CERTIFICATION TEST REPORT

Report Number. : 11626381H-E3V2

Applicant	:	SONY MOBILE COMMUNICATIONS, INC. 4-12-3 HIGASHI-SHINAGAWA, SHINAGAWA -KU, TOKYO, 140-0002, JAPAN
FCC ID	:	PY7-54254H
EUT Description	:	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, GPS & NFC
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C

Date Of Issue:

April 07, 2017

Prepared by:

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	3/28/17	Initial Issue	C. Vergonio
V2	4/7/17	Updated Page 17, 26 & 30 to the correct Clause of RSS-247.	C. Vergonio

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SONY MOBILE COMMUNICATIONS, INC. 4-12-3 HIGASHI-SHINAGAWA, SHINAGAWA -KU, TOKYO, 140-0002, JAPAN
EUT DESCRIPTION:	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, GPS & NFC
SERIAL NUMBER:	RADIATED: CB512DQZV2, CB512DQZU5 CONDUCTED: CB512DHRTV, CB512DHRVC
DATE TESTED:	MARCH 14 to 28, 2017

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:

CHARLES VERGONIO
WiSE PROJECT LEAD
UL VERIFICATION SERVICES INC.

Prepared By:

JASON QIAN
WiSE LAB ENGINEER
UL VERIFICATION SERVICES INC.

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 v03r05 and ANSI C63.10-2013.

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)

The above test sites and facilities are covered under FCC Test Firm Registration # 208313.

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
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 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 Phone with BT, DTS/UNII a/b/g/n/ac, GPS & NFC.

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 (1Mbps)	7.08	5.11
2402 - 2480	BLE (2Mbps)	7.08	5.11

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two integrated antennas, with the following maximum gains:

Frequency Band (GHz)	Antenna Gain (dBi)
2402-2480	-5.20

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was SONY, s_atp_1_00067_A_9_4.
The test utility software used during testing was Tera Term Ver 4.79.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated band edge, harmonics, and spurious emissions from 1 GHz to 18GHz were performed with the EUT was set to transmit at the Low/Middle/High channels.

Radiated emission below 30MHz, below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT was 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, and it was determined that Z-Axis orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z-Axis orientation.

Worst-case data rates were 1Mbps

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Lenovo	20B7S0A200	PC015REW	NA
AC Adapter	SONY	1300-7137.1	4016W40310044	NA
Headphones	SONY	N/A	N/A	N/A

I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	Antenna	1	RF	Shielded	0.2	To spectrum Analyzer
2	USB	1	USB	Shielded	1	N/A
3	DC	1	DC	Shielded	0.3	N/A

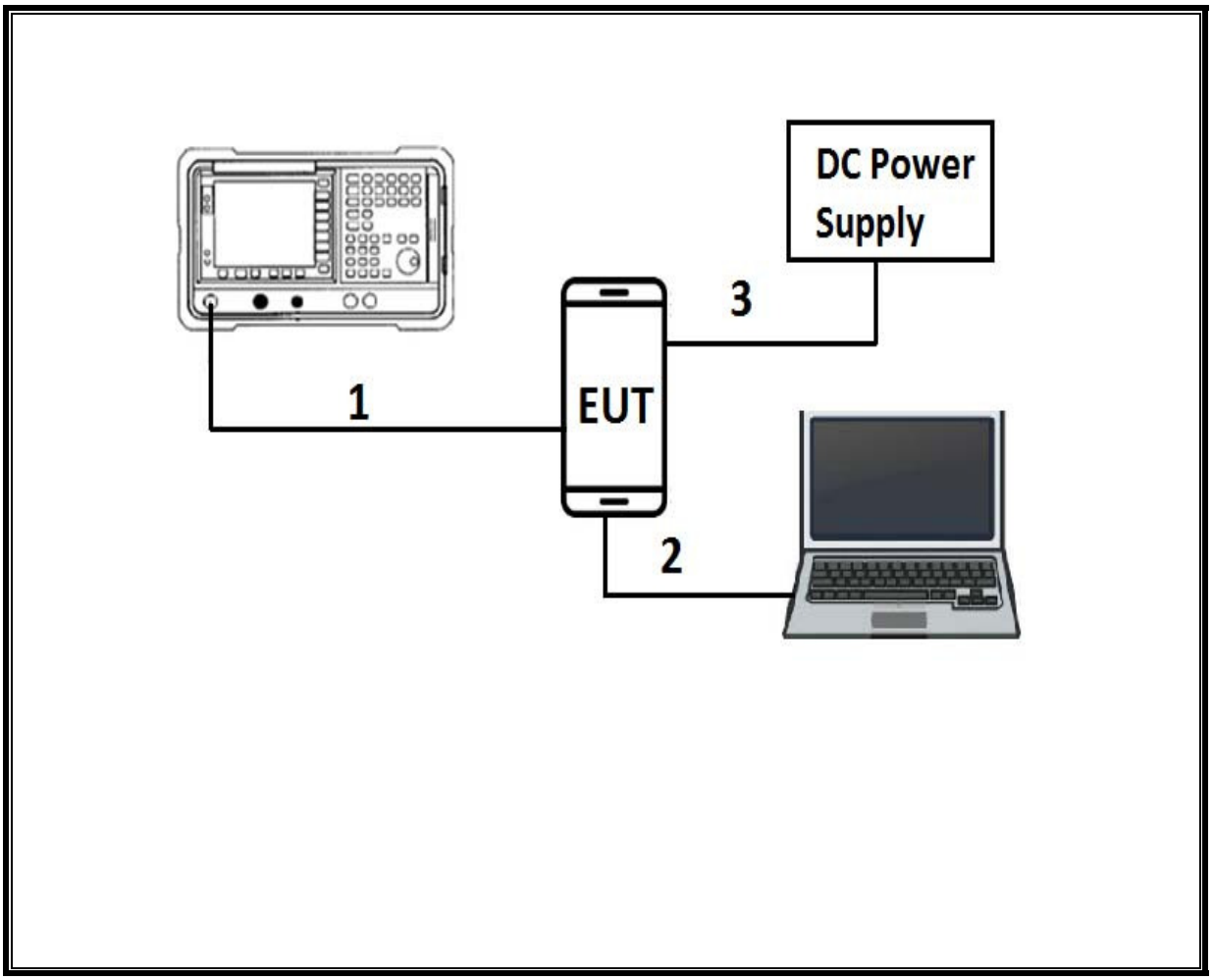
I/O CABLES (RADIATED AND CONDUCTED EMISSIONS)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Shielded	3	N/A
2	Audio	1	3.5mm	Shielded	1	N/A

TEST SETUP

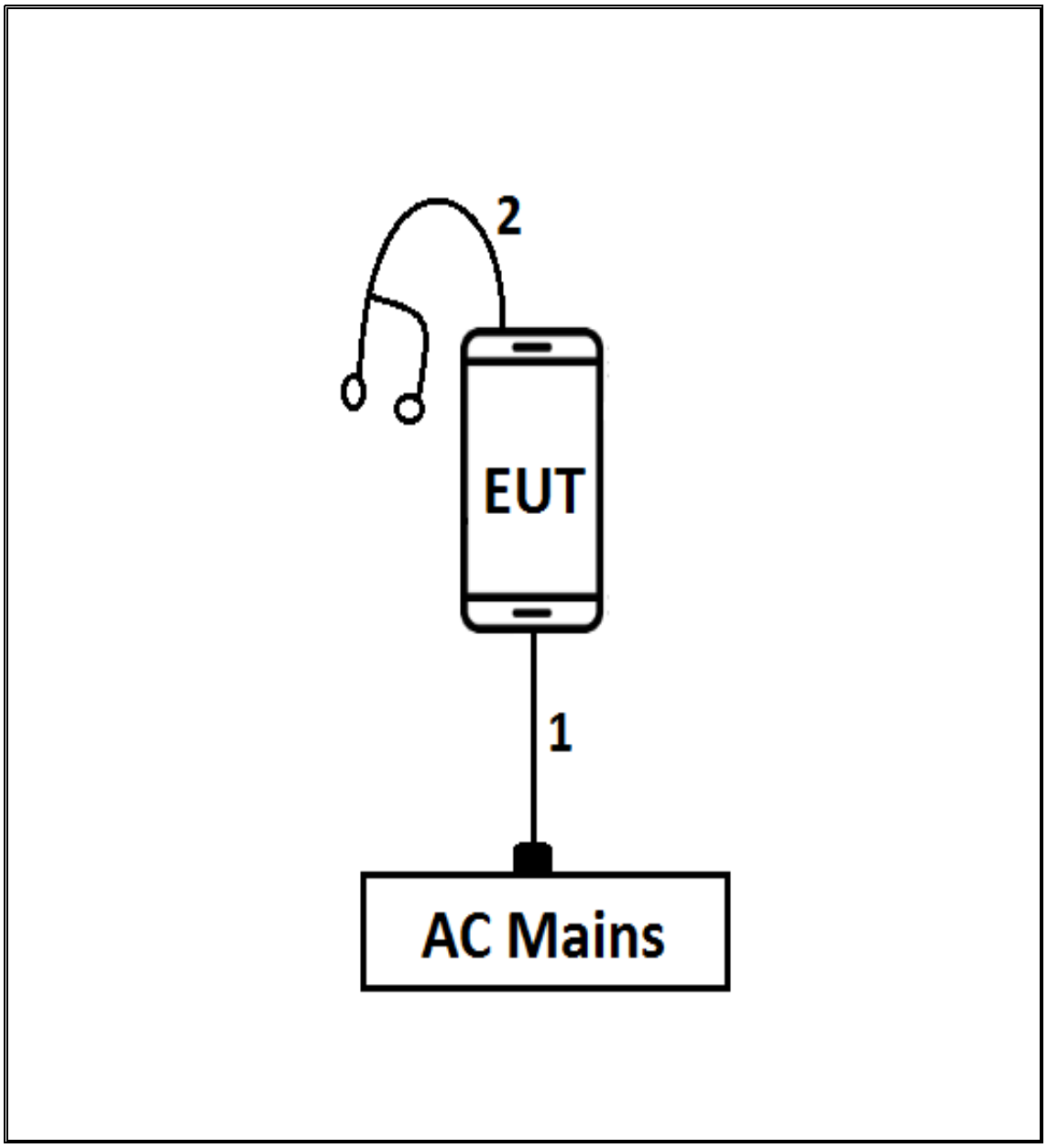
CONDUCTED TEST SETUP DIAGRAM

The EUT was tested connected to a host Laptop via USB cable adapter and spectrum analyzer to antenna port. Test software exercised the EUT.



TEST SETUP

RADIATED AND AC LINE CONDUCTED EMISSIONS SETUP DIAGRAM



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, Broadband Hybrid, 30MHz to 2000MHz w/4dB Pad	Sunol Sciences Corp.	JB3	T477	06/22/2017
Antenna, Active Loop 9kHz-30MHz	ETS-Lindgren	6502	T1683	02/17/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T345	03/07/2018
Antenna, Horn 18-26.5GHz	ARA	MWH-1826/B	T449	05/26/2017
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1264	07/08/2017
Power Sensor, P – series, 50MHz to 18GHz, Wideband	Agilent (Keysight) Technologies	N1921A	T413	06/20/2017
Amplifier, 1-26.5GHz	Agilent (Keysight) Technologies	8449B	T404	07/05/2017
Amplifier, 10kHz-1GHz	Agilent (Keysight) Technologies	8447D	T15	08/26/2017
RF Amplifier	MITEQ	AFS42-00101800-25-S-42	T493	02/15/2018
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Agilent (Keysight) Technologies	E4440A	T199	07/22/2017
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T907	01/23/2018
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Agilent (Keysight) Technologies	E9030A	T905	01/11/2018
LISN	FISCHER	FCC-LISN-50/250-25-2-01	T1310	06/08/2017

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	Ver 9.5, Apr 26, 2016
Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015
Antenna Port Software	UL	UL RF	Ver 5.1.1, July 15, 2016

7. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result
15.247 (a)(2)	RSS-247 5.2.1	Occupied Band width (6dB)	>500KHz	Conducted	Pass
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass
15.247	RSS-247 5.4.4	TX conducted output power	<30dBm		Pass
15.247	RSS-247 5.2.2	PSD	<8dBm		Pass
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass
15.205, 15.209, 15.247(d)	RSS-GEN 8.9/7	Radiated Spurious Emission	< 54dBuV/m		Pass

8. ANTENNA PORT TEST RESULTS

8.1. MEASUREMENT METHODS

6 dB BW: KDB 558074 D01 v03r05, Section 8.1.

Output Power: KDB 558074 D01 v03r05, Section 9.1.1.

Power Spectral Density: KDB 558074 D01 v03r05, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r05, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r05, Section 12.1.

Band-edge: KDB 558074 D01 v03r05, Section 12.1.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

8.2. ON TIME, DUTY CYCLE

LIMITS

None; for reporting purposes only.

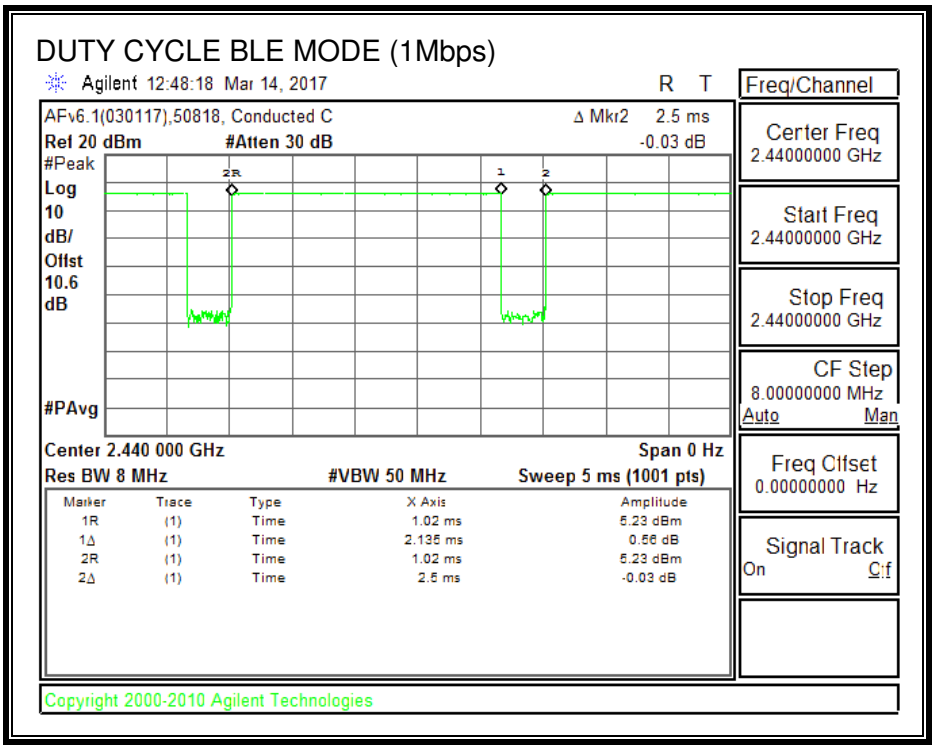
PROCEDURE

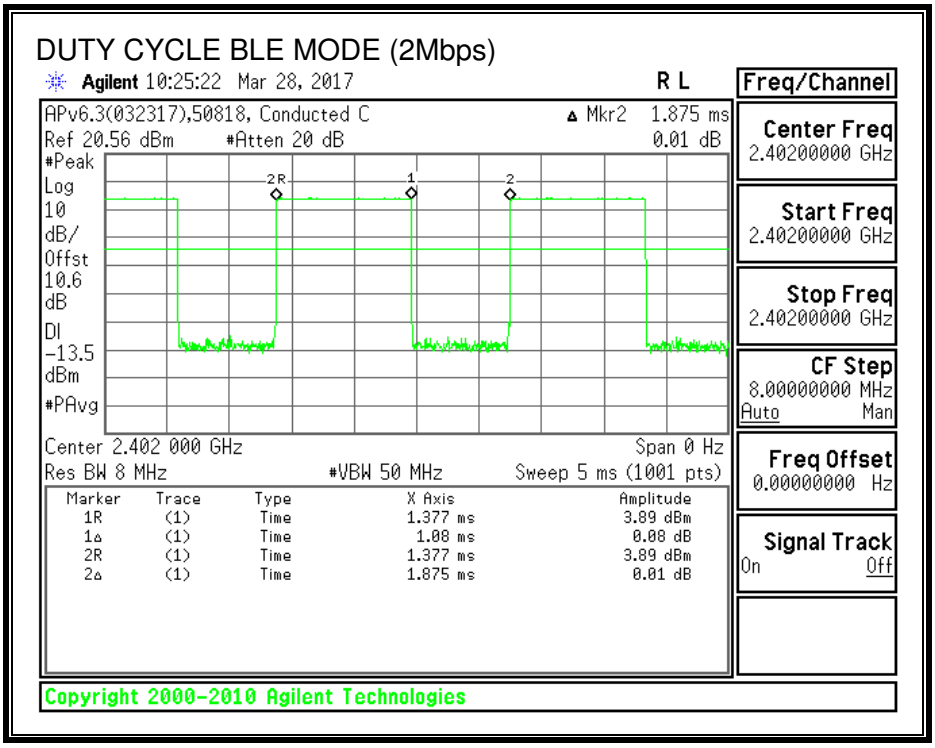
KDB 558074 Zero-Span Spectrum Analyzer Method.

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/T Minimum VBW (kHz)
BLE (1Mbps)	2.135	2.5	0.853	85.399	0.685	0.468
BLE (2Mbps)	1.08	1.875	0.576	57.6	2.4	0.926

DUTY CYCLE PLOT





8.3.1. 6 dB BANDWIDTH

LIMITS

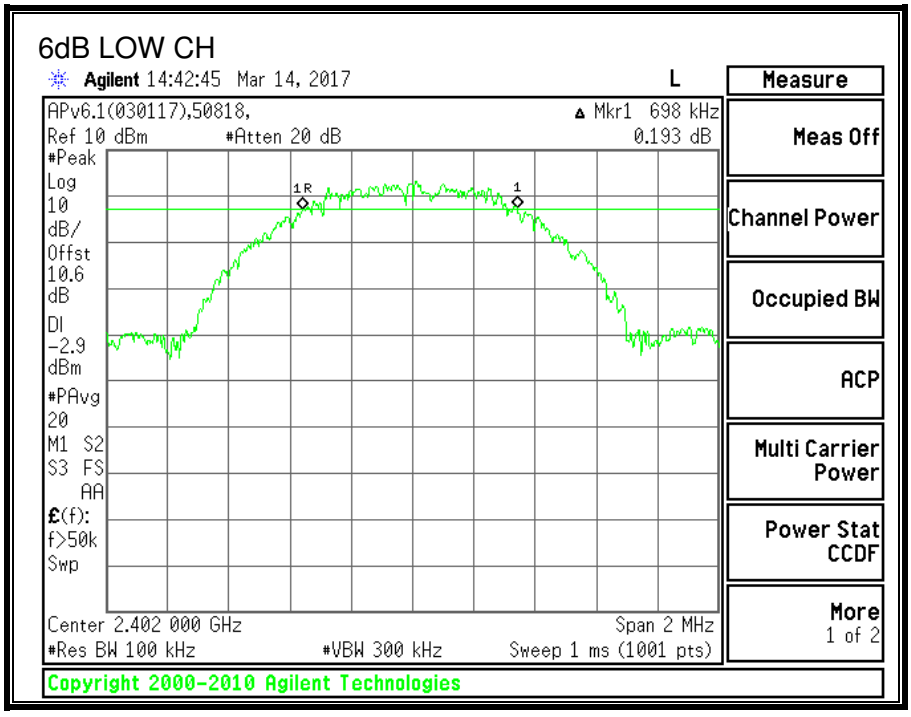
FCC §15.247 (a) (2)
IC RSS-247 (5.2) (1)

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

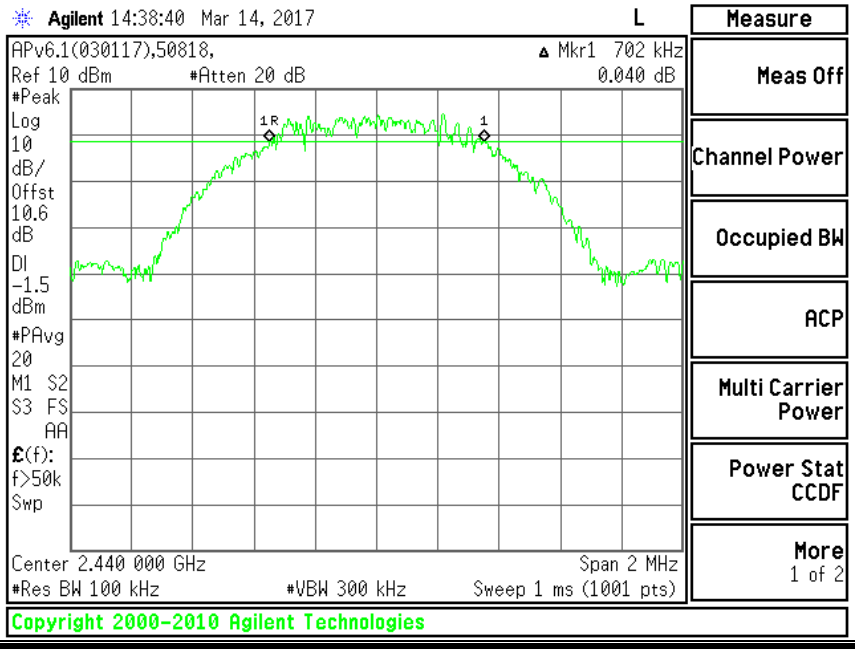
RESULTS

6 dB BANDWIDTH (1Mbps)

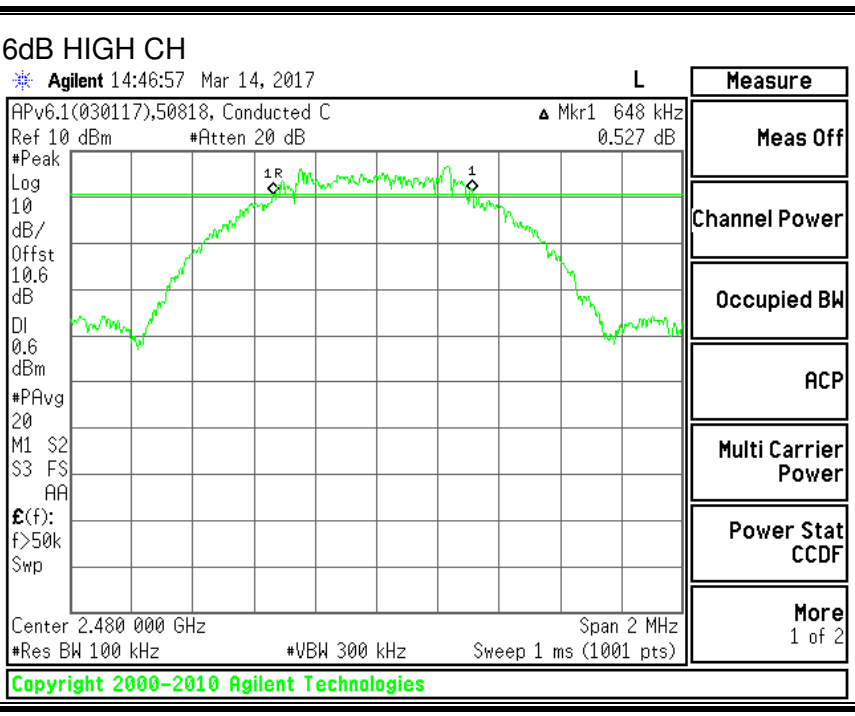
Channel	Frequency	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.698	0.5
Middle	2440	0.702	0.5
High	2480	0.648	0.5



6dB MID CH

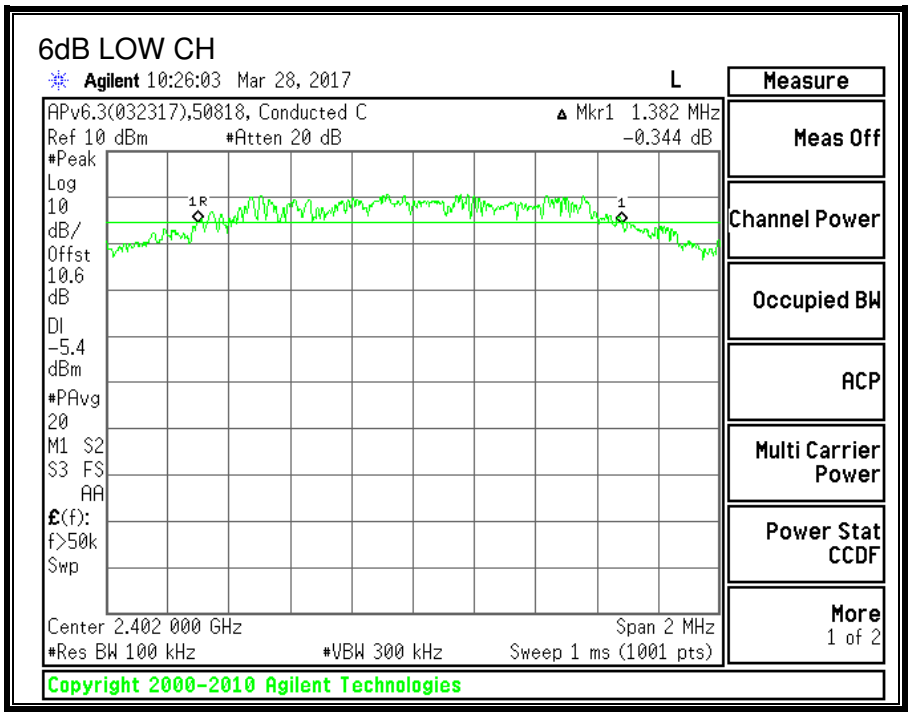


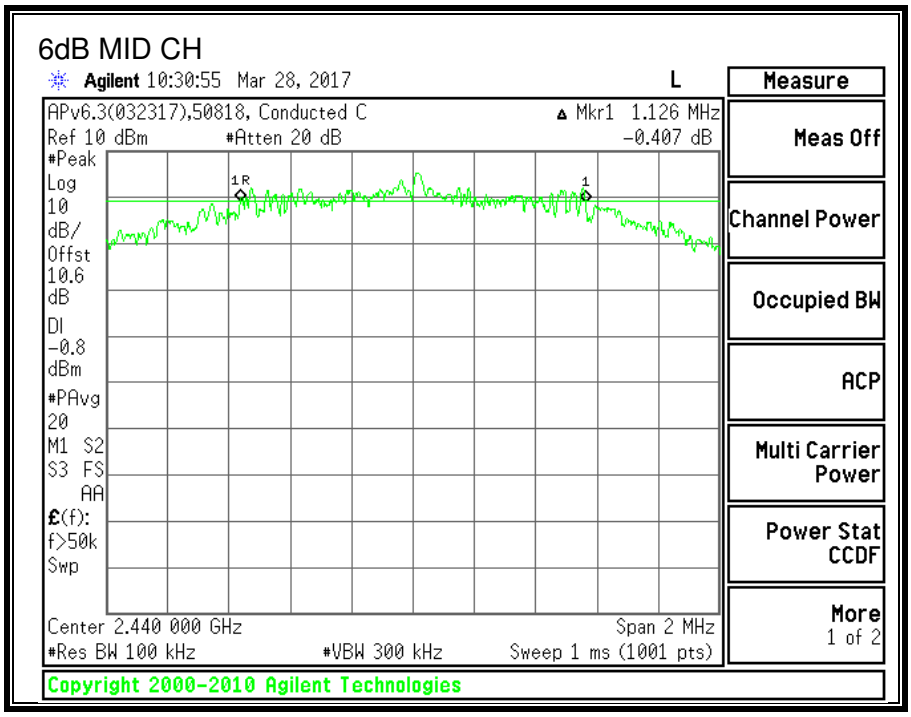
6dB HIGH CH

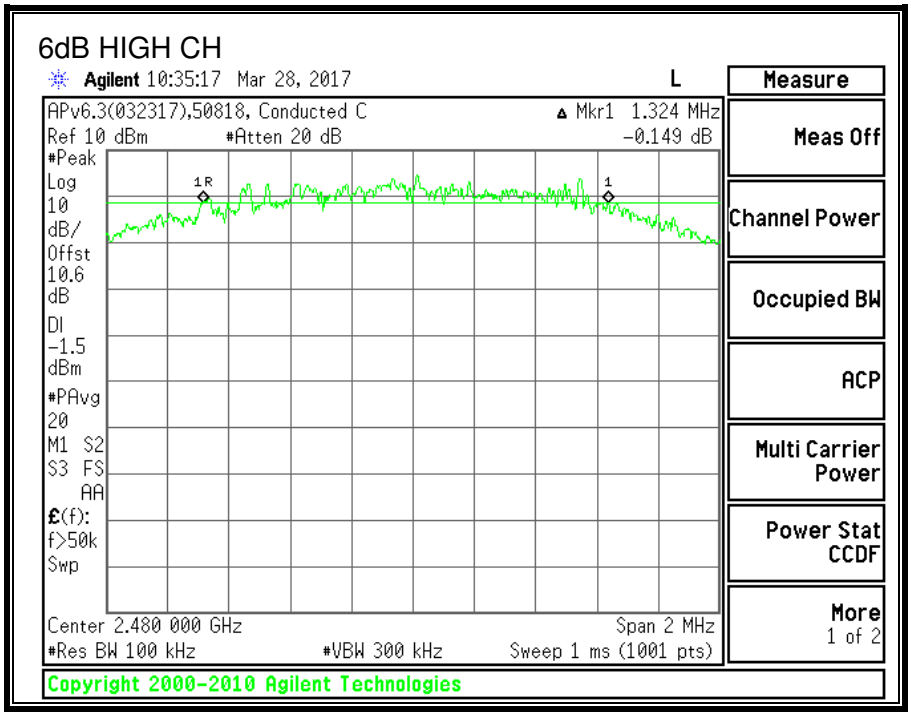


6 dB BANDWIDTH (2Mbps)

Channel	Frequency	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	1.382	0.5
Middle	2440	1.126	0.5
High	2480	1.324	0.5







8.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

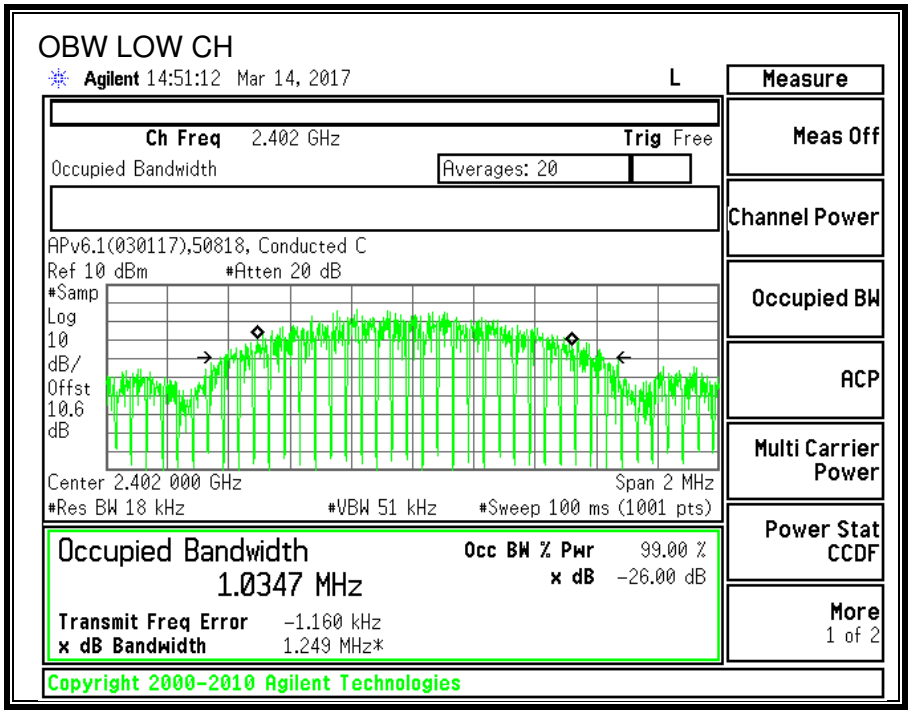
Test Procedure

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.

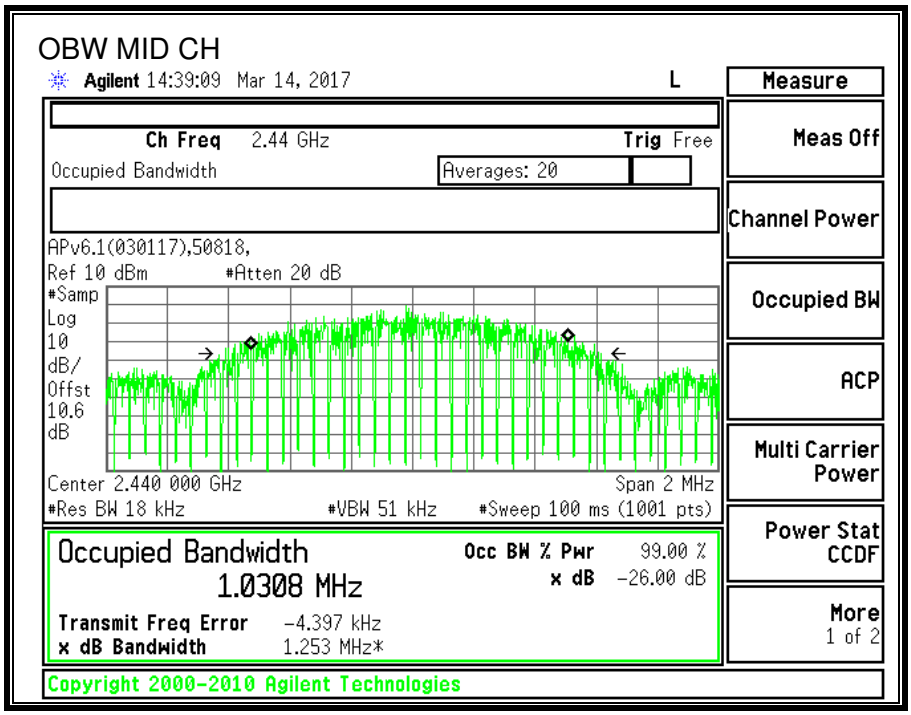
RESULTS

99% BANDWIDTH (1Mbps)

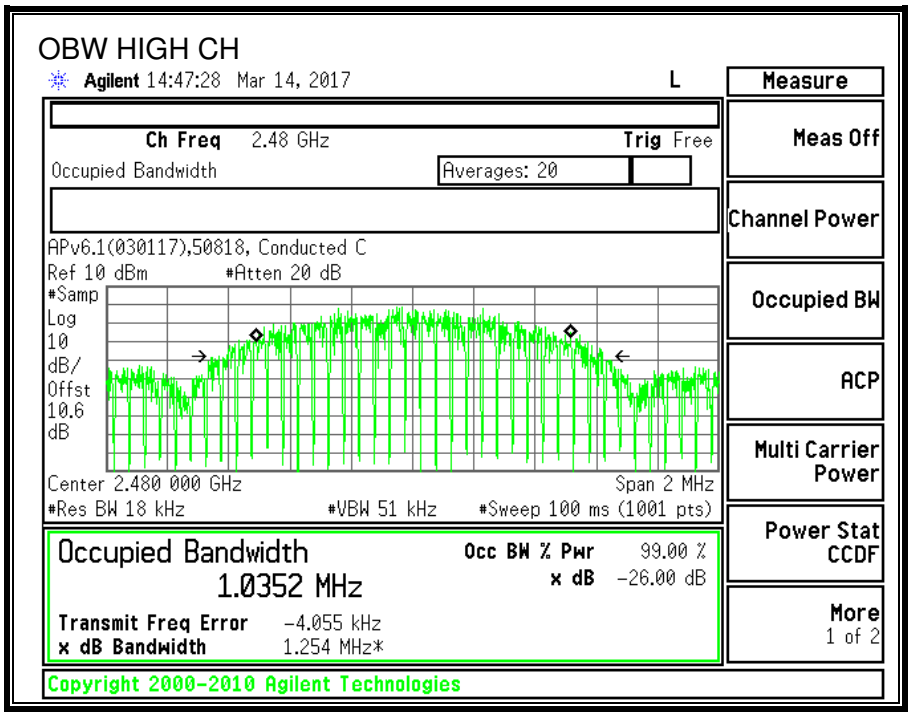
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0347
Middle	2440	1.0308
High	2480	1.0352



OBW MID CH

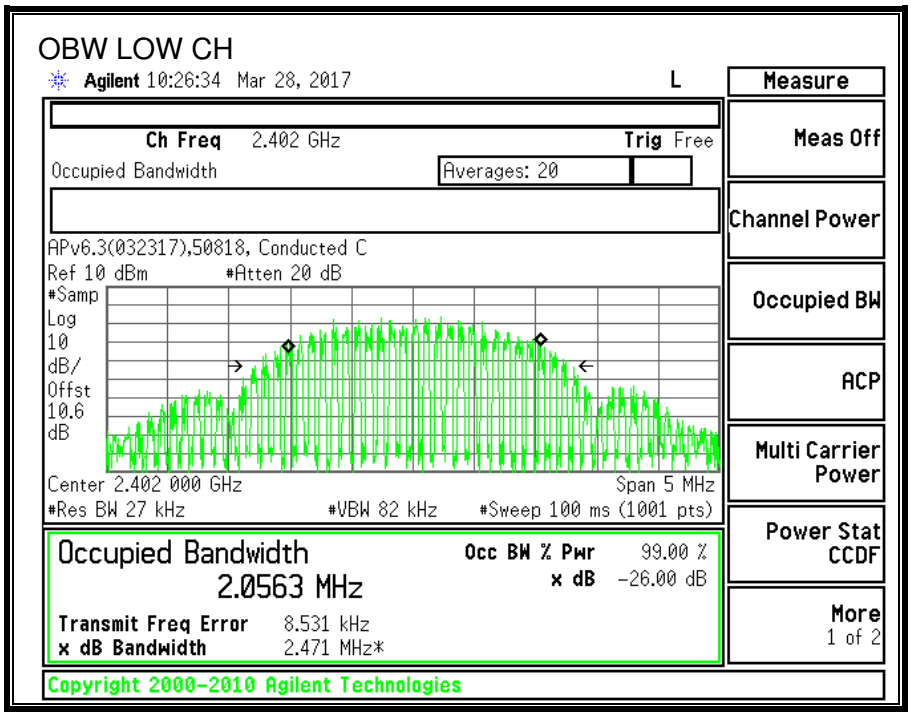


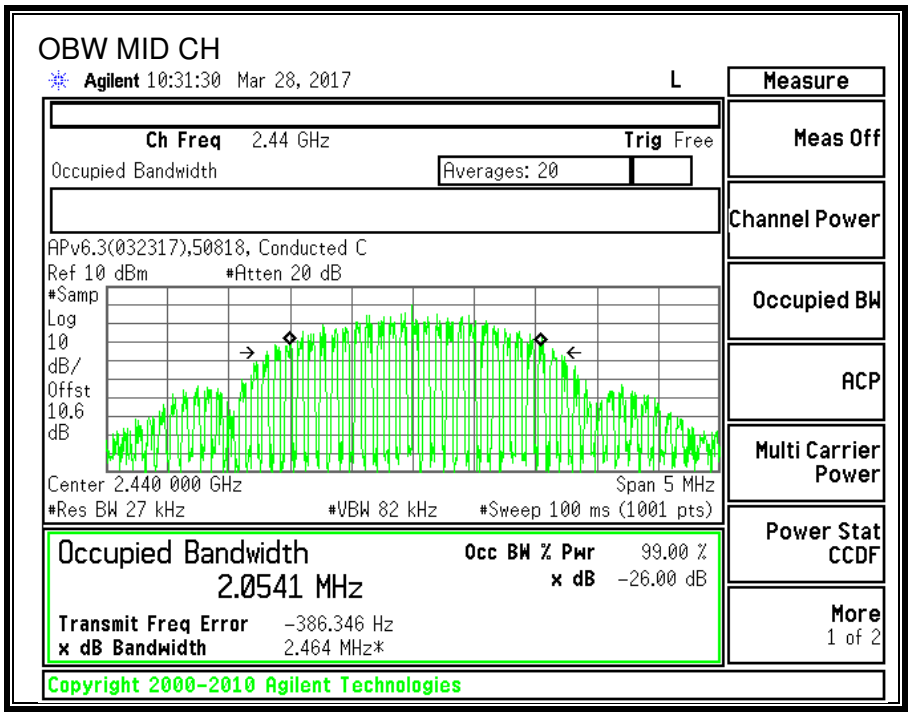
OBW HIGH CH

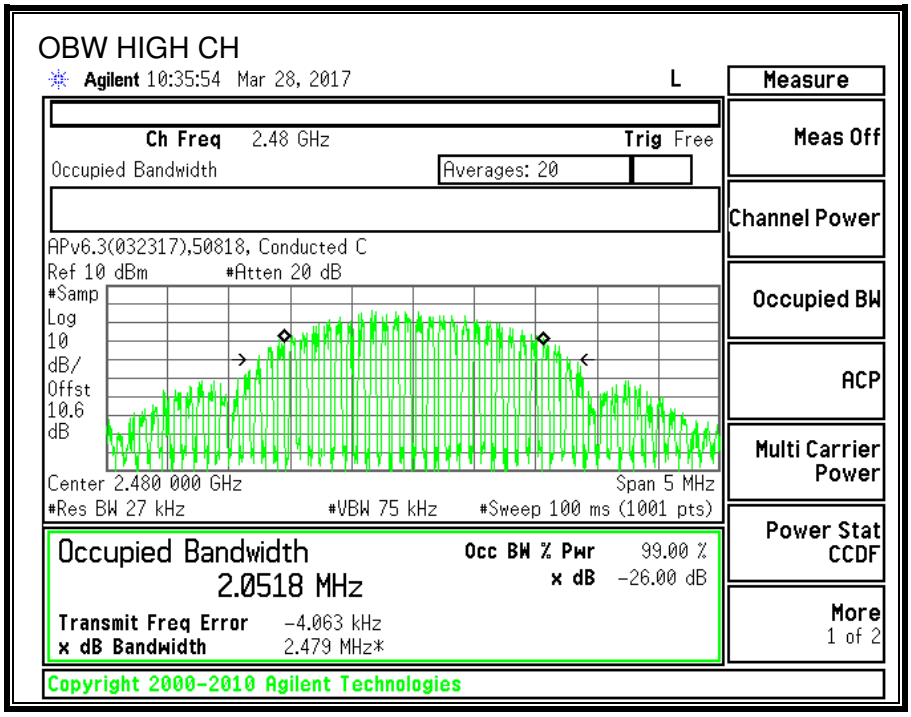


99% BANDWIDTH (2Mbps)

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	2.0563
Middle	2440	2.0541
High	2480	2.0518







8.3.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

The cable assembly insertion loss of 10.6 dB (including 10 dB pad and 0.6 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

TEST ENGINEER:	50818	**Date:**	3/14/2017

1Mbps

Channel	Frequency (MHz)	AV Power (dBm)
Low	2402	3.91
Middle	2440	5.53
High	2480	6.67

2Mbps

Channel	Frequency (MHz)	AV Power (dBm)
Low	2402	3.87
Middle	2440	5.52
High	2480	6.66

8.3.4. OUTPUT POWER

LIMITS

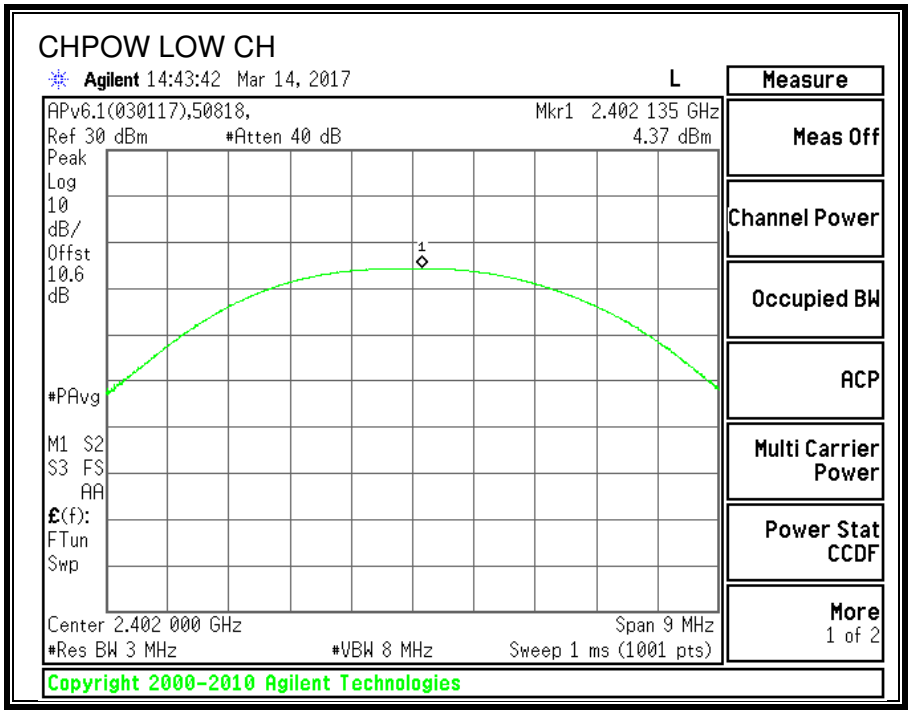
FCC §15.247 (b)
IC RSS-247 (5.4) (4)

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

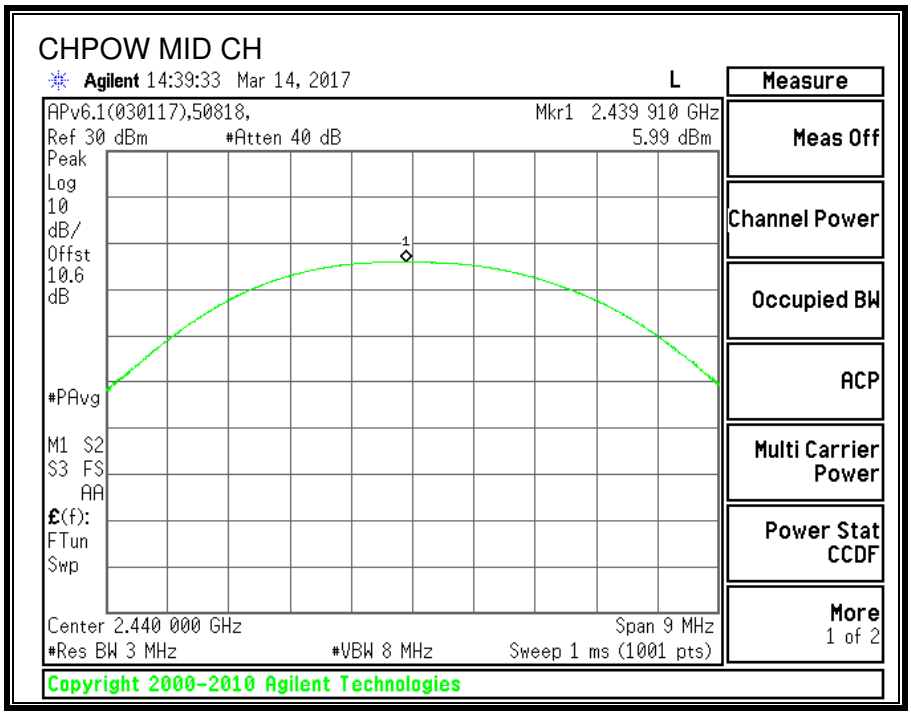
RESULTS

OUTPUT POWER (1Mbps)

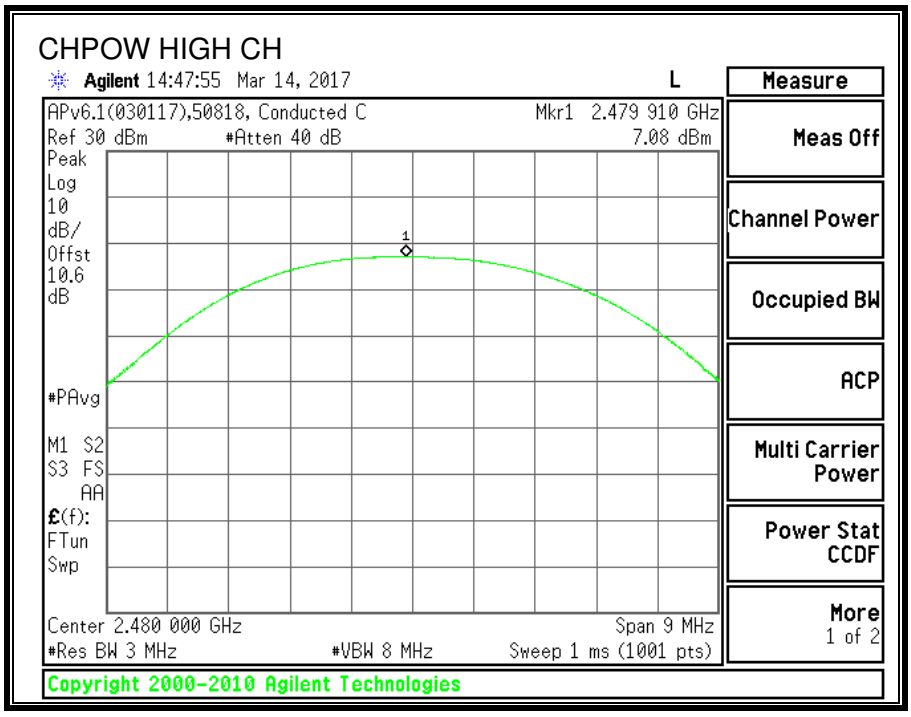
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	4.37	30	-25.63
Middle	2440	5.99	30	-24.01
High	2480	7.08	30	-22.92



CHPOW MID CH

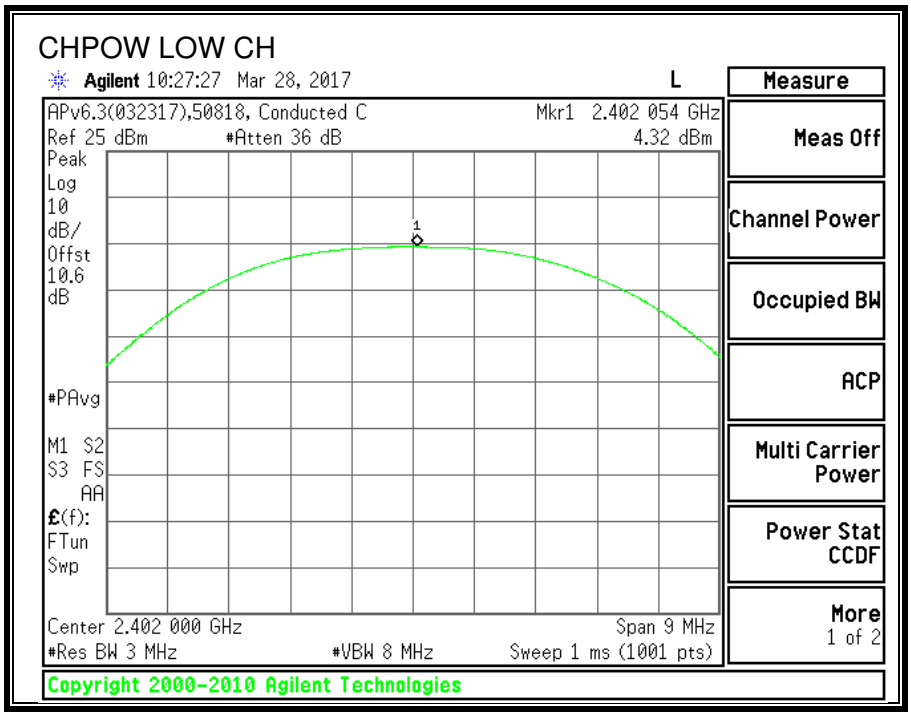


CHPOW HIGH CH

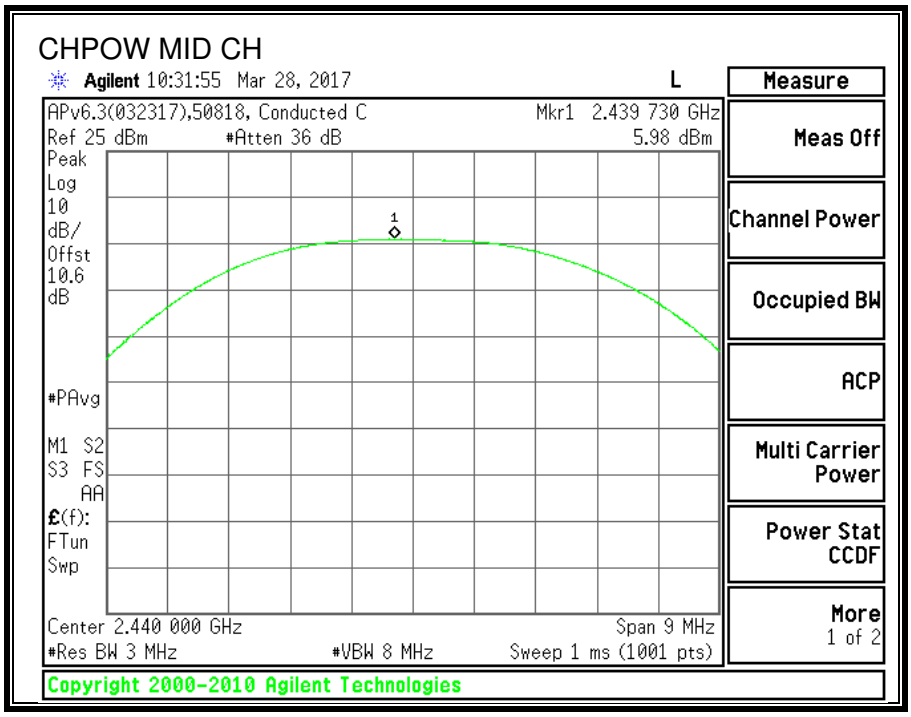


OUTPUT POWER (2Mbps)

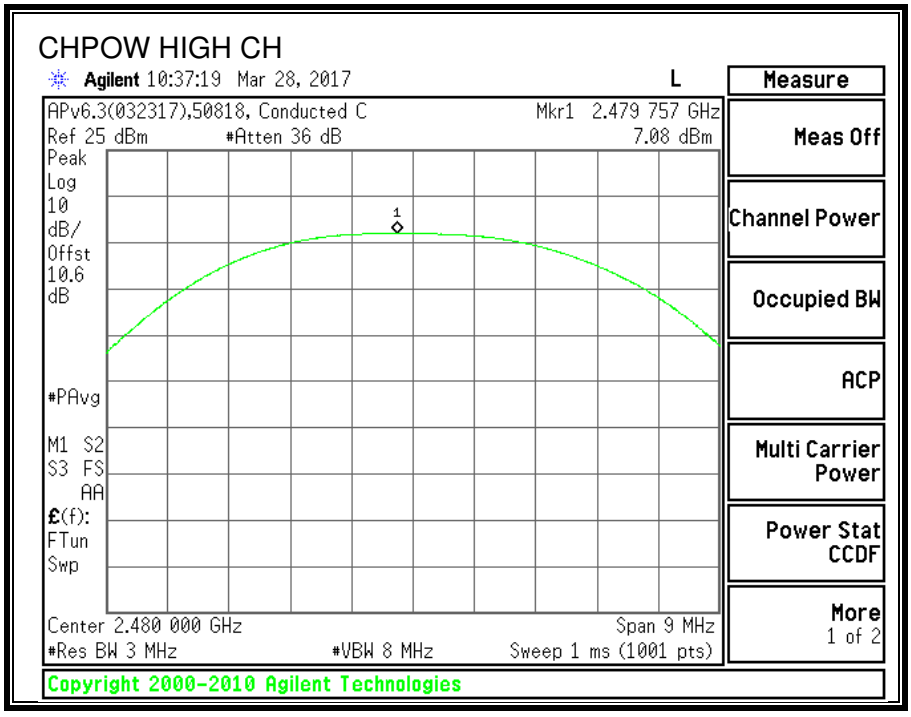
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	4.32	30	-25.68
Middle	2440	5.98	30	-24.02
High	2480	7.08	30	-22.92



CHPOW MID CH



CHPOW HIGH CH



8.3.5. POWER SPECTRAL DENSITY

LIMITS

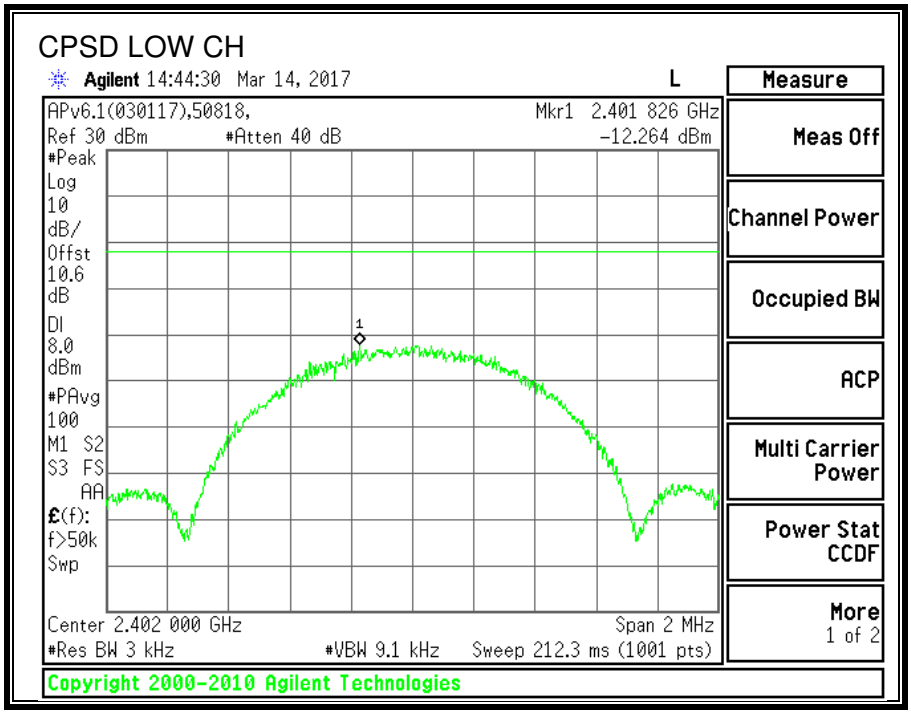
FCC §15.247 (e)
IC RSS-247 (5.2) (2)

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.

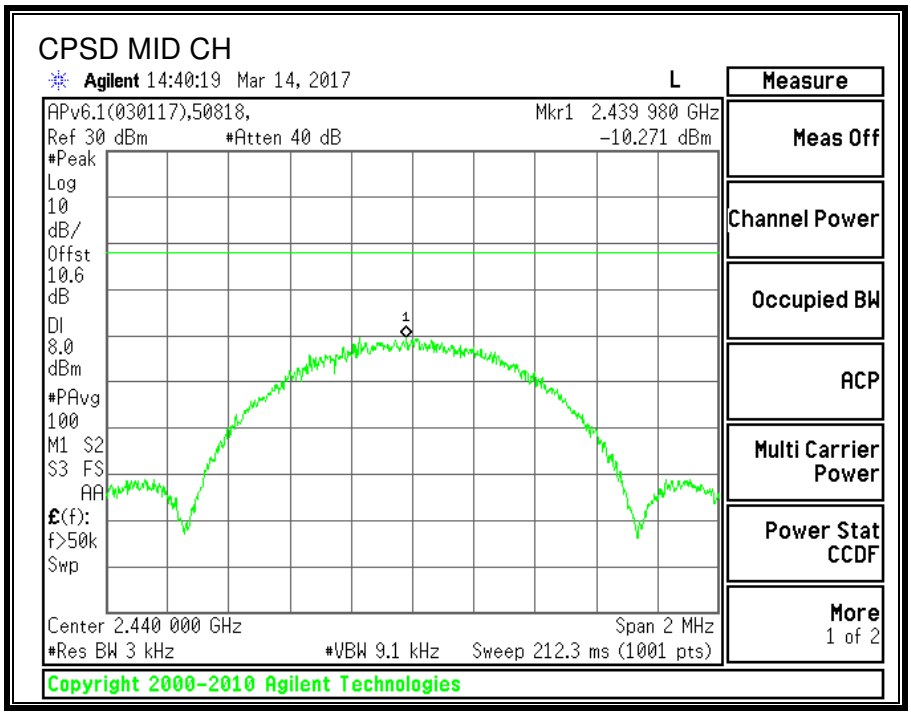
RESULTS

POWER SPECTRAL DENSITY (1Mbps)

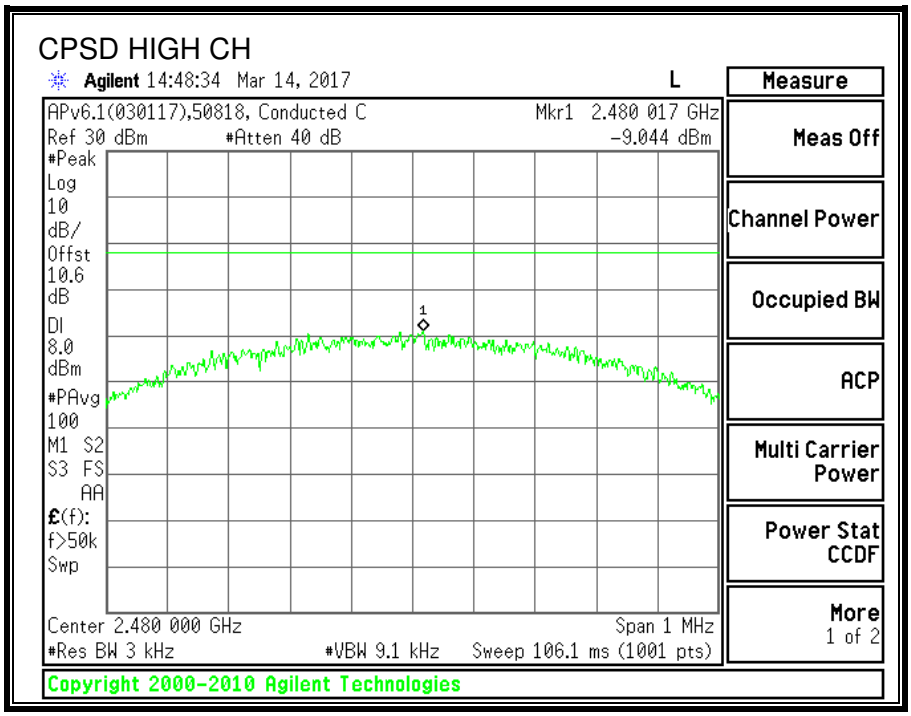
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-12.264	8	-20.264
Middle	2440	-10.271	8	-18.271
High	2480	-9.044	8	-17.044



CPSD MID CH

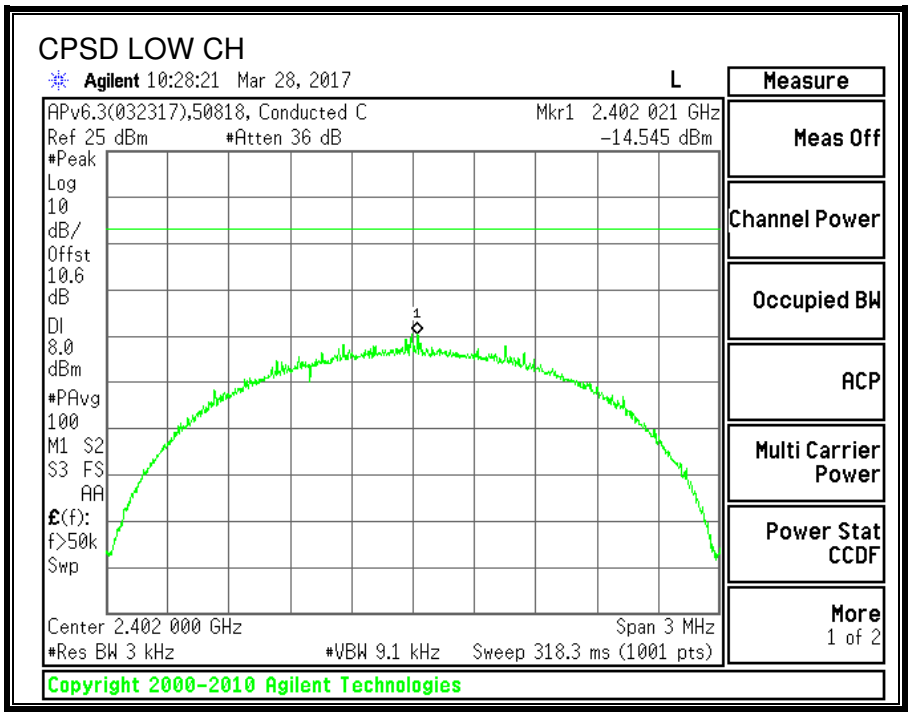


CPSD HIGH CH

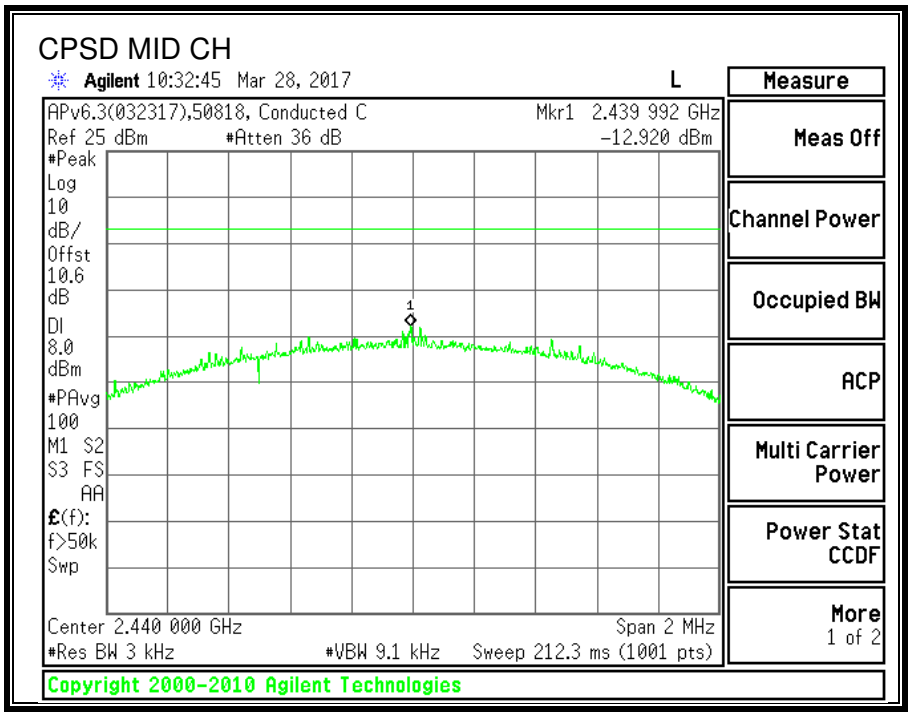


POWER SPECTRAL DENSITY (2Mbps)

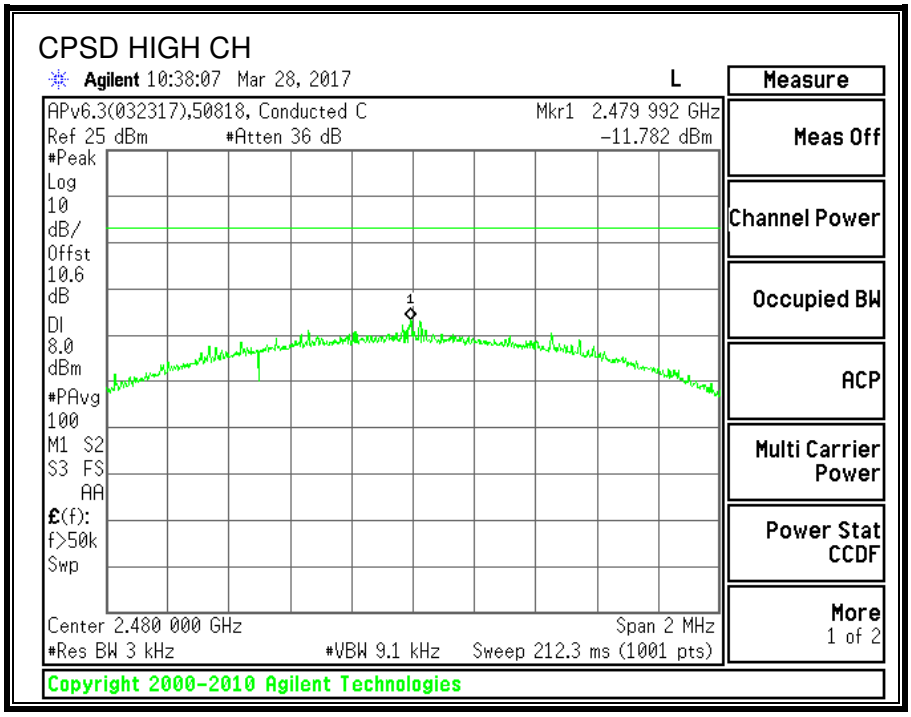
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-14.545	8	-22.545
Middle	2440	-12.920	8	-20.92
High	2480	-11.782	8	-19.782



CPSD MID CH



CPSD HIGH CH



8.3.6. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

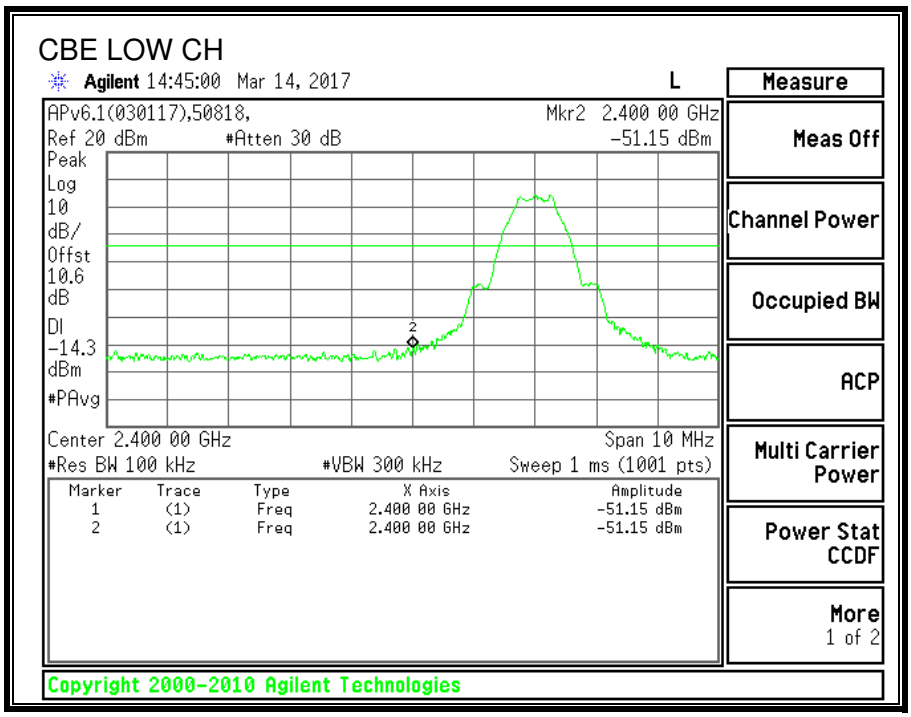
LIMITS

FCC §15.247 (d)
IC RSS-247 (5.5)

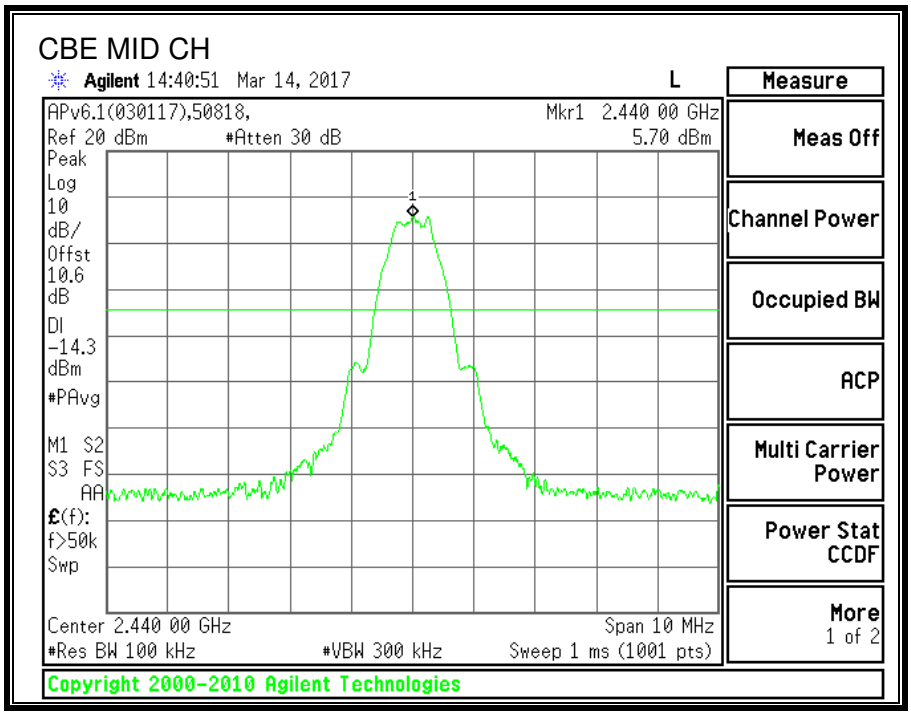
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

RESULTS

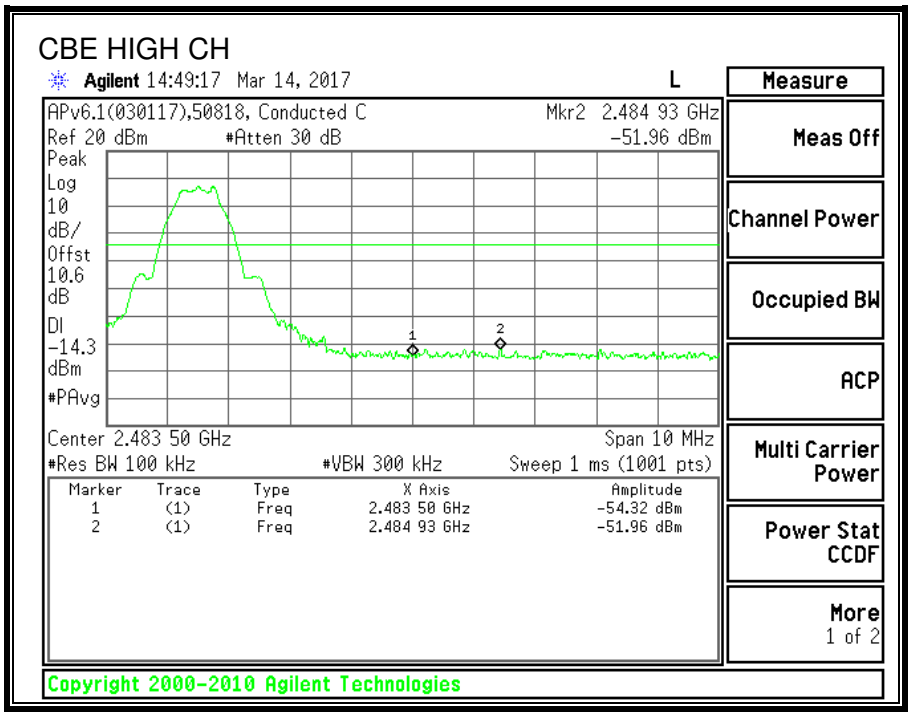
CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS (1Mbps)



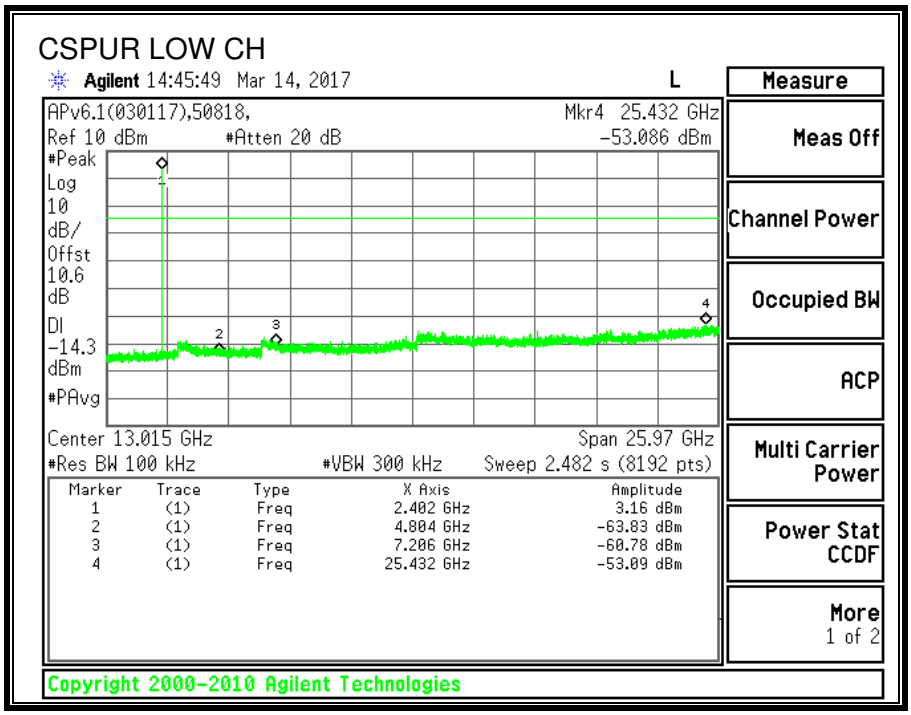
CBE MID CH



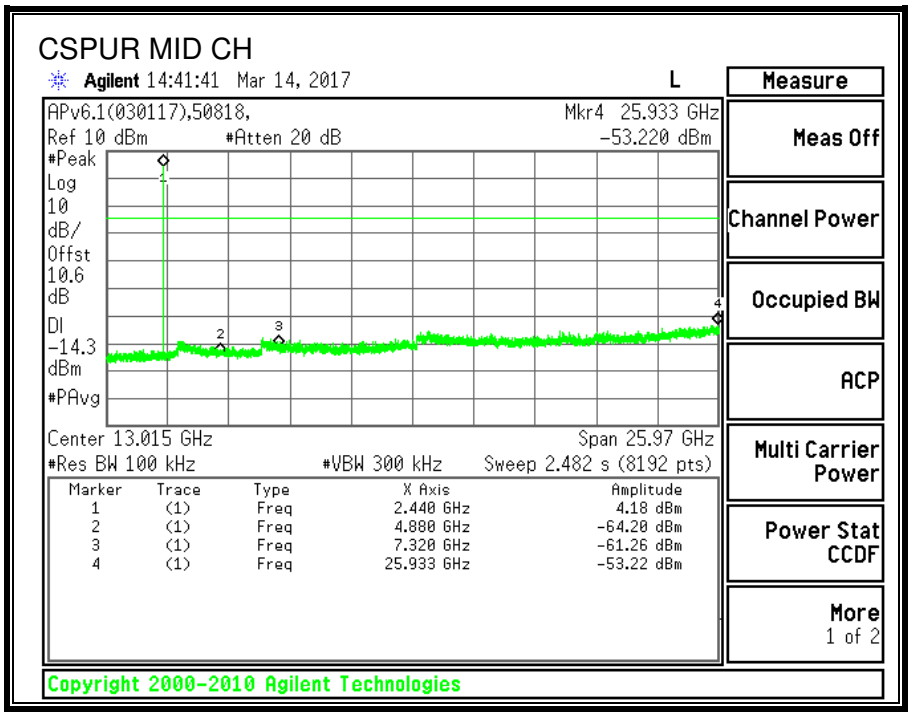
CBE HIGH CH

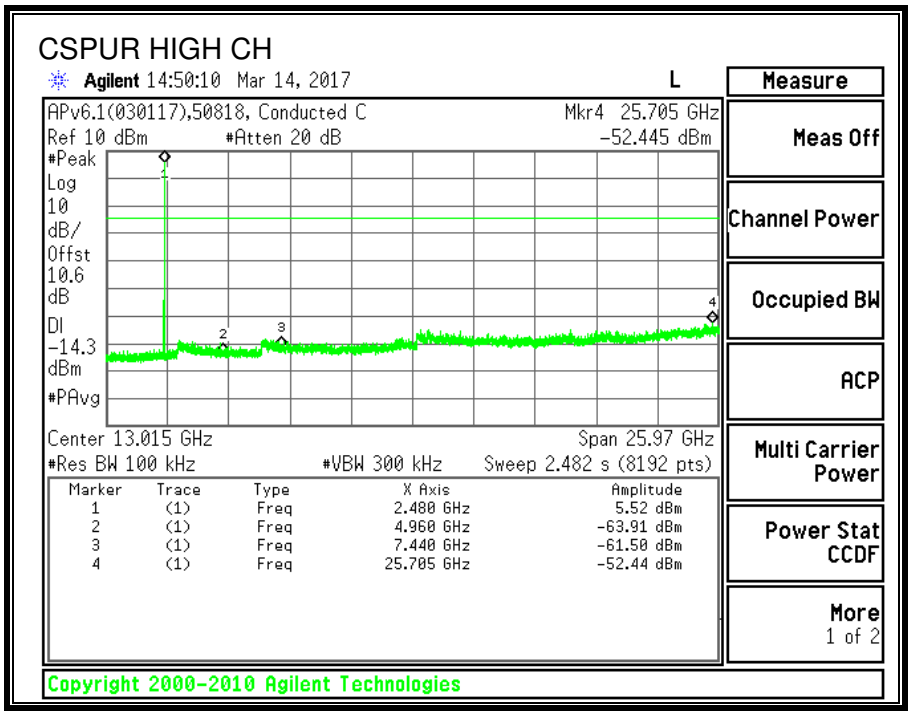


CSPUR LOW CH

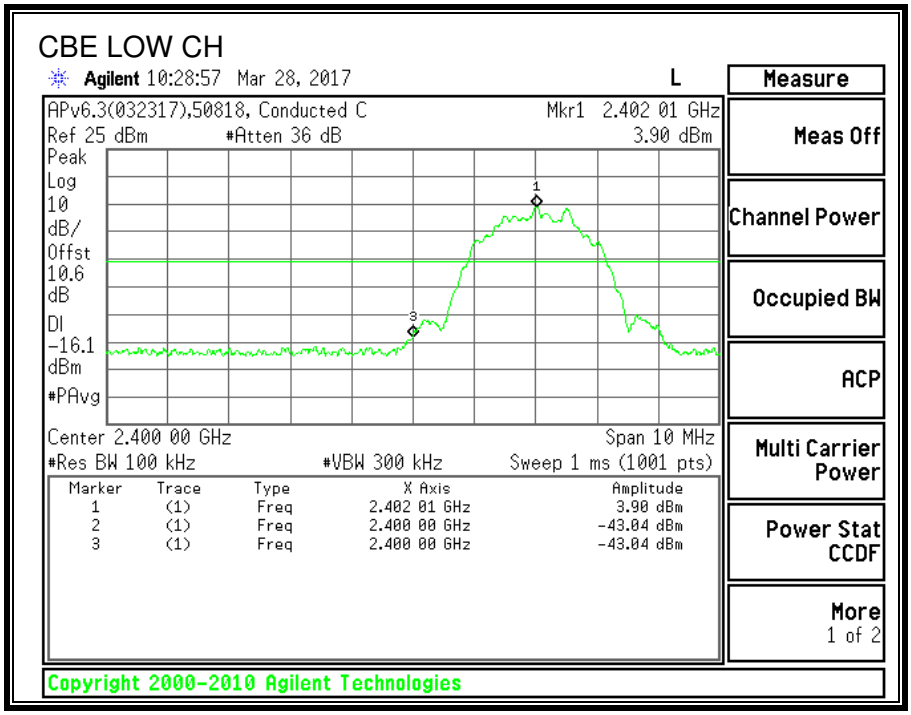


CSPUR MID CH

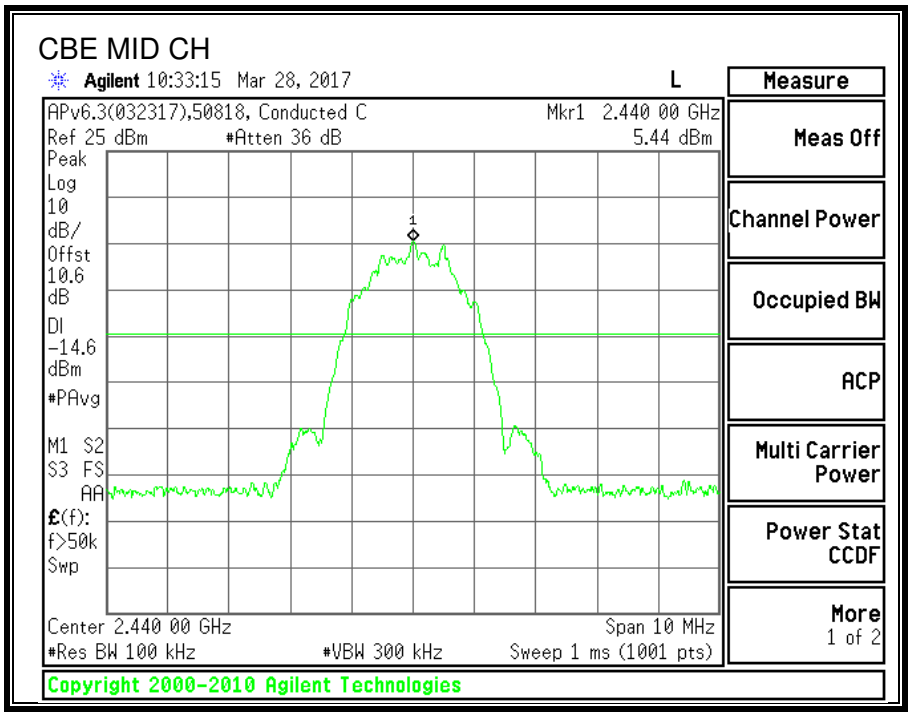




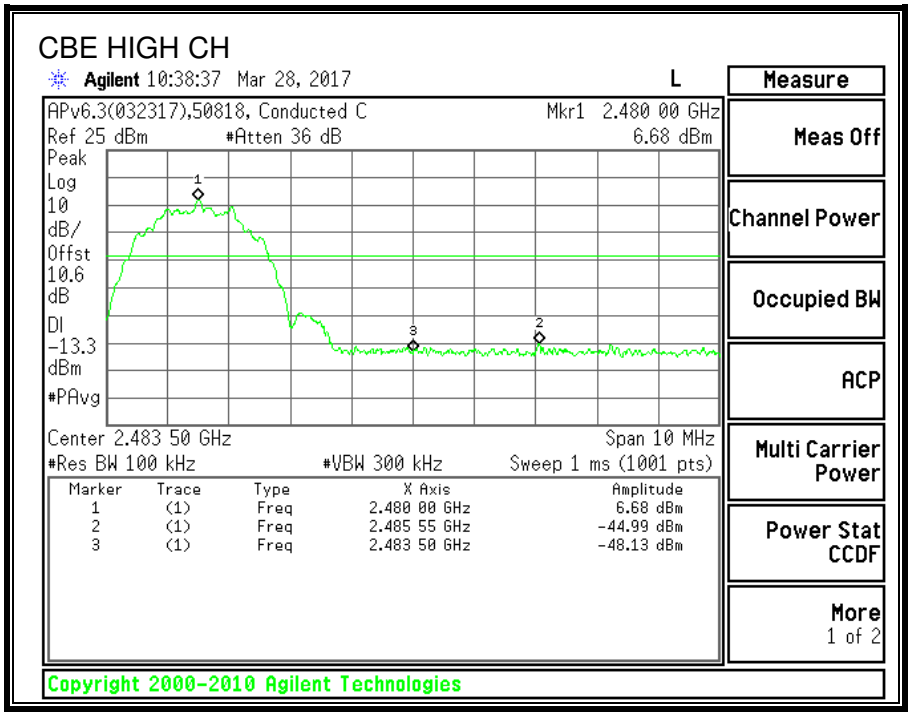
CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS (2Mbps)



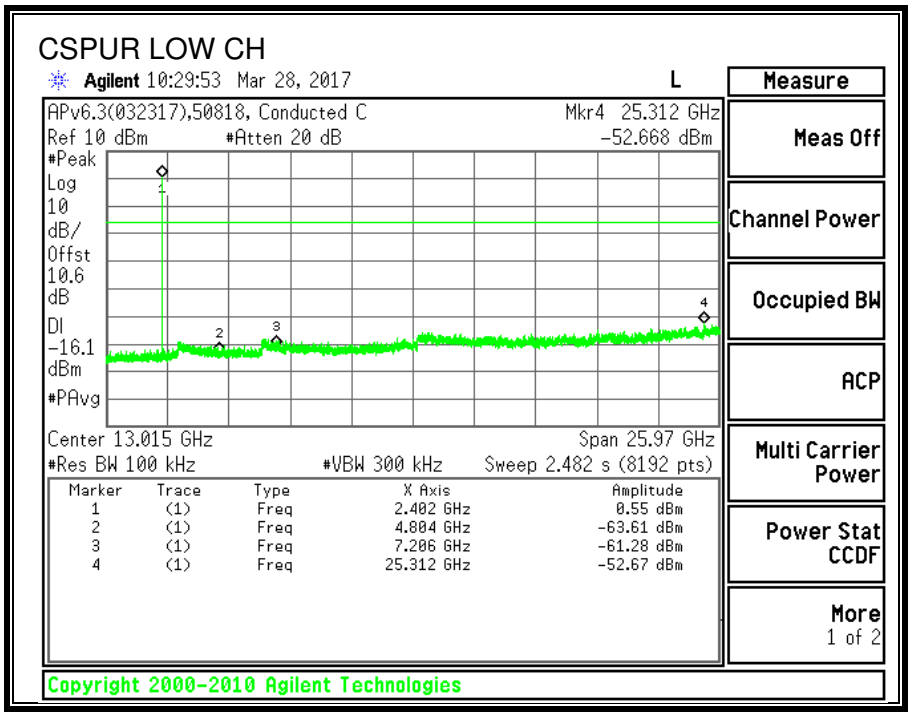
CBE MID CH



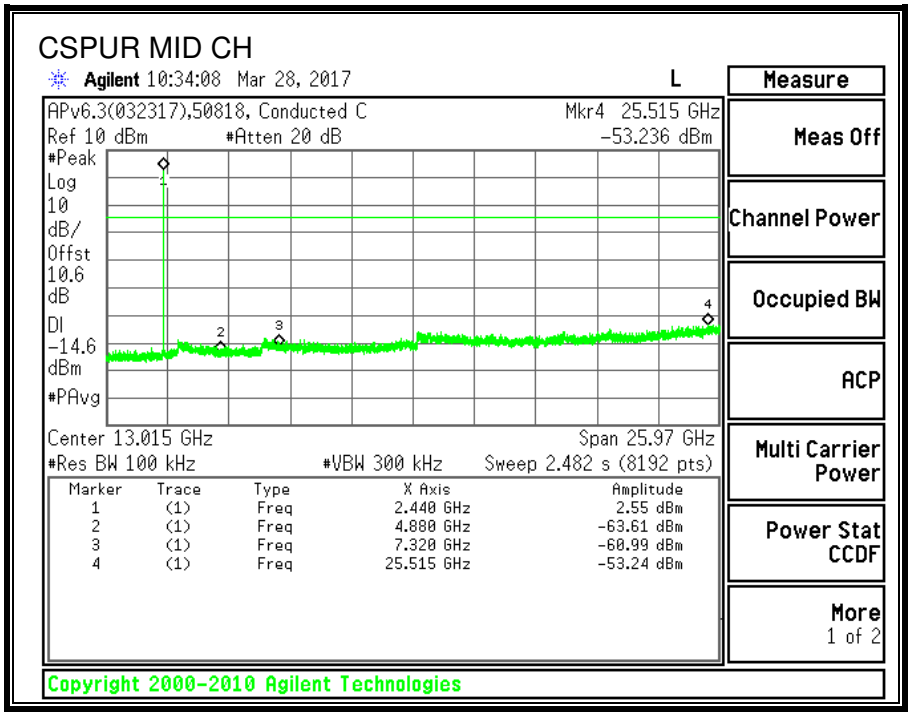
CBE HIGH CH



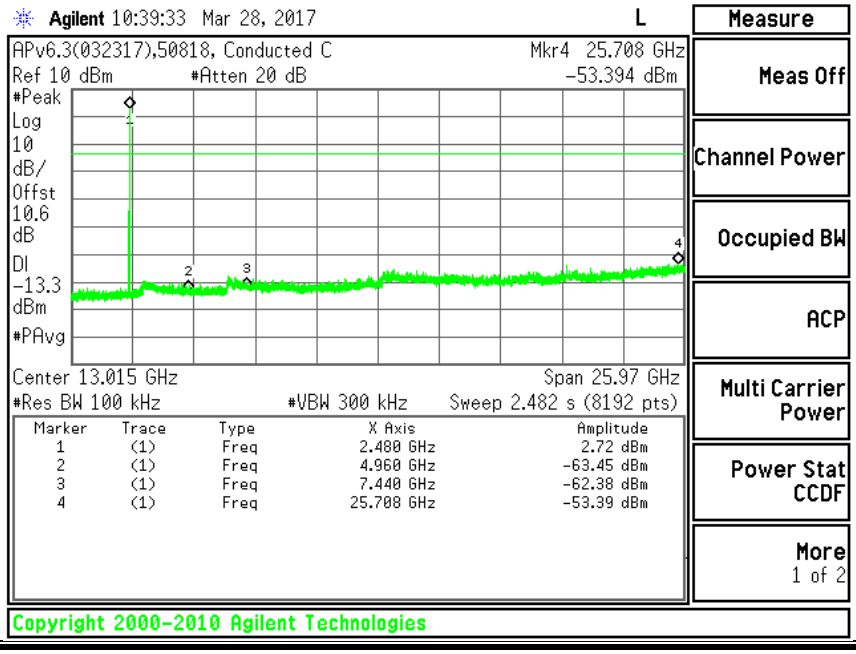
CSPUR LOW CH



CSPUR MID CH



CSPUR HIGH CH



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209
IC RSS-GEN, Section 8.9 and 8.10.

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 for measurement below 1GHz; 1.5 m above the ground plane for measurement 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 pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

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.

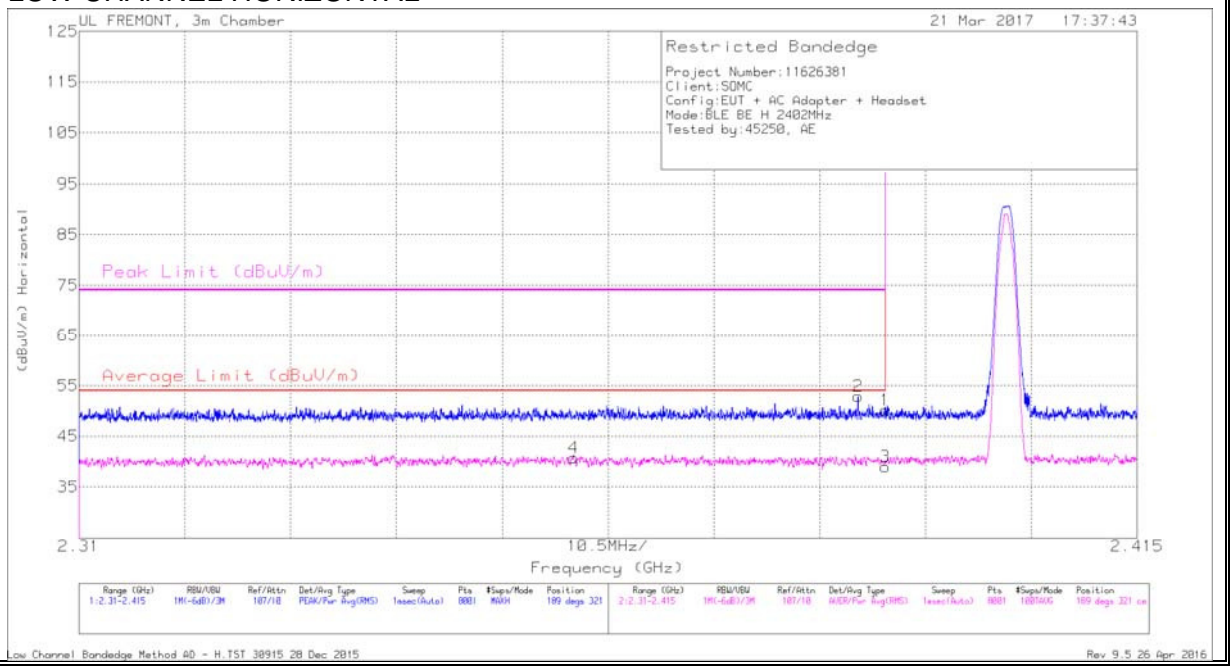
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

Results

Radiated Bandedge and Spurious Emissions were tested using 1Mbps as Worst-case data rates.

9.2.1. RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL HORIZONTAL

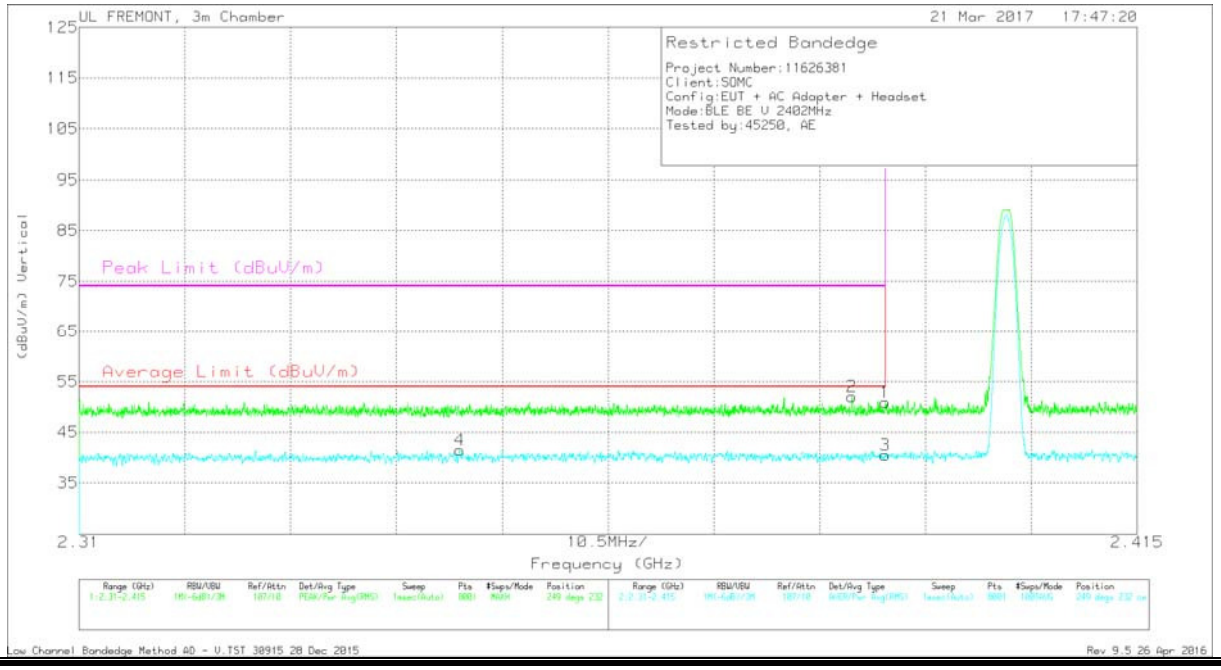


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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
4	2.359	29.69	RMS	31.9	-20.9	.69	41.38	54	-12.62	-	-	189	321	H
2	2.387	41.9	Pk	31.9	-20.9	0	52.9	-	-	74	-21.1	189	321	H
1	2.39	39.08	Pk	31.9	-20.8	0	50.18	-	-	74	-23.82	189	321	H
3	2.39	27.93	RMS	31.9	-20.8	.69	39.72	54	-14.28	-	-	189	321	H

Pk - Peak detector
RMS - RMS detection

LOW CHANNEL VERTICAL



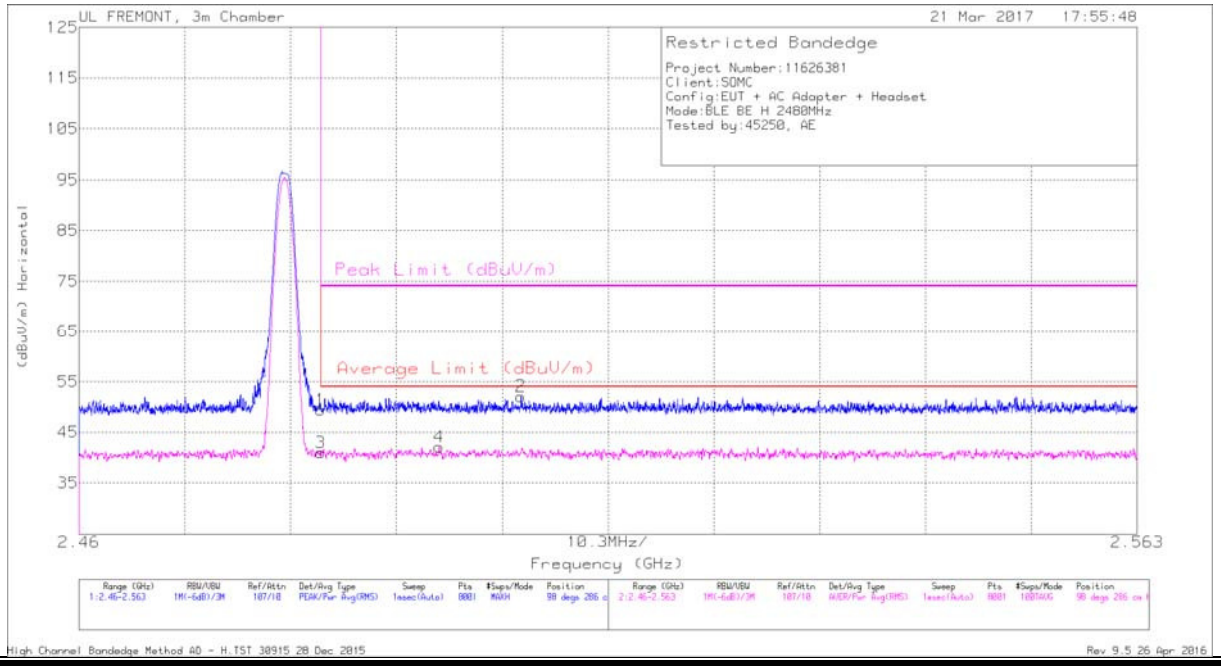
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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
4	2.348	29.73	RMS	31.8	-20.8	.69	41.42	54	-12.58	-	-	249	232	V
2	2.387	41.02	Pk	31.9	-20.9	0	52.02	-	-	74	-21.98	249	232	V
1	2.39	39.82	Pk	31.9	-20.8	0	50.92	-	-	74	-23.08	249	232	V
3	2.39	28.71	RMS	31.9	-20.8	.69	40.5	54	-13.5	-	-	249	232	V

Pk - Peak detector
RMS - RMS detection

9.2.2. AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL

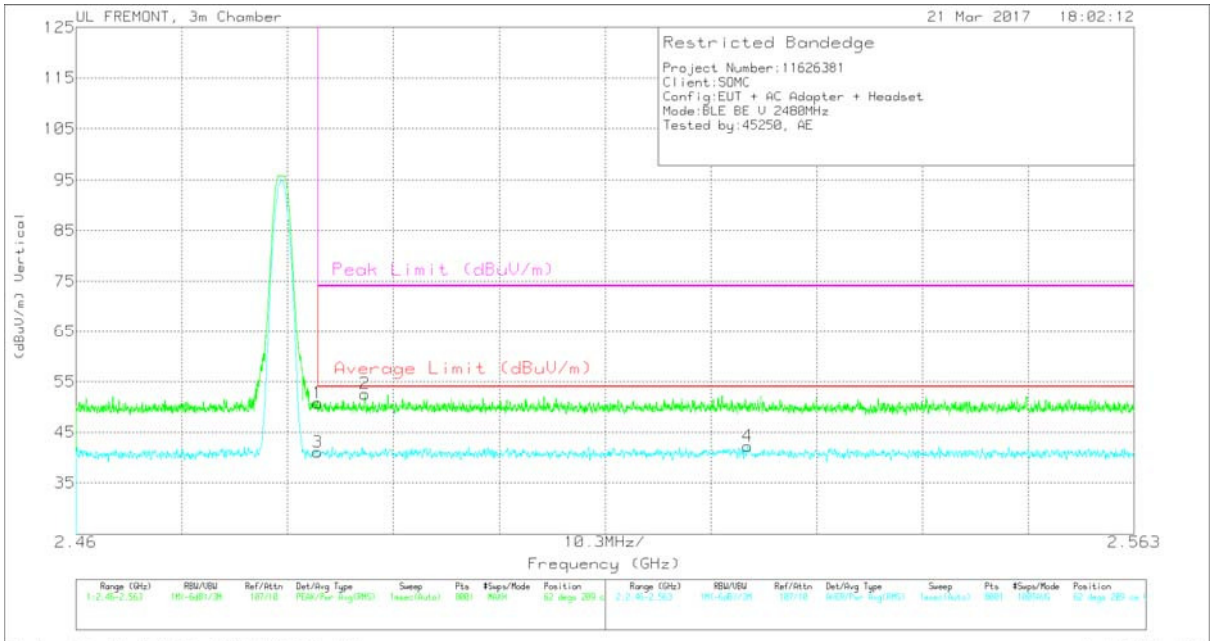


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	37.85	Pk	32.4	-20.8	0	49.45	-	-	74	-24.55	98	286	H
3	2.484	28.69	RMS	32.4	-20.8	.69	40.98	54	-13.02	-	-	98	286	H
4	2.495	29.73	RMS	32.5	-20.8	.69	42.12	54	-11.88	-	-	98	286	H
2	2.503	40.39	Pk	32.5	-20.8	0	52.09	-	-	74	-21.91	98	286	H

Pk - Peak detector
RMS - RMS detection

HIGH CHANNEL VERTICAL



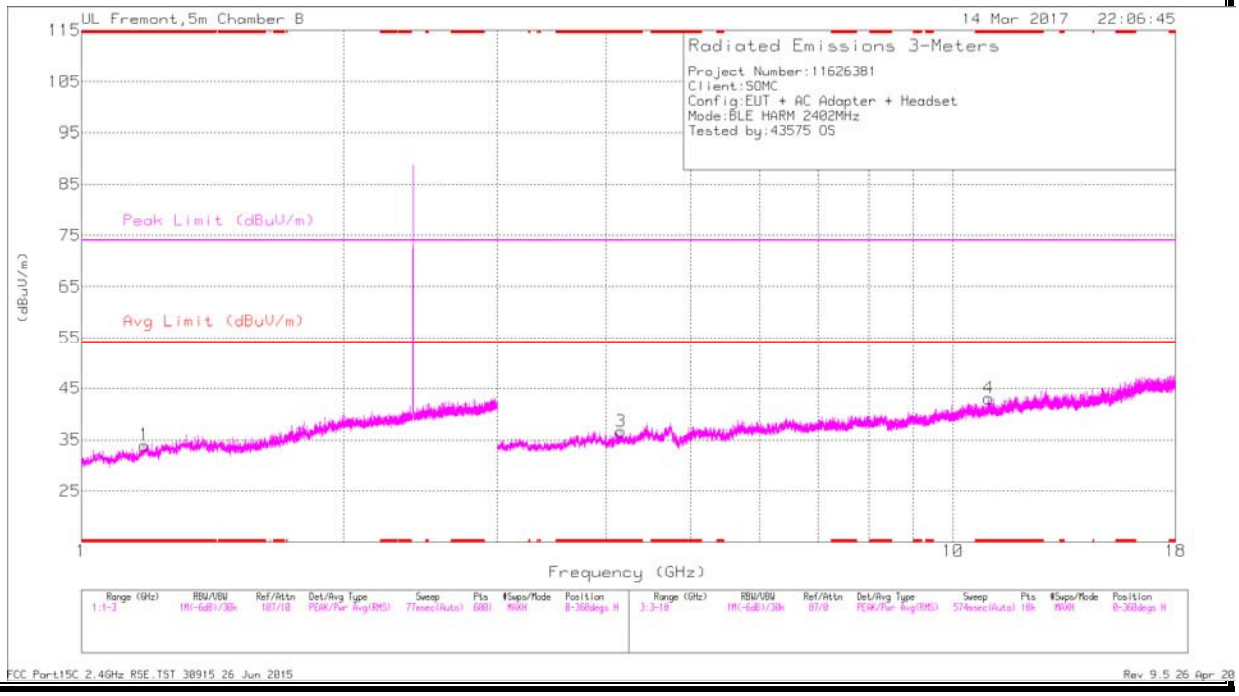
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T712 (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	39.14	Pk	32.4	-20.8	0	50.74	-	-	74	-23.26	62	209	V
3	2.484	28.81	RMS	32.4	-20.8	.69	41.1	54	-12.9	-	-	62	209	V
2	2.488	41.09	Pk	32.4	-20.9	0	52.59	-	-	74	-21.41	62	209	V
4	2.525	29.79	RMS	32.4	-20.6	.69	42.28	54	-11.72	-	-	62	209	V

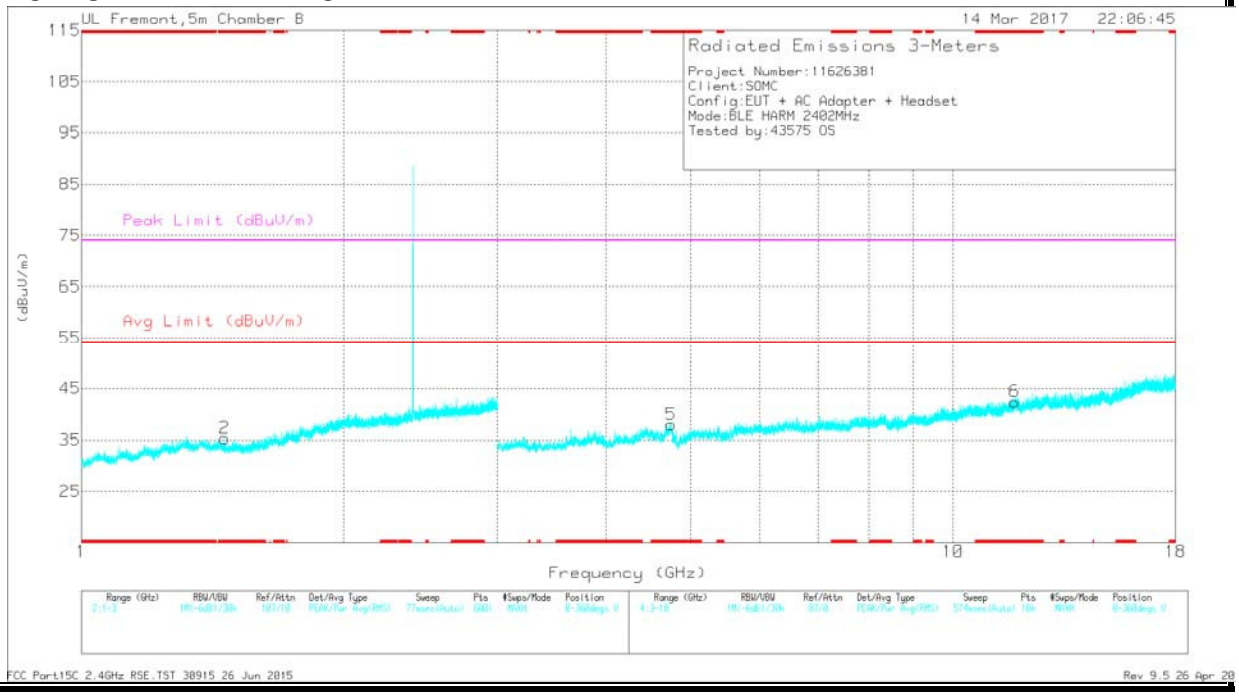
Pk - Peak detector
RMS - RMS detection

9.2.3. HARMONICS AND SPURIOUS EMISSIONS 1 TO 18 GHz

LOW CHANNEL HORIZONTAL



LOW CHANNEL VERTICAL

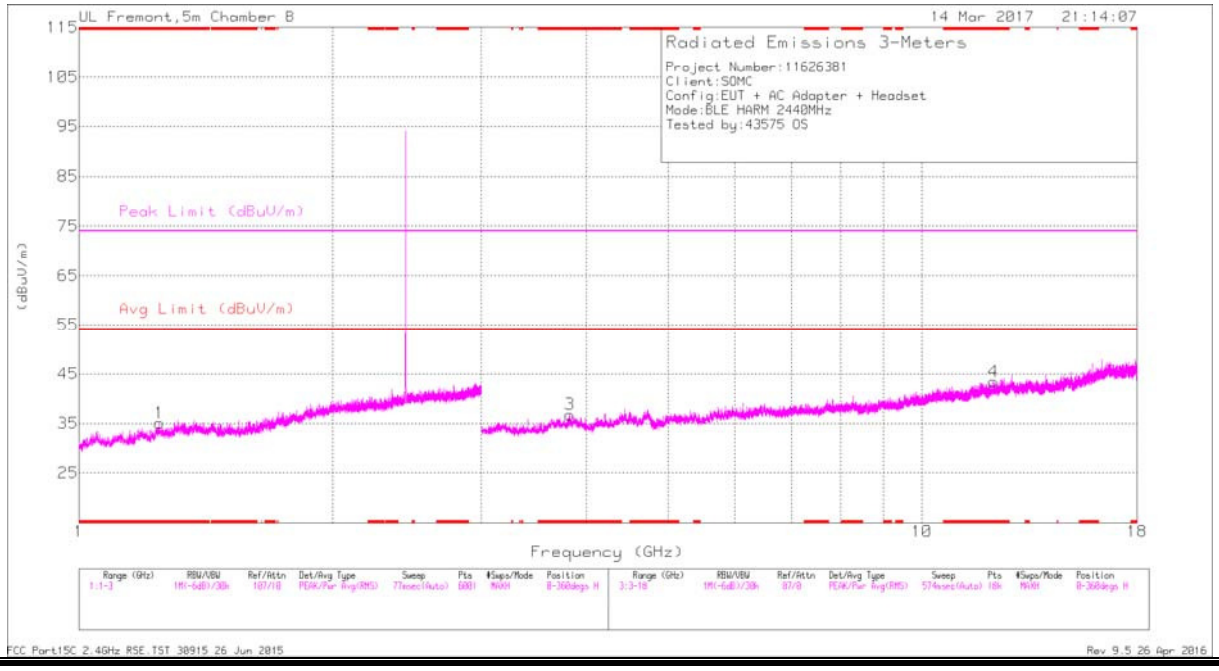


Radiated Emissions

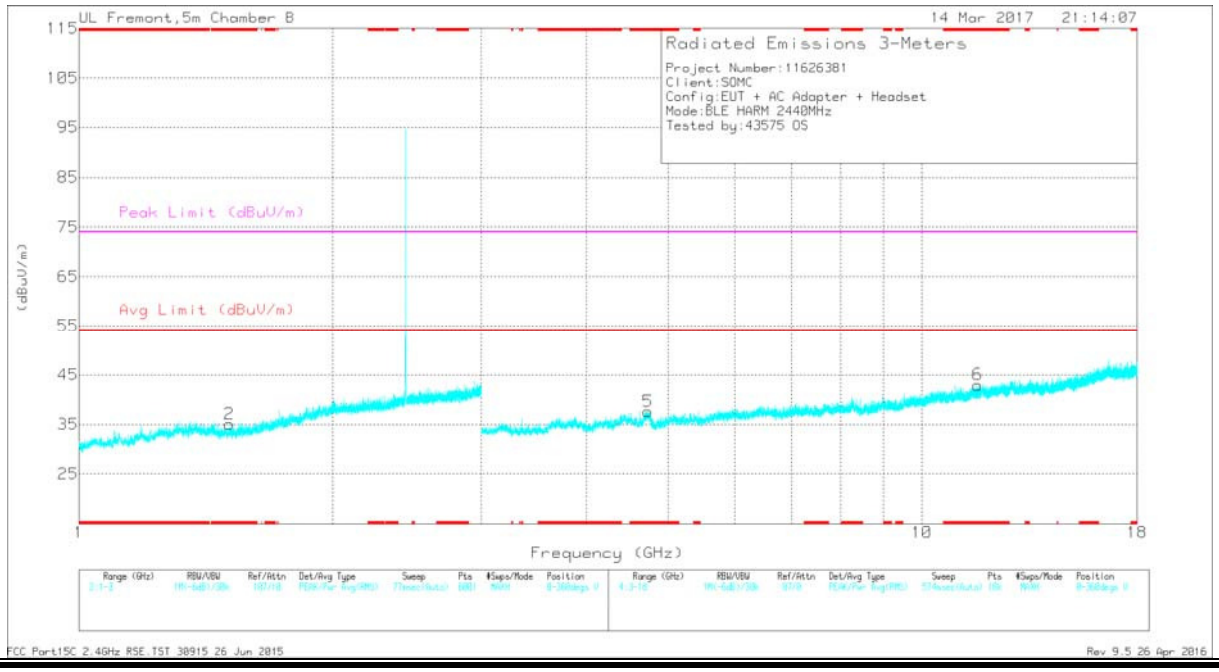
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/ Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.182	34.34	PK2	28.2	-22.5	0	40.04	-	-	74	-33.96	240	392	H
* 1.18	20.71	MAv1	28.2	-22.7	.69	26.9	54	-27.1	-	-	240	392	H
* 1.457	34.29	PK2	28.2	-21.4	0	41.09	-	-	74	-32.91	266	151	V
* 1.459	18.67	MAv1	28.2	-21.4	.69	26.16	54	-27.84	-	-	266	151	V
* 4.161	37.83	PK2	33.7	-29.9	0	41.63	-	-	74	-32.37	136	302	H
* 4.159	27.17	MAv1	33.7	-29.9	.69	31.66	54	-22.34	-	-	136	302	H
* 10.986	32.83	PK2	37.9	-22.8	0	47.93	-	-	74	-26.07	52	278	H
* 10.988	21.37	MAv1	37.9	-22.8	.69	37.16	54	-16.84	-	-	52	278	H
* 4.747	37.87	PK2	33.9	-28.6	0	43.17	-	-	74	-30.83	253	151	V
* 4.747	27.06	MAv1	33.9	-28.6	.69	33.05	54	-20.95	-	-	253	151	V
* 11.766	32.78	PK2	38.7	-22.6	0	48.88	-	-	74	-25.12	158	313	V
* 11.766	20.9	MAv1	38.7	-22.6	.69	37.69	54	-16.31	-	-	158	313	V

* - indicates frequency in CFR15.205/RSS-GEN 8.10 -Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

MID CHANNEL HORIZONTAL



MID CHANNEL VERTICAL

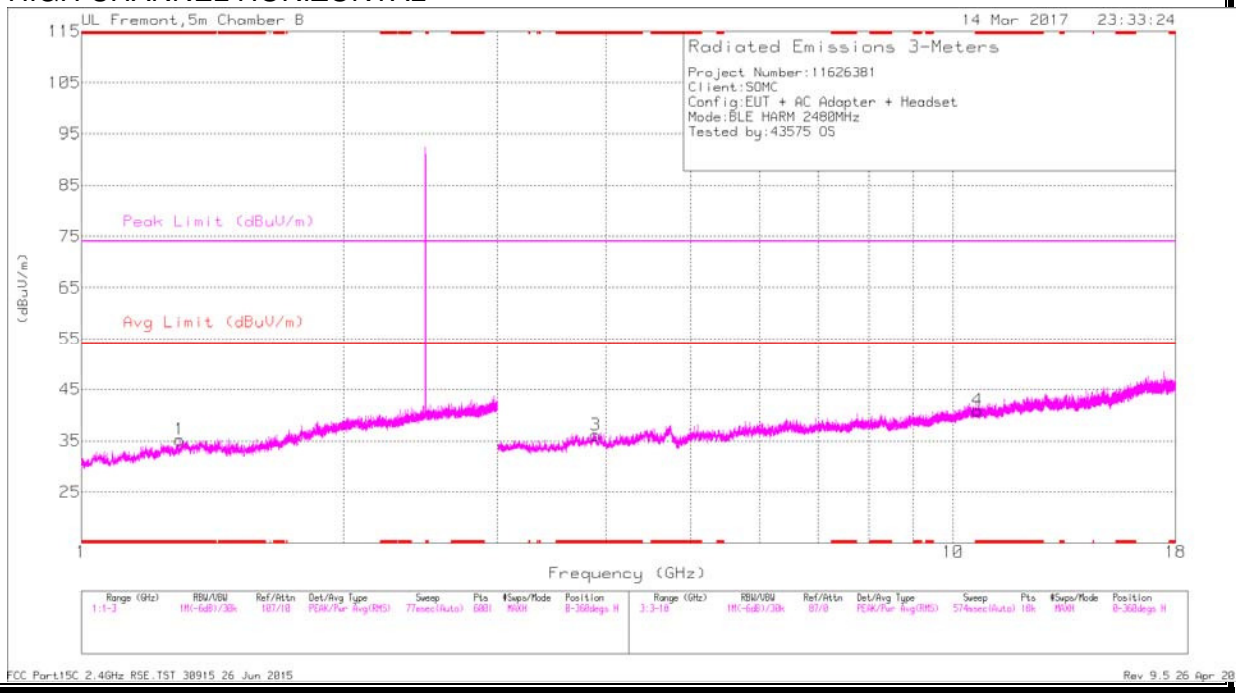


Radiated Emissions

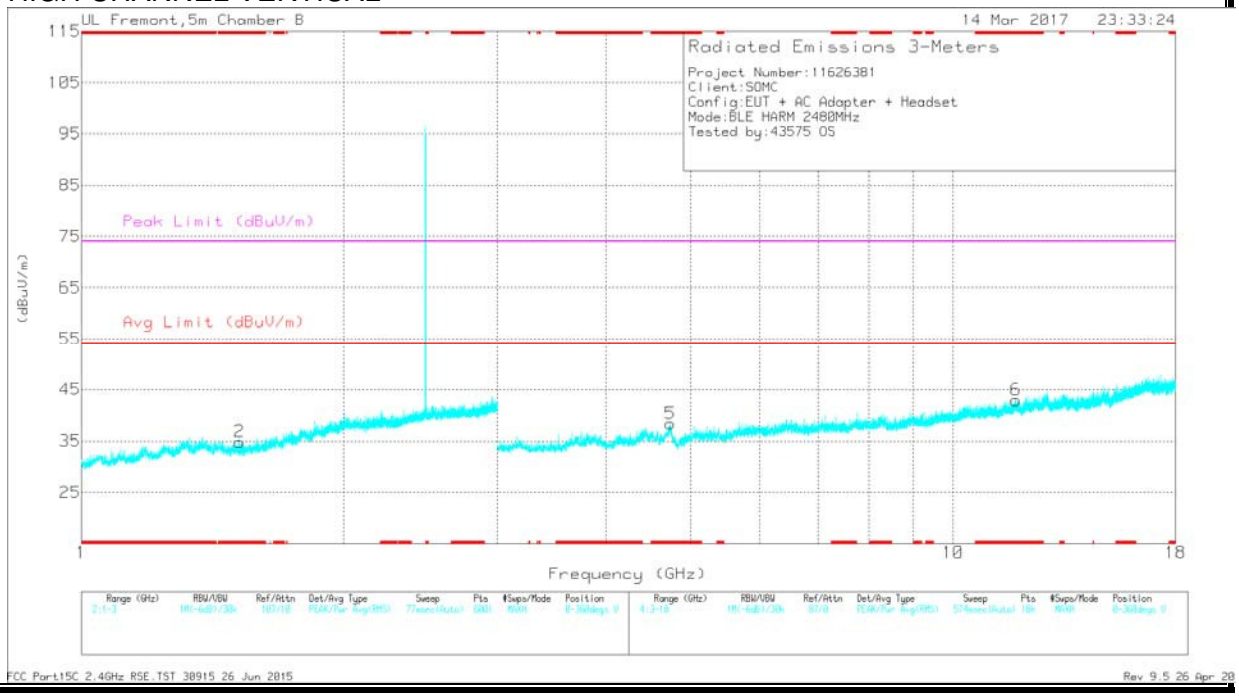
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 1.246	34.9	PK2	28.6	-22.4	0	41.1	-	-	74	-32.9	53	123	H
* 1.246	20.38	MAv1	28.6	-22.4	.69	27.27	54	-26.73	-	-	53	123	H
* 1.505	34.51	PK2	27.8	-21.2	0	41.11	-	-	74	-32.89	163	112	V
* 1.507	19.94	MAv1	27.8	-21.2	.69	27.23	54	-26.77	-	-	163	112	V
* 3.823	38.15	PK2	33.4	-30	0	41.55	-	-	74	-32.45	317	317	H
* 3.823	27.47	MAv1	33.4	-30	.69	31.56	54	-22.44	-	-	317	317	H
* 12.155	32.74	PK2	39	-22.7	0	49.04	-	-	74	-24.96	211	234	H
* 12.158	20.49	MAv1	39	-22.7	.69	37.48	54	-16.52	-	-	211	234	H
* 4.735	37.96	PK2	34	-28.6	0	43.36	-	-	74	-30.64	90	360	V
* 4.735	27.25	MAv1	34	-28.6	.69	33.34	54	-20.66	-	-	90	360	V
* 11.64	31.89	PK2	38.5	-22.8	0	47.59	-	-	74	-26.41	69	319	V
* 11.64	20.96	MAv1	38.5	-22.8	.69	37.35	54	-16.65	-	-	69	319	V

* - indicates frequency in CFR15.205/RSS-GEN 8.10 -Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

HIGH CHANNEL HORIZONTAL



HIGH CHANNEL VERTICAL



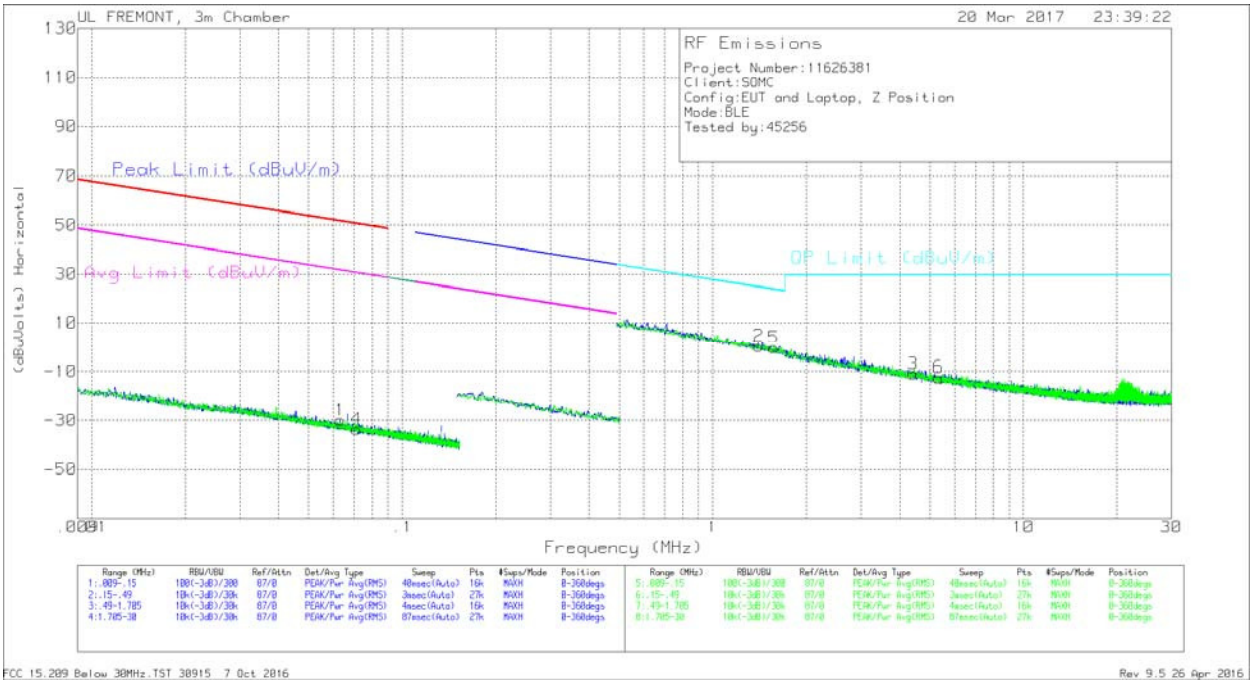
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
* 1.295	34.58	PK2	28.9	-22.1	0	41.38	-	-	74	-32.62	18	198	H
* 1.296	19.71	MAv1	28.9	-22.1	.69	27.2	54	-26.8	-	-	18	198	H
* 1.518	34.58	PK2	27.8	-21.4	0	40.98	-	-	74	-33.02	328	376	V
* 1.517	18.91	MAv1	27.8	-21.4	.69	26	54	-28	-	-	328	376	V
* 3.886	38.16	PK2	33.3	-29.4	0	42.06	-	-	74	-31.94	182	135	H
* 3.886	27.07	MAv1	33.3	-29.4	.69	31.66	54	-22.34	-	-	182	135	H
* 10.671	32.6	PK2	37.9	-23.2	0	47.3	-	-	74	-26.7	196	151	H
* 10.671	20.85	MAv1	37.9	-23.2	.69	36.24	54	-17.76	-	-	196	151	H
* 4.74	37.56	PK2	34	-28.6	0	42.96	-	-	74	-31.04	325	366	V
* 4.74	27.23	MAv1	34	-28.6	.69	33.32	54	-20.68	-	-	325	366	V
* 11.813	31.91	PK2	38.7	-22.1	0	48.51	-	-	74	-25.49	10	184	V
* 11.813	20.65	MAv1	38.7	-22.1	.69	37.94	54	-16.06	-	-	10	184	V

* - indicates frequency in CFR15.205/RSS-GEN 8.10 -Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

9.2.4. SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

HORIZONTAL AND VERTICAL PLOTS



NOTE: KDB 937606 OATS and Chamber Correlation Justification

- Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.
- OATs and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 300m	DC Corr (dB)	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.06321	36.72	Pk	12	1.4	-80	0	-29.88	51.57	-81.45	31.57	-61.45	-	-	0-360
4	.0713	33.11	Pk	11.9	1.4	-80	0	-33.59	50.52	-84.11	30.52	-64.11	-	-	0-360

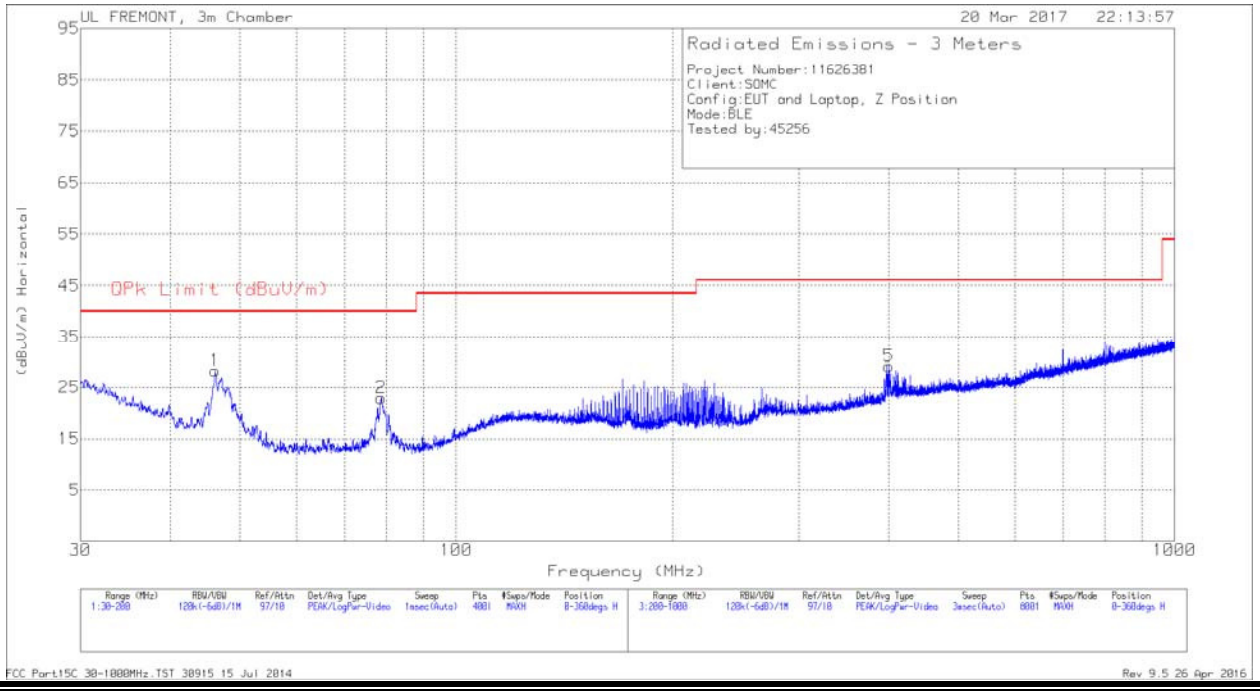
Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 30m	DC Corr (dB)	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
2	1.40626	27.21	Pk	11.8	1.5	-40	0	.51	-	-	-	-	24.67	-24.16	0-360
5	1.57209	26.43	Pk	11.9	1.5	-40	0	-.17	-	-	-	-	23.7	-23.87	0-360
3	4.41356	15.91	Pk	11.6	1.5	-40	0	-10.99	-	-	-	-	29.5	-40.49	0-360
6	5.32584	14.49	Pk	11.5	1.5	-40	0	-12.51	-	-	-	-	29.5	-42.01	0-360

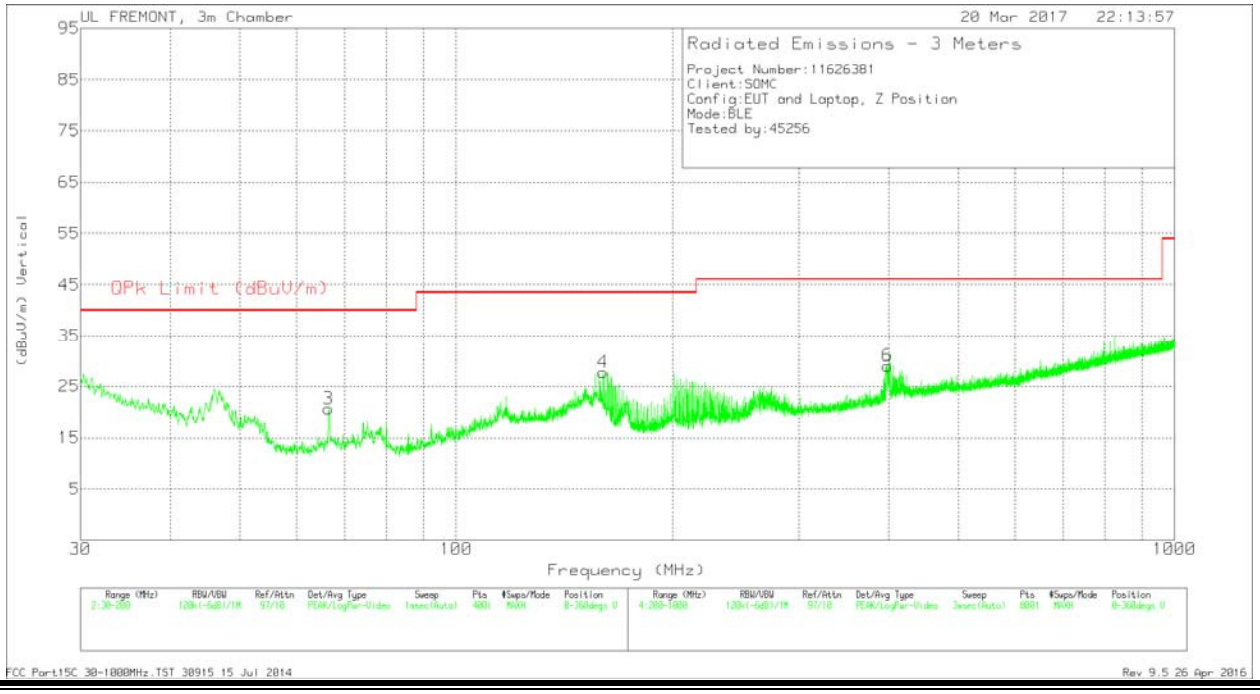
Pk - Peak detector

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

HORIZONTAL PLOT



VERTICAL PLOT



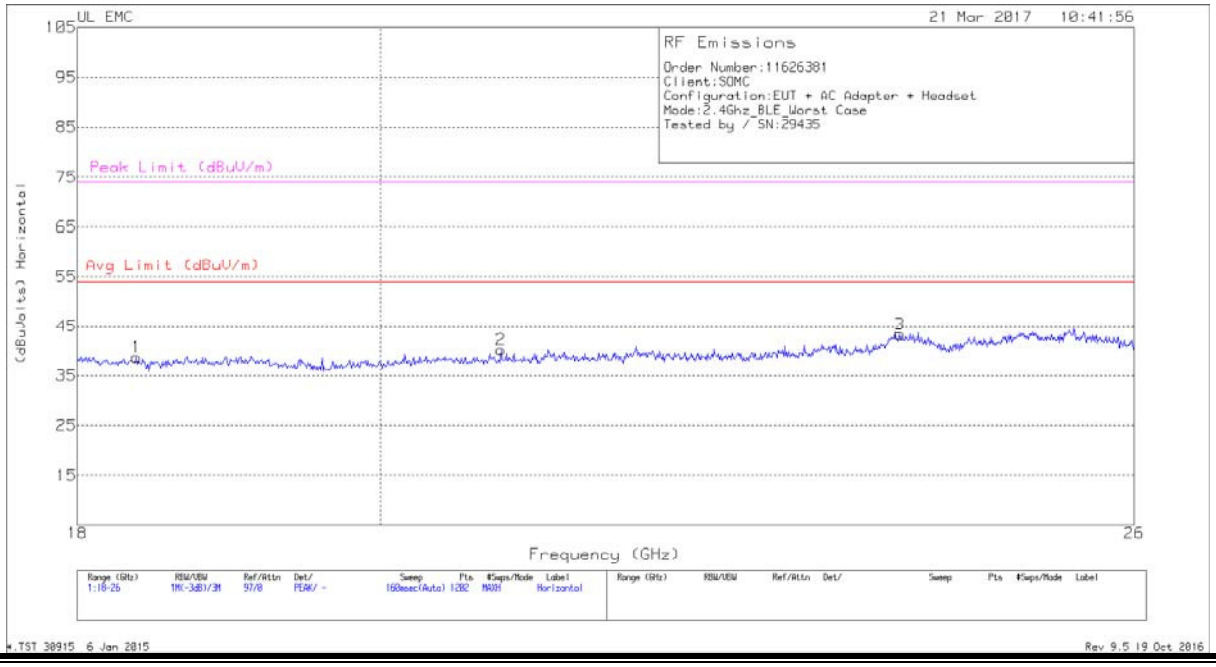
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T408 (dB/m)	Amp/Cbl (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	46.1925	41.7	Pk	13.6	-27	0	28.3	40	-11.7	0-360	400	H
3	66.4225	35.4	Pk	12	-26.7	0	20.7	40	-19.3	0-360	100	V
2	78.62	37.92	Pk	11.6	-26.6	0	22.92	40	-17.08	0-360	400	H
4	160.2625	37.01	Pk	16.3	-25.5	0	27.81	43.52	-15.71	0-360	100	V
6	398.8	34.08	Pk	19.5	-24.5	0	29.08	46.02	-16.94	0-360	200	V
5	400.4	34.05	Pk	19.6	-24.5	0	29.15	46.02	-16.87	0-360	300	H

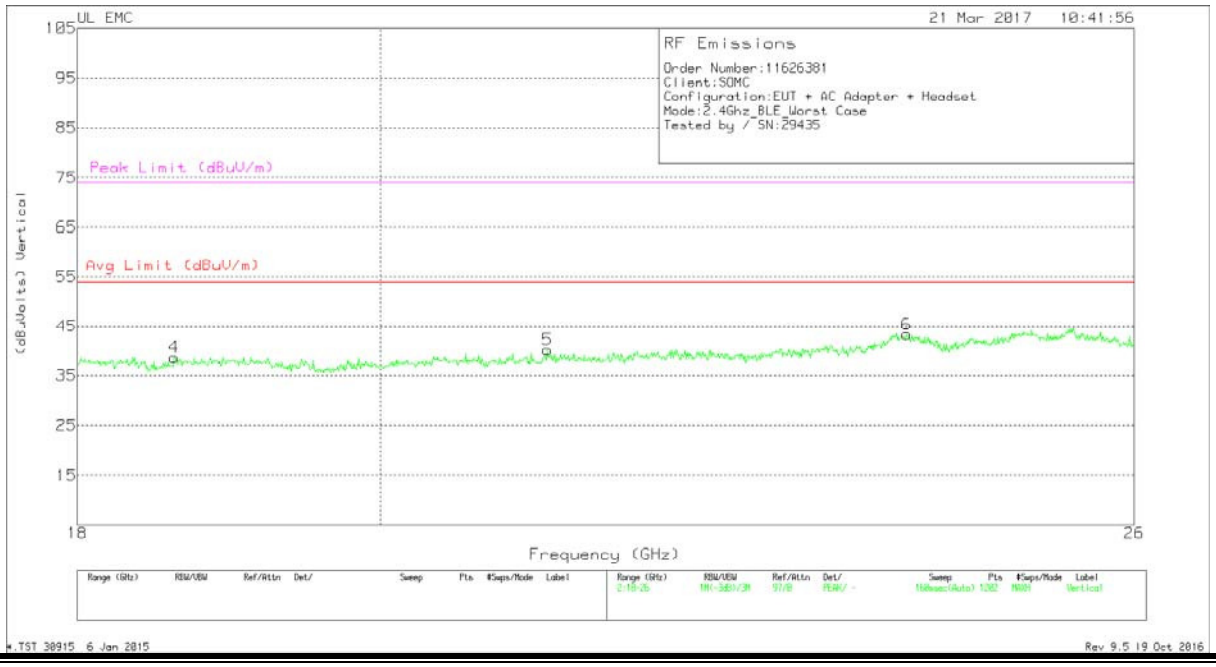
Pk - Peak detector

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

HORIZONTAL PLOT



VERTICAL PLOT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T449 (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	18.373	40.87	Pk	32.4	-25.1	-9.5	38.67	54	-15.33	74	-35.33
2	20.858	41.97	Pk	33.1	-25.4	-9.5	40.17	54	-13.83	74	-33.83
3	23.962	43.03	Pk	34	-24.2	-9.5	43.33	54	-10.67	74	-30.67
4	18.616	40.57	Pk	32.5	-24.9	-9.5	38.67	54	-15.33	74	-35.33
5	21.197	41.37	Pk	33.1	-24.8	-9.5	40.17	54	-13.83	74	-33.83
6	24.022	43.03	Pk	34	-24.2	-9.5	43.33	54	-10.67	74	-30.67

Pk - Peak detector

9.3. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)
RSS-Gen 8.8

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	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

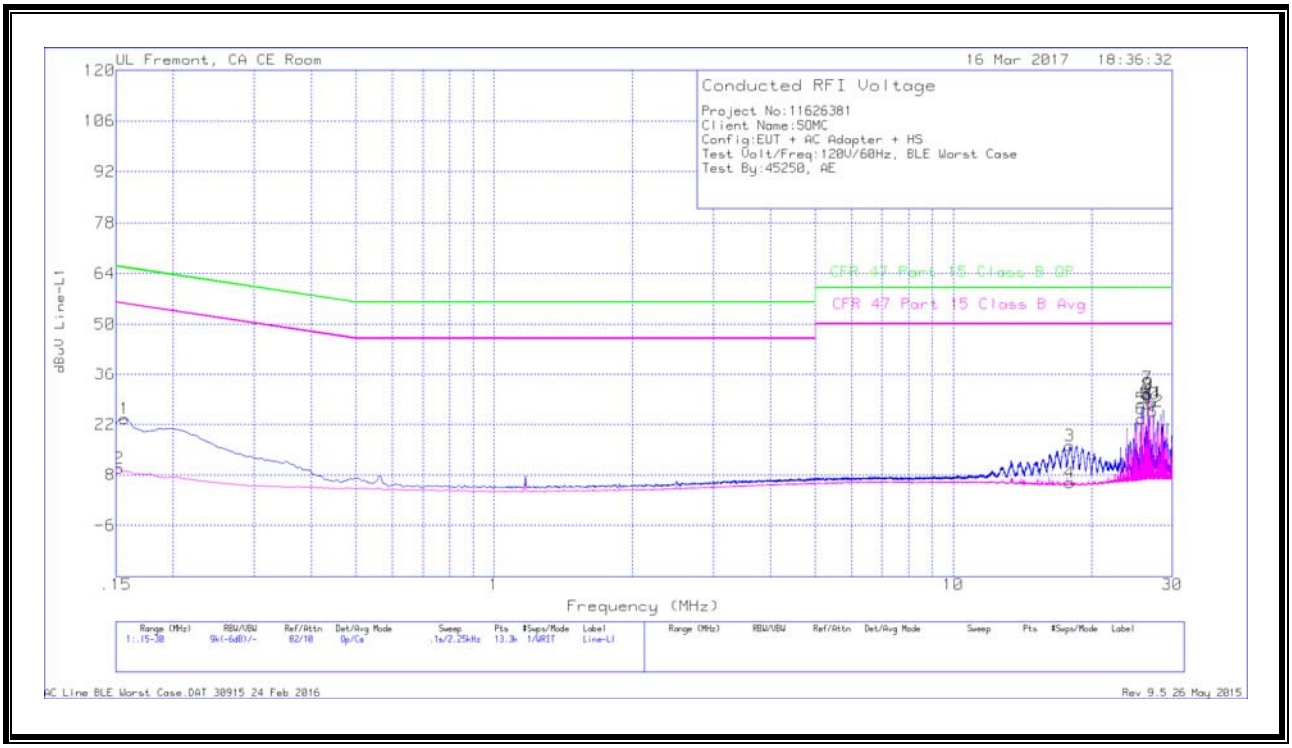
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

LINE 1 RESULTS



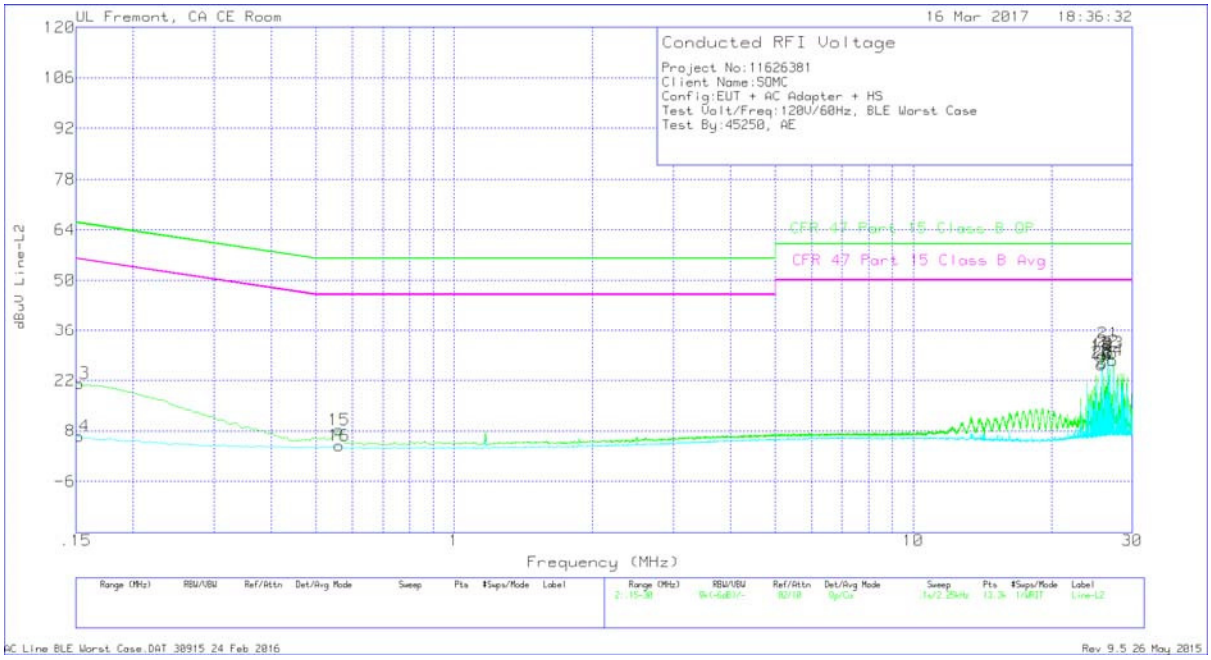
WORST EMISSIONS

Trace Markers

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.15675	13.38	Qp	0	.1	10.1	23.58	65.63	-42.05	-	-
2	.15225	-.41	Ca	.1	.1	10.1	9.89	-	-	55.88	-45.99
3	17.9385	5.48	Qp	0	.3	10.3	16.08	60	-43.92	-	-
4	17.93963	-4.81	Ca	0	.3	10.3	5.79	-	-	50	-44.21
5	25.6965	15.38	Qp	.1	.3	10.5	26.28	60	-33.72	-	-
6	25.6965	12.62	Ca	.1	.3	10.5	23.52	-	-	50	-26.48
7	26.49075	21.58	Qp	.1	.3	10.5	32.48	60	-27.52	-	-
8	26.49075	19.34	Ca	.1	.3	10.5	30.24	-	-	50	-19.76
9	26.61225	19.69	Qp	.1	.3	10.5	30.59	60	-29.41	-	-
10	26.61225	16.78	Ca	.1	.3	10.5	27.68	-	-	50	-22.32
11	27.16125	17.16	Qp	.1	.3	10.5	28.06	60	-31.94	-	-
12	27.1635	14.78	Ca	.1	.3	10.5	25.68	-	-	50	-24.32

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS



WORST EMISSIONS

Trace Markers

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables C2&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
13	.15225	11.13	Qp	0	0	10.1	21.23	65.88	-44.65	-	-
14	.15225	-3.49	Ca	0	0	10.1	6.61	-	-	55.88	-49.27
15	.56175	-1.88	Qp	0	.1	10.1	8.32	56	-47.68	-	-
16	.56175	-6.33	Ca	0	.1	10.1	3.87	-	-	46	-42.13
17	25.6965	17.65	Qp	.1	.3	10.5	28.55	60	-31.45	-	-
18	25.6965	15.53	Ca	.1	.3	10.5	26.43	-	-	50	-23.57
19	25.87875	18.23	Qp	.1	.3	10.5	29.13	60	-30.87	-	-
20	25.881	15.99	Ca	.1	.3	10.5	26.89	-	-	50	-23.11
21	26.61225	21.5	Qp	.1	.3	10.5	32.4	60	-27.6	-	-
22	26.61225	19.06	Ca	.1	.3	10.5	29.96	-	-	50	-20.04
23	27.16125	18.73	Qp	.1	.3	10.5	29.63	60	-30.37	-	-
24	27.1635	16.6	Ca	.1	.3	10.5	27.5	-	-	50	-22.5

Qp - Quasi-Peak detector
Ca - CISPR average detection