



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

BT3.0+EDR, 802.11b/g/n 1x1 HT20, GSM850/1900 & WCDMA850/1900 Bar phone

MODEL NUMBER: GT-B5510L

FCC ID: A3LGTB5510L

REPORT NUMBER: 11I13983-2A

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Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	10/05/11	Initial Issue	F. Ibrahim
A	10/06/11	Update output power	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+EDR, 802.11B/G/N 1X1 HT20, GSM850/1900 &
WCDMA850/1900 BAR PHONE

FCC MODEL: GT-B5510L

SERIAL NUMBER: FI 201D (Conducted Unit), FI 201B (Radiated Unit)

DATE TESTED: AUGUST 31 - OCTOBER 06, 2011

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:



CHIN PANG
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, 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:

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

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 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+EDR, 802.11 b/g/n 1x1 HT20, GSM850/1900, WCDMA850/1900MHz Bar phone.

The radio module is manufactured by Samsung.

5.2. MAXIMUM OUTPUT POWER

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 – 2462	802.11b	14.85	30.55
2412 – 2462	802.11g	21.29	134.59
2412 - 2462	802.11n HT20	20.50	112.20

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna, with a maximum gain of 2.56 dBi for 2.4GHz band.

5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was B5510L.010, rev 1.0.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

For the fundamental investigation, since the EUT is a portable device that has three orientations; therefore X, Y and Z orientations have been investigated, also with AC/DC adapter, and earphone, and the worst case was found to be at Y orientation with AC Adapter.

Worst-case data rates as provided by the client were:

802.11b Mode: 1 Mbps

802.11g Mode: 6 Mbps

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	ETAOU10EBE	SC3ZA16MS/7-E	DoC
Earphone	Samsung	N/A	FT032B	NA

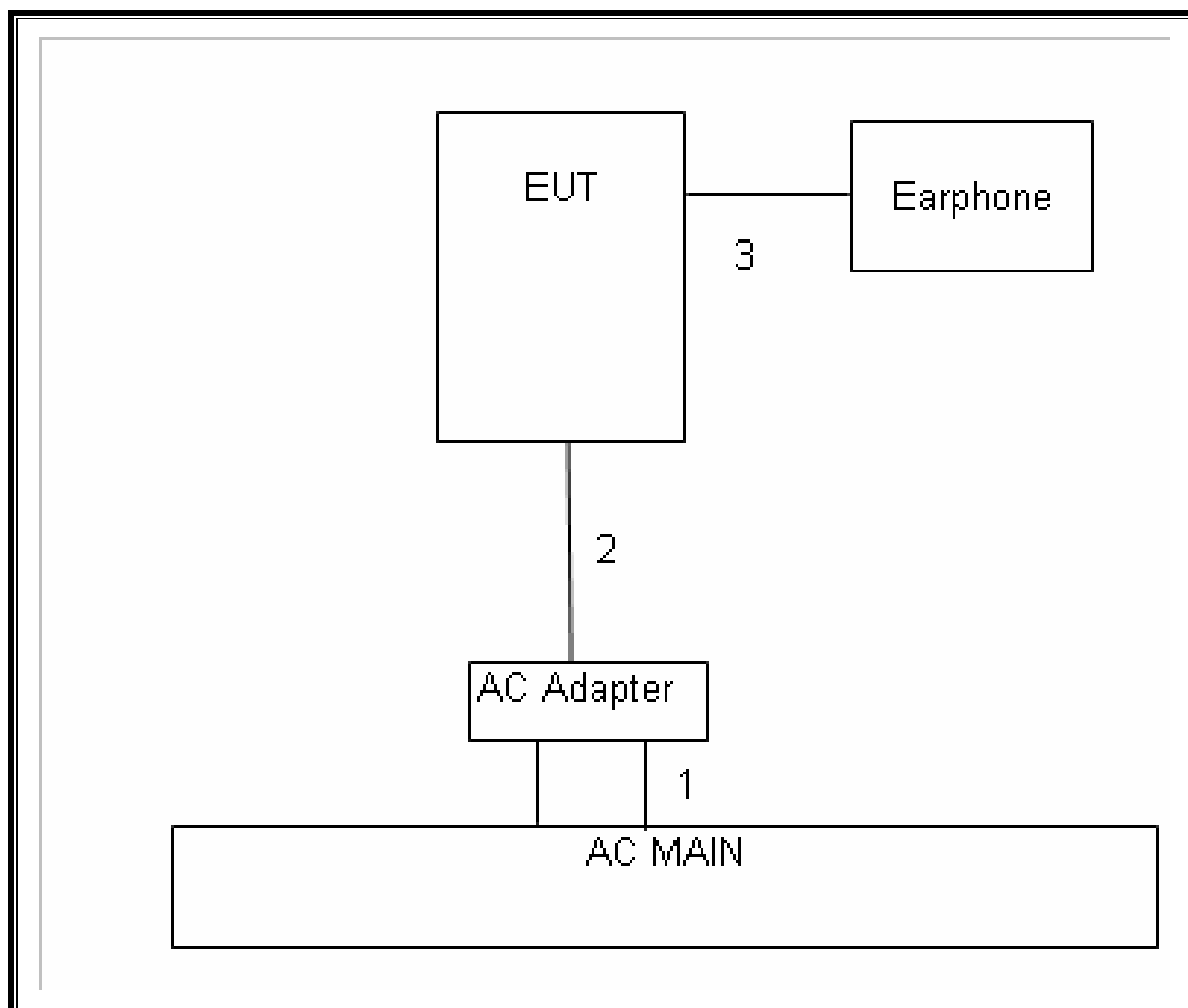
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Un-shielded	2m	NA
2	DC	1	DC	Un-shielded	1m	NA
3	Audio	1	3.5mm	Un-shielded	1.8m	NA

TEST SETUP

The EUT is a stand alone device.

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
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07-12-12
Antenna, Horn, 18 GHz	EMCO	3115	C00783	06-29-12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00778	01-27-12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	07-12-12
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08-30-12
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11-10-11
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRC13192	N02683	CNR
Power Meter	Agilent / HP	437B	N02778	08-11-12
Power Sensor, 18 GHz	Agilent / HP	8481A	N02781	08-17-12
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	07-28-12

6.1. 802.11b MODE IN THE 2.4 GHz BAND

6.1.1. 6 dB BANDWIDTH

LIMITS

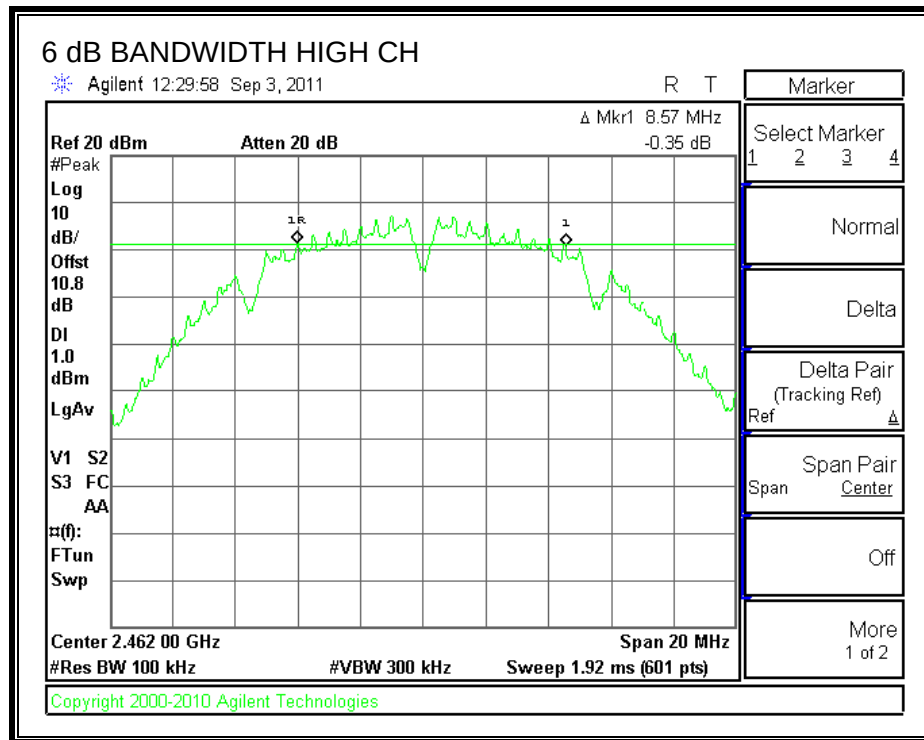
FCC §15.247 (a) (2)

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

TEST PROCEDURE

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

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	9.03	0.5
Middle	2437	9.07	0.5
High	2462	8.57	0.5



6.1.2. 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.

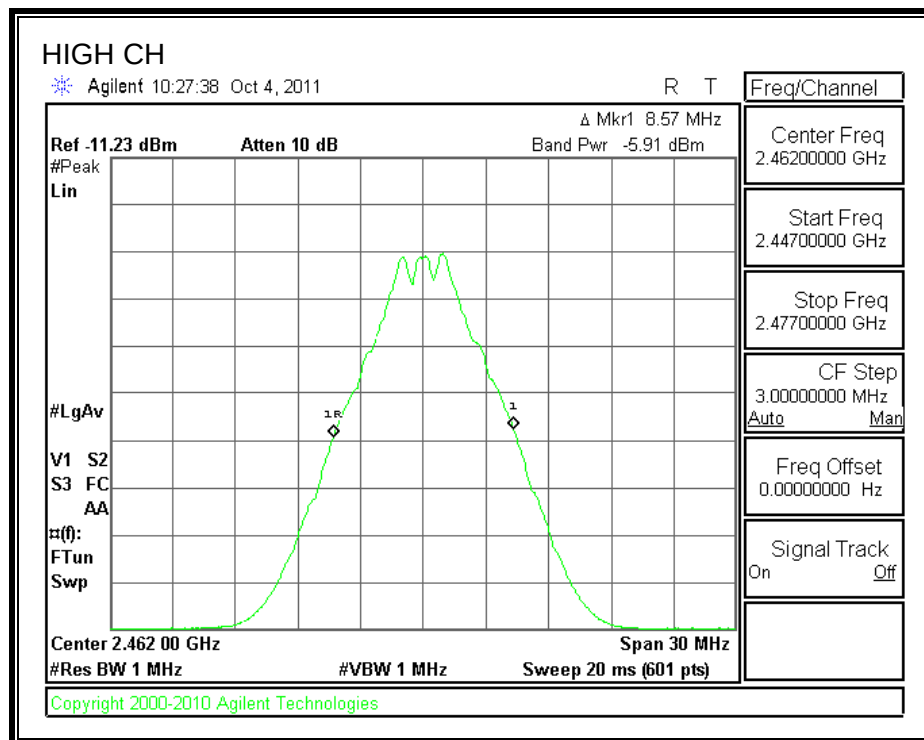
TEST PROCEDURE

Peak power is measured using the Channel bandwidth Alternative peak output power procedure specified in "TCB Training for Devices covered under Scopes A1 - A4" by Joe Dichoso, May 2003.

RESULTS

The cable assembly insertion loss of 10.8dB (including 10 dB pad and 0.8dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Peak Power Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-5.39	20.24	14.85	30	-15.15
Middle	2437	-5.66	20.24	14.58	30	-15.42
High	2462	-5.91	20.24	14.33	30	-15.67



6.1.3. 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 11dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Frequency (MHz)	Power (dBm)
2412	12.94
2437	12.81
2462	12.58

6.1.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

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

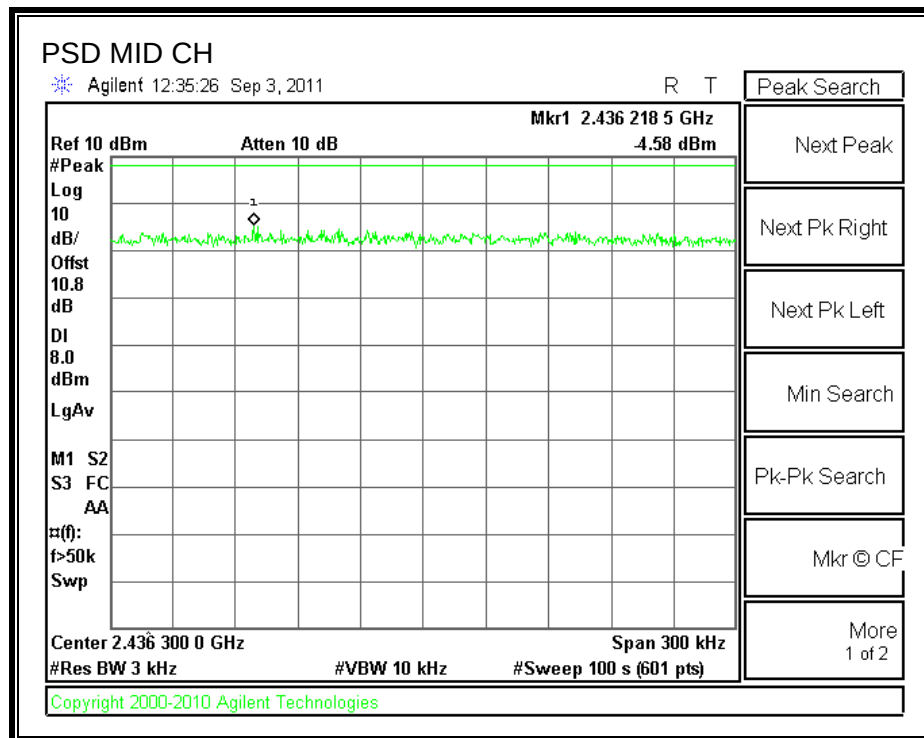
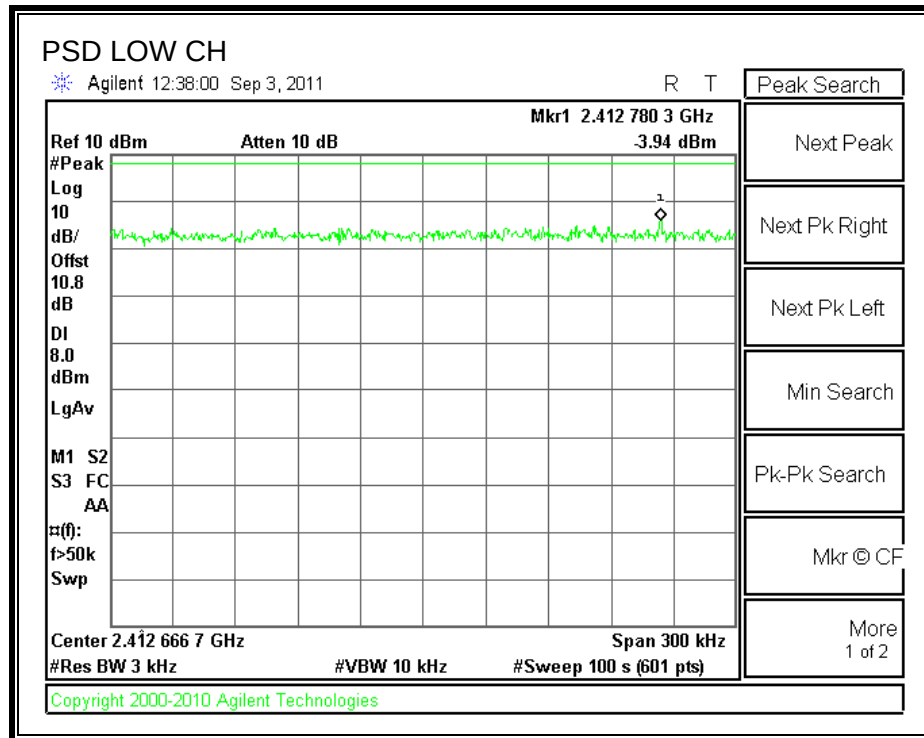
TEST PROCEDURE

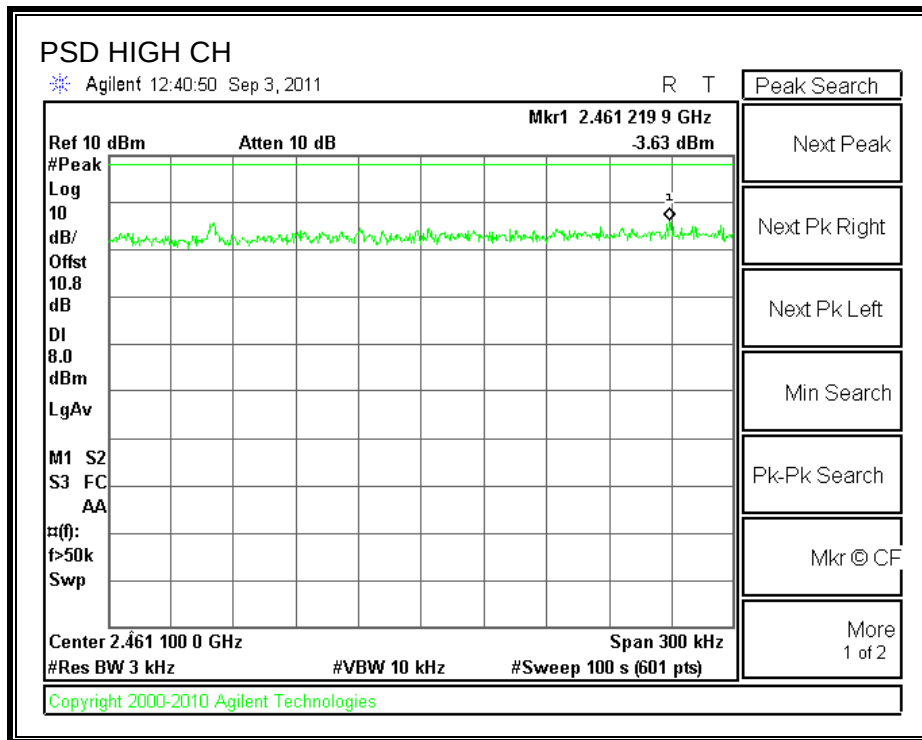
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-3.94	8	-11.94
Middle	2437	-4.58	8	-12.58
High	2462	-3.63	8	-11.63

POWER SPECTRAL DENSITY





6.1.5. 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.

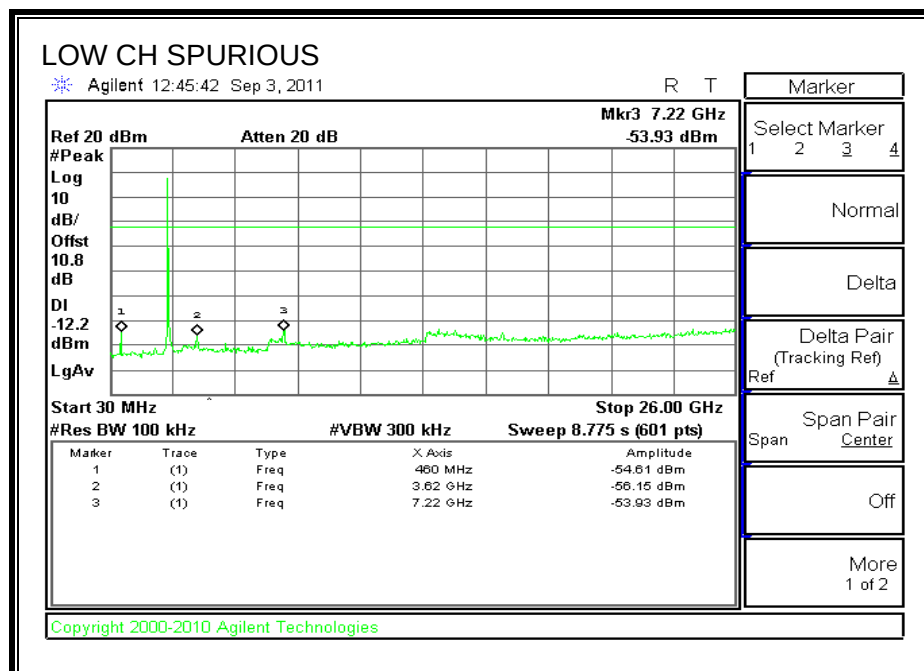
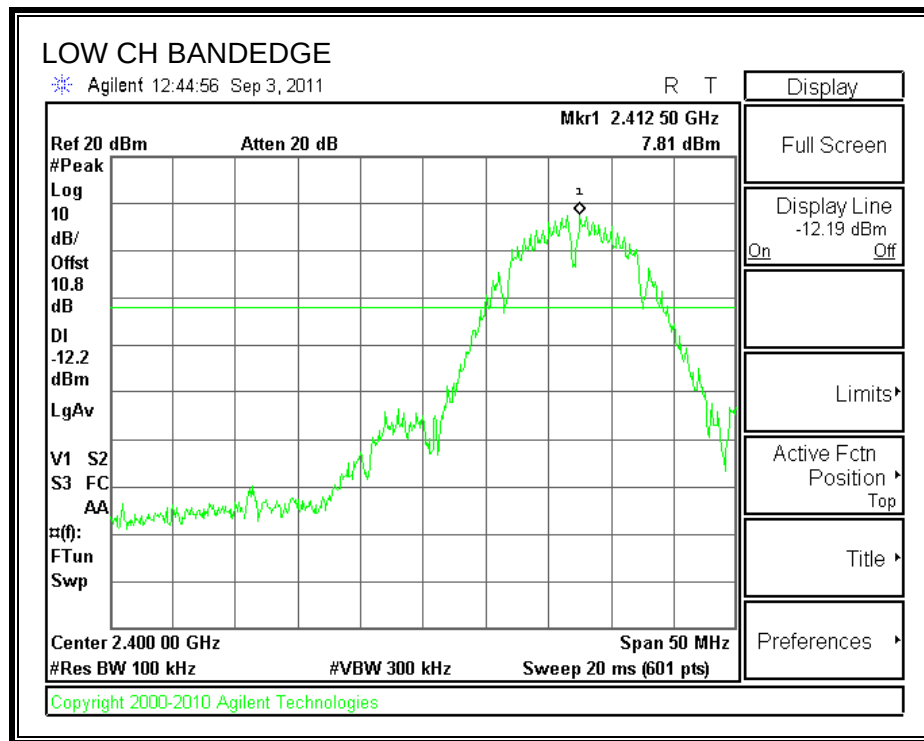
TEST PROCEDURE

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.

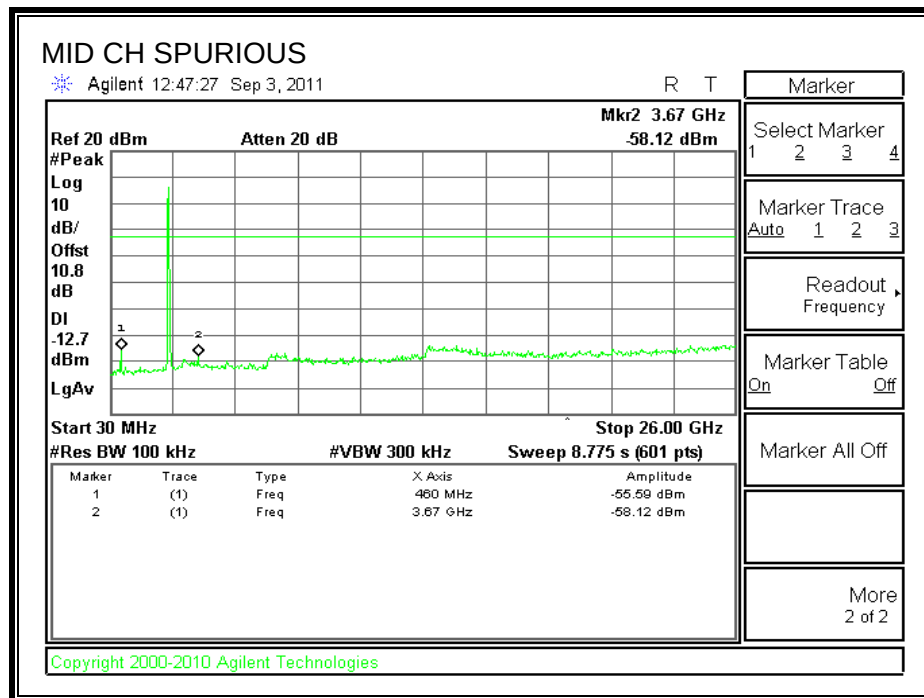
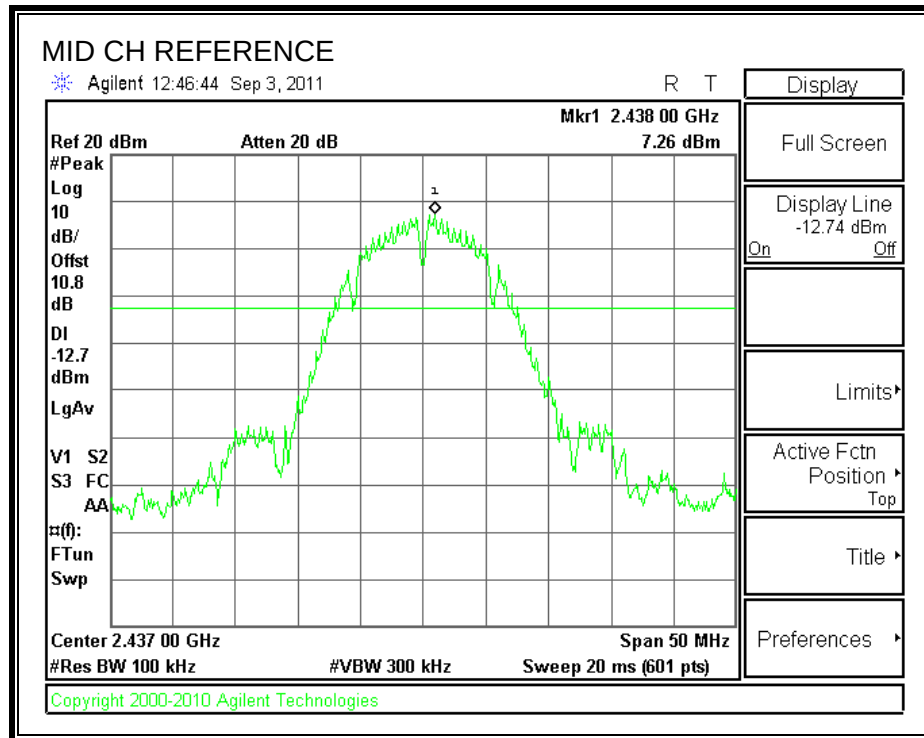
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

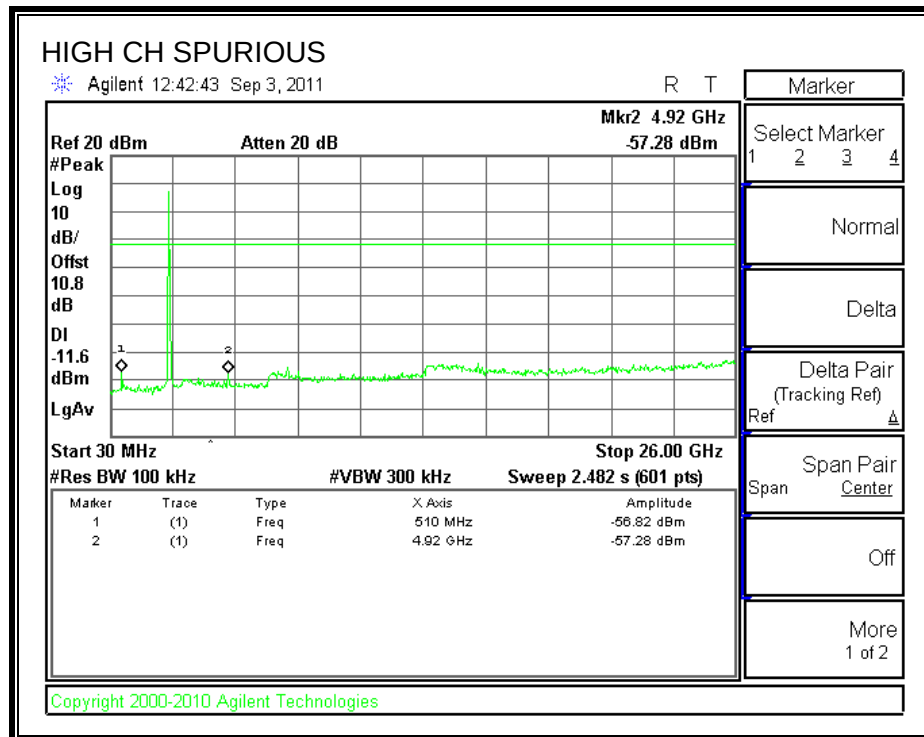
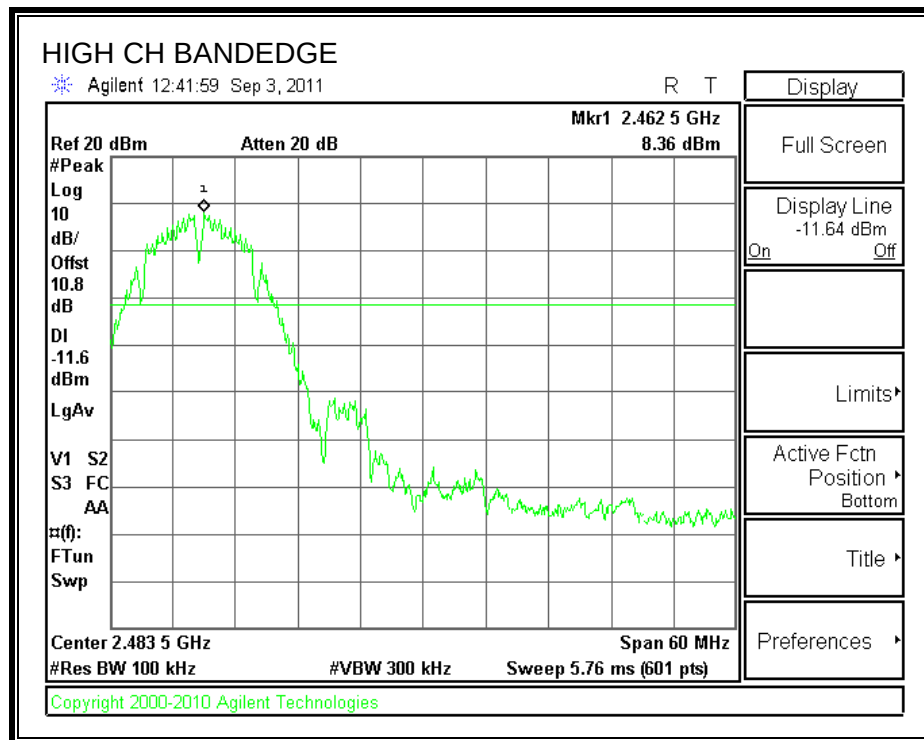
SPURIOUS EMISSIONS, LOW CHANNEL



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



6.2. 802.11g MODE IN THE 2.4 GHz BAND

6.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

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

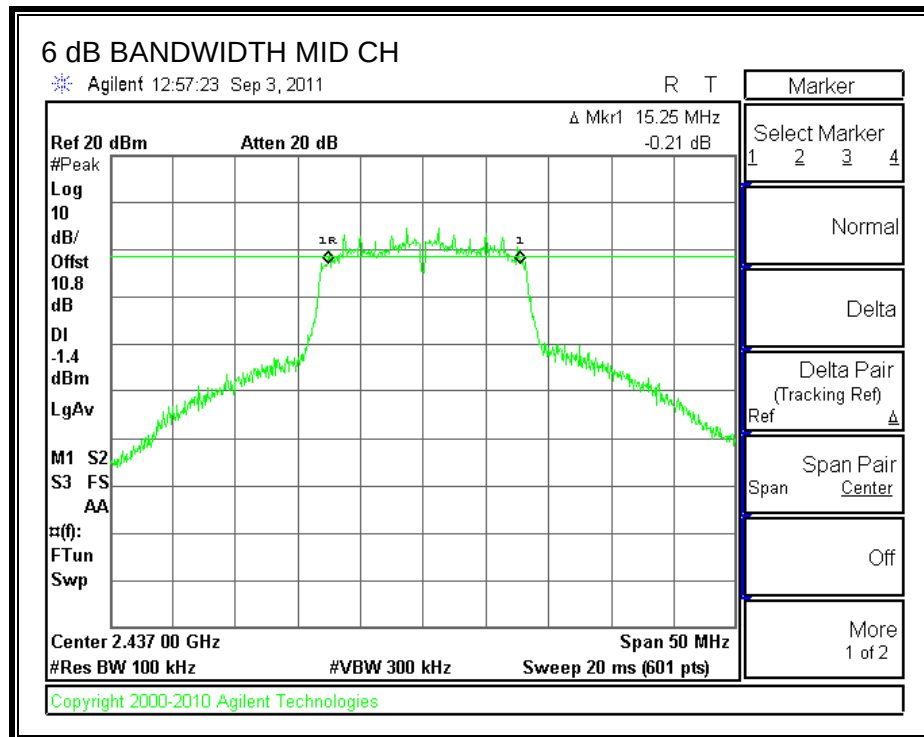
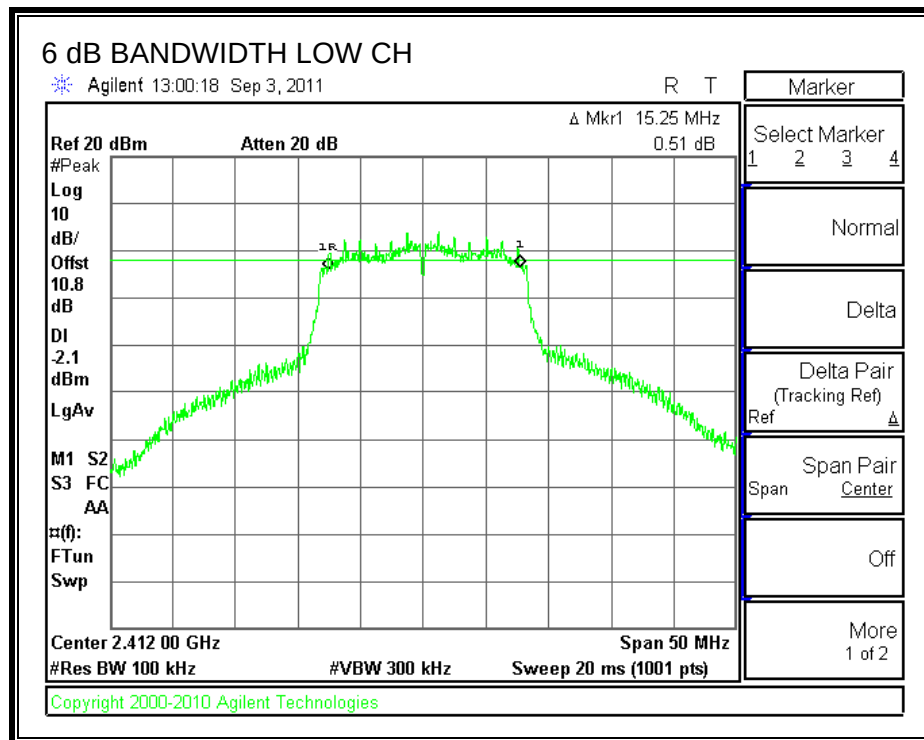
TEST PROCEDURE

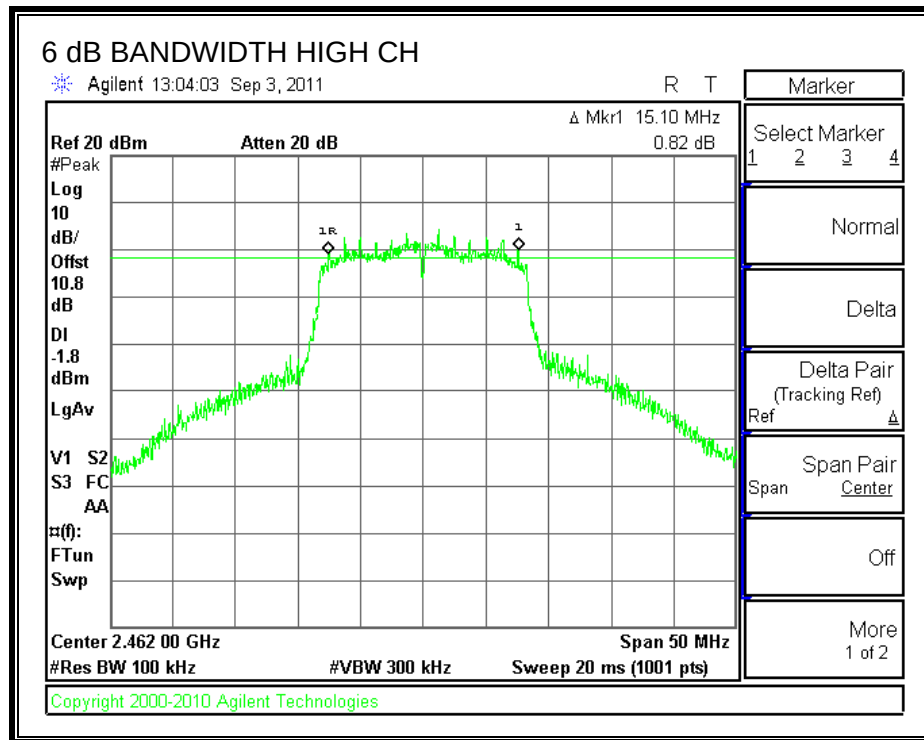
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.25	0.5
Middle	2437	15.25	0.5
High	2462	15.10	0.5

6 dB BANDWIDTH





6.2.2. 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

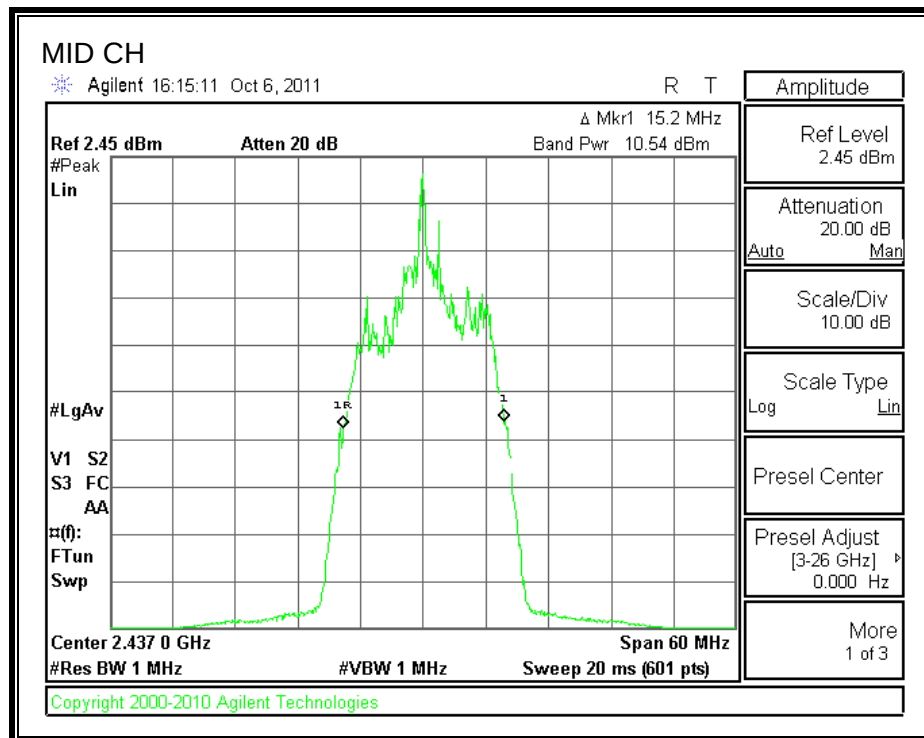
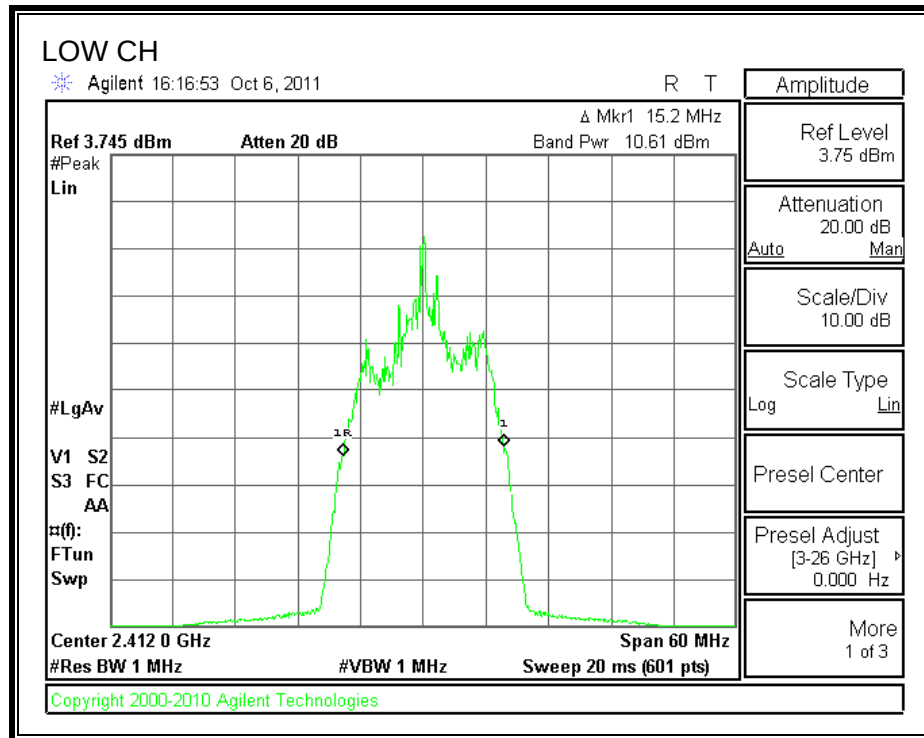
Peak power is measured using the Channel bandwidth Alternative peak output power procedure specified in "TCB Training for Devices covered under Scopes A1 - A4" by Joe Dichoso, May 2003.

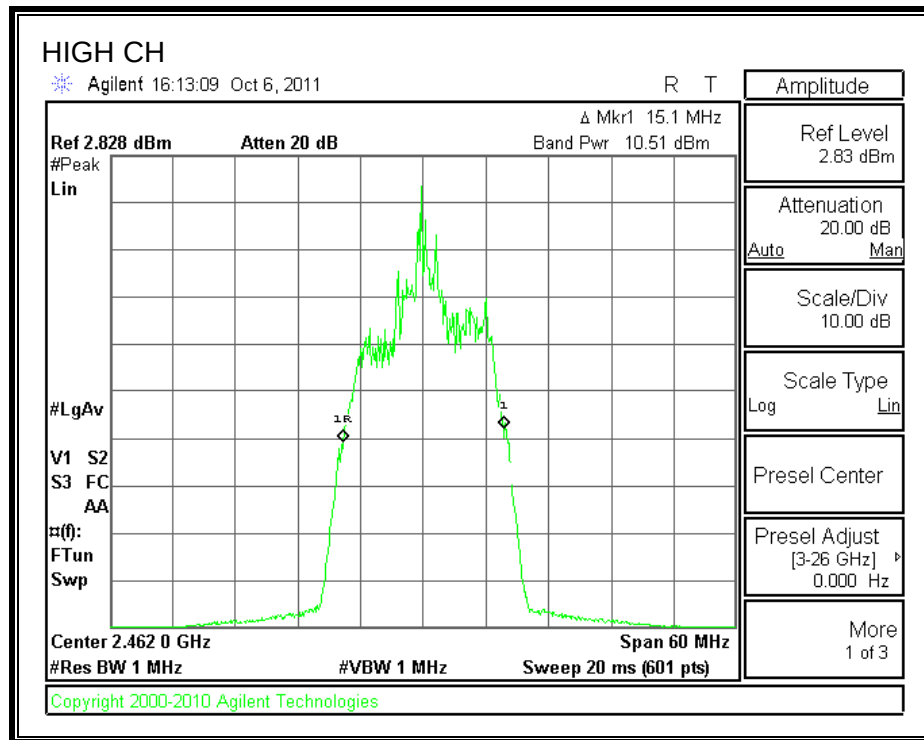
RESULTS

The cable assembly insertion loss of 10.8dB (including 10 dB pad and 0.8dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Peak power Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	10.61	10.68	21.29	30	-8.71
Middle	2437	10.54	10.68	21.22	30	-8.78
High	2462	10.51	10.68	21.19	30	-8.81

OUTPUT POWER





6.2.3. 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 10.8 dB (including 10 dB pad and 0.8dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	2412	12.92
Middle	2437	12.77
High	2462	12.79

6.2.4. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

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

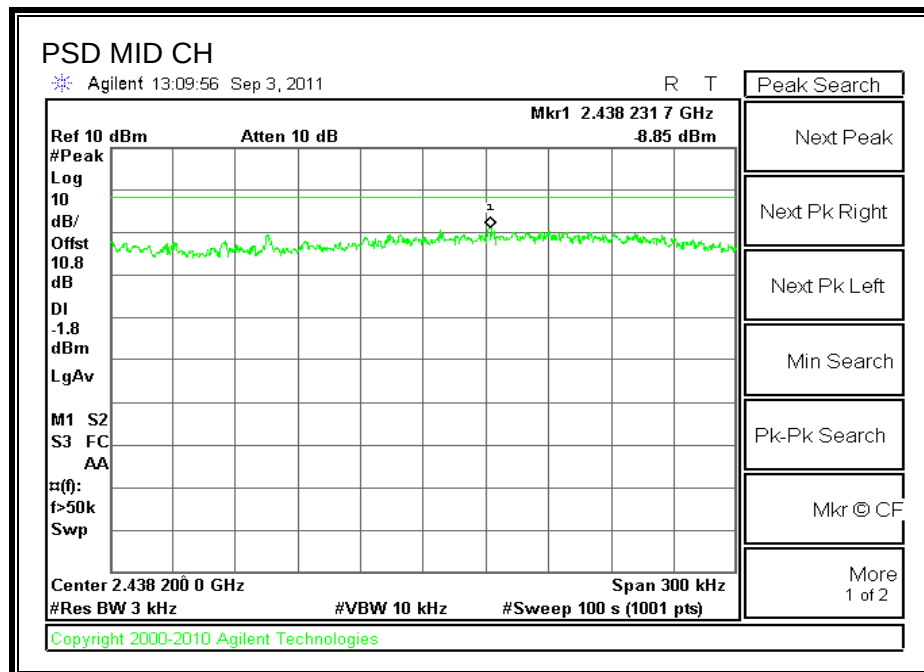
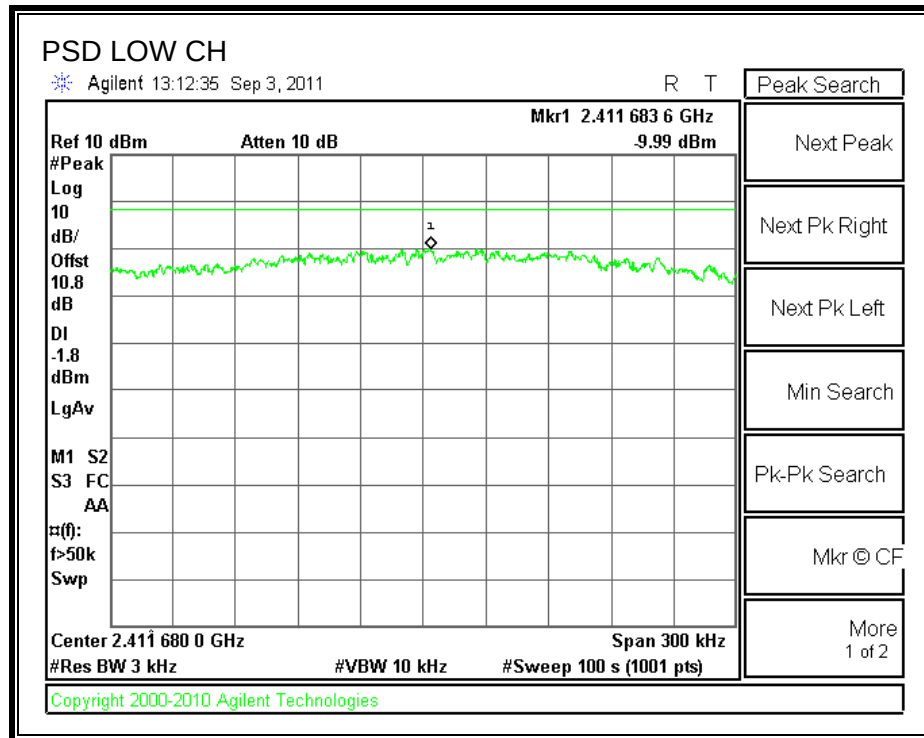
TEST PROCEDURE

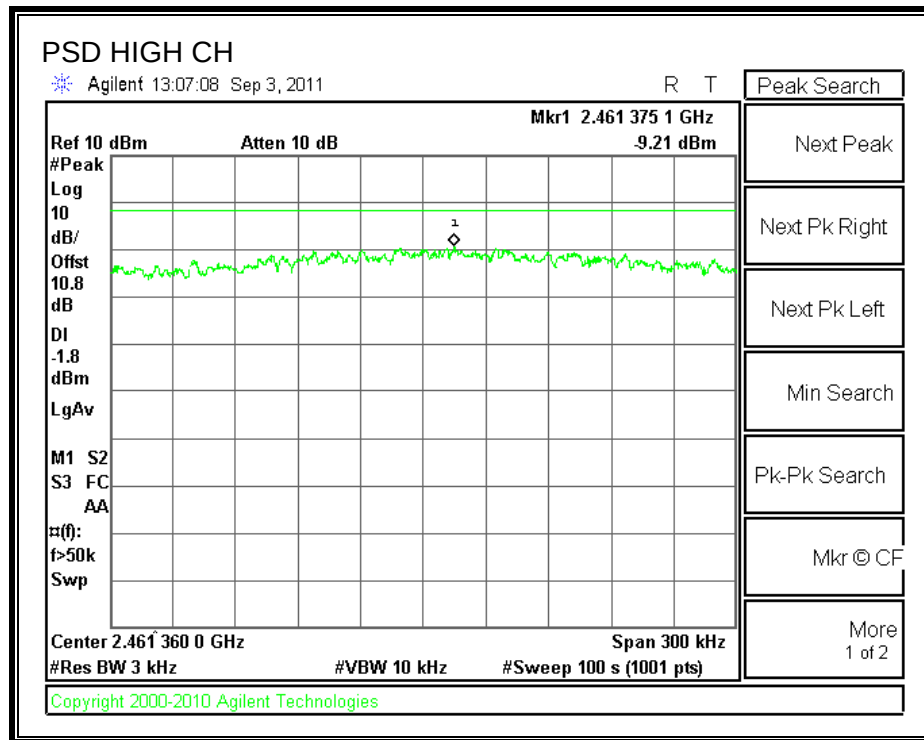
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-9.99	8	-17.99
Middle	2437	-8.85	8	-16.85
High	2462	-9.21	8	-17.21

POWER SPECTRAL DENSITY





6.2.5. 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.

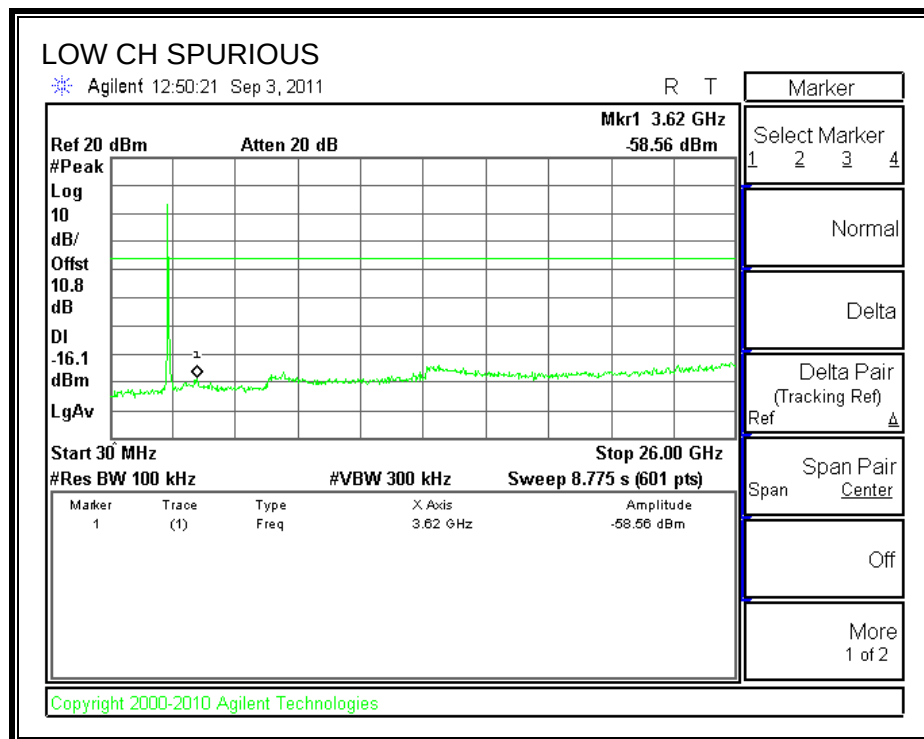
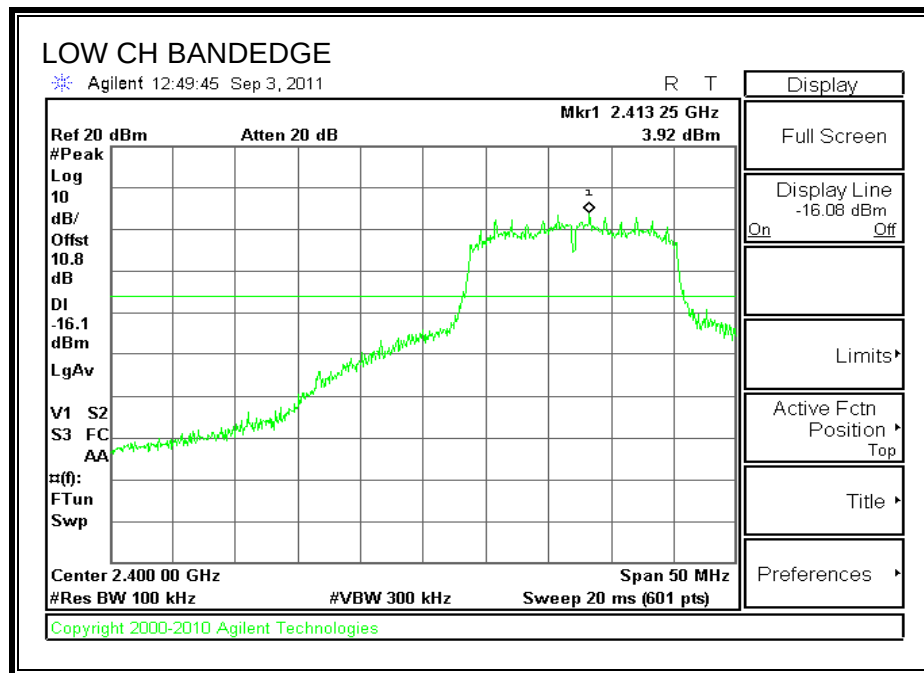
TEST PROCEDURE

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.

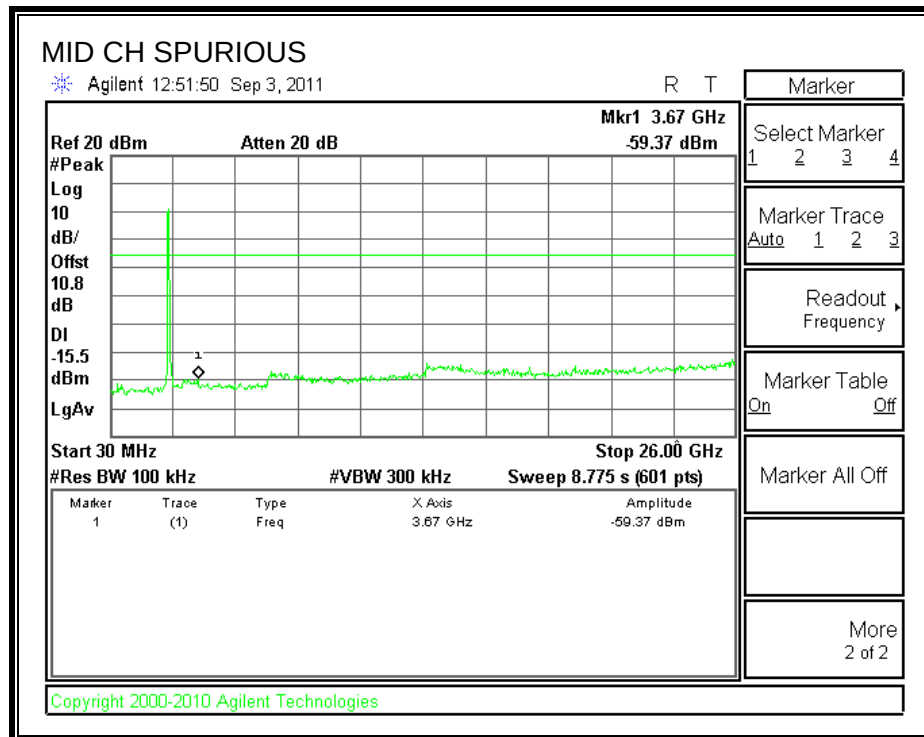
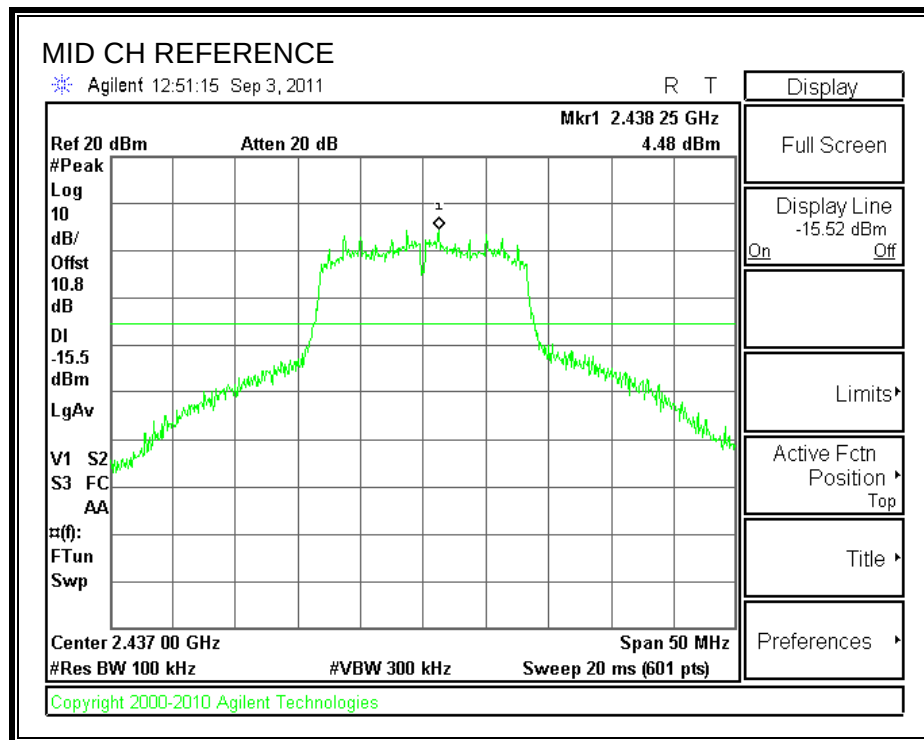
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

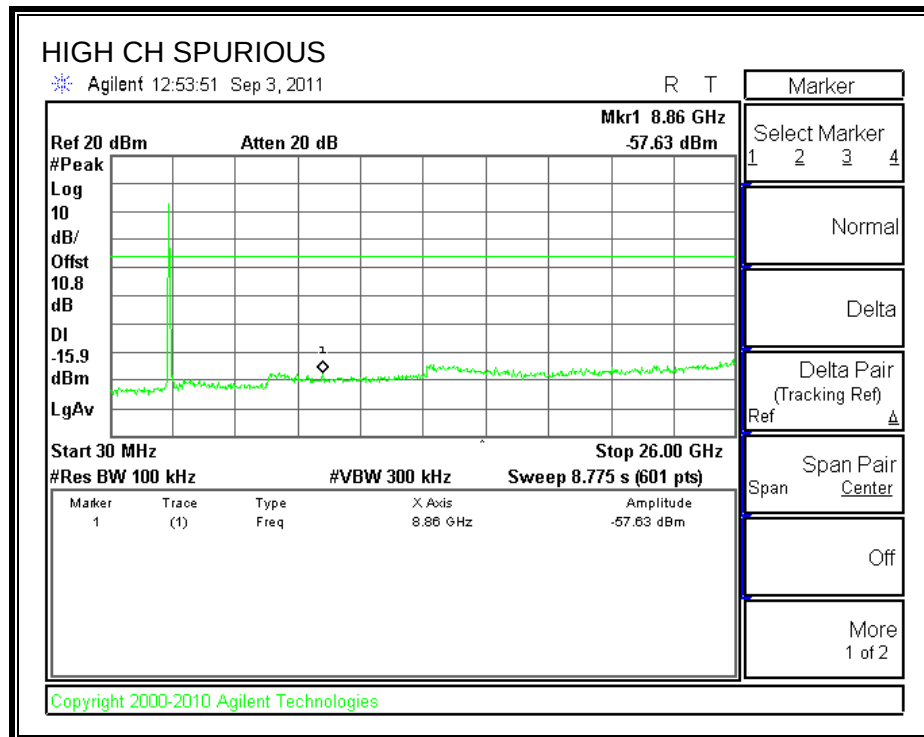
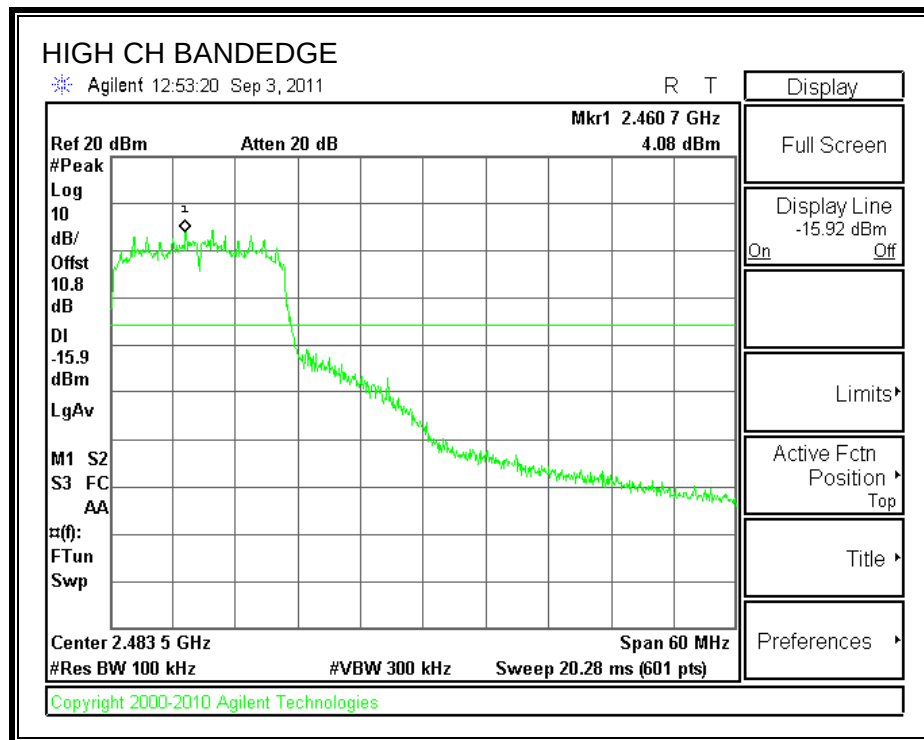
SPURIOUS EMISSIONS, LOW CHANNEL



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



6.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

6.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

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

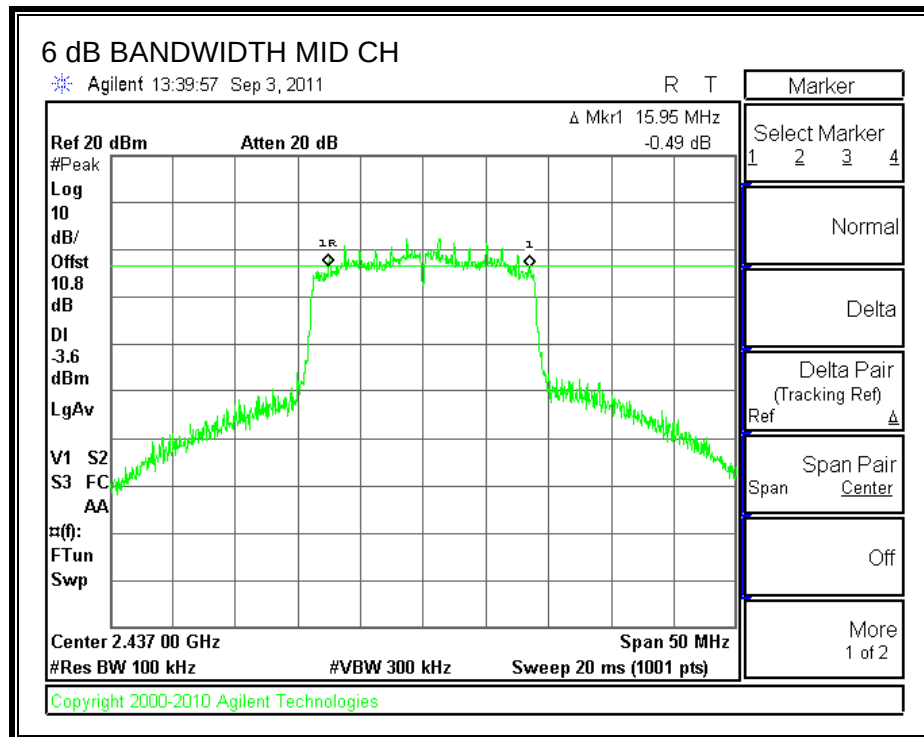
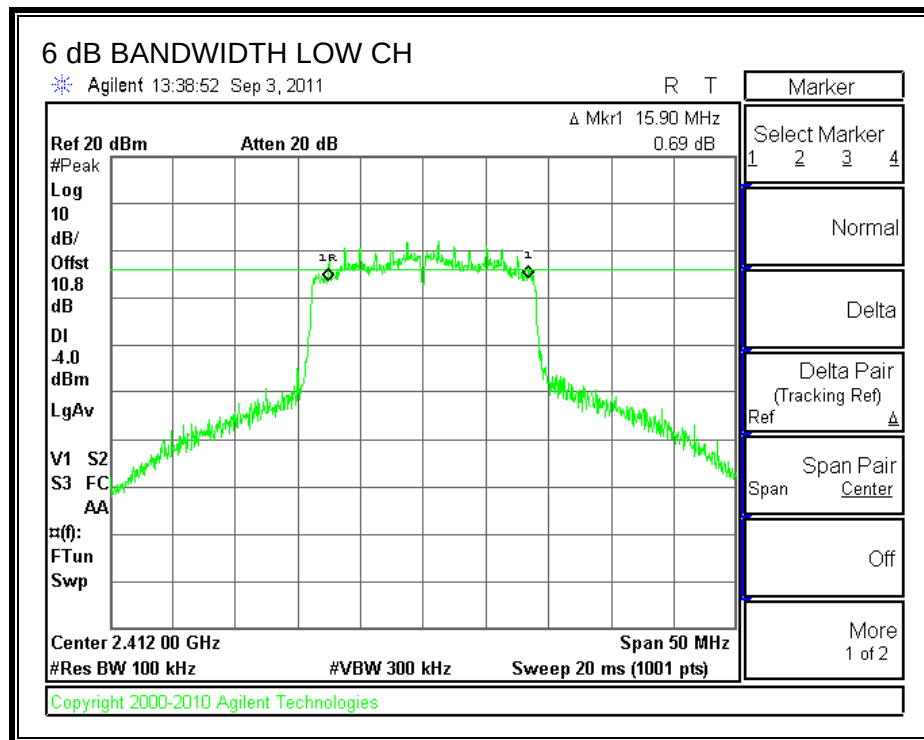
TEST PROCEDURE

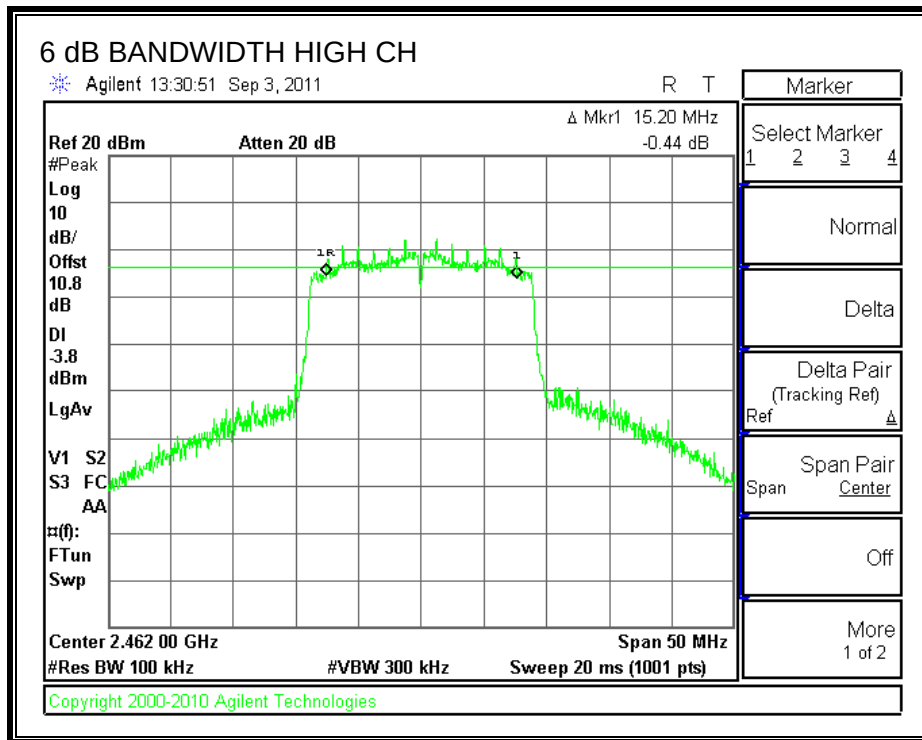
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.90	0.5
Middle	2437	15.95	0.5
High	2462	15.20	0.5

6 dB BANDWIDTH





6.3.2. 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

Peak power is measured using the Channel bandwidth Alternative peak output power procedure specified in "TCB Training for Devices covered under Scopes A1 - A4" by Joe Dichoso, May 2003.

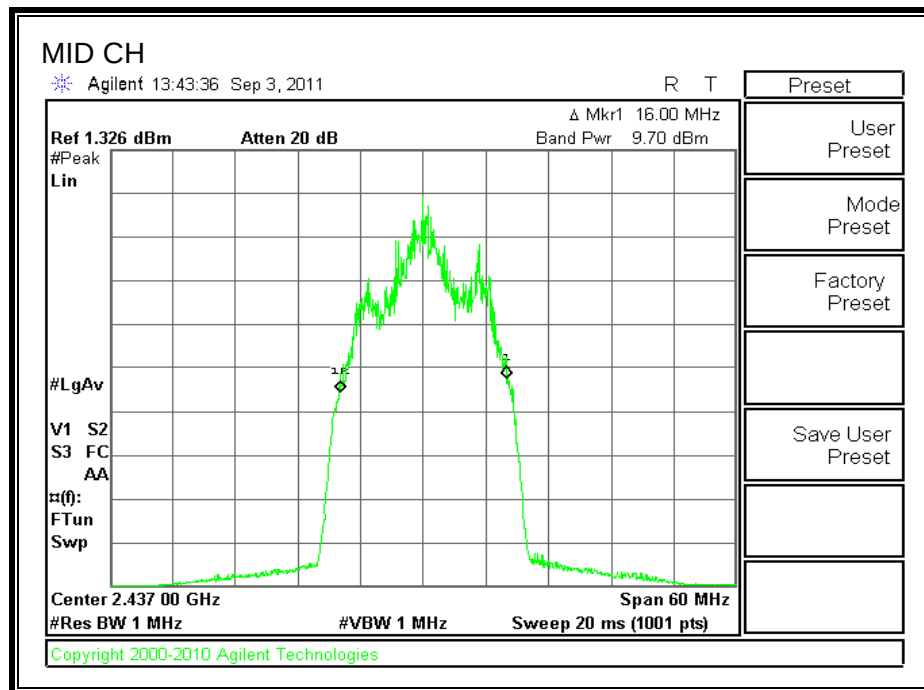
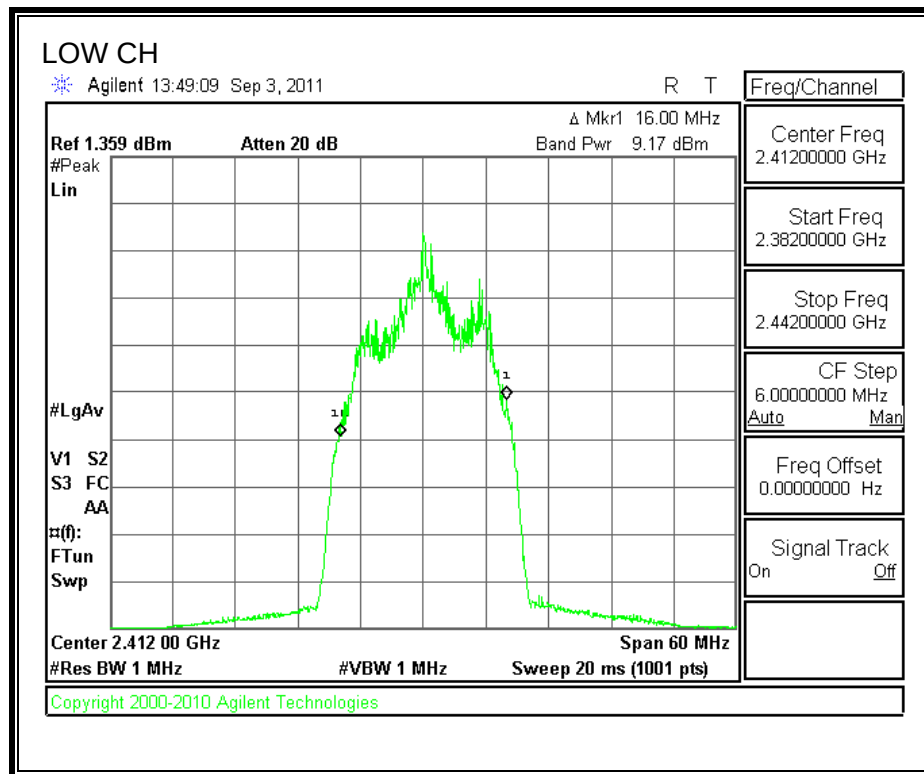
RESULTS

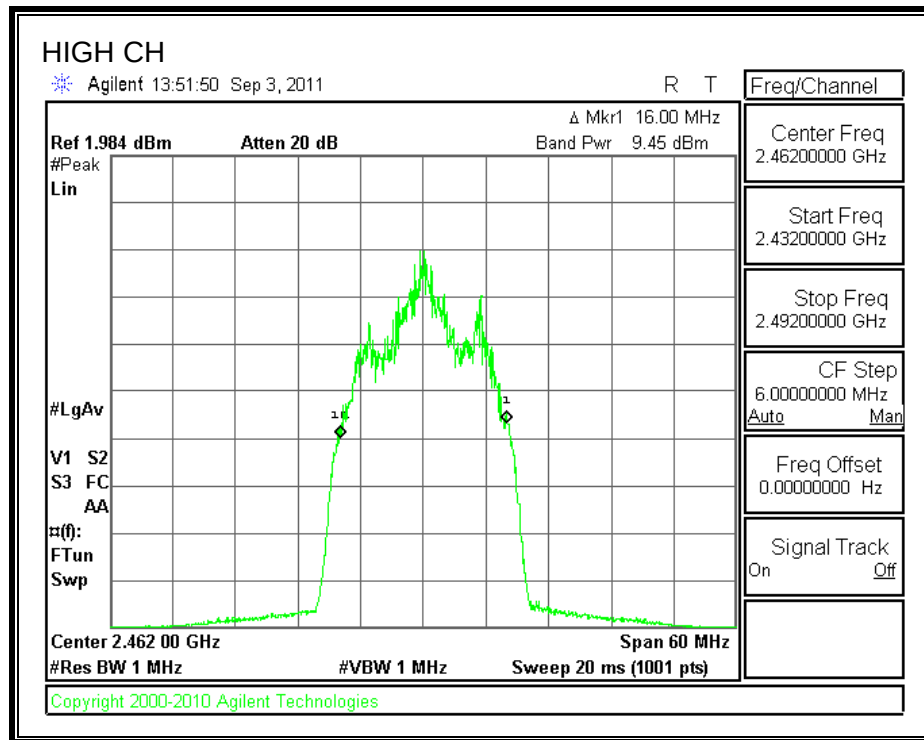
The cable assembly insertion loss of 10.8dB (including 10 dB pad and 0.8dB cable) was entered as an offset in the power meter to allow for direct reading of power.

OUTPUT POWER

Channel	Frequency (MHz)	Peak power Meter Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	9.17	10.8	19.97	30	-10.03
Middle	2437	9.70	10.8	20.50	30	-9.50
High	2462	9.45	10.8	20.25	30	-9.75

OUTPUT POWER





6.3.3. 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 10.8dB (including 10 dB pad and 0.8 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	11.90
Middle	2437	12.50
High	2462	12.20

6.3.4. 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.

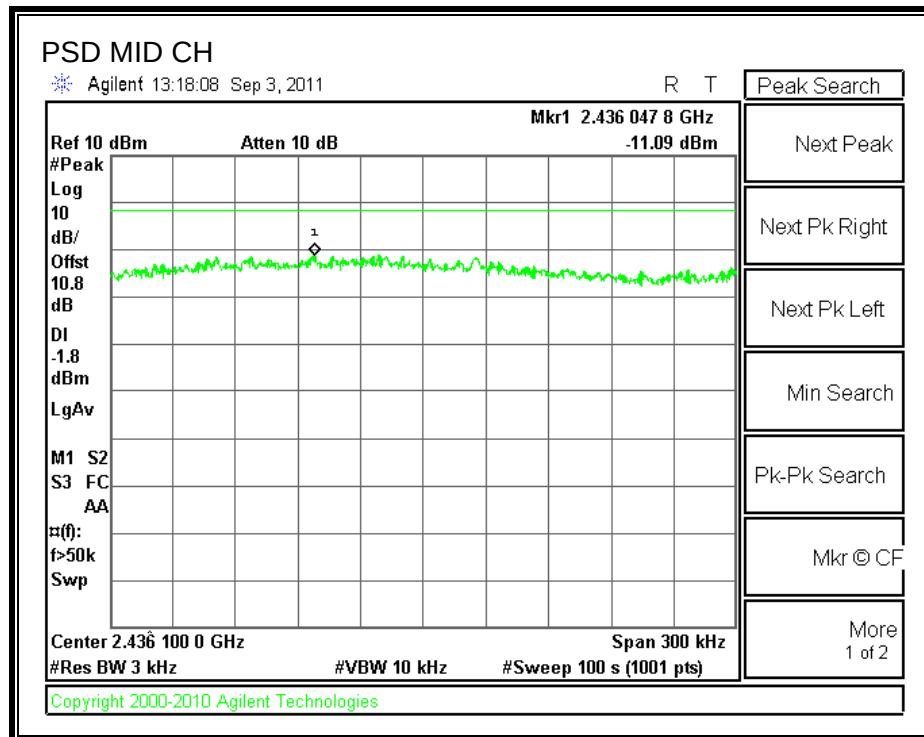
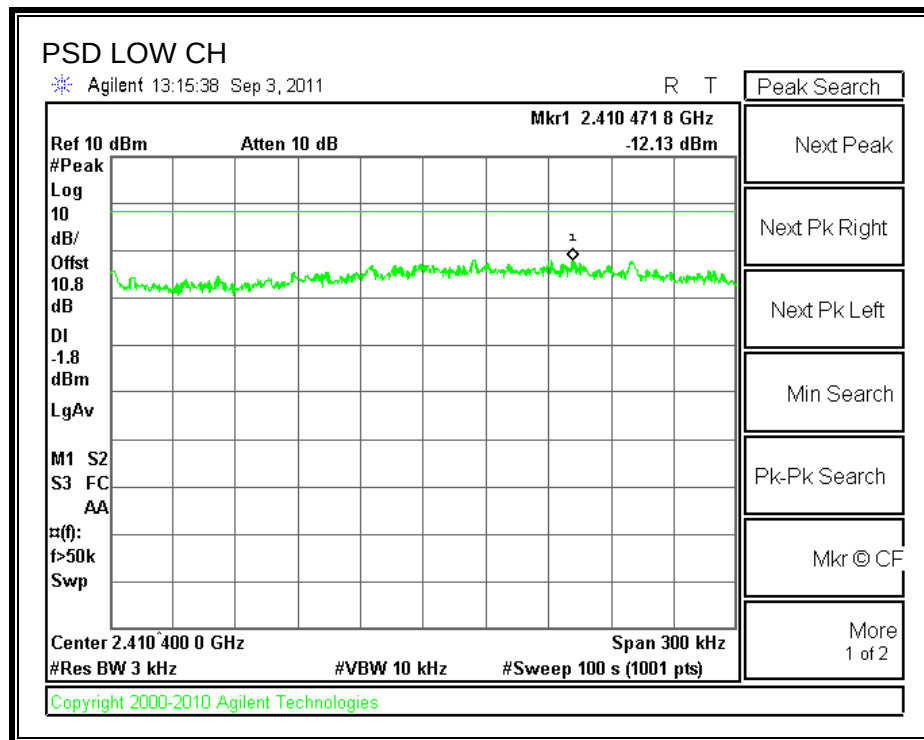
TEST PROCEDURE

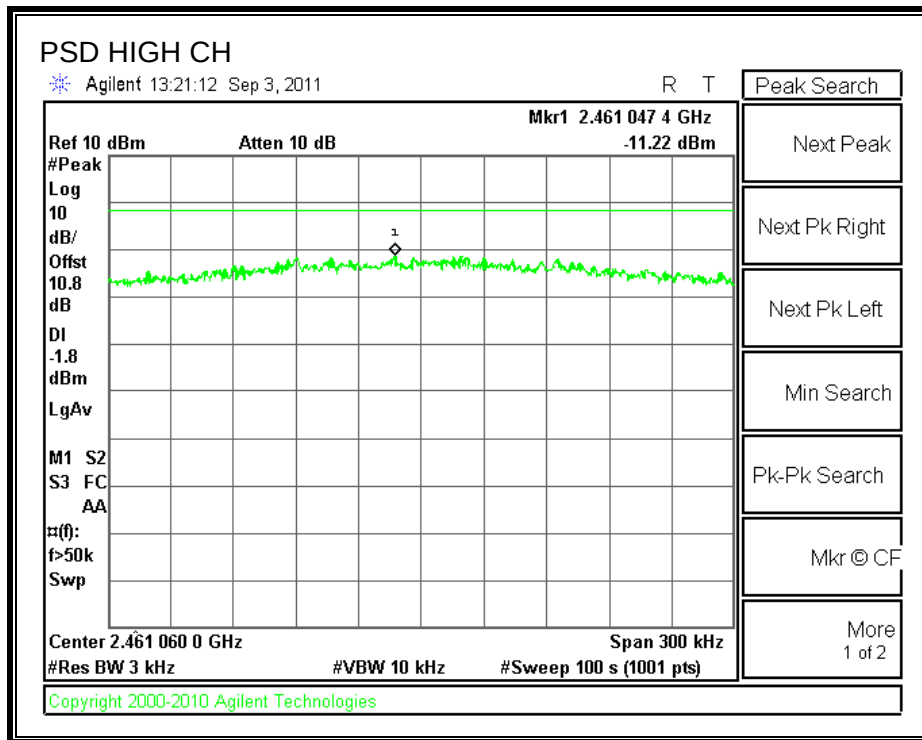
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-12.13	8	-20.13
Middle	2437	-11.09	8	-19.09
High	2462	-11.22	8	-19.22

POWER SPECTRAL DENSITY





6.3.5. 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.

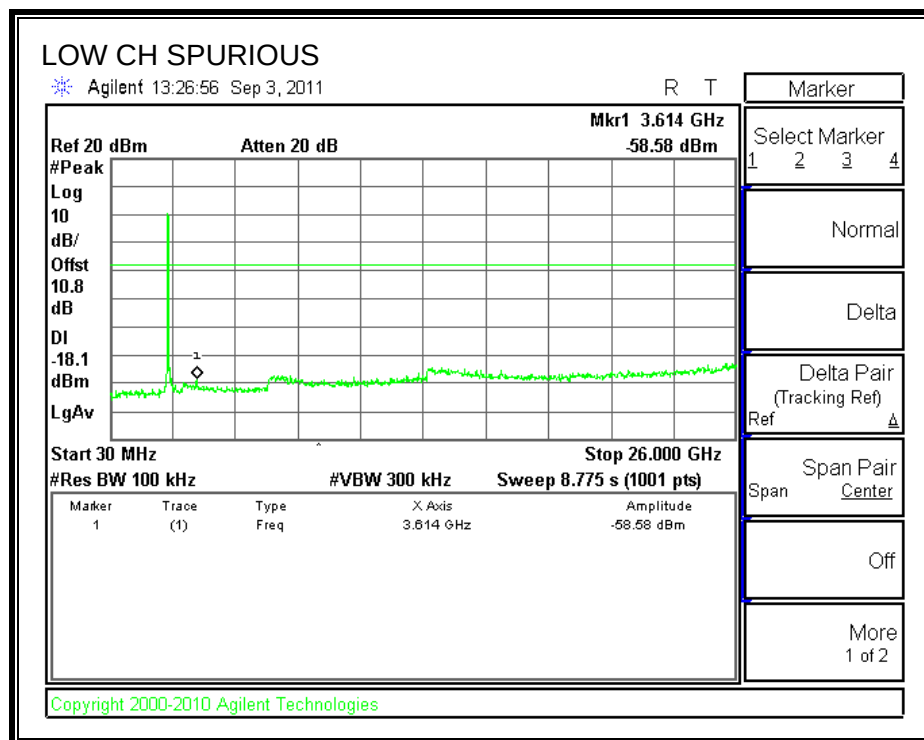
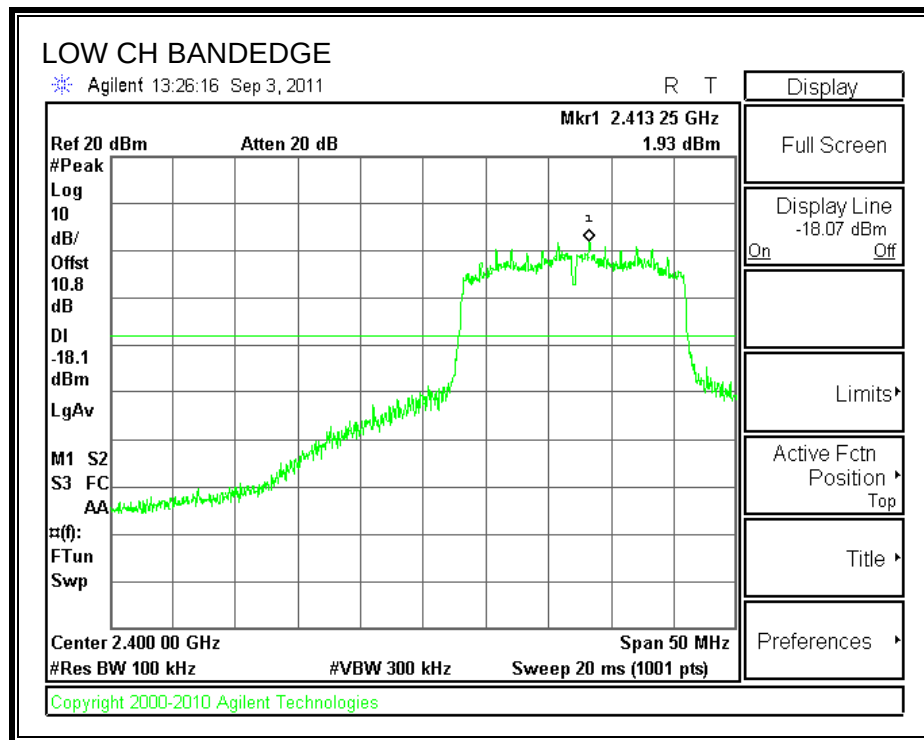
TEST PROCEDURE

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.

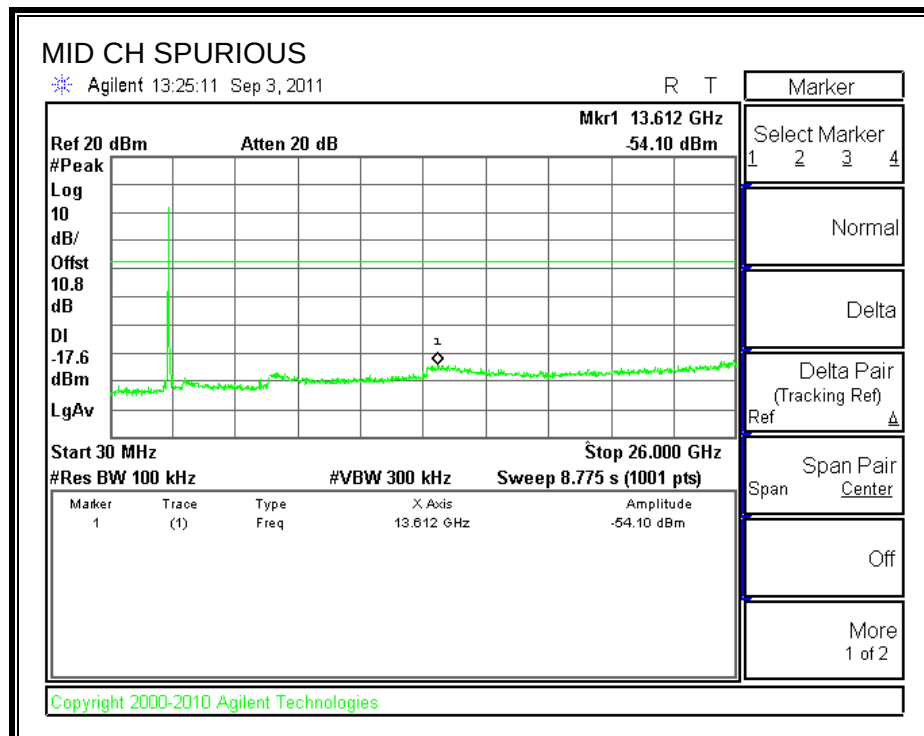
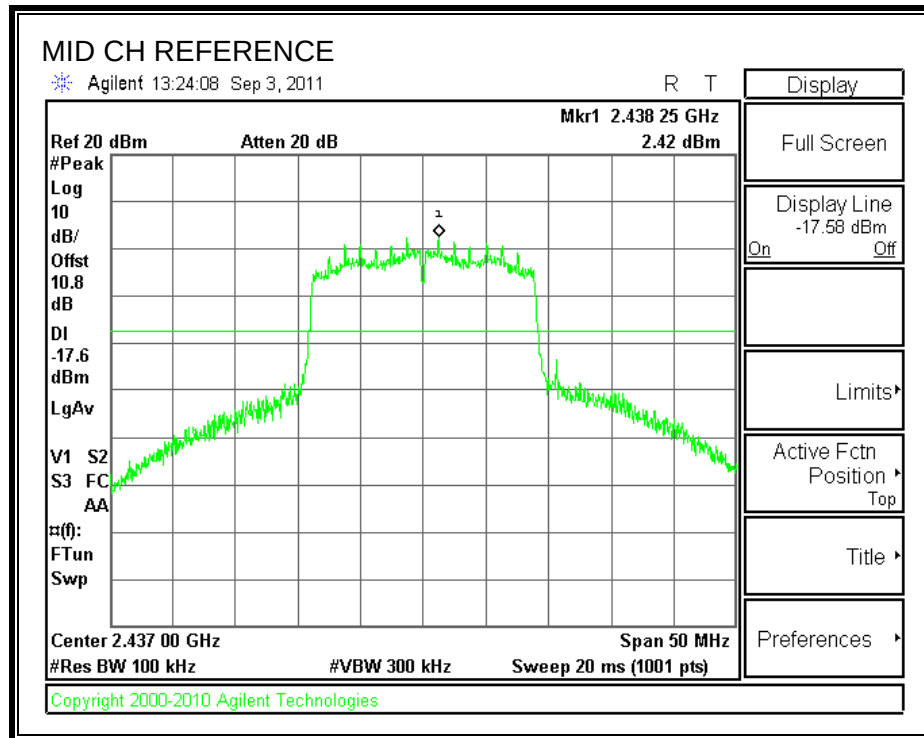
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

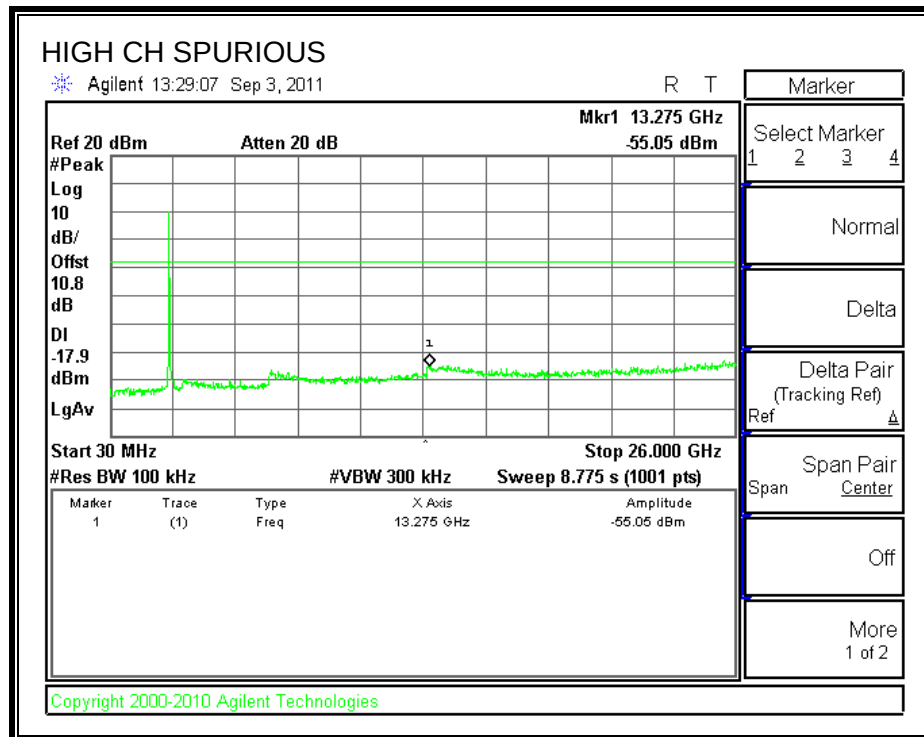
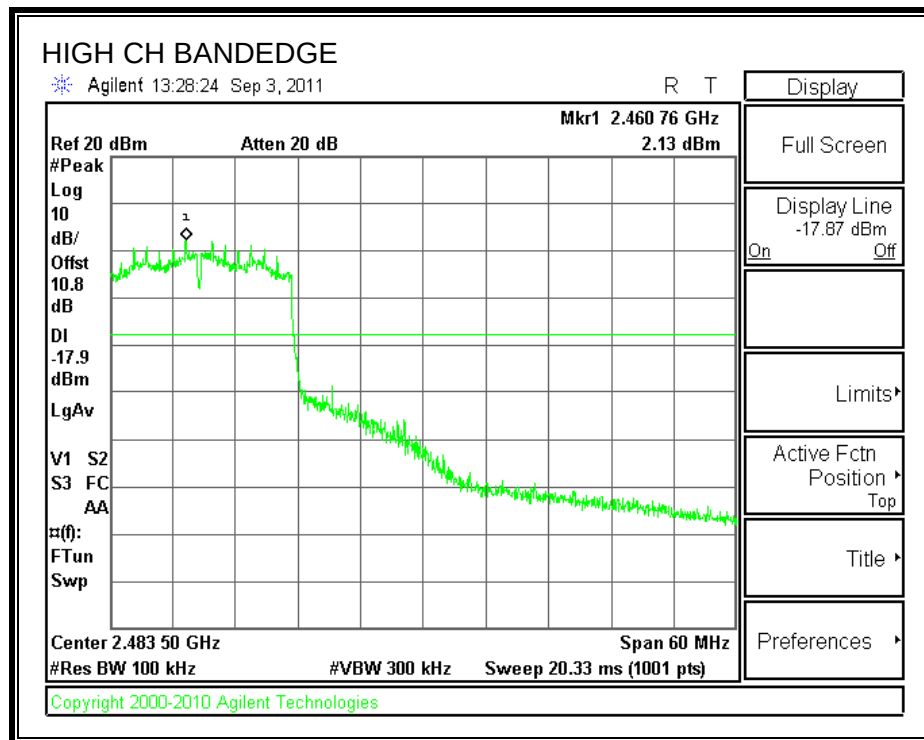
SPURIOUS EMISSIONS, LOW CHANNEL



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



7. RADIATED TEST RESULTS

7.1. 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.

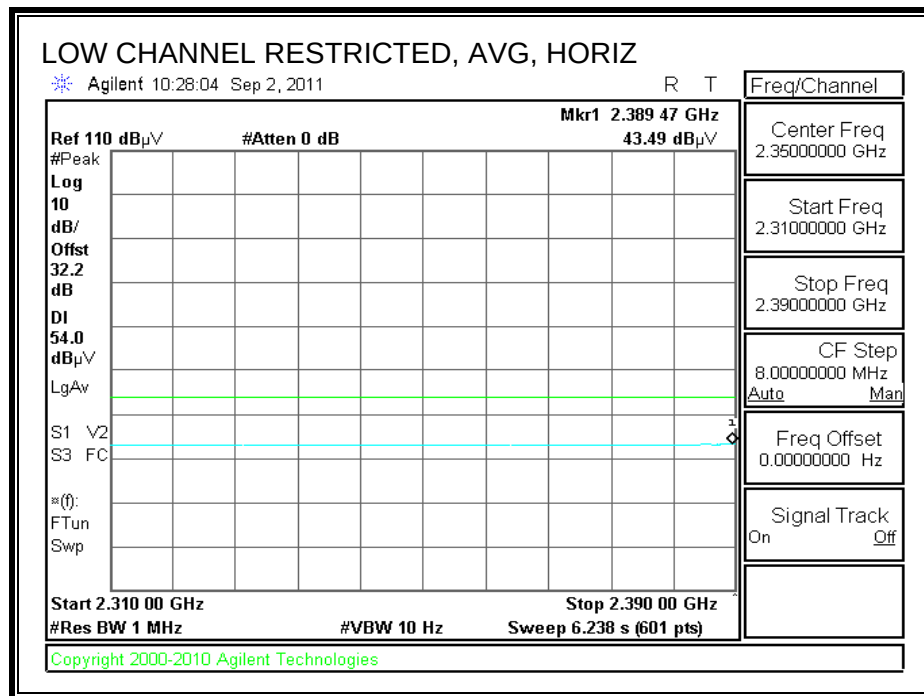
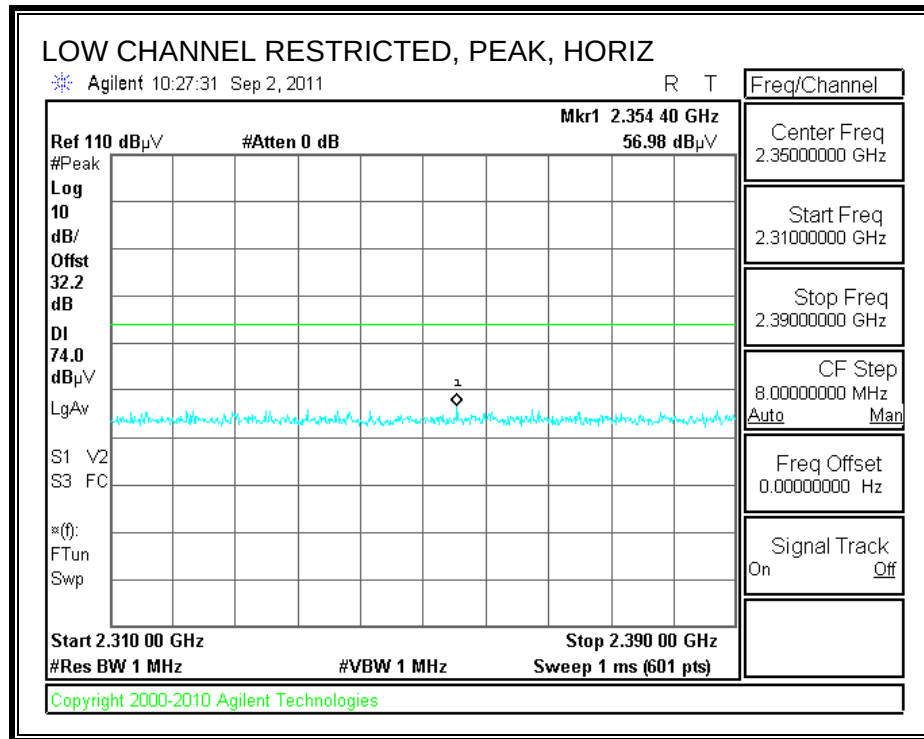
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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.

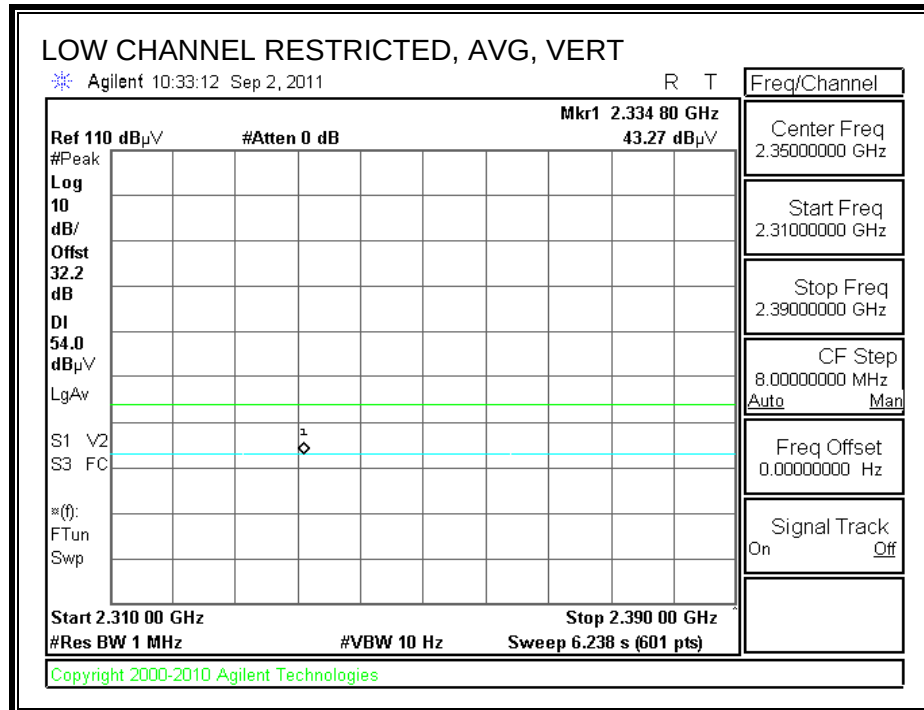
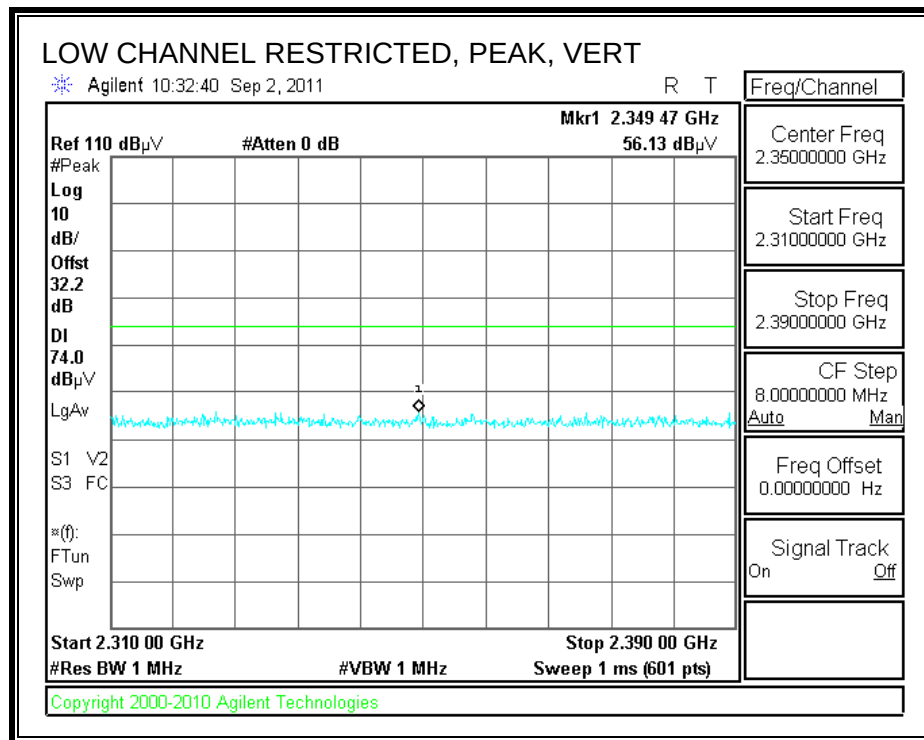
7.2. TRANSMITTER ABOVE 1 GHz FOR 2.4GHz BAND

7.2.1. FOR 802.11b MODE

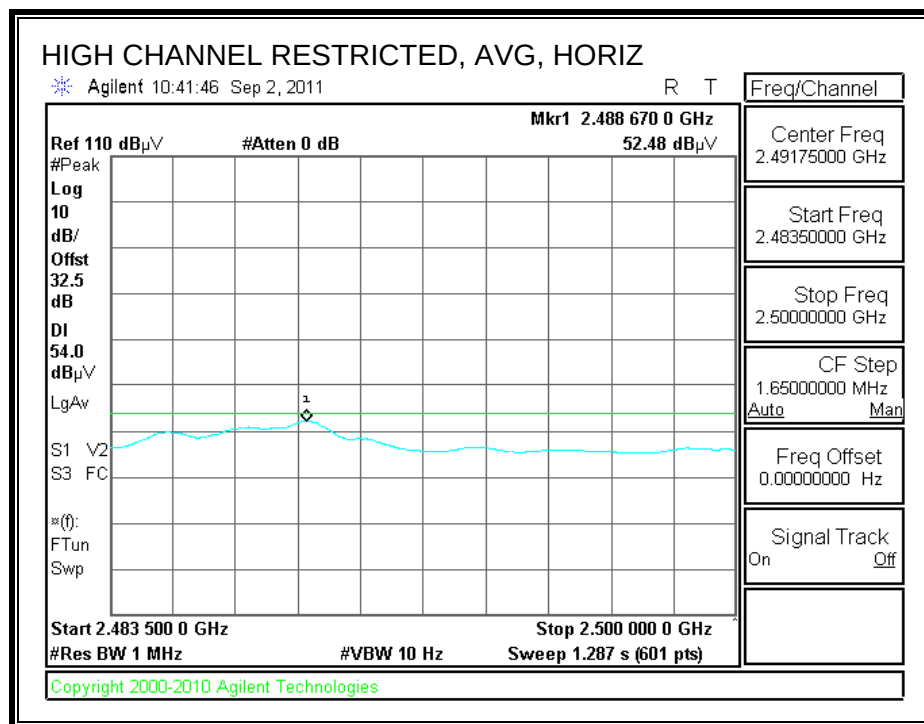
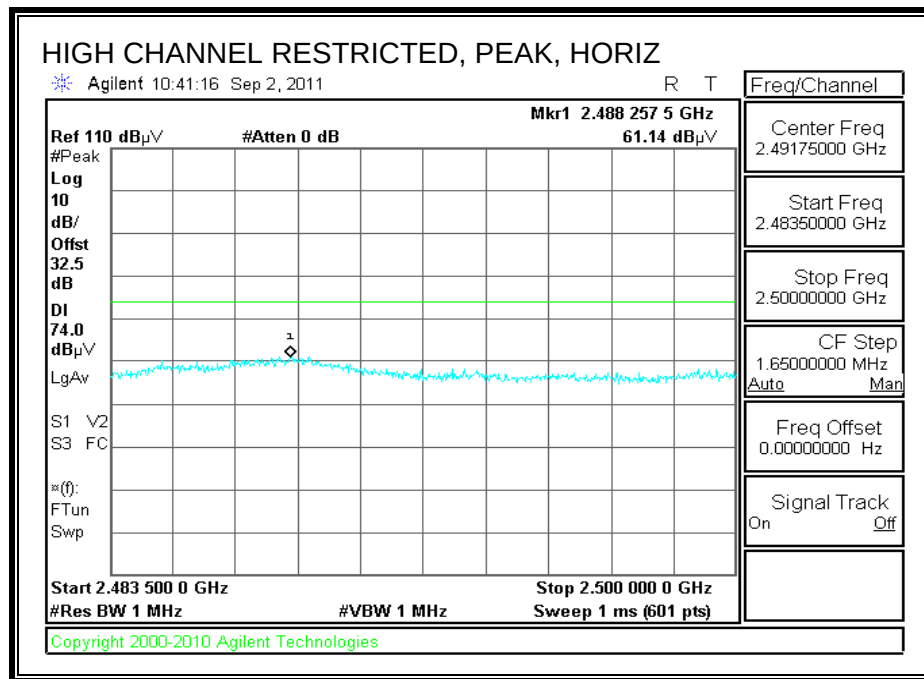
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



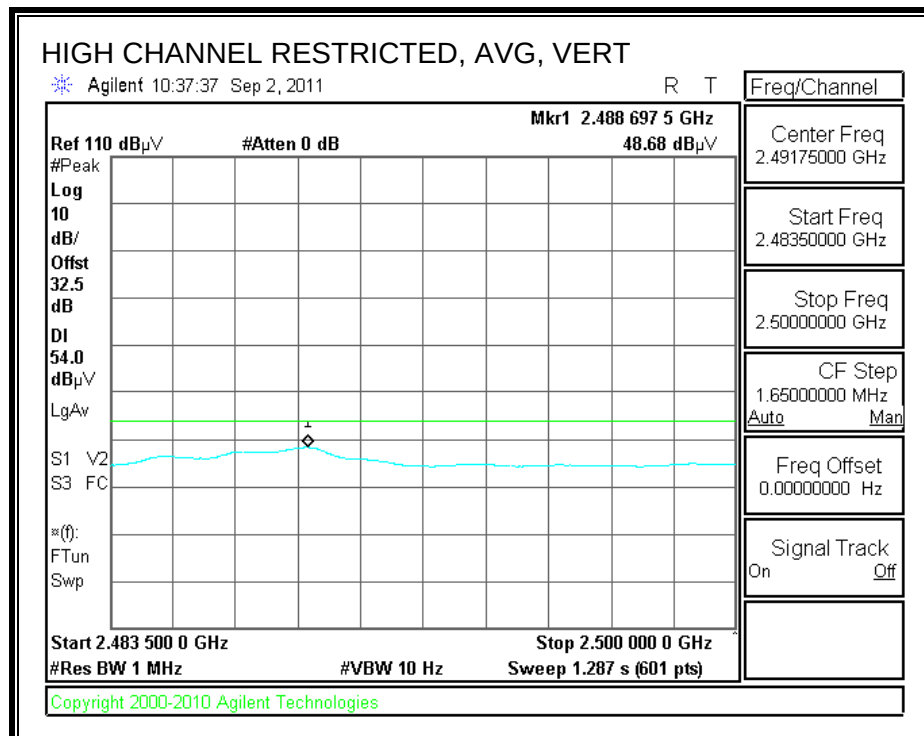
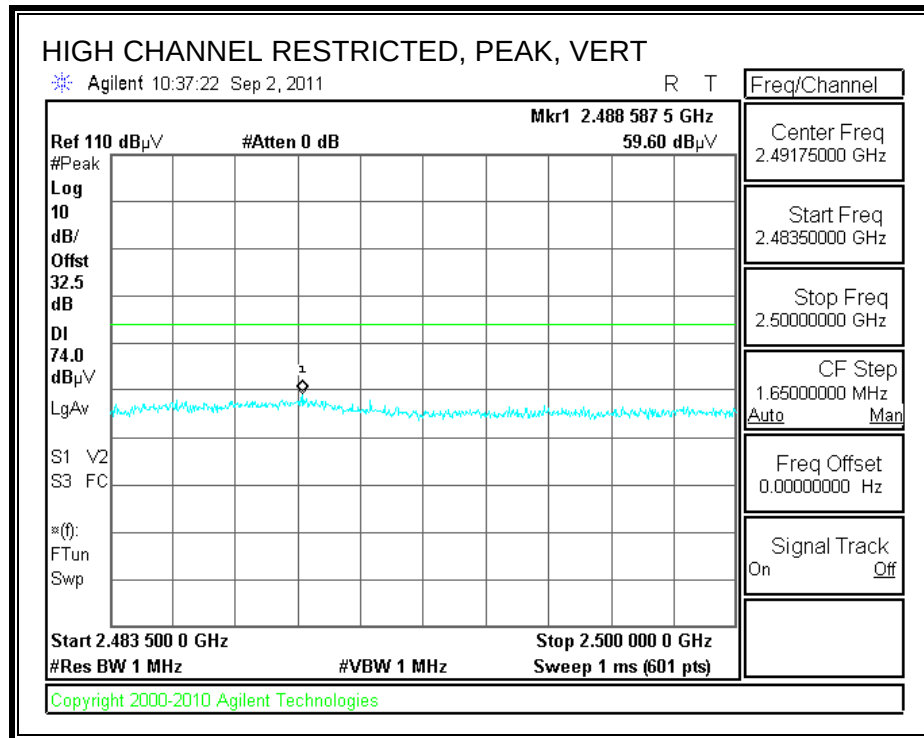
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

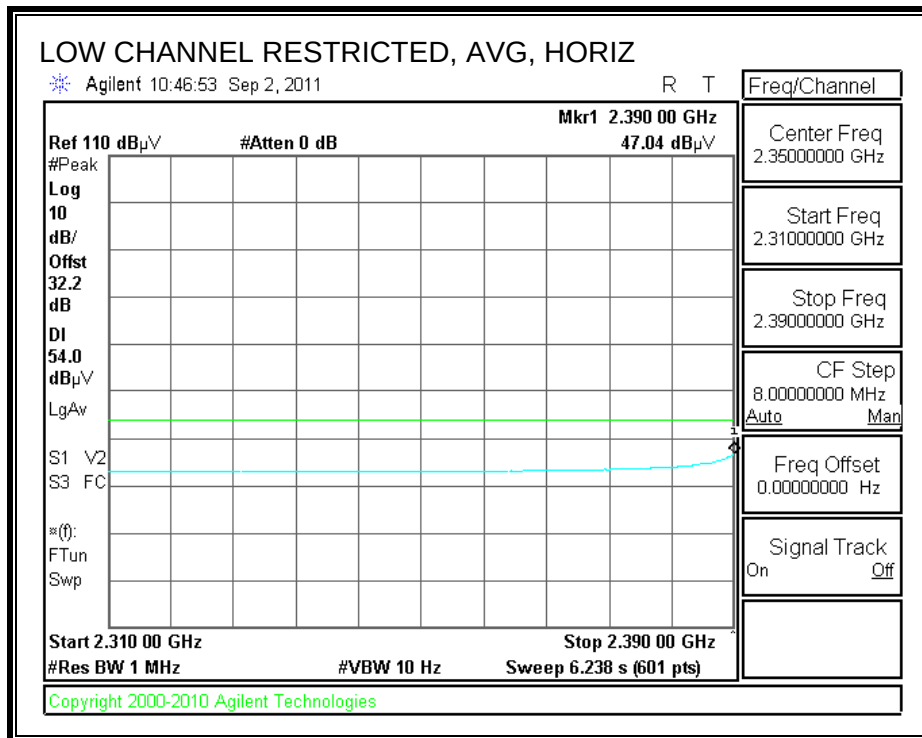
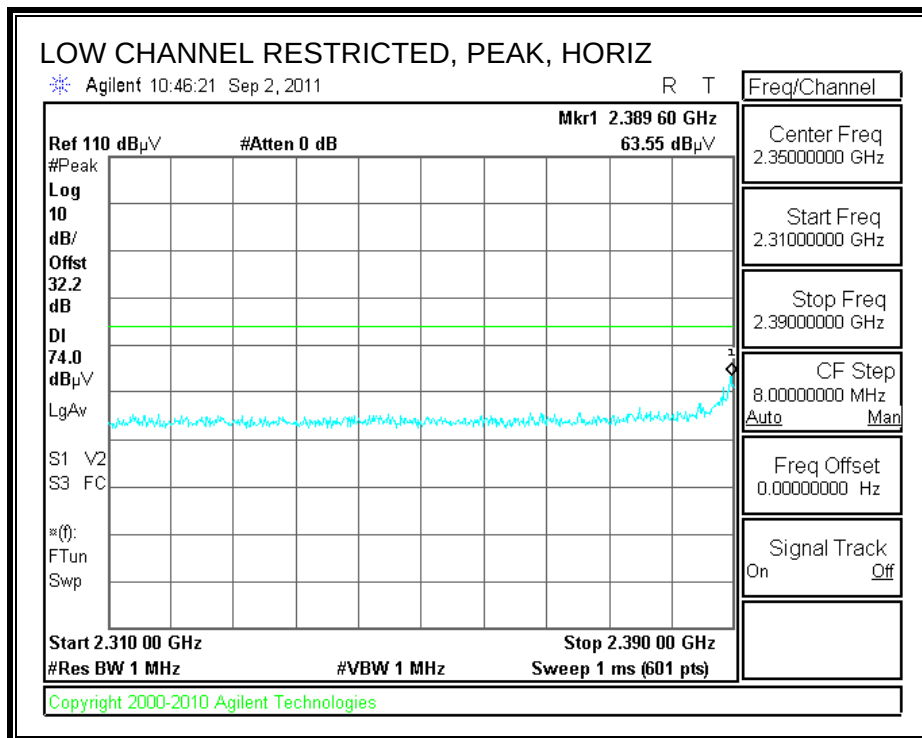


HARMONICS AND SPURIOUS EMISSIONS

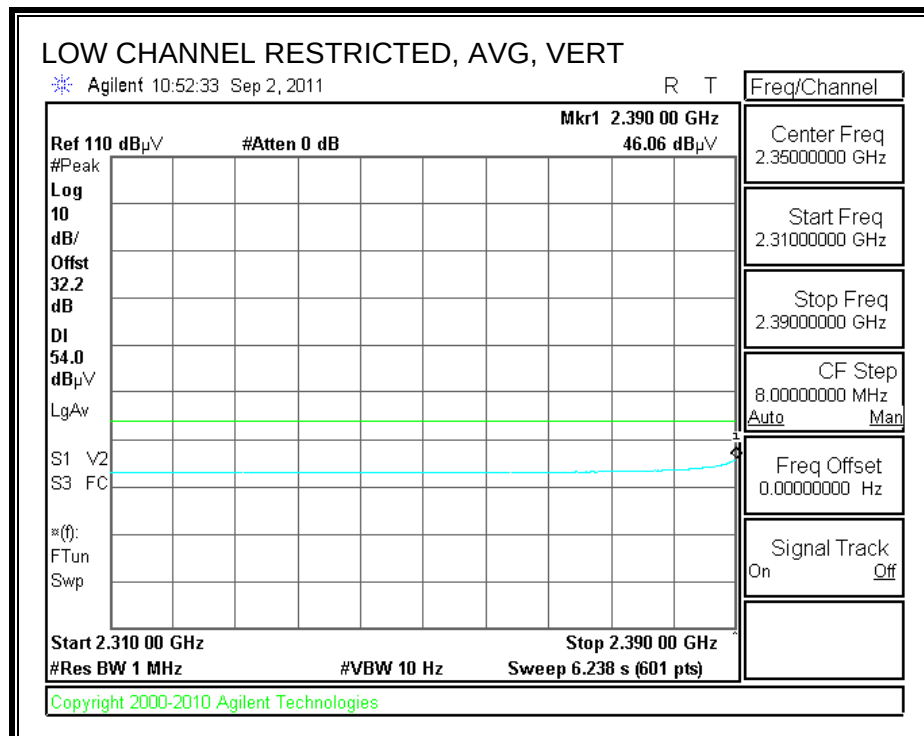
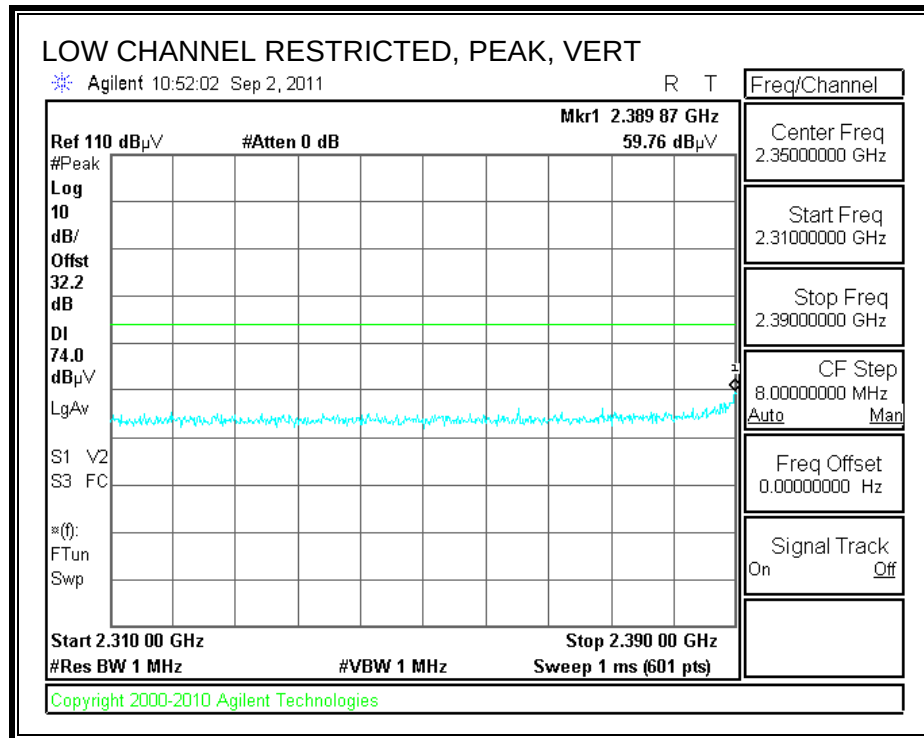
High Frequency Measurement																
Compliance Certification Services, Fremont 3m Chamber																
Company: Samsung																
Project #: 11I13983																
Date: 10/3/2011																
Test Engineer: David Garcia/Mark Nolting																
Configuration: EUT with adapter and headset																
Mode: TX, 11b																
Test Equipment:																
Horn 1-18GHz		Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz		Horn > 18GHz		Limit								
T60; S/N: 2238 @3m		T34 HP 8449B						FCC 15.205								
Hi Frequency Cables																
3' cable 22807700		12' cable 22807600		20' cable 22807500		HPF		Reject Filter		Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz						
3' cable 22807700		12' cable 22807600		20' cable 22807500		HPF_4.0GHz										
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr 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 ch: 2412MHz																
4.824	3.0	46.8	36.6	33.9	6.8	-34.1	0.0	0.6	54.0	43.8	74	54	-20.0	-10.2	H	
4.824	3.0	47.3	40.2	33.9	6.8	-34.1	0.0	0.6	54.5	47.4	74	54	-19.5	-6.6	V	
Mid ch: 2437MHz																
4.874	3.0	47.2	38.7	33.9	6.8	-34.0	0.0	0.6	54.6	46.0	74	54	-19.4	-8.0	H	
7.311	3.0	47.9	35.8	36.6	9.1	-33.1	0.0	0.6	61.1	49.0	74	54	-12.9	-5.0	H	
4.874	3.0	48.3	41.3	33.9	6.8	-34.0	0.0	0.6	55.6	48.7	74	54	-18.4	-5.3	V	
7.311	3.0	49.6	39.0	36.6	9.1	-33.1	0.0	0.6	62.8	52.2	74	54	-11.2	-1.8	V	
High ch: 2462MHz																
4.924	3.0	47.9	40.9	34.0	6.8	-34.0	0.0	0.6	55.4	48.3	74	54	-18.6	-5.7	H	
7.386	3.0	47.9	36.6	36.6	9.1	-33.1	0.0	0.6	61.2	50.0	74	54	-12.8	-4.0	H	
4.924	3.0	50.0	45.2	34.0	6.8	-34.0	0.0	0.6	57.4	52.7	74	54	-16.6	-1.3	V	
7.386	3.0	48.5	39.3	36.6	9.1	-33.1	0.0	0.6	61.8	52.6	74	54	-12.2	-1.4	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												

7.2.2. FOR 802.11g MODE

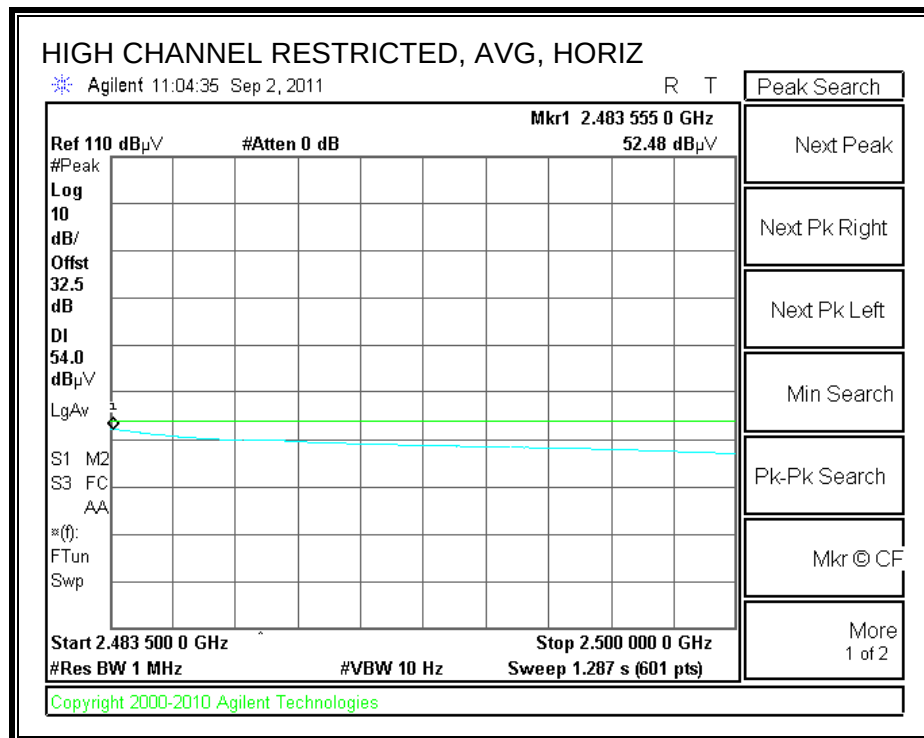
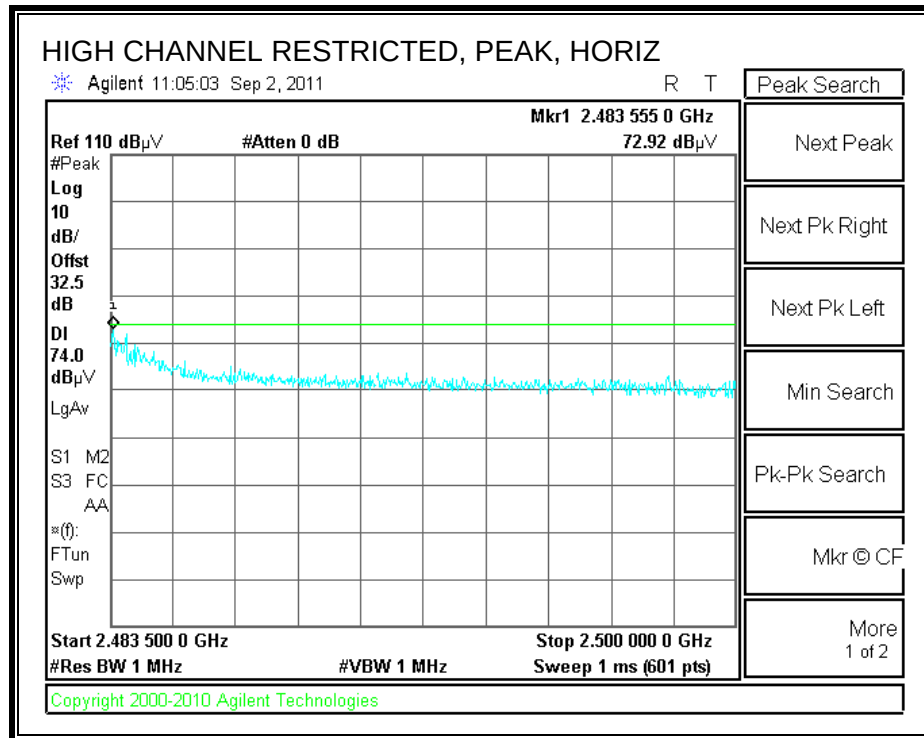
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



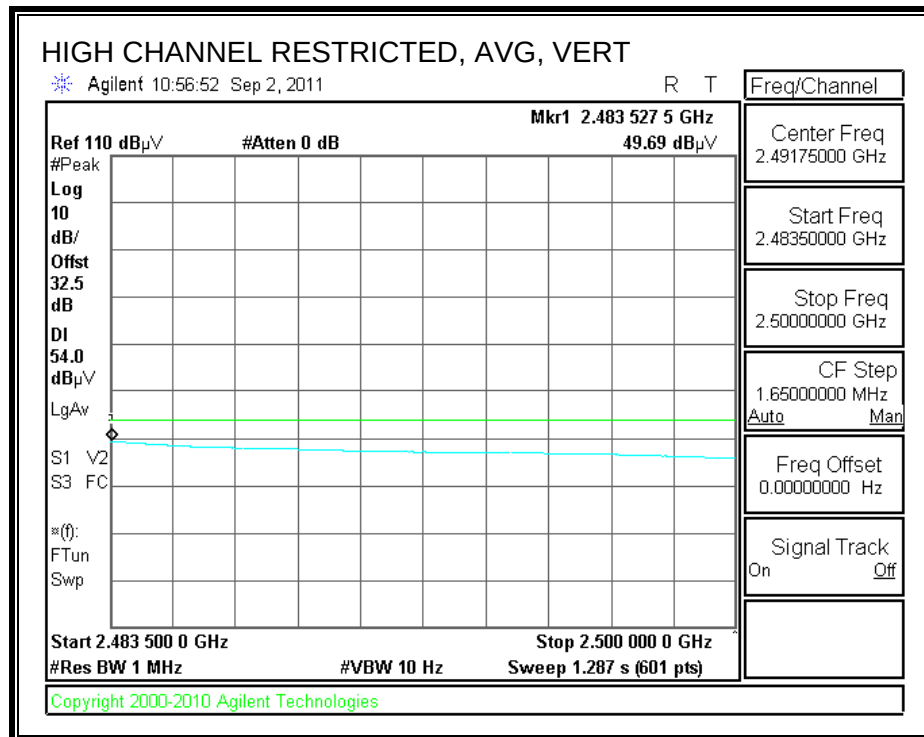
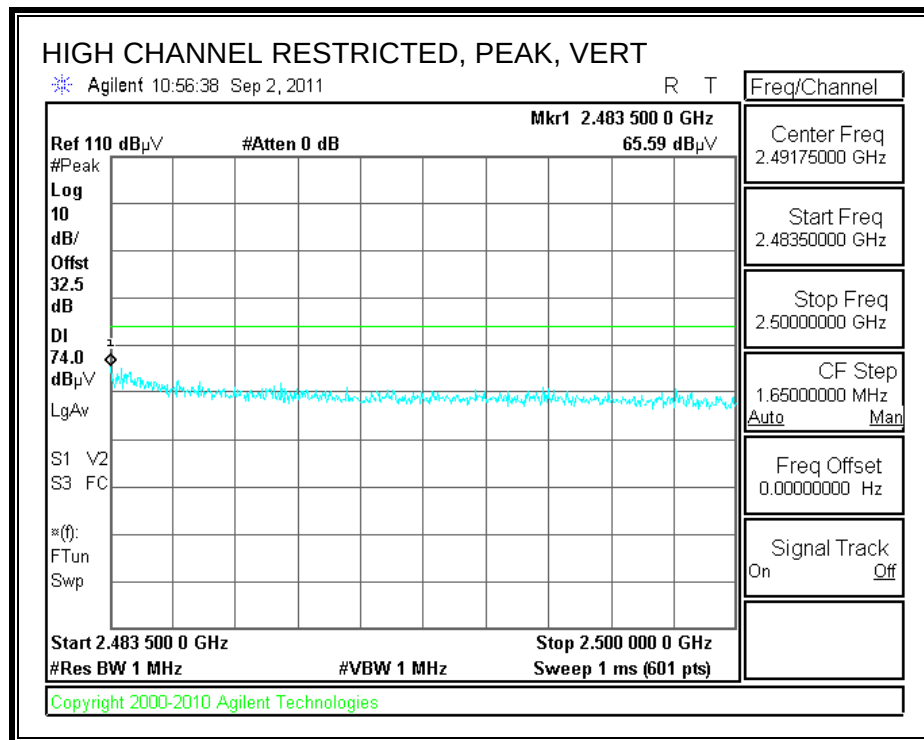
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement

Compliance Certification Services, Fremont 5m Chamber

Test Engr: Chin Pang
Date: 09-02-11
Project #: 11113983
Company: Samsung
Test Target: Fcc 15.247
Mode Oper: g mode, TX

f Measurement Frequency Amp Preamp Gain Average Field Strength Limit
Dist Distance to Antenna D Corr Distance Correct to 3 meters Peak Field Strength Limit
Read Analyzer Reading Avg Average Field Strength @ 3 m Margin vs. Average Limit
AF Antenna Factor Peak Calculated Peak Field Strength Margin vs. Peak Limit
CL Cable Loss HPF High Pass Filter

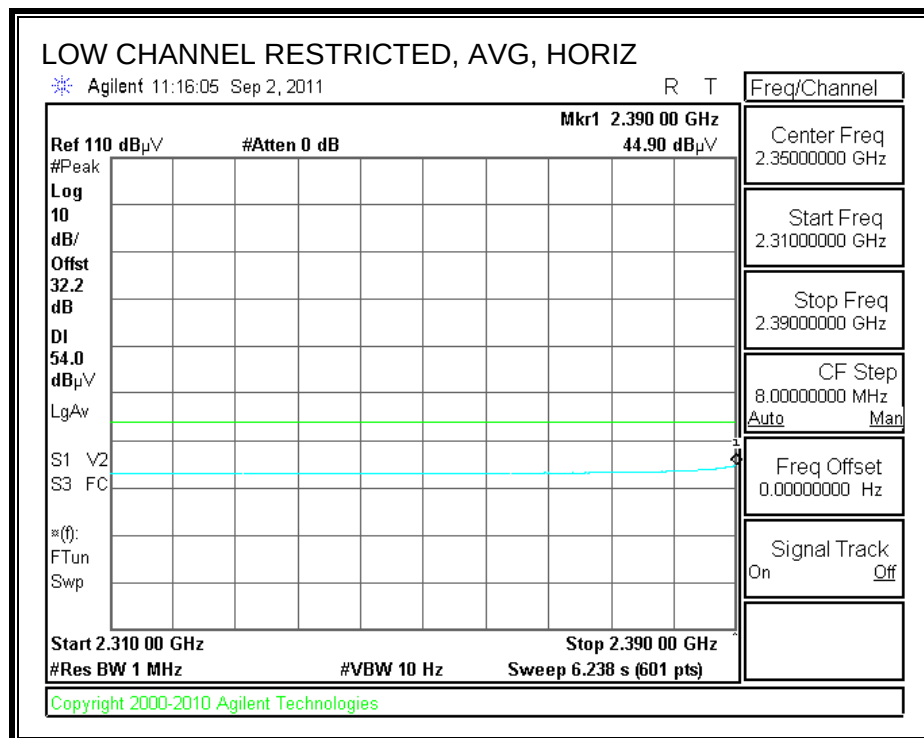
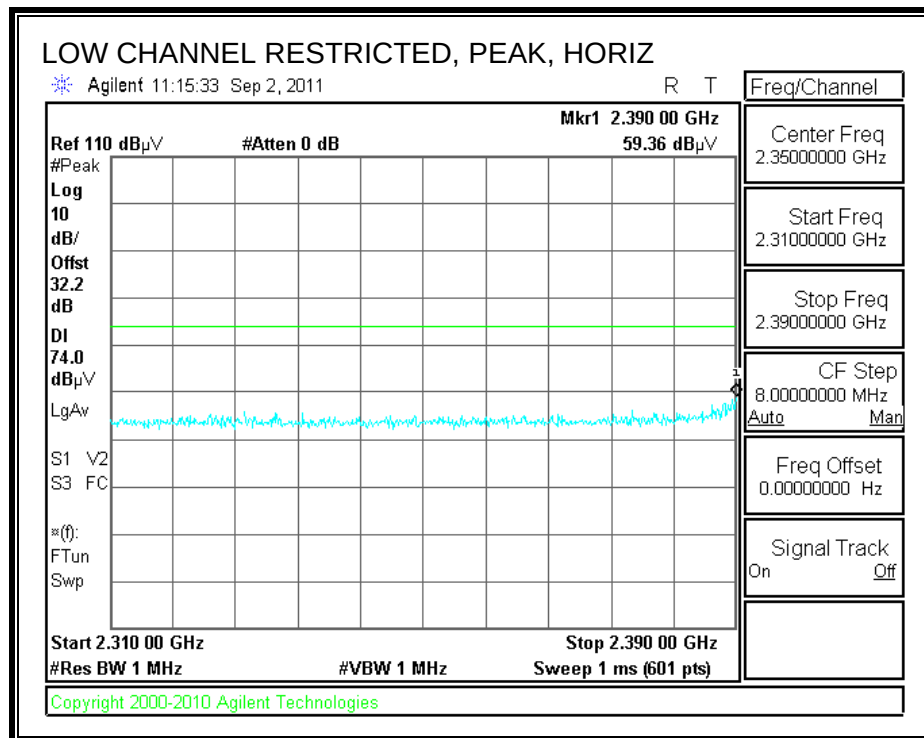
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fitr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol V/H	Det P/A/QP	Notes
Low Ch, 2412MHz													
4.824	3.0	58.0	33.2	6.3	-34.8	0.0	0.0	62.6	74.0	-11.4	H	P	
4.824	3.0	44.1	33.2	6.3	-34.8	0.0	0.0	48.8	54.0	-5.2	H	A	
4.824	3.0	62.0	33.2	6.3	-34.8	0.0	0.0	66.6	74.0	-7.4	V	P	
4.824	3.0	48.3	33.2	6.3	-34.8	0.0	0.0	52.9	54.0	-1.1	V	A	
Mid Ch, 2437MHz													
4.874	3.0	58.9	33.2	6.3	-34.8	0.0	0.0	63.6	74.0	-10.4	H	P	
4.874	3.0	44.8	33.2	6.3	-34.8	0.0	0.0	49.6	54.0	-4.4	H	A	
7.311	3.0	55.3	36.2	8.5	-34.9	0.0	0.0	65.0	74.0	-9.0	H	P	
7.311	3.0	41.1	36.2	8.5	-34.9	0.0	0.0	50.9	54.0	-3.1	H	A	
4.874	3.0	61.6	33.2	6.3	-34.8	0.0	0.0	66.4	74.0	-7.6	V	P	
4.874	3.0	48.3	33.2	6.3	-34.8	0.0	0.0	53.1	54.0	-0.9	V	A	
7.311	3.0	50.2	36.2	8.5	-34.9	0.0	0.0	59.9	74.0	-14.1	V	P	
7.311	3.0	36.0	36.2	8.5	-34.9	0.0	0.0	45.7	54.0	-8.3	V	A	
High Ch, 2462MHz													
4.924	3.0	60.9	33.3	6.3	-34.8	0.0	0.0	65.7	74.0	-8.3	H	P	
4.924	3.0	45.6	33.3	6.3	-34.8	0.0	0.0	50.5	54.0	-3.5	H	A	
7.386	3.0	57.3	36.3	8.5	-34.9	0.0	0.0	67.2	74.0	-6.8	H	P	
7.386	3.0	42.9	36.3	8.5	-34.9	0.0	0.0	52.7	54.0	-1.3	H	A	
4.924	3.0	62.2	33.3	6.3	-34.8	0.0	0.0	67.0	74.0	-7.0	V	P	
4.924	3.0	46.8	33.3	6.3	-34.8	0.0	0.0	51.6	54.0	-2.4	V	A	
7.386	3.0	55.5	36.3	8.5	-34.9	0.0	0.0	65.4	74.0	-8.6	V	P	
7.386	3.0	39.8	36.3	8.5	-34.9	0.0	0.0	49.7	54.0	-4.3	V	A	

Rev. 4.1.2.7

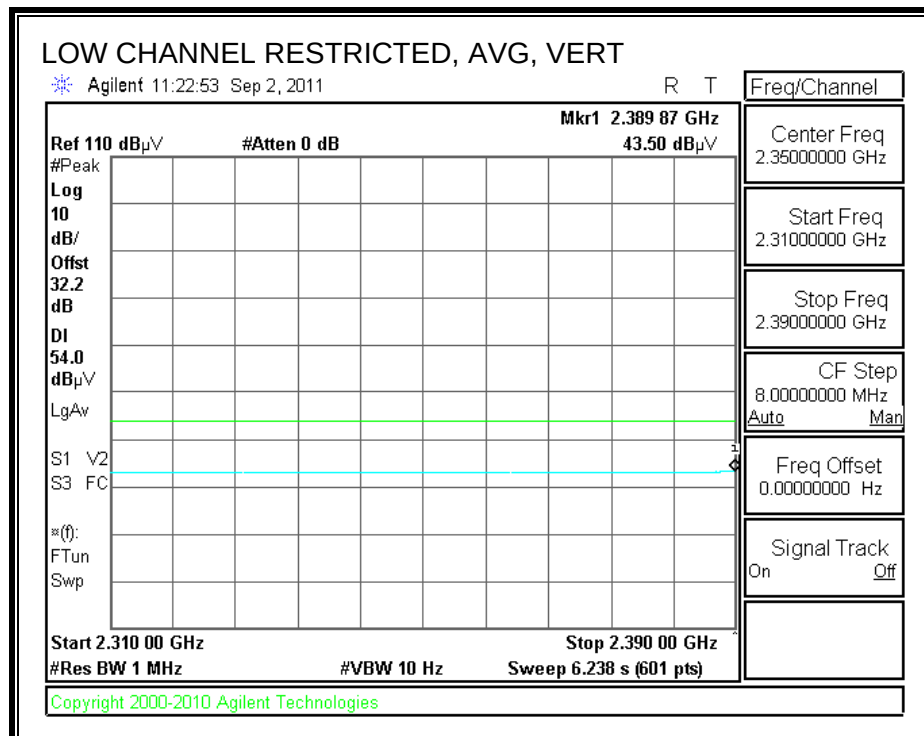
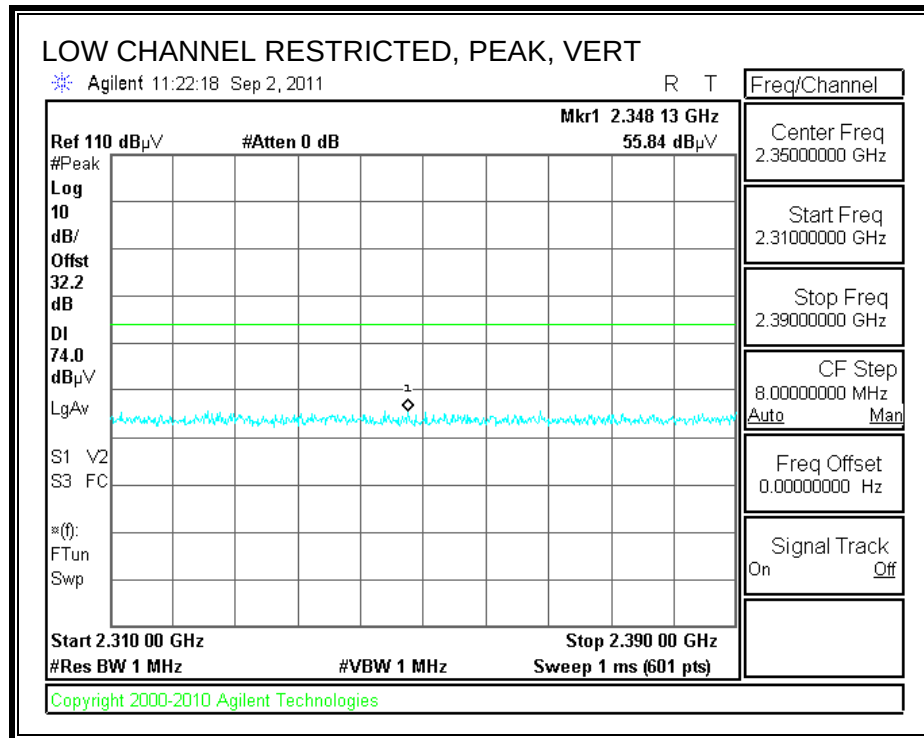
Note: No other emissions were detected above the system noise floor.

7.2.3. FOR 802.11n HT20 SISO MODE

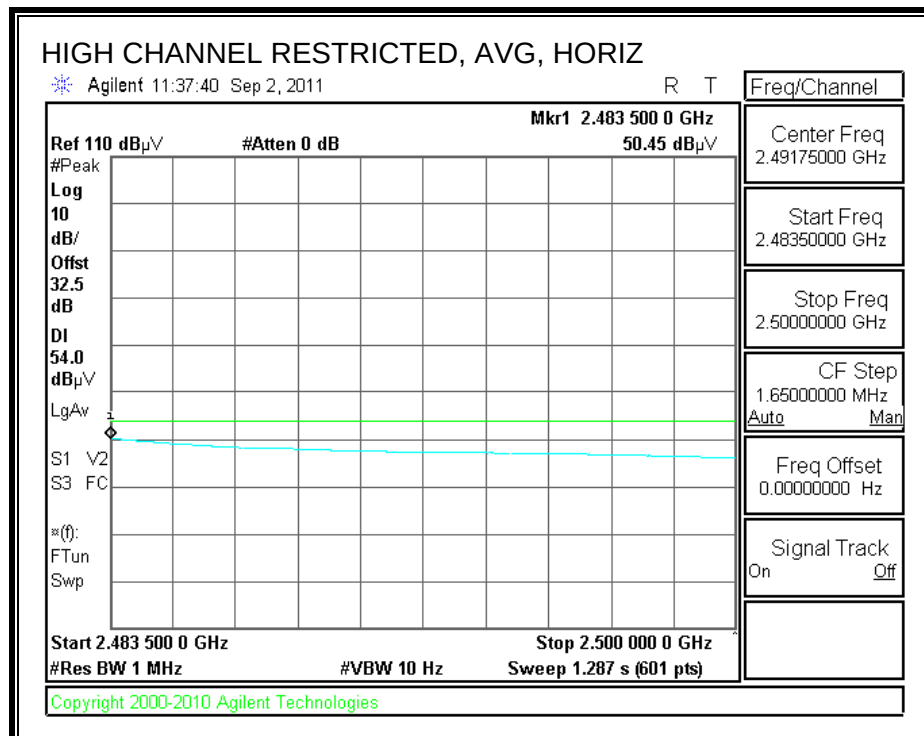
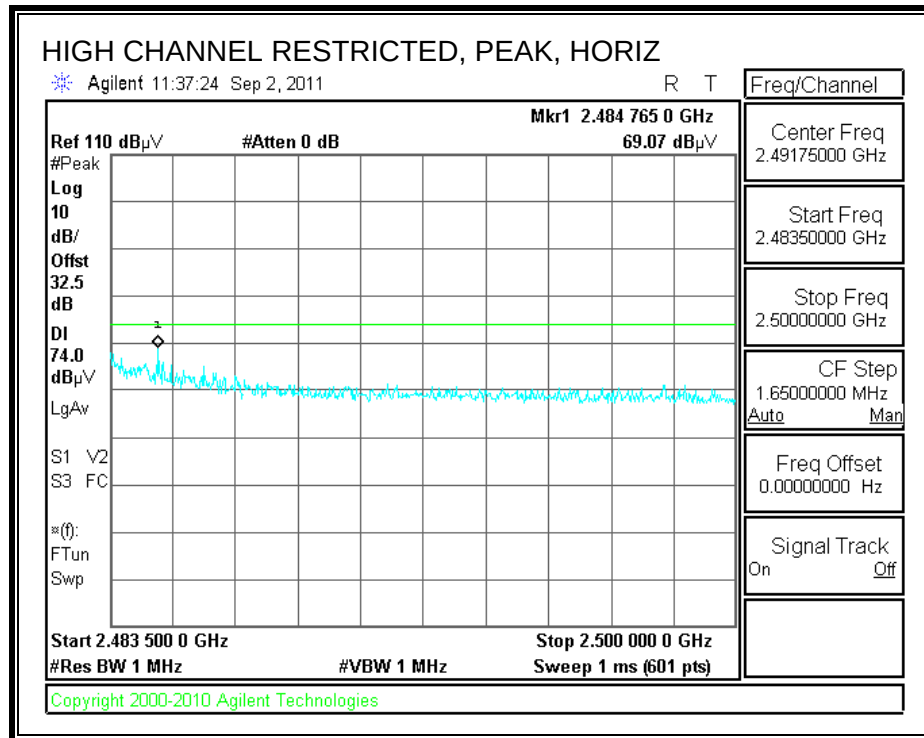
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



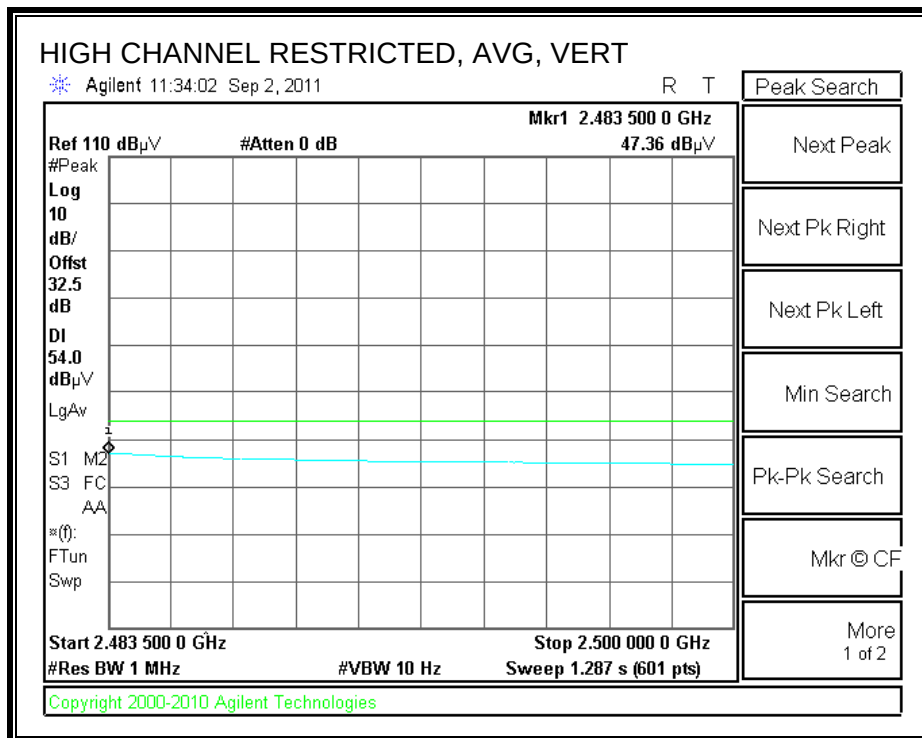
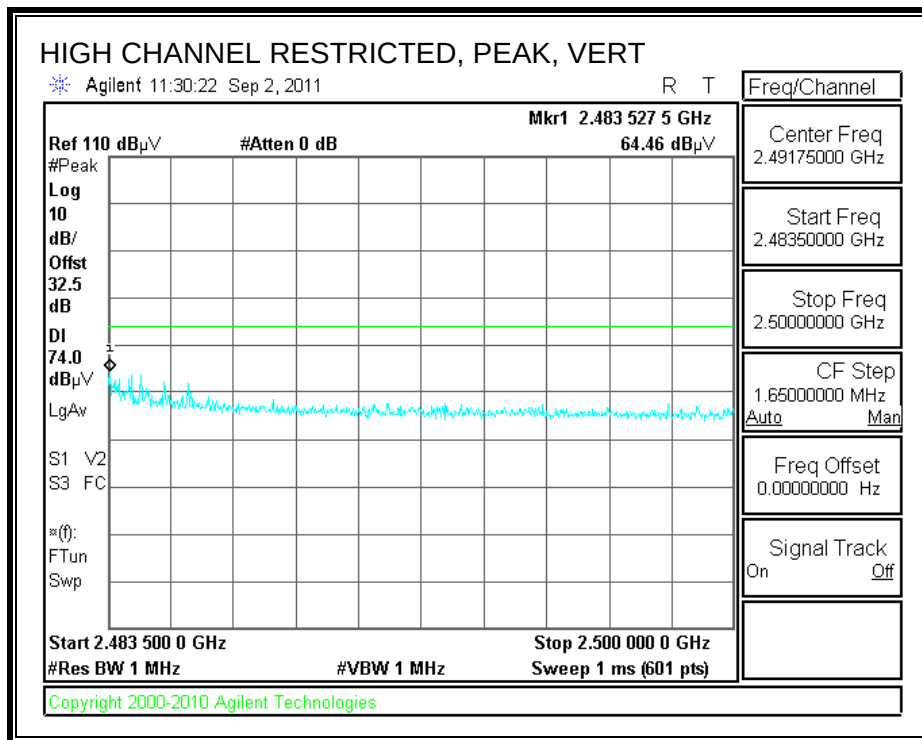
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber

Test Engr: Chin Pang
Date: 09-02-11
Project #: 11113983
Company: Samsung
Test Target: FCC 15.247
Mode Oper: HT20, TX

f Measurement Frequency Amp Preamp Gain Average Field Strength Limit
Dist Distance to Antenna D Corr Distance Correct to 3 meters Peak Field Strength Limit
Read Analyzer Reading Avg Average Field Strength @ 3 m Margin vs. Average Limit
AF Antenna Factor Peak Calculated Peak Field Strength Margin vs. Peak Limit
CL Cable Loss HPF High Pass Filter

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fitr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Low Ch, 2412MHz													
4.824	3.0	54.4	33.2	6.3	-34.8	0.0	0.0	59.1	74.0	-14.9	H	P	
4.824	3.0	40.0	33.2	6.3	-34.8	0.0	0.0	44.7	54.0	-9.3	H	A	
4.824	3.0	60.3	33.2	6.3	-34.8	0.0	0.0	64.9	74.0	-9.1	V	P	
4.824	3.0	45.7	33.2	6.3	-34.8	0.0	0.0	50.4	54.0	-3.6	V	A	
Mid Ch, 2437MHz													
4.874	3.0	55.6	33.2	6.3	-34.8	0.0	0.0	60.3	74.0	-13.7	H	P	
4.874	3.0	42.5	33.2	6.3	-34.8	0.0	0.0	47.2	54.0	-6.8	H	A	
7.311	3.0	50.8	36.2	8.5	-34.9	0.0	0.0	60.6	74.0	-13.4	H	P	
7.311	3.0	36.0	36.2	8.5	-34.9	0.0	0.0	45.7	54.0	-8.3	H	A	
4.874	3.0	60.6	33.2	6.3	-34.8	0.0	0.0	65.3	74.0	-8.7	V	P	
4.874	3.0	46.1	33.2	6.3	-34.8	0.0	0.0	50.8	54.0	-3.2	V	A	
7.311	3.0	47.7	36.2	8.5	-34.9	0.0	0.0	57.4	74.0	-16.6	V	P	
7.311	3.0	34.0	36.2	8.5	-34.9	0.0	0.0	43.8	54.0	-10.2	V	A	
High Ch, 2460MHz													
4.924	3.0	58.9	33.3	6.3	-34.8	0.0	0.0	63.7	74.0	-10.3	H	P	
4.924	3.0	45.1	33.3	6.3	-34.8	0.0	0.0	50.0	54.0	-4.0	H	A	
7.386	3.0	54.9	36.3	8.5	-34.9	0.0	0.0	64.7	74.0	-9.3	H	P	
7.386	3.0	40.2	36.3	8.5	-34.9	0.0	0.0	50.1	54.0	-3.9	H	A	
4.924	3.0	60.7	33.3	6.3	-34.8	0.0	0.0	65.5	74.0	-8.5	V	P	
4.924	3.0	46.2	33.3	6.3	-34.8	0.0	0.0	51.1	54.0	-2.9	V	A	
7.386	3.0	51.7	36.3	8.5	-34.9	0.0	0.0	61.6	74.0	-12.4	V	P	
7.386	3.0	37.2	36.3	8.5	-34.9	0.0	0.0	47.1	54.0	-6.9	V	A	

Rev. 4.1.2.7

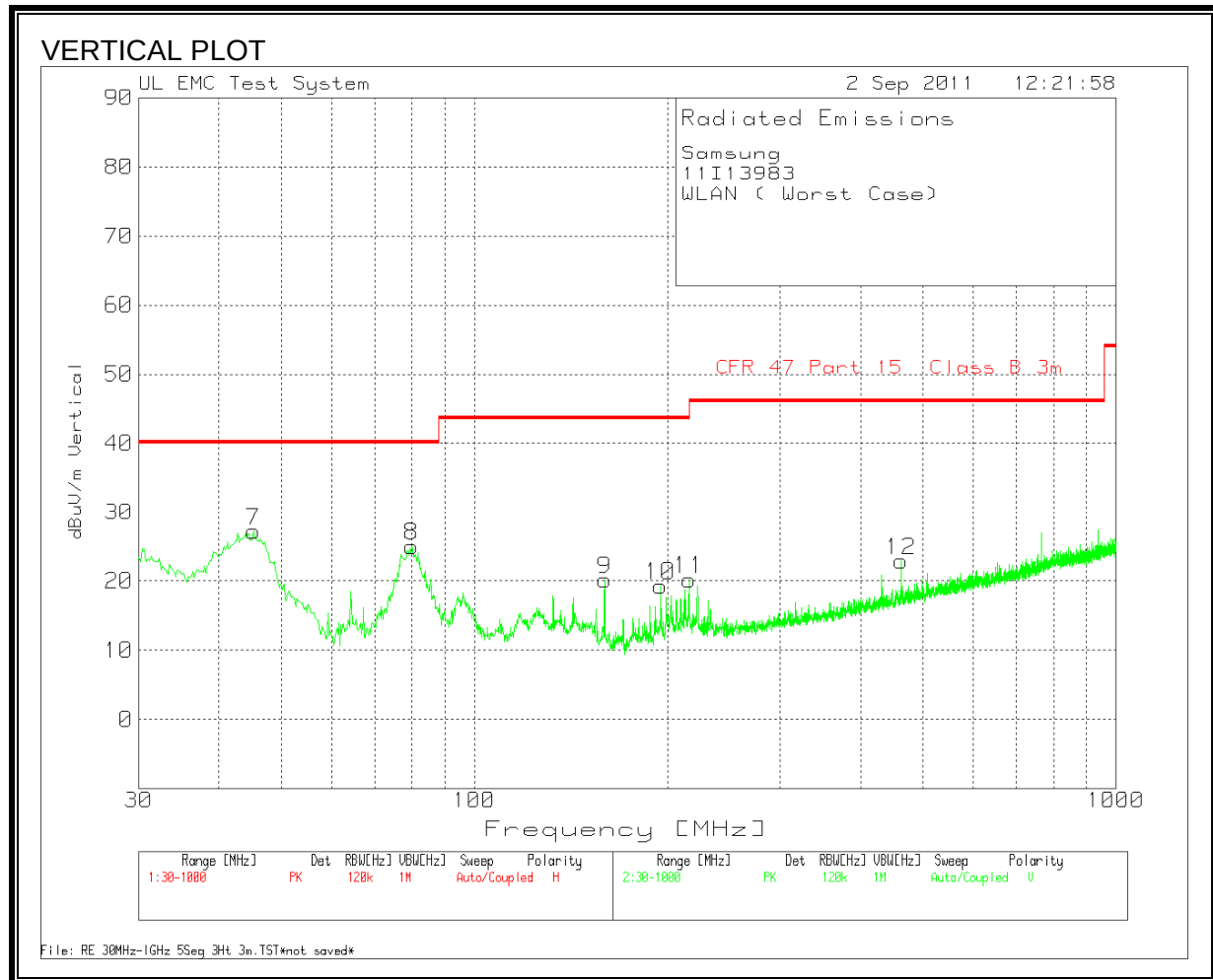
Note: No other emissions were detected above the system noise floor.

7.3. WORST-CASE BELOW 1 GHz

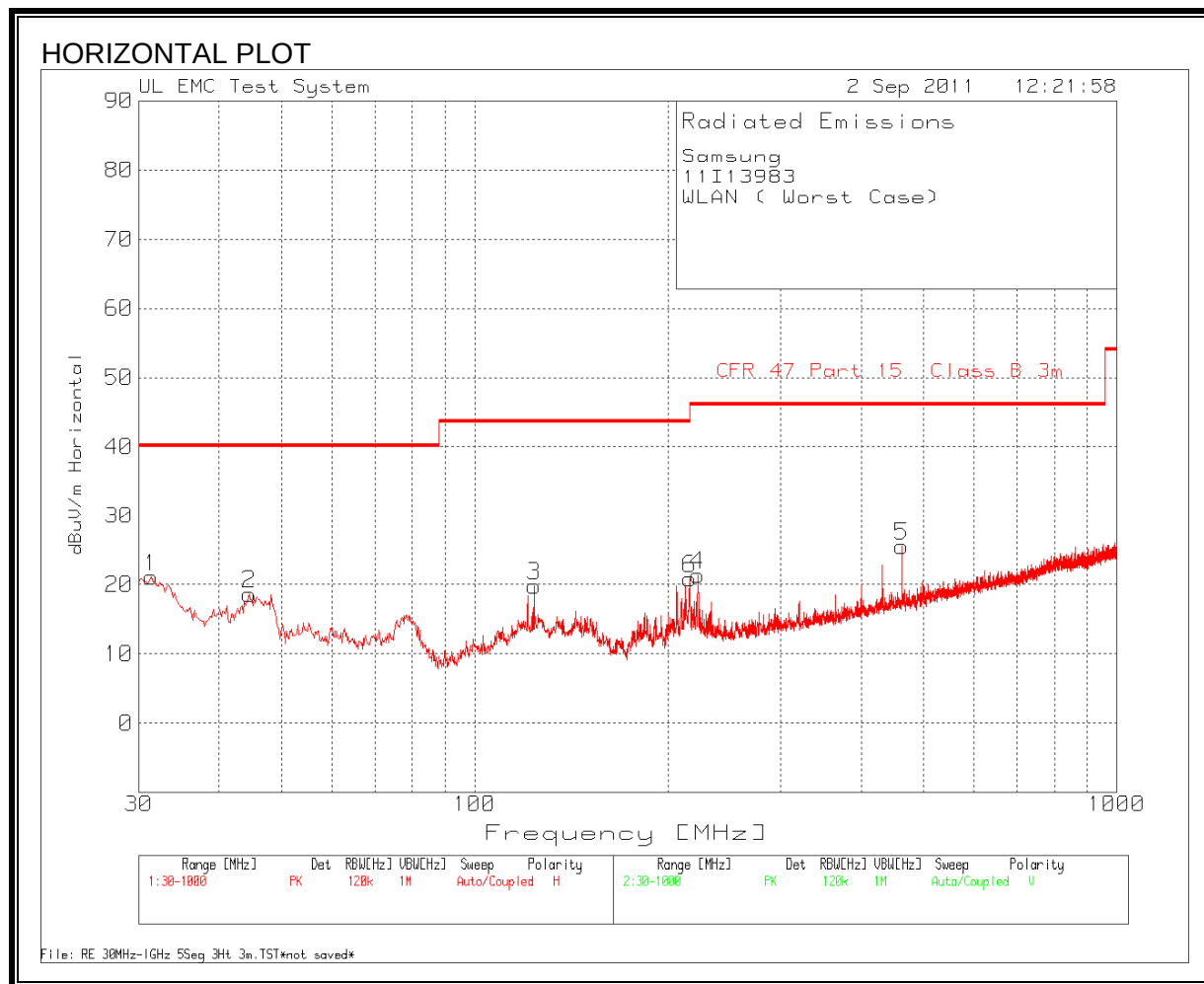
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

DATA									
Samsung									
11I13983									
WLAN (Worst Case)									
Range 1 30 - 1000MHz									
Frequency	Reading	Detector	Cable. TX	PreAmp. TX	Bilog Fac	dBuV/m	Part 15B	Margin	Polarity
31.3569	29.93	PK	0.9	-29.5	19.7	21.03	40	-18.97	Horz
44.5384	35.73	PK	1	-29.4	11.3	18.63	40	-21.37	Horz
123.8209	33.65	PK	1.5	-29.2	13.8	19.75	43.5	-23.75	Horz
222.6819	36.11	PK	2.1	-28.8	11.9	21.31	46	-24.69	Horz
462.6619	35.7	PK	3	-29.3	16.1	25.5	46	-20.5	Horz
216.0911	35.82	PK	2	-28.9	11.9	20.82	46	-25.18	Horz
Range 2 30 - 1000MHz									
Frequency	Reading	Detector	Cable. TX	PreAmp. TX	Bilog Fac	dBuV/m	Part 15B	Margin	Polarity
45.3137	44.67	PK	1	-29.4	10.9	27.17	40	-12.83	Vert
79.8181	45.45	PK	1.3	-29.4	7.6	24.95	40	-15.05	Vert
159.6823	36.63	PK	1.7	-29.1	10.9	20.13	43.5	-23.37	Vert
195.2528	34.72	PK	1.9	-28.9	11.6	19.32	43.5	-24.18	Vert
216.285	35.15	PK	2	-28.9	11.9	20.15	46	-25.85	Vert
462.468	33.05	PK	3	-29.3	16.1	22.85	46	-23.15	Vert

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



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



8. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

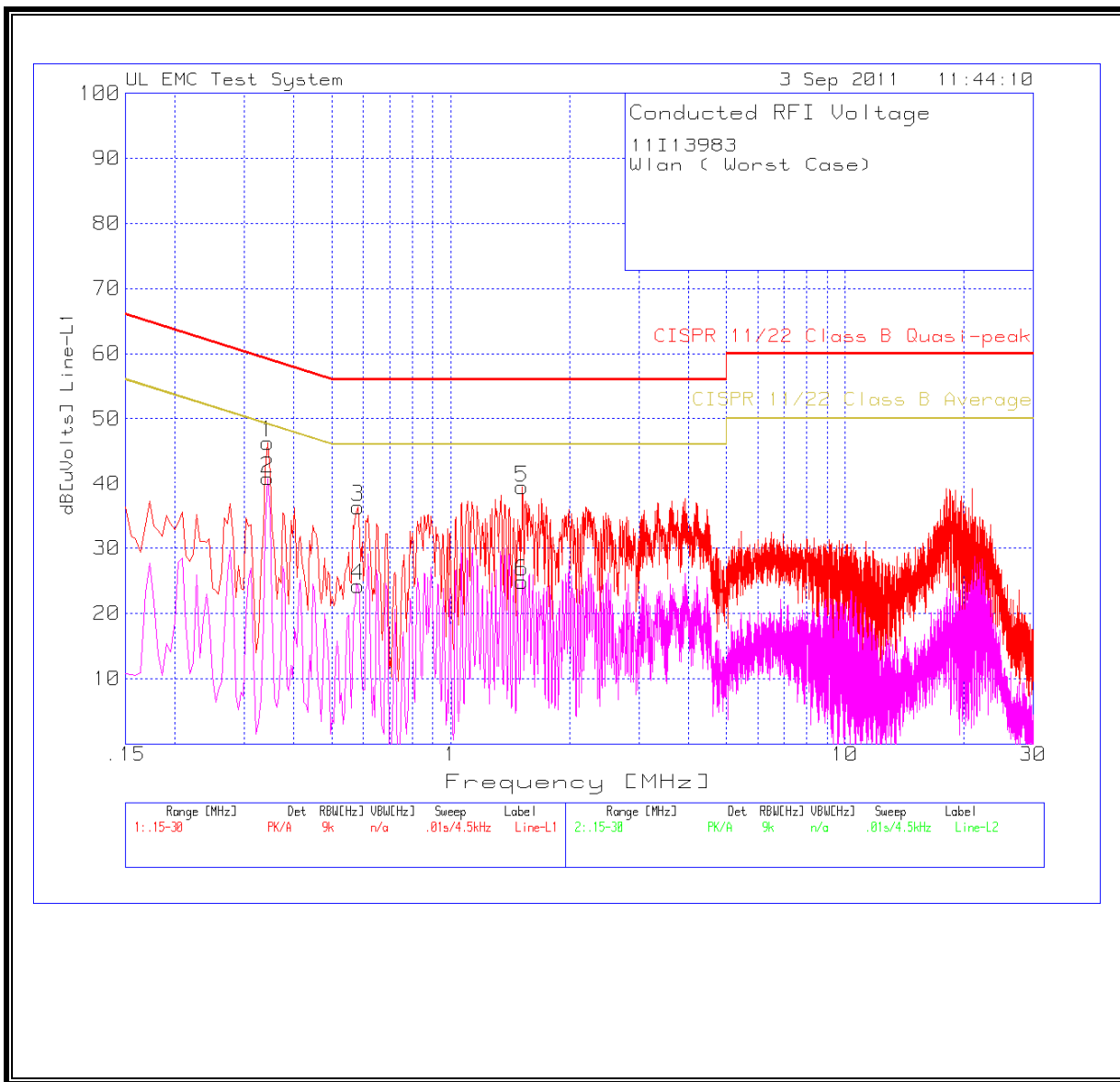
ANSI C63.4

RESULTS

6 WORST EMISSIONS

11I13983									
Wlan (Worst Case)									
Line-L1 .15 - 30MHz									
Frequency	Reading	Detector	LISN [dB]	Cable [dB]	dB[uVolts]	CISPR B	Qp	Margin	CISPR B A
0.3435	46.37	PK	0	0	46.37	59.1		-12.73	49.1
0.3435	40.8	Av	0	0	40.8	-		-	49.1
0.582	36.33	PK	0	0	36.33	56		-19.67	46
0.582	24.22	Av	0	0	24.22	-		-	46
1.518	39.41	PK	0	0	39.41	56		-16.59	46
1.518	24.91	Av	0	0	24.91	-		-	46
Line-L2 .15 - 30MHz									
Frequency	Reading	Detector	LISN [dB]	Cable [dB]	dB[uVolts]	CISPR B	Qp	Margin	CISPR B A
0.3435	44.62	PK	0	0	44.62	59.1		-14.48	49.1
0.3435	35.77	Av	0	0	35.77	-		-	49.1
0.438	32.75	PK	0	0	32.75	57.1		-24.35	47.1
0.438	28.25	Av	0	0	28.25	-		-	47.1
1.5945	34.28	PK	0	0	34.28	56		-21.72	46
1.5945	22.19	Av	0	0	22.19	-		-	46

LINE 1 RESULTS



LINE 2 RESULTS

