



## Test Report

Product Name : Mini PCI Card  
Model No : MS-6833A  
FCC ID : I4L-MS6833A

Applicant : MICRO-STAR INT'L Co., LTD

Address : No 69, Li-De st., Jung-He City, Taipei Hsien, Taiwan, R.O.C

Date of Receipt : Jul. 02, 2004

Issued Date : Jul. 15, 2004

Report No. : 047L030FI

The test results relate only to the samples tested.

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This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

# Test Report Certification

Issued Date : Jul. 15, 2004

Report No. : 047L030FI



Accredited by NIST (NVLAP)

NVLAP Lab Code: 200533-0

Product Name : Mini PCI Card

Applicant : MICRO-STAR INT'L Co., LTD

Address : No 69, Li-De st., Jung-He City, Taipei Hsien, Taiwan, R.O.C

Manufacturer : MICRO-STAR INT'L Co., LTD

Model No. : MS-6833A

Rated Voltage : DC 3.3V

Trade Name : MSI

Measurement Standard : FCC CFR Title 47 Part 15 Subpart C: 2003

Measurement Procedure : ANSI C63.4: 2001

Test Result : Complied



Test results relate only to the samples tested.

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( Grace Lin )

Tested By :   
( Jeff Wu )

Approved By :   
( Gene Chang )

# TABLE OF CONTENTS

| Description                                                    | Page      |
|----------------------------------------------------------------|-----------|
| <b>1. GENERAL INFORMATION .....</b>                            | <b>4</b>  |
| 1.1. EUT Description.....                                      | 4         |
| 1.2. Operational Description .....                             | 5         |
| 1.3. Tested System Details.....                                | 6         |
| 1.4. Configuration of tested System .....                      | 6         |
| 1.5. EUT Exercise Software .....                               | 6         |
| 1.6. Test Facility .....                                       | 7         |
| <b>2. Conducted Emission.....</b>                              | <b>8</b>  |
| 2.1. Test Equipment.....                                       | 8         |
| 2.2. Test Setup .....                                          | 8         |
| 2.3. Limits .....                                              | 8         |
| 2.4. Test Procedure .....                                      | 9         |
| 2.5. Uncertainty .....                                         | 9         |
| 2.6. Test Result of Conducted Emission.....                    | 10        |
| <b>3. Peak Power Output .....</b>                              | <b>22</b> |
| 3.1. Test Equipment.....                                       | 22        |
| 3.2. Test Setup .....                                          | 22        |
| 3.3. Limits .....                                              | 22        |
| 3.4. Uncertainty .....                                         | 22        |
| 3.5. Test Result of Peak Power Output.....                     | 23        |
| <b>4. Radiated Emission.....</b>                               | <b>25</b> |
| 4.1. Test Equipment.....                                       | 25        |
| 4.2. Test Setup .....                                          | 25        |
| 4.3. Limits .....                                              | 26        |
| 4.4. Test Procedure .....                                      | 27        |
| 4.5. Uncertainty .....                                         | 27        |
| 4.6. Test Result of Radiated Emission.....                     | 28        |
| <b>5. Band Edge .....</b>                                      | <b>40</b> |
| 5.1. Test Equipment.....                                       | 40        |
| 5.2. Test Setup .....                                          | 40        |
| 5.3. Limits .....                                              | 41        |
| 5.4. Test Procedure .....                                      | 41        |
| 5.5. Uncertainty .....                                         | 41        |
| 5.6. Test Result of Band Edge .....                            | 42        |
| <b>6. Occupied Bandwidth.....</b>                              | <b>46</b> |
| 6.1. Test Equipment.....                                       | 46        |
| 6.2. Test Setup .....                                          | 46        |
| 6.3. Limits .....                                              | 46        |
| 6.4. Uncertainty .....                                         | 46        |
| 6.5. Test Result of Occupied Bandwidth .....                   | 47        |
| <b>7. Power Density .....</b>                                  | <b>53</b> |
| 7.1. Test Equipment.....                                       | 53        |
| 7.2. Test Setup .....                                          | 53        |
| 7.3. Limits .....                                              | 53        |
| 7.4. Uncertainty .....                                         | 53        |
| 7.5. Test Result of Power Density .....                        | 54        |
| <b>8. EMI Reduction Method During Compliance Testing .....</b> | <b>60</b> |

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

## 1. GENERAL INFORMATION

### 1.1. EUT Description

|                           |                                                                |
|---------------------------|----------------------------------------------------------------|
| Product Name              | : Mini PCI Card                                                |
| Trade Name                | : MSI                                                          |
| Model No.                 | : MS-6833A                                                     |
| Frequency Range           | : 2412MHz to 2462MHz                                           |
| FCC ID                    | : I4L-MS6833A                                                  |
| Channel Number            | : 11                                                           |
| Data Speed (IEEE 802.11b) | : 1Mbps, 2Mbps, 5.5Mbps, 11Mbps                                |
| Data Speed (IEEE 802.11g) | : 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps |
| Type of Modulation        | : DSSS / OFDM                                                  |
| Antenna Type              | : Connector                                                    |
| Antenna Gain              | : MS-1002, 2.99dBi                                             |
|                           | : FAVORTRON AN5, 2.85dBi                                       |
|                           | : ADA3P-713K601, 2dBi                                          |
|                           | : E12B Antenna, 1.92dBi                                        |
|                           | : FIC, 1.56dBi                                                 |
|                           | : CLEVO 285P, 0.47dBi                                          |
|                           | : E12S, 0.31dBi                                                |
|                           | : 258KA0, 0.13dBi                                              |
|                           | : FOXCONN N223, -0.06dBi                                       |
|                           | : CLEVO 5600, -0.45dBi                                         |
|                           | : SmartAnt UniWill U11, -1.16 dBi                              |
|                           | : M300N, -2.45dBi                                              |
| Channel Control           | : Auto                                                         |
| Channel separation        | : 5M                                                           |

Note: Base on the verification, the MS-1002 with maximum antenna gain was selected as final test.

#### Frequency of Each Channel:

| Channel    | Frequency | Channel    | Frequency | Channel     | Frequency |
|------------|-----------|------------|-----------|-------------|-----------|
| Channel 1: | 2412 MHz  | Channel 5: | 2432 MHz  | Channel 9:  | 2452 MHz  |
| Channel 2: | 2417 MHz  | Channel 6: | 2437 MHz  | Channel 10: | 2457 MHz  |
| Channel 3: | 2422 MHz  | Channel 7: | 2442 MHz  | Channel 11: | 2462 MHz  |
| Channel 4: | 2427 MHz  | Channel 8: | 2447 MHz  |             |           |

Note:

1. This device is a 2.4GHz Mini PCI Card included a 2.4GHz receiving function, a 2.4GHz transmitting function.
2. Regards to the frequency band operation; the highest rate that was included the lowest 、 middle and highest frequency of channel were selected to perform the test, then shown on this report.
3. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.

## 1.2. Operational Description

EUT is a Mini PCI Card with 11 channels. This device provided four kinds of transmitting speed 1, 2, 5.5 and 11Mbps. The device of RF carrier is DBPSK, DQPSK and CCK (IEEE 802.11b) or eight kinds of transmitting speed 6, 9, 12, 18, 24, 36, 48 and 54Mbps. The device of RF carrier is OFDM (IEEE 802.11g).

The device adapts direct sequence spread spectrum modulation. The antenna was Connector provides diversity function to improve the receiving function.

This Mini PCI Card, compliant with IEEE 802.11b and IEEE 802.11g, is a high-efficiency Wireless LAN adapter. It allows your computer to connect to a wireless network and to share resources, such as files or printers without being bound to the network wires. Operation in 2.4GHz Direct Sequence Spread Spectrum (DSSS) radio transmission, the Mini PCI Card Wired Equivalent Protection (WEP) algorithm is used. In addition, its standard compliance ensures that it can communicate with any IEEE 802.11b and IEEE 802.11g network.

|            |                            |
|------------|----------------------------|
| Test Mode: | Mode 1: Transmitter 11Mbps |
|            | Mode 1: Transmitter 54Mbps |

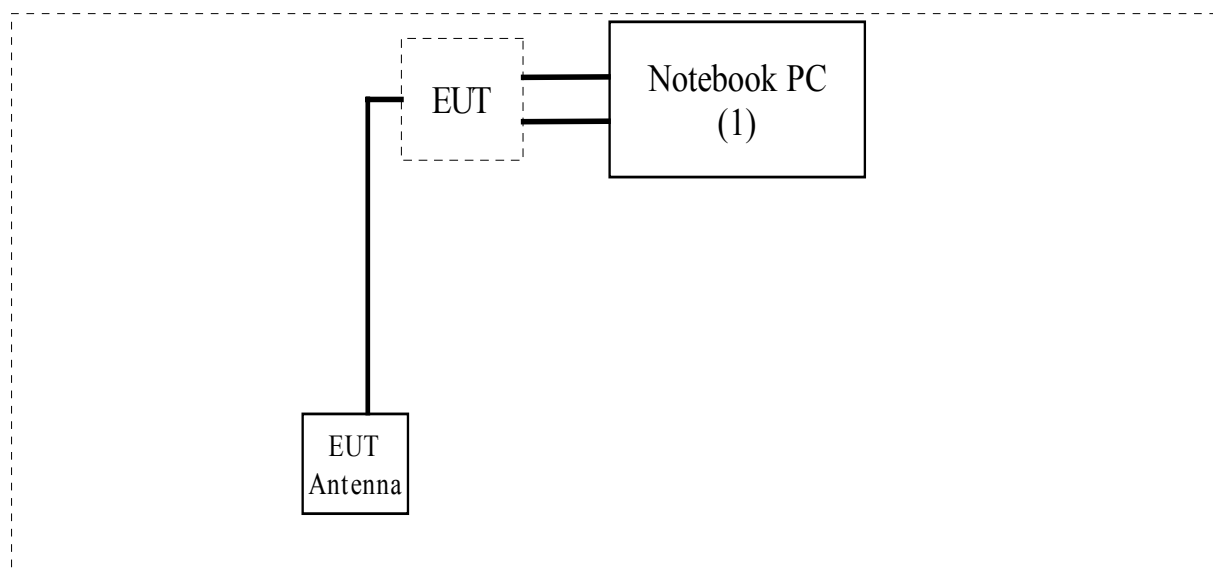
### 1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

|     | Product     | Manufacturer | Model No. | Serial No. | FCC ID | Power Cord         |
|-----|-------------|--------------|-----------|------------|--------|--------------------|
| (1) | Notebook PC | DELL         | PP01L     | N/A        | DoC    | Non-Shielded, 1.8m |

|    | Signal Cable Type | Signal cable Description |
|----|-------------------|--------------------------|
| A. | N/A               | N/A                      |

### 1.4. Configuration of tested System



### 1.5. EUT Exercise Software

- (1) Setup the EUT and simulators as shown on 1.4
- (2) Turn on the power of all equipment.
- (3) PC reads data from disk.
- (4) Data will to coerce transmitting through EUT.
- (5) Repeat the above procedure (3) to (4)

## 1.6. Test Facility

Ambient conditions in the laboratory:

| Items                      | Required (IEC 68-1) | Actual   |
|----------------------------|---------------------|----------|
| Temperature (°C)           | 15-35               | 20-35    |
| Humidity (%RH)             | 25-75               | 50-65    |
| Barometric pressure (mbar) | 860-1060            | 950-1000 |

Site Description: June 22, 2001 File on  
Federal Communications Commission  
FCC Engineering Laboratory  
7435 Oakland Mills Road  
Columbia, MD 21046  
Reference 31040/SIT1300F2



0914

ILAC MRA

July 03, 2001 Accreditation on NVLAP  
NVLAP Lab Code: 200533-0



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## 2. Conducted Emission

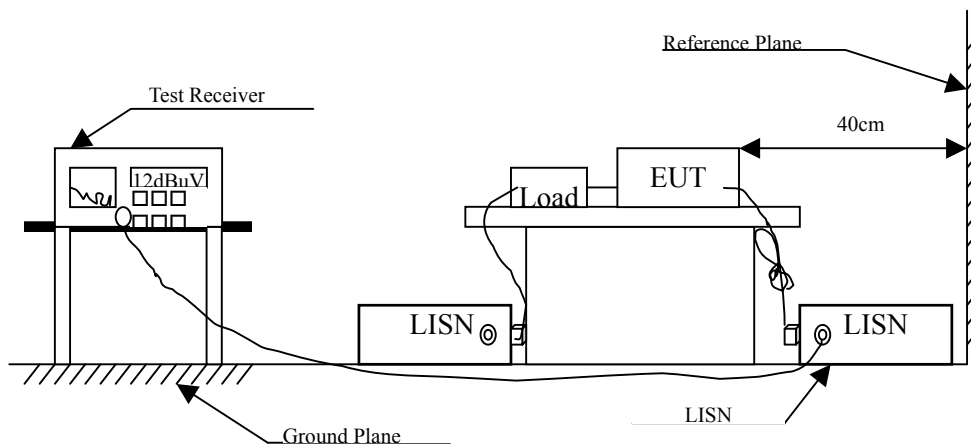
### 2.1. Test Equipment

The following test equipment are used during the conducted emission test:

| Item | Instrument         | Manufacturer | Type No./Serial No | Last Cal. | Remark      |
|------|--------------------|--------------|--------------------|-----------|-------------|
| 1    | Test Receiver      | R & S        | ESCS 30/825442/17  | May, 2004 |             |
| 2    | L.I.S.N.           | R & S        | ESH3-Z5/825016/6   | May, 2004 | EUT         |
| 3    | L.I.S.N.           | Kyoritsu     | KNW-407/8-1420-3   | May, 2004 | Peripherals |
| 4    | Pulse Limiter      | R & S        | ESH3-Z2            | May, 2004 |             |
| 5    | No.1 Shielded Room |              |                    | N/A       |             |

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

### 2.2. Test Setup



### 2.3. Limits

| FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit |                      |                      |
|-----------------------------------------------------|----------------------|----------------------|
| Frequency<br>MHz                                    | Limits               |                      |
|                                                     | uV                   | dBuV                 |
| 0.15 - 0.50                                         | 66-56 <sub>(註)</sub> | 56-46 <sub>(註)</sub> |
| 0.50-5.0                                            | 56                   | 46                   |
| 5.0 - 30                                            | 60                   | 50                   |

## 2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2001 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

## 2.5. Uncertainty

The measurement uncertainty is defined as  $\pm 2.02$  dB

## 2.6. Test Result of Conducted Emission

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmitter 11Mbps (Channel 1)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| * 0.181    | 0.60  | 0.10   | 49.53   | 50.23    | 64.43  |
| 0.236      | 0.60  | 0.10   | 42.68   | 43.38    | 62.24  |
| 0.295      | 0.60  | 0.10   | 36.51   | 37.21    | 60.40  |
| 0.416      | 0.60  | 0.10   | 28.88   | 29.58    | 57.54  |
| 3.963      | 0.60  | 0.16   | 27.07   | 27.83    | 56.00  |
| 14.267     | 0.86  | 0.33   | 27.33   | 28.52    | 60.00  |
| Average    |       |        |         |          |        |
| * 0.181    | 0.60  | 0.10   | 39.60   | 40.30    | 54.44  |
| 0.236      | 0.60  | 0.10   | 32.00   | 32.70    | 52.24  |
| 0.295      | 0.60  | 0.10   | 26.10   | 26.80    | 50.38  |
| 0.416      | 0.60  | 0.10   | 18.10   | 18.80    | 47.53  |
| 3.963      | 0.60  | 0.16   | 15.90   | 16.66    | 46.00  |
| 14.267     | 0.86  | 0.33   | 17.20   | 18.39    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter 11Mbps (Channel 1)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| * 0.177    | 0.60  | 0.10   | 51.76   | 52.46    | 64.61  |
| 0.236      | 0.60  | 0.10   | 42.86   | 43.56    | 62.24  |
| 0.298      | 0.60  | 0.10   | 35.80   | 36.50    | 60.29  |
| 0.416      | 0.60  | 0.10   | 31.25   | 31.95    | 57.54  |
| 10.787     | 0.66  | 0.23   | 26.44   | 27.33    | 60.00  |
| 14.279     | 0.86  | 0.33   | 26.32   | 27.51    | 60.00  |
| Average    |       |        |         |          |        |
| * 0.177    | 0.60  | 0.10   | 41.70   | 42.40    | 54.63  |
| 0.236      | 0.60  | 0.10   | 31.00   | 31.70    | 52.24  |
| 0.298      | 0.60  | 0.10   | 26.50   | 27.20    | 50.30  |
| 0.416      | 0.60  | 0.10   | 26.10   | 26.80    | 47.53  |
| 10.787     | 0.66  | 0.23   | 21.60   | 22.49    | 50.00  |
| 14.279     | 0.86  | 0.33   | 16.20   | 17.39    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmitter 11Mbps (Channel 6)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| * 0.173    | 0.60  | 0.10   | 45.93   | 46.63    | 64.79  |
| 0.240      | 0.60  | 0.10   | 41.29   | 41.99    | 62.10  |
| 0.357      | 0.60  | 0.10   | 32.64   | 33.34    | 58.80  |
| 4.033      | 0.60  | 0.16   | 28.15   | 28.91    | 56.00  |
| 6.943      | 0.60  | 0.18   | 25.69   | 26.47    | 60.00  |
| 14.244     | 0.86  | 0.33   | 34.93   | 36.12    | 60.00  |
| Average    |       |        |         |          |        |
| * 0.173    | 0.60  | 0.10   | 36.50   | 37.20    | 54.82  |
| 0.240      | 0.60  | 0.10   | 30.30   | 31.00    | 52.10  |
| 0.357      | 0.60  | 0.10   | 27.90   | 28.60    | 48.80  |
| 4.033      | 0.60  | 0.16   | 19.30   | 20.06    | 46.00  |
| 6.943      | 0.60  | 0.18   | 19.80   | 20.58    | 50.00  |
| 14.244     | 0.86  | 0.33   | 19.10   | 20.29    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter 11Mbps (Channel 6)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| * 0.177    | 0.60  | 0.10   | 51.21   | 51.91    | 64.61  |
| 0.240      | 0.60  | 0.10   | 41.94   | 42.64    | 62.10  |
| 0.353      | 0.60  | 0.10   | 33.80   | 34.50    | 58.89  |
| 3.802      | 0.60  | 0.16   | 30.52   | 31.28    | 56.00  |
| 6.795      | 0.60  | 0.18   | 25.91   | 26.69    | 60.00  |
| 13.545     | 0.83  | 0.31   | 30.51   | 31.65    | 60.00  |
| Average    |       |        |         |          |        |
| * 0.177    | 0.60  | 0.10   | 41.20   | 41.90    | 54.63  |
| 0.240      | 0.60  | 0.10   | 30.70   | 31.40    | 52.10  |
| 0.353      | 0.60  | 0.10   | 26.30   | 27.00    | 48.89  |
| 3.802      | 0.60  | 0.16   | 23.20   | 23.96    | 46.00  |
| 6.795      | 0.60  | 0.18   | 13.90   | 14.68    | 50.00  |
| 13.545     | 0.83  | 0.31   | 22.00   | 23.14    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmitter 11Mbps (Channel 11)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| 0.185      | 0.60  | 0.10   | 37.89   | 38.59    | 64.25  |
| * 0.236    | 0.60  | 0.10   | 41.00   | 41.70    | 62.24  |
| 0.357      | 0.60  | 0.10   | 32.60   | 33.30    | 58.80  |
| 3.865      | 0.60  | 0.16   | 32.09   | 32.85    | 56.00  |
| 7.119      | 0.60  | 0.19   | 31.62   | 32.41    | 60.00  |
| 13.982     | 0.85  | 0.32   | 30.64   | 31.81    | 60.00  |
| Average    |       |        |         |          |        |
| 0.185      | 0.60  | 0.10   | 27.90   | 28.60    | 54.26  |
| 0.236      | 0.60  | 0.10   | 29.50   | 30.20    | 52.24  |
| * 0.357    | 0.60  | 0.10   | 28.10   | 28.80    | 48.80  |
| 3.865      | 0.60  | 0.16   | 23.40   | 24.16    | 46.00  |
| 7.119      | 0.60  | 0.19   | 11.30   | 12.09    | 50.00  |
| 13.982     | 0.85  | 0.32   | 24.20   | 25.37    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter 11Mbps (Channel 11)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| * 0.181    | 0.60  | 0.10   | 49.81   | 50.51    | 64.43  |
| 0.236      | 0.60  | 0.10   | 41.47   | 42.17    | 62.24  |
| 0.357      | 0.60  | 0.10   | 35.91   | 36.61    | 58.80  |
| 4.107      | 0.60  | 0.16   | 29.71   | 30.47    | 56.00  |
| 7.115      | 0.60  | 0.19   | 30.53   | 31.32    | 60.00  |
| 14.236     | 0.86  | 0.33   | 35.51   | 36.70    | 60.00  |
| Average    |       |        |         |          |        |
| * 0.181    | 0.60  | 0.10   | 39.70   | 40.40    | 54.44  |
| 0.236      | 0.60  | 0.10   | 30.40   | 31.10    | 52.24  |
| 0.357      | 0.60  | 0.10   | 28.90   | 29.60    | 48.80  |
| 4.107      | 0.60  | 0.16   | 21.10   | 21.86    | 46.00  |
| 7.115      | 0.60  | 0.19   | 11.20   | 11.99    | 50.00  |
| 14.236     | 0.86  | 0.33   | 19.50   | 20.69    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmitter 54Mbps (Channel 1)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| 0.173      | 0.60  | 0.10   | 40.69   | 41.39    | 64.79  |
| * 0.240    | 0.60  | 0.10   | 40.31   | 41.01    | 62.10  |
| 0.361      | 0.60  | 0.10   | 30.67   | 31.37    | 58.71  |
| 4.002      | 0.60  | 0.16   | 31.74   | 32.50    | 56.00  |
| 6.986      | 0.60  | 0.18   | 26.73   | 27.51    | 60.00  |
| 13.951     | 0.84  | 0.32   | 28.75   | 29.91    | 60.00  |
| Average    |       |        |         |          |        |
| 0.173      | 0.60  | 0.10   | 30.20   | 30.90    | 54.82  |
| 0.240      | 0.60  | 0.10   | 28.80   | 29.50    | 52.10  |
| * 0.361    | 0.60  | 0.10   | 26.50   | 27.20    | 48.71  |
| 4.002      | 0.60  | 0.16   | 22.40   | 23.16    | 46.00  |
| 6.986      | 0.60  | 0.18   | 20.70   | 21.48    | 50.00  |
| 13.951     | 0.84  | 0.32   | 21.50   | 22.66    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter 54Mbps (Channel 1)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| * 0.181    | 0.60  | 0.10   | 49.39   | 50.09    | 64.43  |
| 0.236      | 0.60  | 0.10   | 39.99   | 40.69    | 62.24  |
| 0.361      | 0.60  | 0.10   | 34.15   | 34.85    | 58.71  |
| 4.123      | 0.60  | 0.16   | 29.33   | 30.09    | 56.00  |
| 7.115      | 0.60  | 0.19   | 31.77   | 32.56    | 60.00  |
| 14.232     | 0.86  | 0.33   | 34.67   | 35.86    | 60.00  |
| Average    |       |        |         |          |        |
| * 0.181    | 0.60  | 0.10   | 38.50   | 39.20    | 54.44  |
| 0.236      | 0.60  | 0.10   | 27.80   | 28.50    | 52.24  |
| 0.361      | 0.60  | 0.10   | 27.00   | 27.70    | 48.71  |
| 4.123      | 0.60  | 0.16   | 21.80   | 22.56    | 46.00  |
| 7.115      | 0.60  | 0.19   | 14.20   | 14.99    | 50.00  |
| 14.232     | 0.86  | 0.33   | 18.80   | 19.99    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmitter 54Mbps (Channel 6)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| * 0.177    | 0.60  | 0.10   | 48.66   | 49.36    | 64.61  |
| 0.236      | 0.60  | 0.10   | 38.56   | 39.26    | 62.24  |
| 0.298      | 0.60  | 0.10   | 34.62   | 35.32    | 60.29  |
| 3.584      | 0.60  | 0.16   | 30.13   | 30.89    | 56.00  |
| 6.752      | 0.60  | 0.18   | 27.09   | 27.87    | 60.00  |
| 14.248     | 0.86  | 0.33   | 26.40   | 27.59    | 60.00  |
| Average    |       |        |         |          |        |
| * 0.177    | 0.60  | 0.10   | 38.50   | 39.20    | 54.63  |
| 0.236      | 0.60  | 0.10   | 27.40   | 28.10    | 52.24  |
| 0.298      | 0.60  | 0.10   | 23.50   | 24.20    | 50.30  |
| 3.584      | 0.60  | 0.16   | 21.60   | 22.36    | 46.00  |
| 6.752      | 0.60  | 0.18   | 17.10   | 17.88    | 50.00  |
| 14.248     | 0.86  | 0.33   | 14.90   | 16.09    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter 54Mbps (Channel 6)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| * 0.181    | 0.60  | 0.10   | 49.41   | 50.11    | 64.43  |
| 0.302      | 0.60  | 0.10   | 33.89   | 34.59    | 60.18  |
| 0.478      | 0.60  | 0.10   | 30.85   | 31.55    | 56.37  |
| 3.888      | 0.60  | 0.16   | 31.99   | 32.75    | 56.00  |
| 6.994      | 0.60  | 0.18   | 28.37   | 29.15    | 60.00  |
| 14.224     | 0.86  | 0.33   | 35.59   | 36.78    | 60.00  |
| Average    |       |        |         |          |        |
| * 0.181    | 0.60  | 0.10   | 38.50   | 39.20    | 54.44  |
| 0.302      | 0.60  | 0.10   | 24.20   | 24.90    | 50.19  |
| 0.478      | 0.60  | 0.10   | 27.00   | 27.70    | 46.37  |
| 3.888      | 0.60  | 0.16   | 24.20   | 24.96    | 46.00  |
| 6.994      | 0.60  | 0.18   | 22.50   | 23.28    | 50.00  |
| 14.224     | 0.86  | 0.33   | 18.60   | 19.79    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmitter 54Mbps (Channel 11)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| * 0.177    | 0.60  | 0.10   | 48.49   | 49.19    | 64.61  |
| 0.236      | 0.60  | 0.10   | 38.26   | 38.96    | 62.24  |
| 0.298      | 0.60  | 0.10   | 34.60   | 35.30    | 60.29  |
| 0.361      | 0.60  | 0.10   | 30.86   | 31.56    | 58.71  |
| 3.888      | 0.60  | 0.16   | 33.22   | 33.98    | 56.00  |
| 14.244     | 0.86  | 0.33   | 27.27   | 28.46    | 60.00  |
| Average    |       |        |         |          |        |
| * 0.177    | 0.60  | 0.10   | 38.20   | 38.90    | 54.63  |
| 0.236      | 0.60  | 0.10   | 26.90   | 27.60    | 52.24  |
| 0.298      | 0.60  | 0.10   | 23.70   | 24.40    | 50.30  |
| 0.361      | 0.60  | 0.10   | 27.00   | 27.70    | 48.71  |
| 3.888      | 0.60  | 0.16   | 24.90   | 25.66    | 46.00  |
| 14.244     | 0.86  | 0.33   | 16.60   | 17.79    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter 54Mbps (Channel 11)

| Frequency  | Cable | LISN   | Reading | Emission | Limits |
|------------|-------|--------|---------|----------|--------|
|            | Loss  | Factor | Level   | Level    |        |
| MHz        | dB    | dB     | dBuV    | dBuV     | dBuV   |
| =====      |       |        |         |          |        |
| Quasi-Peak |       |        |         |          |        |
| * 0.181    | 0.60  | 0.10   | 49.35   | 50.05    | 64.43  |
| 0.236      | 0.60  | 0.10   | 38.78   | 39.48    | 62.24  |
| 0.361      | 0.60  | 0.10   | 34.57   | 35.27    | 58.71  |
| 3.830      | 0.60  | 0.16   | 31.07   | 31.83    | 56.00  |
| 6.994      | 0.60  | 0.18   | 27.74   | 28.52    | 60.00  |
| 13.990     | 0.85  | 0.32   | 28.57   | 29.74    | 60.00  |
| Average    |       |        |         |          |        |
| * 0.181    | 0.60  | 0.10   | 38.40   | 39.10    | 54.44  |
| 0.236      | 0.60  | 0.10   | 27.10   | 27.80    | 52.24  |
| 0.361      | 0.60  | 0.10   | 27.50   | 28.20    | 48.71  |
| 3.830      | 0.60  | 0.16   | 22.70   | 23.46    | 46.00  |
| 6.994      | 0.60  | 0.18   | 21.40   | 22.18    | 50.00  |
| 13.990     | 0.85  | 0.32   | 20.80   | 21.97    | 50.00  |

Note:

1. All Reading Levels are Quasi-Peak value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

### 3. Peak Power Output

#### 3.1. Test Equipment

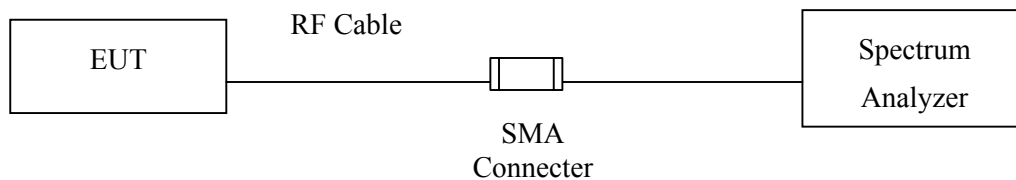
The following test equipments are used during the radiated emission tests:

|   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal. |
|---|-------------------|--------------|----------------------|-----------|
| X | Spectrum Analyzer | Advantest    | R3272 / 72421194     | May, 2004 |

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.  
2. Mark "X" test instruments are used to measure the final test results.

#### 3.2. Test Setup

##### Conduction Power Measurement



#### 3.3. Limits

The maximum peak power shall be less 1 Watt.

#### 3.4. Uncertainty

The measurement uncertainty is defined as  $\pm 1.27$  dB

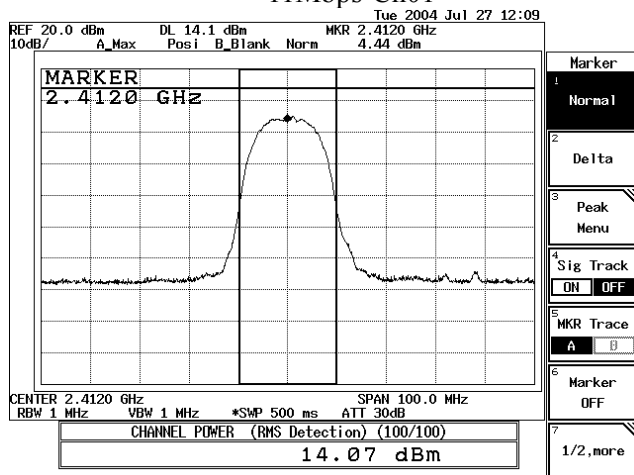
### 3.5. Test Result of Peak Power Output

Product : Mini PCI Card  
 Test Item : Peak Power Output Data  
 Test Site : No.3OATS  
 Test Mode : Transmitter 11Mbps

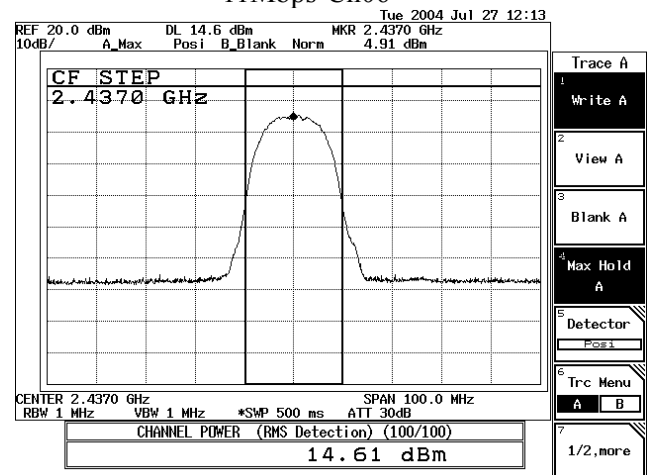
#### Data Speed: 11Mbps

| Channel No. | Frequency (MHz) | Measurement | Required Limit | Result |
|-------------|-----------------|-------------|----------------|--------|
| 1           | 2412.00         | 14.07dBm    | 1 Watt= 30 dBm | Pass   |
| 6           | 2437.00         | 14.61dBm    | 1 Watt= 30 dBm | Pass   |
| 11          | 2462.00         | 13.98dBm    | 1 Watt= 30 dBm | Pass   |

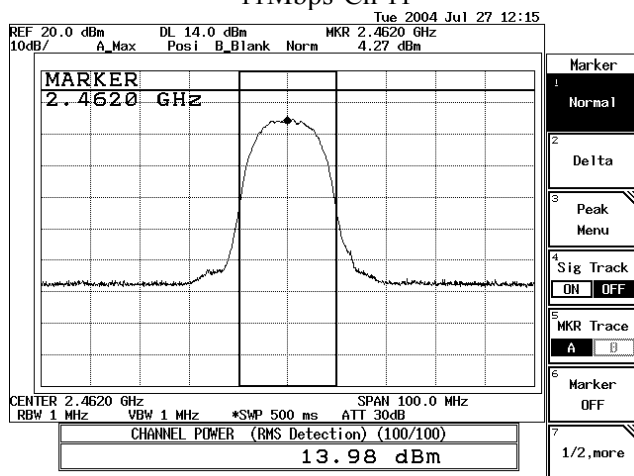
11Mbps-Ch01



11Mbps-Ch06



11Mbps-Ch 11

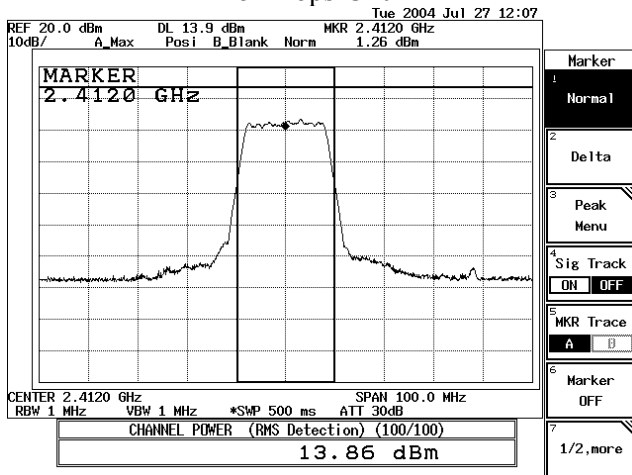


Product : Mini PCI Card  
 Test Item : Peak Power Output Data  
 Test Site : No.3OATS  
 Test Mode : Transmitter 54Mbps

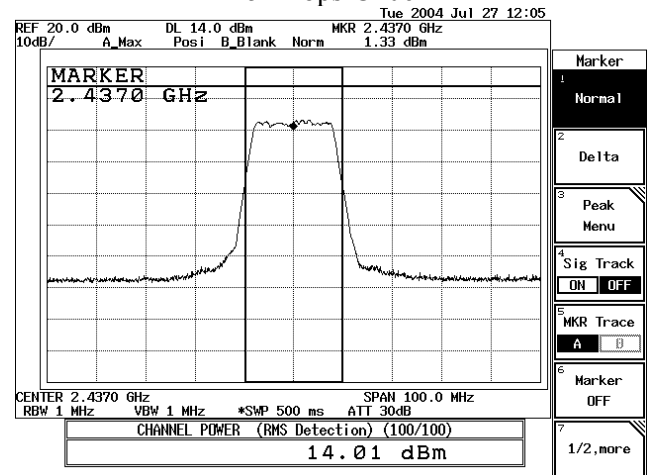
**Data Speed: 54Mbps**

| Channel No. | Frequency (MHz) | Measurement | Required Limit | Result |
|-------------|-----------------|-------------|----------------|--------|
| 1           | 2412.00         | 13.85dBm    | 1 Watt= 30 dBm | Pass   |
| 6           | 2437.00         | 14.01dBm    | 1 Watt= 30 dBm | Pass   |
| 11          | 2462.00         | 14.01dBm    | 1 Watt= 30 dBm | Pass   |

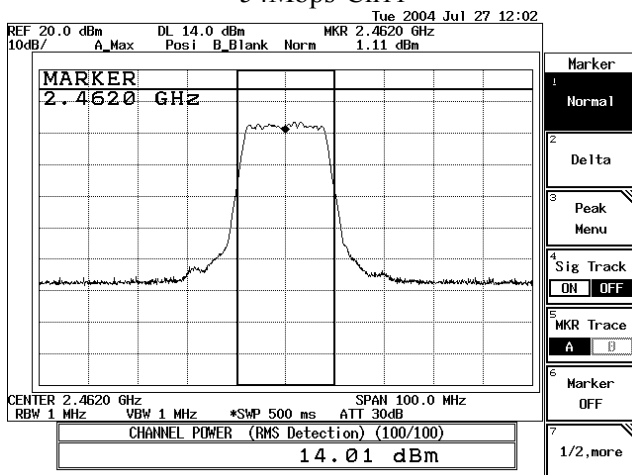
54Mbps-Ch01



54Mbps-Ch06



54Mbps-Ch11



## 4. Radiated Emission

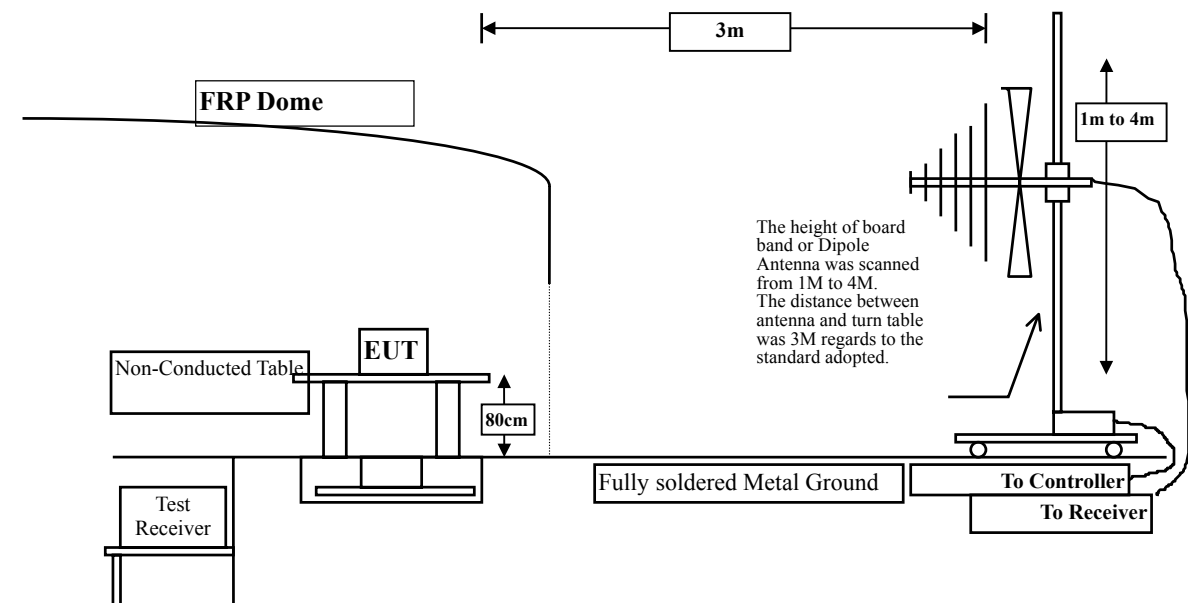
### 4.1. Test Equipment

The following test equipment are used during the radiated emission test:

| Test Site | Equipment           | Manufacturer | Model No./Serial No.  | Last Cal.  |
|-----------|---------------------|--------------|-----------------------|------------|
| Site # 1  | Test Receiver       | R & S        | ESCS 30 / 825442/14   | May, 2004  |
|           | Spectrum Analyzer   | Advantest    | R3261C / 71720140     | May, 2004  |
|           | Pre-Amplifier       | HP           | 8447D/3307A01812      | May, 2004  |
|           | Bilog Antenna       | Chase        | CBL6112B / 12452      | Sep., 2003 |
|           | Horn Antenna        | EM           | EM6917 / 103325       | May, 2004  |
| Site # 2  | Test Receiver       | R & S        | ESCS 30 / 825442/17   | May, 2004  |
|           | Spectrum Analyzer   | Advantest    | R3261C / 71720609     | May, 2004  |
|           | Pre-Amplifier       | HP           | 8447D/3307A01814      | May, 2004  |
|           | Bilog Antenna       | Chase        | CBL6112B / 2455       | Sep., 2003 |
|           | Horn Antenna        | EM           | EM6917 / 103325       | May, 2004  |
| Site # 3  | X Test Receiver     | R & S        | ESI 26 / 838786 / 004 | May, 2004  |
|           | X Spectrum Analyzer | Advantest    | R3162 / 100803480     | May, 2004  |
|           | X Pre-Amplifier     | QTK          | QTK-AMP-03 / 0003     | May, 2004  |
|           | X Bilog Antenna     | SCHAFFNER    | CBL6112B / 2697       | May, 2004  |
|           | X Horn Antenna      | Schwarzbeck  | BBHA9170/708          | July, 2004 |
|           | X Horn Antenna      | ETS          | 3115 / 0005-6160      | Jul., 2004 |
|           | X Pre-Amplifier     | QTK          | QTK-AMP-01 / 0001     | Jul., 2004 |

- Note:
1. All equipments that need to calibrate are with calibration period of 1 year.
  2. Mark "X" test instruments are used to measure the final test results.

### 4.2. Test Setup



### 4.3. Limits

#### ➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

| FCC Part 15 Subpart C Paragraph 15.209(a) Limits |          |           |
|--------------------------------------------------|----------|-----------|
| Frequency<br>MHz                                 | uV/m @3m | dBuV/m@3m |
| 30-88                                            | 100      | 40        |
| 88-216                                           | 150      | 43.5      |
| 216-960                                          | 200      | 46        |
| Above 960                                        | 500      | 54        |

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
  2. In the Above Table, the tighter limit applies at the band edges.
  3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

#### 4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2001 on radiated measurement.

The additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field strength of harmonics measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30 )is 120 kHz, above 1GHz are 1 MHz.

The frequency range from 30MHz to 10th harmonics is checked.

#### 4.5. Uncertainty

The measurement uncertainty is defined as  $\pm 3.8$  dB above 1GHz as  $\pm 3.9$  dB

#### 4.6. Test Result of Radiated Emission

Product : Mini PCI Card  
Test Item : Harmonic Radiated Emission Data  
Test Site : No.3OATS  
Test Mode : Mode 1: Transmitter 11Mbps(Channel 1)

| Frequency               | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|-------------------------|-------|--------|--------|---------|----------|--------|--------|
|                         | Loss  | Factor |        | Level   | Level    |        |        |
| MHz                     | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |
| <b>Horizontal</b>       |       |        |        |         |          |        |        |
| <b>Peak Detector</b>    |       |        |        |         |          |        |        |
| 4824.000                | 4.23  | 31.21  | 34.68  | 45.59   | 46.35    | 27.65  | 74.00  |
| 7236.000                | 5.63  | 35.87  | 34.99  | 43.91   | 50.42    | 23.58  | 74.00  |
| 9648.000                | 7.00  | 37.84  | 35.10  | 43.84   | 53.58    | 20.42  | 74.00  |
| 12060.00                | 8.40  | 38.62  | 34.14  | 43.74   | 56.61    | 17.39  | 74.00  |
| 14472.00                | 9.77  | 40.93  | 34.03  | 36.10   | 52.77    | 21.23  | 74.00  |
| 16884.00                | 11.17 | 36.25  | 34.06  | 39.65   | 53.01    | 20.99  | 74.00  |
| 19296.00                | 11.80 | 36.71  | 33.80  | 38.93   | 53.64    | 20.36  | 74.00  |
| 21708.00                | 11.80 | 37.15  | 33.80  | 38.56   | 53.71    | 20.29  | 74.00  |
| 24120.00                | 11.80 | 37.70  | 33.80  | 38.23   | 53.93    | 20.07  | 74.00  |
| <b>Average Detector</b> |       |        |        |         |          |        |        |
| 12060.00                | 8.40  | 38.62  | 34.14  | 32.50   | 45.37    | 8.63   | 54.00  |
| <b>Vertical</b>         |       |        |        |         |          |        |        |
| <b>Peak Detector</b>    |       |        |        |         |          |        |        |
| 4824.000                | 4.23  | 31.21  | 34.68  | 44.87   | 45.63    | 28.37  | 74.00  |
| 7236.000                | 5.63  | 35.87  | 34.99  | 43.44   | 49.95    | 24.05  | 74.00  |
| 9648.000                | 7.00  | 37.84  | 35.10  | 43.95   | 53.69    | 20.31  | 74.00  |
| 12060.00                | 8.40  | 38.62  | 34.14  | 43.23   | 56.10    | 17.90  | 74.00  |
| 14472.00                | 9.77  | 40.93  | 34.03  | 34.86   | 51.53    | 22.47  | 74.00  |
| 16884.00                | 11.17 | 36.25  | 34.06  | 38.52   | 51.88    | 22.12  | 74.00  |
| 19296.00                | 11.80 | 36.71  | 33.80  | 37.58   | 52.29    | 21.71  | 74.00  |
| 21708.00                | 11.80 | 37.15  | 33.80  | 37.56   | 52.71    | 21.29  | 74.00  |
| 24120.00                | 11.80 | 37.70  | 33.80  | 37.42   | 53.12    | 20.88  | 74.00  |
| <b>Average Detector</b> |       |        |        |         |          |        |        |
| 12060.00                | 8.40  | 38.62  | 34.14  | 32.27   | 45.14    | 8.86   | 54.00  |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Probe Factor + Cable Loss- PreAMP.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Mini PCI Card  
Test Item : Harmonic Radiated Emission Data  
Test Site : No.3 OATS  
Test Mode : Mode 1: Transmitter 11Mbps(Channel 6)

| Frequency               | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|-------------------------|-------|--------|--------|---------|----------|--------|--------|
|                         | Loss  | Factor |        | Level   | Level    |        |        |
| MHz                     | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |
| <b>Horizontal</b>       |       |        |        |         |          |        |        |
| <b>Peak Detector</b>    |       |        |        |         |          |        |        |
| 4874.000                | 4.26  | 31.37  | 34.69  | 44.20   | 45.15    | 28.85  | 74.00  |
| 7311.000                | 5.67  | 36.00  | 35.01  | 43.44   | 50.10    | 23.90  | 74.00  |
| 9748.000                | 7.06  | 37.90  | 35.10  | 44.56   | 54.42    | 19.58  | 74.00  |
| 12185.00                | 8.47  | 38.65  | 34.09  | 43.47   | 56.50    | 17.50  | 74.00  |
| 14622.00                | 9.87  | 40.71  | 34.05  | 35.33   | 51.86    | 22.14  | 74.00  |
| 17059.00                | 11.25 | 36.27  | 34.04  | 38.84   | 52.32    | 21.68  | 74.00  |
| 19496.00                | 11.80 | 36.79  | 33.80  | 37.75   | 52.54    | 21.46  | 74.00  |
| 21933.00                | 11.80 | 37.18  | 33.80  | 37.78   | 52.96    | 21.04  | 74.00  |
| 24370.00                | 11.80 | 37.68  | 33.80  | 37.83   | 53.51    | 20.49  | 74.00  |
| <b>Average Detector</b> |       |        |        |         |          |        |        |
| 9748.000                | 7.06  | 37.90  | 35.10  | 33.33   | 43.19    | 10.81  | 54.00  |
| 12185.00                | 8.47  | 38.65  | 34.09  | 32.90   | 45.93    | 8.07   | 54.00  |
| <b>Vertical</b>         |       |        |        |         |          |        |        |
| <b>Peak Detector</b>    |       |        |        |         |          |        |        |
| 4874.000                | 4.26  | 31.37  | 34.69  | 43.98   | 44.93    | 29.07  | 74.00  |
| 7311.000                | 5.67  | 36.00  | 35.01  | 43.23   | 49.89    | 24.11  | 74.00  |
| 9748.000                | 7.06  | 37.90  | 35.10  | 43.80   | 53.66    | 20.34  | 74.00  |
| 12185.00                | 8.47  | 38.65  | 34.09  | 43.83   | 56.86    | 17.14  | 74.00  |
| 14622.00                | 9.87  | 40.71  | 34.05  | 34.58   | 51.11    | 22.89  | 74.00  |
| 17059.00                | 11.25 | 36.27  | 34.04  | 38.25   | 51.73    | 22.27  | 74.00  |
| 19496.00                | 11.80 | 36.79  | 33.80  | 37.71   | 52.50    | 21.50  | 74.00  |
| 21933.00                | 11.80 | 37.18  | 33.80  | 37.80   | 52.98    | 21.02  | 74.00  |
| 24370.00                | 11.80 | 37.68  | 33.80  | 37.69   | 53.37    | 20.63  | 74.00  |
| <b>Average Detector</b> |       |        |        |         |          |        |        |
| 12185.00                | 8.47  | 38.65  | 34.09  | 32.63   | 45.66    | 8.34   | 54.00  |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz ◦
4. Emission Level = Reading Level + Probe Factor + Cable Loss- PreAMP.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Mini PCI Card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 11Mbps(Channel 11)

| Frequency               | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|-------------------------|-------|--------|--------|---------|----------|--------|--------|
|                         | Loss  | Factor |        | Level   | Level    |        |        |
| MHz                     | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |
| <b>Horizontal</b>       |       |        |        |         |          |        |        |
| <b>Peak Detector</b>    |       |        |        |         |          |        |        |
| 4924.000                | 4.31  | 31.43  | 34.69  | 42.83   | 43.88    | 30.12  | 74.00  |
| 7386.000                | 5.72  | 36.12  | 35.02  | 42.86   | 49.68    | 24.32  | 74.00  |
| 9848.000                | 7.13  | 38.00  | 35.07  | 43.88   | 53.94    | 20.06  | 74.00  |
| 12310.00                | 8.53  | 38.68  | 34.03  | 43.18   | 56.36    | 17.64  | 74.00  |
| 14772.00                | 9.95  | 40.50  | 34.05  | 35.11   | 51.50    | 22.50  | 74.00  |
| 17234.00                | 11.35 | 36.23  | 34.02  | 38.19   | 51.75    | 22.25  | 74.00  |
| 19696.00                | 11.80 | 36.84  | 33.80  | 37.88   | 52.72    | 21.28  | 74.00  |
| 22158.00                | 11.80 | 37.18  | 33.80  | 37.98   | 53.16    | 20.84  | 74.00  |
| 24620.00                | 11.80 | 37.66  | 33.80  | 37.71   | 53.37    | 20.63  | 74.00  |
| <b>Average Detector</b> |       |        |        |         |          |        |        |
| 12310.00                | 8.53  | 38.68  | 34.03  | 32.73   | 45.91    | 8.09   | 54.00  |
| <b>Vertical</b>         |       |        |        |         |          |        |        |
| <b>Peak Detector</b>    |       |        |        |         |          |        |        |
| 4924.000                | 4.31  | 31.43  | 34.69  | 43.19   | 44.24    | 29.76  | 74.00  |
| 7386.000                | 5.72  | 36.12  | 35.02  | 42.61   | 49.43    | 24.57  | 74.00  |
| 9848.000                | 7.13  | 38.00  | 35.07  | 43.80   | 53.86    | 20.14  | 74.00  |
| 12310.00                | 8.53  | 38.68  | 34.03  | 43.66   | 56.84    | 17.16  | 74.00  |
| 14772.00                | 9.95  | 40.50  | 34.05  | 35.00   | 51.39    | 22.61  | 74.00  |
| 17234.00                | 11.35 | 36.23  | 34.02  | 38.35   | 51.91    | 22.09  | 74.00  |
| 19696.00                | 11.80 | 36.84  | 33.80  | 37.71   | 52.55    | 21.45  | 74.00  |
| 22158.00                | 11.80 | 37.18  | 33.80  | 37.85   | 53.03    | 20.97  | 74.00  |
| 24620.00                | 11.80 | 37.66  | 33.80  | 37.96   | 53.62    | 20.38  | 74.00  |
| <b>Average Detector</b> |       |        |        |         |          |        |        |
| 12310.00                | 8.53  | 38.68  | 34.03  | 32.21   | 45.39    | 8.61   | 54.00  |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Probe Factor + Cable Loss- PreAMP.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Mini PCI Card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmitter 54Mbps (Channel 1)

| Frequency               | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|-------------------------|-------|--------|--------|---------|----------|--------|--------|
|                         | Loss  | Factor |        | Level   | Level    |        |        |
| MHz                     | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |
| <b>Horizontal</b>       |       |        |        |         |          |        |        |
| <b>Peak Detector</b>    |       |        |        |         |          |        |        |
| 4824.000                | 4.23  | 31.21  | 34.68  | 43.03   | 43.79    | 30.21  | 74.00  |
| 7236.000                | 5.63  | 35.87  | 34.99  | 45.00   | 51.51    | 22.49  | 74.00  |
| 9648.000                | 7.00  | 37.84  | 35.10  | 43.55   | 53.29    | 20.71  | 74.00  |
| 12060.00                | 8.40  | 38.62  | 34.14  | 40.56   | 53.43    | 20.57  | 74.00  |
| 14472.00                | 9.77  | 40.93  | 34.03  | 34.80   | 51.47    | 22.53  | 74.00  |
| 16884.00                | 11.17 | 36.25  | 34.06  | 38.50   | 51.86    | 22.14  | 74.00  |
| 19296.00                | 11.80 | 36.71  | 33.80  | 37.40   | 52.11    | 21.89  | 74.00  |
| 21708.00                | 11.80 | 37.15  | 33.80  | 37.56   | 52.71    | 21.29  | 74.00  |
| 24120.00                | 11.80 | 37.70  | 33.80  | 37.42   | 53.12    | 20.88  | 74.00  |
| <b>Average Detector</b> |       |        |        |         |          |        |        |
| ---                     |       |        |        |         |          |        |        |
| <b>Vertical</b>         |       |        |        |         |          |        |        |
| <b>Peak Detector</b>    |       |        |        |         |          |        |        |
| 4824.000                | 4.23  | 31.21  | 34.68  | 43.91   | 44.67    | 29.33  | 74.00  |
| 7236.000                | 5.63  | 35.87  | 34.99  | 43.71   | 50.22    | 23.78  | 74.00  |
| 9648.000                | 7.00  | 37.84  | 35.10  | 43.98   | 53.72    | 20.28  | 74.00  |
| 12060.00                | 8.40  | 38.62  | 34.14  | 40.86   | 53.73    | 20.27  | 74.00  |
| 14472.00                | 9.77  | 40.93  | 34.03  | 34.86   | 51.53    | 22.47  | 74.00  |
| 16884.00                | 11.17 | 36.25  | 34.06  | 38.52   | 51.88    | 22.12  | 74.00  |
| 19296.00                | 11.80 | 36.71  | 33.80  | 37.59   | 52.30    | 21.70  | 74.00  |
| 21708.00                | 11.80 | 37.15  | 33.80  | 37.56   | 52.71    | 21.29  | 74.00  |
| 24120.00                | 11.80 | 37.70  | 33.80  | 37.62   | 53.32    | 20.68  | 74.00  |
| <b>Average Detector</b> |       |        |        |         |          |        |        |
| ---                     |       |        |        |         |          |        |        |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Probe Factor + Cable Loss- PreAMP.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Mini PCI Card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 54Mbps (Channel 6)

| Frequency            | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|----------------------|-------|--------|--------|---------|----------|--------|--------|
|                      | Loss  | Factor |        | Level   | Level    |        |        |
| MHz                  | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |
| <b>Horizontal</b>    |       |        |        |         |          |        |        |
| <b>Peak Detector</b> |       |        |        |         |          |        |        |
| 4874.000             | 4.26  | 31.37  | 34.69  | 44.44   | 45.39    | 28.61  | 74.00  |
| 7311.000             | 5.67  | 36.00  | 35.01  | 42.80   | 49.46    | 24.54  | 74.00  |
| 9748.000             | 7.06  | 37.90  | 35.10  | 43.19   | 53.05    | 20.95  | 74.00  |
| 12185.00             | 8.47  | 38.65  | 34.09  | 40.16   | 53.19    | 20.81  | 74.00  |
| 14622.00             | 9.87  | 40.71  | 34.05  | 35.07   | 51.60    | 22.40  | 74.00  |
| 17059.00             | 11.25 | 36.27  | 34.04  | 38.15   | 51.63    | 22.37  | 74.00  |
| 19496.00             | 11.80 | 36.79  | 33.80  | 37.46   | 52.25    | 21.75  | 74.00  |
| 21933.00             | 11.80 | 37.18  | 33.80  | 37.75   | 52.93    | 21.07  | 74.00  |
| 24370.00             | 11.80 | 37.68  | 33.80  | 37.69   | 53.37    | 20.63  | 74.00  |

**Average Detector**

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**Vertical**

**Peak Detector**

|          |       |       |       |       |       |       |       |
|----------|-------|-------|-------|-------|-------|-------|-------|
| 4874.000 | 4.26  | 31.37 | 34.69 | 43.18 | 44.13 | 29.87 | 74.00 |
| 7311.000 | 5.67  | 36.00 | 35.01 | 42.51 | 49.17 | 24.83 | 74.00 |
| 9748.000 | 7.06  | 37.90 | 35.10 | 43.59 | 53.45 | 20.55 | 74.00 |
| 12185.00 | 8.47  | 38.65 | 34.09 | 40.30 | 53.33 | 20.67 | 74.00 |
| 14622.00 | 9.87  | 40.71 | 34.05 | 34.59 | 51.12 | 22.88 | 74.00 |
| 17059.00 | 11.25 | 36.27 | 34.04 | 38.29 | 51.77 | 22.23 | 74.00 |
| 19496.00 | 11.80 | 36.79 | 33.80 | 37.71 | 52.50 | 21.50 | 74.00 |
| 21933.00 | 11.80 | 37.18 | 33.80 | 37.75 | 52.93 | 21.07 | 74.00 |
| 24370.00 | 11.80 | 37.68 | 33.80 | 37.69 | 53.37 | 20.63 | 74.00 |

**Average Detector**

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Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Probe Factor + Cable Loss- PreAMP.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Mini PCI Card  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 54Mbps(Channel 11)

| Frequency            | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|----------------------|-------|--------|--------|---------|----------|--------|--------|
|                      | Loss  | Factor |        | Level   | Level    |        |        |
| MHz                  | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |
| <b>Horizontal</b>    |       |        |        |         |          |        |        |
| <b>Peak Detector</b> |       |        |        |         |          |        |        |
| 4924.000             | 4.31  | 31.43  | 34.69  | 44.09   | 45.14    | 28.86  | 74.00  |
| 7386.000             | 5.72  | 36.12  | 35.02  | 42.82   | 49.64    | 24.36  | 74.00  |
| 9848.000             | 7.13  | 38.00  | 35.07  | 43.69   | 53.75    | 20.25  | 74.00  |
| 12310.00             | 8.53  | 38.68  | 34.03  | 40.75   | 53.93    | 20.07  | 74.00  |
| 14772.00             | 9.95  | 40.50  | 34.05  | 34.68   | 51.07    | 22.93  | 74.00  |
| 17234.00             | 11.35 | 36.23  | 34.02  | 37.83   | 51.39    | 22.61  | 74.00  |
| 19696.00             | 11.80 | 36.84  | 33.80  | 37.22   | 52.06    | 21.94  | 74.00  |
| 22158.00             | 11.80 | 37.18  | 33.80  | 37.70   | 52.88    | 21.12  | 74.00  |
| 24620.00             | 11.80 | 37.66  | 33.80  | 37.96   | 53.62    | 20.38  | 74.00  |

#### Average Detector

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#### Vertical

##### Peak Detector

|          |       |       |       |       |       |       |       |
|----------|-------|-------|-------|-------|-------|-------|-------|
| 4924.000 | 4.31  | 31.43 | 34.69 | 43.04 | 44.09 | 29.91 | 74.00 |
| 7386.000 | 5.72  | 36.12 | 35.02 | 43.68 | 50.50 | 23.50 | 74.00 |
| 9848.000 | 7.13  | 38.00 | 35.07 | 43.68 | 53.74 | 20.26 | 74.00 |
| 12310.00 | 8.53  | 38.68 | 34.03 | 40.68 | 53.86 | 20.14 | 74.00 |
| 14772.00 | 9.95  | 40.50 | 34.05 | 35.38 | 51.77 | 22.23 | 74.00 |
| 17234.00 | 11.35 | 36.23 | 34.02 | 38.25 | 51.81 | 22.19 | 74.00 |
| 19696.00 | 11.80 | 36.84 | 33.80 | 37.39 | 52.23 | 21.77 | 74.00 |
| 22158.00 | 11.80 | 37.18 | 33.80 | 37.61 | 52.79 | 21.21 | 74.00 |
| 24620.00 | 11.80 | 37.66 | 33.80 | 37.96 | 53.62 | 20.38 | 74.00 |

#### Average Detector

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#### Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz °
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz °
4. Emission Level = Reading Level + Probe Factor + Cable Loss- PreAMP.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Mini PCI Card  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 11Mbps (Channel 1)

| Frequency          | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|--------------------|-------|--------|--------|---------|----------|--------|--------|
|                    | Loss  | Factor |        | Level   | Level    |        |        |
| MHz                | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |
| =====              |       |        |        |         |          |        |        |
| <b>Horizontal:</b> |       |        |        |         |          |        |        |
| 99.840             | 1.23  | 11.55  | 0.00   | 14.52   | 27.30    | 16.20  | 43.50  |
| * 132.820          | 1.40  | 11.49  | 0.00   | 23.12   | 36.01    | 7.49   | 43.50  |
| 502.390            | 3.30  | 16.37  | 0.00   | 10.30   | 29.97    | 16.03  | 46.00  |
| 613.940            | 3.88  | 18.33  | 0.00   | 8.98    | 31.19    | 14.81  | 46.00  |
| 669.230            | 4.16  | 18.27  | 0.00   | 9.96    | 32.39    | 13.61  | 46.00  |
| 801.150            | 4.84  | 19.20  | 0.00   | 7.15    | 31.20    | 14.80  | 46.00  |
| <b>Vertical:</b>   |       |        |        |         |          |        |        |
| * 132.820          | 1.40  | 10.55  | 0.00   | 20.32   | 32.27    | 11.23  | 43.50  |
| 446.130            | 3.01  | 17.05  | 0.00   | 9.18    | 29.24    | 16.76  | 46.00  |
| 545.070            | 3.52  | 18.61  | 0.00   | 5.35    | 27.48    | 18.52  | 46.00  |
| 605.210            | 3.83  | 19.49  | 0.00   | 4.79    | 28.11    | 17.89  | 46.00  |
| 914.640            | 5.43  | 21.26  | 0.00   | 2.71    | 29.39    | 16.61  | 46.00  |
| 980.600            | 5.77  | 19.94  | 0.00   | 3.99    | 29.70    | 24.30  | 54.00  |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 11Mbps (Channel 6)

| Frequency          | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|--------------------|-------|--------|--------|---------|----------|--------|--------|
|                    | Loss  | Factor |        | Level   | Level    |        |        |
| MHz                | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |
| =====              |       |        |        |         |          |        |        |
| <b>Horizontal:</b> |       |        |        |         |          |        |        |
| 99.840             | 1.23  | 11.55  | 0.00   | 13.95   | 26.73    | 16.77  | 43.50  |
| * 133.790          | 1.40  | 11.39  | 0.00   | 22.55   | 35.34    | 8.16   | 43.50  |
| 500.450            | 3.29  | 16.26  | 0.00   | 12.38   | 31.93    | 14.07  | 46.00  |
| 669.230            | 4.16  | 18.27  | 0.00   | 9.60    | 32.03    | 13.97  | 46.00  |
| 701.240            | 4.33  | 18.10  | 0.00   | 12.29   | 34.72    | 11.28  | 46.00  |
| 987.390            | 5.80  | 20.60  | 0.00   | 3.61    | 30.02    | 23.98  | 54.00  |
| <b>Vertical:</b>   |       |        |        |         |          |        |        |
| * 132.820          | 1.40  | 10.55  | 0.00   | 19.87   | 31.82    | 11.68  | 43.50  |
| 364.650            | 2.59  | 14.64  | 0.00   | 10.13   | 27.37    | 18.63  | 46.00  |
| 446.130            | 3.01  | 17.05  | 0.00   | 7.59    | 27.65    | 18.35  | 46.00  |
| 656.620            | 4.10  | 17.65  | 0.00   | 6.56    | 28.31    | 17.69  | 46.00  |
| 757.500            | 4.62  | 20.38  | 0.00   | 3.48    | 28.48    | 17.52  | 46.00  |
| 937.920            | 5.55  | 21.15  | 0.00   | 2.08    | 28.78    | 17.22  | 46.00  |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 11Mbps (Channel 11)

| Frequency | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|-----------|-------|--------|--------|---------|----------|--------|--------|
|           | Loss  | Factor |        | Level   | Level    |        |        |
| MHz       | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |

**Horizontal:**

|           |      |       |      |       |       |       |       |
|-----------|------|-------|------|-------|-------|-------|-------|
| 99.840    | 1.23 | 11.55 | 0.00 | 14.99 | 27.77 | 15.73 | 43.50 |
| * 133.790 | 1.40 | 11.39 | 0.00 | 23.77 | 36.56 | 6.94  | 43.50 |
| 446.130   | 3.01 | 16.16 | 0.00 | 11.99 | 31.17 | 14.83 | 46.00 |
| 543.130   | 3.51 | 17.80 | 0.00 | 10.75 | 32.06 | 13.94 | 46.00 |
| 577.080   | 3.69 | 17.62 | 0.00 | 13.54 | 34.85 | 11.15 | 46.00 |
| 601.330   | 3.81 | 17.66 | 0.00 | 11.16 | 32.63 | 13.37 | 46.00 |

**Vertical:**

|           |      |       |      |       |       |       |       |
|-----------|------|-------|------|-------|-------|-------|-------|
| * 133.790 | 1.40 | 10.49 | 0.00 | 19.75 | 31.65 | 11.85 | 43.50 |
| 543.130   | 3.51 | 18.49 | 0.00 | 9.46  | 31.46 | 14.54 | 46.00 |
| 577.080   | 3.69 | 19.37 | 0.00 | 8.37  | 31.43 | 14.57 | 46.00 |
| 613.940   | 3.88 | 19.33 | 0.00 | 9.55  | 32.76 | 13.24 | 46.00 |
| 701.240   | 4.33 | 18.30 | 0.00 | 6.74  | 29.37 | 16.63 | 46.00 |
| 945.680   | 5.59 | 20.98 | 0.00 | 3.48  | 30.05 | 15.95 | 46.00 |

**Note:**

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 54Mbps (Channel 1)

| Frequency          | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|--------------------|-------|--------|--------|---------|----------|--------|--------|
|                    | Loss  | Factor |        | Level   | Level    |        |        |
| MHz                | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |
| =====              |       |        |        |         |          |        |        |
| <b>Horizontal:</b> |       |        |        |         |          |        |        |
| 100.810            | 1.23  | 11.33  | 0.00   | 13.75   | 26.31    | 17.19  | 43.50  |
| * 133.790          | 1.40  | 11.39  | 0.00   | 21.65   | 34.44    | 9.06   | 43.50  |
| 400.540            | 2.78  | 14.85  | 0.00   | 13.70   | 31.33    | 14.67  | 46.00  |
| 577.080            | 3.69  | 17.62  | 0.00   | 10.08   | 31.39    | 14.61  | 46.00  |
| 611.030            | 3.86  | 18.12  | 0.00   | 10.59   | 32.57    | 13.43  | 46.00  |
| 669.230            | 4.16  | 18.27  | 0.00   | 9.37    | 31.80    | 14.20  | 46.00  |
| <b>Vertical:</b>   |       |        |        |         |          |        |        |
| 99.840             | 1.23  | 9.76   | 0.00   | 14.62   | 25.61    | 17.89  | 43.50  |
| * 132.820          | 1.40  | 10.55  | 0.00   | 18.65   | 30.60    | 12.90  | 43.50  |
| 298.690            | 2.25  | 12.14  | 0.00   | 14.90   | 29.30    | 16.70  | 46.00  |
| 475.230            | 3.16  | 16.56  | 0.00   | 9.13    | 28.85    | 17.15  | 46.00  |
| 577.080            | 3.69  | 19.37  | 0.00   | 8.00    | 31.06    | 14.94  | 46.00  |
| 669.230            | 4.16  | 17.66  | 0.00   | 9.39    | 31.21    | 14.79  | 46.00  |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 54Mbps (Channel 6)

| Frequency          | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|--------------------|-------|--------|--------|---------|----------|--------|--------|
|                    | Loss  | Factor |        | Level   | Level    |        |        |
| MHz                | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |
| =====              |       |        |        |         |          |        |        |
| <b>Horizontal:</b> |       |        |        |         |          |        |        |
| 99.840             | 1.23  | 11.55  | 0.00   | 13.34   | 26.12    | 17.38  | 43.50  |
| * 133.790          | 1.40  | 11.39  | 0.00   | 21.95   | 34.74    | 8.76   | 43.50  |
| 401.510            | 2.78  | 14.76  | 0.00   | 13.50   | 31.05    | 14.95  | 46.00  |
| 601.330            | 3.81  | 17.66  | 0.00   | 11.60   | 33.07    | 12.93  | 46.00  |
| 669.230            | 4.16  | 18.27  | 0.00   | 12.03   | 34.46    | 11.54  | 46.00  |
| 696.390            | 4.30  | 18.48  | 0.00   | 10.42   | 33.20    | 12.80  | 46.00  |
| <b>Vertical:</b>   |       |        |        |         |          |        |        |
| 133.790            | 1.40  | 10.49  | 0.00   | 16.06   | 27.96    | 15.54  | 43.50  |
| 300.630            | 2.26  | 12.06  | 0.00   | 13.01   | 27.33    | 18.67  | 46.00  |
| 390.630            | 2.73  | 15.45  | 0.00   | 9.15    | 27.33    | 18.67  | 46.00  |
| * 577.080          | 3.69  | 19.37  | 0.00   | 9.34    | 32.40    | 13.60  | 46.00  |
| 613.940            | 3.88  | 19.33  | 0.00   | 8.99    | 32.20    | 13.80  | 46.00  |
| 669.230            | 4.16  | 17.66  | 0.00   | 10.09   | 31.91    | 14.09  | 46.00  |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss.

Product : Mini PCI Card  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 54Mbps (Channel 11)

| Frequency          | Cable | Probe  | PreAMP | Reading | Emission | Margin | Limit  |
|--------------------|-------|--------|--------|---------|----------|--------|--------|
|                    | Loss  | Factor |        | Level   | Level    |        |        |
| MHz                | dB    | dB/m   | dB     | dBuV    | dBuV/m   | dB     | dBuV/m |
| =====              |       |        |        |         |          |        |        |
| <b>Horizontal:</b> |       |        |        |         |          |        |        |
| 99.840             | 1.23  | 11.55  | 0.00   | 13.56   | 26.34    | 17.16  | 43.50  |
| * 132.820          | 1.40  | 11.49  | 0.00   | 22.09   | 34.98    | 8.52   | 43.50  |
| 389.870            | 2.72  | 14.12  | 0.00   | 13.53   | 30.37    | 15.63  | 46.00  |
| 543.130            | 3.51  | 17.80  | 0.00   | 9.91    | 31.22    | 14.78  | 46.00  |
| 611.030            | 3.86  | 18.12  | 0.00   | 11.10   | 33.08    | 12.92  | 46.00  |
| 669.230            | 4.16  | 18.27  | 0.00   | 10.39   | 32.82    | 13.18  | 46.00  |
| <b>Vertical:</b>   |       |        |        |         |          |        |        |
| 133.790            | 1.40  | 10.49  | 0.00   | 15.62   | 27.52    | 15.98  | 43.50  |
| 390.840            | 2.73  | 15.45  | 0.00   | 11.02   | 29.20    | 16.80  | 46.00  |
| 543.130            | 3.51  | 18.49  | 0.00   | 7.87    | 29.87    | 16.13  | 46.00  |
| 577.080            | 3.69  | 19.37  | 0.00   | 7.91    | 30.97    | 15.03  | 46.00  |
| * 613.940          | 3.88  | 19.33  | 0.00   | 8.66    | 31.87    | 14.13  | 46.00  |
| 669.230            | 4.16  | 17.66  | 0.00   | 9.49    | 31.31    | 14.69  | 46.00  |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss.

## 5. Band Edge

### 5.1. Test Equipment

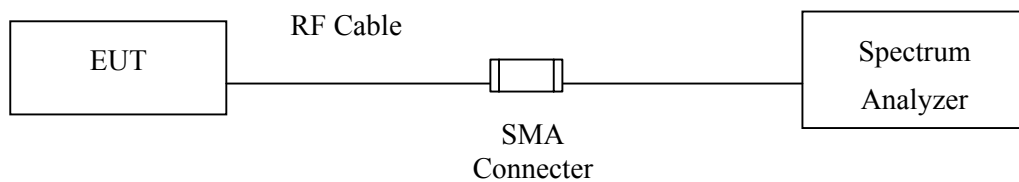
The following test equipments are used during the band edge tests:

| Equipment           | Manufacturer | Model No./Serial No. | Last Cal.  |
|---------------------|--------------|----------------------|------------|
| X Spectrum Analyzer | Advantest    | R3272 / 72421194     | May, 2004  |
| X Test Receiver     | R & S        | ESCS 30 / 825442/14  | May, 2004  |
| X Spectrum Analyzer | Advantest    | R3261C / 71720140    | May, 2004  |
| X Pre-Amplifier     | HP           | 8447D/3307A01812     | May, 2004  |
| X Bilog Antenna     | Chase        | CBL6112B / 12452     | Sep., 2003 |
| X Horn Antenna      | EM           | EM6917 / 103325      | May, 2004  |

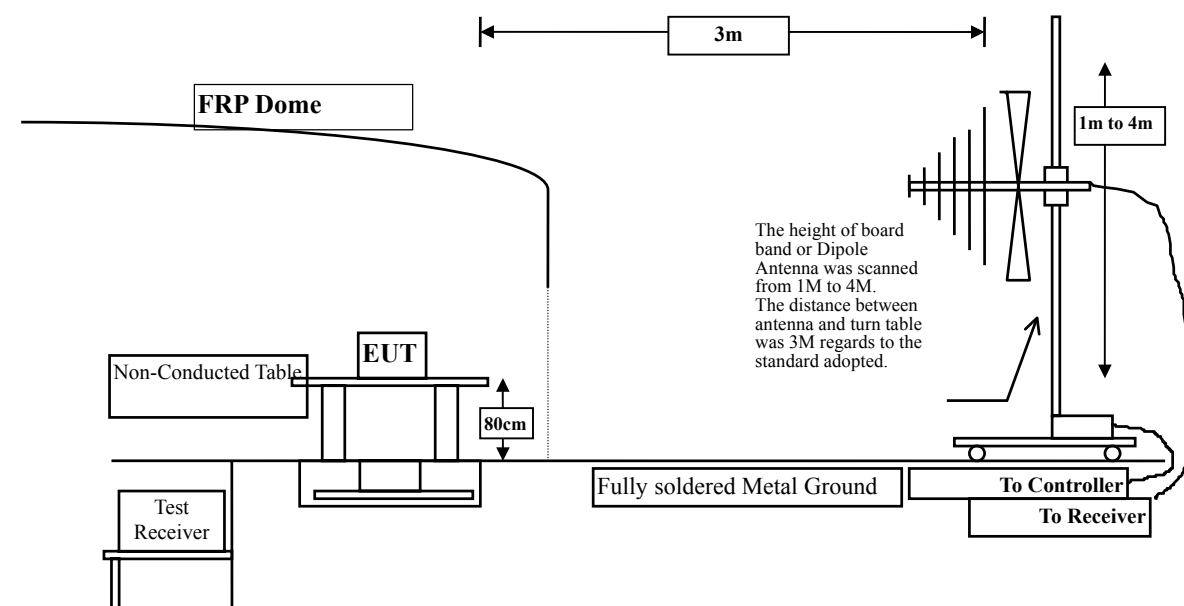
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.  
2. Mark "X" test instruments are used to measure the final test results.

### 5.2. Test Setup

#### RF Conducted Measurement:



#### RF Radiated Measurement:



### **5.3. Limits**

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

### **5.4. Test Procedure**

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2001 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30 )is 120 kHz, above 1GHz are 1 MHz.

### **5.5. Uncertainty**

The measurement uncertainty is defined as  $\pm 1$  MHz

## 5.6. Test Result of Band Edge

Product : Mini PCI Card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 11Mbps

### RF Radiated Measurement:

| Channel No.    | Frequency (MHz) | Required Limit (dBc) | Result |
|----------------|-----------------|----------------------|--------|
| 1 (Horizontal) | <2400           | >20                  | Pass   |
| 1 (Vertical)   | <2400           | >20                  | Pass   |

Figure Channel 1:

(Horizontal)

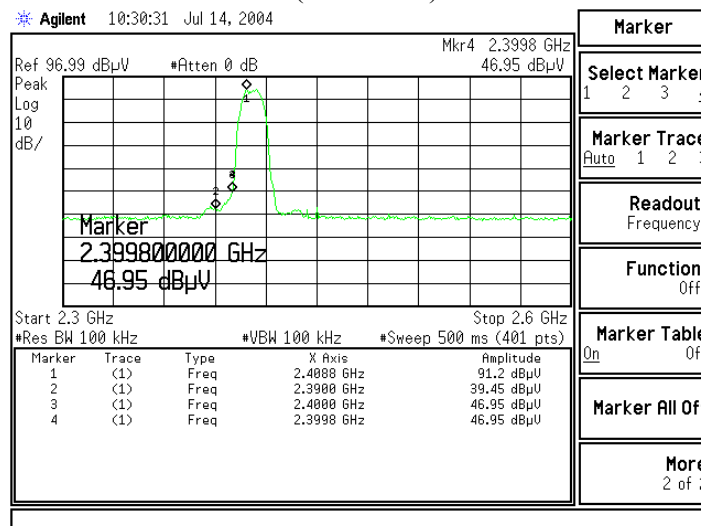
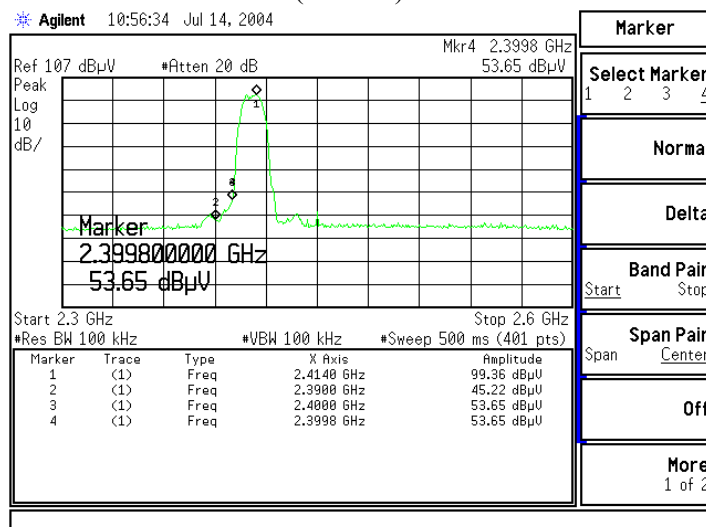


Figure Channel 1:

(Vertical)



Product : Mini PCI Card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 11Mbps

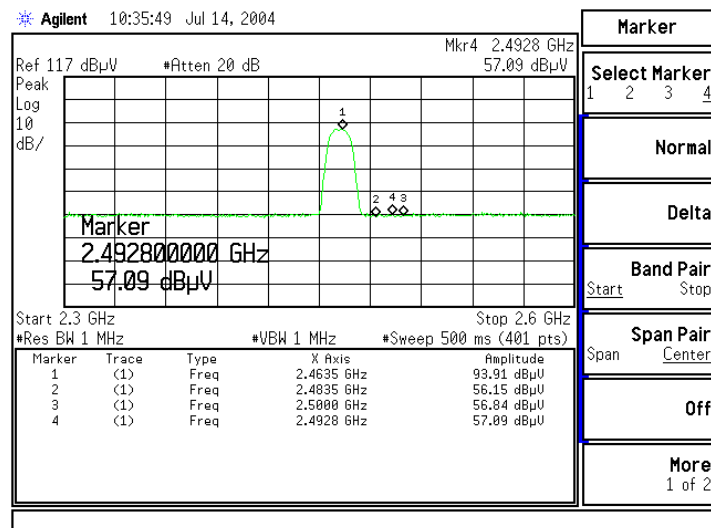
**RF Radiated Measurement (Peak):**

| Channel No.    | Frequency (MHz) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|----------------|-----------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11(Horizontal) | 2492.800        | 57.09                | 52.54                   | 74.00               | 54.00                  | Pass   |
| 11(Vertical)   | 2486.800        | 58.27                | 53.72                   | 74.00               | 54.00                  | Pass   |

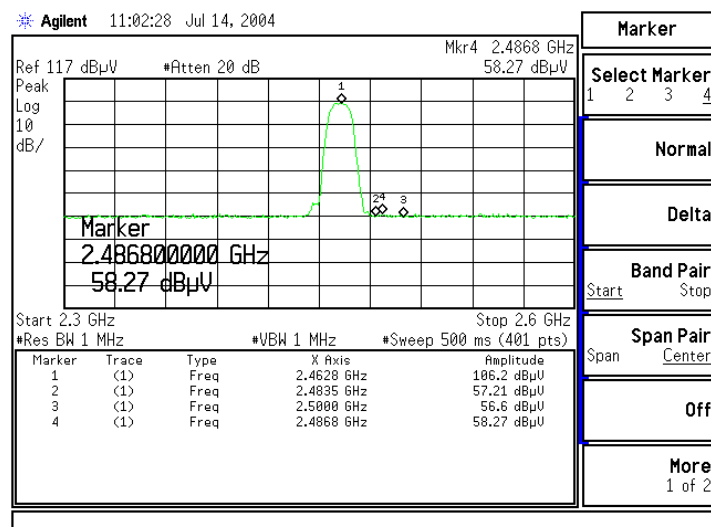
**RF Radiated Measurement (Average):**

| Channel No.    | Frequency (MHz) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|----------------|-----------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11(Horizontal) | --              | --                   | --                      | 74.00               | 54.00                  | Pass   |
| 11(Vertical)   | --              | --                   | --                      | 74.00               | 54.00                  | Pass   |

**Figure Channel 11:** (Horizontal)



**Figure Channel 11:** (Vertical)

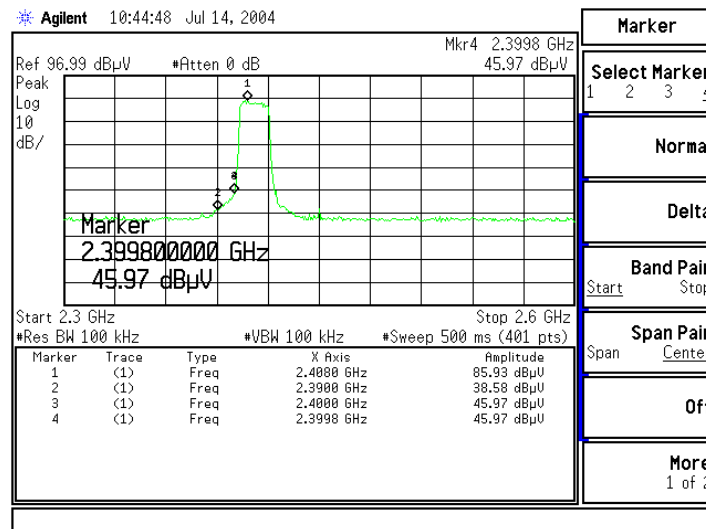


Product : Mini PCI Card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 54Mbps

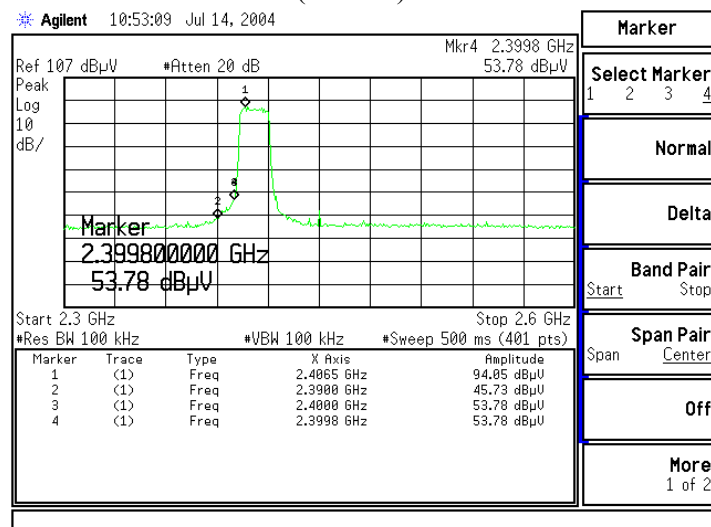
**RF Radiated Measurement:**

| Channel No.    | Frequency (MHz) | Required Limit (dBc) | Result |
|----------------|-----------------|----------------------|--------|
| 1 (Horizontal) | <2400           | >20                  | Pass   |
| 1 (Vertical)   | <2400           | >20                  | Pass   |

**Figure Channel 1:** (Horizontal)



**Figure Channel 1:** (Vertical)



Product : Mini PCI Card  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 54Mbps

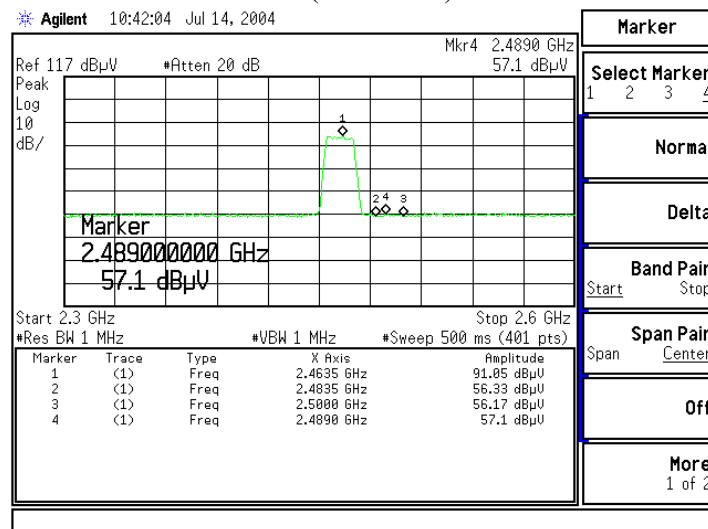
**RF Radiated Measurement (Peak):**

| Channel No.    | Frequency (MHz) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|----------------|-----------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11(Horizontal) | 2489.00         | 57.10                | 52.55                   | 74.00               | 54.00                  | Pass   |
| 11(Vertical)   | 2485.300        | 58.57                | 54.02                   | 74.00               | 54.00                  | Pass   |

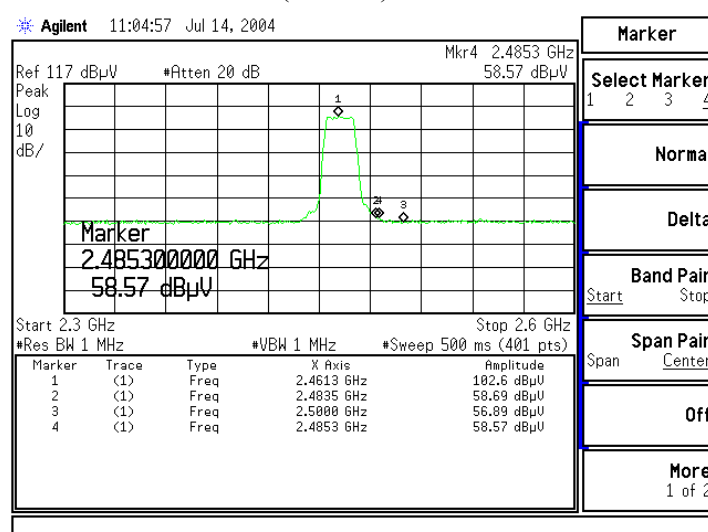
**RF Radiated Measurement (Average):**

| Channel No.    | Frequency (MHz) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|----------------|-----------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11(Horizontal) | --              | --                   | --                      | 74.00               | 54.00                  | Pass   |
| 11(Vertical)   | 2485.300        | 48.03                | 43.48                   | 74.00               | 54.00                  | Pass   |

**Figure Channel 11:** (Horizontal)



**Figure Channel 11:** (Vertical)



Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

## 6. Occupied Bandwidth

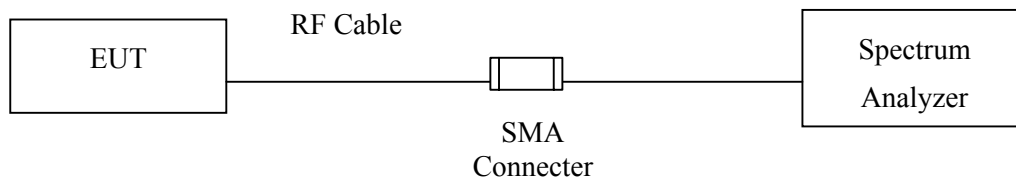
### 6.1. Test Equipment

The following test equipments are used during the radiated emission tests:

|   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal. |
|---|-------------------|--------------|----------------------|-----------|
| X | Spectrum Analyzer | Advantest    | R3272 / 72421194     | May, 2004 |

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.  
2. Mark "X" test instruments are used to measure the final test results.

### 6.2. Test Setup



### 6.3. Limits

The minimum bandwidth shall be at least 500kHz.

### 6.4. Uncertainty

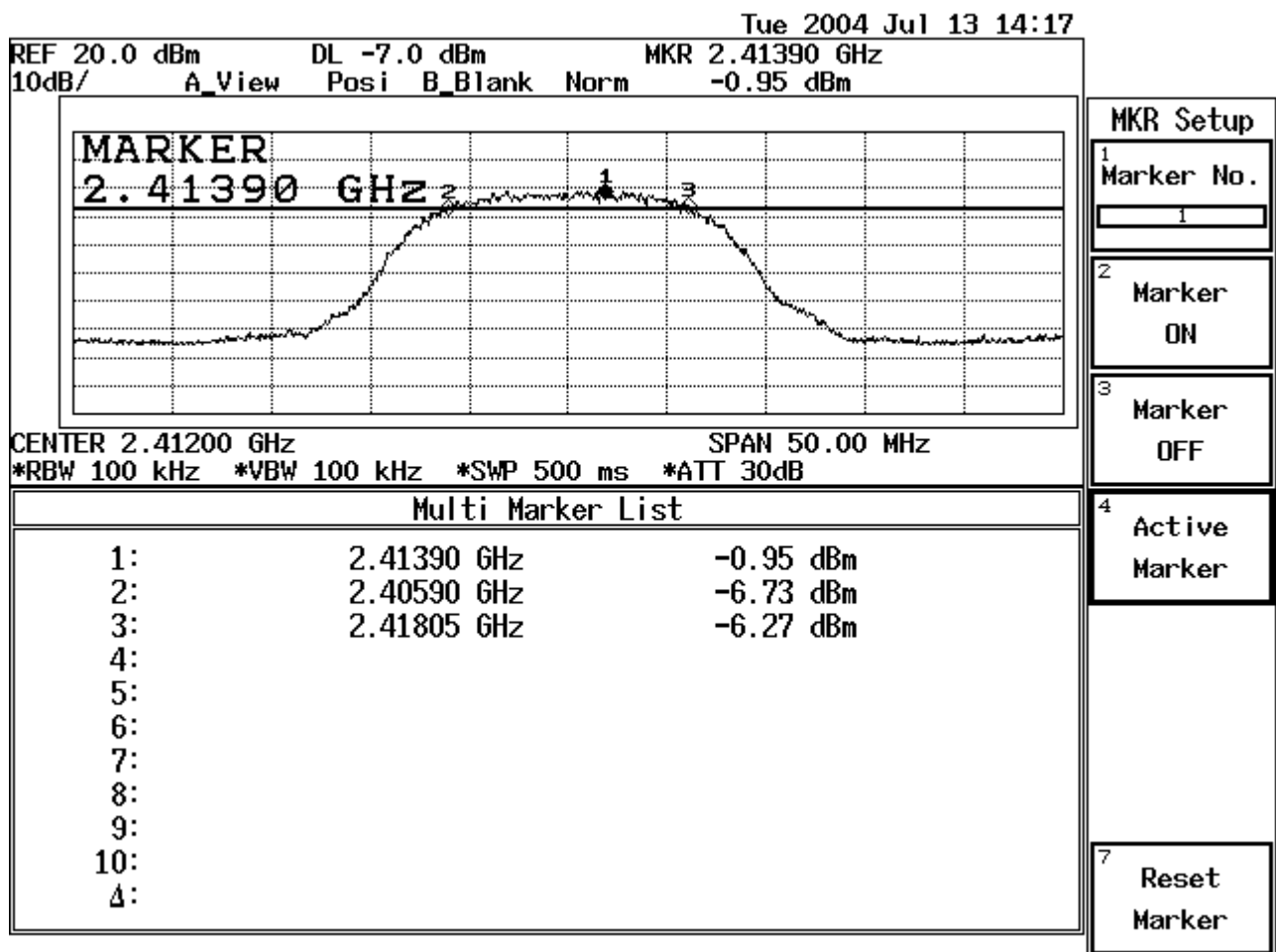
The measurement uncertainty is defined as  $\pm 1.27$  dB

## 6.5. Test Result of Occupied Bandwidth

Product : Mini PCI Card  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Transmitter 11Mbps (Channel 1)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 1 (11Mbps)  | 2412.00         | 12150                   | >500                 | Pass   |

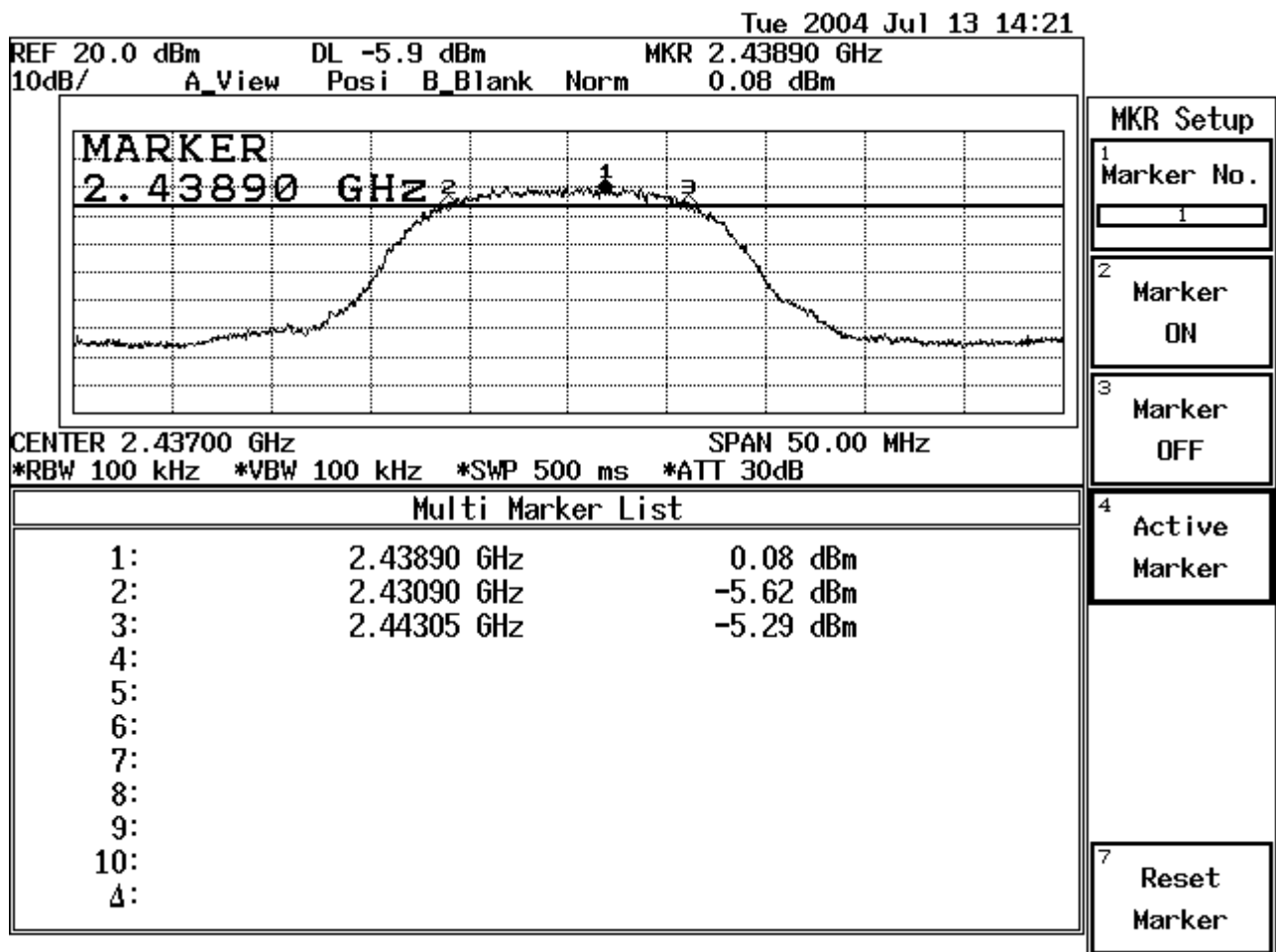
Figure Channel 1: 11Mbps



Product : Mini PCI Card  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Transmitter 11Mbps (Channel 6)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6 (11Mbps)  | 2437.00         | 12150                   | >500                 | Pass   |

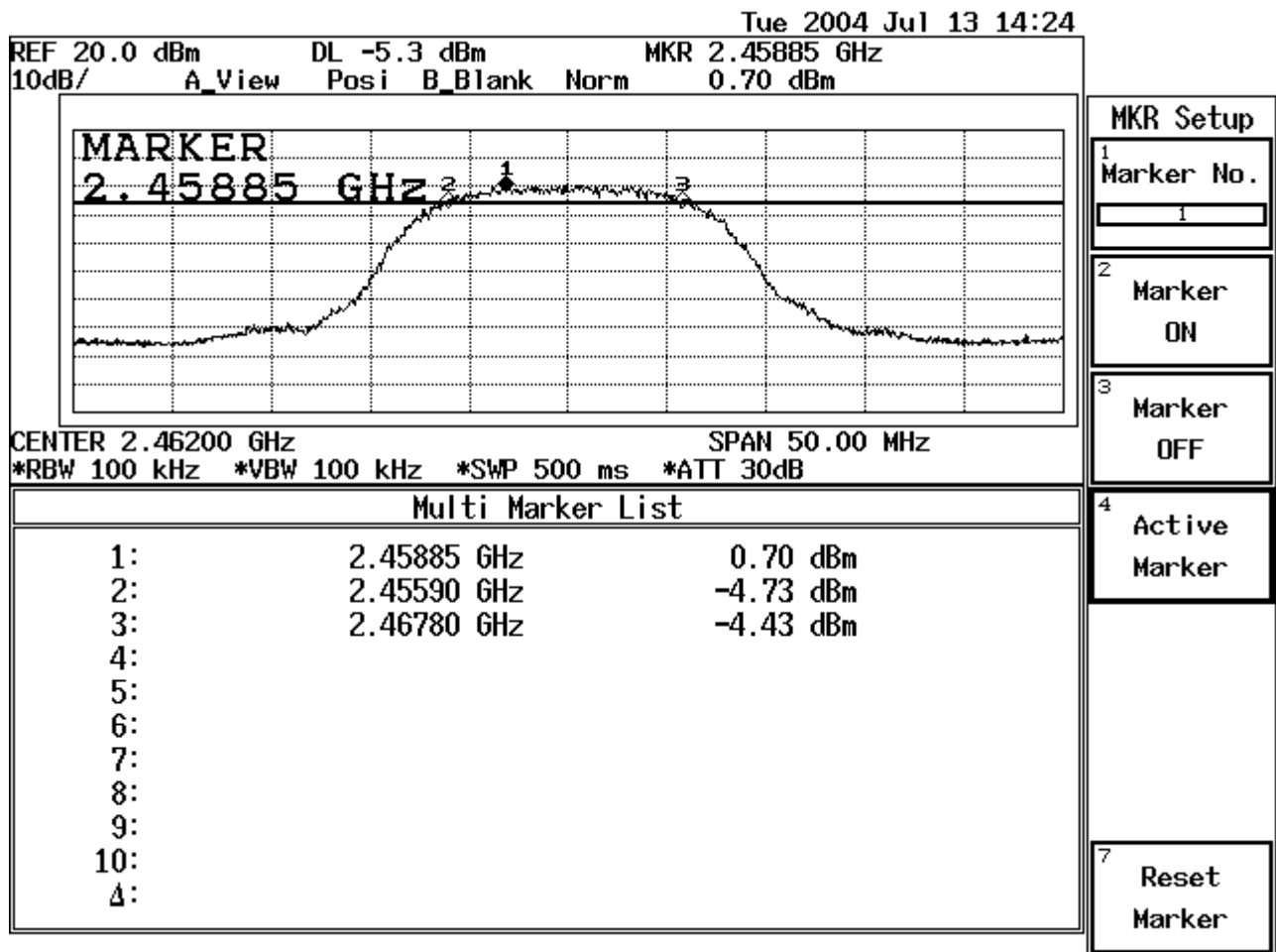
Figure Channel 6: 11Mbps



Product : Mini PCI Card  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Transmitter 11Mbps (Channel 11)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11 (11Mbps) | 2462            | 11900                   | >500                 | Pass   |

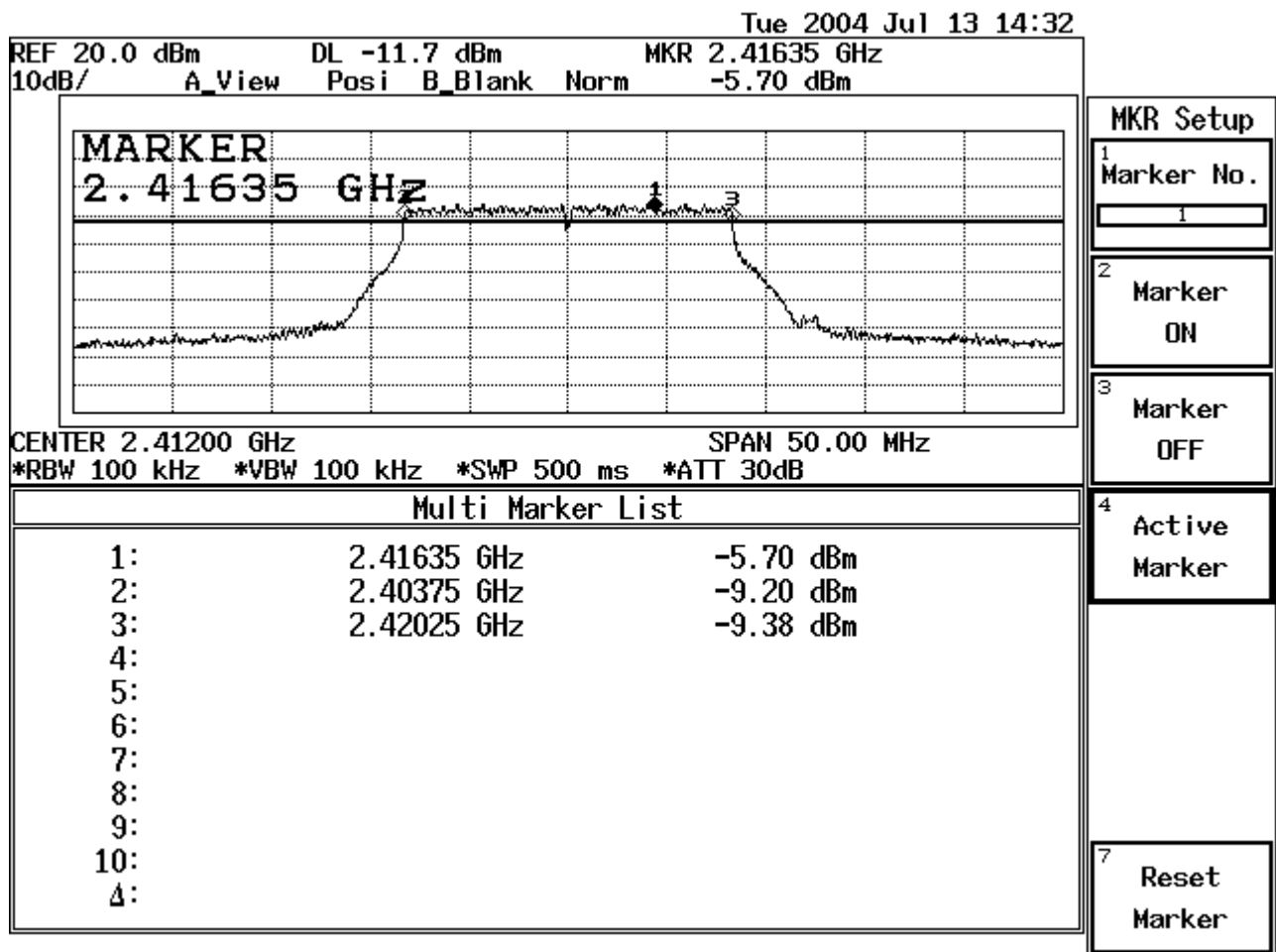
Figure Channel 11: 11Mbps



Product : Mini PCI Card  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Transmitter 54Mbps (Channel 1)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 1 (54Mbps)  | 2412            | 16500                   | >500                 | Pass   |

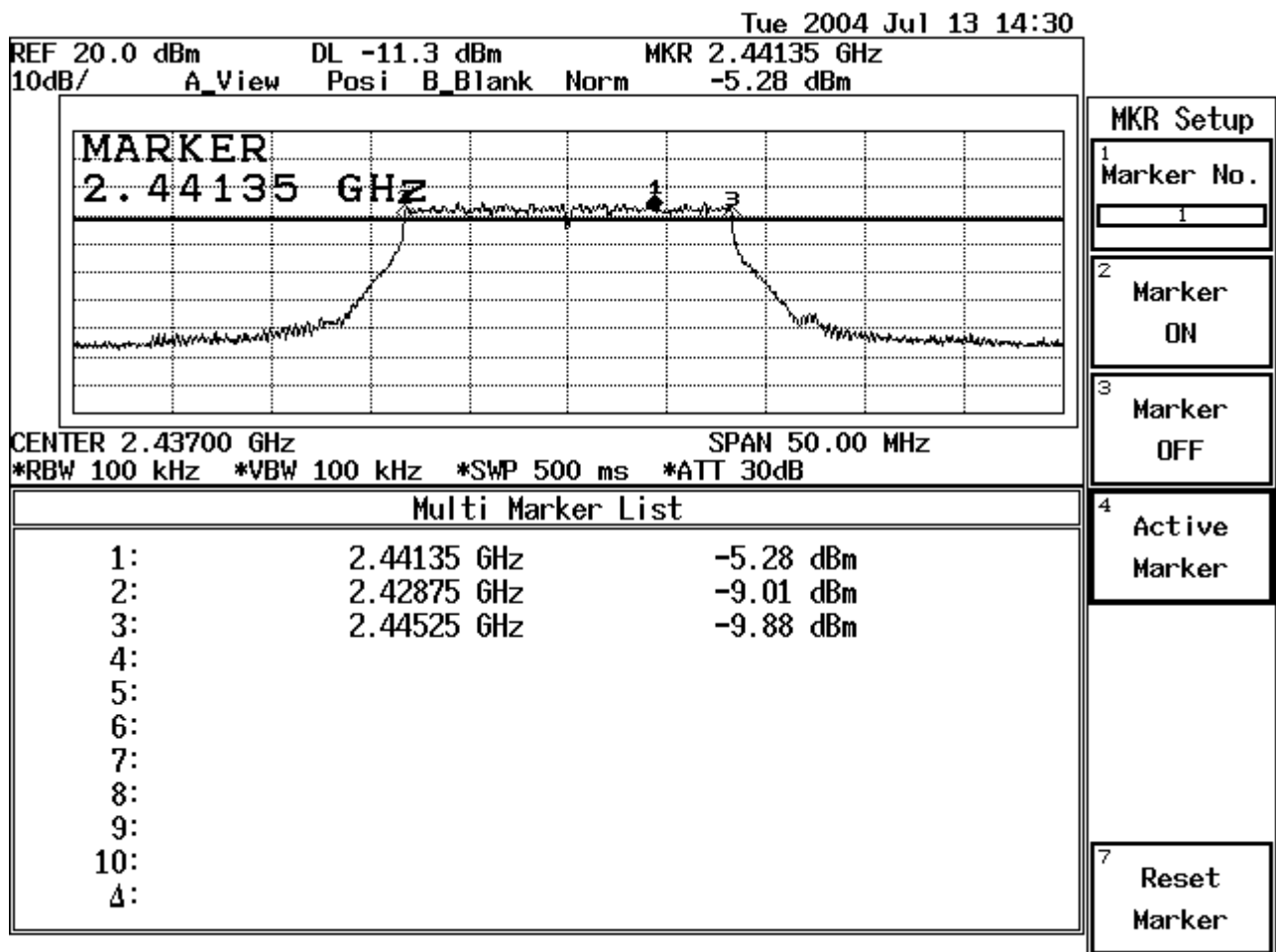
Figure Channel 1: 54Mbps



Product : Mini PCI Card  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Transmitter 54Mbps (Channel 06)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6 (54Mbps)  | 2437            | 16500                   | >500                 | Pass   |

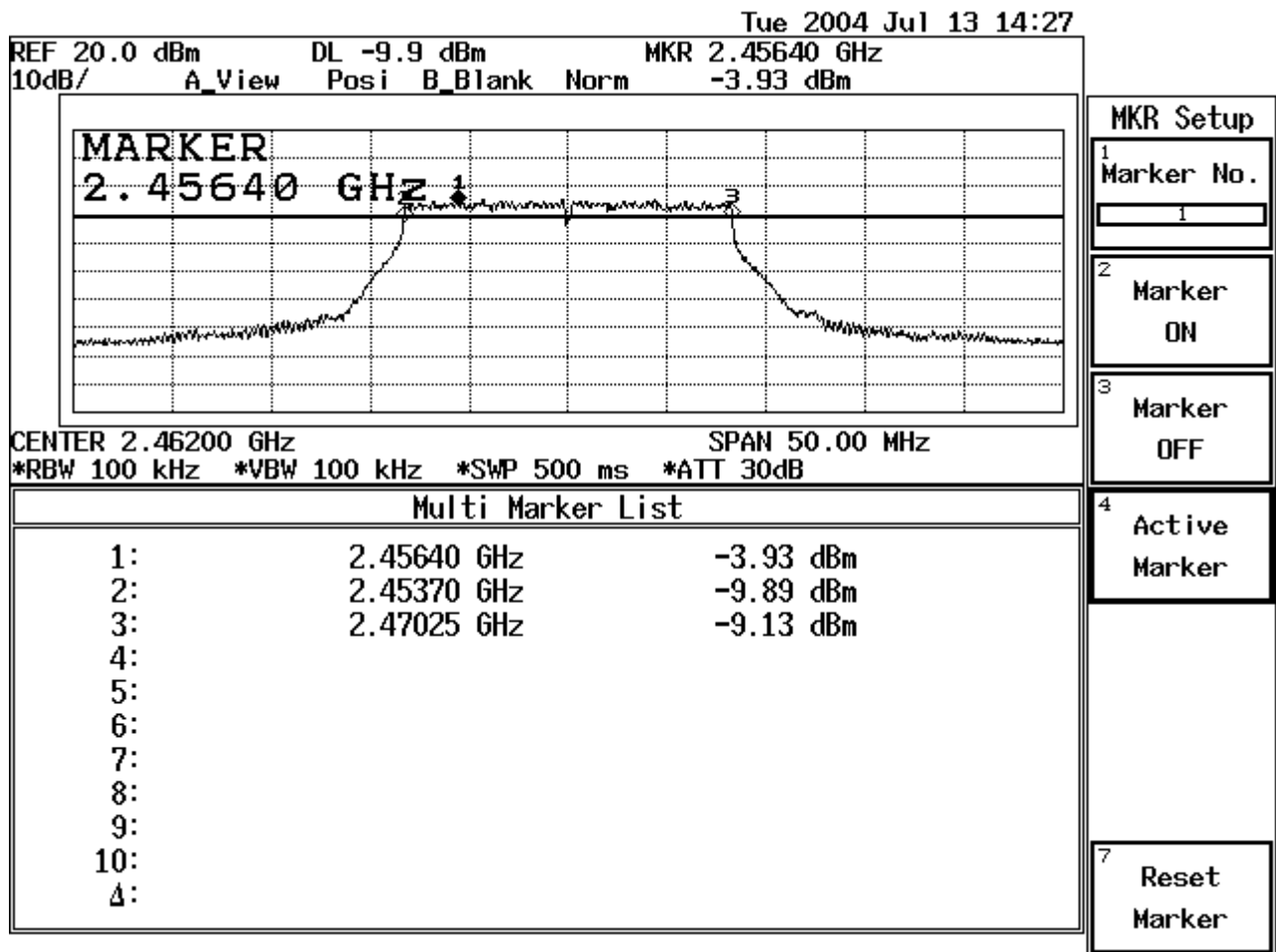
Figure Channel 6: 54Mbps



Product : Mini PCI Card  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Transmitter 54Mbps (Channel 11)

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11 (54Mbps) | 2462            | 16550                   | >500                 | Pass   |

Figure Channel 11: 54Mbps



## 7. Power Density

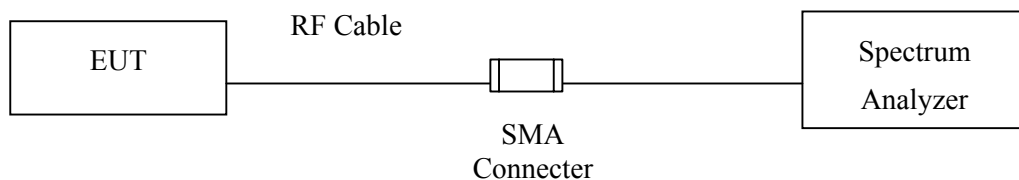
### 7.1. Test Equipment

The following test equipments are used during the radiated emission tests:

|   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal. |
|---|-------------------|--------------|----------------------|-----------|
| X | Spectrum Analyzer | Advantest    | R3272 / 72421194     | May, 2004 |

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.  
2. Mark "X" test instruments are used to measure the final test results.

### 7.2. Test Setup



### 7.3. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

### 7.4. Uncertainty

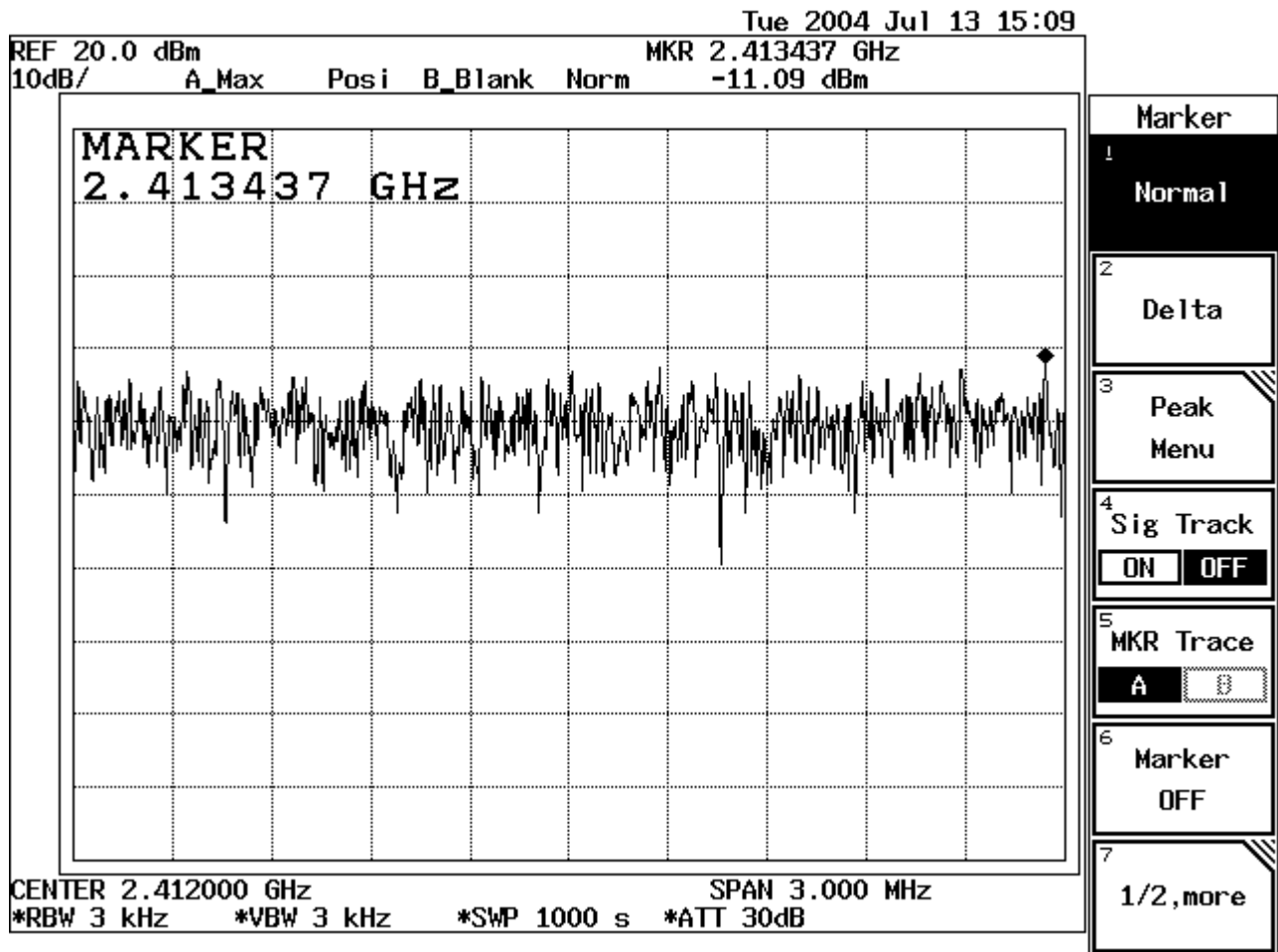
The measurement uncertainty is defined as  $\pm 1.27$  dB

## 7.5. Test Result of Power Density

Product : Mini PCI Card  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Transmitter 11Mbps (Channel 1)

| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|-------------|-----------------|---------------------|-------------|--------|
| 1 (11Mbps)  | 2412            | -11.09              | < 8dBm      | Pass   |

**Figure Channel 1:** 11Mbps

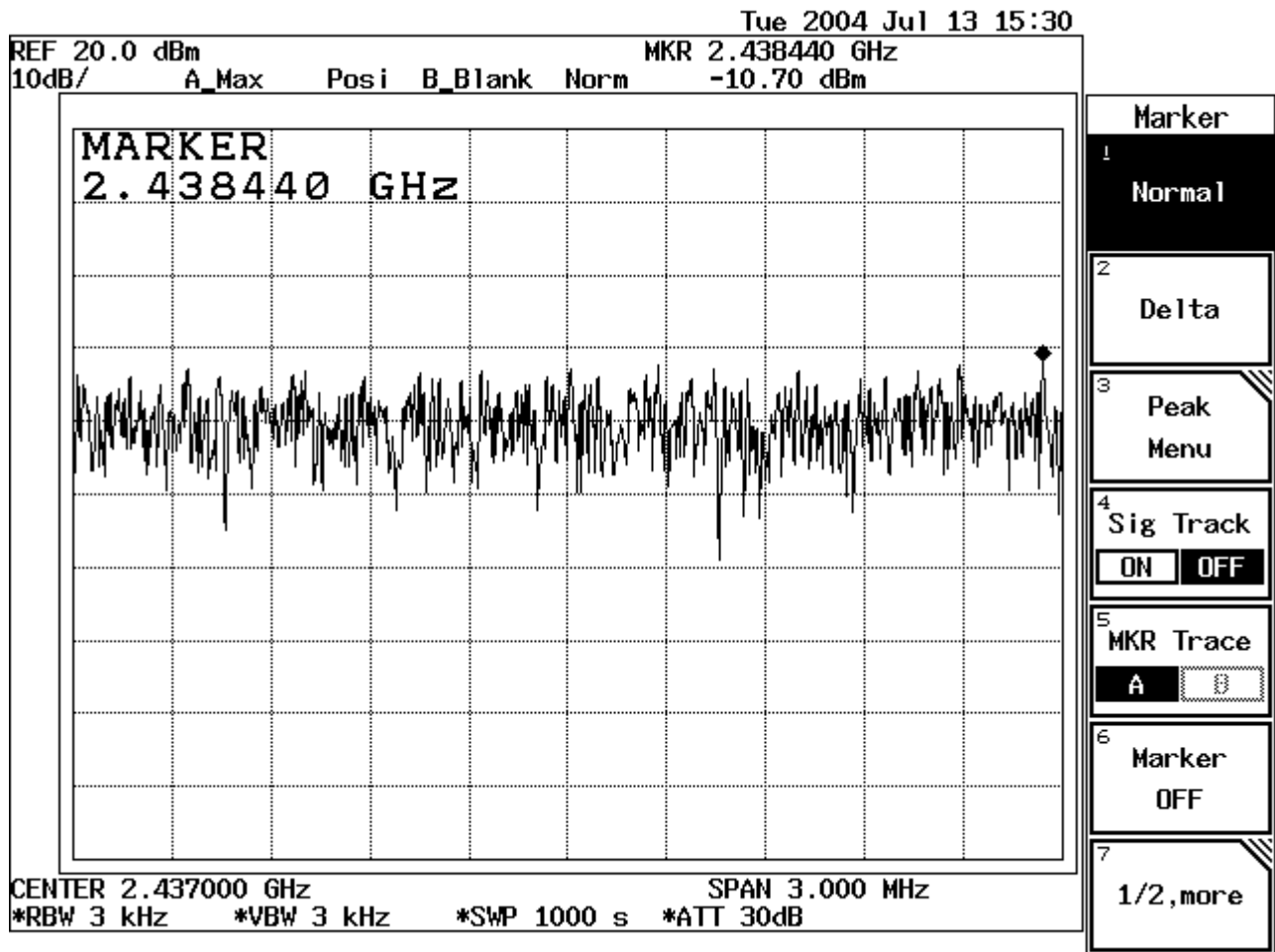


Product : Mini PCI Card  
 Test Item : Power Density Data  
 Test Site : No.3OATS  
 Test Mode : Transmitter 11Mbps (Channel 6)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6 (11Mbps)  | 2437.000        | -10.70                  | < 8dBm               | Pass   |

Figure Channel 6:

11Mbps

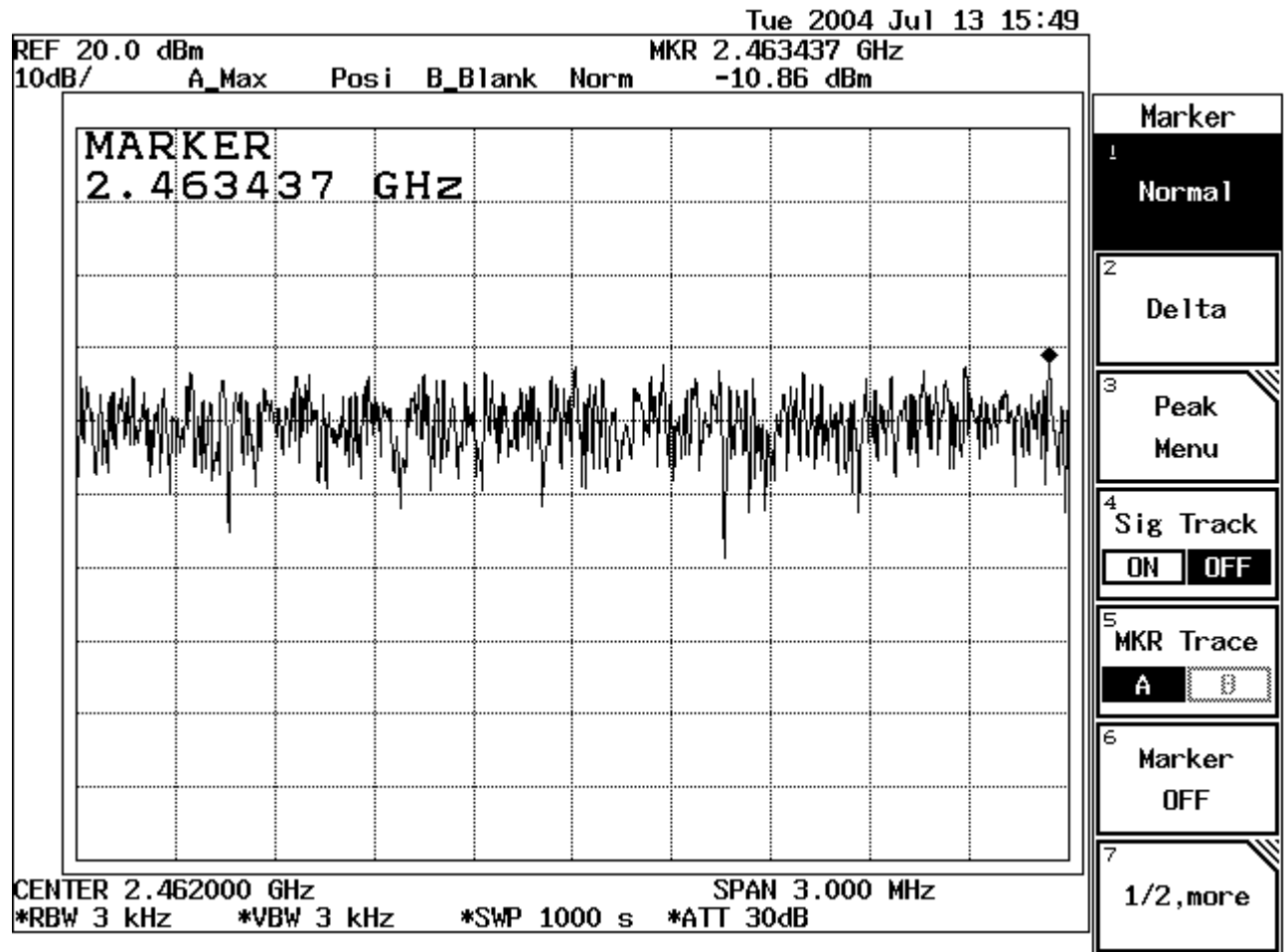


Product : Mini PCI Card  
 Test Item : Density Data  
 Test Site : No.3 OATS  
 Test Mode : Transmitter 11Mbps (Channel 11)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11 (11Mbps) | 2462            | -10.86                  | < 8dBm               | Pass   |

Figure Channel 11:

11Mbps

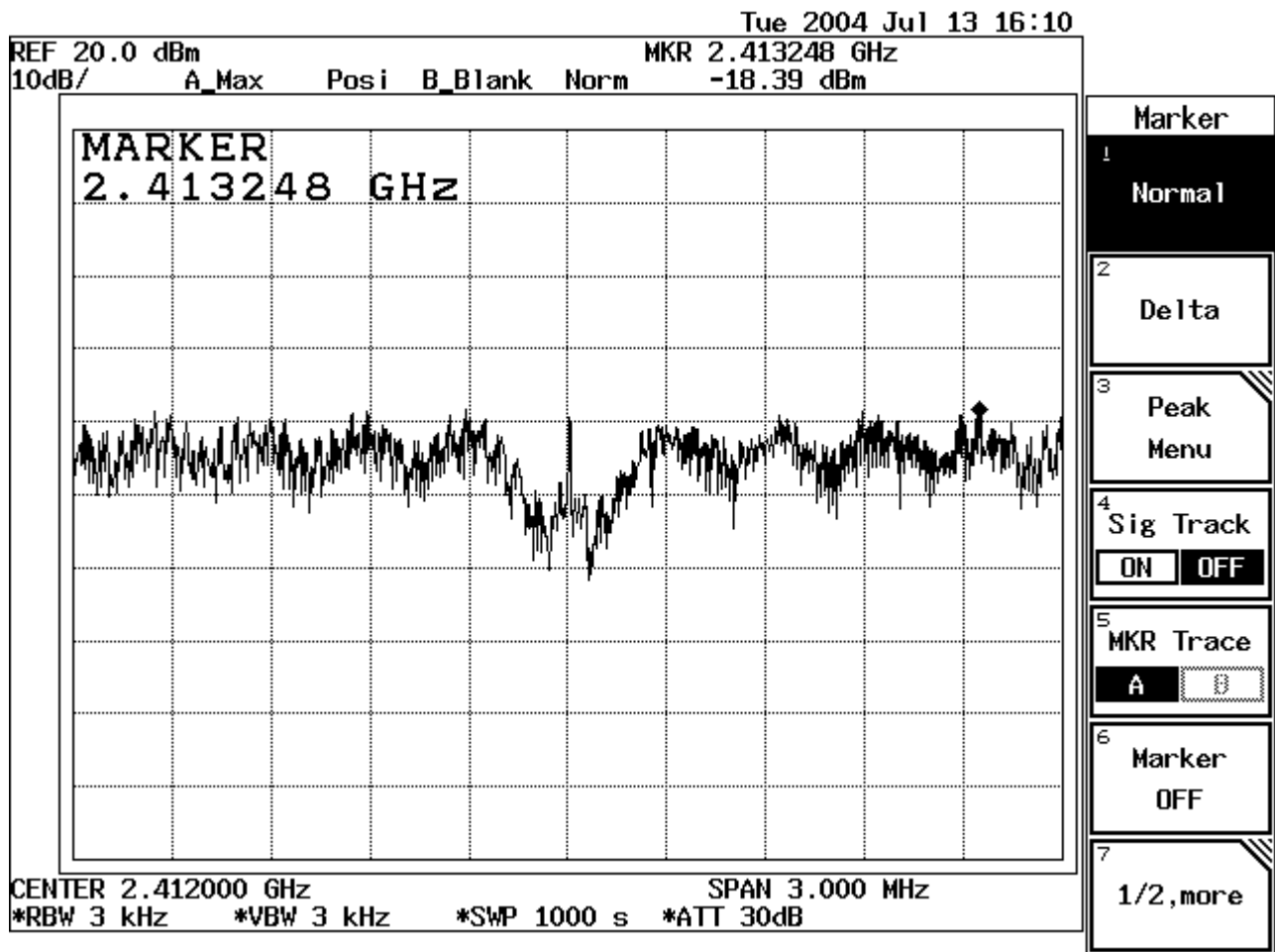


Product : Mini PCI Card  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Transmitter 54Mbps (Channel 1)

| Channel No. | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Result |
|-------------|-----------------|---------------------|-------------|--------|
| 1 (54Mbps)  | 2412            | -18.39              | < 8dBm      | Pass   |

Figure Channel 1:

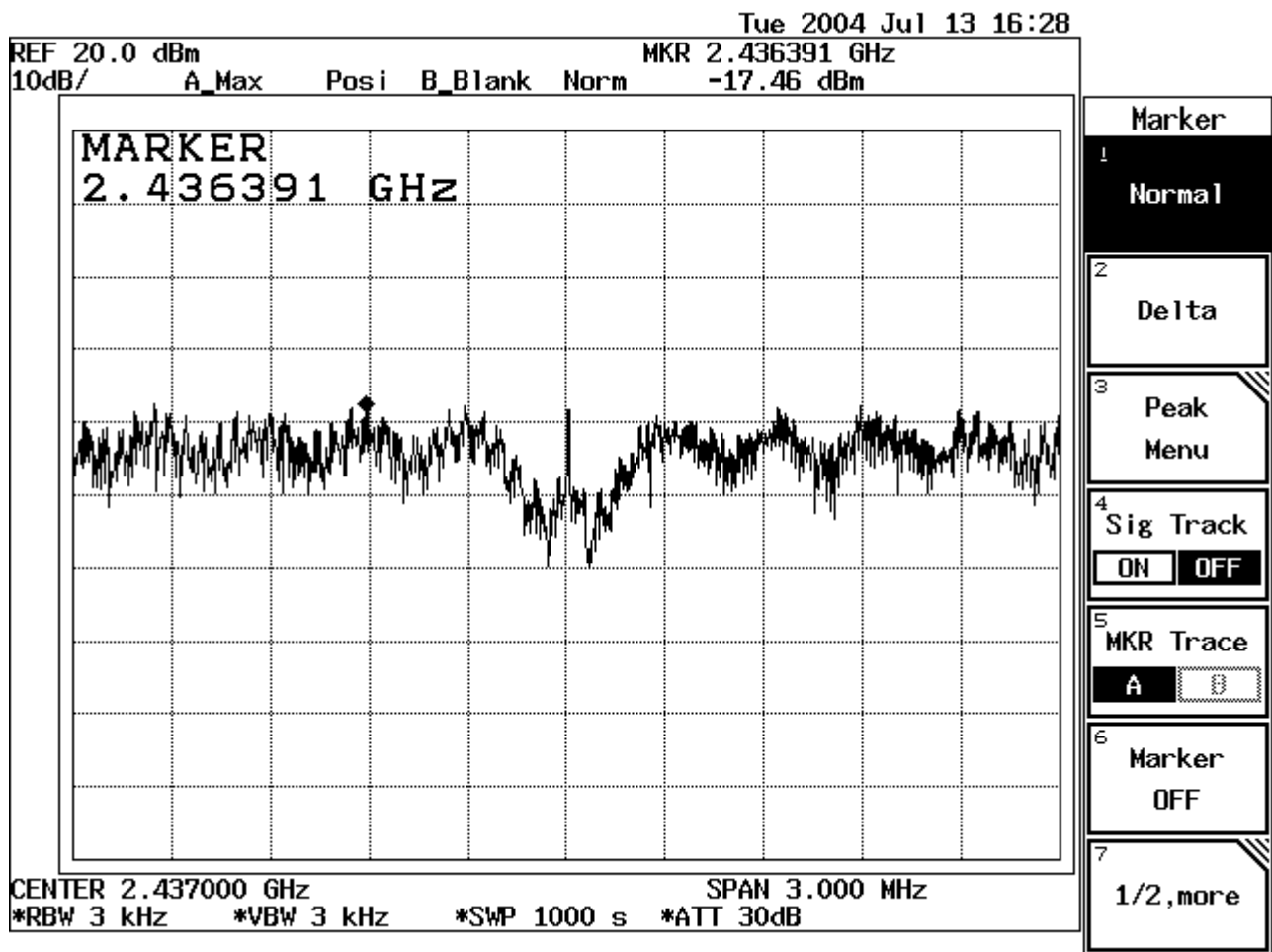
54Mbps



Product : Mini PCI Card  
 Test Item : Power Density Data  
 Test Site : No.3OATS  
 Test Mode : Transmitter 54Mbps (Channel 6)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 6 (54Mbps)  | 2437            | -17.46                  | < 8dBm               | Pass   |

**Figure Channel 6:** 54Mbps

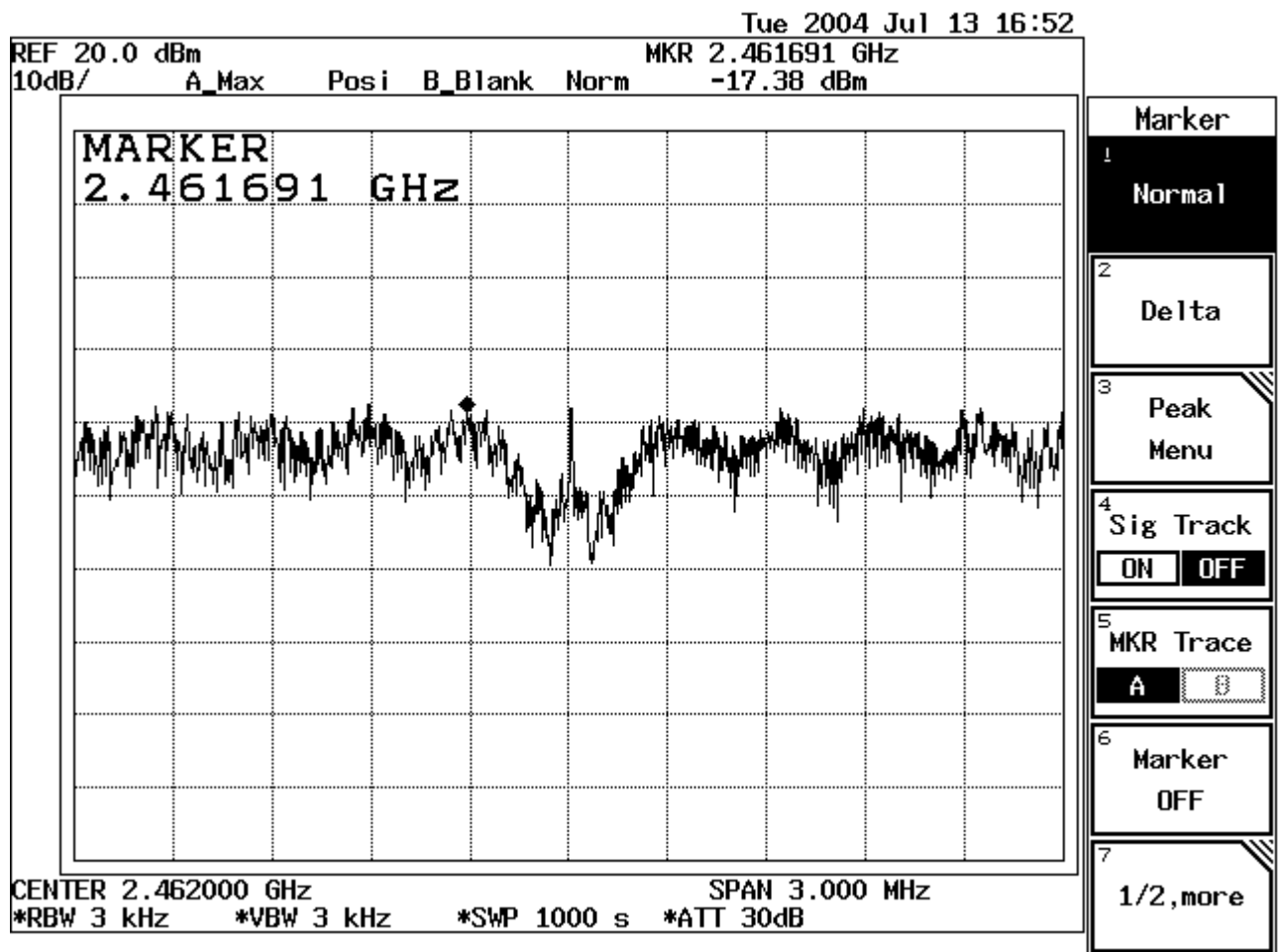


Product : Mini PCI Card  
 Test Item : Density Data  
 Test Site : No.3 OATS  
 Test Mode : Transmitter 54Mbps (Channel 11)

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11 (54Mbps) | 2462            | -17.38                  | < 8dBm               | Pass   |

Figure Channel 11:

54Mbps



## **8. EMI Reduction Method During Compliance Testing**

No modification was made during testing.

## Attachment 1: EUT Test Photographs

## Attachment 1: EUT Test Setup Photographs

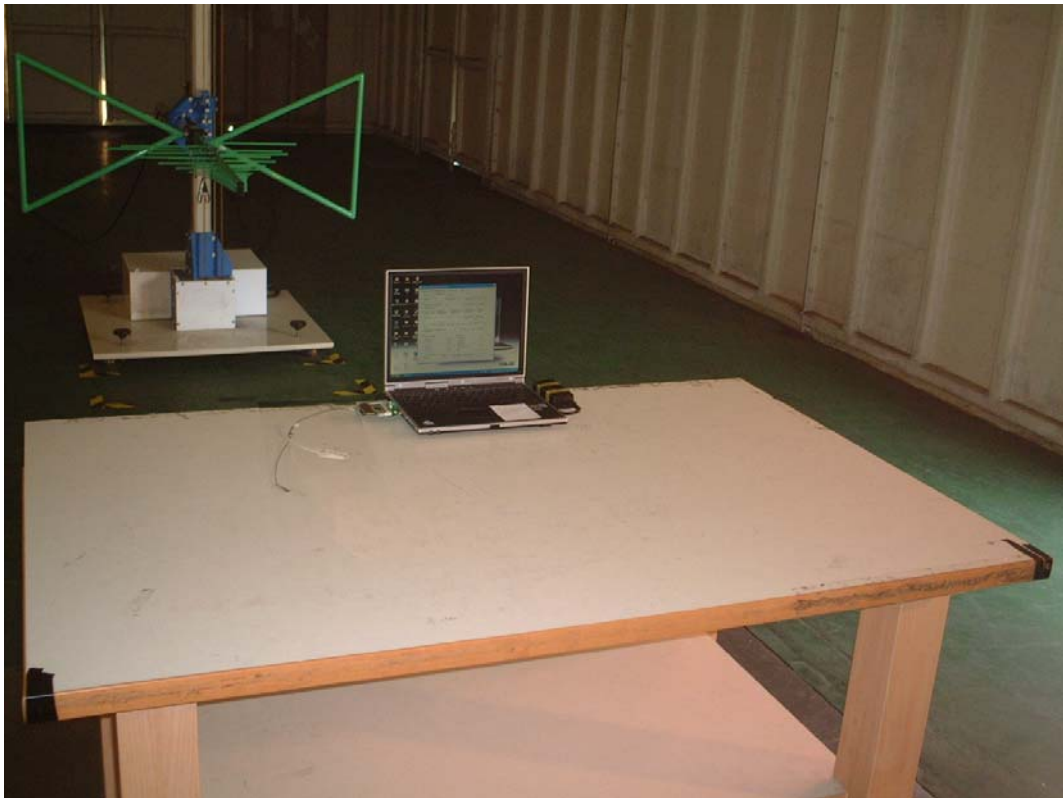
Front View of Conducted Test



Back View of Conducted Test



Front View of Radiated Test



Back View of Radiated Test



Front View of Radiated Test (Horn)



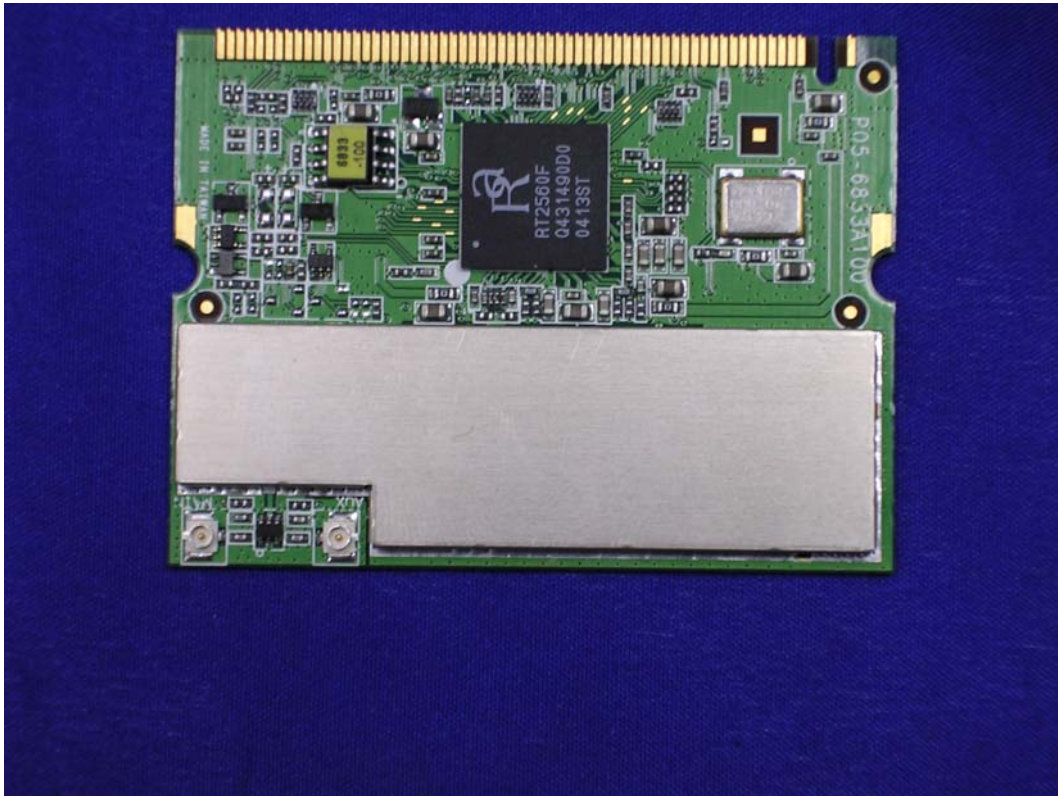
Back View of Radiated Test (Horn)



## Attachment 2: EUT Detailed Photographs

## Attachment 2 : EUT Detailed Photographs

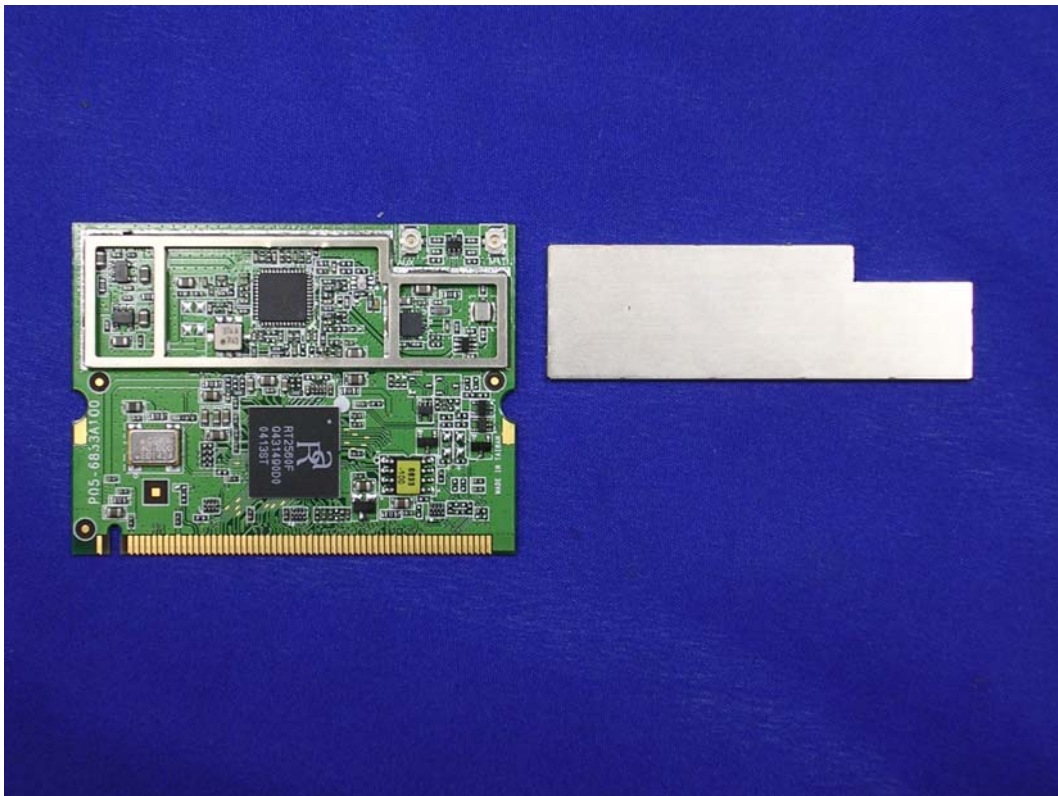
### (1) EUT Photo



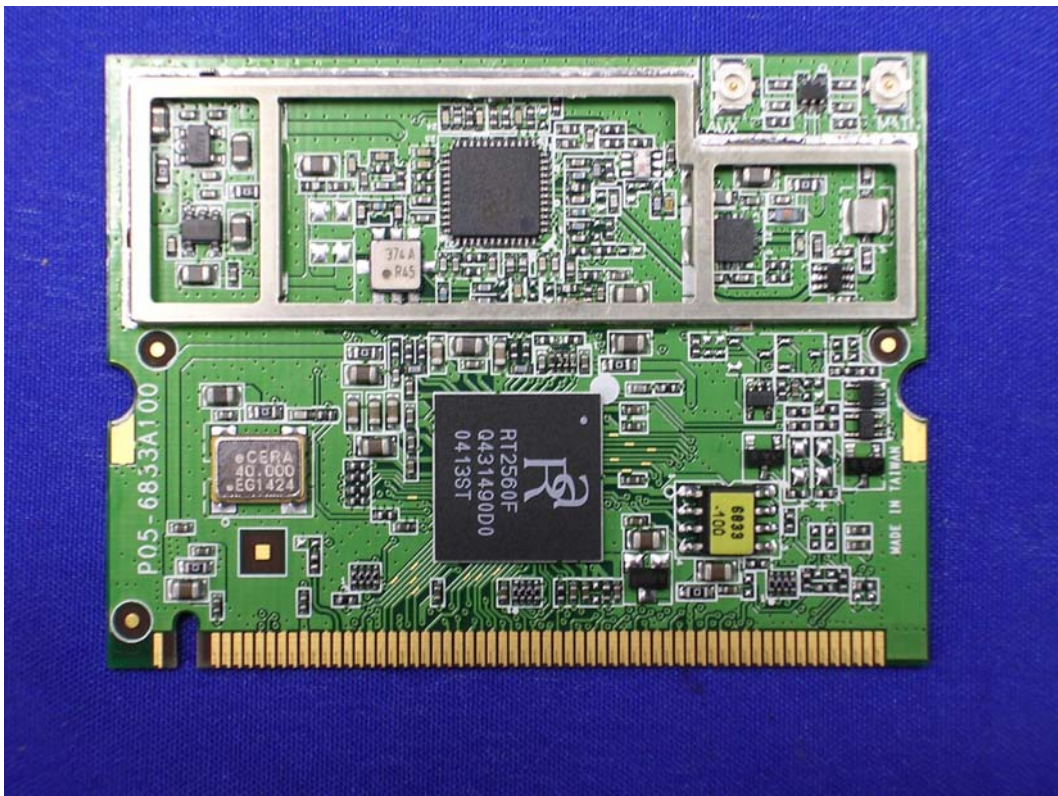
### (2) EUT Photo



(3) EUT Photo



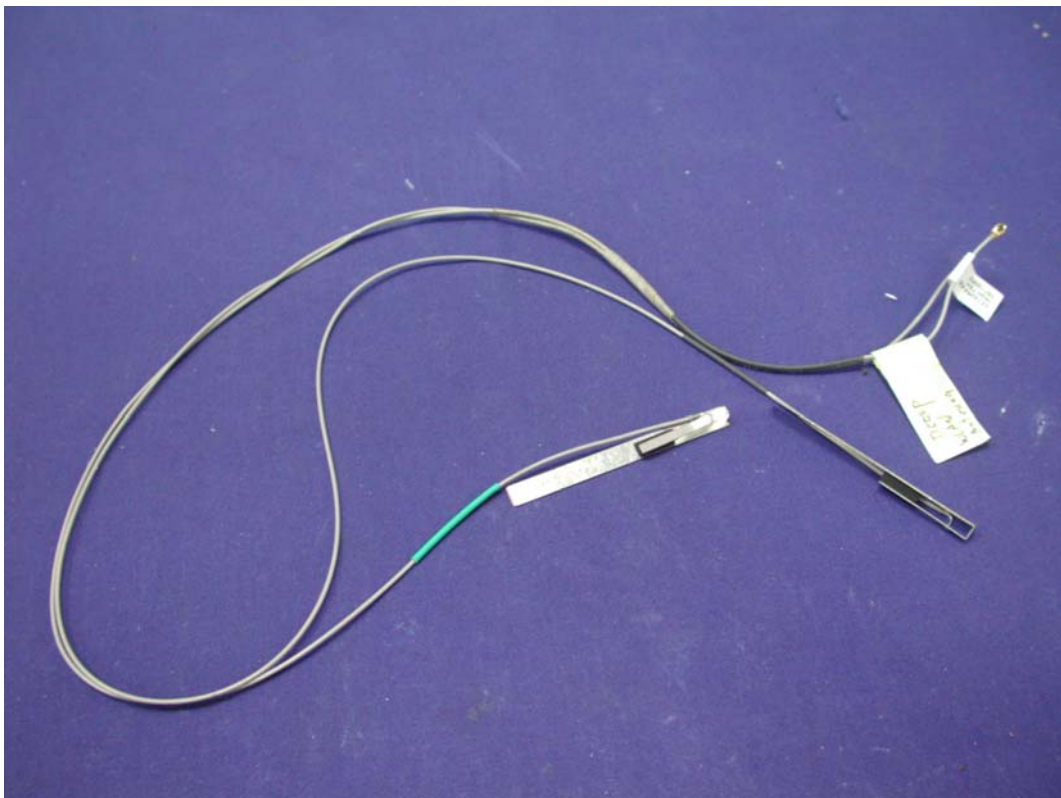
(4) EUT Photo



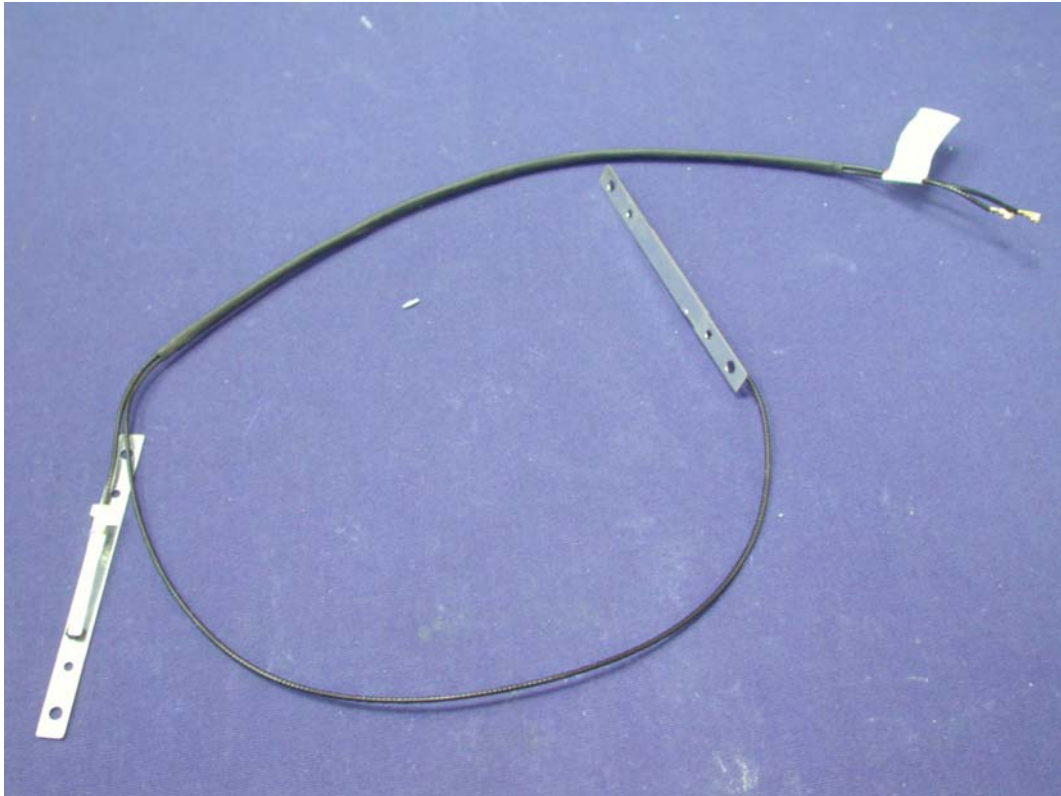
(5) EUT Photo



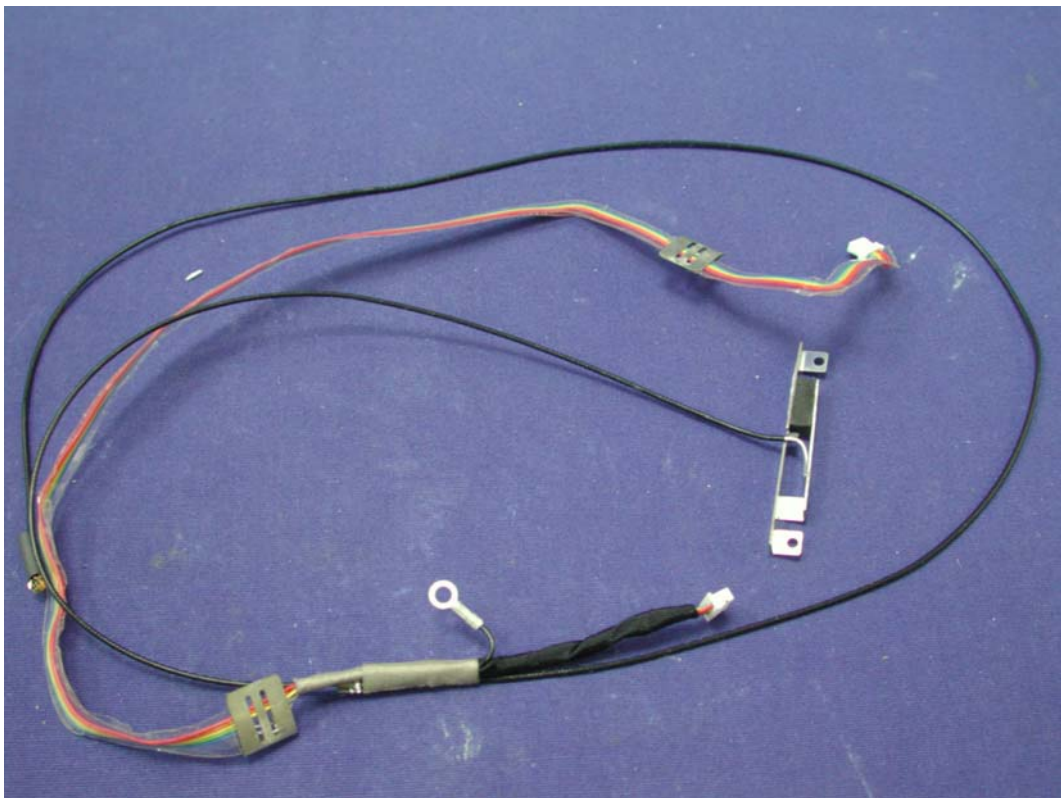
(6) EUT Photo



(7) EUT Photo



(8) EUT Photo



(9) EUT Photo



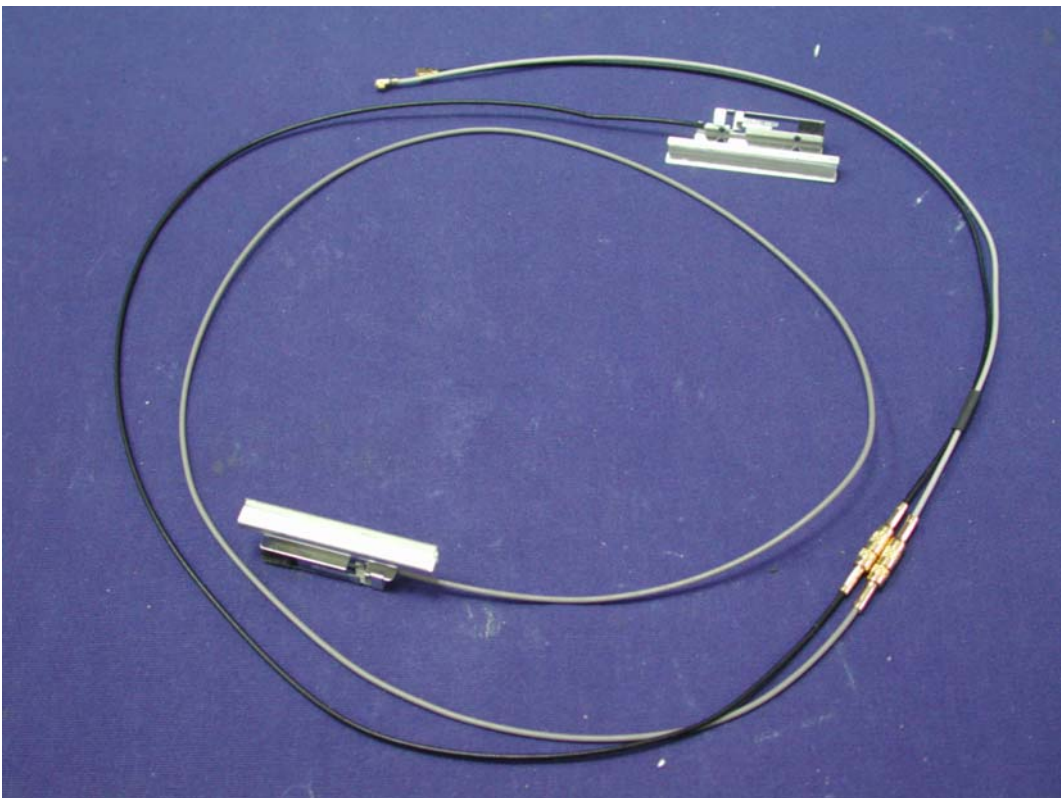
(10) EUT Photo



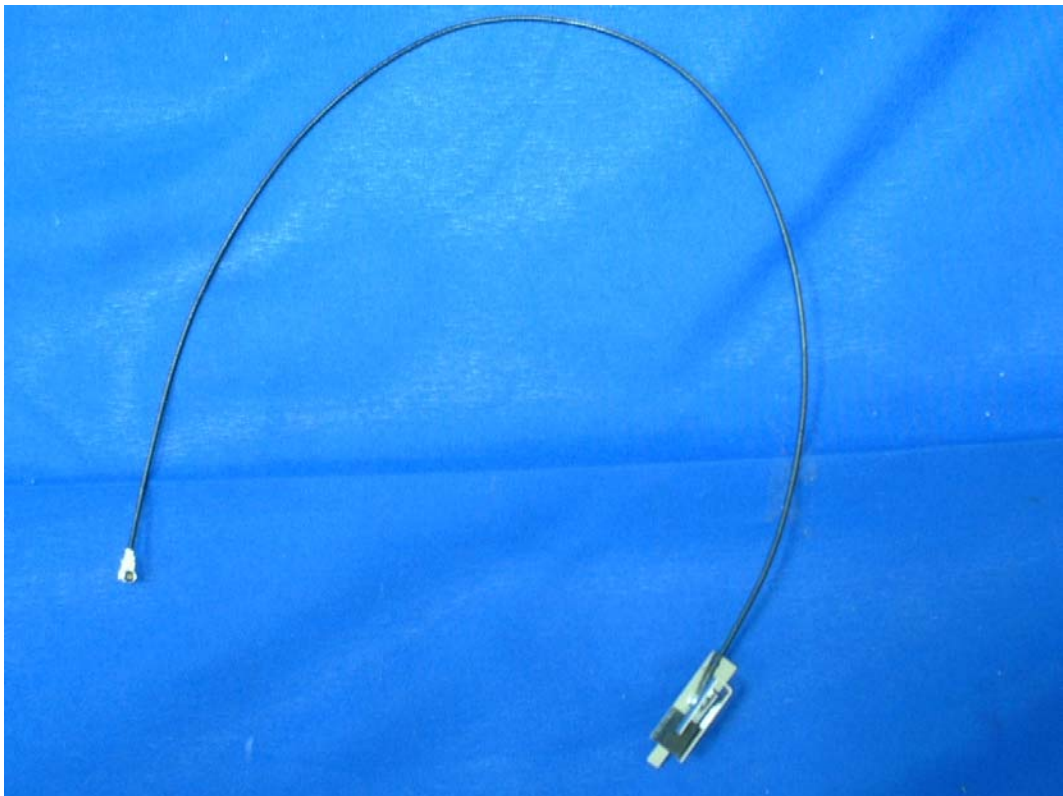
(11) EUT Photo



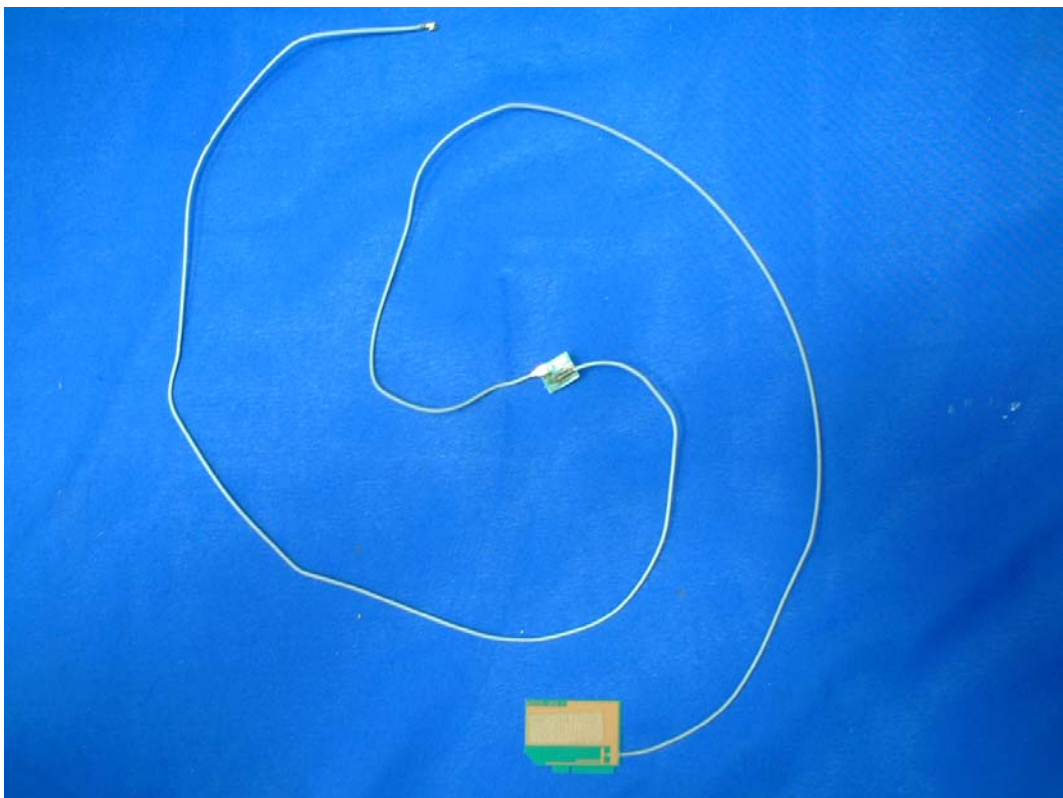
(12) EUT Photo



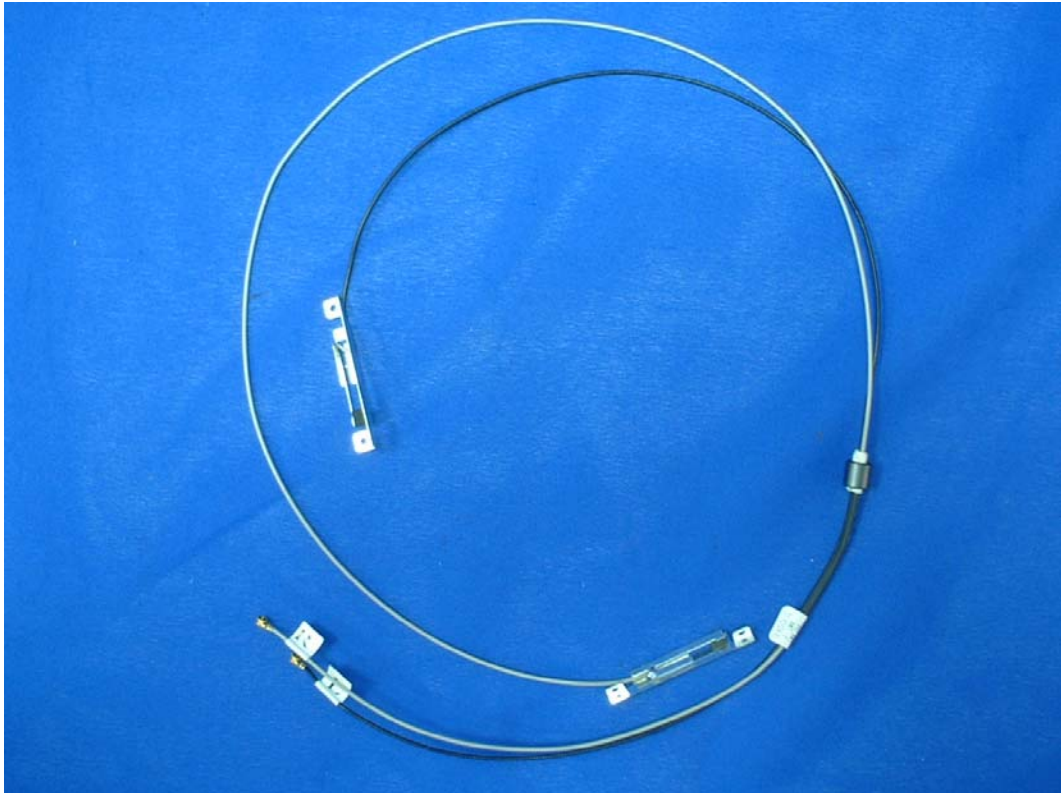
(13) EUT Photo



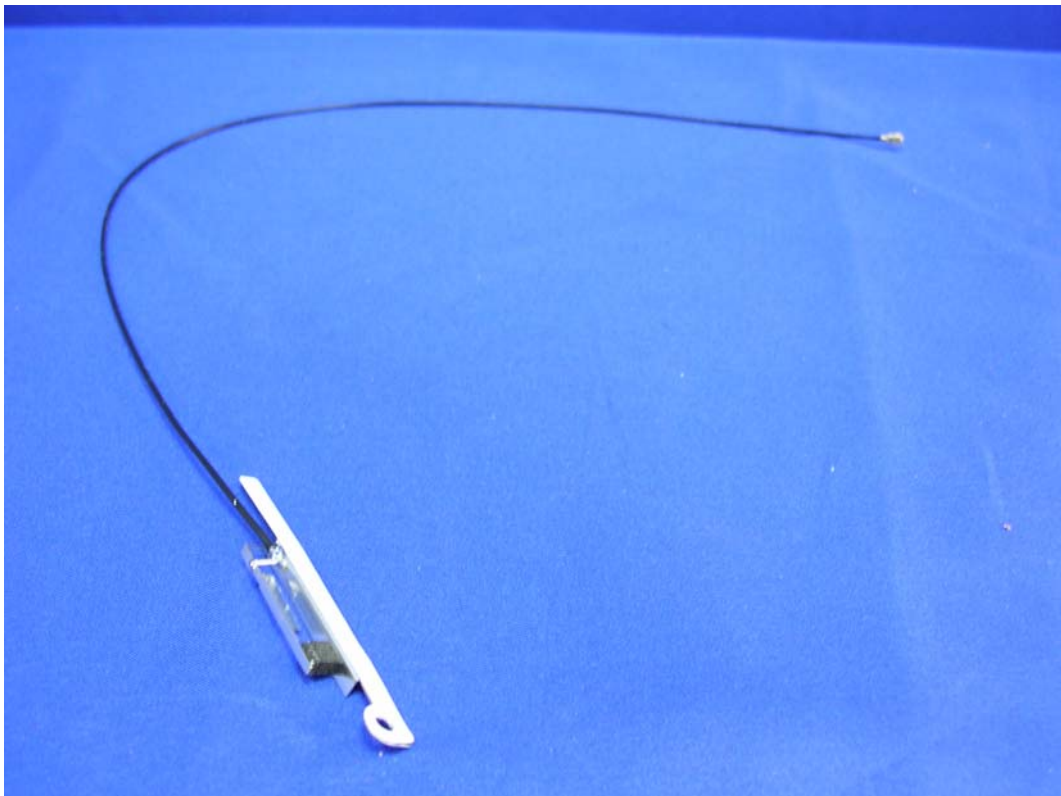
(14) EUT Photo



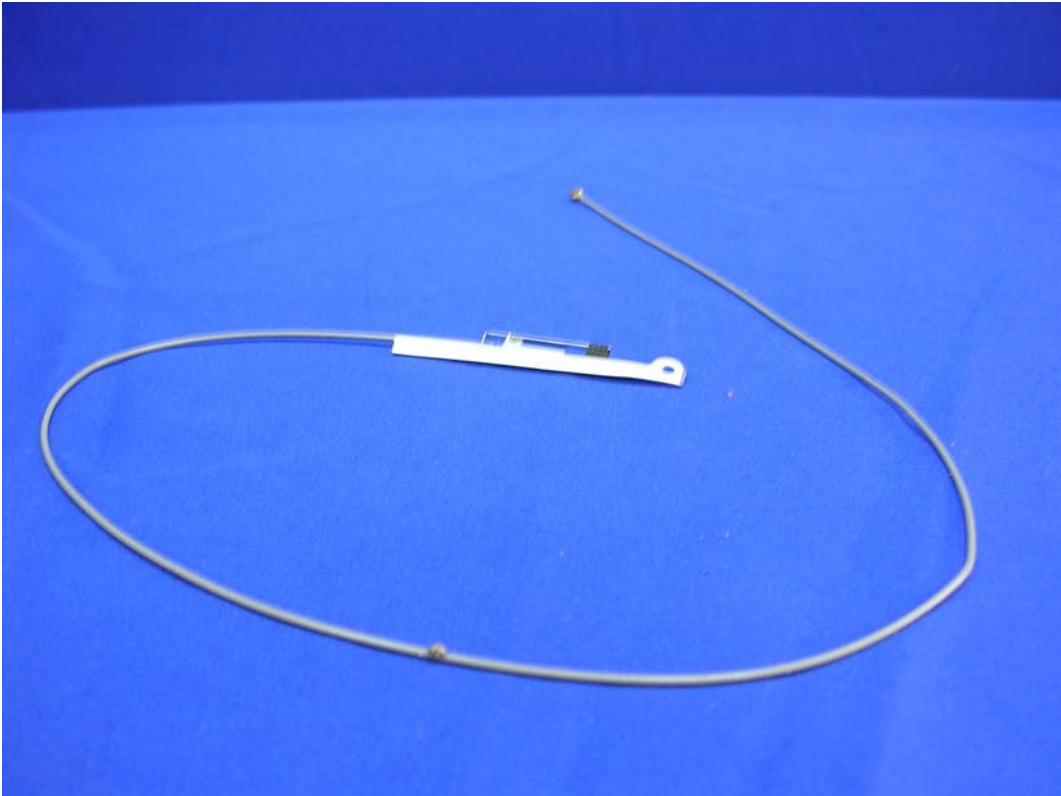
(15) EUT Photo



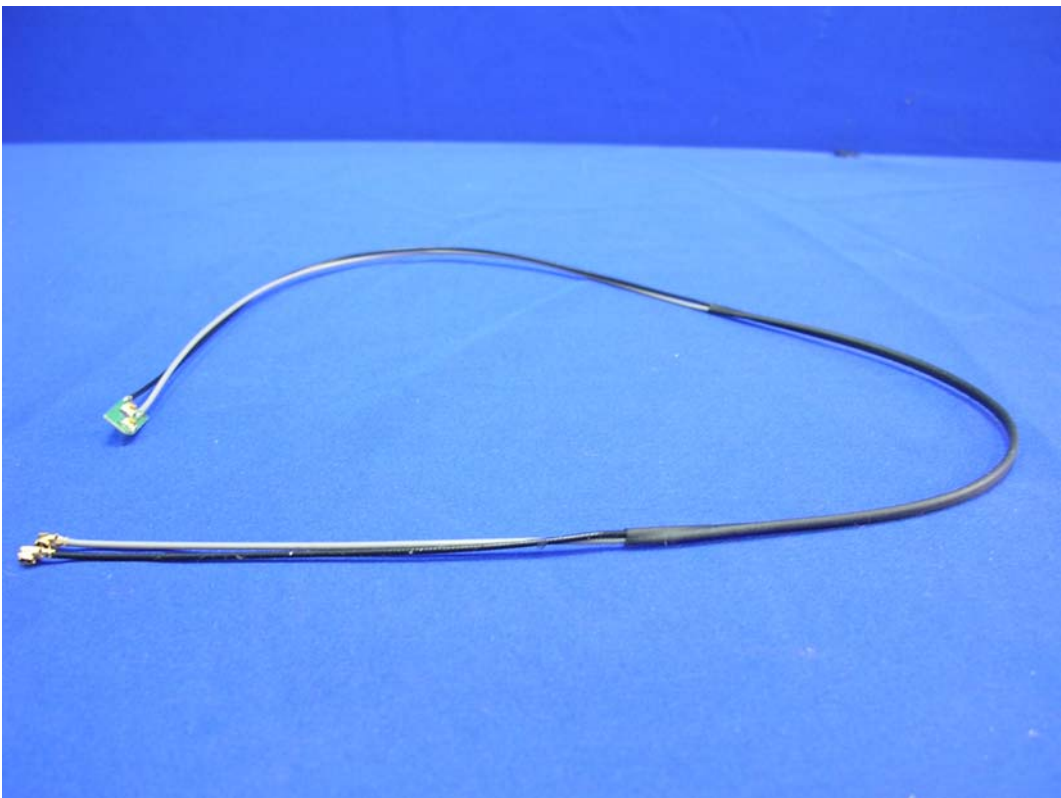
(16) EUT Photo



(17) EUT Photo



(18) EUT Photo



## RF Exposure Evaluation declaration

Product Name : Mini PCI Card

Model No : MS-6833A

FCC ID. : I4L-MS6833A

Applicant : MICRO-STAR INT'L Co., LTD

Address : No 69, Li-De st., Jung-He City, Taipei Hsien, Taiwan, R.O.C

Date of Receipt : Jul. 02, 2004

Issued Date : Jul. 15, 2004

Report No. : 047L030FI

The declaration results relate only to the samples calculated.

The declaration shall not be reproduced except in full without the written approval of QuieTek Corporation.

This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

## 1. RF Exposure Evaluation

### 1.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz)                                     | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time (Minutes) |
|-----------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| (A) Limits for Occupational/ Control Exposures            |                               |                               |                                     |                        |
| 300-1500                                                  | --                            | --                            | F/300                               | 6                      |
| 1500-100,000                                              | --                            | --                            | 5                                   | 6                      |
| (B) Limits for General Population/ Uncontrolled Exposures |                               |                               |                                     |                        |
| 300-1500                                                  | --                            | --                            | F/1500                              | 6                      |
| 1500-100,000                                              | --                            | --                            | 1                                   | 30                     |

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

### 1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

### 1.3. Test Result of RF Exposure Evaluation

Product : Mini PCI Card  
Test Item : RF Exposure Evaluation  
Test Site : No.3 OATS

#### Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber in linear scale.

#### (802.11b)

##### Output Power Into Antenna & RF Exposure Evaluation Distance (2.99dBi):

| Channel | Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 2.5 cm (mW/cm <sup>2</sup> ) |
|---------|-----------------|------------------------------|---------------------------------------------------|
| 1       | 2412.70         | 25.5270                      | 0.6470                                            |
| 6       | 2437.70         | 28.9068                      | 0.7327                                            |
| 11      | 2462.70         | 25.0035                      | 0.6337                                            |

#### (802.11g)

##### Output Power Into Antenna & RF Exposure Evaluation Distance (2.99 dBi):

| Channel | Frequency (MHz) | Output Power to Antenna (mW) | Power Density at R = 2.5 cm (mW/cm <sup>2</sup> ) |
|---------|-----------------|------------------------------|---------------------------------------------------|
| 1       | 2412.70         | 24.2661                      | 0.6151                                            |
| 6       | 2437.70         | 25.1768                      | 0.6381                                            |
| 11      | 2462.70         | 25.1768                      | 0.6381                                            |

The distance r (4<sup>th</sup> column) calculated from the Fries transmission formula is far shorter than 2.5 cm separation requirement.