



FCC CFR47 PART 15 SUBPART C

**BLUETOOTH LOW ENERGY
CERTIFICATION TEST REPORT**

FOR

GSM1900 Phone with WiFi/BT

MODEL NUMBER: GT-I9128I

FCC ID: A3LGTI9128I

REPORT NUMBER: 13I15225-3 Revision B

ISSUE DATE: AUGUST 5, 2013

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



NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	6/26/13	Initial Issue	P. Kim
A	7/29/13	Update administrative information	P. Kim
B	8/5/13	Update administrative information	P. Kim

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY	5
a. <i>MEASURING INSTRUMENT CALIBRATION.....</i>	<i>5</i>
b. <i>SAMPLE CALCULATION.....</i>	<i>5</i>
c. <i>MEASUREMENT UNCERTAINTY</i>	<i>5</i>
5. EQUIPMENT UNDER TEST	6
a. <i>DESCRIPTION OF EUT.....</i>	<i>6</i>
b. <i>MAXIMUM OUTPUT POWER.....</i>	<i>6</i>
c. <i>DESCRIPTION OF AVAILABLE ANTENNAS.....</i>	<i>6</i>
d. <i>SOFTWARE AND FIRMWARE</i>	<i>6</i>
e. <i>WORST-CASE CONFIGURATION AND MODE</i>	<i>7</i>
f. <i>DESCRIPTION OF TEST SETUP.....</i>	<i>8</i>
6. TEST AND MEASUREMENT EQUIPMENT	10
7. ANTENNA PORT TEST RESULTS.....	11
a. <i>6 dB BANDWIDTH</i>	<i>11</i>
b. <i>99% BANDWIDTH</i>	<i>15</i>
c. <i>OUTPUT POWER</i>	<i>19</i>
d. <i>AVERAGE POWER.....</i>	<i>23</i>
e. <i>POWER SPECTRAL DENSITY.....</i>	<i>24</i>
f. <i>CONDUCTED SPURIOUS EMISSIONS</i>	<i>28</i>
8. RADIATED TEST RESULTS.....	35
a. <i>LIMITS AND PROCEDURE.....</i>	<i>35</i>
b. <i>TRANSMITTER ABOVE 1 GHz.....</i>	<i>36</i>
c. <i>TX ABOVE 1 GHz FOR BLUETOOTH LOW ENERGY MODE IN THE 2.4 GHz BAND..</i>	<i>36</i>
d. <i>WORST-CASE BELOW 1 GHz</i>	<i>53</i>
9. AC POWER LINE CONDUCTED EMISSIONS.....	56
10. SETUP PHOTOS	60

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: GSM1900 Phone with WiFi/BT

MODEL: GT-I9128I

SERIAL NUMBER: 0677A774 (RADIATED)
20A084AD (CONDUCTED)

DATE TESTED: JUNE 6-21, 2013

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.

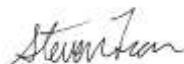
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. 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:



PHILIP KIM
WISE PROGRAM MANAGER
UL VERIFICATIONS SERVICES INC

Tested By:



STEVEN TRAN
WISE LAB TECHNICIAN
UL VERIFICATIONS SERVICES INC

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, 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 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

a. 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.

b. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

c. 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 1000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

a. DESCRIPTION OF EUT

The EUT is an 802.11 B/G/N 1X1 HT20, + BT4.0 (LE) + GSM1900 bar phone.

b. 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	1.99	1.58

c. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of 0.55 dBi.

d. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was REV1.0 and the software was I9128I.001

e. 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 Z orientation.

f. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung Electronics	ETA0U82CBC	DK1C220TS/A-E	DoC
Headset	Samsung Electronics	N/A	N/A	DoC

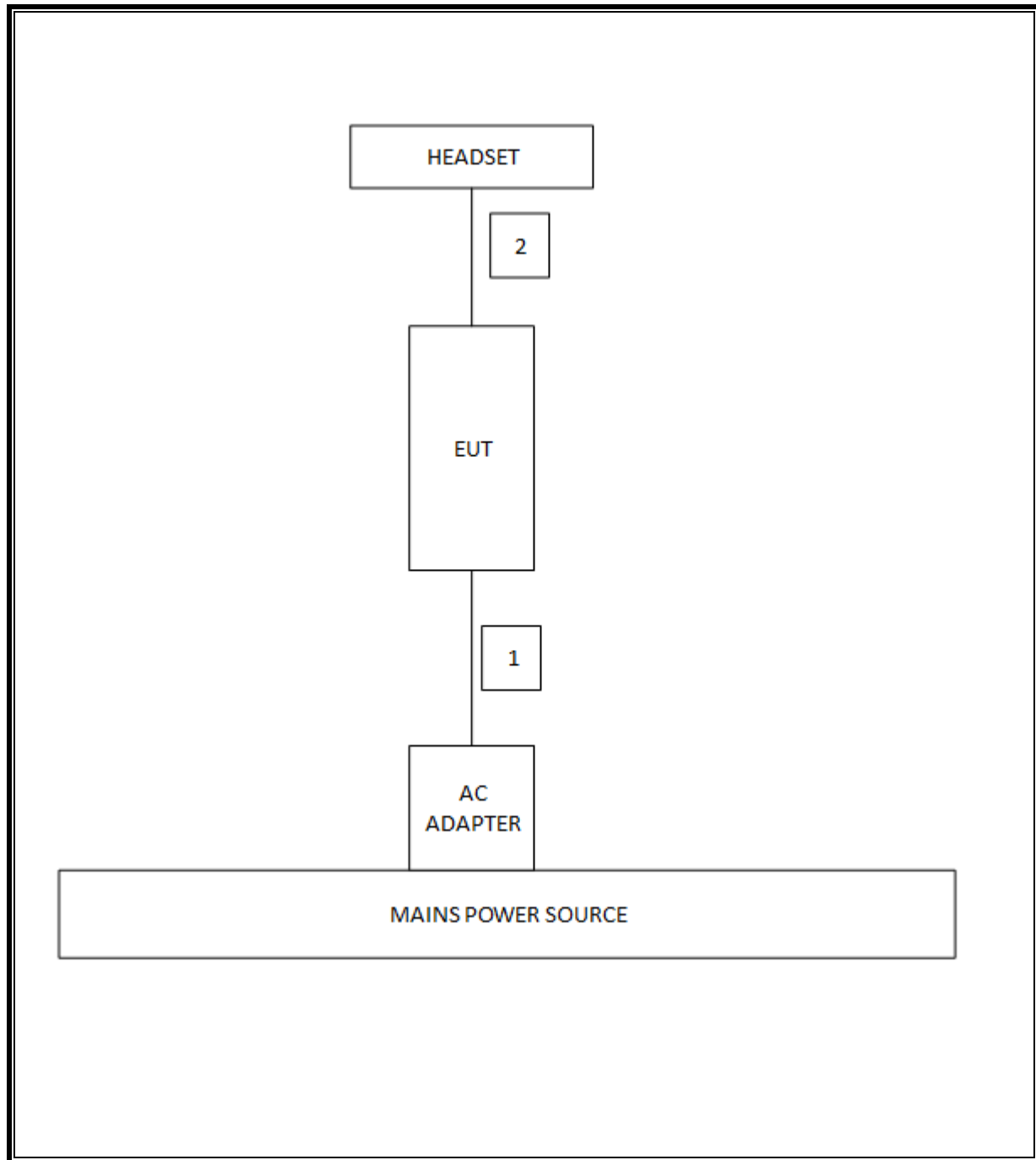
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Shielded	1.6m	N/A
2	Headset	1	Audio	Shielded	1.5m	N/A

TEST SETUP

The EUT is a stand-alone unit that was tested in the worst case orientation and configuration, where applicable, during the tests. Test software exercised the radio.

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 Date	Cal Due
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	C01011	03/23/12	03/28/14
Antenna, Horn, 18 GHz	ETS	3117	C01006	12/11/12	12/11/13
Antenna, Horn, 25.5 GHz	ARA	MWH-1826/B	C00980	11/14/12	11/14/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	01/28/13	01/28/14
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	10/22/12	10/22/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	10/21/12	10/21/13
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/08/12	08/08/13
CBT Bluetooth Tester	R & S	CBT	None	05/15/12	04/11/14
Peak Power Meter	Agilent / HP	E4416A	C00963	12/13/12	12/13/13
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/13/12	12/13/13
LISN, 30 MHz	FCC	50/250-25-2	C00626	01/14/13	01/14/14
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	N02684	CNR	CNR

7. ANTENNA PORT TEST RESULTS

a. 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.

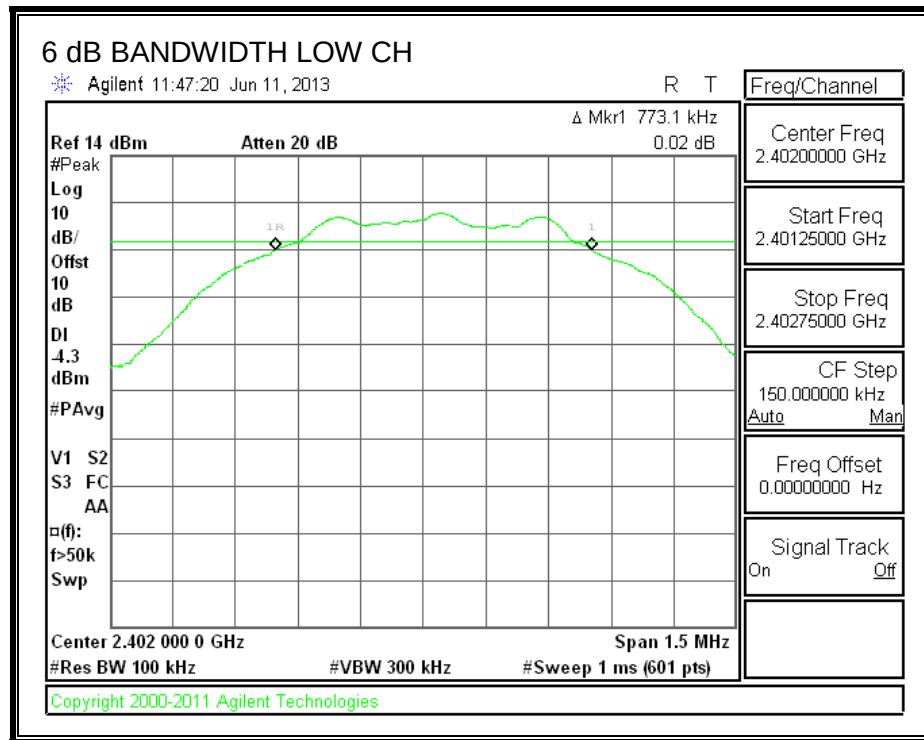
TEST PROCEDURE

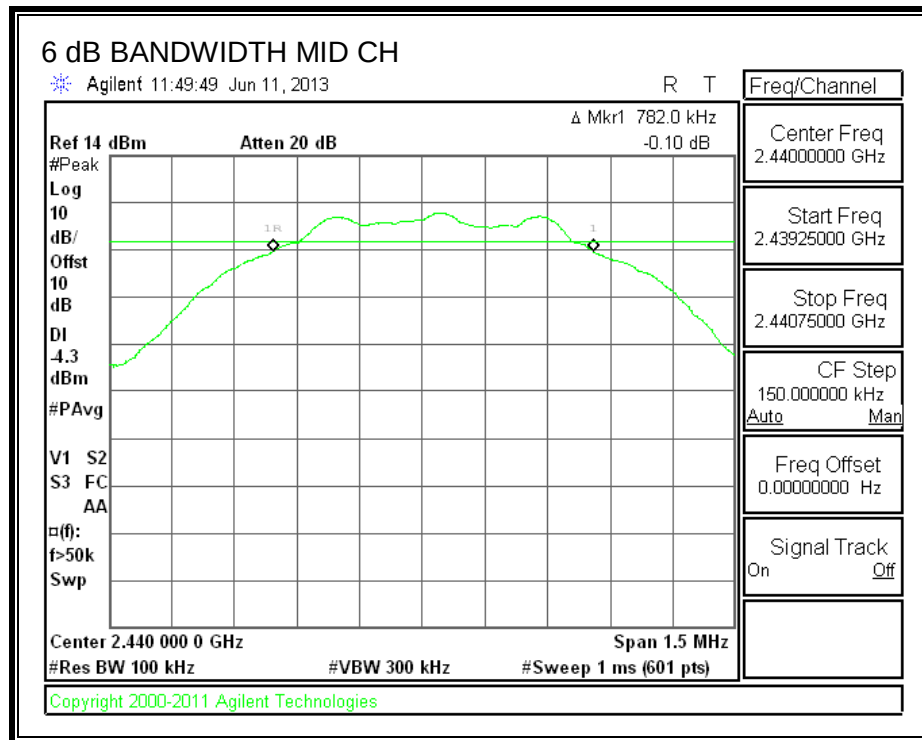
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

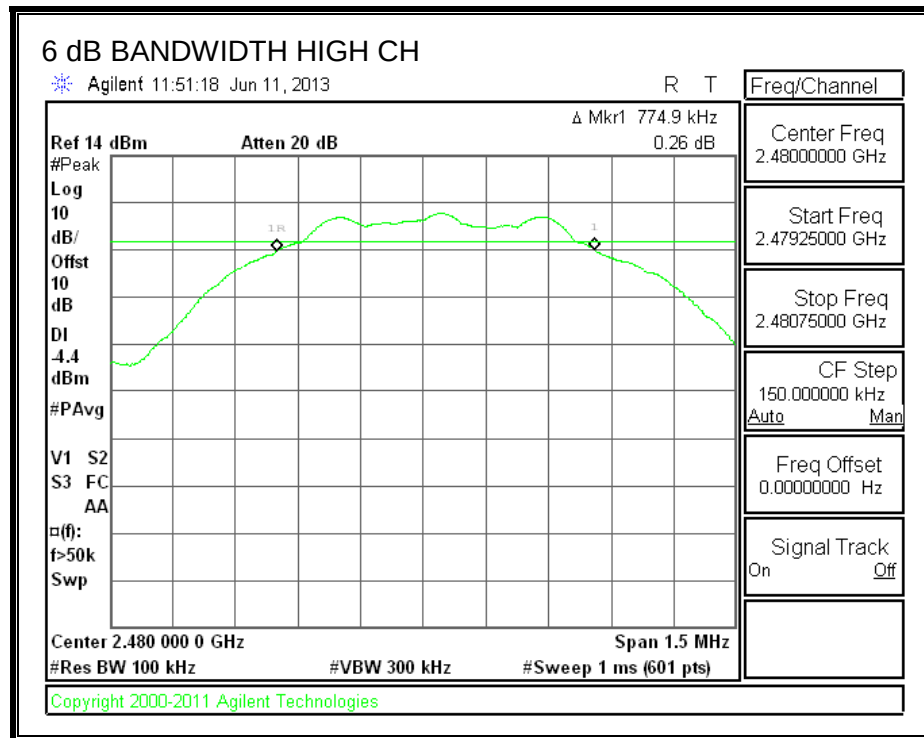
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (MHz)
Low	2402	773.1000	0.5
Middle	2440	782.0000	0.5
High	2480	774.9000	0.5

6 dB BANDWIDTH







b. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

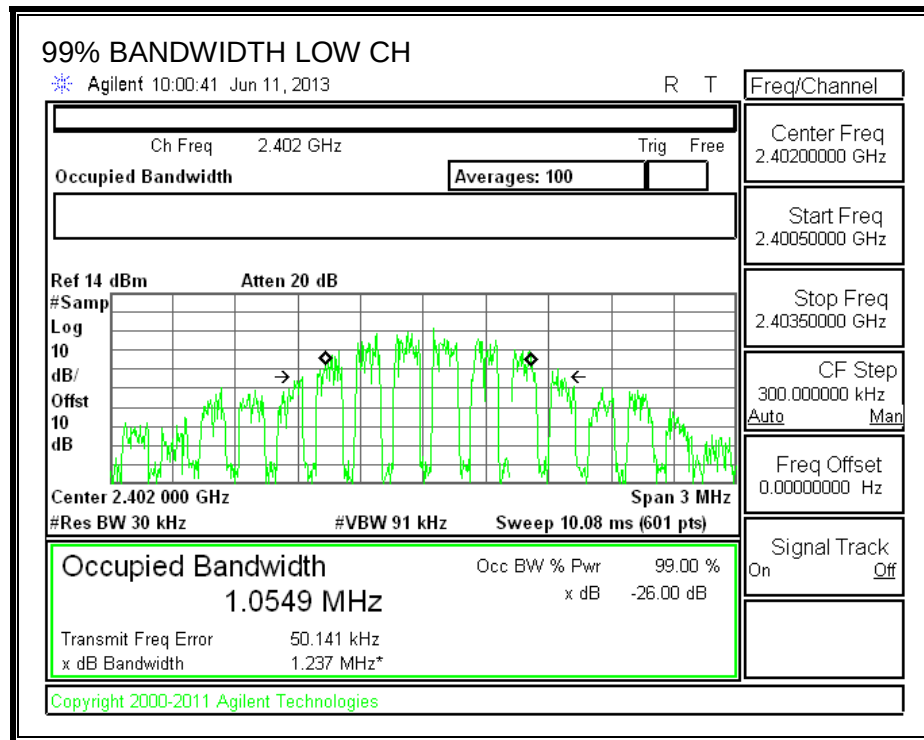
TEST PROCEDURE

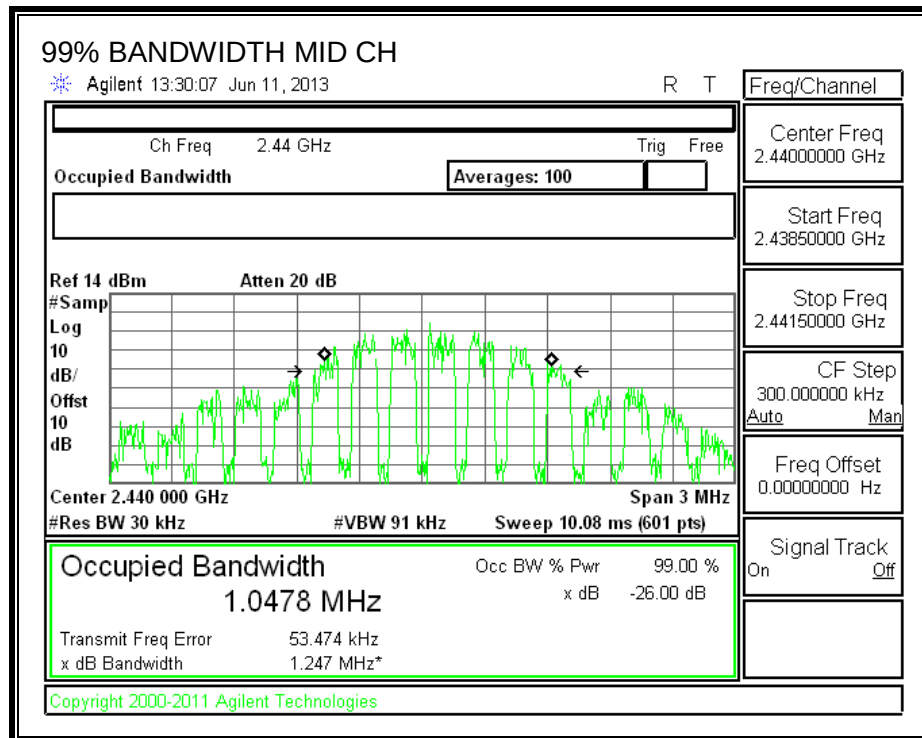
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

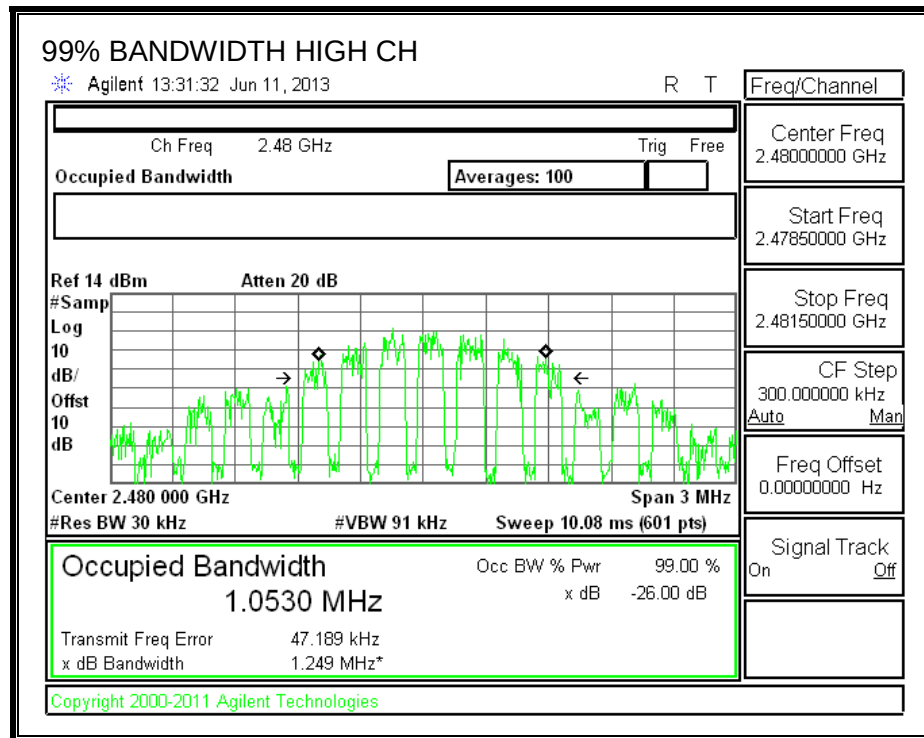
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2402	1.0549
Middle	2440	1.0478
High	2480	1.0530

99% BANDWIDTH







c. 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.

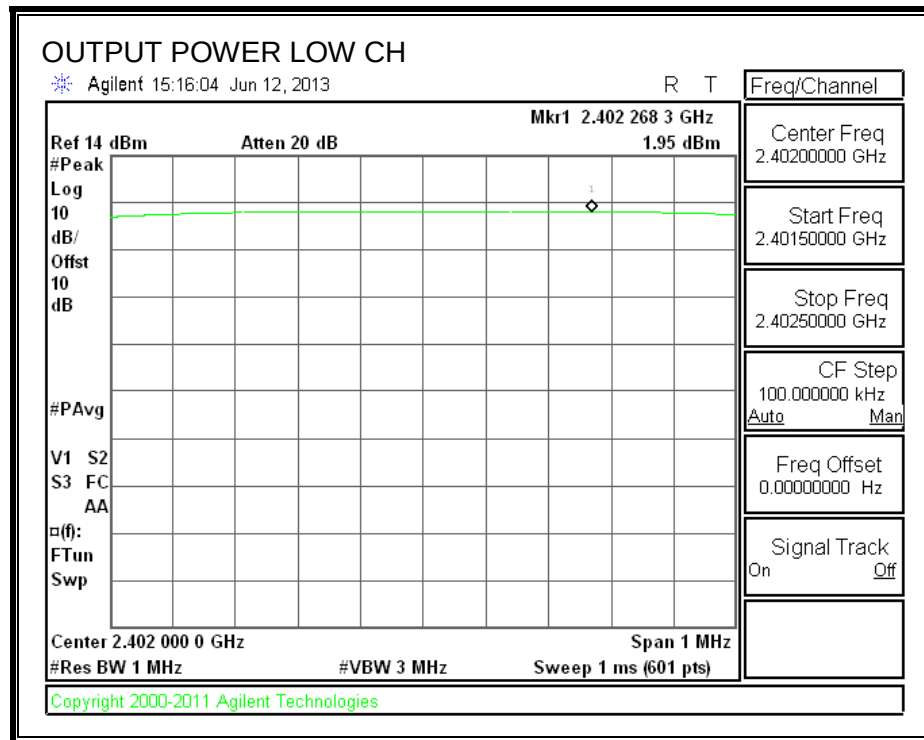
TEST PROCEDURE

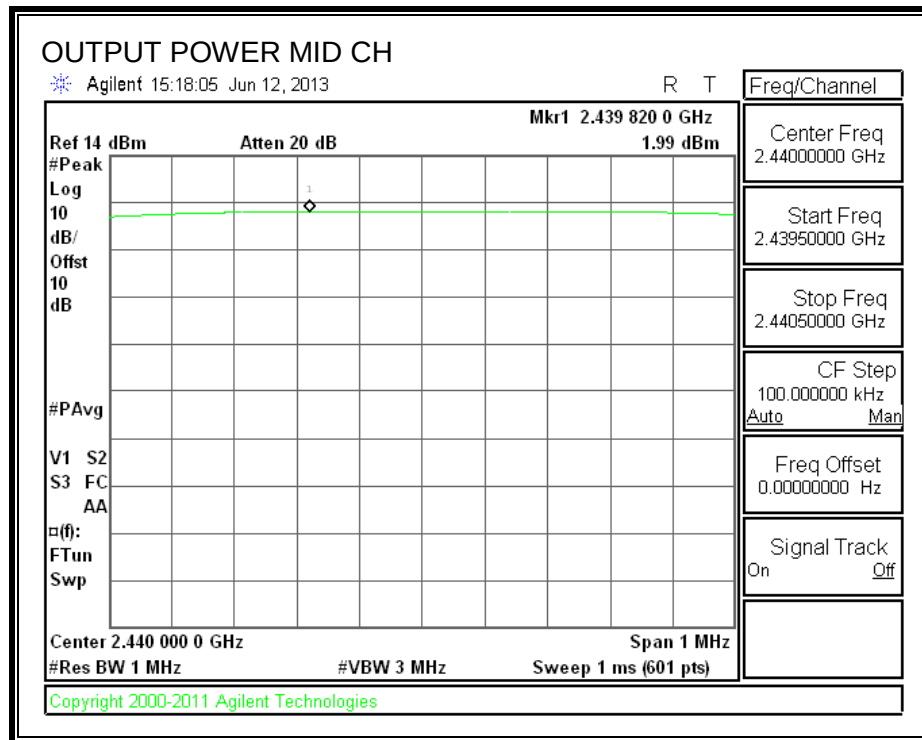
Peak power is measured using "Maximum peak conducted output power" under KDB 558074 D01.

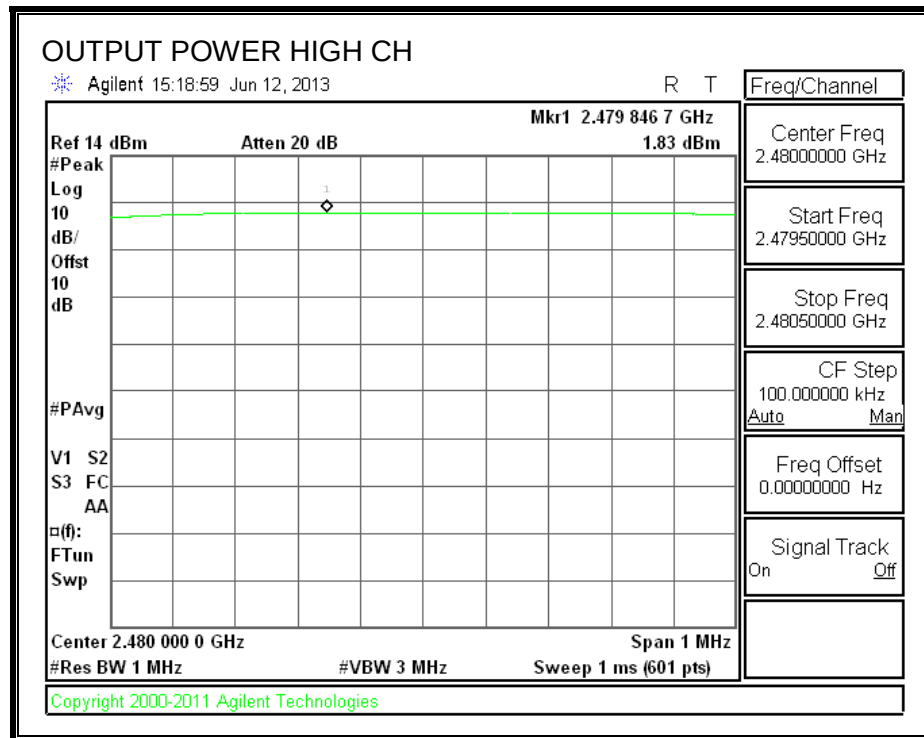
RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2402	1.950	30	-28.050
Middle	2440	1.990	30	-28.010
High	2480	1.830	30	-28.170

OUTPUT POWER







d. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

Channel	Frequency (MHz)	AV power (dBm)
Low	2402	-0.87
Middle	2440	-0.82
High	2480	-0.92

e. 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.

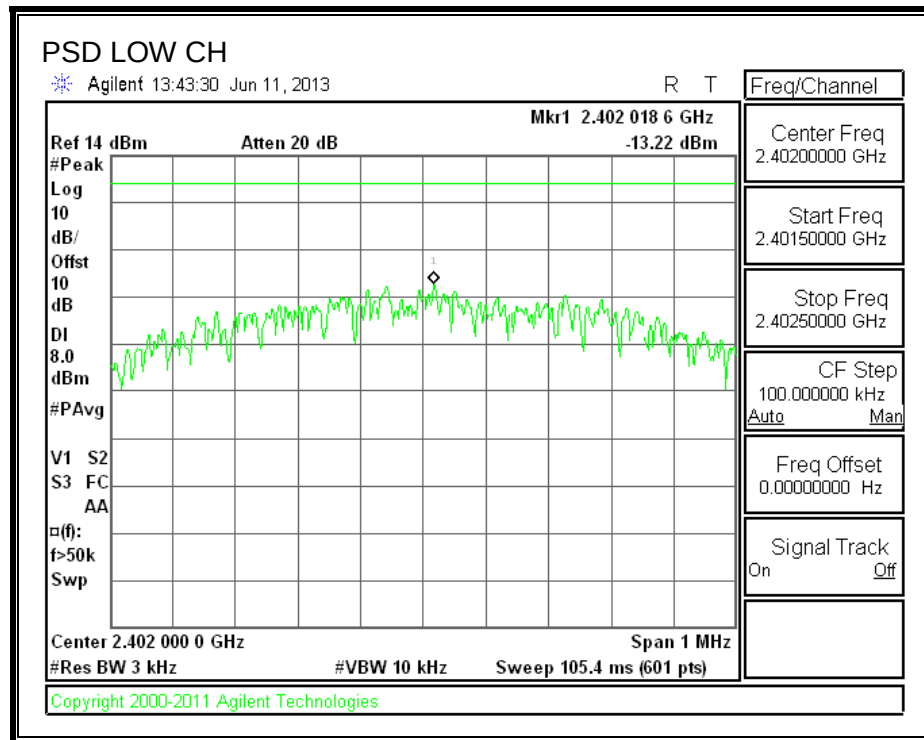
TEST PROCEDURE

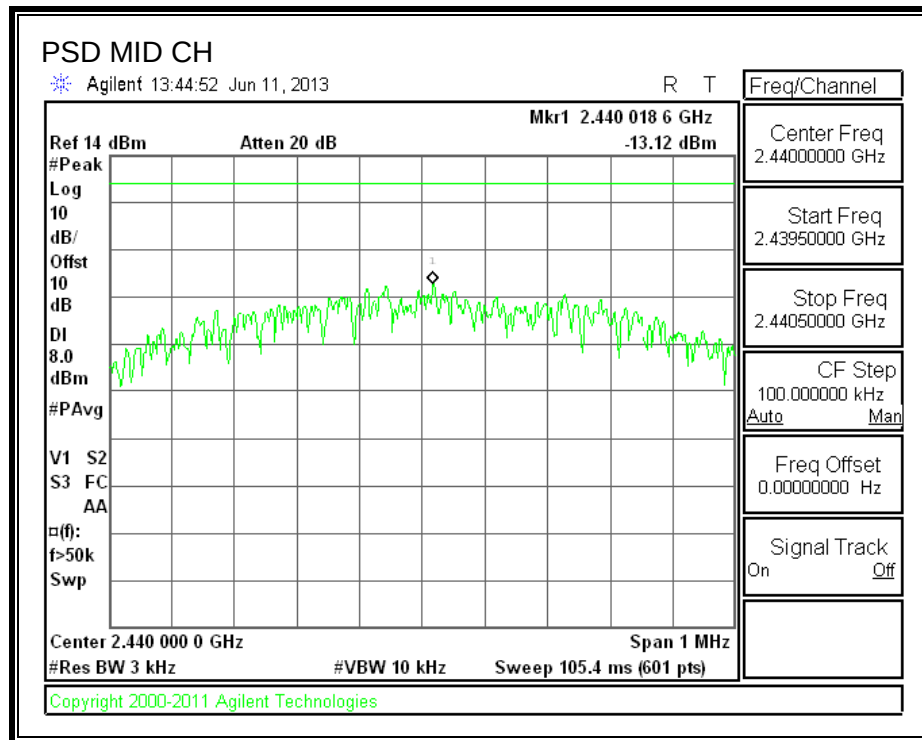
Method PKPSD (Peak PSD) under KDB558074 D01 DTS Meas Guidance V03r01 was utilized to perform the test.

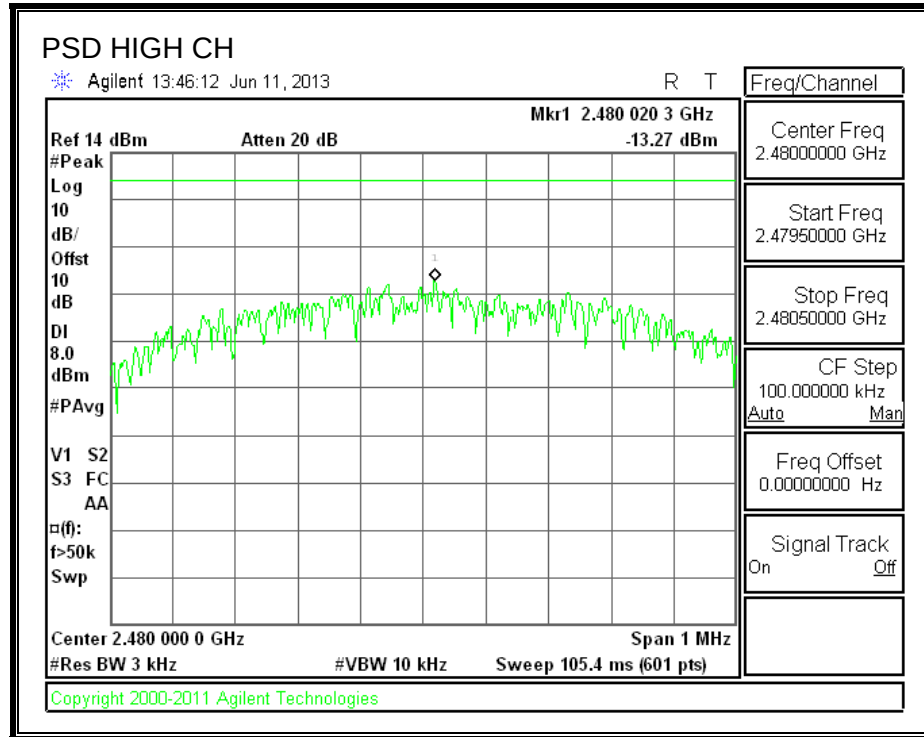
RESULTS

Channel	Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-13.22	8	-21.22
Middle	2440	-13.12	8	-21.12
High	2480	-13.27	8	-21.27

POWER SPECTRAL DENSITY







f. 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.

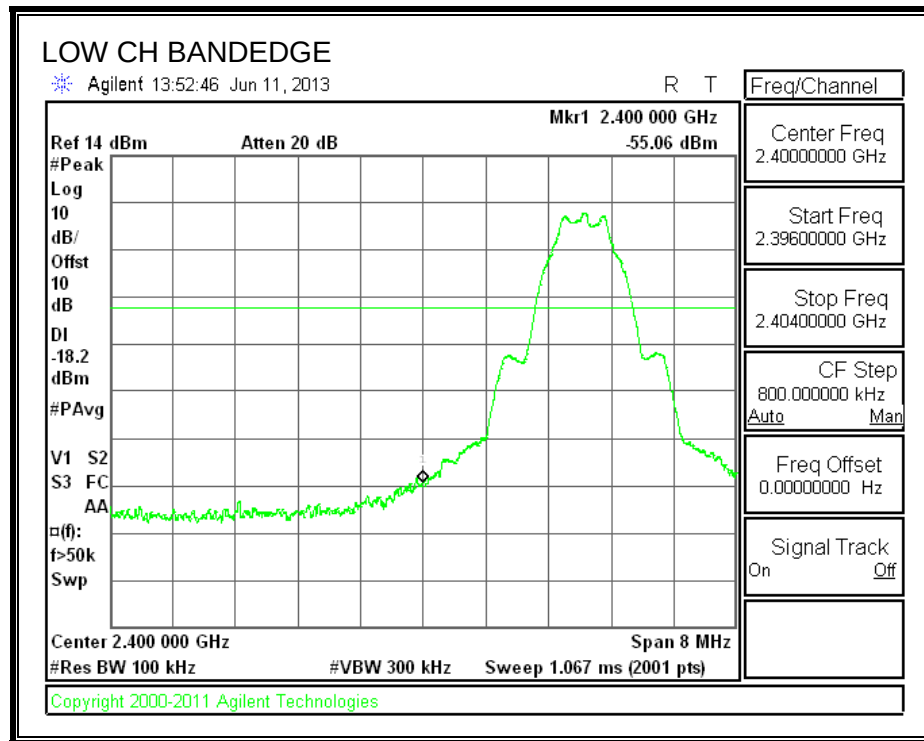
TEST PROCEDURE

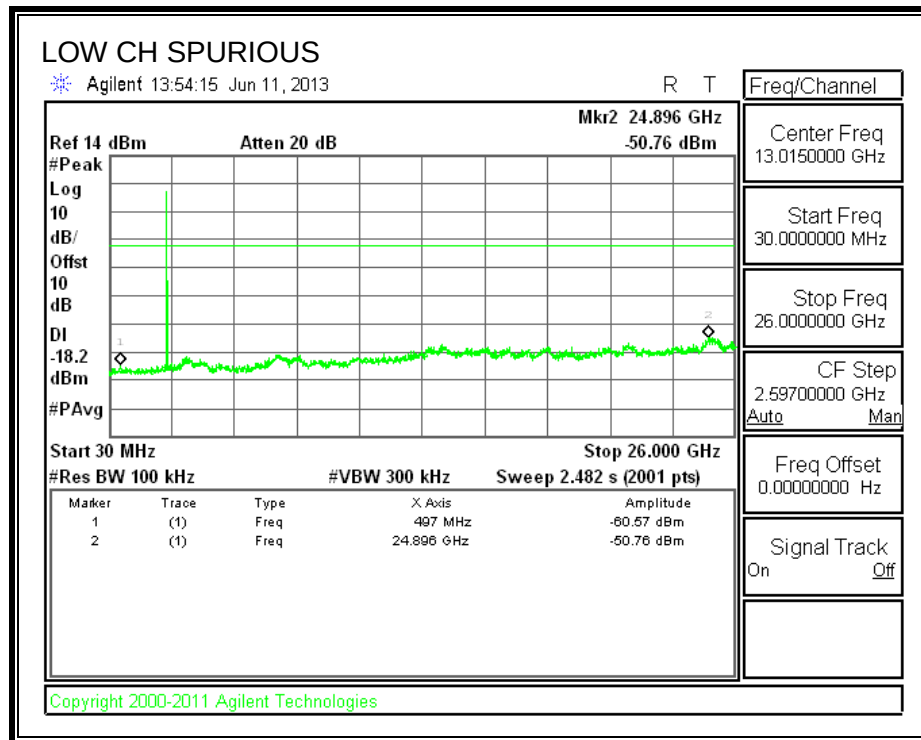
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

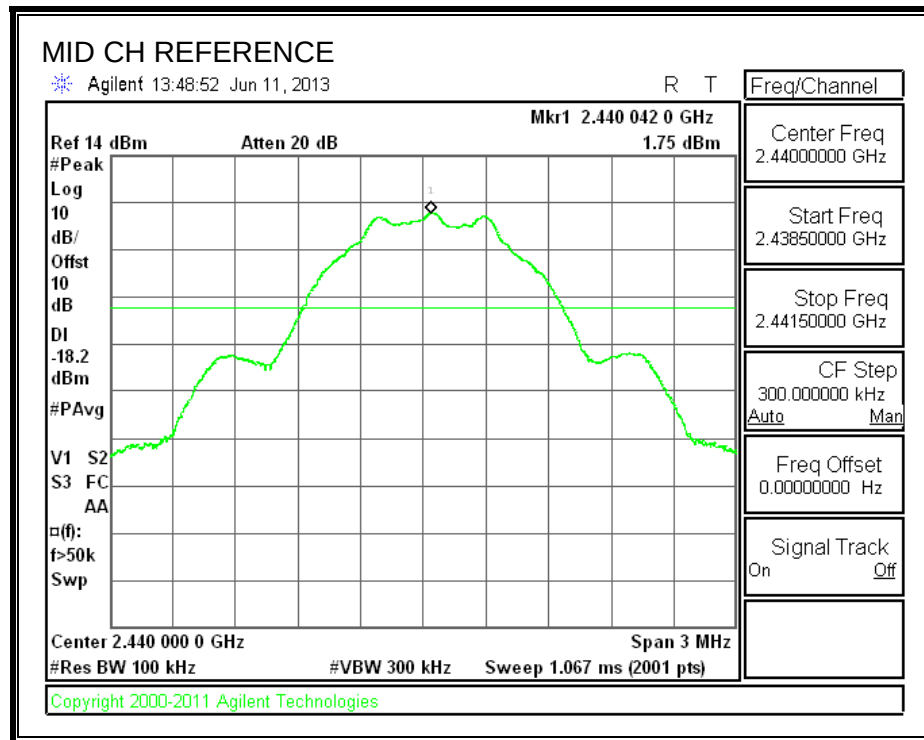
RESULTS

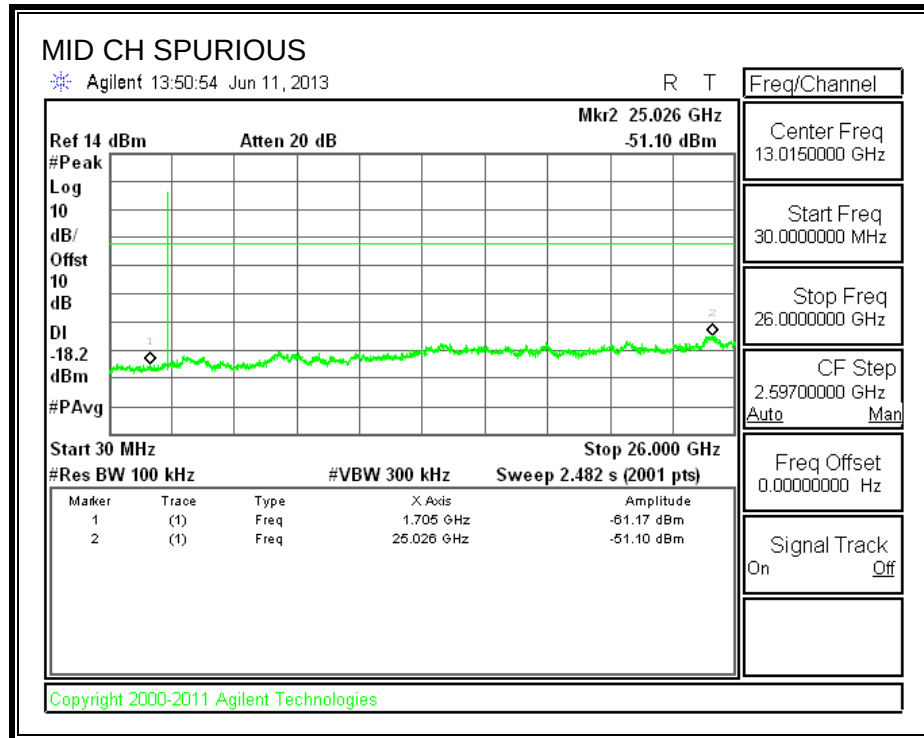
SPURIOUS EMISSIONS, LOW CHANNEL



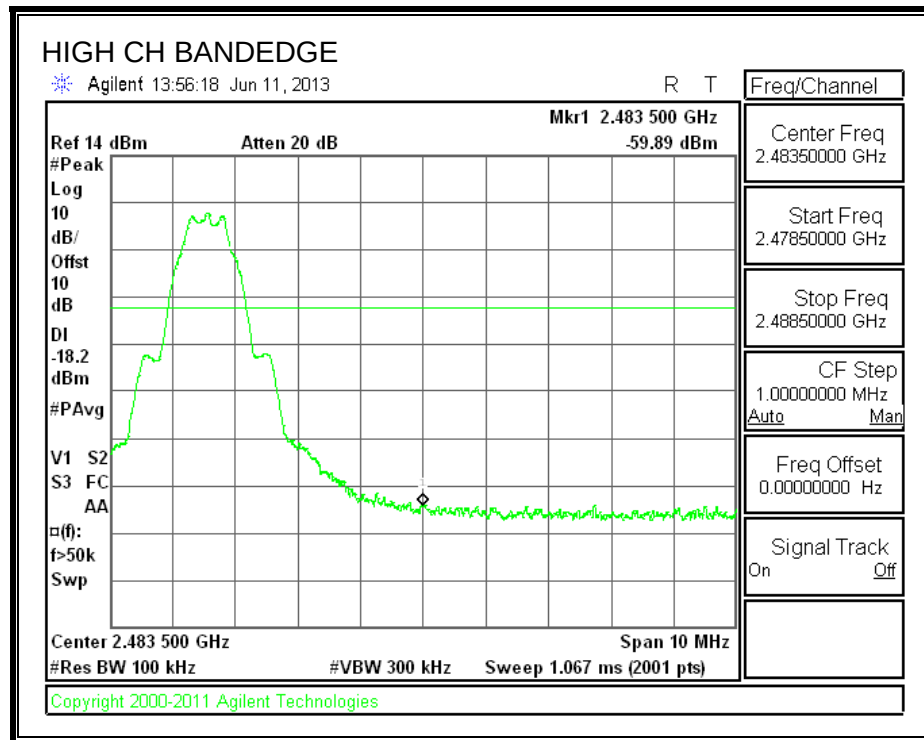


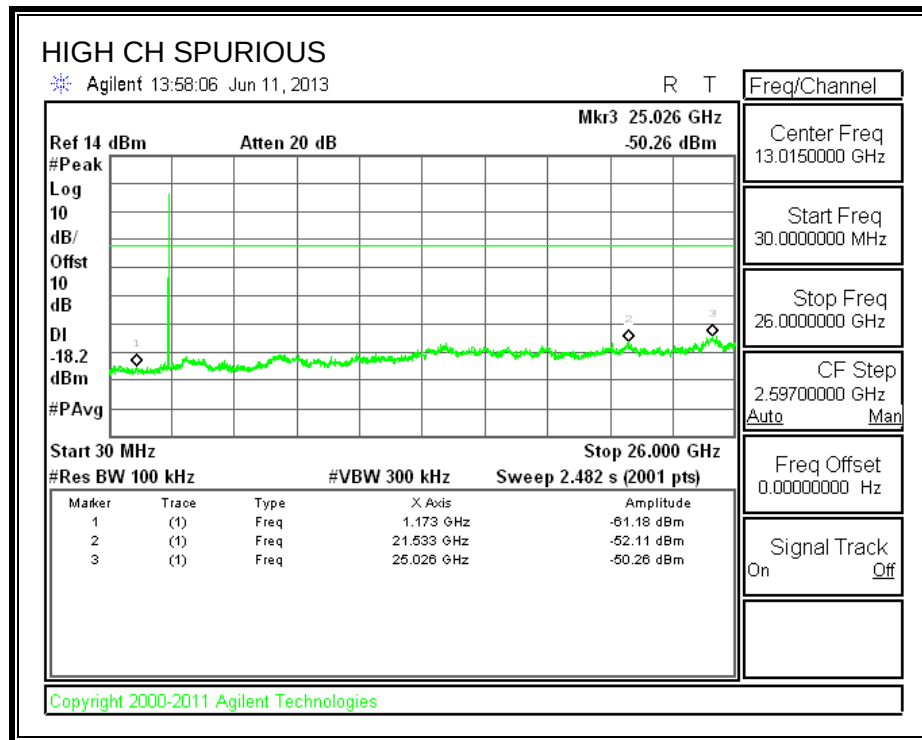
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





8. RADIATED TEST RESULTS

a. 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 C63.10-2009. 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.

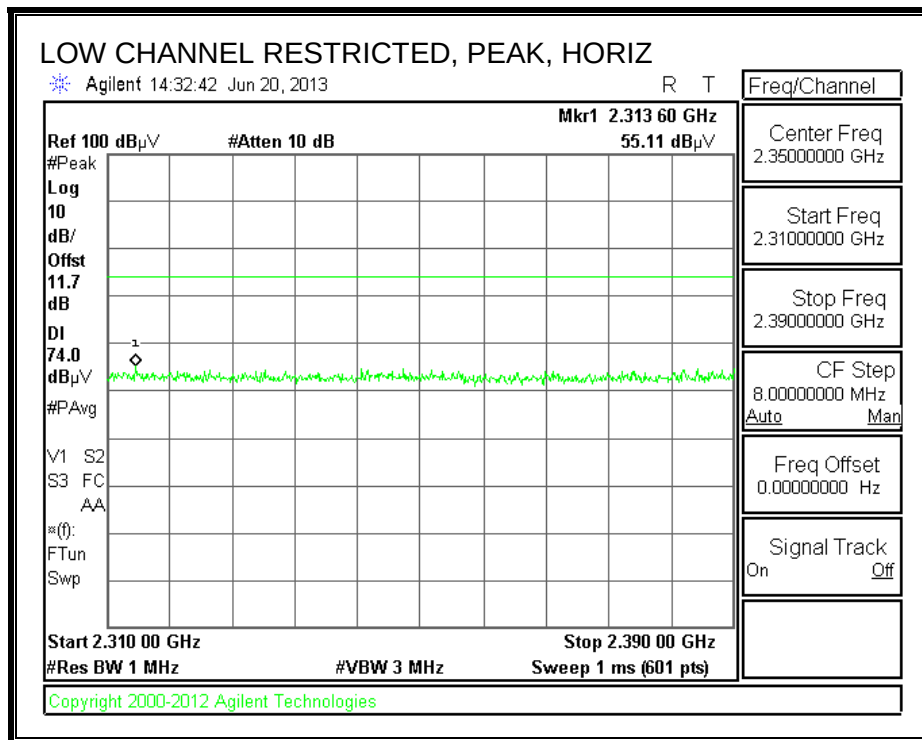
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 3 MHz for average measurements, with Duty cycle factor included under Offset value as Directional coupler + 10 * Log(1/DC).

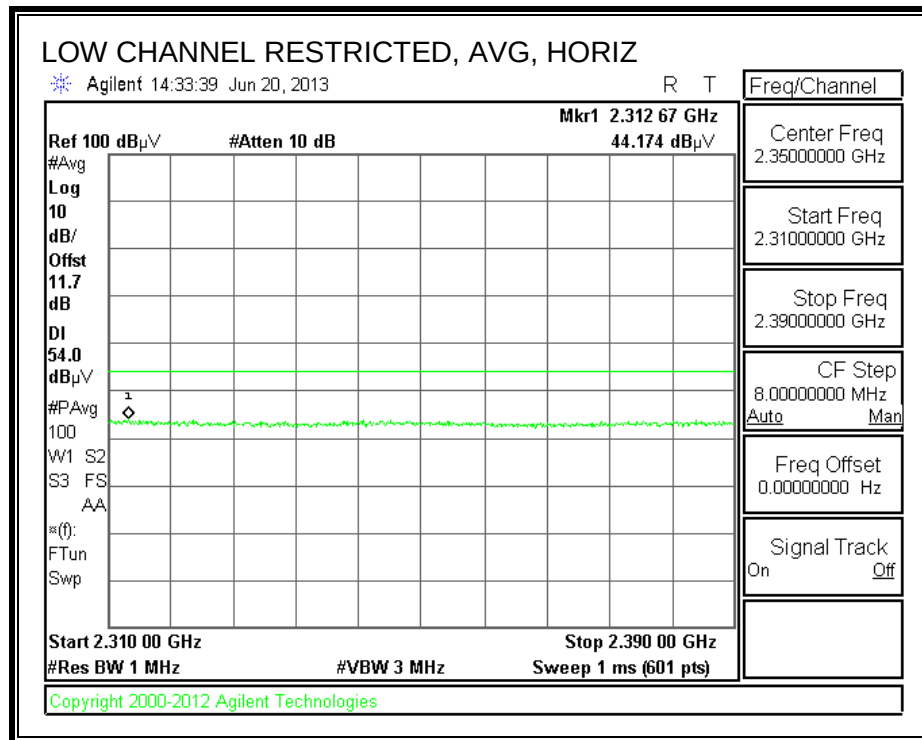
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

b. TRANSMITTER ABOVE 1 GHz

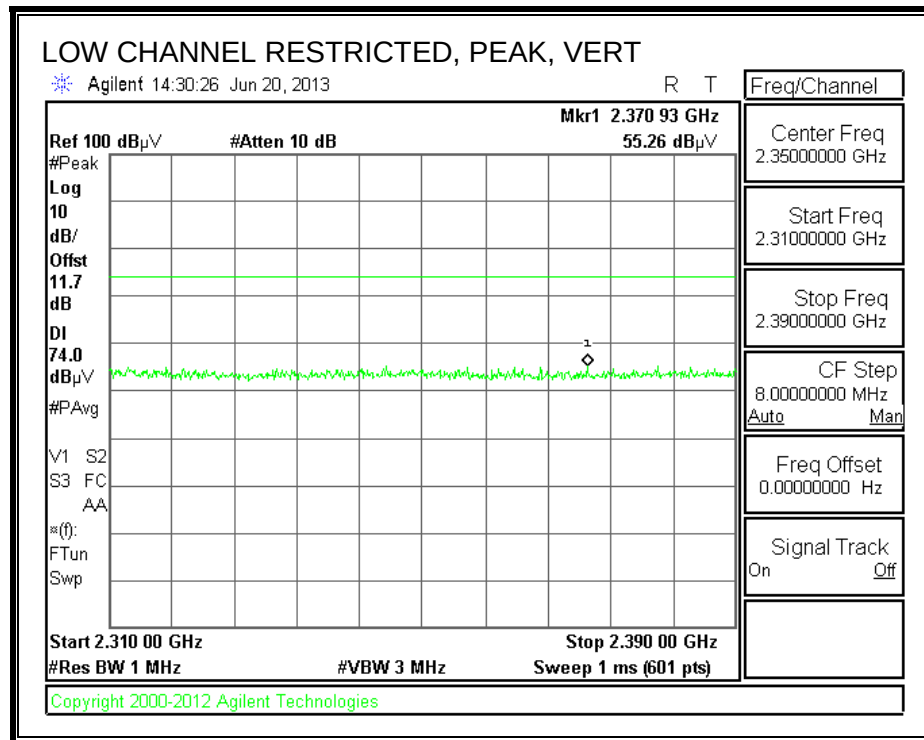
c. TX ABOVE 1 GHz FOR BLUETOOTH LOW ENERGY MODE IN THE 2.4 GHz BAND

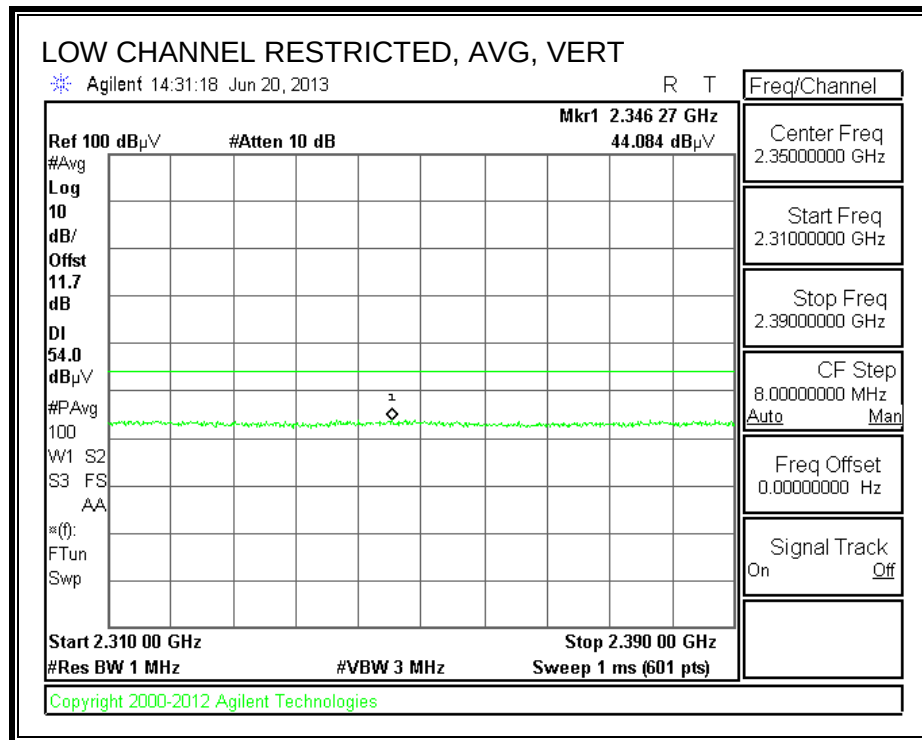
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



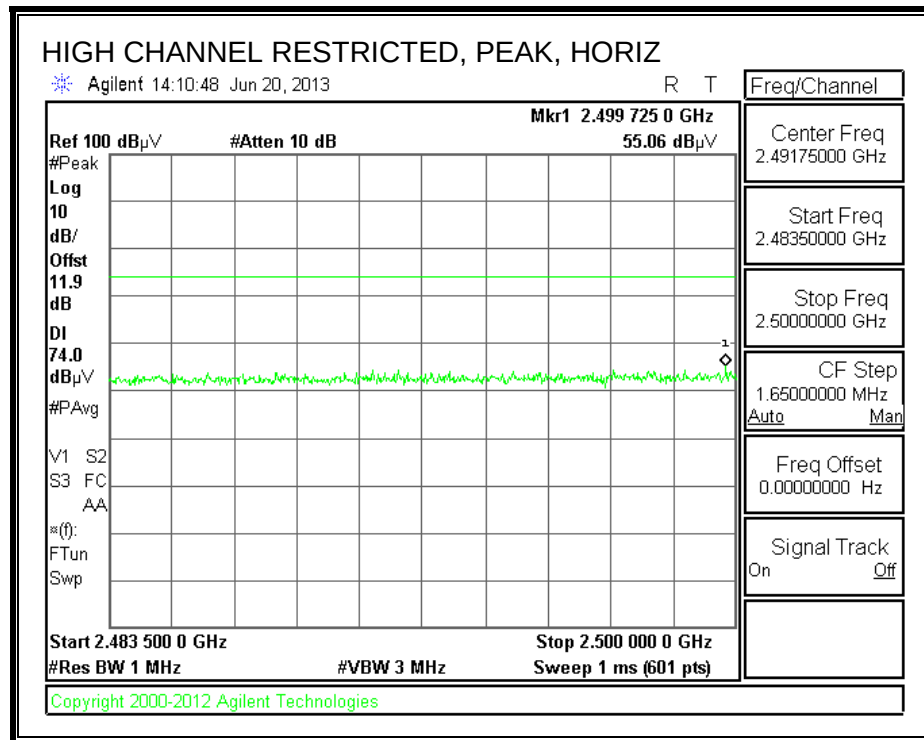


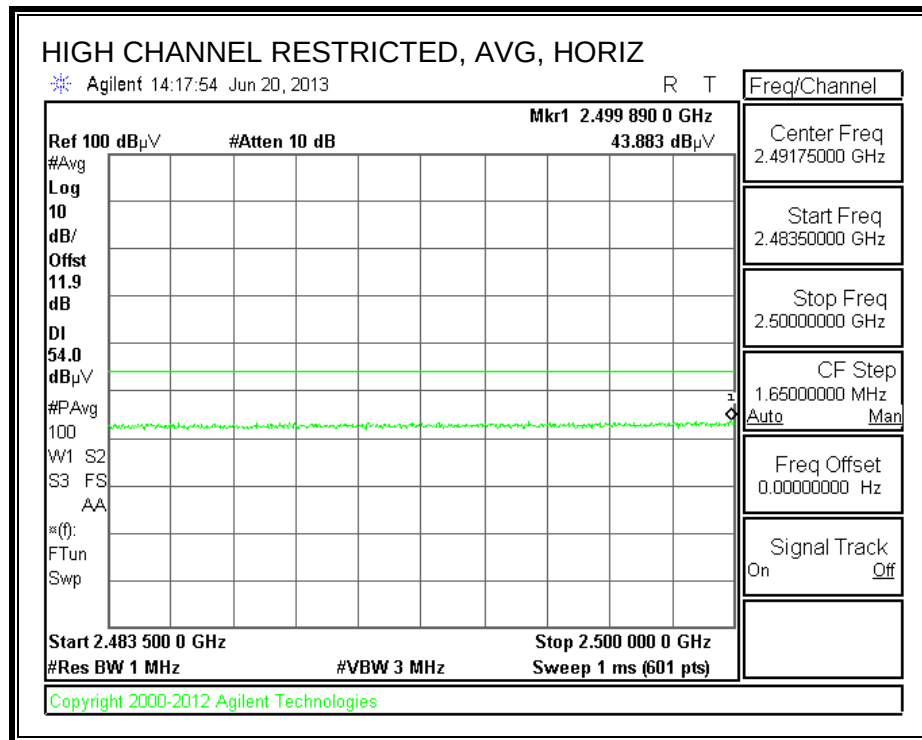
RESTRICTED BANDEGE (LOW CHANNEL, VERTICAL)



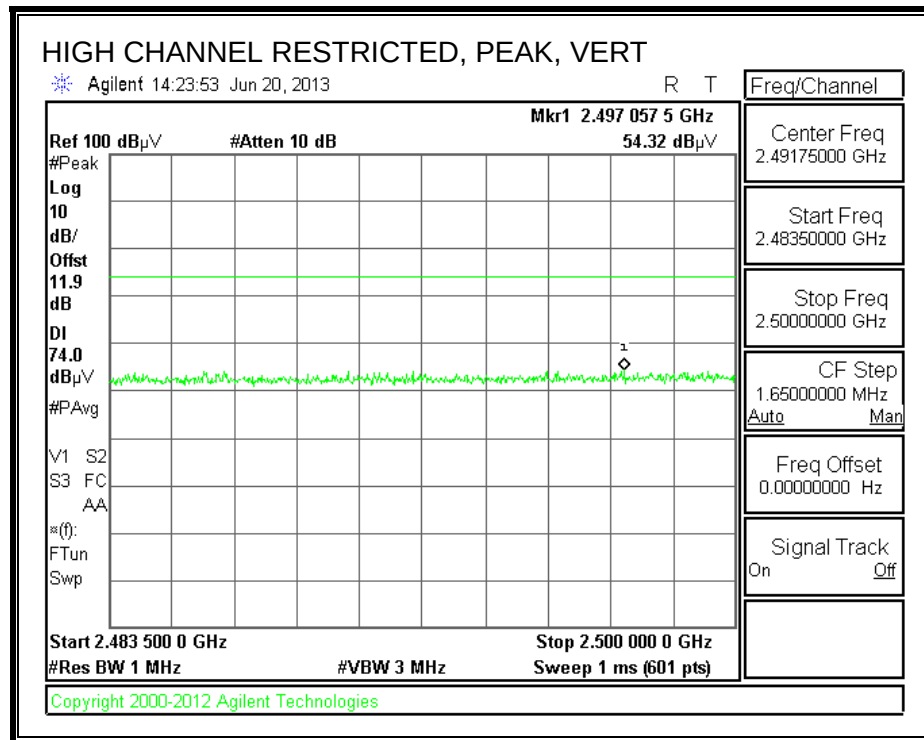


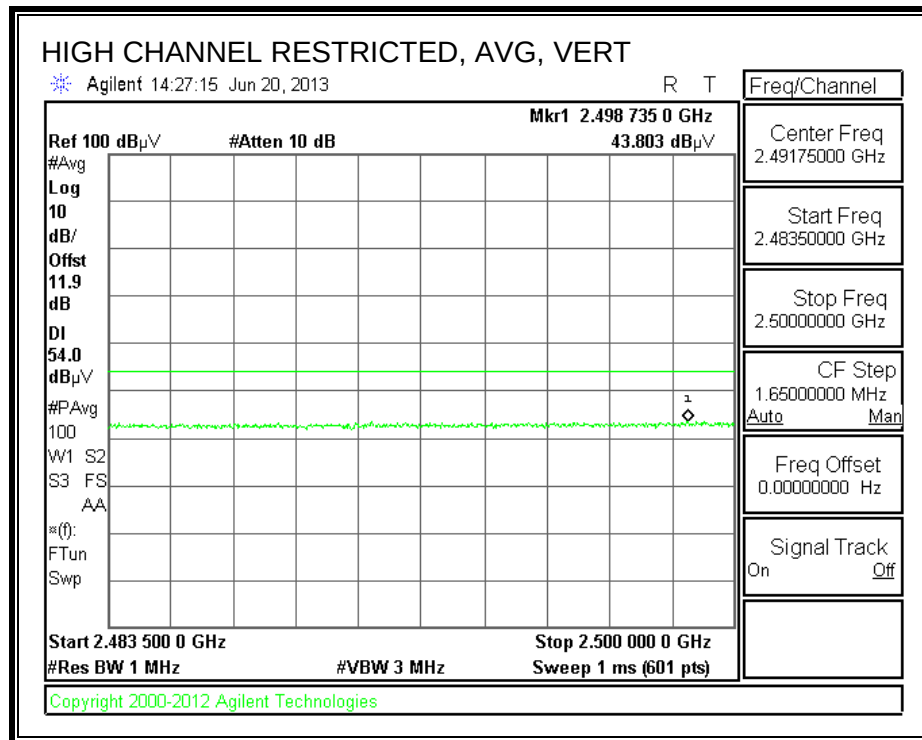
RESTRICTED BANDEGE (HIGH CHANNEL, HORIZONTAL)

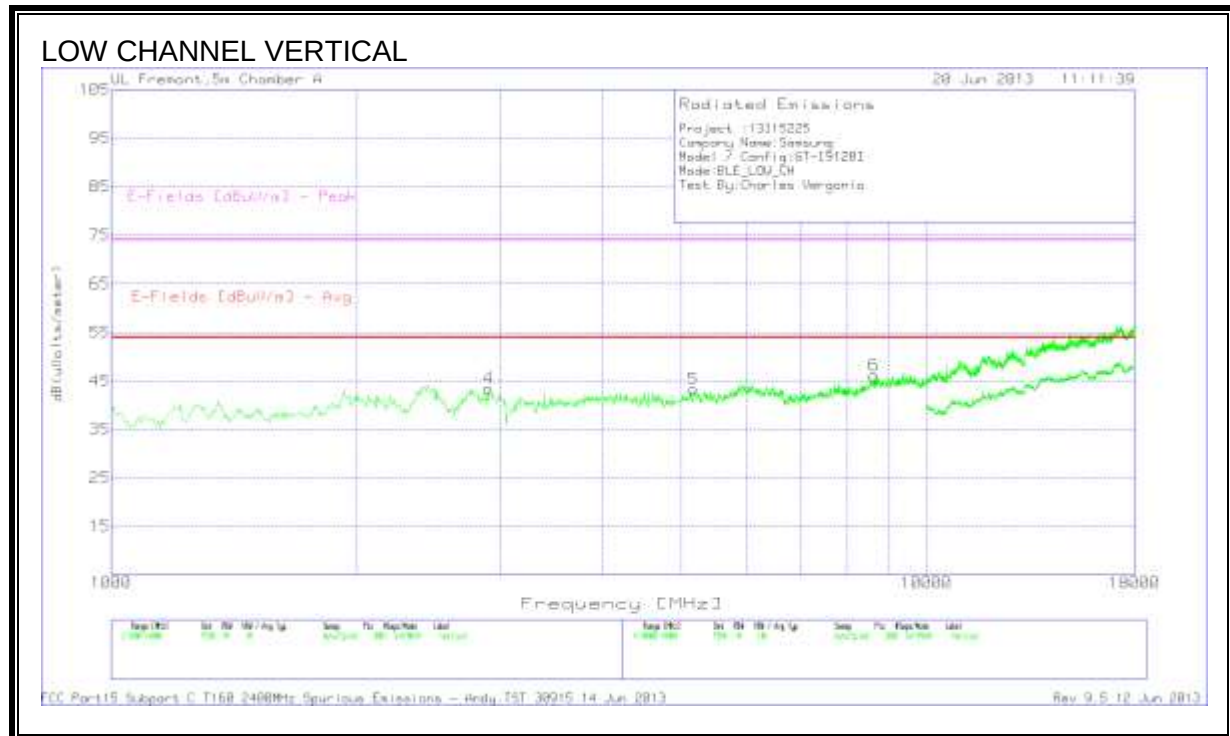




RESTRICTED BANDEGE (HIGH CHANNEL, VERTICAL)







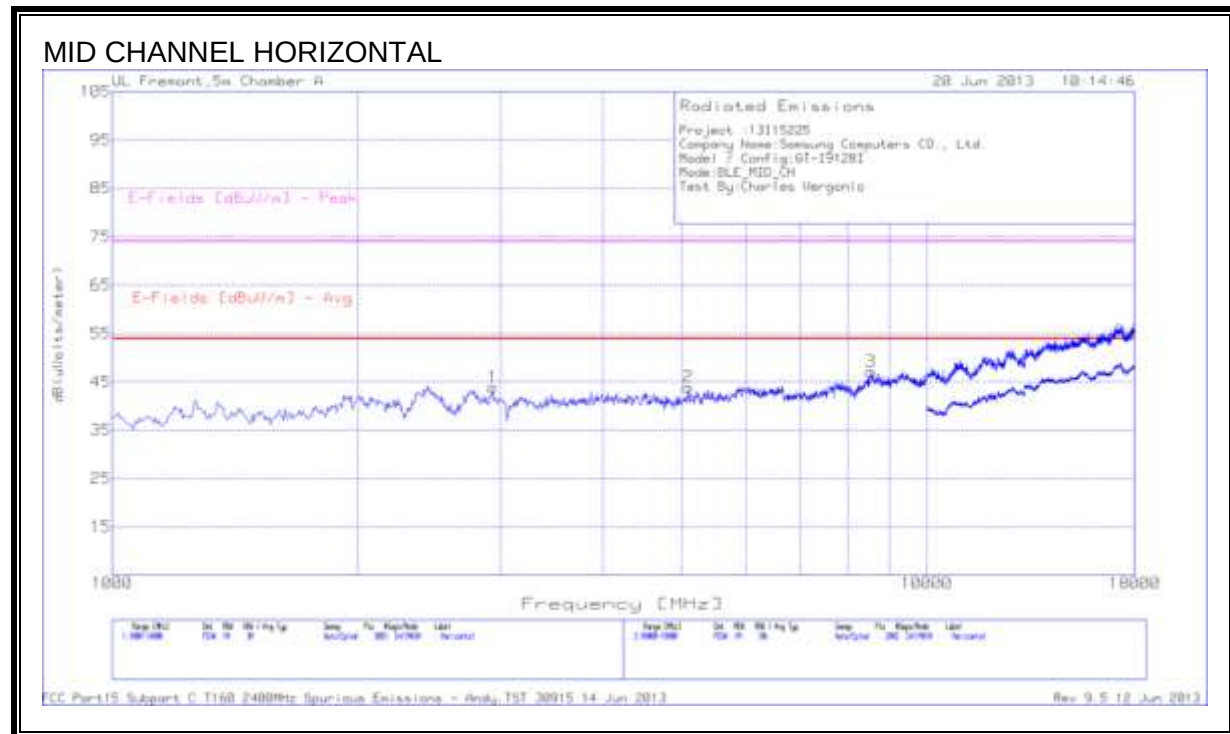
LOW CHANNEL HORIZONTAL AND VERTICAL DATA

Project: 13I15225
Company Name: Samsung
Model / Config: GT-19128I
Mode: BLE_Low_CH
Test by: Charles Vergonio

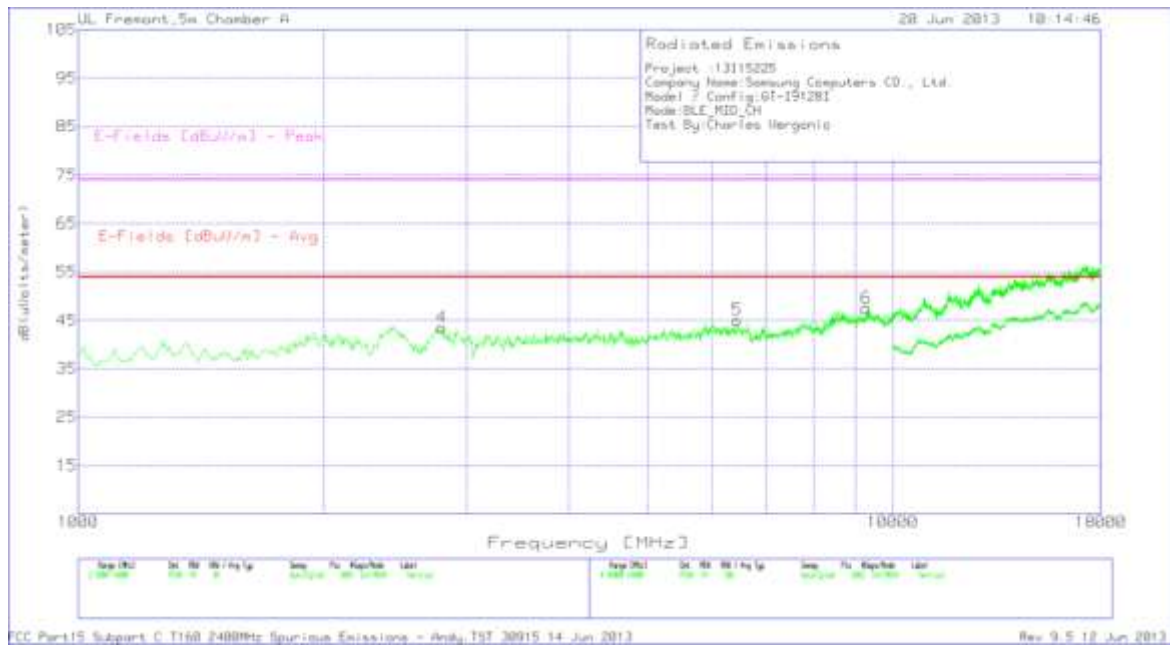
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T136 Ant Factor [dB/m]	T144 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	Corrected Reading dB(uVolts /meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height (cm)	Polarity
1	2.761	42.86	PK	32.6	-36.8	4.8	0.9	44.36	53.97	-9.61	74	-29.64	101	Horz
2	6.051	37.02	PK	35.3	-35.6	7.7	0.2	44.62	53.97	-9.35	74	-29.38	200	Horz
3	8.905	36.22	PK	35.8	-36.1	9.8	0.4	46.12	53.97	-7.85	74	-27.88	101	Horz
4	2.903	41.92	PK	32.4	-36.7	4.9	0.9	43.42	53.97	-10.55	74	-30.58	100	Vert
5	5.179	37.39	PK	34.2	-35.5	7	0.2	43.29	53.97	-10.68	74	-30.71	200	Vert
6	8.622	36.41	PK	35.7	-36	9.6	0.4	46.11	53.97	-7.86	74	-27.89	200	Vert

PK - Peak detector

FCC Part15 Subpart C T160 2400MHz Spurious Emissions - Andy.TST 30915 14 Jun 2013Rev 9.5 12 Jun 2013



MID CHANNEL VERTICAL



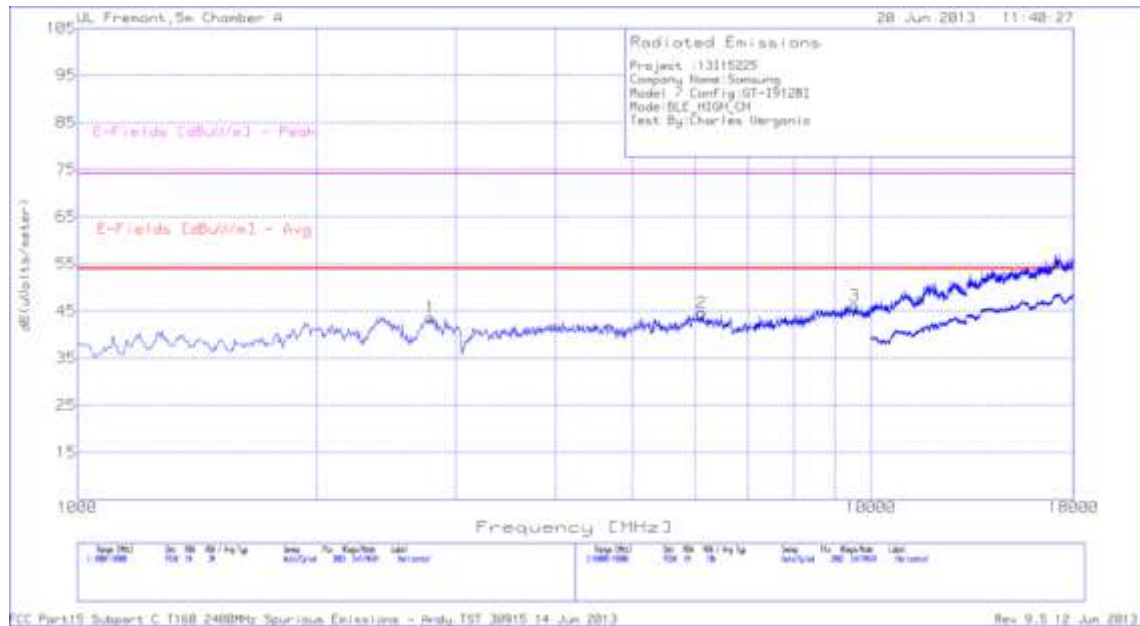
MID CHANNEL HORIZONTAL AND VERTICAL DATA

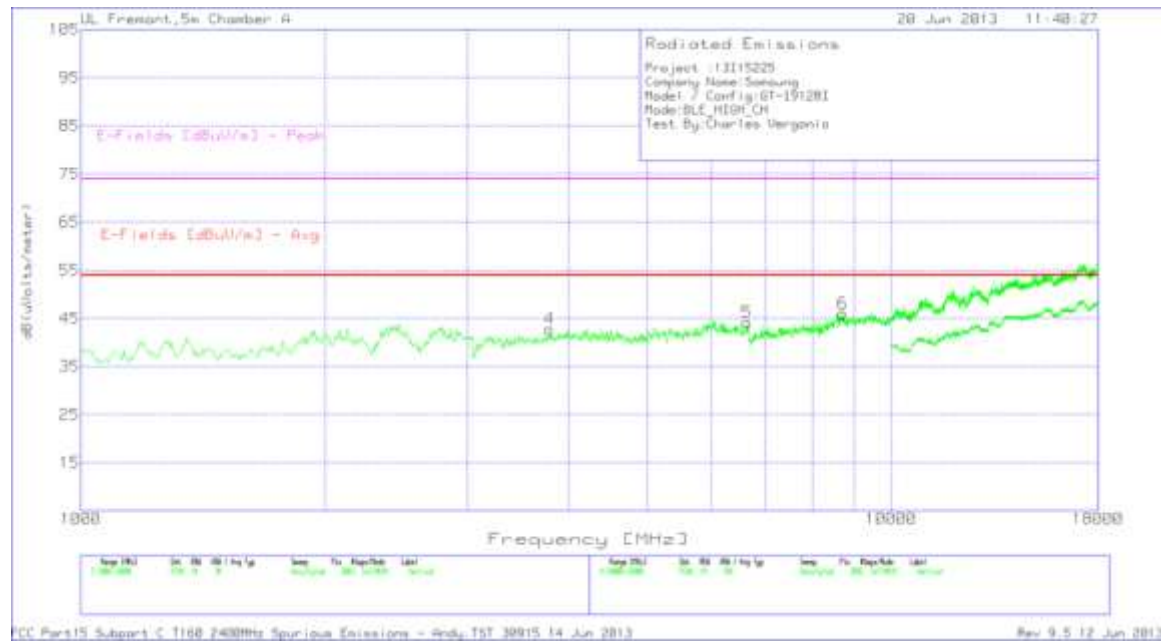
Project: 1315225
Company Name: Samsung
Model / Config: GT-19128I
Mode: BLE_MID_CH
Test by: Charles Vergonio

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T136 Ant Factor [dB/m]	T144 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	Corrected Reading dB(uVolts/meter)	E-Fields [dBuV/m] Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height (cm)	Polarity
1	2.931	42.19	PK	32.5	-36.7	5	0.9	43.89	53.97	-10.08	74	-30.11	200	Horz
2	5.094	38.32	PK	34	-35.6	7	0.2	43.92	53.97	-10.05	74	-30.08	101	Horz
3	8.543	37.51	PK	35.7	-36	9.5	0.4	47.11	53.97	-6.86	74	-26.89	101	Horz
4	2.795	41.94	PK	32.6	-36.7	4.8	0.9	43.54	53.97	-10.43	74	-30.46	100	Vert
5	6.442	36.76	PK	35.5	-35.6	8.1	0.3	45.06	53.97	-8.91	74	-28.94	200	Vert
6	9.285	36.87	PK	36.3	-36.2	10	0.5	47.47	53.97	-6.5	74	-26.53	200	Vert

PK - Peak detector

HIGH CHANNEL HORIZONTAL





HIGH CHANNEL HORIZONTAL AND VERTICAL DATA

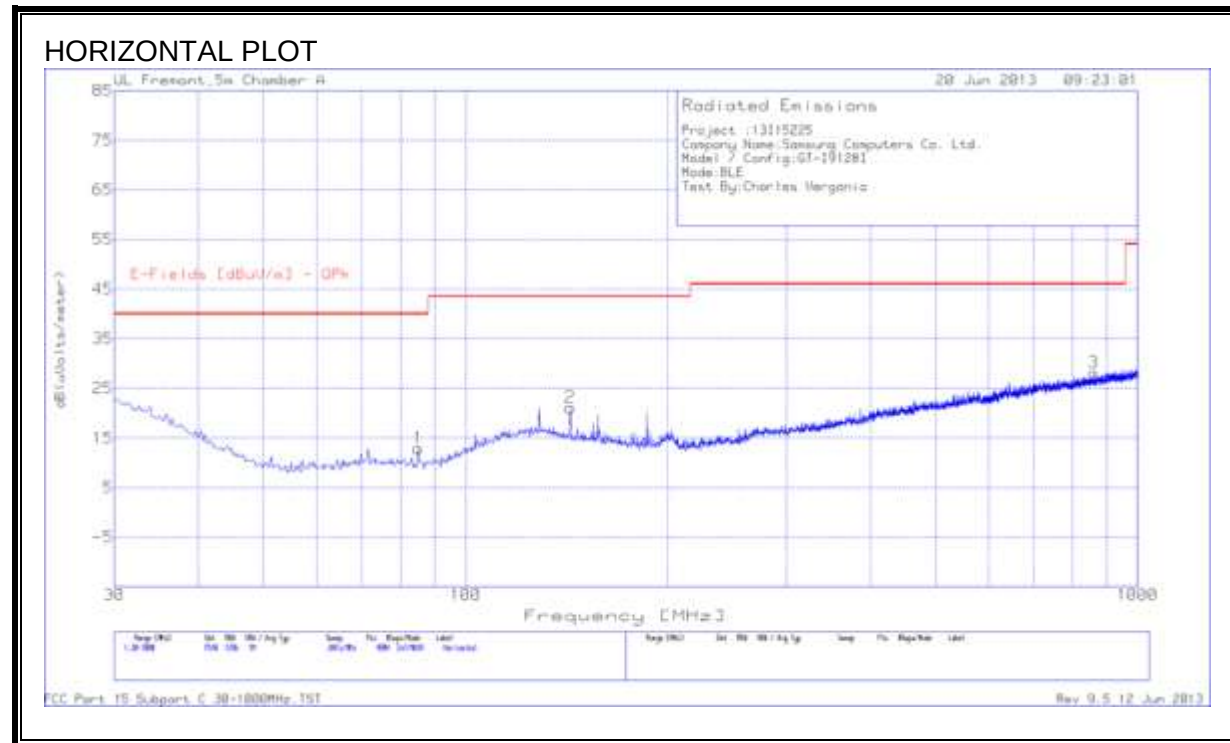
Project: 13I15225
Company Name: Samsung
Model / Config: GT-19128I
Mode: BLE_HIGH_CH
Test by: Charles Vergonio

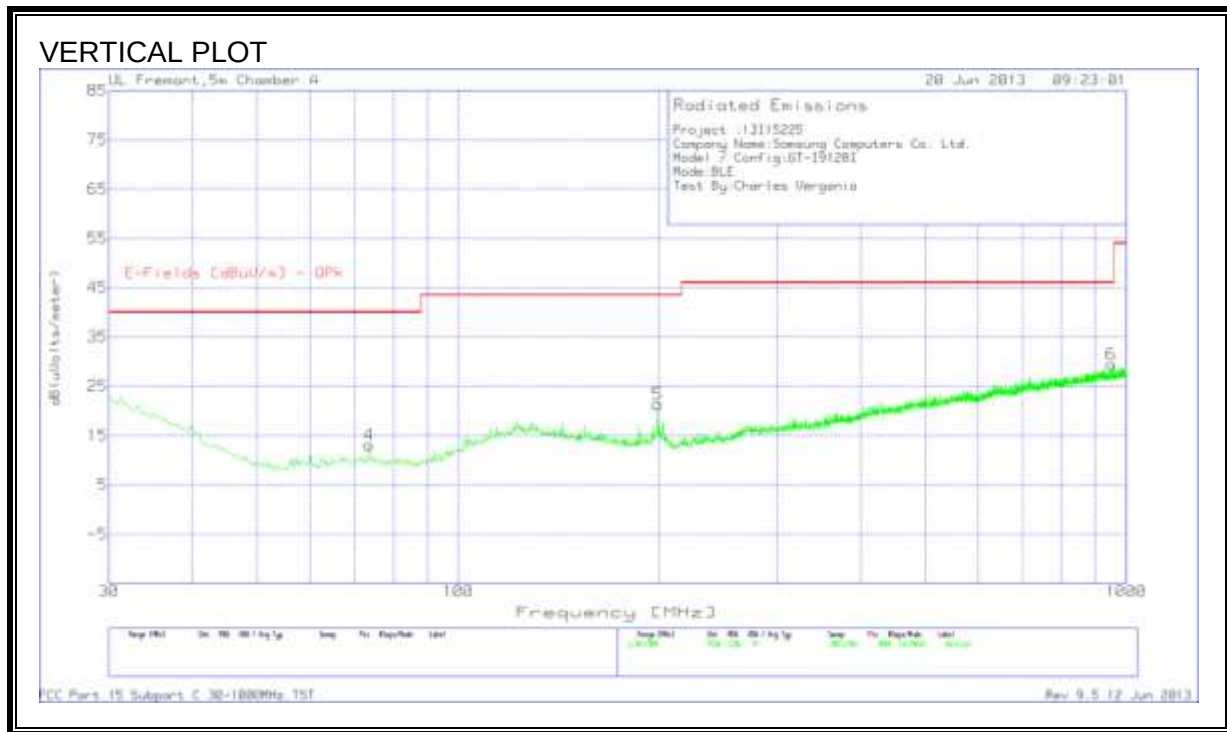
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T136 Ant Factor [dB/m]	T144 Preamp Gain [dB]	Cable Factor [dB]	T160 BRF [dB]	Corrected Reading dB(uVolts/meter)	E-Fields [dBuV/m] - Avg	Margin (dB)	E-Fields [dBuV/m] - Peak	Margin (dB)	Height (cm)	Polarity
1	2.784	42.03	PK	32.6	-36.7	4.8	0.9	43.63	53.97	-10.34	74	-30.37	200	Horz
2	6.125	36.94	PK	35.3	-35.6	7.8	0.2	44.64	53.97	-9.33	74	-29.36	101	Horz
3	9.54	35.02	PK	36.6	-36.2	10.1	0.6	46.12	53.97	-7.85	74	-27.88	200	Horz
4	3.786	39.19	PK	33.5	-36.1	5.9	0.3	42.79	53.97	-11.18	74	-31.21	200	Vert
5	6.64	35.77	PK	35.5	-35.6	8.2	0.3	44.17	53.97	-9.8	74	-29.83	200	Vert
6	8.719	36.19	PK	35.8	-36	9.6	0.4	45.99	53.97	-7.98	74	-28.01	200	Vert

PK - Peak detector

d. WORST-CASE BELOW 1 GHz

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





HORIZONTAL AND VERTICAL DATA

Project: 13I15225
Company Name: Samsung
Model / Config: GT-19128I
Mode: BLE_low channel worst case
Test by: Charles Vergonio

Marker	Frequency (MHz)	Meter Reading dBuV)	Det	T185 Antenna Factor dB/m	T64 preamp/cable loss [dB]	Corrected Reading dB(uVolts/meter)	E-Fields [dBuV/m] - QPk	Margin (dB)	Height (cm)	Polarity
1	85.0062	32.51	PK	7.5	-27.1	12.91	40	-27.09	400	Horz
2	143.1626	35.03	PK	12.8	-26.7	21.13	43.52	-22.39	200	Horz
3	860.4247	29.2	PK	21.7	-22.7	28.2	46.02	-17.82	400	Horz
4	73.6173	32.18	PK	8.1	-27.2	13.08	40	-26.92	200	Vert
5	198.8958	35.44	PK	12.1	-26.2	21.34	43.52	-22.18	200	Vert
6	950.0824	29.32	PK	22.6	-22.5	29.42	46.02	-16.6	300	Vert

PK - Peak detector
FCC Part 15 Subpart C 30-1000MHz.TST Rev 9.5 12 Jun 2013

9. 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

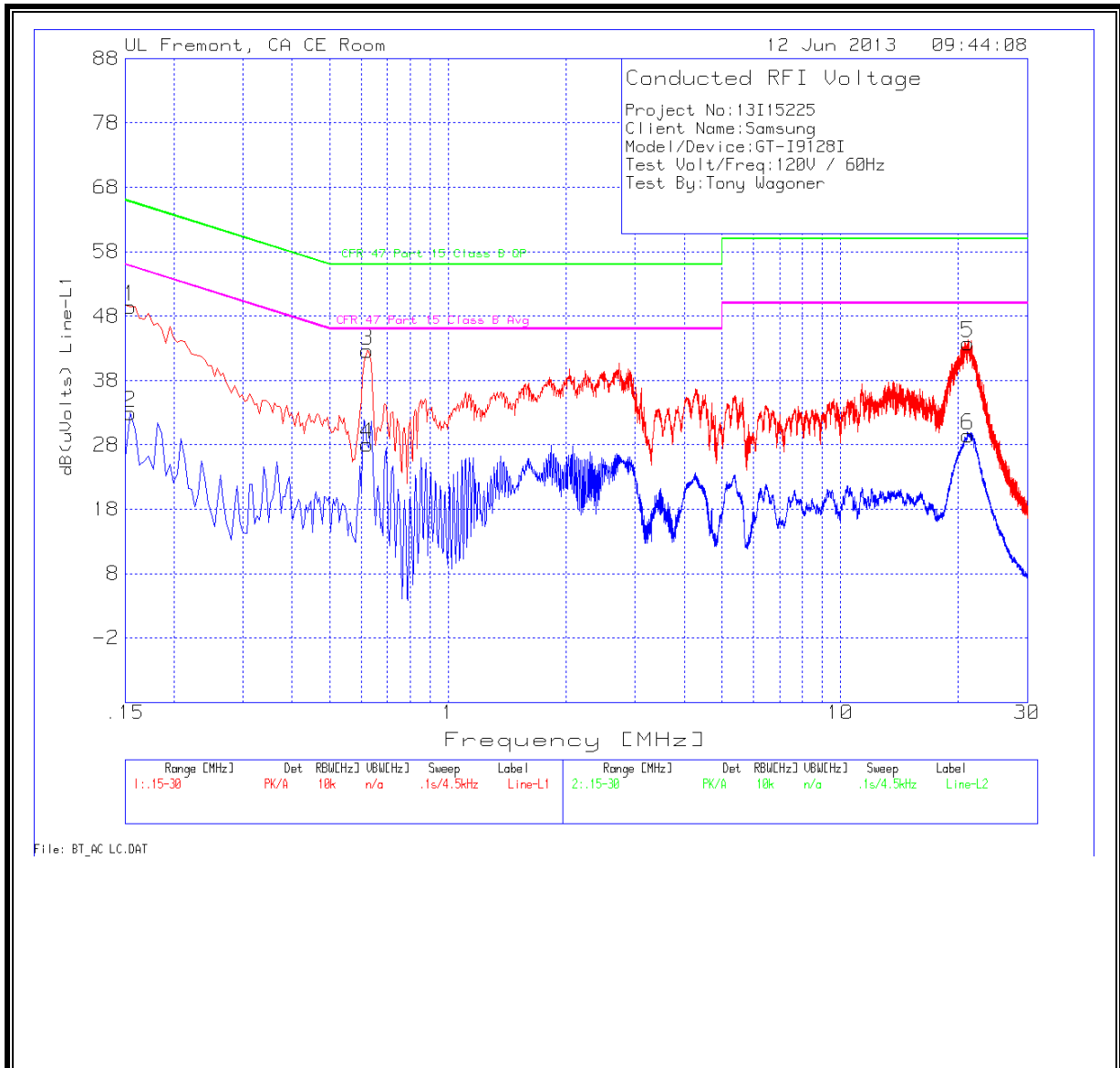
^{*} Decreases with the logarithm of the frequency.

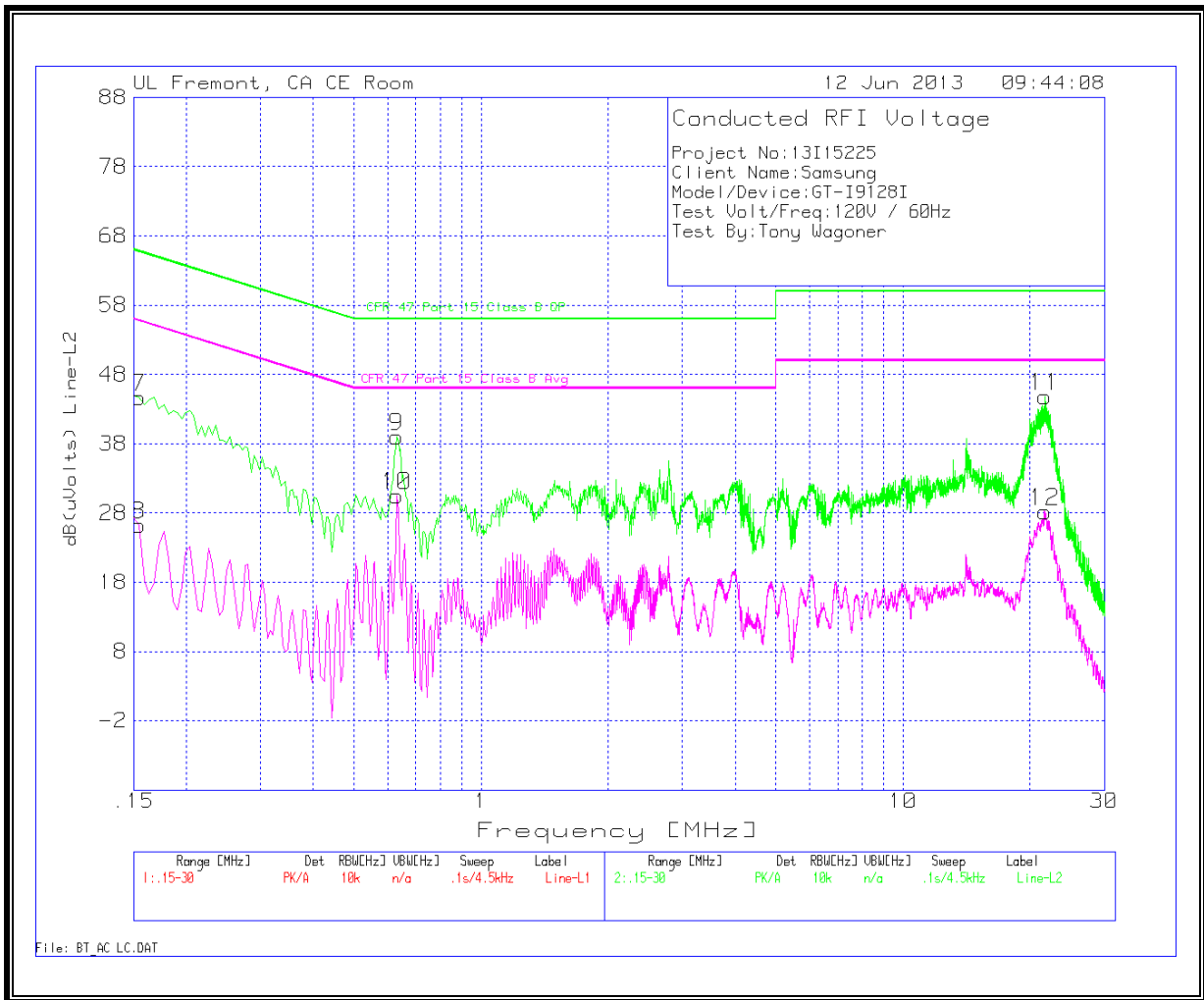
TEST PROCEDURE

ANSI C63.10-2009

RESULTS

6 WORST EMISSIONS





LINE 1 and 2 RESULTS

Project No:	13I15225								
Client Name:	Samsung								
Model/Device:	GT-I9128I								
Test Volt/Freq:	120V / 60Hz								
Test By:	Tony Wagoner								
Line-L1 .15 - 30MHz									
Test Frequenc	Meter Reading	Detector	T24 IL L1.TXT	LC Cables 1&3.TXT	dB(uVolts)	CFR 47 Part 15	Margin	CFR 47 Part 15	Margin
0.1545	49.38	PK	0.1	0	49.48	65.8	-16.32	-	-
0.1545	32.9	Av	0.1	0	33	-	-	55.8	-22.8
0.6225	42.48	PK	0.1	0	42.58	56	-13.42	-	-
0.6225	27.94	Av	0.1	0	28.04	-	-	46	-17.96
21.1515	43.27	PK	0.3	0.2	43.77	60	-16.23	-	-
21.1515	28.99	Av	0.3	0.2	29.49	-	-	50	-20.51
Line-L2 .15 - 30MHz									
Test Frequenc	Meter Reading	Detector	T24 IL L2.TXT	LC Cables 2&3.TXT	dB(uVolts)	CFR 47 Part 15	Margin	CFR 47 Part 15	Margin
0.1545	44.55	PK	0.1	0	44.65	65.8	-21.15	-	-
0.1545	26.11	Av	0.1	0	26.21	-	-	55.8	-29.59
0.6315	38.93	PK	0.1	0	39.03	56	-16.97	-	-
0.6315	30.39	Av	0.1	0	30.49	-	-	46	-15.51
21.723	44.29	PK	0.3	0.2	44.79	60	-15.21	-	-
21.723	27.69	Av	0.3	0.2	28.19	-	-	50	-21.81
PK - Peak detector									
QP - Quasi-Peak detector									
Av - Average detector									