# FCC CFR47 PART 15 SUBPART C
# CERTIFICATION TEST REPORT

**FOR**

**PDA PHONE**

**MODEL NUMBERS: KAIS100, KAIS110, KAIS120**

**FCC ID: NM8KS**

**REPORT NUMBER: 07U10984-1, REVISION B**

**ISSUE DATE: JUNE 27, 2007**

*Prepared for*
**HIGH TECH COMPUTER CORP.**
**23 HSIN HUA RD.**
**TAOYUAN 330, TAIWAN**

*Prepared by*
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NVLAP LAB CODE 200065-0

Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| -- | 05/10/07 | Initial Issue | T. Chan |
| B | 05/27/07 | Separated the WLAN and Bluetooth into individual reports | Chin Pang |

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** HIGH TECH COMPUTER CORP.
23 HISN HUA ROAD
TAOYUAN 330, TAIWAN

**EUT DESCRIPTION:** PDA PHONE

**MODEL TESTED:** KAIS120

**MODELS:** KAIS100, KAIS110, KAIS120

**SERIAL NUMBER:** TY709G000545

**DATE TESTED:** APRIL 13-16, 2007

| 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:

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# 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 47173 Benicia Street, Fremont, 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 |
| Radiated Emission, Above 200 MHz | +/- 4.3 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 PDA Phone and is manufactured by High Tech Computer.

**ACCESSORIES**

| Subassembly Description | Manufacturer | Part Number | Model Number |
|---|---|---|---|
| AC ADAPTER FOR EUT | Delta Electronic | 79H00051-01M | ADP-5FH B |
| 3.7V Li-ion Battery | Dynapack | 35H00088-00M | KAIS160 |
| Earphone | Merry Electronics Co., LTG | NA | EMC220 |
| USB Cable | NA | NA | NA |
| PDA | HTC | TY709G000591 | KAIS100 |
| PDA | HTC | TY709G000606 | KAIS110 |
| PDA | HTC | TY709G000545 | KAIS120 |

## 5.2. MANUFACTURER'S DESCRIPTION OF MODEL DIFFERENCES

The EUT was chosen as a representative model of the model series. The following table shows the model differences.

| Model Name | Model Differences |
|---|---|
| KAIS100 | With 3.0 Megapixel Color CMOS Camera |
| KAIS110 | No Camera |
| KAIS120 | With two cameras, Main Camera: 3.0 Megapixel Color CMOS Camera. Second Camera : Color CMOS CIF camera |

*: Model tested: KAIS120

## 5.3. MAXIMUM OUTPUT POWER

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

| Frequency Range (MHz) | Mode | Output Power (dBm) | Output Power (mW) |
|---|---|---|---|
| 2412 - 2462 | 802.11b | 20.83 | 121.06 |
| 2412 - 2462 | 802.11g | 20.45 | 110.92 |

## 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a fixed internal PIFA antenna with a maximum peak gain of 1.5dBi.

## 5.5. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was mapi_firmware_1150.

The EUT driver software installed in the host support equipment during testing was Kaiser_RS_V214_1025_USB.

The test utility software used during testing was radioscope.exe

## 5.6. 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 2412 MHz.

The worst-case data rate for this channel is determined to be 1 Mb/s, for b mode and 6 M/s for g mode.

The EUT is a portable device, therefore X, Y, & Z positions with and without AC adapter, PDA open and closed position and mobile configuration have been investigated. The worst case is to evaluate at EUT open and at Y position with battery operated.

The EUT models-KAIS100, KAIS110 and KAIS120 have been investigated during baseline scan and found no different in these models. Since KAIS120 has more option than the other models, therefore, it's used for the test.

## 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| PERIPHERAL SUPPORT EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| Laptop | Toshiba | Satellite | 9167937PU | DoC |
| AC Adapter | Toshiba | PA3083U-1ACA | 0109a0043422g | DoC |

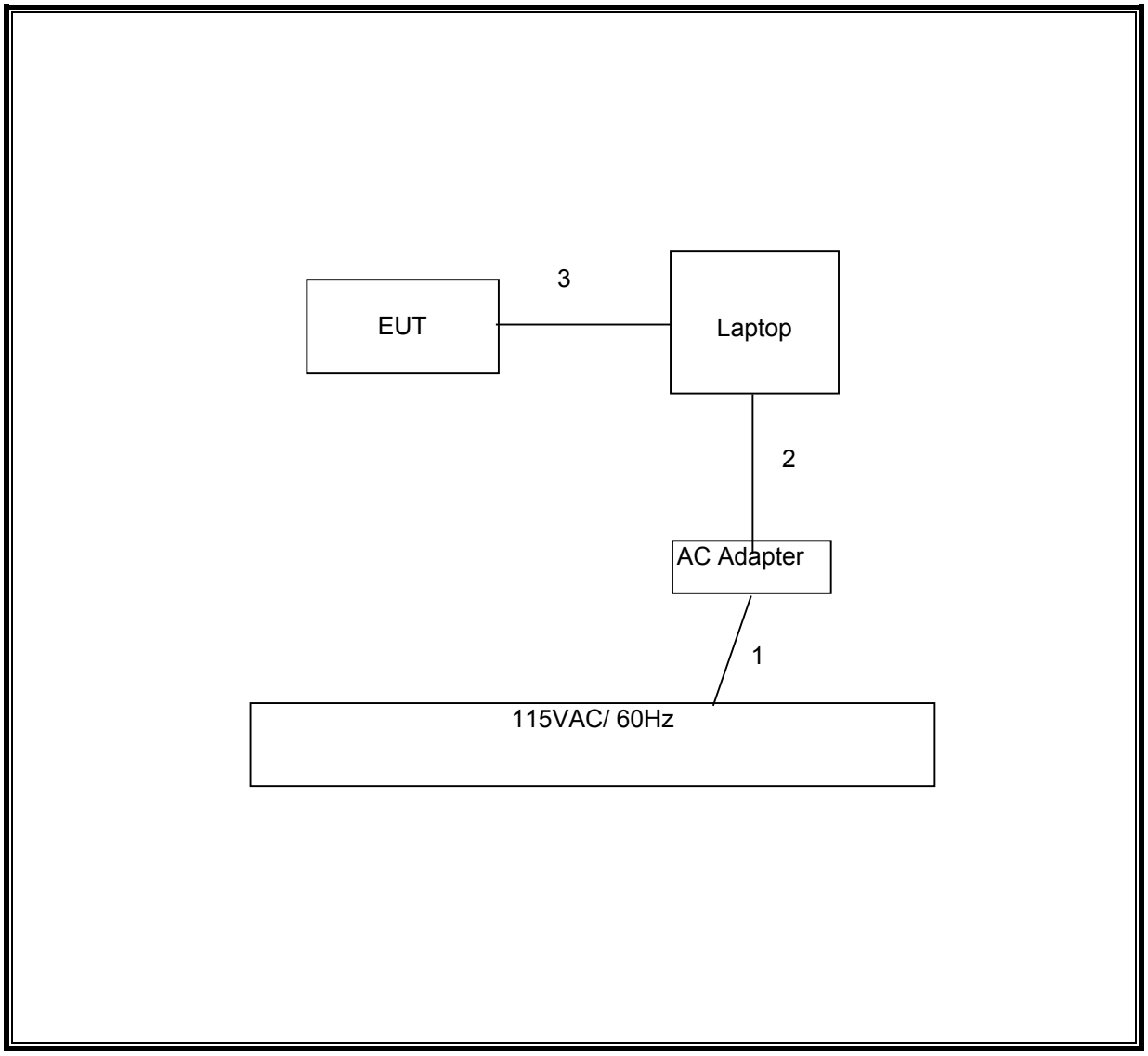
### I/O CABLES

| 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 | NA |
| 2 | DC | 1 | DC | Un-shielded | 2m | NA |

### TEST SETUP

The EUT is connected to a host laptop computer via a USB cable 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** | **Serial Number** | **Cal Due** |
| Spectrum Analyzer 3 Hz ~ 44 GHz | Agilent / HP | E4446A | US42510266 | 10/18/2007 |
| Peak Power Meter | Agilent / HP | E4416A | GB41291160 | 12/2/2007 |
| Peak / Average Power Sensor | Agilent | E9327A | US40440755 | 12/2/2007 |
| Preamplifier, 1 ~ 26.5 GHz | Agilent / HP | 8449B | 3008A00369 | 8/17/2007 |
| Antenna, Bilog 30 MHz ~ 2 Ghz | Sunol Sciences | JB1 | A121003 | 9/3/2007 |
| Antenna, Horn 1 ~ 18 GHz | EMCO | 3115 | 6717 | 4/22/2008 |
| LISN, 10 kHz ~ 30 MHz | FCC | LISN-50/250-25-2 | 2023 | 8/30/2007 |
| EMI Test Receiver | R & S | ESHS 20 | 827129/006 | 6/3/2007 |
| Preamplifier, 1300 MHz | Agilent / HP | 8447D | 1937A02062 | 1/23/2008 |
| SA RF Section, 1.5 GHz | Agilent / HP | 85680B | 2814A04227 | 1/7/2008 |
| SA Display Section 2 | Agilent / HP | 85662A | 2816A16696 | 4/7/2008 |
| Quasi-Peak Adaptor | Agilent / HP | 85650A | 3145A01654 | 1/21/2008 |
| 4.0 High Pass Filter | Micro Tronics | HPM13351 | 3 | N/A |

# 7. LIMITS AND RESULTS

## 7.1. CHANNEL TESTS FOR THE 2400 TO 2483.5 MHz BAND

### 7.1.1. 6 dB BANDWIDTH

**LIMIT**

§15.247 (a) (2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

**TEST PROCEDURE**

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

**RESULTS**

No non-compliance noted:

802.11b Mode

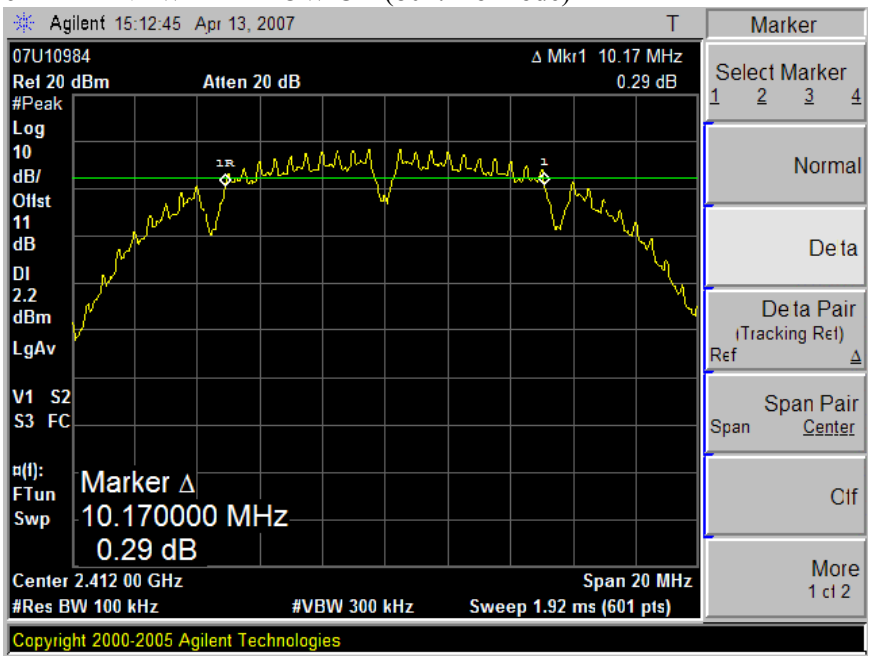
| Channel | Frequency (MHz) | 6 dB Bandwidth (kHz) | Minimum Limit (kHz) | Margin (kHz) |
|---|---|---|---|---|
| Low | 2412 | 10170 | 500 | 9670 |
| Middle | 2437 | 10170 | 500 | 9670 |
| High | 2462 | 10170 | 500 | 9670 |

802.11g Mode

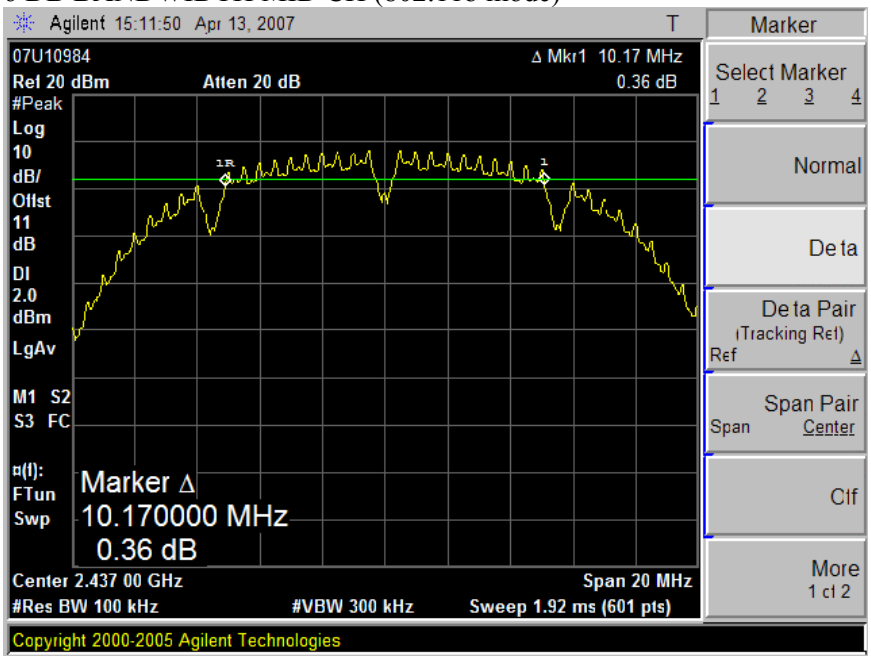
| Channel | Frequency (MHz) | 6 dB Bandwidth (kHz) | Minimum Limit (kHz) | Margin (kHz) |
|---|---|---|---|---|
| Low | 2412 | 16400 | 500 | 15900 |
| Middle | 2437 | 16400 | 500 | 15900 |
| High | 2462 | 16430 | 500 | 15930 |

## 6 DB BANDWIDTH (802.11b MODE)

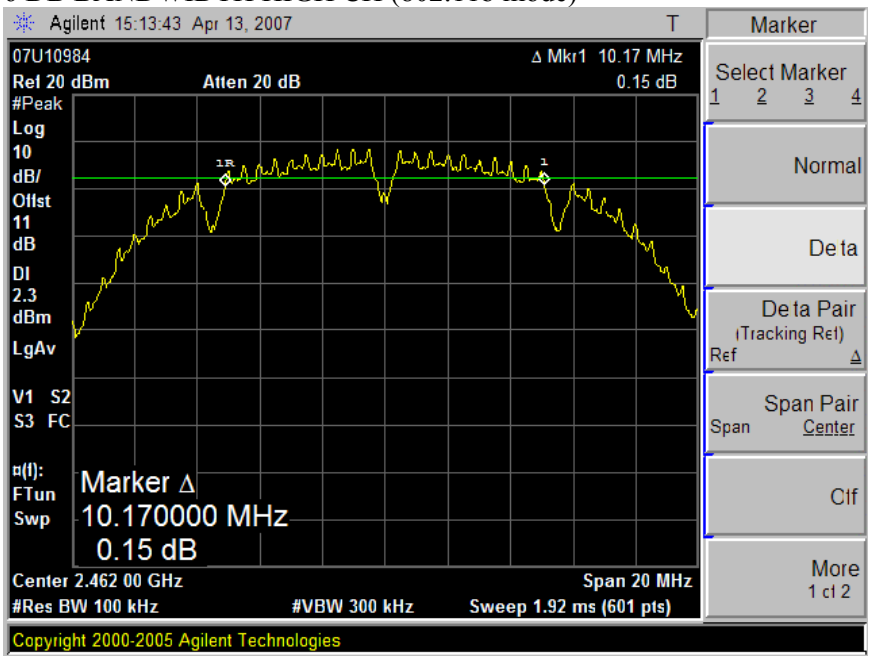
6 DB BANDWIDTH LOW CH (802.11b mode)



6 DB BANDWIDTH MID CH (802.11b mode)

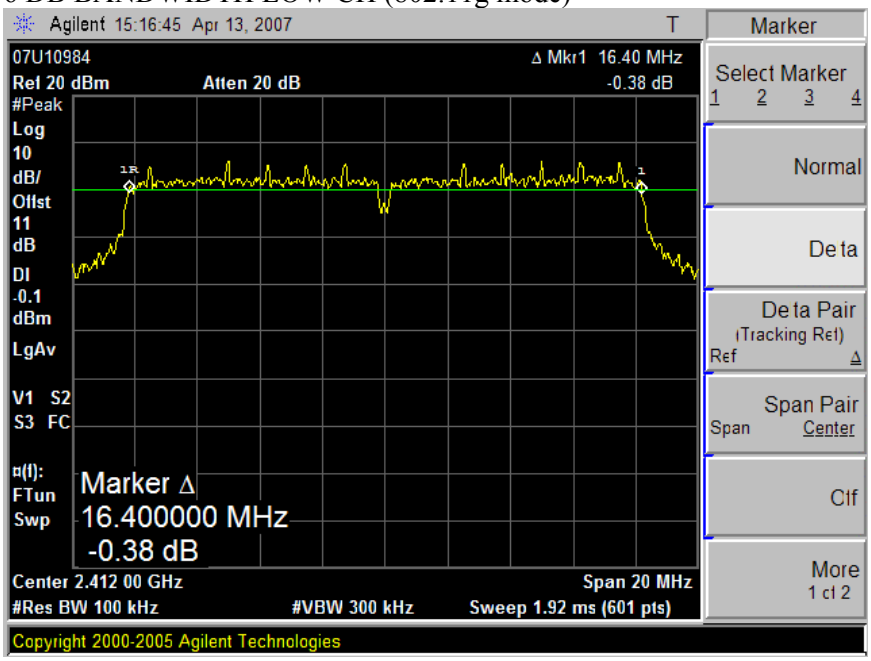


6 DB BANDWIDTH HIGH CH (802.11b mode)

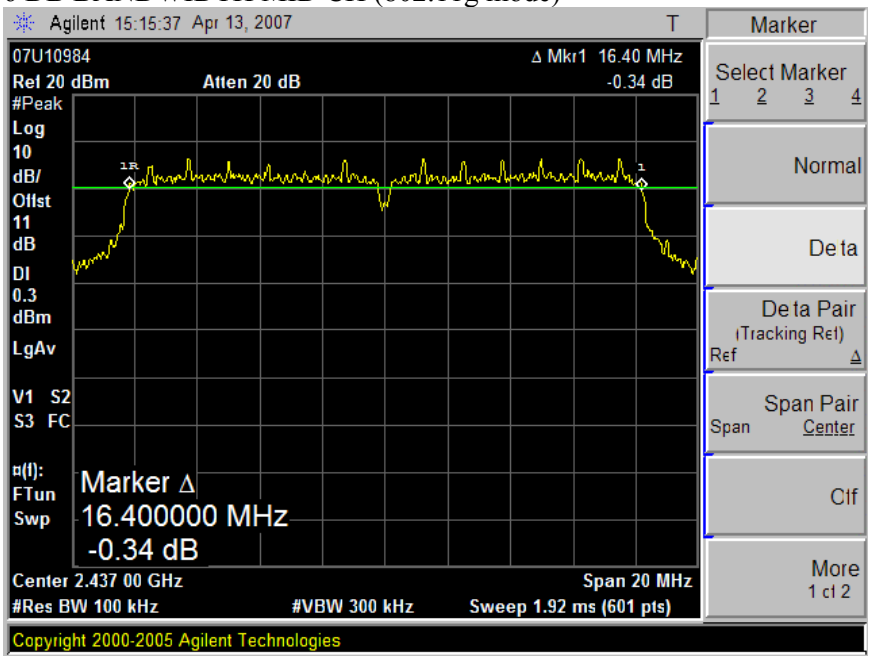


## 6 DB BANDWIDTH (802.11g MODE)

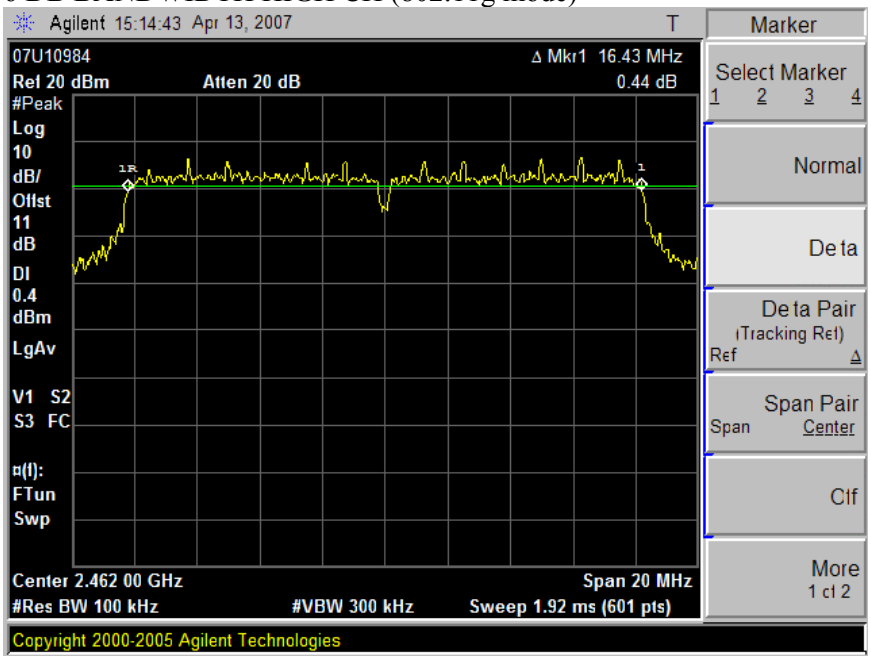
6 DB BANDWIDTH LOW CH (802.11g mode)



6 DB BANDWIDTH MID CH (802.11g mode)



6 DB BANDWIDTH HIGH CH (802.11g mode)



### 7.1.2. 99% BANDWIDTH

**LIMIT**

None; for reporting purposes only.

**TEST PROCEDURE**

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

**RESULTS**

No non-compliance noted:

802.11b Mode

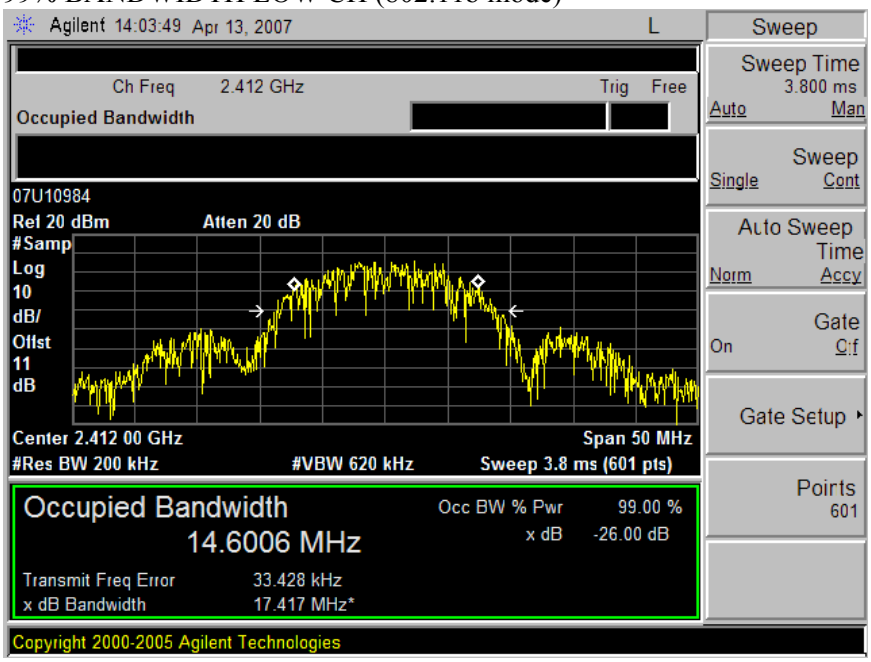
| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low | 2412 | 14.6006 |
| Middle | 2437 | 14.9642 |
| High | 2462 | 14.8396 |

802.11g Mode

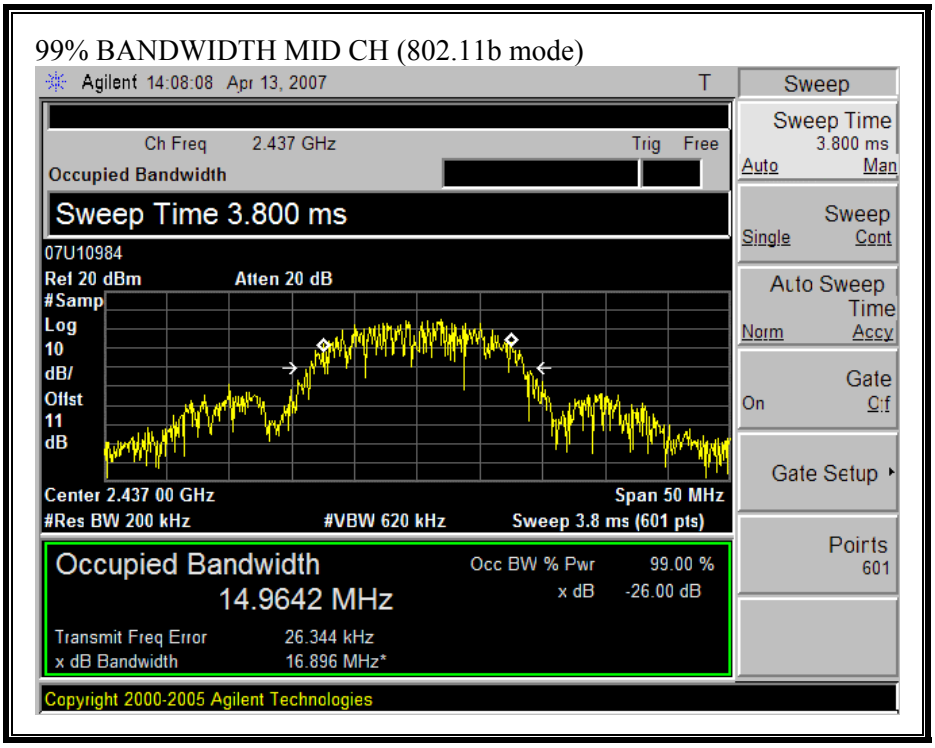
| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low | 2412 | 16.4323 |
| Middle | 2437 | 16.5608 |
| High | 2462 | 16.5718 |

**99% BANDWIDTH (802.11b MODE)**

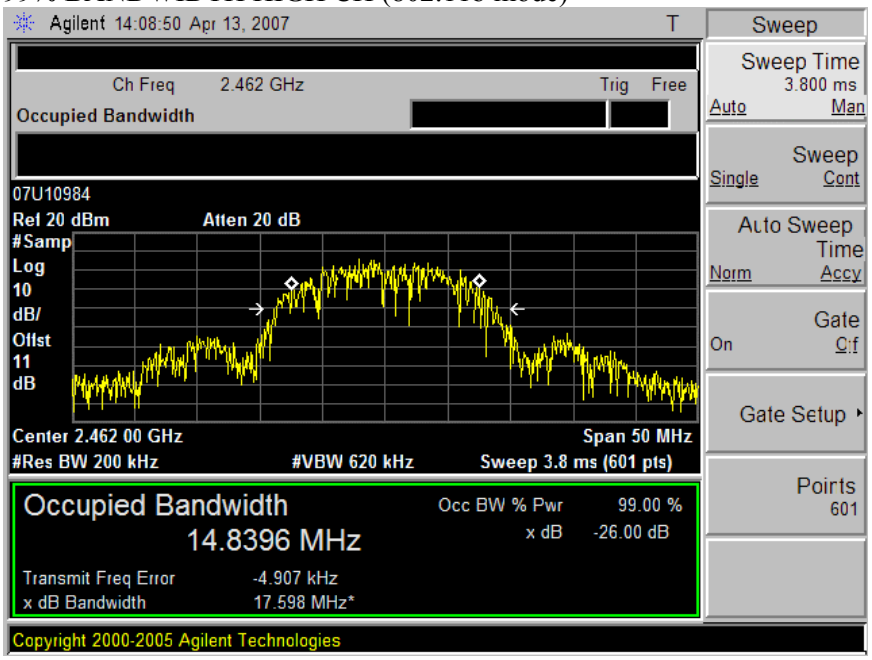
99% BANDWIDTH LOW CH (802.11b mode)



99% BANDWIDTH MID CH (802.11b mode)

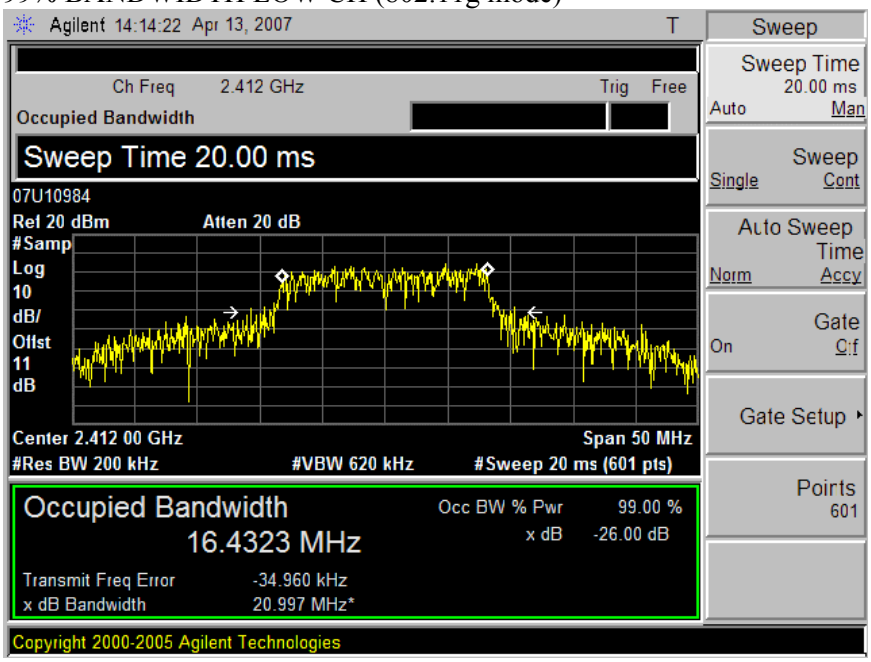


99% BANDWIDTH HIGH CH (802.11b mode)

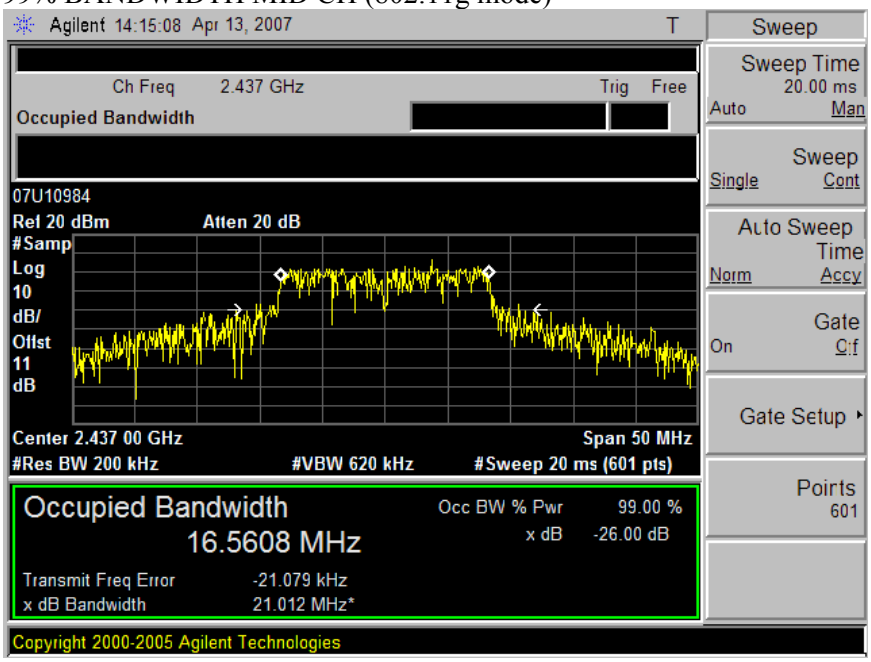


**99% BANDWIDTH (802.11g MODE)**

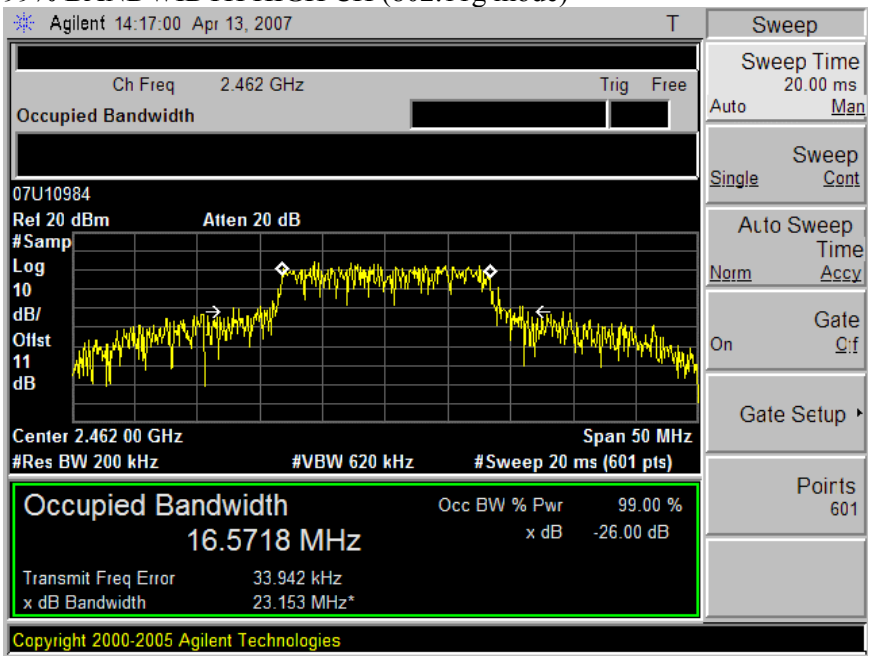
99% BANDWIDTH LOW CH (802.11g mode)



99% BANDWIDTH MID CH (802.11g mode)



99% BANDWIDTH HIGH CH (802.11g mode)



## 7.1.3. PEAK OUTPUT POWER

**PEAK POWER LIMIT**

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt.

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

§15.247 (b) (4) (i) Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

**TEST PROCEDURE**

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.

## RESULTS

The maximum antenna gain is 1.5 dBi for other than fixed, point-to-point operations, therefore the limit is 30 dBm.

No non-compliance noted:

802.11b Mode

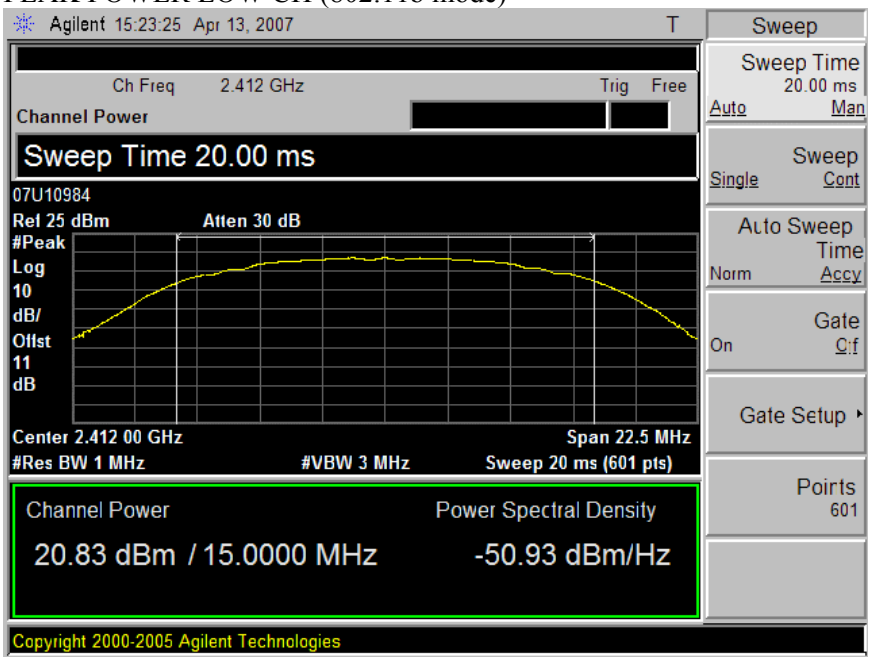
| Channel | Frequency (MHz) | Peak Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2412 | 20.83 | 30 | -9.17 |
| Middle | 2437 | 20.65 | 30 | -9.35 |
| High | 2462 | 20.63 | 30 | -9.37 |

802.11g Mode

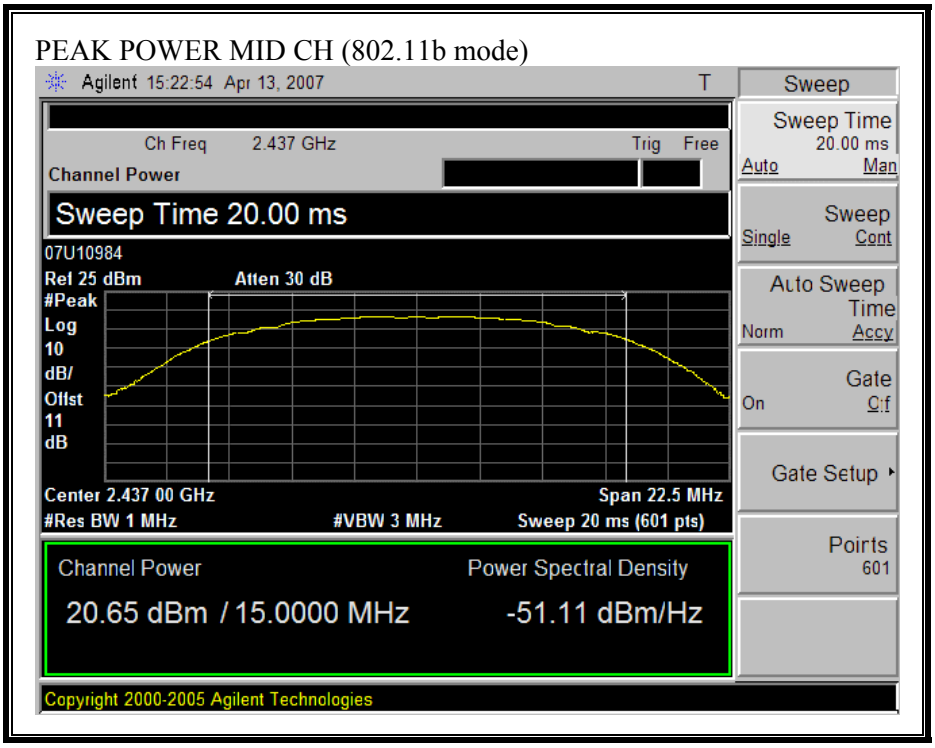
| Channel | Frequency (MHz) | Peak Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2412 | 20.33 | 30 | -9.67 |
| Middle | 2437 | 20.45 | 30 | -9.55 |
| High | 2462 | 20.11 | 30 | -9.89 |

**OUTPUT POWER (802.11b MODE)**

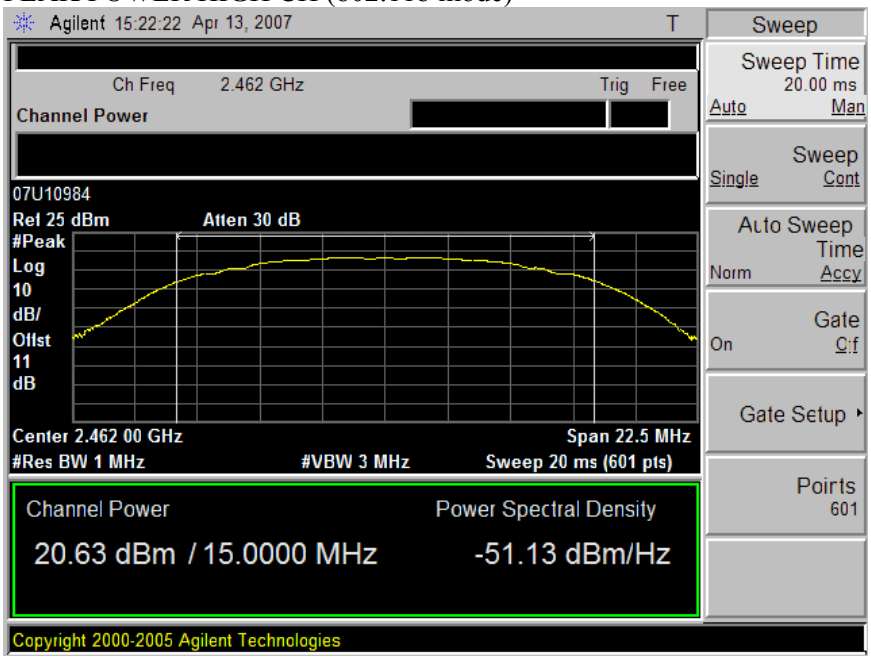
PEAK POWER LOW CH (802.11b mode)



PEAK POWER MID CH (802.11b mode)

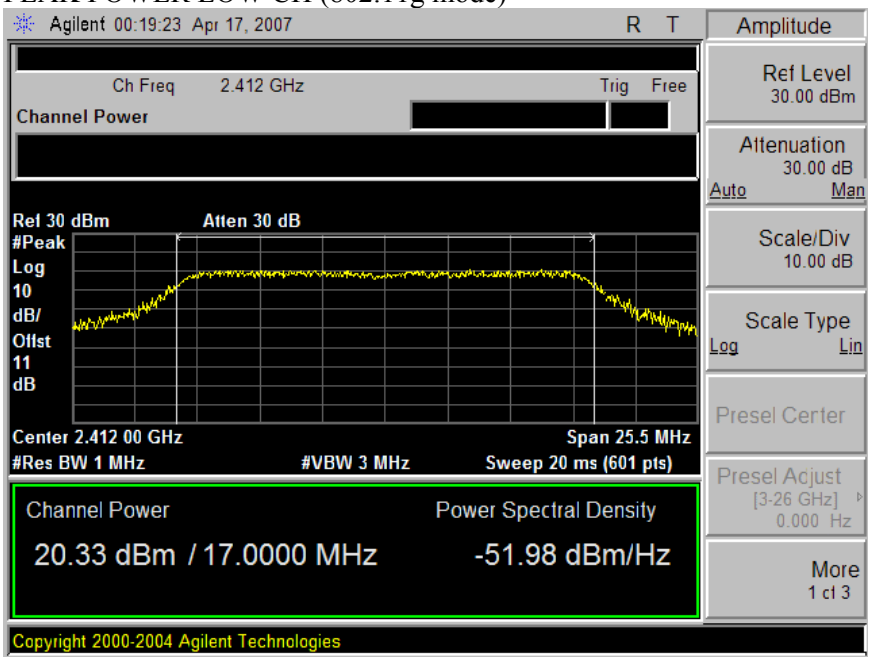


PEAK POWER HIGH CH (802.11b mode)

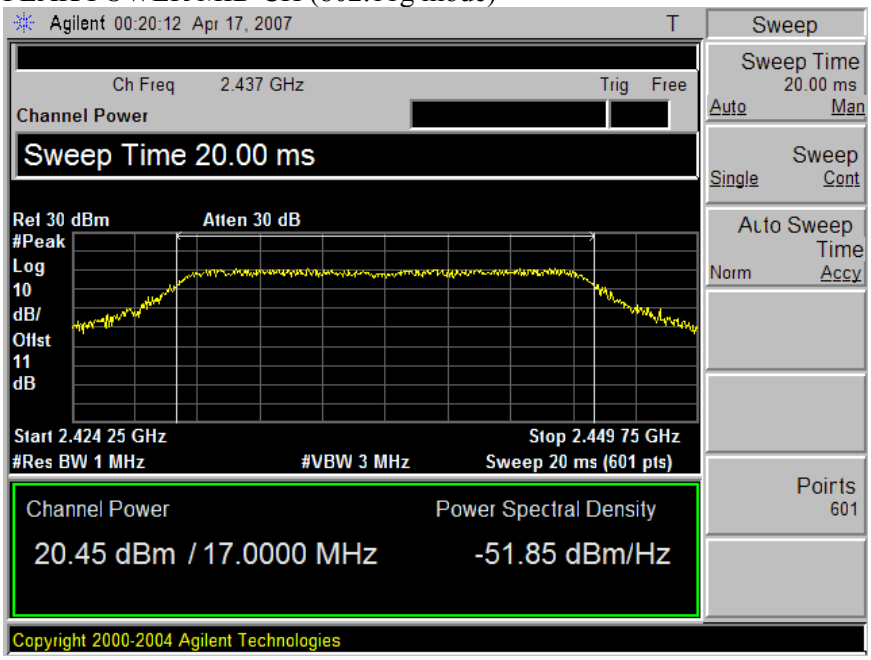


**OUTPUT POWER (802.11g MODE)**

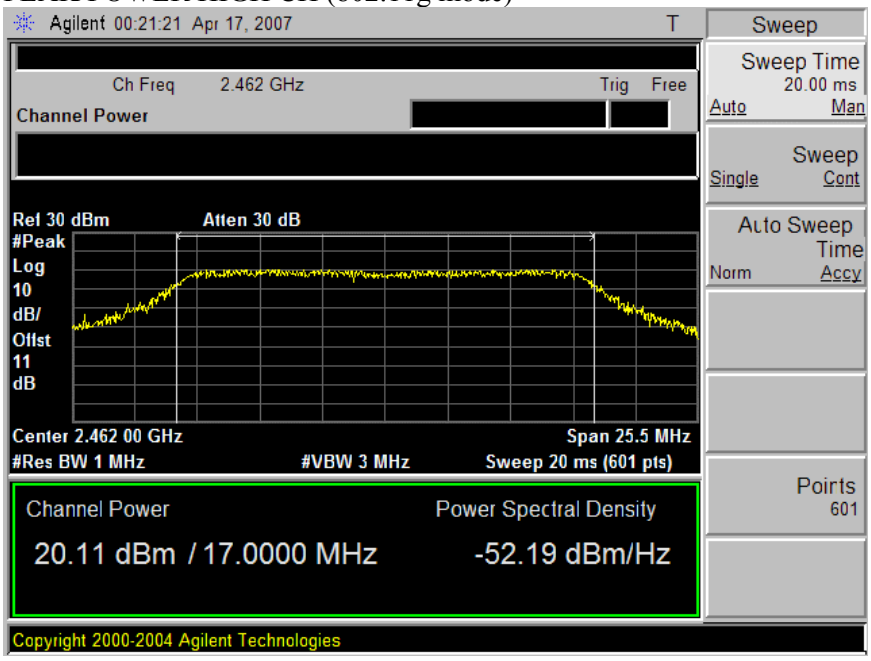
PEAK POWER LOW CH (802.11g mode)



PEAK POWER MID CH (802.11g mode)



PEAK POWER HIGH CH (802.11g mode)



## 7.1.4. MAXIMUM PERMISSIBLE EXPOSURE

**LIMITS**

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

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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

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

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

f = frequency in MHz
* = Plane-wave equivalent power density
NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

**CALCULATIONS**

Given

$E = \sqrt{(30 * P * G)} / d$

and

$S = E ^ 2 / 3770$

where

E = Field Strength in Volts/meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$d = \sqrt{((30 * P * G) / (3770 * S))}$

Changing to units of Power to mW and Distance to cm, using:

P (mW) = P (W) / 1000 and
d (cm) =100 * d (m)

yields

$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$
$d = 0.282 * \sqrt{(P * G / S)}$

where

d = distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and
G (numeric) = 10 ^ (G (dBi) / 10)

yields

$d = 0.282 * 10 ^ ((P + G) / 20) / \sqrt{S}$

where

d = MPE distance in cm
P = Power in dBm
G = Antenna Gain in dBi
S = Power Density Limit in mW/cm^2

Rearranging terms to calculate the power density at a specific distance yields

$S = 0.0795 * 10 ^ ((P + G) / 10) / (d^2)$

**LIMITS**

From §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm^2

**RESULTS**

No non-compliance noted: (MPE distance equals 20 cm)

| Mode | MPE Distance (cm) | Output Power (dBm) | Antenna Gain (dBi) | Power Density (mW/cm^2) |
|---|---|---|---|---|
| 802.11b | 20.0 | 20.83 | 1.50 | 0.03 |
| 802.11g | 20.0 | 20.45 | 1.50 | 0.03 |

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

## 7.1.5. 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 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.

802.11b Mode

| Channel | Frequency (MHz) | Power (dBm) |
|---|---|---|
| Low | 2412 | 16.71 |
| Middle | 2437 | 16.83 |
| High | 2462 | 16.95 |

802.11g Mode

| Channel | Frequency (MHz) | Power (dBm) |
|---|---|---|
| Low | 2412 | 14.05 |
| Middle | 2437 | 14.03 |
| High | 2462 | 14.15 |

## 7.1.6. PEAK POWER SPECTRAL DENSITY

**LIMIT**

§15.247 (d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

**TEST PROCEDURE**

The transmitter output is connected to a spectrum analyzer, the maximum level in a 3 kHz bandwidth is measured with the spectrum analyzer using RBW = 3 kHz and VBW > 3 kHz, sweep time = span / 3 kHz, and video averaging is turned off. The PPSD is the highest level found across the emission in any 3 kHz band.

**RESULTS**

No non-compliance noted:

802.11b Mode

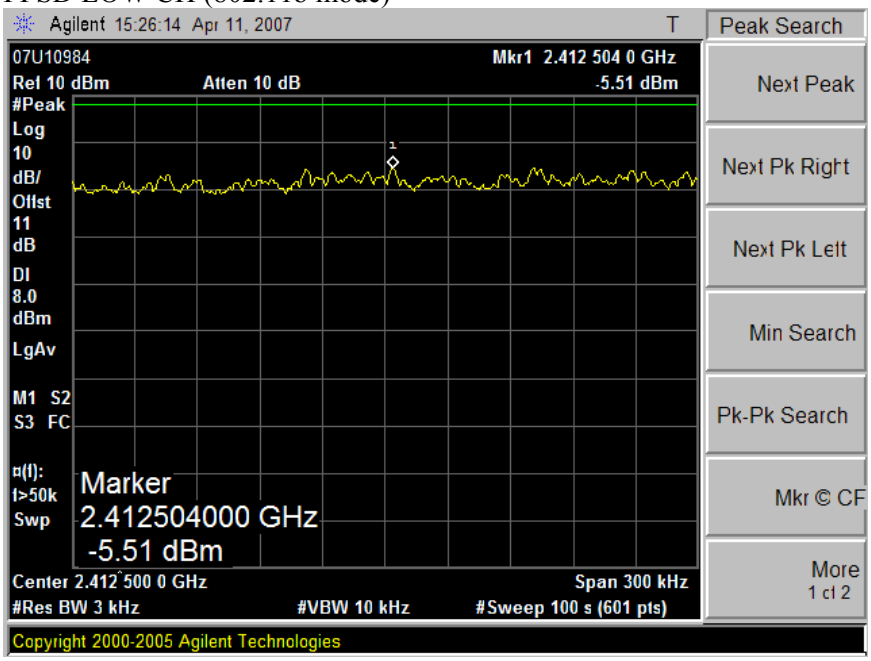
| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2412 | -5.51 | 8 | -13.51 |
| Middle | 2437 | -5.06 | 8 | -13.06 |
| High | 2462 | -4.97 | 8 | -12.97 |

802.11g Mode

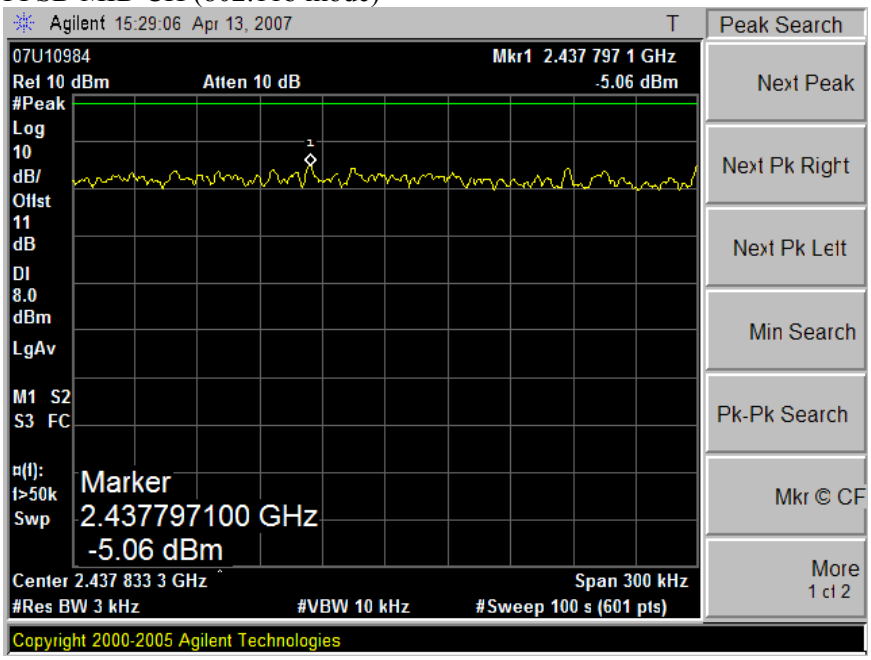
| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2412 | -10.82 | 8 | -18.82 |
| Middle | 2437 | -10.38 | 8 | -18.38 |
| High | 2462 | -11.18 | 8 | -19.18 |

## PEAK POWER SPECTRAL DENSITY (802.11b MODE)

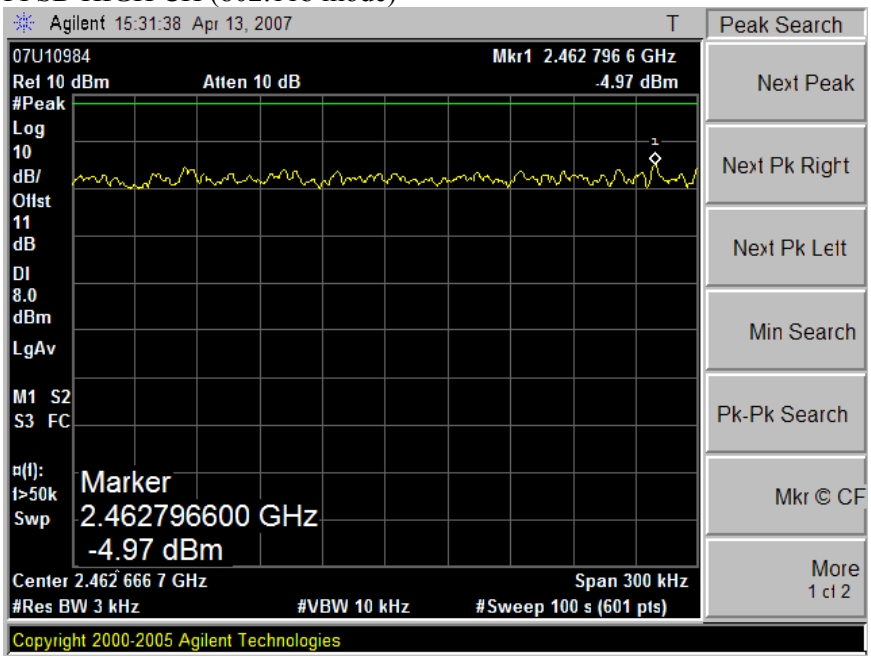
PPSD LOW CH (802.11b mode)



PPSD MID CH (802.11b mode)

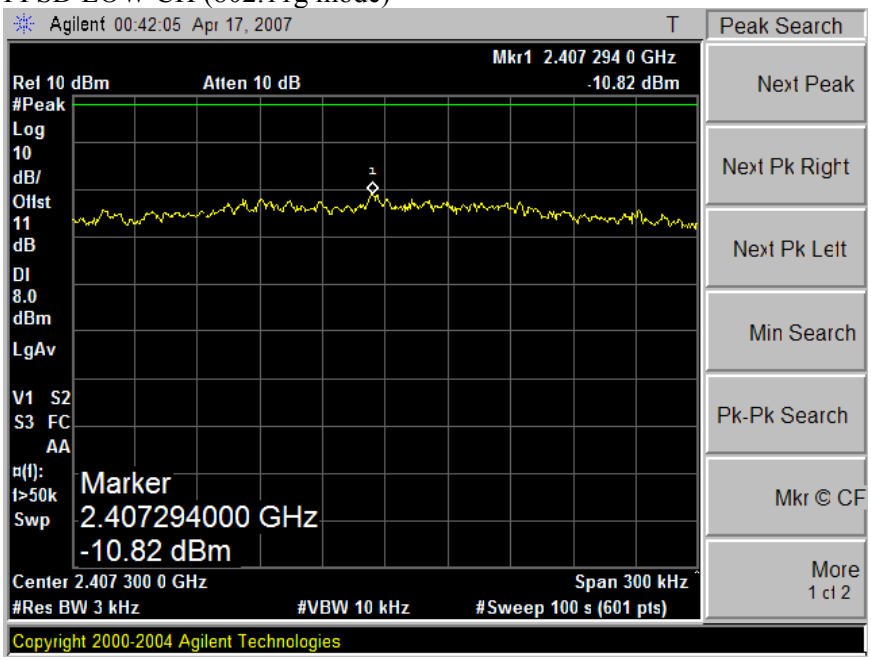


PPSD HIGH CH (802.11b mode)

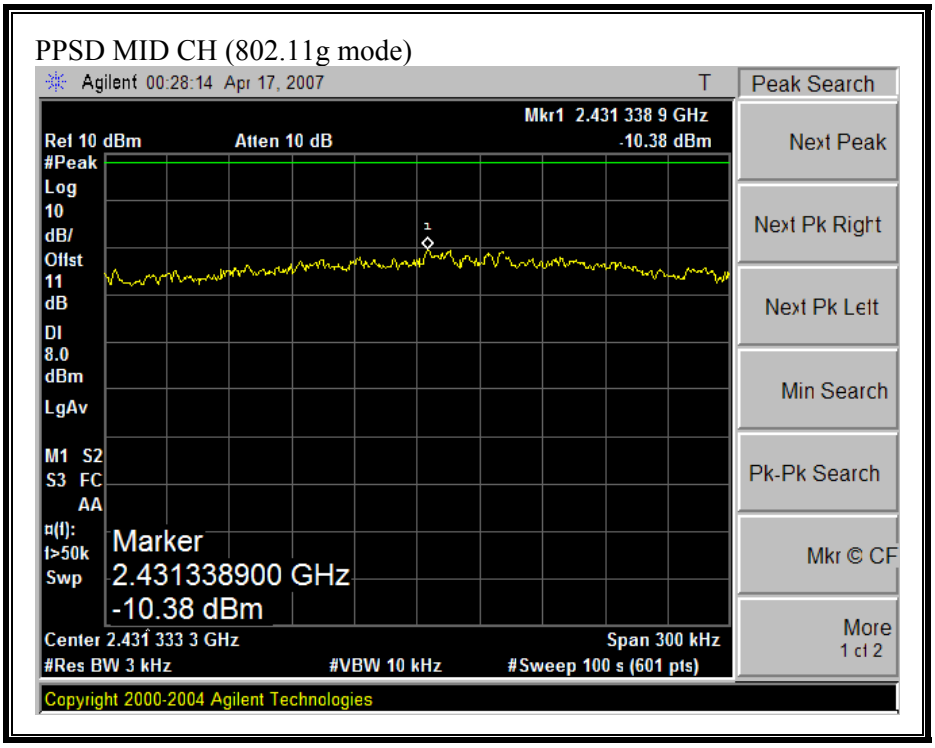


## PEAK POWER SPECTRAL DENSITY (802.11g MODE)

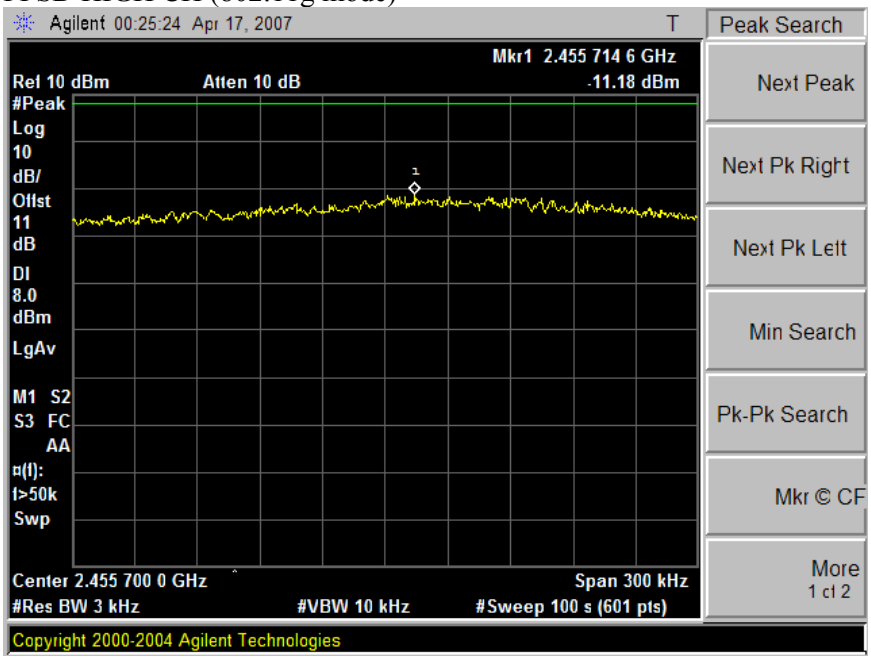
PPSD LOW CH (802.11g mode)



PPSD MID CH (802.11g mode)



PPSD HIGH CH (802.11g mode)



## 7.1.7. CONDUCTED SPURIOUS EMISSIONS

**LIMITS**

§15.247 (c) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in§15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

**TEST PROCEDURE**

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

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

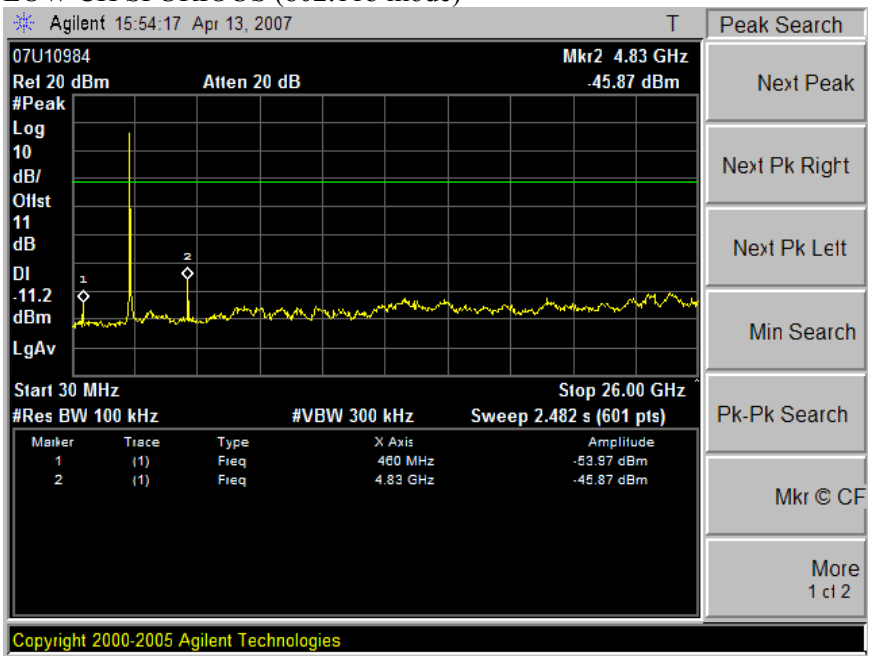
**RESULTS**

No non-compliance noted:

**SPURIOUS EMISSIONS, LOW CHANNEL (802.11b MODE)**

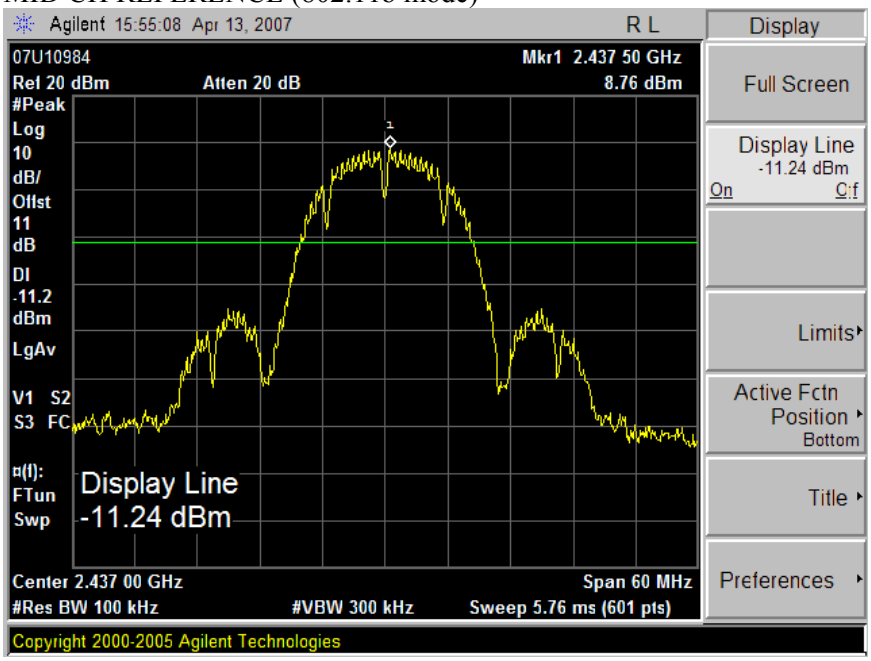
LOW CH BANDEDGE (802.11b mode)

LOW CH SPURIOUS (802.11b mode)

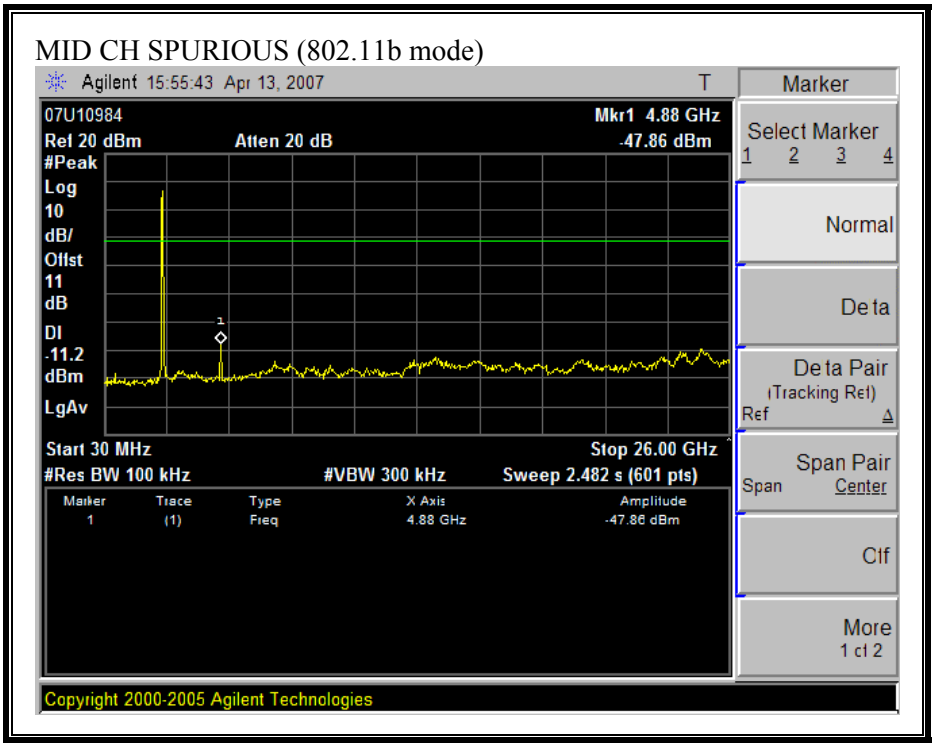


**SPURIOUS EMISSIONS, MID CHANNEL (802.11b MODE)**

MID CH REFERENCE (802.11b mode)

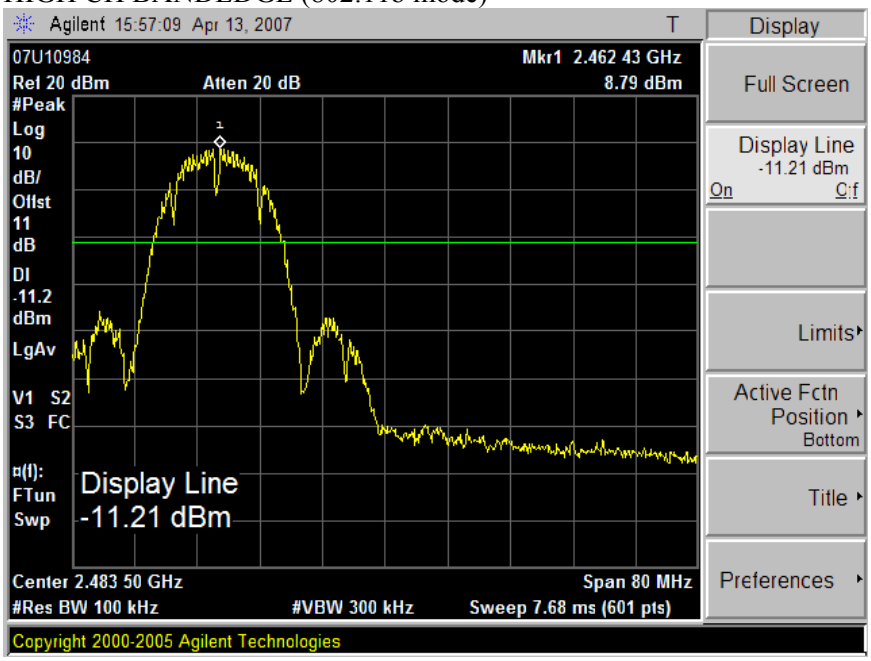


MID CH SPURIOUS (802.11b mode)

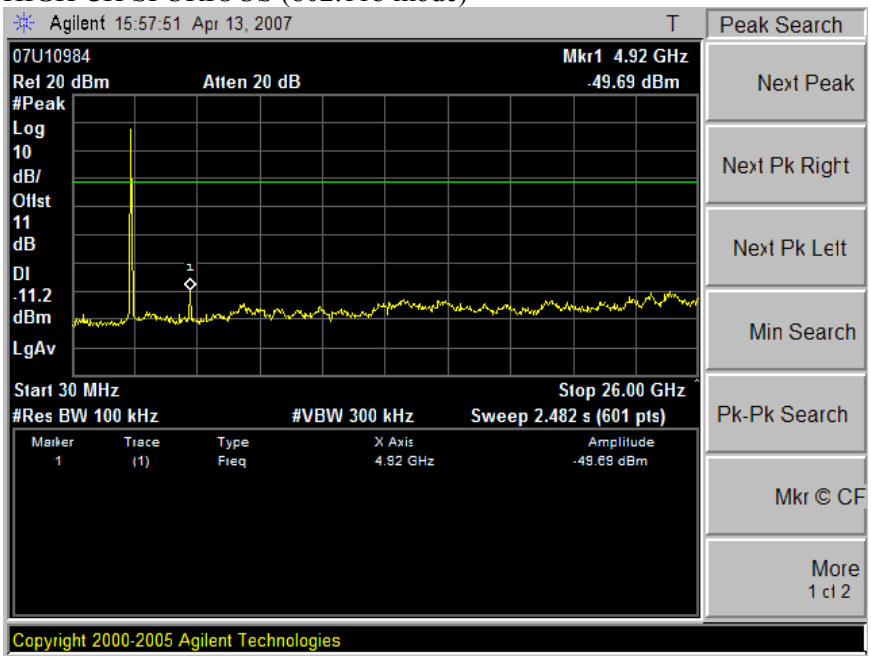


**SPURIOUS EMISSIONS, HIGH CHANNEL (802.11b MODE)**

HIGH CH BANDEDGE (802.11b mode)

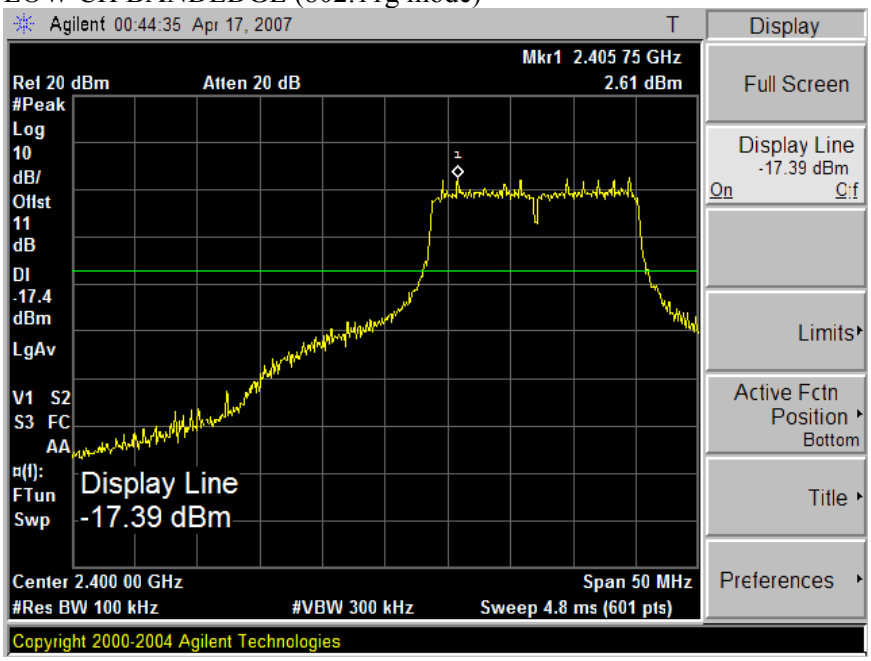


HIGH CH SPURIOUS (802.11b mode)

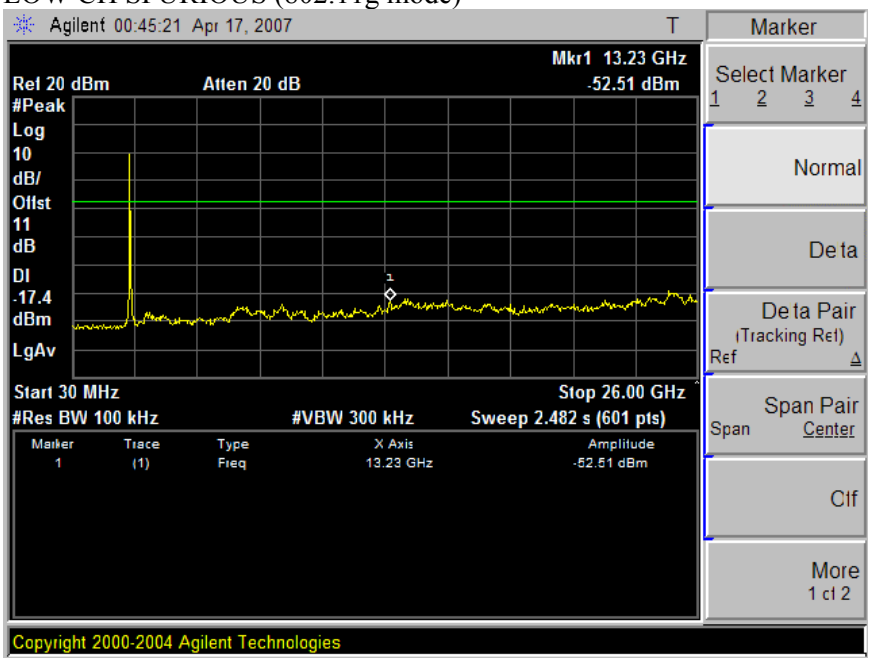


**SPURIOUS EMISSIONS, LOW CHANNEL (802.11g MODE)**

LOW CH BANDEDGE (802.11g mode)

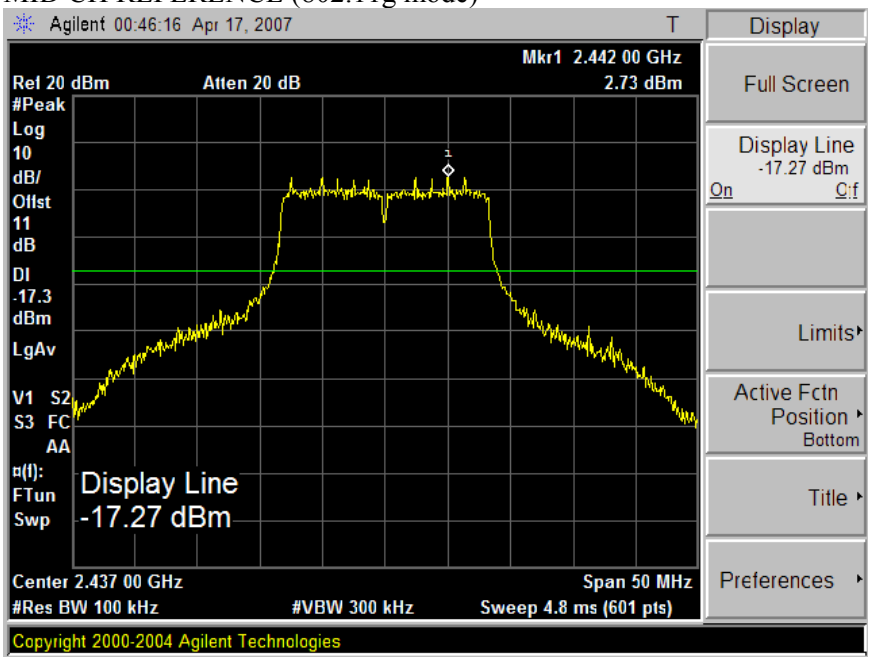


LOW CH SPURIOUS (802.11g mode)

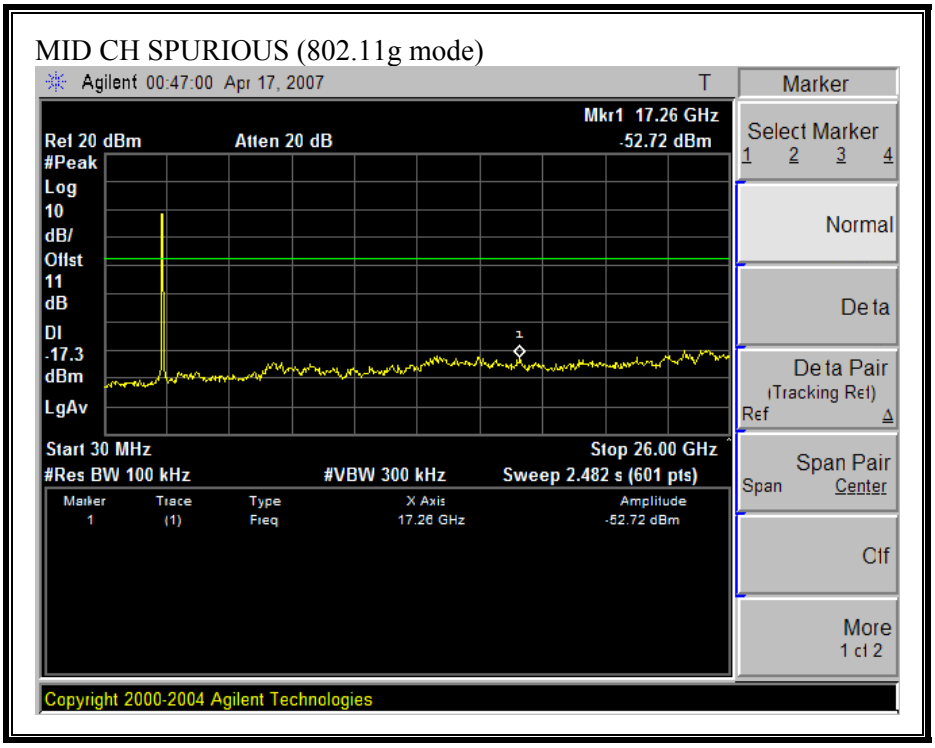


**SPURIOUS EMISSIONS, MID CHANNEL (802.11g MODE)**

MID CH REFERENCE (802.11g mode)

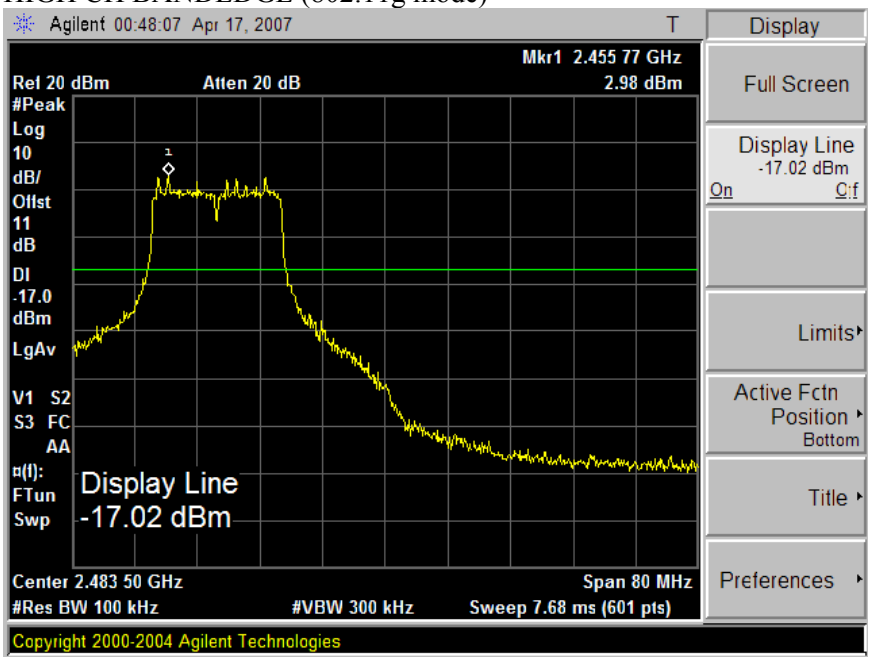


MID CH SPURIOUS (802.11g mode)

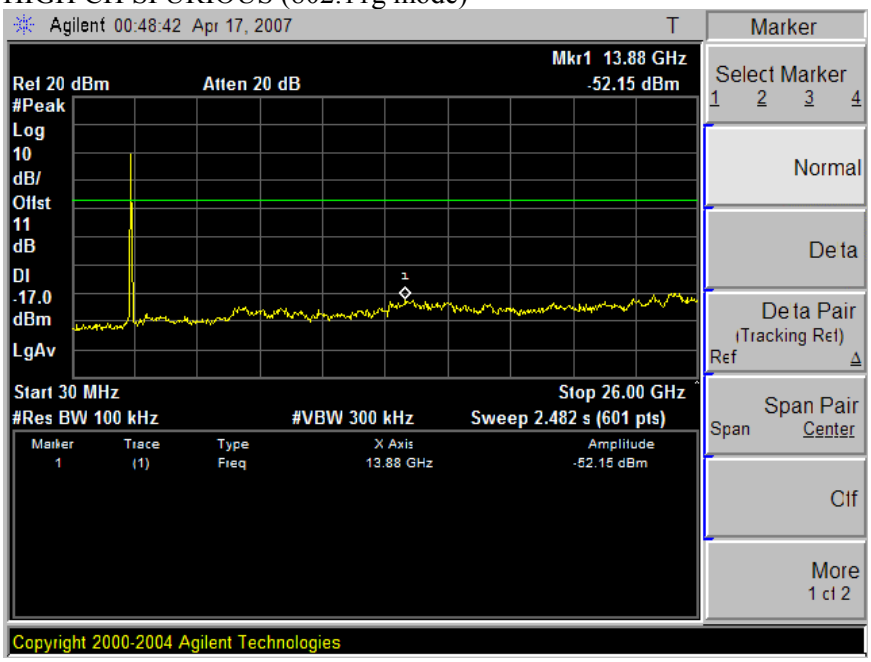


**SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g MODE)**

HIGH CH BANDEDGE (802.11g mode)



HIGH CH SPURIOUS (802.11g mode)



# 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 |
| [1]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 | ([2]) |
| 13.36 - 13.41 | | | |

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] 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 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

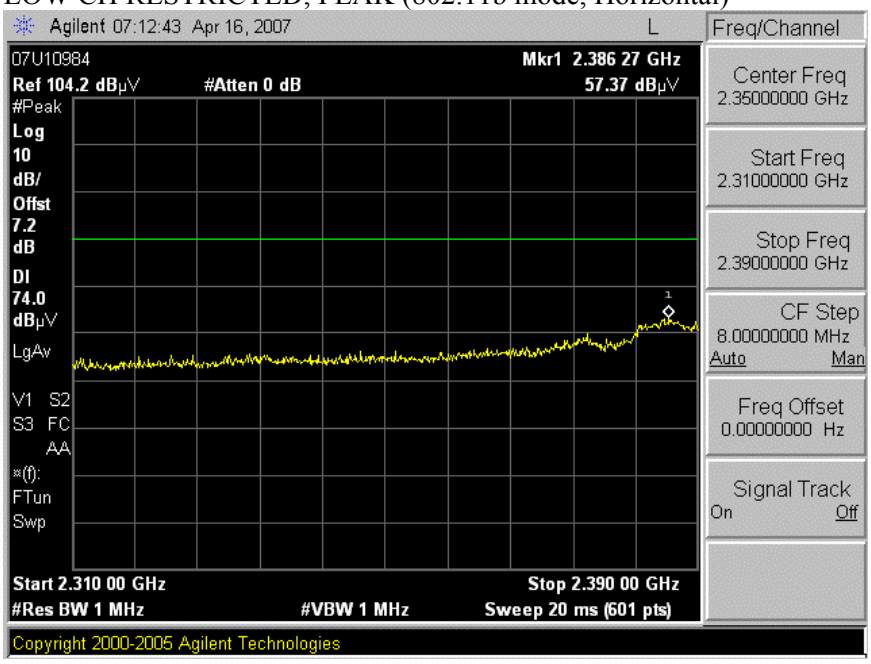
The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each 5 GHz band.

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.

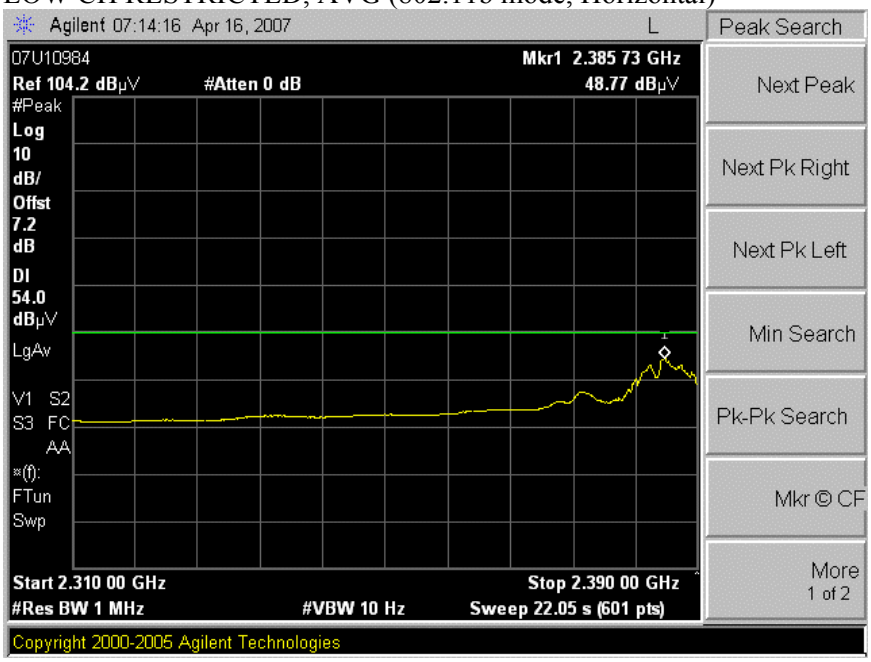
## 7.2.2. TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BAND

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

LOW CH RESTRICTED, PEAK (802.11b mode, Horizontal)

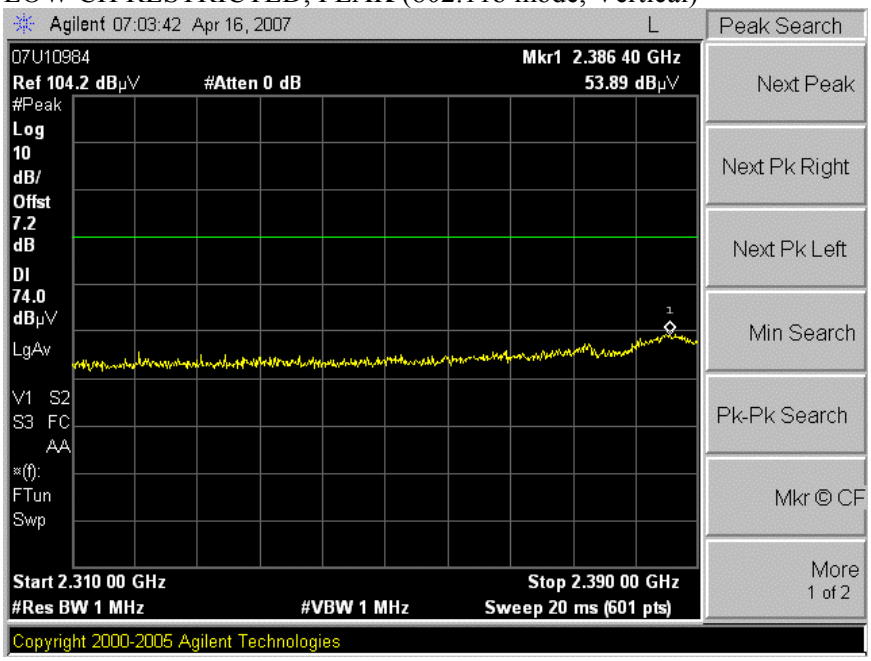


LOW CH RESTRICTED, AVG (802.11b mode, Horizontal)

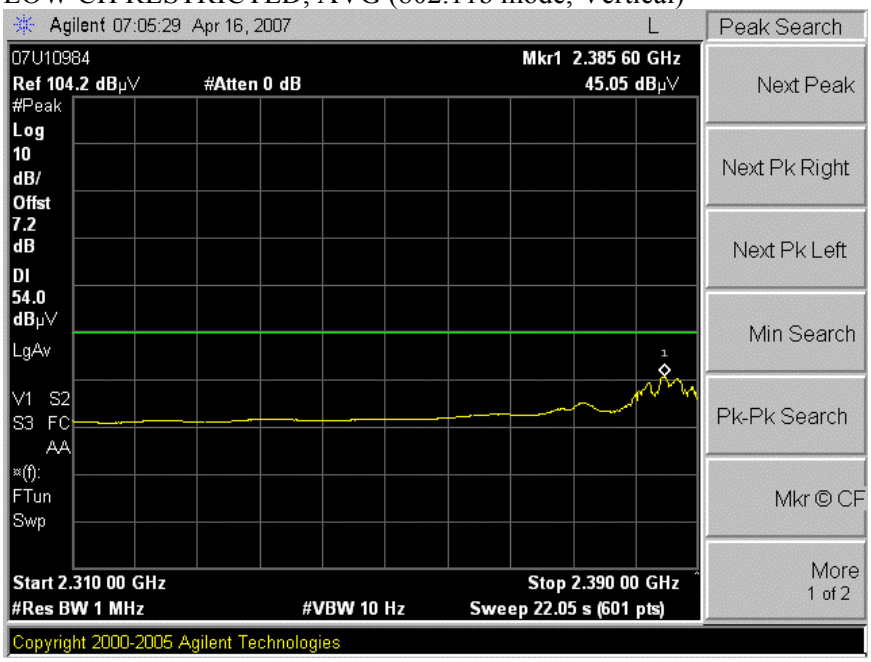


**RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)**

LOW CH RESTRICTED, PEAK (802.11b mode, Vertical)

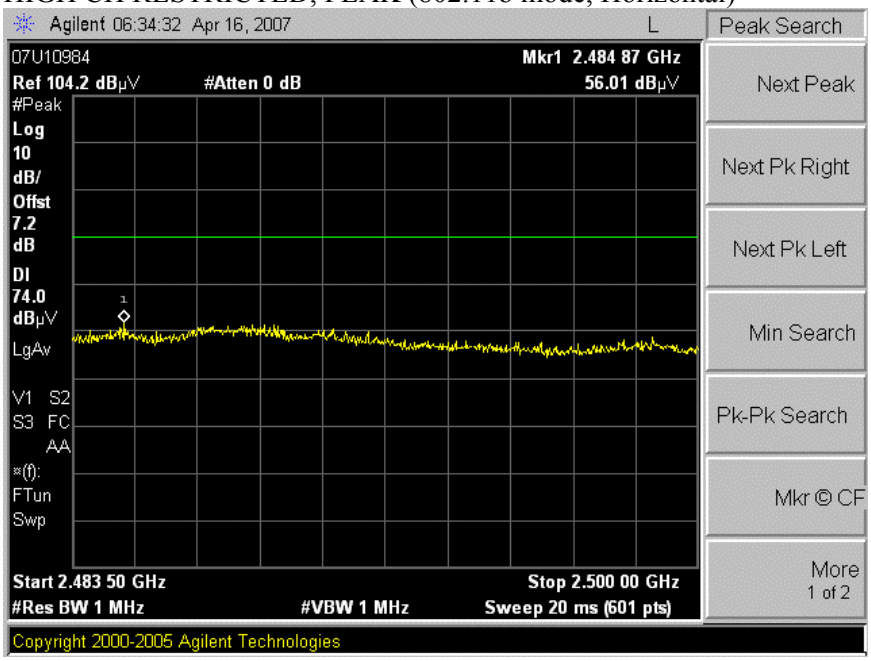


LOW CH RESTRICTED, AVG (802.11b mode, Vertical)

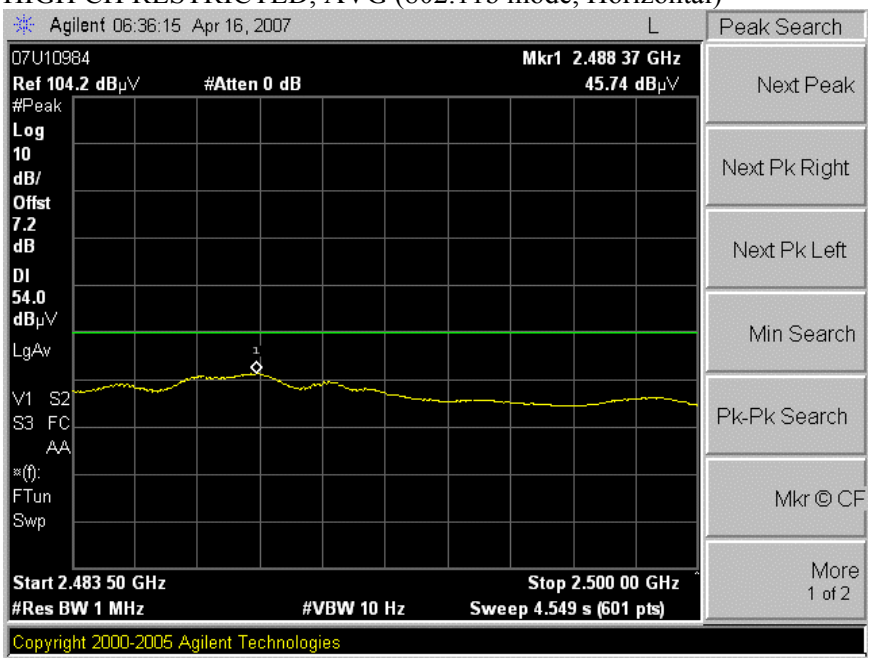


**RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)**

HIGH CH RESTRICTED, PEAK (802.11b mode, Horizontal)

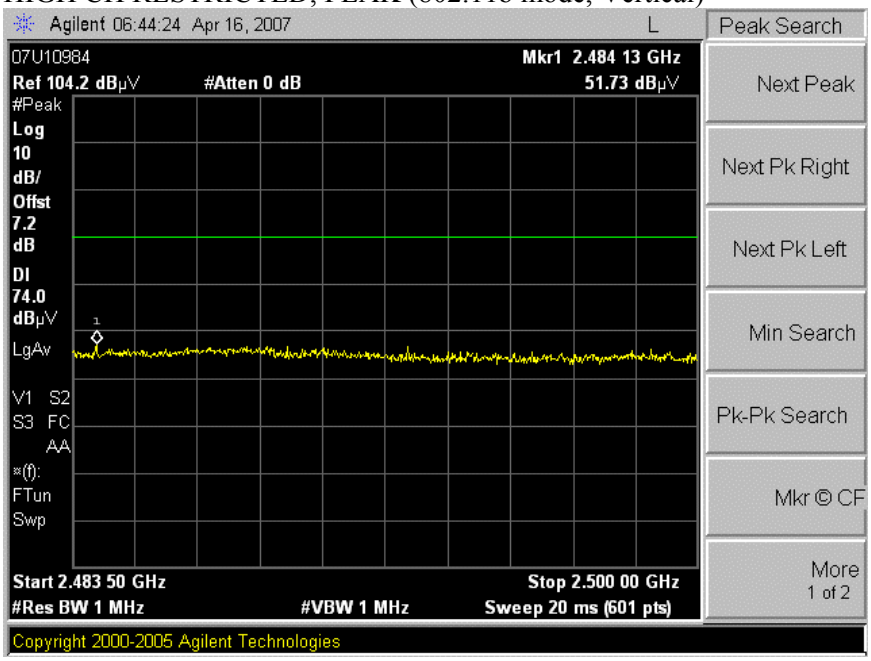


HIGH CH RESTRICTED, AVG (802.11b mode, Horizontal)

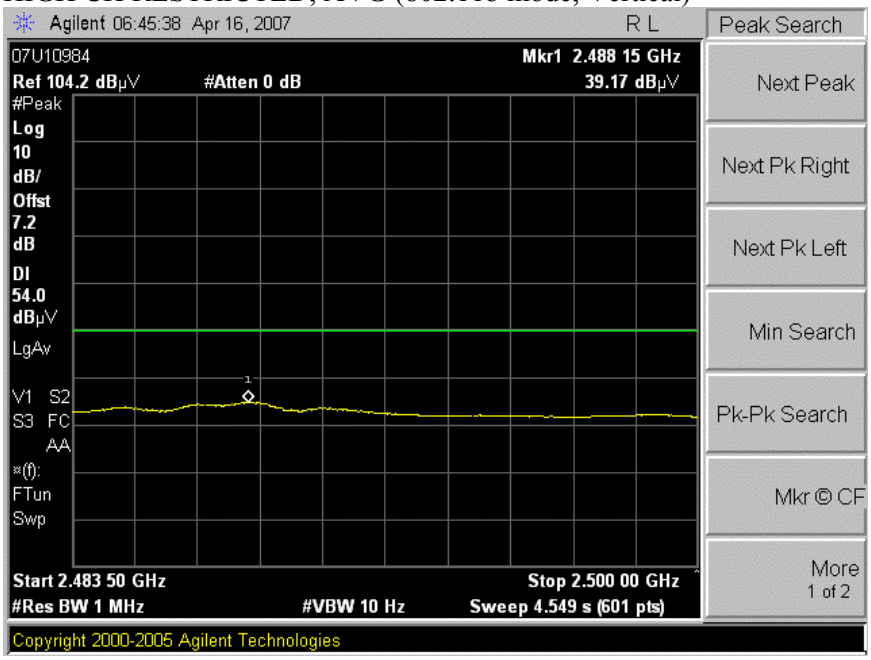


**RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)**

HIGH CH RESTRICTED, PEAK (802.11b mode, Vertical)



HIGH CH RESTRICTED, AVG (802.11b mode, Vertical)



## HARMONICS AND SPURIOUS EMISSIONS (b MODE)

High Frequency Measurement
Compliance Certification Services, Fremont Chamber A

**Company:** High Tech Computer Corp
**Project #:** 07U10984
**Date:** April 16th 2007
**Test Engineer:** Anoop Singh
**Configuration:** EUT Only
**Mode: Transmit** TX, B mode Harmonic spurs

**Test Equipment:**

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T60; S/N: 2238 @3m | T34 HP 8449B | | | FCC 15.205 |

Hi Frequency Cables

| 2 foot cable | 3 foot cable | 12 foot cable | HPF | Reject Filter |
|---|---|---|---|---|
| | | Gordon 203134001 | | R_001 |

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

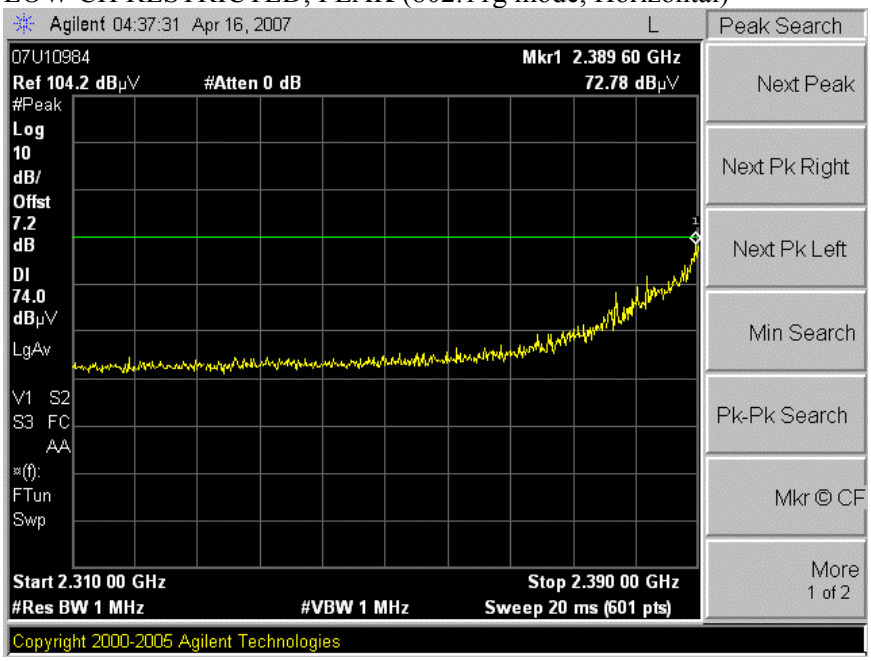
| f GHz | Dist (m) | Read Pk dBuV | Read Avg. dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Low Channel** | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 42.4 | 39.0 | 33.0 | 6.9 | -34.8 | 0.0 | 0.0 | 47.5 | 44.1 | 74 | 54 | -26.5 | -9.9 | V |
| 4.824 | 3.0 | 39.6 | 36.4 | 33.0 | 6.9 | -34.8 | 0.0 | 0.0 | 44.7 | 41.5 | 74 | 54 | -29.3 | -12.5 | H |
| **Mid Channel** | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 42.0 | 38.8 | 33.1 | 6.9 | -34.8 | 0.0 | 0.0 | 47.2 | 44.0 | 74 | 54 | -26.8 | -10.0 | V |
| 4.874 | 3.0 | 40.3 | 36.6 | 33.1 | 6.9 | -34.8 | 0.0 | 0.0 | 45.5 | 41.8 | 74 | 54 | -28.5 | -12.2 | H |
| **High Channel** | | | | | | | | | | | | | | | |
| 4.924 | 3.0 | 41.6 | 38.4 | 33.1 | 7.0 | -34.8 | 0.0 | 0.0 | 46.8 | 43.6 | 74 | 54 | -27.2 | -10.4 | V |
| 4.924 | 3.0 | 40.2 | 36.5 | 33.1 | 7.0 | -34.8 | 0.0 | 0.0 | 45.4 | 41.7 | 74 | 54 | -28.6 | -12.3 | H |

**No other frequency was detected above the system nosie floor**
Rev. 5.1.6

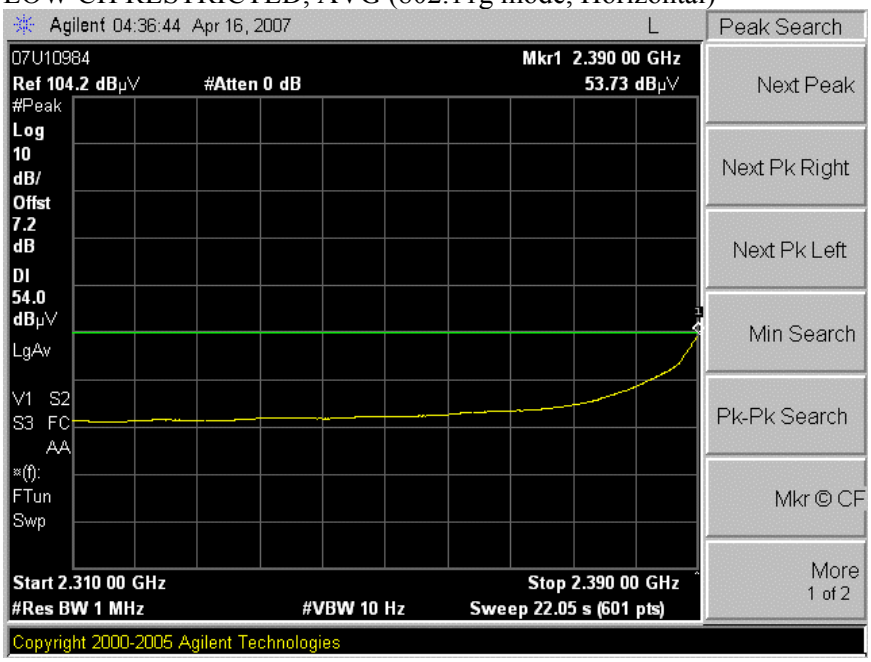
| | | | | | |
|---|---|---|---|---|---|
| f | Measurement Frequency | Amp | Preamp Gain | Avg Lim | Average Field Strength Limit |
| Dist | Distance to Antenna | D Corr | Distance Correct to 3 meters | Pk Lim | Peak Field Strength Limit |
| Read | Analyzer Reading | Avg | Average Field Strength @ 3 m | 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 | | |

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

LOW CH RESTRICTED, PEAK (802.11g mode, Horizontal)

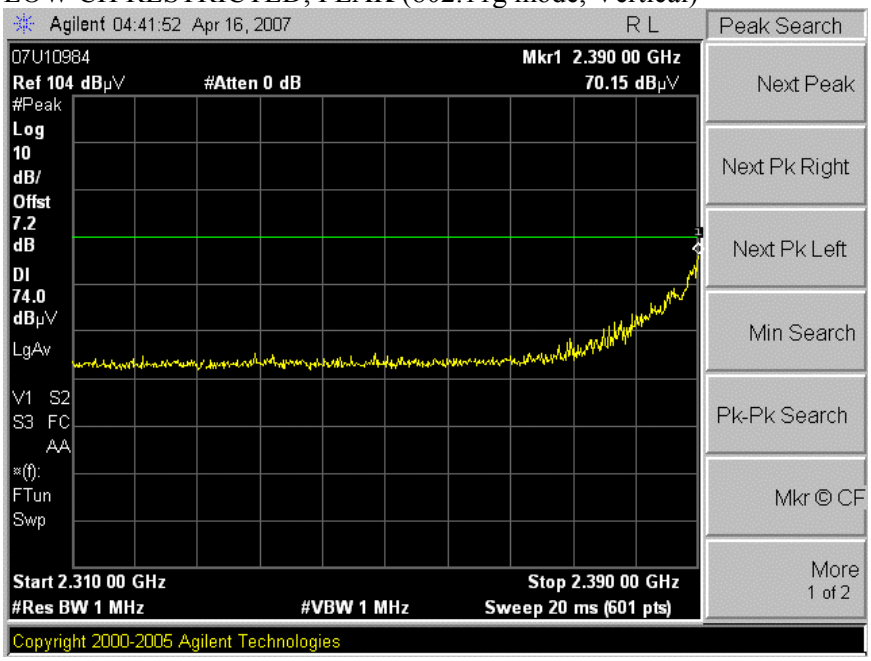


LOW CH RESTRICTED, AVG (802.11g mode, Horizontal)

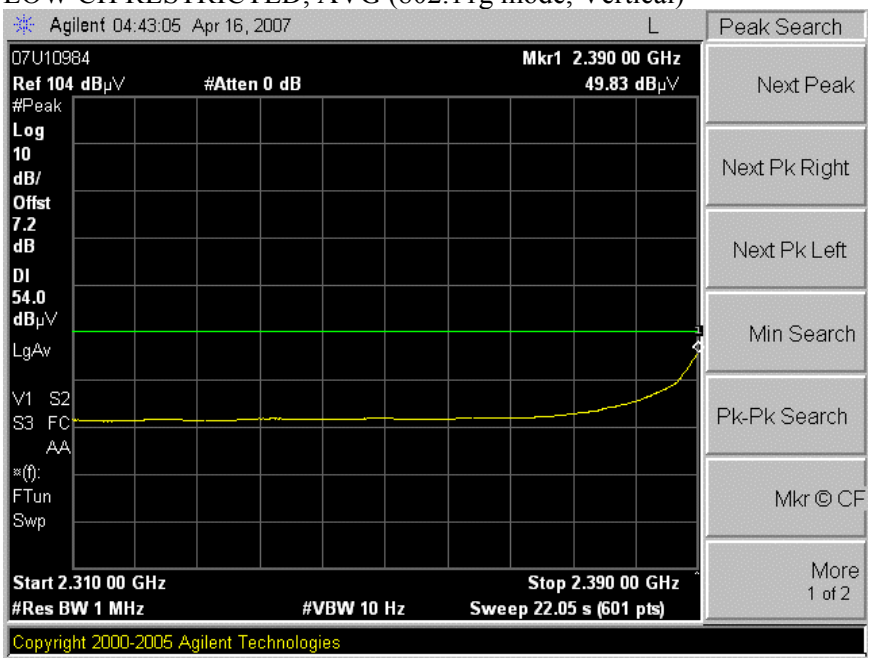


**RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)**

LOW CH RESTRICTED, PEAK (802.11g mode, Vertical)

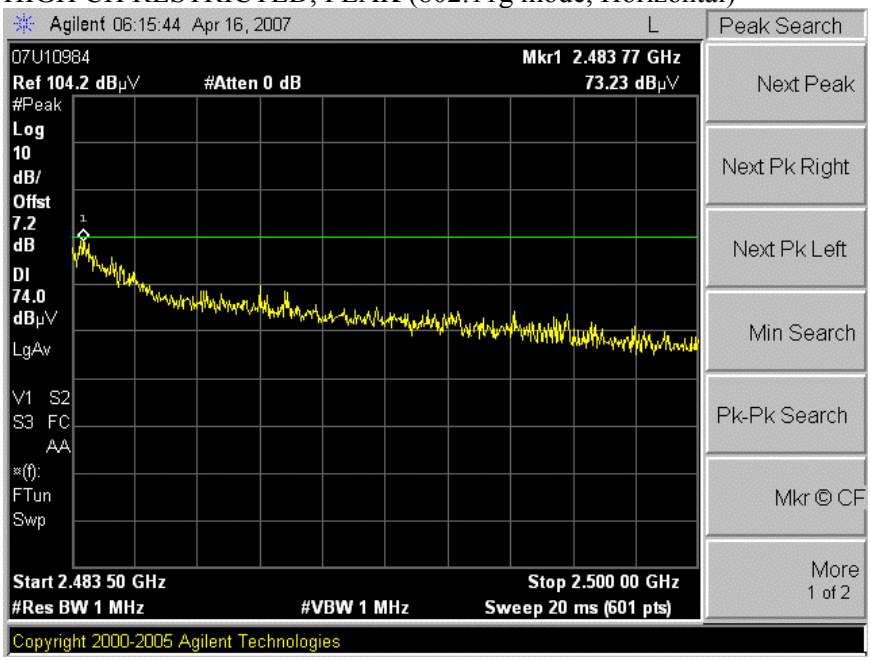


LOW CH RESTRICTED, AVG (802.11g mode, Vertical)

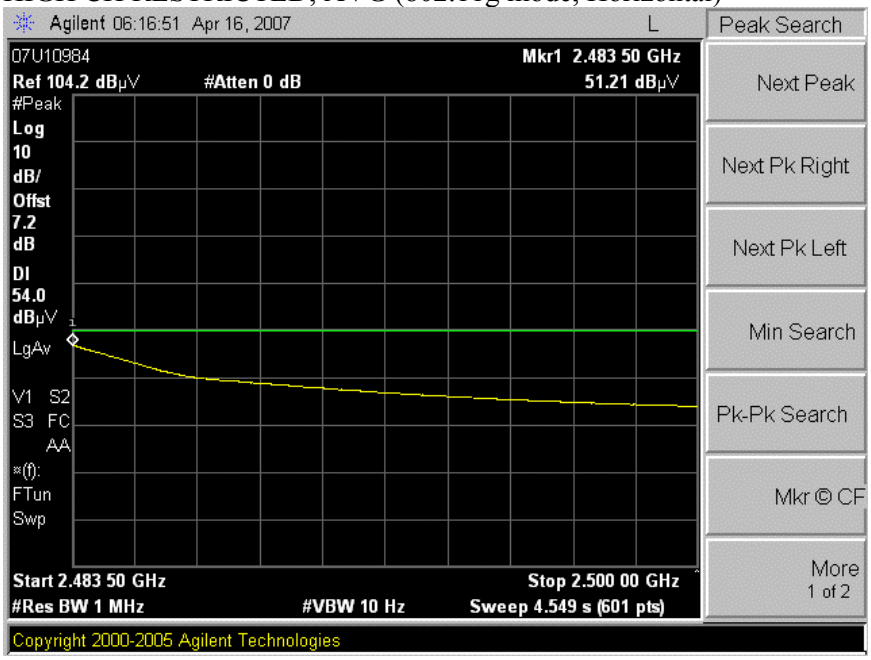


**RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)**

HIGH CH RESTRICTED, PEAK (802.11g mode, Horizontal)

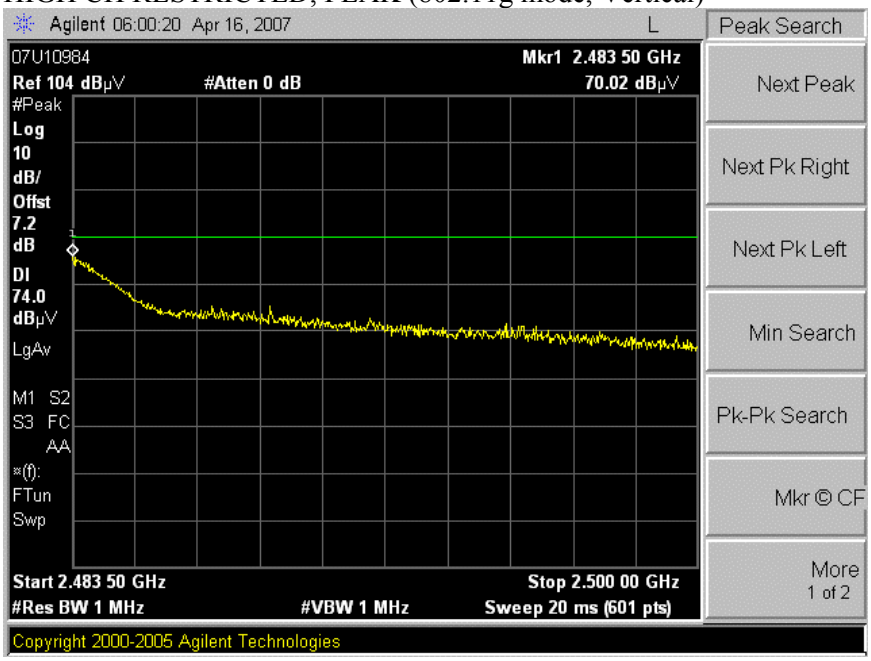


HIGH CH RESTRICTED, AVG (802.11g mode, Horizontal)

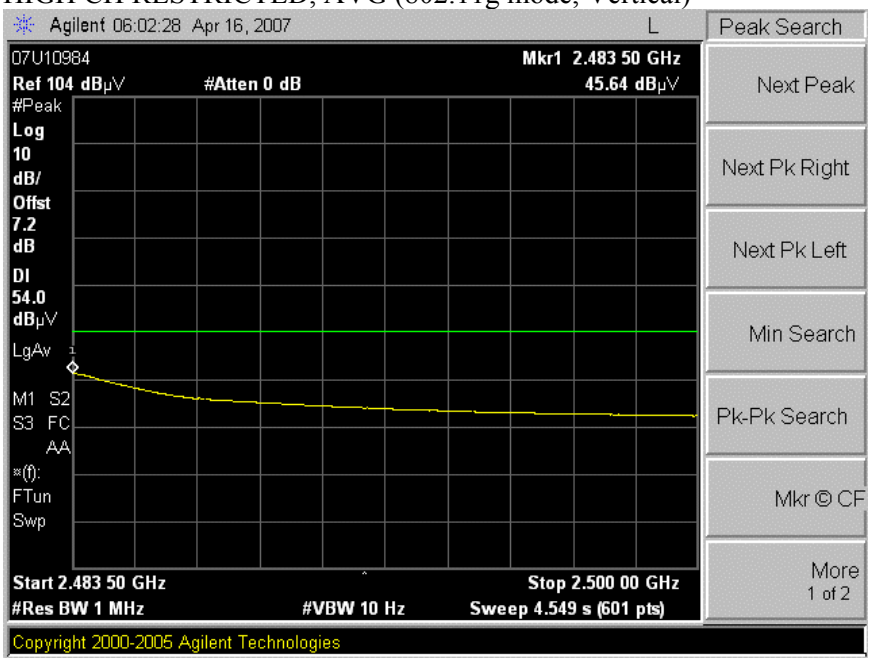


**RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)**

HIGH CH RESTRICTED, PEAK (802.11g mode, Vertical)



HIGH CH RESTRICTED, AVG (802.11g mode, Vertical)



## HARMONICS AND SPURIOUS EMISSIONS (g MODE)

High Frequency Measurement
Compliance Certification Services, Fremont Chamber A

**Company:** High Tech Computer Corp
**Project #:** 07U10984
**Date:** April 16th 2007
**Test Engineer:** Anoop Singh
**Configuration:** EUT Only
**Mode: Transmit** TX, G mode Harmonic spurs

**Test Equipment:**

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T60; S/N: 2238 @3m | T34 HP 8449B | | | FCC 15.205 |

Hi Frequency Cables

| 2 foot cable | 3 foot cable | 12 foot cable | HPF | Reject Filter |
|---|---|---|---|---|
| | | Gordon 203134001 | | 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 | 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 Channel** | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 41.0 | 26.8 | 33.0 | 6.9 | -34.8 | 0.0 | 0.0 | 46.1 | 31.9 | 74 | 54 | -27.9 | -22.1 | V |
| 4.824 | 3.0 | 40.4 | 26.6 | 33.0 | 6.9 | -34.8 | 0.0 | 0.0 | 45.5 | 31.7 | 74 | 54 | -28.5 | -22.3 | H |
| **Mid Channel** | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 40.1 | 26.6 | 33.1 | 6.9 | -34.8 | 0.0 | 0.0 | 45.3 | 31.7 | 74 | 54 | -28.7 | -22.3 | V |
| 4.874 | 3.0 | 40.8 | 26.4 | 33.1 | 6.9 | -34.8 | 0.0 | 0.0 | 46.0 | 31.6 | 74 | 54 | -28.0 | -22.4 | H |
| **High Channel** | | | | | | | | | | | | | | | |
| 4.924 | 3.0 | 39.8 | 26.9 | 33.1 | 7.0 | -34.8 | 0.0 | 0.0 | 45.0 | 32.1 | 74 | 54 | -29.0 | -21.9 | V |
| 4.924 | 3.0 | 40.3 | 26.7 | 33.1 | 7.0 | -34.8 | 0.0 | 0.0 | 45.6 | 31.9 | 74 | 54 | -28.4 | -22.1 | H |

**No other frequency was detected above the system nosie floor**
Rev. 5.1.6

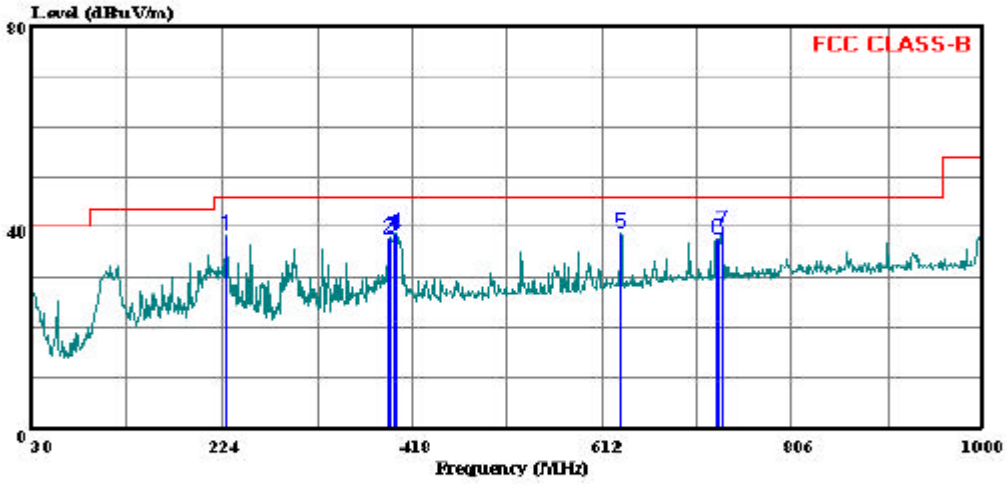
## 7.2.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

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

HORIZONTAL PLOT

COMPLIANCE Engineering Services, Inc.
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 12 File#: 07U10984Chamber.EMI
Date: 04-16-2007 Time: 11:24:28




Trace: 11 Ref Trace:

Condition: FCC CLASS-B 3m B-5M CHAMBER 012007 HORIZONTAL
Test Operator: : Doug Anderson
Company: : HTC
Project #: : 07U10984
Configuration: : EUT via USB to Dell PC w/Printer/Modem
Mode of Operation:: GSM Standby/802.11g Mid Ch Tx ( Worst Case )
Target : FCC Class B

HORIZONTAL DATA

Page: 1

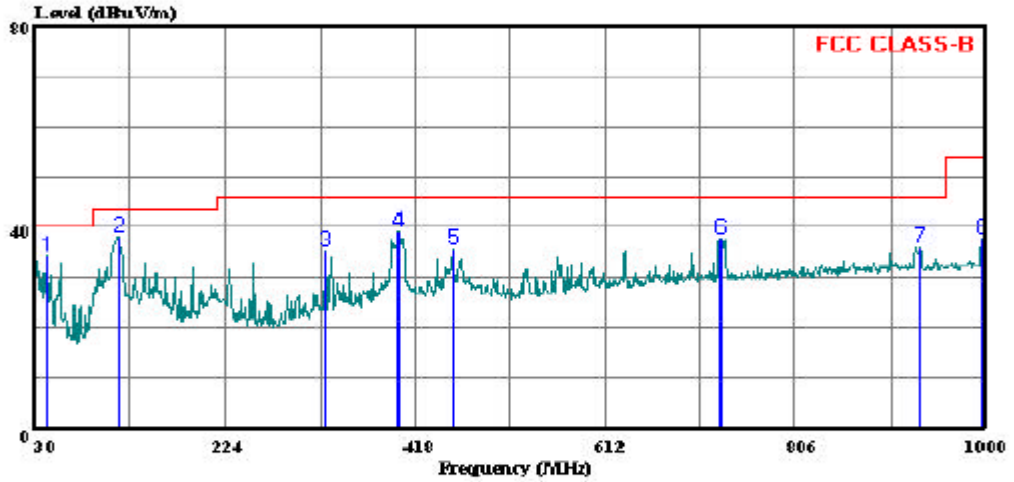
| | Freq | Read Level | Probe Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 229.820 | 53.40 | 11.62 | 1.60 | 28.08 | 38.54 | 46.00 | -7.46 | Peak |
| 2 | 394.720 | 47.90 | 15.88 | 2.15 | 28.06 | 37.87 | 46.00 | -8.13 | Peak |
| 3 | 397.630 | 48.00 | 15.93 | 2.17 | 28.06 | 38.04 | 46.00 | -7.96 | Peak |
| 4 | 401.510 | 48.80 | 16.01 | 2.17 | 28.06 | 38.93 | 46.00 | -7.07 | Peak |
| 5 | 631.400 | 43.70 | 19.70 | 2.78 | 27.26 | 38.91 | 46.00 | -7.09 | Peak |
| 6 | 730.340 | 40.80 | 20.92 | 3.02 | 26.98 | 37.76 | 46.00 | -8.24 | Peak |
| 7 | 733.250 | 42.40 | 20.96 | 3.05 | 26.98 | 39.43 | 46.00 | -6.57 | Peak |

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

VERTICAL PLOT

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

Data#: 10 File#: 07U10984Chamber.EMI
Date: 04-16-2007 Time: 11:17:55




Trace: 9 Ref Trace:

Condition: FCC CLASS-B 3m B-5M CHAMBER 012007 VERTICAL
Test Operator: : Doug Anderson
Company: : HTC
Project #: : 07U10984
Configuration: : EUT via USB to Dell PC w/Printer/Modem
Mode of Operation:: GSM Standby/802.11g Mid Ch Tx ( Worst Case )
Target : FCC Class B

VERTICAL DATA

Page: 1

| | Freq | Read Level | Probe Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 41.640 | 47.09 | 14.89 | 0.68 | 28.42 | 34.24 | 40.00 | -5.76 | Peak |
| 2 | 115.360 | 52.30 | 13.01 | 1.12 | 28.28 | 38.16 | 43.50 | -5.34 | Peak |
| 3 | 325.850 | 47.10 | 14.50 | 1.93 | 28.05 | 35.49 | 46.00 | -10.51 | Peak |
| 4 | 401.510 | 49.10 | 16.01 | 2.17 | 28.06 | 39.23 | 46.00 | -6.77 | Peak |
| 5 | 456.800 | 43.90 | 17.19 | 2.34 | 27.90 | 35.52 | 46.00 | -10.48 | Peak |
| 6 | 729.370 | 40.80 | 20.91 | 3.01 | 26.98 | 37.74 | 46.00 | -8.26 | Peak |
| 7 | 933.070 | 36.90 | 23.06 | 3.55 | 27.44 | 36.07 | 46.00 | -9.93 | Peak |
| 8 | 995.150 | 38.30 | 23.63 | 3.61 | 27.78 | 37.76 | 54.00 | -16.24 | Peak |

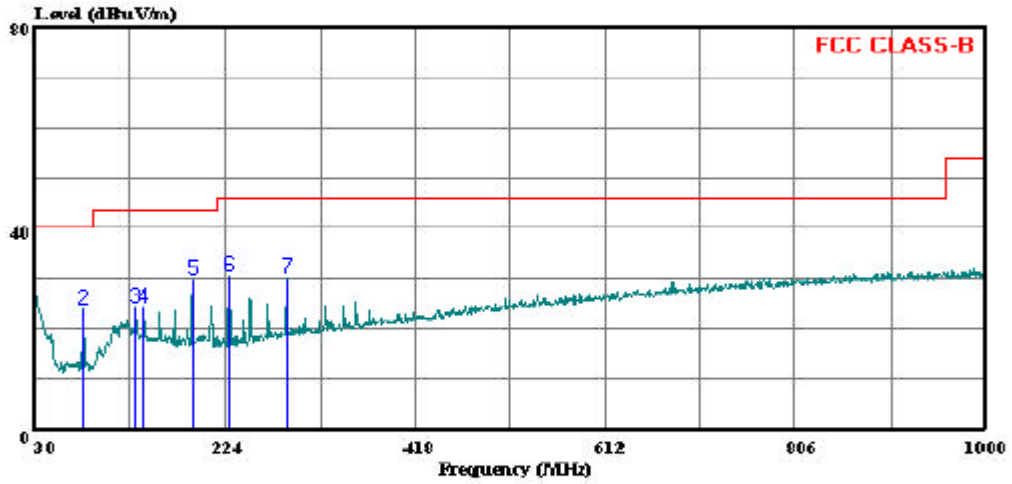
**WITH PHIHONG AC ADAPTER**

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

HORIZONTAL PLOT

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

Data#: 4 File#: 07U10984Chamber.EMI
Date: 04-13-2007 Time: 16:39:03




Trace: 3 Ref Trace:

Condition: FCC CLASS-B 3m B-5M CHAMBER 012007 HORIZONTAL
Test Operator: : Doug Anderson
Company: : HTC
Project #: : 07U10984
Configuration: : EUT w/Phihong AC Adapter
Mode of Operation:: GSM Standby/802.11g Mid Ch Tx ( Worst Case )
Target : FCC Class B

HORIZONTAL DATA

Page: 1

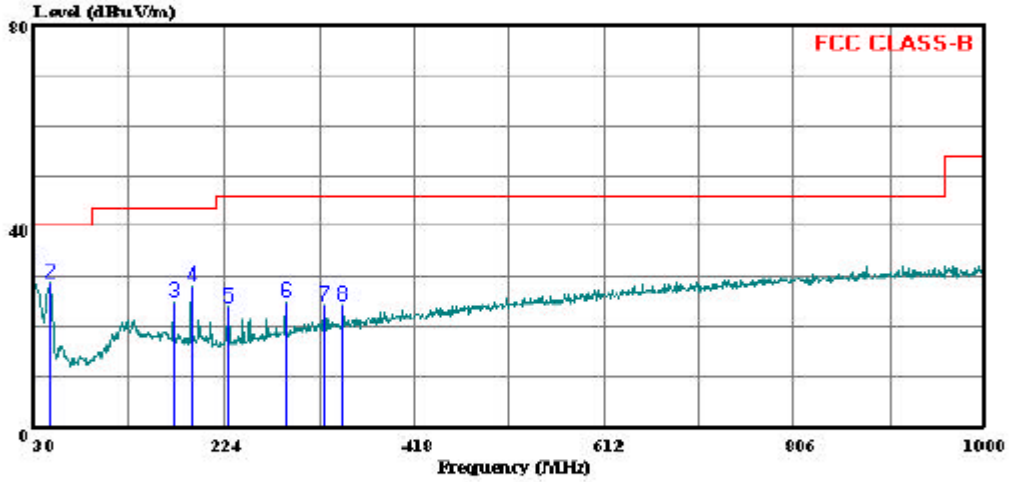
| | Freq | Read Level | Probe Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 30.000 | 32.30 | 22.03 | 0.62 | 28.41 | 26.54 | 40.00 | -13.46 | Peak |
| 2 | 78.500 | 43.10 | 8.09 | 0.93 | 28.28 | 23.83 | 40.00 | -16.17 | Peak |
| 3 | 132.820 | 37.40 | 13.89 | 1.21 | 28.23 | 24.27 | 43.50 | -19.23 | Peak |
| 4 | 141.550 | 37.50 | 13.64 | 1.23 | 28.22 | 24.15 | 43.50 | -19.35 | Peak |
| 5 | 191.020 | 44.50 | 12.09 | 1.45 | 28.13 | 29.91 | 43.50 | -13.59 | Peak |
| 6 | 229.820 | 45.40 | 11.62 | 1.60 | 28.08 | 30.54 | 46.00 | -15.46 | Peak |
| 7 | 287.050 | 43.00 | 13.49 | 1.83 | 28.04 | 30.27 | 46.00 | -15.73 | Peak |

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

VERTICAL PLOT

COMPLIANCE Engineering Services, Inc.
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 2 File#: 07U10984Chamber.EMI
Date: 04-13-2007 Time: 16:23:43




Trace: 1 Ref Trace:

Condition: FCC CLASS-B 3m B-5M CHAMBER 012007 VERTICAL
Test Operator: : Doug Anderson
Company: : HTC
Project #: : 07U10984
Configuration: : EUT w/Phihong AC Adapter
Mode of Operation:: GSM Standby/802.11g Mid Ch Tx ( Worst Case )
Target : FCC Class B

VERTICAL DATA

Page: 1

| | Freq | Read Level | Probe Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 30.000 | 35.70 | 22.03 | 0.62 | 28.41 | 29.94 | 40.00 | -10.06 | Peak |
| 2 | 46.490 | 44.93 | 11.42 | 0.70 | 28.39 | 28.66 | 40.00 | -11.34 | Peak |
| 3 | 171.620 | 39.50 | 12.08 | 1.38 | 28.16 | 24.80 | 43.50 | -18.70 | Peak |
| 4 | 191.020 | 42.80 | 12.09 | 1.45 | 28.13 | 28.21 | 43.50 | -15.29 | Peak |
| 5 | 229.820 | 38.70 | 11.62 | 1.60 | 28.08 | 23.84 | 46.00 | -22.16 | Peak |
| 6 | 287.050 | 37.70 | 13.49 | 1.83 | 28.04 | 24.97 | 46.00 | -21.03 | Peak |
| 7 | 325.850 | 35.70 | 14.50 | 1.93 | 28.05 | 24.09 | 46.00 | -21.91 | Peak |
| 8 | 345.250 | 35.50 | 14.92 | 2.01 | 28.05 | 24.38 | 46.00 | -21.62 | Peak |

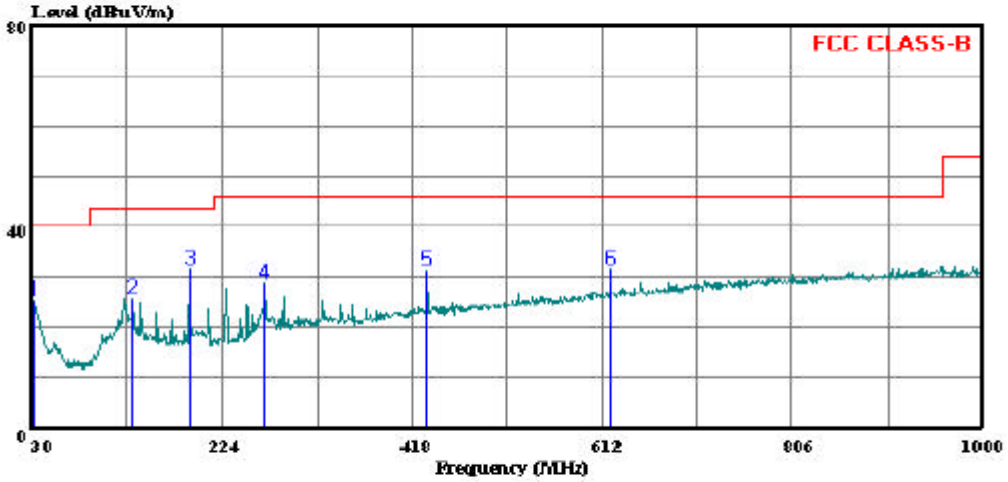
**WITH DELTA AC POWER ADAPTER**

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

HORIZONTAL PLOT

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

Data#: 6 File#: 07U10984Chamber.EMI
Date: 04-13-2007 Time: 17:13:06




Trace: 5 Ref Trace:

Condition: FCC CLASS-B 3m B-5M CHAMBER 012007 HORIZONTAL
Test Operator: : Doug Anderson
Company: : HTC
Project #: : 07U10984
Configuration: : EUT w/Delta AC Adapter
Mode of Operation:: GSM Standby/802.11g Mid Ch Tx ( Worst Case )
Target : FCC Class B

HORIZONTAL DATA

Page: 1

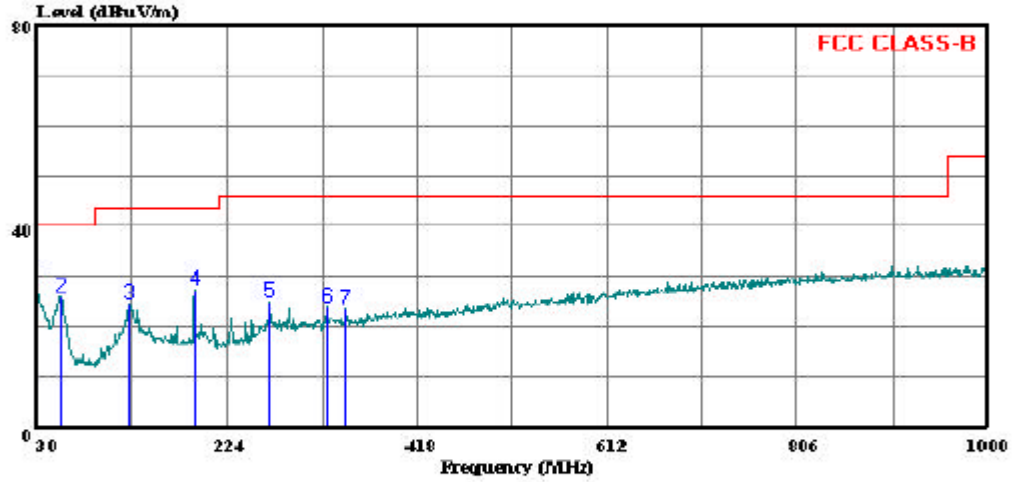
| | Freq | Read Level | Probe Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 31.940 | 31.90 | 21.20 | 0.62 | 28.41 | 25.30 | 40.00 | -14.70 | Peak |
| 2 | 132.820 | 38.80 | 13.89 | 1.21 | 28.23 | 25.67 | 43.50 | -17.83 | Peak |
| 3 | 191.020 | 46.20 | 12.09 | 1.45 | 28.13 | 31.61 | 43.50 | -11.89 | Peak |
| 4 | 267.650 | 42.40 | 12.83 | 1.73 | 28.05 | 28.92 | 46.00 | -17.08 | Peak |
| 5 | 432.550 | 40.10 | 16.68 | 2.26 | 27.97 | 31.07 | 46.00 | -14.93 | Peak |
| 6 | 620.730 | 36.70 | 19.56 | 2.71 | 27.30 | 31.67 | 46.00 | -14.33 | Peak |

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

VERTICAL PLOT

COMPLIANCE Engineering Services, Inc.
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 8 File#: 07U10984Chamber.EMI
Date: 04-13-2007 Time: 17:36:50




Trace: 7 Ref Trace:

Condition: FCC CLASS-B 3m B-5M CHAMBER 012007 VERTICAL
Test Operator: : Doug Anderson
Company: : HTC
Project #: : 07U10984
Configuration: : EUT w/Delta AC Adapter
Mode of Operation:: GSM Standby/802.11g Mid Ch Tx( Worst Case )
Target : FCC Class B

VERTICAL DATA

Page: 1

| | Freq | Read Level | Probe Factor | Cable Loss | Preamp Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 30.000 | 34.50 | 22.03 | 0.62 | 28.41 | 28.74 | 40.00 | -11.26 | Peak |
| 2 | 55.220 | 45.30 | 8.20 | 0.75 | 28.36 | 25.88 | 40.00 | -14.12 | Peak |
| 3 | 125.060 | 37.50 | 14.07 | 1.18 | 28.24 | 24.51 | 43.50 | -18.99 | Peak |
| 4 | 191.020 | 42.10 | 12.09 | 1.45 | 28.13 | 27.51 | 43.50 | -15.99 | Peak |
| 5 | 267.650 | 38.30 | 12.83 | 1.73 | 28.05 | 24.82 | 46.00 | -21.18 | Peak |
| 6 | 324.880 | 35.50 | 14.49 | 1.95 | 28.05 | 23.89 | 46.00 | -22.11 | Peak |
| 7 | 345.250 | 34.80 | 14.92 | 2.01 | 28.05 | 23.68 | 46.00 | -22.32 | 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 µH/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:

**EUT CONNECTED TO PC VIA USB**

**6 WORST EMISSIONS**

| NOTEBOOK PC CONDUCTED EMISSIONS DATA (115VAC 60Hz) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Freq. | Reading | | | Closs | Limit | | Margin | | Remark |
| (MHz) | PK (dBuV) | QP (dBuV) | AV (dBuV) | (dB) | QP | AV | QP (dB) | AV (dB) | L1 / L2 |
| 1.14 | 43.95 | -- | 29.60 | 0.00 | 56.00 | 46.00 | -12.05 | -16.40 | L1 |
| 1.40 | 45.44 | -- | 31.83 | 0.00 | 56.00 | 46.00 | -10.56 | -14.17 | L1 |
| 1.46 | 44.85 | -- | 28.79 | 0.00 | 56.00 | 46.00 | -11.15 | -17.21 | L1 |
| 1.03 | 43.34 | -- | 34.93 | 0.00 | 56.00 | 46.00 | -12.66 | -11.07 | L2 |
| 1.31 | 44.67 | -- | 32.72 | 0.00 | 56.00 | 46.00 | -11.33 | -13.28 | L2 |
| 1.55 | 43.86 | -- | 30.21 | 0.00 | 56.00 | 46.00 | -12.14 | -15.79 | L2 |
| 6 Worst Data | | | | | | | | | |

**WITH PHIHONG AC ADAPTER**

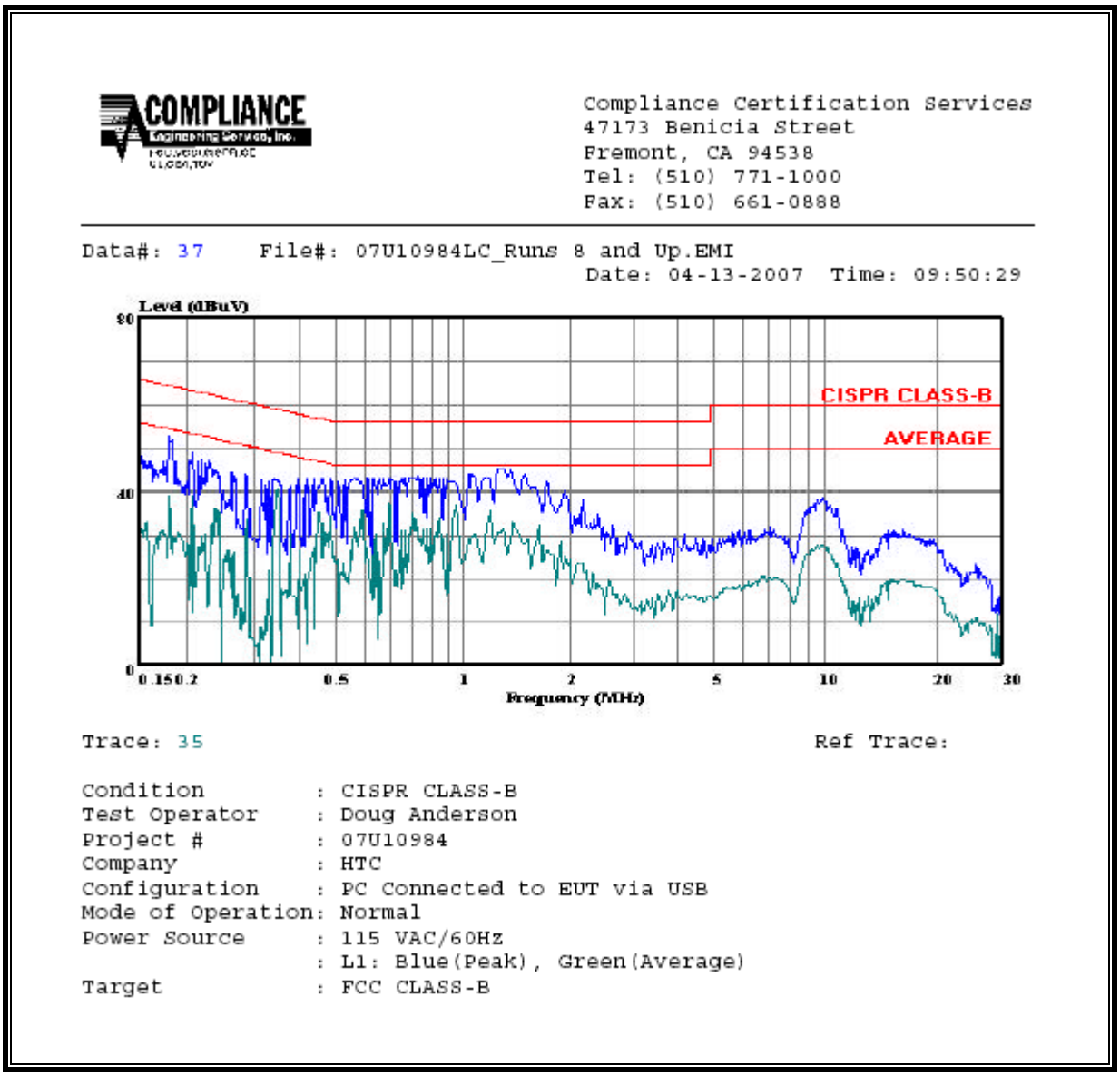
| CONDUCTED EMISSIONS DATA (115VAC 60Hz) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Freq. | Reading | | | Closs | Limit | | Margin | | Remark |
| (MHz) | PK (dBuV) | QP (dBuV) | AV (dBuV) | (dB) | QP | AV | QP (dB) | AV (dB) | L1 / L2 |
| 0.37 | 50.31 | -- | 32.34 | 0.00 | 58.57 | 48.57 | -8.26 | -16.23 | L1 |
| 0.54 | 45.09 | -- | 25.37 | 0.00 | 56.00 | 46.00 | -10.91 | -20.63 | L1 |
| 1.70 | 42.82 | -- | 24.01 | 0.00 | 56.00 | 46.00 | -13.18 | -21.99 | L1 |
| 0.37 | 50.37 | -- | 37.74 | 0.00 | 58.57 | 48.57 | -8.20 | -10.83 | L2 |
| 0.54 | 47.86 | -- | 27.79 | 0.00 | 56.00 | 46.00 | -8.14 | -18.21 | L2 |
| 1.99 | 43.92 | -- | 26.89 | 0.00 | 56.00 | 46.00 | -12.08 | -19.11 | L2 |
| 6 Worst Data | | | | | | | | | |

**WITH DELTA AC ADAPTER**

| DELTA CONDUCTED EMISSIONS DATA (115VAC 60Hz) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Freq. | Reading | | | Closs | Limit | 0 | Margin | | Remark |
| (MHz) | PK (dBuV) | QP (dBuV) | AV (dBuV) | (dB) | QP | AV | QP (dB) | AV (dB) | L1 / L2 |
| 0.19 | 42.64 | -- | 31.77 | 0.00 | 64.08 | 54.08 | -21.44 | -22.31 | L1 |
| 0.88 | 44.55 | -- | 15.44 | 0.00 | 56.00 | 46.00 | -11.45 | -30.56 | L1 |
| 0.96 | 46.26 | -- | 28.36 | 0.00 | 56.00 | 46.00 | -9.74 | -17.64 | L1 |
| 0.51 | 41.34 | -- | 33.93 | 0.00 | 56.00 | 46.00 | -14.66 | -12.07 | L2 |
| 0.82 | 39.69 | -- | 32.20 | 0.00 | 56.00 | 46.00 | -16.31 | -13.80 | L2 |
| 2.51 | 45.45 | -- | 32.36 | 0.00 | 56.00 | 46.00 | -10.55 | -13.64 | L2 |
| 6 Worst Data | | | | | | | | | |

**EUT CONNECTED TO PC VIA USB**

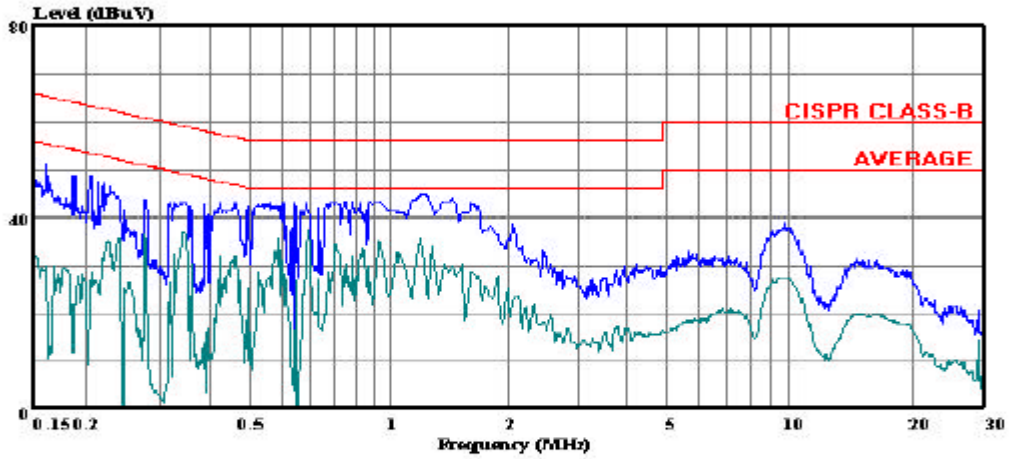
**LINE 1 RESULTS**



**LINE 2 RESULTS**

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

Data#: 44 File#: 07U10984LC_Runs 8 and Up.EMI
Date: 04-13-2007 Time: 10:10:21

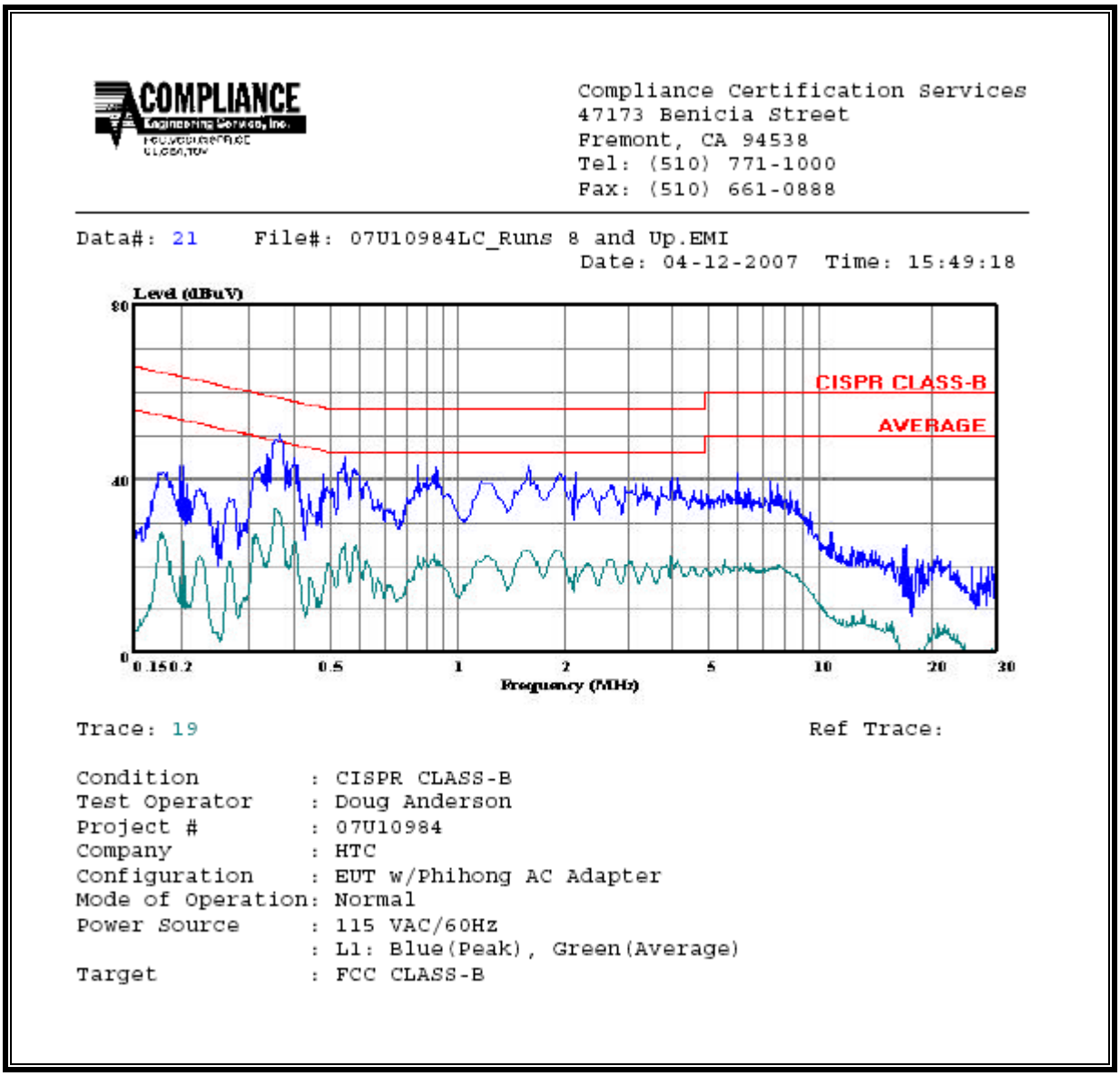



Trace: 42 Ref Trace:

Condition : CISPR CLASS-B
Test Operator : Doug Anderson
Project # : 07U10984
Company : HTC
Configuration : PC Connected to EUT via USB
Mode of Operation: Normal
Power Source : 115 VAC/60Hz
: L2: Blue(Peak), Green(Average)
Target : FCC CLASS-B

**WITH PHIHONG AC ADAPTER**

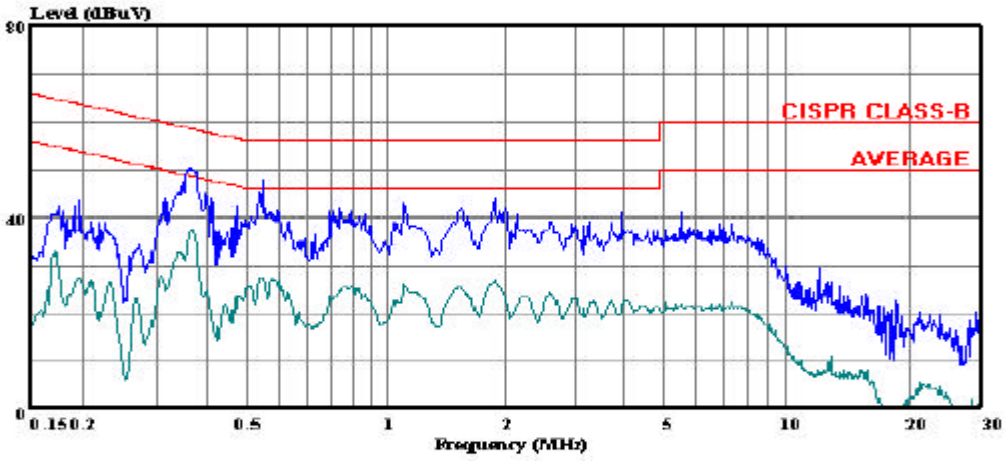
**LINE 1 RESULTS**



**LINE 2 RESULTS**

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

Data#: 28 File#: 07U10984LC_Runs 8 and Up.EMI
Date: 04-12-2007 Time: 16:06:06




Trace: 26 Ref Trace:

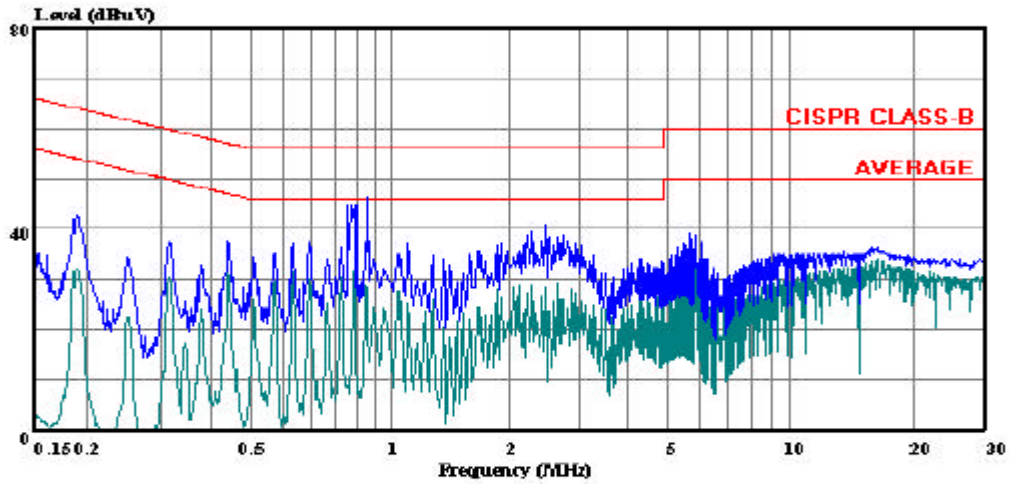
Condition : CISPR CLASS-B
Test Operator : Doug Anderson
Project # : 07U10984
Company : HTC
Configuration : EUT w/Phihong AC Adapter
Mode of Operation: Normal
Power Source : 115 VAC/60Hz
: L2: Blue(Peak), Green(Average)
Target : FCC CLASS-B

**WITH DELTA AC ADAPTER**

**LINE 1 RESULTS**

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

Data#: 7 File#: 07U10894LC.EMI Date: 04-12-2007 Time: 14:45:43



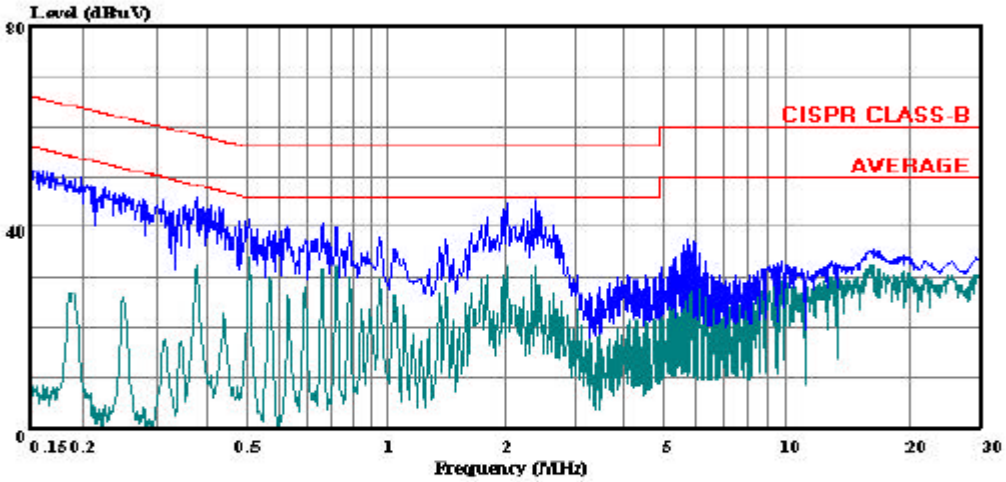

Trace: 5 Ref Trace:

Condition : CISPR CLASS-B
Test Operator : Doug Anderson
Project # : 07U10894
Company : HTC
Configuration : EUT w/Delta AC Adapter
Mode of Operation: Normal
Power Source : 115 VAC/60Hz
: L1: Blue(Peak), Green(Average)
Target : FCC Class B

**LINE 2 RESULTS**

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

Data#: 14 File#: 07U10894LC.EMI Date: 04-12-2007 Time: 15:08:23




Trace: 12 Ref Trace:

Condition : CISPR CLASS-B
Test Operator : Doug Anderson
Project # : 07U10894
Company : HTC
Configuration : EUT w/Delta AC Adapter
Mode of Operation: Normal
Power Source : 115 VAC/60Hz
: L2: Blue(Peak), Green(Average)
Target : FCC Class B