



FCC CFR47 PART 15 SUBPART C

BLUETOOTH LOW ENERGY

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE + BLUETOOTH + WLAN b/g/n & NFC WATCH

MODEL NUMBER: LG-W200A, LGW200A, W200A

FCC ID: ZNFW200A

REPORT NUMBER: 15I21604-E3V3

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Prepared for

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Date	Revisions	Revised By
V1	09/29/15	Initial Issue	
		- Updated section 8.2, to reference ANSI C63.10 for 99% BW test procedure.	
V2	10/01/15	- Updated page 37, two descriptions for radiated test frequency range: one ups to 26GHz the other ups to 40 GHz. Changed to 18GHz. This is referenced in ANSI C63.10, 5.2.	I.Netto
V3	10/02/15	Updated Section 9.1	D. Corona

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1. ATTESTATION OF TEST RESULTS

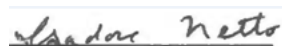
COMPANY NAME: LG ELECTRONICS MOBILECOMM U.S.A., INC.
EUT DESCRIPTION: GSM/WCDMA/LTE + BLUETOOTH + WLAN b/g/n & NFC WATCH
MODEL: LG-W200A, LGW200A, W200A
SERIAL NUMBER: 223B9
DATE TESTED: JULY 2-7 and AUGUST 29, 2015

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.

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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, and KDB 558074 D01 v03r03, ANSI C63.10-2009 for FCC.

ANSI C63.10-2009 Deviation

Radiated spurious emission above 1GHz EUT height is 1.5m not 0.8m.

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:

$$\begin{aligned}\text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable} \\ &\text{Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m}\end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 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 GSM/WCDMA/LTE + BLUETOOTH + WLAN b/g/n & NFC WATCH

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	9.06	8.05

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -1.9 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
AC Adapter	LG	MCS-02WRE	RB550800170	N/A
Earphone				

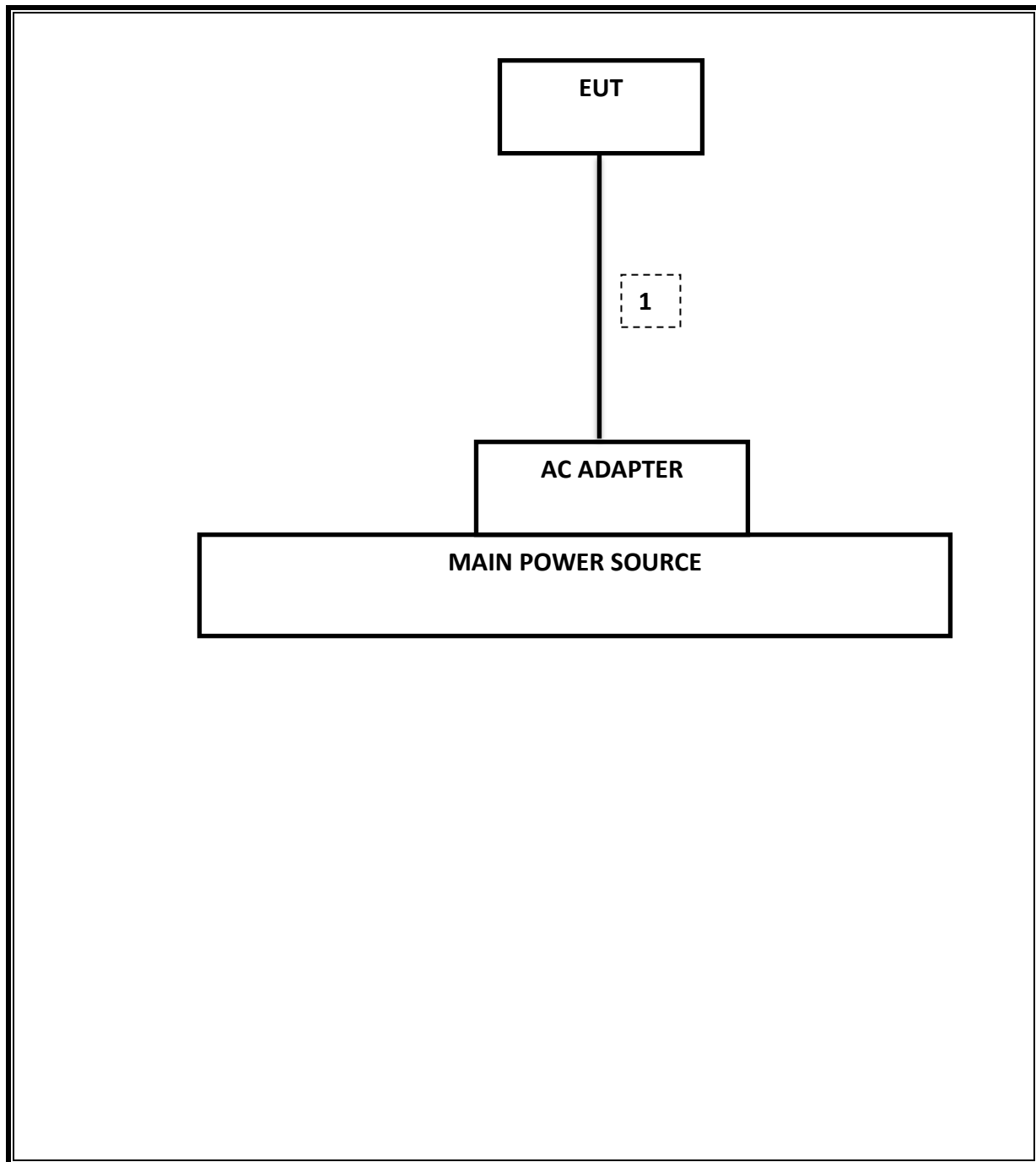
I/O CABLES

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

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
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01171	02/13/16
Antenna, Horn, 18GHz	EMCO	3115	C00783	10/25/15
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	11/14/15
RF Preamplifier, 100KHz -> 1300MHz	HP	TBD	C00825	06/01/16
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	924343	03/23/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	T404	06/29/16
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/15
CBT Bluetooth Tester	R & S	CBT	T258	06/30/16
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
Radiated Software	UL	UL EMC	Ver 9.5, July 22, 2014	
Conducted Software	UL	UL EMC	Ver 9.5, May 17 2012	
CLT Software	UL	UL RF	Ver 1.0, Feb 2 2015	
Antenna Port Software	UL	UL RF	Ver 2.1.1.1, Jan 20 2015	

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	0.686 MHz
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-49.21 dBm
15.247	RSS-247 5.4.4	TX conducted output power	<30dBm		Pass	9.06 dBm
15.247	RSS-247 5.2.2	PSD	<8dBm		Pass	-0.09 dBm
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass	23.4 dBuV (AV)
15.205, 15.209	RSS-GEN 8.9/7	Radiated Spurious Emission	< 54dBuV/m		Pass	43.52 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

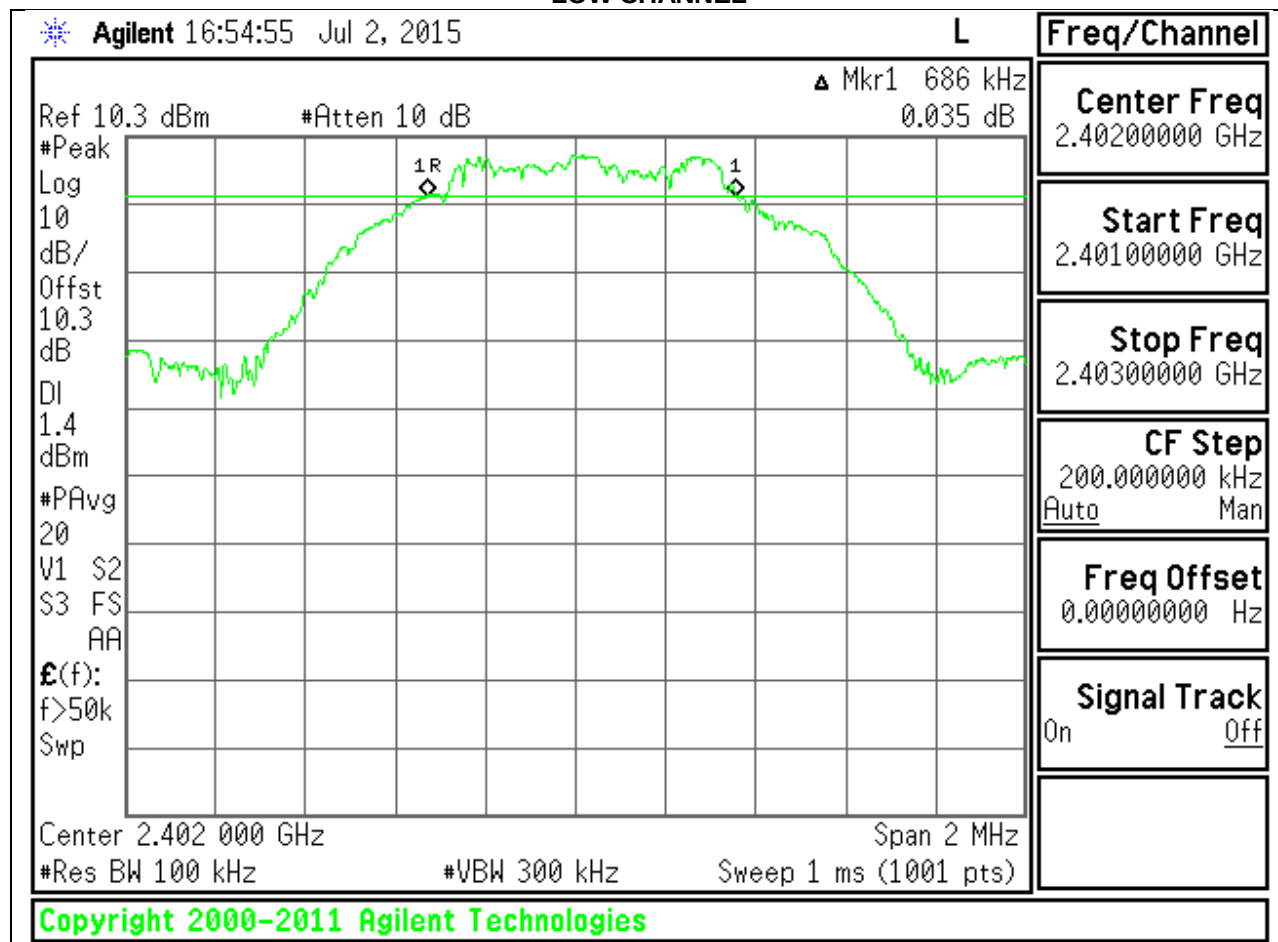
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

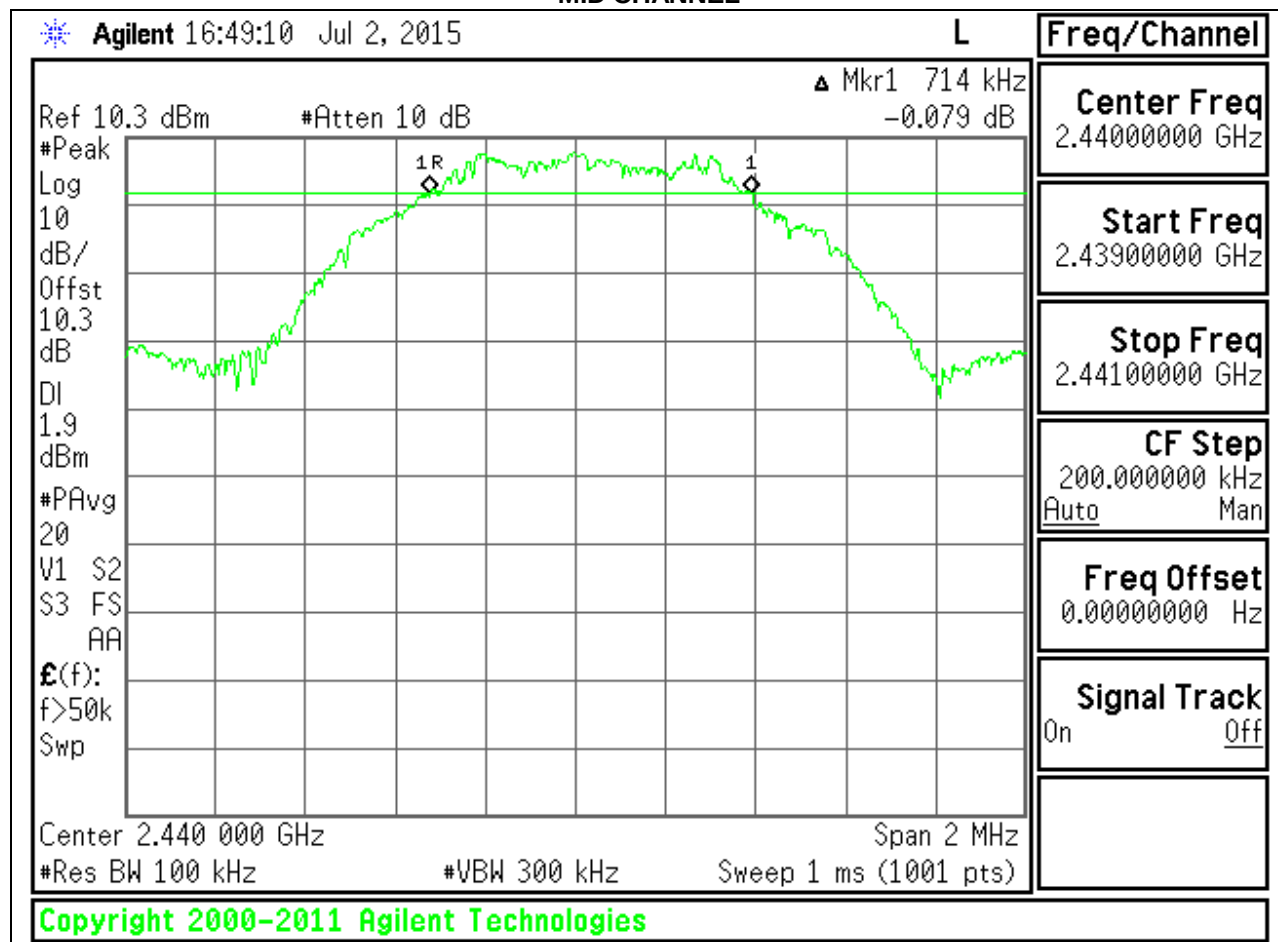
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.6860	0.5
Middle	2440	0.7140	0.5
High	2480	0.7100	0.5

6 dB BANDWIDTH PLOTS

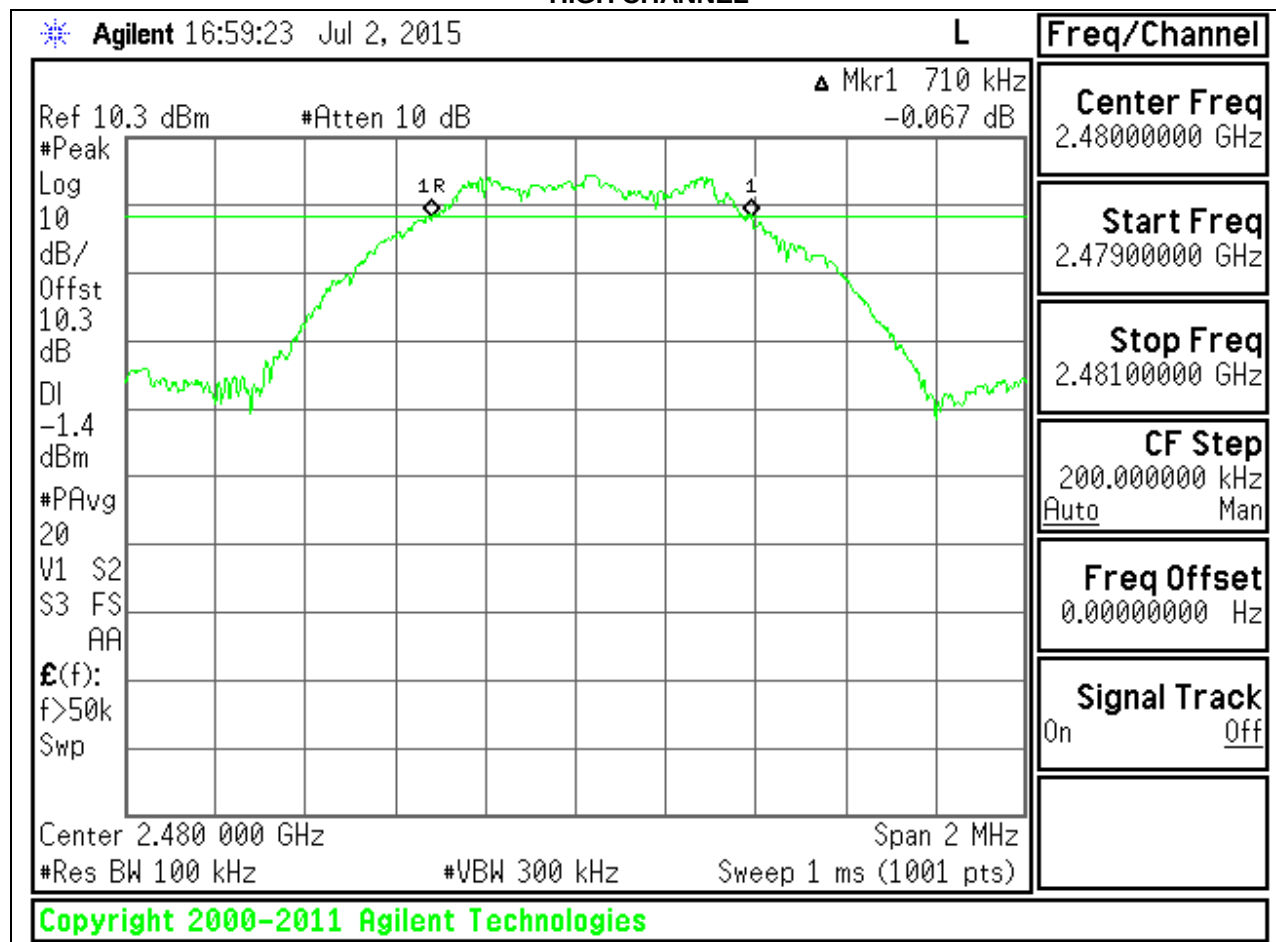
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

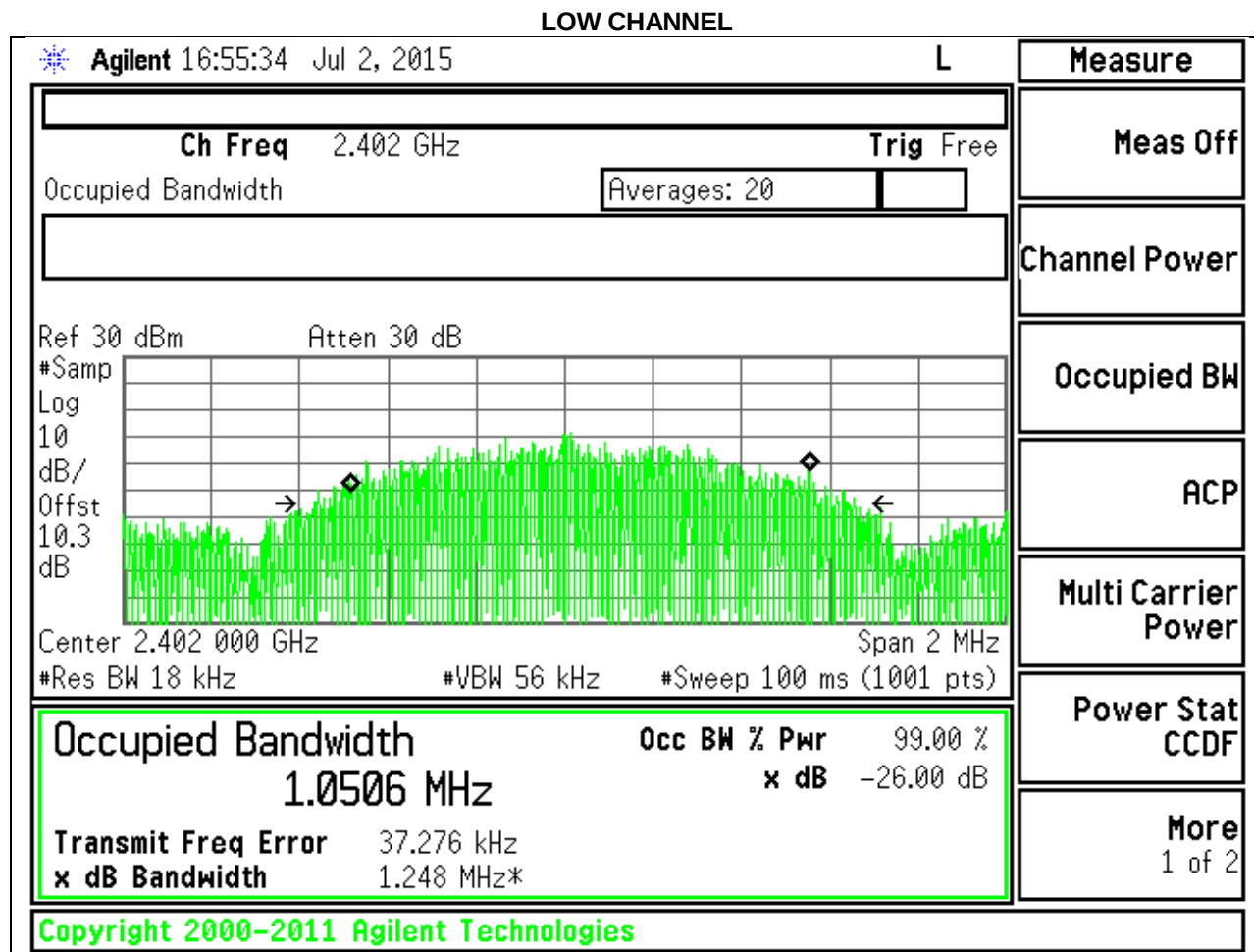
TEST PROCEDURE

Reference to ANSI C63.10 (6.9.3) test procedures: 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.

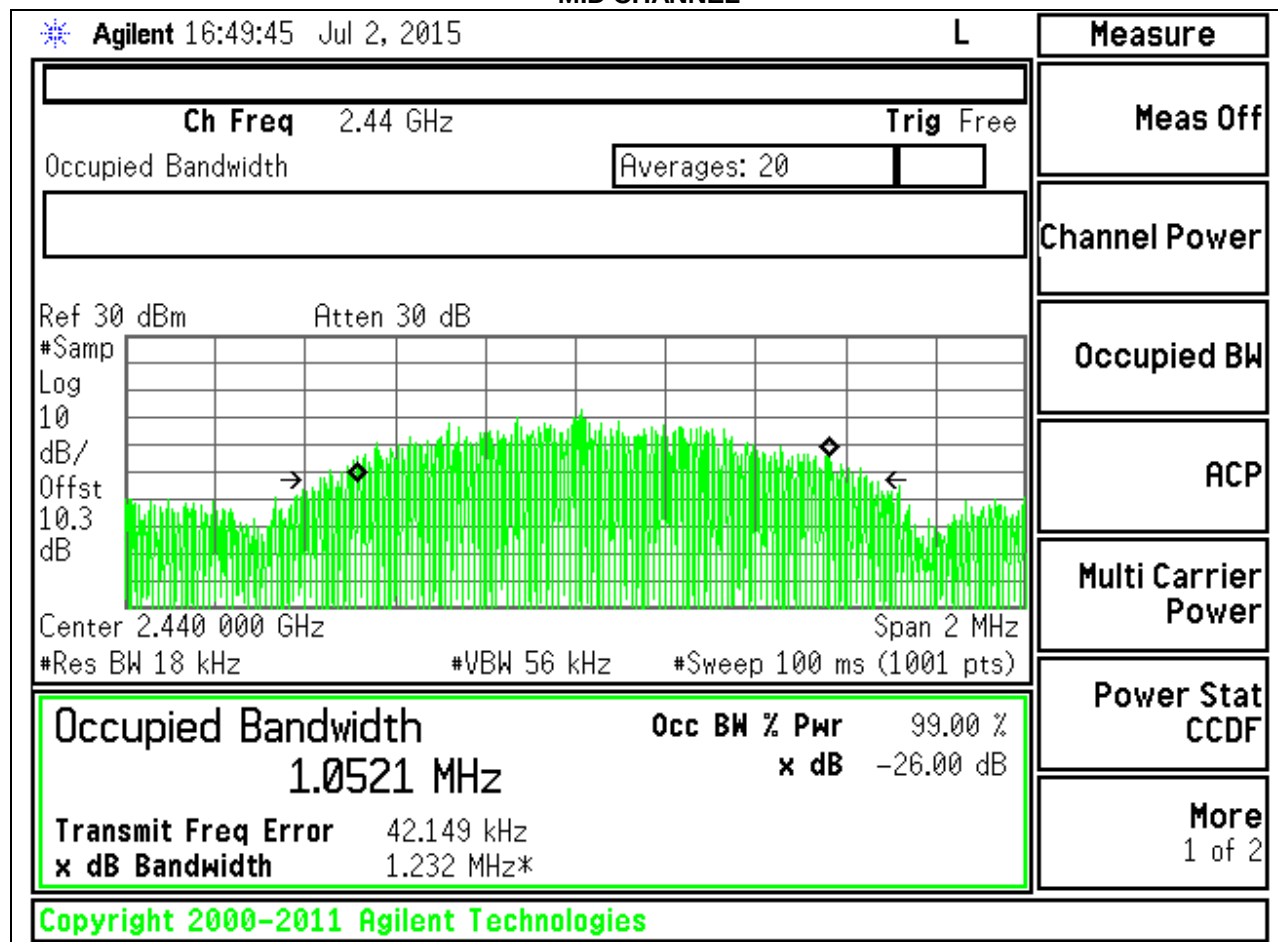
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0506
Middle	2440	1.0521
High	2480	1.0542

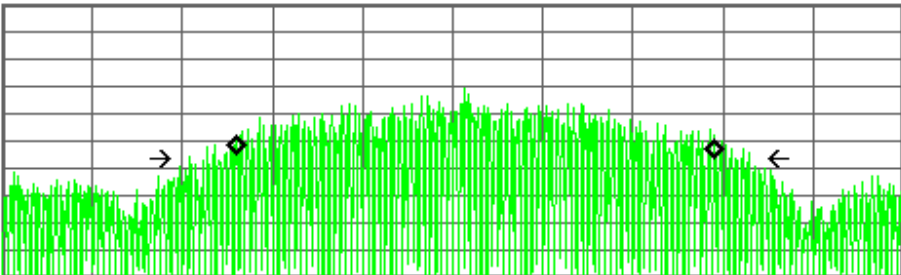
99% BANDWIDTH PLOTS



MID CHANNEL



HIGH CHANNEL

Agilent 16:59:52 Jul 2, 2015		L		Measure	
Ch Freq 2.48 GHz Trig Free				Meas Off	
Occupied Bandwidth Averages: 20				Channel Power	
Ref 30 dBm Atten 30 dB				Occupied BW	
#Samp Log 10 dB/ Offst 10.3 dB				ACP	
				Multi Carrier Power	
Center 2.480 000 GHz Span 2 MHz				Power Stat CCDF	
#Res BW 18 kHz #VBW 56 kHz #Sweep 100 ms (1001 pts)				More	
Occupied Bandwidth 1.0542 MHz				Occ BW % Pwr 99.00 %	
Transmit Freq Error 43.765 kHz				x dB -26.00 dB	
x dB Bandwidth 1.257 MHz*				1 of 2	
Copyright 2000-2011 Agilent Technologies					

8.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-247 5.4.4

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

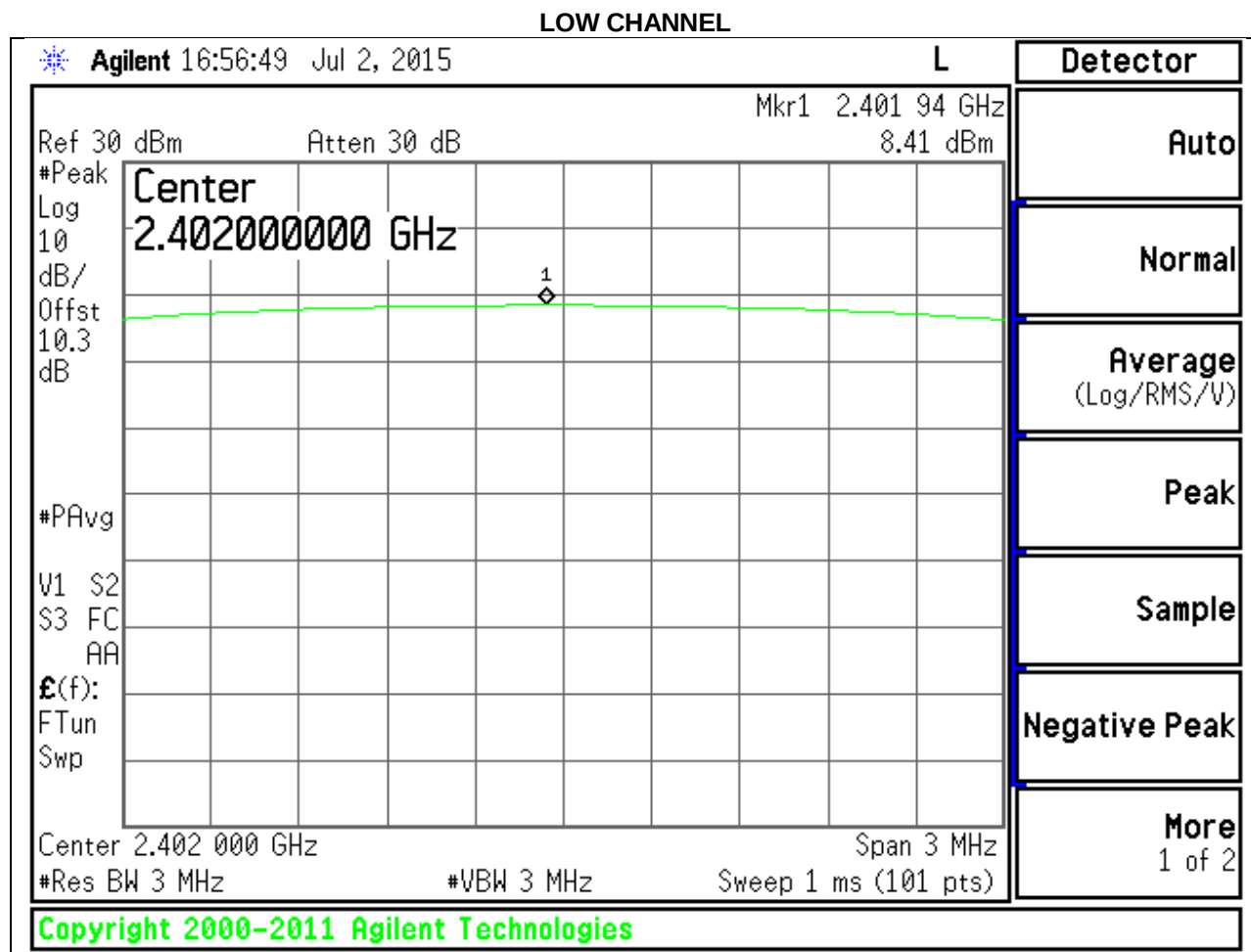
TEST PROCEDURE

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

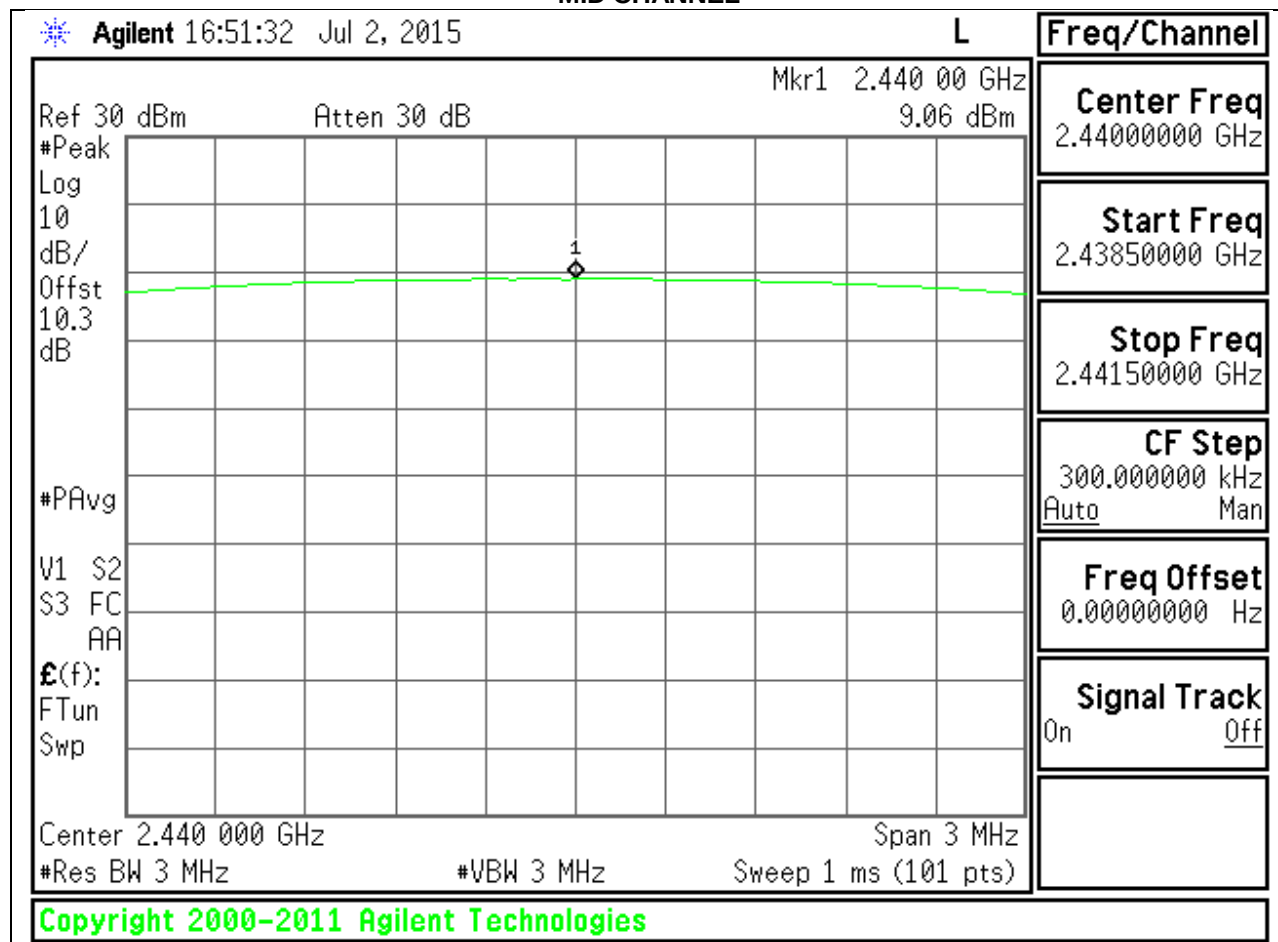
RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	8.410	30	-21.590
Middle	2440	9.060	30	-20.940
High	2480	5.530	30	-24.470

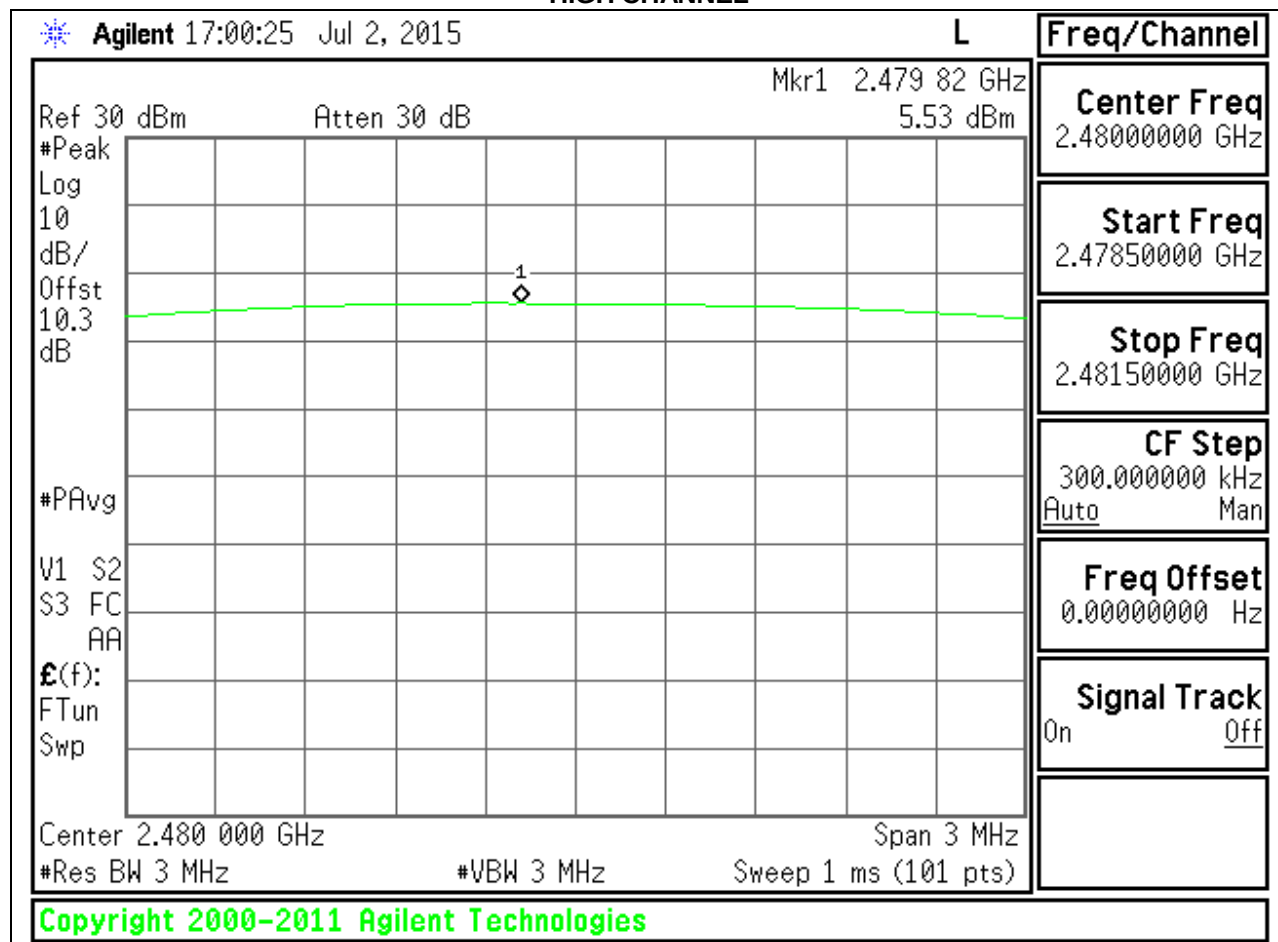
OUTPUT POWER PLOTS



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	6.50
Middle	2440	7.41
High	2480	3.34

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

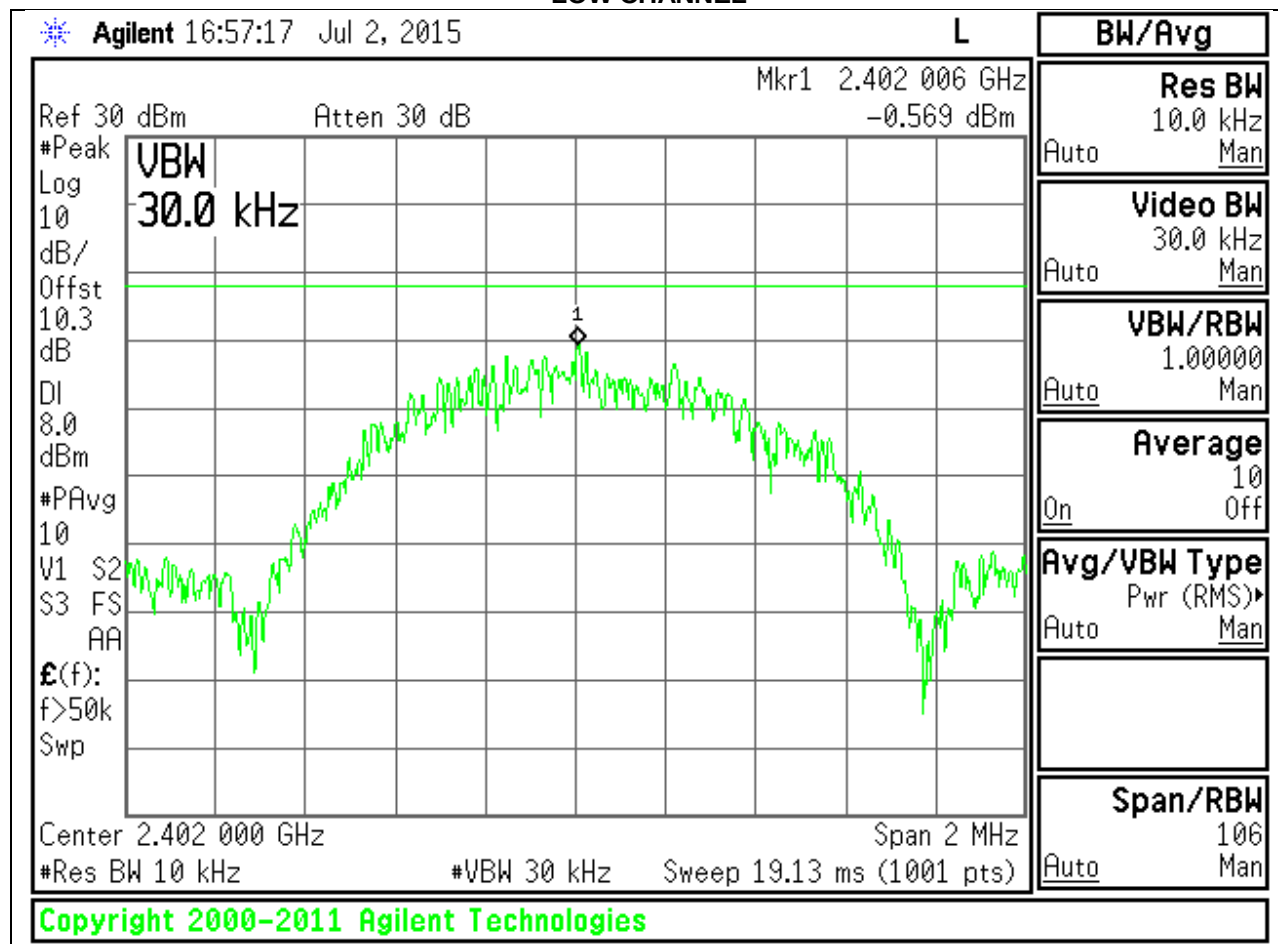
Power Spectral Density was performed utilizing the "Method PKPSD (Peak PSD)" under KDB558074 D01 DTS Meas Guidance v03r03.

RESULTS

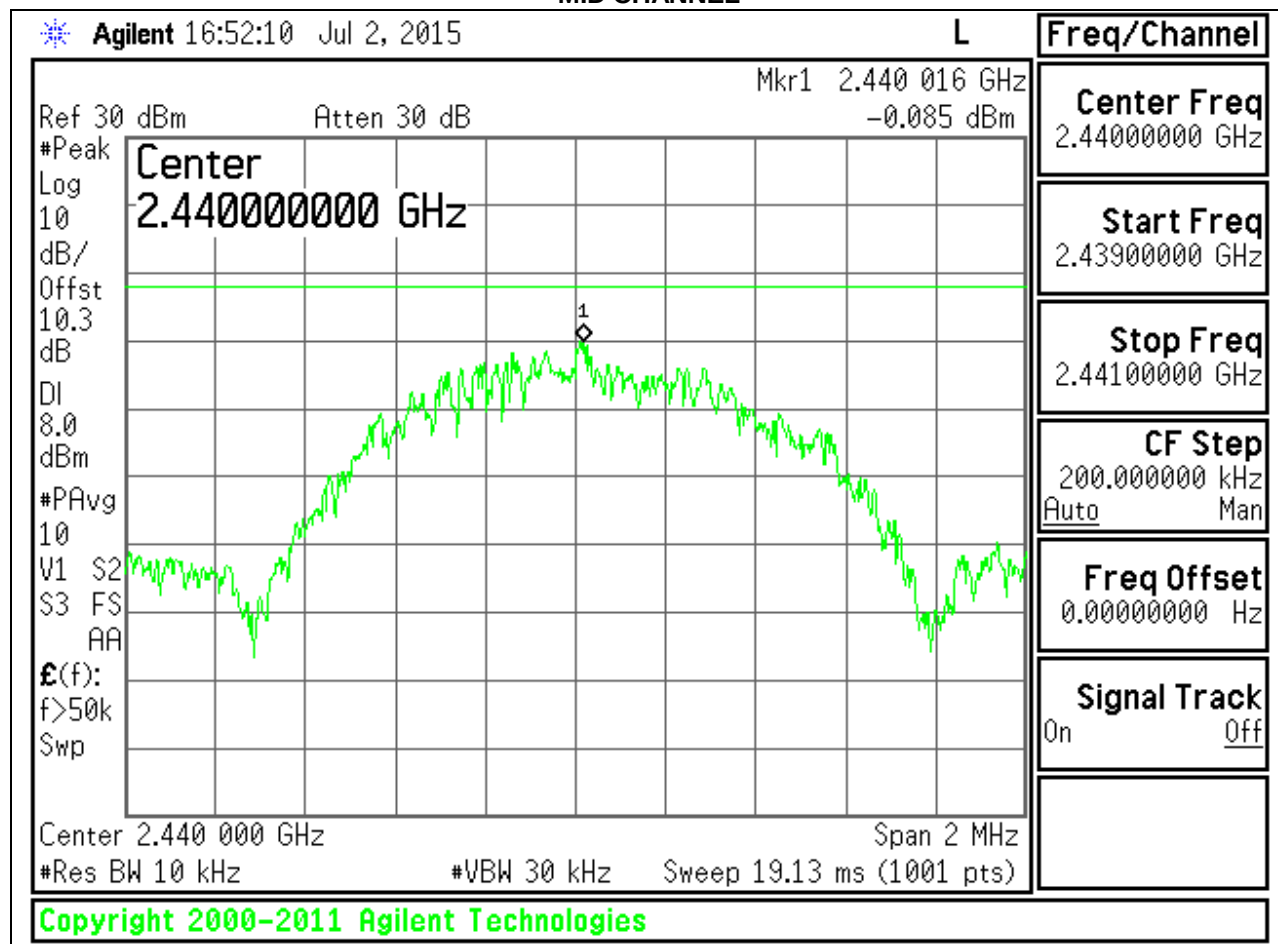
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-0.57	8	-8.57
Middle	2440	-0.09	8	-8.09
High	2480	-3.45	8	-11.45

POWER SPECTRAL DENSITY PLOTS

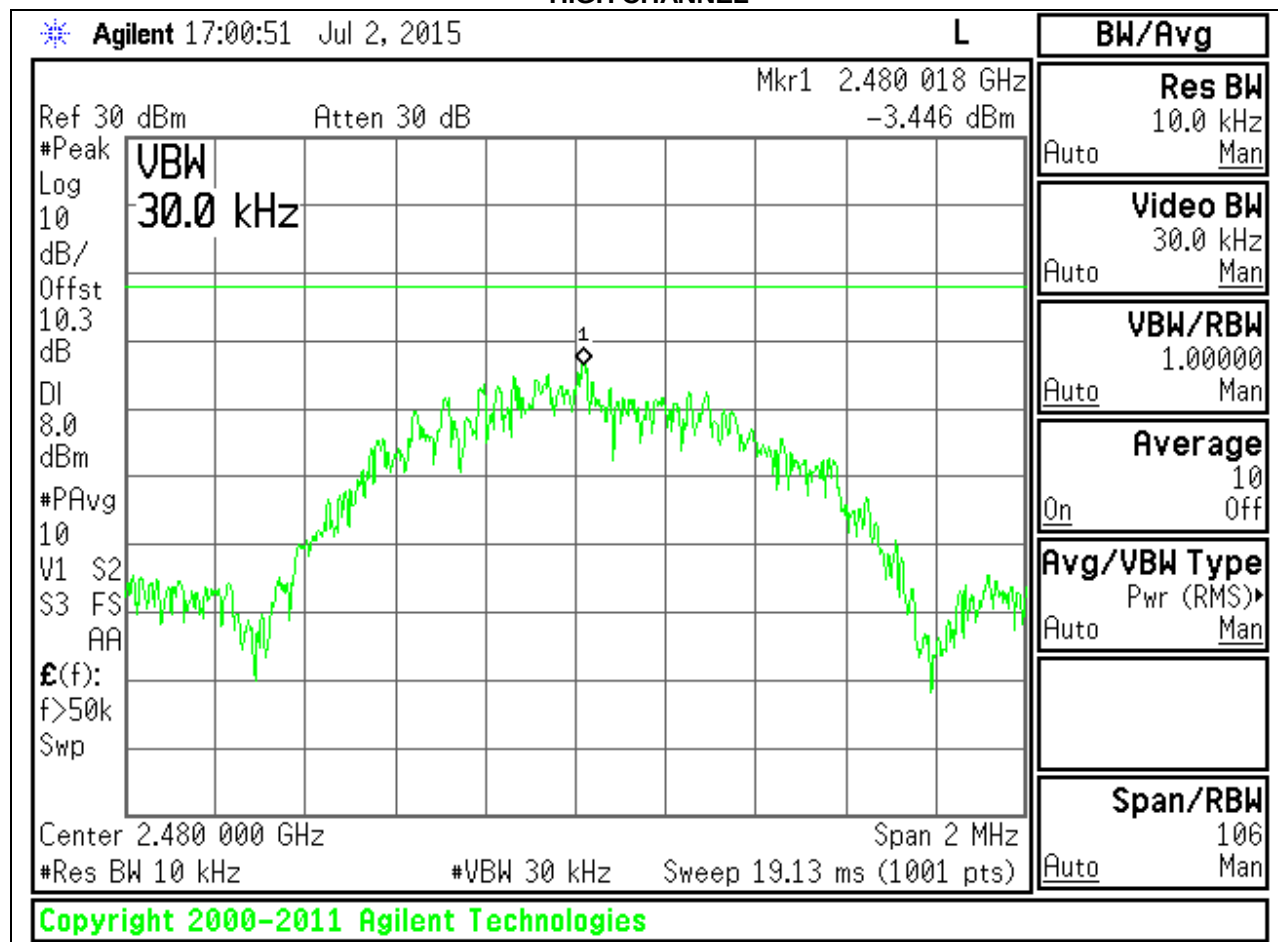
LOW CHANNEL



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.

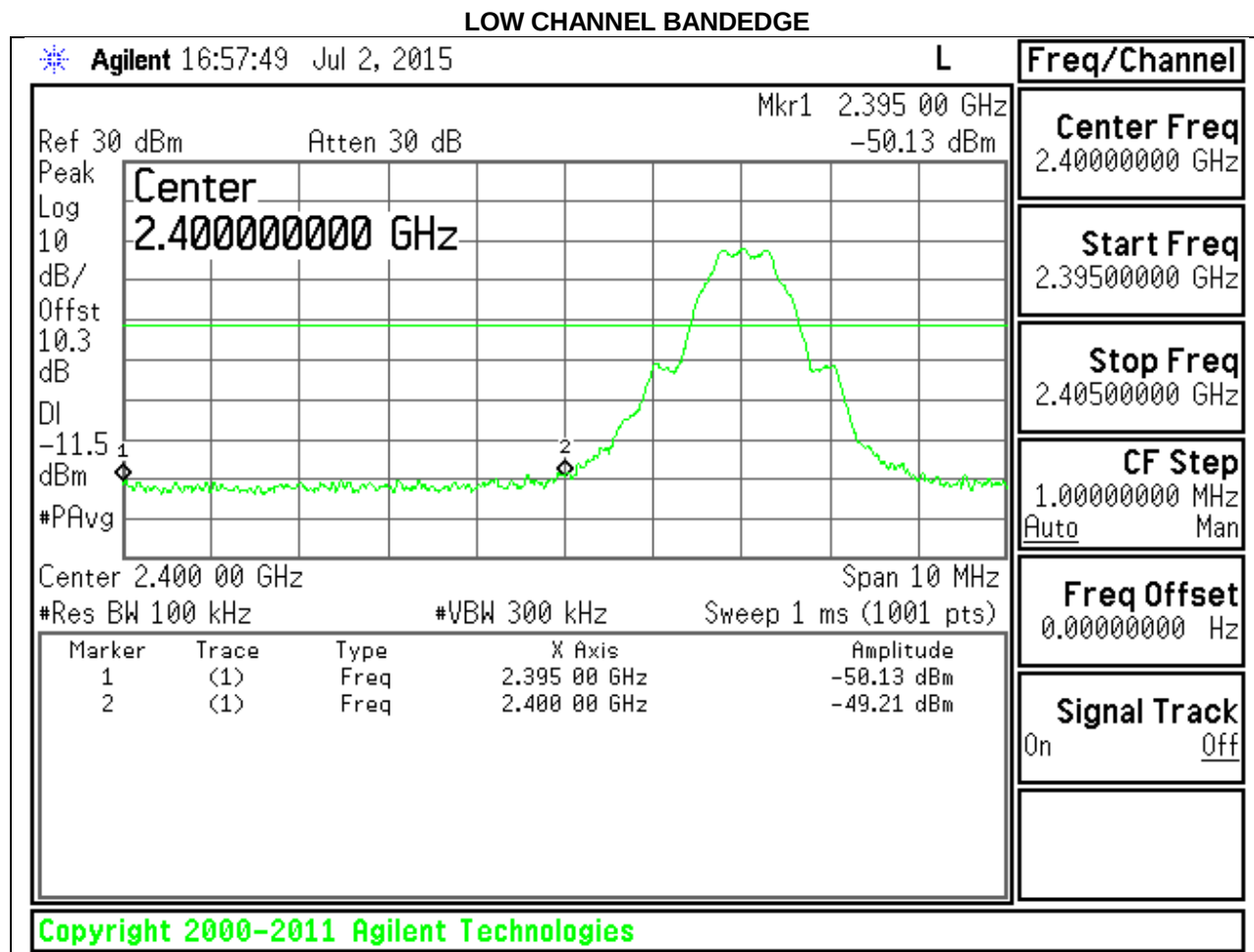
TEST PROCEDURE

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.

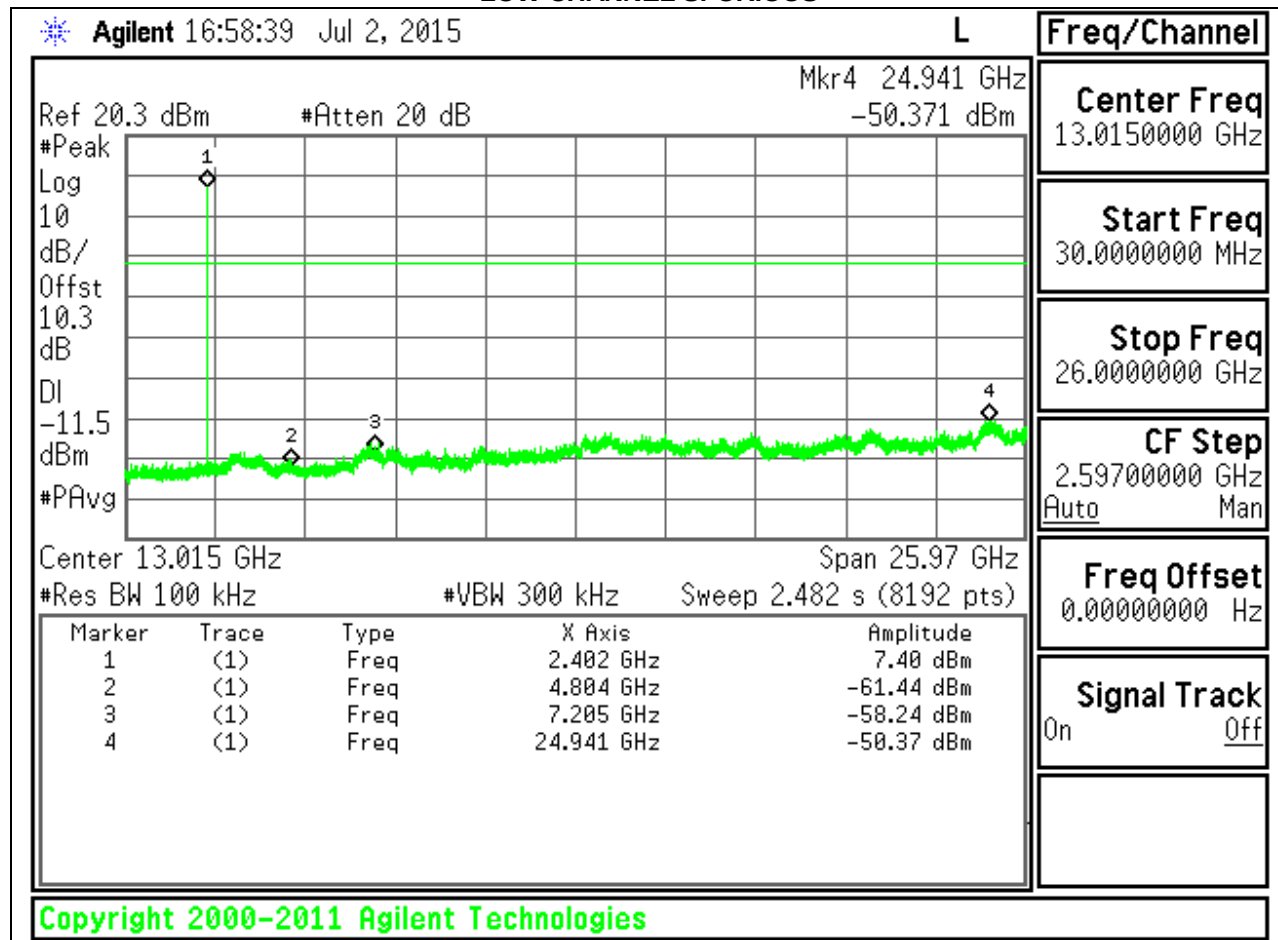
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

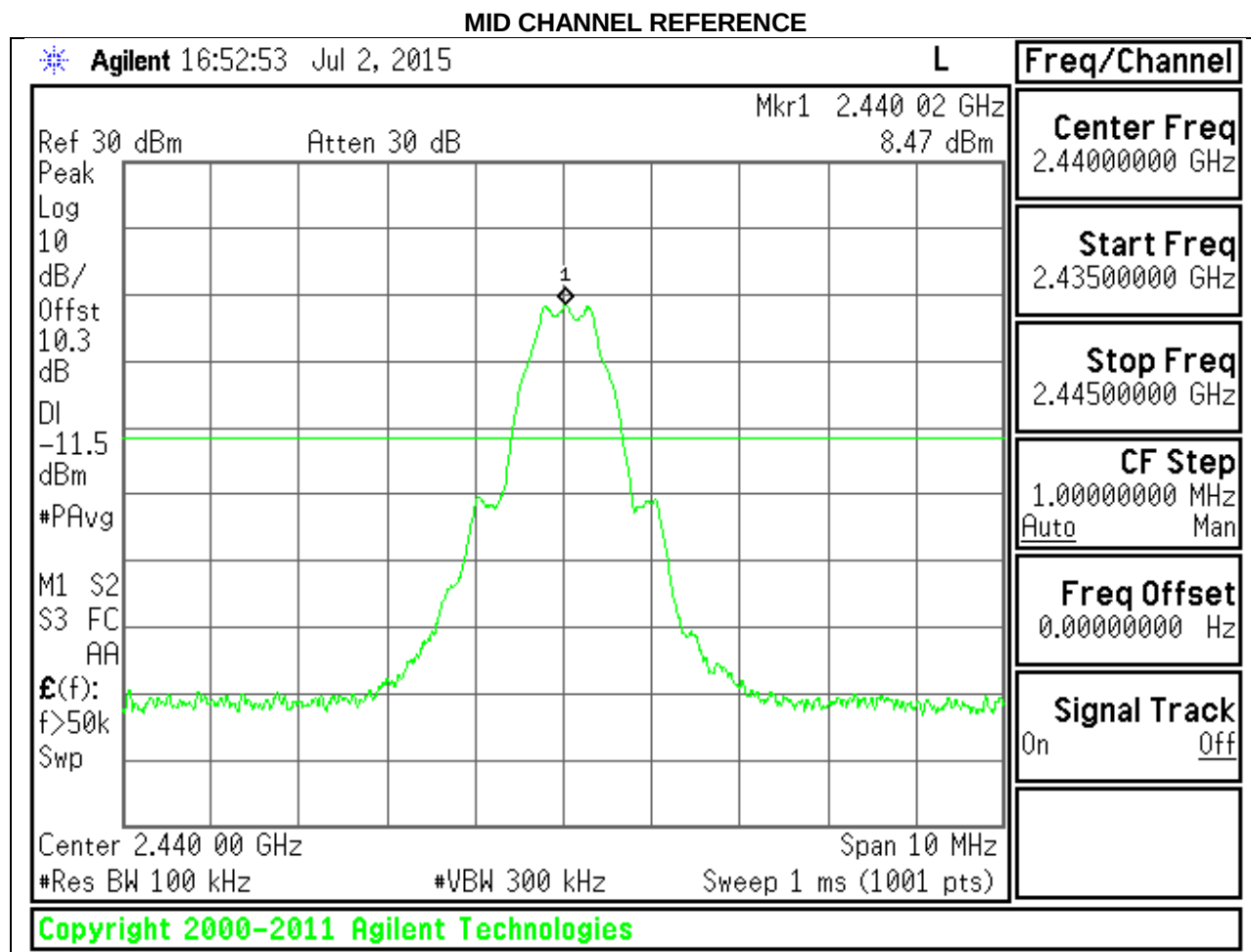
SPURIOUS EMISSIONS, LOW CHANNEL



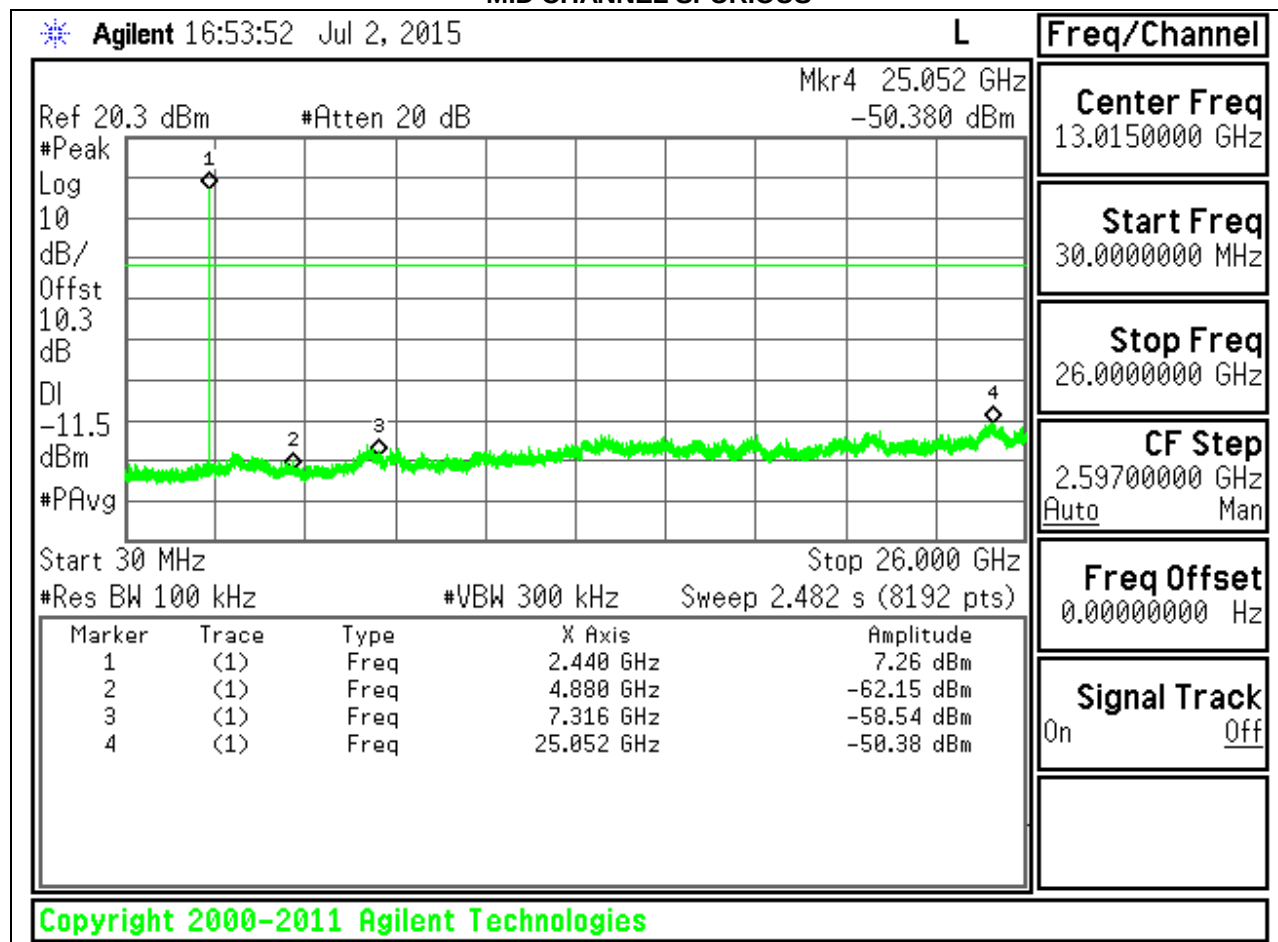
LOW CHANNEL SPURIOUS



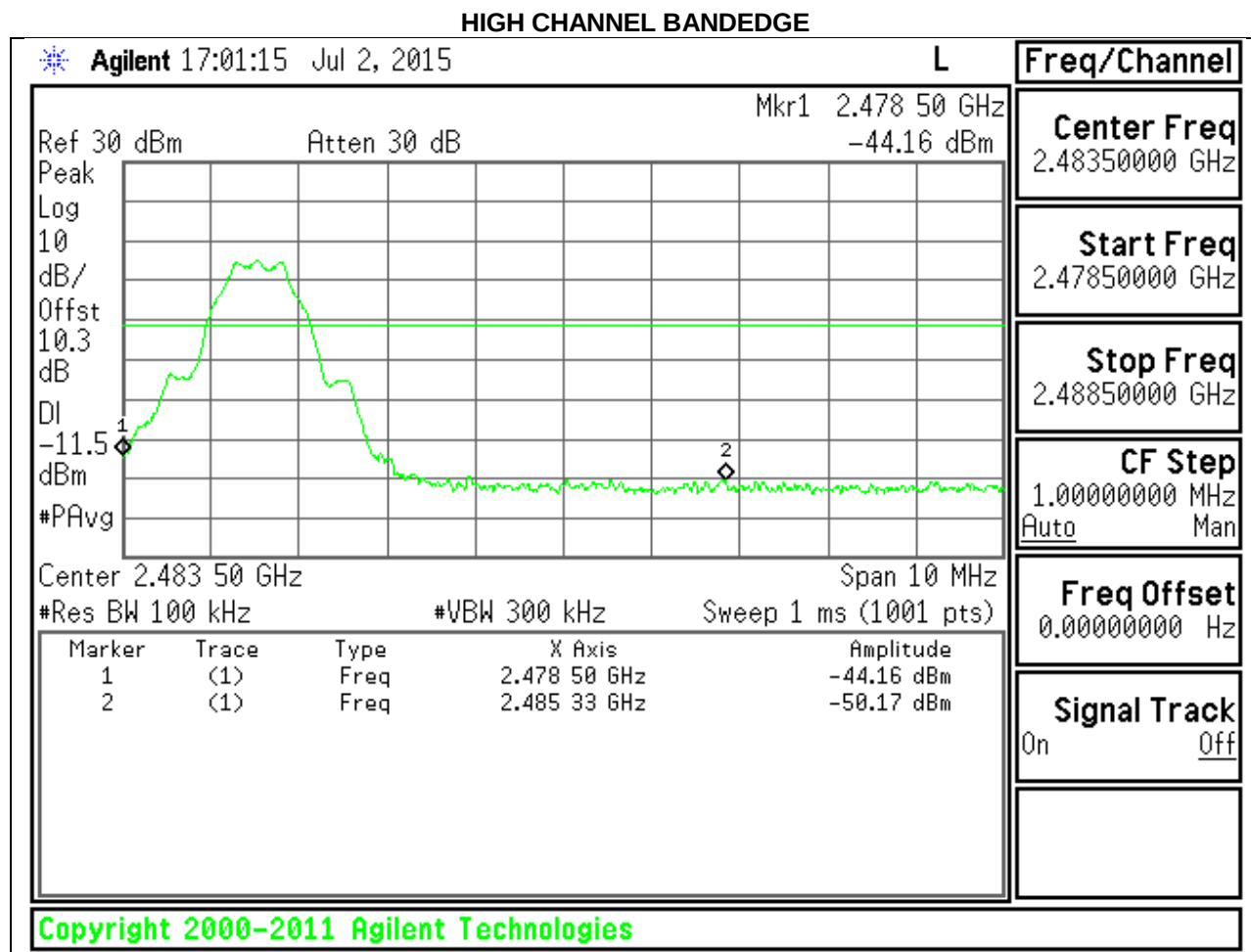
SPURIOUS EMISSIONS, MID CHANNEL



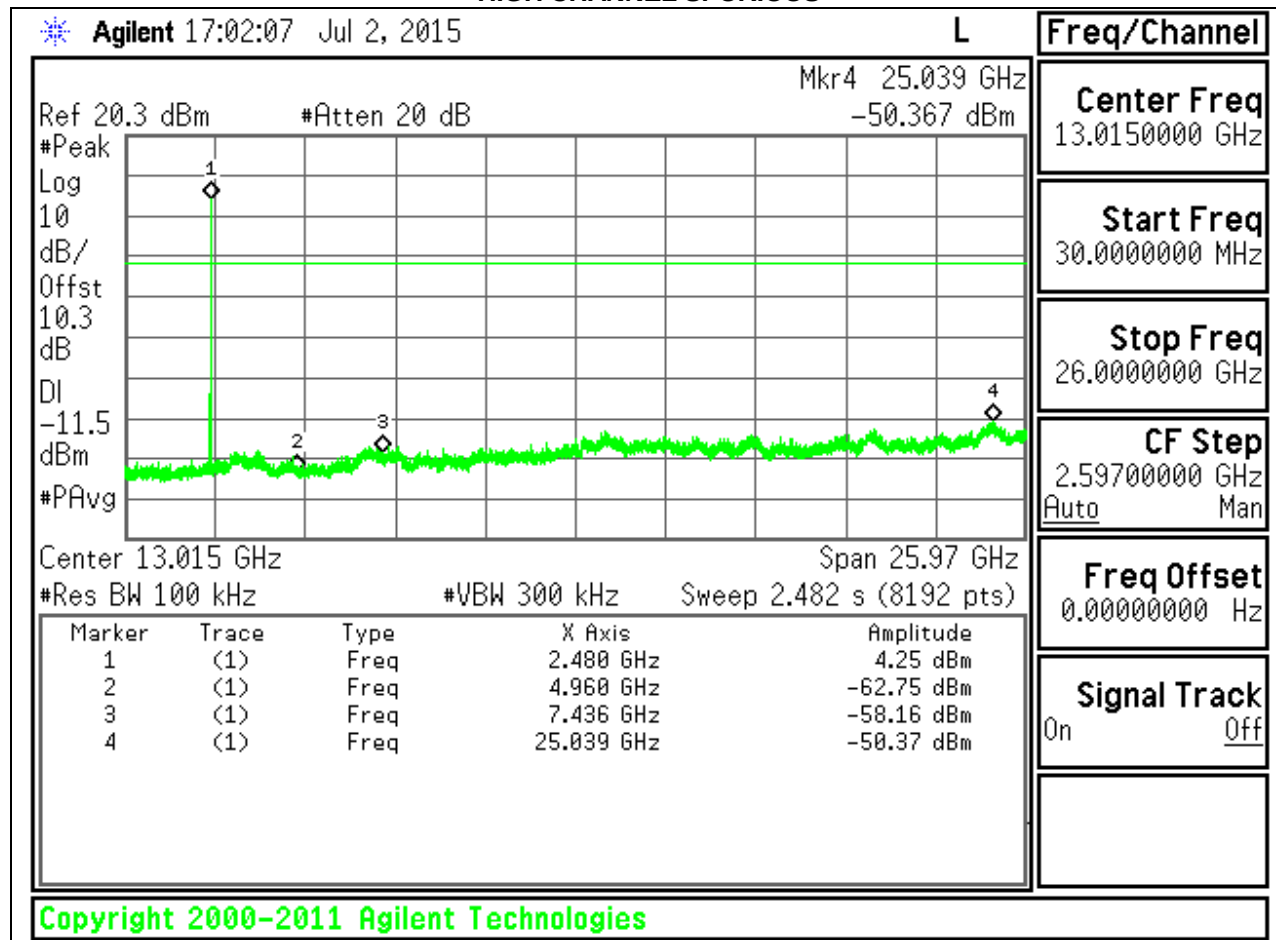
MID CHANNEL SPURIOUS



SPURIOUS EMISSIONS, HIGH CHANNEL



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 ($\mu\text{V/m}$) at 3 m	Field Strength Limit (dB $\mu\text{V/m}$) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. 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.

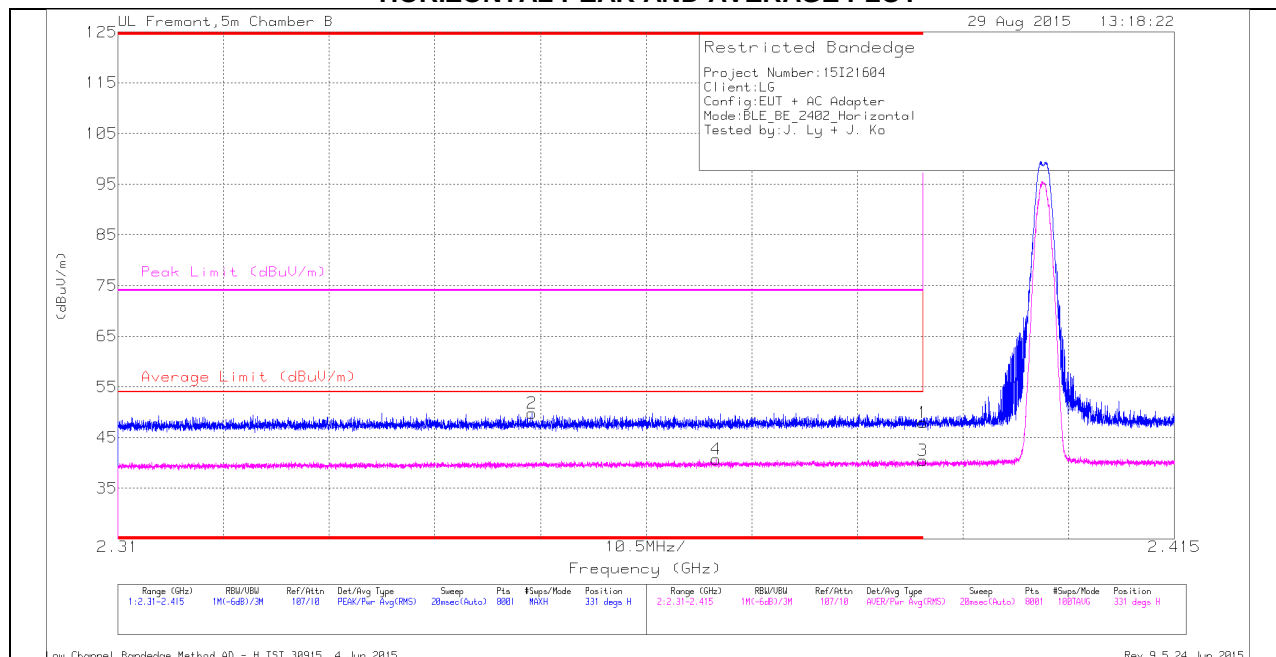
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor = $10 \log(1/x)$. For this sample: DCF = $10 \log(1/0.618) = 2.05\text{dB}$

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. TRANSMITTER ABOVE 1 GHz RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

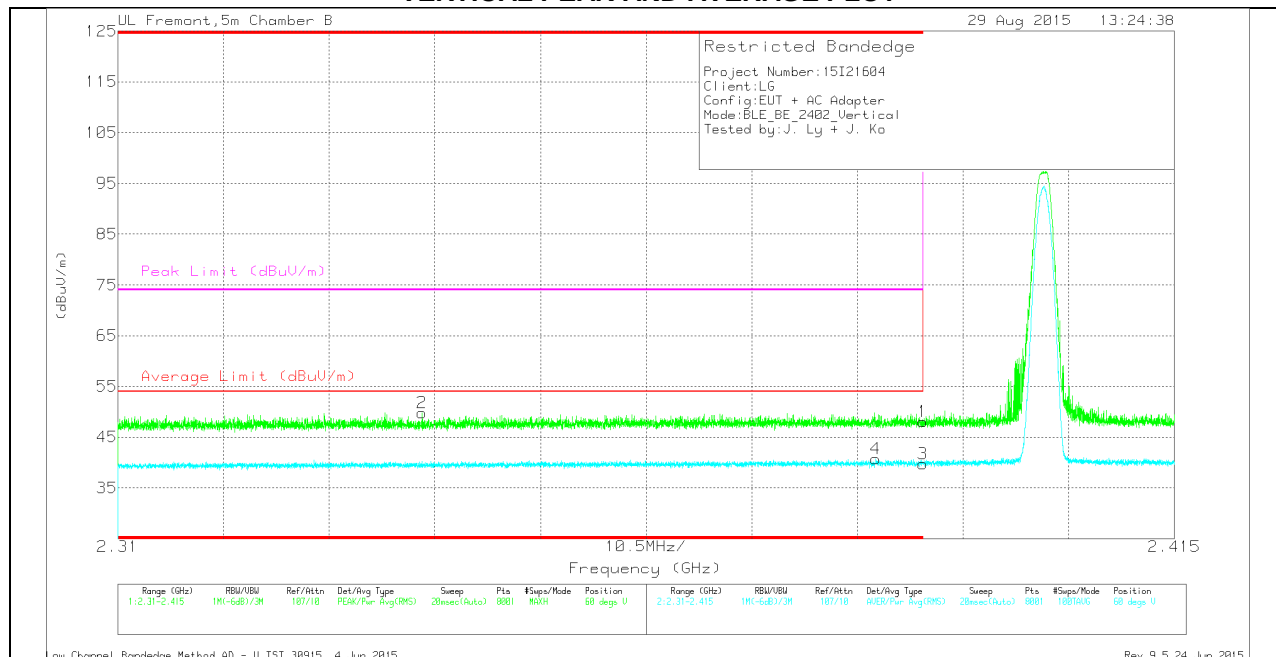
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Filt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40	Pk	32	-24.1	0	47.9	-	-	74	-26.1	331	199	H
2	* 2.351	42.24	Pk	31.8	-24.2	0	49.84	-	-	74	-24.16	331	199	H
3	* 2.39	30.54	RMS	32	-24.1	2.05	40.49	54	-13.51	-	-	331	199	H
4	* 2.369	30.98	RMS	31.9	-24.2	2.05	40.73	54	-13.27	-	-	331	199	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

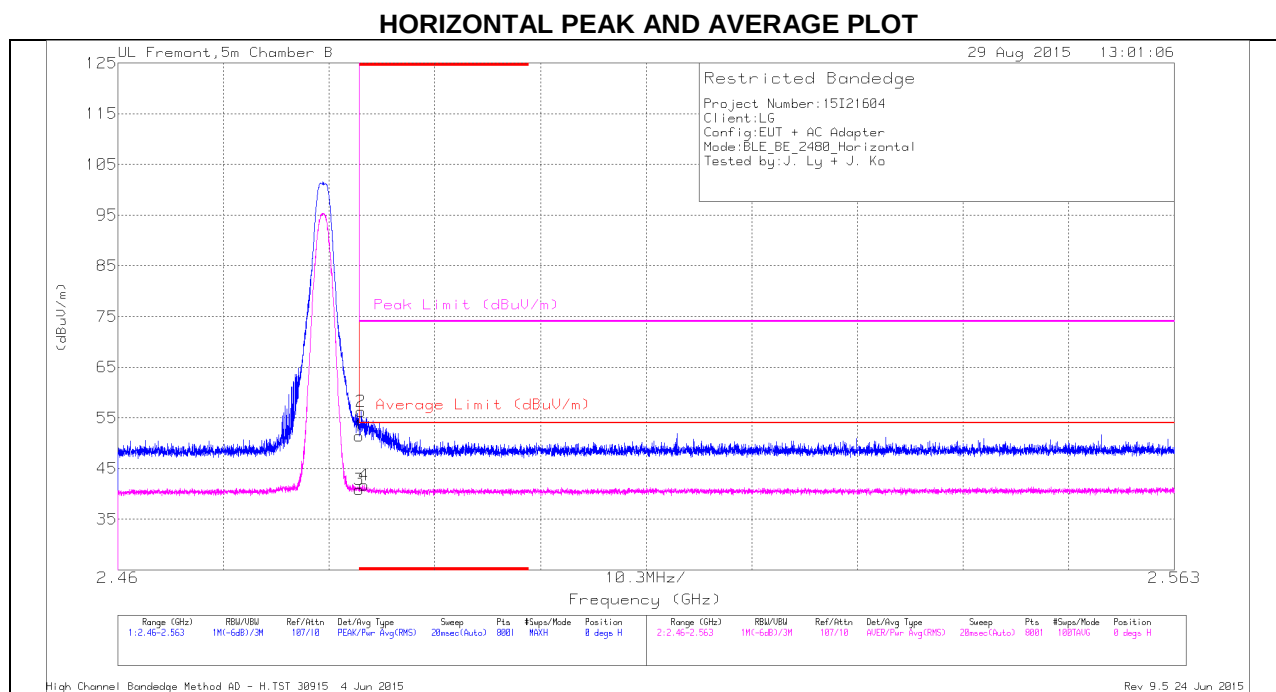
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	40.19	Pk	32	-24.1	0	48.09	-	-	74	-25.91	60	362	V
2	* 2.34	42.29	Pk	31.7	-24.2	0	49.79	-	-	74	-24.21	60	362	V
3	* 2.39	29.81	RMS	32	-24.1	2.05	39.76	54	-14.24	-	-	60	362	V
4	* 2.385	30.75	RMS	32	-24.1	2.05	40.7	54	-13.3	-	-	60	362	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)



HORIZONTAL DATA

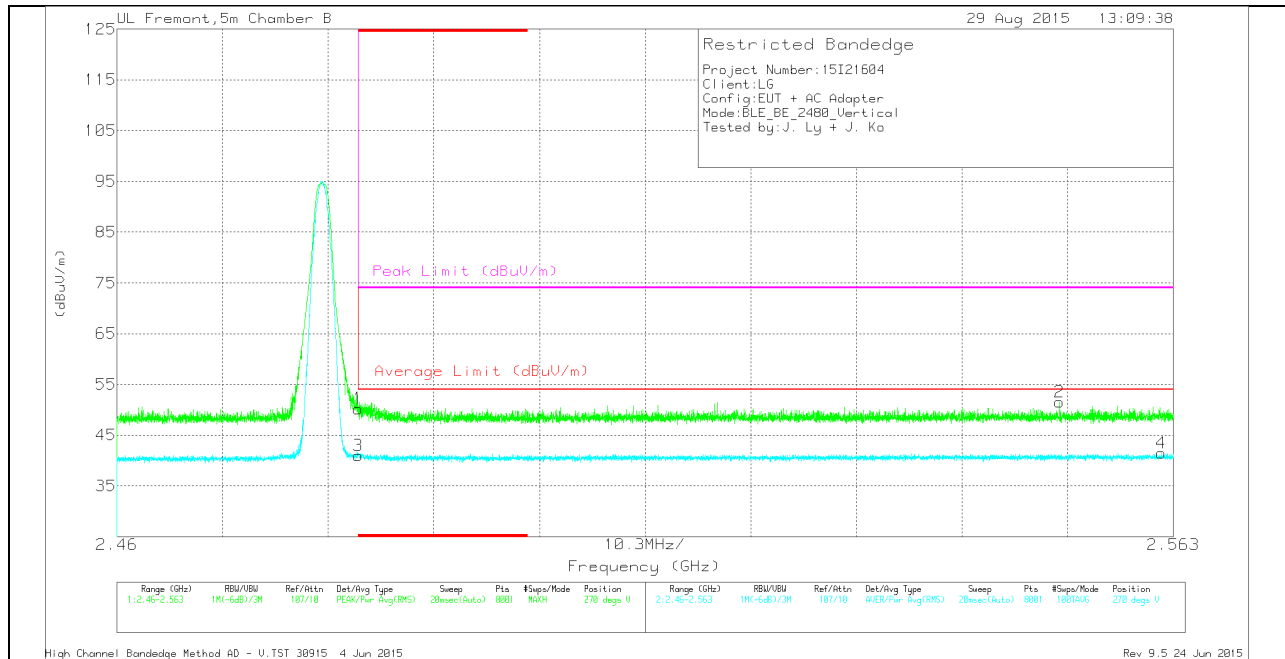
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fit r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	42.91	Pk	32.5	-24	0	51.41	-	-	74	-22.59	0	184	H
2	* 2.484	47.7	Pk	32.5	-24	0	56.2	-	-	74	-17.8	0	184	H
3	* 2.484	30.35	RMS	32.5	-24	2.05	40.9	54	-13.1	-	-	0	184	H
4	* 2.484	31.22	RMS	32.5	-24	2.05	41.77	54	-12.23	-	-	0	184	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL PEAK AND AVERAGE PLOT



VERTICAL DATA

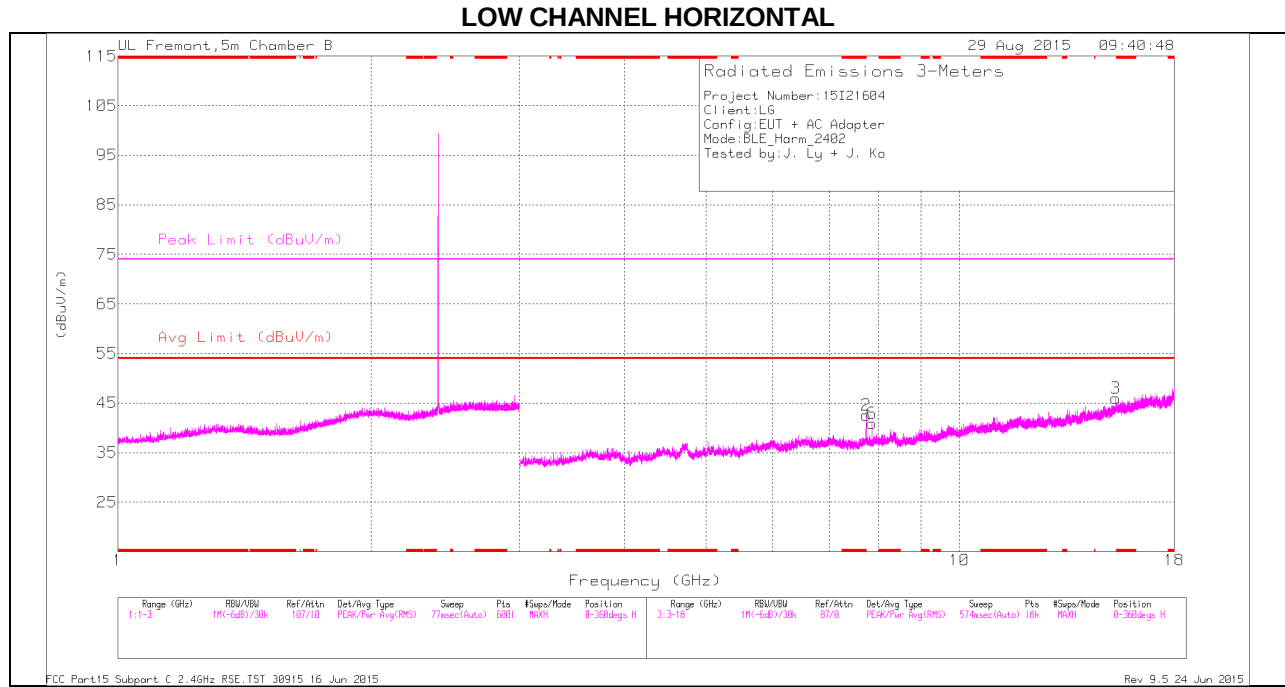
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Filt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	41.73	Pk	32.5	-24	0	50.23	-	-	74	-23.77	270	129	V
3	* 2.484	30.38	RMS	32.5	-24	2.05	40.93	54	-13.07	-	-	270	129	V
2	2.552	42.74	Pk	32.7	-23.9	0	51.54	-	-	74	-22.46	270	129	V
4	2.562	30.61	RMS	32.7	-23.9	2.05	41.46	-	-	-	-	270	129	V

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

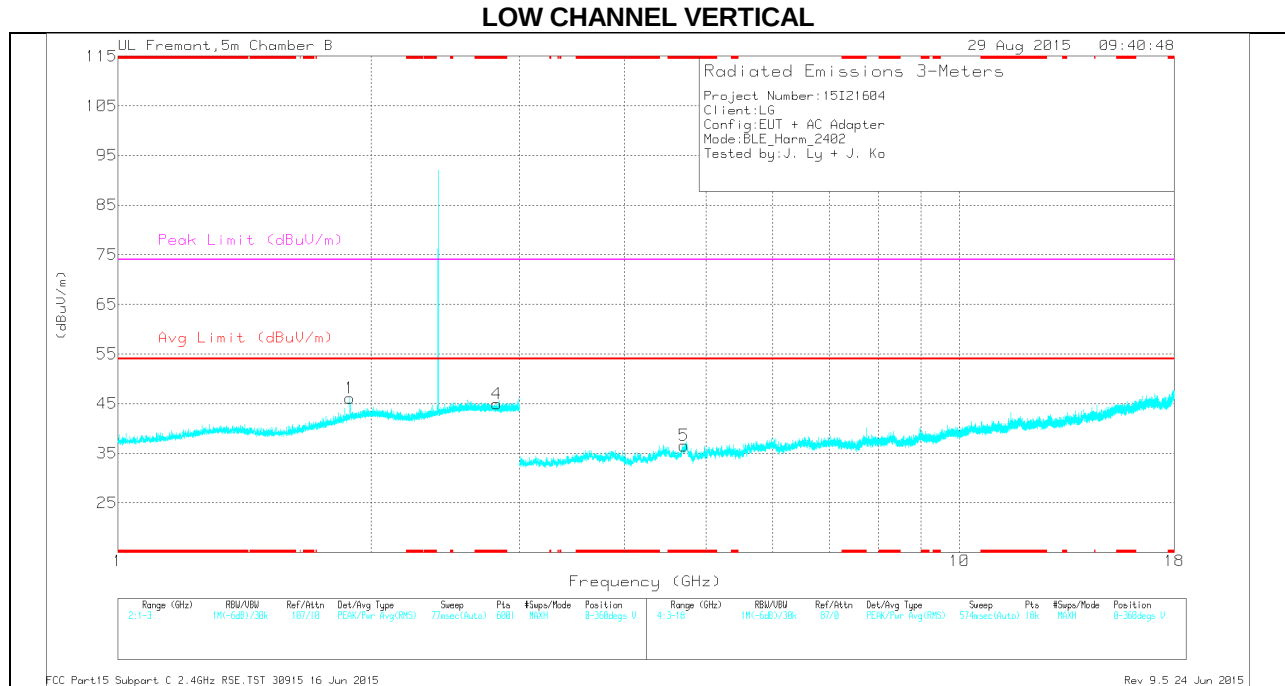
Pk - Peak detector

RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.



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 T345 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.82	36.03	Pk	32.6	-23.7	0	44.93	-	-	74	-29.07	0-360	199	V
5	* 4.707	33.63	Pk	34.2	-31.3	0	36.53	-	-	74	-37.47	0-360	101	V
1	1.887	39.04	Pk	31.7	-24.6	0	46.14	-	-	-	-	0-360	199	V
2	7.752	35.41	Pk	35.5	-28.3	0	42.61	-	-	-	-	0-360	101	H
6	7.868	34.47	Pk	35.6	-29.2	0	40.87	-	-	-	-	0-360	101	H
3	15.345	28.12	Pk	40.7	-22.8	0	46.02	-	-	-	-	0-360	200	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

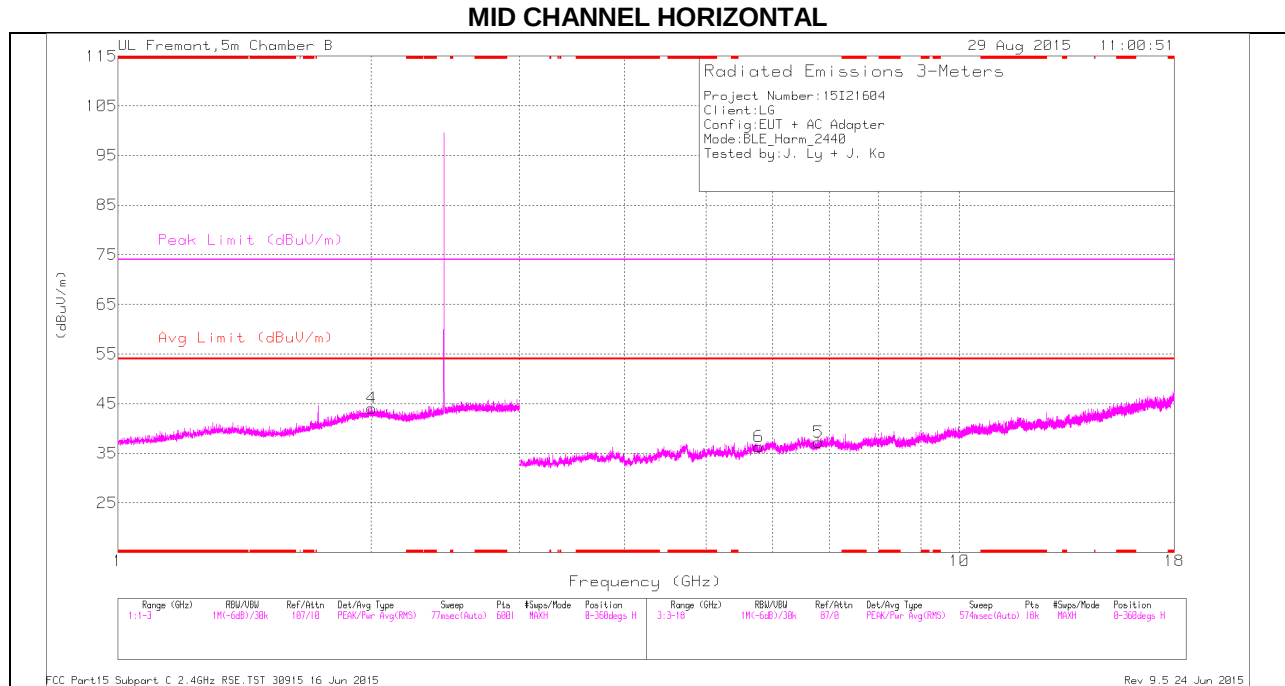
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 2.819	43.93	PK2	32.6	-23.7	0	52.83	-	-	74	-21.17	302	400	V
* 2.821	32.31	MAV1	32.6	-23.7	2.05	43.26	54	-10.74	-	-	302	400	V
* 4.707	41.81	PK2	34.2	-31.3	0	44.71	-	-	74	-29.29	302	400	V
* 4.709	30.74	MAV1	34.2	-31.2	2.05	35.79	54	-18.21	-	-	302	400	V
1.885	44.42	PK2	31.6	-24.6	0	51.42	-	-	-	-	302	400	V
1.885	31.95	MAV1	31.6	-24.6	2.05	41	54	-13	-	-	302	400	V
1.885	32.3	MAV1	31.6	-24.6	2.05	41.35	54	-12.65	-	-	302	400	V
7.751	39.77	PK2	35.5	-28.2	0	47.07	-	-	74	-26.93	302	400	H
7.751	39.4	PK2	35.5	-28.2	0	46.7	-	-	74	-27.3	302	400	H
7.754	28.01	MAV1	35.5	-28.3	2.05	37.26	54	-16.74	-	-	302	400	H
7.754	28.17	MAV1	35.5	-28.3	2.05	37.42	54	-36.58	-	-	302	400	H
7.867	40.12	PK2	35.6	-29.2	0	46.52	-	-	74	-27.48	302	400	H
7.87	28.35	MAV1	35.6	-29.2	2.05	36.8	54	-37.2	-	-	302	400	H
15.344	23.57	MAV1	40.7	-22.8	2.05	43.52	54	-10.48	-	-	302	400	H
15.347	34.8	PK2	40.7	-22.7	0	52.8	-	-	74	-21.2	302	400	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

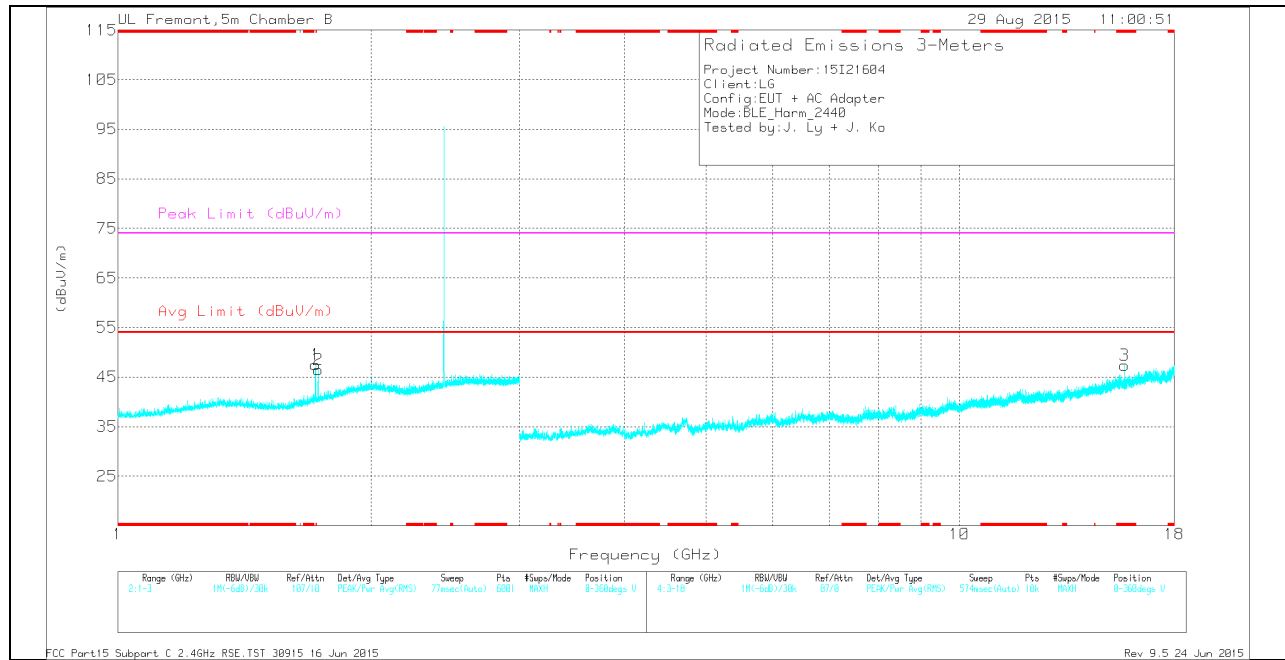
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average



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 T345 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 15.703	29.89	Pk	40.6	-23.1	0	47.39	-	-	74	-26.61	0-360	200	V
1	1.717	42.33	Pk	29.9	-24.7	0	47.53	-	-	-	-	0-360	101	V
2	1.729	41.33	Pk	30	-24.8	0	46.53	-	-	-	-	0-360	101	V
4	2.001	36.29	Pk	32.3	-24.5	0	44.09	-	-	-	-	0-360	101	H
6	5.779	33.24	Pk	35.1	-32	0	36.34	-	-	-	-	0-360	200	H
5	6.801	31.37	Pk	35.9	-30.1	0	37.17	-	-	-	-	0-360	200	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

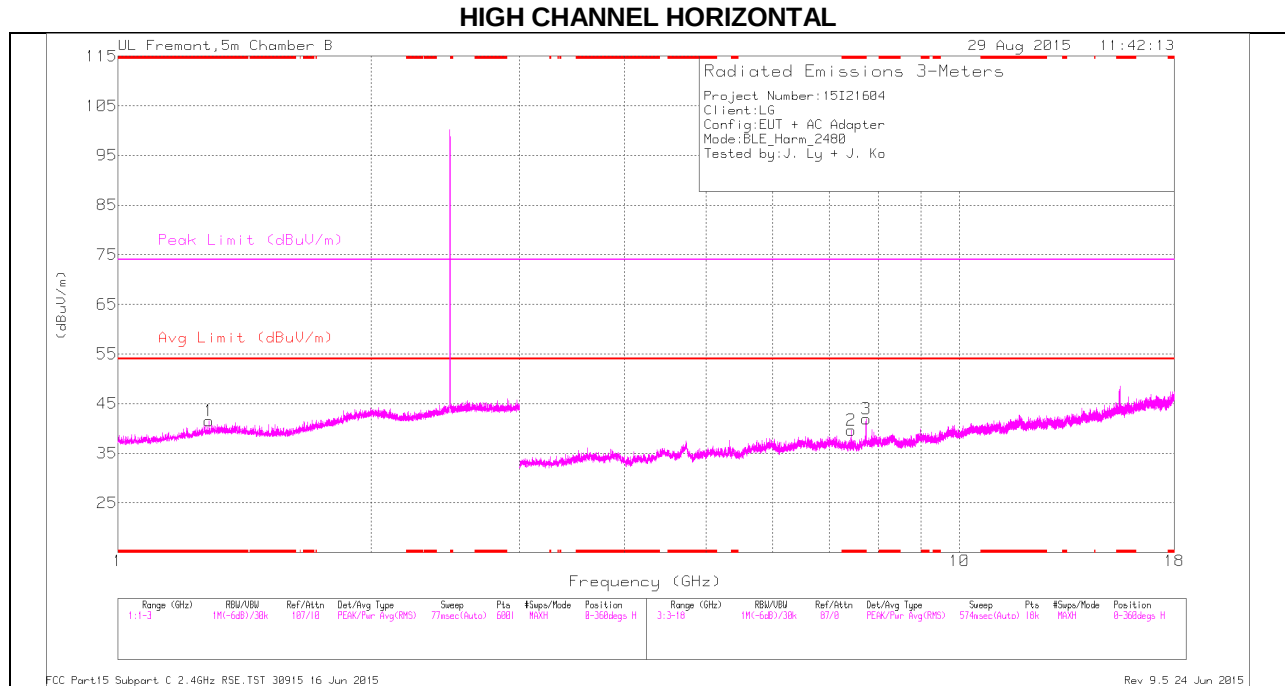
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 15.705	34.56	PK2	40.6	-23.1	0	52.06	-	-	74	-21.94	187	303	V
* 15.705	23.07	MAV1	40.6	-23.1	2.05	42.62	54	-11.38	-	-	187	303	V
1.717	44.54	PK2	29.9	-24.8	0	49.64	-	-	74	-24.36	121	170	V
1.718	32.06	MAV1	29.9	-24.8	2.05	39.21	54	-34.79	-	-	121	170	V
1.728	44.49	PK2	30	-24.8	0	49.69	-	-	74	-24.31	187	303	V
1.73	32.35	MAV1	30	-24.8	2.05	39.6	54	-14.4	-	-	187	303	V
2	32.34	MAV1	32.3	-24.5	2.05	42.19	54	-11.81	-	-	121	170	H
2.001	43.97	PK2	32.3	-24.5	0	51.77	-	-	74	-22.23	121	170	H
5.78	30.73	MAV1	35.1	-32	2.05	35.88	54	-18.12	-	-	187	303	H
5.781	42.85	PK2	35.1	-32	0	45.95	-	-	74	-28.05	187	303	H
6.8	28.49	MAV1	35.9	-30.1	2.05	36.34	54	-17.66	-	-	187	303	H
6.801	39.88	PK2	35.9	-30.1	0	45.68	-	-	74	-28.32	187	303	H

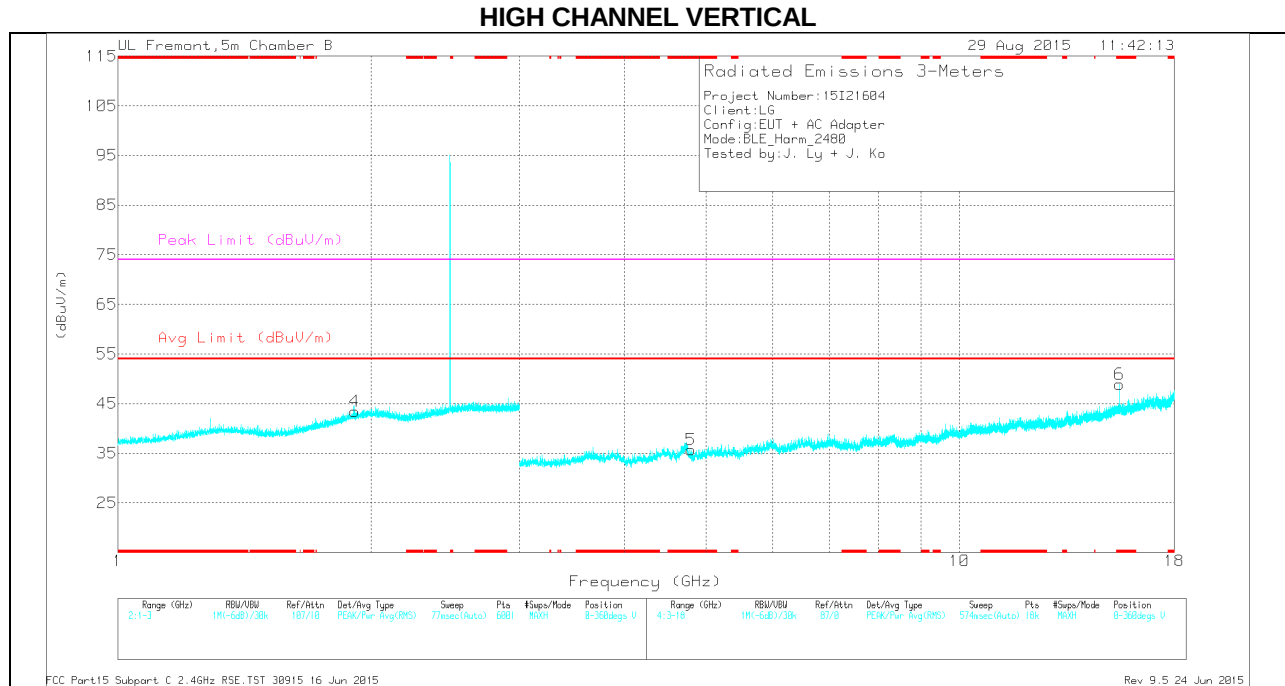
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.



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 T345 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.283	37.64	Pk	29.3	-25.4	0	41.54	-	-	74	-32.46	0-360	199	H
2	* 7.441	33.5	Pk	35.3	-29.2	0	39.6	-	-	74	-34.4	0-360	101	H
5	* 4.793	32.3	Pk	34.3	-30.9	0	35.7	-	-	74	-38.3	0-360	200	V
6	* 15.5	31.36	Pk	40.9	-23.4	0	48.86	-	-	74	-25.14	0-360	101	V
4	1.913	36.17	Pk	31.9	-24.6	0	43.47	-	-	-	-	0-360	199	V
3	7.752	34.76	Pk	35.5	-28.3	0	41.96	-	-	-	-	0-360	199	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.284	44.08	PK2	29.3	-25.4	0	47.98	-	-	74	-26.02	1	101	H
* 1.283	32.74	MAV1	29.3	-25.4	2.05	38.69	54	-15.31	-	-	1	101	H
* 7.441	42.41	PK2	35.3	-29.2	0	48.51	-	-	74	-25.49	312	131	H
* 7.439	31.17	MAV1	35.3	-29.2	2.05	39.32	54	-14.68	-	-	312	131	H
* 4.793	40.73	PK2	34.3	-30.9	0	44.13	-	-	74	-29.87	312	131	V
* 4.795	29.64	MAV1	34.3	-30.9	2.05	35.09	54	-18.91	-	-	312	131	V
* 15.501	35.5	PK2	40.9	-23.4	0	53	-	-	74	-21	312	131	V
* 15.499	23.76	MAV1	40.9	-23.4	2.05	43.31	54	-10.69	-	-	312	131	V
1.913	43.69	PK2	31.9	-24.6	0	50.99	-	-	74	-23.01	1	101	V
1.914	32.1	MAV1	31.9	-24.6	2.05	41.45	54	-12.55	-	-	1	101	V
7.752	28.09	MAV1	35.5	-28.3	2.05	37.34	54	-16.66	-	-	312	131	H
7.753	38.96	PK2	35.5	-28.3	0	46.16	-	-	74	-27.84	312	131	H

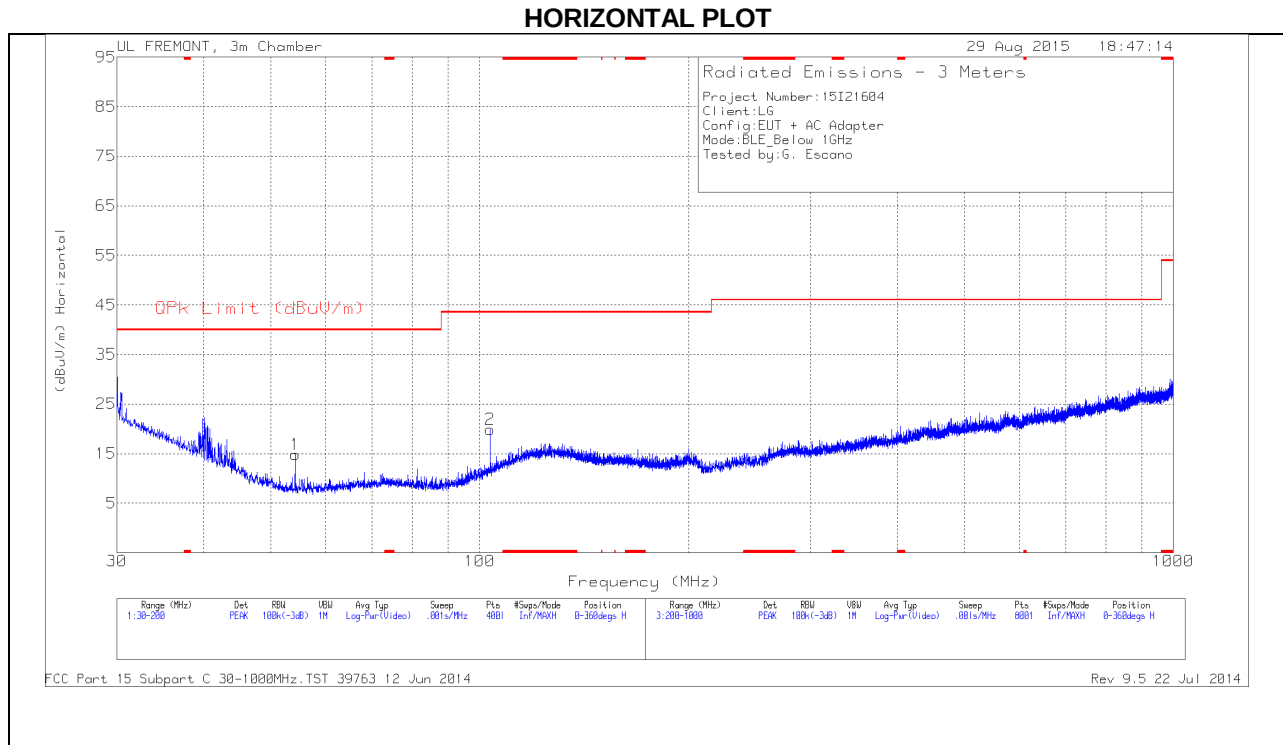
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

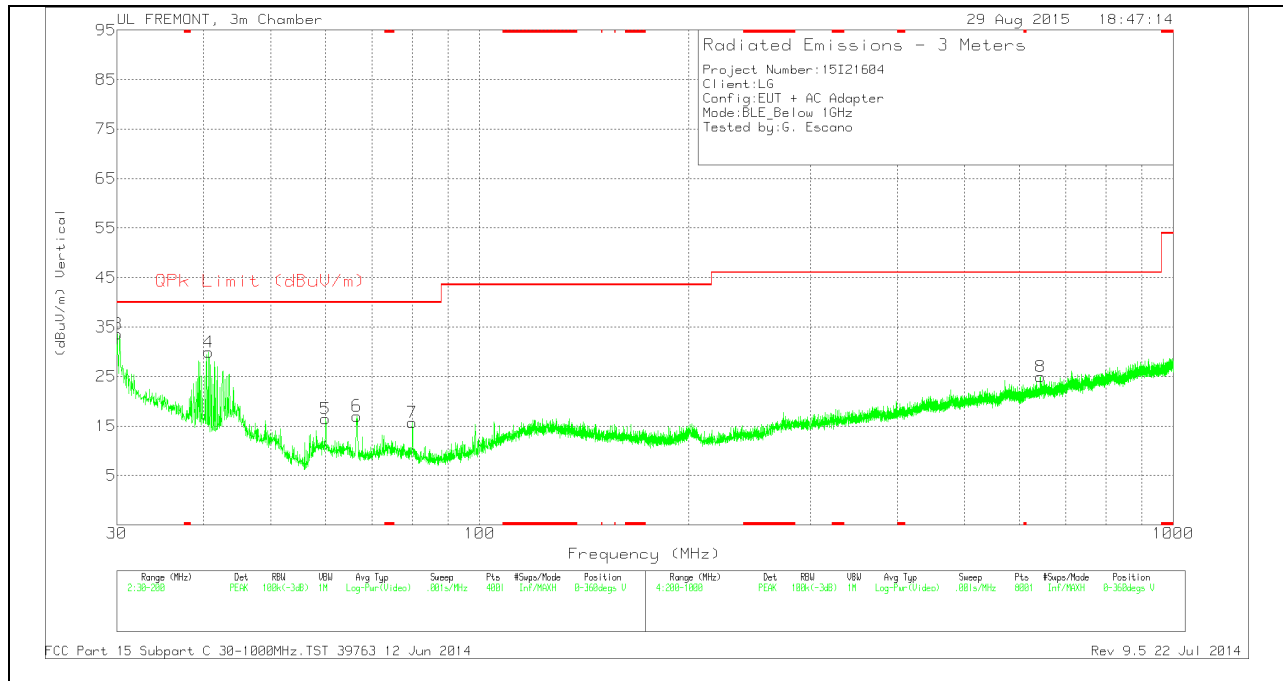
MAV1 - KDB558074 Option 1 Maximum RMS Average

9.3. WORST-CASE BELOW 1 GHz

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



VERTICAL PLOT



BELOW 1 GHz TABLE

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	30.0425	39.06	PK	21.8	-27.3	33.56	40	-6.44	0-360	100	V
4	40.71	43.16	PK	13.7	-27	29.86	40	-10.14	0-360	100	V
1	54.225	34.5	PK	7.2	-26.9	14.8	40	-25.2	0-360	400	H
5	60.005	35.99	PK	7.3	-26.8	16.49	40	-23.51	0-360	100	V
6	66.5925	35.63	PK	8.1	-26.7	17.03	40	-22.97	0-360	100	V
7	79.98	34.35	PK	8	-26.6	15.75	40	-24.25	0-360	100	V
2	103.5675	35.54	PK	10.6	-26.3	19.84	43.52	-23.68	0-360	100	H
8	643.8	29.94	PK	19.5	-24.5	24.94	46.02	-21.08	0-360	300	V

PK - 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.

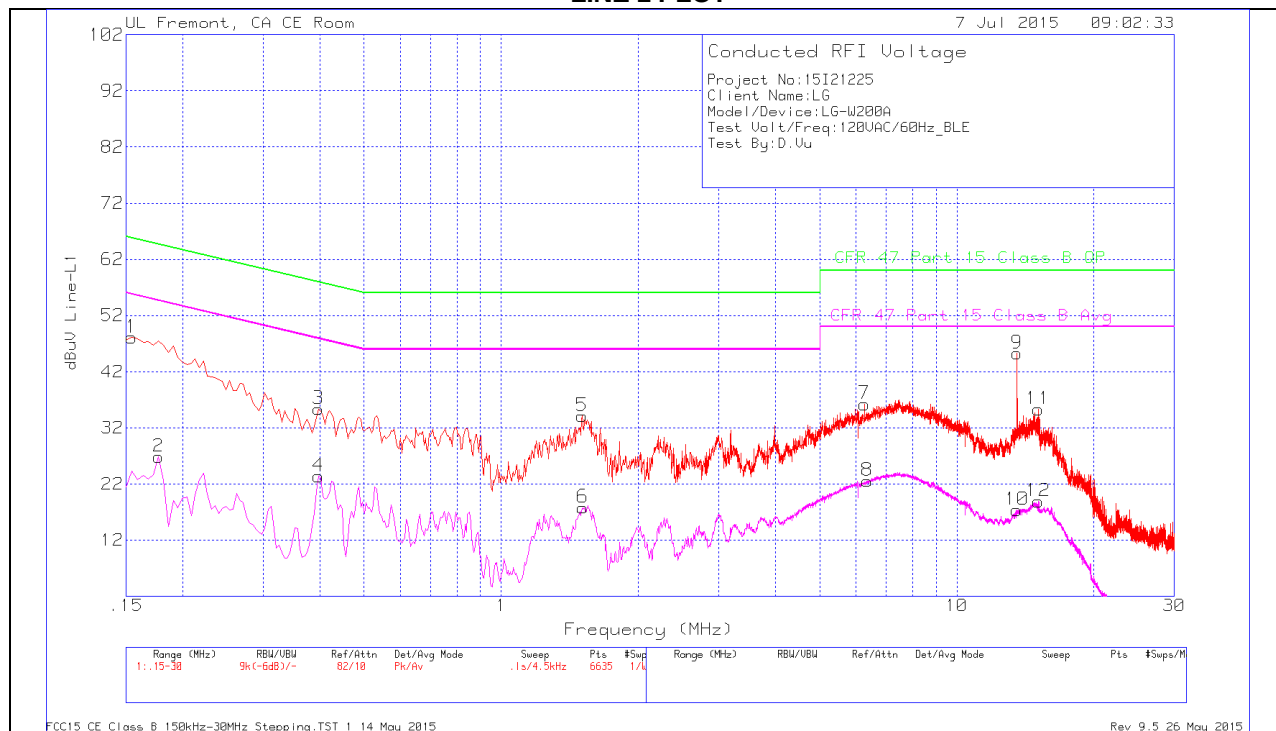
TEST PROCEDURE

ANSI C63.10

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

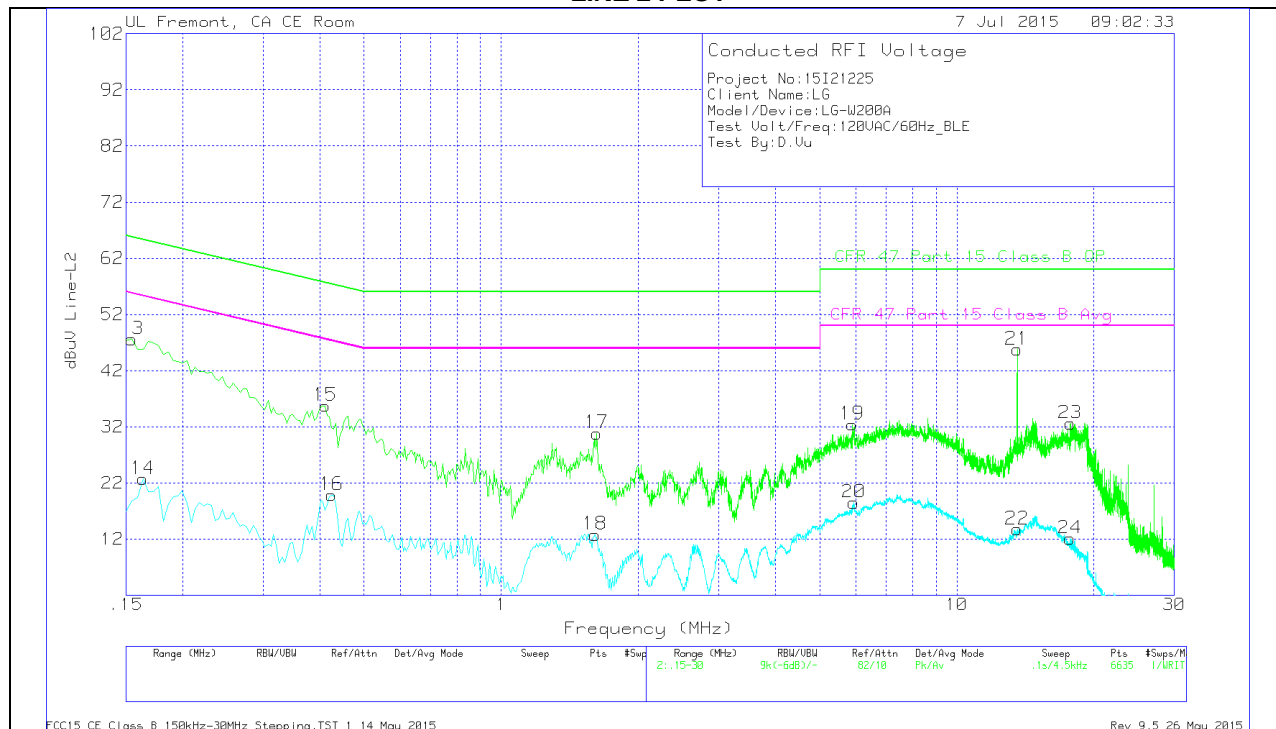
Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
1	.1545	46.78	Pk	1.3	0	48.08	65.75	-17.67		
2	.177	25.76	Av	1.1	0	26.86	-	-	54.63	-27.77
3	.3975	34.97	Pk	.4	0	35.37	57.91	-22.54		
4	.3975	22.99	Av	.4	0	23.39	-	-	47.91	-24.52
5	1.5045	33.8	Pk	.2	.1	34.1	56	-21.9		
6	1.509	17.51	Av	.2	.1	17.81	-	-	46	-28.19
7	6.2655	35.94	Pk	.2	.1	36.24	60	-23.76		
8	6.36	22.25	Av	.2	.1	22.55	-	-	50	-27.45
9	13.56	44.86	Pk	.2	.2	45.26	60	-14.74		
10	13.551	16.97	Av	.2	.2	17.37	-	-	50	-32.63
11	15.0945	34.81	Pk	.3	.2	35.31	60	-24.69		
12	15.1035	18.41	Av	.3	.2	18.91	-	-	50	-31.09

Pk - Peak detector

Av - Average detection

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	CFR 47 Part 15 Class B QP	Margin (dB)	CFR 47 Part 15 Class B Avg	Margin (dB)
13	.1545	46.19	Pk	1.4	0	47.59	65.75	-18.16		
14	.1635	21.42	Av	1.3	0	22.72	-	-	55.28	-32.56
15	.411	35.36	Pk	.4	0	35.76	57.63	-21.87		
16	.4245	19.47	Av	.4	0	19.87	-	-	47.36	-27.49
17	1.6215	30.56	Pk	.2	.1	30.86	56	-25.14		
18	1.608	12.5	Av	.2	.1	12.8	-	-	46	-33.2
19	5.8965	32.12	Pk	.2	.1	32.42	60	-27.58		
20	5.9415	18.24	Av	.2	.1	18.54	-	-	50	-31.46
21	13.569	45.36	Pk	.2	.2	45.76	60	-14.24		
22	13.569	13.35	Av	.2	.2	13.75	-	-	50	-36.25
23	17.7495	32.1	Pk	.3	.2	32.6	60	-27.4		
24	17.727	11.6	Av	.3	.2	12.1	-	-	50	-37.9

Pk - Peak detector

Av - Average detection