



**FCC CFR47 PART 15 SUBPART C  
CLASS II PERMISSIVE CHANGE  
TEST REPORT**

**FOR**

**PCI Express 802.11 b/g Transceiver**

**MODEL NUMBER: PA3501U-1MPC**

**FCC ID: CJ6UPA3501WL**

**REPORT NUMBER: 05U3821-1B**

**ISSUE DATE: JANUARY 30, 2006**

*Prepared for*

**TOSHIBA CORPORATION  
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**LAB CODE:200065-0**

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
A	1/10/06	Initial Issue	DG
B	1/30/2006	Added g Turbo mode radiated data, add new Average and maximum PK power measurements, added Class II Permissive Change description.	DG

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** TOSHIBA CORPORATION  
DIGITAL MEDIA NETWORK COMPANY  
2-9 SUEHIRO-CHO, OME  
TOKYO, 198-8710, JAPAN

**EUT DESCRIPTION:** PCI Express 802.11 b/g Transceiver

**MODEL:** PA3501U-1MPC

**SERIAL NUMBER:** 1159N000048

**DATE TESTED:** DECEMBER 16, 2005 – JANUARY 29, 2006

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. 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 Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



DAVID GARCIA  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES



FRANK IBRAHIM  
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 and FCC CFR 47 Part 15.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is an 802.11b/g transceiver.

The radio module is manufactured by Atheros Communications, Inc.

### 5.2. MAXIMUM OUTPUT POWER

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

2400 to 2483.5 MHz Authorized Band

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412 - 2462	802.11b	23.46	221.82
2412 - 2462	802.11g	26.45	441.57
2412 - 2462	802.11g turbo	25.21	331.89

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two integrated omni-directional PIFA type antennas for diversity; model WNC001 antenna has a maximum gain of 1.8 dBi. Additional antennas of same type and lower gain are used with this radio and listed in the FCC submission.

### 5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was Atheros Radio Test, Revision 5.3 Build #11.

The test utility software used during testing was ART-V53\_build 13.

## 5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 2437 MHz in 11b mode.

The worst-case data rate for this channel is determined to be 1 Mb/s, based on previous experience with Atheros based WLAN product design architectures.

Thus radiated and power line conducted emissions tests were made at 2437 MHz in the 802.11b mode, at 1 Mb/s.

## 5.6. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

1. The radio module has a limited module approval and is installed in a portable condition.

2. Add new antenna models:

Hitachi: HTL017 , Gain = -1.3 dBi  
HFT40, Gain = -0.2 dBi

Tyco: TIAN01, Gain = -0.3 dBi  
TBN001, Gain = +1.1 dBi

WNC: WNC001 Gain = +1.8 dBi

The WNC antenna, model WNC001, was tested due to it having the highest antenna gain. All the antennas are similar in design.

Full antenna details are included in separate exhibit.

## 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	Toshiba	PA3503U-1MPC	05B-011	DoC
AC/DC Adapter	Toshiba	PA3283U-1ACA	02X19214	DoC

### I/O CABLES

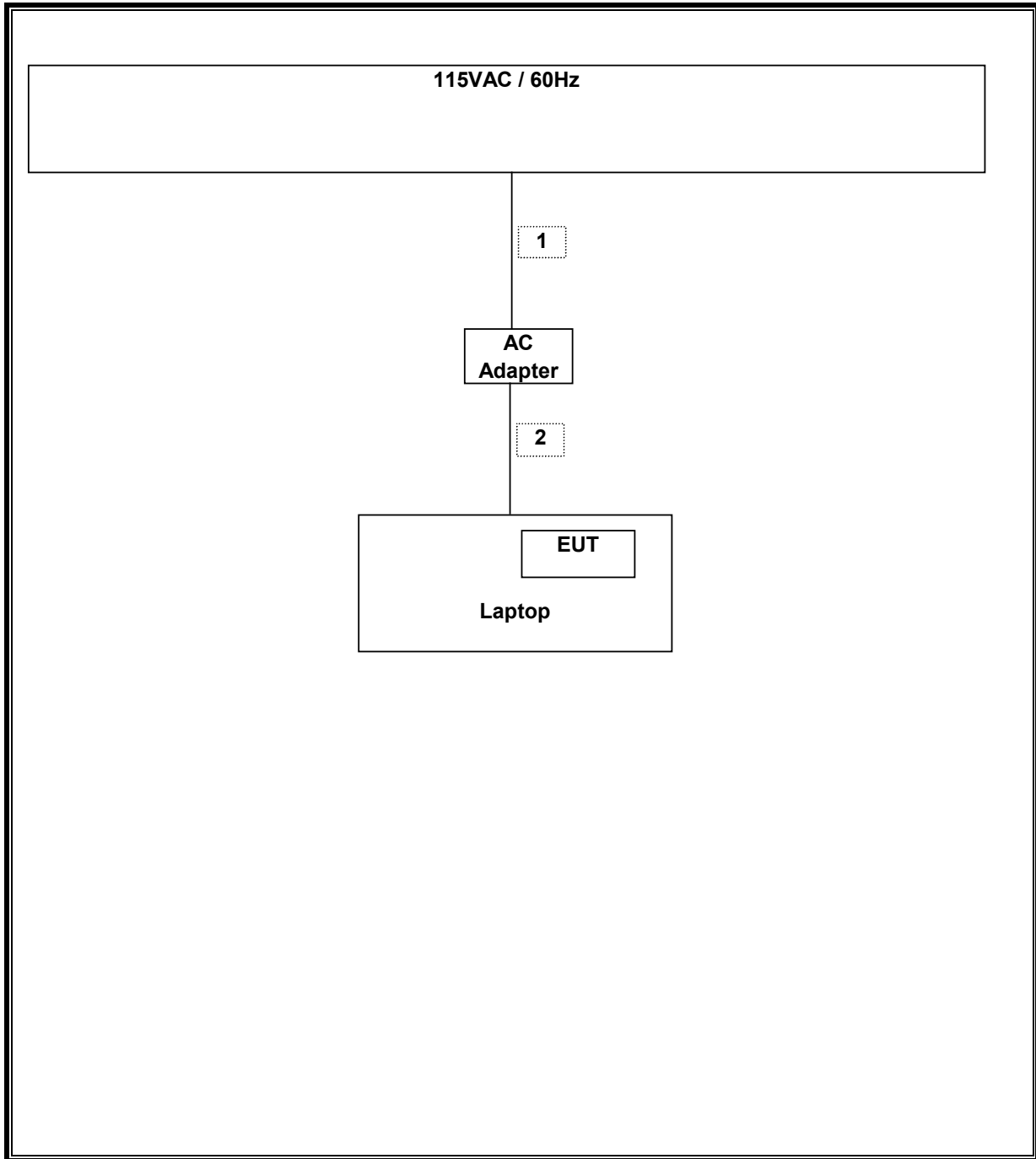
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	AC	Unshielded	2m	N/A
2	DC	1	DC	Unshielded	2m	N/A

### TEST SETUP

The EUT is installed in a host laptop computer. 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	Serial Number	Cal Due
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent	E4446A	MY43360112	3/28/2006
EMI Test Receiver	R & S	ESHS 20	827129/006	6/3/2006
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2006
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	8/30/2006
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29301	4/22/2006
Antenna, Horn 18 ~ 26 GHz	ARA	MWH-1826/B	1049	9/12/2006
Preamplifier, 1 ~ 26 GHz	HP	8449B	3008A00931	6/24/2006
Peak Power Meter	Agilent	E4416A	GB41291160	2/9/2006
Peak / Average Power Sensor	Agilent	E9327A	US40440755	2/10/2006
2.4-2.5 GHz Reject Filter	Micro-Tronics	BRM50702	002	C.N.R.
4.0 GHz High Pass Filter	Micro-Tronics	HPM13351	002	C.N.R.
Spectrum Analyzer, 26.5 GHz	HP	8593EM	3710A00205	1/6/2006
Antenna, Bilog 30 MHz ~ 2 GHz	Sunol Sciences	JB1	A121003	3/3/2006
Preamplifier, 1300 MHz	HP	8447D	1937A02062	1/7/2006

## 7. LIMITS AND RESULTS

### 7.1. AVERAGE POWER

#### AVERAGE POWER LIMIT

None: for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to a power meter.

#### RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11.6 dB (including 10 dB pad and 1.6 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

#### 802.11b Mode

Channel	Frequency (MHz)	Power (dBm)
Low	2412	20.50
Middle	2437	19.93
High	2462	20.31

#### 802.11g Mode

Channel	Frequency (MHz)	Power (dBm)
Low	2412	19.50
Middle	2437	19.20
High	2462	18.30

#### 802.11g Turbo Mode

Channel	Frequency (MHz)	Power (dBm)
Middle	2437	19.20

## 7.2. RADIATED EMISSIONS

### 7.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

#### LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41			

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

### **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.

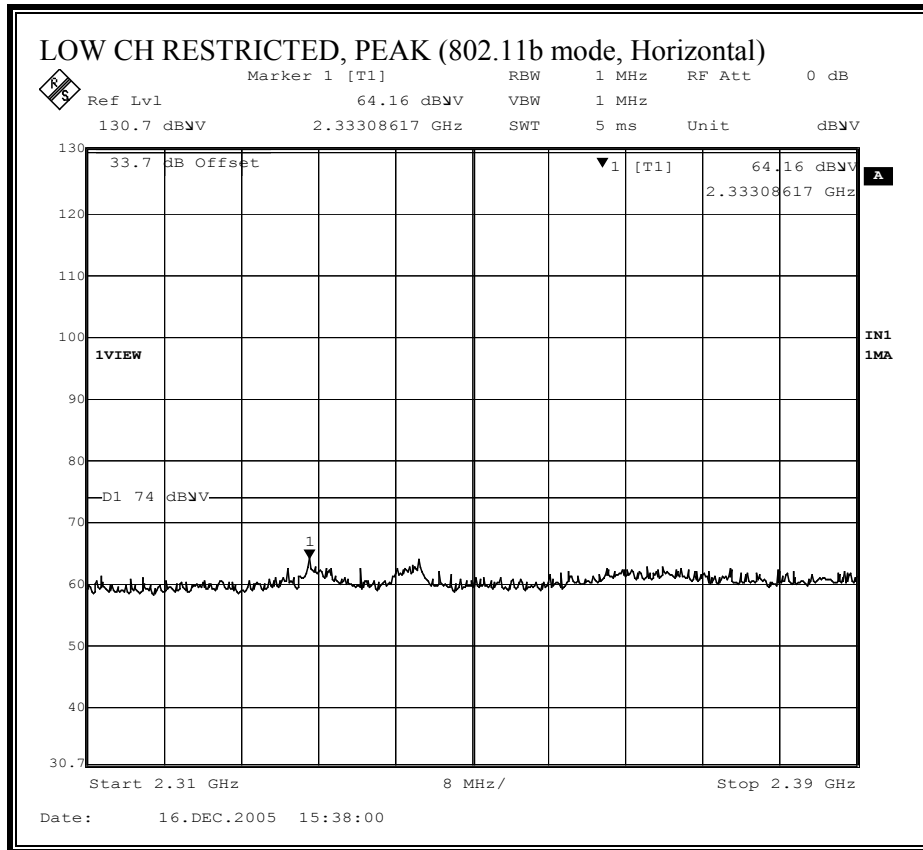
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

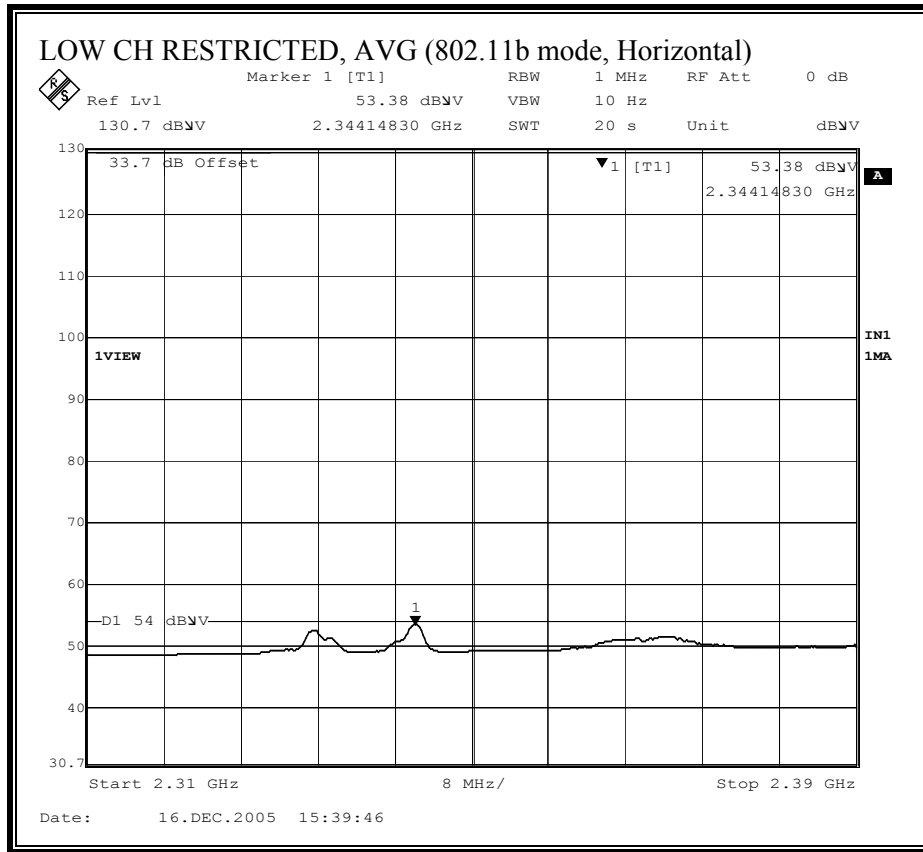
The spectrum from 30 MHz to 25 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

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.

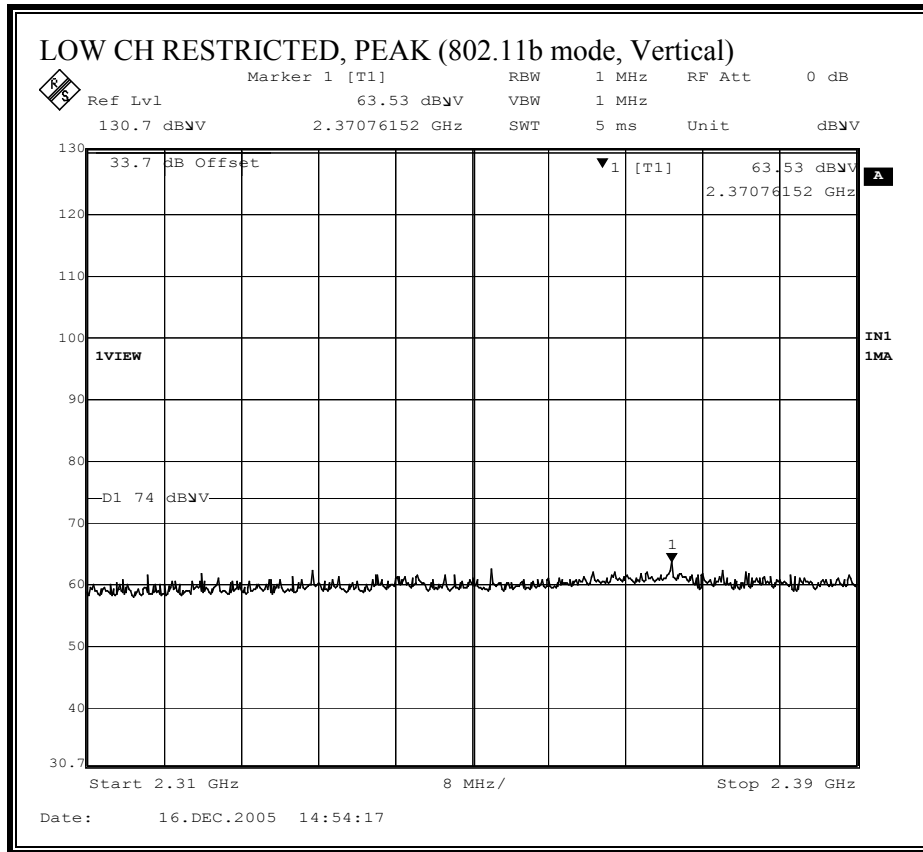
**TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BAND**

**RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)**

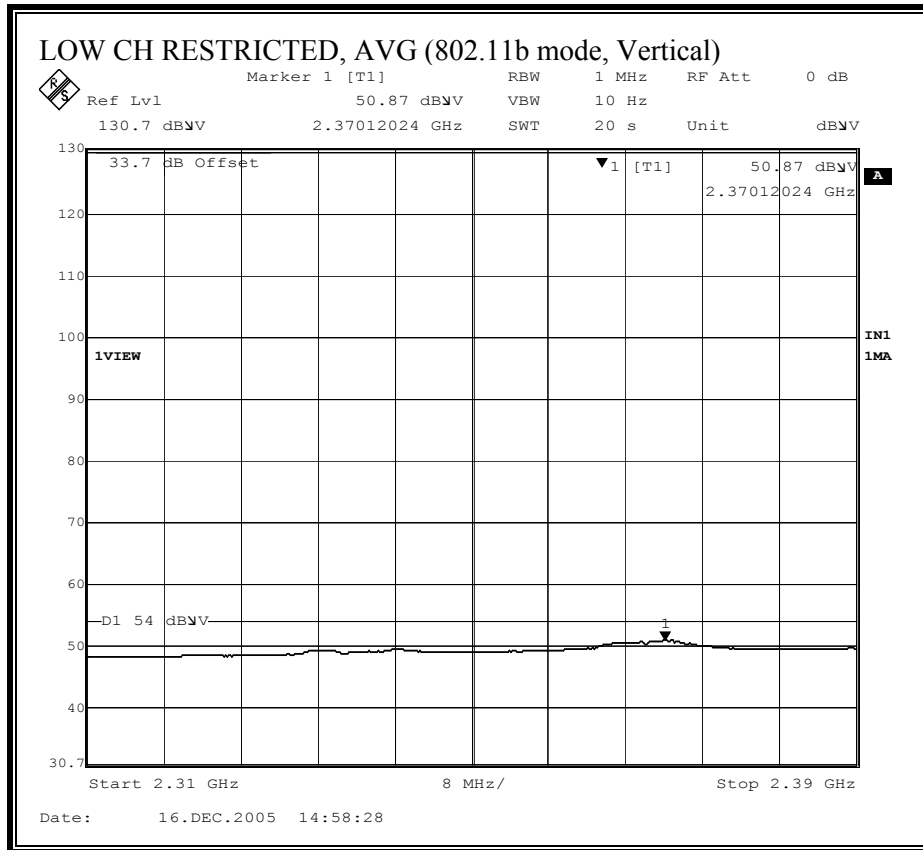




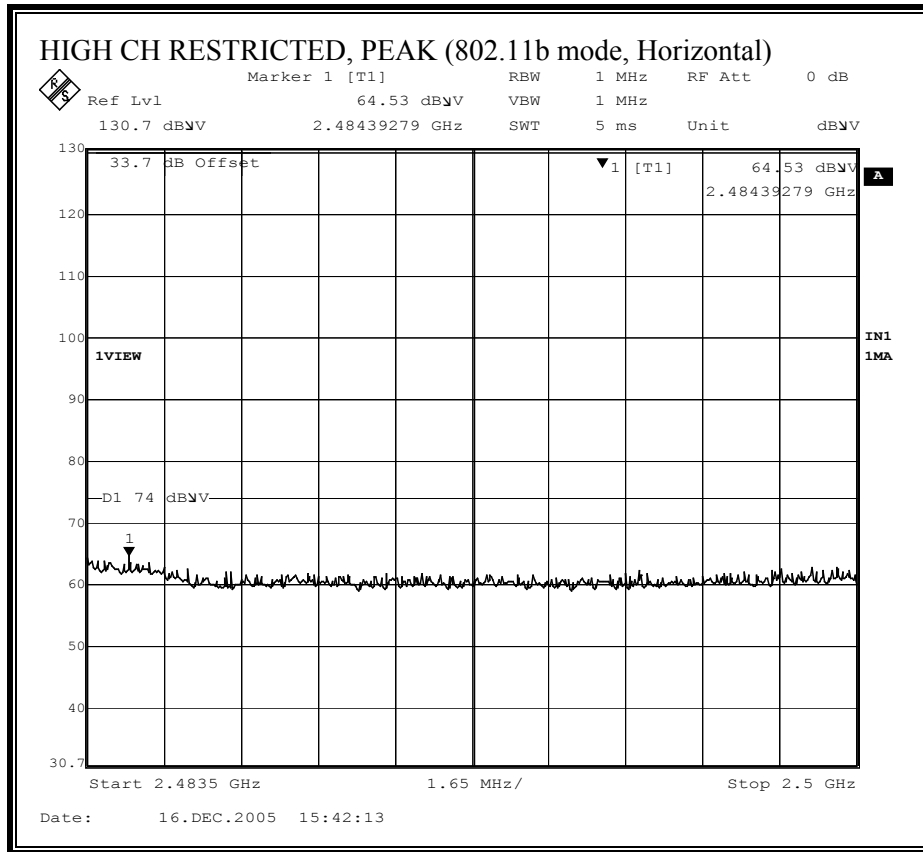
**RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)**

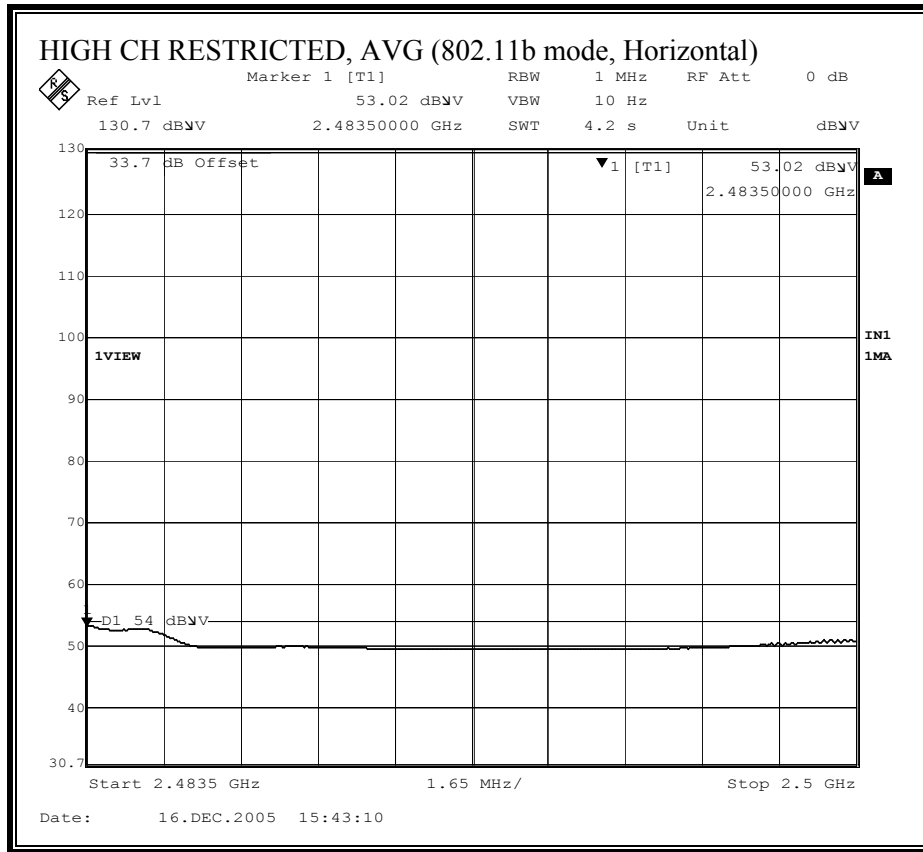




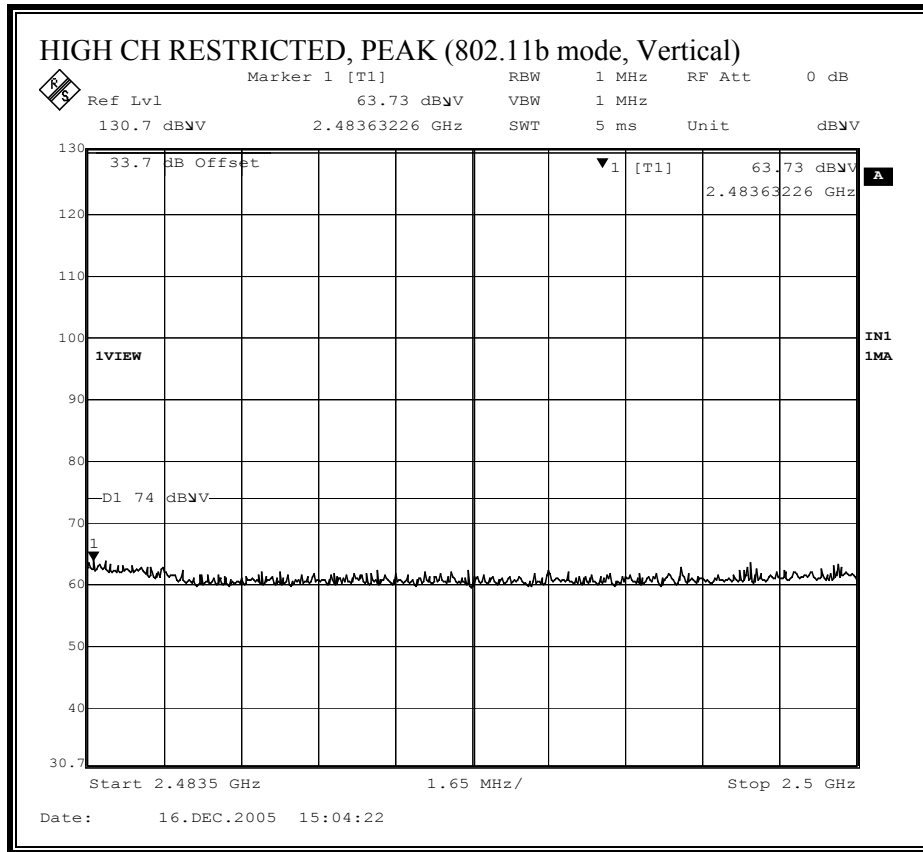


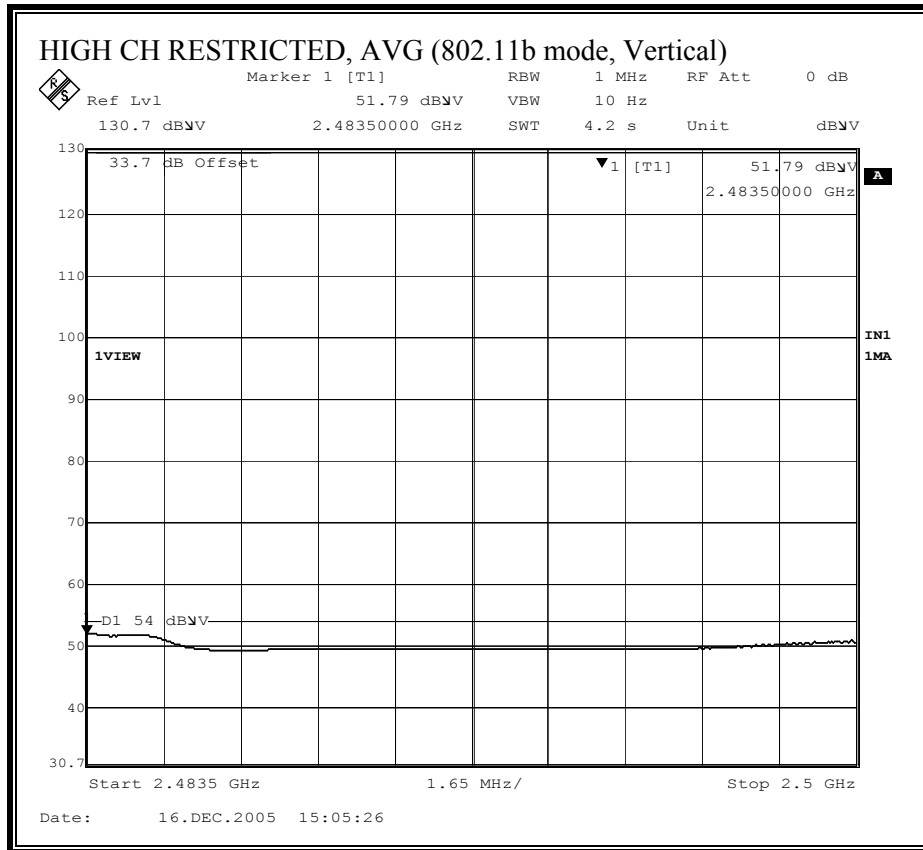
**RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)**





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





**HARMONICS AND SPURIOUS EMISSIONS (b MODE)**

12/19/05 **High Frequency Measurement**  
 Compliance Certification Services, Morgan Hill 5m chamber

**Test Engr:** Frak Ibrahim  
**Project #:** 05U3821  
**Company:** Toshiba  
**EUT Descrp.:** MiniPCExpress 802.11 b/g transceiver  
**EUT M/N:** AR5BXB61  
**Test Target:** FCC 15.247  
**Configuration:** Stand Alone EUT  
**Mode Oper:** TX ON in 11b mode

**Test Equipment:**

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz
T119; S/N: 29301 @3m	T144 Miteq 3008A00931		T125; ARA 18-26GHz; S/N:1007

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Frank 177080001	Frank 187209001		R_001

**Peak Measurements**  
 RBW=VBW=1MHz

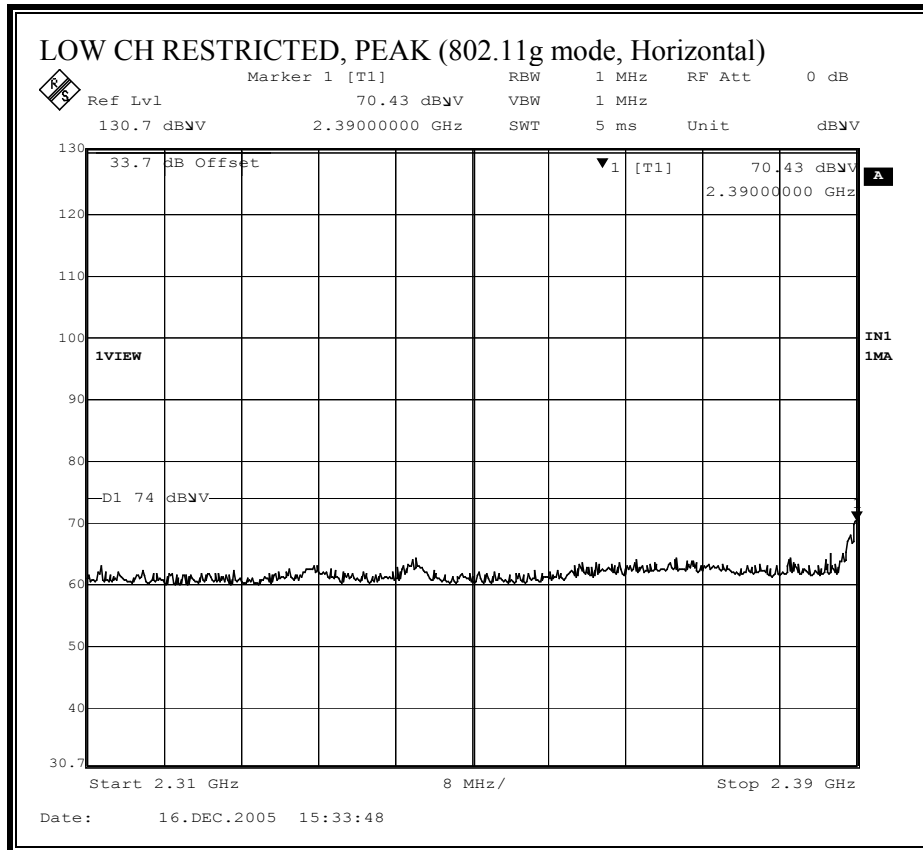
**Average Measurements**  
 RBW=1MHz; VBW=10Hz

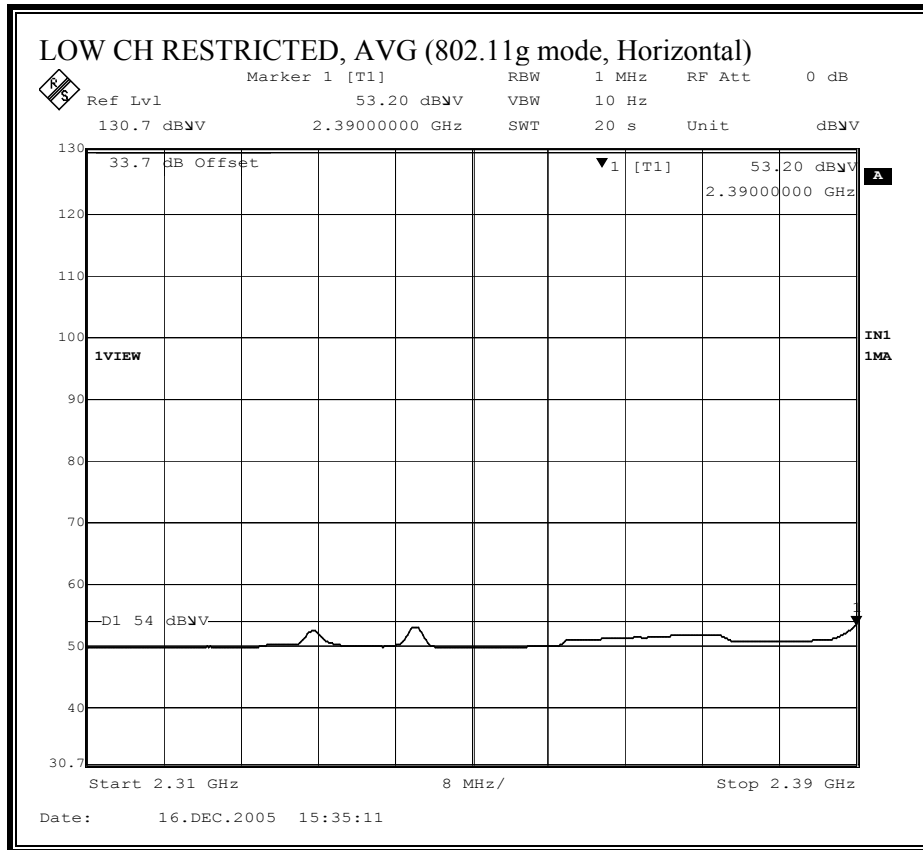
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
<b>Low Channel</b>															
4.824	3.0	52.3	48.0	34.0	4.0	-36.5	0.0	0.0	53.8	49.5	74	54	-20.2	-4.5	V
4.824	3.0	48.4	42.8	34.0	4.0	-36.5	0.0	0.0	49.9	44.3	74	54	-24.1	-9.7	H
<b>Mid Channel</b>															
4.874	3.0	54.9	52.3	34.1	4.0	-36.5	0.0	0.0	56.5	53.9	74	54	-17.5	-0.1	V
4.874	3.0	51.4	46.5	34.1	4.0	-36.5	0.0	0.0	53.0	48.1	74	54	-21.0	-5.9	H
7.311	3.0	49.2	40.7	35.6	4.6	-36.2	0.0	0.0	53.2	44.8	74	54	-20.8	-9.2	H
<b>High Channel</b>															
4.924	3.0	54.9	51.7	34.1	4.0	-36.5	0.0	0.0	56.5	53.3	74	54	-17.5	-0.7	V
7.386	3.0	53.2	49.1	35.7	4.6	-36.2	0.0	0.0	57.2	53.1	74	54	-16.8	-0.9	V
4.924	3.0	48.6	42.8	34.1	4.0	-36.5	0.0	0.0	50.2	44.5	74	54	-23.8	-9.5	H
7.386	3.0	48.1	39.8	35.7	4.6	-36.2	0.0	0.0	52.2	43.9	74	54	-21.8	-10.1	H

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		

EUT scanned from 1 GHz to 25 GHz, no other signals above noise floor were found

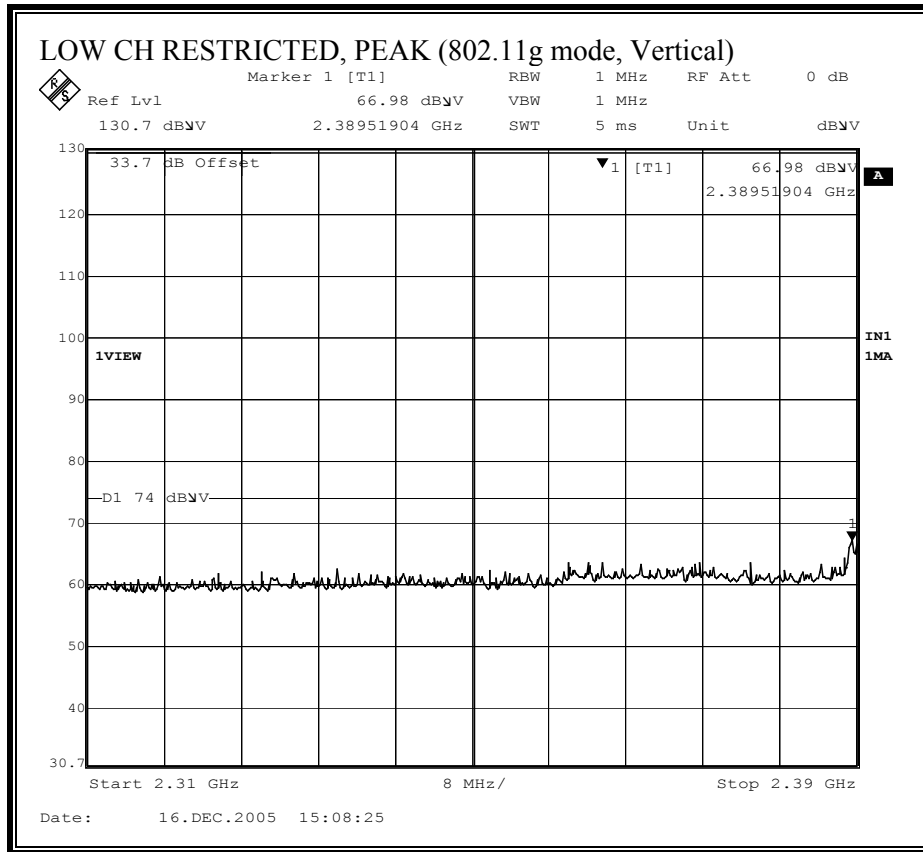
**RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)**

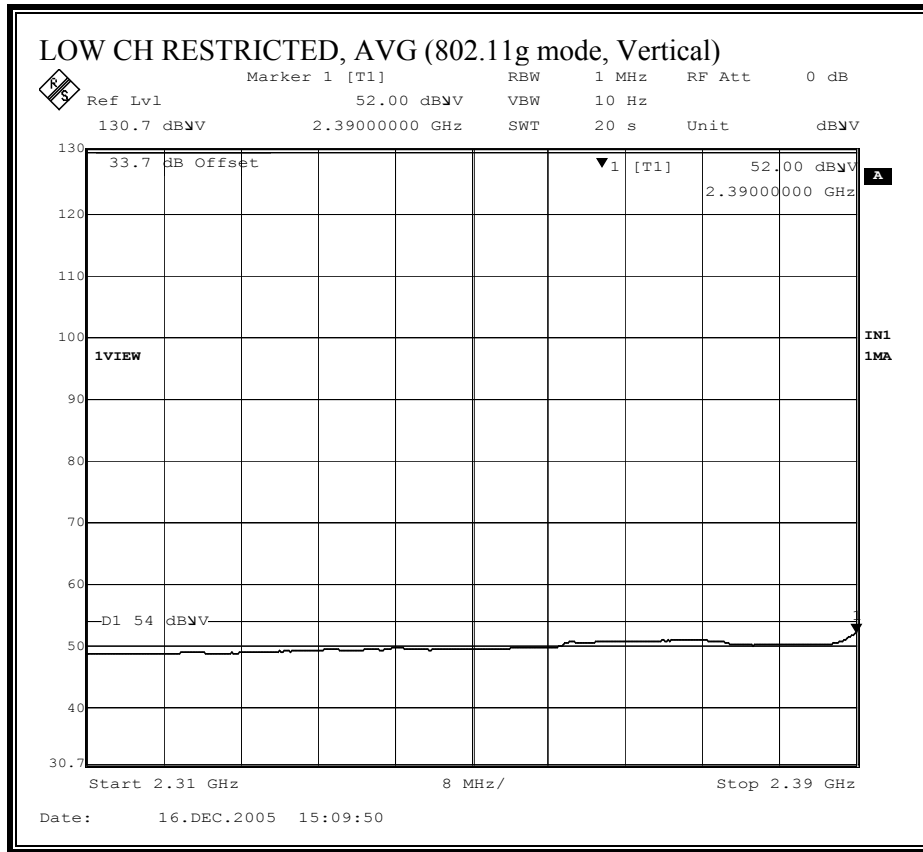




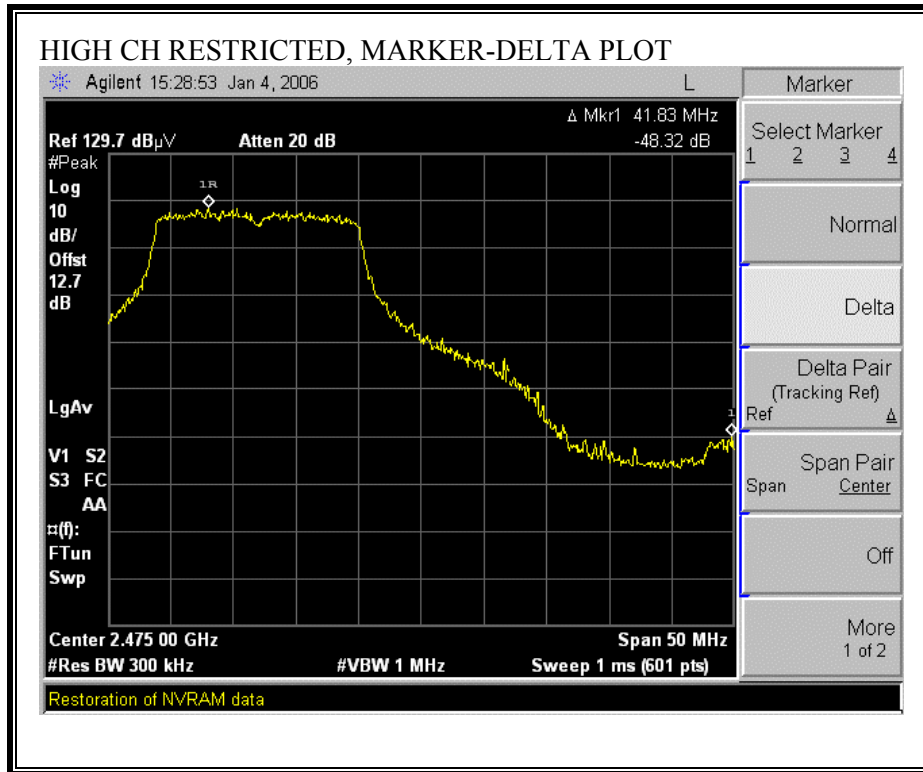


**RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)**





**RESTRICTED BANDEGE (g MODE, HIGH CHANNEL – MARKER-DELTA PLOT)**



**RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL – DATA)**

01/06/06 **High Frequency Measurement**  
 Compliance Certification Services, Morgan Hill Open Field Site

**Test Engr:** Frank Ibrahim  
**Project #:** 05U3821  
**Company:** Toshiba  
**EUT Descrip.:** MiniPClexpress 802.11 b/g transceiver  
**EUT M/N:** AR5BXB61  
**Test Target:** FCC 15.247  
**Configuration:** Stand Alone EUT  
**Mode Oper:** TX ON in 11g mode

**Test Equipment:**

Horn 1-18GHz Pre-amplifier 1-26GHz Pre-amplifier 26-40GHz Horn > 18GHz  
 T60; S/N: 2238 @3m

Hi Frequency Cables  
 2 foot cable 3 foot cable 12 foot cable HPF Reject Filter  
 Frank 187209001

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

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
2.462	3.0	78.2	67.5												V, Fundamental Measurement
2.484	3.0	29.9	19.2	28.6	1.9	0.0	0.0	0.0	60.3	49.6	74	54	-13.7	-4.4	V, Reading with applied delta
2.462	3.0	80.7	71.4												H, Fundamental Measurement
2.484	3.0	32.3	23.1	28.6	1.9	0.0	0.0	0.0	62.8	53.5	74	54	-11.2	-0.5	H, Reading with applied delta

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

**HARMONICS AND SPURIOUS EMISSIONS (g MODE)**

12/19/05 **High Frequency Measurement**  
 Compliance Certification Services, Morgan Hill 5m chamber

**Test Engr:** Frank Ibrahim  
**Project #:** 05U3821  
**Company:** Toshiba  
**EUT Descr.:** MiniPClexpress 802.11 b/g transceiver  
**EUT M/N:** AR5BXB61  
**Test Target:** FCC 15.247  
**Configuration:** Stand Alone EUT  
**Mode Oper:** TX ON in 11g mode

**Test Equipment:**

<b>Horn 1-18GHz</b>	<b>Pre-amplifier 1-26GHz</b>	<b>Pre-amplifier 26-40GHz</b>	<b>Horn &gt; 18GHz</b>
T119; S/N: 29301 @3m	T144 Miteq 3008A00931		T125; ARA 18-26GHz; S/N:1007

Hi Frequency Cables

<b>2 foot cable</b>	<b>3 foot cable</b>	<b>12 foot cable</b>	<b>HPF</b>	<b>Reject Filter</b>	<b>Peak Measurements</b> RBW=VBW=1MHz
	Frank 177080001	Frank 187209001		R_001	<b>Average Measurements</b> RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
<b>Low Channel</b>															
4.824	3.0	46.7	35.8	34.0	4.0	-36.5	0.0	0.0	48.2	37.3	74	54	-25.8	-16.7	V
<b>Mid Channel</b>															
4.874	3.0	50.2	38.5	34.1	4.0	-36.5	0.0	0.0	51.8	40.1	74	54	-22.2	-13.9	V
7.311	3.0	52.3	37.4	35.6	4.6	-36.2	0.0	0.0	56.3	41.4	74	54	-17.7	-12.6	V
<b>High Channel</b>															
4.924	3.0	47.5	36.7	34.1	4.0	-36.5	0.0	0.0	49.2	38.4	74	54	-24.8	-15.6	V
7.386	3.0	58.6	41.6	35.7	4.6	-36.2	0.0	0.0	62.7	45.7	74	54	-11.3	-8.3	V

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		

EUT scanned from 1 GHz to 25 GHz, no other signals above noise floor were found

**HARMONICS AND SPURIOUS EMISSIONS (g TURBO MODE)**

01/29/06 **High Frequency Measurement**  
 Compliance Certification Services, Morgan Hill Open Field Site

**Test Engr:** David Garcia  
**Project #:** 05U3821  
**Company:** Toshiba  
**EUT Descrip.:** 802.11 b/g transceiver  
**EUT M/N:** PA3501U-1MPC  
**Test Target:** FCC 15.247/IC RSS 210  
**Mode Oper:** g Turbo

**Test Equipment:**

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz
T60; S/N: 2238 @3m	T34 HP 8449B		

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
Frank 177079007		Frank 187209001		

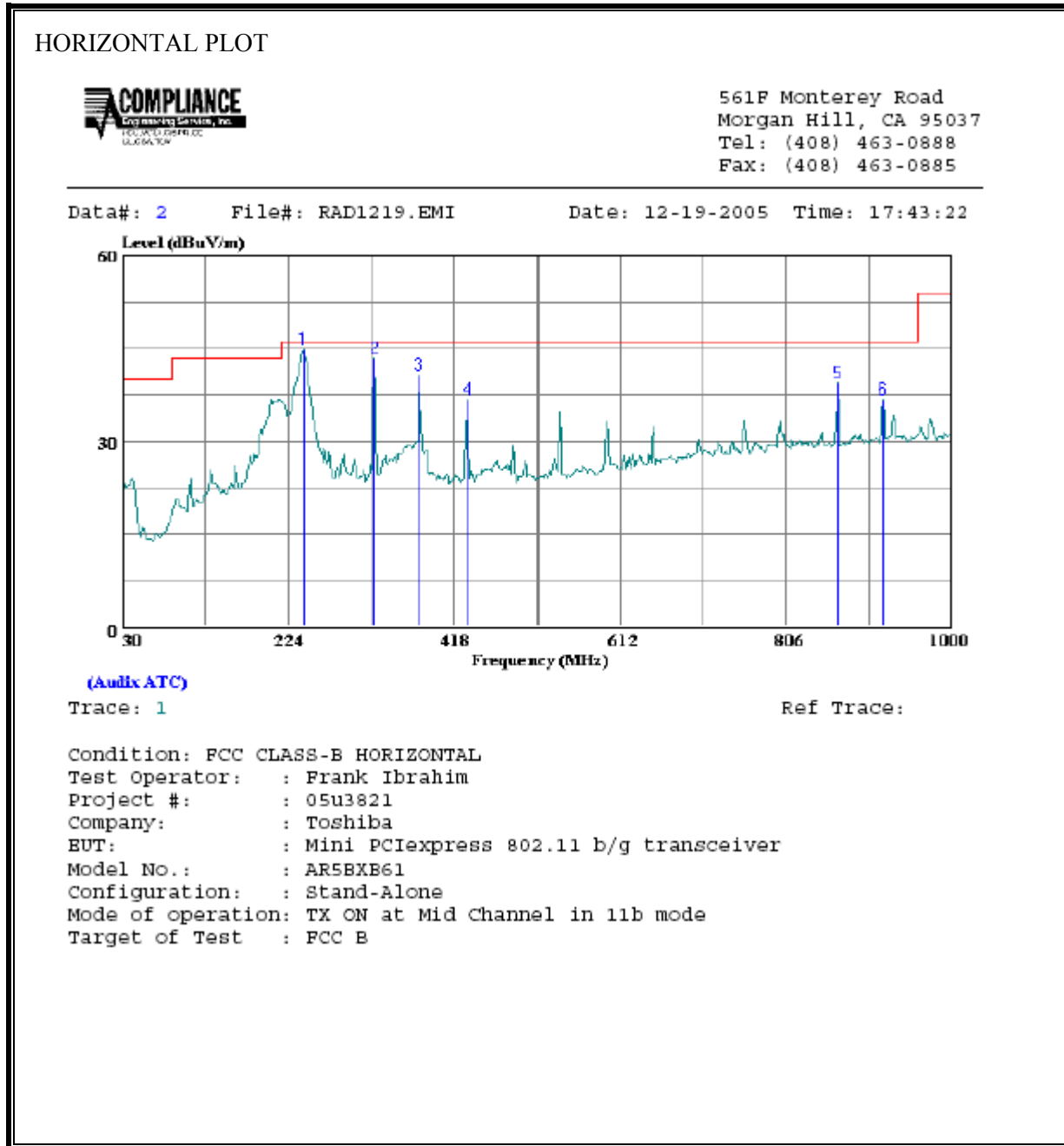
**Peak Measurements**  
 RBW=VBW=1MHz  
**Average Measurements**  
 RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Filtr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
<b>2437 CHANNEL</b>															
4.874	3.0	52.3	38.5	33.7	3.5	-34.8	0.0	0.0	54.7	40.9	74	54	-19.3	-13.1	V
7.311	3.0	61.0	43.3	36.2	4.3	-34.1	0.0	0.0	67.3	49.6	74	54	-6.7	-4.4	V
12.185	3.0	49.9	38.5	38.4	5.2	-32.5	0.0	0.0	61.0	49.6	74	54	-13.0	-4.4	V
4.874	3.0	53.3	39.0	33.7	3.5	-34.8	0.0	0.0	55.7	41.4	74	54	-18.3	-12.6	H
7.311	3.0	59.6	41.2	36.2	4.3	-34.1	0.0	0.0	65.9	47.5	74	54	-8.1	-6.5	H
12.185	3.0	54.5	37.5	38.4	5.2	-32.5	0.0	0.0	65.6	48.6	74	54	-8.4	-5.4	H
Note: No further noise was 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		

## 7.2.2. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

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

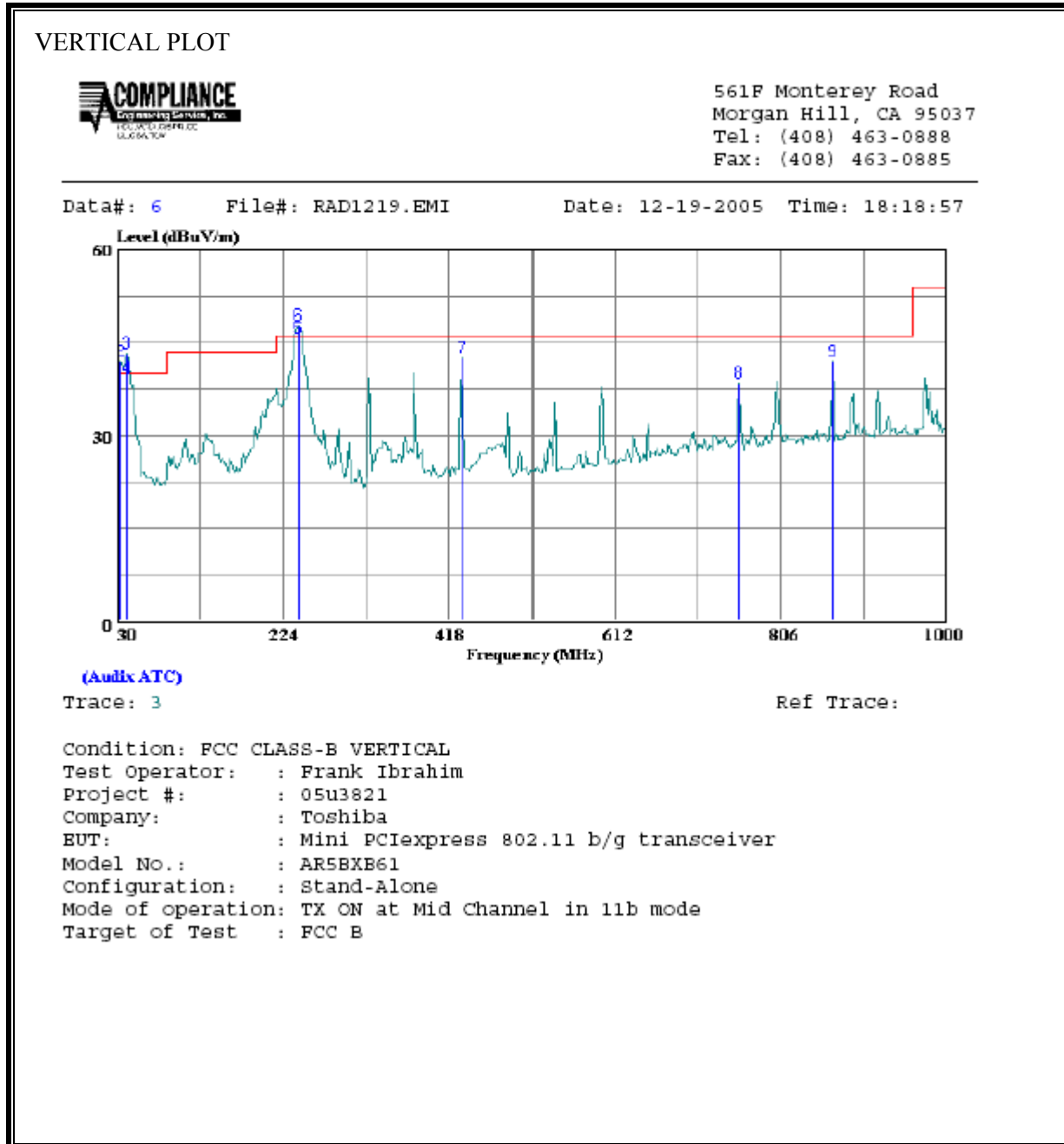


HORIZONTAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	242.430	58.84	-13.99	44.85	46.00	-1.15	Peak
2	324.880	54.58	-11.18	43.40	46.00	-2.60	Peak
3	378.230	50.74	-10.00	40.74	46.00	-5.26	Peak
4	434.490	45.37	-8.67	36.70	46.00	-9.30	Peak
5	866.140	40.79	-1.25	39.54	46.00	-6.46	Peak
6	919.490	37.52	-0.83	36.69	46.00	-9.31	Peak



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



VERTICAL DATA

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	33.880	47.20	-8.87	38.33	40.00	-1.67	QP
2 *	33.880	50.76	-8.87	41.89	40.00	1.89	Peak
3 *	41.640	56.26	-13.02	43.24	40.00	3.24	Peak
4	41.640	53.00	-13.67	39.33	40.00	-0.67	QP
5	242.430	59.70	-13.99	45.71	46.00	-0.29	QP
6 *	242.430	61.78	-13.99	47.79	46.00	1.79	Peak
7	434.490	51.20	-8.67	42.53	46.00	-3.47	Peak
8	756.530	40.96	-2.47	38.49	46.00	-7.51	Peak
9	866.140	43.12	-1.25	41.87	46.00	-4.13	Peak

### 7.3. POWERLINE CONDUCTED EMISSIONS

#### LIMIT

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

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

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both peak detection and quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

Line conducted data is recorded for both NEUTRAL and HOT lines.

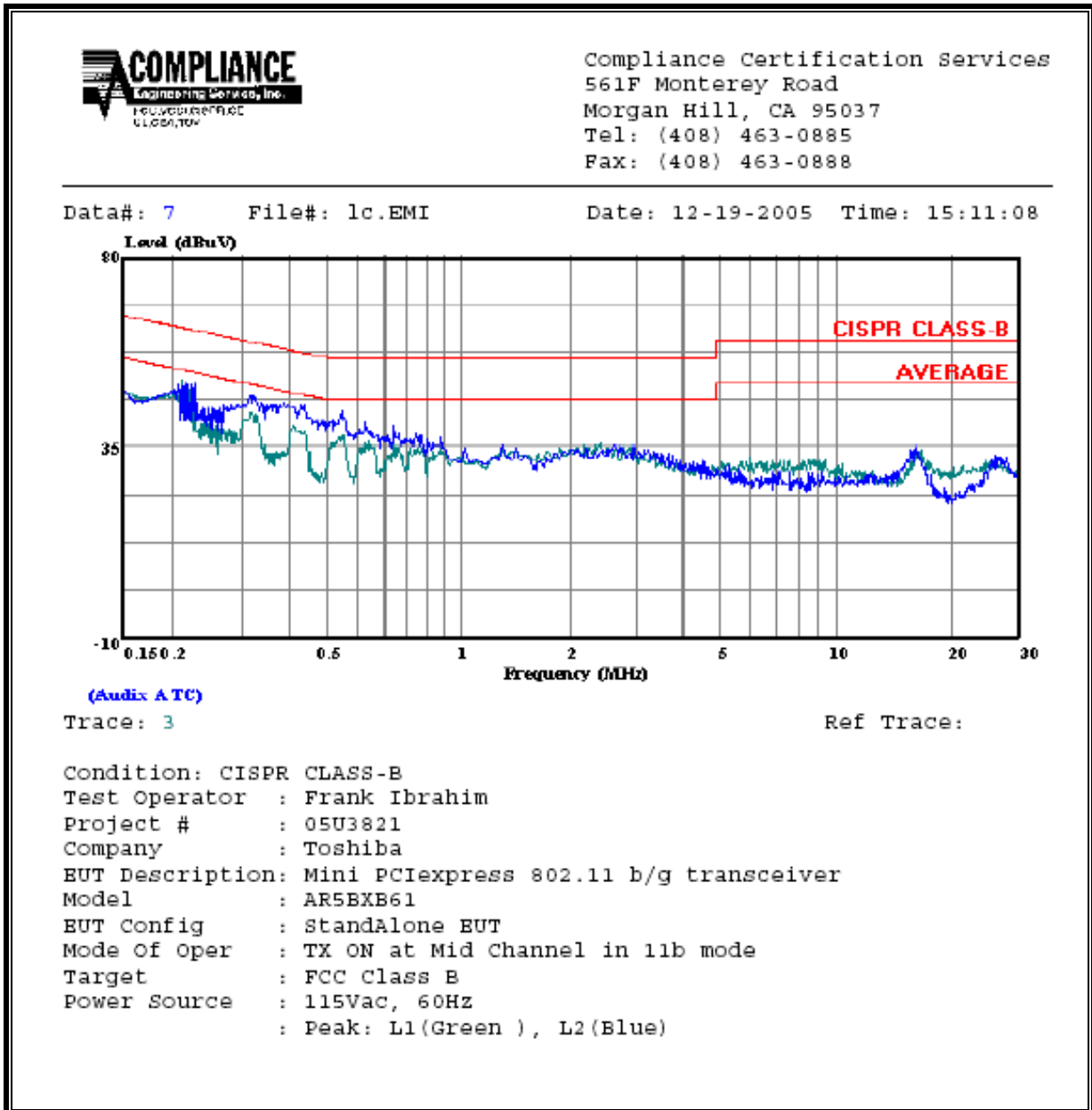
#### RESULTS

No non-compliance noted:

**6 WORST EMISSIONS**

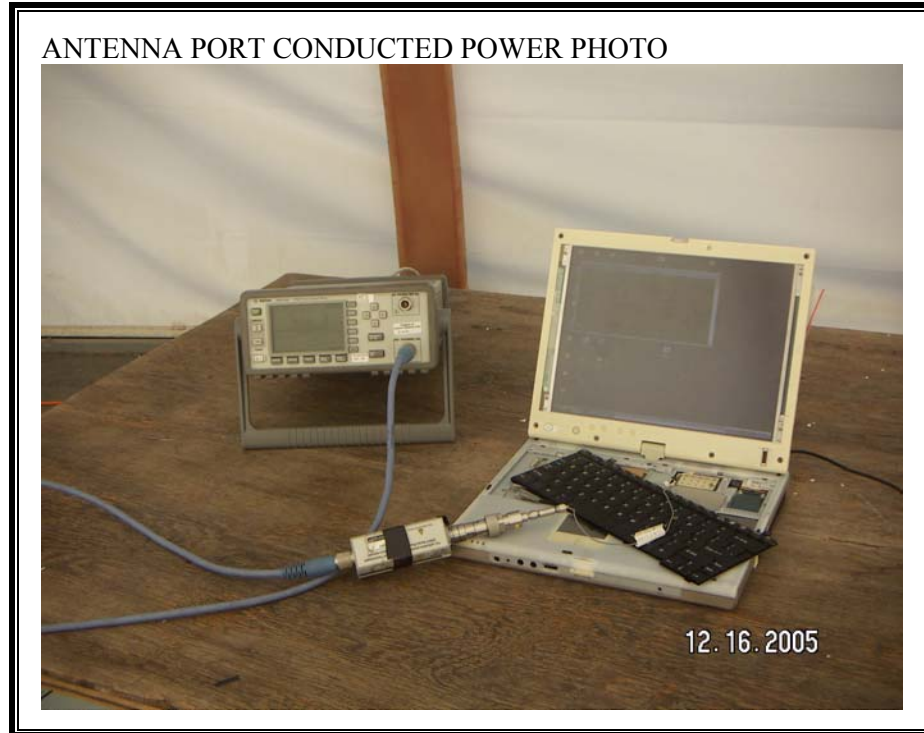
CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.15	48.74	--	--	0.00	66.00	56.00	-17.26	-7.26	L1
0.21	50.76	--	--	0.00	63.13	53.13	-12.37	-2.37	L1
0.32	43.05	--	--	0.00	59.76	49.76	-16.71	-6.71	L1
0.15	48.76	--	--	0.00	66.00	56.00	-17.24	-7.24	L2
0.22	50.16	--	--	0.00	62.93	52.93	-12.77	-2.77	L2
0.23	49.96	--	--	0.00	62.49	52.49	-12.53	-2.53	L2
6 Worst Data									

**LINE 1 AND LINE 2 RESULTS**

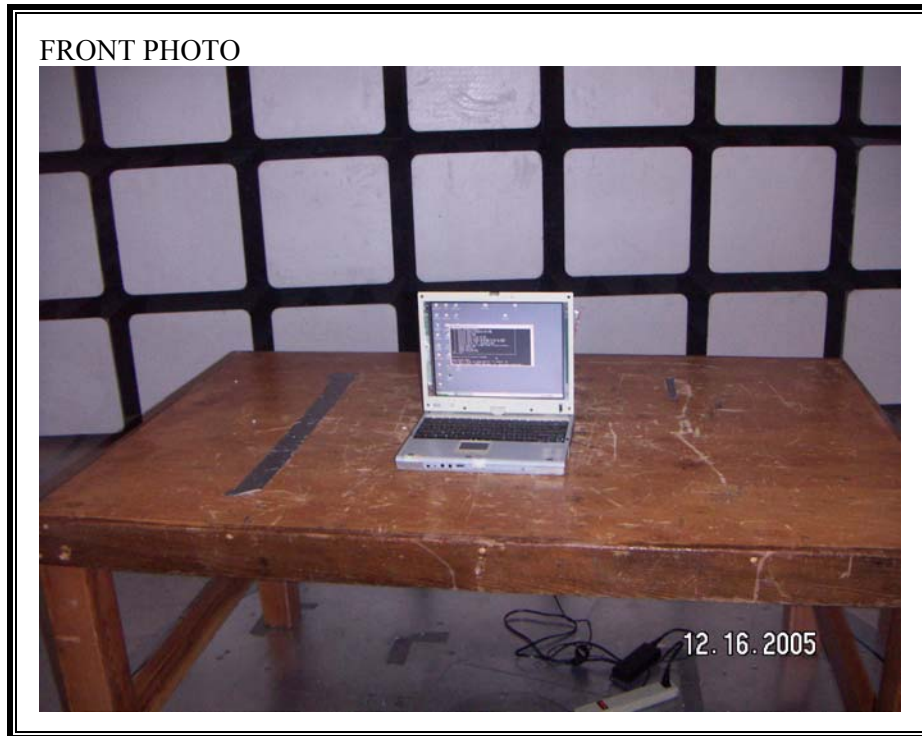


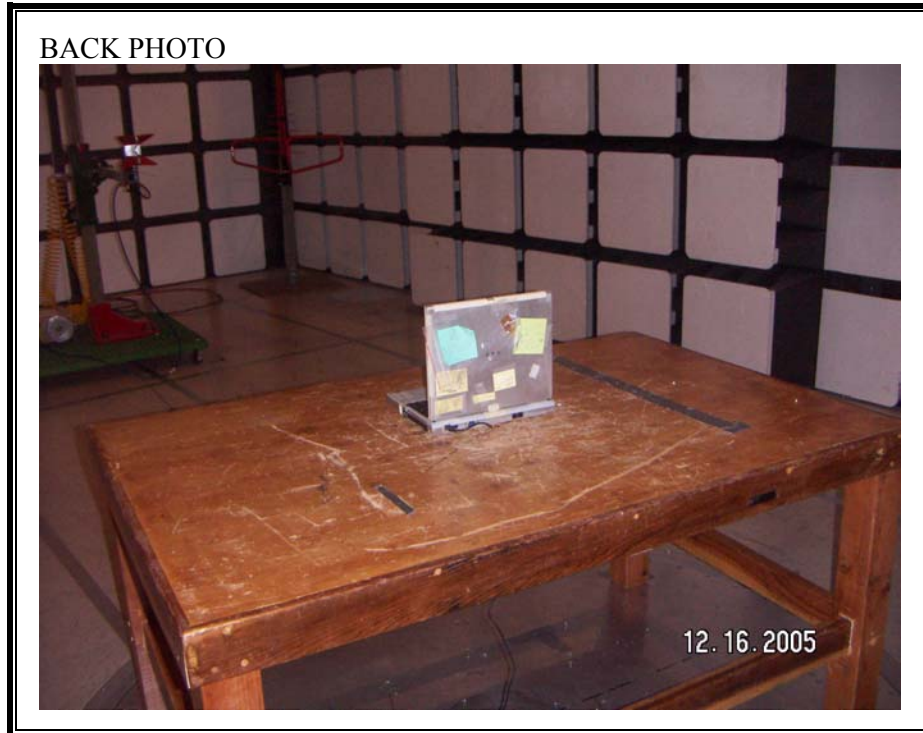
## 8. SETUP PHOTOS

### ANTENNA PORT CONDUCTED POWR MEASUREMENT SETUP



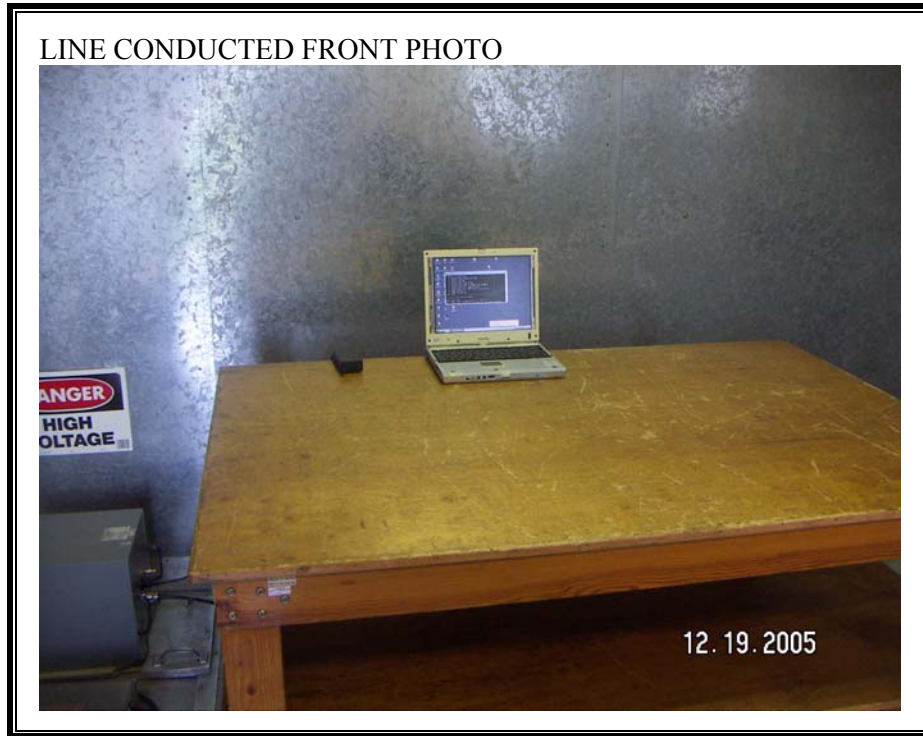
**RADIATED RF MEASUREMENT SETUP**







**POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP**





**END OF REPORT**