FCC CFR47 PART 15 SUBPART C

BLUETOOTH LOW ENERGY

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/CDMA + BLUETOOTH + DTS/UNII a/b/g/n RADIO MODULE

MODEL NUMBER: QM8626

FCC ID: J9CQM8626

REPORT NUMBER: 15U19820-E2, Revision B

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	05/08/15	Initial Issue	CHOON OOI
A	08/10/15	Revised Antenna Gain an Setup Photo Revised Duty Cycle Result on Page 39-51 Revised KDB 558074 D01 DTS Meas Guidance v03r02 to v03r03 Revised Section 2	CHOON OOI
B	08/26/15	Updated Conducted Setup Picture	CHOON OOI

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: QUALCOMM TECHNOLOGIES, INC.

EUT DESCRIPTION: GSM/WCDMA/CDMA + BLUETOOTH + DTS/UNII a/b/g/n RADIO MODULE

MODEL: QM8626

SERIAL NUMBER: N10KRK5FL

DATE TESTED: JANUARY 28 – APRIL 13, 2015

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:

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PROJECT LEAD
UL Verification Services Inc.

Tested By:

CHARLES VERGONIO
WiSE LAB ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

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

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 26000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/CDMA + BLUETOOTH + DTS/UNII a/b/g/n RADIO MODULE.

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	1.96	1.57

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an antenna, with a maximum gain of 1.7 dBi.

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

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	N/A	N/A	N/A	N/A

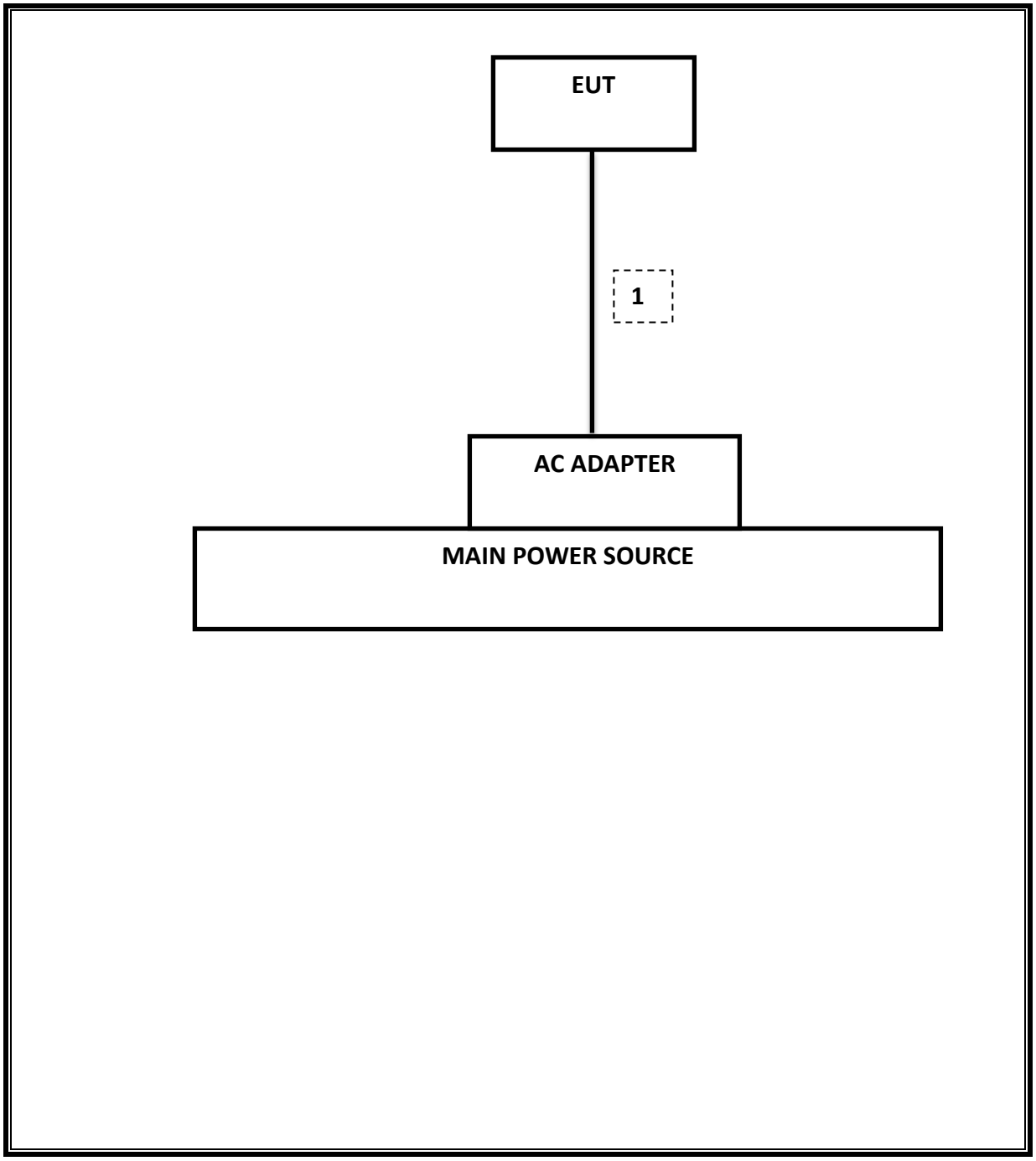
I/O CABLES

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

TEST SETUP

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

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment List				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/13/16
Antenna, Horn, 18GHz	EMCO	3115	C00783	10/25/15
Antenna, Horn, 25.5 GHz	ARA	MWH-1826/B	C00980	11/14/15
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	01/28/16
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/15
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/15
CBT Bluetooth Tester	R & S	CBT	None	07/12/15
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/15
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/15
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/16
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR

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

8.

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	0.679 MHz
2.1051, 15.247 (d)	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-43.01dBm
15.247	TX conducted output power	<30dBm		Pass	1.96dBm
15.247	PSD	<8dBm		Pass	-5.62dBm
15.207 (a)	AC Power Line conducted emissions	Section 10	Radiated	Pass	56.77dBuV(PK)
15.205, 15.209	Radiated Spurious Emission	< 54dBuV/m		Pass	42.48 dBuV/m

ANTENNA PORT TEST RESULTS

8.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

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

TEST PROCEDURE

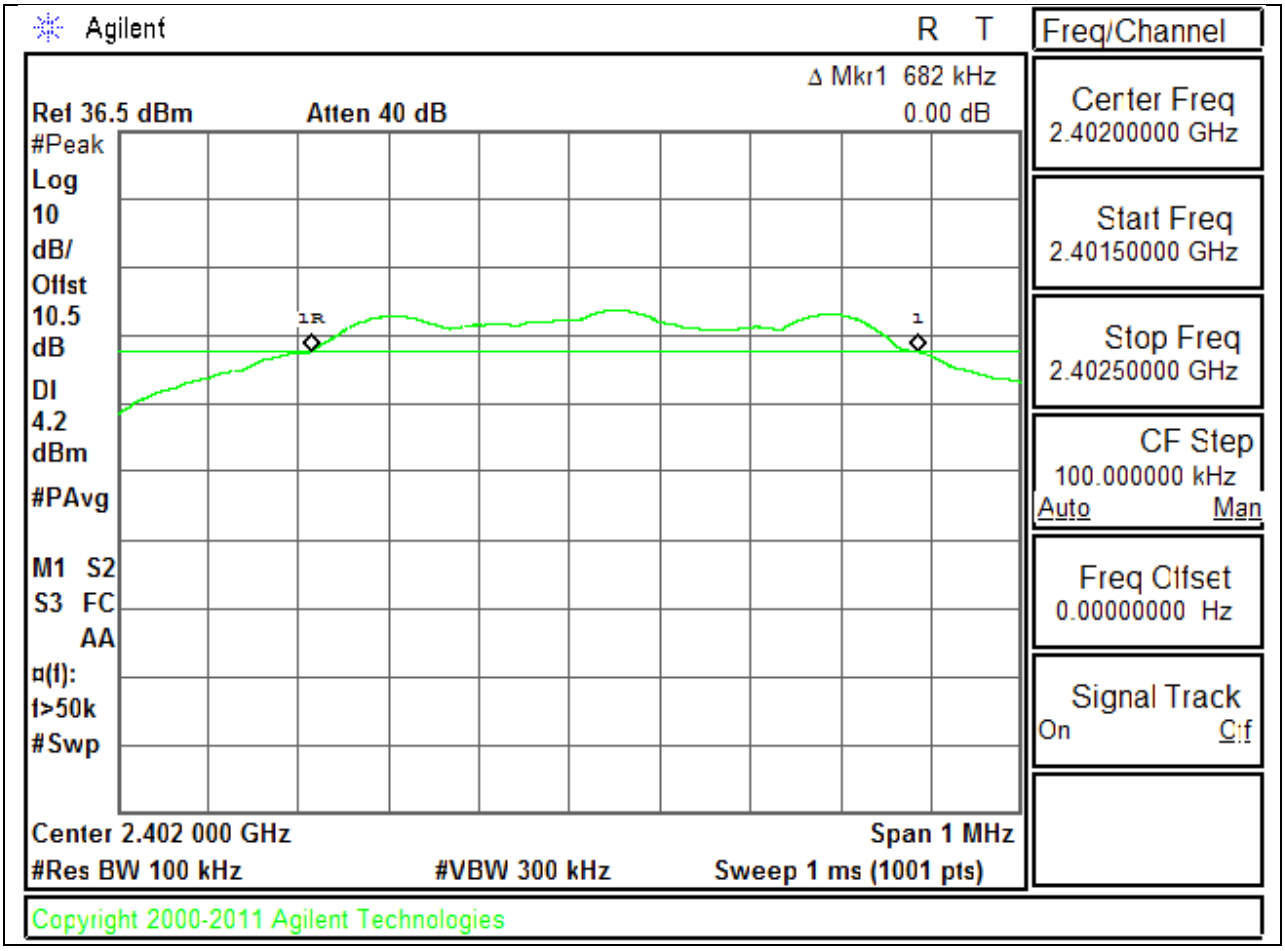
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

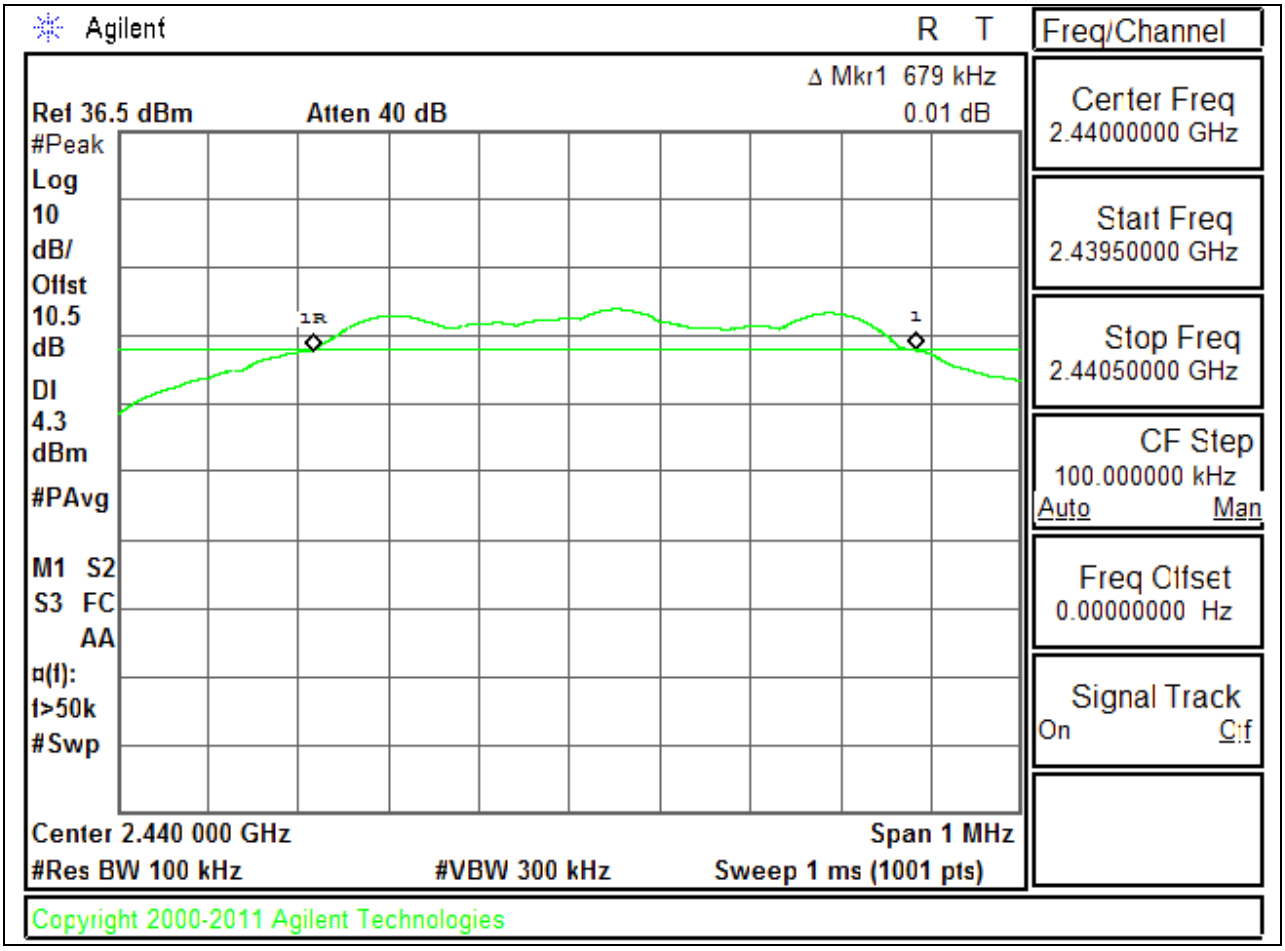
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.6820	0.5
Middle	2440	0.6790	0.5
High	2480	0.6800	0.5

6 dB BANDWIDTH PLOTS

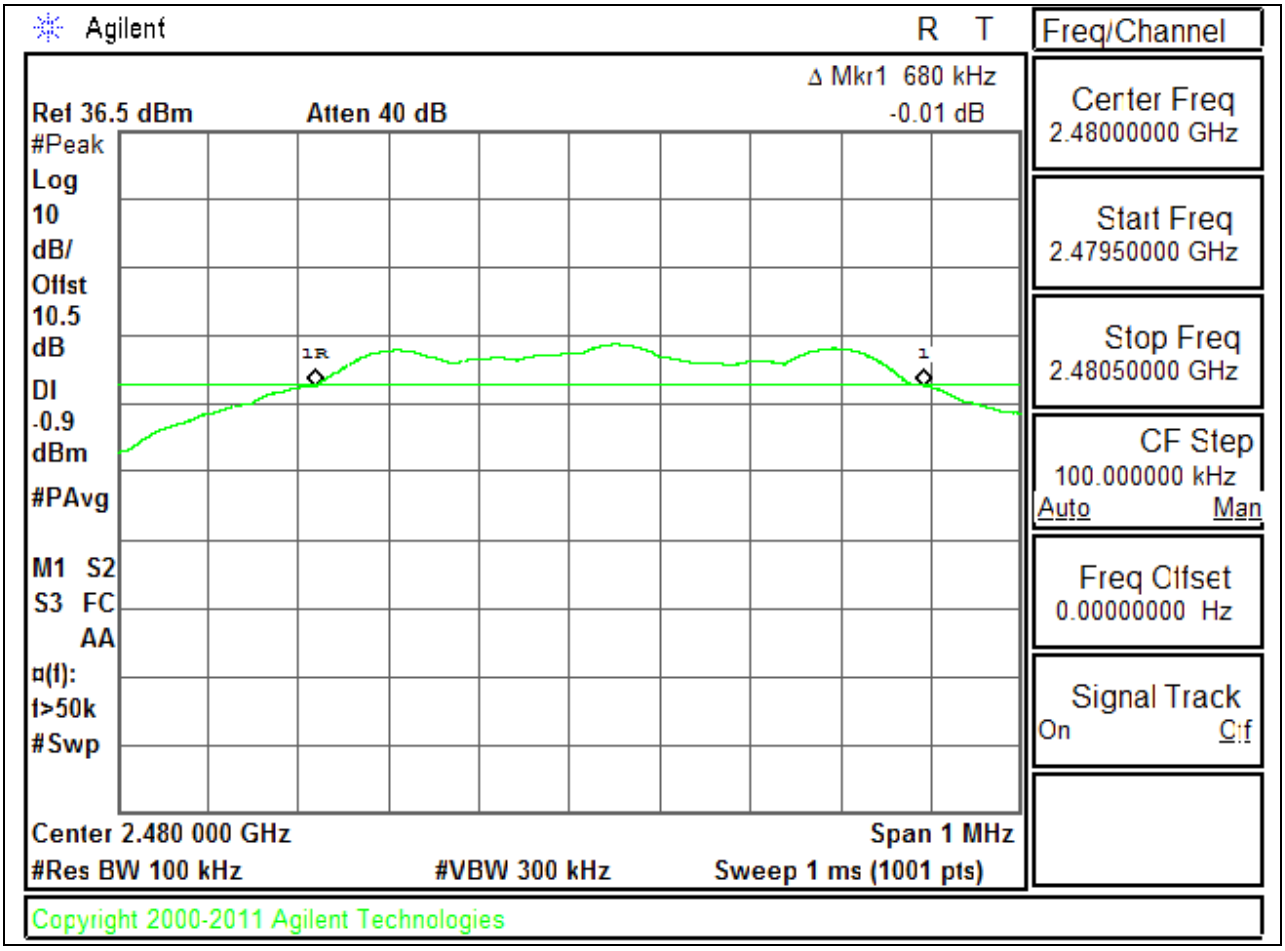
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

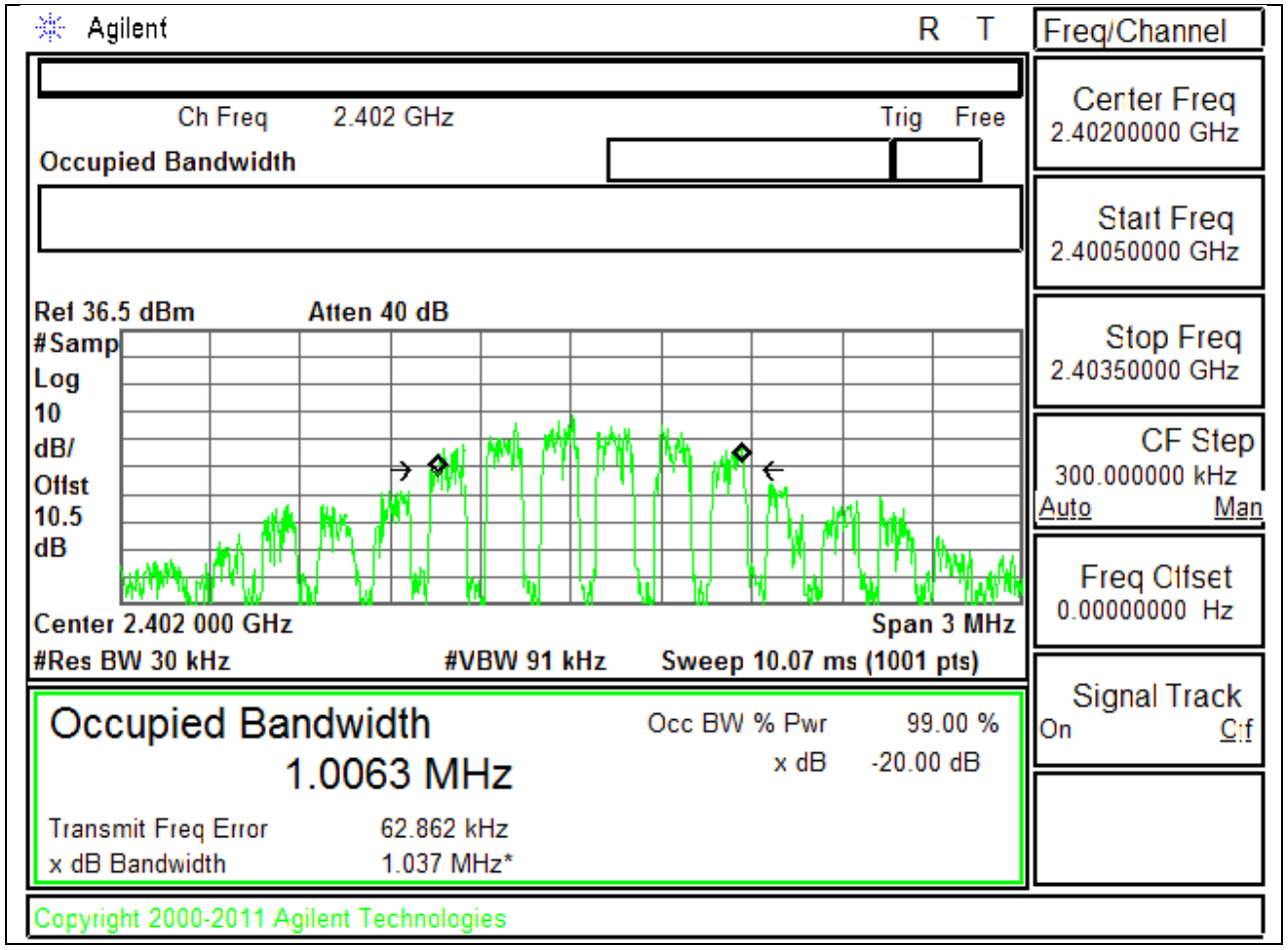
Reference to KDB558074 D01 DTS Meas Guidance v03r03: The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

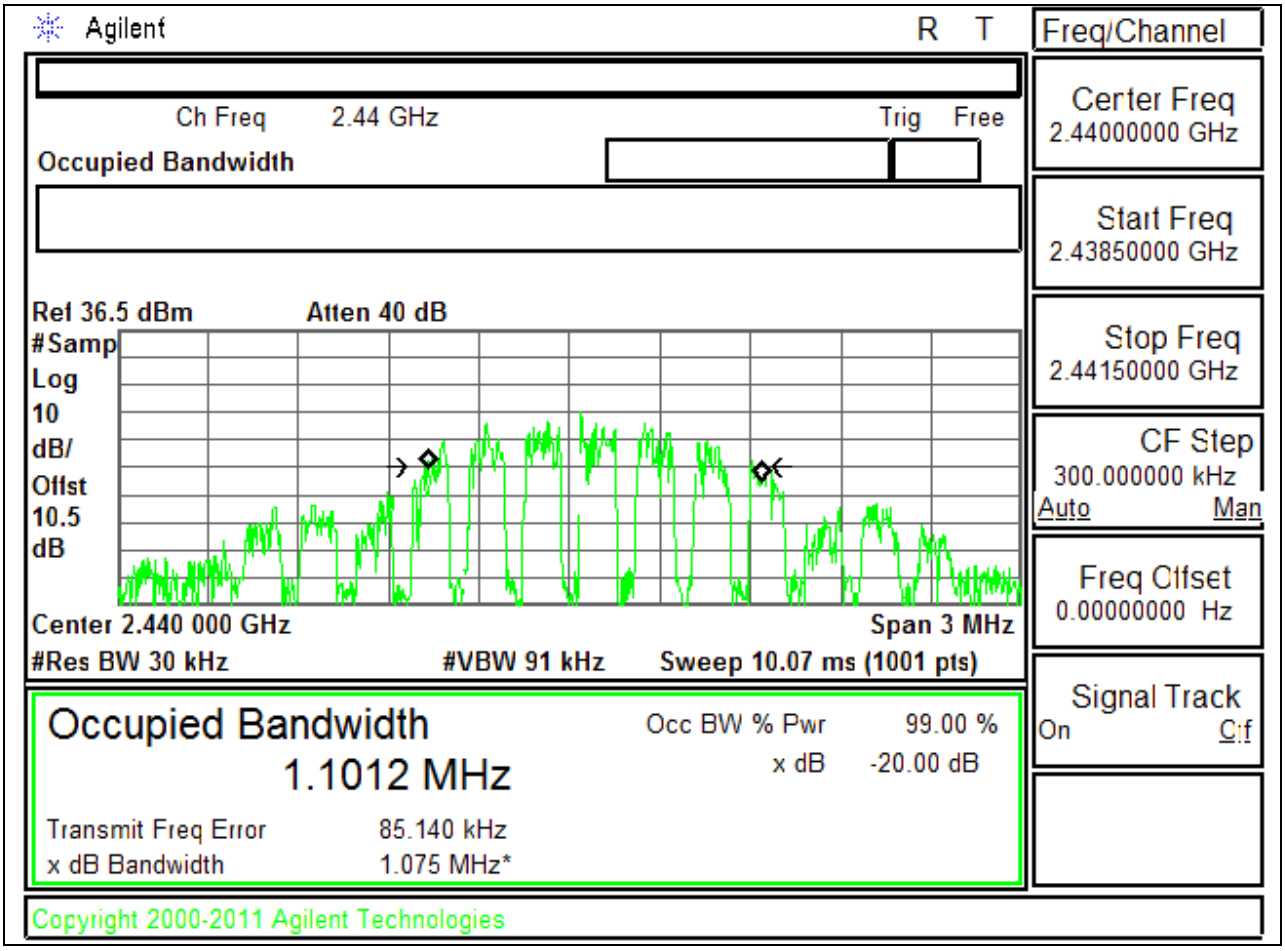
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0063
Middle	2440	1.1012
High	2480	1.0290

99% BANDWIDTH PLOTS

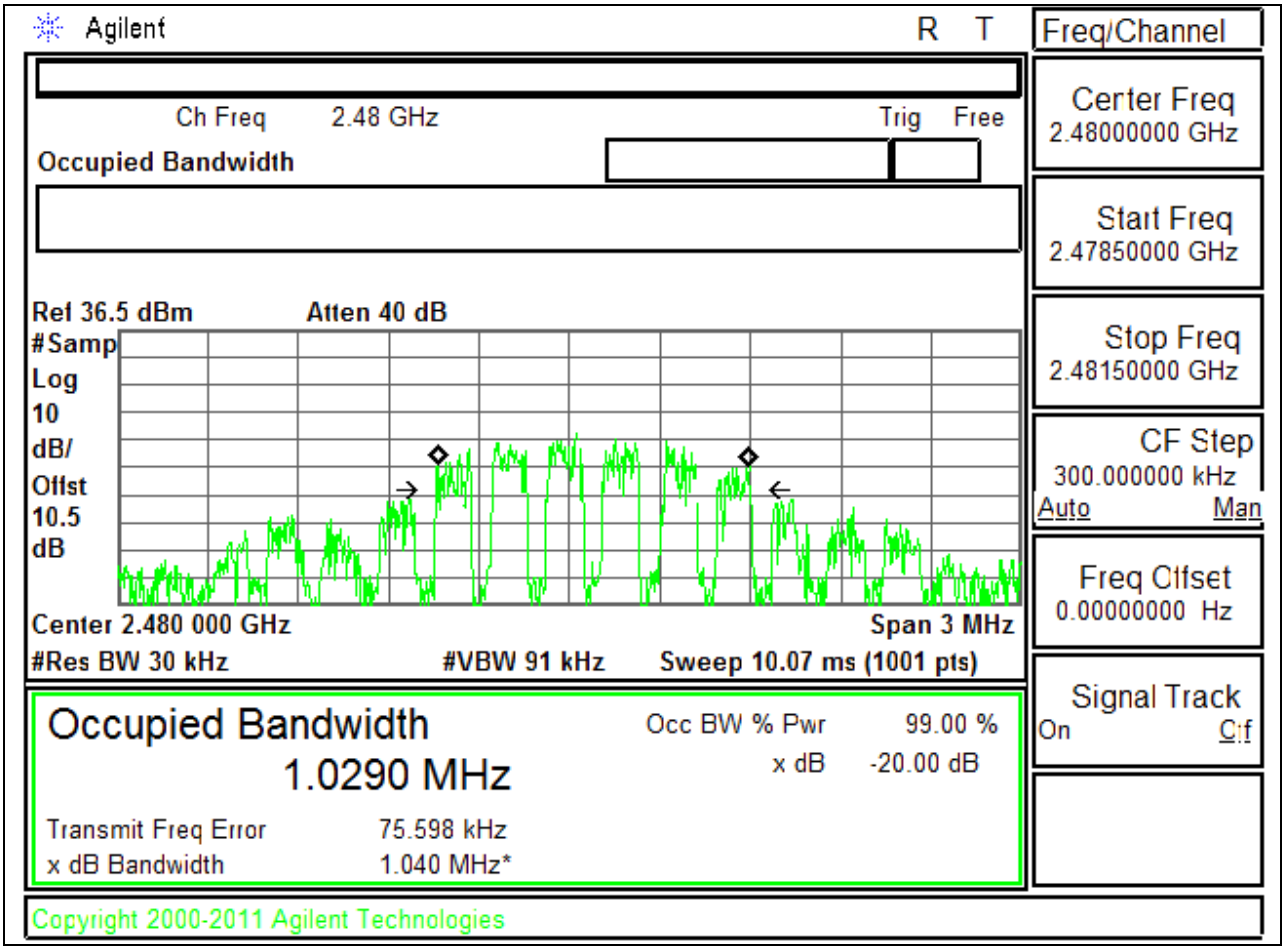
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

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

TEST PROCEDURE

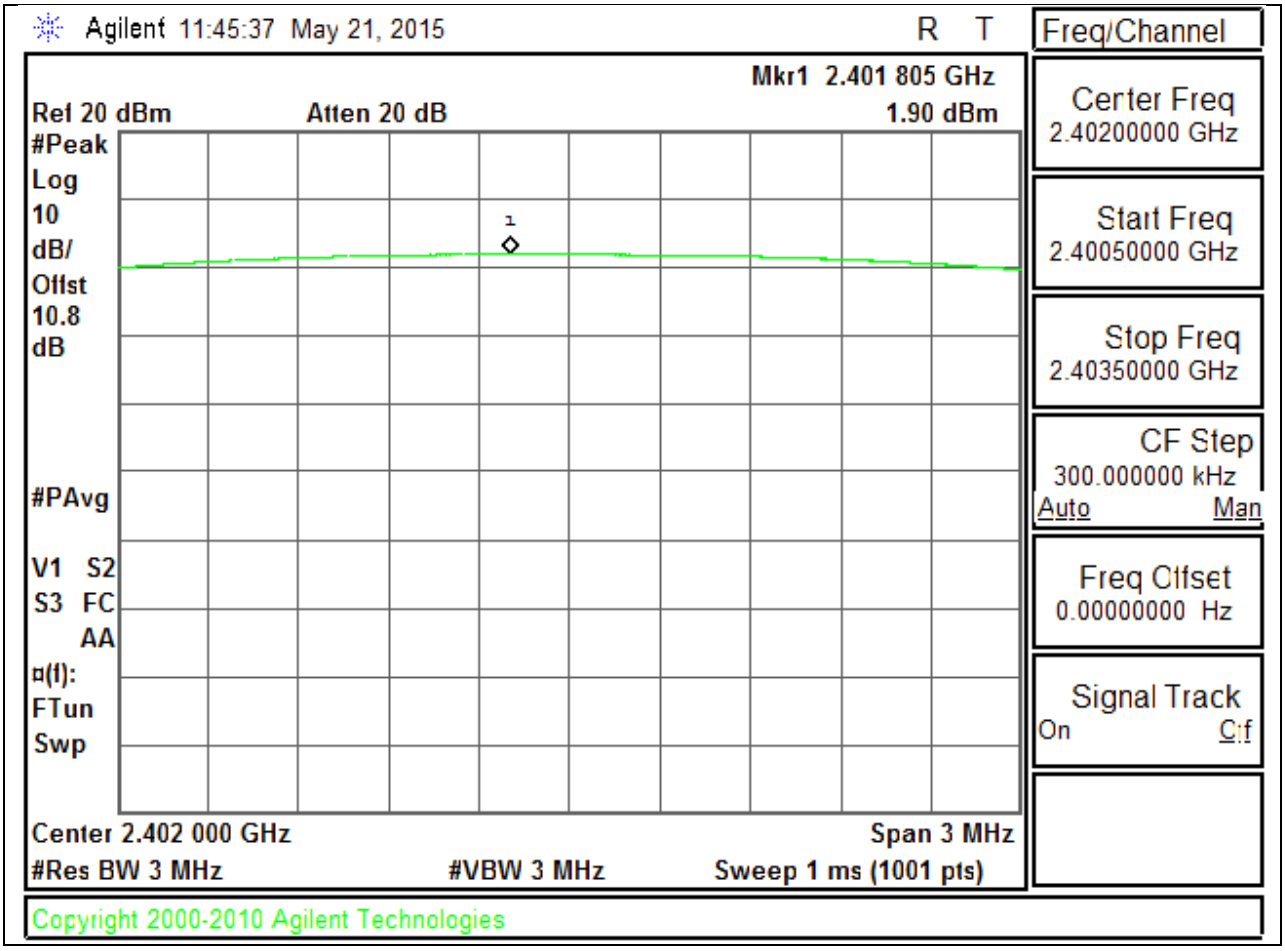
Peak power is measured using KDB558074 D01 DTS Meas Guidance v03r03 under section 9.1.1 utilizing spectrum analyze.

RESULTS

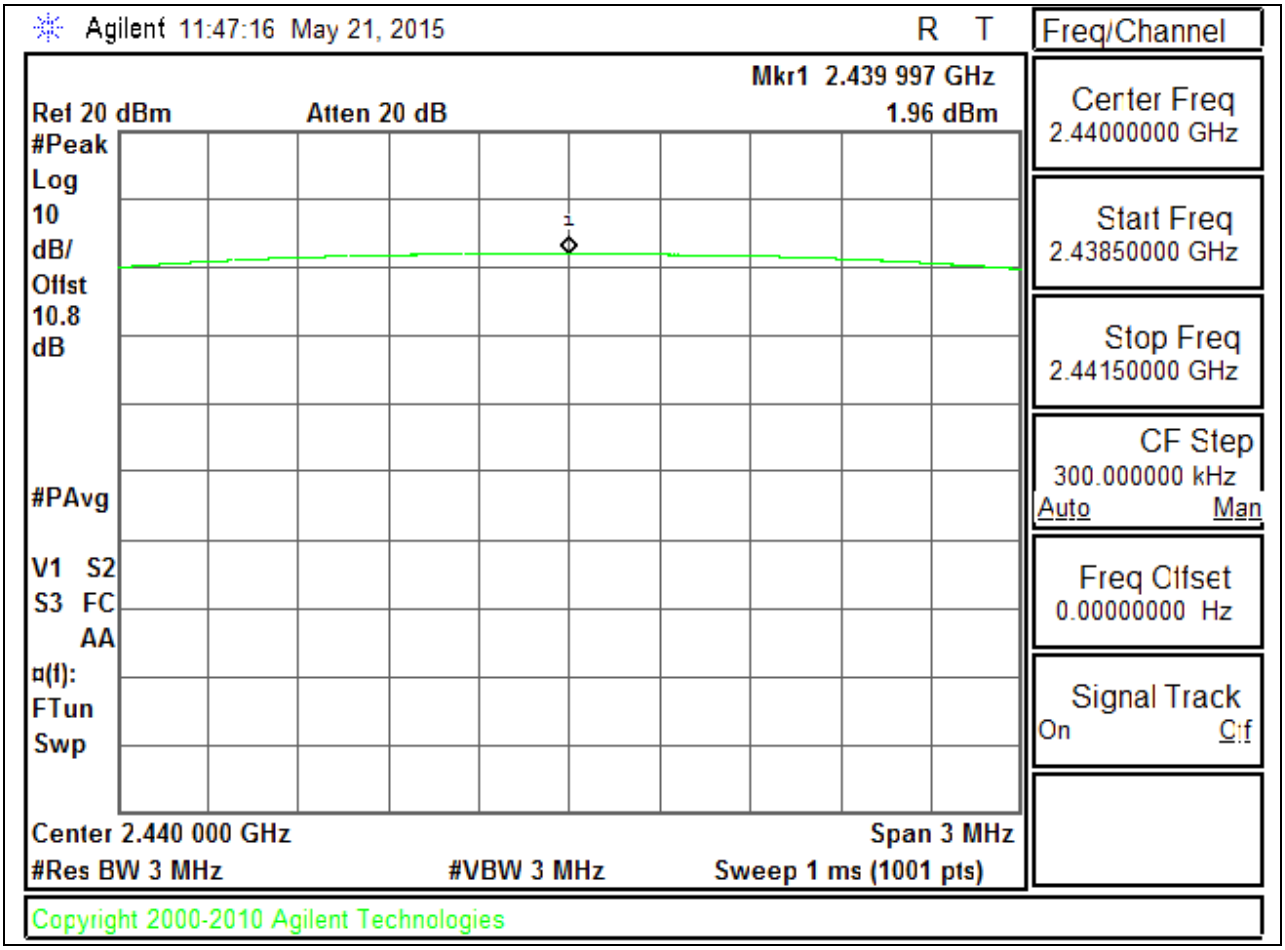
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	1.900	30	-28.100
Middle	2440	1.960	30	-28.040
High	2480	0.590	30	-29.410

OUTPUT POWER PLOTS

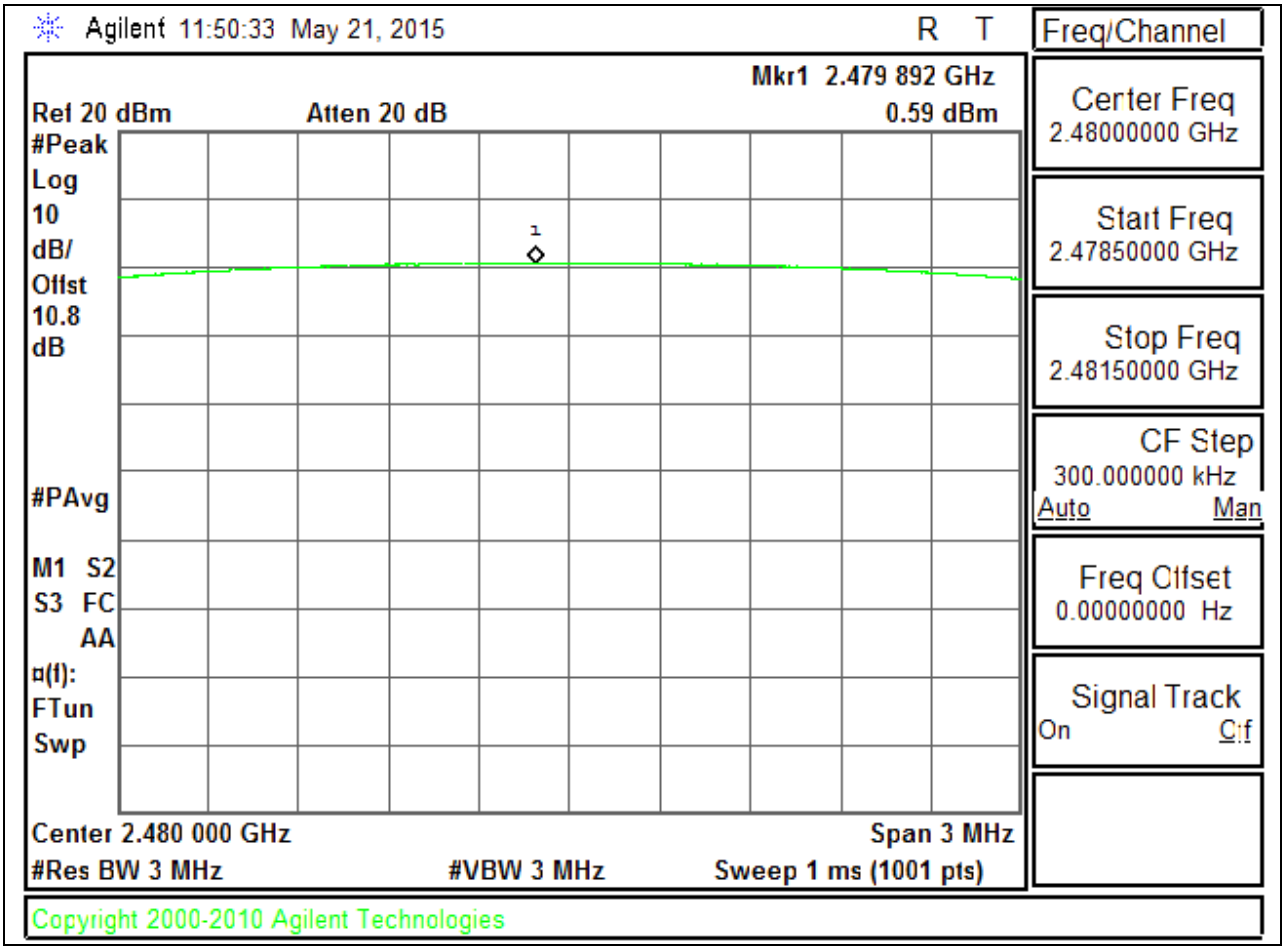
LOW CHANNEL



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	0.6
Middle	2440	0.95
High	2480	-1.95

8.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

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

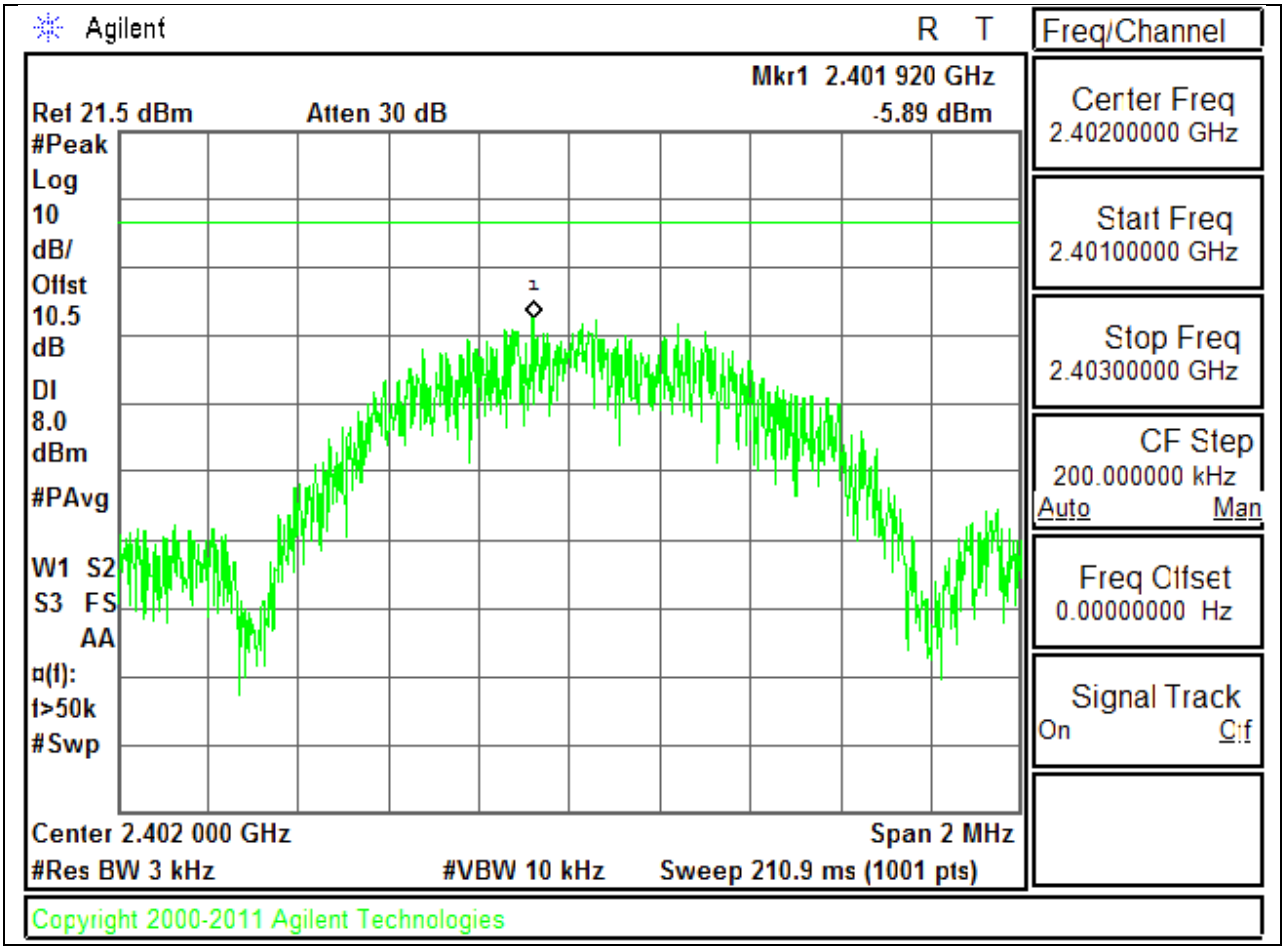
Power Spectral Density was performed utilizing the "Method PKPSD (Peak PSD)" under KDB558074 D01 DTS Meas Guidance v03r03

RESULTS

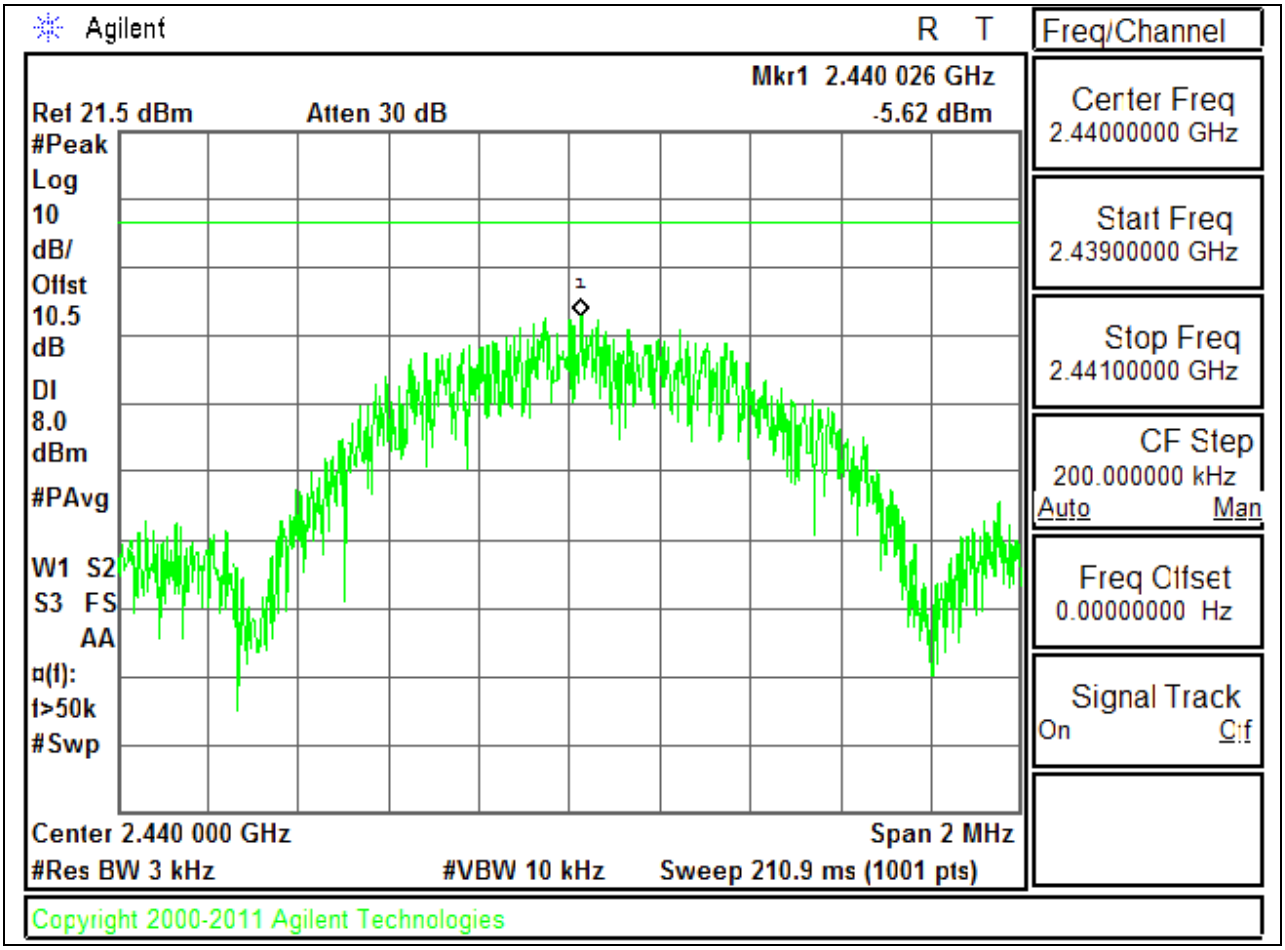
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-5.89	8	-13.89
Middle	2440	-5.62	8	-13.62
High	2480	-10.78	8	-18.78

POWER SPECTRAL DENSITY PLOTS

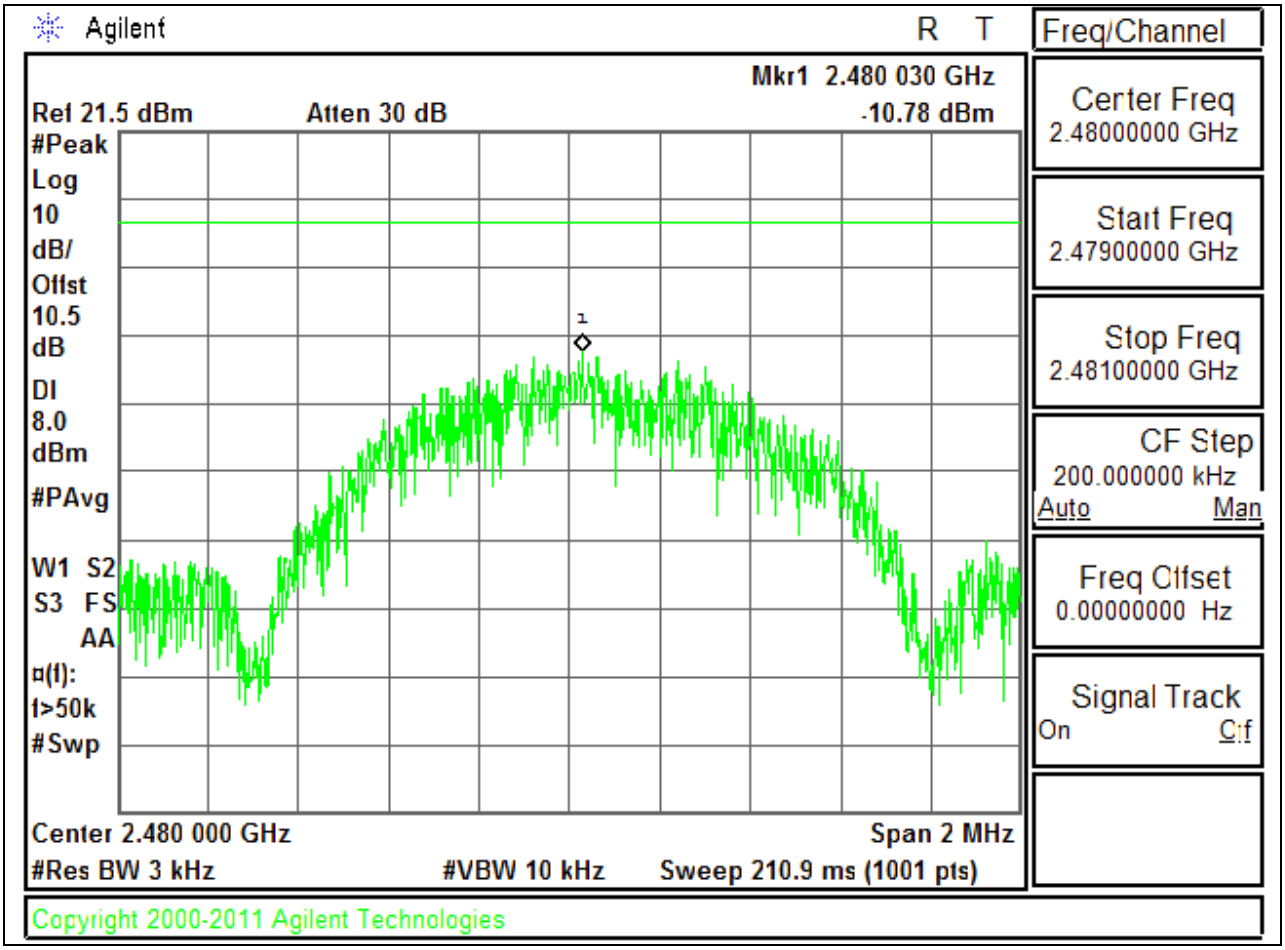
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

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

TEST PROCEDURE

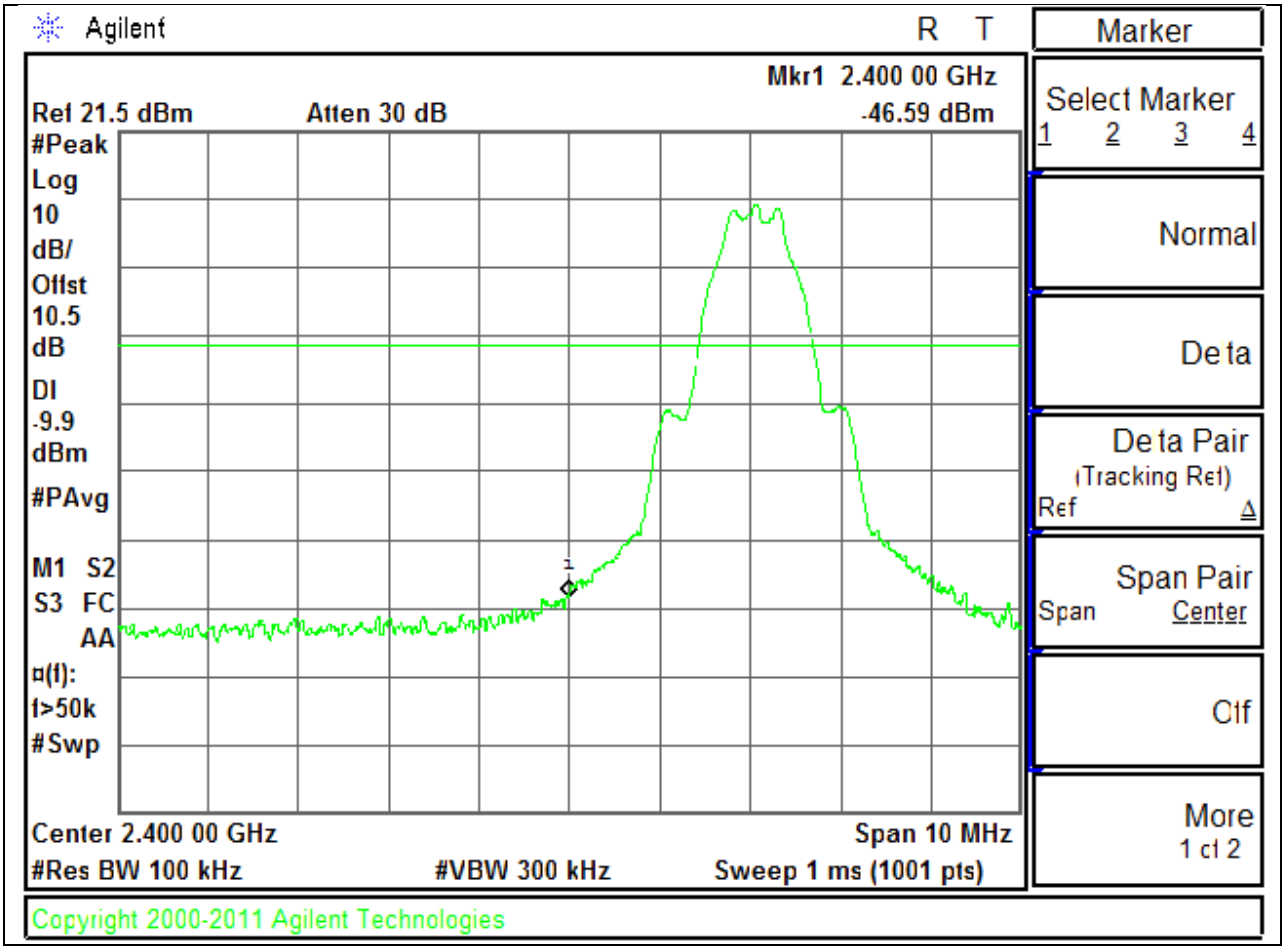
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

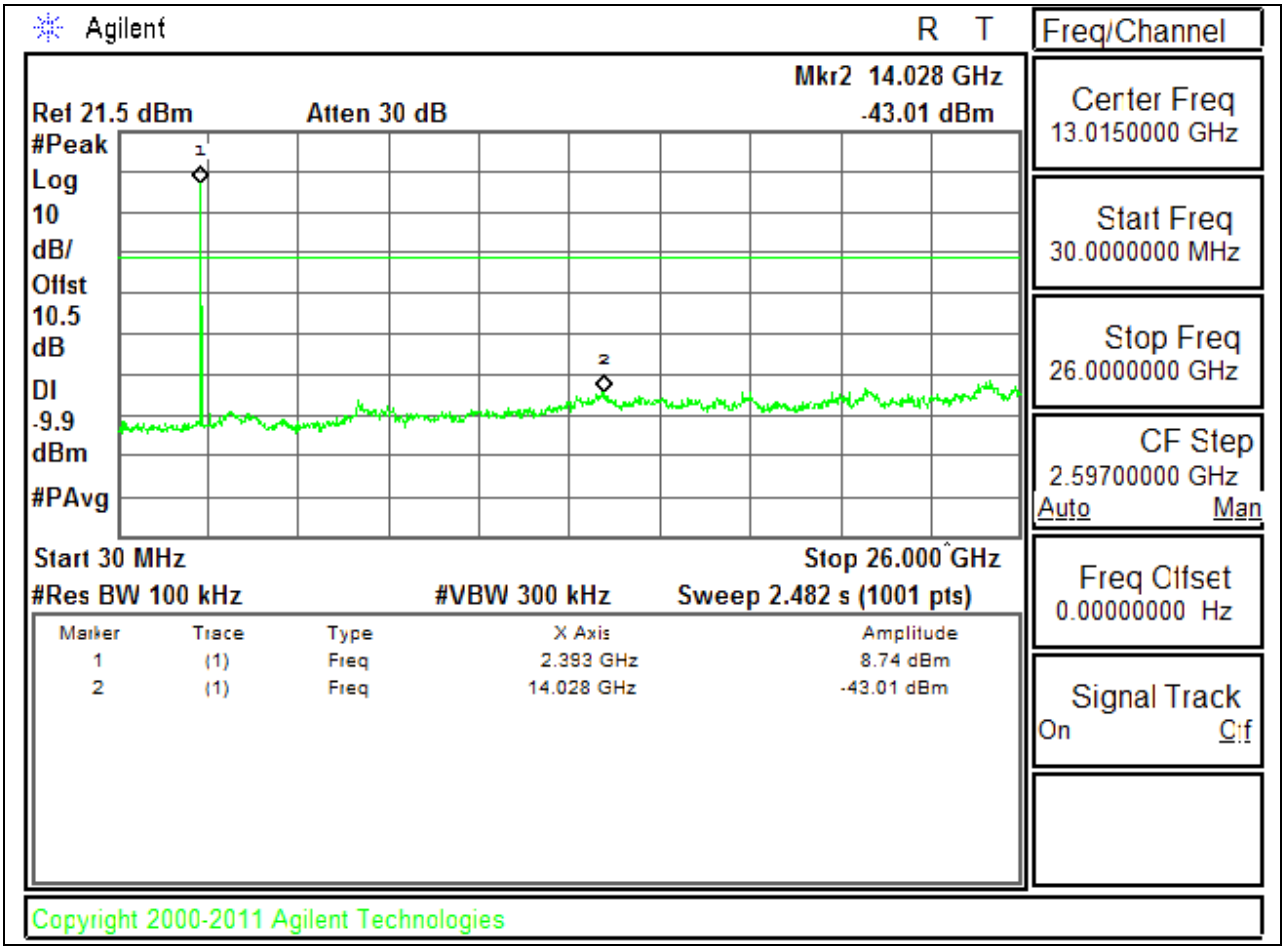
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL

LOW CHANNEL BANDEDGE

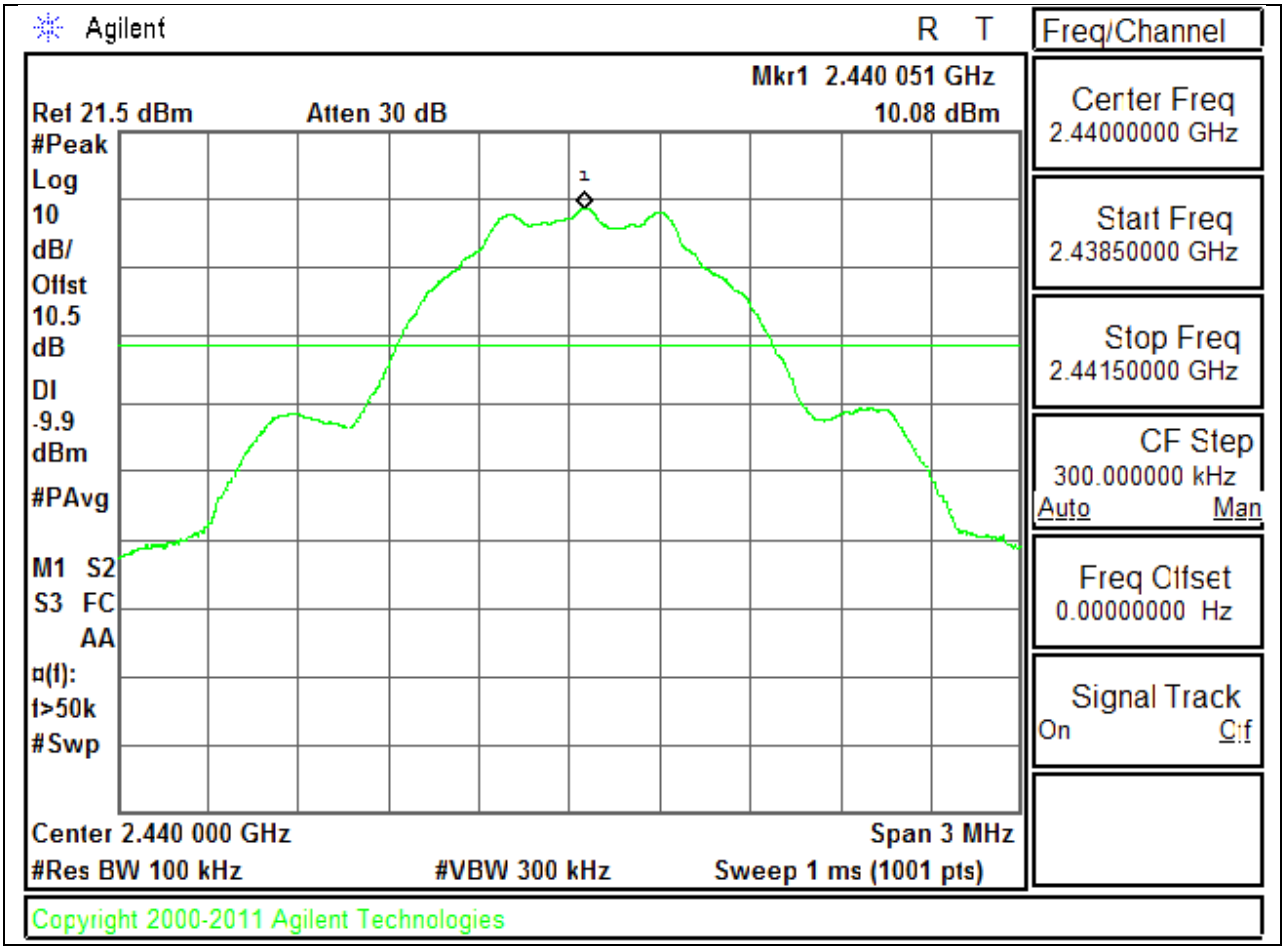


LOW CHANNEL SPURIOUS

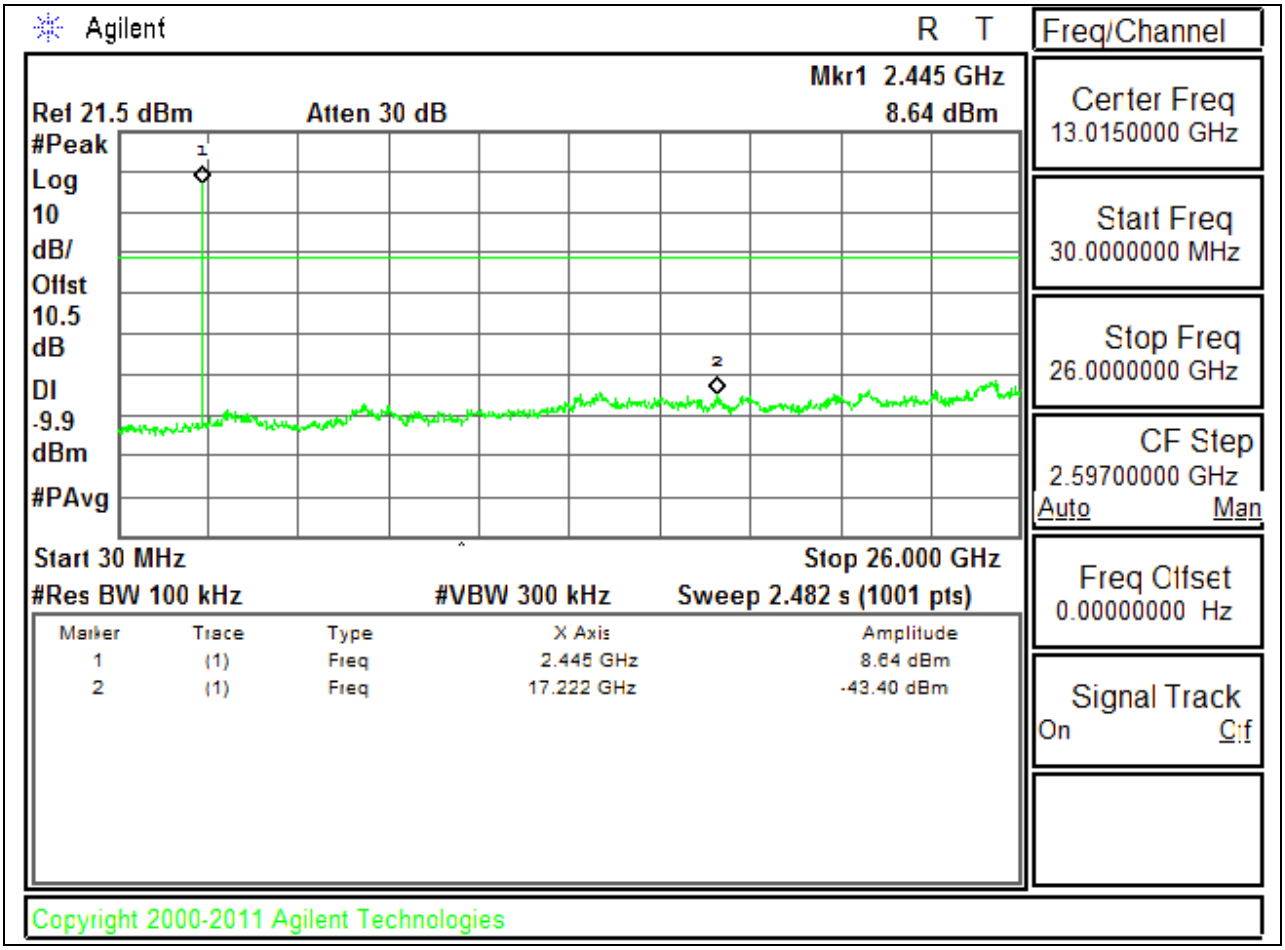


SPURIOUS EMISSIONS, MID CHANNEL

MID CHANNEL REFERENCE

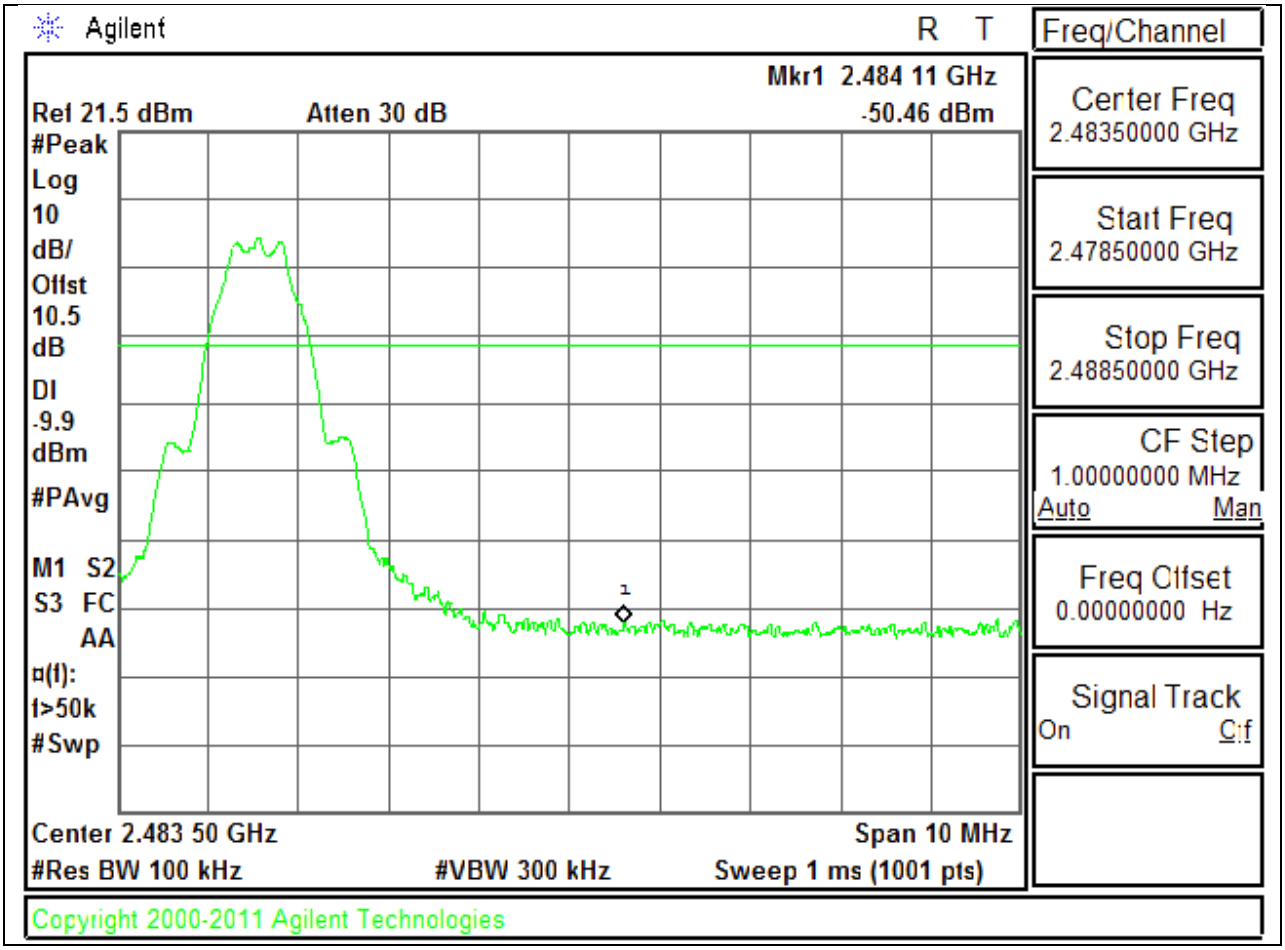


MID CHANNEL SPURIOUS

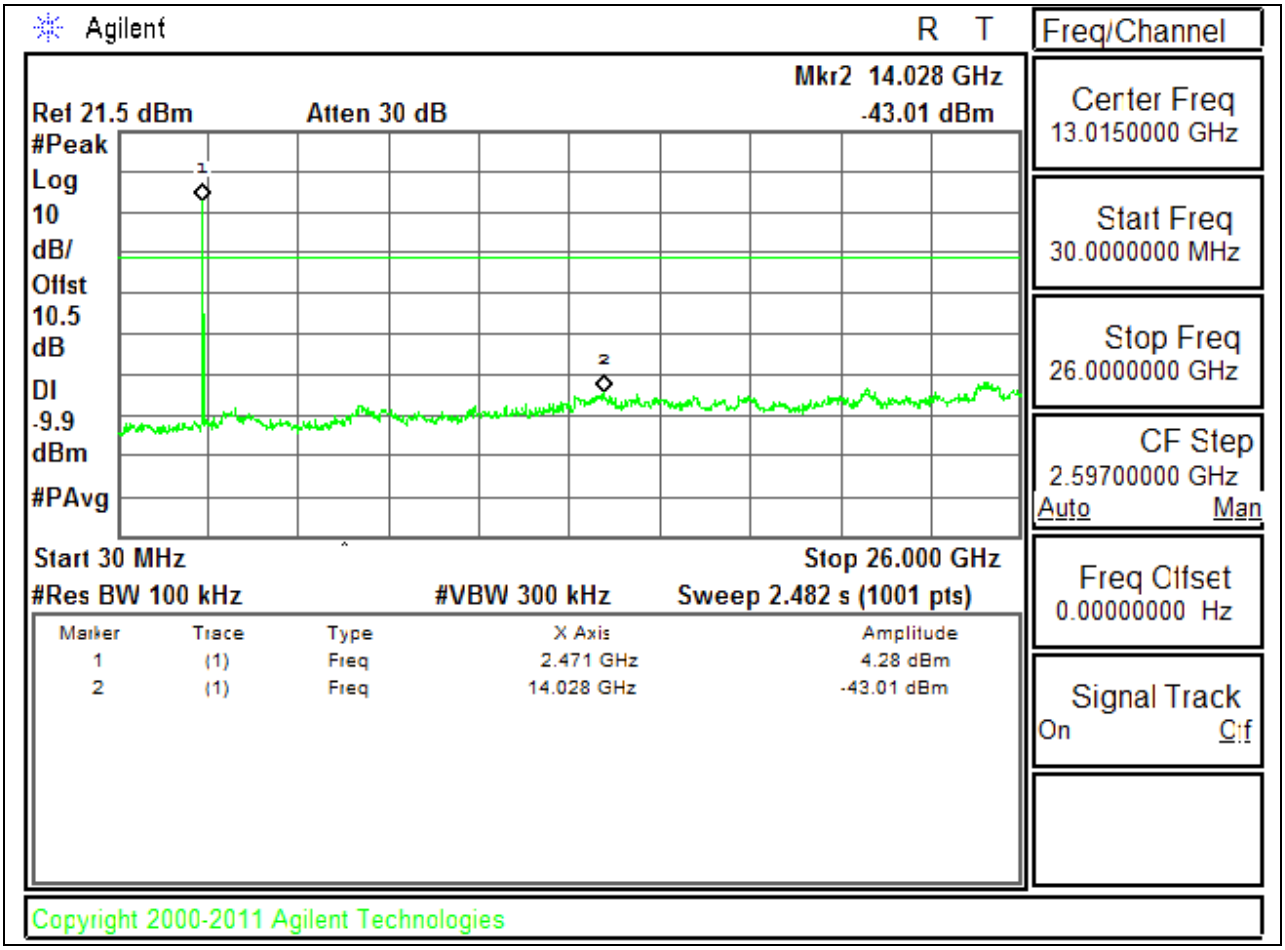


SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE



HIGH CHANNEL SPURIOUS



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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 C63.4 - 2009. 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(1/0.620)=2.076dB

(Spectrum Analyzer round it up to 2.1dB)

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.

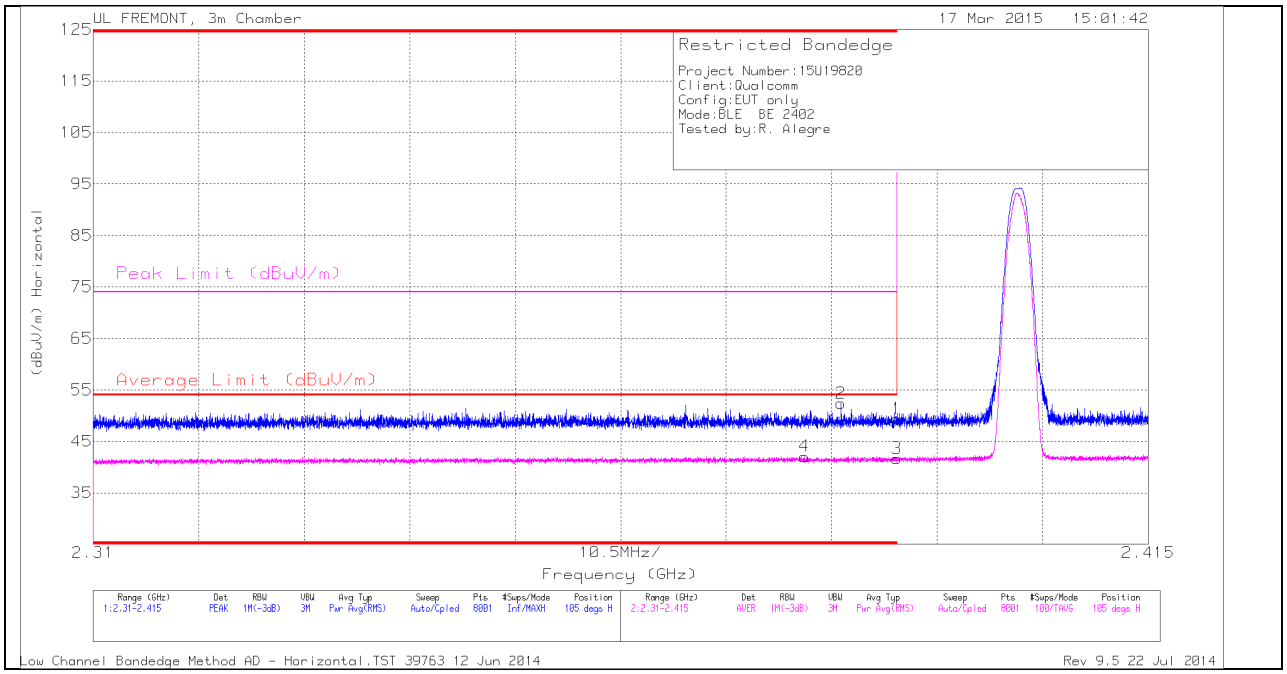
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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)

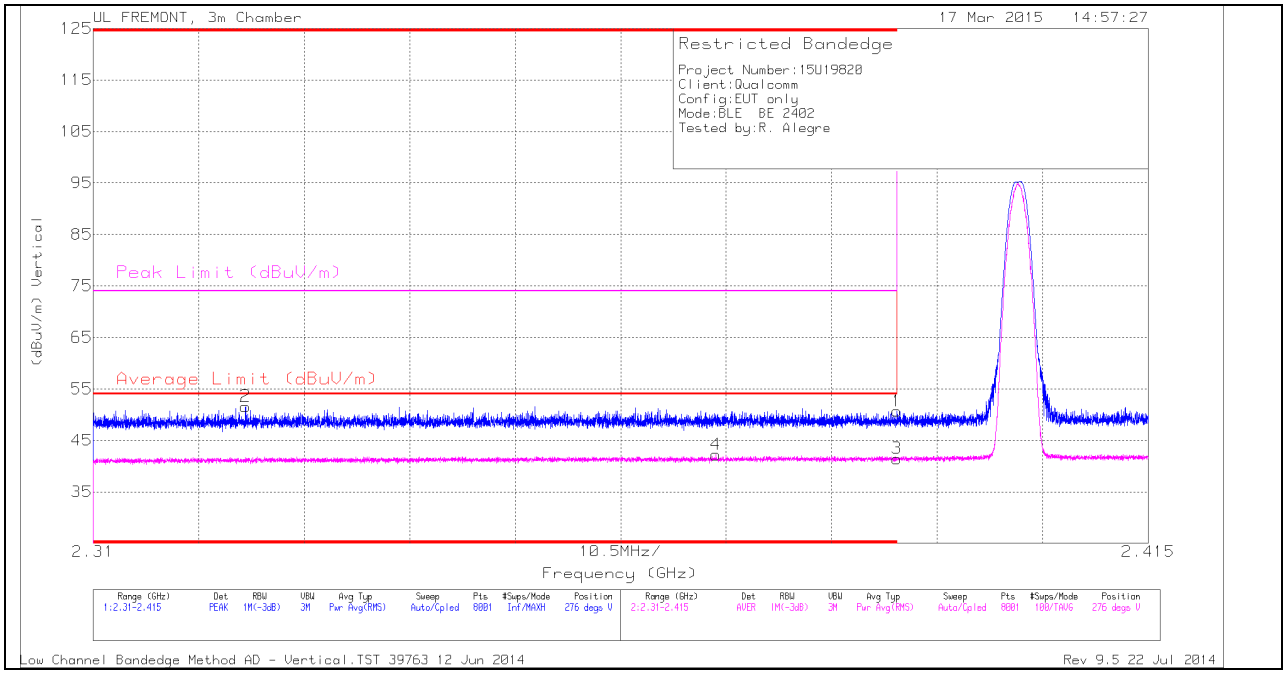
HORIZONTAL PEAK AND AVERAGE PLOT



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	40.47	PK	32	-23.1	0	49.37	-	-	74	-24.63	105	396	H
2	* 2.384	43.49	PK	32	-23.1	0	52.39	-	-	74	-21.61	105	396	H
3	* 2.39	30.73	RMS	32	-23.1	2.1	41.73	54	-12.27	-	-	105	396	H
4	* 2.381	31.23	RMS	31.9	-23.1	2.1	42.13	54	-11.87	-	-	105	396	H

VERTICAL PEAK AND AVERAGE PLOT

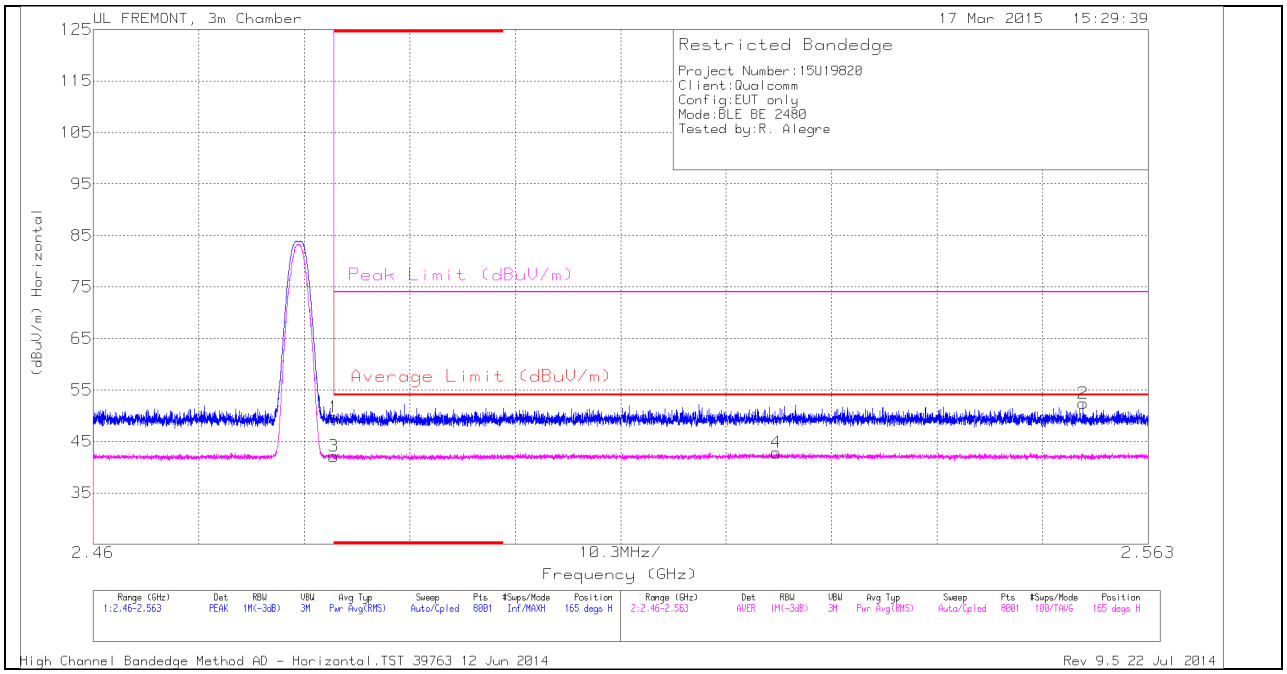


VERTICAL DATA

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	41.78	PK	32	-23.1	0	50.68	-	-	74	-23.32	276	127	V
2	* 2.325	43	PK	31.7	-23.1	0	51.6	-	-	74	-22.4	276	127	V
3	* 2.39	30.52	RMS	32	-23.1	2.1	41.52	54	-12.48	-	-	276	127	V
4	* 2.372	31.37	RMS	31.9	-23.1	2.1	42.27	54	-11.73	-	-	276	127	V

AUTHORIZED BANDEDGE (HIGH CHANNEL)

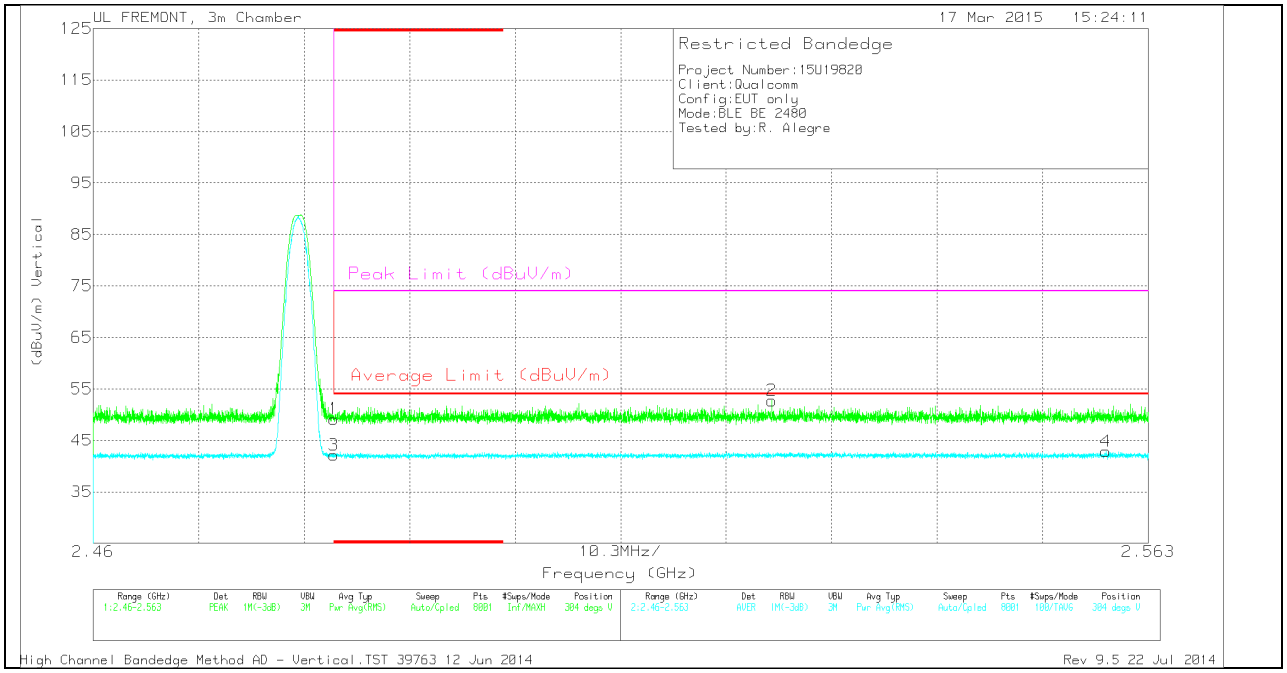
HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T119 (dB/m)	Amp/Cbl/Flt 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	40.22	PK	32.3	-22.8	0	49.72	-	-	74	-24.28	165	152	H
3	* 2.484	30.55	RMS	32.3	-22.8	2.1	42.15	54	-11.85	-	-	165	152	H
4	2.527	31.07	RMS	32.4	-22.7	2.1	42.87	54	-11.13	-	-	165	152	H
2	2.557	42.68	PK	32.4	-22.7	0	52.38	-	-	74	-21.62	165	152	H

VERTICAL PEAK AND AVERAGE PLOT

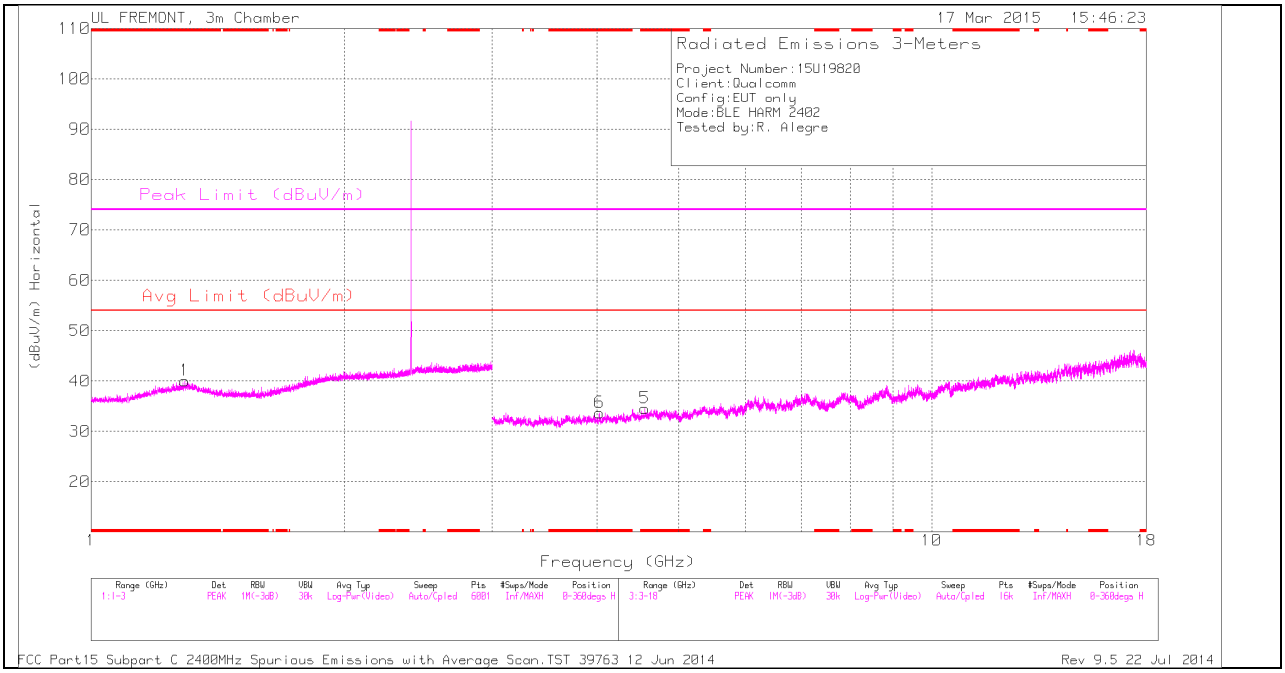


VERTICAL DATA

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	39.67	PK	32.3	-22.8	0	49.17	-	-	74	-24.83	304	100	V
3	* 2.484	30.58	RMS	32.3	-22.8	2.1	42.18	54	-11.82	-	-	304	100	V
2	2.526	43.03	PK	32.4	-22.7	0	52.73	-	-	74	-21.27	304	100	V
4	2.559	31.09	RMS	32.4	-22.7	2.1	42.89	54	-11.11	-	-	304	100	V

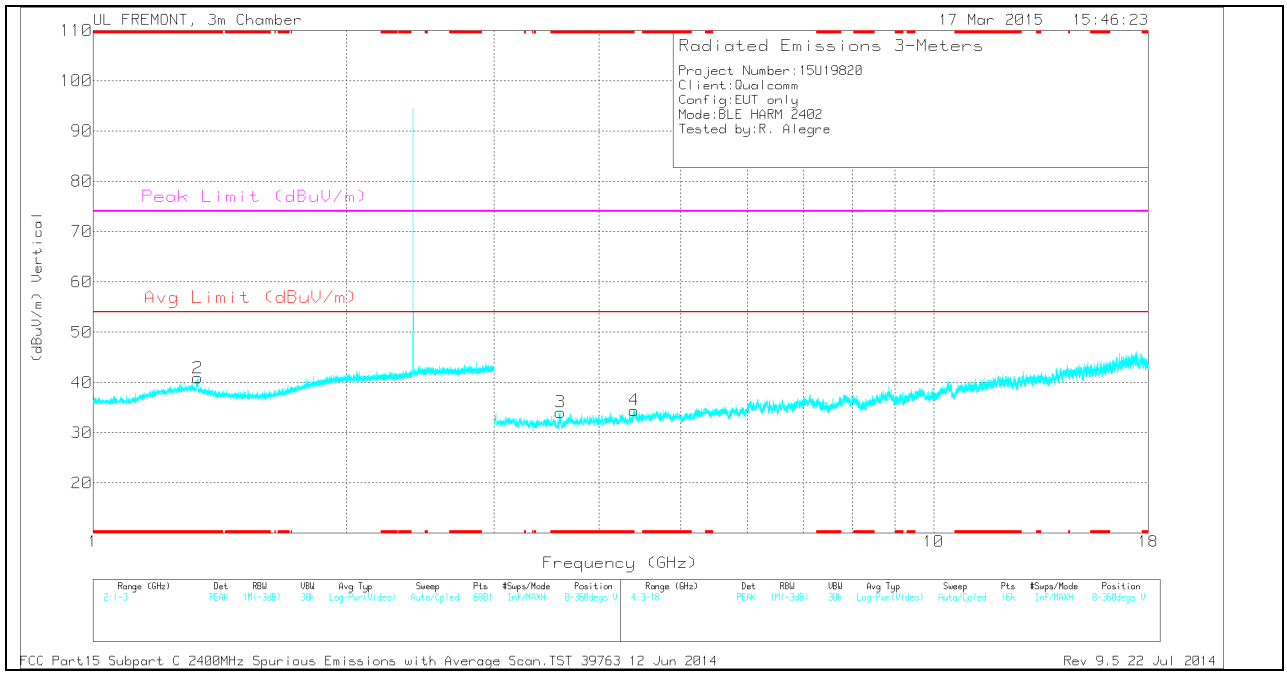
HARMONICS AND SPURIOUS EMISSIONS

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
1	* 1.292	34.09	PK	29.8	-23.8	0	40.09	-	-	74	-33.91	0-360	100	H
2	* 1.332	35.18	PK	29.5	-23.8	0	40.88	-	-	74	-33.12	0-360	100	V
5	* 4.56	31.69	PK	33.8	-30.9	0	34.59	-	-	74	-39.41	0-360	200	H
6	* 4.026	32.02	PK	33.2	-31.5	0	33.72	-	-	74	-40.28	0-360	100	H
3	* 3.596	32.99	PK	32.8	-31.7	0	34.09	-	-	74	-39.91	0-360	200	V
4	4.401	30.86	PK	33.6	-30	0	34.46	-	-	-	-	0-360	200	V

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
* 1.332	43.21	PK2	29.5	-23.8	0	48.91	-	-	74	-25.09	265	308	V
* 1.331	31.36	MAv1	29.5	-23.8	2.1	39.16	54	-14.84	-	-	265	308	V
* 3.594	42.67	PK2	32.8	-31.7	0	43.77	-	-	74	-30.23	0	137	V
* 3.594	30.81	MAv1	32.8	-31.7	2.1	34.01	54	-19.99	-	-	0	137	V

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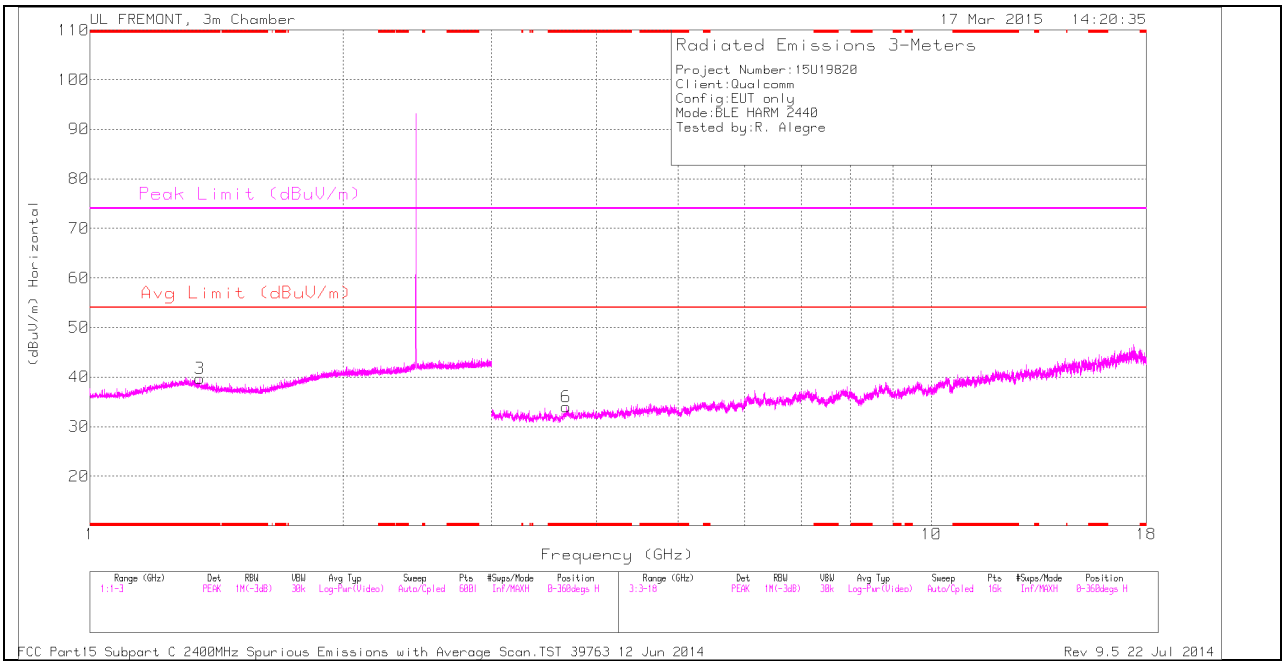
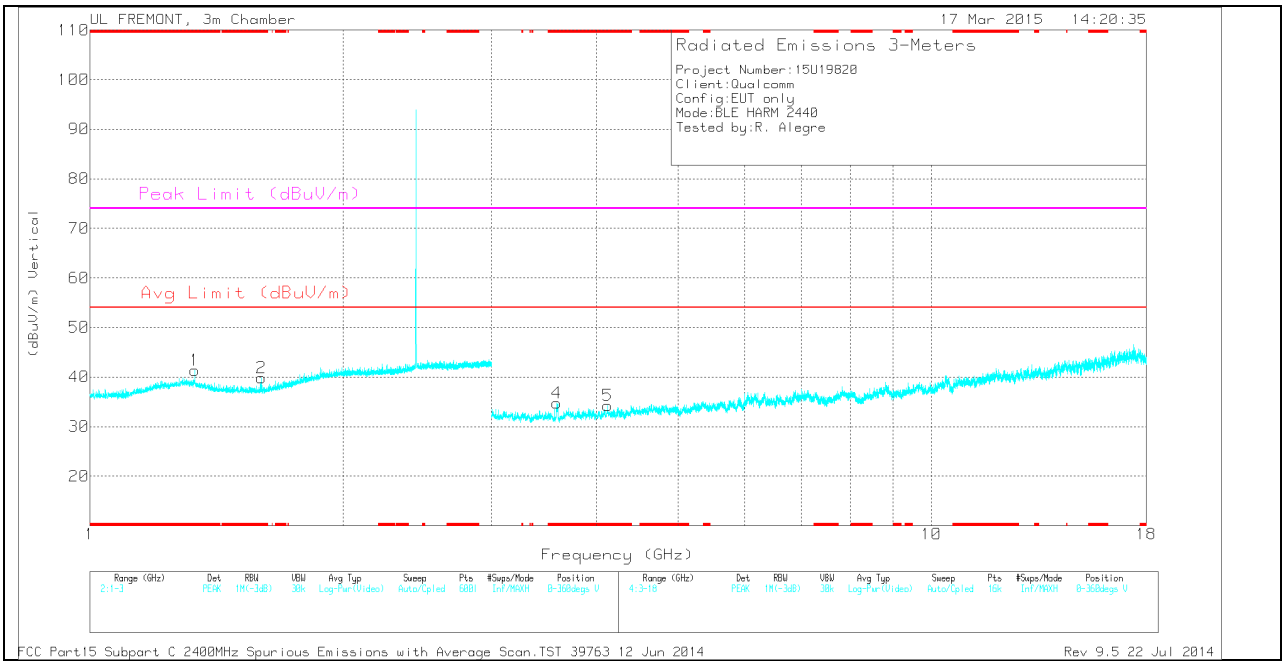
MID CHANNEL HORIZONTAL



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
3	* 1.35	34.17	PK	29.3	-23.8	0	39.67	-	-	74	-34.33	0-360	200	H
1	* 1.332	35.65	PK	29.5	-23.8	0	41.35	-	-	74	-32.65	0-360	200	V
2	* 1.598	35.22	PK	28	-23.4	0	39.82	-	-	74	-34.18	0-360	100	V
6	* 3.683	31.7	PK	33	-30.7	0	34	-	-	74	-40	0-360	100	H
4	* 3.584	33.54	PK	32.8	-31.6	0	34.74	-	-	74	-39.26	0-360	100	V
5	* 4.123	31.9	PK	33.3	-31	0	34.2	-	-	74	-39.8	0-360	200	V

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
* 1.332	43.56	PK2	29.5	-23.8	0	49.26	-	-	74	-24.74	265	308	V
* 1.33	31.31	MAv1	29.5	-23.8	2.1	39.11	54	-14.89	-	-	265	308	V
* 3.586	44.15	PK2	32.8	-31.6	0	45.35	-	-	74	-28.65	0	137	V
* 3.586	31.27	MAv1	32.8	-31.6	2.1	34.57	54	-19.43	-	-	0	137	V

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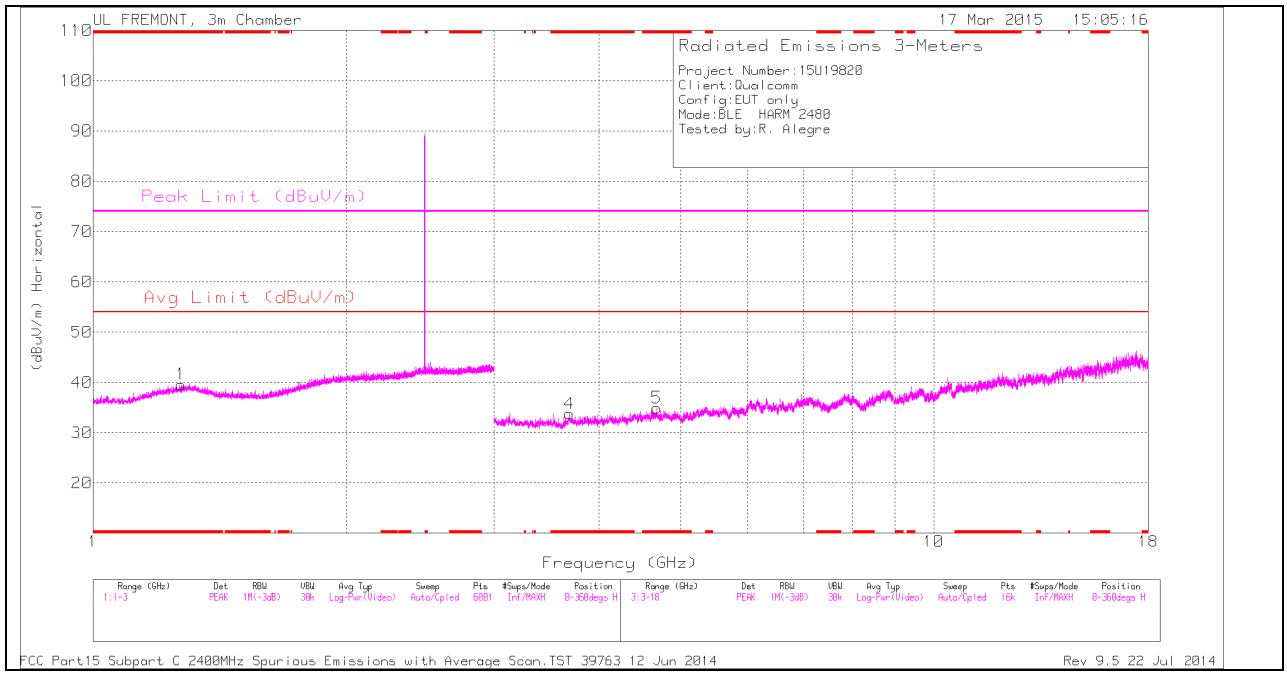
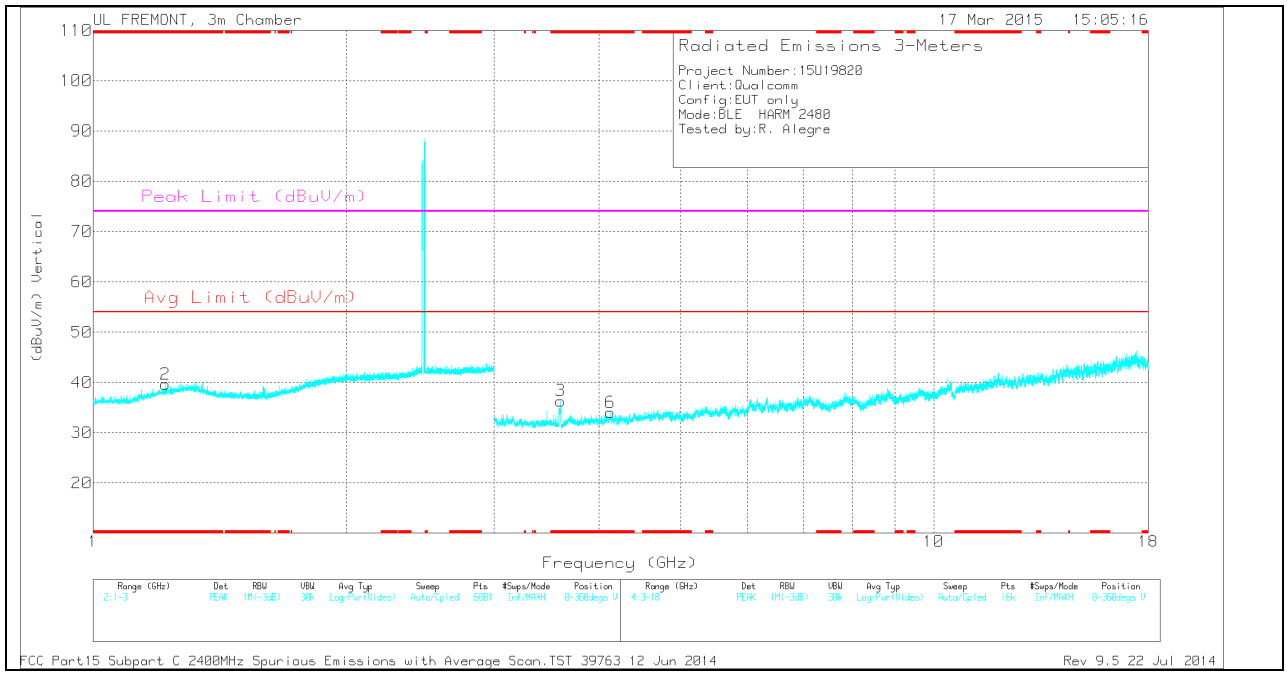
HIGH CHANNEL HORIZONTAL



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
1	* 1.273	33.79	PK	29.6	-23.8	0	39.59	-	-	74	-34.41	0-360	100	H
2	* 1.22	34.33	PK	29.1	-23.8	0	39.63	-	-	74	-34.37	0-360	200	V
4	* 3.685	31.48	PK	33	-30.7	0	33.78	-	-	74	-40.22	0-360	100	H
5	* 4.683	31.62	PK	34	-30.7	0	34.92	-	-	74	-39.08	0-360	100	H
3	* 3.598	35.24	PK	32.8	-31.7	0	36.34	-	-	74	-37.66	0-360	100	V
6	* 4.125	31.73	PK	33.3	-31	0	34.03	-	-	74	-39.97	0-360	200	V

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
* 3.598	44.79	PK2	32.8	-31.7	0	45.89	-	-	74	-28.11	0	137	V
* 3.597	32.82	MAv1	32.8	-31.7	2.1	36.02	54	-17.98	-	-	0	137	V

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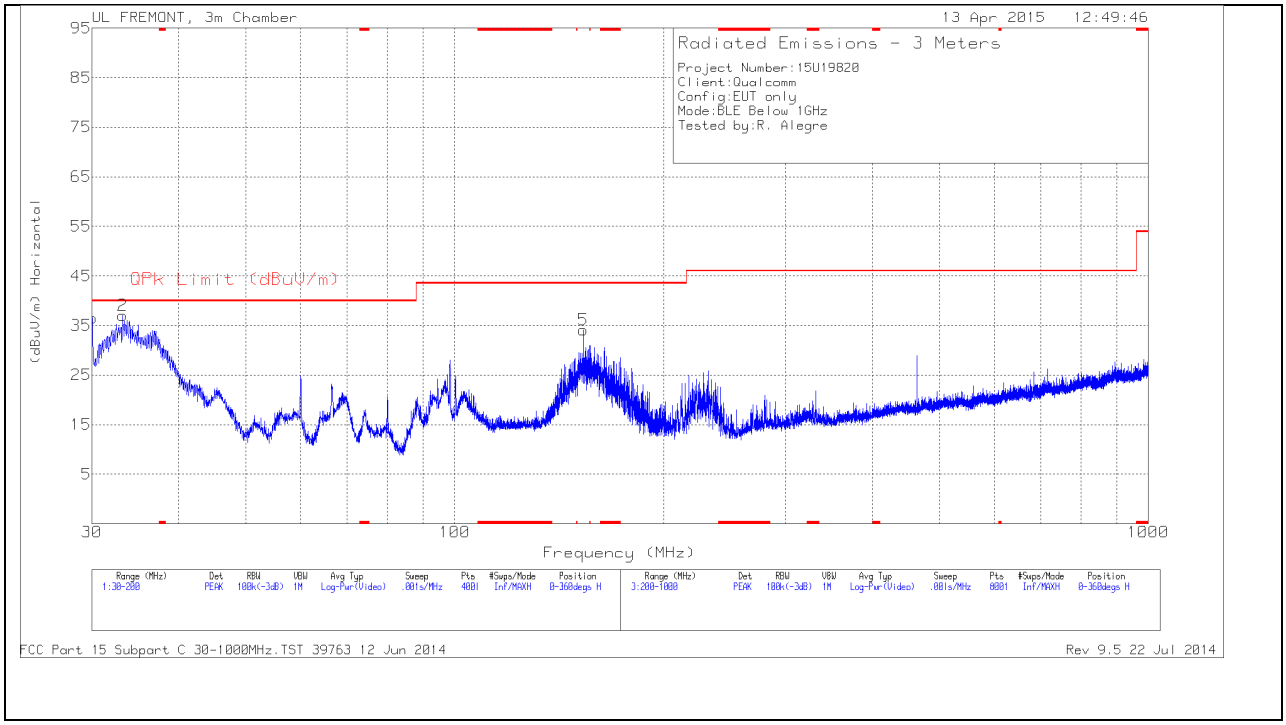
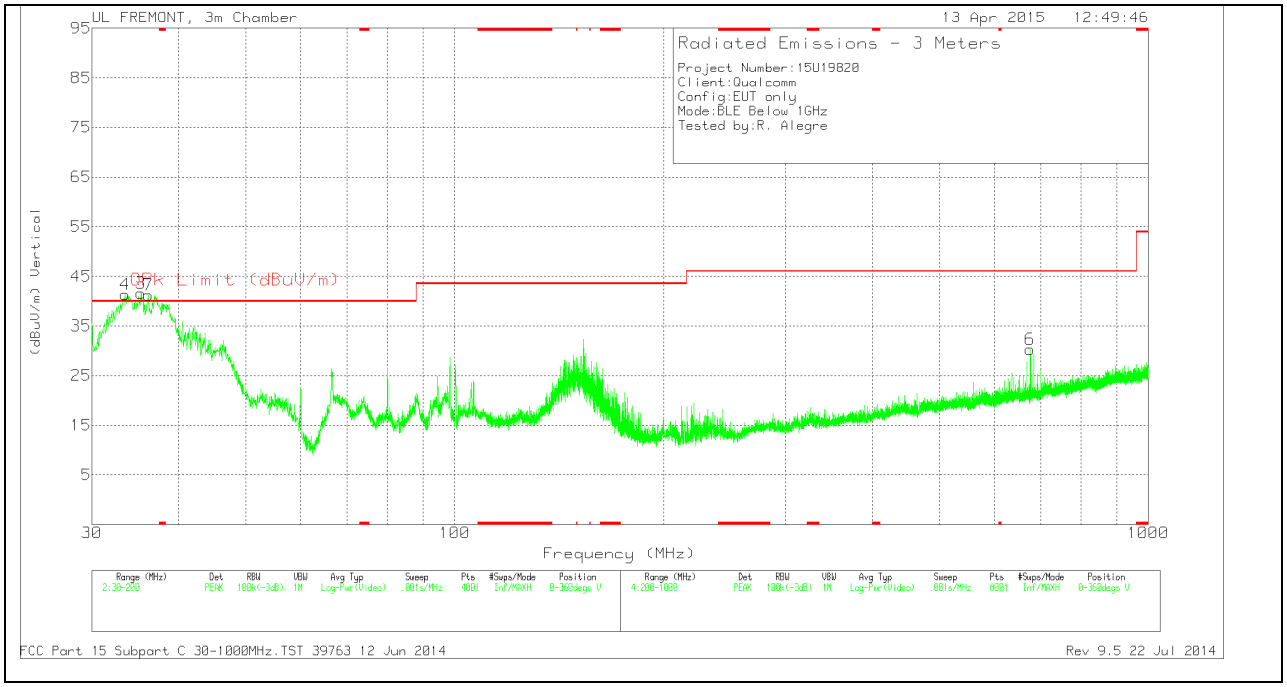
9.3. WORST-CASE BELOW 1 GHz

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
1	30.0425	42.24	PK	21.8	-27.5	36.54	40	-3.46	0-360	300	H
2	33.1875	45.07	PK	19.4	-27.5	36.97	40	-3.03	0-360	300	H
4	33.5275	49.79	PK	19.1	-27.5	41.39	40	1.39	0-360	100	V
3	35.3125	51.29	PK	17.8	-27.5	41.59	40	1.59	0-360	100	V
7	36.205	51.5	PK	17.1	-27.4	41.2	40	1.2	0-360	100	V
5	153.2925	48.29	PK	12.1	-26.3	34.09	43.52	-9.43	0-360	200	H
6	676	36.34	PK	19.3	-25.3	30.34	46.02	-15.68	0-360	100	V

PK - Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 9 Jul 2013 Rev 9.5 12 Jun 2013

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
33.5275	45.41	QP	19.1	-27.5	37.01	40	-2.99	175	100	V
35.3125	32.71	QP	17.8	-27.5	23.01	40	-16.99	357	274	V
36.205	44.56	QP	17.1	-27.4	34.26	40	-5.74	237	100	V

QP - Quasi-Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 39763 12 Jun 2014

Rev 9.5 22 Jul 2014

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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.

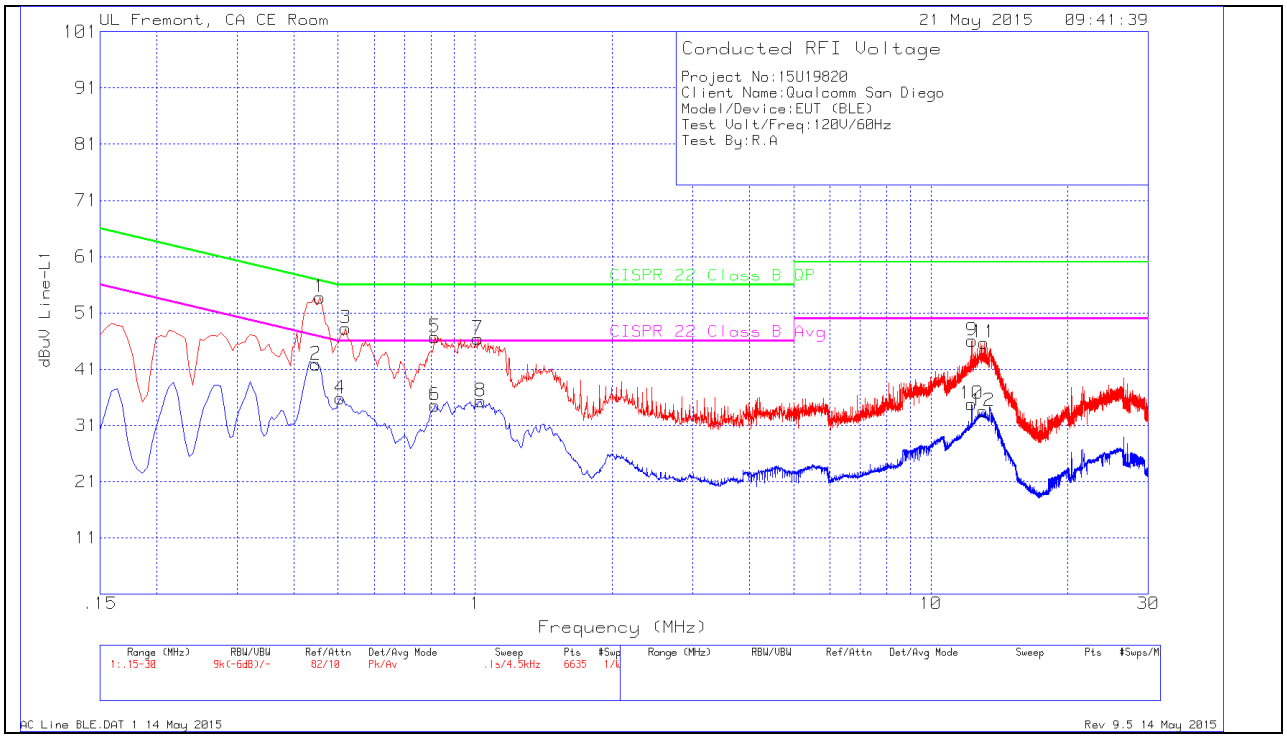
TEST PROCEDURE

ANSI C63.4 - 2009

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT

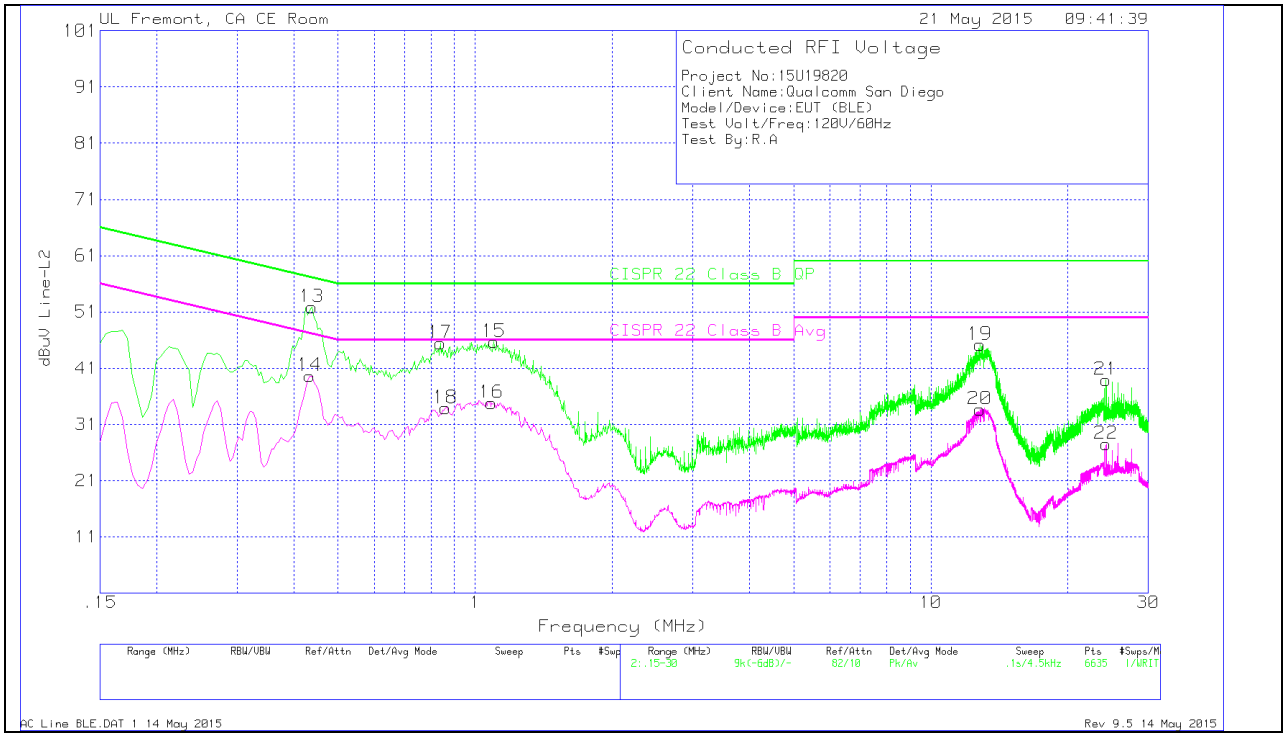


LINE 1 RESULTS

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	.456	53.38	Pk	.4	0	53.78	56.77	-2.99		
2	.447	41.43	Av	.4	0	41.83	-	-	46.93	-5.1
3	.519	47.99	Pk	.3	0	48.29	56	-7.71		
4	.5055	35.5	Av	.3	0	35.8	-	-	46	-10.2
5	.816	46.39	Pk	.3	0	46.69	56	-9.31		
6	.816	34.29	Av	.3	0	34.59	-	-	46	-11.41
7	1.014	46.22	Pk	.2	0	46.42	56	-9.58		
8	1.0275	35.09	Av	.2	0	35.29	-	-	46	-10.71
9	12.3045	45.68	Pk	.2	.2	46.08	60	-13.92		-
10	12.291	34.4	Av	.2	.2	34.8	-	-	50	-15.2
11	13.083	45.31	Pk	.2	.2	45.71	60	-14.29		
12	13.0245	33.15	Av	.2	.2	33.55	-	-	50	-16.45

LINE 2 PLOT



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)
13	.438	51.44	Pk	.4	0	51.84	57.1	-5.26		
14	.4335	39.22	Av	.4	0	39.62	-	-	47.19	-7.57
15	1.0995	45.27	Pk	.3	.1	45.67	56	-10.33		
16	1.086	34.53	Av	.3	0	34.83	-	-	46	-11.17
17	.8385	45.05	Pk	.3	.1	45.45	56	-10.55		
18	.861	33.58	Av	.3	0	33.88	-	-	46	-12.12
19	12.822	44.76	Pk	.2	.2	45.16	60	-14.84		
20	12.822	33.27	Av	.2	.2	33.67	-	-	50	-16.33
21	24.2475	38.33	Pk	.3	.3	38.93	60	-21.07		
22	24.252	26.89	Av	.3	.3	27.49	-	-	50	-22.51