FCC CFR47 PART 15 SUBPART C

BLUETOOTH LOW ENERGY

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA Phone + Bluetooth, DTS/UNII a/b/g/n & ANT+

MODEL NUMBER: SM-G7108V

FCC ID: A3LSMG7108V

REPORT NUMBER: 14U16956-3, Revision B

ISSUE DATE: February 17, 2014

Prepared for

SAMSUNG ELECTRONICS CO., LTD.
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Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	2/3/14	Initial Issue	P. Kim
A	2/14/14	Updated EUT name; Page 14; Duty cycle plot; Page 6	P. Kim
B	2/17/14	Updated harmonic data	P. Kim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD. 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA
EUT DESCRIPTION:	GSM/WCDMA Phone + Bluetooth, DTS/UNII a/b/g/n & ANT+
MODEL:	SM-G7108V
SERIAL NUMBER:	FL-027-F (Radiated) FL-027-A (Conducted)
DATE TESTED:	January 27 – February 3, 2014

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:

PHILIP KIM
WiSE PROGRAM MANAGER
UL Verification Services Inc.

Tested By:

STEVEN TRAN
WiSE TEST TECHNICIAN
UL Verification Services Inc.

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2. TEST METHODOLOGY

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

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 18000 MHz	4.94 dB

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA Phone + Bluetooth, DTS/UNII a/b/g/n & ANT+

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	2.85	1.93

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

5.4. WORST-CASE CONFIGURATION AND MODE

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

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

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	Samsung	SM-G7108V	N/A	N/A
Earphone	Samsung	N/A	N/A	N/A

I/O CABLES

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

TEST SETUP

The EUT is continuously communicating to the Bluetooth tester during the tests.
EUT was set in the Hidden menu mode to enable BLE communications.

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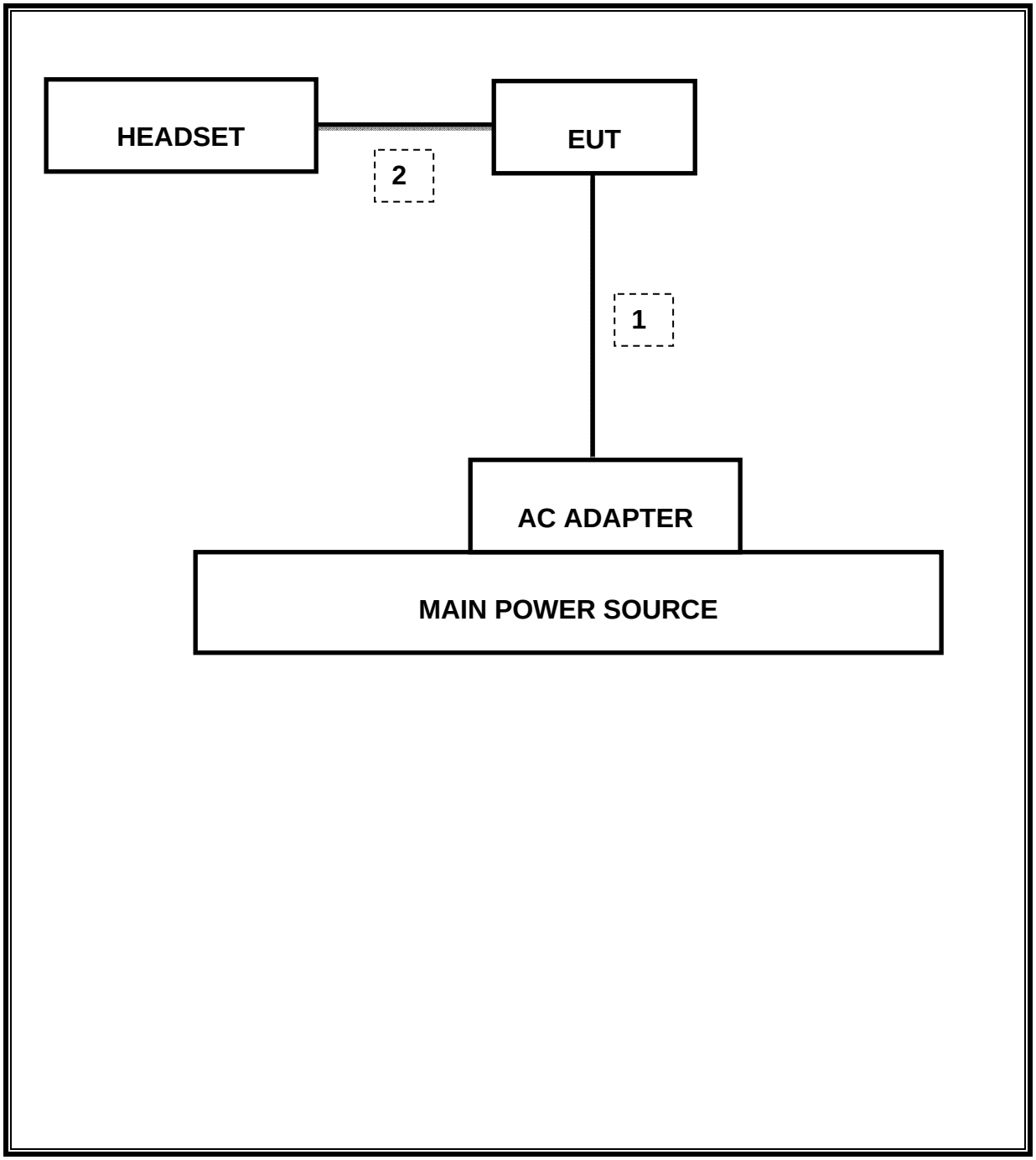
SETUP DIAGRAM FOR TESTS



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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 Date**	**Cal Due**
ntenna, Biconolog, 30MHz-1 G	Sunol Sciences	JB1	C01171	03/23/13	02/13/14
Antenna, Horn, 18GHz	EMCO	3115	C00783	10/25/13	10/25/14
Antenna, Horn, 25.5 GHz	ARA	MWH-1826/B	C00980	11/14/13	11/14/14
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	01/28/14	01/28/15
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/13	10/22/14
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/20/13	12/20/14
CBT Bluetooth Tester	R & S	CBT	None	07/12/13	07/12/14
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/13	12/13/14
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/13	12/13/14
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/14	01/14/15
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR	CNR
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/2013	12/13/2014
Peak / Average Power Sens	Agilent / HP	E9327A	C00964	12/13/2013	12/13/2014

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7. SUMMARY

8.

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
15.247 (a)(2)	RSS-210 A8.2(a)	Occupied Band width (6dB)	>500KHz	Conducted	Pass	0.7334MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-35.8dBm
15.247	RSS-210 A8.4	TX conducted output power	<30dBm		Pass	2.85dBm
15.247	RSS-210 A8.2	PSD	<8dBm		Pass	-12.40dBm
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	28.01dBuV(AV)
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	48.31dBuV/m

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ANTENNA PORT TEST RESULTS

8.1. 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.

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	0.7334	0.5
Middle	2440	0.7470	0.5
High	2480	0.7486	0.5

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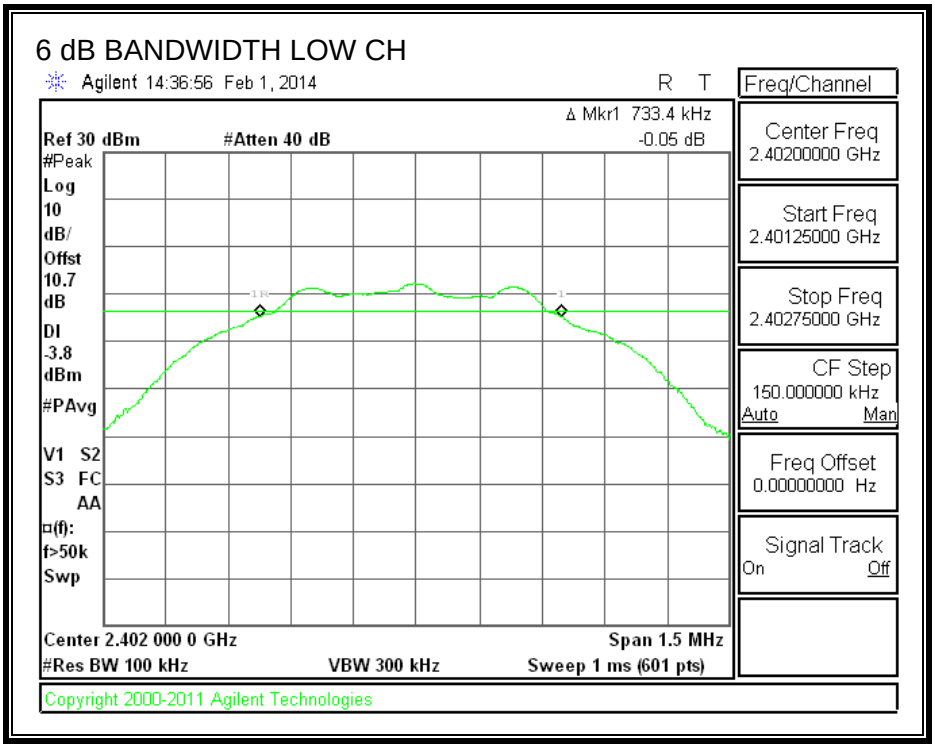
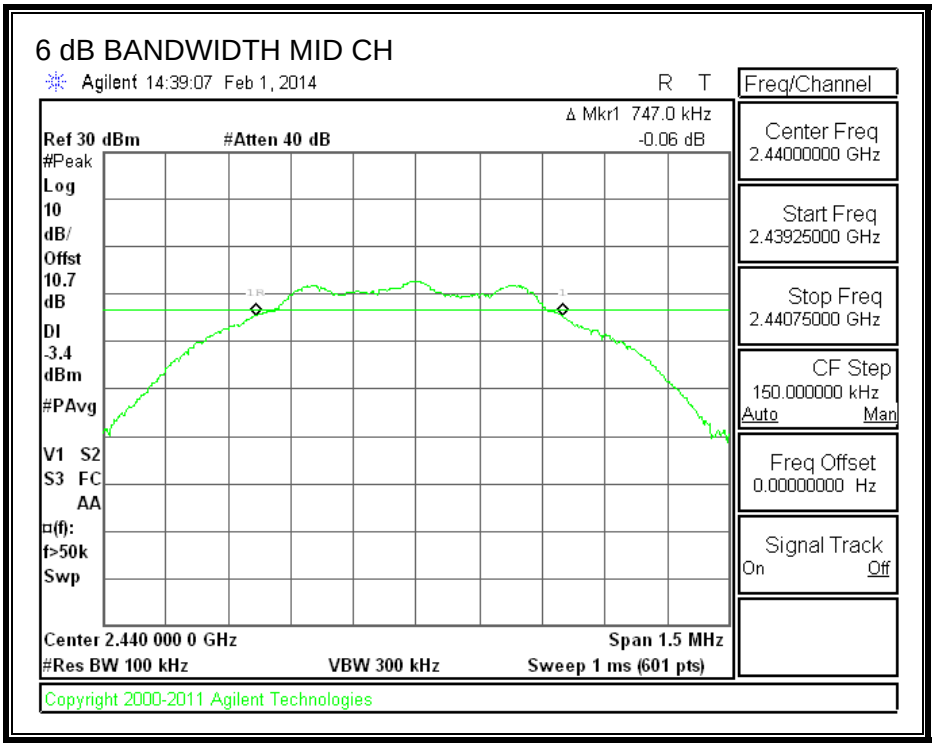
6 dB BANDWIDTH





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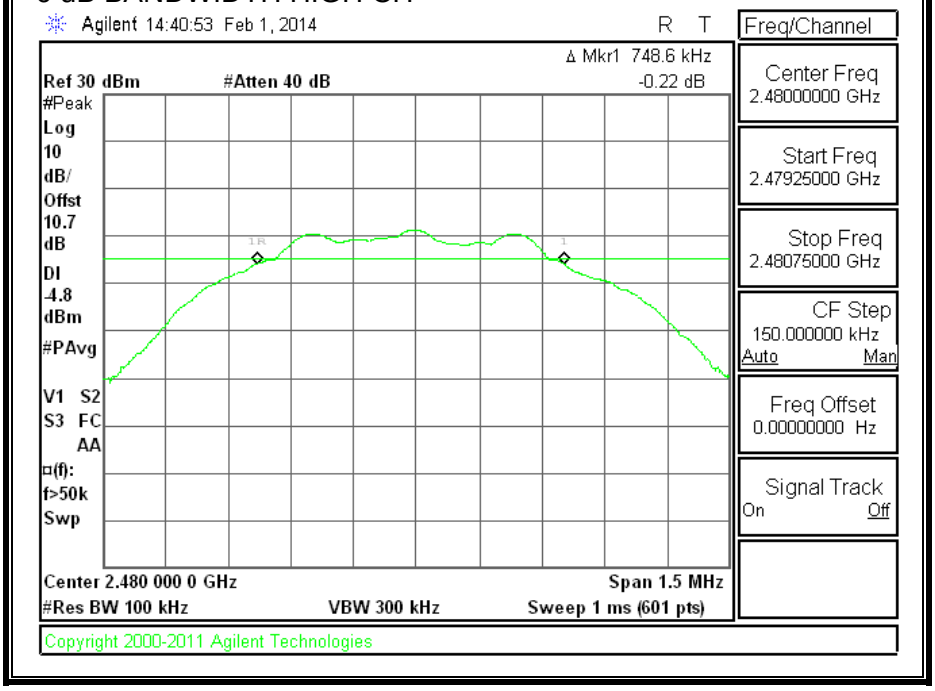
6 dB BANDWIDTH HIGH CH



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8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Reference to RSS-GEN Section 4.6.1: 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	1.0531
Middle	2440	1.0527
High	2480	1.0550

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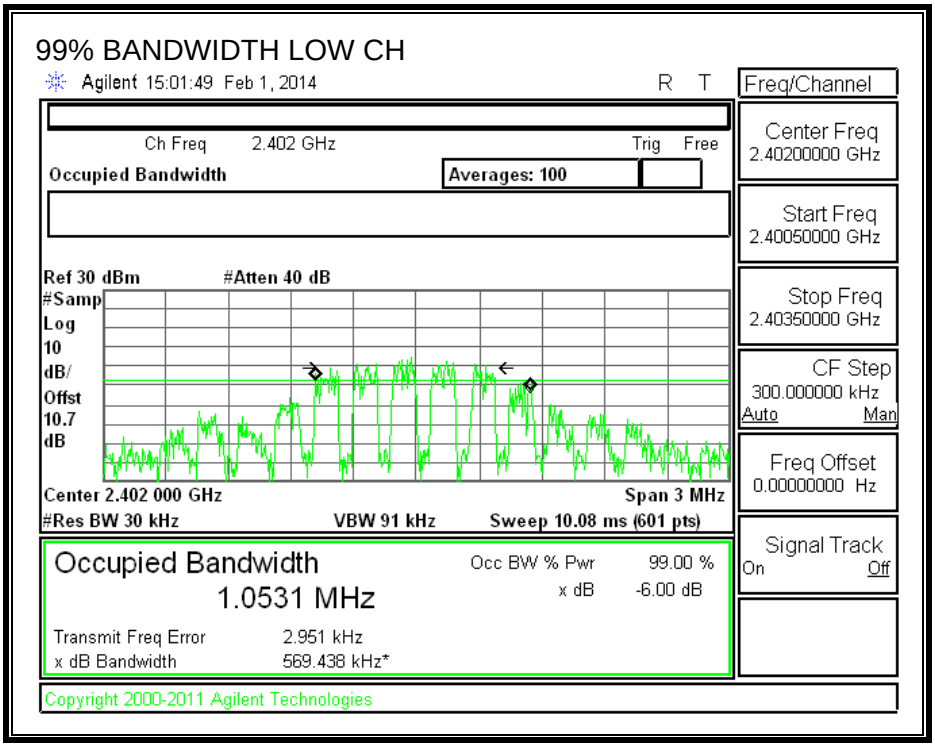
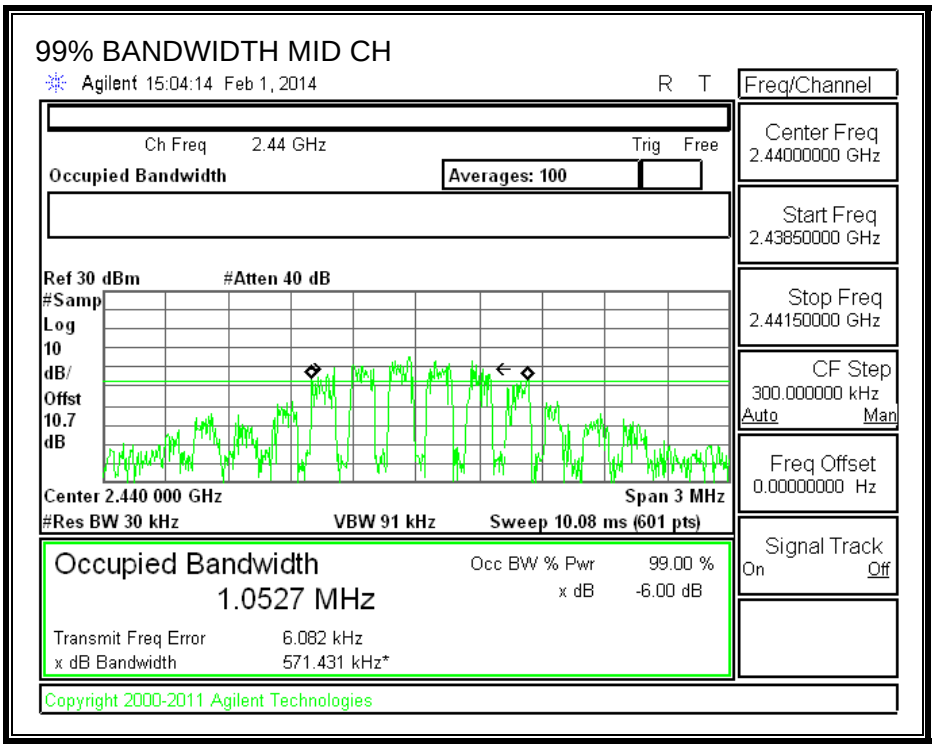
99% BANDWIDTH





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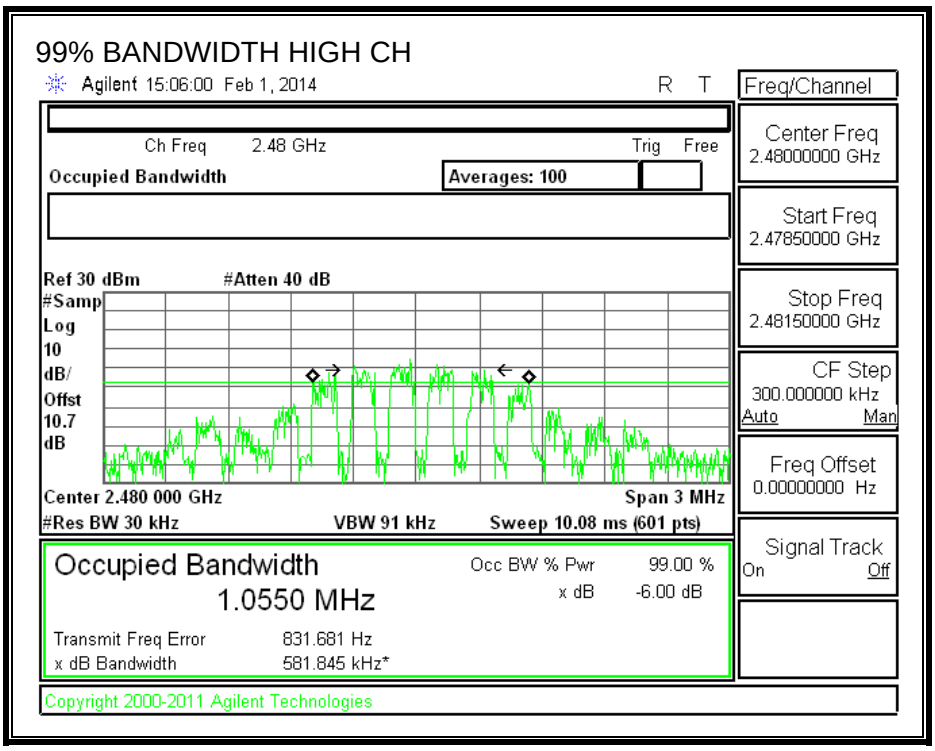

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8.3. OUTPUT POWER

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.

TEST PROCEDURE

Peak power is measured using KDB558074 D01 DTS Meas Guidance v03r01 April 9, 2013 under section 9.1.1 utilizing spectrum analyze.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	2.460	30	-27.540
Middle	2440	2.850	30	-27.150
High	2480	1.540	30	-28.460

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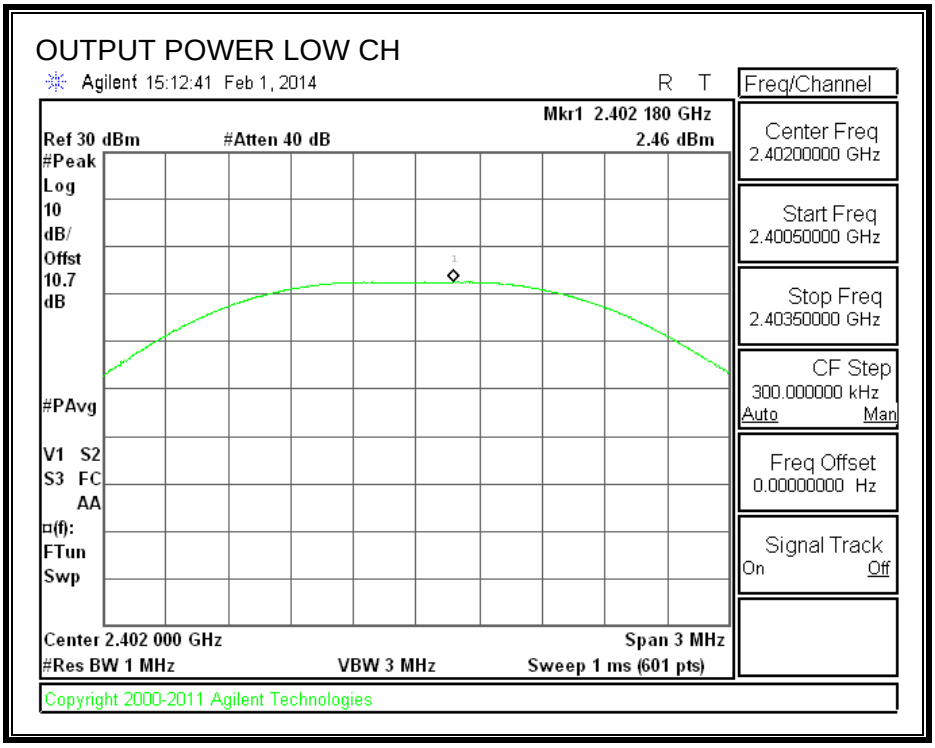
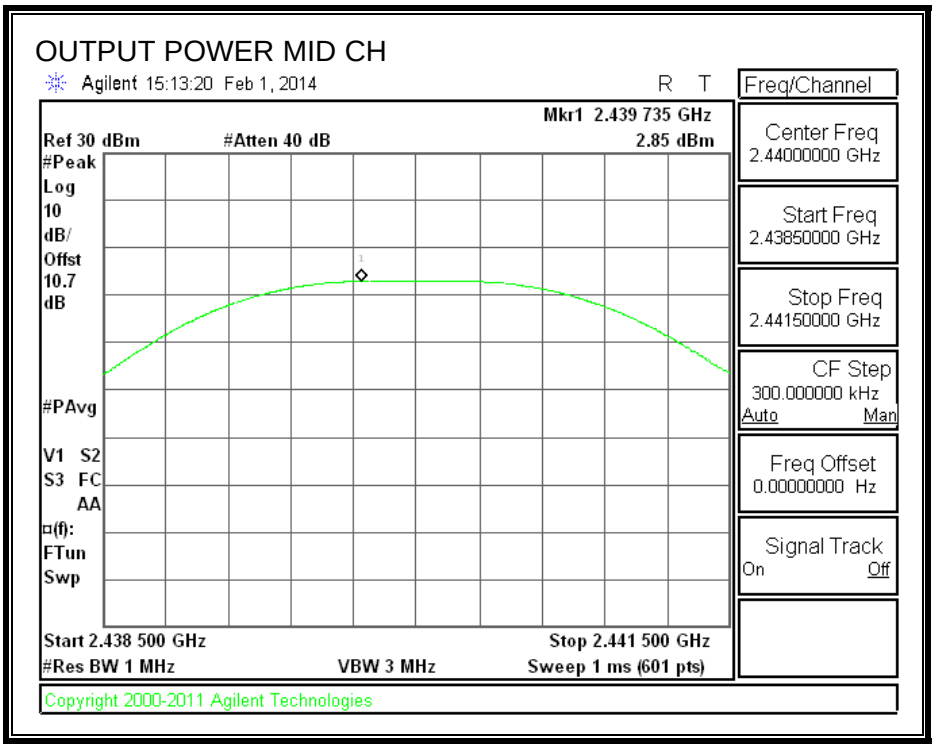
OUTPUT POWER





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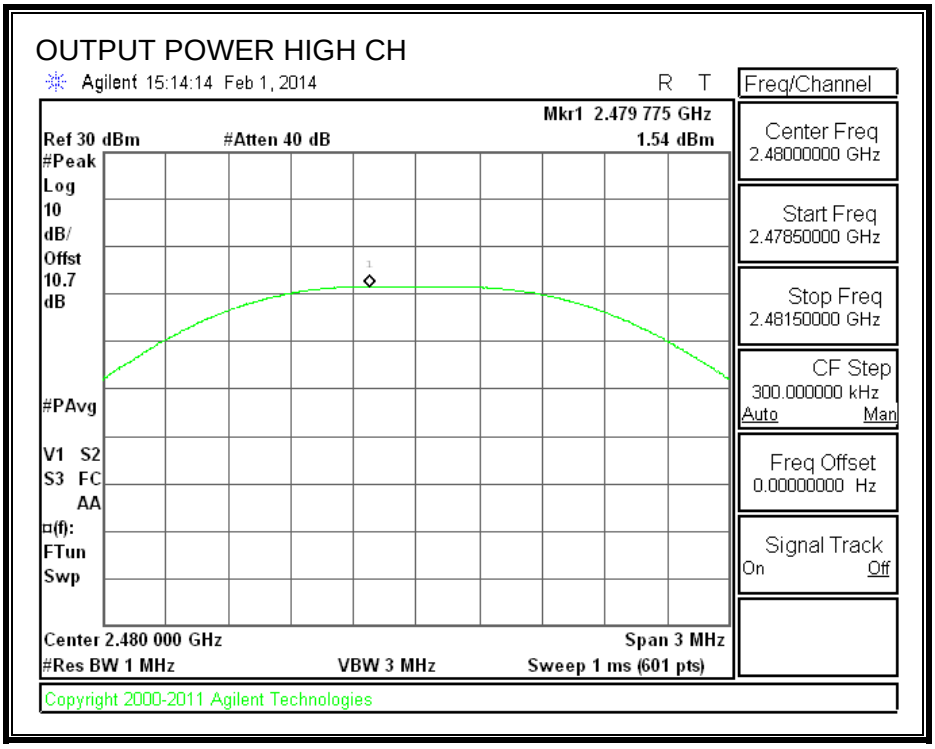
OUTPUT POWER HIGH CH



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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	1.98
Middle	2440	2.40
High	2480	1.12

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8.5. 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.

TEST PROCEDURE

Power Spectral Density was performed utilizing the “Method PKPSD (Peak PSD)” under KDB558074 D01 DTS Meas Guidance v03r01, April 9, 2013

RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-12.78	8	-20.78
Middle	2440	-12.40	8	-20.40
High	2480	-13.76	8	-21.76

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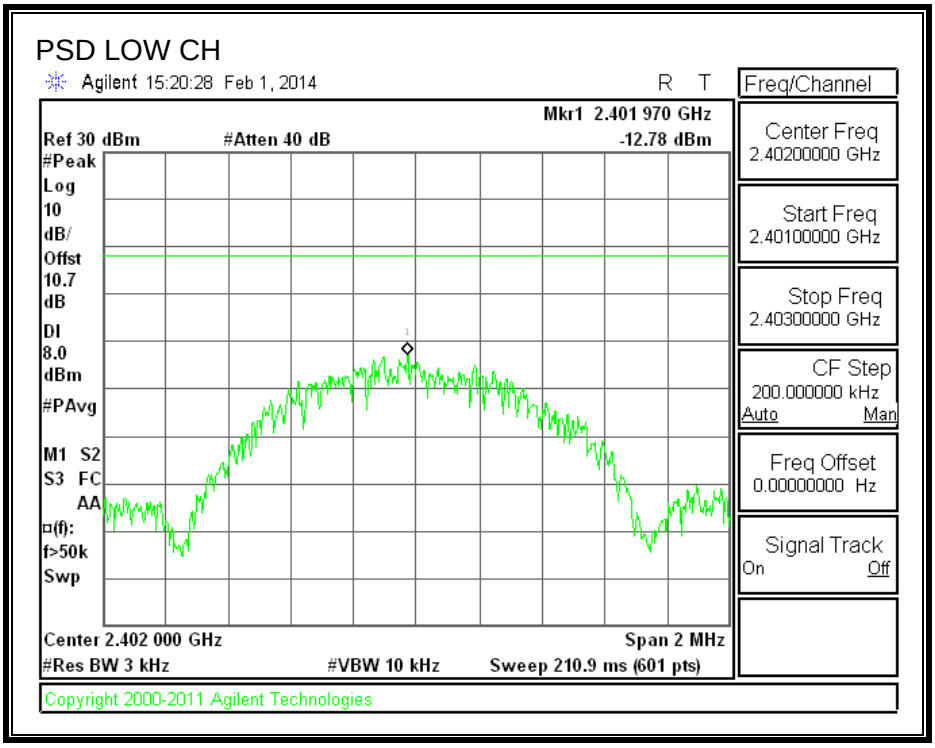
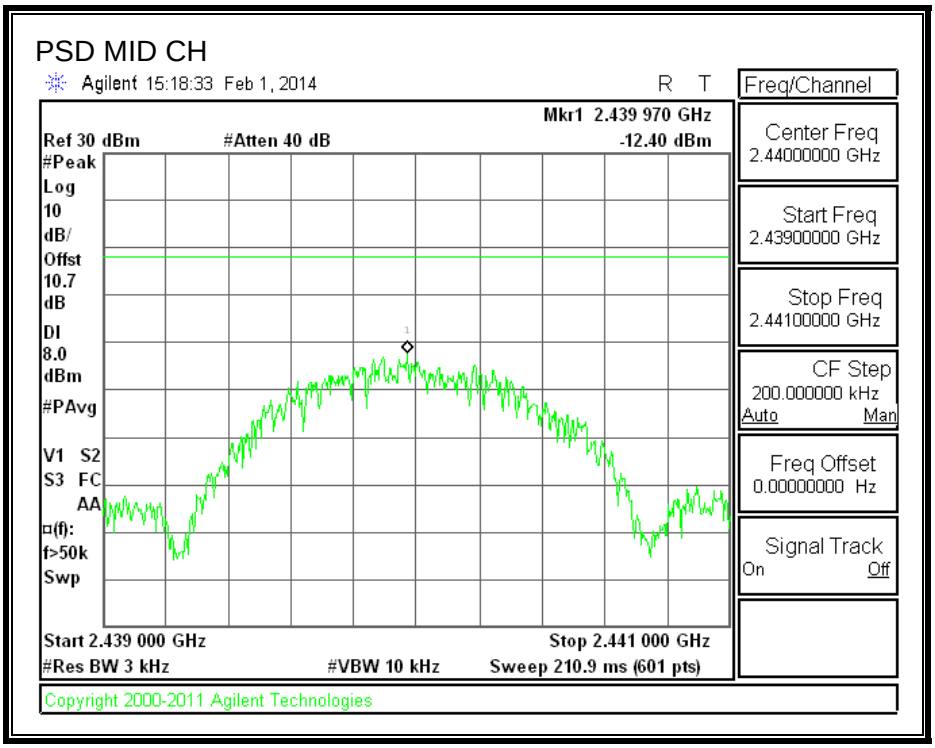
POWER SPECTRAL DENSITY





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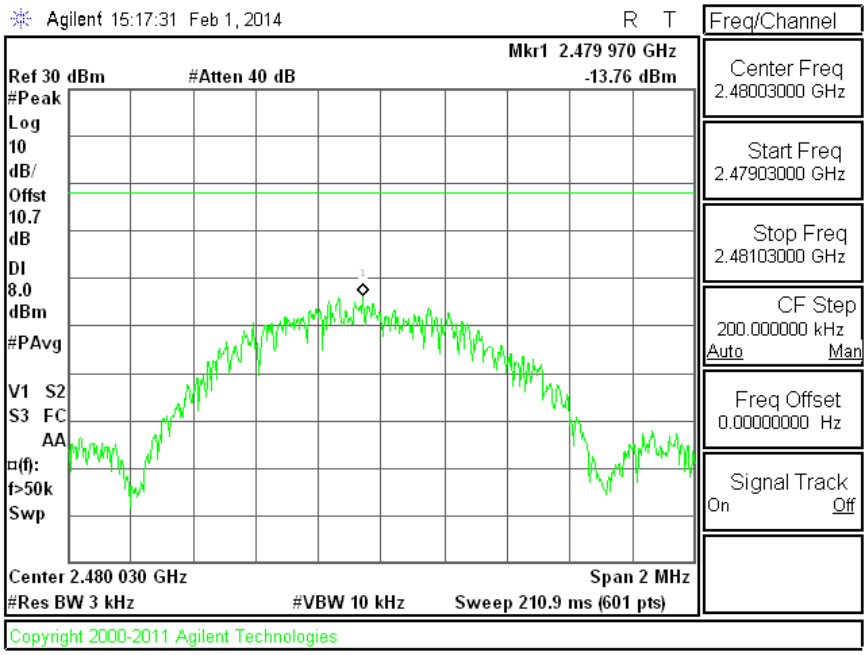
PSD HIGH CH



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8.6. 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.

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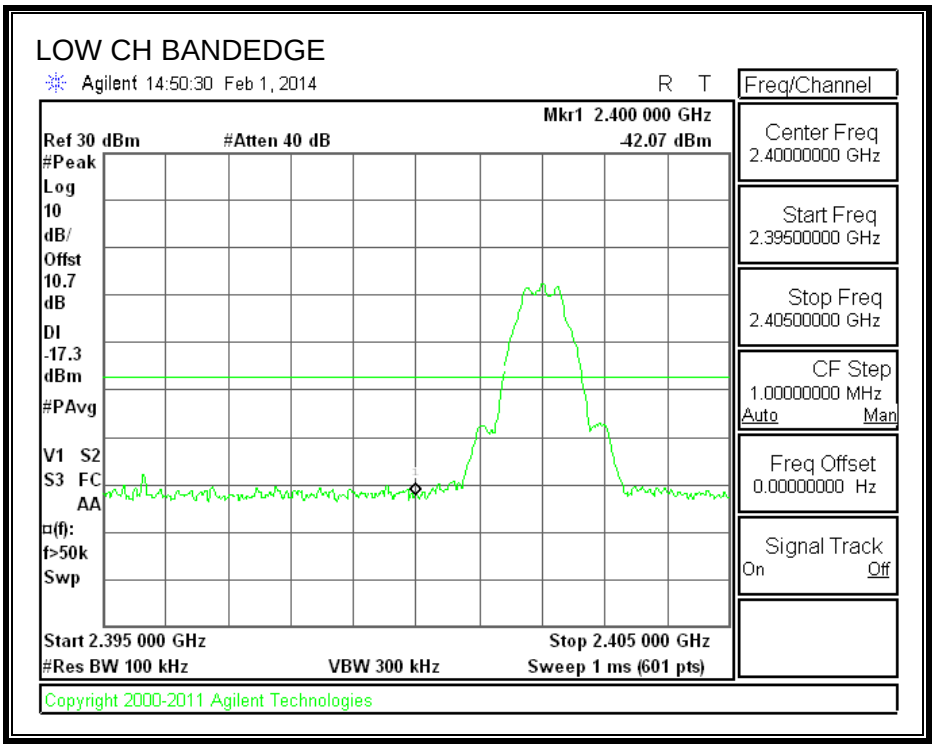
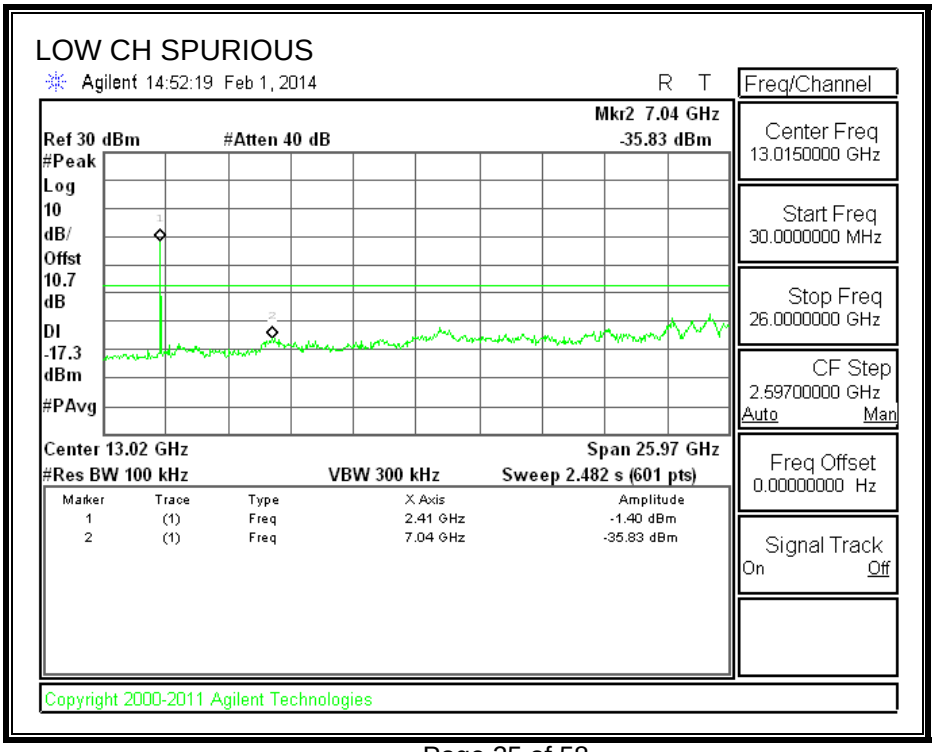
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL





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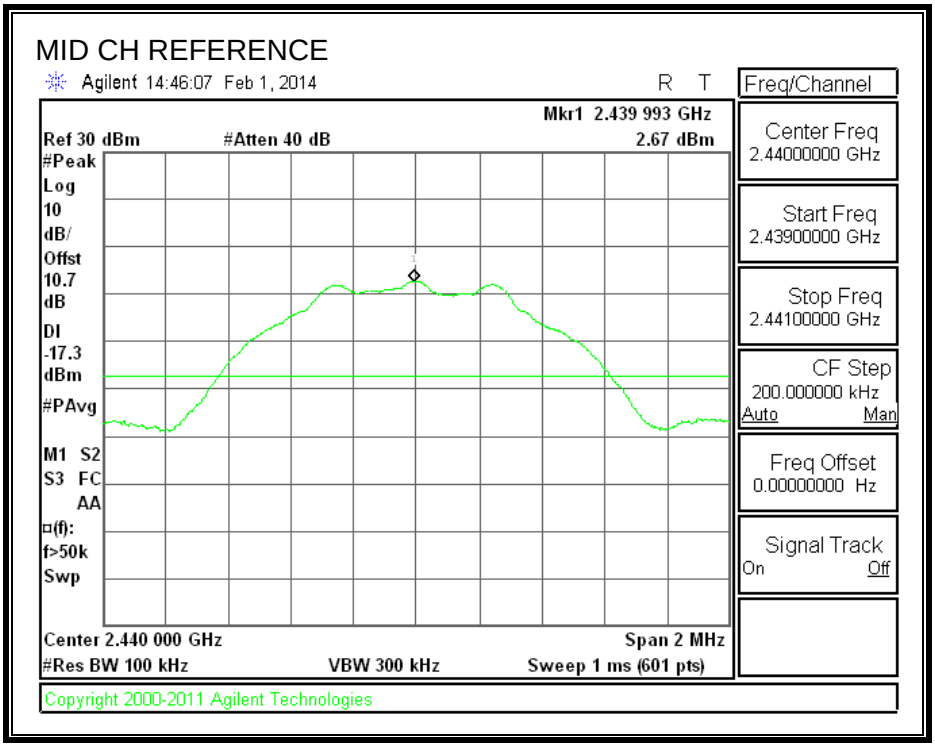
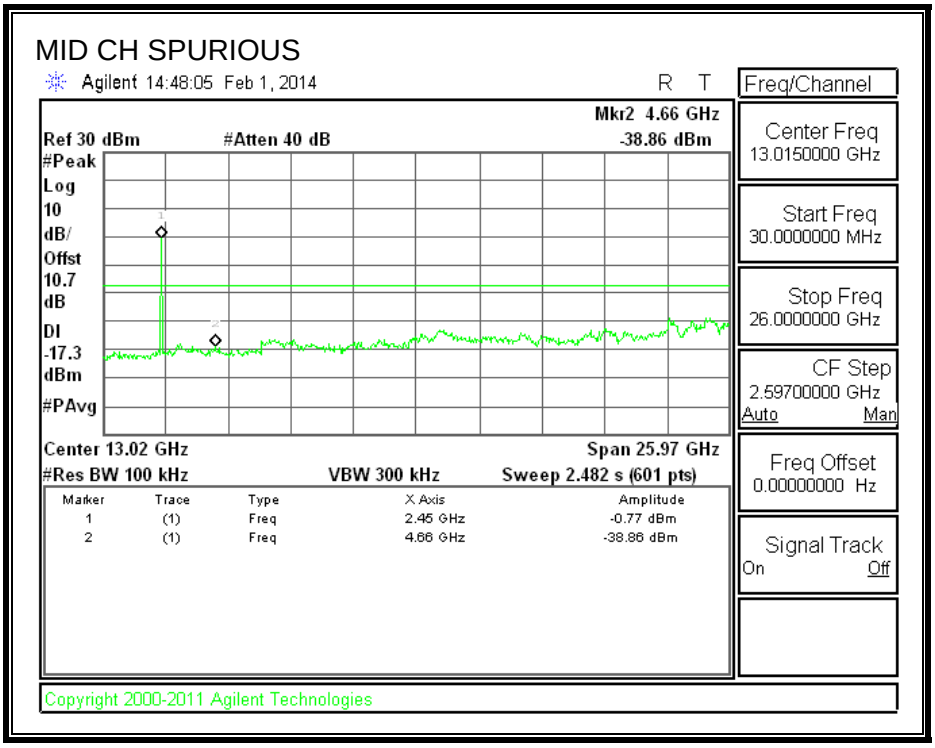
SPURIOUS EMISSIONS, MID CHANNEL





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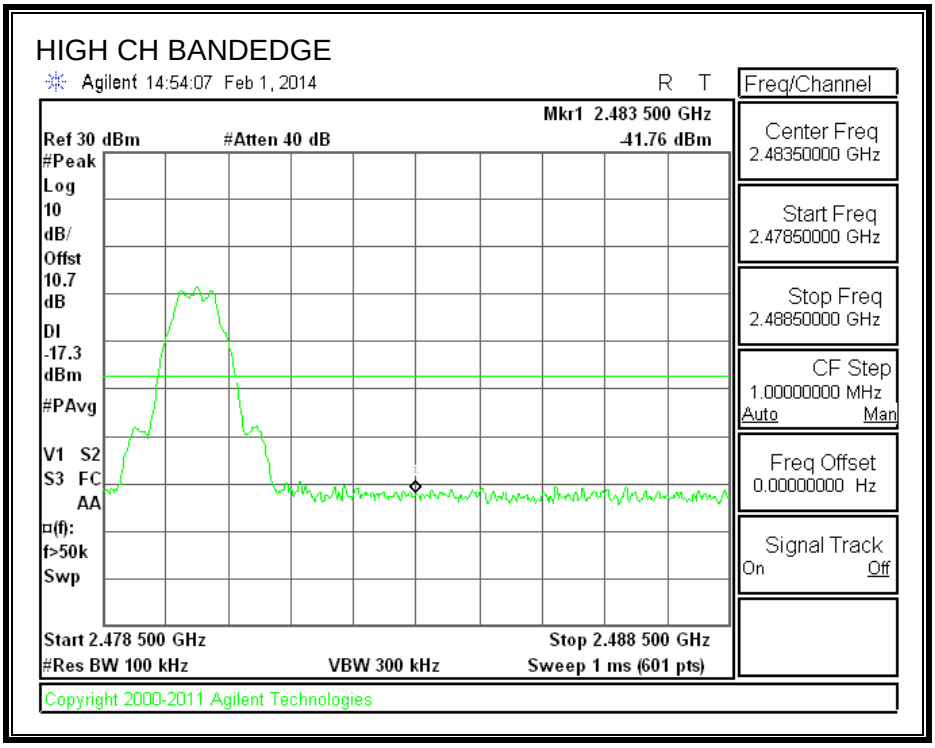
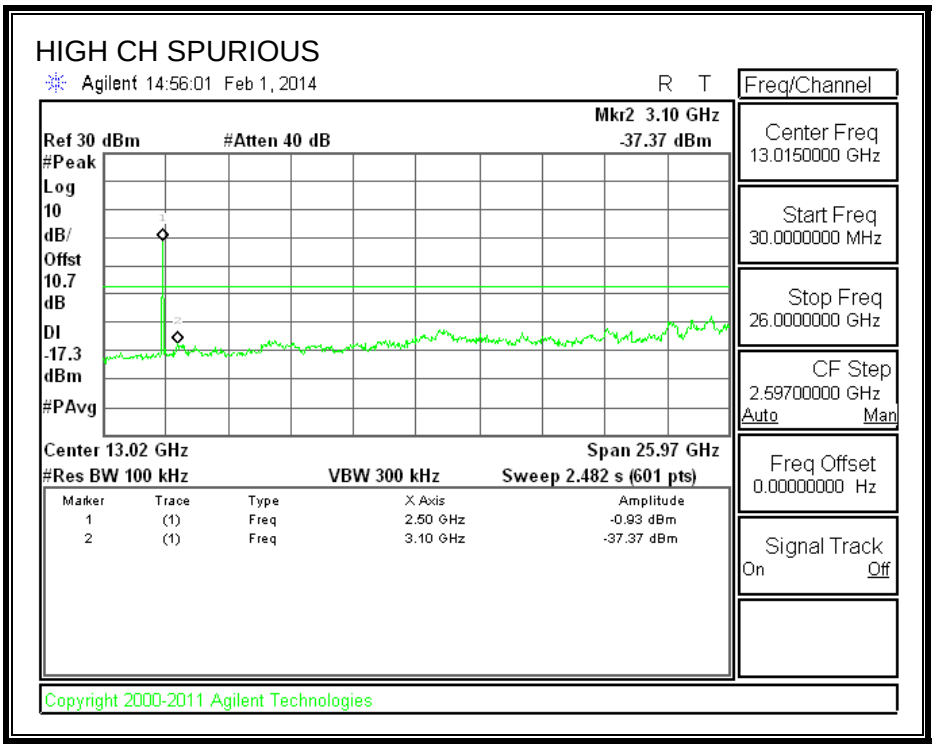
SPURIOUS EMISSIONS, HIGH CHANNEL





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9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (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 - 2009. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor = 10 log (1/x). For this sample: DCF =2dB

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

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

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

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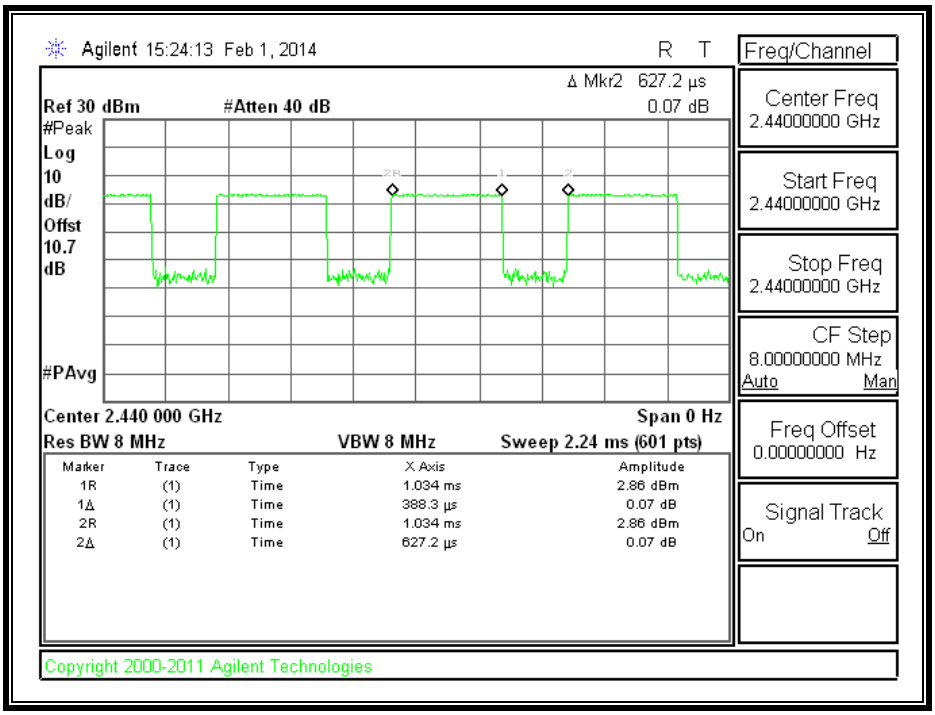
Duty cycle plot



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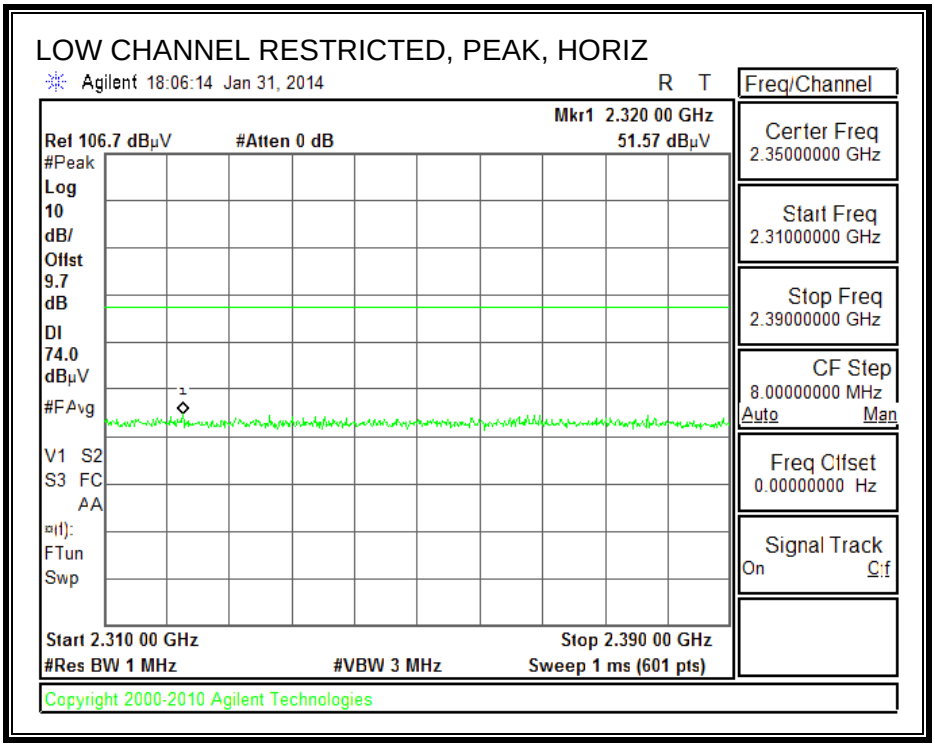
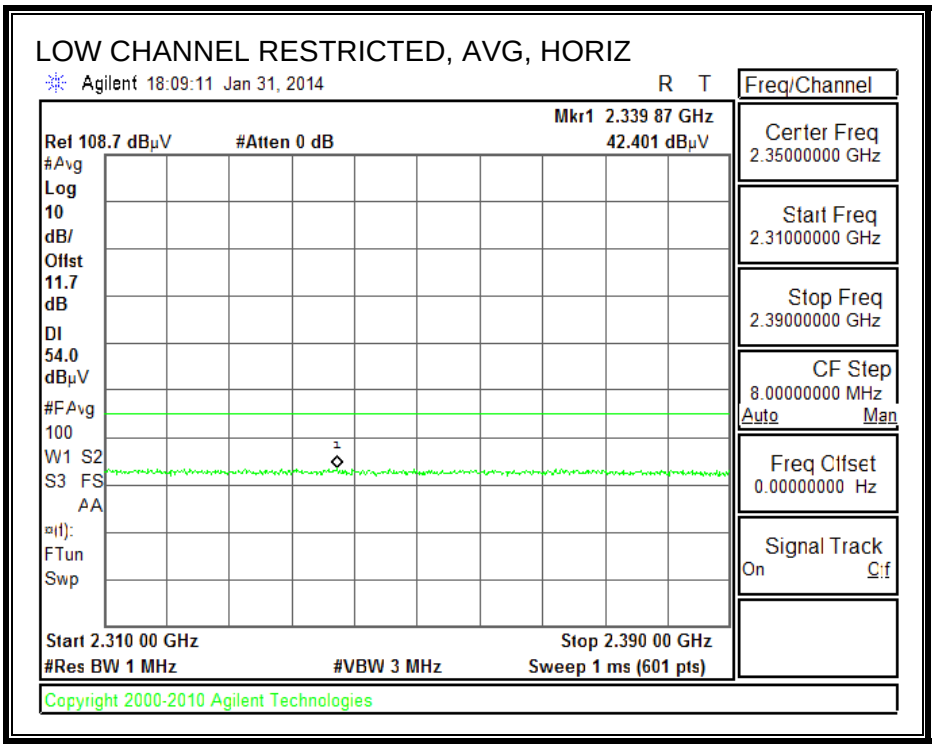
9.2. TRANSMITTER ABOVE 1 GHz

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)





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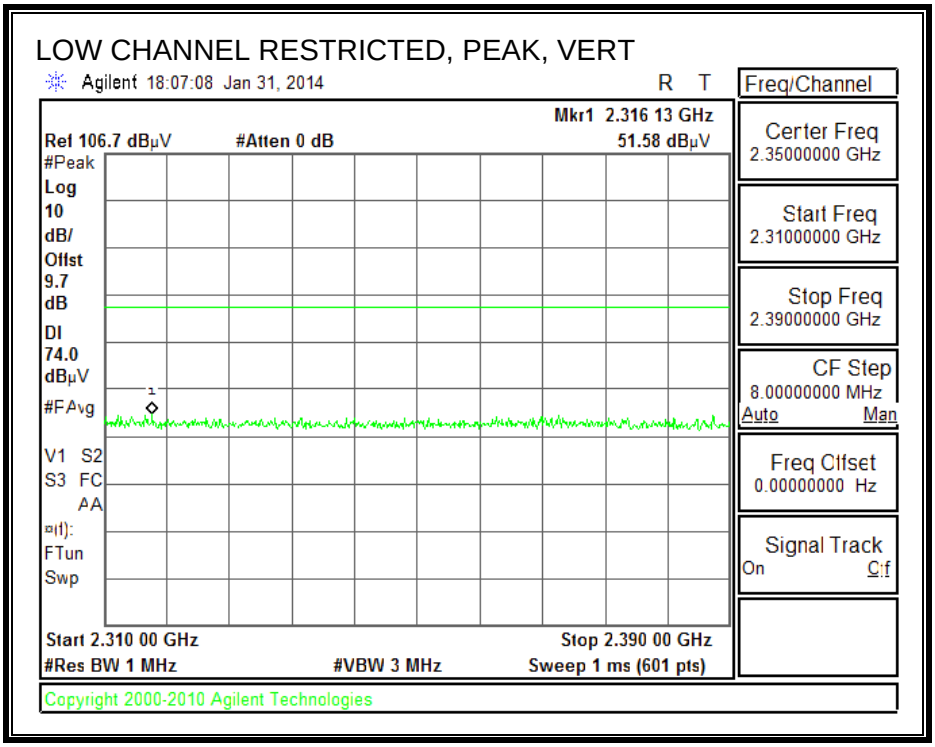
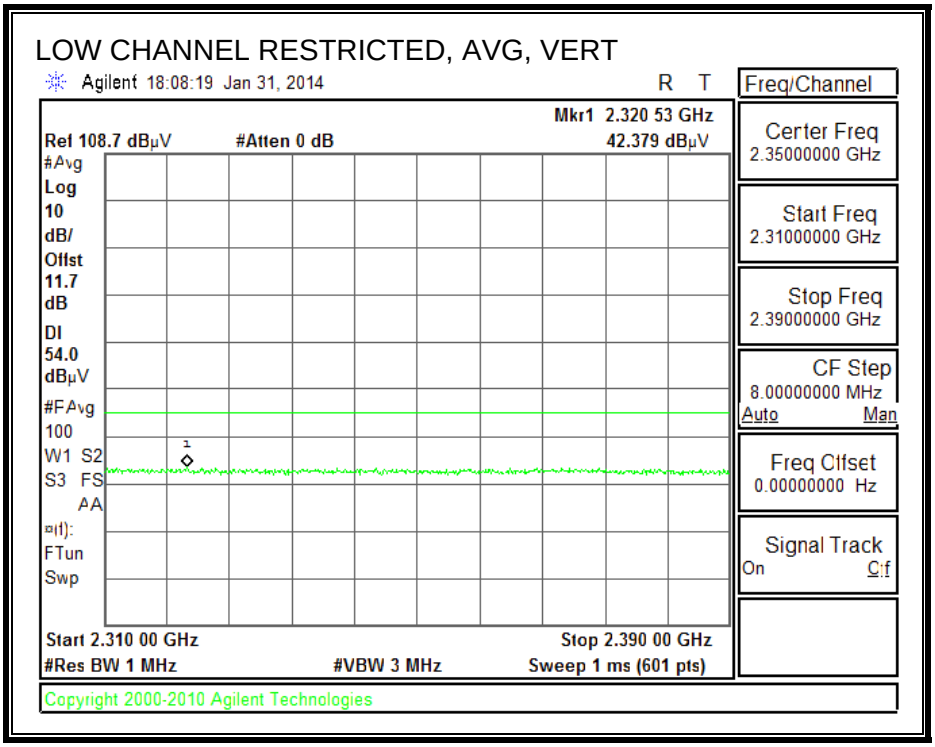
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)





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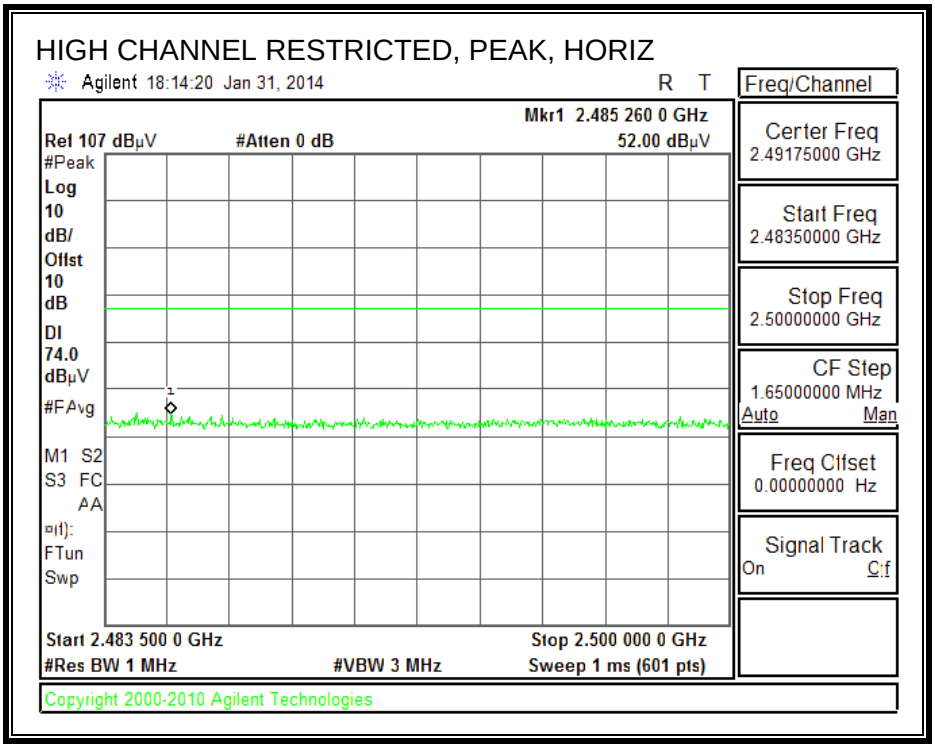
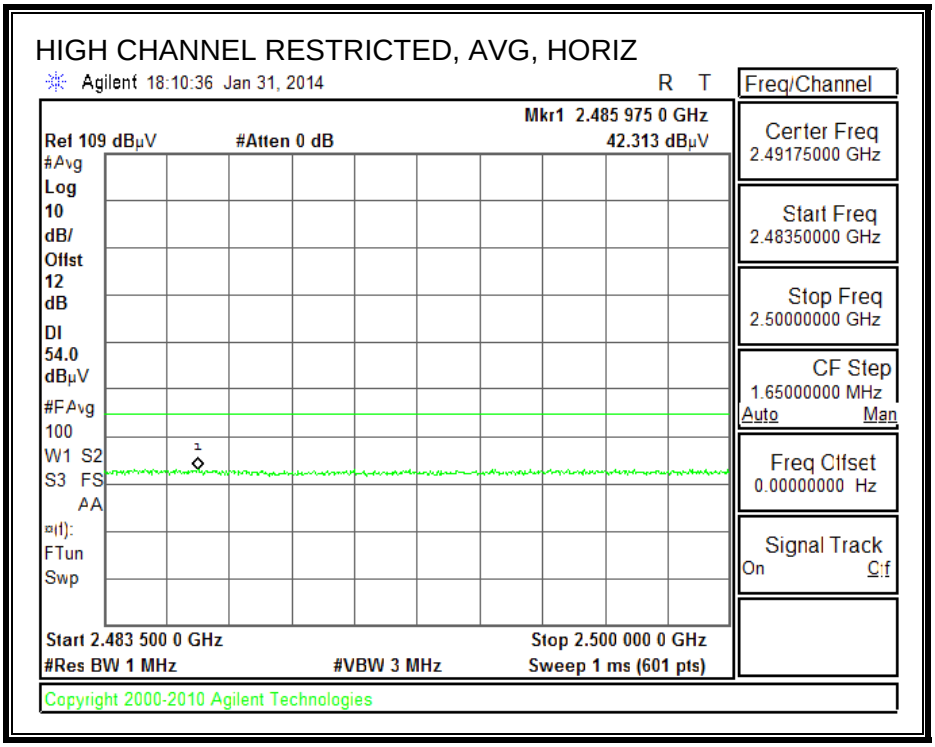
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





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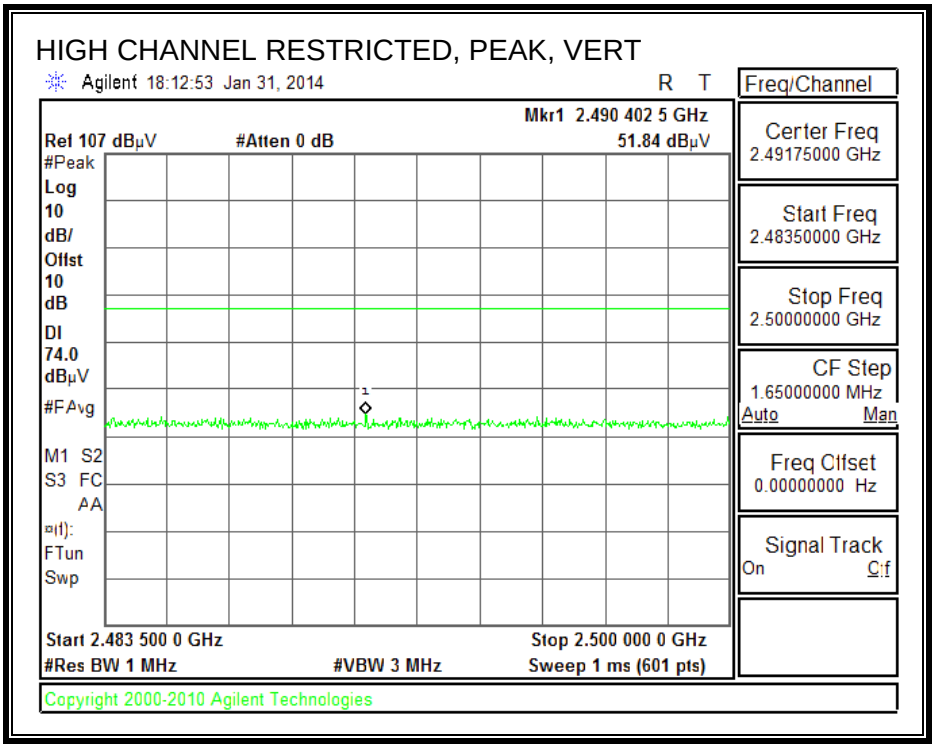
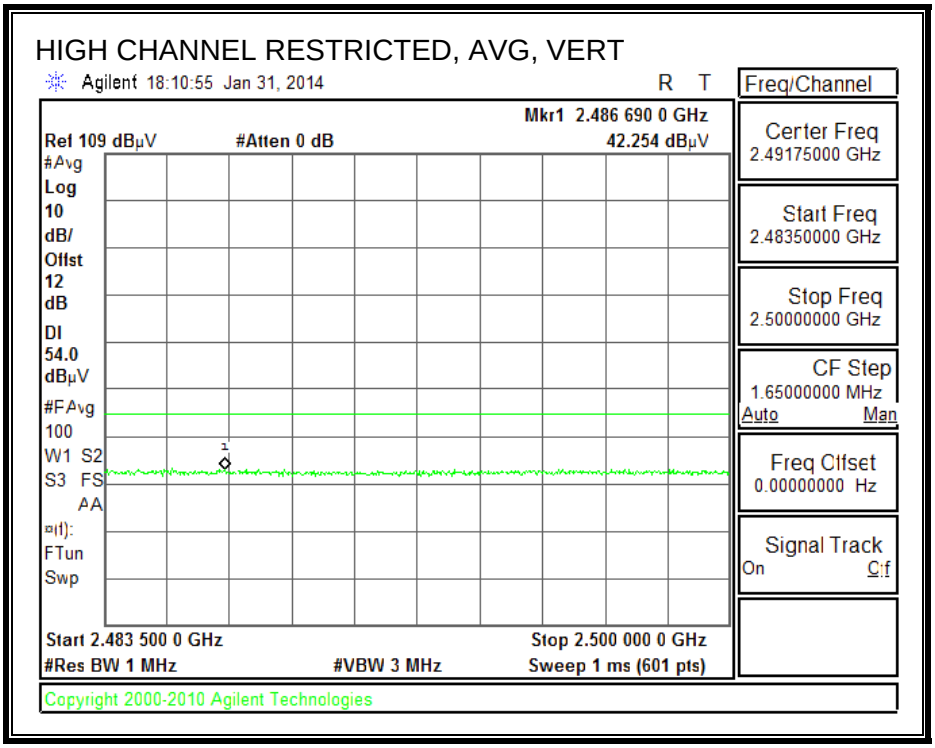
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





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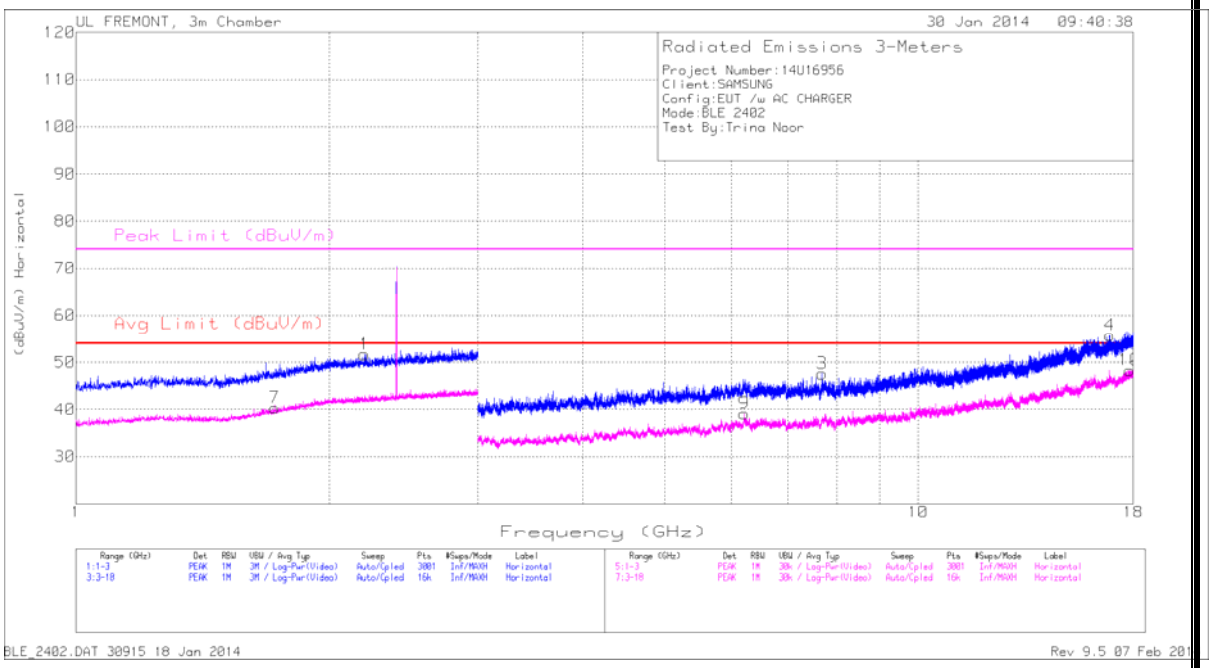
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL
HORIZONTAL



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

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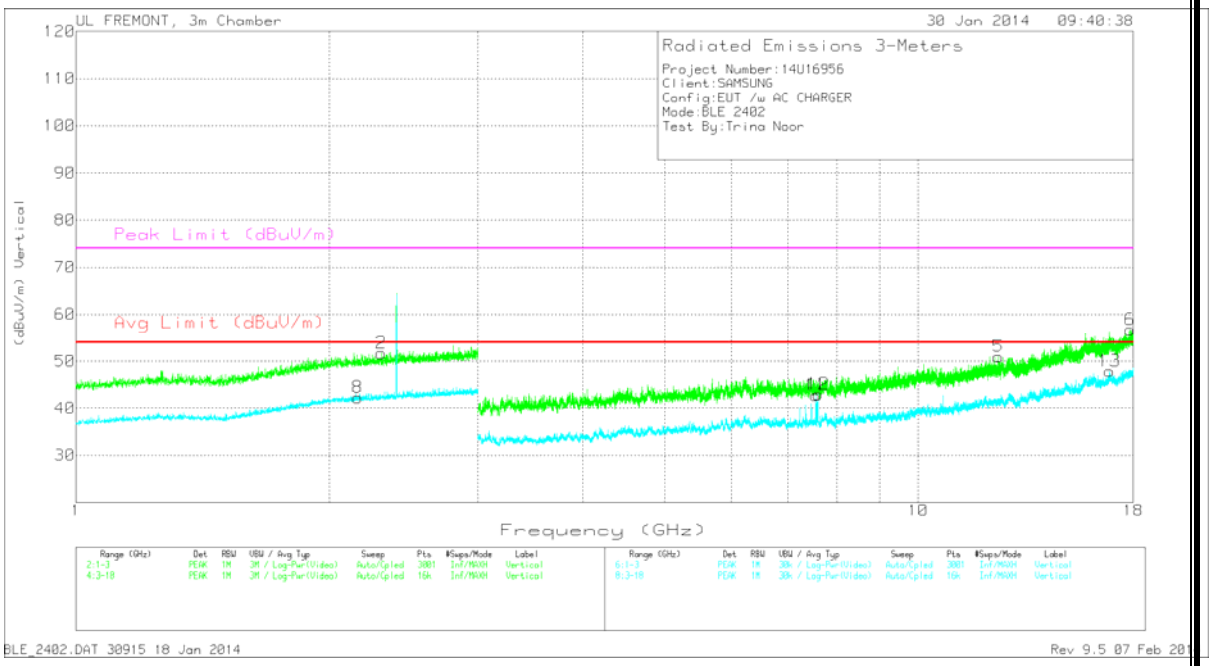
VERTICAL



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

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LOW CHANNEL DATA
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
7	1.722	34.15	Avg	29.9	-23.7	40.35	54	-13.65	-	-	0-360	201	H
8	2.161	33.46	Avg	32	-23.2	42.26	54	-11.74	-	-	0-360	99	V
1	2.2	42.89	PK	32	-23.2	51.69	-	-	74	-22.31	0-360	202	H
2	2.305	42.51	PK	32.2	-23	51.71	-	-	74	-22.29	0-360	202	V
9	6.215	30.95	Avg	36	-27.8	39.15	54	-14.85	-	-	0-360	99	H
11	7.553	34.04	Avg	36	-27.3	42.74	54	-11.26	-	-	0-360	202	V
12	7.606	34.24	Avg	36.1	-27.4	42.94	54	-11.06	-	-	0-360	202	V
3	7.688	38.09	PK	36.2	-26.7	47.59	-	-	74	-26.41	0-360	99	H
5	12.449	34.28	PK	39.2	-22.5	50.98	-	-	74	-23.02	0-360	99	V
13	16.869	25.1	Avg	41.6	-18.8	47.9	54	-6.1	-	-	0-360	99	V
4	16.881	33.36	PK	41.5	-19.1	55.76	-	-	74	-18.24	0-360	99	H
10	17.829	24.61	Avg	42.2	-18.5	48.31	54	-5.69	-	-	0-360	99	H
6	17.835	33.14	PK	42.2	-18.6	56.74	-	-	74	-17.26	0-360	99	V

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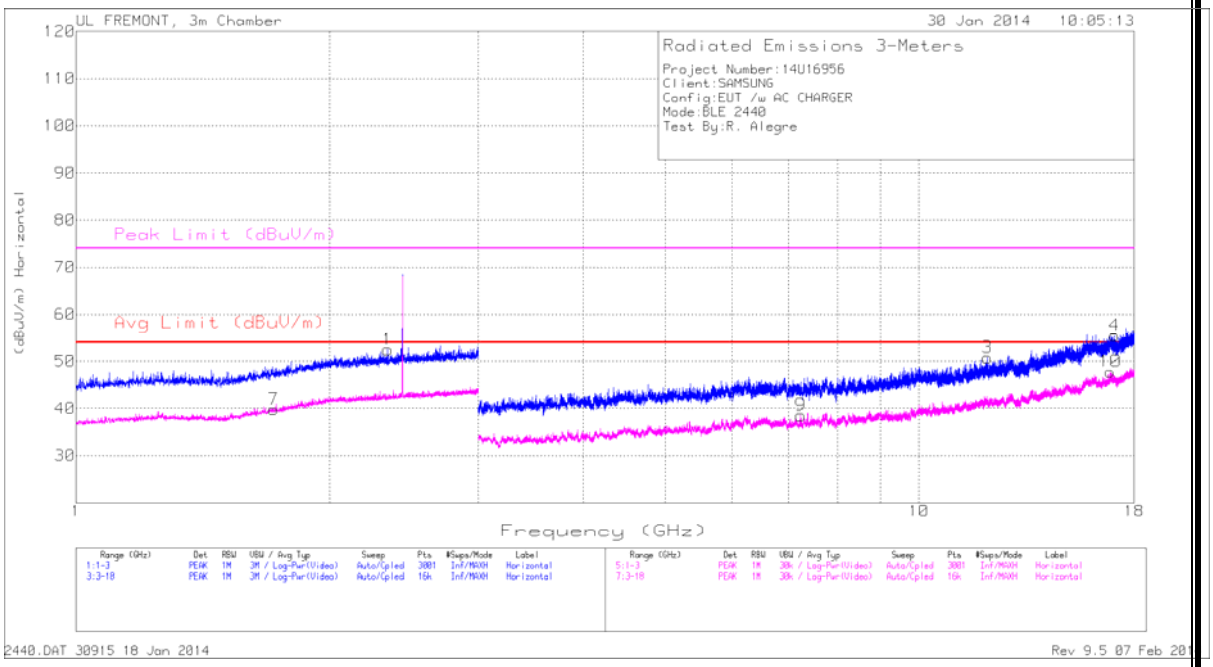
MID CHANNEL

HORIZONTAL



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

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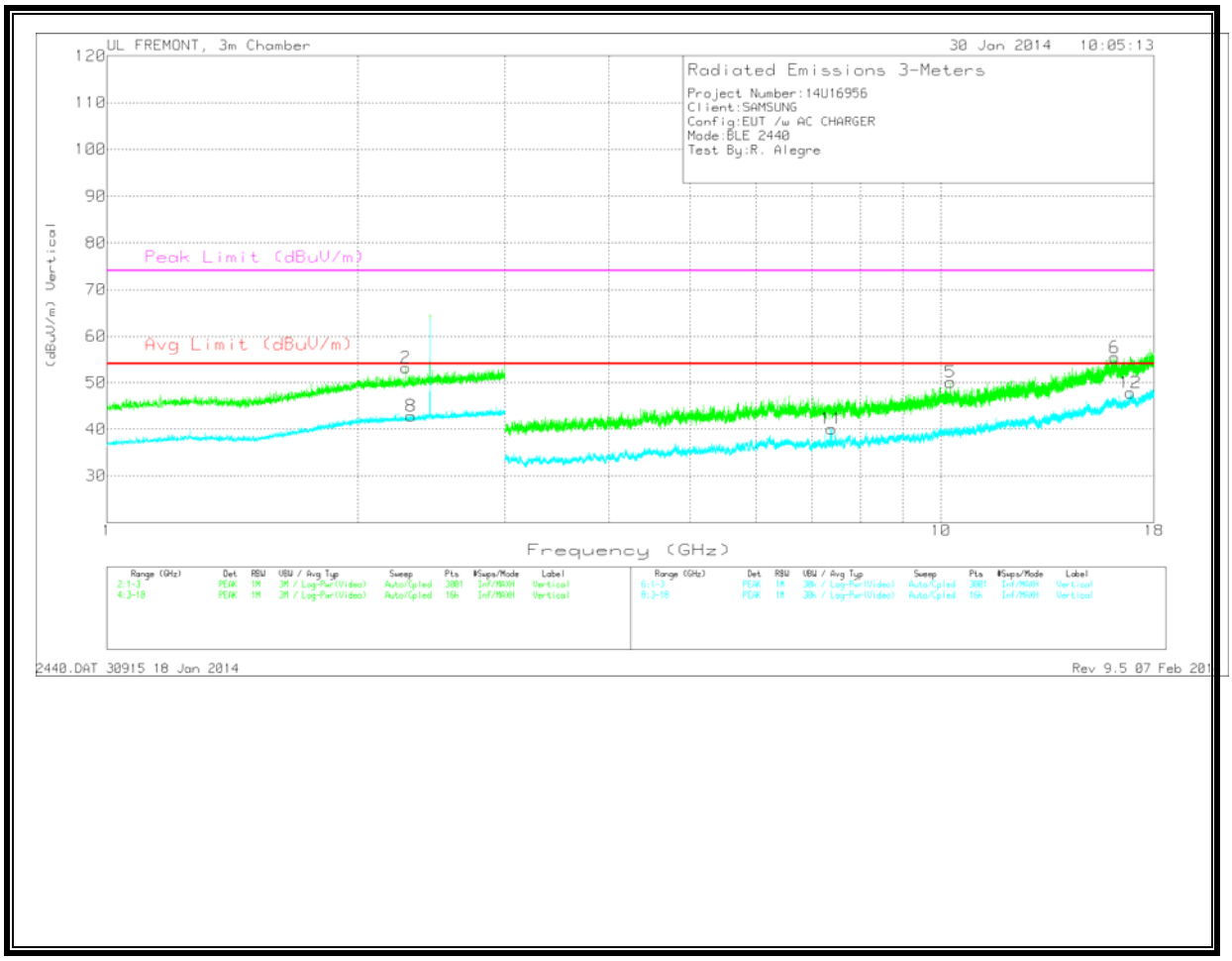
VERTICAL



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

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MID CHANNEL DATA

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
7	1.716	33.68	Avg	29.8	-23.7	39.78	54	-14.22	-	-	0-360	99	H
2	2.283	44.09	PK	32.2	-23.1	53.19	-	-	74	-20.81	0-360	99	V
8	2.315	33.61	Avg	32.2	-23	42.81	54	-11.19	-	-	0-360	202	V
1	2.343	43.28	PK	32.2	-23	52.48	-	-	74	-21.52	0-360	201	H
9	7.24	30.13	Avg	35.8	-27.4	38.53	54	-15.47	-	-	0-360	99	H
11	7.394	31.6	Avg	35.9	-27.4	40.1	54	-13.9	-	-	0-360	99	V
5	10.264	35.67	PK	38	-23.6	50.07	-	-	74	-23.93	0-360	99	V
3	12.051	34.26	PK	39.2	-22.7	50.76	-	-	74	-23.24	0-360	202	H
6	16.156	33.7	PK	41.5	-19.8	55.4	-	-	74	-18.6	0-360	202	V
10	16.864	25	Avg	41.6	-18.8	47.8	54	-6.2	-	-	0-360	202	H
12	16.865	25.02	Avg	41.6	-18.8	47.82	54	-6.18	-	-	0-360	202	V
4	17.068	33.52	PK	41.5	-19.5	55.52	-	-	74	-18.48	0-360	202	H

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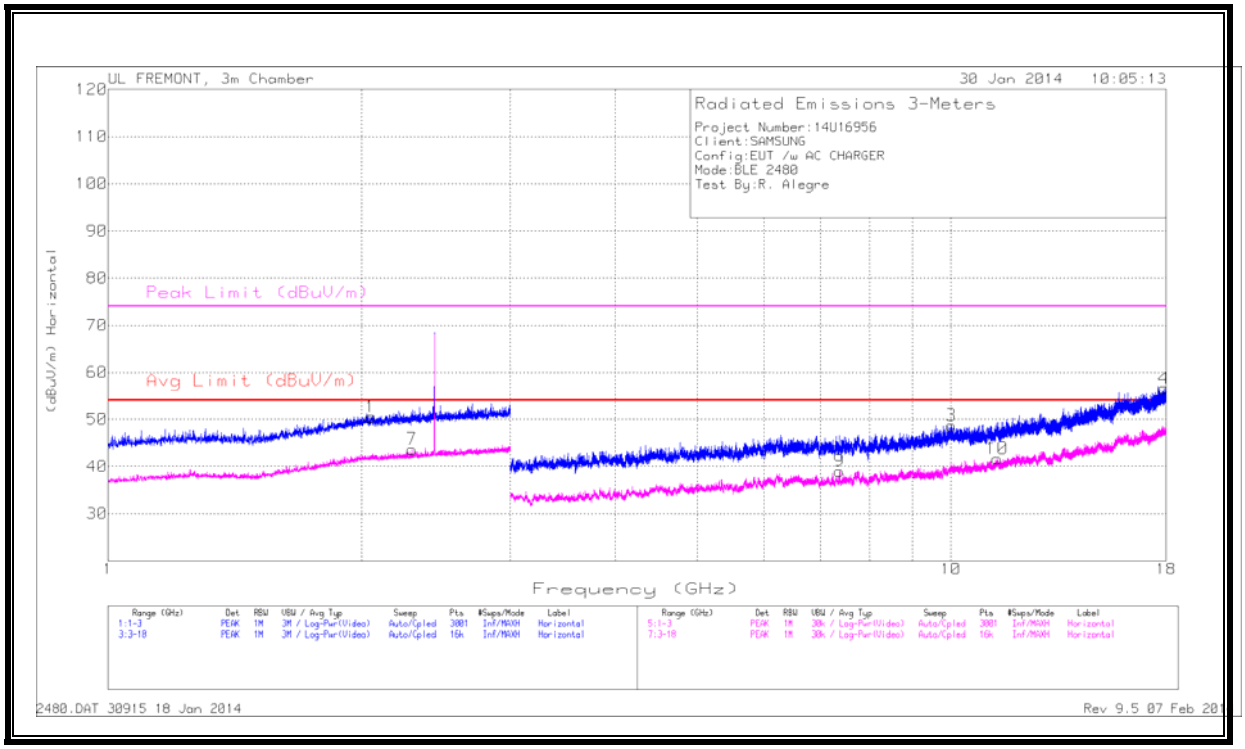
HIGH CHANNEL
HORIZONTAL



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

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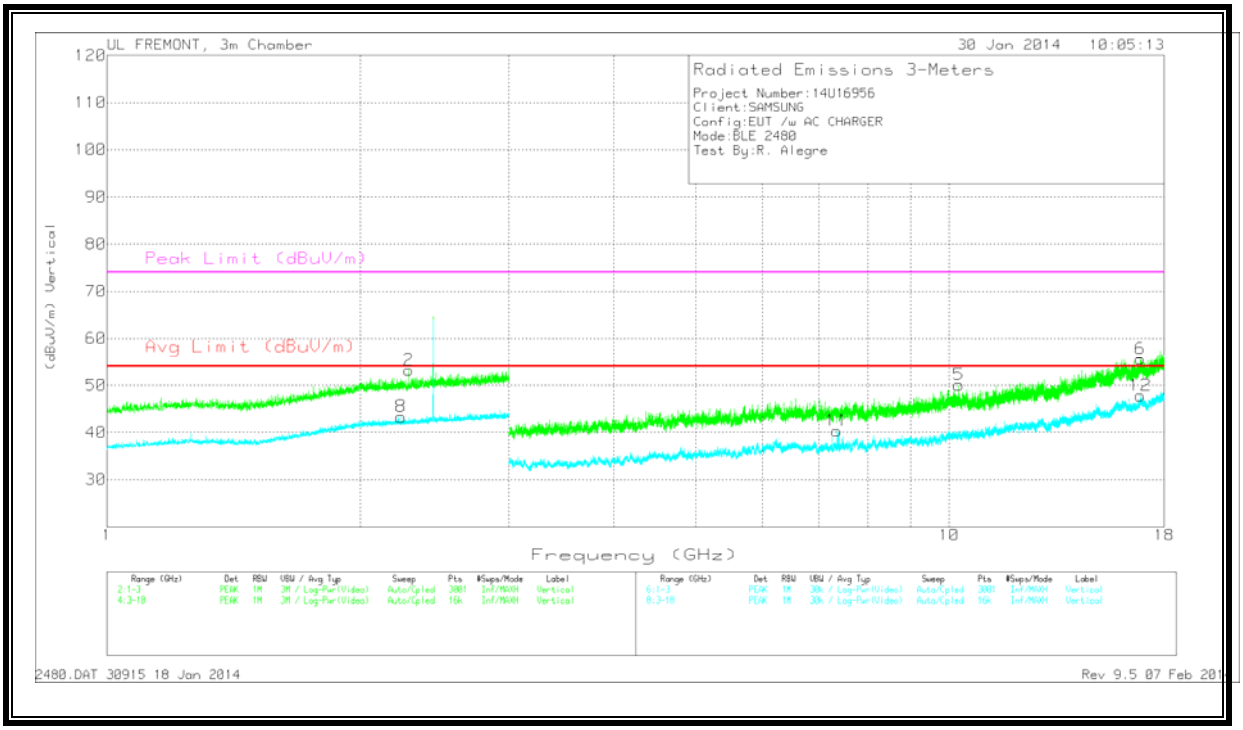
VERTICAL



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

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HIGH CHANNEL DATA
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.049	42.07	PK	31.9	-23.5	50.47	-	-	74	-23.53	0-360	201	H
8	2.235	34.32	Avg	32.1	-23.1	43.32	54	-10.68	-	-	0-360	202	V
2	2.283	44.09	PK	32.2	-23.1	53.19	-	-	74	-20.81	0-360	99	V
7	2.295	34.51	Avg	32.2	-23.1	43.61	54	-10.39	-	-	0-360	99	H
11	7.355	32.45	Avg	35.9	-28	40.35	54	-13.65	-	-	0-360	202	V
9	7.371	30.92	Avg	35.9	-27.8	39.02	54	-14.98	-	-	0-360	99	H
3	10.018	34.95	PK	37.8	-24.1	48.65	-	-	74	-25.35	0-360	99	H
5	10.264	35.67	PK	38	-23.6	50.07	-	-	74	-23.93	0-360	99	V
10	11.346	25.63	Avg	38.6	-22.6	41.63	54	-12.37	-	-	0-360	202	H
6	16.854	33.14	PK	41.6	-19.1	55.64	-	-	74	-18.36	0-360	202	V
12	16.865	25.02	Avg	41.6	-18.8	47.82	54	-6.18	-	-	0-360	202	V
4	17.89	32.98	PK	42.2	-18.6	56.58	-	-	74	-17.42	0-360	202	H

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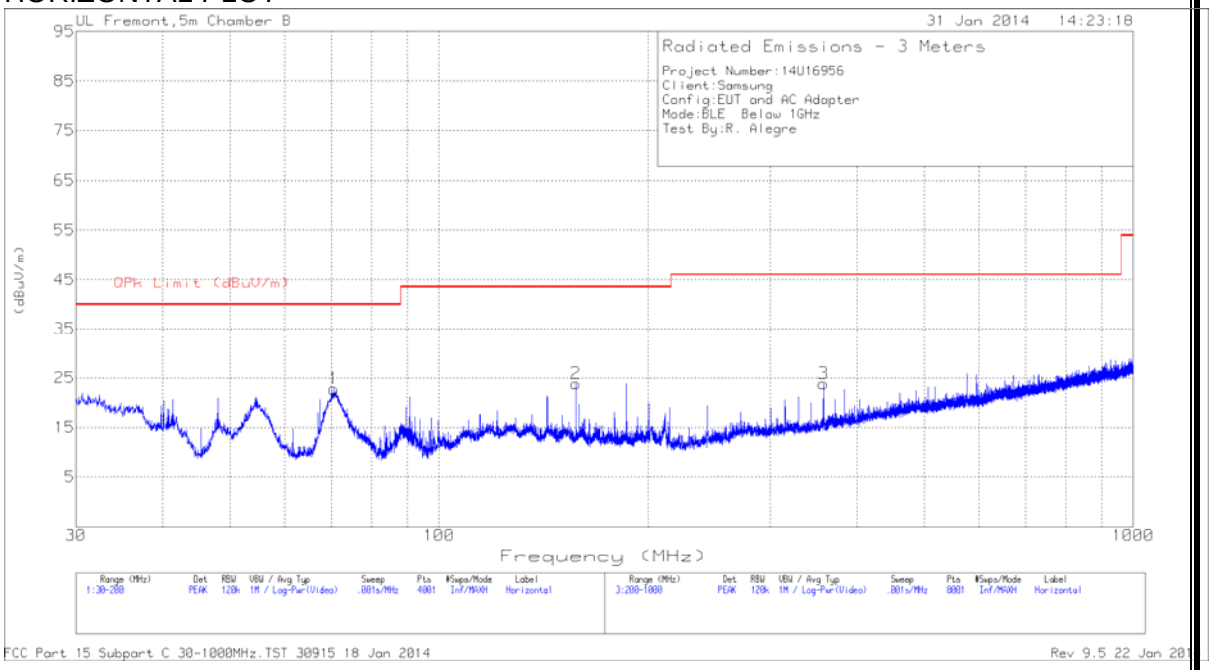
9.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



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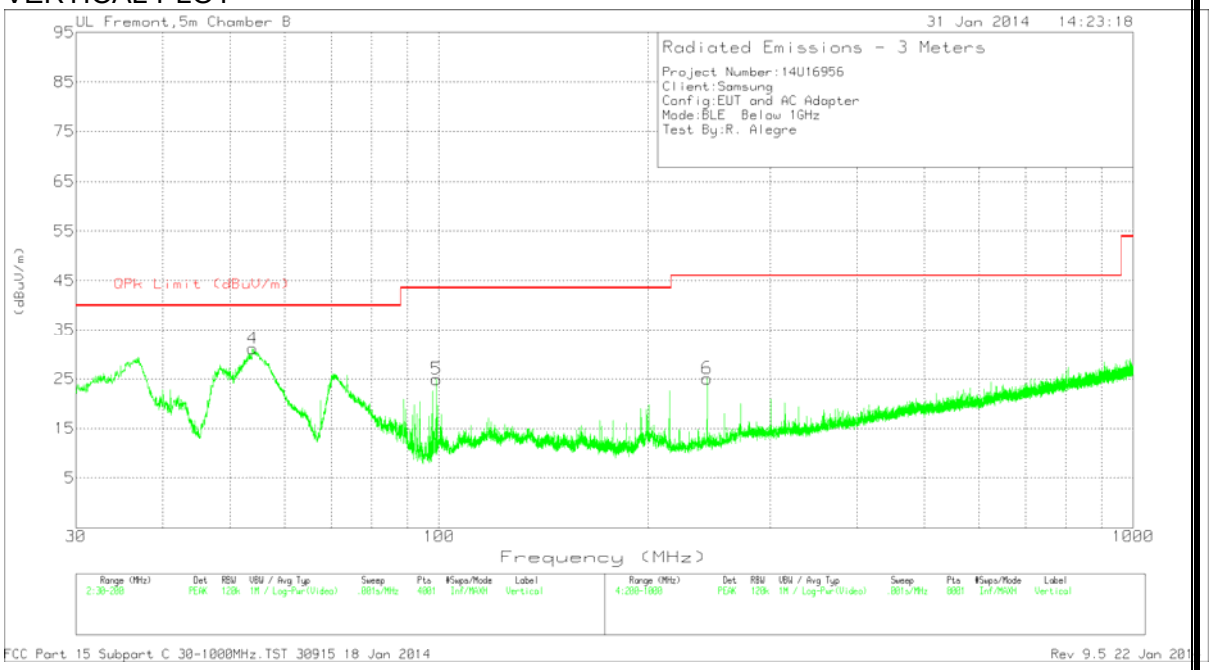
VERTICAL PLOT



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Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T243 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	53.9275	52.86	PK	6.9	-28.6	31.16	40	-8.84	0-360	101	V
1	70.545	43.26	PK	7.9	-28.4	22.76	40	-17.24	0-360	200	H
5	99.19	43.23	PK	9.8	-28.1	24.93	43.52	-18.59	0-360	101	V
2	157.5	39.01	PK	12.2	-27.4	23.81	43.52	-19.71	0-360	100	H
6	243.4	39.95	PK	11.6	-26.5	25.05	46.02	-20.97	0-360	200	V
3	357.9	35.02	PK	14.6	-25.8	23.82	46.02	-22.2	0-360	200	H

PK - Peak detector

FCC Part 15 Subpart C 30-1000MHz.TST 30915 18 Jan 2014 Rev 9.5 22 Jan 2014

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10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

ANSI C63.4 - 2009

RESULTS

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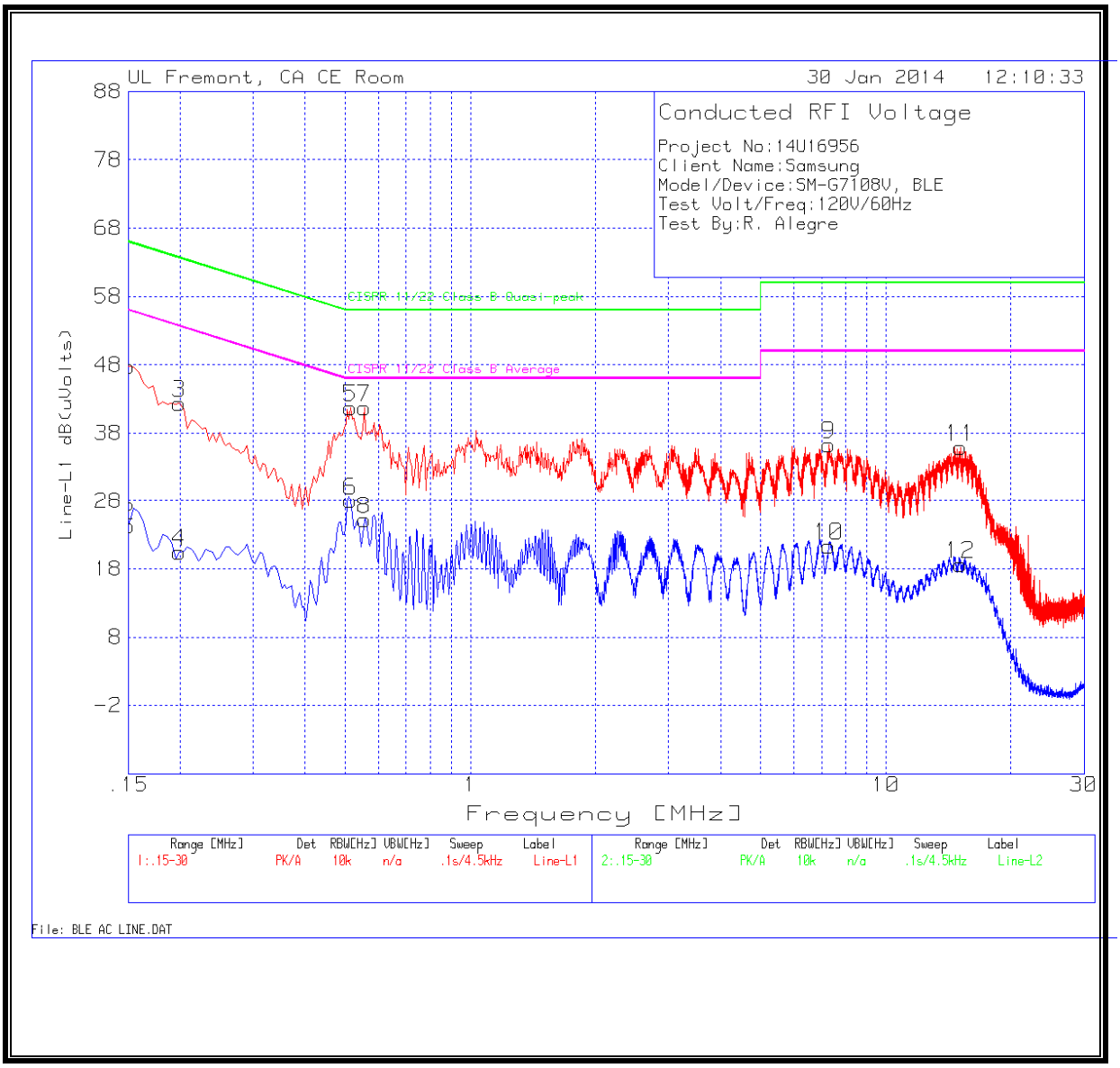
6 WORST EMISSIONS



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Line-L1 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
1	.15	46.36	PK	1.4	0	47.76	66	-18.24	-	-
2	.15	22.91	Av	1.4	0	24.31	-	-	56	-31.69
3	.1995	41.41	PK	.9	0	42.31	63.6	-21.29	-	-
4	.1995	19.52	Av	.9	0	20.42	-	-	53.6	-33.18
5	.5145	41.41	PK	.3	0	41.71	56	-14.29	-	-
6	.5145	27.71	Av	.3	0	28.01	-	-	46	-17.99
7	.555	41.45	PK	.3	0	41.75	56	-14.25	-	-
8	.555	24.97	Av	.3	0	25.27	-	-	46	-20.73
9	7.287	36.05	PK	.2	.1	36.35	60	-23.65	-	-
10	7.287	21.01	Av	.2	.1	21.31	-	-	50	-28.69
11	15.1305	35.45	PK	.3	.2	35.95	60	-24.05	-	-
12	15.1305	18.15	Av	.3	.2	18.65	-	-	50	-31.35

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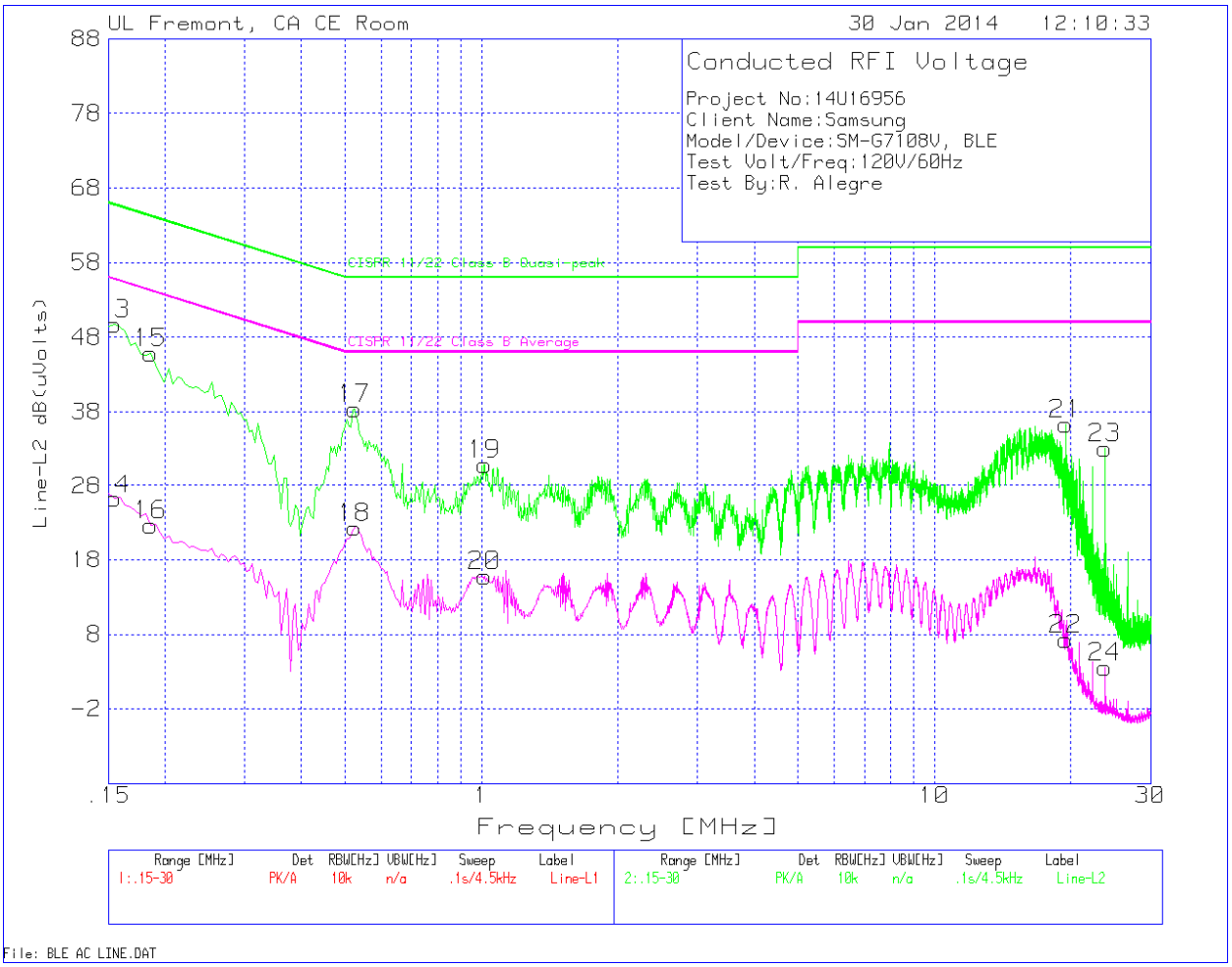

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Line-L2 .15 - 30MHz

Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dB(uVolts)	CISPR 11/22 Class B Quasi-peak	Margin to Limit (dB)	CISPR 11/22 Class B Average	Margin to Limit (dB)
13	.1545	48.27	PK	1.4	0	49.67	65.8	-16.13	-	-
14	.1545	24.78	Av	1.4	0	26.18	-	-	55.8	-29.62
15	.186	44.7	PK	1.1	0	45.8	64.2	-18.4	-	-
16	.186	21.48	Av	1.1	0	22.58	-	-	54.2	-31.62
17	.5235	37.95	PK	.4	0	38.35	56	-17.65	-	-
18	.5235	21.91	Av	.4	0	22.31	-	-	46	-23.69
19	1.0185	30.6	PK	.3	0	30.9	56	-25.1	-	-
20	1.0185	15.48	Av	.3	0	15.78	-	-	46	-30.22
21	19.4775	35.78	PK	.3	.2	36.28	60	-23.72	-	-
22	19.4775	6.81	Av	.3	.2	7.31	-	-	50	-42.69
23	23.7345	32.52	PK	.3	.2	33.02	60	-26.98	-	-
24	23.7345	3.11	Av	.3	.2	3.61	-	-	50	-46.39

PK - Peak detector
Av - average detection

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