



**FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8**

**BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT**

FOR

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

MODEL NUMBER: SM-G850S; SM-G850K; SM-G850L

FCC ID: A3LSMG850KOR

IC: 649E-SMG850KOR

REPORT NUMBER: 14U17914-3

ISSUE DATE: JUNE 6, 2014

Prepared for

**SAMSUNG ELECTRONICS CO., LTD.
416, MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA**

Prepared by

**UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888**



NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	06/06/14	Initial Issue	P. Zhang

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY	5
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	<i>5</i>
4.2. <i>SAMPLE CALCULATION</i>	<i>5</i>
4.3. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>5</i>
5. EQUIPMENT UNDER TEST	6
5.1. <i>DESCRIPTION OF EUT</i>	<i>6</i>
5.2. <i>MAXIMUM OUTPUT POWER.....</i>	<i>6</i>
5.3. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i>	<i>6</i>
5.4. <i>WORST-CASE CONFIGURATION AND MODE.....</i>	<i>7</i>
5.5. <i>DESCRIPTION OF TEST SETUP.....</i>	<i>8</i>
6. TEST AND MEASUREMENT EQUIPMENT	10
7. SUMMARY	11
8. ANTENNA PORT TEST RESULTS	11
8.1. <i>6 dB BANDWIDTH.....</i>	<i>12</i>
8.2. <i>99% BANDWIDTH.....</i>	<i>15</i>
8.3. <i>OUTPUT POWER.....</i>	<i>18</i>
8.4. <i>AVERAGE POWER.....</i>	<i>21</i>
8.5. <i>POWER SPECTRAL DENSITY.....</i>	<i>22</i>
8.6. <i>CONDUCTED SPURIOUS EMISSIONS.....</i>	<i>25</i>
9. RADIATED TEST RESULTS.....	29
9.1. <i>LIMITS AND PROCEDURE.....</i>	<i>29</i>
9.2. <i>TRANSMITTER ABOVE 1 GHz.....</i>	<i>30</i>
9.3. <i>WORST-CASE BELOW 1 GHz.....</i>	<i>43</i>
10. AC POWER LINE CONDUCTED EMISSIONS	46
11. SETUP PHOTOS	50

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac, ANT+ & NFC

MODEL: SM-G850S; SM-G850K; SM-G850L

SERIAL NUMBER: 1883968 (Conducted), 1883967(Radiated)

DATE TESTED: MAY 29 – JUNE 5, 2014

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	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:



PENG ZHANG
CONSUMER TECHNOLOGY DIVISION
PROJECT LEAD
UL Verification Services Inc.

Tested By:



CHARLES VERGONIO
CONSUMER TECHNOLOGY DIVISION
LAB ENGINEER
UL Verification Services Inc.

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, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

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

47173 Benicia Street	47266 Benicia Street
<input type="checkbox"/> Chamber A	<input type="checkbox"/> Chamber D
<input checked="" type="checkbox"/> Chamber B	<input type="checkbox"/> Chamber E
<input type="checkbox"/> Chamber C	<input type="checkbox"/> Chamber F

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n/ac & ANT+. SM-G850S, SM-G850K, SM-G850L are same hardware but for different carrier.

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	5.32	3.40

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of -3.64 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	EP-TA11KWK	N/A	N/A
Earphone	SAMSUNG	N/A	N/A	N/A

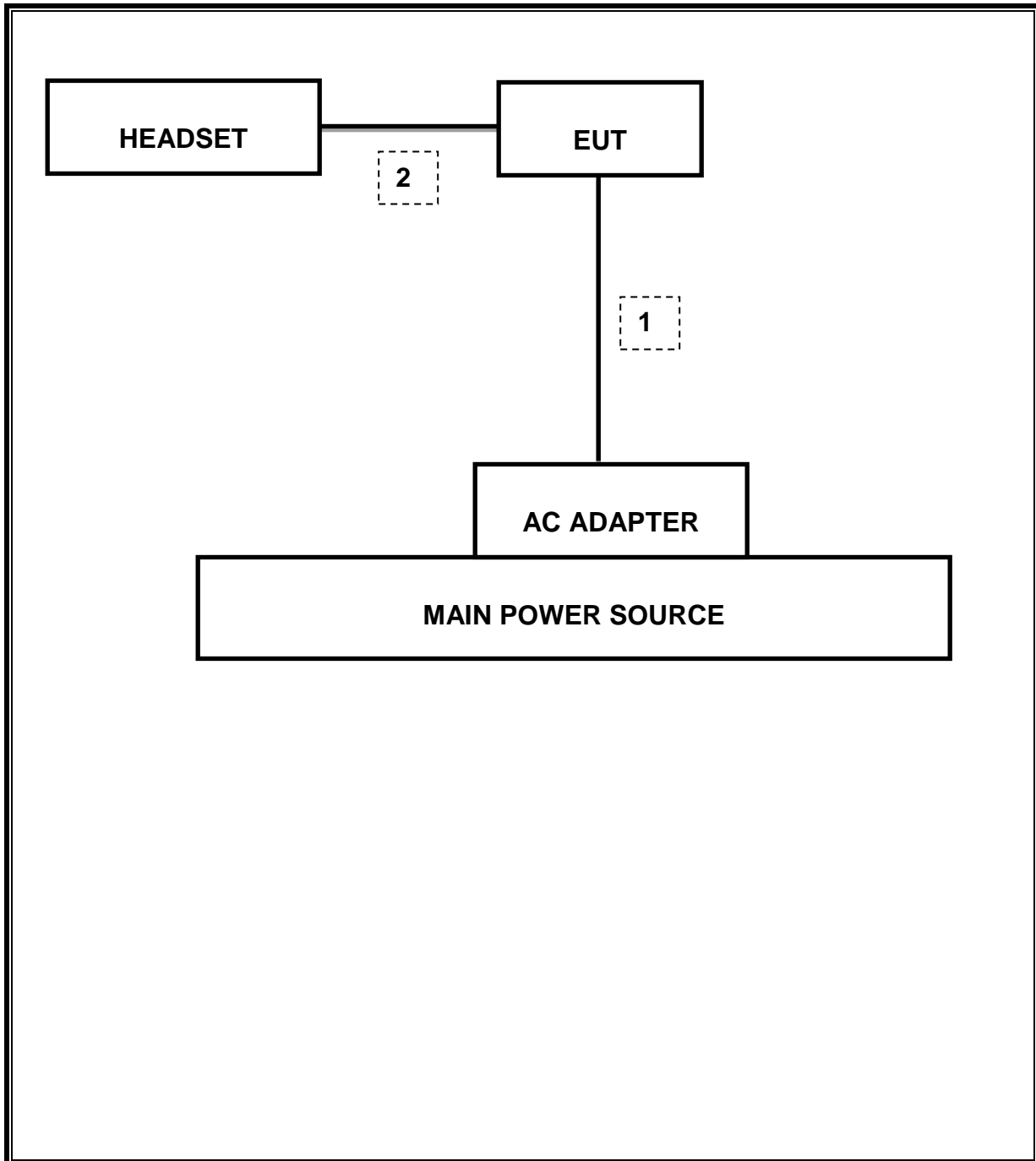
I/O CABLES

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

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
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	4/1/2015
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	2/26/2015
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	8/8/2014
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	5/8/2015
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	10/22/2014
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	N/A	3/6/2015
Antenna, Horn, 18 GHz	ETS	3117	C01022	2/21/2015
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	12/17/2014
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/2014
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/2014
LISN, 30 MHz	FCC	50/250-25-2	C00626	1/14/2015

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	0.7221MHz
2.1051, 15.247 (d)	RSS-210 A8.5	Band Edge / Conducted Spurious Emission	-20dBc		Pass	-50.01dBm
15.247	RSS-210 A8.4	TX conducted output power	<30dBm		Pass	5.32dBm
15.247	RSS-210 A8.2	PSD	<8dBm		Pass	-8.83dBm
15.207 (a)	RSS-GEN 7.2.2	AC Power Line conducted emissions	Section 10	Radiated	Pass	32.88dBuV(AV)
15.205, 15.209	RSS-210 Clause 2.6, RSS-210 Clause 6	Radiated Spurious Emission	< 54dBuV/m		Pass	44.03dBuV/m

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.

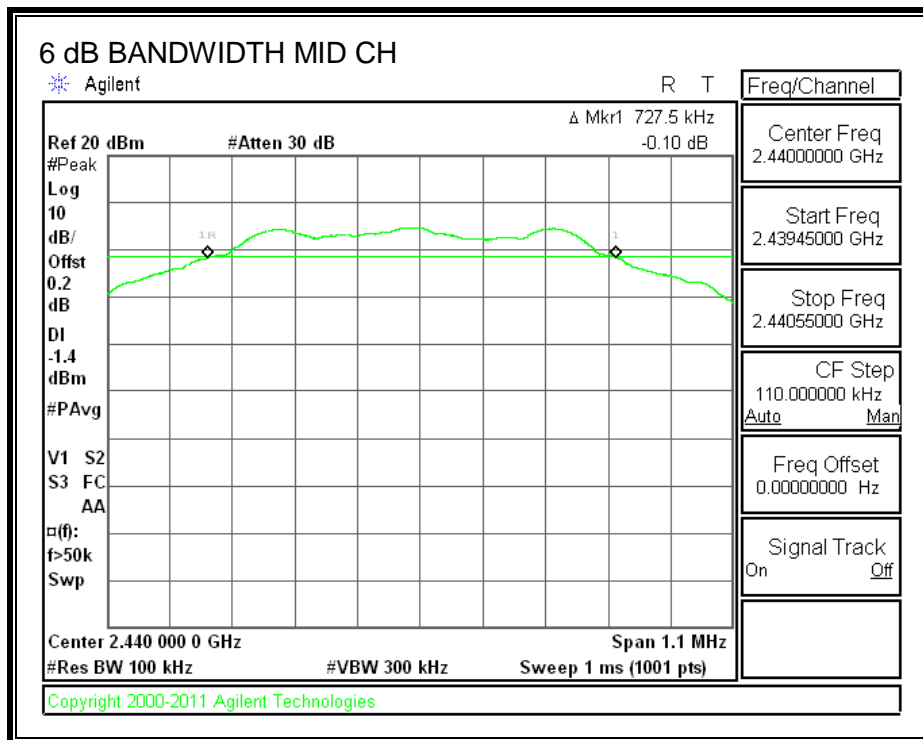
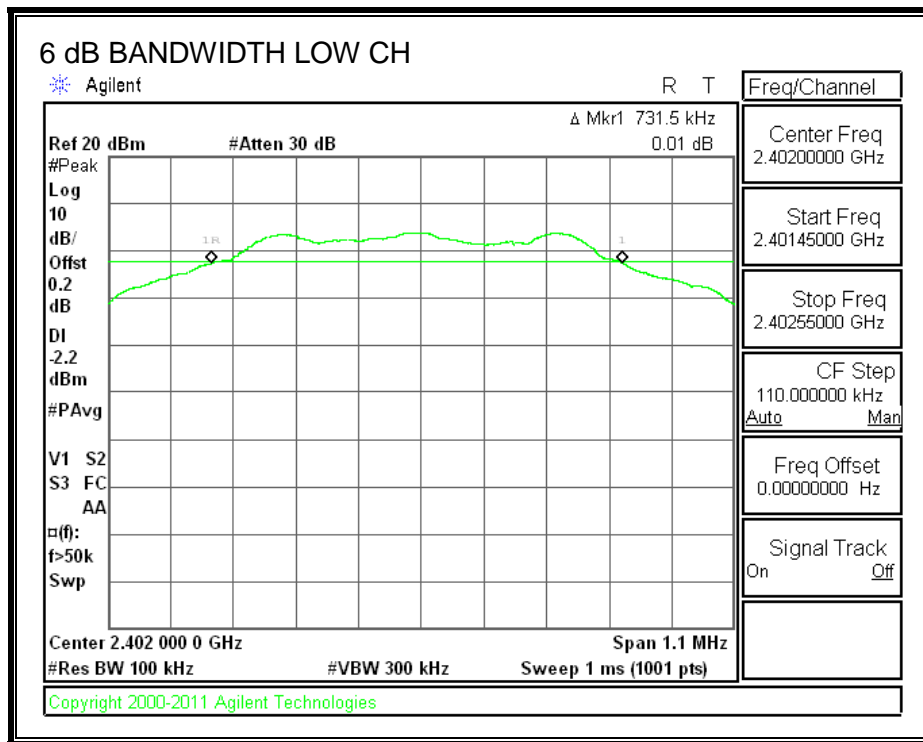
TEST PROCEDURE

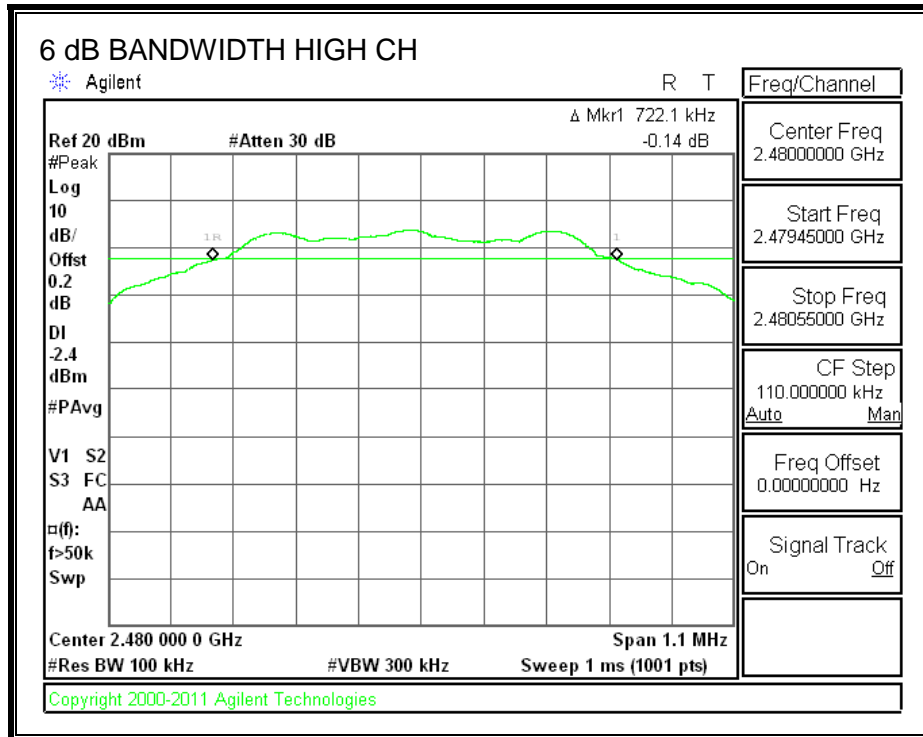
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2402	0.7315	0.5
Middle	2440	0.7275	0.5
High	2480	0.7221	0.5

6 dB BANDWIDTH





8.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

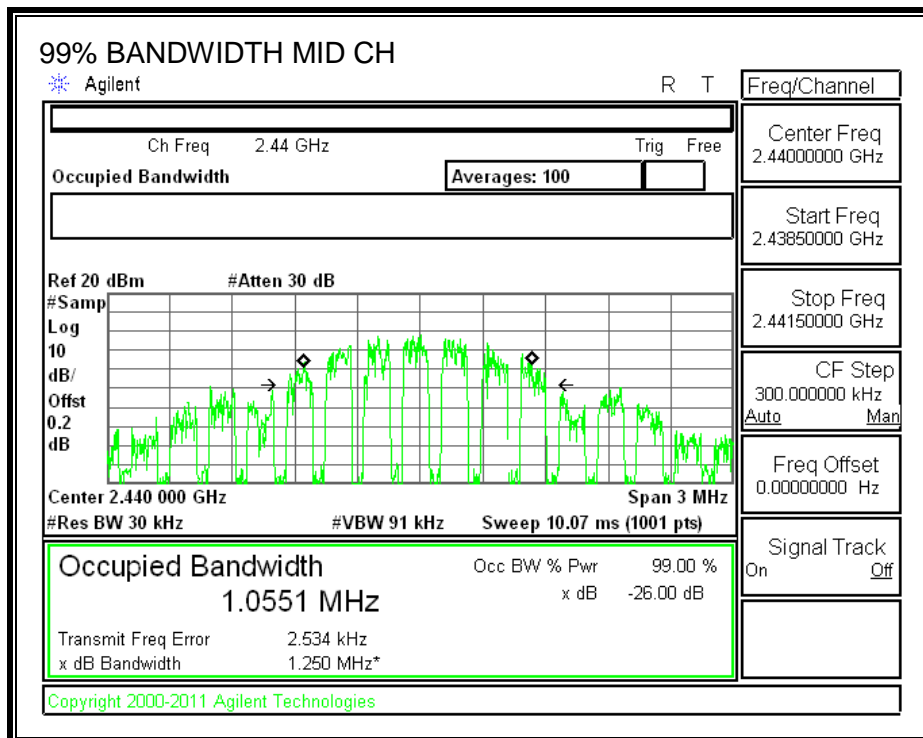
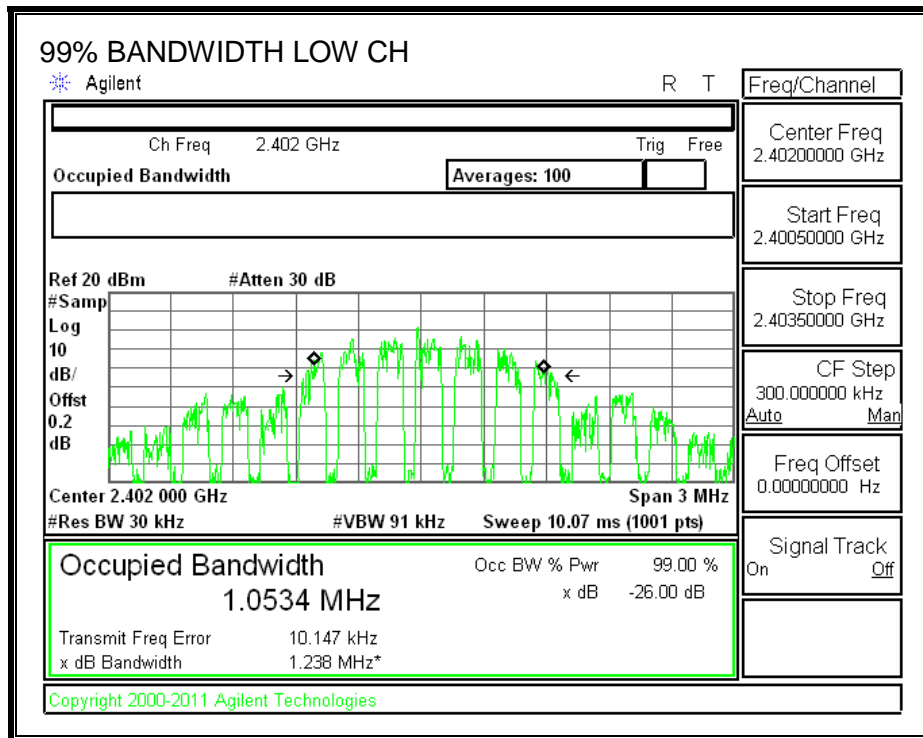
TEST PROCEDURE

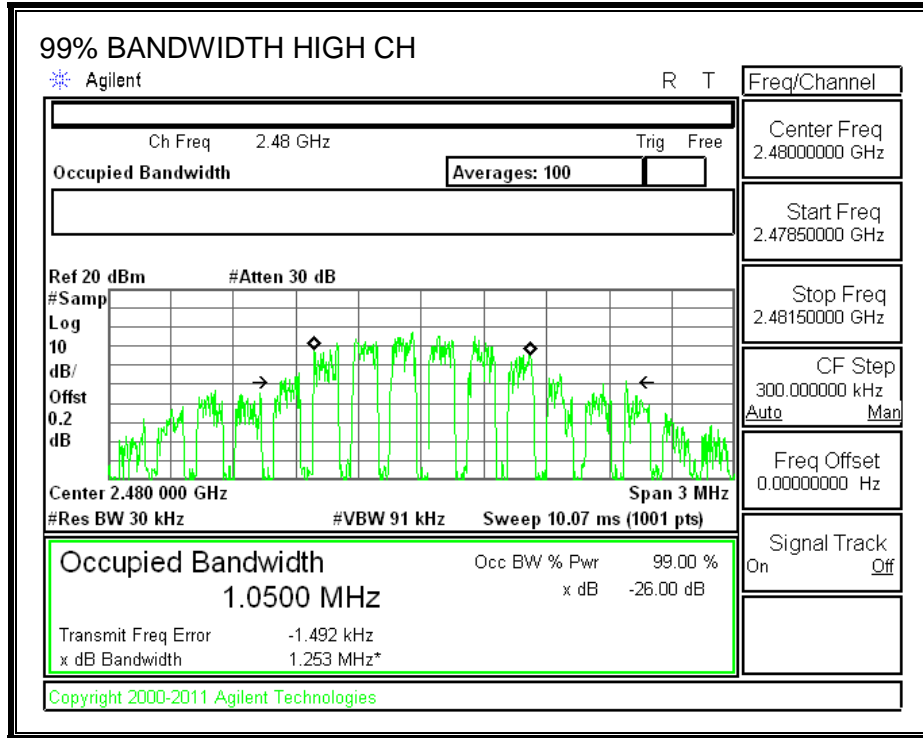
Reference to KDB558074 D01 DTS Meas Guidance v03r01: The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0534
Middle	2440	1.0551
High	2480	1.0500

99% BANDWIDTH





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.

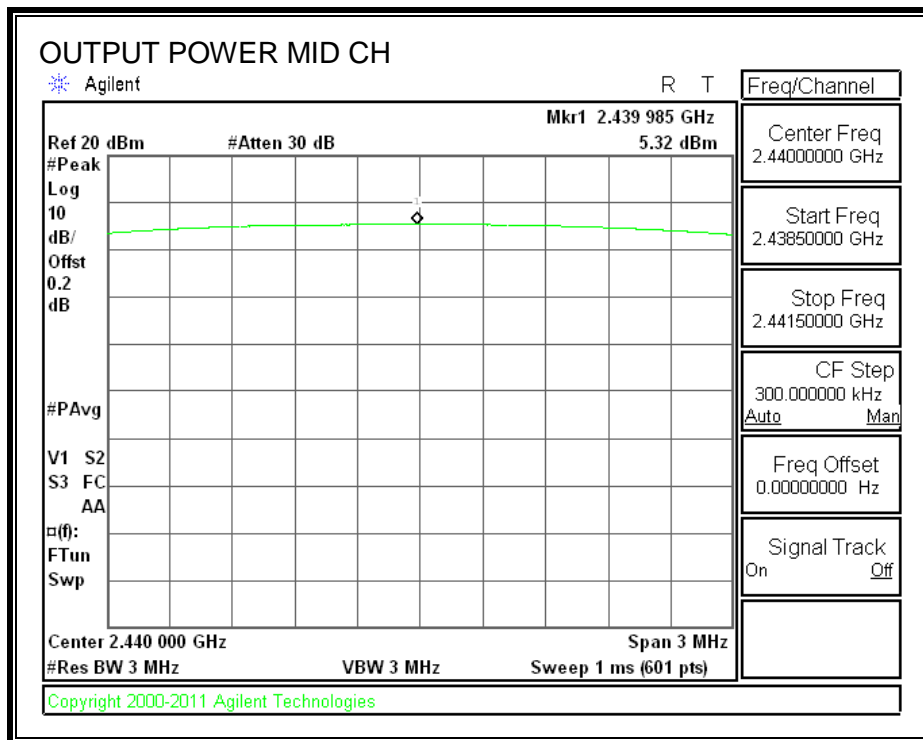
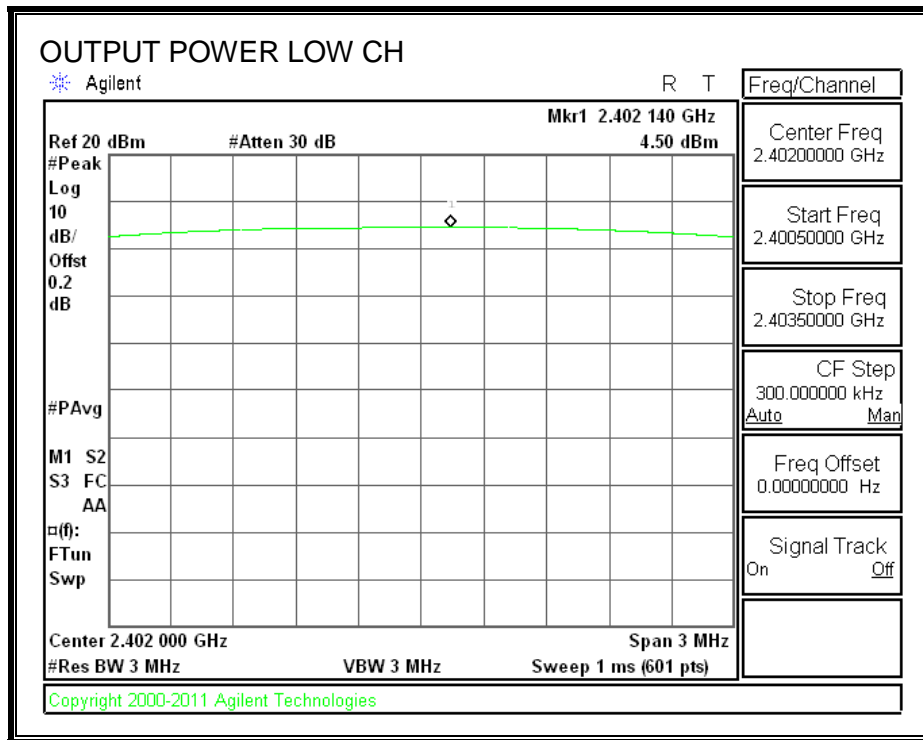
TEST PROCEDURE

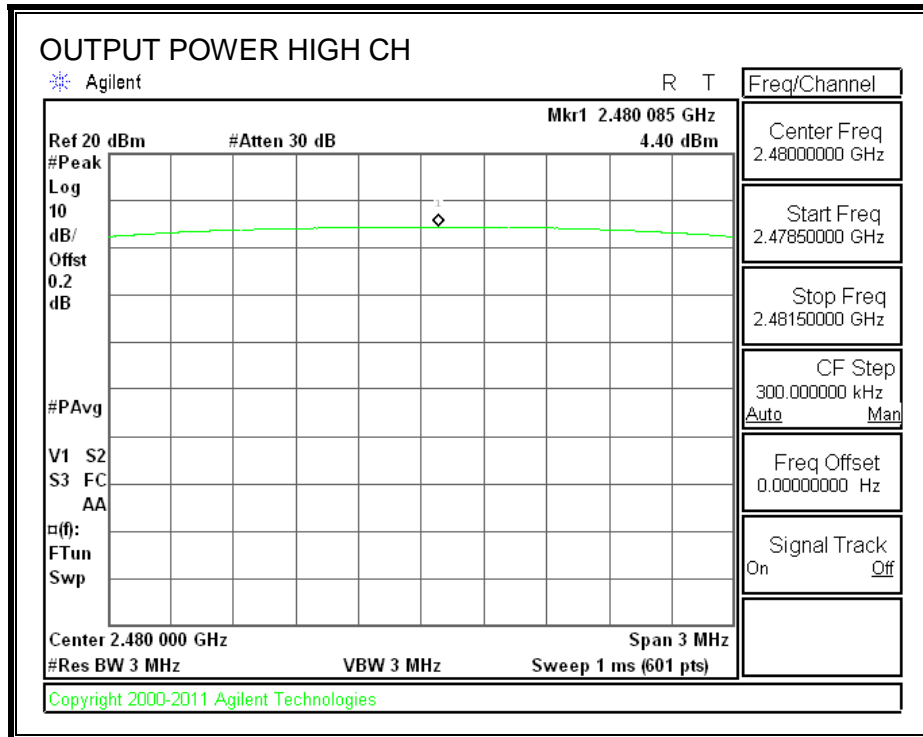
Peak power is measured using KDB558074 D01 DTS Meas Guidance v03r01 April 9, 2013 under section 9.1.1 utilizing spectrum analyzer.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	4.500	30	-25.500
Middle	2440	5.320	30	-24.680
High	2480	4.400	30	-25.600

OUTPUT POWER





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 10.2 dB (including 10 dB pad and 0.2 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	4.5
Middle	2440	5.3
High	2480	4.4

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.

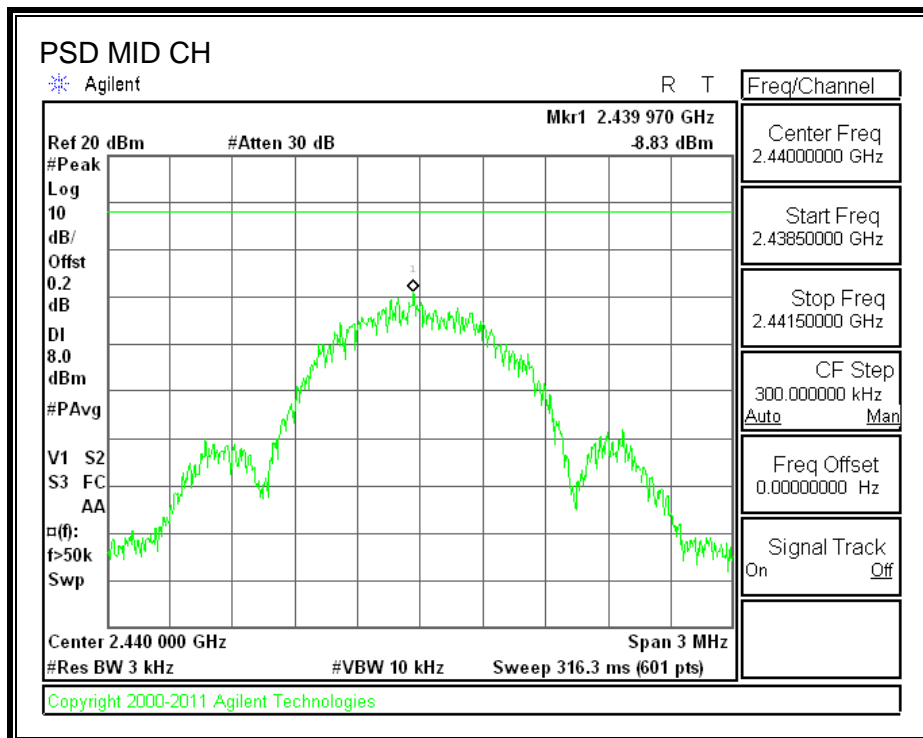
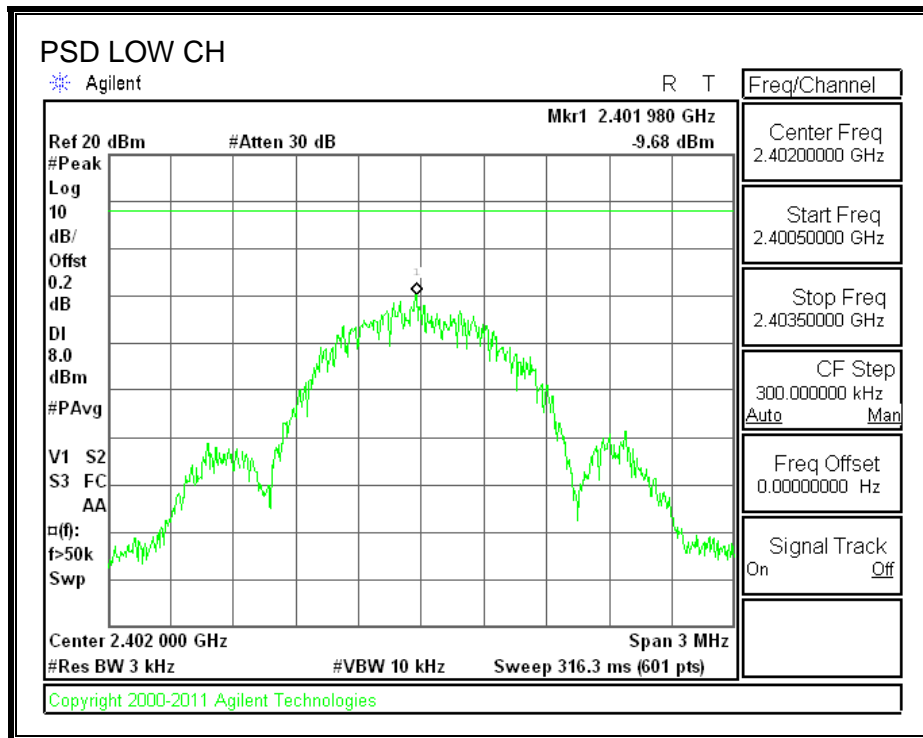
TEST PROCEDURE

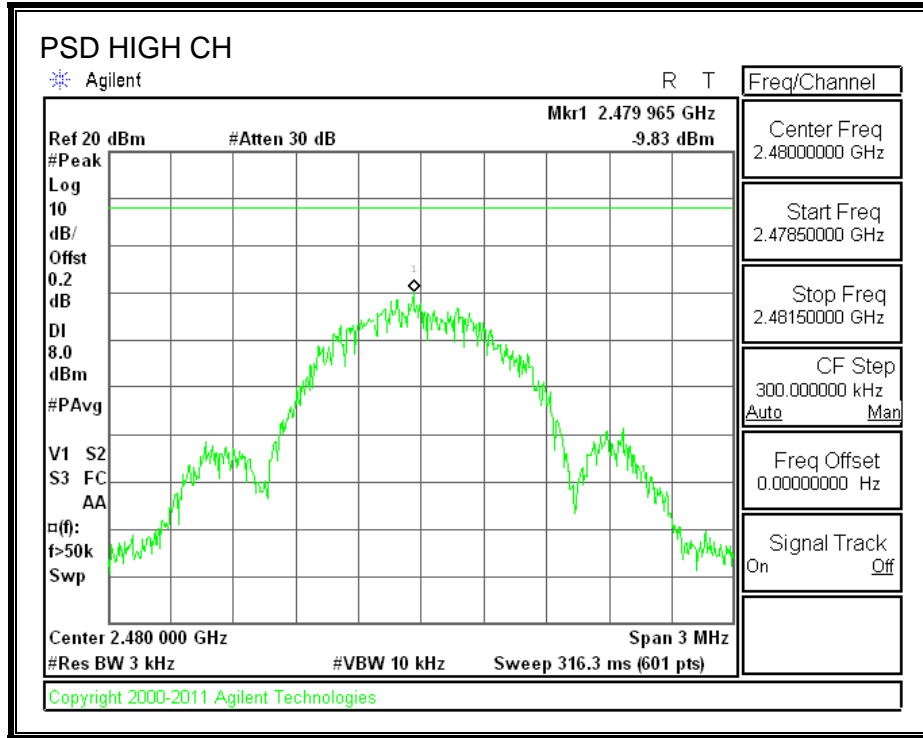
Power Spectral Density was performed utilizing the “Method PKPSD (Peak PSD)” under KDB558074 D01 DTS Meas Guidance v03r01, April 9, 2013

RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-9.68	8	-17.68
Middle	2440	-8.83	8	-16.83
High	2480	-9.83	8	-17.83

POWER SPECTRAL DENSITY





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.

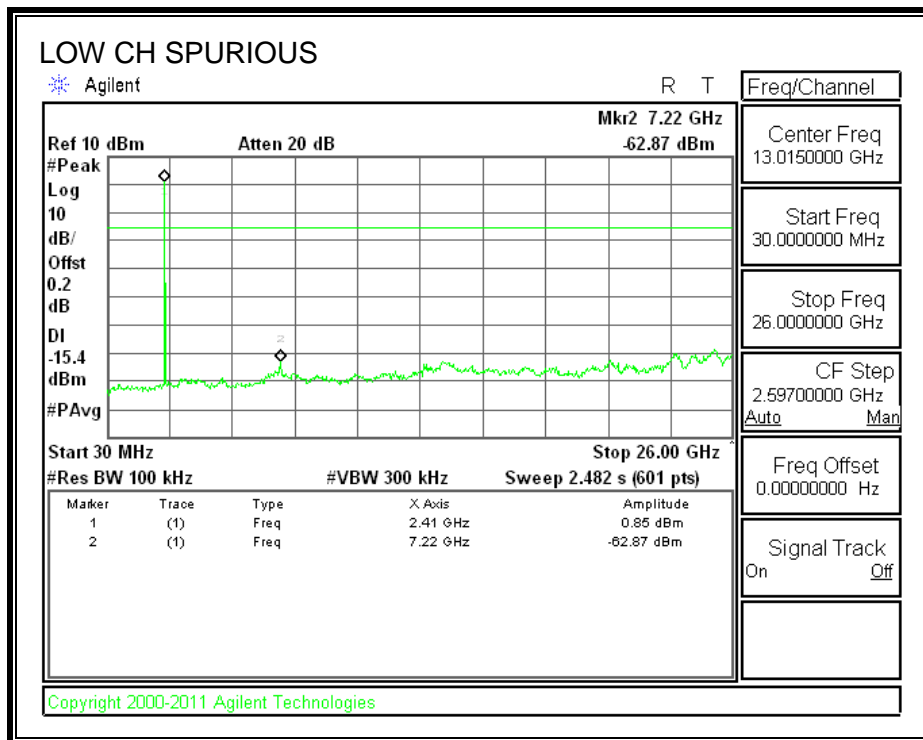
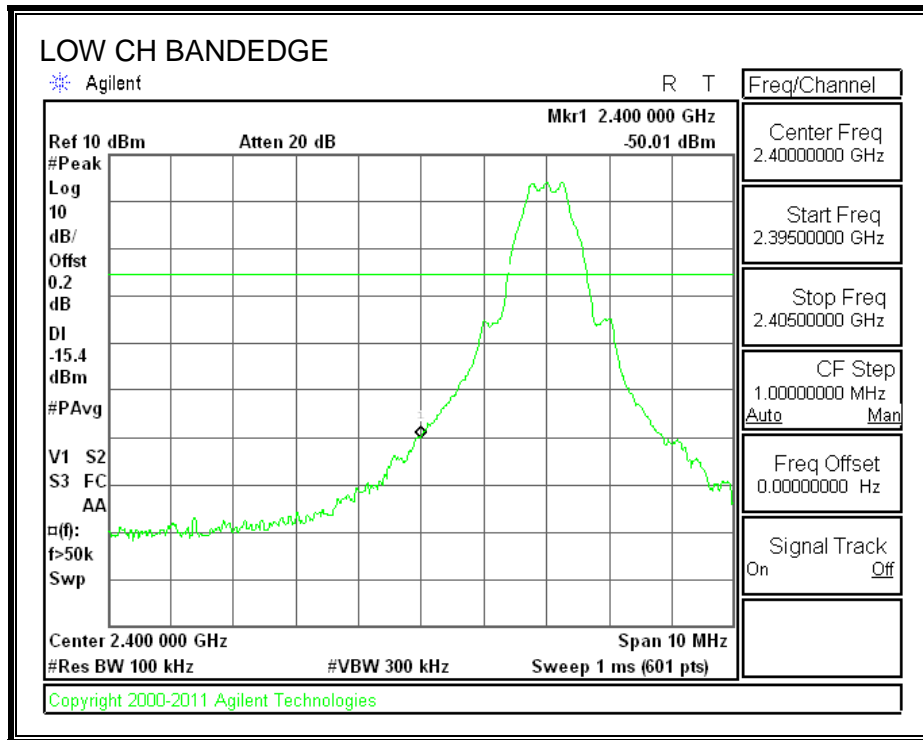
TEST PROCEDURE

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.

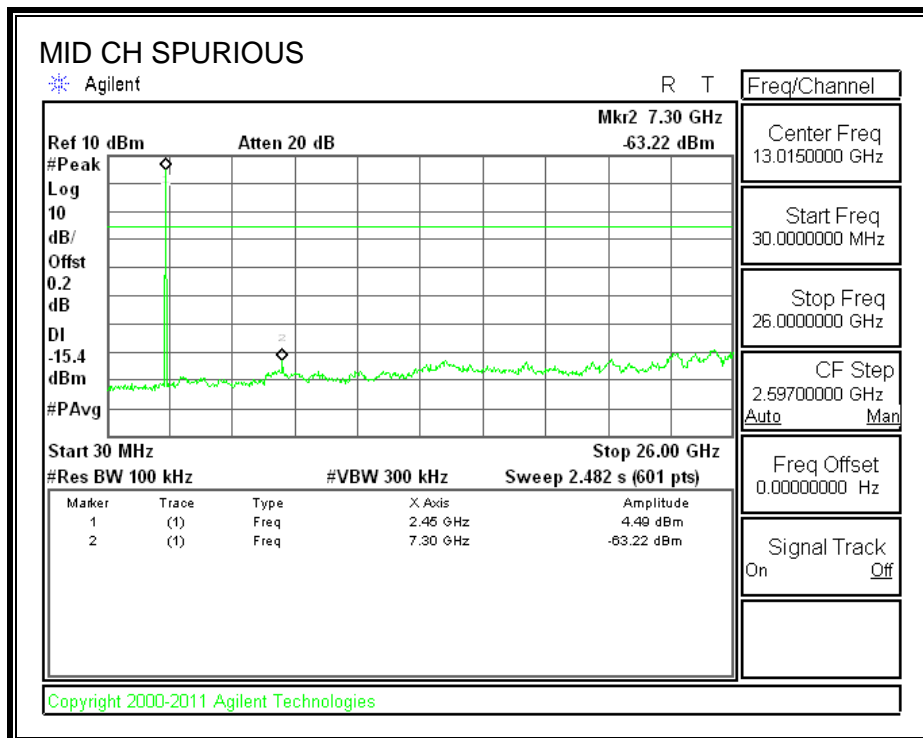
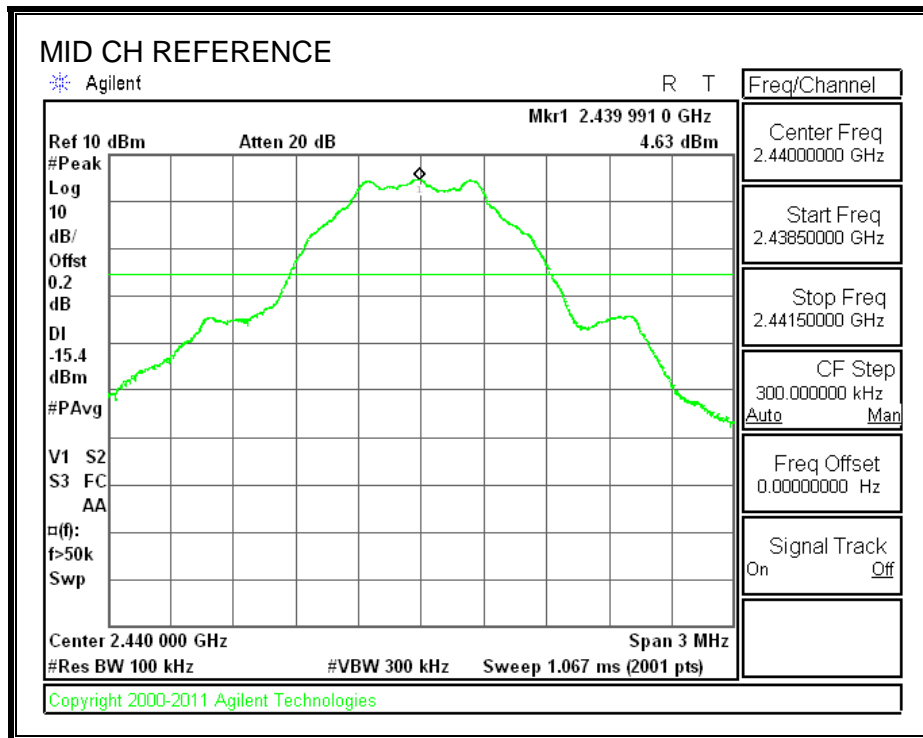
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

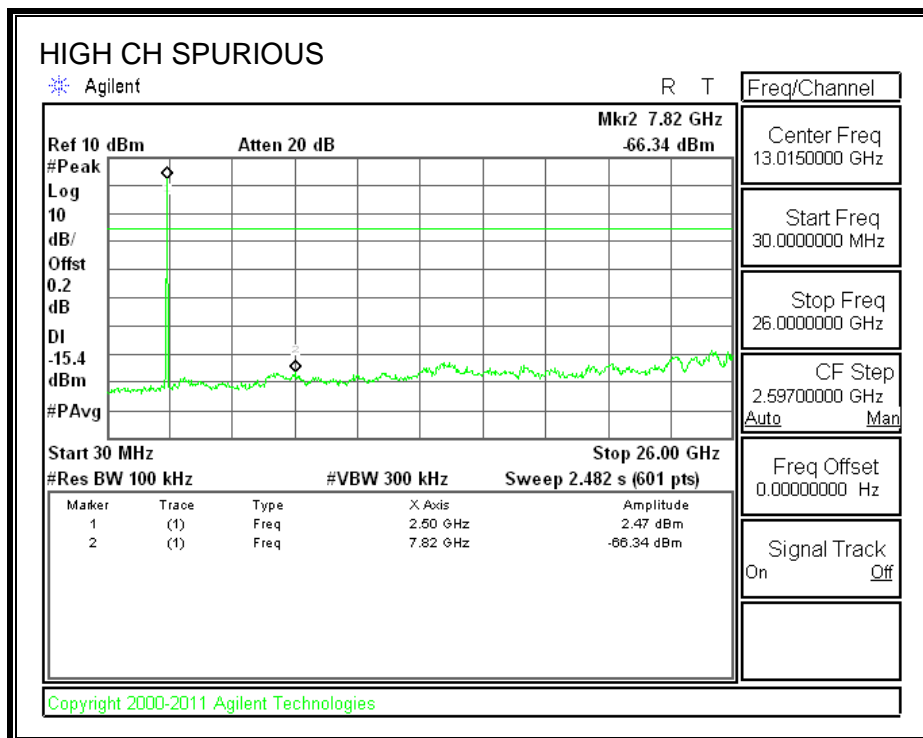
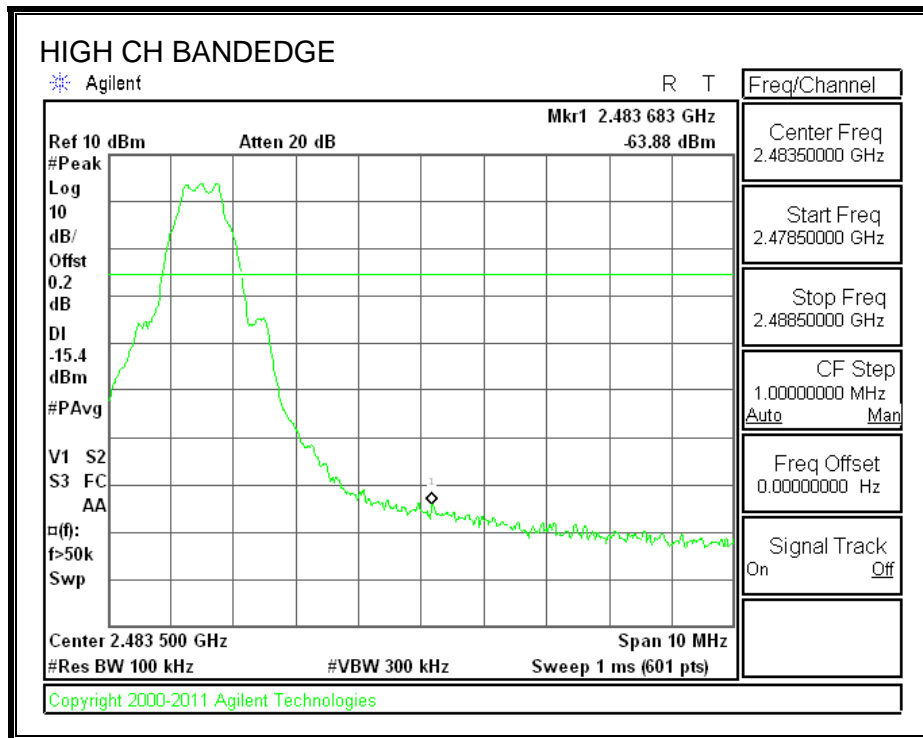
SPURIOUS EMISSIONS, LOW CHANNEL



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



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.

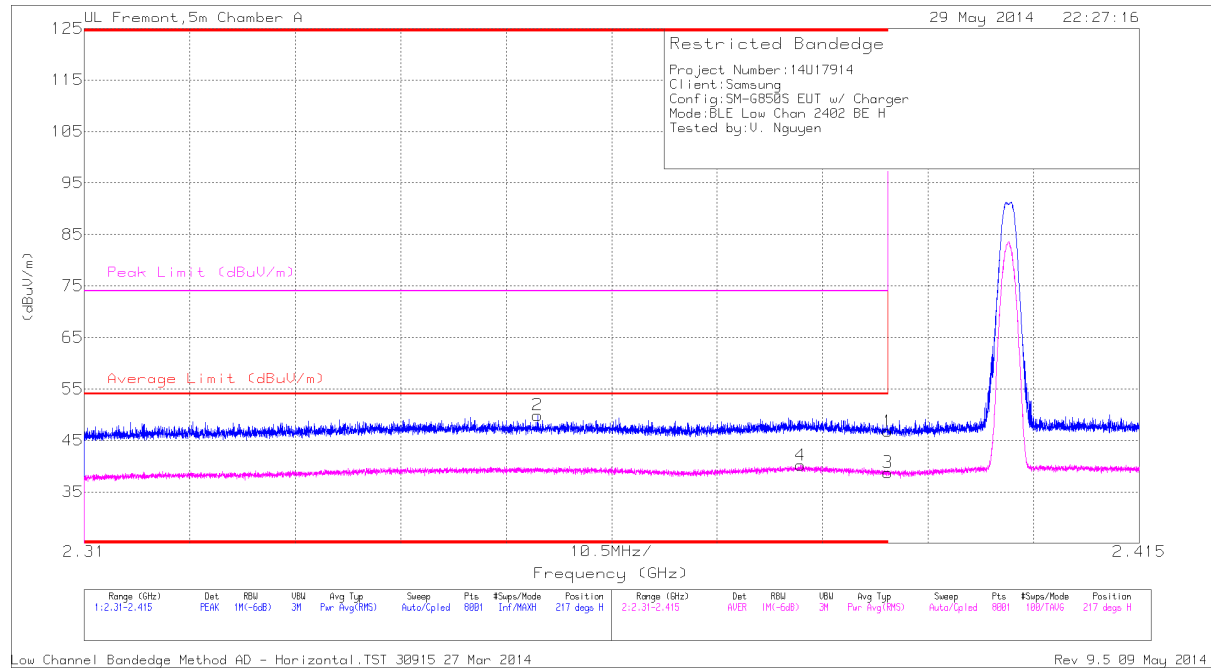
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and add duty cycle factor for average measurements. Duty cycle factor = $10 \log(1/x)$. For this sample: DCF = $10 \log(1/0.618) = 2.08 \text{ dB}$ (Spectrum Analyzer round it up to 2.1 dB)

The spectrum from 1GHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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

9.2. TRANSMITTER ABOVE 1 GHz

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



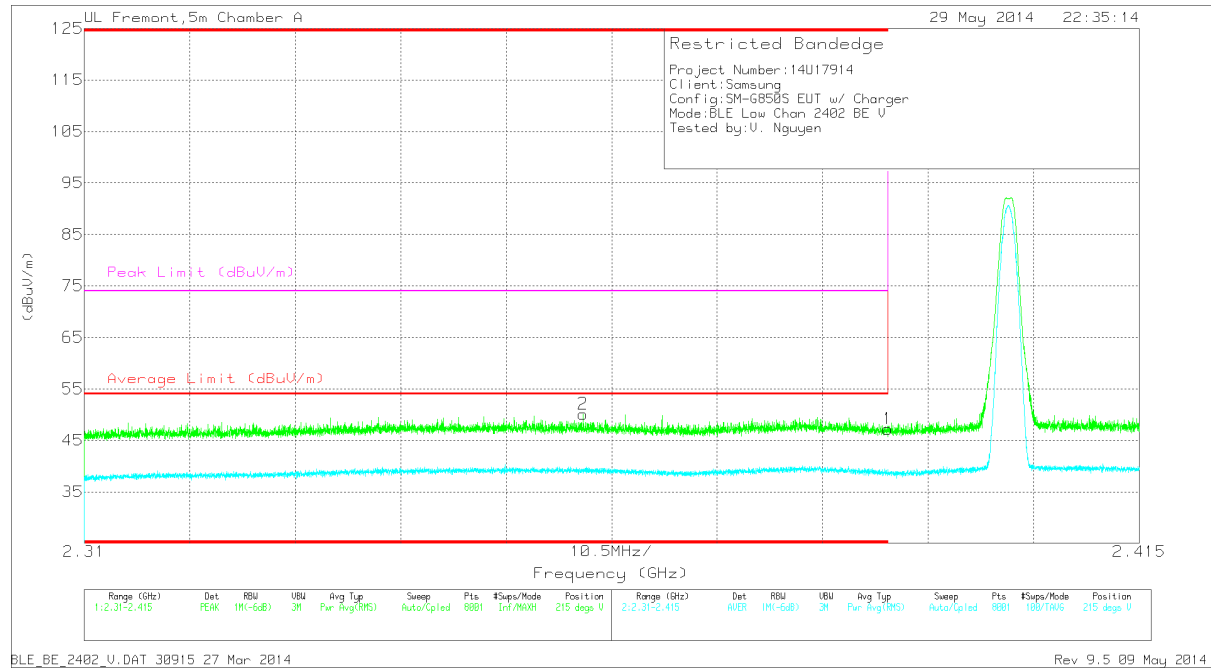
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	38.96	PK	32.2	-24.4	0	46.76	-	-	74	-27.24	217	286	H
2	* 2.355	41.8	PK	31.9	-23.8	0	49.9	-	-	74	-24.1	217	286	H
3	* 2.39	28.85	RMS	32.2	-24.4	2.1	38.75	54	-15.25	-	-	217	286	H
4	* 2.381	29.39	RMS	32.2	-23.5	2.1	40.19	54	-13.81	-	-	217	286	H

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

PK - Peak detector

RMS - RMS detection

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



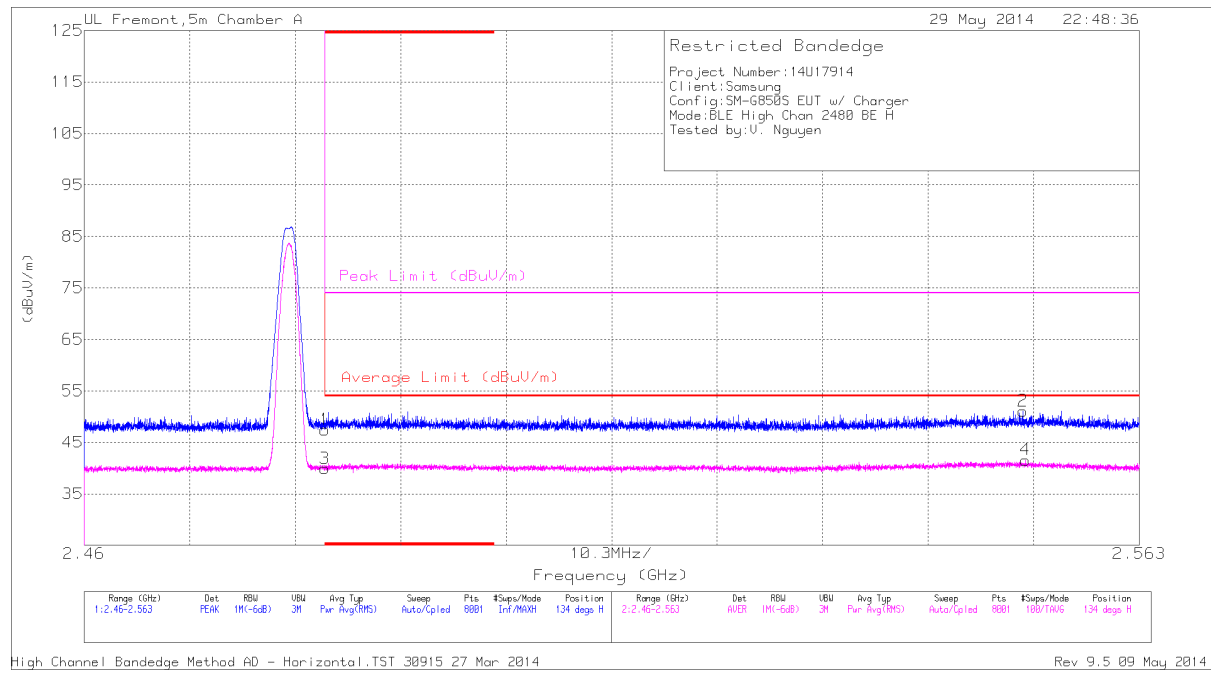
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Fitter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.352	30.04	RMS	31.9	-23.7	2.1	40.34	54	-13.66	-	-	215	287	V
2	* 2.36	41.91	PK	32	-23.8	0	50.11	-	-	74	-23.89	215	287	V
1	* 2.39	39.42	PK	32.2	-24.4	0	47.22	-	-	74	-26.78	215	287	V
3	* 2.39	28.84	RMS	32.2	-24.4	2.1	38.74	54	-15.26	-	-	215	287	V

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

PK - Peak detector

RMS - RMS detection

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



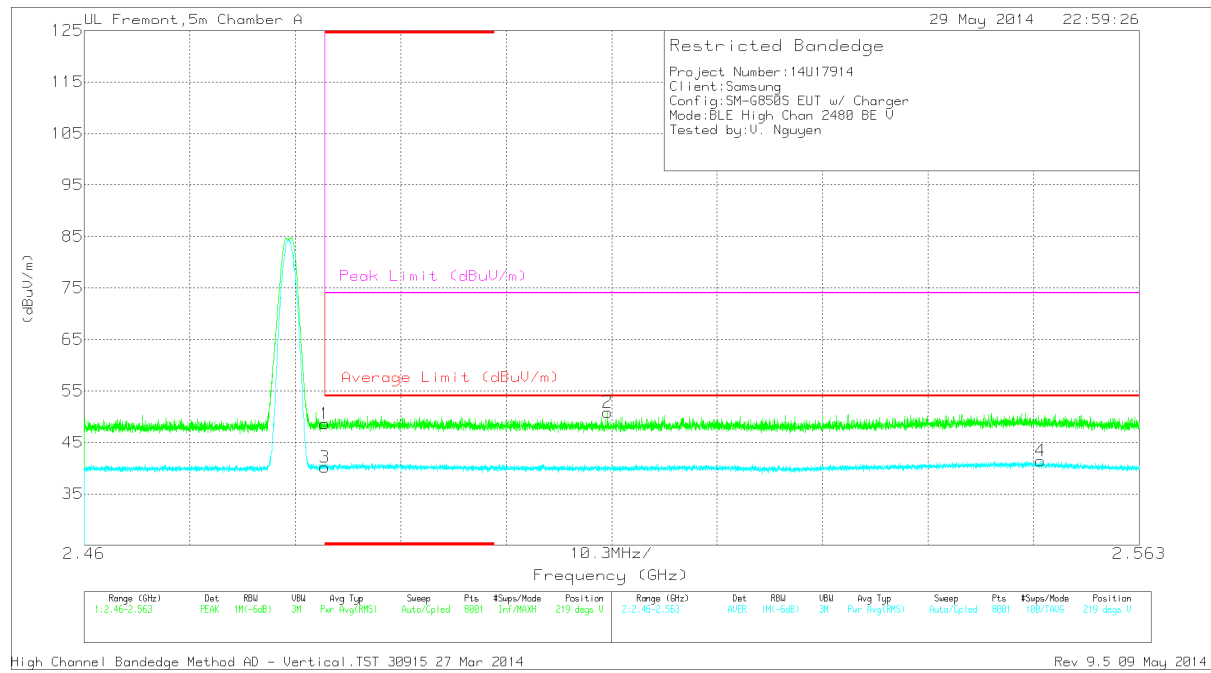
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/Filter/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	38.27	PK	32.7	-23.5	0	47.47	-	-	74	-26.53	134	269	H
3	* 2.484	28.64	RMS	32.7	-23.5	2.1	39.94	54	-14.06	-	-	134	269	H
2	2.552	41.3	PK	32.9	-23.1	0	51.1	-	-	74	-22.9	134	269	H
4	2.552	29.69	RMS	32.9	-23.1	2.1	41.59	54	-12.41	-	-	134	269	H

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

PK - Peak detector

RMS - RMS detection

RESTRICTED BANDEGE (HIGH CHANNEL, VERTICAL)



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cb/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	* 2.484	39.42	PK	32.7	-23.5	0	48.62	-	-	74	-25.38	219	340	V
3	* 2.484	28.86	RMS	32.7	-23.5	2.1	40.16	54	-13.84	-	-	219	340	V
2	2.511	41.75	PK	32.8	-23.7	0	50.85	-	-	74	-23.15	219	340	V
4	2.553	29.64	RMS	32.9	-23.2	2.1	41.44	54	-12.56	-	-	219	340	V

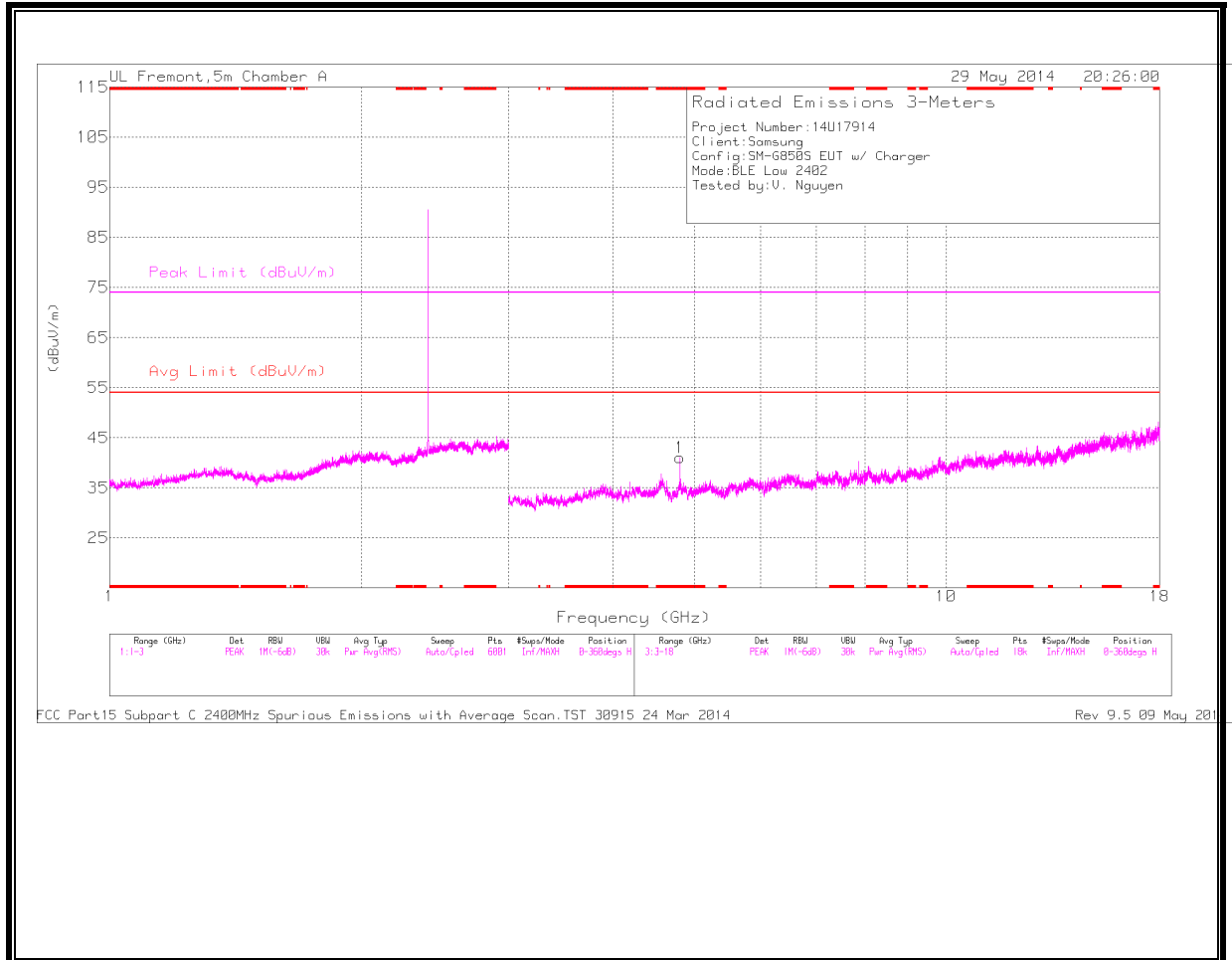
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK - Peak detector

RMS - RMS detection

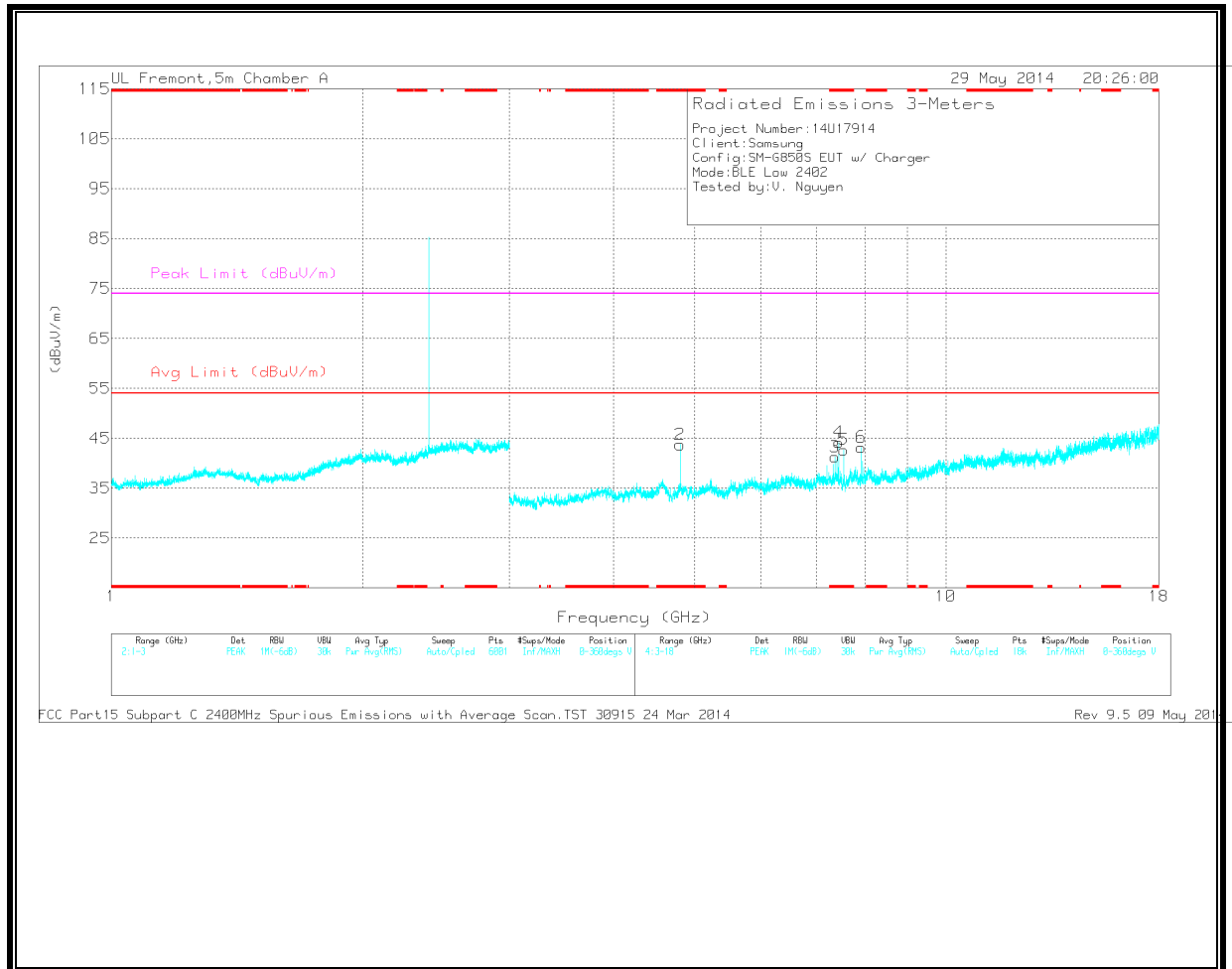
HARMONICS AND SPURIOUS EMISSIONS

**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.

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

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.804	37.02	PK	34	-30	0	41.02	-	-	74	-32.98	0-360	200	H
2	* 4.803	39.84	PK	34	-30.1	0	43.74	-	-	74	-30.26	0-360	100	V
3	* 7.364	31.29	PK	35.3	-25.3	0	41.29	-	-	74	-32.71	0-360	100	V
4	* 7.44	34.71	PK	35.3	-25.8	0	44.21	-	-	74	-29.79	0-360	200	V
5	* 7.546	34.31	PK	35.3	-26.9	0	42.71	-	-	74	-31.29	0-360	100	V
6	7.919	34.4	PK	35.5	-26.7	0	43.2	-	-	-	-	0-360	100	V

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

PK - Peak detector

Radiated Emissions

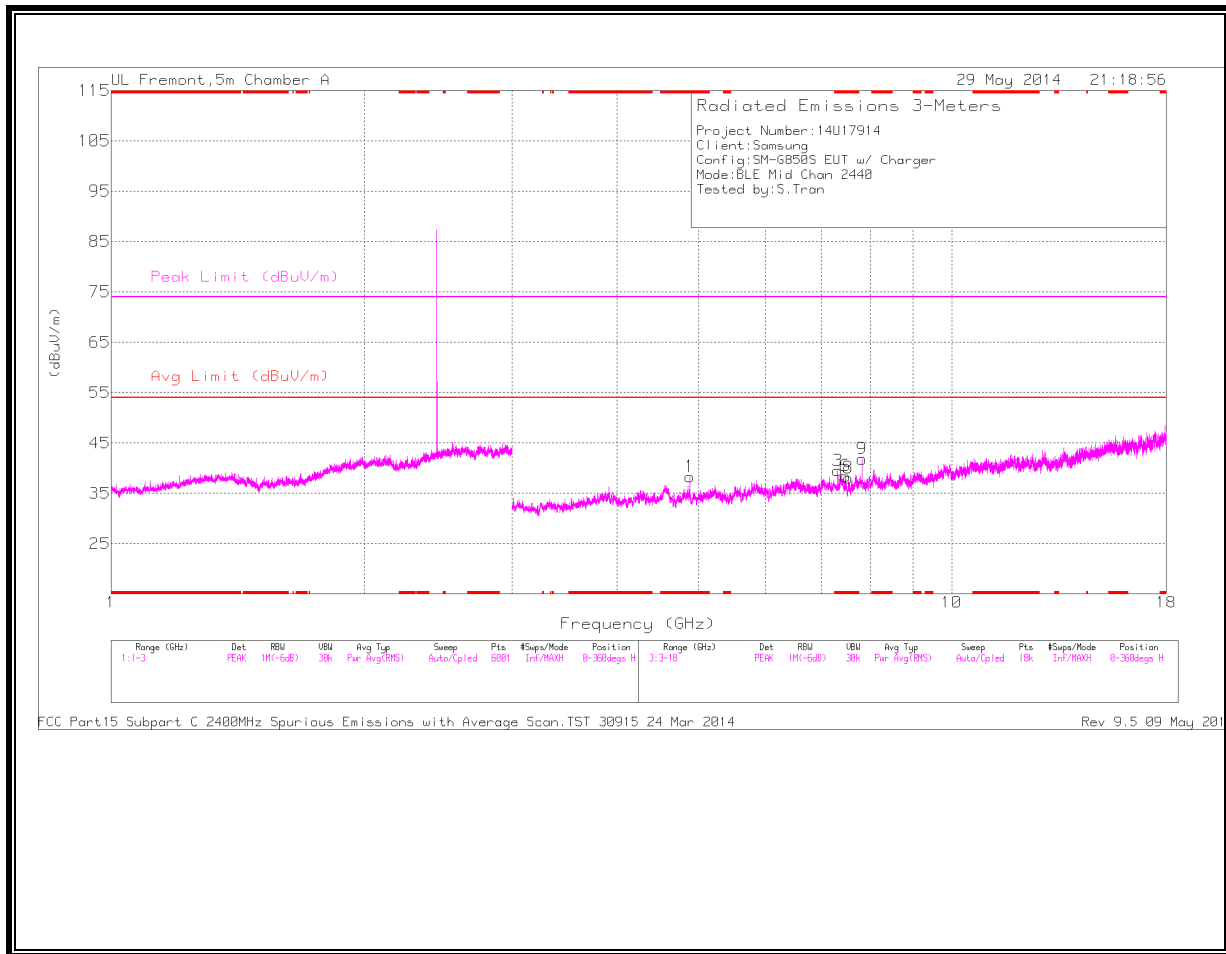
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.804	41.89	PK2	34	-30	0	45.89	-	-	74	-28.11	359	201	H
* 4.804	32.49	MAV1	34	-30	2.1	38.59	54	-15.41	-	-	359	201	H
* 4.804	41.11	PK2	34	-30	0	45.11	-	-	74	-28.89	359	100	V
* 4.804	31.9	MAV1	34	-30	2.1	38	54	-16	-	-	359	100	V
* 7.362	36.36	PK2	35.3	-25.4	0	46.26	-	-	74	-27.74	359	100	V
* 7.362	24.86	MAV1	35.3	-25.4	2.1	36.86	54	-17.14	-	-	359	100	V
* 7.44	35.32	PK2	35.3	-25.8	0	44.82	-	-	74	-29.18	315	201	V
* 7.442	24.03	MAV1	35.3	-25.9	2.1	35.53	54	-18.47	-	-	315	201	V
* 7.544	36.43	PK2	35.3	-26.9	0	44.83	-	-	74	-29.17	315	100	V
* 7.547	25.85	MAV1	35.3	-26.8	2.1	36.45	54	-17.55	-	-	315	100	V
7.921	37.7	PK2	35.5	-26.8	0	46.4	-	-	-	-	315	100	V

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

PK2 - KDB558074 Method: Maximum Peak

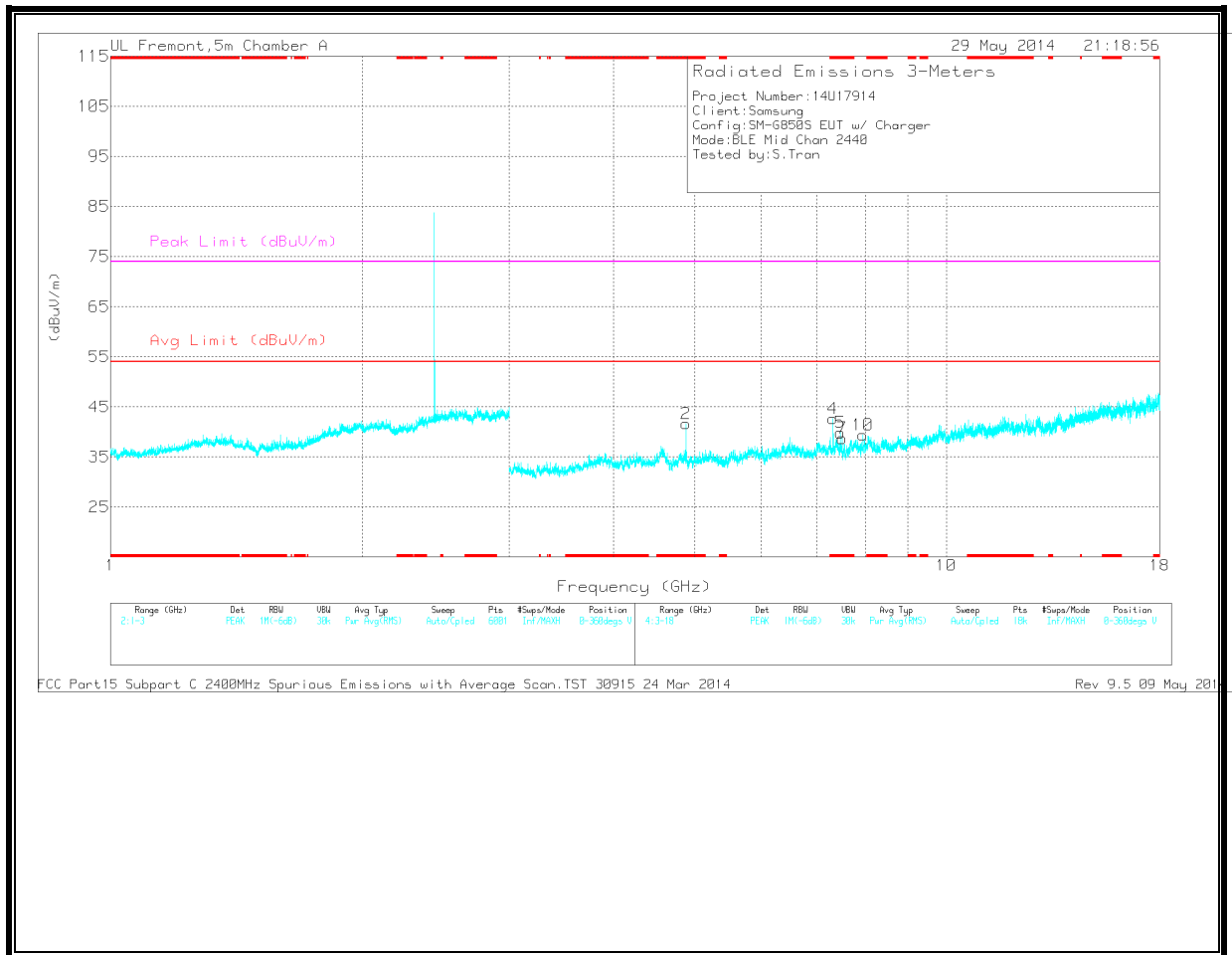
MID CHANNEL

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.

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

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 4.879	35.86	PK	34	-28.2	0	41.66	-	-	74	-32.34	0-360	200	V
1	* 4.88	32.51	PK	34	-28.2	0	38.31	-	-	74	-35.69	0-360	100	H
4	* 7.319	34.14	PK	35.2	-26.7	0	42.64	-	-	74	-31.36	0-360	100	V
3	* 7.321	31.02	PK	35.2	-26.7	0	39.52	-	-	74	-34.48	0-360	200	H
5	* 7.473	30.67	PK	35.3	-26.1	0	39.87	-	-	74	-34.13	0-360	200	V
6	* 7.475	29.37	PK	35.3	-26.2	0	38.47	-	-	74	-35.53	0-360	200	H
7	* 7.507	30.43	PK	35.3	-27	0	38.73	-	-	74	-35.27	0-360	200	V
8	* 7.528	30.17	PK	35.3	-27.4	0	38.07	-	-	74	-35.93	0-360	200	H
9	7.828	32.75	PK	35.5	-26.4	0	41.85	-	-	-	-	0-360	200	H
10	7.944	30.6	PK	35.5	-26.7	0	39.4	-	-	-	-	0-360	200	V

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

PK - Peak detector

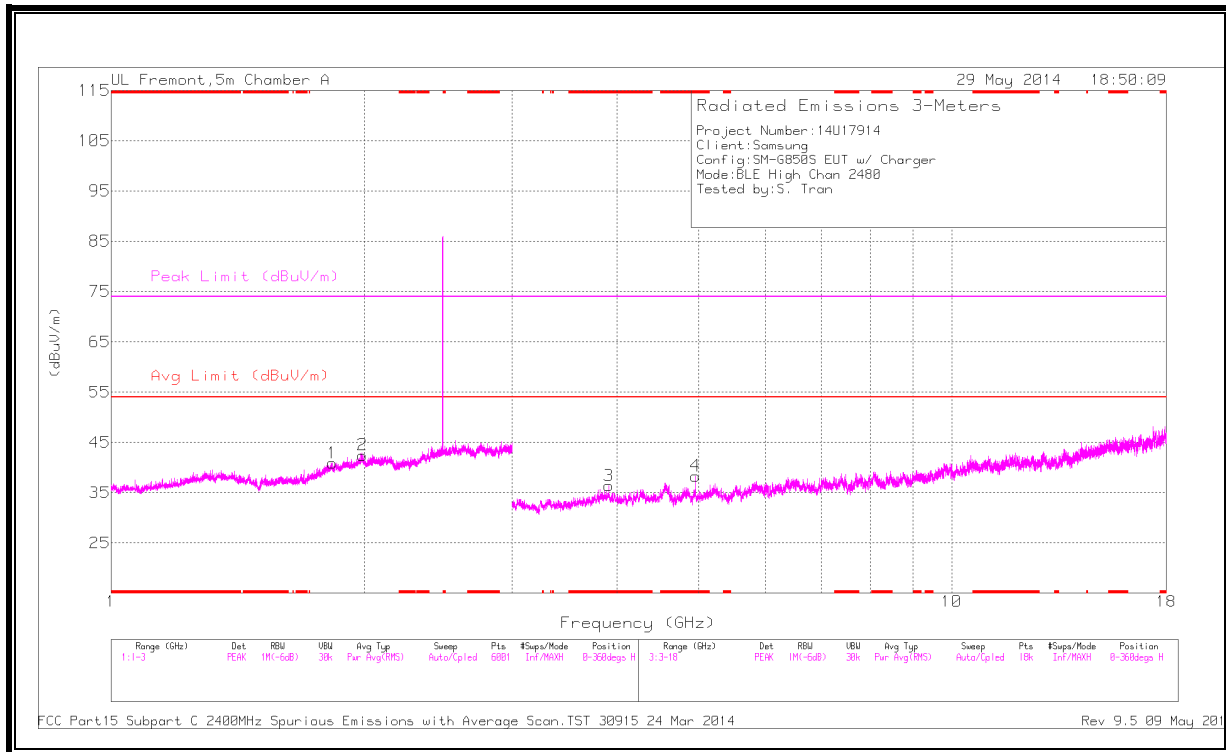
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Filtr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.88	42.71	PK2	34	-28.2	0	48.51	-	-	74	-25.49	69	327	H
* 4.88	34.38	MAV1	34	-28.2	2.1	42.28	54	-11.72	-	-	69	327	H
* 7.319	41.99	PK2	35.2	-26.7	0	50.49	-	-	74	-23.51	169	289	H
* 7.319	33.43	MAV1	35.2	-26.7	2.1	44.03	54	-9.97	-	-	169	289	H
* 7.465	36.55	PK2	35.3	-26.2	0	45.65	-	-	74	-28.35	0	300	H
* 7.48	25.3	MAV1	35.3	-26.4	2.1	36.3	54	-17.7	-	-	0	300	H
* 7.536	36.53	PK2	35.3	-27.3	0	44.53	-	-	74	-29.47	63	193	H
* 7.534	25.35	MAV1	35.3	-27.3	2.1	35.45	54	-18.55	-	-	63	193	H
* 4.88	41.62	PK2	34	-28.2	0	47.42	-	-	74	-26.58	128	341	V
* 4.88	33.85	MAV1	34	-28.2	2.1	41.75	54	-12.25	-	-	128	341	V
* 7.319	40.21	PK2	35.2	-26.7	0	48.71	-	-	74	-25.29	137	100	V
* 7.319	30.25	MAV1	35.2	-26.7	2.1	40.85	54	-13.15	-	-	137	100	V
* 7.475	36.63	PK2	35.3	-26.2	0	45.73	-	-	74	-28.27	19	272	V
* 7.481	25.2	MAV1	35.3	-26.4	2.1	36.2	54	-17.8	-	-	19	272	V
* 7.497	36.7	PK2	35.3	-26.7	0	45.3	-	-	74	-28.7	103	198	V
* 7.498	25.16	MAV1	35.3	-26.7	2.1	35.86	54	-18.14	-	-	103	198	V

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

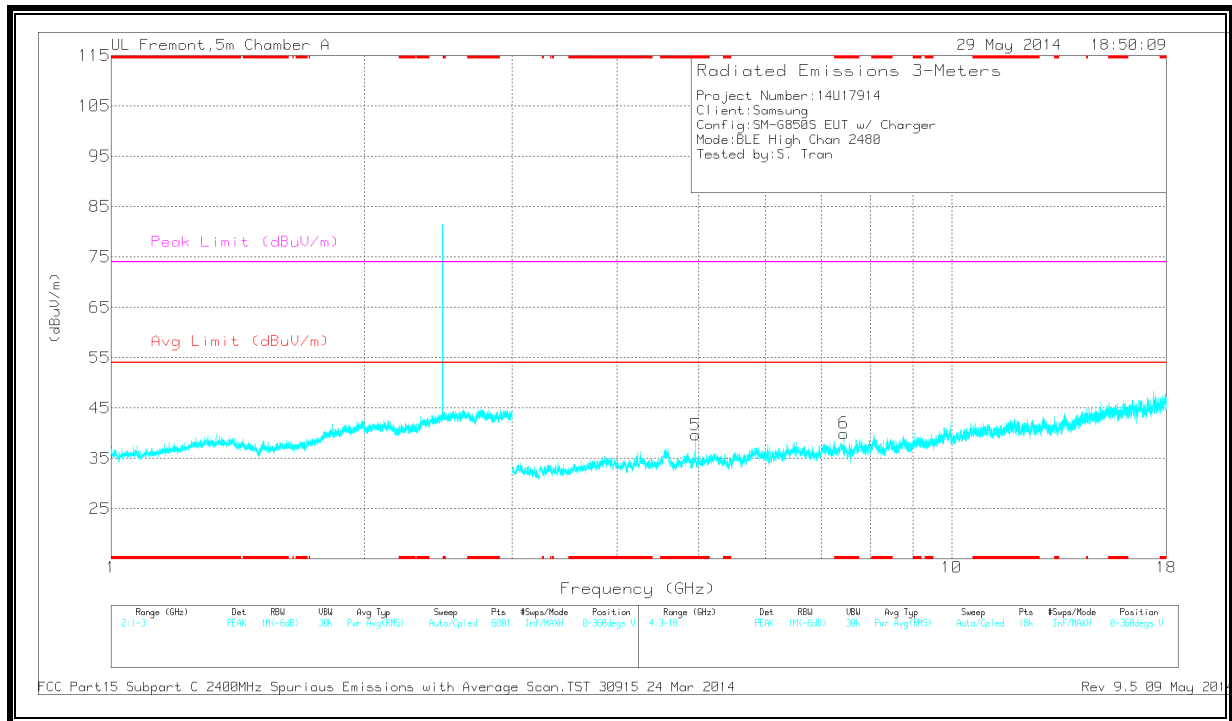
PK2 - KDB558074 Method: Maximum Peak

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.

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

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 3.911	32.82	PK	33.8	-30.2	0	36.42	-	-	74	-37.58	0-360	200	H
4	* 4.96	34.13	PK	33.9	-29.7	0	38.33	-	-	74	-35.67	0-360	200	H
5	* 4.96	35.46	PK	33.9	-29.7	0	39.66	-	-	74	-34.34	0-360	201	V
6	* 7.439	30.47	PK	35.3	-25.8	0	39.97	-	-	74	-34.03	0-360	100	V
1	1.834	35.17	PK	30.9	-25.2	0	40.87	-	-	-	-	0-360	100	H
2	1.992	35.06	PK	32	-24.6	0	42.46	-	-	-	-	0-360	200	H

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

PK - Peak detector

Radiated Emissions

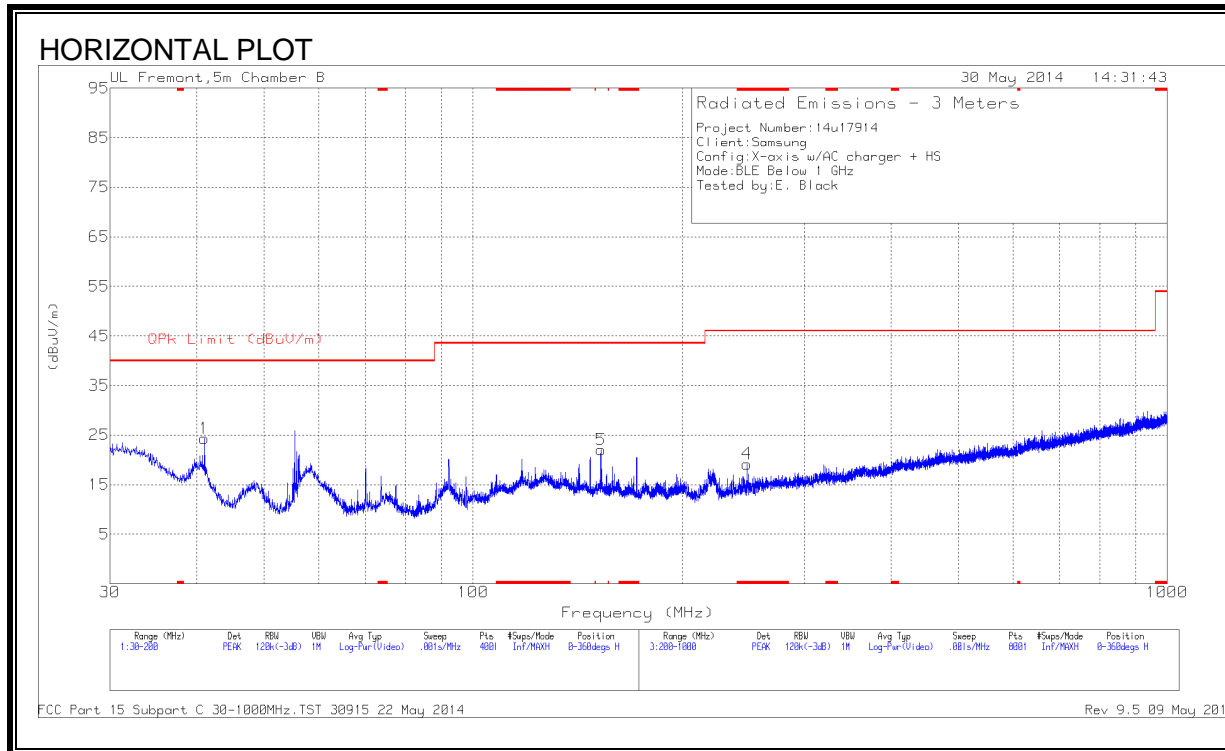
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl/Ftr /Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 3.913	39.74	PK2	33.8	-30.2	0	43.34	-	-	74	-30.66	359	201	H
* 3.911	28.99	MAV1	33.8	-30.2	2.1	34.79	54	-19.21	-	-	359	201	H
* 4.958	38.89	PK2	33.9	-29.6	0	43.19	-	-	74	-30.81	359	201	H
* 4.96	28.78	MAV1	33.9	-29.7	2.1	35.18	54	-18.82	-	-	359	201	H
* 4.96	39.09	PK2	33.9	-29.7	0	43.29	-	-	74	-30.71	359	201	V
* 4.96	28.51	MAV1	33.9	-29.7	2.1	34.91	54	-19.09	-	-	359	201	V
* 7.439	38.23	PK2	35.3	-25.8	0	47.73	-	-	74	-26.27	359	100	V
* 7.439	27.89	MAV1	35.3	-25.8	2.1	39.59	54	-14.41	-	-	359	100	V
1.836	43.1	PK2	31	-25.3	0	48.8	-	-	-	-	359	100	H
1.994	42.77	PK2	32.1	-24.7	0	50.17	-	-	-	-	359	201	H

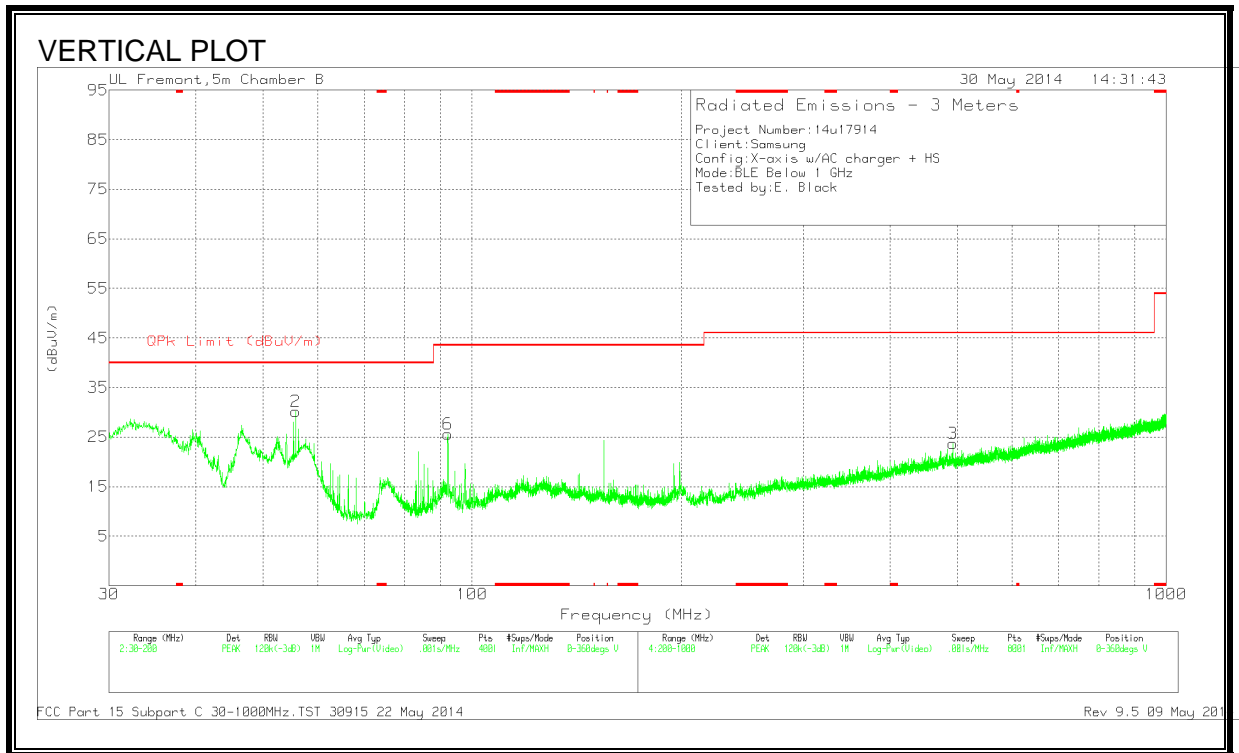
* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

9.3. WORST-CASE BELOW 1 GHz

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





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	* 248.2	33.99	PK	11.6	-26.4	19.19	46.02	-26.83	0-360	101	H
1	41.05	39.76	PK	13.2	-28.6	24.36	40	-15.64	0-360	400	H
2	55.7125	51.42	PK	7.2	-28.5	30.12	40	-9.88	0-360	101	V
6	92.3475	45.51	PK	8.2	-28.1	25.61	43.52	-17.91	0-360	101	V
5	152.8675	37.14	PK	12.3	-27.4	22.04	43.52	-21.48	0-360	200	H
3	492.4	31.77	PK	17.7	-25.8	23.67	46.02	-22.35	0-360	200	V

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

PK - Peak detector

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

6 WORST EMISSIONS

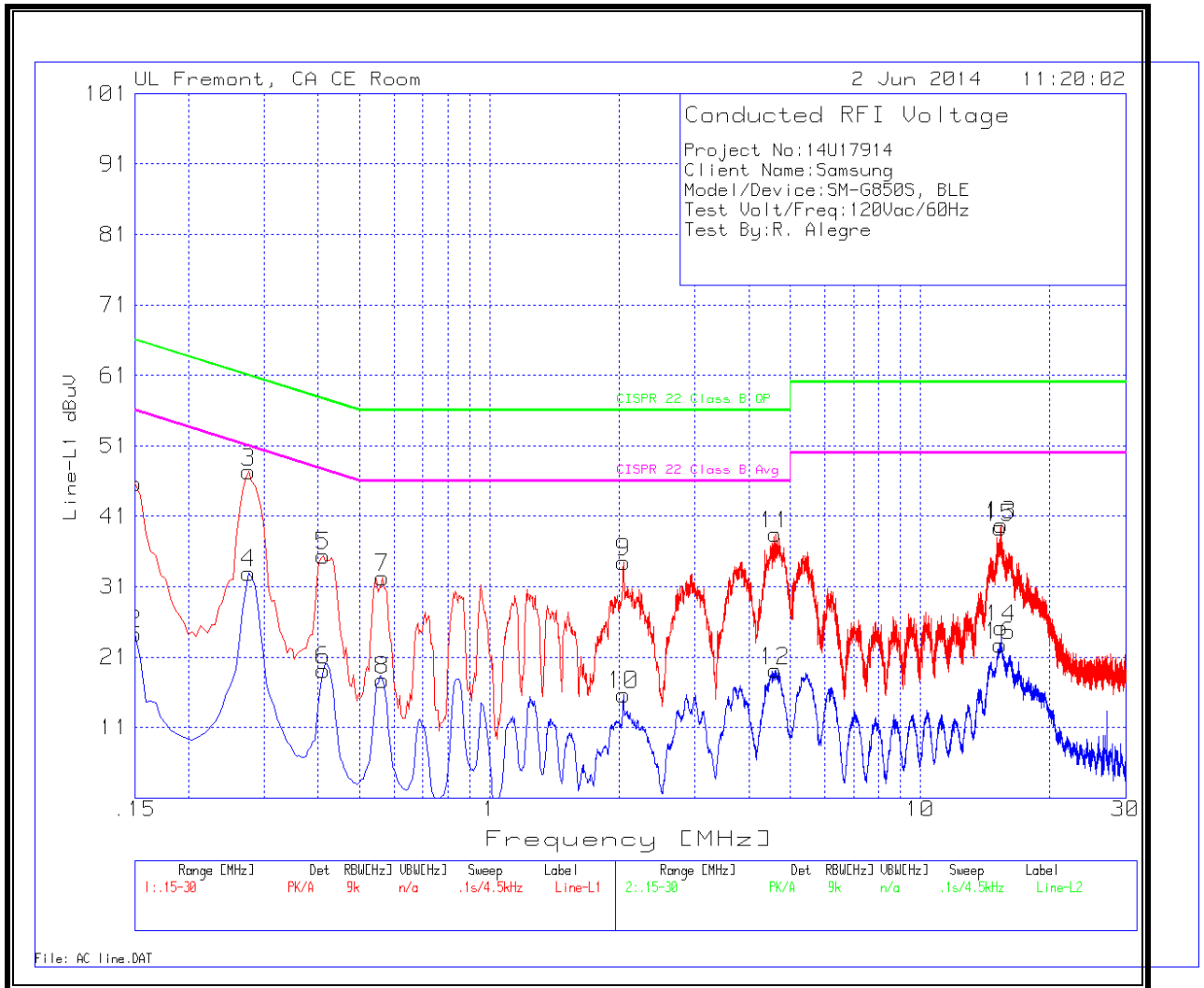
Line-L1 .15 - 30MHz

Trace Markers										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L1 (dB)	LC Cables 1&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
1	.15	44.3	PK	1.4	0	45.7	66	-20.3	-	-
2	.15	22.86	Av	1.4	0	24.26	-	-	56	-31.74
3	.276	46.7	PK	.6	0	47.3	60.9	-13.6	-	-
4	.276	32.28	Av	.6	0	32.88	-	-	50.9	-18.02
5	.411	34.97	PK	.4	0	35.37	57.6	-22.23	-	-
6	.411	18.73	Av	.4	0	19.13	-	-	47.6	-28.47
7	.564	31.98	PK	.3	0	32.28	56	-23.72	-	-
8	.564	17.4	Av	.3	0	17.7	-	-	46	-28.3
9	2.0445	34.17	PK	.2	.1	34.47	56	-21.53	-	-
10	2.0445	15.33	Av	.2	.1	15.63	-	-	46	-30.37
11	4.605	38.11	PK	.2	.1	38.41	56	-17.59	-	-
12	4.605	18.77	Av	.2	.1	19.07	-	-	46	-26.93
15	15.3465	38.85	PK	.3	.2	39.35	60	-20.65	-	-
16	15.3465	22.18	Av	.3	.2	22.68	-	-	50	-27.32
13	15.4545	39.22	PK	.3	.2	39.72	60	-20.28	-	-
14	15.4545	24.63	Av	.3	.2	25.13	-	-	50	-24.87

Line-L2 .15 - 30MHz

Trace Markers										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	T24 IL L2 (dB)	LC Cables 2&3 (dB)	Corrected Reading dBuV	CISPR 22 Class B QP	Margin to Limit (dB)	CISPR 22 Class B Avg	Margin to Limit (dB)
17	.15	46.82	PK	1.5	0	48.32	66	-17.68	-	-
18	.15	21.57	Av	1.5	0	23.07	-	-	56	-32.93
19	.267	41.72	PK	.7	0	42.42	61.2	-18.78	-	-
20	.267	20.25	Av	.7	0	20.95	-	-	51.2	-30.25
21	.4335	30.99	PK	.4	0	31.39	57.2	-25.81	-	-
22	.4335	13.21	Av	.4	0	13.61	-	-	47.2	-33.59
23	.852	30.17	PK	.3	0	30.47	56	-25.53	-	-
24	.852	12.76	Av	.3	0	13.06	-	-	46	-32.94
25	1.986	28.44	PK	.2	.1	28.74	56	-27.26	-	-
26	1.986	8.63	Av	.2	.1	8.93	-	-	46	-37.07
27	4.623	35.52	PK	.2	.1	35.82	56	-20.18	-	-
28	4.623	15.16	Av	.2	.1	15.46	-	-	46	-30.54
29	5.0775	37.46	PK	.2	.1	37.76	60	-22.24	-	-
30	5.0775	14.18	Av	.2	.1	14.48	-	-	50	-35.52
31	15.234	41.37	PK	.3	.2	41.87	60	-18.13	-	-
32	15.234	25.19	Av	.3	.2	25.69	-	-	50	-24.31

LINE 1 RESULTS



LINE 2 RESULTS

