

# FCC CFR47 PART 15 SUBPART C CERTIFICATION TEST REPORT

FOR

# 802.11b/g MINI-PCI RADIO MODULE

# MODEL NUMBER: AIR-MP21G-A-K9

FCC ID: LDK102049

# **REPORT NUMBER: 03U2181-1**

# **ISSUE DATE: AUGUST 29, 2003**

Prepared for CISCO SYSTEMS, INC. 170 WEST TASMAN SAN JOSE, CA 95134 USA

Prepared by

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LAB CODE:200065-0

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# **1. TEST RESULT CERTIFICATION**

FCC PART 15 SUBPART C

| STANDA           | RD TEST RESULTS                 |
|------------------|---------------------------------|
|                  | APPLICABLE STANDARDS            |
| DATE TESTED:     | AUGUST 7 – AUGUST 28, 2003      |
| MODEL:           | AIR-MP21G-A-K9                  |
| EUT DESCRIPTION: | 802.11B/G MINI PCI RADIO MODULE |
|                  | SAN JOSE, CA 95134, USA         |
|                  | 170 WEST TASMAN                 |
| COMPANY NAME:    | CISCO SYSTEMS, INC.             |

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:** This document reports conditions under which testing was conducted and results of tests performed. 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.

Approved & Released For CCS By:

Tested By:

MH

MIKE HECKROTTE CHIEF ENGINEER COMPLIANCE CERTIFICATION SERVICES

Califian Ston

NO NON-COMPLIANCE NOTED

WILLIAM ZHUANG EMC ENGINEER COMPLIANCE CERTIFICATION SERVICES

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# 2. EUT DESCRIPTION

The EUT is an 802.11b/g radio module with a MiniPCI interface. It operates in the 2400 - 2483.5 MHz band. The peak power output is 22.93 dBm (196 mW) in the 802.11b mode and 18.7 dBm (74 mW) in the 802.11g mode.

This module was tested with four antenna types, plus two dipole antennas configured for diversity operation, using the highest gain version of each type, as follows:

| Antenna Type          | Model<br>Number as Tested | Max Gain<br>as Tested<br>dBi | MPE<br>cm | Mode of<br>Operation |
|-----------------------|---------------------------|------------------------------|-----------|----------------------|
| Yagi                  | AIR-ANT2410Y-R            | 10                           | 12.5      | Point to Multipoint  |
| Patch                 | AIR-ANT3549               | 8.5                          | 10.5      | Point to Multipoint  |
| Omni                  | AIR-ANT2506               | 5                            | 7.0       | Omnidirectional      |
| Dipole                | AIR-ANT4941               | 2.2                          | 5.1       | Omnidirectional      |
| Two Dipoles           | Two AIR-ANT4941           | 2.2                          | 5.1       | Omnidirectional      |
| (Diversity Operation) |                           |                              |           |                      |

This module was tested for co-location with the Cisco AIR-RM20A-A-K9 5 GHz radio, FCC ID: LDK10245 using the two dipole diversity antenna configuration.

This module may also be used with the following antennas, each of which has the same or less gain than the corresponding antenna type that was tested.

| Antenna Type | Model<br>Number as Tested | Max Gain<br>as Tested<br>dBi | MPE<br>cm | Mode of<br>Operation |
|--------------|---------------------------|------------------------------|-----------|----------------------|
| Patch        | AIR-ANT2012               | 6.5                          | 8.4       | Point to Multipoint  |
| Patch        | AIR-ANT1729               | 6.0                          | 7.9       | Point to Multipoint  |
| Omni         | AIR-ANT3213               | 5                            | 7.0       | Omnidirectional      |
| Omni         | AIR-ANT1728               | 5                            | 7.0       | Omnidirectional      |
| Omni         | Maxrad MUF24005           | 5                            | 7.0       | Omnidirectional      |
| Omni         | Maxrad MAXC24005          | 5                            | 7.0       | Omnidirectional      |
| Omni         | AIR-ANT3551               | 2.2                          | 5.1       | Omnidirectional      |
| Omni         | AIR-ANT5959               | 2.0                          | 5.0       | Omnidirectional      |

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# 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4/1992, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

# 4. FACILITIES AND ACCREDITATION

The open area test sites and conducted 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 C63.7, ANSI C63.4 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 <u>http://www.ccsemc.com</u>.

No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.

# 5. CALIBRATION AND UNCERTAINTY

# 5.1. MEASURING INSTRUMENT CALIBRATION

The measurement instruments utilized to perform the tests documented in this report have been calibrated in accordance with the manufacturer's recommendations, and are traceable to national standards.

# 5.2. MEASUREMENT UNCERTAINTY

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

| 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%.

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# 5.3. TEST AND MEASUREMENT EQUIPMENT

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

| TEST AND MEASUREMENT EQUIPMENT LIST |               |             |                  |                         |  |  |  |
|-------------------------------------|---------------|-------------|------------------|-------------------------|--|--|--|
| Name of Equipment                   | Manufacturer  | Model       | Serial<br>Number | Calibration<br>Due Date |  |  |  |
| Quasi-Peak Adapter                  | HP            | 85650A      | 2521A01038       | 7/16/2004               |  |  |  |
| SA Display Section                  | HP            | 85662A      | 2314A04793       | 7/16/2004               |  |  |  |
| SA RF Section                       | HP            | 85680A      | 2314A02604       | 7/16/2004               |  |  |  |
| Preamplifier                        | HP            | 8447D       | 2944A06833       | 8/22/2003               |  |  |  |
| Antenna, Biconical                  | Eaton         | 94455-1     | 1214             | 3/6/04                  |  |  |  |
| Antenna, Log Periodic               | EMCO          | 3146        | 9107-3163        | 3/06/04                 |  |  |  |
| EMI Test Receiver                   | R & S         | ESHS 20     | 827129/006       | 7/17/2004               |  |  |  |
| LISN, 10 kHz ~ 30 MHz               | FCC           | 50/250-25-2 | 114              | 9/6/2003                |  |  |  |
| Spectrum Analyzer                   | AGILENT       | E4446A      | US42070220       | 1/13/04                 |  |  |  |
| Pre-amplifier                       | MITEQ         | NSP2600-SP  | 924341           | 4/25/04                 |  |  |  |
| Horn Antenna                        | EMCO          | 3115        | 6717             | 2/4/04                  |  |  |  |
| Power Meter                         | AGILENT       | E4416A      | 0841291160       | 11/7/04                 |  |  |  |
| Power Sensor                        | Agilent       | E9327A      | US40440755       | 08/09/03                |  |  |  |
| Antenna, Biconical                  | Eaton         | 94455-1     | 1214             | 3/6/04                  |  |  |  |
| Antenna, Log Periodic               | EMCO          | 3146        | 9107-3163        | 3/06/04                 |  |  |  |
| Preamplifier                        | Miteq         | NSP10023988 | 646456           | 4/26/04                 |  |  |  |
| High Pass Filter (4.57GHz)          | FSY Microwave | FM-4570-9SS | 003              | N.C.R.                  |  |  |  |

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# 6. SETUP OF EQUIPMENT UNDER TEST

## SUPPORT EQUIPMENT

| Device Type   | Manufacturer | Model Number | Serial Number         | FCC ID |
|---------------|--------------|--------------|-----------------------|--------|
| Laptop        | IBM          | 2647         | 78-B3952              | Doc    |
| Power Adapter | IBM          | 02K6665      | 11502K66657A2U81385RR | Doc    |
| Power Supply  | KRM          | AEEC-350     | 9712154746            | N/A    |

### I/O CABLES

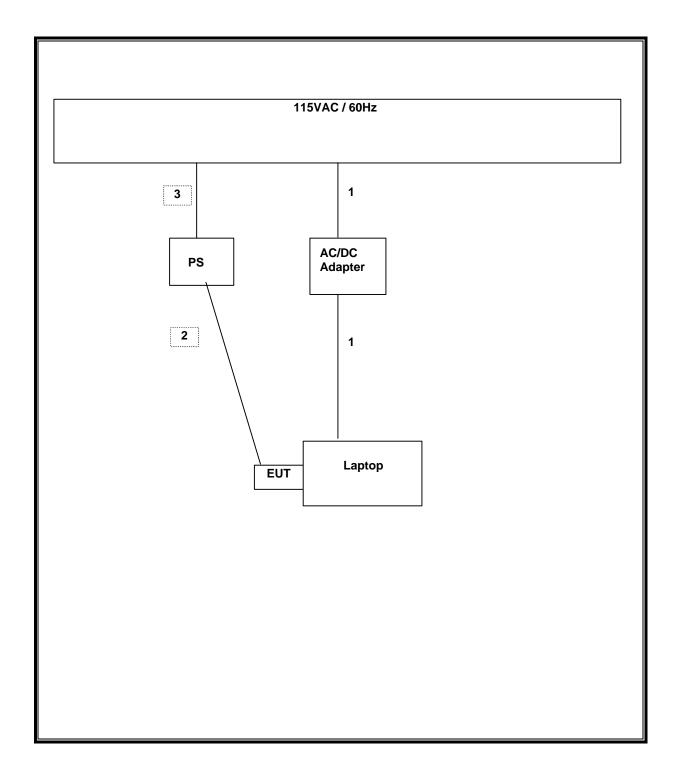
| Cable | I/O  | # of I/O | Connector | Type of     | Cable  | Data    |         |                         |
|-------|------|----------|-----------|-------------|--------|---------|---------|-------------------------|
| No    | Port | Port     | Туре      | Cable       | Length | Traffic | Bundled | Remark                  |
| 1     | AC   | 1        | US 115V   | Un-shielded | 2m     | No      | No      | Integrated with Adapter |
| 2     | DC   | 1        | DC        | Un-shielded | 1m     | No      | No      | N/A                     |
| 3     | AC   | 1        | US115     | Un-shielded | 1m     | No      | No      | N/A                     |

### TEST SETUP

The EUT is 802.11b/g mini PCI radio. It was connected to a laptop via a cardbus-to-miniPCI adapter / extension board during the tests. Power was furnished by an external power supply set to 3.3 VDC. Test software exercised the radio card.

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#### SETUP DIAGRAM



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#### SETUP FOR COLOCATION TESTS

#### SUPPORT EQUIPMENT

| Device Type   | Manufacturer | Model Number | Serial Number         | FCC ID |
|---------------|--------------|--------------|-----------------------|--------|
| Laptop        | IBM          | 2647         | 78-B3952              | Doc    |
| Power Adapter | IBM          | 02K6665      | 11502K66657A2U81385RR | Doc    |
| Access Point  | CISCO        | AIR-AP1210   | FHK0721J06P           | DoC    |
| Power Adapter | CISCO        | PSA18U-480C  | 131210148A2           | DoC    |

#### I/O CABLES

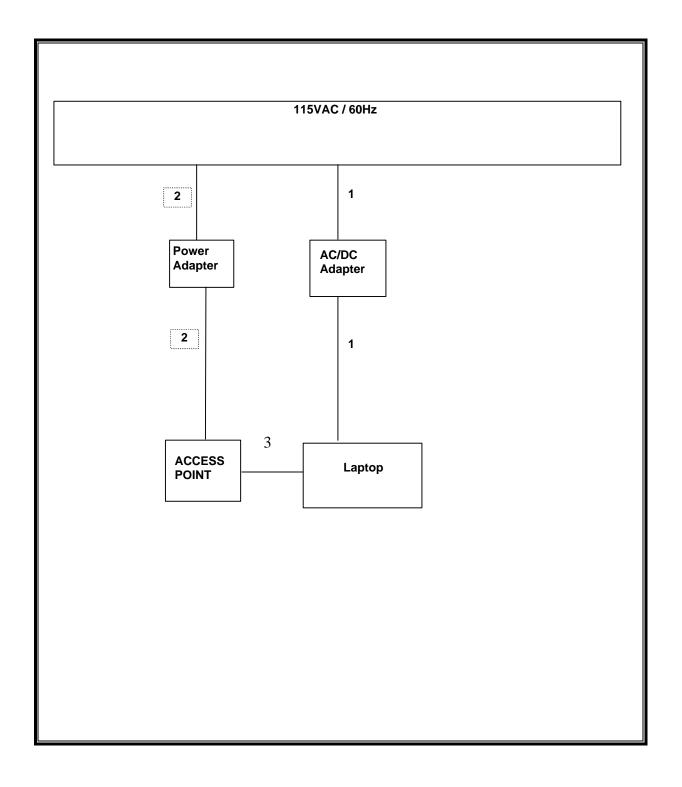
| Cable | I/O      | # of I/O | Connector | Type of     | Cable  | Data    |         |                         |
|-------|----------|----------|-----------|-------------|--------|---------|---------|-------------------------|
| No    | Port     | Port     | Туре      | Cable       | Length | Traffic | Bundled | Remark                  |
| 1     | AC       | 1        | US 115V   | Un-shielded | 2m     | No      | No      | Integrated with Adapter |
| 2     | AC       | 1        | US 115V   | Un-shielded | 2m     | No      | No      | Integrated with Adapter |
| 3     | Ethernet | 1        | RJ45      | Un-shielded | 2m     | Yes     | No      | N/A                     |

#### TEST SETUP

The EUT is 802.11b/g mini PCI radio. For collocation testing, the EUT was installed in an access point that was also equipped with a 5 GHz radio module. The access point was controlled by a laptop via Ethernet. Test software exercised both radio cards.

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#### SETUP DIAGRAM



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# 7. APPLICABLE LIMITS AND TEST RESULTS

# 7.1. 6 dB BANDWIDTH

## <u>LIMIT</u>

§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 100 kHz. The sweep time is coupled.

### <u>RESULTS</u>

No non-compliance noted:

#### 802.11b Mode

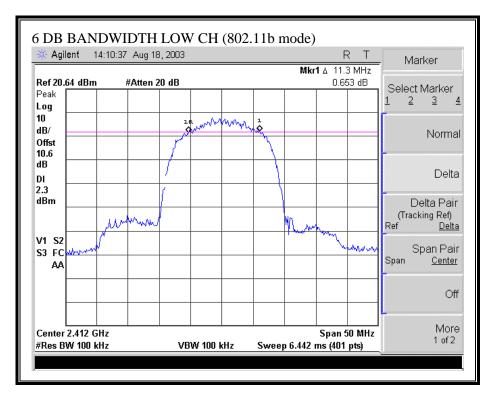
| Channel | Frequency | 6 dB Bandwidth | Minimum Limit | Margin |
|---------|-----------|----------------|---------------|--------|
|         | (MHz)     | (kHz)          | (kHz)         | (kHz)  |
| Low     | 2412      | 11300          | 500           | 10800  |
| Middle  | 2437      | 11300          | 500           | 10800  |
| High    | 2462      | 11100          | 500           | 10600  |

## 802.11g Normal Mode

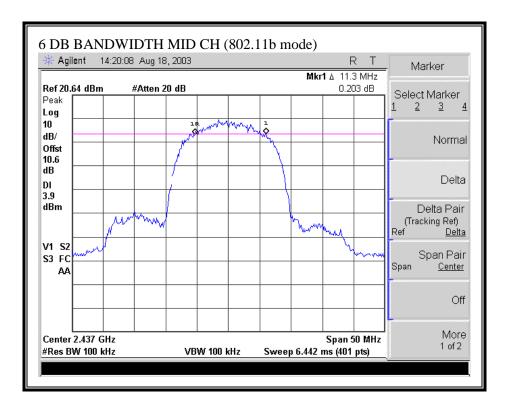
| Channel | Frequency | 6 dB Bandwidth | Minimum Limit | Margin |
|---------|-----------|----------------|---------------|--------|
|         | (MHz)     | (kHz)          | (kHz)         | (kHz)  |
| Low     | 2412      | 16100          | 500           | 15600  |
| Middle  | 2437      | 16400          | 500           | 15900  |
| High    | 2462      | 16400          | 500           | 15900  |

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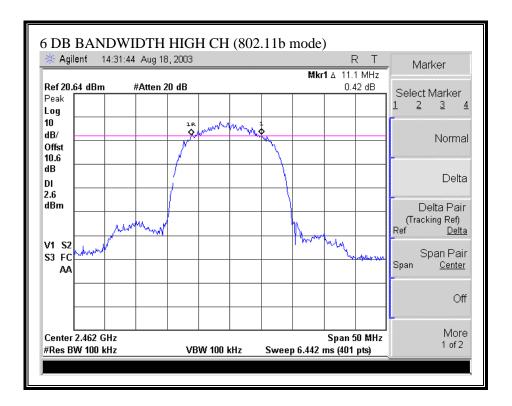
#### 6 DB BANDWIDTH (802.11b MODE)



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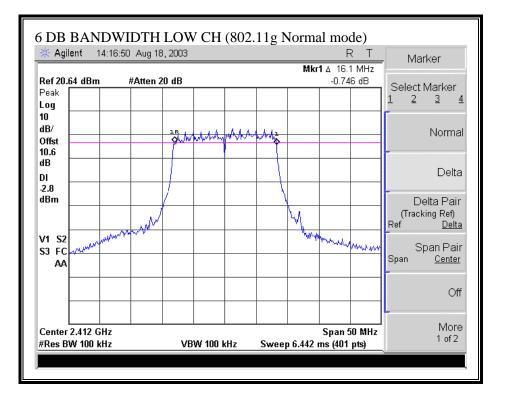


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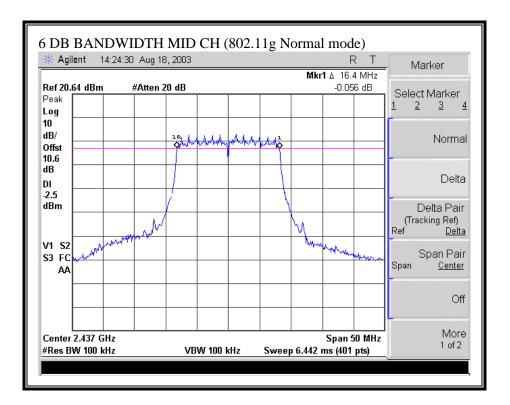


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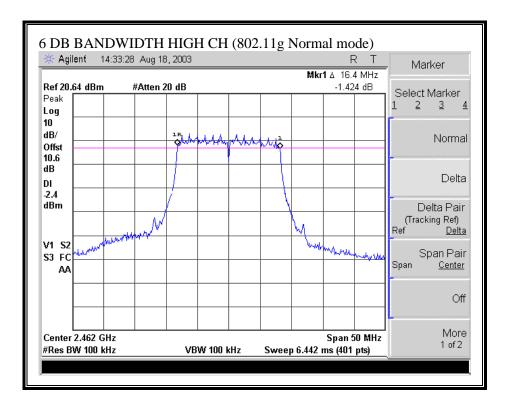
#### 6 DB BANDWIDTH (802.11g NORMAL MODE)



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# 7.2. 99% **BANDWIDTH**

### <u>LIMIT</u>

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

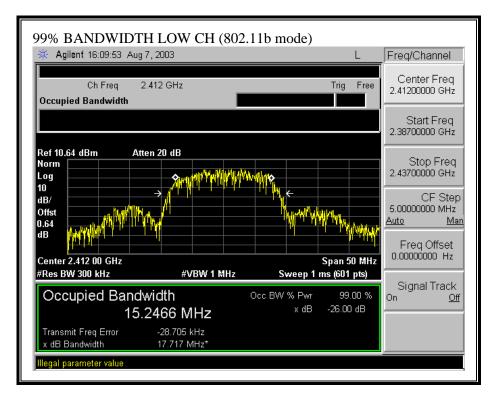
| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
|         | (MHz)     | (MHz)         |
| Low     | 2412      | 15.25         |
| Middle  | 2437      | 15.33         |
| High    | 2462      | 15.29         |

802.11g Normal Mode

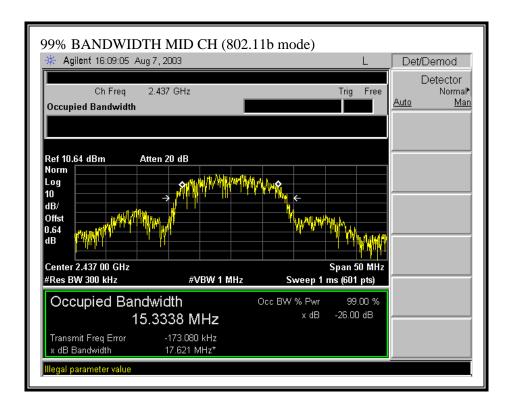
| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
|         | (MHz)     | (MHz)         |
| Low     | 2412      | 16.45         |
| Middle  | 2437      | 16.43         |
| High    | 2462      | 16.10         |

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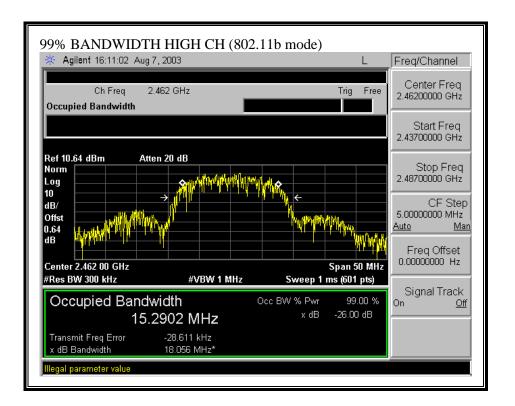
#### 99% BANDWIDTH (802.11b MODE)



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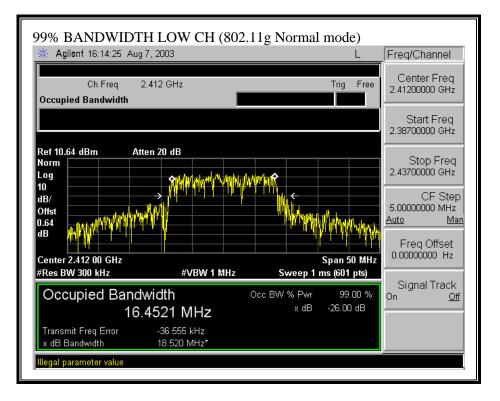


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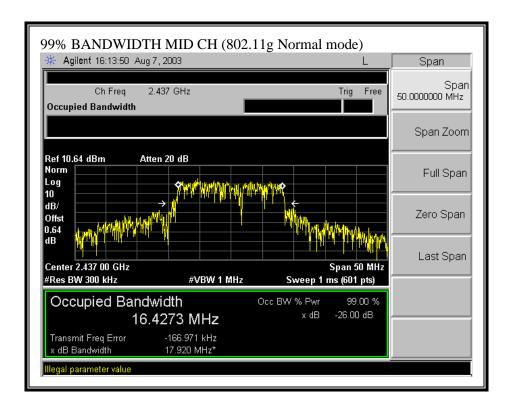


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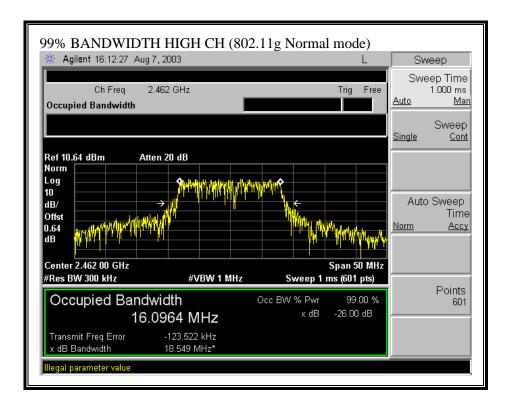
#### 99% BANDWIDTH (802.11g NORMAL MODE)



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# 7.3. 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) (4) Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is 10 dBi, therefore the limit is 26 dBm.

#### 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.

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#### **RESULTS**

No non-compliance noted:

802.11b Mode

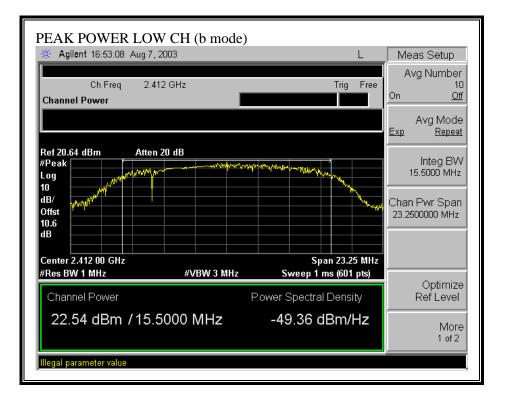
| Channel | Frequency | Peak Power | Limit | Margin |
|---------|-----------|------------|-------|--------|
|         | (MHz)     | (dBm)      | (dBm) | (dB)   |
| Low     | 2412      | 22.54      | 26    | -3.46  |
| Middle  | 2437      | 22.67      | 26    | -3.33  |
| High    | 2462      | 22.93      | 26    | -3.07  |

## 802.11g Normal Mode

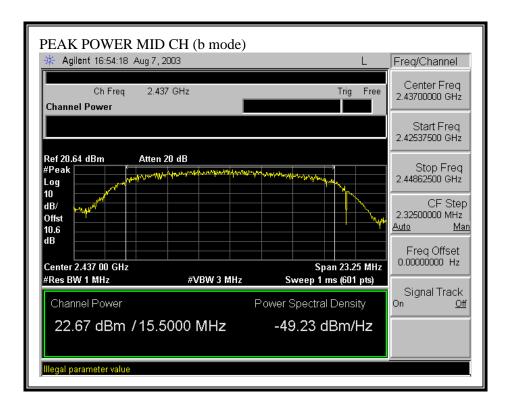
| Channel | Frequency | Peak Power | Limit | Margin |
|---------|-----------|------------|-------|--------|
|         | (MHz)     | (dBm)      | (dBm) | (dB)   |
| Low     | 2412      | 18.57      | 26    | -7.43  |
| Middle  | 2437      | 18.41      | 26    | -7.59  |
| High    | 2462      | 18.70      | 26    | -7.30  |

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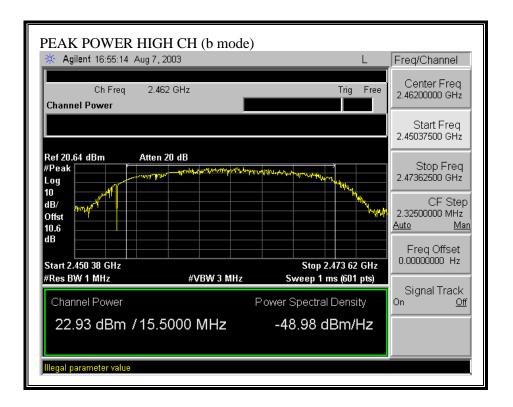
#### OUTPUT POWER (802.11b MODE)



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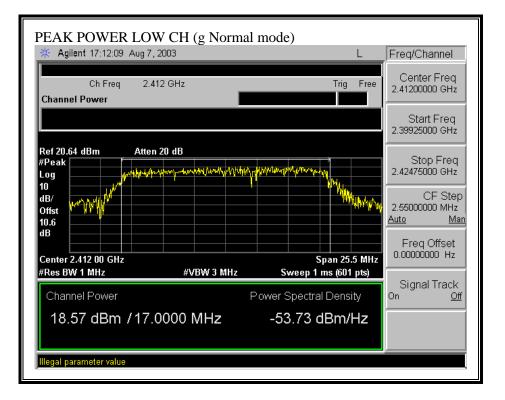


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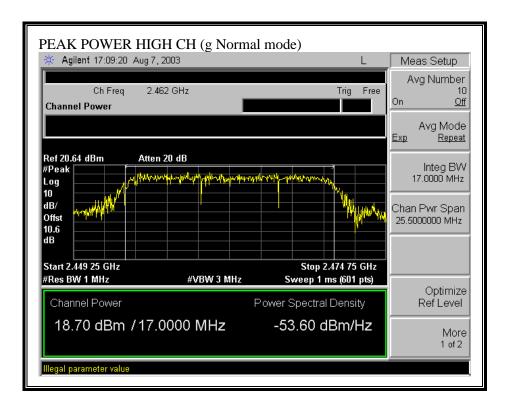
#### OUTPUT POWER (802.11g NORMAL MODE)



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| Agilent 17:10:57 Aug 7,        |            |  | Freq/Channel                                 |
|--------------------------------|------------|--|--|
| Ch Freq 2.4<br>Channel Power   | 37 GHz     | Trig Free                                  | 2.43700000 GHz                               |
|                                |            |  | Start Freq<br>2.42425000 GHz                 |
| #Peak                          | 20 dB      | Marine and a service and the               | Stop Freq<br>2.44975000 GHz                  |
| dB/<br>Offst<br>10.6           |            |  | CF Step<br>2.55000000 MHz<br><u>Auto Mar</u> |
| dB Center 2.437 00 GHz         |            | Span 25.5 MH                               | Freq Offset<br>0.00000000 Hz                 |
| #Res BW 1 MHz<br>Channel Power | #VBW 3 MHz | Sweep 1 ms (601 pts) Ower Spectral Density | Signal Track                                 |
| 18.41 dBm /17.                 |            |  |  |

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# 7.4. MAXIMUM PERMISSIBLE EXPOSURE

### **LIMITS**

15.247 (b) (5) Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See 1.1307(b)(1) of this chapter.

### **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 mW and cm, using:

P (mW) = P (W) / 1000 and d (cm) =100 \* d (m) d = 100 \*  $\sqrt{((30 * (P / 1000) * G) / (3770 * S))}$ 

yields

where

d = distance in cm P = Power in mW G = Numeric antenna gain

 $d = 0.282 * \sqrt{(P * G / S)}$ 

 $S = Power Density in mW / cm^2$ 

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Substituting the logarithmic form of power and gain using:

| Substit | $P(mW) = 10 \wedge (P(dBm) / 10)$ and             |              |
|---------|---|--------------|
|         |   |              |
|         | $G (numeric) = 10 \wedge (G (dBi) / 10)$          |              |
| yields  |   |              |
|         | $d = 0.282 * 10 \wedge ((P + G) / 20) / \sqrt{S}$ | Equation (1) |
| where   |   |              |
|         | d = MPE distance in cm                            |              |
|         | P = Power in dBm                                  |              |
|         | G = Antenna Gain in dBi                           |              |
|         | $S = Power Density Limit in mW / cm^2$            |              |
|         |   |              |

Equation (1) and the measured peak power is used to calculate the MPE distance.

#### **LIMITS**

 $S = 1.0 \text{ mW} / \text{cm}^2 \text{ from } 1.1310 \text{ Table } 1$ 

### RESULTS

No non-compliance noted:

| Mode           | Power Density Limit | Output Power | Antenna Gain | MPE Distance |
|----------------|---------------------|--------------|--------------|--------------|
|                | (mW/cm^2)           | (dBm)        | (dBi)        | (cm)         |
| 802.11b        | 1.0                 | 22.93        | 10.00        | 12.50        |
| 802.11g Normal | 1.0                 | 18.70        | 10.00        | 7.68         |
|                |                     |              |              |              |

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.

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# 7.5. 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 10.64 dB (including 10 dB pad and 0.64 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11b Mode

| Channel | Frequency | Average Power |
|---------|-----------|---------------|
|         | (MHz)     | (dBm)         |
| Low     | 2412      | 19.47         |
| Middle  | 2437      | 19.74         |
| High    | 2462      | 20.13         |

## 802.11g Normal Mode

| Channel | Frequency | Average Power |
|---------|-----------|---------------|
|         | (MHz)     | (dBm)         |
| Low     | 2412      | 14.86         |
| Middle  | 2437      | 14.61         |
| High    | 2462      | 14.70         |

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# 7.6. PEAK POWER SPECTRAL DENSITY

## <u>LIMIT</u>

§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

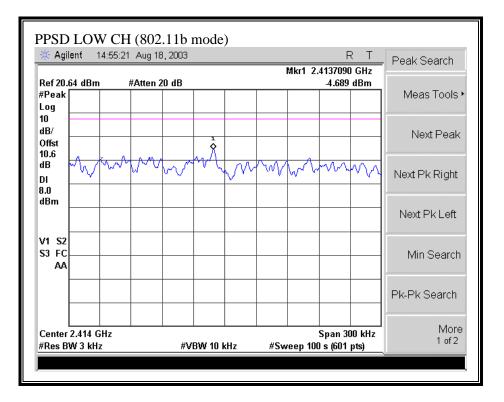
| Channel | Frequency | PPSD  | Limit | Margin |
|---------|-----------|-------|-------|--------|
|         | (MHz)     | (dBm) | (dBm) | (dB)   |
| Low     | 2412      | -4.69 | 8     | -12.69 |
| Middle  | 2437      | -3.46 | 8     | -11.46 |
| High    | 2462      | -5.15 | 8     | -13.15 |

#### 802.11g Normal Mode

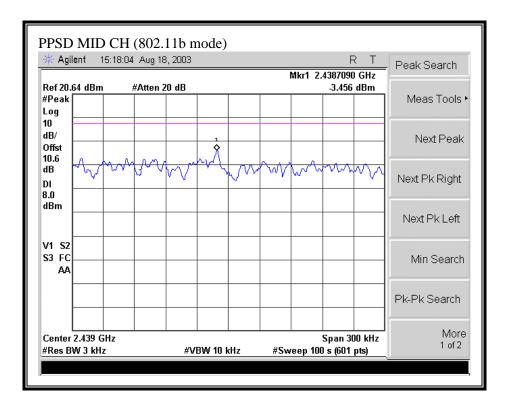
| Channel | Frequency | PPSD   | Limit | Margin |
|---------|-----------|--------|-------|--------|
|         | (MHz)     | (dBm)  | (dBm) | (dB)   |
| Low     | 2412      | -10.57 | 8     | -18.57 |
| Middle  | 2437      | -10.46 | 8     | -18.46 |
| High    | 2462      | -9.70  | 8     | -17.70 |

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#### PEAK POWER SPECTRAL DENSITY (802.11b MODE)



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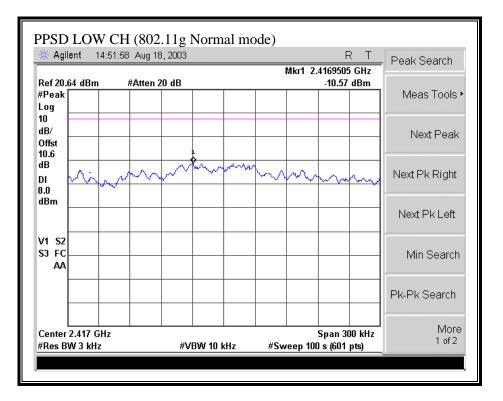


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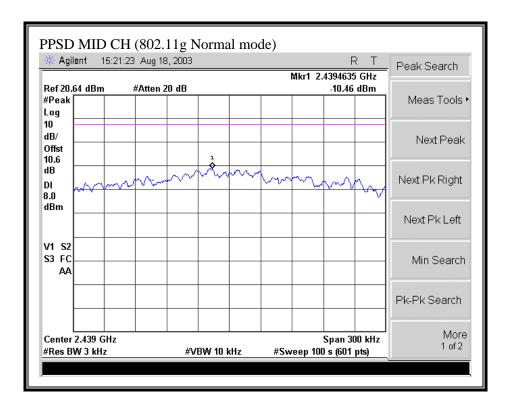
| 🔆 Agil                  | ent    | 15:58:57 | 7 Aug 18 | 6, 2003 |         |     |        | Mket 3   | R<br>4637090 (          | T<br>2H2 | Peak Search    |
|-------------------------|--------|----------|----------|---------|---------|-----|--------|----------|-------------------------|----------|----------------|
| Ref 20.<br>#Peak<br>Log | 64 dBm |          | #Atten 2 | 0 dB    |         |     |        | WIKIT 2. | -5.153 d                |          | Meas Tools     |
| 10<br>dB/<br>Offst      |        |          |          |         | 1       |     |        |          |                         |          | Next Peak      |
| 10.6<br>dB<br>DI<br>8.0 | $\sim$ | w.Å      | ww       | w.      | m       | M   | $\sim$ | Wh       | m                       | $\sim$   | Next Pk Right  |
| dBm                     |        |          |          |         |         |     |        |          |                         | _        | Next Pk Left   |
| V1 S2<br>S3 FC<br>AA    |        |          |          |         |         |     |        |          |                         |          | Min Search     |
|                         |        |          |          |         |         |     |        |          |                         |          | Pk-Pk Search   |
| Center<br>#Res B        |        |          |          | #VI     | BW 10 I | kHz | #Sw    |          | Span 300<br>) s (601 pt |          | More<br>1 of 2 |

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#### PEAK POWER SPECTRAL DENSITY (802.11g NORMAL MODE)



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| 🔆 Agi                   |                   | 10.05.0 | 4 Aug 18 | , 2005 |         |     |        | Mkr1 2. | R<br>4579490          |          | Peak Search    |
|-------------------------|-------------------|---------|----------|--------|---------|-----|--------|---------|-----------------------|----------|----------------|
| Ref 20.<br>#Peak<br>Log | 64 dBn            | n       | #Atten 2 | 20 dB  |         |     |        |         | -9.699                | dBm      | Meas Tools     |
| 10<br>dB/<br>Offst      |                   |         |          |        |         |     | _      |         |                       |          | Next Peak      |
| 10.6<br>dB<br>DI<br>8.0 | ~                 | h       | ~        | w      | m       | m   | $\sim$ | Low P   | m                     | <u>.</u> | Next Pk Right  |
| dBm                     |                   |         |          |        |         |     |        |         |                       |          | Next Pk Left   |
| V1 S2<br>S3 FC<br>AA    |                   |         |          |        |         |     |        |         |                       |          | Min Search     |
|                         |                   |         |          |        |         |     |        |         |                       |          | Pk-Pk Search   |
|                         | 2.458 (<br>W 3 kH |         |          | #V     | BW 10 I | (Hz | #Sw    |         | Span 30<br>) s (601 p |          | More<br>1 of 2 |

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# 7.7. 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 §15.205(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 100 kHz.

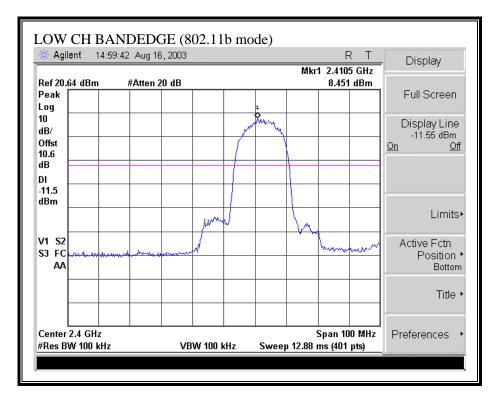
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

## **RESULTS**

No non-compliance noted:

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

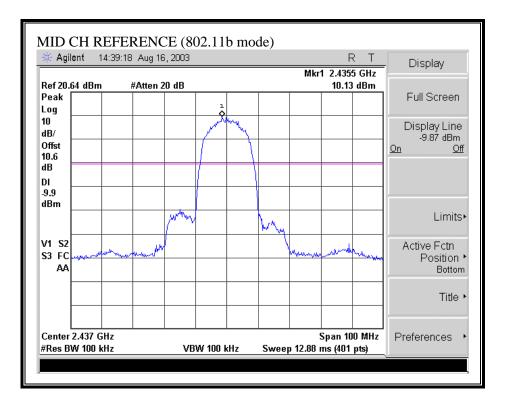


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| 🔆 Agilent 15:0                  | 1:36 Aug 16, 2003 |                     | R T<br>Mkr1 2.95 GHz                 | – Marker   |
|---------------------------------|-------------------|---------------------|--------------------------------------|--|
| Ref 20.64 dBm<br>Peak<br>Log    | #Atten 20 dB      |                     | 42.98 dBm                            | Select Marker<br>1 2 3 4                         |
| 10<br>dB/<br>Offst<br>10.6      |                   |                     |                                      | Norma  |
| dB<br>DI<br>-11.5<br>dBm        |                   |                     |                                      | Delta  |
| v1 s2                           |                   |                     |                                      | Delta Pair<br>(Tracking Ref)<br>Ref <u>Delta</u> |
| S3 FC                           |                   | and mindle and make | man hand and and the                 | Span Pair<br>Span <u>Center</u>                  |
|                                 |                   |                     |                                      | Off  |
| Start 30 MHz<br>#Res BW 100 kHz |                   | 00 kHz Sw           | Stop 26 GHz<br>eep 3.346 s (401 pts) | More<br>1 of 2                                   |

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

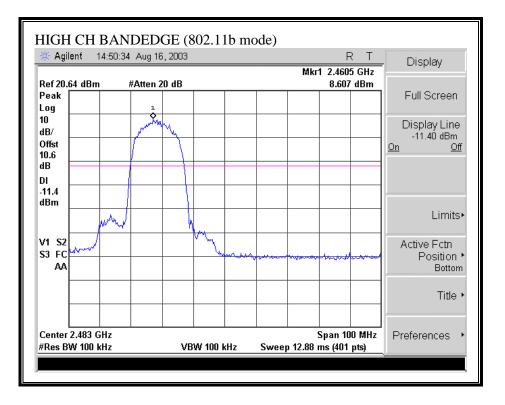


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| 🔆 Agile              | ent 14:4         | 2:42 Aug 16         | , 2003 |         |           |        |          | F                | · · | . Marker                                       |
|----------------------|------------------|---------------------|--------|---------|-----------|--------|----------|------------------|-----|--|
| Ref 20.6<br>Peak 「   | 4 dBm            | #Atten 2            | 0 dB   |         |           |        | M        | kr1 2.9<br>42.69 |     | Select Marker                                  |
| Log                  |                  |                     |        |         |           |        |          |                  |     | 1 2 3 4  |
| 10<br>dB/<br>Offst   |                  |                     |        |         |           |        |          |                  |     | Normal   |
| 10.6<br>dB<br>DI     |                  |                     |        |         |           |        |          |                  |     | -<br>Delta                                     |
| -9.9<br>dBm          |                  |                     |        |         |           |        |          |                  |     | _<br>Delta Pair<br>(Tracking Ref)<br>Ref Delta |
| V1 S2<br>S3 FC<br>AA | mar la           | ~ day of a standard | ~~~~~~ | with    | potentino | w~~~~~ | me Adua  | Awar             | nym |  |
|                      |                  |                     |        |         |           |        |          |                  |     | Off  |
| Start 30<br>#Res BV  | MHz<br>V 100 kHz |                     | VBW    | V 100 k | (Hz       | Swee   | ep 3.346 | Stop 2<br>s (401 |     | More<br>1 of 2                                 |

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

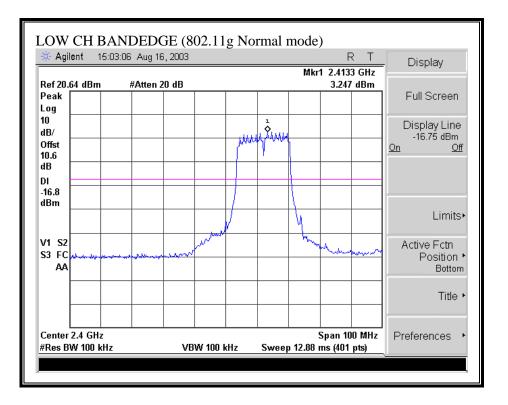


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| ∰ Agilent 14:5                    | i2:33 Aug 16, 2003    |           |   | R T                          | Marker  |
|-----------------------------------|-----------------------|-----------|---|------------------------------|---|
| Ref 20.64 dBm<br>Peak<br>Log      | #Atten 20 dB          |           |   | 42.5 dBm                     | Select Marker   |
| 10 dB/<br>dB/<br>Offst<br>10.6 dB |                       |           |   |                              | - Normal  |
| DI<br>-11.4<br>dBm                |                       |           |   |                              | Delta<br>Delta Pair<br>(Tracking Ref)<br>Ref <u>Delta</u> |
| V1 S2<br>S3 FC<br>AA              | and the second second | plumentur | man and and and and and and and and and a |                              | ∽ Span Pair<br>Span <u>Center</u>                         |
|                                   |                       |           |   |                              | Off   |
| Start 30 MHz<br>#Res BW 100 kHz   | VB                    | W 100 kHz | Sweep 3.34                                | Stop 26 GH:<br>6 s (401 pts) | Z More<br>1 of 2  |

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## SPURIOUS EMISSIONS, LOW CHANNEL (802.11g NORMAL MODE)

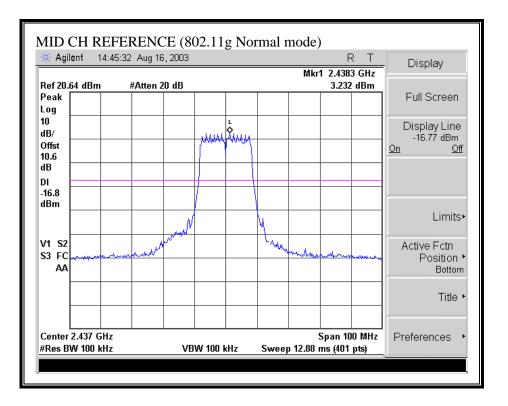


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| 🔆 Agil                           | ent 1             | 5:04:52 | 2 Aug 18 | 6,2003      |                     |         |      |             | F                 | · ·  | - Marker  |
|----------------------------------|-------------------|---------|----------|-------------|---------------------|---------|------|-------------|-------------------|------|---|
| Ref 20.6                         | 64 dBm            |         | #Atten 2 | 20 dB       |                     |         |      | M           | kr1 2.9<br>_43.19 |      | Select Marker   |
| Peak<br>Log                      |                   |         |          |             |                     |         |      |             |                   |      | 1 2 3 4   |
| 10<br>dB/<br>Offst<br>10.6<br>dB |                   |         |          |             |                     |         |      |             |                   |      | Norma   |
| DI<br>-16.8<br>dBm               |                   | 1       |          |             |                     |         |      |             |                   |      | Delta<br>Delta Pair<br>(Tracking Ref)<br>Ref <u>Delta</u> |
| V1 S2<br>S3 FC<br>AA             | - And             | hur     |          | <u>~~~~</u> | ad you get a second | jur mar | www  | na sharan a | ~                 | ~~~~ | Span Pair<br>Span <u>Center</u>                           |
|                                  |                   |         |          |             |                     |         |      |             |                   |      | Off   |
| Start 30<br>#Res B               | ) MHz<br>W 100 ki | Hz      |          | VB          | <br>W 100 I         | kHz     | Swee | ep 3.346    | Stop 2<br>s (401  |      | L<br>More<br>1 of 2                                       |

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## SPURIOUS EMISSIONS, MID CHANNEL (802.11g NORMAL MODE)

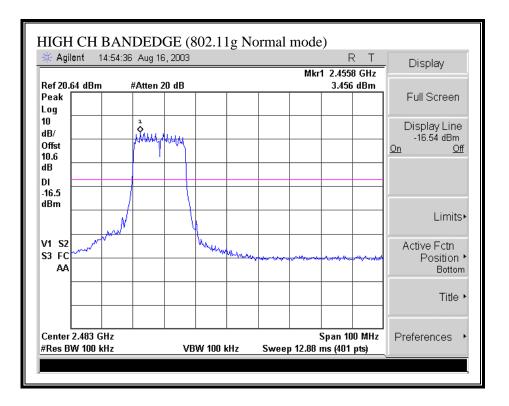


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| 🔆 Agilent 14:4  | 47:38 Aug 16, 2003 |           |             | R T         | – Marker                           |
|-----------------|--------------------|-----------|-------------|-------------|------------------------------------|
| Ref 20.64 dBm   | #Atten 20 dB       |           | 14          | 42.99 dBm   | Colort Marker                      |
| Peak            |                    |           |             |             | Select Marker                      |
| Log             |                    |           |             |             |                                    |
| dB/             |                    |           |             |             | Normal                             |
| Offst           |                    |           |             |             | Normai                             |
| 10.6<br>dB      |                    |           |             |             | -                                  |
| DI              |                    |           |             |             | Delta                              |
| -16.8           |                    |           |             |             |                                    |
| dBm             |                    |           |             |             | Delta Pair                         |
|                 |                    |           |             |             | (Tracking Ref)<br>Ref <u>Delta</u> |
| v1 s2           |                    |           |             |             |                                    |
| S3 FC           | man                | mont      | manne       | munuha      | Span Pair                          |
| AA              |                    |           |             |             | Span <u>Center</u>                 |
|                 |                    |           |             |             | 1                                  |
|                 |                    |           |             |             | Off                                |
|                 |                    |           |             |             | L                                  |
| Start 30 MHz    |                    |           |             | Stop 26 GHz | More                               |
| #Res BW 100 kHz | . VE               | W 100 kHz | Sweep 3.346 |             | 1 of 2                             |

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## SPURIOUS EMISSIONS, HIGH CHANNEL (802.11g NORMAL MODE)



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| 🔆 Agilent                     | 14:56:0  | 05 Aug 16, 2003 | j<br>       |                       | R<br>Mkr1 2.95              | GHz       | Marker                                |
|-------------------------------|----------|-----------------|-------------|-----------------------|-----------------------------|-----------|---------------------------------------|
| Ref 20.64 (<br>Peak<br>Log    | 1Bm      | #Atten 20 dB    |             |                       | -43.05 dl                   | Rm        | elect Marker<br><u>2 3</u> 4          |
| 10 dB/<br>Offst<br>10.6<br>dB |          |                 |             |                       |                             |           | Norma                                 |
| ab<br>DI<br>-16.5<br>dBm      |          |                 |             |                       |                             |           | Delta<br>Delta Pair<br>(Tracking Ref) |
| V1 S2<br>S3 FC 🗠<br>AA        | <br><br> | have many       |             | and the second staged | Manna                       | wwh<br>sp |                                       |
|                               |          |                 |             |                       |                             |           | Off                                   |
| Start 30 M<br>#Res BW 1       |          | <br>            | /BW 100 kHz | Sweep 3               | Stop 26  <br>346 s (401 pts |           | More<br>1 of 2                        |

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## 7.8. RADIATED 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     | $(^{2})$      |
| 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.

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\$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 (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.

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## 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.

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.

## **RESULTS**

No non-compliance noted:

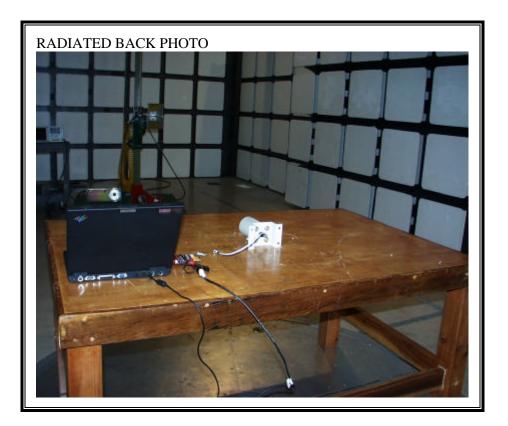
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## 7.8.1. RADIATED EMISSIONS WITH 10 dBi YAGI ANTENNA

## RADIATED RF MEASUREMENT SETUP

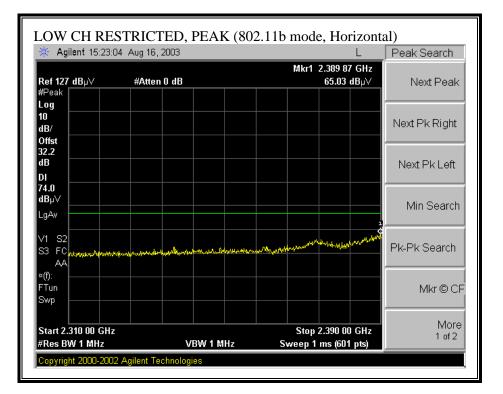


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## RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

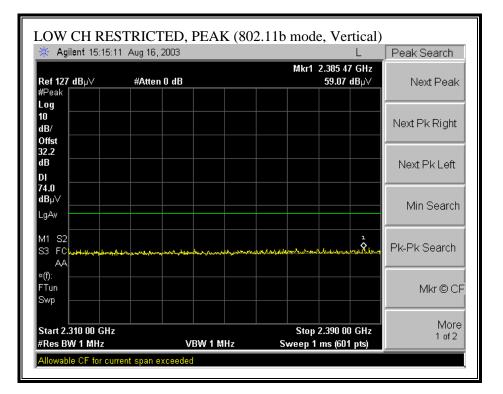


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| 🔆 Agilent 15:25:                    | 33 Aug 16, 2003 |       |                                    | L             | Peak Search    |
|-------------------------------------|-----------------|-------|------------------------------------|---------------|----------------|
| <b>Ref 127 dB</b> µ∨<br>#Peak       | #Atten 0 dB     |       | Mkr1 2.390 0<br>53.64              | 0 GHz<br>dBµ∨ | Next Peak      |
| Log                                 |                 |       |                                    |               |                |
| 10<br>dB/                           |                 |       |                                    |               | Next Pk Right  |
| Offst                               |                 |       |                                    |               |                |
| 32.2<br>dB                          |                 |       |                                    |               | Next Pk Left   |
| DI                                  |                 |       |                                    |               |                |
| 34.0<br>dBµ∨                        |                 |       |                                    |               | Min Search     |
| LgAv                                |                 |       |                                    |               | Min Search     |
| W1 S2                               |                 |       |                                    |               | DL DL Caarab   |
| S3 FC                               |                 |       |                                    | i<br>A        | Pk-Pk Search   |
| ×(f):                               |                 |       |                                    |               |                |
| FTun Swp                            |                 |       |                                    |               | Mkr © CF       |
|                                     |                 |       |                                    |               |                |
| Start 2.310 00 GH;<br>#Res BW 1 MHz |                 | 10 Hz | Stop 2.390 0<br>Sweep 6.238 s (601 |               | More<br>1 of 2 |

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

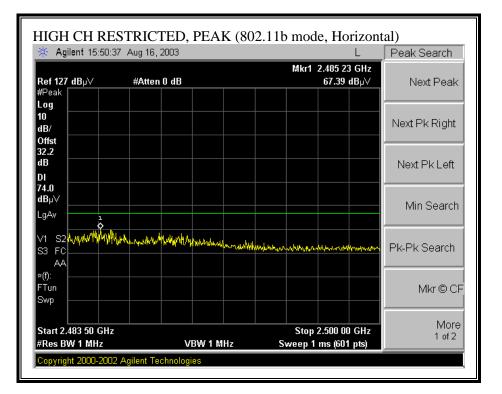


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| 🔆 Agilent 15:16:              | 25 Aug 16, 2003 |          |                          | L   | Peak Search    |
|-------------------------------|-----------------|----------|--------------------------|-----|----------------|
| <b>Ref 127 dB</b> µ∨<br>#Peak | #Atten 0 dB     |          | Mkr1 2.390 00<br>46.07 d |     | Next Peak      |
| Log                           |                 |          |                          |     |                |
| 10<br>dB/                     |                 |          |                          |     | Next Pk Right  |
| Offst                         |                 |          |                          |     |                |
| 32.2 dB                       |                 |          |                          |     | Next Pk Left   |
| DI                            |                 |          |                          |     |                |
| 54.0<br>dBµ∀                  |                 |          |                          |     | Min Search     |
| LgAv                          |                 |          |                          |     | Min Search     |
| W1 S2                         |                 |          |                          |     |                |
| S3 FC                         |                 |          |                          |     | Pk-Pk Search   |
| ×(f):                         |                 |          |                          |     |                |
| FTun Swp                      |                 |          |                          |     | Mkr©CF         |
|                               |                 |          |                          |     |                |
| Start 2.310 00 GH:            |                 | <u> </u> | Stop 2.390 00            | GHz | More<br>1 of 2 |

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

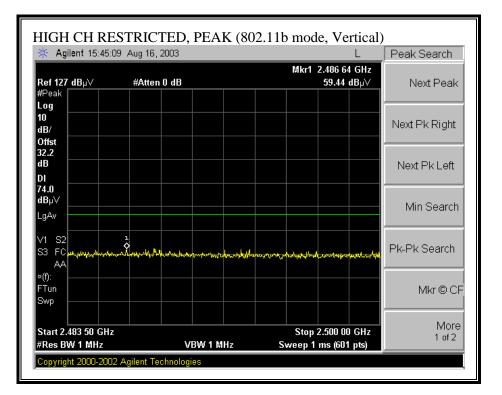


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| 🔆 Agilent 15:51::                   | 28 Aug 16, 2003 | L  | Peak Search   |
|-------------------------------------|-----------------|--|---------------|
| <b>Ref 127 dB</b> µ∀<br>#Peak       | #Atten 0 dB     | Mkr1 2.486 08 GH<br>51.10 dBµ                  |               |
| Log                                 |                 |  | Next Dk Dight |
| dB/<br>Offst<br>32.2                |                 |  | Next Pk Right |
| dB<br>DI                            |                 |  | Next Pk Left  |
| 54.0<br>dBµ∨                        |                 |  | Min Search    |
| LgAv<br>W1 S2                       |                 |  |               |
|                                     | 1<br>♦          |  | Pk-Pk Search  |
| ≈(f):<br>FTun<br>Swp                |                 |  | Mkr © C       |
|                                     |                 |  | More          |
| Start 2.483 50 GHz<br>#Res BW 1 MHz | :<br>#VBW 10 I  | Stop 2.500 00 GH<br>Iz Sweep 1.287 s (601 pts) | z 1 of 2      |

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



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| 🔆 Agilent 15:46:2                   | 23 Aug 16, 2003 |         |                     | L                          | Peak Search   |
|-------------------------------------|-----------------|---------|---------------------|----------------------------|---------------|
| <b>Ref 127 dB</b> µ∨<br>#Peak       | #Atten 0 dB     |         | Mkr1                | 2.483 53 GHz<br>46.35 dBµ∨ | Next Peak     |
| Log                                 |                 |         |                     |                            |               |
| 10<br>dB/                           |                 |         |                     |                            | Next Pk Right |
| Offst<br>32.2<br>dB                 |                 |         |                     |                            |               |
| DI                                  |                 |         |                     |                            | Next Pk Left  |
| 54.0<br>dBµ∀                        |                 |         |                     |                            | Min Search    |
| LgAv                                |                 |         |                     |                            |               |
| W1 S2<br>S3 FC                      |                 |         |                     |                            | Pk-Pk Search  |
| AA₁<br>×(f): ♠                      |                 |         |                     |                            |               |
| FTun<br>Swp                         |                 |         |                     |                            | Mkr © CF      |
|                                     |                 |         |                     |                            | More          |
| Start 2.483 50 GHz<br>#Res BW 1 MHz |                 | ¥ 10 Hz | Stop<br>Sweep 1.287 | 2.500 00 GHz <sup>°</sup>  | 1 of 2        |

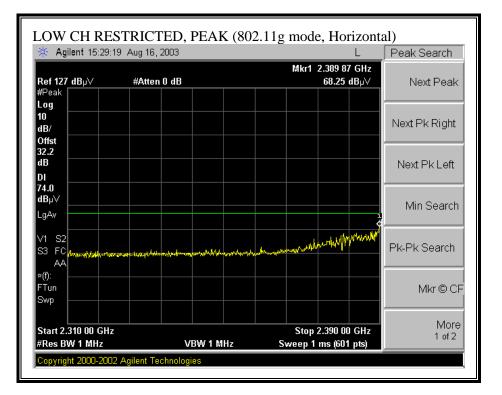
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#### HARMONICS AND SPURIOUS EMISSIONS (b MODE)

| oject #<br>ompany<br>JT Des | :03U218<br>y Name: | Cisco Syster<br>2.11b/g min  | ms, Akron<br>i-PCI Card | -            | -          |                                     |            |                             |  |              |              |  |                         |   |  |
|-----------------------------|--------------------|--|-------------------------|--------------|------------|-------------------------------------|------------|-----------------------------|--|--------------|--------------|--|-------------------------|---|--|
| est Tar                     | get:FCC            | 15.247   |                         |              |            |                                     |            |                             |  |              |              |  |                         |   |  |
| lode Op                     | oer:Trar           | ismit with Y   | 'agi Antenna            |              |            |                                     |            |                             |  |              |              |  |                         |   |  |
| est Equ                     | ipment:            |  |                         |              |            |                                     |            |                             |  |              |              |  |                         |   |  |
| FMCO                        | Horn 1-            | 18CHz  | Pre-amplif              | or 1-26C3    | 17         | 5                                   | Spectrum A | nalyzer                     |  |              | Horn > 18    | CHa  |                         |   |  |
|                             | N: 3245            |  | T86 Miteq 9             |              |            |                                     | ent E4446A |                             | er _                                     |              | Horn > 18    | GHZ  | -                       |   |  |
| 1.57, 3/                    |                    |  | 100 Milled              | 24341        |            |                                     |            |                             |  |              |              |  |                         |   |  |
| Hi Freq                     | tt)                |  | (4 ~ 6 ft)              | 🗸 (12 ft)    |            | ]                                   |            | 1 MHz                       | Measureme<br>Resolution E<br>Video Bandv | andwidth     |              | <b>leasuremen</b><br>lution Bandw<br>Bandwidth |                         |   |  |
| f                           | Dist               | Read Pk  | Read Avg.               | AF           | CL         | Amp                                 | D Corr     | HPF                         | Peak                                     | Avg          | Pk Lim       | Avg Lim  | Pk Mar                  | Avg Mar   | Notes                                    |
| GHz                         | feet               | dBuV   | dBuV                    | dB/m         | dB         | dB                                  | dB         |                             | dBuV/m                                   | dBuV/m       | dBuV/m       | dBuV/m   | dB                      | dB  |  |
| 824                         | 9.8                | 60.3   | 49.9                    | 33.8         | 3.9        | -45.6                               | 0.0        | 1.0                         | 53.3                                     | 42.9         | 74.0         | 54.0   | -20.7                   | -11.1   | b mode, Low ch, V                        |
| 824<br>236                  | 9.8<br>9.8         | 58.2<br>53.6   | 46.2                    | 33.8<br>36.9 | 3.9<br>4.9 | -45.6<br>-46.6                      | 0.0        | 1.0<br>1.0                  | 51.2<br>49.7                             | 39.2<br>41.9 | 74.0<br>74.0 | 54.0<br>54.0                                   | -22.8<br>-24.3          | -14.8<br>-12.1  | b mode, Low ch, H<br>b mode, Low ch, V   |
| 236                         | 9.8                | 48.9   | 38.2                    | 36.9         | 4.9        | -46.6                               | 0.0        | 1.0                         | 45.0                                     | 34.3         | 74.0         | 54.0   | -29.0                   | -12.1   | b mode, Low ch, H                        |
| 548                         | 9.8                | 47.1   | 38.0                    | 38.6         | 5.8        | -45.2                               | 0.0        | 1.0                         | 47.2                                     | 38.1         | 74.0         | 54.0   | -26.8                   | -15.9   | b mode, Low ch, V                        |
| 648                         | 9.8                | 49.2   | 38.0                    | 38.6         | 5.8        | -45.2                               | 0.0        | 1.0                         | 49.3                                     | 38.1         | 74.0         | 54.0   | -24.7                   | -15.9   | b mode, Low ch, H                        |
| 374                         | 9.8                | 63.9   | 50.2                    | 33.8         | 3.9        | -45.6                               | 0.0        | 1.0                         | 56.9                                     | 43.2         | 74.0         | 54.0   | -17.1                   | -10.8   | b mode, Mid ch, V                        |
| 874<br>311                  | 9.8<br>9.8         | 50.3<br>57.6   | 41.2 48.9               | 33.8<br>37.0 | 3.9<br>4.9 | -45.6<br>-46.6                      | 0.0        | 1.0<br>1.0                  | 43.3<br>53.9                             | 34.2<br>45.2 | 74.0         | 54.0<br>54.0                                   | -30.7<br>-20.1          | -19.8<br>-8.8   | b mode, Mid ch, H<br>b mode, Mid ch, V   |
| 311                         | 9.8                | 55.9   | 44.6                    | 37.0         | 4.9        | -46.6                               | 0.0        | 1.0                         | 52.2                                     | 40.9         | 74.0         | 54.0   | -20.1                   | -13.1   | b mode, Mid ch, H                        |
| 748                         | 9.8                | 49.3   | 41.9                    | 38.5         | 5.8        | -45.1                               | 0.0        | 1.0                         | 49.5                                     | 42.1         | 74.0         | 54.0   | -24.5                   | -11.9   | b mode, Mid ch, V                        |
| 748                         | 9.8                | 48.5   | 40.7                    | 38.5         | 5.8        | -45.1                               | 0.0        | 1.0                         | 48.7                                     | 40.9         | 74.0         | 54.0   | -25.3                   | -13.1   | b mode, Mid ch, H                        |
| 924<br>924                  | 9.8<br>9.8         | 61.2<br>55.4   | 49.2                    | 33.8<br>33.8 | 3.9        | -45.7<br>-45.7                      | 0.0        | 1.0<br>1.0                  | 54.2                                     | 42.2         | 74.0<br>74.0 | 54.0<br>54.0                                   | -19.8<br>-25.6          | -11.8<br>-15.9  | b mode, High ch, V                       |
| 924<br>386                  | 9.8                | 55.4   | 45.1<br>44.5            | 37.1         | 3.9<br>5.0 | -45.7                               | 0.0        | 1.0                         | 48.4<br>54.3                             | 38.1<br>40.9 | 74.0         | 54.0   | -25.0                   | -13.9   | b mode, High ch, H<br>b mode, High ch, V |
| 386                         | 9.8                | 50.4   | 39.2                    | 37.1         | 5.0        | -46.5                               | 0.0        | 1.0                         | 46.8                                     | 35.6         | 74.0         | 54.0   | -27.2                   | -18.4   | b mode, High ch, H                       |
| .848                        | 9.8                | 50.6   | 46.0                    | 38.5         | 5.8        | -45.0                               | 0.0        | 1.0                         | 50.9                                     | 46.3         | 74.0         | 54.0   | -23.1                   | -7.7  | b mode, High ch, V                       |
| 848                         | 9.8                | 51.2   | 42.2                    | 38.5         | 5.8        | -45.0                               | 0.0        | 1.0                         | 51.5                                     | 42.5         | 74.0         | 54.0   | -22.5                   | -11.5   | b mode, High ch, H                       |
|                             |                    | Measureme<br>Distance to<br>Analyzer R<br>Antenna Fa<br>Cable Loss | leading<br>actor        | у            |            | Amp<br>D Corr<br>Avg<br>Peak<br>HPF | Average    | Correc<br>Field S<br>d Peak | t to 3 mete<br>trength @<br>Field Stre   | 3 m          |              | Pk Lim   | Peak Field<br>Margin vs | Field Strengt<br>d Strength L<br>s. Average L<br>s. Peak Limi | imit<br>imit                             |

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

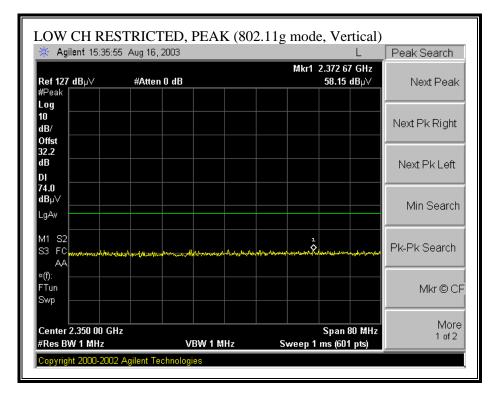


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| 🔆 Agilent 15:30::  | 25 Aug 16, 2003 | L                               | Peak Search    |
|--------------------|-----------------|---------------------------------|----------------|
| Ref 127 dBµ∨       | #Atten 0 dB     | Mkr1 2.390 00 GHz<br>52.71 dBµ∀ | Next Peak      |
| #Peak<br>Log       |                 |                                 |                |
| 10<br>dB/          |                 |                                 | Next Pk Right  |
| Offst              |                 |                                 |                |
| 32.2<br>dB         |                 |                                 | Next Pk Left   |
| DI                 |                 |                                 |                |
| 54.0<br>dBµ∨       |                 |                                 | Min Search     |
| LgAv               |                 |                                 | wiin Search    |
| W1 S2              |                 |                                 | Pk-Pk Search   |
| S3 FC              |                 |                                 | FK-FK Search   |
| «(f):              |                 |                                 |                |
| FTun<br>Swp        |                 |                                 | Mkr © Cf       |
| owb.               |                 |                                 |                |
| Start 2.310 00 GHz |                 | Ŝtop 2.390 00 GHz               | More<br>1 of 2 |

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

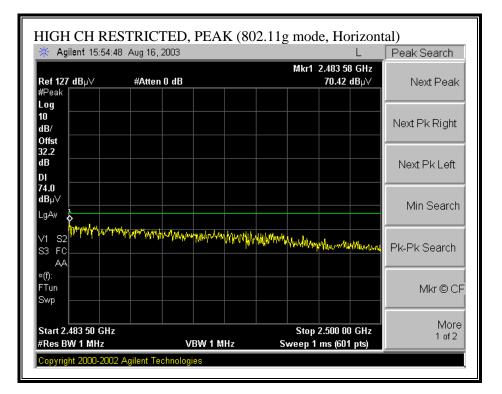


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| 🔆 Agilent 15:37               | :49 Aug 16, 2003 |   |        | L                          | Peak Search    |
|-------------------------------|------------------|---|--------|----------------------------|----------------|
| <b>Ref 127 dB</b> µ∨<br>#Peak | #Atten 0 dB      |   | Mkr1 2 | 2.390 00 GHz<br>45.76 dBµ∀ | Next Peak      |
| Log                           |                  |   |        |                            |                |
| 10<br>dB/                     |                  |   |        |                            | Next Pk Right  |
| Offst<br>32.2                 |                  |   |        |                            |                |
| dB<br>DI                      |                  |   |        |                            | Next Pk Left   |
| 54.0<br>dBµ∨                  |                  |   |        |                            | Min Co anab    |
| LgAv                          |                  |   |        |                            | Min Search     |
| W1 S2                         |                  |   |        |                            | Pk-Pk Search   |
| S3 FC                         |                  |   |        |                            |                |
| ×(f):<br>FTun                 |                  |   |        |                            | ¢<br>Mkr©CF    |
| Swp                           |                  |   |        |                            |                |
| Start 2.310 00 GH             | 7                | ^ | Stop 2 | 2.390 00 GHz               | More<br>1 of 2 |

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

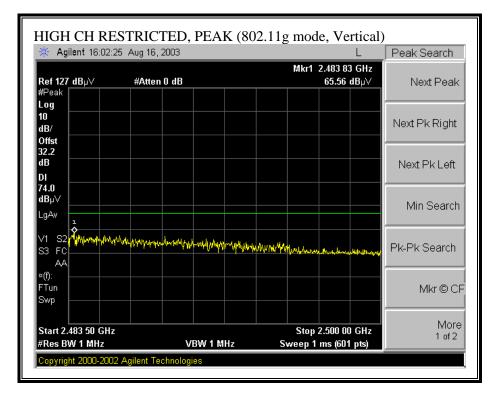


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| 🔆 Agilent 15:55:   | 35 Aug 16, 2003 |   |        | L                         | Peak Search    |
|--------------------|-----------------|---|--------|---------------------------|----------------|
| Ref 127 dBµ∀       | #Atten 0 dl     | 3 |        | .483 50 GHz<br>50.55 dBµ∨ | Next Peak      |
| #Peak<br>Log       |                 |   |        |                           |                |
| 10 dB/             |                 |   |        |                           | Next Pk Right  |
| Offst<br>32.2      |                 |   |        |                           |                |
| dB                 |                 |   |        |                           | Next Pk Left   |
| DI<br>54.0         |                 |   |        |                           | -              |
| dBµ∨               |                 |   |        |                           | Min Search     |
| LgAv               |                 |   |        |                           |                |
| W1 S2<br>S3 FC     |                 |   |        |                           | Pk-Pk Search   |
|                    |                 |   |        |                           |                |
| ≈(f):<br>FTun      |                 |   |        |                           | Mkr © CF       |
| Swp                |                 |   |        |                           |                |
| Start 2.483 50 GH; |                 |   | Stop 2 | .500 00 GHz               | More<br>1 of 2 |

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



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| 🔆 Agilent 16:03:2                   | 21 Aug 16, 2003 |        |                       | L                          | Peak Search   |
|-------------------------------------|-----------------|--------|-----------------------|----------------------------|---------------|
| <b>Ref 127 dB</b> µ∨<br>#Peak       | #Atten 0 dB     |        | Mkr1 :                | 2.483 50 GHz<br>47.73 dBµ∀ | Next Peak     |
| Log                                 |                 |        |                       |                            |               |
| 10<br>dB/                           |                 |        |                       |                            | Next Pk Right |
| Offst<br>32.2                       |                 |        |                       |                            |               |
| dB                                  |                 |        |                       |                            | Next Pk Left  |
| DI                                  |                 |        |                       |                            |               |
| dBµ∨<br>LgAv                        |                 |        |                       |                            | Min Search    |
| w1 S2                               |                 |        |                       |                            |               |
| S3 FC                               |                 |        |                       |                            | Pk-Pk Search  |
| ×(f):                               |                 |        |                       |                            |               |
| FTun Swp                            |                 |        |                       |                            | Mkr © CF      |
|                                     |                 |        |                       |                            | More          |
| Start 2.483 50 GHz<br>#Res BW 1 MHz | #VBW            | 40.11- | Stop 2<br>Sweep 1.287 | 2.500 00 GHz               | 1 of 2        |

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#### HARMONICS AND SPURIOUS EMISSIONS (g NORMAL MODE)

| Sys: SN: 3245 @1m        Agilent E4446A Analyzer         Agilent E4446A Analyzer         Agilent E4446A Analyzer         Arcrage Measurements:<br>1 MHz Resolution Bandwidth         Arcrage Measurements:<br>1 MHz Resolutio   | ject #:03U21<br>npany Namo | iam Zhuang<br>181-1<br>e:Cisco Syste<br>802.11b/g min<br>m 1200 D |              | ugan n    | ш Ор        | си <b>г</b> IeiQ | Jue        |          |              |          |            |              |           |             |  |
|---|----------------------------|---|--------------|-----------|-------------|------------------|------------|----------|--------------|----------|------------|--------------|-----------|-------------|--|
| Spectrum Analyzer       Horn > 18GHz         Tigs Si/N: 3245 @ In       The reagenities I T86 Miteg 924341       Call I I I I I I I I I I I I I I I I I I   | -                          |   | 'agi Antenna |           |             |                  |            |          |              |          |            |              |           |             |  |
| Total part 2 total         Tage manual part 2 total         Total part 2 total         Total part 2 total         Total part 2 total         Per Massurements:<br>1 MHz Resolution Bandwidth       Average Measurements:<br>1 MHz Resolution Bandwidth         Colspan="2">Open Mark 2 total part 2 total         Per Massurements:<br>1 MHz Resolution Bandwidth       Average Measurements:<br>1 MHz Resolution Bandwidth         Open Mark 2 total part 2 total         Per Massurements:<br>1 MHz Resolution Bandwidth       Average Measurements:<br>1 MHz Resolution Bandwidth         Open Mark 2 total part 2 total  |                            | _   | Pro omplife  | or 1 26CL | <b>I</b> -2 | 5                | Spectrum A | nalyzer  |              |          | ¥7         |              |           |             |  |
| V (2 ft)       C (2 - 3 ft)       C (1 - 6 ft)       V (12 ft)       Image: A reasonable of the analysis of |                            |   |              |           | -           |                  |            |          | er 🚽         |          | HOFII > 10 | GHZ          | -         |             |  |
| GHz         feet         dBuV         dBv/         dB         dB         dB         dBuV/m         dBuV  |                            |   | (4 ~ 6 ft)   | 🗸 (12 ft) |             |                  |            | 1 MHz    | Resolution E | andwidth | 1 MHz Reso | lution Bandw |           |             |  |
| 824         9.8         52.8         44.5         33.8         3.9         45.6         0.0         1.0         45.8         37.5         74.0         54.0         -28.2         -16.5         g mode, Low           824         9.8         51.2         40.6         33.8         3.9         445.6         0.0         1.0         44.2         33.6         74.0         54.0         -26.3         -16.5         g mode, Low           236         9.8         51.6         41.0         36.9         49         -46.6         0.0         1.0         47.7         37.1         74.0         54.0         -26.3         -16.9         g mode, Low           236         9.8         47.4         38.2         36.9         4.9         -46.6         0.0         1.0         47.0         37.6         74.0         54.0         -26.3         -16.4         g mode, Low           648         9.8         48.2         35.5         38.6         5.8         -45.2         0.0         1.0         45.0         -27.0         -16.4         g mode, Mode, Low           874         9.8         47.9         40.1         33.8         3.9         -45.6         0.0         1.0         45.0   |                            |   |              |           |             |                  |            | HPF      |              |          |            |              |           |             | Notes                                    |
| 824         9.8         51.2         40.6         33.8         3.9         -45.6         0.0         1.0         44.2         33.6         74.0         54.0         -29.8         -20.4         g mode, Low           236         9.8         51.6         41.0         36.9         4.9         -46.6         0.0         1.0         47.7         37.1         74.0         54.0         -26.3         -16.9         g mode, Low           236         9.8         47.4         38.2         36.9         49.4         60.0         1.0         47.7         37.1         74.0         54.0         -26.3         -16.9         g mode, Low           648         9.8         46.2         37.5         38.6         5.8         -45.2         0.0         1.0         47.0         37.6         74.0         54.0         -22.4         -13.9         g mode, Low           648         9.8         45.2         35.5         38.6         0.0         1.0         44.3         35.6         74.0         54.0         -22.4         -13.9         g mode, Mid           874         9.8         47.9         40.1         33.8         3.9         -45.6         0.0         1.0         40.9  |                            |   |              |           |             |                  |            | 1.0      |              |          |            |              |           |             |  |
| 236       9.8       51.6       41.0       36.9       4.9       46.6       0.0       1.0       47.7       37.1       74.0       54.0       -26.3       -16.9       g mode, Low         236       9.8       47.4       38.2       36.9       4.9       46.6       0.0       1.0       47.7       37.1       74.0       54.0       -26.3       -16.7       g mode, Low         236       9.8       46.0       37.5       38.6       5.8       45.2       0.0       1.0       47.0       37.6       74.0       54.0       -27.0       -16.4       g mode, Low         648       9.8       48.2       35.5       38.6       5.8       45.2       0.0       1.0       47.0       37.6       74.0       54.0       -25.7       -18.4       g mode, Low         874       9.8       48.2       33.5       1.8       0.0       1.0       40.9       33.1       74.0       54.0       -22.4       -13.9       g mode, Mid         311       9.8       53.6       42.1       37.0       4.9       -46.6       0.0       1.0       49.0       38.7       74.0       54.0       -24.3       -14.6       g mode, Mid       74.0   |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             | g mode, Low ch, V                        |
| 648         9.8         46.9         37.5         38.6         5.8         -45.2         0.0         1.0         47.0         37.6         74.0         54.0         -27.0         -16.4         g mode, Low           648         9.8         48.2         35.5         38.6         5.8         -45.2         0.0         1.0         47.0         37.6         74.0         54.0         -25.7         -16.4         g mode, Low           874         9.8         58.6         47.1         33.8         3.9         -45.6         0.0         1.0         51.6         42.1         -13.9         g mode, Mid           874         9.8         47.9         40.1         33.8         3.9         -45.6         0.0         1.0         40.9         33.1         74.0         54.0         -22.4         -13.9         g mode, Mid           311         9.8         50.7         38.8         37.0         4.9         46.6         0.0         1.0         47.0         35.1         74.0         54.0         -27.0         -18.9         g mode, Mid           311         9.8         49.5         39.2         38.5         5.8         -45.1         0.0         1.0         49.7   |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             | g mode, Low ch, V                        |
| 648       9.8       48.2       35.5       38.6       5.8       -45.2       0.0       1.0       48.3       35.6       74.0       54.0       -25.7       -18.4       g mode, Mid         874       9.8       58.6       47.1       33.8       3.9       45.6       0.0       1.0       48.3       35.6       74.0       54.0       -25.7       -18.4       g mode, Mid         874       9.8       47.9       40.1       33.8       3.9       45.6       0.0       1.0       40.9       33.1       74.0       54.0       -33.1       -20.9       g mode, Mid         311       9.8       50.7       38.8       37.0       4.9       -46.6       0.0       1.0       47.0       35.1       74.0       54.0       -24.1       -15.6       g mode, Mid         311       9.8       50.7       38.8       37.0       4.9       -46.6       0.0       1.0       47.0       35.1       74.0       54.0       -24.1       -15.6       g mode, Mid         748       9.8       48.8       38.5       38.5       5.8       -45.1       0.0       1.0       49.0       38.7       74.0       54.0       -25.4       -14.6 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>g mode, Low ch, H</td></td<>   |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             | g mode, Low ch, H                        |
| 874       9.8       58.6       47.1       33.8       3.9       -45.6       0.0       1.0       10.6       40.1       74.0       54.0       -22.4       -13.9       g mode, Mid         874       9.8       47.9       40.1       33.8       3.9       -45.6       0.0       1.0       40.9       33.1       74.0       54.0       -22.4       -13.9       g mode, Mid         874       9.8       45.5       42.1       37.0       4.9       -46.6       0.0       1.0       49.9       38.4       74.0       54.0       -24.1       -15.6       g mode, Mid         311       9.8       405.5       30.2       38.8       37.0       4.9       -46.6       0.0       1.0       49.9       38.4       74.0       54.0       -24.1       -15.6       g mode, Mid         748       9.8       49.5       30.2       38.5       5.8       -45.1       0.0       1.0       49.0       38.7       74.0       54.0       -24.3       -14.6       g mode, Mid         924       9.8       45.6       46.4       33.8       3.9       -45.7       0.0       1.0       42.1       35.1       74.0       54.0       -25.4       <   |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             | g mode, Low ch, V                        |
| 874       9.8       47.9       40.1       33.8       3.9       -45.6       0.0       1.0       40.9       33.1       74.0       54.0       -33.1       -20.9       g mode, Mid         311       9.8       53.6       42.1       37.0       4.9       -46.6       0.0       1.0       49.9       38.4       74.0       54.0       -23.1       -20.9       g mode, Mid         311       9.8       50.7       38.8       37.0       4.9       -46.6       0.0       1.0       47.0       35.1       74.0       54.0       -27.0       -18.9       g mode, Mid         748       9.8       49.5       39.2       38.5       5.8       -45.1       0.0       1.0       49.7       39.4       74.0       54.0       -27.0       -18.9       g mode, Mid         748       9.8       45.5       46.4       33.8       3.9       -45.7       0.0       1.0       49.0       38.7       74.0       54.0       -25.0       -15.3       g mode, High         924       9.8       45.5       38.5       37.1       5.0       -46.5       0.0       1.0       42.1       35.1       74.0       54.0       -25.4       -14.6  |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             |  |
| 311       9.8       53.6       42.1       37.0       4.9       -46.6       0.0       1.0       49.9       38.4       74.0       54.0       -24.1       -15.6       g mode, Mid         311       9.8       50.7       38.8       37.0       4.9       -46.6       0.0       1.0       47.0       35.1       74.0       54.0       -27.0       -18.9       g mode, Mid         748       9.8       49.5       39.2       38.5       5.8       -45.1       0.0       1.0       47.0       39.4       74.0       54.0       -27.0       -18.9       g mode, Mid         748       9.8       49.5       39.2       38.5       5.8       -45.1       0.0       1.0       49.0       38.7       74.0       54.0       -25.0       -15.3       g mode, High         924       9.8       45.1       42.1       33.8       3.9       -45.7       0.0       1.0       48.6       39.4       74.0       54.0       -25.4       -14.6       g mode, High         386       9.8       51.4       38.8       37.1       5.0       -46.5       0.0       1.0       47.0       54.0       -25.2       -18.8       g mode, High <tr< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>g mode, Mid ch, H</td></tr<>  |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             | g mode, Mid ch, H                        |
| 748         9.8         49.5         39.2         39.2         5.8         -45.1         0.0         1.0         49.7         39.4         74.0         54.0         -24.3         -14.6         g mode, Mid           748         9.8         48.8         38.5         38.5         5.8         -45.1         0.0         1.0         49.7         39.4         74.0         54.0         -25.0         -15.3         g mode, Mid           924         9.8         55.6         46.4         33.8         3.9         -45.7         0.0         1.0         48.6         39.4         74.0         54.0         -25.4         -14.6         g mode, Mid           924         9.8         55.6         46.4         33.8         3.9         -45.7         0.0         1.0         42.1         35.1         74.0         54.0         -25.4         -14.6         g mode, High           926         9.8         51.4         38.5         37.1         5.0         -46.5         0.0         1.0         47.8         35.2         74.0         54.0         -23.1         -19.1         g mode, High           848         9.8         48.4         41.2         38.5         5.8         -45.0   |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             | g mode, Mid ch, V                        |
| 748         9.8         48.8         38.5         5.8         -45.1         0.0         1.0         49.0         38.7         74.0         54.0         -25.0         -15.3         g mode, High           924         9.8         55.6         46.4         33.8         3.9         -45.7         0.0         1.0         48.6         39.4         74.0         54.0         -25.4         -14.6         g mode, High           924         9.8         49.1         42.1         33.8         3.9         45.7         0.0         1.0         42.1         35.1         74.0         54.0         -25.4         -14.6         g mode, High           386         9.8         54.5         38.5         37.1         5.0         -46.5         0.0         1.0         47.8         35.2         74.0         54.0         -25.3         -12.5         g mode, High           346         9.8         51.4         38.8         37.1         5.0         -46.5         0.0         1.0         47.8         35.2         74.0         54.0         -26.2         -18.8         g mode, High           848         9.8         51.7         41.2         38.5         5.8         -45.0         0.0  |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             | g mode, Mid ch, H                        |
| 924         9.8         55.6         46.4         33.8         3.9         -45.7         0.0         1.0         48.6         39.4         74.0         54.0         -25.4         -14.6         g mode, High<br>g mode, High<br>g mode, High           924         9.8         49.1         42.1         33.8         3.9         -45.7         0.0         1.0         42.1         35.1         74.0         54.0         -25.4         -14.6         g mode, High<br>g mode, High           386         9.8         54.5         38.5         37.1         5.0         -46.5         0.0         1.0         54.0         -23.1         -19.1         g mode, High<br>g mode, High           386         9.8         51.4         38.8         37.1         5.0         -46.5         0.0         1.0         47.8         35.2         74.0         54.0         -26.2         -18.8         g mode, High           848         9.8         48.4         41.2         38.5         5.8         -45.0         0.0         1.0         48.7         41.5         74.0         54.0         -26.2         -18.8         g mode, High           848         9.8         51.7         41.2         38.5         5.8         -45.0   |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             | g mode, Mid ch, V                        |
| 924         9.8         49.1         42.1         33.8         3.9         -45.7         0.0         1.0         42.1         35.1         74.0         54.0         -31.9         -18.9         g mode, High<br>g mode, High<br>386           386         9.8         54.5         38.5         37.1         5.0         -46.5         0.0         1.0         42.1         35.1         74.0         54.0         -23.1         -19.1         g mode, High<br>g mode, High<br>35.2         74.0         54.0         -26.2         1.8.8         g mode, High<br>g mode, High<br>54.0         -26.2         1.8.8         g mode, High<br>35.2         74.0         54.0         -26.2         1.8.8         g mode, High<br>35.2         74.0         54.0         -26.2         1.8.8         g mode, High<br>35.2         74.0         54.0         -26.2         1.8.8         g mode, High<br>36.0         -25.3         -12.5         g mode, High<br>36.0         -22.0         -12.5         g mode, High<br>36.0         -22.0         -12.5         g mode, High<br>36.0         -22.0         -12.5         g mode, High<br>36.0         -10.0         -10.0         -10.0         -10.0         -10.0         -12.5         g mode, High<br>36.0         -12.5         g mode, High<br>36.0         -10.0         -10.0         -12.5         g mode, High<br>36.0  |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             |  |
| 386         9.8         54.5         38.5         37.1         5.0         -46.5         0.0         1.0         50.9         34.9         74.0         54.0         -23.1         -19.1         g mode, High           386         9.8         51.4         38.8         37.1         5.0         -46.5         0.0         1.0         47.8         35.2         74.0         54.0         -26.2         -18.8         g mode, High           848         9.8         48.4         41.2         38.5         5.8         -45.0         0.0         1.0         48.7         74.0         54.0         -26.2         -18.8         g mode, High           848         9.8         51.7         41.2         38.5         5.8         -45.0         0.0         1.0         48.7         41.5         74.0         54.0         -28.3         -12.5         g mode, High           848         9.8         51.7         41.2         38.5         5.8         -45.0         0.0         1.0         45.0         -26.0         -12.5         g mode, High           9.8         51.7         41.2         38.5         5.8         -45.0         0.0         1.0         52.0         41.5         74.0   |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             | g mode, High ch, H                       |
| 848         9.8         48.4         41.2         38.5         5.8         -45.0         0.0         1.0         48.7         41.5         74.0         54.0         -25.3         -12.5         g mode, High           848         9.8         51.7         41.2         38.5         5.8         -45.0         0.0         1.0         52.0         41.5         74.0         54.0         -22.0         -12.5         g mode, High           6         Measurement Frequency         Ang         Preamp Gain         Avg Lim         Average Field Strength Limit           7         Distance to Antenna         D Corr         Distance Correct to 3 meters         Pk Lim         Peak Field Strength Limit           8         Areage Field Strength         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  | 86 9.8                     | 54.5  | 38.5         | 37.1      |             | -46.5            |            | 1.0      | 50.9         | 34.9     | 74.0       | 54.0         | -23.1     | -19.1       | g mode, High ch, V                       |
| 848     9.8     51.7     41.2     38.5     5.8     45.0     0.0     1.0     52.0     41.5     74.0     54.0     -22.0     -12.5     g mode, High       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       AF     Antenna Factor     Peak     Calculated Peak Field Strength     Pk Mar     Margin vs. Peak Limit  |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             | g mode, High ch, H                       |
| f     Measurement Frequency     Amp     Preamp Gain     Avg Lim     Average Field Strength Limit       Dist     Distance to Antenna     D Corr     Distance Correct to 3 meters     Pk Lim     Peak Field Strength Limit       Read     Analyzer Reading     Avg     Average Field Strength @ 3 m     Avg Mar     Margin vs. Average Limit       AF     Antenna Factor     Peak     Calculated Peak Field Strength     Pk Mar     Margin vs. Peak Limit   |                            |   |              |           |             |                  |            |          |              |          |            |              |           |             | g mode, High ch, V<br>g mode, High ch, H |
| DistDistance to AntennaD CorrDistance Correct to 3 metersPk LimPeak Field Strength LimitReadAnalyzer ReadingAvgAverage Field Strength @ 3 mAvg MarMargin vs. Average LimitAFAntenna FactorPeakCalculated Peak Field StrengthPk MarMargin vs. Peak Limit   |                            |   |              |           |             |                  |            | 1.0      |              |          |            |              |           |             |  |
| AF Antenna Factor Peak Calculated Peak Field Strength Pk Mar Margin vs. Peak Limit  | Dist                       |   |              |           |             |                  | -          |          | t to 3 mete  | ers      |            | -            |           |             |  |
|   | Read                       | Analyzer R  | teading      |           |             | Avg              | Average    | Field S  | trength @    | 3 m      |            | Avg Mar      | Margin vs | . Average L | imit                                     |
|   | AF                         | Antenna F   | actor        |           |             | Peak             | Calculate  | ed Peak  | Field Stre   | ngth     |            | Pk Mar       | Margin vs | . Peak Limi | t  |
| CL Cable Loss HPF High Pass Filter  |                            | Cable Loss  | 5            |           |             | HPF              | High Pas   | s Filter |              |          |            |              |           |             |  |
|   | CL                         |   |              |           |             |                  |            |          |              |          |            |              |           |             |  |

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# 7.8.2. RADIATED EMISSIONS WITH 8.5 dBi PATCH ANTENNA

## RADIATED RF MEASUREMENT SETUP

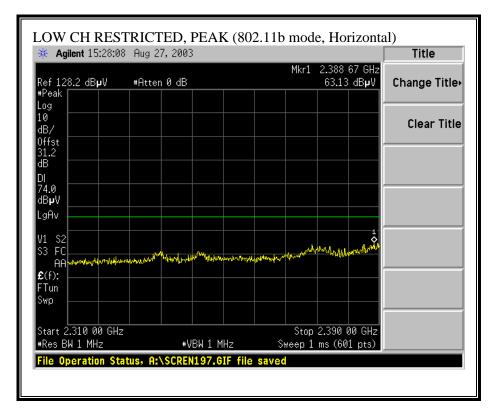


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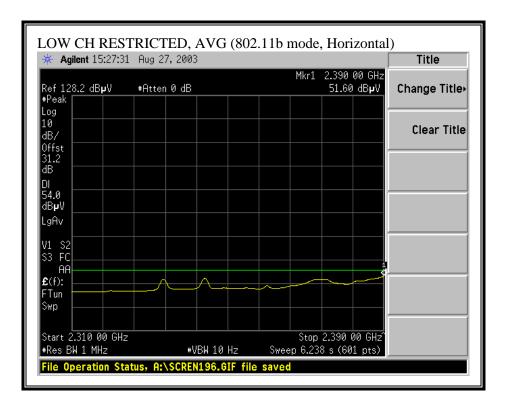


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### RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

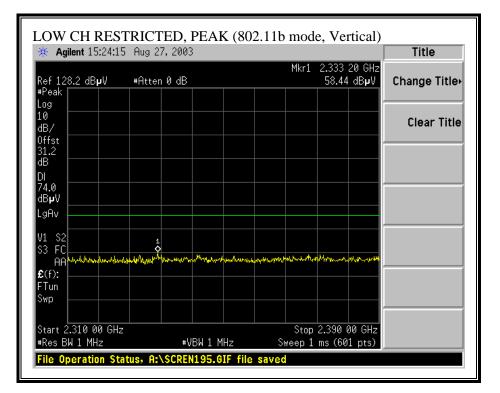


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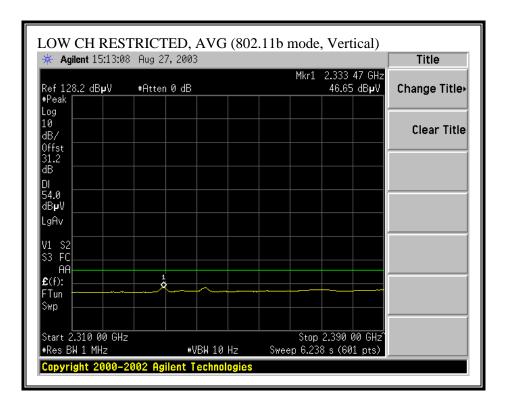


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### RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)

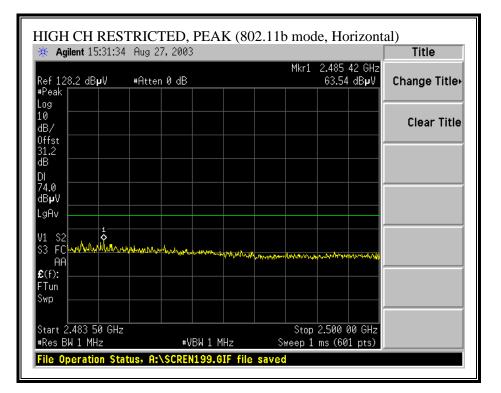


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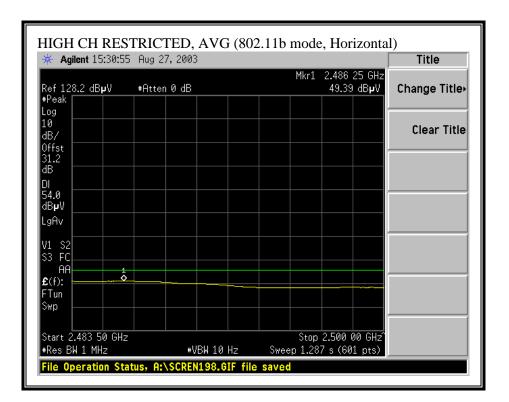


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### RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)

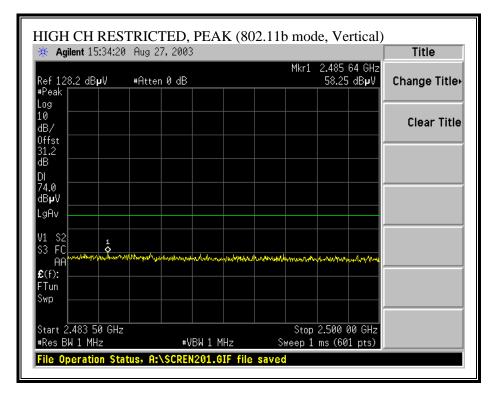


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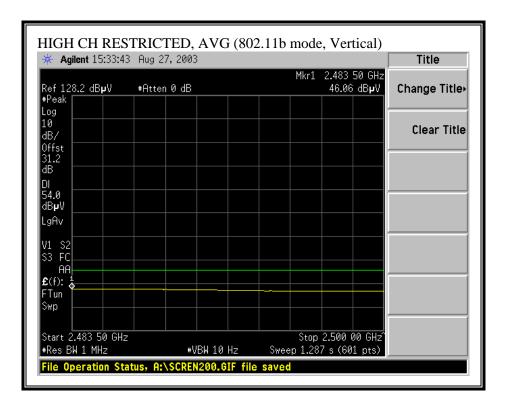


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### RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)



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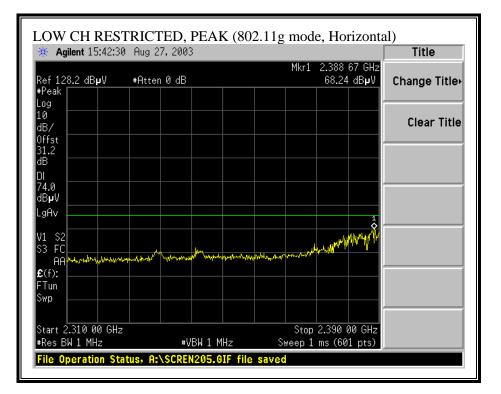
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#### HARMONICS AND SPURIOUS EMISSIONS (b MODE)

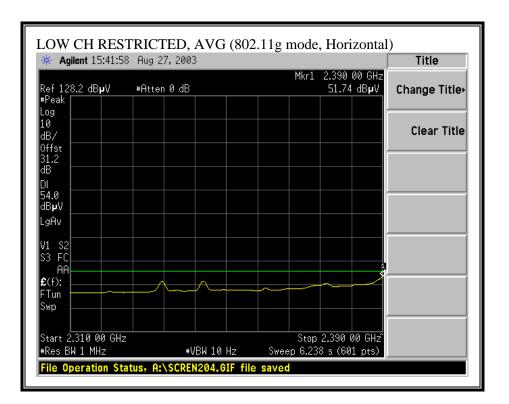
| EMCO Horn 1-<br>T59; S/N: 3245                                 | C 15.247<br>nsmit with P<br>18CHz<br>@1m<br>les | Pre-amplify<br>T86 Miteq 9 | er 1-26GF    | lz<br>-    |                | spectrum A   |            |  |               | Horn > 18        | GHz                                     |                |                              |  |
|--|---|----------------------------|--------------|------------|----------------|--------------|------------|--|---------------|------------------|---|----------------|------------------------------|--|
| T59; S/N: 3245<br>Hi Frequency Cat<br>☑ (2 ft)                 | 18GHz<br>@1m                                    | Pre-amplife<br>T86 Miteq 9 | er 1-26GF    | Iz<br>-    |                |              |            |  |               | Horn > 18        | GHz                                     |                |                              |  |
| EMCO Horn 1-<br>T59; S/N: 3245<br>Hi Frequency Cat<br>♥ (2 ft) | -18GHz<br>@1m 🚽                                 | T86 Miteq 9                |              | Iz         |                |              |            |  |               | Horn > 18        | GHz                                     |                |                              |  |
| EMCO Horn 1-<br>T59; S/N: 3245<br>Hi Frequency Cat<br>♥ (2 ft) | -18GHz<br>@1m 🚽                                 | T86 Miteq 9                |              | łz         |                |              |            |  |               | Horn > 18        | GHz                                     |                |                              |  |
| T59; S/N: 3245<br>Hi Frequency Cat<br>☑ (2 ft)                 | @1m 🔻   | T86 Miteq 9                |              | Hz<br>T    |                |              |            |  |               | Horn > 18        | GHz                                     |                |                              |  |
| Hi Frequency Cat   | bles  |                            | 024341       | -          | Agile          | nt E4446A    | Analyze    |  |               |                  |   |                |                              |  |
| 🔽 (2 ft)   |   | (4 ~ 6 ft)                 |              | _          | 1              |              |            | ·r 🗣                                     |               |                  |   | -              |                              |  |
| 🔽 (2 ft)   |   | (4 ~ 6 ft)                 |              |            |                |              |            |  |               |                  |   |                |                              |  |
| f Dist   |   |                            | ✓ (12 ft)    |            |                |              | 1 MHz      | Measureme<br>Resolution B<br>Video Bandw | andwidth      |                  | leasuremen<br>lution Bandw<br>Bandwidth |                |                              |  |
| I Dist   | D ID  | <b>D</b> 14                | 4.5          | CI         |                | D.C.         | IDE        | <b>D</b> 1                               |               | DI T.            | 4 T.                                    | DI M           |                              | N. /                                     |
| GHz feet   | Read Pk<br>dBuV                                 | Read Avg.<br>dBuV          | AF<br>dB/m   | CL<br>dB   | Amp<br>dB      | D Corr<br>dB | HPF        | Peak<br>dBuV/m                           | Avg<br>dBuV/m | Pk Lim<br>dBuV/m | Avg Lim<br>dBuV/m                       | Pk Mar<br>dB   | Avg Mar<br>dB                | Notes                                    |
| 824 9.8  | 63.3  | 49.6                       | 33.8         | 3.9        | -45.6          | 0.0          | 1.0        | 56.3                                     | 42.6          | 74.0             | 54.0                                    | -17.7          | -11.4                        | b mode, Low ch, V                        |
| 824 9.8  | 52.9  | 41.0                       | 33.8         | 3.9        | -45.6          | 0.0          | 1.0        | 45.9                                     | 34.0          | 74.0             | 54.0                                    | -28.1          | -20.0                        | b mode, Low ch, H                        |
| 236 9.8  | 58.1  | 48.4                       | 36.9         | 4.9        | -46.6          | 0.0          | 1.0        | 54.2                                     | 44.5          | 74.0             | 54.0                                    | -19.8          | -9.5                         | b mode, Low ch, V                        |
| 236 9.8<br>648 9.8   | 54.9<br>51.1                                    | 43.4 43.1                  | 36.9<br>38.6 | 4.9        | -46.6<br>-45.2 | 0.0          | 1.0<br>1.0 | 51.1<br>51.2                             | 39.5<br>43.2  | 74.0 74.0        | 54.0<br>54.0                            | -22.9<br>-22.8 | -14.5<br>-10.8               | b mode, Low ch, H<br>b mode, Low ch, V   |
| 648 9.8  | 49.8  | 41.3                       | 38.6         | 5.8        | -45.2          | 0.0          | 1.0        | 49.9                                     | 41.4          | 74.0             | 54.0                                    | -22.0          | -12.6                        | b mode, Low ch, V                        |
| 874 9.8  | 64.5  | 52.2                       | 33.8         | 3.9        | -45.6          | 0.0          | 1.0        | 57.5                                     | 45.2          | 74.0             | 54.0                                    | -16.5          | -8.8                         | b mode, Mid ch, V                        |
| 874 9.8  | 56.2  | 45.8                       | 33.8         | 3.9        | -45.6          | 0.0          | 1.0        | 49.3                                     | 38.8          | 74.0             | 54.0                                    | -24.7          | -15.2                        | b mode, Mid ch, H                        |
| 311 9.8  | 56.5  | 47.5                       | 37.0         | 4.9        | -46.6          | 0.0          | 1.0        | 52.7                                     | 43.8          | 74.0             | 54.0                                    | -21.3          | -10.2                        | b mode, Mid ch, V                        |
| 311         9.8           748         9.8                      | 59.3<br>52.1                                    | 45.8<br>41.6               | 37.0<br>38.5 | 4.9<br>5.8 | -46.6<br>-45.1 | 0.0          | 1.0<br>1.0 | 55.6<br>52.3                             | 42.1<br>41.8  | 74.0<br>74.0     | 54.0<br>54.0                            | -18.4<br>-21.7 | -11.9<br>-12.2               | b mode, Mid ch, H<br>b mode, Mid ch, V   |
| 748 9.8  | 52.9  | 42.3                       | 38.5         | 5.8        | -45.1          | 0.0          | 1.0        | 53.0                                     | 42.4          | 74.0             | 54.0                                    | -21.0          | -11.6                        | b mode, Mid ch, H                        |
| 924 9.8  | 60.4  | 47.5                       | 33.8         | 3.9        | -45.7          | 0.0          | 1.0        | 53.4                                     | 40.6          | 74.0             | 54.0                                    | -20.6          | -13.4                        | b mode, High ch, V                       |
| 924 9.8<br>386 9.8   | 56.9  | 45.3<br>40.9               | 33.8         | 3.9        | -45.7          | 0.0          | 1.0        | 49.9<br>47.9                             | 38.3<br>37.3  | 74.0<br>74.0     | 54.0<br>54.0                            | -24.1<br>-26.1 | -15.7                        | b mode, High ch, H                       |
| 386 9.8<br>386 9.8   | 51.4<br>50.5                                    | 39.4                       | 37.1<br>37.1 | 5.0<br>5.0 | -46.5<br>-46.5 | 0.0          | 1.0        | 46.9                                     | 35.9          | 74.0             | 54.0                                    | -20.1          | -16.7<br>-18.1               | b mode, High ch, V<br>b mode, High ch, H |
| 848 9.8  | 47.0  | 35.7                       | 38.5         | 5.8        | -45.0          | 0.0          | 1.0        | 47.2                                     | 36.0          | 74.0             | 54.0                                    | -26.8          | -18.0                        | b mode, High ch, V                       |
| 848 9.8  | 48.0  | 36.7                       | 38.5         | 5.8        | -45.0          | 0.0          | 1.0<br>1.0 | 48.3                                     | 37.0          | 74.0             | 54.0                                    | -25.7          | -17.0                        | b mode, High ch, H                       |
|  |   | · E                        |              |            |                |              |            |  |               |                  | а. т. <sup>.</sup>                      |                | : 11.0,                      | · • · ·                                  |
| f<br>Dist  |   | ent Frequenc               | у            |            | Amp<br>D Corr  | Preamp C     |            | t to 3 mete                              |               |                  |   |                | ield Strengtl<br>Strength Li |  |
|  | Distance to<br>Analyzer R                       |                            |              |            | Avg            |              |            | trength @                                |               |                  |   |                | . Average Li                 |  |
| AF   | Antenna Fa                                      |                            |              |            | Peak           | •            |            | Field Stre                               |               |                  |   |                | . Peak Limit                 |  |
| CL   | Cable Loss                                      |                            |              |            | HPF            | High Pas     |            |  | ngui          |                  | I K Iviai                               | wagin vs       | . I Cak Lillin               |  |
| CL   | Cable Loss                                      |                            |              |            | III I          | ringii r as  | s Filler   |  |               |                  |   |                |                              |  |

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

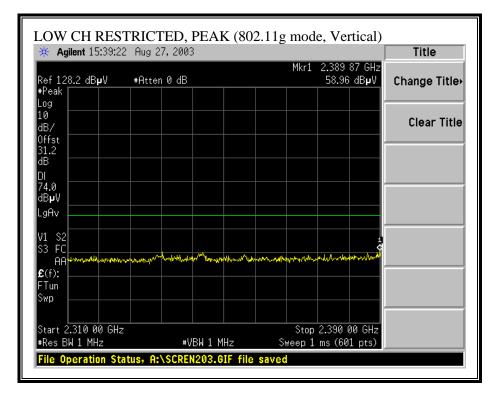


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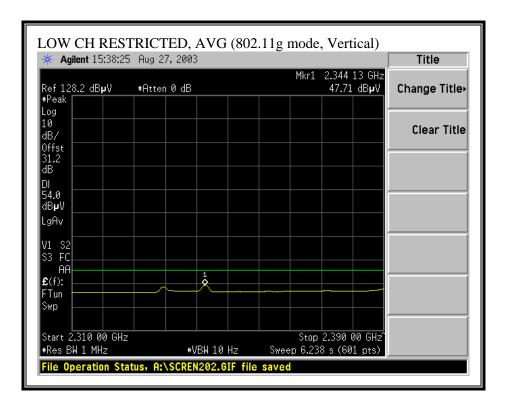


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## RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)

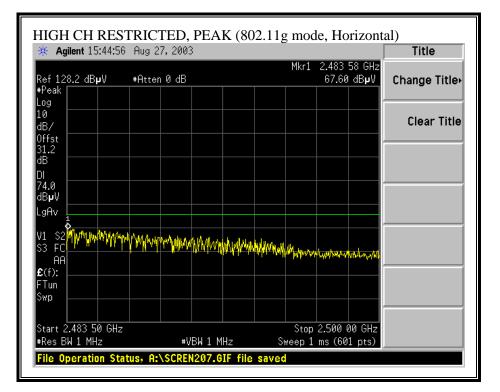


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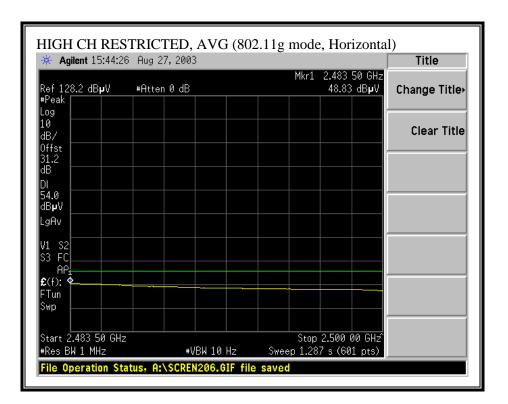


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### RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)

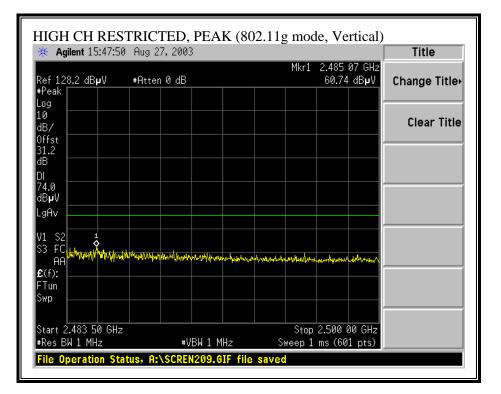


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## RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)



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| Agilent 15:47:10       | 3 Aug 27, 20 | 03 |      |                               | Title       |
|------------------------|--------------|----|------|-------------------------------|-------------|
| ef 128.2 dB <b>µ</b> V | #Atten 0 dE  | }  | Mkr1 | 2.483 50 GH:<br>46.02 dBµV    |             |
| Peak<br>Dg             |              |    |      |                               |             |
| 0<br>B/                |              |    |      |                               | Clear Title |
| ffst<br>1.2            |              |    |      |                               |             |
| B                      |              |    |      |                               |             |
| 4.0                    |              |    |      |                               |             |
| 4.0<br>B <b>µ</b> V    |              |    |      |                               |             |
| gAv 🛛                  |              |    |      |                               |             |
| 1 \$2                  |              |    |      |                               |             |
| 3 FC                   |              |    |      |                               |             |
| AA                     |              |    |      |                               |             |
| (f): 4<br>Tun          |              |    |      |                               |             |
| wp                     |              |    |      |                               |             |
|                        |              |    |      |                               |             |
| tart 2.483 50 GHz      |              |    | Stop | 2.500 00 GHz<br>7 s (601 pts) |             |

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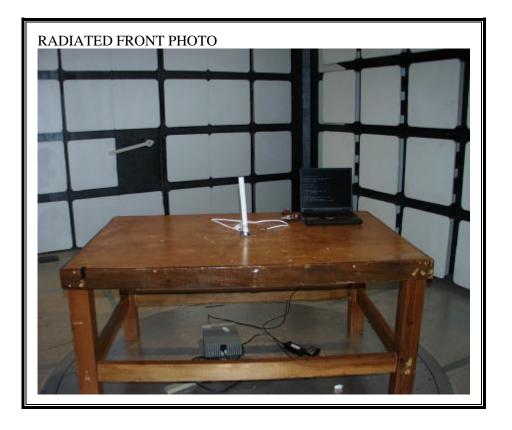
#### HARMONICS AND SPURIOUS EMISSIONS (g NORMAL MODE)

| Project #<br>Company<br>EUT Des<br>EUT M/I<br>Fest Tary | 4:03U218<br>y Name:<br>scrip.:80<br>N:Orion<br>get:FCC | Cisco Syster<br>2.11b/g min<br>1200 D<br>2 15.247                  | ms, Akron<br>i-PCI Card<br>atch Antenna |              |            |                                     |            |                              |  |              |              |  |                         |   |   |
|---|--|--|---|--------------|------------|-------------------------------------|------------|------------------------------|--|--------------|--------------|--|-------------------------|---|---|
| -   | ipment:  |  | aten Antenna                            | 1            |            |                                     |            |                              |  |              |              |  |                         |   |   |
| EMCO  | Horn 1-  | 18GHz  | Pre-amplife                             | er 1-26GF    | łz         | 5                                   | Spectrum A | nalyzer                      |  |              | Horn > 18    | GHz  |                         |   |   |
| T59; S/   | 'N: 3245 (   | @1m 🔫  | T86 Miteq 9                             | 24341        | -          | Agile                               | ent E4446A | Analyze                      | er 🚽                                       |              |              |  | -                       |   |   |
| Hi Fred   | quency Cab<br>ft)                                      |  | <b>(4 ~ 6 ft)</b>                       | ✔ (12 ft)    |            | ]                                   |            | 1 MHz                        | Measureme<br>Resolution E<br>Video Bandv   | andwidth     |              | <b>leasuremen</b><br>lution Bandw<br>Bandwidth |                         |   |   |
| f   | Dist   | Read Pk  | Read Avg.                               | AF           | CL         | Amp                                 | D Corr     | HPF                          | Peak                                       | Avg          | Pk Lim       | Avg Lim  | Pk Mar                  | Avg Mar   | Notes                                   |
| GHz   | feet   | dBuV   | dBuV                                    | dB/m         | dB         | dB                                  | dB         | 1.0                          | dBuV/m                                     |              | dBuV/m       | dBuV/m   | dB                      | dB  |   |
| 4.824<br>4.824  | 9.8<br>9.8   | 54.8<br>47.9   | 49.7<br>40.5                            | 33.8<br>33.8 | 3.9<br>3.9 | -45.6<br>-45.6                      | 0.0        | 1.0                          | 47.8<br>40.9                               | 42.7<br>33.5 | 74.0<br>74.0 | 54.0<br>54.0                                   | -26.2<br>-33.1          | -11.3<br>-20.5  | g mode, Low ch, V<br>g mode, Low ch, H  |
| .236  | 9.8  | 52.1   | 45.2                                    | 36.9         | 4.9        | -46.6                               | 0.0        | 1.0                          | 48.2                                       | 41.3         | 74.0         | 54.0   | -25.8                   | -12.7   | g mode, Low ch, H                       |
| .236  | 9.8  | 50.7   | 42.6                                    | 36.9         | 4.9        | -46.6                               | 0.0        | 1.0                          | 46.9                                       | 38.7         | 74.0         | 54.0   | -27.1                   | -15.3   | g mode, Low ch, H                       |
| .648  | 9.8  | 49.7   | 42.6                                    | 38.6         | 5.8        | -45.2                               | 0.0        | 1.0                          | 49.8                                       | 42.7         | 74.0         | 54.0   | -24.2                   | -11.3   | g mode, Low ch, V                       |
| .648<br>.874  | 9.8<br>9.8   | 50.0<br>56.5   | 42.5                                    | 38.6<br>33.8 | 5.8<br>3.9 | -45.2<br>-45.6                      | 0.0        | 1.0<br>1.0                   | 50.1<br>49.5                               | 42.6         | 74.0         | 54.0<br>54.0                                   | -23.9<br>-24.5          | -11.4<br>-16.3  | g mode, Low ch, H                       |
| .874  | 9.8  | 50.5   | 44.7                                    | 33.8         | 3.9        | -45.6                               | 0.0        | 1.0                          | 49.5                                       | 41.3         | 74.0         | 54.0   | -24.5                   | -10.5   | g mode, Mid ch, V<br>g mode, Mid ch, H  |
| .311  | 9.8  | 51.1   | 38.9                                    | 37.0         | 4.9        | -46.6                               | 0.0        | 1.0                          | 47.3                                       | 35.2         | 74.0         | 54.0   | -26.7                   | -18.8   | g mode, Mid ch, V                       |
| .311  | 9.8  | 54.5   | 45.1                                    | 37.0         | 4.9        | -46.6                               | 0.0        | 1.0                          | 50.8                                       | 41.4         | 74.0         | 54.0   | -23.2                   | -12.6   | g mode, Mid ch, H                       |
| 9.748   | 9.8  | 54.4   | 41.4                                    | 38.5         | 5.8        | -45.1                               | 0.0        | 1.0                          | 54.6                                       | 41.6         | 74.0         | 54.0   | -19.4                   | -12.4   | g mode, Mid ch, V                       |
| 9.748   | 9.8  | 52.1   | 46.1                                    | 38.5         | 5.8        | -45.1                               | 0.0        | 1.0                          | 52.2                                       | 46.2         | 74.0         | 54.0   | -21.8                   | -7.8<br>-8.7  | g mode, Mid ch, H<br>g mode, High ch, V |
| 4.924<br>4.924  | 9.8<br>9.8   | 65.7<br>57.6   | 52.2<br>47.5                            | 33.8<br>33.8 | 3.9<br>3.9 | -45.7<br>-45.7                      | 0.0        | 1.0<br>1.0                   | 58.7<br>50.6                               | 45.3<br>40.5 | 74.0<br>74.0 | 54.0<br>54.0                                   | -15.3<br>-23.4          | -8.7  | g mode, High ch, V                      |
| 7.386   | 9.8  | 50.6   | 42.0                                    | 37.1         | 5.0        | -46.5                               | 0.0        | 1.0                          | 47.1                                       | 38.4         | 74.0         | 54.0   | -26.9                   | -15.6   | g mode, High ch, V                      |
| 7.386   | 9.8  | 47.5   | 36.9                                    | 37.1         | 5.0        | -46.5                               | 0.0        | 1.0                          | 43.9                                       | 33.4         | 74.0         | 54.0   | -30.1                   | -20.6   | g mode, High ch, H                      |
| 9.848   | 9.8  | 40.2   | 40.2                                    | 38.5         | 5.8        | -45.0                               | 0.0        | 1.0                          | 40.4                                       | 40.5         | 74.0         | 54.0   | -33.6                   | -13.5   | g mode, High ch, V                      |
| 0.848   | 9.8  | 46.0   | 36.2                                    | 38.5         | 5.8        | -45.0                               | 0.0        | 1.0<br>1.0                   | 46.3                                       | 36.5         | 74.0         | 54.0   | -27.7                   | -17.5   | g mode, High ch, H                      |
|   |  | Measureme<br>Distance to<br>Analyzer R<br>Antenna Fa<br>Cable Loss | leading<br>actor                        | y            |            | Amp<br>D Corr<br>Avg<br>Peak<br>HPF | Average    | Correc<br>Field S<br>ed Peak | et to 3 mete<br>Strength @<br>c Field Stre | 3 m          |              | Pk Lim<br>Avg Mar                              | Peak Field<br>Margin vs | Field Strengt<br>I Strength Li<br>. Average L<br>. Peak Limit | imit<br>imit                            |

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# 7.8.3. RADIATED EMISSIONS WITH 5 dBi OMNI ANTENNA

# RADIATED RF MEASUREMENT SETUP

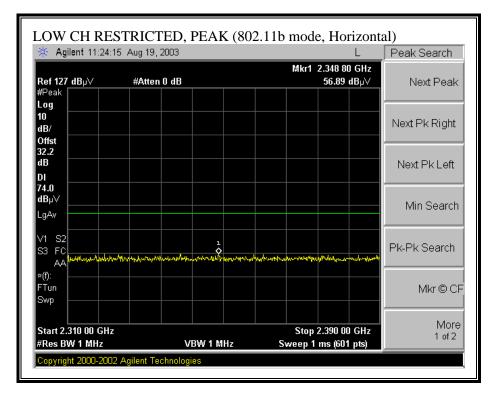


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### RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

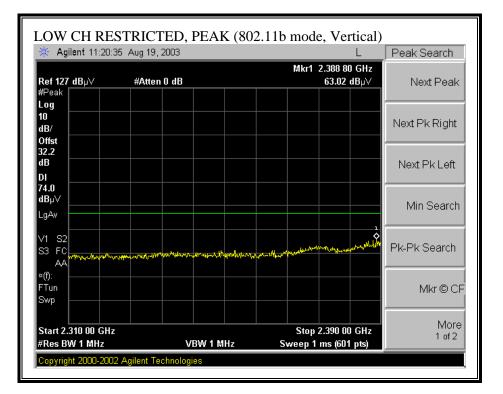


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| 🔆 Agilent 11:24:5   | 51 Aug 19, 2003 | L                              | Peak Search   |
|---------------------|-----------------|--------------------------------|---------------|
| Ref 127 dBµ∀        | #Atten 0 dB     | Mkr1 2.389 20 GH<br>44.32 dBµ∖ |               |
| #Peak<br>Log        |                 |                                | *             |
| 10 dB/              |                 |                                | Next Pk Right |
| Offst<br>32.2<br>dB |                 |                                | Next Pk Left  |
| DI                  |                 |                                |               |
| dBµ∨                |                 |                                | Min Search    |
| LgAv                |                 |                                |               |
| V1 S2               |                 |                                | Pk-Pk Search  |
| ×(f):<br>FTun       |                 |                                | Mkr © CF      |
| Swp                 |                 |                                |               |
| Start 2.310 00 GHz  |                 | Stop 2.390 00 GH               | , More        |
| #Res BW 1 MHz       | #VBW 30 I       |                                | 1 of 2        |

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

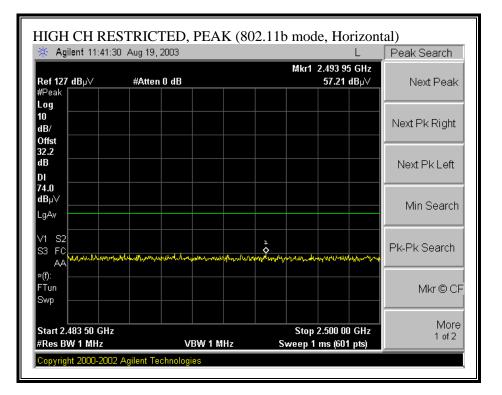


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| 🔆 Agilent 11:21:2    | 1 Aug 19, 2003 |         |                    | L                | Peak Search   |
|----------------------|----------------|---------|--------------------|------------------|---------------|
| Ref 127 dBµ∀         | #Atten 0 dB    |         | Mkr1 2.390<br>50.1 | 00 GHz<br>5 dBµ∨ | Next Peak     |
| #Peak<br>Log         |                |         |                    | *                |               |
| 10<br>dB/            |                |         |                    |                  | Next Pk Right |
| Offst<br>32.2<br>dB  |                |         |                    |                  | Next Pk Left  |
| DI                   |                |         |                    |                  |               |
| dBµ∨<br>LgAv         |                |         |                    |                  | Min Search    |
| V1 S2<br>S3 FC       |                |         |                    |                  | Pk-Pk Search  |
| ×(f):<br>FTun<br>Swp |                |         |                    |                  | Mkr © CF      |
| Start 2.310 00 GHz   |                |         | Stop 2.390         | 00 GHz           | More          |
| #Res BW 1 MHz        | #VR            | W 30 Hz | Sweep 2.079 s (60  |                  | 1 of 2        |

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

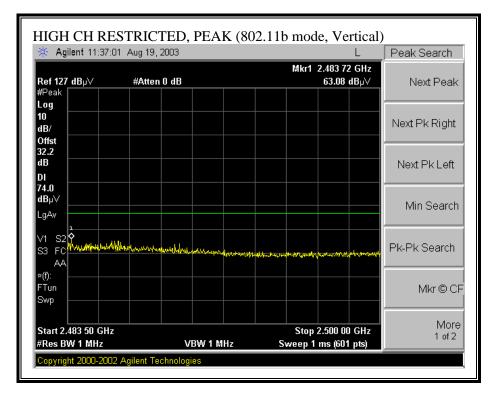


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| 🔆 Agilent 11:42:                    | 05 Aug 19, 2003 |         |                                 | L                | Peak Search   |
|-------------------------------------|-----------------|---------|---------------------------------|------------------|---------------|
| Ref 127 dBµ∨                        | #Atten 0 dB     |         | Mkr1 2.484<br>44.6              | 13 GHz<br>8 dBµ∨ | Next Peak     |
| #Peak<br>Log                        |                 |         |                                 | *                |               |
| 10<br>dB/                           |                 |         |                                 |                  | Next Pk Right |
| Offst<br>32.2<br>dB<br>DI           |                 |         |                                 |                  | Next Pk Left  |
| 54.0<br>dBµ∨<br>LgAv                |                 |         |                                 |                  | Min Search    |
| V1 S2<br>S3 FC                      |                 |         |                                 |                  | Pk-Pk Search  |
| AA<br>≈(f):<br>FTun<br>Swp          |                 |         |                                 |                  | <br>Mkr © Cf  |
| Start 2.483 50 GH                   |                 |         | S4=:: 2-500                     | 00 CH-           | More          |
| Start 2.483 50 GH2<br>#Res BW 1 MHz | z<br>#VBW:      | 30 Hz S | Stop 2.500<br>weep 428.9 ms (6l |                  | 1 of 2        |

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



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| 🔆 Agilent 11:37:4                   | 2 Aug 19, 2003 |           |                     | L                          | Peak Search   |
|-------------------------------------|----------------|-----------|---------------------|----------------------------|---------------|
| Ref 127 dBµ∨                        | #Atten 0 dB    |           | Mkr1                | 2.483 50 GHz<br>48.39 dBµ∀ | Next Peak     |
| #Peak<br>Log                        |                |           |                     |                            |               |
| 10<br>dB/                           |                |           |                     |                            | Next Pk Right |
| Offst<br>32.2                       |                |           |                     |                            |               |
| dB<br>DI                            |                |           |                     |                            | Next Pk Left  |
| 54.0<br>dBµ∨                        |                |           |                     |                            | Min Search    |
| LgAv                                |                |           |                     |                            |               |
| V1 S2<br>S3 FC                      |                |           |                     |                            | Pk-Pk Search  |
| ×(f):                               |                |           |                     |                            |               |
| FTun<br>Swp                         |                |           |                     |                            | Mkr © CF      |
|                                     |                |           |                     |                            | More          |
| Start 2.483 50 GHz<br>#Res BW 1 MHz |                | VBW 30 Hz | Stop<br>Sweep 428.9 | 2.500 00 GHz               | 1 of 2        |

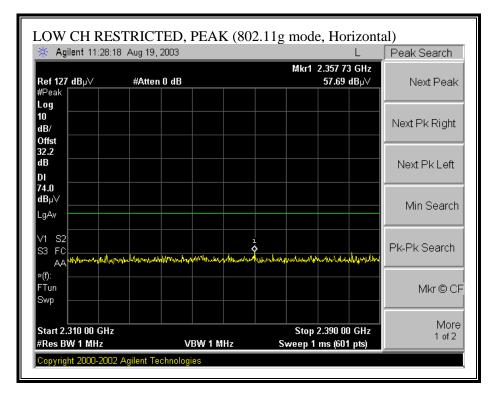
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#### HARMONICS AND SPURIOUS EMISSIONS (b MODE)

| ompan<br>UT Des |                               | Cisco Syster<br>2.11b/g min  |                            |              |            |                                     |                          |                              |  |               |                  |  |                         |   |  |
|-----------------|-------------------------------|--|----------------------------|--------------|------------|-------------------------------------|--------------------------|------------------------------|--|---------------|------------------|--|-------------------------|---|--|
| est Tar         | get:FCC                       | 15.247   | )mni Antenna               | 1            |            |                                     |                          |                              |  |               |                  |  |                         |   |  |
| est Equ         | ipment:                       |  |                            |              |            |                                     |                          |                              | _  |               |                  |  |                         |   |  |
|                 | Horn 1-1                      |  | Pre-amplife<br>T86 Miteq 9 |              | łz         |                                     | Spectrum A<br>ent E4446A |                              |  |               | Horn >18         | GHz                                    |                         |   |  |
|                 | uency Cab                     |  | roomateq                   | 2.0.11       |            |                                     |                          |                              |  |               |                  |  |                         |   |  |
| <b>V</b> (2     |                               |  | (4 ~ 6 ft)                 | 🗸 (12 ft)    |            |                                     |                          | 1 MHz                        | Measureme<br>Resolution E<br>Video Bandw   | andwidth      |                  | easuremen<br>lution Bandw<br>Bandwidth |                         |   |  |
| f<br>GHz        | Dist<br>feet                  | Read Pk<br>dBuV  | Read Avg.<br>dBuV          | AF<br>dB/m   | CL<br>dB   | Amp<br>dB                           | D Corr<br>dB             | HPF                          | Peak<br>dBuV/m                             | Avg<br>dBuV/m | Pk Lim<br>dBuV/m | Avg Lim<br>dBuV/m                      | Pk Mar<br>dB            | Avg Mar<br>dB   | Notes                                    |
| .824            | 9.8                           | 62.2   | 48.8                       | 33.8         | 3.9        | -45.6                               | 0.0                      | 1.0                          | 55.2                                       | 41.8          | 74.0             | 54.0                                   | -18.8                   | -12.2   | b mode, Low ch, V                        |
| 824<br>236      | 9.8<br>9.8                    | 54.9<br>56.9   | 43.2<br>46.9               | 33.8<br>36.9 | 3.9<br>4.9 | -45.6<br>-46.6                      | 0.0                      | 1.0<br>1.0                   | 47.9<br>53.0                               | 36.2<br>43.0  | 74.0<br>74.0     | 54.0<br>54.0                           | -26.1<br>-21.0          | -17.8<br>-11.0  | b mode, Low ch, H<br>b mode, Low ch, V   |
| 236             | 9.8                           | 55.2   | 43.5                       | 36.9         | 4.9        | -46.6                               | 0.0                      | 1.0                          | 51.4                                       | 39.6          | 74.0             | 54.0                                   | -22.6                   | -14.4   | b mode, Low ch, H                        |
| 648<br>648      | 9.8<br>9.8                    | 52.0<br>49.9   | 44.4<br>41.1               | 38.6<br>38.6 | 5.8<br>5.8 | -45.2<br>-45.2                      | 0.0                      | 1.0<br>1.0                   | 52.1<br>50.0                               | 44.5 41.2     | 74.0             | 54.0<br>54.0                           | -21.9<br>-24.0          | -9.5<br>-12.8   | b mode, Low ch, V<br>b mode, Low ch, H   |
| 874             | 9.8                           | 64.2   | 51.8                       | 33.8         | 3.9        | -45.6                               | 0.0                      | 1.0                          | 57.2                                       | 44.8          | 74.0             | 54.0                                   | -16.8                   | -9.2  | b mode, Mid ch, V                        |
| 874<br>311      | 9.8<br>9.8                    | 56.7<br>57.3   | 45.9<br>48.7               | 33.8<br>37.0 | 3.9<br>4.9 | -45.6<br>-46.6                      | 0.0                      | 1.0<br>1.0                   | 49.8<br>53.5                               | 38.9<br>45.0  | 74.0             | 54.0<br>54.0                           | -24.2                   | -15.1<br>-9.0   | b mode, Mid ch, H<br>b mode, Mid ch, V   |
| 311             | 9.8                           | 55.3   | 44.9                       | 37.0         | 4.9        | -46.6                               | 0.0                      | 1.0                          | 51.6                                       | 41.2          | 74.0             | 54.0                                   | -22.4                   | -12.8   | b mode, Mid ch, H                        |
| 748<br>748      | 9.8<br>9.8                    | 49.4<br>50.8   | 39.5<br>41.5               | 38.5<br>38.5 | 5.8<br>5.8 | -45.1<br>-45.1                      | 0.0                      | 1.0<br>1.0                   | 49.6<br>50.9                               | 39.7<br>41.6  | 74.0             | 54.0<br>54.0                           | -24.4<br>-23.1          | -14.3<br>-12.4  | b mode, Mid ch, V<br>b mode, Mid ch, H   |
| 924             | 9.8                           | 59.1   | 47.0                       | 33.8         | 3.9        | -45.7                               | 0.0                      | 1.0                          | 52.1                                       | 40.1          | 74.0             | 54.0                                   | -21.9                   | -13.9   | b mode, High ch, V                       |
| 924<br>386      | 9.8<br>9.8                    | 55.3<br>51.8   | 43.3<br>40.8               | 33.8<br>37.1 | 3.9<br>5.0 | -45.7<br>-46.5                      | 0.0                      | 1.0<br>1.0                   | 48.3<br>48.3                               | 36.3<br>37.2  | 74.0             | 54.0<br>54.0                           | -25.7                   | -17.7<br>-16.8  | b mode, High ch, H<br>b mode, High ch, V |
| .386            | 9.8                           | 52.2   | 41.9                       | 37.1         | 5.0        | -46.5                               | 0.0                      | 1.0                          | 48.6                                       | 38.4          | 74.0             | 54.0                                   | -25.4                   | -15.6   | b mode, High ch, H                       |
| .848<br>.848    | 9.8<br>9.8                    | 49.0<br>50.2   | 37.1<br>38.5               | 38.5<br>38.5 | 5.8<br>5.8 | -45.0<br>-45.0                      | 0.0                      | 1.0<br>1.0                   | 49.2<br>50.5                               | 37.4<br>38.8  | 74.0<br>74.0     | 54.0<br>54.0                           | -24.8<br>-23.5          | -16.6<br>-15.2  | b mode, High ch, V<br>b mode, High ch, H |
|                 | f<br>Dist<br>Read<br>AF<br>CL | Measureme<br>Distance to<br>Analyzer R<br>Antenna Fa<br>Cable Loss | leading<br>actor           | y            |            | Amp<br>D Corr<br>Avg<br>Peak<br>HPF | Average                  | Correc<br>Field S<br>ed Peak | et to 3 mete<br>Strength @<br>c Field Stre | 3 m           |                  | Pk Lim<br>Avg Mar                      | Peak Field<br>Margin vs | Field Strengt<br>d Strength L<br>s. Average L<br>s. Peak Limi | imit<br>.imit                            |

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

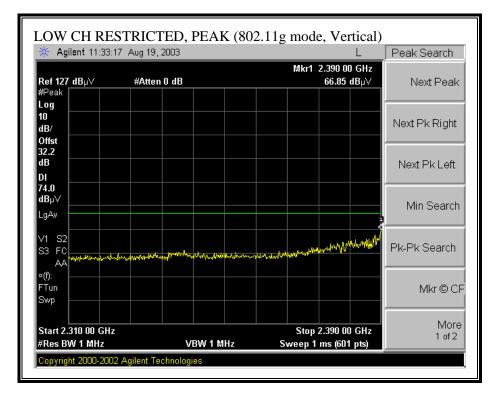


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| 🔆 Agilent 11:29:                    | 26 Aug 19, 2003 |           |                       | L                          | Peak Search    |
|-------------------------------------|-----------------|-----------|-----------------------|----------------------------|----------------|
| Ref 127 dBµ∨                        | #Atten 0 dB     |           | Mkr1 3                | 2.344 27 GHz<br>44.85 dBµ∨ | Next Peak      |
| #Peak<br>Log                        |                 |           |                       |                            |                |
| 10 dB/                              |                 |           |                       |                            | Next Pk Right  |
| Offst<br>32.2<br>dB                 |                 |           |                       |                            | Next Pk Left   |
| DI                                  |                 |           |                       |                            | NOXET IN EOIL  |
| 54.0<br>dBµ∨                        |                 |           |                       |                            | Min Search     |
| LgAv                                |                 |           |                       |                            |                |
| V1 S2<br>S3 FC                      |                 |           |                       |                            | Pk-Pk Search   |
| ×(f):                               |                 |           |                       |                            |                |
| FTun Swp                            |                 |           | ·····                 |                            | Mkr © CF       |
|                                     |                 |           |                       |                            |                |
| Start 2.310 00 GHz<br>#Res BW 1 MHz |                 | VBW 30 Hz | Stop 2<br>Sweep 2.079 | 2.390 00 GHz               | More<br>1 of 2 |

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

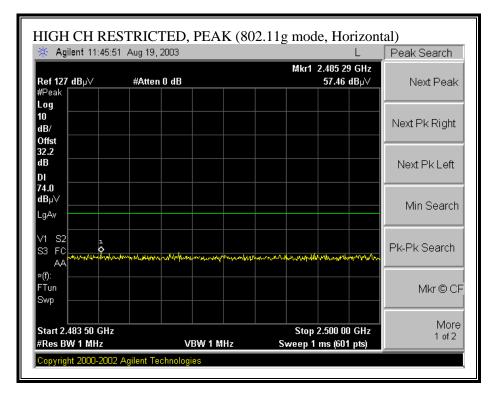


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| 🔆 Agilent 11:33:5                   | 8 Aug 19, 2003 |           |                                 | L                 | Peak Search    |
|-------------------------------------|----------------|-----------|---------------------------------|-------------------|----------------|
| Ref 127 dBµ∨                        | #Atten 0 dB    |           | Mkr1 2.390<br>50.1              | 00 GHz<br>17 dBµ∨ | Next Peak      |
| #Peak<br>Log                        |                |           |                                 | *                 |                |
| 10<br>dB/                           |                |           |                                 |                   | Next Pk Right  |
| Offst<br>32.2                       |                |           |                                 |                   |                |
| dB<br>DI                            |                |           |                                 |                   | Next Pk Left   |
| 54.0<br>dBµ∀                        |                |           |                                 |                   | <br>Min Search |
| LgAv                                |                |           |                                 |                   |                |
| V1 S2<br>S3 FC                      |                |           |                                 |                   | Pk-Pk Search   |
| ×(f):                               |                |           |                                 |                   |                |
| Tun<br>Swp                          |                |           |                                 |                   | Mkr © Cł       |
|                                     |                |           |                                 |                   | More           |
| Start 2.310 00 GHz<br>#Res BW 1 MHz |                | VBW 30 Hz | Stop 2.390<br>Sweep 2.079 s (61 |                   | 1 of 2         |

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

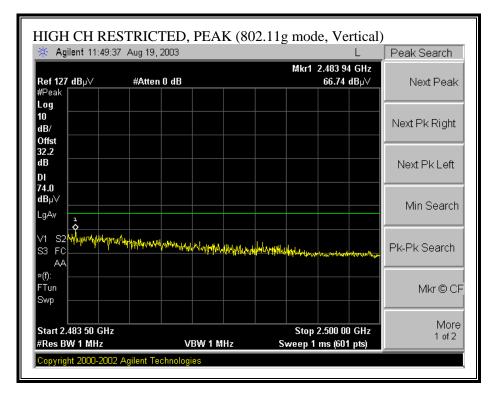


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| 🔆 Agilent 11:46:2                   | 7 Aug 19, 2003 |         |                            | L                      | Peak Search   |
|-------------------------------------|----------------|---------|----------------------------|------------------------|---------------|
| Ref 127 dBµ∀                        | #Atten 0 dB    |         |                            | 83 83 GHz<br>4.91 dBµ∀ | Next Peak     |
| #Peak<br>Log                        |                |         |                            | *                      |               |
| 10<br>dB/                           |                |         |                            |                        | Next Pk Right |
| Offst<br>32.2<br>dB<br>DI           |                |         |                            |                        | Next Pk Left  |
| 54.0<br>dBµ∨<br>LgAw                |                |         |                            |                        | Min Search    |
| V1 S2<br>S3 FC                      |                |         |                            |                        | Pk-Pk Search  |
| AA<br>≈(f): ↓<br>FTun<br>Swp        |                |         |                            |                        | <br>Mkr © Cf  |
|                                     |                |         |                            |                        | More          |
| Start 2.483 50 GHz<br>#Res BW 1 MHz | #\/B/          | V 30 Hz | Stop 2.5<br>Sweep 428.9 ms | 00 00 GHz<br>(601 ptc) | 1 of 2        |

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



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|                    | 7 Aug 19, 2003 |      | L                          | Peak Search    |
|--------------------|----------------|------|----------------------------|----------------|
| Ref 127 dBµ∨       | #Atten 0 dB    | Mkr1 | 2.483 50 GHz<br>48.02 dBµ∨ | Next Peak      |
| #Peak<br>Log       |                |      |                            |                |
| 10<br>dB/          |                |      |                            | Next Pk Right  |
| Offst              |                |      |                            |                |
| 32.2<br>dB         |                |      |                            | Next Pk Left   |
| DI                 |                |      |                            | NOATICEOR      |
| 54.0<br>dBµ∨       |                |      |                            | Min Cooreb     |
| LgAv               |                |      |                            | Min Search     |
| W1 S2              |                |      |                            | Pk-Pk Search   |
| S3 FC              |                |      |                            | FK-FK Sedicit  |
| ×(f): *            |                | <br> |                            |                |
| FTun<br>Swp        |                |      |                            | Mkr © CF       |
|                    |                |      |                            |                |
| Start 2.483 50 GHz |                | Stor | 2.500 00 GHz               | More<br>1 of 2 |

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#### HARMONICS AND SPURIOUS EMISSIONS (g NORMAL MODE)

| t Eng<br>ject #<br>npany<br>T Des<br>T M/I<br>t Tary | r:Willia<br>:03U218<br>y Name:<br>crip.:80<br>N:Orion<br>get:FCC | m Zhuang<br>81-1<br>Cisco Syster<br>2.11b/g min<br>1200 D<br>2 15.247 | i-PCI Card       |              | шОр        | си <b>г</b> 1010                    | Jue        |                              |  |              |              |  |                         |   |  |
|--|--|---|------------------|--------------|------------|-------------------------------------|------------|------------------------------|--|--------------|--------------|--|-------------------------|---|--|
| -  | oer:Tran<br>ipment:  |   | )mni Antenna     | 1            |            |                                     |            |                              |  |              |              |  |                         |   |  |
|  | Horn 1-  |   | Pre-amplife      | or 1-26CF    | Iz I       | 5                                   | Spectrum A | nalyzer                      |  |              | Horn > 18    | CH-                                      |                         |   |  |
|  | N: 3245 (  |   | T86 Miteq 9      |              | -          |                                     | ent E4446A |                              | er 🚽                                     |              | HOFII > 10   | 9911Z                                    | -                       |   |  |
| Hi Freq  | ti) ft)  |   | (4 ~ 6 ft)       | ✓ (12 ft)    |            | ,<br> <br>                          |            | 1 MHz                        | deasureme<br>Resolution E<br>Video Bandv | andwidth     |              | leasuremen<br>olution Bandw<br>Bandwidth |                         |   |  |
| f  | Dist   | Read Pk   | Read Avg.        | AF           | CL         | Amp                                 | D Corr     | HPF                          | Peak                                     | Avg          | Pk Lim       | Avg Lim                                  | Pk Mar                  | Avg Mar   | Notes                                    |
| GHz  | feet   | dBuV  | dBuV             | dB/m         | dB         | dB                                  | dB         | 10                           | dBuV/m                                   |              | dBuV/m       | dBuV/m                                   | dB                      | dB  |  |
| 824<br>824   | 9.8<br>9.8   | 51.4<br>50.2  | 45.8<br>42.5     | 33.8<br>33.8 | 3.9<br>3.9 | -45.6<br>-45.6                      | 0.0        | 1.0<br>1.0                   | 44.4<br>43.2                             | 38.8<br>35.5 | 74.0<br>74.0 | 54.0<br>54.0                             | -29.6<br>-30.8          | -15.2<br>-18.5  | g mode, Low ch, V<br>g mode, Low ch, H   |
| 236  | 9.8  | 51.5  | 39.6             | 36.9         | 4.9        | -46.6                               | 0.0        | 1.0                          | 47.6                                     | 35.8         | 74.0         | 54.0                                     | -26.4                   | -18.2   | g mode, Low ch, V                        |
| 236  | 9.8  | 51.8  | 39.6             | 36.9         | 4.9        | -46.6                               | 0.0        | 1.0                          | 47.9                                     | 35.7         | 74.0         | 54.0                                     | -26.1                   | -18.3   | g mode, Low ch, H                        |
| 548  | 9.8  | 52.0  | 45.9             | 38.6         | 5.8        | -45.2                               | 0.0        | 1.0                          | 52.1                                     | 46.0         | 74.0         | 54.0                                     | -21.9                   | -8.0  | g mode, Low ch, V                        |
| 548<br>374   | 9.8<br>9.8   | 50.6<br>52.5  | 40.5<br>46.7     | 38.6         | 5.8<br>3.9 | -45.2<br>-45.6                      | 0.0        | 1.0<br>1.0                   | 50.7<br>45.5                             | 40.6<br>39.8 | 74.0         | 54.0<br>54.0                             | -23.3<br>-28.5          | -13.4<br>-14.2  | g mode, Low ch, H                        |
| 374  | 9.8  | 52.5  | 40.7             | 33.8<br>33.8 | 3.9        | -45.6                               | 0.0        | 1.0                          | 45.1                                     | 39.8         | 74.0         | 54.0                                     | -28.9                   | -14.2   | g mode, Mid ch, V<br>g mode, Mid ch, H   |
| 311  | 9.8  | 50.5  | 39.1             | 37.0         | 4.9        | -46.6                               | 0.0        | 1.0                          | 46.8                                     | 35.4         | 74.0         | 54.0                                     | -27.2                   | -18.6   | g mode, Mid ch, V                        |
| 311  | 9.8  | 51.0  | 39.1             | 37.0         | 4.9        | -46.6                               | 0.0        | 1.0                          | 47.3                                     | 35.3         | 74.0         | 54.0                                     | -26.7                   | -18.7   | g mode, Mid ch, H                        |
| 748  | 9.8  | 51.7  | 45.9             | 38.5         | 5.8        | -45.1                               | 0.0        | 1.0                          | 51.9                                     | 46.1         | 74.0         | 54.0                                     | -22.1                   | -7.9  | g mode, Mid ch, V                        |
| 748<br>924   | 9.8<br>9.8   | 49.9<br>54.5  | 40.5 46.7        | 38.5         | 5.8<br>3.9 | -45.1<br>-45.7                      | 0.0        | 1.0                          | 50.1<br>47.6                             | 40.7<br>39.7 | 74.0<br>74.0 | 54.0<br>54.0                             | -23.9<br>-26.4          | -13.3<br>-14.3  | g mode, Mid ch, H<br>g mode, High ch, V  |
| 924  | 9.8  | 53.2  | 46.6             | 33.8<br>33.8 | 3.9        | -45.7                               | 0.0        | 1.0                          | 46.3                                     | 39.6         | 74.0         | 54.0                                     | -20.4                   | -14.3   | g mode, High ch, H                       |
| 386  | 9.8  | 50.6  | 39.0             | 37.1         | 5.0        | -46.5                               | 0.0        | 1.0                          | 47.0                                     | 35.4         | 74.0         | 54.0                                     | -27.0                   | -18.6   | g mode, High ch, V                       |
| 386  | 9.8  | 52.0  | 39.5             | 37.1         | 5.0        | -46.5                               | 0.0        | 1.0                          | 48.4                                     | 36.0         | 74.0         | 54.0                                     | -25.6                   | -18.0   | g mode, High ch, H                       |
| .848<br>.848   | 9.8<br>9.8   | 47.7<br>48.5  | 39.7<br>39.6     | 38.5<br>38.5 | 5.8<br>5.8 | -45.0<br>-45.0                      | 0.0        | 1.0<br>1.0                   | 47.9<br>48.8                             | 40.0<br>39.9 | 74.0<br>74.0 | 54.0<br>54.0                             | -26.1<br>-25.2          | -14.0<br>-14.1  | g mode, High ch, V<br>g mode, High ch, H |
| 040  | 9.0  | 40.0  | 59.0             | 30.3         | 5.0        | -43.0                               | 0.0        | 1.0                          | 40.0                                     | 39.9         | /4.0         | 54.0                                     | -23.2                   | -14.1   | g mode, righ cit, r                      |
|  |  | Measureme<br>Distance to<br>Analyzer R<br>Antenna Fa<br>Cable Loss    | leading<br>actor | y            |            | Amp<br>D Corr<br>Avg<br>Peak<br>HPF | Average    | Correc<br>Field S<br>ed Peak | t to 3 mete<br>strength @<br>Field Stre  | 3 m          |              | Pk Lim                                   | Peak Field<br>Margin vs | řield Strengt<br>l Strength L<br>. Average L<br>. Peak Limi | imit<br>imit                             |

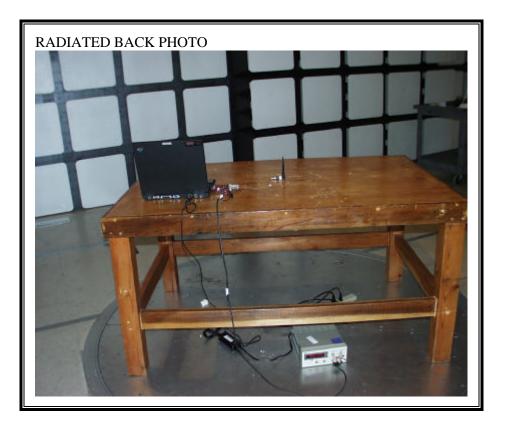
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# 7.8.4. RADIATED EMISSIONS WITH 2.2 dBi DIPOLE ANTENNA

## RADIATED RF MEASUREMENT SETUP

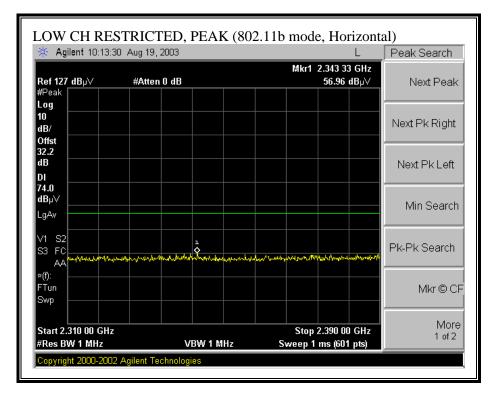


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## RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)

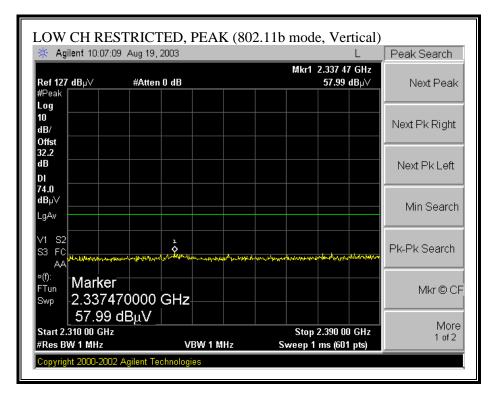


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| 🔆 Agilent 10:14   | :20 Aug 19, 2003 |   |                    | L                 | Peak Search    |
|-------------------|------------------|---|--------------------|-------------------|----------------|
| Ref 127 dBµ∀      | #Atten 0 dB      |   | Mkr1 2.390<br>44.9 | IOOGHz<br>99 dBµ∨ | Next Peak      |
| #Peak<br>Log      |                  |   |                    | *                 |                |
| 10<br>dB/         |                  |   |                    |                   | Next Pk Right  |
| Offst<br>32.2     |                  |   |                    |                   |                |
| dB<br>DI          |                  |   |                    |                   | Next Pk Left   |
| 54.0<br>dBµ∨      |                  |   |                    |                   | Min Search     |
|                   |                  |   |                    |                   |                |
| V1 S2<br>S3 FC    |                  |   |                    |                   | Pk-Pk Search   |
| ×(f):             |                  | · |                    |                   | Munaci         |
| Swp               |                  |   |                    |                   | Mkr © CF       |
| Start 2.310 00 GH | z                |   | Stop 2.390         | 00 GHz            | More<br>1 of 2 |

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

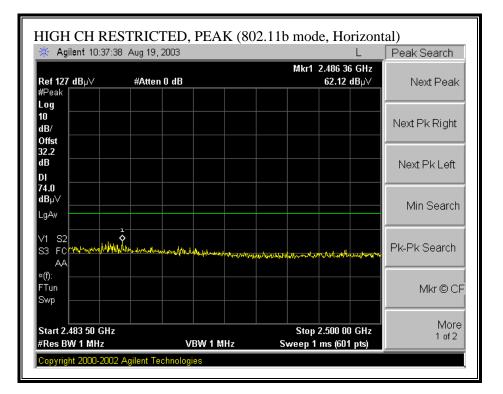


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| 🔆 Agilent 10:08                           | 3:58 Aug 19, 2003 | L   | Peak Search   |
|---|-------------------|---|---------------|
| <b>Ref 127 dB</b> µ∨<br>#Peak             | #Atten 0 dB       | Mkr1 2.339 20 GHz<br>45.71 dBµ∀                 |               |
| Log                                       |                   | *   |               |
| dB/<br>Offst<br>32.2                      |                   |   | Next Pk Right |
| dB DI                                     |                   |   | Next Pk Left  |
| 54.0<br>dBµ∨<br>LgAv                      |                   |   | Min Search    |
| V1 S2<br>S3 FC                            |                   |   | Pk-Pk Search  |
| AA<br>≈(f):<br>FTun                       | <u> </u>          | ····  | Mkr © CF      |
| Swp<br>Start 2.310 00 GH<br>#Res BW 1 MHz | Iz<br>#VBW 30 I   | Stop 2.390 00 GHz<br>Iz Sweep 2.079 s (601 pts) | More          |

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

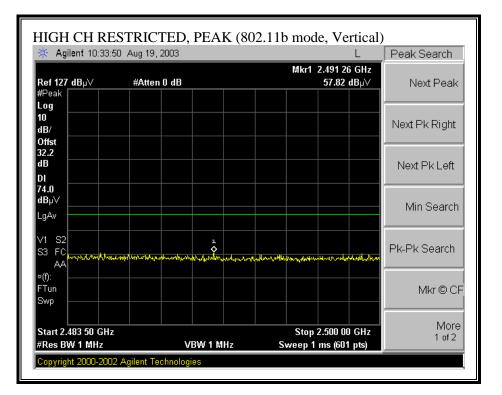


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| 🔆 Agilent 10:38:3                   | 32 Aug 19, 2003 |      | L                          | Peak Search   |
|-------------------------------------|-----------------|------|----------------------------|---------------|
| Ref 127 dBµ∀                        | #Atten 0 dB     | Mkr1 | 2.483 50 GHz<br>47.63 dBµ∀ | Next Peak     |
| #Peak<br>Log                        |                 |      | *                          |               |
| 10 dB/                              |                 |      |                            | Next Pk Right |
| Offst<br>32.2<br>dB                 |                 |      |                            | Next Pk Left  |
| DI                                  |                 |      |                            | Next PK Leit  |
| 54.0<br>dBµ∨                        |                 |      |                            | Min Search    |
| LgAv                                |                 |      |                            |               |
| ∨1 S2<br>S3 FC                      |                 |      |                            | Pk-Pk Search  |
| AA₁<br>≈(f): ♠<br>FTun              | <u> </u>        |      | <u> </u>                   | <br>Mkr©CF    |
| Swp                                 |                 |      |                            |               |
|                                     |                 |      |                            | More          |
| Start 2.483 50 GHz<br>#Res BW 1 MHz | #VBW 30         |      | 2.500 00 GHz               | 1 of 2        |

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



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| 🔆 Agilent 10:34:4                   | 14 Aug 19, 2003 |           |                     | L                          | Peak Search   |
|-------------------------------------|-----------------|-----------|---------------------|----------------------------|---------------|
| Ref 127 dBµ∀                        | #Atten 0 dB     |           | Mkr1                | 2.485 56 GHz<br>45.18 dBµ∀ | Next Peak     |
| #Peak<br>Log                        |                 |           |                     |                            |               |
| 10 dB/                              |                 |           |                     |                            | Next Pk Right |
| Offst<br>32.2<br>dB                 |                 |           |                     |                            | Next Pk Left  |
| DI                                  |                 |           |                     |                            |               |
| dBµ∨<br>LgAv                        |                 |           |                     |                            | Min Search    |
| ·                                   |                 |           |                     |                            |               |
| ∨1 S2<br>S3 FC                      |                 |           |                     |                            | Pk-Pk Search  |
| *(f):                               |                 |           |                     |                            |               |
| FTun<br>Swp                         |                 |           |                     |                            | Mkr©Cf        |
| Start 2.483 50 GHz                  |                 |           | Eter 1              | 2 500 00 CU-               | More          |
| start 2.483 50 GHz<br>#Res BW 1 MHz |                 | 'BW 30 Hz | Stop<br>Sweep 428.9 | 2.500 00 GHz               | 1 of 2        |

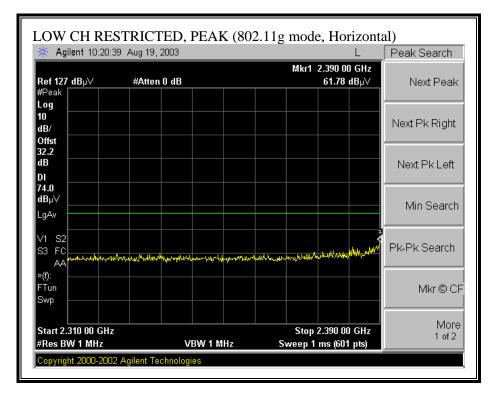
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#### HARMONICS AND SPURIOUS EMISSIONS (b MODE)

| EMCO Horn 1                   | C 15.247<br>ansmit with D<br>t:<br>1-18GHz<br>5 @ 1m v | Dipole Antenn<br>Pre-amplife<br>T86 Miteq 5 | er 1-26GF    | Iz         |                | Spectrum A  | nalyzer    |  |              |                                       |              |                |                               |  |
|-------------------------------|--|---|--------------|------------|----------------|-------------|------------|--|--------------|---------------------------------------|--------------|----------------|-------------------------------|--|
| EMCO Horn 1<br>T59; S/N: 3245 | <u>t:</u><br>1-18GHz<br>5 @1m ▼<br>ables ───           | Pre-amplif                                  | er 1-26GF    | Iz         |                | Spectrum A  | nalyzer    |  |              |                                       |              |                |                               |  |
| EMCO Horn 1<br>T59; S/N: 3245 | 1-18GHz<br>5 @1m ▼<br>ables                            |   |              | Iz         |                | Spectrum A  | nalyzer    |  |              |                                       |              |                |                               |  |
| T59; S/N: 3245                | 5@1m 🚽   |   |              | Łz         |                | Spectrum A  | nalyzer    |  |              |                                       |              |                |                               |  |
| Hi Frequency Ca               | ables  | T86 Miteq 9                                 | 24341        | -          |                |             |            |  |              | Horn > 18                             | GHz          |                |                               |  |
|                               |  | 1   |              |            | Agile          | ent E4446A  | Analyze    | er 🚽                                     |              |                                       |              | -              |                               |  |
|                               |  |   |              | _          | I              |             |            |  |              |                                       |              |                |                               |  |
|                               | (2 ~ 3 ft)   | (4 ~ 6 ft)                                  | 🗸 (12 ft)    |            |                |             | 1 MHz      | Acasureme<br>Resolution B<br>/ideo Bandw | andwidth     | Average M<br>1 MHz Reso<br>10Hz Video |              |                |                               |  |
| f Dist                        | Read Pk  | Read Avg.                                   | AF           | CL         | Amp            | D Corr      | UDF        | Peak                                     | Avg          | Pk Lim                                | Avg Lim      | Pk Mor         | Avg Mar                       | Notes                                    |
| GHz feet                      |  | dBuV  | dB/m         | dB         | dB             | dB          | III F      | dBuV/m                                   | dBuV/m       |                                       | dBuV/m       | dB             | dB                            | Notes                                    |
| 824 9.8                       | 59.4   | 49.1  | 33.8         | 3.9        | -45.6          | 0.0         | 1.0        | 52.4                                     | 42.1         | 74.0                                  | 54.0         | -21.6          | -11.9                         | b mode, Low ch, V                        |
| 824 9.8                       | 56.5   | 45.3  | 33.8         | 3.9        | -45.6          | 0.0         | 1.0        | 49.5                                     | 38.4         | 74.0                                  | 54.0         | -24.5<br>-23.3 | -15.6                         | b mode, Low ch, H                        |
| 236 9.8<br>236 9.8            | 54.6<br>53.1   | 45.3<br>38.8                                | 36.9<br>36.9 | 4.9<br>4.9 | -46.6<br>-46.6 | 0.0         | 1.0        | 50.7<br>49.2                             | 41.5<br>34.9 | 74.0<br>74.0                          | 54.0<br>54.0 | -23.5          | -12.5<br>-19.1                | b mode, Low ch, V<br>b mode, Low ch, H   |
| 648 9.8                       | 49.9   | 38.1  | 38.6         | 5.8        | -45.2          | 0.0         | 1.0        | 50.0                                     | 38.2         | 74.0                                  | 54.0         | -24.0          | -15.8                         | b mode, Low ch, N                        |
| 648 9.8                       | 48.0   | 38.1  | 38.6         | 5.8        | -45.2          | 0.0         | 1.0        | 48.1                                     | 38.2         | 74.0                                  | 54.0         | -25.9          | -15.8                         | b mode, Low ch, H                        |
| 874 9.8                       | 64.2   | 51.9  | 33.8         | 3.9        | -45.6          | 0.0         | 1.0        | 57.2                                     | 44.9         | 74.0                                  | 54.0         | -16.8          | -9.1                          | b mode, Mid ch, V                        |
| 874 9.8<br>311 9.8            | 53.8<br>58.0   | 43.5<br>48.5                                | 33.8<br>37.0 | 3.9<br>4.9 | -45.6<br>-46.6 | 0.0         | 1.0<br>1.0 | 46.8<br>54.3                             | 36.5<br>44.7 | 74.0                                  | 54.0<br>54.0 | -27.2<br>-19.7 | -17.5<br>-9.3                 | b mode, Mid ch, H<br>b mode, Mid ch, V   |
| 311 9.8                       | 56.1   | 46.5  | 37.0         | 4.9        | -46.6          | 0.0         | 1.0        | 52.3                                     | 44.7         | 74.0                                  | 54.0         | -19.7          | -12.2                         | b mode, Mid ch, H                        |
| 748 9.8                       | 51.6   | 43.6  | 38.5         | 5.8        | -45.1          | 0.0         | 1.0        | 51.8                                     | 43.8         | 74.0                                  | 54.0         | -22.2          | -10.2                         | b mode, Mid ch, V                        |
| 748 9.8                       | 51.3   | 42.6  | 38.5         | 5.8        | -45.1          | 0.0         | 1.0        | 51.5                                     | 42.8         | 74.0                                  | 54.0         | -22.5          | -11.2                         | b mode, Mid ch, H                        |
| 924 9.8                       | 61.8   | 49.8  | 33.8         | 3.9        | -45.7          | 0.0         | 1.0        | 54.8                                     | 42.8         | 74.0                                  | 54.0         | -19.2          | -11.2                         | b mode, High ch, V                       |
| 924 9.8<br>386 9.8            | 56.7<br>56.1   | 44.2<br>45.6                                | 33.8<br>37.1 | 3.9<br>5.0 | -45.7<br>-46.5 | 0.0         | 1.0<br>1.0 | 49.7<br>52.6                             | 37.3<br>42.0 | 74.0<br>74.0                          | 54.0<br>54.0 | -24.3<br>-21.4 | -16.7<br>-12.0                | b mode, High ch, H<br>b mode, High ch, V |
| 386 9.8                       | 53.1   | 41.3  | 37.1         | 5.0        | -46.5          | 0.0         | 1.0        | 49.5                                     | 37.7         | 74.0                                  | 54.0         | -24.5          | -16.3                         | b mode, High ch, H                       |
| .848 9.8                      | 51.9   | 45.7  | 38.5         | 5.8        | -45.0          | 0.0         | 1.0        | 52.1                                     | 45.9         | 74.0                                  | 54.0         | -21.9          | -8.1                          | b mode, High ch, V                       |
| 848 9.8                       | 48.1   | 40.9  | 38.5         | 5.8        | -45.0          | 0.0         | 1.0<br>1.0 | 48.3                                     | 41.1         | 74.0                                  | 54.0         | -25.7          | -12.9                         | b mode, High ch, H                       |
| f                             |  | ent Frequenc                                | y            |            | Amp            | Preamp C    | Gain       |  |              | 1                                     |              |                | ield Strengt                  |  |
| Dist<br>Read                  | Distance to<br>Analyzer R                              |   |              |            | Avg            |             |            | t to 3 mete<br>trength @                 |              |                                       |              |                | l Strength Li<br>. Average Li |  |
| AF                            | Antenna Fa   |   |              |            | Peak           | •           |            | Field Stre                               |              |                                       |              |                | . Peak Limit                  |  |
| CL                            | Cable Loss   |   |              |            | HPF            | High Pas    |            |  | ngui         |                                       | I K IVIAI    | wargin vs      | . I Cak Lillin                |  |
| CL                            | Cable Loss   |   |              |            | III I          | ringii r as | s I mei    |  |              |                                       |              |                |                               |  |

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

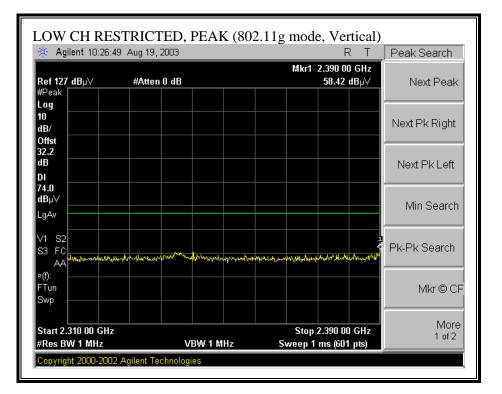


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| 🔆 Agilent 10:21:3                                 | 0 Aug 19, 2003 | L   | Peak Search   |
|---|----------------|---|---------------|
| Ref 127 dBµ∀                                      | #Atten 0 dB    | Mkr1 2.390 00 GH:<br>47.68 dBµ∖                 |               |
| #Peak<br>Log                                      |                |   |               |
| 10<br>dB/   |                |   | Next Pk Right |
| Offst<br>32.2<br>dB                               |                |   | Next Pk Left  |
| DI  |                |   | NOALT K LOIL  |
| 54.0<br>dBµ∨                                      |                |   | Min Search    |
| LgAv  |                |   |               |
| V1 S2<br>S3 FC                                    |                |   | Pk-Pk Search  |
| AA<br>≈(f):<br>FTun                               | ·····          |   | Murriel CO    |
| Swp   |                |   | Mkr © CF      |
|   |                |   | More          |
| Start 2. <mark>310 00 GHz</mark><br>#Res BW 1 MHz | #VBW 30 F      | Stop 2.390 00 GH2<br>Iz Sweep 2.079 s (601 pts) | 1 of 2        |

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

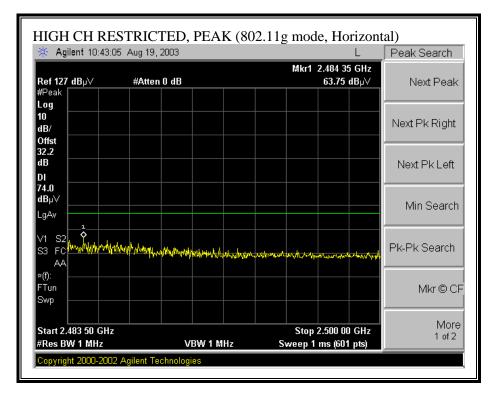


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| 🔆 Agilent 10:27:                    | 43 Aug 19, 2003 |                                    | L Pea | k Search       |
|-------------------------------------|-----------------|------------------------------------|-------|----------------|
| Ref 127 dBµ∨                        | #Atten 0 dB     | Mkr1 2.337<br>45.8                 |       | Next Peak      |
| #Peak<br>Log                        |                 |                                    | *     |                |
| 10 dB/                              |                 |                                    | Nex   | t Pk Right     |
| Offst<br>32.2                       |                 |                                    |       |                |
| dB                                  |                 |                                    | Ne    | xt Pk Left     |
| DI<br>54.0<br>dBµ∀                  |                 |                                    |       |                |
| LgAv                                |                 |                                    |       | /lin Search    |
| ∨1 S2<br>S3 FC                      |                 |                                    | Pk-F  | k Search       |
| AA<br>≈(f):                         | 1               |                                    |       |                |
| FTun Swp                            |                 |                                    |       | Mkr © CF       |
|                                     |                 |                                    |       |                |
| Start 2.310 00 GH:<br>#Res BW 1 MHz | z<br>#VBW 30    | Stop 2.390<br>Hz Sweep 2.079 s (60 |       | More<br>1 of 2 |

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

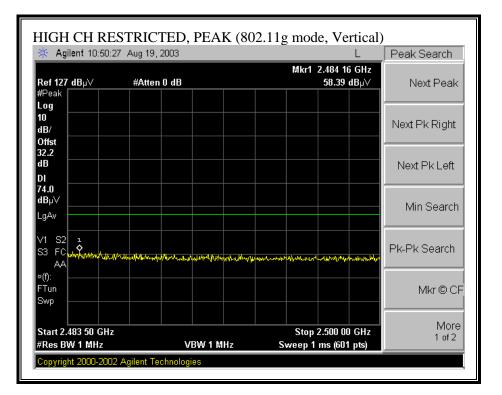


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| 🔆 Agilent 10:44:0                   | 13 Aug 19, 2003 |            |                     | L            | Peak Search   |
|-------------------------------------|-----------------|------------|---------------------|--------------|---------------|
| Ref 127 dBµ∨                        | #Atten 0 dl     | 3          | Mkr1                | Next Peak    |               |
| #Peak<br>Log                        |                 |            |                     |              |               |
| 10 dB/                              |                 |            |                     |              | Next Pk Right |
| Offst<br>32.2                       |                 |            |                     |              |               |
| dB<br>DI                            |                 |            |                     |              | Next Pk Left  |
| 54.0<br>dBµ∨                        |                 |            |                     |              | Min Search    |
| LgAv                                |                 |            |                     |              |               |
| ∨1 S2<br>S3 FC                      |                 |            |                     |              | Pk-Pk Search  |
| ×(f): ♦                             |                 |            |                     |              |               |
| FTun<br>Swp                         |                 |            |                     |              | Mkr © Cl      |
|                                     |                 |            |                     |              | More          |
| Start 2.483 50 GHz<br>#Res BW 1 MHz |                 | #VBW 30 Hz | Stop<br>Sweep 428.9 | 2.500 00 GHz | 1 of 2        |

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



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| 🔆 Agilent 10:51:2                   | 2 Aug 19, 2003 |          |                         | L                          | Peak Search   |
|-------------------------------------|----------------|----------|-------------------------|----------------------------|---------------|
| Ref 127 dBµ∨                        | #Atten 0 dB    |          | Mkr1 3                  | 2.483 50 GHz<br>45.72 dBµ∀ | Next Peak     |
| #Peak<br>Log                        |                |          |                         |                            |               |
| 10 dB/                              |                |          |                         |                            | Next Pk Right |
| Offst<br>32.2<br>dB                 |                |          |                         |                            | Next Divise   |
| DI                                  |                |          |                         |                            | Next Pk Left  |
| 54.0<br>dBµ∀                        |                |          |                         |                            | Min Search    |
| LgAv                                |                |          |                         |                            |               |
| V1 S2<br>S3 FC                      |                |          |                         |                            | Pk-Pk Search  |
| ×(f): ↓<br>FTun                     |                |          |                         |                            | <br>Mkr©CF    |
| Swp                                 |                |          |                         |                            |               |
|                                     |                |          |                         |                            | More          |
| Start 2.483 50 GHz<br>#Res BW 1 MHz | 114            | BW 30 Hz | Stop 2<br>Sweep 428.9 i | 2.500 00 GHz               | 1 of 2        |

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#### HARMONICS AND SPURIOUS EMISSIONS (g NORMAL MODE)

| Project #<br>Company<br>EUT Des<br>EUT M/I<br>Fest Tary | 4:03U218<br>y Name:<br>scrip.:80<br>N:Orion<br>get:FCC | Cisco Syster<br>2.11b/g min<br>1200 D<br>2 15.247                  |                            | a            |            |                                     |                          |                             |  |              |              |  |                         |   |  |
|---|--|--|----------------------------|--------------|------------|-------------------------------------|--------------------------|-----------------------------|--|--------------|--------------|--|-------------------------|---|--|
| Fest Equ  | ipment:  |  |                            |              |            |                                     |                          |                             |  |              |              |  |                         |   |  |
|   | Horn 1-  |  | Pre-amplife<br>T86 Miteq 9 |              | łz         |                                     | Spectrum A<br>ent E4446A |                             | er 🚽                                     |              | Horn > 18    | BGHz   | •                       |   |  |
| Hi Free   | quency Cab<br>ft)                                      |  | (4 ~ 6 ft)                 | V (12 ft)    |            |                                     |                          | 1 MHz                       | Measureme<br>Resolution E<br>Video Bandy | Bandwidth    |              | <b>leasuremen</b><br>Jution Bandw<br>Bandwidth |                         |   |  |
| f   | Dist   | Read Pk  |                            | AF           | CL         | Amp                                 | D Corr                   | HPF                         | Peak                                     | Avg          | Pk Lim       | Avg Lim  |                         | Avg Mar   | Notes                                    |
| GHz   | feet   | dBuV   | dBuV                       | dB/m         | dB         | dB                                  | dB                       | 1.0                         |  | dBuV/m       | dBuV/m       |  | dB                      | dB  |  |
| 1.824<br>1.824  | 9.8<br>9.8   | 51.3<br>49.4   | 43.0<br>39.8               | 33.8<br>33.8 | 3.9<br>3.9 | -45.6<br>-45.6                      | 0.0                      | 1.0                         | 44.3<br>42.4                             | 36.0<br>32.9 | 74.0<br>74.0 | 54.0<br>54.0                                   | -29.7<br>-31.6          | -18.0<br>-21.1  | g mode, Low ch, V<br>g mode, Low ch, H   |
| 1.024   | 9.8  | 52.9   | 40.5                       | 36.9         | 4.9        | -45.0                               | 0.0                      | 1.0                         | 42.4                                     | 36.6         | 74.0         | 54.0   | -25.0                   | -17.4   | g mode, Low ch, H                        |
| 7.236   | 9.8  | 51.7   | 39.3                       | 36.9         | 4.9        | -46.6                               | 0.0                      | 1.0                         | 47.8                                     | 35.4         | 74.0         | 54.0   | -26.2                   | -18.6   | g mode, Low ch, H                        |
| 0.648   | 9.8  | 50.2   | 38.4                       | 38.6         | 5.8        | -45.2                               | 0.0                      | 1.0                         | 50.3                                     | 38.5         | 74.0         | 54.0   | -23.7                   | -15.5   | g mode, Low ch, V                        |
| 0.648   | 9.8  | 49.3   | 37.1                       | 38.6         | 5.8        | -45.2                               | 0.0                      | 1.0                         | 49.4                                     | 37.2         | 74.0         | 54.0   | -24.6                   | -16.8   | g mode, Low ch, H                        |
| .874<br>.874  | 9.8<br>9.8   | 55.6<br>50.6   | 46.1<br>41.8               | 33.8<br>33.8 | 3.9<br>3.9 | -45.6<br>-45.6                      | 0.0                      | 1.0<br>1.0                  | 48.6<br>43.6                             | 39.1<br>34.8 | 74.0         | 54.0<br>54.0                                   | -25.4                   | -14.9<br>-19.2  | g mode, Mid ch, V<br>g mode, Mid ch, H   |
| .311  | 9.8  | 53.3   | 41.8                       | 37.0         | 3.9<br>4.9 | -45.6                               | 0.0                      | 1.0                         | 43.6                                     | 34.8         | 74.0         | 54.0   | -30.4                   | -19.2   | g mode, Mid ch, H                        |
| 7.311   | 9.8  | 50.1   | 39.1                       | 37.0         | 4.9        | -46.6                               | 0.0                      | 1.0                         | 46.3                                     | 35.4         | 74.0         | 54.0   | -27.7                   | -18.6   | g mode, Mid ch, H                        |
| 9.748   | 9.8  | 50.5   | 39.2                       | 38.5         | 5.8        | -45.1                               | 0.0                      | 1.0                         | 50.7                                     | 39.4         | 74.0         | 54.0   | -23.3                   | -14.6   | g mode, Mid ch, V                        |
| 9.748   | 9.8  | 49.5   | 37.7                       | 38.5         | 5.8        | -45.1                               | 0.0                      | 1.0                         | 49.7                                     | 37.9         | 74.0         | 54.0   | -24.3                   | -16.1   | g mode, Mid ch, H                        |
| .924  | 9.8  | 55.8   | 46.3                       | 33.8         | 3.9        | -45.7                               | 0.0                      | 1.0                         | 48.8                                     | 39.3         | 74.0         | 54.0   | -25.2                   | -14.7   | g mode, High ch, V                       |
| 4.924<br>7.386  | 9.8<br>9.8   | 50.8<br>53.5   | 41.5 40.5                  | 33.8<br>37.1 | 3.9<br>5.0 | -45.7<br>-46.5                      | 0.0                      | 1.0<br>1.0                  | 43.8<br>49.9                             | 34.5<br>36.9 | 74.0 74.0    | 54.0<br>54.0                                   | -30.2<br>-24.1          | -19.5<br>-17.1  | g mode, High ch, H                       |
| 1.386   | 9.8  | 53.5   | 40.5<br>39.4               | 37.1         | 5.0        | -46.5                               | 0.0                      | 1.0                         | 49.9                                     | 36.9         | 74.0         | 54.0   | -24.1                   | -17.1   | g mode, High ch, V<br>g mode, High ch, H |
| 0.848   | 9.8  | 49.9   | 40.9                       | 38.5         | 5.8        | -40.5                               | 0.0                      | 1.0                         | 50.1                                     | 41.2         | 74.0         | 54.0   | -23.2                   | -10.1   | g mode, High ch, V                       |
| 9.848   | 9.8  | 49.5   | 41.3                       | 38.5         | 5.8        | -45.0                               | 0.0                      | 1.0                         | 49.8                                     | 41.6         | 74.0         | 54.0   | -24.2                   | -12.4   | g mode, High ch, H                       |
|   |  | Measureme<br>Distance to<br>Analyzer R<br>Antenna Fa<br>Cable Loss | leading<br>actor           | y            |            | Amp<br>D Corr<br>Avg<br>Peak<br>HPF | Average                  | Correc<br>Field S<br>d Peak | t to 3 mete<br>strength @<br>Field Stre  | 3 m          |              | Pk Lim<br>Avg Mar                              | Peak Field<br>Margin vs | Field Strengt<br>I Strength L<br>Average L<br>Peak Limi | imit<br>imit                             |

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# 7.8.5. RADIATED EMISSIONS WITH TWO 2.2 dBi DIPOLES (DIVERSITY OPERATION) AND CO-LOCATED RADIATED EMISSIONS

## 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 dominant transmitter is set to the worst case channel. The spurious emissions performance of the dominant transmitter is investigated as the settings of the non-dominant transmitter are varied. Worst case results are reported.

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.

## <u>RESULTS</u>

No non-compliance noted:

The dominant transmitter is the 2.4 GHz radio. The non-dominant transmitter is the 5 GHz radio. The measurement results below are the worst case of stand-alone operation of the 2.4 GHz radio and collocated operation of the 2.4 GHz radio with the 5 GHz radio.

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#### RADIATED RF MEASUREMENT SETUP

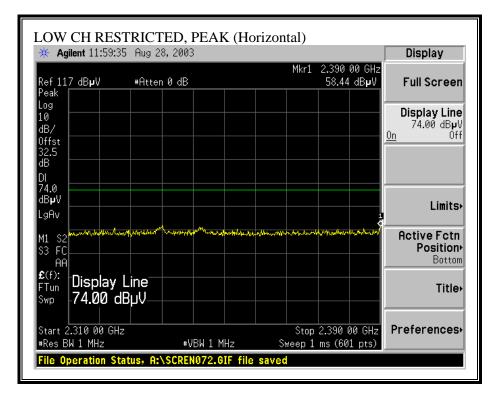


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#### WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL), b MODE

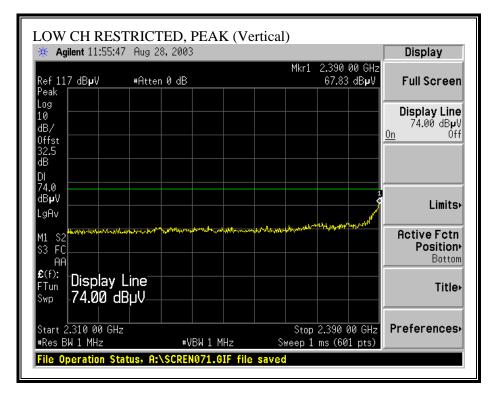


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| 🔆 Agilent 12:00:4                           | 0 Aug 28, 2 | 003        |                  |                                | Display                                     |
|---|-------------|------------|------------------|--------------------------------|---|
| Ref 117 dB <b>µ</b> V<br>Peak               | #Atten 0 d  | IB         | Mkr1             | 1 2.333 47 GH<br>47.71 dBµ     |   |
| Log<br>10<br>dB/<br>Offst<br>32.5           |             |            |                  |                                | Display Line<br>54.00 dByV<br><u>On</u> Off |
| dB<br>DI<br>54.0<br>dB <b>µ</b> V<br>LgAv   |             |            |                  |                                | Limits                                      |
| M1 S2<br>S3 FC<br>AA                        | 1           |            |                  |                                | Active Fctn<br>Position<br>Bottom           |
| £(f): Display<br>FTun<br>Swp <b>54.00 d</b> |             |            |                  |                                | Title                                       |
| Start 2.310 00 GH:<br>#Res BW 1 MHz         | 2           | #VBW 10 Hz | Sto<br>Sweep 6.2 | p 2.390 00 GH<br>38 s (601 pts |   |

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### WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL), b MODE

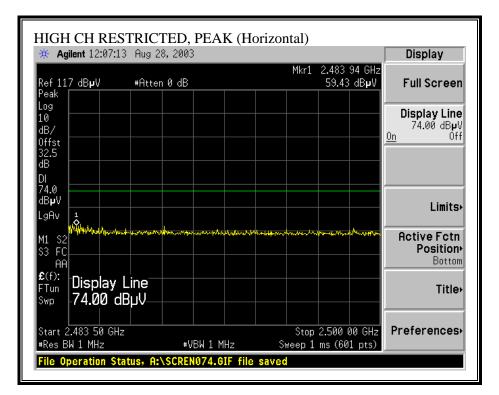


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| Agilent 11:53:31                    | Aug 28, 200 | 3         |                    |                               | Display                                     |
|-------------------------------------|-------------|-----------|--------------------|-------------------------------|---|
| Ref 117 dB <b>µ</b> V<br>Peak       | #Atten 0 dB |           | Mkr1               | 2.390 00 GHz<br>48.02 dBµV    | Full Screen                                 |
| Log<br>10<br>dB/<br>0ffst<br>32.5   |             |           |                    |                               | Display Line<br>54.00 dBµV<br><u>On</u> Off |
| dB<br>DI<br>54.0<br>dBµV<br>LgAv    |             |           |                    |                               | Limits                                      |
| M1 S2<br>S3 FC<br>AA                |             | ~         |                    | 1                             | Active Fctn<br>Position<br>Bottom           |
| £(f):<br>FTun<br>Swp 54.00 dB       |             |           |                    |                               | Title                                       |
| Start 2.310 00 GHz<br>#Res BW 1 MHz | <br>#'      | /BW 10 Hz | Stop<br>Sweep 6.23 | 2.390 00 GHz<br>8 s (601 pts) | Preferences                                 |

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#### WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL), b MODE

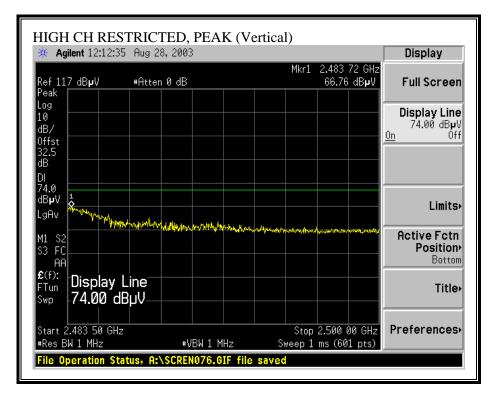


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| 🔆 Agilent 12:08:00 Aug                           | g 28, 2003 |                             | Display                                     |
|--|------------|-----------------------------|---|
| Ref 117 dB <b>µ</b> V #At<br>Peak                | ten 0 dB   | Mkr1 2.483 66 0<br>45.24 dB |   |
| Log<br>10<br>dB/<br>0ffst                        |            |                             | Display Line<br>54.00 dBµ\<br><u>On</u> Off |
| 32.5<br>dB<br>DI<br>54.0<br>dBµV                 |            |                             |   |
| LgAv<br>M1 S2                                    |            |                             | Active Fctn<br>Position                     |
| S3 FC<br>AA<br>£(f):<br>FTun <b>Display Line</b> |            |                             | Bottom                                      |
| Swp 54.00 dBµV                                   |            | Stop 2 500 00 G             | Hzî Preferences                             |
| #Res BW 1 MHz                                    | ₩VBW 10 Hz |                             |   |

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#### WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL), b MODE

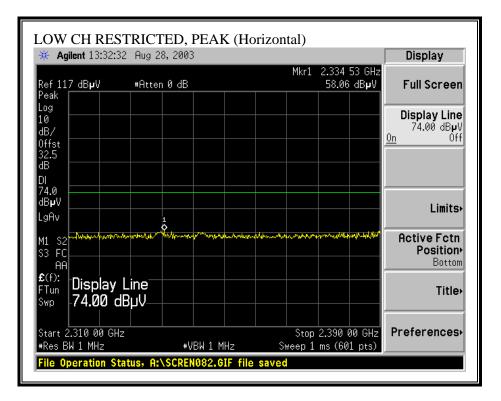


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| 🔆 Agilent 12:13:                   | 14 Aug 28,   | 2003       |      |                                | Display                                     |
|------------------------------------|--------------|------------|------|--------------------------------|---|
| Ref 117 dB <b>µ</b> V<br>Peak      | #Atten (     | ) dB       | Mkr1 | 2.483 50 GHz<br>47.00 dBµV     | Full Screen                                 |
| Log                                |              |            |      |                                | Display Line<br>54.00 dByV<br><u>On</u> Off |
| ав<br>DI<br>54.0<br>dВµV<br>LgAv   |              |            |      |                                | Limits                                      |
| M1 S2<br>S3 FC<br>AA               |              |            |      |                                | Active Fctn<br>Position<br>Bottom           |
| £(f): Display<br>FTun 54.00 (      | Line<br>dBµV |            |      |                                | Title                                       |
| Start 2.483 50 GH<br>#Res BW 1 MHz | l            | #VBW 10 Hz |      | 2.500 00 GHz<br>37 s (601 pts) | Preferences                                 |

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## WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL), g MODE

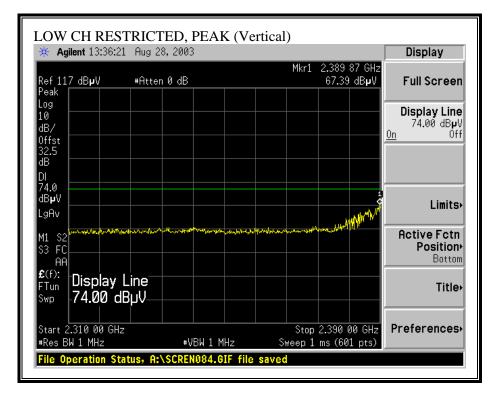


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| 🔆 Agilent 13:33:13                              | 7 Aug 28, 2003 |              |      |                                     | Display                                     |
|---|----------------|--------------|------|-------------------------------------|---|
|   | #Atten 0 dB    |              | Mkr1 | 2.333 33 GHz<br>47.15 dB <b>µ</b> V |   |
| Peak<br>Log<br>10<br>dB/<br>Offst<br>32.5<br>dB |                |              |      |                                     | Display Line<br>54.00 dBµV<br><u>On</u> Off |
| DI<br>54.0<br>dBµV<br>LgAv                      |                |              |      |                                     | Limits                                      |
| M1 S2<br>S3 FC<br>AA                            |                | ~            |      |                                     | Active Fctn<br>Position<br>Bottom           |
| £(f): Display<br>FTun<br>Swp 54.00 d            | Line<br>BµV    |              |      |                                     | Title                                       |
| Start 2.310 00 GHz<br>#Res BW 1 MHz             |                | <br>BW 10 Hz |      | <br>2.390 00 GHz<br>8 s (601 pts)   | Preferences                                 |

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#### WORST-CASE RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL), g MODE

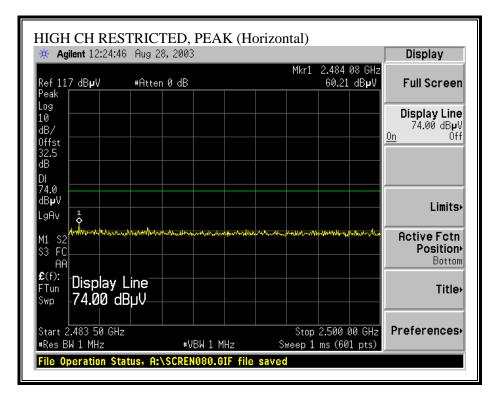


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| * Agilent 13:36:55                 |          |         |    | Mkr1 | 2.390   |               | Display                    |
|------------------------------------|----------|---------|----|------|---------|---------------|----------------------------|
| Ref 117 dB <b>µ</b> V<br>Peak      | #Atten ( | 0 dB    |    |      | 47.27   | dB <b>µ</b> V | Full Screer                |
| Log                                |          |         |    |      |         |               | Display Line               |
| 10<br>dB/                          |          |         |    |      |         |               | Display Line<br>54.00 dBpl |
| Offst                              |          |         |    |      |         |               | <u>On</u> Öff              |
| 32.5<br>dB                         |          |         |    |      |         |               |                            |
|                                    |          |         |    |      |         |               |                            |
| 54.0                               |          |         |    |      |         |               |                            |
| dB <b>µ</b> V<br>LgAv              |          |         |    |      |         |               | Limits                     |
|                                    |          |         |    |      |         |               |                            |
| M1 S2                              |          |         |    |      |         | 1             | Active Fctn<br>Position    |
| S3 FC                              |          |         |    |      |         | <sup>y</sup>  | Bottom                     |
| £(f): Dicplay                      | lino     |         |    |      |         |               |                            |
| FTun <b>DISpidy</b><br>Swp 54.00 d |          |         |    |      |         |               | Title                      |
| <b>3</b>                           |          |         |    |      |         |               |                            |
| Start 2.310 00 GHz                 |          |         |    | Stop | 2.390 0 | 00 GHz        | Preferences                |
| #Res BW 1 MHz                      |          | #VBW 10 | Hz |      |         |               |                            |

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#### WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL), g MODE

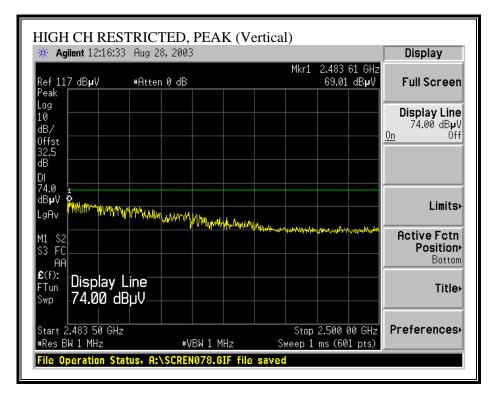


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| 🔆 Agilent 12:25:33 Aug                 | 28,2003    |                             | Display                              |
|--|------------|-----------------------------|--------------------------------------|
| Ref 117 dB <b>µ</b> V #Att<br>Peak I I | en 0 dB    | Mkr1 2.483 83 (<br>45.13 dB |                                      |
| Log<br>10<br>dB/<br>0ffst<br>32.5      |            |                             | Display Line<br>54.00 dBµ\<br>On Off |
| dB<br>DI<br>54.0<br>dBµV               |            |                             | Limits                               |
| LgAv<br>M1 S2<br>S3 FC 1               |            |                             | Active Fctn<br>Position<br>Bottom    |
| £(f):<br>FTun<br>Swp 54.00 dBµV-       |            |                             | Title                                |
| Start 2.483 50 GHz<br>#Res BW 1 MHz    | #VBW 10 Hz |                             | Hz <sup>*</sup> Preferences          |

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#### WORST-CASE RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL), g MODE



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| 🔆 Agilent 12:21:4                         | 3 Aug 28,2  | 2003       |      |                               | Display                                     |
|---|-------------|------------|------|-------------------------------|---|
| Ref 117 dB <b>µ</b> V<br>Peak             | #Atten 0    | dB         | Mkr1 | 2.483 50 GHz<br>46.97 dBµV    | Full Screen                                 |
| Log                                       |             |            |      |                               | Display Line<br>54.00 dByV<br><u>On</u> Off |
| ав<br>DI<br>54.0<br>dВ <b>µ</b> V<br>LgAv |             |            |      |                               | Limits                                      |
| M1 S2 <u>1</u><br>S3 FC <b>6</b>          |             |            |      | ·                             | Active Fctn<br>Position<br>Bottom           |
| £(f): Display<br><sup>FTun</sup> 54.00 d  | Line<br>BµV |            |      |                               | Title                                       |
| Start 2.483 50 GHz<br>#Res BW 1 MHz       | 2           | #VBW 10 Hz |      | 2.500 00 GHz<br>7 s (601 pts) | Preferences                                 |

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#### WORST-CASE HARMONICS AND SPURIOUS EMISSIONS, b MODE

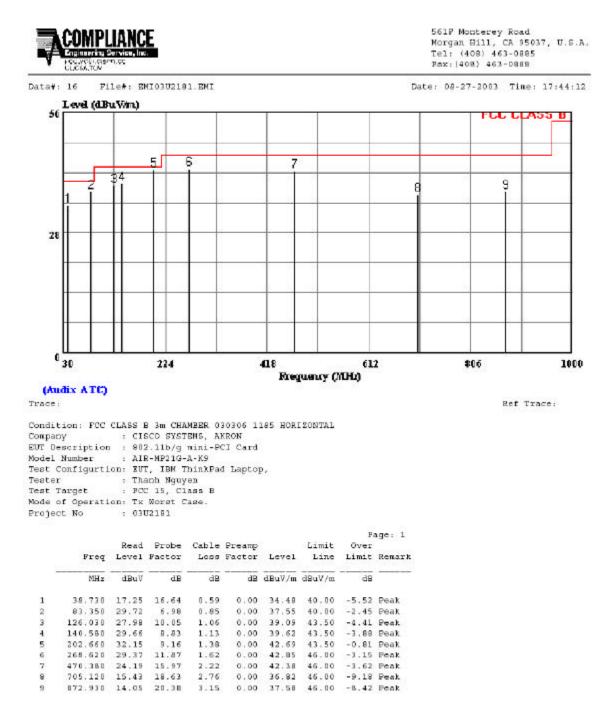
Note: The 802.11b mode is worst-case compared to the 802.11g mode. Only worst-case results are reported below.

| ompiian   |  |   | Measureme<br>Services, Mo  |  | ill Ope   | en Field   | Site   |  |  |  |  |  |  |  |   |  |
|---|--|---|--|--|---|--|--|--|--|--|--|--|--|--|---|--|
| est Engr:   |  | Yan Zheng   |  |  |   |  |  |  |  |  |  |  |  |  |   |  |
| oject #:  |  | 03U2181   |  |  |   |  |  |  |  |  |  |  |  |  |   |  |
| ompany:   |  | Cisco System  | IS   |  |   |  |  |  |  |  |  |  |  |  |   |  |
| UT Desci  | rip.:  | 802.11b/g R   | adio Module  |  |   |  |  |  |  |  |  |  |  |  |   |  |
| UT M/N:   |  |   | -A-K9 / AP110  | D  |   |  |  |  |  |  |  |  |  |  |   |  |
| est Targe   |  | FCC Class B   |  |  |   |  |  |  |  |  |  |  |  |  |   |  |
| ode Ope   | r:   | Transmit, Wo  | orst-case config   | uration of   | f two Co  | o-Located  | radios   |  |  |  |  |  |  |  |   |  |
| st Equip  | ment:  |   |  |  |   |  |  |  |  |  |  |  |  |  |   |  |
| EMCO H  | Iorn 1-1   | 18GHz   | Pre-amplife  | er 1-26GF  | łz  | 5  | Spectrum A   | nalyzer  |  |  | Horn > 18  | GHz  |  |  |   |  |
| T73; S/N  | : 6717 (   | @3m 🚽   | T86 Miteq 9  | 24341  | Ŧ   | Agile  | ent E4446A   | Analyzo  | er 🚽   | T117; ARA  | 18-26GHz; S  | 5/N:1013   | •  |  |   |  |
| F Hi Freque   | ency Cabl  | es  |  |  |   |  |  | Peak M   | Aeasureme  | nts:   | Average M  | leasurement  | s.   |  |   |  |
| (2 ft)  | ) F  | ✓ (2 ~ 3 ft)  | (4 ~ 6 ft)   | ✓ (12 ft)  |   |  |  |  | Resolution E   |  |  | lution Bandw   |  |  |   |  |
|   |  | ( )   | ( )  | (12 11)  |   |  |  |  | Video Bandv  |  | 10Hz Video   |  |  |  |   |  |
|   |  |   |  |  |   |  |  |  |  |  |  |  |  |  |   |  |
|   |  |   |  |  |   |  |  |  |  |  |  |  |  |  |   |  |
| f   | Dist   | Read Pk   | Read Avg   | ΔF   | CL  | Amn  | D Corr   | HPF  | Peak   | Δνσ  | Pk Lim   | Avg Lim  | Pk Mar   | Avg Mar  | Notes                                     |  |
|   | Dist<br>feet   | Read Pk<br>dBuV   | Read Avg.<br>dBuV  | AF<br>dB/m   | CL<br>dB  | Amp<br>dB  | D Corr<br>dB   | HPF  | Peak<br>dBuV/m   | Avg<br>dBuV/m  | Pk Lim<br>dBuV/m   | Avg Lim<br>dBuV/m  | Pk Mar<br>dB   | Avg Mar<br>dB  | Notes                                     |  |
| f<br>GHz  | Dist<br>feet   | Read Pk<br>dBuV   | Read Avg.<br>dBuV  | AF<br>dB/m   | CL<br>dB  | Amp<br>dB  | D Corr<br>dB   | HPF  |  | Avg<br>dBuV/m  |  |  | Pk Mar<br>dB   | Avg Mar<br>dB  | Notes                                     |  |
| GHz<br>Channel 1 (  | feet<br>2412M  | dBuV<br>Hz)   | dBuV   | dB/m   | dB  | dB   | dB   |  | dBuV/m   | dBuV/m   | dBuV/m   | dBuV/m   | dB   | dB   |   |  |
| GHz<br>Channel 1 (  | feet<br>2412M<br>9.8   | dBuV<br>Hz)<br>55.6   | dBuV<br>43.6   | dB/m<br>33.4   | dB<br>4.4   | dB<br>-45.6  | dB<br>0.0  | 1.0  | dBuV/m<br>48.8   | dBuV/m<br>36.8   | dBuV/m   | dBuV/m<br>54.0   | dB<br>-25.2  | dB<br>-17.2  | V   |  |
| GHz<br>Channel 1 (<br>.824<br>.824  | feet<br>2412M<br>9.8<br>9.8  | dBuV<br>Hz)<br>55.6<br>53.3   | dBuV   | dB/m   | dB  | dB   | dB   |  | dBuV/m   | dBuV/m   | dBuV/m   | dBuV/m   | dB   | dB   |   |  |
|   | feet<br>2412M<br>9.8<br>9.8  | dBuV<br>Hz)<br>55.6<br>53.3<br>Hz)  | dBuV<br>43.6   | dB/m<br>33.4   | dB<br>4.4<br>4.4                                    | dB<br>-45.6<br>-45.6   | dB<br>0.0  | 1.0  | dBuV/m<br>48.8<br>46.5   | dBuV/m<br>36.8   | dBuV/m   | dBuV/m<br>54.0   | dB<br>-25.2  | dB<br>-17.2  | V   |  |
| GHz<br>Channel 1 (<br>.824<br>.824<br>Channe 6 (2<br>.874<br>.311   | feet<br>2412M<br>9.8<br>9.8<br>2437MI<br>9.8<br>9.8<br>9.8   | dBuV<br>Hz)<br>55.6<br>53.3<br>Hz)<br>58.2<br>61.0  | dBuV<br>43.6<br>40.7<br>46.2<br>40.9                                 | dB/m<br>33.4<br>33.4<br>33.4<br>35.8   | dB<br>4.4<br>4.4<br>4.4<br>5.7                      | dB<br>-45.6<br>-45.6<br>-45.6<br>-45.6                                     | dB<br>0.0<br>0.0<br>0.0<br>0.0                             | 1.0<br>1.0<br>1.0<br>1.0                             | dBuV/m<br>48.8<br>46.5<br>51.4<br>56.9   | dBuV/m<br>36.8<br>33.9   | dBuV/m<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0                         | dBuV/m<br>54.0<br>54.0<br>54.0<br>54.0                                 | dB<br>-25.2<br>-27.5<br>-22.6<br>-17.1                                     | dB<br>-17.2<br>-20.1<br>-14.6<br>-17.2                                     | V<br>H<br>V<br>V                          |  |
| GHz<br>hannel 1 (<br>.824<br>.824<br>hanne 6 (2<br>.874<br>.311<br>.311   | feet<br>2412M<br>9.8<br>9.8<br>2437MI<br>9.8<br>9.8<br>9.8<br>9.8  | dBuV<br>Hz)<br>55.6<br>53.3<br>Hz)<br>58.2<br>61.0<br>51.8                                | dBuV<br>43.6<br>40.7<br>46.2<br>40.9<br>39.3                         | dB/m<br>33.4<br>33.4<br>33.4<br>35.8<br>35.8                                 | dB<br>4.4<br>4.4<br>5.7<br>5.7                      | dB<br>-45.6<br>-45.6<br>-45.6<br>-46.6<br>-46.6                            | dB<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0                      | 1.0<br>1.0<br>1.0<br>1.0<br>1.0                      | dBuV/m<br>48.8<br>46.5<br>51.4<br>56.9<br>47.7                                 | dBuV/m<br>36.8<br>33.9<br>39.4<br>36.8<br>35.2                         | dBuV/m<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0                         | dBuV/m<br>54.0<br>54.0<br>54.0<br>54.0<br>54.0<br>54.0                 | dB<br>-25.2<br>-27.5<br>-22.6<br>-17.1<br>-26.3                            | dB<br>-17.2<br>-20.1<br>-14.6<br>-17.2<br>-18.8                            | V<br>H<br>V<br>V<br>H                     |  |
| GHz<br>hannel 1 ( .824 .824 Channe 6 (2 .874 .311 .311 .874   | feet<br>2412M<br>9.8<br>9.8<br>2437MI<br>9.8<br>9.8<br>9.8<br>9.8<br>9.8<br>9.8                                | dBuV<br>Hz)<br>55.6<br>53.3<br>Hz)<br>58.2<br>61.0<br>51.8<br>54.5                        | dBuV<br>43.6<br>40.7<br>46.2<br>40.9                                 | dB/m<br>33.4<br>33.4<br>33.4<br>35.8   | dB<br>4.4<br>4.4<br>4.4<br>5.7                      | dB<br>-45.6<br>-45.6<br>-45.6<br>-45.6                                     | dB<br>0.0<br>0.0<br>0.0<br>0.0                             | 1.0<br>1.0<br>1.0<br>1.0                             | dBuV/m<br>48.8<br>46.5<br>51.4<br>56.9   | dBuV/m<br>36.8<br>33.9<br>39.4<br>36.8                                 | dBuV/m<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0                         | dBuV/m<br>54.0<br>54.0<br>54.0<br>54.0                                 | dB<br>-25.2<br>-27.5<br>-22.6<br>-17.1                                     | dB<br>-17.2<br>-20.1<br>-14.6<br>-17.2                                     | V<br>H<br>V<br>V                          |  |
| GHz<br>Channel 1 (<br>.824<br>.824<br>Channe 6 (2<br>.874<br>.311<br>.311   | feet<br>2412M<br>9.8<br>9.8<br>2437MI<br>9.8<br>9.8<br>9.8<br>9.8<br>9.8<br>9.8                                | dBuV<br>Hz)<br>55.6<br>53.3<br>Hz)<br>58.2<br>61.0<br>51.8<br>54.5                        | dBuV<br>43.6<br>40.7<br>46.2<br>40.9<br>39.3                         | dB/m<br>33.4<br>33.4<br>33.4<br>35.8<br>35.8                                 | dB<br>4.4<br>4.4<br>5.7<br>5.7                      | dB<br>-45.6<br>-45.6<br>-45.6<br>-46.6<br>-46.6                            | dB<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0                      | 1.0<br>1.0<br>1.0<br>1.0<br>1.0                      | dBuV/m<br>48.8<br>46.5<br>51.4<br>56.9<br>47.7                                 | dBuV/m<br>36.8<br>33.9<br>39.4<br>36.8<br>35.2                         | dBuV/m<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0                         | dBuV/m<br>54.0<br>54.0<br>54.0<br>54.0<br>54.0<br>54.0                 | dB<br>-25.2<br>-27.5<br>-22.6<br>-17.1<br>-26.3                            | dB<br>-17.2<br>-20.1<br>-14.6<br>-17.2<br>-18.8                            | V<br>H<br>V<br>V<br>H                     |  |
| GHz<br>hannel 1 ( .824 .824 .824 .824 .311 .311 .311 .874 .874 .4874 .316 .874 .387 .386 .386 .386 .386 .386 .386 .386 .386 | feet<br>2412M<br>9.8<br>9.8<br>2437MI<br>9.8<br>9.8<br>9.8<br>9.8<br>9.8<br>(2462M<br>9.8<br>9.8<br>9.8<br>9.8 | dBuV<br>Hz)<br>55.6<br>53.3<br>4z)<br>58.2<br>61.0<br>51.8<br>54.5<br>Hz)<br>54.8<br>55.4 | dBuV<br>43.6<br>40.7<br>46.2<br>40.9<br>39.3<br>41.5<br>42.7<br>39.3 | dB/m<br>33.4<br>33.4<br>35.8<br>35.8<br>33.4<br>33.4<br>33.5<br>33.5<br>36.0 | dB<br>4.4<br>4.4<br>5.7<br>5.7<br>4.4<br>4.5<br>5.7 | dB<br>-45.6<br>-45.6<br>-45.6<br>-45.6<br>-45.6<br>-45.6<br>-45.7<br>-46.5 | dB<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0 | 1.0<br>1.0<br>1.0<br>1.0<br>1.0<br>1.0<br>1.0<br>1.0 | dBuV/m<br>48.8<br>46.5<br>51.4<br>56.9<br>47.7<br>47.7<br>47.7<br>48.1<br>51.5 | dBuV/m<br>36.8<br>33.9<br>39.4<br>36.8<br>35.2<br>34.7<br>35.9<br>35.4 | dBuV/m<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0 | dBuV/m<br>54.0<br>54.0<br>54.0<br>54.0<br>54.0<br>54.0<br>54.0<br>54.0 | dB<br>-25.2<br>-27.5<br>-22.6<br>-17.1<br>-26.3<br>-26.3<br>-25.9<br>-22.5 | dB<br>-17.2<br>-20.1<br>-14.6<br>-17.2<br>-18.8<br>-19.3<br>-18.1<br>-18.6 | V<br>H<br>V<br>V<br>H<br>H<br>H<br>V<br>V |  |
| GHz Channel 1 ( .824 .824 Channe 6 ( .874 .311 .311 .874 Channe 11  | feet<br>2412M<br>9.8<br>9.8<br>2437MI<br>9.8<br>9.8<br>9.8<br>9.8<br>9.8<br>(2462M<br>9.8                      | dBuV<br>Hz)<br>55.6<br>53.3<br>Hz)<br>58.2<br>61.0<br>51.8<br>54.5<br>Hz)<br>54.8         | dBuV<br>43.6<br>40.7<br>46.2<br>40.9<br>39.3<br>41.5<br>42.7         | dB/m<br>33.4<br>33.4<br>35.8<br>35.8<br>33.4<br>33.4<br>33.5                 | dB<br>4.4<br>4.4<br>5.7<br>5.7<br>4.4<br>4.5        | -45.6<br>-45.6<br>-45.6<br>-46.6<br>-46.6<br>-46.6<br>-45.7                | dB<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0<br>0.0        | 1.0<br>1.0<br>1.0<br>1.0<br>1.0<br>1.0               | dBuV/m<br>48.8<br>46.5<br>51.4<br>56.9<br>47.7<br>47.7<br>48.1                 | dBuV/m<br>36.8<br>33.9<br>39.4<br>36.8<br>35.2<br>34.7<br>35.9         | dBuV/m<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0<br>74.0 | dBuV/m<br>54.0<br>54.0<br>54.0<br>54.0<br>54.0<br>54.0<br>54.0         | dB<br>-25.2<br>-27.5<br>-22.6<br>-17.1<br>-26.3<br>-26.3<br>-25.9          | dB<br>-17.2<br>-20.1<br>-14.6<br>-17.2<br>-18.8<br>-19.3<br>-18.1          | V<br>H<br>V<br>V<br>H<br>H<br>V           |  |

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## 7.9. RADIATED EMISSIONS BELOW 1 GHZ

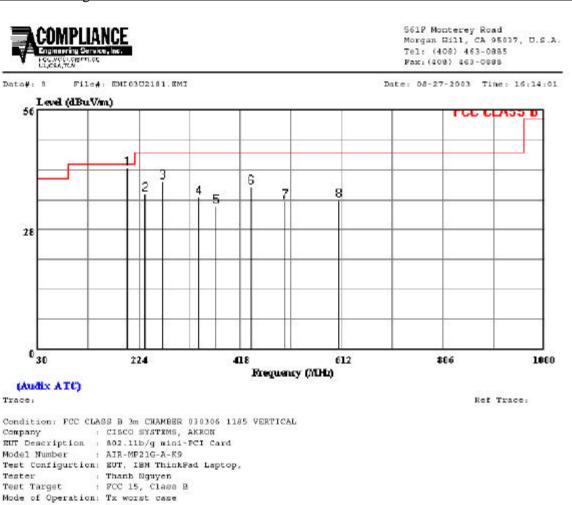
#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



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Project No

: 0302181



|   |         |       |        |       |        |        |        | P      | age: 1 |
|---|---------|-------|--------|-------|--------|--------|--------|--------|--------|
|   |         | Read  | Probe  | Cable | Preamp |        | Limit  | Over   |        |
|   | Freq    | Level | Factor | Loss  | Pactor | Level  | Line   | Limit  | Remark |
|   | MHz     | dBuV  | dB     | dB    | dB     | dBu∛/m | dBuV/m | dB     |        |
| 1 | 201.690 | 31,93 | 9.08   | 1.30  | 0.00   | 42.39  | 43.50  | -1.11  | Peak   |
| 2 | 235.640 | 23.77 | 11.02  | 1.47  | 0.00   | 36.26  | 46.00  | -9.74  | Peak   |
| 3 | 268.620 | 25.84 | 11.87  | 1.62  | 0.00   | 39.32  | 46.00  | -6.68  | Peak   |
| 4 | 337.490 | 20,71 | 13.02  | 1.85  | 0.00   | 35.58  | 46.00  | -10.42 | Peak   |
| 5 | 371.440 | 17.69 | 13.84  | 1,96  | 0.00   | 33.49  | 46.00  | -12.51 | Peak   |
| 6 | 439.340 | 20.69 | 15.32  | 2.15  | 0.00   | 38.16  | 46.00  | -7.84  | Peak   |
| 7 | 504.330 | 15.66 | 16.60  | 2.31  | 0.00   | 34.57  | 46.00  | -11.43 | Peak   |
| 8 | 606.180 | 14.69 | 17.75  | 2.53  | 0.00   | 34,97  | 46.00  | -11.03 | Peak   |
|   |         |       |        |       |        |        |        |        |        |

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# 7.10. POWERLINE CONDUCTED EMISSIONS

## <u>LIMIT</u>

\$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:

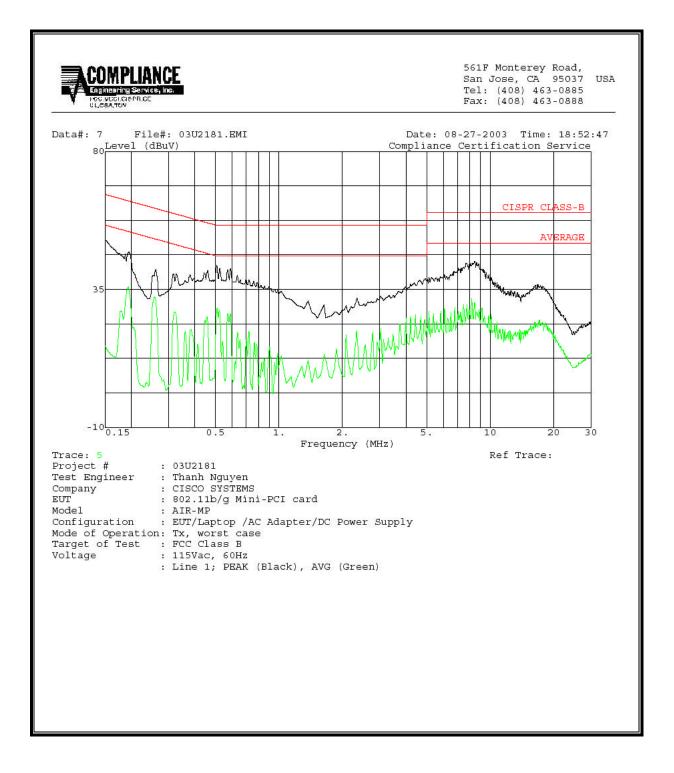
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#### **<u>6 WORST EMISSIONS</u>**

|           | CONDUCTED EMISSIONS DATA (115VAC 60Hz) |           |           |               |       |       |         |         |         |  |  |
|-----------|--|-----------|-----------|---------------|-------|-------|---------|---------|---------|--|--|
| Freq.     | Reading                                |           |           | Closs         | Limit | EN_B  | Mar     | gin     | Remark  |  |  |
| (MHz)     | PK (dBuV)                              | QP (dBuV) | AV (dBuV) | ( <b>dB</b> ) | QP    | AV    | QP (dB) | AV (dB) | L1 / L2 |  |  |
| 0.15      | 51.06                                  |           |           | 0.00          | 65.94 | 55.94 | -14.88  | -4.88   | L1      |  |  |
| 8.46      | 44.26                                  |           |           | 0.00          | 60.00 | 50.00 | -15.74  | -5.74   | L1      |  |  |
| 0.51      | 42.80                                  |           |           | 0.00          | 56.00 | 46.00 | -13.20  | -3.20   | L1      |  |  |
| 0.15      | 58.03                                  |           | 21.64     | 0.00          | 65.94 | 55.94 | -7.91   | -34.30  | L2      |  |  |
| 0.25      | 51.92                                  |           | 33.50     | 0.00          | 63.11 | 53.11 | -11.19  | -19.61  | L2      |  |  |
| 7.98      | 43.00                                  |           | 29.95     | 0.00          | 60.00 | 50.00 | -17.00  | -20.05  | L2      |  |  |
| 6 Worst I | Data                                   |           |           |               |       |       |         |         |         |  |  |

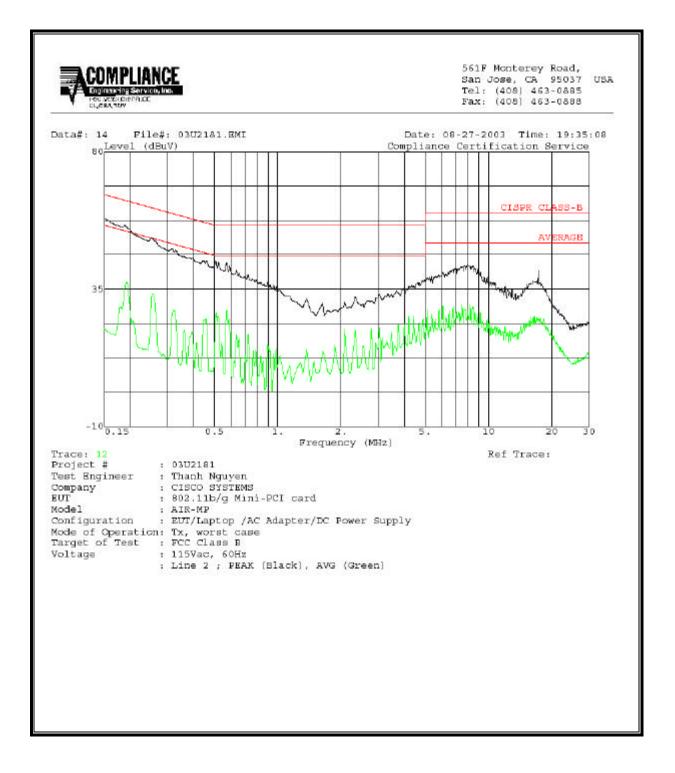
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#### LINE 1 RESULTS



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#### LINE 2 RESULTS



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# 8. SETUP PHOTOS

## ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

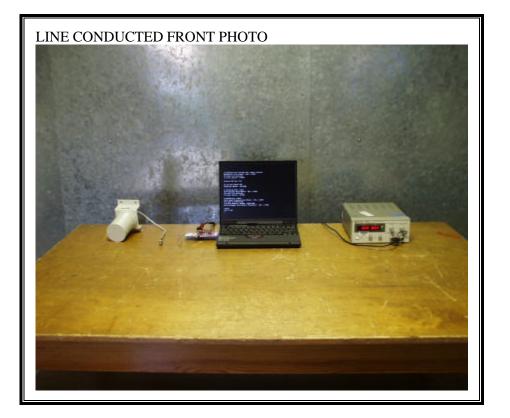


#### RADIATED RF MEASUREMENT SETUP

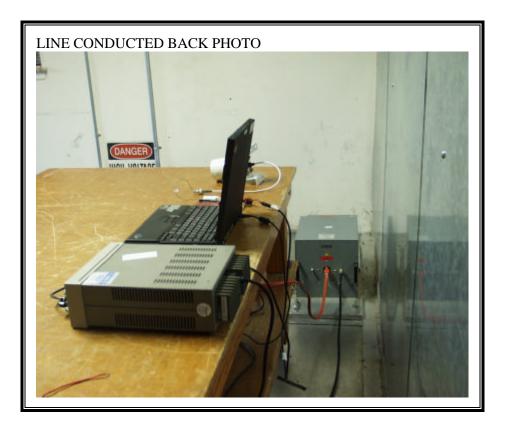
See separate photographs for each antenna type.

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#### POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP



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# **END OF REPORT**

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