# FCC CFR47 PART 15 SUBPART C
# CERTIFICATION
# TEST REPORT

**FOR**

**BLUETOOTH SCANNER**

**MODEL NUMBER: BT2141-03**

**FCC ID: T9J-RN1022-M**

**REPORT NUMBER: 06U10284-1, REVISION B**

**ISSUE DATE: JUNE 01, 2006**

*Prepared for*
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**LAB CODE:200065-0**

## Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| - | 5/30/06 | Initial Issue | MH |
| B | 6/01/06 | Updated EUT description, model number and section 5.1 | DZ |



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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** ROVING NETWORKS
431 MONTEREY AVE, SUITE 5
LOS GATOS, CA 95030, USA

**EUT DESCRIPTION:** BLUETOOTH SCANNER

**MODEL:** BT2141-03

**SERIAL NUMBER:** 01746

**DATE TESTED:** MAY 17- 20, 2006

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

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note**: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

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ENGINEERING MANAGER
COMPLIANCE CERTIFICATION SERVICES

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EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES




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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

# 3. FACILITIES AND ACCREDITATION

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

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

## 4.2. MEASUREMENT UNCERTAINTY

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

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

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




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# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth scanner powered by batteries.

The radio module is manufactured by Roving Networks.

The Applicant name, EUT model number and EUT description were changed after testing commenced, all data in this report is applicable to the Applicant name, model number and description documented in Section 1 above.

## 5.2. MAXIMUM OUTPUT POWER

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

2400 to 2483.5 MHz Authorized Band

| Frequency Range (MHz) | Output Power (dBm) | Output Power (mW) |
|---|---|---|
| 2402 - 2480 | 2.64 | 1.84 |

## 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a single chip antenna. Two models are available: one is YAGOE with a maximum gain of 4.1 dBi and the other is TDK with a maximum gain of 0 dBi.

## 5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was BLUETEST 2833.

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

The test utility software used during testing was Bluetest.exe

## 5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 2480 MHz.




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## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| PERIPHERAL SUPPORT EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| Laptop | Sony | PCG-F390 | 28305031-3030373 | DoC |
| PS2 mouse | Logitech | 811375-000 | LZA9037 | DoC |
| Interface card | Roving Networks | Plotech 4-944-0 | E169497 | NA |

### I/O CABLES

| I/O CABLE LIST | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No.** | **Port** | **# of Identical Ports** | **Connector Type** | **Cable Type** | **Cable Length** | **Remarks** |
| 1 | AC | 1 | US 115V | Un-shielded | 2m | No |
| 2 | DC | 2 | DC Plug | Un-shielded | 2m | No |
| 3 | Serial | 1 | DB9 | Un-shielded | 2m | Yes |
| 4 | Mouse | 1 | PS/2 | Un-shielded | 2m | Yes |
| 5 | N/A | N/A | DC | Un-shielded | .5m | No |

### TEST SETUP

The EUT is connected to the serial port of a laptop computer via an interface card. Test software exercised the radio card.




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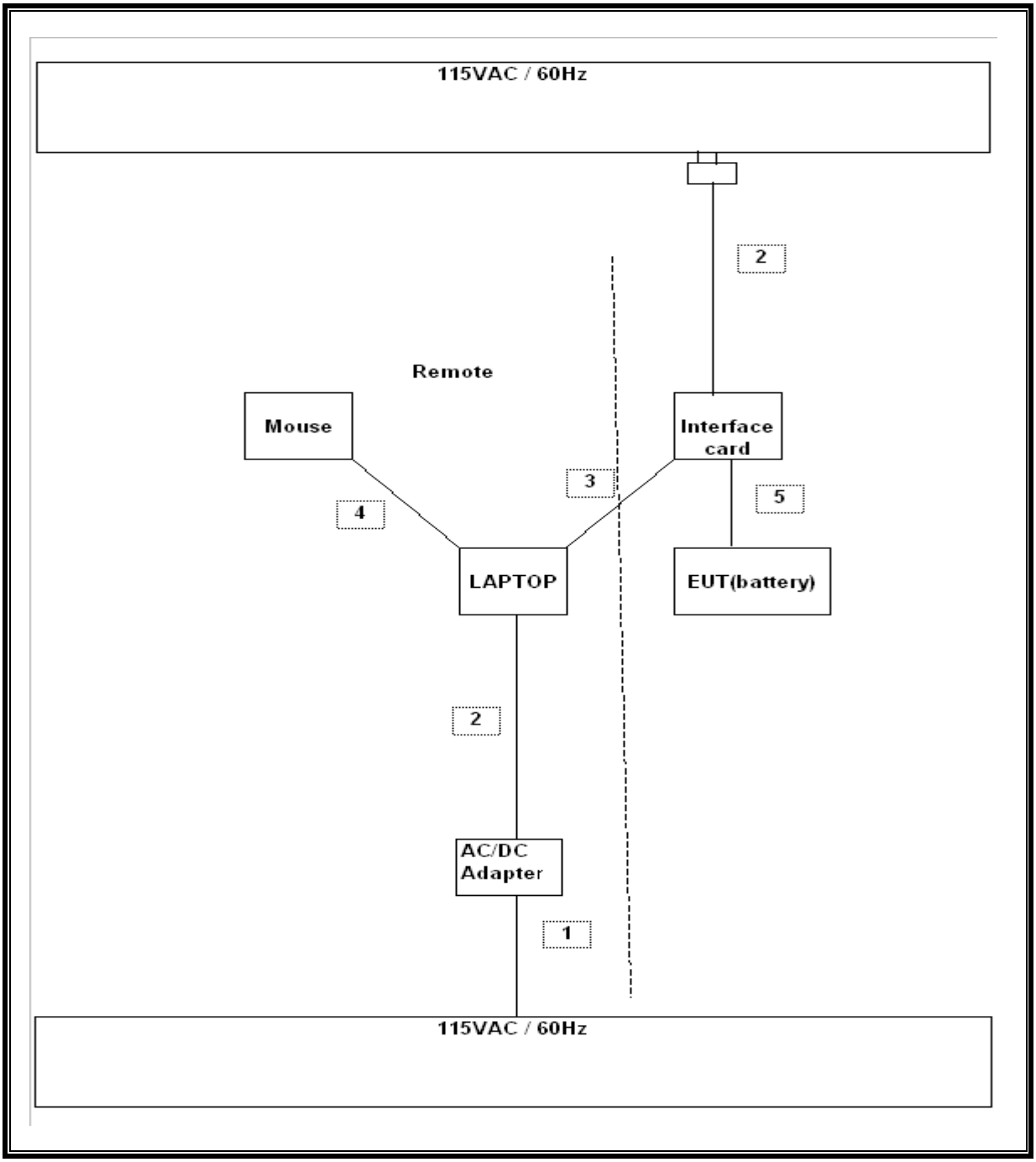
**SETUP DIAGRAM FOR TESTS**







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# 6. TEST AND MEASUREMENT EQUIPMENT

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

| TEST EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **Cal Due** |
| Antenna, Horn 1 ~ 18 GHz | EMCO | 3115 | 2/15/1906 | 4/22/2007 |
| Spectrum Analyzer 3 Hz ~ 44 GHz | Agilent / HP | E4446A | MY45300064 | 12/19/06 |
| Preamplifier, 1 ~ 26.5 GHz | Agilent / HP | 8449B | 3008A00561 | 10/3/07 |
| EMI Receiver, 9 kHz ~ 2.9 GHz | Agilent / HP | 8542E | 3942A00286 | 2/4/07 |
| RF Filter Section | Agilent / HP | 85420E | 3705A00256 | 2/4/07 |
| Antenna, Bilog 30 MHz ~ 2 Ghz | Sunol Sciences | JB1 | A121003 | 9/3/06 |
| Power Meter | Agilent / HP | 438B | 3125U09516 | 2/15/07 |



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# 7. LIMITS AND RESULTS

## 7.1. ANTENNA PORT CHANNEL TESTS

### 7.1.1. 20 dB BANDWIDTH

**LIMIT**

None; for reporting purposes only.

**TEST PROCEDURE**

The transmitter output is connected to a spectrum analyzer. The RBW is set to 1% to 3% of the 20 dB bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled.

**RESULTS**

No non-compliance noted:

| Channel | Frequency (MHz) | 20 dB Bandwidth (kHz) |
|---|---|---|
| Low | 2402 | 940.1487 |
| Middle | 2441 | 912.2811 |
| High | 2480 | 912.9189 |




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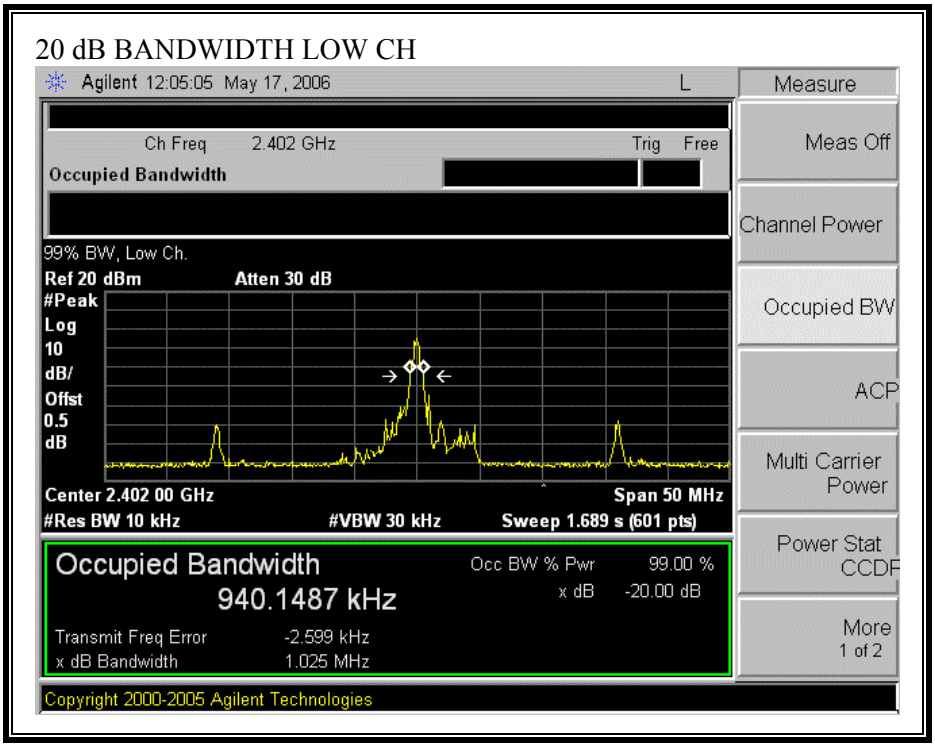
**20 dB BANDWIDTH**







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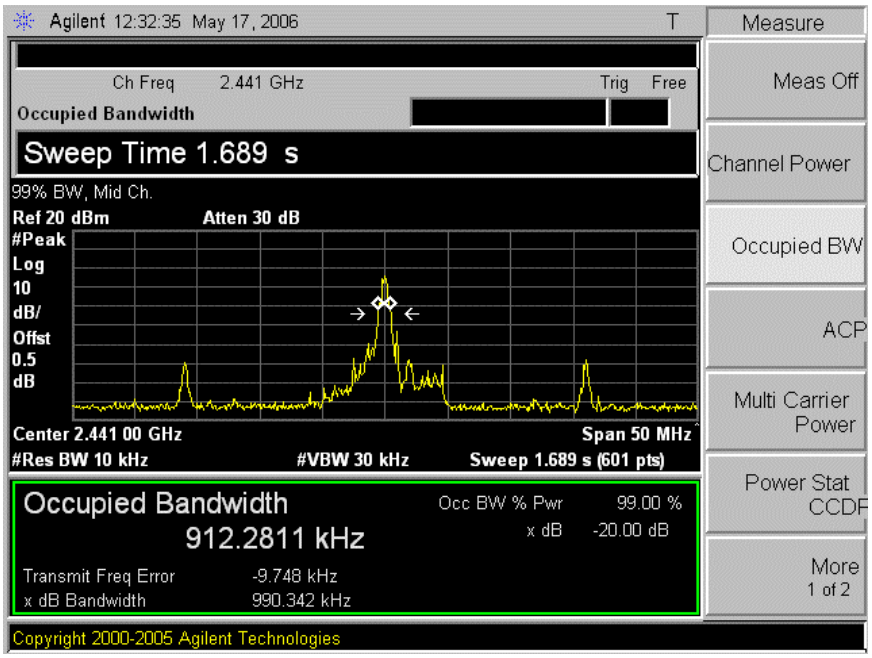
20 dB BANDWIDTH MID CH







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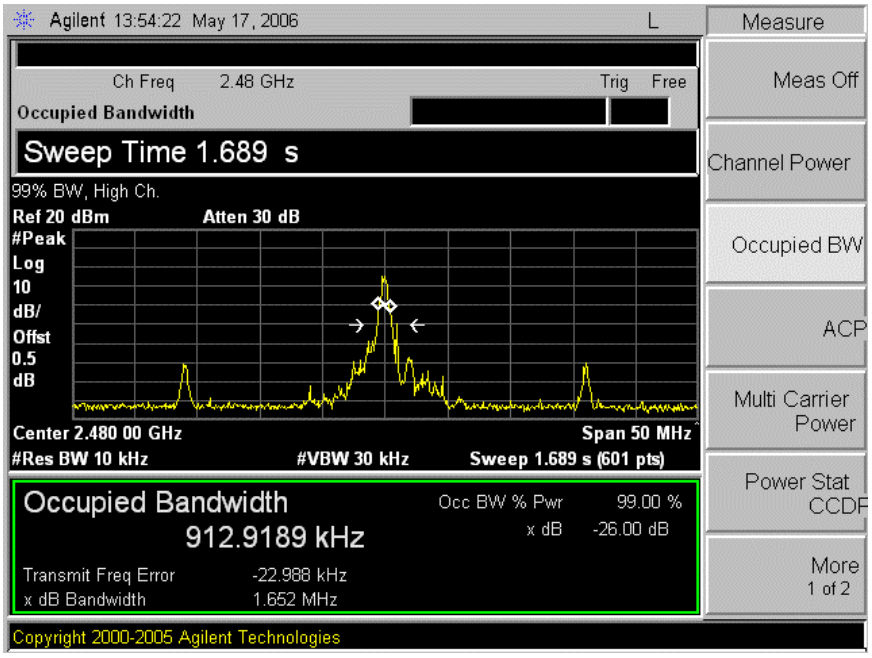
20 dB BANDWIDTH HIGH CH







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### 7.1.2. HOPPING FREQUENCY SEPARATION

**LIMIT**

§15.247 (a) (1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

**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.

**RESULTS**

No non-compliance noted:



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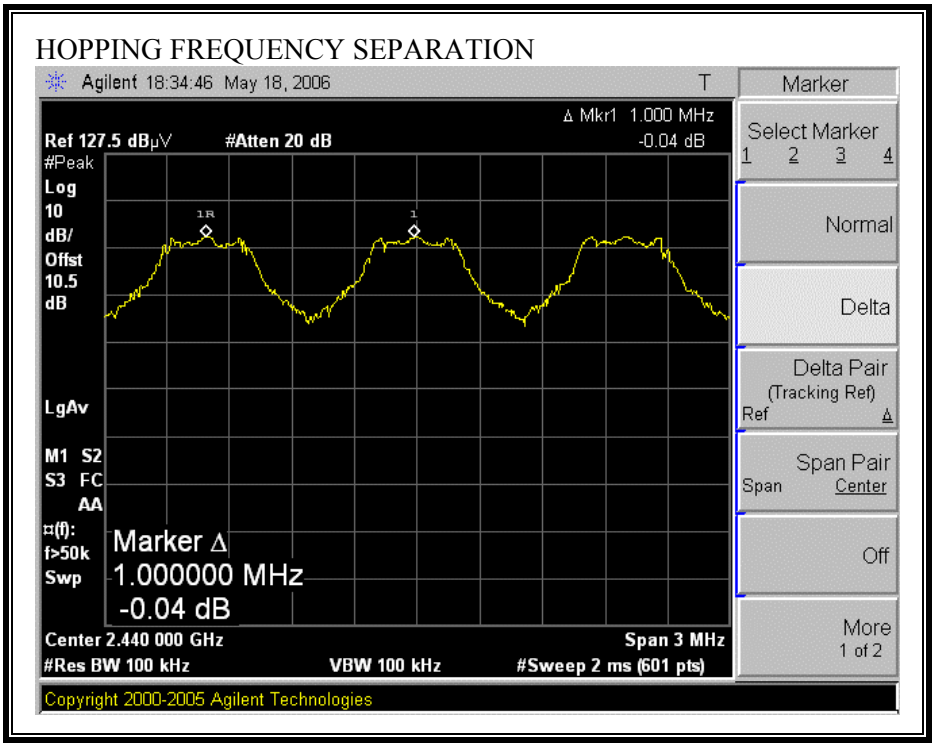
## HOPPING FREQUENCY SEPARATION







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### 7.1.3. NUMBER OF HOPPING CHANNELS

**LIMIT**

§15.247 (a) (1) (iii) Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

**TEST PROCEDURE**

The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to 1 % of the span. The analyzer is set to Max Hold.

**RESULTS**

No non-compliance noted:

79 Channels observed.



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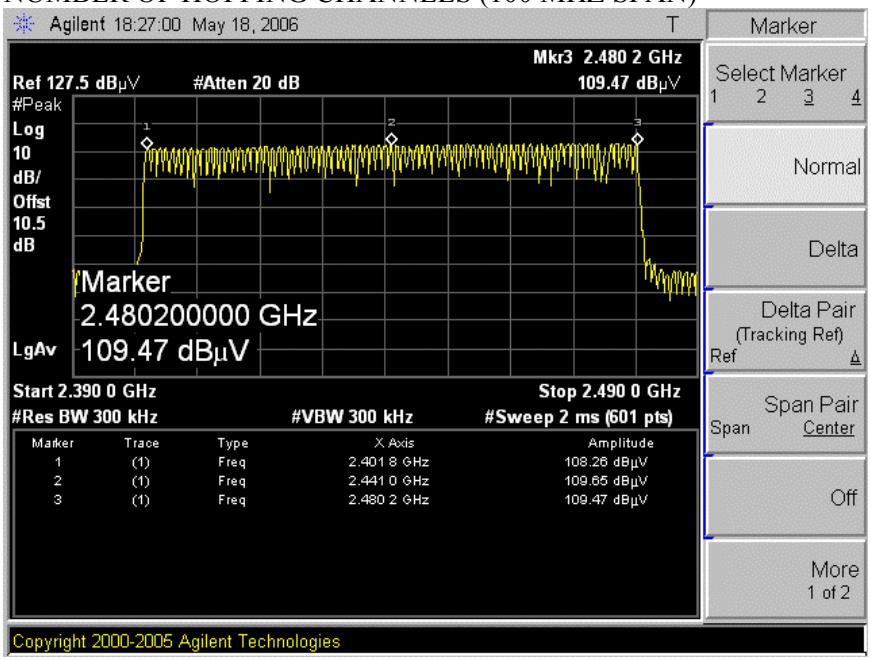
**NUMBER OF HOPPING CHANNELS**

NUMBER OF HOPPING CHANNELS (100 MHZ SPAN)







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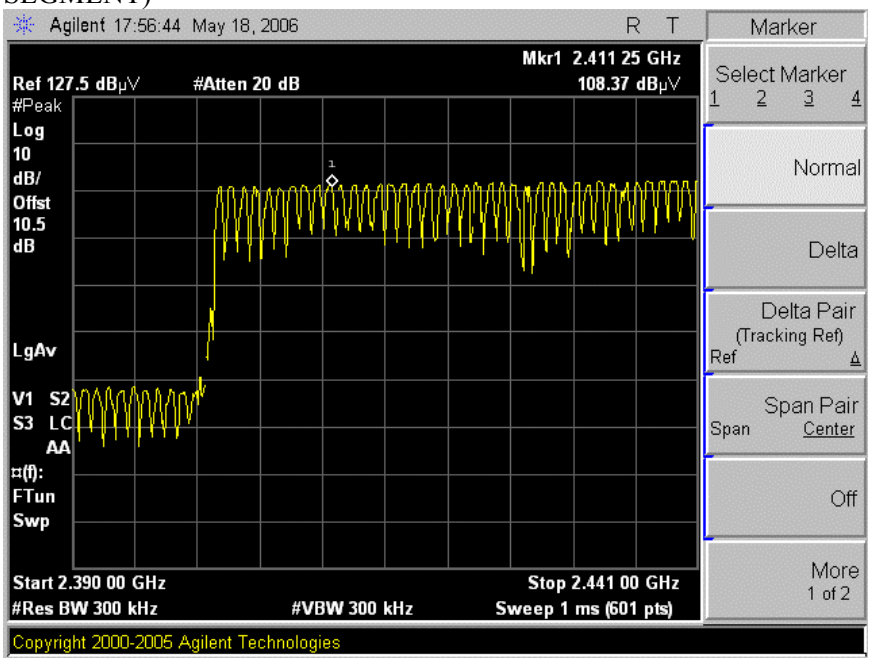
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, FIRST SEGMENT)







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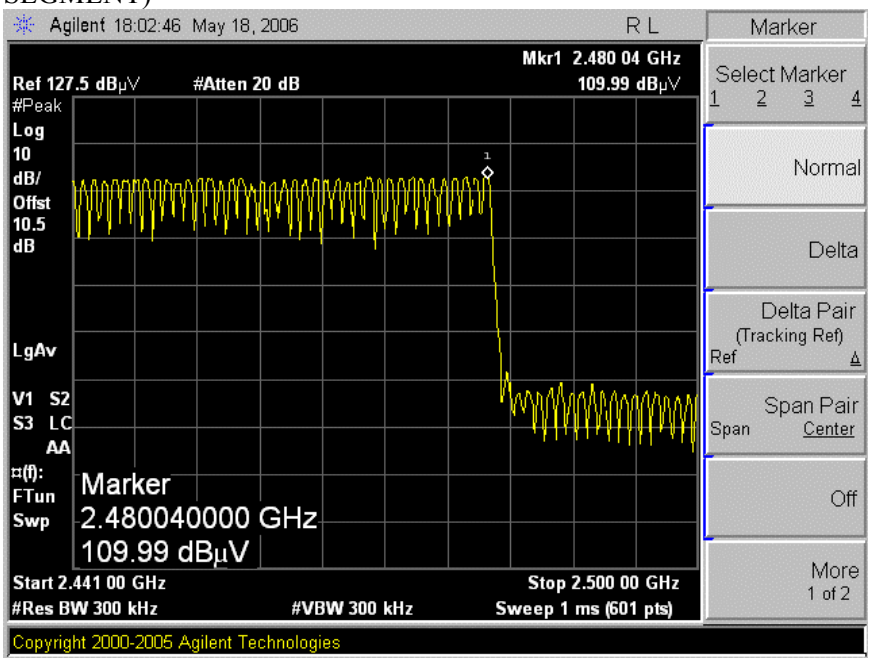
NUMBER OF HOPPING CHANNELS (30 MHZ SPAN, SECOND SEGMENT)







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## 7.1.4. AVERAGE TIME OF OCCUPANCY

**LIMIT**

§15.247 (a) (1) (iii) Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

**TEST PROCEDURE**

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

**RESULTS**

No non-compliance noted:

Time Of Occupancy = 10 * 30 pulses * 0.436 msec = 130.8 msec




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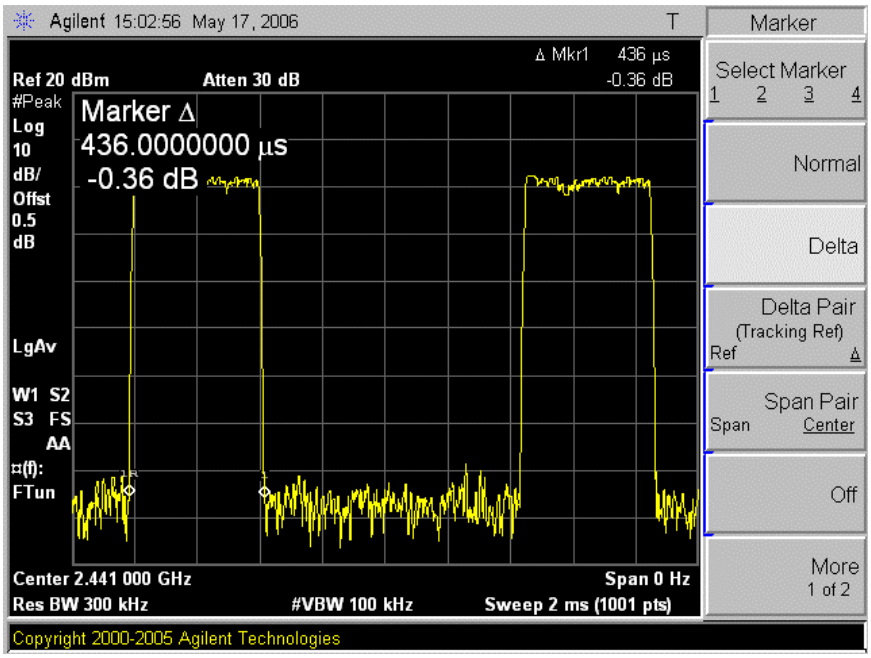
**PULSE WIDTH**

PULSE WIDTH







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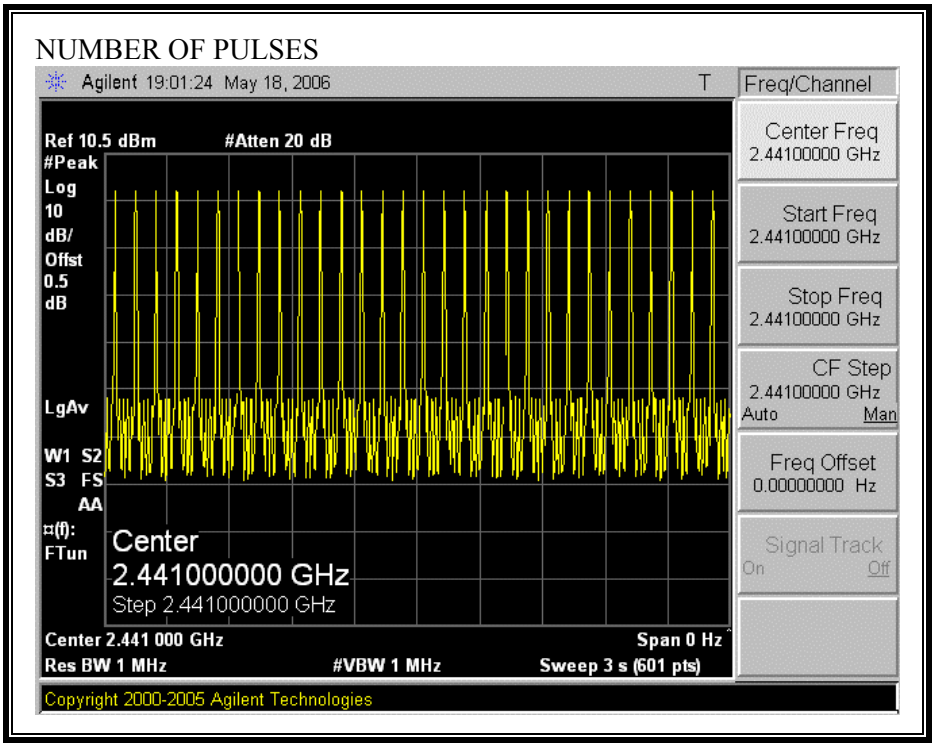
**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD**







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### 7.1.5. 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) (1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels: 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 4.1dBi, therefore the limit is 30 dBm.

**TEST PROCEDURE**

The transmitter output is connected to a spectrum analyzer and the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

**RESULTS**

No non-compliance noted:

| Channel | Frequency (MHz) | Peak Power (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | 1.01 | 30 | -28.99 |
| Middle | 2441 | 2.46 | 30 | -27.54 |
| High | 2480 | 2.64 | 30 | -27.36 |




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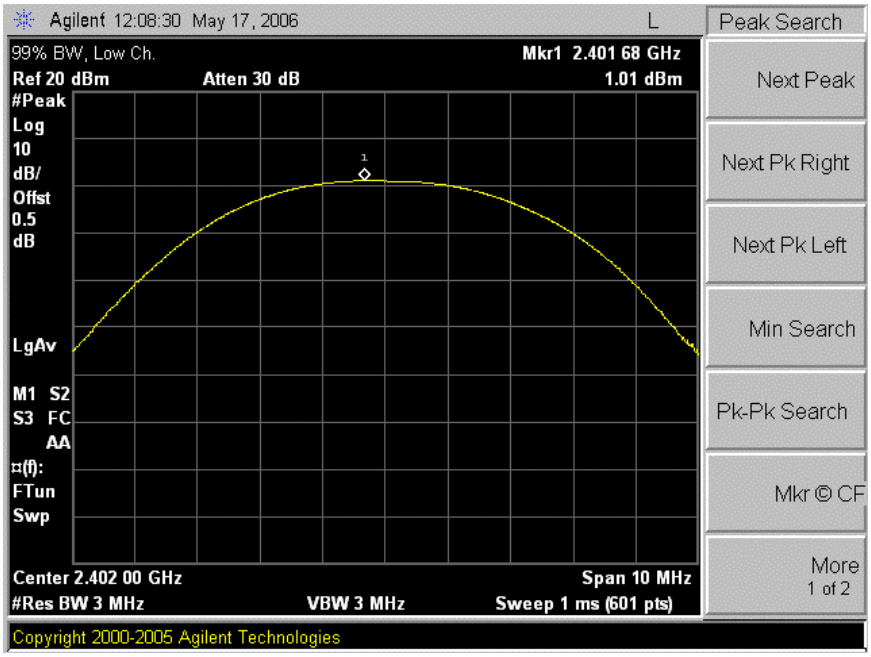
**OUTPUT POWER**

PEAK POWER LOW CH







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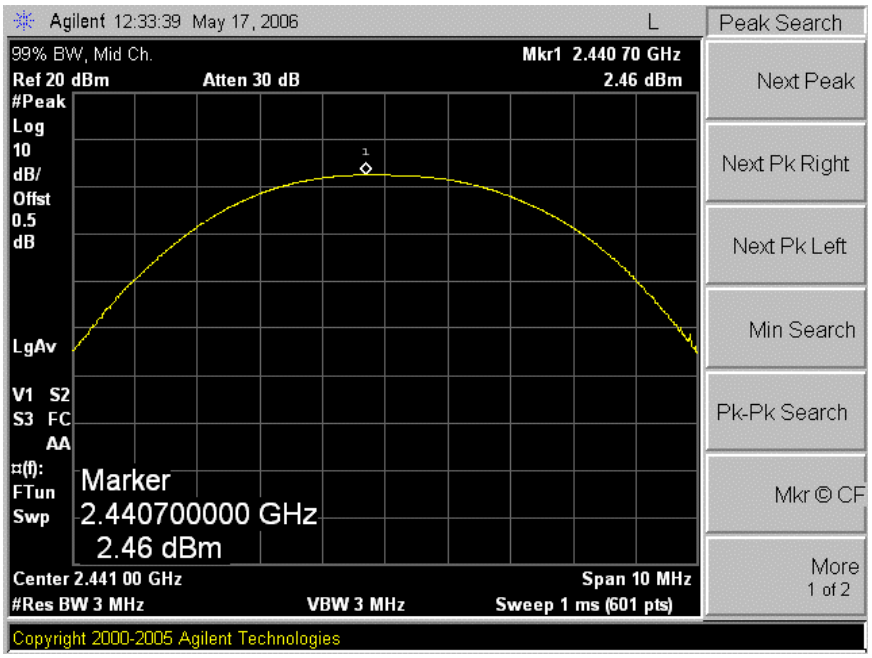
PEAK POWER MID CH







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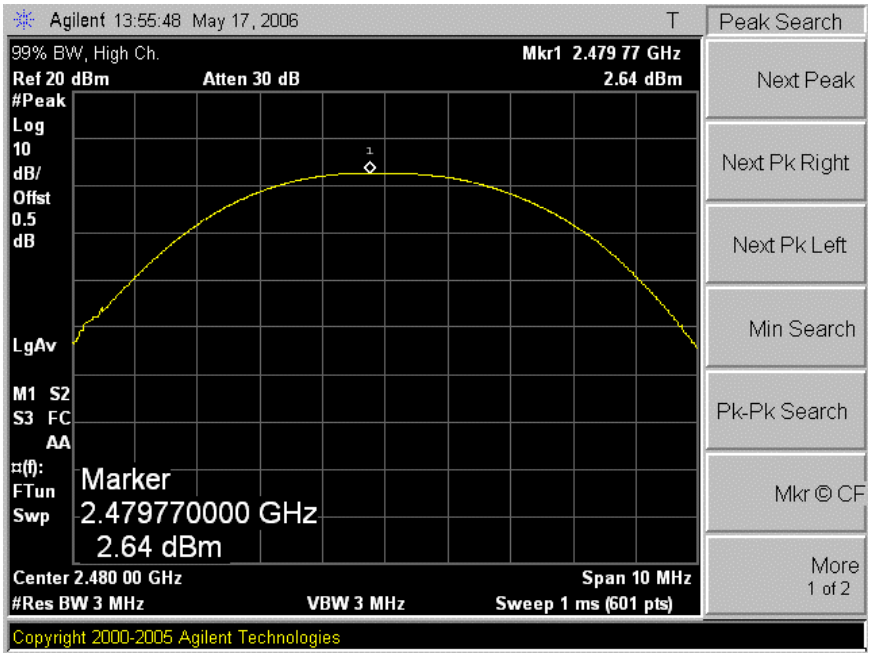
PEAK POWER HIGH CH







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### 7.1.6. RF EXPOSURE REQUIREMENT

The output power is below the SAR Threshold of the RF exposure requirement.

### 7.1.7. 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 .5 dB was entered as an offset in the power meter to allow for direct reading of power.

| Channel | Frequency (MHz) | Average Power (dBm) |
|---|---|---|
| Low | 2402 | -4.46 |
| Middle | 2441 | -3.32 |
| High | 2480 | -2.60 |




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## 7.1.8. CONDUCTED SPURIOUS EMISSIONS

**LIMITS**

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

**TEST PROCEDURE**

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

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

**RESULTS**

No non-compliance noted:




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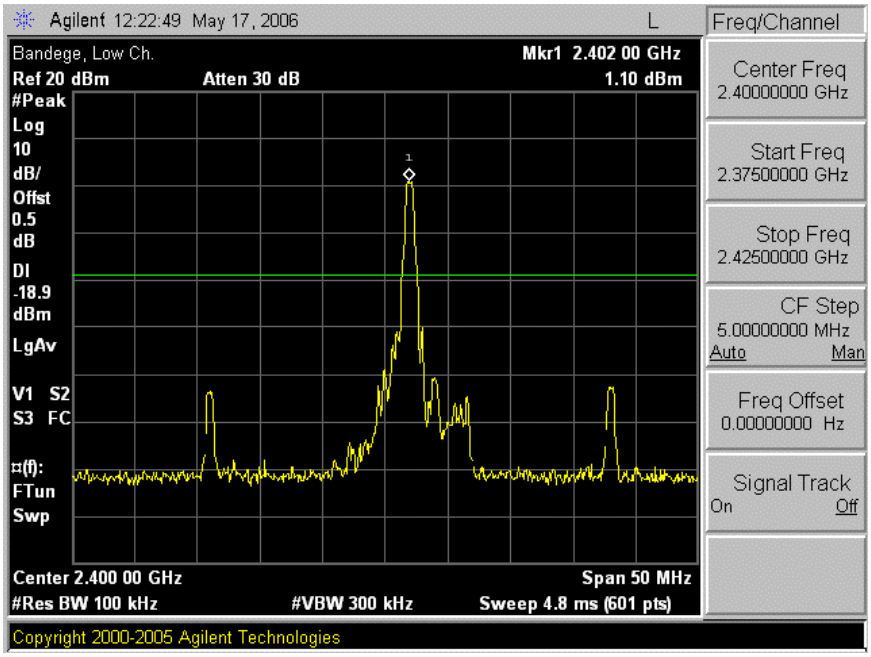
**SPURIOUS EMISSIONS, LOW CHANNEL**

LOW CHANNEL BANDEDGE







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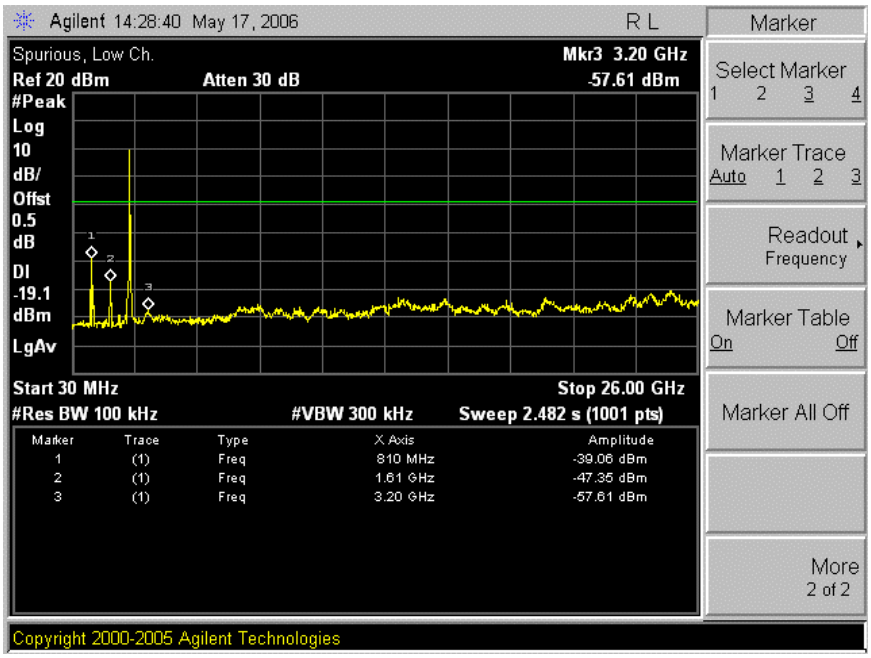
LOW CHANNEL SPURIOUS







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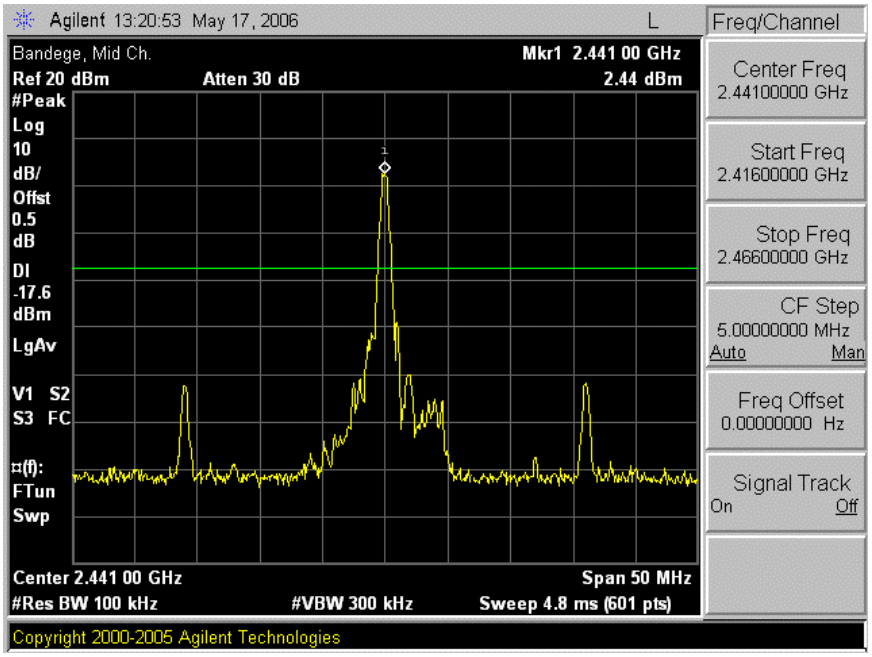
**SPURIOUS EMISSIONS, MID CHANNEL**

MID CHANNEL REFERENCE







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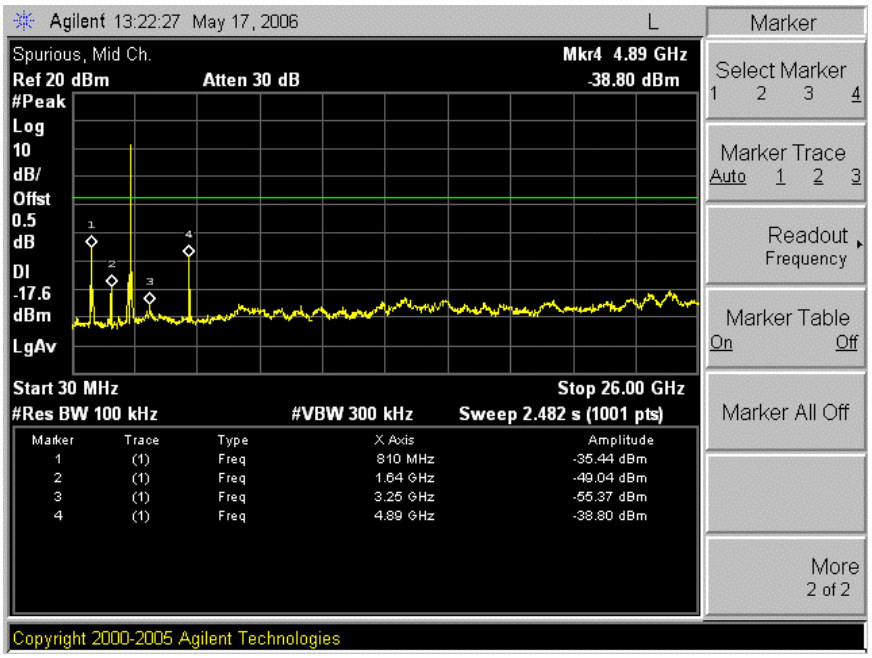
MID CHANNEL SPURIOUS







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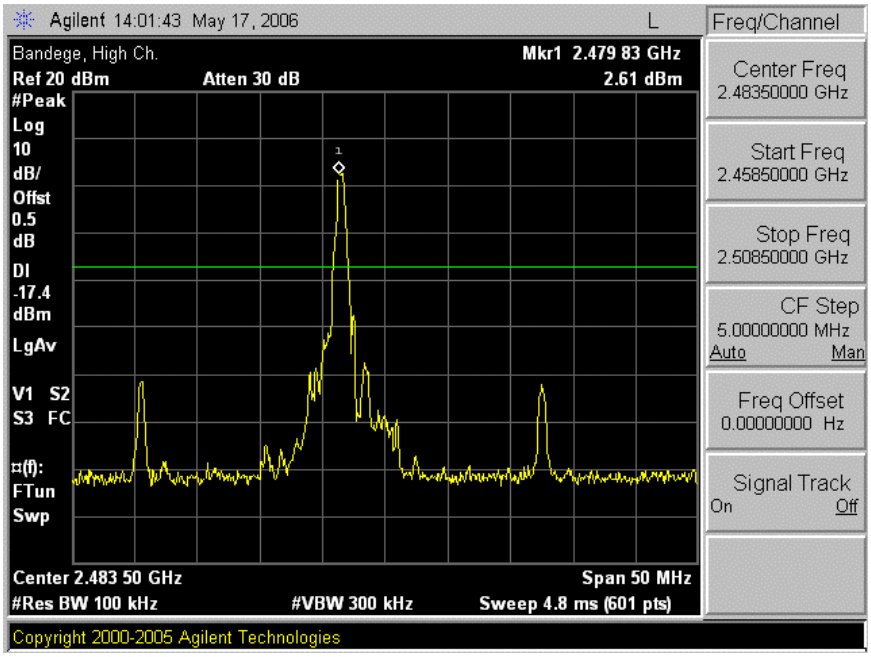
**SPURIOUS EMISSIONS, HIGH CHANNEL**

HIGH CHANNEL BANDEDGE







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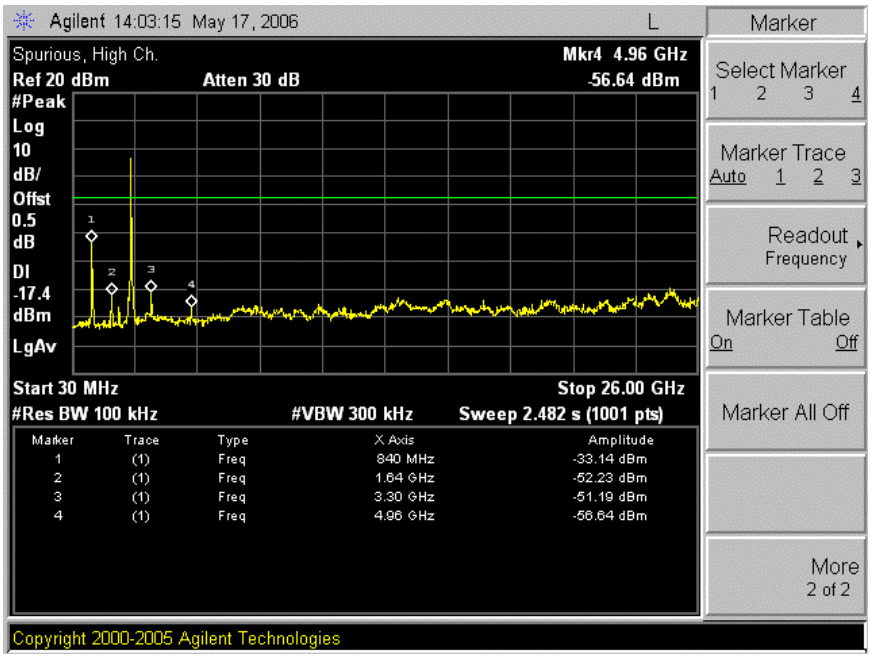
HIGH CHANNEL SPURIOUS







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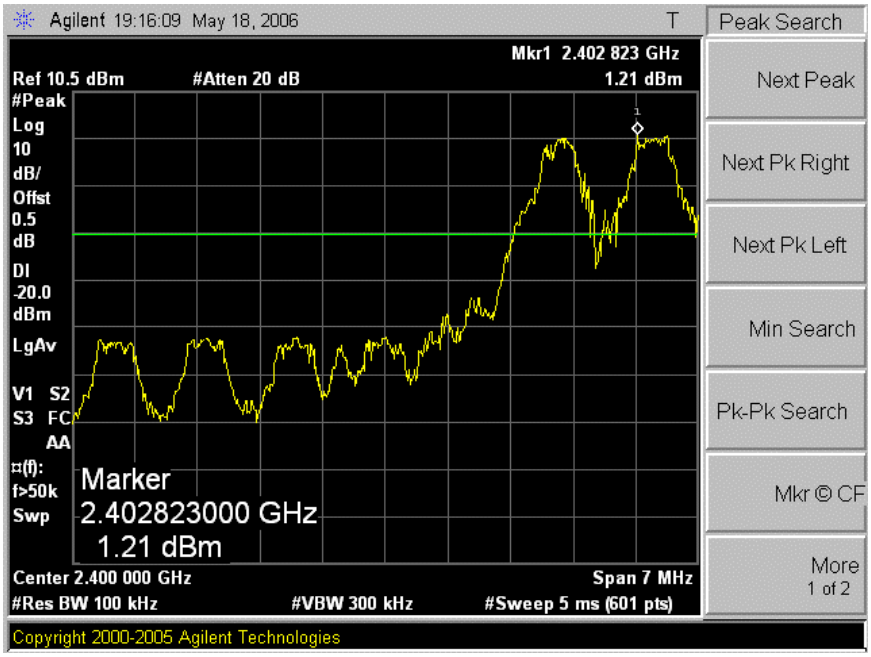
**SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON**

LOW BANDEDGE WITH HOPPING ON







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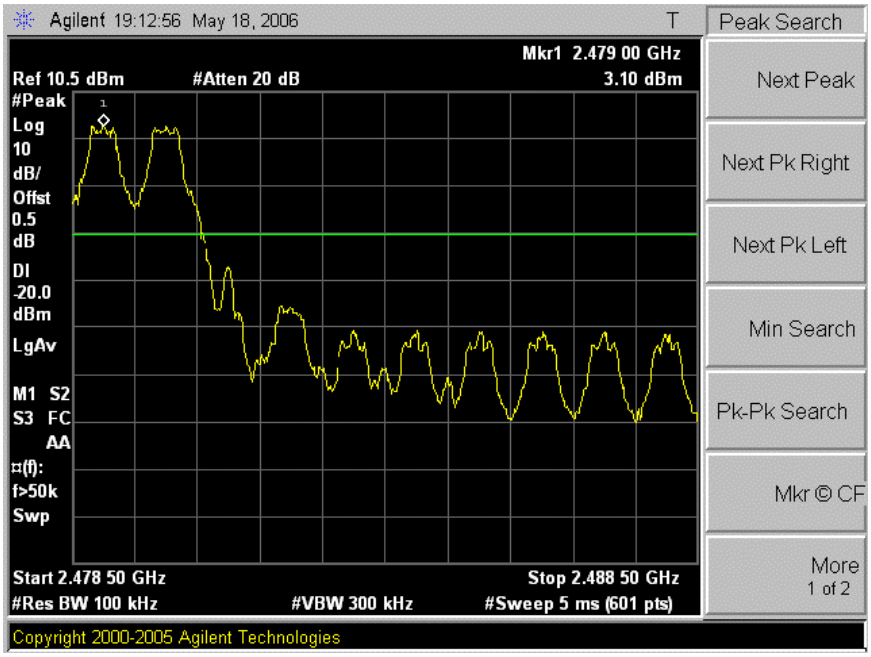
HIGH BANDEDGE WITH HOPPING ON







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# 7.2. RADIATED EMISSIONS

## 7.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

**LIMITS**

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

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

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

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




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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 (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 in the 2.4 GHz band.

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

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



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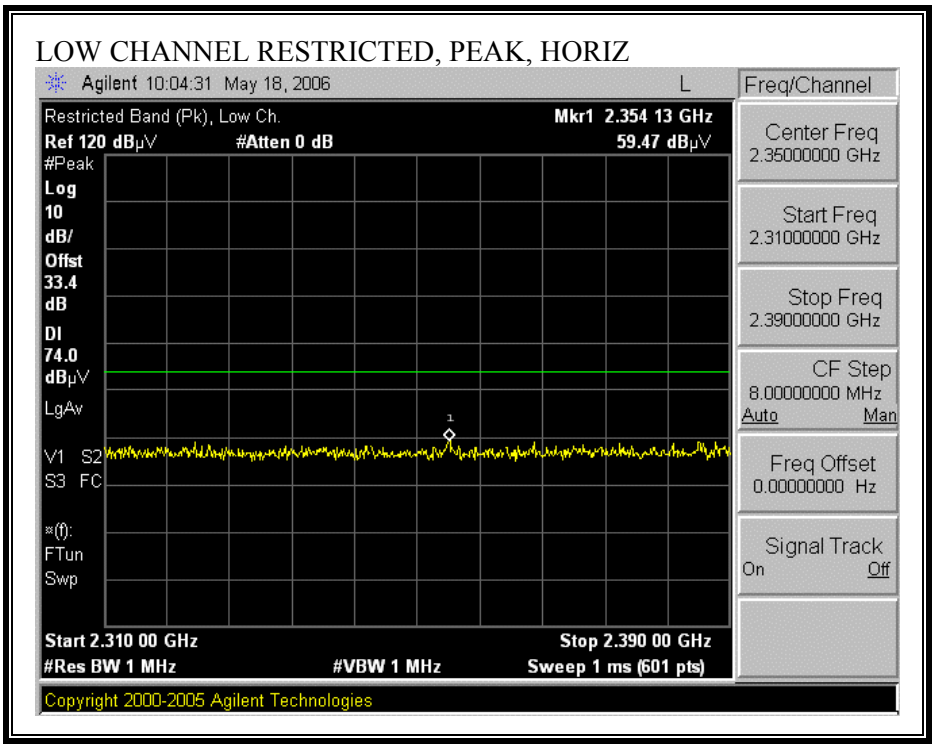
## 7.2.2. TRANSMITTER RADIATED EMISSIONS ABOVE 1 GHZ

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







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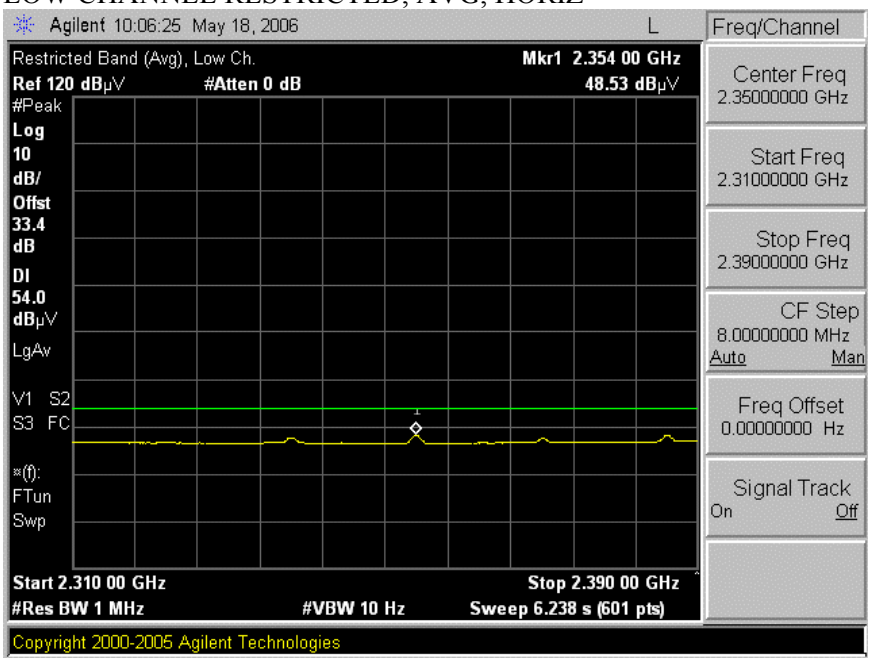
LOW CHANNEL RESTRICTED, AVG, HORIZ







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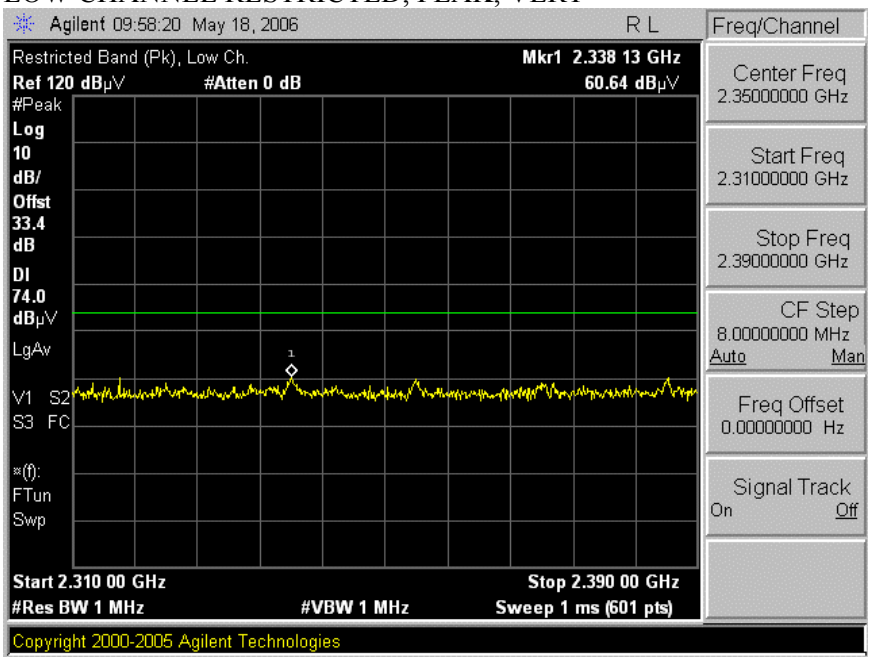
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**

LOW CHANNEL RESTRICTED, PEAK, VERT







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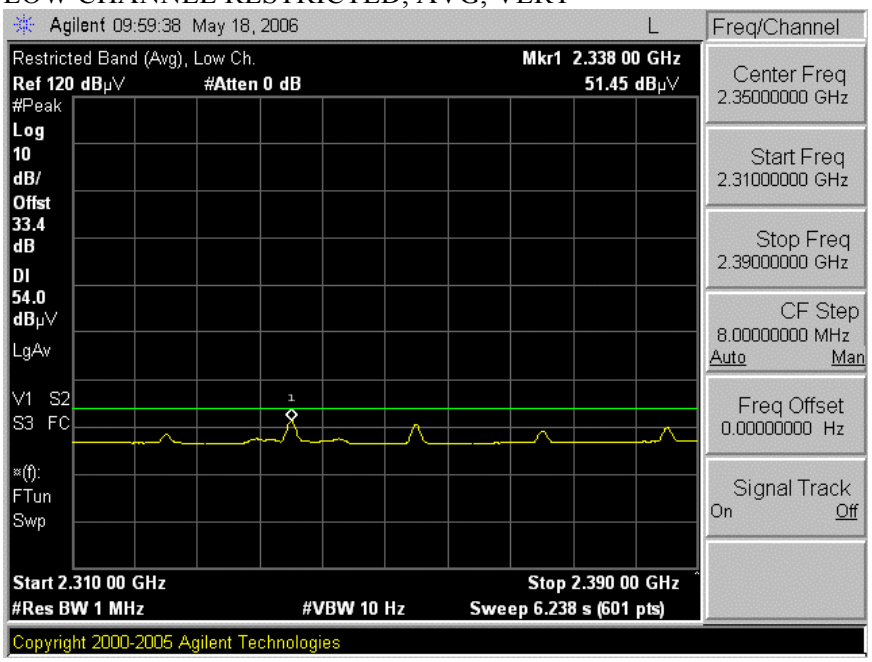
LOW CHANNEL RESTRICTED, AVG, VERT







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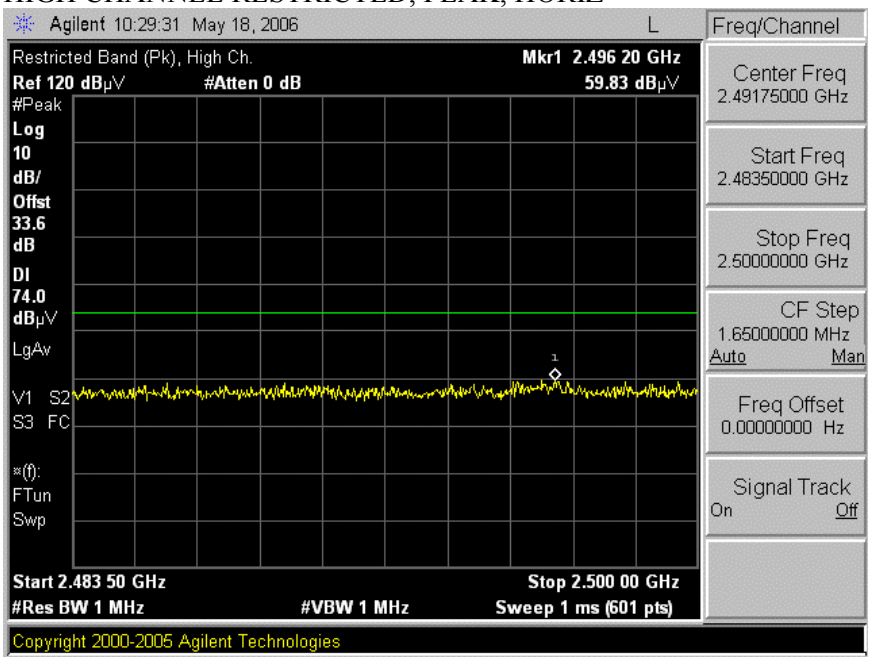
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**

HIGH CHANNEL RESTRICTED, PEAK, HORIZ







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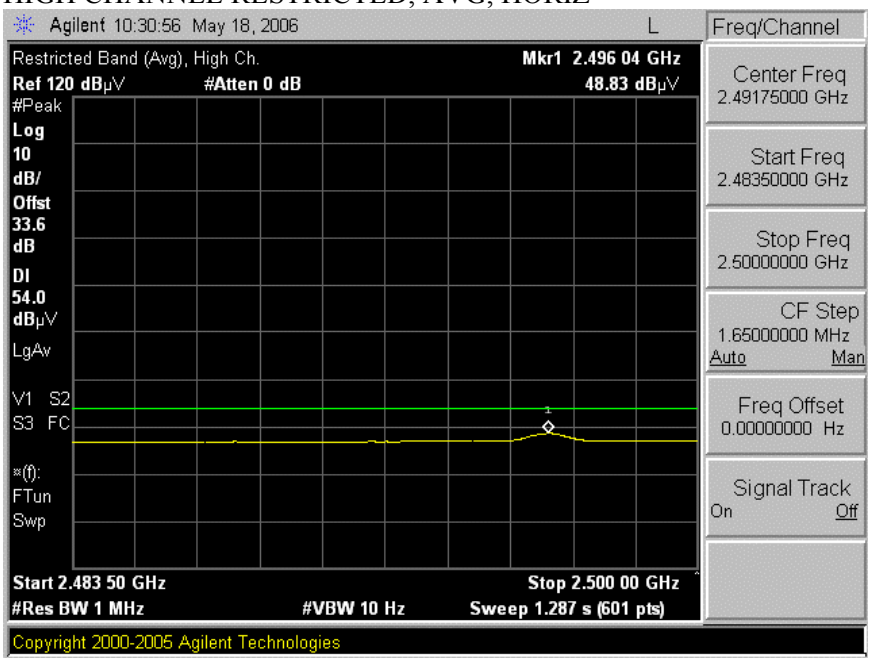
HIGH CHANNEL RESTRICTED, AVG, HORIZ







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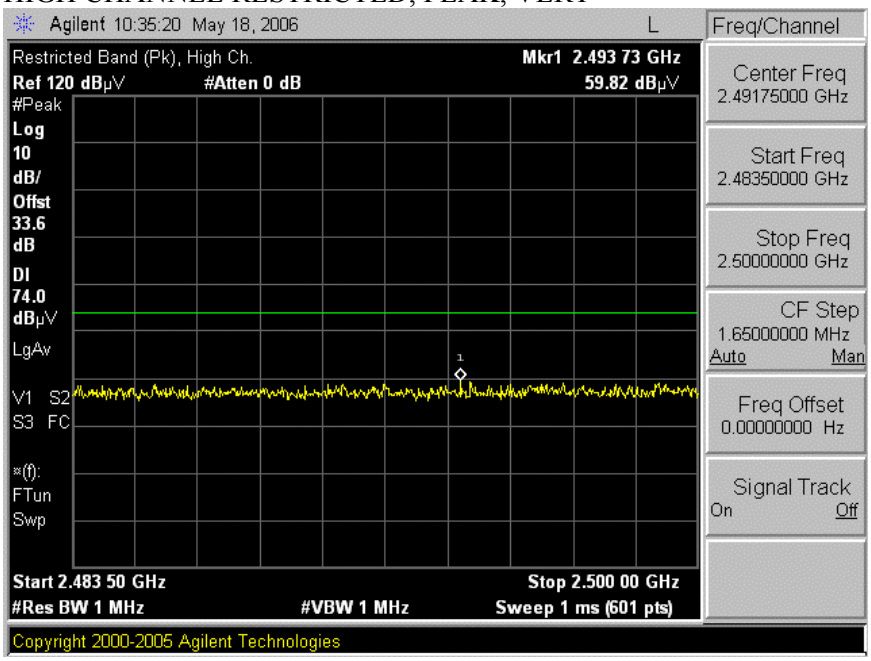
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**

HIGH CHANNEL RESTRICTED, PEAK, VERT







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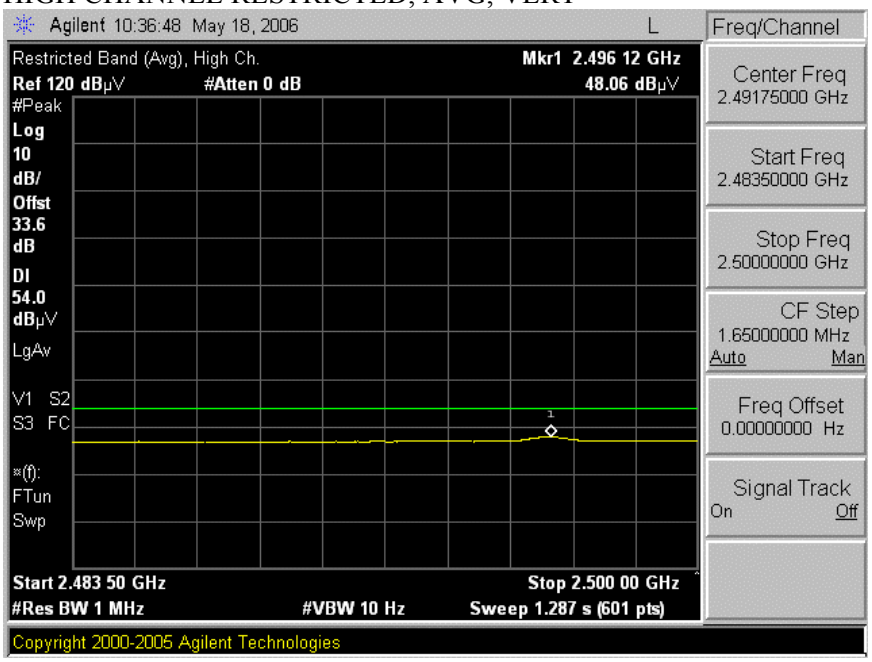
HIGH CHANNEL RESTRICTED, AVG, VERT







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## HARMONICS AND SPURIOUS EMISSIONS

High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Company: MicroVision
Project # : 06U10284
Date: 05/18/2006
Test Engineer: Thanh Nguyen
Configuration: EUT, Interface card and remote support Laptop.
Mode: Transmit
Average Power Meter: Low = -4.46 dBm, Mid = -3.32 dBm, High = -2.60 dBm

Test Equipment:

| Horn 1-18GHz | Pre-amplifer 1-26GHz | Pre-amplifer 26-40GHz | Horn > 18GHz | Limit |
|---|---|---|---|---|
| T119; S/N: 29301 @3m | T34 HP 8449B | | | FCC 15.209 |

Hi Frequency Cables

| 2 foot cable | 3 foot cable | 12 foot cable | HPF | Reject Filter |
|---|---|---|---|---|
| | Thanh 187215003 | Thanh 208946003 | HPF_4.0GHz | |

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

| f GHz | Dist (m) | Read Pk dBuV | Read Avg. dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fltr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tx High Channel 2480MHz | | | | | | | | | | | | | | | |
| 4.960 | 3.0 | 45.5 | 39.2 | 33.8 | 2.7 | -34.8 | 0.0 | 0.6 | 47.8 | 41.5 | 74 | 54 | -26.2 | -12.5 | V |
| 7.440 | 3.0 | 42.3 | 29.7 | 35.2 | 3.7 | -34.1 | 0.0 | 0.6 | 47.7 | 35.2 | 74 | 54 | -26.3 | -18.8 | V |
| 9.920 | 3.0 | 43.9 | 30.2 | 36.5 | 4.0 | -32.9 | 0.0 | 0.8 | 52.3 | 38.6 | 74 | 54 | -21.7 | -15.4 | V |
| 4.960 | 3.0 | 46.4 | 42.0 | 33.8 | 2.7 | -34.8 | 0.0 | 0.6 | 48.7 | 44.4 | 74 | 54 | -25.3 | -9.6 | H |
| 7.440 | 3.0 | 42.1 | 29.8 | 35.2 | 3.7 | -34.1 | 0.0 | 0.6 | 47.5 | 35.3 | 74 | 54 | -26.5 | -18.7 | H |
| 9.920 | 3.0 | | | 36.5 | 4.0 | -32.9 | 0.0 | 0.8 | 8.5 | 8.5 | 74 | 54 | -65.5 | -45.5 | Noise floor |
| Tx Mid Channel 2441 MHz | | | | | | | | | | | | | | | |
| 4.882 | 3.0 | 45.6 | 40.2 | 33.7 | 2.6 | -34.8 | 0.0 | 0.6 | 47.7 | 42.4 | 74 | 54 | -26.3 | -11.6 | V |
| 7.323 | 3.0 | 41.4 | 28.9 | 35.2 | 3.7 | -34.1 | 0.0 | 0.6 | 46.8 | 34.3 | 74 | 54 | -27.2 | -19.7 | V |
| 9.764 | 3.0 | 42.6 | 28.7 | 36.3 | 4.0 | -33.3 | 0.0 | 0.8 | 50.5 | 36.6 | 74 | 54 | -23.5 | -17.4 | Noise floor |
| 4.882 | 3.0 | 44.6 | 38.9 | 33.7 | 2.6 | -34.8 | 0.0 | 0.6 | 46.8 | 41.0 | 74 | 54 | -27.2 | -13.0 | H |
| 7.323 | 3.0 | 41.3 | 28.2 | 35.2 | 3.7 | -34.1 | 0.0 | 0.6 | 46.7 | 33.6 | 74 | 54 | -27.3 | -20.4 | H |
| 9.764 | 3.0 | 41.9 | 28.7 | 36.3 | 4.0 | -33.3 | 0.0 | 0.8 | 49.8 | 36.6 | 74 | 54 | -24.2 | -17.4 | Noise floor |
| Tx Low 2402MHz | | | | | | | | | | | | | | | |
| 4.804 | 3.0 | 44.2 | 36.6 | 33.7 | 2.6 | -34.8 | 0.0 | 0.6 | 46.2 | 38.6 | 74 | 54 | -27.8 | -15.4 | H |
| 7.204 | 3.0 | 41.9 | 28.5 | 35.2 | 3.6 | -34.2 | 0.0 | 0.6 | 47.2 | 33.7 | 74 | 54 | -26.8 | -20.3 | H |
| 9.608 | 3.0 | 41.0 | 28.4 | 36.2 | 4.0 | -33.7 | 0.0 | 0.8 | 48.3 | 35.7 | 74 | 54 | -25.7 | -18.3 | Noise floor |
| 4.804 | 3.0 | 43.6 | 31.2 | 33.7 | 2.6 | -34.8 | 0.0 | 0.6 | 45.6 | 33.2 | 74 | 54 | -28.4 | -20.8 | V |
| 7.204 | 3.0 | 41.5 | 31.0 | 35.2 | 3.6 | -34.2 | 0.0 | 0.6 | 46.7 | 36.3 | 74 | 54 | -27.3 | -17.7 | V |
| 9.608 | 3.0 | 41.8 | 28.5 | 36.2 | 4.0 | -33.7 | 0.0 | 0.8 | 49.1 | 35.8 | 74 | 54 | -24.9 | -18.2 | V |

Rev. 5.1.6

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




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

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

HORIZONTAL DATA

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

Data#: 6 File#: 10284.EMI Date: 05-19-2006 Time: 18:43:13
Audix ATC

Condition: FCC CLASS-B HORIZONTAL
Test Operator: : Thanh Nguyen
Company: : MicroVision
Project #: : 06U10284
EUT Description: : Flic Smart Module (Bluetooth Scanner)
Model No: : SM-2
S/N: :
Configuration: : EUT, Interface card,remote laptop
Mode of Operation: Transmit Data 2 (hopping)
Test Target: : FCC Part 15.247

Page: 1

| | Freq | Read Level | Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | |
| 1 | 151.250 | 22.47 | 14.07 | 36.54 | 43.50 | -6.96 | Peak |
| 2 | 401.510 | 19.23 | 18.08 | 37.31 | 46.00 | -8.69 | Peak |
| 3 | 487.840 | 14.50 | 20.00 | 34.50 | 46.00 | -11.50 | Peak |
| 4 | 567.380 | 16.19 | 21.12 | 37.31 | 46.00 | -8.69 | Peak |
| 5 | 606.180 | 15.32 | 21.63 | 36.95 | 46.00 | -9.05 | Peak |
| 6 | 670.200 | 14.23 | 22.66 | 36.89 | 46.00 | -9.11 | Peak |




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

VERTICAL DATA

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

Data#: 8 File#: 10284.EMI Date: 05-19-2006 Time: 18:46:57
Audix ATC

Condition: FCC CLASS-B VERTICAL
Test Operator : Thanh Nguyen
Company : MicroVision
Project #: : 06U10284
EUT Description: : Flic Smart Module (Bluetooth Scanner)
Model No: : SM-2
S/N: :
Configuration: : EUT, Interface card,remote laptop
Mode of Operation: Transmit Data 2 (hopping)
Test Target: : FCC Part 15.247

Page: 1

| | Freq | Read Level | Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | |
| 1 | 69.770 | 21.27 | 9.32 | 30.59 | 40.00 | -9.41 | Peak |
| 2 | 150.280 | 18.91 | 14.10 | 33.01 | 43.50 | -10.49 | Peak |
| 3 | 230.790 | 22.02 | 13.08 | 35.10 | 46.00 | -10.90 | Peak |
| 4 | 439.340 | 16.52 | 18.96 | 35.48 | 46.00 | -10.52 | Peak |
| 5 | 601.330 | 13.22 | 21.50 | 34.72 | 46.00 | -11.28 | Peak |
| 6 | 674.080 | 13.44 | 22.71 | 36.15 | 46.00 | -9.85 | Peak |



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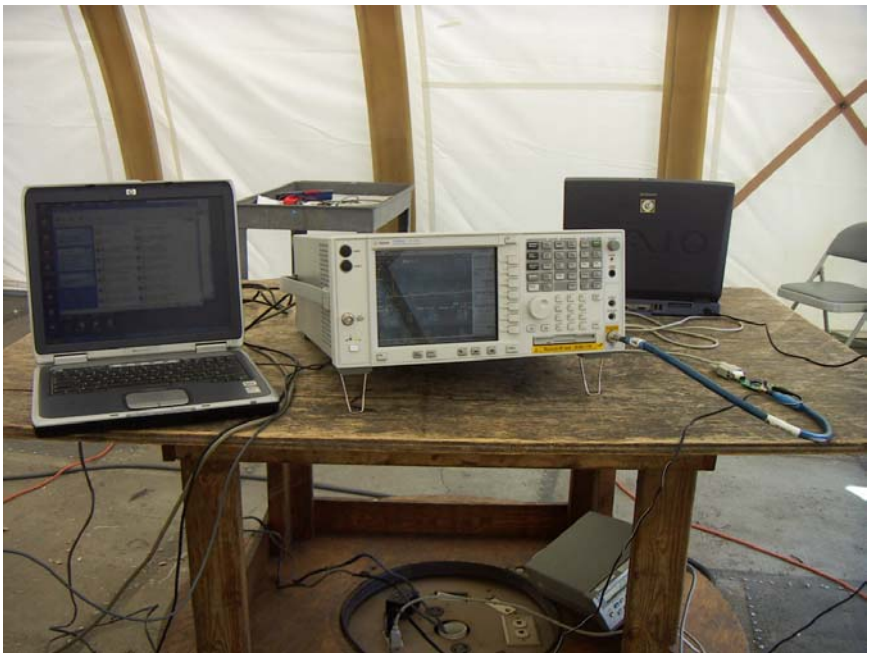
# 8. SETUP PHOTOS

**ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP**

ANTENNA PORT CONDUCTED PHOTO



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**RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION**

X-AXIS FRONT PHOTO

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X-AXIS BACK PHOTO

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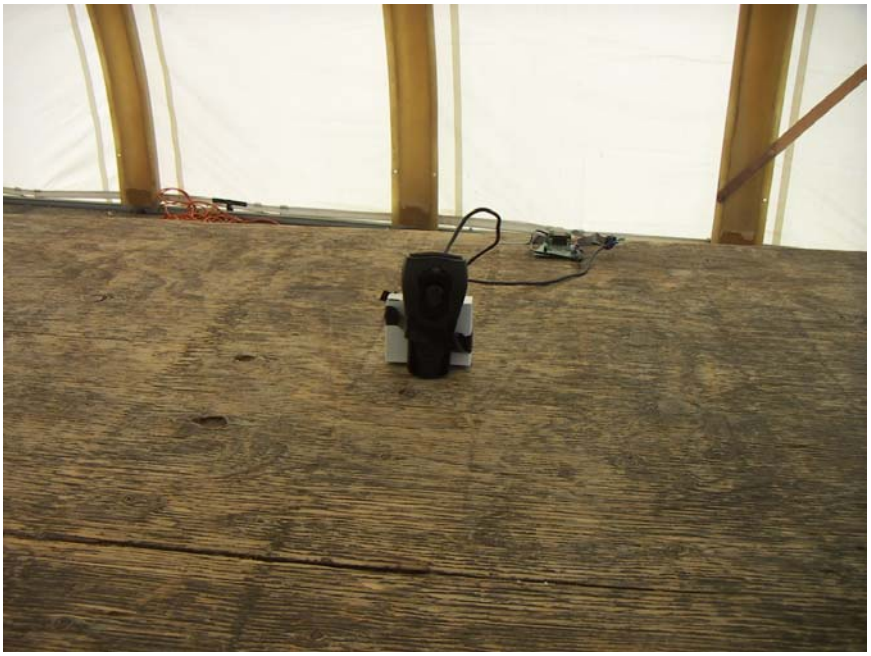
Y-AXIS FRONT PHOTO



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Y-AXIS BACK PHOTO

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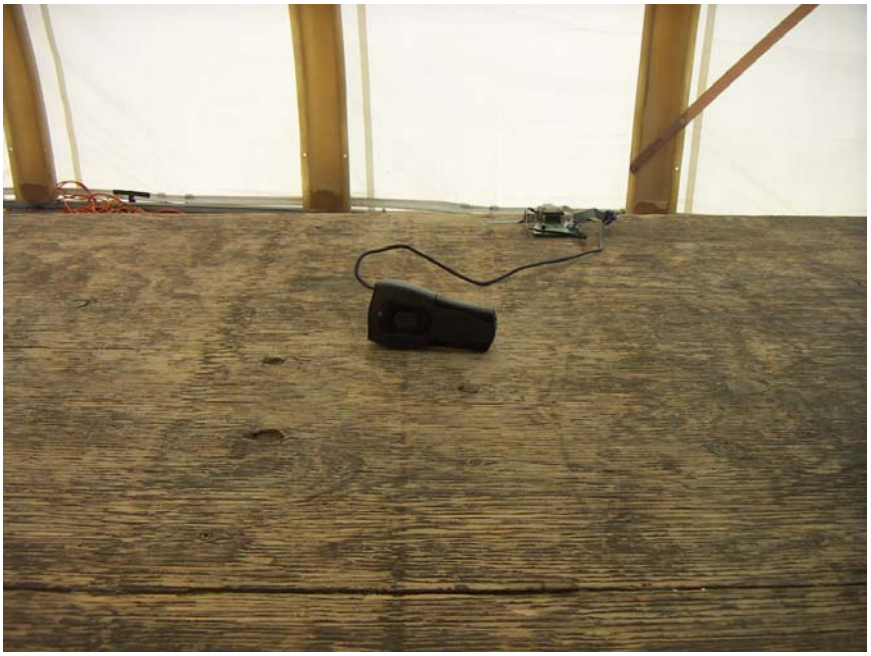
Z-AXIS FRONT PHOTO



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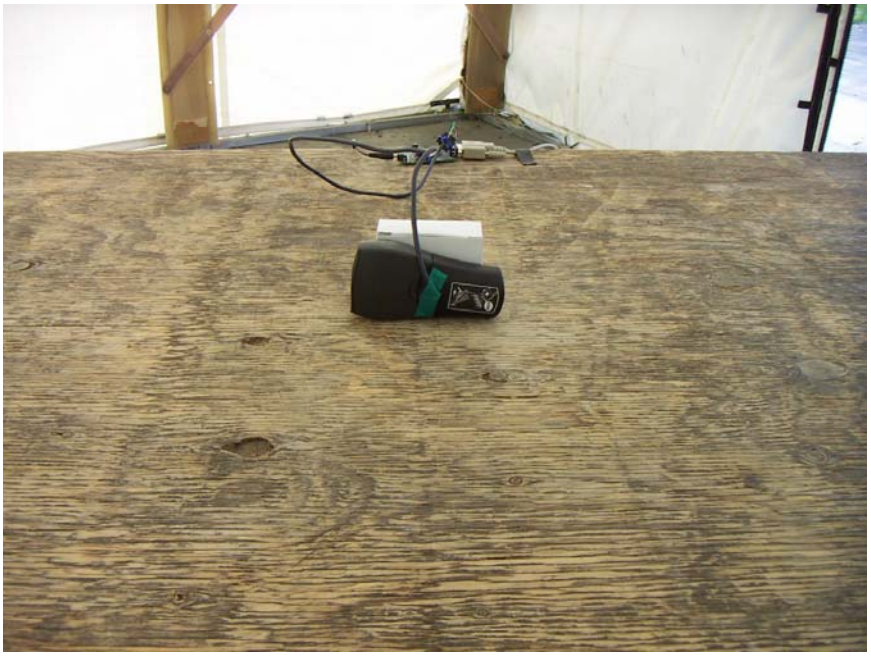
Z-AXIS BACK PHOTO



# END OF REPORT



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