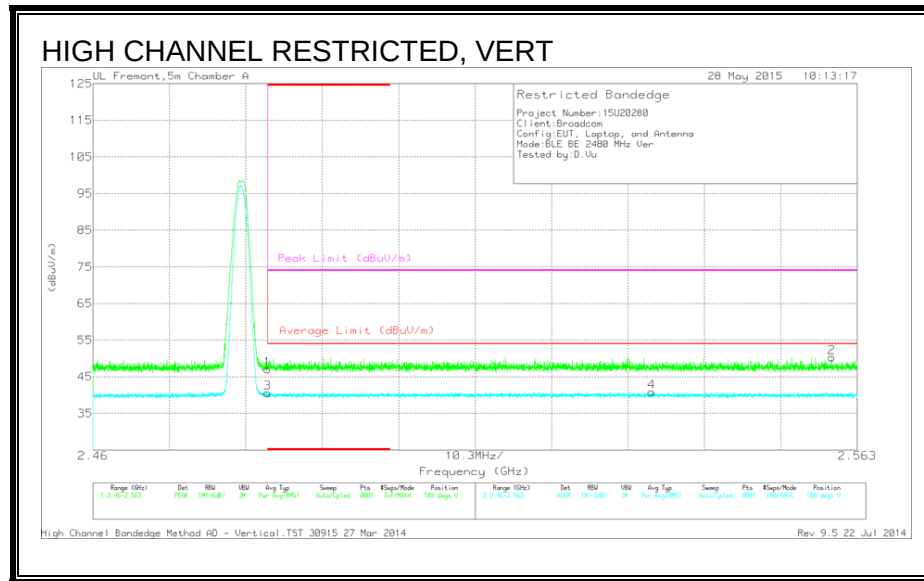
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.71	PK	32.1	-24.8	0	49.01	-	-	74	-24.99	211	226	H
3	* 2.484	31.58	RMS	32.1	-24.8	2.15	41.03	54	-12.97	-	-	211	226	H
4	* 2.484	31.85	RMS	32.1	-24.8	2.15	41.30	54	-12.70	-	-	211	226	H
2	2.561	43.28	PK	32.2	-24.7	0	50.78	-	-	74	-23.22	211	226	H

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

PK - Peak detector

RMS - RMS detection

RESTRICTED BANDEDGE (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	39.73	PK	32.1	-24.8	0	47.03	-	-	74	-26.97	108	332	V
3	* 2.484	31.17	RMS	32.1	-24.8	2.15	40.62	54	-13.38	-	-	108	332	V
4	2.535	31.42	RMS	32.1	-24.7	2.15	40.97	54	-13.03	-	-	108	332	V
2	2.56	42.84	PK	32.2	-24.7	0	50.34	-	-	74	-23.66	108	332	V

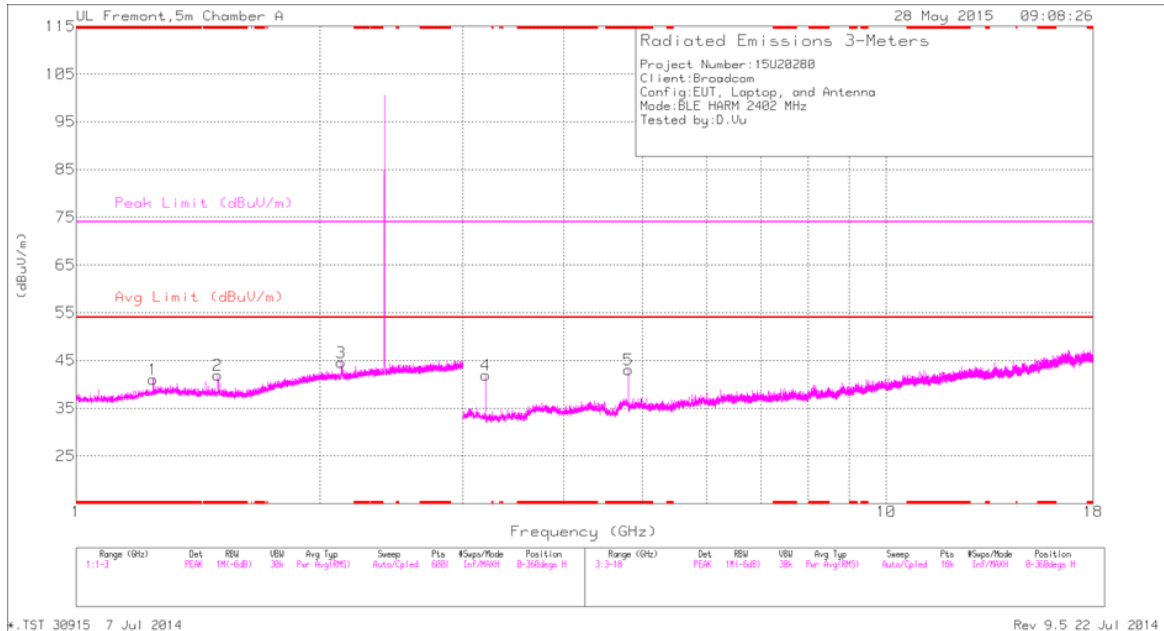
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

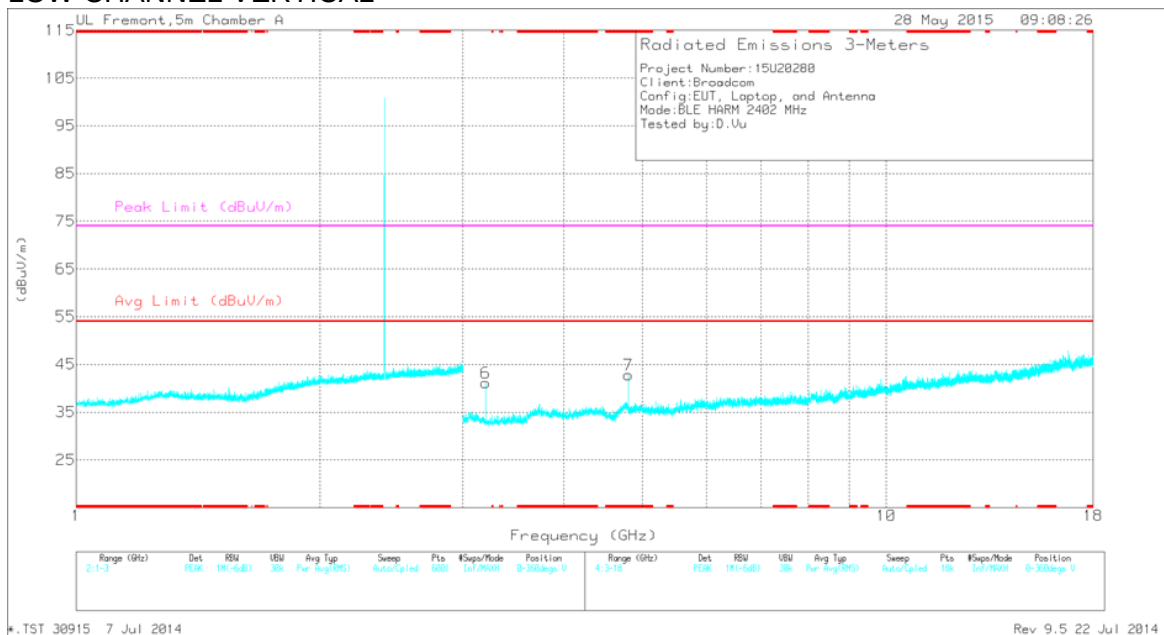
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL



LOW CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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	* 1.245	47.42	PK2	28.4	-26.1	0	49.72	-	-	74	-24.28	341	311	H
	* 1.246	33.03	MAv1	28.4	-26.1	2.15	37.48	54	-16.52	-	-	341	311	H
2	* 1.497	46.36	PK2	28.1	-25.9	0	48.56	-	-	74	-25.44	277	174	H
	* 1.496	32.95	MAv1	28.1	-25.9	2.15	37.30	54	-16.70	-	-	277	174	H
5	* 4.804	44.87	PK2	34	-31.1	0	47.77	-	-	74	-26.23	8	278	H
	* 4.804	37.23	MAv1	34	-31.2	2.15	42.18	54	-11.82	-	-	8	278	H
7	* 4.802	41.59	PK2	34	-31.2	0	44.39	-	-	74	-29.61	359	202	V
	* 4.801	30.75	MAv1	34	-31.2	2.15	35.70	54	-18.30	-	-	359	202	V
3	2.124	38.44	Pk	31.4	-25.3	0	44.54	-	-	74	-29.46	0-360	201	H
4	3.202	42.37	Pk	32.7	-33.2	0	41.87	-	-	74	-32.13	0-360	201	H
6	3.202	41.7	Pk	32.7	-33.2	0	41.2	-	-	74	-32.8	0-360	201	V

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

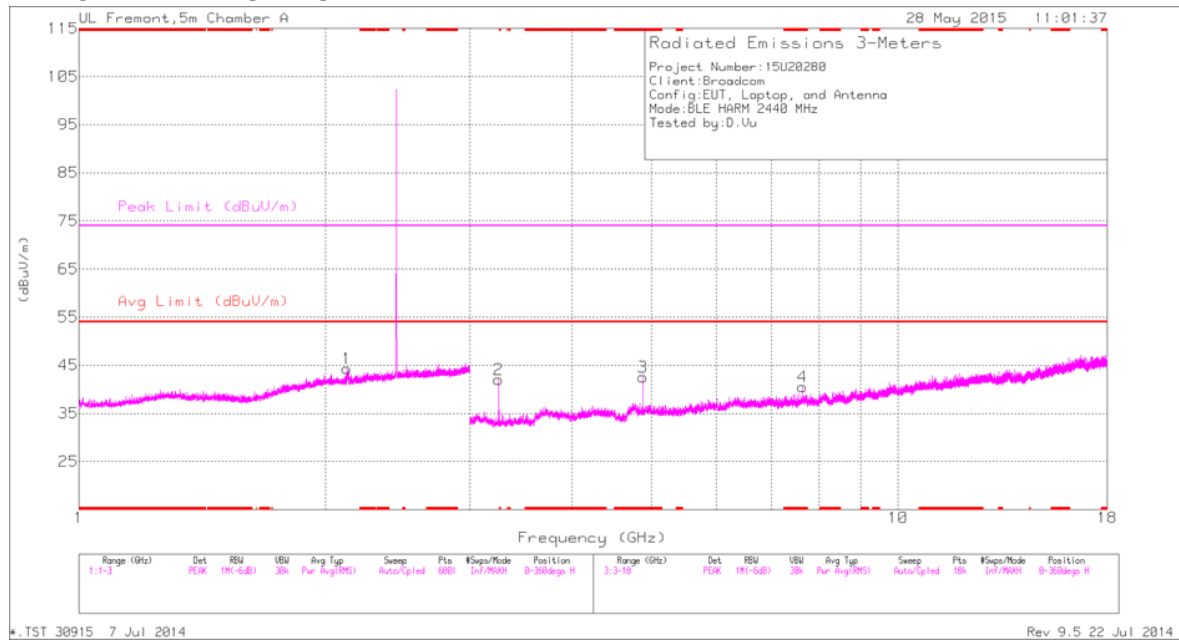
PK - Peak detector

PK2 - KDB558074 Method: Maximum Peak

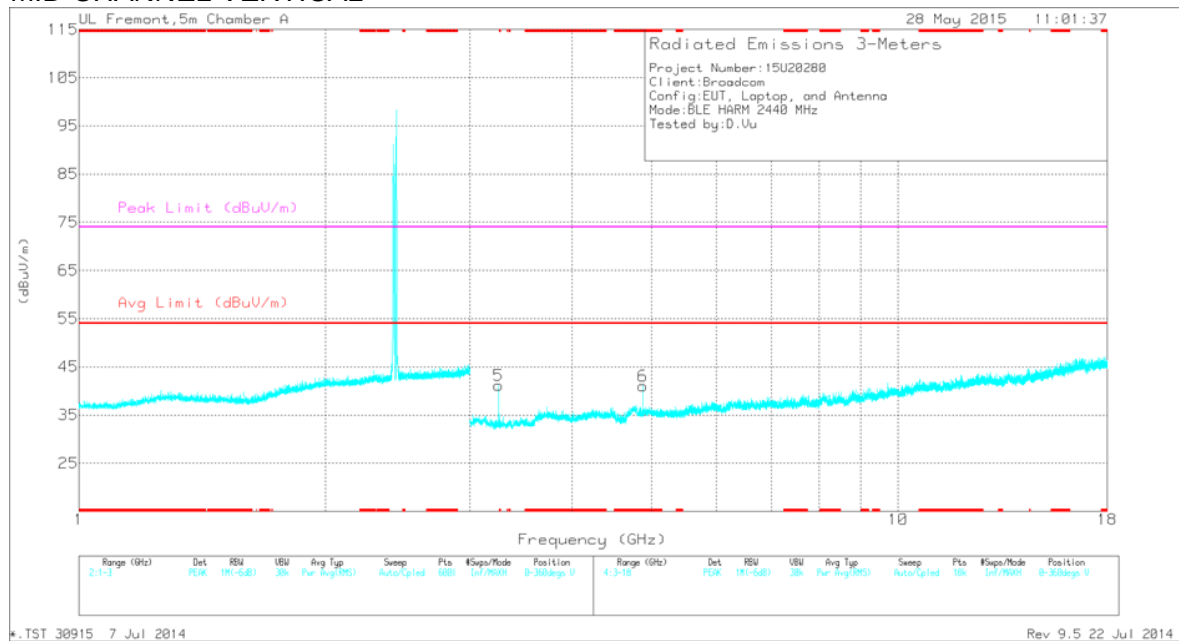
MAv1 - KDB558074 Option 1 Maximum RMS Average

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

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL



MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
3	* 4.88	44.81	PK2	33.9	-30	0	48.71	-	-	74	-25.29	217	232	H
	* 4.88	36.47	MAv1	33.9	-30	2.15	42.52	54	-11.48	-	-	217	232	H
4	* 7.641	36.34	PK2	35.6	-25.9	0	46.04	-	-	74	-27.96	188	328	H
	* 7.639	25.49	MAv1	35.6	-26	2.15	37.24	54	-16.76	-	-	188	328	H
6	* 4.802	41.59	PK2	34	-31.2	0	44.39	-	-	74	-29.61	359	202	V
	* 4.801	30.75	MAv1	34	-31.2	2.15	35.70	54	-18.30	-	-	359	202	V
1	2.124	38.19	PK	31.4	-25.3	0	44.29	-	-	-	-	0-360	100	H
2	3.253	42.72	PK	32.8	-33.5	0	42.02	-	-	-	-	0-360	201	H
5	3.253	41.89	PK	32.8	-33.5	0	41.19	-	-	-	-	0-360	100	V

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

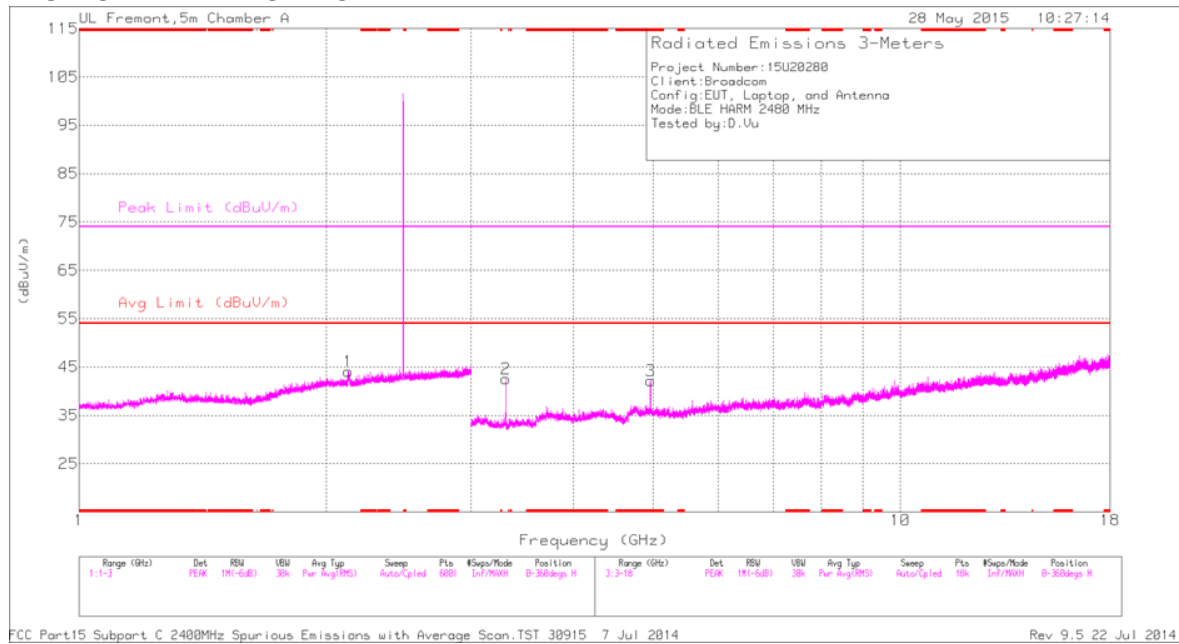
PK - Peak detector

PK2 - KDB558074 Method: Maximum Peak

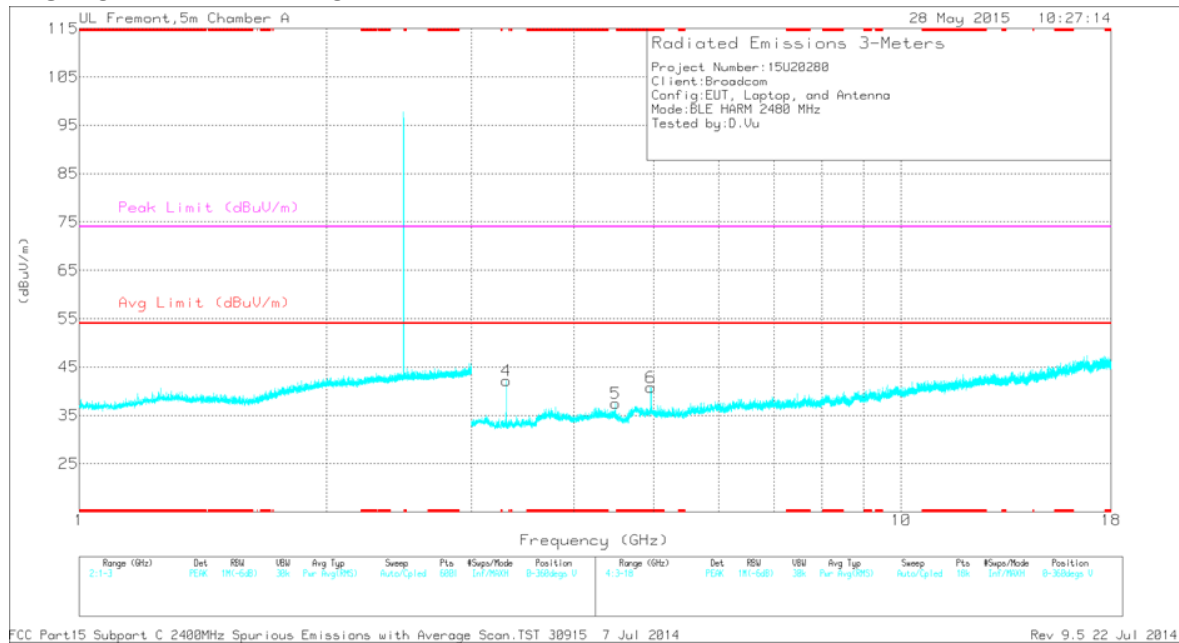
MAv1 - KDB558074 Option 1 Maximum RMS Average

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

HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



HIGH CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
3	* 4.961	44.46	PK2	33.9	-29.9	0	48.46	-	-	74	-25.54	215	204	H
	* 4.96	35.33	MAv1	33.9	-29.9	2.15	41.48	54	-12.52	-	-	215	204	H
6	* 4.961	41.28	PK2	33.9	-29.9	0	45.28	-	-	74	-28.72	359	100	V
	* 4.961	29.11	MAv1	33.9	-29.9	2.15	35.26	54	-18.74	-	-	359	100	V
1	2.128	37.96	PK	31.4	-25.3	0	44.06	-	-	-	-	0-360	201	H
2	3.307	42.79	PK	32.8	-33	0	42.59	-	-	-	-	0-360	201	H
4	3.307	42.4	PK	32.8	-33	0	42.2	-	-	-	-	0-360	201	V
5	4.492	35.02	PK	33.9	-31.5	0	37.42	-	-	-	-	0-360	100	V

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

PK - Peak detector

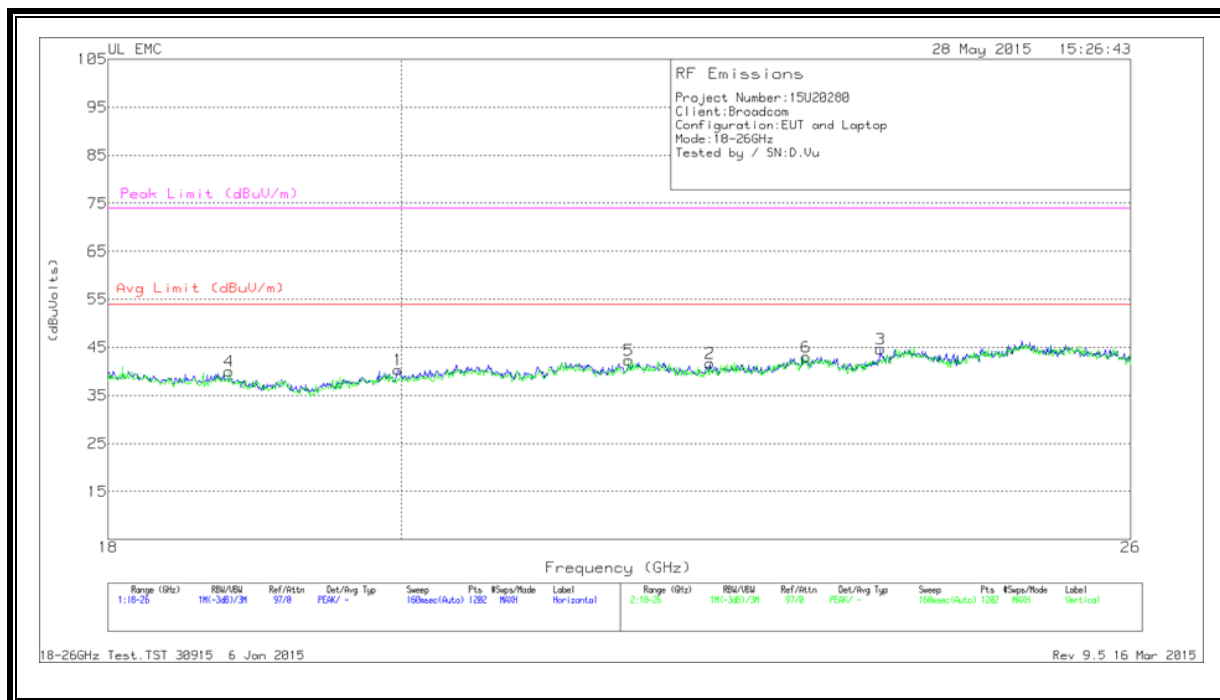
PK2 - KDB558074 Method: Maximum Peak

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	19.978	41.03	Pk	33.0	-24.2	-9.5	40.3	54	-13.7	74	-33.7
2	22.35	41.67	Pk	33.0	-23.5	-9.5	41.7	54	-12.3	74	-32.3
3	23.762	43.27	Pk	33.8	-22.9	-9.5	44.7	54	-9.3	74	-29.3
4	18.799	41.30	Pk	32.5	-24.3	-9.5	40.0	54	-14.0	74	-34.0
5	21.704	42.13	Pk	33.3	-23.6	-9.5	42.3	54	-11.7	74	-31.7
6	23.136	42.10	Pk	33.5	-23.1	-9.5	43.0	54	-11.0	74	-31.0

Pk - Peak detector

9.4. WORST-CASE BELOW 1 GHz

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

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 166.5525	55.95	PK	11.7	-30.2	37.45	43.52	-6.07	0-360	200	H
4	* 266.4	48.14	PK	12.6	-29.6	31.14	46.02	-14.88	0-360	101	H
8	65.6575	47.4	PK	8	-30.8	24.6	40	-15.4	0-360	101	V
1	105.0975	41.36	PK	11.6	-30.5	22.46	43.52	-21.06	0-360	200	H
9	149.8075	52.21	PK	12.7	-30.2	34.71	43.52	-8.81	0-360	101	V
3	196.94	51.95	PK	12.2	-30	34.15	43.52	-9.37	0-360	100	H
5	299.4	59.44	PK	13.4	-29.4	43.44	46.02	-2.58	0-360	101	H
10	346.5	41.6	PK	14.1	-29.2	26.5	46.02	-19.52	0-360	200	V
6	415.7	44.33	PK	15.8	-29	31.13	46.02	-14.89	0-360	200	H
11	415.7	39.98	PK	15.8	-29	26.78	46.02	-19.24	0-360	200	V
12	692.9	40.29	PK	20	-28.2	32.09	46.02	-13.93	0-360	101	V
13	762.1	35.48	PK	20.8	-28.3	27.98	46.02	-18.04	0-360	200	V
14	897.7	38.23	PK	22.3	-27.4	33.13	46.02	-12.89	0-360	200	V
7	898.4	39.01	PK	22.3	-27.4	33.91	46.02	-12.11	0-360	300	H

Radiated Emissions

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
299.5784	39.33	QP	13.4	-29.4	23.33	46.02	-22.69	138	112	H

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

PK - Peak detector

QP - Quasi-Peak detector

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

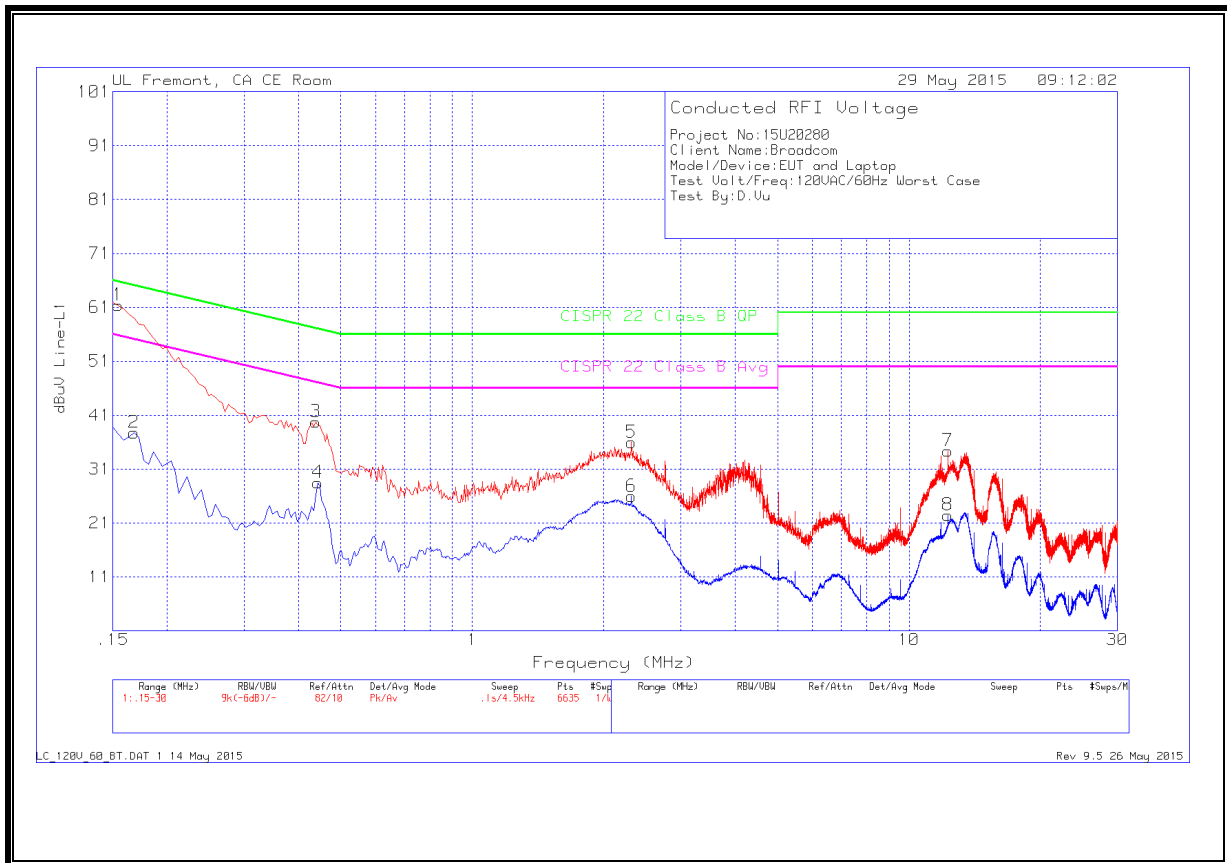
RSS-Gen Clause 8.8

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



Trace Markers

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	.1545	60.08	Pk	1.3	0	61.38	65.75	-4.37	-	-
2	.168	36.55	Av	1.2	0	37.75	-	-	55.06	-17.31
3	.438	39.35	Pk	.4	0	39.75	57.1	-17.35	47.1	-7.35
4	.4425	28.07	Av	.4	0	28.47	-	-	47.01	-18.54
5	2.3145	35.64	Pk	.2	.1	35.94	56	-20.06	46	-10.06
6	2.3145	25.64	Av	.2	.1	25.94	-	-	46	-20.06
7	12.273	33.96	Pk	.2	.2	34.36	60	-25.64	50	-15.64
8	12.273	22.06	Av	.2	.2	22.46	-	-	50	-27.54

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)
.15563	36.83	Ca	1.3	0	38.13	-	-	55.69	-17.56
.15563	55.93	Qp	1.3	0	57.23	65.69	-8.46	-	-

Pk - Peak detector

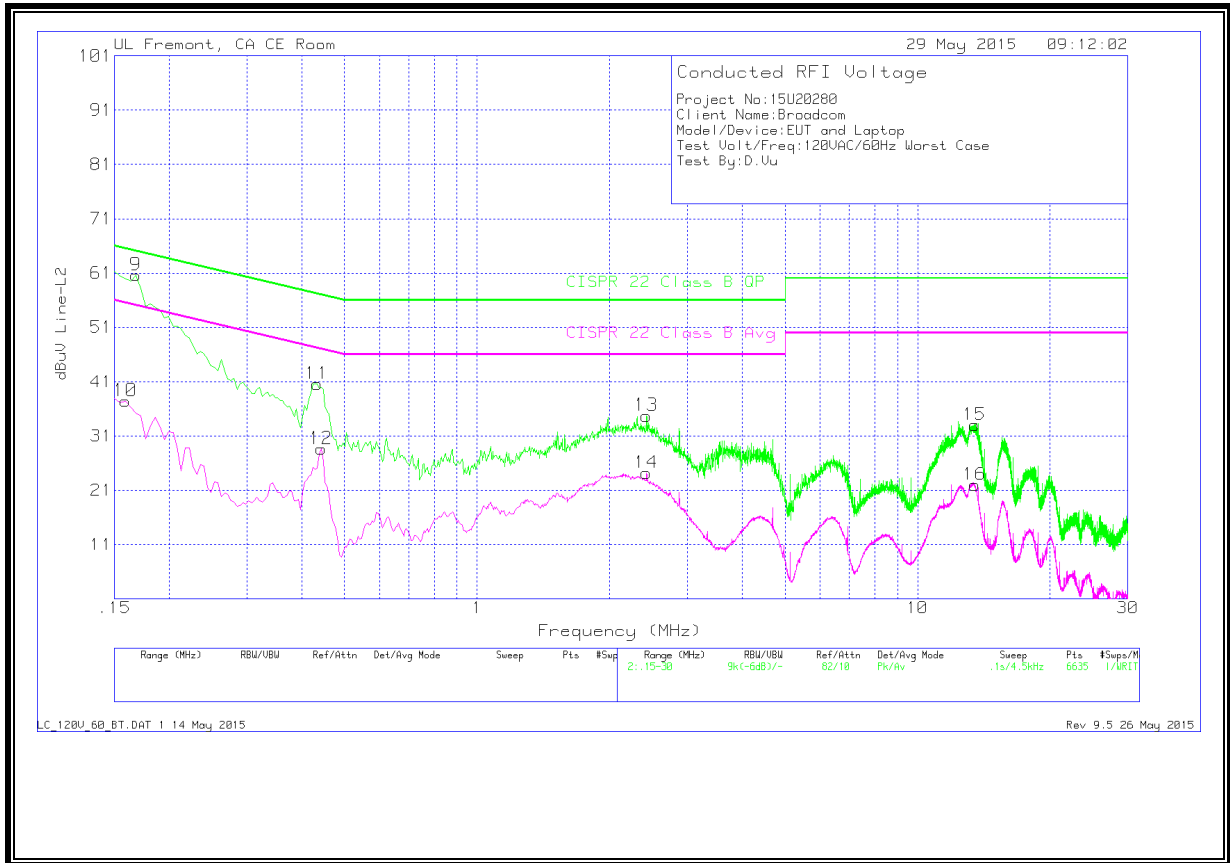
Av - Average detection

Peak/Average/RMS Emissions

Ca - CISPR average detection

Qp - Quasi-Peak detector

LINE 2 RESULTS



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)
9	.168	59.32	Pk	1.3	0	60.62	65.06	-4.44	-	-
10	.159	36.03	Av	1.4	0	37.43	-	-	55.52	-18.09
11	.4335	40.21	Pk	.4	0	40.61	57.19	-16.58	47.19	-6.58
12	.4425	28.22	Av	.4	0	28.62	-	-	47.01	-18.39
13	2.4225	34.43	Pk	.2	.1	34.73	56	-21.27	46	-11.27
14	2.4225	23.9	Av	.2	.1	24.2	-	-	46	-21.8
15	13.47	32.61	Pk	.2	.2	33.01	60	-26.99	50	-16.99
16	13.479	21.63	Av	.2	.2	22.03	-	-	50	-27.97

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)
.16778	36.47	Ca	1.3	0	37.77	-	-	55.07	-17.3
.16778	54.09	Qp	1.3	0	55.39	65.07	-9.68	-	-

Pk - Peak detector

Av - Average detection

Peak/Average/RMS Emissions

Ca - CISPR average detection

Qp - Quasi-Peak detector