



**FCC CFR47 CERTIFICATION**

**PART 24E**

**TEST REPORT**

***FOR***

**KYOCERA CORPORATION**

**MODEL: UTC1900D-US-A**

**FCC ID: JOYIUC19AA**

**REPORT NUMBER: 04I2701-3**

**ISSUE DATE: JUNE 10, 2004**

*Prepared for*

**KYOCERA CORPORATION  
2-1-1 KAGAHARA TSUZUKI-KU  
YOKOHAMA-SHI,  
JAPAN**

*Prepared by*

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## 1. TEST RESULT CERTIFICATION

**COMPANY NAME:** KYOCERA CORPORATION  
2-1-1 KAGAHARA TSUZUKI-KU YOKOHAMA-SHI  
KANAGAWA 224-8502, JAPAN

**EUT DESCRIPTION:** USER TERMINAL ( CARD TYPE ) OF WIRELESS BROADBAND  
INTERNET SYSTEM

**MODEL NUMBER:** UTC1900D-US-A

**DATE TESTED:** JUNE 01 TO JUNE 6, 2004

|                       |                                                                   |
|-----------------------|-------------------------------------------------------------------|
| TYPE OF EQUIPMENT     | INTENTIONAL RADIATOR, LICENSED TX MODULE IN<br>MOBILE APPLICATION |
| MEASUREMENT PROCEDURE | ANSI C63.4 / 2001, TIA/EIA 603                                    |
| PROCEDURE             | CERTIFICATION                                                     |
| FCC RULE              | CFR 47 PART 24 Subpart E                                          |

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 24 Subpart E-Broadband PCS. The equipment in the configuration described in this report, shows the measured emission levels emanating from the equipment do not exceed the specified limit.

**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.

Tested By:



Released For CCS By:



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VIEN TRAN  
EMC TECHNICIAN  
COMPLIANCE CERTIFICATION SERVICES

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THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

## 2. EUT DESCRIPTION

The EUT is a 1900MHz User Terminal (Card Type) of Wireless Broadband Internet System, which has an output power of 27.1dBm / 512mW (EIRP Peak Output Power), which is designed for the bands transmitting of frequency range 1900MHz to 1910MHz.

## 3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

## 4. TEST FACILITY

The open area test sites and conducted measurement facilities used to collect the radiated 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.

## 5. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2))

## 6. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

## 7. TEST SETUP, PROCEDURE AND RESULT

### 7.1. SECTION 2.1046: RF POWER OUTPUT

#### INSTRUMENTS LIST

| TEST EQUIPMENT LIST              |              |           |            |           |
|----------------------------------|--------------|-----------|------------|-----------|
| Name of Equipment                | Manufacturer | Model No. | Serial No. | Due Date  |
| Spectrum Analyzer 20 Hz ~ 44 GHz | Agilent      | E4446A    | US42070220 | 1/13/2005 |
| Peak Power Meter                 | Agilent      | E4416A    | GB41291160 | 11/7/2004 |
| Power Sensor, 100 kHz ~ 4.2 GHz  | HP           | 8482A     | 2349A08568 | 11/7/2004 |
| 10dB Attenuator                  | Weinschel    | 56-10     | M2348      | CNR       |
| Antenna, Horn 1 ~ 18 GHz         | EMCO         | 3115      | 6717       | 2/4/2005  |
| Antenna, Horn 1 ~ 18 GHz         | EMCO         | 3115      | 2238       | 2/4/2005  |
| Signal Generator                 | R&S          | SMP04     | DE34210    | 5/25/2005 |

MEASUREMENT PROCEDURE

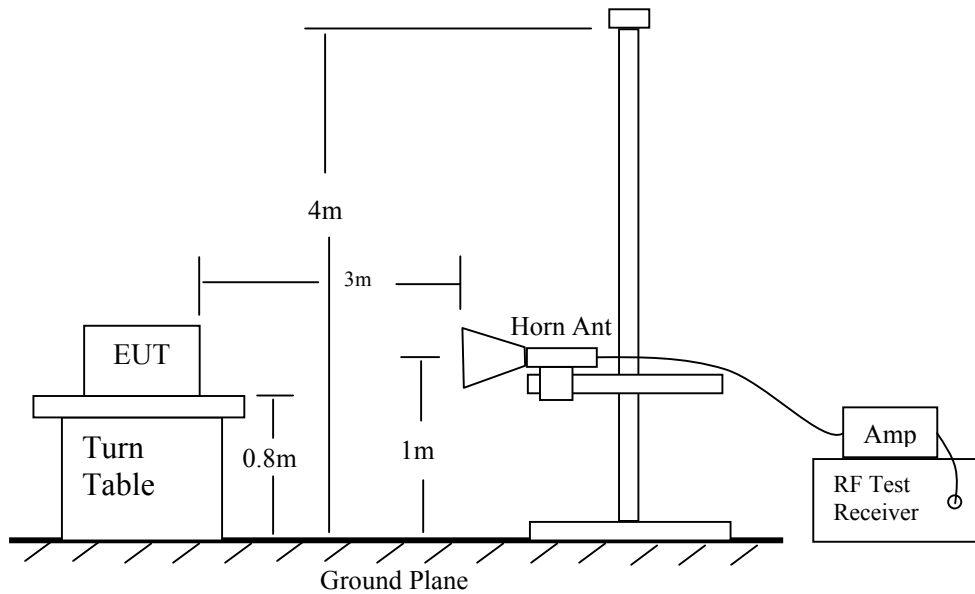
- 1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
- 2). The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the frequency of the transmitter.
- 3). The output of the test antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4). The transmitter shall be placed 0.80 meter above the ground plane, the X, Y, and Z positions shall be tested and the worst case reported if necessary. The transmitter shall be switched on with typical modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 6). The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 8). The maximum signal level detected by the measuring receiver shall be noted.
- 9). The transmitter shall be replaced by a tuned dipole (substitution antenna).
- 10). The substitution antenna shall be oriented for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- 11). The substitution antenna shall be connected to a calibrated signal generator.
- 12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

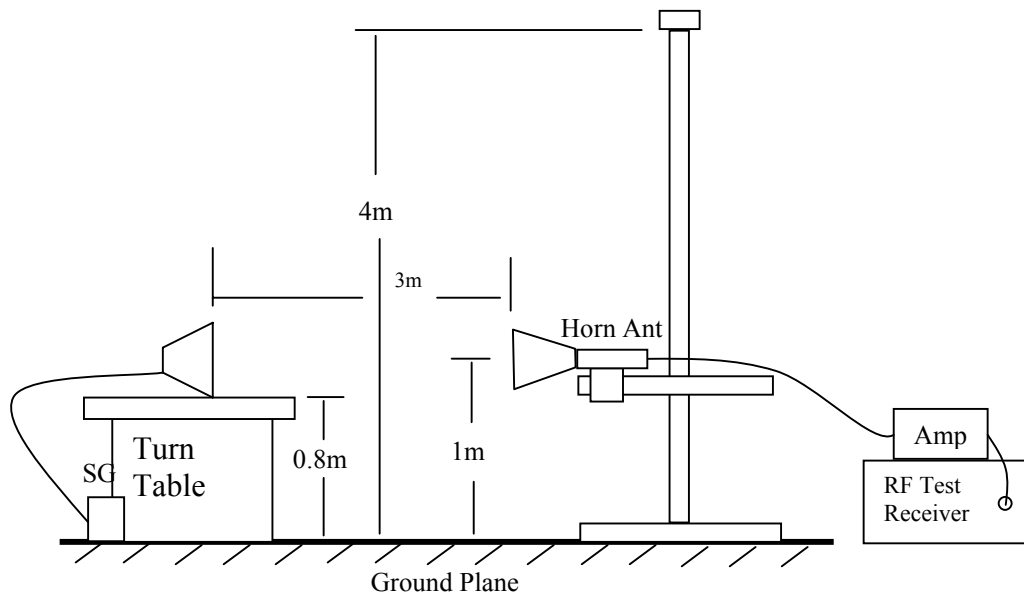
15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.



Radiated Emission Above 1000 MHz



Radiated Emission – Substitution Method setup

X position:



Y position:



Z position:



**Test result:**Output Power:**BPSK**

|          | Ch.# | Freq. (MHz) | EIRP Peak Power (dBm) | Conducted Average Power (dBm) |
|----------|------|-------------|-----------------------|-------------------------------|
| Low Ch.  | 0    | 1900.3125   | 24.10                 | 16.35                         |
| Mid Ch.  | 7    | 1904.6875   | 23.80                 | 17.42                         |
| High Ch. | 15   | 1909.6875   | 26.40                 | 17.28                         |

**QPSK**

|          | Ch.# | Freq. (MHz) | EIRP Peak Power (dBm) | Conducted Average Power (dBm) |
|----------|------|-------------|-----------------------|-------------------------------|
| Low Ch.  | 0    | 1900.3125   | 25.90                 | 16.25                         |
| Mid Ch.  | 7    | 1904.6875   | 26.50                 | 16.22                         |
| High Ch. | 15   | 1909.6875   | 25.70                 | 17.10                         |

**8PSK**

|          | Ch.# | Freq. (MHz) | EIRP Peak Power (dBm) | Conducted Average Power (dBm) |
|----------|------|-------------|-----------------------|-------------------------------|
| Low Ch.  | 0    | 1900.3125   | 26.40                 | 16.40                         |
| Mid Ch.  | 7    | 1904.6875   | 25.10                 | 16.92                         |
| High Ch. | 15   | 1909.6875   | 27.10                 | 17.10                         |

**12QAM**

|          | Ch.# | Freq. (MHz) | EIRP Peak Power (dBm) | Conducted Average Power (dBm) |
|----------|------|-------------|-----------------------|-------------------------------|
| Low Ch.  | 0    | 1900.3125   | 26.00                 | 14.37                         |
| Mid Ch.  | 7    | 1904.6875   | 25.40                 | 15.26                         |
| High Ch. | 15   | 1909.6875   | 27.10                 | 15.40                         |

**16QAM**

|          | Ch.# | Freq. (MHz) | EIRP Peak Power (dBm) | Conducted Average Power (dBm) |
|----------|------|-------------|-----------------------|-------------------------------|
| Low Ch.  | 0    | 1900.3125   | 24.20                 | 14.77                         |
| Mid Ch.  | 7    | 1904.6875   | 24.20                 | 15.30                         |
| High Ch. | 15   | 1909.6875   | 25.90                 | 15.32                         |

Output Power (EIRP):

| f<br>GHz              | SA reading<br>(dBuV) | SG reading<br>(dBm) | CL<br>(dB) | Gain<br>(dB) | Gain<br>(dBd) | EIRP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes                    |
|-----------------------|----------------------|---------------------|------------|--------------|---------------|---------------|----------------|----------------|--------------------------|
| <b>BPSK</b>           |                      |                     |            |              |               |               |                |                |                          |
| Low Ch, 1900.3125MHz  |                      |                     |            |              |               |               |                |                |                          |
| 1.900                 | 85.7                 | 18.3                | 1.4        | 7.2          | 5.1           | 24.1          | 33.0           | -8.9           | PK Vert @ Worst Position |
| Mid Ch, 1904.6875MHz  |                      |                     |            |              |               |               |                |                |                          |
| 1.904                 | 85.3                 | 17.9                | 1.4        | 7.2          | 5.1           | 23.8          | 33.0           | -9.2           | PK Vert @ Worst Position |
| High Ch, 1909.6875MHz |                      |                     |            |              |               |               |                |                |                          |
| 1.91000               | 88.0                 | 20.5                | 1.4        | 7.2          | 5.1           | 26.4          | 33.0           | -6.6           | PK Vert @ Worst Position |
| <b>QPSK</b>           |                      |                     |            |              |               |               |                |                |                          |
| Low Ch, 1900.3125MHz  |                      |                     |            |              |               |               |                |                |                          |
| 1.90000               | 87.5                 | 20.0                | 1.4        | 7.2          | 5.1           | 25.9          | 33.0           | -7.1           | PK Vert @ Worst Position |
| Mid Ch, 1904.6875MHz  |                      |                     |            |              |               |               |                |                |                          |
| 1.90447               | 88.1                 | 20.7                | 1.4        | 7.2          | 5.1           | 26.5          | 33.0           | -6.5           | PK Vert @ Worst Position |
| High Ch, 1909.6875MHz |                      |                     |            |              |               |               |                |                |                          |
| 1.90970               | 87.2                 | 19.8                | 1.4        | 7.2          | 5.1           | 25.7          | 33.0           | -7.3           | PK Vert @ Worst Position |
| <b>8PSK</b>           |                      |                     |            |              |               |               |                |                |                          |
| Low Ch, 1900.3125MHz  |                      |                     |            |              |               |               |                |                |                          |
| 1.90035               | 88.0                 | 20.5                | 1.4        | 7.2          | 5.1           | 26.4          | 33.0           | -6.6           | PK Vert @ Worst Position |
| Mid Ch, 1904.6875MHz  |                      |                     |            |              |               |               |                |                |                          |
| 1.90447               | 86.7                 | 19.2                | 1.4        | 7.2          | 5.1           | 25.1          | 33.0           | -7.9           | PK Vert @ Worst Position |
| High Ch, 1909.6875MHz |                      |                     |            |              |               |               |                |                |                          |
| 1.90970               | 88.6                 | 21.2                | 1.4        | 7.2          | 5.1           | 27.1          | 33.0           | -5.9           | PK Vert @ Worst Position |
| <b>12QAM</b>          |                      |                     |            |              |               |               |                |                |                          |
| Low Ch, 1900.3125MHz  |                      |                     |            |              |               |               |                |                |                          |
| 1.90035               | 87.6                 | 20.1                | 1.4        | 7.2          | 5.1           | 26.0          | 33.0           | -7.0           | PK Vert @ Worst Position |
| Mid Ch, 1904.6875MHz  |                      |                     |            |              |               |               |                |                |                          |
| 1.90447               | 86.9                 | 19.5                | 1.4        | 7.2          | 5.1           | 25.4          | 33.0           | -7.6           | PK Vert @ Worst Position |
| High Ch, 1909.6875MHz |                      |                     |            |              |               |               |                |                |                          |
| 1.90970               | 88.6                 | 21.2                | 1.4        | 7.2          | 5.1           | 27.1          | 33.0           | -5.9           | PK Vert @ Worst Position |
| <b>16QAM</b>          |                      |                     |            |              |               |               |                |                |                          |
| Low Ch, 1900.3125MHz  |                      |                     |            |              |               |               |                |                |                          |
| 1.90035               | 85.7                 | 18.3                | 1.4        | 7.2          | 5.1           | 24.2          | 33.0           | -8.8           | PK Vert @ Worst Position |
| Mid Ch, 1904.6875MHz  |                      |                     |            |              |               |               |                |                |                          |
| 1.90035               | 85.7                 | 18.3                | 1.4        | 7.2          | 5.1           | 24.2          | 33.0           | -8.8           | PK Vert @ Worst Position |
| High Ch, 1909.6875MHz |                      |                     |            |              |               |               |                |                |                          |
| 1.90970               | 87.4                 | 20.0                | 1.4        | 7.2          | 5.1           | 25.9          | 33.0           | -7.1           | PK Vert @ Worst Position |

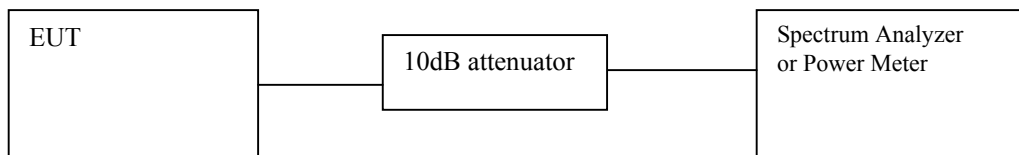
The peak reading is included the duty cycle factor of  $10 \cdot \log(0.33) = -4.8$

**7.2. SECTION 2.1047: MODULATION CHARACTERISTICS**

Not applicable.

**7.3. SECTION 2.1049: OCCUPIED BANDWIDTH****OCCUPIED BANDWIDTH:****INSTRUMENTS LIST**

| <b>TEST EQUIPMENT LIST</b>             |                     |                  |                   |                  |
|----------------------------------------|---------------------|------------------|-------------------|------------------|
| <b>Name of Equipment</b>               | <b>Manufacturer</b> | <b>Model No.</b> | <b>Serial No.</b> | <b>Due Date</b>  |
| <b>Spectrum Analyzer</b>               | <b>HP</b>           | <b>E4446A</b>    | <b>US42510266</b> | <b>7/23/2004</b> |
| <b>10dB Attenuator</b>                 | <b>Weinschel</b>    | <b>56-10</b>     | <b>M2348</b>      | <b>CNR</b>       |
| <b>Power Meter</b>                     | <b>HP</b>           | <b>436A</b>      | <b>2709A29209</b> | <b>7/15/2004</b> |
| <b>Power Sensor, 100 kHz ~ 4.2 GHz</b> | <b>HP</b>           | <b>8482A</b>     | <b>2349A08568</b> | <b>7/15/2004</b> |

**TEST SETUP**

**TEST PROCEDURE**

The EUT's output RF connector (made solely for the purpose of the test) was connected with a short cable to the spectrum analyzer, RES BW was set to about 1% of emission BW, -26 dBc display line was placed on the screen (or 99% bandwidth), the occupied BW is the delta frequency between the two points where the display line intersects the signal trace.

**RESULT**

No non-compliance noted, reference only.

**BPSK**

|          | Ch.# | Freq. (MHz) | 99% BW (KHz) | 26dBc BW (KHz) |
|----------|------|-------------|--------------|----------------|
| Low Ch.  | 0    | 1900.3125   | 521.544      | 607.622        |
| Mid Ch.  | 7    | 1904.6875   | 523.036      | 533.110        |
| High Ch. | 15   | 1909.6875   | 516.173      | 613.784        |

**QPSK**

|          | Ch.# | Freq. (MHz) | 99% BW (KHz) | 26dBc BW (KHz) |
|----------|------|-------------|--------------|----------------|
| Low Ch.  | 0    | 1900.3125   | 510.610      | 610.488        |
| Mid Ch.  | 7    | 1904.6875   | 523.916      | 536.052        |
| High Ch. | 15   | 1909.6875   | 526.924      | 536.290        |

**8PSK**

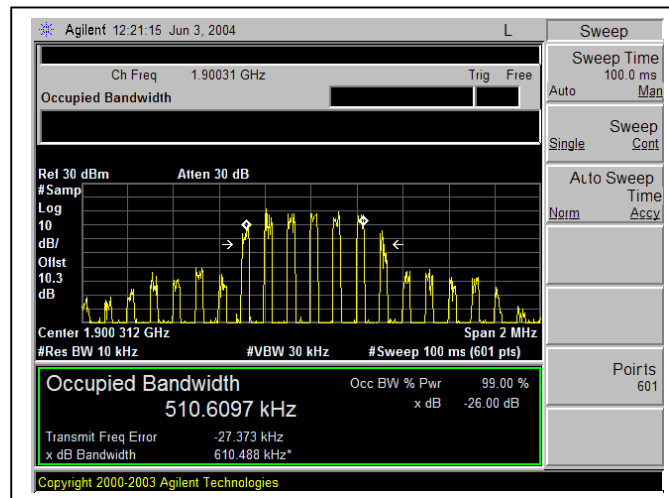
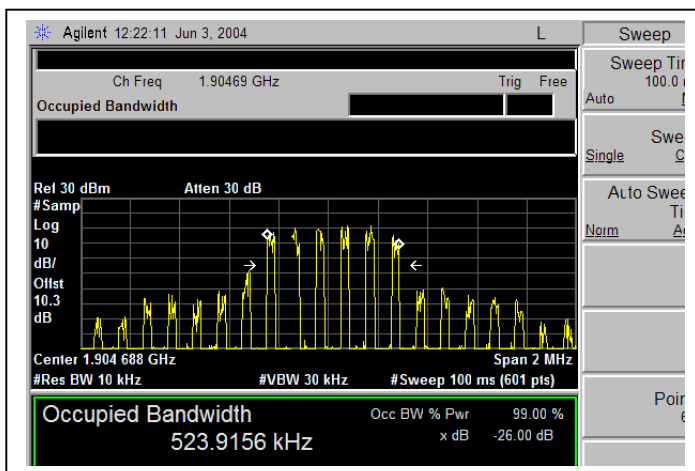
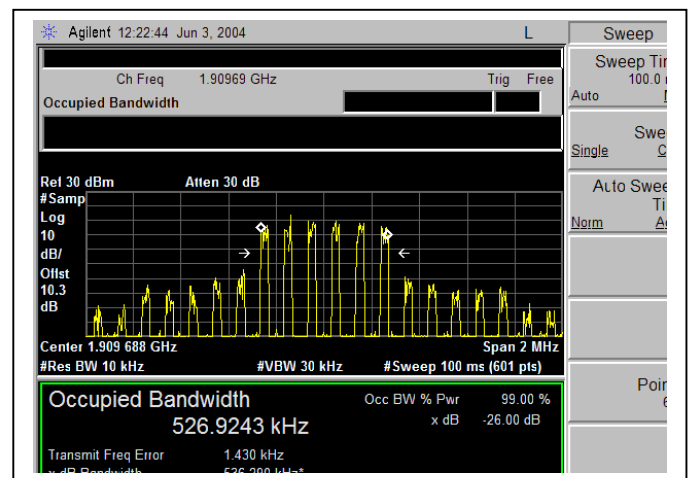
|          | Ch.# | Freq. (MHz) | 99% BW (KHz) | 26dBc BW (KHz) |
|----------|------|-------------|--------------|----------------|
| Low Ch.  | 0    | 1900.3125   | 521.132      | 610.952        |
| Mid Ch.  | 7    | 1904.6875   | 516.716      | 607.554        |
| High Ch. | 15   | 1909.6875   | 528.401      | 536.526        |

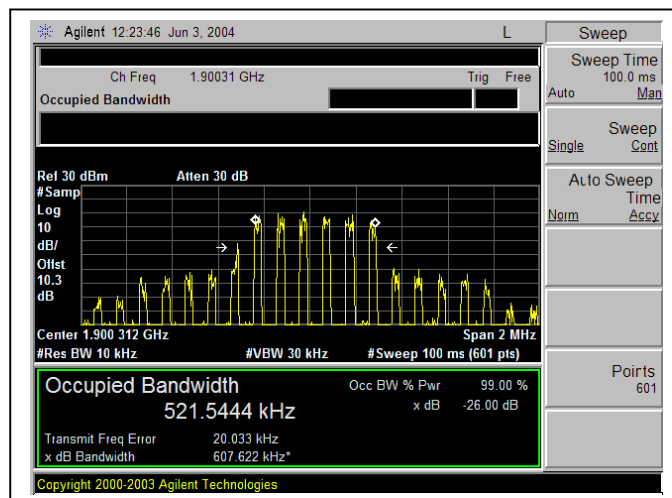
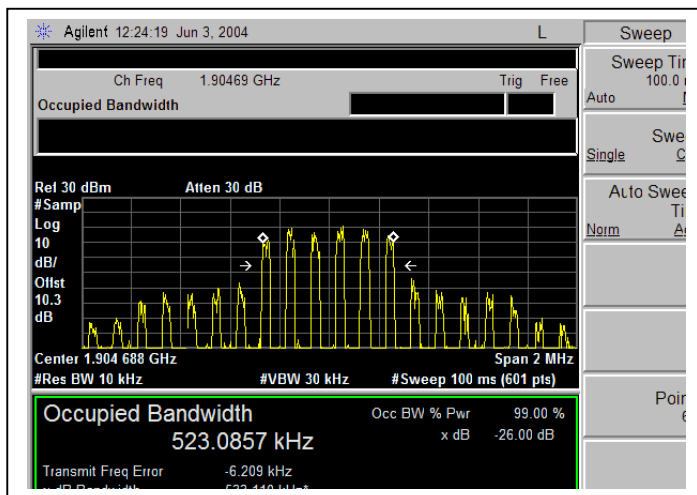
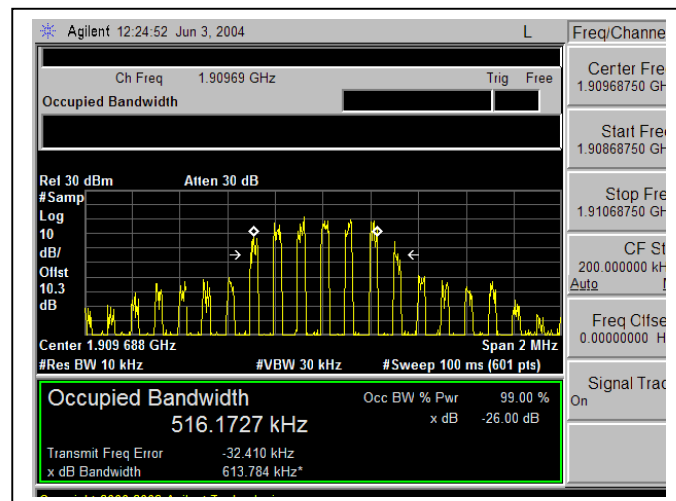
**12QAM**

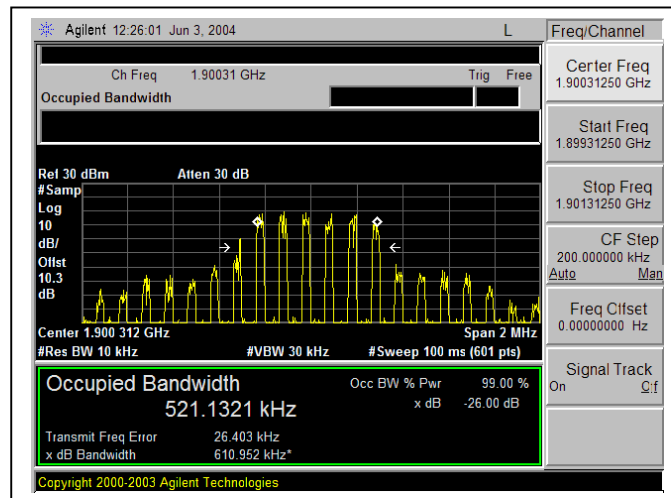
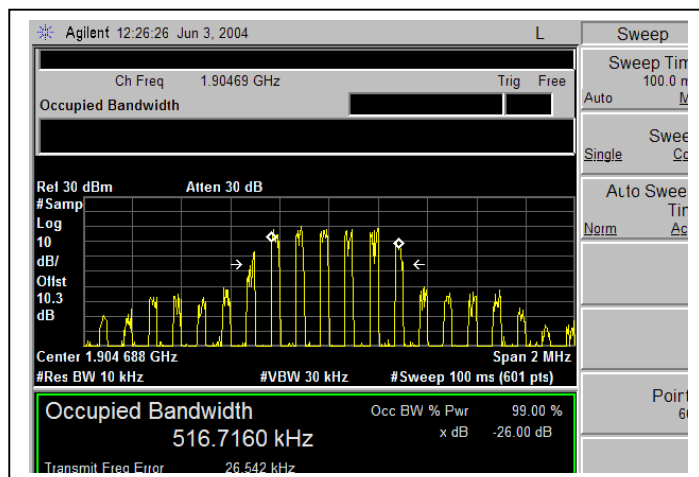
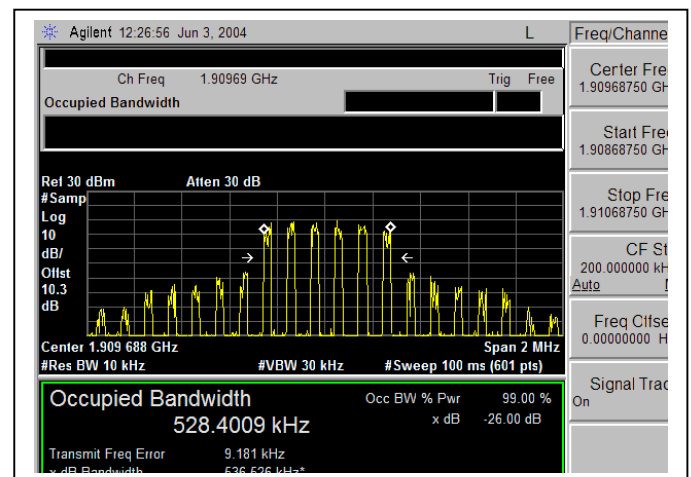
|          | Ch.# | Freq. (MHz) | 99% BW (KHz) | 26dBc BW (KHz) |
|----------|------|-------------|--------------|----------------|
| Low Ch.  | 0    | 1900.3125   | 524.332      | 610.950        |
| Mid Ch.  | 7    | 1904.6875   | 529.230      | 536.550        |
| High Ch. | 15   | 1909.6875   | 523.056      | 534.984        |

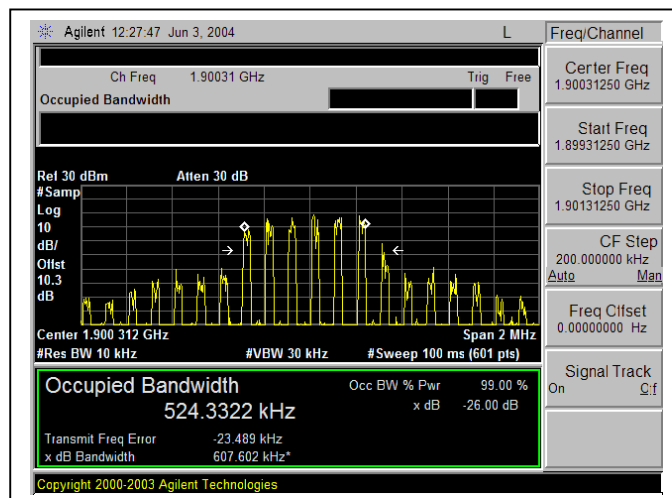
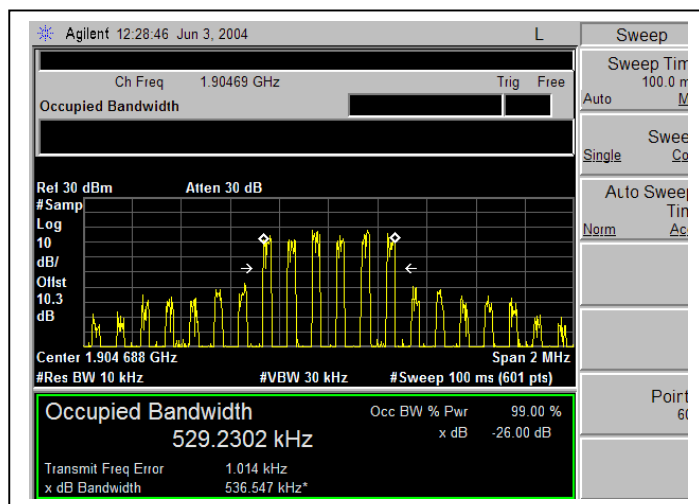
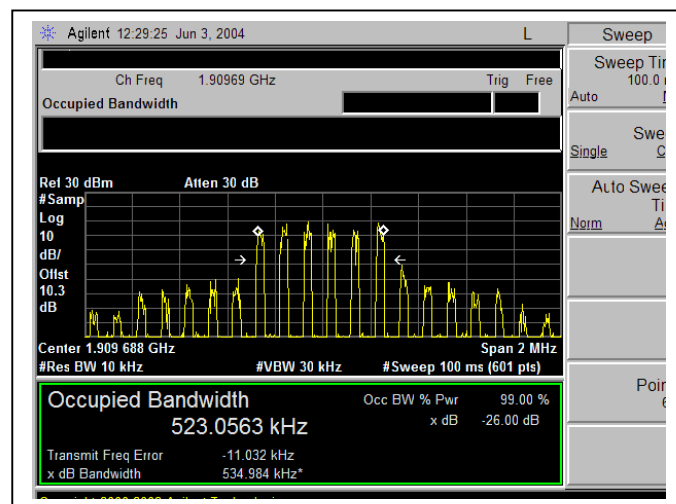
**16QAM**

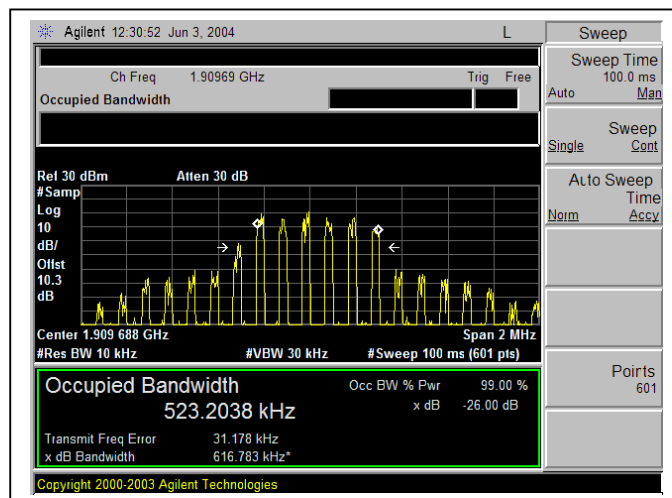
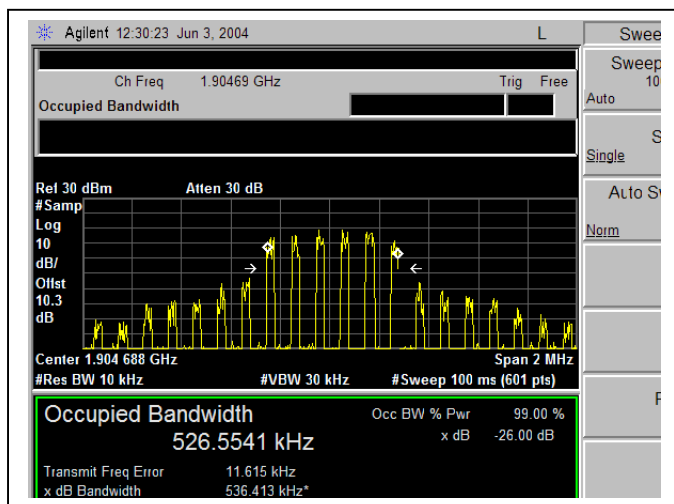
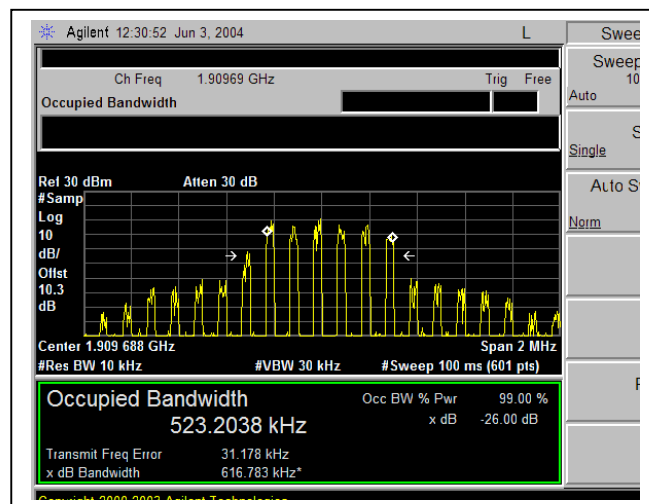
|          | Ch.# | Freq. (MHz) | 99% BW (KHz) | 26dBc BW (KHz) |
|----------|------|-------------|--------------|----------------|
| Low Ch.  | 0    | 1900.3125   | 523.204      | 616.783        |
| Mid Ch.  | 7    | 1904.6875   | 526.554      | 536.413        |
| High Ch. | 15   | 1909.6875   | 523.204      | 616.783        |

BPSK Modulation:Low ChannelMid Channel:High Channel

QPSK Modulation:Low ChannelMid Channel:High Channel:

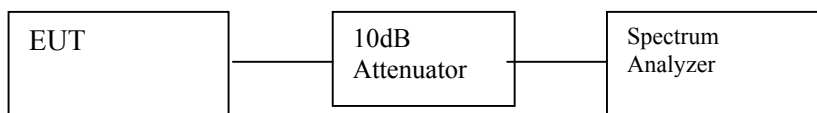
8PSK Modulation:Low ChannelMid Channel:High Channel:

12QAM Modulation:Low ChannelMid Channel:High Channel:

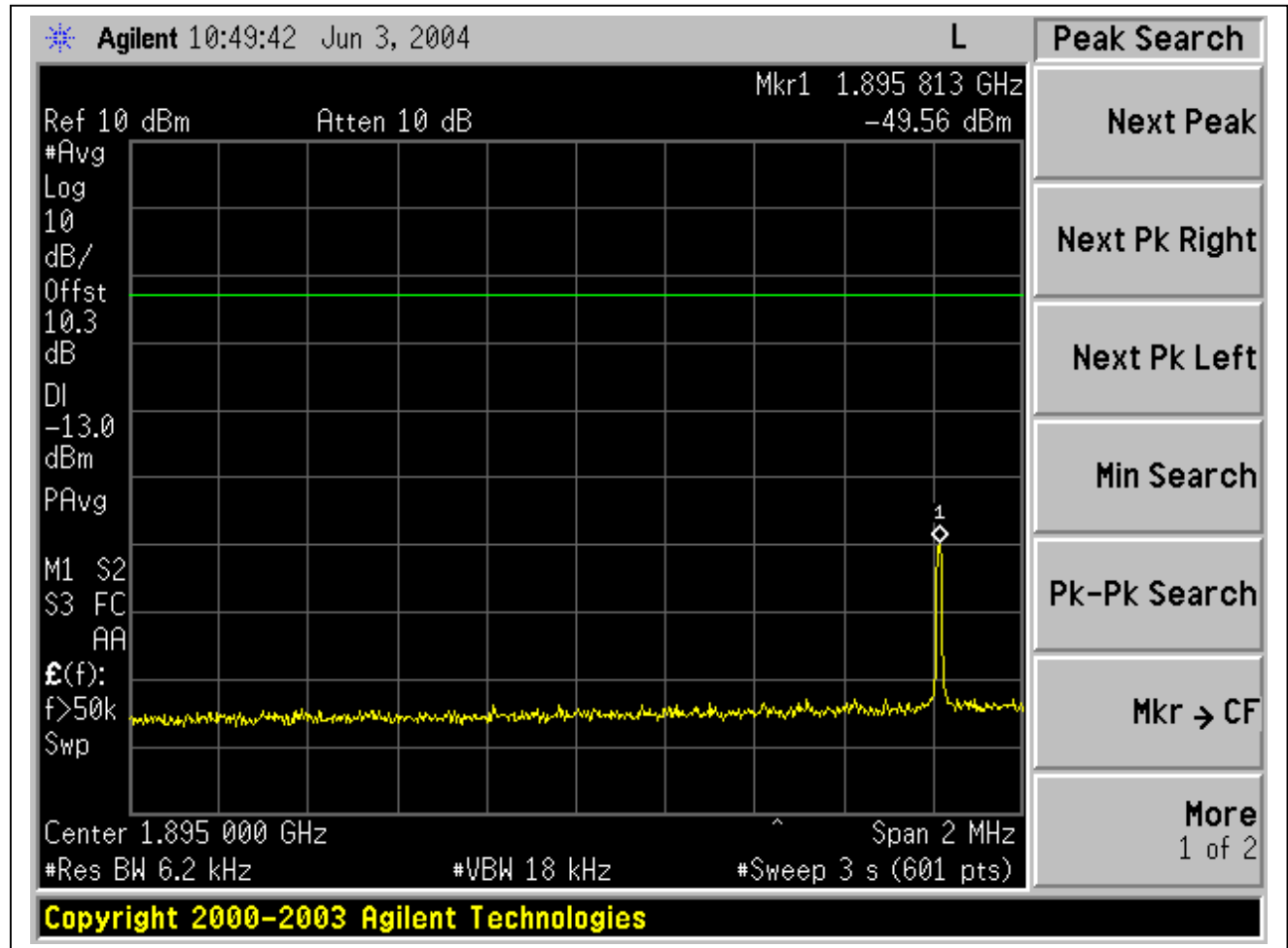
16QAM Modulation:Low ChannelMid Channel:High Channel:

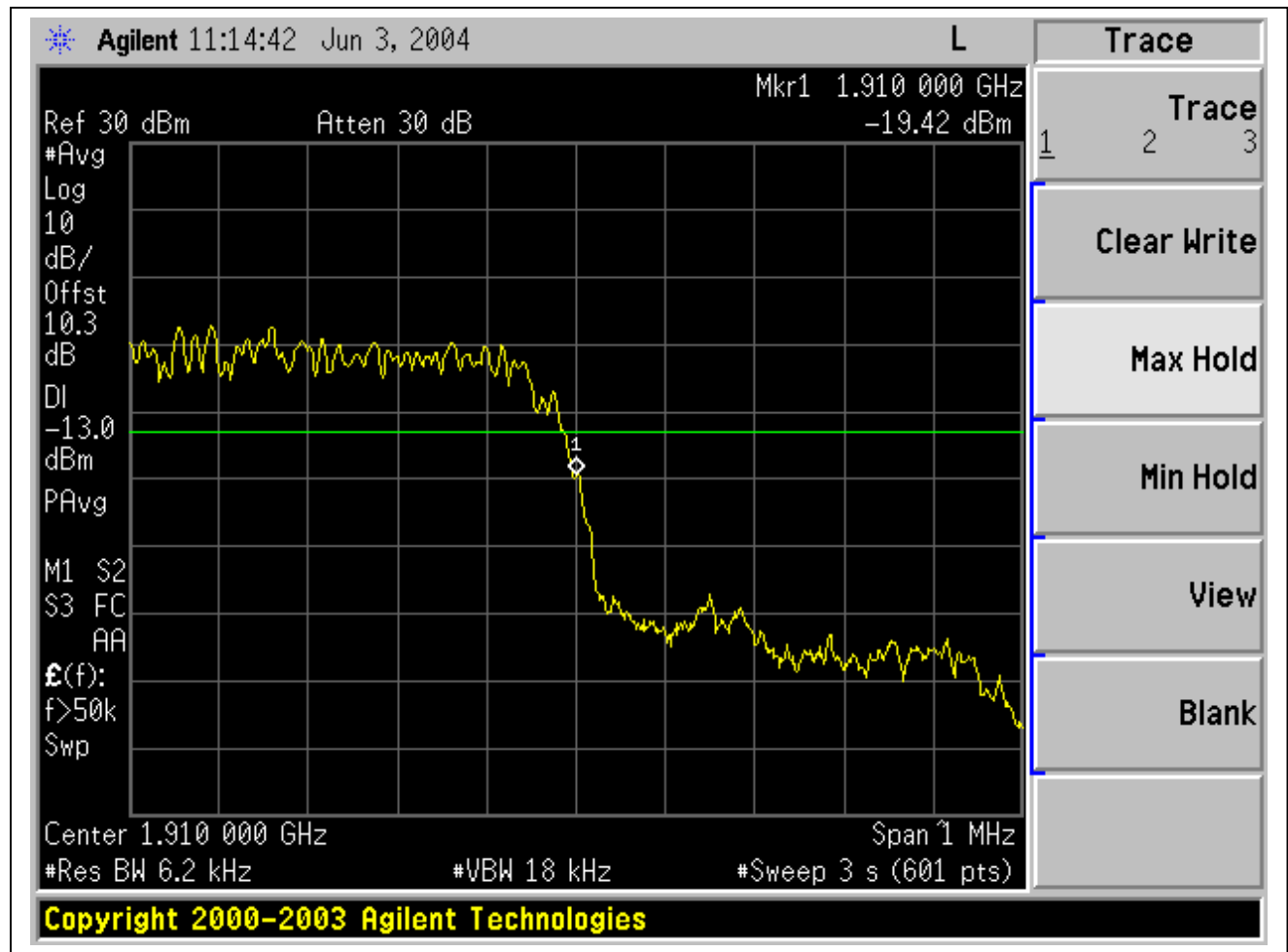
**7.4. SECTION 2.1051: SPURIOUS EMISSION AT ANTENNA TERMINAL****INSTRUMENTS LIST**

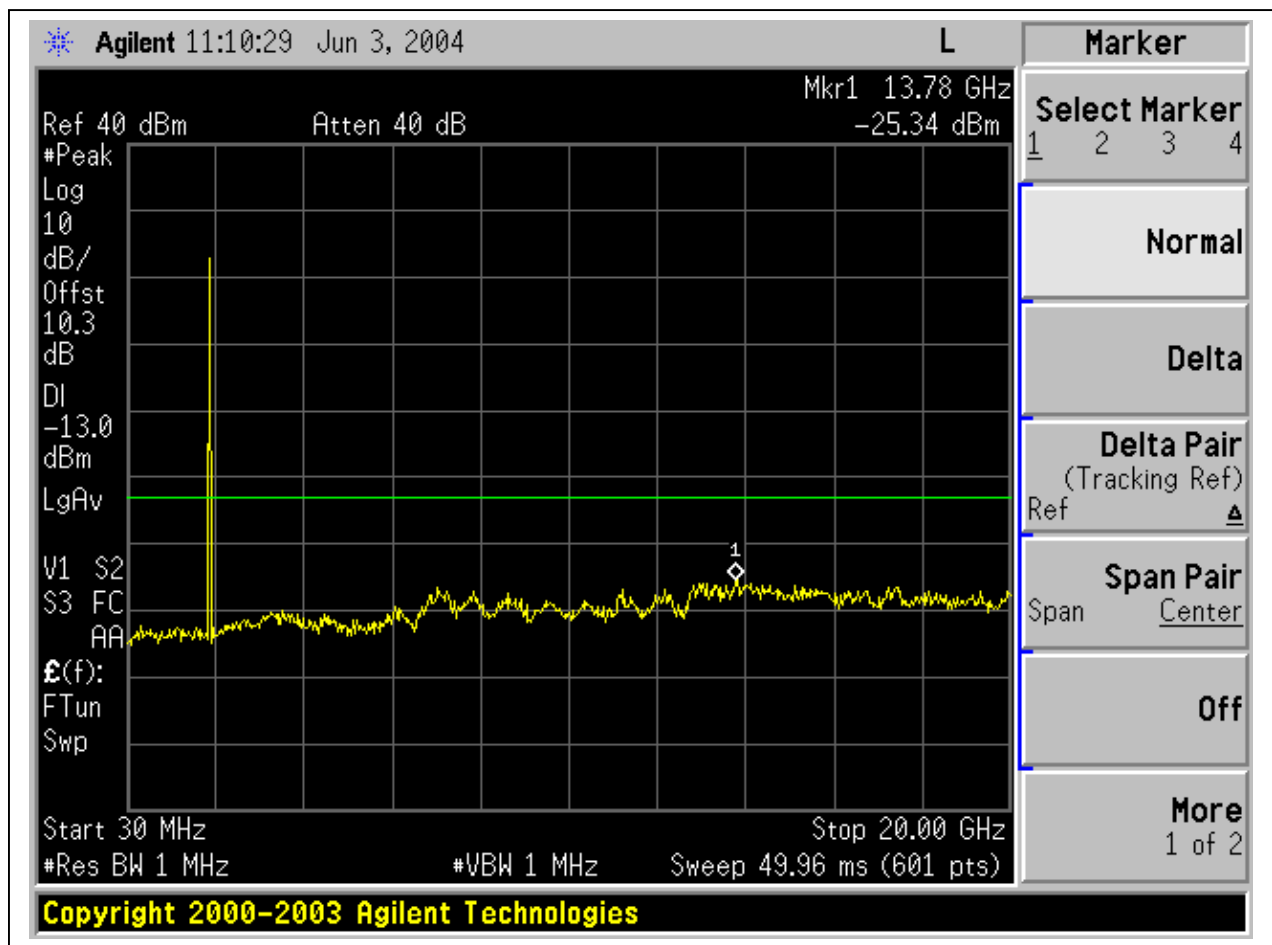
| <b>TEST EQUIPMENT LIST</b>             |                     |                  |                   |                  |
|----------------------------------------|---------------------|------------------|-------------------|------------------|
| <b>Name of Equipment</b>               | <b>Manufacturer</b> | <b>Model No.</b> | <b>Serial No.</b> | <b>Due Date</b>  |
| <b>Spectrum Analyzer</b>               | <b>HP</b>           | <b>E4446A</b>    | <b>US42510266</b> | <b>7/23/2004</b> |
| <b>10dB Attenuator</b>                 | <b>Weinschel</b>    | <b>56-10</b>     | <b>M2348</b>      | <b>CNR</b>       |
| <b>Power Meter</b>                     | <b>HP</b>           | <b>436A</b>      | <b>2709A29209</b> | <b>7/15/2004</b> |
| <b>Power Sensor, 100 kHz ~ 4.2 GHz</b> | <b>HP</b>           | <b>8482A</b>     | <b>2349A08568</b> | <b>7/15/2004</b> |

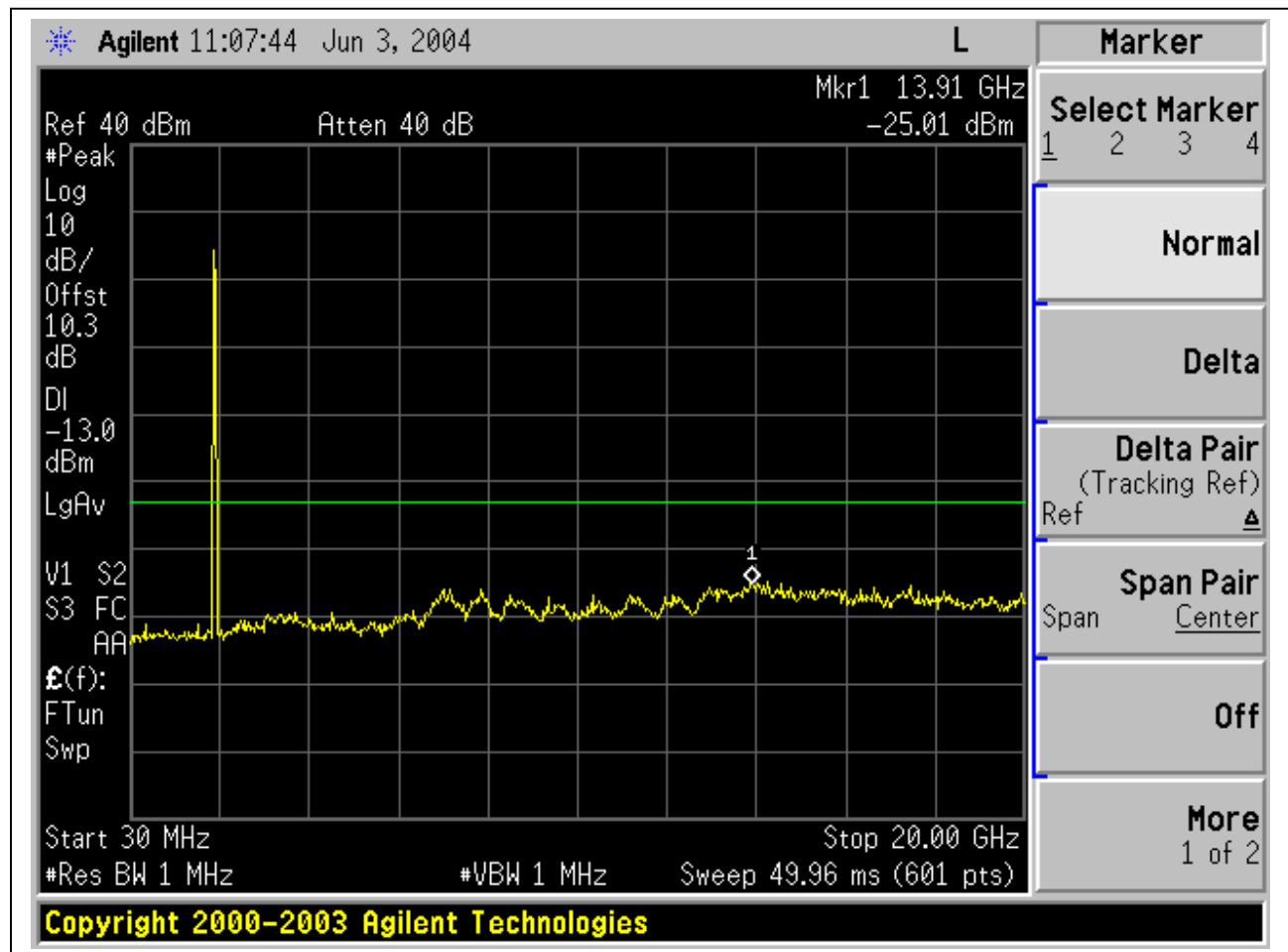
**TEST SETUP****TEST PROCEDURE**

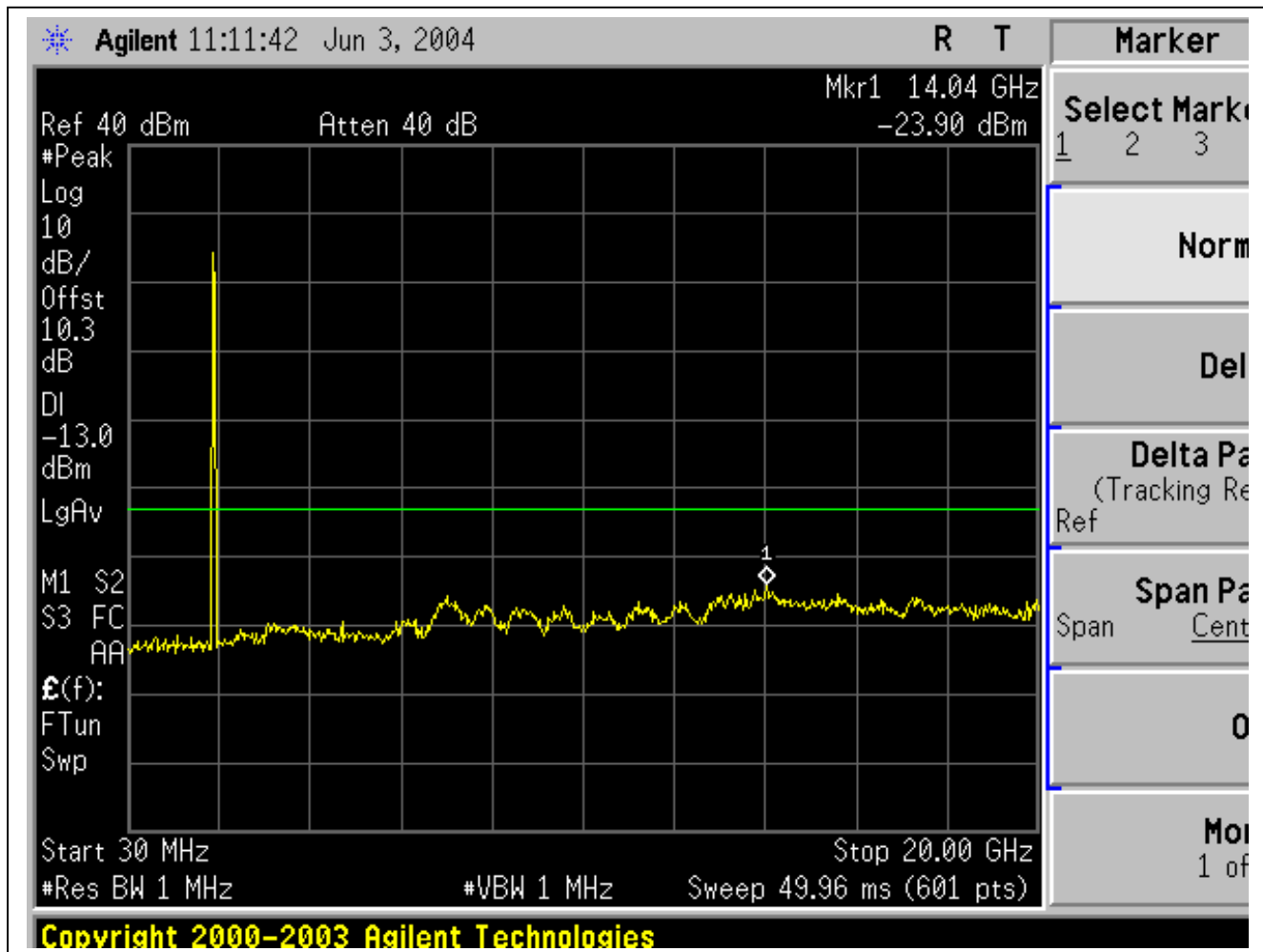
- 1) RF signal or three balanced signals (intermodulation measurement) were applied to the RF input. One set as close as possible to the bottom of the block edge and one set as close as possible to the top of the block edge. Set the RES BW to 1% of the emission bandwidth to show compliance with the -13dBm limit, in the 1 MHz bands immediately outside and adjacent to the top and bottom edges of the frequency block.
- 2) For the Out-of-Band measurements a 1 MHz RES BW was used to scan from 15 MHz to 10xfo of the fundamental carrier for all frequency block. A display line was placed at -13dBm to show compliance for spurious, harmonics, and intermodulation emissions.

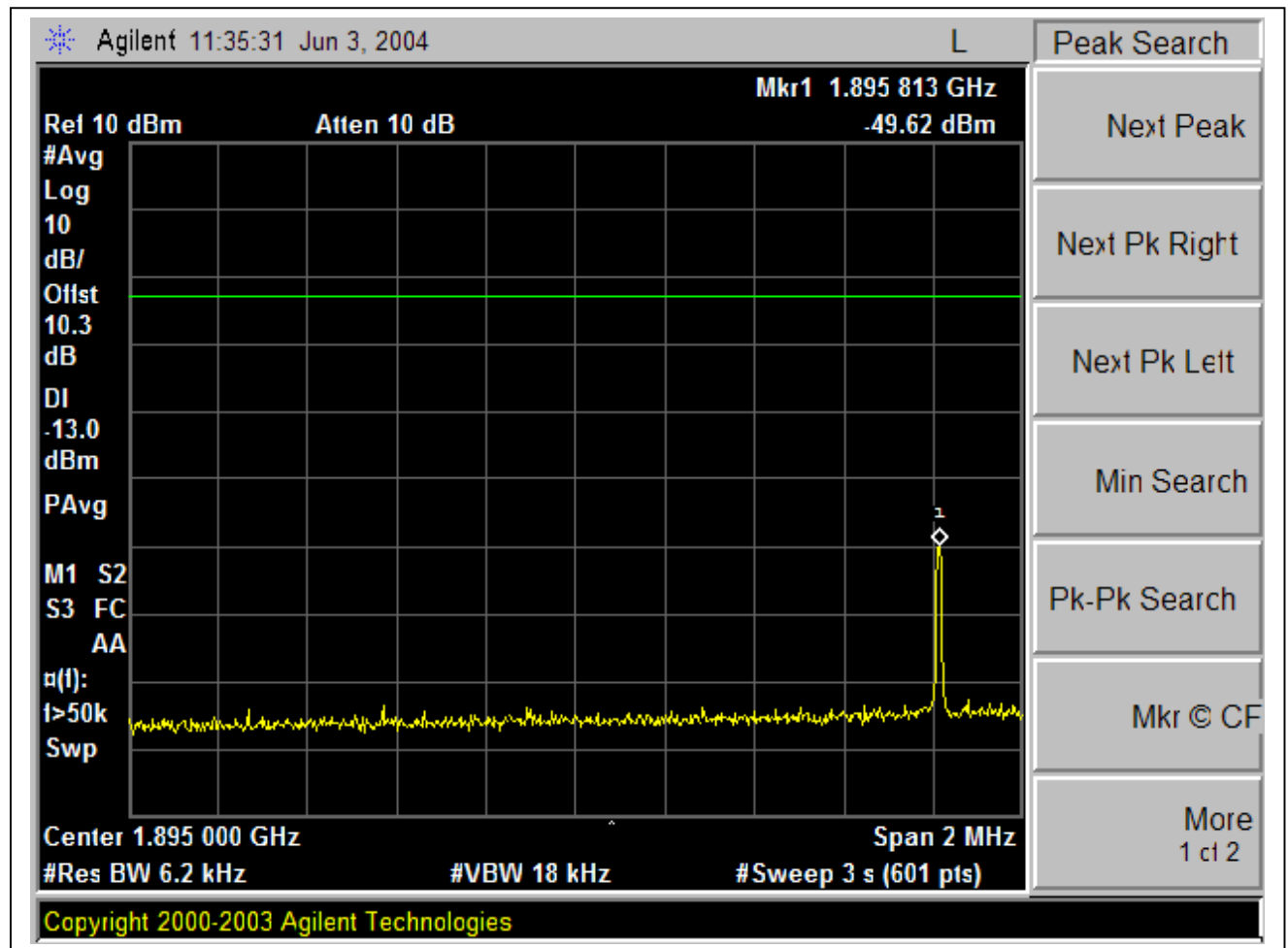
RESULT:BPSK Modulation: Band Edges, Out-Of-Band EmissionsLow Channel Band Edge

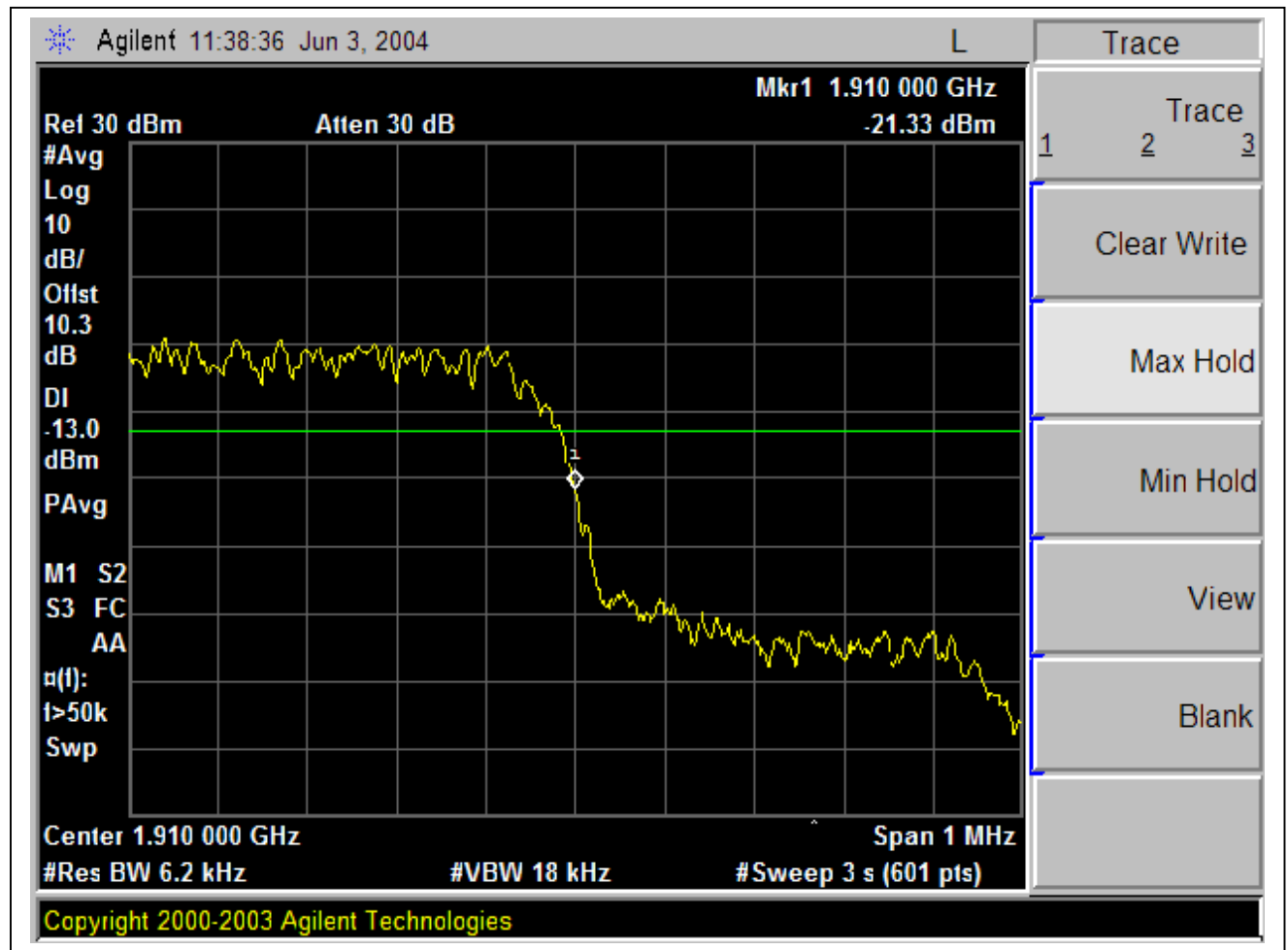
High Channel Band Edge

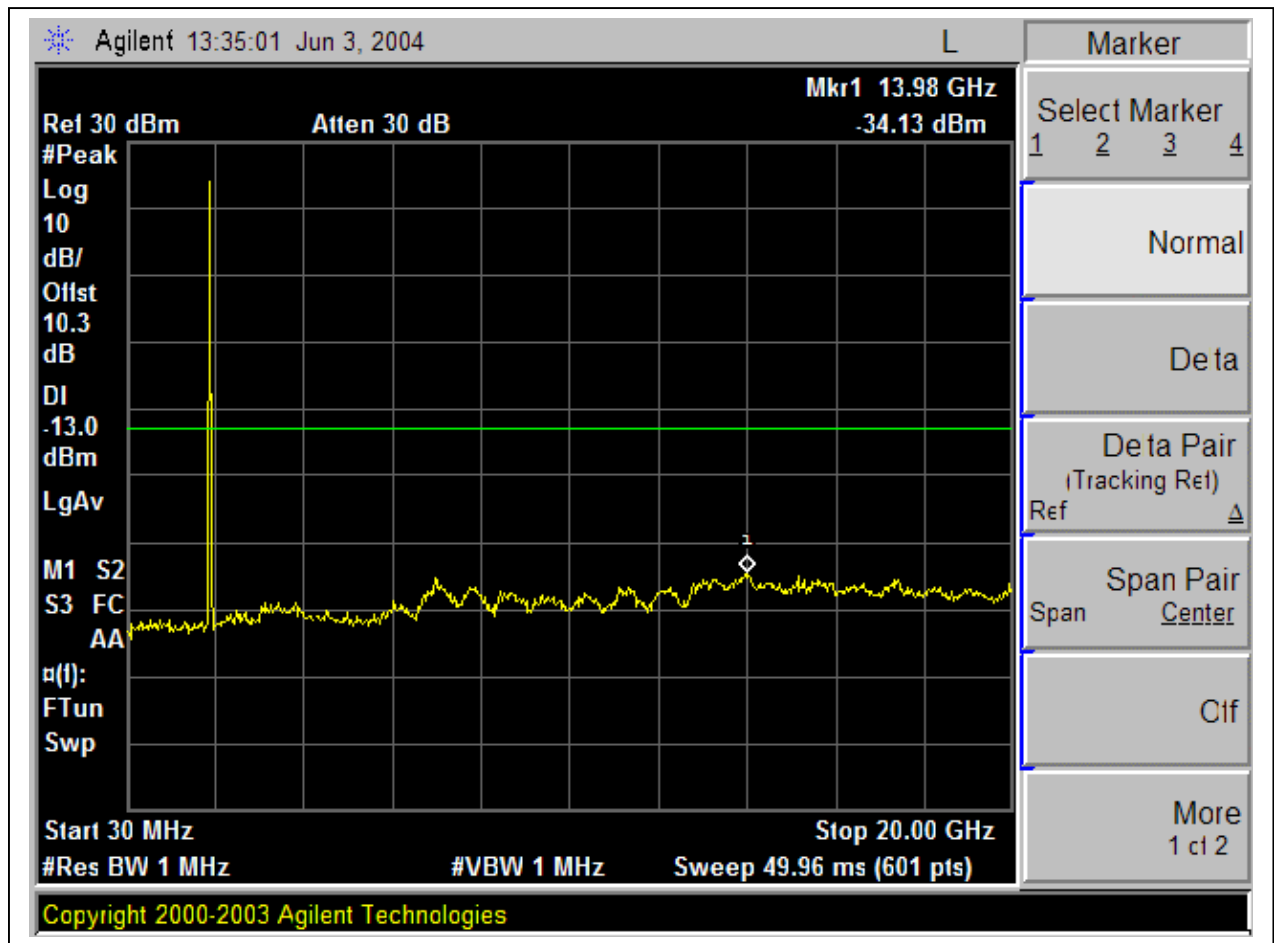
Low Channel, Out-Of-Band Emissions

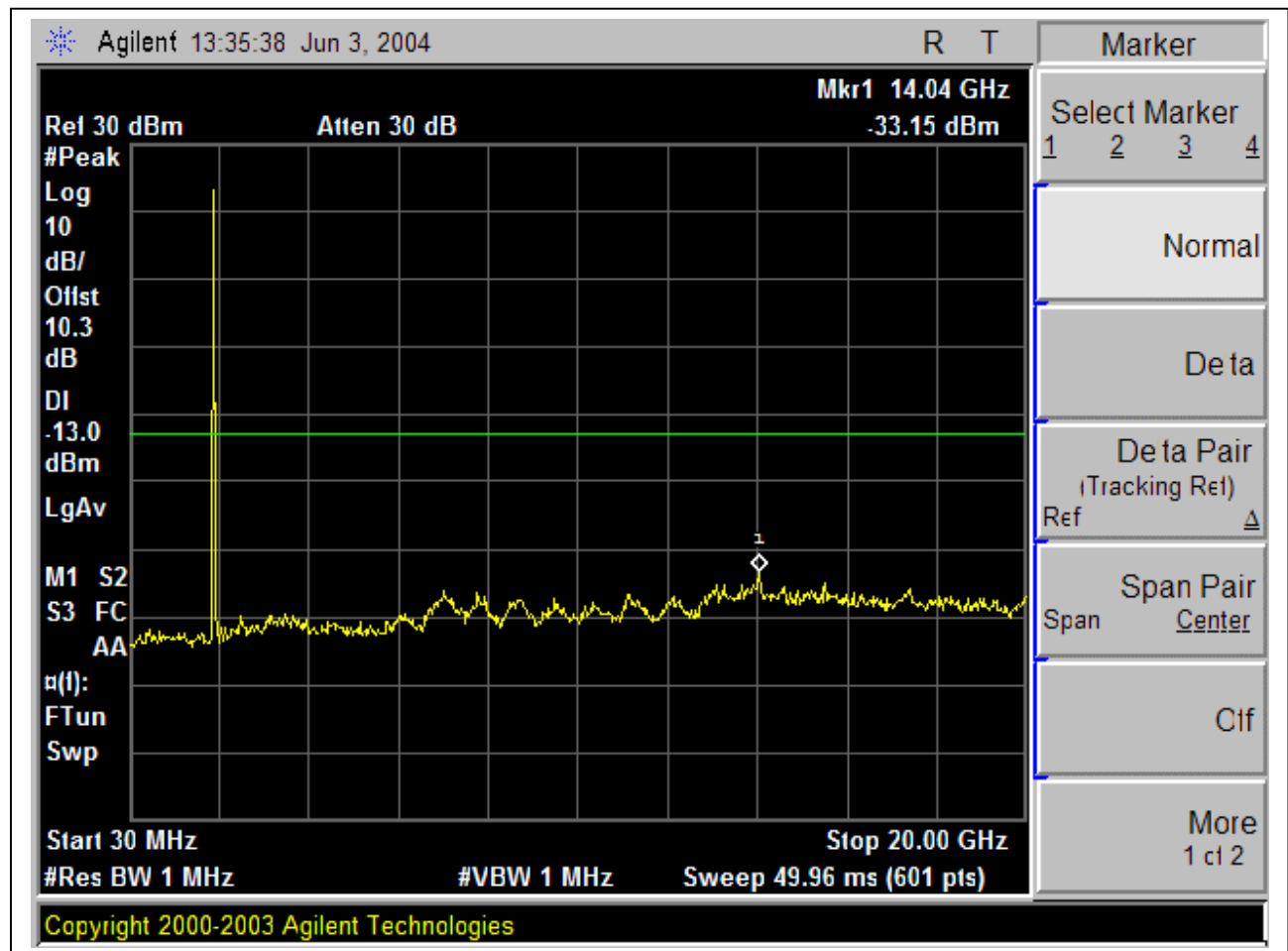
Mid Channel, Out-Of-Band Emissions

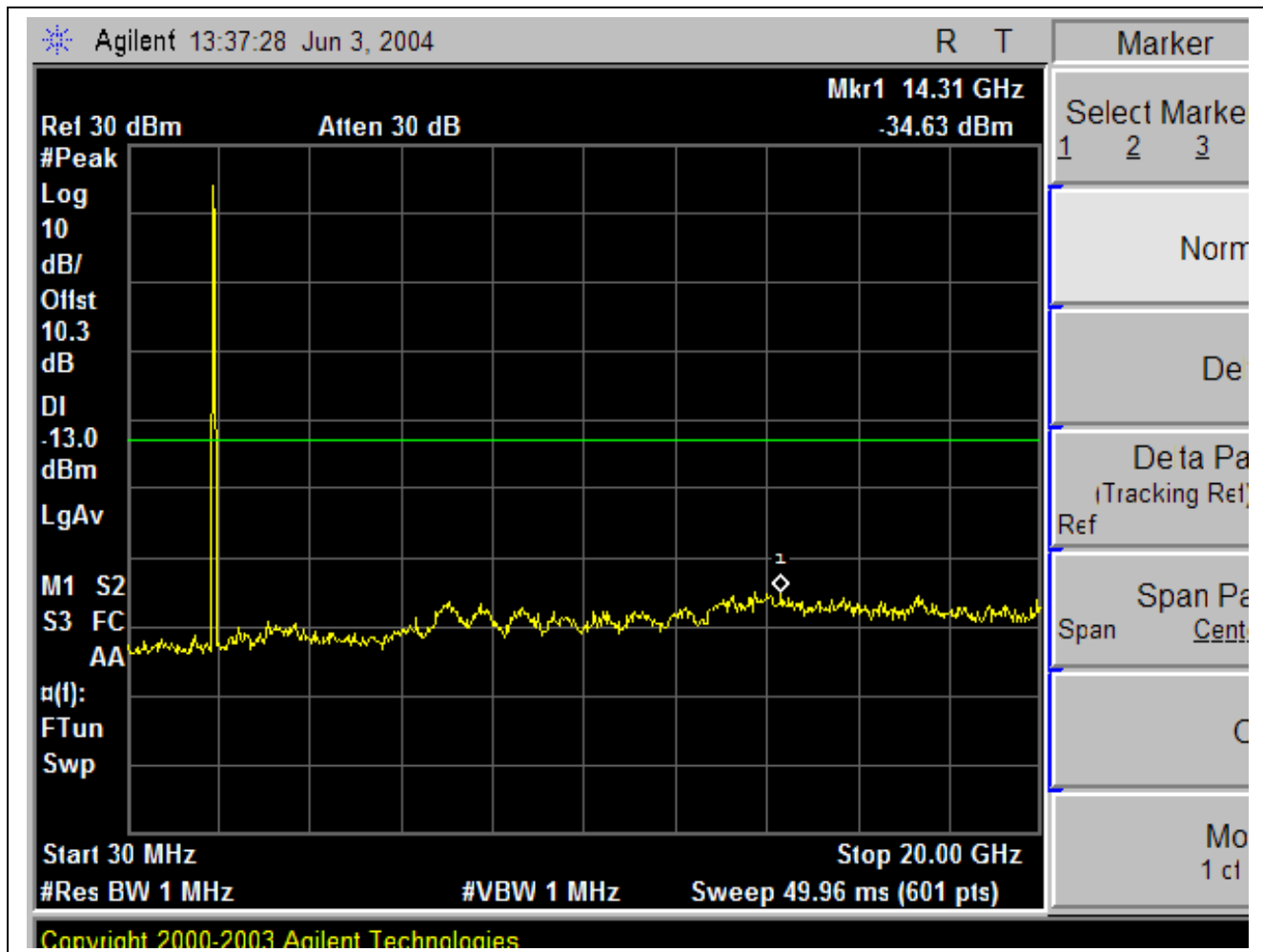
High Channel, Out-Of-Band Emissions

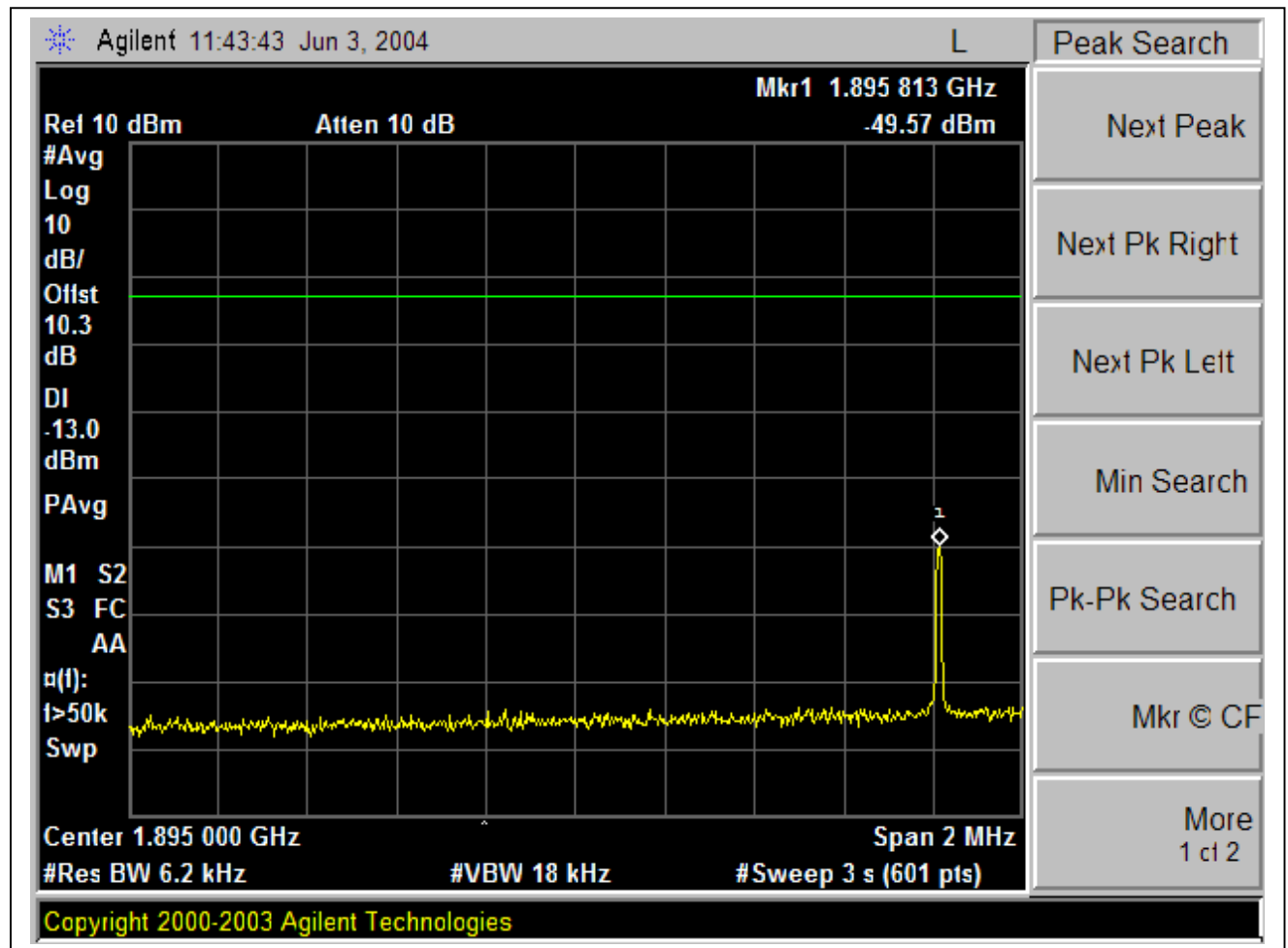
QPSK Modulation: Band Edges, Out-Of-Band EmissionsLow Channel Band Edge

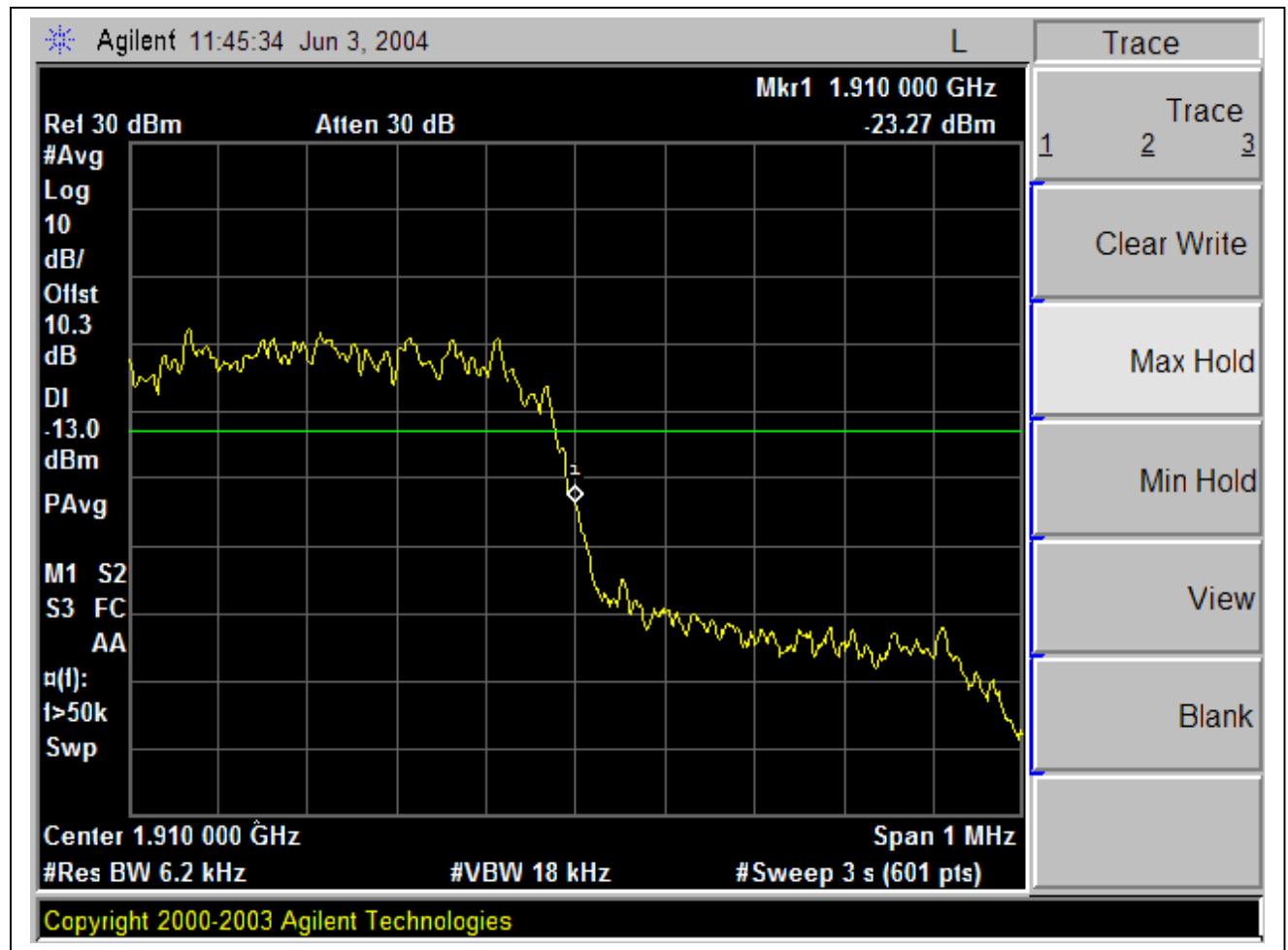
High Channel Band Edge

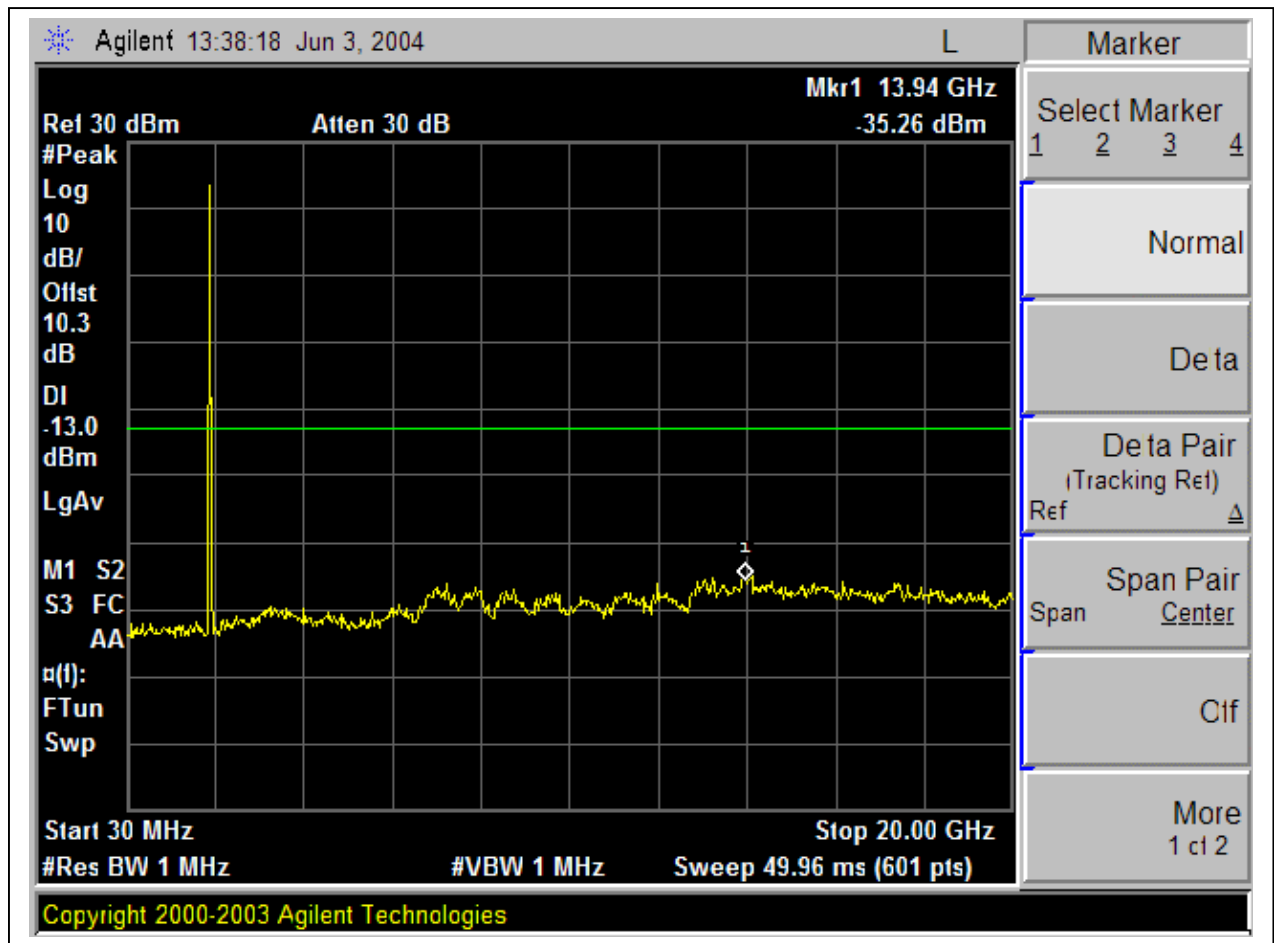
Low Channel, Out-Of-Band Emissions

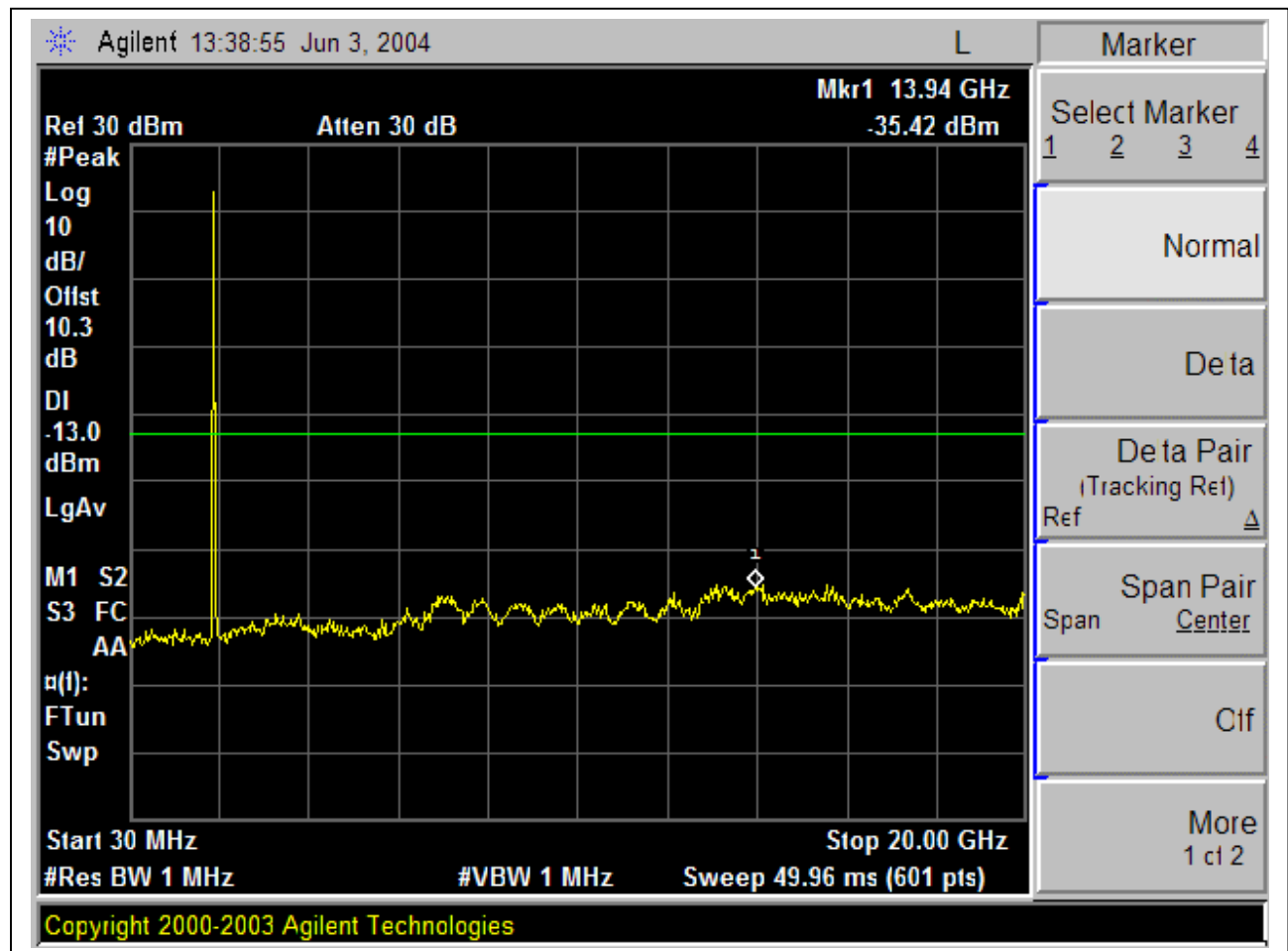
Mid Channel, Out-Of-Band Emissions

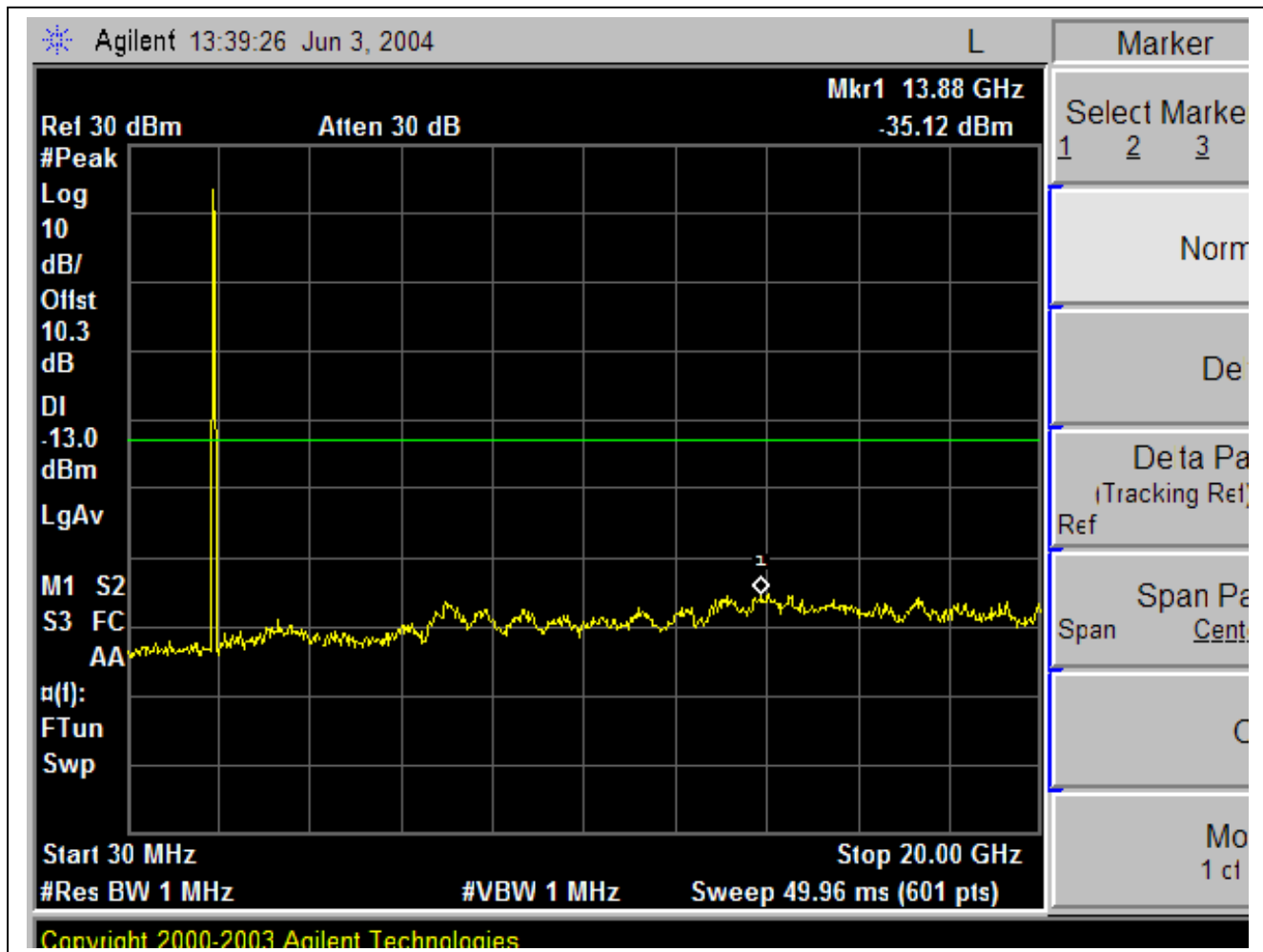
High Channel, Out-Of-Band Emissions

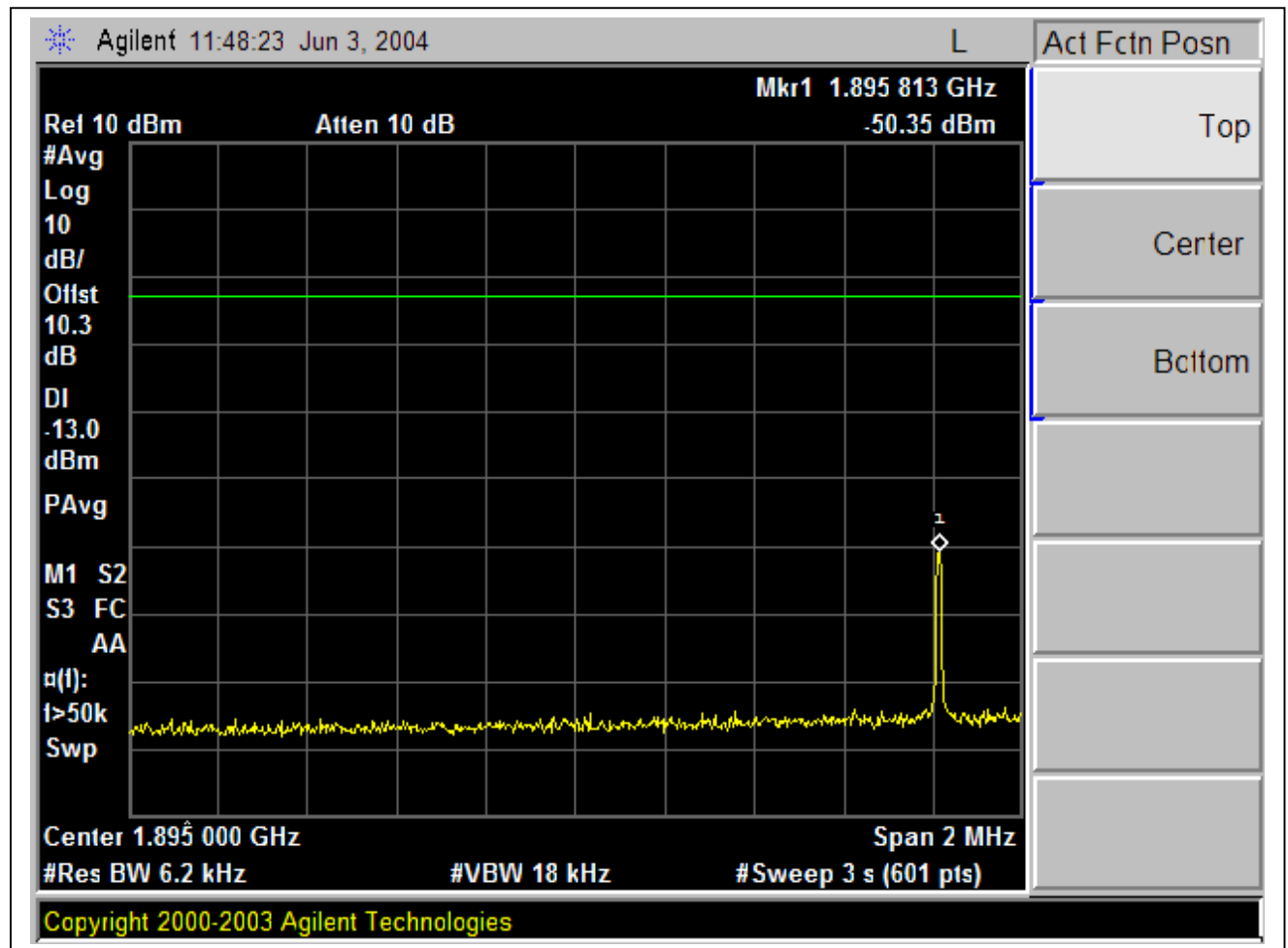
8PSK Modulation: Band Edges, Out-Of-Band EmissionsLow Channel Band Edge

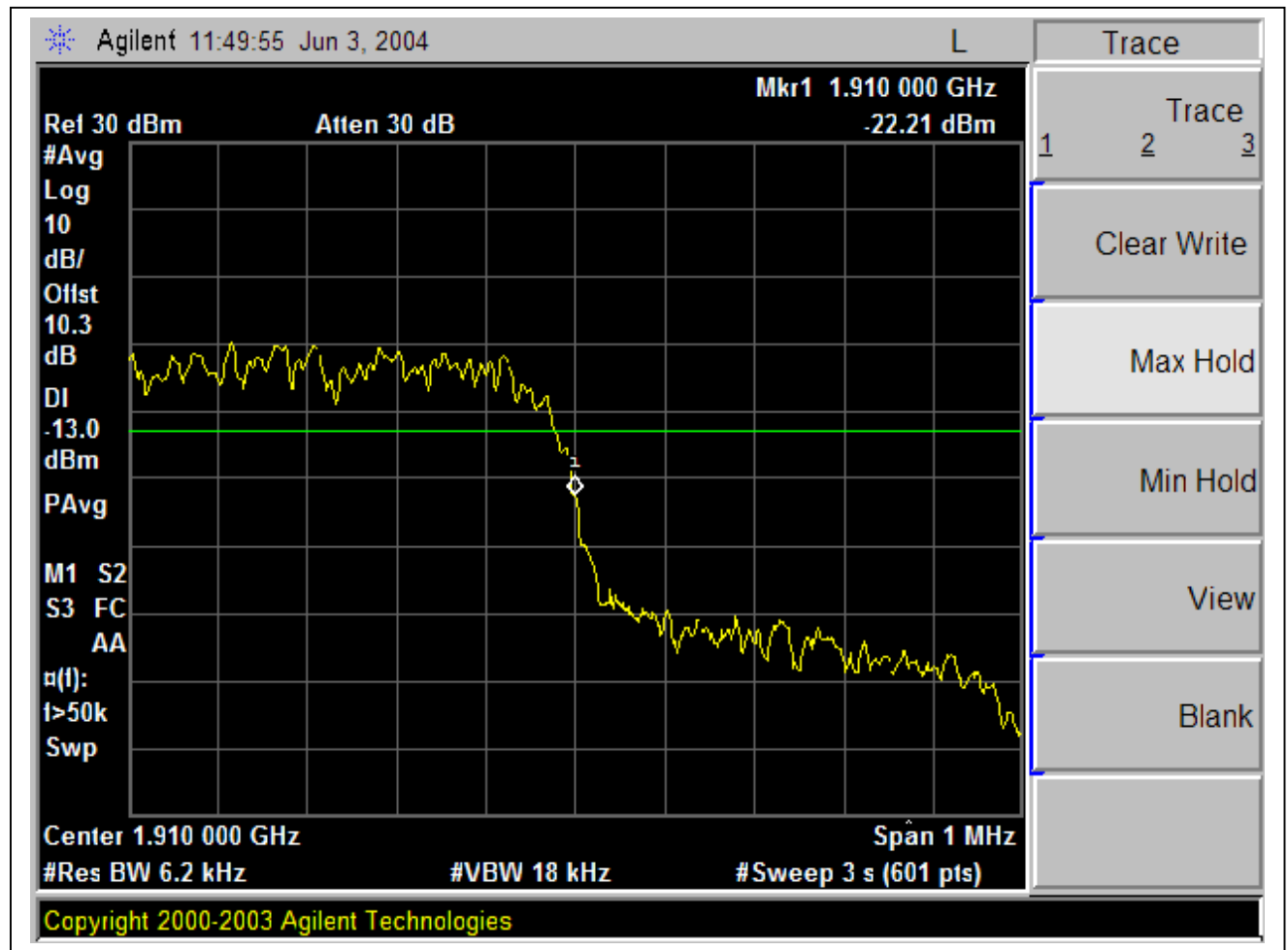
High Channel Band Edge

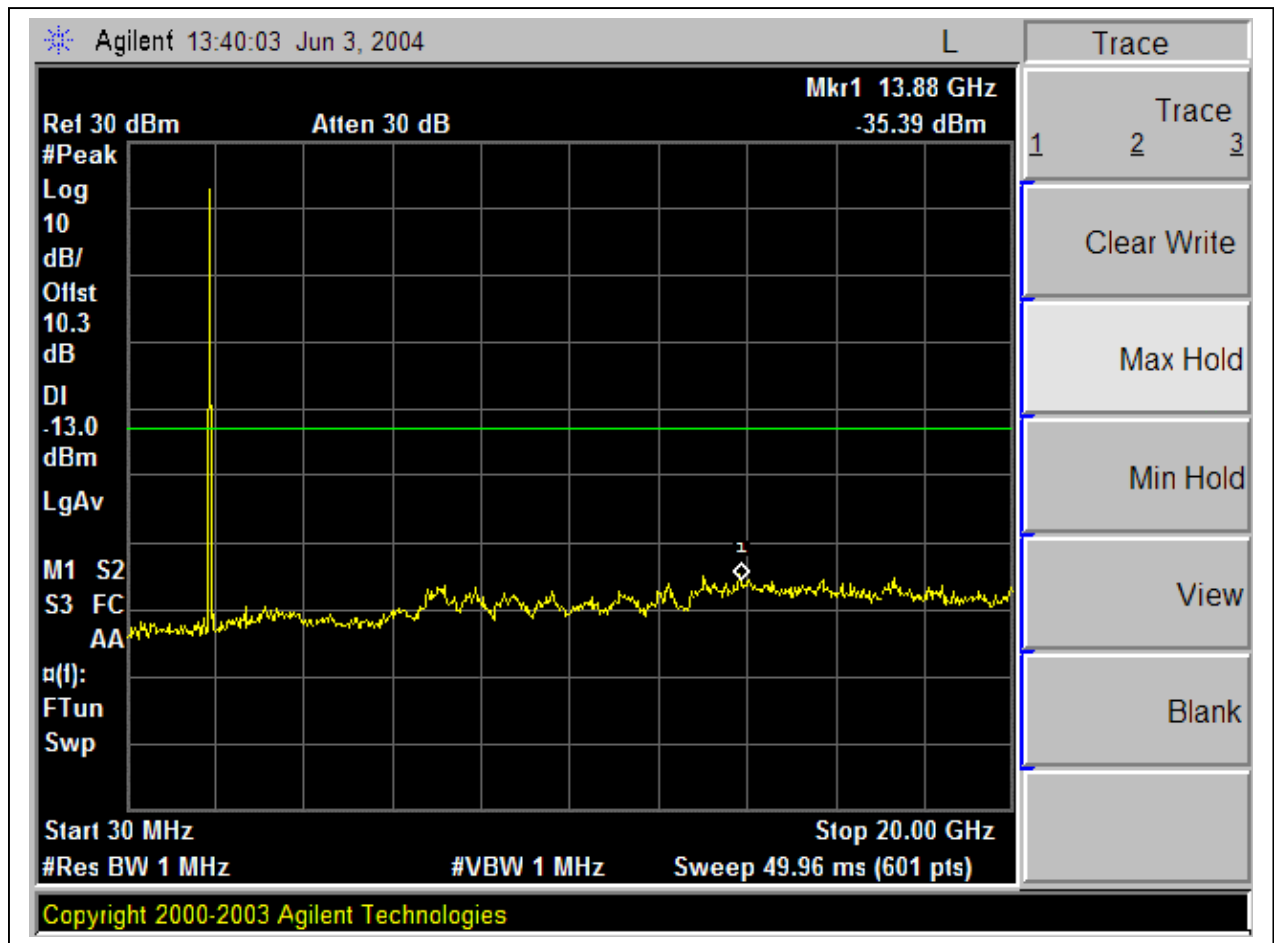
Low Channel, Out-Of-Band Emissions

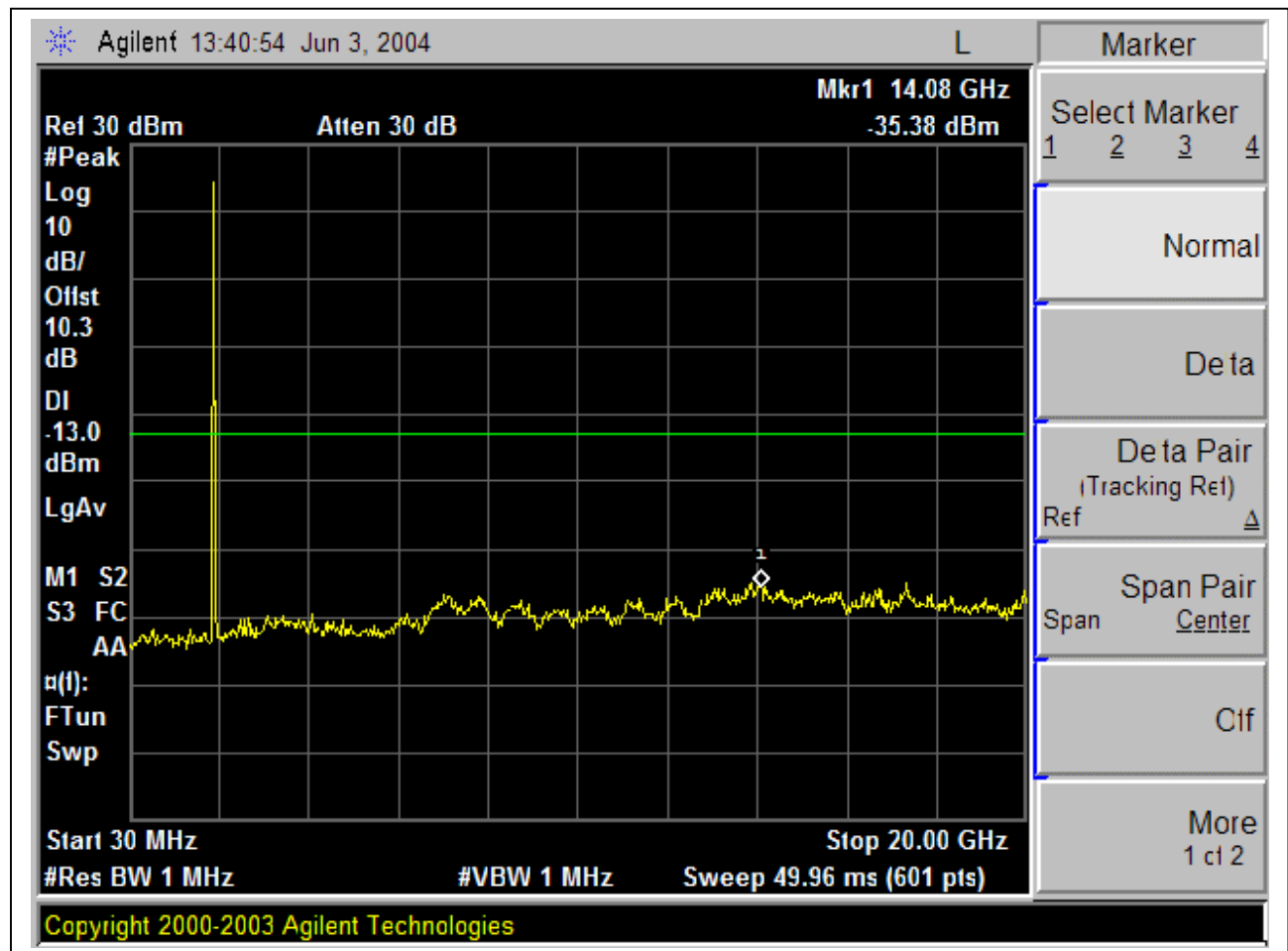
Mid Channel, Out-Of-Band Emissions

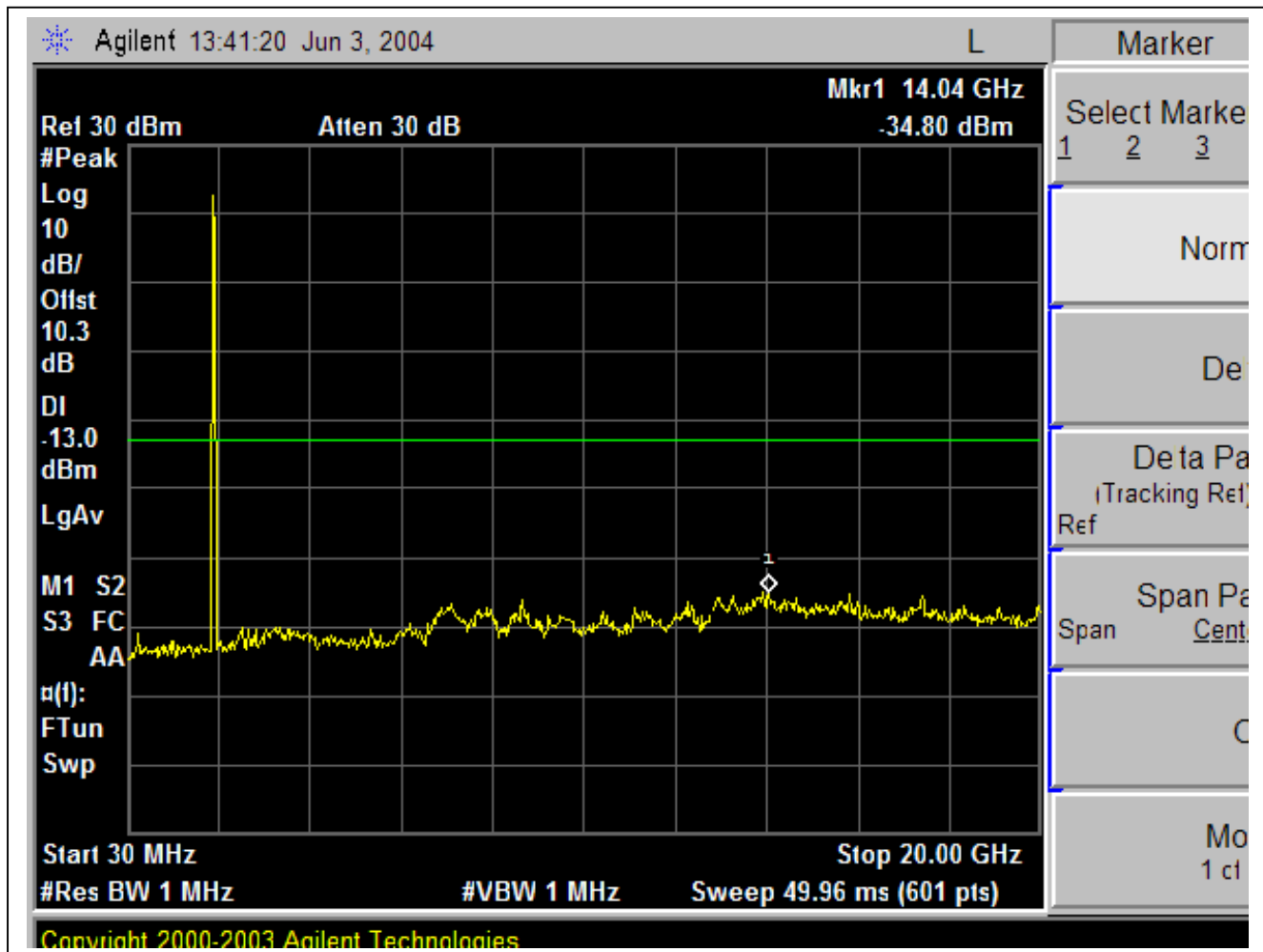
High Channel, Out-Of-Band Emissions

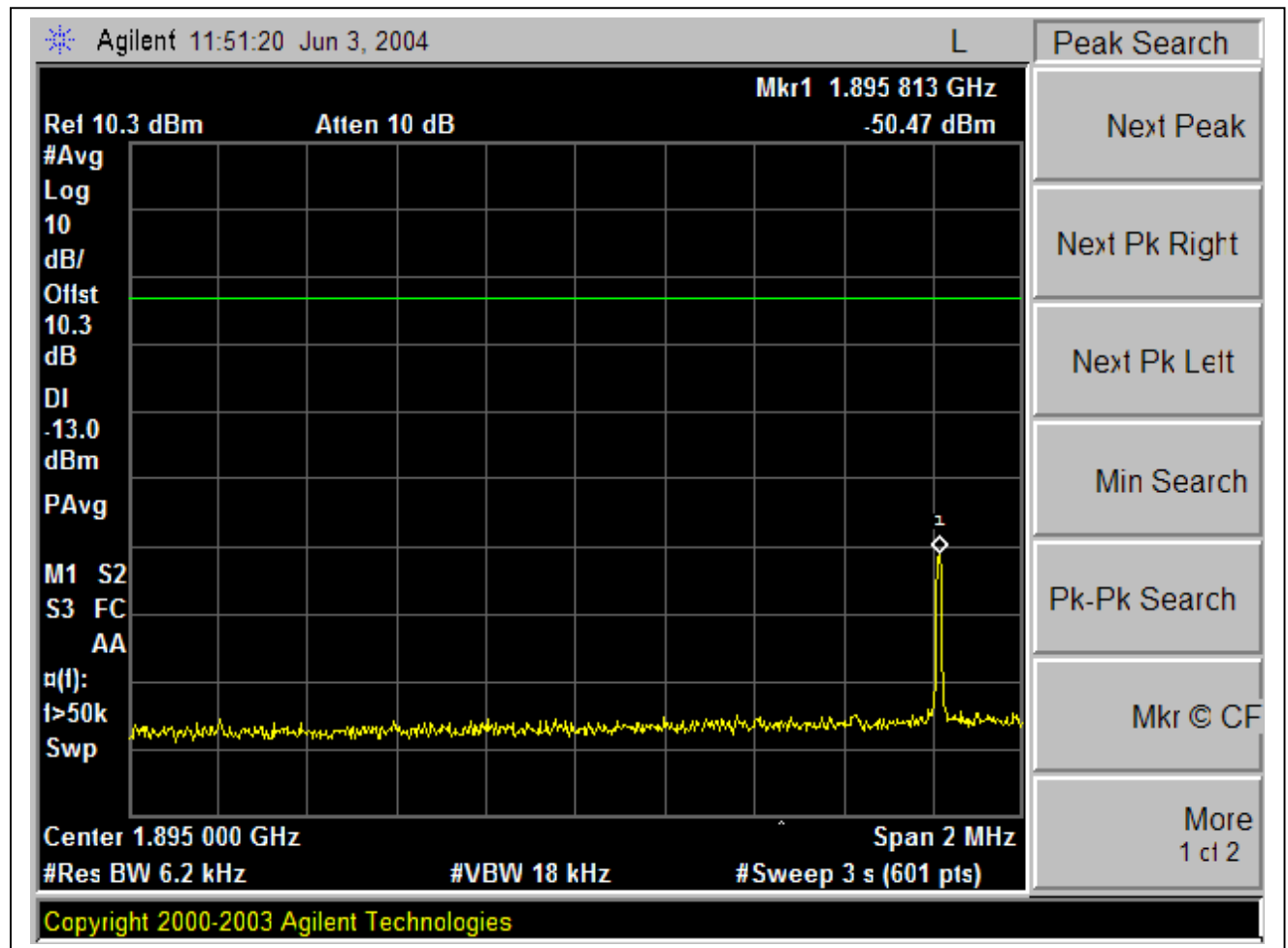
12QAM Modulation: Band Edges, Out-Of-Band EmissionsLow Channel Band Edge

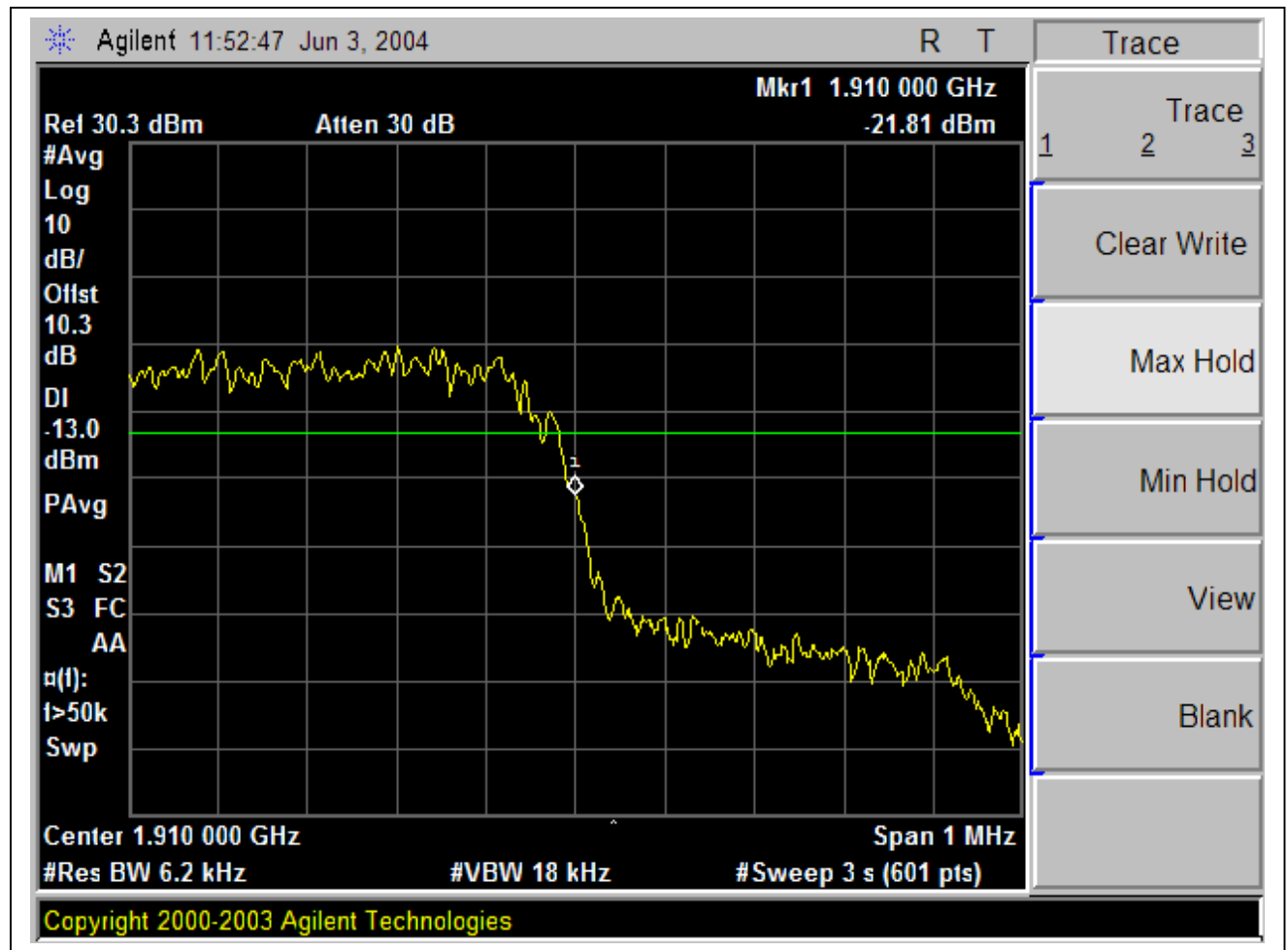
High Channel Band Edge

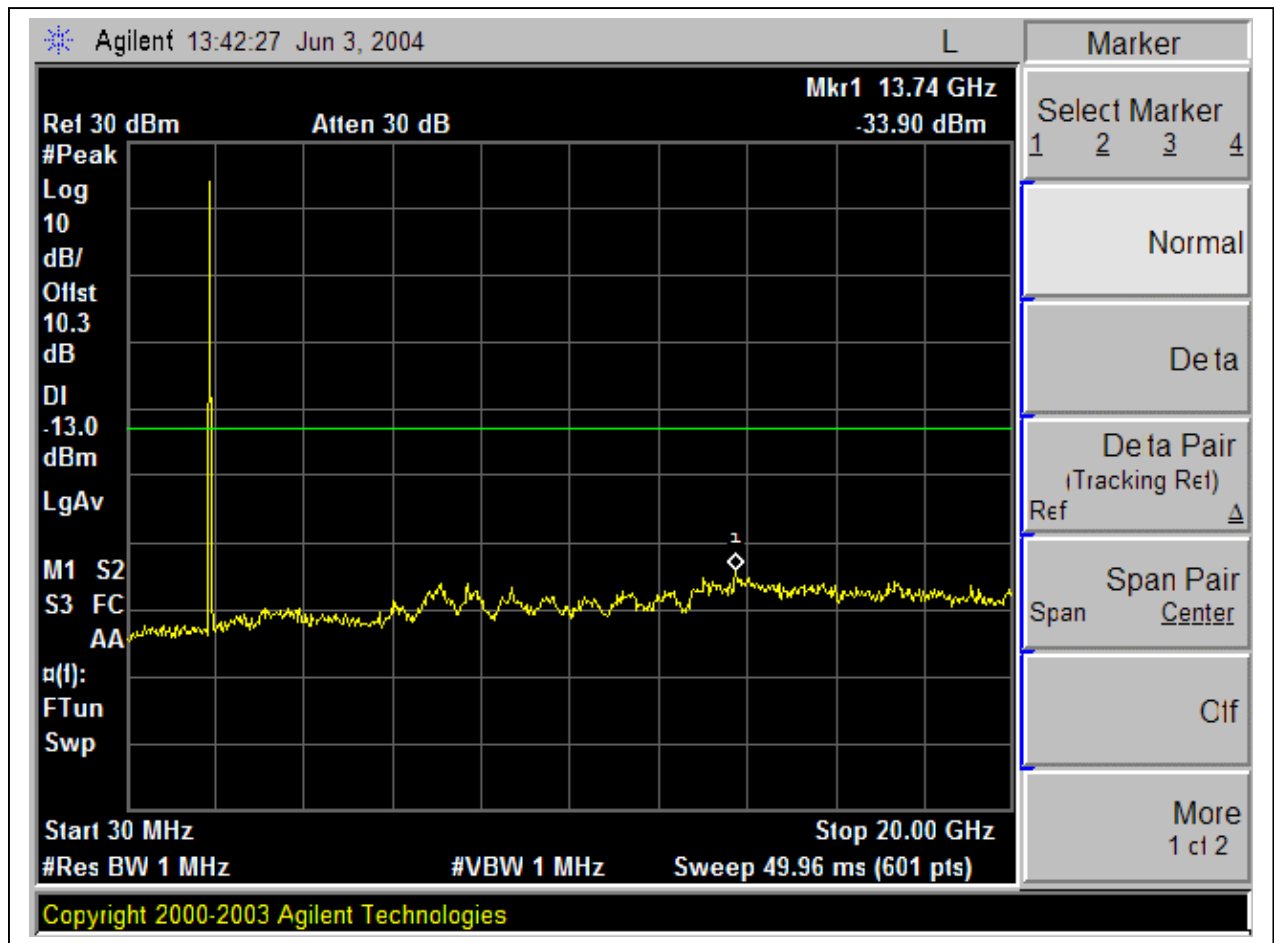
Low Channel, Out-Of-Band Emissions

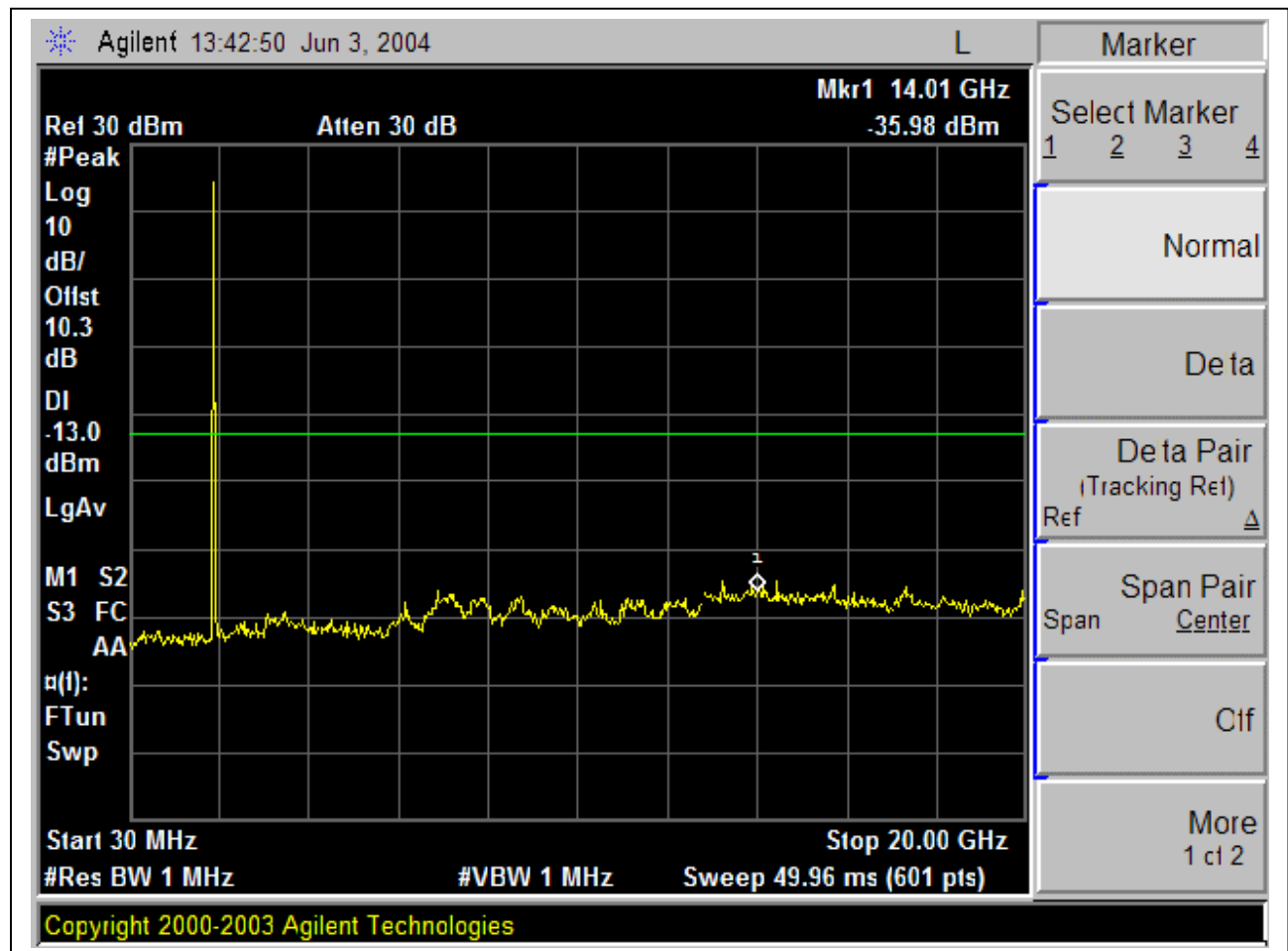
Mid Channel, Out-Of-Band Emissions

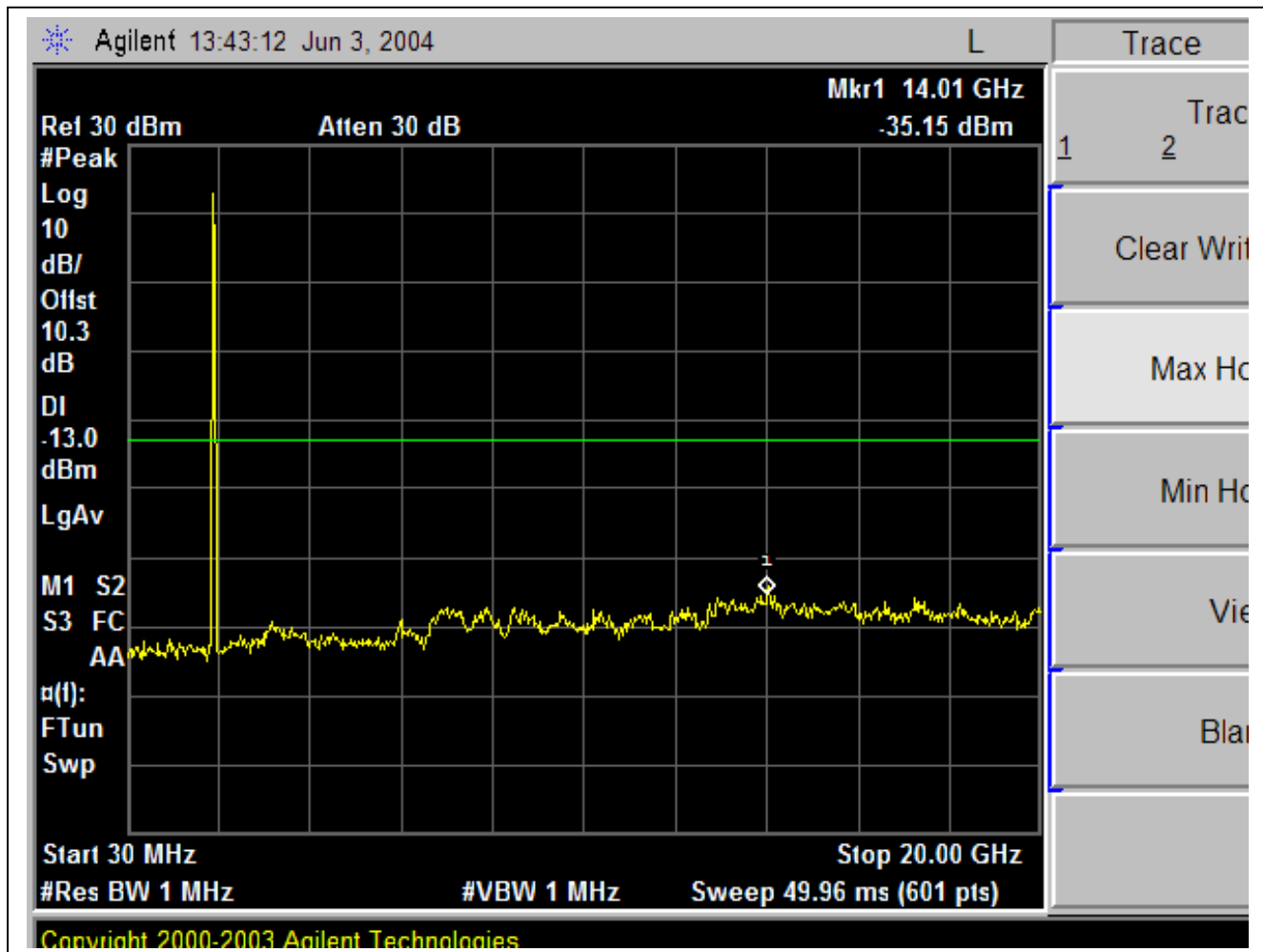
High Channel, Out-Of-Band Emissions

16QAM Modulation: Band Edges, Out-Of-Band EmissionsLow Channel Band Edge

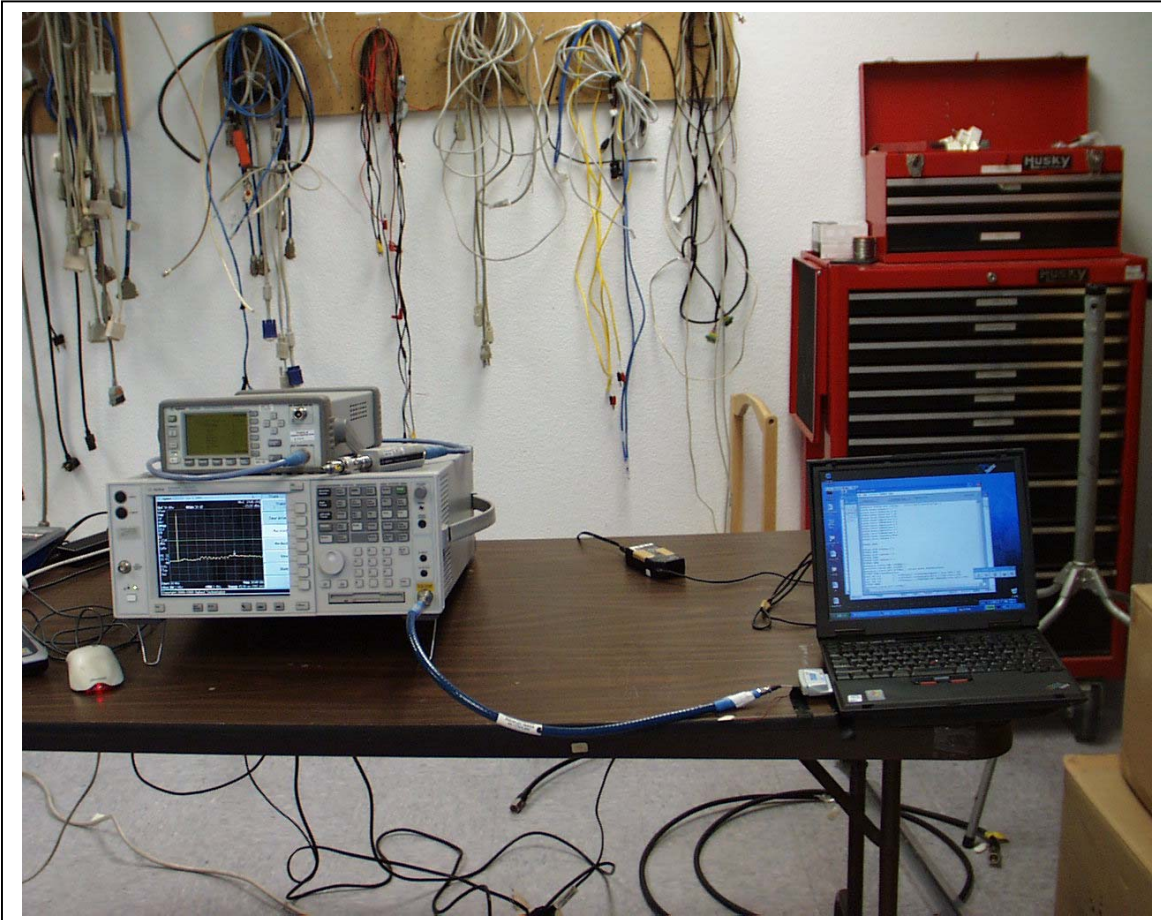
High Channel Band Edge

Low Channel, Out-Of-Band Emissions

Mid Channel, Out-Of-Band Emissions

High Channel, Out-Of-Band Emissions

### Test Setup Photos



**7.5. SECTION 2.1053: FIELD STRENGTH OF SPURIOUS RADIATION****INSTRUMENTS LIST**

| <b>TEST EQUIPMENT LIST</b>      |                     |                   |                   |                  |
|---------------------------------|---------------------|-------------------|-------------------|------------------|
| <b>Name of Equipment</b>        | <b>Manufacturer</b> | <b>Model No.</b>  | <b>Serial No.</b> | <b>Due Date</b>  |
| <b>Spectrum Analyzer</b>        | <b>Agilent</b>      | <b>E4446A</b>     | <b>MY43360112</b> | <b>1/13/2005</b> |
| <b>Amplifier 1-26GHz</b>        | <b>MITEQ</b>        | <b>NSP2600-SP</b> | <b>924342</b>     | <b>4/26/2005</b> |
| <b>Antenna, Horn 1 ~ 18 GHz</b> | <b>EMCO</b>         | <b>3115</b>       | <b>6717</b>       | <b>2/4/2005</b>  |
| <b>Antenna, Tuned Dipole</b>    | <b>CDI</b>          | <b>Roberts</b>    | <b>116</b>        | <b>5/15/2005</b> |
| <b>Peak Power Meter</b>         | <b>Agilent</b>      | <b>E4416A</b>     | <b>GB41291160</b> | <b>11/7/2004</b> |
| <b>Signal Generator</b>         | <b>R &amp; S</b>    | <b>SMP04</b>      | <b>DE34210</b>    | <b>5/25/2005</b> |
| <b>2.7GHz HPF</b>               | <b>MicroTronic</b>  | <b>HPM13194</b>   | <b>1</b>          | <b>CNR</b>       |
| <b>Antenna, Horn 1 ~ 18 GHz</b> | <b>EMCO</b>         | <b>3115</b>       | <b>2238</b>       | <b>2/4/2005</b>  |

## Detector Function Setting of Test Receiver

| Frequency Range<br>(MHz) | Detector Function                                                            | Resolution<br>Bandwidth                                                     | Video Bandwidth                                                             |
|--------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| Above 1000               | <input checked="" type="checkbox"/> Peak<br><input type="checkbox"/> Average | <input checked="" type="checkbox"/> 1 MHz<br><input type="checkbox"/> 1 MHz | <input checked="" type="checkbox"/> 1 MHz<br><input type="checkbox"/> 10 Hz |

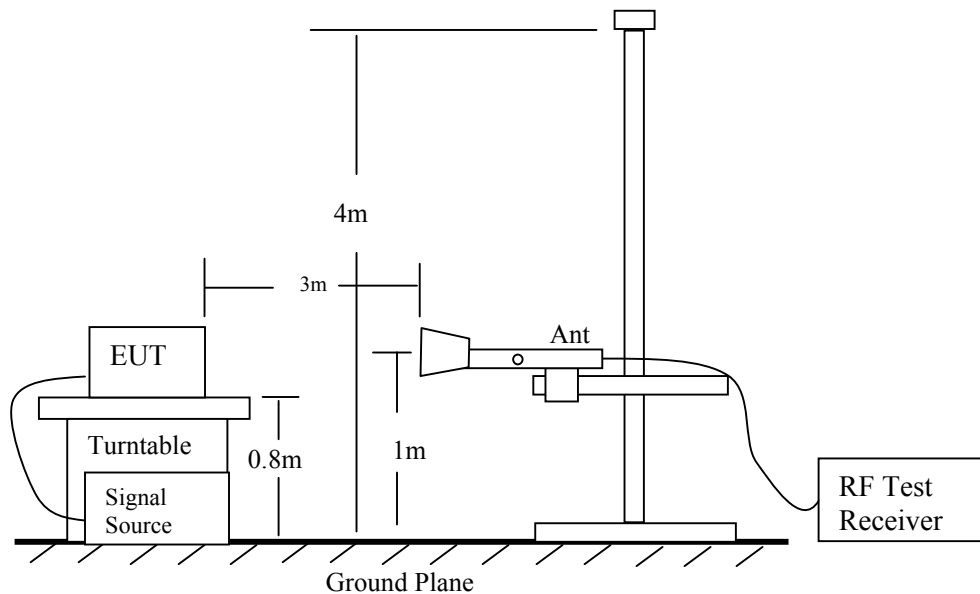
**TEST SETUP**

Fig 1: Radiated Emission Measurement

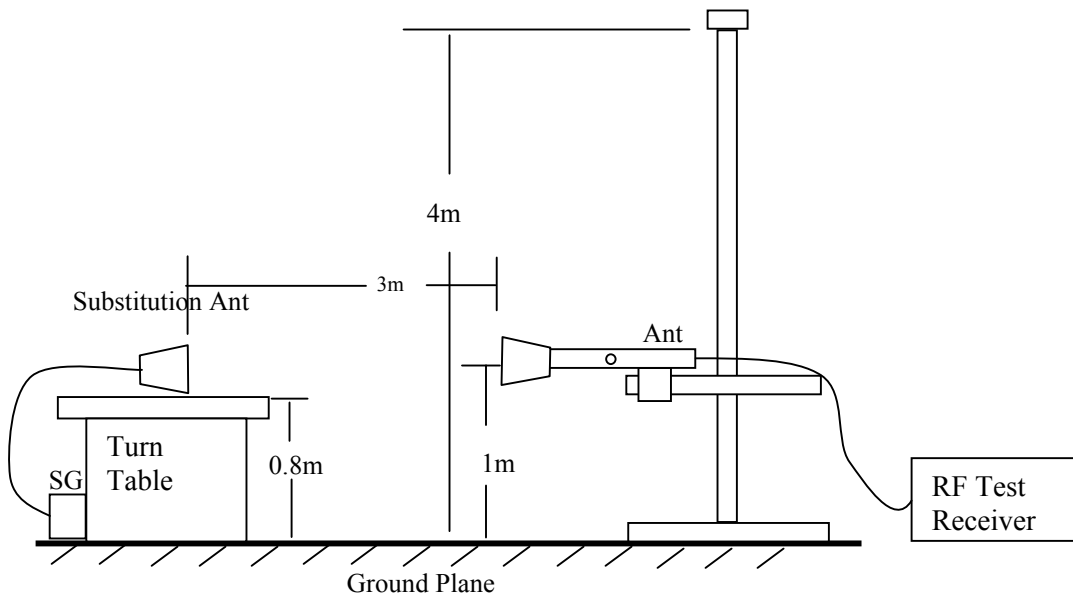


Fig 2: Radiated Emission – Substitution Method set-up

**TEST PROCEDURE**

- 1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
- 2). The test antenna shall be oriented initially for vertical polarization located 1m from the EUT to correspond to the frequency of the transmitter.
- 3). The output of the test antenna shall be connected to the measuring receiver and either a peak or average detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 6). The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 8). The maximum signal level detected by the measuring receiver shall be noted.
- 9). The transmitter shall be replaced by a substitution antenna.
- 10). The substitution antenna shall be oriented for vertical polarization.
- 11). The substitution antenna shall be connected to a calibrated signal generator.
- 12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- 14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- 15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- 16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.
- 17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

**RESULT**

No non-compliance noted, as shown below

BPSK: Low, Mid, & High Channels:

| f<br>GHz                                                                               | SA reading<br>(dBuV) | SG reading<br>(dBm) | CL<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes          |
|----------------------------------------------------------------------------------------|----------------------|---------------------|------------|---------------|---------------|--------------|----------------|----------------|----------------|
| <b>low ch, 1900.3125MHz</b>                                                            |                      |                     |            |               |               |              |                |                |                |
| 3.800                                                                                  | 49.5                 | -47.5               | 2.5        | 9.5           | 7.4           | -40.4        | -13.0          | -27.4          | V              |
| 5.700                                                                                  | 44.0                 | -48.5               | 3.3        | 11.2          | 9.0           | -40.6        | -13.0          | -27.6          | H, noise floor |
| 3.80000                                                                                | 45.0                 | -51.9               | 2.5        | 9.5           | 7.4           | -44.8        | -13.0          | -31.8          | V              |
| 5.70000                                                                                | 43.0                 | -48.5               | 3.3        | 11.2          | 9.0           | -40.6        | -13.0          | -27.6          | H, noise floor |
| <b>Mid Ch, 1904.6875MHz</b>                                                            |                      |                     |            |               |               |              |                |                |                |
| 3.80900                                                                                | 47.5                 | -49.4               | 2.5        | 9.5           | 7.4           | -42.4        | -13.0          | -29.4          | V              |
| 5.71000                                                                                | 43.3                 | -49.2               | 3.3        | 11.2          | 9.0           | -41.3        | -13.0          | -28.3          | H, noise floor |
| 3.80900                                                                                | 44.5                 | -52.3               | 2.5        | 9.5           | 7.4           | -45.3        | -13.0          | -32.3          | V              |
| 5.71400                                                                                | 42.8                 | -48.7               | 3.3        | 11.2          | 9.0           | -40.8        | -13.0          | -27.8          | H, noise floor |
| <b>High ch, 1909.6875MHz</b>                                                           |                      |                     |            |               |               |              |                |                |                |
| 3.81900                                                                                | 48.4                 | -48.5               | 2.5        | 9.5           | 7.4           | -41.5        | -13.0          | -28.5          |                |
| 5.72900                                                                                | 43.0                 | -49.5               | 3.3        | 11.2          | 9.1           | -41.6        | -13.0          | -28.6          | noise floor    |
| 3.81900                                                                                | 44.4                 | -52.4               | 2.5        | 9.5           | 7.4           | -45.4        | -13.0          | -32.4          |                |
| 5.72900                                                                                | 42.0                 | -49.5               | 3.3        | 11.2          | 9.1           | -41.6        | -13.0          | -28.6          | noise floor    |
| <b>Note: No other emissions were detected above the system noise floor up to 20GHz</b> |                      |                     |            |               |               |              |                |                |                |

QPSK: Low, Mid, & High Channels:

| f<br>GHz                                                                               | SA reading<br>(dBuV) | SG reading<br>(dBm) | CL<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes          |
|----------------------------------------------------------------------------------------|----------------------|---------------------|------------|---------------|---------------|--------------|----------------|----------------|----------------|
| <b>Low ch, 1900.3125MHz</b>                                                            |                      |                     |            |               |               |              |                |                |                |
| 3.800                                                                                  | 46.8                 | -50.2               | 2.5        | 9.5           | 7.4           | -43.1        | -13.0          | -30.1          | V              |
| 5.700                                                                                  | 43.7                 | -48.8               | 3.3        | 11.2          | 9.0           | -40.9        | -13.0          | -27.9          | H,noise floor  |
| 3.80000                                                                                | 44.9                 | -52.0               | 2.5        | 9.5           | 7.4           | -45.0        | -13.0          | -32.0          | V              |
| 5.70000                                                                                | 42.6                 | -48.9               | 3.3        | 11.2          | 9.0           | -41.0        | -13.0          | -28.0          | H, noise floor |
|                                                                                        |                      |                     |            |               |               |              |                |                |                |
| <b>Mid ch, 1904.6875MHz</b>                                                            |                      |                     |            |               |               |              |                |                |                |
| 3.80900                                                                                | 48.2                 | -48.7               | 2.5        | 9.5           | 7.4           | -41.7        | -13.0          | -28.7          | V              |
| 5.71000                                                                                | 43.5                 | -49.0               | 3.3        | 11.2          | 9.0           | -41.1        | -13.0          | -28.1          | H,noise floor  |
| 3.80900                                                                                | 45.1                 | -51.7               | 2.5        | 9.5           | 7.4           | -44.7        | -13.0          | -31.7          | V              |
| 5.71400                                                                                | 43.0                 | -48.5               | 3.3        | 11.2          | 9.0           | -40.6        | -13.0          | -27.6          | H, noise floor |
|                                                                                        |                      |                     |            |               |               |              |                |                |                |
| <b>High ch, 1909.6875MHz</b>                                                           |                      |                     |            |               |               |              |                |                |                |
| 3.81900                                                                                | 48.7                 | -48.2               | 2.5        | 9.5           | 7.4           | -41.2        | -13.0          | -28.2          | V              |
| 5.72900                                                                                | 43.4                 | -49.1               | 3.3        | 11.2          | 9.1           | -41.2        | -13.0          | -28.2          | H,noise floor  |
| 3.81900                                                                                | 45.2                 | -51.6               | 2.5        | 9.5           | 7.4           | -44.6        | -13.0          | -31.6          | V              |
| 5.72900                                                                                | 42.3                 | -49.2               | 3.3        | 11.2          | 9.1           | -41.3        | -13.0          | -28.3          | H, noise floor |
|                                                                                        |                      |                     |            |               |               |              |                |                |                |
| <b>Note: No other emissions were detected above the system noise floor up to 20GHz</b> |                      |                     |            |               |               |              |                |                |                |
|                                                                                        |                      |                     |            |               |               |              |                |                |                |

8PSK: Low, Mid, & High Channels:

| f<br>GHz                                                                               | SA reading<br>(dBuV) | SG reading<br>(dBm) | CL<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes         |
|----------------------------------------------------------------------------------------|----------------------|---------------------|------------|---------------|---------------|--------------|----------------|----------------|---------------|
| <b>Low ch, 1900.3125MHz</b>                                                            |                      |                     |            |               |               |              |                |                |               |
| 3.800                                                                                  | 47.7                 | -49.3               | 2.5        | 9.5           | 7.4           | -42.2        | -13.0          | -29.2          | V             |
| 5.700                                                                                  | 41.8                 | -50.7               | 3.3        | 11.2          | 9.0           | -42.8        | -13.0          | -29.8          | H,noise floor |
| 3.80000                                                                                | 43.5                 | -53.4               | 2.5        | 9.5           | 7.4           | -46.3        | -13.0          | -33.3          | V             |
| 5.70000                                                                                | 42.2                 | -49.3               | 3.3        | 11.2          | 9.0           | -41.4        | -13.0          | -28.4          | H,noise floor |
| <b>Mid ch, 1904.6875MHz</b>                                                            |                      |                     |            |               |               |              |                |                |               |
| 3.80900                                                                                | 49.2                 | -47.7               | 2.5        | 9.5           | 7.4           | -40.7        | -13.0          | -27.7          | V             |
| 5.71000                                                                                | 43.8                 | -48.7               | 3.3        | 11.2          | 9.0           | -40.8        | -13.0          | -27.8          | H,noise floor |
| 3.80900                                                                                | 44.3                 | -52.5               | 2.5        | 9.5           | 7.4           | -45.5        | -13.0          | -32.5          | V             |
| 5.71400                                                                                | 42.3                 | -49.2               | 3.3        | 11.2          | 9.0           | -41.3        | -13.0          | -28.3          | H,noise floor |
| <b>High ch, 1909.6875MHz</b>                                                           |                      |                     |            |               |               |              |                |                |               |
| 3.81900                                                                                | 48.0                 | -48.9               | 2.5        | 9.5           | 7.4           | -41.9        | -13.0          | -28.9          | V             |
| 5.72900                                                                                | 44.0                 | -48.5               | 3.3        | 11.2          | 9.1           | -40.6        | -13.0          | -27.6          | H,noise floor |
| 3.81900                                                                                | 44.7                 | -52.1               | 2.5        | 9.5           | 7.4           | -45.1        | -13.0          | -32.1          | V             |
| 5.72900                                                                                | 43.7                 | -47.8               | 3.3        | 11.2          | 9.1           | -39.9        | -13.0          | -26.9          | H,noise floor |
| <b>Note: No other emissions were detected above the system noise floor up to 20GHz</b> |                      |                     |            |               |               |              |                |                |               |

12QAM: Low, Mid, & High Channels:

| f<br>GHz                                                                        | SA reading<br>(dBuV) | SG reading<br>(dBm) | CL<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes          |
|---------------------------------------------------------------------------------|----------------------|---------------------|------------|---------------|---------------|--------------|----------------|----------------|----------------|
| <b>Low ch, 1900.3125MHz</b>                                                     |                      |                     |            |               |               |              |                |                |                |
| 3.800                                                                           | 48.4                 | -48.6               | 2.5        | 9.5           | 7.4           | -41.5        | -13.0          | -28.5          | V              |
| 5.700                                                                           | 42.5                 | -50.0               | 3.3        | 11.2          | 9.0           | -42.1        | -13.0          | -29.1          | H, noise floor |
| 3.80000                                                                         | 43.4                 | -53.5               | 2.5        | 9.5           | 7.4           | -46.4        | -13.0          | -33.4          | V              |
| 5.70000                                                                         | 42.1                 | -49.4               | 3.3        | 11.2          | 9.0           | -41.5        | -13.0          | -28.5          | H, noise floor |
|                                                                                 |                      |                     |            |               |               |              |                |                |                |
| <b>Mid ch, 1904.6875MHz</b>                                                     |                      |                     |            |               |               |              |                |                |                |
| 3.80900                                                                         | 48.1                 | -48.8               | 2.5        | 9.5           | 7.4           | -41.8        | -13.0          | -28.8          | V              |
| 5.71000                                                                         | 43.2                 | -49.3               | 3.3        | 11.2          | 9.0           | -41.4        | -13.0          | -28.4          | H, noise floor |
| 3.80900                                                                         | 43.6                 | -53.2               | 2.5        | 9.5           | 7.4           | -46.2        | -13.0          | -33.2          | V              |
| 5.71400                                                                         | 41.8                 | -49.7               | 3.3        | 11.2          | 9.0           | -41.8        | -13.0          | -28.8          | H, noise floor |
|                                                                                 |                      |                     |            |               |               |              |                |                |                |
| <b>High ch, 1909.6875MHz</b>                                                    |                      |                     |            |               |               |              |                |                |                |
| 3.81900                                                                         | 48.9                 | -48.0               | 2.5        | 9.5           | 7.4           | -41.0        | -13.0          | -28.0          | V              |
| 5.72900                                                                         | 42.5                 | -50.0               | 3.3        | 11.2          | 9.1           | -42.1        | -13.0          | -29.1          | H, noise floor |
| 3.81900                                                                         | 43.8                 | -53.0               | 2.5        | 9.5           | 7.4           | -46.0        | -13.0          | -33.0          | V              |
| 5.72900                                                                         | 42.0                 | -49.5               | 3.3        | 11.2          | 9.1           | -41.6        | -13.0          | -28.6          | H, noise floor |
|                                                                                 |                      |                     |            |               |               |              |                |                |                |
|                                                                                 |                      |                     |            |               |               |              |                |                |                |
|                                                                                 |                      |                     |            |               |               |              |                |                |                |
| Note: No other emissions were detected above the system noise floor up to 20GHz |                      |                     |            |               |               |              |                |                |                |
|                                                                                 |                      |                     |            |               |               |              |                |                |                |

16QAM: Low, Mid, & High Channels:

| f<br>GHz                                                                               | SA reading<br>(dBuV) | SG reading<br>(dBm) | CL<br>(dB) | Gain<br>(dBi) | Gain<br>(dBd) | ERP<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Notes          |
|----------------------------------------------------------------------------------------|----------------------|---------------------|------------|---------------|---------------|--------------|----------------|----------------|----------------|
| <b>Low ch, 1900.3125MHz</b>                                                            |                      |                     |            |               |               |              |                |                |                |
| 3.800                                                                                  | 48.0                 | -49.0               | 2.5        | 9.5           | 7.4           | -41.9        | -13.0          | -28.9          | V              |
| 5.700                                                                                  | 43.0                 | -49.5               | 3.3        | 11.2          | 9.0           | -41.6        | -13.0          | -28.6          | H, noise floor |
| 3.80000                                                                                | 43.6                 | -53.3               | 2.5        | 9.5           | 7.4           | -46.2        | -13.0          | -33.2          | V              |
| 5.70000                                                                                | 41.8                 | -49.7               | 3.3        | 11.2          | 9.0           | -41.8        | -13.0          | -28.8          | H, noise floor |
|                                                                                        |                      |                     |            |               |               |              |                |                |                |
| <b>Mid ch, 1904.6875MHz</b>                                                            |                      |                     |            |               |               |              |                |                |                |
| 3.80900                                                                                | 48.1                 | -48.9               | 2.5        | 9.5           | 7.4           | -41.8        | -13.0          | -28.8          | V              |
| 5.71000                                                                                | 43.1                 | -49.4               | 3.3        | 11.2          | 9.0           | -41.5        | -13.0          | -28.5          | H, noise floor |
| 3.80900                                                                                | 44.0                 | -52.8               | 2.5        | 9.5           | 7.4           | -45.8        | -13.0          | -32.8          | V              |
| 5.71400                                                                                | 42.5                 | -49.0               | 3.3        | 11.2          | 9.0           | -41.1        | -13.0          | -28.1          | H, noise floor |
|                                                                                        |                      |                     |            |               |               |              |                |                |                |
| <b>High ch, 1909.6875MHz</b>                                                           |                      |                     |            |               |               |              |                |                |                |
| 3.81900                                                                                | 47.5                 | -49.4               | 2.5        | 9.5           | 7.4           | -42.4        | -13.0          | -29.4          | V              |
| 5.72900                                                                                | 43.2                 | -49.3               | 3.3        | 11.2          | 9.1           | -41.4        | -13.0          | -28.4          | H, noise floor |
| 3.81900                                                                                | 43.4                 | -53.4               | 2.5        | 9.5           | 7.4           | -46.4        | -13.0          | -33.4          | V              |
| 5.72900                                                                                | 42.3                 | -49.2               | 3.3        | 11.2          | 9.1           | -41.3        | -13.0          | -28.3          | H, noise floor |
|                                                                                        |                      |                     |            |               |               |              |                |                |                |
|                                                                                        |                      |                     |            |               |               |              |                |                |                |
|                                                                                        |                      |                     |            |               |               |              |                |                |                |
| <b>Note: No other emissions were detected above the system noise floor up to 20GHz</b> |                      |                     |            |               |               |              |                |                |                |
|                                                                                        |                      |                     |            |               |               |              |                |                |                |

## 7.6. SECTION 2.1055: FREQUENCY STABILITY

### INSTRUMENTS LIST

| TEST EQUIPMENT LIST            |              |              |            |            |
|--------------------------------|--------------|--------------|------------|------------|
| Name of Equipment              | Manufacturer | Model No.    | Serial No. | Due Date   |
| EMI Test Receiver              | R & S        | ESIB40       | 100192     | 11/21/2004 |
| Temperature / Humidity Chamber | Thermotron   | SE 600-10-10 | 29800      | 5/30/2005  |
| Splitter                       | Agilent      | N/A          | 2339A06150 | N/A        |
| 10dB Pad                       | Weinschel    | 56-10        | M2348      | N/A        |
| Signal Generator               | Agilent      | E4432B       | MY41000108 | 11/14/2005 |

Detector Function Setting of Test Receiver

| Frequency Range (MHz)      | Detector Function | Resolution Bandwidth | Video Bandwidth |
|----------------------------|-------------------|----------------------|-----------------|
| Show entire High emissions | Peak              | 300 Hz               | 300 Hz          |

### TEST SETUP

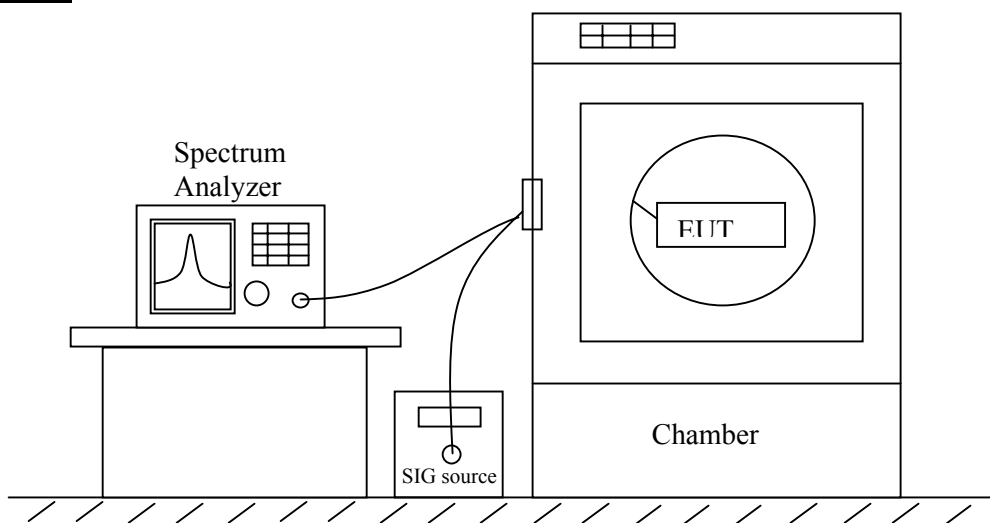


Fig. 3: Frequency Stability Setup

## Test Setup Photos



**TEST PROCEDURE**

- **Frequency stability versus environmental temperature**

- 1). Setup the configuration per figure 6 for frequencies measurement inside the environmental chamber. Set the temperature of the chamber to 25°C. Set SA Resolution Bandwidth low enough to obtain the desired frequency resolution and measure the EUT 25°C operating frequency as reference frequency.
- 2). Turn EUT off and set Chamber temperature to -30°C.
- 3). Allow sufficient time (approximately 20 to 30 minus after chamber reach the assigned temperature) for EUT to stabilize. Turn on EUT and measure the EUT operating frequency. Turn off EUT after the measurement.
- 4). Repeat step 3 with a 10°C increased per stage until the highest temperature of +50°C reached, record all measured frequencies on each temperature step.

- **Frequency stability versus AC input voltage**

- 1). Setup the configuration per figure 6 and set chamber temperature to 25°C. Use a variable AC power supply to power the EUT and set AC output voltage to EUT nominal input AC voltage. Set SA Resolution Bandwidth low enough to obtain the desired frequency resolution and measure the EUT 25°C operating frequency as reference frequency.
- 2). Slowly reduce the EUT input voltage to specified extreme voltage variation ( $\pm 15\%$ ) and record the maximum frequency change.

**RESULT**

No non-compliance noted, as shown below because the EUT uses the same OSC in both receiver and transmitter LO circuit. As a result, the frequency does not shift in Frequency Stability Test.

**Frequency stability versus environmental temperature**

| Reference Frequency: Low or High Channel @ 25°C<br>Limit: to stay within the authorized block |                                 |                                               |             |              |             |
|-----------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|-------------|--------------|-------------|
| Power Supply<br>(Vac)                                                                         | Environment<br>Temperature (°C) | Frequency Deviation Measured with Time Elapse |             |              |             |
|                                                                                               |                                 | (MHz)                                         | Delta (ppm) | Limit (ppm)  | Delta (Hz)  |
| 115.00                                                                                        | 50                              | 1910.00780                                    | -0.157      | ± 2.5        | 300.0000002 |
| 115.00                                                                                        | 40                              | 1910.00780                                    | -0.157      | ± 2.5        | 300.0000002 |
| 115.00                                                                                        | 30                              | 1910.00760                                    | -0.052      | ± 2.5        | 99.99999997 |
| <b>115.00</b>                                                                                 | <b>25</b>                       | <b>1910.00750</b>                             | <b>0</b>    | <b>± 2.5</b> | <b>0</b>    |
| 115.00                                                                                        | 20                              | 1910.00740                                    | 0.052       | ± 2.5        | -100        |
| 115.00                                                                                        | 10                              | 1910.00720                                    | 0.157       | ± 2.5        | -300        |
| 115.00                                                                                        | 0                               | 1910.00720                                    | 0.157       | ± 2.5        | -300        |
| 115.00                                                                                        | -10                             | 1910.00720                                    | 0.157       | ± 2.5        | -300        |
| 115.00                                                                                        | -20                             | 1910.00680                                    | 0.366       | ± 2.5        | -700        |
| 115.00                                                                                        | -30                             | 1910.00680                                    | 0.366       | ± 2.5        | -700        |
| 97.75                                                                                         | 25                              | 1910.00850                                    | -0.524      | ± 2.5        | 1000        |
| 132.25                                                                                        | 25                              | 1910.00780                                    | -0.157      | ± 2.5        | 300.0000002 |

## 7.7. RADIATED EMISSION

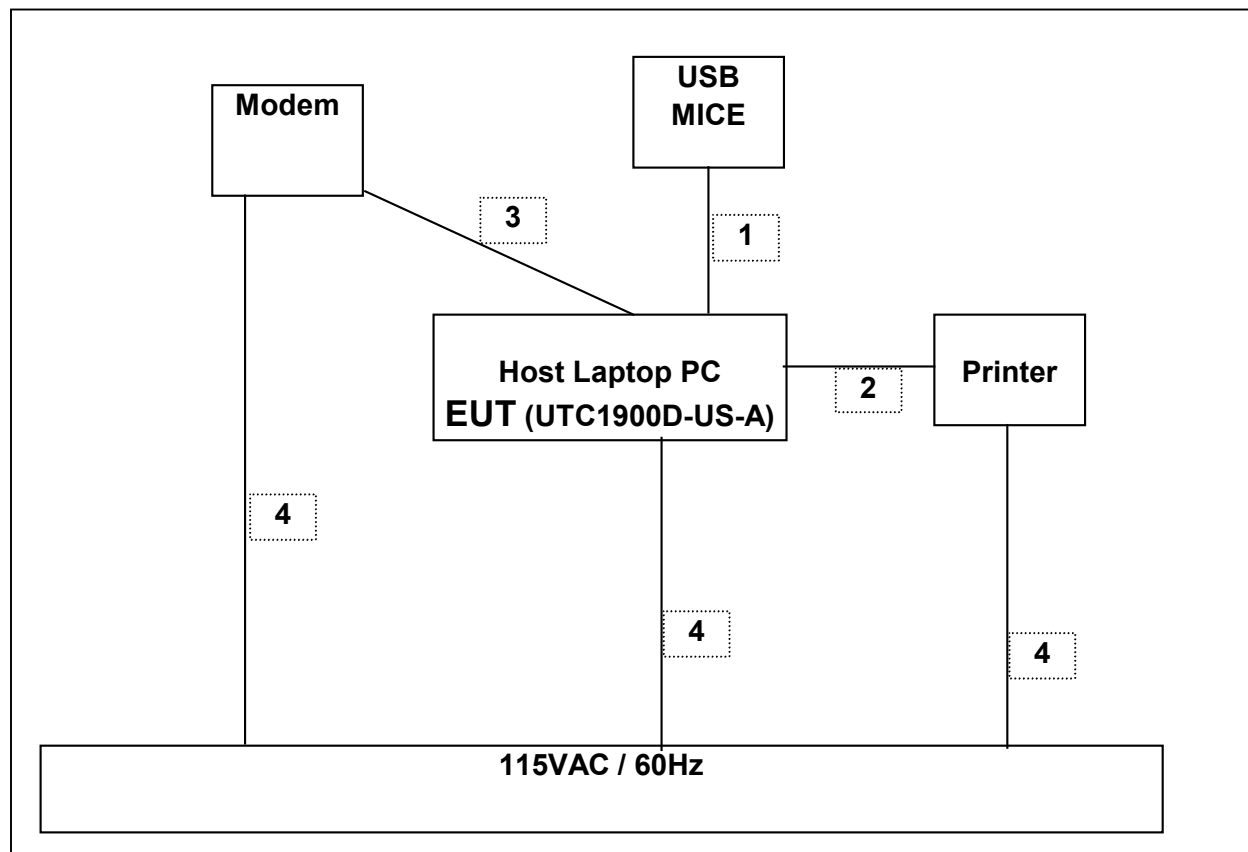
### Detector Setting of Spectrum Analyzer

| Frequency Range (MHz) | Detector Function                                                                          | Resolution Bandwidth                                                                     | Video Bandwidth                                                                          |
|-----------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 30 to 1000            | <input checked="" type="checkbox"/> Peak<br><input checked="" type="checkbox"/> Quasi Peak | <input checked="" type="checkbox"/> 100 KHz<br><input checked="" type="checkbox"/> 1 MHz | <input checked="" type="checkbox"/> 100 KHz<br><input checked="" type="checkbox"/> 1 MHz |

### I/O Cables

| Cable No | I/O Port | # of I/O Port | Connector Type | Type of Cable | Cable Length | Data Traffic | Bundled | Remark |
|----------|----------|---------------|----------------|---------------|--------------|--------------|---------|--------|
| 1        | Mouse    | 1             | USB            | Un-shielded   | 2m           | Yes          | No      | N/A    |
| 2        | Paralell | 1             | DB25           | Un-shielded   | 2m           | Yes          | Yes     | N/A    |
| 3        | Diel Up  | 1             | RJ11           | Un-shielded   | 2m           | Yes          | Yes     | N/A    |
| 4        | AC       | 3             | US 115V        | Un-shielded   | 2m           | No           | No      | N/A    |

### TEST SETUP



**TEST PROCEDURE**

1. The EUT was placed on the turn table 0.8 meter above ground inside 3 meter Anechoic Chamber.
2. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
3. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.
4. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
5. Rotate the turn table and stop at the angle where the measurement device has maximum reading
6. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
7. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures (3)~(6). If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.

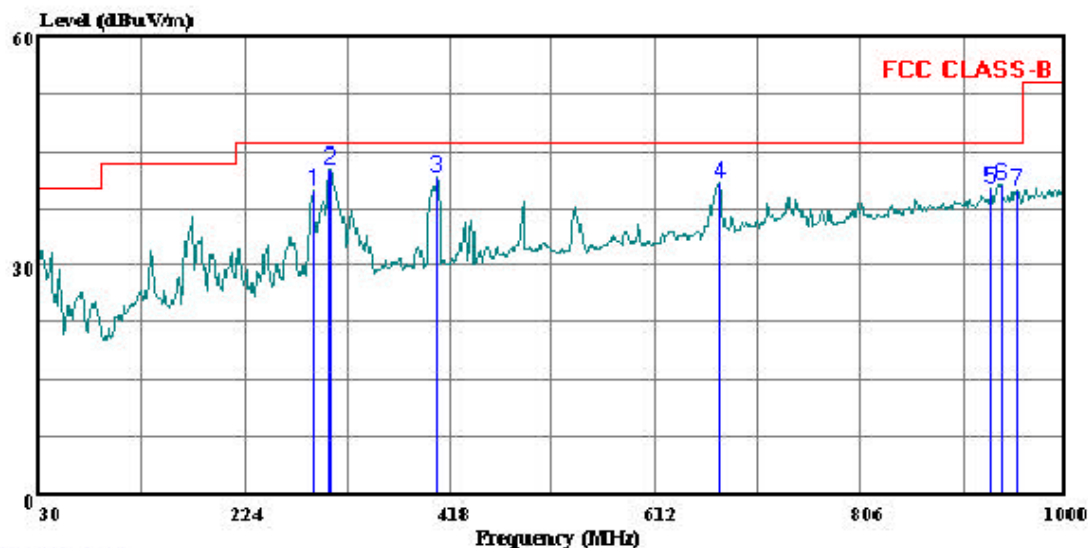
**MEASUREMENT RESULT**

*No non-compliance noted, as shown below.*

VERTICAL POLARIZATION, 30-1000MHz

561F Monterey Road  
San Jose, CA 95131  
Tel: (408) 463-0888  
Fax: (408) 463-0885

Data#: 32 File#: 04i2701.emi Date: 06-03-2004 Time: 18:50:31



(Auxiliary ATC)

Trace: 31

Ref Trace:

Condition: 3m VERTICAL

Test Operator: : Ben Du

Project #: : 04U2701-3

Company: : KYOCERA Corp.

EUT: : UTC

Model No: : UTC1900D-US-A

Configuration: : EUT w/ Laptop PC ,Printer, Modem, MS

Target of Test: : FCC B

Mode of Operation: Tx & Communicating

: IBM Laptop PC

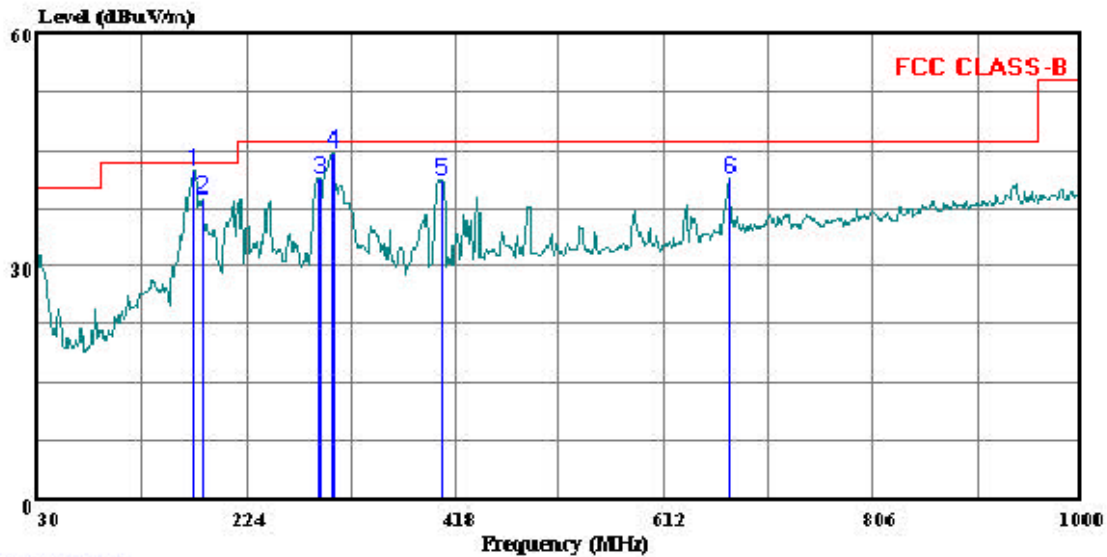
Page: 1

|      |              |       | Read   |           | Limit  | Over  |
|------|--------------|-------|--------|-----------|--------|-------|
| Freq | Remark       | Level | Factor | Level     | Line   | Limit |
| MHz  |              | dBuV  |        | dB dBuV/m | dBuV/m | dB    |
| 1    | 288.990 Peak | 24.05 | 15.65  | 39.70     | 46.00  | -6.30 |
| 2    | 305.480 Peak | 26.57 | 16.03  | 42.60     | 46.00  | -3.40 |
| 3    | 405.390 Peak | 23.13 | 18.32  | 41.45     | 46.00  | -4.55 |
| 4    | 672.140 Peak | 17.41 | 23.31  | 40.72     | 46.00  | -5.28 |
| 5    | 929.190 Peak | 13.13 | 26.76  | 39.89     | 46.00  | -6.11 |
| 6    | 938.890 Peak | 13.71 | 26.84  | 40.55     | 46.00  | -5.45 |

HORIZONTAL POLARIZATION, 30-1000MHz

561F Monterey Road  
San Jose, CA 95131  
Tel: (408) 463-0888  
Fax: (408) 463-0885

Data#: 30 File#: 04i2701.emi Date: 06-03-2004 Time: 18:45:33



(Auxiliary ATC)

Trace: 29

Ref Trace:

Condition: 3m HORIZONTAL

Test Operator: : Ben Du

Project #: : 04U2701-3

Company: : KYOCERA Corp.

EUT: : UTC

Model No: : UTC1900D-US-A

Configuration: : EUT w/ Laptop PC ,Printer, Modem, MS

Target of Test: : FCC B

Mode of Operation: Tx & Communicating

: IBM Laptop PC

Page: 1

|      |              |       | Read   |        | Limit  | Over  |
|------|--------------|-------|--------|--------|--------|-------|
| Freq | Remark       | Level | Factor | Level  | Line   | Limit |
| MHz  |              | dBuV  | dB     | dBuV/m | dBuV/m | dB    |
| 1    | 174.530 Peak | 29.17 | 13.16  | 42.33  | 43.50  | -1.17 |
| 2    | 182.290 Peak | 25.67 | 12.94  | 38.61  | 43.50  | -4.89 |
| 3    | 290.930 Peak | 25.68 | 15.74  | 41.42  | 46.00  | -4.58 |
| 4    | 303.540 Peak | 28.71 | 15.99  | 44.70  | 46.00  | -1.30 |
| 5    | 405.390 Peak | 22.67 | 18.32  | 40.99  | 46.00  | -5.01 |
| 6    | 672.140 Peak | 18.00 | 23.31  | 41.31  | 46.00  | -4.69 |

### Radiated Emission photos



## 7.8. POWERLINE CONDUCTED EMISSION

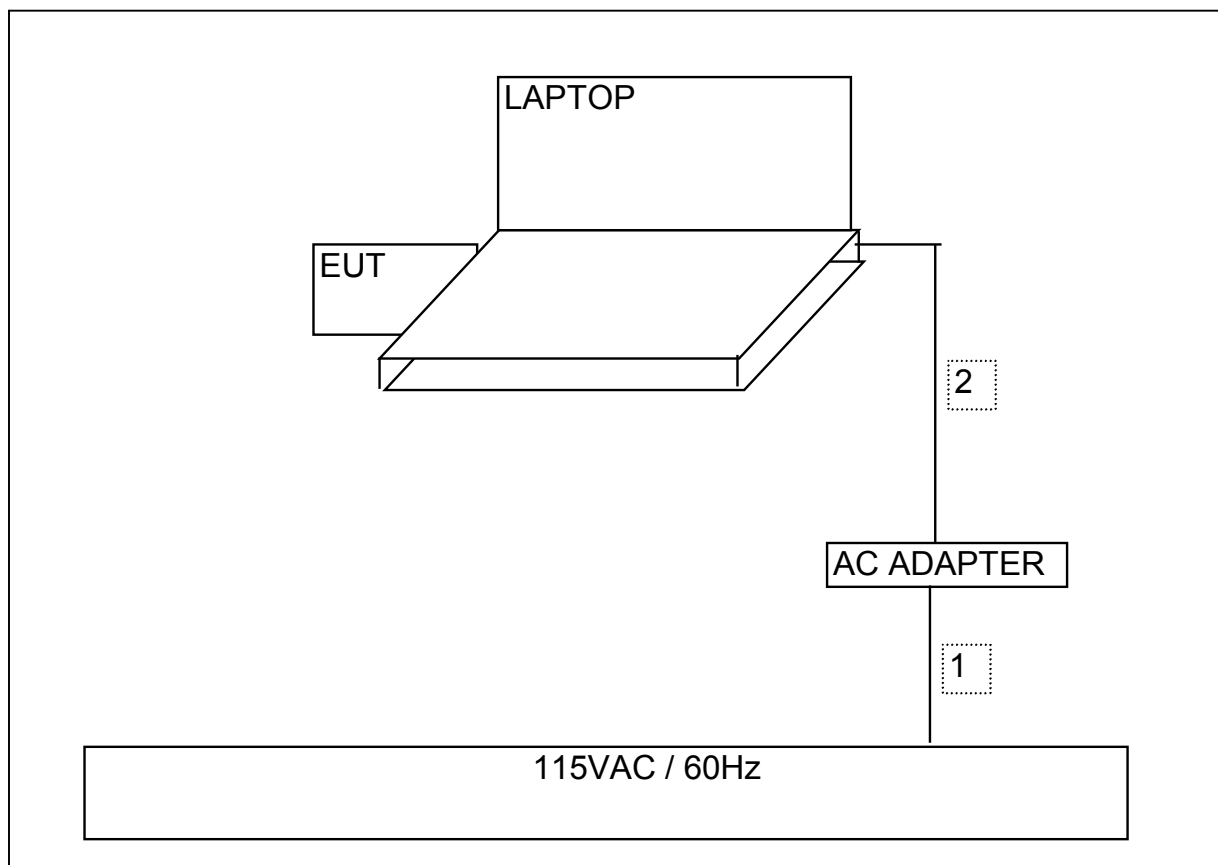
Detector Function Setting of Test Receiver

| Frequency Range (MHz) | Detector Function                                                                     | Resolution Bandwidth                      | Video Bandwidth                           |
|-----------------------|---------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|
| 150 KHz to 30 MHz     | <input checked="" type="checkbox"/> Peak<br><input type="checkbox"/> CISPR Quasi Peak | <input checked="" type="checkbox"/> 9 KHz | <input checked="" type="checkbox"/> 9 KHz |

### TEST I/O CABLES

| Cable No | I/O Port | # of I/O Port | Connector Type | Type of Cable | Cable Length | Data Traffic | Bundled | Remark                       |
|----------|----------|---------------|----------------|---------------|--------------|--------------|---------|------------------------------|
| 1        | AC       | 1             | US115V         | SHIELED       | 2            | NO           | NO      | Bundled AC Cable for LC test |
| 2        | DC       | 1             | DC             | SHIELED       | 3            | NO           | NO      | Ferrite on DC output end     |

### TEST SETUP



**TEST PROCEDURE**

1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in a continuous mode.
2. Line conducted data was recorded for both NEUTRAL and HOT lines.

**MEASUREMENT RESULT**

*No non-compliance noted, as shown below.*

| CONDUCTED EMISSIONS DATA (115VAC 60Hz) |           |           |           |       |       |       |         |         |         |
|----------------------------------------|-----------|-----------|-----------|-------|-------|-------|---------|---------|---------|
| Freq.                                  | Reading   |           |           | Closs | Limit | EN B  | Margin  |         | Remark  |
| (MHz)                                  | PK (dBuV) | QP (dBuV) | AV (dBuV) | (dB)  | QP    | AV    | QP (dB) | AV (dB) | L1 / L2 |
| 0.16                                   | 55.49     | --        | 41.26     | 0.00  | 65.63 | 55.63 | -10.14  | -14.37  | L1      |
| 0.96                                   | 31.36     | --        | 20.43     | 0.00  | 56.00 | 46.00 | -24.64  | -25.57  | L1      |
| 5.36                                   | 26.56     | --        | 16.30     | 0.00  | 60.00 | 50.00 | -33.44  | -33.70  | L1      |
| 0.16                                   | 52.58     | --        | 38.67     | 0.00  | 65.63 | 55.63 | -13.05  | -16.96  | L2      |
| 0.96                                   | 32.30     | --        | 20.96     | 0.00  | 56.00 | 46.00 | -56.00  | -25.04  | L2      |
| 5.36                                   | 28.10     | --        | 12.76     | 0.00  | 60.00 | 50.00 | -31.90  | -37.24  | L2      |
| 6 Worst Data                           |           |           |           |       |       |       |         |         |         |

LINE ONE

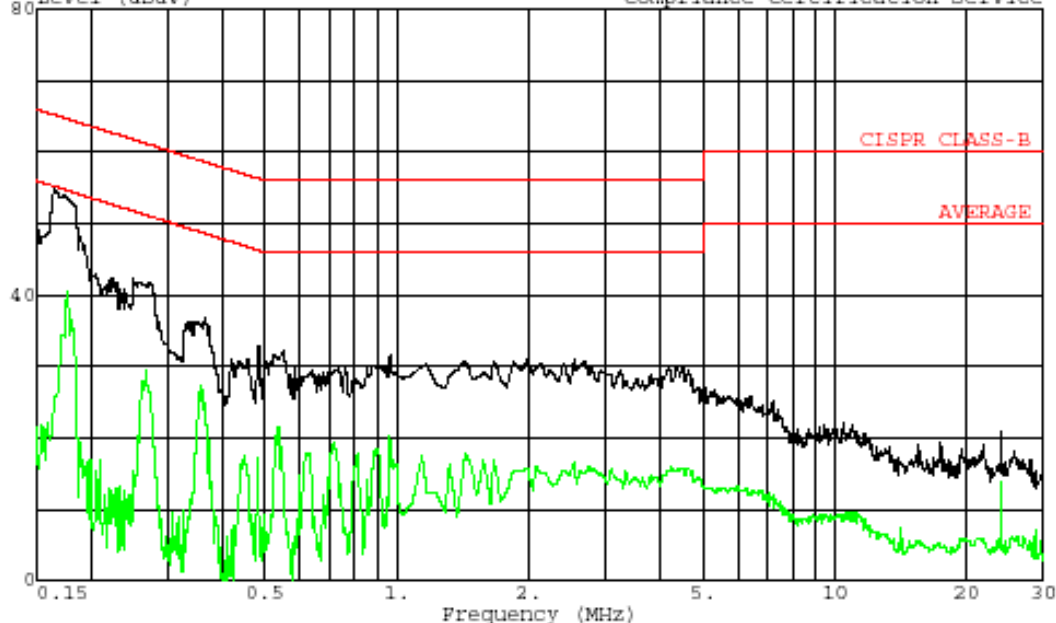
561F Monterey Road,  
Morgan Hill, CA 95037 USA  
Tel: (408) 463-0885  
Fax: (408) 463-0888

Data#: 10 File#: KYO-3.EMI

Date: 06-03-2004 Time: 15:17:58

Level (dBuV)

Compliance Certification Service



Trace: 8  
Project # : 04I2701-3\_L1 PEAK & AVERAGE  
Test Operator : VIEN TRAN  
Company : KYOCERA  
EUT : USER TERMINAL CARD TYPE  
Model : WIRELESS BROADBAND INTERNET  
Configuration : UTC1900D-US-A  
Mode of Operation: Normal  
Target of Test : EUT/LAPTOP  
Voltage : FCC Class B  
Voltage : 115VAC / 60 Hz  
L1: Peak(Black) , Average (Green)

Ref Trace:

LINE TWO

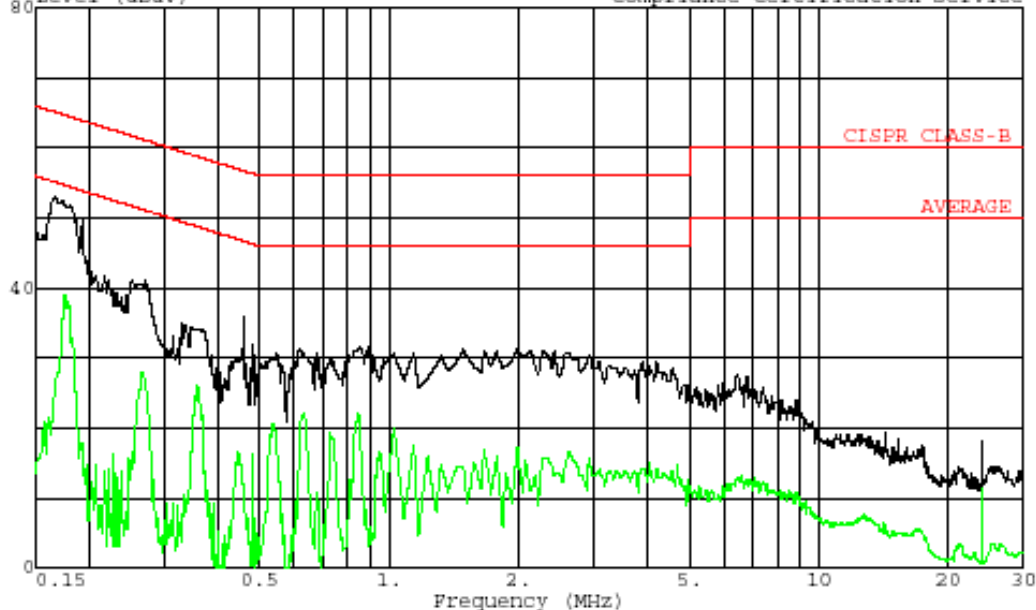
561F Monterey Road,  
Morgan Hill, CA 95037 USA  
Tel: (408) 463-0885  
Fax: (408) 463-0888

Data#: 17 File#: KYO-3.EMI

Date: 06-03-2004 Time: 15:37:46

Level (dBuV)

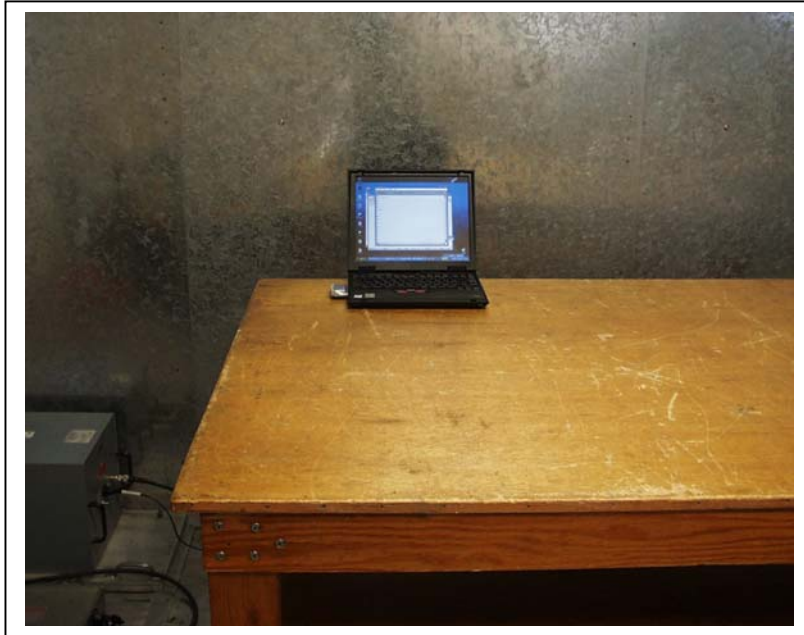
Compliance Certification Service



Trace: 15

Ref Trace:

Project # : 04I2701-3 L2 PEAK & AVERAGE  
Test Operator : VIEN TRAN  
Company : KYOCERA  
EUT : USER TERMINAL CARD TYPE  
Model : WIRELESS BROADBAND INTERNET  
Configuration : UTC1900D-US-A  
Mode of Operation: Normal  
Target of Test : FCC Class B  
Voltage : 115VAC / 60 Hz  
L2: Peak (Black) , Average (Green)

**AC Conducted Emission photos**

## **8. APENDIX**

### **8.1. EXTERNAL & INTERNAL PHOTOS**

Please refer to attached sheets.

### **8.2. SCHEMATICS**

Please refer to attached sheets.

### **8.3. BLOCK DIAGRAM**

Please refer to attached sheets.

### **8.4. USER MANUAL**

Please refer to attached sheets.

# **END OF REPORT**