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

CERTIFICATION TEST REPORT

FOR

802.11 bgn 1X2 MINI CARD
(TESTED INSIDE OF LIBRETTO W100)

MODEL: PA3758U-1MPC

FCC ID: CJ6UPA3758WL
IC: 248H-DPA3758W

REPORT NUMBER: 10U13220-1

ISSUE DATE: MAY 18, 2010

Prepared for
TOSHIBA AMERICA INFORMATION SYSTEMS, INC
9740 IRVINE BLVD.
IRVINE, CA 92618-1697, U.S.A.

Prepared by
COMPLIANCE CERTIFICATION SERVICES
47173 BENICIA STREET
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	05/18/10	Initial Issue	T. Chan

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: 802.11 bgn 1X2 MINI CARD
(TESTED INSIDE OF LIBRETTO W100)

MODEL NUMBER: PA3758U-1MPC

SERIAL NUMBER: PCN2287CC201

DATE TESTED: MAY 13-18, 2010

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:

THU CHAN
EMC MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11bgn 20/40MHz 1x2 mini radio card.

The radio module is manufactured by Realtek Semiconductor Corp.

5.2. MAXIMUM OUTPUT POWER

The test measurement passed within ± 0.5dBm of the original output power.

5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application is adding portable tablet Toshiba Tablet (Libretto W100).

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna with a maximum gain of -0.32 dBi for 2.4GHz band.

5.5. SOFTWARE AND FIRMWARE

The test utility and driver software used during testing was Realtek 11n singlechip PCIE WLAN NIC mass production kit, file version: 5.1009.1229.2008

5.6. WORST-CASE CONFIGURATION AND MODE

Worst-Case data rates were utilized from preliminary testing of the Chipset, original FCC ID TX2-RTL819SE with grant date on 01/22/09, so worst-case data rates used during the radiated emissions testing are as follows:

_For Bandedge measurement: 802.11n HT40 mode, MCS0, 13.5Mbps, OFDM modulation.
_All TX harmonic spurious, RX, below 1GHz spurious, and AC line condition measurements: 802.11b mode, 1Mbps, CCK modulation.

The EUT is a portable device, therefore, X, Y, Z position has been investigated and the X 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	Libretto W100	PLW10U-AAAA1	DoC
AC/DC Adaptor	Toshiba	PA3822U-1ACA	229100324000013	DoC

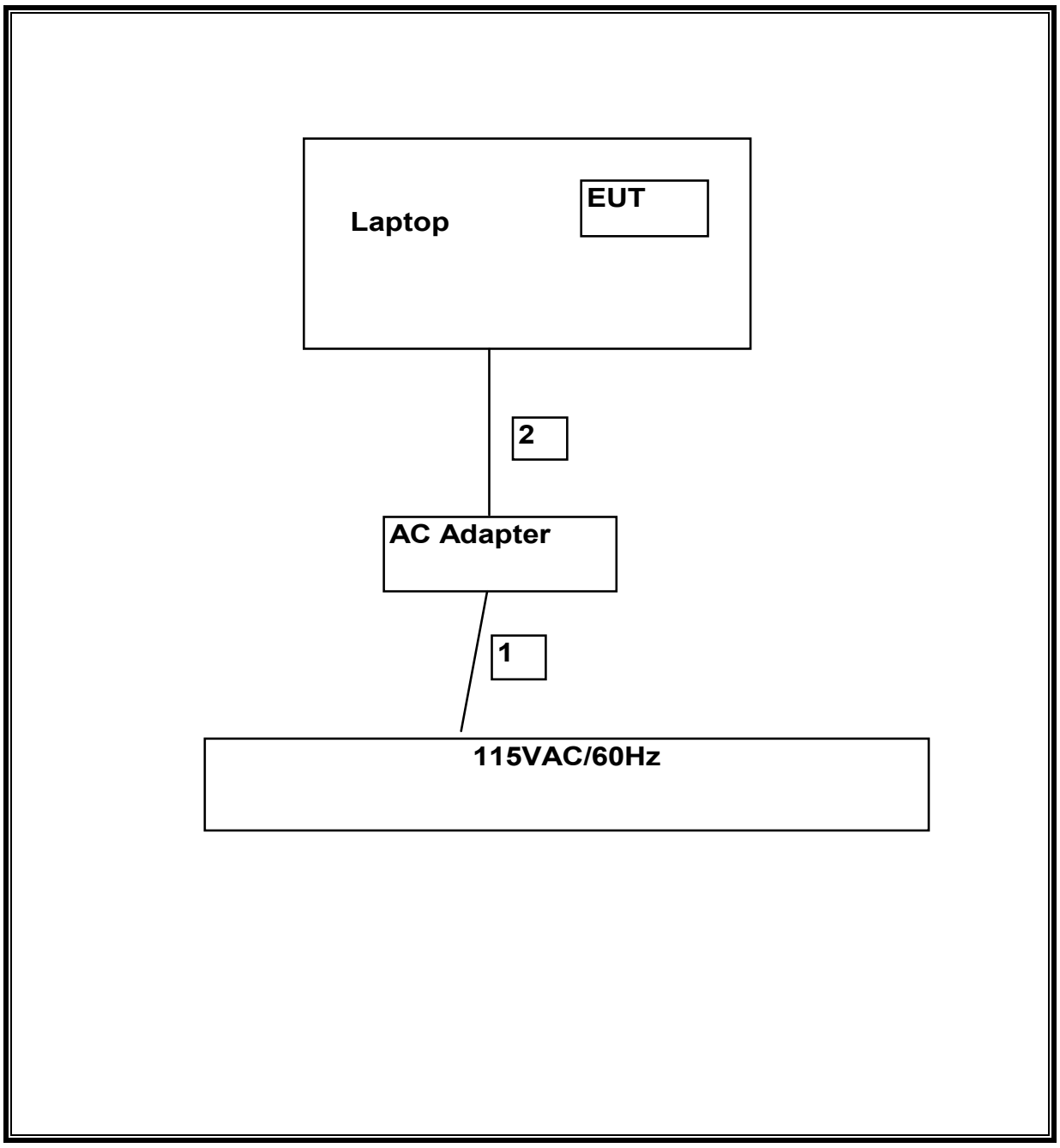
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identic 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**
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	08/04/10
Antenna, Horn, 18 GHz	EMCO	3115	C00945	07/29/10
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	07/06/10
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	07/14/10
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01176	08/24/10
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	BRC13192	N02683	CNR

7. RADIATED TEST RESULTS

7.1. 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.

7.2. TRANSMITTER ABOVE 1 GHz

7.2.1. 802.11b IN THE 2.4 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS (WORST-CASE)

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Test Engr: Chin Pang
Date: 05/17/10
Project #: 10U13220
Company: Toshiba
EUT Description: 802.11 bgn Mini Card
EUT M/N: PA3758U-1MPC
Test Target: FCC 15.247
Mode Oper: TX, b mode

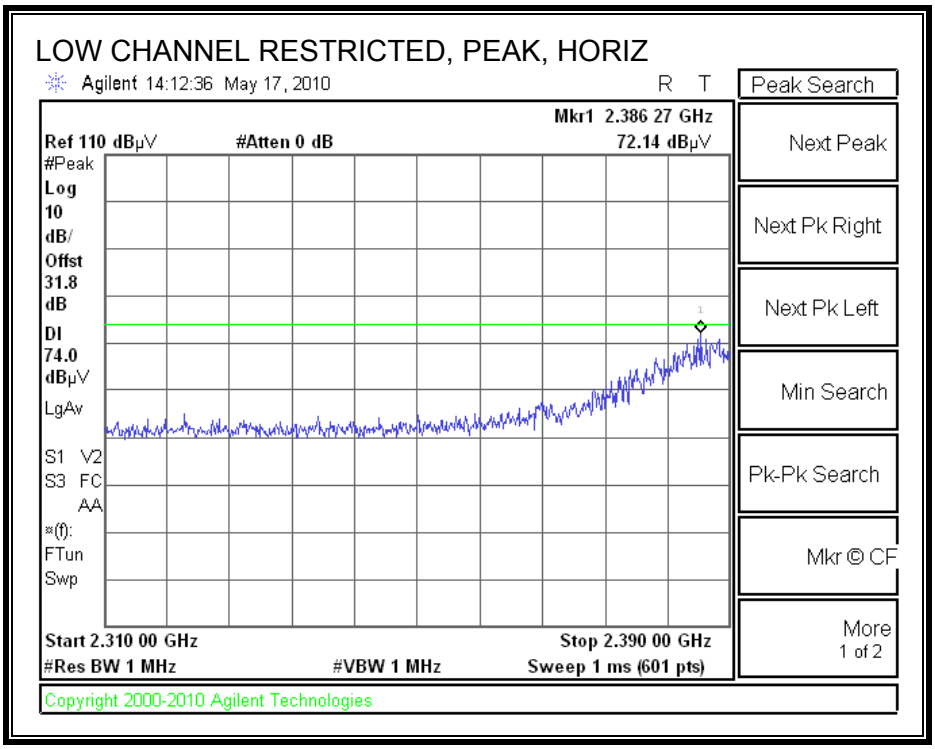
f	Measurement Frequency	Amp	Preamp Gain		Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters		Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m		Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength		Margin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

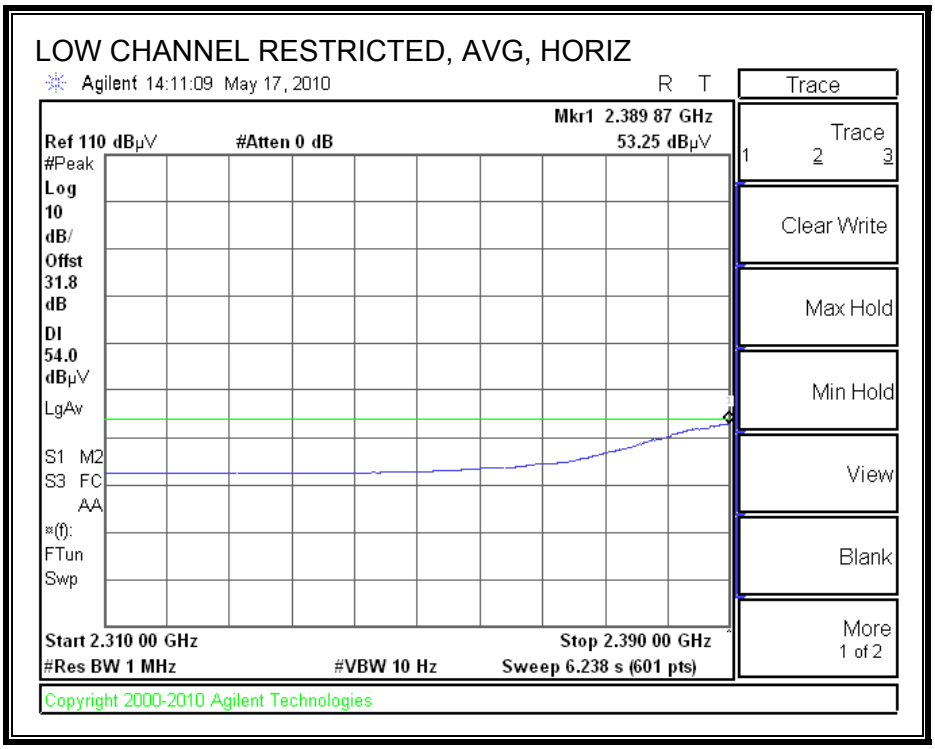
f GHz	Dist (m)	Read dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Corr. dBuV/m	Limit dBuV/m	Margin dB	Ant. Pol. V/H	Det. P/A/QP	Notes
Low Ch, 2412MHz													
4.824	3.0	40.0	33.0	5.8	-36.5	0.0	0.0	42.4	74.0	-31.6	H	P	
4.824	3.0	32.0	33.0	5.8	-36.5	0.0	0.0	34.4	54.0	-19.6	H	A	
4.824	3.0	42.5	33.0	5.8	-36.5	0.0	0.0	44.9	74.0	-29.1	V	P	
4.824	3.0	37.4	33.0	5.8	-36.5	0.0	0.0	39.7	54.0	-14.3	V	A	
Mid Ch, 2437MHz													
4.874	3.0	40.2	33.1	5.8	-36.5	0.0	0.0	42.7	74.0	-31.3	H	P	
4.874	3.0	32.3	33.1	5.8	-36.5	0.0	0.0	34.8	54.0	-19.2	H	A	
7.311	3.0	39.8	35.3	7.3	-36.2	0.0	0.0	46.1	74.0	-27.9	H	P	
7.311	3.0	30.5	35.3	7.3	-36.2	0.0	0.0	36.8	54.0	-17.2	H	A	
4.874	3.0	42.5	33.1	5.8	-36.5	0.0	0.0	44.9	74.0	-29.1	V	P	
4.874	3.0	37.0	33.1	5.8	-36.5	0.0	0.0	39.4	54.0	-14.6	V	A	
7.311	3.0	39.4	35.3	7.3	-36.2	0.0	0.0	45.7	74.0	-28.3	V	P	
7.311	3.0	28.6	35.3	7.3	-36.2	0.0	0.0	34.9	54.0	-19.1	V	A	
High Ch, 2462MHz													
4.924	3.0	40.7	33.1	5.9	-36.5	0.0	0.0	43.3	74.0	-30.7	H	P	
4.924	3.0	33.0	33.1	5.9	-36.5	0.0	0.0	35.6	54.0	-18.4	H	A	
7.386	3.0	38.1	35.4	7.3	-36.2	0.0	0.0	44.6	74.0	-29.4	H	P	
7.386	3.0	25.4	35.4	7.3	-36.2	0.0	0.0	31.9	54.0	-22.1	H	A	
4.924	3.0	42.2	33.1	5.9	-36.5	0.0	0.0	44.7	74.0	-29.3	V	P	
4.924	3.0	36.1	33.1	5.9	-36.5	0.0	0.0	38.7	54.0	-15.3	V	A	
7.386	3.0	37.7	35.4	7.3	-36.2	0.0	0.0	44.2	74.0	-29.8	V	P	
7.386	3.0	25.9	35.4	7.3	-36.2	0.0	0.0	32.4	54.0	-21.6	V	A	

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

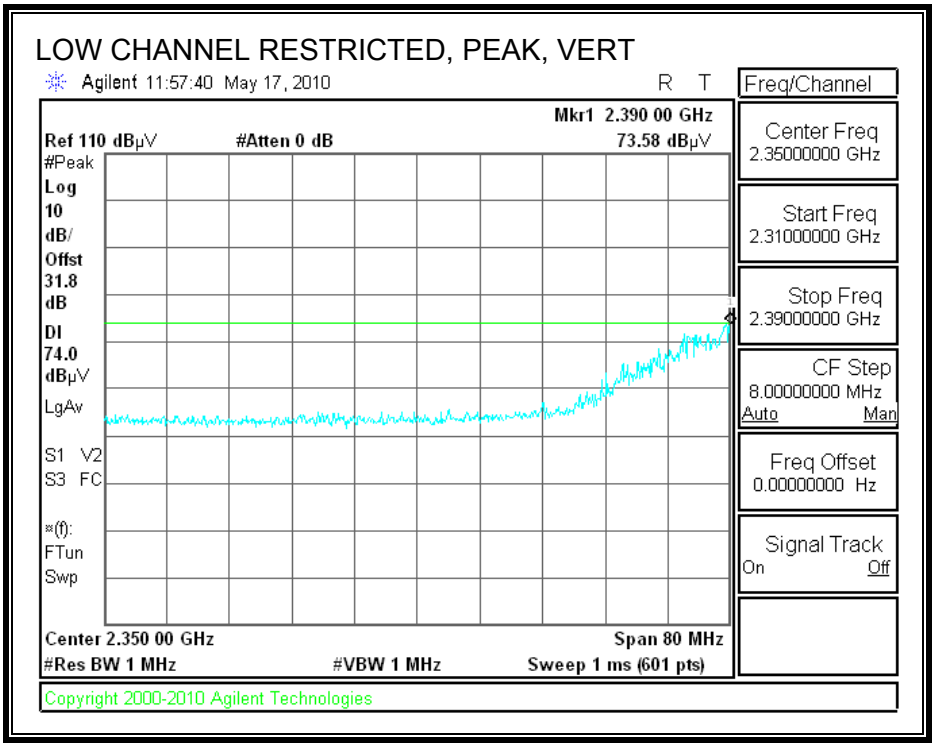
7.2.2. 802.11n HT40 MODE IN THE 2.4 GHz BAND

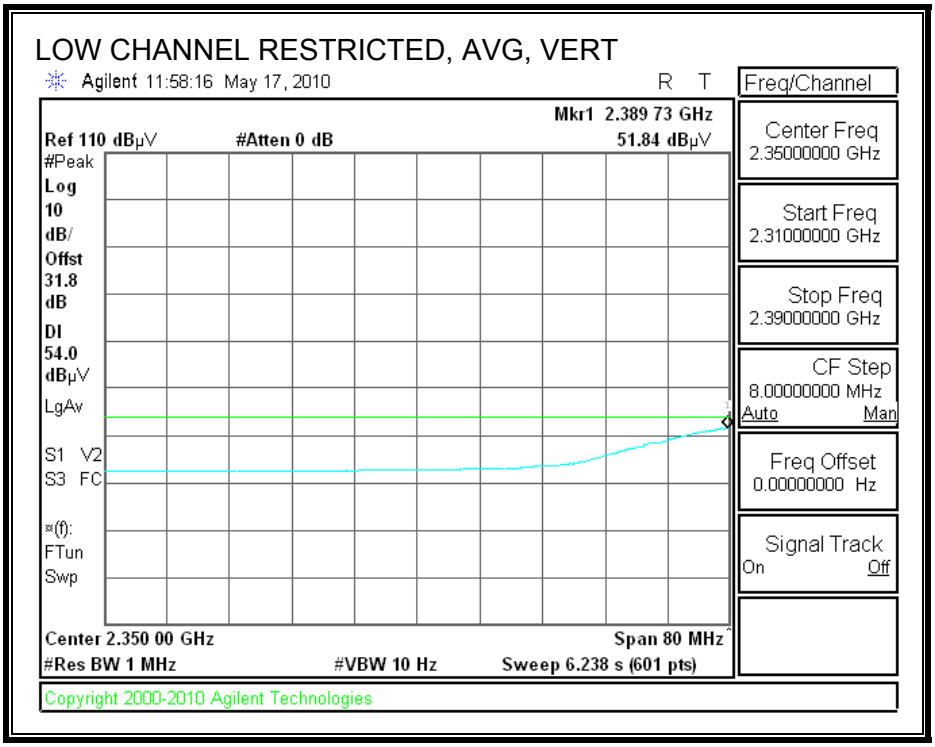
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



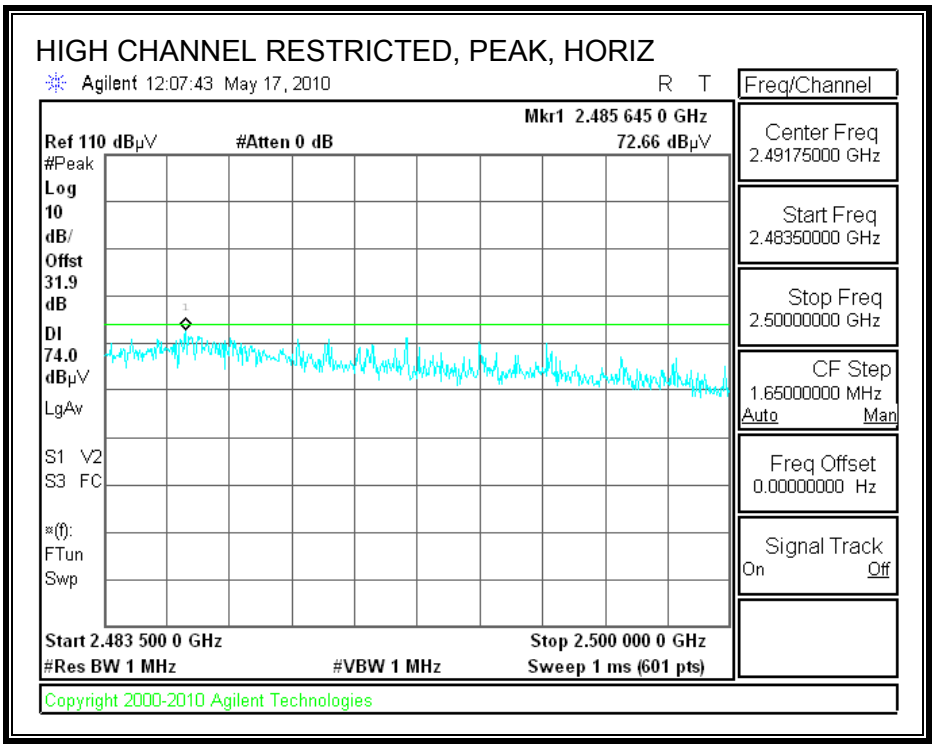


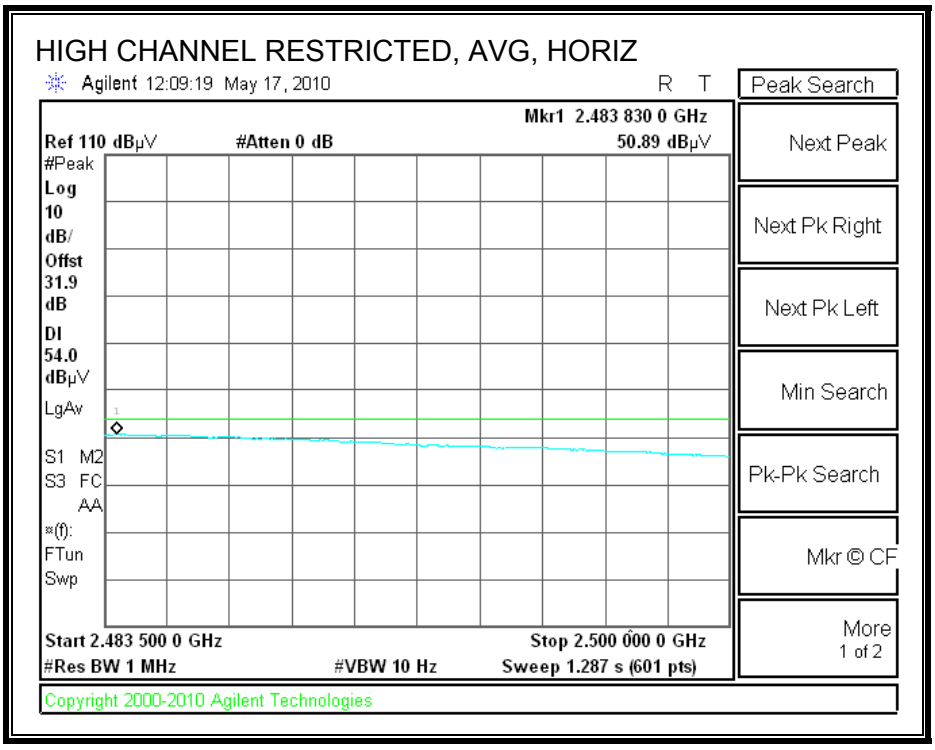
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



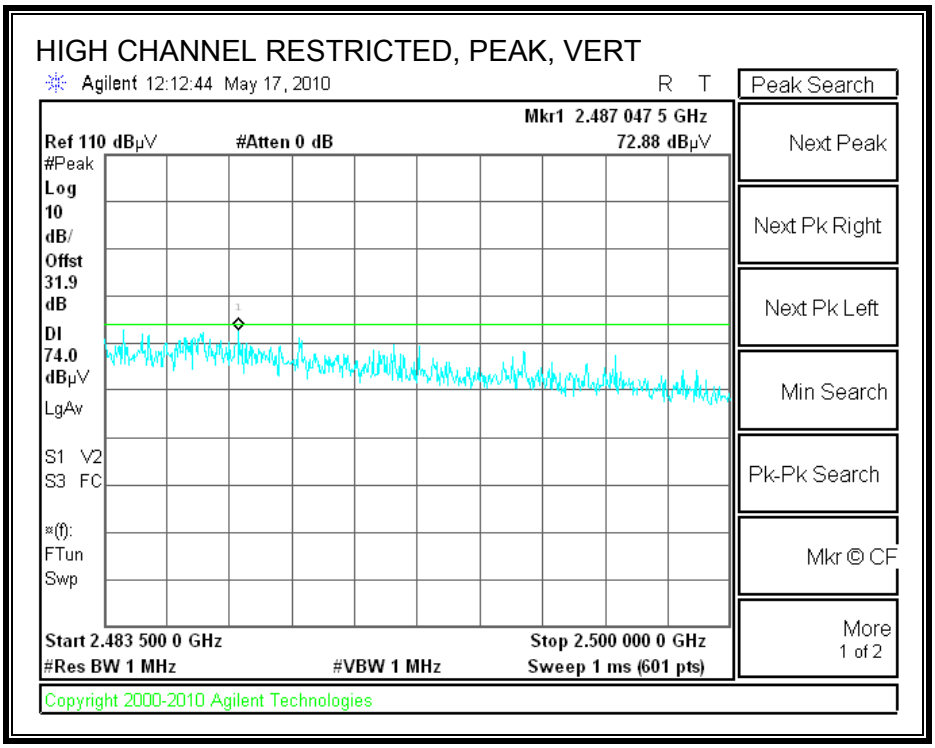


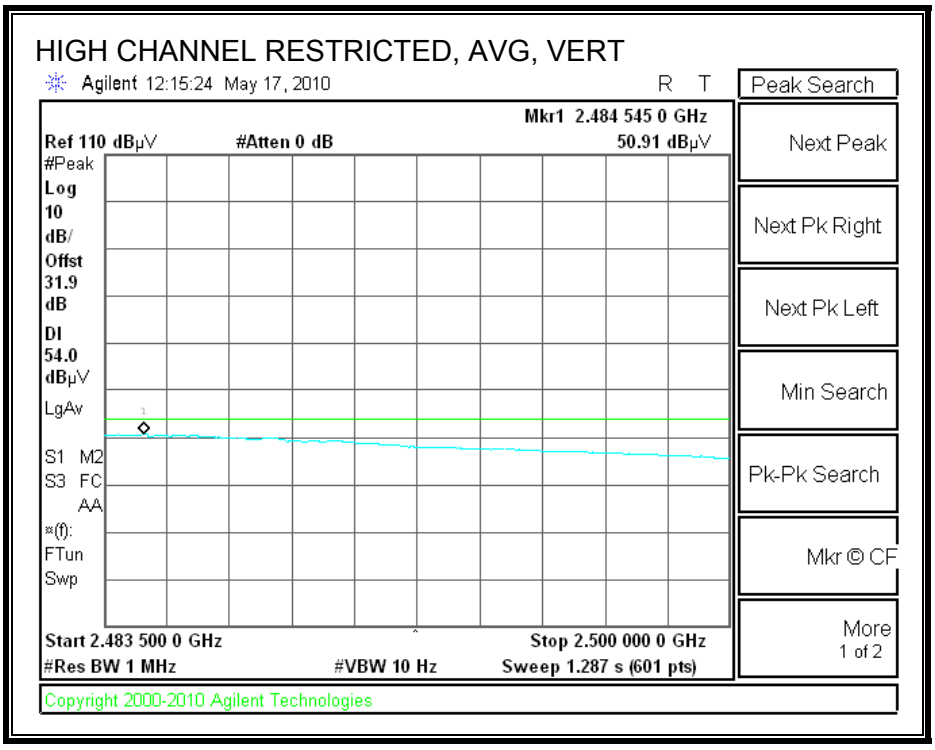
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





7.3. RECEIVER ABOVE 1 GHz

High Frequency Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Toshiba
Project #: 10U13220
Date: 5/17/2010
Test Engineer: Chin Pang
Configuration: EUT and AC Adapter
Mode: RX mode (Worst Case)

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz	Limit
T73; S/N: 6717 @3m	T144 Miteq 3008A00931			FCC 15.209

Hi Frequency Cables

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

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
1.253	3.0	52.7	36.5	24.7	2.7	-39.1	0.0	0.0	40.9	24.7	74	54	-33.1	-29.3	H
1.585	3.0	51.5	35.0	25.8	3.0	-38.7	0.0	0.0	41.7	25.2	74	54	-32.3	-28.8	H
4.873	3.0	52.0	43.8	33.1	5.8	-36.5	0.0	0.0	54.5	46.3	74	54	-19.5	-7.7	H
1.253	3.0	53.0	36.3	24.7	2.7	-39.1	0.0	0.0	41.2	24.5	74	54	-32.8	-29.5	V
1.583	3.0	51.8	34.8	25.8	3.0	-38.7	0.0	0.0	42.0	25.0	74	54	-32.0	-29.0	V
4.873	3.0	47.6	39.5	33.1	5.8	-36.5	0.0	0.0	50.1	42.0	74	54	-23.9	-12.0	V

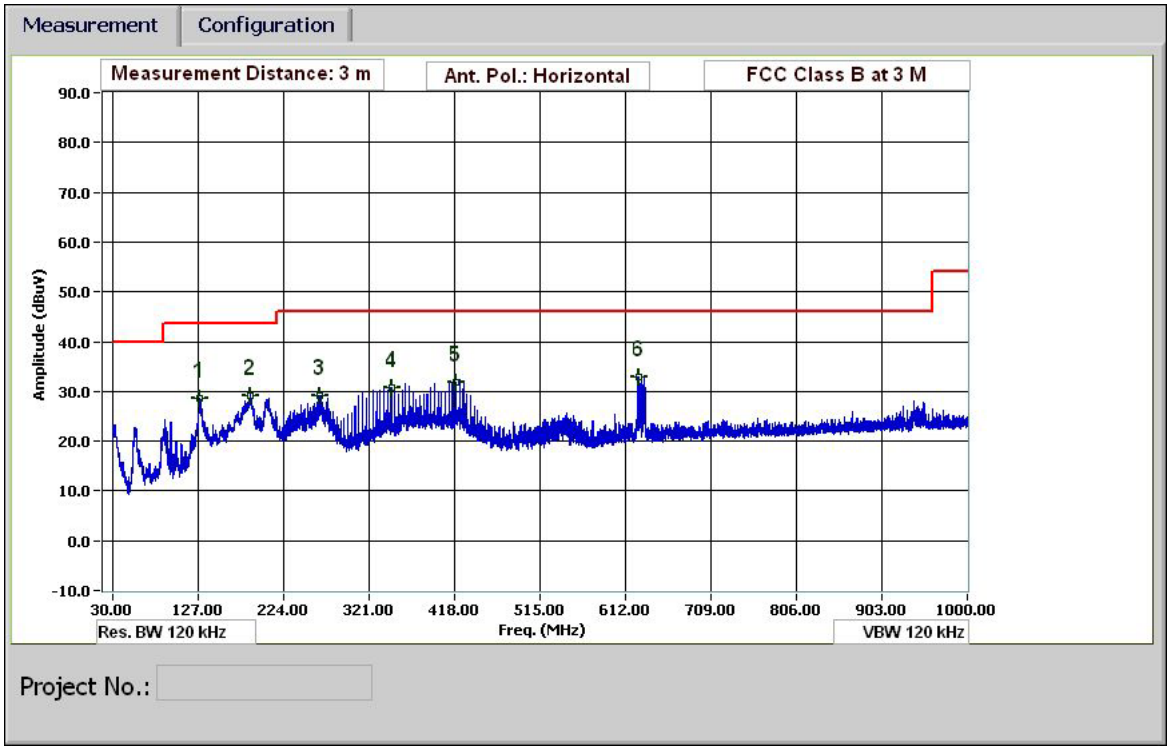
Rev. 07.22.09
Note: No other emissions were detected above the system noise floor.

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		

7.4. WORST CASE BELOW 1 GHz

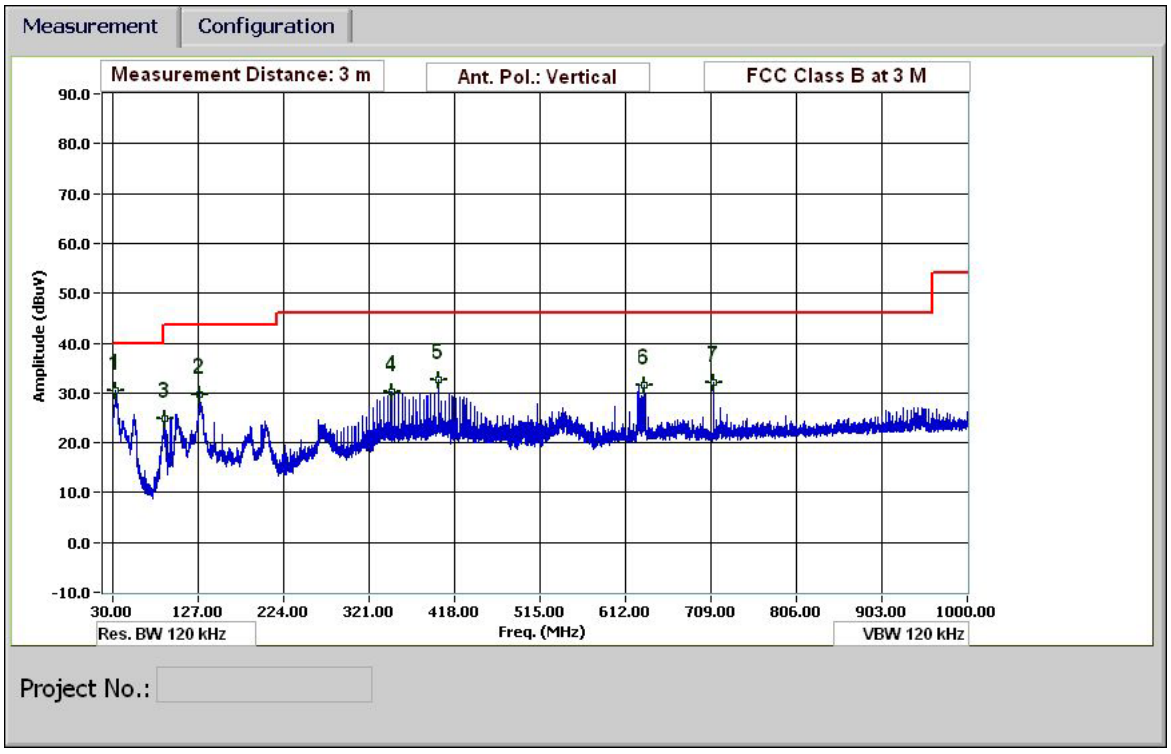
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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

VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

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

Test Engr: Chin Pang
Date: 05/17/10
Project #: 10U13220
Company: Toshiba
EUT Description: 802.11 bgn 1x2 Mini Card
EUT M/N: PA3758U-1MPC
Test Target: FCC 15B
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
33.600	3.0	39.9	18.5	0.5	28.4	0.0	0.0	30.6	40.0	-9.4	V	P	
88.922	3.0	44.8	7.5	0.8	28.3	0.0	0.0	24.9	43.5	-18.6	V	P	
129.004	3.0	43.3	13.6	1.1	28.3	0.0	0.0	29.6	43.5	-13.9	V	P	
346.093	3.0	42.6	14.1	1.6	28.1	0.0	0.0	30.2	46.0	-15.8	V	P	
399.975	3.0	43.9	14.9	1.8	28.1	0.0	0.0	32.5	46.0	-13.5	V	P	
633.625	3.0	37.9	18.8	2.3	27.4	0.0	0.0	31.6	46.0	-14.4	V	P	
712.468	3.0	37.0	19.8	2.5	27.2	0.0	0.0	32.0	46.0	-14.0	V	P	
128.764	3.0	42.2	13.6	1.1	28.3	0.0	0.0	28.5	43.5	-15.0	H	P	
185.526	3.0	45.1	11.2	1.2	28.2	0.0	0.0	29.3	43.5	-14.2	H	P	
265.210	3.0	43.7	12.3	1.4	28.2	0.0	0.0	29.2	46.0	-16.8	H	P	
346.093	3.0	43.2	14.1	1.6	28.1	0.0	0.0	30.9	46.0	-15.1	H	P	
419.896	3.0	42.7	15.3	1.9	28.0	0.0	0.0	31.8	46.0	-14.2	H	P	
626.425	3.0	39.4	18.7	2.3	27.4	0.0	0.0	33.0	46.0	-13.0	H	P	

8. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

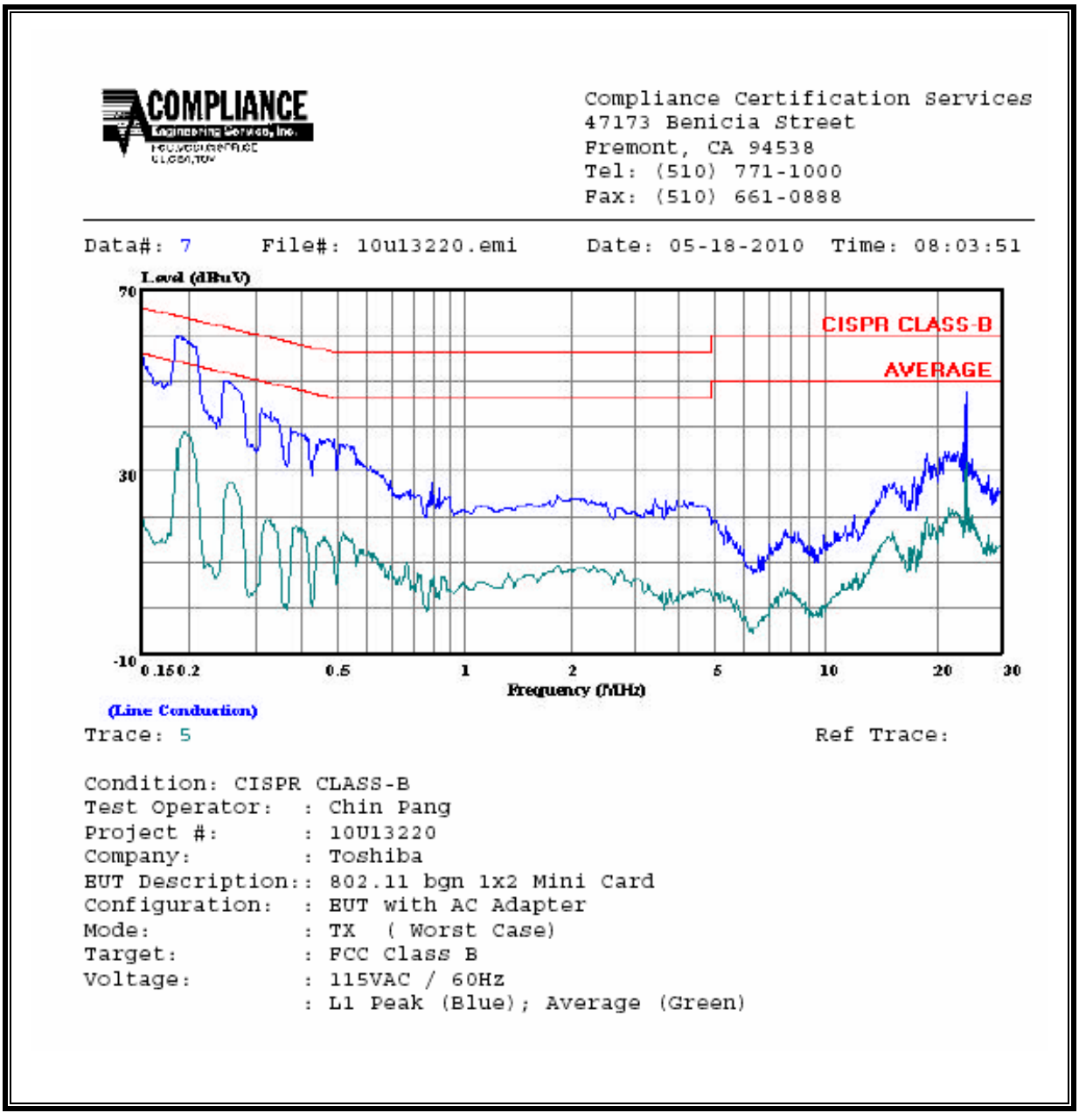
ANSI C63.4

RESULTS

6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.19	59.46	--	38.60	0.00	64.04	54.04	-4.58	-15.44	L1
0.26	49.99	--	27.54	0.00	61.43	51.43	-11.44	-23.89	L1
24.01	47.42	--	38.17	0.00	60.00	50.00	-12.58	-11.83	L1
0.20	57.12	--	35.91	0.00	63.69	53.69	-6.57	-17.78	L2
0.26	47.43	--	26.24	0.00	61.50	51.50	-14.07	-25.26	L2
24.01	47.28	--	38.02	0.00	60.00	50.00	-12.72	-11.98	L2
6 Worst Data									

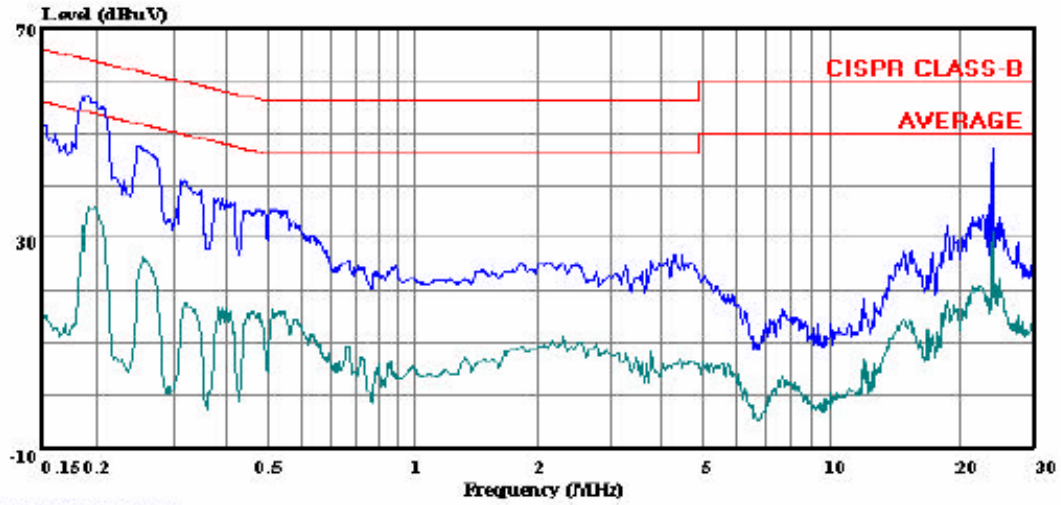
LINE 1 RESULTS



LINE 2 RESULTS

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

Data#: 14 File#: 10u13220.emi Date: 05-18-2010 Time: 08:18:13



(Line Conduction)

Trace: 12 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Chin Pang
Project #: : 10U13220
Company: : Toshiba
EUT Description:: 802.11 bgn 1x2 Mini Card
Configuration: : EUT with AC Adapter
Mode: : TX (Worst Case)
Target: : FCC Class B
Voltage: : 115VAC / 60Hz
: L2 Peak (Blue); Average (Green)