



**FCC CFR47 CERTIFICATION  
CLASS II PERMISSIVE CHANGE  
TEST REPORT**

**FOR**

**WIRELESS LAN MINI-PCI EXPRESS, 802.11A/B/G**

**MODEL NUMBER: PA3489U-1MPC & PA3441U-1MPC (Optional)**

**FCC ID: CJ6UPA3489WL**

**REPORT NUMBER: 06U10441-1**

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*Prepared for*

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

*Prepared by*

**COMPLIANCE CERTIFICATION SERVICES  
561F MONTEREY ROAD,  
MORGAN HILL, CA 95037, USA  
TEL: (408) 463-0885  
FAX: (408) 463-0888**



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## TABLE OF CONTENTS

|                                                                |           |
|----------------------------------------------------------------|-----------|
| <b>1. ATTESTATION OF TEST RESULTS.....</b>                     | <b>4</b>  |
| <b>2. TEST METHODOLOGY .....</b>                               | <b>5</b>  |
| <b>3. FACILITIES AND ACCREDITATION .....</b>                   | <b>5</b>  |
| <b>4. CALIBRATION AND UNCERTAINTY.....</b>                     | <b>5</b>  |
| 4.1. MEASURING INSTRUMENT CALIBRATION.....                     | 5         |
| 4.2. MEASUREMENT UNCERTAINTY.....                              | 5         |
| <b>5. EQUIPMENT UNDER TEST.....</b>                            | <b>6</b>  |
| 5.1. DESCRIPTION OF EUT .....                                  | 6         |
| 5.2. DESCRIPTION OF AVAILABLE ANTENNAS.....                    | 6         |
| 5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE.....            | 6         |
| 5.4. SOFTWARE AND FIRMWARE.....                                | 6         |
| 5.5. WORST-CASE CONFIGURATION AND MODE.....                    | 6         |
| 5.6. DESCRIPTION OF TEST SETUP .....                           | 7         |
| <b>6. CHANNEL TESTS FOR 5150 – 5350 MHz BAND.....</b>          | <b>10</b> |
| 6.1. LIMITS AND RESULTS.....                                   | 10        |
| 6.1.1. AVERAGE POWER.....                                      | 10        |
| 6.2. RADIATED EMISSIONS.....                                   | 11        |
| 6.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS .....           | 11        |
| 6.2.2. TRANSMITTER ABOVE 1 GHZ FOR 5150 TO 5350 MHz BAND ..... | 13        |
| 6.2.3. TRANSMITTER ABOVE 1 GHZ FOR 5150 TO 5250 MHz BAND ..... | 21        |
| 6.2.4. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz.....          | 31        |
| 6.3. POWERLINE CONDUCTED EMISSIONS .....                       | 35        |
| <b>7. SETUP PHOTOS .....</b>                                   | <b>39</b> |

## 1. ATTESTATION OF TEST RESULTS

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

**EUT DESCRIPTION:** WIRELESS LAN MINI-PCI EXPRESS, 802.11A/B/G

**MODEL:** PA3489U-1MPC & PA3441U-1MPC (OPTIONAL)

**SERIAL NUMBER:** WC3604110164

**DATE TESTED:** JULY 14-15, 2006

| APPLICABLE STANDARDS  |                         |
|-----------------------|-------------------------|
| STANDARD              | TEST RESULTS            |
| FCC PART 15 SUBPART E | 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:



ALVIN ILARINA  
EMC SUPERVISOR  
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 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**

Wireless LAN Mini-PCI Express, 802.11a/b/g module.

### **5.2. DESCRIPTION OF AVAILABLE ANTENNAS**

The radio utilizes PIFA antenna model number HFT40 manufactured by Hitachi Cable, Ltd with a peak gain of 0.89 dBi in the 5150-5350 MHz band.

### **5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE**

|           |                                                                |
|-----------|----------------------------------------------------------------|
| Change #1 | The subject approved module is being used in a different host. |
| Change #2 | Collocation with CDMA CELL-PCS module.                         |
| Change #3 | Collocation with Bluetooth Module.                             |

### **5.4. SOFTWARE AND FIRMWARE**

The EUT driver software installed in the host support equipment during testing were CRTU rev. 4.0.22.0.

### **5.5. WORST-CASE CONFIGURATION AND MODE**

Radiated emissions tests above 1 GHz were performed on each applicable L/M/H channel.

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 2437 MHz in 11g mode. The worst-case data rate for this channel is determined to be 6 Mb/s.

Thus worst-case radiated emissions below 1 GHz and power line conducted emissions tests were made at 2437 MHz in the 802.11g mode, at 6 Mb/s.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| PERIPHERAL SUPPORT EQUIPMENT LIST |              |              |               |        |
|-----------------------------------|--------------|--------------|---------------|--------|
| Description                       | Manufacturer | Model        | Serial Number | FCC ID |
| Laptop                            | Toshiba      | Satellite    | NA            | DoC    |
| AC Adapter                        | Toshiba      | PA3283U-3ACA | G71C00043310  | DoC    |

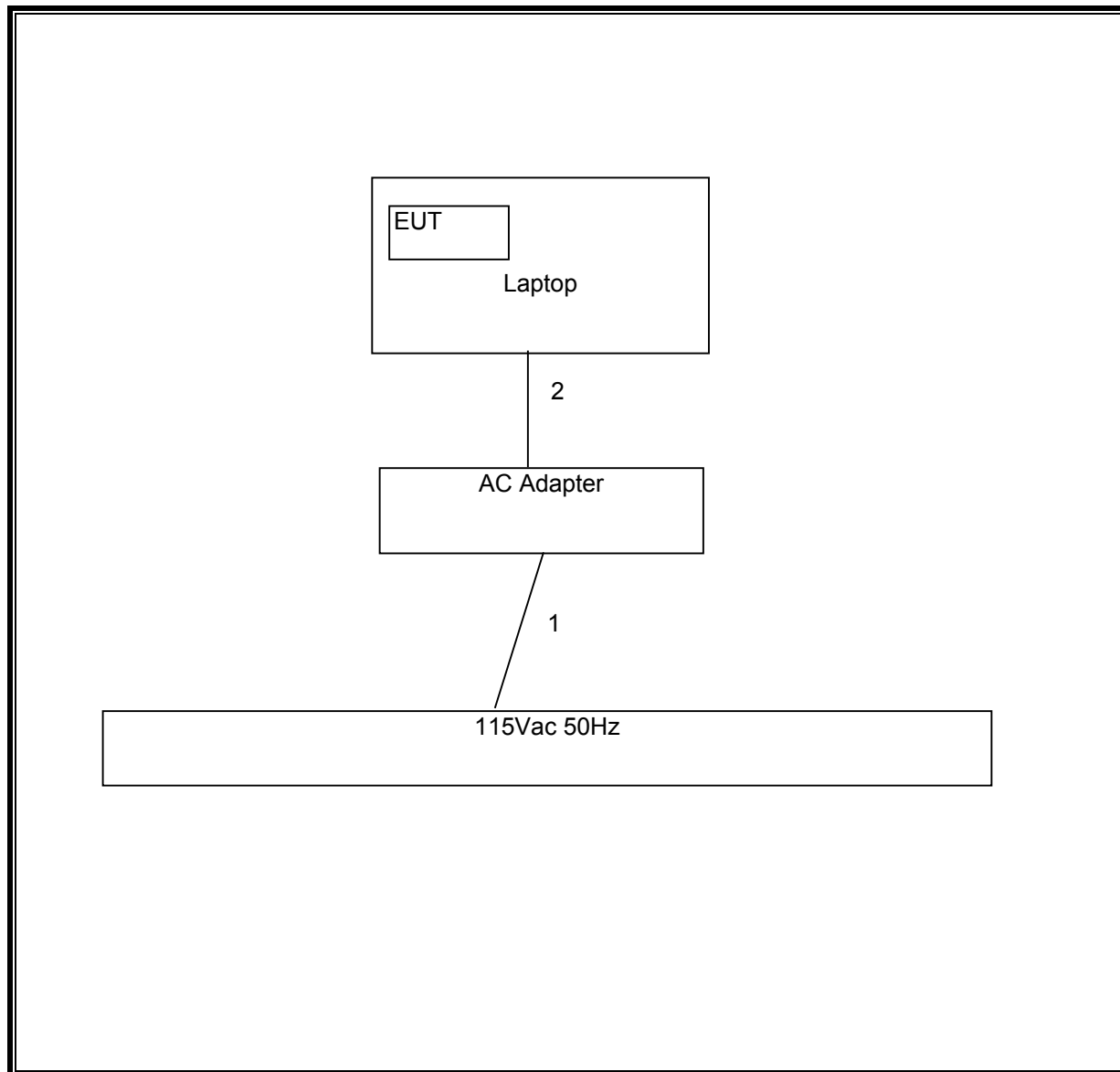
### I/O CABLES

| I/O CABLE LIST |      |                      |                |             |              |         |
|----------------|------|----------------------|----------------|-------------|--------------|---------|
| Cable No.      | Port | # of Identical Ports | Connector Type | Cable Type  | Cable Length | Remarks |
| 1              | AC   | 1                    | US 115V        | Un-shielded | 2m           | No      |
| 2              | DC   | 1                    | DC             | Un-shielded | 2m           | No      |

### TEST SETUP

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

**SETUP DIAGRAM FOR TESTS**





## 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    |
| Antenna, Horn 1 ~ 18 GHz        | EMCO          | 3115            | 5/22/1918     | 4/22/2007  |
| Preamplifier, 1 ~ 26.5 GHz      | Agilent / HP  | 8449B           | 3008A00561    | 10/3/2007  |
| Antenna, Horn 18 ~ 26 GHz       | ARA           | MWH-1826/B      | 1049          | 9/12/2006  |
| Spectrum Analyzer 3 Hz ~ 44 GHz | Agilent / HP  | E4446A          | MY45300064    | 12/19/2006 |
| EMI Test Receiver               | R & S         | ESHS 20         | 827129/006    | 6/3/2007   |
| LISN, 10 kHz ~ 30 MHz           | FCC           | LISN-30/250-252 | 2023          | 8/30/2006  |
| Preamplifier, 26 ~ 40 GHz       | Miteq         | NSP4000-SP2     | 924343        | 8/18/2006  |
| Wireless Communication Test Set | Agilent       | 8960 Series 10  | E6515C        | 6/28/2007  |
| Peak / Average Power Sensor     | Agilent       | E9327A          | US40440755    | 12/2/2007  |
| Peak Power Meter                | Agilent / HP  | E4416A          | GB41291160    | 12/2/2007  |
| Preamplifier, 1 ~ 26 GHz        | Miteq         | NSP2600-SP      | 924342        | 9/2/2006   |
| Preamplifier, 26 ~ 40 GHz       | Miteq         | NSP4000-SP2     | 924343        | 8/18/2006  |
| 7.6 GHz High Pass Filter        | Micro-Tronics | HPM13195        | 001           | C.N.R.     |

## 6. CHANNEL TESTS FOR 5150 – 5350 MHz BAND

### 6.1. LIMITS AND RESULTS

#### 6.1.1. AVERAGE POWER

##### AVERAGE POWER LIMIT

None: for reporting purposes only. The average power for each channel was set to the average power specified in the original filing.

##### TEST PROCEDURE

The transmitter output is connected to a power meter.

##### RESULTS

No non-compliance noted:

The cable assembly insertion loss of 12.2 dB (including 10 dB pad and 2.2 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11a Mode, UNII

| Channel | Frequency<br>(MHz) | Average Power<br>(dBm) |
|---------|--------------------|------------------------|
| Low     | 5180               | 15.80                  |
| Mid     | 5260               | 17.40                  |
| High    | 5320               | 17.20                  |

## 6.2. RADIATED EMISSIONS

### 6.2.1. 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<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(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 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each band.

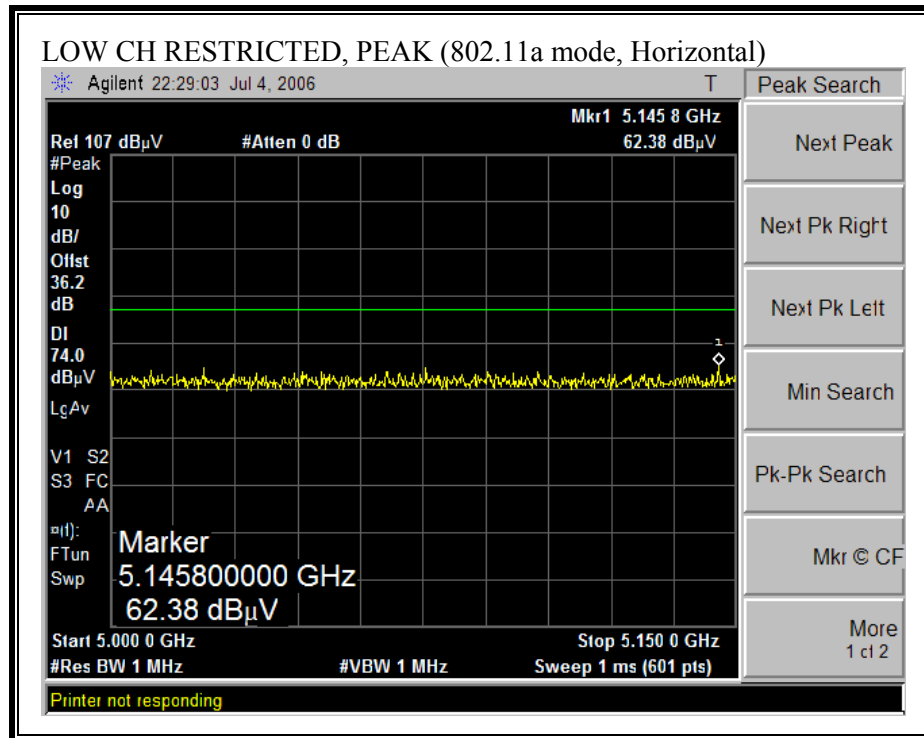
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

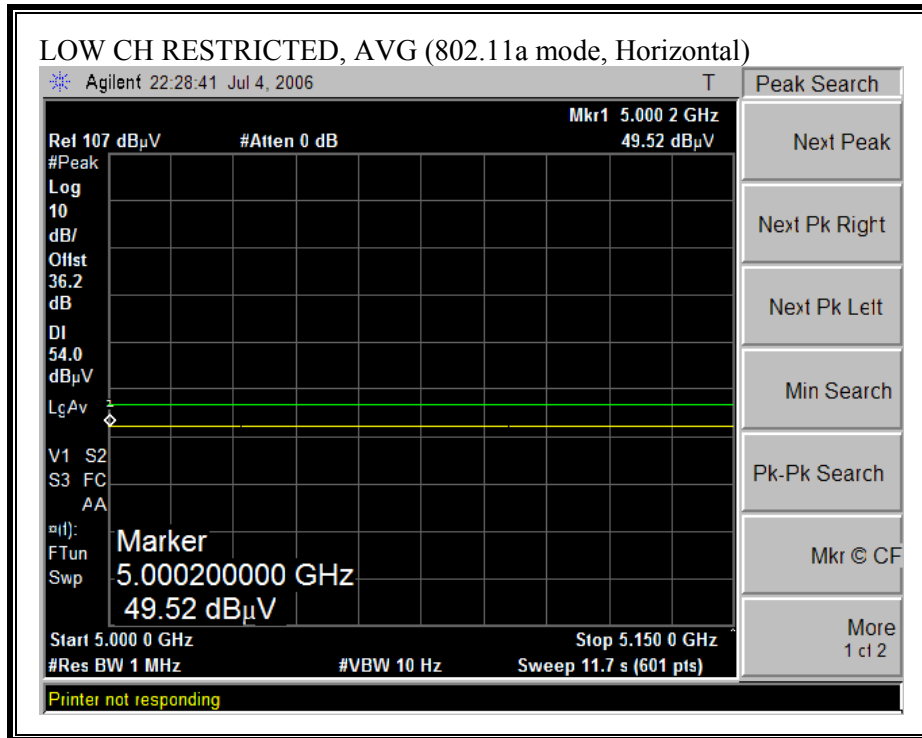
For the portable configuration the EUT is investigated in the X, Y, and Z orientations with the worse case reported.

## 6.2.2. TRANSMITTER ABOVE 1 GHZ FOR 5150 TO 5350 MHz BAND

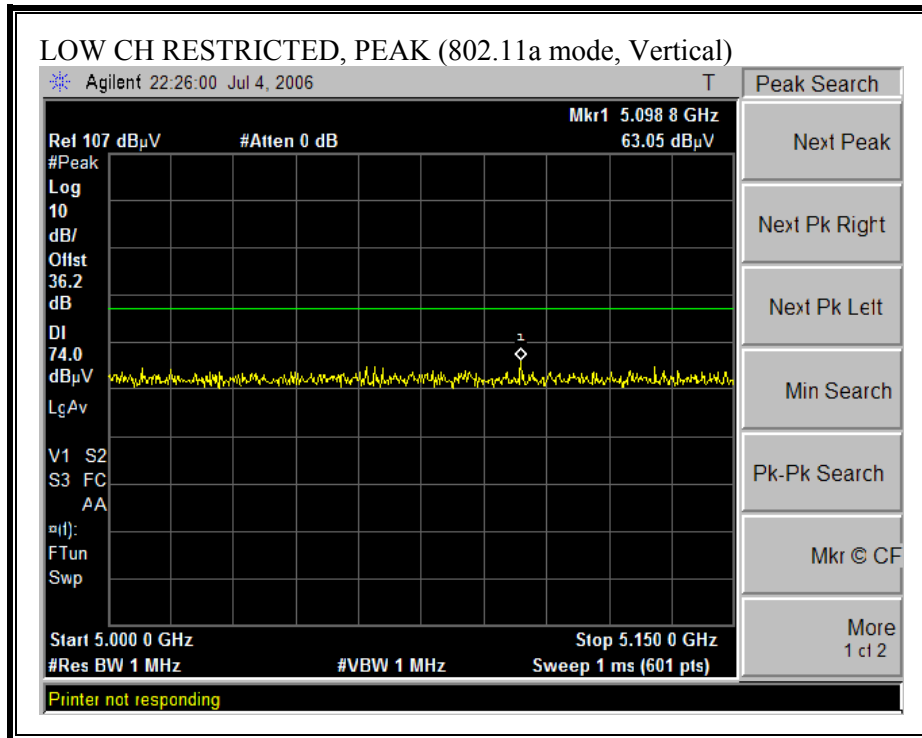
### PORTABLE CONFIGURATION

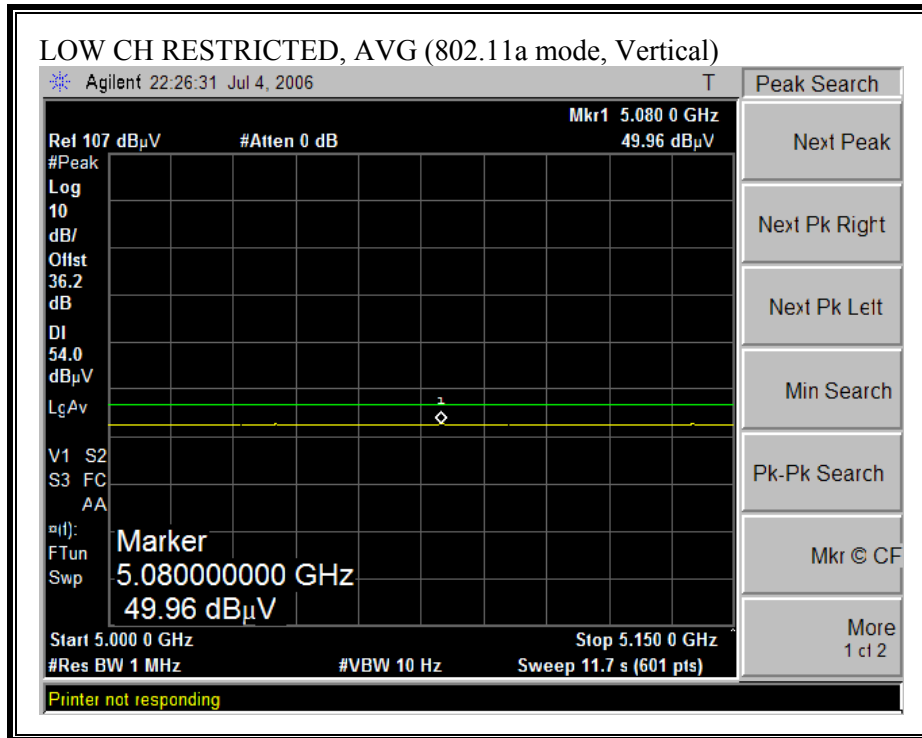
### RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, HORIZONTAL)





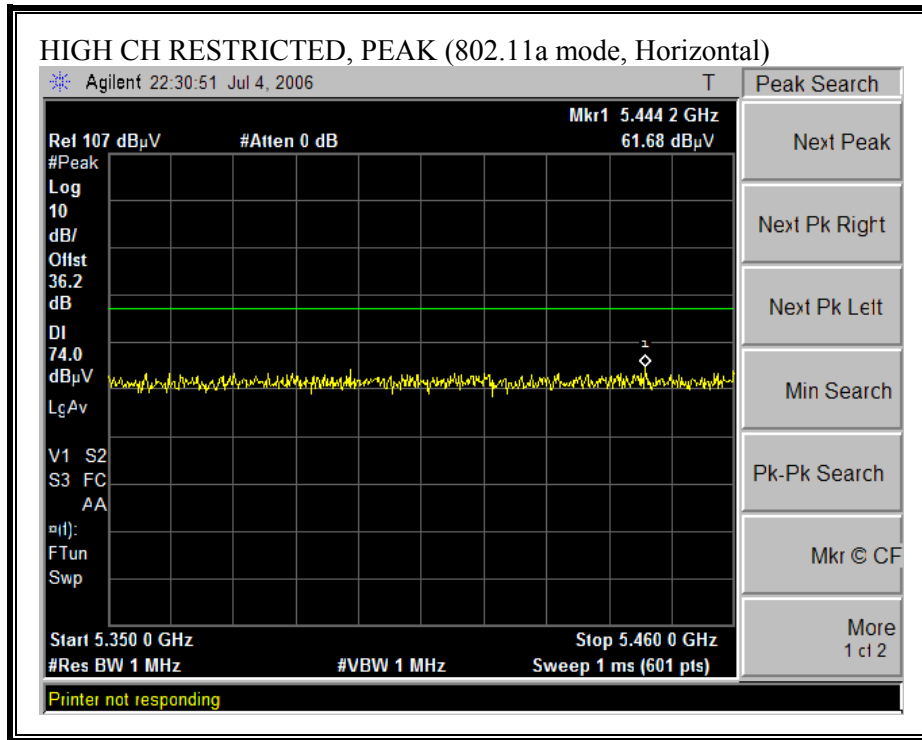
**RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, VERTICAL)**

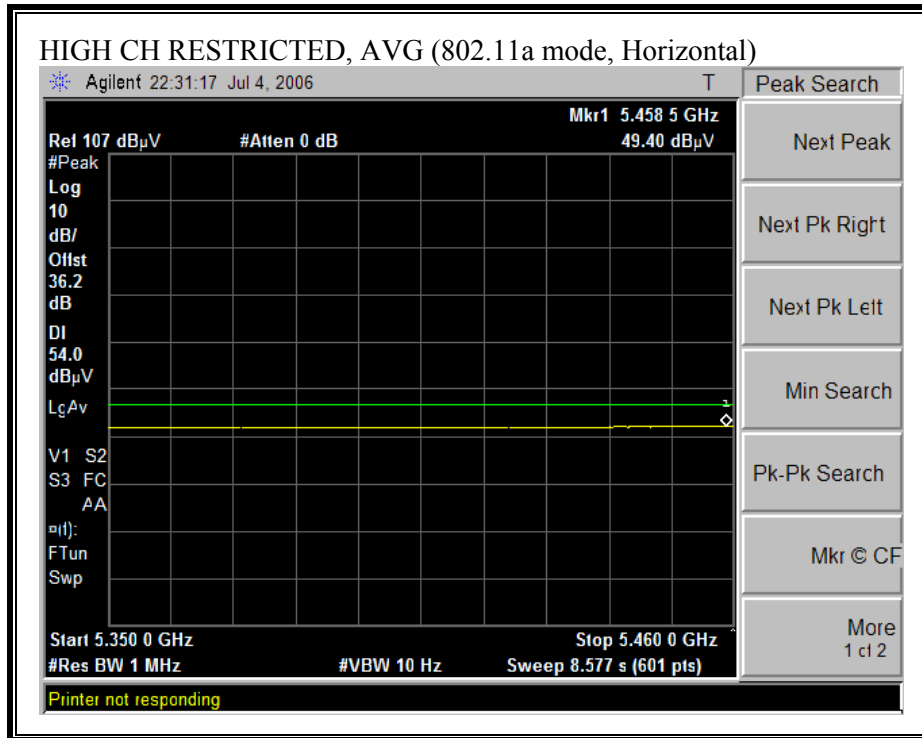




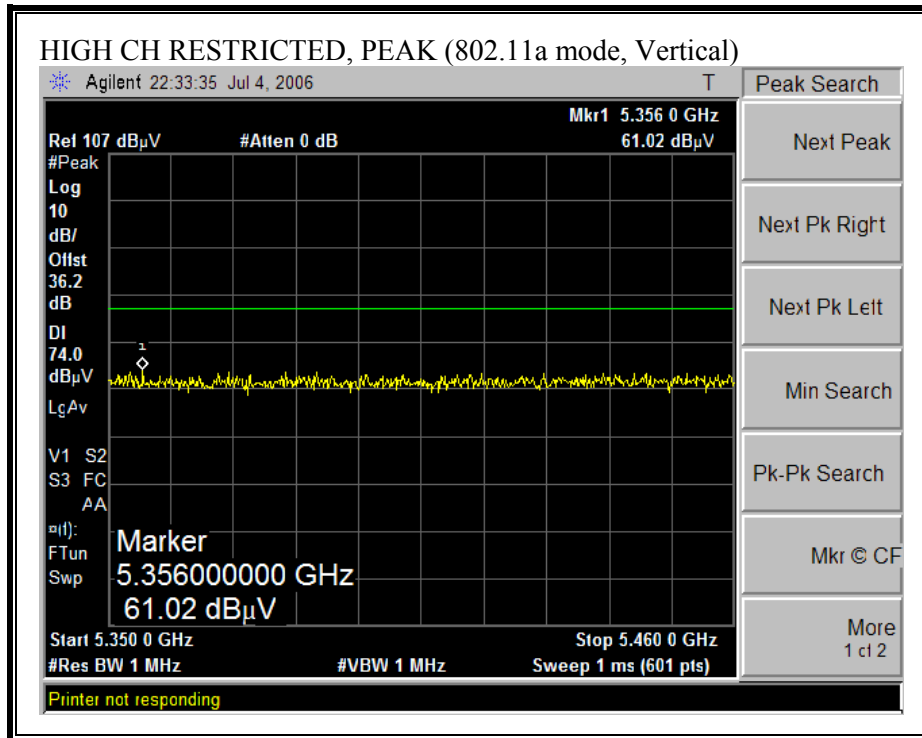


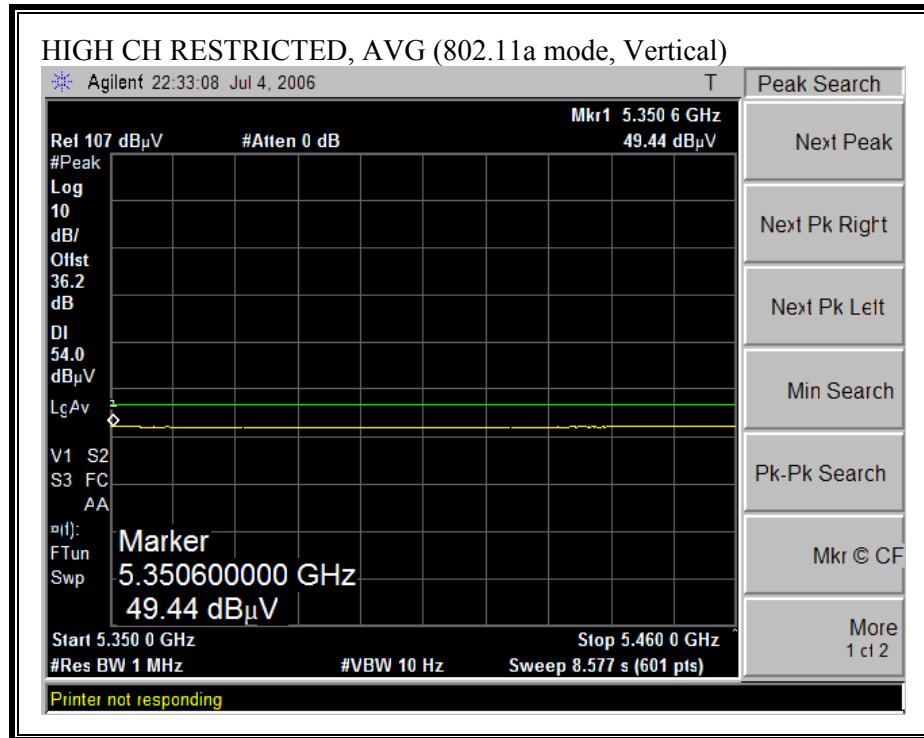
**RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, HORIZONTAL)**





**RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, VERTICAL)**

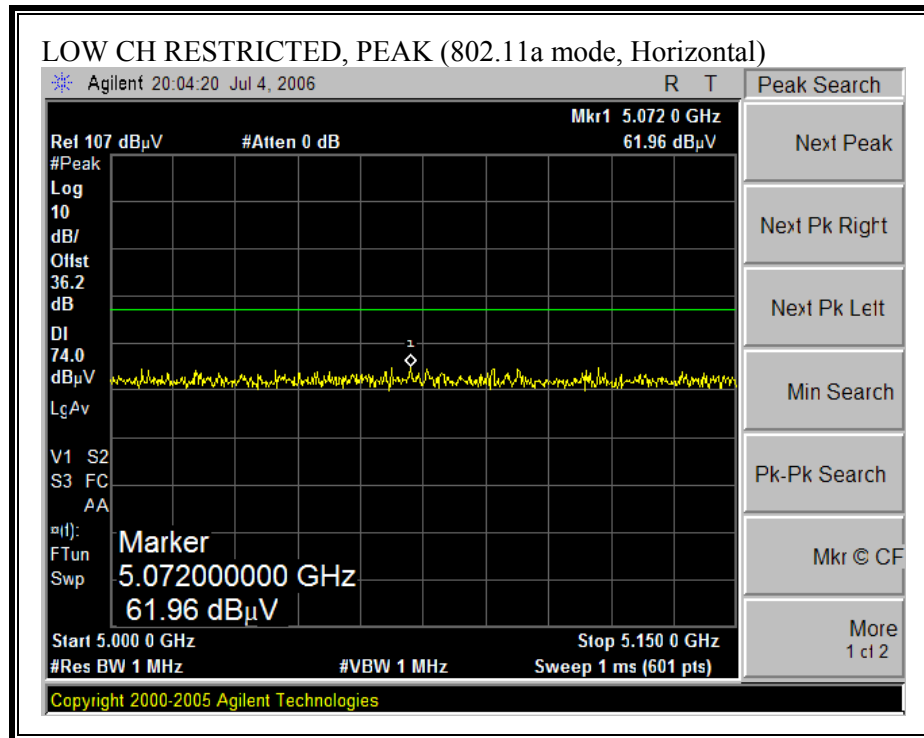


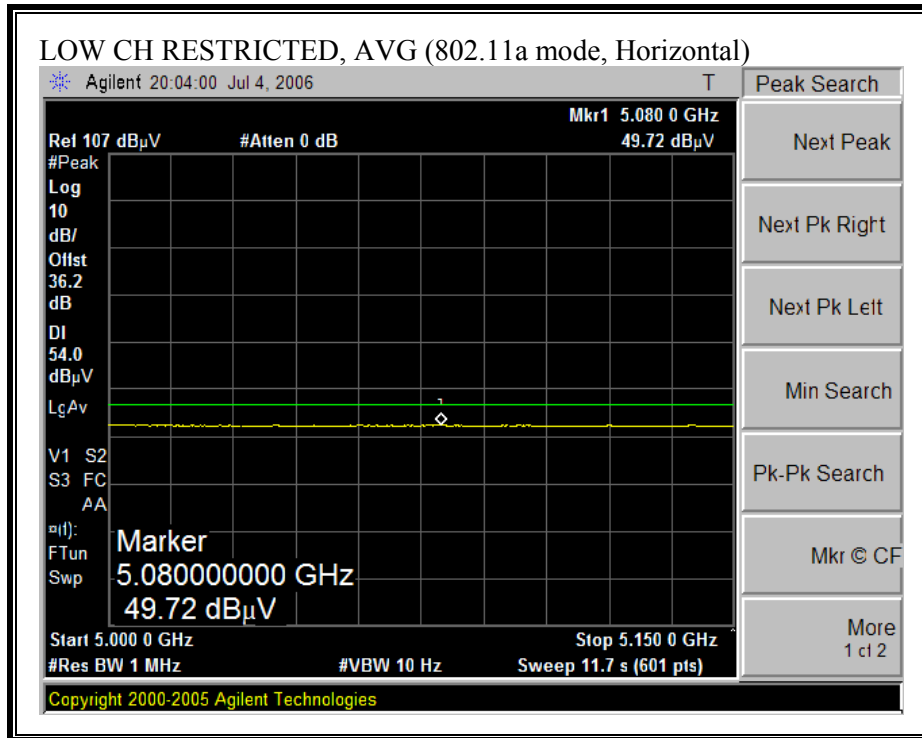


### 6.2.3. TRANSMITTER ABOVE 1 GHZ FOR 5150 TO 5250 MHz BAND

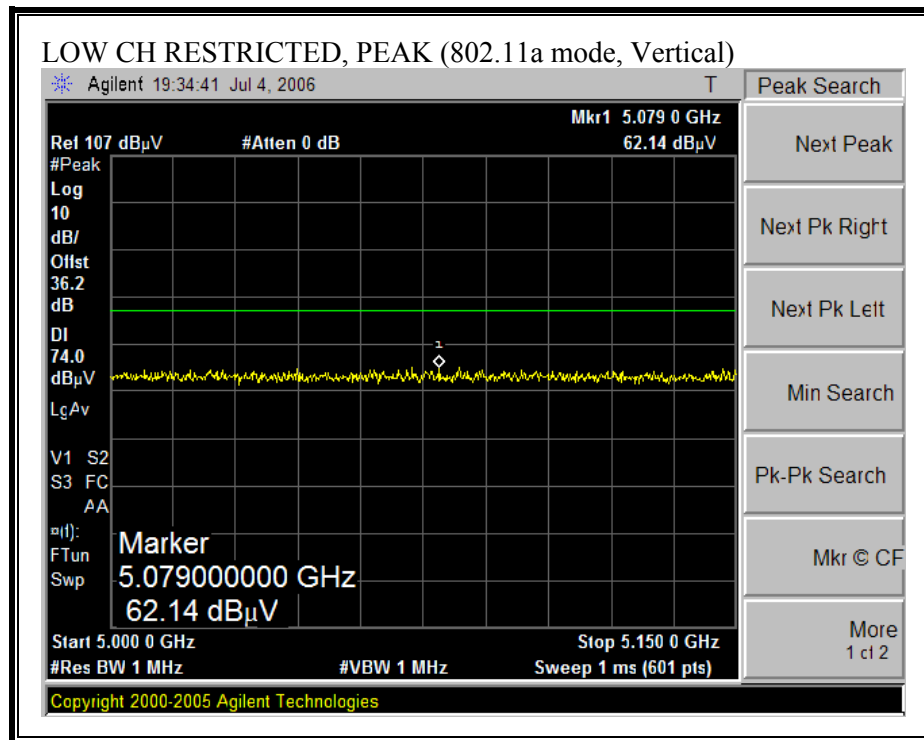
#### MOBILE CONFIGURATION

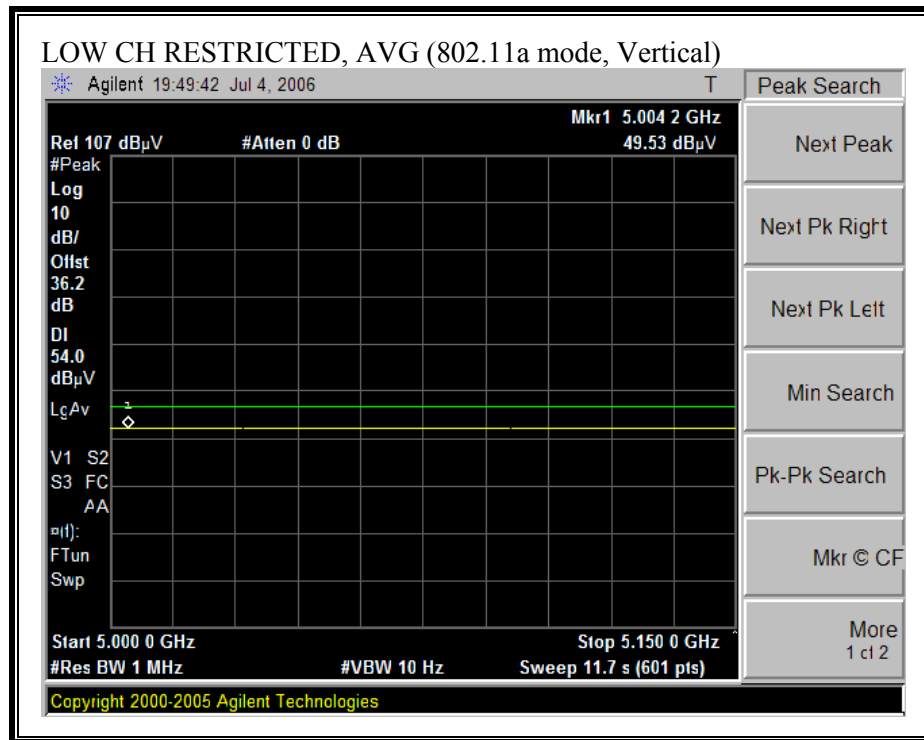
#### RESTRICTED BANEDGE (802.11a MODE, LOW CHANNEL, HORIZONTAL)





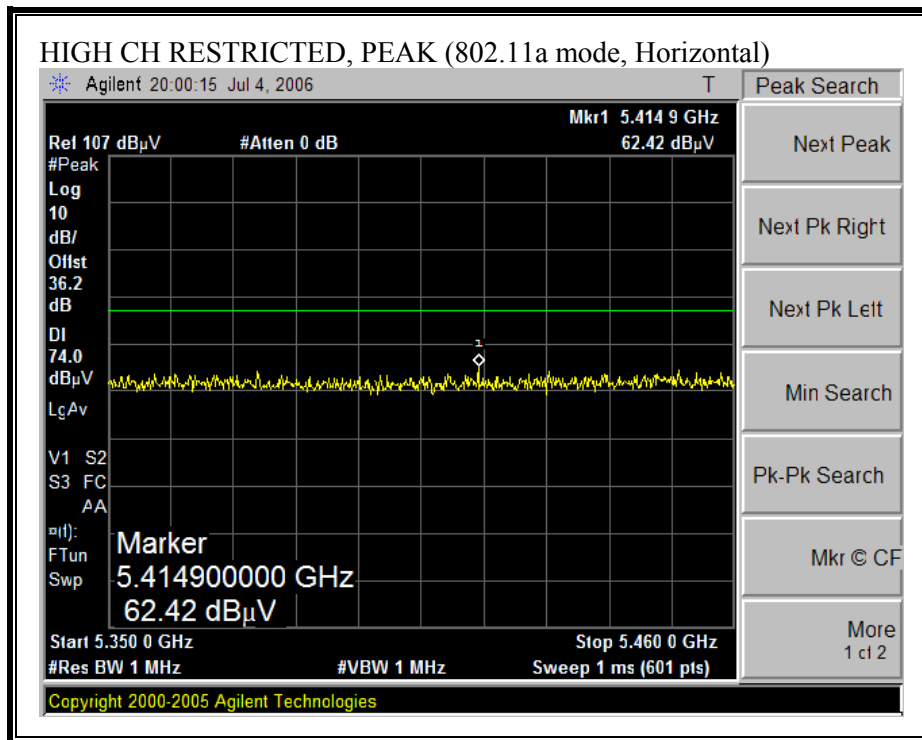
**RESTRICTED BANDEDGE (802.11a MODE, LOW CHANNEL, VERTICAL)**

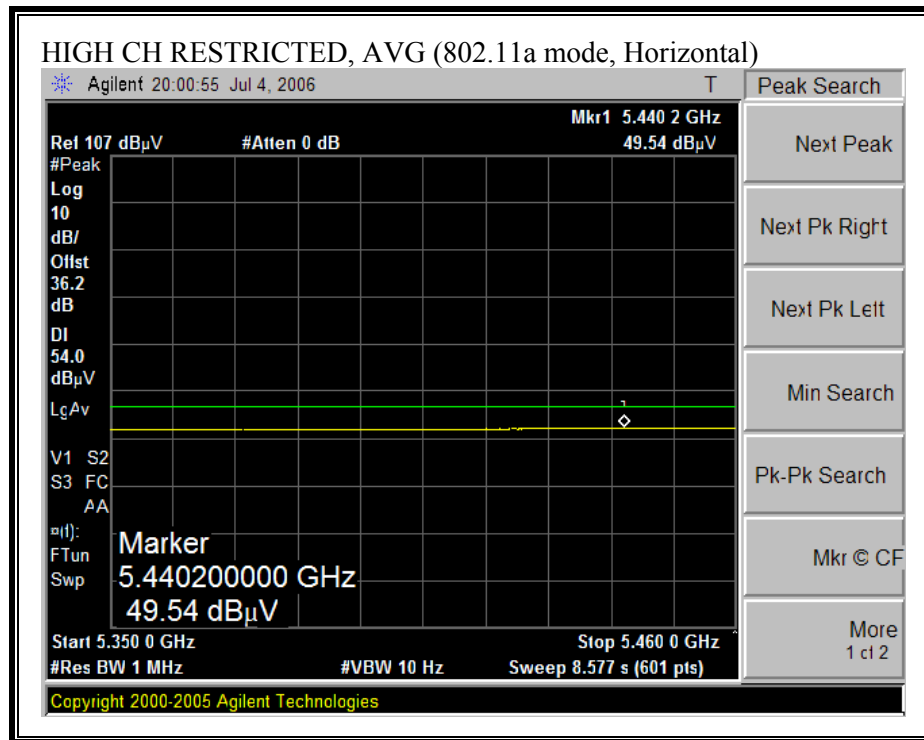




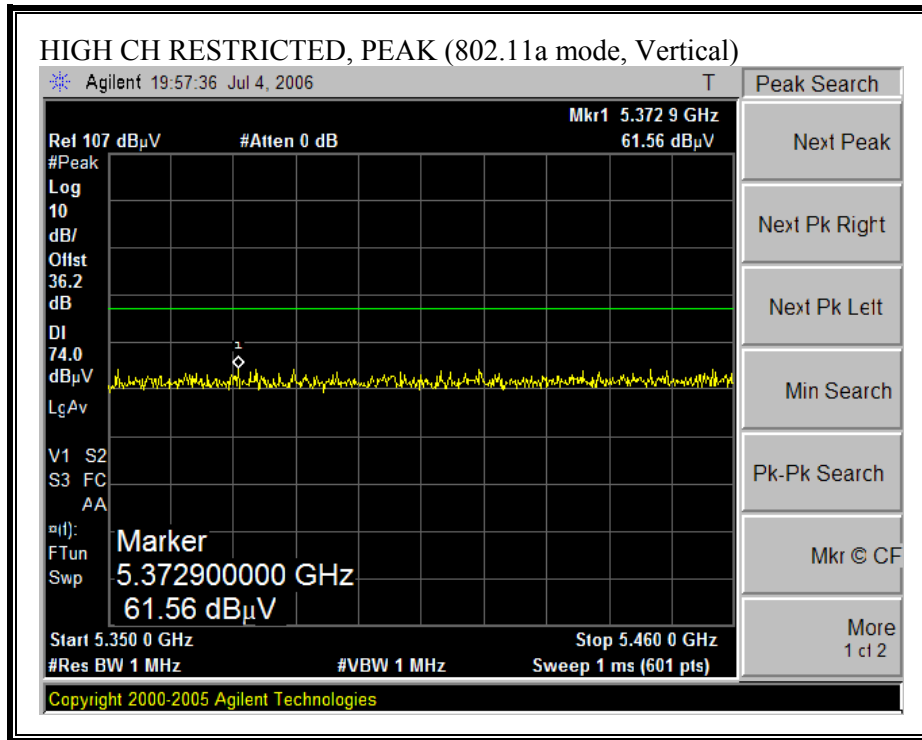


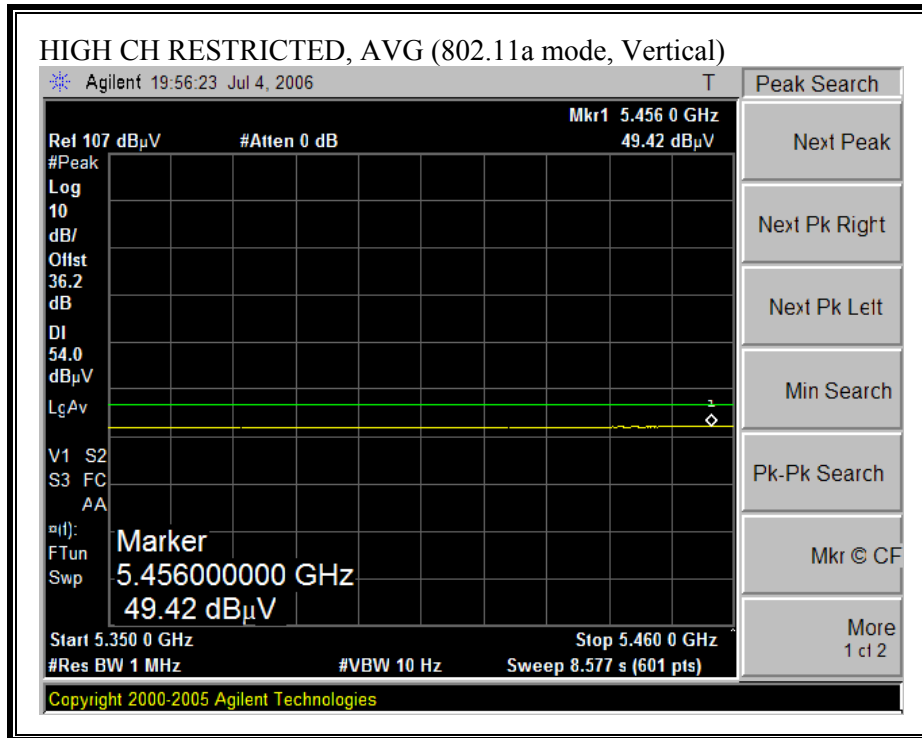
**RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, HORIZONTAL)**





**RESTRICTED BANDEDGE (802.11a MODE, HIGH CHANNEL, VERTICAL)**





**PORTABLE CONFIGURATION HARMONICS AND SPURIOUS EMISSIONS (802.11a MODE)**

| High Frequency Measurement                                           |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
|----------------------------------------------------------------------|-----------------------|--------------|-----------------------|--------------------------------|-------|------------------------|------------------------------|---------|-----------------------------|------------|---------------|----------------|-----------|------------|-------------------|--|
| Compliance Certification Services, Morgan Hill Open Field Site       |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| Company: Toshiba                                                     |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| Project #:                                                           |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| Date: 7/13/06                                                        |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| Test Engineer: Chin Pang                                             |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| Configuration: Portable Configuration (Worst Case)                   |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| Mode: TX, a mode 5.2GHz Band                                         |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| Test Equipment:                                                      |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| Horn 1-18GHz                                                         |                       |              | Pre-amplifier 1-26GHz |                                |       | Pre-amplifier 26-40GHz |                              |         | Horn > 18GHz                |            |               | Limit          |           |            |                   |  |
| T73; S/N: 6717 @3m                                                   |                       |              | T144 Miteq 3008A00931 |                                |       | T88 Miteq 26-40GHz     |                              |         | T39; ARA 18-26GHz; S/N:1013 |            |               | FCC 15.205     |           |            |                   |  |
| Hi Frequency Cables                                                  |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| 2 foot cable                                                         |                       |              | 3 foot cable          |                                |       | 12 foot cable          |                              |         | HPF                         |            |               | Reject Filter  |           |            | Peak Measurements |  |
| Frank 177079007                                                      |                       |              |                       |                                |       | Chin 200354001         |                              |         | HPF_7.6GHz                  |            |               |                |           |            | 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)       |  |
| Low Ch                                                               |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| 15.540                                                               | 3.0                   | 45.8         | 33.0                  | 38.1                           | 6.1   | -34.8                  | 0.0                          | 0.7     | 55.8                        | 43.0       | 74            | 54             | -18.2     | -11.0      | V                 |  |
| 15.540                                                               | 3.0                   | 44.6         | 32.6                  | 38.1                           | 6.1   | -34.8                  | 0.0                          | 0.7     | 54.6                        | 42.6       | 74            | 54             | -19.4     | -11.4      | H                 |  |
| Mid Ch                                                               |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| 15.780                                                               | 3.0                   | 45.2         | 32.4                  | 37.5                           | 6.1   | -34.6                  | 0.0                          | 0.7     | 54.9                        | 42.1       | 74            | 54             | -19.1     | -11.9      | V                 |  |
| 15.780                                                               | 3.0                   | 44.0         | 32.0                  | 37.5                           | 6.1   | -34.6                  | 0.0                          | 0.7     | 53.7                        | 41.7       | 74            | 54             | -20.3     | -12.3      | H                 |  |
| High Ch                                                              |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| 10.640                                                               | 3.0                   | 45.0         | 32.5                  | 37.1                           | 4.6   | -36.6                  | 0.0                          | 0.8     | 50.9                        | 38.4       | 74            | 54             | -23.1     | -15.6      | V                 |  |
| 15.960                                                               | 3.0                   | 44.7         | 32.3                  | 37.1                           | 6.1   | -34.5                  | 0.0                          | 0.7     | 54.1                        | 41.7       | 74            | 54             | -19.9     | -12.3      | V                 |  |
| 10.640                                                               | 3.0                   | 44.5         | 32.0                  | 37.1                           | 4.6   | -36.6                  | 0.0                          | 0.8     | 50.4                        | 37.9       | 74            | 54             | -23.6     | -16.1      | H                 |  |
| 15.960                                                               | 3.0                   | 43.4         | 31.4                  | 37.1                           | 6.1   | -34.5                  | 0.0                          | 0.7     | 52.8                        | 40.8       | 74            | 54             | -21.2     | -13.2      | H                 |  |
| Rev. 5.1.6                                                           |                       |              |                       |                                |       |                        |                              |         |                             |            |               |                |           |            |                   |  |
| 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               |       |                        |                              |         |                             |            |               |                |           |            |                   |  |



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

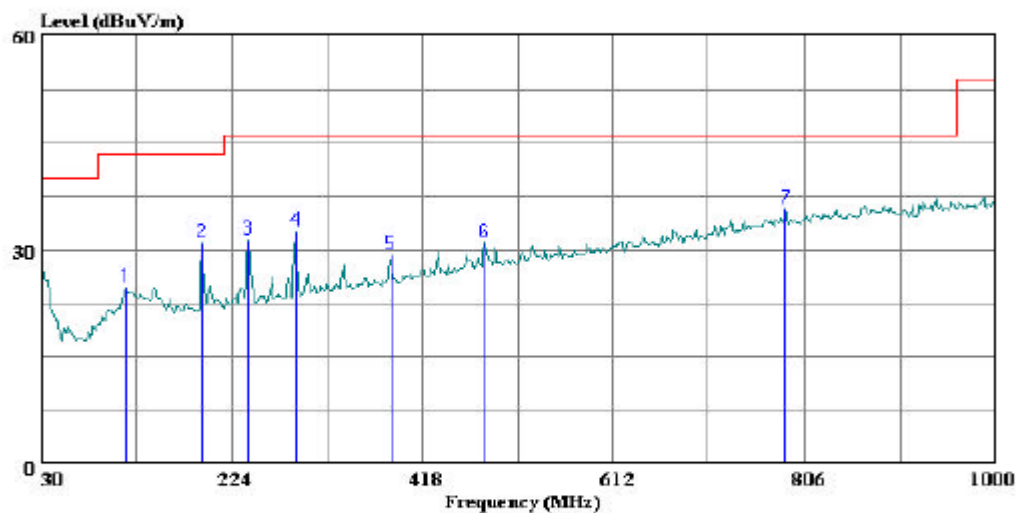
### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

#### HORIZONTAL PLOT



561F Monterey Road  
Morgan Hill, CA 95037  
Tel: (408) 463-0888  
Fax: (408) 463-0885

Data#: 4 File#: Toshiba emi.BMI Date: 07-13-2006 Time: 17:53:07



(Auxiliary)

Trace: 3

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL  
Test Operator: : Chin Pang  
Company: : Toshiba  
Project #: : 06U10441  
Configuration: : EUT inside the Laptop  
Mode of Operation: TX ( Worst Case )

## HORIZONTAL DATA

Page: 1

|   | Freq    | Read<br>Level | Factor | Level  | Limit<br>Line | Over<br>Limit | Remark |
|---|---------|---------------|--------|--------|---------------|---------------|--------|
|   | MHz     | dBuV          | dB     | dBuV/m | dBuV/m        | dB            |        |
| 1 | 116.330 | 9.91          | 14.71  | 24.62  | 43.50         | -18.88        | Peak   |
| 2 | 193.930 | 17.41         | 13.56  | 30.97  | 43.50         | -12.53        | Peak   |
| 3 | 240.490 | 17.73         | 13.54  | 31.27  | 46.00         | -14.73        | Peak   |
| 4 | 288.990 | 17.31         | 15.26  | 32.57  | 46.00         | -13.43        | Peak   |
| 5 | 385.990 | 11.57         | 17.73  | 29.30  | 46.00         | -16.70        | Peak   |
| 6 | 482.020 | 11.01         | 19.87  | 30.88  | 46.00         | -15.12        | Peak   |
| 7 | 785.630 | 11.47         | 24.35  | 35.82  | 46.00         | -10.18        | Peak   |



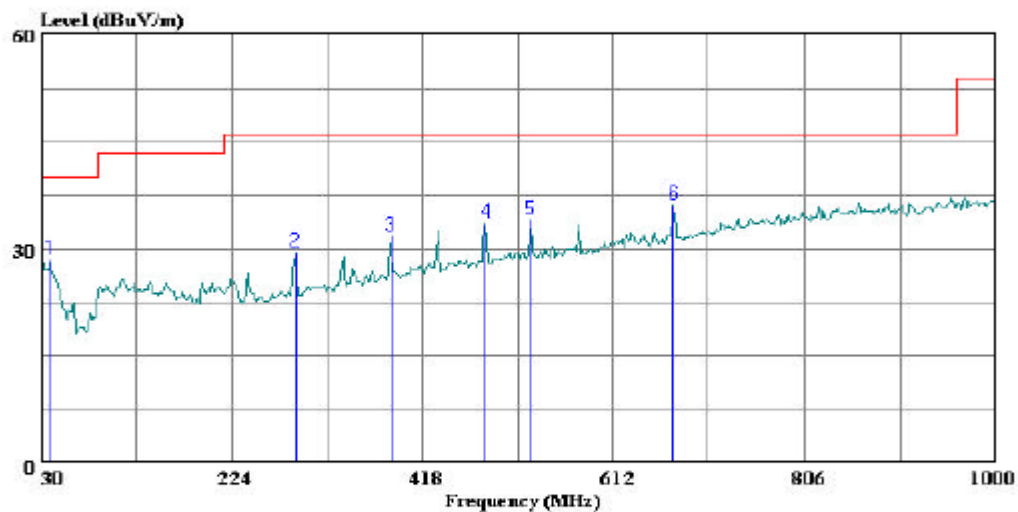
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)**

VERTICAL PLOT



561F Monterey Road  
Morgan Hill, CA 95037  
Tel: (408) 463-0888  
Fax: (408) 463-0885

Data#: 2 File#: Toshiba emi.EMI Date: 07-13-2006 Time: 17:49:26



(Auxiliary ATC)

Trace: 1

Ref Trace:

Condition: FCC CLASS-B VERTICAL  
Test Operator: : Chin Pang  
Company: : Toshiba  
Project #: : 06U10441  
Configuration: : EUT inside the Laptop  
Mode of Operation: TX ( Worst Case )

## VERTICAL DATA

Page: 1

|   | Freq    | Read<br>Level | Factor | Level  | Limit<br>Line | Over<br>Limit | Remark |
|---|---------|---------------|--------|--------|---------------|---------------|--------|
|   | MHz     | dBuV          | dB     | dBuV/m | dBuV/m        | dB            |        |
| 1 | 38.730  | 12.37         | 16.12  | 28.49  | 40.00         | -11.51        | Peak   |
| 2 | 288.990 | 14.31         | 15.26  | 29.57  | 46.00         | -16.43        | Peak   |
| 3 | 385.990 | 13.99         | 17.73  | 31.72  | 46.00         | -14.28        | Peak   |
| 4 | 482.990 | 13.79         | 19.89  | 33.68  | 46.00         | -12.32        | Peak   |
| 5 | 528.580 | 13.49         | 20.63  | 34.12  | 46.00         | -11.88        | Peak   |
| 6 | 674.080 | 13.39         | 22.71  | 36.10  | 46.00         | -9.90         | Peak   |

### 6.3. 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.

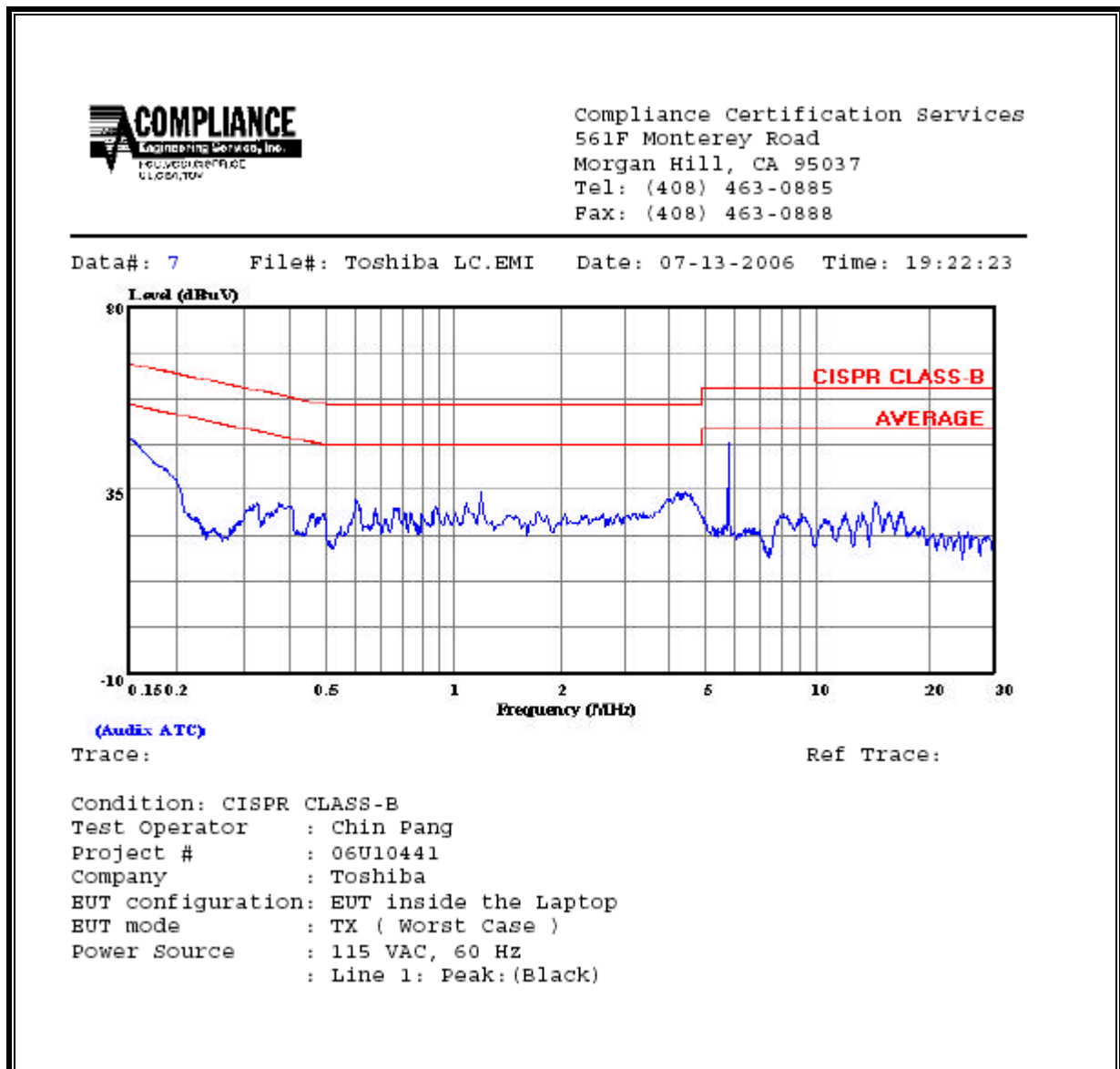
#### RESULTS

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                                   | 47.11     | --        | --        | 0.00  | 65.84 | 55.84 | -18.73  | -8.73   | L1      |
| 1.29                                   | 34.46     | --        | --        | 0.00  | 56.00 | 46.00 | -21.54  | -11.54  | L1      |
| 5.90                                   | 46.32     | --        | --        | 0.00  | 60.00 | 50.00 | -13.68  | -3.68   | L1      |
| 0.16                                   | 47.52     | --        | --        | 0.00  | 65.67 | 55.67 | -18.15  | -8.15   | L2      |
| 0.49                                   | 32.28     | --        | --        | 0.00  | 56.24 | 46.24 | -23.96  | -13.96  | L2      |
| 4.25                                   | 36.16     | --        | --        | 0.00  | 56.00 | 46.00 | -19.84  | -9.84   | L2      |
| 6 Worst Data                           |           |           |           |       |       |       |         |         |         |

## LINE 1 RESULTS

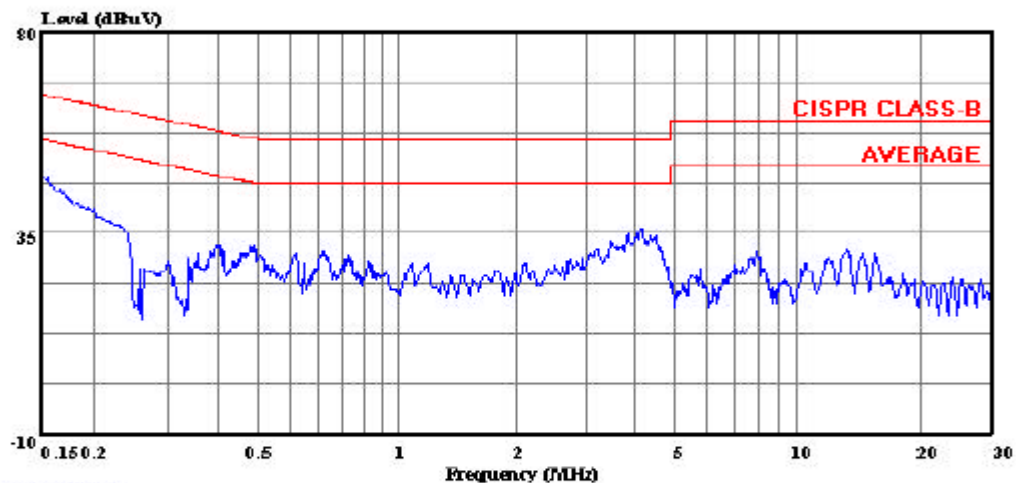


## LINE 2 RESULTS



Compliance Certification Services  
561F Monterey Road  
Morgan Hill, CA 95037  
Tel: (408) 463-0885  
Fax: (408) 463-0888

Data#: 14 File#: Toshiba LC.EMI Date: 07-13-2006 Time: 19:38:29



(Auxiliary ATC)

Trace:

Ref Trace:

Condition: CISPR CLASS-B  
Test Operator : Chin Pang  
Project # : 06U10441  
Company : Toshiba  
EUT configuration: EUT inside the Laptop  
EUT mode : TX ( Worst Case )  
Power Source : 115 VAC, 60 Hz  
Line 2: Peak: (Black)