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

BLUETOOTH LOW ENERGY CERTIFICATION TEST REPORT

FOR

BLUETOOTH & DTS/UNII a/b/g/n/ac

MODEL NUMBER: GG1

FCC ID: A4R-GG1
IC: 10395A-GG1

REPORT NUMBER: 15U19985-E6

ISSUE DATE: MAY 13, 2015

Prepared for
GOOGLE INC.
1600 AMPHITHEATRE PARKWAY
MOUNTAIN VIEW CA, 94043, U.S.A

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	5/13/15	Initial Issue	F. de Anda

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: GOOGLE INC.
1600 AMPHITHEATRE PARKWAY
MOUNTAIN VIEW, CA, 94043, U.S.A

EUT DESCRIPTION: BLUETOOTH & DTS/UNII a/b/g/n/ac

MODEL: GG1

SERIAL NUMBER: HWP1A22F1446002Y, HWP1A42E1444002T

DATE TESTED: April 22, 2015 – April 29, 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.

Approved & Released For
UL Verification Services Inc. By:

FRANCISCO DE ANDA
PROJECT LEAD
UL Verification Services Inc.

Tested By:

CLIFFORD SUSA
EMC ENGINEER
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, 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 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
	☐ Chamber G
	☐ 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:

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 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 accessory device that incorporates 2.4GHz, 5GHz WLAN, BT and BT-LE radio with integral antenna. The EUT is provided with an AC charger and a USB cable. When connected to a PC, the USB cable provides a path for charging and data transfer.

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	1.80	1.51

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PCB antenna with a maximum gain of 4dBi for 2.4GHz band.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was V1.0.

The EUT driver software installed in the support equipment during testing was ver 6.37.32.34.1

5.5. WORST-CASE CONFIGURATION AND MODE

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

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X- orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X-orientation.

Worst-case data rates as provided by the client were:

BLE: 1Mbps Mbps.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Apple	Macbook Air	C02FX0VTDJDJDK	N/A
AC Adapter	Apple	A1343	ADP-85EBT	N/A

I/O CABLES

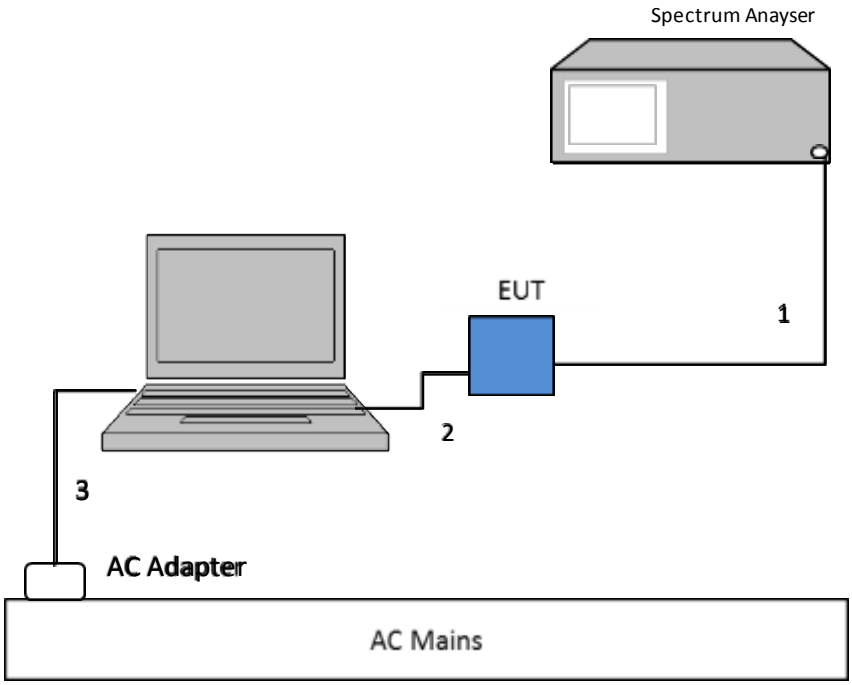
I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	Antenna	1	Coax	Shielded	0.2	
2	USB	1	USB	Shielded	0.5	
3	DC	1	DC	Shielded	1.5	

TEST SETUP

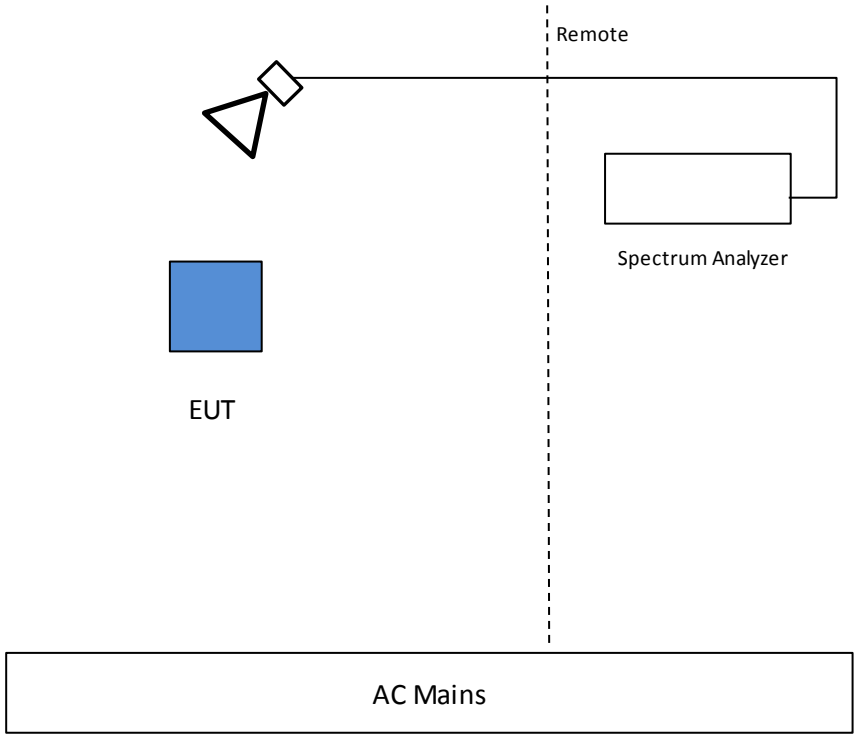
The EUT is connected to a host laptop via USB cable, test software exercises the radio.

SETUP DIAGRAM FOR TESTS

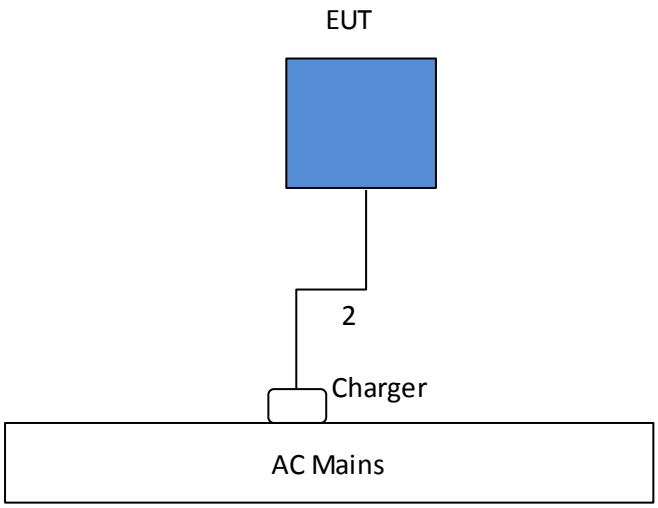
Conducted Port



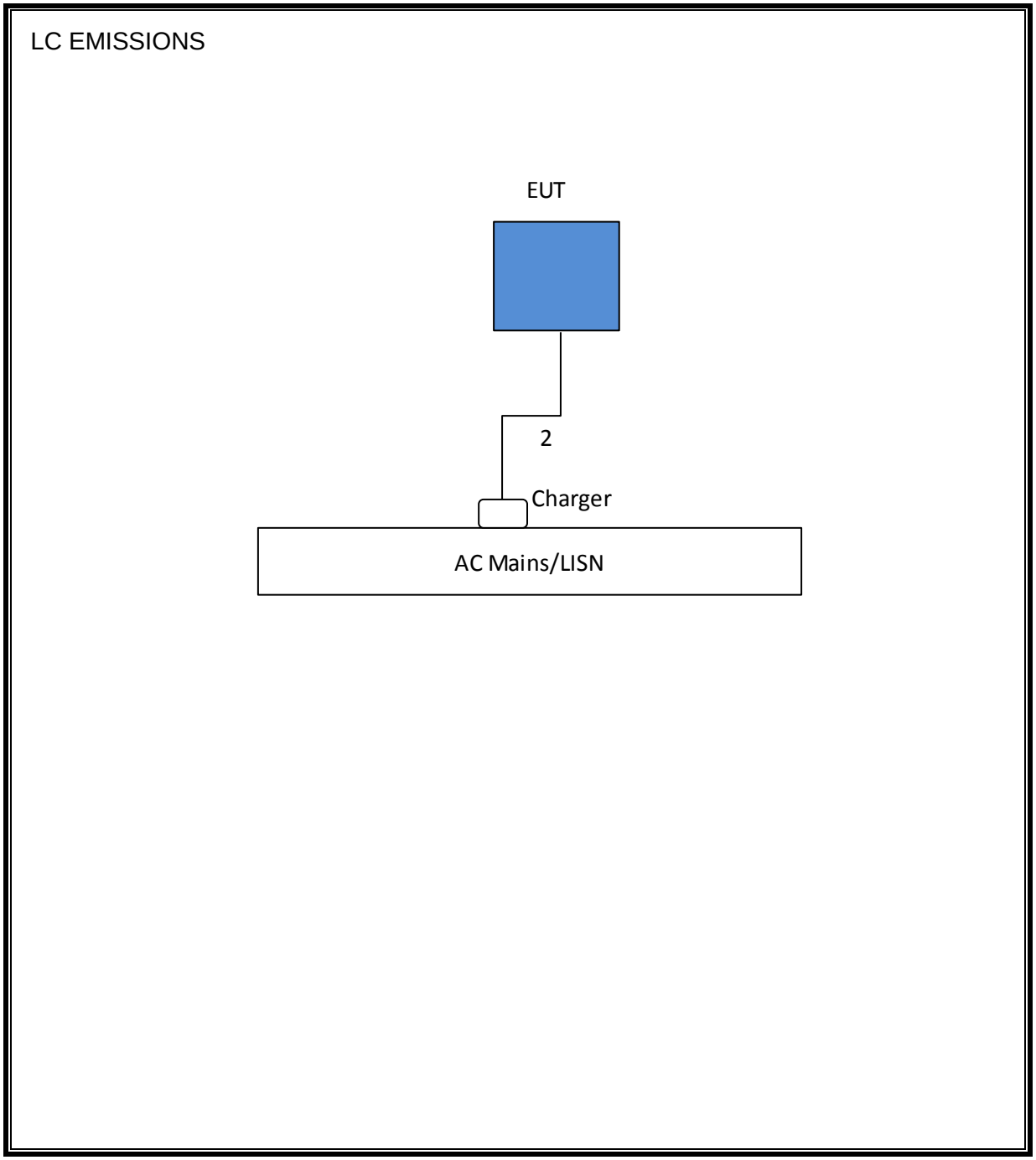
Radiated > 1GHz



Radiated <1GHz



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		
Conducted Software	UL	UL EMC	Ver 2.1.4		
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	906	05/07/14	05/07/15
Antenna, Horn 18GHz	ETS Lindgren	3117	712	01/07/15	01/07/16
Antenna, Hybrid, 30MHz to 1GHz	Sunol Sciences	JB3	900	05/14/14	05/14/15
Amplifier, 1-18GHz	Miteq	AFS42-00101800-25-S-42	495	06/05/14	06/05/15
Amplifier, 10kHz - 1GHz	Sonoma	310N	835	06/05/14	06/05/15
Spectrum Analyzer, 40GHz	HP	8564E	106	08/06/14	08/06/15
Antenna, Horn 18-26GHz	ARA	MWH-1826	89	12/17/14	12/17/15
Amplifier, 1 - 26GHz	Agilent	8449B	404	06/05/14	06/05/15
LISN, 30MHz	FCC	50/250-25-2	24	01/16/15	01/16/16
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent	N9030A	917	05/08/14	05/08/15

7. MEASUREMENT METHODS

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

Output Power: KDB 558074 D01 v03r02, Section 9.1.1.

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

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

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

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

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

LIMITS

None; for reporting purposes only.

PROCEDURE

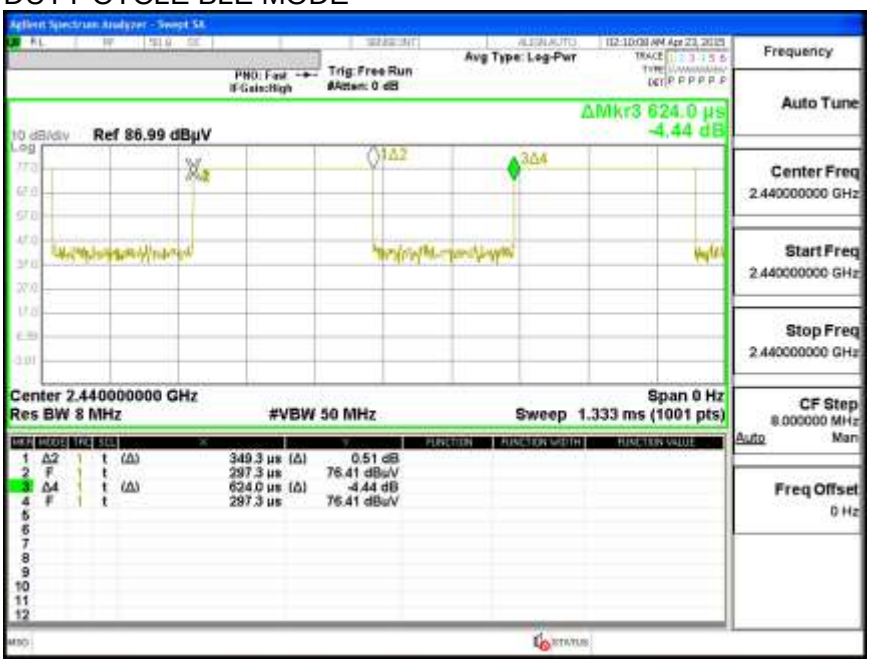
KDB 558074 Zero-Span Spectrum Analyzer Method.

8.1.1. ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
BLE	0.349	0.624	0.560	55.98%	2.52	2.863

8.1.2. DUTY CYCLE PLOTS

DUTY CYCLE BLE MODE



8.2. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

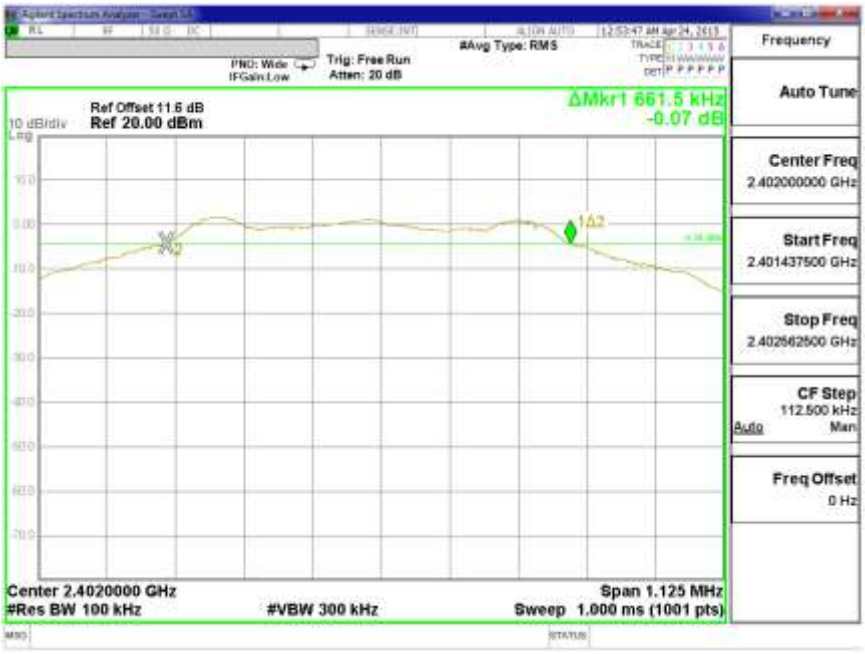
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.6615	0.5
Middle	2440	0.6689	0.5
High	2480	0.6605	0.5

6 dB BANDWIDTH

6 dB BANDWIDTH LOW CH



6 dB BANDWIDTH MID CH

6 dB BANDWIDTH HIGH CH

8.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

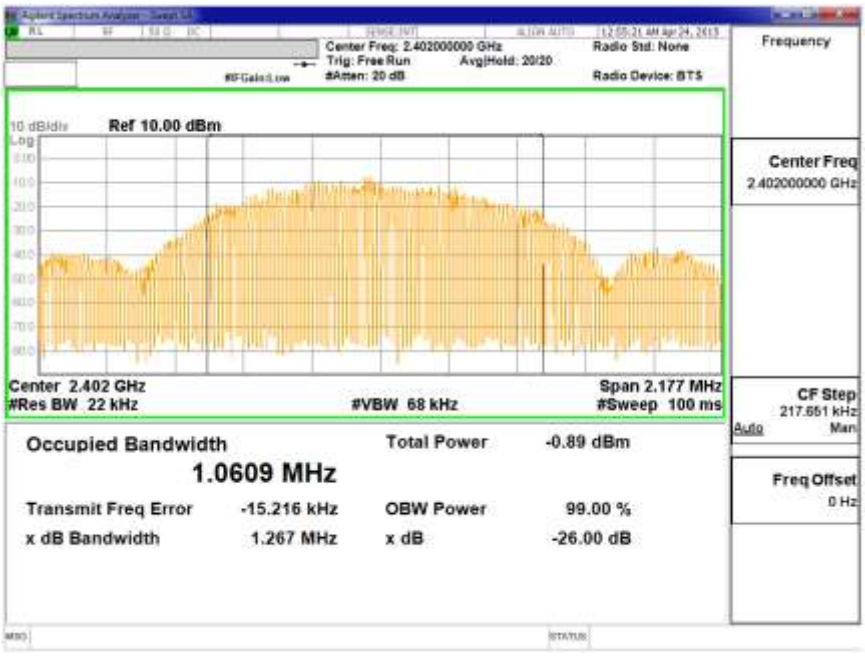
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

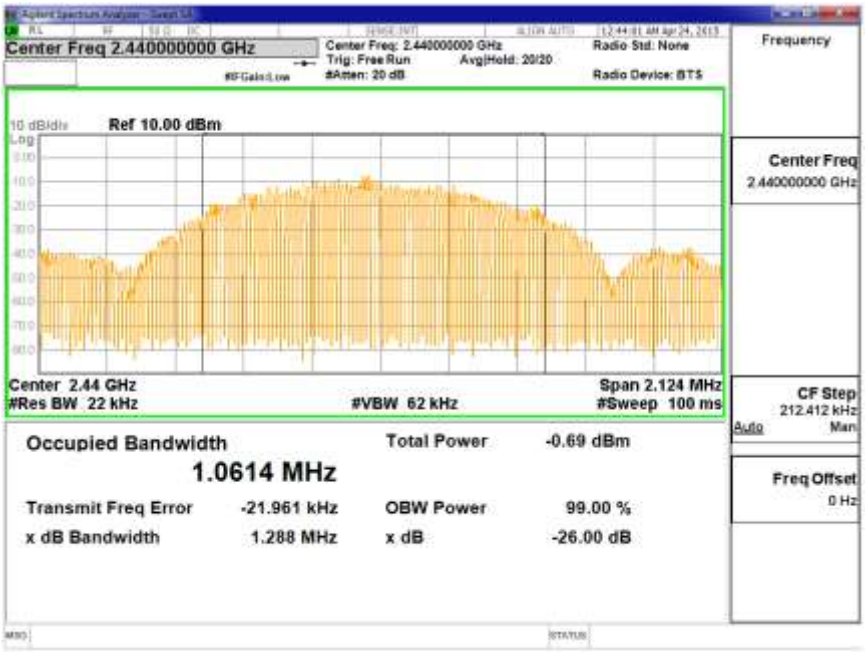
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0609
Middle	2440	1.0614
High	2480	1.0614

99% BANDWIDTH

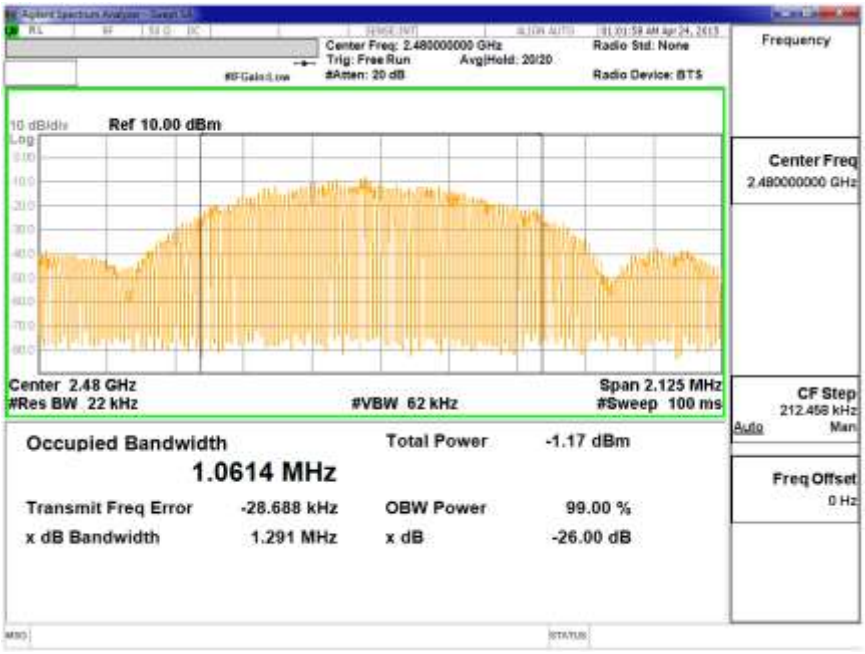
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



8.4. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

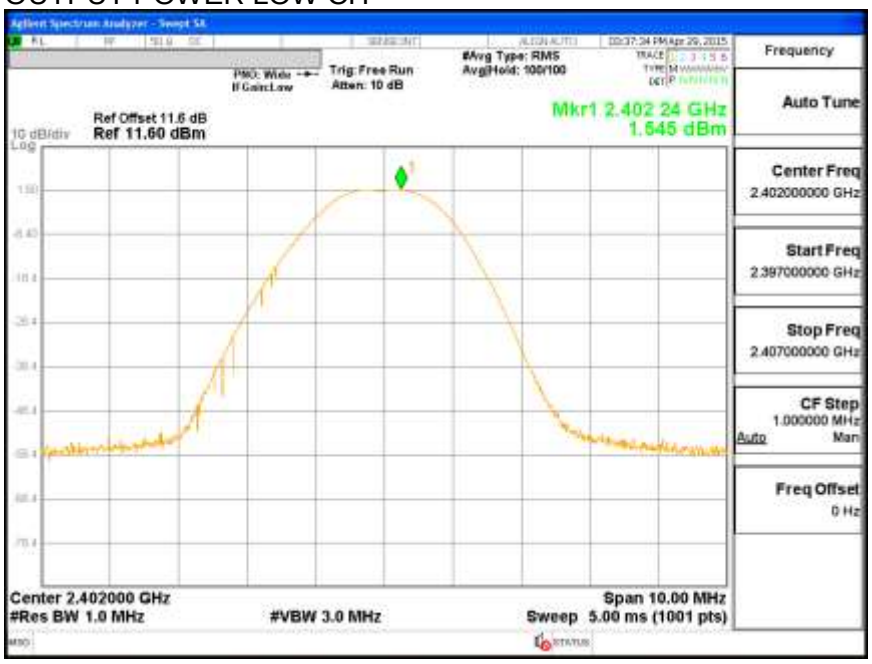
The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

RESULTS

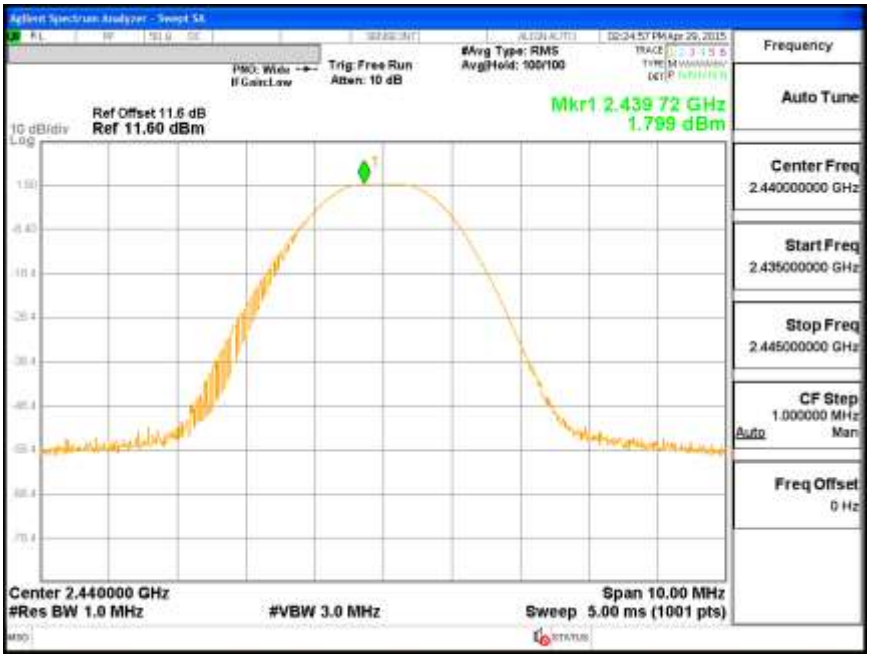
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	1.545	30	-28.455
Middle	2440	1.799	30	-28.201
High	2480	1.635	30	-28.365

OUTPUT POWER

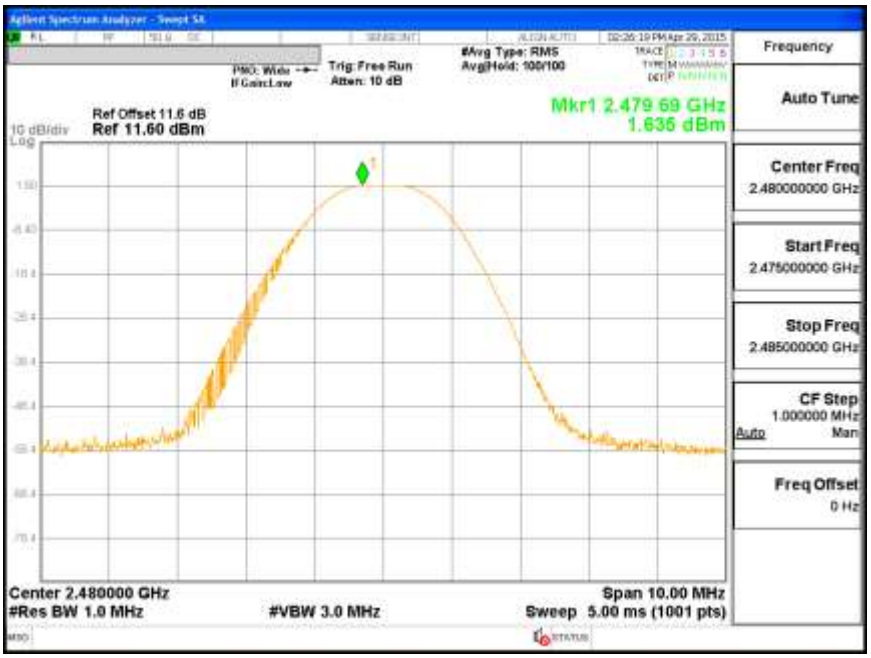
OUTPUT POWER LOW CH



OUTPUT POWER MID CH



OUTPUT POWER HIGH CH



8.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

RESULTS

The cable assembly insertion loss of11.6 dB (including 10 dB pad and 1.6 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	1.41
Middle	2440	1.78
High	2480	1.26

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	-13.44	8	-21.44
Middle	2440	-12.81	8	-20.81
High	2480	-13.04	8	-21.04

POWER SPECTRAL DENSITY

PSD LOW CH

PSD MID CH

PSD HIGH CH

8.7. CONDUCTED 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.

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.

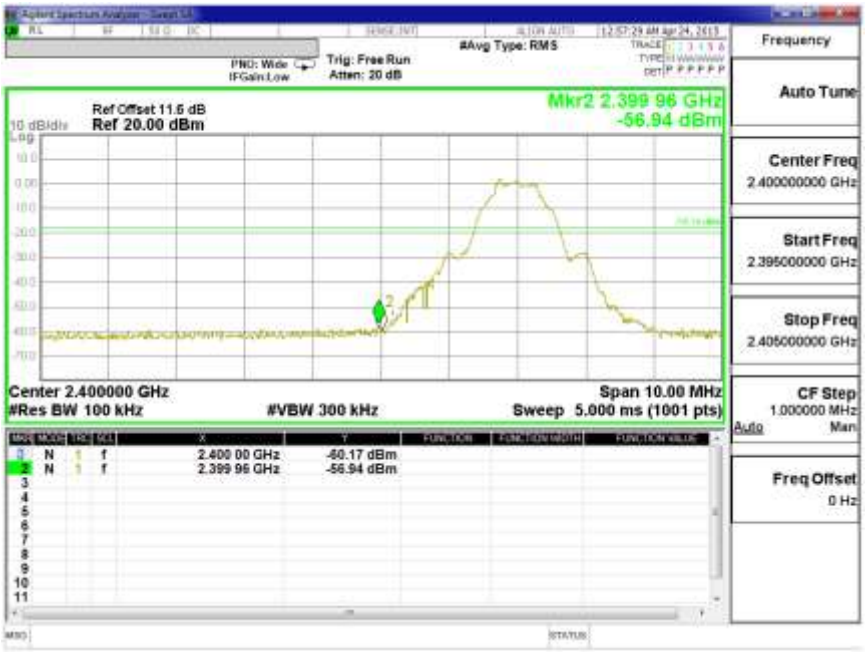
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

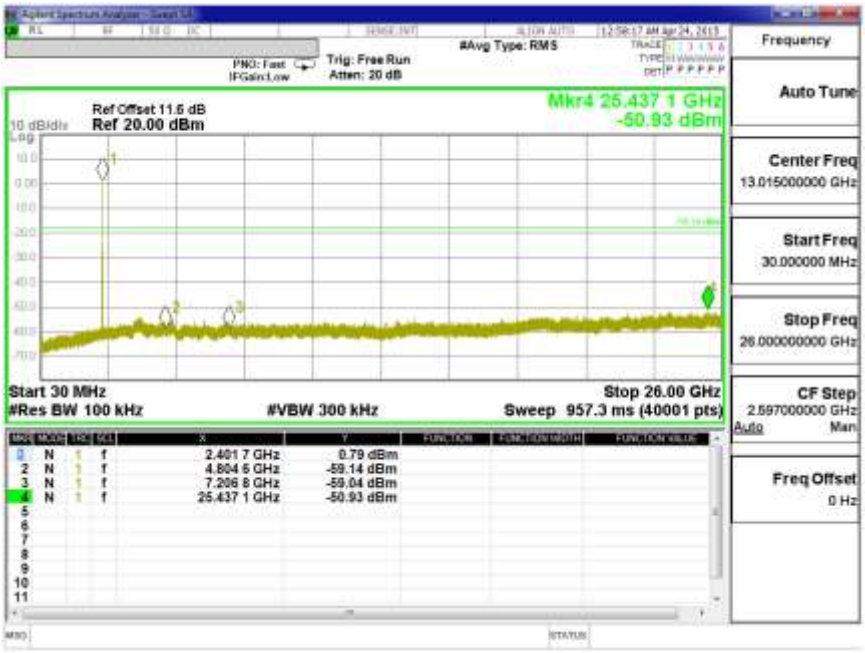
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL

LOW CH BANDEDGE

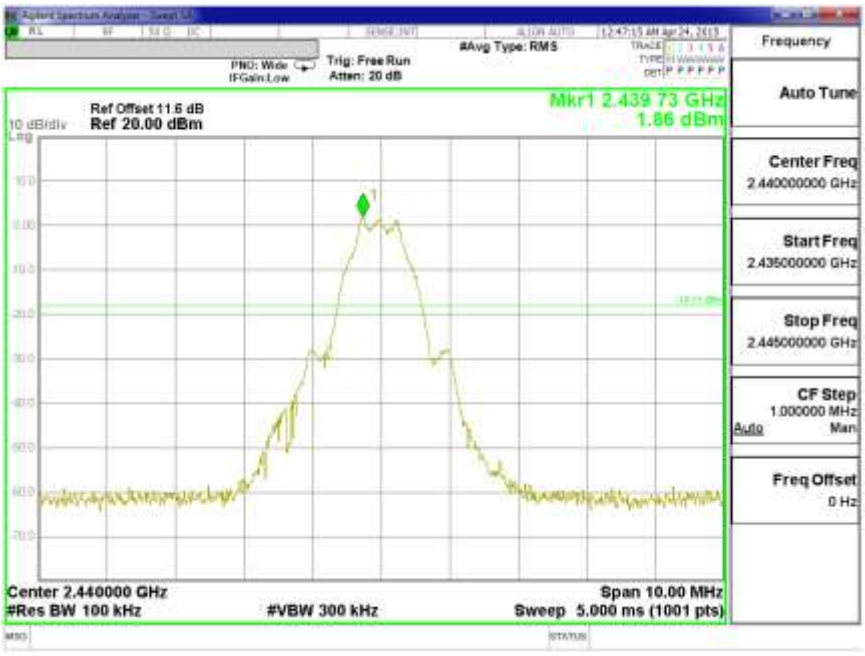


LOW CH SPURIOUS

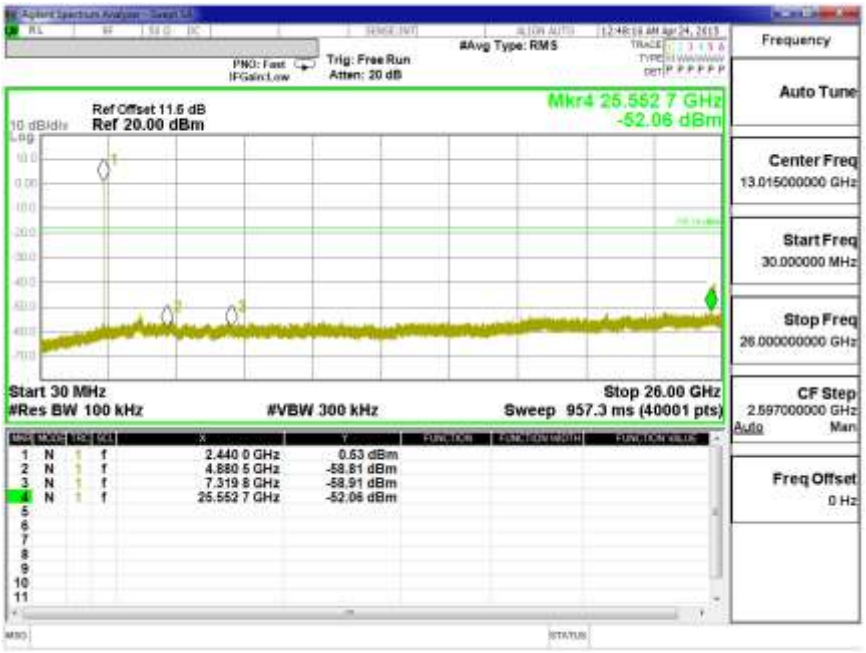


SPURIOUS EMISSIONS, MID CHANNEL

MID CH REFERENCE

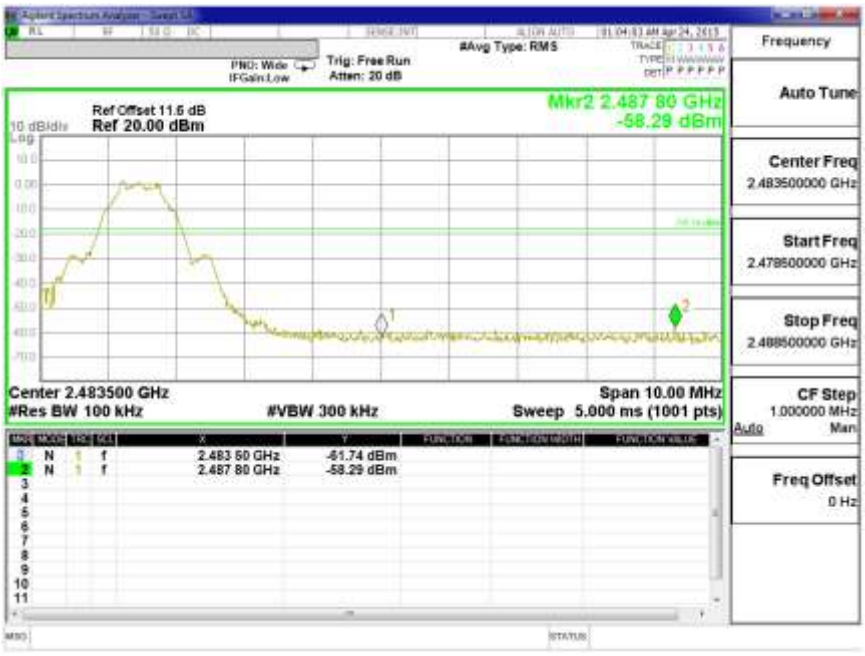


MID CH SPURIOUS

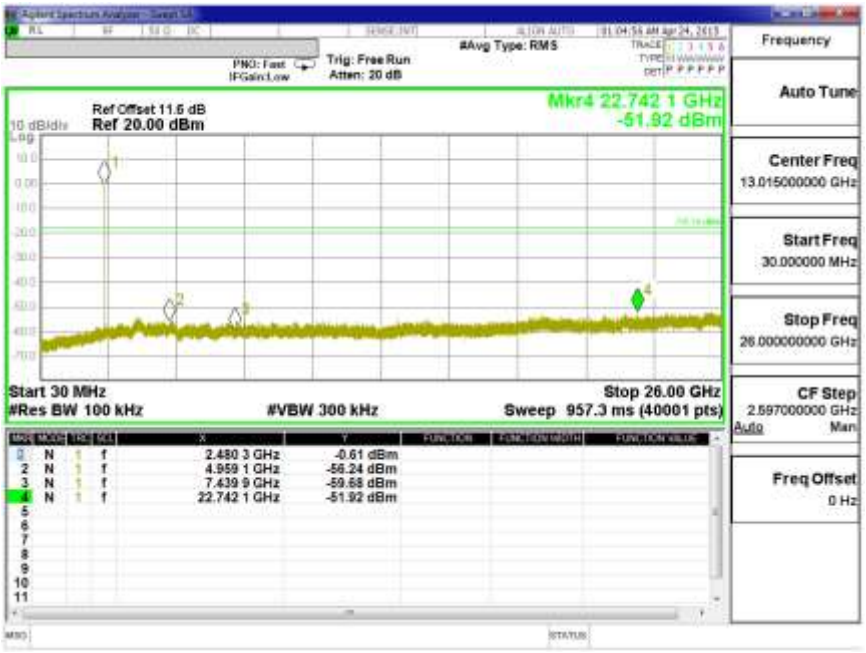


SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CH BANDEDGE



HIGH CH 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 7.1.2 (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 C63.4. 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 10 Hz for average measurements.

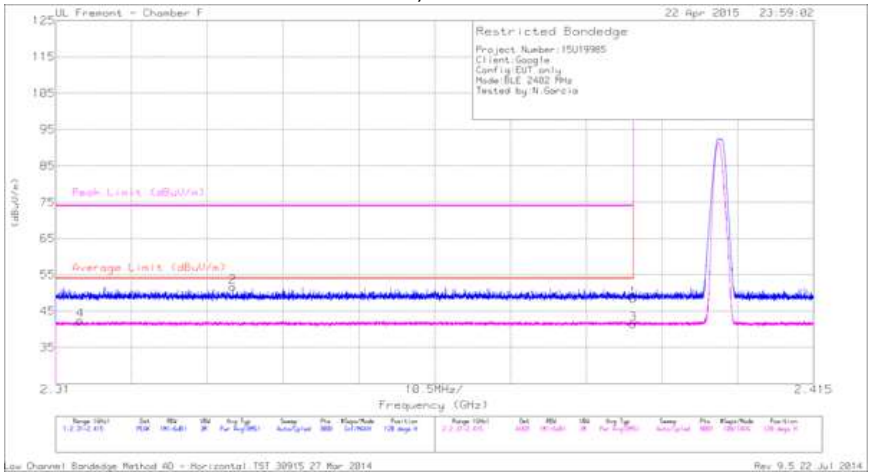
For 2.4 GHz band, the spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

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

RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL RESTRICTED, HORIZ



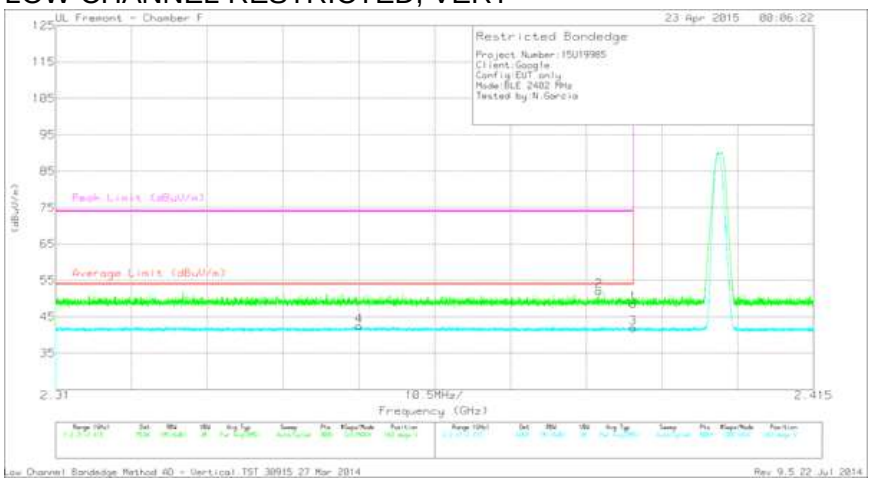
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (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	37.38	PK	31.9	-20.9	0	48.38	-	-	74	-25.62	120	141	H
2	* 2.335	40.84	PK	31.8	-21	0	51.64	-	-	74	-22.36	120	141	H
3	* 2.39	27.98	RMS	31.9	-20.9	2.52	41.5	54	-12.5	-	-	120	141	H
4	* 2.313	29.09	RMS	31.8	-21	2.52	42.41	54	-11.59	-	-	120	141	H

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

PK - Peak detector
RMS - RMS detection

LOW CHANNEL RESTRICTED, VERT



Trace Markers

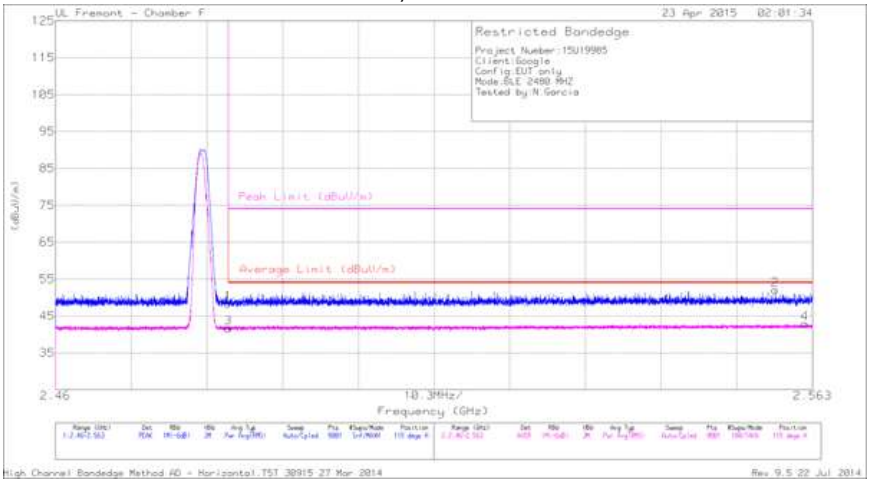
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	37.58	PK	31.9	-20.9	0	48.58	-	-	74	-25.42	103	221	V
2	* 2.385	41.12	PK	31.9	-20.9	0	52.12	-	-	74	-21.88	103	221	V
3	* 2.39	28.5	RMS	31.9	-20.9	2.52	42.02	54	-11.98	-	-	103	221	V
4	* 2.352	28.93	RMS	31.9	-20.9	2.52	42.45	54	-11.55	-	-	103	221	V

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

PK - Peak detector
RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL BANDEDGE, HORIZ



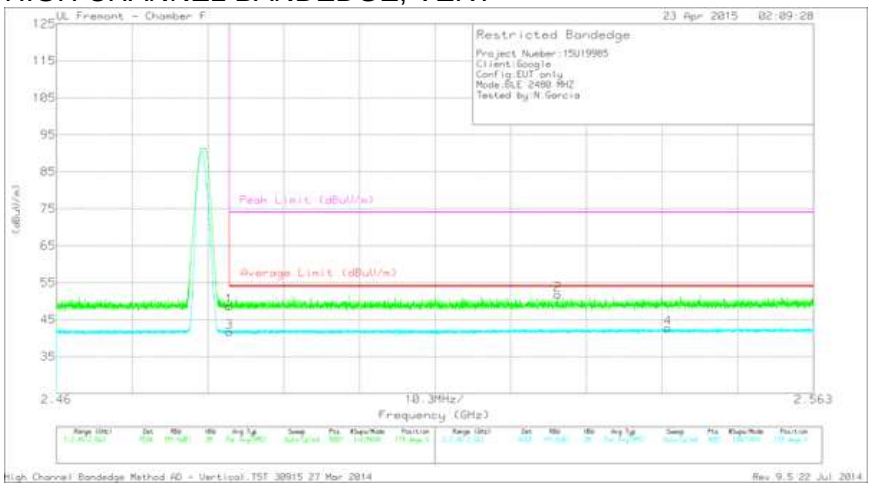
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (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	37.1	PK	32.2	-20.9	0	48.4	-	-	74	-25.6	115	208	H
2	2.558	40.35	PK	32.5	-20.8	0	52.05	-	-	74	-21.95	115	208	H
3	* 2.484	27.91	RMS	32.2	-20.9	2.52	41.73	54	-12.27	-	-	115	208	H
4	2.562	28.69	RMS	32.5	-20.8	2.52	42.91	54	-11.09	-	-	115	208	H

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

PK - Peak detector
RMS - RMS detection

HIGH CHANNEL BANDEDGE, VERT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (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	37.37	PK	32.2	-20.9	0	48.67	-	-	74	-25.33	178	263	V
2	2.528	40.31	PK	32.4	-20.9	0	51.81	-	-	74	-22.19	178	263	V
3	* 2.484	27.88	RMS	32.2	-20.9	2.52	41.7	54	-12.3	-	-	178	263	V
4	2.543	28.74	RMS	32.4	-20.9	2.52	42.76	54	-11.24	-	-	178	263	V

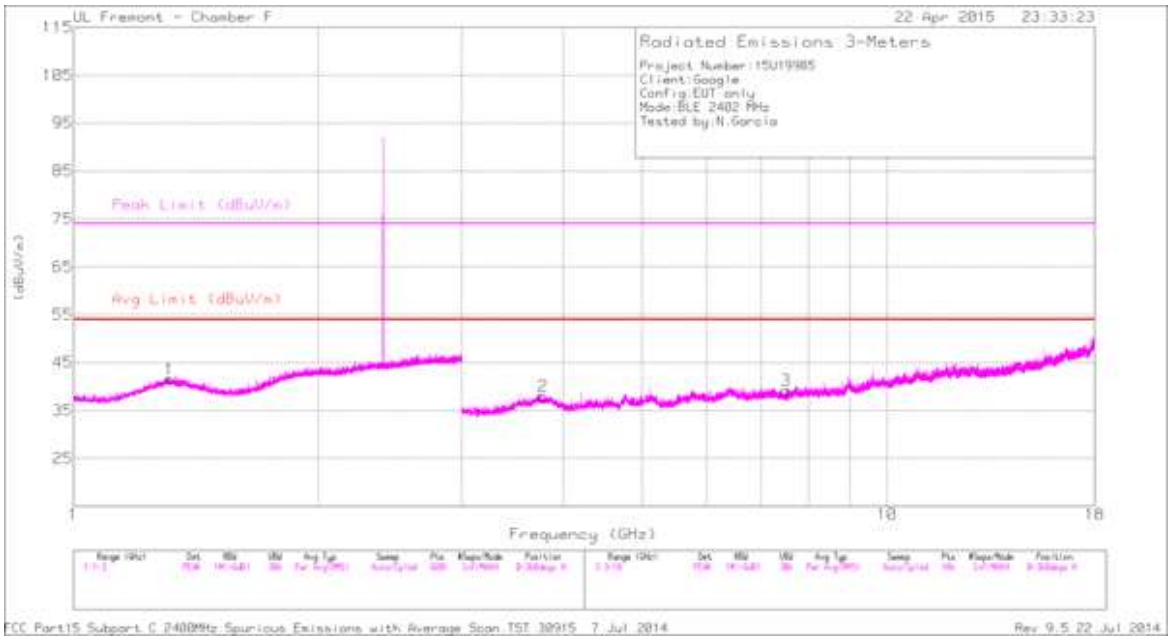
* - indicates frequency in CFR 47, Part 15 Restricted Band" and "Industry Canada RSS-Restricted Band

PK - Peak detector
RMS - RMS detection

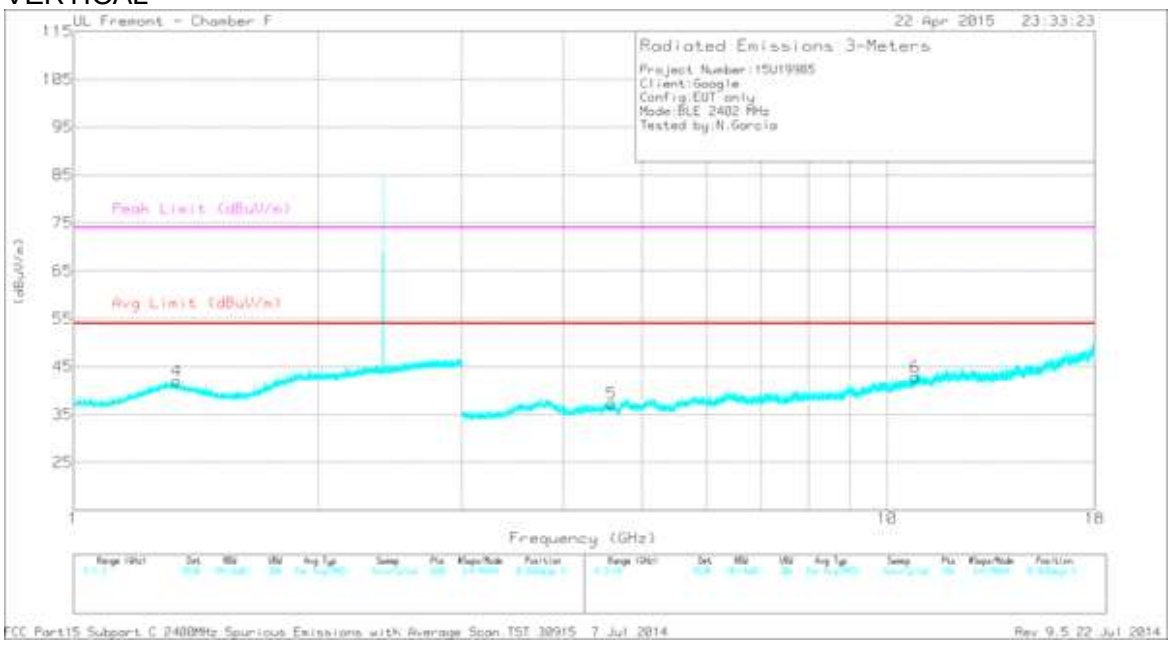
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL

HORIZONTAL



VERTICAL



Trace Markers

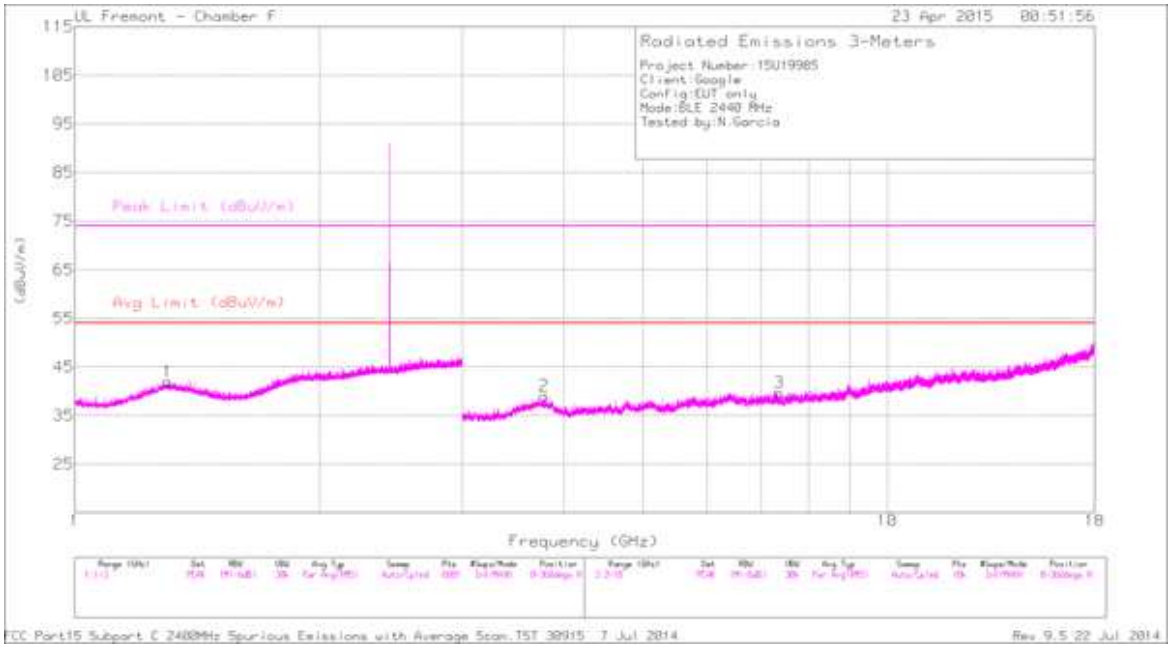
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.313	41.55	PK2	29.9	-22.2	0	49.25	-	-	74	-24.75	1	202	H
	* 1.311	30.25	MAv1	29.9	-22.2	2.52	40.47	54	-13.53	-	-	1	202	H
4	* 1.337	41.7	PK2	29.7	-22.2	0	49.2	-	-	74	-24.8	11	209	V
	* 1.34	30.47	MAv1	29.7	-22.2	2.52	40.49	54	-13.51	-	-	11	209	V
2	* 3.778	38.11	PK2	34.3	-28.7	0	43.71	-	-	74	-30.29	30	192	H
	* 3.778	27.63	MAv1	34.3	-28.7	2.52	35.75	54	-18.25	-	-	30	192	H
3	* 7.513	36.53	PK2	35.7	-25.8	0	46.43	-	-	74	-27.57	12	202	H
	* 7.513	25.93	MAv1	35.7	-25.8	2.52	38.35	54	-15.65	-	-	12	202	H
5	* 4.585	37.81	PK2	34	-28	0	43.81	-	-	74	-30.19	22	198	V
	* 4.583	27.16	MAv1	34	-28	2.52	35.68	54	-18.32	-	-	22	198	V
6	* 10.841	34.69	PK2	38.1	-22	0	50.79	-	-	74	-23.21	13	102	V
	* 10.839	23.3	MAv1	38.1	-22	2.52	41.92	54	-12.08	-	-	13	102	V

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

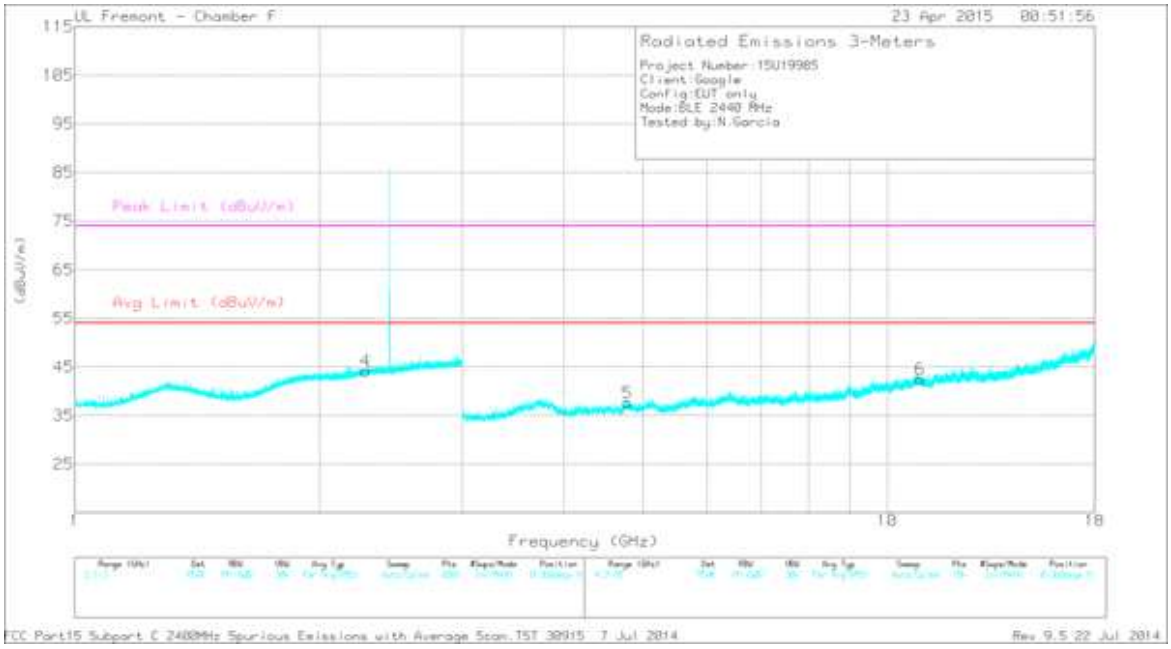
PK - Peak detector
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL

HORIZONTAL



VERTICAL



Trace Markers

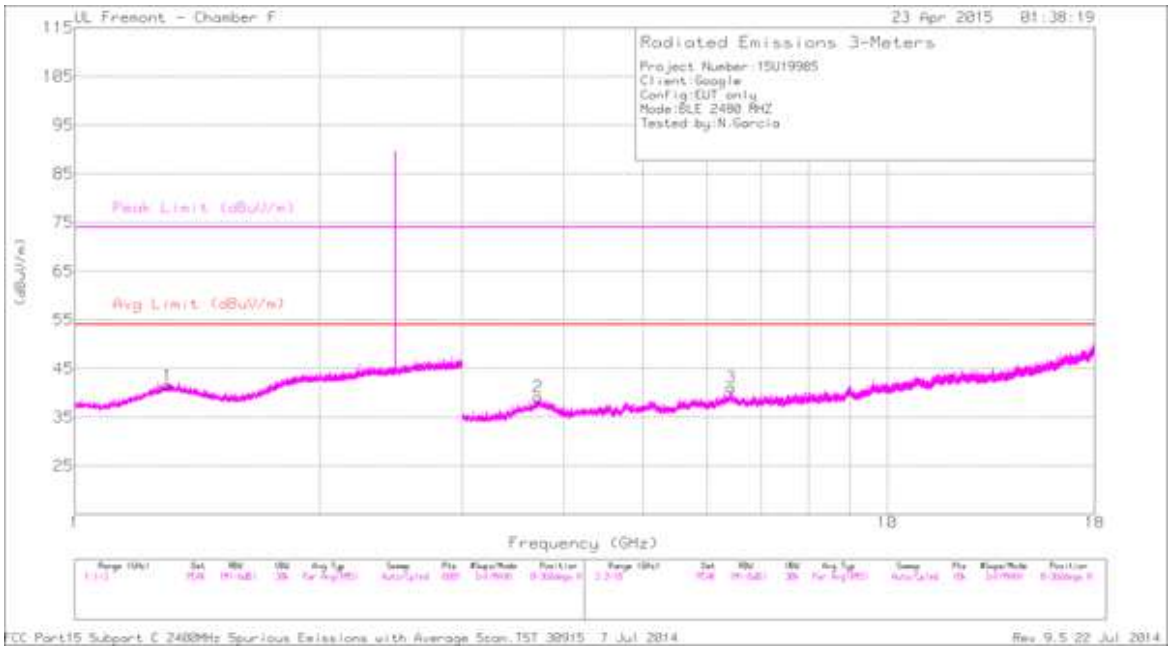
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.303	41.89	PK2	30	-22.2	0	49.69	-	-	74	-24.31	360	202	H
	* 1.303	30.44	MAv1	30	-22.2	2.52	40.76	54	-13.24	-	-	360	202	H
4	* 2.281	41.42	PK2	31.7	-21	0	52.12	-	-	74	-21.88	360	101	V
	* 2.281	30.24	MAv1	31.7	-21	2.52	43.46	54	-10.54	-	-	360	101	V
2	* 3.781	38.46	PK2	34.2	-28.7	0	43.96	-	-	74	-30.04	360	101	H
	* 3.785	27.37	MAv1	34.2	-28.7	2.52	35.39	54	-18.61	-	-	360	101	H
3	* 7.366	36.45	PK2	35.7	-26	0	46.15	-	-	74	-27.85	360	101	H
	* 7.366	25.88	MAv1	35.7	-26	2.52	38.1	54	-15.9	-	-	360	101	H
5	* 4.79	38.82	PK2	34.1	-27.5	0	45.42	-	-	74	-28.58	360	101	V
	* 4.79	27.51	MAv1	34.1	-27.5	2.52	36.63	54	-17.37	-	-	360	101	V
6	* 10.975	34.36	PK2	38.1	-22.2	0	50.26	-	-	74	-23.74	360	101	V
	* 10.976	23.34	MAv1	38.1	-22.2	2.52	41.76	54	-12.24	-	-	360	101	V

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

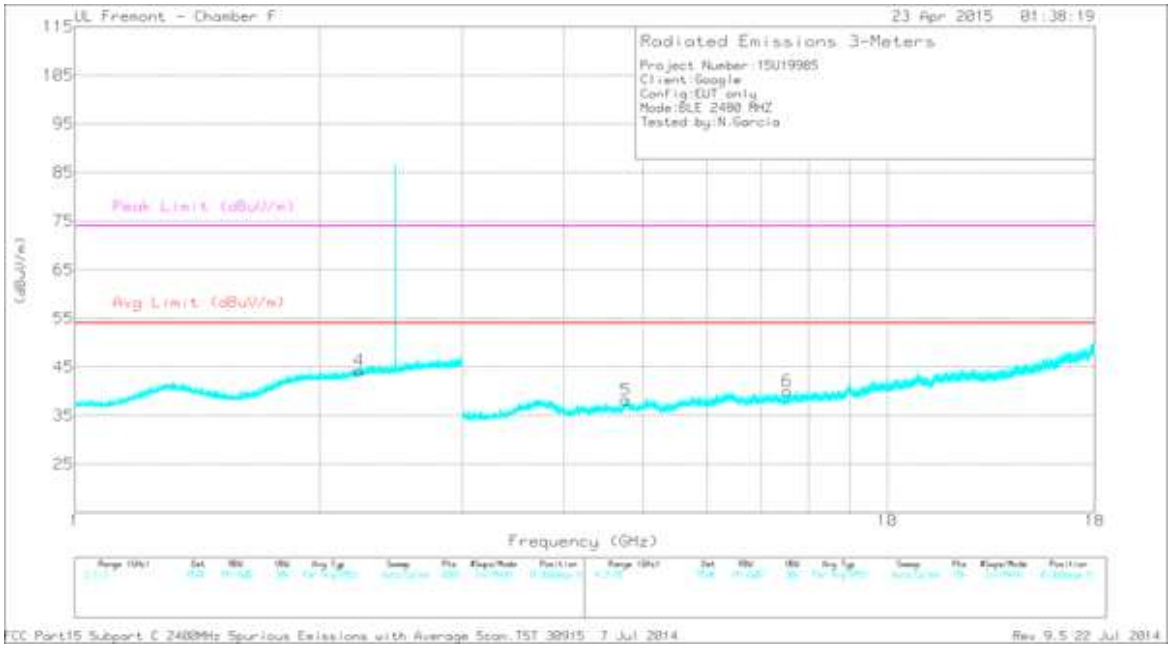
PK - Peak detector
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL

HORIZONTAL



VERTICAL



Trace Markers

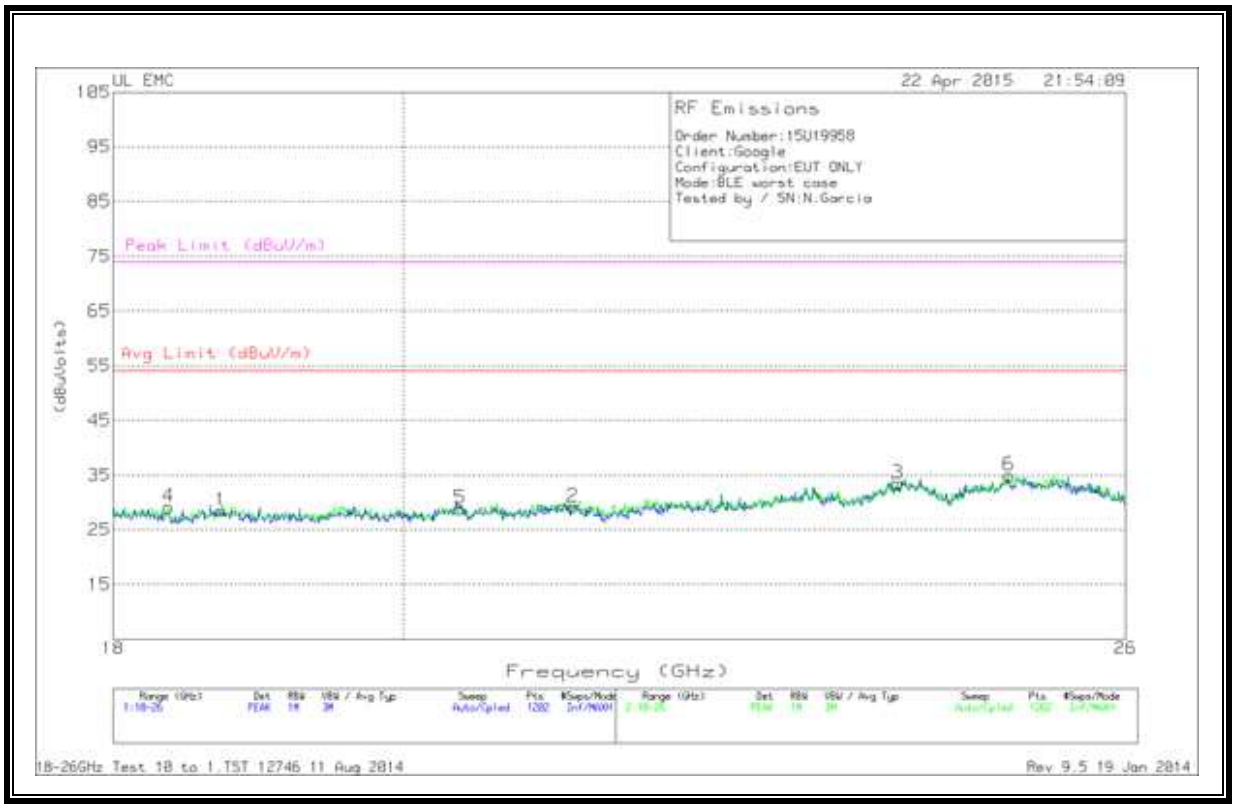
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T120 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.299	41.58	PK2	30	-22.2	0	49.38	-	-	74	-24.62	1	202	H
	* 1.299	30.52	MAv1	30	-22.2	2.52	40.84	54	-13.16	-	-	1	202	H
4	* 2.24	42.2	PK2	31.6	-21	0	52.8	-	-	74	-21.2	1	202	V
	* 2.241	30.3	MAv1	31.6	-21	2.52	43.42	54	-10.58	-	-	1	202	V
2	* 3.719	38.71	PK2	34.6	-29.3	0	44.01	-	-	74	-29.99	11	100	H
	* 3.717	27.98	MAv1	34.6	-29.3	2.52	35.8	54	-18.2	-	-	11	100	H
3	6.433	37.46	PK2	35.9	-27.1	0	46.26	-	-	-	-	14	100	H
	6.431	26.54	MAv1	35.9	-27.1	2.52	37.86	-	-	-	-	14	100	H
5	* 4.769	37.94	PK2	34.1	-27.4	0	44.64	-	-	74	-29.36	14	202	V
	* 4.768	27.52	MAv1	34.1	-27.4	2.52	36.74	54	-17.26	-	-	14	202	V
6	* 7.533	37.16	PK2	35.7	-25.8	0	47.06	-	-	74	-26.94	14	202	V
	* 7.531	25.95	MAv1	35.7	-25.8	2.52	38.37	54	-15.63	-	-	14	202	V

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

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

9.3. WORST-CASE ABOVE 18 GHz

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



Trace Markers

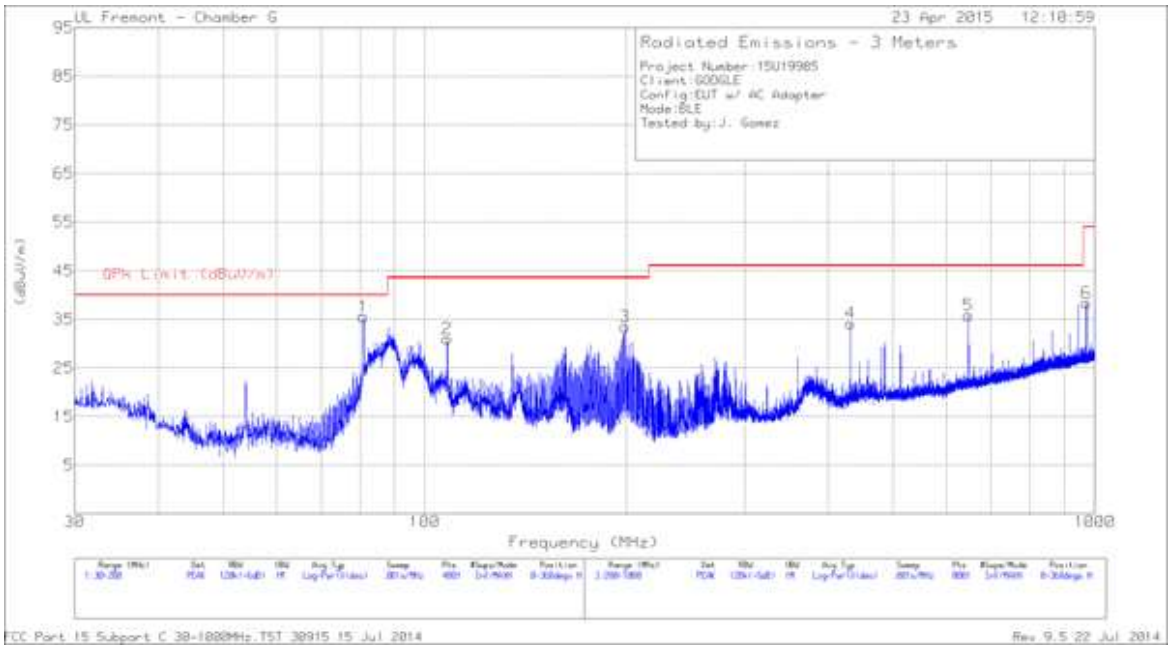
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T89 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.719	40.7	PK	32.7	-24.9	-20	28.5	54	-25.5	74	-45.5
2	21.271	40.37	PK	33.3	-24.5	-20	29.167	54	-24.833	74	-44.833
3	23.935	43.3	PK	34.2	-24	-20	33.5	54	-20.5	74	-40.5
4	18.366	41.77	PK	32.5	-25.1	-20	29.167	54	-24.833	74	-44.833
5	20.418	40.53	PK	33	-24.7	-20	28.833	54	-25.167	74	-45.167
6	24.921	44.2	PK	34.5	-23.7	-20	35	54	-19	74	-39

PK - Peak detector

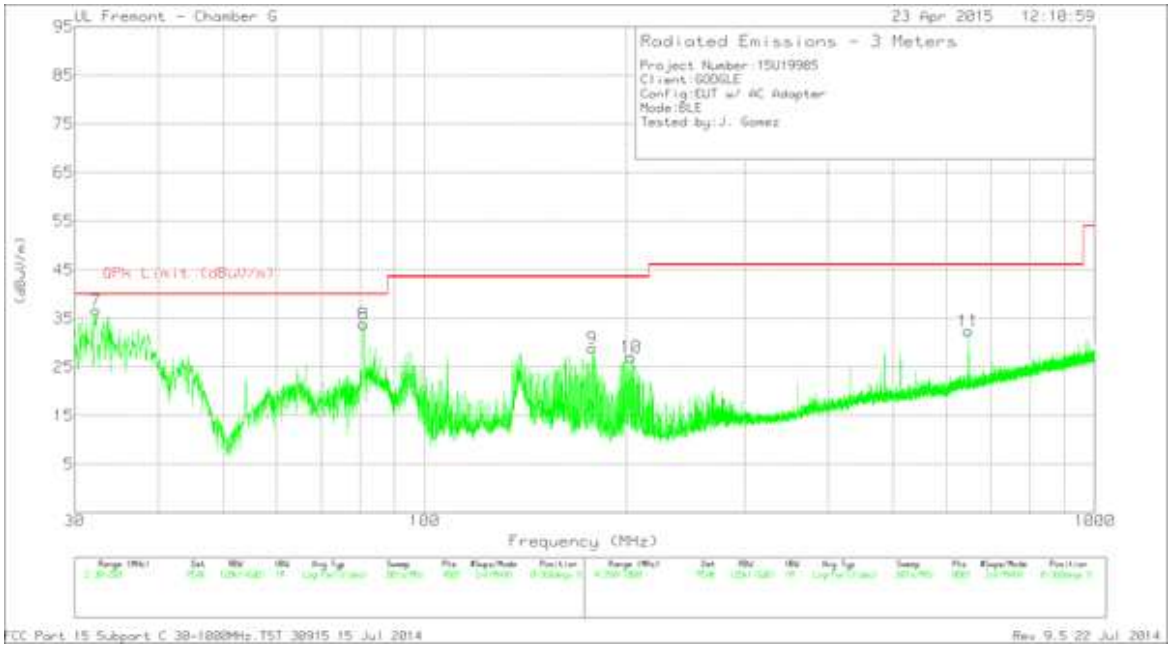
9.4. WORST-CASE BELOW 1 GHz

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

HORIZTONAL



VERTICAL



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T899 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
7	32.905	36.42	QP	22.1	-31.3	27.22	40	-12.78	257	104	V
1	81	56.5	QP	10.3	-30.7	36.1	40	-3.9	177	268	H

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 C63.4

RESULTS

6 WORST EMISSIONS

Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
1	.18128	41.87	Qp	1.1	0	42.97	64.43	-21.46	-	-
2	.18713	32.89	Ca	1	0	33.89	-	-	54.16	-20.27
3	.24338	37.82	Qp	.7	0	38.52	61.98	-23.46	-	-
4	.25013	19.07	Ca	.7	0	19.77	-	-	51.75	-31.98
5	.30413	29.4	Qp	.5	0	29.9	60.13	-30.23	-	-
6	.30413	13.4	Ca	.5	0	13.9	-	-	50.13	-36.23

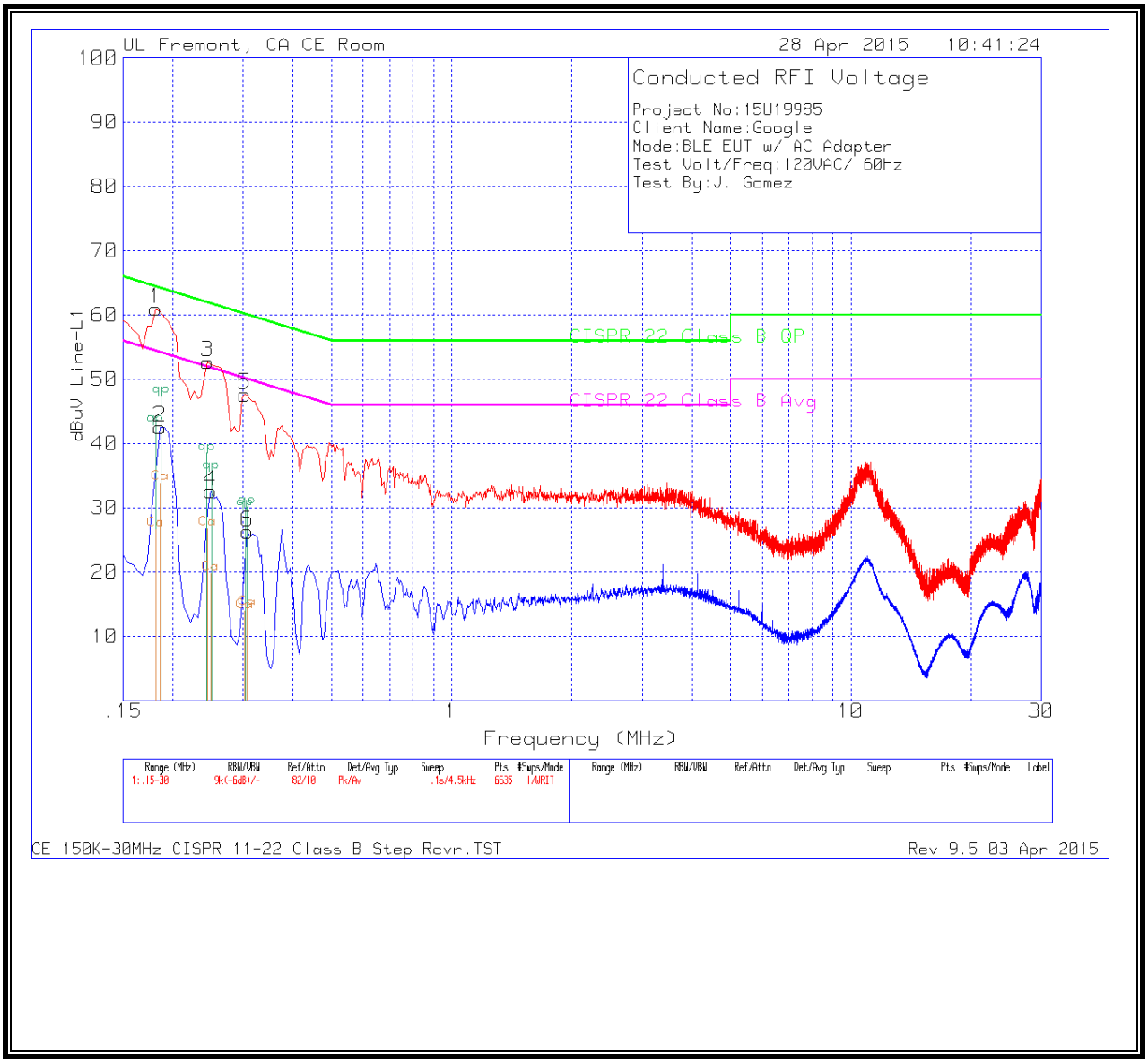
Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2	LC Cables 2&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
7	.17363	42.28	Qp	1.2	0	43.48	64.78	-21.3	-	-
8	.18263	36.17	Ca	1.1	0	37.27	-	-	54.37	-17.1
9	.23438	39.12	Qp	.8	0	39.92	62.29	-22.37	-	-
10	.23888	23.28	Ca	.8	0	24.08	-	-	52.14	-28.06
11	.54578	38.17	Qp	.3	0	38.47	56	-17.53	-	-
12	.54578	32.79	Ca	.3	0	33.09	-	-	46	-12.91

Ca - CISPR average detection

Qp - Quasi-Peak detector

LINE 1 RESULTS



LINE 2 RESULTS