



**FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 7**

CERTIFICATION TEST REPORT

FOR

WIRELESS LAN MODULE

MODEL NUMBER: DWM-W024

**FCC ID: EW4DWMW024
IC: 4250A-DWMW024**

REPORT NUMBER: 09J12662-1, Revision B

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Prepared for
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NVLAP LAB CODE 200065-0

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MITSUMI ELECTRIC CO., LTD
1601, SAKAI, ATSUGI-SHI
KANAGAWA, JAPAN

EUT DESCRIPTION: WIRELESS LAN MODULE

MODEL: DWM-W024

SERIAL NUMBER: Conducted Unit: TJF110962618
Radiated Unit: TJF112658427 (Foxconn Antenna)
TJF112871356 (Tyco Antenna)

DATE TESTED: JUNE 22-25, 2009

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 7 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 2	Pass

Compliance Certification Services, Inc. (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 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by 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 CCS By:

Tested By:



THU CHAN
EMC MANAGER
COMPLIANCE CERTIFICATION SERVICES

CHIN PANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 2, and RSS-210 Issue 7.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a WIRELESS LAN MODULE (802.11 + 802.11b/g).

The radio module is manufactured by Mitsumi Electric Co., Ltd.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2472	802.11	2.47	1.77
2412 - 2462	802.11b	8.20	6.61
2412 - 2462	802.11g	13.27	21.23

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two different types of antennas, with a maximum gain of 0.879 dBi for Foxconn antenna (Dipole) and 0.80 dBi for Tyco antenna (PIFA).

5.4. SOFTWARE AND FIRMWARE

The EUT test utility software installed in the host computer during testing was Atheros Radio Test (ART) 6000, revision 1.5.1, BUILD MnM.

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 802.11 mode were made at 2 Mb/s.

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.

The worst-position was the EUT with highest emissions. To determine the worst-case, the EUT was investigated for X, Y, Z, and mobile position, the worst-position was turned out to be at X position.

For AC line conducted and radiated emissions below 1 GHz. To determine the worst-case, the EUT was investigated with four different AC/DC adapters, and the worst-case configuration is turned out to be a Mitsumi AC/DC adapter

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	HP	Compaq 6710b	CNU80800TB	DoC
AC Adapter	HP	PA-1900-18H2	W97950ELLV10VM	DoC
EUT AC Adapter	Mitsumi	WAP-002(USA)	NA	DoC
EUT AC Adapter	Tabuchi	WAP-002(USA)	C3ET101	DoC
USB Adapter Board	NA	NA	NA	NA

I/O CABLES (ANTENNA PORT CONDUCTED SETUP)

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	USB	1	USB	Un-shielded	0.5m	NA
4	Mic	1	Earphone	Un-shielded	1m	NA
5	Antenna Port	1	Spectrum	Un-shielded	0.1m	NA

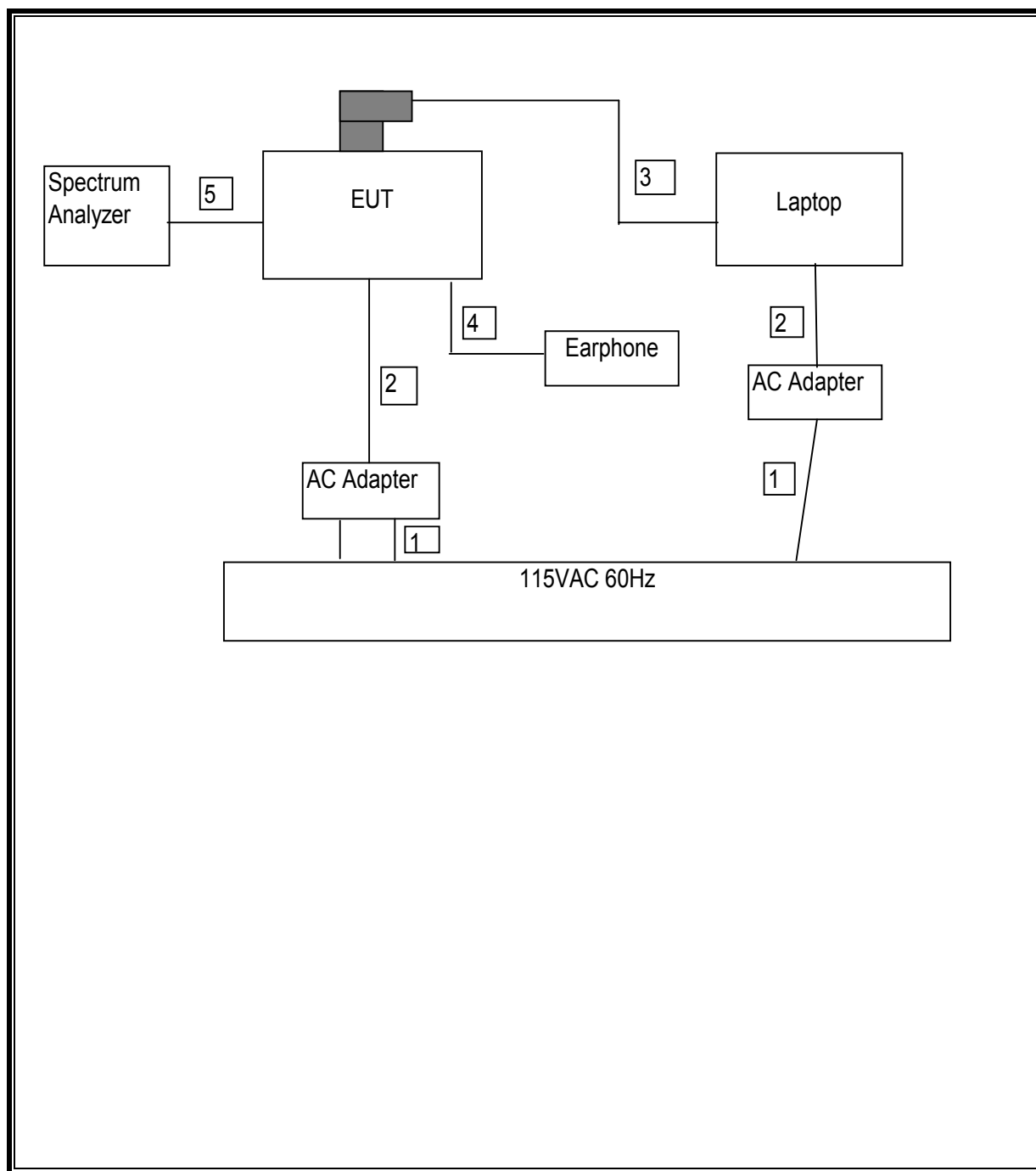
I/O CABLES (RADIATED EMISSIONS SETUP)

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	Mic	1	Earphone	Un-shielded	1m	NA

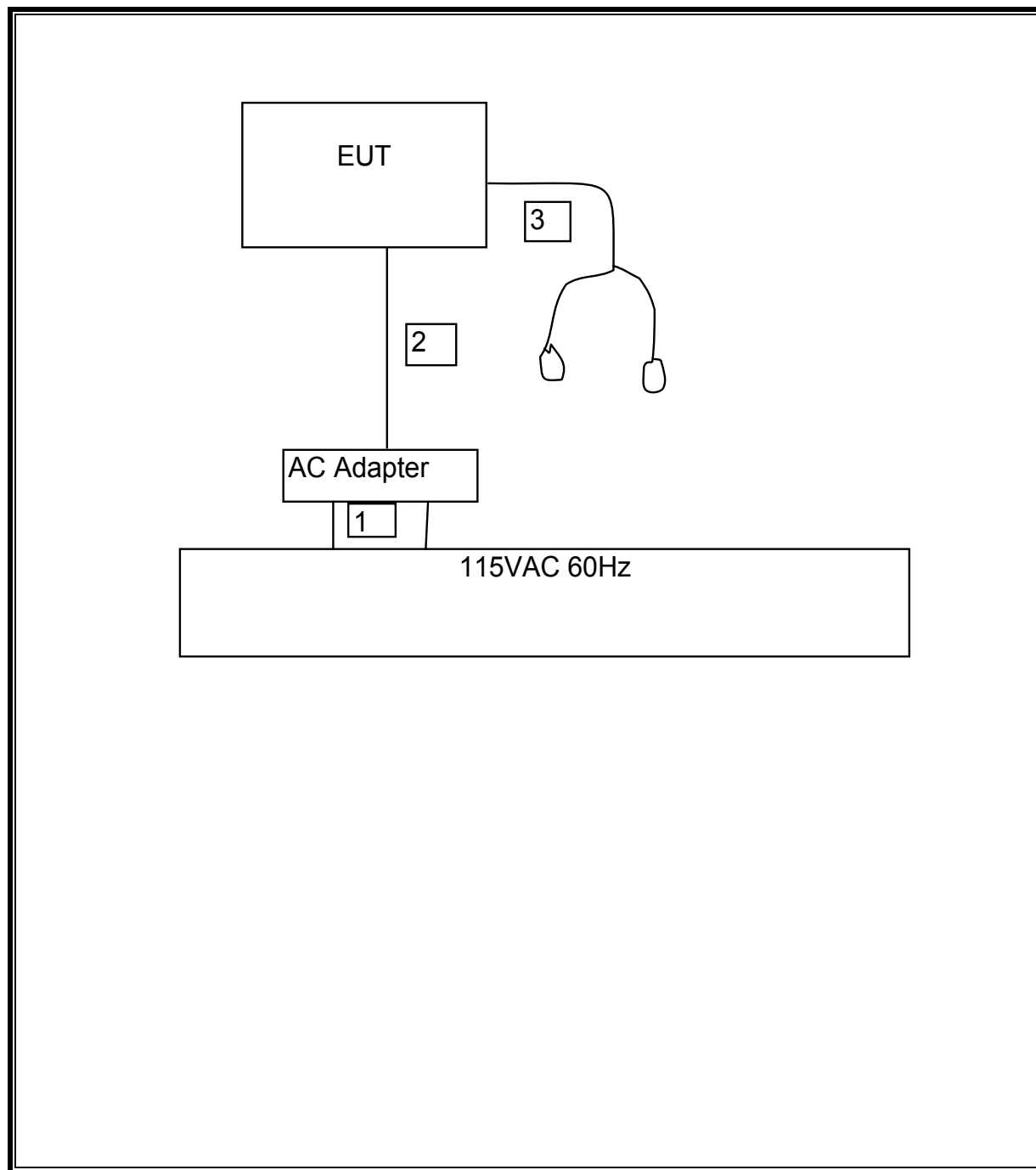
TEST SETUP

For radiated emissions, the host Laptop is removed after exercised the radio card.

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP DIAGRAM



RADIATED EMISSIONS SETUP



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	2/4/2010
Antenna, Horn, 18 GHz	EMCO	3115	C00945	4/22/2010
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	1/14/2010
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	12/16/2009
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	6/1/2010
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRM50702	N02685	CNR
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	8/6/2009
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/29/2009
Peak Power Meter	Agilent / HP	E4416A	C00963	12/4/2009
Peak / Average Power Sensor	Agilent / HP	E9327A	C00964	12/7/2009

7. ANTENNA PORT TEST RESULTS

7.1. 802.11 MODE

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.

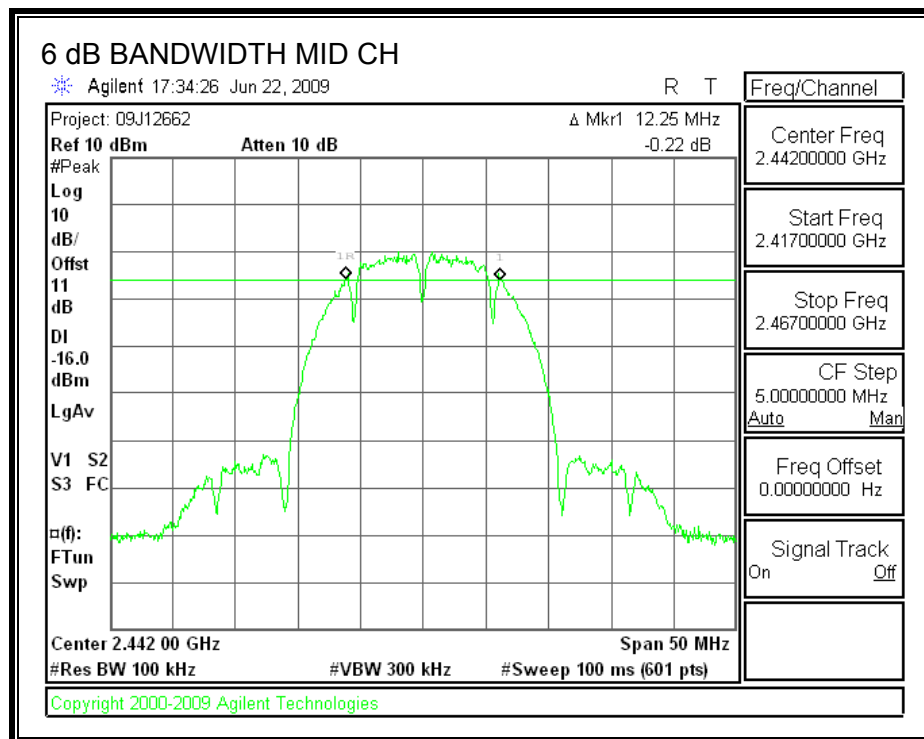
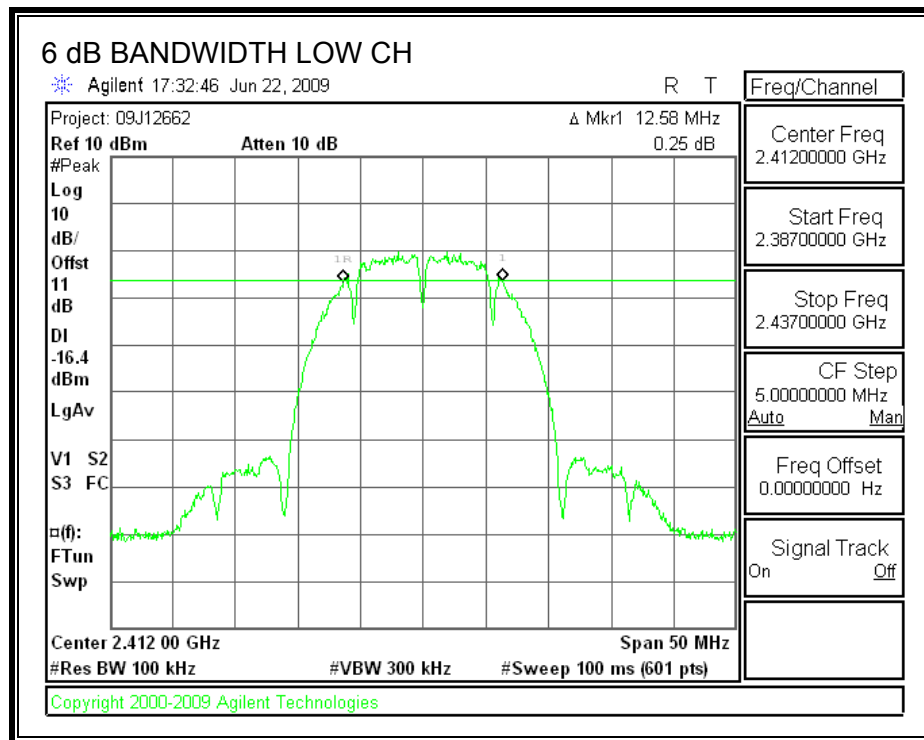
TEST PROCEDURE

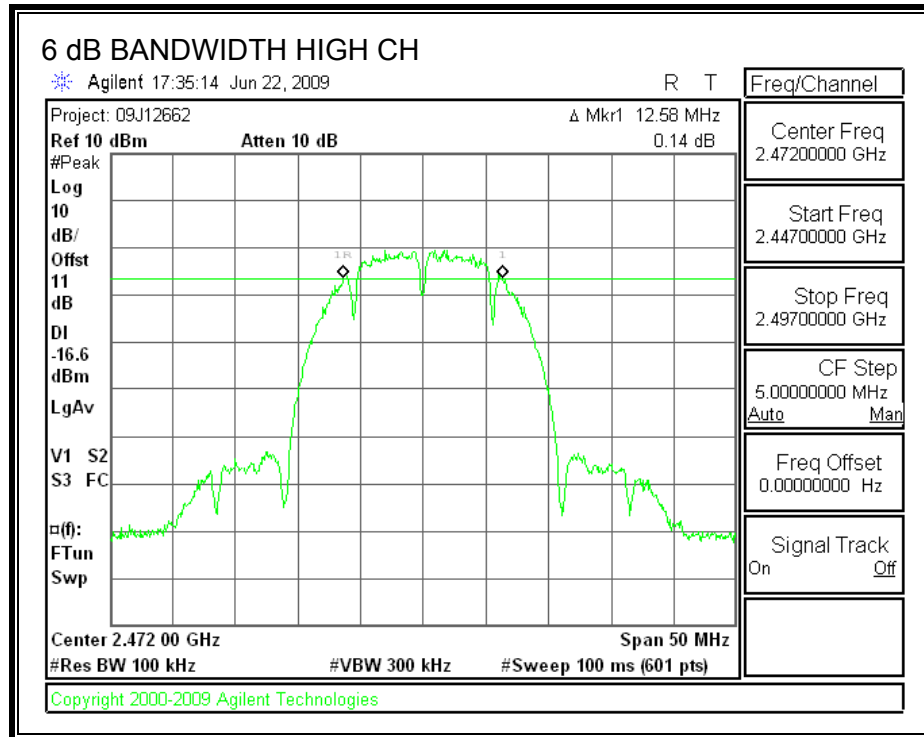
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	12.58	0.5
Middle	2442	12.25	0.5
High	2472	12.58	0.5

6 dB BANDWIDTH





7.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

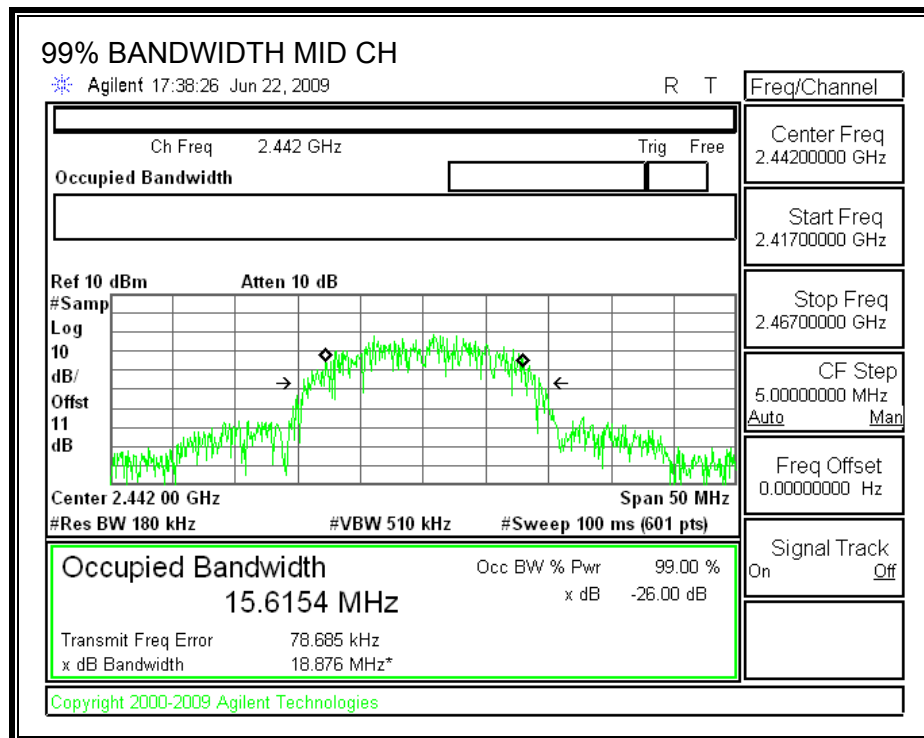
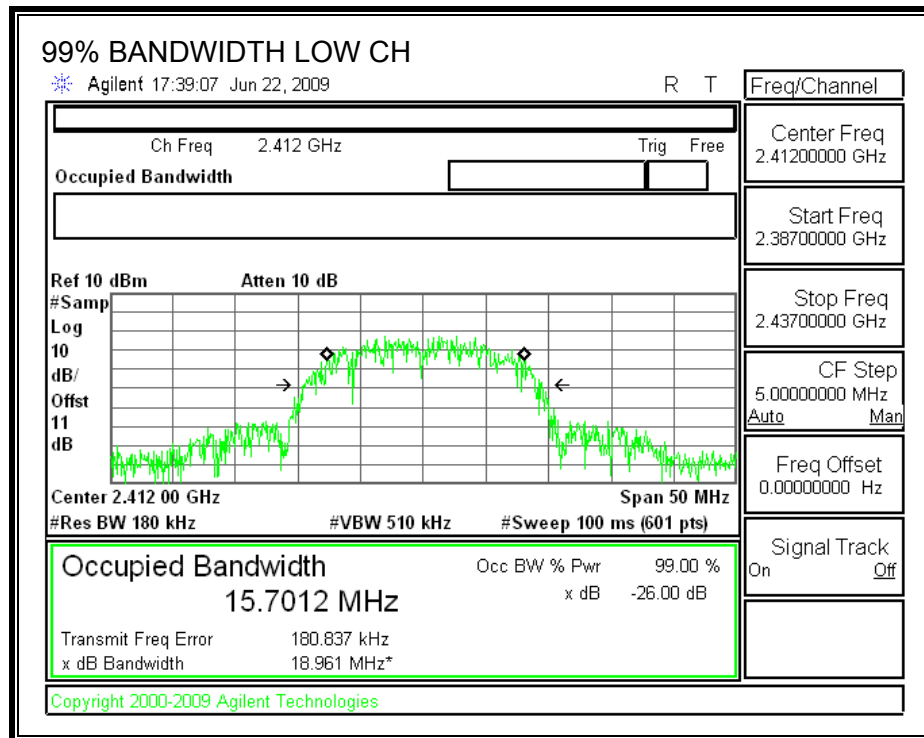
TEST PROCEDURE

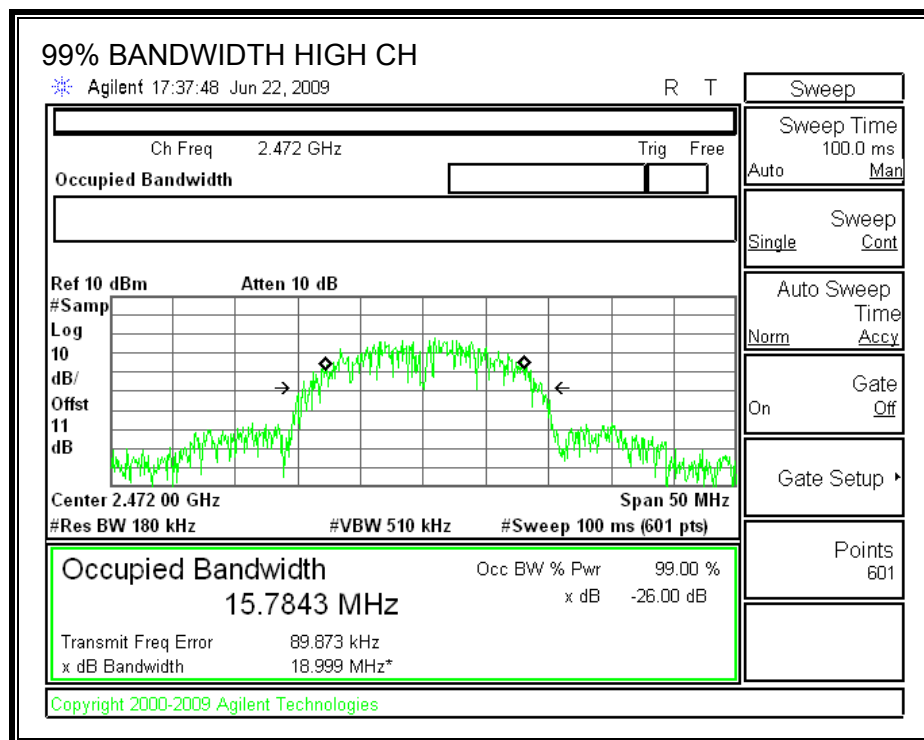
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	15.7012
Middle	2442	15.6154
High	2472	15.7843

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.

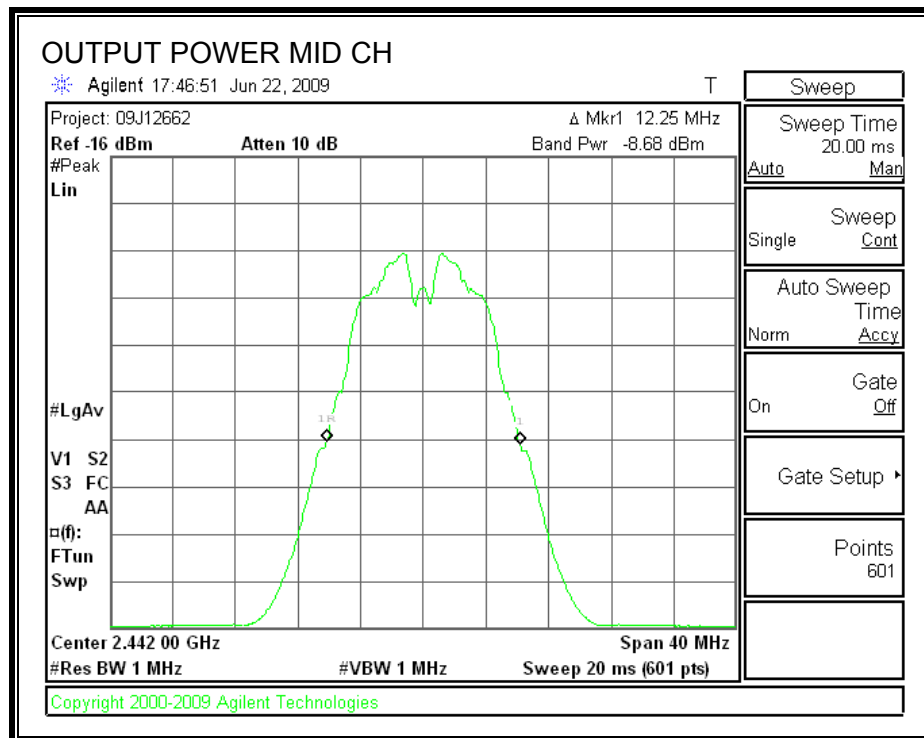
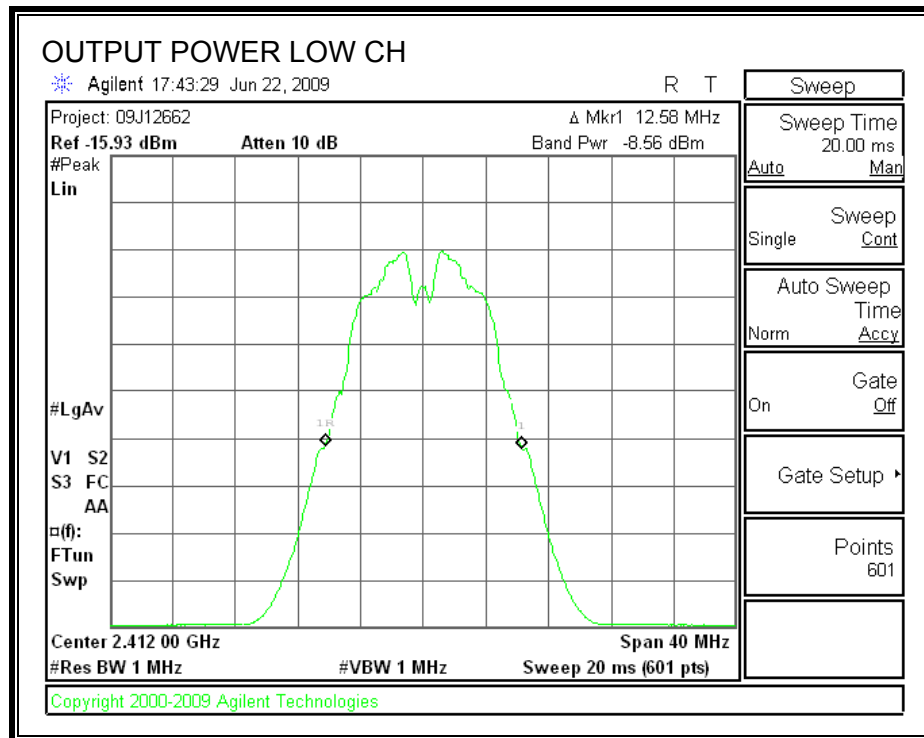
TEST PROCEDURE

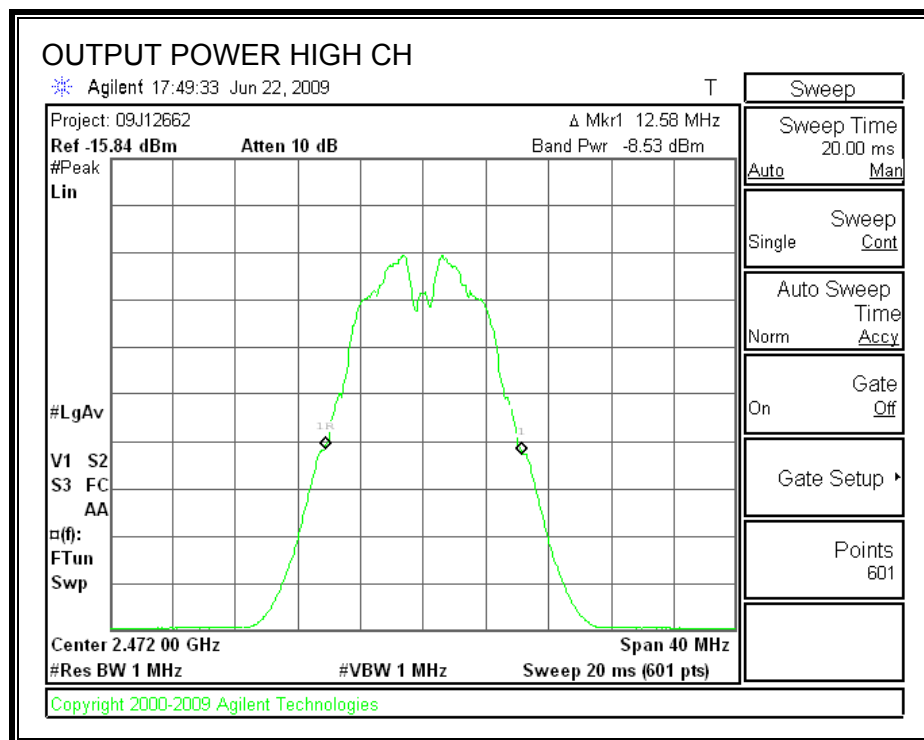
Peak power is measured using the Channel bandwidth Alternative peak output power procedure specified in "TCB Training for Devices covered under Scopes A1 - A4" by Joe Dichoso, May 2003.

RESULTS

Channel	Frequency (MHz)	Spectrum Analyzer Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-8.56	11	2.44	30	-27.56
Middle	2442	-8.68	11	2.32	30	-27.68
High	2472	-8.53	11	2.47	30	-27.53

OUTPUT POWER





7.1.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 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	0.25
Middle	2442	0.32
High	2472	0.20

7.1.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

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

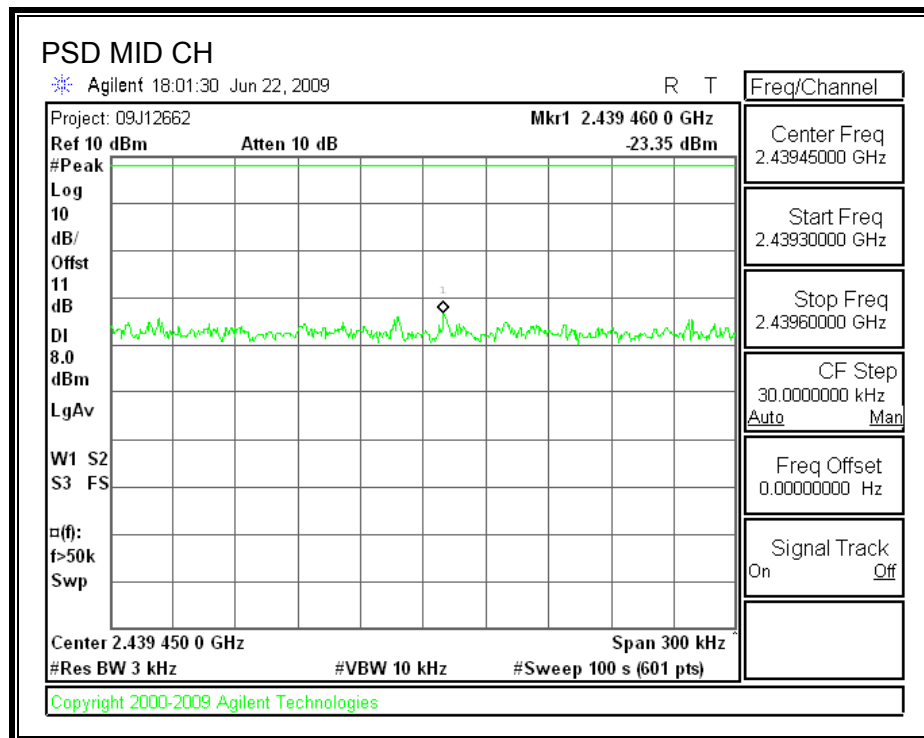
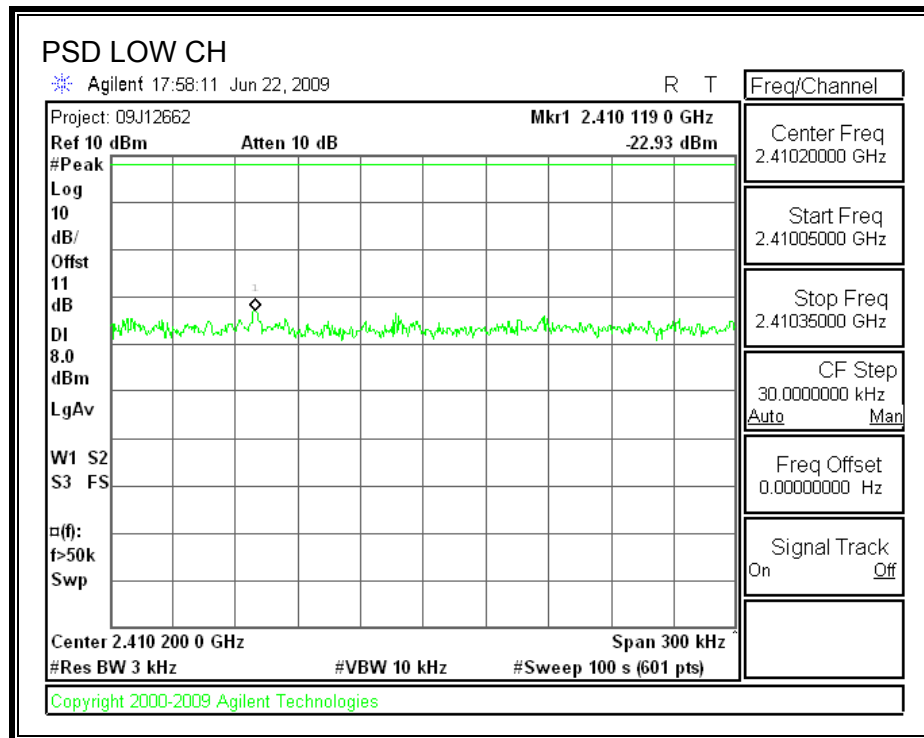
TEST PROCEDURE

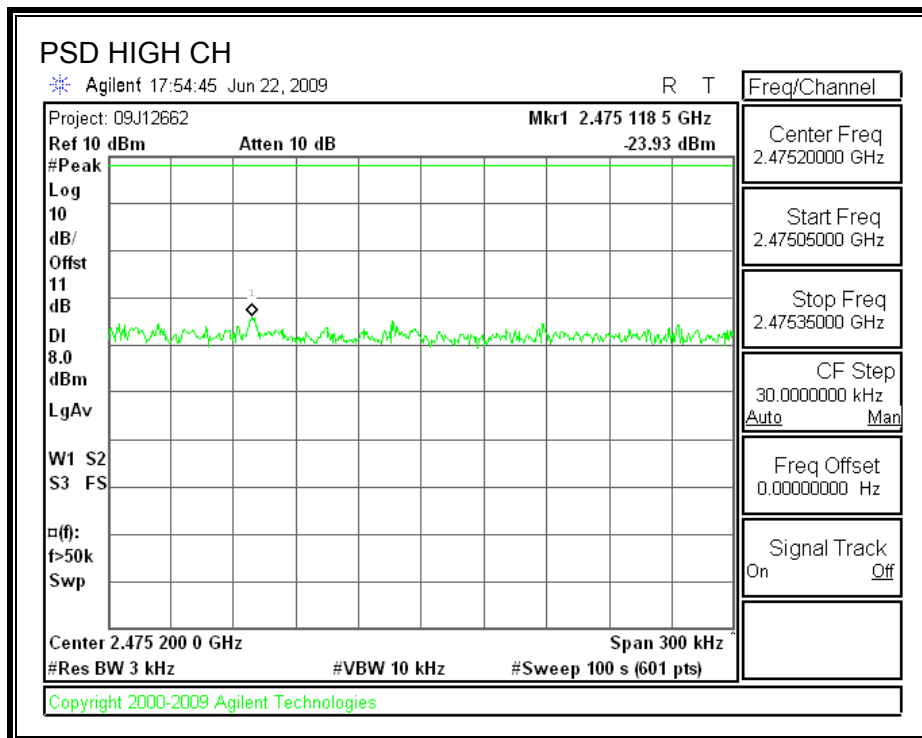
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-22.93	8	-30.93
Middle	2442	-23.35	8	-31.35
High	2472	-23.93	8	-31.93

POWER SPECTRAL DENSITY





7.1.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

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

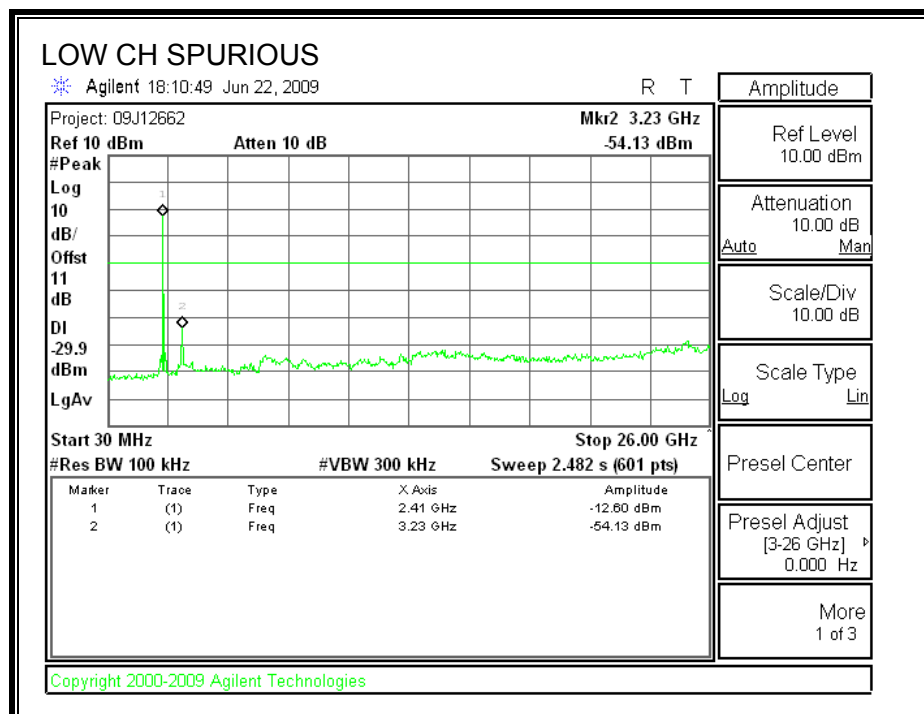
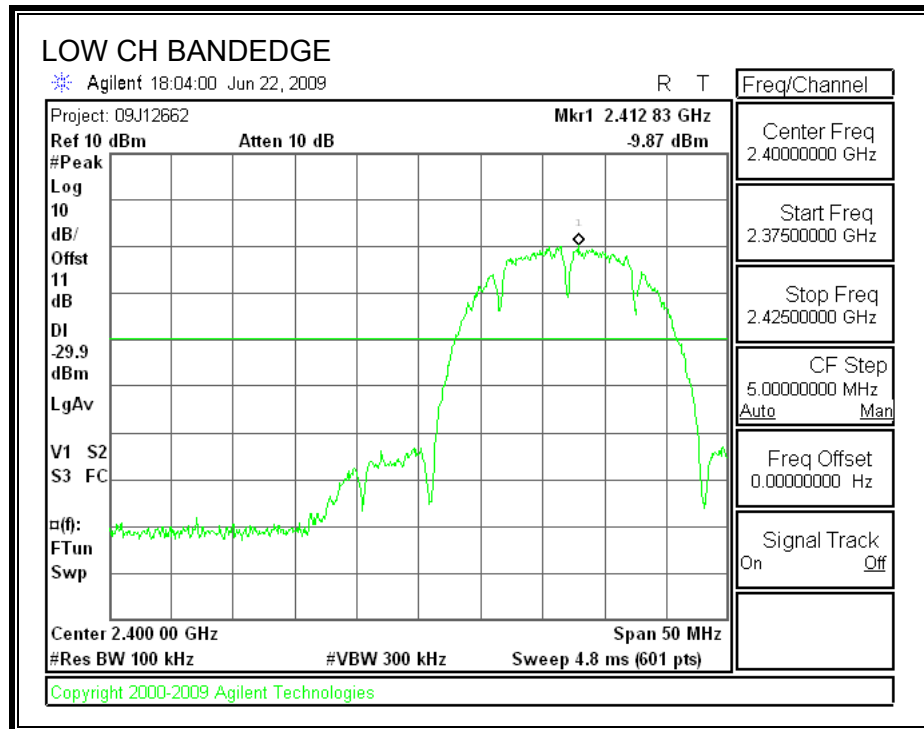
TEST PROCEDURE

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

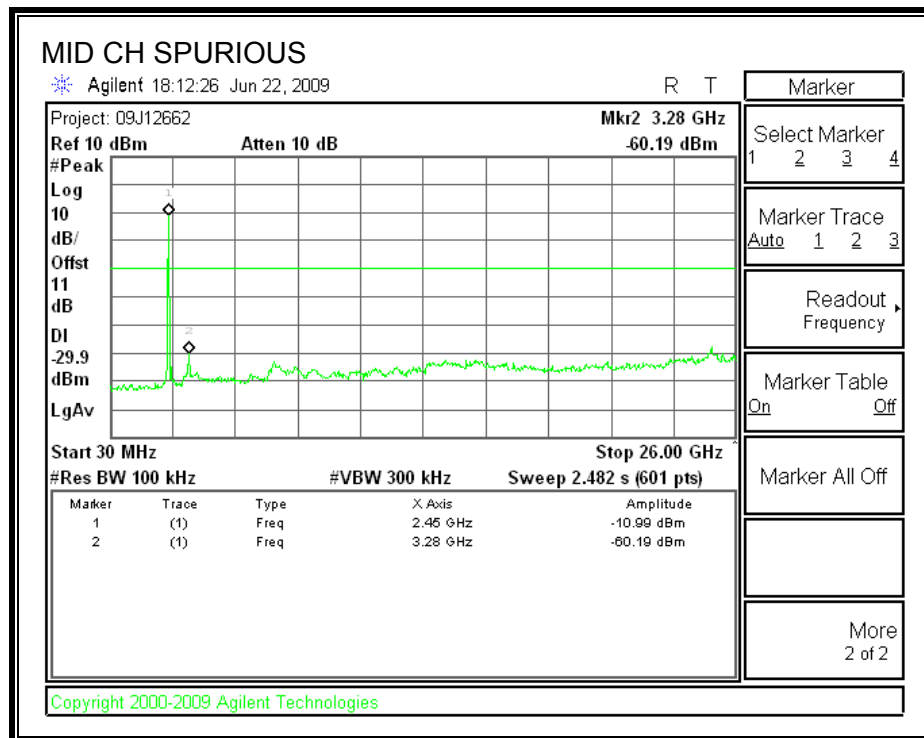
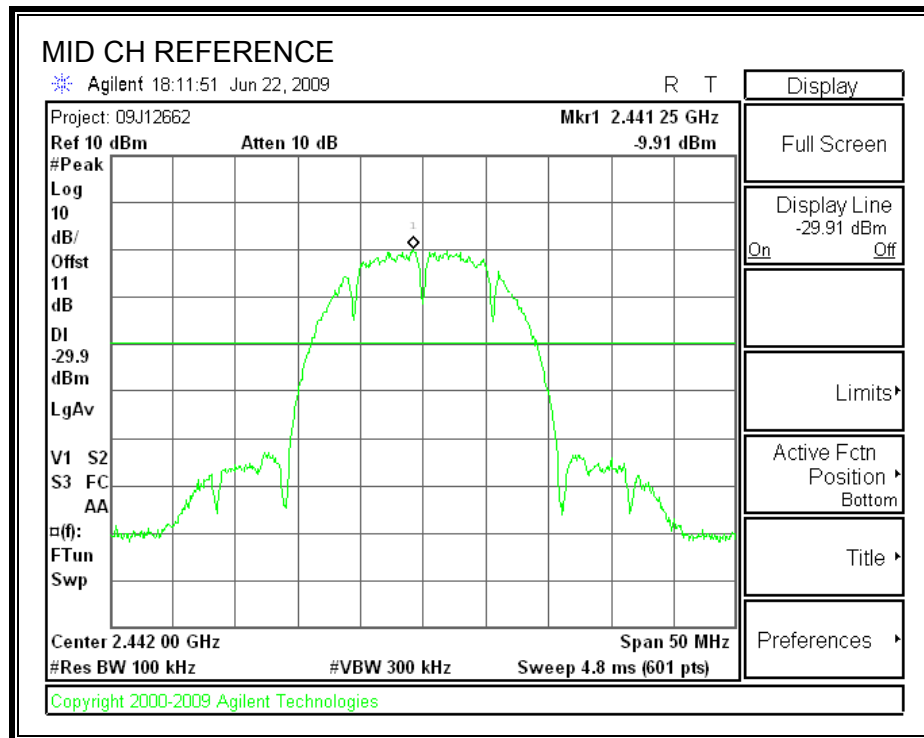
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

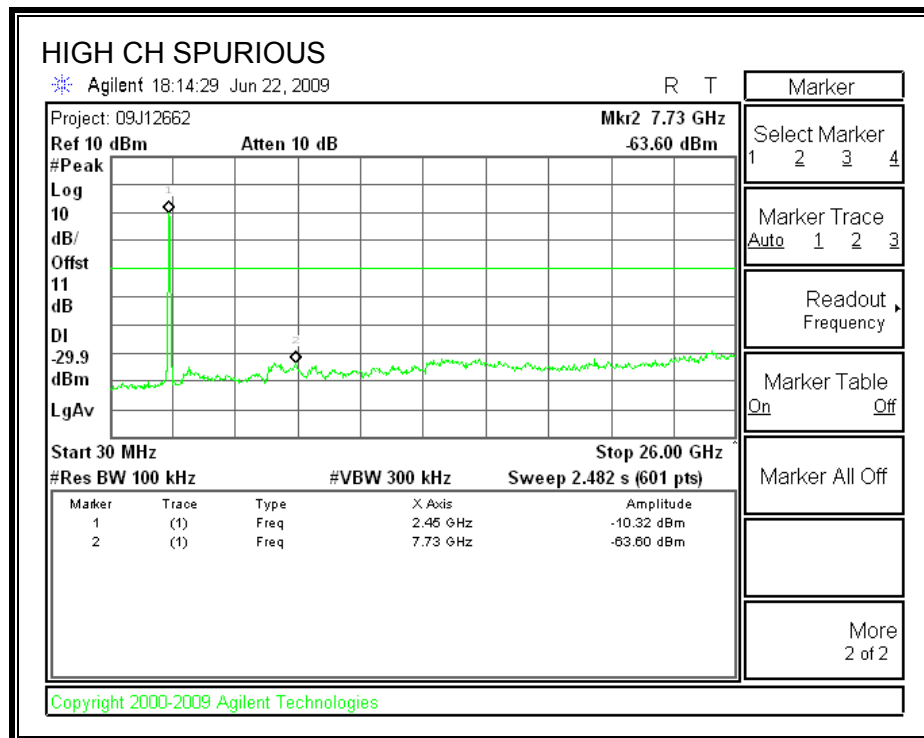
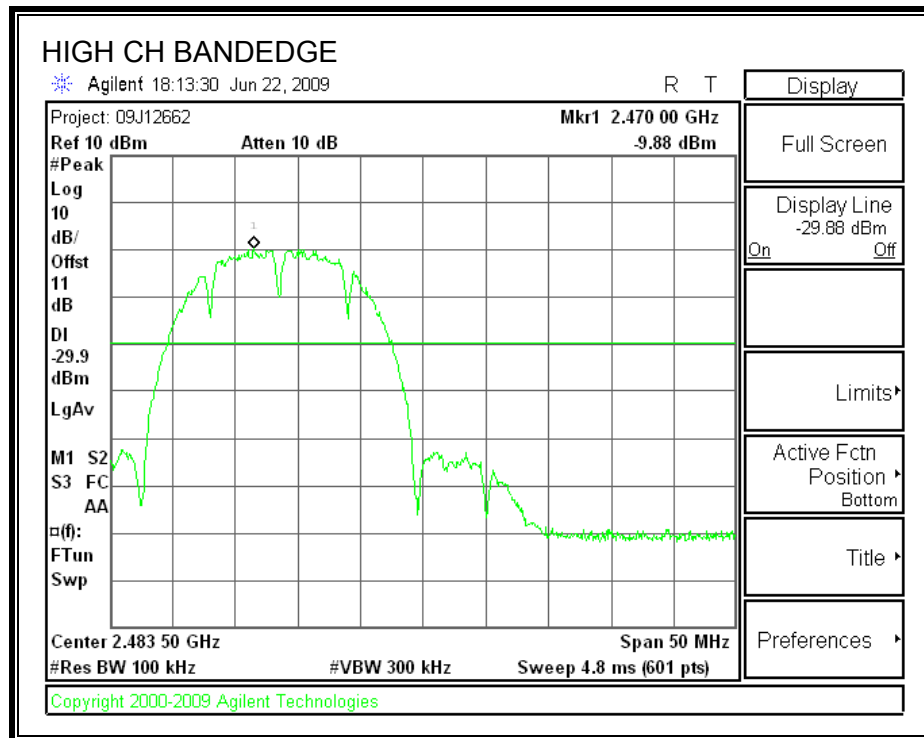
SPURIOUS EMISSIONS, LOW CHANNEL



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



7.2. 802.11b MODE

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.

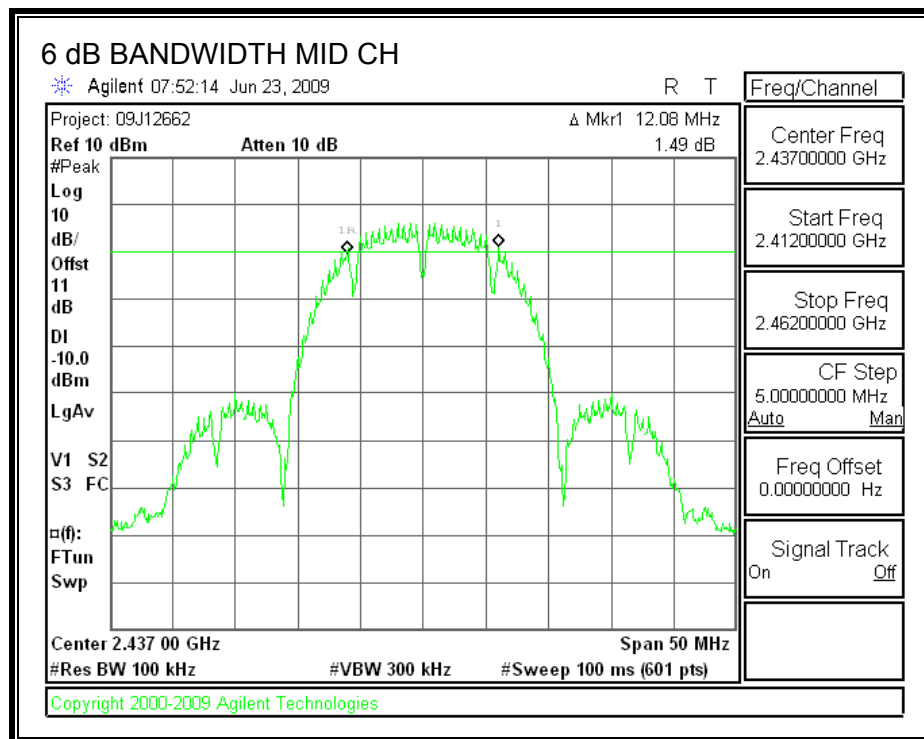
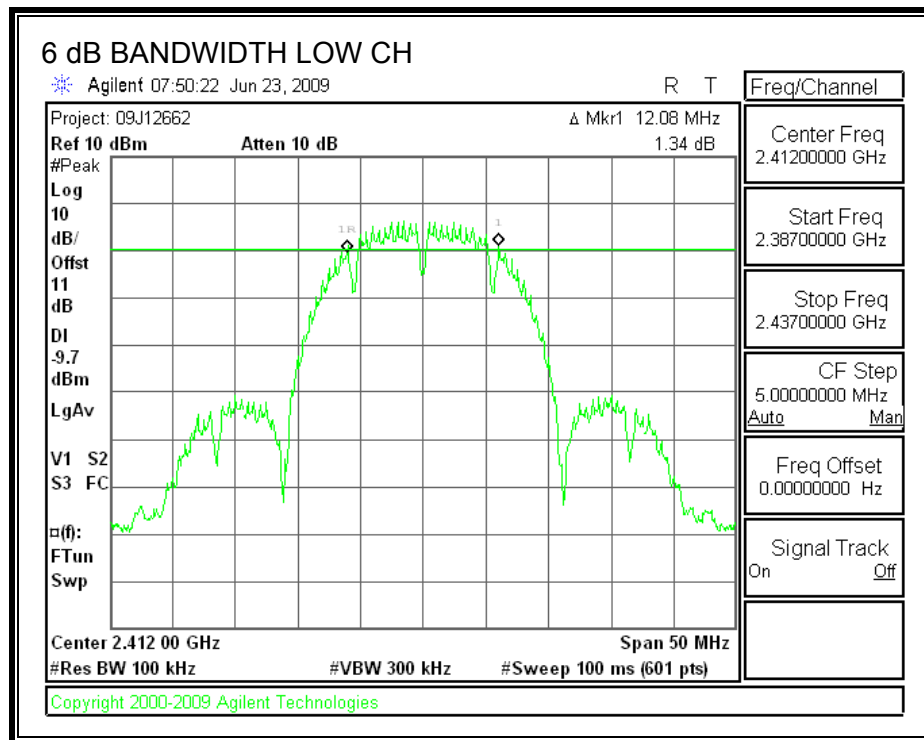
TEST PROCEDURE

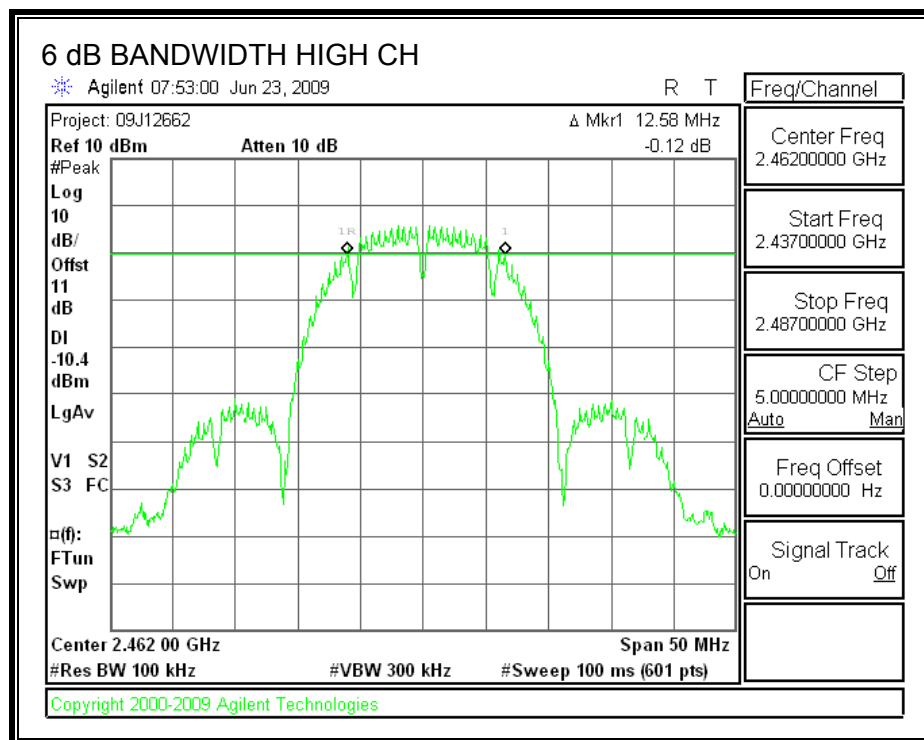
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	12.08	0.5
Middle	2437	12.08	0.5
High	2462	12.58	0.5

6 dB BANDWIDTH





7.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

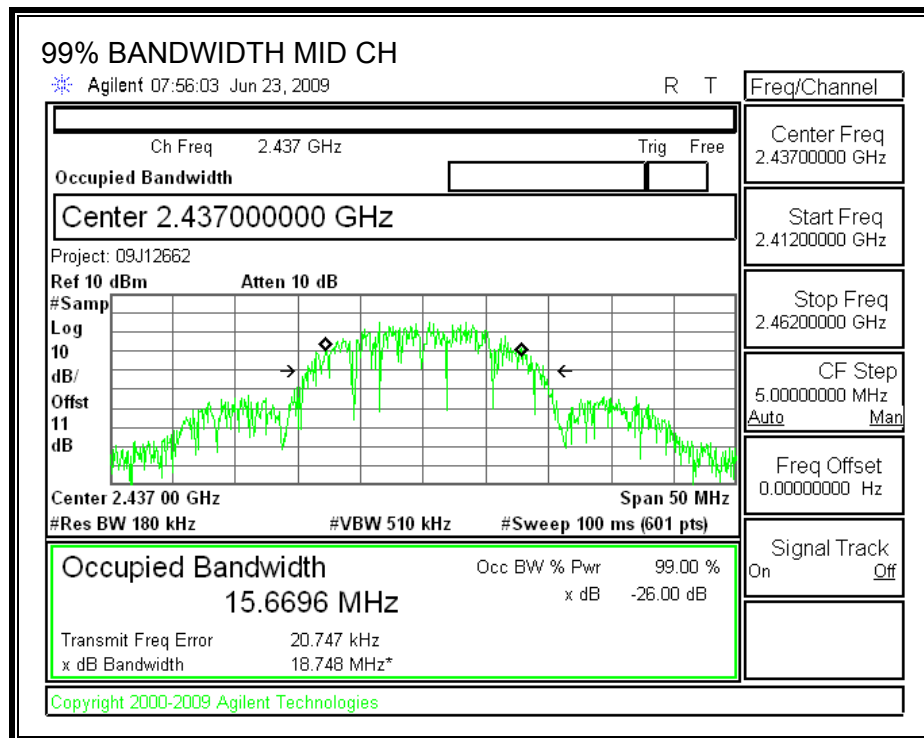
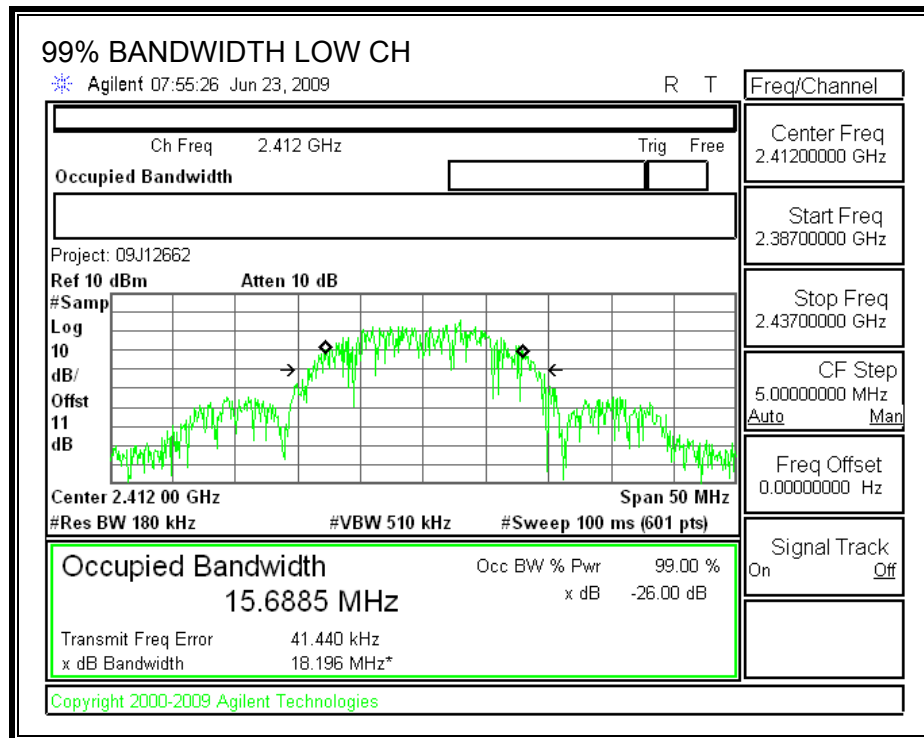
TEST PROCEDURE

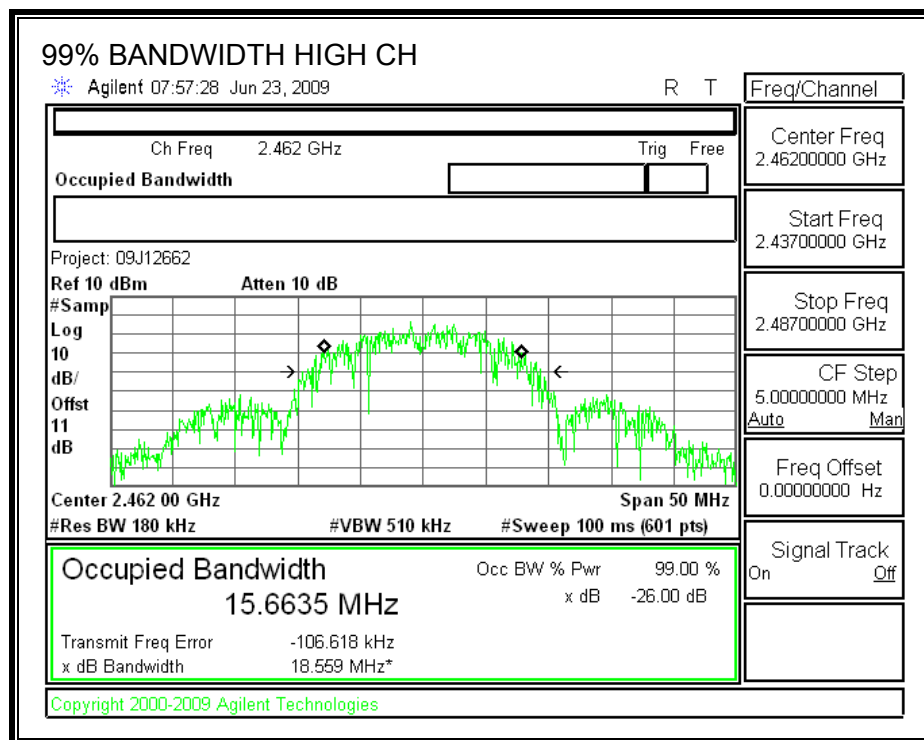
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	15.6885
Middle	2437	15.6696
High	2462	15.6635

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.

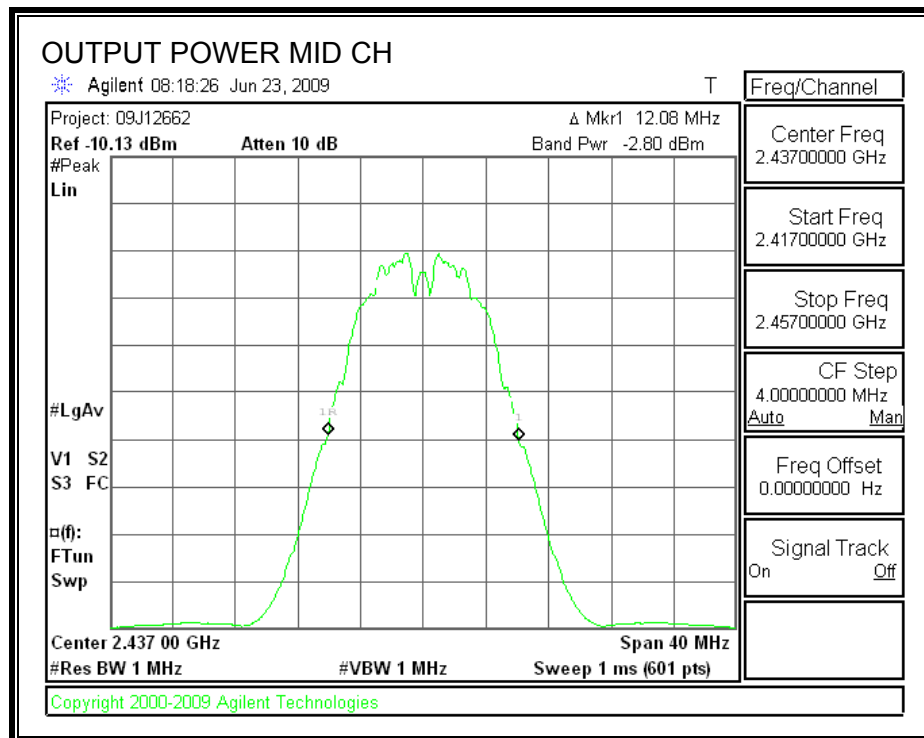
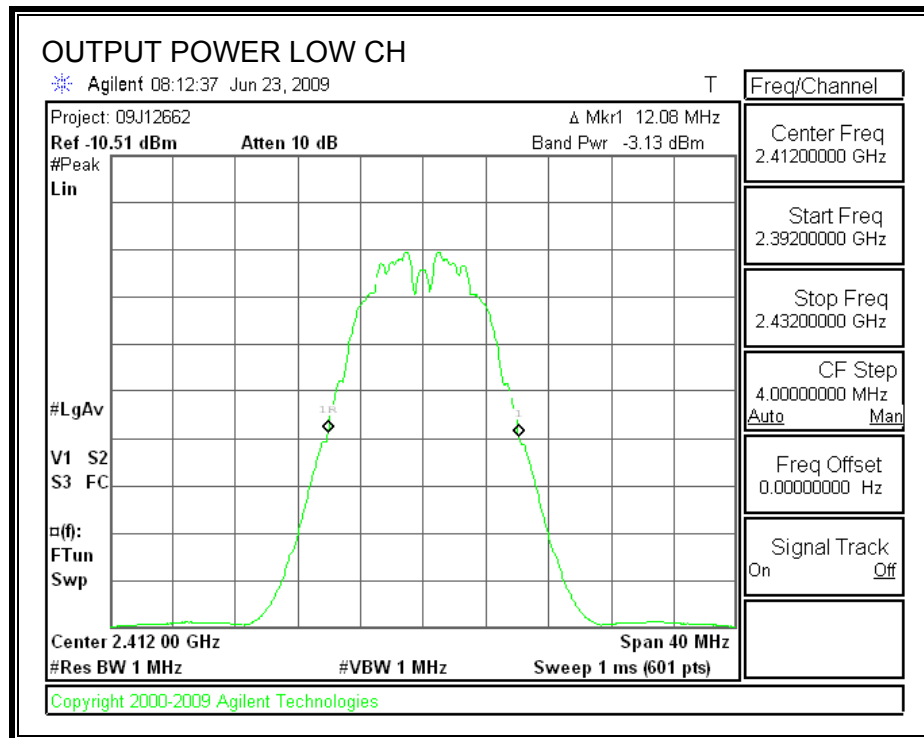
TEST PROCEDURE

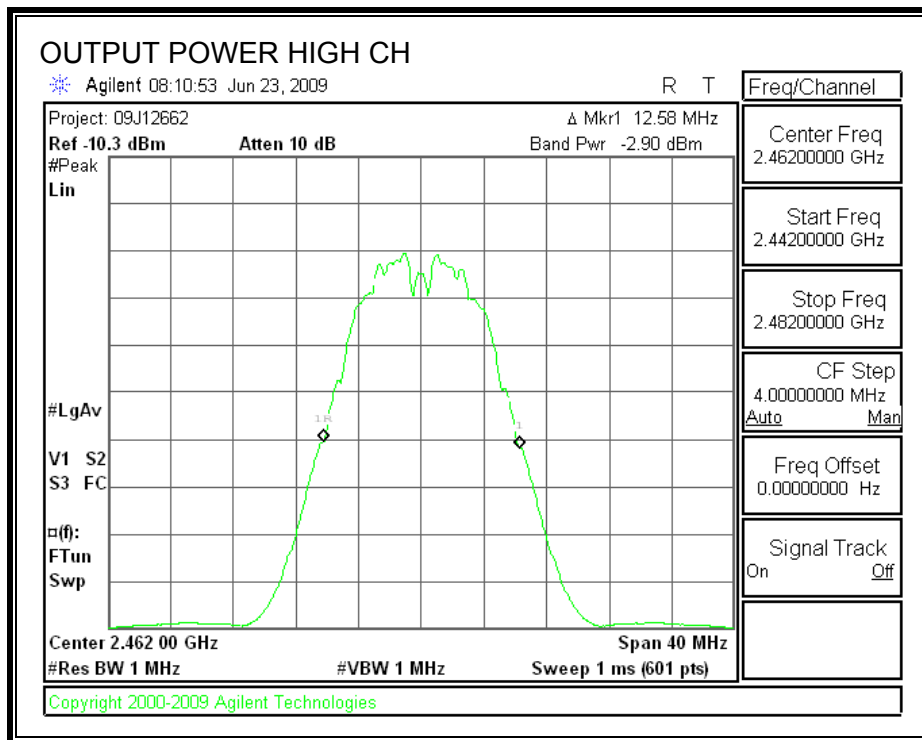
Peak power is measured using the Channel bandwidth Alternative peak output power procedure specified in "TCB Training for Devices covered under Scopes A1 - A4" by Joe Dichoso, May 2003.

RESULTS

Channel	Frequency (MHz)	Spectrum Analyzer Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-3.13	11	7.87	30	-22.13
Middle	2437	-2.8	11	8.20	30	-21.80
High	2462	-2.9	11	8.10	30	-21.90

OUTPUT POWER





7.2.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 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	5.04
Middle	2437	5.75
High	2462	5.53

7.2.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

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

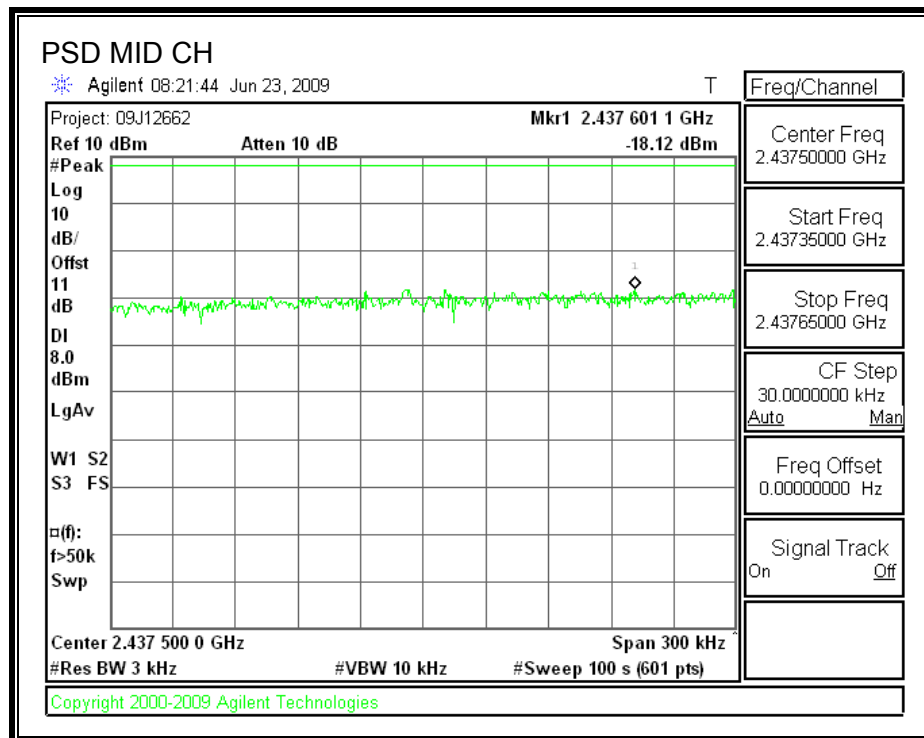
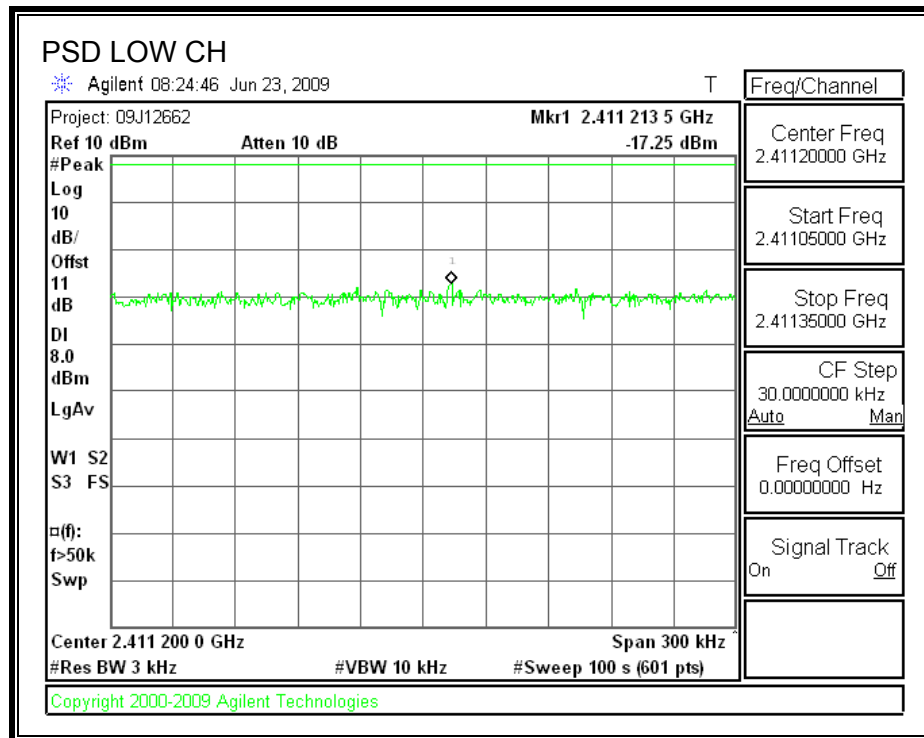
TEST PROCEDURE

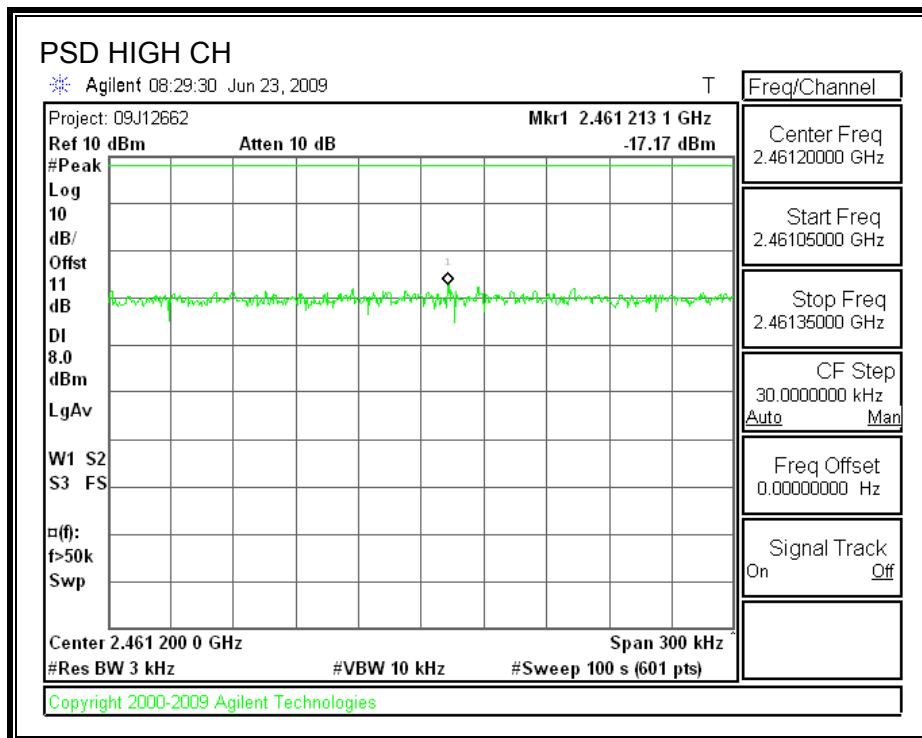
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-17.25	8	-25.25
Middle	2437	-18.12	8	-26.12
High	2462	-17.17	8	-25.17

POWER SPECTRAL DENSITY





7.2.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

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

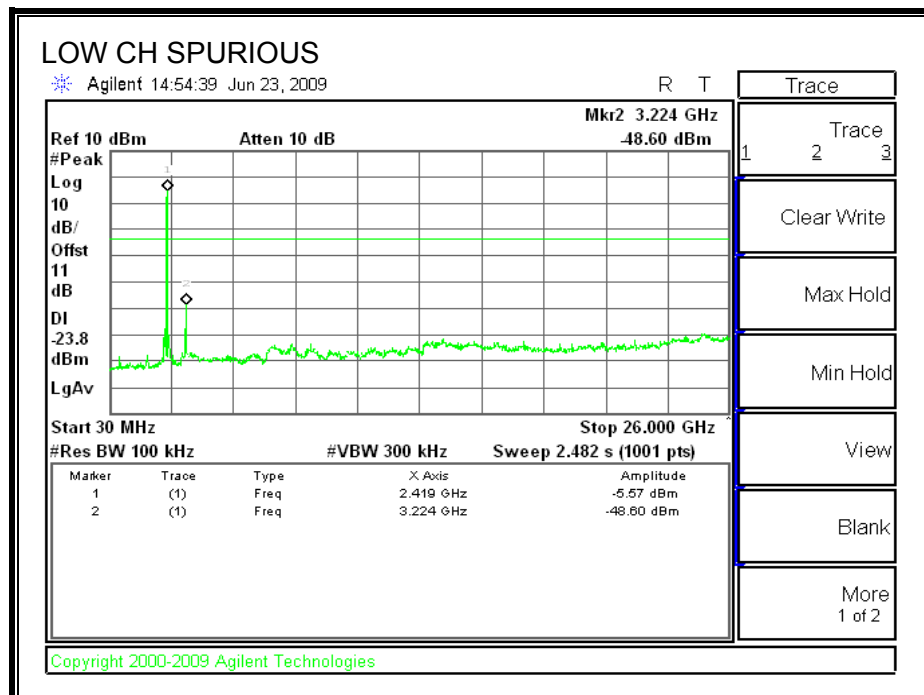
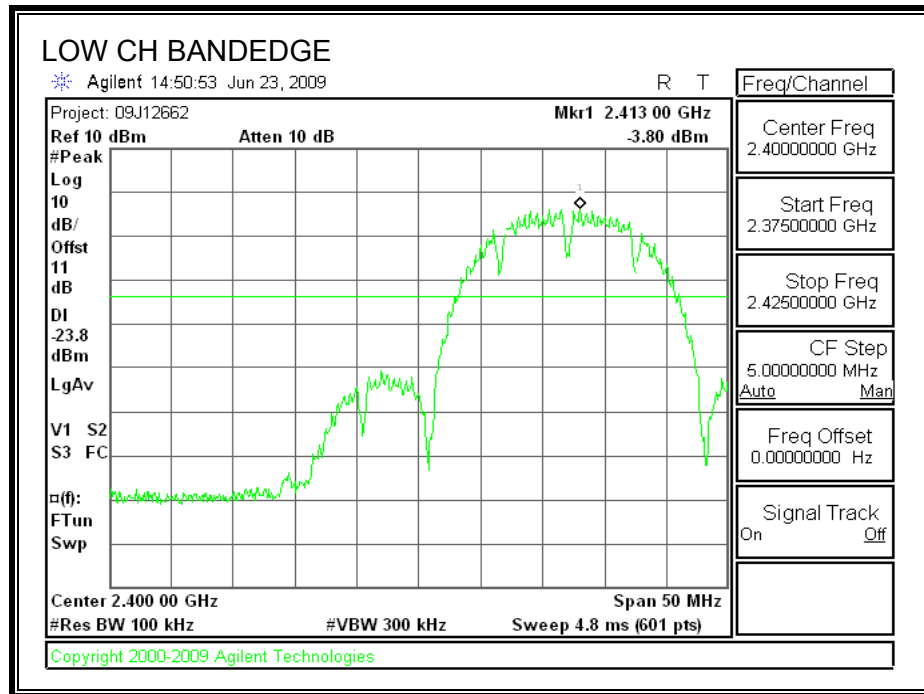
TEST PROCEDURE

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

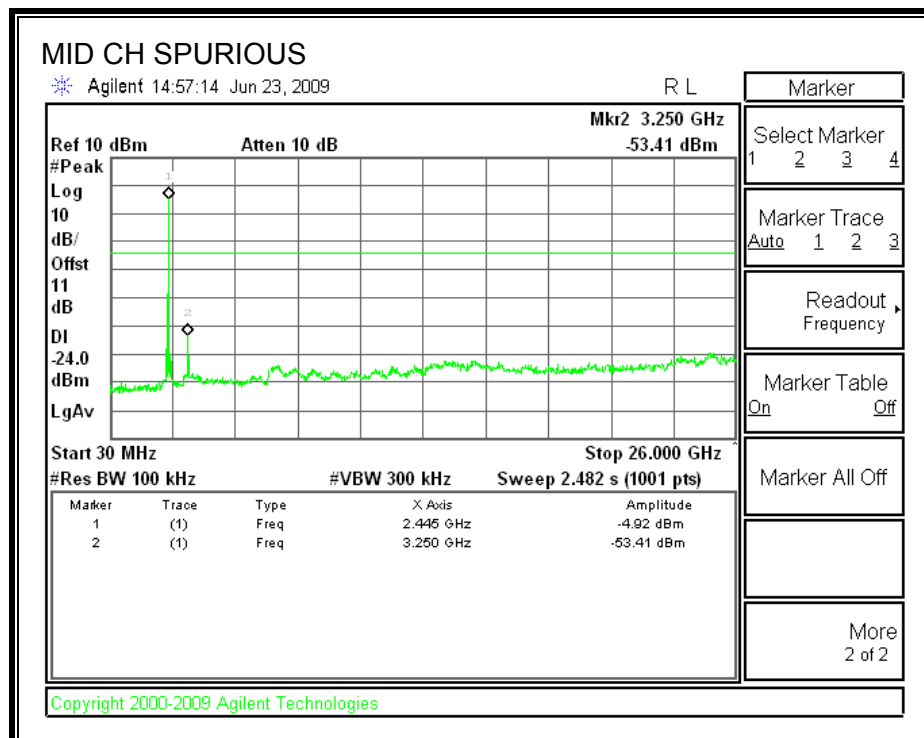
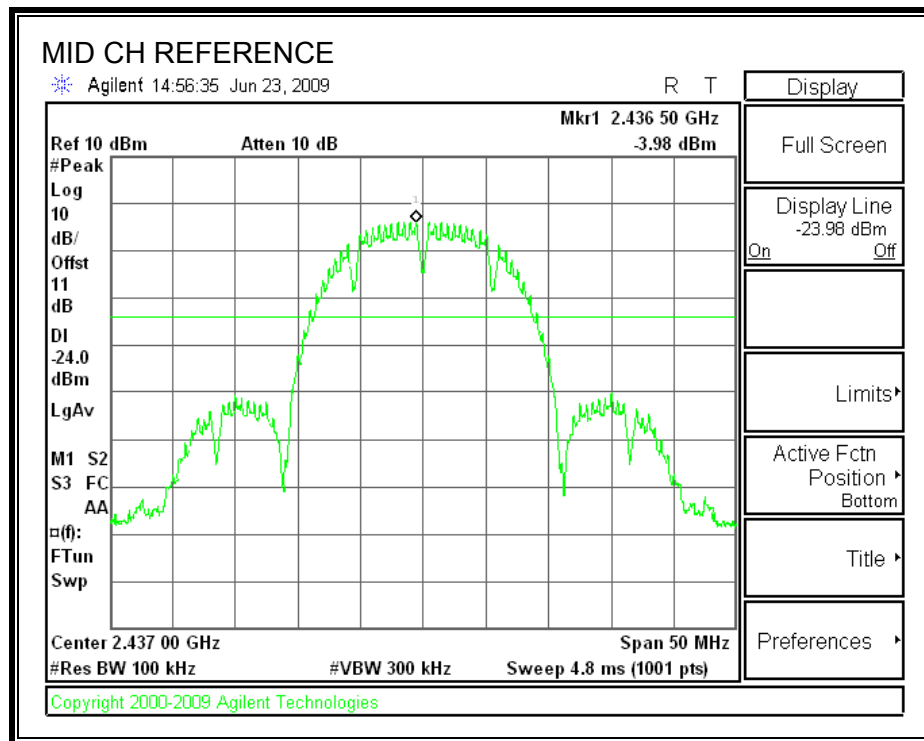
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

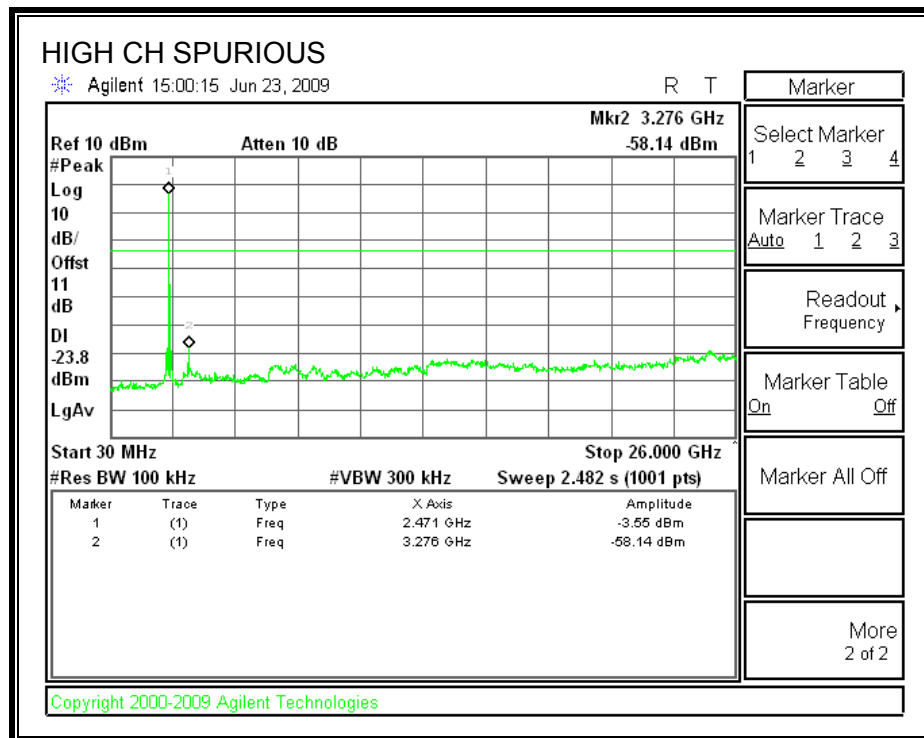
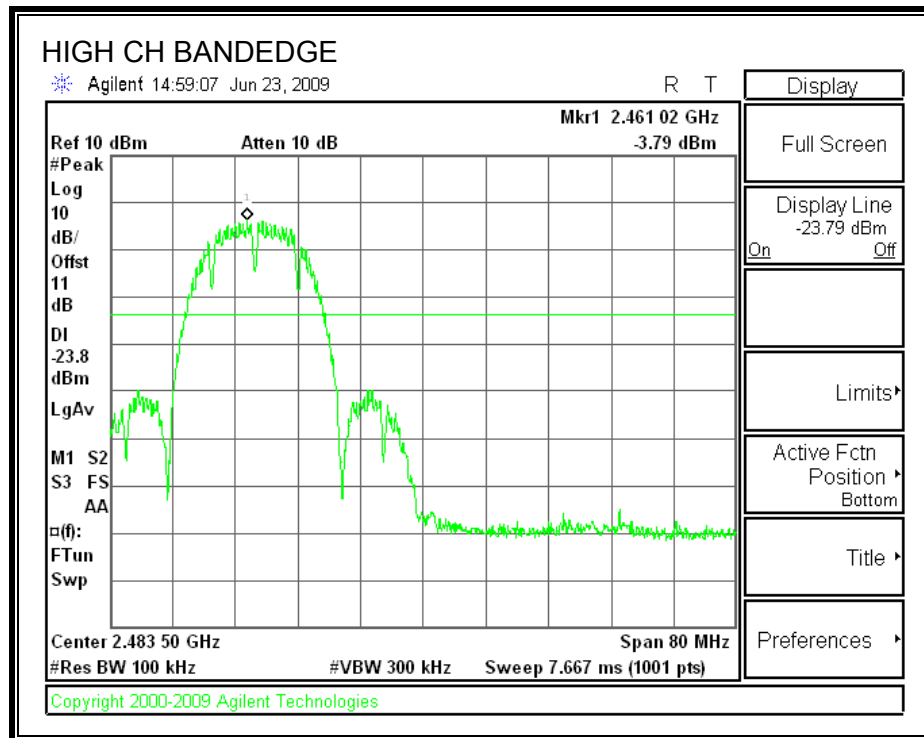
SPURIOUS EMISSIONS, LOW CHANNEL



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



7.3. 802.11g MODE

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.

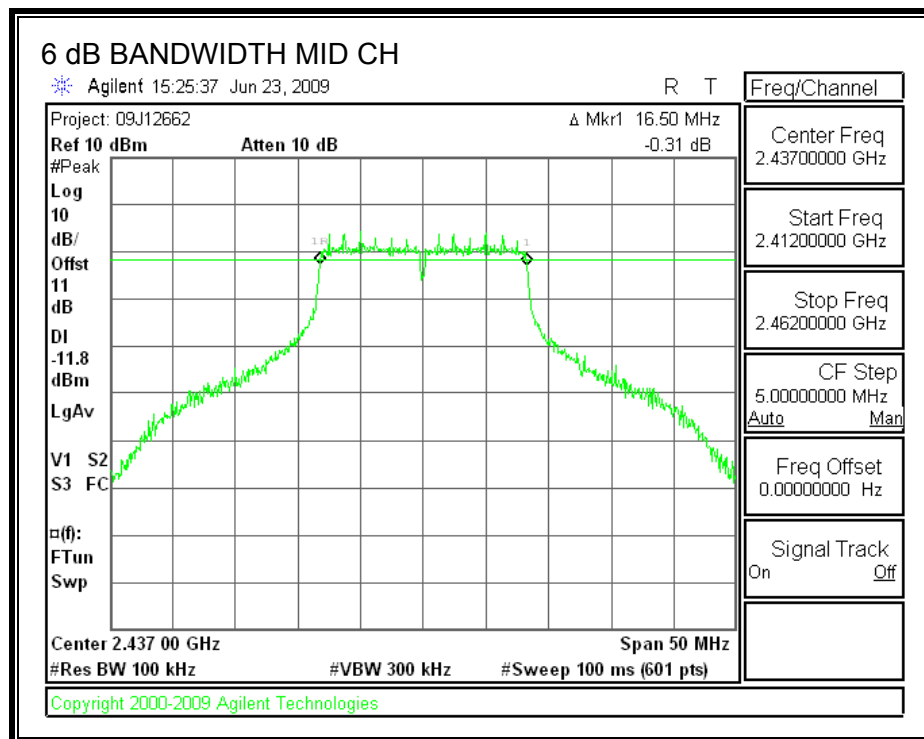
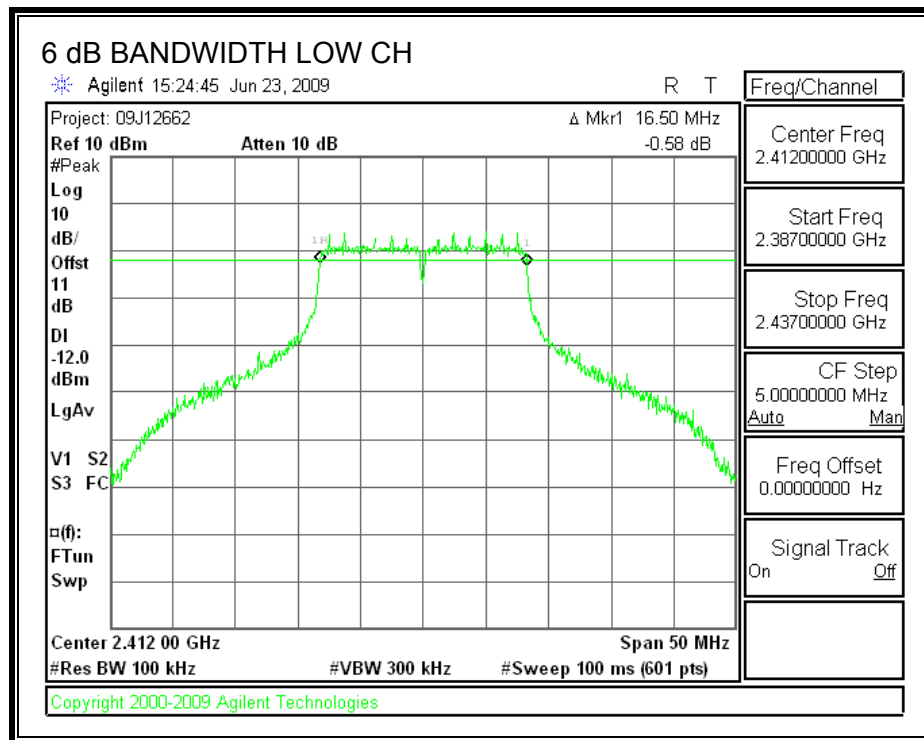
TEST PROCEDURE

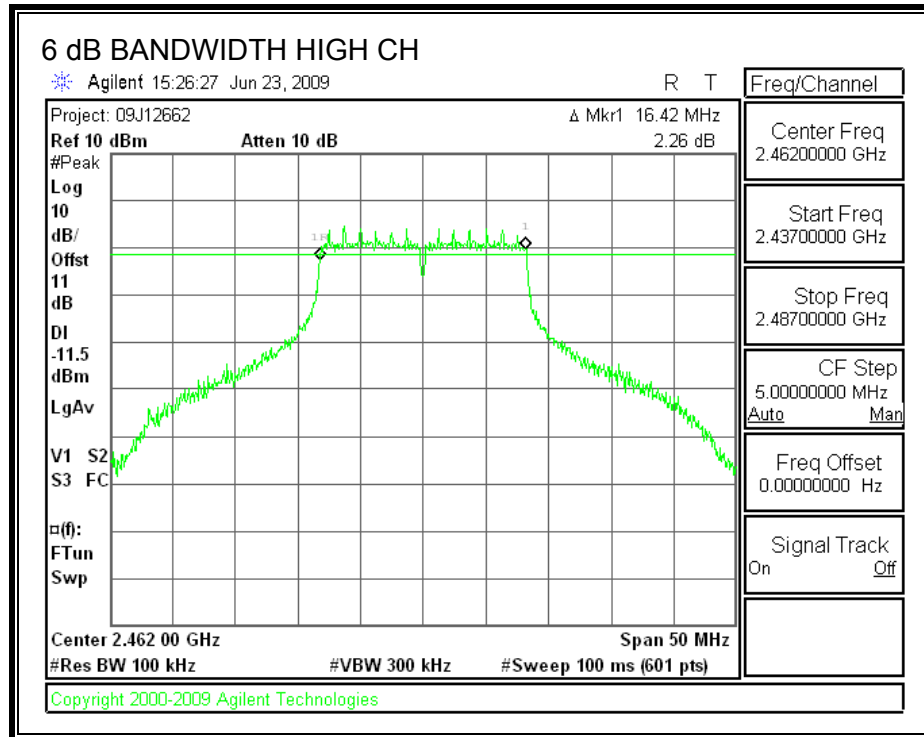
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	16.5	0.5
Middle	2437	16.5	0.5
High	2462	16.42	0.5

6 dB BANDWIDTH





7.3.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

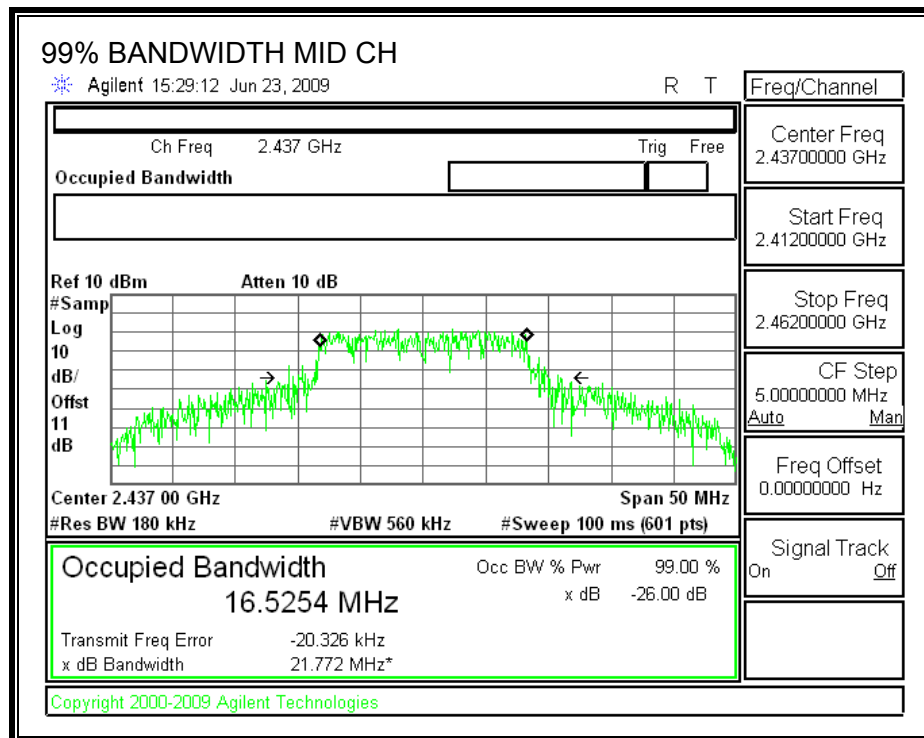
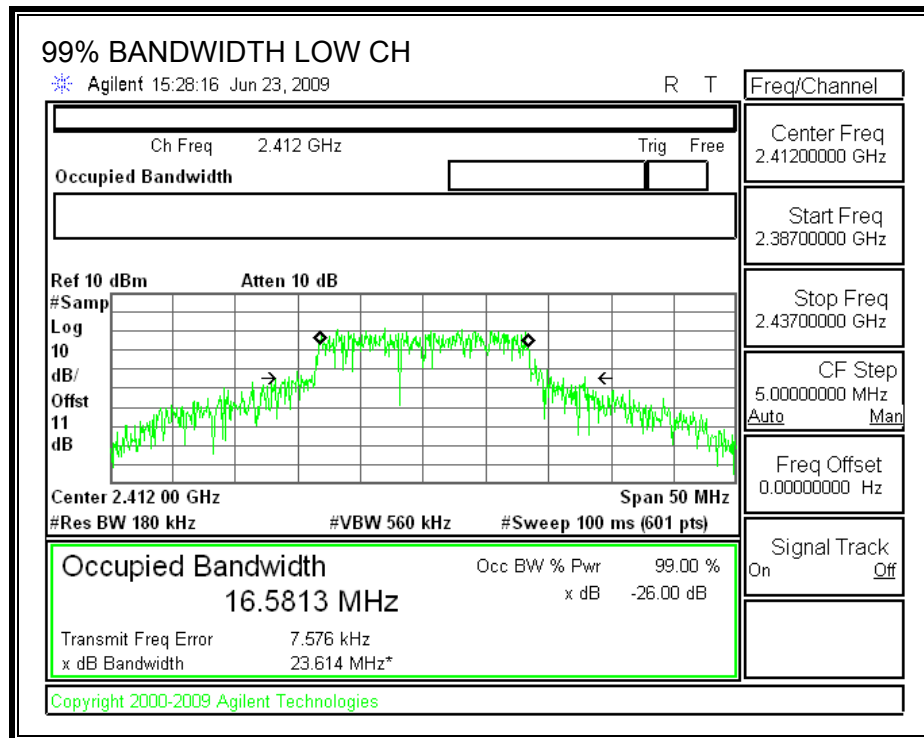
TEST PROCEDURE

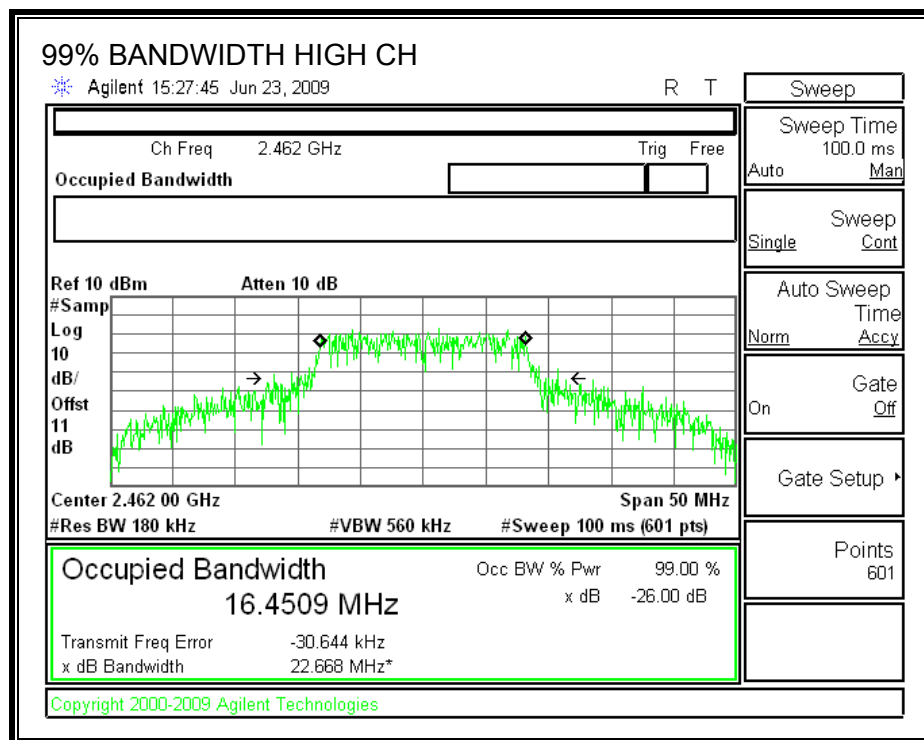
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.5813
Middle	2437	16.5254
High	2462	16.4509

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

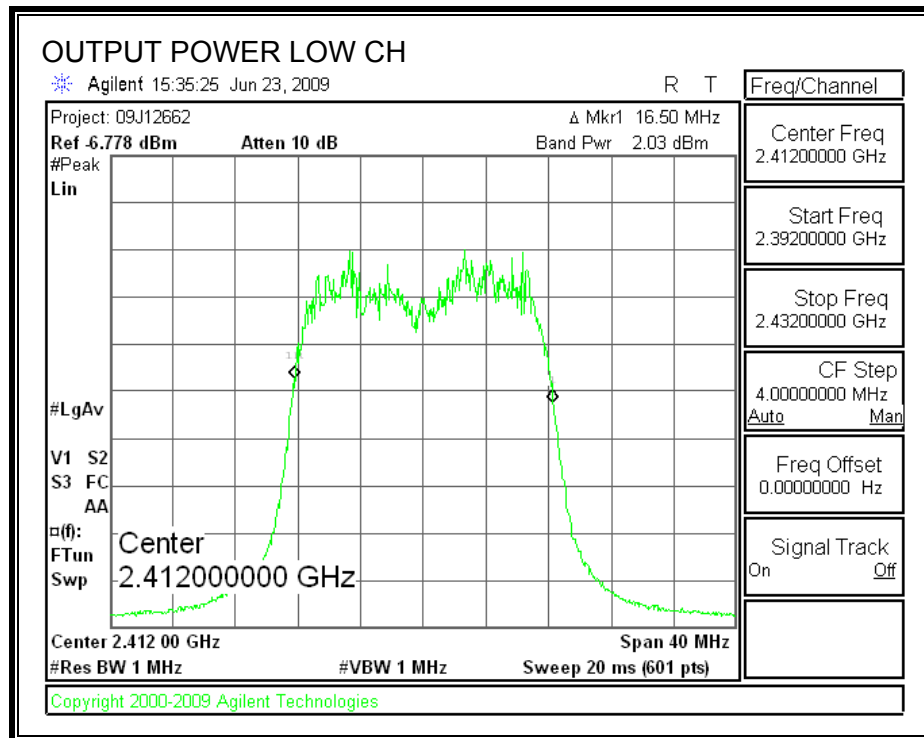
TEST PROCEDURE

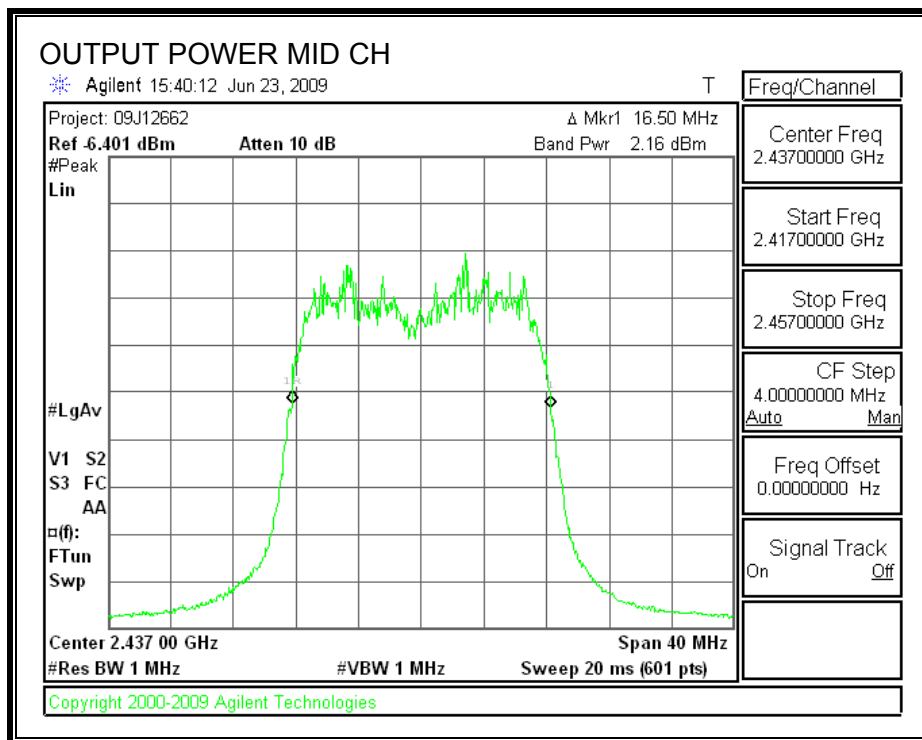
Peak power is measured using the Channel bandwidth Alternative peak output power procedure specified in "TCB Training for Devices covered under Scopes A1 - A4" by Joe Dichoso, May 2003.

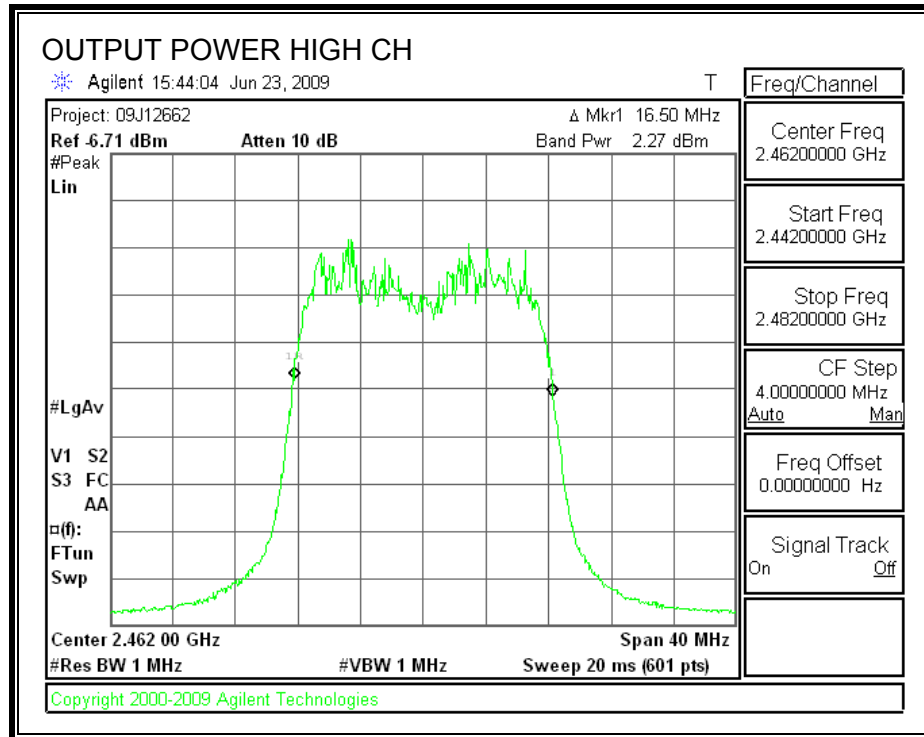
RESULTS

Channel	Frequency (MHz)	Spectrum Analyzer Reading (dBm)	Attenuator and Cable Offset (dB)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	2.03	11	13.03	30	-16.97
Middle	2437	2.16	11	13.16	30	-16.84
High	2462	2.27	11	13.27	30	-16.73

OUTPUT POWER







7.3.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

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

Channel	Frequency (MHz)	Power (dBm)
Low	2412	4.96
Middle	2437	5.69
High	2462	5.47

7.3.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

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

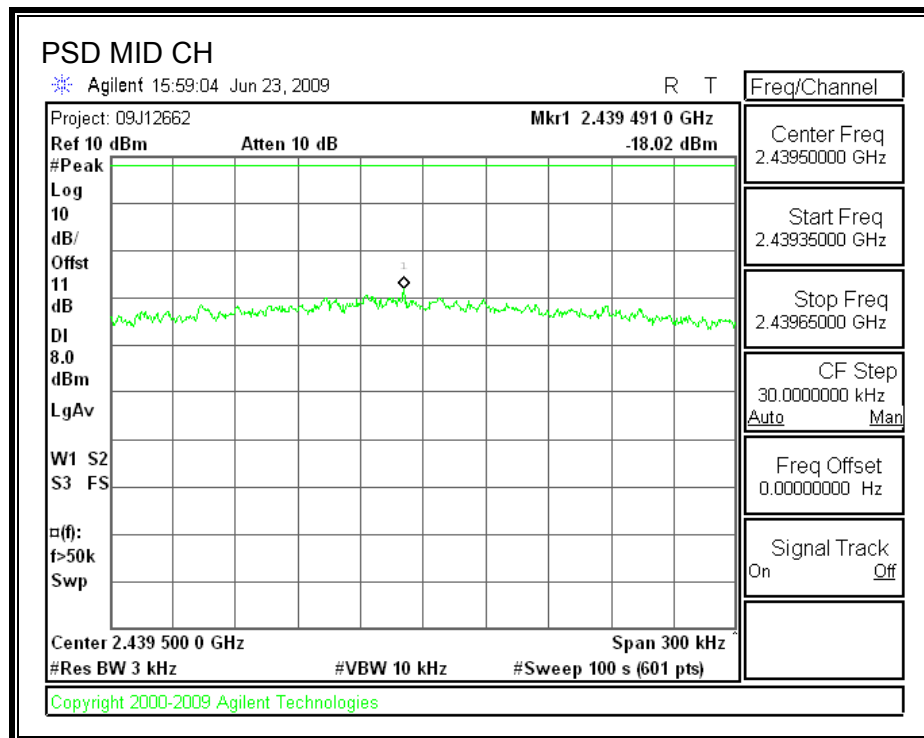
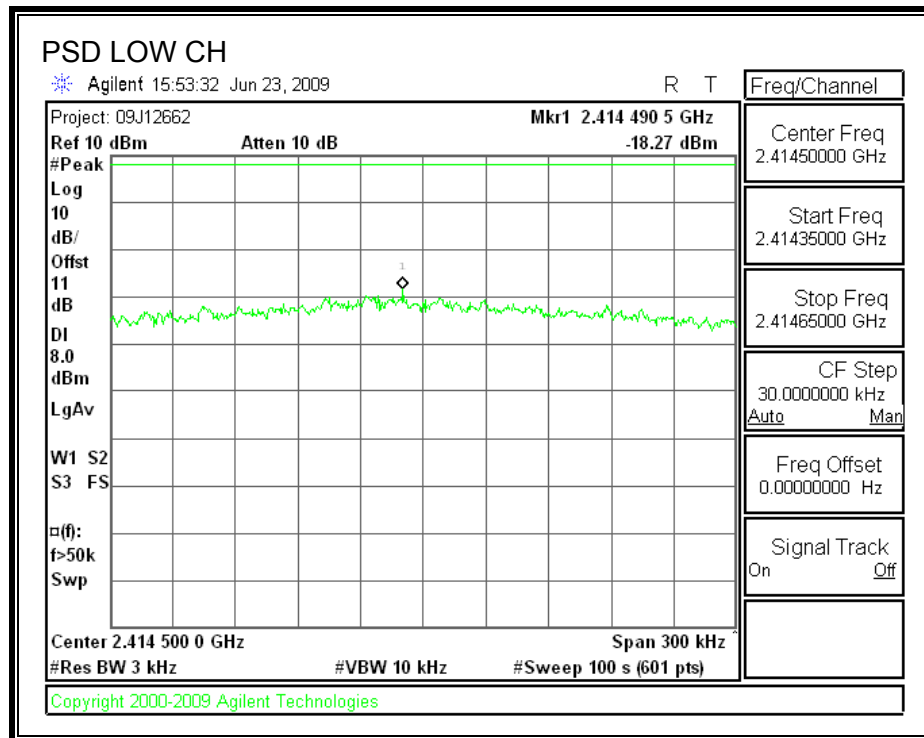
TEST PROCEDURE

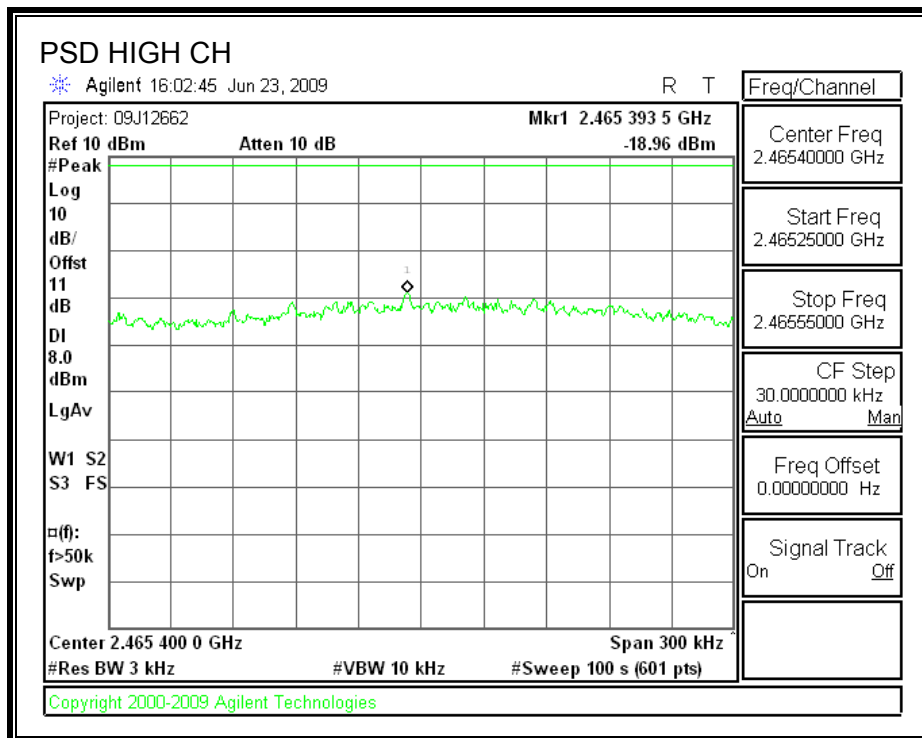
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-18.27	8	-26.27
Middle	2437	-18.02	8	-26.02
High	2462	-18.96	8	-26.96

POWER SPECTRAL DENSITY





7.3.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

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

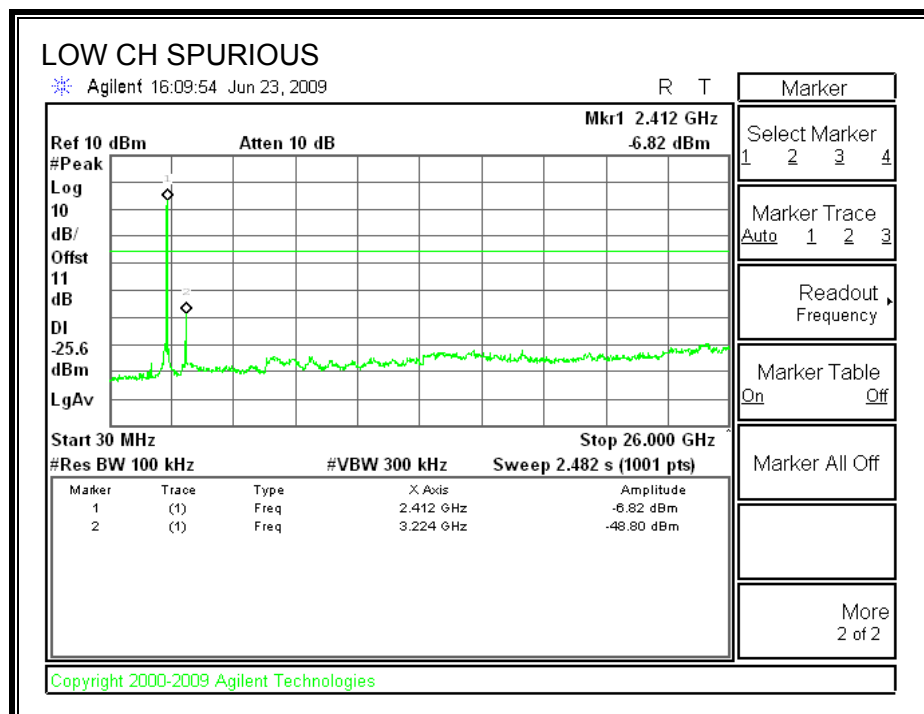
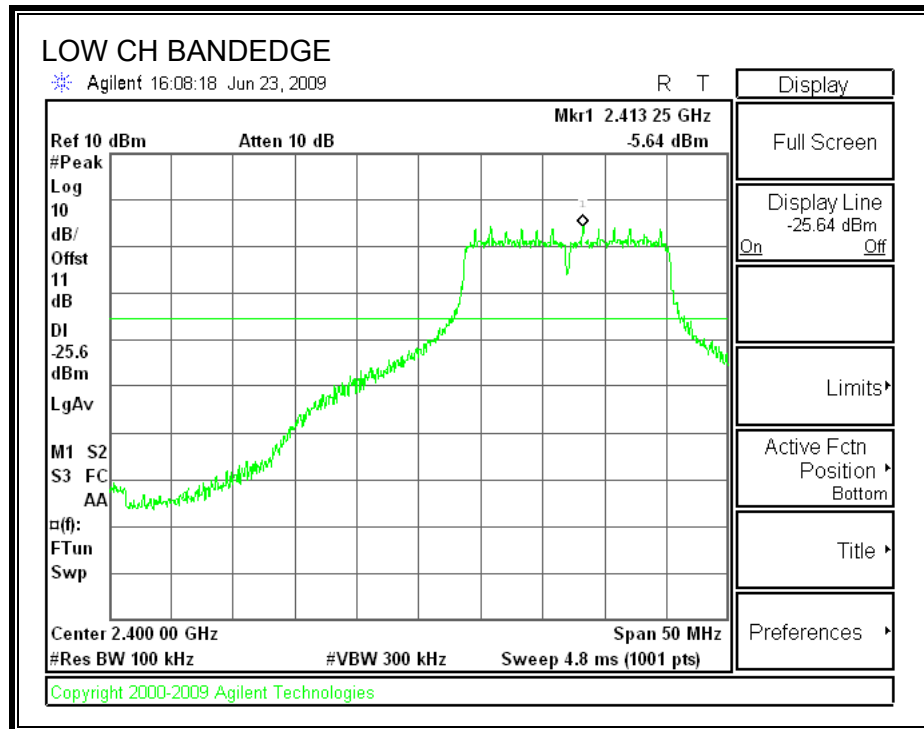
TEST PROCEDURE

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

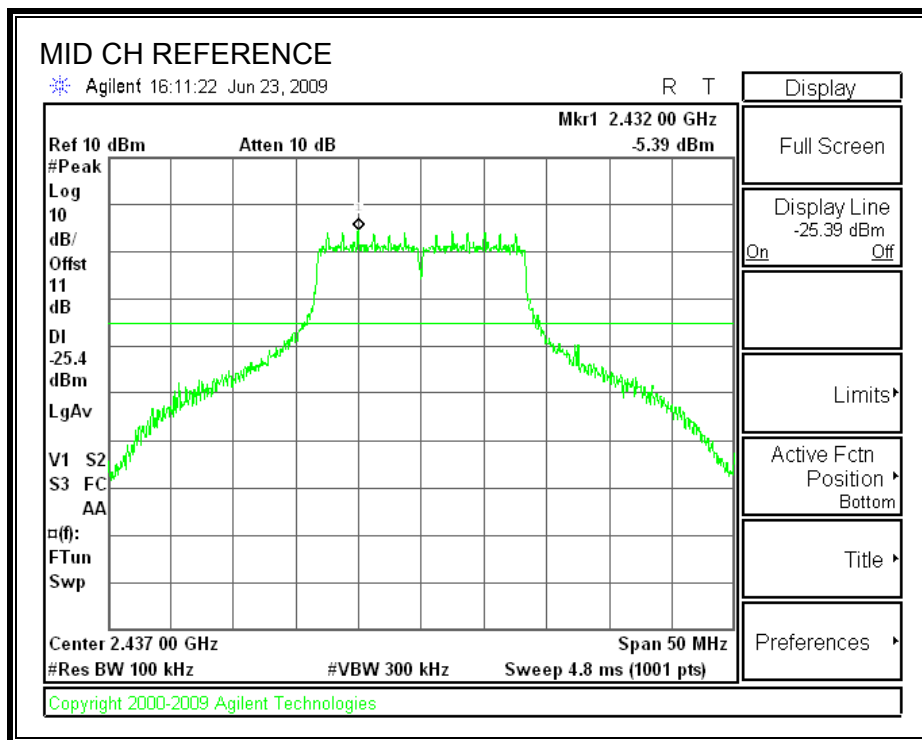
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

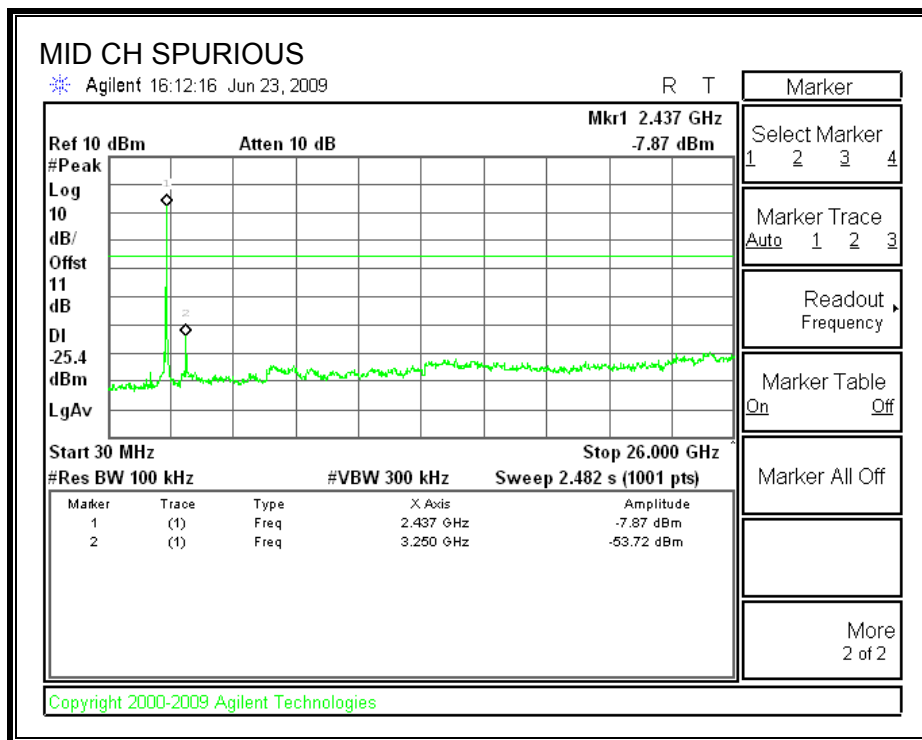
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL

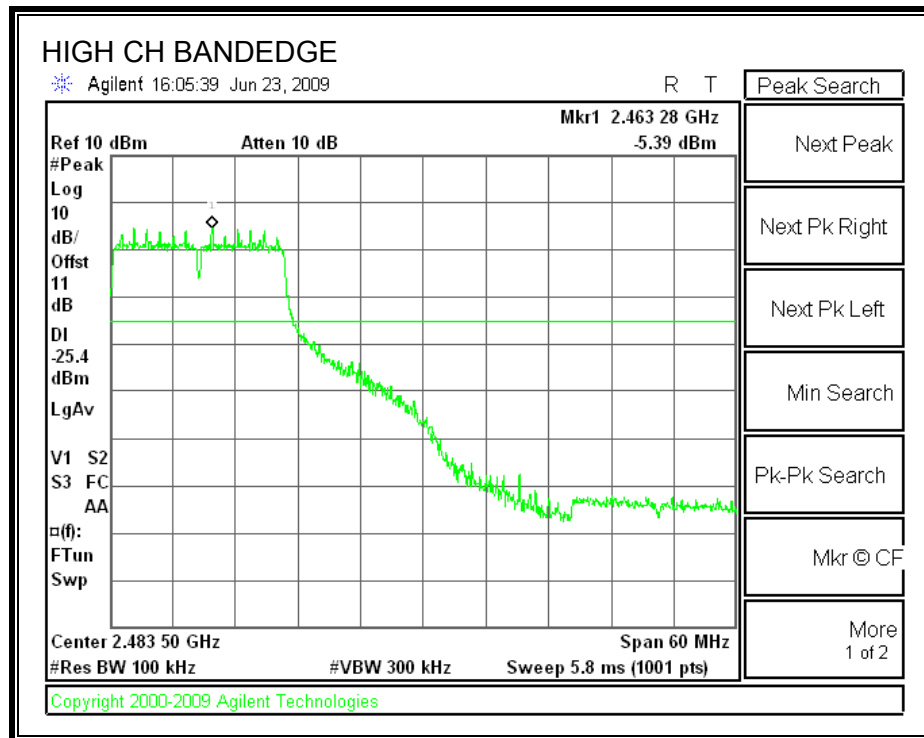


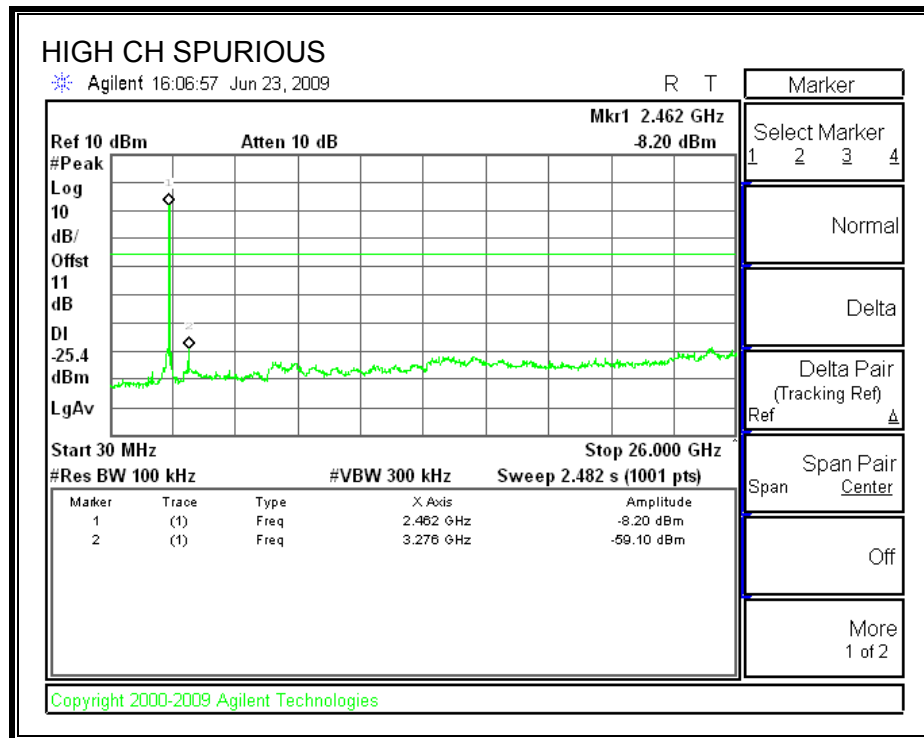
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





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.

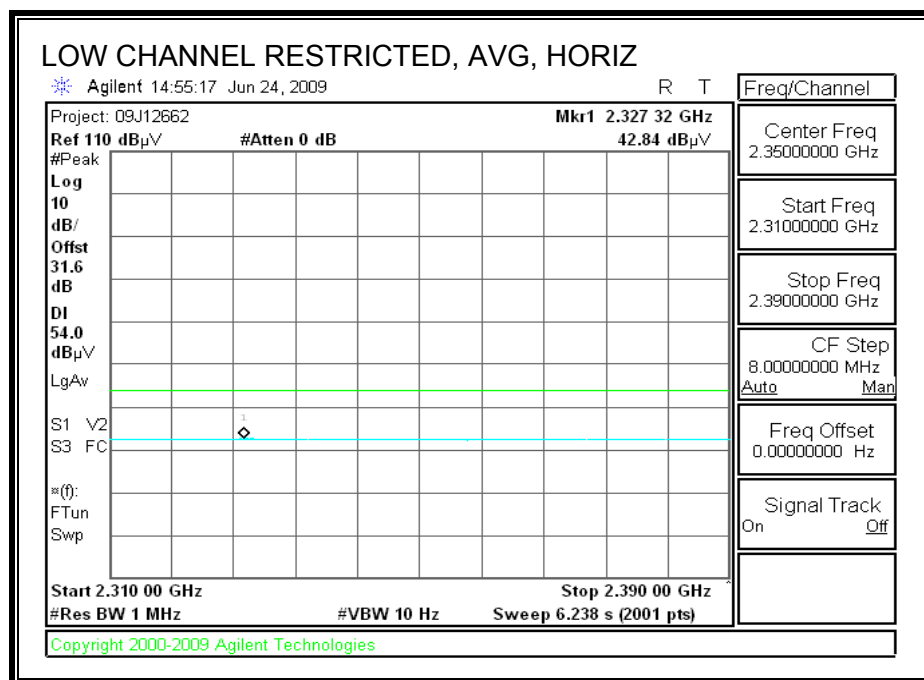
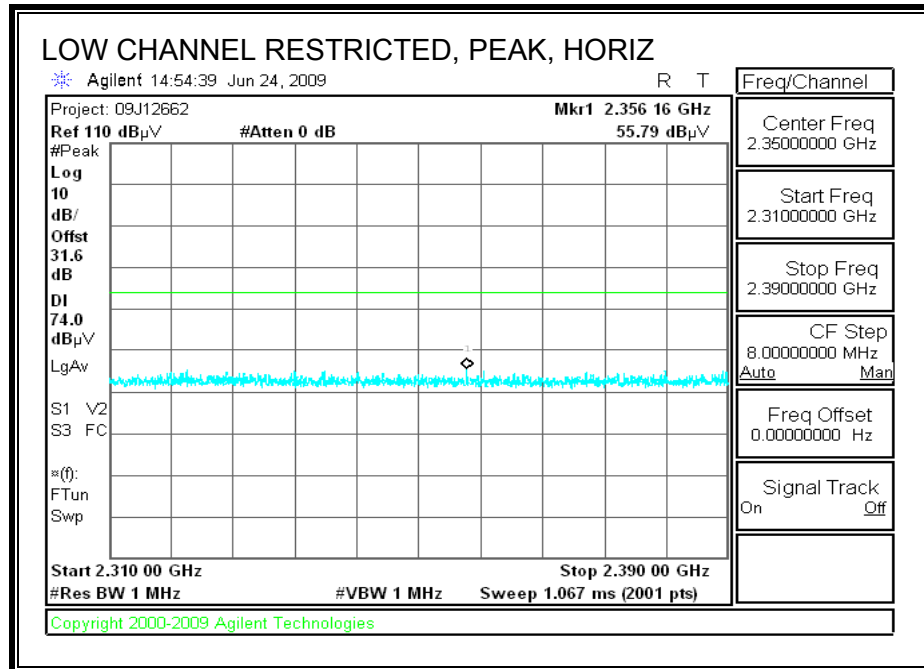
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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.

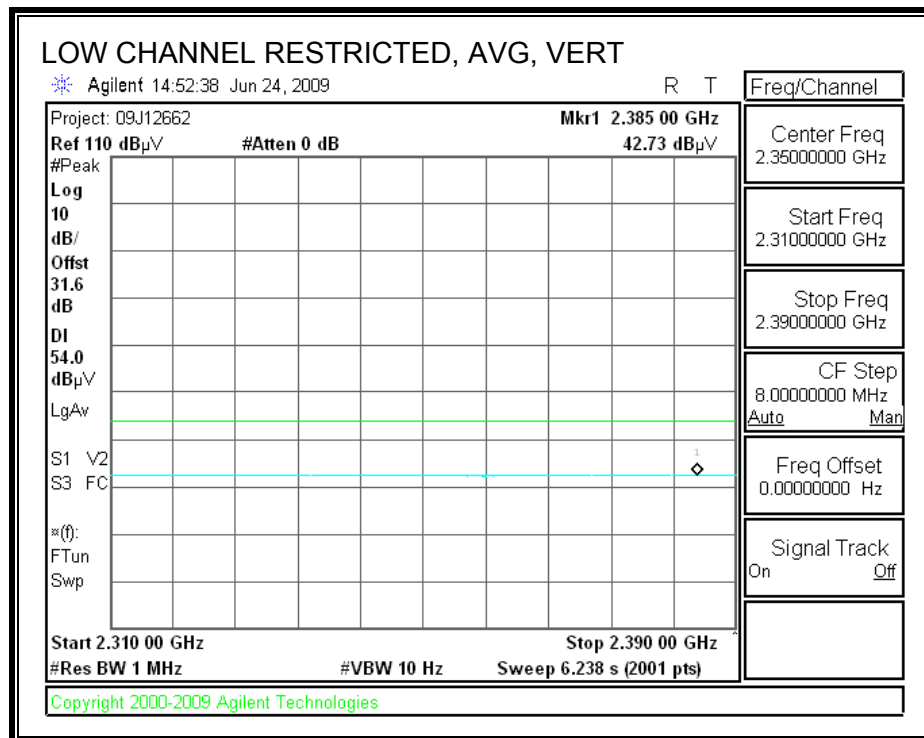
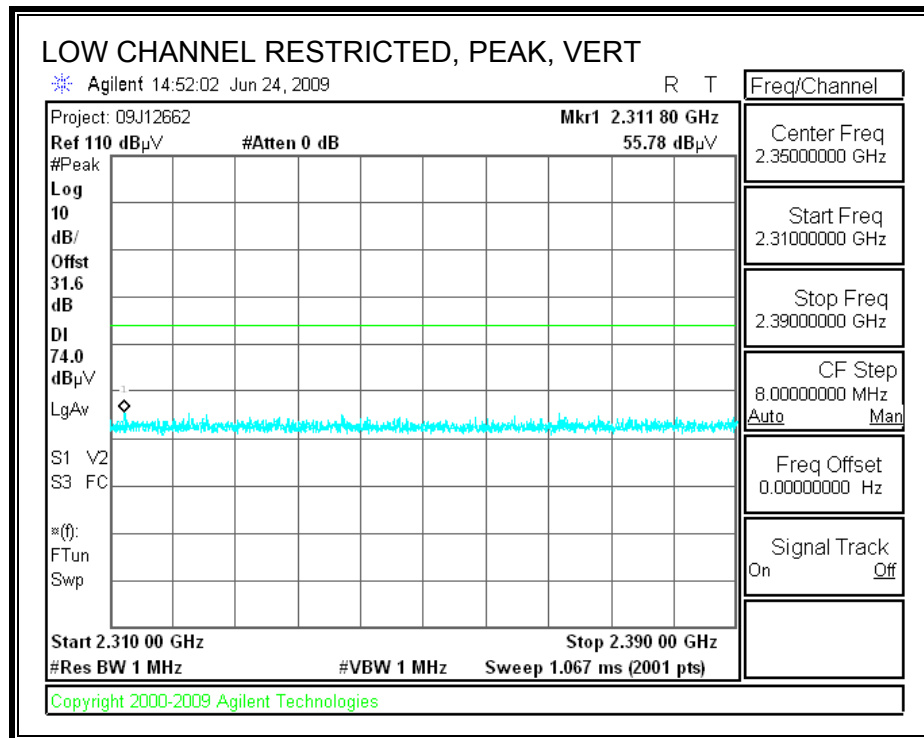
8.2. TRANSMITTER ABOVE 1 GHz

8.2.1. 802.11 EUT WITH FOXCONN ANTENNA AT WORST CASE POSITION

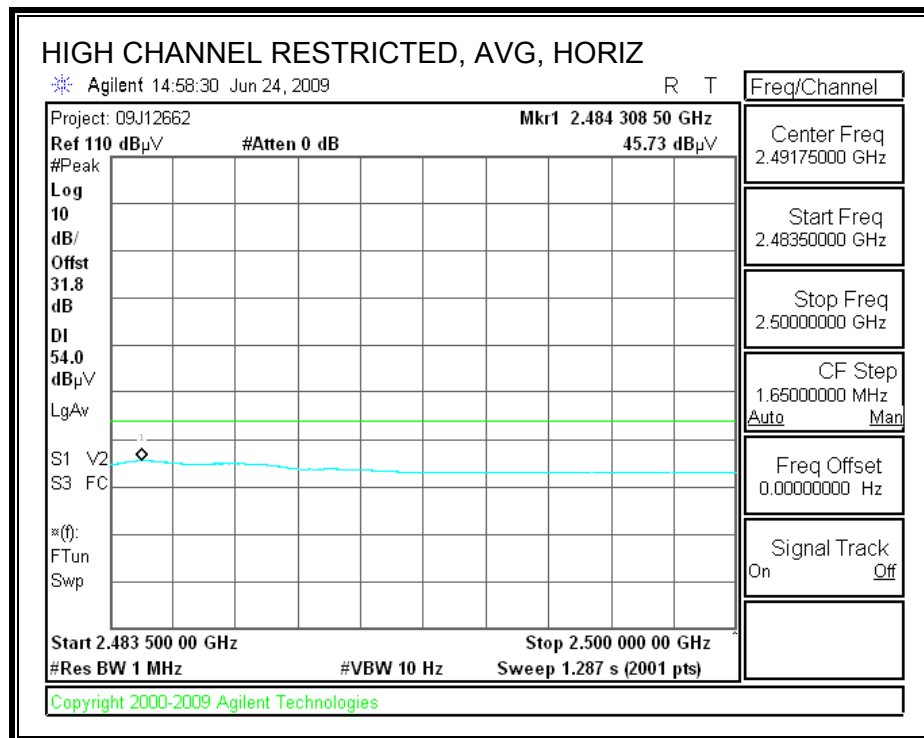
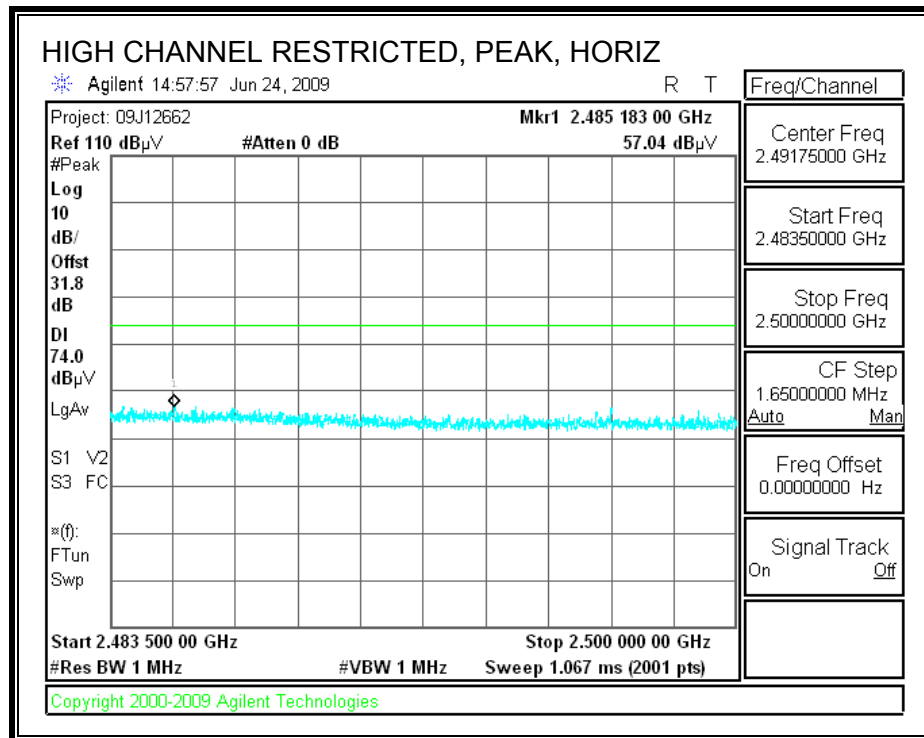
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



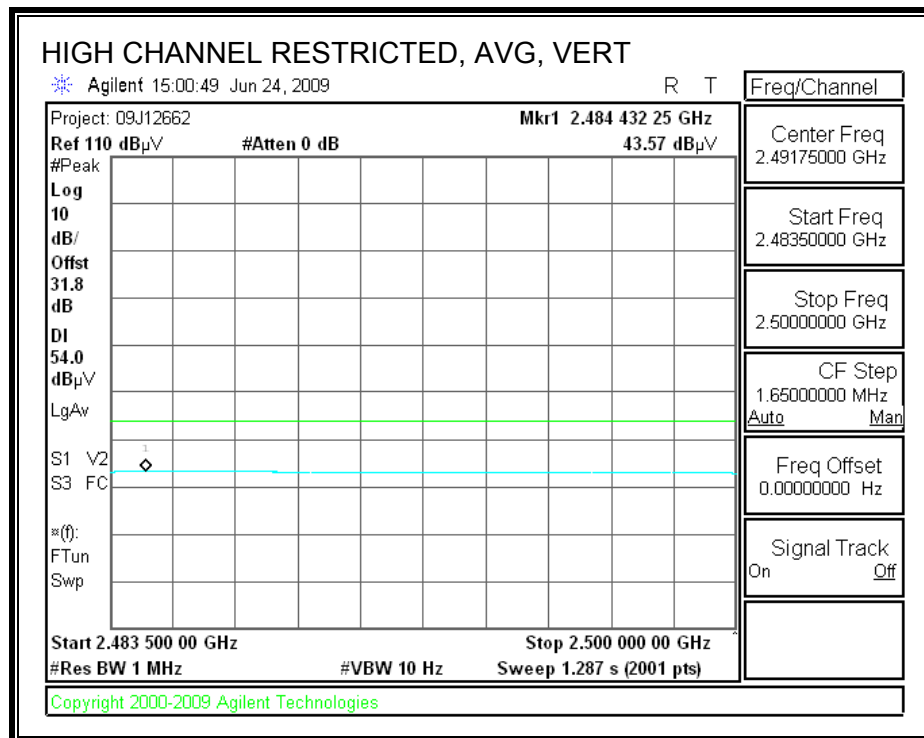
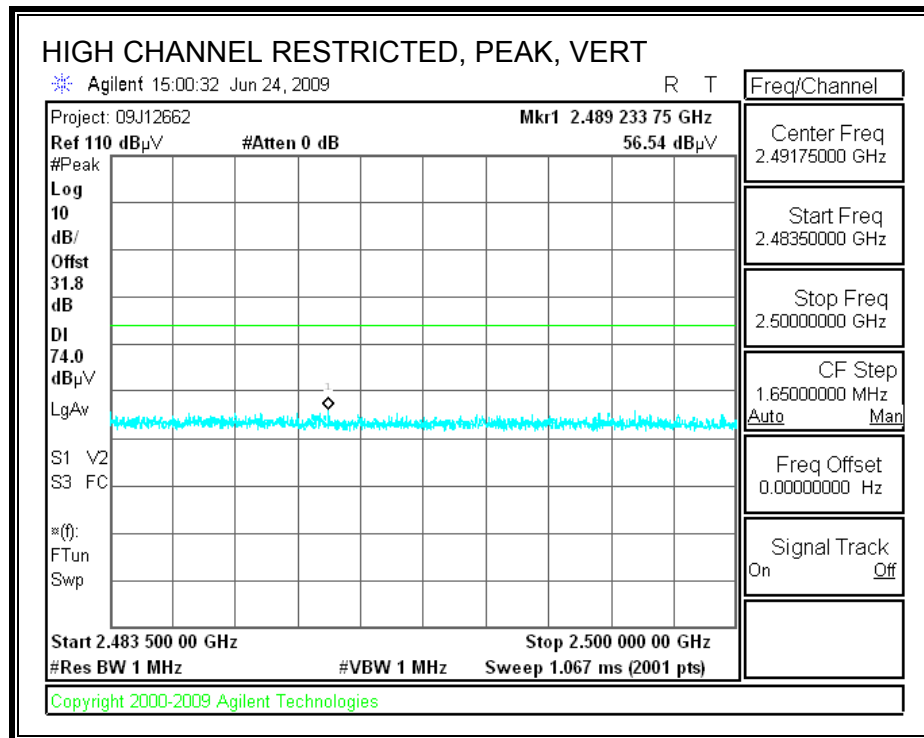
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

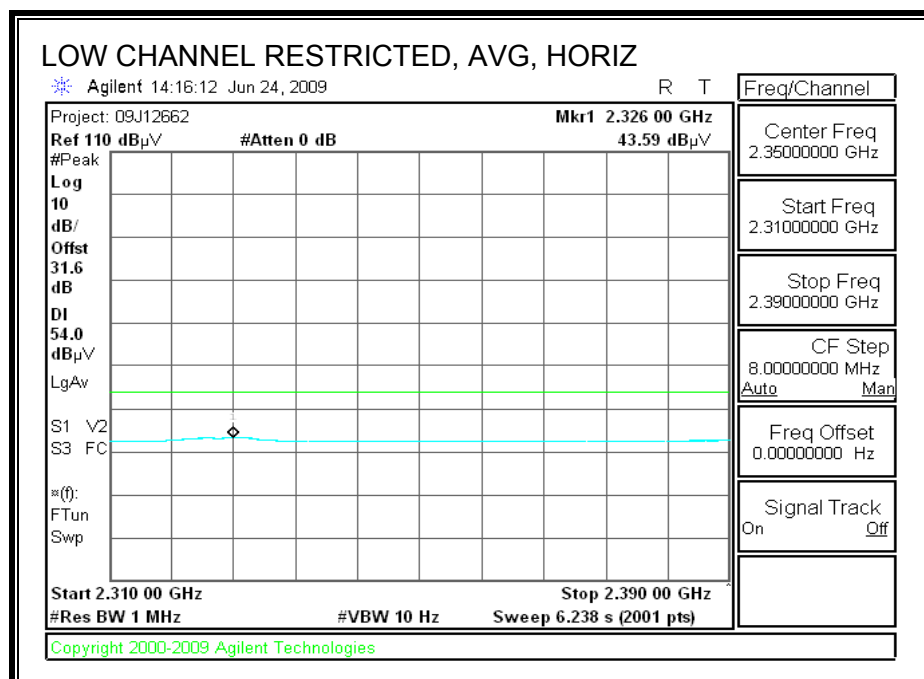
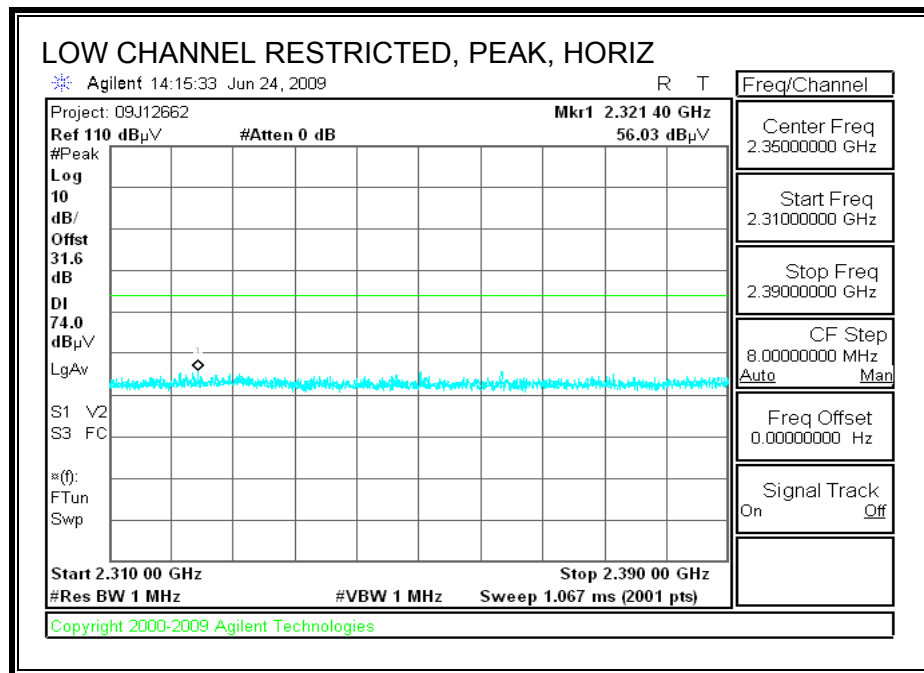


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

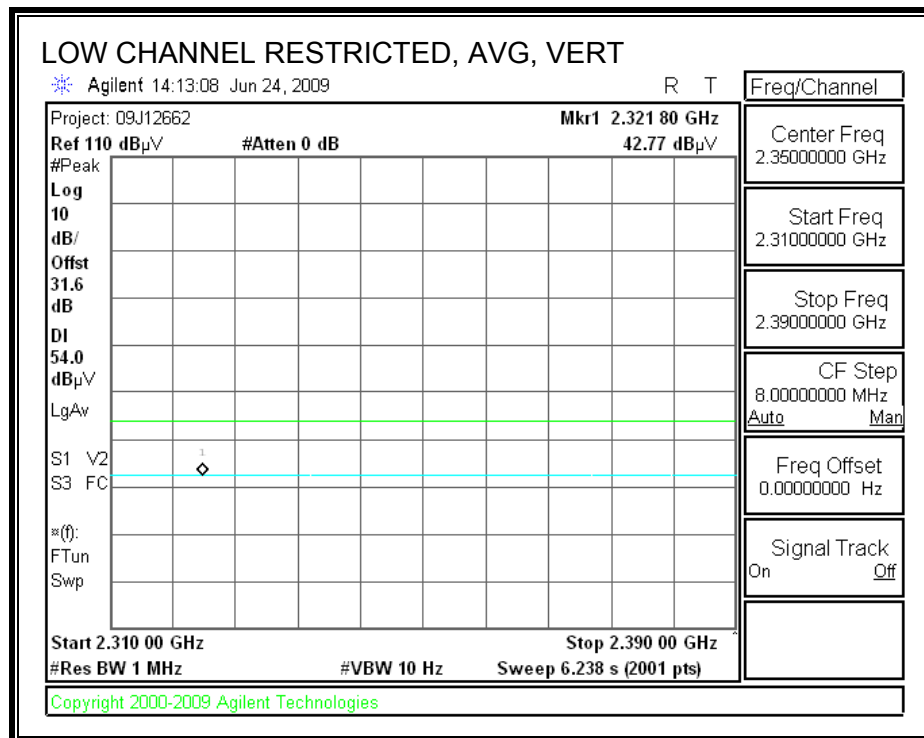
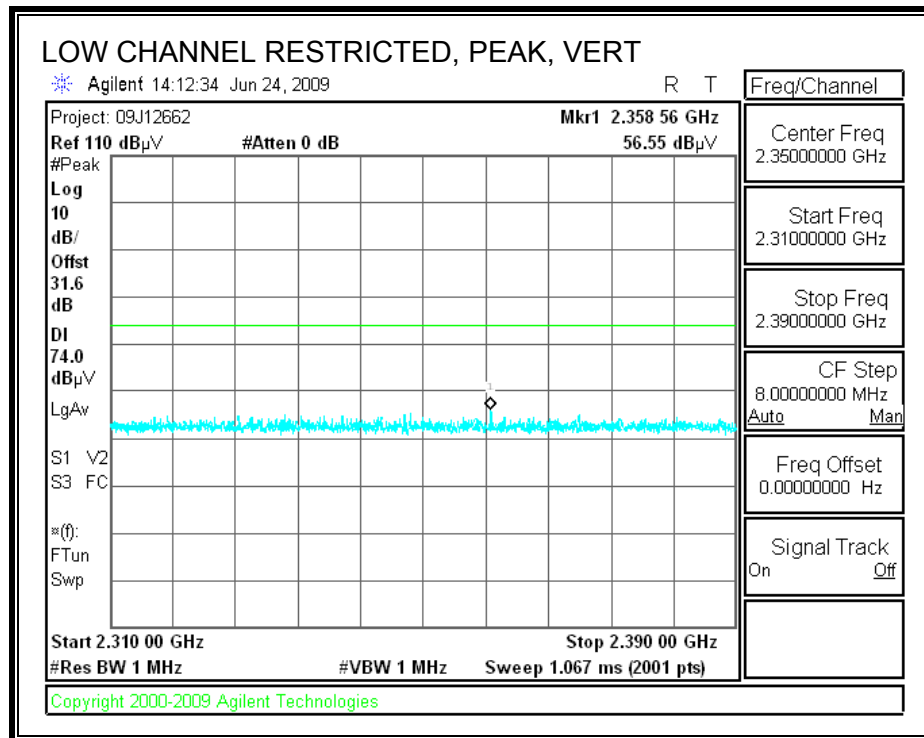


8.2.2. 802.11b EUT WITH FOXCONN ANTENNA AT WORST CASE POSITION

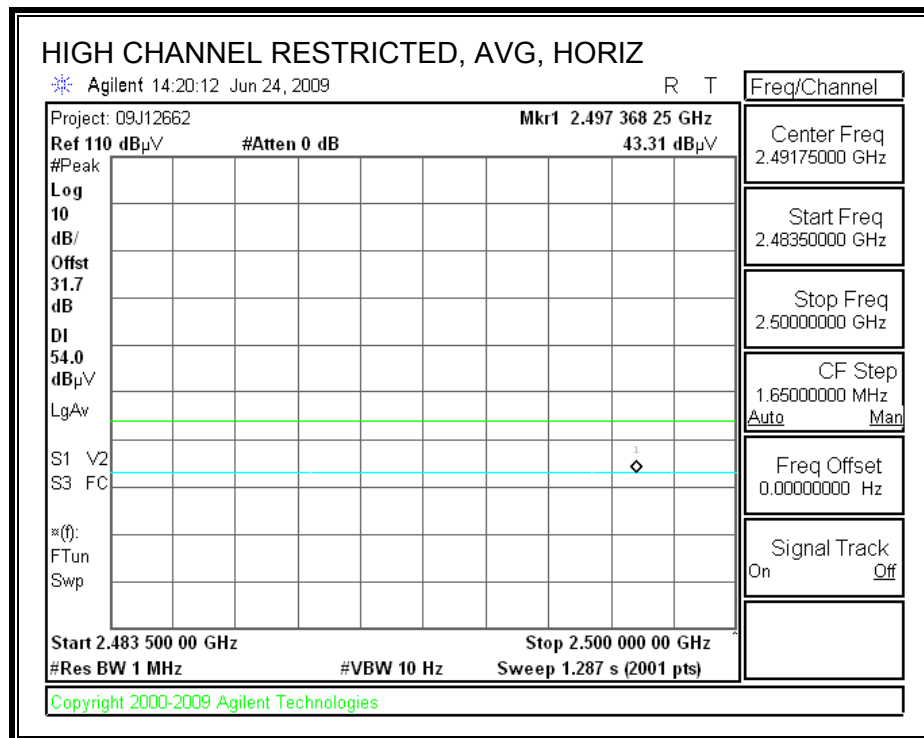
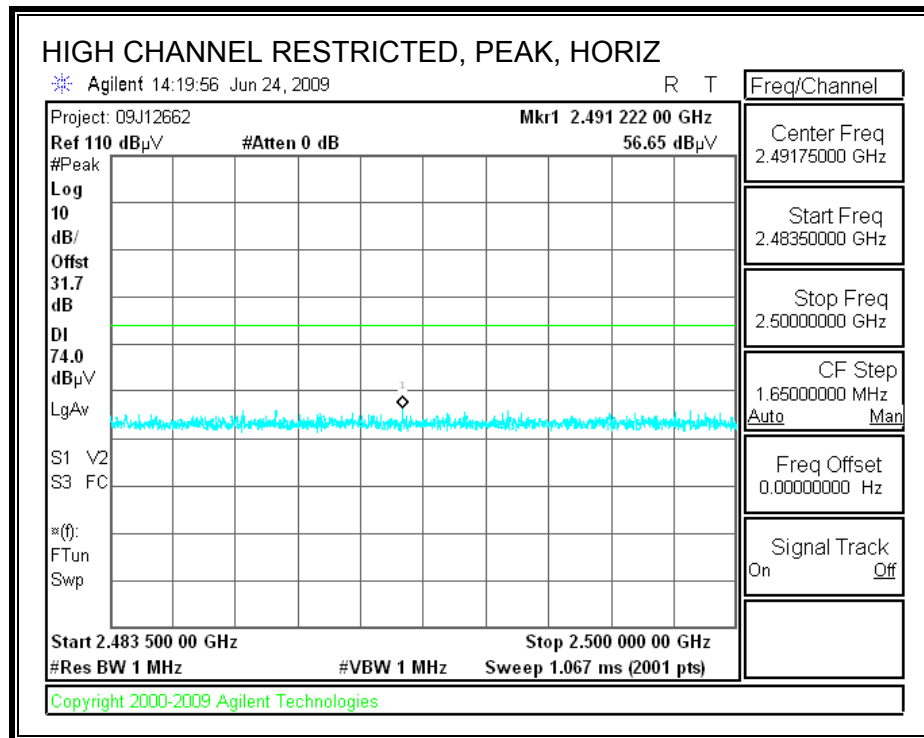
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



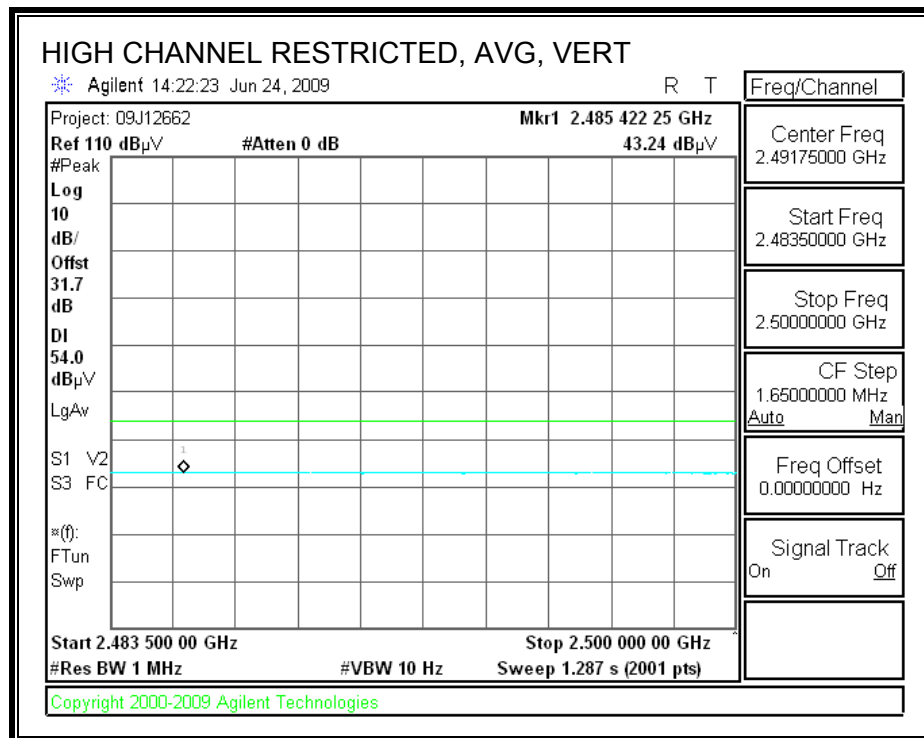
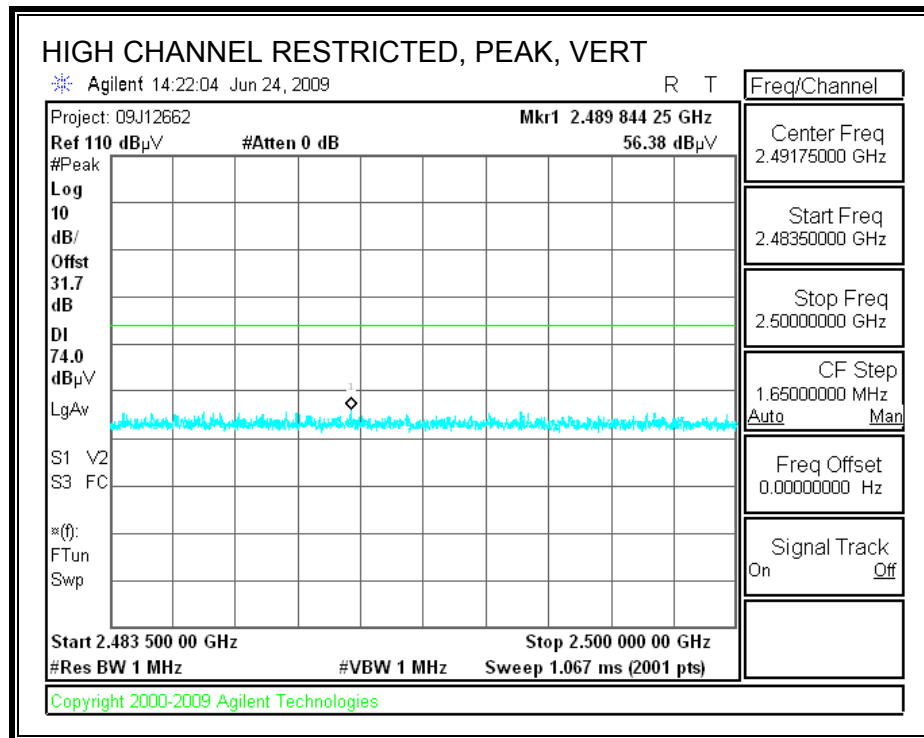
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

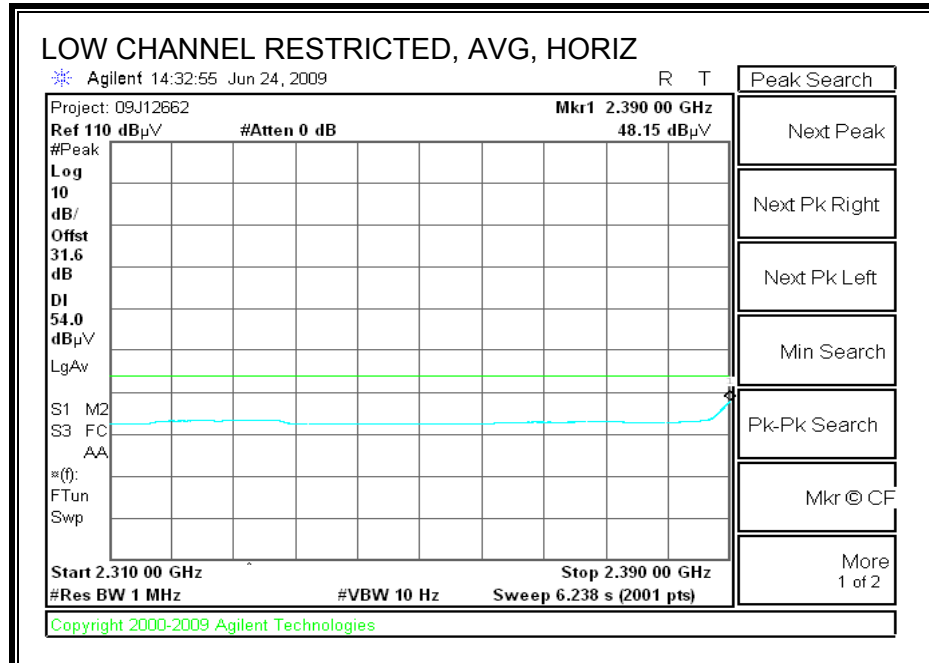
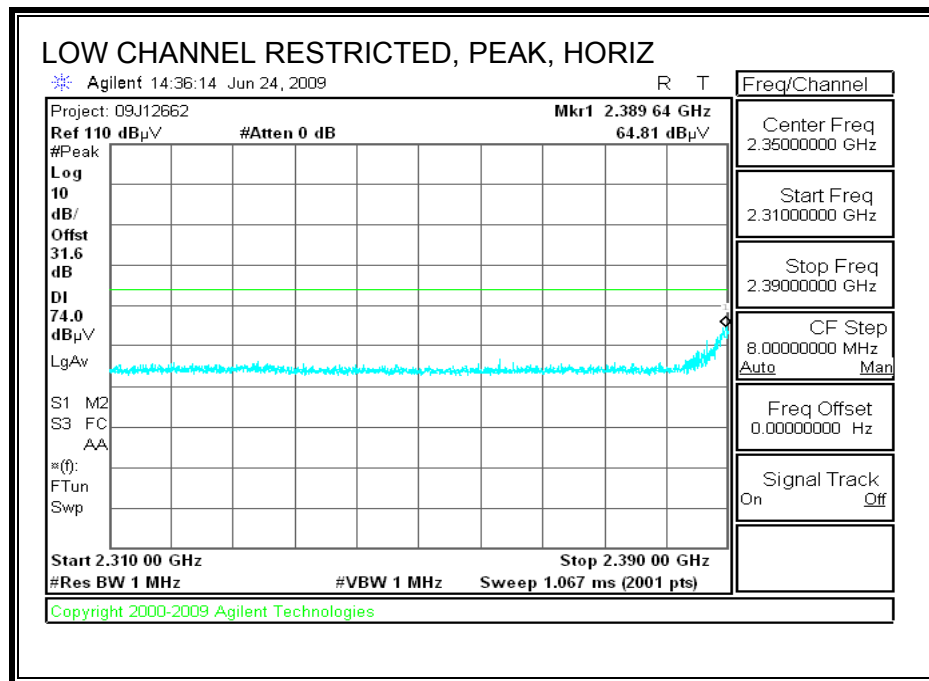


HARMONICS AND SPURIOUS EMISSIONS

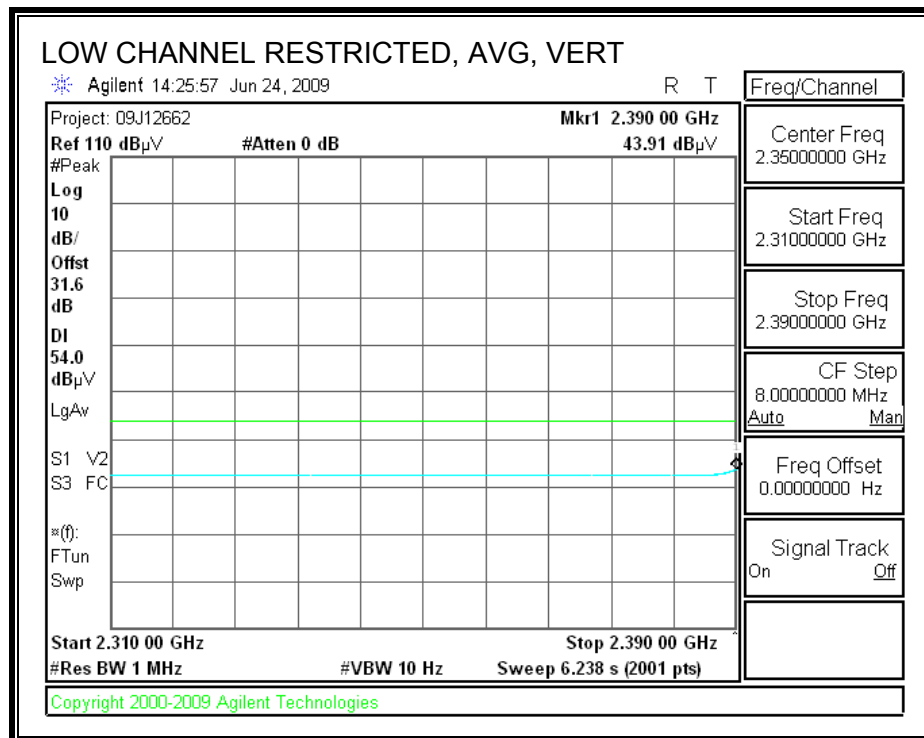
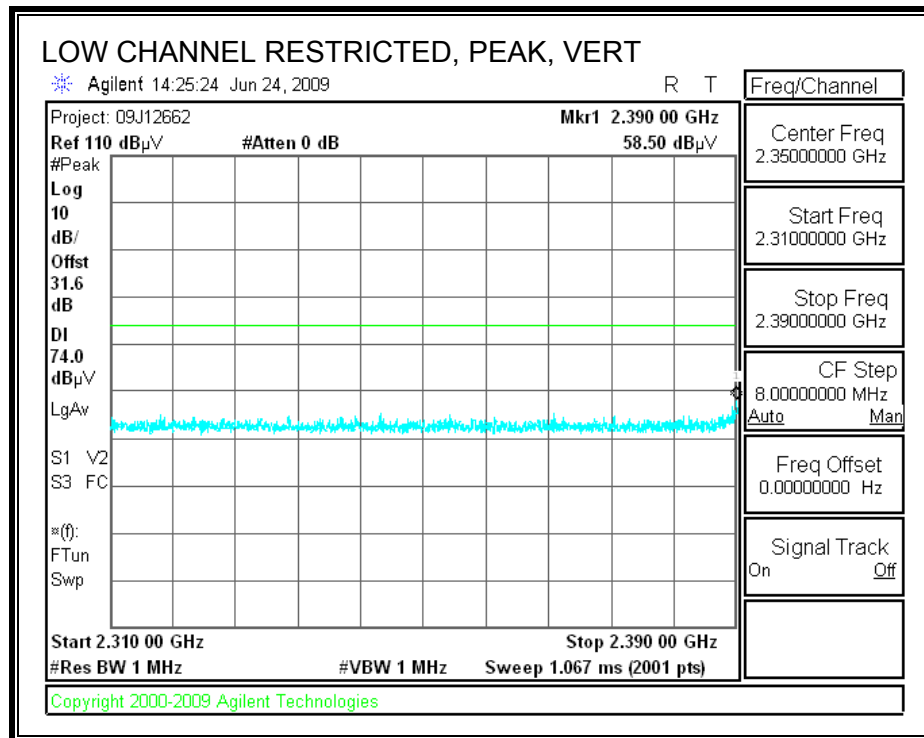
High Frequency Measurement															
Compliance Certification Services, Fremont 5m Chamber															
Company: Nintendo Project #: 09J12662 Date: 6/22/2009 Test Engineer: Chin Pang Configuration: EUT with Foxconn ant / Earphone Mode: TX, b mode															
Test Equipment:															
Horn 1-18GHz		Pre-amplifier 1-26GHz		Pre-amplifier 26-40GHz		Horn > 18GHz		Limit							
T73; S/N: 6717 @3m		T144 Miteq 3008A00931						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				R_001							
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filt 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															
4.812	3.0	39.0	26.7	33.0	5.8	-36.5	0.0	0.0	41.3	29.0	74	54	-32.7	-25.0	V
4.812	3.0	38.5	26.5	33.0	5.8	-36.5	0.0	0.0	40.8	28.8	74	54	-33.2	-25.2	H
Mid Ch, 2437MHz															
4.874	3.0	40.5	29.0	33.1	5.8	-36.5	0.0	0.0	43.0	31.5	74	54	-31.0	-22.5	V
4.874	3.0	38.0	26.4	33.1	5.8	-36.5	0.0	0.0	40.5	28.9	74	54	-33.5	-25.1	H
High Ch, 2462MHz															
4.924	3.0	39.2	26.9	33.1	5.9	-36.5	0.0	0.0	41.8	29.5	74	54	-32.2	-24.5	V
4.924	3.0	39.0	26.5	33.1	5.9	-36.5	0.0	0.0	41.6	29.1	74	54	-32.4	-24.9	H
Rev. 11.10.08															
Note: No other emissions were detected above the system noise floor															
f	Measurement Frequency		Amp	Preamp Gain		Avg Lim	Average Field Strength Limit								
Dist	Distance to Antenna		D Corr	Distance Correct to 3 meters		Pk Lim	Peak Field Strength Limit								
Read	Analyzer Reading		Avg	Average Field Strength @ 3 m		Avg Mar	Margin vs. Average Limit								
AF	Antenna Factor		Peak	Calculated Peak Field Strength		Pk Mar	Margin vs. Peak Limit								
CL	Cable Loss		HPF	High Pass Filter											

8.2.3. 802.11g EUT WITH FOXCONN ANTENNA AT WORST CASE POSITION

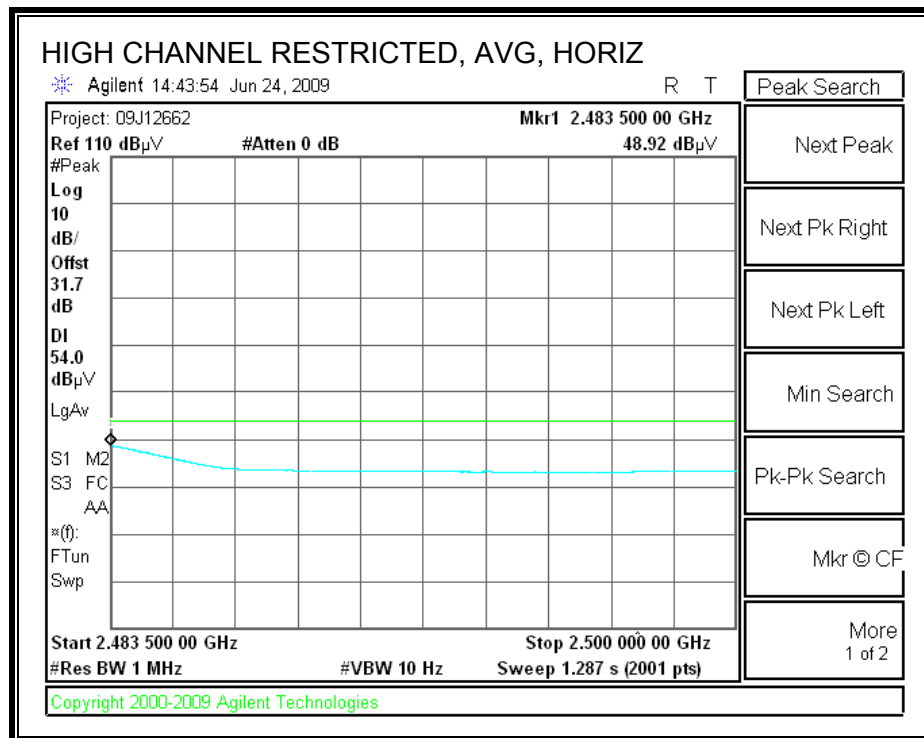
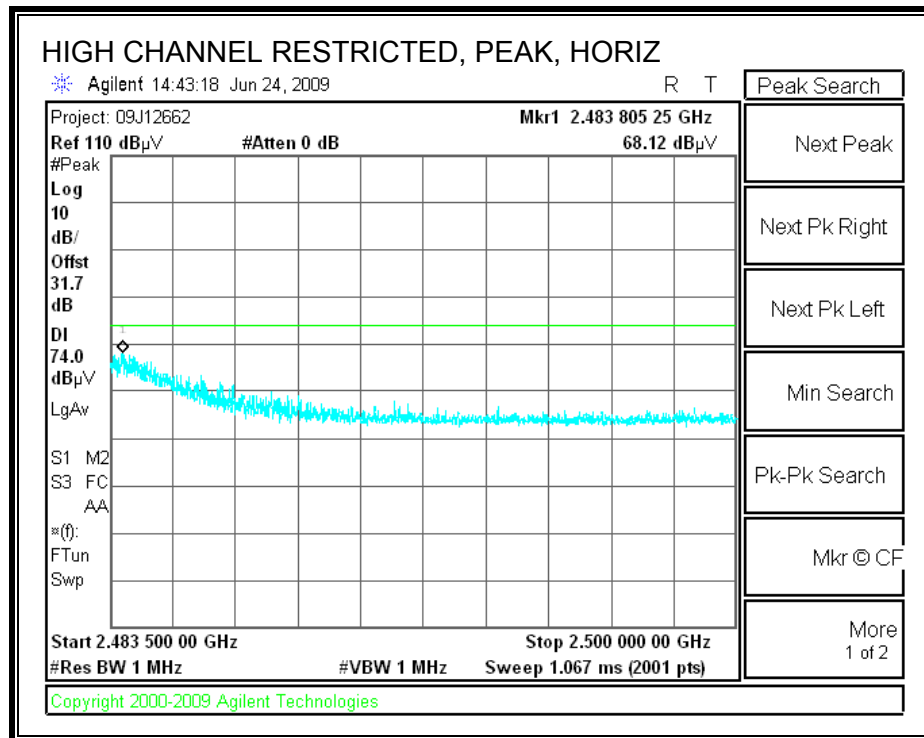
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



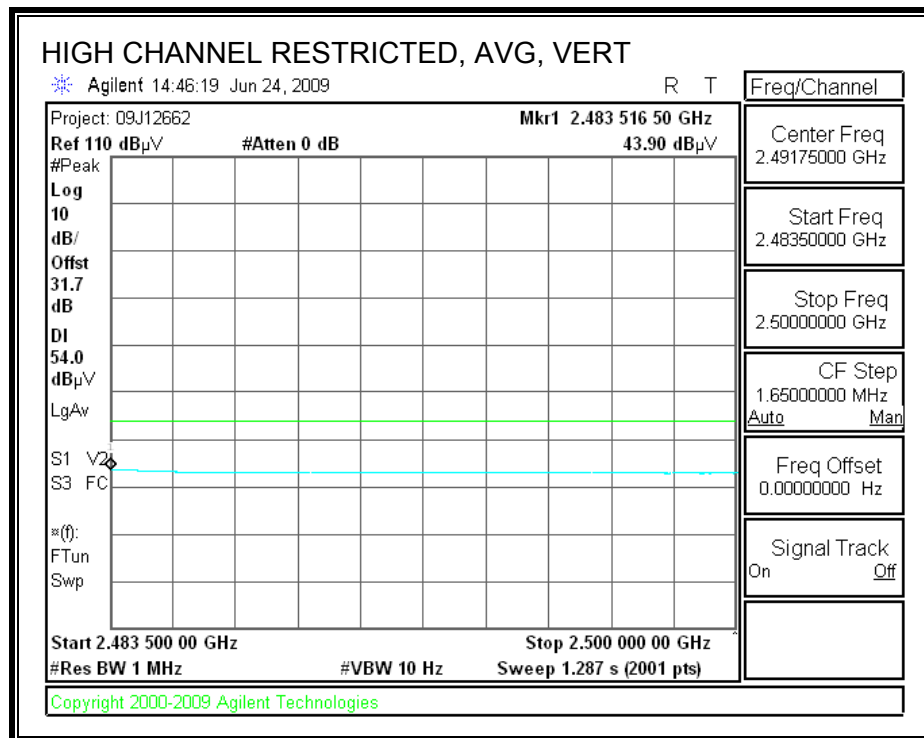
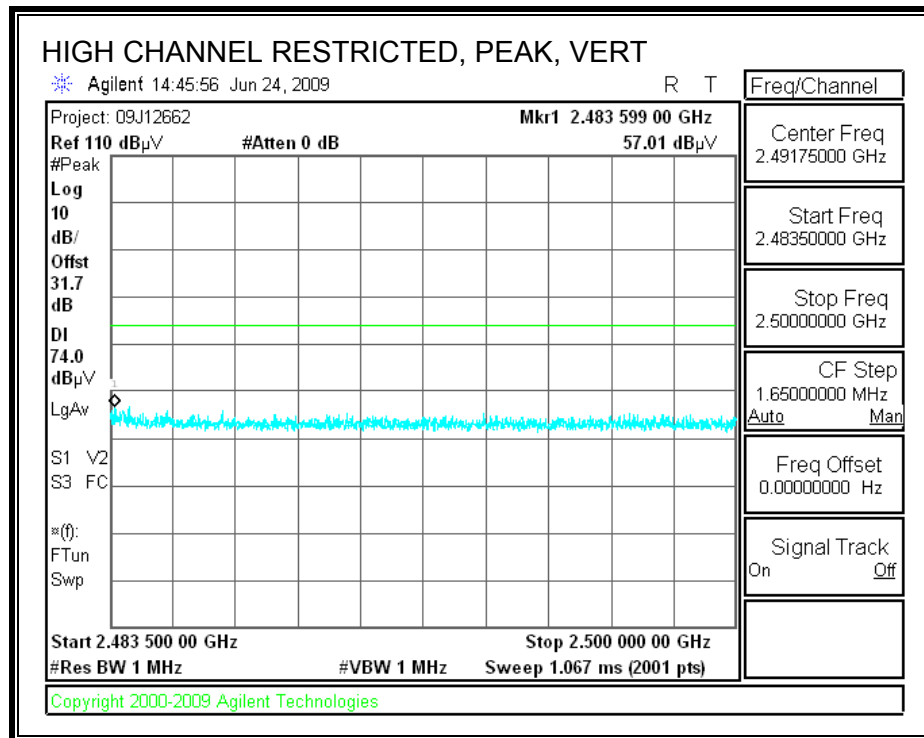
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

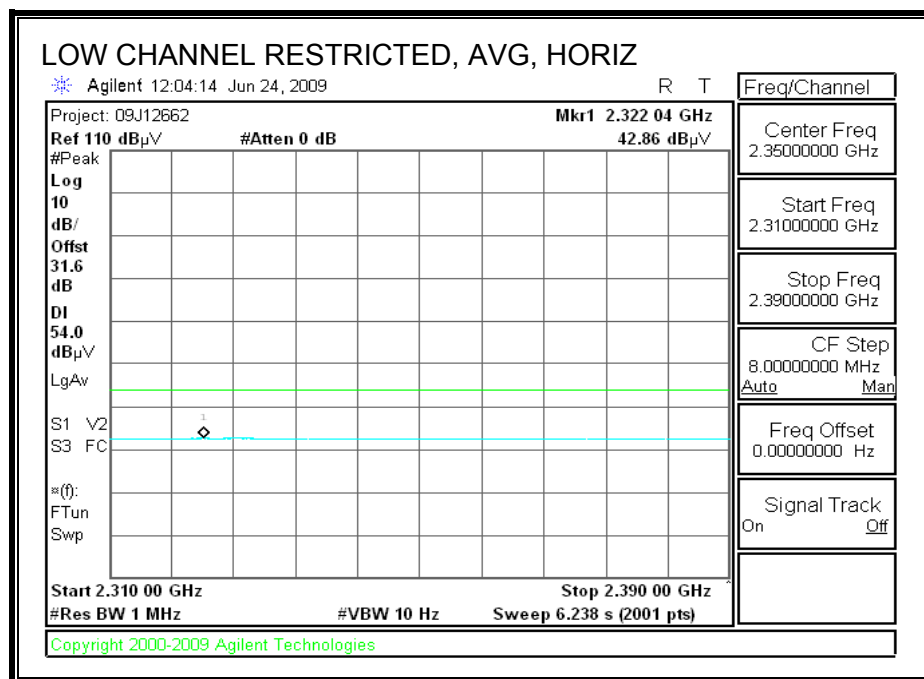
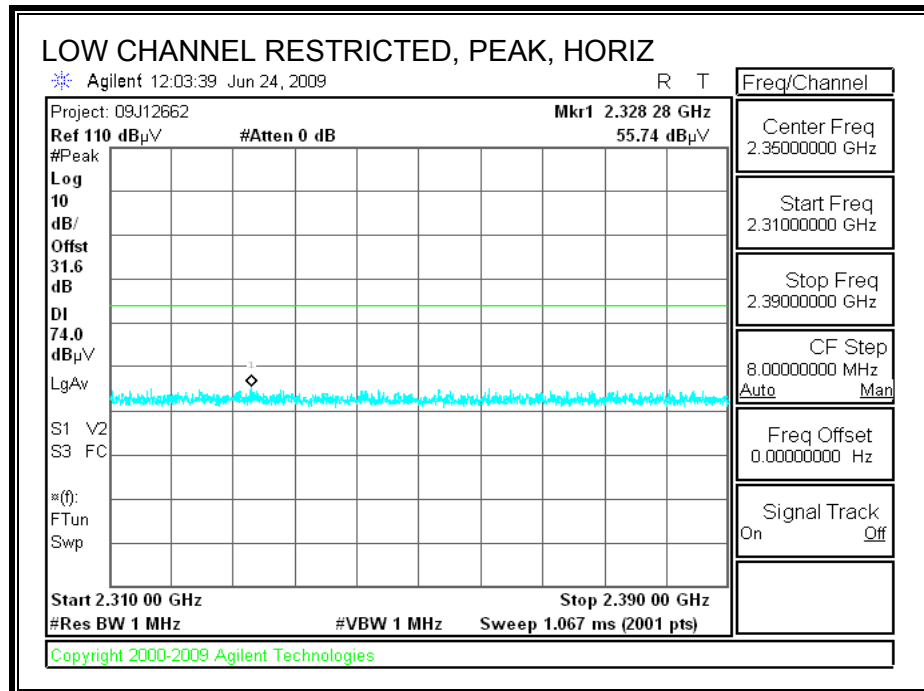


HARMONICS AND SPURIOUS EMISSIONS

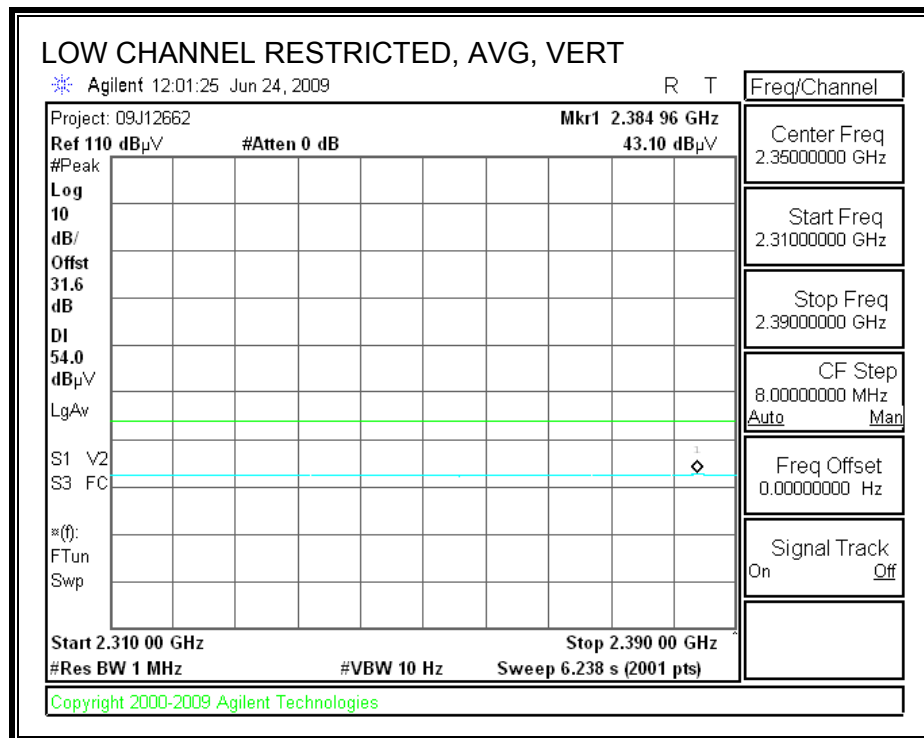
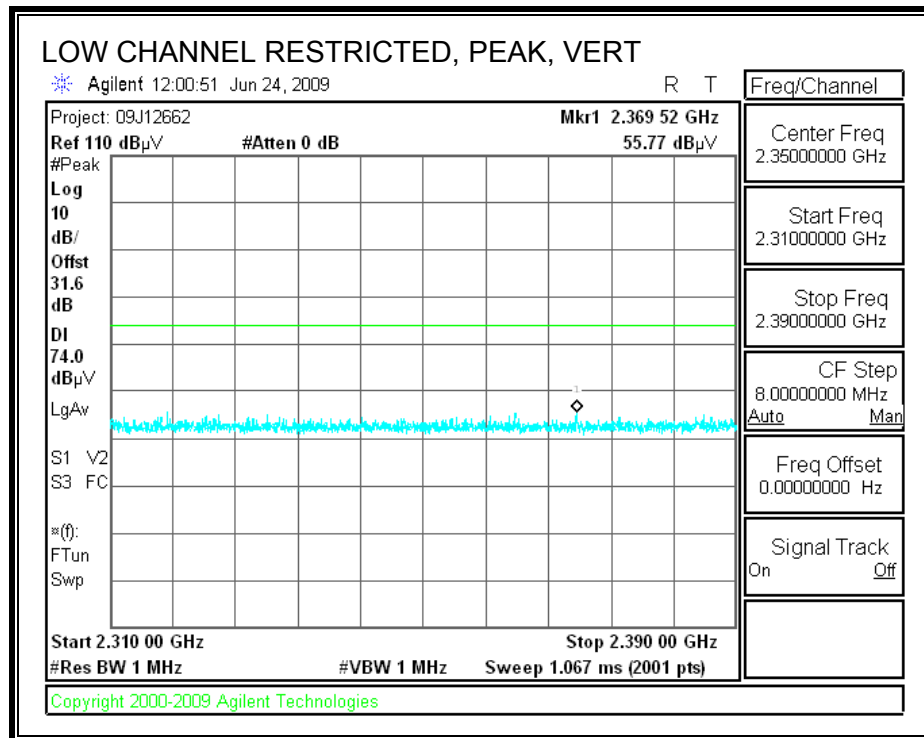
High Frequency Measurement															
Compliance Certification Services, Fremont 5m Chamber															
Company: Nintendo Project #: 09J12662 Date: 6/23/2009 Test Engineer: Chin Pang Configuration: EUT with Foxconn Antenna / Earphone Mode: TX, g mode															
Test Equipment:															
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				R_001							
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filt 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	38.5	27.7	32.7	5.8	-34.8	0.0	0.0	42.1	31.3	74	54	-31.9	-22.7	V
4.824	3.0	39.2	28.0	32.7	5.8	-34.8	0.0	0.0	42.8	31.6	74	54	-31.2	-22.4	H
Mid Ch, 2437MHz															
4.874	3.0	38.6	27.8	32.7	5.8	-34.8	0.0	0.0	42.3	31.5	74	54	-31.7	-22.5	V
4.874	3.0	38.1	27.0	32.7	5.8	-34.8	0.0	0.0	41.8	30.7	74	54	-32.2	-23.3	H
High Ch, 2462MHz															
4.924	3.0	39.7	27.8	32.7	5.9	-34.8	0.0	0.0	43.5	31.6	74	54	-30.5	-22.4	V
4.924	3.0	39.5	27.6	32.7	5.9	-34.8	0.0	0.0	43.3	31.4	74	54	-30.7	-22.6	H
Rev. 11.10.08															
Note: No other emissions were detected above the system noise floor															
f	Measurement Frequency		Amp	Preamp Gain		Avg Lim	Average Field Strength Limit								
Dist	Distance to Antenna		D Corr	Distance Correct to 3 meters		Pk Lim	Peak Field Strength Limit								
Read	Analyzer Reading		Avg	Average Field Strength @ 3 m		Avg Mar	Margin vs. Average Limit								
AF	Antenna Factor		Peak	Calculated Peak Field Strength		Pk Mar	Margin vs. Peak Limit								
CL	Cable Loss		HPF	High Pass Filter											

8.2.4. 802.11 EUT WITH FOXCONN ANTENNA AND AC ADAPTER

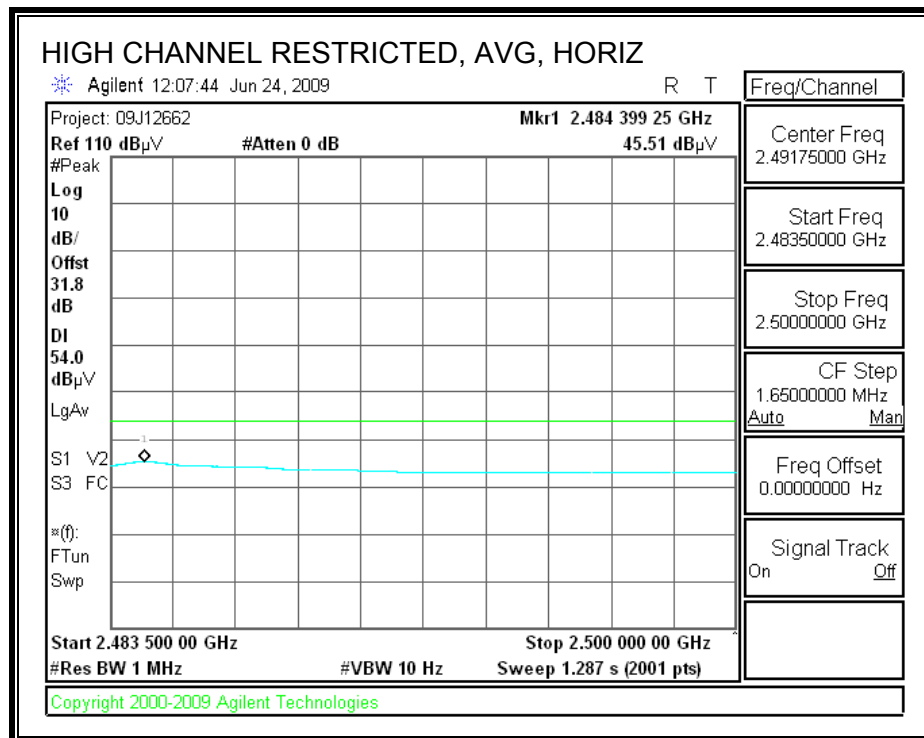
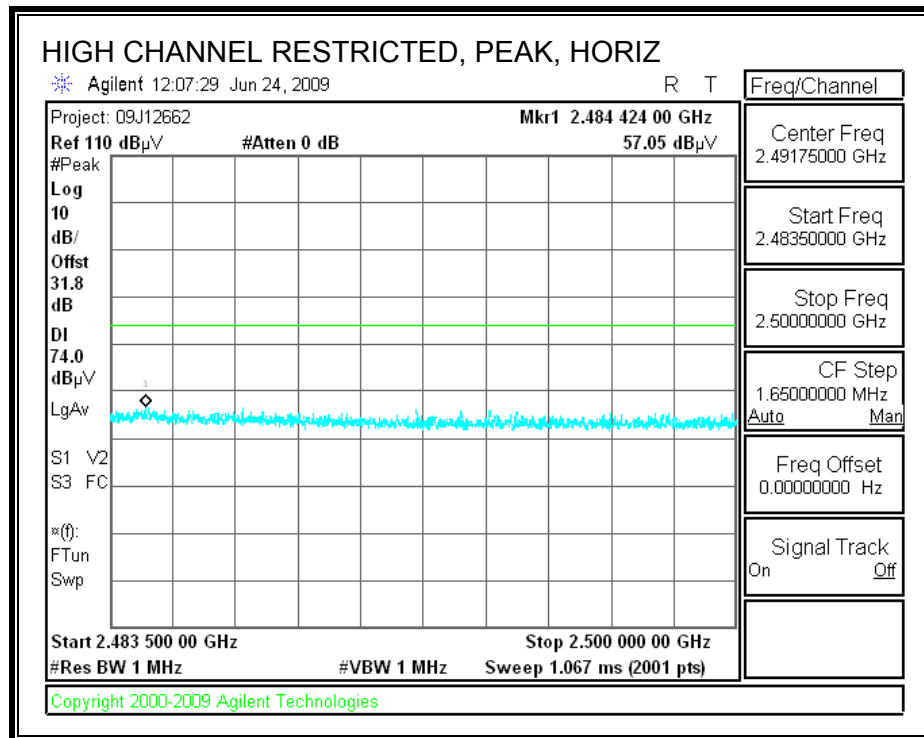
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



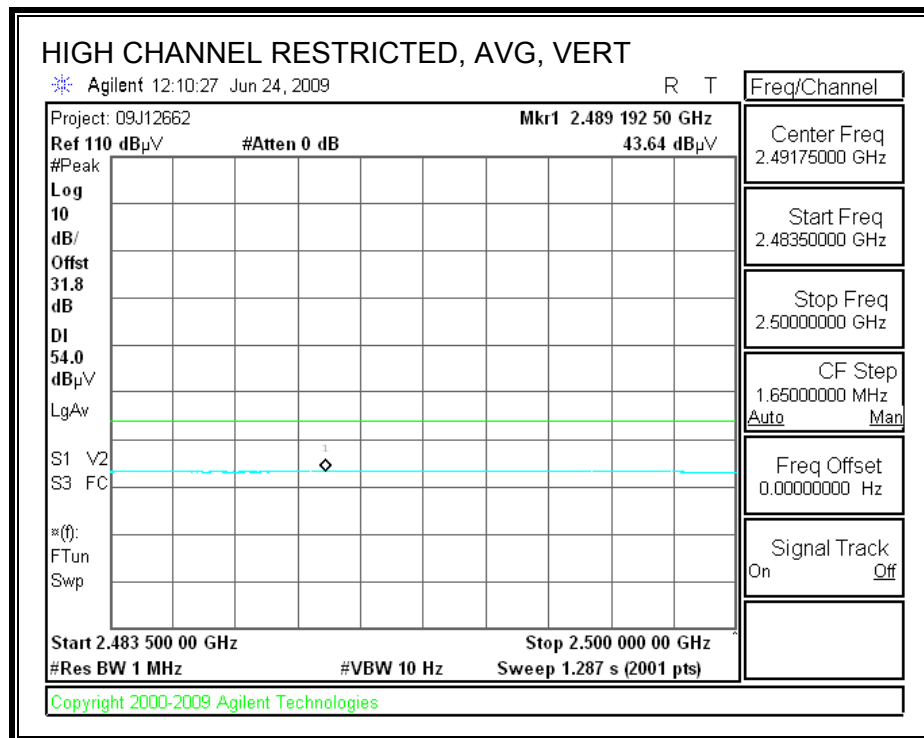
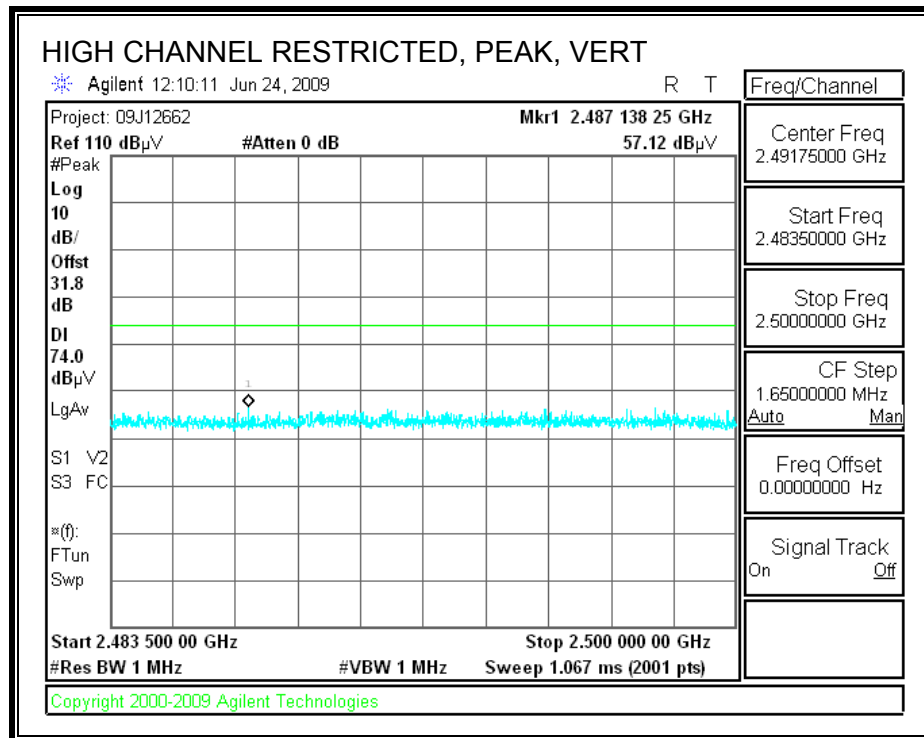
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

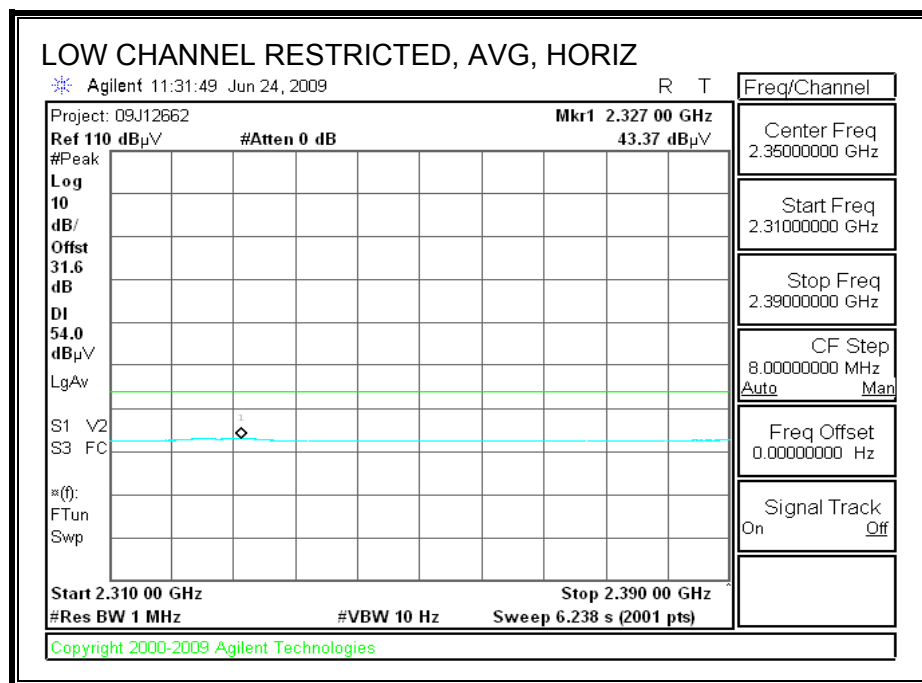
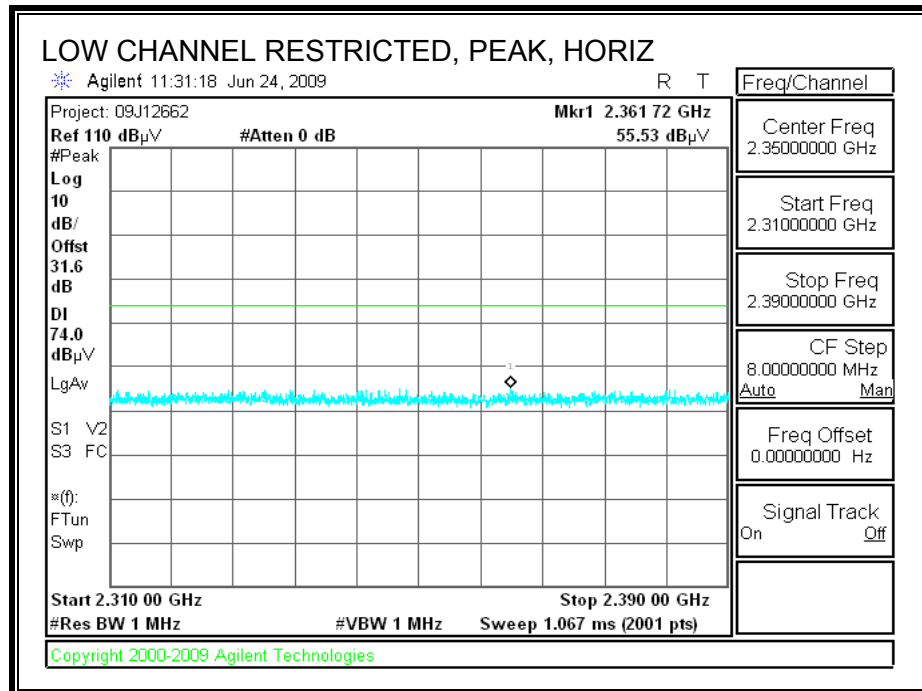


HARMONICS AND SPURIOUS EMISSIONS

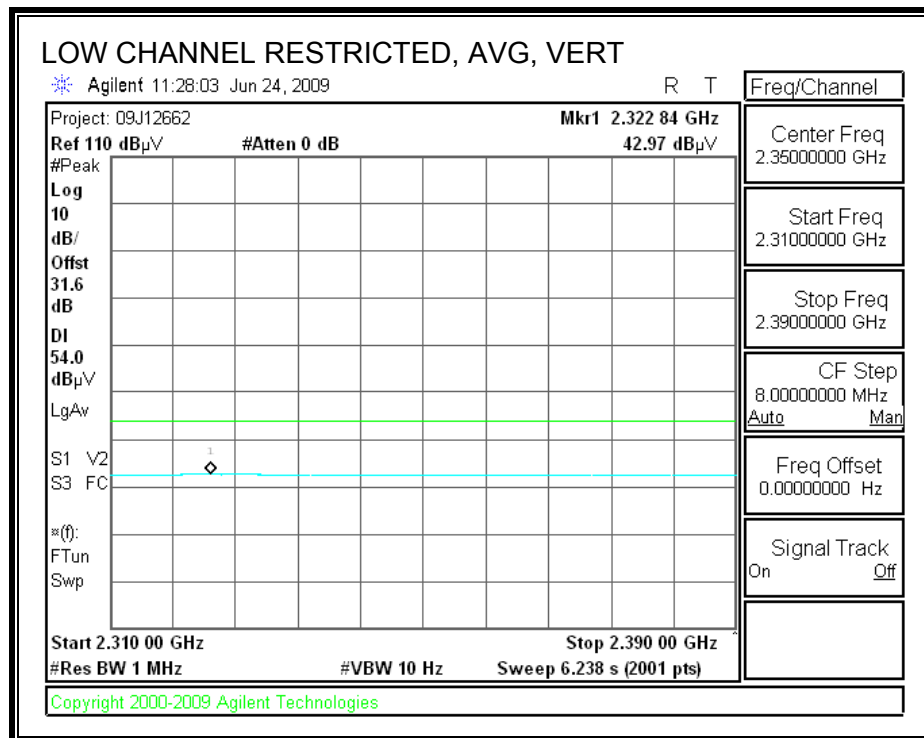
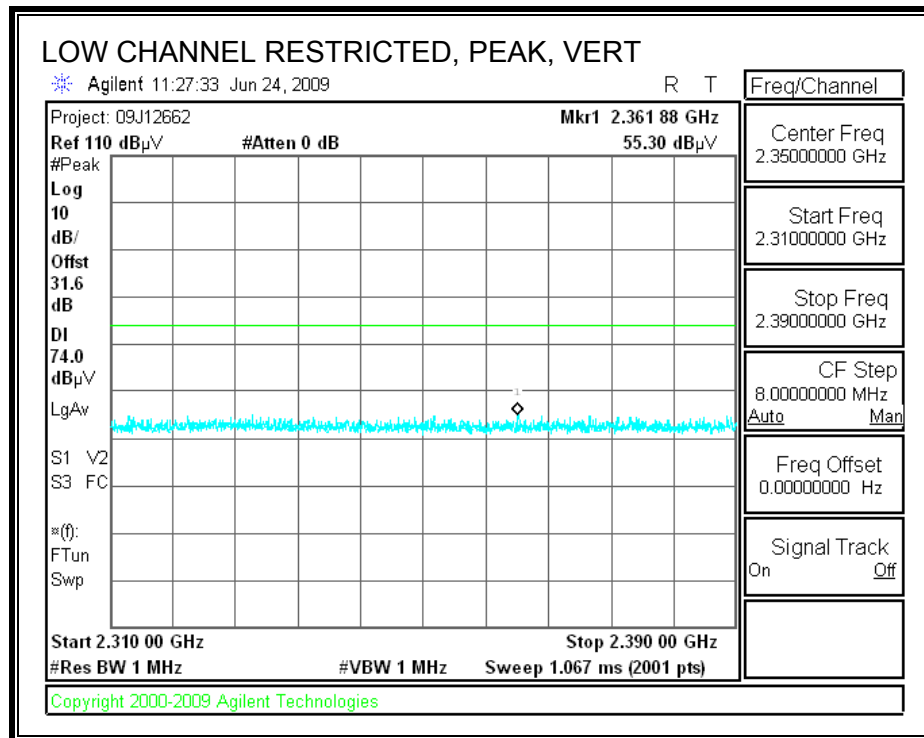
High Frequency Measurement															
Compliance Certification Services, Fremont 5m Chamber															
Company: Nintendo Project #: 09J12662 Date: 6/24/2009 Test Engineer: Chin Pang Configuration: EUT with Foxconn Antenna /AC Adaptor/ Earphone Mode: TX, 802.11															
Test Equipment:															
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				R_001							
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	38.0	26.0	32.7	5.8	-34.8	0.0	0.0	41.6	29.6	74	54	-32.4	-24.4	V
4.824	3.0	39.2	26.5	32.7	5.8	-34.8	0.0	0.0	42.8	30.1	74	54	-31.2	-23.9	H
Mid Ch, 2442MHz															
4.884	3.0	41.5	28.0	32.7	5.8	-34.8	0.0	0.0	45.2	31.7	74	54	-28.8	-22.3	V
4.884	3.0	39.0	26.0	32.7	5.8	-34.8	0.0	0.0	42.7	29.7	74	54	-31.3	-24.3	H
High Ch, 2472MHz															
4.944	3.0	40.6	26.5	32.8	5.9	-34.8	0.0	0.0	44.4	30.3	74	54	-29.6	-23.7	V
4.944	3.0	38.8	26.1	32.8	5.9	-34.8	0.0	0.0	42.6	29.9	74	54	-31.4	-24.1	H
Rev. 11.10.08															
Note: No other emissions were detected above the system noise floor															
f	Measurement Frequency		Amp	Preamp Gain		Avg Lim	Average Field Strength Limit								
Dist	Distance to Antenna		D Corr	Distance Correct to 3 meters		Pk Lim	Peak Field Strength Limit								
Read	Analyzer Reading		Avg	Average Field Strength @ 3 m		Avg Mar	Margin vs. Average Limit								
AF	Antenna Factor		Peak	Calculated Peak Field Strength		Pk Mar	Margin vs. Peak Limit								
CL	Cable Loss		HPF	High Pass Filter											

8.2.5. 802.11b EUT WITH FOXCONN ANTENNA AND AC ADAPTER

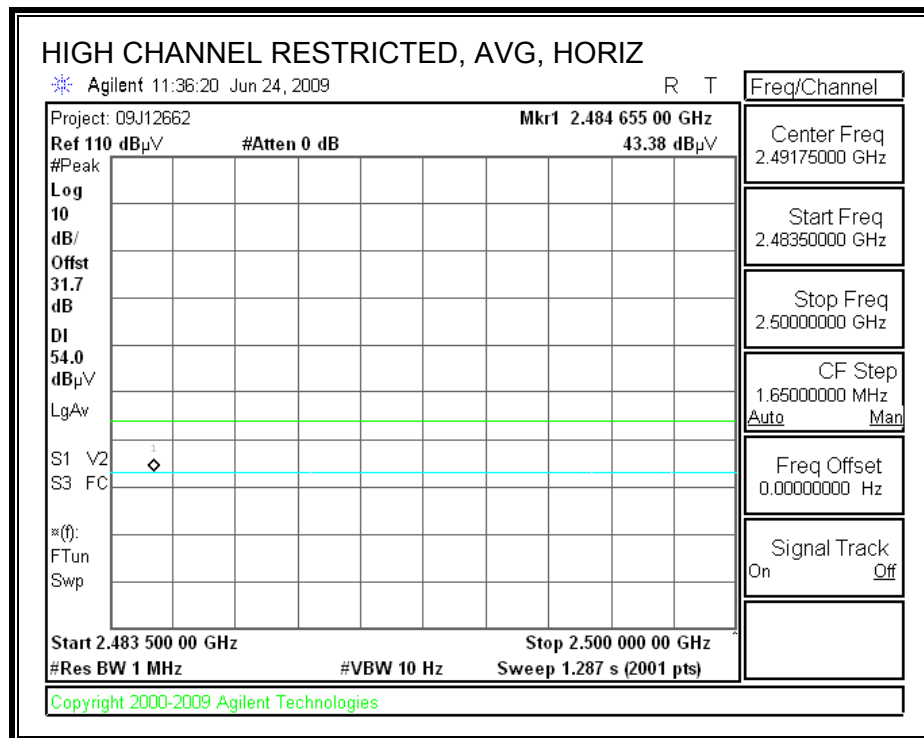
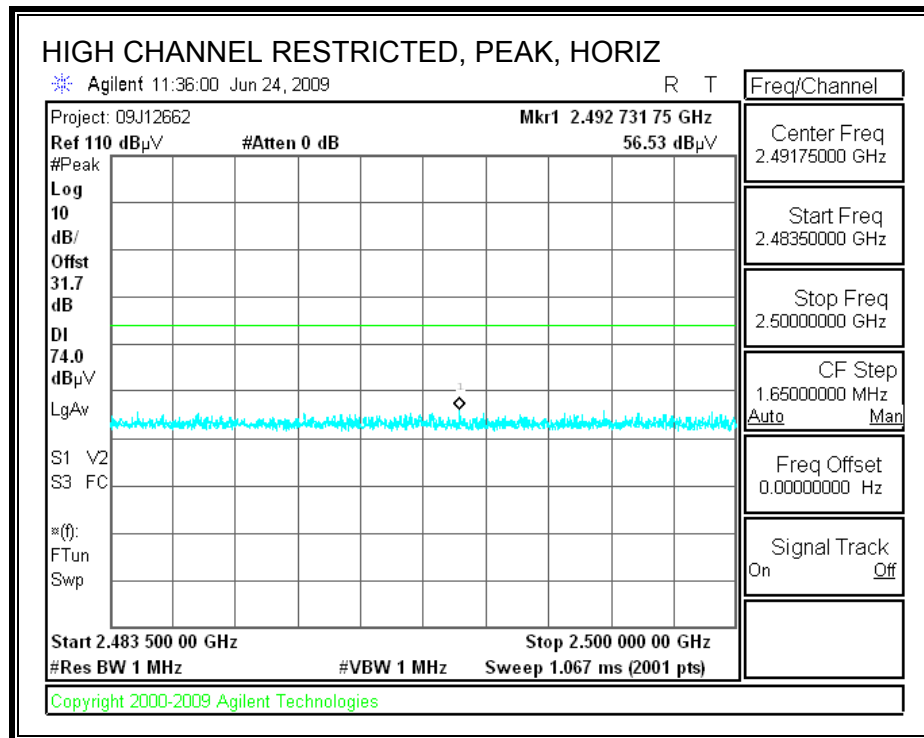
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



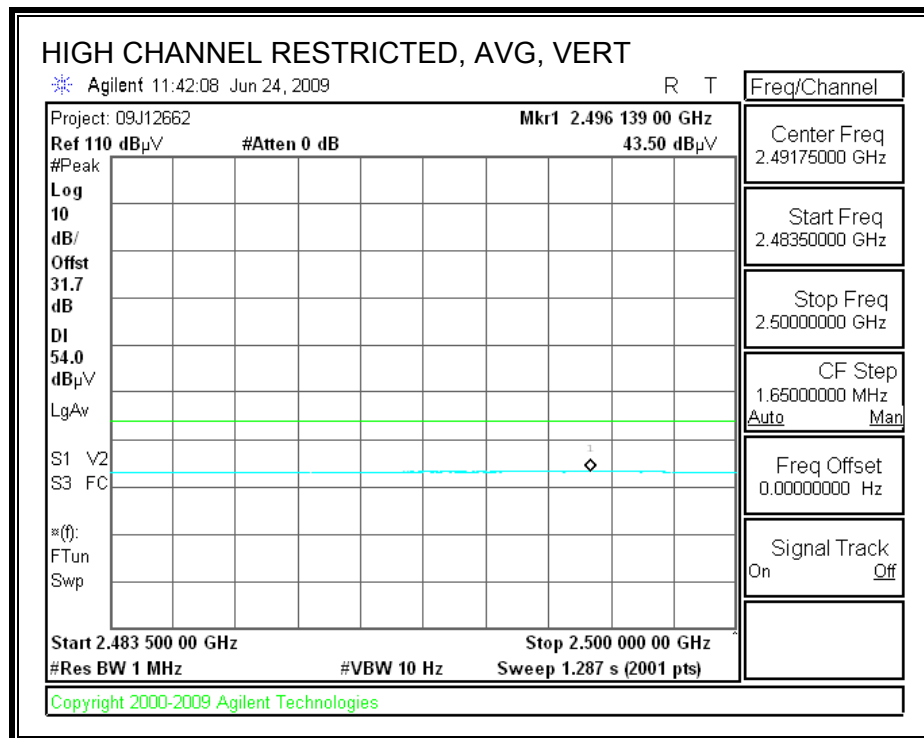
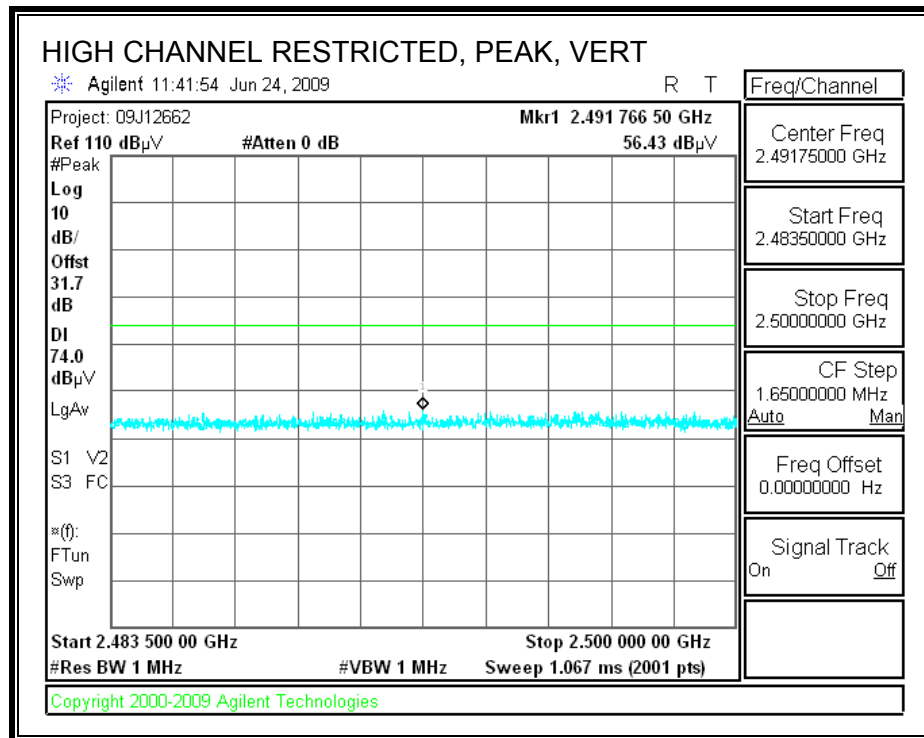
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
 Compliance Certification Services, Fremont 5m Chamber

Company: Nintendo
 Project #: 09J12662
 Date: 6/23/2009
 Test Engineer: Chin Pang
 Configuration: EUT with Foxconn Antenna / AC Adapter/Earphone
 Mode: TX, b mode

Test Equipment:

Horn 1-18GHz
 T60; S/N: 2238 @3m

Pre-amplifier 1-26GHz
 T34 HP 8449B

Pre-amplifier 26-40GHz

Horn > 18GHz

Limit
 FCC 15.205

3' cable 22807700
 3' cable 22807700

12' cable 22807600
 12' cable 22807600

20' cable 22807500
 20' cable 22807500

HPF

Reject Filter
 R_001

Peak Measurements
 RBW=VBW=1MHz
Average Measurements
 RBW=1MHz; VBW=10Hz

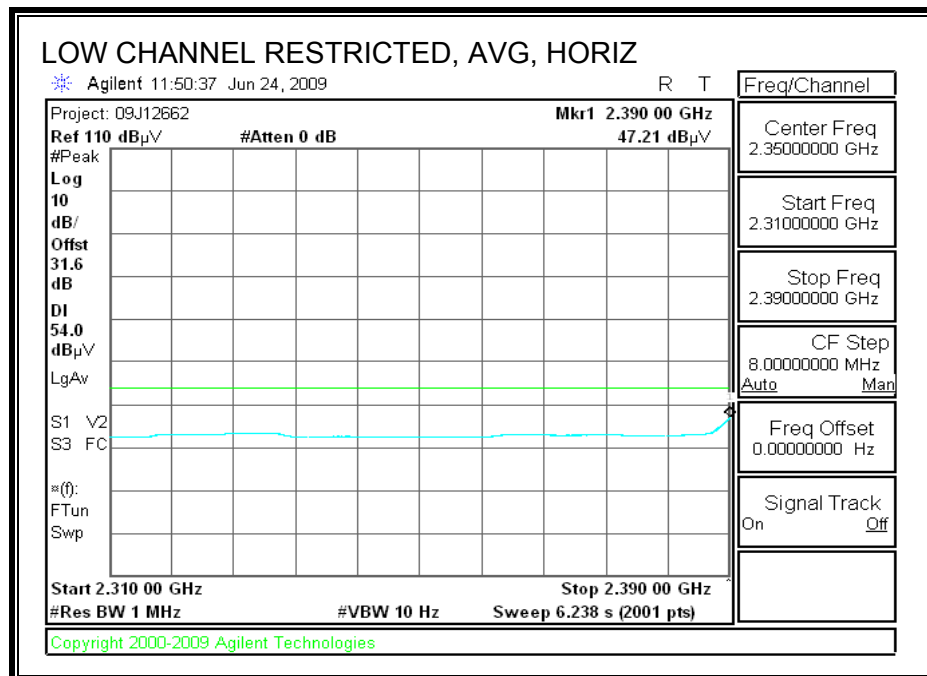
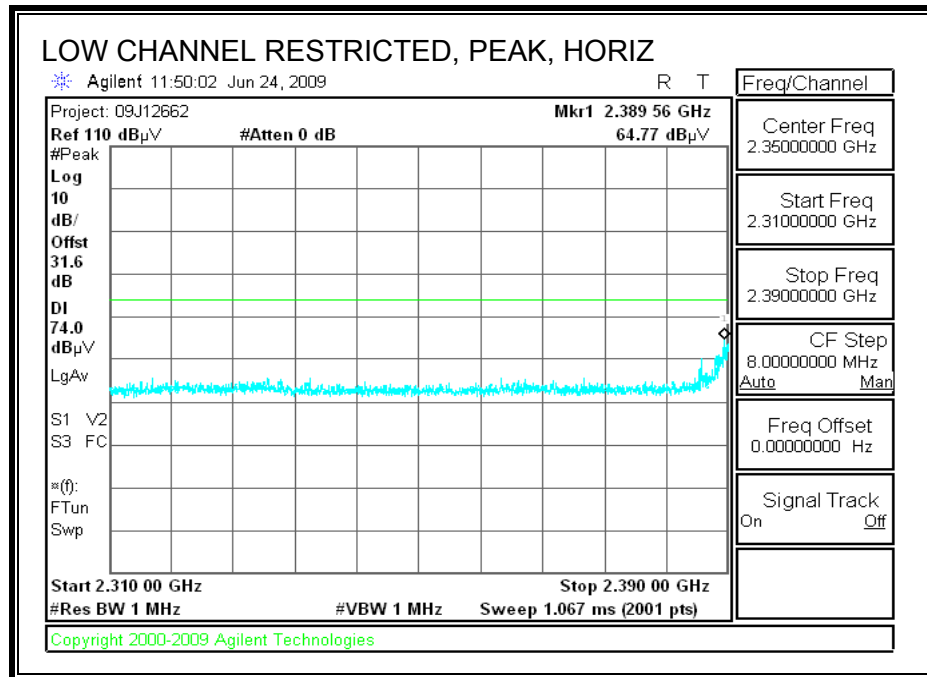
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Low Ch, 2412MHz															
4.824	3.0	39.5	29.3	32.7	5.8	-34.8	0.0	0.0	43.1	32.9	74	54	-30.9	-21.1	V
4.824	3.0	38.7	27.6	32.7	5.8	-34.8	0.0	0.0	42.3	31.2	74	54	-31.7	-22.8	H
Mid Ch, 2437MHz															
4.874	3.0	39.0	28.0	32.7	5.8	-34.8	0.0	0.0	42.7	31.7	74	54	-31.3	-22.3	V
4.874	3.0	38.5	26.7	32.7	5.8	-34.8	0.0	0.0	42.2	30.4	74	54	-31.8	-23.6	H
High Ch, 2462MHz															
4.924	3.0	39.3	28.8	32.7	5.9	-34.8	0.0	0.0	43.1	32.6	74	54	-30.9	-21.4	V
4.924	3.0	39.0	27.3	32.7	5.9	-34.8	0.0	0.0	42.8	31.1	74	54	-31.2	-22.9	H

Rev. 11.10.08
Note: No other emissions were detected above the system noise floor

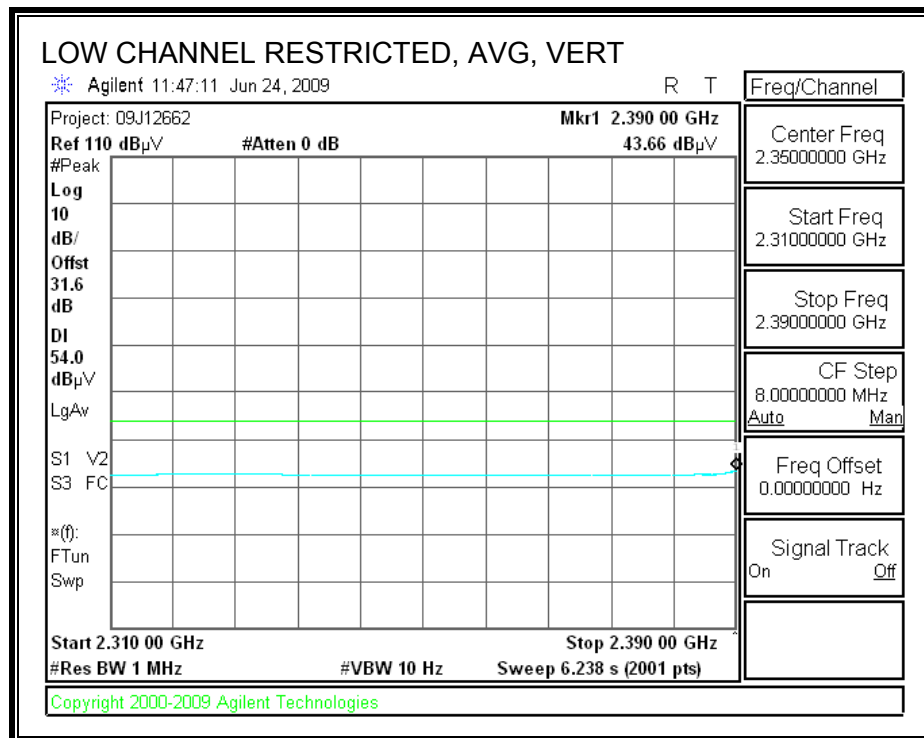
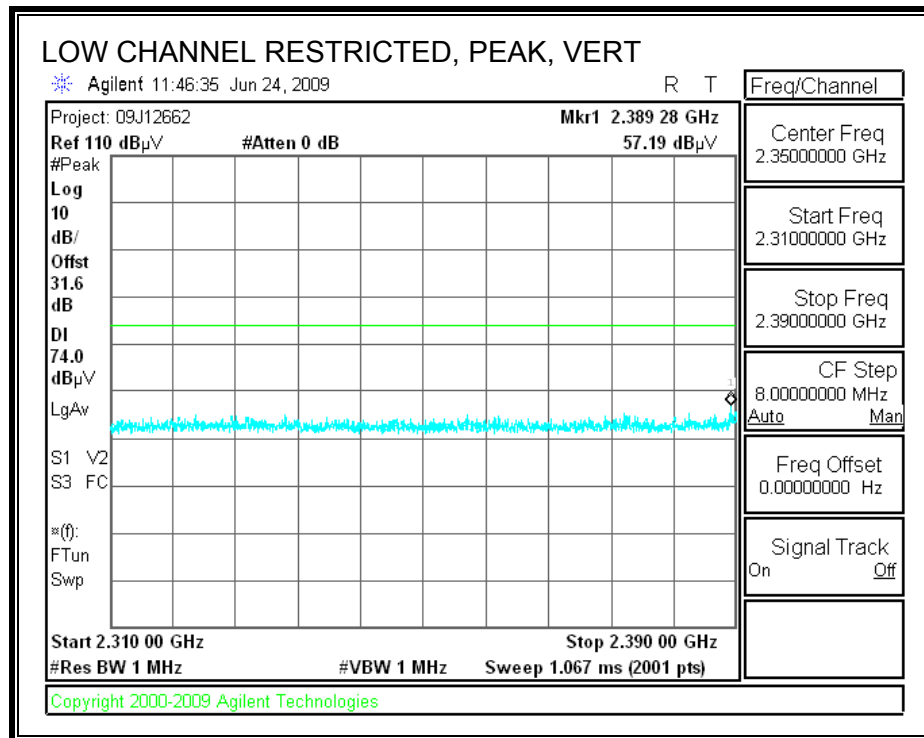
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

8.2.6. 802.11g EUT WITH FOXCONN ANTENNA AND AC ADAPTER

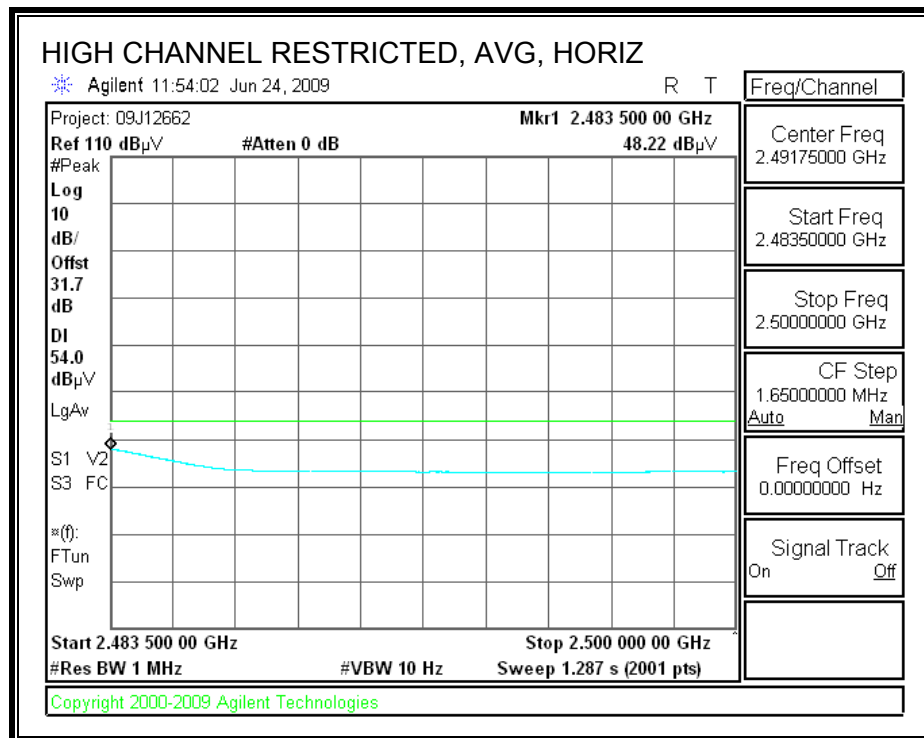
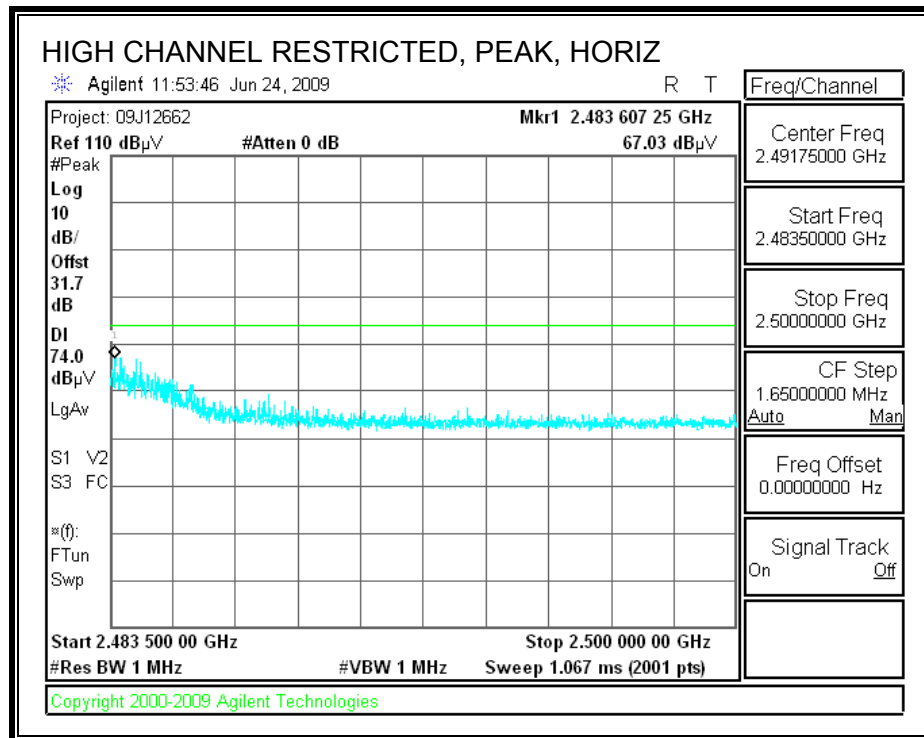
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



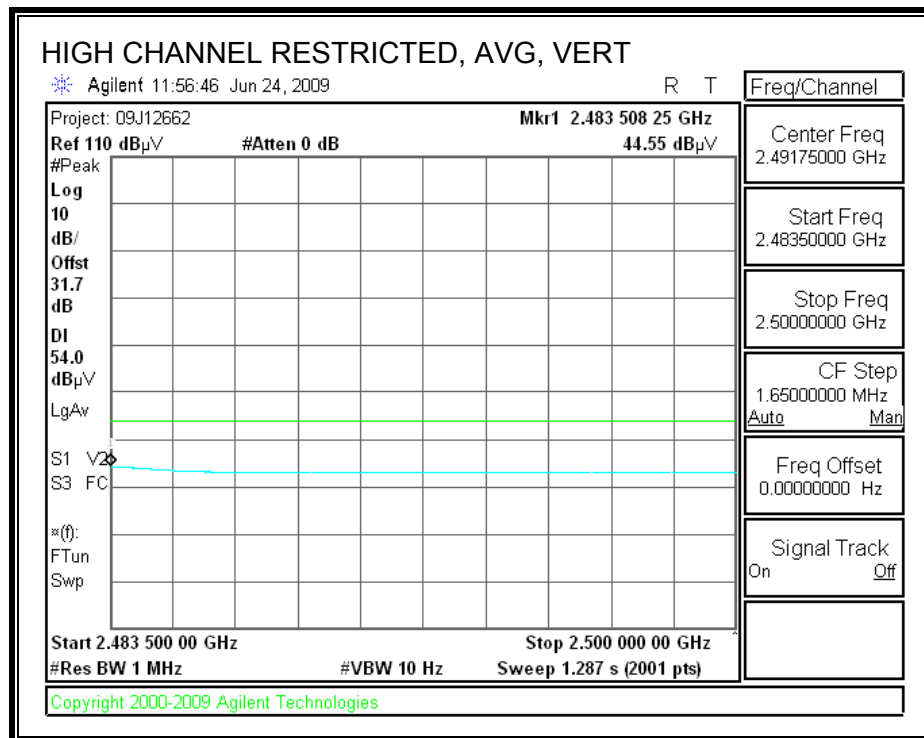
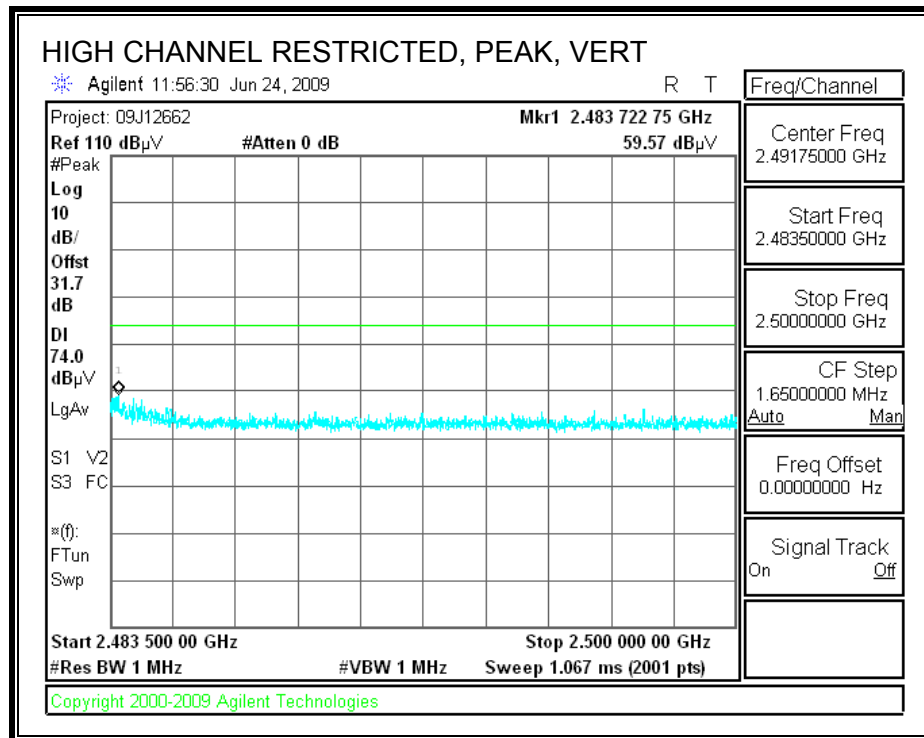
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

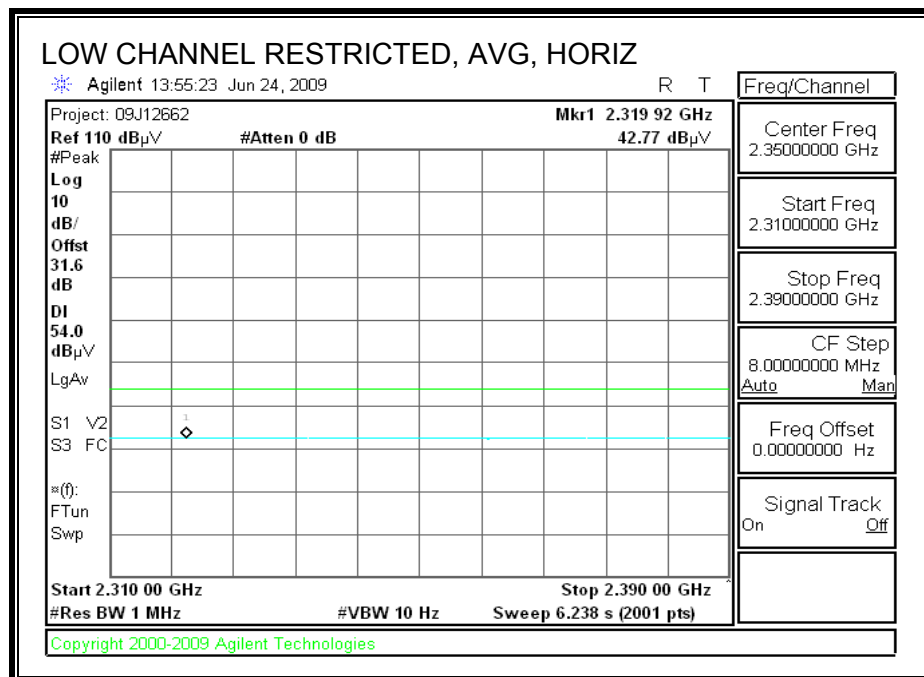
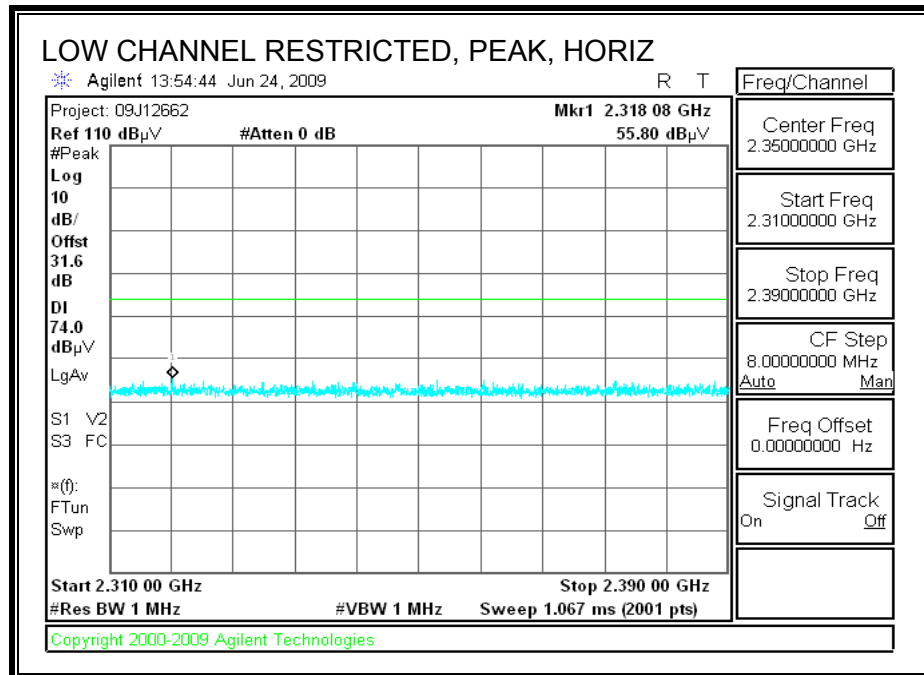


HARMONICS AND SPURIOUS EMISSIONS

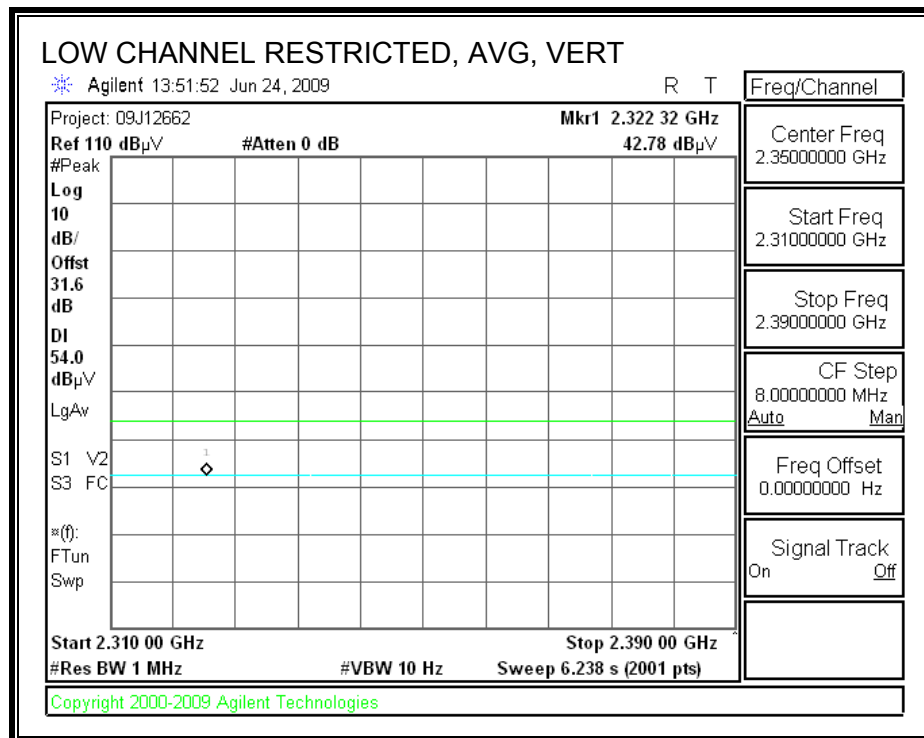
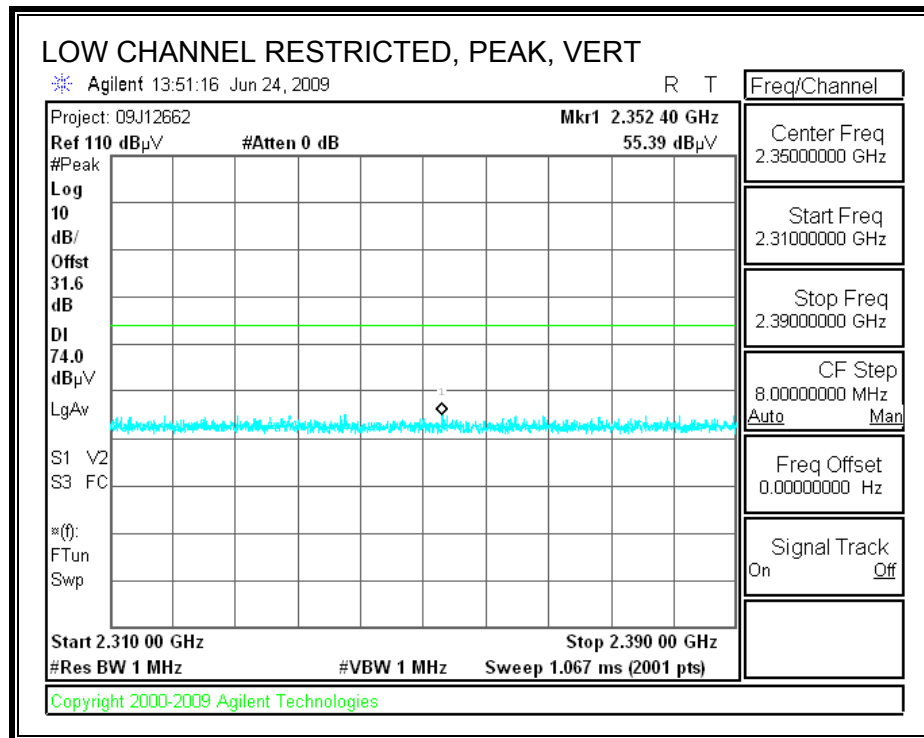
High Frequency Measurement															
Compliance Certification Services, Fremont 5m Chamber															
Company: Nintendo Project #: 09J12662 Date: 6/24/2009 Test Engineer: Chin Pang Configuration: EUT with Foxconn Antenna /AC Adaptor/ Earphone Mode: TX, g mode															
Test Equipment:															
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				R_001							
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filt 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	39.8	26.4	32.7	5.8	-34.8	0.0	0.0	43.4	30.0	74	54	-30.6	-24.0	V
4.824	3.0	38.5	26.0	32.7	5.8	-34.8	0.0	0.0	42.1	29.6	74	54	-31.9	-24.4	H
Mid Ch, 2437MHz															
4.874	3.0	38.4	26.0	32.7	5.8	-34.8	0.0	0.0	42.1	29.7	74	54	-31.9	-24.3	V
4.874	3.0	38.0	25.8	32.7	5.8	-34.8	0.0	0.0	41.7	29.5	74	54	-32.3	-24.5	H
High Ch, 2462MHz															
4.924	3.0	38.6	26.2	32.7	5.9	-34.8	0.0	0.0	42.4	30.0	74	54	-31.6	-24.0	V
4.924	3.0	38.3	26.0	32.7	5.9	-34.8	0.0	0.0	42.1	29.8	74	54	-31.9	-24.2	H
Rev. 11.10.08															
Note: No other emissions were detected above the system noise floor															
f	Measurement Frequency		Amp	Preamp Gain		Avg Lim	Average Field Strength Limit								
Dist	Distance to Antenna		D Corr	Distance Correct to 3 meters		Pk Lim	Peak Field Strength Limit								
Read	Analyzer Reading		Avg	Average Field Strength @ 3 m		Avg Mar	Margin vs. Average Limit								
AF	Antenna Factor		Peak	Calculated Peak Field Strength		Pk Mar	Margin vs. Peak Limit								
CL	Cable Loss		HPF	High Pass Filter											

8.2.7. 802.11 EUT WITH TYCO ANTENNA AND AC ADAPTER

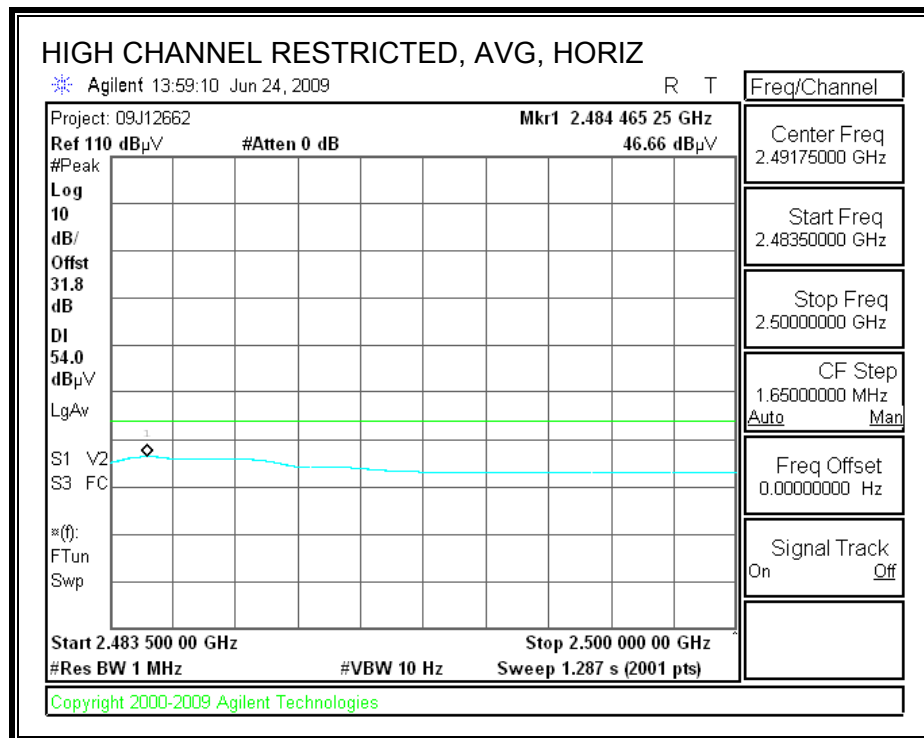
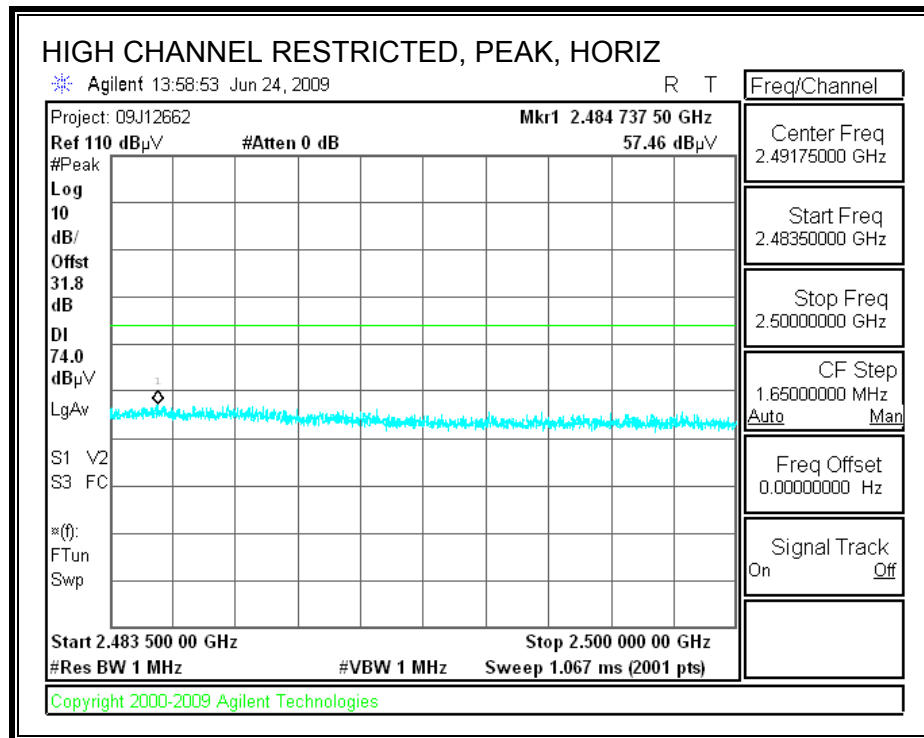
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



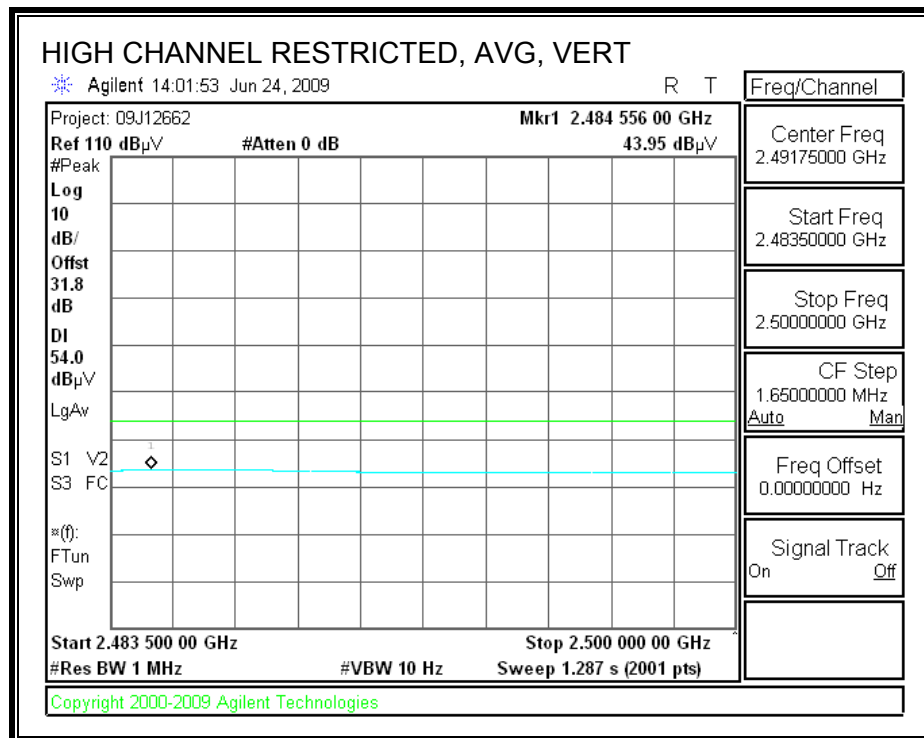
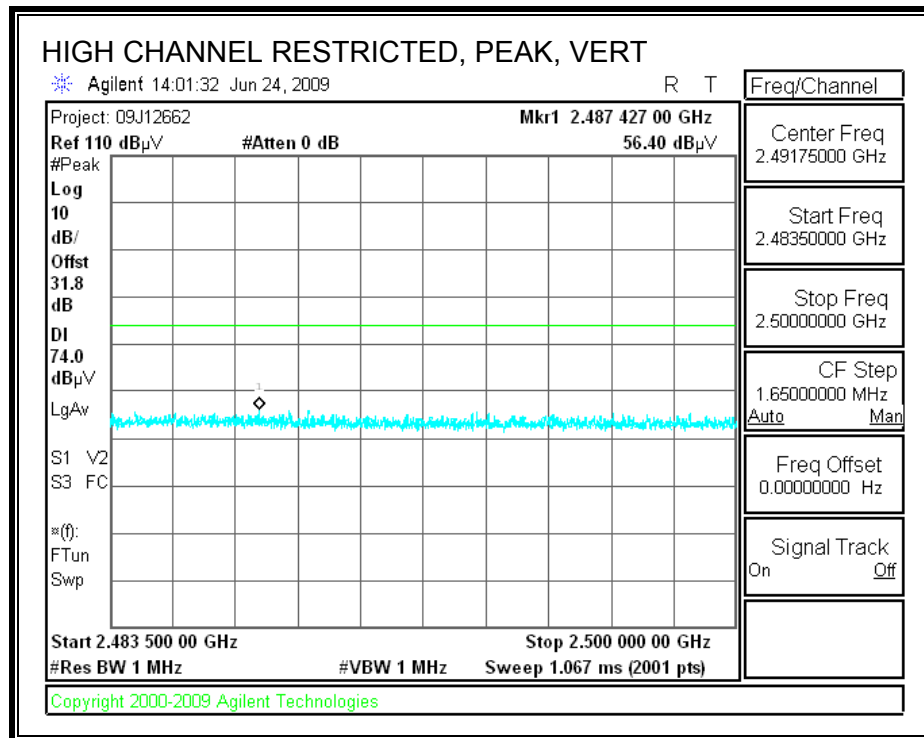
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)

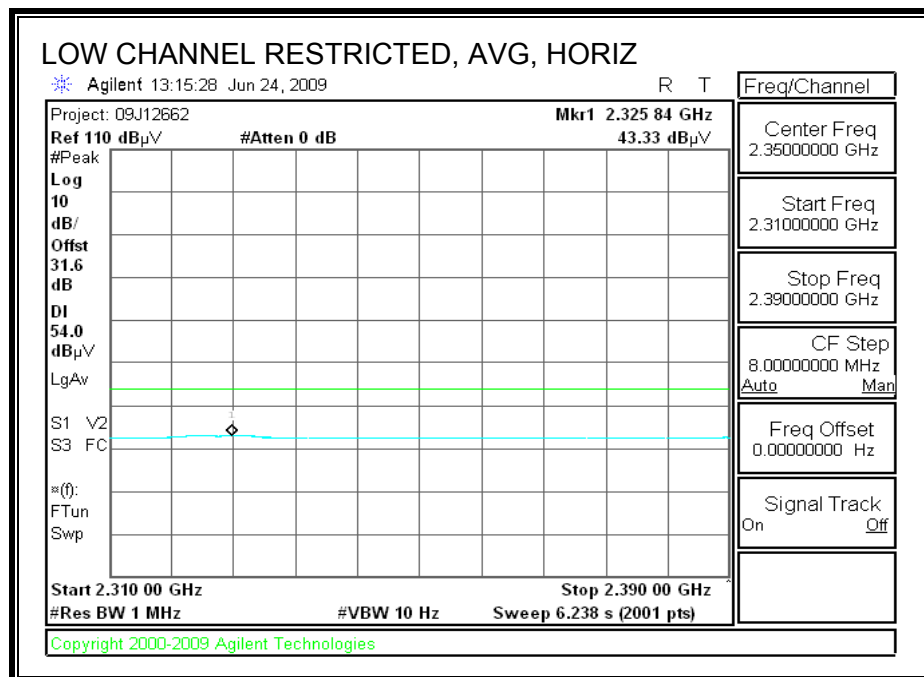
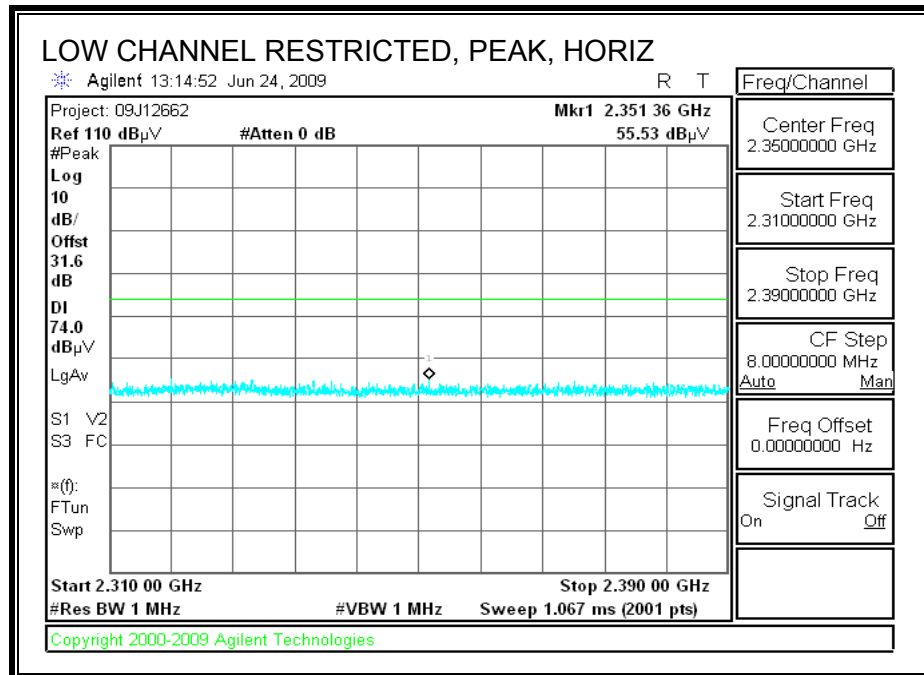


RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

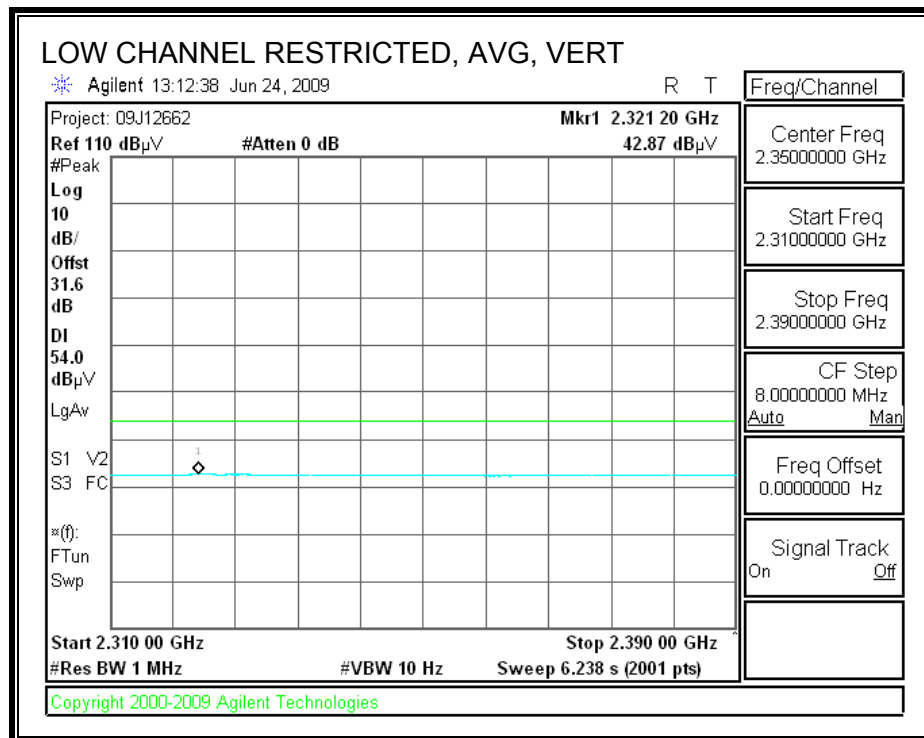
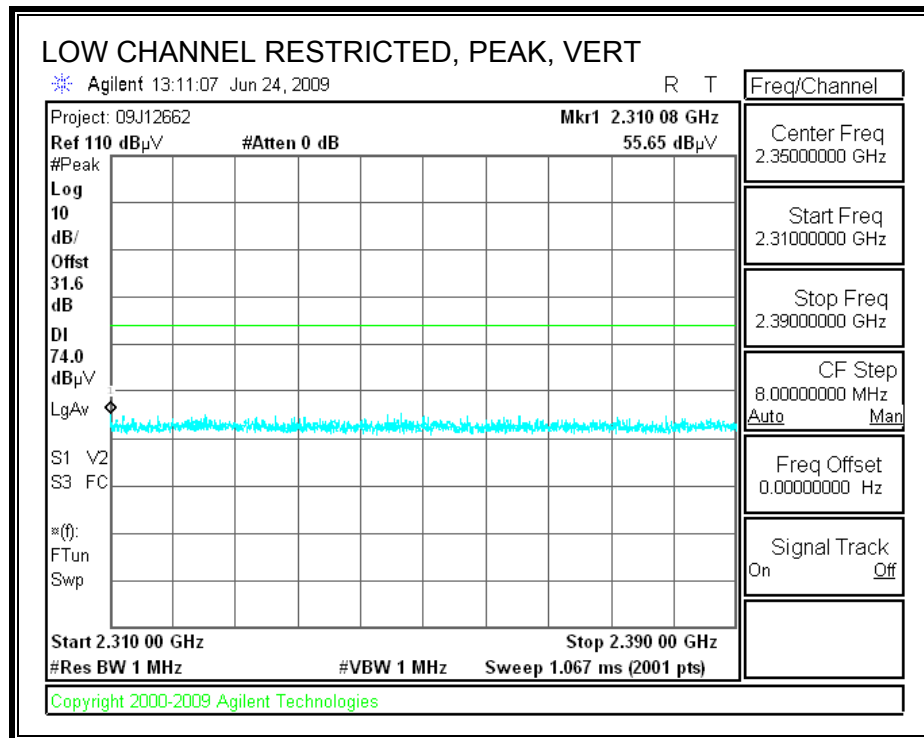


8.2.8. 802.11b EUT WITH TYCO ANTENNA AND AC ADAPTER

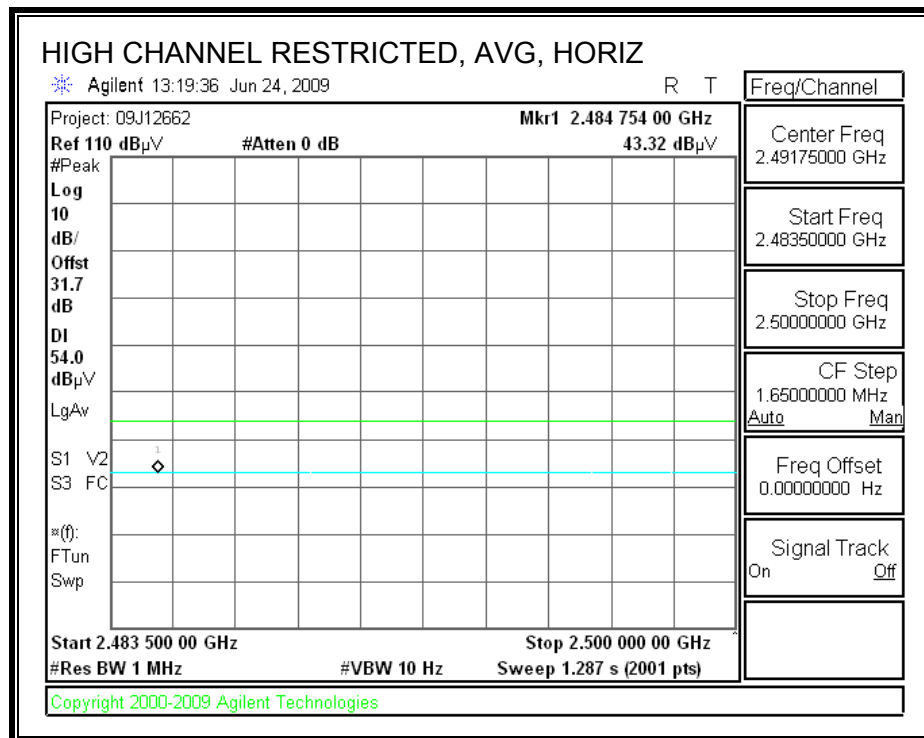
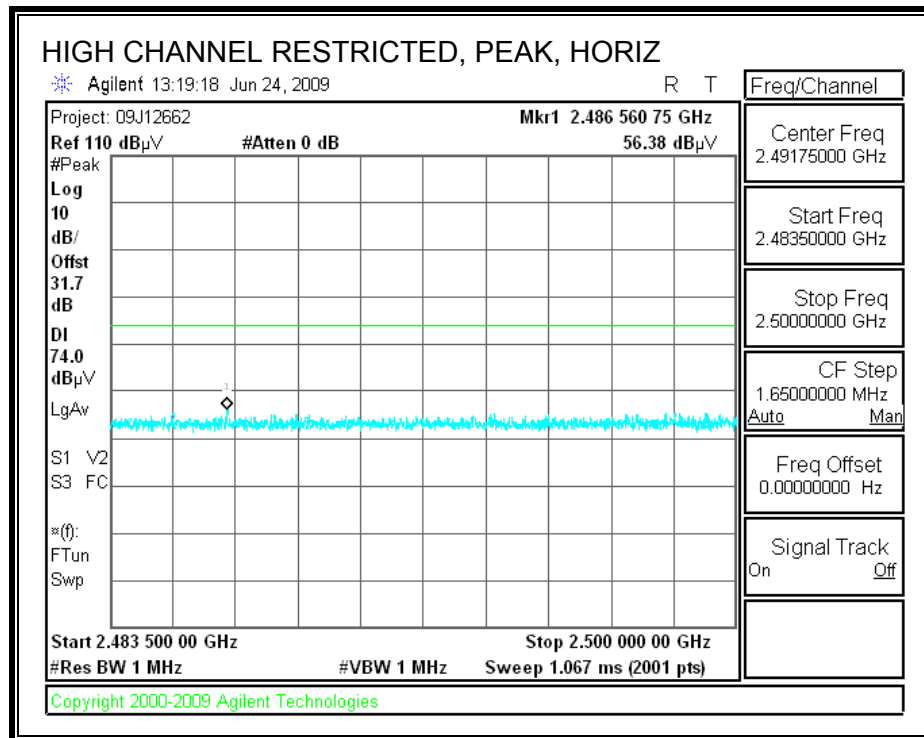
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



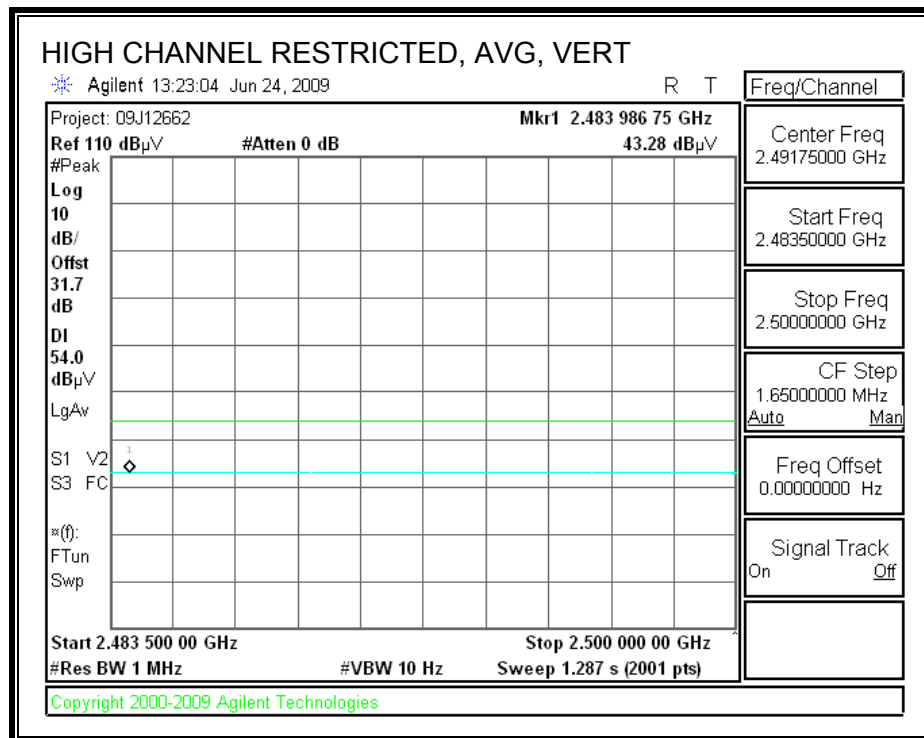
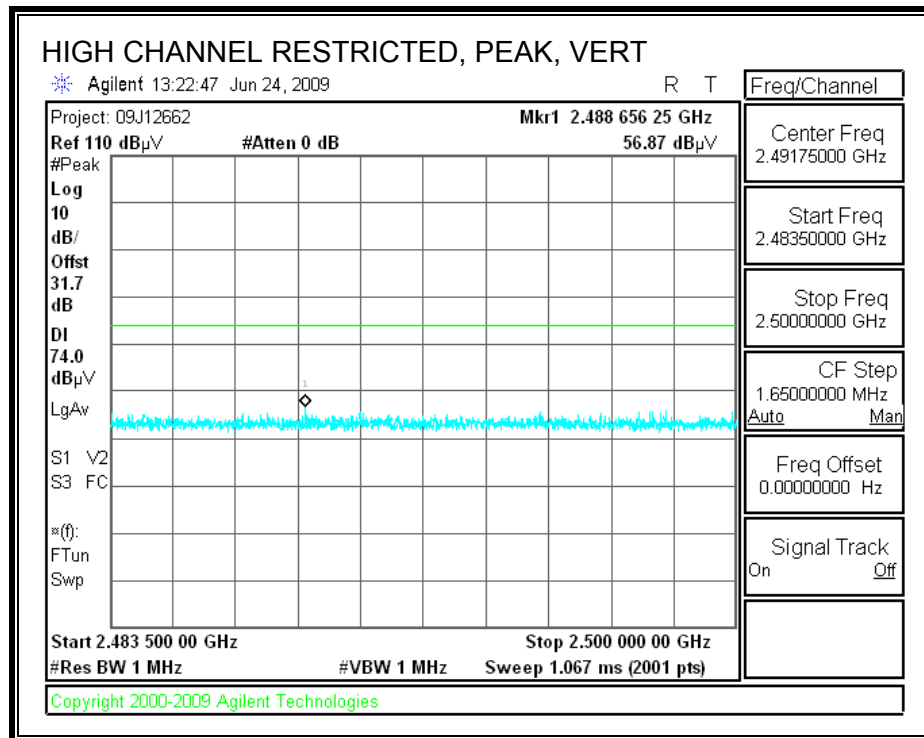
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

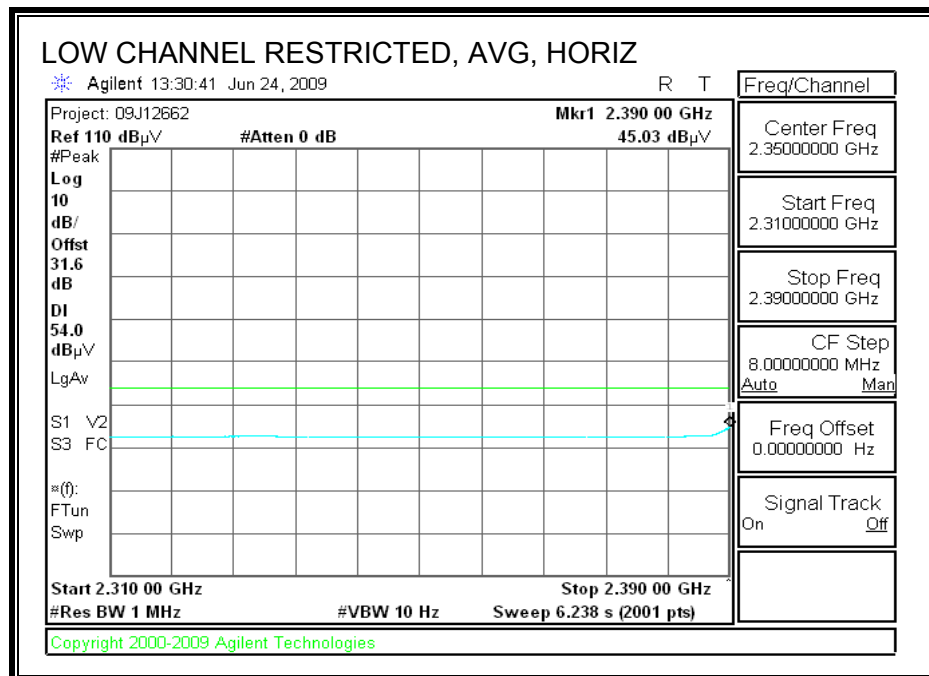
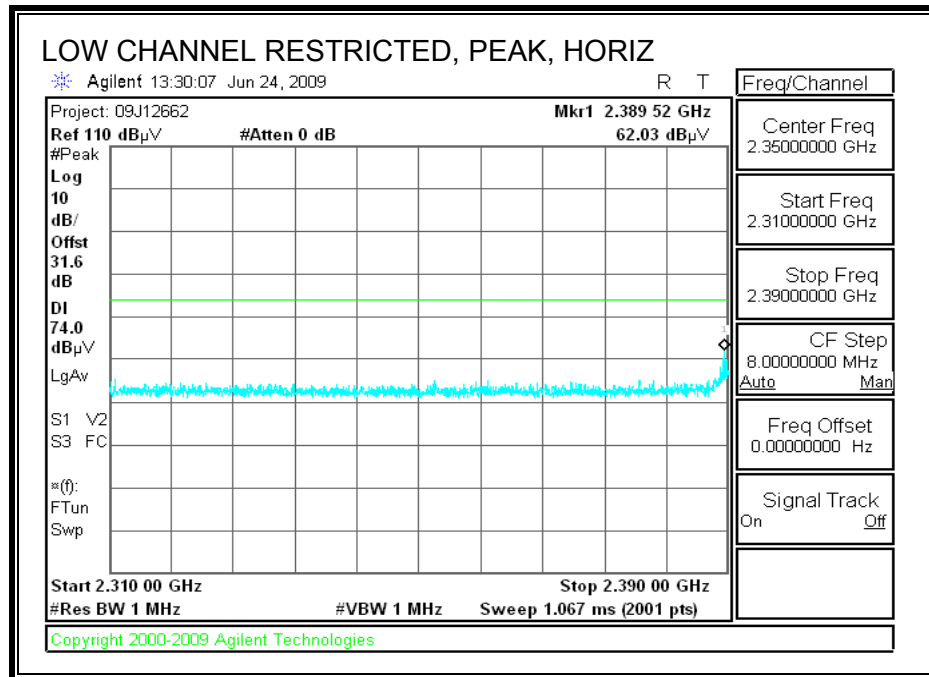


HARMONICS AND SPURIOUS EMISSIONS

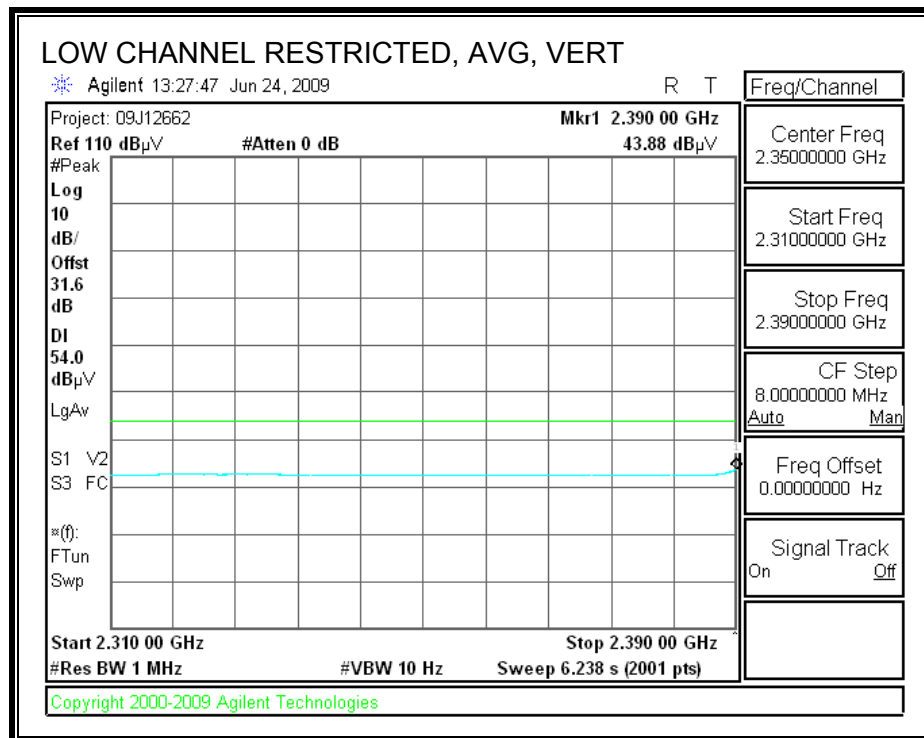
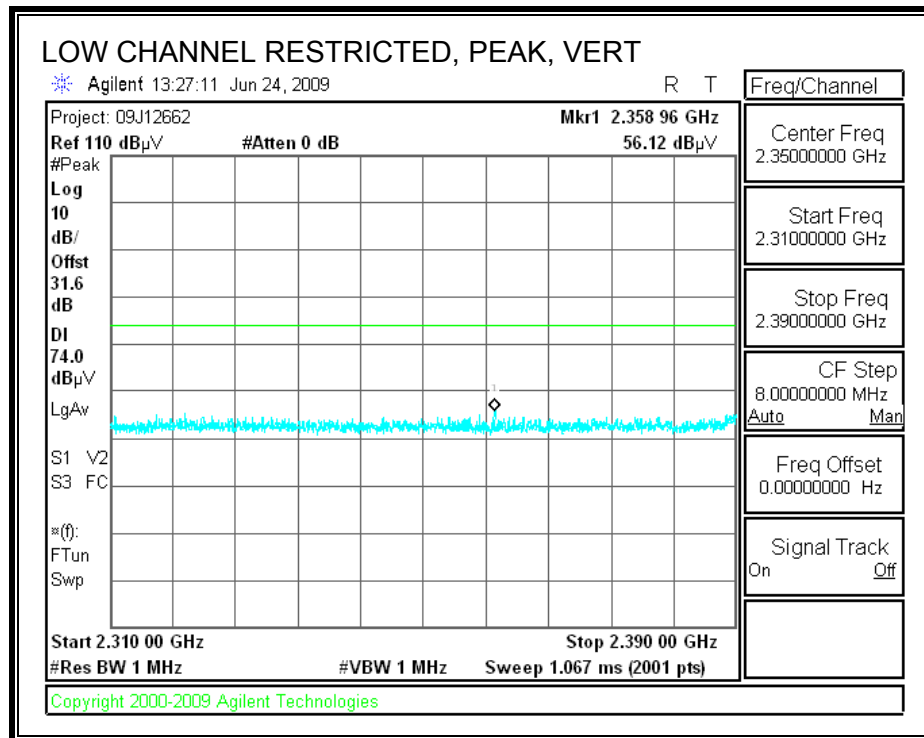
High Frequency Measurement															
Compliance Certification Services, Fremont 5m Chamber															
Company: Nintendo Project #: 09J12662 Date: 6/25/2009 Test Engineer: Chin Pang Configuration: EUT with Tyco Antenna / AC Adapter / Earphone Mode: TX, b mode															
Test Equipment:															
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				R_001							
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filt 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	38.5	26.5	32.7	5.8	-34.8	0.0	0.0	42.1	30.1	74	54	-31.9	-23.9	V
4.824	3.0	39.1	26.3	32.7	5.8	-34.8	0.0	0.0	42.7	29.9	74	54	-31.3	-24.1	H
Mid Ch, 2437MHz															
4.874	3.0	40.0	28.3	32.7	5.8	-34.8	0.0	0.0	43.7	32.0	74	54	-30.3	-22.0	V
4.874	3.0	38.5	26.5	32.7	5.8	-34.8	0.0	0.0	42.2	30.2	74	54	-31.8	-23.8	H
High Ch, 2462MHz															
4.924	3.0	39.0	26.7	32.7	5.9	-34.8	0.0	0.0	42.8	30.5	74	54	-31.2	-23.5	V
4.924	3.0	38.2	26.0	32.7	5.9	-34.8	0.0	0.0	42.0	29.8	74	54	-32.0	-24.2	H
Rev. 11.10.08															
Note: No other emissions were detected above the system noise floor															
f	Measurement Frequency		Amp	Preamp Gain		Avg Lim	Average Field Strength Limit								
Dist	Distance to Antenna		D Corr	Distance Correct to 3 meters		Pk Lim	Peak Field Strength Limit								
Read	Analyzer Reading		Avg	Average Field Strength @ 3 m		Avg Mar	Margin vs. Average Limit								
AF	Antenna Factor		Peak	Calculated Peak Field Strength		Pk Mar	Margin vs. Peak Limit								
CL	Cable Loss		HPF	High Pass Filter											

8.2.9. 802.11g EUT WITH TYCO ANTENNA AND AC ADAPTER

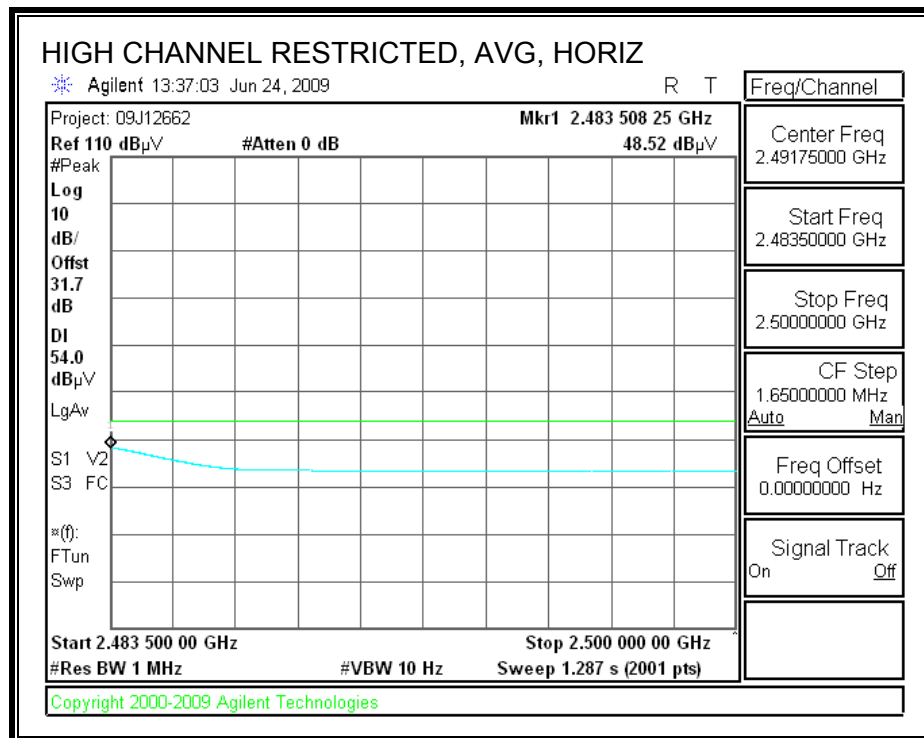
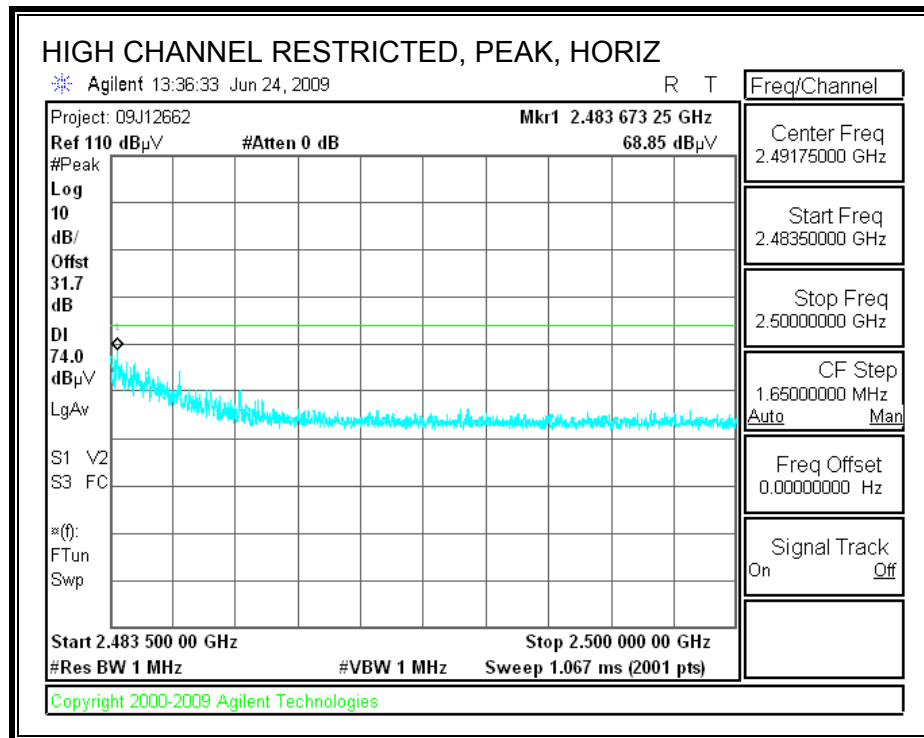
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



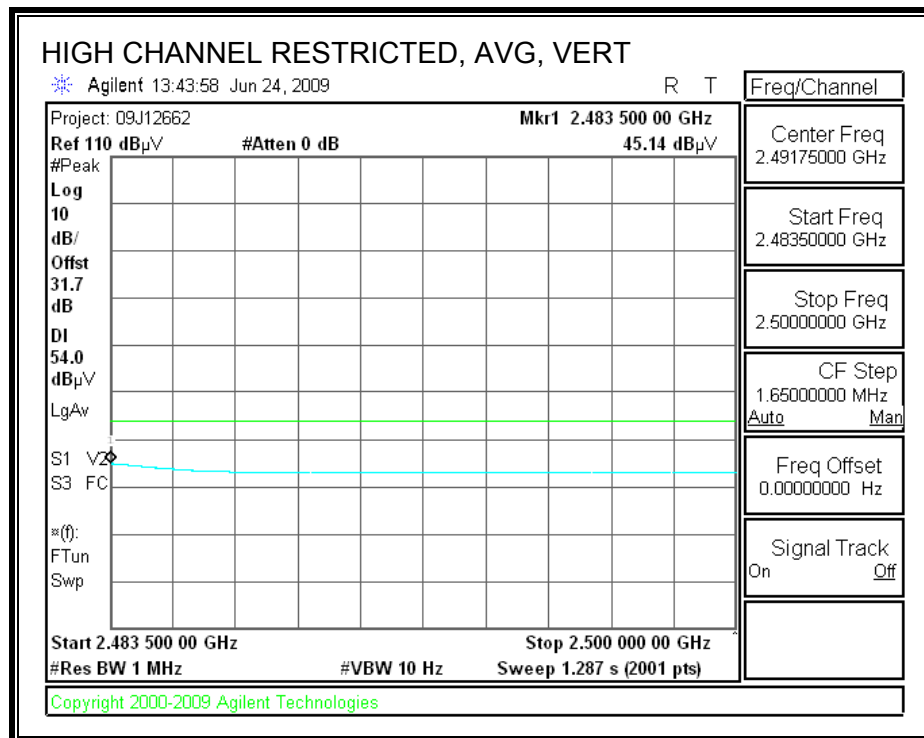
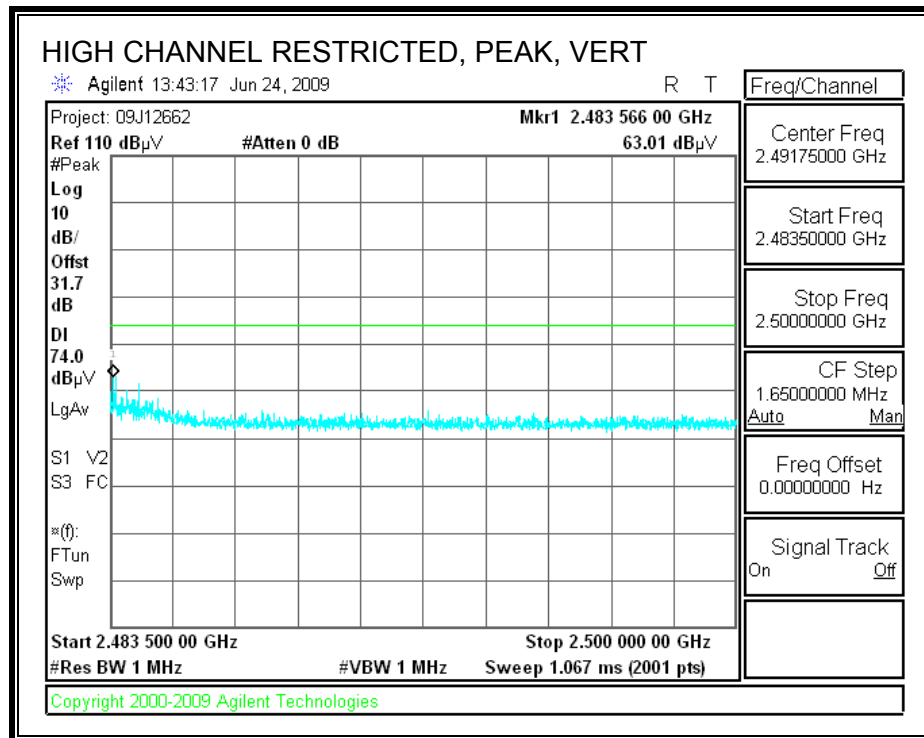
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement															
Compliance Certification Services, Fremont 5m Chamber															
Company: Nintendo Project #: 09J12662 Date: 6/25/2009 Test Engineer: Chin Pang Configuration: EUT with Tyco Antenna / AC Adapter / Earphone Mode: TX, g mode															
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				R_001							
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filt 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	39.0	27.4	32.7	5.8	-34.8	0.0	0.0	42.6	31.0	74	54	-31.4	-23.0	V
4.824	3.0	38.8	27.2	32.7	5.8	-34.8	0.0	0.0	42.4	30.8	74	54	-31.6	-23.2	H
Mid Ch, 2437MHz															
4.874	3.0	38.5	27.2	32.7	5.8	-34.8	0.0	0.0	42.2	30.9	74	54	-31.8	-23.1	V
4.874	3.0	38.0	27.0	32.7	5.8	-34.8	0.0	0.0	41.7	30.7	74	54	-32.3	-23.3	H
High Ch, 2462MHz															
4.924	3.0	38.6	27.2	32.7	5.9	-34.8	0.0	0.0	42.4	31.0	74	54	-31.6	-23.0	V
4.924	3.0	38.2	27.1	32.7	5.9	-34.8	0.0	0.0	42.0	30.9	74	54	-32.0	-23.1	H
Rev. 11.10.08															
Note: No other emissions were detected above the system noise floor															
f	Measurement Frequency		Amp	Preamp Gain		Avg Lim	Average Field Strength Limit								
Dist	Distance to Antenna		D Corr	Distance Correct to 3 meters		Pk Lim	Peak Field Strength Limit								
Read	Analyzer Reading		Avg	Average Field Strength @ 3 m		Avg Mar	Margin vs. Average Limit								
AF	Antenna Factor		Peak	Calculated Peak Field Strength		Pk Mar	Margin vs. Peak Limit								
CL	Cable Loss		HPF	High Pass Filter											

8.3. RECEIVER ABOVE 1 GHz

8.3.1. FOXCONN ANTENNA

High Frequency Measurement															
Compliance Certification Services, Fremont 5m Chamber															
Company: Nintendo Project #: 09J12662 Date: 6/25/2009 Test Engineer: Chin Pang Configuration: EUT with Foxconn antenna / AC Adapter/ Earphone Mode: RX (Worst Case)															
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 15.209							
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											
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)
Mid Ch															
1.330	3.0	60.0	40.0	25.6	2.7	-37.8	0.0	0.0	50.5	30.5	74	54	-23.5	-23.5	H
2.495	3.0	50.0	34.3	28.3	3.9	-36.3	0.0	0.0	46.0	30.3	74	54	-28.0	-23.7	H
3.180	3.0	45.0	36.5	30.1	4.5	-35.7	0.0	0.0	43.9	35.4	74	54	-30.1	-18.6	H
1.330	3.0	58.5	38.6	25.6	2.7	-37.8	0.0	0.0	49.0	29.1	74	54	-25.0	-24.9	V
2.495	3.0	48.0	33.2	28.3	3.9	-36.3	0.0	0.0	44.0	29.2	74	54	-30.0	-24.8	V
3.180	3.0	44.0	34.6	30.1	4.5	-35.7	0.0	0.0	42.9	33.5	74	54	-31.1	-20.5	V
Rev. 11.10.08															
Note: No other emissions were detected above the system noise floor.															
f	Measurement Frequency			Amp	Preamp Gain			Avg Lim	Average Field Strength Limit						
Dist	Distance to Antenna			D Corr	Distance Correct to 3 meters			Pk Lim	Peak Field Strength Limit						
Read	Analyzer Reading			Avg	Average Field Strength @ 3 m			Avg Mar	Margin vs. Average Limit						
AF	Antenna Factor			Peak	Calculated Peak Field Strength			Pk Mar	Margin vs. Peak Limit						
CL	Cable Loss			HPF	High Pass Filter										

8.3.2. TYCO ANTENNA

High Frequency Measurement															
Compliance Certification Services, Fremont 5m Chamber															
Company: Nintendo Project #: 09J12662 Date: 6/25/2009 Test Engineer: Chin Pang Configuration: EUT with Tyco antenna / AC Adapter/ Earphone Mode: RX (Worst Case)															
Test Equipment:															
Horn 1-18GHz		Pre-amplifer 1-26GHz		Pre-amplifer 26-40GHz		Horn > 18GHz		Limit							
T60; S/N: 2238 @3m		T34 HP 8449B						FCC 15.209							
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											
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Ftr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Mid Ch															
1.330	3.0	60.0	40.0	25.6	2.7	-37.8	0.0	0.0	50.5	30.5	74	54	-23.5	-23.5	H
2.495	3.0	47.8	31.5	28.3	3.9	-36.3	0.0	0.0	43.8	27.5	74	54	-30.2	-26.5	H
3.180	3.0	44.0	35.6	30.1	4.5	-35.7	0.0	0.0	42.9	34.5	74	54	-31.1	-19.5	H
1.331	3.0	60.0	41.5	25.6	2.7	-37.8	0.0	0.0	50.5	32.0	74	54	-23.5	-22.0	V
2.400	3.0	47.0	33.0	28.0	3.8	-36.3	0.0	0.0	42.6	28.6	74	54	-31.4	-25.4	V
2.800	3.0	44.0	32.0	29.1	4.2	-36.0	0.0	0.0	41.3	29.3	74	54	-32.7	-24.7	V
3.180	3.0	46.3	38.5	30.1	4.5	-35.7	0.0	0.0	45.2	37.4	74	54	-28.8	-16.6	V
Rev. 11.10.08															
Note: No other emissions were detected above the system noise floor.															
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. WORST-CASE BELOW 1 GHz

802.11 MODE (WORST CASE)

EUT WITH FOXCONN ANTENNA WITHOUT AC ADAPTER

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

DATA

30-1000MHz Frequency Measurement

Compliance Certification Services, Fremont 5m Chamber

Test Engr: Chin Pang

Date: 06/24/09

Project #: 09J12662

Company: Nintendo

EUT Description: 802.11 b/g portable game machine with Wireless Lan

Configuration: EUT with Foxconn Antenna(Worst Case Position) and Earphone

EUT M/N:

Test Target: FCC Class B

Mode Oper: TX, (Worst Case)

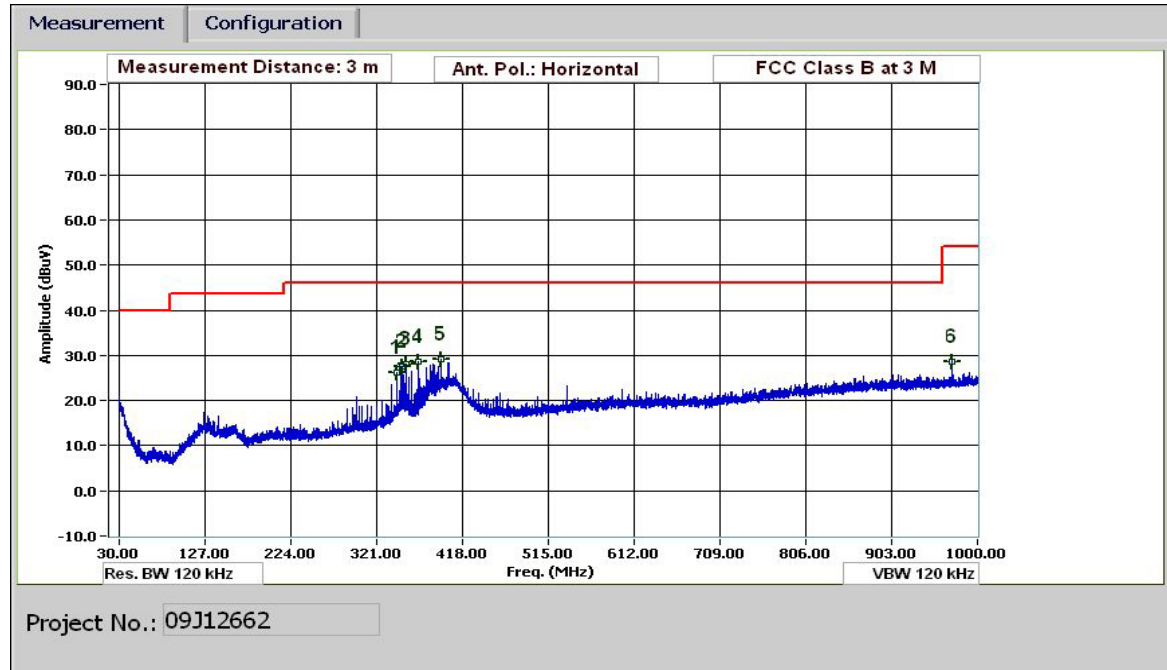
f	Measurement Frequency	Amp	Preamp Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filter dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
horiz													
343.453	3.0	38.1	14.2	1.6	27.7	0.0	0.0	26.2	46.0	-19.8	H	EP	
349.093	3.0	39.4	14.2	1.6	27.7	0.0	0.0	27.6	46.0	-18.4	H	EP	
354.733	3.0	39.8	14.3	1.6	27.7	0.0	0.0	28.0	46.0	-18.0	H	EP	
368.654	3.0	40.4	14.5	1.7	27.8	0.0	0.0	28.7	46.0	-17.3	H	EP	
393.855	3.0	40.5	14.9	1.7	28.0	0.0	0.0	29.1	46.0	-16.9	H	EP	
971.799	3.0	30.9	22.5	2.9	27.7	0.0	0.0	28.6	54.0	-25.4	H	EP	
125.524	3.0	28.0	14.1	0.9	28.0	0.0	0.0	15.0	43.5	-28.5	V	EP	
385.335	3.0	33.1	14.8	1.7	27.9	0.0	0.0	21.7	46.0	-24.3	V	EP	
396.495	3.0	32.5	15.0	1.7	28.0	0.0	0.0	21.2	46.0	-24.8	V	EP	
971.919	3.0	30.2	22.5	2.9	27.7	0.0	0.0	28.0	54.0	-26.0	V	EP	

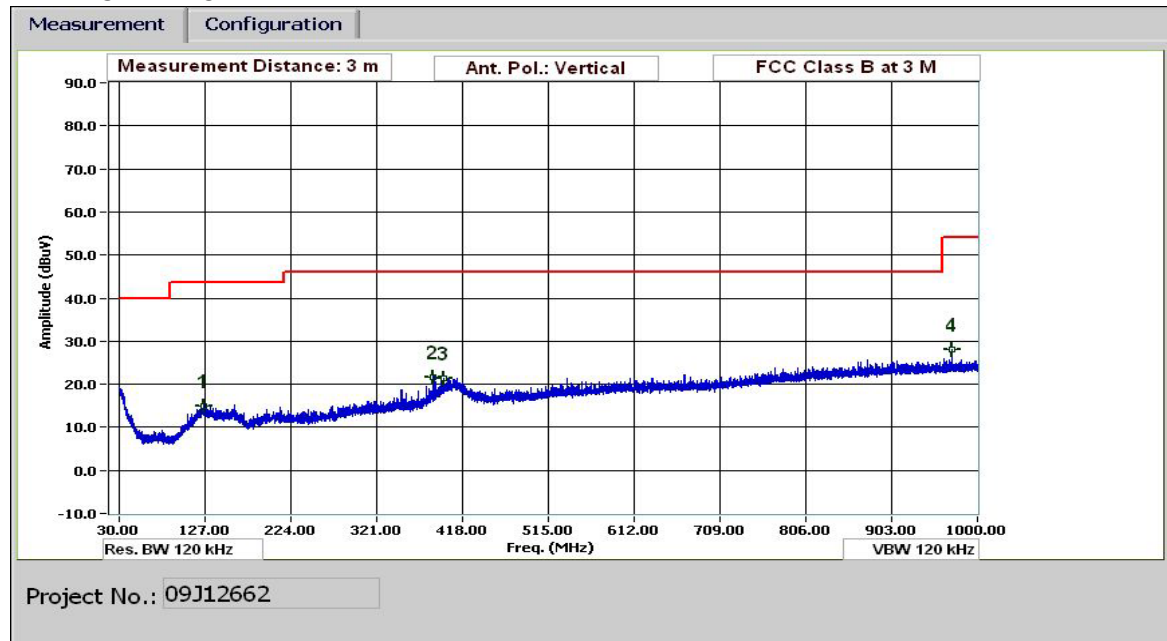
Rev. 1.27.09

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

HORIZONTAL PLOT



VERTICAL PLOT



802.11 b MODE

EUT WITH FOXCONN ANTENNA WITH WORST CASE AC ADAPTER

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

DATA

30-1000MHz Frequency Measurement

Compliance Certification Services, Fremont 5m Chamber

Test Engr: Chin Pang

Date: 06/24/09

Project #: 09J12662

Company: Nintendo

EUT Description: 802.11 b/g portable game machine with wireless Lan

Configuration: EUT with Foxconn antenna / AC Adapter/ Earphone

EUT M/N:

Test Target: FCC Class B

Mode Oper: TX, (Worst Case)

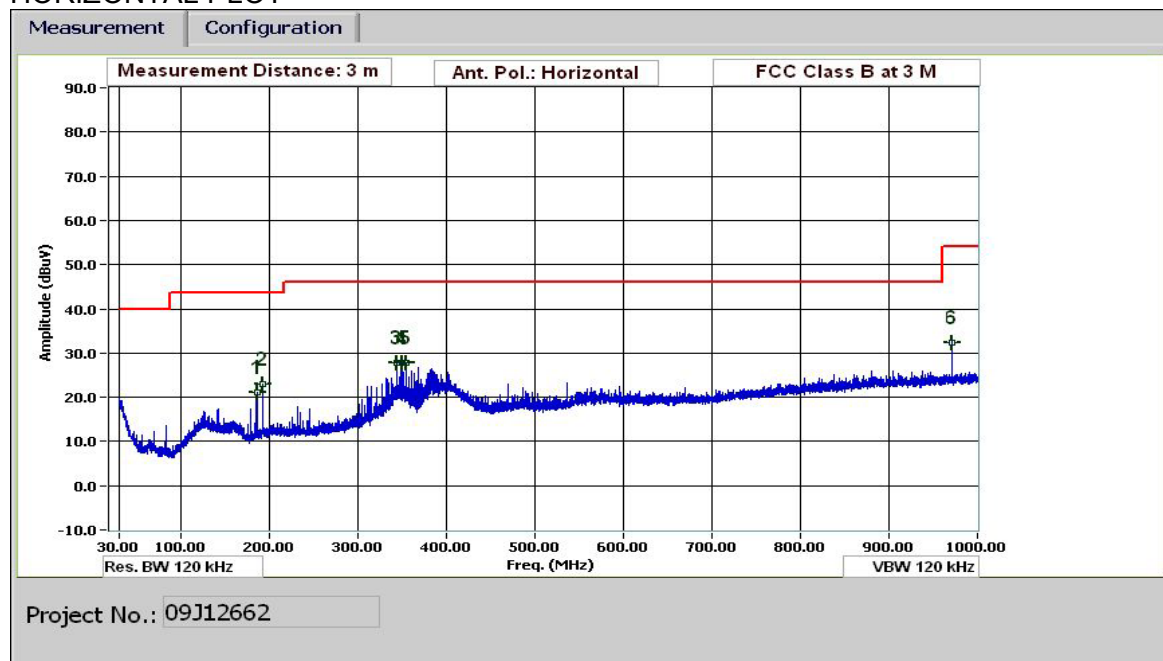
f	Measurement Frequency	Amp	Preamplifier Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filter dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol V/H	Det. P/A/QP	Notes
horiz													
185.526	3.0	36.5	11.1	1.1	27.4	0.0	0.0	21.2	43.5	-22.3	H	EP	
191.647	3.0	37.8	11.4	1.1	27.4	0.0	0.0	22.9	43.5	-20.6	H	EP	
343.453	3.0	39.6	14.2	1.6	27.7	0.0	0.0	27.7	46.0	-18.3	H	EP	
349.093	3.0	39.6	14.2	1.6	27.7	0.0	0.0	27.8	46.0	-18.2	H	EP	
354.733	3.0	39.7	14.3	1.6	27.7	0.0	0.0	27.9	46.0	-18.1	H	EP	
971.799	3.0	34.8	22.5	2.9	27.7	0.0	0.0	32.5	54.0	-21.5	H	EP	
61.561	3.0	38.5	8.0	0.7	28.3	0.0	0.0	18.8	40.0	-21.2	V	EP	
70.082	3.0	38.9	8.2	0.7	28.3	0.0	0.0	19.5	40.0	-20.5	V	EP	
169.206	3.0	34.0	11.4	1.1	27.6	0.0	0.0	18.9	43.5	-24.6	V	EP	
368.654	3.0	37.7	14.5	1.7	27.8	0.0	0.0	26.1	46.0	-19.9	V	EP	
391.455	3.0	36.8	14.9	1.7	28.0	0.0	0.0	25.4	46.0	-20.6	V	EP	
971.919	3.0	32.8	22.5	2.9	27.7	0.0	0.0	30.5	54.0	-23.5	V	EP	

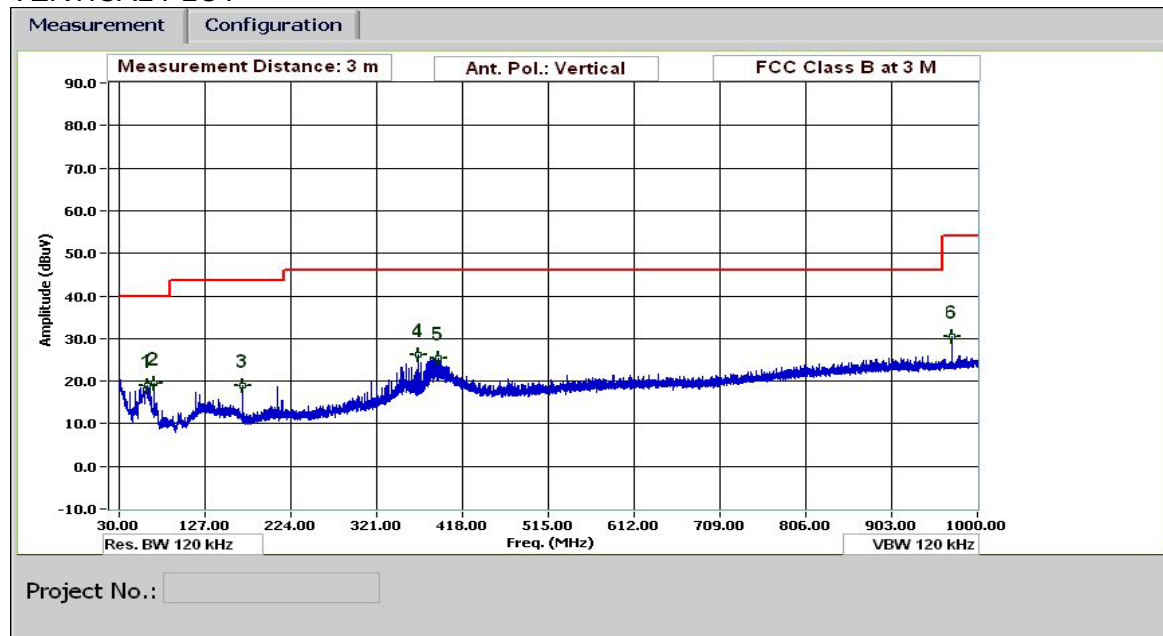
Rev. 1.27.09

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

HORIZONTAL PLOT



VERTICAL PLOT



802.11 g MODE

EUT WITH TYCO ANTENNA WITH WORST CASE AC ADAPTER

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

DATA

30-1000MHz Frequency Measurement

Compliance Certification Services, Fremont 5m Chamber

Test Engr: Chin Pang

Date: 06/24/09

Project #: 09J12662

Company: Nintendo

EUT Description: 802.11 b/g portable game machine with wireless Lan

Configuration: EUT with Tyco Antenna (PIFA), AC Adapter and Earphone

EUT M/N:

Test Target: FCC Class B

Mode Oper: TX (Worst Case)

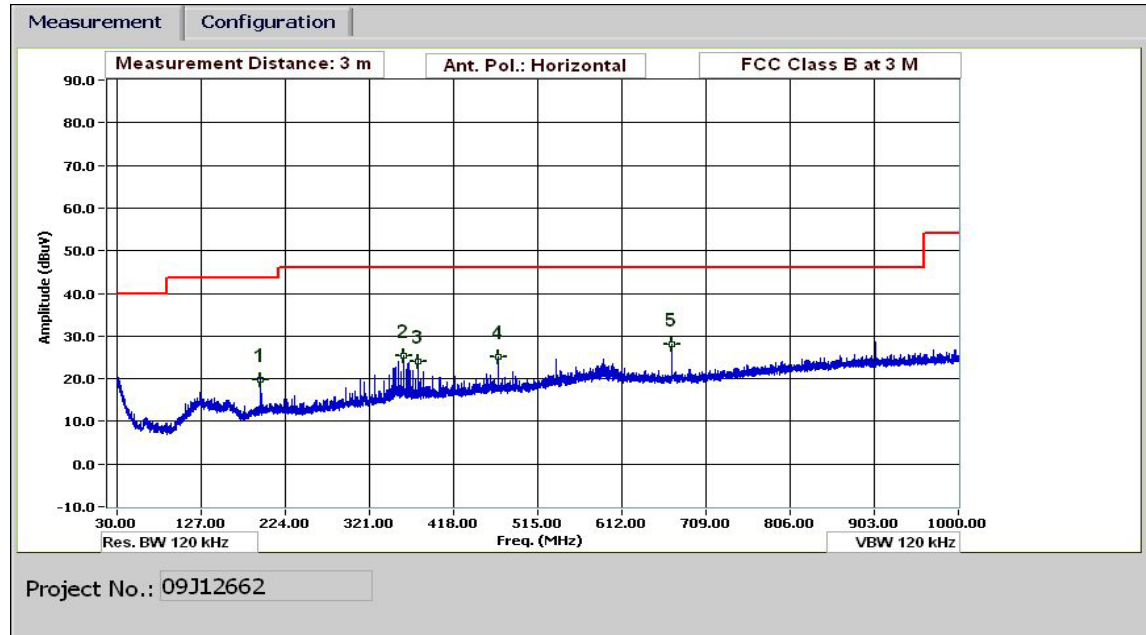
f	Measurement Frequency	Amp	Preamplifier Gain	Margin	Margin vs. Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		
Read	Analyzer Reading	Filter	Filter Insert Loss		
AF	Antenna Factor	Corr.	Calculated Field Strength		
CL	Cable Loss	Limit	Field Strength Limit		

f MHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filter dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
horiz data													
195.127	3.0	34.5	11.6	1.1	27.4	0.0	0.0	19.9	43.5	-23.6	H	EP	
360.254	3.0	37.0	14.4	1.6	27.8	0.0	0.0	25.3	46.0	-20.7	H	EP	
376.934	3.0	35.6	14.7	1.7	27.9	0.0	0.0	24.1	46.0	-21.9	H	EP	
469.218	3.0	35.4	16.3	1.9	28.4	0.0	0.0	25.2	46.0	-20.8	H	EP	
670.226	3.0	35.6	18.8	2.3	28.5	0.0	0.0	28.2	46.0	-17.8	H	EP	
64.081	3.0	38.4	8.0	0.7	28.3	0.0	0.0	18.8	40.0	-21.2	V	EP	
190.447	3.0	34.3	11.3	1.1	27.4	0.0	0.0	19.3	43.5	-24.2	V	EP	
360.254	3.0	36.9	14.4	1.6	27.8	0.0	0.0	25.1	46.0	-20.9	V	EP	
365.894	3.0	36.2	14.5	1.7	27.8	0.0	0.0	24.5	46.0	-21.5	V	EP	
536.301	3.0	32.6	17.4	2.1	28.6	0.0	0.0	23.5	46.0	-22.5	V	EP	

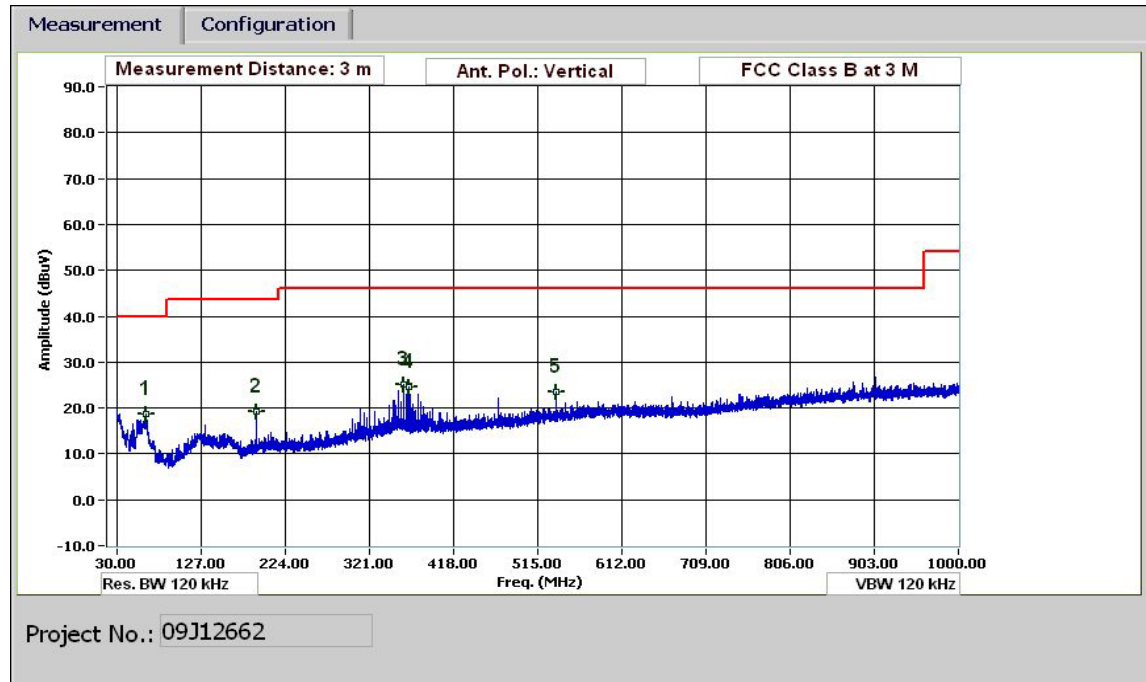
Rev. 1.27.09

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

HORIZONTAL PLOT



VERTICAL PLOT



9. MAXIMUM PERMISSIBLE EXPOSURE

FCC RULES

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

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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

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

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

f = frequency in MHz

* = Plane-wave equivalent power density

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

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

IC RULES

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

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

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

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

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

EQUATIONS

Power density is given by:

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

where

S = Power density in W/m²

EIRP = Equivalent Isotropic Radiated Power in W

D = Separation distance in m

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

Distance is given by:

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

where

D = Separation distance in m

EIRP = Equivalent Isotropic Radiated Power in W

S = Power density in W/m²

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

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

where

P_x = Power of transmitter x

G_x = Numeric gain of antenna x

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

LIMITS

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

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

RESULTS

Band	Mode	Separation Distance (m)	Output Power (dBm)	Antenna Gain (dBi)	IC Power Density (W/m^2)	FCC Power Density (mW/cm^2)
2.4 GHz	802.11	0.20	2.47	0.88	0.00	0.000
2.4GHz	b/g	0.20	13.27	0.88	0.05	0.005

10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

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

TEST PROCEDURE

ANSI C63.4

RESULTS

6 WORST EMISSIONS

TABUCHI AC ADAPTER)

CONDUCTED EMISSIONS DATA (115VAC 60Hz) (Tabuchi-1)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.22	45.45	--	35.07	0.00	62.78	52.78	-17.33	-17.71	L1
1.52	47.51	--	28.94	0.00	56.00	46.00	-8.49	-17.06	L1
9.30	49.15	--	21.00	0.00	60.00	50.00	-10.85	-29.00	L1
0.22	49.80	--	44.44	0.00	62.74	52.74	-12.94	-8.30	L2
1.32	45.46	--	29.62	0.00	56.00	46.00	-10.54	-16.38	L2
8.98	52.42	--	33.07	0.00	60.00	50.00	-7.58	-16.93	L2
6 Worst Data									

MITSUMI AC ADAPTER)

CONDUCTED EMISSIONS DATA (115VAC 60Hz) (Mitsumi-2)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.25	46.91	--	37.67	0.00	61.82	51.82	-14.91	-14.15	L1
1.00	40.85	--	25.55	0.00	56.00	46.00	-15.15	-20.45	L1
2.50	41.56	--	30.43	0.00	56.00	46.00	-14.44	-15.57	L1
0.25	49.15	--	34.26	0.00	61.72	51.72	-12.57	-17.46	L2
1.00	43.82	--	33.11	0.00	56.00	46.00	-12.18	-12.89	L2
2.50	40.41	--	25.67	0.00	56.00	46.00	-15.59	-20.33	L2
6 Worst Data									

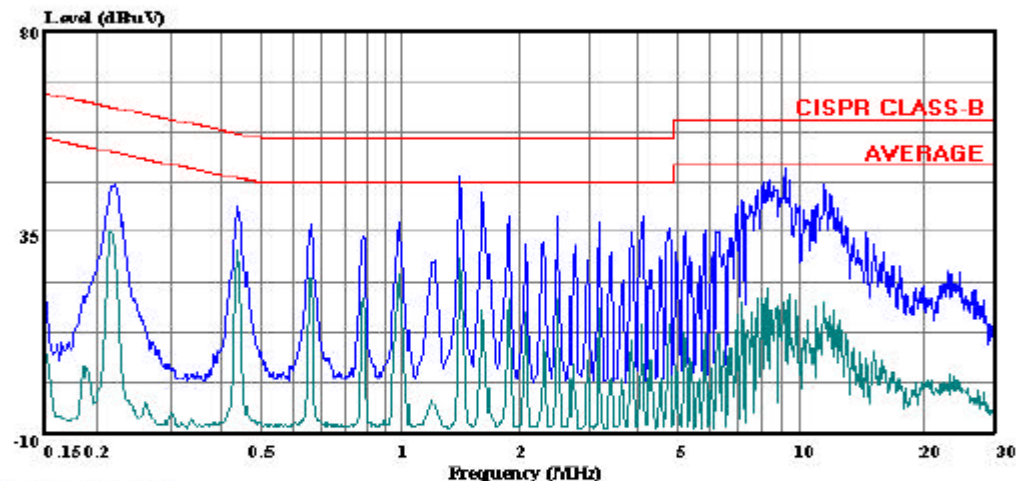
LINE 1 RESULTS

TABUCHI AC ADAPTER



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

Data#: 35 File#: 09J12663 LC.EMI Date: 06-22-2009 Time: 15:40:31



(Line Conduction)

Trace: 33

Ref Trace:

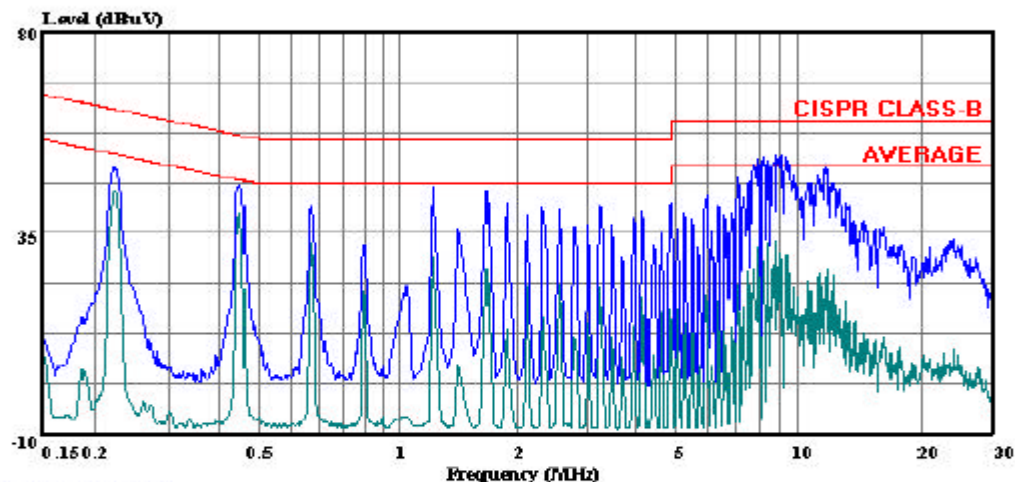
Condition: CISPR CLASS-B
Test Operator: : Oliver Su
Project #: : 09J12662
Company: : Nintendo
EUT Description: : 802.11bg portable game machine with wireless Lan
Mode: : Test mode TX
Target: : CISPR Class B
Voltage: : 115VAC, 60H
: L1: Peak (Blue) , Average (Green)
: Tabuchi-1 Adapter

LINE 2 RESULTS



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

Data#: 49 File#: 09J12663 LC.BMI Date: 06-22-2009 Time: 16:12:08



(Line Conduction)

Trace: 47

Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Oliver Su
Project #: : 09J12662
Company: : Nintendo
BUT Description: : 802.11bg portable game machine with wireless Lan
Mode: : Test mode TX
Target: : CISPR Class B
Voltage: : 115VAC, 60H
: L2: Peak (Blue) , Average (Green)
: Tabuchi-1 Adapter

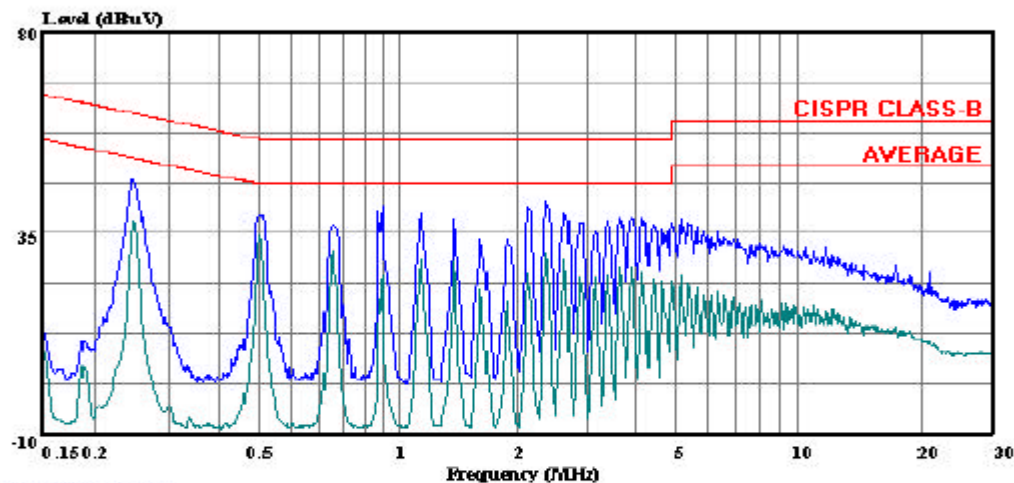
LINE 1 RESULTS

MITSUMI AC ADAPTER



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

Data#: 35 File#: 09J12662 LC.EMI Date: 06-22-2009 Time: 17:12:03



(Line Conduction)

Trace: 33

Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Oliver Su
Project #: : 09J12662
Company: : Nintendo
EUT Description: : 802.11bg portable game machine with wireless Lan
Mode: : Test mode TX
Target: : CISPR Class B
Voltage: : 115VAC, 60Hz
: L1: Peak (Blue) , Average (Green)
: AC Adapter: Mitsumi -2

LINE 2 RESULTS

