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

CERTIFICATION TEST REPORT

FOR

802.11 a/b/g/n + BT2.1

MODEL NUMBER: A1395

FCC ID: BCGA1395
IC: 579C-A1395

REPORT NUMBER: 10U13548-1, Revision B

ISSUE DATE: MARCH 01, 2011

Prepared for
APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	12/29/10	Initial Issue	F. Ibrahim
A	02/22/11	Revised model number, FCC ID, and IC ID.	A. Zaffar
B	03/01/11	Revised description of EUT setup section, removed MPE section, removed AV power section and added co-location data for 5.8 GHz band.	F. Ibrahim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA, 95014, U.S.A.

EUT DESCRIPTION: 802.11a/b/g/n + BT 2.1

MODEL: A1395

SERIAL NUMBER: PT523312

DATE TESTED: DECEMBER 13, 2010 – FEBRUARY 28, 2011

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

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:

TOM CHEN
EMC ENGINEER
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, 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 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:

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

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

802.11 a/b/g/n + BT2.1

The radio module is manufactured by Apple, Inc.

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	21.20	131.83
2412 - 2462	802.11g	24.40	275.42
2412 - 2462	802.11n HT20	24.50	281.84

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5745 - 5825	802.11a	24.40	275.42
5745 - 5825	802.11n HT20	24.50	281.84

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes the following antenna:

Antenna Name	Description	Manufacturer	Cable Length
631-1482 WiFi / Bluetooth	PIFA	Amphenol / Tyco	81.6 mm

	631-1482 WiFi / Bluetooth
	Peak Gain (includes Cable)
Freq [GHz]	dBi
2.4-2.484	0.59
5.15 - 5.25	4.07
5.25 - 5.35	4.2
5.47-5.725	4.21
5.725-5.85	3.57

5.4. SOFTWARE AND FIRMWARE

The firmware installed on the EUT was version 4.221.50.2 (BCM MFGTEST)

The EUT driver rev: 0x4dd3202

The test utility software: wl.exe version: 4.218 RC175.1

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case data rate for each mode is determined to be as follows, based on preliminary tests of the chipset utilized in this radio.

All final tests in the 802.11b mode were made at 1 Mb/s.
All final tests in the 802.11g mode were made at 6 Mb/s.
All final tests in the 802.11a mode were made at 6 Mb/s.
All final tests in the 802.11n HT20 SISO mode were made at MCS0.

For radiated emissions below 1 GHz and Power Line Conducted Emissions, the worst-case configuration is determined to be the mode and channel with the highest output power

To determine the worst-position of highest emissions, the EUT's antenna was investigated for X, Y, Z positions, and the worst position was turned out to be a Y-position.

Radiated Co-located BE and Harmonics was performed in the 5.8 GHz band for worst-case channel.

5.6. DESCRIPTION OF TEST SETUP

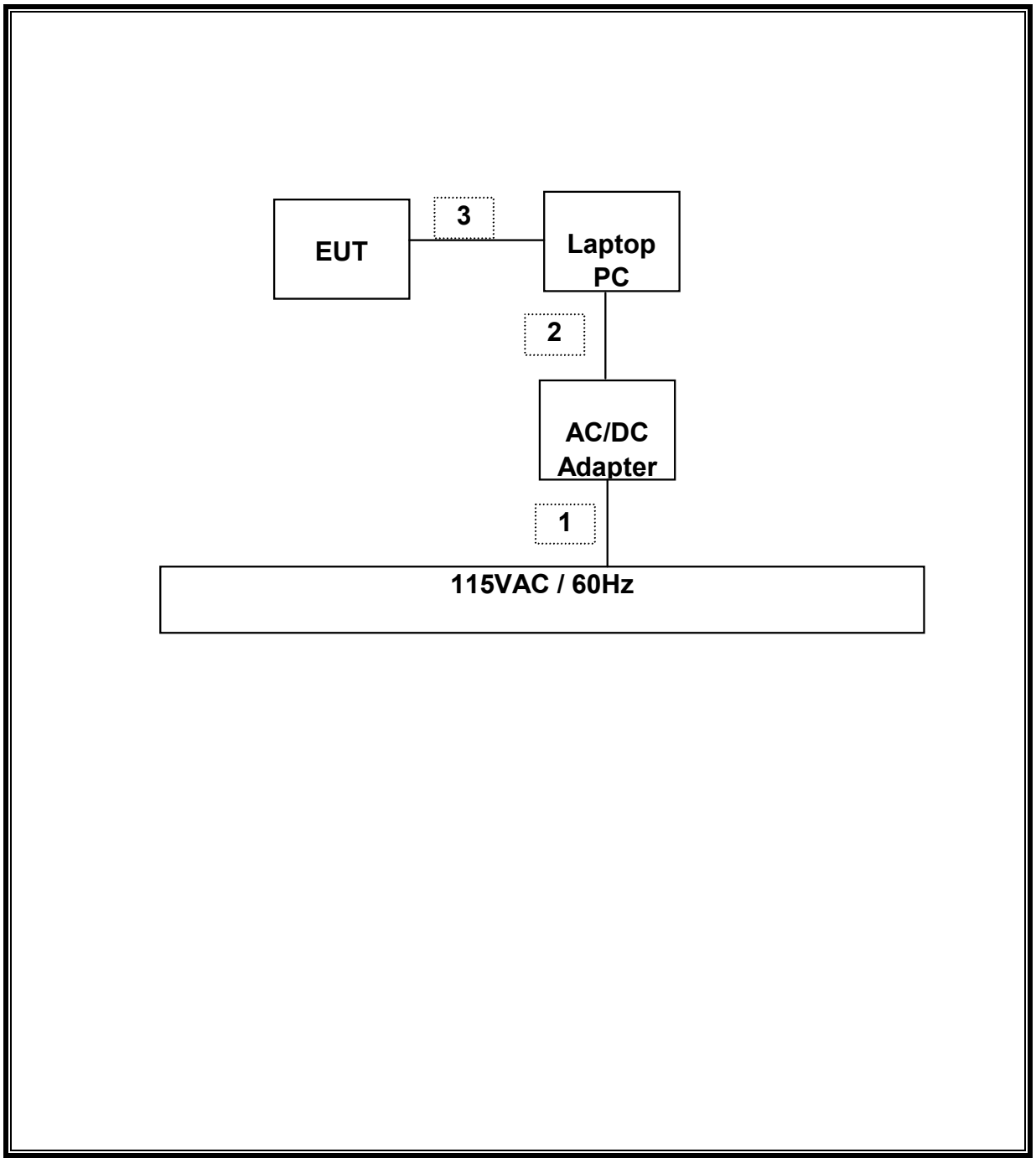
SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Apple	A1286	W8917005998	DoC
Laptop AC Adapter	Apple	A1290	N/A	DoC

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	N/A
2	DC	1	DC	Un-shielded	2m	N/A
3	USB	1	USB	Un-shielded	1m	Connect to Laptop

SETUP DIAGRAM FOR TESTS



Note: Laptop PC was used to control the operation of the EUT.

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	C01052	07/14/11
Antenna, Horn, 18 GHz	EMCO	3115	C00945	06/29/11
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/06/11
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	07/12/11
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/06/11
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	05/06/11
Reject Filter, 2.0-2.9 GHz	Micro-Tronics	BRM50702	N02684	CNR
High Pass Filter, 7.6 GHz	Micro-Tronics	HPM13195	N02682	CNR
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/30/11
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01159	05/08/11
Peak Power Meter	Boonton	4541	C01186	03/01/11
Peak Power Sensor	Boonton	57318	C01202	02/23/11

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)

IC RSS-210 A8.2 (a)

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

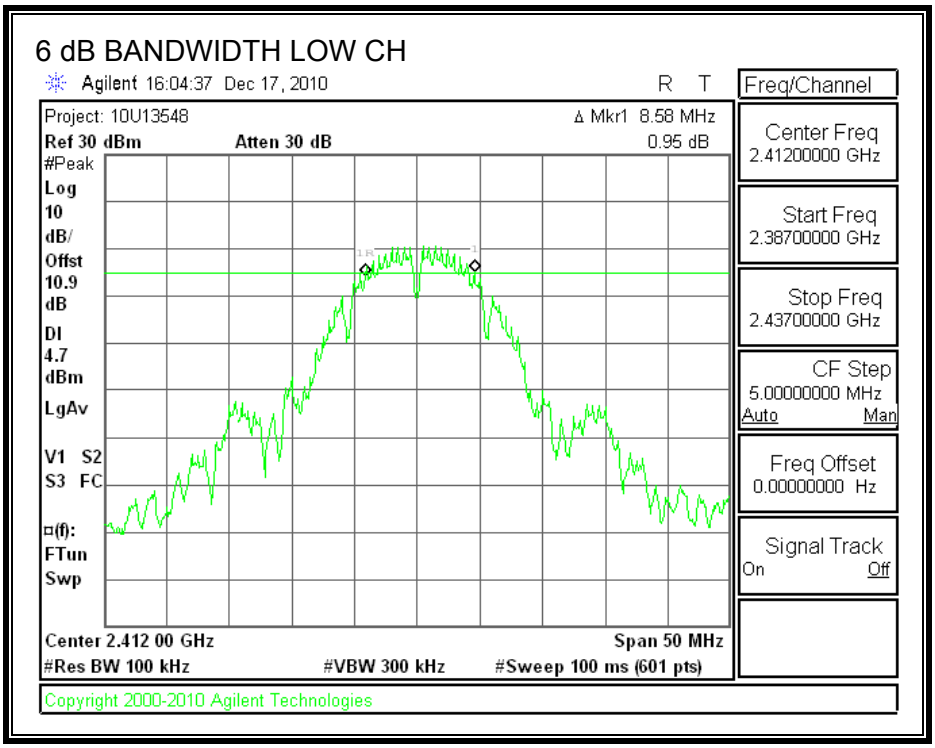
TEST PROCEDURE

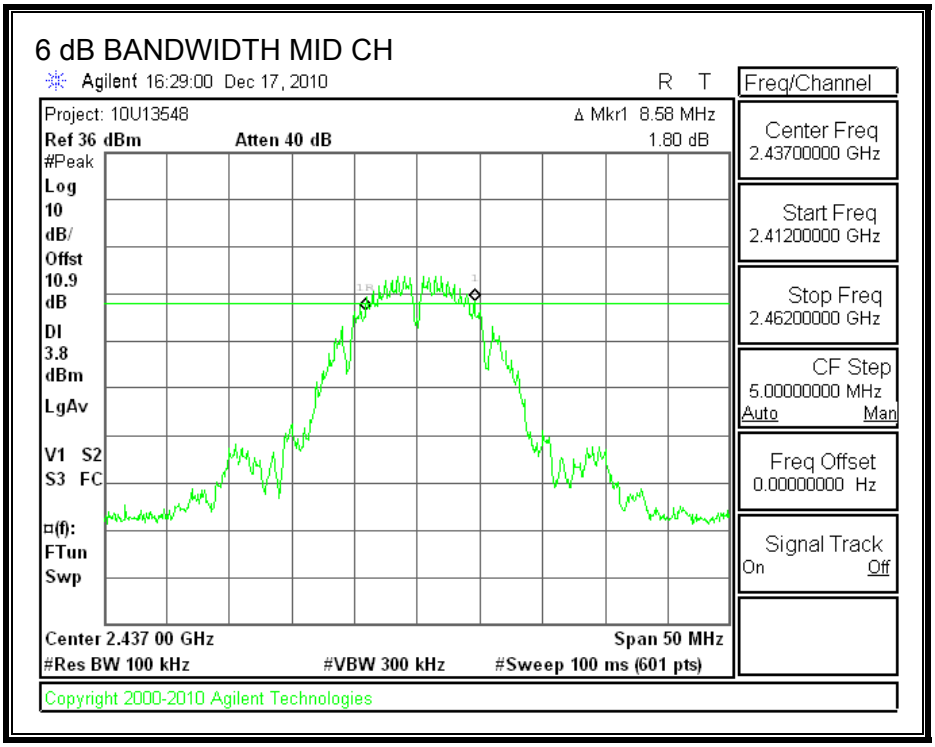
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

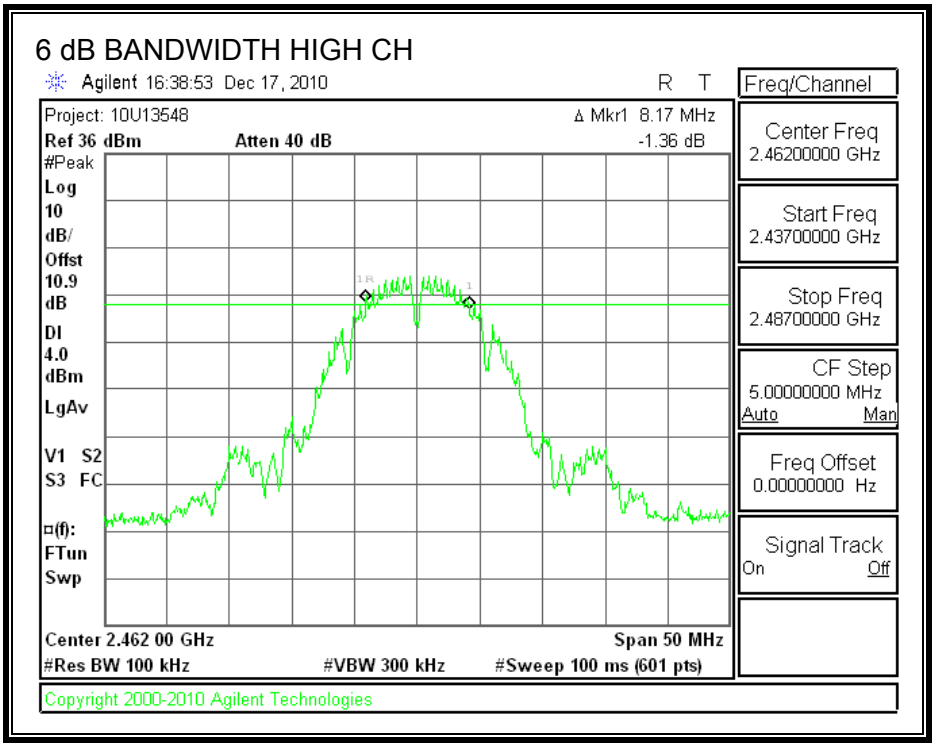
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	8.58	0.5
Middle	2437	8.58	0.5
High	2462	8.17	0.5

6 dB BANDWIDTH







7.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

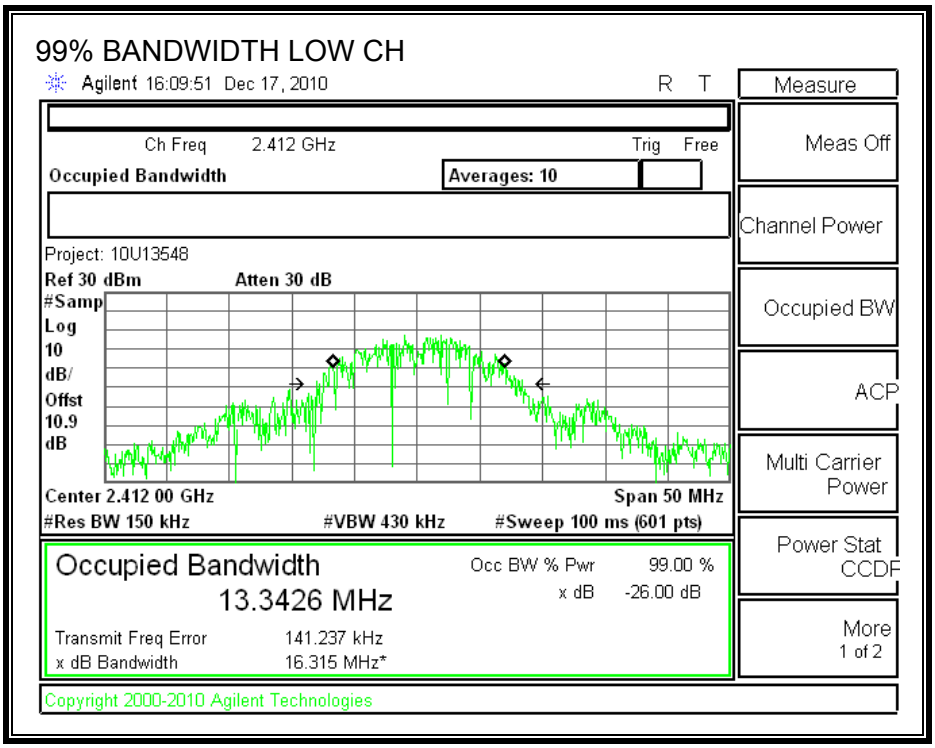
TEST PROCEDURE

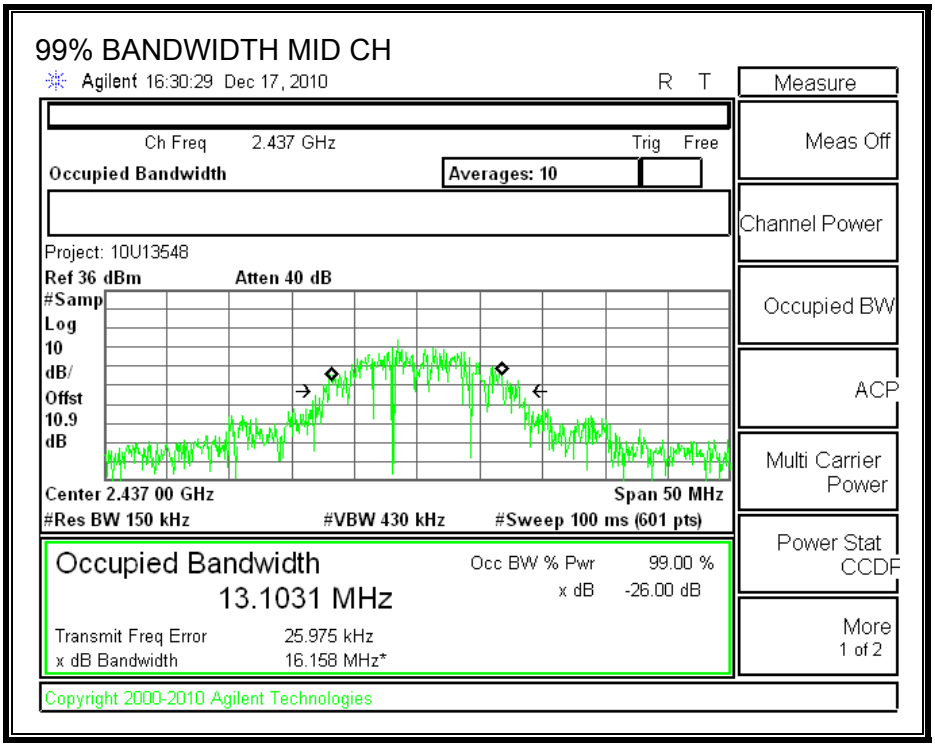
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

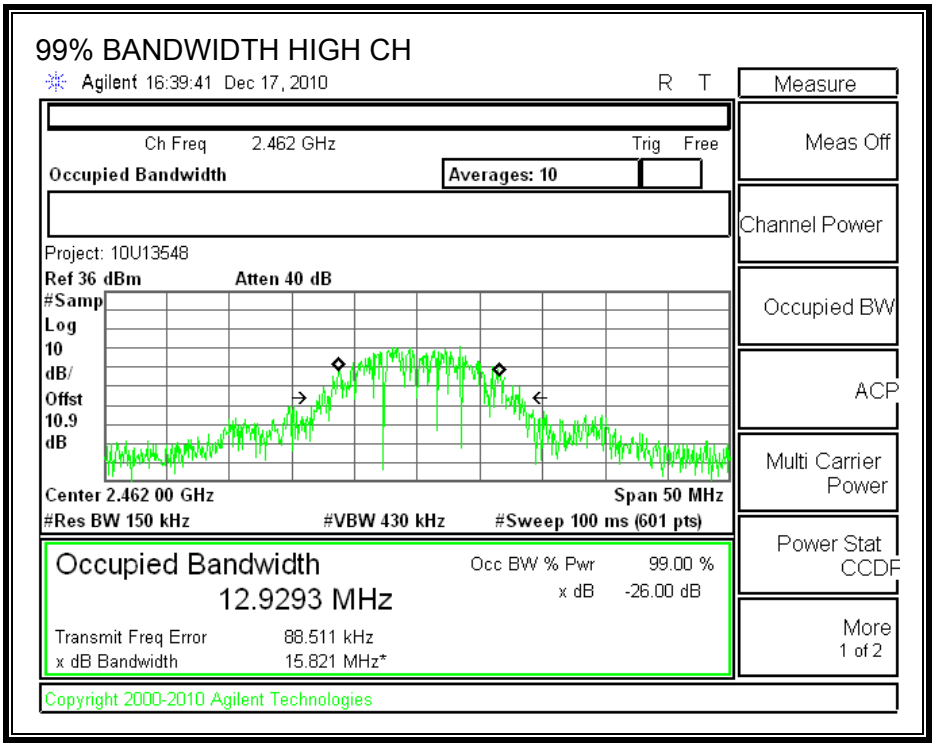
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	13.3426
Middle	2437	13.1031
High	2462	12.9293

99% BANDWIDTH







7.1.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

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

TEST PROCEDURE

Peak power is measured using wide bandwidth peak power meter.

RESULTS

Channel	Frequency (MHz)	Peak Power Meter Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	10.20	10.8	21.00	30	-9.00
Middle	2437	9.90	10.8	20.70	30	-9.30
High	2462	10.40	10.8	21.20	30	-8.80

7.1.4. 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.

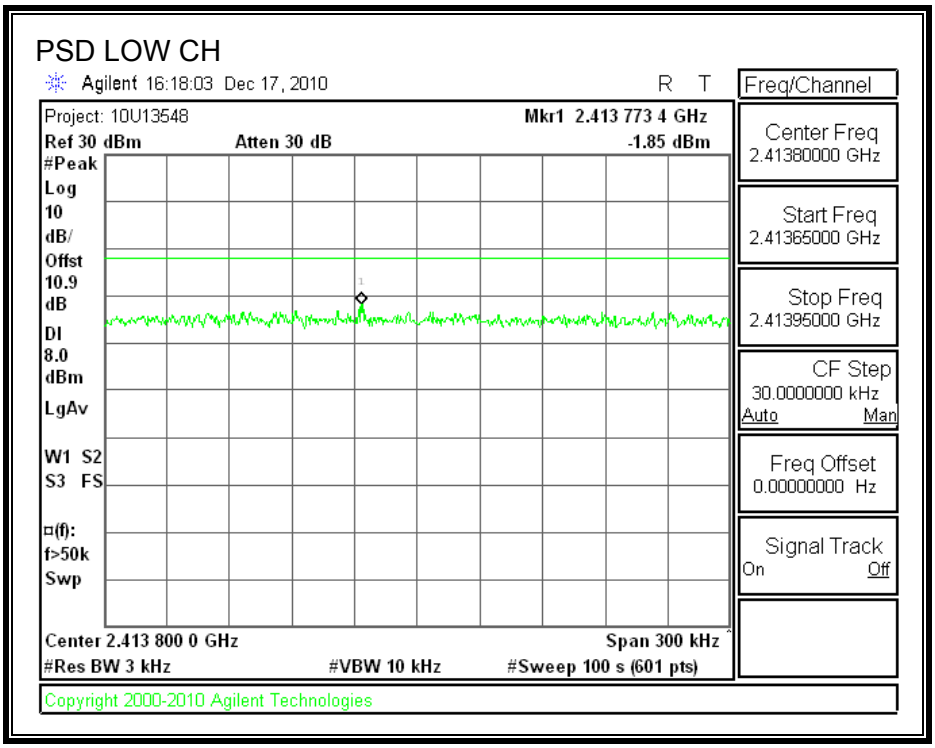
TEST PROCEDURE

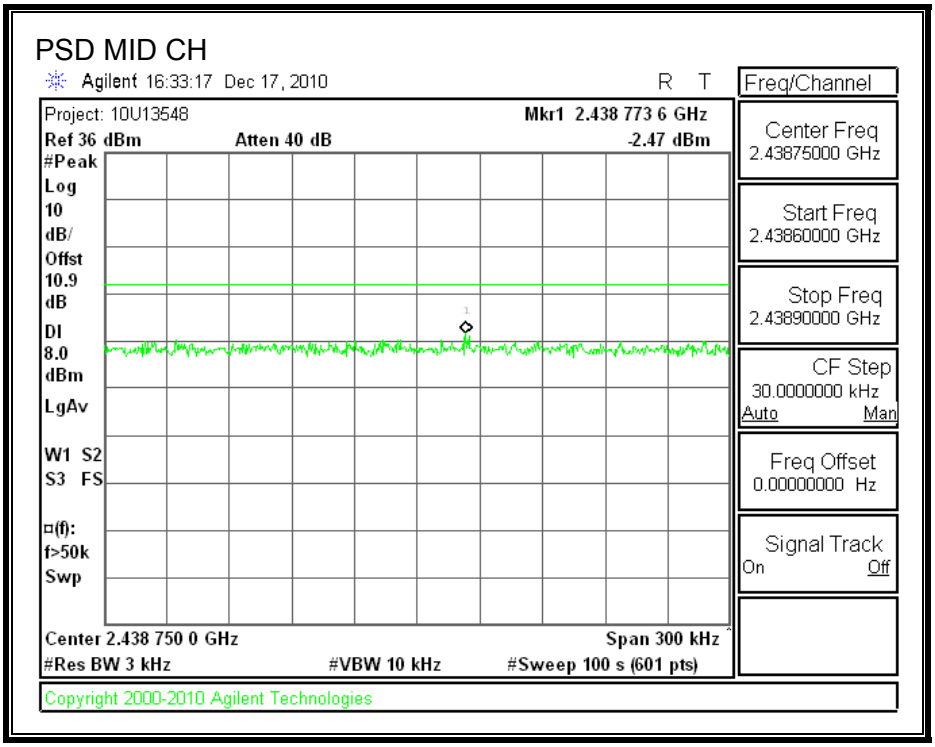
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

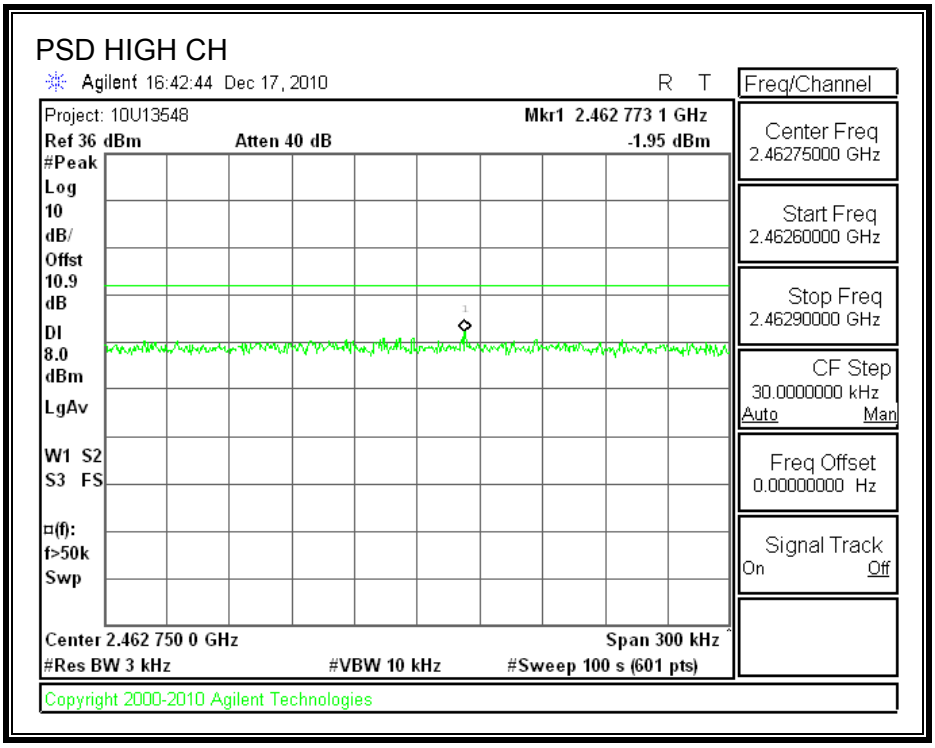
RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-1.85	8	-9.85
Middle	2437	-2.47	8	-10.47
High	2462	-1.95	8	-9.95

POWER SPECTRAL DENSITY







7.1.5. 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.

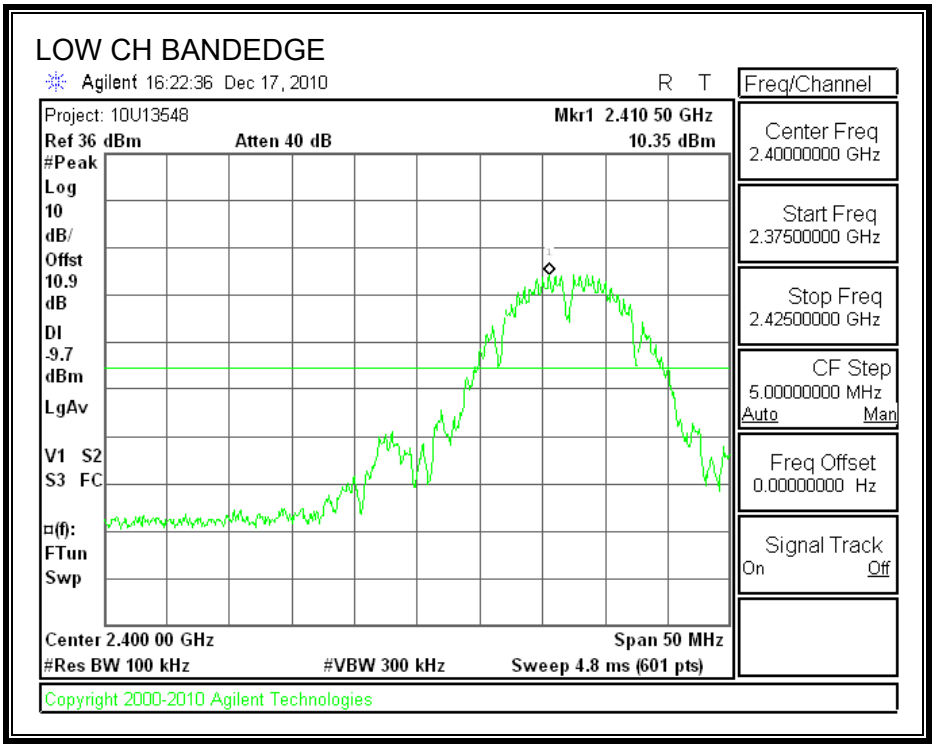
TEST PROCEDURE

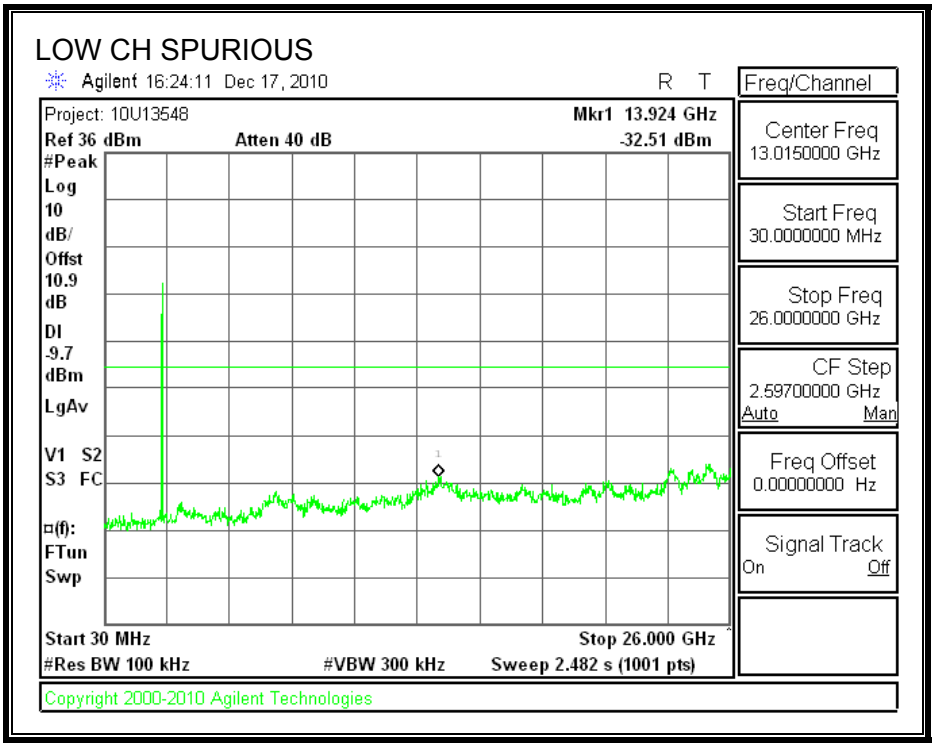
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

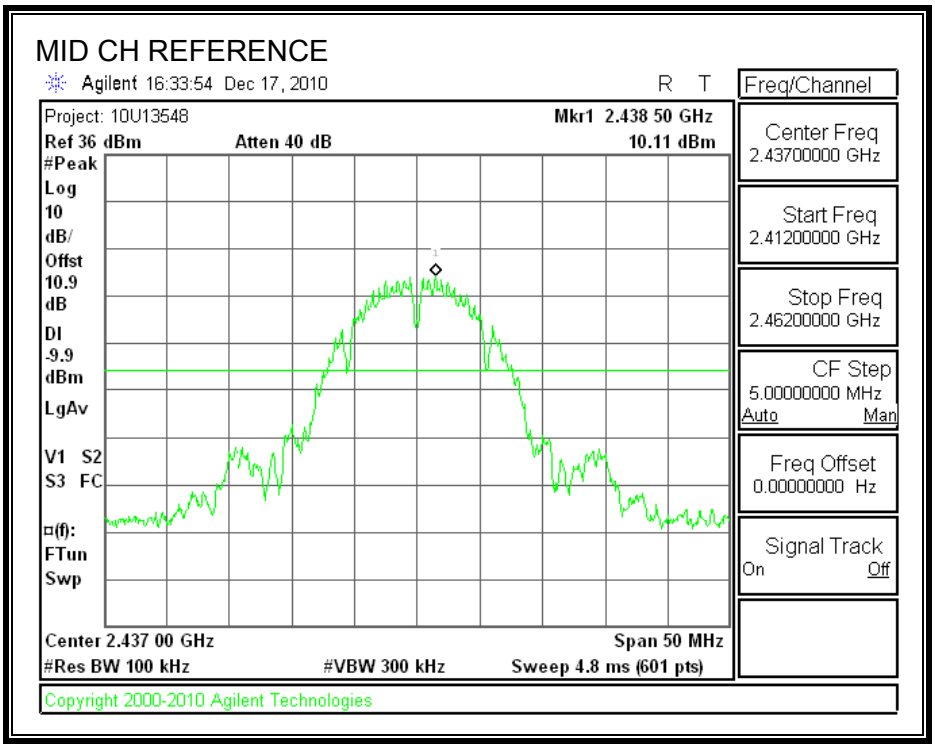
RESULTS

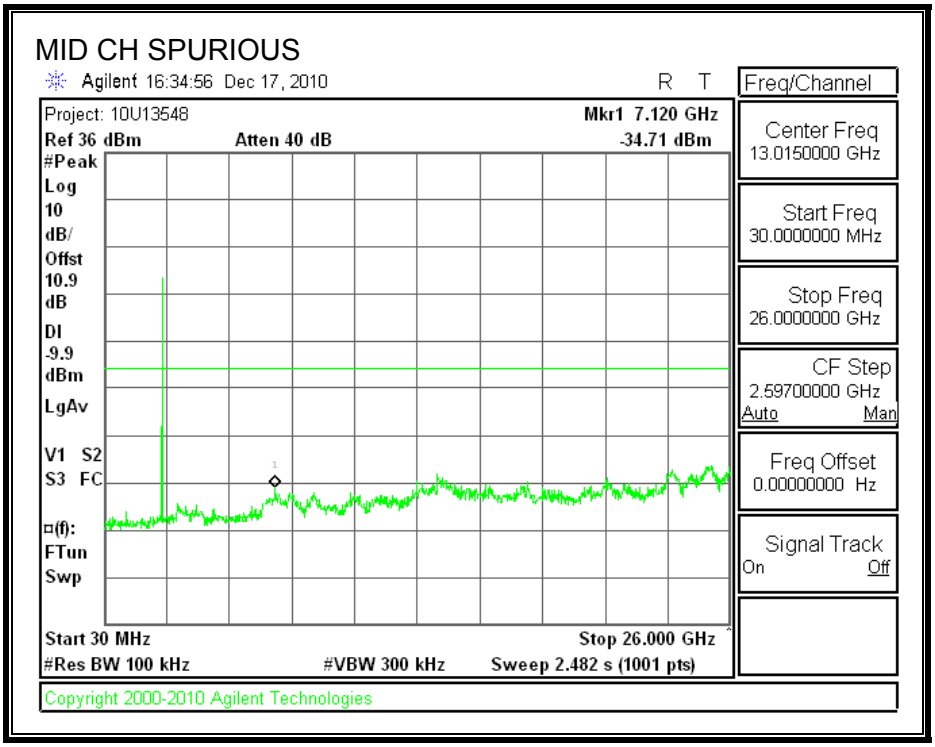
SPURIOUS EMISSIONS, LOW CHANNEL



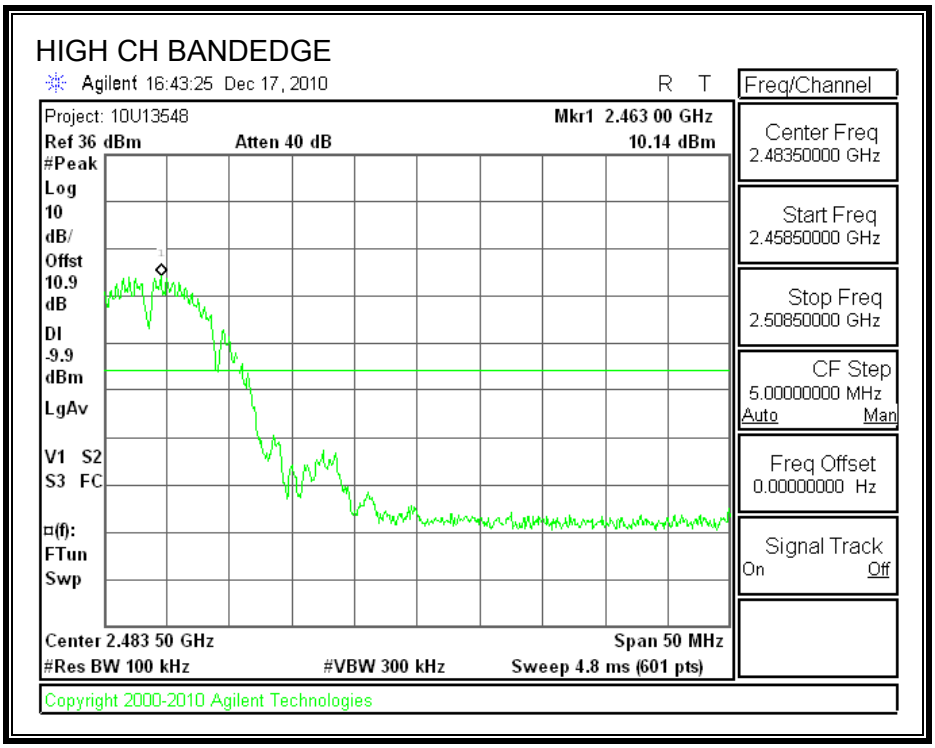


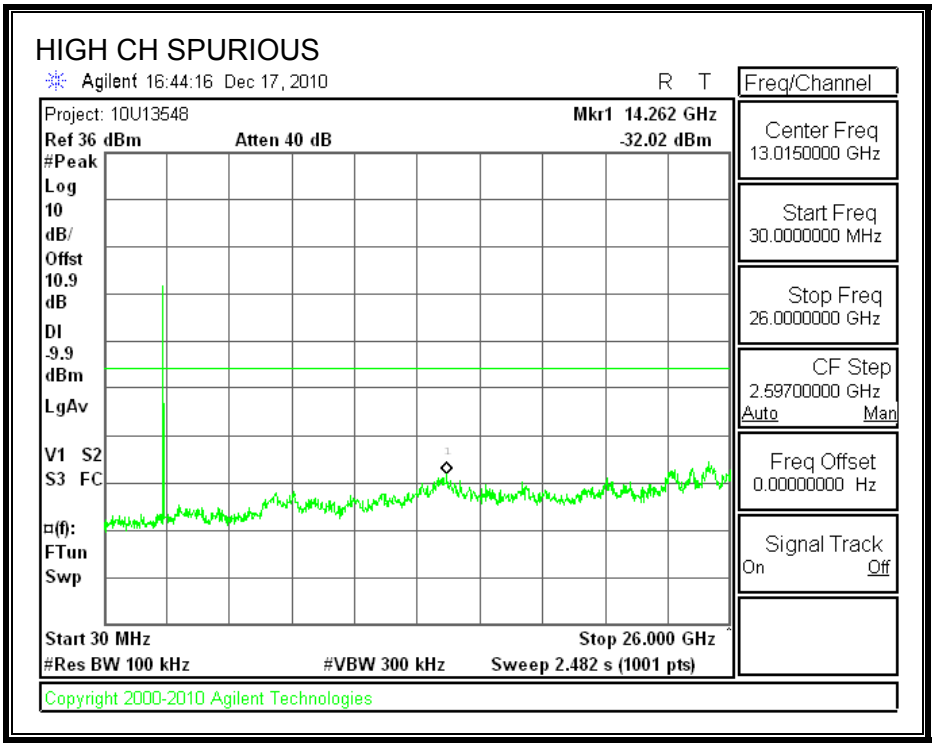
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





7.2. 802.11g MODE IN THE 2.4 GHz BAND

7.2.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

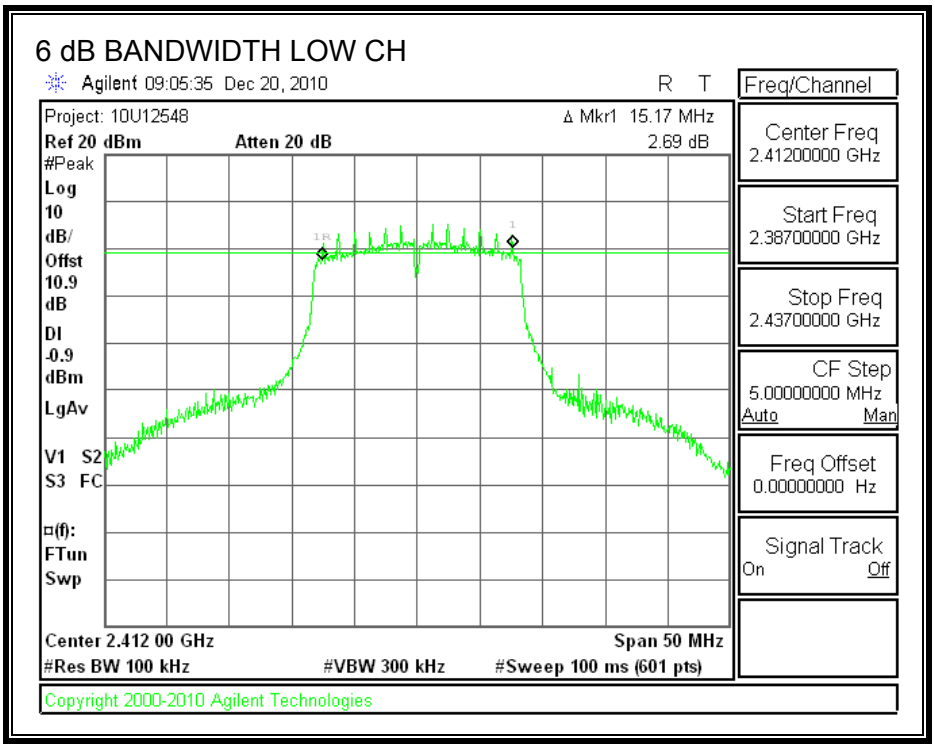
TEST PROCEDURE

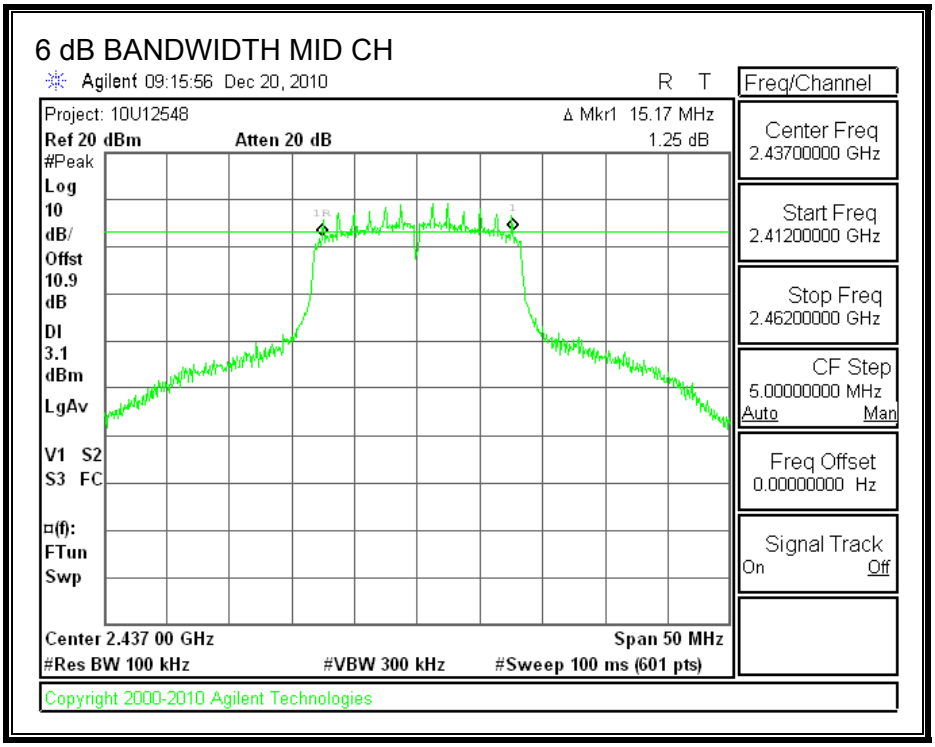
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

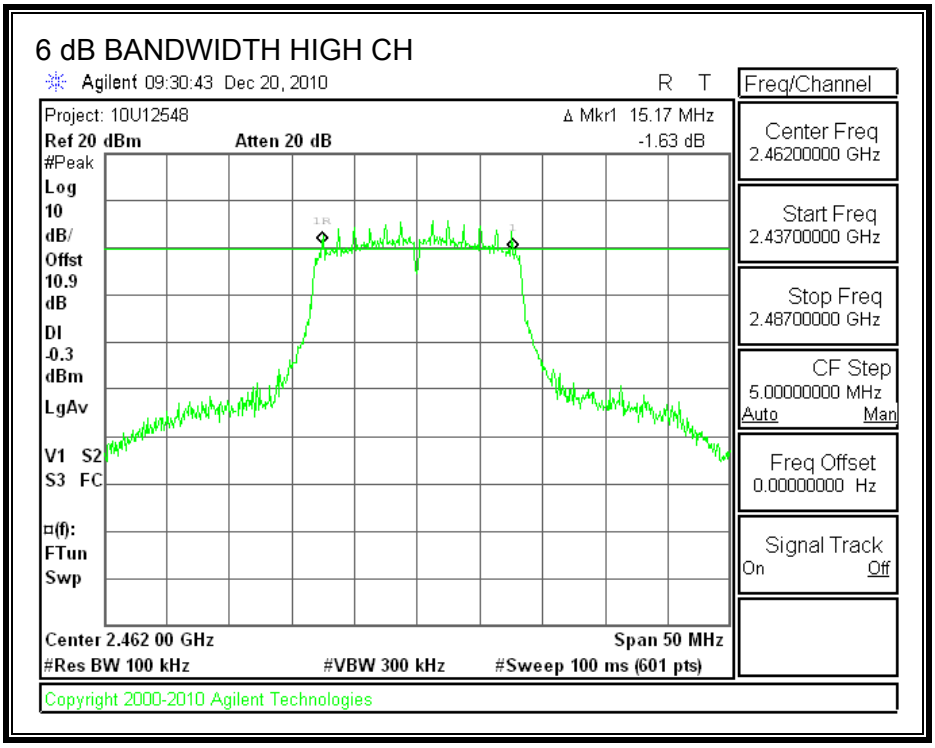
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.17	0.5
Middle	2437	15.17	0.5
High	2462	15.17	0.5

6 dB BANDWIDTH







7.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

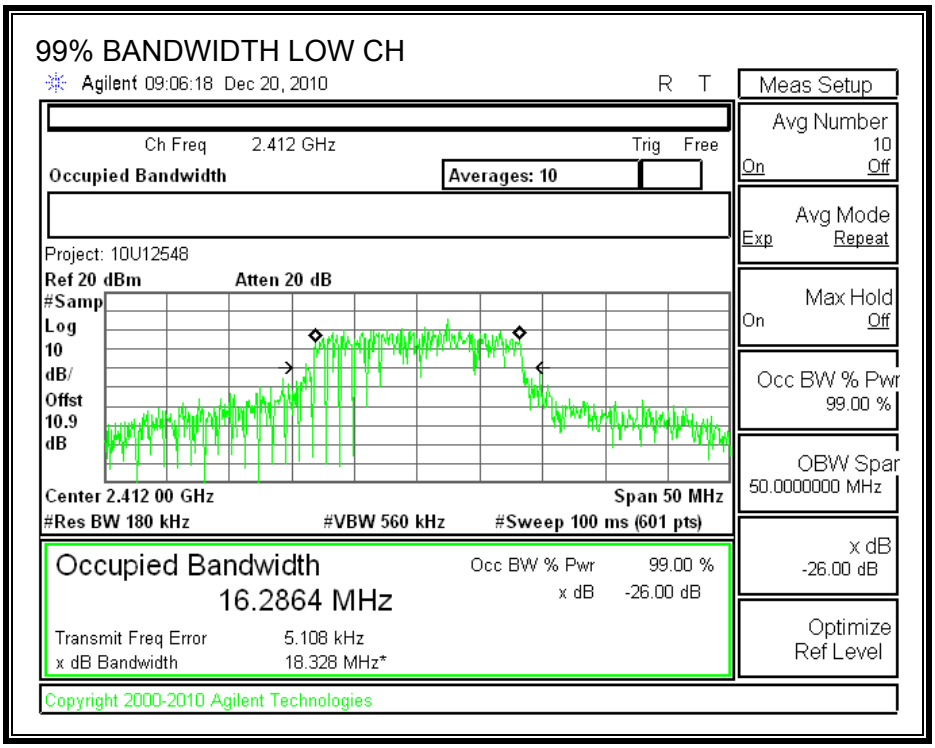
TEST PROCEDURE

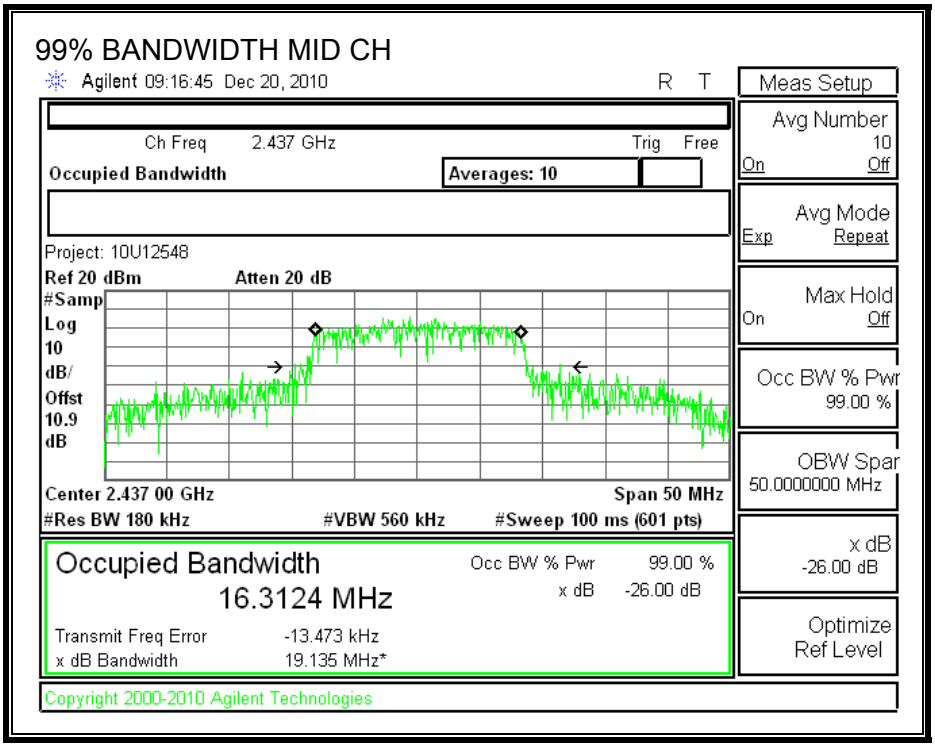
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

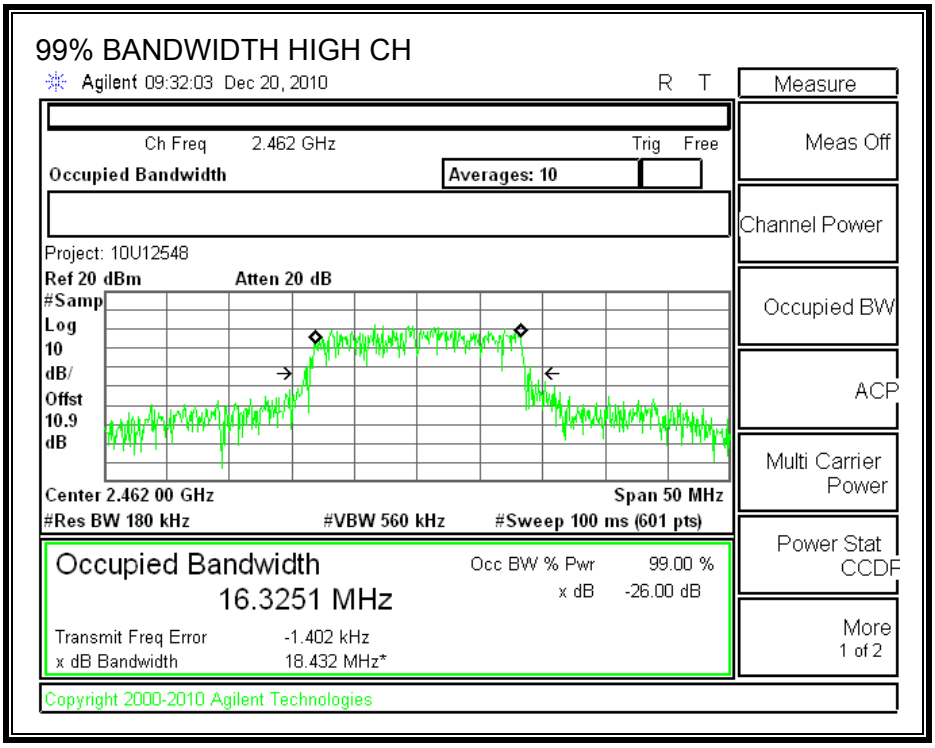
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.2864
Middle	2437	16.3124
High	2462	16.3251

99% BANDWIDTH







7.2.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

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

TEST PROCEDURE

Peak power is measured using a wide bandwidth peak power meter.

RESULTS

Channel	Frequency (MHz)	Peak Power Meter Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	11.5	10.8	22.30	30	-7.70
Middle	2437	13.6	10.8	24.40	30	-5.60
High	2462	12.2	10.8	23.00	30	-7.00

7.2.4. 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.

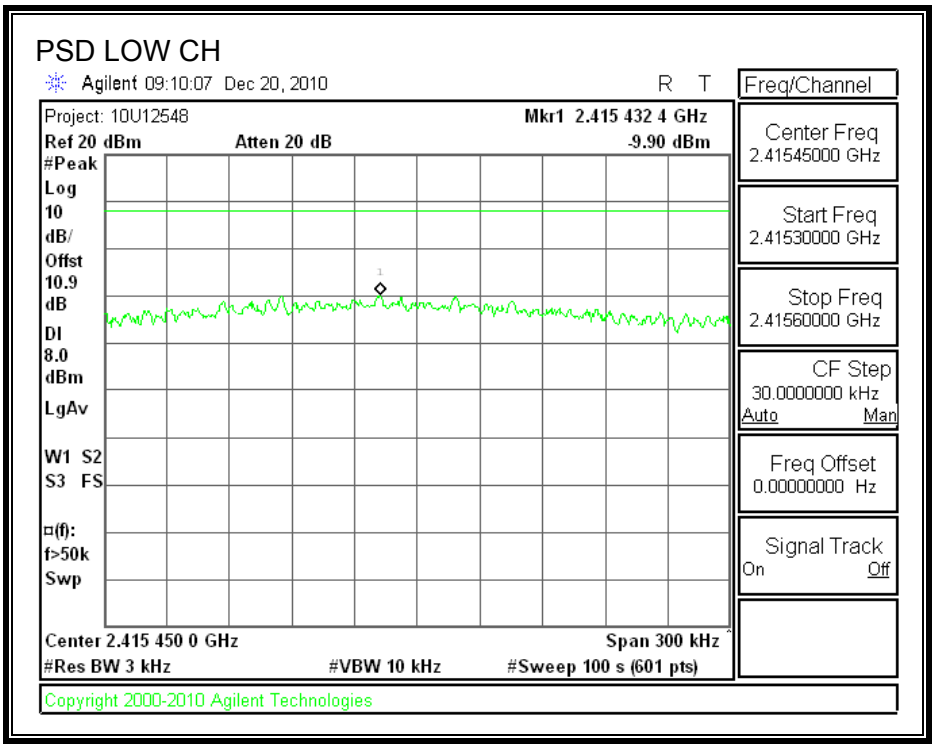
TEST PROCEDURE

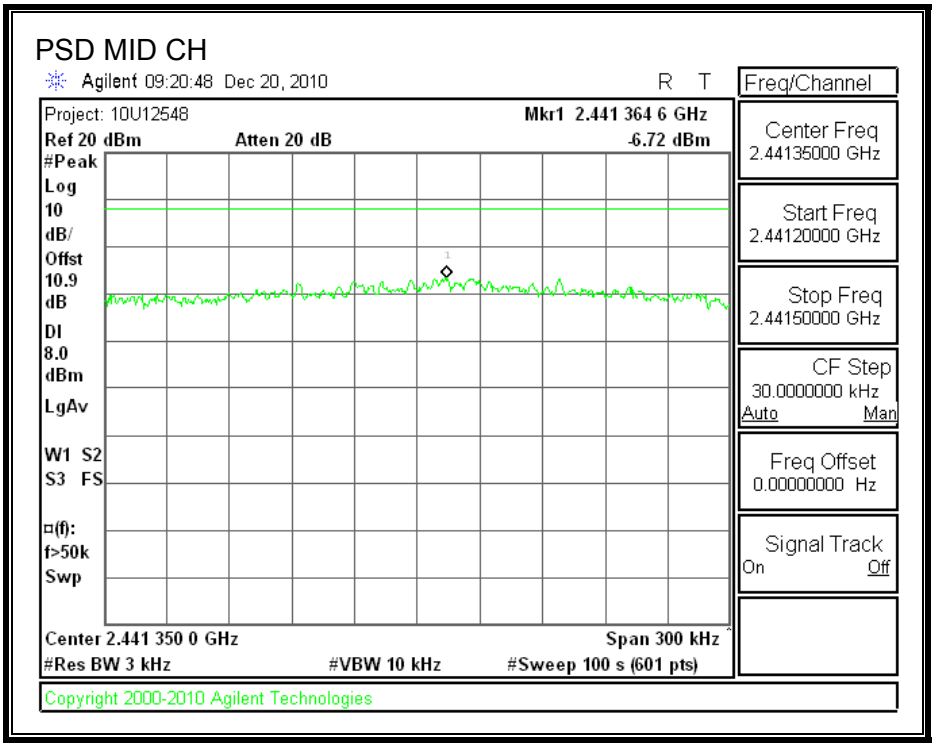
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

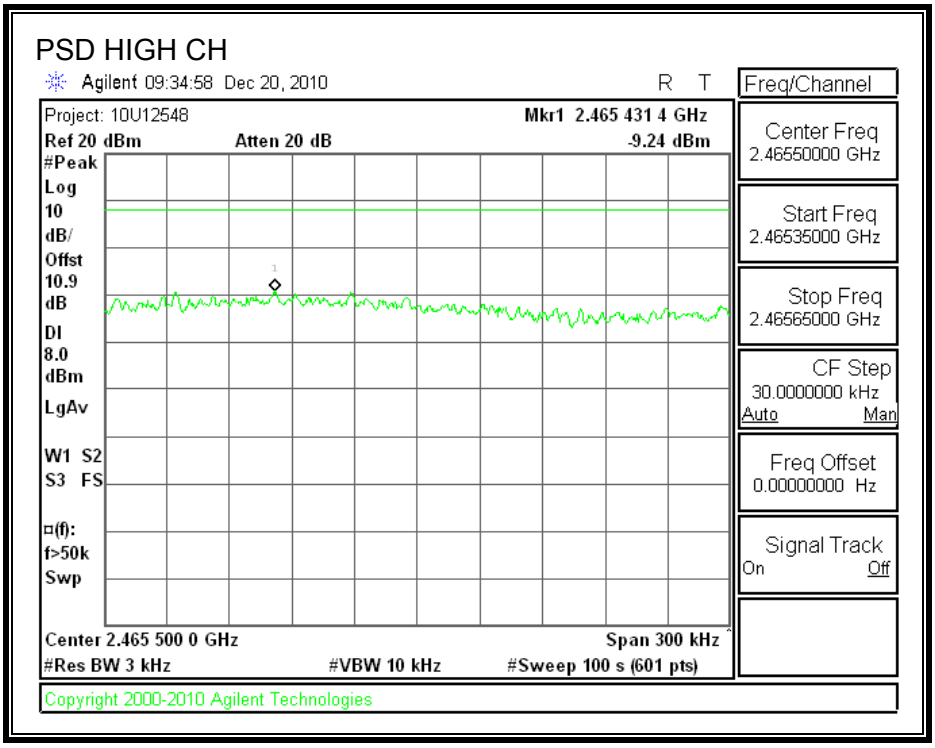
RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-9.90	8	-17.90
Middle	2437	-6.72	8	-14.72
High	2462	-9.24	8	-17.24

POWER SPECTRAL DENSITY







7.2.5. 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.

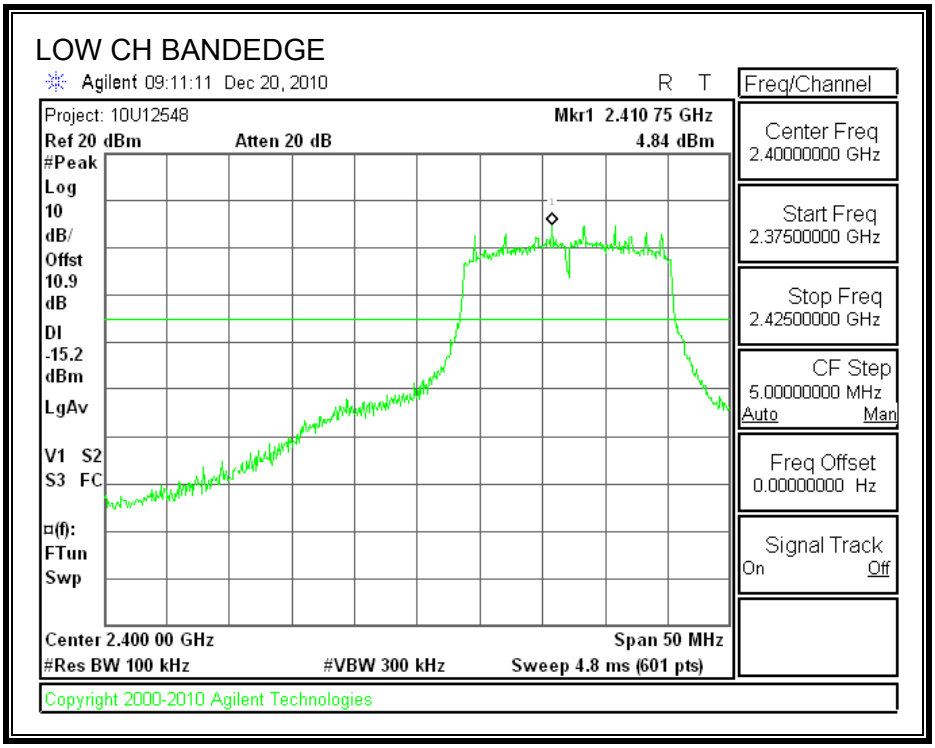
TEST PROCEDURE

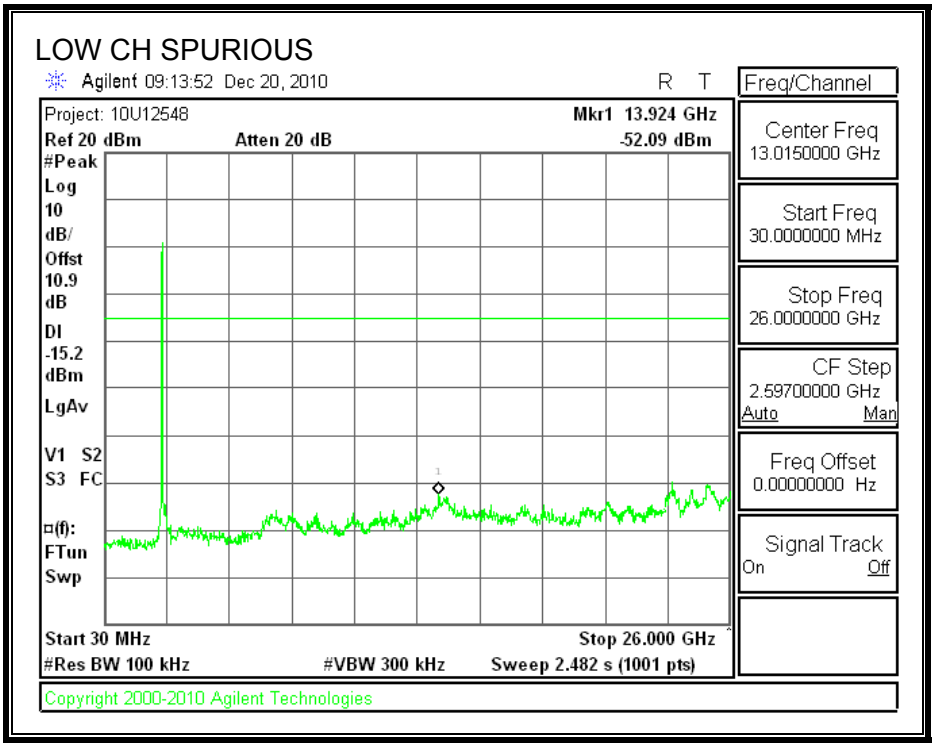
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

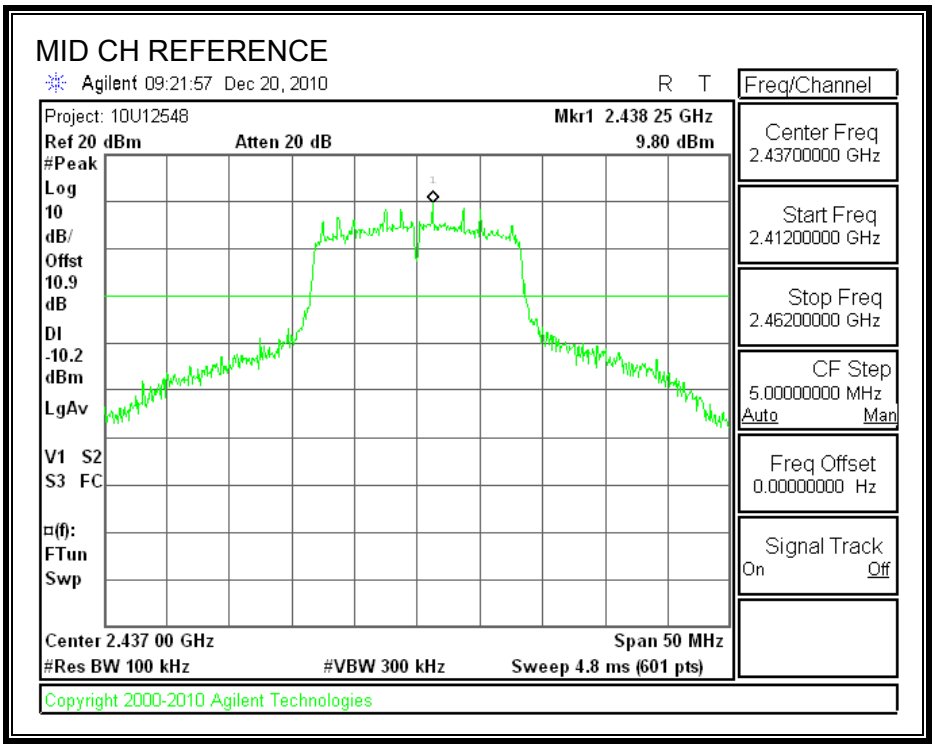
RESULTS

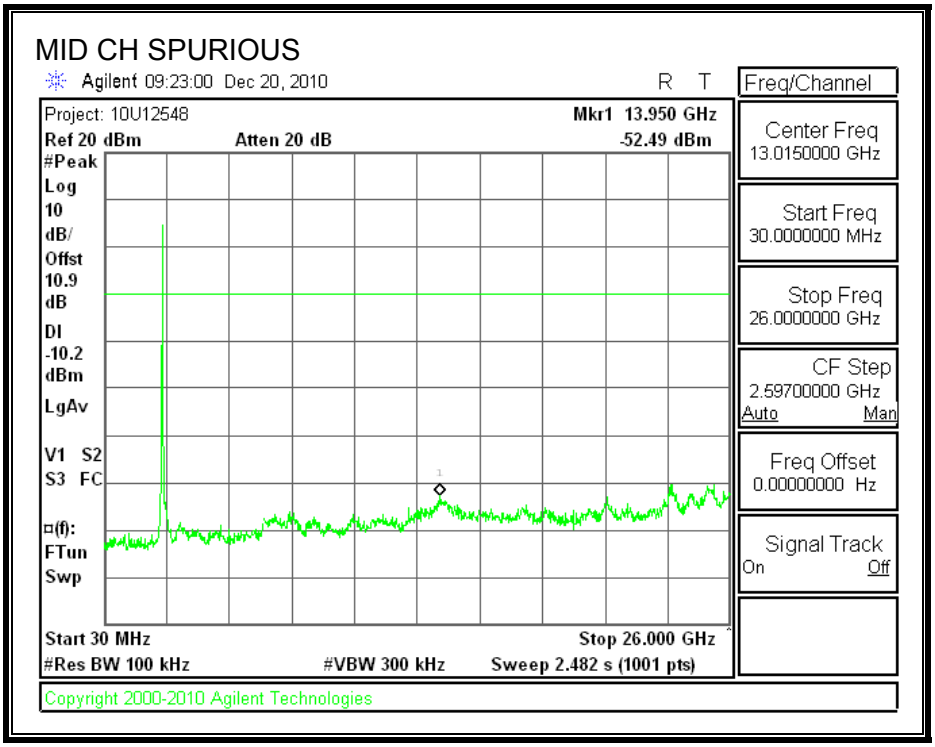
SPURIOUS EMISSIONS, LOW CHANNEL



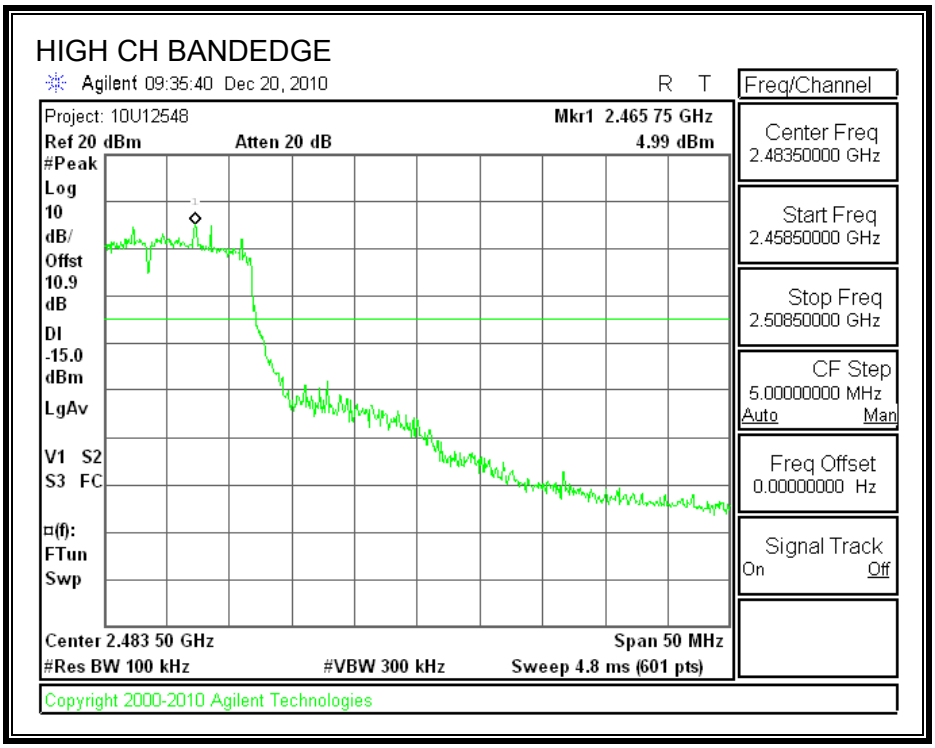


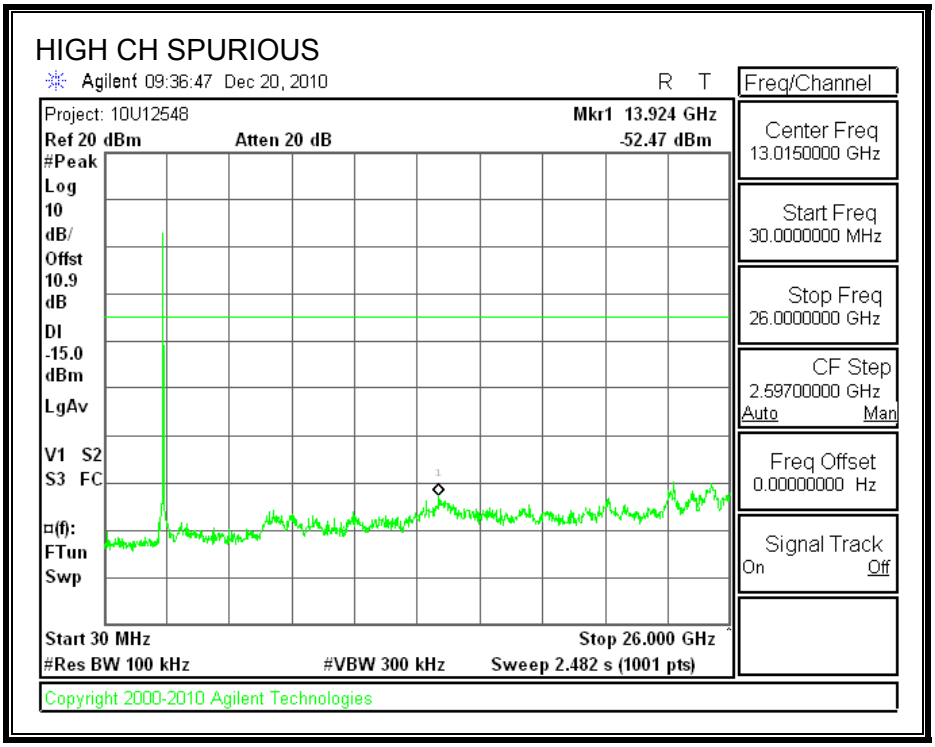
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





7.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

7.3.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

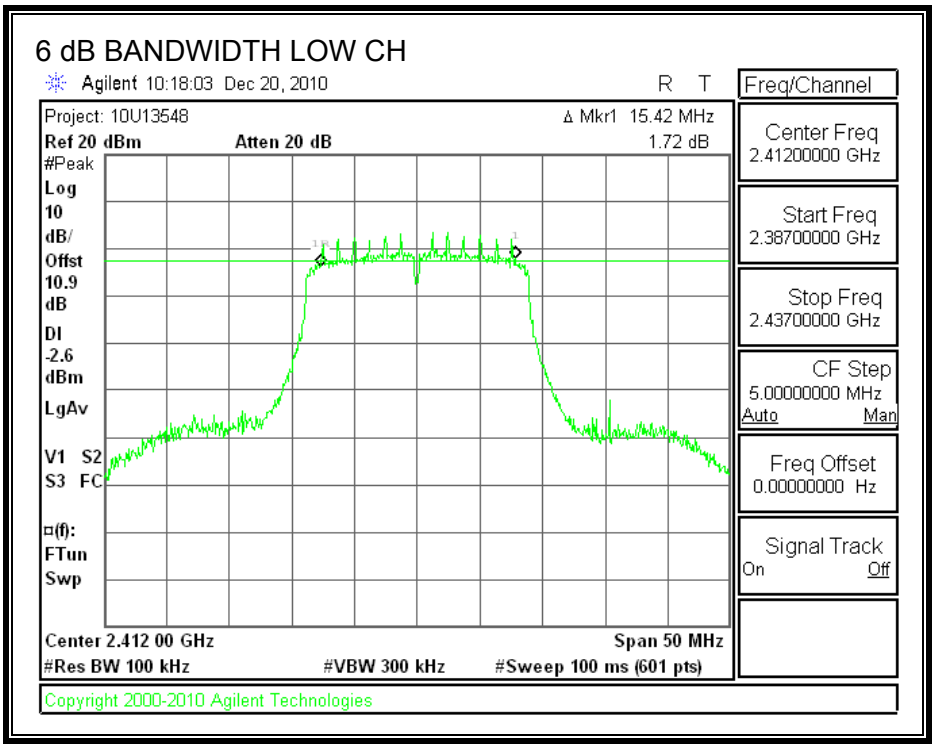
TEST PROCEDURE

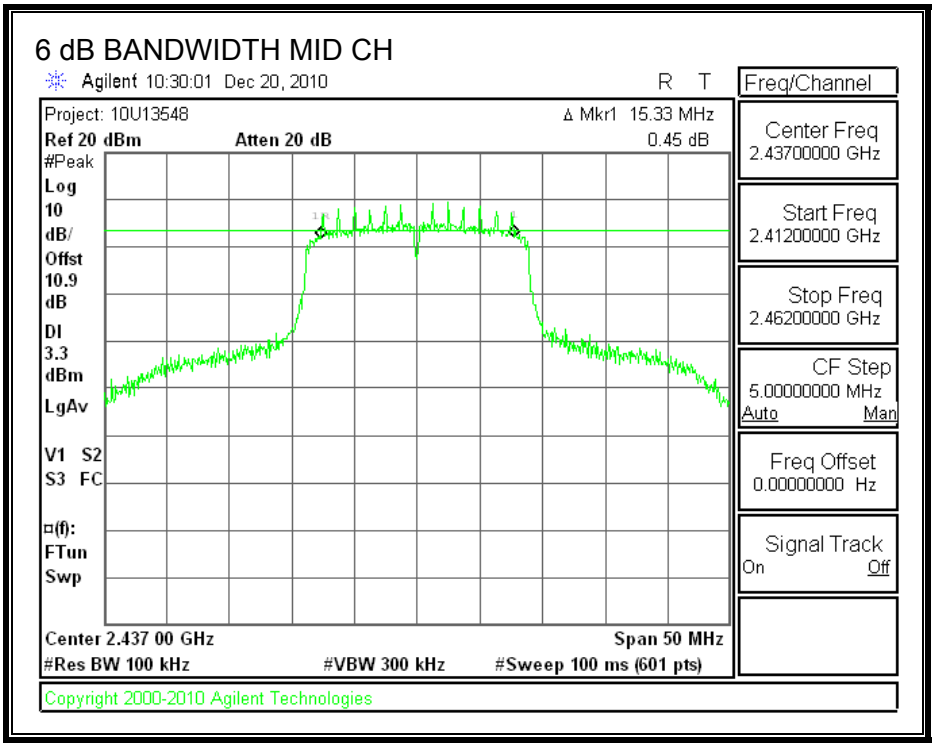
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

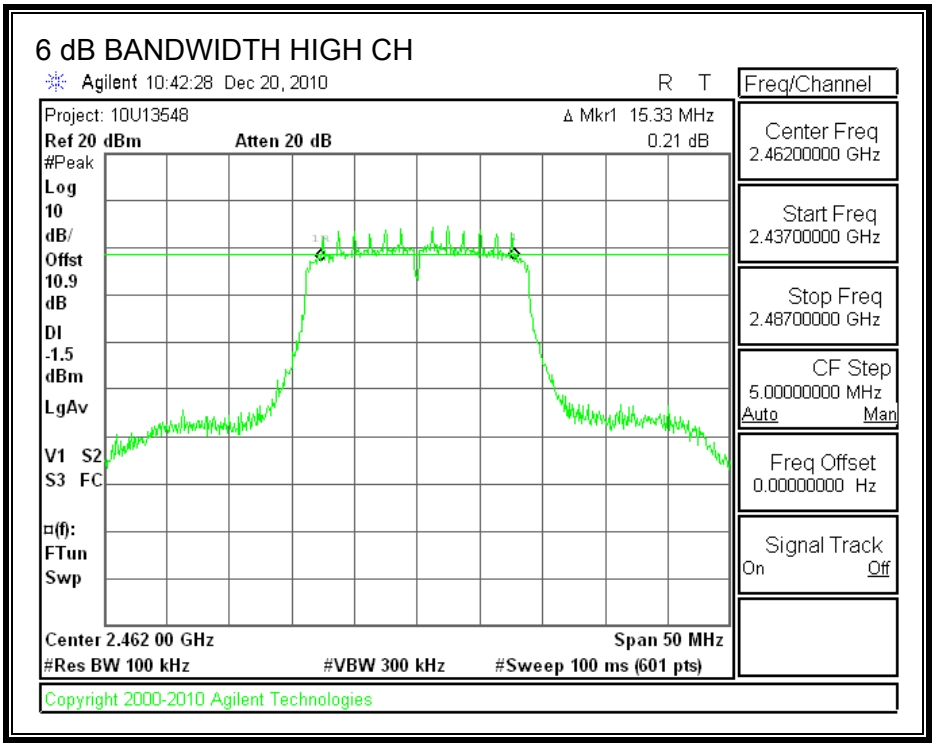
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	15.42	0.5
Middle	2437	15.33	0.5
High	2462	15.33	0.5

6 dB BANDWIDTH







7.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

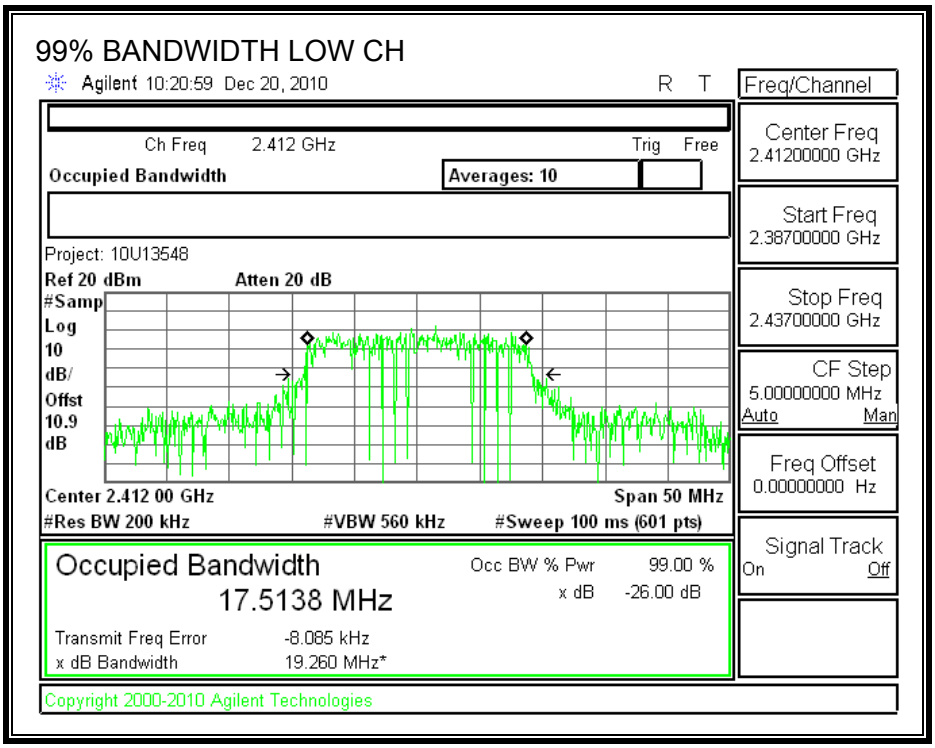
TEST PROCEDURE

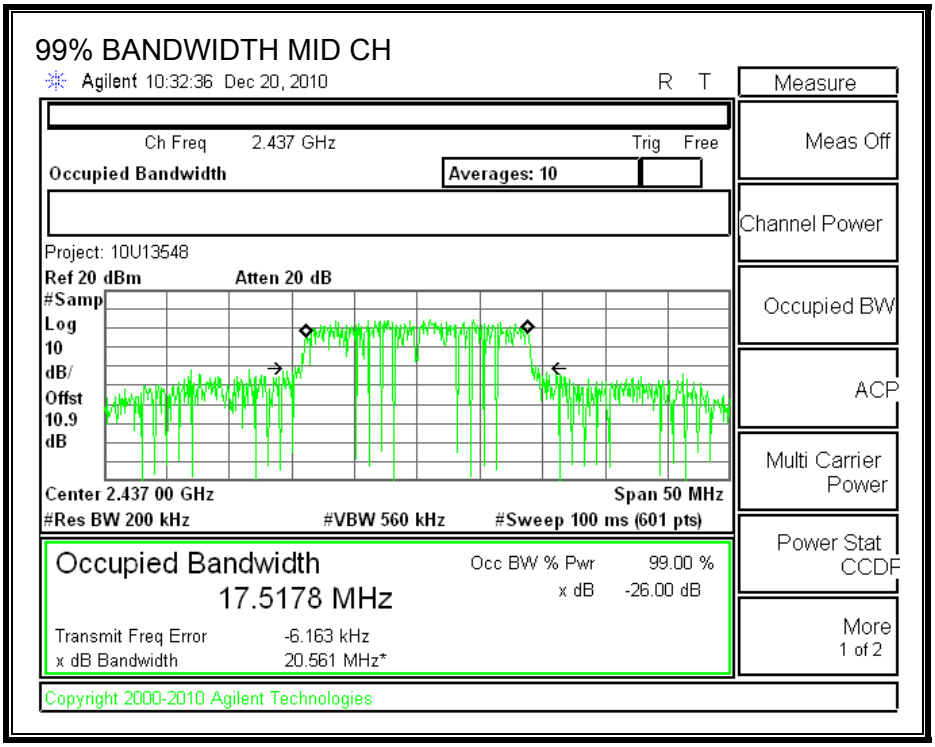
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

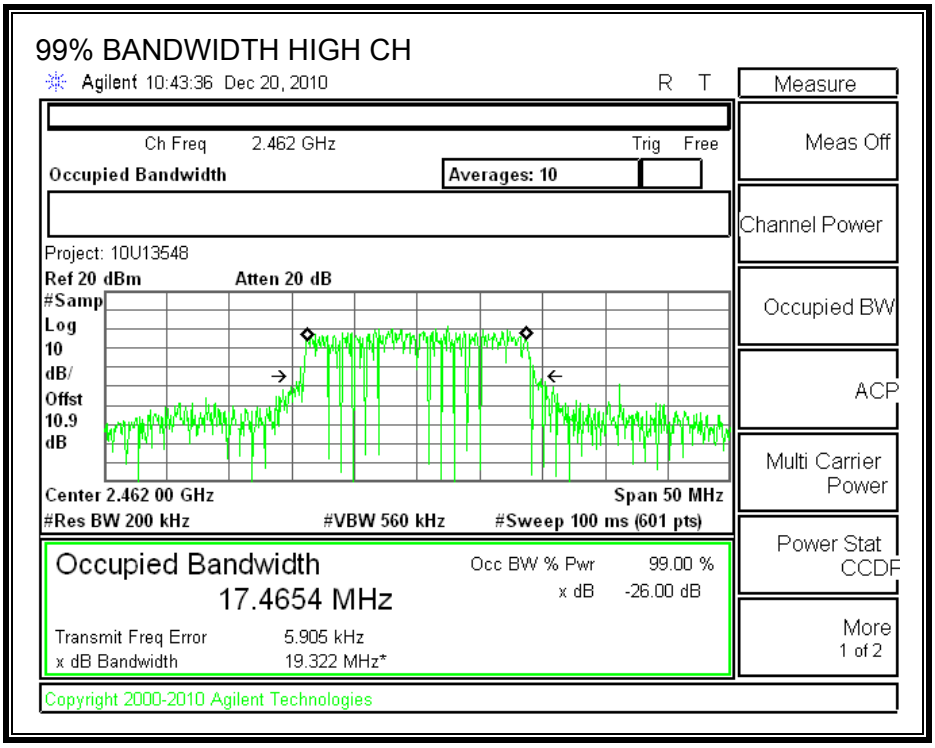
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.5138
Middle	2437	17.5178
High	2462	17.4654

99% BANDWIDTH







7.3.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

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

TEST PROCEDURE

Peak power is measured using a wide bandwidth peak power meter.

RESULTS

Channel	Frequency (MHz)	Spectrum Analyzer Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	11.4	10.8	22.20	30	-7.80
Middle	2437	13.7	10.8	24.50	30	-5.50
High	2462	11.3	10.8	22.10	30	-7.90

7.3.4. 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.

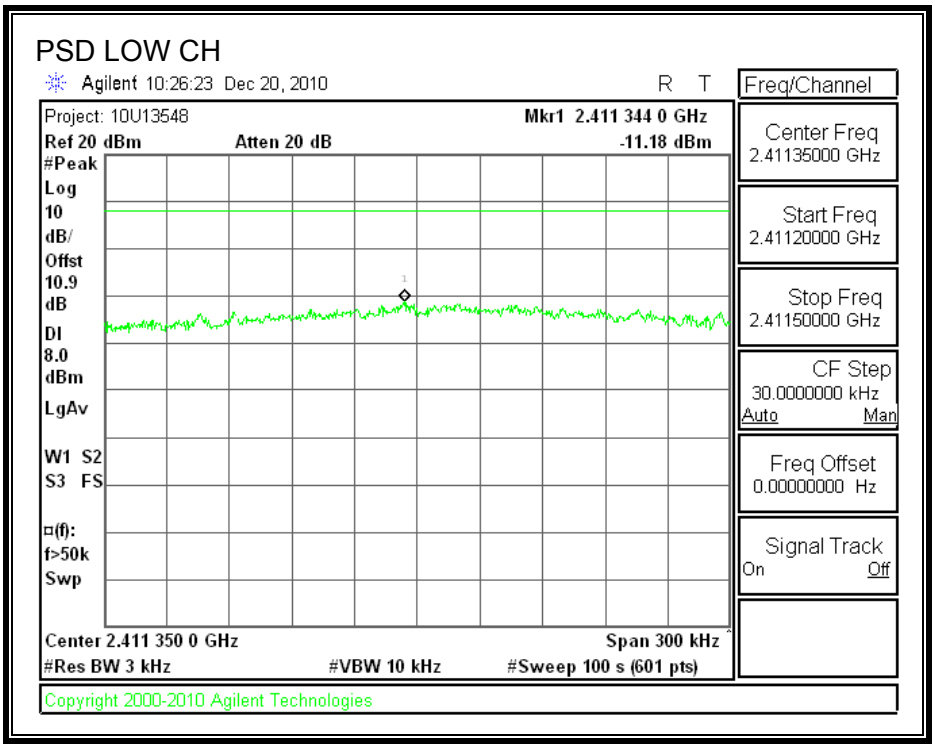
TEST PROCEDURE

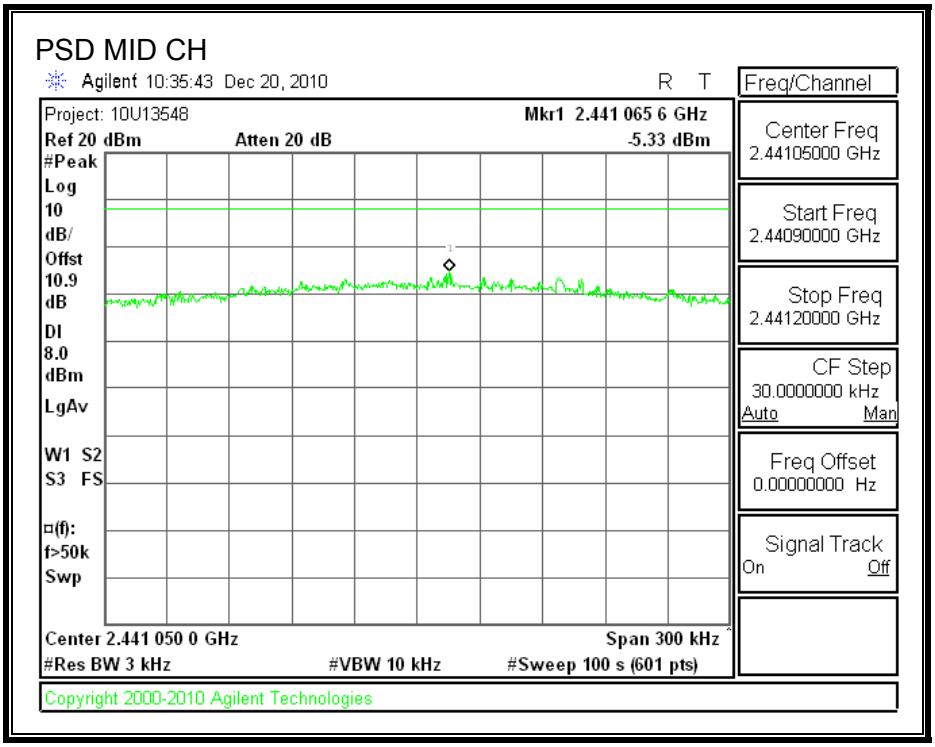
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

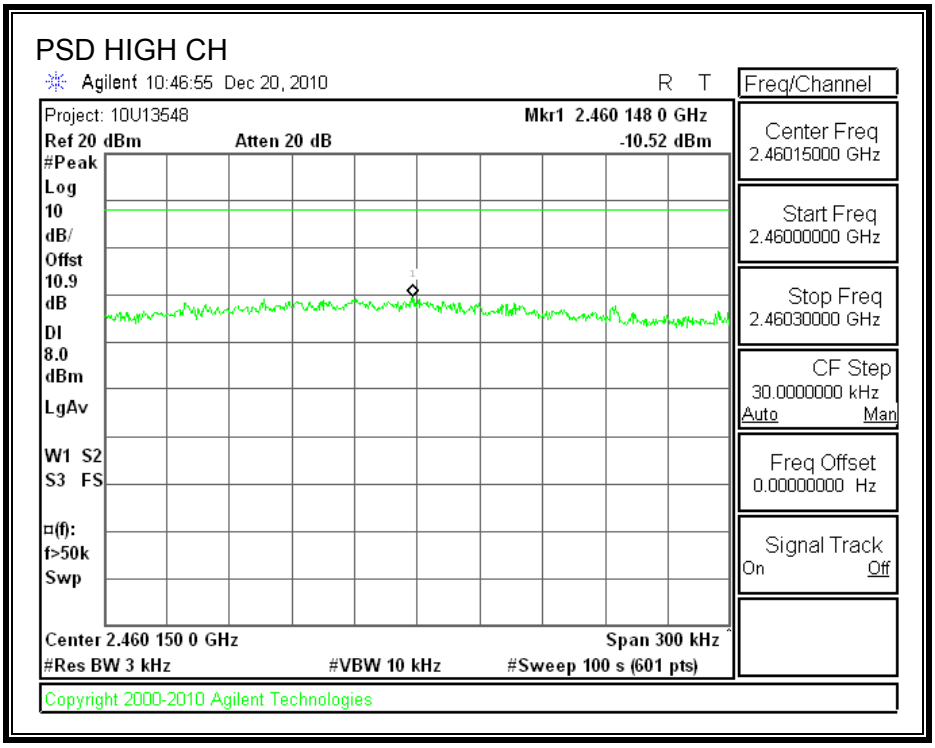
RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-11.18	8	-19.18
Middle	2437	-5.33	8	-13.33
High	2462	-10.52	8	-18.52

POWER SPECTRAL DENSITY







7.3.5. 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.

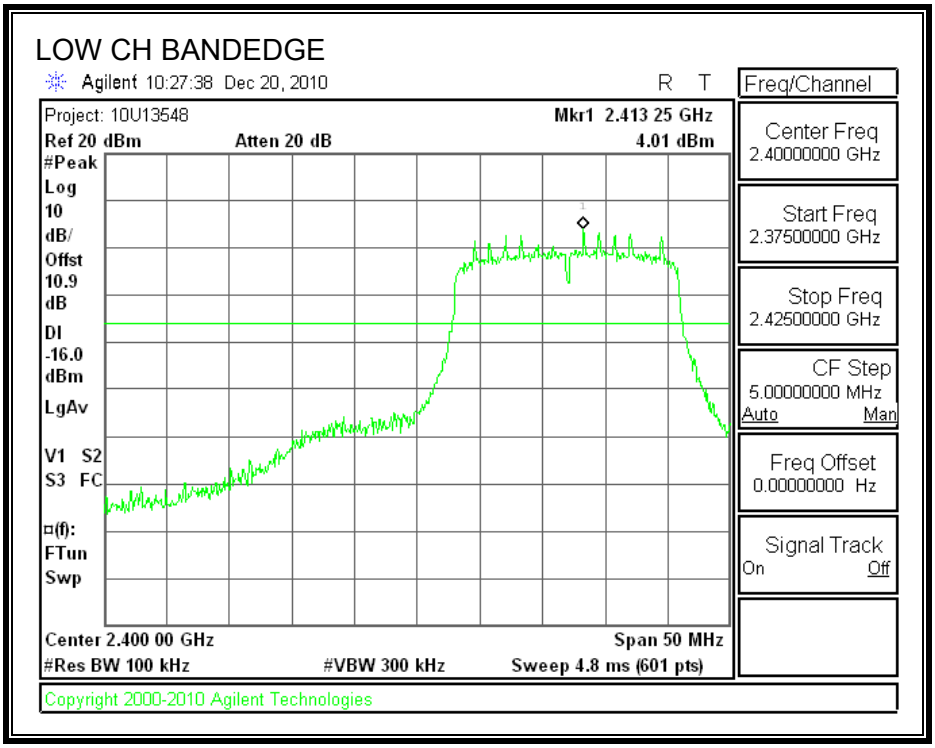
TEST PROCEDURE

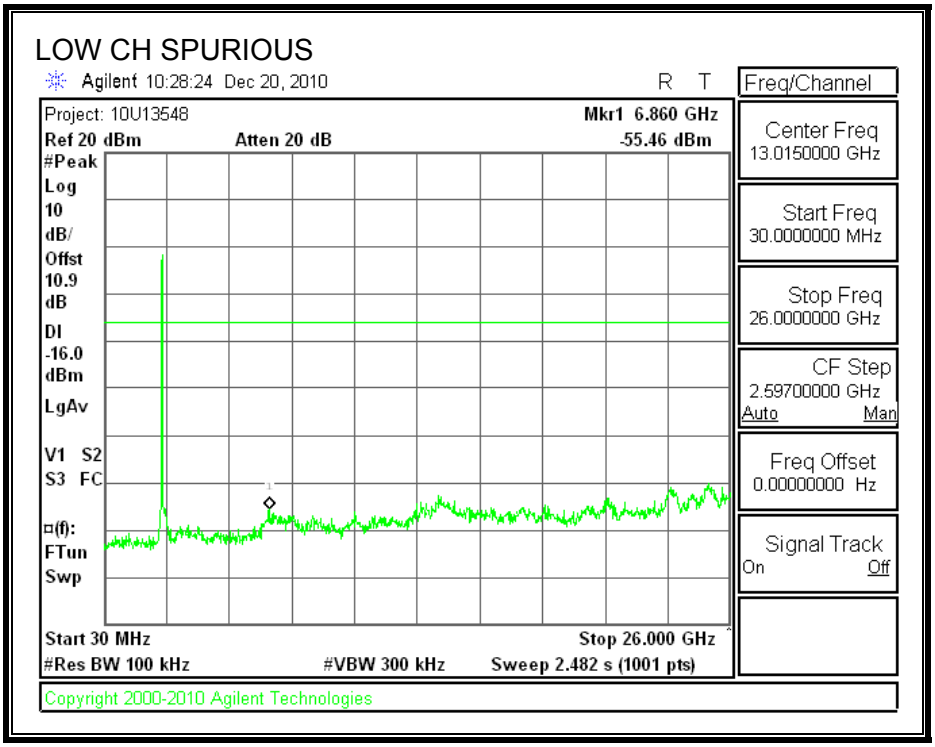
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

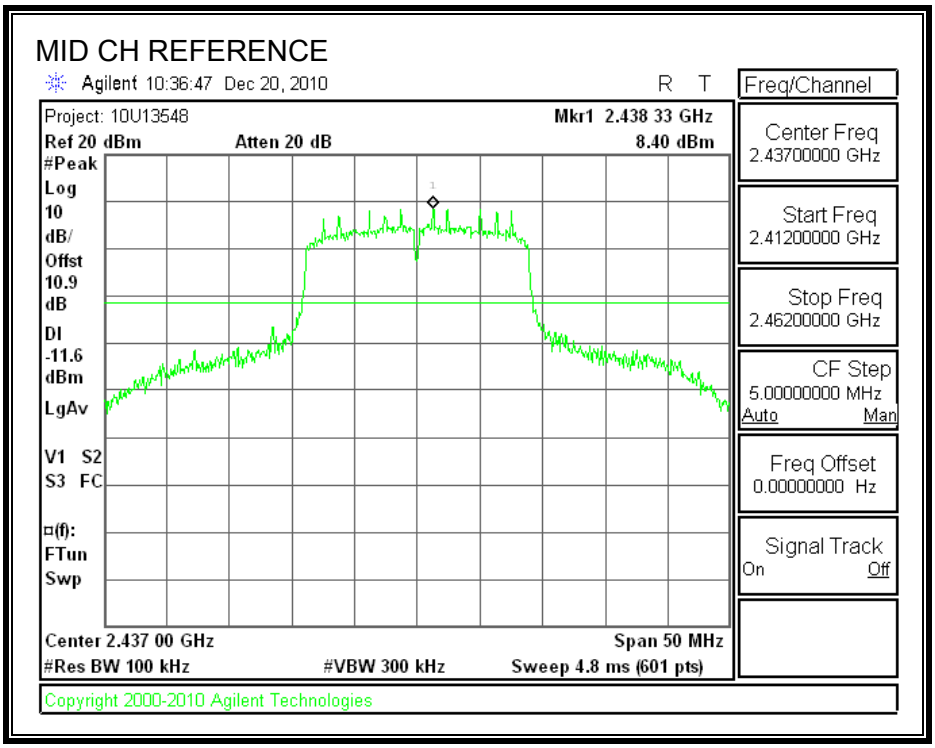
RESULTS

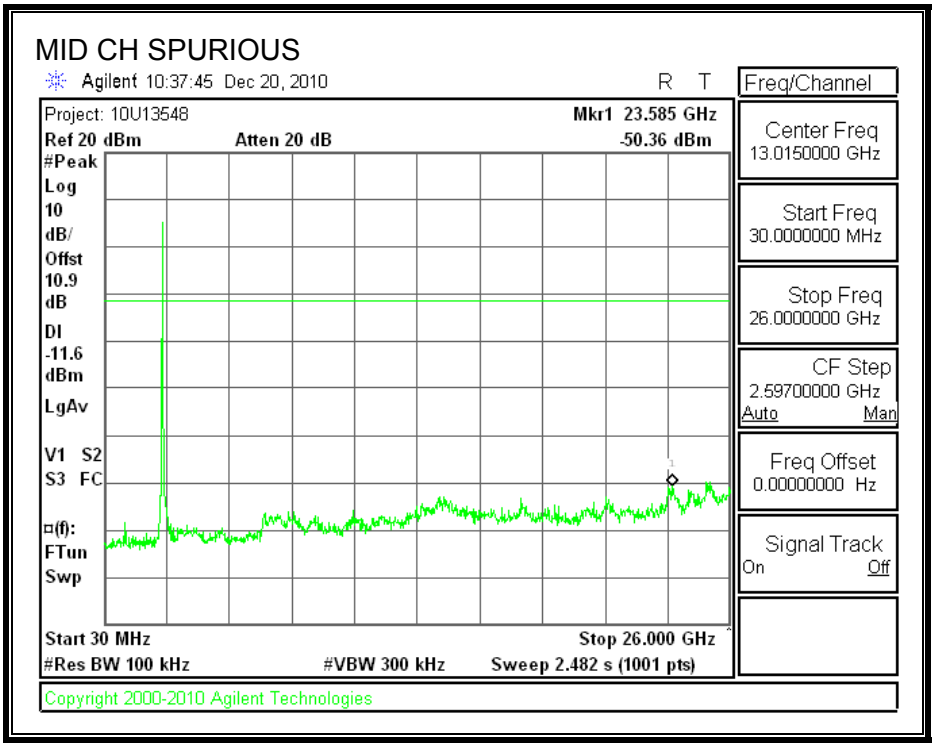
SPURIOUS EMISSIONS, LOW CHANNEL



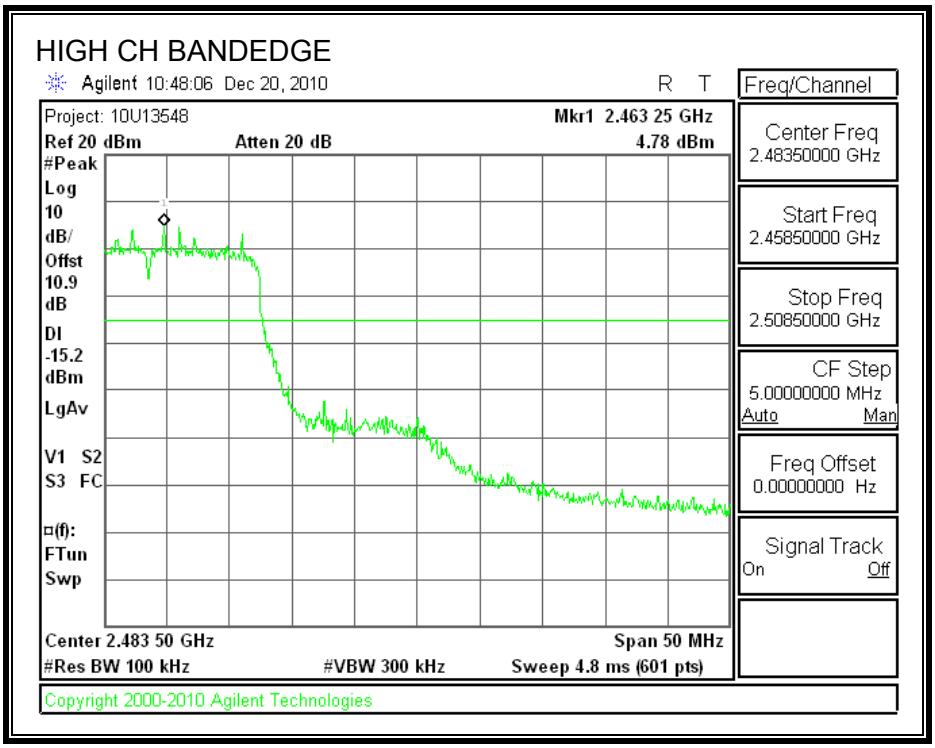


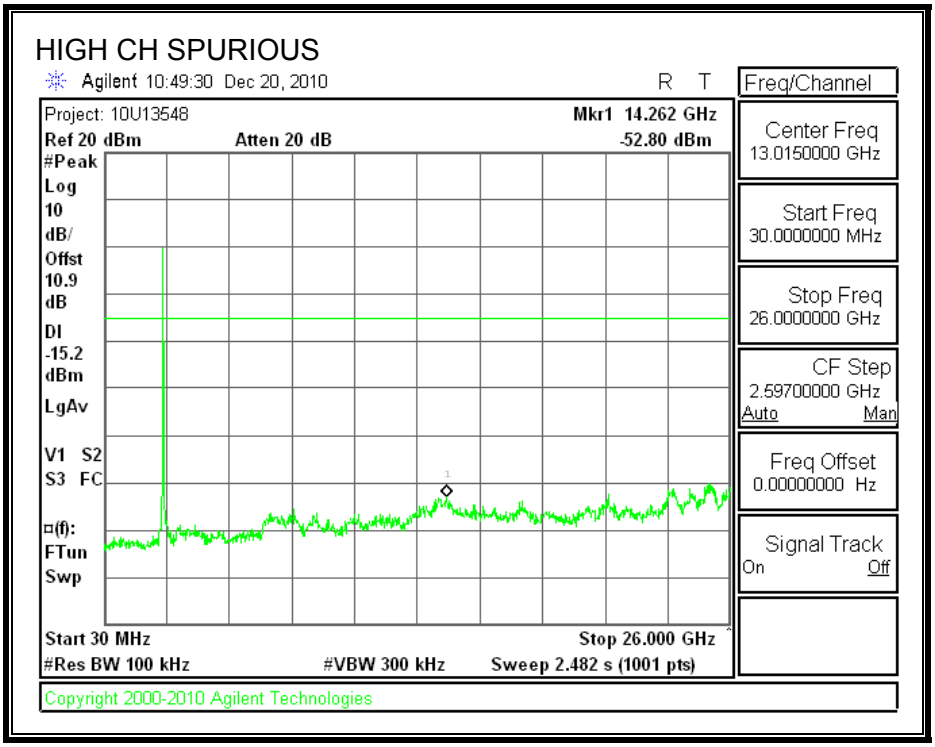
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





7.4. 802.11a MODE IN THE 5.8 GHz BAND

7.4.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

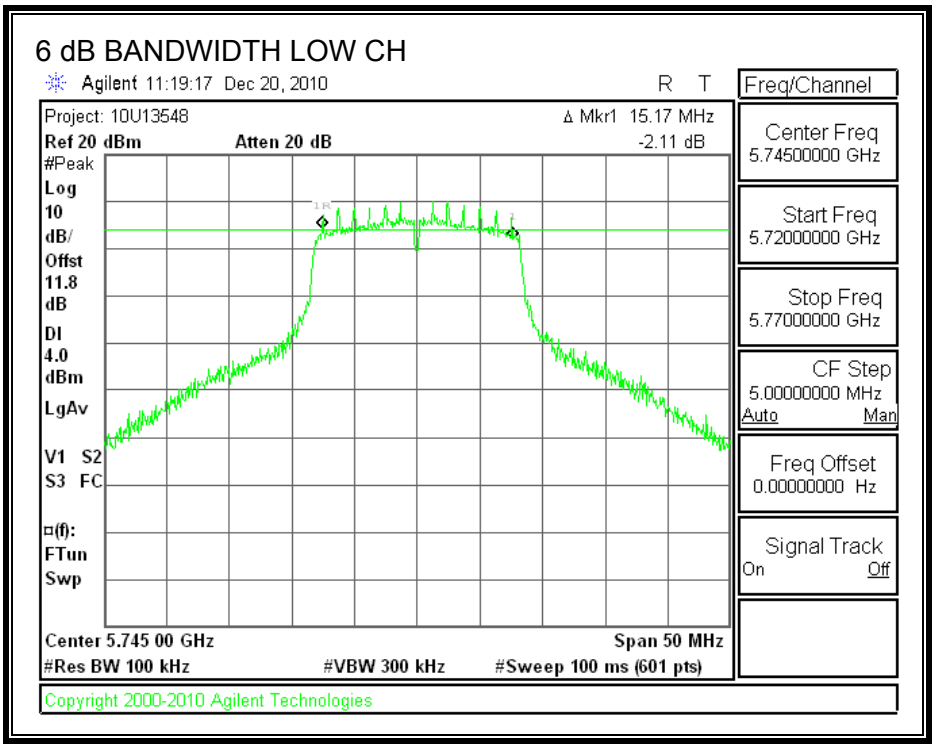
TEST PROCEDURE

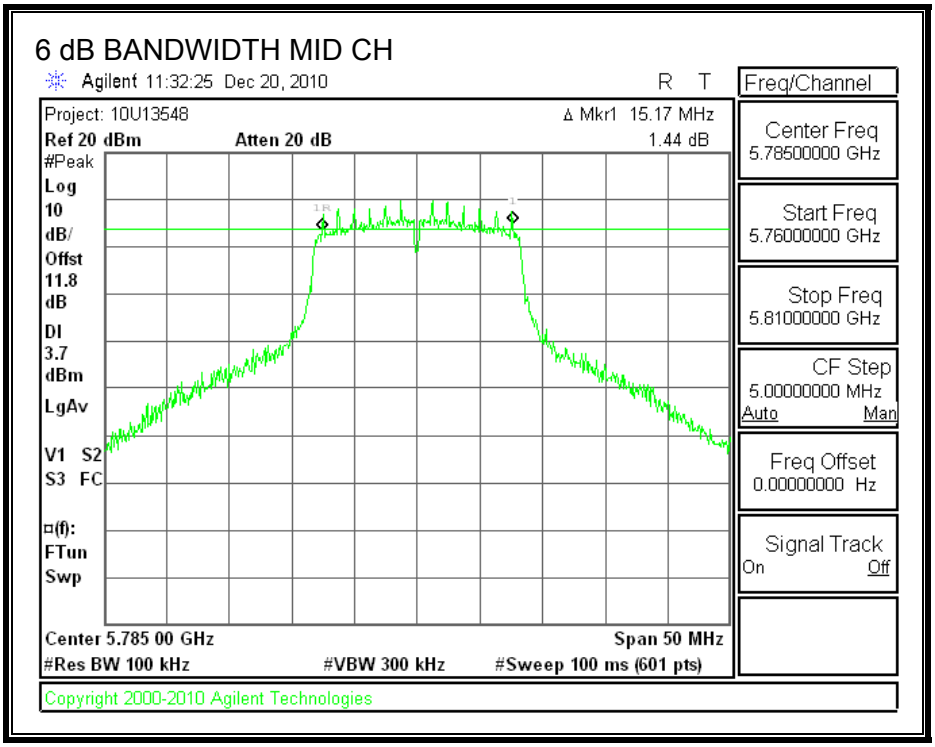
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

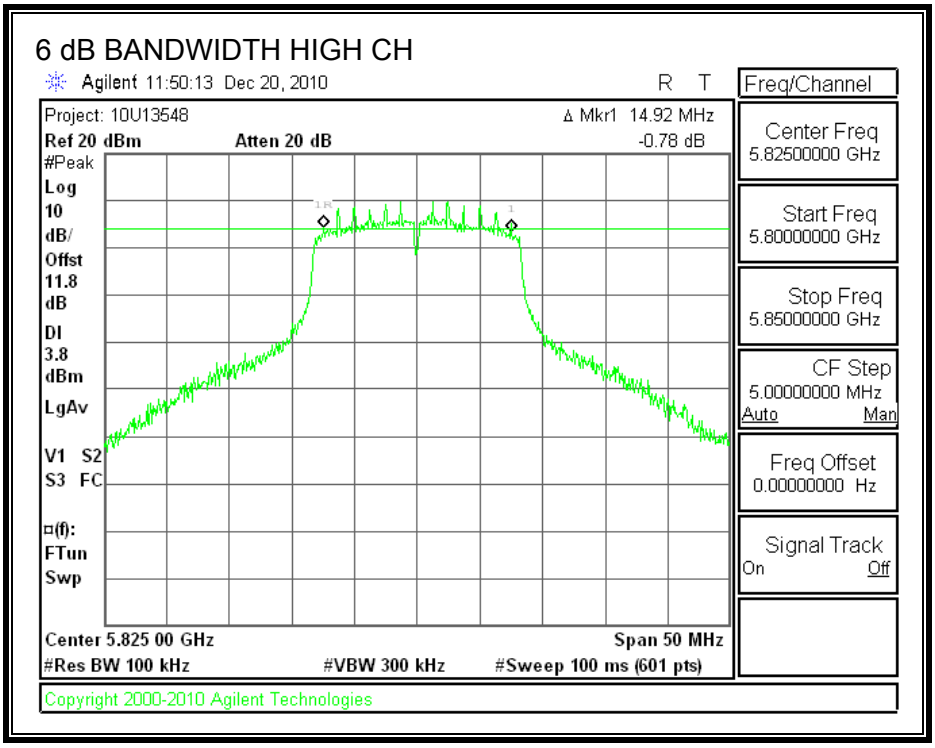
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	15.17	0.5
Middle	5785	15.17	0.5
High	5825	14.92	0.5

6 dB BANDWIDTH







7.4.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

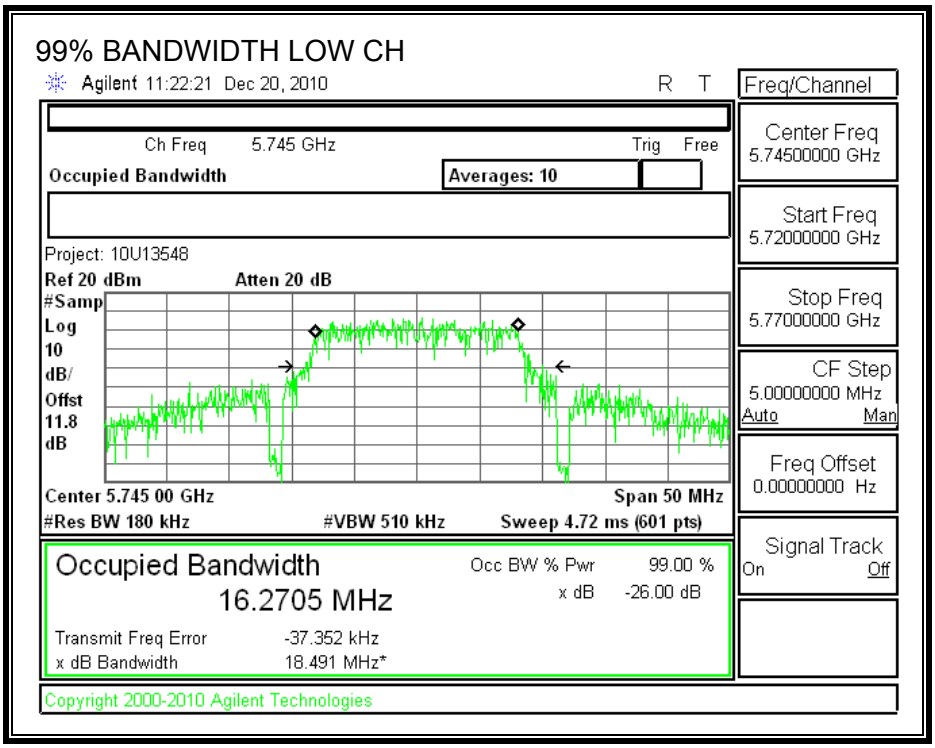
TEST PROCEDURE

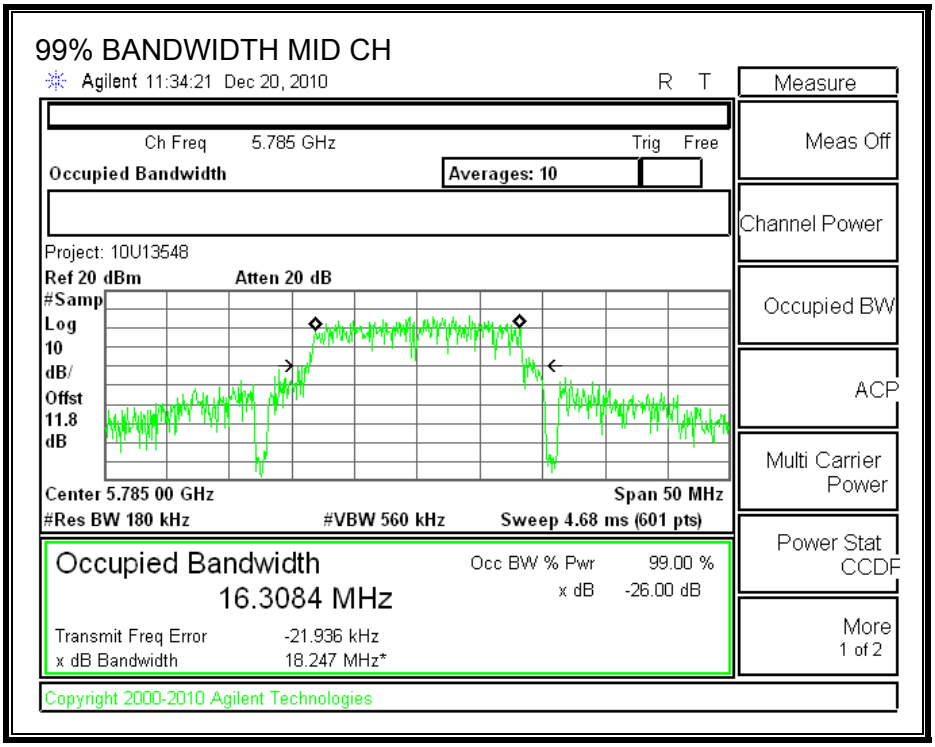
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

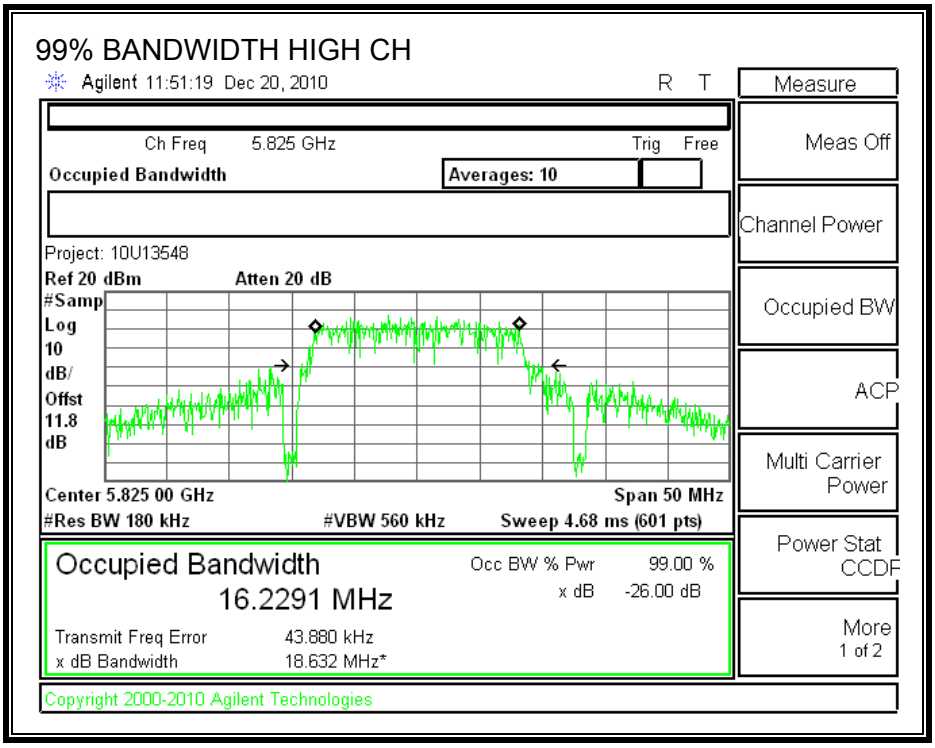
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	16.2705
Middle	5785	16.3084
High	5825	16.2291

99% BANDWIDTH







7.4.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

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

TEST PROCEDURE

Peak power is measured using a wide bandwidth peak power meter.

RESULTS

Channel	Frequency (MHz)	Spectrum Analyzer Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	5745	12.6	11.8	24.40	30	-5.60
Middle	5785	12.4	11.8	24.20	30	-5.80
High	5825	12.4	11.8	24.20	30	-5.80

7.4.4. 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.

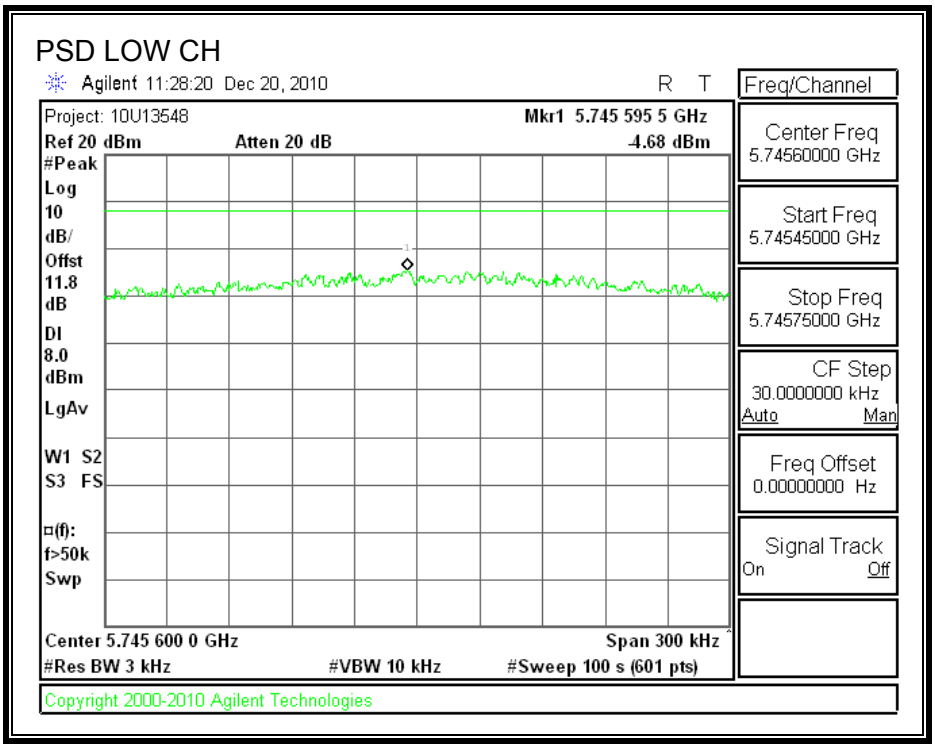
TEST PROCEDURE

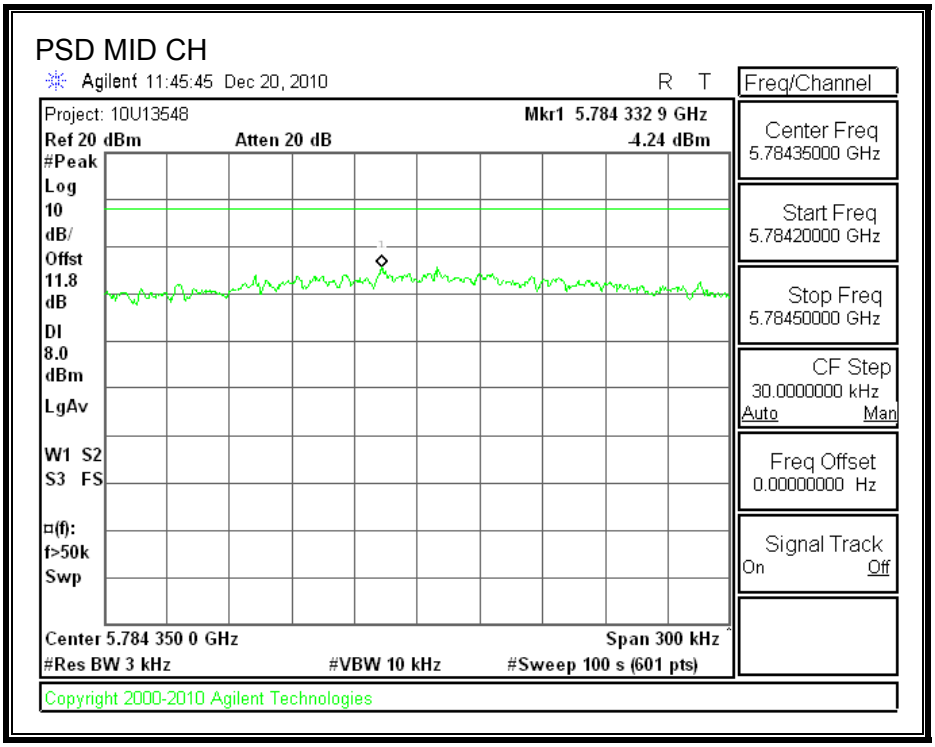
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

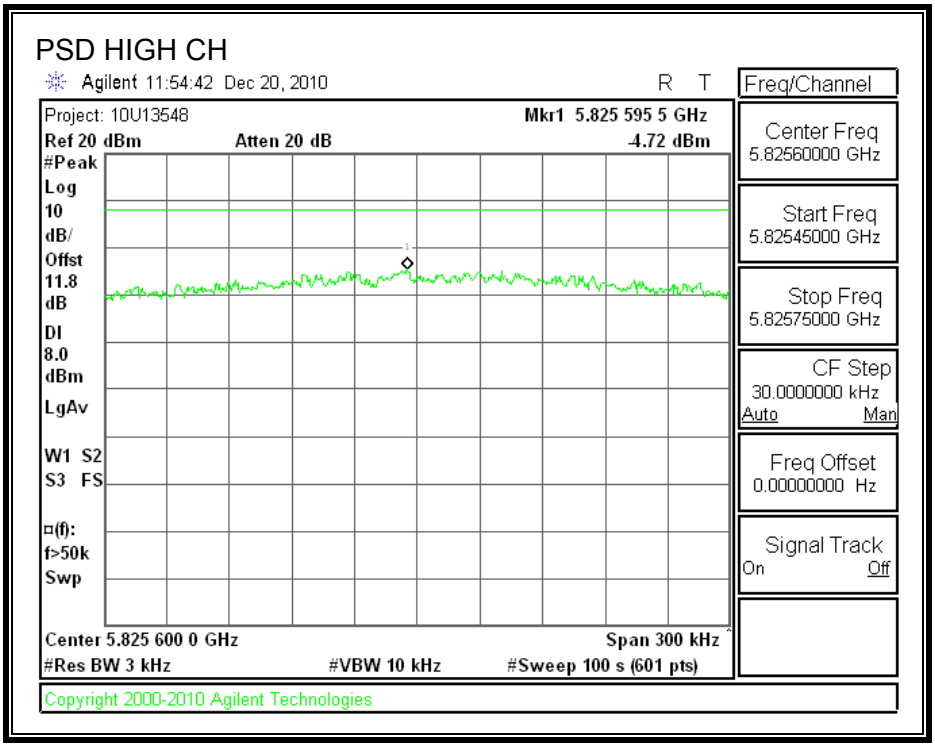
RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	-4.68	8	-12.68
Middle	5785	-4.24	8	-12.24
High	5825	-4.72	8	-12.72

POWER SPECTRAL DENSITY







7.4.5. 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.

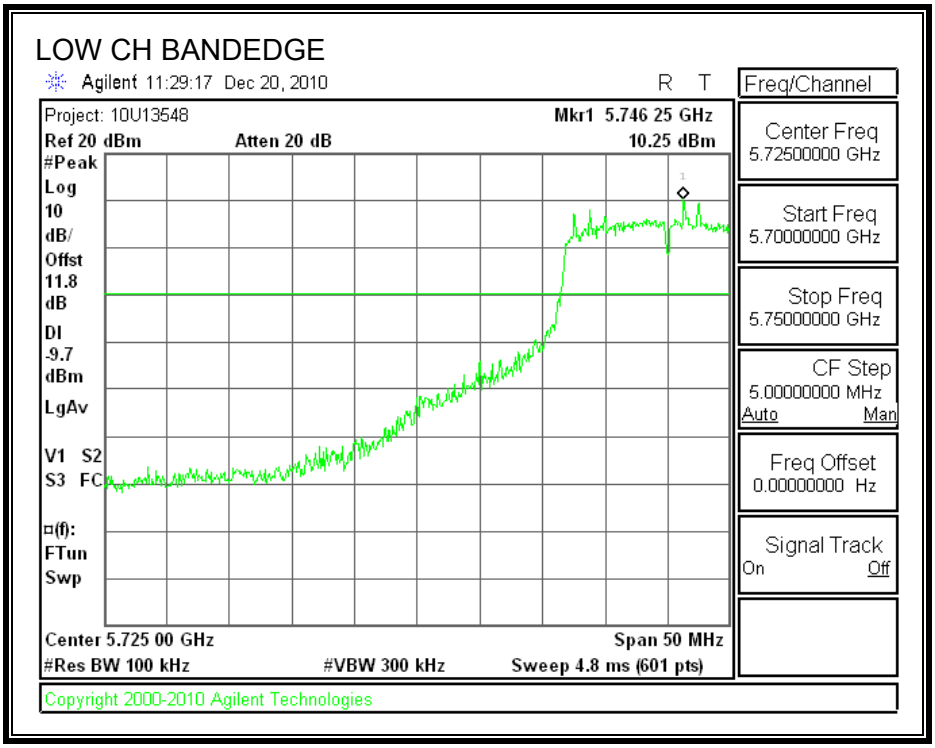
TEST PROCEDURE

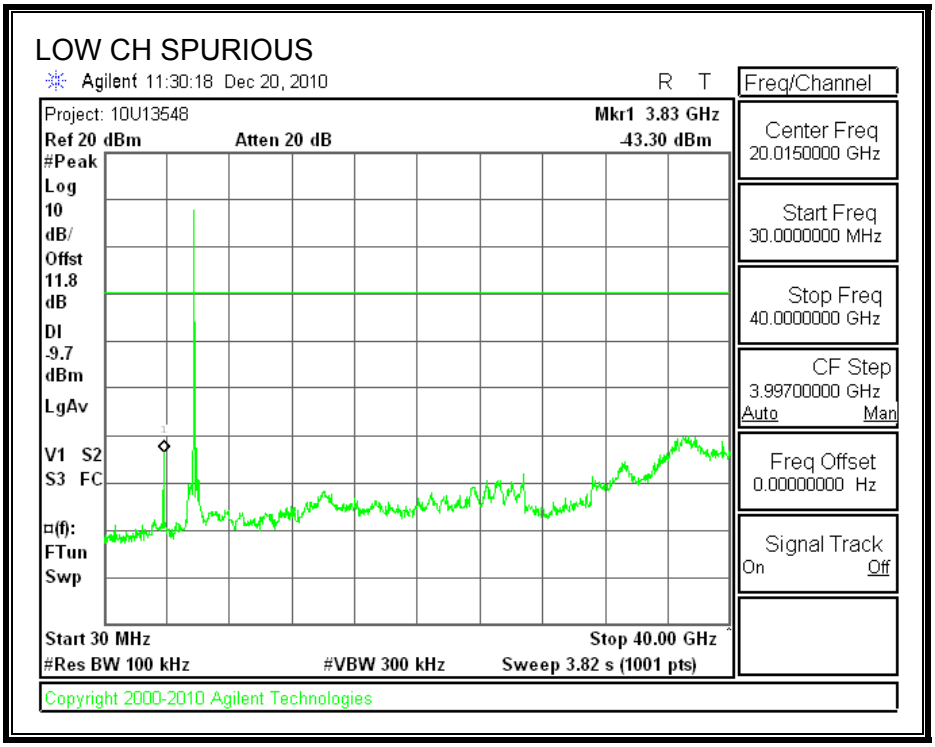
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

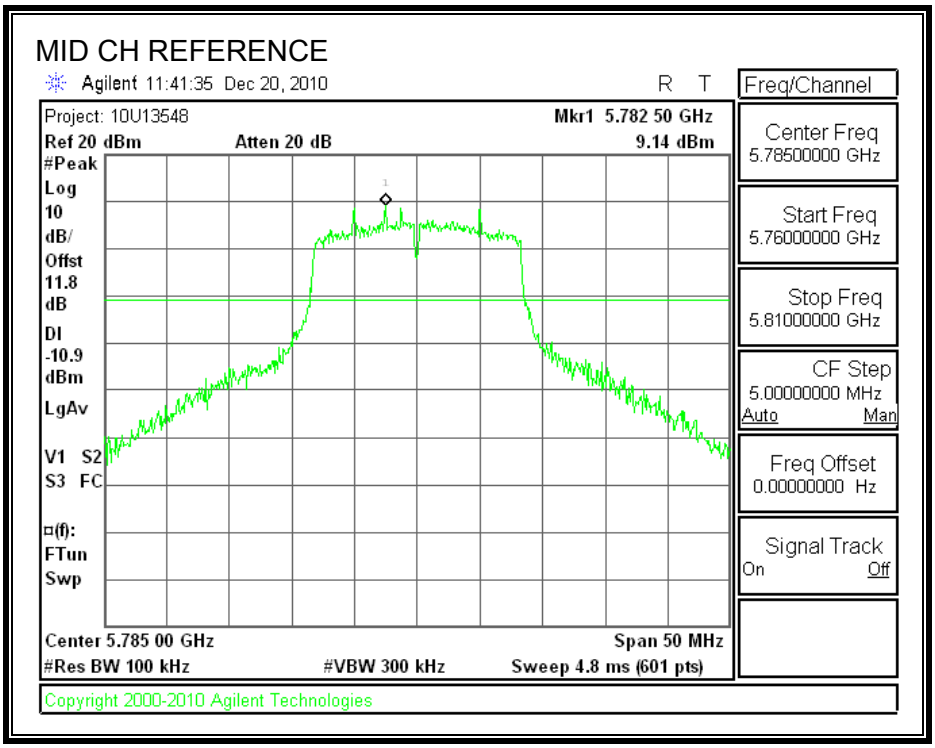
RESULTS

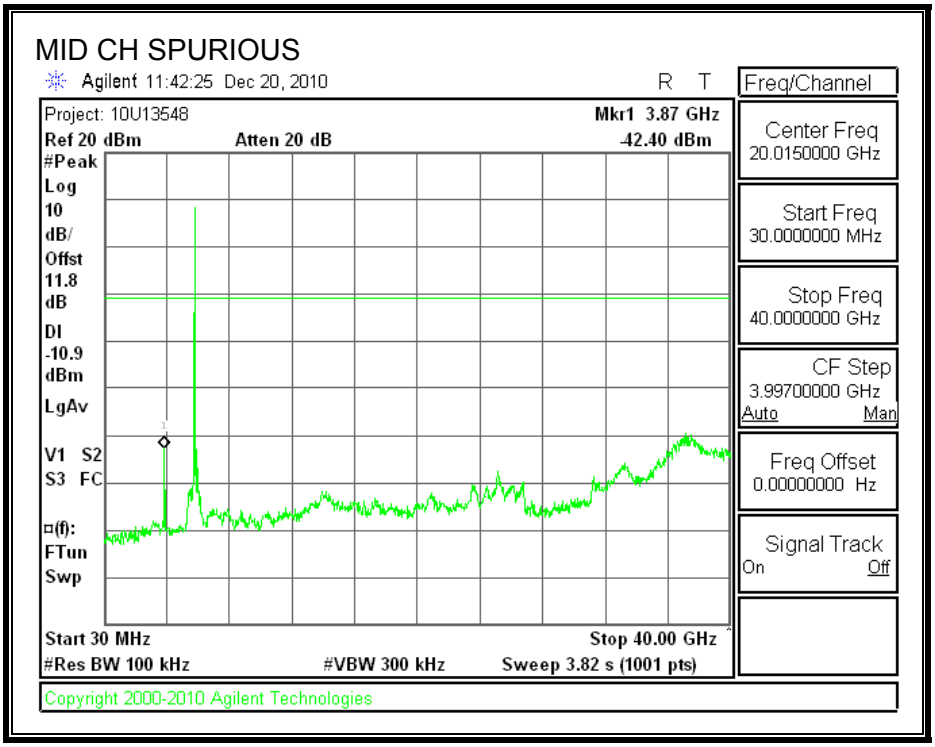
SPURIOUS EMISSIONS, LOW CHANNEL



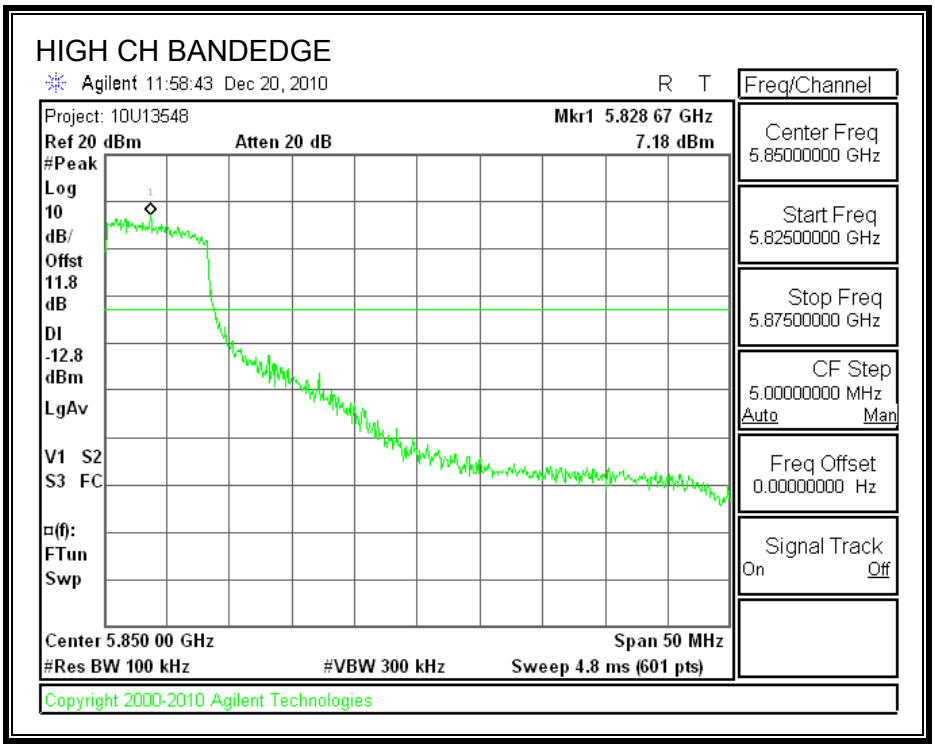


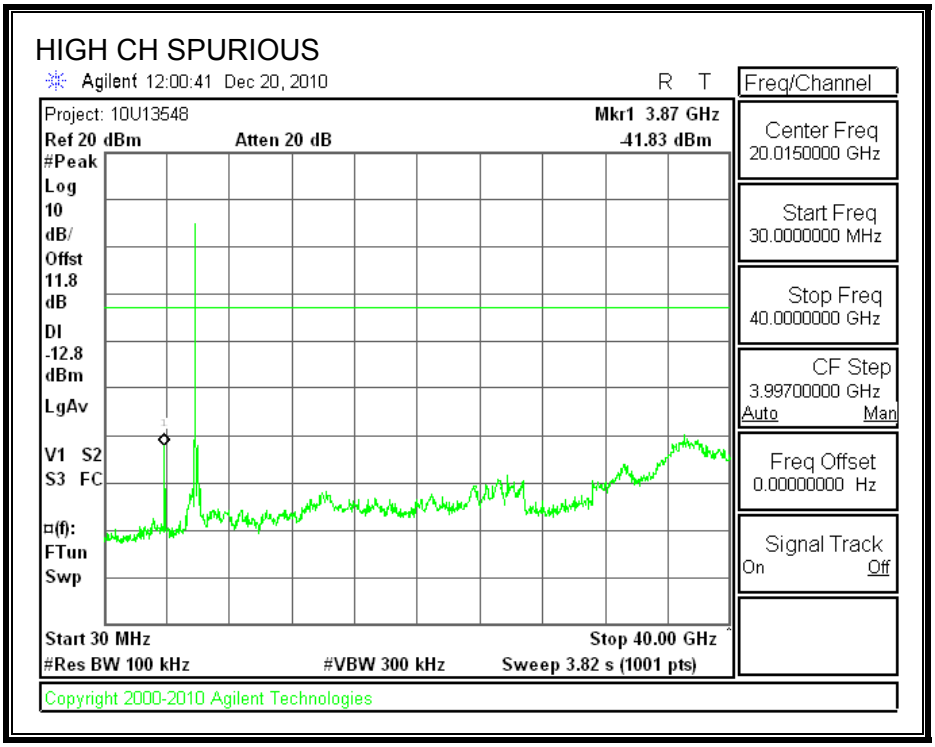
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





7.5. 802.11n HT20 MODE IN THE 5.8 GHz BAND

7.5.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

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

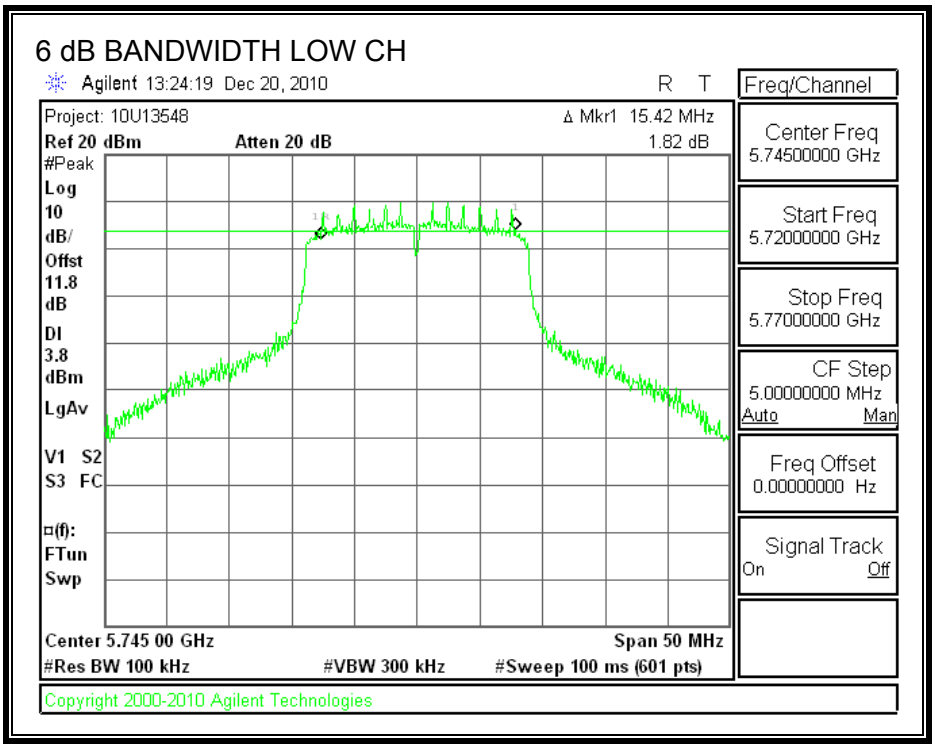
TEST PROCEDURE

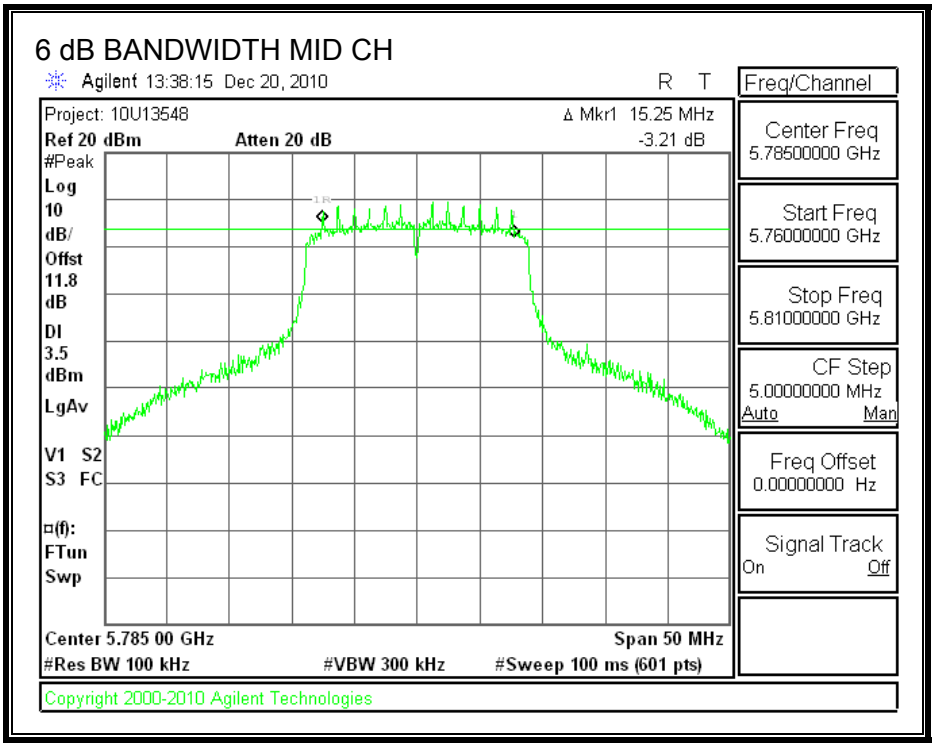
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

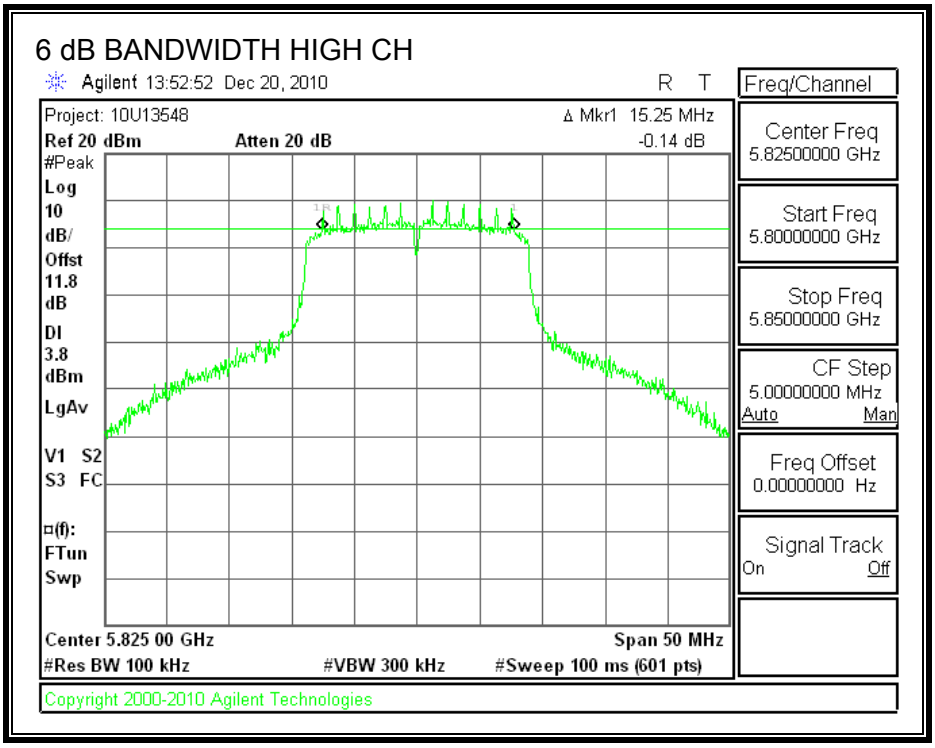
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	15.42	0.5
Middle	5785	15.25	0.5
High	5825	15.25	0.5

6 dB BANDWIDTH







7.5.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

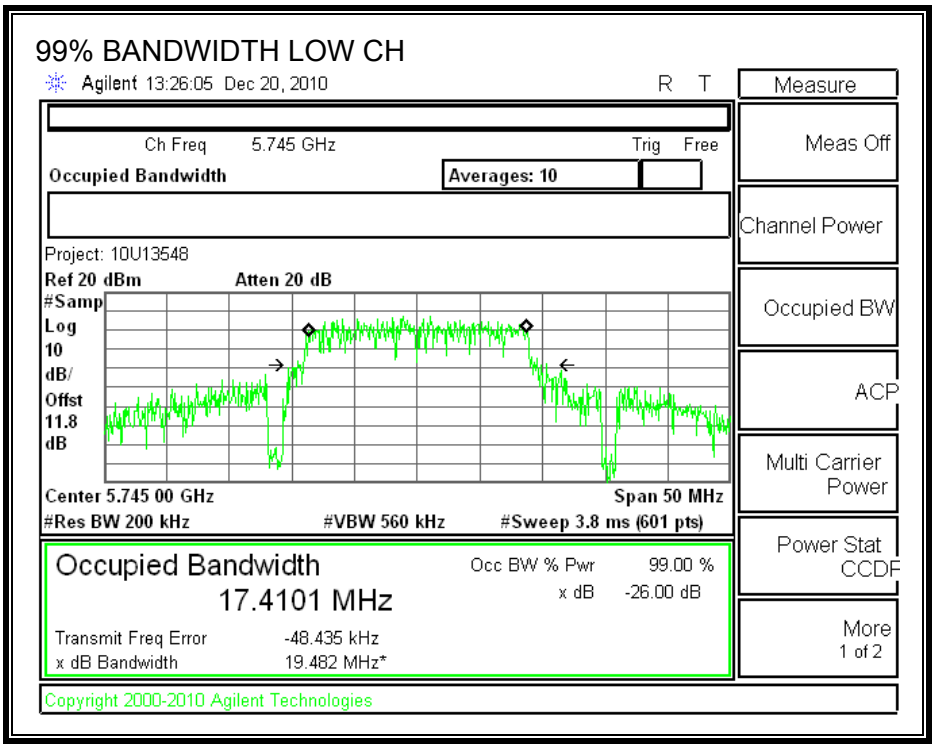
TEST PROCEDURE

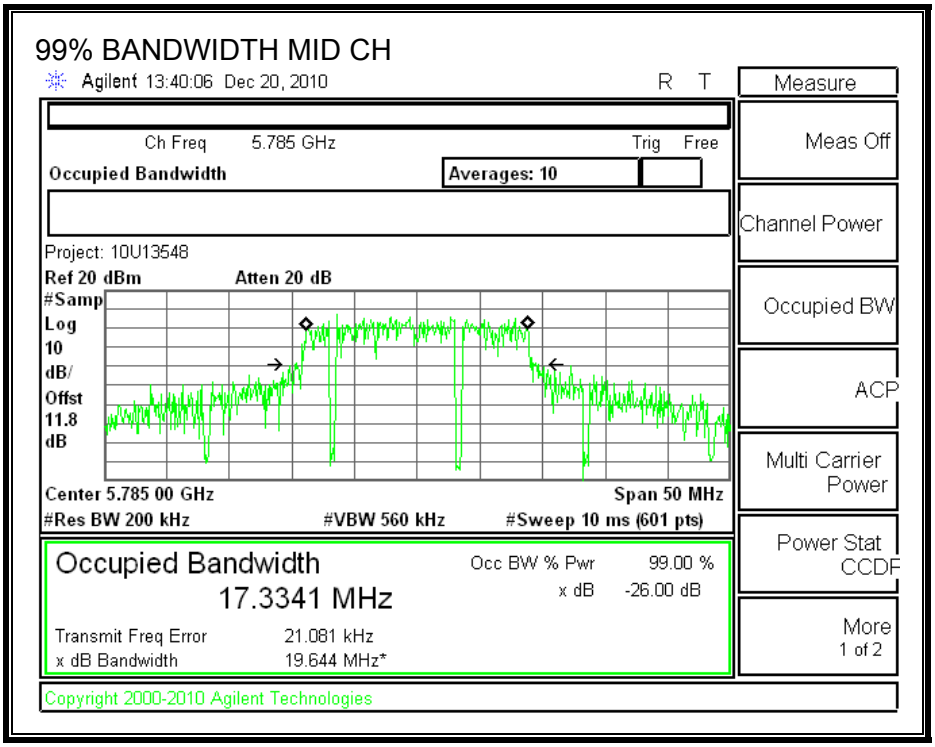
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

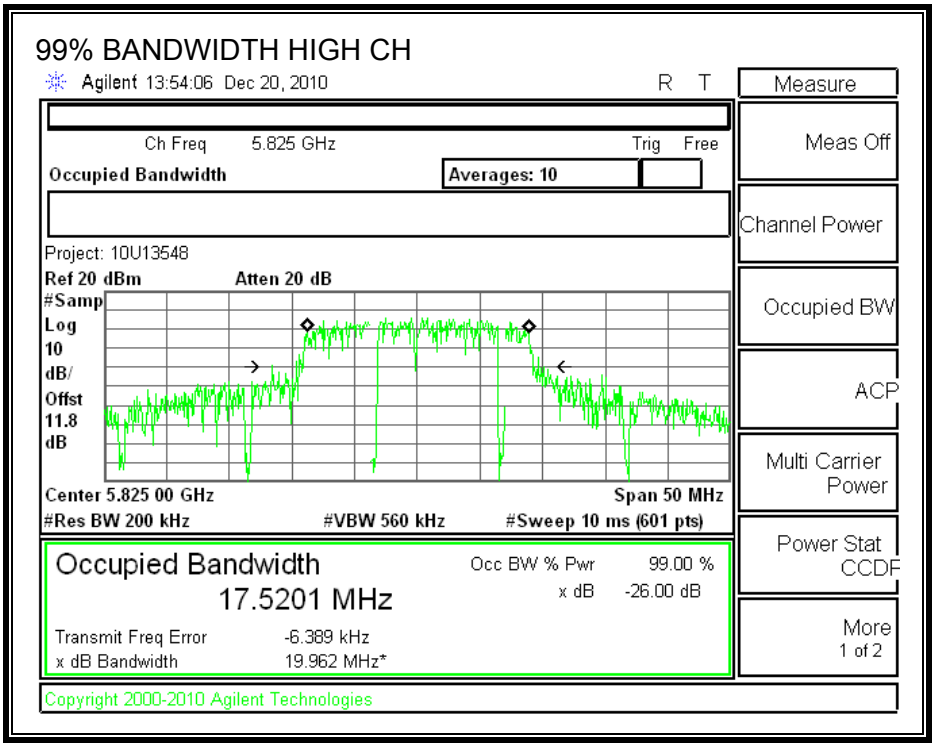
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.4101
Middle	5785	17.3341
High	5825	17.5201

99% BANDWIDTH







7.5.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

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

TEST PROCEDURE

Peak power is measured using a wide bandwidth peak power meter.

RESULTS

Channel	Frequency (MHz)	Spectrum Analyzer Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	5745	12.7	11.8	24.50	30	-5.50
Middle	5785	12.4	11.8	24.20	30	-5.80
High	5825	12.4	11.8	24.20	30	-5.80

7.5.4. 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.

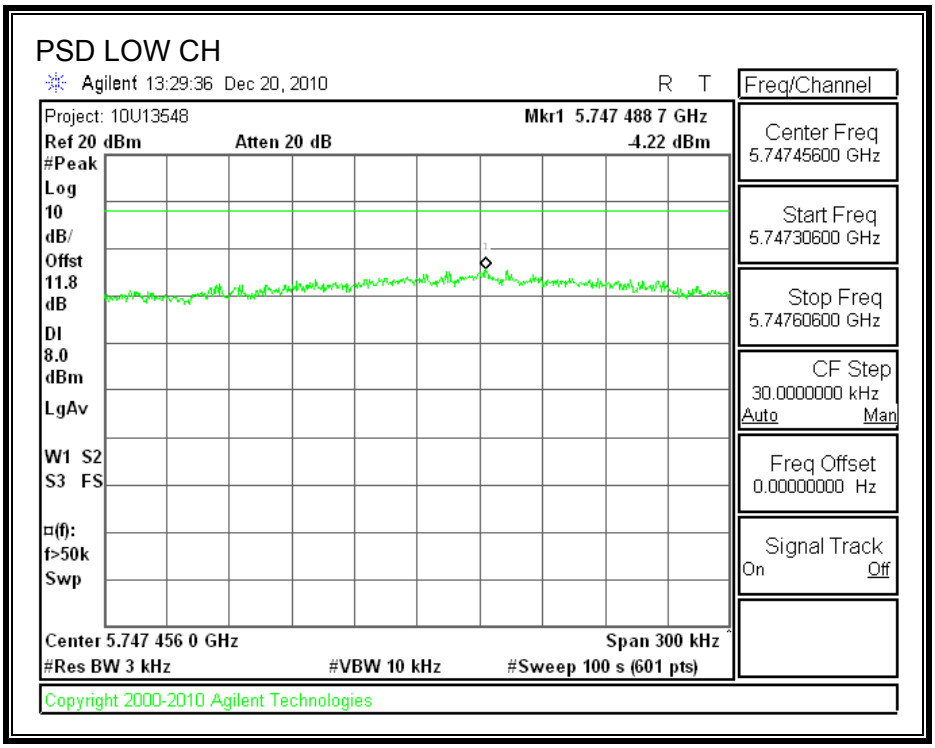
TEST PROCEDURE

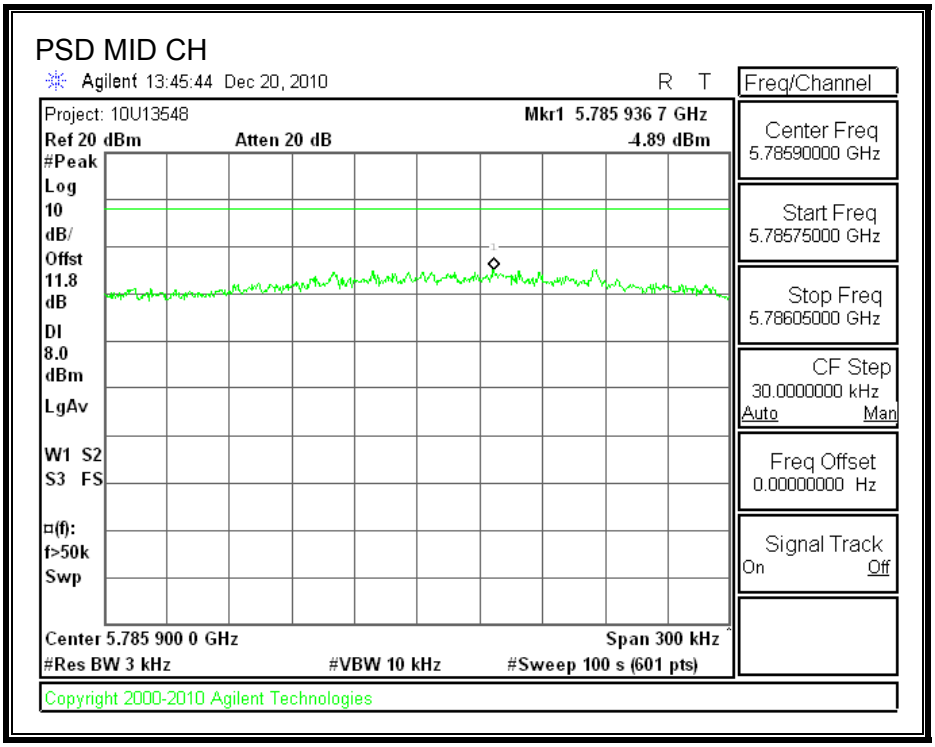
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

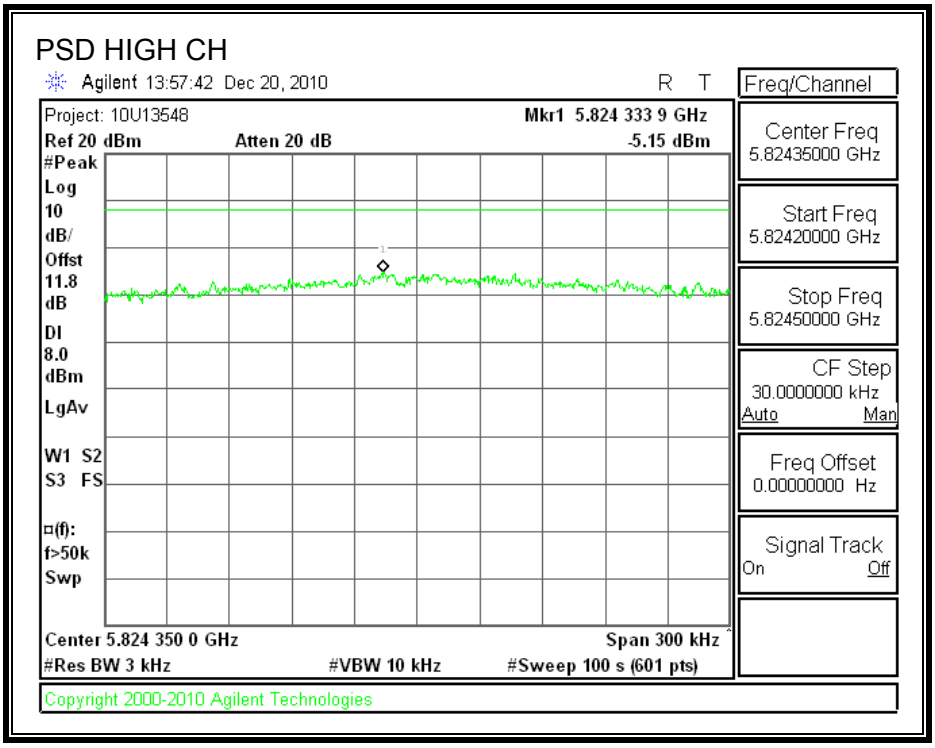
RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	5745	-4.22	8	-12.22
Middle	5785	-4.89	8	-12.89
High	5825	-5.15	8	-13.15

POWER SPECTRAL DENSITY







7.5.5. 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.

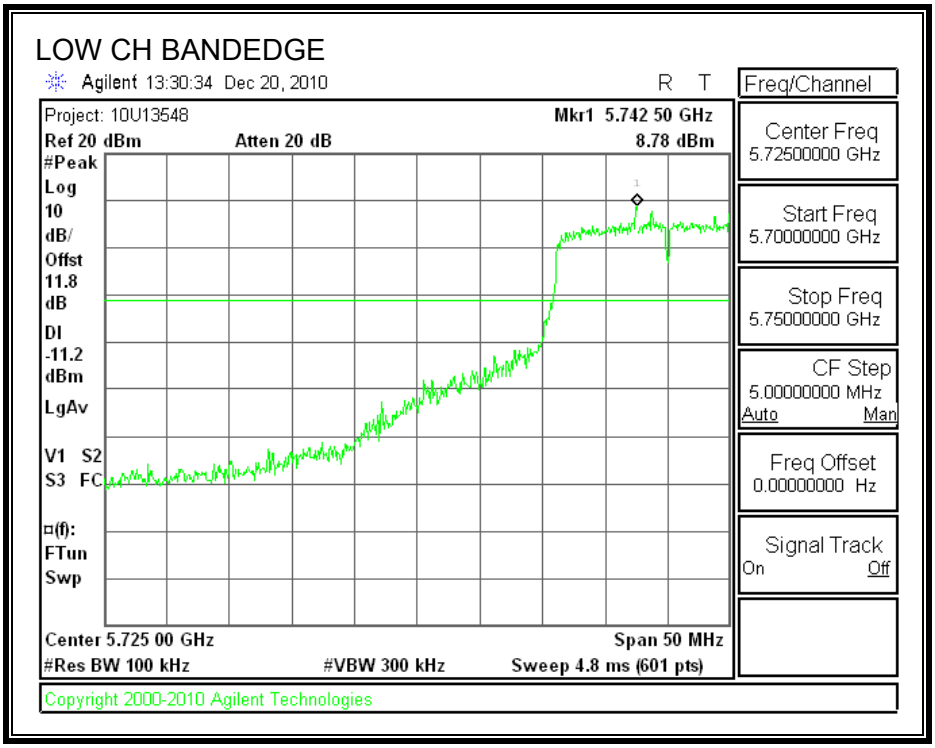
TEST PROCEDURE

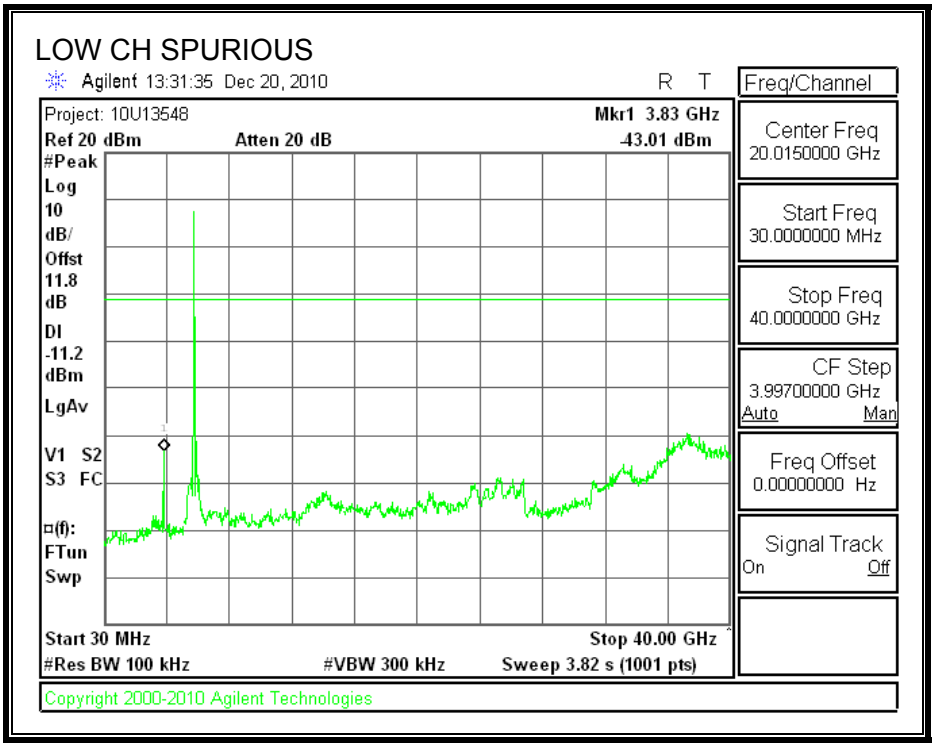
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

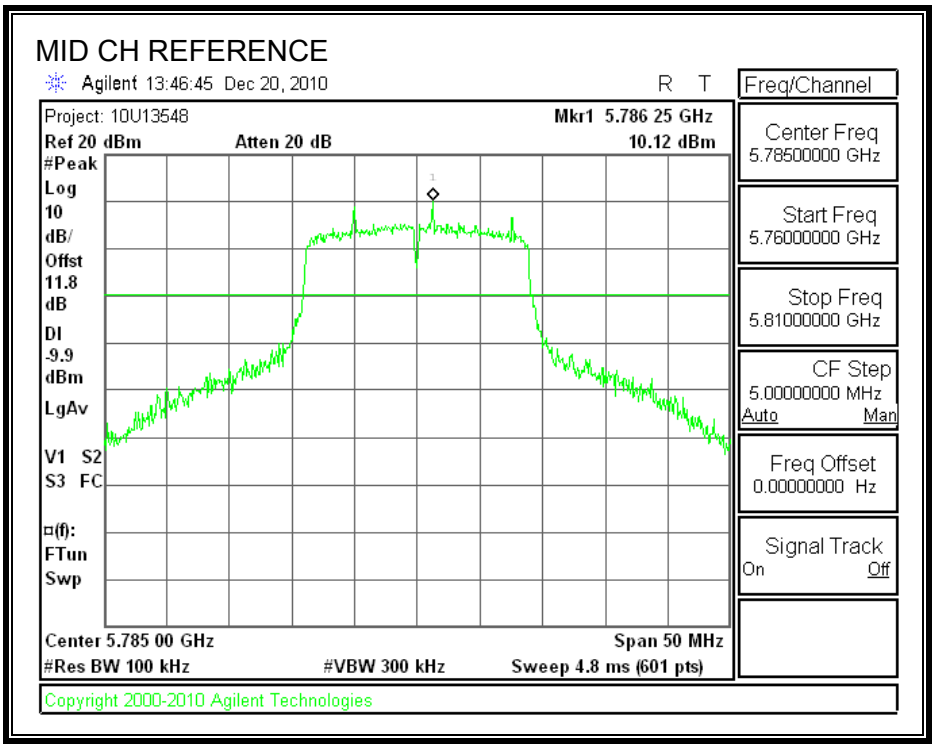
RESULTS

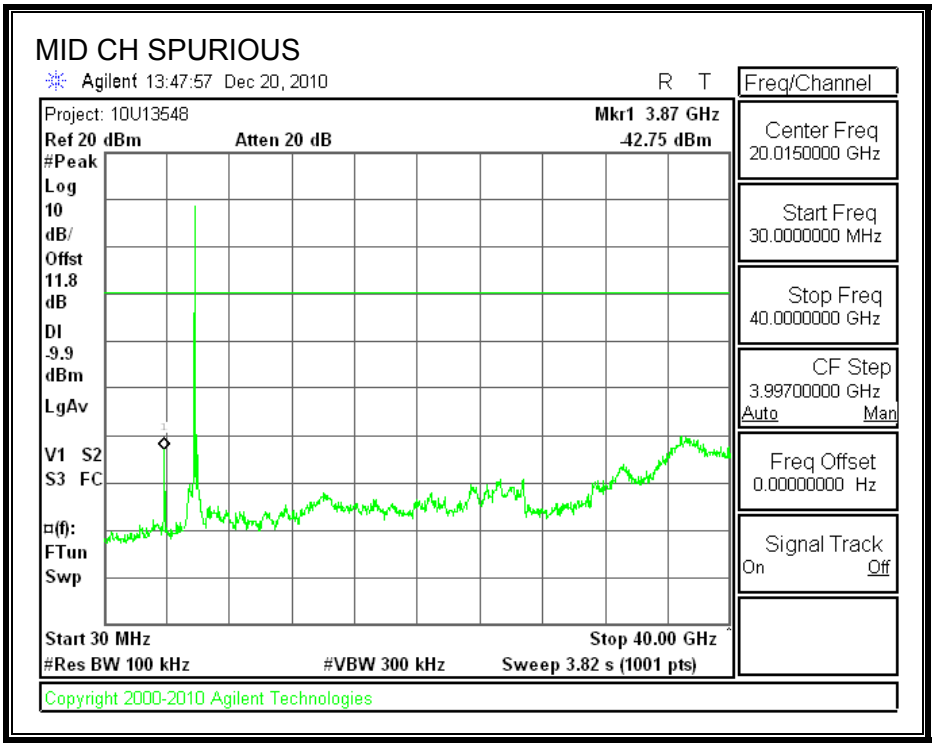
SPURIOUS EMISSIONS, LOW CHANNEL



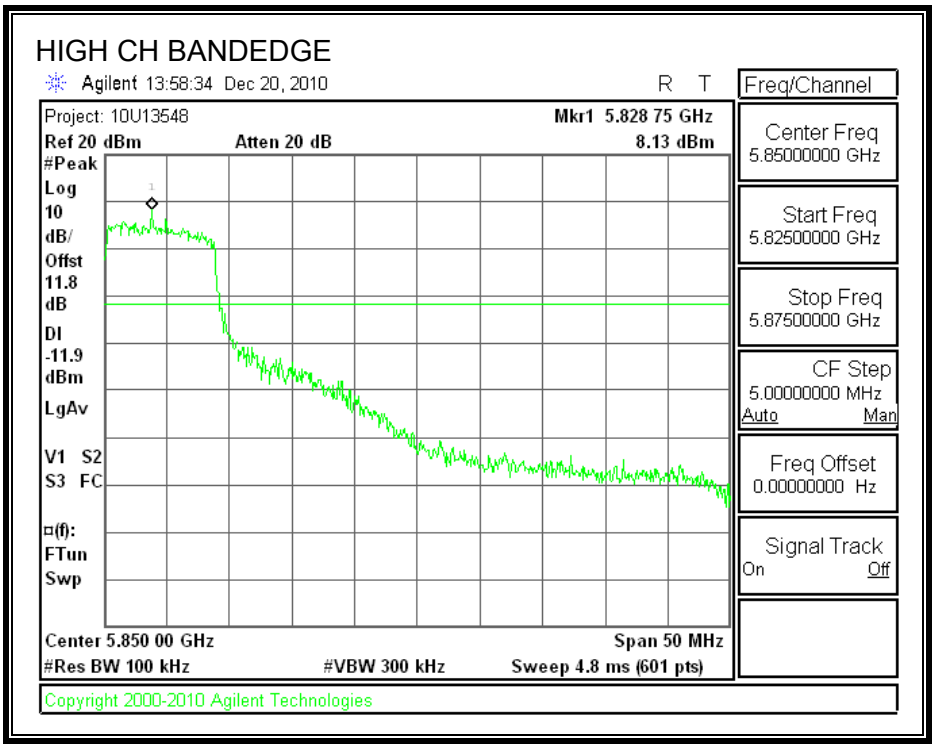


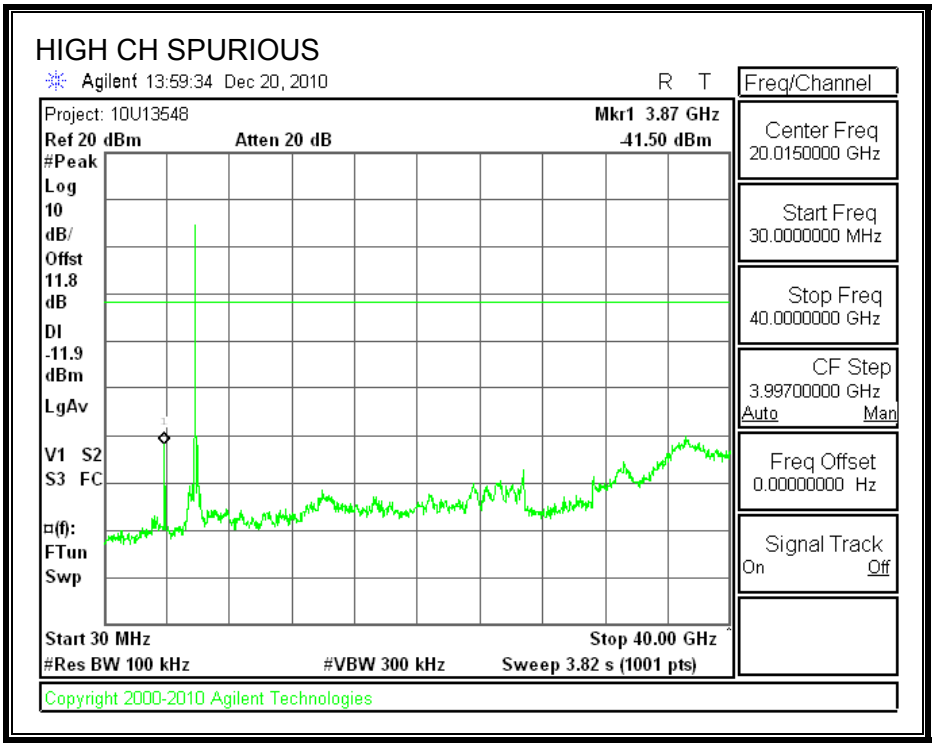
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

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

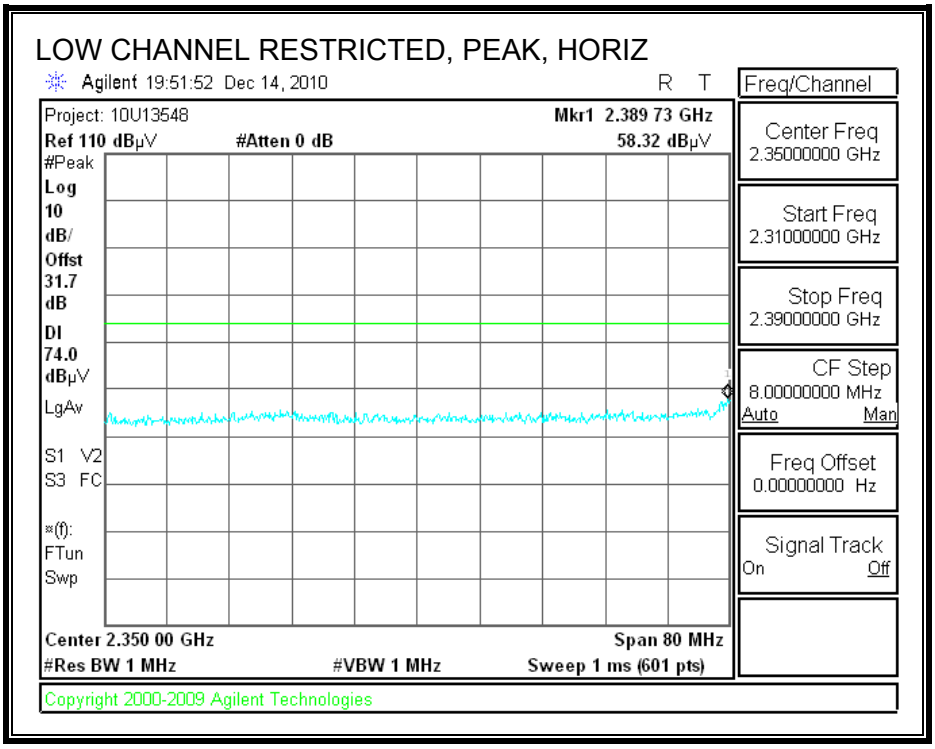
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable 5 GHz band.

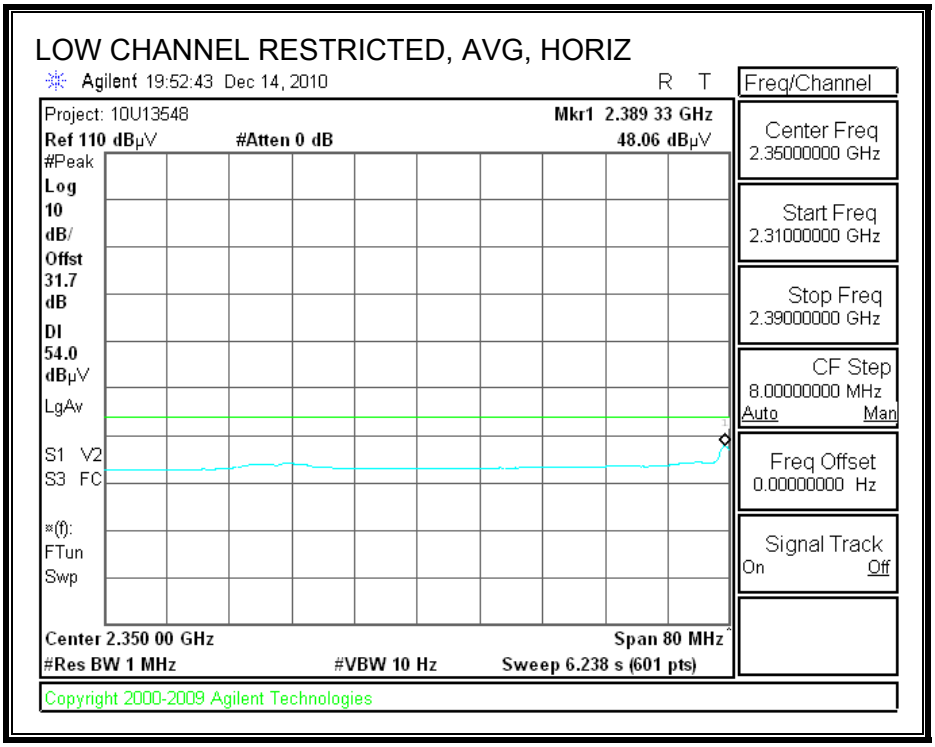
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

8.2. TRANSMITTER ABOVE 1 GHz

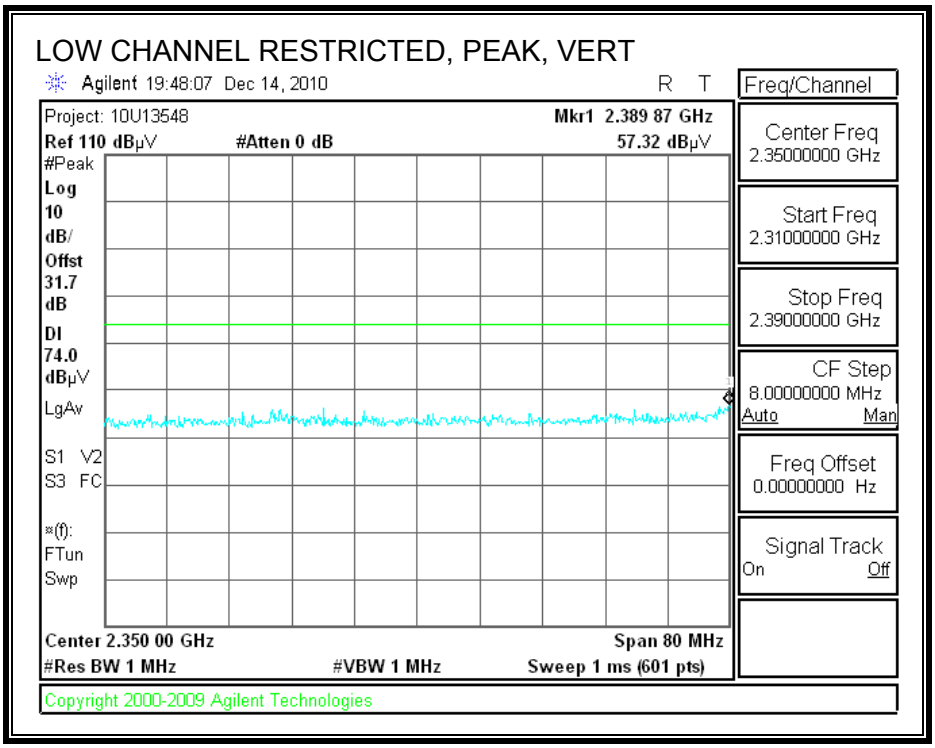
8.2.1. TX ABOVE 1 GHz FOR 802.11b MODE IN THE 2.4 GHz BAND

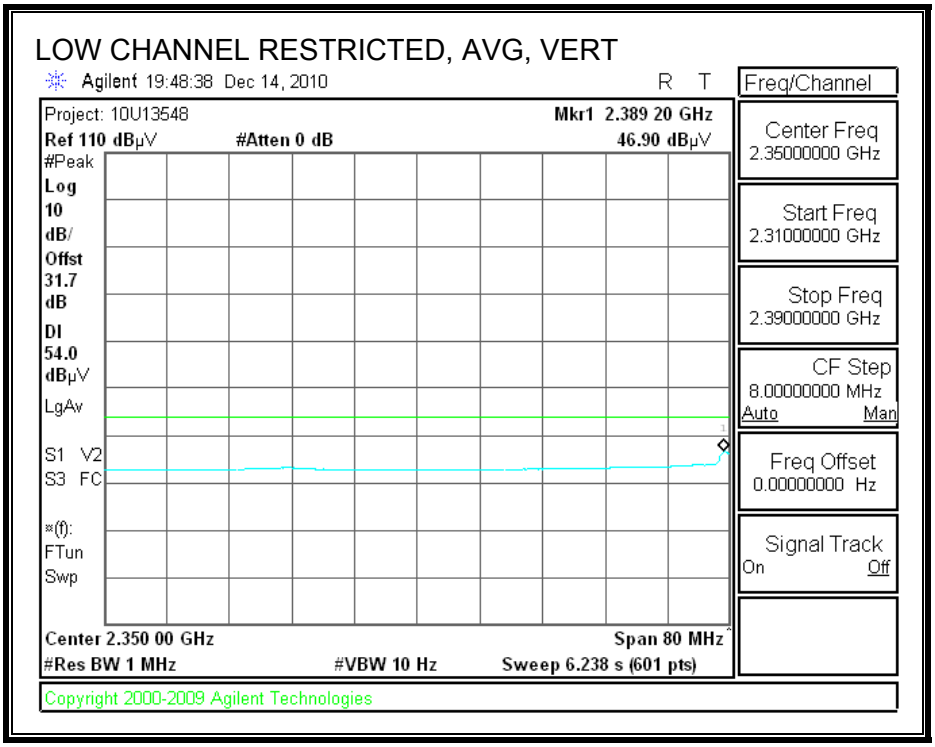
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



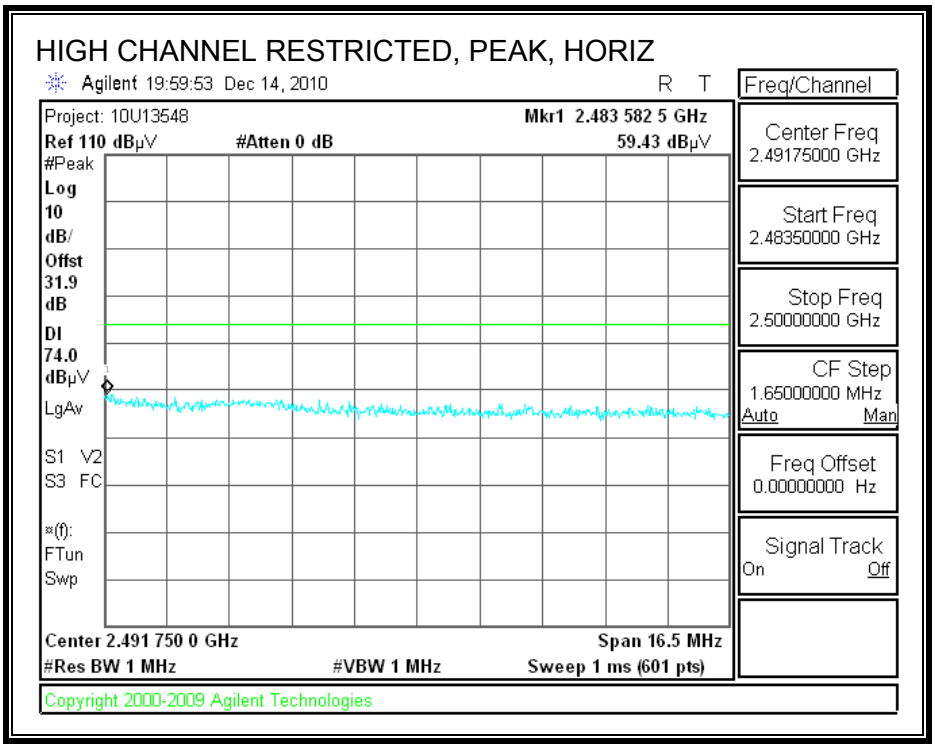


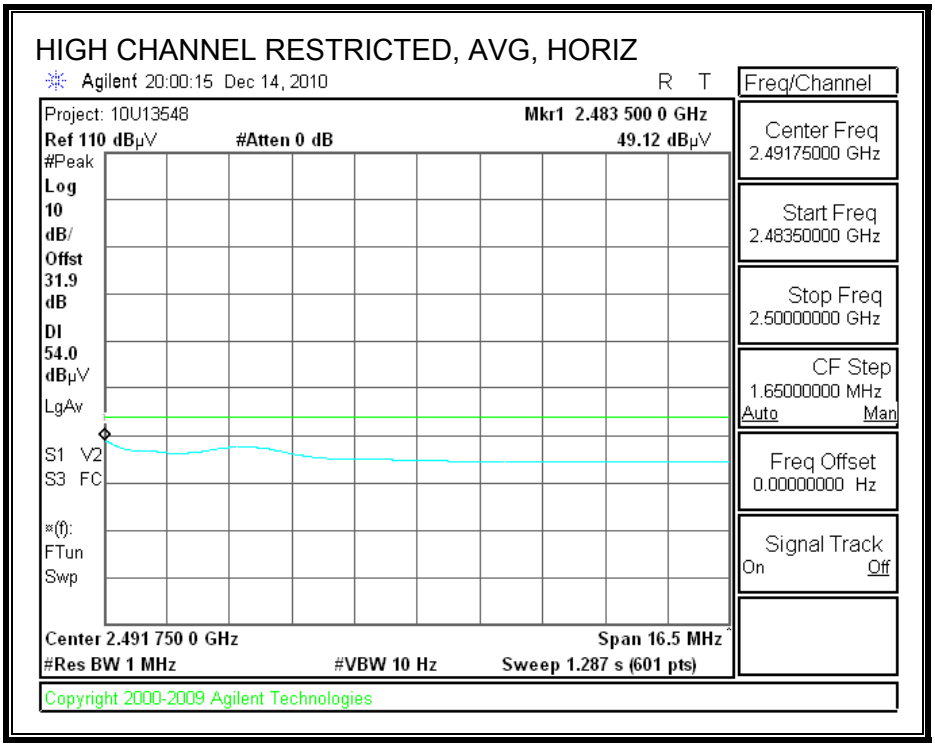
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



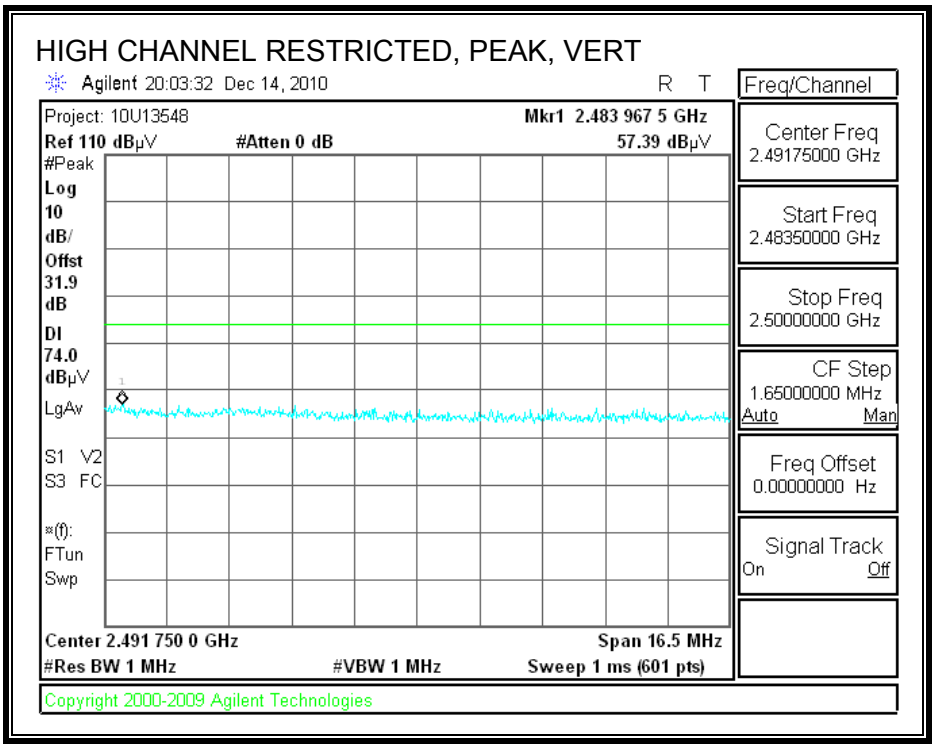


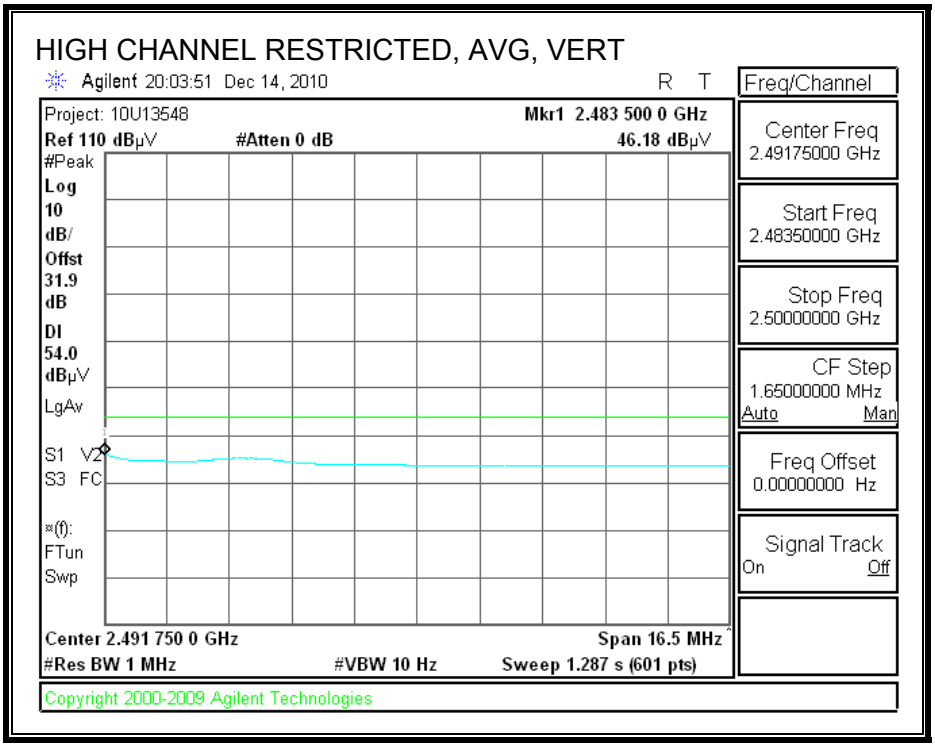
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom chen
Date: 12/13/10
Project #: 10U13548
Test Target: FCC Class B
Mode Oper: TX mode, 802.11b

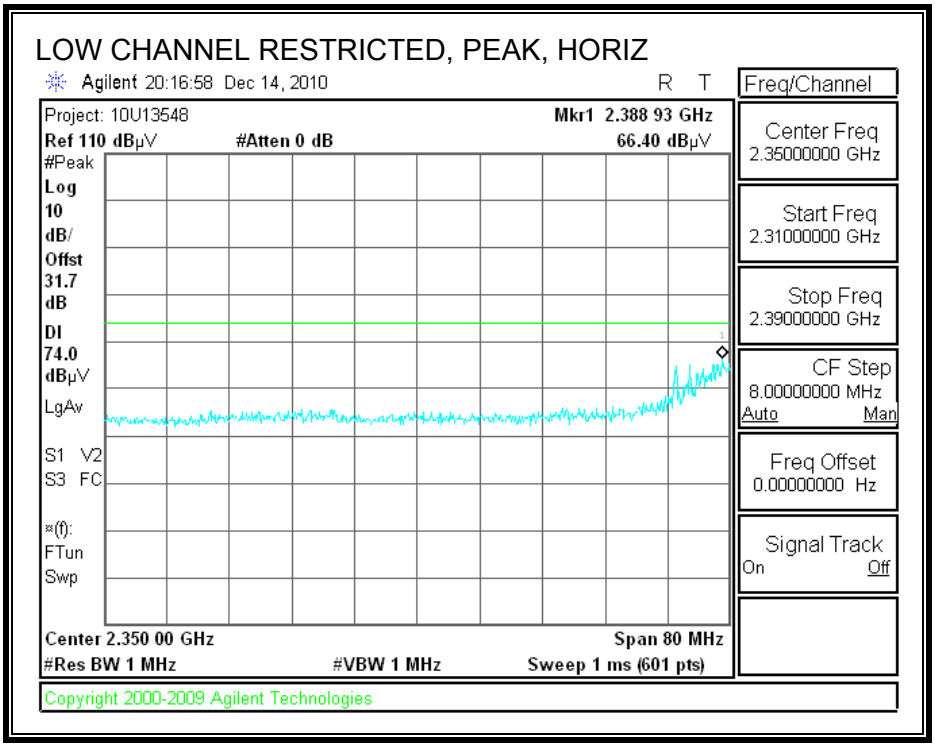
f	Measurement Frequency	Amp	Preamp Gain		Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m		Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength		Margin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

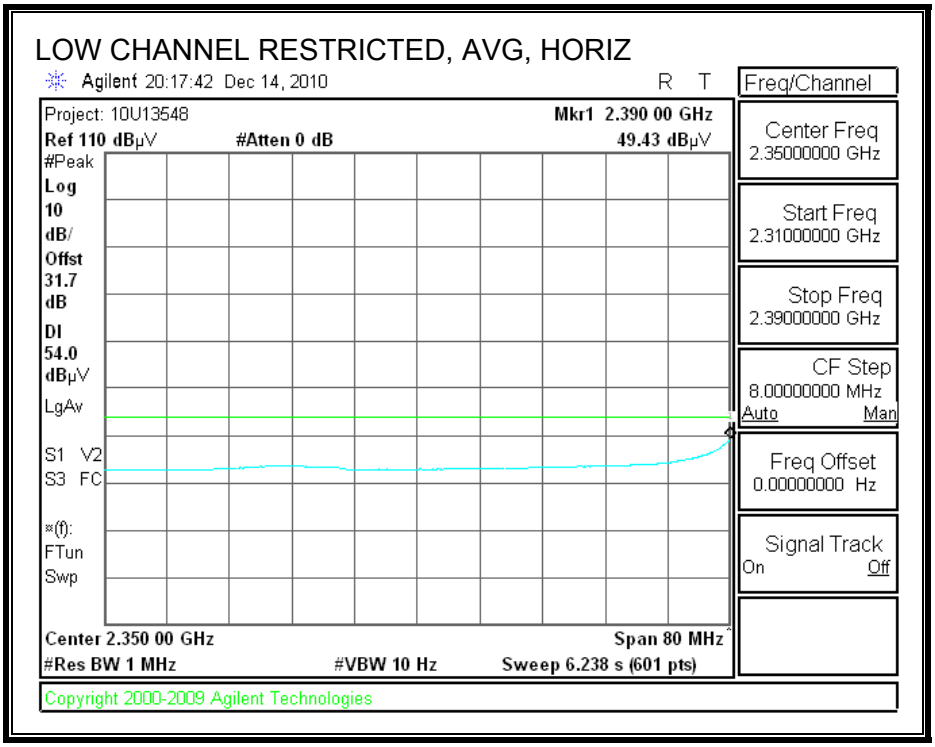
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
2412 MHz Low CH, b mode													
4.824	3.0	42.5	32.8	5.8	-34.8	0.0	0.0	46.2	74.0	-27.8	V	P	
4.824	3.0	36.8	32.8	5.8	-34.8	0.0	0.0	40.6	54.0	-13.4	V	A	
12.060	3.0	34.1	38.5	9.8	-32.4	0.0	0.0	50.0	74.0	-24.0	V	P	
12.060	3.0	22.0	38.5	9.8	-32.4	0.0	0.0	37.9	54.0	-16.1	V	A	
2412 MHz Low CH, b mode													
4.824	3.0	47.8	32.8	5.8	-34.8	0.0	0.0	51.5	74.0	-22.5	H	P	
4.824	3.0	45.1	32.8	5.8	-34.8	0.0	0.0	48.8	54.0	-5.2	H	A	
12.060	3.0	34.3	38.5	9.8	-32.4	0.0	0.0	50.1	74.0	-23.9	H	P	
12.060	3.0	22.0	38.5	9.8	-32.4	0.0	0.0	37.8	54.0	-16.2	H	A	
2437 MHz Mid CH, b mode													
4.874	3.0	44.6	32.8	5.8	-34.9	0.0	0.0	48.4	74.0	-25.6	H	P	
4.874	3.0	43.0	32.8	5.8	-34.9	0.0	0.0	46.8	54.0	-7.2	H	A	
7.311	3.0	38.3	35.2	7.3	-34.7	0.0	0.0	46.1	74.0	-27.9	H	P	
7.311	3.0	26.5	35.2	7.3	-34.7	0.0	0.0	34.3	54.0	-19.7	H	A	
2437 MHz Mid CH, b mode													
4.874	3.0	39.8	32.8	5.8	-34.9	0.0	0.0	43.6	74.0	-30.4	V	P	
4.874	3.0	32.4	32.8	5.8	-34.9	0.0	0.0	36.2	54.0	-17.8	V	A	
7.311	3.0	37.6	35.2	7.3	-34.7	0.0	0.0	45.4	74.0	-28.6	V	P	
7.311	3.0	24.8	35.2	7.3	-34.7	0.0	0.0	32.6	54.0	-21.4	V	A	
2462 MHz High CH, b mode													
4.924	3.0	39.6	32.8	5.9	-34.9	0.0	0.0	43.5	74.0	-30.5	V	P	
4.924	3.0	31.4	32.8	5.9	-34.9	0.0	0.0	35.2	54.0	-18.8	V	A	
7.386	3.0	37.6	35.3	7.3	-34.6	0.0	0.0	45.5	74.0	-28.5	V	P	
7.386	3.0	25.4	35.3	7.3	-34.6	0.0	0.0	33.4	54.0	-20.6	V	A	
2462 MHz High CH, b mode													
4.924	3.0	42.6	32.8	5.9	-34.9	0.0	0.0	46.5	74.0	-27.5	H	P	
4.924	3.0	36.7	32.8	5.9	-34.9	0.0	0.0	40.6	54.0	-13.4	H	A	
7.386	3.0	38.7	35.3	7.3	-34.6	0.0	0.0	46.7	74.0	-27.3	H	P	
7.386	3.0	26.3	35.3	7.3	-34.6	0.0	0.0	34.3	54.0	-19.7	H	A	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

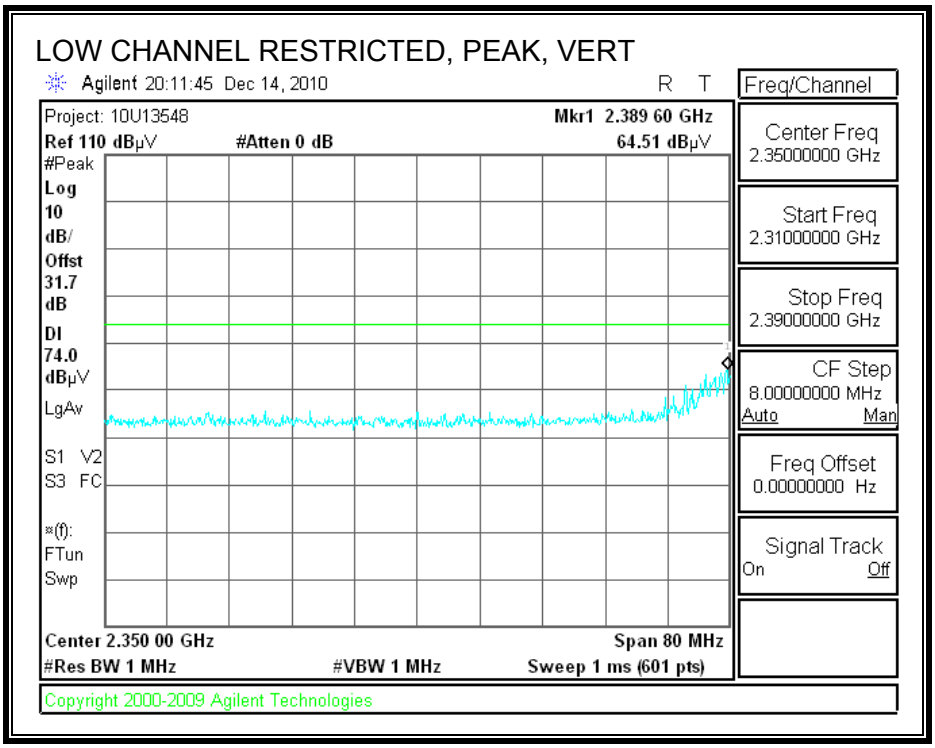
8.2.2. TX ABOVE 1 GHz FOR 802.11g MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

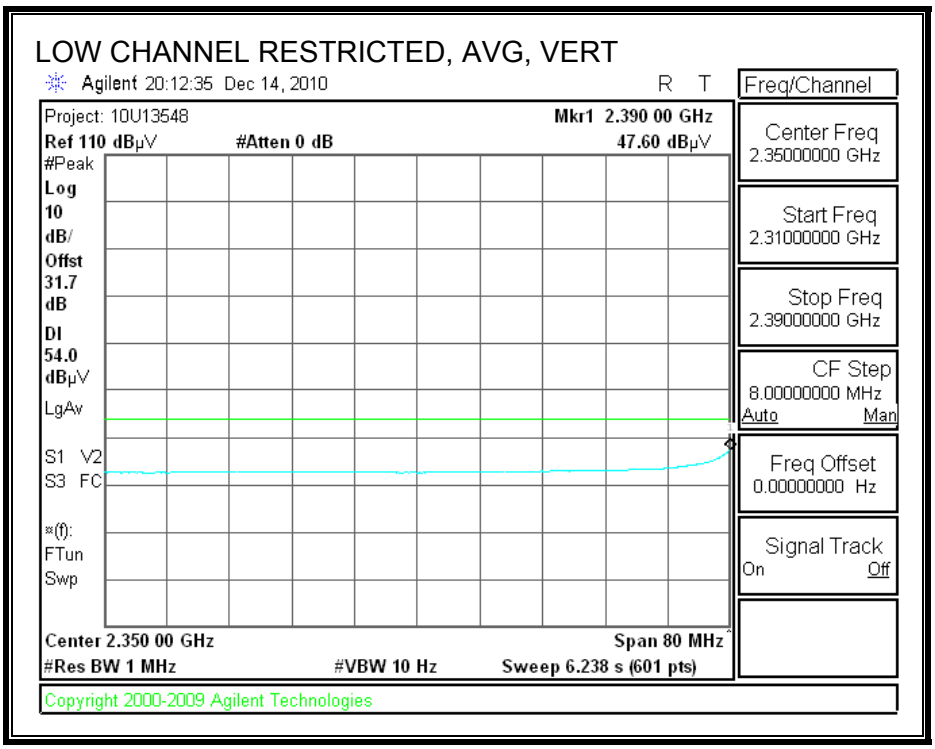




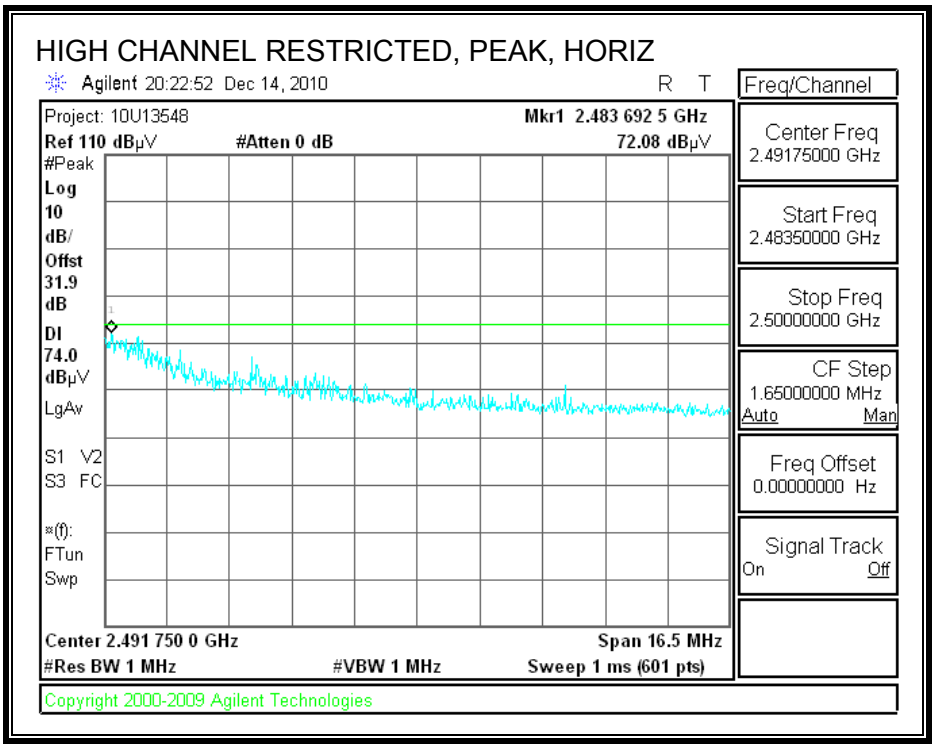
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

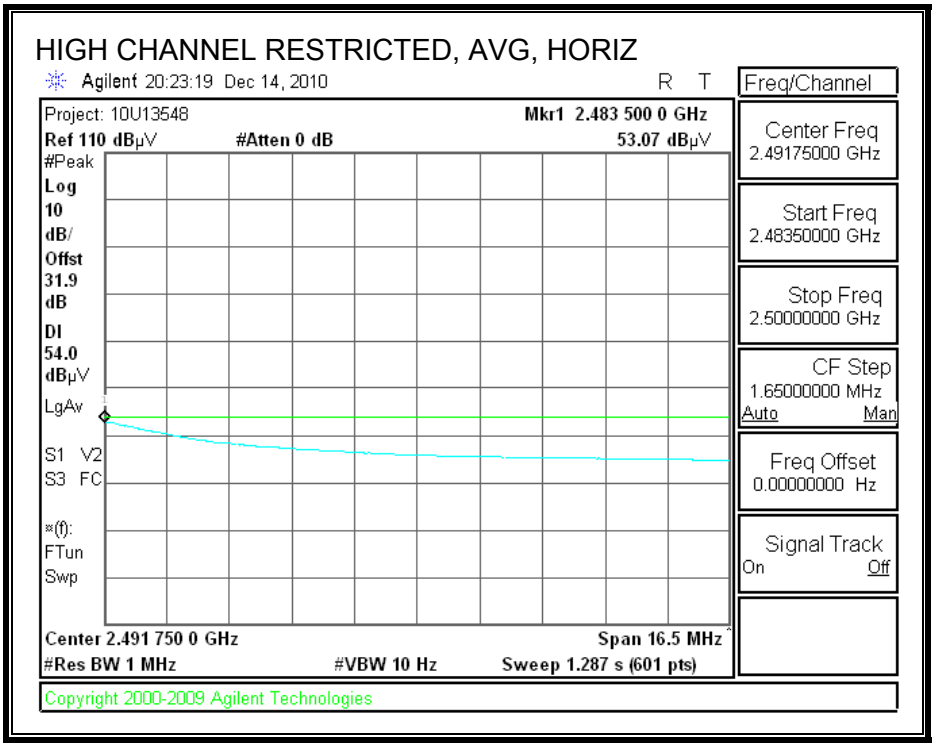


LOW CHANNEL RESTRICTED, AVG, VERT

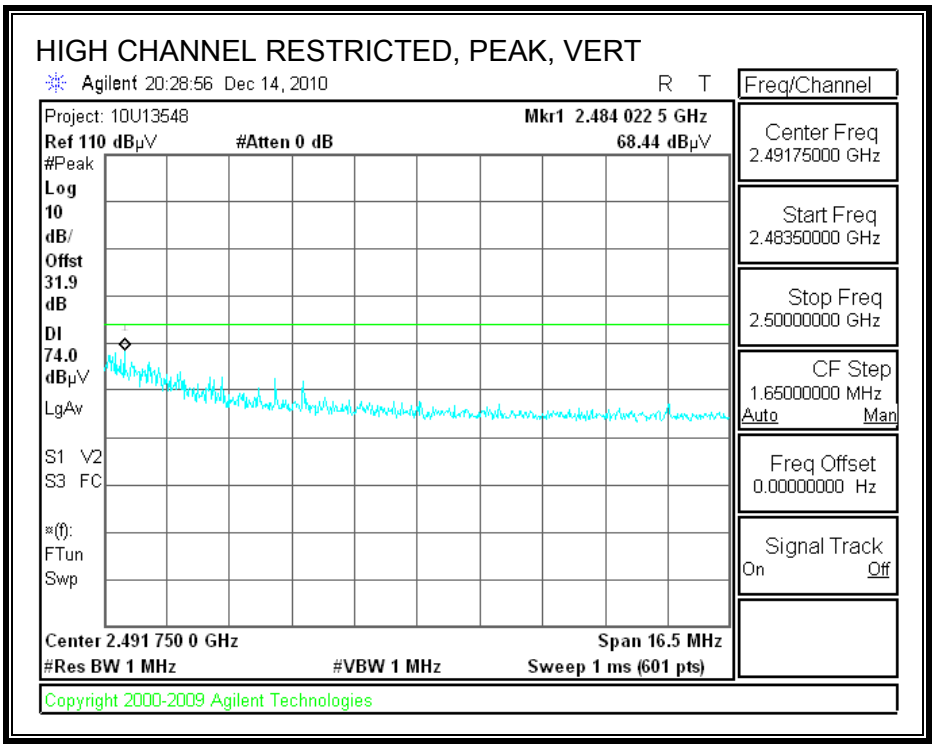


RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

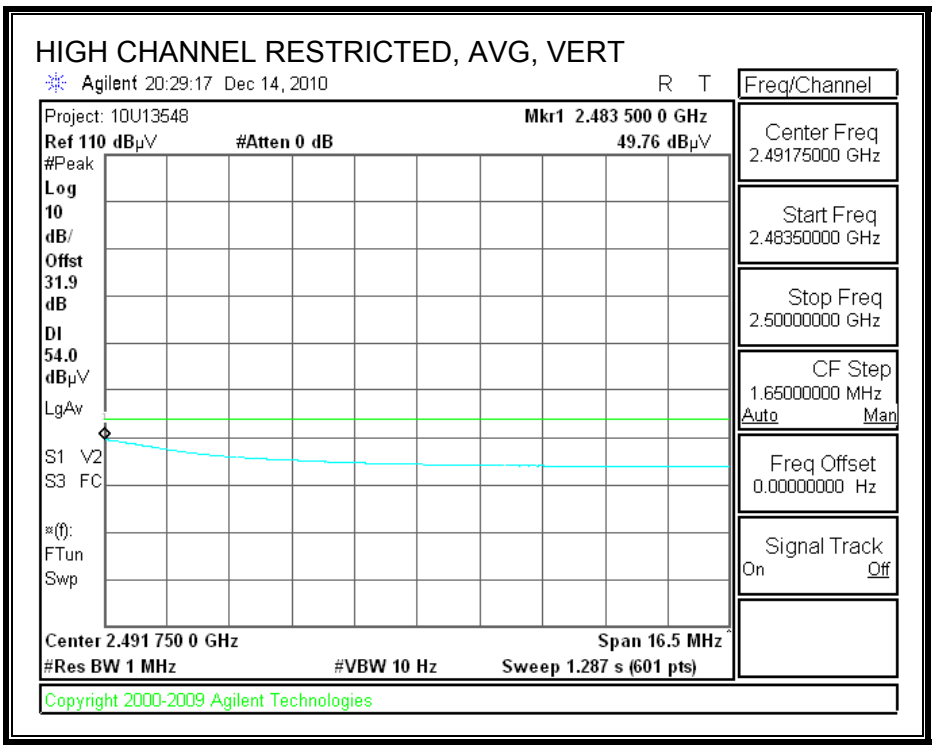




RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HIGH CHANNEL RESTRICTED, AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom chen
Date: 12/13/10
Project #: 10U13548
Test Target: FCC Class B
Mode Oper: TX mode, 802.11g

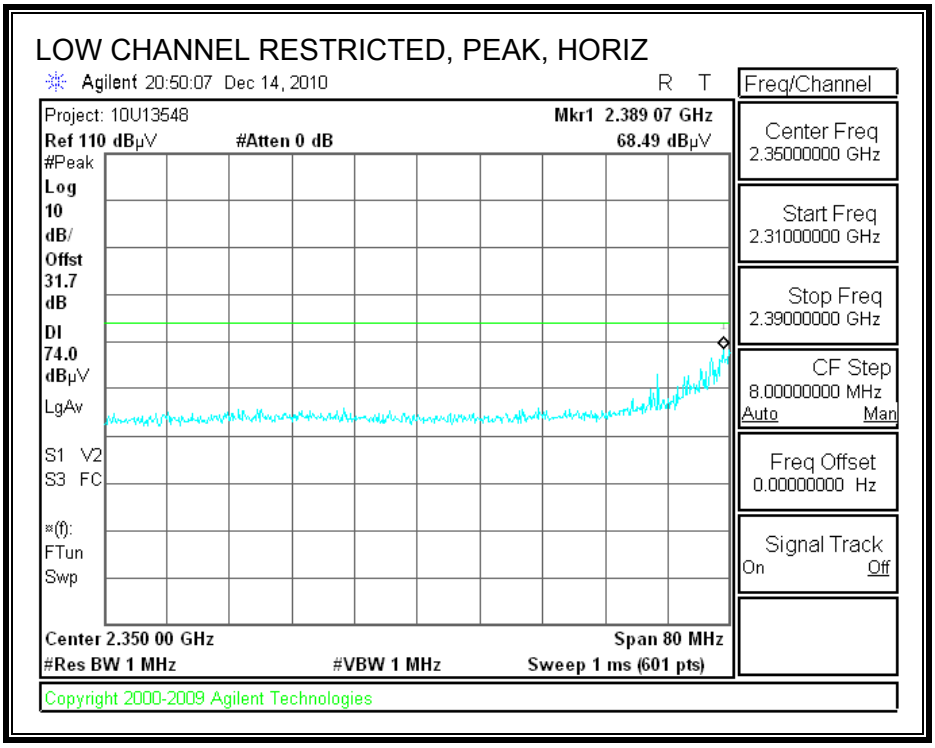
f	Measurement Frequency	Amp	Preamp Gain		Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m		Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength		Margin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

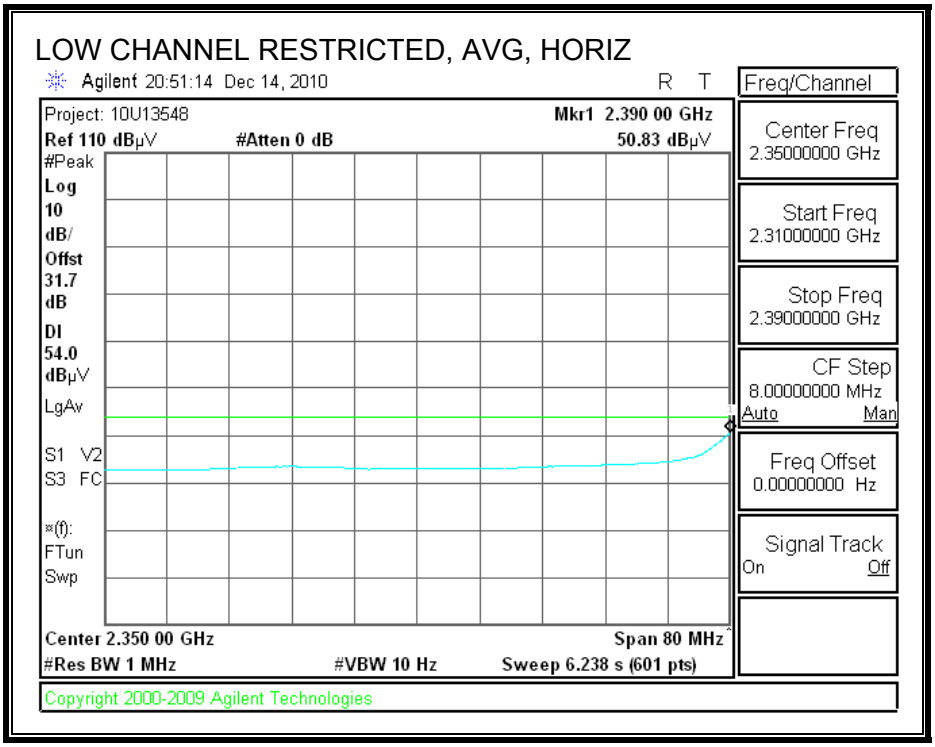
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
2412 MHz Low CH, g mode													
4.824	3.0	41.5	32.8	5.8	-34.8	0.0	0.0	45.3	74.0	-28.7	H	P	
4.824	3.0	28.5	32.8	5.8	-34.8	0.0	0.0	32.2	54.0	-21.8	H	A	
12.060	3.0	34.1	38.5	9.8	-32.4	0.0	0.0	50.0	74.0	-24.0	H	P	
12.060	3.0	22.0	38.5	9.8	-32.4	0.0	0.0	37.9	54.0	-16.1	H	A	
2412 MHz Low CH, g mode													
4.824	3.0	37.8	32.8	5.8	-34.8	0.0	0.0	41.6	74.0	-32.4	V	P	
4.824	3.0	25.9	32.8	5.8	-34.8	0.0	0.0	29.7	54.0	-24.3	V	A	
12.060	3.0	34.1	38.5	9.8	-32.4	0.0	0.0	49.9	74.0	-24.1	V	P	
12.060	3.0	22.0	38.5	9.8	-32.4	0.0	0.0	37.8	54.0	-16.2	V	A	
2437 MHz Mid CH, g mode													
4.874	3.0	40.2	32.8	5.8	-34.9	0.0	0.0	44.0	74.0	-30.0	V	P	
4.874	3.0	27.8	32.8	5.8	-34.9	0.0	0.0	31.6	54.0	-22.4	V	A	
7.311	3.0	37.3	35.2	7.3	-34.7	0.0	0.0	45.1	74.0	-28.9	V	P	
7.311	3.0	24.9	35.2	7.3	-34.7	0.0	0.0	32.7	54.0	-21.3	V	A	
2437 MHz Mid CH, g mode													
4.874	3.0	45.4	32.8	5.8	-34.9	0.0	0.0	49.2	74.0	-24.8	H	P	
4.874	3.0	31.6	32.8	5.8	-34.9	0.0	0.0	35.4	54.0	-18.6	H	A	
7.311	3.0	37.8	35.2	7.3	-34.7	0.0	0.0	45.6	74.0	-28.4	H	P	
7.311	3.0	25.1	35.2	7.3	-34.7	0.0	0.0	32.9	54.0	-21.1	H	A	
2462 MHz High CH, g mode													
4.924	3.0	37.9	32.8	5.9	-34.9	0.0	0.0	41.7	74.0	-32.3	H	P	
4.924	3.0	25.6	32.8	5.9	-34.9	0.0	0.0	29.5	54.0	-24.5	H	A	
7.386	3.0	38.0	35.3	7.3	-34.6	0.0	0.0	46.0	74.0	-28.0	H	P	
7.386	3.0	24.9	35.3	7.3	-34.6	0.0	0.0	32.9	54.0	-21.1	H	A	
2462 MHz High CH, g mode													
4.924	3.0	38.2	32.8	5.9	-34.9	0.0	0.0	42.0	74.0	-32.0	V	P	
4.924	3.0	25.6	32.8	5.9	-34.9	0.0	0.0	29.5	54.0	-24.5	V	A	
7.386	3.0	37.2	35.3	7.3	-34.6	0.0	0.0	45.1	74.0	-28.9	V	P	
7.386	3.0	24.9	35.3	7.3	-34.6	0.0	0.0	32.9	54.0	-21.1	V	A	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

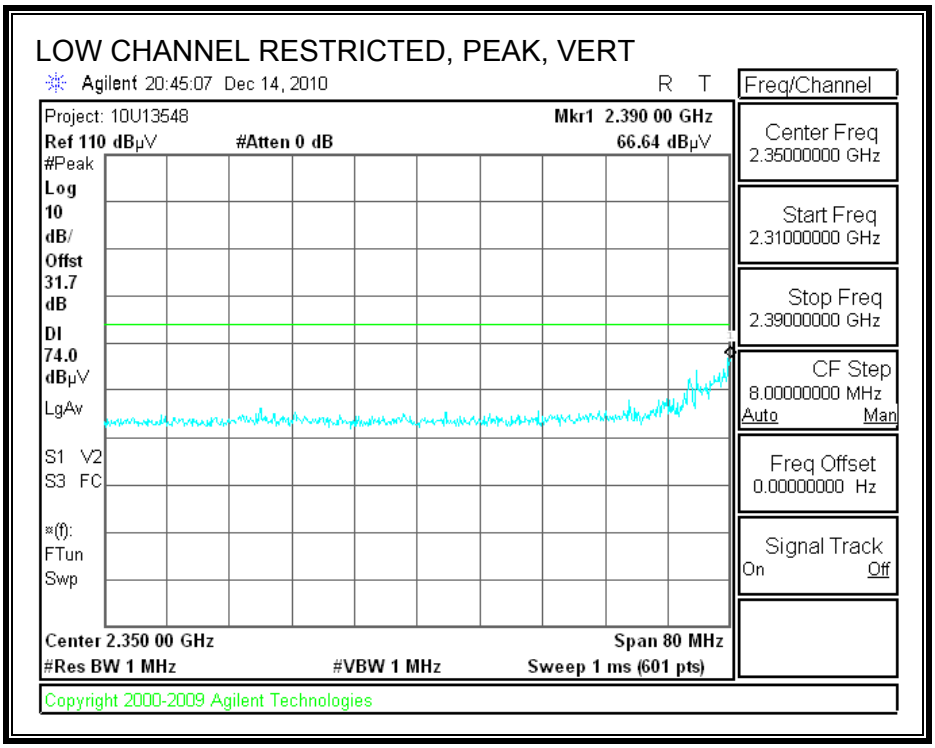
8.2.3. TX ABOVE 1 GHz FOR 802.11n HT20 MODE IN THE 2.4 GHz BAND

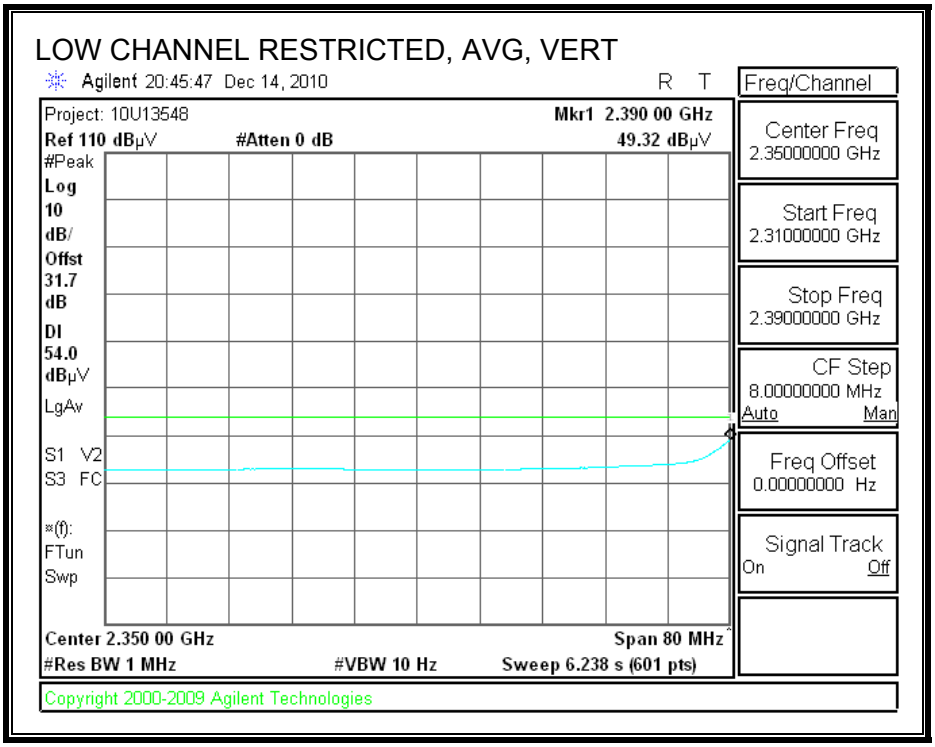
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



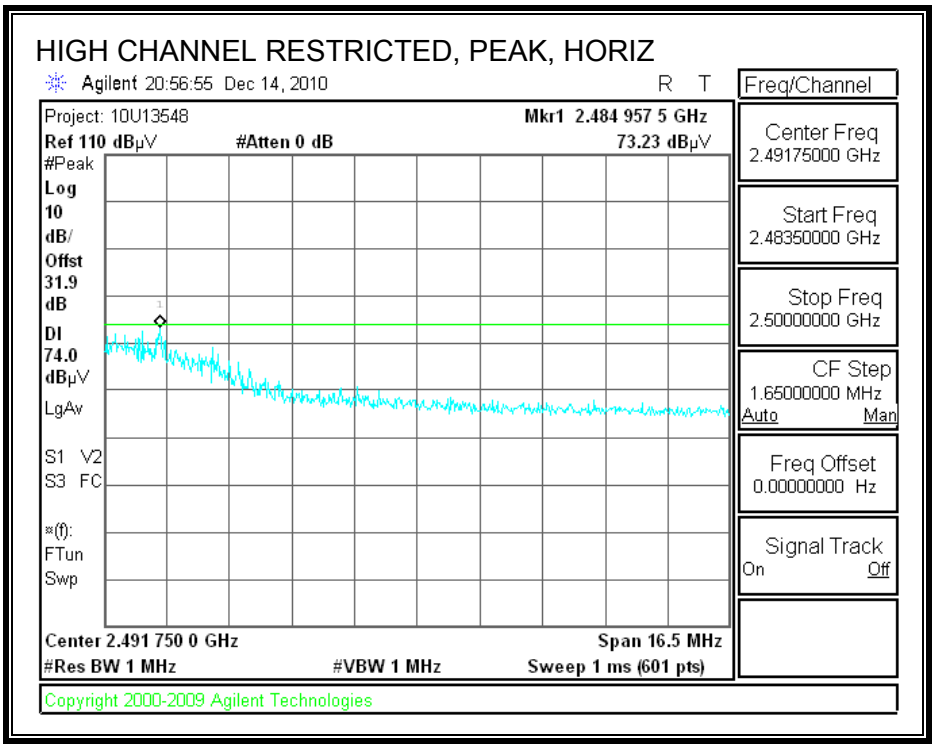


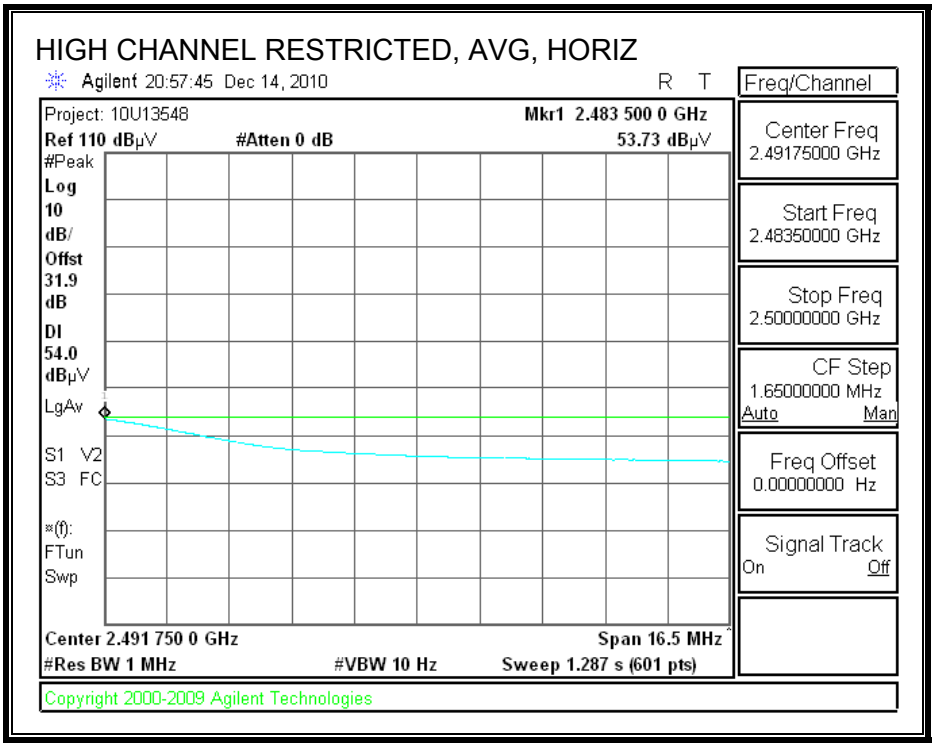
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



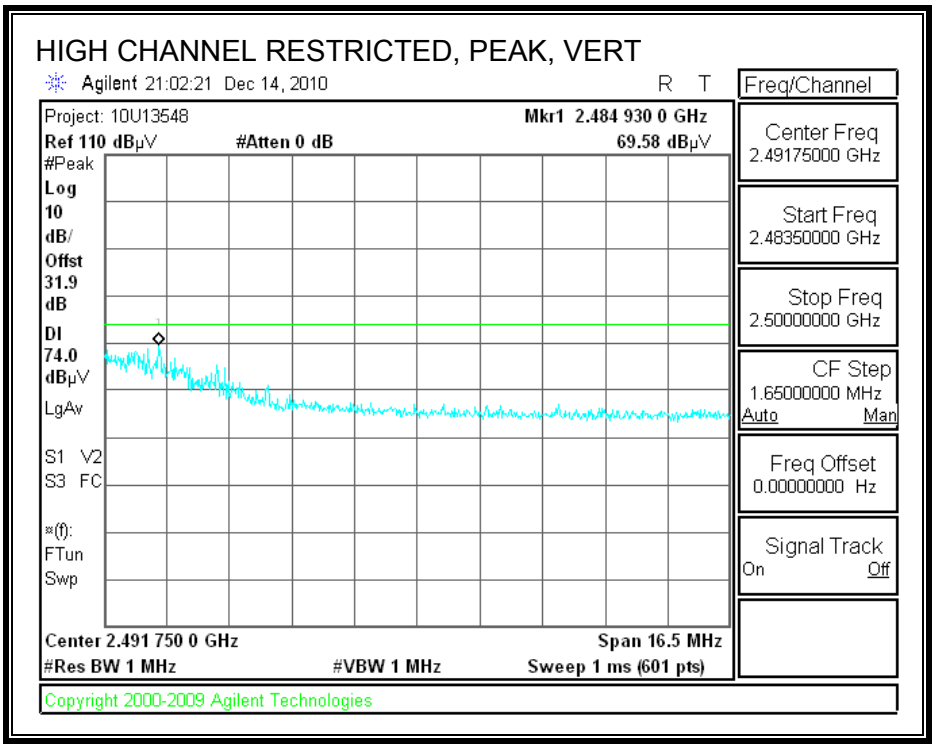


RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

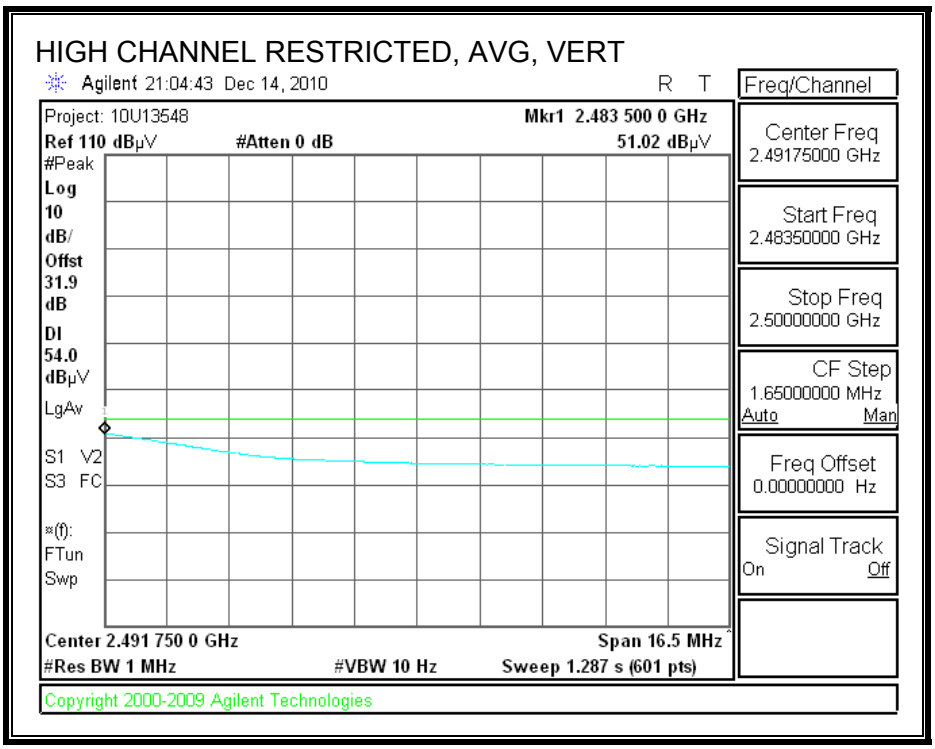




RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HIGH CHANNEL RESTRICTED, AVG, VERT



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom chen
Date: 12/13/10
Project #: 10U13548
Test Target: FCC Class B
Mode Oper: TX mode, 802.11n

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	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
2412 MHz Low CH, HT20 mode													
4.824	3.0	37.8	32.8	5.8	-34.8	0.0	0.0	41.5	74.0	-32.5	V	P	
4.824	3.0	25.9	32.8	5.8	-34.8	0.0	0.0	29.6	54.0	-24.4	V	A	
12.060	3.0	34.2	38.5	9.8	-32.4	0.0	0.0	50.1	74.0	-23.9	V	P	
12.060	3.0	22.0	38.5	9.8	-32.4	0.0	0.0	37.8	54.0	-16.2	V	A	
2412 MHz Low CH, HT20 mode													
4.824	3.0	42.0	32.8	5.8	-34.8	0.0	0.0	45.7	74.0	-28.3	H	P	
4.824	3.0	28.7	32.8	5.8	-34.8	0.0	0.0	32.4	54.0	-21.6	H	A	
12.060	3.0	34.2	38.5	9.8	-32.4	0.0	0.0	50.0	74.0	-24.0	H	P	
12.060	3.0	22.0	38.5	9.8	-32.4	0.0	0.0	37.8	54.0	-16.2	H	A	
2437 MHz Mid CH, HT20 mode													
4.874	3.0	43.3	32.8	5.8	-34.9	0.0	0.0	47.1	74.0	-26.9	H	P	
4.874	3.0	30.6	32.8	5.8	-34.9	0.0	0.0	34.4	54.0	-19.6	H	A	
7.311	3.0	36.7	35.2	7.3	-34.7	0.0	0.0	44.5	74.0	-29.5	H	P	
7.311	3.0	24.8	35.2	7.3	-34.7	0.0	0.0	32.6	54.0	-21.4	H	A	
2437 MHz Mid CH, HT20 mode													
4.874	3.0	39.5	32.8	5.8	-34.9	0.0	0.0	43.3	74.0	-30.7	V	P	
4.874	3.0	27.0	32.8	5.8	-34.9	0.0	0.0	30.8	54.0	-23.2	V	A	
7.311	3.0	37.3	35.2	7.3	-34.7	0.0	0.0	45.1	74.0	-28.9	V	P	
7.311	3.0	24.8	35.2	7.3	-34.7	0.0	0.0	32.6	54.0	-21.4	V	A	
2462 MHz High CH, HT20 mode													
4.924	3.0	37.4	32.8	5.9	-34.9	0.0	0.0	41.2	74.0	-32.8	V	P	
4.924	3.0	25.6	32.8	5.9	-34.9	0.0	0.0	29.5	54.0	-24.5	V	A	
7.386	3.0	37.0	35.3	7.3	-34.6	0.0	0.0	44.9	74.0	-29.1	V	P	
7.386	3.0	24.9	35.3	7.3	-34.6	0.0	0.0	32.8	54.0	-21.2	V	A	
2462 MHz High CH, HT20 mode													
4.924	3.0	38.8	32.8	5.9	-34.9	0.0	0.0	42.7	74.0	-31.3	H	P	
4.924	3.0	26.7	32.8	5.9	-34.9	0.0	0.0	30.6	54.0	-23.4	H	A	
7.386	3.0	37.1	35.3	7.3	-34.6	0.0	0.0	45.1	74.0	-28.9	H	P	
7.386	3.0	24.9	35.3	7.3	-34.6	0.0	0.0	32.9	54.0	-21.1	H	A	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

8.2.4. TX ABOVE 1 GHz FOR 802.11a MODE IN THE 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom chen
Date: 12/16/10
Project #: 10U13548
Company: FCC Class B
Test Target: FCC Class B
Mode Oper: TX mode, 802.11a

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	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
5745 MHz Low CH													
11.490	3.0	35.9	38.1	9.5	-33.1	0.0	0.7	51.1	74.0	-22.9	V	P	
11.490	3.0	22.6	38.1	9.5	-33.1	0.0	0.7	37.8	54.0	-16.2	V	A	
11.490	3.0	34.8	38.1	9.5	-33.1	0.0	0.7	49.9	74.0	-24.1	H	P	
11.490	3.0	22.7	38.1	9.5	-33.1	0.0	0.7	37.8	54.0	-16.2	H	A	
5785 MHz Mid CH													
11.570	3.0	35.9	38.1	9.5	-33.0	0.0	0.7	51.3	74.0	-22.7	H	P	
11.570	3.0	22.2	38.1	9.5	-33.0	0.0	0.7	37.6	54.0	-16.4	H	A	
11.570	3.0	34.8	38.1	9.5	-33.0	0.0	0.7	50.2	74.0	-23.8	V	P	
11.570	3.0	22.1	38.1	9.5	-33.0	0.0	0.7	37.4	54.0	-16.6	V	A	
5825 MHz High CH													
11.650	3.0	34.8	38.2	9.6	-32.9	0.0	0.7	50.4	74.0	-23.6	H	P	
11.650	3.0	22.3	38.2	9.6	-32.9	0.0	0.7	37.9	54.0	-16.1	H	A	
11.650	3.0	34.8	38.2	9.6	-32.9	0.0	0.7	50.4	74.0	-23.6	V	P	
11.650	3.0	22.4	38.2	9.6	-32.9	0.0	0.7	38.0	54.0	-16.0	V	A	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

8.2.5. TX ABOVE 1 GHz FOR 802.11n HT20 MODE IN THE 5.8 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom chen
Date: 12/16/10
Project #: 10U13548
Test Target: FCC Class B
Mode Oper: TX mode, 802.11n HT20

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

Average Field Strength Limit
Peak Field Strength Limit
Margin vs. Average Limit
Margin vs. Peak Limit

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
5745 MHz Low CH													
11.490	3.0	36.3	38.1	9.5	-33.1	0.0	0.7	51.4	74.0	-22.6	V	P	
11.490	3.0	22.7	38.1	9.5	-33.1	0.0	0.7	37.8	54.0	-16.2	V	A	
11.490	3.0	36.6	38.1	9.5	-33.1	0.0	0.7	51.8	74.0	-22.2	H	P	
11.490	3.0	23.3	38.1	9.5	-33.1	0.0	0.7	38.5	54.0	-15.5	H	A	
5785 MHz Mid CH													
11.570	3.0	35.5	38.1	9.5	-33.0	0.0	0.7	50.9	74.0	-23.1	H	P	
11.570	3.0	22.2	38.1	9.5	-33.0	0.0	0.7	37.5	54.0	-16.5	H	A	
11.570	3.0	34.9	38.1	9.5	-33.0	0.0	0.7	50.3	74.0	-23.7	V	P	
11.570	3.0	22.1	38.1	9.5	-33.0	0.0	0.7	37.5	54.0	-16.5	V	A	
5825 MHz High CH													
11.650	3.0	34.2	38.2	9.6	-32.9	0.0	0.7	49.8	74.0	-24.2	V	P	
11.650	3.0	22.3	38.2	9.6	-32.9	0.0	0.7	37.9	54.0	-16.1	V	A	
11.650	3.0	34.6	38.2	9.6	-32.9	0.0	0.7	50.2	74.0	-23.8	H	P	
11.650	3.0	22.4	38.2	9.6	-32.9	0.0	0.7	37.9	54.0	-16.1	H	A	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

8.3. CO-LOCATION WORST CASE TX ABOVE 1 GHz (802.11n / 5.8 GHz BAND)

HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom chen
Date: 02/28/11
Project #: 10U13548
Test Target: FCC Class B
Mode Oper: TX mode, 802.11n HT20 / BT CH78

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

Average Field Strength Limit
Peak Field Strength Limit
Margin vs. Average Limit
Margin vs. Peak Limit

f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
5745 MHz Low CH													
11.490	3.0	35.5	38.1	9.5	-33.1	0.0	0.7	50.6	74.0	-22.6	V	P	
11.490	3.0	21.9	38.1	9.5	-33.1	0.0	0.7	37.1	54.0	-16.2	V	A	
11.490	3.0	35.8	38.1	9.5	-33.1	0.0	0.7	51.0	74.0	-22.2	H	P	
11.490	3.0	22.5	38.1	9.5	-33.1	0.0	0.7	37.7	54.0	-15.5	H	A	
5785 MHz Mid CH													
11.570	3.0	34.8	38.1	9.5	-33.0	0.0	0.7	50.1	74.0	-23.1	H	P	
11.570	3.0	21.4	38.1	9.5	-33.0	0.0	0.7	36.8	54.0	-16.5	H	A	
11.570	3.0	34.1	38.1	9.5	-33.0	0.0	0.7	49.5	74.0	-23.7	V	P	
11.570	3.0	21.3	38.1	9.5	-33.0	0.0	0.7	36.7	54.0	-16.5	V	A	
5825 MHz High CH													
11.650	3.0	33.4	38.2	9.6	-32.9	0.0	0.7	49.0	74.0	-24.2	V	P	
11.650	3.0	21.5	38.2	9.6	-32.9	0.0	0.7	37.1	54.0	-16.1	V	A	
11.650	3.0	33.8	38.2	9.6	-32.9	0.0	0.7	49.4	74.0	-23.8	H	P	
11.650	3.0	21.6	38.2	9.6	-32.9	0.0	0.7	37.1	54.0	-16.1	H	A	

Rev. 4.1.2.7
Note: No other emissions were detected above the system noise floor.

8.4. RECEIVER ABOVE 1 GHz

8.4.1. RX ABOVE 1 GHz FOR 20 MHz BANDWIDTH IN THE 2.4 GHz BAND

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Project #: 10U13548
Date: 12/17/2010
Test Engineer: Tom Chen
Configuration: EUT alone
Mode: RX mode

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T59; S/N: 3245 @3m	T145 Agilent 3008A005(			RX RSS 210

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		

Peak Measurements
RBW=VBW=1MHz
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)
1.137	3.0	50.0	42.0	24.4	2.5	-36.0	0.0	0.0	40.9	32.9	74	54	-33.1	-21.1	V
1.630	3.0	45.9	39.7	26.3	3.1	-35.7	0.0	0.0	39.5	33.4	74	54	-34.5	-20.6	V
6.721	3.0	43.3	30.5	34.5	6.9	-34.8	0.0	0.0	50.0	37.2	74	54	-24.0	-16.8	V
1.053	3.0	46.2	31.2	24.1	2.4	-36.1	0.0	0.0	36.7	21.6	74	54	-37.3	-32.4	H
1.357	3.0	46.8	31.8	25.3	2.8	-35.9	0.0	0.0	38.9	24.0	74	54	-35.1	-30.0	H
1.850	3.0	45.5	30.5	27.1	3.3	-35.5	0.0	0.0	40.4	25.4	74	54	-33.6	-28.6	H

Rev. 07.22.09

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		

8.4.2. RX ABOVE 1 GHz FOR 20 MHz BANDWIDTH IN THE 5.8 GHz BAND

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Project #: 10U13548
Date: 12/17/2010
Test Engineer: Tom Chen
Configuration: EUT alone
Mode: RX mode, 5.8Ghz

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T59; S/N: 3245 @3m	T145 Agilent 3008A005(			RX RSS 210

Hi Frequency Cables

3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF	Reject Filter
3' cable 22807700	12' cable 22807600	20' cable 22807500		

Peak Measurements
RBW=VBW=1MHz
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)
1.127	3.0	46.6	30.3	24.4	2.5	-36.1	0.0	0.0	37.4	21.2	74	54	-36.6	-32.8	V
1.293	3.0	46.0	29.7	25.0	2.7	-35.9	0.0	0.0	37.8	21.5	74	54	-36.2	-32.5	V
2.680	3.0	43.4	28.5	29.1	4.1	-35.2	0.0	0.0	41.4	26.5	74	54	-32.6	-27.5	V
1.153	3.0	44.6	29.6	24.5	2.5	-36.0	0.0	0.0	35.6	20.6	74	54	-38.4	-33.4	H
1.540	3.0	45.1	31.5	25.9	3.0	-35.7	0.0	0.0	38.3	24.7	74	54	-35.7	-29.3	H
2.767	3.0	43.3	28.3	29.3	4.1	-35.2	0.0	0.0	41.6	26.6	74	54	-32.4	-27.4	H

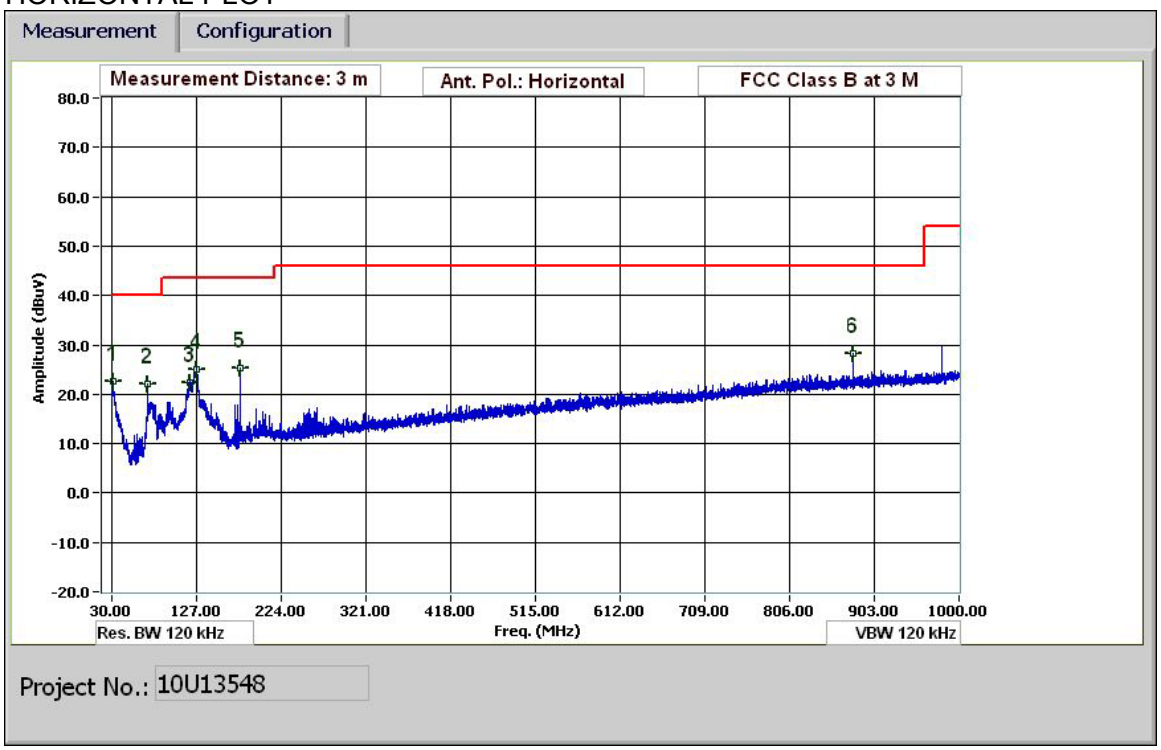
Rev. 07.22.09

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		

8.5. WORST-CASE BELOW 1 GHz

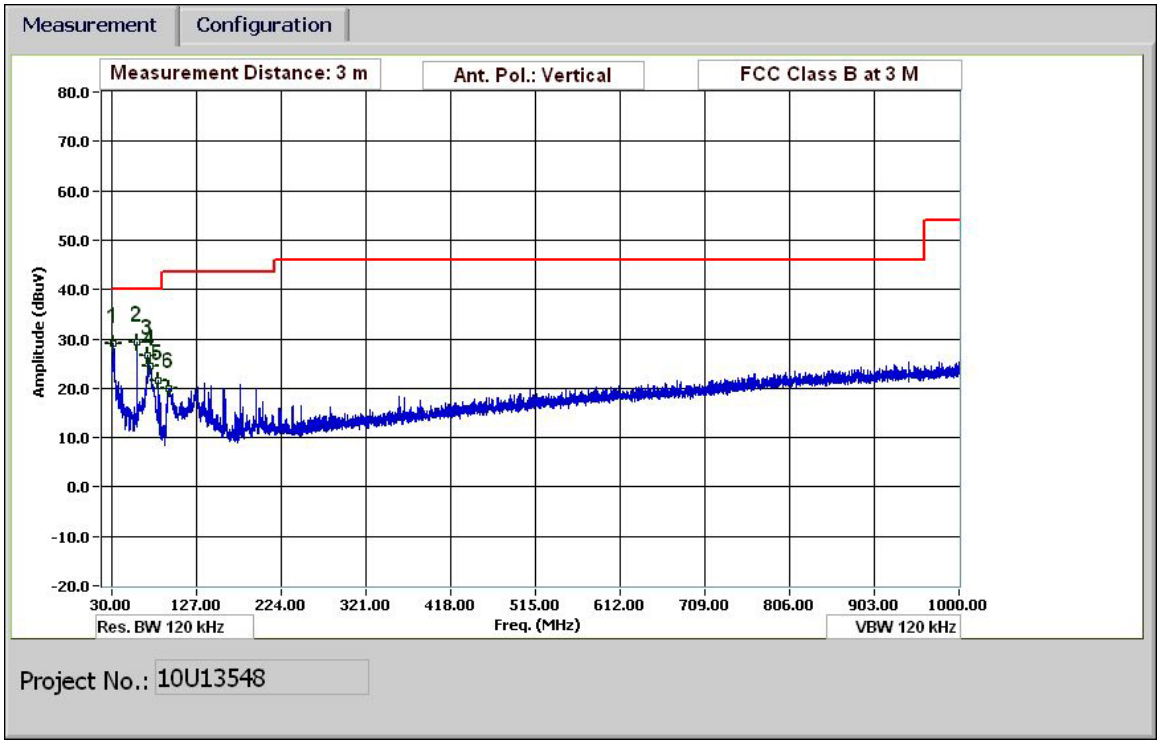
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

30-1000MHz Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Tom Chen
Date: 12/17/10
Project #: 10U13548
Test Target: FCC Class B
Mode Oper: TX mode Worst case

f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Pad dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Horizontal													
32.04	3.0	32.3	19.4	0.5	29.7	0.0	0.0	22.5	40.0	-17.5	H	P	
71.402	3.0	42.9	8.2	0.7	29.6	0.0	0.0	22.2	40.0	-17.8	H	P	
119.644	3.0	37.2	13.7	1.0	29.5	0.0	0.0	22.3	43.5	-21.2	H	P	
126.844	3.0	39.7	13.8	1.0	29.4	0.0	0.0	25.1	43.5	-18.4	H	P	
177.366	3.0	42.9	10.4	1.2	29.1	0.0	0.0	25.3	43.5	-18.2	H	P	
879.155	3.0	32.5	21.4	3.0	28.7	0.0	0.0	28.2	46.0	-17.8	H	P	
Vertical													
32.04	3.0	38.8	19.4	0.5	29.7	0.0	0.0	29.0	40.0	-11.0	V	P	
59.041	3.0	50.5	7.9	0.7	29.6	0.0	0.0	29.5	40.0	-10.5	V	P	
70.802	3.0	47.3	8.2	0.7	29.6	0.0	0.0	26.6	40.0	-13.4	V	P	
74.162	3.0	45.3	8.0	0.8	29.6	0.0	0.0	24.4	40.0	-15.6	V	P	
83.642	3.0	42.7	7.6	0.8	29.6	0.0	0.0	21.5	40.0	-18.5	V	P	
94.923	3.0	39.7	8.8	0.9	29.5	0.0	0.0	19.8	43.5	-23.7	V	P	

Rev. 1.27.09
Note: No other emissions were detected above the system noise floor.

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

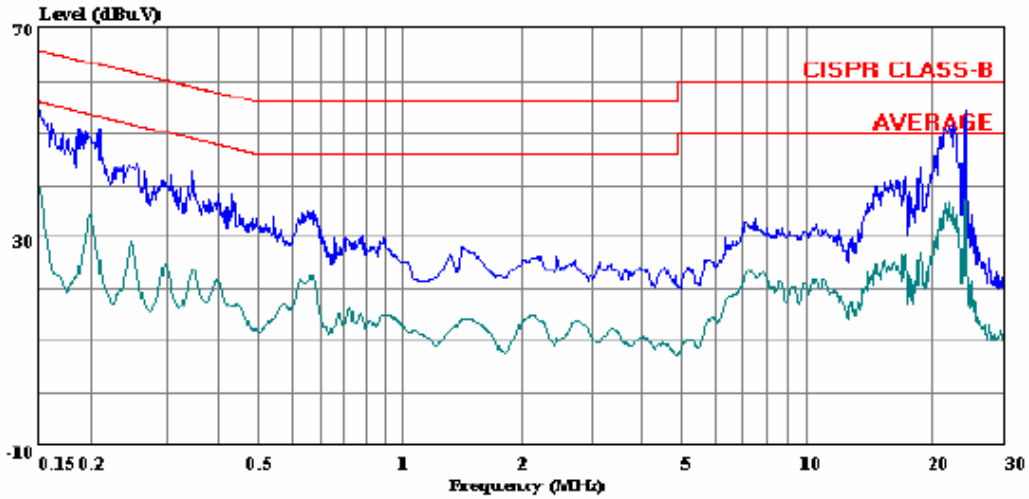
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.15	52.60	--	34.66	0.00	65.84	55.84	-13.24	-21.18	L1
0.21	51.08	--	25.61	0.00	63.28	53.28	-12.20	-27.67	L1
24.01	54.58	--	45.07	0.00	60.00	50.00	-5.42	-4.93	L1
0.15	53.47	--	33.40	0.00	65.84	55.84	-12.37	-22.44	L2
0.20	51.52	--	31.87	0.00	63.82	53.82	-12.30	-21.95	L2
22.90	50.47	--	32.17	0.00	60.00	50.00	-9.53	-17.83	L2
6 Worst Data									

LINE 1 RESULTS

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 7 File#: 10U13548-LC.EMI Date: 12-17-2010 Time: 13:49:54



Trace: 5 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: Tom Chen
Project # : 10U13548

Configuration: EUT with AC adapter only
Mode : TX mode worst case
Target : FCC Class B
Voltage : 115 VAC / 60 Hz
: L1: (Peak: Blue, Average: Green)

LINE 2 RESULTS