



**FCC CFR47 PART 15 SUBPART C  
INDUSTRY CANADA RSS-210 ISSUE 7  
CLASS II PERMISSIVE CHANGE**

**CERTIFICATION TEST REPORT**

**FOR**

**802.11BGN 20/40MHZ 1X1 HB95  
(TESTED INSIDE OF TOSHIBA PORTEGE M780 TABLET)**

**MODEL NUMBER: PA3722U-1MPC**

**FCC ID: CJ6UPA3722WL  
IC: 248H-DPA3722W**

**REPORT NUMBER: 09U12979-1**

**ISSUE DATE: JANUARY 12, 2010**

*Prepared for*  
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9740 IRVINE BLVD.  
IRVINE, CA 92618-1697, U.S.A.**

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**NVLAP LAB CODE 200065-0**

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	01/12/10	Initial Issue	T. Chan

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** TOSHIBA AMERICA INFORMATION SYSTEMS, INC.  
9740 IRVINE BLVD.  
IRVINE BLVD., CA 92618-1697, U.S.A.

**EUT DESCRIPTION:** 802.11BGN 20/40MHZ 1X1 HB95  
(TESTED INSIDE OF TOSHIBA PORTEGE M780 TABLET)

**MODEL NUMBER:** PA3722U-1MPC

**SERIAL NUMBER:** Y9065711H

**DATE TESTED:** DECEMBER 10-16, 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, FCC 06-96, 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:

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

### 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 an 802.11bgn 20/40MHz 1x1 HB95 radio card.

The radio module is manufactured by Atheros Communications.

### 5.2. MAXIMUM OUTPUT POWER

The test measurement passed within  $\pm 0.5$ dBm of the original output power.

In order to pass the bandedge measurement, g-and HT20 modes high channel have to be reduced the output power as table shown below, no change on other channel or other DTS bands.

Frequency Band	Mode	Frequency (MHz)	Reduced Peak Output Power (dBm)
2.4GHz	g	2462	21.07
2.4GHz	HT20	2462	18.50

### 5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application is adding portable tablet Toshiba Portege M780 Tablet Series.

### 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an PIFA antenna, model TBN003 with a maximum gain of 0.58 dBi for 2.4GHz band.

### 5.5. SOFTWARE AND FIRMWARE

The test utility and driver software used during testing was Art ANWI 1.4 and Devlib Revision 0.9 Build #21 Art\_11n.

### 5.6. WORST-CASE CONFIGURATION AND MODE

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

The worst-case also investigated for X, Y, Z, and mobile orientation of the support laptop. Mobile position was turned out as worst-case orientation.

## 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
LAPTOP	Toshiba	Portege M780	Y9065711H	DoC
AC/DC Adaptor	Toshiba	PA3755U-1ACA	G71C000A5210	DoC

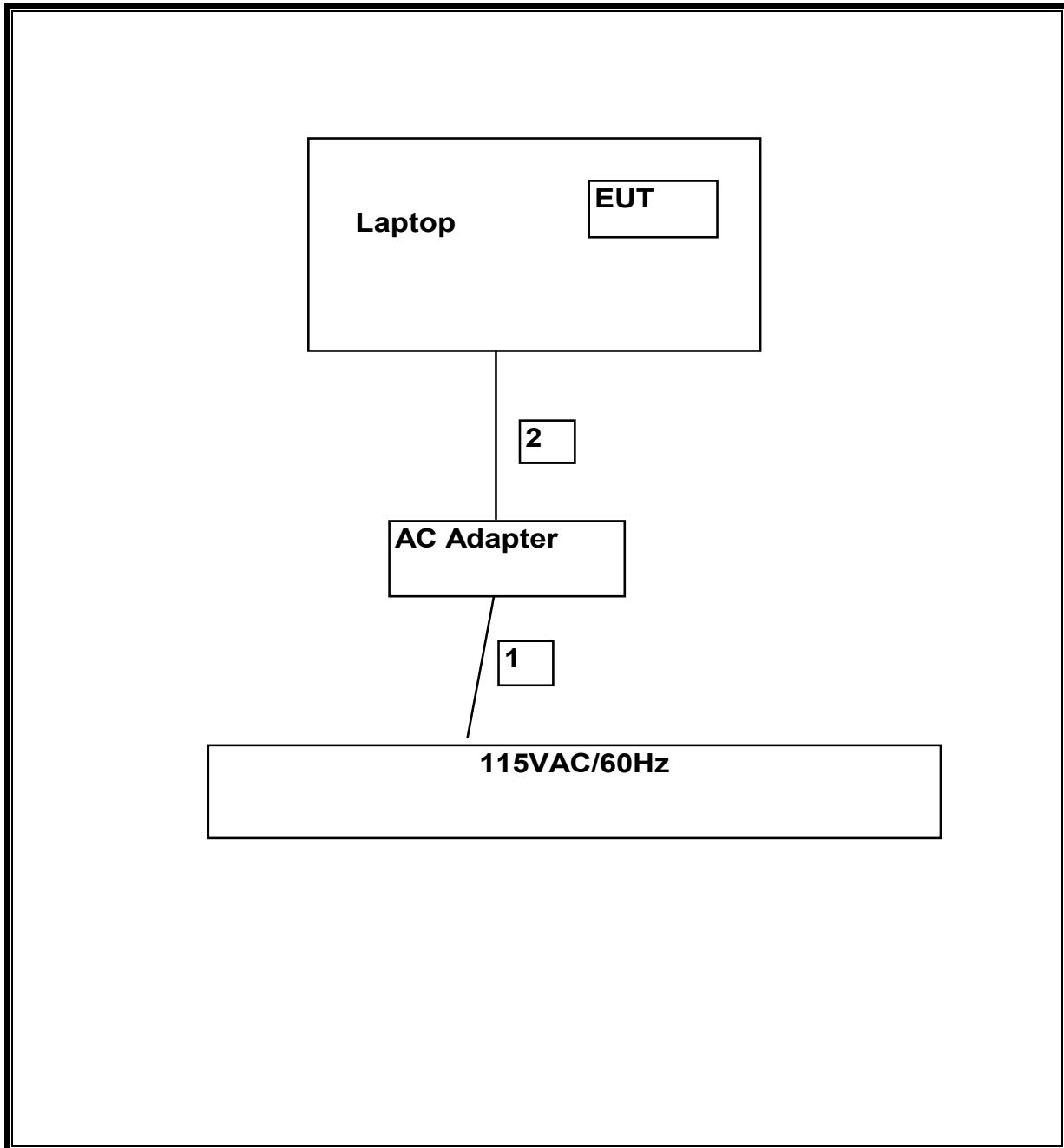
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	AC	Un-Shielded	1.0 m	N/A
2	DC	1	DC	Un-Shielded	2.0 m	Ferrite at one End

### TEST SETUP

The EUT is installed in a host laptop computer during the tests. Test software exercised the radio card.

**SETUP DIAGRAM FOR TESTS**





## 6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/31/10
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	02/04/10
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00778	01/06/11
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	01/14/10
Antenna, Horn, 18 GHz	EMCO	3115	C00783	01/29/10
Peak Power Meter	Boonton	4541	C01186	01/19/10
Peak Power Sensor	Boonton	57318		02/02/10
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/06/10
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	05/06/11
Reject Filter, 2.4-2.5 GHz	Micro-Tronics	BRM50702	N02685	CNR
Highpass Filter, 4.0 GHz	Micro-Tronics	HPM13351	N02708	N/A
Highpass Filter, 7.6 GHz	Micro-Tronics	HPM13195	N02682	N/A

## 7. ANTENNA PORT TEST RESULTS

### 7.1. 802.11g Legacy mode in THE 2.4 GHz BAND

#### 7.1.1. 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

The transmitter output is connected to a Boonton 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)	Output Power (dBm)	Limit (dBm)	Margin (dB)
High	2462	21.07	30	-8.93

## 7.1.2. AVERAGE POWER

### LIMITS

None; for reporting purposes only.

### TEST PROCEDURE

The transmitter output is connected to a Boonton 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)
High	2462	12.80

**7.2. 802.11 HT20 mode in THE 2.4 GHz BAND**

**7.2.1. 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**

The transmitter output is connected to a Boonton 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)	Output Power (dBm)	Limit (dBm)	Margin (dB)
High	2462	18.50	30	-11.50

## 7.2.2. AVERAGE POWER

### LIMITS

None; for reporting purposes only.

### TEST PROCEDURE

The transmitter output is connected to a Boonton 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)
High	2462	10.20

## 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, and 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.

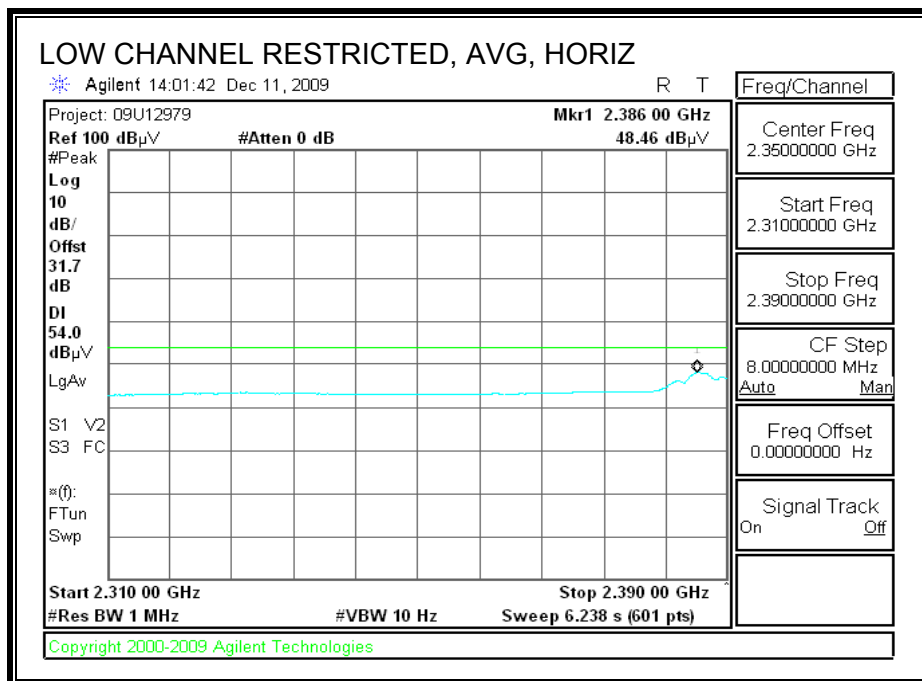
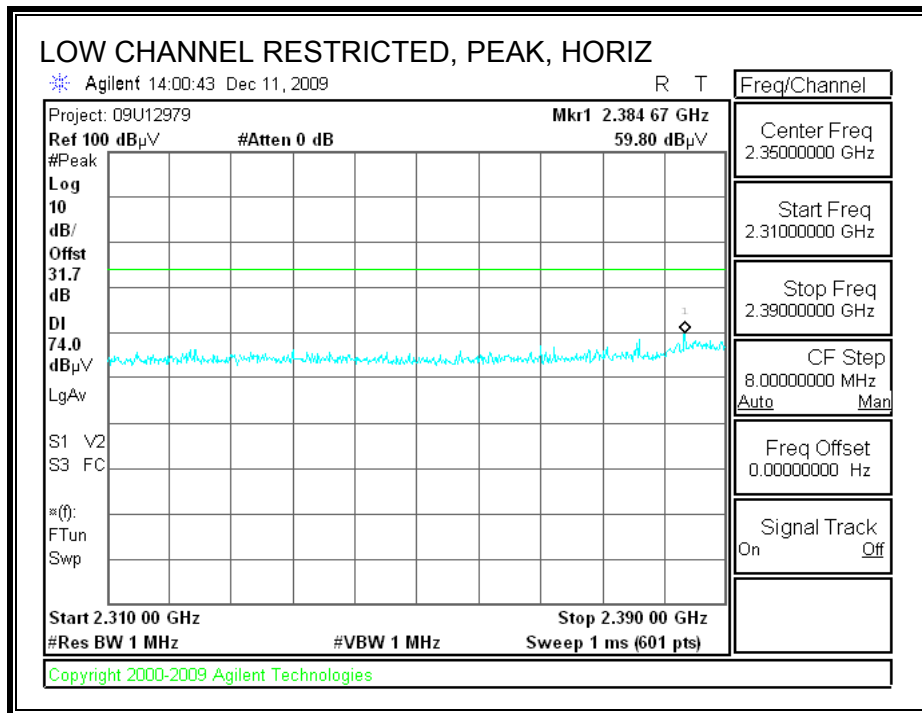
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

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.

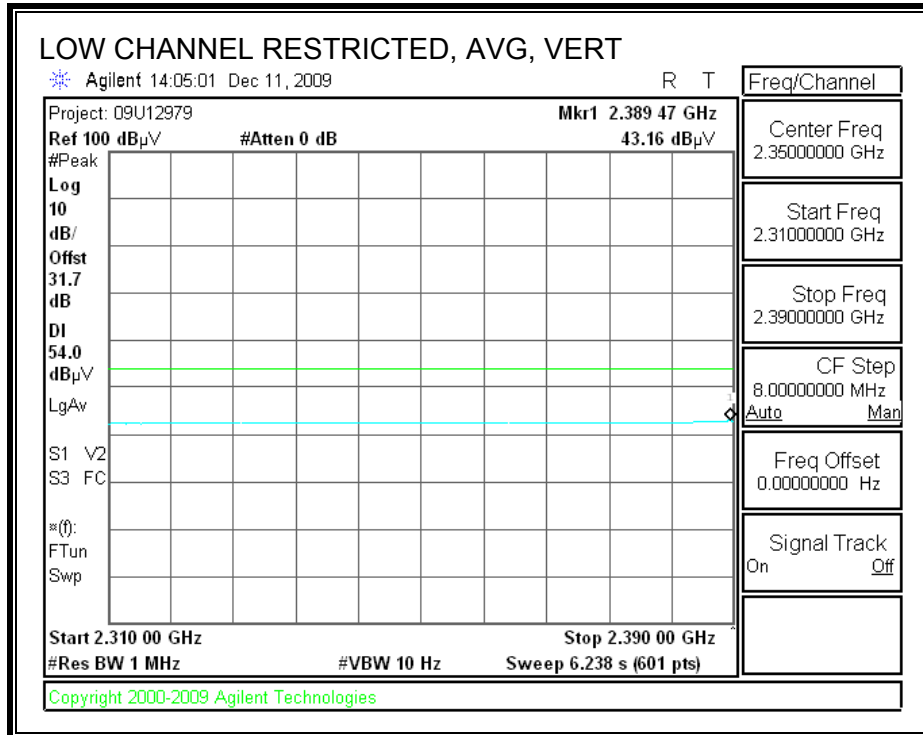
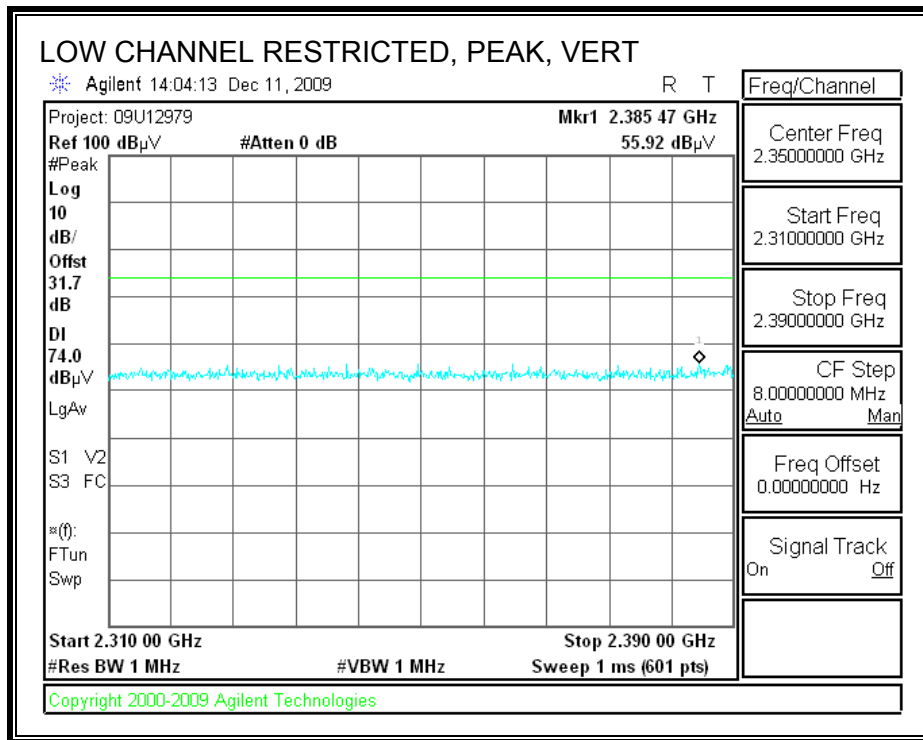
## 8.2. TRANSMITTER ABOVE 1 GHz

### 8.2.1. 802.11b MODE IN THE 2.4 GHz BAND

#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

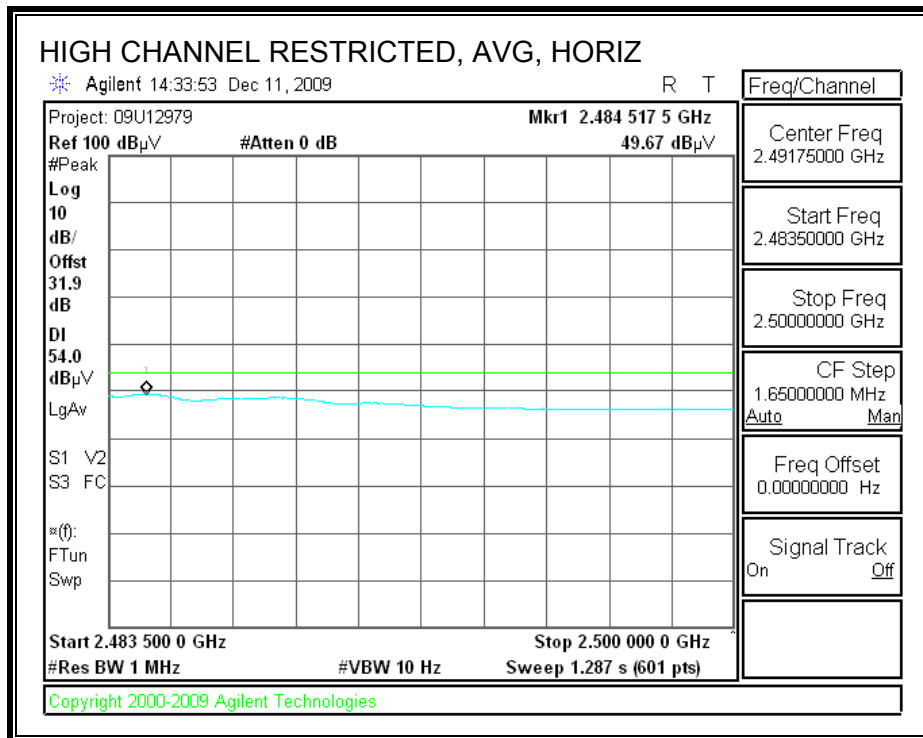
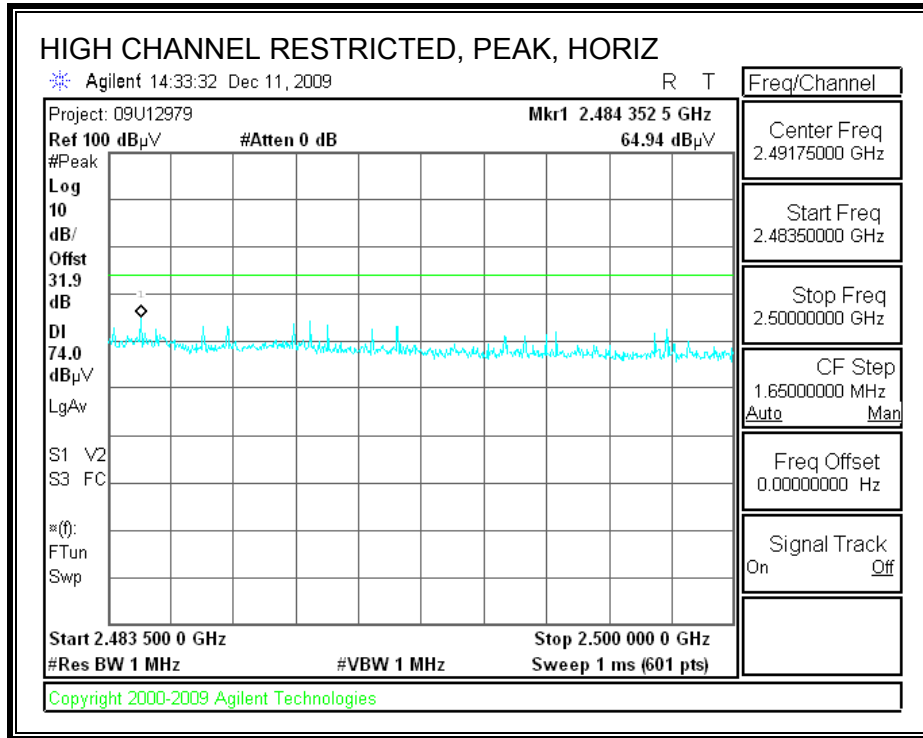


**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

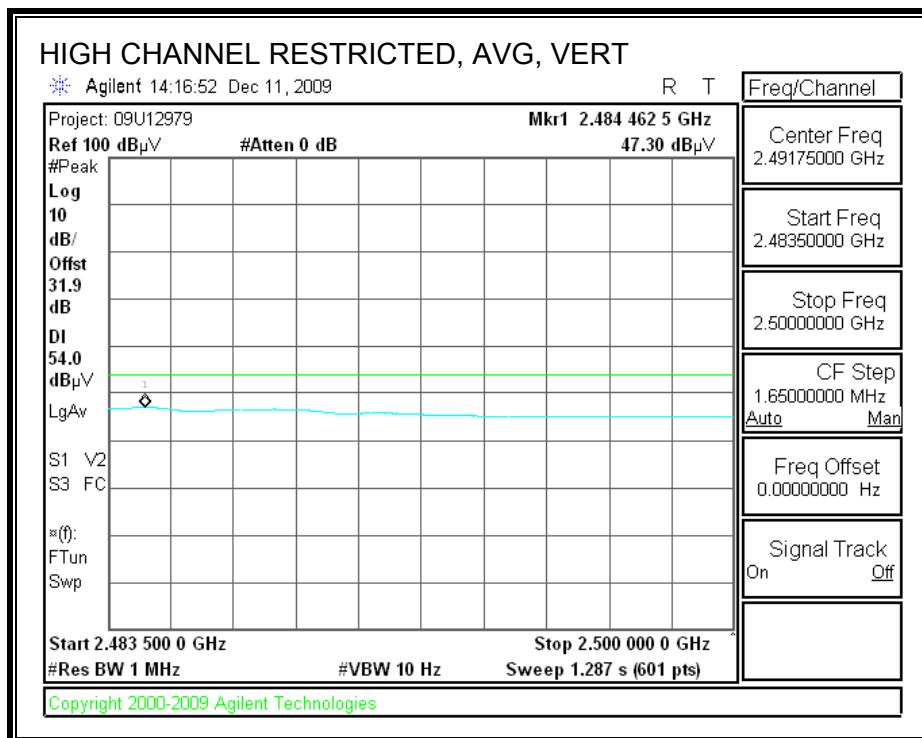
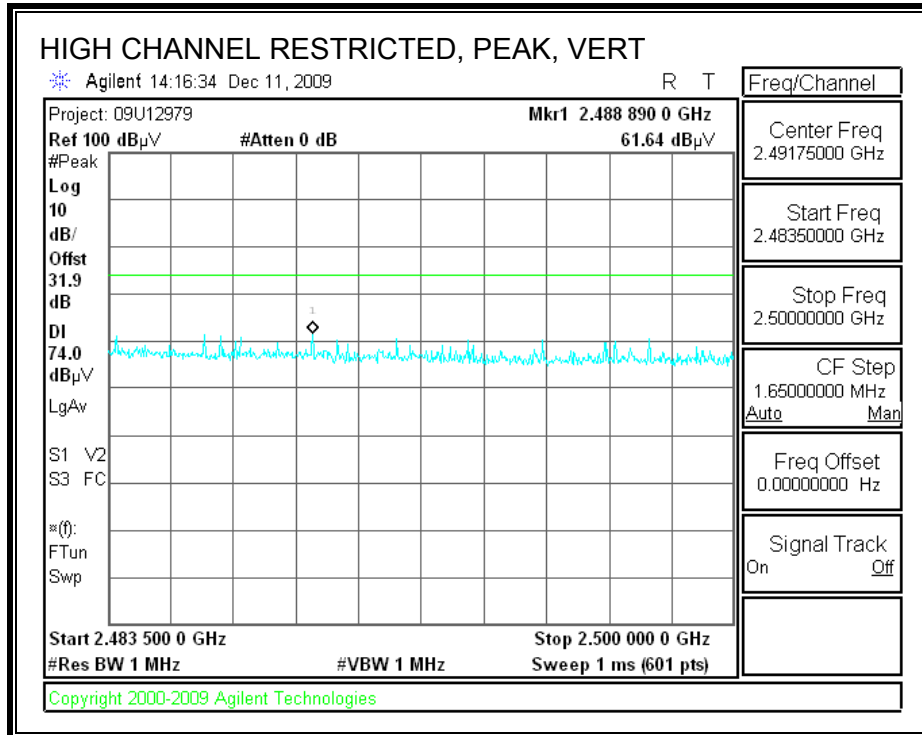




**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

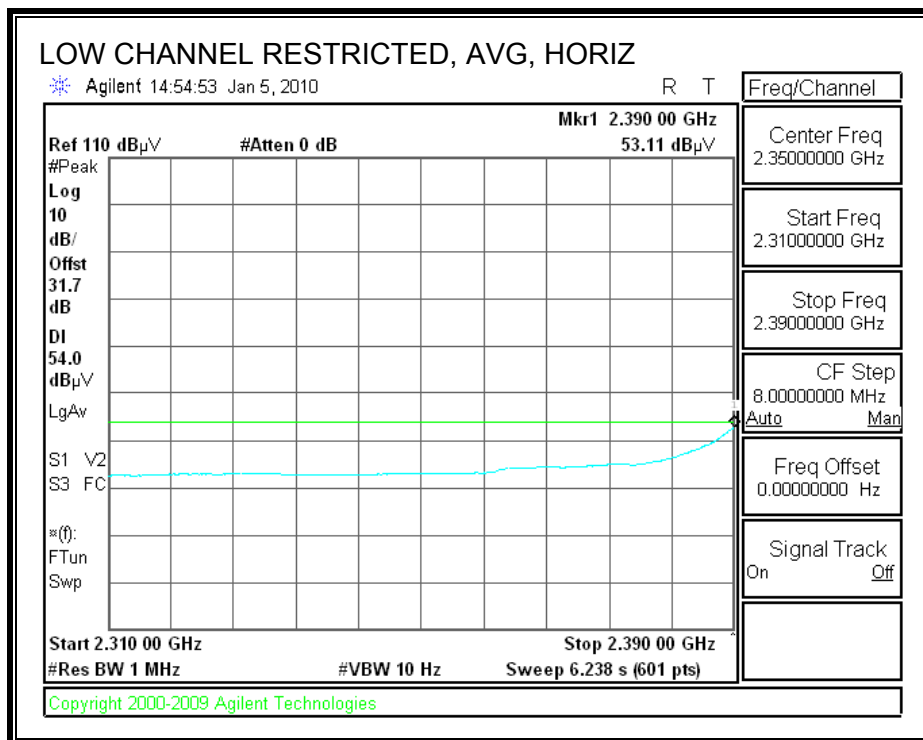
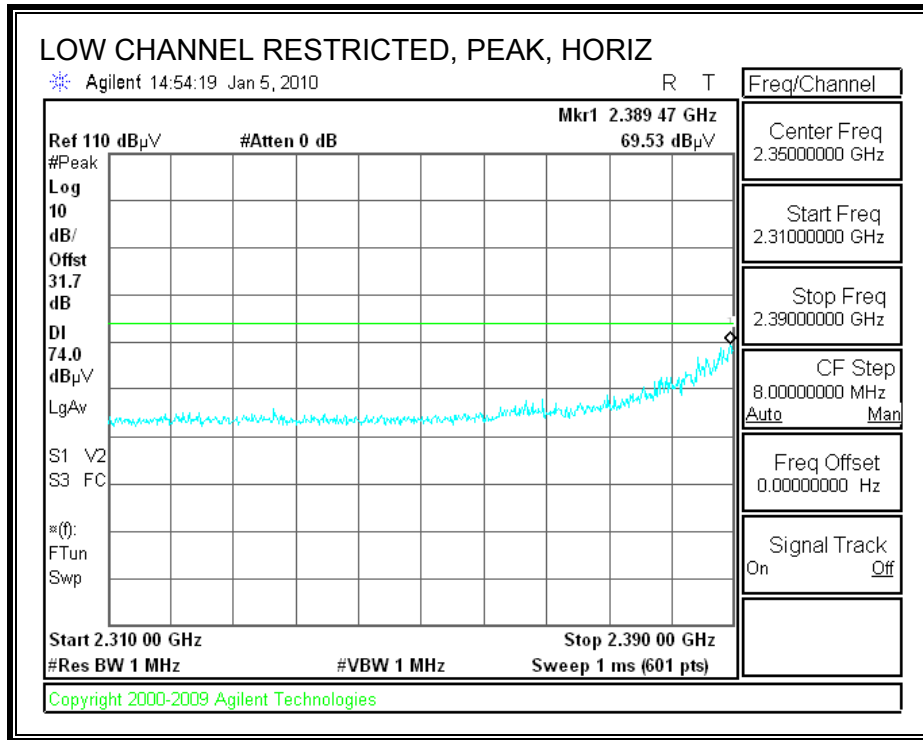


**HARMONICS AND SPURIOUS EMISSIONS (WORST-CASE)**

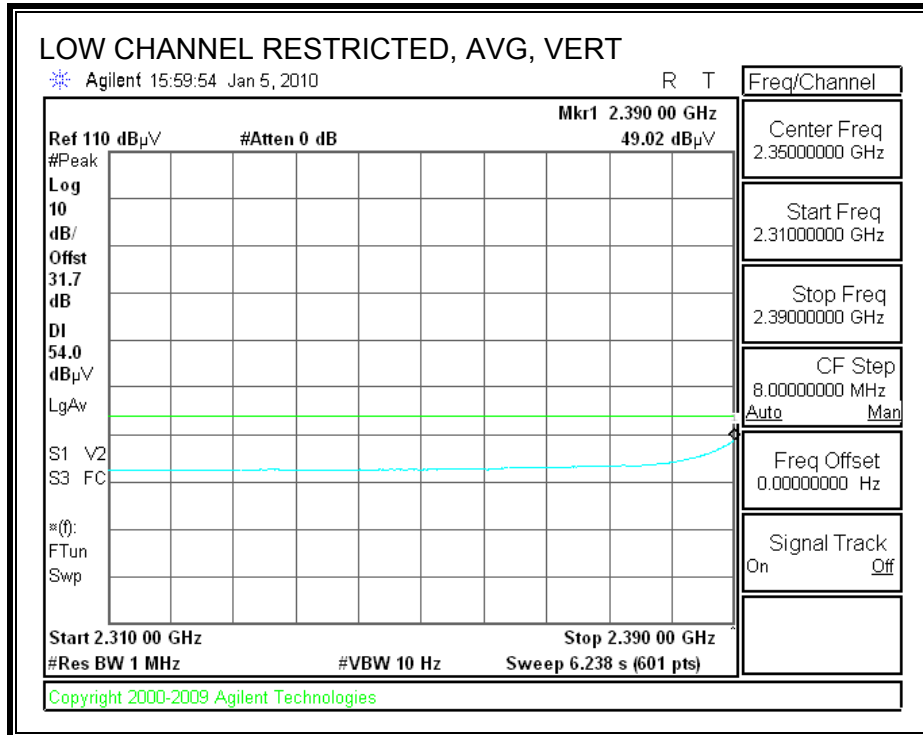
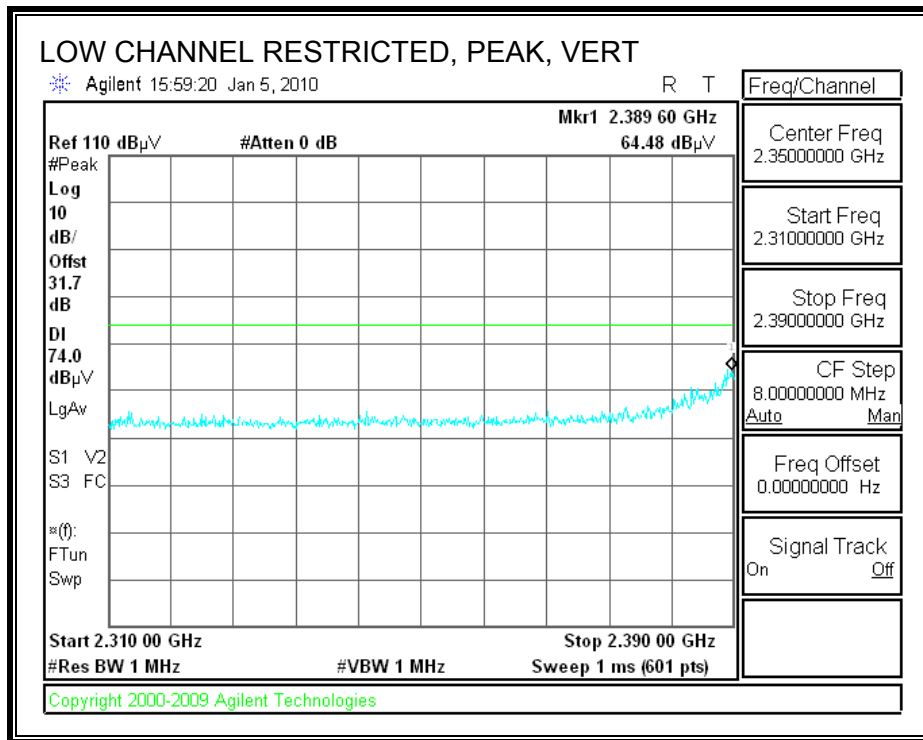
High Frequency Measurement													
Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		Chin Pang											
Date:		01/06/10											
Project #:		09U12979											
Company:		Toshiba											
EUT Description:		802.11 bgn 20 1x1 HB95 inside Wengen30 Tablet											
EUT M/N:		PA3722U-IMPC											
Test Target:		FCC 15.247											
Mode Oper:		TX, b 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	Dist	Read	AF	CL	Amp	D Corr	Filtr	Corr.	Limit	Margin	Ant. Pol.	Det.	Notes
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
<b>Low Ch, 2412MHz</b>													
4.824	3.0	41.6	32.8	5.8	-34.8	0.0	0.0	45.3	74.0	-28.7	H	P	
4.824	3.0	35.0	32.8	5.8	-34.8	0.0	0.0	38.7	54.0	-15.3	H	A	
12.060	3.0	34.9	38.5	9.8	-32.4	0.0	0.0	50.7	74.0	-23.3	H	P	
12.060	3.0	22.6	38.5	9.8	-32.4	0.0	0.0	38.4	54.0	-15.6	H	A	
4.824	3.0	40.9	32.8	5.8	-34.8	0.0	0.0	44.6	74.0	-29.4	V	P	
4.824	3.0	33.8	32.8	5.8	-34.8	0.0	0.0	37.5	54.0	-16.5	V	A	
<b>Mid Ch, 2437MHz</b>													
4.874	3.0	44.9	32.8	5.8	-34.9	0.0	0.0	48.7	74.0	-25.3	H	P	
4.874	3.0	40.9	32.8	5.8	-34.9	0.0	0.0	44.7	54.0	-9.3	H	A	
7.311	3.0	39.5	35.2	7.3	-34.7	0.0	0.0	47.3	74.0	-26.7	H	P	
7.311	3.0	29.6	35.2	7.3	-34.7	0.0	0.0	37.4	54.0	-16.6	H	A	
4.874	3.0	44.5	32.8	5.8	-34.9	0.0	0.0	48.3	74.0	-25.7	V	P	
4.874	3.0	40.2	32.8	5.8	-34.9	0.0	0.0	43.9	54.0	-10.1	V	A	
7.311	3.0	41.2	35.2	7.3	-34.7	0.0	0.0	49.0	74.0	-25.0	V	P	
7.311	3.0	32.1	35.2	7.3	-34.7	0.0	0.0	39.9	54.0	-14.1	V	A	
<b>High Ch, 2462MHz</b>													
4.924	3.0	44.7	32.8	5.9	-34.9	0.0	0.0	48.6	74.0	-25.4	H	P	
4.924	3.0	41.4	32.8	5.9	-34.9	0.0	0.0	45.3	54.0	-8.7	H	A	
7.386	3.0	39.5	35.3	7.3	-34.6	0.0	0.0	47.5	74.0	-26.5	H	P	
7.386	3.0	29.5	35.3	7.3	-34.6	0.0	0.0	37.4	54.0	-16.6	H	A	
4.924	3.0	44.5	32.8	5.9	-34.9	0.0	0.0	48.4	74.0	-25.6	V	P	
4.924	3.0	40.9	32.8	5.9	-34.9	0.0	0.0	44.8	54.0	-9.2	V	A	
7.386	3.0	42.6	35.3	7.3	-34.6	0.0	0.0	50.6	74.0	-23.4	V	P	
7.386	3.0	35.7	35.3	7.3	-34.6	0.0	0.0	43.7	54.0	-10.3	V	A	
Rev. 4.1.2.7													
Note: No other emissions were detected above the system noise floor.													

### 8.2.2. 802.11g MODE IN THE 2.4 GHz BAND

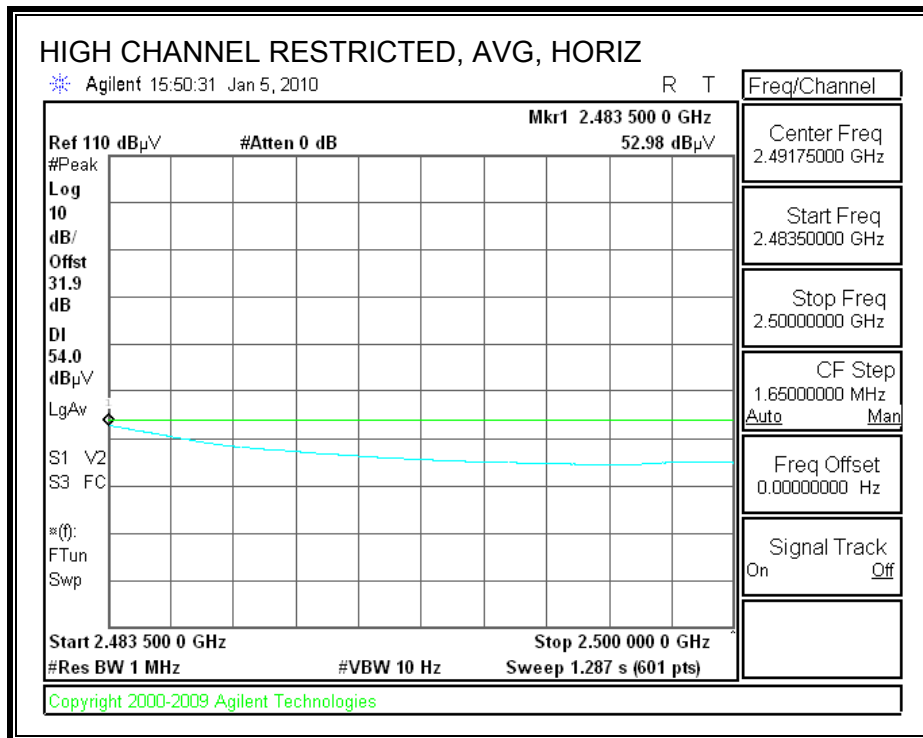
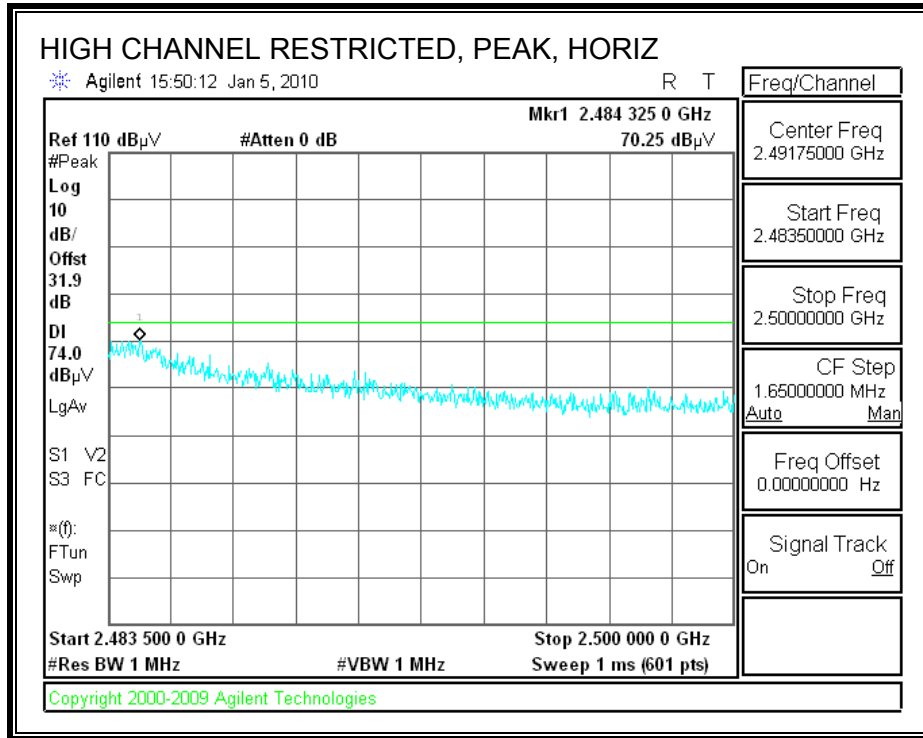
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



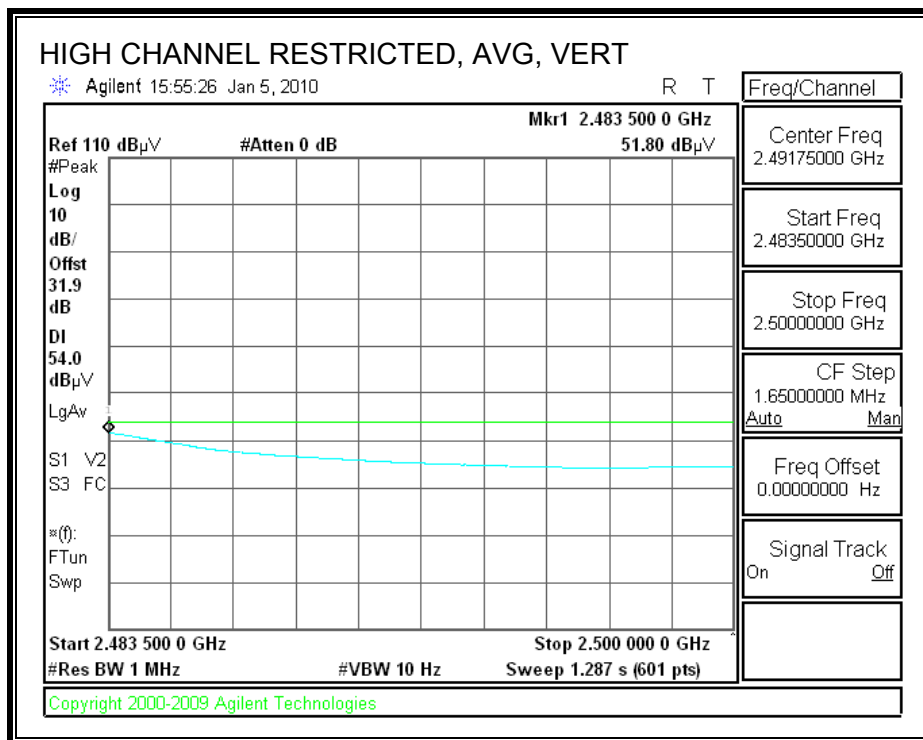
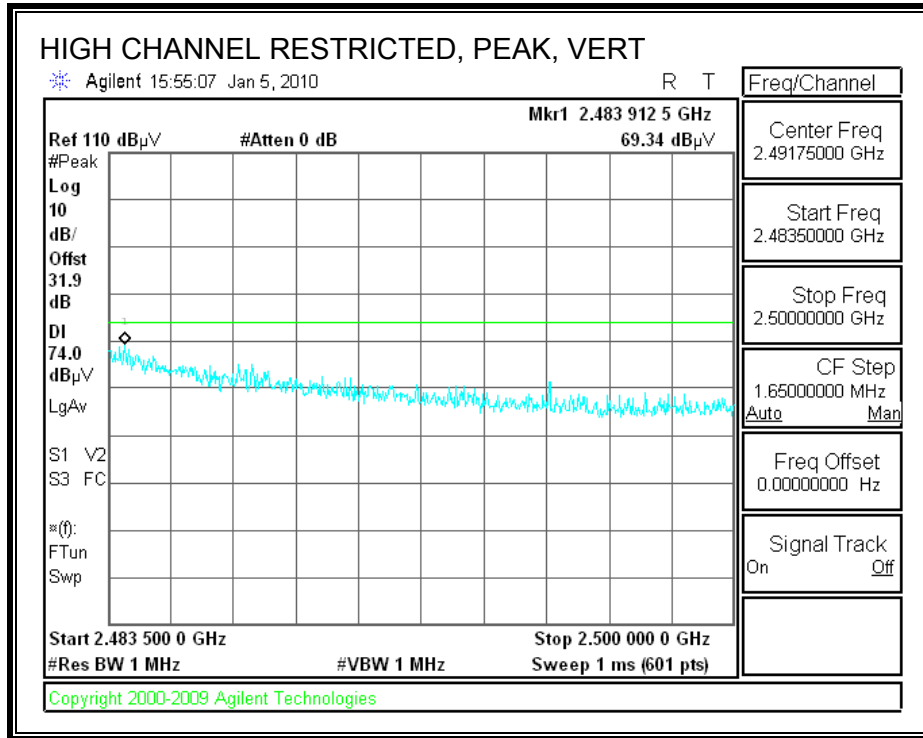
**RESTRICTED BANEDGE (LOW CHANNEL, VERTICAL)**



**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



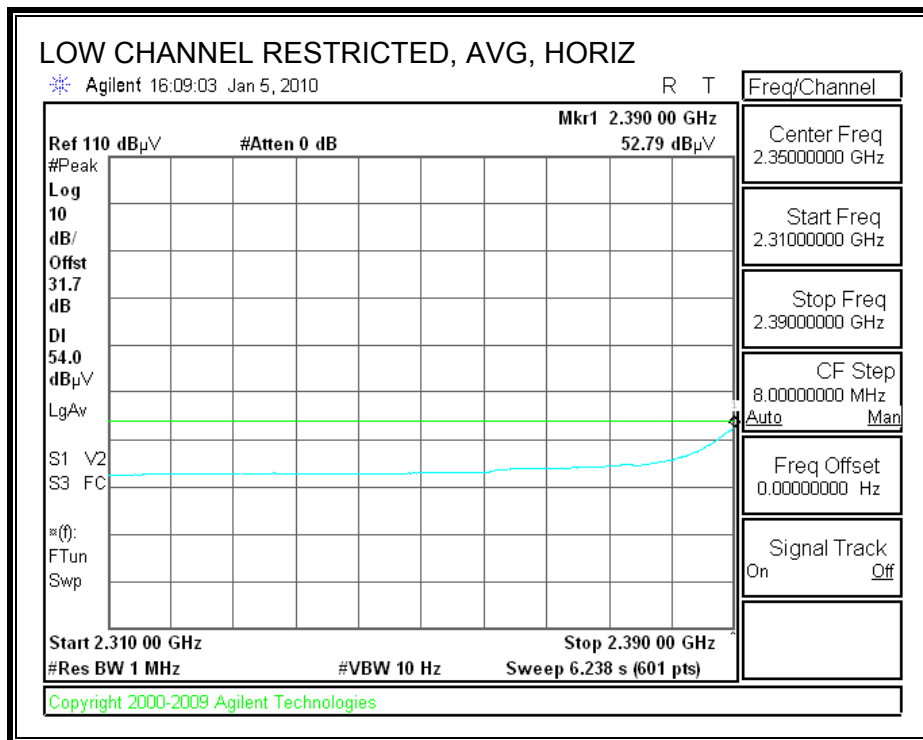
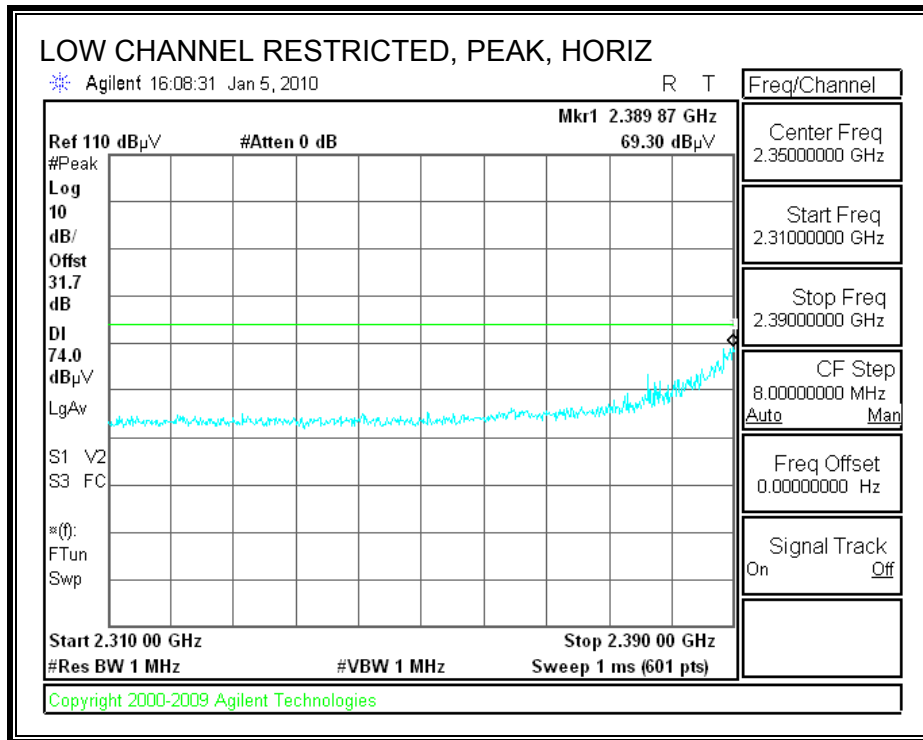
**HARMONICS AND SPURIOUS EMISSIONS (WORST-CASE)**

High Frequency Measurement													
Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		Chin Pang											
Date:		01/06/10											
Project #:		09U12979											
Company:		Toshiba											
EUT Description:		802.11 bgn 20 1x1 HB95 inside Wengen30 Tablet											
EUT M/N:		PA3722U-1MPC											
Test Target:		FCC 15.247											
Mode Oper:		TX, g 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	Fitr dB	Corr. dB	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
<b>Low Ch, 2412MHz</b>													
4.824	3.0	45.6	32.8	5.8	-34.8	0.0	0.0	49.3	74.0	-24.7	H	P	
4.824	3.0	31.2	32.8	5.8	-34.8	0.0	0.0	34.9	54.0	-19.1	H	A	
4.824	3.0	44.5	32.8	5.8	-34.8	0.0	0.0	48.3	74.0	-25.7	V	P	
4.824	3.0	30.5	32.8	5.8	-34.8	0.0	0.0	34.3	54.0	-19.7	V	A	
<b>Mid Ch, 2437MHz</b>													
4.874	3.0	43.3	32.8	5.8	-34.9	0.0	0.0	47.1	74.0	-26.9	H	P	
4.874	3.0	30.9	32.8	5.8	-34.9	0.0	0.0	34.7	54.0	-19.3	H	A	
7.311	3.0	45.6	35.2	7.3	-34.7	0.0	0.0	53.4	74.0	-20.6	H	P	
7.311	3.0	31.8	35.2	7.3	-34.7	0.0	0.0	39.6	54.0	-14.4	H	A	
4.874	3.0	44.9	32.8	5.8	-34.9	0.0	0.0	48.7	74.0	-25.3	V	P	
4.874	3.0	31.5	32.8	5.8	-34.9	0.0	0.0	35.3	54.0	-18.7	V	A	
7.311	3.0	49.6	35.2	7.3	-34.7	0.0	0.0	57.4	74.0	-16.6	V	P	
7.311	3.0	35.1	35.2	7.3	-34.7	0.0	0.0	42.9	54.0	-11.1	V	A	
<b>High Ch, 2462MHz</b>													
4.924	3.0	45.4	32.8	5.9	-34.9	0.0	0.0	49.3	74.0	-24.7	H	P	
4.924	3.0	32.2	32.8	5.9	-34.9	0.0	0.0	36.1	54.0	-17.9	H	A	
7.386	3.0	47.3	35.3	7.3	-34.6	0.0	0.0	55.2	74.0	-18.8	H	P	
7.386	3.0	32.8	35.3	7.3	-34.6	0.0	0.0	40.7	54.0	-13.3	H	A	
4.924	3.0	44.1	32.8	5.9	-34.9	0.0	0.0	47.9	74.0	-26.1	V	P	
4.924	3.0	31.7	32.8	5.9	-34.9	0.0	0.0	35.5	54.0	-18.5	V	A	
7.386	3.0	53.0	35.3	7.3	-34.6	0.0	0.0	60.9	74.0	-13.1	V	P	
7.386	3.0	38.1	35.3	7.3	-34.6	0.0	0.0	46.1	54.0	-7.9	V	A	
Rev. 4.1.2.7													
Note: No other emissions were detected above the system noise floor.													

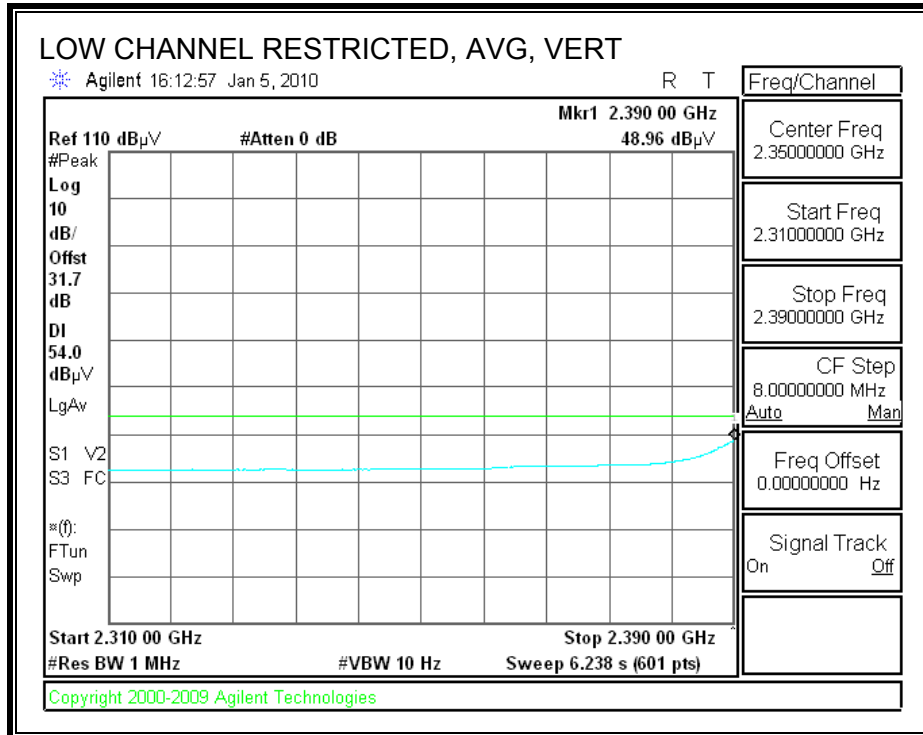
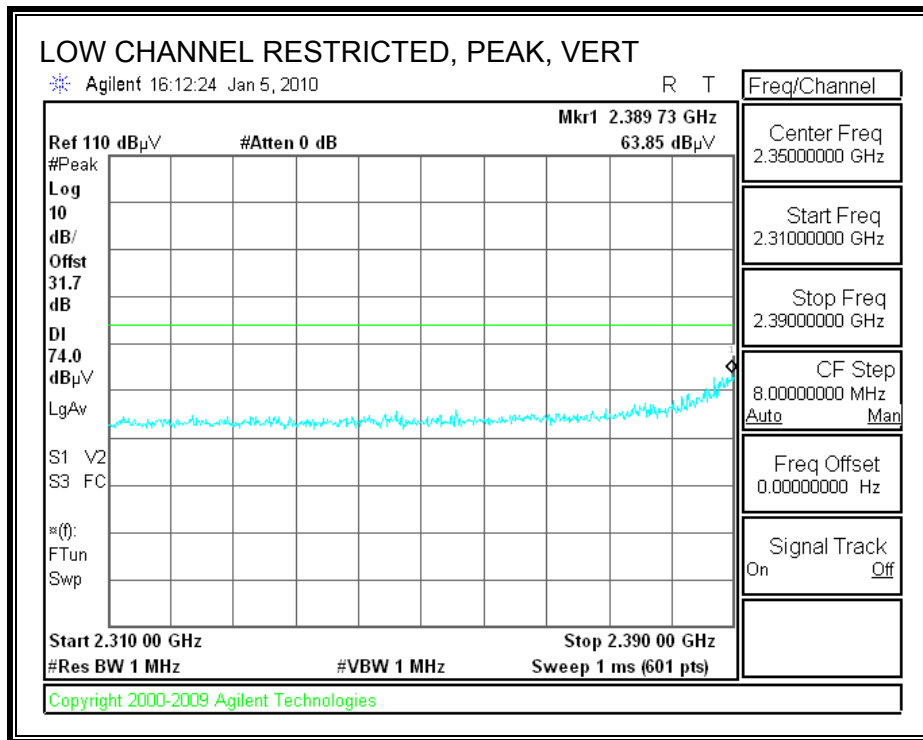


### 8.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

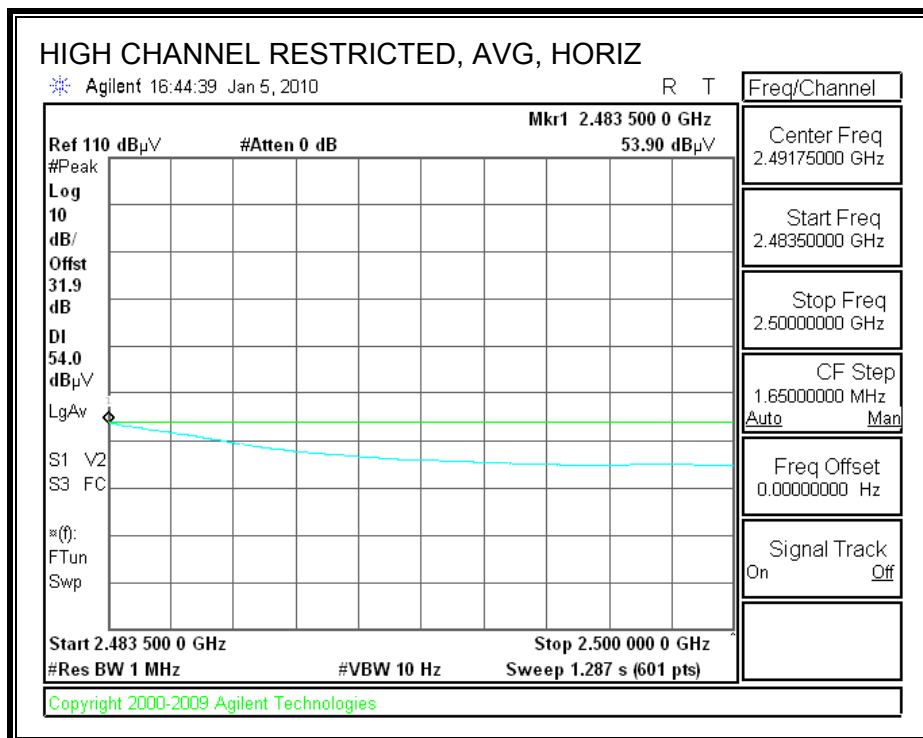
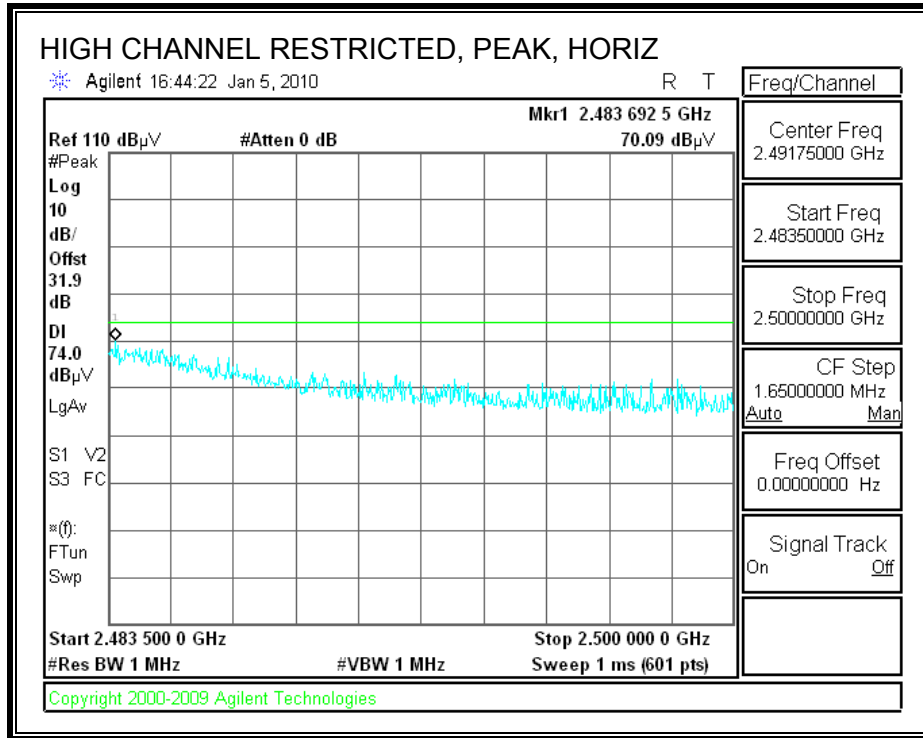
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



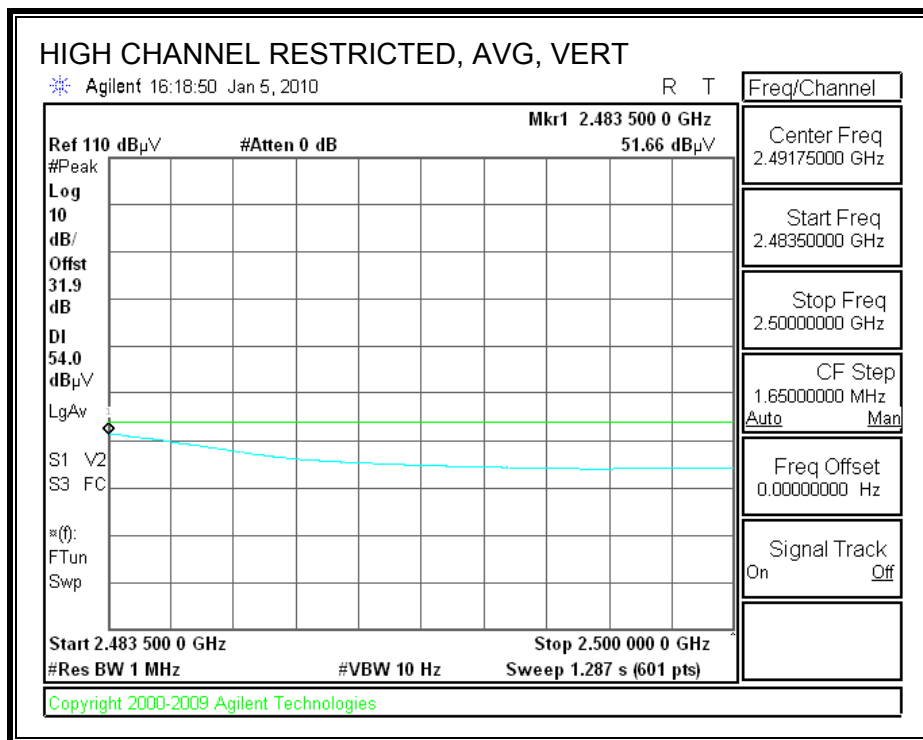
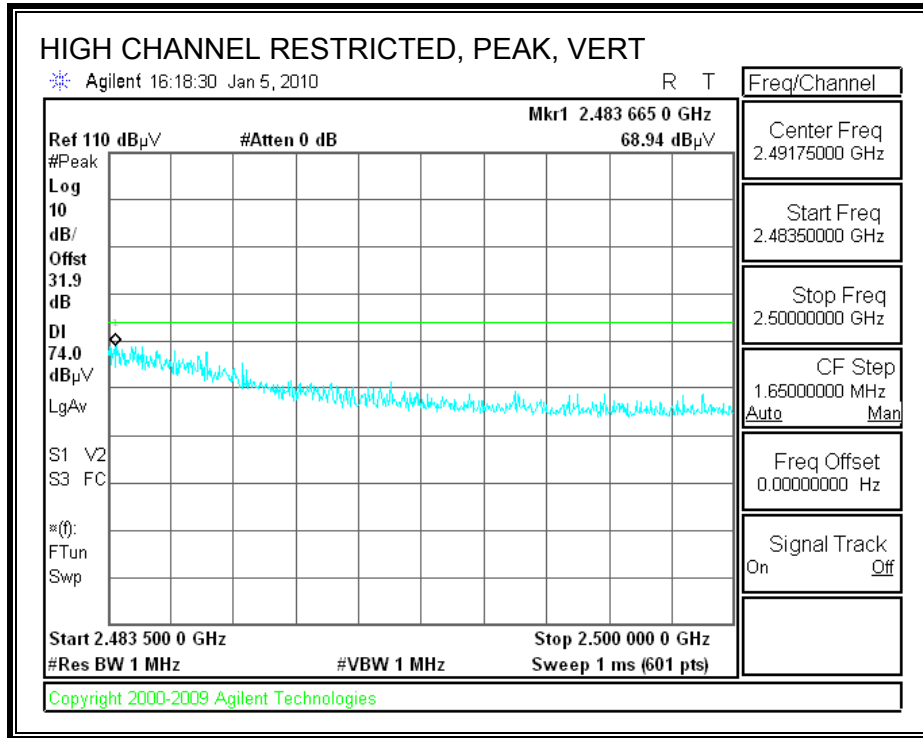
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

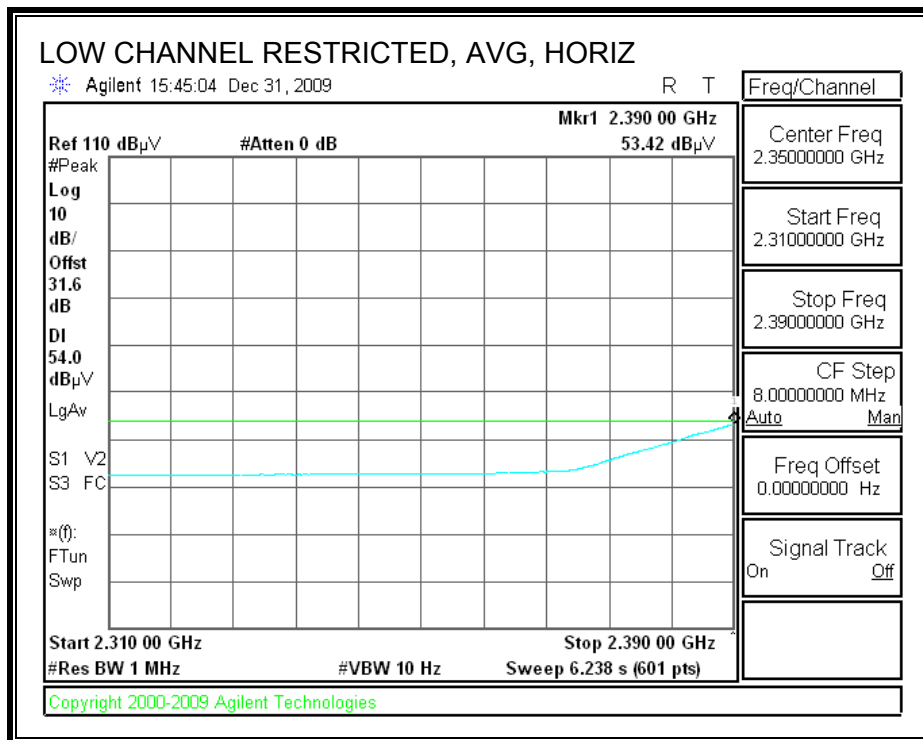
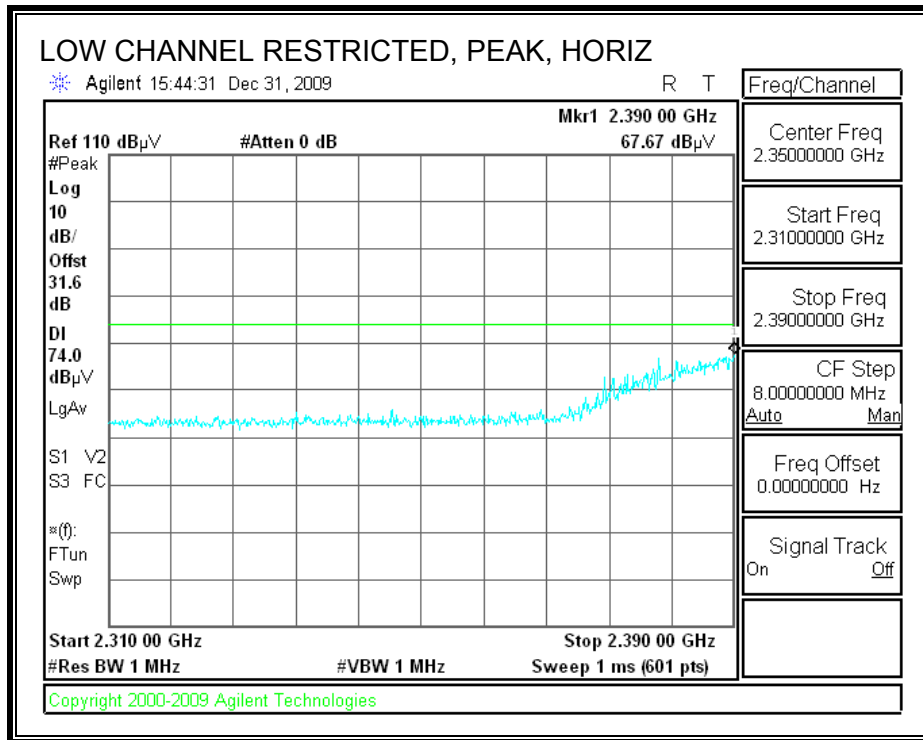


**HARMONICS AND SPURIOUS EMISSIONS (WORST-CASE)**

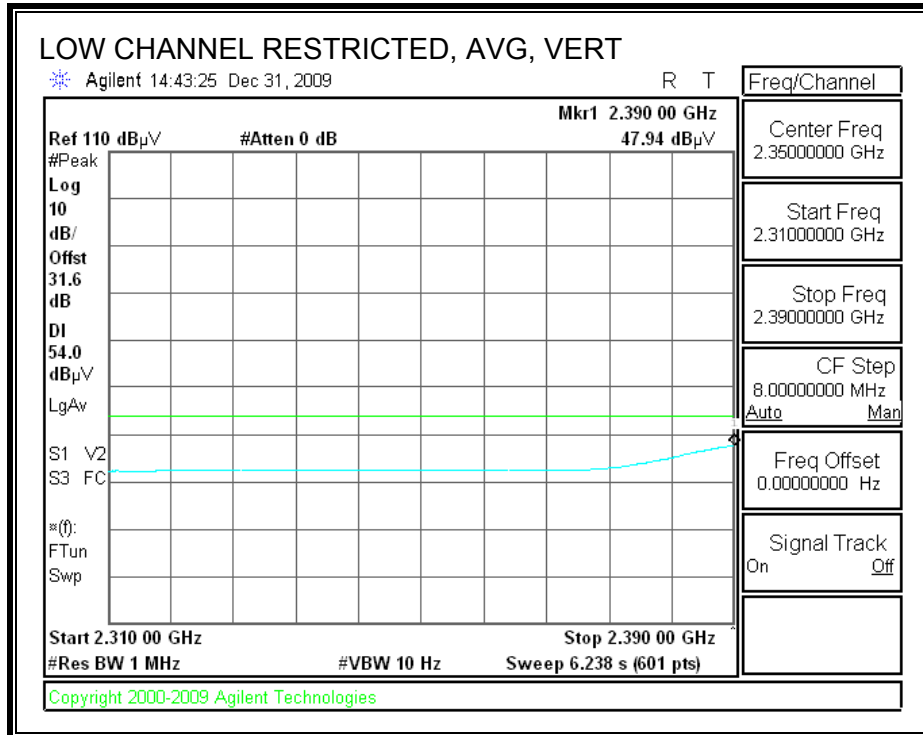
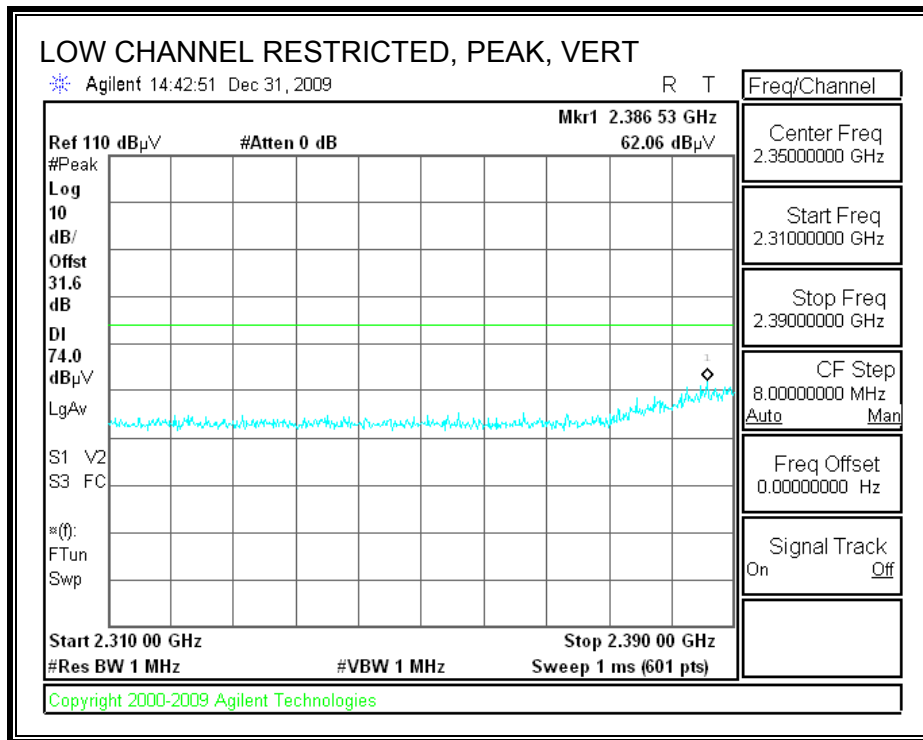
High Frequency Measurement													
Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		Chin Pang											
Date:		01/06/10											
Project #:		09U12979											
Company:		Toshiba											
EUT Description:		802.11 bgn 20 1x1 HB95 inside Wengen30 Tablet											
EUT M/N:		PA3722U-1MPC											
Test Target:		FCC 15.247											
Mode Oper:		TX, HI20											
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	Dist	Read	AF	CL	Amp	D Corr	Filtr	Corr.	Limit	Margin	Ant. Pol.	Det.	Notes
GHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP
<b>Low Ch, 2412MHz</b>													
4.824	3.0	44.8	32.8	5.8	-34.8	0.0	0.0	48.5	74.0	-25.5	H	P	
4.824	3.0	30.9	32.8	5.8	-34.8	0.0	0.0	34.6	54.0	-19.4	H	A	
4.824	3.0	43.4	32.8	5.8	-34.8	0.0	0.0	47.1	74.0	-26.9	V	P	
4.824	3.0	30.5	32.8	5.8	-34.8	0.0	0.0	34.2	54.0	-19.8	V	A	
<b>Mid Ch, 2437MHz</b>													
4.874	3.0	44.0	32.8	5.8	-34.9	0.0	0.0	47.8	74.0	-26.2	H	P	
4.874	3.0	30.5	32.8	5.8	-34.9	0.0	0.0	34.3	54.0	-19.7	H	A	
7.311	3.0	46.4	35.2	7.3	-34.7	0.0	0.0	54.2	74.0	-19.8	H	P	
7.311	3.0	31.8	35.2	7.3	-34.7	0.0	0.0	39.6	54.0	-14.4	H	A	
4.874	3.0	43.1	32.8	5.8	-34.9	0.0	0.0	46.9	74.0	-27.2	V	P	
4.874	3.0	31.1	32.8	5.8	-34.9	0.0	0.0	34.9	54.0	-19.1	V	A	
7.311	3.0	48.7	35.2	7.3	-34.7	0.0	0.0	56.5	74.0	-17.5	V	P	
7.311	3.0	33.7	35.2	7.3	-34.7	0.0	0.0	41.5	54.0	-12.5	V	A	
<b>High Ch, 2462MHz</b>													
4.924	3.0	41.4	32.8	5.9	-34.9	0.0	0.0	45.2	74.0	-28.8	H	P	
4.924	3.0	29.5	32.8	5.9	-34.9	0.0	0.0	33.4	54.0	-20.6	H	A	
7.386	3.0	48.2	35.3	7.3	-34.6	0.0	0.0	56.2	74.0	-17.8	H	P	
7.386	3.0	34.1	35.3	7.3	-34.6	0.0	0.0	42.0	54.0	-12.0	H	A	
4.924	3.0	46.0	32.8	5.9	-34.9	0.0	0.0	49.8	74.0	-24.2	V	P	
4.924	3.0	33.0	32.8	5.9	-34.9	0.0	0.0	36.9	54.0	-17.1	V	A	
7.386	3.0	50.4	35.3	7.3	-34.6	0.0	0.0	58.3	74.0	-15.7	V	P	
7.386	3.0	35.1	35.3	7.3	-34.6	0.0	0.0	43.0	54.0	-11.0	V	A	
Rev. 4.1.2.7													
Note: No other emissions were detected above the system noise floor.													

### 8.2.4. 802.11n HT40 MODE IN THE 2.4 GHz BAND

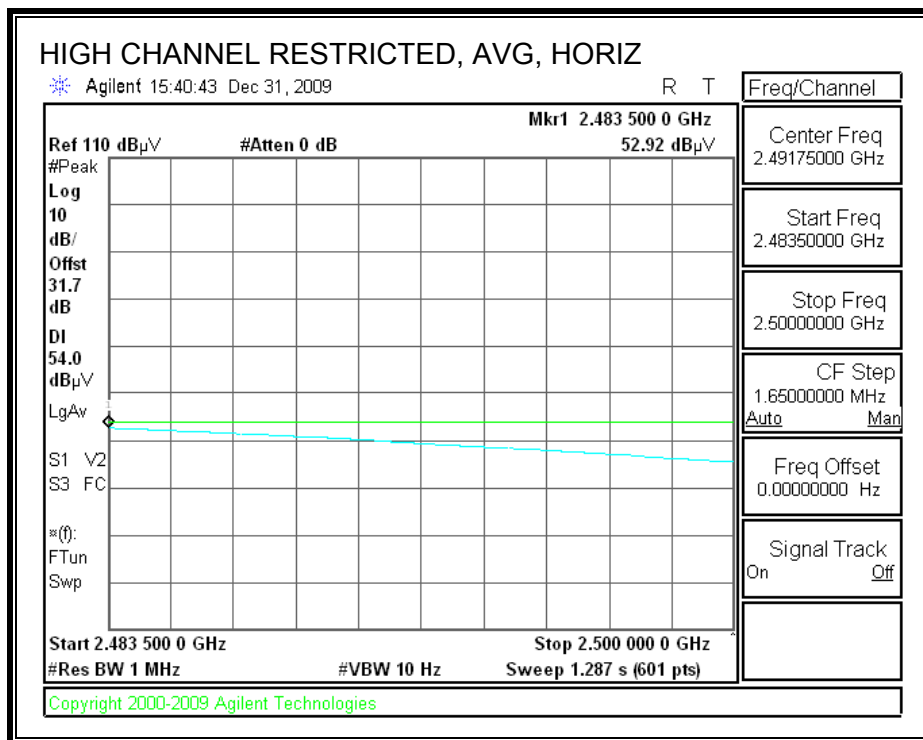
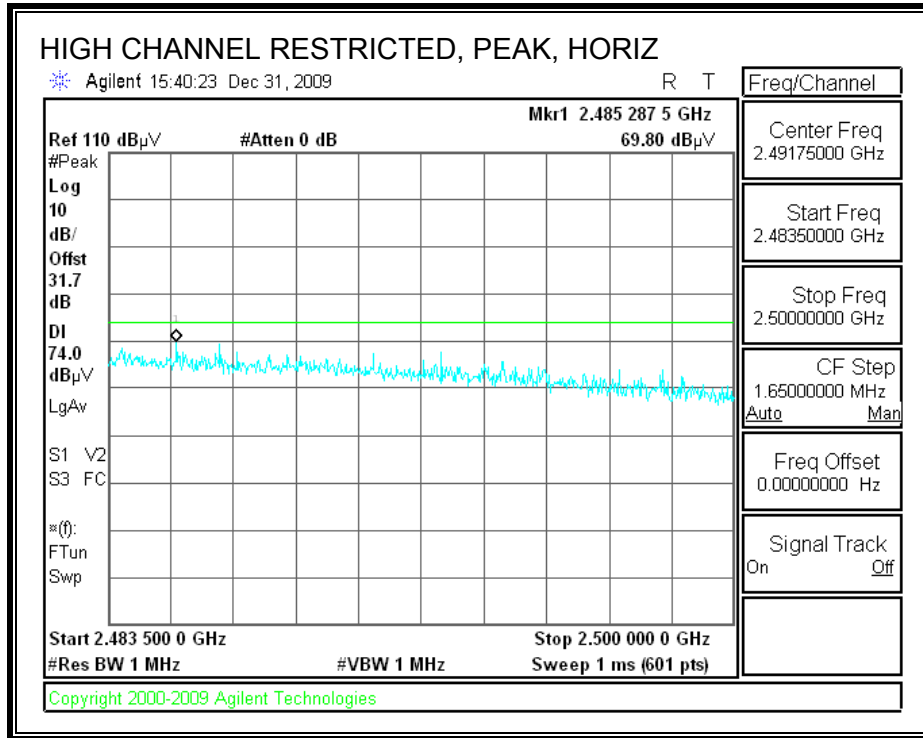
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

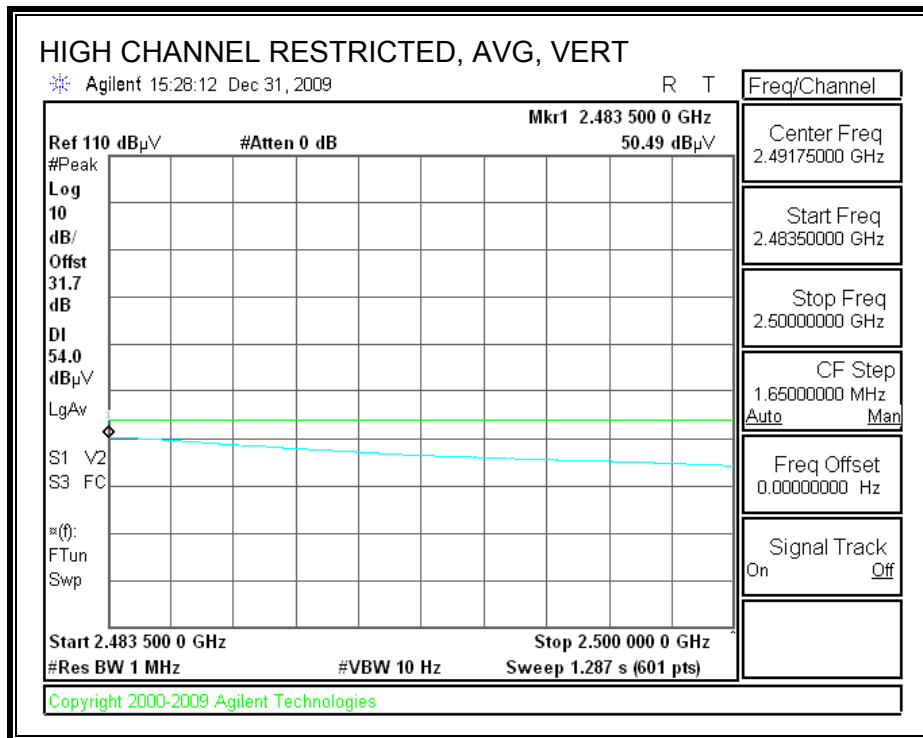
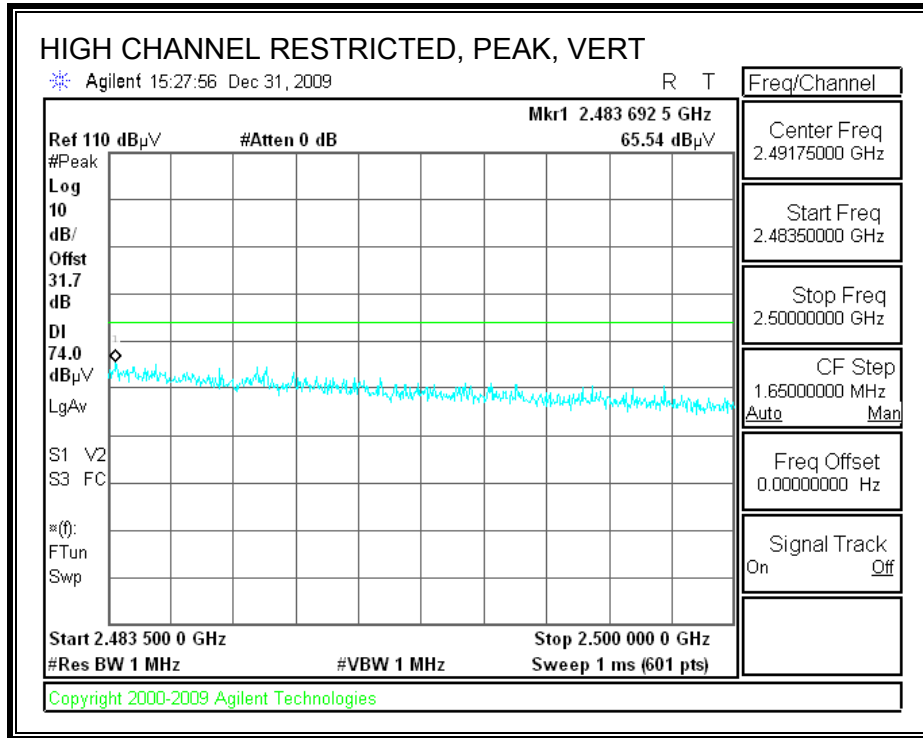


**RESTRICTED BANEDGE (HIGH CHANNEL, HORIZONTAL)**





**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



**HARMONICS AND SPURIOUS EMISSIONS (WORST-CASE)**

**High Frequency Measurement**

Compliance Certification Services, Fremont 5m Chamber

Test Engr: Chin Pang  
 Date: 01/06/10  
 Project #: 09U12979  
 Company: Toshiba  
 EUT Description: 802.11 bgn 20 1x1 HB95 inside Wengen30 Tablet  
 EUT M/N: PA3722U-1MPC  
 Test Target: FCC 15.247  
 Mode Oper: TX, HI40

f Measurement Frequency Amp Preamplifier 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	Filtr dB	Corr. dB	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
<b>Low Ch, 2422MHz</b>													
4.844	3.0	40.5	32.8	5.8	-34.8	0.0	0.0	44.2	74.0	-29.8	H	P	
4.844	3.0	27.8	32.8	5.8	-34.8	0.0	0.0	31.5	54.0	-22.5	H	A	
7.266	3.0	41.0	35.1	7.2	-34.7	0.0	0.0	48.7	74.0	-25.3	H	P	
7.266	3.0	27.5	35.1	7.2	-34.7	0.0	0.0	35.3	54.0	-18.7	H	A	
4.844	3.0	39.5	32.8	5.8	-34.8	0.0	0.0	43.2	74.0	-30.8	V	P	
4.844	3.0	27.7	32.8	5.8	-34.8	0.0	0.0	31.5	54.0	-22.5	V	A	
7.266	3.0	42.3	35.1	7.2	-34.7	0.0	0.0	50.0	74.0	-24.0	V	P	
7.266	3.0	29.1	35.1	7.2	-34.7	0.0	0.0	36.8	54.0	-17.2	V	A	
<b>Mid Ch, 2437MHz</b>													
4.874	3.0	41.5	32.8	5.8	-34.9	0.0	0.0	45.3	74.0	-28.7	H	P	
4.874	3.0	28.5	32.8	5.8	-34.9	0.0	0.0	32.3	54.0	-21.7	H	A	
7.311	3.0	40.7	35.2	7.3	-34.7	0.0	0.0	48.5	74.0	-25.5	H	P	
7.311	3.0	28.4	35.2	7.3	-34.7	0.0	0.0	36.2	54.0	-17.8	H	A	
4.874	3.0	41.2	32.8	5.8	-34.9	0.0	0.0	44.9	74.0	-29.1	V	P	
4.874	3.0	28.7	32.8	5.8	-34.9	0.0	0.0	32.5	54.0	-21.5	V	A	
7.311	3.0	43.1	35.2	7.3	-34.7	0.0	0.0	50.9	74.0	-23.1	V	P	
7.311	3.0	30.4	35.2	7.3	-34.7	0.0	0.0	38.2	54.0	-15.8	V	A	
<b>High Ch, 2452MHz</b>													
4.904	3.0	41.5	32.8	5.9	-34.9	0.0	0.0	45.3	74.0	-28.7	H	P	
4.904	3.0	28.5	32.8	5.9	-34.9	0.0	0.0	32.4	54.0	-21.6	H	A	
7.356	3.0	42.2	35.3	7.3	-34.6	0.0	0.0	50.1	74.0	-23.9	H	P	
7.356	3.0	28.7	35.3	7.3	-34.6	0.0	0.0	36.6	54.0	-17.4	H	A	
4.904	3.0	42.7	32.8	5.9	-34.9	0.0	0.0	46.5	74.0	-27.5	V	P	
4.904	3.0	29.6	32.8	5.9	-34.9	0.0	0.0	33.4	54.0	-20.6	V	A	
7.356	3.0	47.7	35.3	7.3	-34.6	0.0	0.0	55.6	74.0	-18.4	V	P	
7.356	3.0	33.1	35.3	7.3	-34.6	0.0	0.0	40.9	54.0	-13.1	V	A	

Rev. 4.1.2.7

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

Company: Toshiba  
 Project #: 09U12979  
 Date: 1/06/2010  
 Test Engineer: Chin Pang  
 Configuration: EUT/Laptop  
 Mode: RX ( Worst Case ), 2.4GHz

**Test Equipment:**

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T59; S/N: 3245 @3m	T145 Agilent 3008A0056			FCC 15.209

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

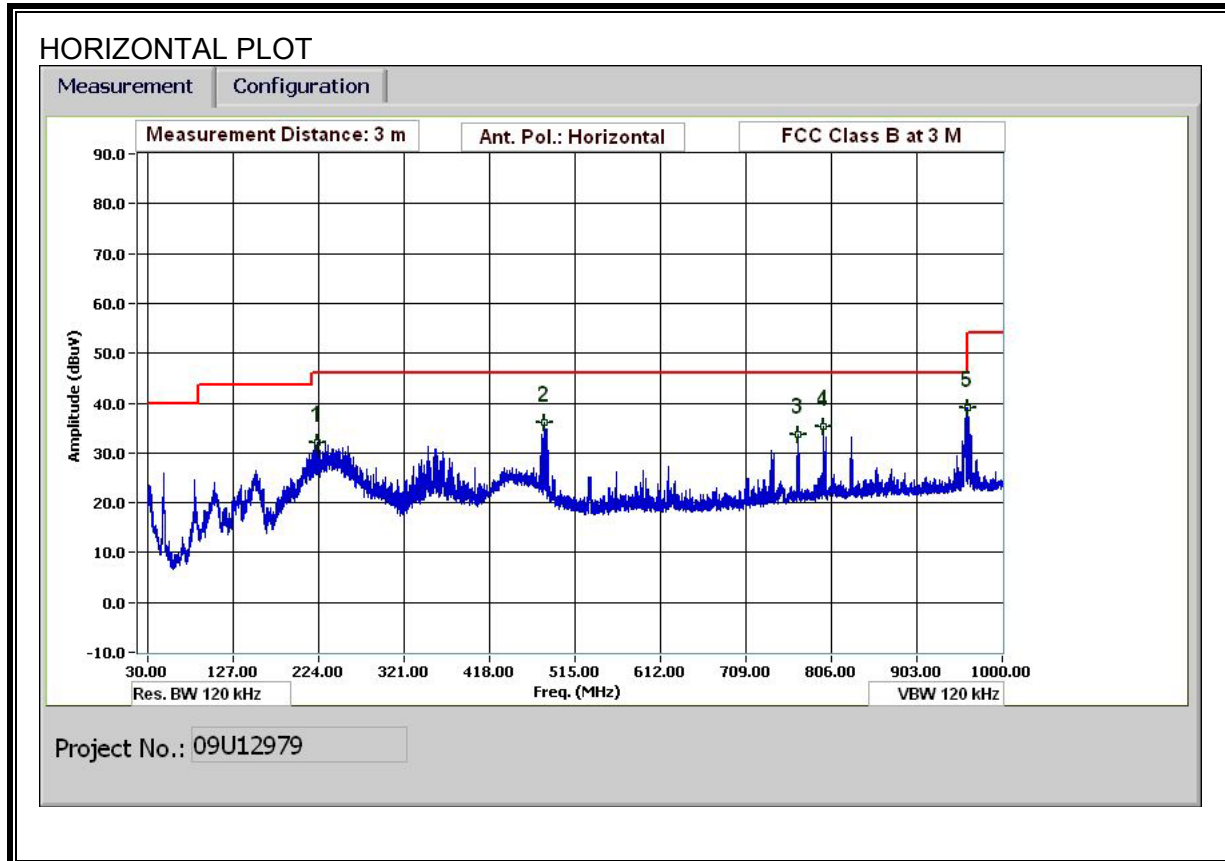
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Ftr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
Mid Ch															
1.330	3.0	56.0	35.6	25.2	2.7	-35.9		0.0	48.0	27.6	74	54	-26.0	-26.4	V
1.660	3.0	53.5	32.5	26.4	3.1	-35.7		0.0	47.3	26.3	74	54	-26.7	-27.7	V
2.130	3.0	48.6	32.2	27.8	3.6	-35.3		0.0	44.7	28.3	74	54	-29.3	-25.7	V
2.665	3.0	47.2	28.6	29.0	4.1	-35.2		0.0	45.1	26.5	74	54	-28.9	-27.5	V
1.330	3.0	50.2	34.2	25.2	2.7	-35.9		0.0	42.2	26.2	74	54	-31.8	-27.8	H
1.660	3.0	50.8	31.3	26.4	3.1	-35.7		0.0	44.6	25.1	74	54	-29.4	-28.9	H
2.650	3.0	48.7	28.5	29.0	4.1	-35.1		0.0	46.6	26.4	74	54	-27.4	-27.6	H

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

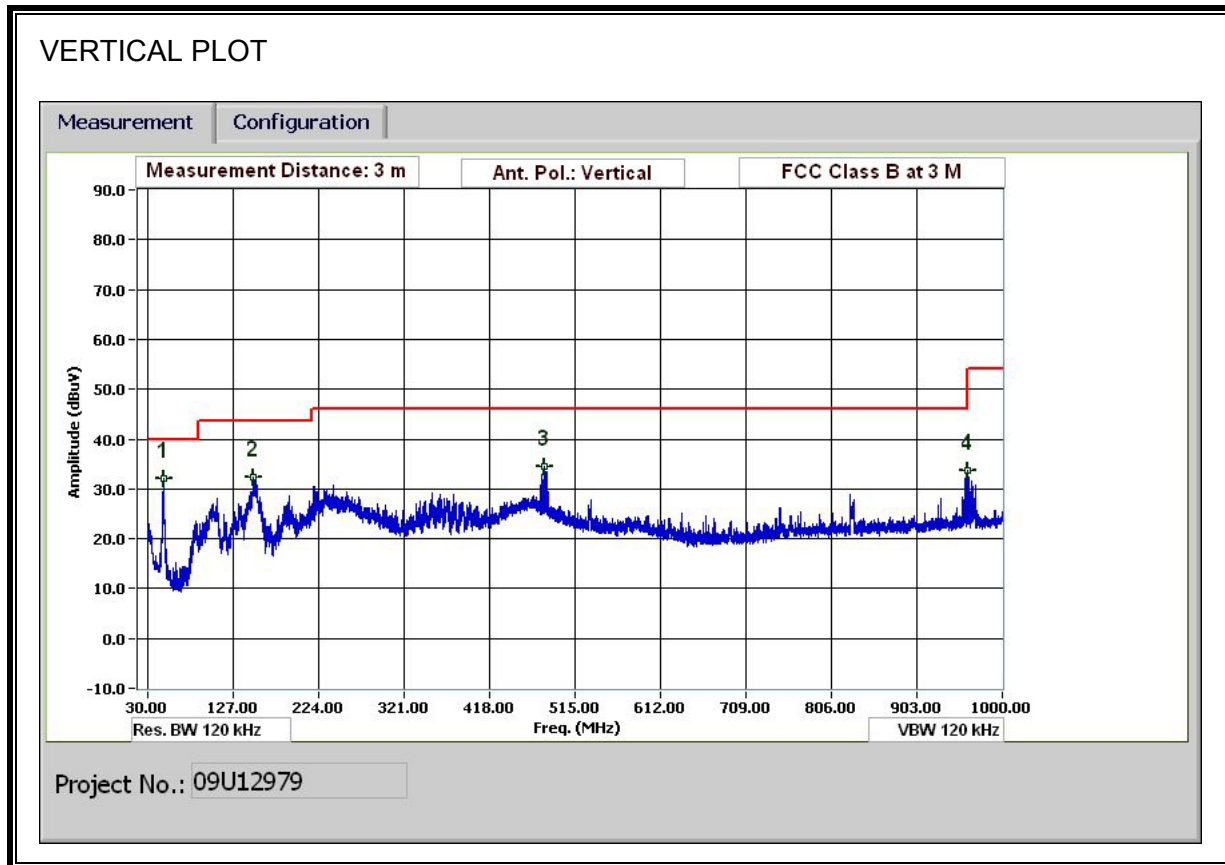
f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field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

### 8.4. WORST CASE BELOW 1 GHz

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



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



**HORIZONTAL AND VERTICAL DATA**

30-1000MHz Frequency Measurement													
Compliance Certification Services, Fremont 5m Chamber													
Test Engr:		Thanh Nguyen											
Date:		12/23/09											
Project #:		09U12979											
Company:		Toshiba											
EUT Description:		802.11 bgn inside the Wengen tablet											
EUT M/N:		HB95-050-D1579											
Test Target:		FCC 15 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	Dist	Read	AF	CL	Amp	D Corr	Filter	Corr.	Limit	Margin	Ant. Pol.	Det.	Notes
MHz	(m)	dBuV	dB/m	dB	dB	dB	dB	dBuV/m	dBuV/m	dB	V/H	P/A/QP	
<b>Worst case</b>													
48.001	3.0	51.9	9.2	0.6	29.6	0.0	0.0	32.1	40.0	-7.9	V	P	
150.245	3.0	48.1	12.6	1.1	29.3	0.0	0.0	32.4	43.5	-11.1	V	P	
480.019	3.0	45.7	16.4	2.1	29.6	0.0	0.0	34.6	46.0	-11.4	V	P	
960.038	3.0	36.8	22.2	3.1	28.5	0.0	0.0	33.7	54.0	-20.3	V	P	
222.128	3.0	47.8	11.9	1.4	28.9	0.0	0.0	32.2	46.0	-13.8	H	P	
480.019	3.0	47.3	16.4	2.1	29.6	0.0	0.0	36.2	46.0	-9.8	H	P	
767.550	3.0	39.9	20.4	2.7	29.3	0.0	0.0	33.7	46.0	-12.3	H	P	
796.592	3.0	40.8	21.0	2.8	29.2	0.0	0.0	35.3	46.0	-10.7	H	P	
959.918	3.0	42.2	22.2	3.1	28.5	0.0	0.0	39.1	46.0	-6.9	H	P	

## 9. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

\*Decreases with the logarithm of the frequency.

### TEST PROCEDURE

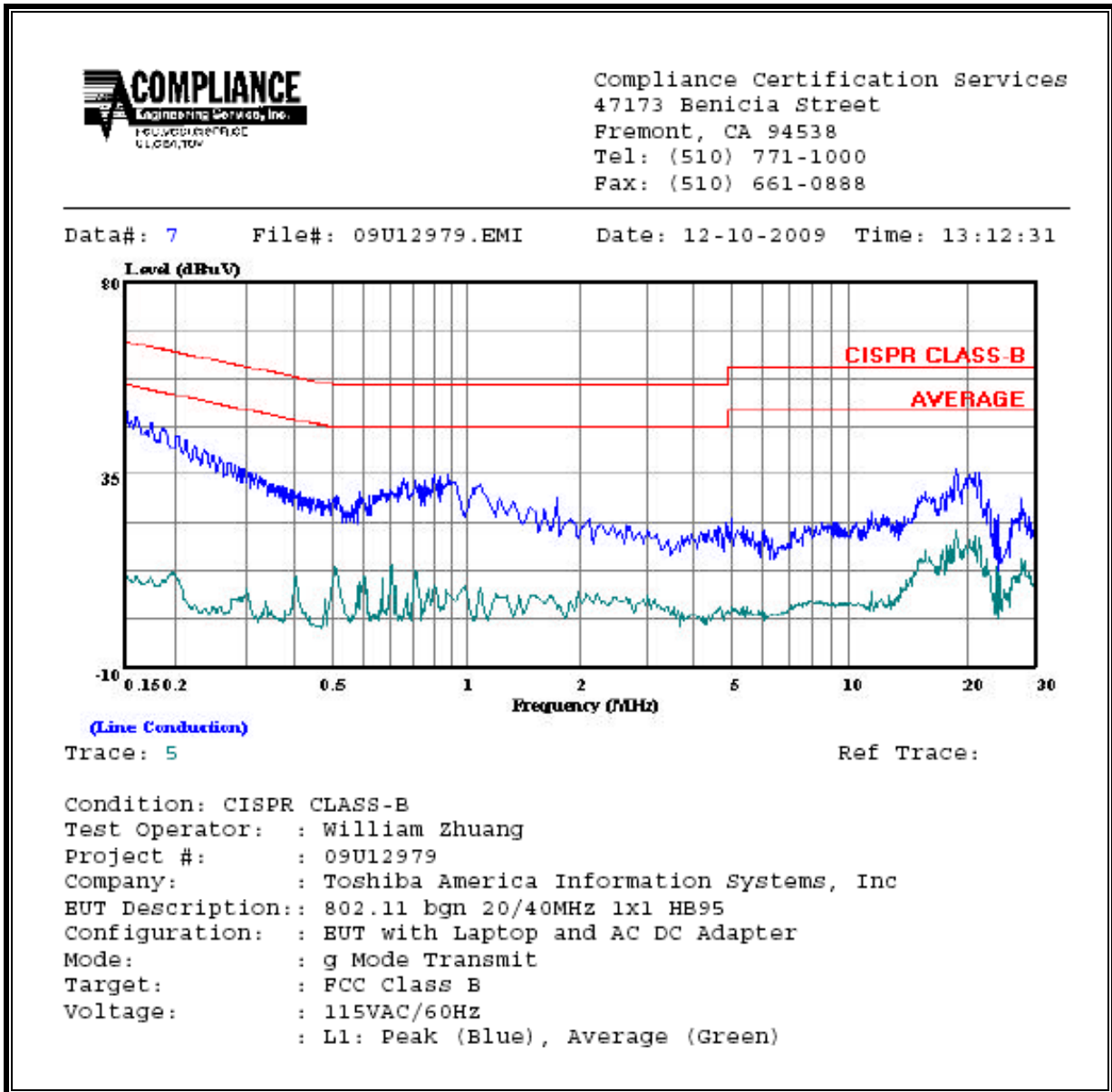
ANSI C63.4

### RESULTS

#### 6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)										
Freq. (MHz)	Reading			Class (dB)	Limit QP	FCC B		Margin		Remark L1 / L2
	PK (dBuV)	QP (dBuV)	AV (dBuV)			AV	QP (dB)	AV (dB)		
0.15	49.90	--	11.38	0.00	66.00	56.00	-16.10	-44.62	L1	
0.98	34.68	--	7.78	0.00	56.00	46.00	-21.32	-38.22	L1	
18.72	36.33	--	21.77	0.00	60.00	50.00	-23.67	-28.23	L1	
0.15	50.24	--	11.75	0.00	66.00	56.00	-15.76	-44.25	L2	
0.84	35.03	--	19.76	0.00	56.00	46.00	-20.97	-26.24	L2	
18.72	35.85	--	21.96	0.00	60.00	50.00	-24.15	-28.04	L2	
6 Worst Data										

**LINE 1 RESULTS**





**LINE 2 RESULTS**

