FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-247 ISSUE 1

BLUETOOTH LOW ENERGY CERTIFICATION TEST REPORT

FOR

Ember Device (HEMOGLOBIN MONITOR)

FCC ID: X44-E0001
IC ID: 7362C-E0001

MODEL NUMBER: E0001

REPORT NUMBER: 15U2071-E3, Revision A

ISSUE DATE: SEPTEMBER 22, 2015

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	05/28/15	Initial Issue	CHOON OOI
A	09/22/15	Revised 99% reference standard on page 17 Revised ANSI C63.4 2009 to ANSI C63.10 2013 Revised worst case result in summary on page 12	CHOON OOI

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	CERCACOR LABORATORIES INC
EUT DESCRIPTION:	Ember Device (HEMOGLOBIN MONITOR)
MODEL:	E0001
SERIAL NUMBER:	Device 14 (Radiated), Device 15 (Conducted)
DATE TESTED:	MAY 15 - 26, 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.

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Tested By:

GLENN ESCANO
WiSE LAB EMC TECHNICIAN
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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, KDB 558074 D01 v03r03, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 1.

ANSI C63.10-2013 Deviation

Radiated spurious emission above 1GHz was performed with the EUT elevated at 0.8m instead of 1.5m.

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(IC: 2324B-1)	☐ Chamber D(IC: 2324B-4)
☐ Chamber B(IC: 2324B-2)	☐ Chamber E(IC: 2324B-5)
☒ Chamber C(IC: 2324B-3)	☐ Chamber F(IC: 2324B-6)
	☐ Chamber G(IC: 2324B-7)
	☐ Chamber H(IC: 2324B-8)

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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

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 Ember Device (HEMOGLOBIN MONITOR).

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	-4.87	0.33

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral antenna, with a maximum gain 2.26dBi.

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 X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
CC Debugger	Texas Instrument	N/A	N/A	N/A
Laptop	Lenovo	T430	PBF1R5R	Doc

I/O CABLES

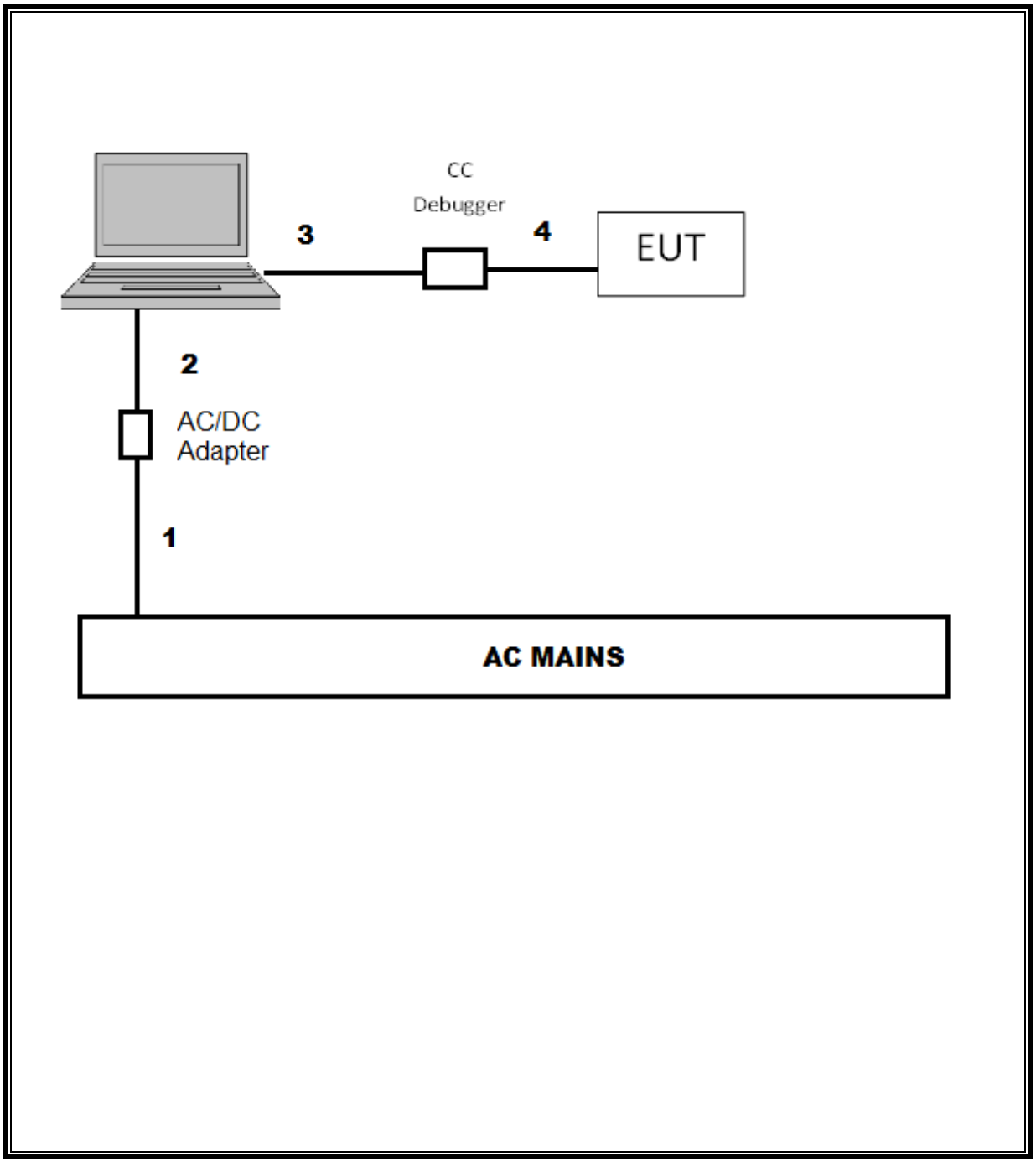
I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	AC Mains	Unshielded	1	AC Mains to AC/DC Adapter
2	AC/DC	1	AC/DC	Unshielded	1m	AC/DC Adapter to Laptop
3	USB	1	Mini-USB	Shielded	1.2m	Laptop to CC Debugger
4	Data Cable	1	8-Pin	Unshielded	.1m	CC Debugger to EUT

TEST SETUP

The EUT is continuously communicating to the Bluetooth tester during the tests.

EUT was set in the Hidden menu mode to enable BLE communications.

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	12/20/15
Spectrum Analyzer,9KHz-40GHz	HP	8564E	106	08/06/15
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	100773	08/15/15
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/15
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/15
Antenna, Horn, 18GHz	EMCO	3115	C00783	10/25/15
Antenna, Horn,18- 26 GHz	ARA	MWH-1826/B	C00946	11/12/15
Antenna, Horn, 26-40 GHz	ARA	MWH-2640	C00891	06/28/15
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	T243	12/08/15
RF Preamplifier, 100KHz -> 1300MHz	HP	TBD	C00825	06/01/15
RF Preamplifier, 26GHz - 40GHz	Miteq	NSP4000-SP2	86	04/07/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	F00351	06/27/15
AC Power Supply, 2,500VA 45-500Hz	Elgar-Ametek	CW2501M	F00013	CNR
RF Preamplifier, 1GHz - 18GHz	Miteq	AFS42-00101800-25-S-42	1818466	05/09/15
Attenuator / Switch driver	HP	11713A	F00204	CNR
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	T420	04/29/16
High Pass Filter 3GHz	Micro-Tronics	HPS17543	T426	04/29/16
High Pass Filter 6GHz	Micro-Tronics	HPS17542	T424	04/29/16

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	Version 9.5, 07/22/14
Conducted Software	UL	UL EMC	Version 9.5, 05/17/14
CLT Software	UL	UL RF	Version 1.0, 02/02/15
Antenna Port Software	UL	UL RF	Version 2.1.1.1, 1/20/15

7. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	RSS-247 5.2 (1)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	0.690 MHz
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-38.84 dBm
15.247	RSS-247 5.4 (4)	TX conducted output power	<30dBm		Pass	-4.87 dBm
15.247	RSS-247 5.2 (2)	PSD	<8dBm		Pass	-17.78 dBm
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass	46.2 dBV
15.205, 15.209	RSS-GEN 8.9	Radiated Spurious Emission	< 54dBuV/m		Pass	46.75 dBuV/m

8. ANTENNA PORT TEST RESULTS

8.1. 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.

TEST PROCEDURE

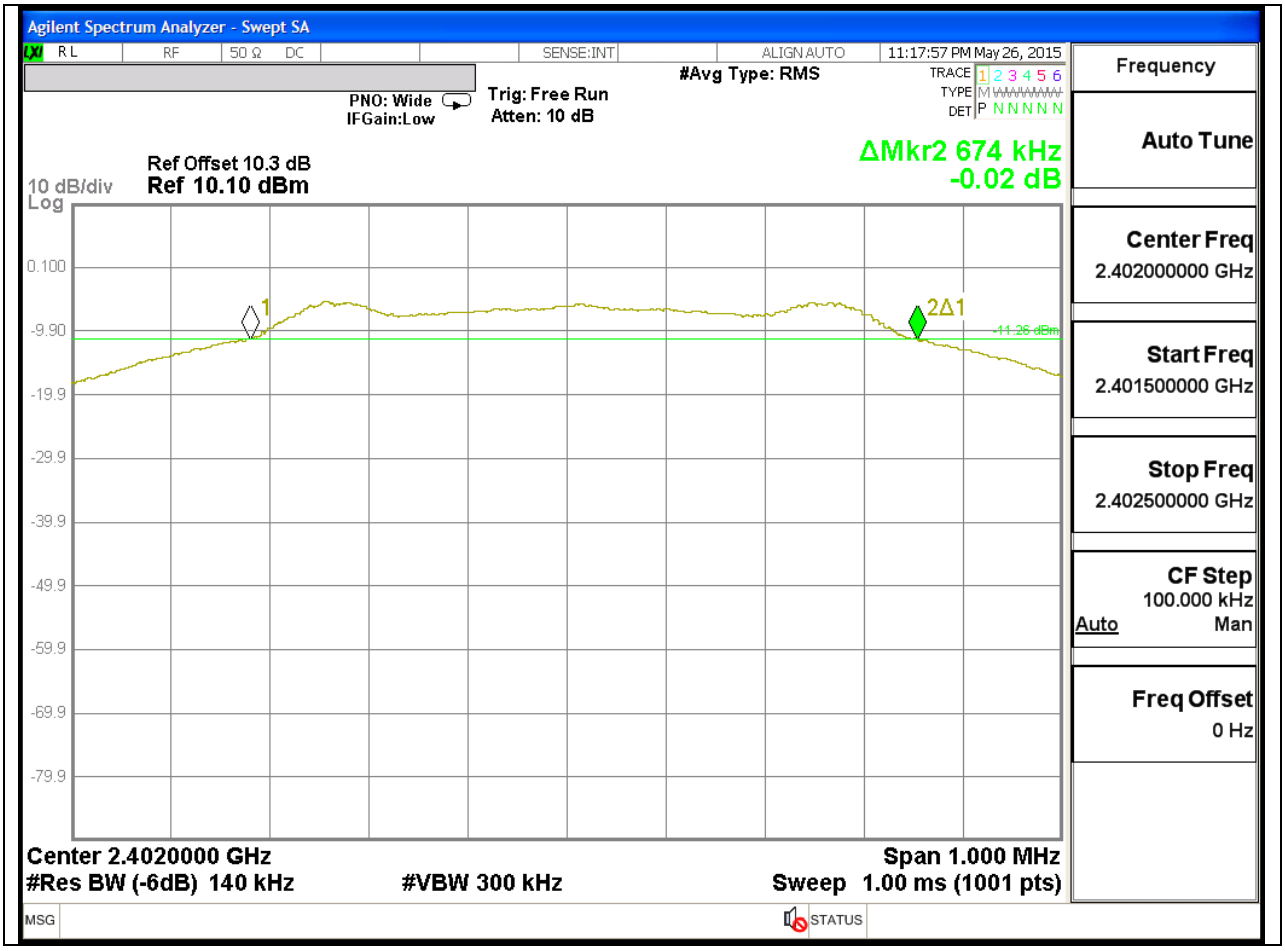
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

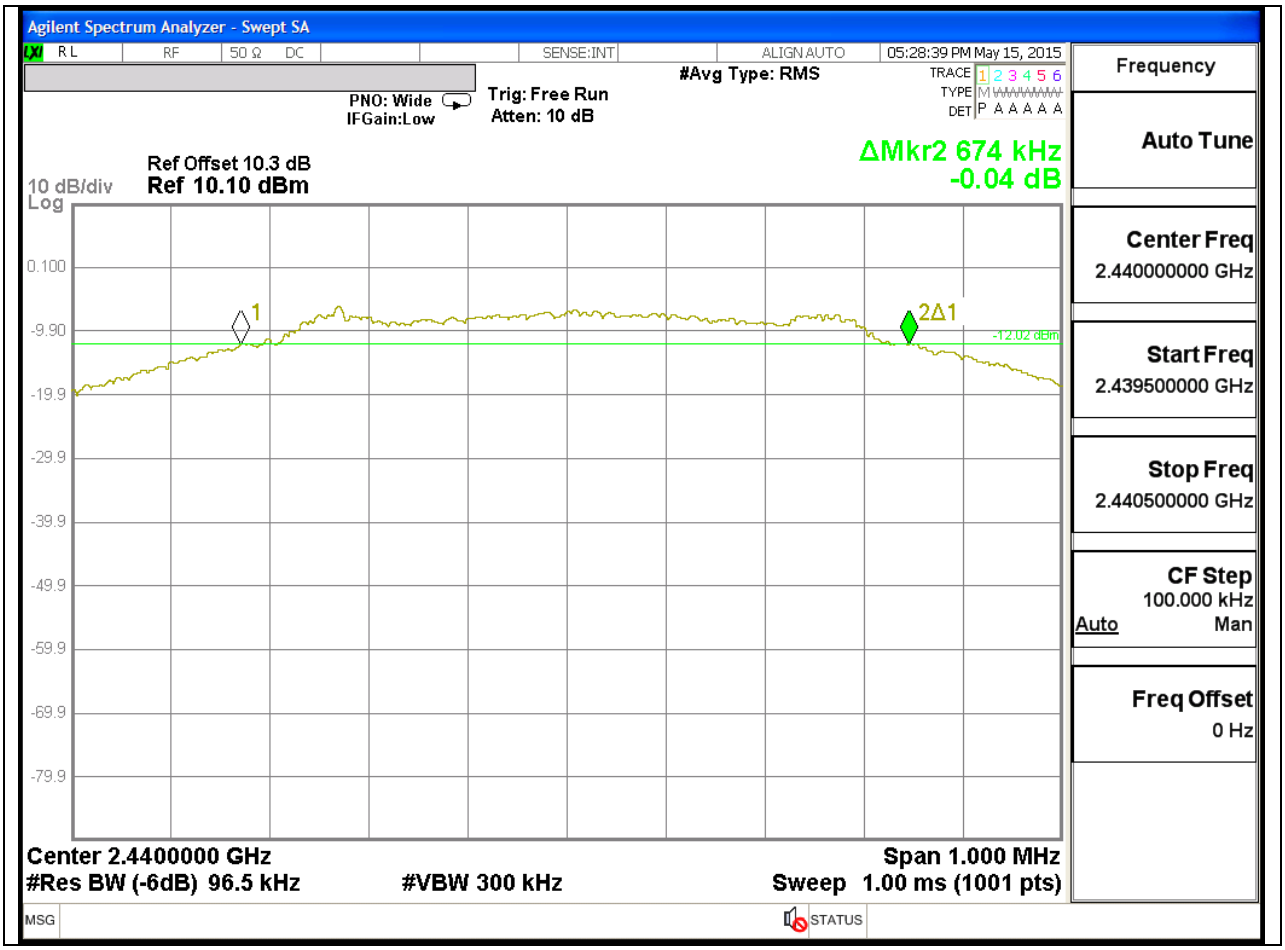
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.674	0.5
Middle	2440	0.674	0.5
High	2480	0.690	0.5

6 dB BANDWIDTH PLOTS

LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

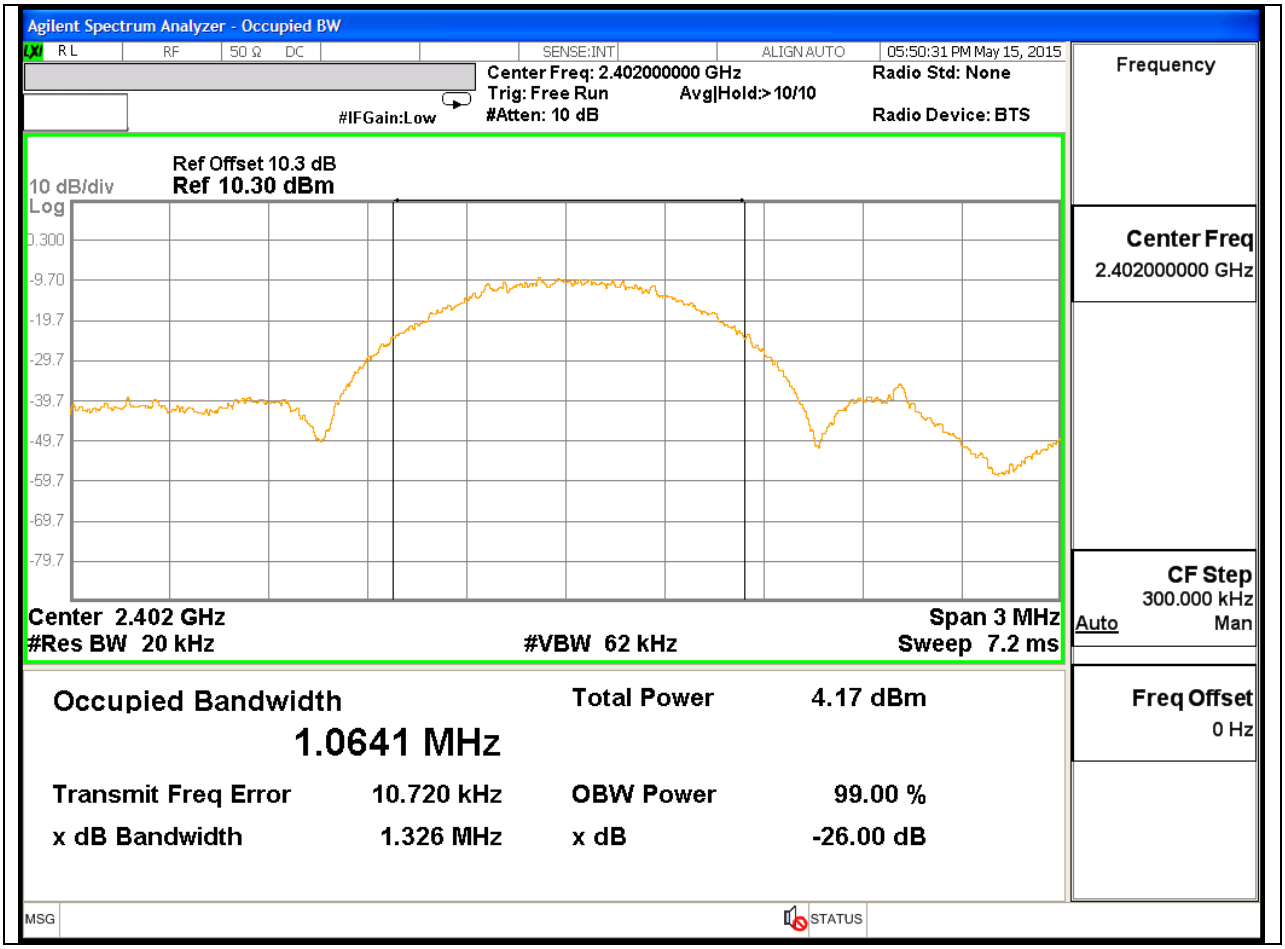
Reference to RSS-Gen 6.6: The transmitter output is connected to the spectrum analyzer. The RBW is set The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

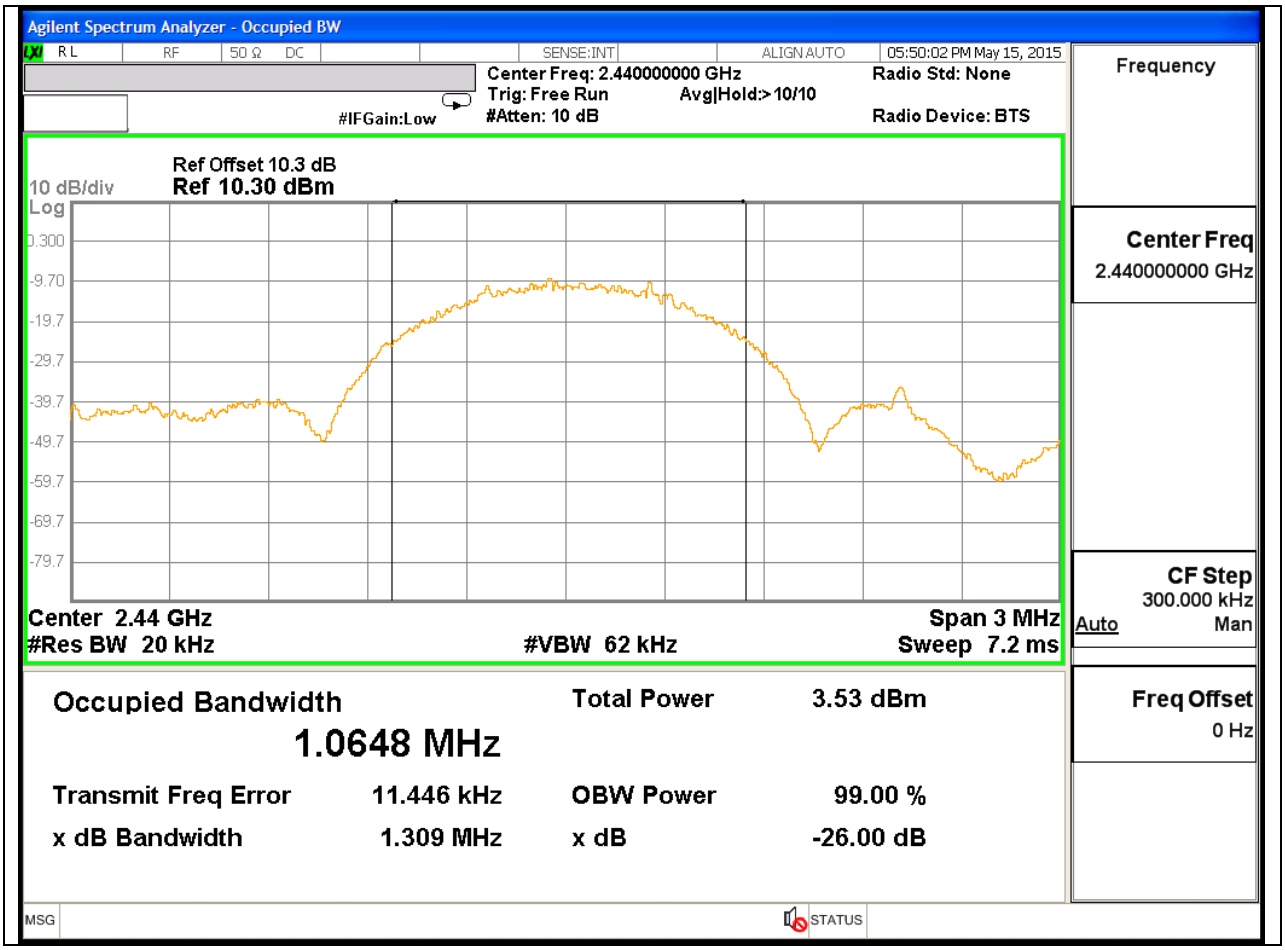
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0641
Middle	2440	1.0648
High	2480	1.0533

99% BANDWIDTH PLOTS

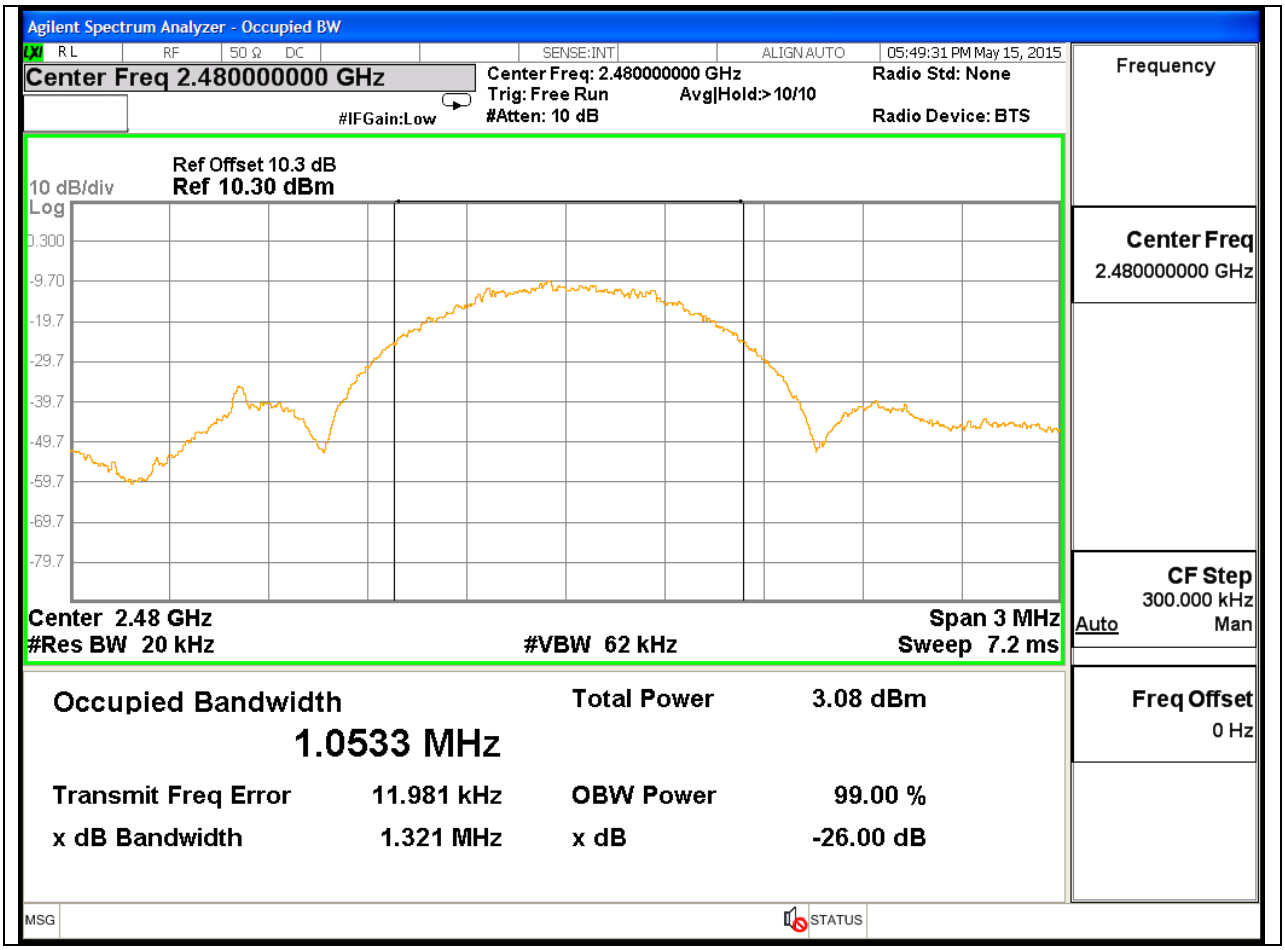
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)
IC RSS-247 5.2(1)

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

TEST PROCEDURE

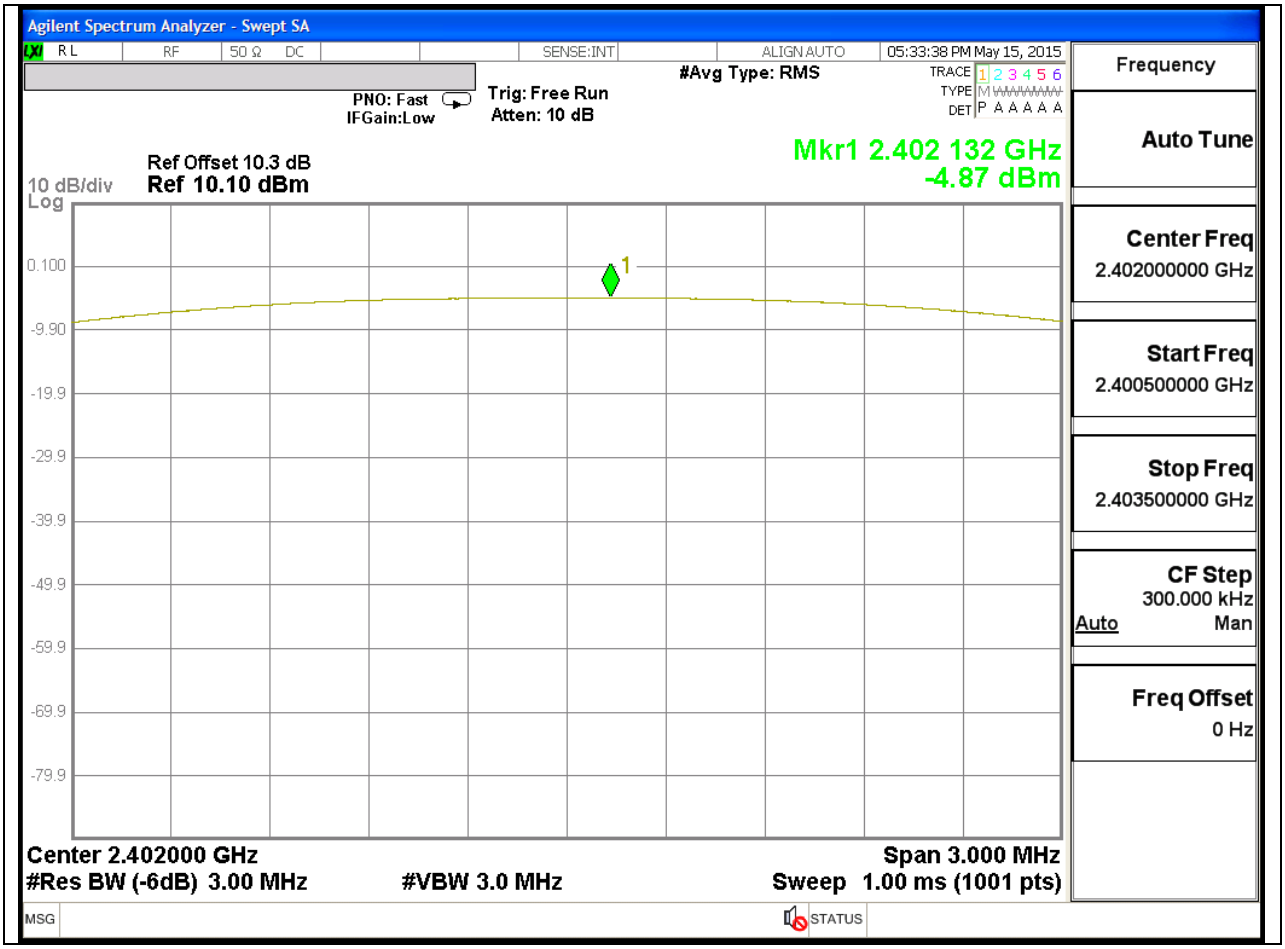
Peak power is measured using KDB558074 D01 DTS Meas Guidance v03r02 under section 9.1.1 utilizing spectrum analyze.

RESULTS

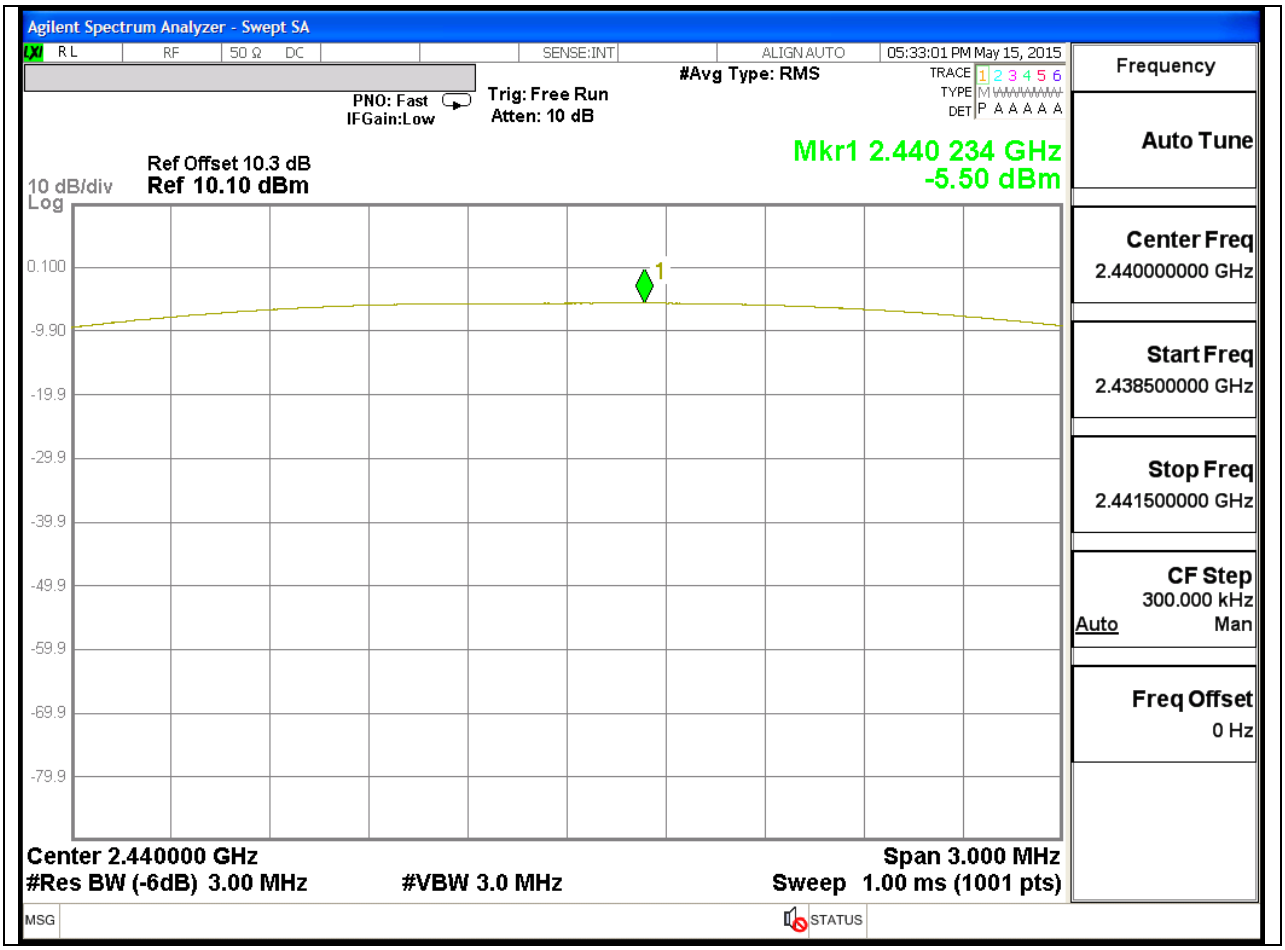
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-4.87	30	-34.87
Middle	2440	-5.50	30	-35.50
High	2480	-6.25	30	-36.25

OUTPUT POWER PLOTS

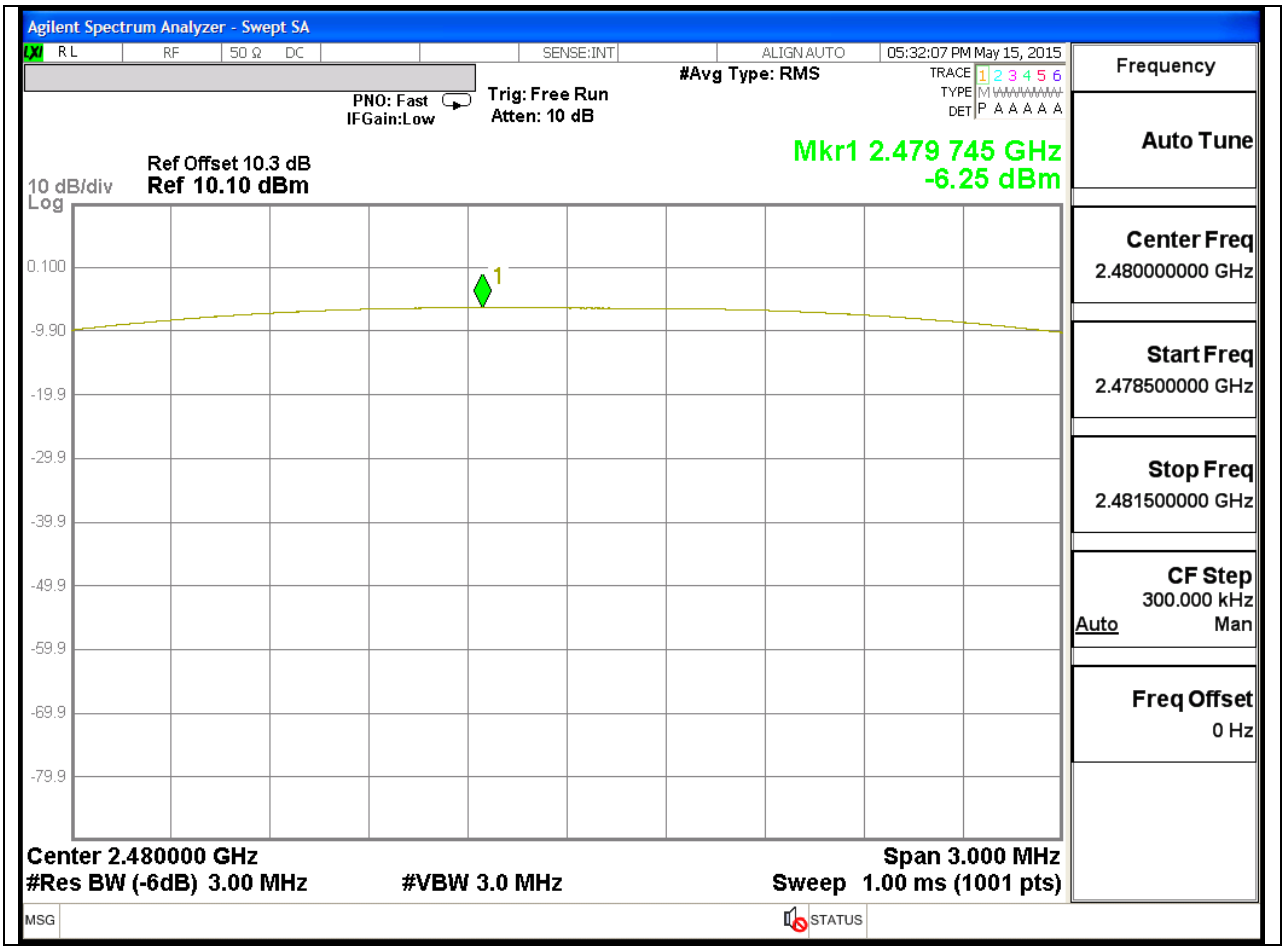
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 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	-6.31
Middle	2440	-6.73
High	2480	-7.21

8.5. 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.

TEST PROCEDURE

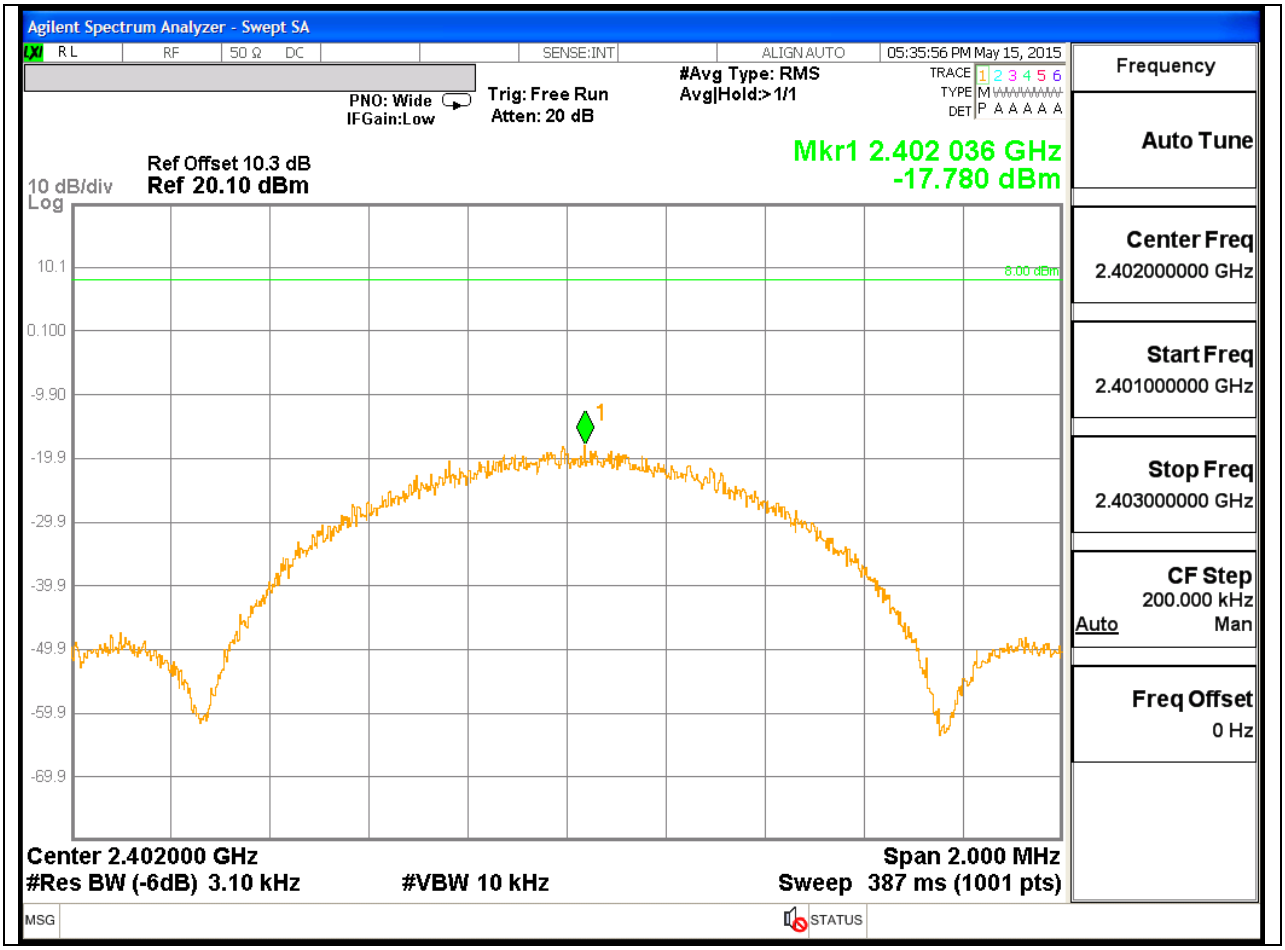
Power Spectral Density was performed utilizing the "Method PKPSD (Peak PSD)" under KDB558074 D01 DTS Meas Guidance v03r02.

RESULTS

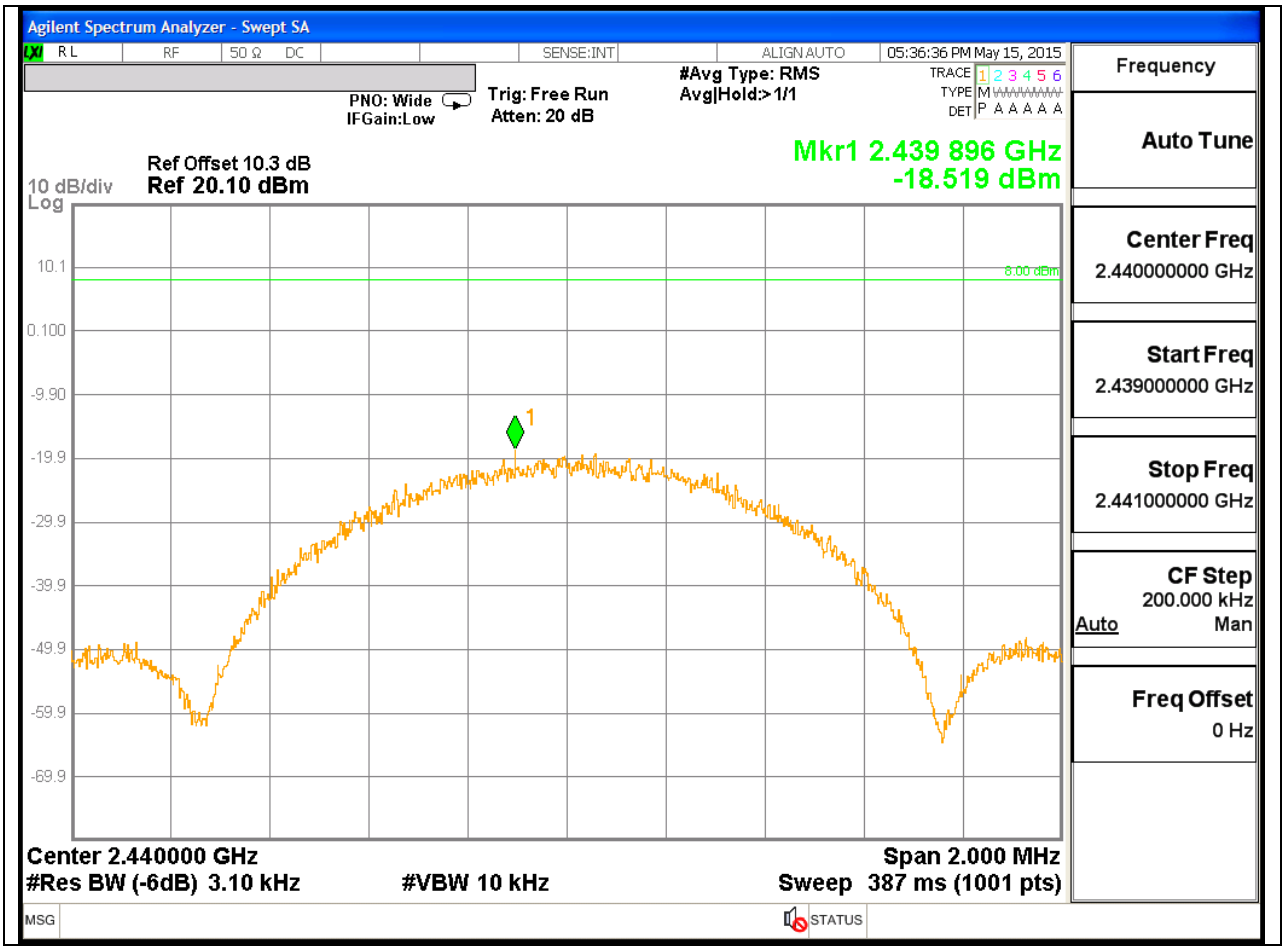
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-17.780	8	-25.780
Middle	2440	-18.519	8	-26.519
High	2480	-20.110	8	-28.110

POWER SPECTRAL DENSITY PLOTS

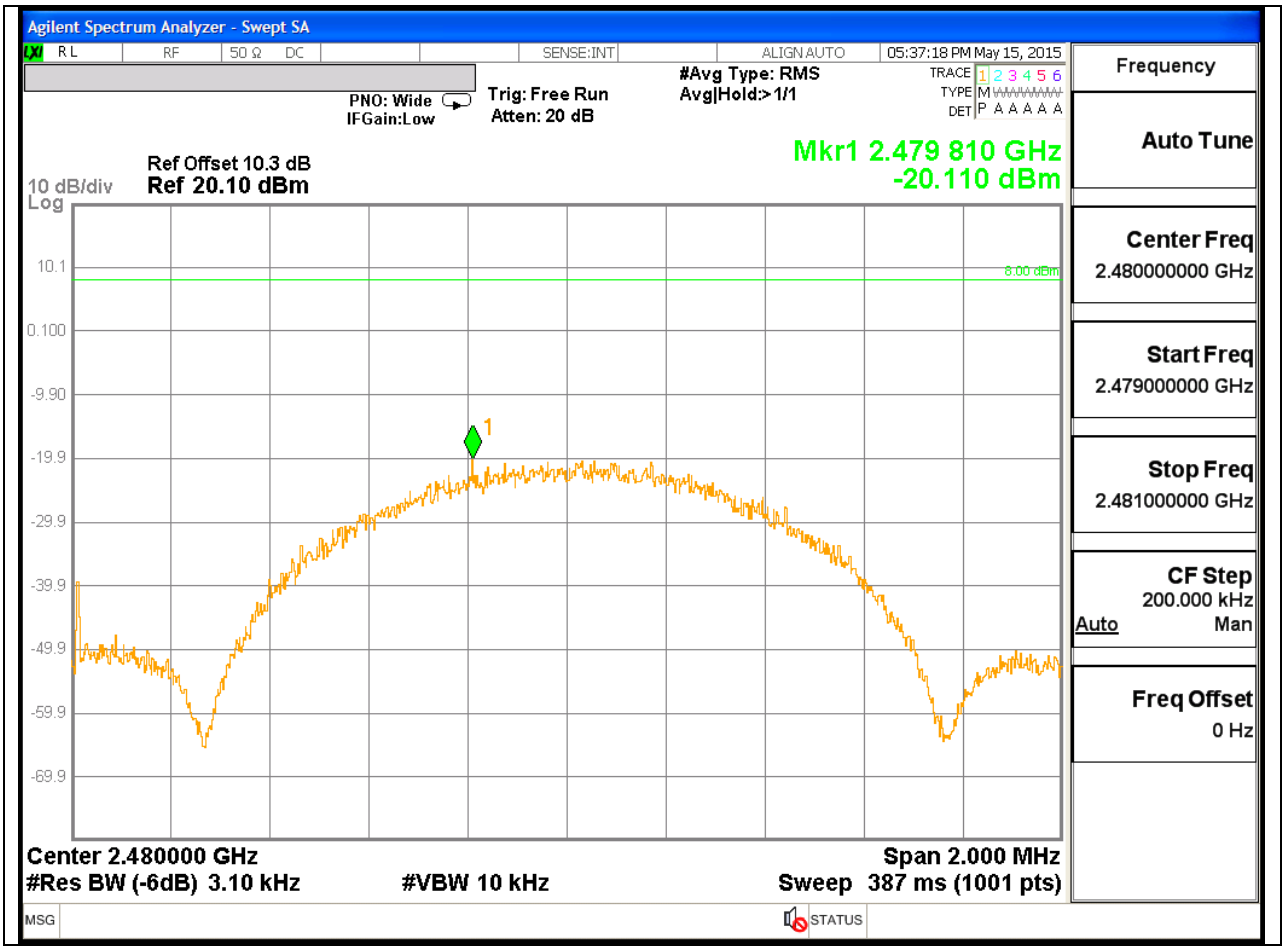
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.6. 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.

TEST PROCEDURE

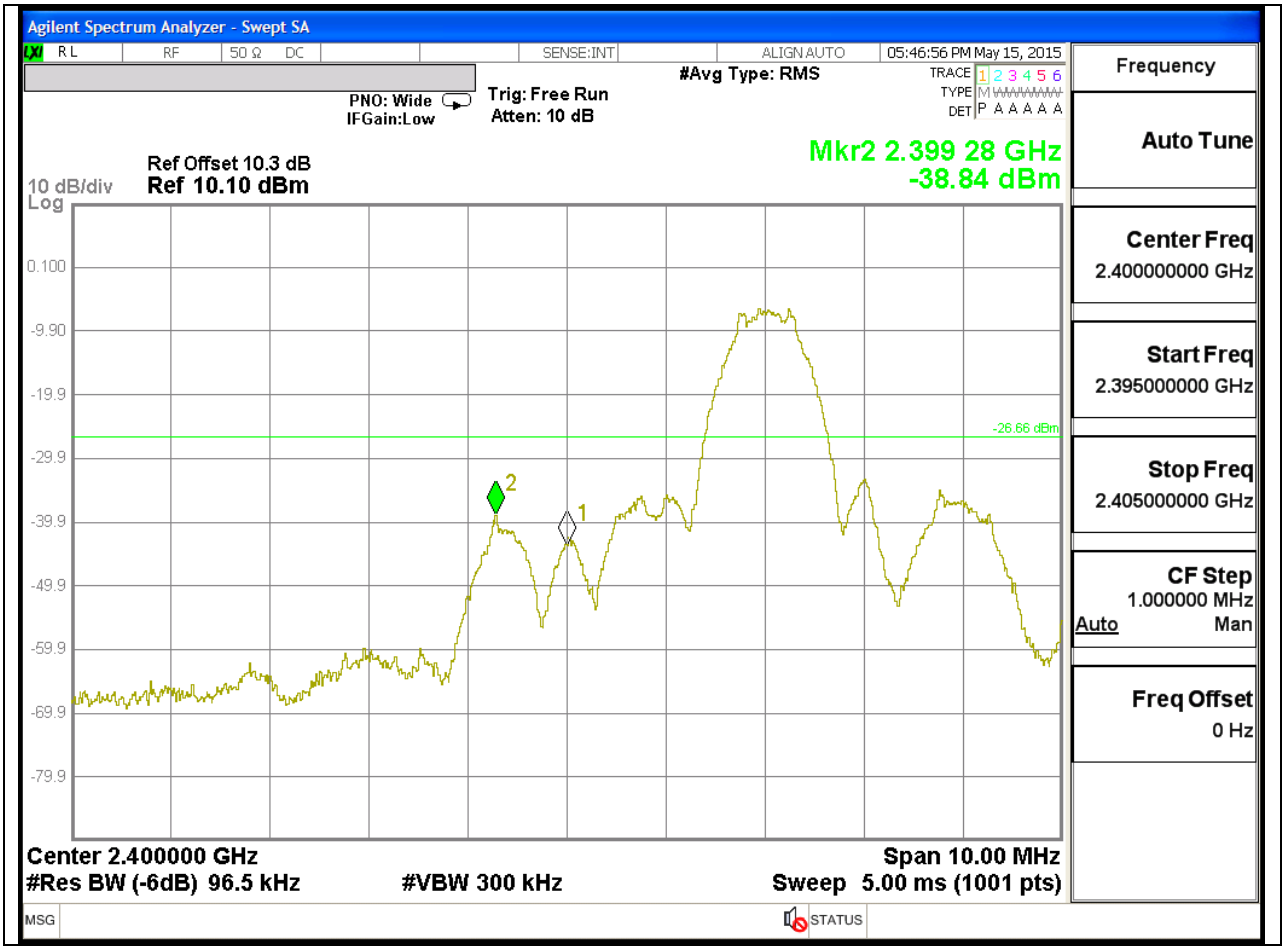
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

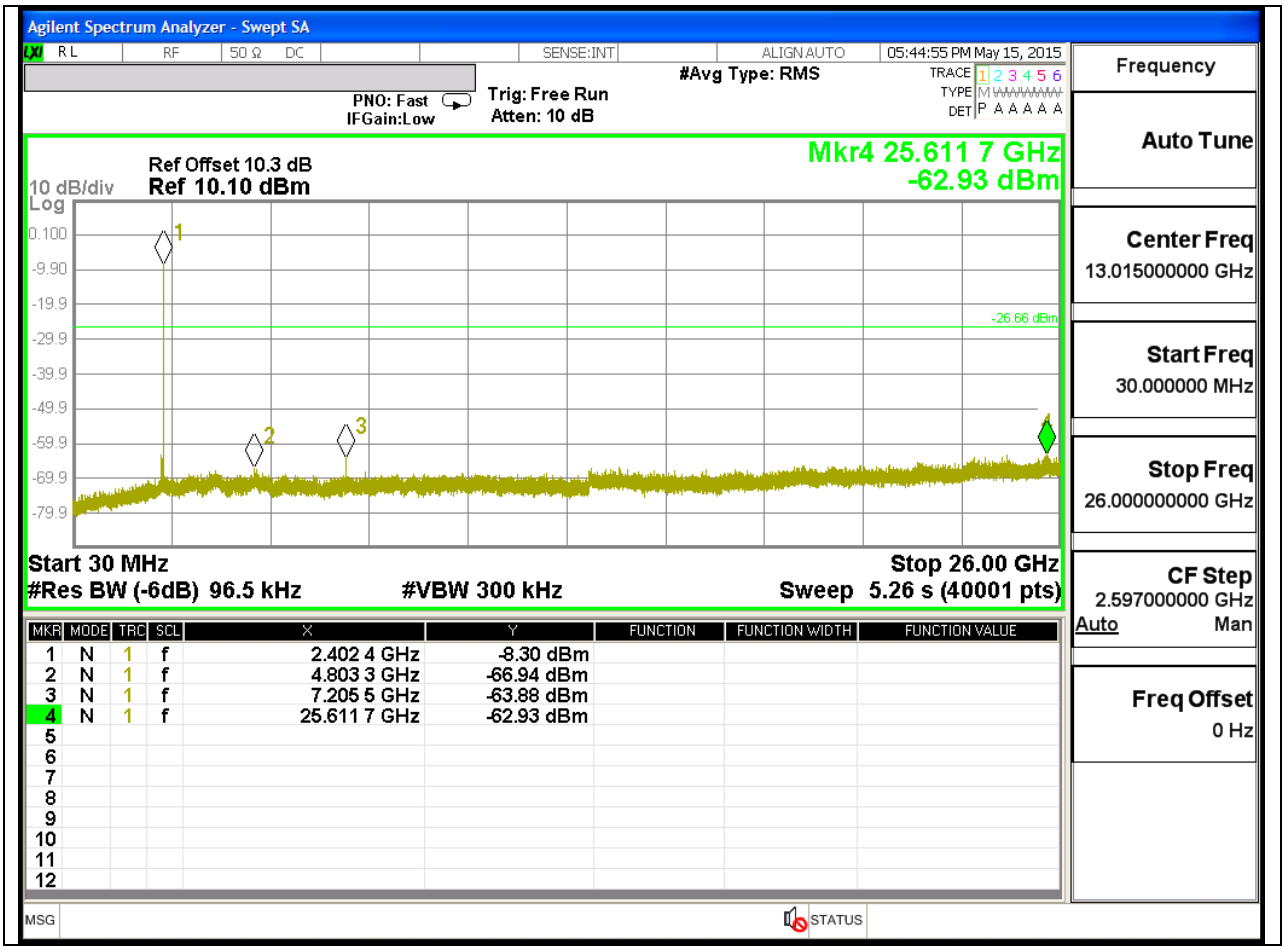
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL

LOW CHANNEL BANDEDGE

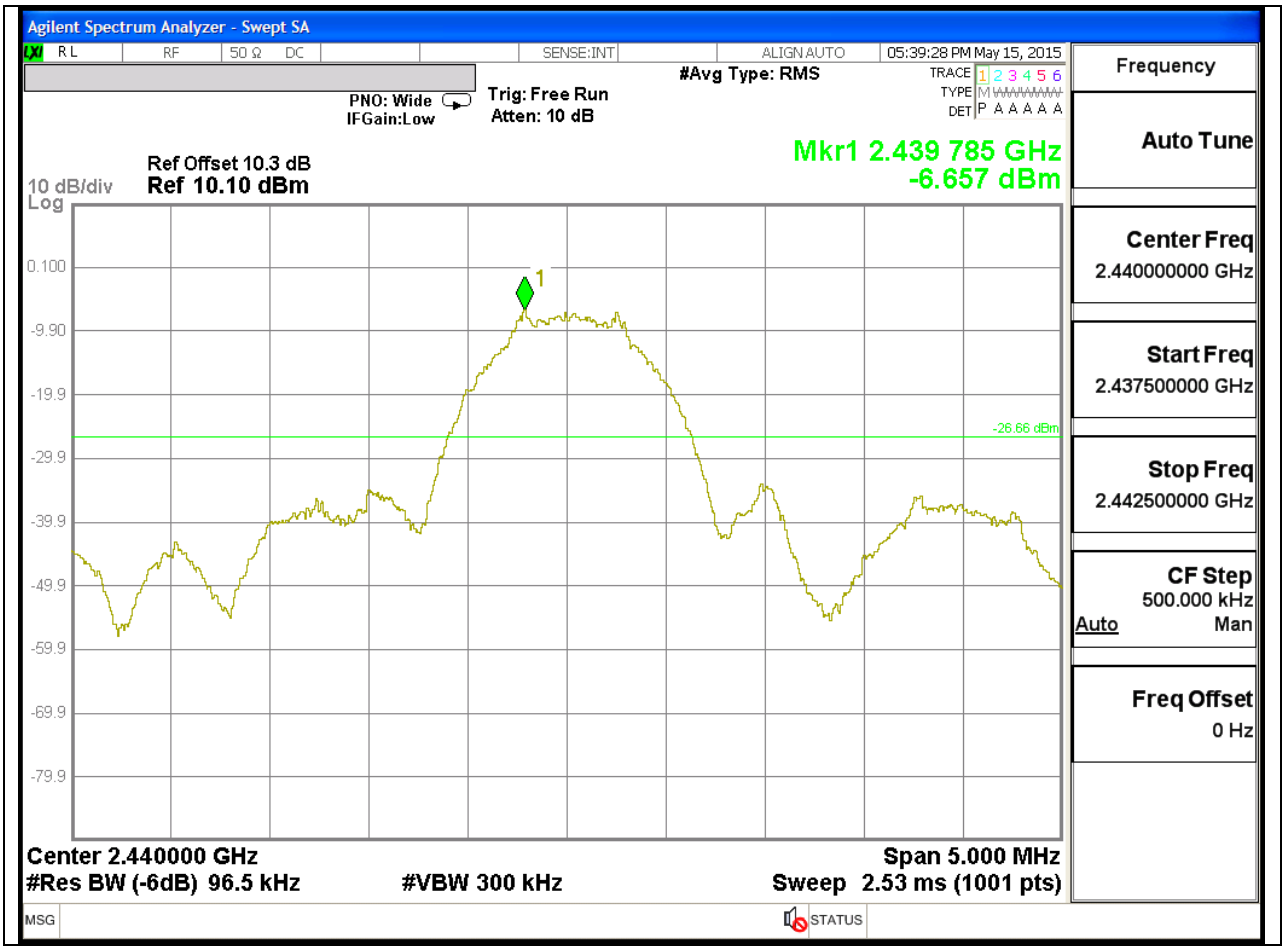


LOW CHANNEL SPURIOUS

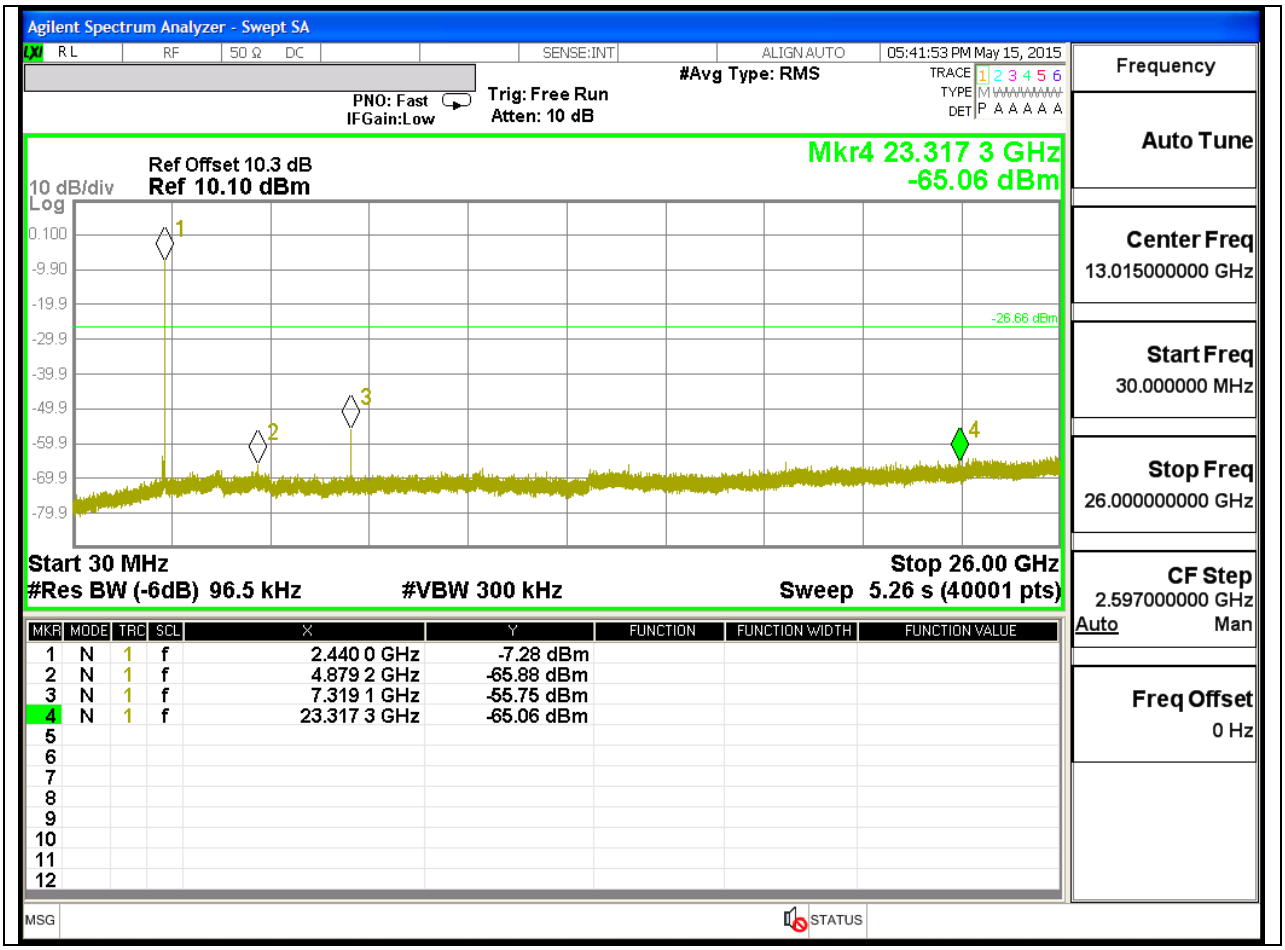


SPURIOUS EMISSIONS, MID CHANNEL

MID CHANNEL REFERENCE

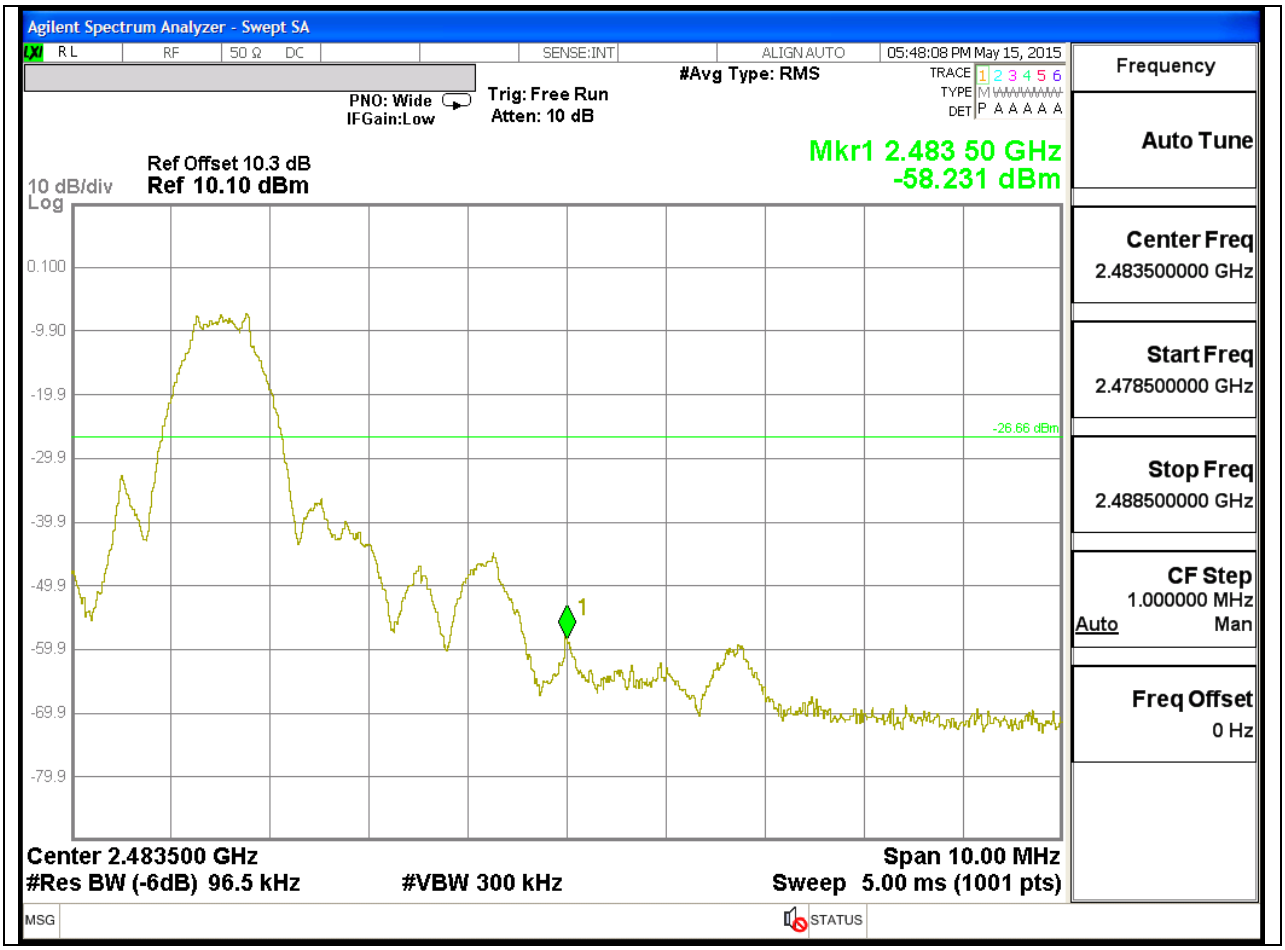


MID CHANNEL SPURIOUS

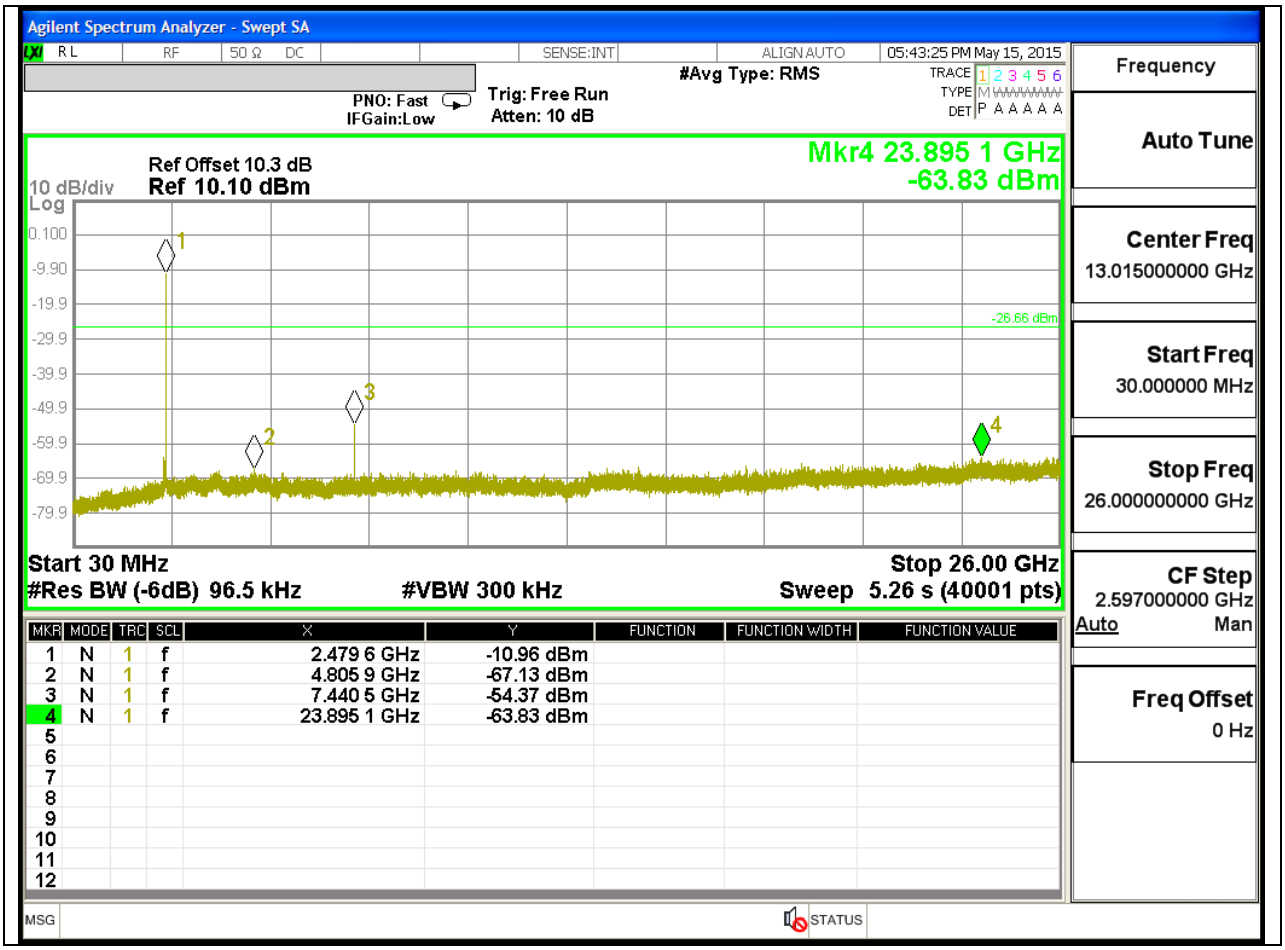


SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE



HIGH CHANNEL SPURIOUS



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN Clause 8.9 (Transmitter)

IC RSS-GEN Clause 7 (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. The EUT is configured in accordance with ANSI C63.10 - 2013. 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 1 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor = 10 log (1/x). For this sample: DCF = 10log(1/1.00)=0dB

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.

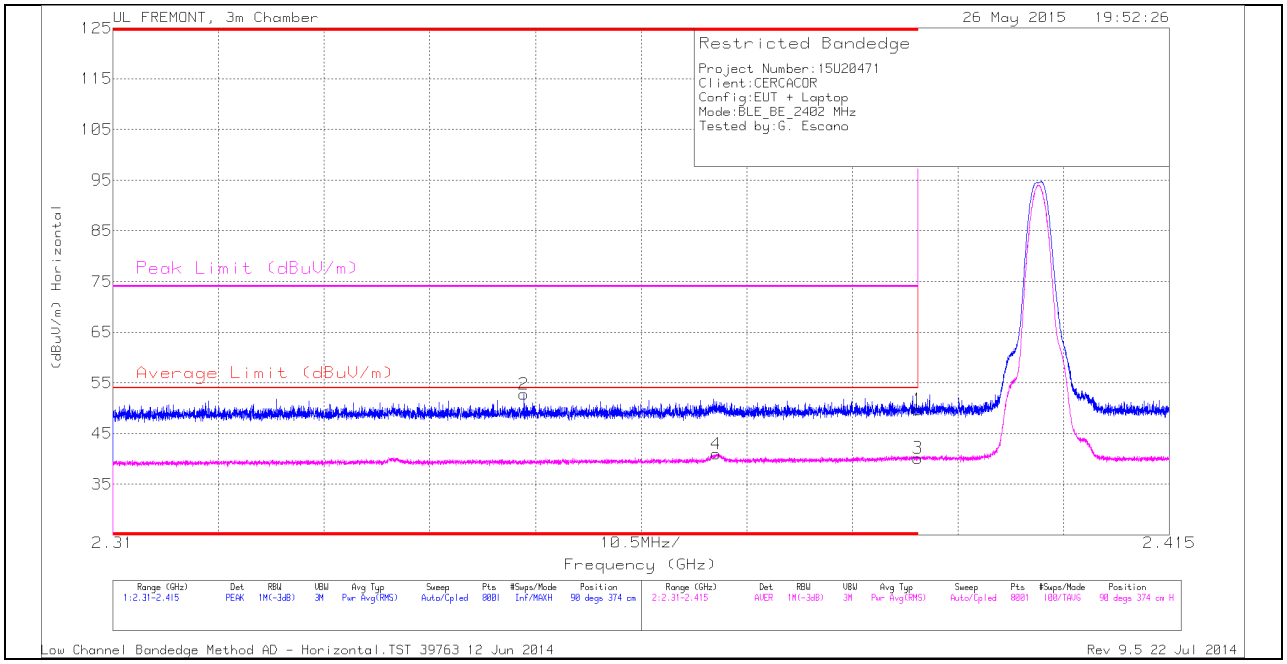
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

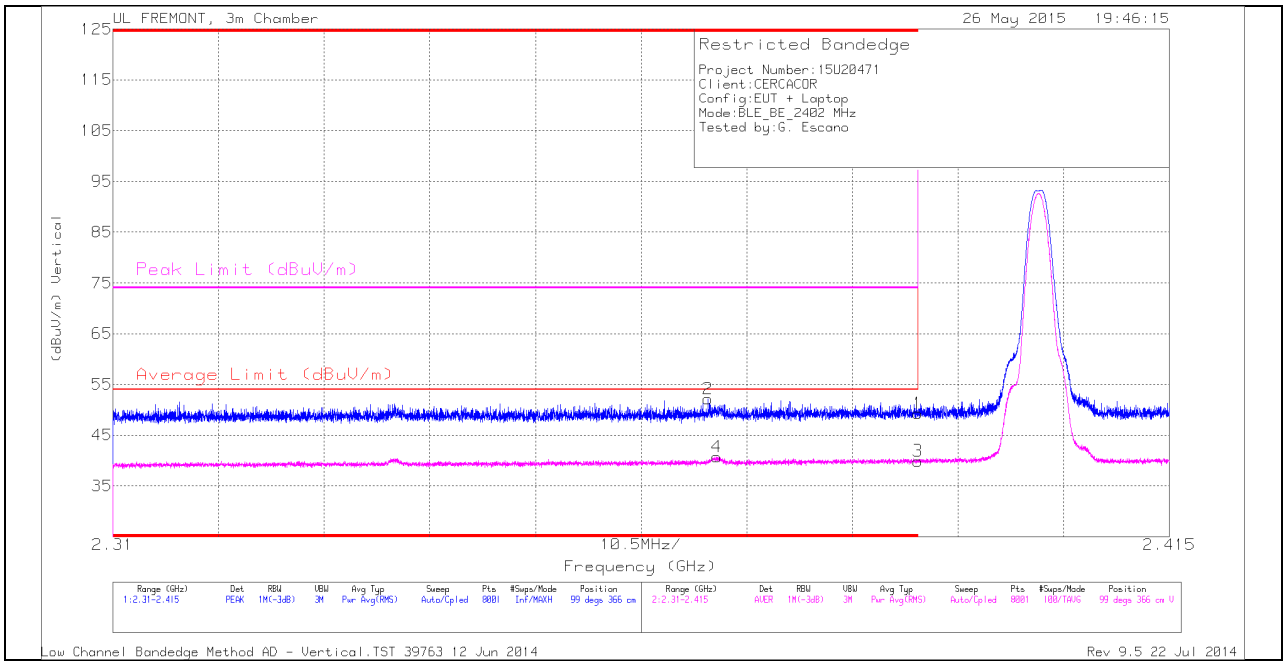
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.83	PK	32	-23.1	0	49.73	-	-	74	-24.27	90	374	H
2	* 2.351	44.14	PK	31.8	-23.2	0	52.74	-	-	74	-21.26	90	374	H
3	* 2.39	31.27	RMS	32	-23.1	0	40.17	54	-13.83	-	-	90	374	H
4	* 2.37	32.18	RMS	31.9	-23.1	0	40.98	54	-13.02	-	-	90	374	H

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

PK - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/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	40.38	PK	32	-23.1	0	49.28	-	-	74	-24.72	99	366	V
2	* 2.369	43.39	PK	31.9	-23.1	0	52.19	-	-	74	-21.81	99	366	V
3	* 2.39	31.02	RMS	32	-23.1	0	39.92	54	-14.08	-	-	99	366	V
4	* 2.37	31.94	RMS	31.9	-23.1	0	40.74	54	-13.26	-	-	99	366	V

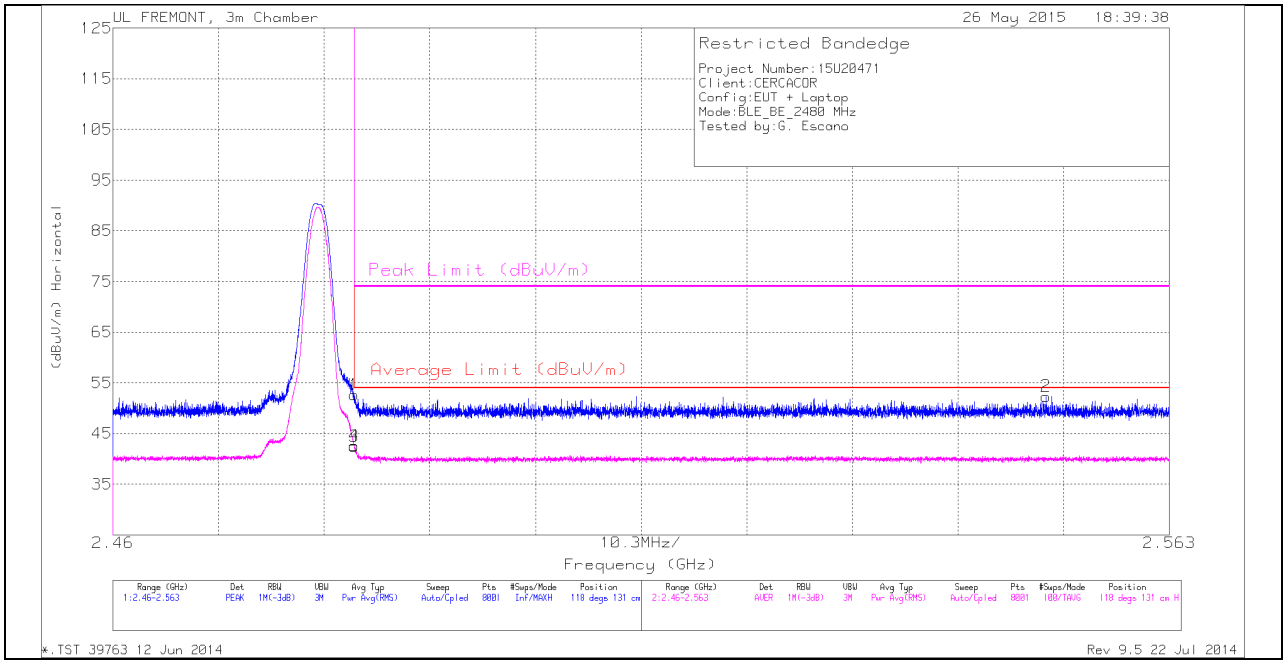
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



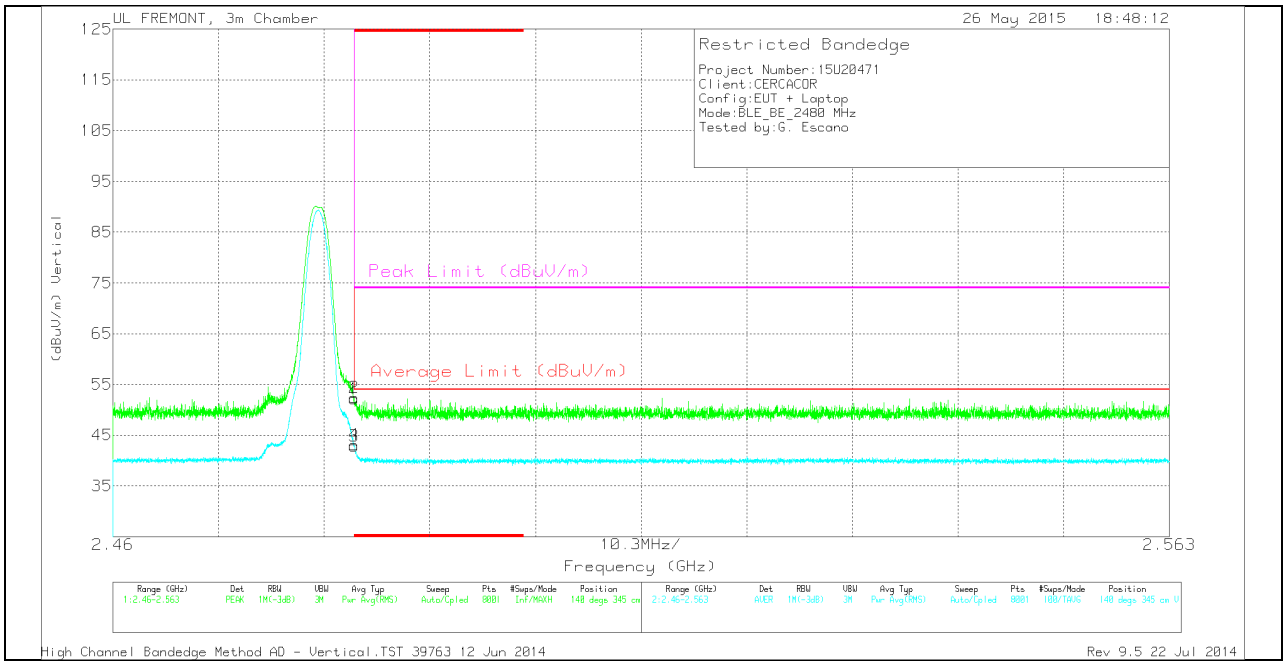
HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/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	43.11	PK	32.3	-22.8	0	52.61	-	-	74	-21.39	118	131	H
3	2.484	33.02	RMS	32.3	-22.8	0	42.52	54	-11.48	-	-	118	131	H
4	2.484	33.05	RMS	32.3	-22.8	0	42.55	54	-11.45	-	-	118	131	H
2	2.551	42.74	PK	32.4	-22.8	0	52.34	-	-	74	-21.66	118	131	H

PK - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Fltr/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	42.63	PK	32.3	-22.8	0	52.13	-	-	74	-21.87	140	345	V
2	* 2.484	42.87	PK	32.3	-22.8	0	52.37	-	-	74	-21.63	140	345	V
3	* 2.484	33.3	RMS	32.3	-22.8	0	42.8	54	-11.2	-	-	140	345	V
4	* 2.484	33.56	RMS	32.3	-22.8	0	43.06	54	-10.94	-	-	140	345	V

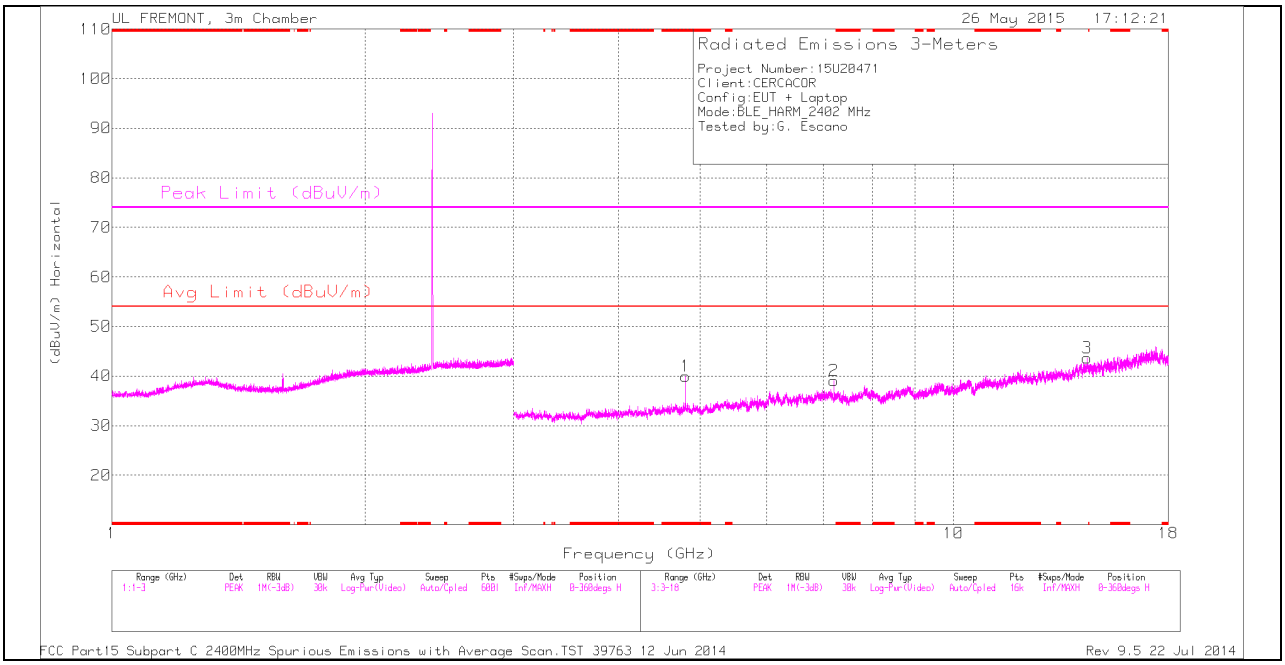
* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

RMS - RMS detection

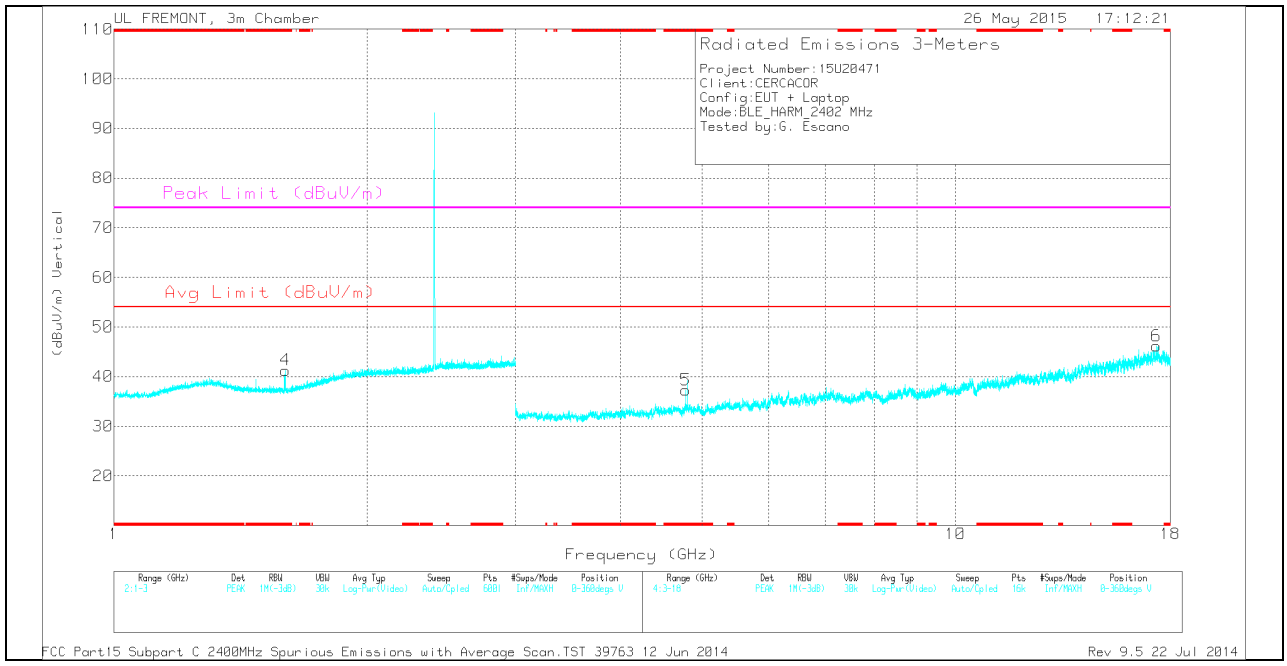
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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 T119 (dB/m)	Amp/Cbl/Fltr /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	* 1.599	36.7	PK	28	-23.4	0	41.3	-	-	74	-32.7	0-360	200	V
1	* 4.806	36.34	PK	34	-30.4	0	39.94	-	-	74	-34.06	0-360	100	H
5	* 4.78	33.83	PK	34	-30.5	0	37.33	-	-	74	-36.67	0-360	100	V
2	7.206	32.71	PK	35.6	-29.2	0	39.11	-	-	-	-	0-360	200	H
3	14.406	30.19	PK	39.6	-26.2	0	43.59	-	-	-	-	0-360	100	H
6	17.335	28.65	PK	41.4	-23.9	0	46.15	-	-	-	-	0-360	100	V

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

PK - Peak detector

RADIATED EMISSIONS

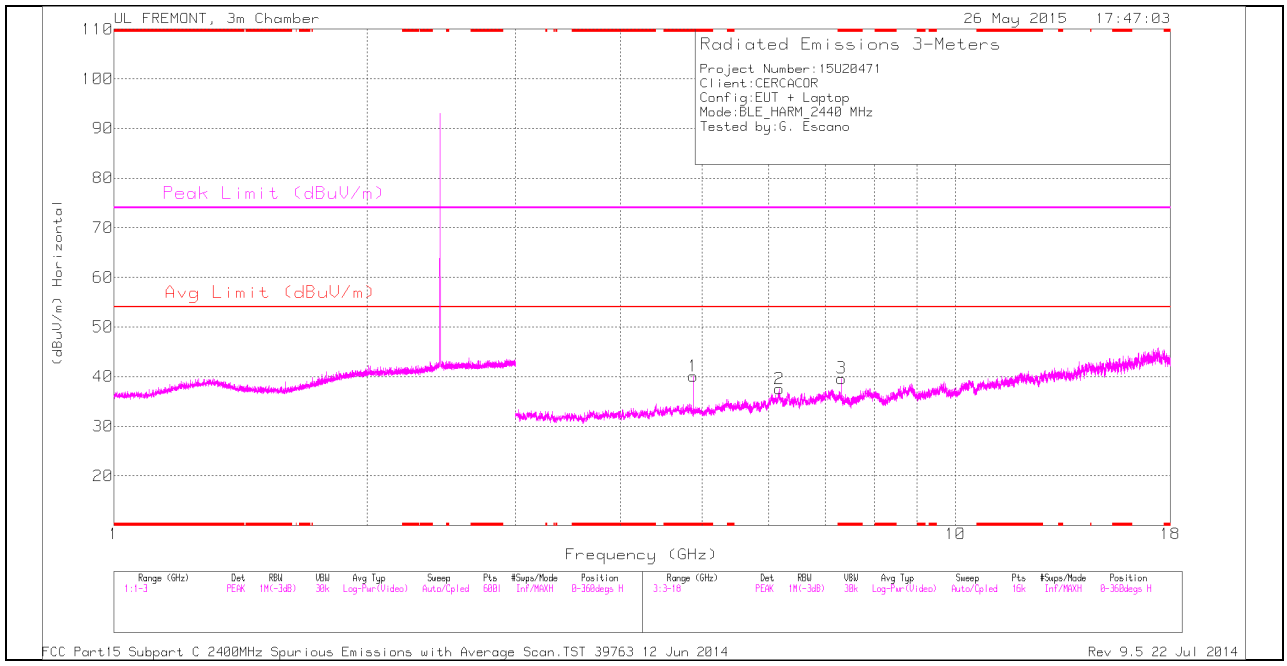
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.598	49.65	PK2	28	-23.4	0	54.25	-	-	74	-19.75	16	201	V
* 1.6	31.28	MAv1	28	-23.4	0	35.88	54	-18.12	-	-	16	201	V
* 4.806	43.38	PK2	34	-30.4	0	46.98	-	-	74	-27.02	222	160	H
* 4.806	35.97	MAv1	34	-30.4	0	39.57	54	-14.43	-	-	222	160	H
* 4.78	45.64	PK2	34	-30.5	0	49.14	-	-	74	-24.86	106	281	V
* 4.78	28.32	MAv1	34	-30.5	0	31.82	54	-22.18	-	-	106	281	V

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

PK2 - KDB558074 Method: Maximum Peak

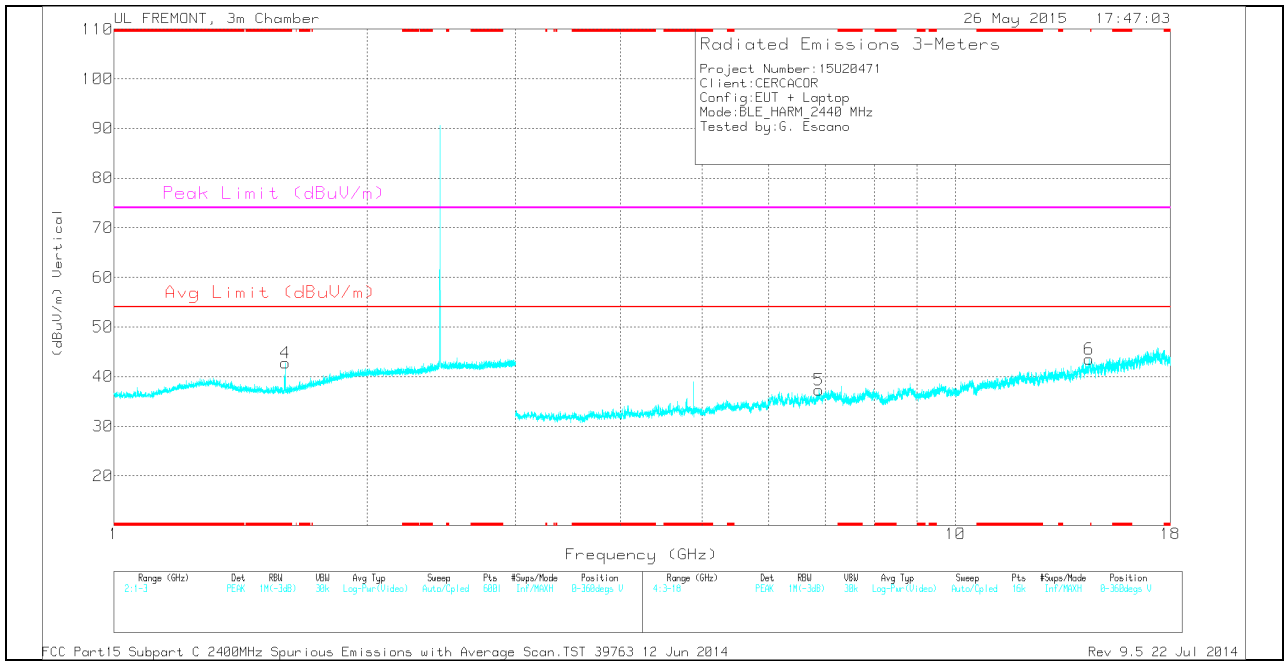
MAv1 - KDB558074 Option 1 Maximum RMS Average

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 T119 (dB/m)	Amp/Cbl/Fltr /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	* 1.599	38.13	PK	28	-23.4	0	42.73	-	-	74	-31.27	0-360	200	V
1	* 4.881	36.33	PK	34	-30.2	0	40.13	-	-	74	-33.87	0-360	200	H
3	* 7.32	32.45	PK	35.6	-28.4	0	39.65	-	-	74	-34.35	0-360	100	H
2	6.171	32.06	PK	35.3	-29.8	0	37.56	-	-	-	-	0-360	100	H
5	6.884	30.27	PK	35.6	-28.6	0	37.27	-	-	-	-	0-360	200	V
6	14.416	30.25	PK	39.6	-26.3	0	43.55	-	-	-	-	0-360	100	V

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

PK - Peak detector

RADIATED EMISSIONS

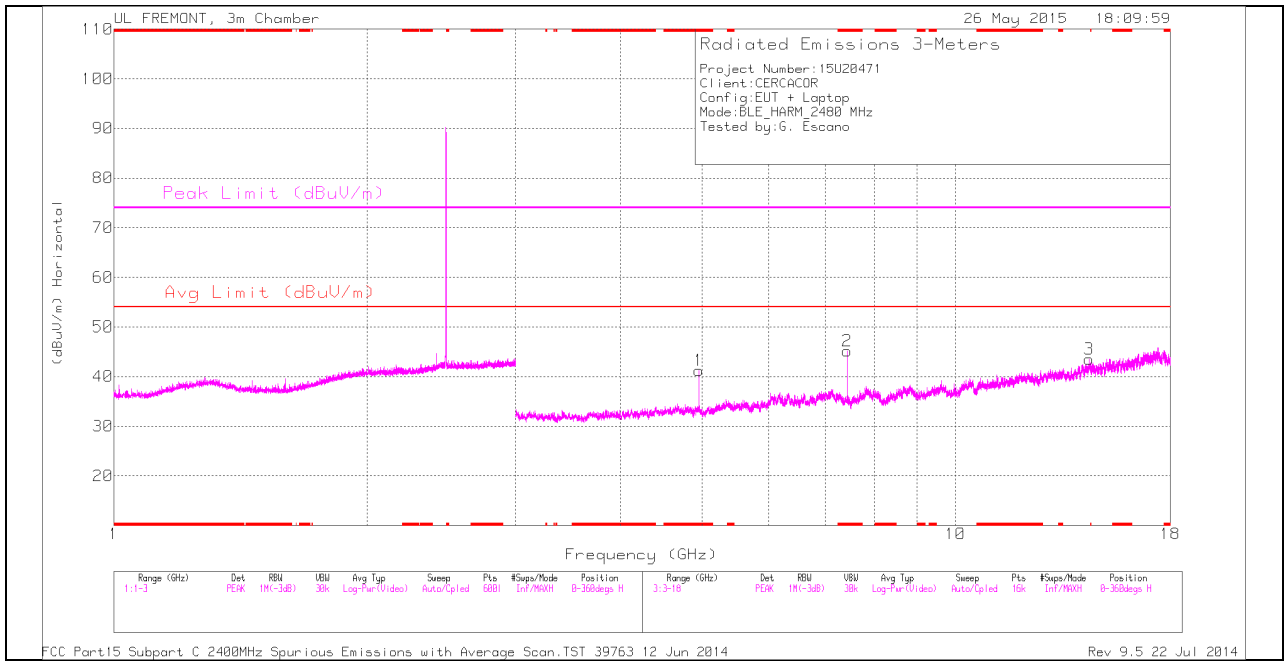
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.599	48.75	PK2	28	-23.4	0	53.35	-	-	74	-20.65	194	198	V
* 1.599	31.09	MAv1	28	-23.4	0	35.69	54	-18.31	-	-	194	198	V
* 4.882	43.44	PK2	34	-30.1	0	47.34	-	-	74	-26.66	314	378	H
* 4.882	36.97	MAv1	34	-30.1	0	40.87	54	-13.13	-	-	314	378	H
* 7.321	41.28	PK2	35.6	-28.4	0	48.48	-	-	74	-25.52	286	159	H
* 7.32	31.93	MAv1	35.6	-28.4	0	39.13	54	-14.87	-	-	286	159	H

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

PK2 - KDB558074 Method: Maximum Peak

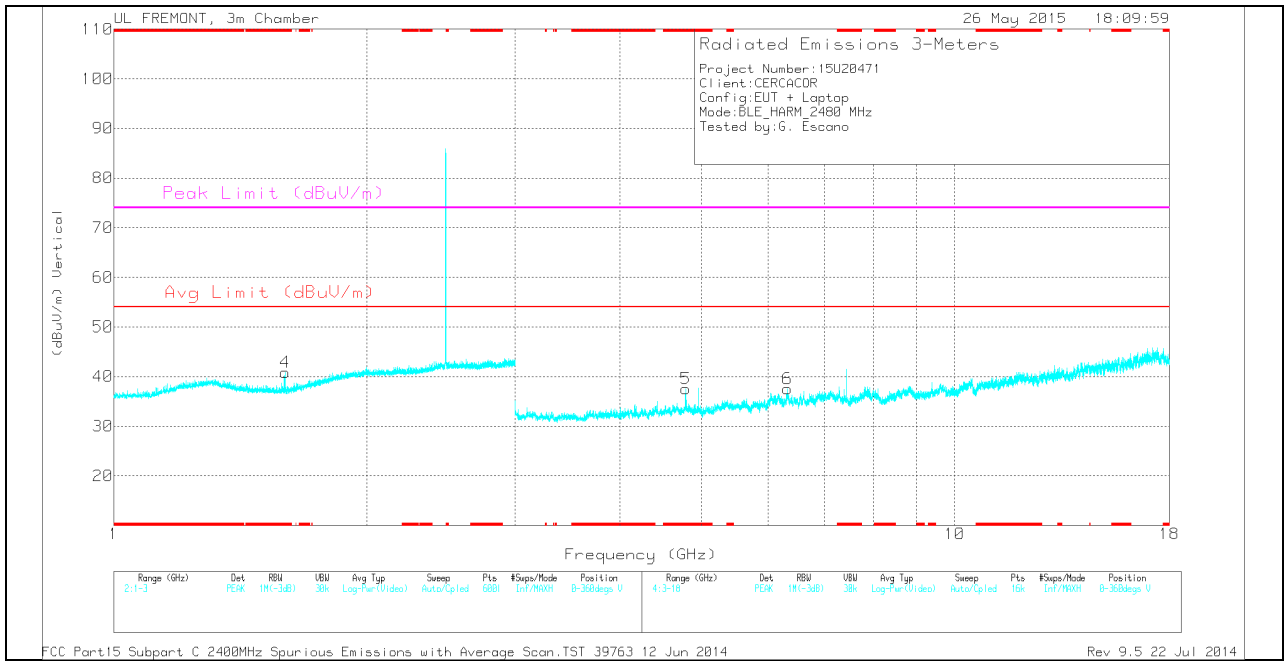
MAv1 - KDB558074 Option 1 Maximum RMS Average

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 T119 (dB/m)	Amp/Cbl/Fltr /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	* 1.598	36.26	PK	28	-23.4	0	40.86	-	-	74	-33.14	0-360	100	V
1	* 4.958	38.15	PK	34	-30.9	0	41.25	-	-	74	-32.75	0-360	200	H
2	* 7.439	38.4	PK	35.7	-28.9	0	45.2	-	-	74	-28.8	0-360	200	H
5	* 4.786	33.82	PK	34	-30.3	0	37.52	-	-	74	-36.48	0-360	200	V
6	6.324	31.31	PK	35.4	-29.2	0	37.51	-	-	-	-	0-360	100	V
3	14.418	30.21	PK	39.6	-26.3	0	43.51	-	-	-	-	0-360	200	H

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

PK - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/ Fltr/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
* 1.6	45.09	PK2	28	-23.4	0	49.69	-	-	74	-24.31	107	288	V
* 1.599	30.63	MAv1	28	-23.4	0	35.23	54	-18.77	-	-	107	288	V
* 4.958	45.2	PK2	34	-30.9	0	48.3	-	-	74	-25.7	317	324	H
* 4.958	39.11	MAv1	34	-30.9	0	42.21	54	-11.79	-	-	317	324	H
* 7.439	46.31	PK2	35.7	-28.9	0	53.11	-	-	74	-20.89	341	325	H
* 7.439	39.95	MAv1	35.7	-28.9	0	46.75	54	-7.25	-	-	341	325	H
* 4.786	43.83	PK2	34	-30.3	0	47.53	-	-	74	-26.47	327	251	V
* 4.784	28.21	MAv1	34	-30.3	0	31.91	54	-22.09	-	-	327	251	V

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

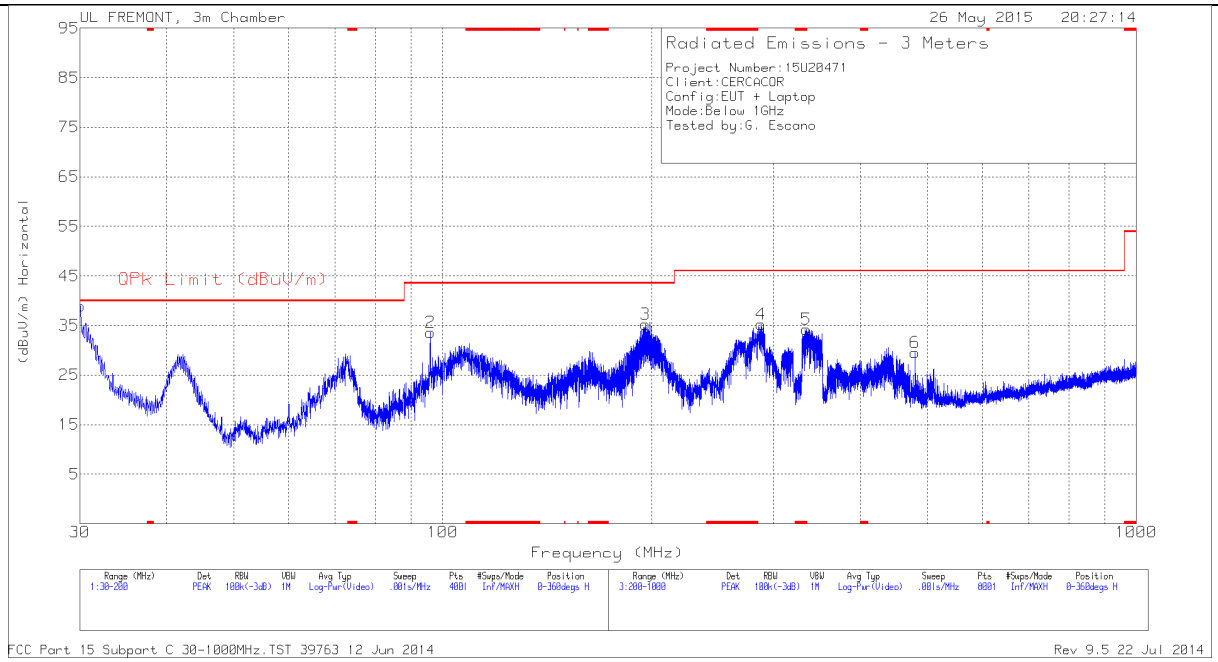
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

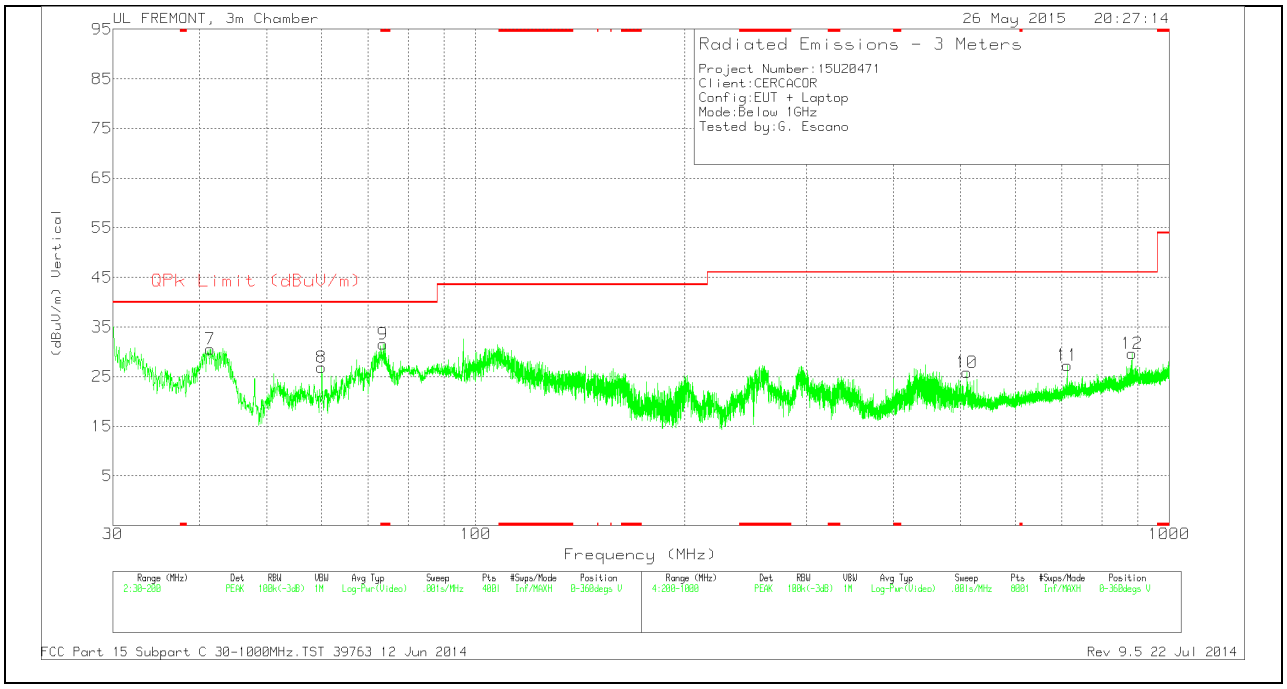
9.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



BELOW 1 GHz TABLE

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
9	* 73.52	50.11	PK	8.4	-27	31.51	40	-8.49	0-360	100	V
5	* 334.4	45.42	PK	14	-25.2	34.22	46.02	-11.8	0-360	100	H
1	30.0425	44.59	PK	21.8	-27.5	38.89	40	-1.11	0-360	100	H
7	41.475	44.75	PK	13.2	-27.4	30.55	40	-9.45	0-360	100	V
8	60.005	46.64	PK	7.3	-27.1	26.84	40	-13.16	0-360	100	V
2	96.0025	51.65	PK	8.8	-26.8	33.65	43.52	-9.87	0-360	100	H
3	195.9625	49.62	PK	11.4	-25.8	35.22	43.52	-8.3	0-360	100	H
4	287.5	46.97	PK	13.4	-25.1	35.27	46.02	-10.75	0-360	100	H
6	480	37.74	PK	17.7	-25.9	29.54	46.02	-16.48	0-360	100	H
10	510.7	33.77	PK	17.9	-25.8	25.87	46.02	-20.15	0-360	200	V
11	713.5	32.21	PK	20.3	-25.2	27.31	46.02	-18.71	0-360	200	V
12	883.5	31.81	PK	21.9	-24	29.71	46.02	-16.31	0-360	100	V

PK - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB/m)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
30.0019	42.6	QP	21.8	-27.5	36.9	40	-3.1	11	113	H

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

QP - Quasi-Peak detector

10. 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.

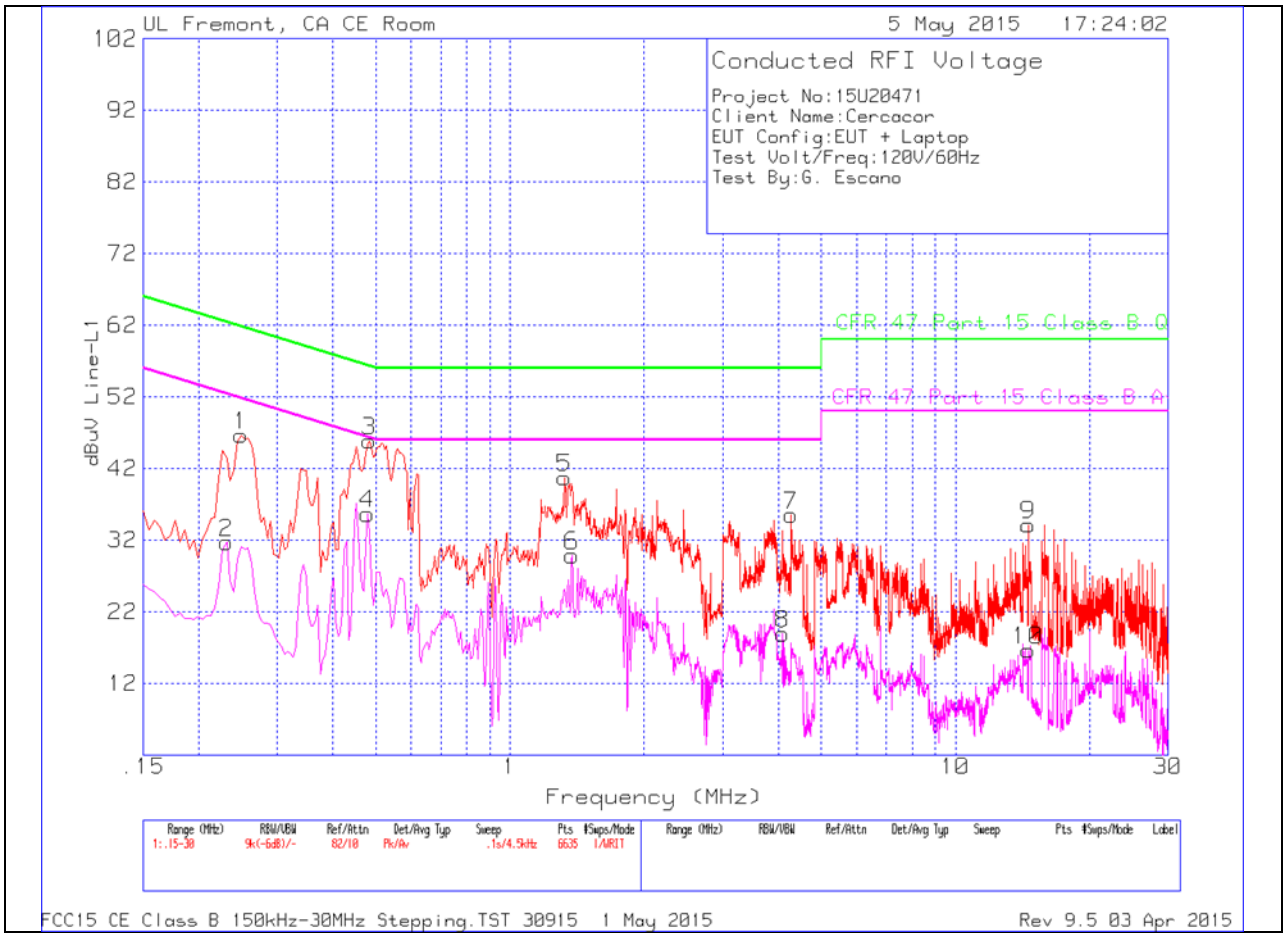
TEST PROCEDURE

ANSI C63.10 - 2013

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

Trace Markers

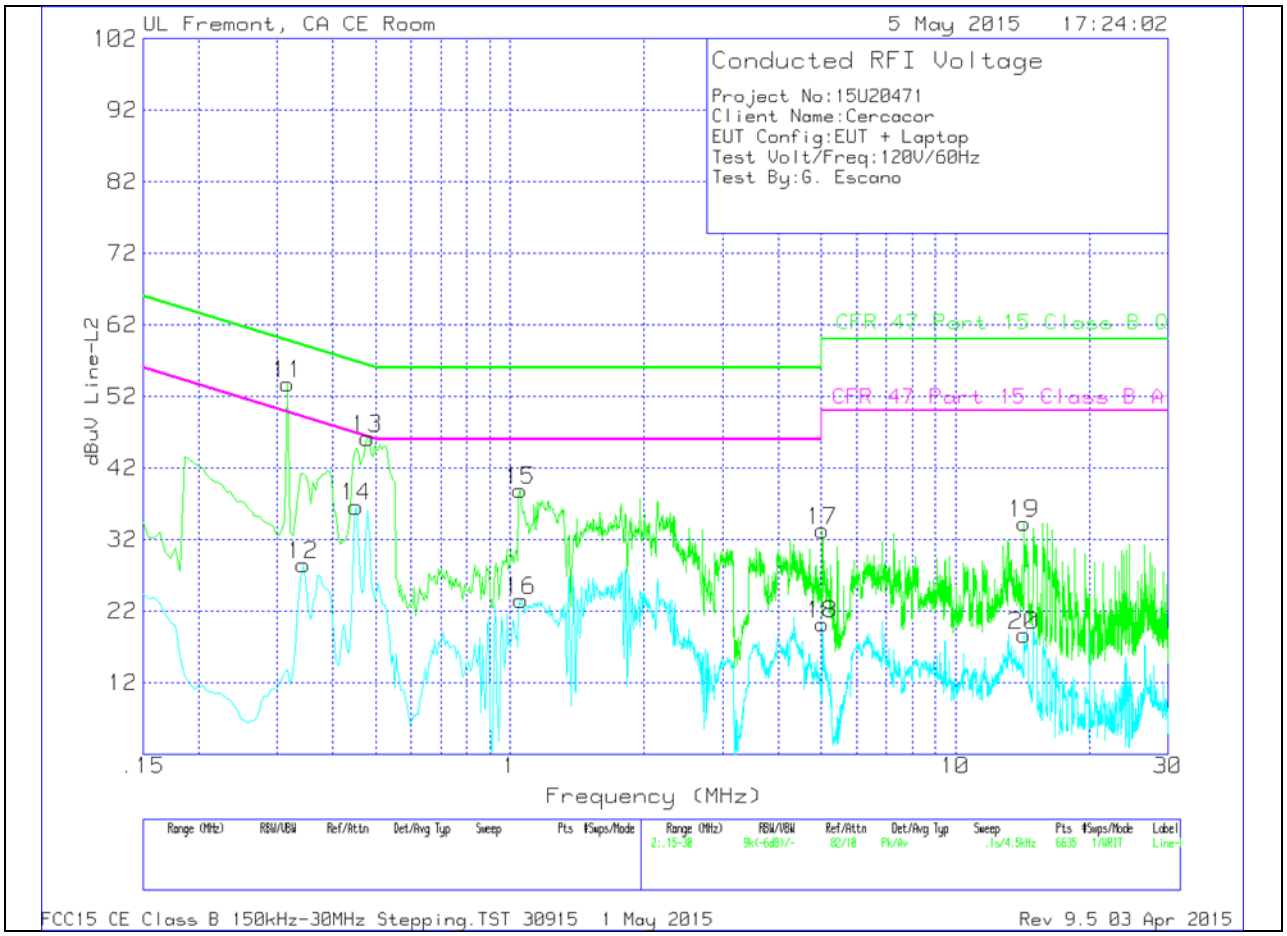
Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
1	.249	45.98	Pk	.7	0	46.68	61.79	-15.11	-	-
2	.231	30.9	Av	.8	0	31.7	-	-	52.41	-20.71
3	.483	45.46	Pk	.4	0	45.86	56.29	-10.43	-	-
4	.4785	35.3	Av	.4	0	35.7	-	-	46.37	-10.67
5	1.3245	40.45	Pk	.2	.1	40.75	56	-15.25	-	-
6	1.3785	29.59	Av	.2	.1	29.89	-	-	46	-16.11
7	4.2765	35.24	Pk	.2	.1	35.54	56	-20.46	-	-
8	4.0965	18.65	Av	.2	.1	18.95	-	-	46	-27.05
9	14.568	33.74	Pk	.2	.2	34.14	60	-25.86	-	-
10	14.568	16.26	Av	.2	.2	16.66	-	-	50	-33.34

Pk - Peak detector

Av - Average detection

LINE 2 PLOT



LINE 2 RESULTS

Trace Markers

Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
11	.3165	53.18	Pk	.6	0	53.78	59.8	-6.02	-	-
12	.3435	27.99	Av	.5	0	28.49	-	-	49.12	-20.63
13	.4785	45.8	Pk	.4	0	46.2	56.37	-10.17	-	-
14	.4515	36.21	Av	.4	0	36.61	-	-	46.85	-10.24
15	1.0545	38.59	Pk	.3	0	38.89	56	-17.11	-	-
16	1.059	23.23	Av	.3	0	23.53	-	-	46	-22.47
17	5.0235	32.99	Pk	.2	.1	33.29	60	-26.71	-	-
18	5.0235	19.89	Av	.2	.1	20.19	-	-	50	-29.81
19	14.262	33.89	Pk	.2	.2	34.29	60	-25.71	-	-
20	14.262	18.27	Av	.2	.2	18.67	-	-	50	-31.33

Pk - Peak detector

Av - Average detection