



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

**BT3.0+HS, 802.11BGN 1X1 HT20, GSM850/1900 & WCDMA850MHZ BAR PHONE
W/HOTSPOT, EDGE RX ONLY**

MODEL NUMBER: GT-S5300B

FCC ID: A3LGTS5300B

REPORT NUMBER: 12I14311-2

ISSUE DATE: MARCH 12, 2012

Prepared for

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	03/12/12	Initial Issue	F. Ibrahim

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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: BT3.0+HS, 802.11BGN 1X1 HT20, GSM850/1900 &
WCDMA850MHZ BAR PHONE W/HOTSPOT, EDGE RX ONLY.

MODEL: GT-S5300B

SERIAL NUMBER: WIFI RSE (RADIATED), FJ-054-D & FJ-066-D (CONDUCTED)

DATE TESTED: FEBRAURY 27- MARCH 9, 2012

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

Compliance Certification Services (UL CCS) 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 CCS 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.

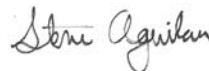
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this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



FRANK IBRAHIM
EMC SUPERVISOR
UL CCS

Tested By:



STEVE AGUILAR
EMC TECHNICIAN
UL CCS

2. TEST METHODOLOGY

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

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

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 1000 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 BT3.0+HS, 802.11BGN 1X1 HT20, GSM850/1900 & WCDMA850MHZ BAR PHONE W/HOTSPOT, EDGE RX ONLY.

The radio module is manufactured by Samsung Electronics Co., Ltd.

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)
2412 - 2462	802.11b	18.56	71.78
2412 - 2462	802.11g	23.85	242.66
2412 - 2462	802.11n HT20	21.97	157.40

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna, with a maximum gain of -3.4 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was WLAN Test Engineering Mode.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission below 1 GHz and power line conducted emission tests were performed with the EUT transmitting at the channel with highest output power as worst-case scenario.

The fundamental frequency was investigated for the EUT in three orthogonal orientations X,Y, and Z (battery-operated), also for EUT with AC/DC adapter and with headset connected; it was found that the worst-case orientation among them was Y orientation without AC/DC adapter and with headset. All final radiated emission testing was performed using the worst-case orientation.

Worst-case data rates used for testing as provided by the client were as follows:

802.11b Mode: 1Mbps

802.11g Mode: 6Mbps

802.11n HT20 Mode: MCS0

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	ETA0V10BBB	SC3ZB03LS17-E	DoC
Headset	Samsung	N/A	FS-066-A	N/A

I/O CABLES (CONDUCTED SETUP)

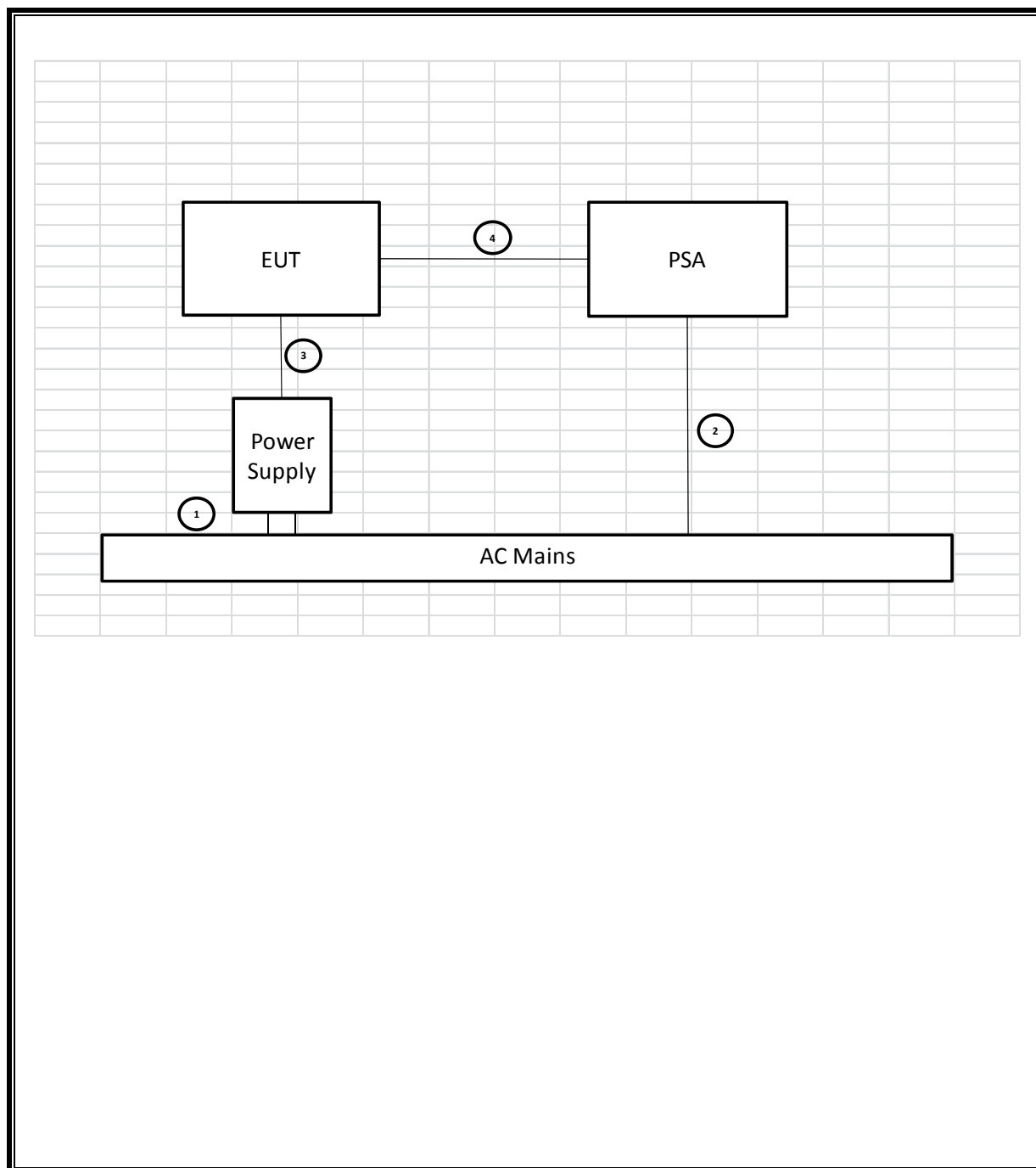
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US AC	US 115V	--	Wall adapter
2	AC	1	AC	AC	1.5	Unshielded
3	DC	1	USB	DC	1,3	Unshielded
4	RF In/Out	1	SMA	--	0.1	--

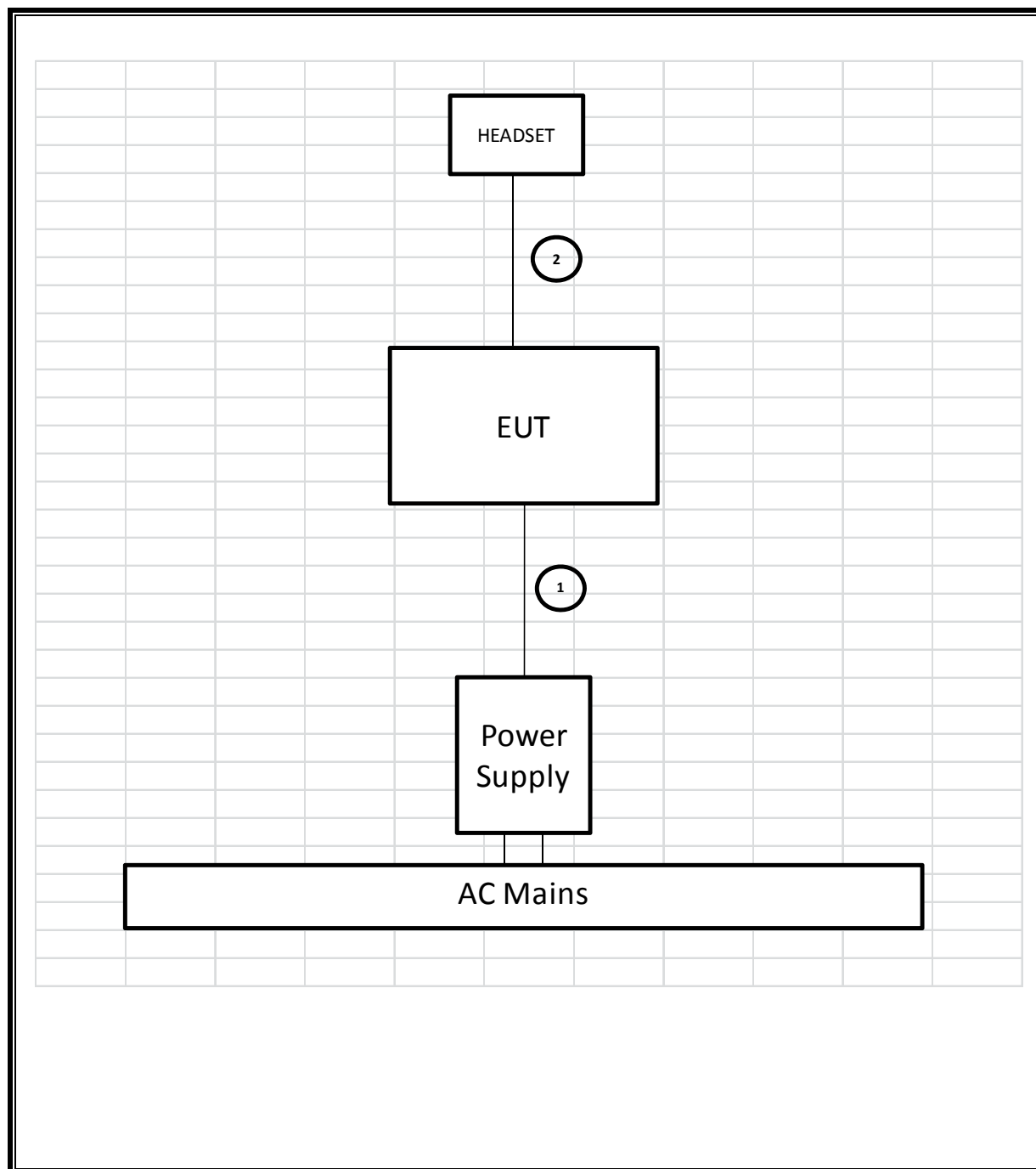
I/O CABLES (RADIATED SETUP)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	Mini USB	1	USB	shielded	1m	N/A
2	Audio	1	Mini-Jack	Unshielded	1.2 m	Volume control attached

TEST SETUP

The EUT is standalone. Adapter and headset is attached as required by the test.
Test software loaded in the EUT is exercised for testing.

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)

SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)

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
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01159	05/11/11	05/11/12
Power Meter	Agilent / HP	437B	--	07/28/11	07/28/12
Power Sensor, 18 GHz	Agilent / HP	8481A	N02782	07/29/11	07/29/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	12/17/10	03/17/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	07/16/11	07/16/12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00580	11/11/11	11/11/12
Antenna, Horn, 18 GHz	EMCO	3115	C00783	06/29/11	06/29/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07/12/11	07/12/12
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	02/16/12	02/16/13
Antenna, Horn, 18 GHz	EMCO	3115	C00945	10/06/11	10/06/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	07/12/11	07/12/12
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00980	07/28/11	07/28/12
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	07/06/11	07/06/12
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/11	12/13/12

7. ANTENNA PORT TEST RESULTS

7.1. 802.11b MODE IN THE 2.4 GHz BAND

7.1.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

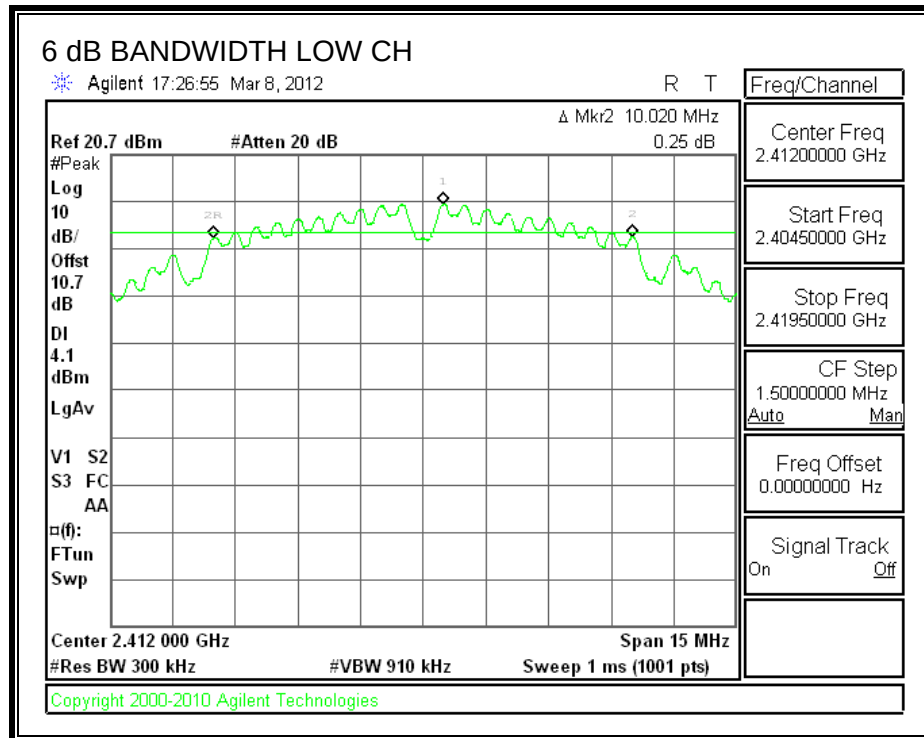
The minimum 6 dB bandwidth shall be at least 500 kHz.

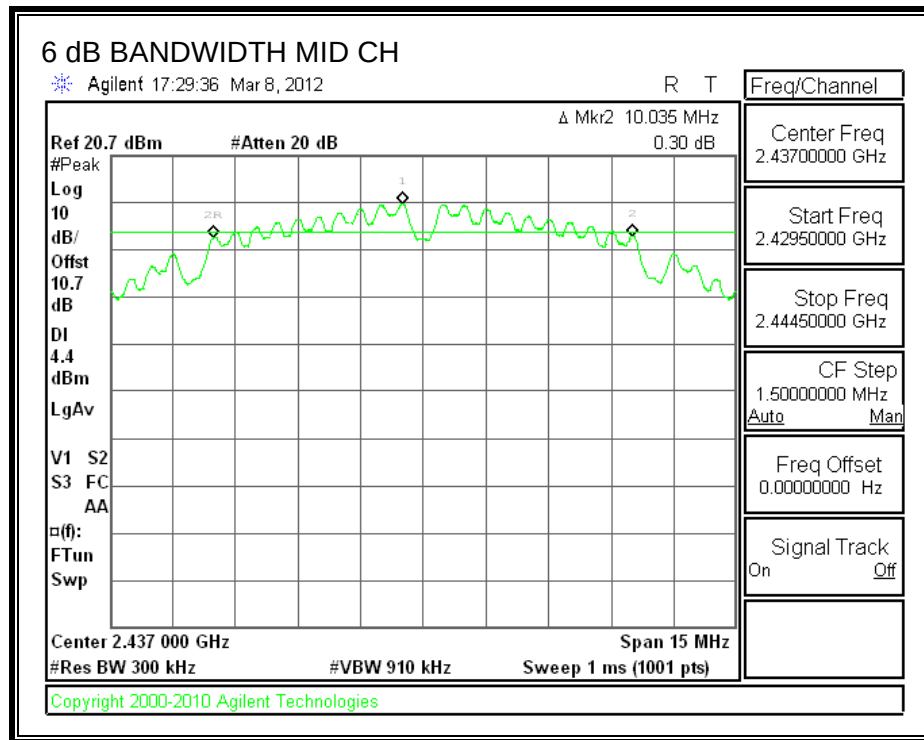
TEST PROCEDURE

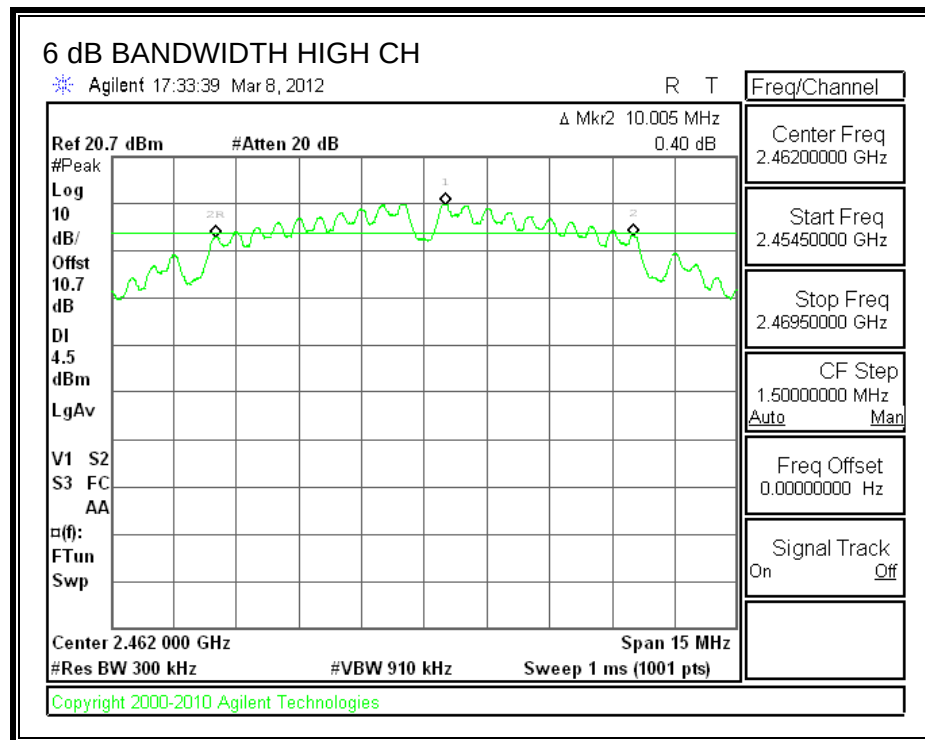
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	10.020	0.5
Middle	2437	10.035	0.5
High	2462	10.005	0.5

6 dB BANDWIDTH





7.1.2. OUTPUT POWER

LIMITS

FCC §15.247 (b)

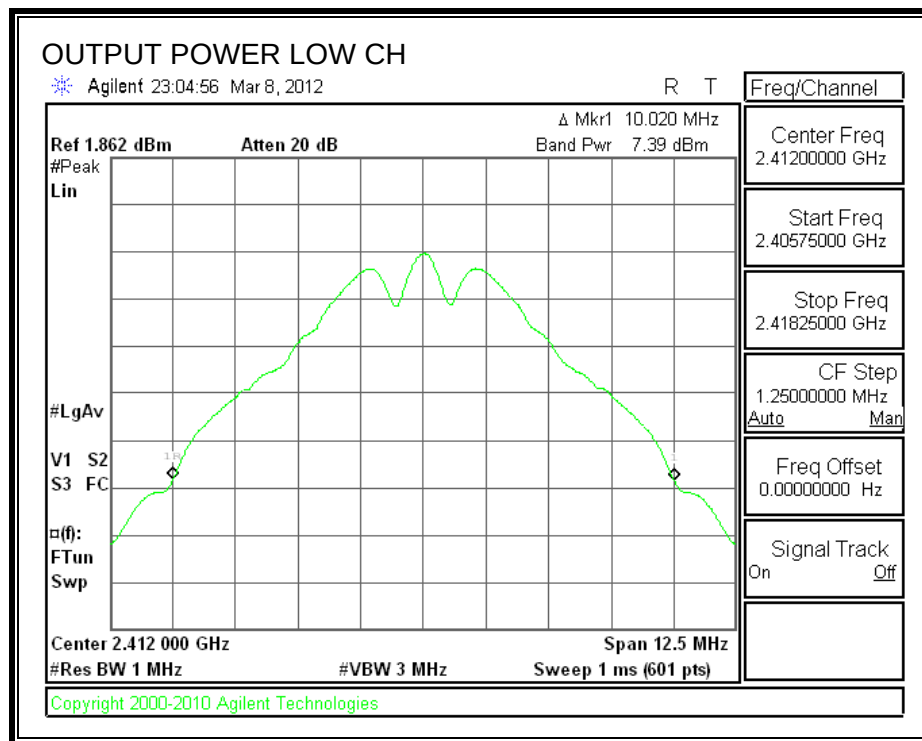
The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

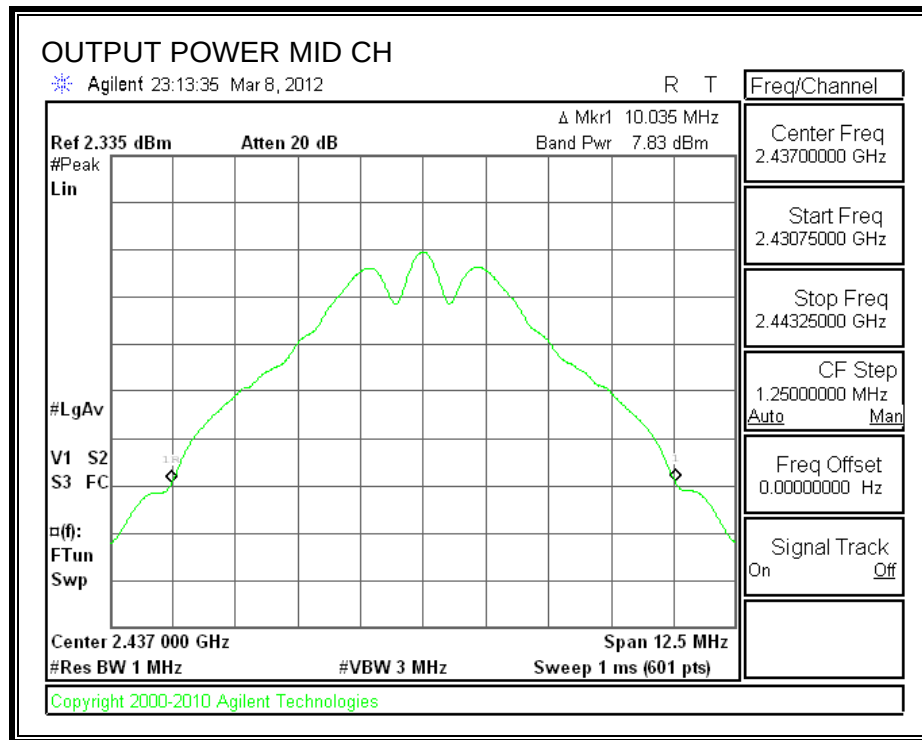
TEST PROCEDURE

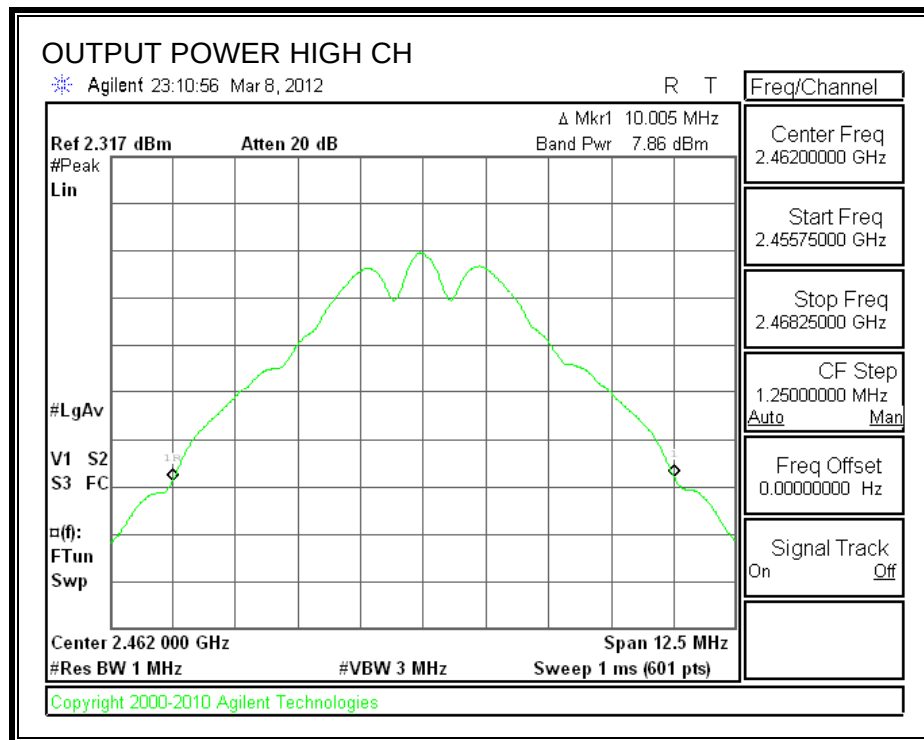
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	7.39	10.7	18.09	30	-11.91
Middle	2437	7.83	10.7	18.53	30	-11.47
High	2462	7.86	10.7	18.56	30	-11.44

OUTPUT POWER





7.1.3. 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 10.7 dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	2412	14.71
Middle	2437	15.02
High	2462	15.20

7.1.4. POWER SPECTRAL DENSITY

LIMITS

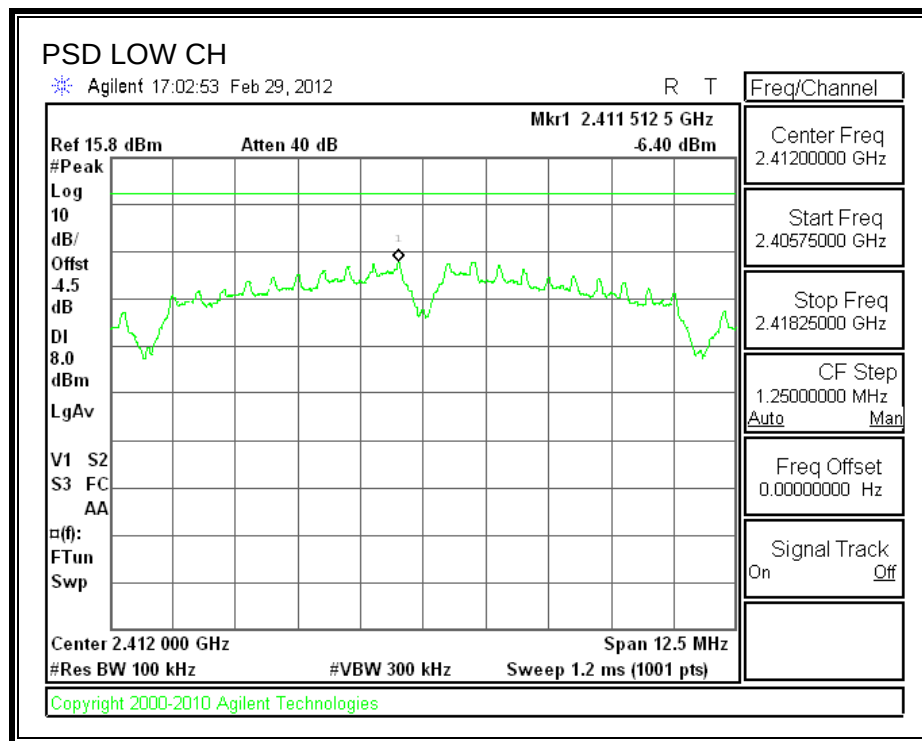
FCC §15.247 (e)

TEST PROCEDURE

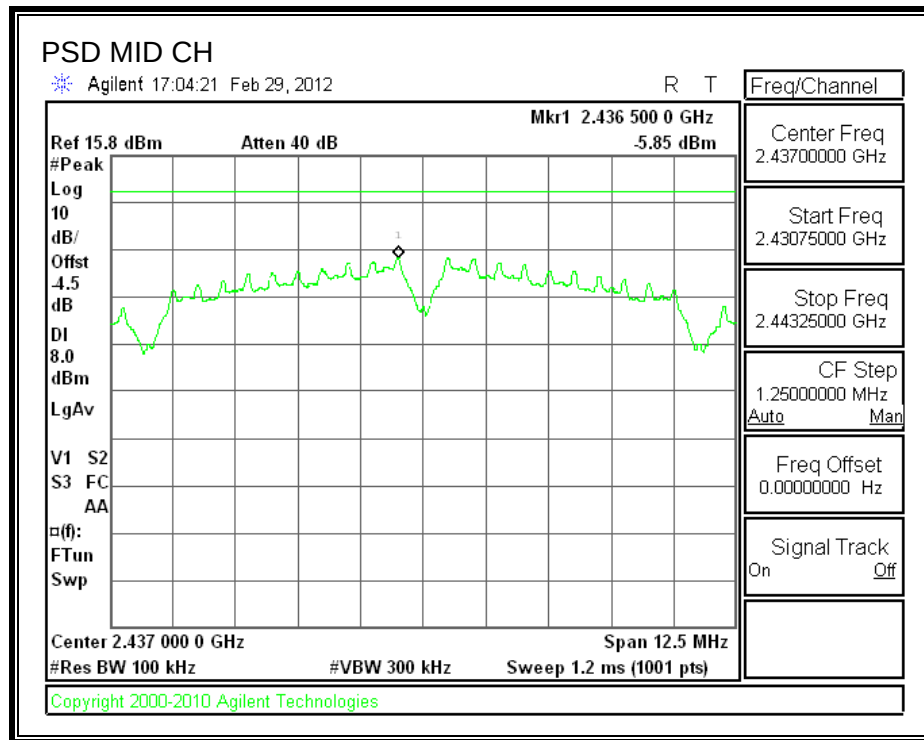
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

RESULTS

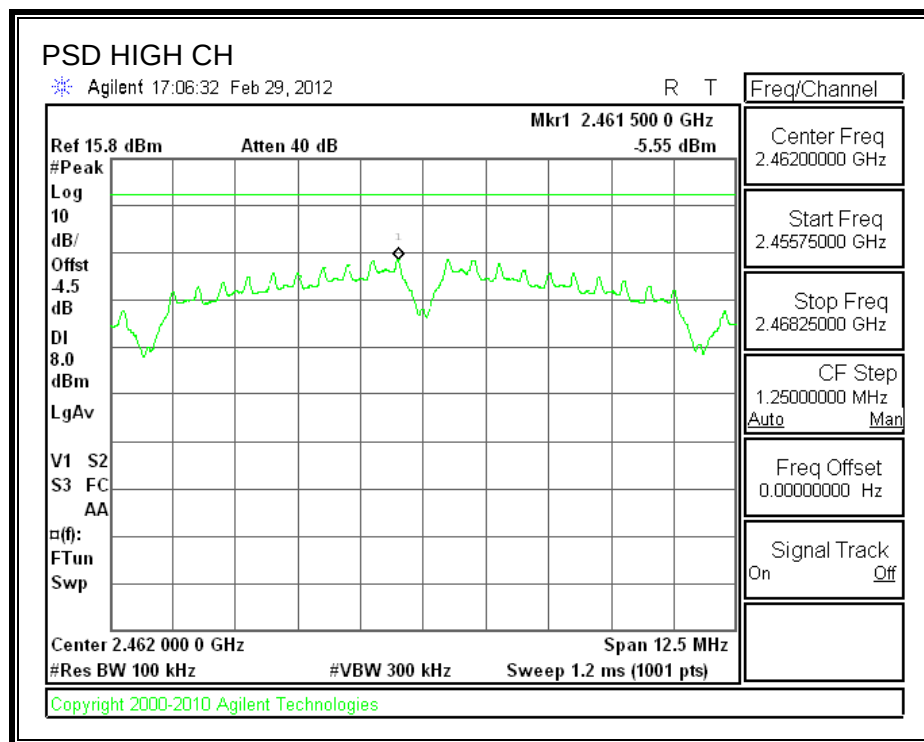
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-6.40	8	-14.40
Middle	2437	-5.85	8	-13.85
High	2462	-5.55	8	-13.55

POWER SPECTRAL DENSITY

Note: Offset = Attenuator + cable loss + $10\log(3\text{kHz}/100\text{kHz})$
 $= 10 + 0.7 + (-15.2)$
 $= -4.5\text{dB}$



Note: Offset = Attenuator + cable loss + $10\log(3\text{kHz}/100\text{kHz})$
 $= 10 + 0.7 + (-15.2)$
 $= -4.5\text{dB}$



Note: Offset = Attenuator + cable loss + $10\log(3\text{kHz}/100\text{kHz})$
 $= 10 + 0.7 + (-15.2)$
 $= -4.5\text{dB}$

7.1.5. CONDUCTED SPURIOUS EMISSIONS

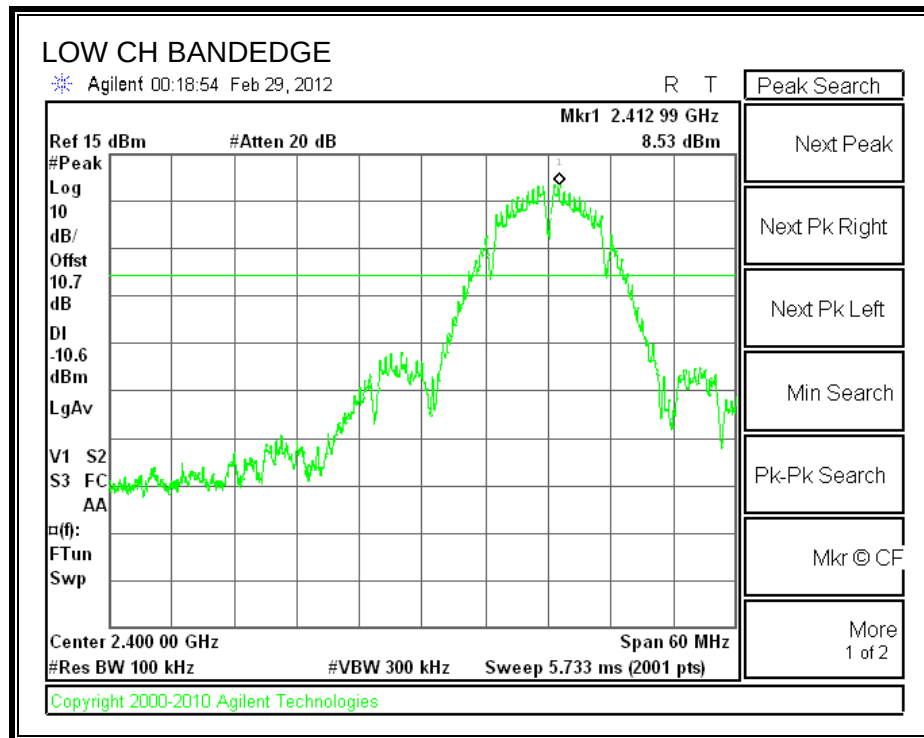
LIMITS

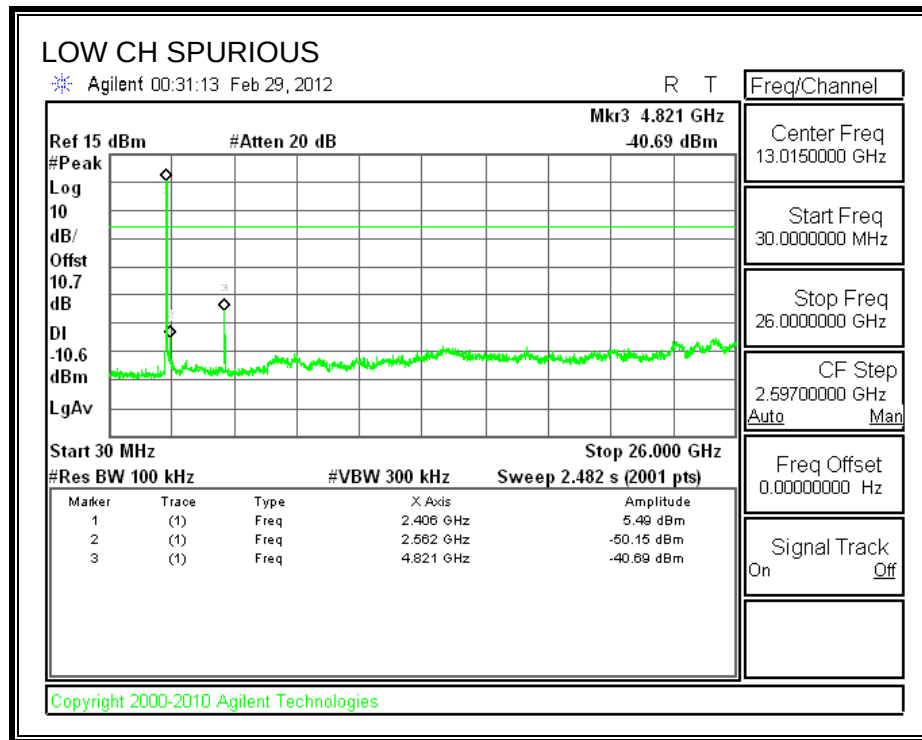
FCC §15.247 (d)

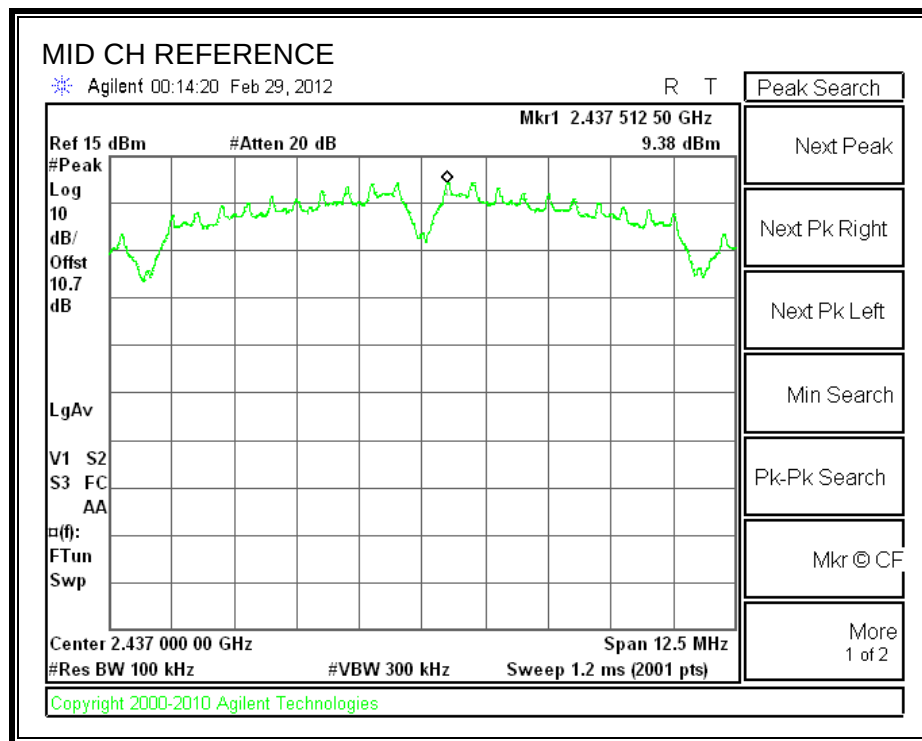
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

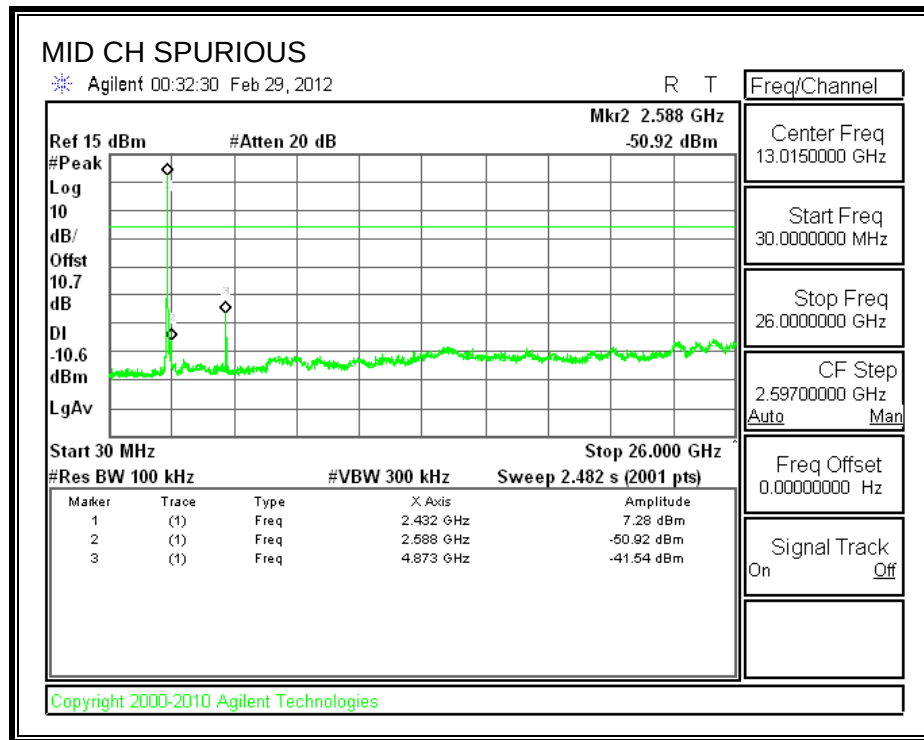
TEST PROCEDURE

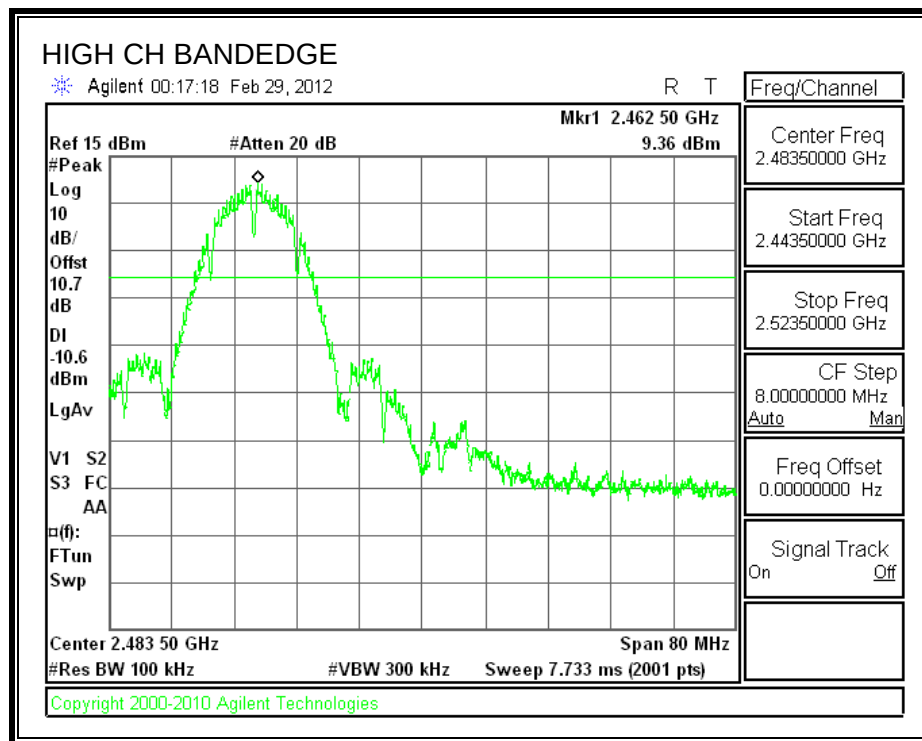
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

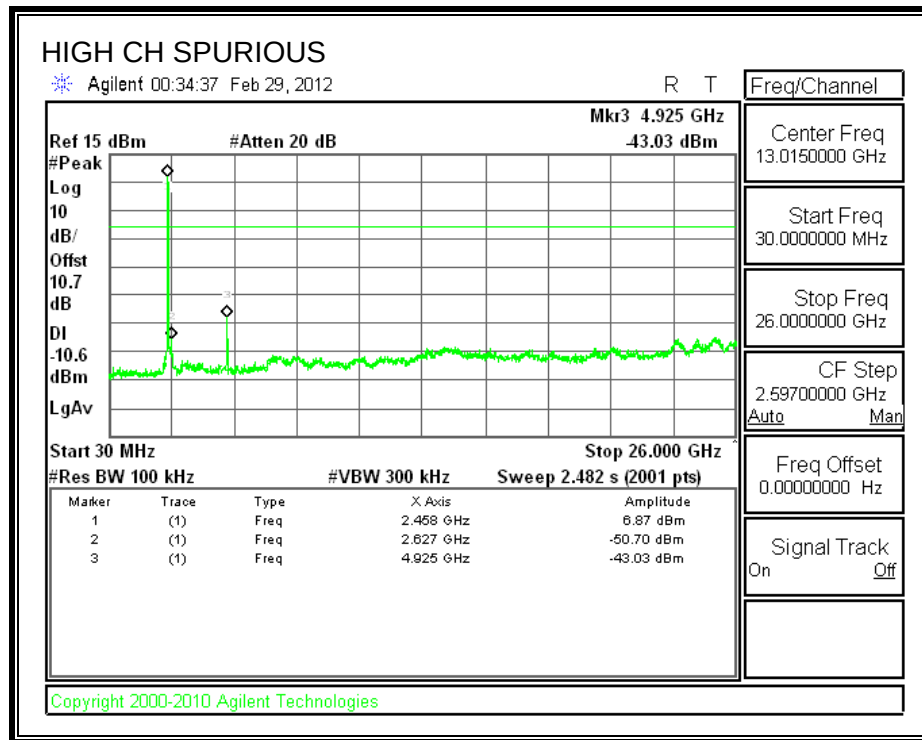
RESULTS**SPURIOUS EMISSIONS, LOW CHANNEL**



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



7.2. 802.11g MODE IN THE 2.4 GHz BAND

7.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

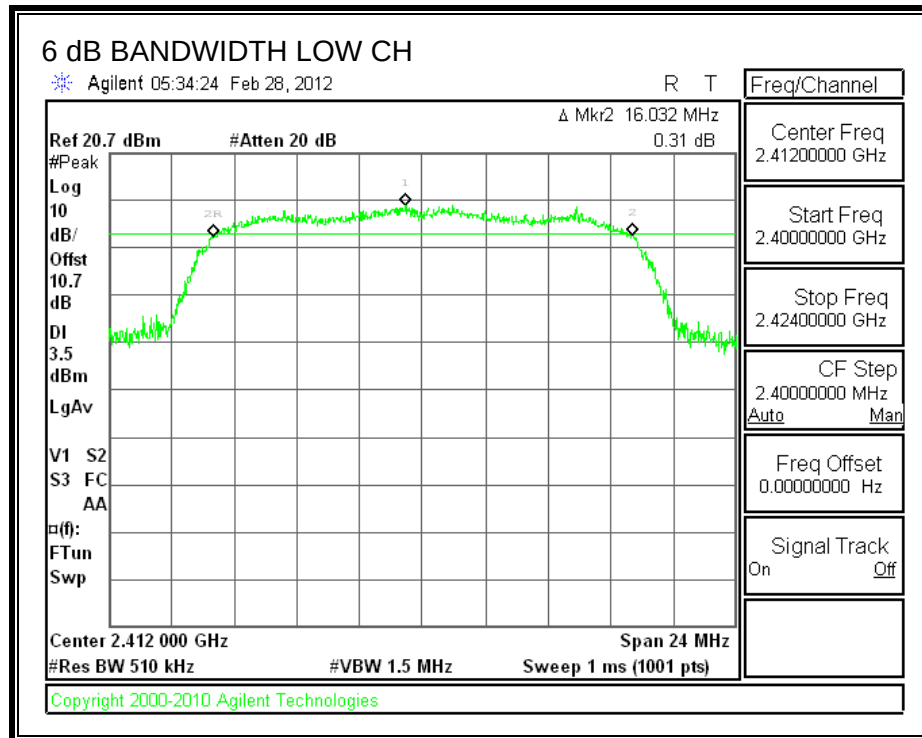
The minimum 6 dB bandwidth shall be at least 500 kHz.

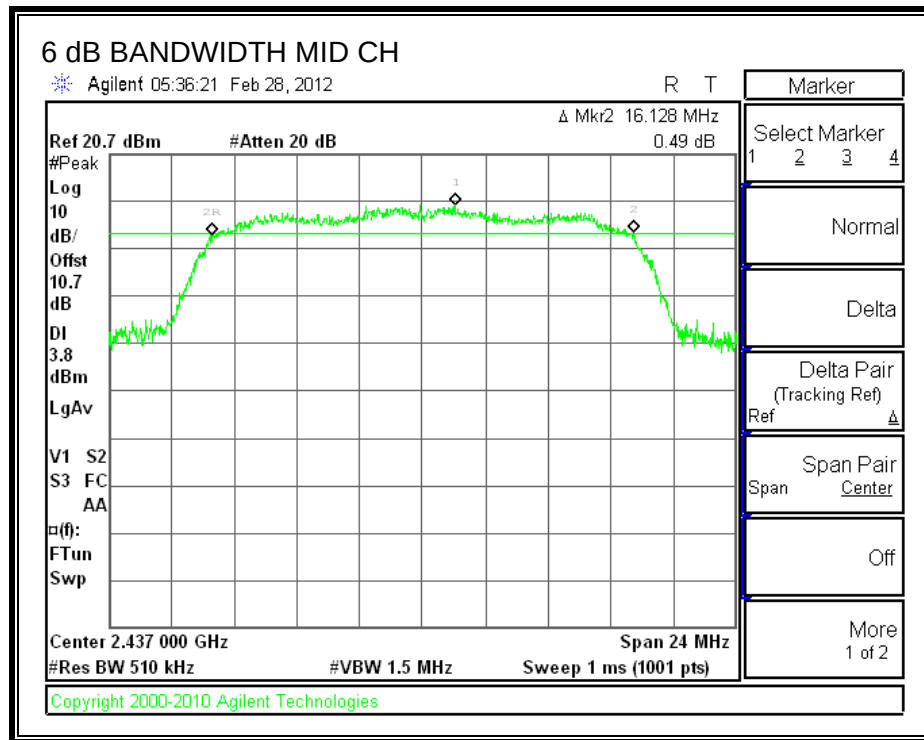
TEST PROCEDURE

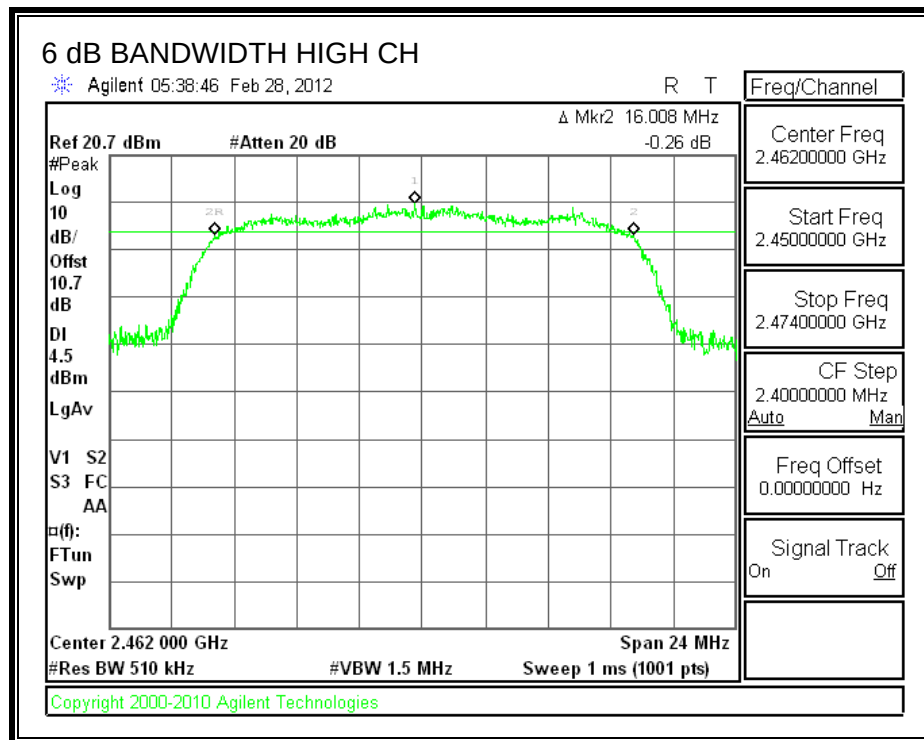
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	16.032	0.5
Middle	2437	16.128	0.5
High	2462	16.008	0.5

6 dB BANDWIDTH





7.2.2. OUTPUT POWER

LIMITS

FCC §15.247 (b)

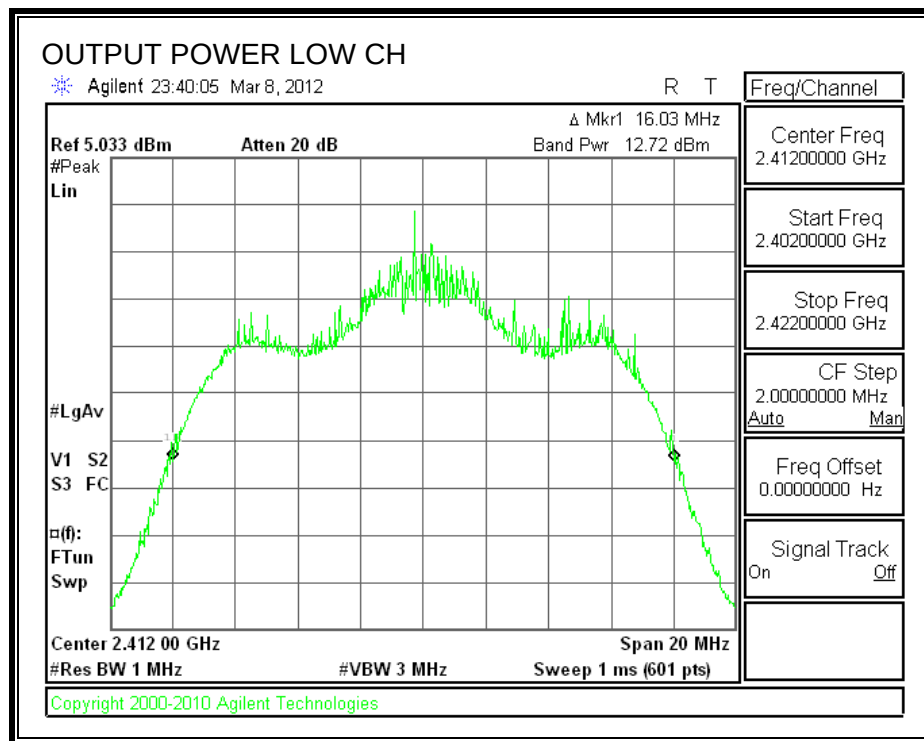
The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

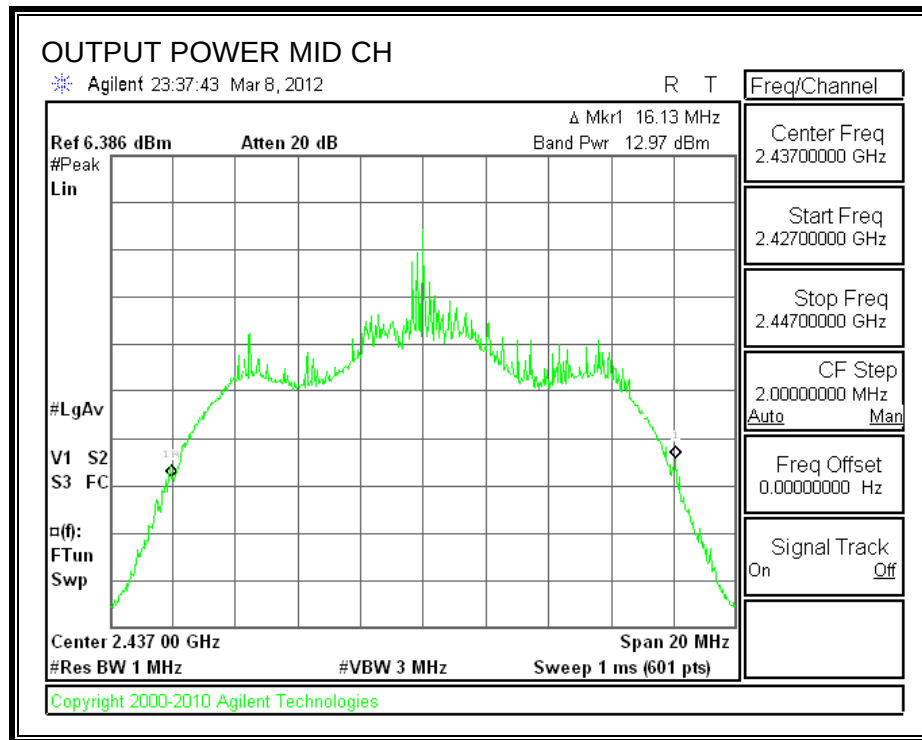
TEST PROCEDURE

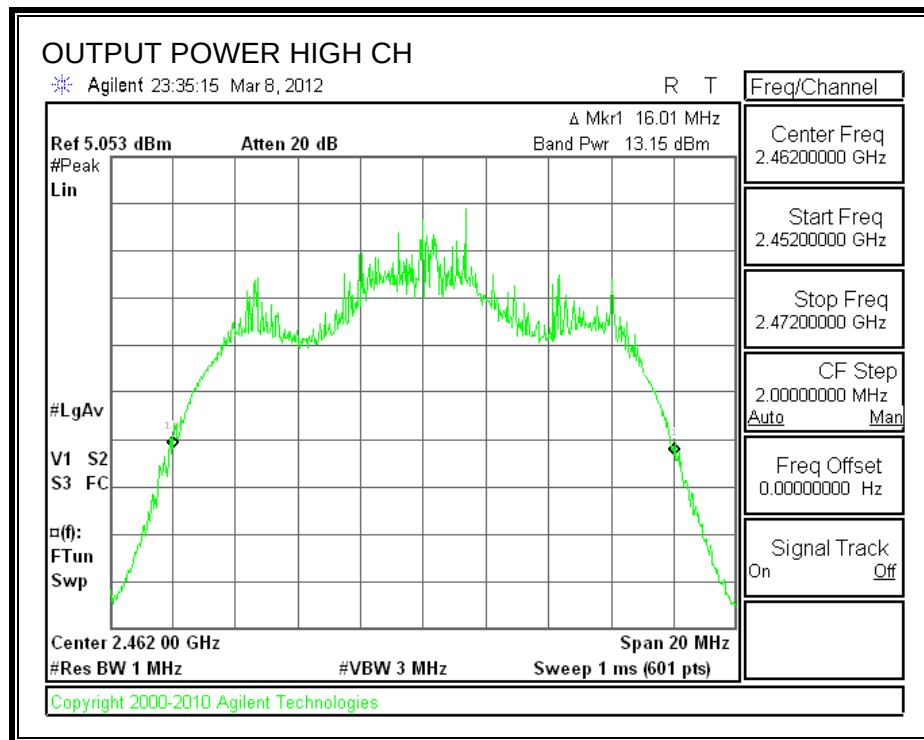
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	12.72	10.7	23.42	30	-6.58
Middle	2437	12.97	10.7	23.67	30	-6.33
High	2462	13.15	10.7	23.85	30	-6.15

OUTPUT POWER





7.2.3. 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 10.7 dB (including 10 dB pad and 0.7dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	2412	14.13
Middle	2437	14.30
High	2462	14.60

7.2.4. POWER SPECTRAL DENSITY

LIMITS

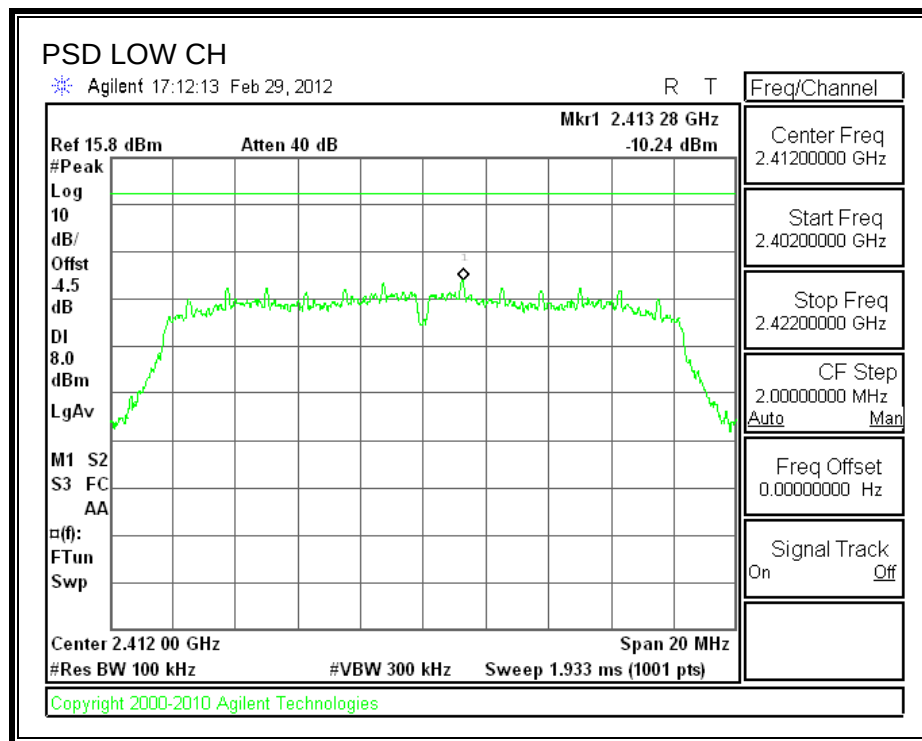
FCC §15.247 (e)

TEST PROCEDURE

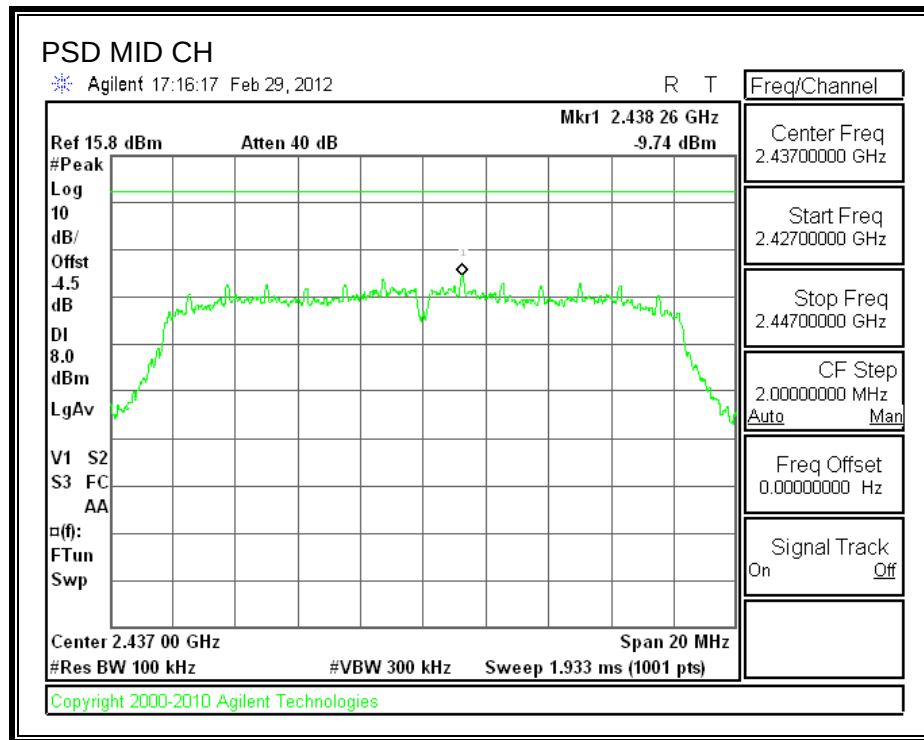
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

RESULTS

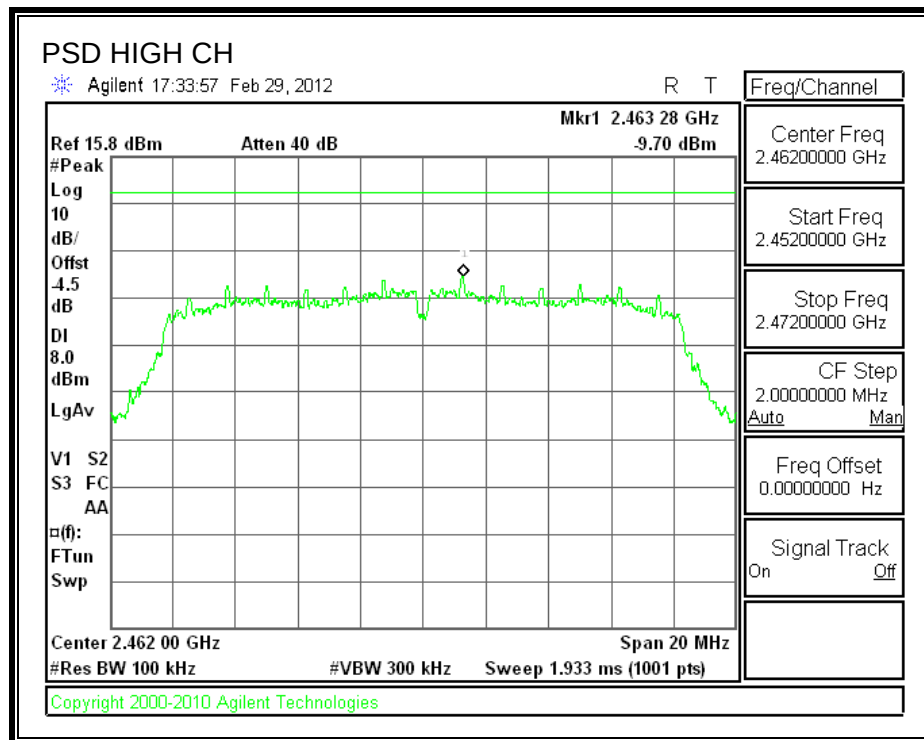
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-10.24	8	-18.24
Middle	2437	-9.74	8	-17.74
High	2462	-9.70	8	-17.70

POWER SPECTRAL DENSITY

Note: Offset = Attenuator + cable loss + $10\log(3\text{kHz}/100\text{kHz})$
 $= 10 + 0.7 + (-15.2)$
 $= -4.5\text{dB}$



Note: Offset = Attenuator + cable loss + $10\log(3\text{kHz}/100\text{kHz})$
 $= 10 + 0.7 + (-15.2)$
 $= -4.5\text{dB}$



Note: Offset = Attenuator + cable loss + $10\log(3\text{kHz}/100\text{kHz})$
 $= 10 + 0.7 + (-15.2)$
 $= -4.5\text{dB}$

7.2.5. CONDUCTED SPURIOUS EMISSIONS

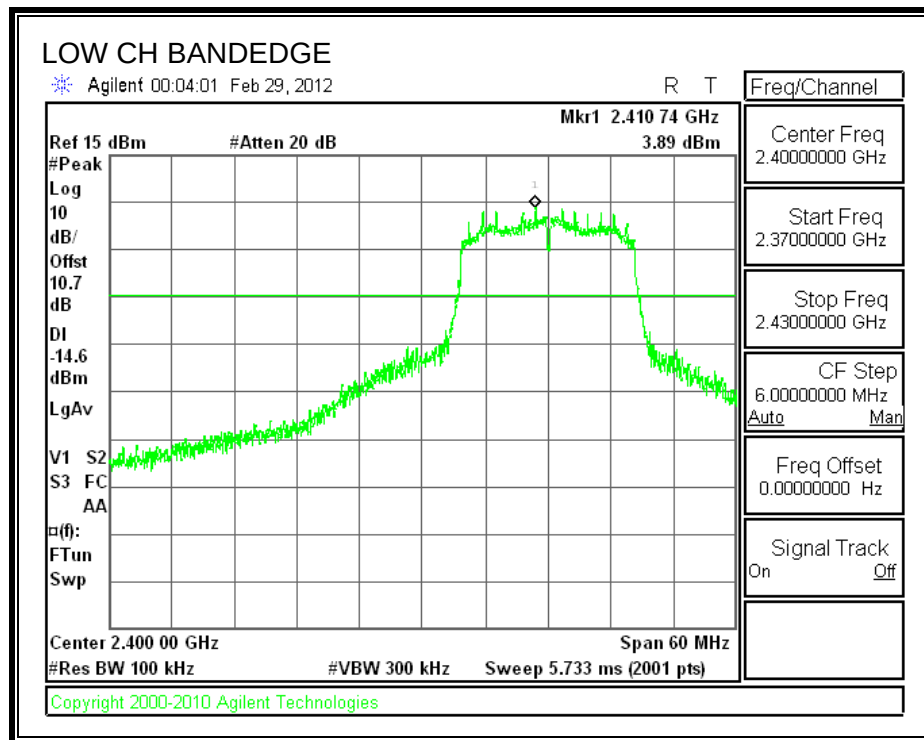
LIMITS

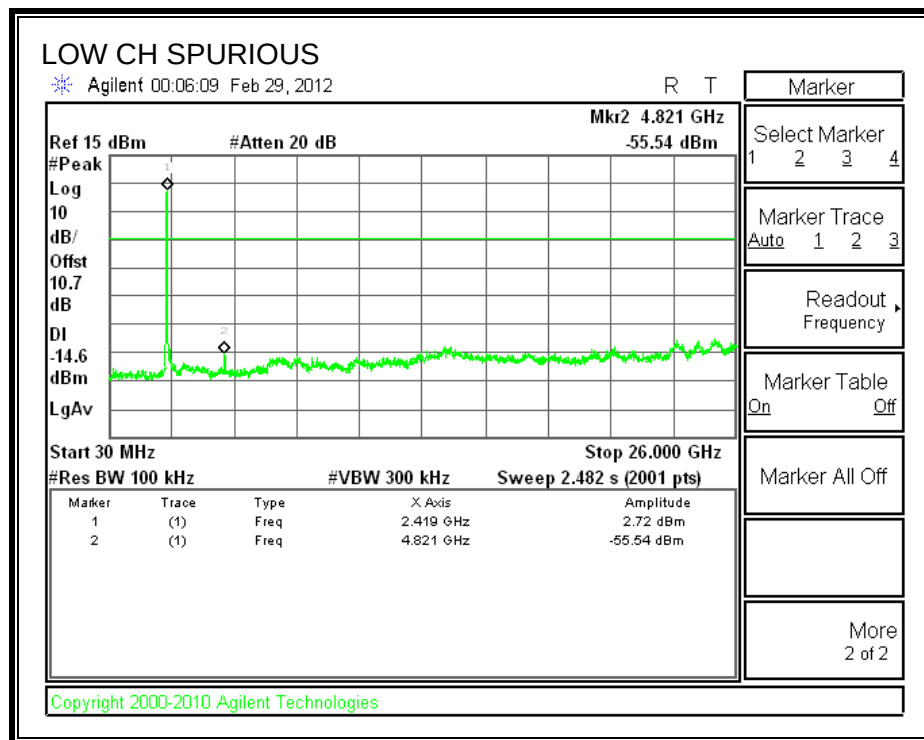
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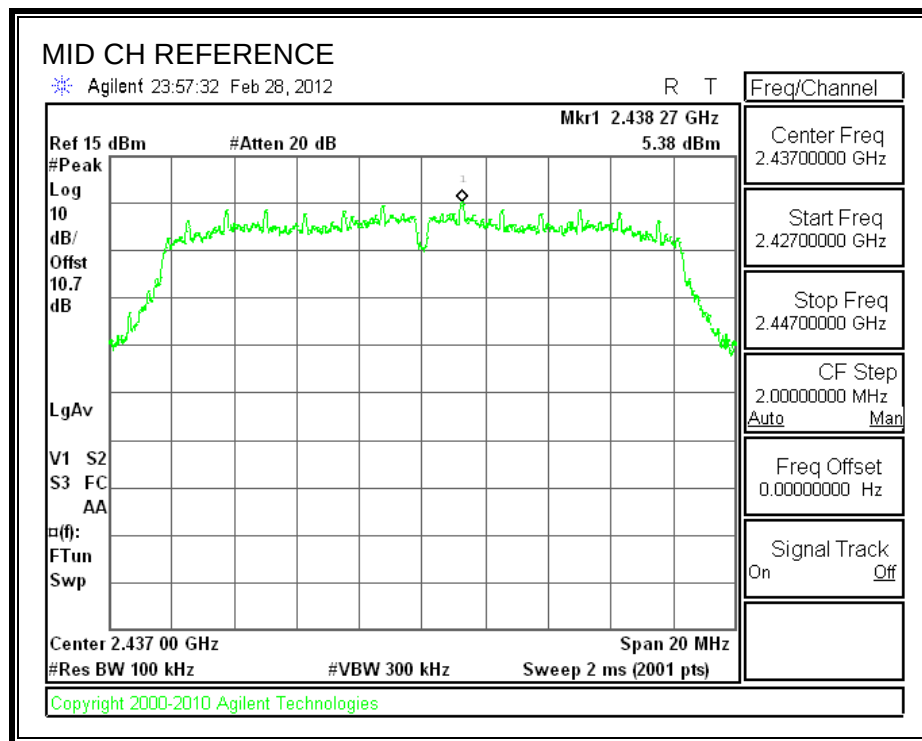
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

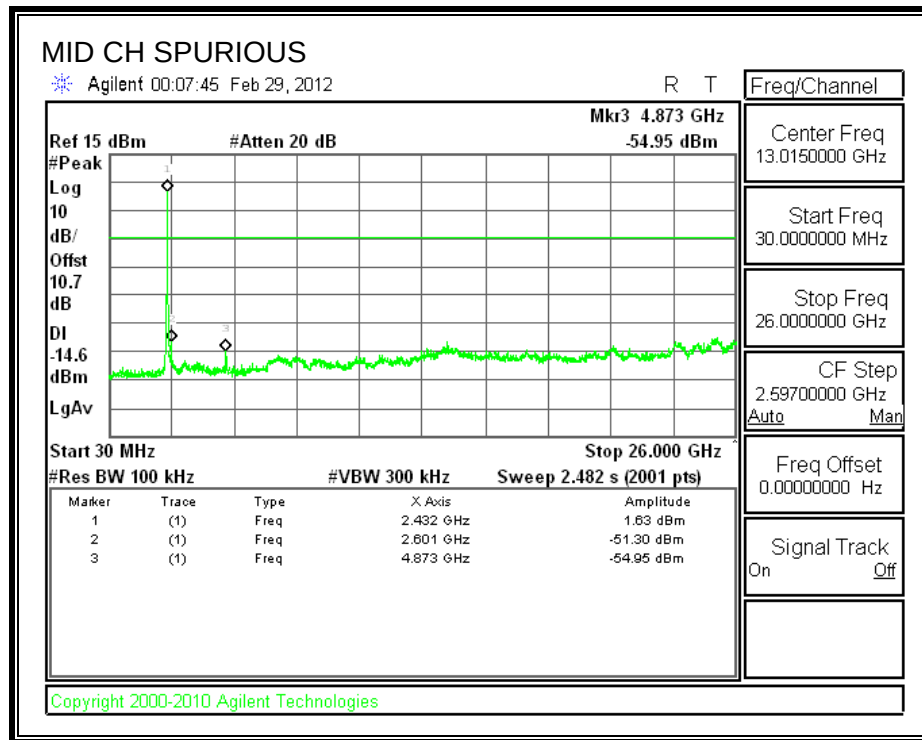
TEST PROCEDURE

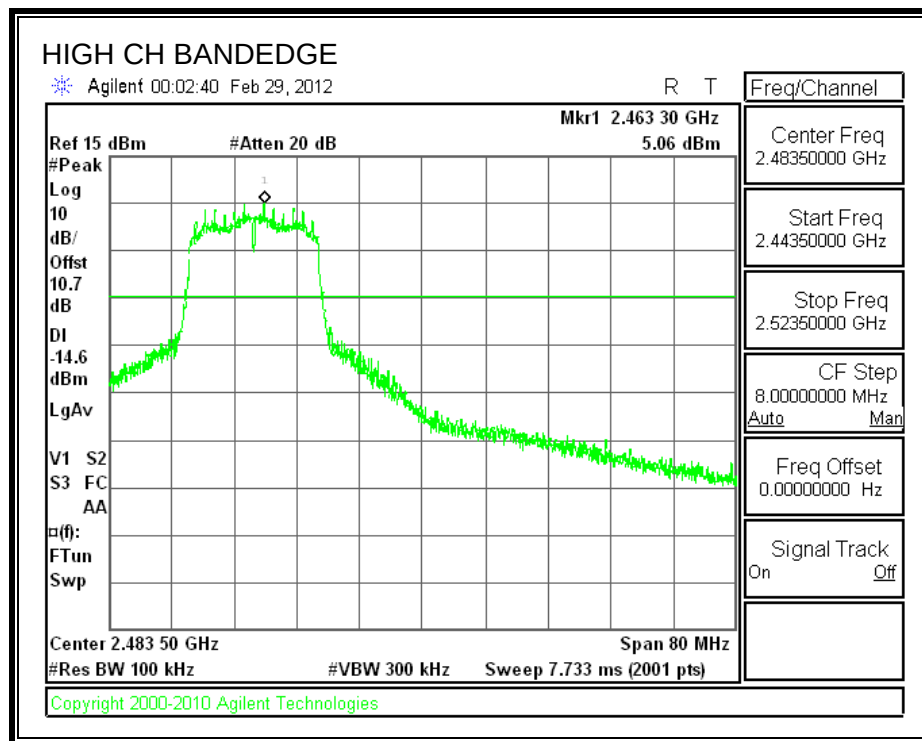
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

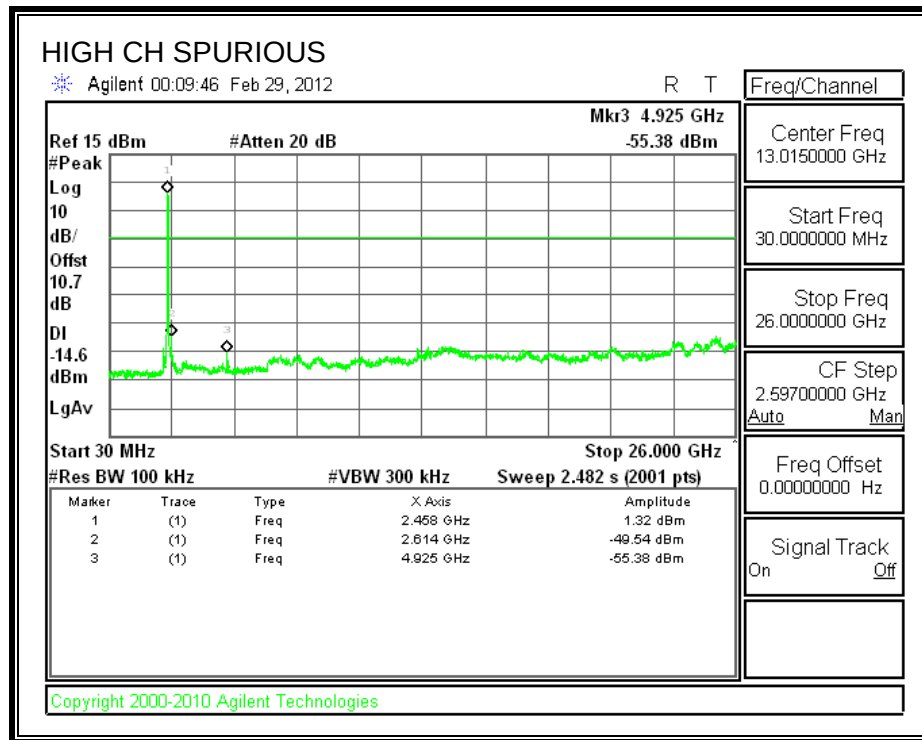
RESULTS**SPURIOUS EMISSIONS, LOW CHANNEL**



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



7.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

7.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

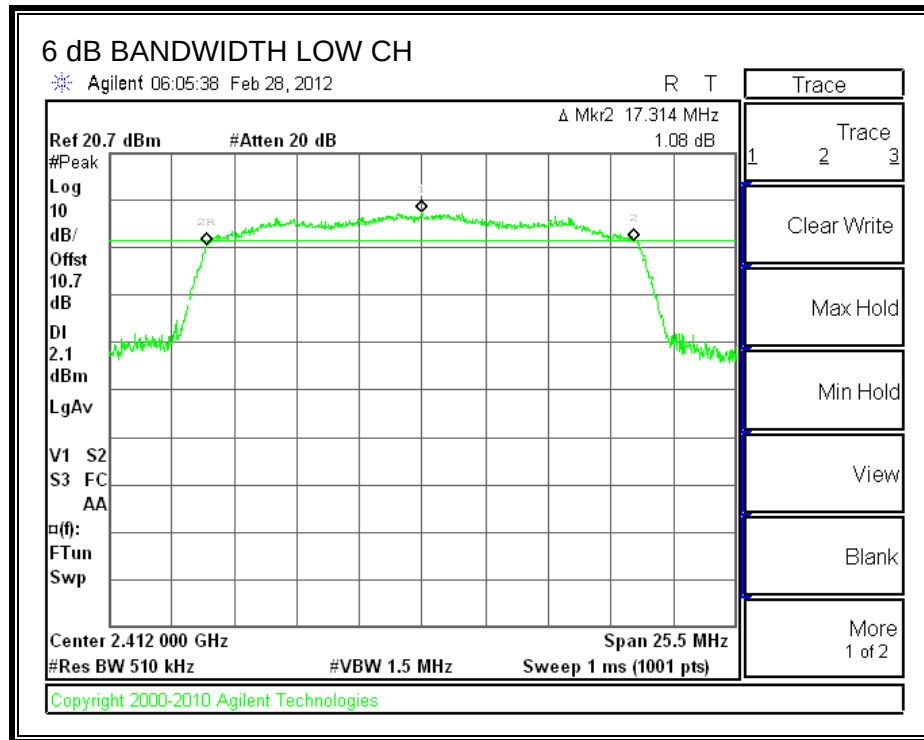
The minimum 6 dB bandwidth shall be at least 500 kHz.

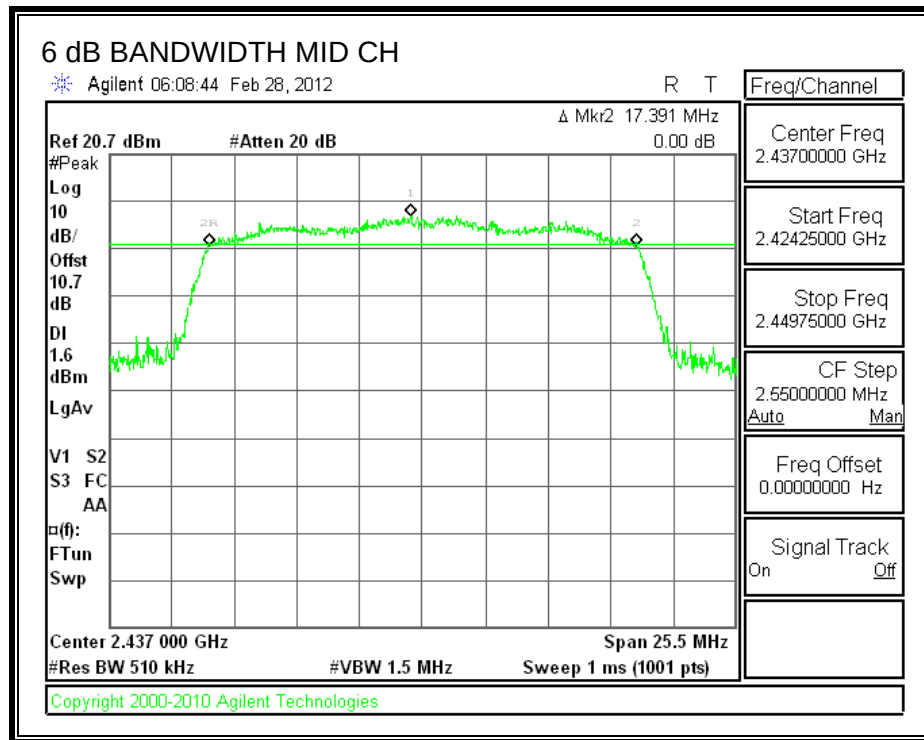
TEST PROCEDURE

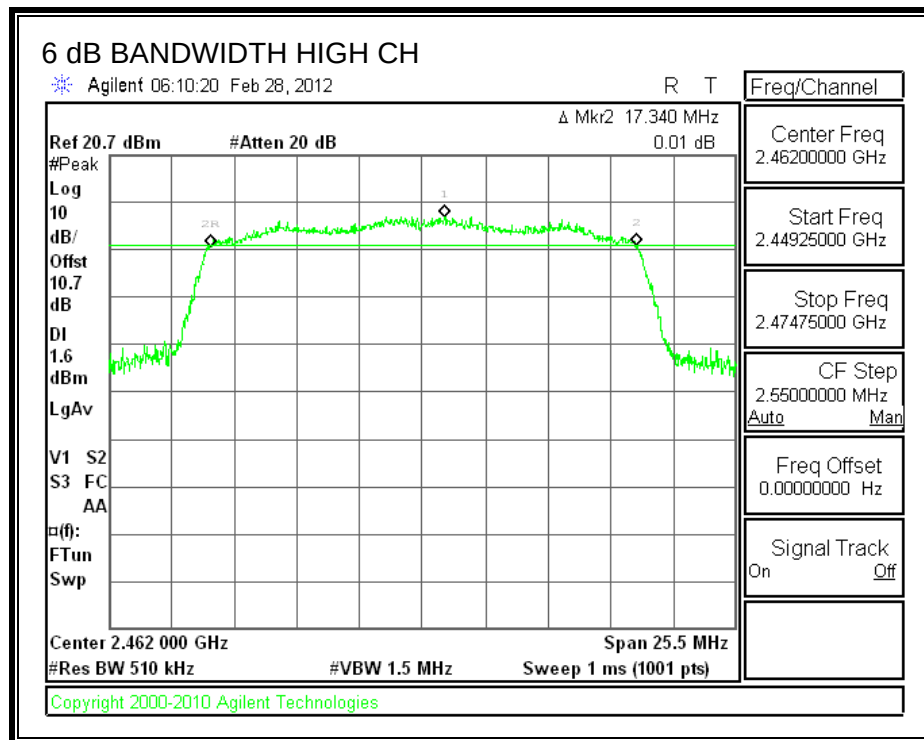
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	17.314	0.5
Middle	2437	17.391	0.5
High	2462	17.340	0.5

6 dB BANDWIDTH





7.3.2. OUTPUT POWER

LIMITS

FCC §15.247 (b)

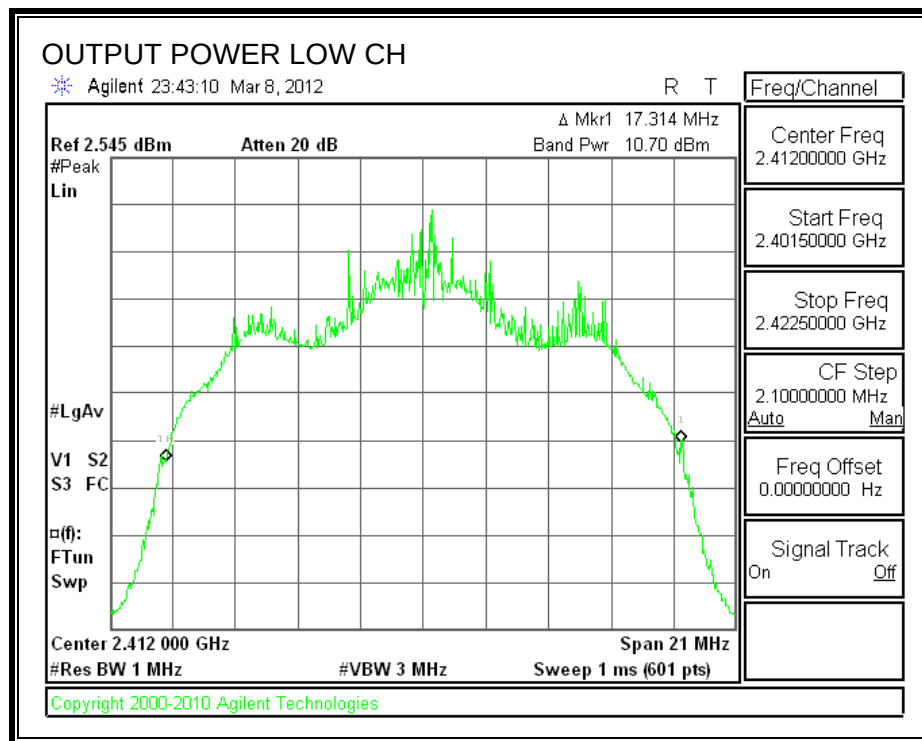
The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

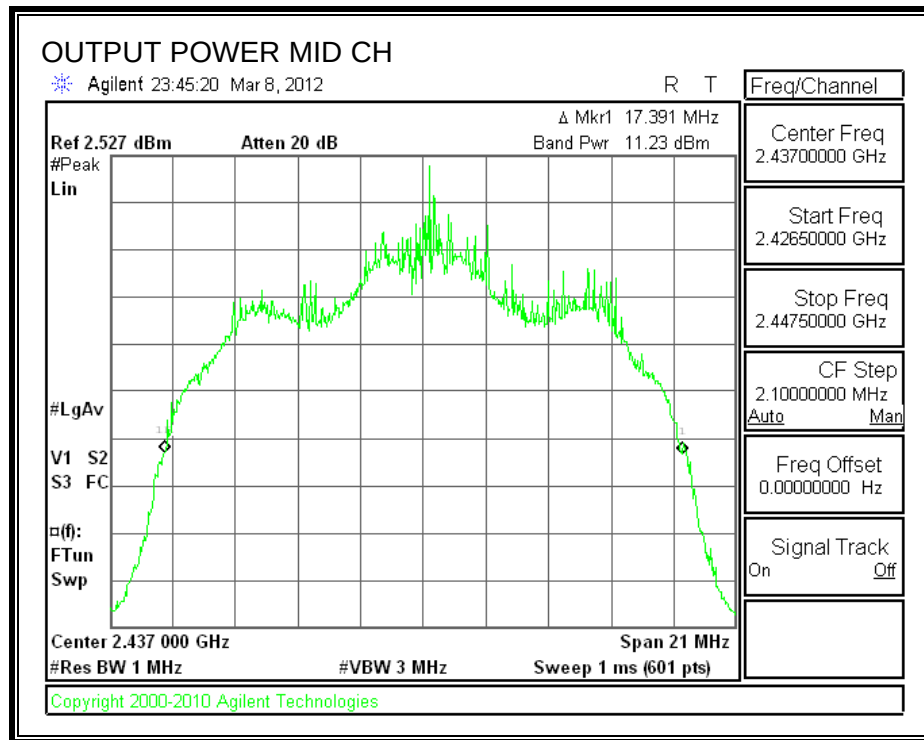
TEST PROCEDURE

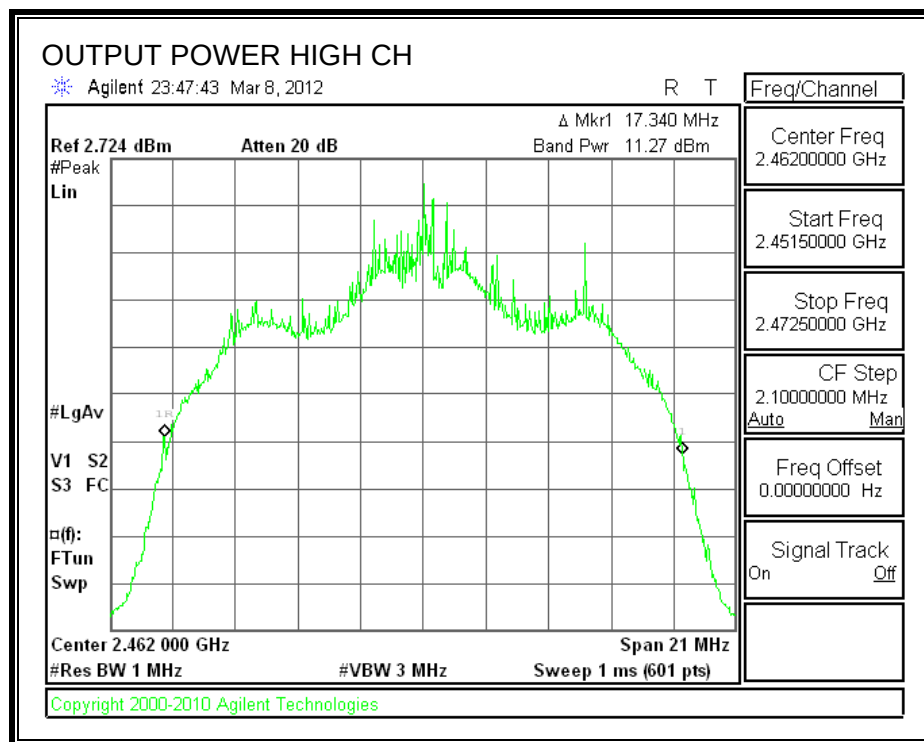
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

RESULTS

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	10.70	10.7	21.40	30	-8.60
Middle	2437	11.23	10.7	21.93	30	-8.07
High	2462	11.27	10.7	21.97	30	-8.03

OUTPUT POWER





7.3.3. 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 10.7 dB (including 10 dB pad and 0.7 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	2412	12.06
Middle	2437	12.35
High	2462	12.56

7.3.4. POWER SPECTRAL DENSITY

LIMITS

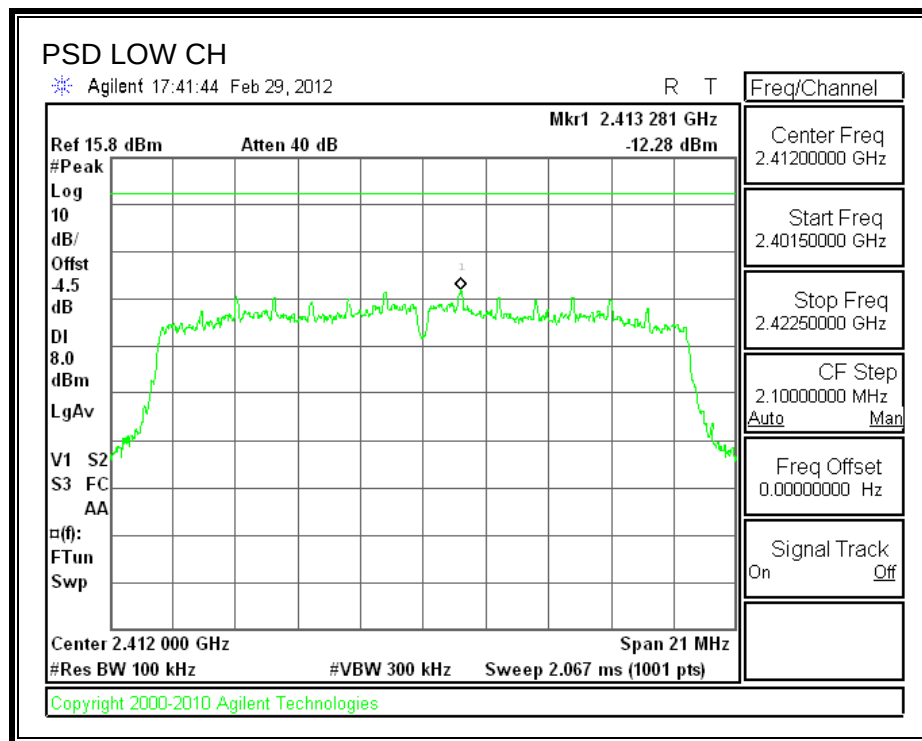
FCC §15.247 (e)

TEST PROCEDURE

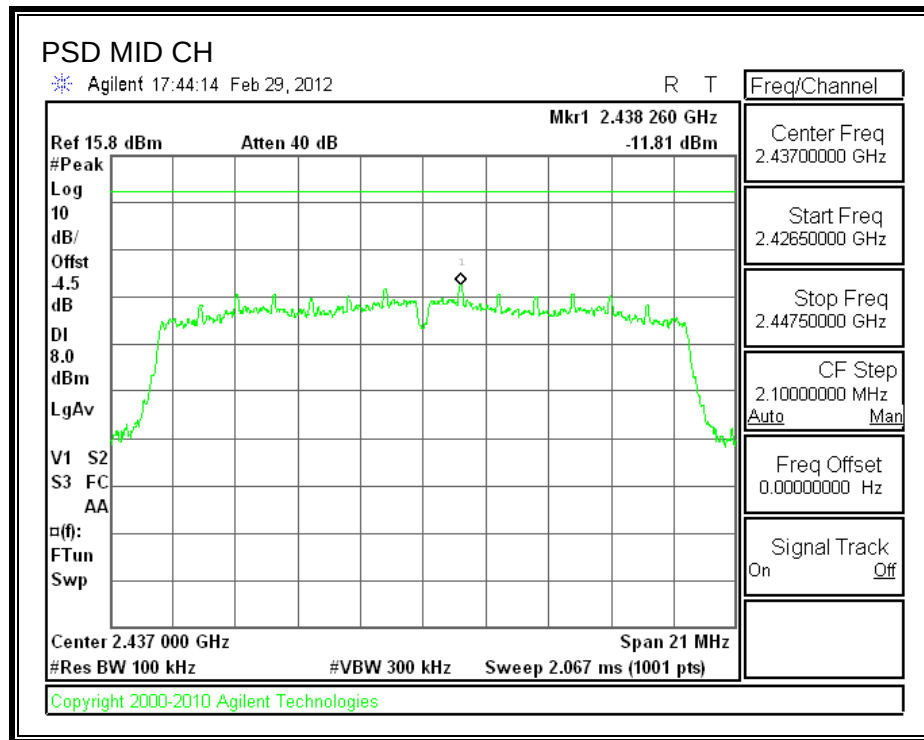
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

RESULTS

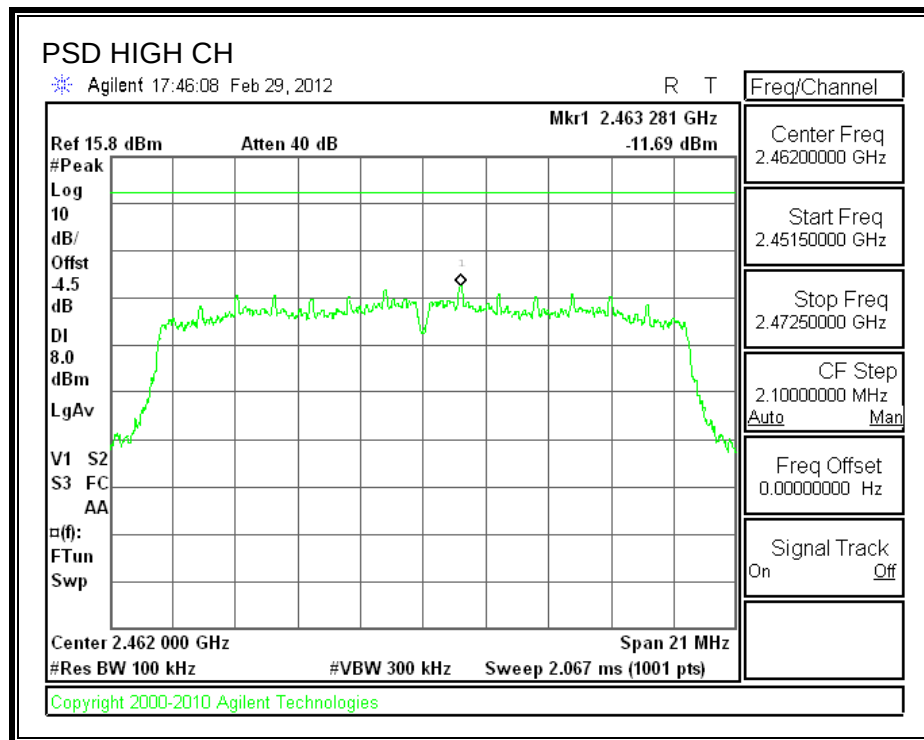
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-12.28	8	-20.28
Middle	2437	-11.81	8	-19.81
High	2462	-11.69	8	-19.69

POWER SPECTRAL DENSITY

Note: Offset = Attenuator + cable loss + $10\log(3\text{kHz}/100\text{kHz})$
 $= 10 + 0.7 + (-15.2)$
 $= -4.5\text{dB}$



Note: Offset = Attenuator + cable loss + $10\log(3\text{kHz}/100\text{kHz})$
 $= 10 + 0.7 + (-15.2)$
 $= -4.5\text{dB}$



Note: Offset = Attenuator + cable loss + $10\log(3\text{kHz}/100\text{kHz})$
 $= 10 + 0.7 + (-15.2)$
 $= -4.5\text{dB}$

7.3.5. CONDUCTED SPURIOUS EMISSIONS

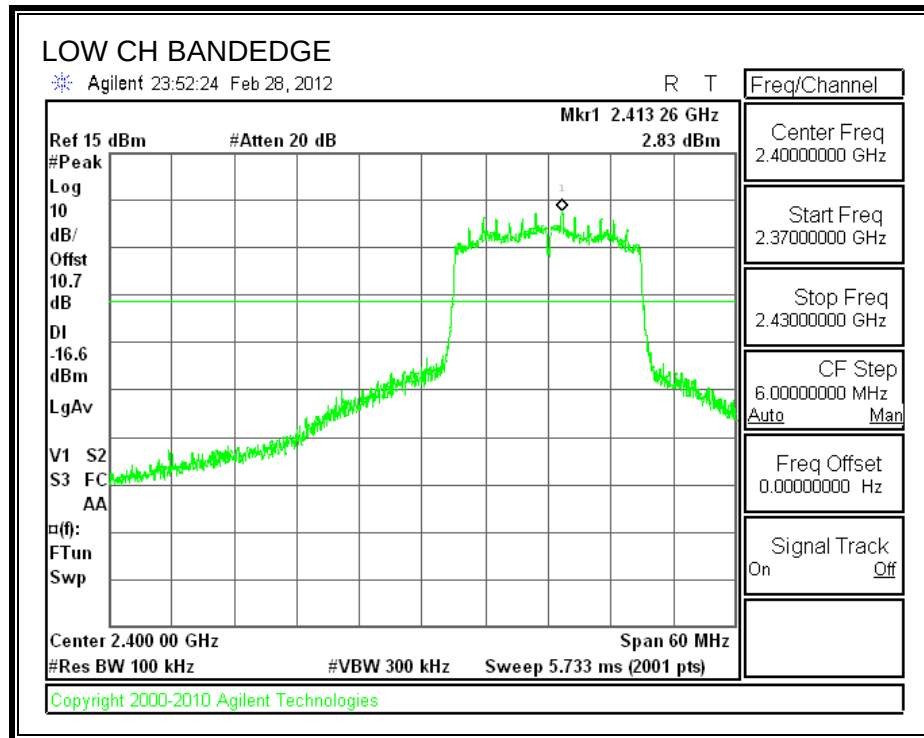
LIMITS

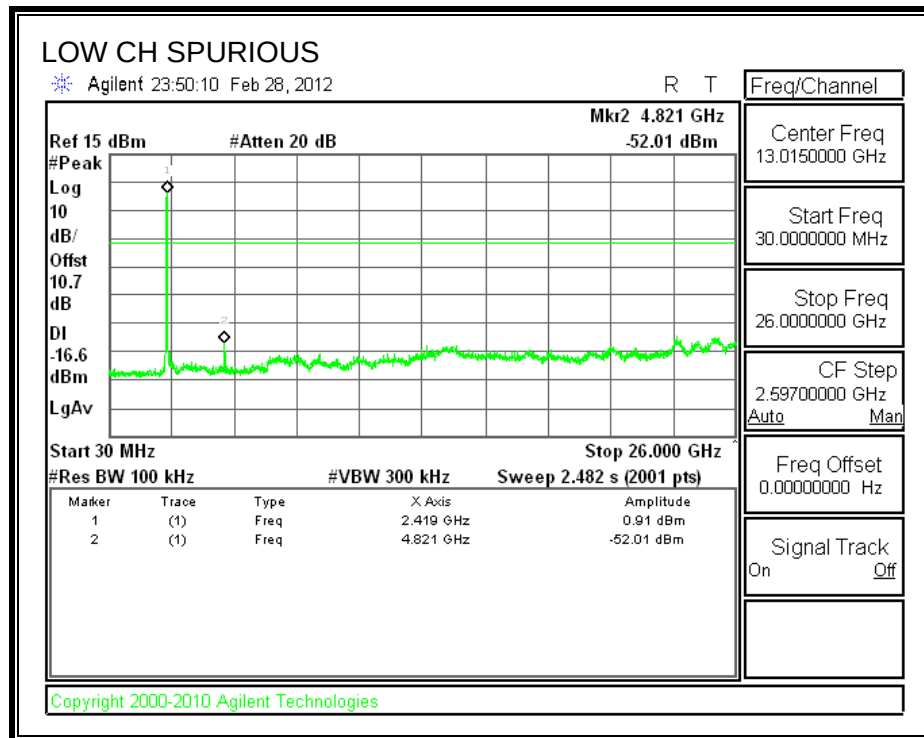
FCC §15.247 (d)

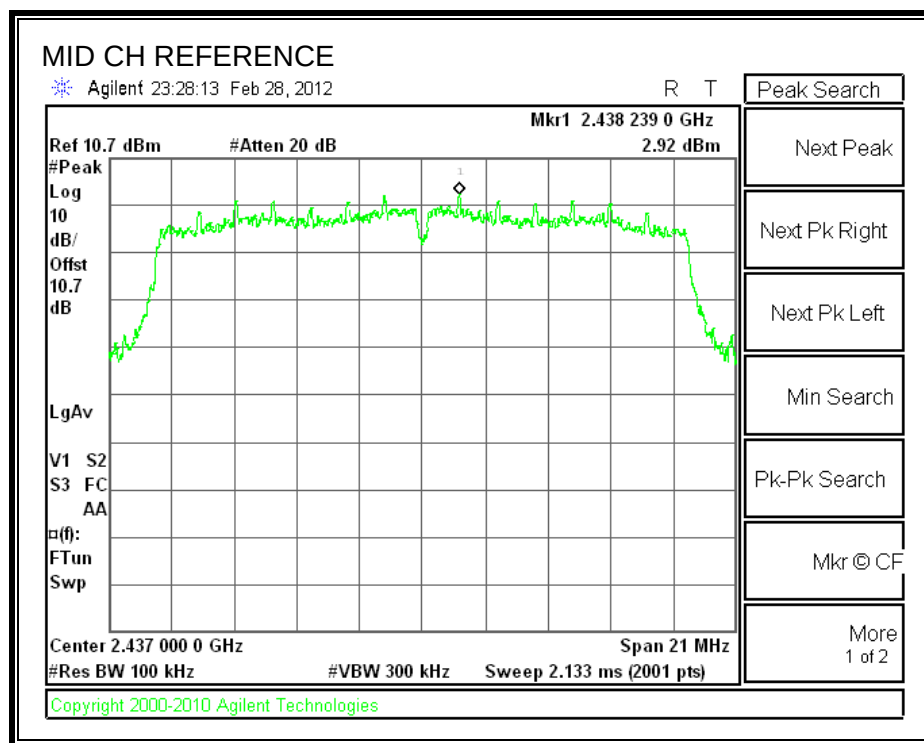
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

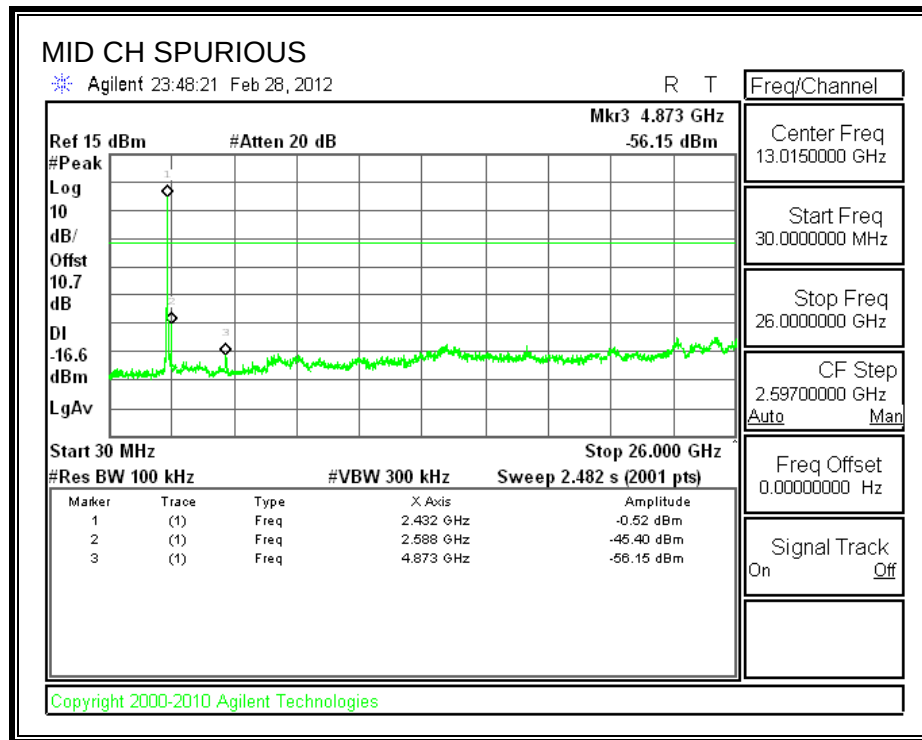
TEST PROCEDURE

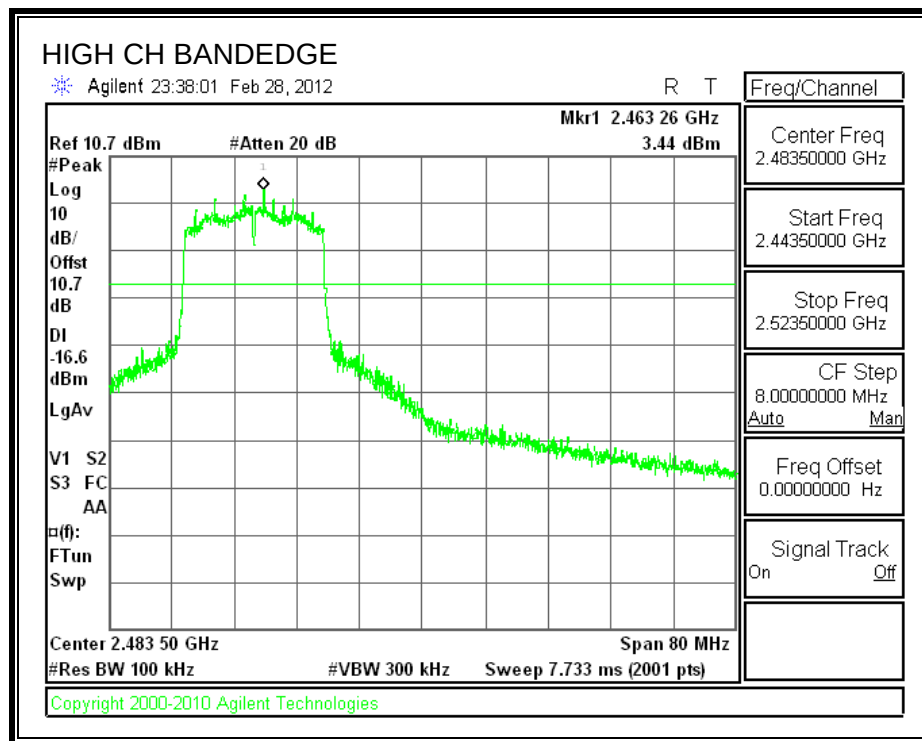
KDB 558074 D01 DTS Measurement Guidance V01 dated 01-18-12.

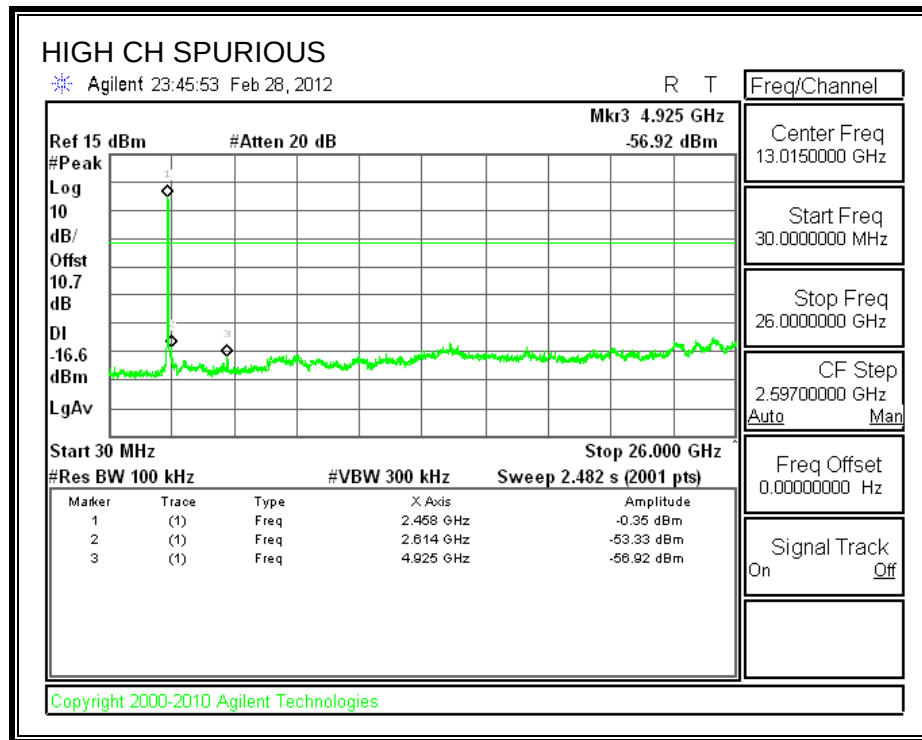
RESULTS**SPURIOUS EMISSIONS, LOW CHANNEL**



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

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

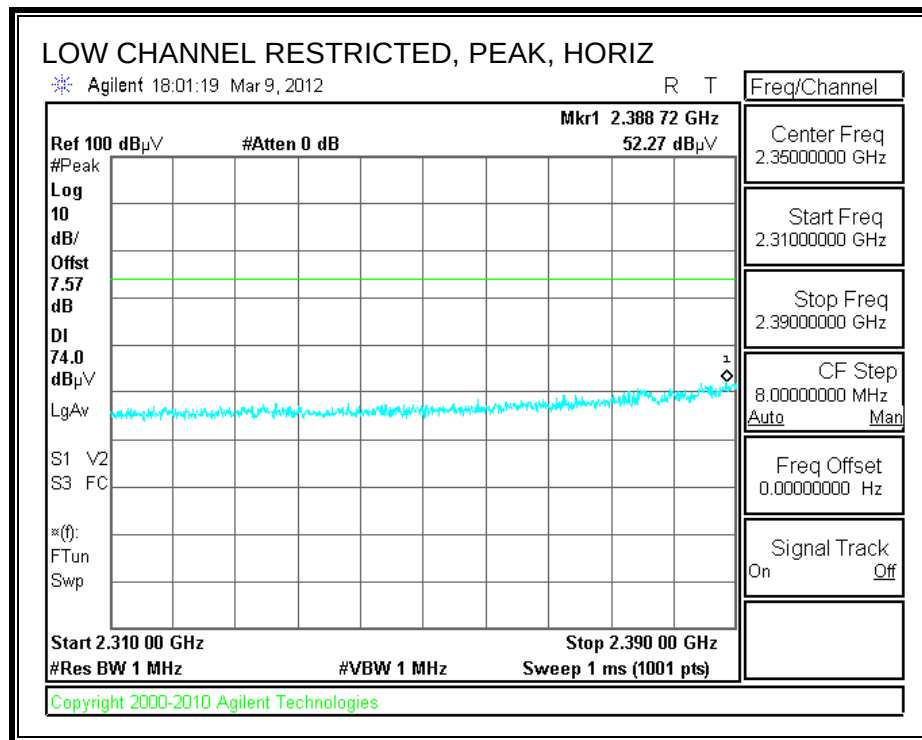
The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

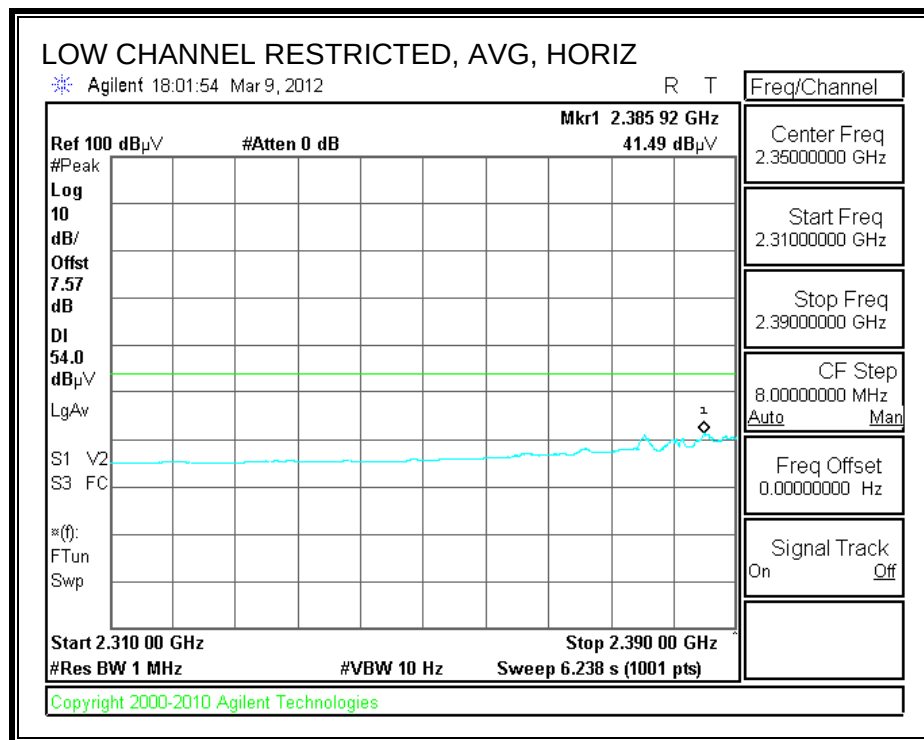
For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

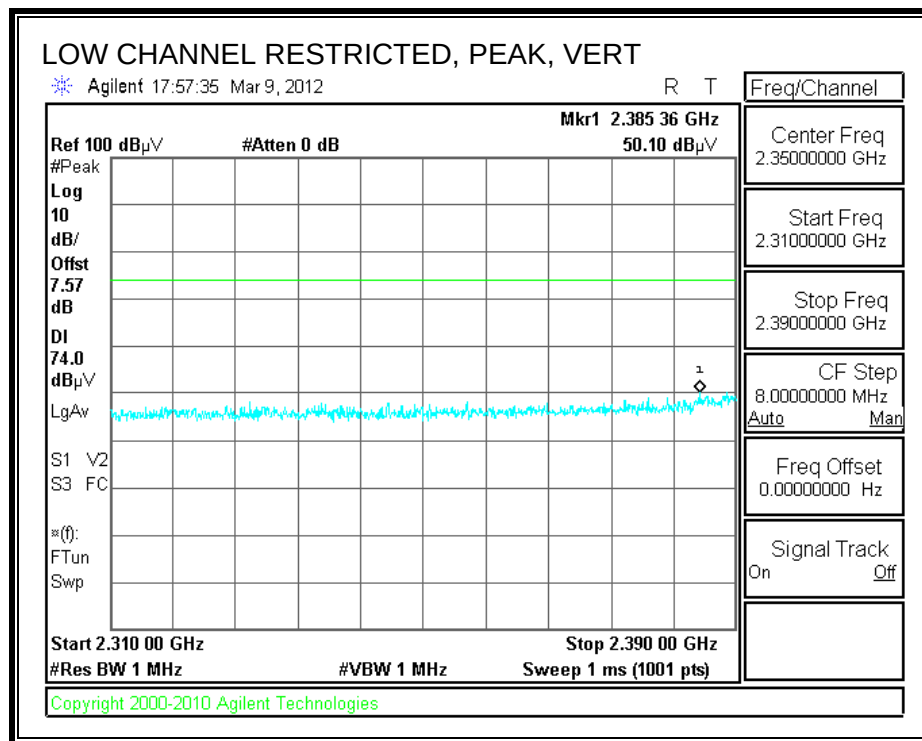
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

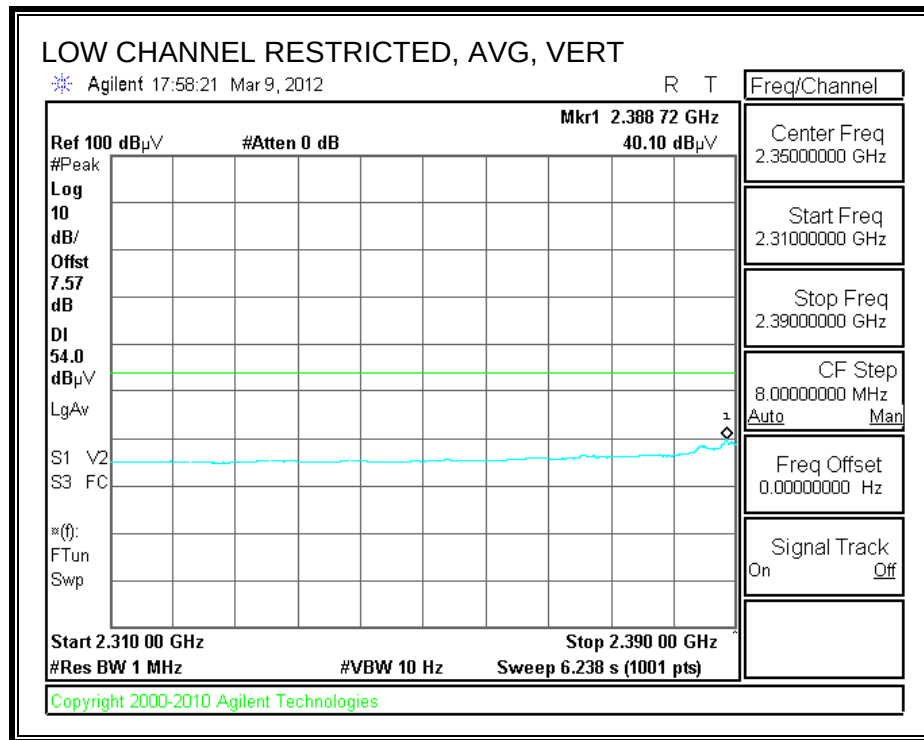
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

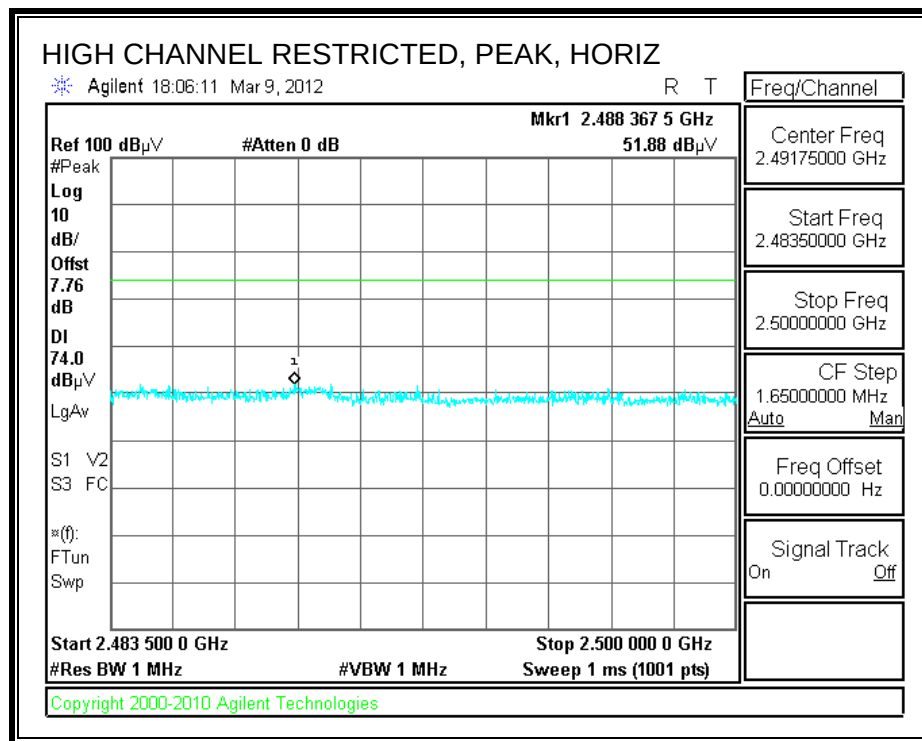
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

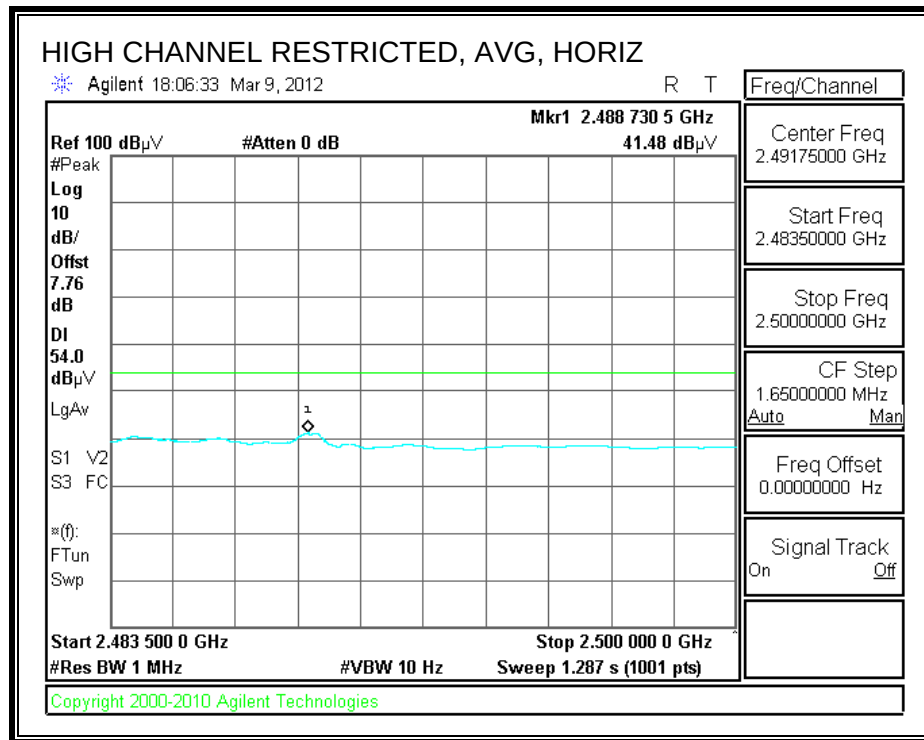
8.2. TRANSMITTER ABOVE 1 GHz**8.2.1. TX ABOVE 1 GHz FOR 802.11b 1TX MODE IN THE 2.4 GHz BAND****RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**

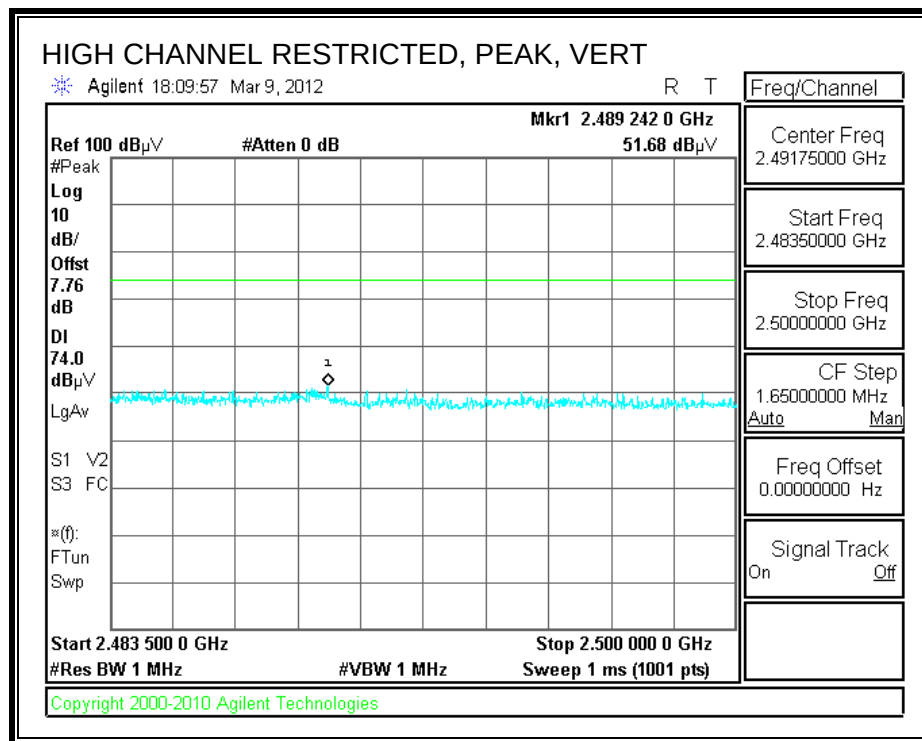


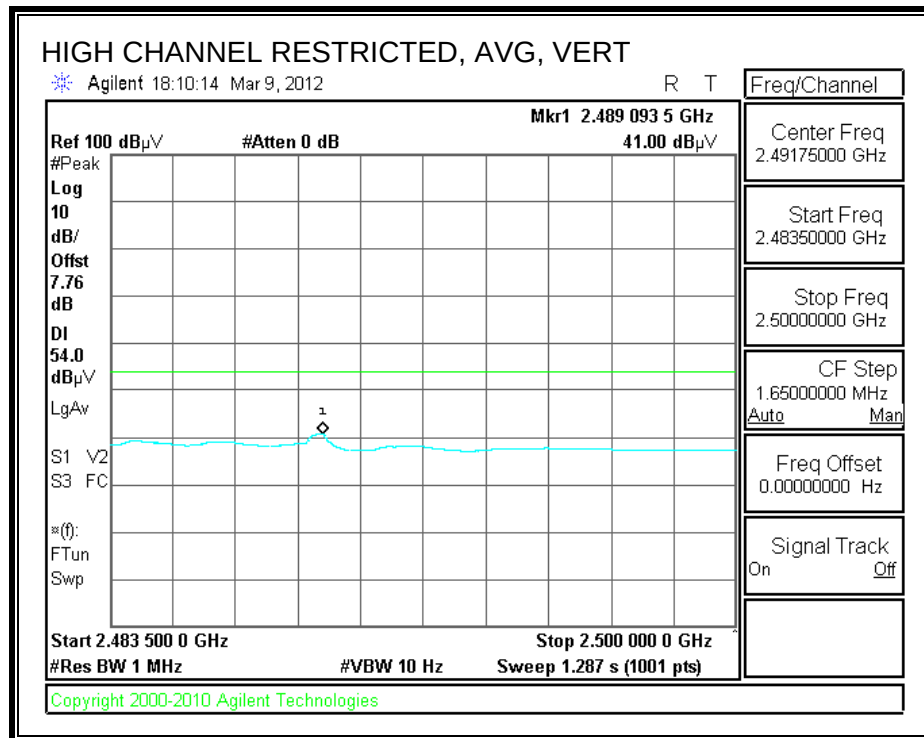
RESTRICTED BANDEGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEGE (HIGH CHANNEL, HORIZONTAL)

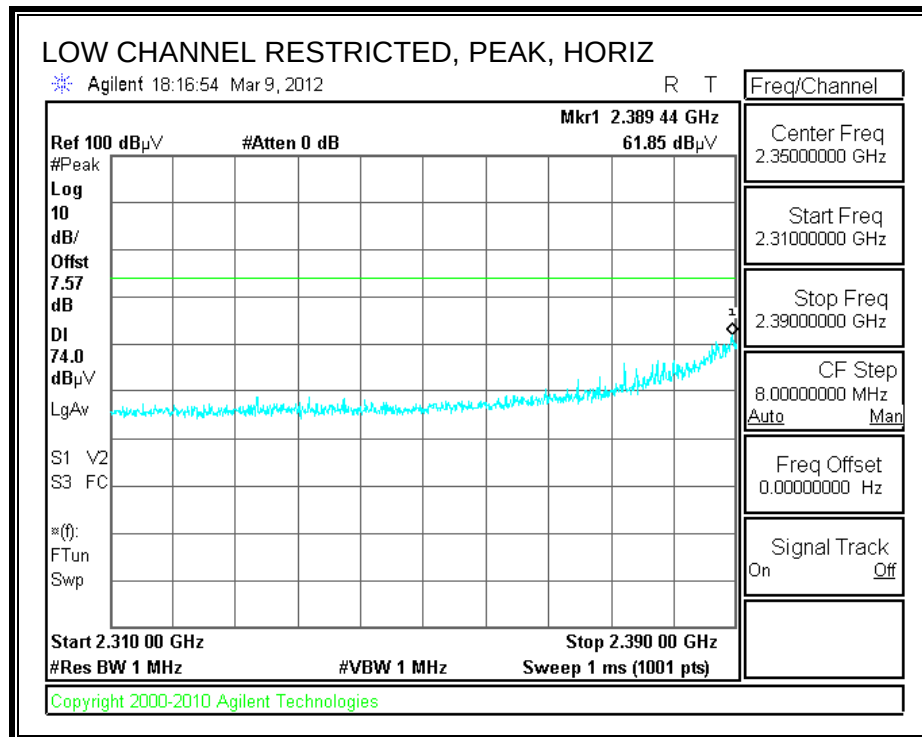


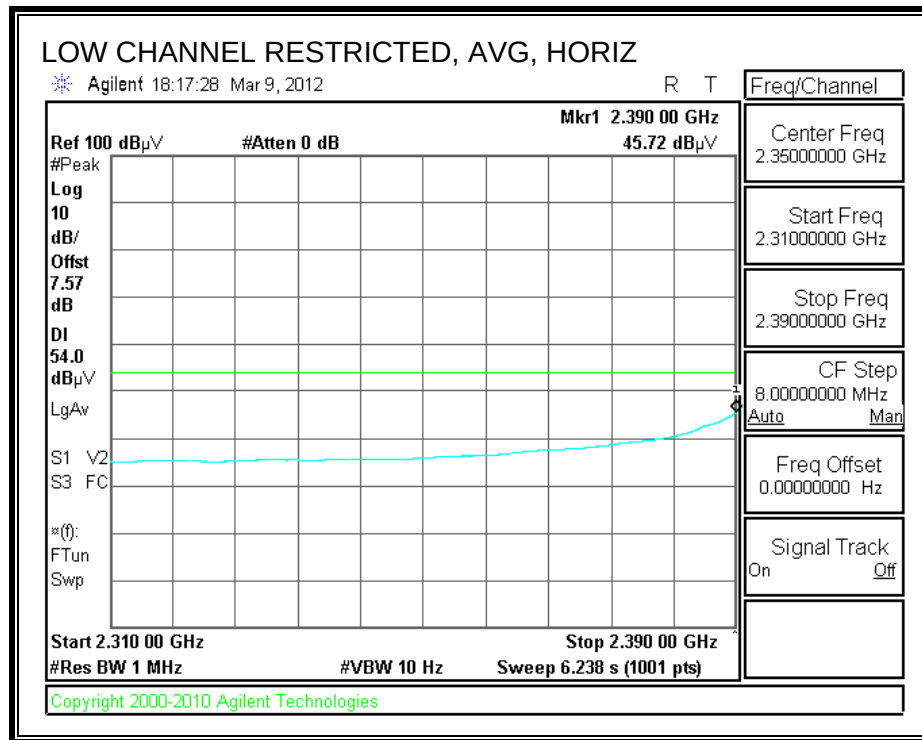
RESTRICTED BANDEGE (HIGH CHANNEL, VERTICAL)

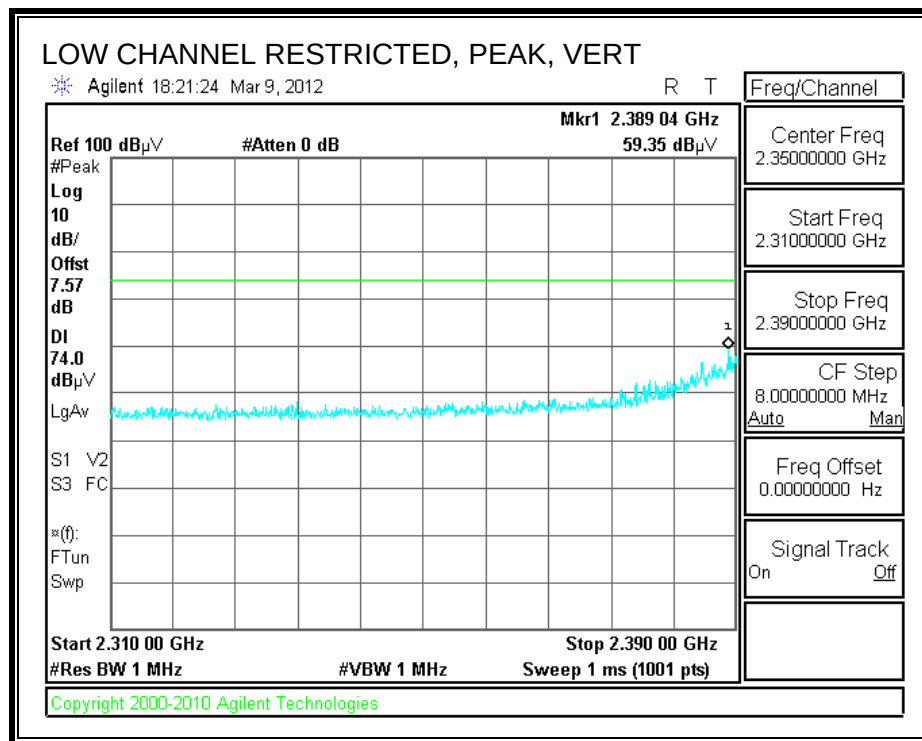


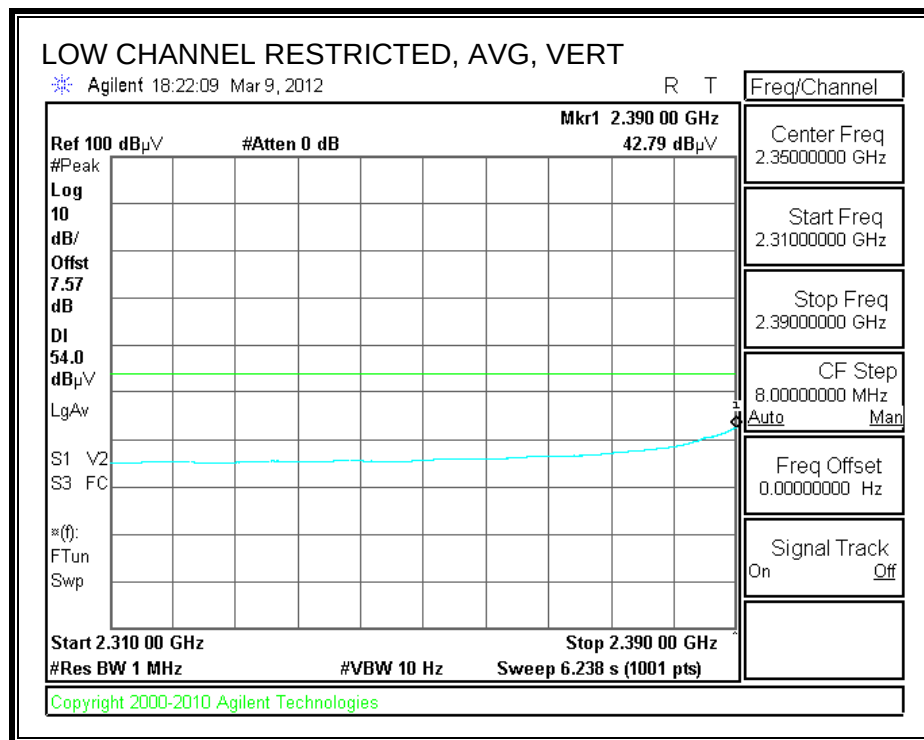
HARMONICS AND SPURIOUS EMISSIONS

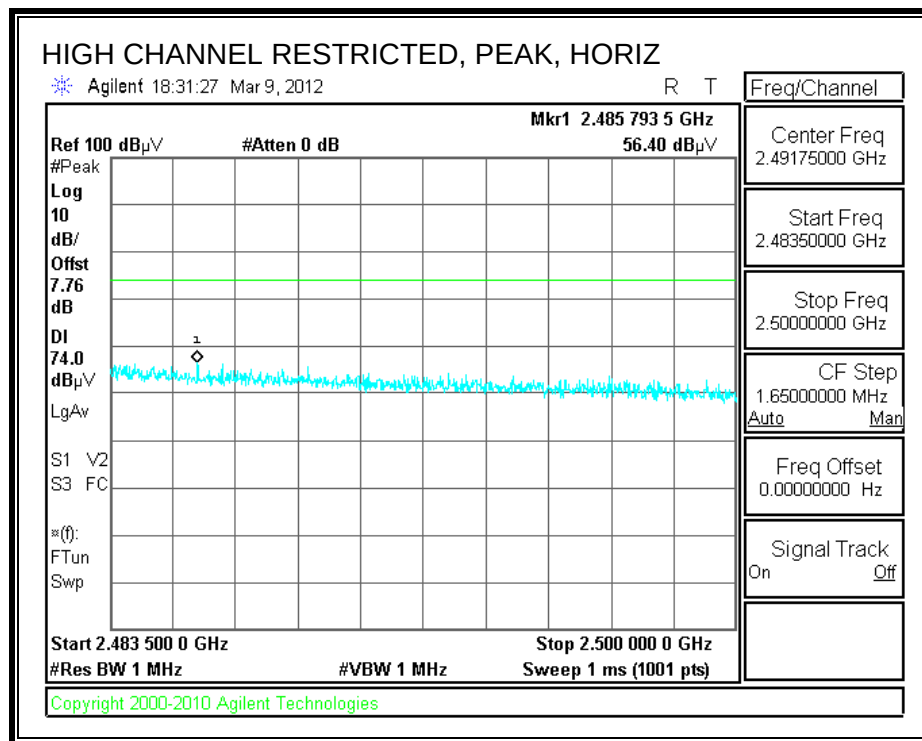
High Frequency Measurement																
Compliance Certification Services, Fremont 5m Chamber-B																
Company:		Samsung Electronics														
Project #:		1214311														
Date:		8/9/2012														
Test Engineer:		S.Aguilar														
Configuration:		EUT with headset (Unit GT5300B WIFIRSE)														
Mode:		TX, B mode														
Test Equipment:																
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit				
T59; S/N: 3245 @3m			T145 Agilent 3008A0056						T89; ARA 18-26GHz; S/N:1049			FCC 15.209				
Hi Frequency Cables																
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements	
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_001			RBW= 1MHz, VBW=3MHz	
															Average Measurements	
															RBW=1MHz ; VBW=10Hz	
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)	
Low Channel (2412 MHz)																
4.824	3.0	41.5	33.3	33.2	6.3	-34.8	0.0	0.0	46.2	37.9	74	54	-27.8	-16.1	H	
4.824	3.0	39.7	32.3	33.2	6.3	-34.8	0.0	0.0	44.3	36.9	74	54	-29.7	-17.1	V	
7.236	3.0	41.5	33.2	36.1	8.5	-34.9	0.0	0.0	51.2	42.8	74	54	-22.8	-11.2	H	
7.236	3.0	40.2	31.6	36.1	8.5	-34.9	0.0	0.0	49.8	41.2	74	54	-24.2	-12.8	V	
Mid Channel (2437 MHz)																
4.873	3.0	44.3	39.4	33.2	6.3	-34.8	0.0	0.0	49.0	44.1	74	54	-25.0	-9.9	H	
4.873	3.0	43.4	38.8	33.2	6.3	-34.8	0.0	0.0	48.1	43.5	74	54	-25.9	-10.5	V	
7.311	3.0	41.8	34.3	36.2	8.5	-34.9	0.0	0.0	51.6	44.0	74	54	-22.4	-10.0	H	
7.311	3.0	42.8	33.8	36.2	8.5	-34.9	0.0	0.0	52.5	43.6	74	54	-21.5	-10.4	V	
High Channel (2462 MHz)																
4.924	3.0	42.4	36.2	33.3	6.3	-34.8	0.0	0.0	47.3	41.1	74	54	-26.7	-12.9	H	
4.924	3.0	42.0	36.6	33.3	6.3	-34.8	0.0	0.0	46.8	41.4	74	54	-27.2	-12.6	V	
7.386	3.0	40.3	31.4	36.3	8.5	-34.9	0.0	0.0	50.2	41.3	74	54	-23.8	-12.7	H	
7.386	3.0	42.3	34.7	36.3	8.5	-34.9	0.0	0.0	52.2	44.5	74	54	-21.8	-9.5	V	
Rev. 07.08.11																
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit			
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit			
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit			
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit			
CL	Cable Loss					HPF	High Pass Filter									

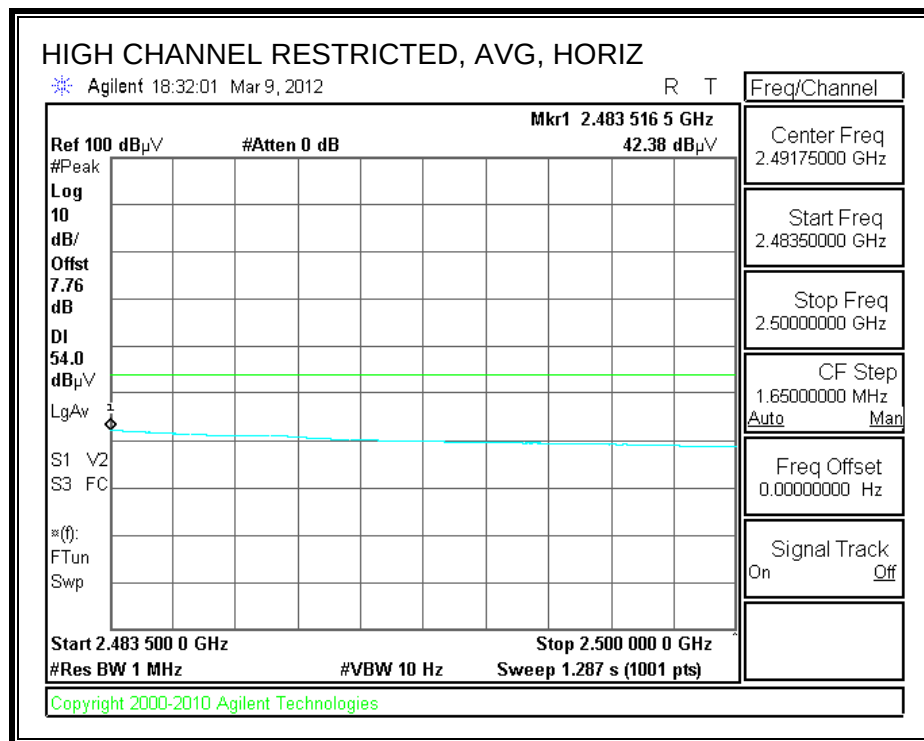
8.2.2. TX ABOVE 1 GHz FOR 802.11g 1TX MODE IN THE 2.4 GHz BAND**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**

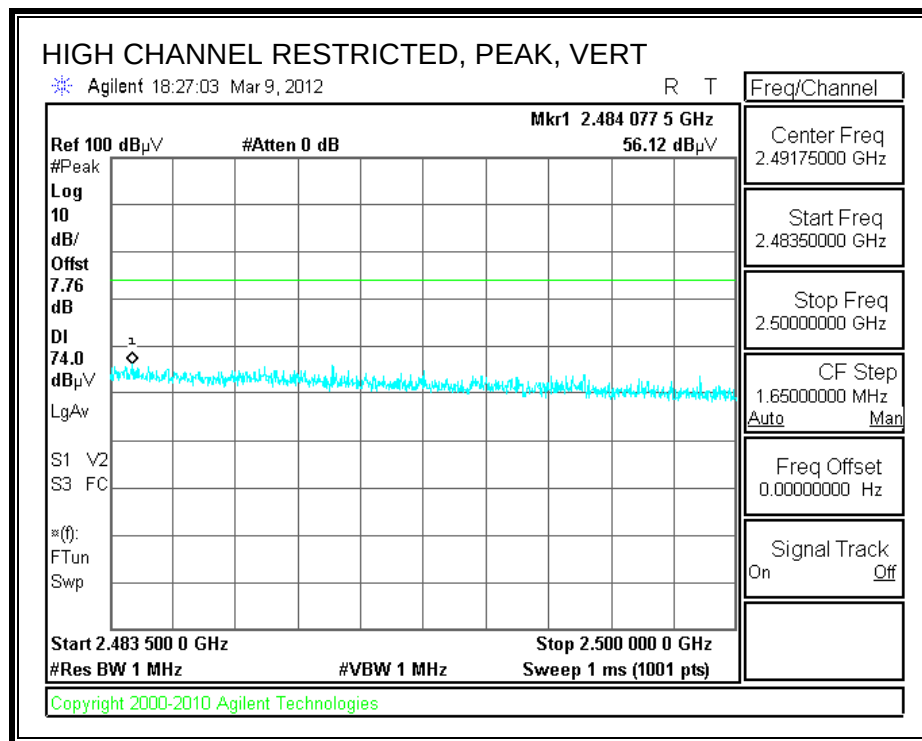


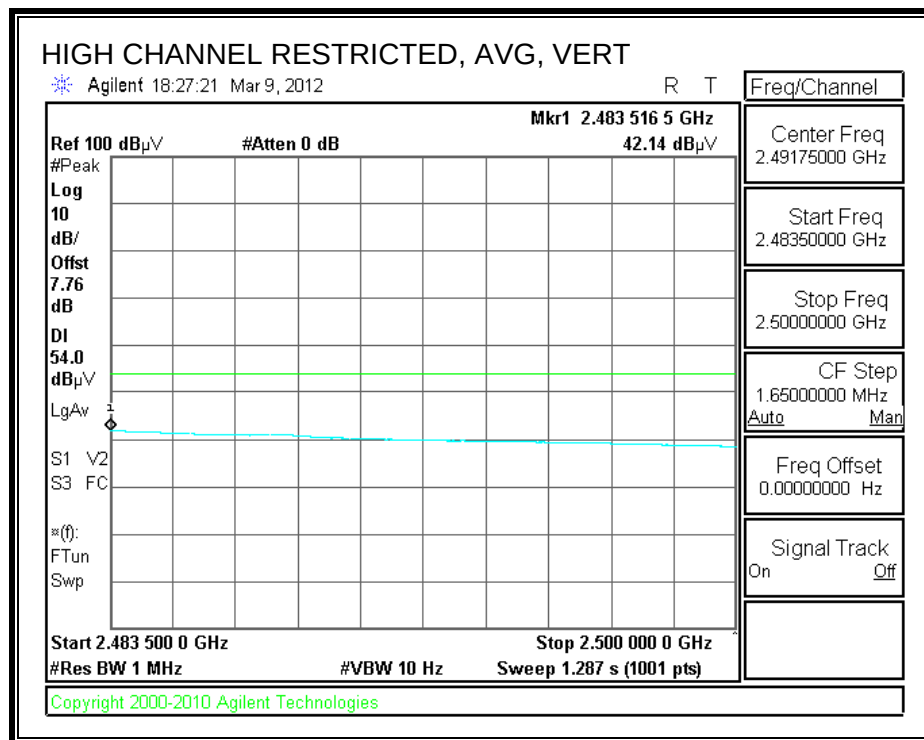
RESTRICTED BANDEGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEGE (HIGH CHANNEL, HORIZONTAL)

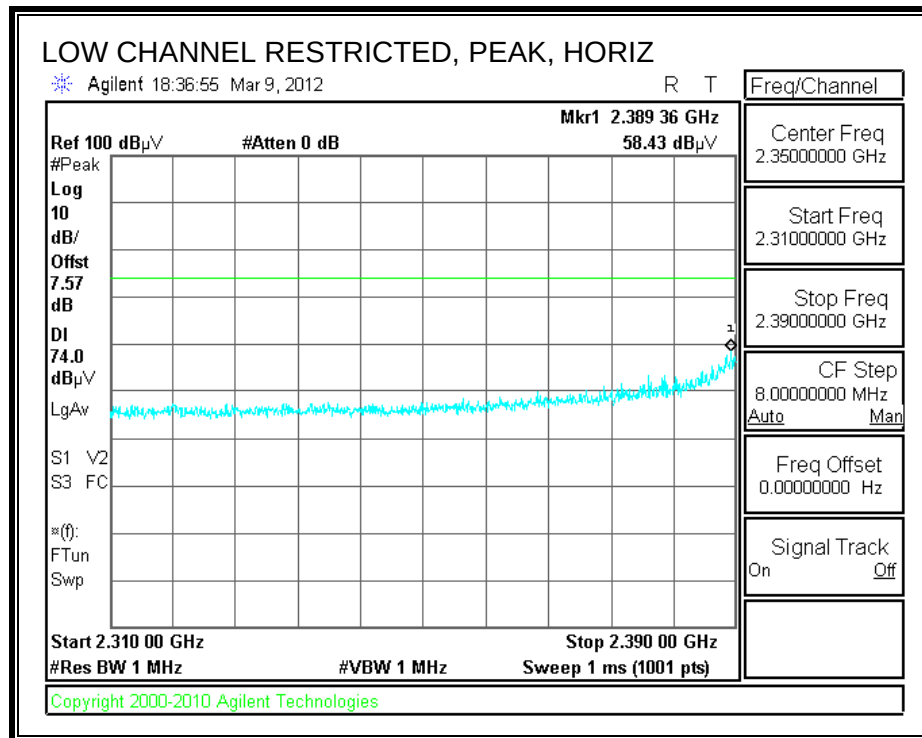


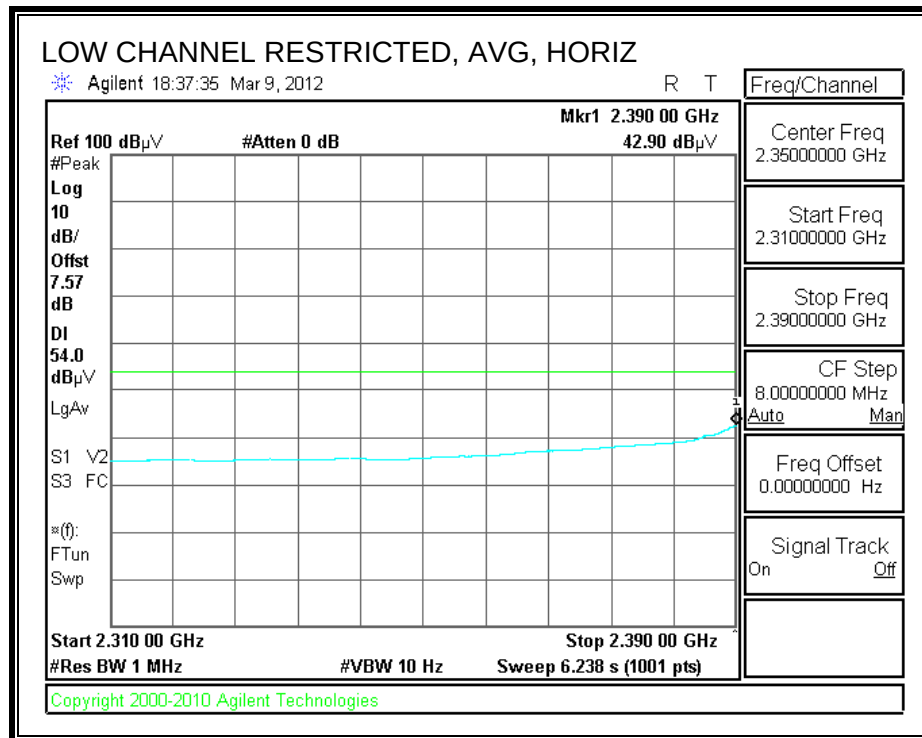
RESTRICTED BANDEGE (HIGH CHANNEL, VERTICAL)

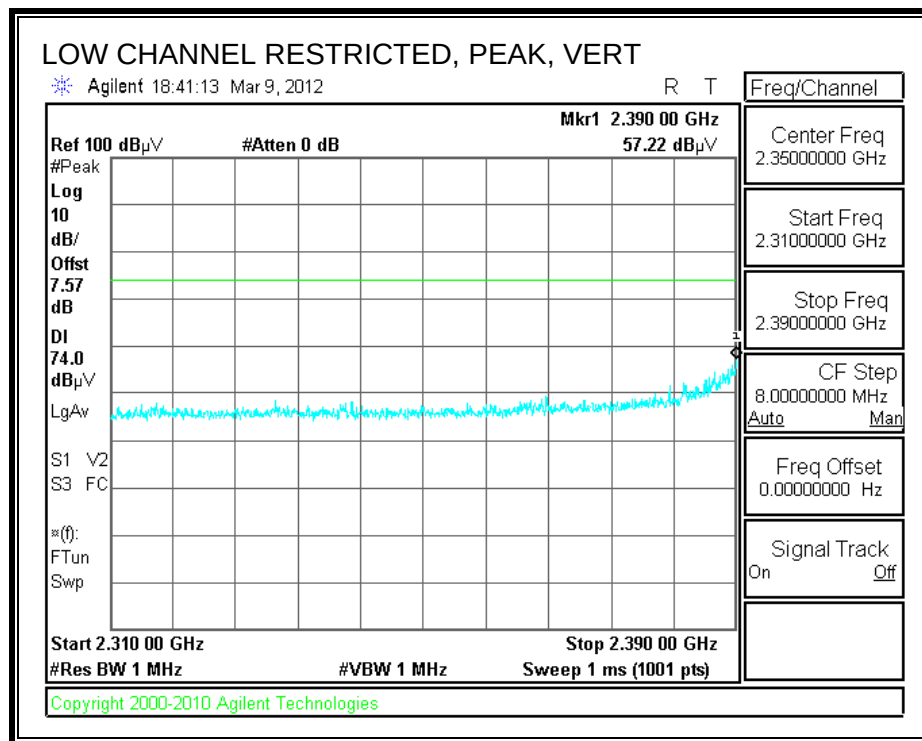


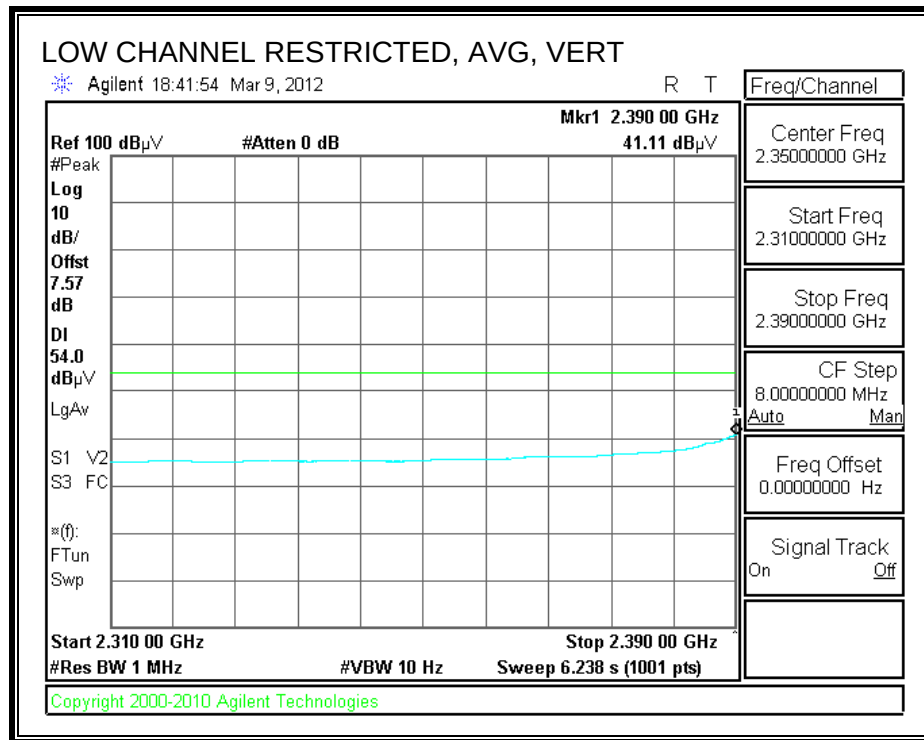
HARMONICS AND SPURIOUS EMISSIONS

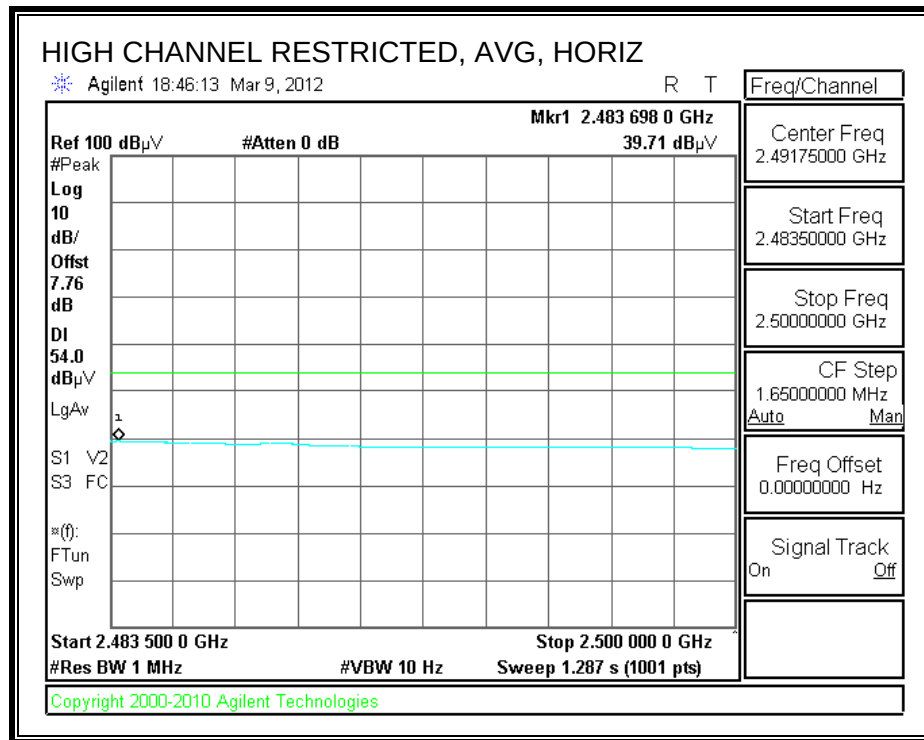
High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber-B																															
Company: Samsung Electronics Project #: 1214311 Date: 8/9/2012 Test Engineer: S.Aguilar Configuration: EUT with headset (Unit GT5300B WIFIRSE) Mode: TX, Gmode																															
Test Equipment:																															
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit																			
T59; S/N: 3245 @3m			T145 Agilent 3008A0056						T89; ARA 18-26GHz; S/N:1049			FCC 15.209																			
Hi Frequency Cables																															
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements RBW=1MHz, VBW=3MHz Average Measurements RBW=1MHz ; VBW=10Hz																
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_001																			
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)																
Low Channel (2412 MHz)																															
4.824	3.0	44.0	30.3	33.2	6.3	-34.8	0.0	0.0	48.7	34.9	74	54	-25.3	-19.1	H																
4.824	3.0	43.3	29.3	33.2	6.3	-34.8	0.0	0.0	47.9	33.9	74	54	-26.1	-20.1	V																
7.236	3.0	44.0	29.8	36.1	8.5	-34.9	0.0	0.0	53.6	39.5	74	54	-20.4	-14.5	H																
7.236	3.0	45.2	30.4	36.1	8.5	-34.9	0.0	0.0	54.8	40.1	74	54	-19.2	-13.9	V																
Mid Channel (2437 MHz)																															
4.876	3.0	44.3	30.3	33.2	6.3	-34.8	0.0	0.0	49.1	35.0	74	54	-24.9	-19.0	H																
4.876	3.0	42.2	29.5	33.2	6.3	-34.8	0.0	0.0	47.0	34.2	74	54	-27.0	-19.8	V																
7.312	3.0	46.1	30.3	36.2	8.5	-34.9	0.0	0.0	55.9	40.0	74	54	-18.1	-14.0	H																
7.312	3.0	47.7	31.4	36.2	8.5	-34.9	0.0	0.0	57.4	41.2	74	54	-16.6	-12.8	V																
High Channel (2462 MHz)																															
4.924	3.0	42.2	28.9	33.3	6.3	-34.8	0.0	0.0	47.1	33.7	74	54	-26.9	-20.3	H																
4.924	3.0	42.3	29.1	33.3	6.3	-34.8	0.0	0.0	47.1	33.9	74	54	-26.9	-20.1	V																
7.385	3.0	44.1	28.9	36.3	8.5	-34.9	0.0	0.0	53.9	38.7	74	54	-20.1	-15.3	H																
7.385	3.0	45.1	30.2	36.3	8.5	-34.9	0.0	0.0	54.9	40.1	74	54	-19.1	-13.9	V																
Rev. 07.08.11																															
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">f Measurement Frequency</td> <td style="width: 33%;">Amp Preamp Gain</td> <td style="width: 33%;">Avg Lim Average Field Strength Limit</td> </tr> <tr> <td>Dist Distance to Antenna</td> <td>D Corr Distance Correct to 3 meters</td> <td>Pk Lim Peak Field Strength Limit</td> </tr> <tr> <td>Read Analyzer Reading</td> <td>Avg Average Field Strength @ 3 m</td> <td>Avg Mar Margin vs. Average Limit</td> </tr> <tr> <td>AF Antenna Factor</td> <td>Peak Calculated Peak Field Strength</td> <td>Pk Mar Margin vs. Peak Limit</td> </tr> <tr> <td>CL Cable Loss</td> <td>HPF High Pass Filter</td> <td></td> </tr> </table>																	f Measurement Frequency	Amp Preamp Gain	Avg Lim Average Field Strength Limit	Dist Distance to Antenna	D Corr Distance Correct to 3 meters	Pk Lim Peak Field Strength Limit	Read Analyzer Reading	Avg Average Field Strength @ 3 m	Avg Mar Margin vs. Average Limit	AF Antenna Factor	Peak Calculated Peak Field Strength	Pk Mar Margin vs. Peak Limit	CL Cable Loss	HPF High Pass Filter	
f Measurement Frequency	Amp Preamp Gain	Avg Lim Average Field Strength Limit																													
Dist Distance to Antenna	D Corr Distance Correct to 3 meters	Pk Lim Peak Field Strength Limit																													
Read Analyzer Reading	Avg Average Field Strength @ 3 m	Avg Mar Margin vs. Average Limit																													
AF Antenna Factor	Peak Calculated Peak Field Strength	Pk Mar Margin vs. Peak Limit																													
CL Cable Loss	HPF High Pass Filter																														

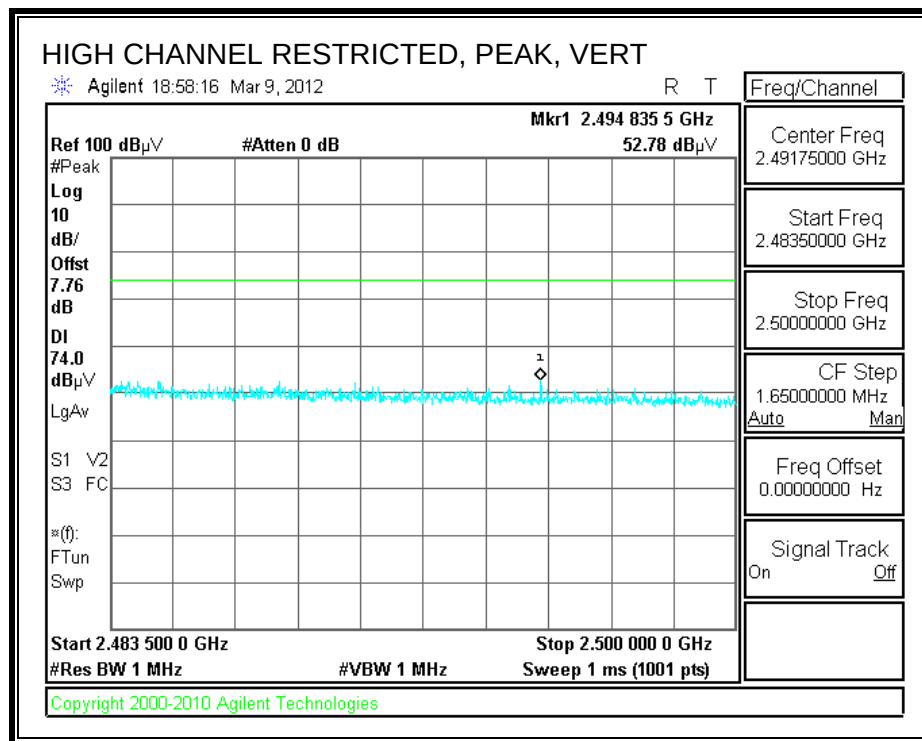
8.2.3. TX ABOVE 1 GHz FOR 802.11n HT20 1TX MODE IN THE 2.4 GHz BAND**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**

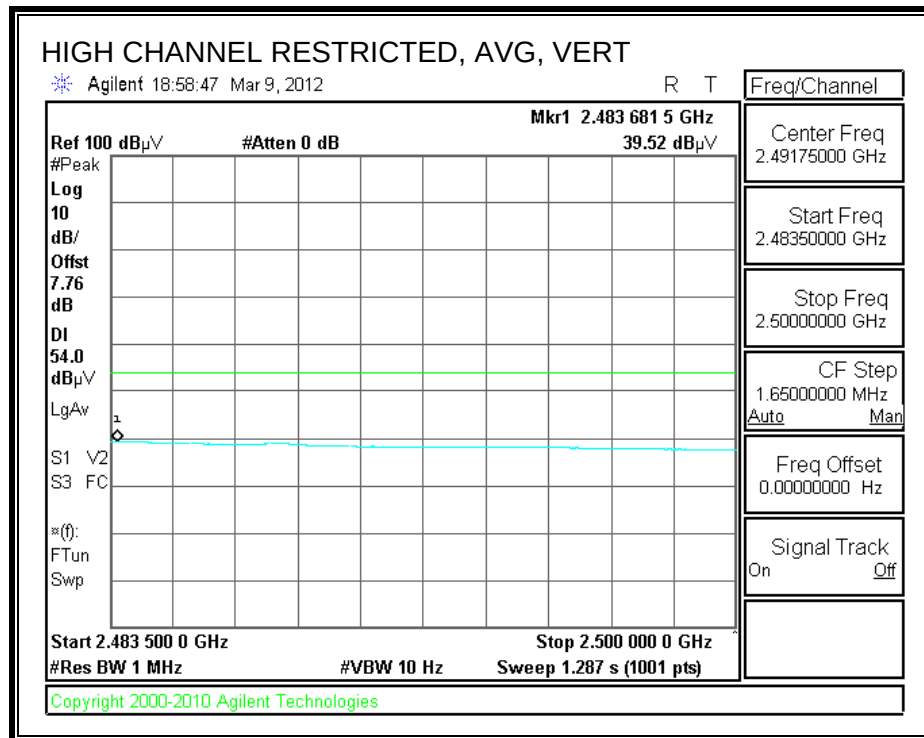


RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



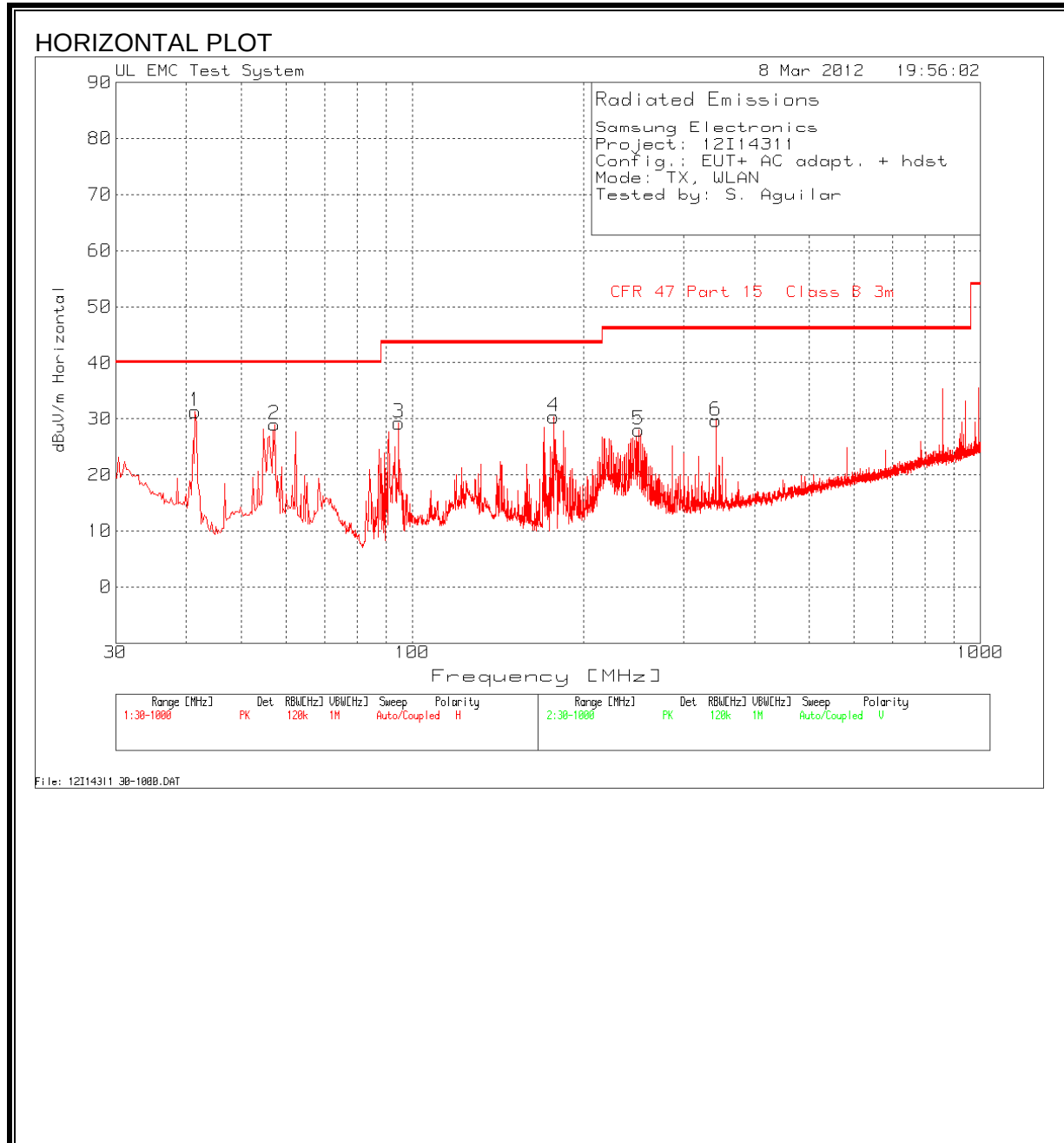


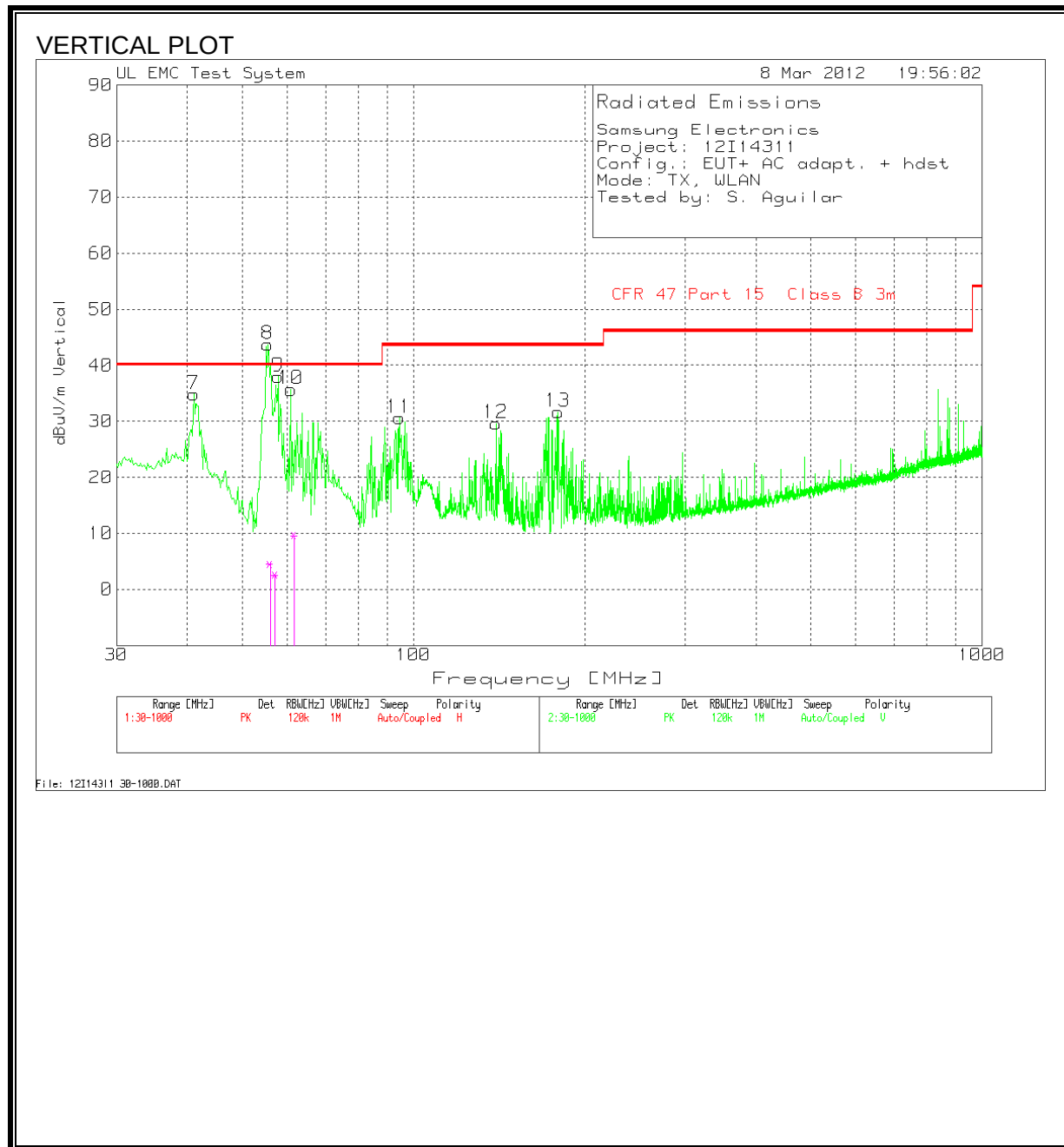
RESTRICTED BANDEGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement																
Compliance Certification Services, Fremont 5m Chamber-B																
Company:		Samsung Electronics														
Project #:		1214311														
Date:		8/9/2012														
Test Engineer:		S.Aguilar														
Configuration:		EUT with headset (Unit GT5300B WIFIRSE)														
Mode:		TX, HT20 mode														
Test Equipment:																
Horn 1-18GHz			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			Horn > 18GHz			Limit				
T59; S/N: 3245 @3m			T145 Agilent 3008A0056						T89; ARA 18-26GHz; S/N:1049			FCC 15.209				
Hi Frequency Cables																
3' cable 22807700			12' cable 22807600			20' cable 22807500			HPF			Reject Filter			Peak Measurements	
3' cable 22807700			12' cable 22807600			20' cable 22807500						R_001			RBW= 1MHz , VBW=3MHz	
Average Measurements																
RBW=1MHz ; VBW=10Hz																
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fctr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)	
Low Channel (2412 MHz)																
4.824	3.0	40.6	27.6	33.2	6.3	-34.8	0.0	0.0	45.3	32.3	74	54	-28.7	-21.7	H	
4.824	3.0	42.3	28.6	33.2	6.3	-34.8	0.0	0.0	46.9	33.2	74	54	-27.1	-20.8	V	
7.423	3.0	37.7	24.5	36.3	8.5	-34.9	0.0	0.0	47.6	34.4	74	54	-26.4	-19.6	H	
7.423	3.0	38.1	24.5	36.3	8.5	-34.9	0.0	0.0	48.0	34.4	74	54	-26.0	-19.6	V	
Mid Channel (2437 MHz)																
4.873	3.0	42.8	28.4	33.2	6.3	-34.8	0.0	0.0	47.5	33.2	74	54	-26.5	-20.8	H	
4.873	3.0	42.8	29.0	33.2	6.3	-34.8	0.0	0.0	47.6	33.7	74	54	-26.4	-20.3	V	
7.313	3.0	40.07	26.34	36.2	8.5	-34.9	0.0	0.0	49.8	36.1	74	54	-24.2	-17.9	H	
7.313	3.0	41.34	26.85	36.2	8.5	-34.9	0.0	0.0	51.1	36.6	74	54	-22.9	-17.4	V	
High Channel (2462 MHz)																
4.923	3.0	40.83	27.84	33.3	6.3	-34.8	0.0	0.0	45.7	32.7	74	54	-28.3	-21.3	H	
4.923	3.0	41.34	28.08	33.3	6.3	-34.8	0.0	0.0	46.2	32.9	74	54	-27.8	-21.1	V	
7.386	3.0	37.8	24.5	36.3	8.5	-34.9	0.0	0.0	47.7	34.4	74	54	-26.3	-19.6	H	
7.386	3.0	42.7	27.5	36.3	8.5	-34.9	0.0	0.0	52.6	37.3	74	54	-21.4	-16.7	V	
Rev. 07.08.11																
f	Measurement Frequency					Amp	Preamp Gain					Avg Lim	Average Field Strength Limit			
Dist	Distance to Antenna					D Corr	Distance Correct to 3 meters					Pk Lim	Peak Field Strength Limit			
Read	Analyzer Reading					Avg	Average Field Strength @ 3 m					Avg Mar	Margin vs. Average Limit			
AF	Antenna Factor					Peak	Calculated Peak Field Strength					Pk Mar	Margin vs. Peak Limit			
CL	Cable Loss					HPF	High Pass Filter									

8.3. WORST-CASE BELOW 1 GHz**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

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

HORIZONTAL AND VERTICAL DATA

Company Name:	Samsung Electronics
Project:	12I14311
Date:	3/8/2012
Configuraiton:	EUT + Headphone + Adapter
Mode:	TX, WLAN, worst case
Tested by:	S.Aguilar

Test Frequency [MHz]	Meter Reading [dB(μV)]	Detector	Pre Amp Factor [dB]	Antenna Factor [dB/m]	Corrected [dB(μV/m)]	Class B PK limit [dB(μV/m)]	QP Margin [dB]	Height [cm]	Polarity
Range 1 30 - 1000MHz									
41.4369	47.32	PK	-29.2	13.2	31.32	40	-8.68	400	Horz
57.1383	50.1	PK	-29	7.9	29	40	-11	400	Horz
94.5504	49.14	PK	-28.6	8.7	29.24	43.5	-14.26	400	Horz
177.3221	47.74	PK	-27.8	10.4	30.34	43.5	-13.16	200	Horz
250.2078	43.39	PK	-27.2	11.8	27.99	46	-18.01	100	Horz
342.2842	42.47	PK	-26.8	14	29.67	46	-16.33	100	Horz
Range 2 30 - 1000MHz									
41.0492	50.67	PK	-29.2	13.4	34.87	40	-5.13	100	Vert
55.3937	64.82	PK	-29	7.9	43.72	40	3.72	200	Vert
55.9428	25.57	QP	-29	7.9	4.47	40	-35.53	178	Vert
57.7198	59.09	PK	-29	7.9	37.99	40	-2.01	100	Vert
57.0811	23.66	QP	-29	7.9	2.56	40	-37.44	186	Vert
60.8213	56.66	PK	-28.9	7.9	35.66	40	-4.34	100	Vert
61.7108	30.58	QP	-28.9	7.9	9.58	40	-30.42	197	Vert
94.3565	50.61	PK	-28.6	8.6	30.61	43.5	-12.89	100	Vert
139.5224	44.65	PK	-28.2	13.2	29.65	43.5	-13.85	100	Vert
179.4544	48.65	PK	-27.8	10.8	31.65	43.5	-11.85	100	Vert

PK - Peak detector

QP - Quasi-peak detector

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.

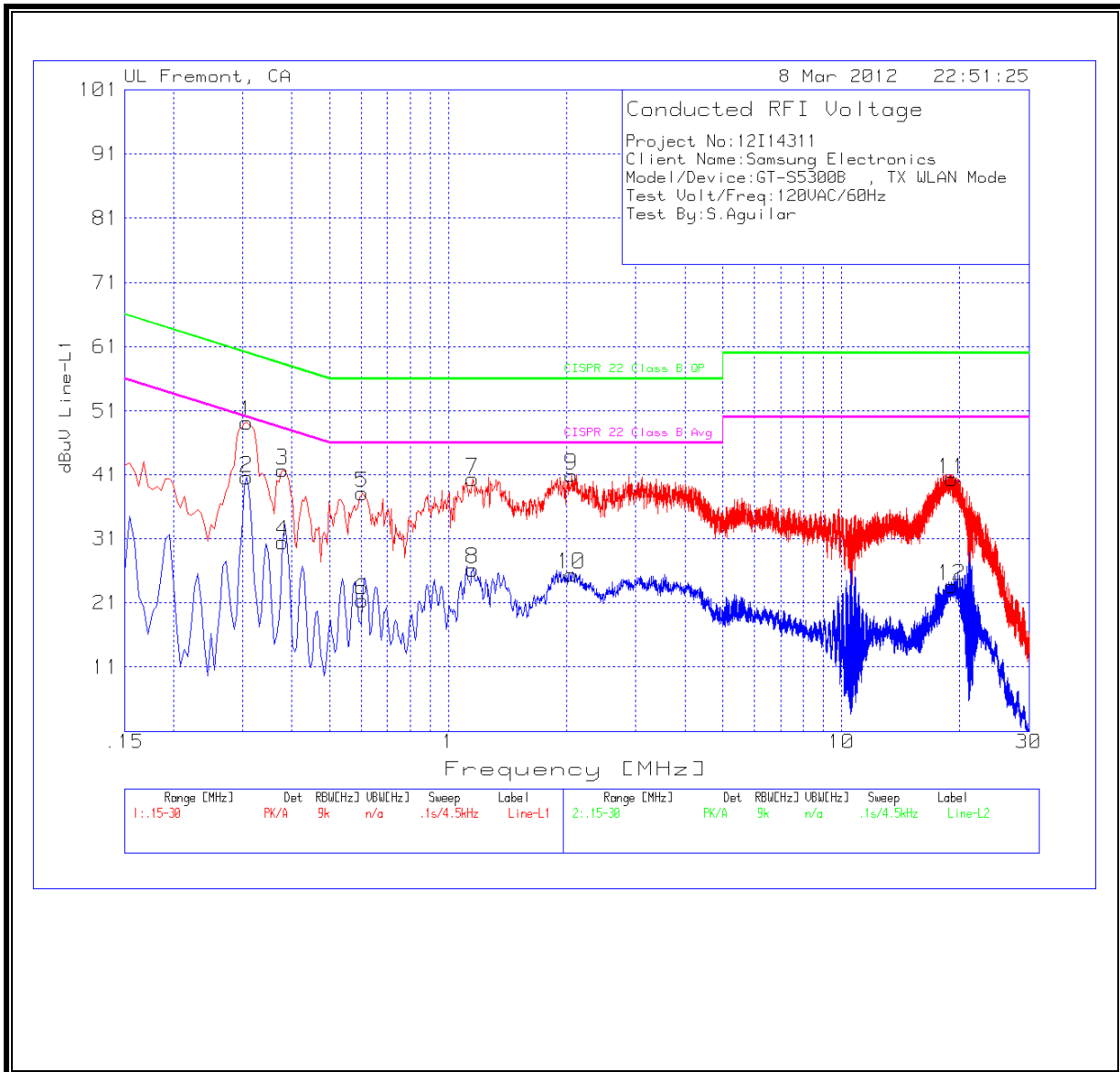
TEST PROCEDURE

ANSI C63.4

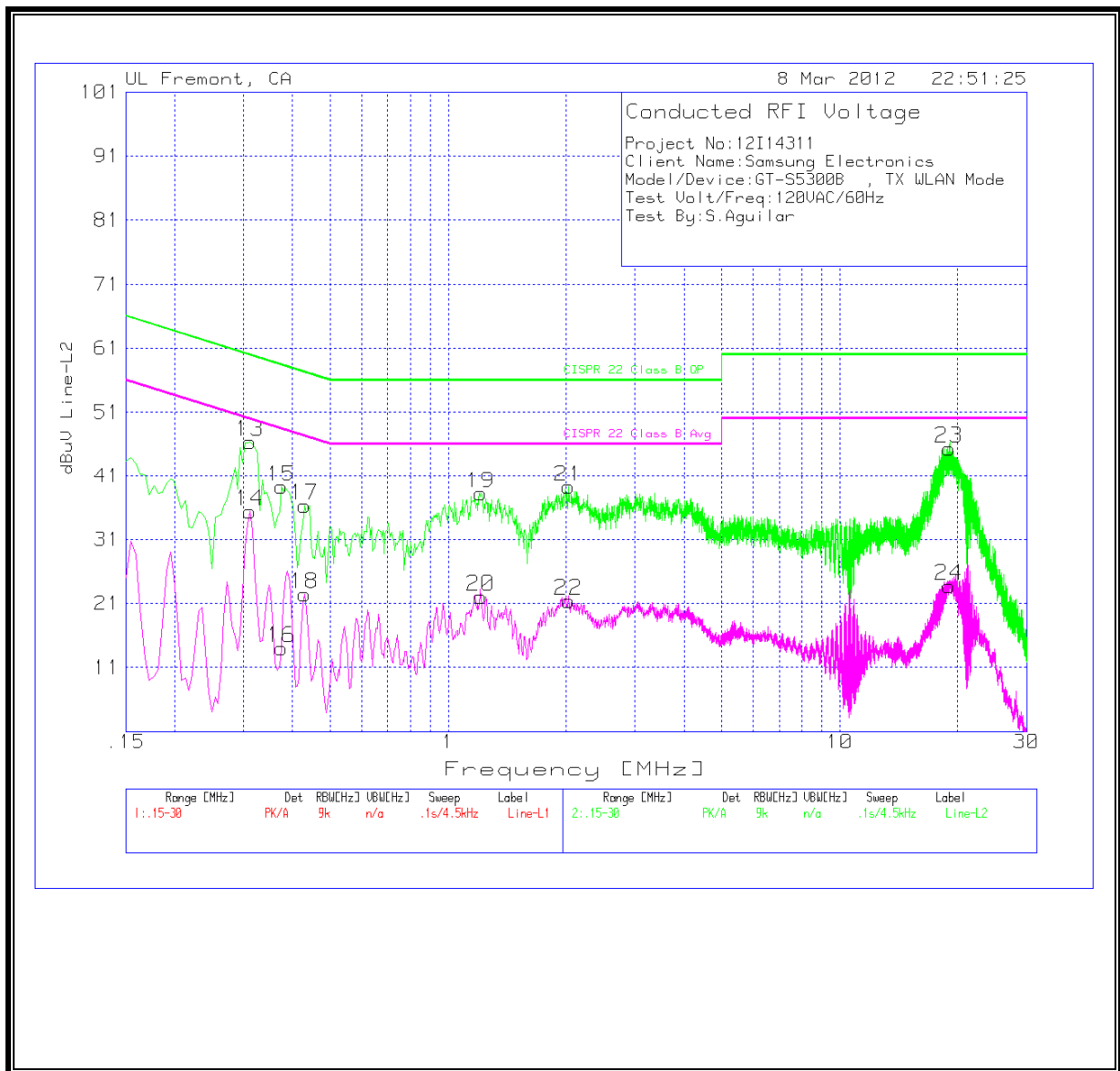
RESULTS**WORST EMISSIONS**

Company Name:		Samsung Electronics							
Project:		12I14311							
Date:		3/8/2012							
Configuraiton:		EUT + Adapter + Headset							
Mode:		TX Mode WLAN, Worst case							
Tested by:		S. Aguilar							
Line-L1 .15 - 30MHz									
Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	LISN [dB]	Cables [dB]	Corrected [dB(uV)]	Class B QP Limit	QP Margin	Class B Av Limit [dB(uV)]	Av Margin [dB]
0.3075	49.16	PK	0.1	0	49.26	60	-10.74	-	-
0.3075	40.4	Av	0.1	0	40.5	-	-	50	-9.5
0.3795	41.58	PK	0.1	0	41.68	58.3	-16.62	-	-
0.3795	30.33	Av	0.1	0	30.43	-	-	48.3	-17.87
0.6045	37.96	PK	0.1	0	38.06	56	-17.94	-	-
0.6045	21.29	Av	0.1	0	21.39	-	-	46	-24.61
1.1535	40.25	PK	0.1	0	40.35	56	-15.65	-	-
1.1535	26.09	Av	0.1	0	26.19	-	-	46	-19.81
2.0625	40.7	PK	0.1	0.1	40.9	56	-15.1	-	-
2.0625	25.16	Av	0.1	0.1	25.36	-	-	46	-20.64
19.086	39.9	PK	0.2	0.2	40.3	60	-19.7	-	-
19.086	23.22	Av	0.2	0.2	23.62	-	-	50	-26.38
Line-L2 .15 - 30MHz									
Test Frequency [MHz]	Meter Reading [dBuV]	Detector Type	LISN [dB]	Cables [dB]	Corrected [dB(uV)]	Class B QP Limit	QP Margin	Class B Av Limit [dB(uV)]	Av Margin [dB]
0.312	46.32	PK	0.1	0	46.42	59.9	-13.48	-	-
0.312	35.29	Av	0.1	0	35.39	-	-	49.9	-14.51
0.375	39.18	PK	0.1	0	39.28	58.4	-19.12	-	-
0.375	13.94	Av	0.1	0	14.04	-	-	48.4	-34.36
0.429	36.18	PK	0.1	0	36.28	57.3	-21.02	-	-
0.429	22.29	Av	0.1	0	22.39	-	-	47.3	-24.91
1.212	38.1	PK	0.1	0	38.2	56	-17.8	-	-
1.212	21.96	Av	0.1	0	22.06	-	-	46	-23.94
2.031	39.05	PK	0.1	0.1	39.25	56	-16.75	-	-
2.031	21.24	Av	0.1	0.1	21.44	-	-	46	-24.56
19.023	44.8	PK	0.3	0.2	45.3	60	-14.7	-	-
19.023	23.26	Av	0.3	0.2	23.76	-	-	50	-26.24
PK - Peak detector									
QP - Quasi-Peak detector									
Av - Average detector									

LINE 1 RESULTS



LINE 2 RESULTS



10. MAXIMUM PERMISSIBLE EXPOSURE

FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

IC RULES

IC Safety Code 6, Section 2.2.1 (a) A person other than an RF and microwave exposed worker shall not be exposed to electromagnetic radiation in a frequency band listed in Column 1 of Table 5, if the field strength exceeds the value given in Column 2 or 3 of Table 5, when averaged spatially and over time, or if the power density exceeds the value given in Column 4 of Table 5, when averaged spatially and over time.

Table 5
Exposure Limits for Persons Not Classed As RF and Microwave Exposed Workers (Including the General Public)

1 Frequency (MHz)	2 Electric Field Strength; rms (V/m)	3 Magnetic Field Strength; rms (A/m)	4 Power Density (W/m ²)	5 Averaging Time (min)
0.003–1	280	2.19		6
1–10	$280/f$	$2.19/f$		6
10–30	28	$2.19/f$		6
30–300	28	0.073	2*	6
300–1 500	$1.585f^{0.5}$	$0.0042f^{0.5}$	$f/150$	6
1 500–15 000	61.4	0.163	10	6
15 000–150 000	61.4	0.163	10	$616\,000/f^{1.2}$
150 000–300 000	$0.158f^{0.5}$	$4.21 \times 10^{-4}f^{0.5}$	$6.67 \times 10^{-5}f$	$616\,000/f^{1.2}$

* Power density limit is applicable at frequencies greater than 100 MHz.

Notes:

1. Frequency, f , is in MHz.
2. A power density of 10 W/m² is equivalent to 1 mW/cm².
3. A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT) or 12.57 milligauss (mG).

EQUATIONS

Power density is given by:

$$S = \text{EIRP} / (4 * \pi * D^2)$$

where

S = Power density in W/m²

EIRP = Equivalent Isotropic Radiated Power in W

D = Separation distance in m

Power density in units of W/m² is converted to units of mW/cm² by dividing by 10.

Distance is given by:

$$D = \text{SQRT} (\text{EIRP} / (4 * \pi * S))$$

where

D = Separation distance in m

EIRP = Equivalent Isotropic Radiated Power in W

S = Power density in W/m²

For multiple colocated transmitters operating simultaneously in frequency bands where the limit is identical, the total power density is calculated using the total EIRP obtained by summing the Power * Gain product (in linear units) of each transmitter.

$$\text{Total EIRP} = (P_1 * G_1) + (P_2 * G_2) + \dots + (P_n * G_n)$$

where

P_x = Power of transmitter x

G_x = Numeric gain of antenna x

In the table(s) below, Power and Gain are entered in units of dBm and dBi respectively and conversions to linear forms are used for the calculations.

LIMITS

From FCC §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm²

From IC Safety Code 6, Section 2.2 Table 5 Column 4, S = 10 W/m²

RESULTS

Band	Mode	Separation Distance (m)	Output Power (dBm)	Antenna Gain (dBi)	IC Power Density (W/m ²)	FCC Power Density (mW/cm ²)
2.4 GHz	WLAN	0.20	15.20	-3.40	0.03	0.003