



**FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210
CERTIFICATION TEST REPORT**

FOR

MOBILE INTERNET LOCATION MGR

MODEL NUMBER: iLM3160-W / iLM3161-W / iL3164-W

**FCC ID: PDC-ILM316X
IC: 5079A-IWM314XS**

**REPORT NUMBER: 08U11688-2
ISSUE DATE: APRIL 21, 2008**

Prepared for

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FREMONT, CA 94538, USA**

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u> | <u>Revised By</u> |
|-------------|-----------------------|------------------|-------------------|
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: AT ROAD, INC.
47071 BAYSIDE PKWY
FREMONT, CA. 94538, USA
EUT DESCRIPTION: MOBILE INTERNET LOCATION MGR
MODEL: ILM3160-W / ILM3161-W / IL3164-W
SERIAL NUMBER: 0503310396
DATE TESTED: MAY 15 - 16, 2005 & APRIL 18, 2008

| APPLICABLE STANDARDS | |
|---|--------------|
| STANDARD | TEST RESULTS |
| CFR 47 Part 15 Subpart C | Pass |
| RSS-210 Issue 7 Annex 8 and RSS-GEN Issue 2 | Pass |

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All expressions of Pass/Fail in this report are opinions expressed by CCS based on interpretations of the test results. 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS 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:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:



YOBİ ZHOU
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 2, and RSS-210 Issue 7.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

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 |
|-------------------------------|-------------|
| Power Line Conducted Emission | +/- 2.3 dB |
| Radiated Emission | +/- 3.4 dB |

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The iLM3160-W / iLM3161-W / iL3164-W Internet Location Manager combines GPS with an EVDO wireless data modem to provide Mobile Resource Management information. The iLM3160-W / iLM3161-W / iL3164-W uses a CDMA 1xEV-DO Wireless Module that supports 3G Digital Cellular Standard and CDMA 1xRTT as well. iLM3160-W / iLM3161-W / iL3164-W also provides 802.11b connectivity between the field tech vehicle and any other 802.11b/g enabled peripheral (2.4GHz Direct Spread Spectrum 802.11b Access Point mode interoperable with WiFi/WECA clients).

The Cellular / PCS radio module is manufactured by Sierra Wireless MC5725 and WLAN radio module is manufactured by Z-Com Inc.

5.2. MAXIMUM OUTPUT POWER

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

| Frequency Range (MHz) | Mode | Output Power (dBm) | Output Power (mW) |
|--------------------------|---------|-----------------------|----------------------|
| 2412 - 2462 | 802.11b | 18.15 | 65.31 |

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a dipole antenna with a maximum gain of 1.7 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT is running with Hyper Terminal program from the host support equipment.

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 2462 MHz.

The worst-case data rate for this channel is determined to be 11 Mb/s, based on previous experience with 802.11b WLAN product design architectures.

Thus all emissions tests were made in the 802.11b mode, 2462 MHz, 11 Mb/s.

5.6. MODIFICATIONS

Adding a round cable snap-its ferrite (Manufacturer: Fair-Rite Products Corp., Part #: 0444173551) to the DC power wires with two turns.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

| PERIPHERAL SUPPORT EQUIPMENT LIST | | | | |
|-----------------------------------|--------------|----------|---------------|--------|
| Description | Manufacturer | Model | Serial Number | FCC ID |
| LAPTOP | HP | ZE44200 | CN25110353 | DOC |
| AC/DC ADAPTER | HP | PA2450U | N/A | N/A |
| DC POWER SUPPLY | KRM | AEEC-350 | N/A | N/A |

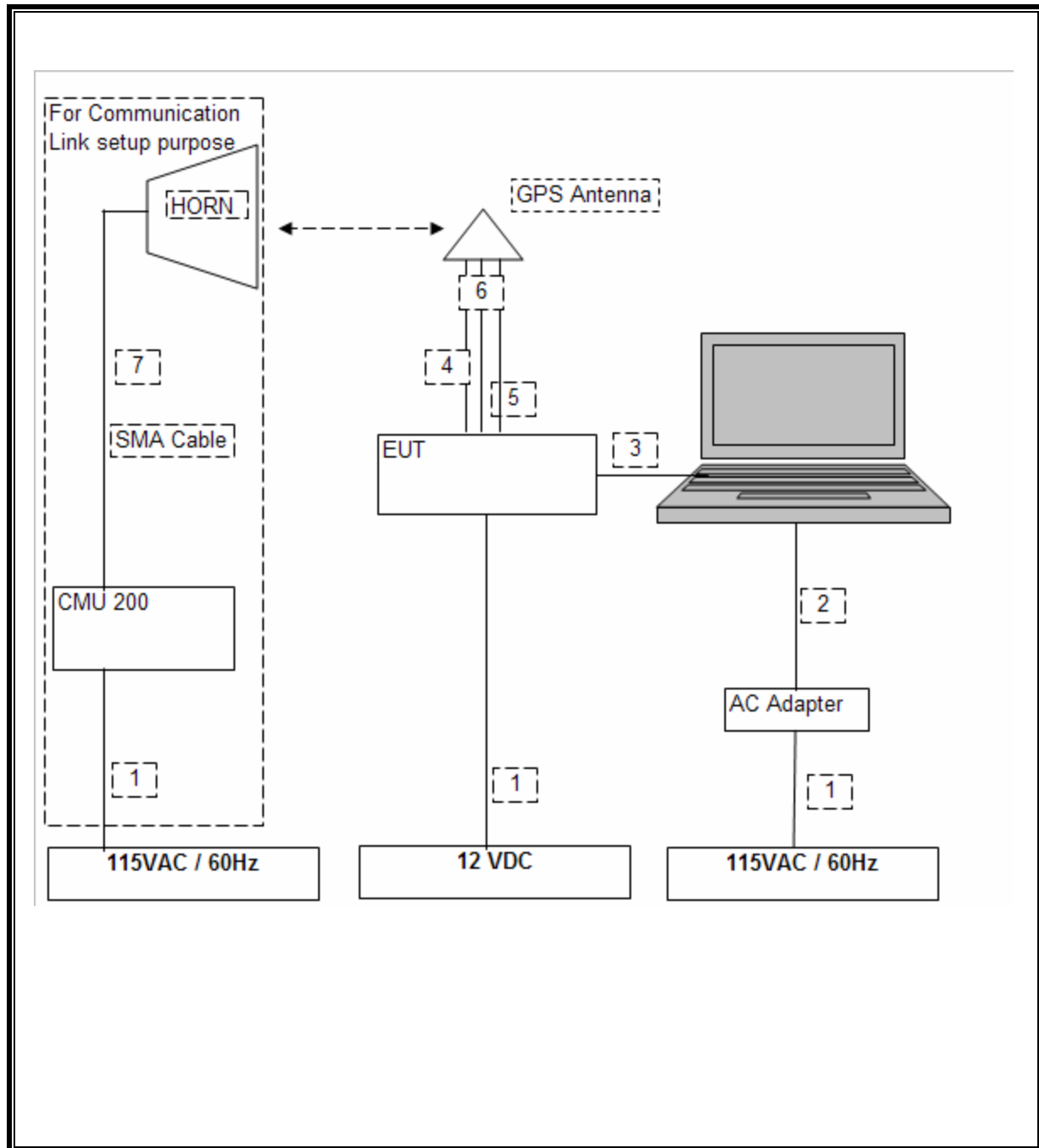
I/O CABLES

| I/O CABLE LIST | | | | | | |
|----------------|--------|----------------------|----------------|-------------|--------------|---------|
| Cable No. | Port | # of Identical Ports | Connector Type | Cable Type | Cable Length | Remarks |
| 1 | AC | 3 | US 115V | Un-shielded | 1.5m | No |
| 2 | DC | 1 | DC | Un-shielded | 1.5m | No |
| 3 | Serial | 1 | DB9 | Shielded | 1m | Yes |
| 4 | GPS | 1 | SMA | Shielded | 5m | Yes |
| 5 | WLAN | 1 | SMA | Shielded | 5m | Yes |
| 6 | GPS | 1 | TNC | Shielded | 5m | Yes |
| 7 | SMA | 1 | SMA | Shielded | .5m | No |

TEST SETUP

The EUT is a stand-alone unit. Test software from the laptop exercises the EUT via serial cable.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

| TEST EQUIPMENT LIST | | | | |
|--------------------------------------|--------------|---------|---------------|------------|
| Description | Manufacturer | Model | Serial Number | Cal Due |
| Communication Tester | R & S | CMU 200 | 838114/032 | 12/26/2008 |
| Peak Power Meter | Agilent | E4416A | GB41291160 | 12/4/2009 |
| Peak / Average Power Sensor | Agilent | E9327A | US40440755 | 12/7/2009 |
| Spectrum Analyzer | Agilent | E4446A | MY43360112 | 3/3/2009 |
| Antenna, Log Periodic 200 ~ 1000 MHz | EMCO | 3146 | 9107-3163 | 5/15/2008 |
| Antenna, Biconical | Eaton | 94455-1 | 1214 | 12/19/2008 |
| SA Display Section 2 | HP | 85662A | 2816A16696 | 5/24/2009 |
| Quasi-Peak Adaptor | HP | 85650A | 2811A01155 | 5/24/2009 |
| SA RF Section, 1.5 GHz | HP | 85680B | 2814A04227 | 9/27/08 |

7. ANTENNA PORT TEST RESULTS

7.1. 802.11b MODE IN THE 2.4 GHz BAND

7.1.1. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

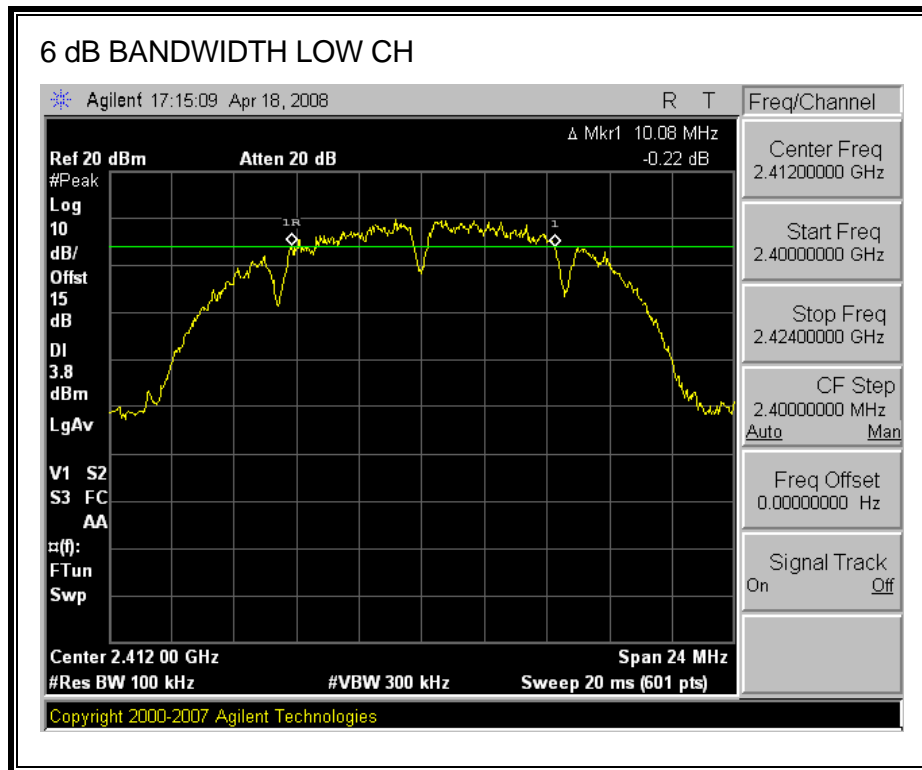
TEST PROCEDURE

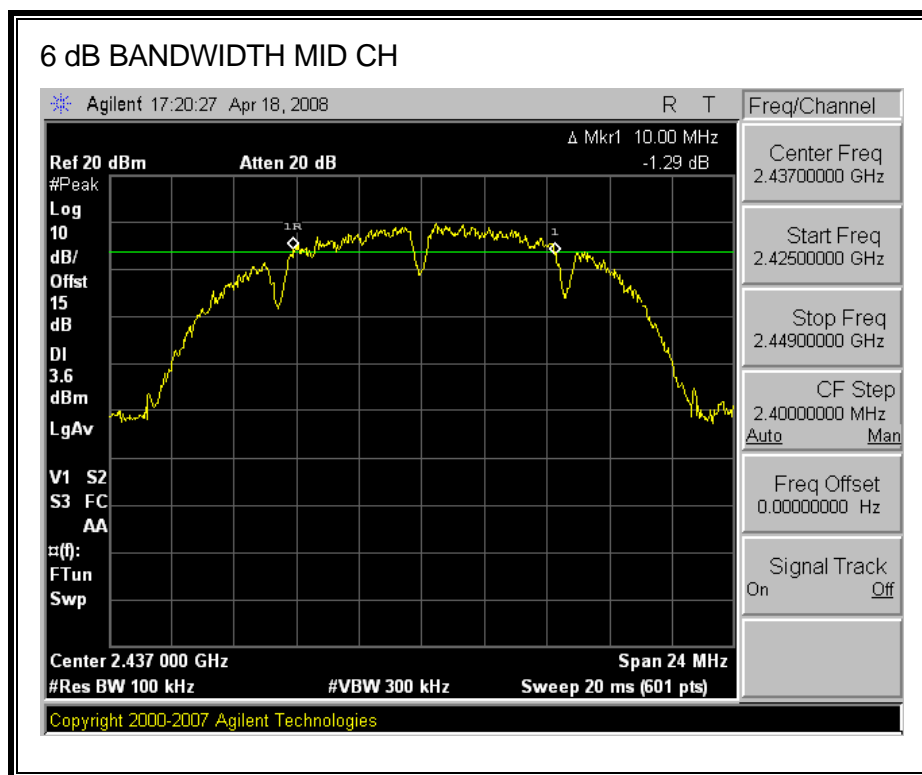
The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

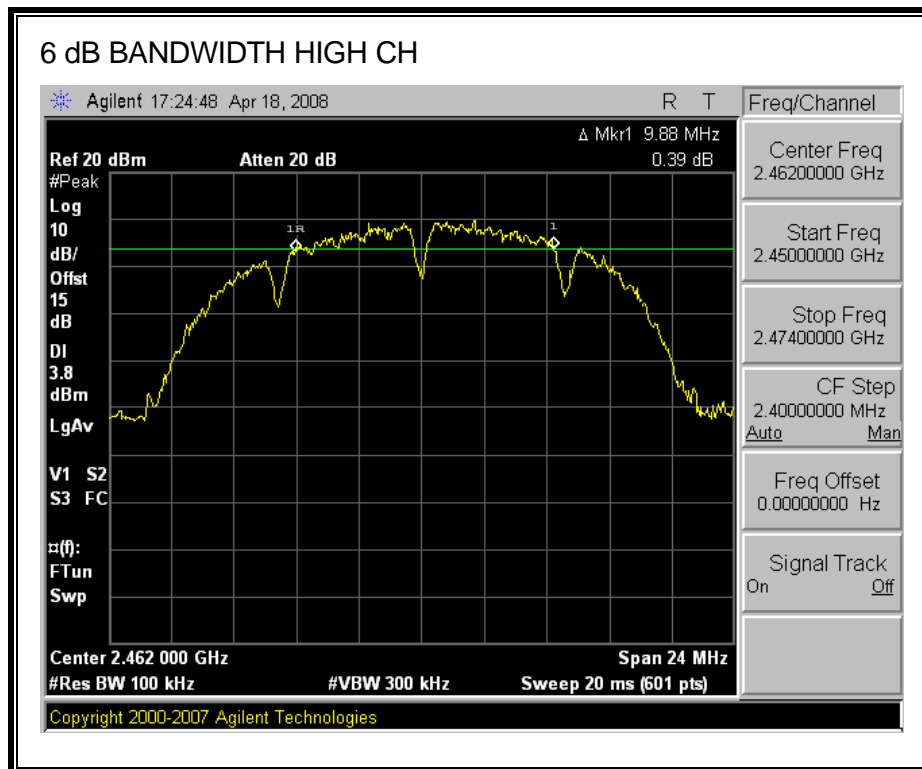
RESULTS

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|--------------------|-------------------------|------------------------|
| Low | 2412 | 10.08 | 0.5 |
| Middle | 2437 | 10.00 | 0.5 |
| High | 2462 | 9.88 | 0.5 |

6 dB BANDWIDTH







7.1.2. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

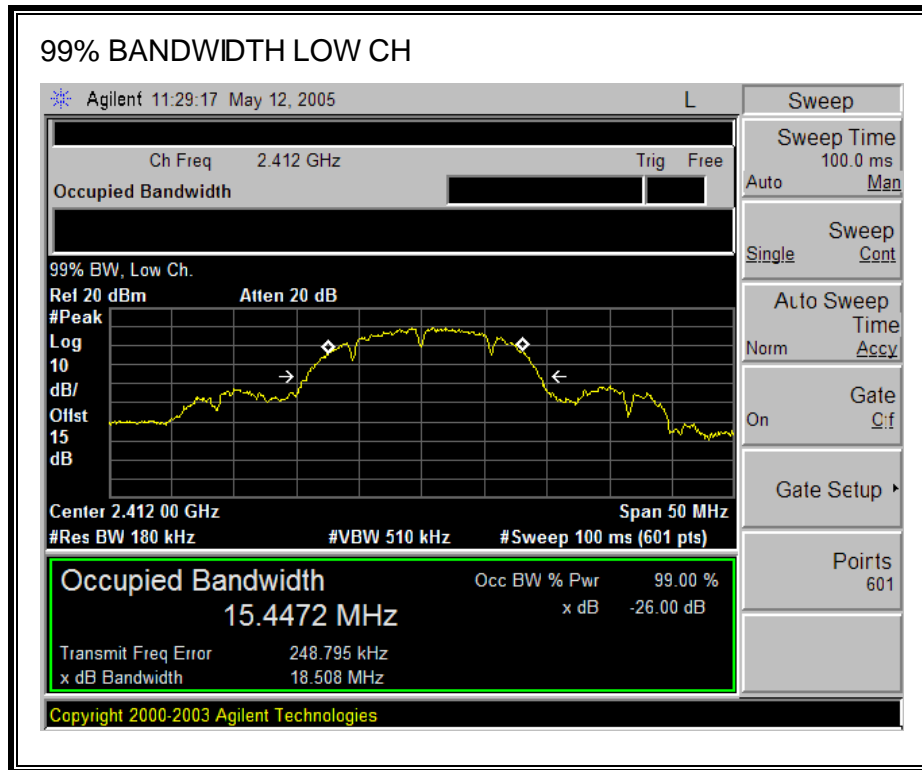
TEST PROCEDURE

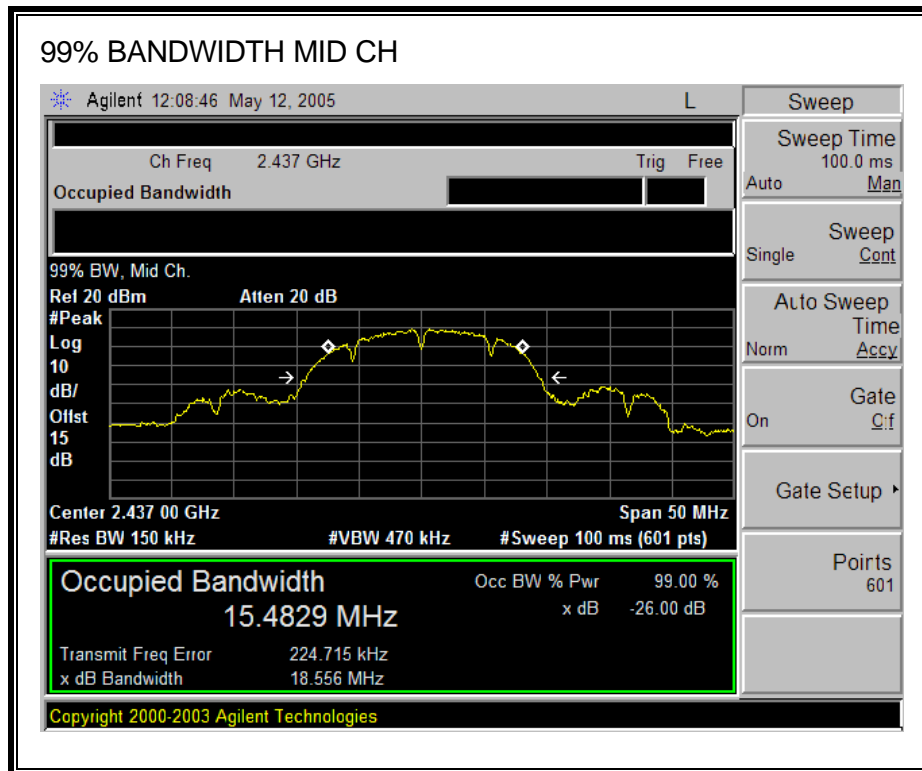
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

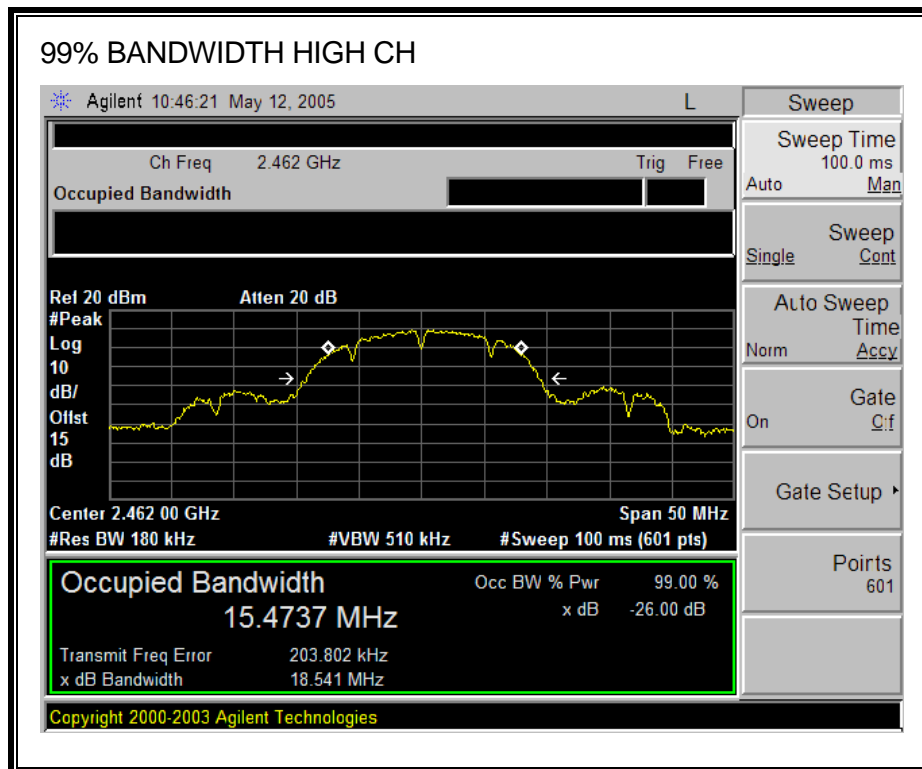
RESULTS

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|--------------------|------------------------|
| Low | 2412 | 15.4472 |
| Middle | 2437 | 15.4829 |
| High | 2462 | 15.4737 |

99% BANDWIDTH







7.1.3. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

The maximum antenna gain is 1.7 dBi for other than fixed, point-to-point operations, therefore the limit is 30 dBm.

TEST PROCEDURE

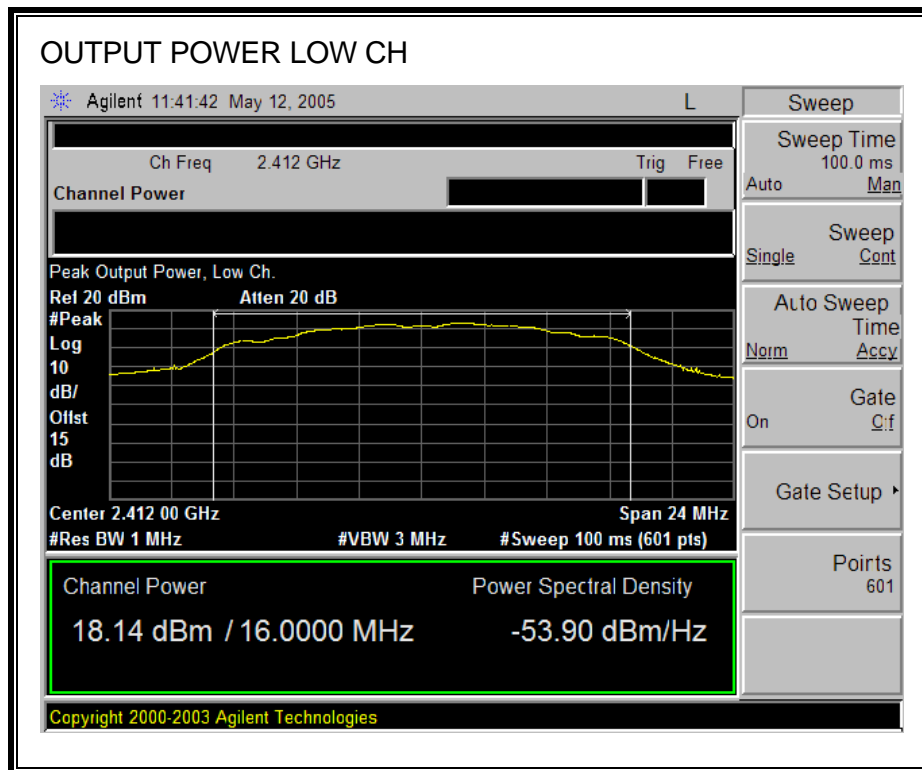
Peak power is measured using the spectrum analyzer's internal channel power integration function. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

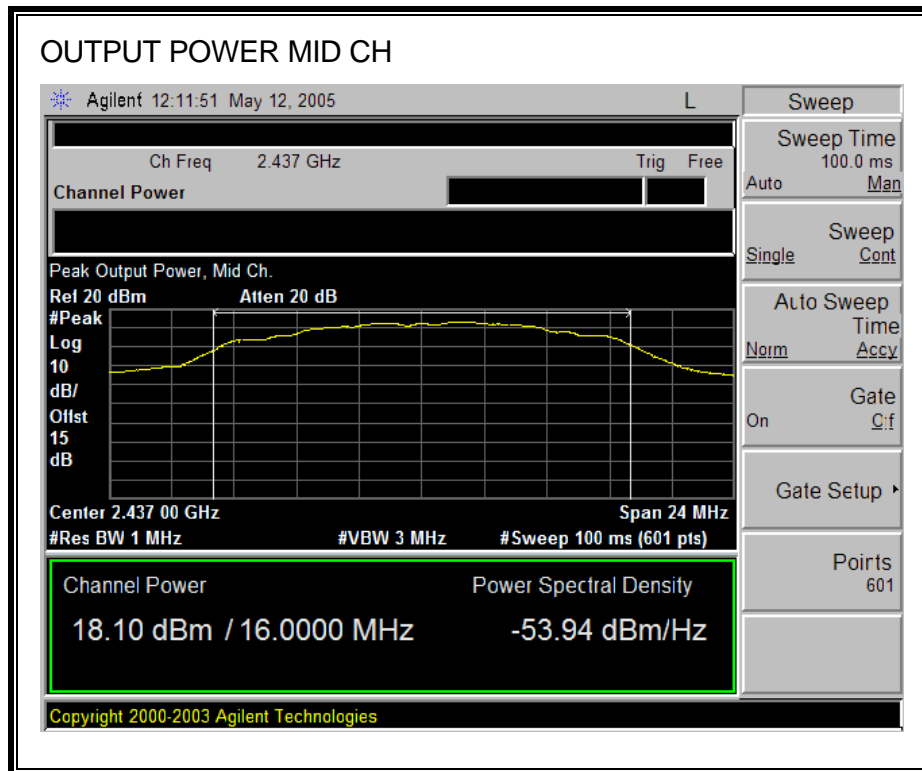
Maximum Conducted Output Power based on RMS averaging over a time interval is measured in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005. The transmitter operates continuously therefore Power Output Option 2, Method # 1 is used.

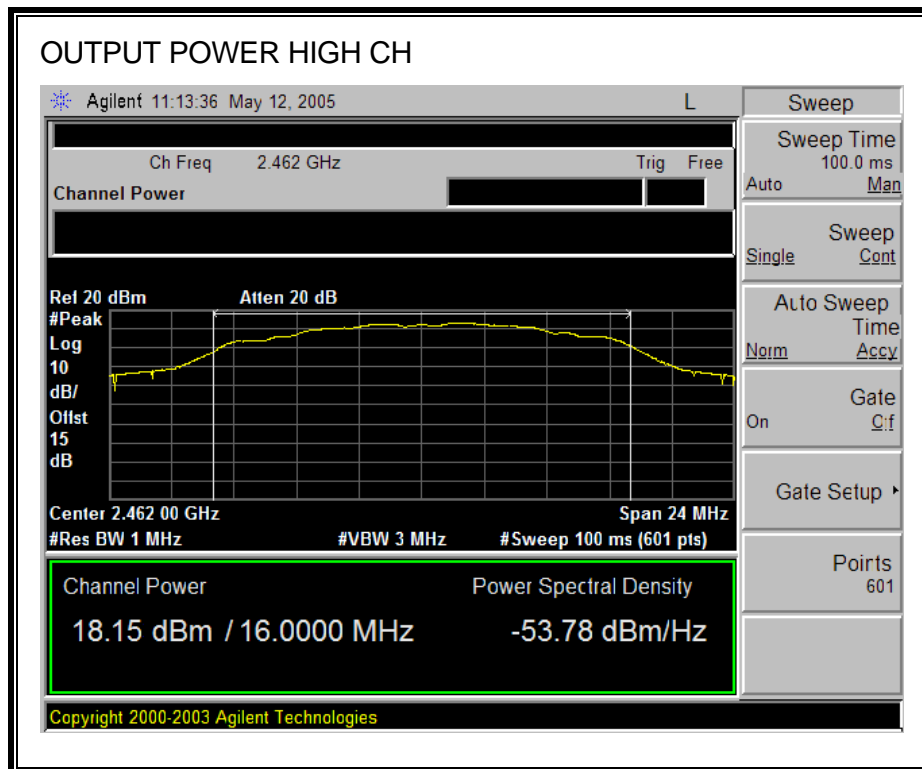
RESULTS

| Channel | Frequency (MHz) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|---------|--------------------|-----------------------|----------------|----------------|
| Low | 2412 | 18.14 | 30 | -11.86 |
| Middle | 2437 | 18.10 | 30 | -11.90 |
| High | 2462 | 18.15 | 30 | -11.85 |

OUTPUT POWER







7.1.4. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 15 dB (including 10 dB pad and 5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

| Channel | Frequency (MHz) | Power (dBm) |
|---------|--------------------|----------------|
| Low | 2412 | 13.27 |
| Middle | 2437 | 13.85 |
| High | 2462 | 13.22 |

7.1.5. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

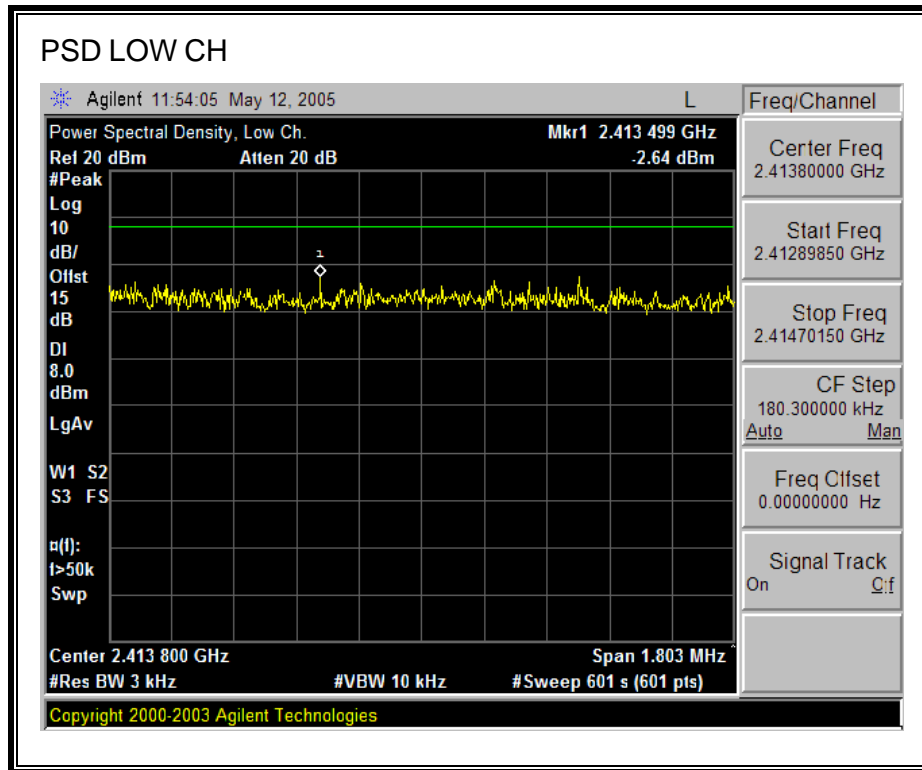
TEST PROCEDURE

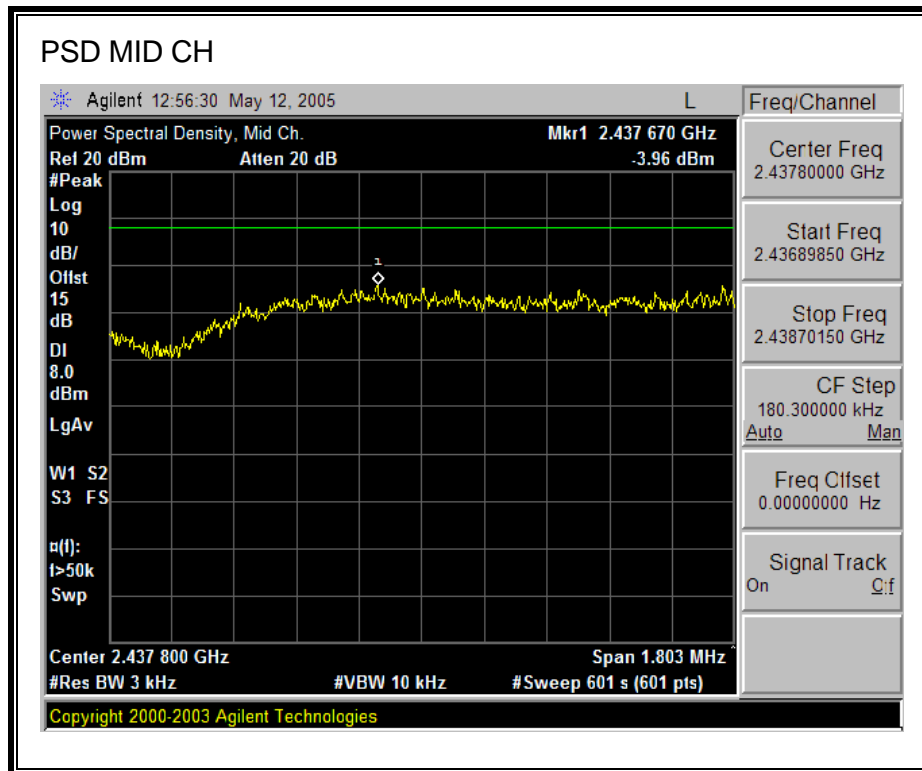
Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured using PSD Option 1 in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005.

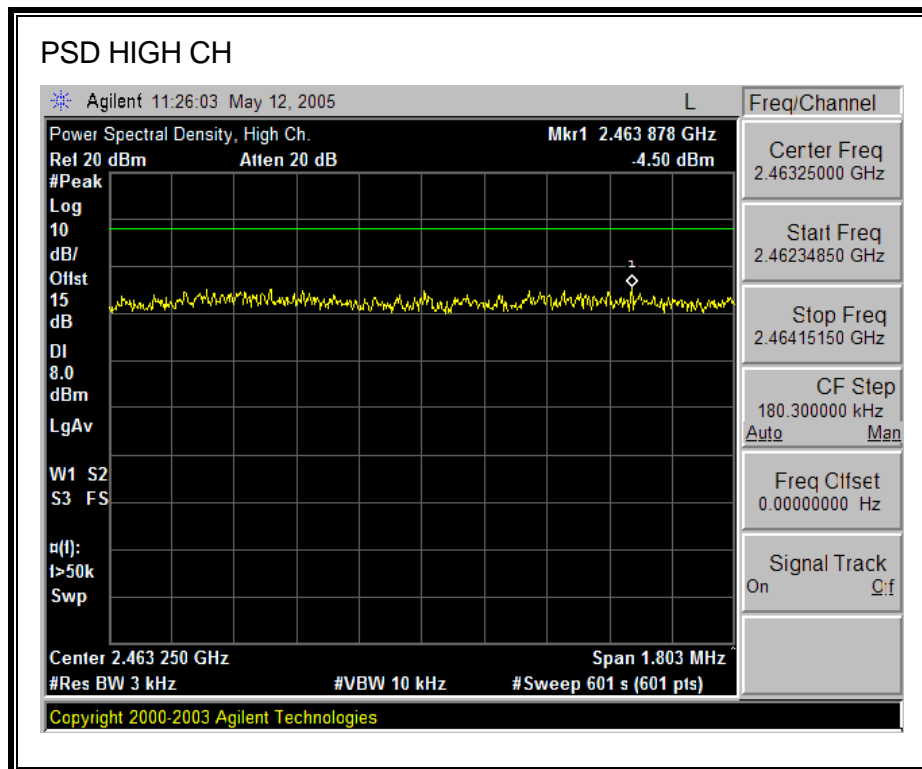
RESULTS

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Margin (dB) |
|---------|--------------------|---------------|----------------|----------------|
| Low | 2412 | -2.64 | 8 | -10.64 |
| Middle | 2437 | -3.96 | 8 | -11.96 |
| High | 2462 | -4.50 | 8 | -12.50 |

POWER SPECTRAL DENSITY







7.1.6. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

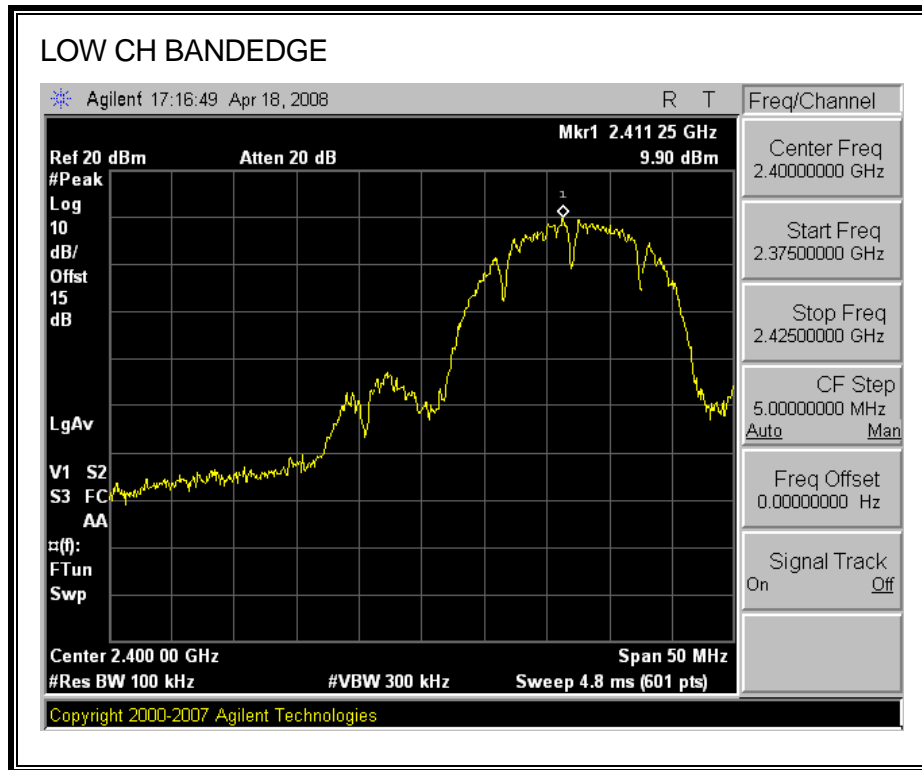
TEST PROCEDURE

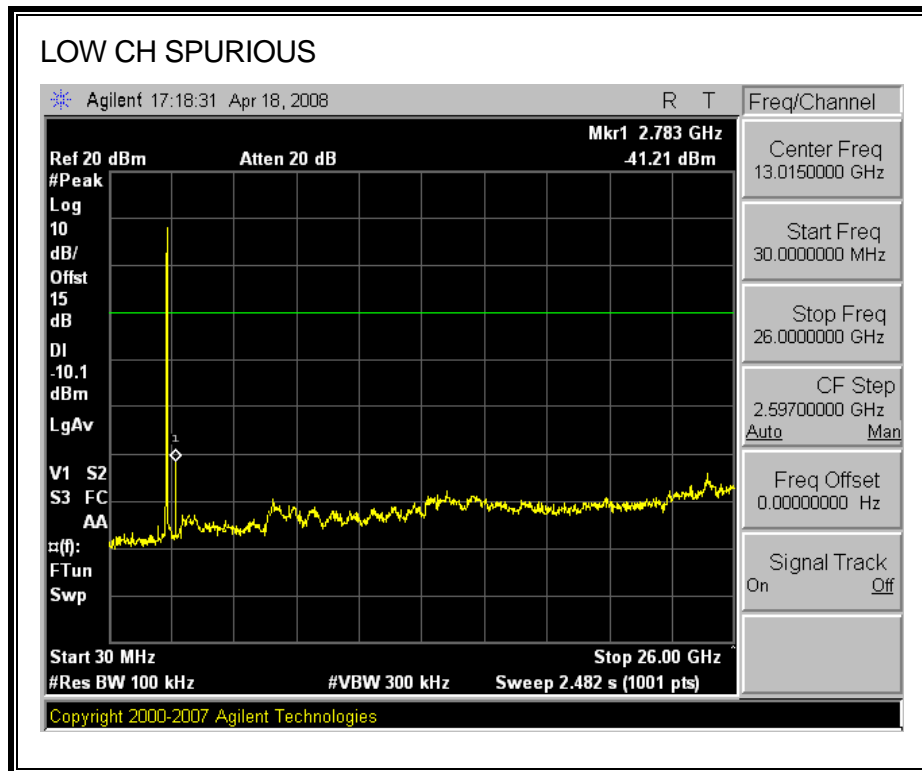
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

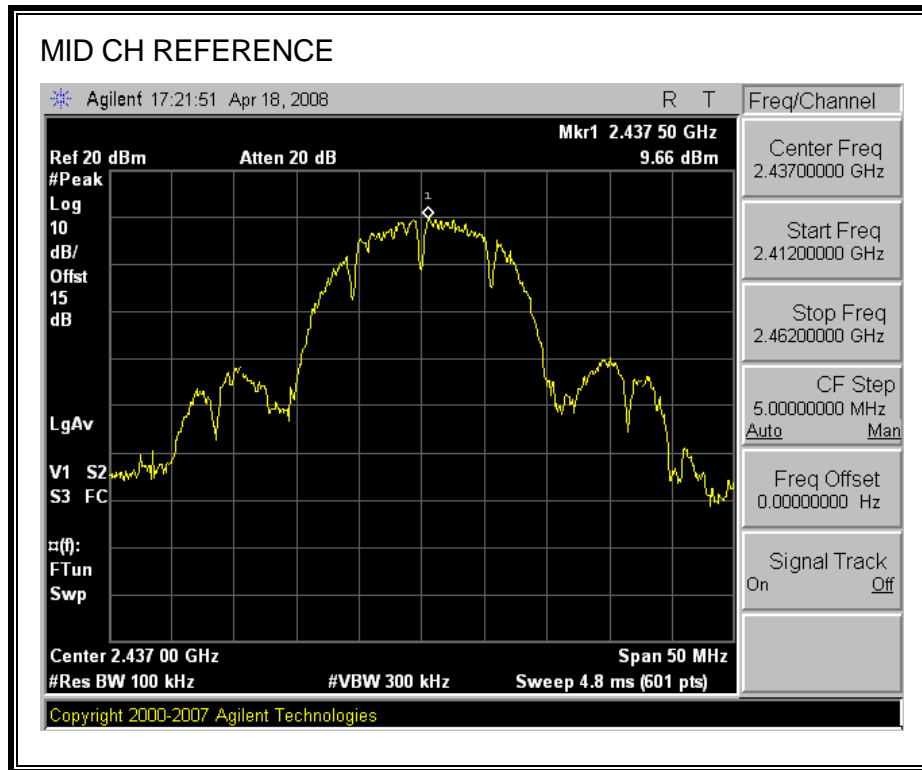
RESULTS

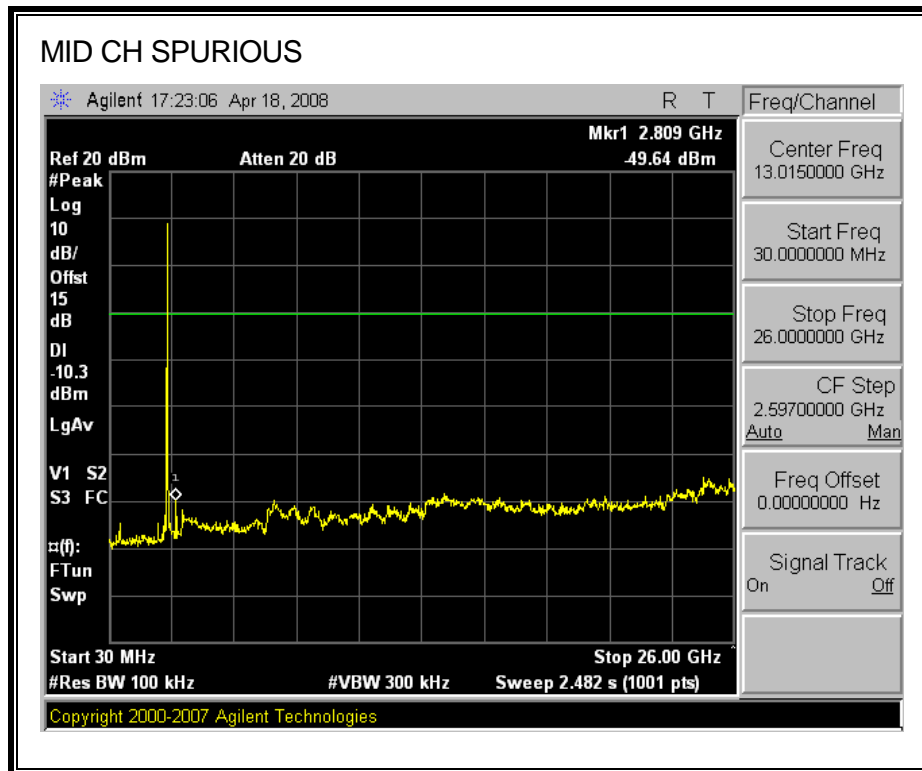
SPURIOUS EMISSIONS, LOW CHANNEL



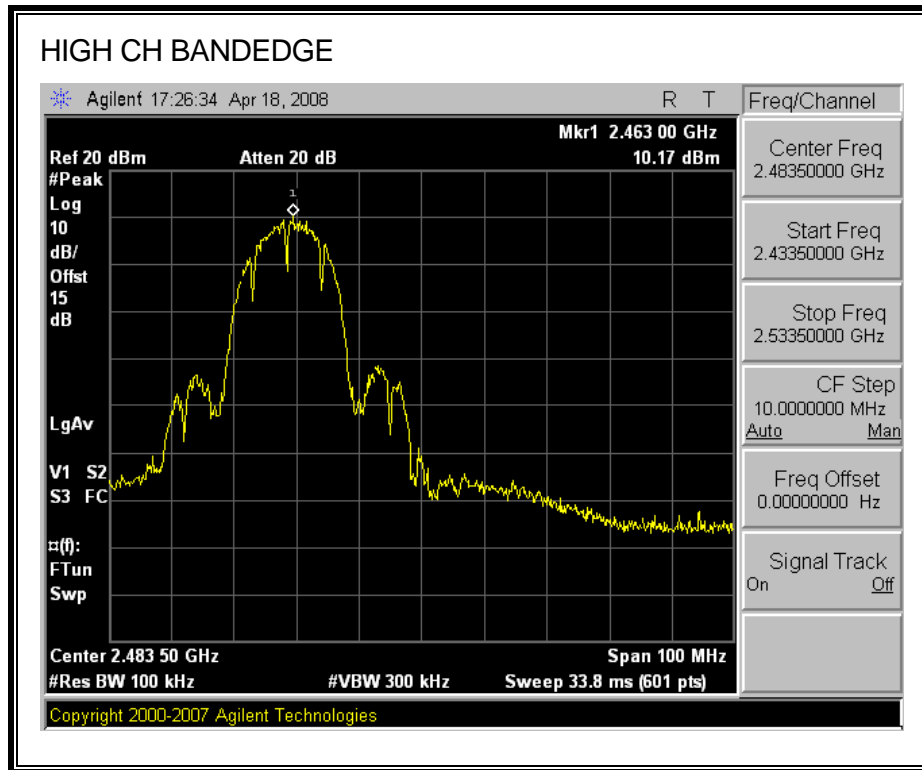


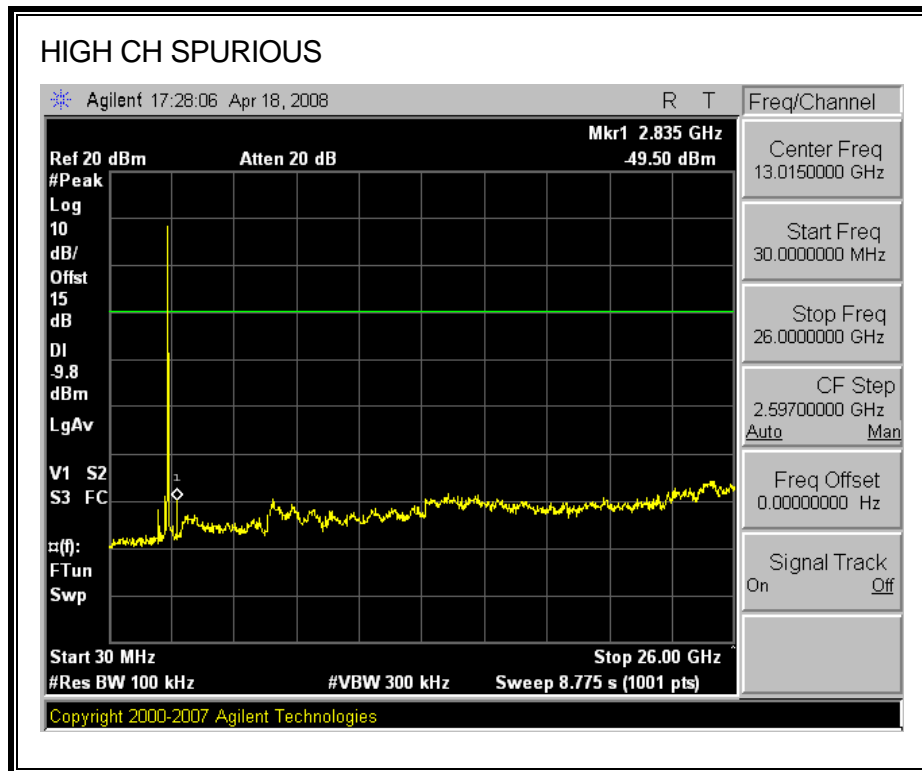
SPURIOUS EMISSIONS, MID CHANNEL





SPURIOUS EMISSIONS, HIGH CHANNEL





8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.6 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

| Frequency Range (MHz) | Field Strength Limit (uV/m) at 3 m | Field Strength Limit (dBuV/m) at 3 m |
|--------------------------|---------------------------------------|---|
| 30 - 88 | 100 | 40 |
| 88 - 216 | 150 | 43.5 |
| 216 - 960 | 200 | 46 |
| Above 960 | 500 | 54 |

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.

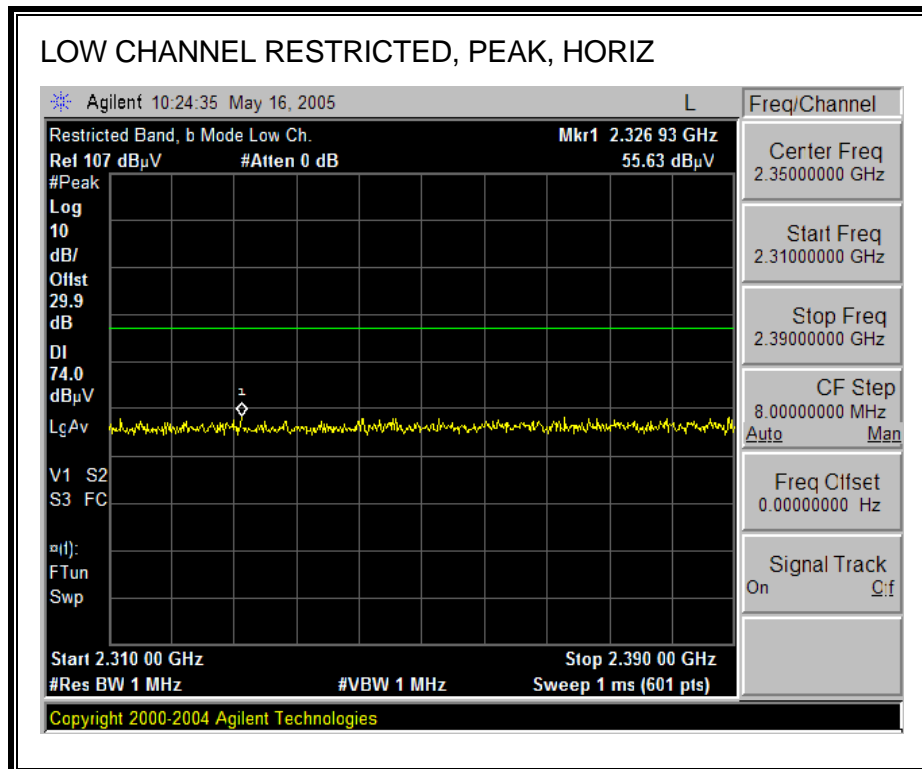
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

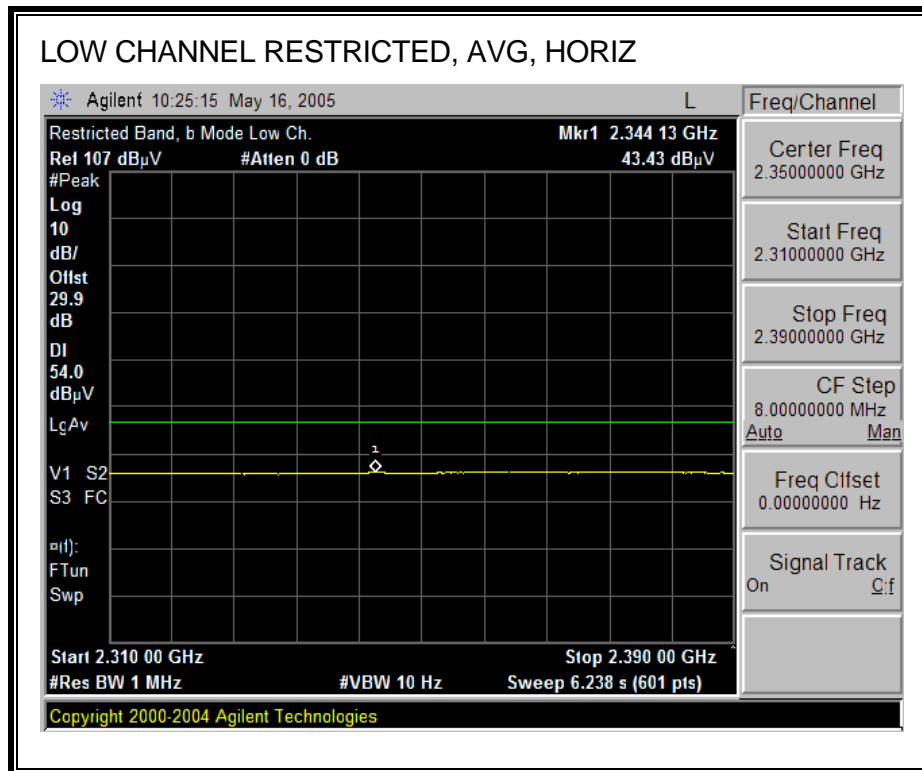
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

8.2. TRANSMITTER ABOVE 1 GHz

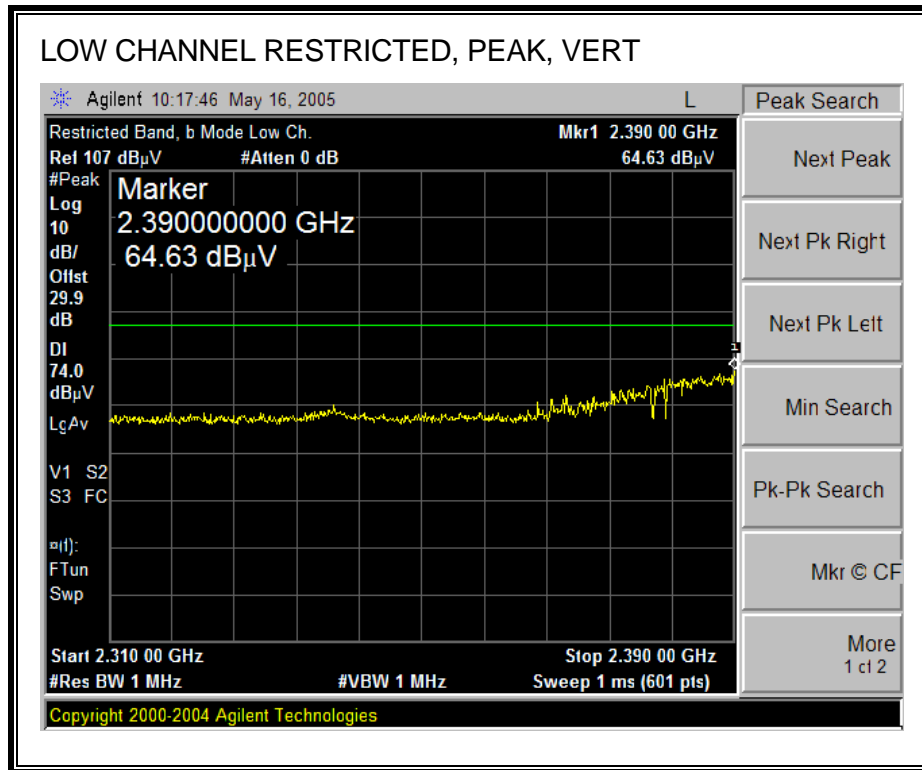
8.2.1. TRANSMITTER ABOVE 1 GHz FOR 802.11b MODE IN THE 2.4 GHz BAND

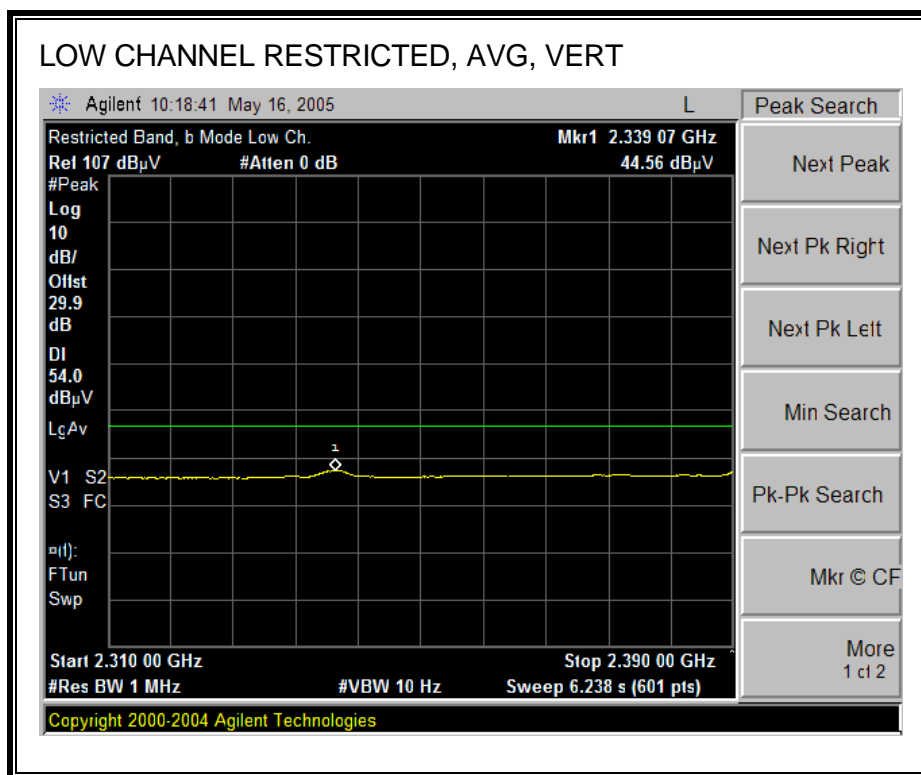
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



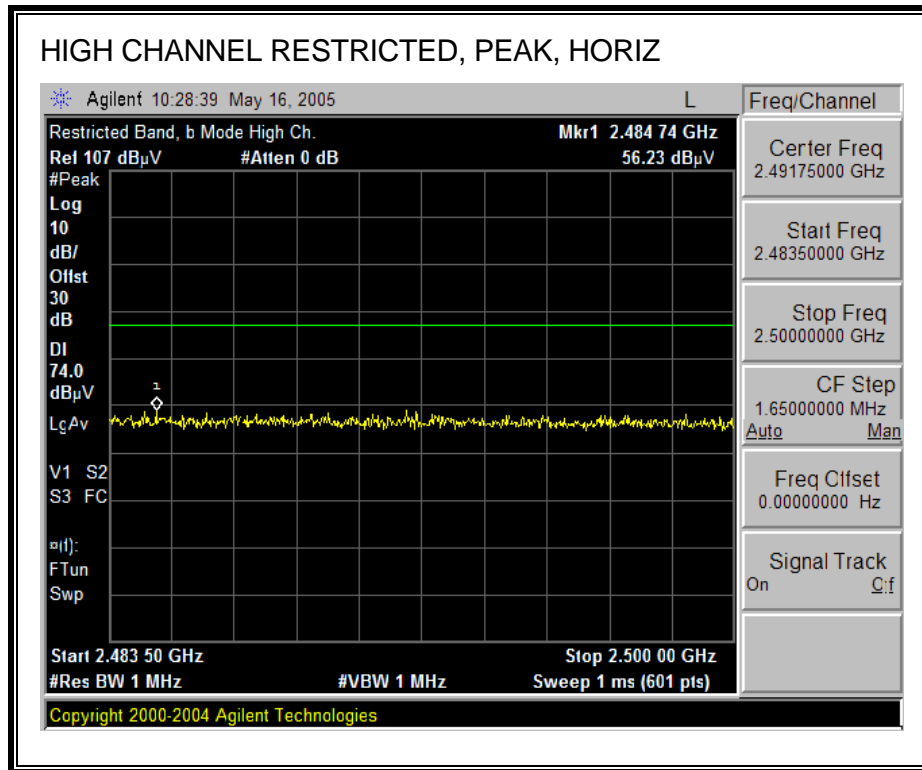


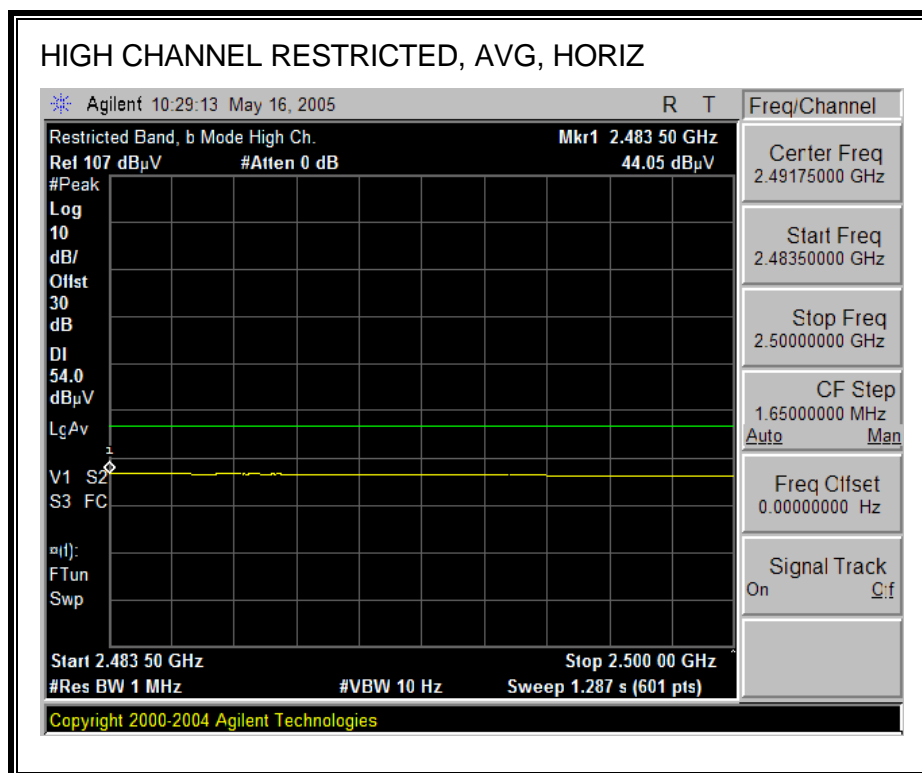
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



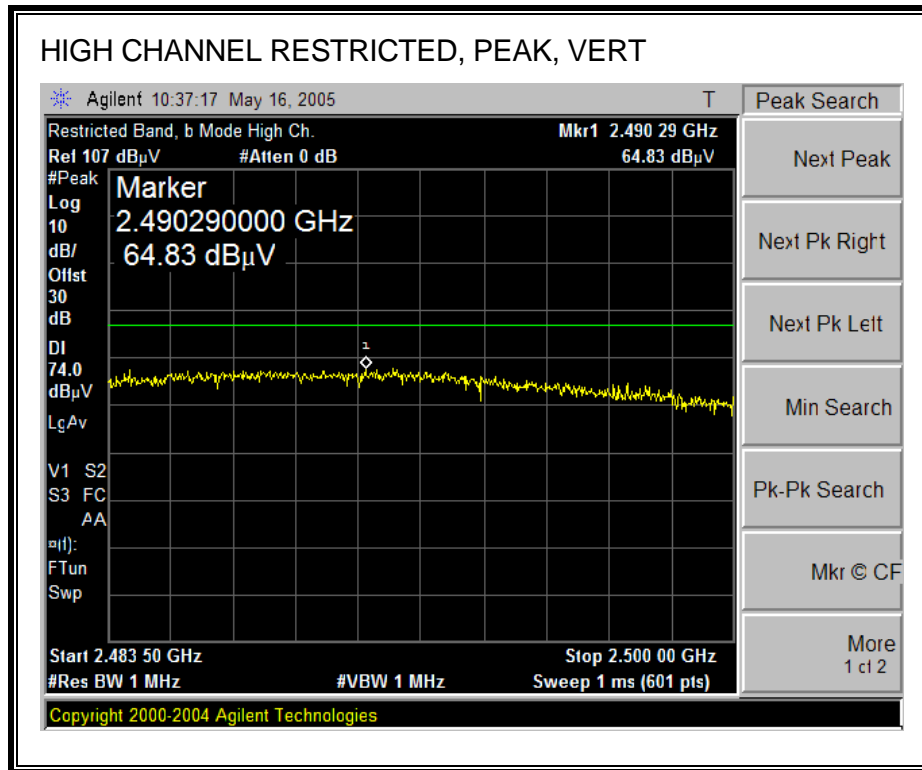


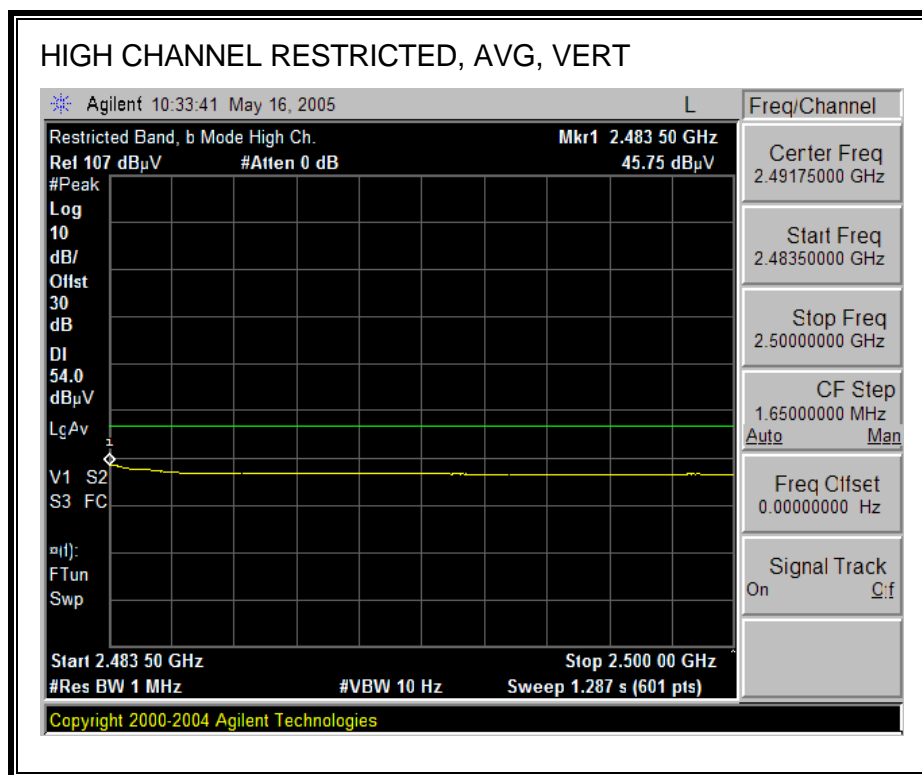
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

05/16/05 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: VIEN TRAN
Project #: 05U3362-1
Company: @ ROAD
EUT Descr.: MOBILE INTERNET LOCATION MGR WITH GPS, 3G CELL, CDMA
EUT M/N: IWM3140 MOBILE HOT SPOT
Test Target: FCC 15.247
Mode Oper: TX WLAN LOW, MID, HI CHANNELS _ HARMONIC SPUR

Test Equipment:

| | | | | |
|---|---------------------------------------|------------------------|--------------|---------------------|
| EMCO Horn 1-18GHz T60; S/N: 2238 @3m | Pre-amplifier 1-26GHz T34 HP 8449B | Pre-amplifier 26-40GHz | Horn > 18GHz | Limit FCC 15.209 |
|---|---------------------------------------|------------------------|--------------|---------------------|

Hi Frequency Cables

| | | | |
|--------------|--------------|------------------------|--------------------------|
| 2 foot cable | 3 foot cable | 4 foot cable 4_Vien | 12 foot cable 12_Vien |
|--------------|--------------|------------------------|--------------------------|

HPF
HPF_4.0GHz

Reject Filter
R_001

Peak Measurements
RBW=VBW=1MHz

Average Measurements
RBW=1MHz ; VBW=10Hz

| f GHz | Dist (m) | Read Pk dBuV | Read Avg. dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Fldr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|--|-------------|-----------------|-------------------|------------|----------|-----------|--------------|------------|----------------|---------------|------------------|-------------------|--------------|---------------|----------------|
| LOW CH | | | | | | | | | | | | | | | |
| 4.824 | 3.0 | 42.5 | 31.0 | 33.6 | 3.4 | -33.6 | 0.0 | 0.6 | 46.6 | 35.1 | 74 | 54 | -27.4 | -18.9 | V |
| 7.236 | 3.0 | 43.8 | 32.3 | 36.1 | 3.9 | -33.3 | 0.0 | 0.6 | 51.1 | 39.7 | 74 | 54 | -22.9 | -14.3 | V, NOISE FLOOR |
| 4.824 | 3.0 | 43.5 | 32.2 | 33.6 | 3.4 | -33.6 | 0.0 | 0.6 | 47.6 | 36.3 | 74 | 54 | -26.4 | -17.7 | H |
| 7.236 | 3.0 | 44.0 | 32.0 | 36.1 | 3.9 | -33.3 | 0.0 | 0.6 | 51.4 | 39.4 | 74 | 54 | -22.6 | -14.6 | H, NOISE FLOOR |
| MID CH | | | | | | | | | | | | | | | |
| 4.874 | 3.0 | 43.7 | 31.1 | 33.7 | 3.4 | -33.5 | 0.0 | 0.6 | 47.9 | 35.3 | 74 | 54 | -26.1 | -18.7 | V |
| 7.311 | 3.0 | 42.8 | 31.0 | 36.2 | 3.9 | -33.3 | 0.0 | 0.6 | 50.2 | 38.4 | 74 | 54 | -23.8 | -15.6 | V, NOISE FLOOR |
| 4.874 | 3.0 | 43.7 | 31.0 | 33.7 | 3.4 | -33.5 | 0.0 | 0.6 | 47.9 | 35.2 | 74 | 54 | -26.1 | -18.8 | V |
| 7.311 | 3.0 | 43.8 | 31.6 | 36.2 | 3.9 | -33.3 | 0.0 | 0.6 | 51.2 | 39.0 | 74 | 54 | -22.8 | -15.0 | H, NOISE FLOOR |
| HI CH | | | | | | | | | | | | | | | |
| 4.924 | 3.0 | 43.7 | 31.3 | 33.7 | 3.5 | -33.5 | 0.0 | 0.6 | 48.0 | 35.6 | 74 | 54 | -26.0 | -18.4 | V |
| 7.386 | 3.0 | 43.9 | 31.9 | 36.2 | 3.9 | -33.3 | 0.0 | 0.6 | 51.4 | 39.4 | 74 | 54 | -22.6 | -14.6 | V, NOISE FLOOR |
| 4.924 | 3.0 | 43.7 | 30.9 | 33.7 | 3.5 | -33.5 | 0.0 | 0.6 | 48.0 | 35.2 | 74 | 54 | -26.0 | -18.8 | V |
| 7.386 | 3.0 | 44.6 | 31.7 | 36.2 | 3.9 | -33.3 | 0.0 | 0.6 | 52.1 | 39.2 | 74 | 54 | -21.9 | -14.8 | H, NOISE FLOOR |
| NO OTHER EMISSIONS WERE DETECTED ABOVE NOISE FLOOR AFTER 3RD HARMONIC. | | | | | | | | | | | | | | | |

| | | | | | |
|------|-----------------------|--------|--------------------------------|---------|------------------------------|
| 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 | | |

8.3. RECEIVER ABOVE 1 GHz

8.3.1. RECEIVER ABOVE 1 GHz FOR 20 MHz BANDWIDTH IN THE 2.4 GHz BAND

| 05/16/05 High Frequency Measurement Compliance Certification Services, Morgan Hill Open Field Site Test Engr: VIEN TRAN Project #: 05U3362-1 Company: @ ROAD EUT Descrip.: MOBILE INTERNET LOCATION MGR WITH GPS, 3G CELL, CDMA EUT M/N: IWM3140 MOBILE HOT SPOT Test Target: FCC 15.247 Mode Oper: RX WLAN LOW, MID, HI CHANNELS Test Equipment: <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 20%;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">EMCO Horn 1-18GHz</div> <div style="border: 1px solid black; padding: 2px;">T60; S/N: 2238 @ 3m</div> </div> <div style="width: 20%;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Pre-amplifier 1-26GHz</div> <div style="border: 1px solid black; padding: 2px;">T34 HP 8449B</div> </div> <div style="width: 20%;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Pre-amplifier 26-40GHz</div> <div style="border: 1px solid black; padding: 2px;"></div> </div> <div style="width: 20%;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Horn > 18GHz</div> <div style="border: 1px solid black; padding: 2px;"></div> </div> </div> <div style="display: flex; justify-content: space-between; align-items: flex-start; margin-top: 10px;"> <div style="width: 40%;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">2 foot cable</div> <div style="border: 1px solid black; padding: 2px;">2_Vien</div> </div> <div style="width: 20%;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">3 foot cable</div> <div style="border: 1px solid black; padding: 2px;"></div> </div> <div style="width: 20%;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">4 foot cable</div> <div style="border: 1px solid black; padding: 2px;">4_Vien</div> </div> <div style="width: 20%;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">12 foot cable</div> <div style="border: 1px solid black; padding: 2px;">12_Vien</div> </div> </div> <div style="display: flex; justify-content: space-between; align-items: flex-start; margin-top: 10px;"> <div style="width: 20%;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">HPF</div> <div style="border: 1px solid black; padding: 2px;"></div> </div> <div style="width: 20%;"> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;">Reject Filter</div> <div style="border: 1px solid black; padding: 2px;"></div> </div> </div> <div style="margin-top: 10px;"> Peak Measurements RBW=VBW=1MHz Average Measurements RBW=1MHz ; VBW=10Hz </div> | | | | | | | | | | | | | | | |
|---|-------------|-----------------|-------------------|------------|----------|-----------|--------------|-------------|----------------|---------------|------------------|-------------------|--------------|---------------|----------------|
| f GHz | Dist (m) | Read Pk dBuV | Read Avg. dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filtr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
| NO EMISSIONS WERE DETECTED ABOVE NOISE FLOOR. | | | | | | | | | | | | | | | |
| <div style="display: flex; justify-content: space-between;"> <div> f Measurement Frequency Dist Distance to Antenna Read Analyzer Reading AF Antenna Factor CL Cable Loss </div> <div> Amp Preamp Gain D Corr Distance Correct to 3 meters Avg Average Field Strength @ 3 m Peak Calculated Peak Field Strength HPF High Pass Filter </div> <div> Avg Lim Average Field Strength Limit Pk Lim Peak Field Strength Limit Avg Mar Margin vs. Average Limit Pk Mar Margin vs. Peak Limit </div> </div> | | | | | | | | | | | | | | | |

8.4. WORST-CASE BELOW 1 GHz

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

HORIZONTAL PLOT



FCC, VCCI, CISPR, CE, AUSTEL, NZ
UL, CSA, TUV, BSMI, DHHS, NVLAP

561F MONTEREY ROAD, SAN JOSE, CA 95037-9001
PHONE: (408) 463-0885 FAX: (408) 463-0888

Project #: 05U3362-1
Report #: 05U3362-1
Date & Time: 05/16/05 5:16 PM
Test Engr: VIEN TRAN

Company: @ ROAD
EUT Description: MOBILE INTERNET LOCATION MGR
Test Configuration: EUT & GPS ANTENNA
Type of Test: FCC CLASS B
Mode of Operation: TX

☒ A-Site

☐ B-Site

☐ C-Site

☐ F-Site

6 Worst Data

Descending

| Freq. (MHz) | Reading (dBuV) | AF (dB) | Closs (dB) | Pre-amp (dB) | Level (dBuV/m) | Limit FCC_B | Margin (dB) | Pol (H/V) | Az (Deg) | Height (Meter) | Mark (P/Q/A) |
|--------------------|-------------------|------------|---------------|-----------------|-------------------|----------------|----------------|--------------|-------------|-------------------|-----------------|
| 200.10 | 58.50 | 12.03 | 1.88 | 27.20 | 45.21 | 43.50 | 1.71 | 3mH | 0.00 | 1.00 | P |
| 200.10 | 56.50 | 12.03 | 1.88 | 27.20 | 43.21 | 43.50 | -0.29 | 3mH | 0.00 | 1.00 | Q |
| 400.00 | 51.80 | 15.92 | 2.83 | 27.48 | 43.07 | 46.00 | -2.93 | 3mH | 0.00 | 1.00 | P |
| 600.00 | 48.00 | 19.36 | 3.63 | 28.38 | 42.61 | 46.00 | -3.39 | 3mH | 0.00 | 1.00 | P |
| 800.00 | 45.50 | 21.70 | 4.27 | 27.84 | 43.63 | 46.00 | -2.37 | 3mH | 0.00 | 1.00 | P |
| 200.10 | 56.30 | 12.03 | 1.88 | 27.20 | 43.01 | 43.50 | -0.49 | 3mV | 0.00 | 1.00 | P |
| 200.10 | 54.20 | 12.03 | 1.88 | 27.20 | 40.91 | 43.50 | -2.59 | 3mV | 0.00 | 1.00 | Q |
| Total # of Data: 7 | | | | | | | | | | | |

RECEIVING MODE:

SPURIOUS EMISSIONS ABOVE 1GHz (WORST-CASE CONFIGURATION)

05/16/05 30 - 1000 MHz Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: VIEN TRAN
Project #: 05U3362-1
Company: @ ROAD
EUT Descrip.: MOBILE INTERNET LOCATION MGR WITH GPS, 3G CELL, CDMA
EUT M/N: IWM3140 MOBILE HOT SPOT
Test Target: RSS 210
Mode Oper: RX SPUR

Test Equipment:

| | | | | |
|---|-----------------------|------------------------|-------------|---------------------|
| EMCO Horn 1-18GHz T60; S/N: 2238 @3m | Pre-amplifier 1-26GHz | Pre-amplifier 26-40GHz | Horn >18GHz | Limit RX RSS 210 |
|---|-----------------------|------------------------|-------------|---------------------|

Hi Frequency Cables

| | | | | | |
|--------------|--------------|------------------------|--------------------------|-----|---------------|
| 2 foot cable | 3 foot cable | 4 foot cable 4_Vien | 12 foot cable 12_Vien | HPF | Reject Filter |
|--------------|--------------|------------------------|--------------------------|-----|---------------|

Peak Measurements
RBW=VBW=1MHz

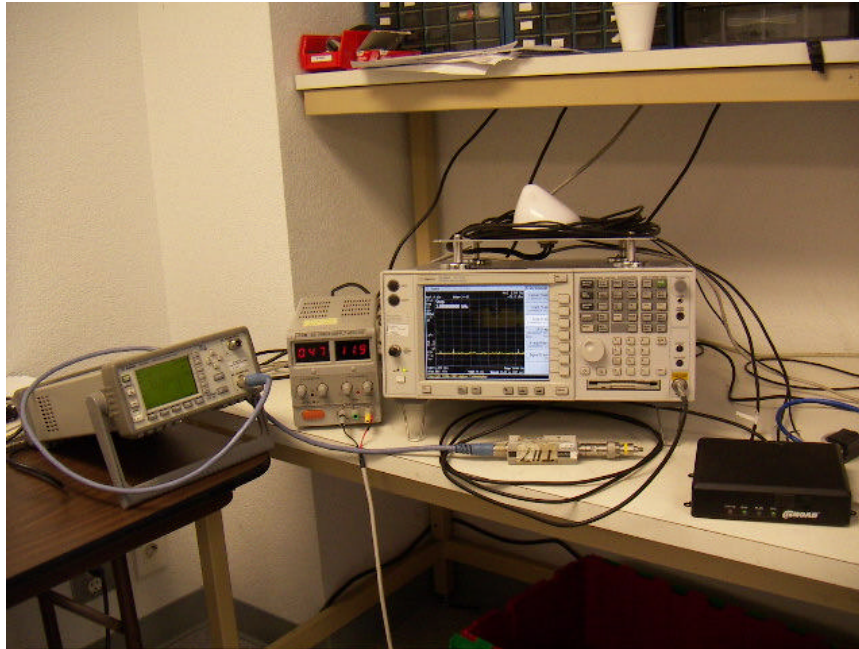
Average Measurements
RBW=1MHz ; VBW=10Hz

| f GHz | Dist (m) | Read Pk dBuV | Read Avg. dBuV | AF dB/m | CL dB | Amp dB | D Corr dB | Filtr dB | Peak dBuV/m | Avg dBuV/m | Pk Lim dBuV/m | Avg Lim dBuV/m | Pk Mar dB | Avg Mar dB | Notes (V/H) |
|---|-----------------------|-----------------|-------------------|------------|--------------------------------|-----------|--------------|-------------|------------------------------|---------------|------------------|-------------------|--------------|---------------|----------------|
| NO EMISSIONS WERE DETECTED ABOVE NOISE FLOOR IN RECEIVER MODE | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | |

9. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

ANTENNA PORT CONDUCTED PHOTO

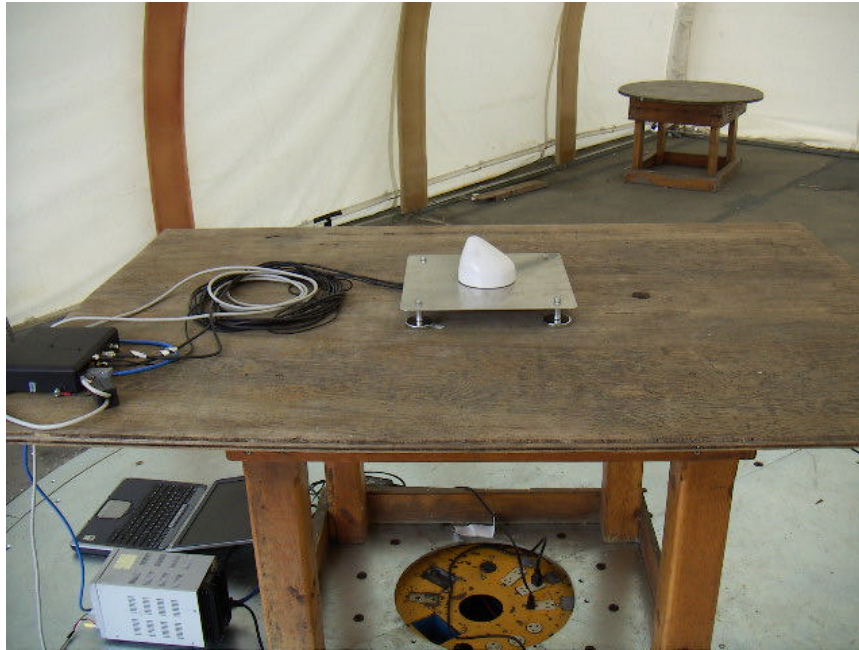


RADIATED RF MEASUREMENT SETUP

RADIATED FRONT PHOTO



RADIATED BACK PHOTO



END OF REPORT