



FCC CFR47 PART 15 SUBPART C

**BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT**

FOR

GSM PHONE + BLUETOOTH and WLAN 2.4GHz b/g/n

MODEL NUMBER: SM-J110H/DS and SM-J110H/DD

FCC ID: A3LSMJ110H

REPORT NUMBER: 15I21230-E3 REVISION A

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Prepared for

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Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Issue			
Rev.	Date	Revisions	Revised By
--	7/14/15	Initial Issue	P. Zhang
A	7/20/15	Update setup photo; update KDB reference.	P. Zhang

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY	6
4.1. MEASURING INSTRUMENT CALIBRATION	6
4.2. SAMPLE CALCULATION	6
4.3. MEASUREMENT UNCERTAINTY	6
5. EQUIPMENT UNDER TEST	7
5.1. DESCRIPTION OF EUT	7
5.2. MAXIMUM OUTPUT POWER.....	7
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	7
5.4. WORST-CASE CONFIGURATION AND MODE.....	8
5.5. DESCRIPTION OF TEST SETUP.....	9
6. TEST AND MEASUREMENT EQUIPMENT	11
7. SUMMARY	12
7.1. 6 dB BANDWIDTH.....	13
7.2. 99% BANDWIDTH.....	17
7.3. OUTPUT POWER.....	21
7.4. AVERAGE POWER.....	25
7.5. POWER SPECTRAL DENSITY	26
7.6. CONDUCTED SPURIOUS EMISSIONS.....	30
8. RADIATED TEST RESULTS.....	37
8.1. LIMITS AND PROCEDURE.....	37
8.2. TRANSMITTER ABOVE 1 GHz.....	38
8.3. WORST-CASE BELOW 1 GHz.....	51
9. AC POWER LINE CONDUCTED EMISSIONS.....	54
10. SETUP PHOTOS.....	59
END OF REPORT	60

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: GSM Phone + Bluetooth and WLAN 2.4GHz b/g/n
MODEL: SM-J110H/DS and SM-J110H/DD
SERIAL NUMBER: R31G600HD0B(Conducted), R31G600HJNP(Radiated)
DATE TESTED: JULY 2-14, 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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UL VERIFICATION SERVICES INC

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009 for FCC, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☒ Chamber A(IC: 2324B-1)	☐ Chamber D(IC: 2324B-4)
☒ Chamber B(IC: 2324B-2)	☐ Chamber E(IC: 2324B-5)
☒ Chamber C(IC: 2324B-3)	☐ Chamber F(IC: 2324B-6)
	☐ Chamber G(IC: 2324B-7)
	☐ Chamber H(IC: 2324B-8)

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 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 PHONE + BLUETOOTH and WLAN 2.4GHz b/g/n

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402-2480	BLE	1.61	1.45

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of 1.59 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 X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	ETAOU10EBE	N/A	N/A
Earphone	Samsung	N/A	N/A	N/A

I/O CABLES

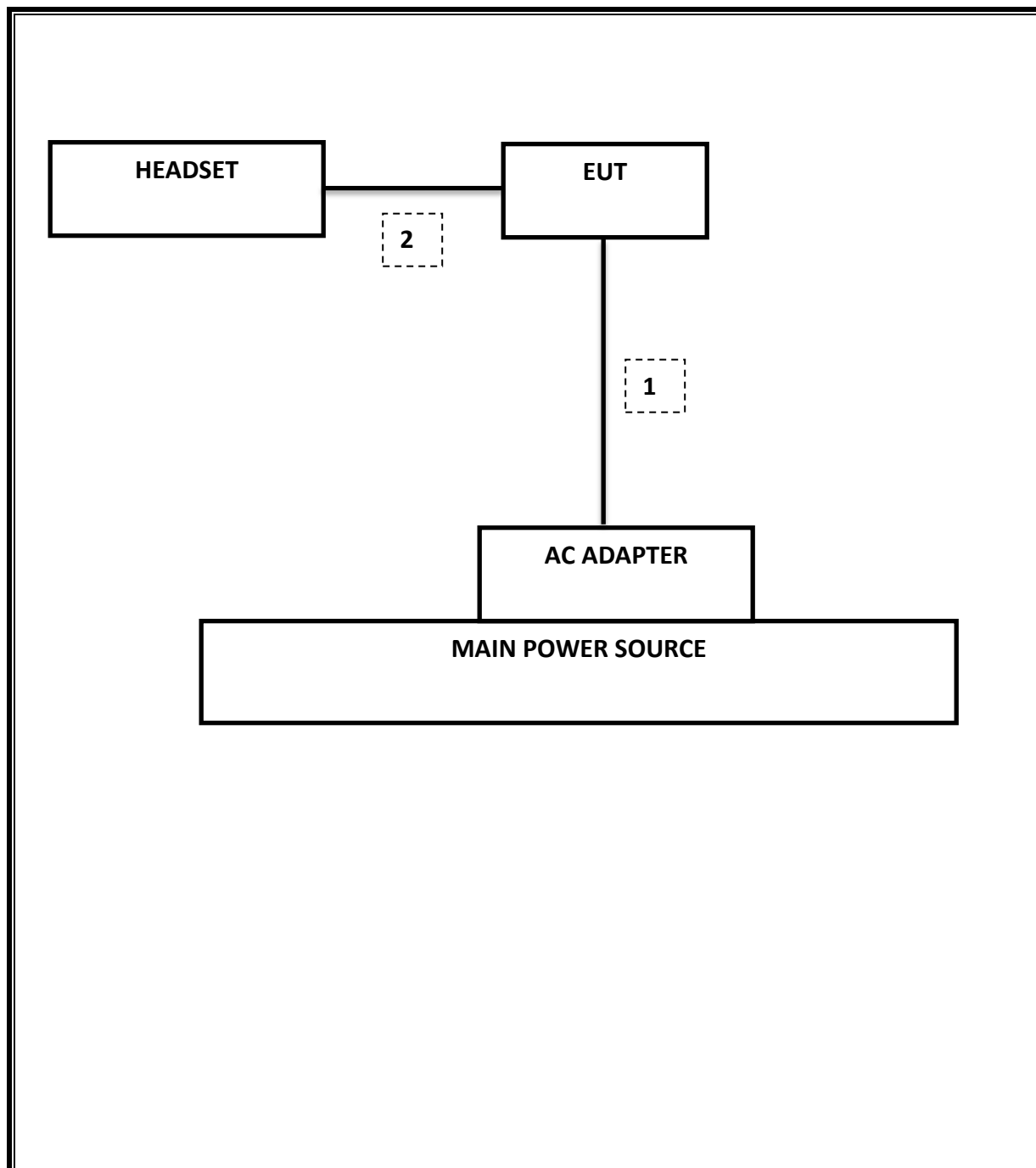
I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Shielded	1.2m	N/A
2	Audio	1	Mini-Jack	Unshielded	1m	N/A

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.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

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

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	0.628 MHz
2.1051, 15.247 (d)	RSS-247 5.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-51.4dBm
15.247	RSS-247 5.4.4	TX conducted output power	<30dBm		Pass	1.61dBm
15.247	RSS-247 5.2.2	PSD	<8dBm		Pass	-8.96 dBm
15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10	Radiated	Pass	44.28 dBuV
15.205, 15.209	RSS-GEN 8.9/7	Radiated Spurious Emission	< 54dBuV/m		Pass	41.68 dBuV/m

ANTENNA PORT TEST RESULTS

7.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

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

TEST PROCEDURE

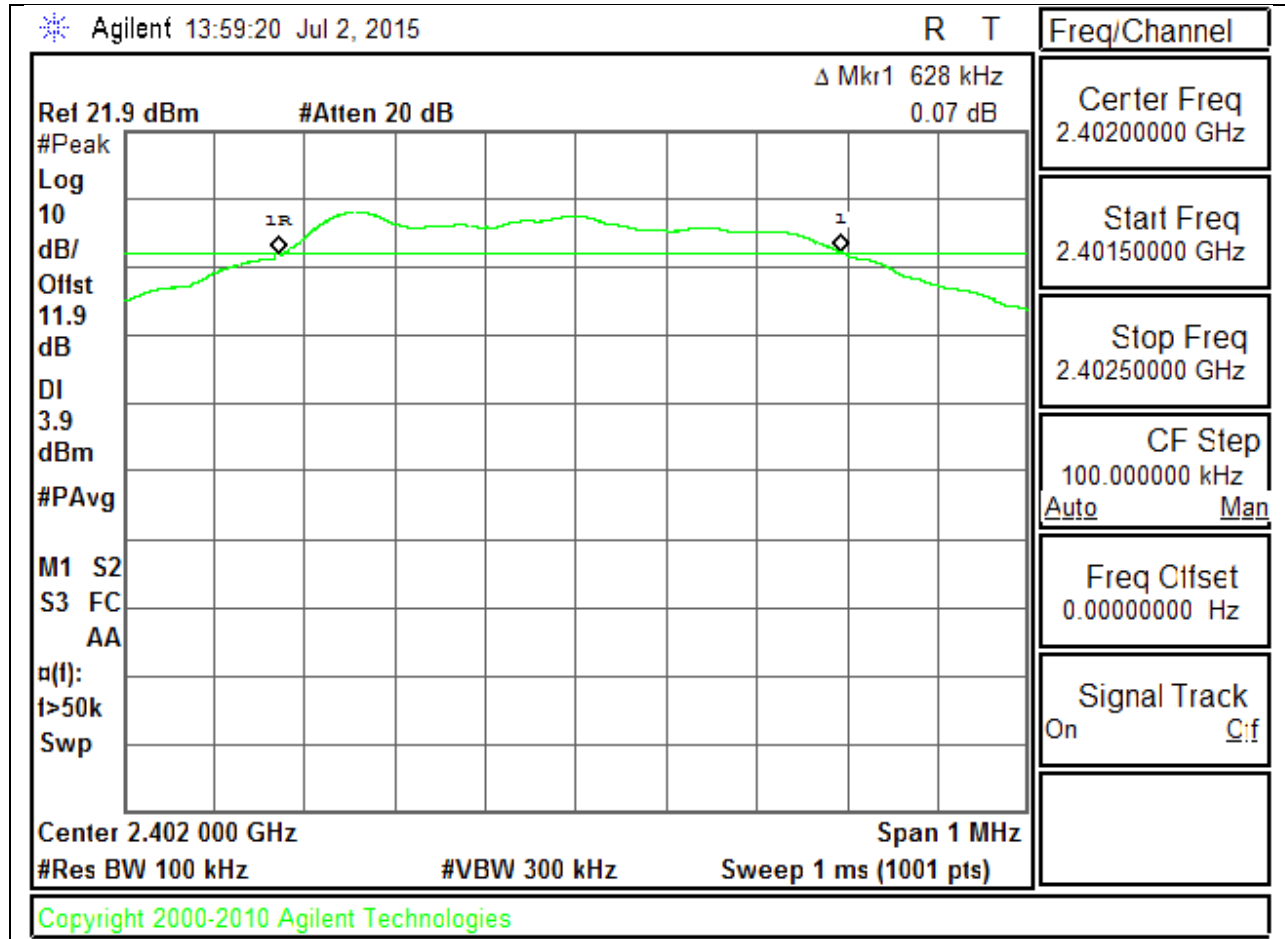
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

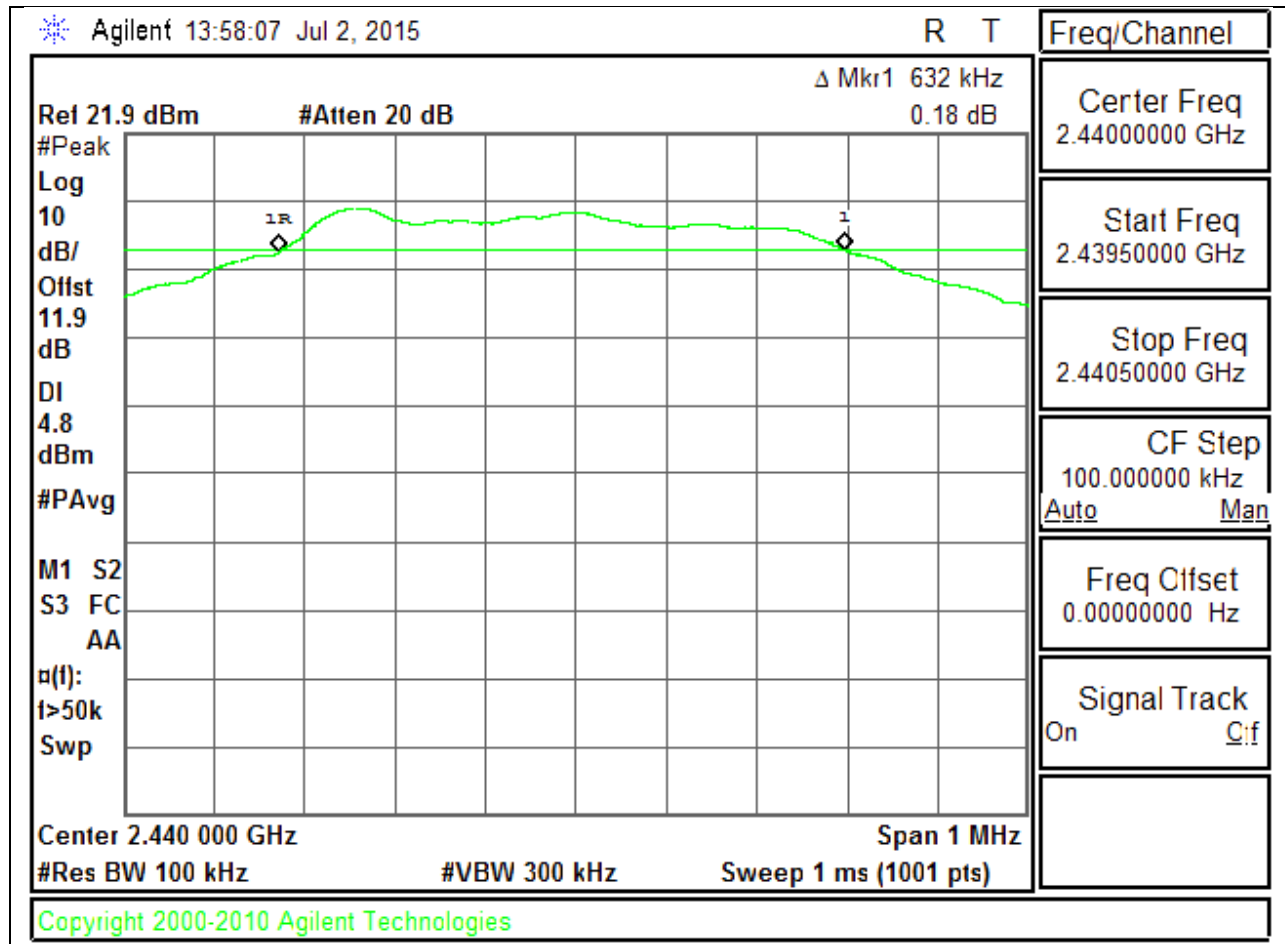
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.6280	0.5
Middle	2440	0.6320	0.5
High	2480	0.6280	0.5

6 dB BANDWIDTH PLOTS

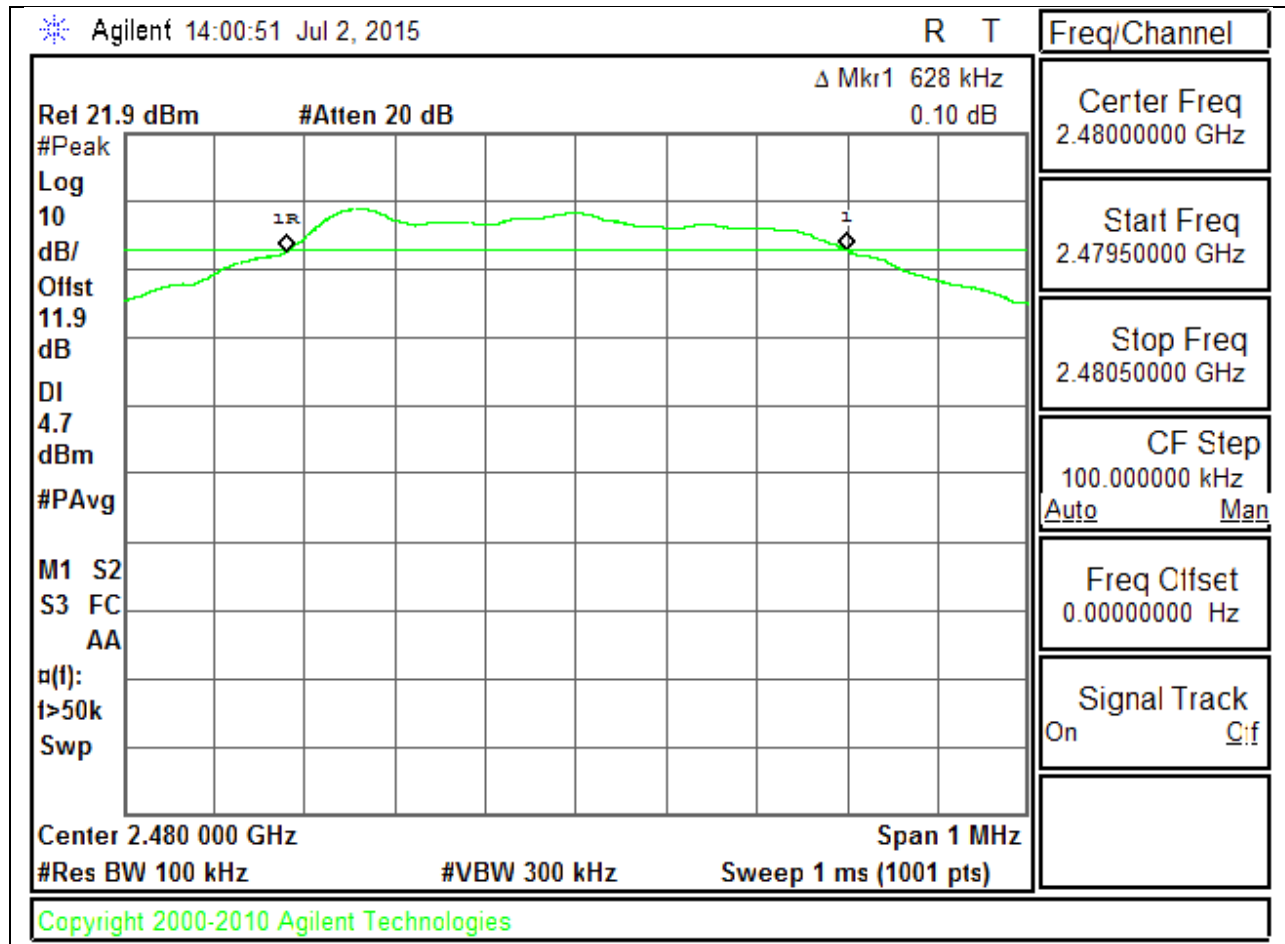
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



7.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

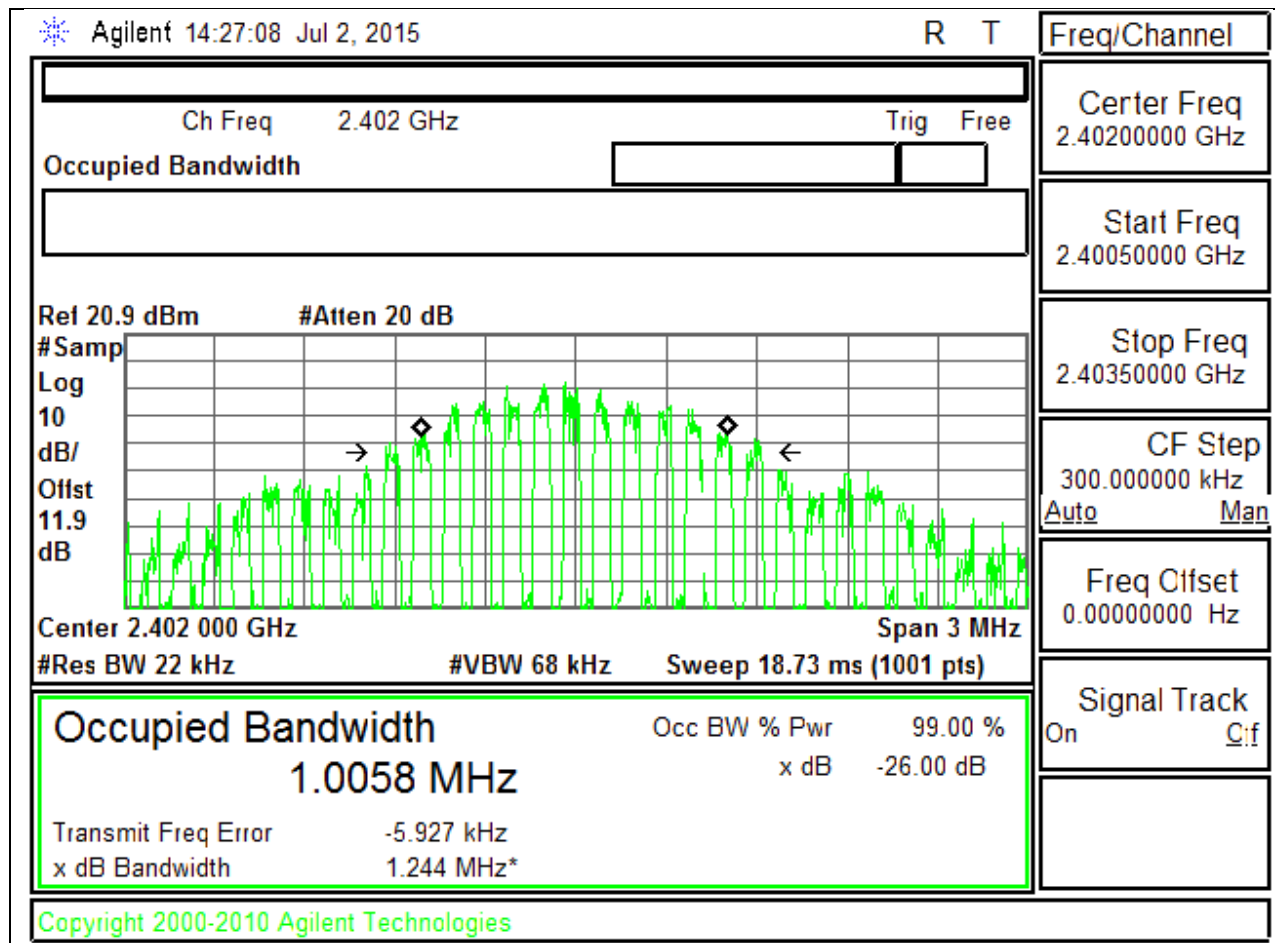
Reference to KDB558074 D01 DTS Meas Guidance v03r03: The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function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

RESULTS

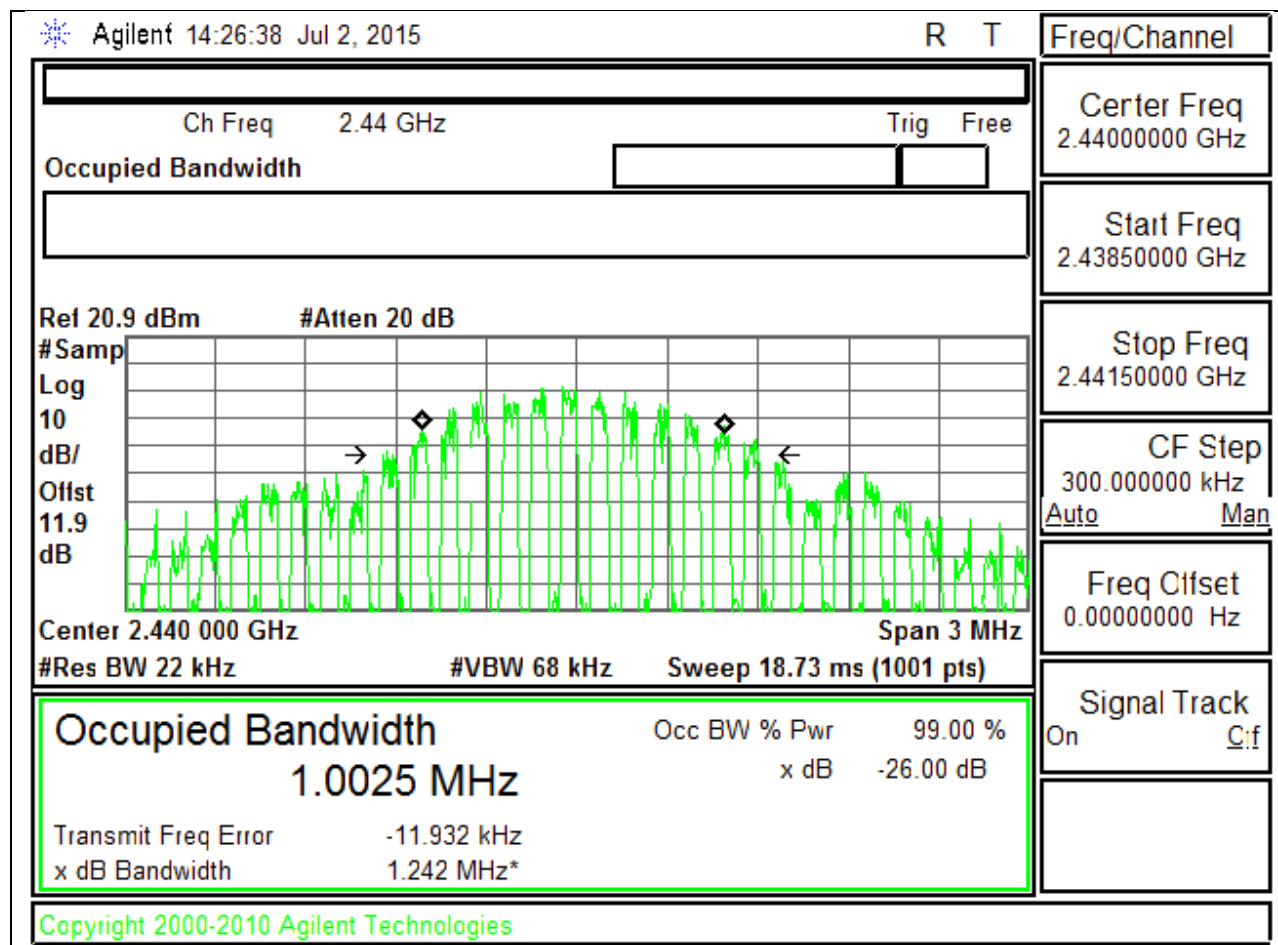
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0058
Middle	2440	1.0025
High	2480	1.0615

99% BANDWIDTH PLOTS

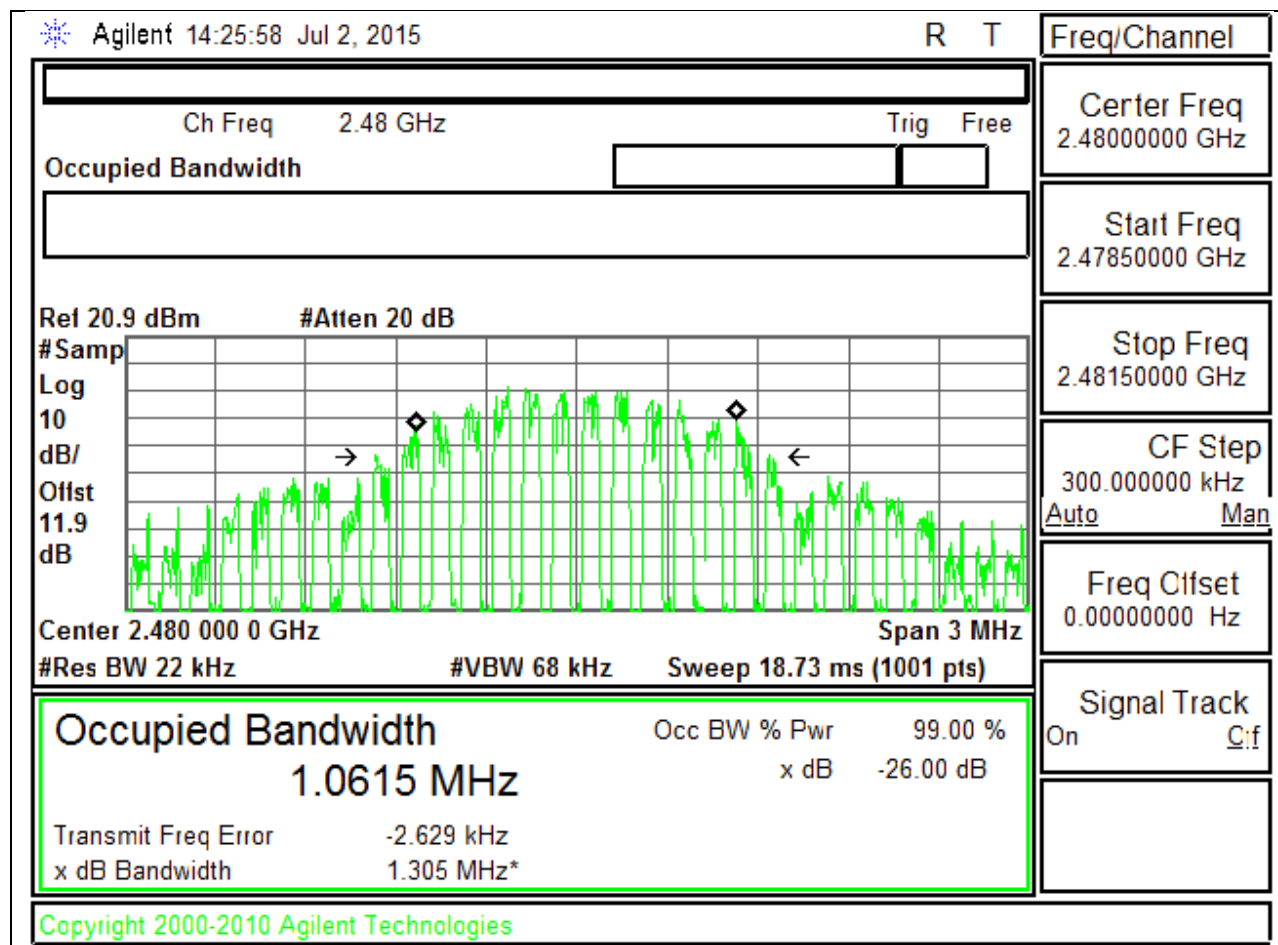
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



7.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

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

TEST PROCEDURE

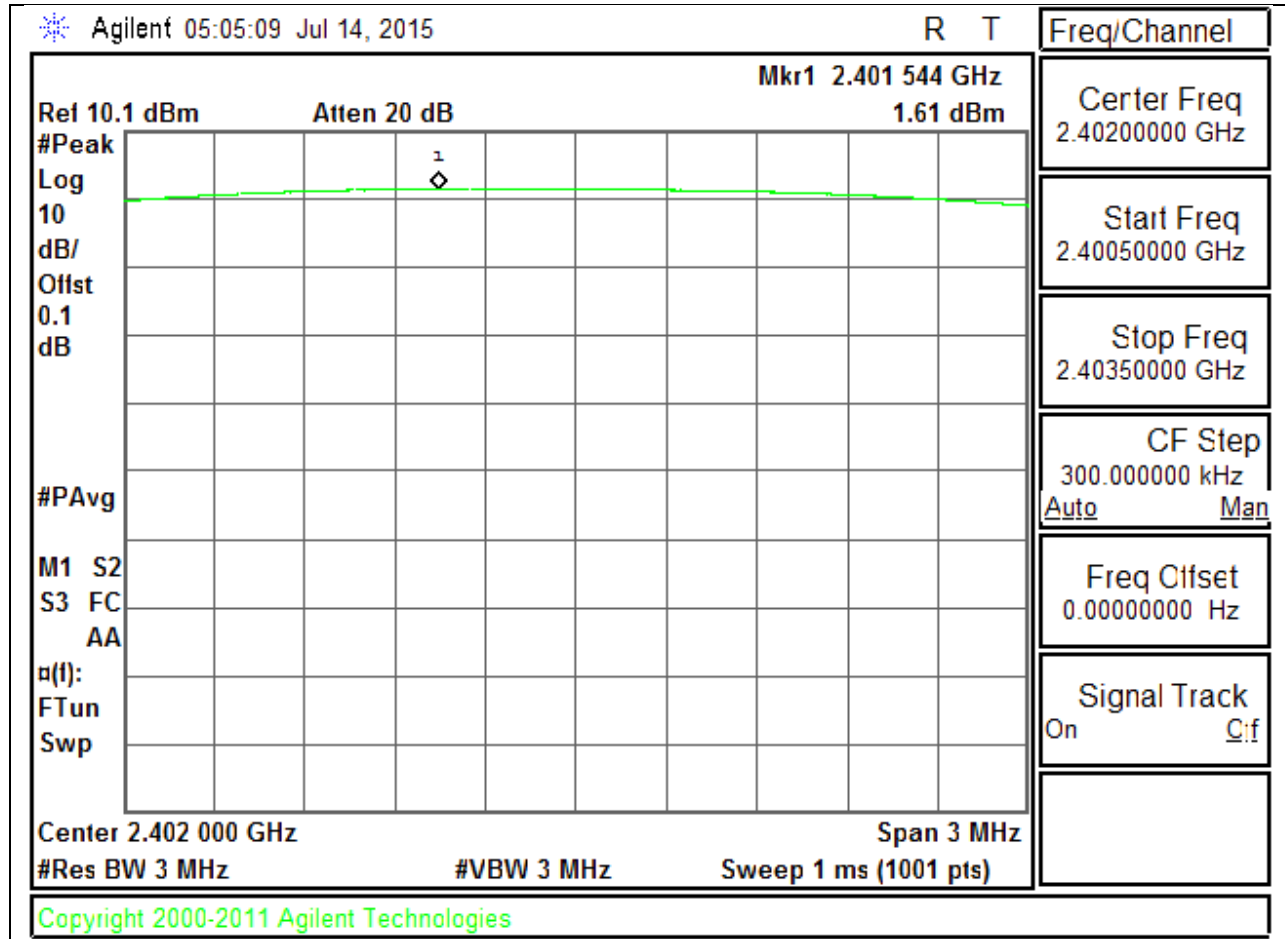
Peak power is measured using KDB558074 D01 DTS Meas Guidance v03r03 under section 9.1.1 utilizing spectrum analyzer.

RESULTS

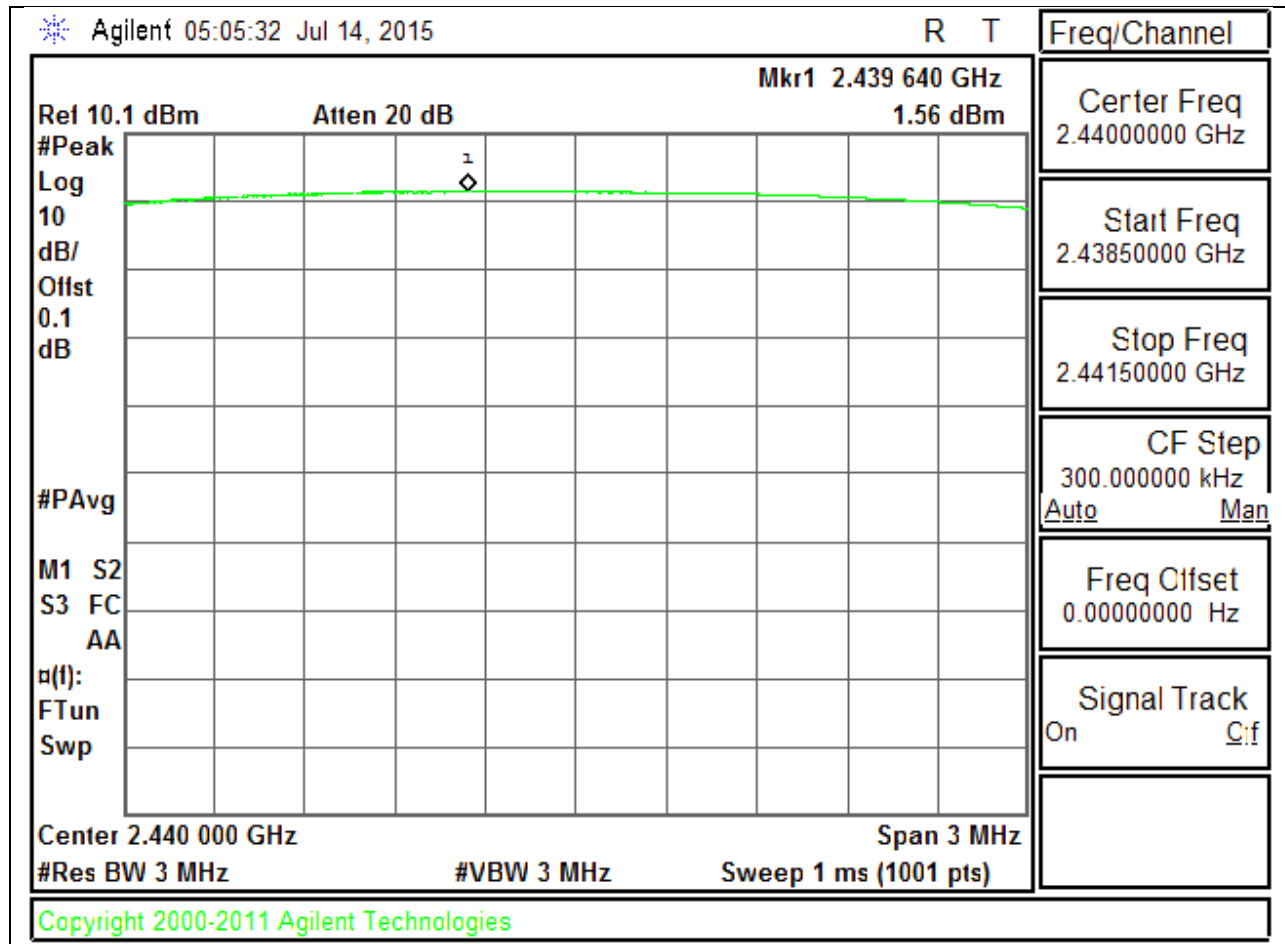
Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	1.610	30	-28.390
Middle	2440	1.560	30	-28.440
High	2480	1.480	30	-28.520

OUTPUT POWER PLOTS

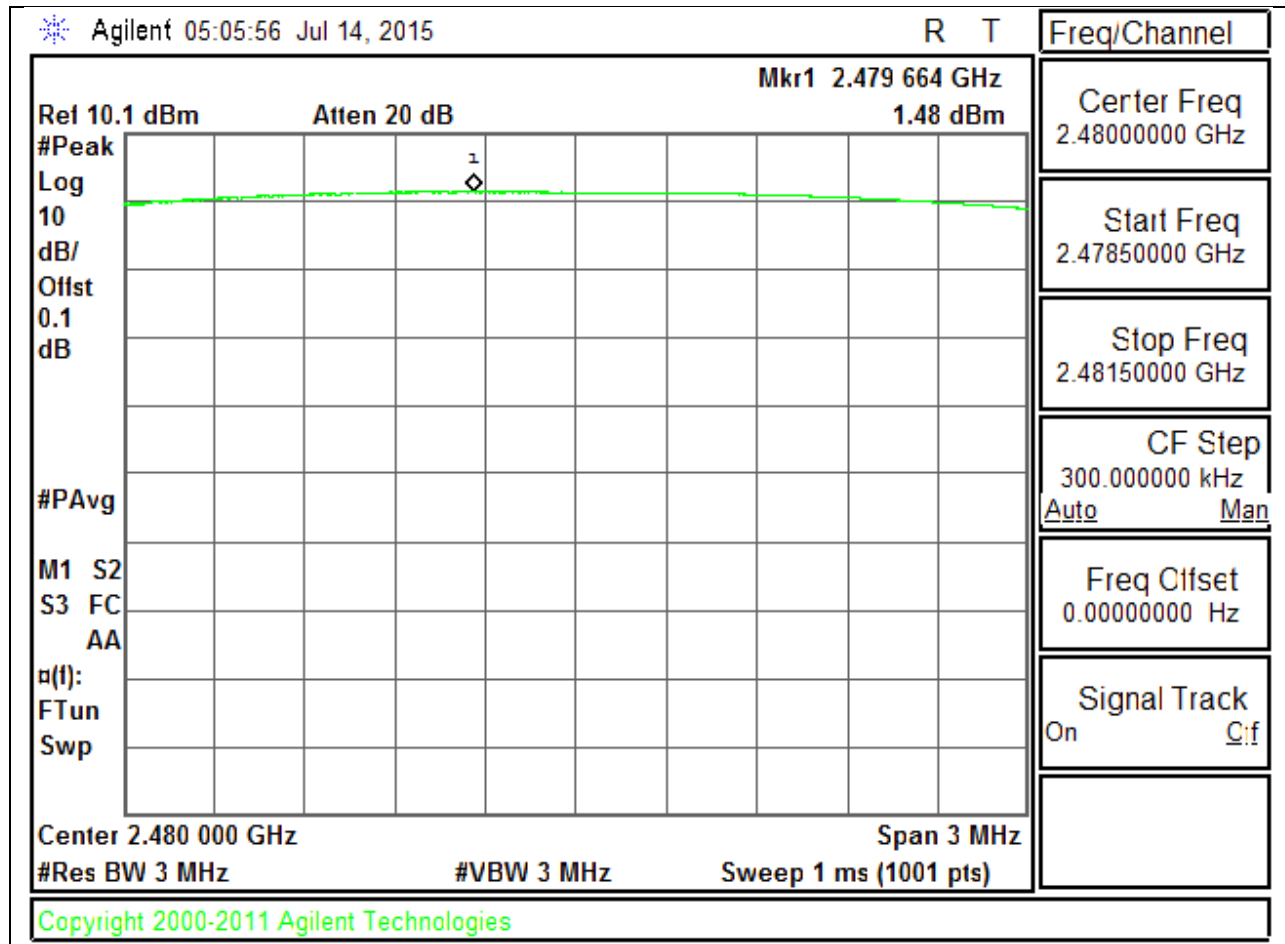
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



7.4. 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	1.28
Middle	2440	1.25
High	2480	1.30

7.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

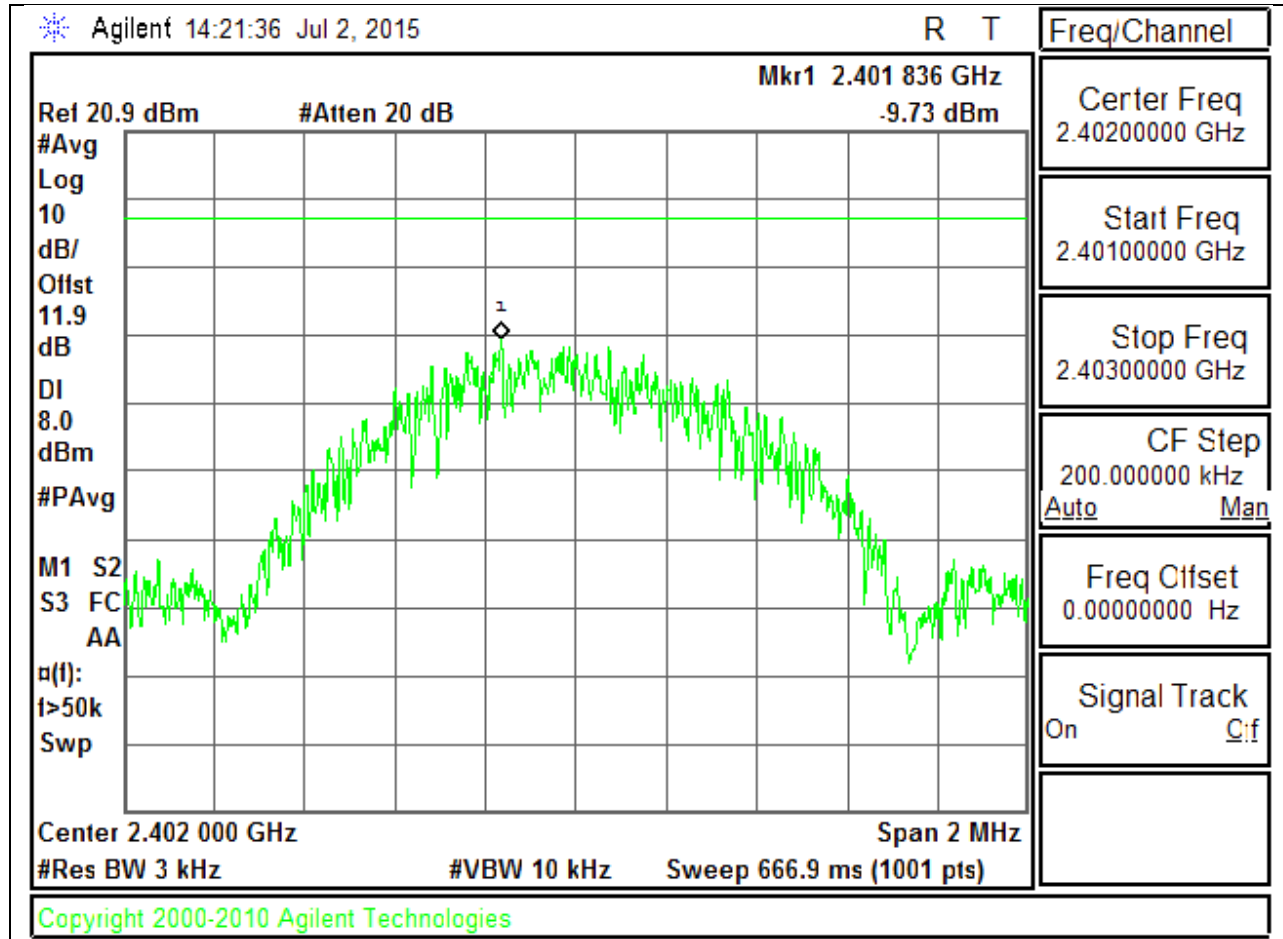
Power Spectral Density was performed utilizing the “Method PKPSD (Peak PSD)” under KDB558074 D01 DTS Meas Guidance v03r03

RESULTS

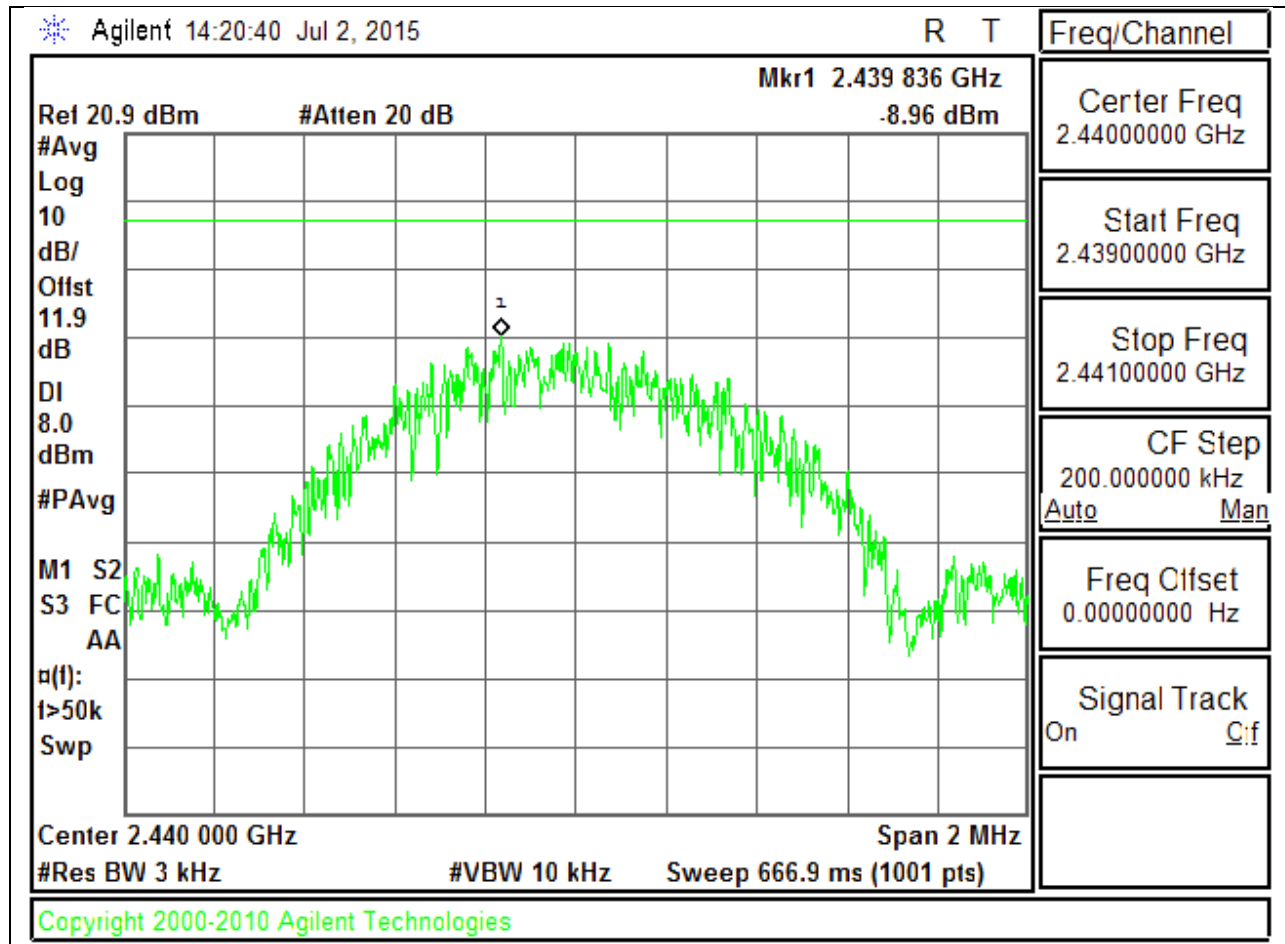
Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-9.73	8	-17.73
Middle	2440	-8.96	8	-16.96
High	2480	-9.01	8	-17.01

POWER SPECTRAL DENSITY PLOTS

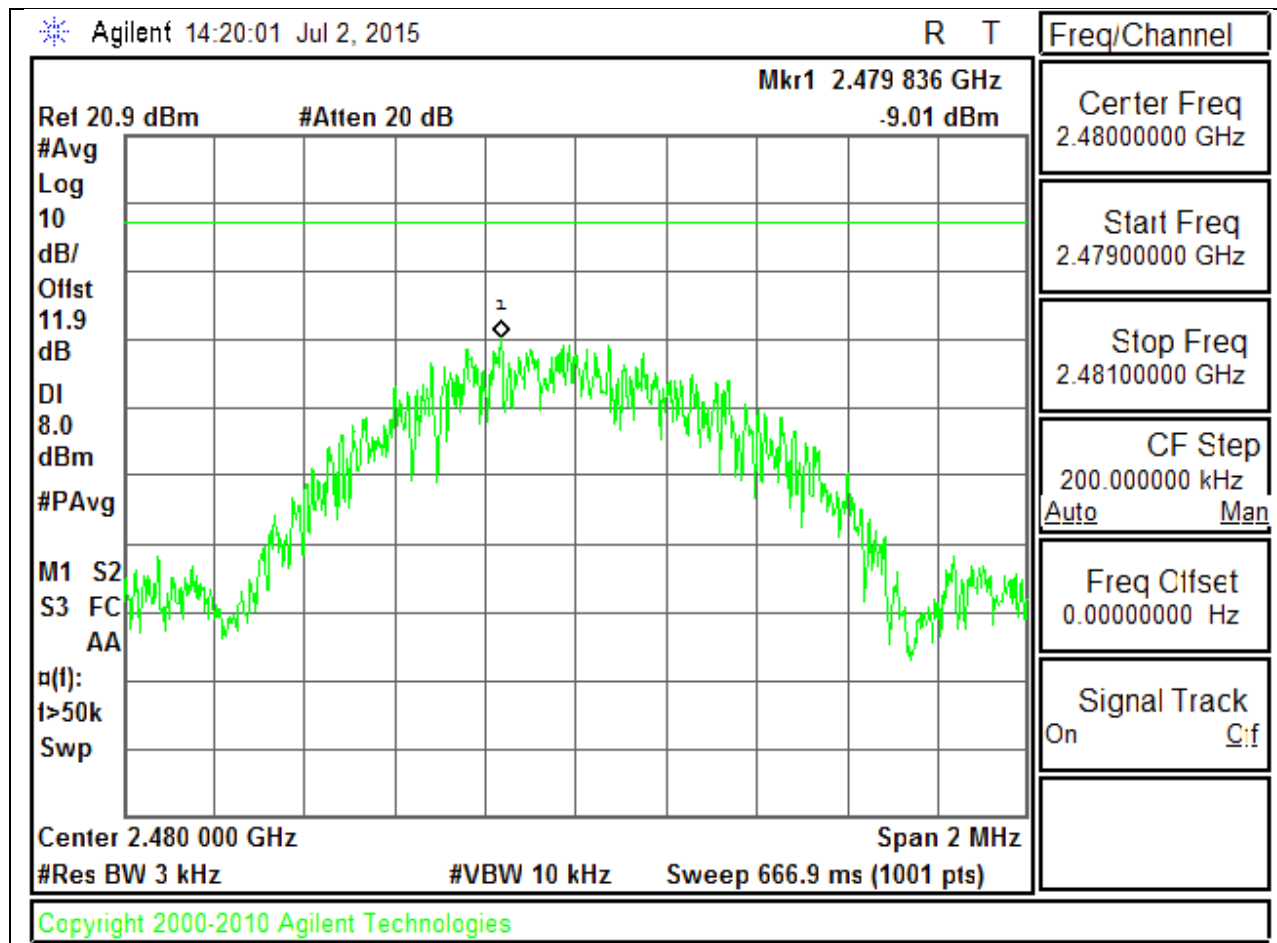
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



7.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

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

TEST PROCEDURE

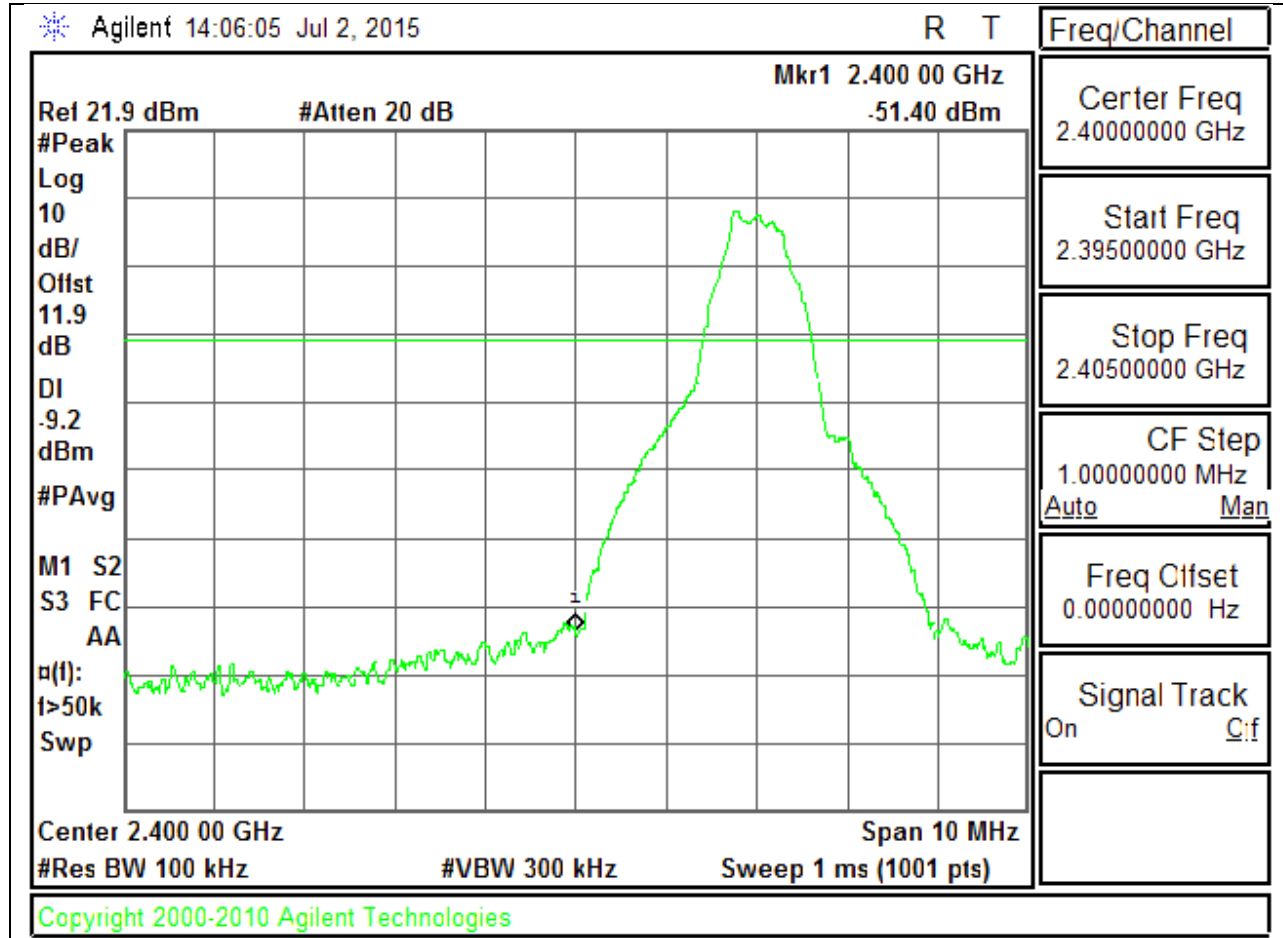
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

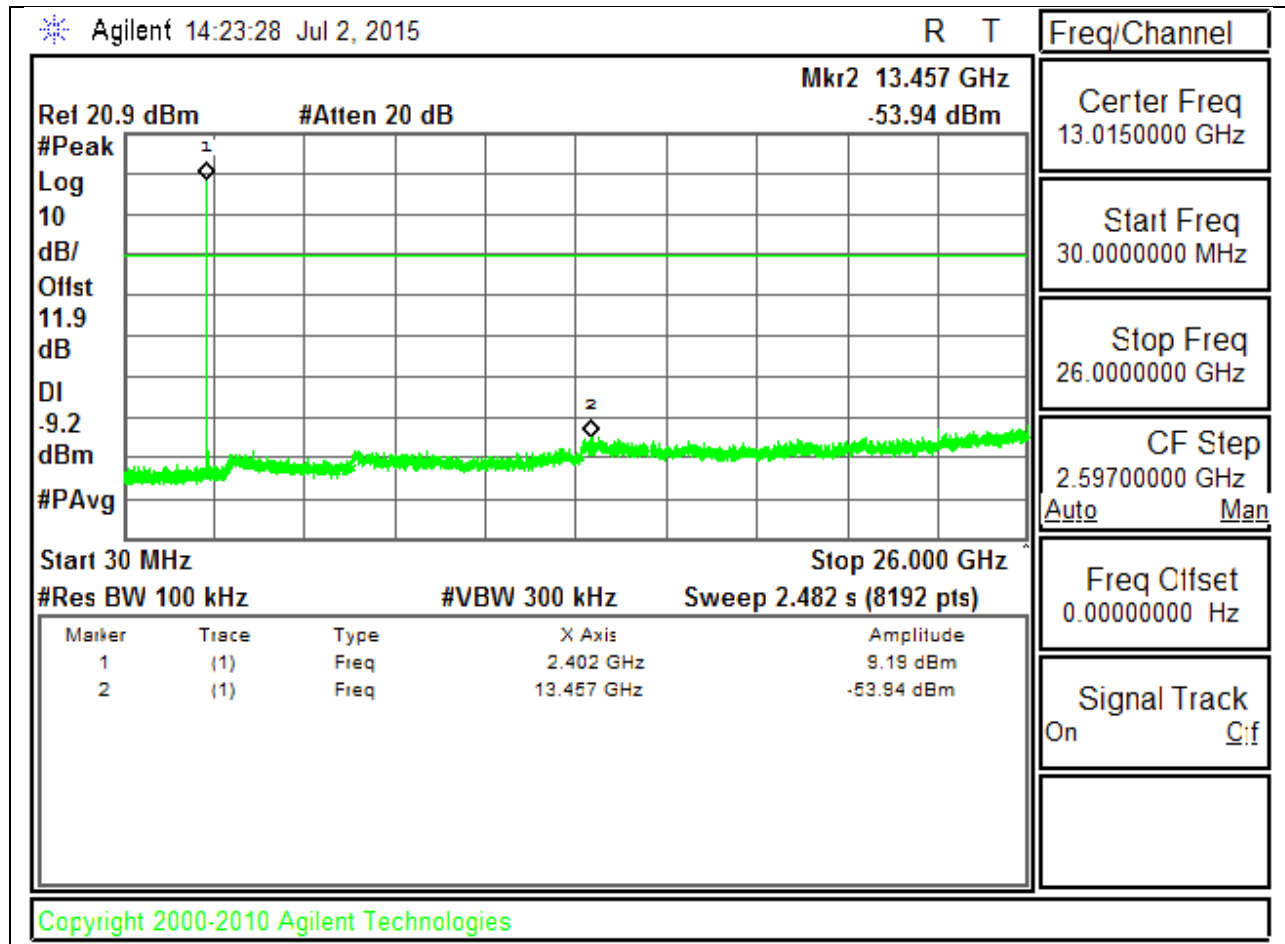
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL

LOW CHANNEL BANDEDGE

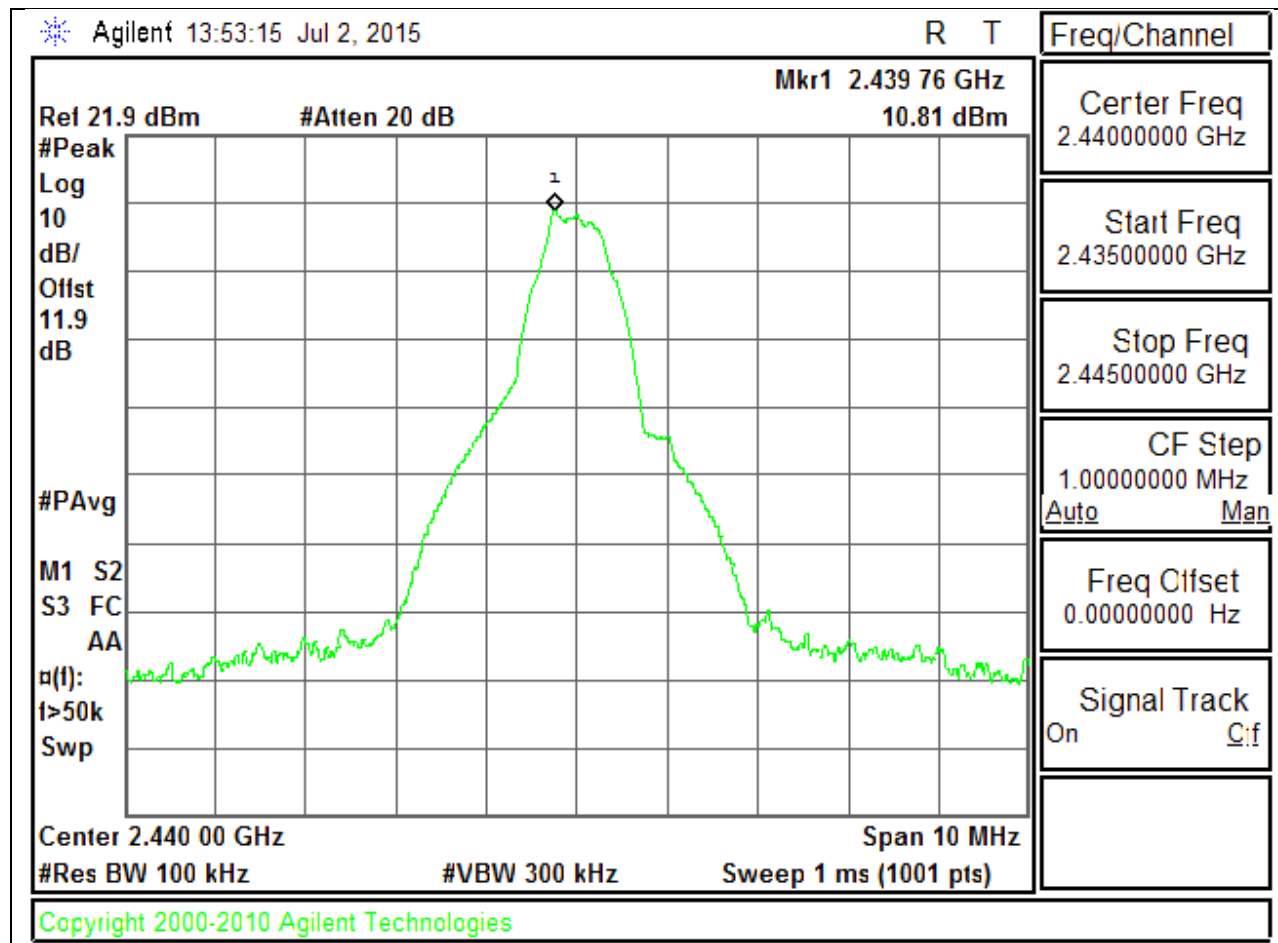


LOW CHANNEL SPURIOUS

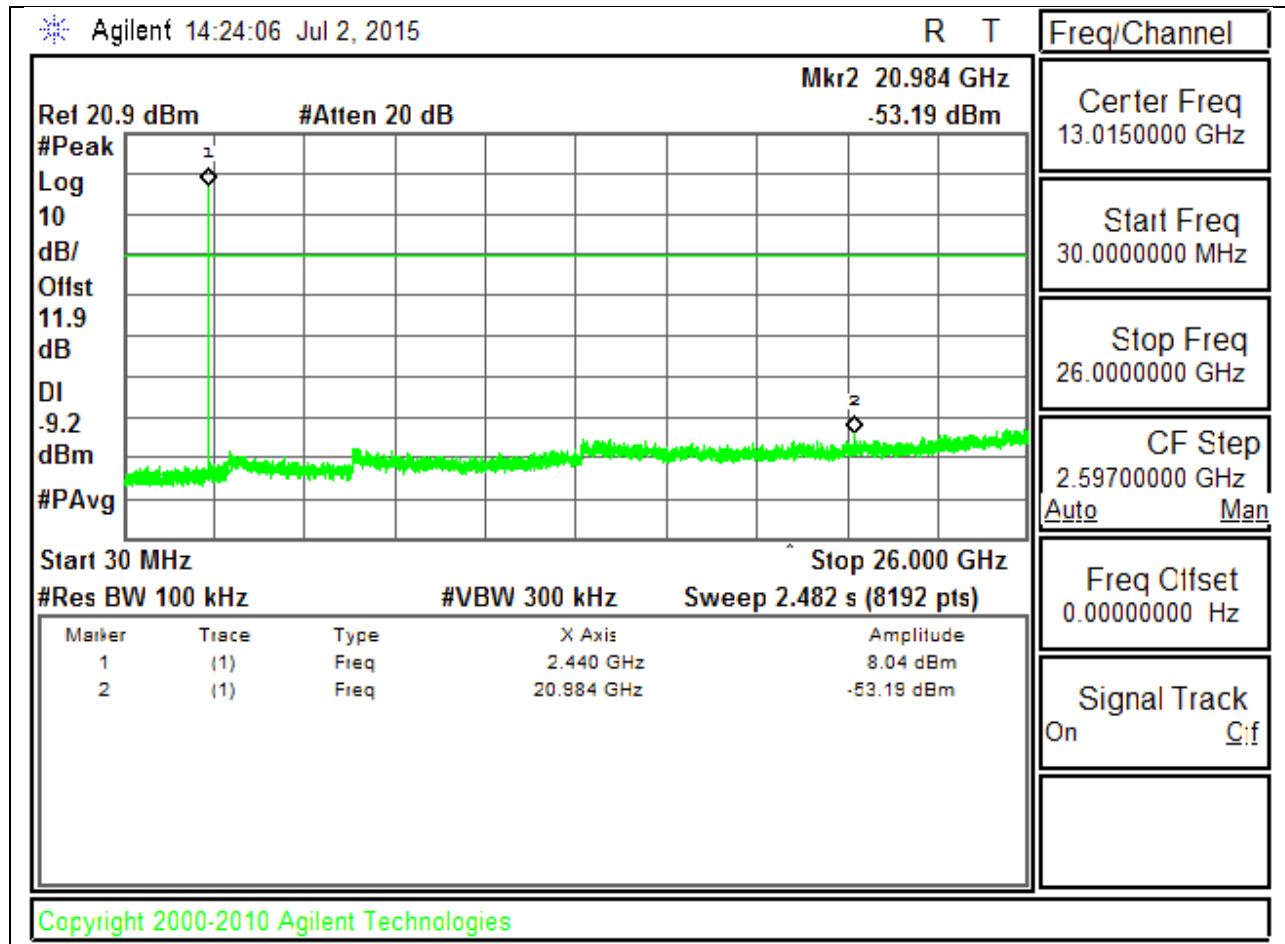


SPURIOUS EMISSIONS, MID CHANNEL

MID CHANNEL REFERENCE

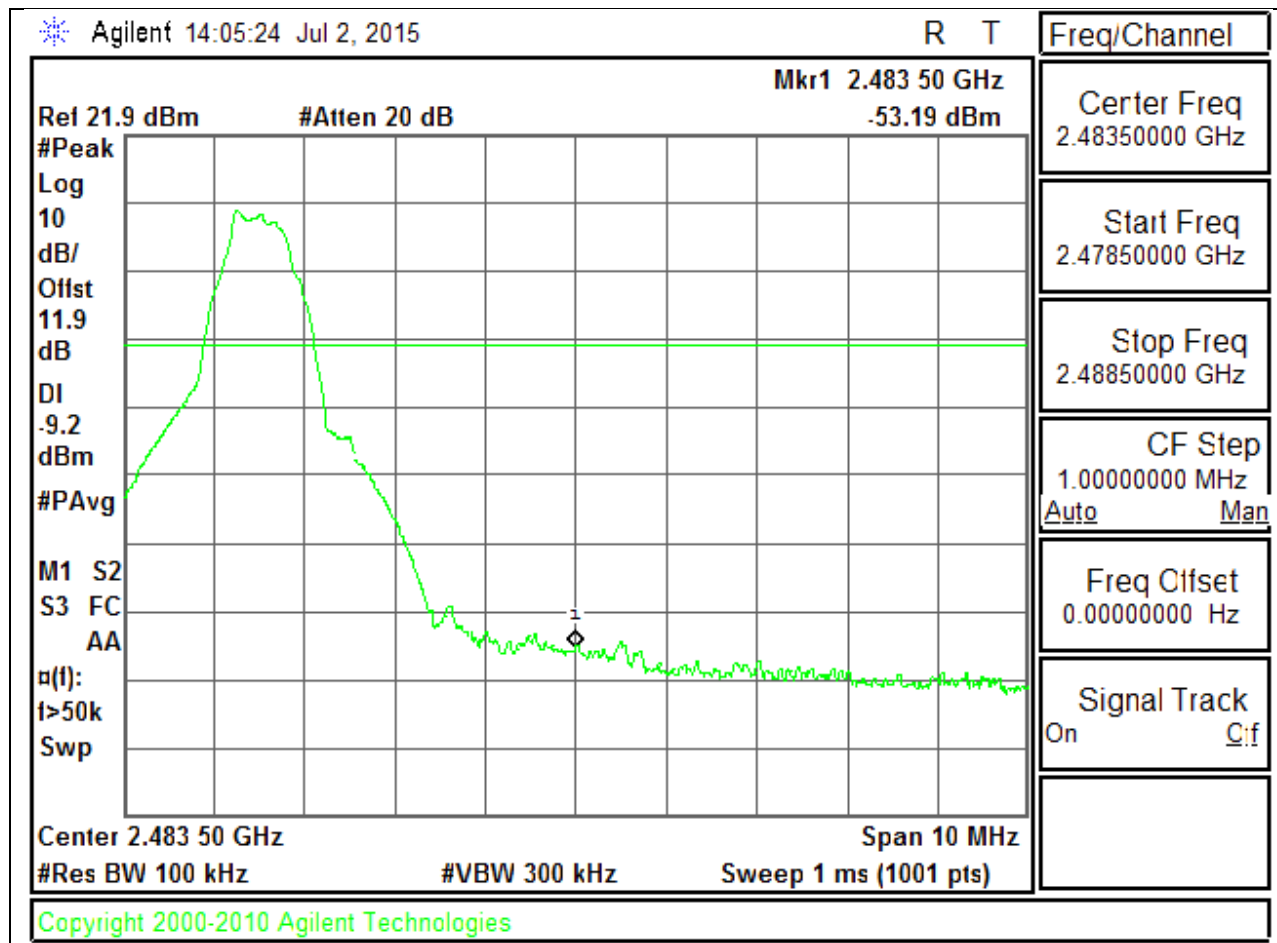


MID CHANNEL SPURIOUS

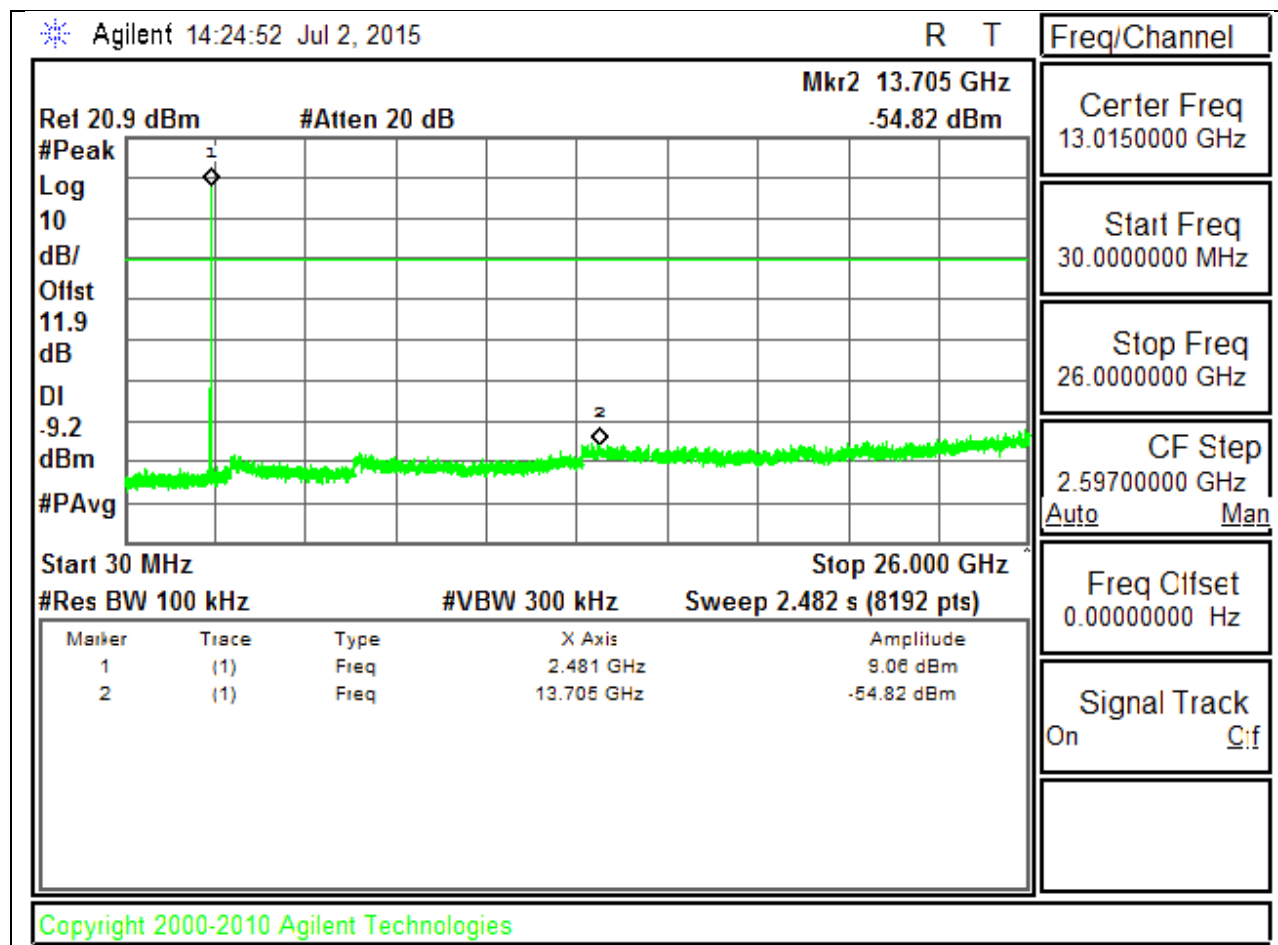


SPURIOUS EMISSIONS, HIGH CHANNEL

HIGH CHANNEL BANDEDGE



HIGH CHANNEL SPURIOUS



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE LIMITS

FCC §15.205 and §15.209

Frequency Range (MHz)	Field Strength Limit (μ V/m) at 3 m	Field Strength Limit (dB μ 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 = 2.97dB

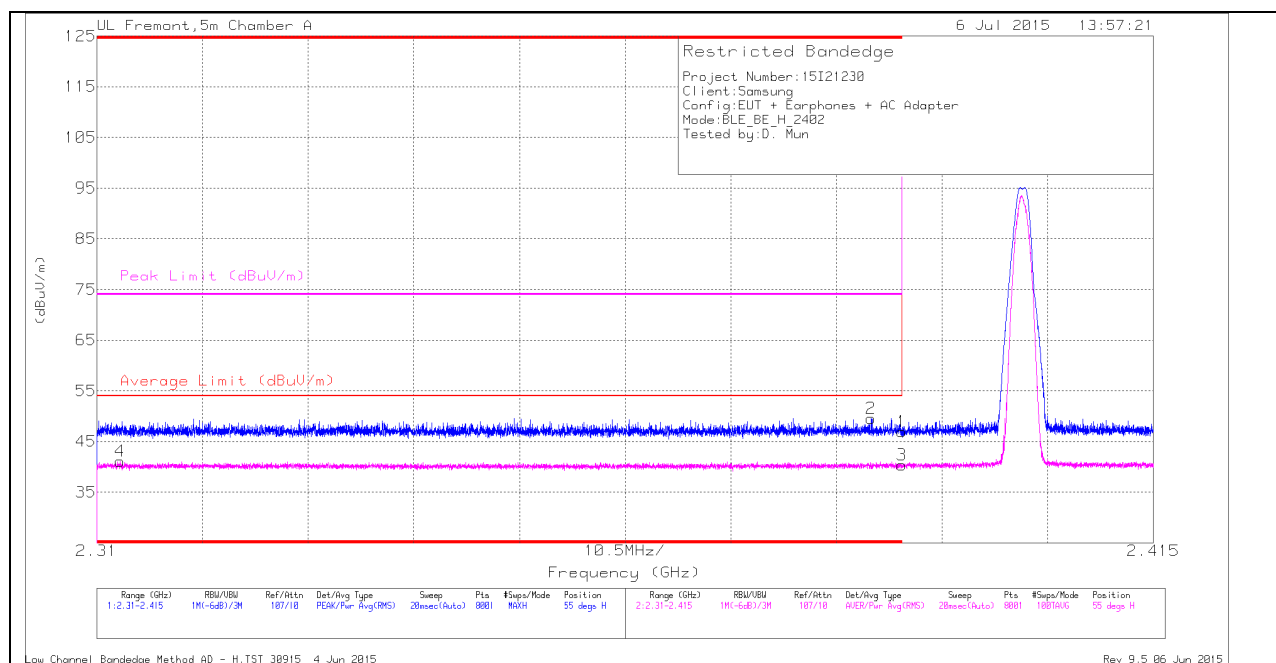
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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.

8.2. TRANSMITTER ABOVE 1 GHz RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

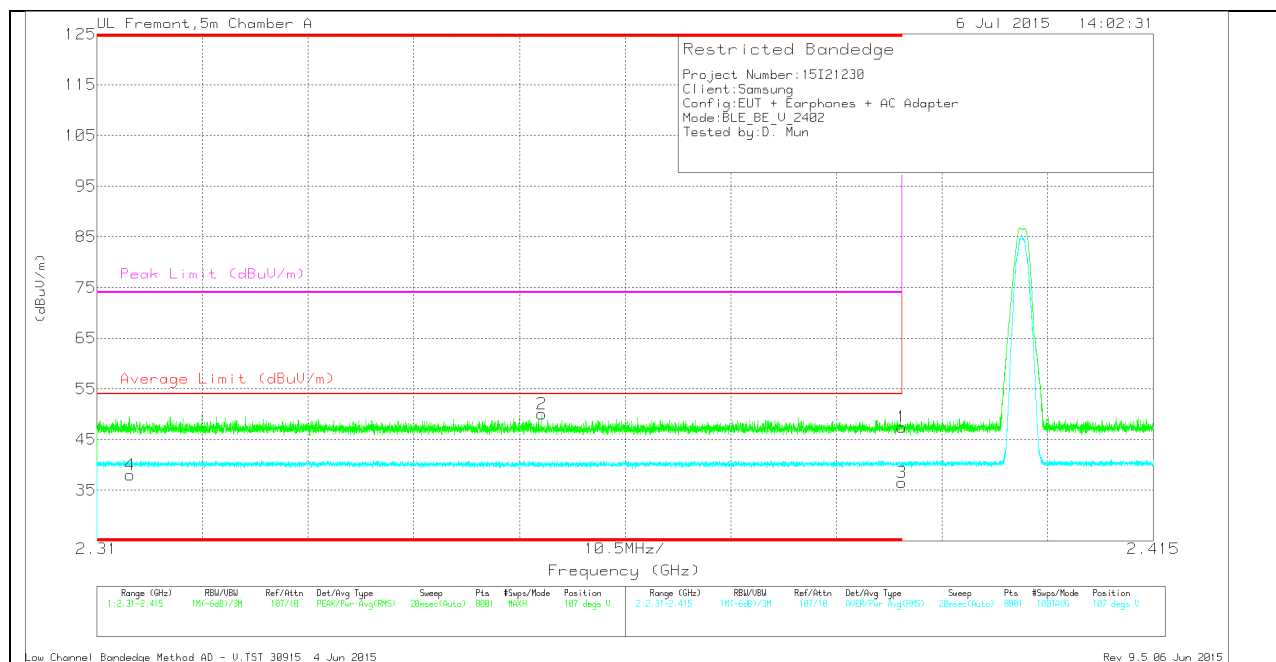
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fitter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	39.89	Pk	32	-24.9	0	46.99	-	-	74	-27.01	55	100	H
2	* 2.387	42.48	Pk	32	-24.9	0	49.58	-	-	74	-24.42	55	100	H
3	* 2.39	30.24	RMS	32	-24.9	2.97	40.31	-	-	-	-	55	100	H
4	* 2.312	31.12	RMS	31.9	-24.9	2.97	41.09	-	-	-	-	55	100	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 T136 (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	40.32	Pk	32	-24.9	0	47.42	-	-	74	-26.58	107	100	V
2	* 2.354	43.17	Pk	31.9	-25	0	50.07	-	-	74	-23.93	107	100	V
3	* 2.39	29.46	RMS	32	-24.9	2.97	39.53	-	-	-	-	107	100	V
4	* 2.313	31	RMS	31.9	-24.9	2.97	40.97	-	-	-	-	107	100	V

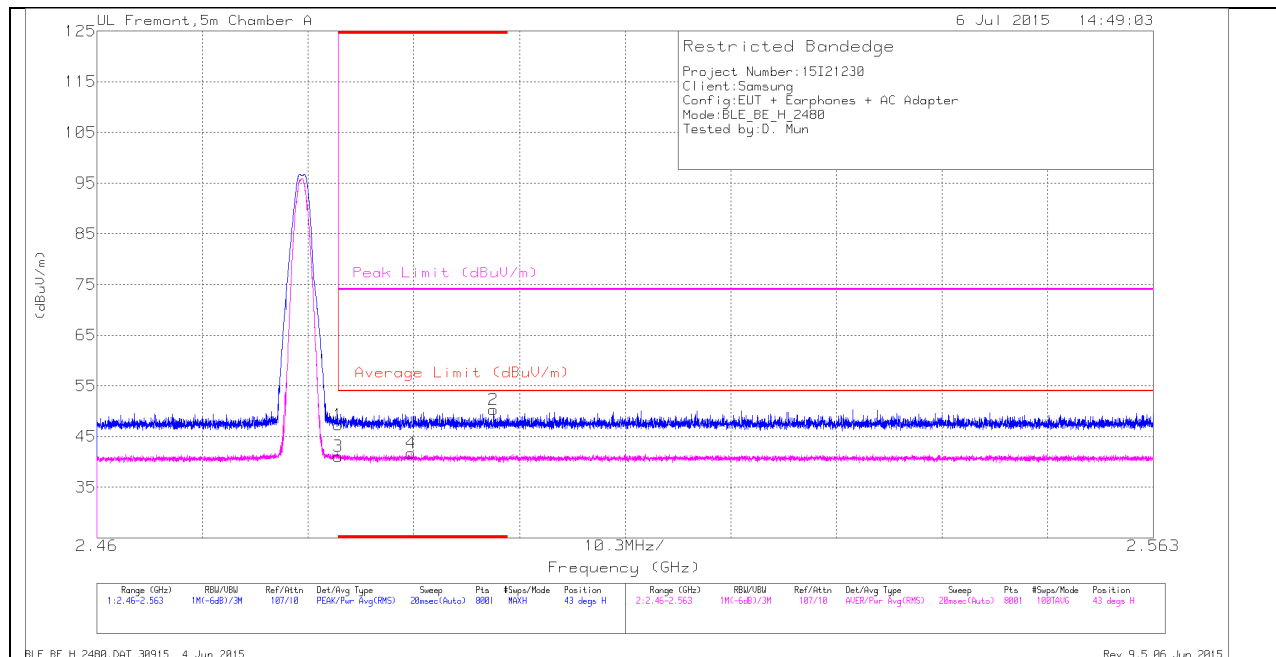
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

AUTHORIZED BANDEDGE (HIGH CHANNEL)

HORIZONTAL PEAK AND AVERAGE PLOT



HORIZONTAL DATA

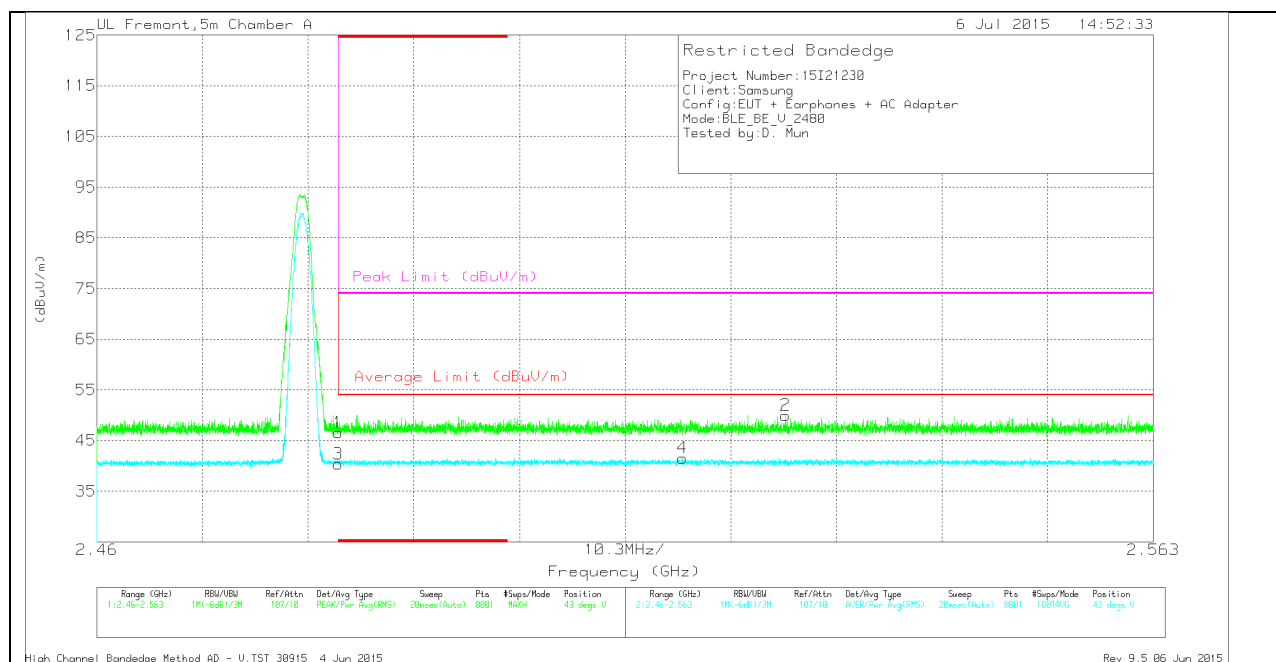
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	40.02	Pk	32.1	-24.8	0	47.32	-	-	74	-26.68	43	286	H
2	* 2.499	42.93	Pk	32.1	-24.7	0	50.33	-	-	74	-23.67	43	286	H
3	* 2.484	30.89	RMS	32.1	-24.8	2.97	41.16	-	-	-	-	43	286	H
4	* 2.491	31.31	RMS	32.1	-24.7	2.97	41.68	-	-	-	-	43	286	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	AFT136 (dB/m)	Amp/Cbl/Ftr/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	39.27	Pk	32.1	-24.8	0	46.57	-	-	74	-27.43	43	286	V
3	* 2.484	30.11	RMS	32.1	-24.8	2.97	40.38	-	-	-	-	43	286	V
4	2.517	31.17	RMS	32.1	-24.7	2.97	41.54	-	-	-	-	43	286	V
2	2.527	42.58	Pk	32.1	-24.7	0	49.98	-	-	74	-24.02	43	286	V

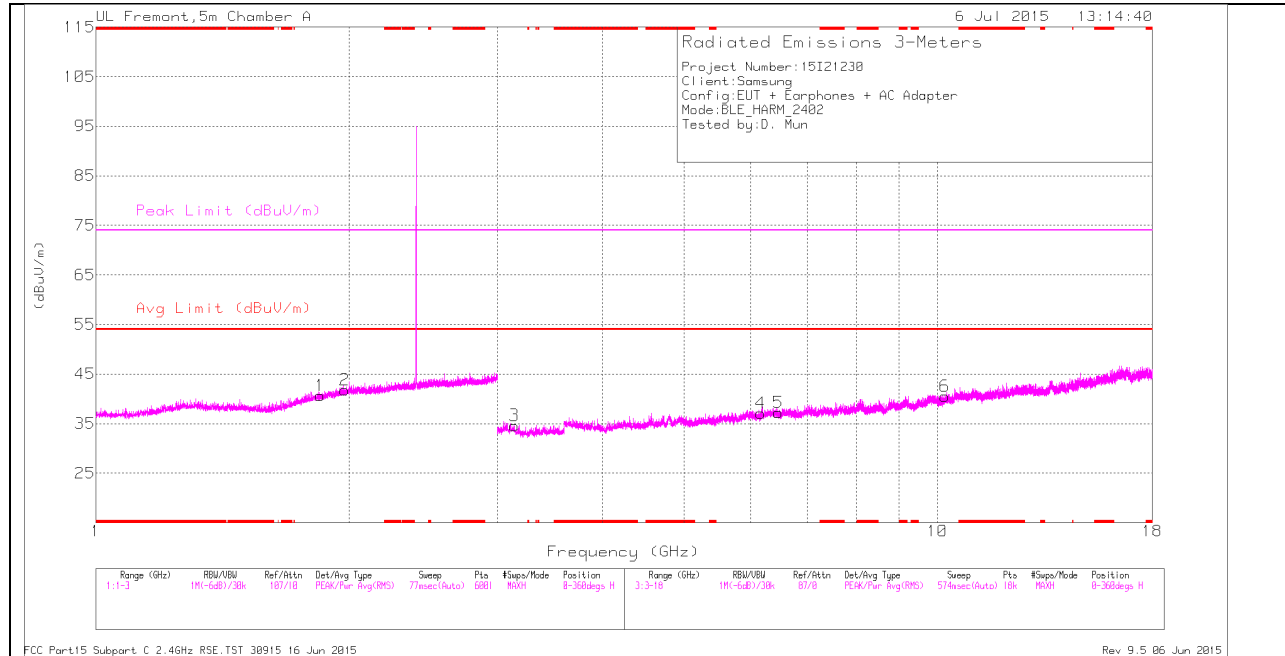
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

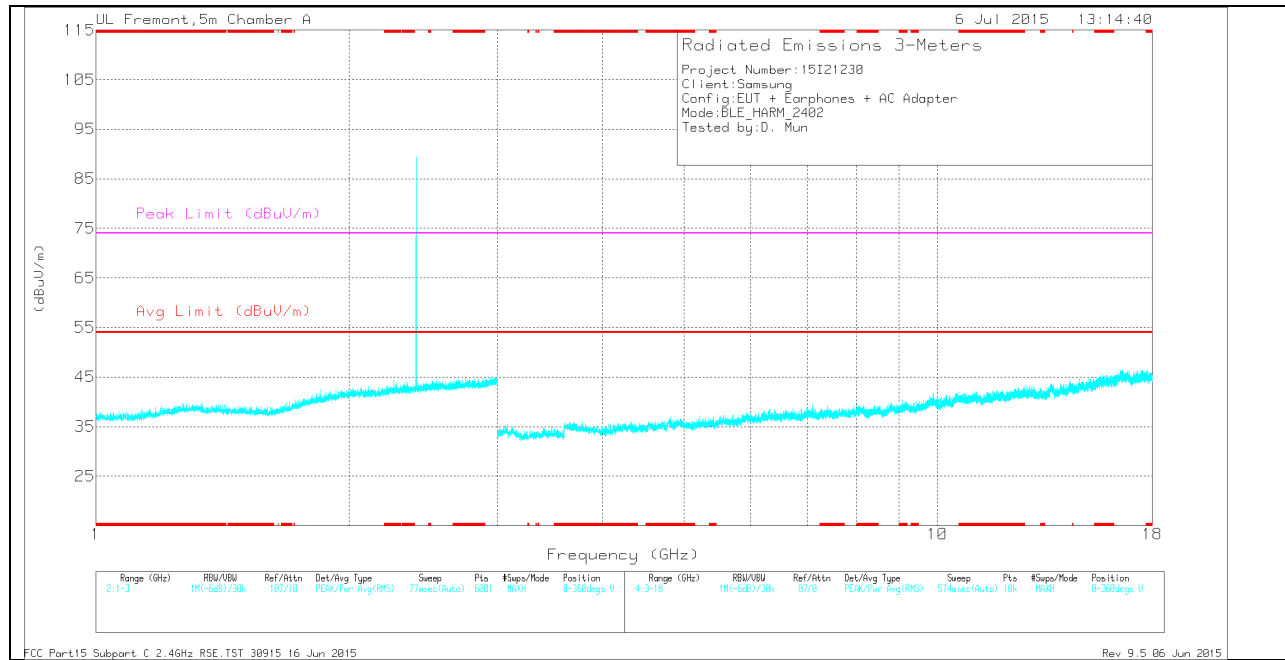
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL



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

LOW CHANNEL VERTICAL



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

LOW CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Filtr/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	1.847	35.77	Pk	30.4	-25.5	40.67	-	-	-	-	0-360	100	H
2	1.977	35.99	Pk	31.1	-25.3	41.79	-	-	-	-	0-360	100	H
3	3.142	33.92	Pk	32.8	-32.1	34.62	-	-	-	-	0-360	100	H
4	6.162	31.03	Pk	35.4	-29.3	37.13	-	-	-	-	0-360	201	H
5	6.468	30.47	Pk	35.5	-28.8	37.17	-	-	-	-	0-360	100	H
6	10.203	27.13	Pk	37.2	-23.8	40.53	-	-	-	-	0-360	201	H

Pk - Peak detector

RADIATED EMISSIONS

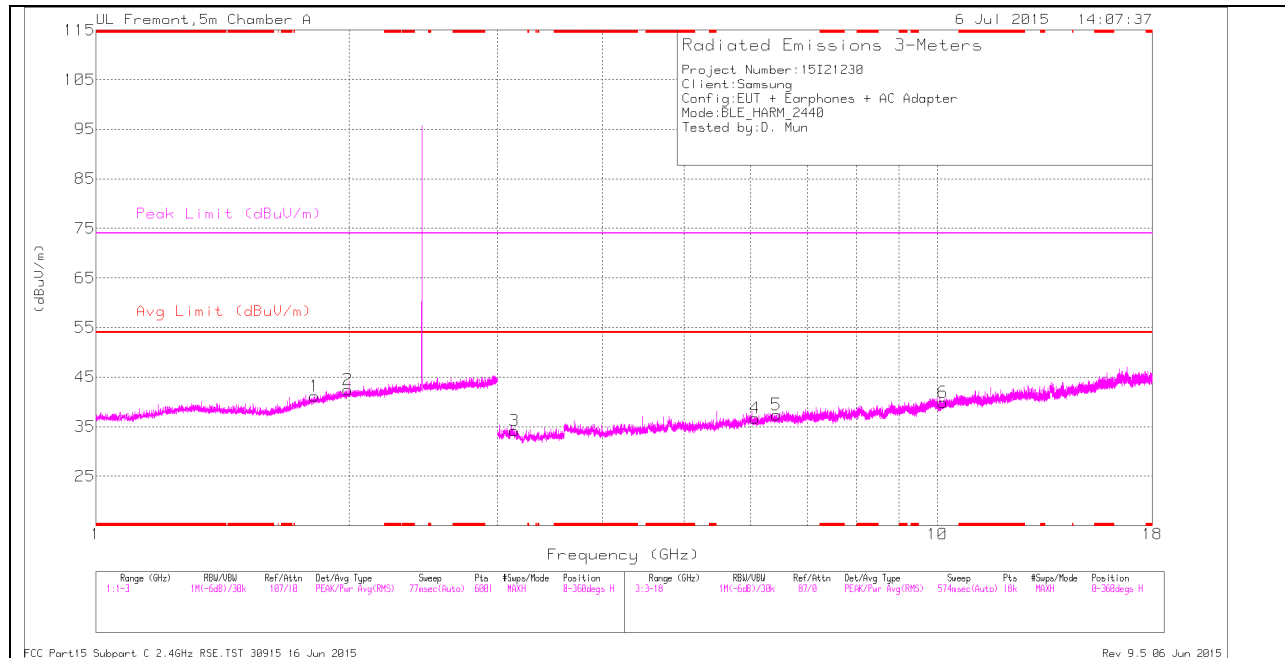
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.846	32.72	MAV1	30.4	-25.5	37.62	-	-	-	-	1	100	H
1.848	44.5	PK2	30.4	-25.5	49.4	-	-	-	-	1	100	H
1.977	45.25	PK2	31.1	-25.3	51.05	-	-	-	-	1	100	H
1.977	32.82	MAV1	31.1	-25.3	38.62	-	-	-	-	1	100	H
3.141	30.74	MAV1	32.8	-32.1	31.44	-	-	-	-	1	100	H
3.143	42	PK2	32.8	-32.1	42.7	-	-	-	-	1	100	H
6.162	38.99	PK2	35.4	-29.3	45.09	-	-	-	-	1	202	H
6.162	27.83	MAV1	35.4	-29.3	33.93	-	-	-	-	1	202	H
6.468	39.1	PK2	35.5	-28.8	45.8	-	-	-	-	1	100	H
6.468	27.89	MAV1	35.5	-28.8	34.59	-	-	-	-	1	100	H
10.202	24	MAV1	37.2	-23.8	37.4	-	-	-	-	1	202	H
10.203	35.32	PK2	37.2	-23.8	48.72	-	-	-	-	1	202	H

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

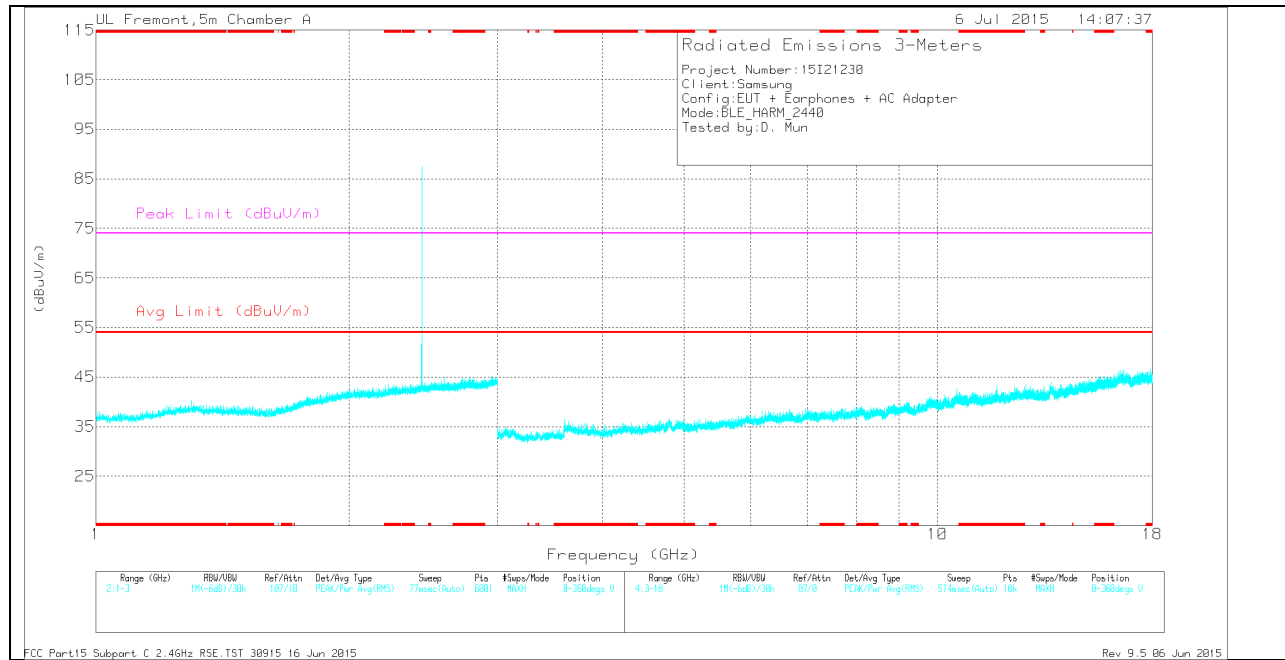
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MID CHANNEL HORIZONTAL



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

MID CHANNEL VERTICAL



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

MID CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (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
1	1.819	36.58	Pk	30.1	-25.5	0	41.18	-	-	-	-	0-360	201	H
2	1.992	36.62	Pk	31.1	-25.3	0	42.42	-	-	-	-	0-360	201	H
3	3.14	33.45	Pk	32.8	-32.1	0	34.15	-	-	-	-	0-360	200	H
4	6.069	30.53	Pk	35.4	-29.2	0	36.73	-	-	-	-	0-360	200	H
5	6.438	30.71	Pk	35.5	-28.8	0	37.41	-	-	-	-	0-360	200	H
6	10.147	27	Pk	37.2	-24.3	0	39.9	-	-	-	-	0-360	200	H

Pk - Peak detector

RADIATED EMISSIONS

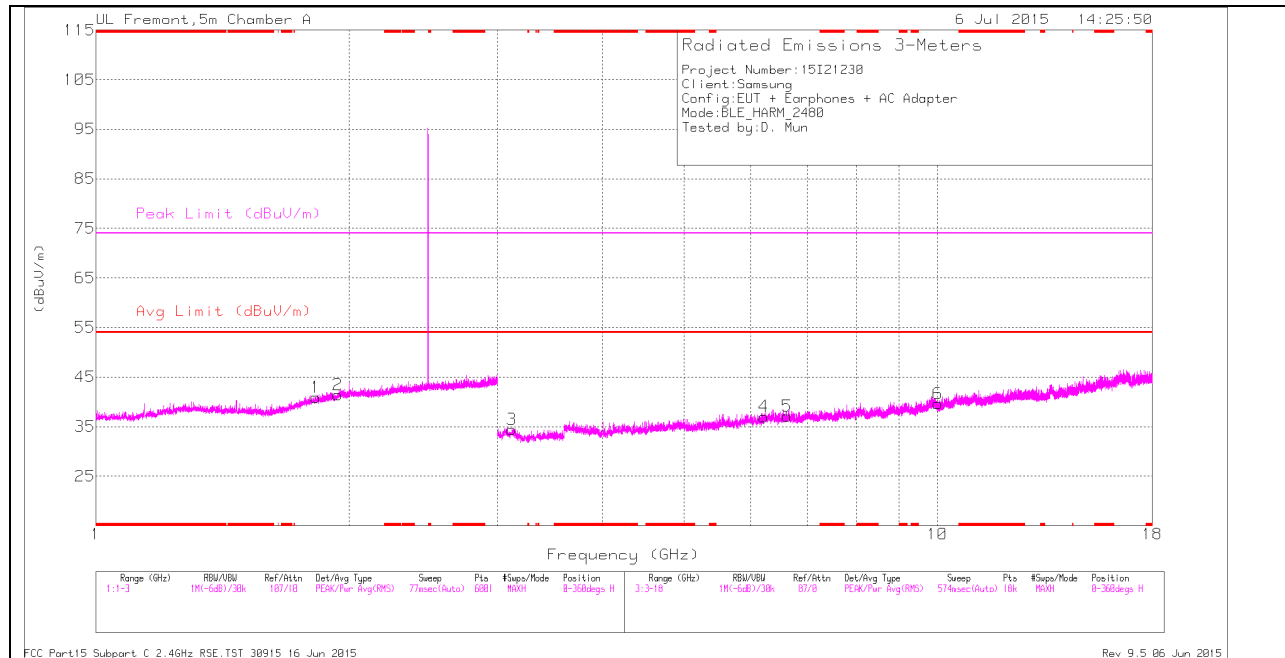
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Fitr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.818	32.86	MAV1	30.1	-25.5	2.97	40.43	-	-	-	-	360	202	H
1.819	44.49	PK2	30.1	-25.5	0	49.09	-	-	-	-	360	202	H
1.99	32.84	MAV1	31.1	-25.3	2.97	41.61	-	-	-	-	360	202	H
1.992	44.75	PK2	31.1	-25.3	0	50.55	-	-	-	-	360	202	H
3.139	42	PK2	32.8	-32.1	0	42.7	-	-	-	-	360	202	H
3.139	30.72	MAV1	32.8	-32.1	2.97	34.39	-	-	-	-	360	202	H
6.069	39.16	PK2	35.4	-29.2	0	45.36	-	-	-	-	360	202	H
6.07	27.91	MAV1	35.4	-29.2	2.97	37.08	-	-	-	-	360	202	H
6.437	39.05	PK2	35.5	-28.8	0	45.75	-	-	-	-	360	202	H
6.439	27.86	MAV1	35.5	-28.8	2.97	37.53	-	-	-	-	360	202	H
10.145	35.38	PK2	37.2	-24.3	0	48.28	-	-	-	-	360	202	H
10.149	24	MAV1	37.2	-24.3	2.97	39.87	-	-	-	-	360	202	H

PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

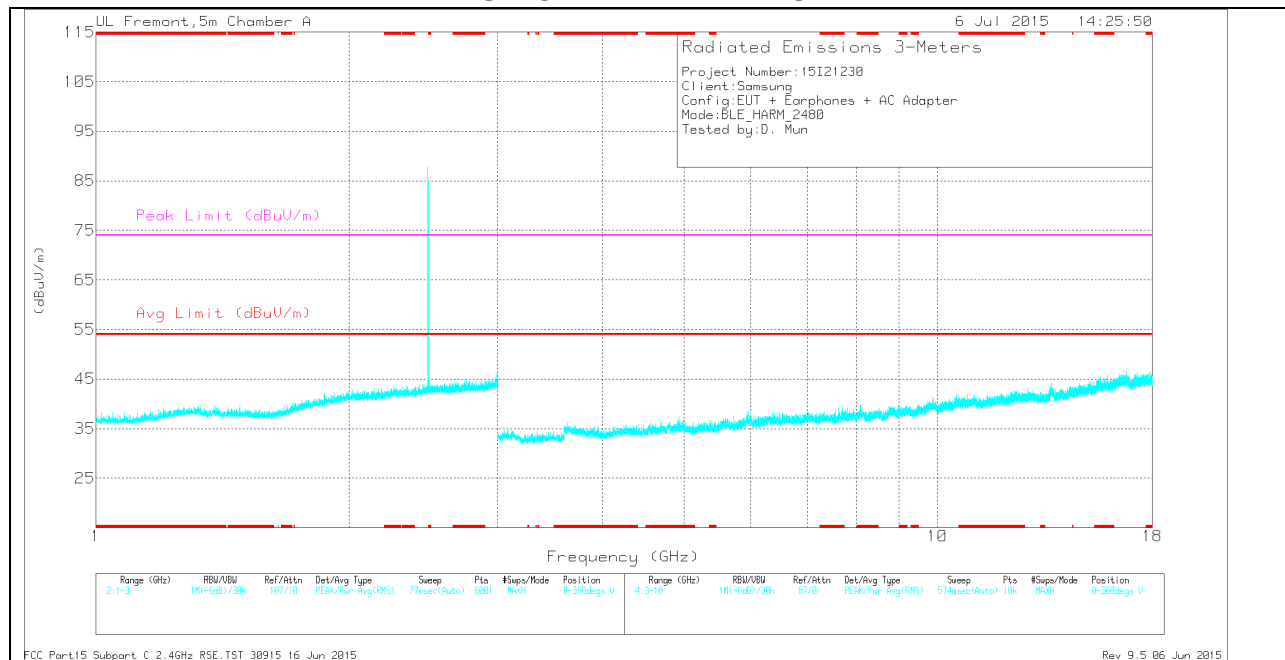
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HIGH CHANNEL HORIZONTAL



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

HIGH CHANNEL VERTICAL



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

HIGH CHANNEL DATA

TRACE MARKERS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/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	1.826	36.24	Pk	30.2	-25.5	0	40.94	-	-	-	-	0-360	201	H
2	1.938	35.93	Pk	30.9	-25.4	0	41.43	-	-	-	-	0-360	201	H
3	3.122	33.41	Pk	32.9	-31.9	0	34.41	-	-	-	-	0-360	200	H
4	6.222	30.23	Pk	35.5	-28.7	0	37.03	-	-	-	-	0-360	200	H
5	6.627	28.95	Pk	35.6	-27.4	0	37.15	-	-	-	-	0-360	200	H
6	10.011	26.38	Pk	37.1	-23.9	0	39.58	-	-	-	-	0-360	200	H

Pk - Peak detector

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/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
1.827	45.02	PK2	30.2	-25.5	0	49.72	-	-	-	-	1	202	H
1.827	32.89	MAV1	30.2	-25.5	2.97	40.56	-	-	-	-	1	202	H
1.938	44.38	PK2	30.9	-25.4	0	49.88	-	-	-	-	1	202	H
1.94	32.82	MAV1	30.9	-25.4	2.97	41.29	-	-	-	-	1	202	H
3.121	42.68	PK2	32.9	-31.9	0	43.68	-	-	-	-	1	202	H
3.121	30.65	MAV1	32.9	-31.9	2.97	34.62	-	-	-	-	1	202	H
6.221	27.51	MAV1	35.5	-28.7	2.97	37.28	-	-	-	-	1	202	H
6.223	38.55	PK2	35.5	-28.7	0	45.35	-	-	-	-	1	202	H
6.626	37.77	PK2	35.6	-27.4	0	45.97	-	-	-	-	1	202	H
6.628	26.62	MAV1	35.6	-27.4	2.97	37.79	-	-	-	-	1	202	H
10.01	34.51	PK2	37.1	-23.9	0	47.71	-	-	-	-	1	202	H
10.01	23.72	MAV1	37.1	-23.9	2.97	39.89	-	-	-	-	1	202	H

PK2 - KDB558074 Method: Maximum Peak

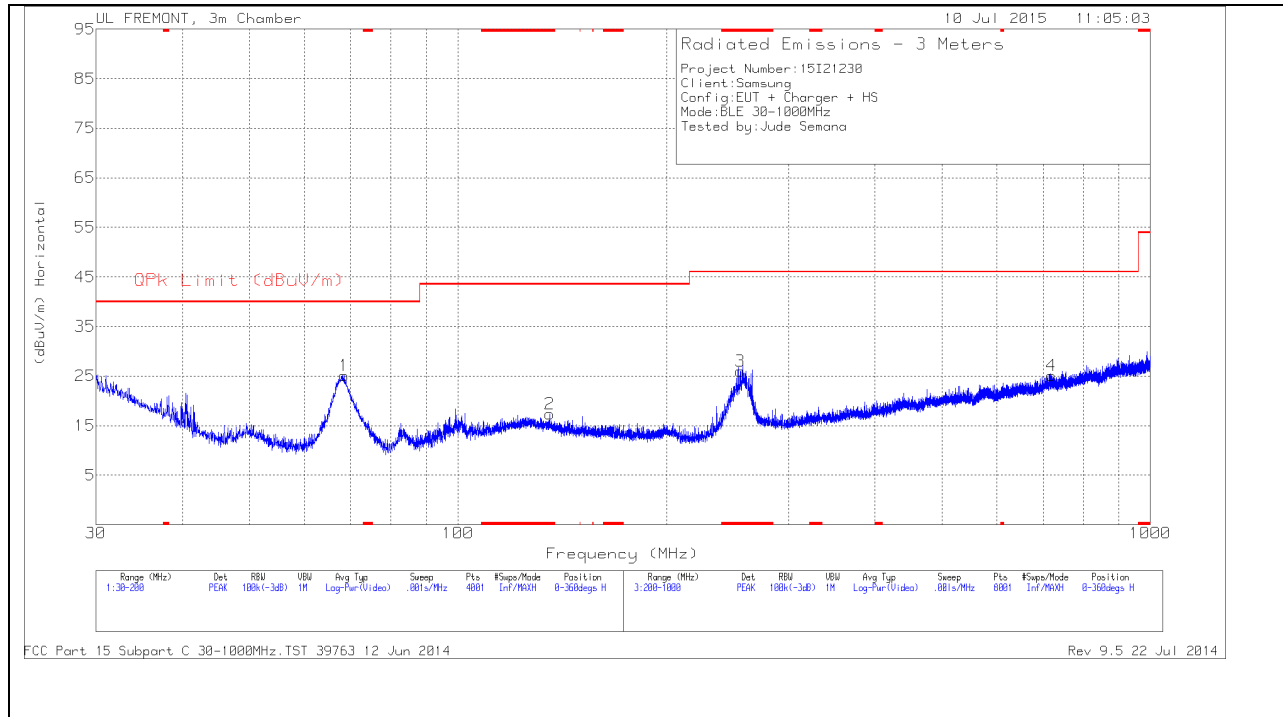
MAV1 - KDB558074 Option 1 Maximum RMS Average

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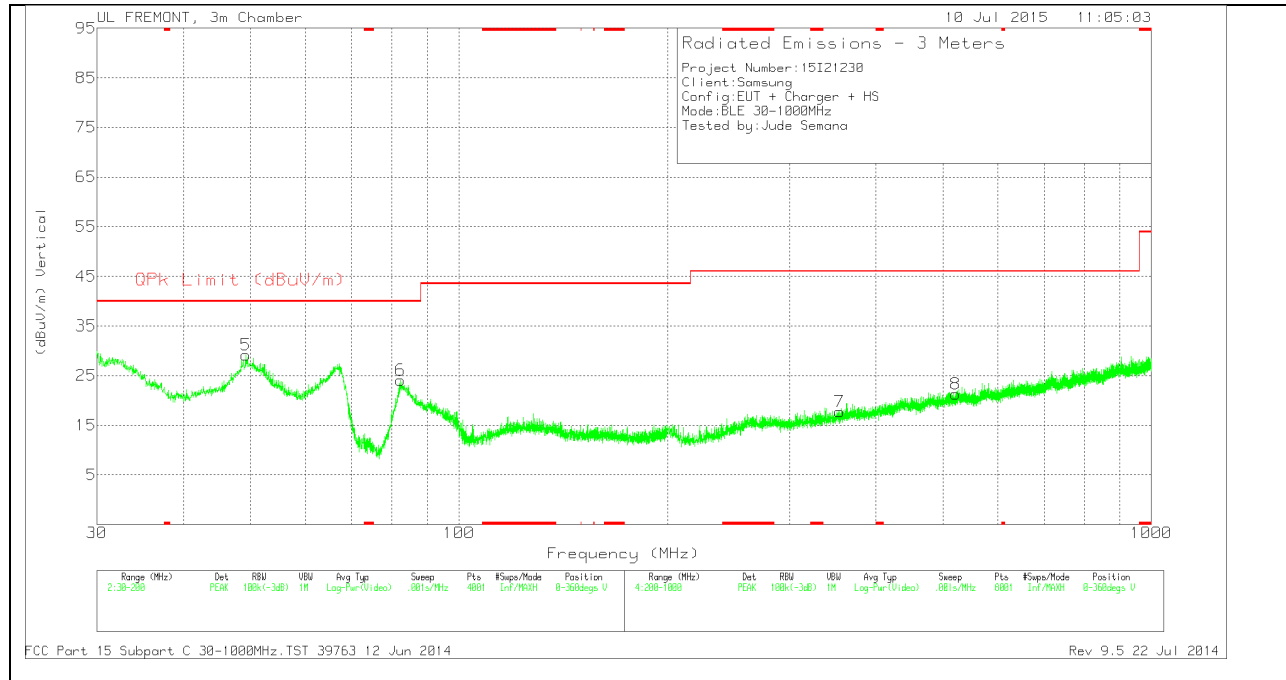
8.3. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



VERTICAL PLOT



BELOW 1 GHz TABLE

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T185 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 135.655	29.8	PK	13.4	-25.9	17.3	43.52	-26.22	0-360	100	H
3	* 255.9	39.07	PK	11.5	-24.6	25.97	46.02	-20.05	0-360	100	H
5	49.21	47.6	PK	8.5	-26.9	29.2	40	-10.8	0-360	100	V
1	68.5475	43.51	PK	8.3	-26.7	25.11	40	-14.89	0-360	300	H
6	82.3175	42.77	PK	7.8	-26.5	24.07	40	-15.93	0-360	100	V
7	354.6	27.83	PK	14.5	-24.6	17.73	46.02	-28.29	0-360	200	V
8	521.4	28.36	PK	17.9	-25	21.26	46.02	-24.76	0-360	100	V
4	719.1	28.8	PK	20.3	-24	25.1	46.02	-20.92	0-360	200	H

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

PK - Peak detector

9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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

^{*} Decreases with the logarithm of the frequency.

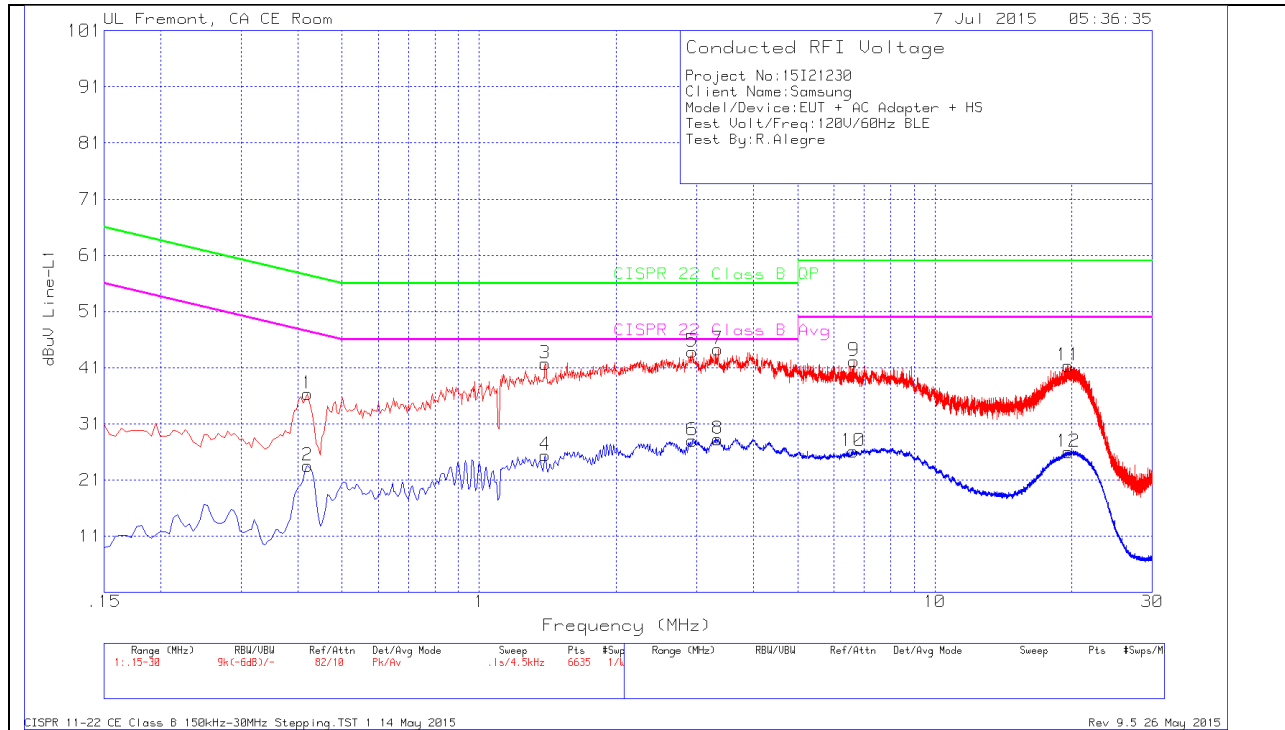
TEST PROCEDURE

ANSI C63.10

RESULTS

6 WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

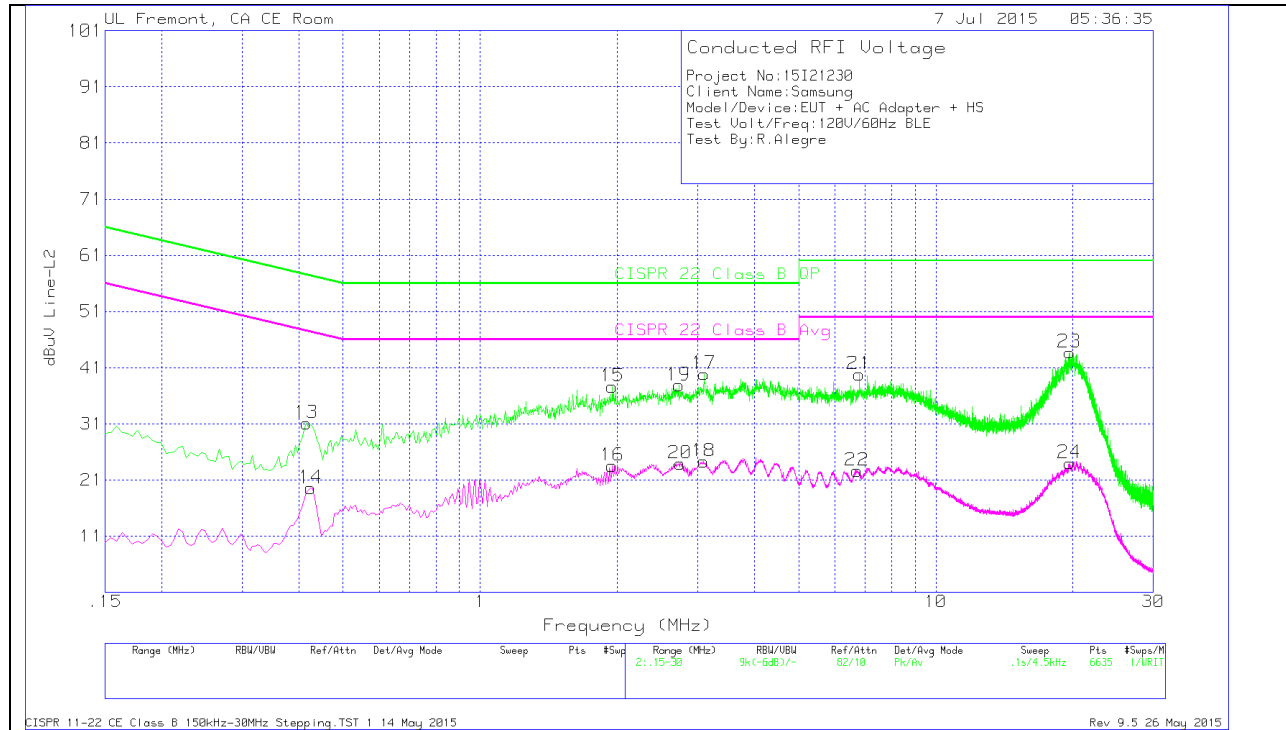
Range 1: Line-L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1	LC Cables 1&3	Corrected Reading dBuV	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
1	.42	35.98	Pk	.4	0	36.38	57.45	-21.07	-	-
2	.42	23.14	Av	.4	0	23.54	-	-	47.45	-23.91
3	1.3965	41.43	Pk	.2	.1	41.73	56	-14.27	-	-
4	1.3965	25.1	Av	.2	.1	25.4	-	-	46	-20.6
5	2.9355	43.54	Pk	.2	.1	43.84	56	-12.16	-	-
6	2.9355	27.75	Av	.2	.1	28.05	-	-	46	-17.95
7	3.3405	43.98	Pk	.2	.1	44.28	56	-11.72	-	-
8	3.3405	28.01	Av	.2	.1	28.31	-	-	46	-17.69
9	6.639	41.87	Pk	.2	.1	42.17	60	-17.83	-	-
10	6.6255	25.83	Av	.2	.1	26.13	-	-	50	-23.87
11	19.6305	40.83	Pk	.3	.2	41.33	60	-18.67	-	-
12	19.6305	25.49	Av	.3	.2	25.99	-	-	50	-24.01

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	CISPR 22 Class B QP	Margin (dB)	CISPR 22 Class B Avg	Margin (dB)
13	.4155	30.73	Pk	.4	0	31.13	57.54	-26.41	-	-
14	.4245	19.14	Av	.4	0	19.54	-	-	47.36	-27.82
15	1.95	37.35	Pk	.2	.1	37.65	56	-18.35	-	-
16	1.95	23.23	Av	.2	.1	23.53	-	-	46	-22.47
17	3.102	39.56	Pk	.2	.1	39.86	56	-16.14	-	-
18	3.093	23.99	Av	.2	.1	24.29	-	-	46	-21.71
19	2.7285	37.55	Pk	.2	.1	37.85	56	-18.15	-	-
20	2.7465	23.62	Av	.2	.1	23.92	-	-	46	-22.08
21	6.792	39.54	Pk	.2	.1	39.84	60	-20.16	-	-
22	6.7155	22.36	Av	.2	.1	22.66	-	-	50	-27.34
23	19.662	43.21	Pk	.3	.2	43.71	60	-16.29	-	-
24	19.662	23.5	Av	.3	.2	24	-	-	50	-26

Pk - Peak detector

Av - Average detection