



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

CERTIFICATION TEST REPORT

FOR

HANDHELD TERMINAL

MODEL NUMBER: IT-300-35E

**FCC ID: BBQIT300
IC: 2388F-IT300**

REPORT NUMBER: 10J13537-6, Revision A

ISSUE DATE: APRIL 7, 2011

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	02/23/11	Initial Issue	F. Ibrahim
A	04/07/11	Added Headphone to 5.5 Worst-configuration, 5.6 Support equipment list and Test Setup, and replaced the plot at Page 66.	F. Ibrahim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: CASIO COMPUTER CO., LTD
6-2 HON-MACHI 1-CHOME
SHIBUYA-KU
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EUT DESCRIPTION: HANDHELD TERMINAL

MODEL: IT-300-35E

SERIAL NUMBER: 053 / 065 /048

DATE TESTED: DECEMBER 30, 2010 - JANUARY 19, 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:

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth and 802.11b/g equipped Handheld Terminal

The radio module is manufactured by Universal Scientific Industrial Corp.

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	16.11	40.83
2412 - 2462	802.11g	20.91	123.31

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a dipole antenna, with a maximum gain of 1.94 dBi.

5.4. SOFTWARE AND FIRMWARE

The operating system installed in the handheld terminals during testing was Windows Mobile.

The test utility software used to operate the wi-fi module during testing was SSINTEI.EXE.

5.5. WORST-CASE CONFIGURATION AND MODE

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

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 EUT also has been evaluated at X, Y, Z-orientations and the worst among them with AC/DC Adapter, USB and Charging Unit and headphone. The highest measured emission was determined the EUT with AC/DC Adapter, USB and Charging Unit and headphone configuration

5.6. DESCRIPTION OF TEST SETUP

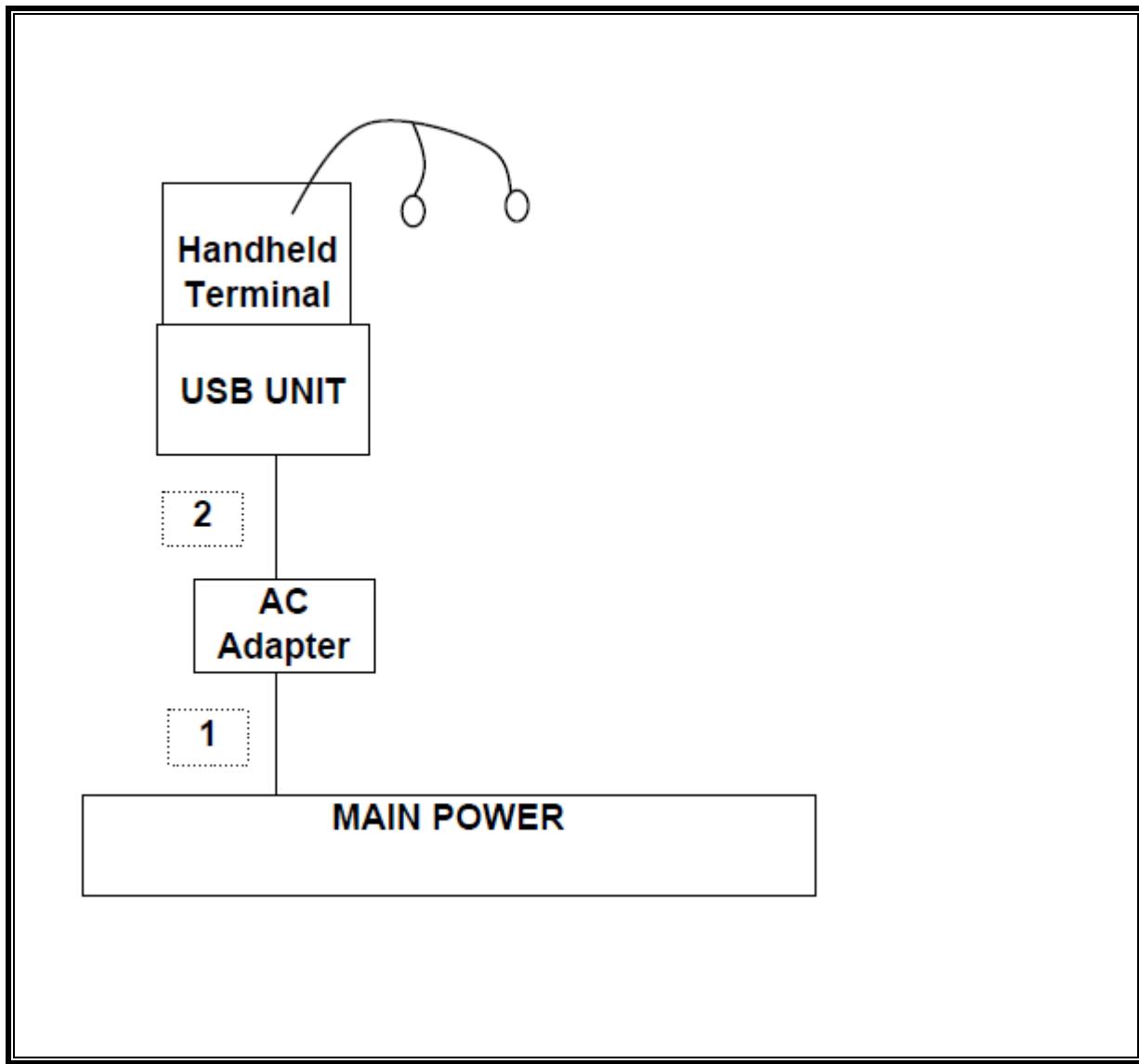
SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST			
Description	Manufacturer	Model	Serial Number
AC/DC Adapter	Casio	AD-S15050B	N/A
USB and Charging Unit	Casio	HA-J65US	N/A
Micro SD	San Disk	09228042950J1	N/A
Headphone	Rastabana	N/A	N/A

I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC Input	1	US115V	Un-Shielded	1.9m	
2	DC Input (USB Unit)	1	Mini-Jack	Shielded	1.85m	Ferrite at USB unit end

TEST SETUP



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Antenna, Horn, 18 GHz	EMCO	3115	C00945	06/29/11
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	07/14/11
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	03/05/11
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07/10/11
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	07/10/11
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/10/11
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	N02481	11/10/11
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	05/06/11
Peak Power Meter	Boonton	4541	C01186	03/01/11

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.

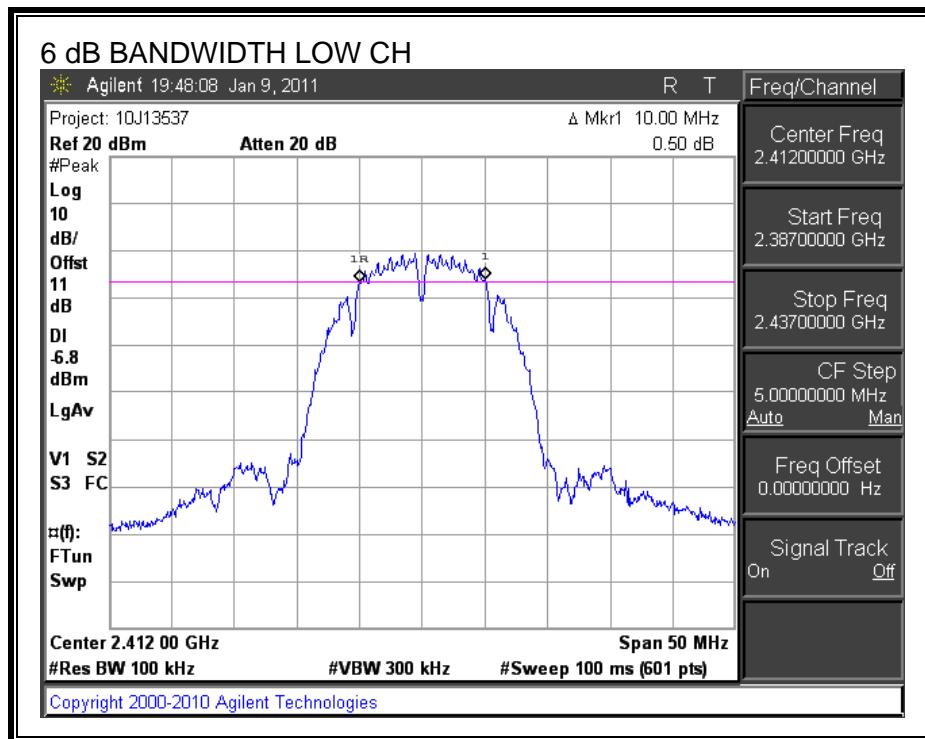
TEST PROCEDURE

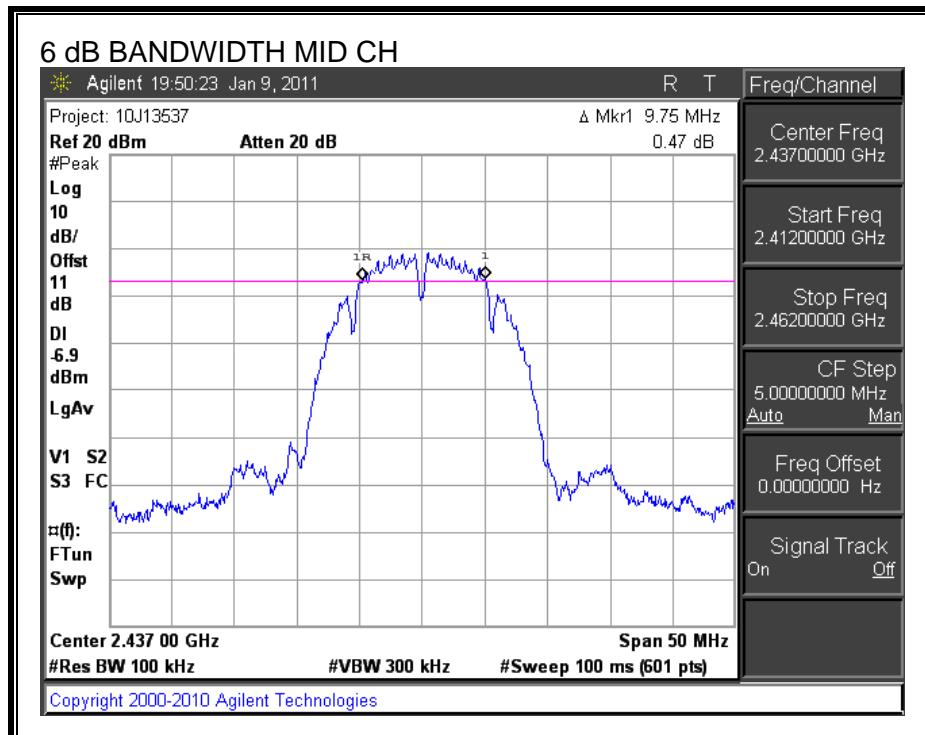
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

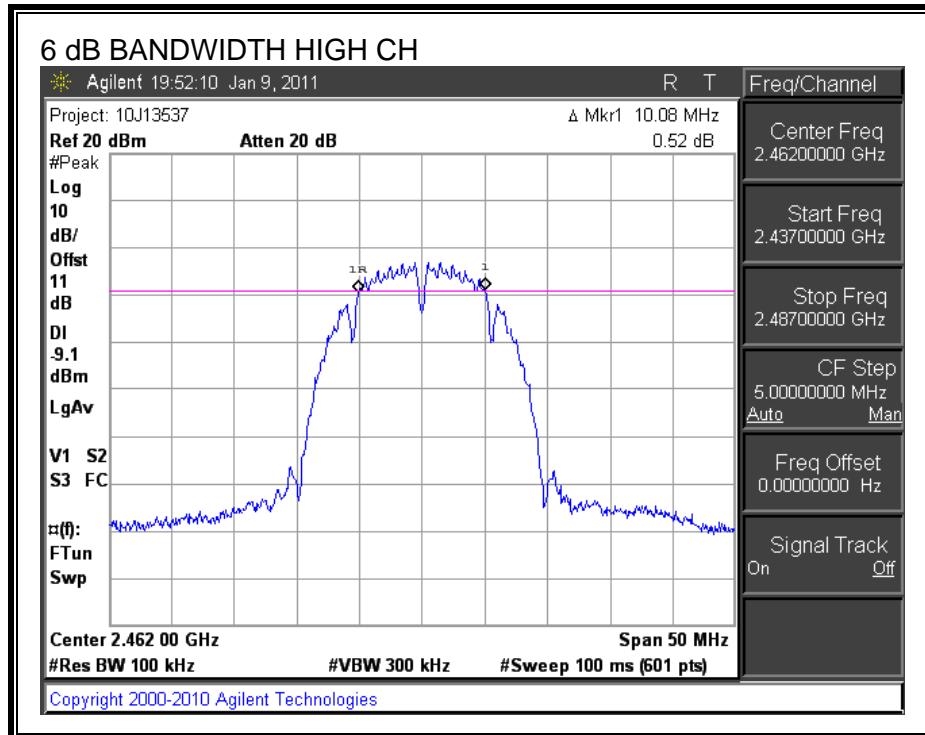
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	10.00	0.5
Middle	2437	9.75	0.5
High	2462	10.08	0.5

6 dB BANDWIDTH







7.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

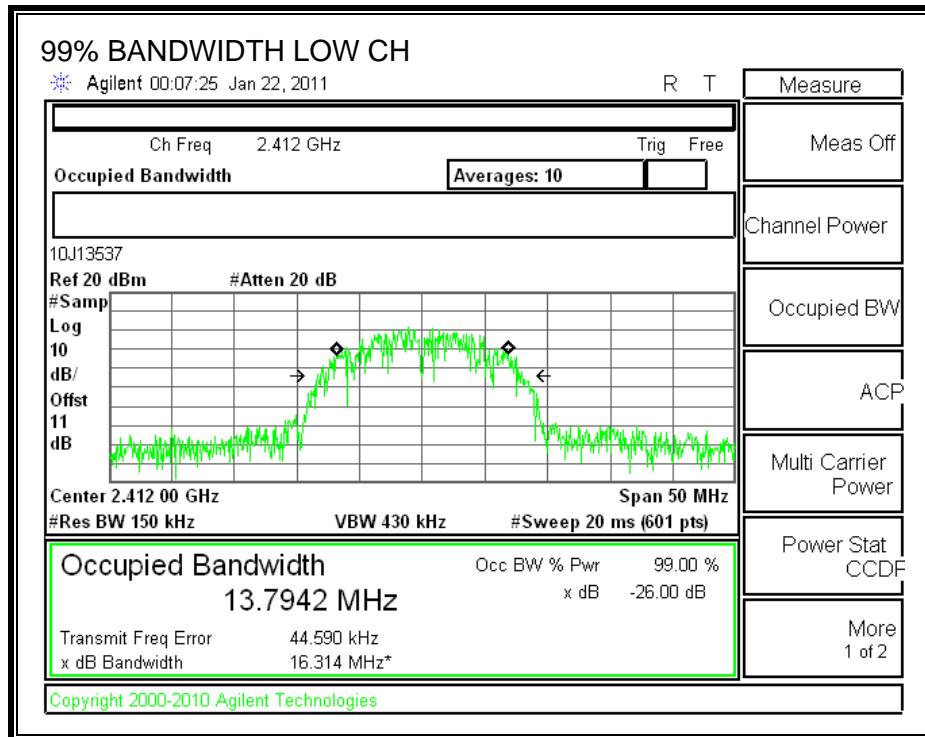
TEST PROCEDURE

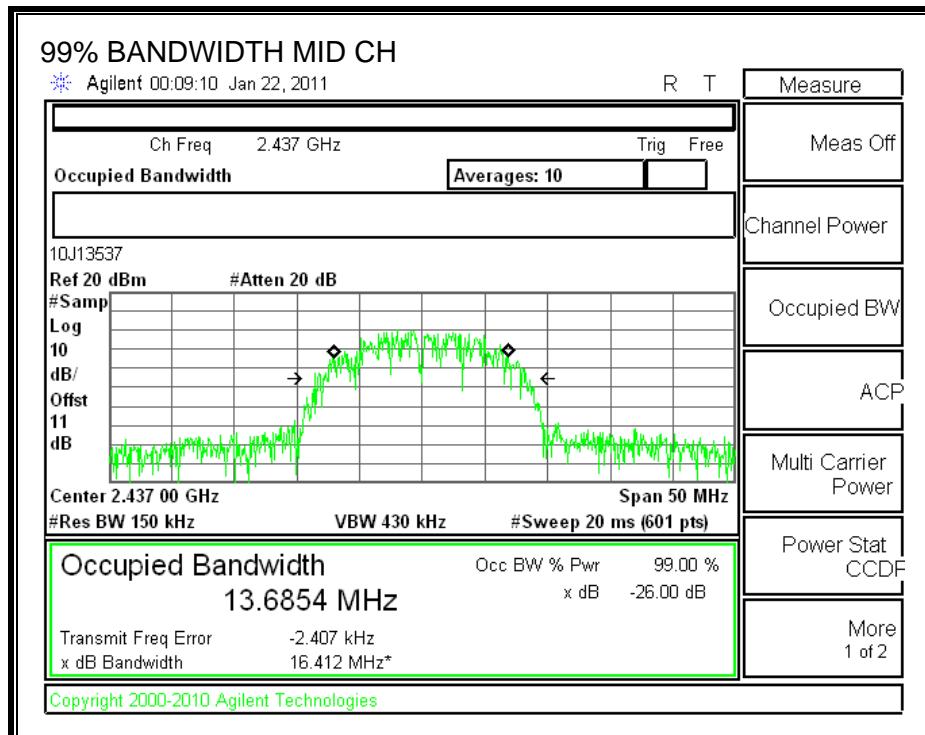
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

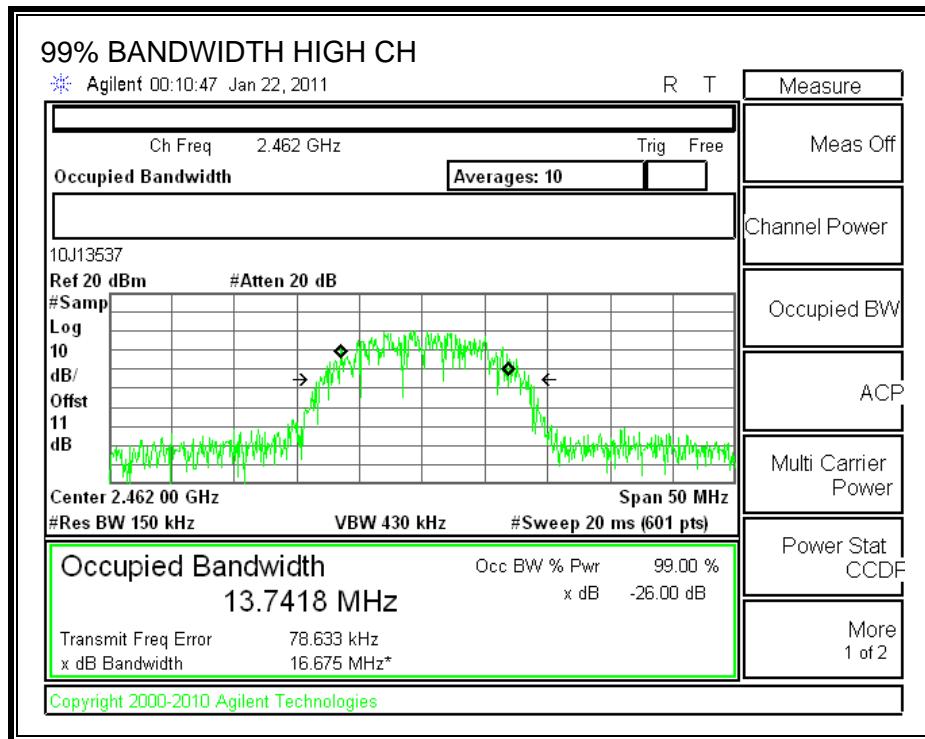
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	13.7942
Middle	2437	13.6854
High	2462	13.7418

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 by power meter in peak mode.

RESULTS

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	16.11	30	-14.19
Middle	2437	15.84	30	-14.46
High	2462	14.45	30	-15.85

7.1.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter in average mode.

RESULTS

The cable assembly insertion loss of 10 dB (including 10 dB pad and 1.3 dB cable provided) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Peak Power (dBm)
Low	2412	12.81
Middle	2437	12.20
High	2462	11.58

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.

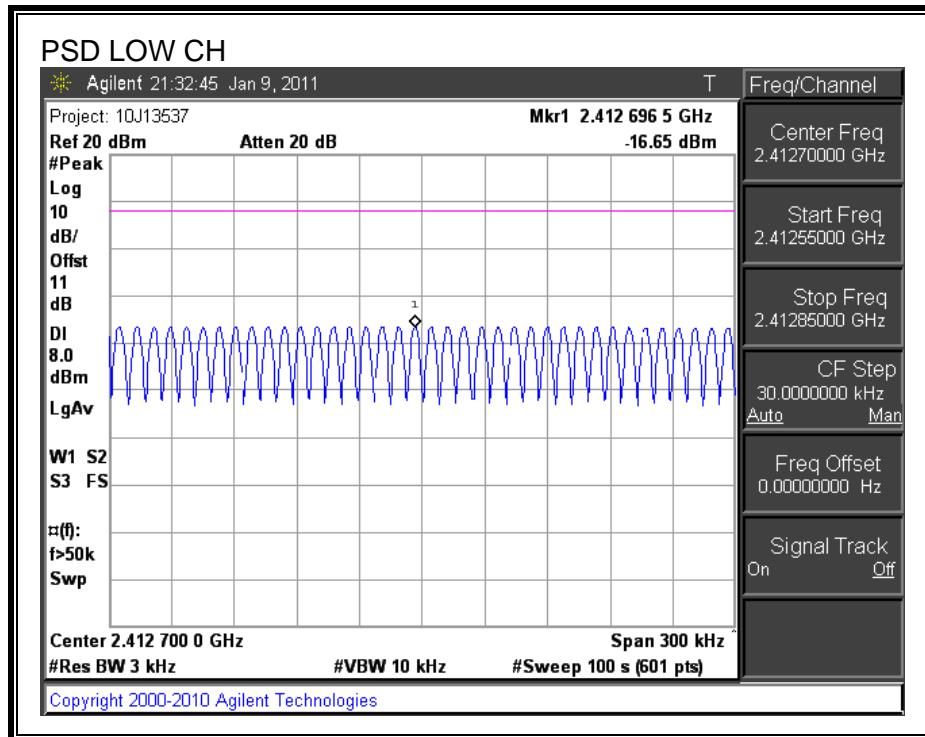
TEST PROCEDURE

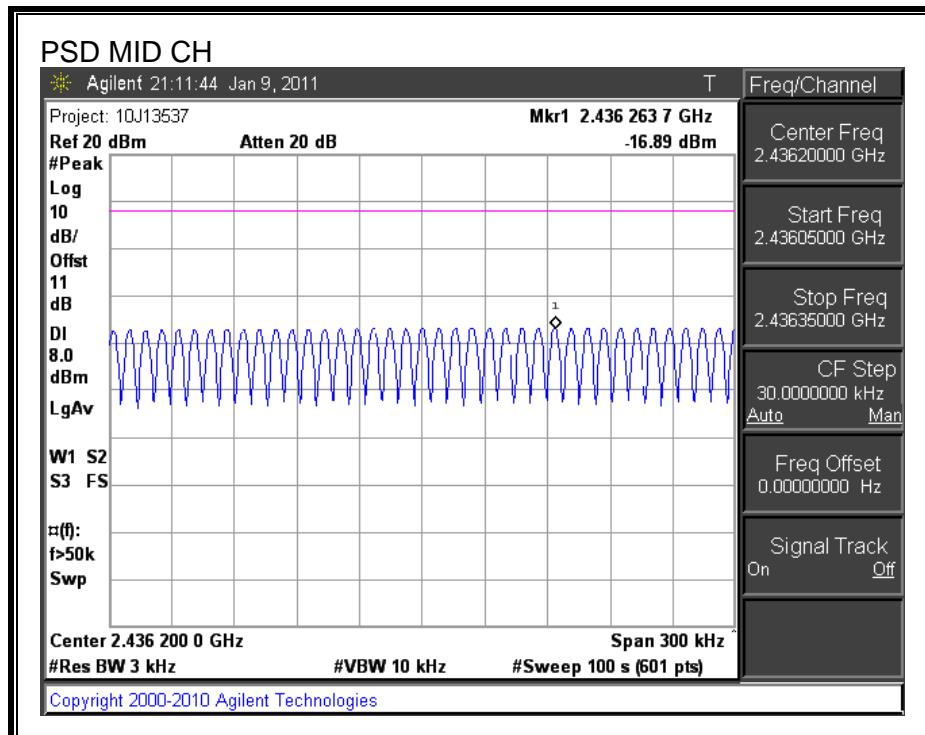
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

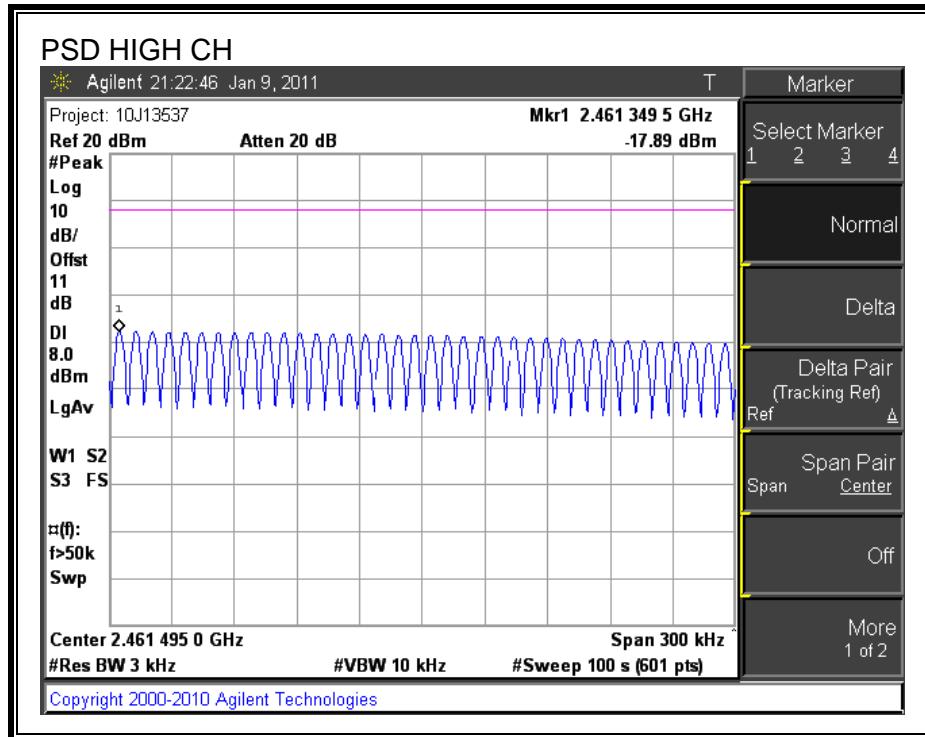
RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-16.65	8	-24.65
Middle	2437	-16.89	8	-24.89
High	2462	-17.89	8	-25.89

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.

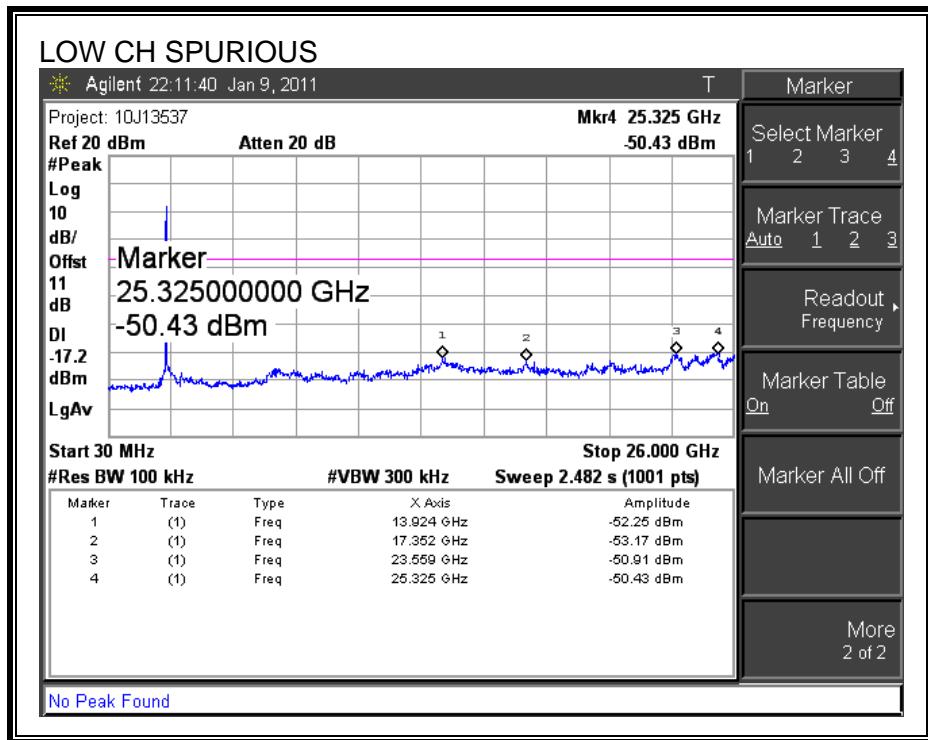
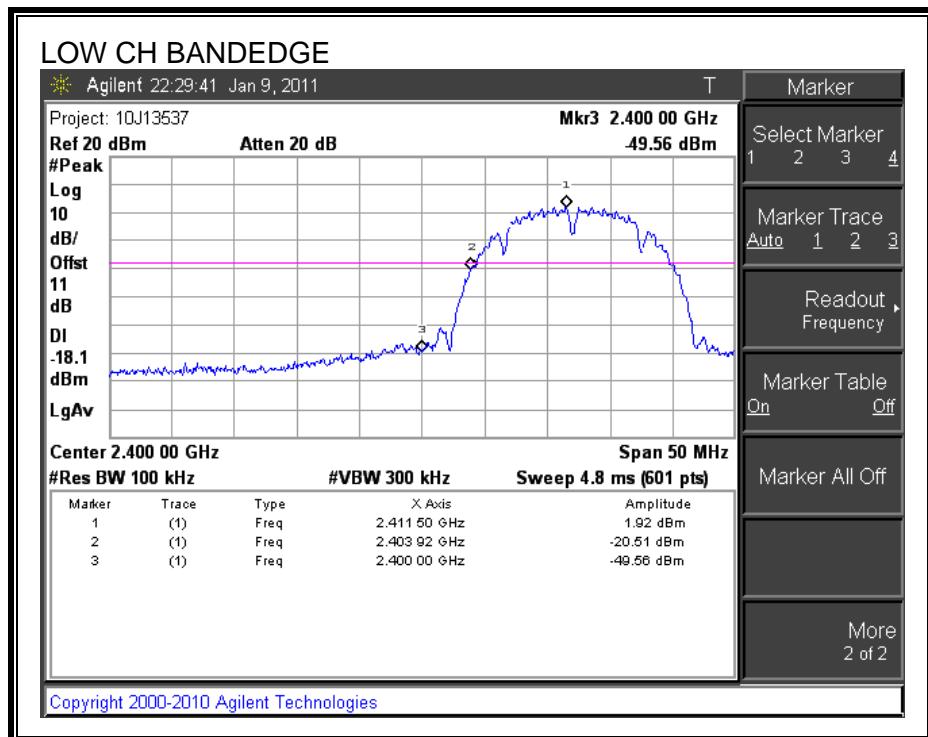
TEST PROCEDURE

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.

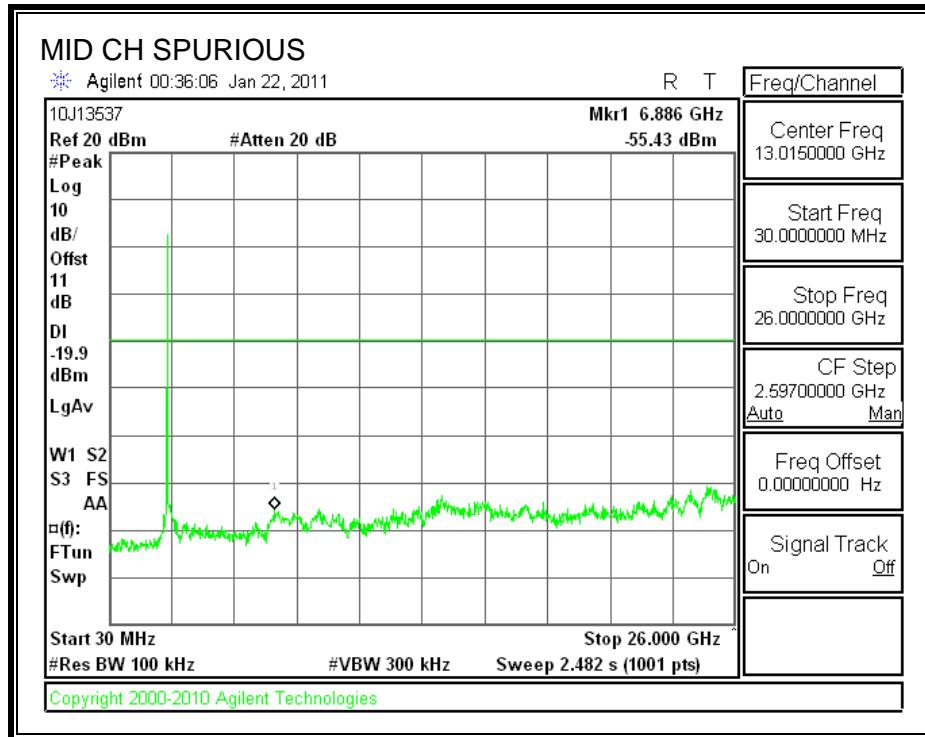
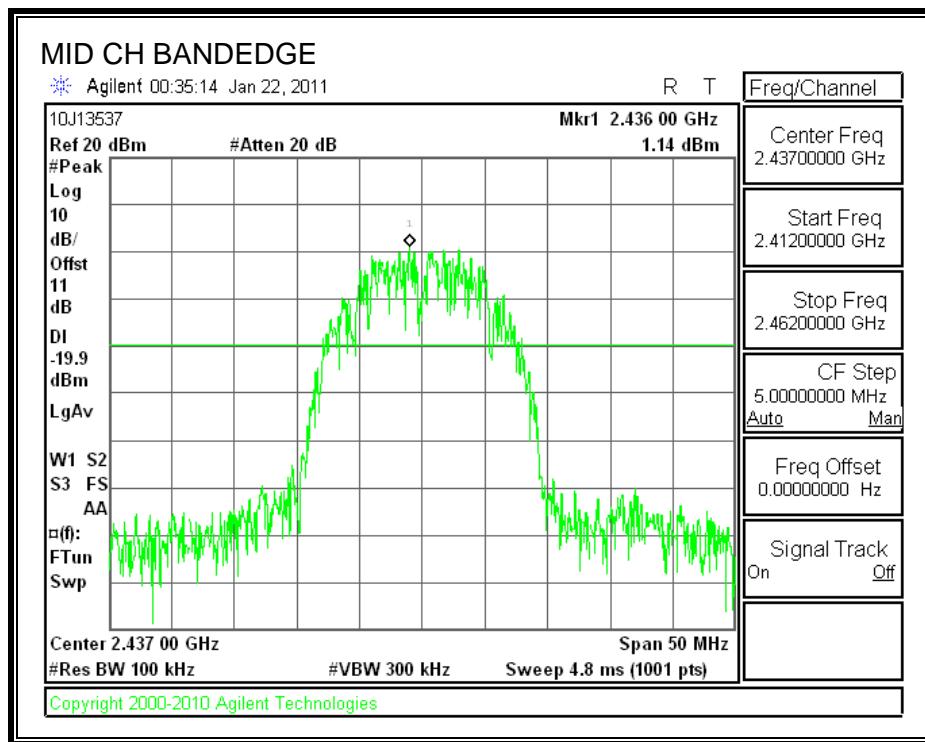
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

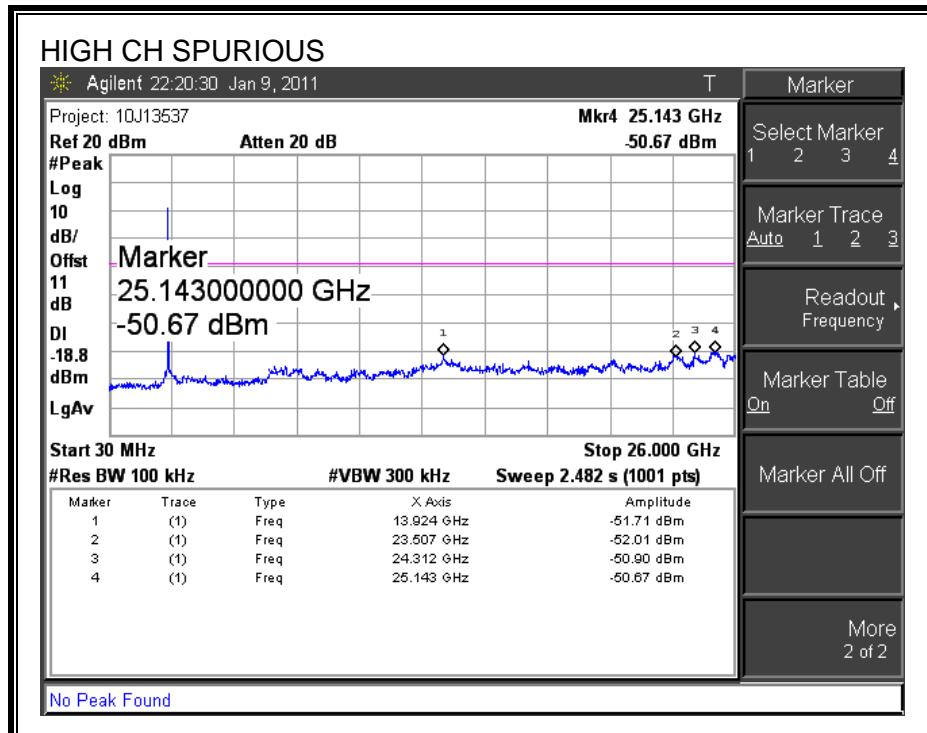
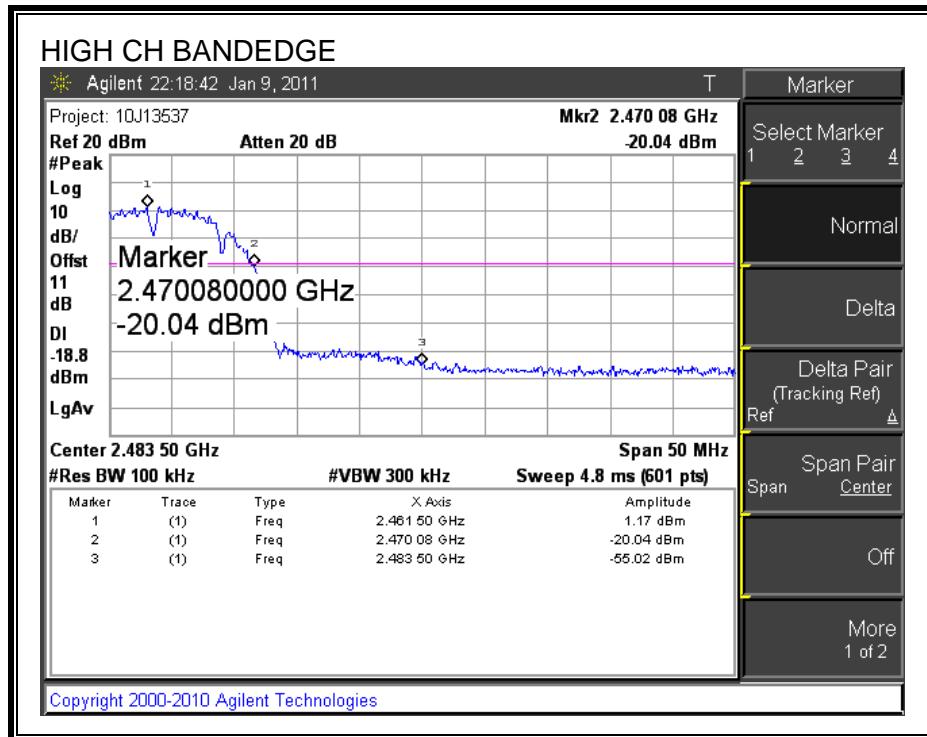
SPURIOUS EMISSIONS, LOW CHANNEL



SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL



7.2. 802.11g 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.

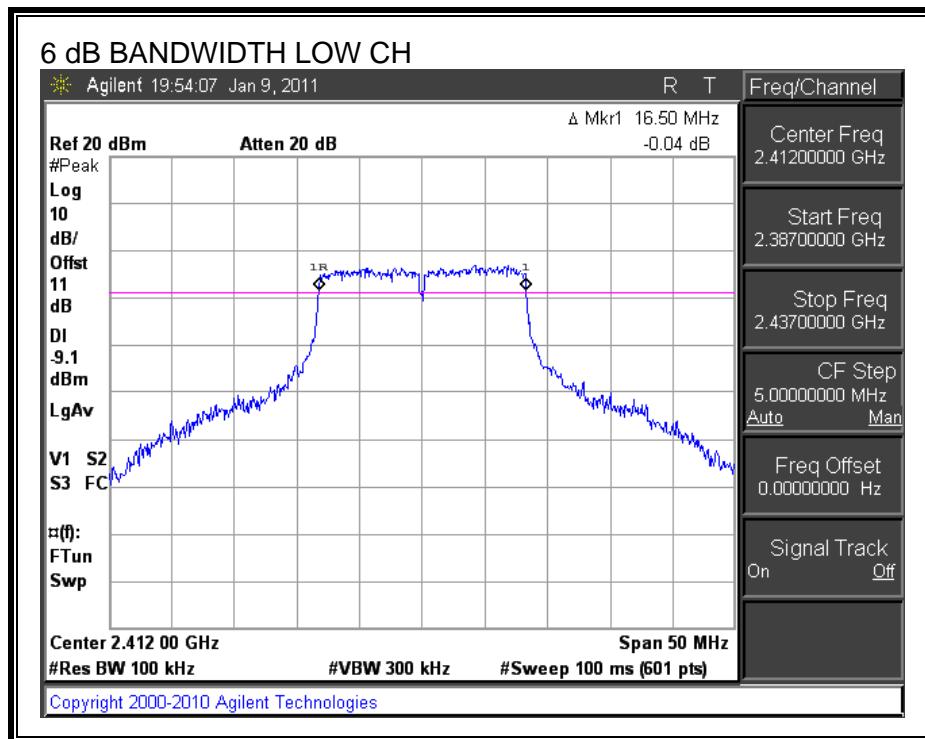
TEST PROCEDURE

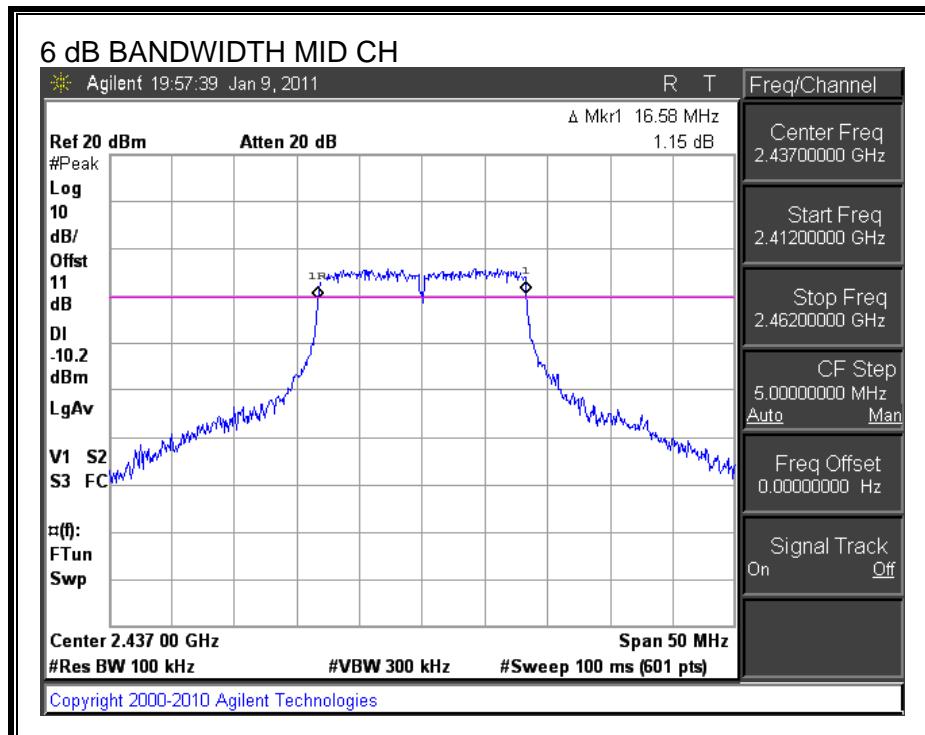
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

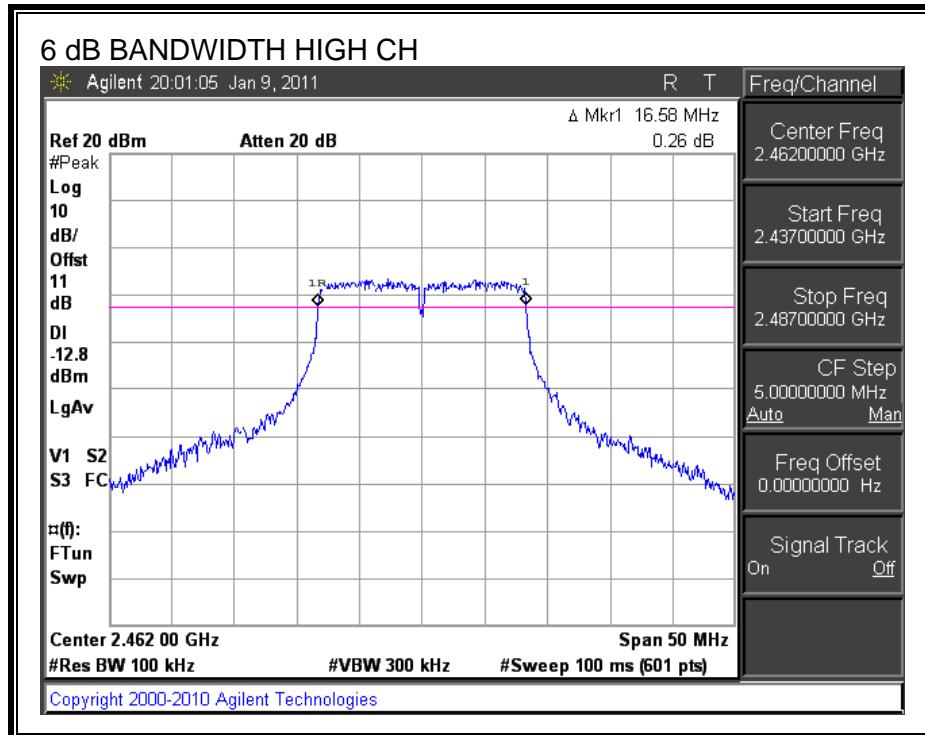
RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	Minimum Limit (kHz)
Low	2412	16500	500
Middle	2437	16580	500
High	2462	16580	500

6 dB BANDWIDTH







7.2.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

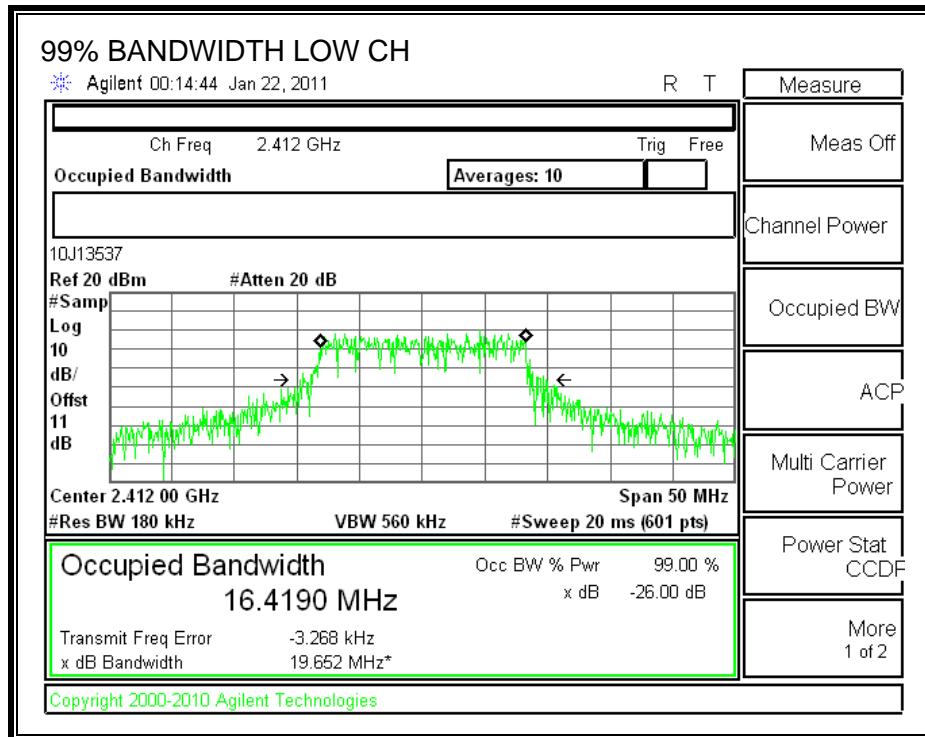
TEST PROCEDURE

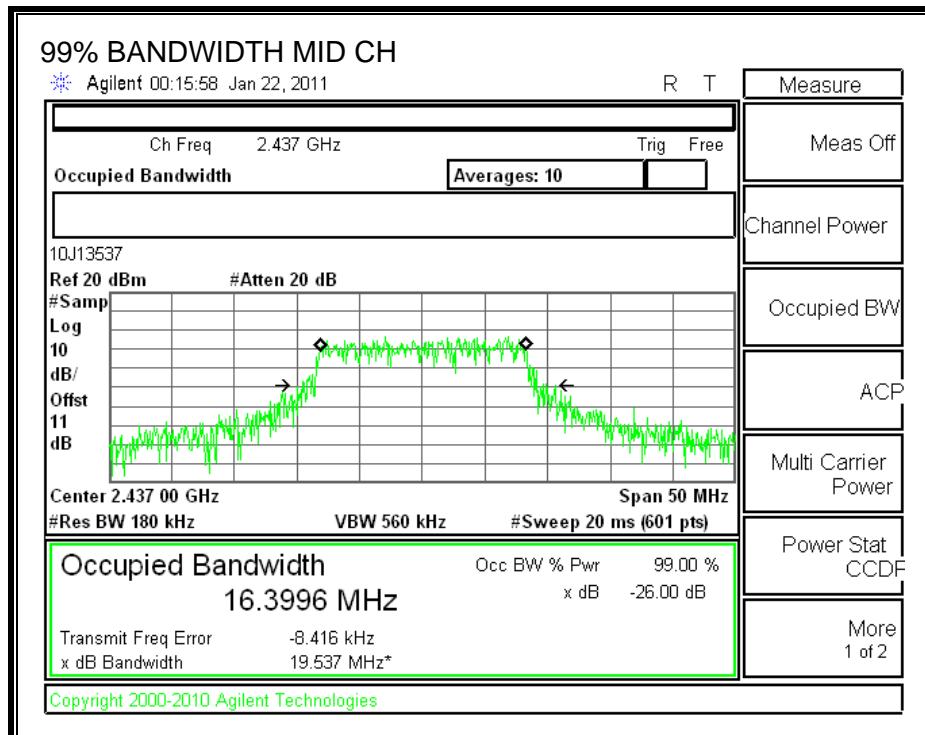
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

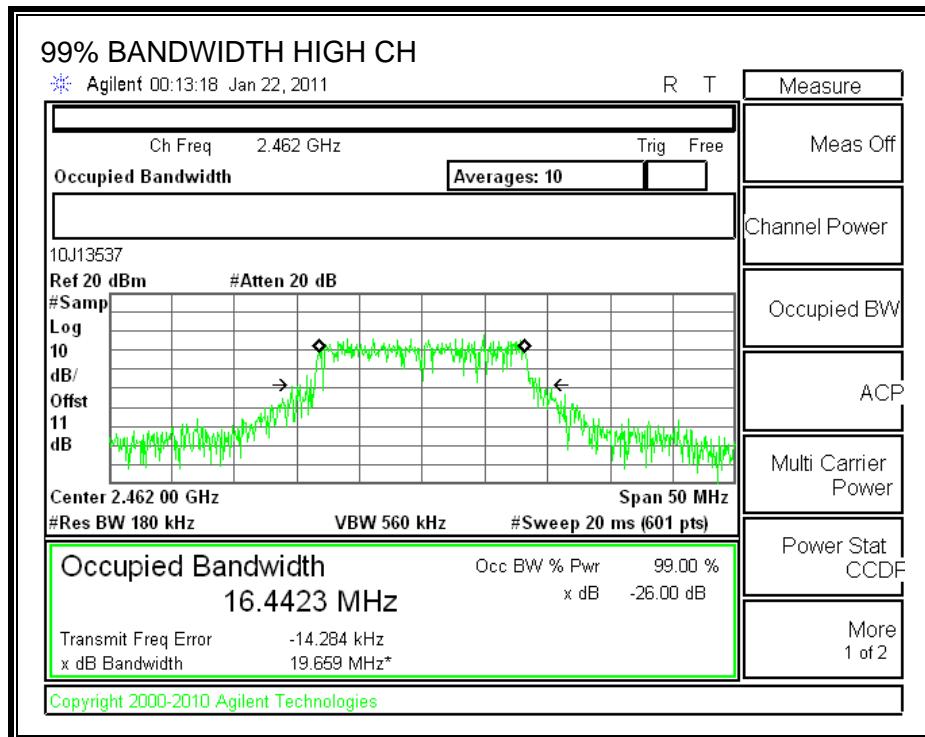
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.419
Middle	2437	16.3996
High	2462	16.4423

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 by power meter in peak mode.

RESULTS

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Margin (dB)
Low	2412	20.91	30	-9.09
Middle	2437	19.87	30	-10.13
High	2462	19.00	30	-11.00

Note: Measurement includes offset of 10 dB attenuator and 1.3 dB for cable/connector provided.

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 11.3 dB (including 10 dB pad and 1.3 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	2412	12.37
Middle	2437	9.49
High	2462	9.01

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.

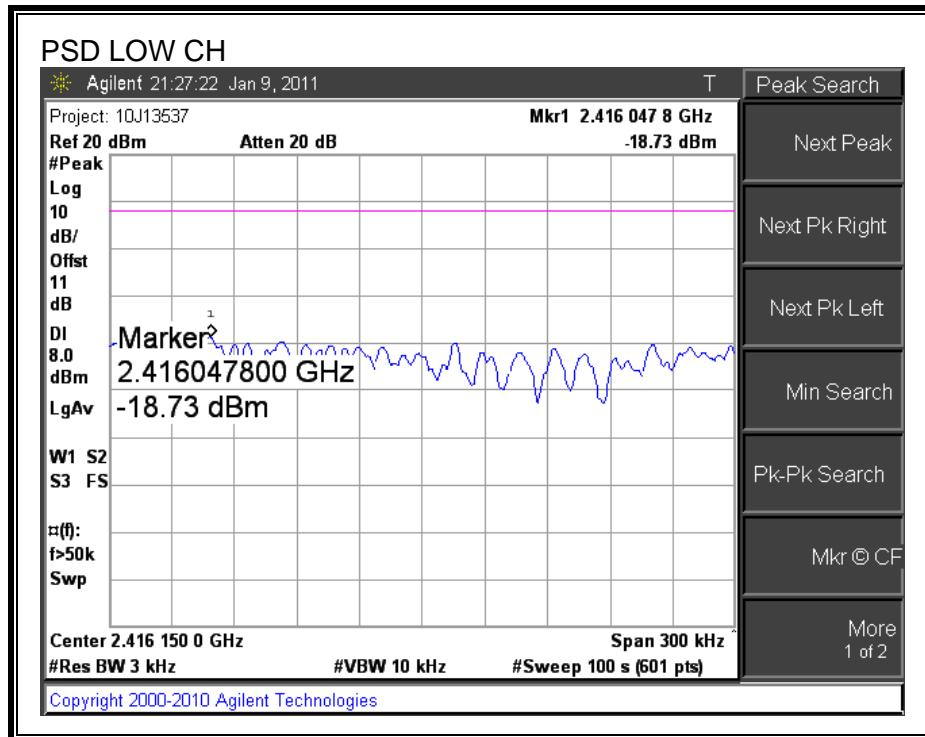
TEST PROCEDURE

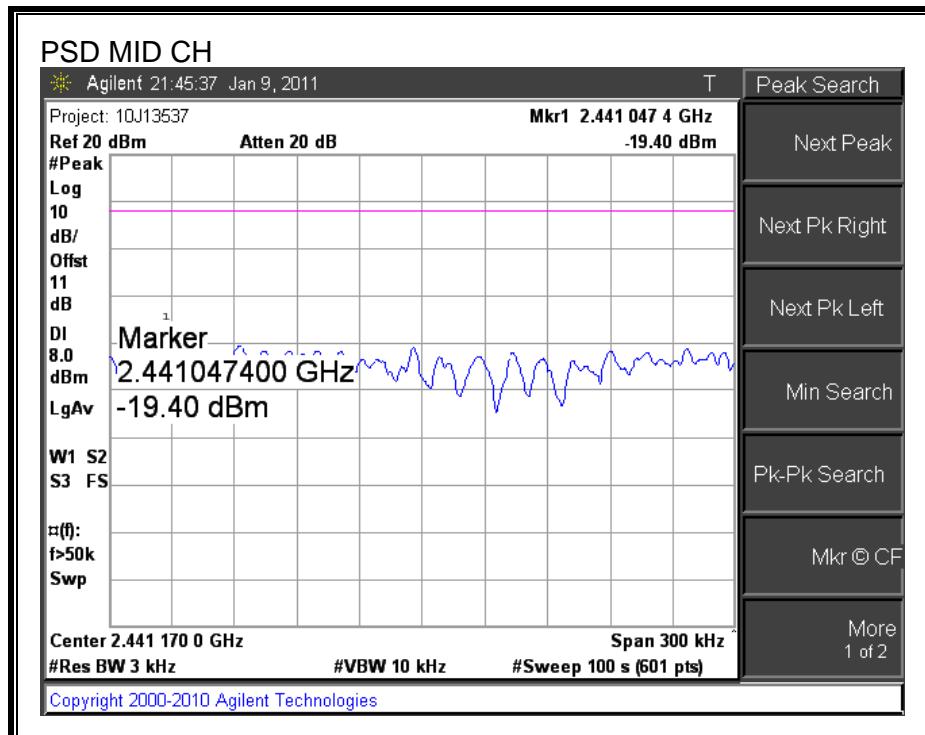
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

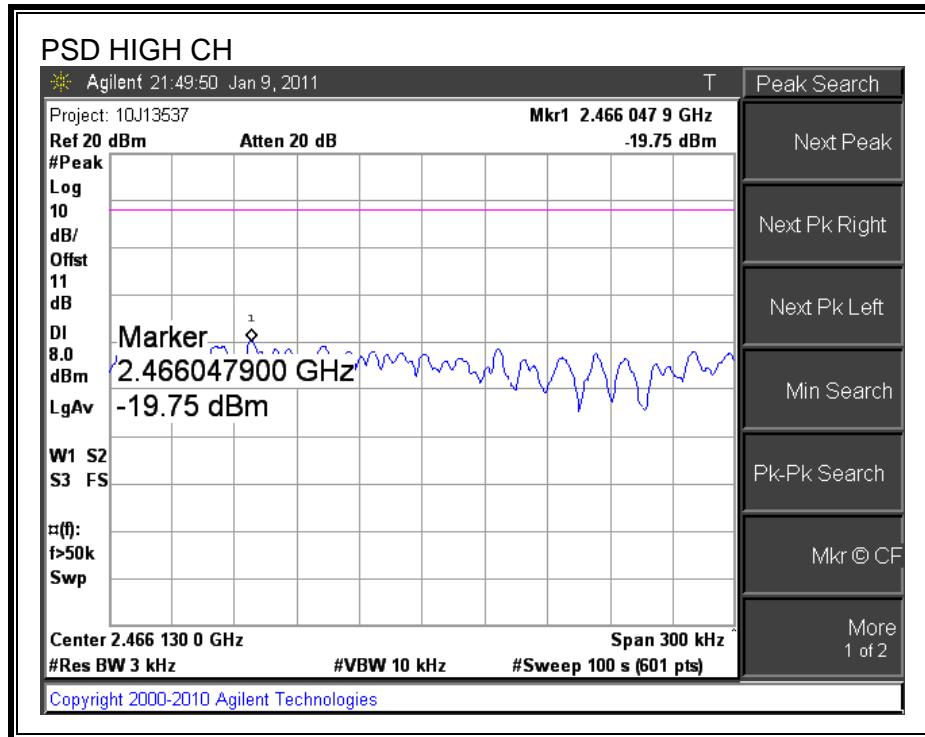
RESULTS

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-18.73	8	-26.73
Middle	2437	-19.40	8	-27.40
High	2462	-19.75	8	-27.75

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.

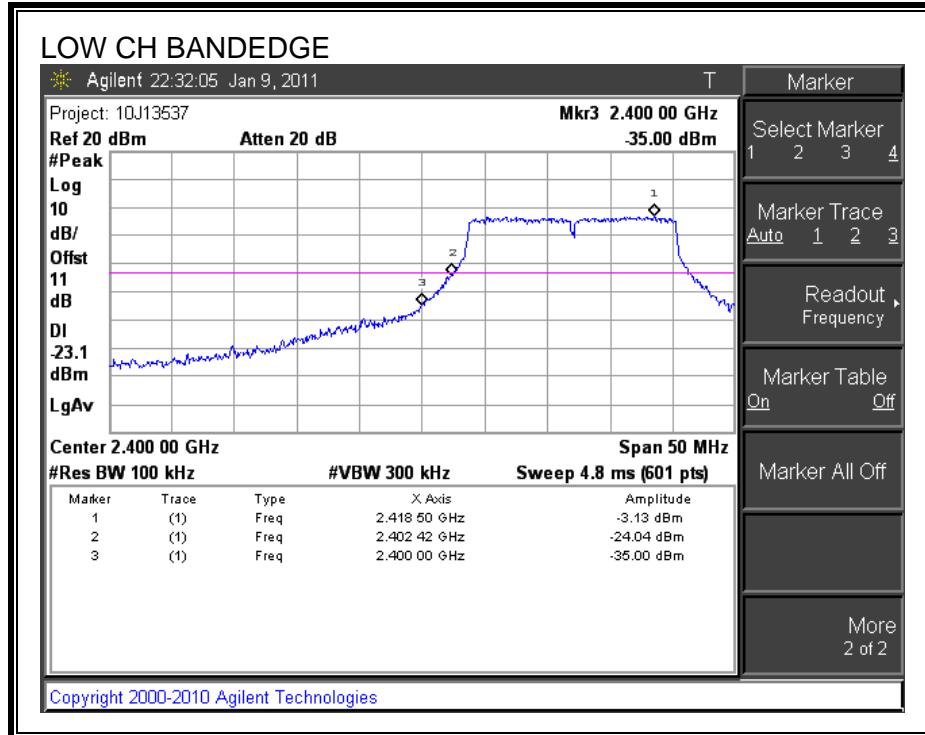
TEST PROCEDURE

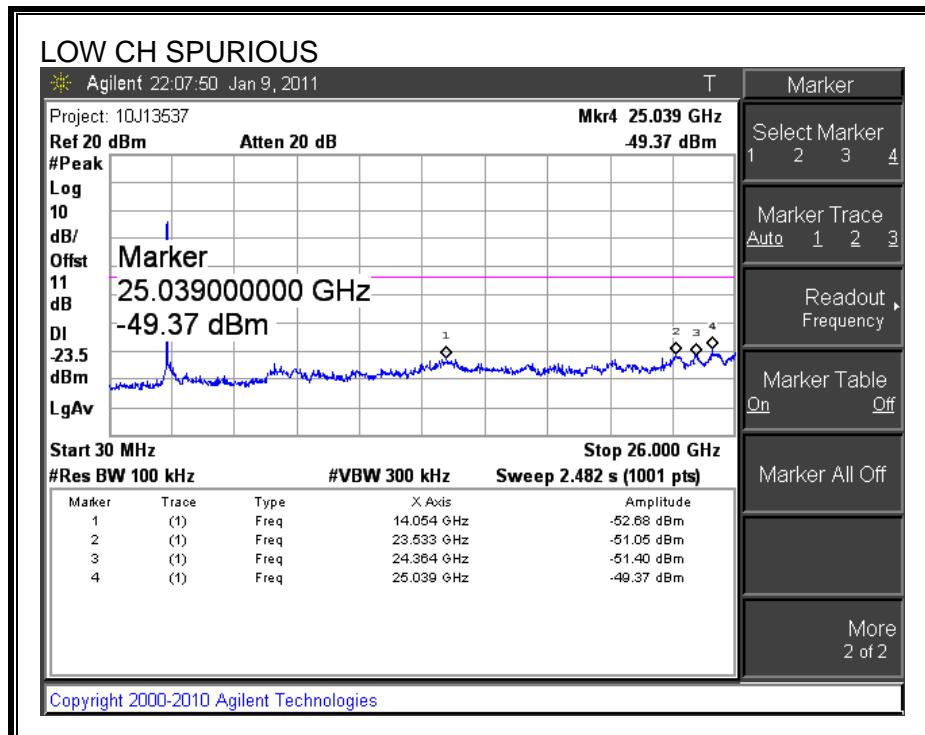
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

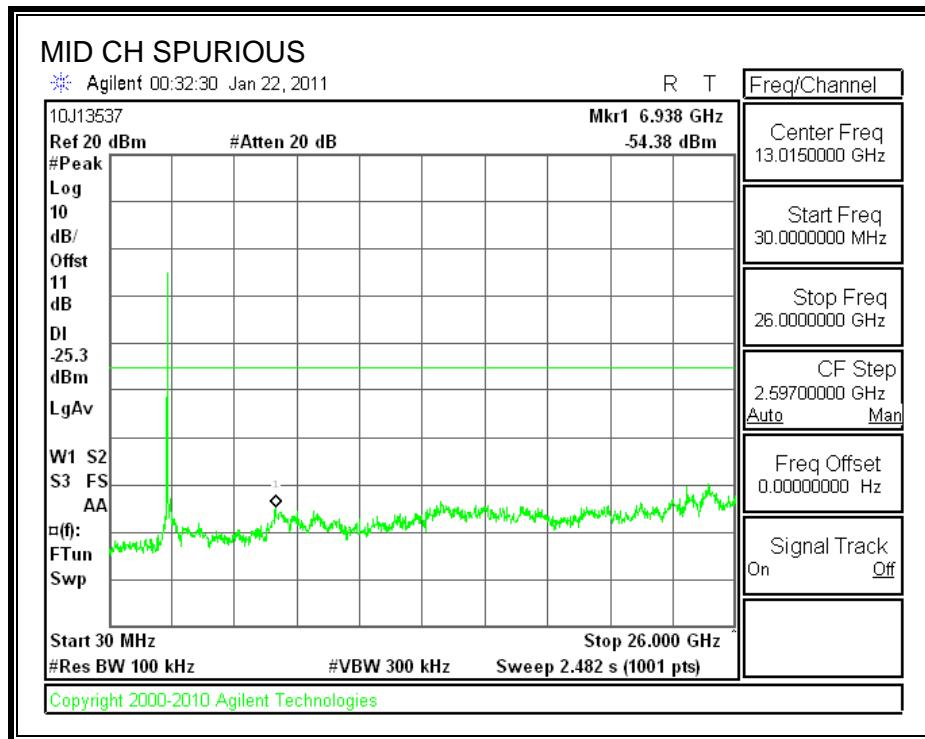
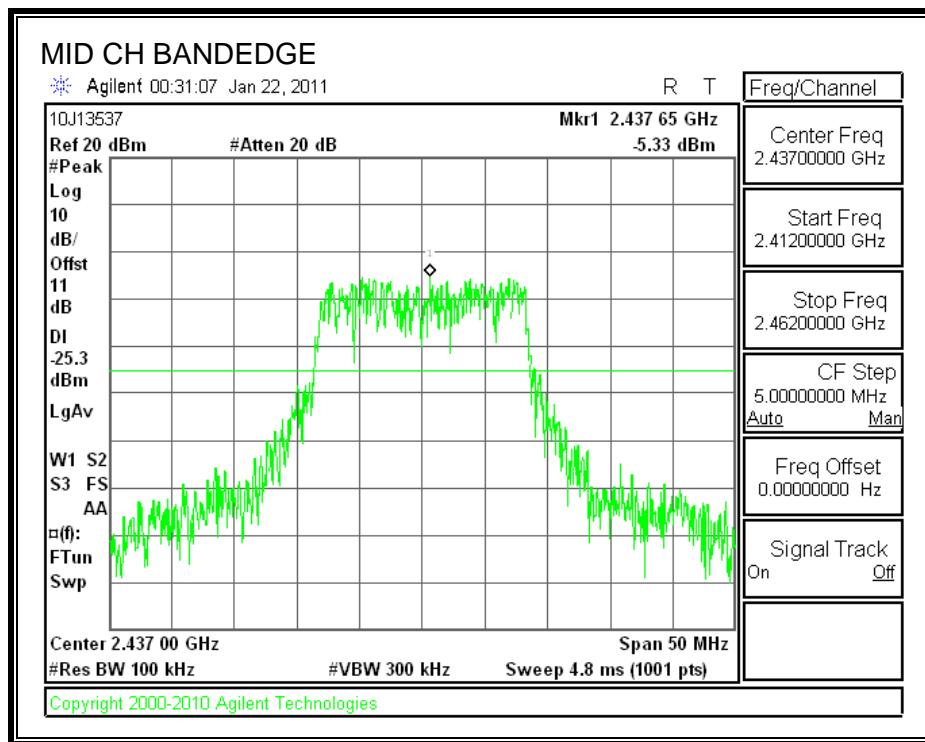
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL

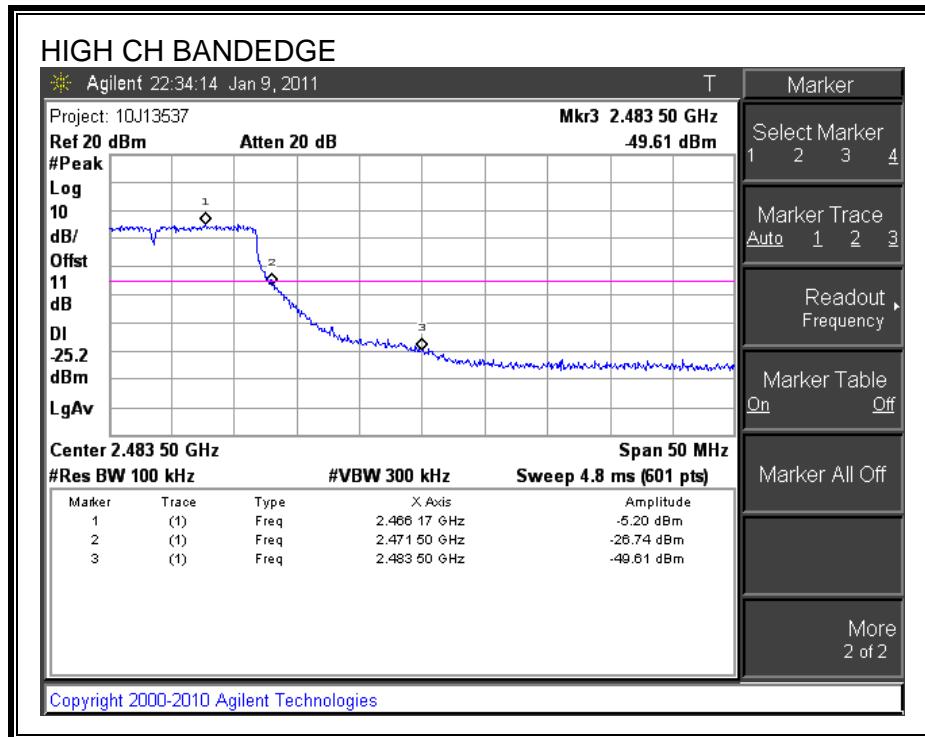


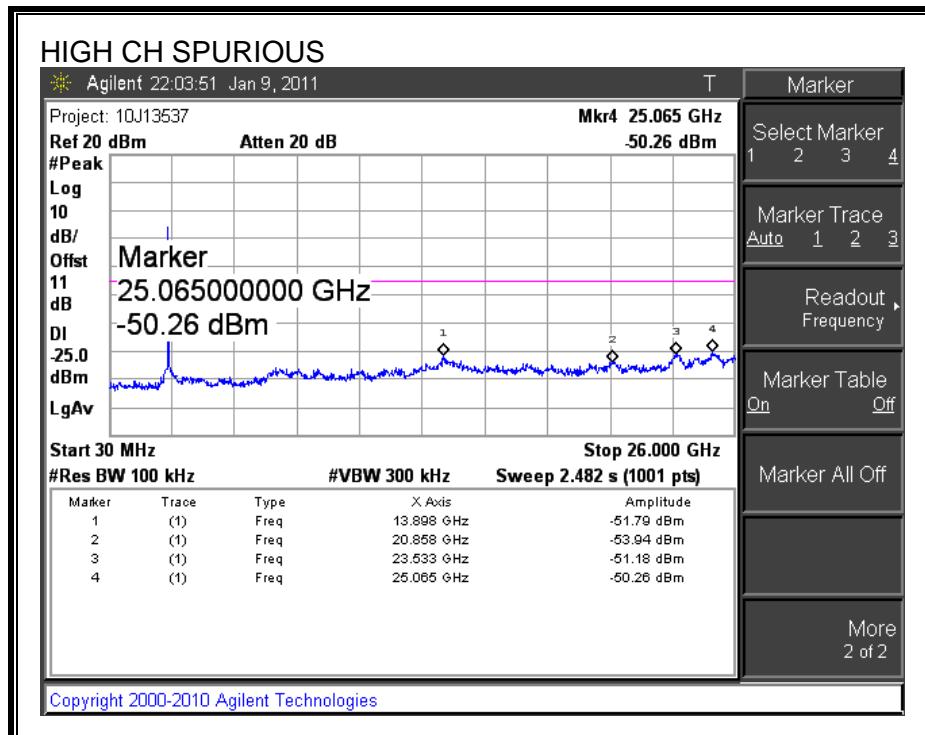


SPURIOUS EMISSIONS, MID CHANNEL



SPURIOUS EMISSIONS, HIGH CHANNEL





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.

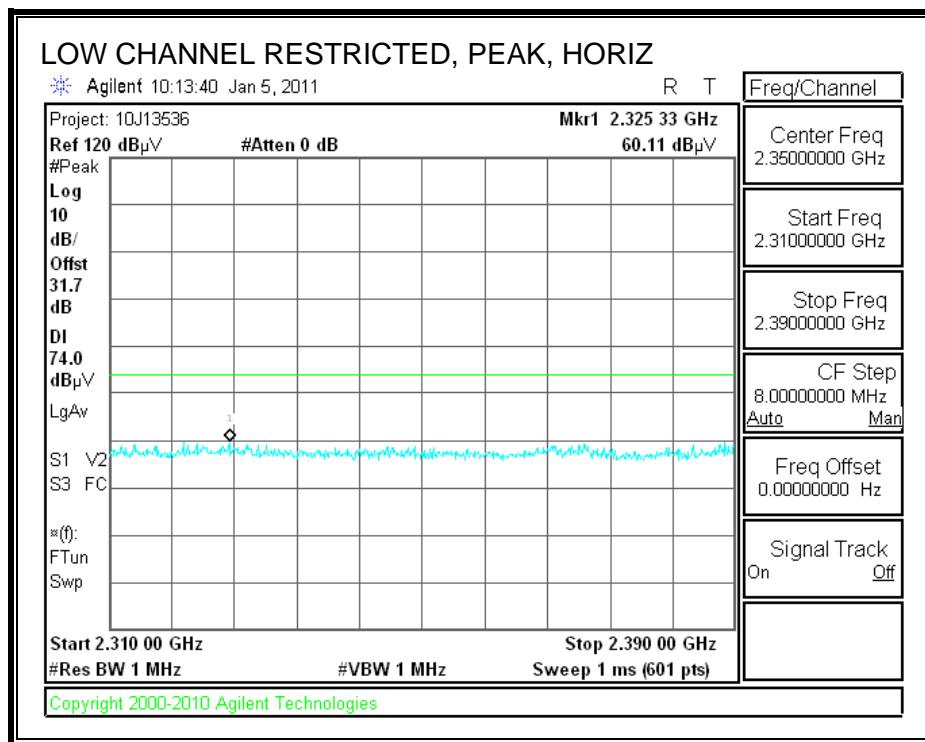
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

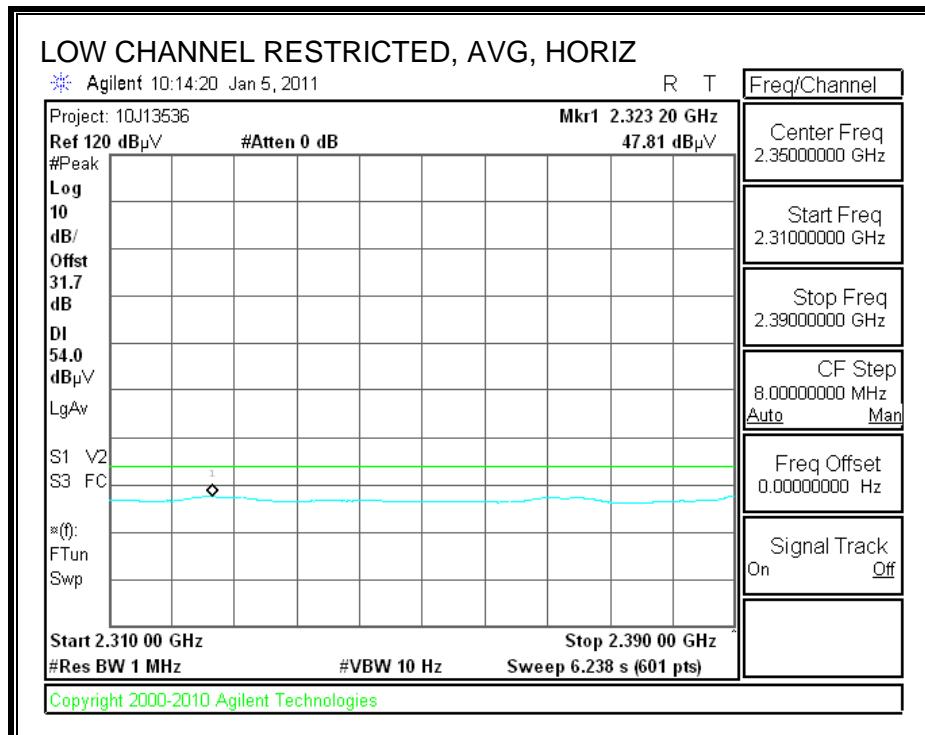
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

8.2. TRANSMITTER ABOVE 1 GHz

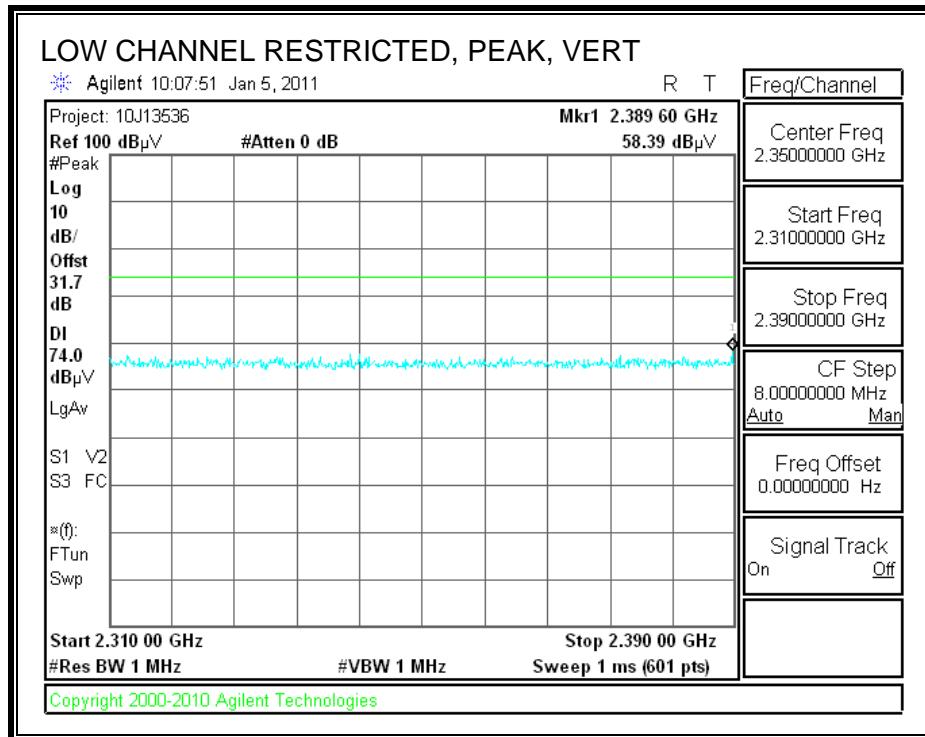
8.2.1. TX ABOVE 1 GHz FOR 802.11b MODE IN THE 2.4 GHz BAND

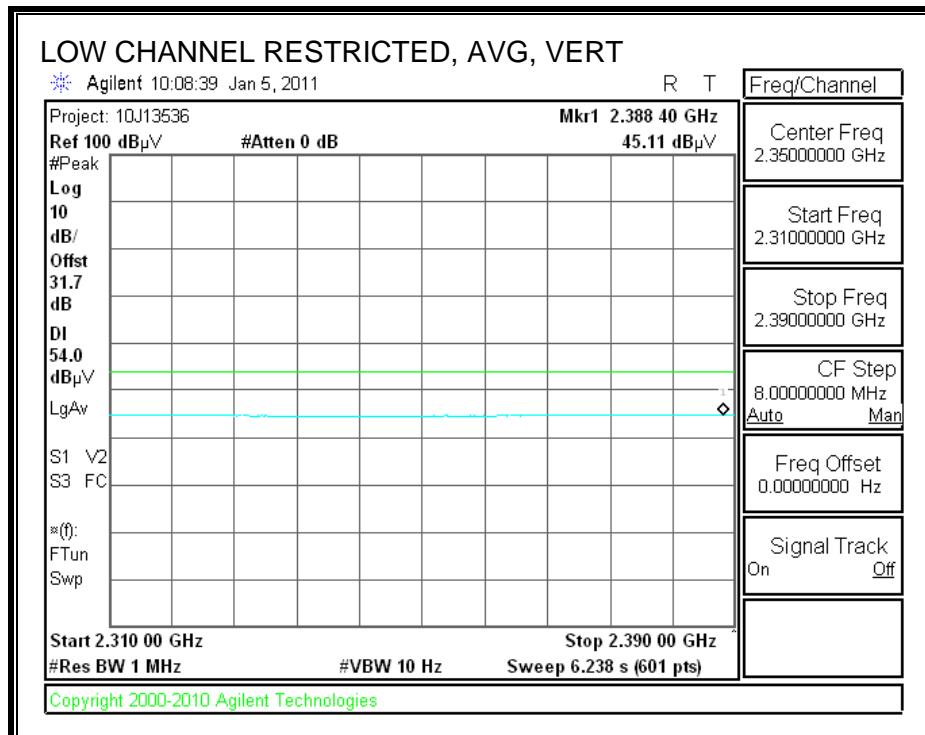
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



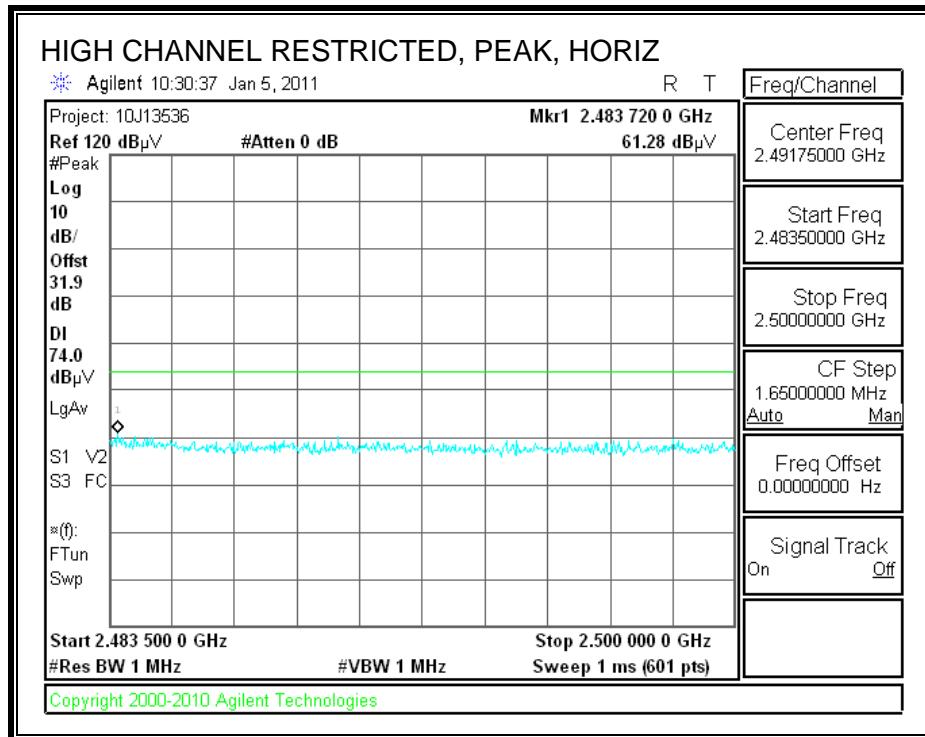


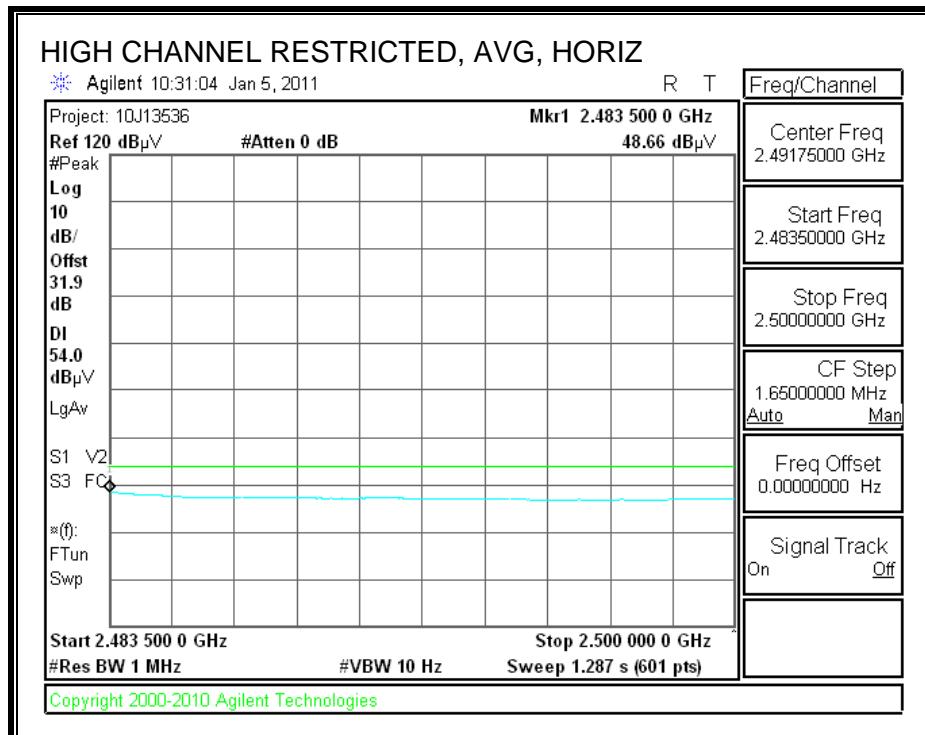
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



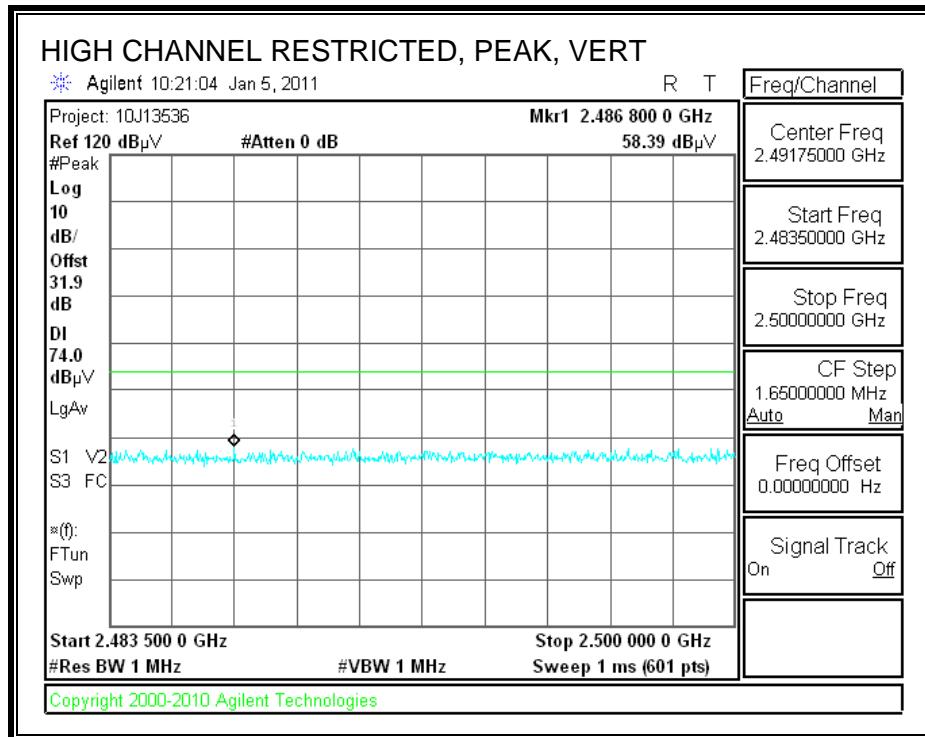


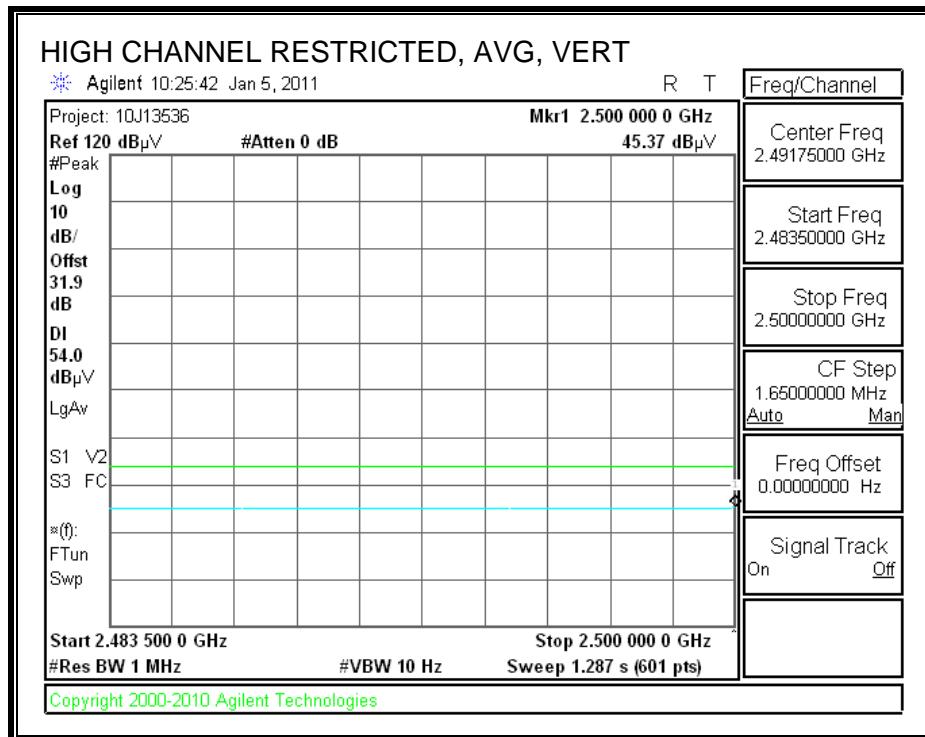
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





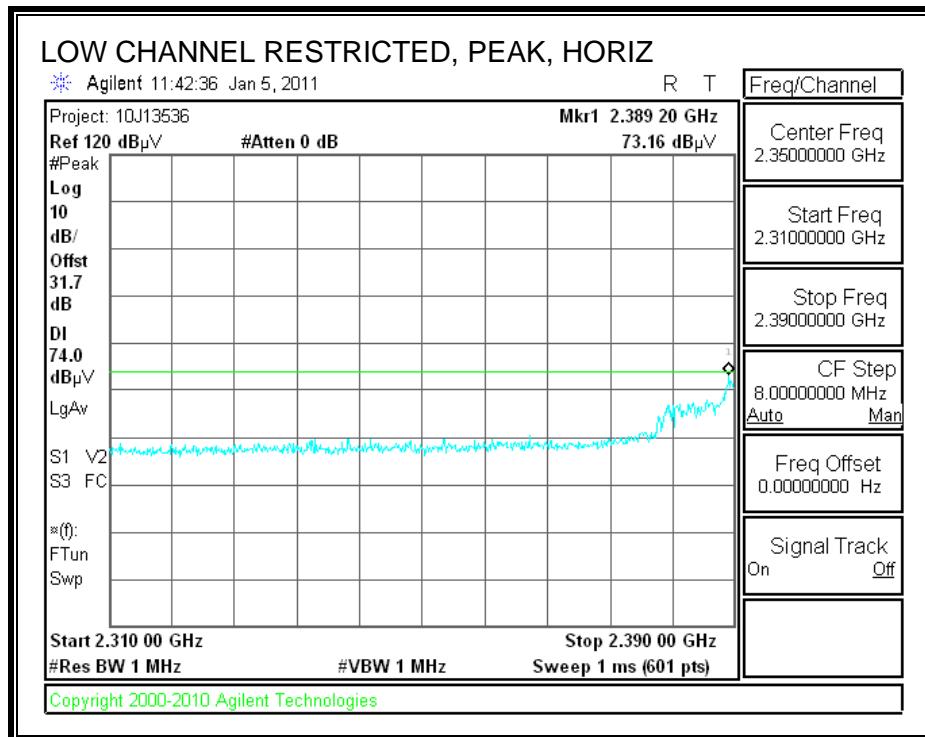
HARMONICS AND SPURIOUS EMISSIONS

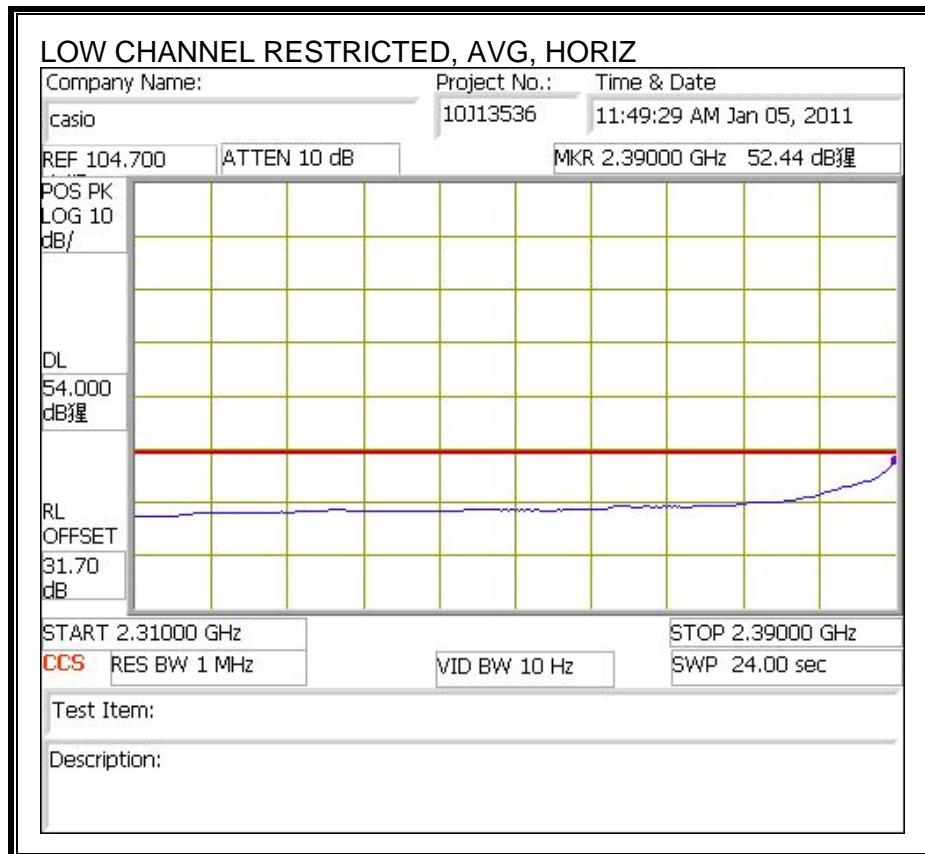
High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		William Zhuang											
Date:		01/05/11											
Project #:		10J13536											
Company:		Casio											
Test Target:		FCC Class B											
Mode Oper:		802.11b mode											
f	Measurement 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
b Mode, Low Ch.													
4.824	3.0	43.4	33.0	5.8	-36.5	0.0	0.0	45.8	74.0	-28.2	V	P	
4.824	3.0	39.4	33.0	5.8	-36.5	0.0	0.0	41.8	54.0	-12.2	V	A	
4.824	3.0	42.2	33.0	5.8	-36.5	0.0	0.0	44.5	74.0	-29.5	H	P	
4.824	3.0	36.5	33.0	5.8	-36.5	0.0	0.0	38.9	54.0	-15.1	H	A	
12.060	3.0	35.3	39.0	9.8	-35.4	0.0	0.0	48.7	74.0	-25.3	V	P	
12.060	3.0	23.0	39.0	9.8	-35.4	0.0	0.0	36.4	54.0	-17.6	V	A	
12.060	3.0	35.1	39.0	9.8	-35.4	0.0	0.0	48.4	74.0	-25.6	H	P	
12.060	3.0	22.8	39.0	9.8	-35.4	0.0	0.0	36.1	54.0	-17.9	H	A	
b Mode, Mid Ch.													
4.874	3.0	39.9	33.1	5.8	-36.5	0.0	0.0	42.4	74.0	-31.6	V	P	
4.874	3.0	33.3	33.1	5.8	-36.5	0.0	0.0	35.7	54.0	-18.3	V	A	
4.874	3.0	41.6	33.1	5.8	-36.5	0.0	0.0	44.1	74.0	-29.9	H	P	
4.874	3.0	35.8	33.1	5.8	-36.5	0.0	0.0	38.3	54.0	-15.8	H	A	
7.311	3.0	41.8	35.3	7.3	-36.2	0.0	0.0	48.1	74.0	-25.9	V	P	
7.311	3.0	35.5	35.3	7.3	-36.2	0.0	0.0	41.8	54.0	-12.2	V	A	
7.311	3.0	41.7	35.3	7.3	-36.2	0.0	0.0	48.1	74.0	-25.9	H	P	
7.311	3.0	35.6	35.3	7.3	-36.2	0.0	0.0	41.9	54.0	-12.1	H	A	
12.185	3.0	35.1	39.0	9.8	-35.4	0.0	0.0	48.5	74.0	-25.5	V	P	
12.185	3.0	23.4	39.0	9.8	-35.4	0.0	0.0	36.8	54.0	-17.2	V	A	
12.185	3.0	35.4	39.0	9.8	-35.4	0.0	0.0	48.8	74.0	-25.2	H	P	
12.185	3.0	23.3	39.0	9.8	-35.4	0.0	0.0	36.7	54.0	-17.3	H	A	
b Mode, High Ch.													
4.924	3.0	39.0	33.1	5.9	-36.5	0.0	0.0	41.5	74.0	-32.5	V	P	
4.924	3.0	30.0	33.1	5.9	-36.5	0.0	0.0	32.5	54.0	-21.5	V	A	
4.924	3.0	41.1	33.1	5.9	-36.5	0.0	0.0	43.7	74.0	-30.3	H	P	
4.924	3.0	34.4	33.1	5.9	-36.5	0.0	0.0	37.0	54.0	-17.0	H	A	
7.386	3.0	41.1	35.4	7.3	-36.2	0.0	0.0	47.6	74.0	-26.4	V	P	
7.386	3.0	34.2	35.4	7.3	-36.2	0.0	0.0	40.7	54.0	-13.4	V	A	
7.386	3.0	40.1	35.4	7.3	-36.2	0.0	0.0	46.6	74.0	-27.4	H	P	
7.386	3.0	32.3	35.4	7.3	-36.2	0.0	0.0	38.8	54.0	-15.2	H	A	
12.310	3.0	35.6	39.0	9.9	-35.4	0.0	0.0	49.1	74.0	-24.9	V	P	
12.310	3.0	23.5	39.0	9.9	-35.4	0.0	0.0	37.0	54.0	-17.0	V	A	
12.310	3.0	35.9	39.0	9.9	-35.4	0.0	0.0	49.4	74.0	-24.6	H	P	
12.310	3.0	23.5	39.0	9.9	-35.4	0.0	0.0	37.0	54.0	-17.0	H	A	

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

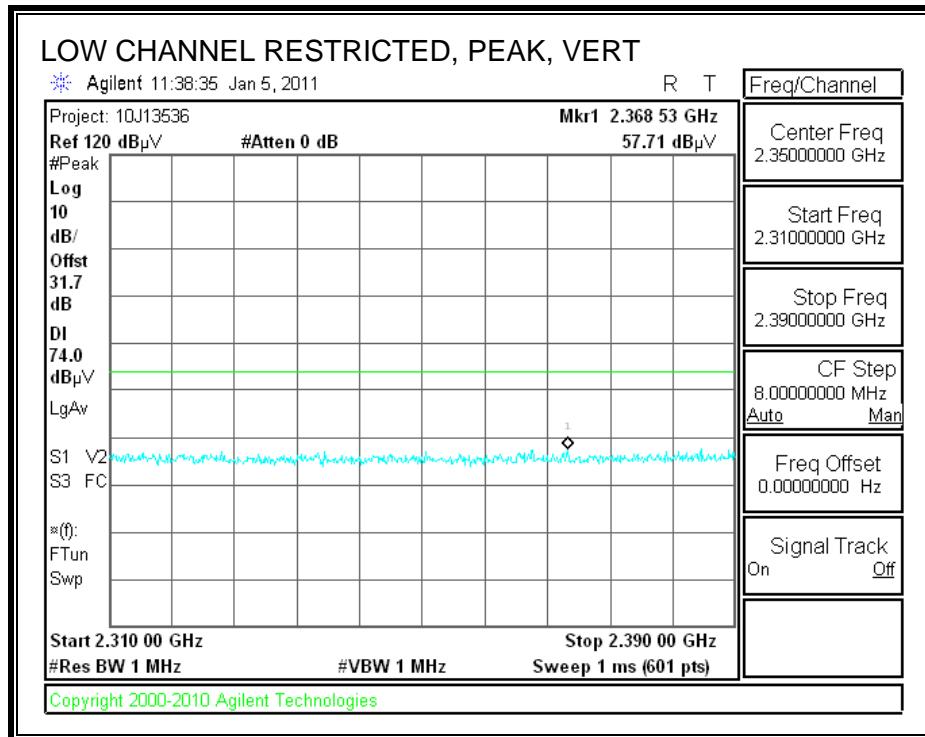
8.2.2. TX ABOVE 1 GHz FOR 802.11g MODE IN THE 2.4 GHz BAND

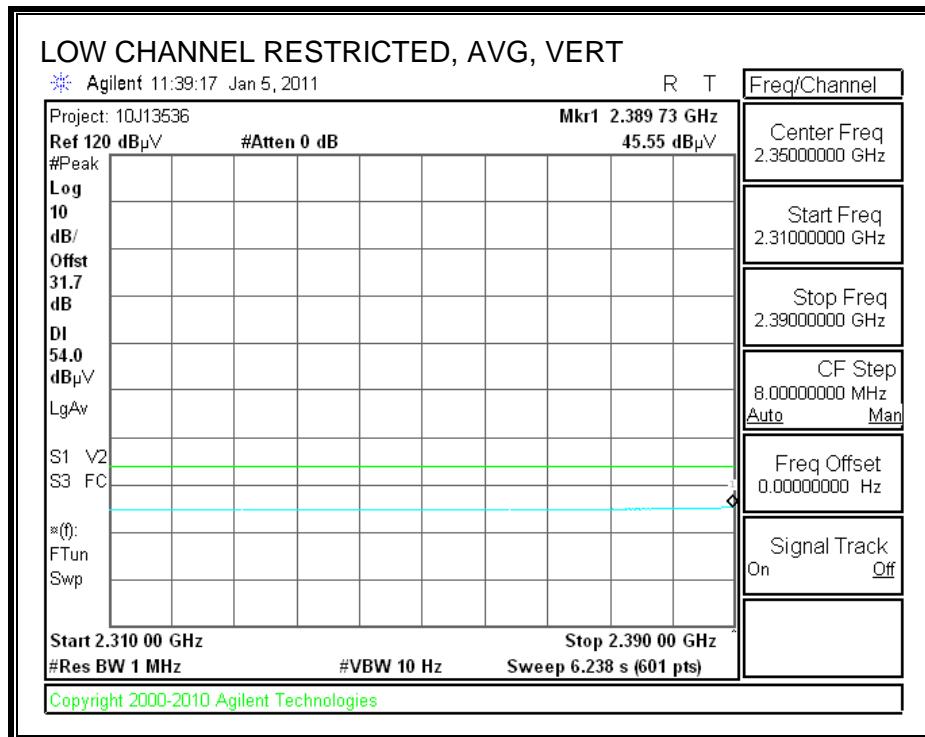
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



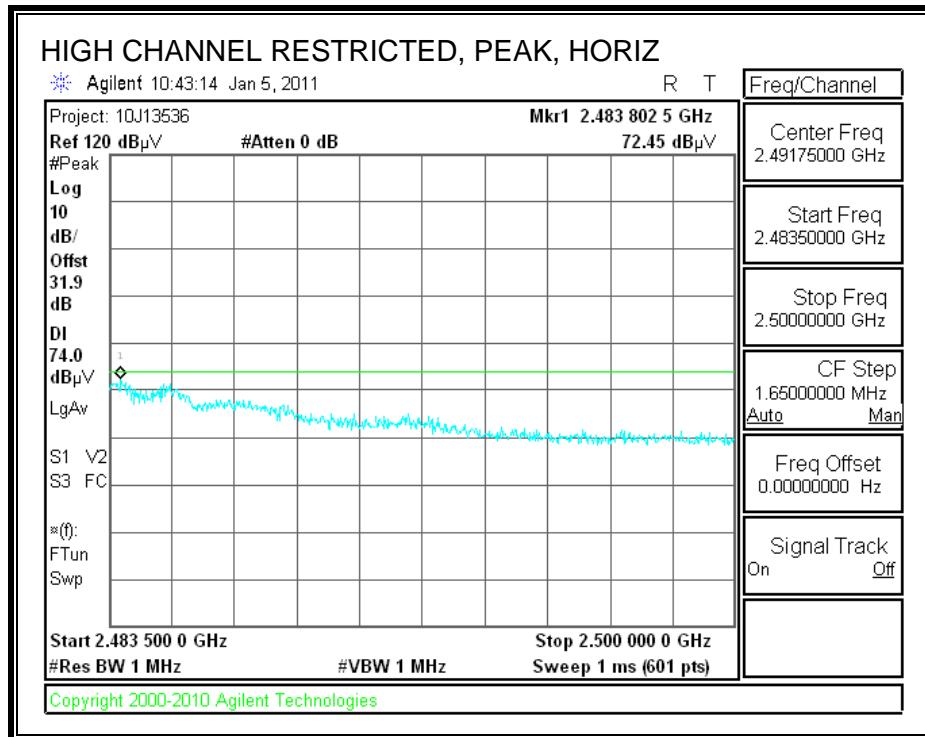


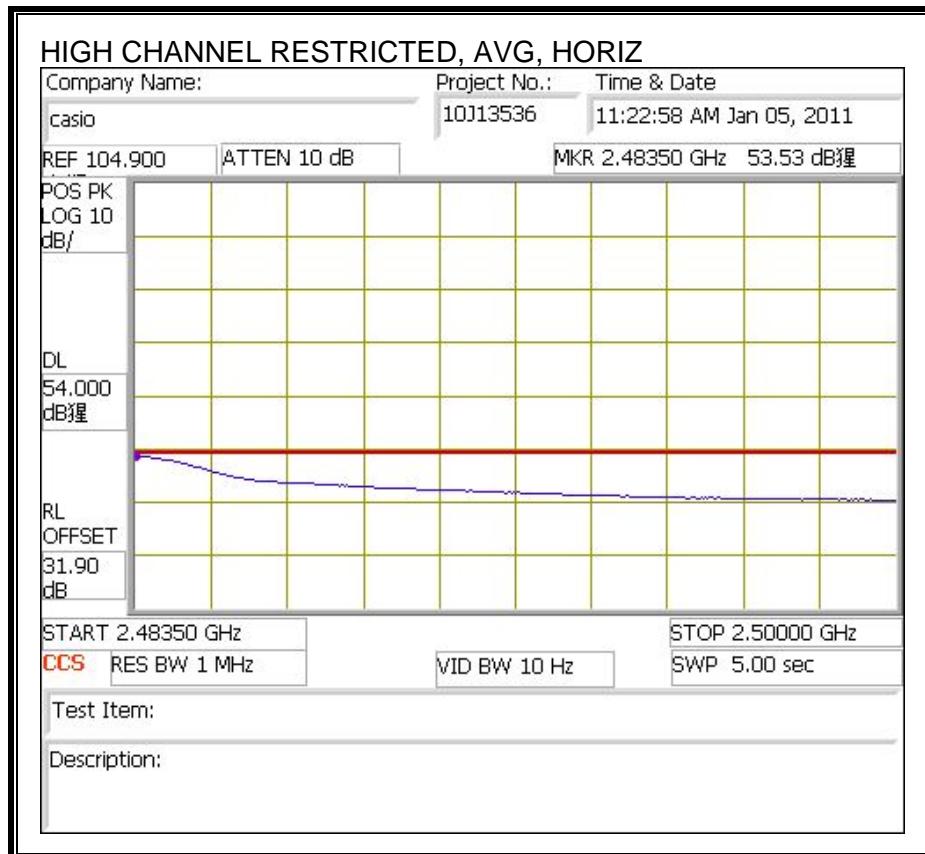
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



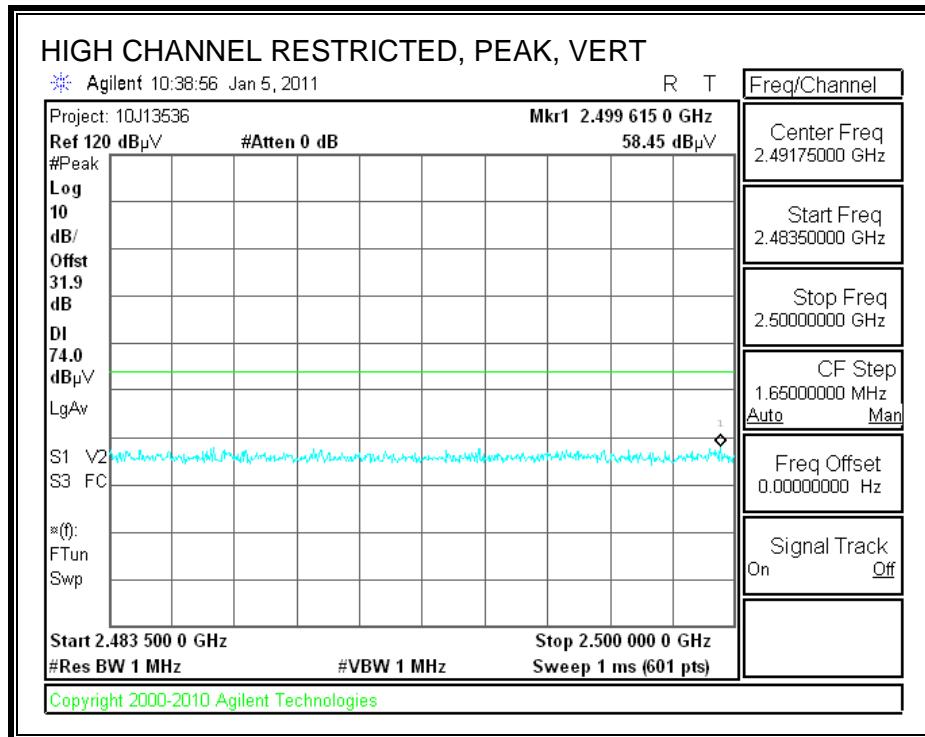


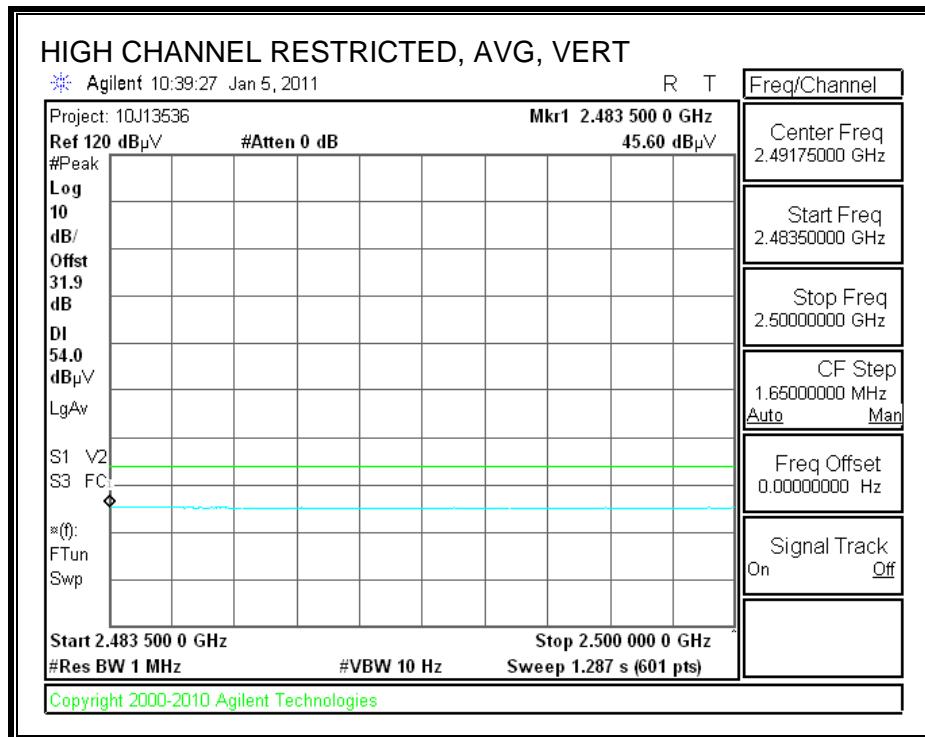
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement **Compliance Certification Services, Fremont 5m Chamber**

Test Engr: William Zhuang
Date: 01/05/11
Project #: 10J13536
Company: Casio
Test Target: FCC Class B
Mode Oper: 802.11g mode

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	Amp dB	D Corr dB	Fltr	Corr.	Limit	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
g Mode, Low Ch.													
4.824	3.0	39.5	33.0	5.8	-36.5	0.0	0.0	41.9	74.0	-32.1	H	P	
4.824	3.0	27.2	33.0	5.8	-36.5	0.0	0.0	29.6	54.0	-24.4	H	A	
4.824	3.0	40.4	33.0	5.8	-36.5	0.0	0.0	42.7	74.0	-31.3	V	P	
4.824	3.0	26.9	33.0	5.8	-36.5	0.0	0.0	29.3	54.0	-24.7	V	A	
12.060	3.0	35.5	39.0	9.8	-35.4	0.0	0.0	48.8	74.0	-25.2	V	P	
12.060	3.0	23.3	39.0	9.8	-35.4	0.0	0.0	36.6	54.0	-17.4	V	A	
12.060	3.0	36.3	39.0	9.8	-35.4	0.0	0.0	49.6	74.0	-24.4	H	P	
12.060	3.0	23.5	39.0	9.8	-35.4	0.0	0.0	36.8	54.0	-17.2	H	A	
g Mode, Mid Ch.													
4.874	3.0	38.3	33.1	5.8	-36.5	0.0	0.0	40.7	74.0	-33.3	H	P	
4.874	3.0	25.8	33.1	5.8	-36.5	0.0	0.0	28.2	54.0	-25.8	H	A	
4.874	3.0	40.6	33.1	5.8	-36.5	0.0	0.0	43.1	74.0	-30.9	V	P	
4.874	3.0	25.9	33.1	5.8	-36.5	0.0	0.0	28.4	54.0	-25.6	V	A	
7.311	3.0	50.7	35.3	7.3	-36.2	0.0	0.0	57.0	74.0	-17.0	V	P	
7.311	3.0	31.9	35.3	7.3	-36.2	0.0	0.0	38.3	54.0	-15.7	V	A	
7.311	3.0	46.8	35.3	7.3	-36.2	0.0	0.0	53.2	74.0	-20.8	H	P	
7.311	3.0	29.1	35.3	7.3	-36.2	0.0	0.0	35.4	54.0	-18.6	H	A	
12.185	3.0	35.7	39.0	9.8	-35.4	0.0	0.0	49.1	74.0	-24.9	H	P	
12.185	3.0	23.5	39.0	9.8	-35.4	0.0	0.0	36.9	54.0	-17.1	H	A	
12.185	3.0	35.5	39.0	9.8	-35.4	0.0	0.0	48.9	74.0	-25.1	V	P	
12.185	3.0	23.4	39.0	9.8	-35.4	0.0	0.0	36.8	54.0	-17.2	V	A	
g Mode, High Ch.													
4.924	3.0	40.1	33.1	2.4	-36.5	0.0	0.0	39.2	74.0	-34.8	V	P	
4.924	3.0	25.9	33.1	2.4	-36.5	0.0	0.0	25.0	54.0	-29.0	V	A	
4.924	3.0	41.3	33.1	2.4	-36.5	0.0	0.0	40.4	74.0	-33.6	H	P	
4.924	3.0	26.4	33.1	2.4	-36.5	0.0	0.0	25.5	54.0	-28.5	H	A	
4.924	3.0	40.6	33.1	4.7	-36.5	0.0	0.0	42.0	74.0	-32.0	H	P	
4.924	3.0	26.0	33.1	4.7	-36.5	0.0	0.0	27.5	54.0	-26.5	H	A	
7.386	3.0	47.7	35.4	5.8	-36.2	0.0	0.0	52.7	74.0	-21.3	V	P	
7.386	3.0	31.1	35.4	5.8	-36.2	0.0	0.0	36.1	54.0	-17.9	V	A	
7.386	3.0	46.2	35.4	5.8	-36.2	0.0	0.0	51.2	74.0	-22.8	H	P	
7.386	3.0	30.0	35.4	5.8	-36.2	0.0	0.0	35.0	54.0	-19.0	H	A	
12.310	3.0	35.6	39.0	7.7	-35.4	0.0	0.0	46.9	74.0	-27.1	V	P	
12.310	3.0	23.5	39.0	7.7	-35.4	0.0	0.0	34.8	54.0	-19.2	V	A	
12.310	3.0	36.4	39.0	7.7	-35.4	0.0	0.0	47.7	74.0	-26.3	H	P	
12.310	3.0	23.6	39.0	7.7	-35.4	0.0	0.0	34.9	54.0	-19.1	H	A	

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

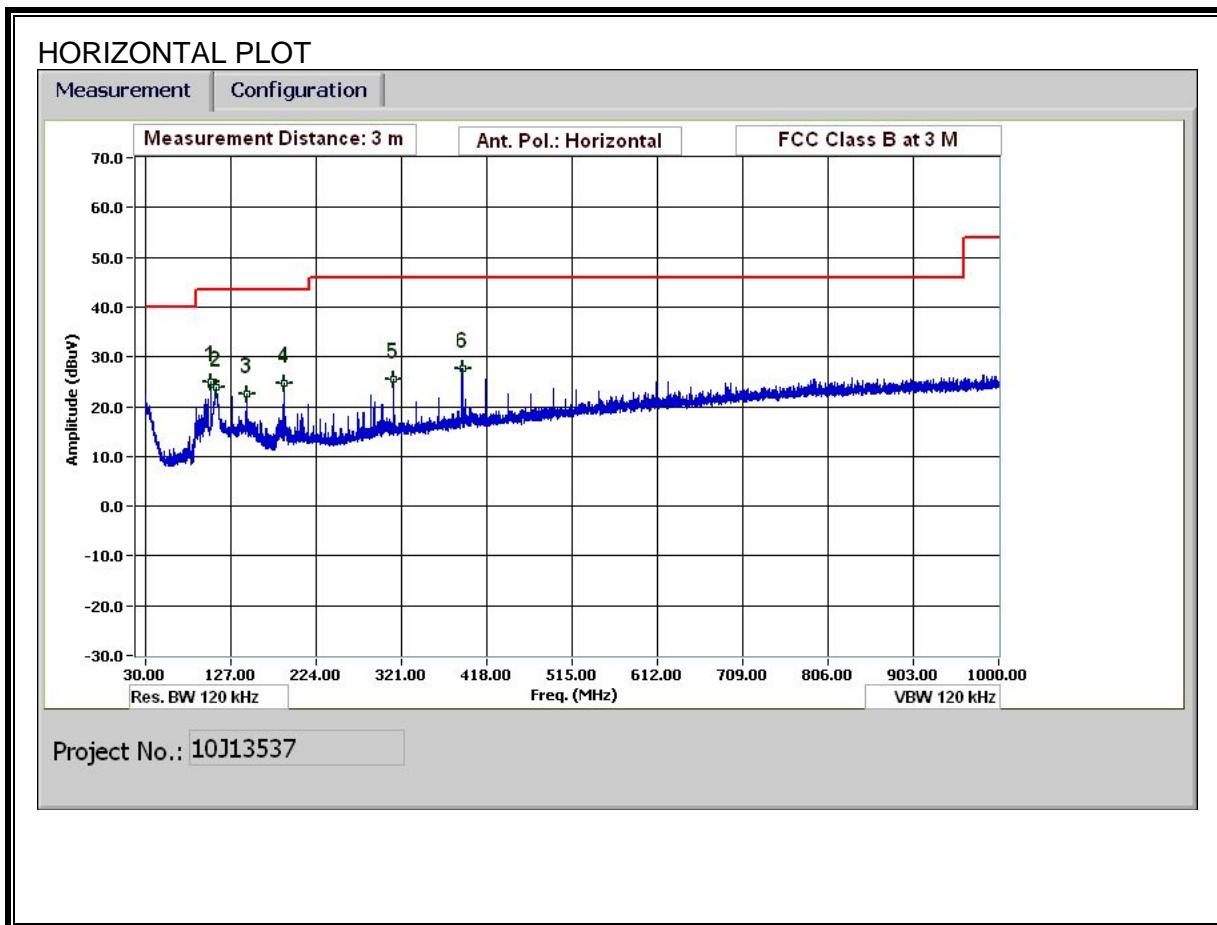
8.3. RECEIVER ABOVE 1 GHz

High Frequency Measurement Compliance Certification Services, Fremont 5m Chamber																																																																									
<p>Company: Casio Project #: 10J13536 Date: 1/5/2010 Test Engineer: Jim Marley Configuration: EUT alone Mode: Receive Mode</p> <p>Test Equipment:</p> <table border="1"> <tr> <td>Horn 1-18GHz</td> <td>Pre-amplifier 1-26GHz</td> <td>Pre-amplifier 26-40GHz</td> <td colspan="4">Horn > 18GHz</td> <td>Limit</td> </tr> <tr> <td>T73; S/N: 6717 @3m</td> <td>T144 Miteq 3008A00931</td> <td></td> <td colspan="4"></td> <td>RX RSS 210</td> </tr> <tr> <td colspan="15">Hi Frequency Cables</td> </tr> <tr> <td>3' cable 22807700</td> <td>12' cable 22807600</td> <td>20' cable 22807500</td> <td colspan="4">HPF</td> <td>Reject Filter</td> <td colspan="6">Peak Measurements RBW=VBW=1MHz</td> </tr> <tr> <td>3' cable 22807700</td> <td>12' cable 22807600</td> <td>20' cable 22807500</td> <td colspan="4"></td> <td></td> <td colspan="6">Average Measurements RBW=1MHz ; VBW=10Hz</td> </tr> </table>															Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz				Limit	T73; S/N: 6717 @3m	T144 Miteq 3008A00931						RX RSS 210	Hi Frequency Cables															3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF				Reject Filter	Peak Measurements RBW=VBW=1MHz						3' cable 22807700	12' cable 22807600	20' cable 22807500						Average Measurements RBW=1MHz ; VBW=10Hz					
Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz				Limit																																																																		
T73; S/N: 6717 @3m	T144 Miteq 3008A00931						RX RSS 210																																																																		
Hi Frequency Cables																																																																									
3' cable 22807700	12' cable 22807600	20' cable 22807500	HPF				Reject Filter	Peak Measurements RBW=VBW=1MHz																																																																	
3' cable 22807700	12' cable 22807600	20' cable 22807500						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)																																																										
1.105	3.0	23.3	12.5	24.2	2.5	-39.3	0.0	0.0	10.6	-0.2	74	54	-63.4	-54.2	H																																																										
3.205	3.0	27.2	16.1	30.5	4.5	-37.2	0.0	0.0	25.0	13.9	74	54	-49.0	-40.1	H																																																										
3.550	3.0	27.0	15.0	31.2	4.8	-36.9	0.0	0.0	26.1	14.1	74	54	-47.9	-39.9	H																																																										
4.705	3.0	25.7	14.1	32.9	5.7	-36.5	0.0	0.0	27.9	16.2	74	54	-46.1	-37.8	H																																																										
7.030	3.0	28.5	17.3	34.9	7.1	-36.2	0.0	0.0	34.2	23.1	74	54	-39.8	-30.9	H																																																										
7.705	3.0	28.7	16.6	35.9	7.5	-36.2	0.0	0.0	35.9	23.7	74	54	-38.1	-30.3	H																																																										
Note: All emissions recorded for this range represent measurement noise floor. No detectable emissions observed.																																																																									
1.135	3.0	26.9	12.6	24.3	2.5	-39.3	0.0	0.0	14.5	0.1	74	54	-59.5	-53.9	V																																																										
3.340	3.0	28.8	15.8	30.8	4.6	-37.1	0.0	0.0	27.1	14.1	74	54	-46.9	-39.9	V																																																										
3.895	3.0	29.2	15.4	32.0	5.1	-36.7	0.0	0.0	29.6	15.8	74	54	-44.4	-38.2	V																																																										
6.985	3.0	30.1	17.3	34.8	7.1	-36.2	0.0	0.0	35.7	22.9	74	54	-38.3	-31.1	V																																																										
7.060	3.0	31.0	17.4	34.9	7.1	-36.2	0.0	0.0	36.8	23.2	74	54	-37.2	-30.8	V																																																										
7.900	3.0	30.1	16.8	36.2	7.6	-36.2	0.0	0.0	37.7	24.4	74	54	-36.3	-29.6	V																																																										
Note: All emissions recorded for this range represent measurement noise floor. No detectable emissions observed.																																																																									
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																																																																						

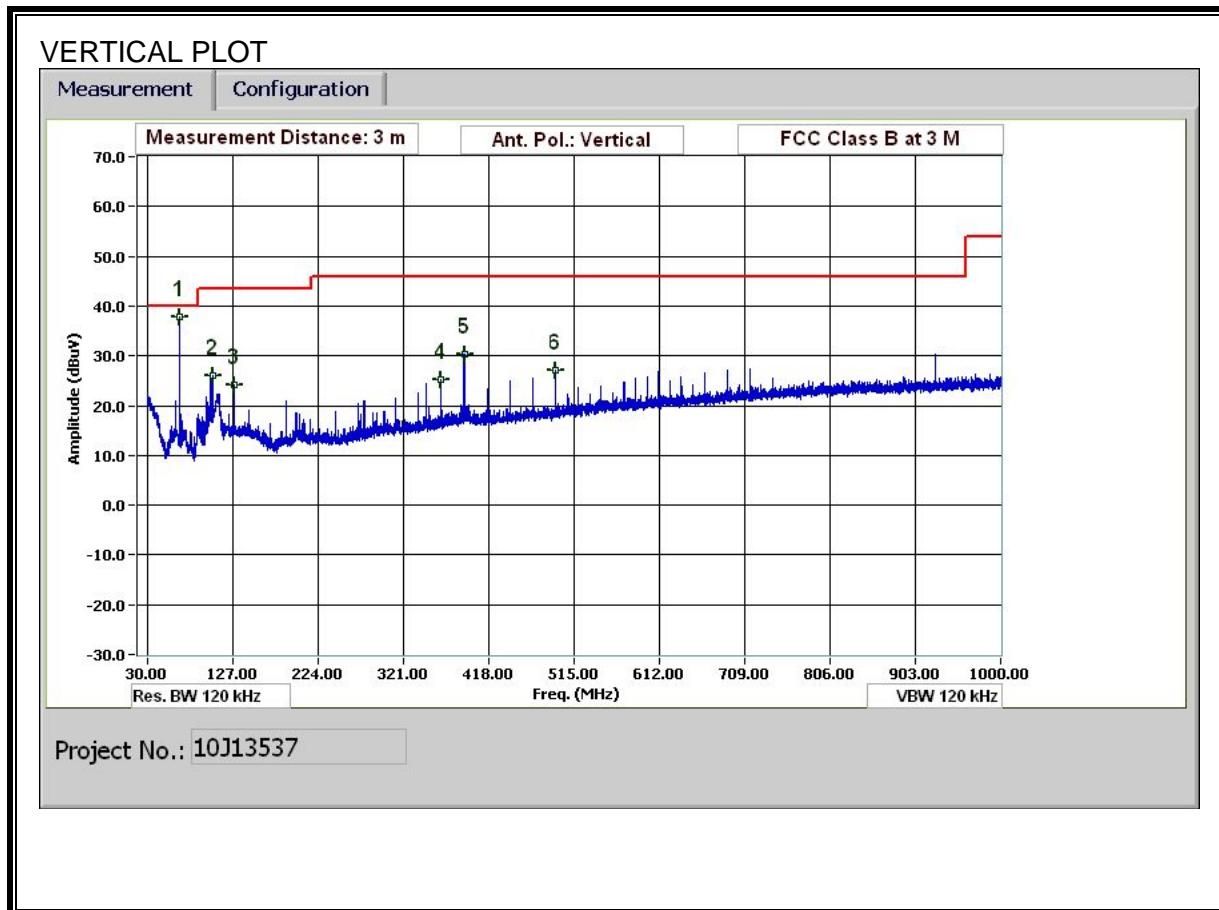
8.4. WORST-CASE BELOW 1 GHz

RESULTS

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



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



TABULATED DATA

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

Test Engr: Tom Chen
Date: 01/19/11
Project #: 10J13537
Company: Casio
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													
104.043	3.0	41.7	10.7	0.9	28.3	0.0	0.0	25.0	43.5	-18.5	H	P	
110.403	3.0	39.3	11.9	1.0	28.3	0.0	0.0	23.8	43.5	-19.7	H	P	
145.565	3.0	36.9	12.9	1.1	28.3	0.0	0.0	22.6	43.5	-20.9	H	P	
187.206	3.0	40.5	11.3	1.2	28.2	0.0	0.0	24.7	43.5	-18.8	H	P	
312.012	3.0	38.6	13.6	1.5	28.1	0.0	0.0	25.6	46.0	-20.4	H	P	
390.015	3.0	39.1	14.8	1.8	28.1	0.0	0.0	27.5	46.0	-18.5	H	P	
Vertical													
66.962	3.0	53.3	8.0	0.7	28.4	0.0	0.0	33.6	40.0	-6.4	V	QP	
103.683	3.0	42.9	10.6	0.9	28.3	0.0	0.0	26.1	43.5	-17.4	V	P	
128.164	3.0	37.8	13.6	1.1	28.3	0.0	0.0	24.2	43.5	-19.3	V	P	
363.974	3.0	37.3	14.4	1.7	28.1	0.0	0.0	25.3	46.0	-20.7	V	P	
390.015	3.0	41.9	14.8	1.8	28.1	0.0	0.0	30.4	46.0	-15.6	V	P	
493.939	3.0	36.2	16.6	2.0	27.8	0.0	0.0	27.0	46.0	-19.0	V	P	

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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

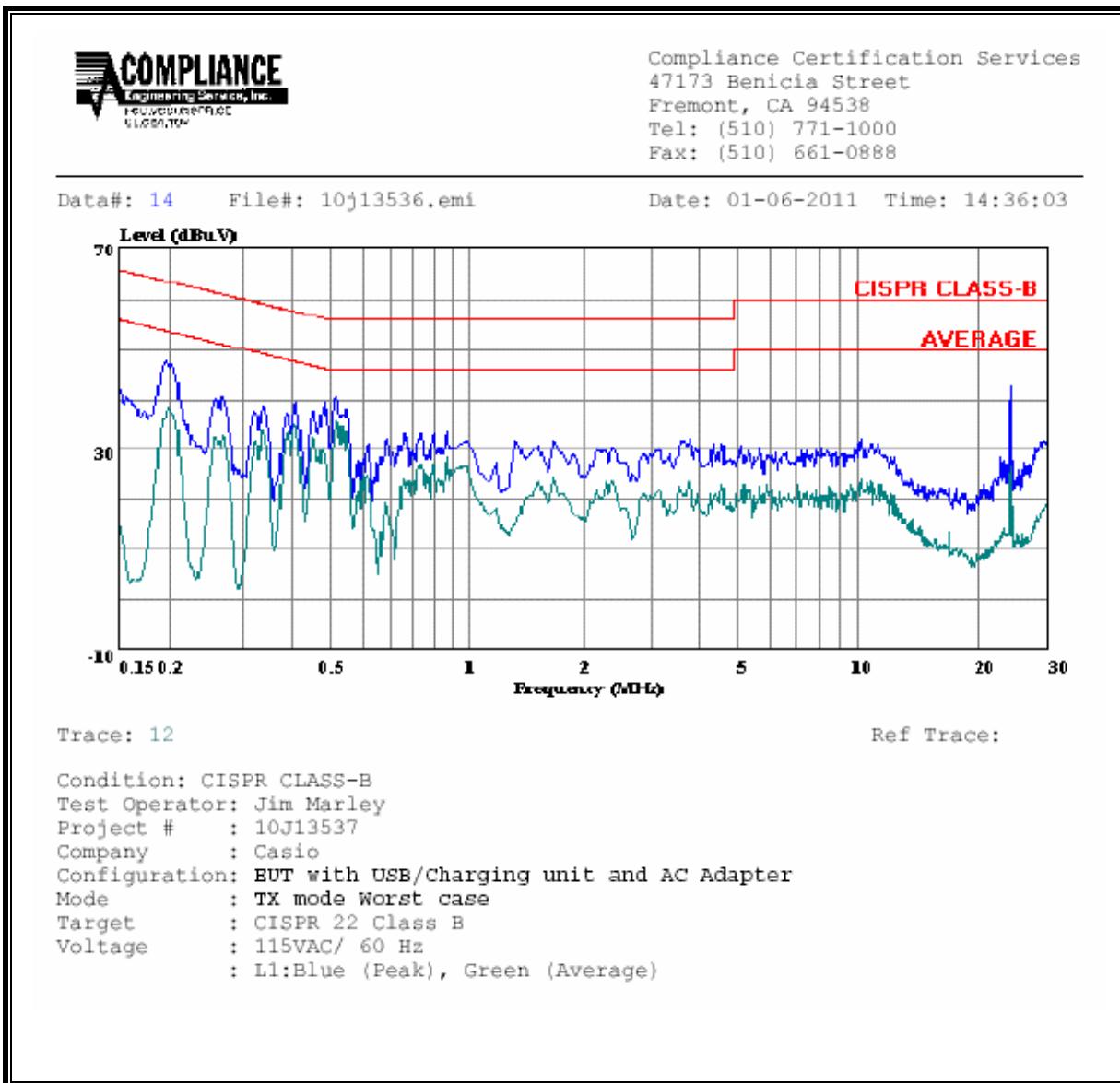
RESULTS

Pass

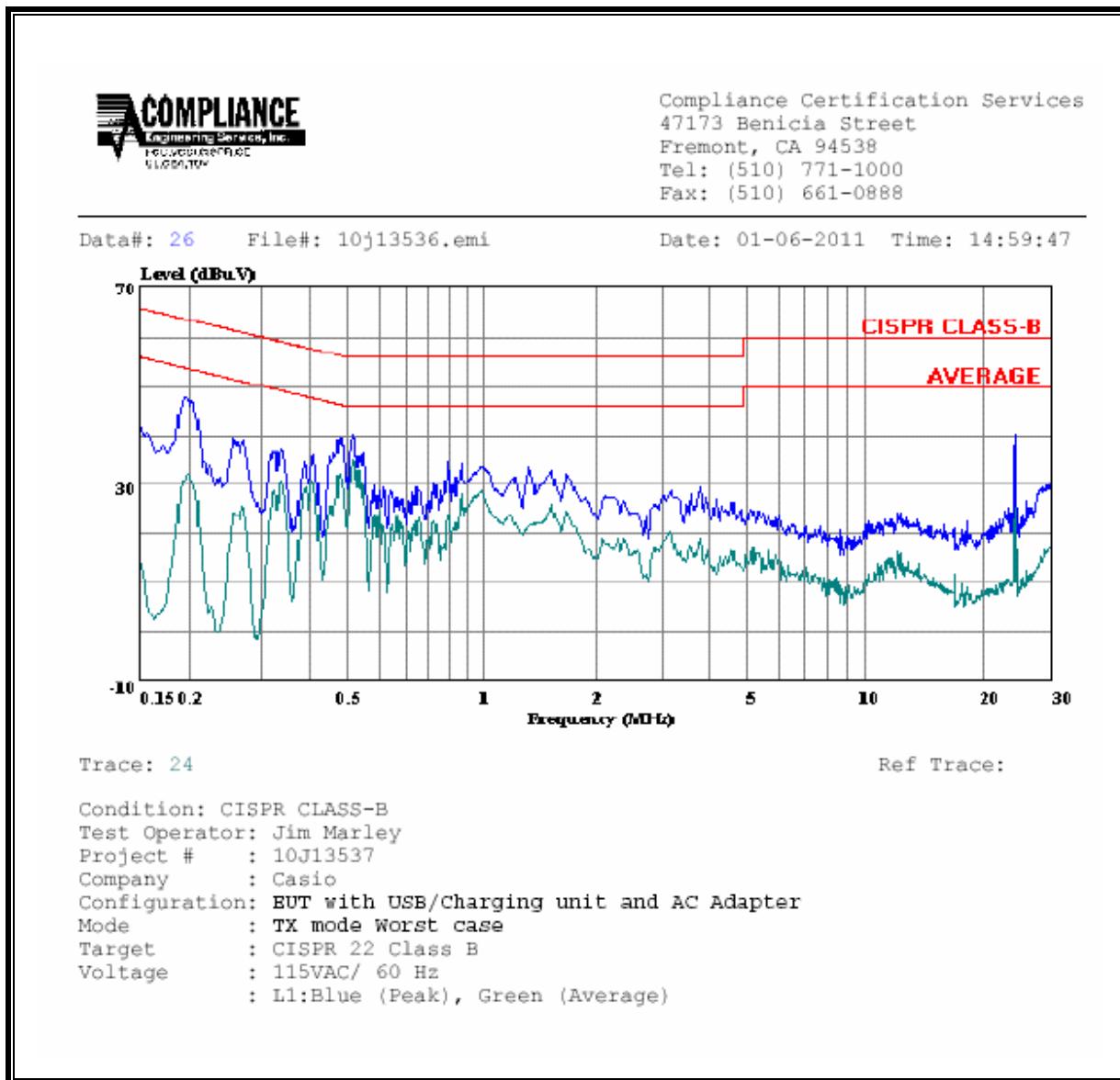
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq. (MHz)	Reading			Closs (dB)	Limit	EN_B	Margin		Remark
	PK (dBuV)	QP (dBuV)	AV (dBuV)				QP (dB)	AV (dB)	
0.20	47.84	--	38.37	0.00	63.82	53.82	-15.98	-15.45	L1
0.41	39.48	--	34.65	0.00	57.69	47.69	-18.21	-13.04	L1
0.52	40.58	--	35.51	0.00	56.00	46.00	-15.42	-10.49	L1
0.20	47.86	--	32.34	0.00	63.69	53.69	-15.83	-21.35	L2
0.48	39.48	--	32.34	0.00	56.32	46.32	-16.84	-13.98	L2
0.52	40.12	--	34.94	0.00	56.00	46.00	-15.88	-11.06	L2
6 Worst Data									

LINE 1 RESULTS



LINE 2 RESULTS



10. MAXIMUM PERMISSIBLE EXPOSURE

FCC RULES

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

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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

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

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

f = frequency in MHz

* = Plane-wave equivalent power density

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

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

IC RULES

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

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

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

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

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

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	802.11b	0.20	16.11	1.94	0.1270	0.0127
2.4 GHz	802.11g	0.20	20.91	1.94	0.3837	0.0384

11. CO-LOCATED MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

Per OTE Bulletin 65, for frequency bands with the same MPE limits, the Power Densities produced by each transmitter are summed. The summation must be under the limit for the band.

Per OTE Bulletin 65, for frequency bands with different limits the Power Densities are calculated separately for each band, divided by the limit for the band and the results are then summed. The summation must be less than 1.

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	Bluetooth	0.20	2.00	-1.63	0.0022	0.0002
2.4 GHz	802.11g	0.20	20.91	1.94	0.3837	0.0384
Colocated					0.3858	0.0386