



## Test Report

Product Name : Projector

Model No. : C400 Wireless

FCC ID : H79DP3625W

Applicant : DELTA ELECTRONICS, INC.

Address : 3, Tung Yuan Road, Chungli Industrial Zone, Taoyuan Hsien  
320, Taiwan, R.O.C.

Date of Receipt : Aug. 25, 2005

Issued Date : Sep. 08, 2005

Report No. : 058L177FI

The test results relate only to the samples tested.

The test report 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

# Test Report Certification

Issued Date : Sep. 08, 2005

Report No. : 058L177FI



Accredited by NIST (NVLAP)

NVLAP Lab Code: 200533-0

Product Name : Projector

Applicant : DELTA ELECTRONICS, INC.

Address : 3, Tung Yuan Road, Chungli Industrial Zone, Taoyuan Hsien 320, Taiwan,  
R.O.C.

Manufacturer : DELTA ELECTRONICS, INC.

Model No. : C400 Wireless

Rated Voltage : AC 120V/60Hz

Working Voltage : DC 3.3V (Powered by EUT)

Trade Name : ThinkVision

Applicable Standard : FCC CFR Title 47 Part 15 Subpart C Section 15.247:2005  
ANSI C63.4: 2003

Test Result : Complied



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Documented By :



( Rebaca Chi )



0914

Tested By :



( Tom Hsieh )

Approved By :



( Gene Chang )



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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

## 1. GENERAL INFORMATION

### 1.1. EUT Description

|                    |                                                  |
|--------------------|--------------------------------------------------|
| Product Name       | : Projector                                      |
| Trade Name         | : ThinkVision                                    |
| Model No.          | : C400 Wireless                                  |
| FCC ID             | : H79DP3625W                                     |
| Frequency Range    | : 2462MHz                                        |
| Channel Number     | : 1                                              |
| Data Speed         | IEEE 802.11b – 11Mbps<br>: IEEE 802.11g – 54Mbps |
| Type of Modulation | : DSSS / OFDM                                    |
| Antenna Type       | : Connector                                      |
| Antenna Gain       | : -3.67dBi                                       |
| Power Cord         | : Non-Shielded, 1.8m                             |

Frequency of Each Channel:

| Channel     | Frequency |
|-------------|-----------|
| Channel 11: | 2462 MHz  |

Note:

1. This device is a Projector including a 2.4GHz transmitter and receiver.
2. These tests are performed on a sample for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.247 for spreading spectrum devices.

## 1.2. Operational Description

The EUT is a wireless Projector with 1 channel. The device has the data speed of 11 Mbps (IEEE 802.11b) and 54 Mbps (IEEE 802.11g). The carrier uses direct sequence spread spectrum modulation. The diversity antenna is connected through the connector.

The Projector complies with IEEE 802.11b and 802.11g. The data to be displayed is obtained before reaching the display device through the software (can be regarded as a desktop mirror), and then is transferred through the wireless network to the built-in wireless processing board inside the projector after being compressed.

|           |                             |
|-----------|-----------------------------|
| Test Mode | Mode 1: Transmitter 802.11b |
|           | Mode 2: Transmitter 802.11g |

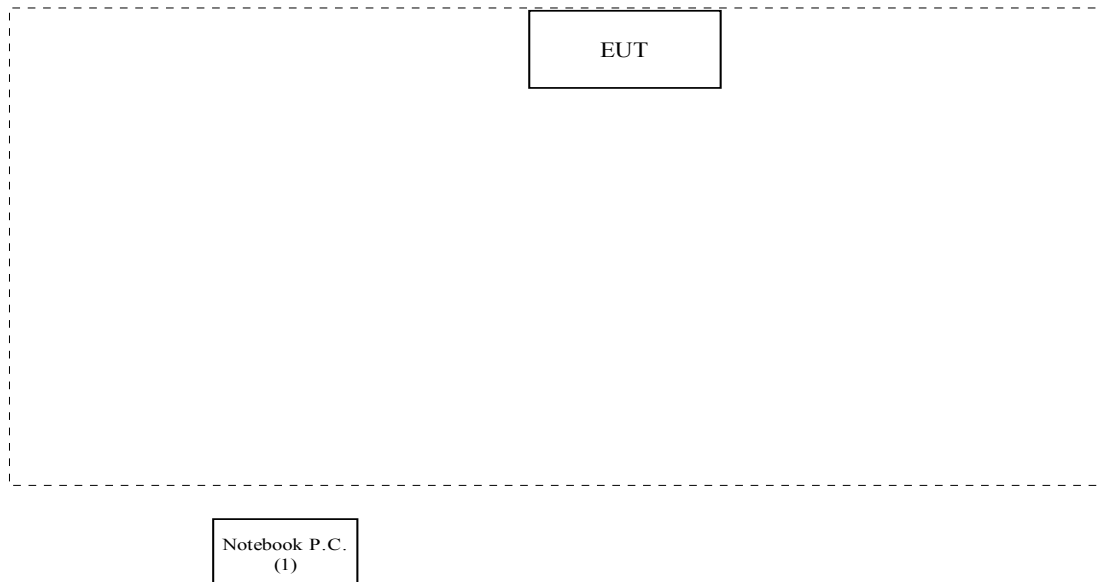
### 1.3. Tested System Details

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         | PPT       | N/A        | DoC    | Non-Shielded, 0.8m |

|    | 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) Notebook PC reads data from disk.
- (4) Data will be transmitting and receiving through EUT.
- (5) The transmitted and receive status will be shown on the monitor.
- (6) Repeat the above procedure (3) to (5)

## 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



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

Site Name: Quietek Corporation



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## 2. Conducted Emission

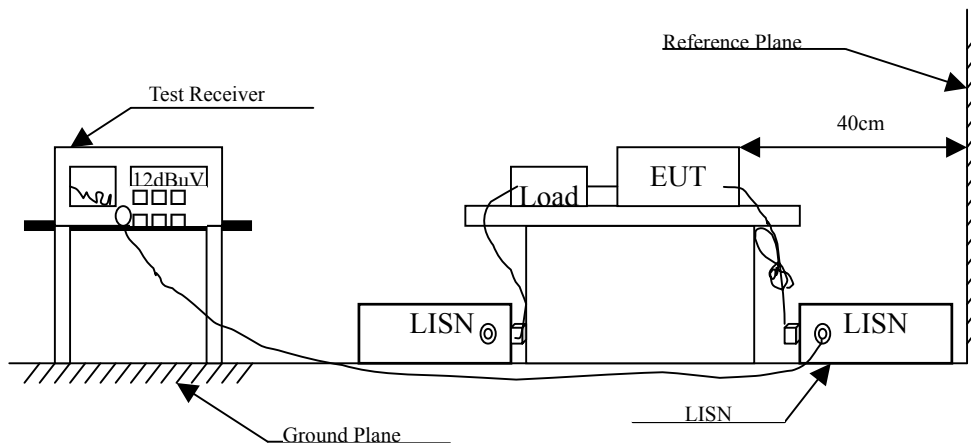
### 2.1. Test Equipment

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, 2005 |             |
| 2    | L.I.S.N.           | R & S        | ESH3-Z5/825016/6   | May, 2005 | EUT         |
| 3    | L.I.S.N.           | Kyoritsu     | KNW-407/8-1420-3   | May, 2005 | Peripherals |
| 4    | Pulse Limiter      | R & S        | ESH3-Z2            | May, 2005 |             |
| 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 refer 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: 2003 on conducted measurement.

Conducted emissions were investigated 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 : Projector  
Test Item : Conducted Emission Test  
Power Line : Line 1  
Test Mode : Mode 1: Transmitter 802.11b

| Frequency<br>MHz  | Correct<br>Factor<br>dB | Reading<br>Level<br>dBuV | Measurement<br>Level<br>dBuV | Margin<br>dB | Limit<br>dBuV |
|-------------------|-------------------------|--------------------------|------------------------------|--------------|---------------|
| <b>LINE 1</b>     |                         |                          |                              |              |               |
| <b>Quasi-Peak</b> |                         |                          |                              |              |               |
| 0.201             | 0.202                   | 49.400                   | 49.602                       | -14.941      | 64.543        |
| 0.280             | 0.203                   | 49.440                   | 49.643                       | -12.642      | 62.286        |
| 0.560             | 0.207                   | 44.850                   | 45.057                       | -10.943      | 56.000        |
| *0.622            | 0.208                   | 46.140                   | 46.348                       | -9.652       | 56.000        |
| 1.076             | 0.214                   | 42.490                   | 42.704                       | -13.296      | 56.000        |
| 24.775            | 0.757                   | 43.250                   | 44.007                       | -15.993      | 60.000        |
| <b>Average</b>    |                         |                          |                              |              |               |
| 0.201             | 0.202                   | 38.260                   | 38.462                       | -16.081      | 54.543        |
| 0.280             | 0.203                   | 45.780                   | 45.983                       | -6.302       | 52.286        |
| 0.560             | 0.207                   | 36.690                   | 36.897                       | -9.103       | 46.000        |
| 0.622             | 0.208                   | 36.160                   | 36.368                       | -9.632       | 46.000        |
| 1.076             | 0.214                   | 30.170                   | 30.384                       | -15.616      | 46.000        |
| *24.775           | 0.757                   | 43.040                   | 43.797                       | -6.203       | 50.000        |

Note:

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

Product : Projector  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmitter 802.11b

| Frequency         | Correct | Reading | Measurement | Margin  | Limit  |
|-------------------|---------|---------|-------------|---------|--------|
| MHz               | Factor  | Level   | Level       |         |        |
|                   | dB      | dBuV    | dBuV        | dB      | dBuV   |
| <b>LINE 2</b>     |         |         |             |         |        |
| <b>Quasi-Peak</b> |         |         |             |         |        |
| 0.205             | 0.202   | 52.430  | 52.632      | -11.797 | 0.205  |
| 0.280             | 0.203   | 49.620  | 49.823      | -12.462 | 0.280  |
| 0.550             | 0.207   | 44.990  | 45.197      | -10.803 | 0.550  |
| *0.623            | 0.208   | 46.280  | 46.488      | -9.512  | 0.623  |
| 1.055             | 0.214   | 42.070  | 42.284      | -13.716 | 1.055  |
| 1.555             | 0.220   | 39.720  | 39.940      | -16.060 | 1.555  |
| <b>Average</b>    |         |         |             |         |        |
| 0.205             | 0.202   | 46.350  | 46.552      | -7.877  | 54.429 |
| *0.280            | 0.203   | 45.950  | 46.153      | -6.132  | 52.286 |
| 0.550             | 0.207   | 36.250  | 36.457      | -9.543  | 46.000 |
| 0.623             | 0.208   | 36.420  | 36.628      | -9.372  | 46.000 |
| 1.055             | 0.214   | 28.330  | 28.544      | -17.456 | 46.000 |
| 1.555             | 0.220   | 26.250  | 26.470      | -19.530 | 46.000 |

Note:

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

Product : Projector  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 2: Transmitter 802.11g

| Frequency         | Correct | Reading | Measurement | Margin  | Limit  |
|-------------------|---------|---------|-------------|---------|--------|
| MHz               | Factor  | Level   | Level       |         |        |
|                   | dB      | dBuV    | dBuV        | dB      | dBuV   |
| <b>LINE 1</b>     |         |         |             |         |        |
| <b>Quasi-Peak</b> |         |         |             |         |        |
| 0.209             | 0.202   | 52.620  | 52.822      | -11.492 | 64.314 |
| 0.284             | 0.203   | 49.850  | 50.053      | -12.118 | 62.171 |
| 0.549             | 0.207   | 45.030  | 45.237      | -10.763 | 56.000 |
| *0.616            | 0.208   | 46.080  | 46.288      | -9.712  | 56.000 |
| 1.116             | 0.214   | 41.990  | 42.204      | -13.796 | 56.000 |
| 1.616             | 0.221   | 39.130  | 39.351      | -16.649 | 56.000 |
| <b>Average</b>    |         |         |             |         |        |
| *0.209            | 0.202   | 50.230  | 50.432      | -3.882  | 54.314 |
| 0.284             | 0.203   | 45.770  | 45.973      | -6.198  | 52.171 |
| 0.549             | 0.207   | 35.640  | 35.847      | -10.153 | 46.000 |
| 0.616             | 0.208   | 34.610  | 34.818      | -11.182 | 46.000 |
| 1.116             | 0.214   | 28.540  | 28.754      | -17.246 | 46.000 |
| 1.616             | 0.221   | 28.150  | 28.371      | -17.629 | 46.000 |

Note:

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

Product : Projector  
Test Item : Conducted Emission Test  
Power Line : Line 2  
Test Mode : Mode 2: Transmitter 802.11g

| Frequency         | Correct | Reading | Measurement | Margin  | Limit  |
|-------------------|---------|---------|-------------|---------|--------|
| MHz               | Factor  | Level   | Level       |         |        |
|                   | dB      | dBuV    | dBuV        | dB      | dBuV   |
| <b>LINE 2</b>     |         |         |             |         |        |
| <b>Quasi-Peak</b> |         |         |             |         |        |
| 0.209             | 0.202   | 52.640  | 52.842      | -11.472 | 64.314 |
| 0.279             | 0.203   | 49.780  | 49.983      | -12.331 | 62.314 |
| 0.339             | 0.204   | 41.850  | 42.054      | -18.546 | 60.600 |
| 0.566             | 0.207   | 45.490  | 45.697      | -10.303 | 56.000 |
| *0.619            | 0.208   | 46.380  | 46.588      | -9.412  | 56.000 |
| 1.119             | 0.214   | 42.290  | 42.504      | -13.496 | 56.000 |
| <b>Average</b>    |         |         |             |         |        |
| *0.209            | 0.202   | 50.230  | 50.432      | -3.882  | 54.314 |
| 0.279             | 0.203   | 45.950  | 46.153      | -6.161  | 52.314 |
| 0.339             | 0.204   | 28.350  | 28.554      | -22.046 | 50.600 |
| 0.566             | 0.207   | 37.420  | 37.627      | -8.373  | 46.000 |
| 0.619             | 0.208   | 36.070  | 36.278      | -9.722  | 46.000 |
| 1.119             | 0.214   | 28.860  | 29.074      | -16.926 | 46.000 |

Note:

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

### 3. Peak Power Output

#### 3.1. Test Equipment

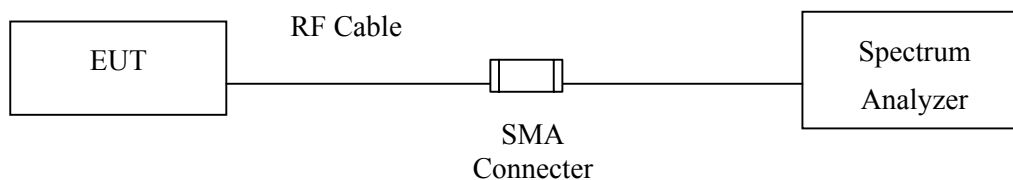
The following test equipments are used during the radiated emission tests:

| Equipment       | Manufacturer | Model No./Serial No. | Last Cal. |
|-----------------|--------------|----------------------|-----------|
| X Test Receiver | R & S        | ESI26 / 838786/004   | May, 2005 |

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

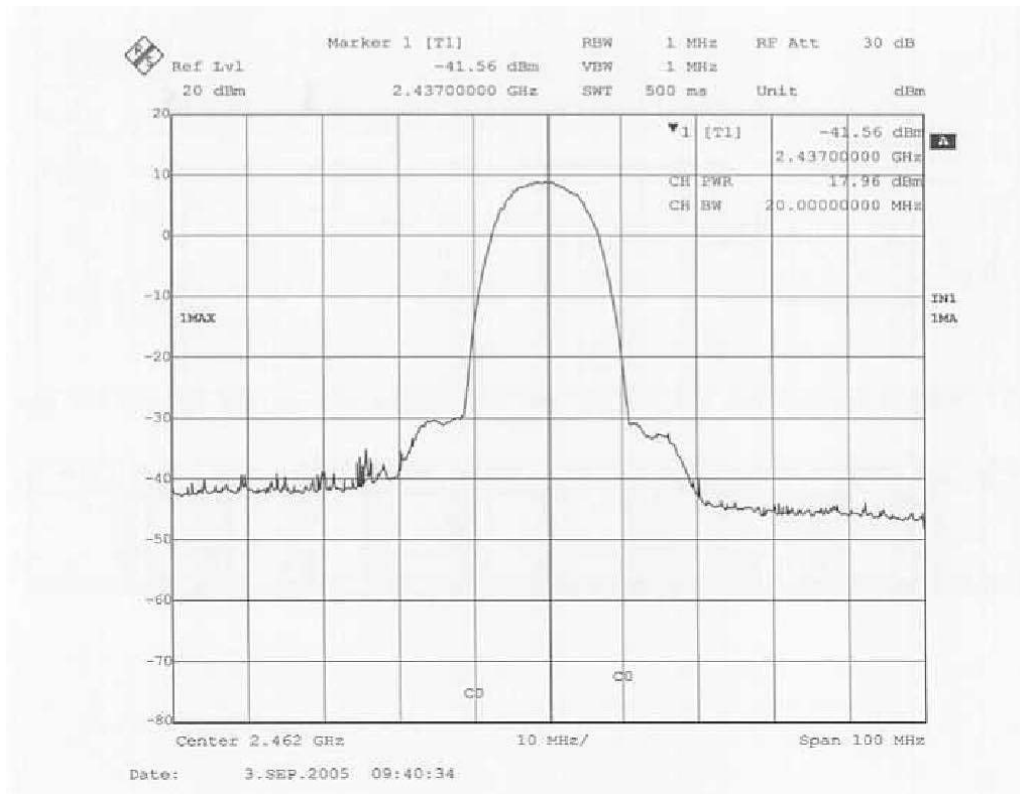
### 3.5. Test Result of Peak Power Output

Product : Projector  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 802.11b

#### Data Speed: 11Mbps

| Channel No. | Frequency (MHz) | Measurement | Required Limit | Result |
|-------------|-----------------|-------------|----------------|--------|
| 11          | 2462.00         | 17.96dBm    | 1Watt= 30 dBm  | Pass   |

#### 11Mbps-CH11

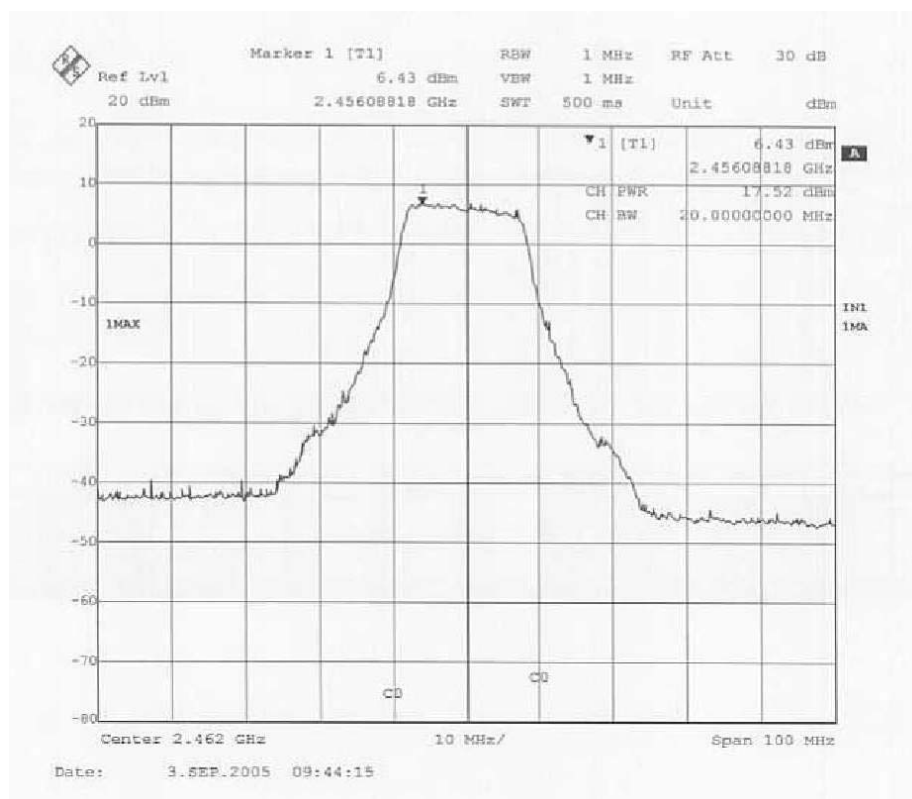


Product : Projector  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter 802.11g

**Data Speed: 54Mbps**

| Channel No. | Frequency (MHz) | Measurement | Required Limit | Result |
|-------------|-----------------|-------------|----------------|--------|
| 11          | 2462.00         | 17.52dBm    | 1Watt= 30 dBm  | Pass   |

**54Mbps-CH011**



## 4. Radiated Emission

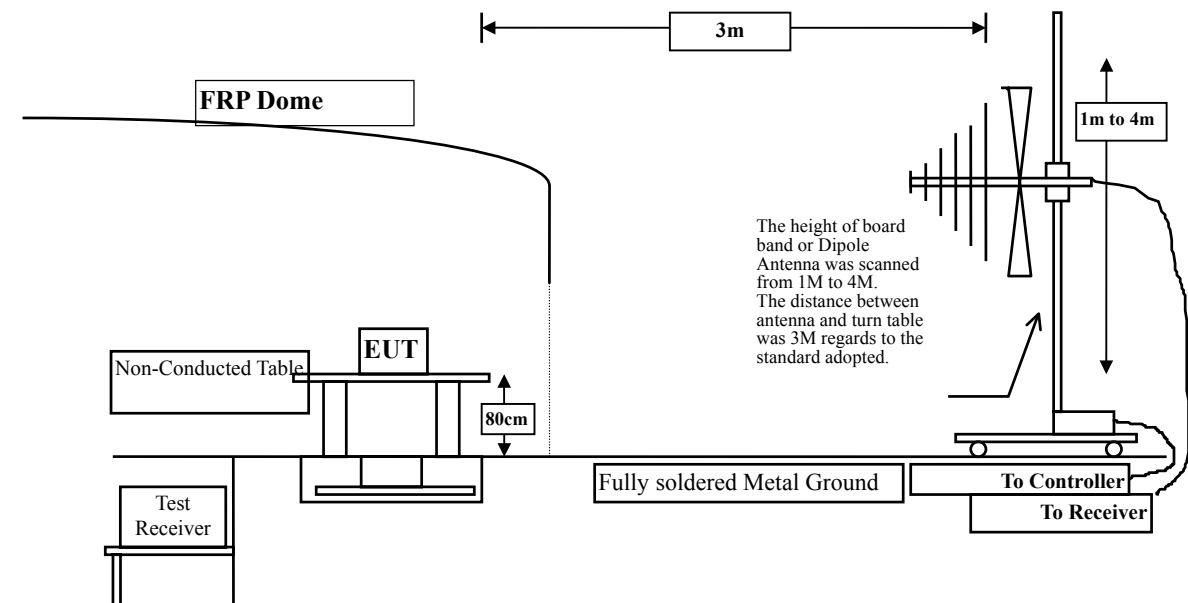
### 4.1. Test Equipment

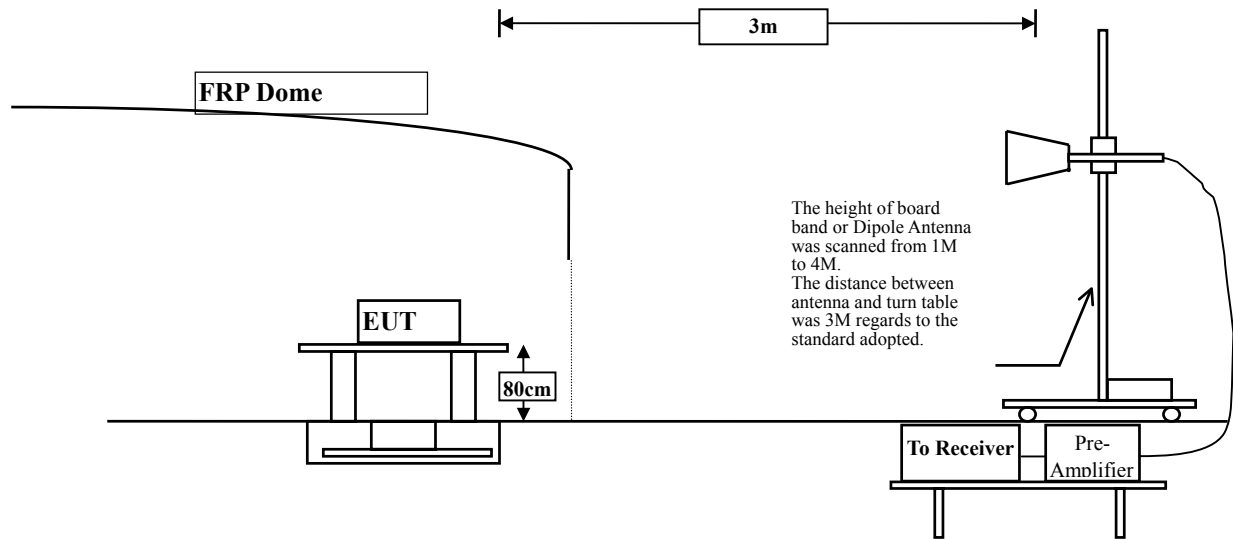
The following test equipment are used during the radiated emission test:

| Test Site |   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal.  |
|-----------|---|-------------------|--------------|----------------------|------------|
| Site # 1  |   | Test Receiver     | R & S        | ESCS 30 / 825442/14  | May, 2005  |
|           |   | Spectrum Analyzer | Advantest    | R3261C / 71720140    | May, 2005  |
|           |   | Pre-Amplifier     | HP           | 8447D/3307A01812     | May, 2005  |
|           |   | Bilog Antenna     | Chase        | CBL6112B / 12452     | Sep., 2005 |
|           |   | Horn Antenna      | EM           | EM6917 / 103325      | May, 2005  |
| Site # 2  |   | Test Receiver     | R & S        | ESCS 30 / 825442/17  | May, 2005  |
|           |   | Spectrum Analyzer | Advantest    | R3261C / 71720609    | May, 2005  |
|           |   | Pre-Amplifier     | HP           | 8447D/3307A01814     | May, 2005  |
|           |   | Bilog Antenna     | Chase        | CBL6112B / 2455      | Sep., 2005 |
|           |   | Horn Antenna      | EM           | EM6917 / 103325      | May, 2005  |
| Site # 3  | X | Test Receiver     | R & S        | ESCS30 /100122       | Feb., 2005 |
|           | X | Spectrum Analyzer | Advantest    | R3162 / 100803480    | May, 2005  |
|           | X | Pre-Amplifier     | QTK          | QTK-AMP-03 / 0003    | May, 2005  |
|           | X | Bilog Antenna     | SCHAFFNER    | CBL6112B / 2697      | May, 2005  |
|           | X | Horn Antenna      | ETS          | 3115 / 0005-6160     | July, 2005 |
|           | X | Pre-Amplifier     | QTK          | QTK-AMP-01 / 0001    | July, 2005 |

- 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 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: 2003 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 : Projector  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 802.11b

| Frequency<br>MHz                | Cable Loss<br>dB | Probe Factor<br>dB/m | PreAMP<br>dB | Reading Level<br>dBuV | Emission Level<br>dBuV/m | Margin<br>dB | Limit<br>dBuV/m |
|---------------------------------|------------------|----------------------|--------------|-----------------------|--------------------------|--------------|-----------------|
| <b>Horizontal Peak Detector</b> |                  |                      |              |                       |                          |              |                 |
| 4924.000                        | 4.30             | 33.90                | 20.06        | 34.22                 | 52.37                    | 21.63        | 74.00           |
| 7386.000                        | 5.72             | 37.14                | 18.76        | 35.74                 | 59.83                    | 14.17        | 74.00           |
| 9848.000                        | 7.12             | 38.44                | 16.83        | 35.34                 | 64.07                    | 9.93         | 74.00           |
| <b>Average Detector</b>         |                  |                      |              |                       |                          |              |                 |
| 7386.000                        | 5.72             | 37.14                | 18.76        | 21.84                 | 45.93                    | 8.07         | 54.00           |
| 9848.000                        | 7.12             | 38.44                | 16.83        | 21.46                 | 50.19                    | 3.81         | 54.00           |
| <b>Vertical Peak Detector</b>   |                  |                      |              |                       |                          |              |                 |
| 4924.000                        | 4.30             | 33.90                | 20.06        | 36.57                 | 54.72                    | 19.28        | 74.00           |
| 7386.000                        | 5.72             | 37.14                | 18.76        | 36.66                 | 60.75                    | 13.25        | 74.00           |
| 9848.000                        | 7.12             | 38.44                | 16.83        | 34.20                 | 62.93                    | 11.07        | 74.00           |
| <b>Average Detector</b>         |                  |                      |              |                       |                          |              |                 |
| 4924.000                        | 4.30             | 33.90                | 20.06        | 22.39                 | 40.54                    | 13.46        | 54.00           |
| 7386.000                        | 5.72             | 37.14                | 18.76        | 22.30                 | 46.39                    | 7.61         | 54.00           |
| 9848.000                        | 7.12             | 38.44                | 16.83        | 21.41                 | 50.14                    | 3.86         | 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 : Projector  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3OATS  
 Test Mode : Mode 2: Transmitter 802.11g

| Frequency<br>MHz        | Cable Probe<br>Loss<br>dB | Factor<br>dB/m | PreAMP<br>dB | Reading<br>Level<br>dBuV | Emission<br>Level<br>dBuV/m | Margin<br>dB | Limit<br>dBuV/m |
|-------------------------|---------------------------|----------------|--------------|--------------------------|-----------------------------|--------------|-----------------|
| <b>Horizontal</b>       |                           |                |              |                          |                             |              |                 |
| <b>Peak Detector</b>    |                           |                |              |                          |                             |              |                 |
| 4924.125                | 4.30                      | 33.90          | 20.06        | 35.96                    | 54.11                       | 19.89        | 74.00           |
| 7386.000                | 5.72                      | 37.14          | 18.76        | 36.71                    | 60.80                       | 13.20        | 74.00           |
| 9848.000                | 7.12                      | 38.44          | 16.83        | 36.21                    | 64.94                       | 9.06         | 74.00           |
| <b>Average Detector</b> |                           |                |              |                          |                             |              |                 |
| 4924.000                | 4.30                      | 33.90          | 20.06        | 27.55                    | 45.70                       | 8.30         | 54.00           |
| 7386.000                | 5.72                      | 37.14          | 18.76        | 22.90                    | 46.99                       | 7.01         | 54.00           |
| 9848.000                | 7.12                      | 38.44          | 16.83        | 21.52                    | 50.25                       | 3.75         | 54.00           |
| <b>Vertical</b>         |                           |                |              |                          |                             |              |                 |
| <b>Peak Detector</b>    |                           |                |              |                          |                             |              |                 |
| 4924.125                | 4.30                      | 33.90          | 20.06        | 36.76                    | 54.91                       | 19.09        | 74.00           |
| 7386.000                | 5.72                      | 37.14          | 18.76        | 36.34                    | 60.43                       | 13.57        | 74.00           |
| 9848.000                | 7.12                      | 38.44          | 16.83        | 35.88                    | 64.61                       | 9.39         | 74.00           |
| <b>Average Detector</b> |                           |                |              |                          |                             |              |                 |
| 4924.000                | 4.30                      | 33.90          | 20.06        | 27.46                    | 45.61                       | 8.39         | 54.00           |
| 7386.000                | 5.72                      | 37.14          | 18.76        | 21.80                    | 45.89                       | 8.11         | 54.00           |
| 9848.000                | 7.12                      | 38.44          | 16.83        | 21.45                    | 50.18                       | 3.82         | 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 : Projector  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 802.11b

| 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> |       |        |        |         |          |        |        |
| 143.980            | 1.45  | 10.87  | 0.00   | 13.27   | 25.60    | 17.90  | 43.50  |
| * 231.270          | 1.90  | 9.57   | 0.00   | 30.72   | 42.20    | 3.80   | 46.00  |
| 240.900            | 1.95  | 10.57  | 0.00   | 24.57   | 37.10    | 8.90   | 46.00  |
| 536.800            | 3.48  | 17.05  | 0.00   | 13.87   | 34.40    | 11.60  | 46.00  |
| 607.150            | 3.85  | 18.00  | 0.00   | 12.45   | 34.29    | 11.71  | 46.00  |
| 762.350            | 4.65  | 19.85  | 0.00   | 10.70   | 35.20    | 10.80  | 46.00  |
| <b>Vertical:</b>   |       |        |        |         |          |        |        |
| 143.980            | 1.45  | 9.96   | 0.00   | 13.47   | 30.03    | 13.47  | 43.50  |
| * 165.800          | 1.57  | 8.42   | 0.00   | 1.67    | 41.83    | 1.67   | 43.50  |
| 192.480            | 1.70  | 8.08   | 0.00   | 13.50   | 30.00    | 13.50  | 43.50  |
| 200.130            | 1.74  | 8.40   | 0.00   | 9.25    | 34.25    | 9.25   | 43.50  |
| 321.100            | 2.37  | 12.43  | 0.00   | 15.86   | 30.14    | 15.86  | 46.00  |
| 367.080            | 2.60  | 14.67  | 0.00   | 15.36   | 30.64    | 15.36  | 46.00  |
| 522.280            | 3.41  | 16.67  | 0.00   | 12.30   | 23.70    | 12.30  | 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 : Projector  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter 802.11g

| 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> |       |        |        |         |          |        |        |
| 143.980            | 1.45  | 10.87  | 0.00   | 22.30   | 34.63    | 8.87   | 43.50  |
| 199.750            | 1.74  | 8.40   | 0.00   | 22.63   | 32.77    | 10.73  | 43.50  |
| * 231.270          | 1.90  | 9.57   | 0.00   | 30.72   | 42.20    | 3.80   | 46.00  |
| 367.080            | 2.60  | 13.98  | 0.00   | 18.36   | 34.95    | 11.05  | 46.00  |
| 587.750            | 3.74  | 17.92  | 0.00   | 12.98   | 34.63    | 11.37  | 46.00  |
| 767.200            | 4.66  | 19.86  | 0.00   | 10.27   | 34.79    | 11.21  | 46.00  |
| <b>Vertical:</b>   |       |        |        |         |          |        |        |
| 177.930            | 1.63  | 8.28   | 0.00   | 21.23   | 31.14    | 12.36  | 43.50  |
| 199.750            | 1.74  | 8.40   | 0.00   | 20.33   | 30.47    | 13.03  | 43.50  |
| 250.680            | 2.00  | 11.86  | 0.00   | 16.25   | 30.11    | 15.89  | 46.00  |
| 367.080            | 2.60  | 14.67  | 0.00   | 13.37   | 30.64    | 15.36  | 46.00  |
| * 500.450          | 3.30  | 16.26  | 0.00   | 15.77   | 35.33    | 10.67  | 46.00  |
| 522.280            | 3.41  | 16.67  | 0.00   | 13.62   | 33.70    | 12.30  | 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

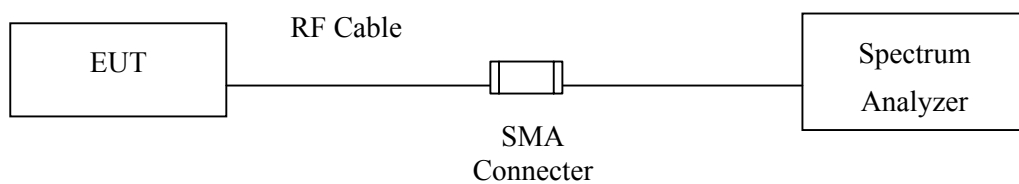
The following test equipments are used during the band edge tests:

| Equipment           | Manufacturer | Model No./Serial No. | Last Cal.  |
|---------------------|--------------|----------------------|------------|
| X Spectrum Analyzer | HP           | E4407B / US39440758  | May, 2005  |
| X Test Receiver     | R & S        | ESCS 30 / 825442/14  | May, 2005  |
| X Spectrum Analyzer | Advantest    | R3261C / 71720140    | May, 2005  |
| X Pre-Amplifier     | HP           | 8447D/3307A01812     | May, 2005  |
| X Bilog Antenna     | Chase        | CBL6112B / 12452     | Sep., 2005 |
| X Horn Antenna      | EM           | EM6917 / 103325      | May, 2005  |

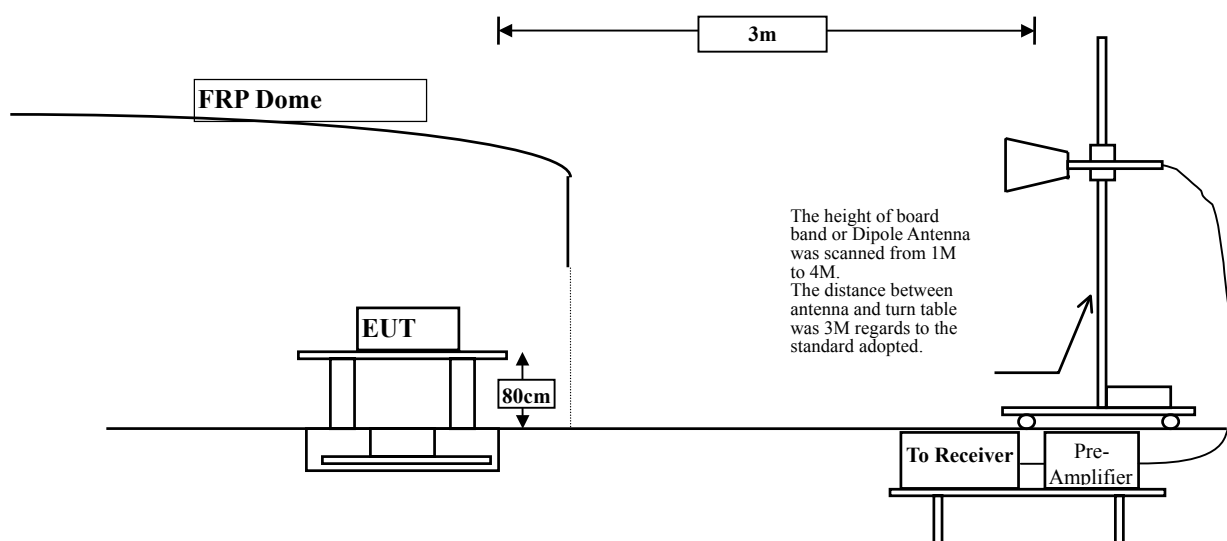
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.  
2. Mark "X" test instruments are used to measure the final test results.

### 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: 2003 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 Conducted is defined as  $\pm 1$  MHz and Radiated above 1GHz as  $\pm 3.9$  dB.

## 5.6. Test Result of Band Edge

Product : Projector  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 802.11b

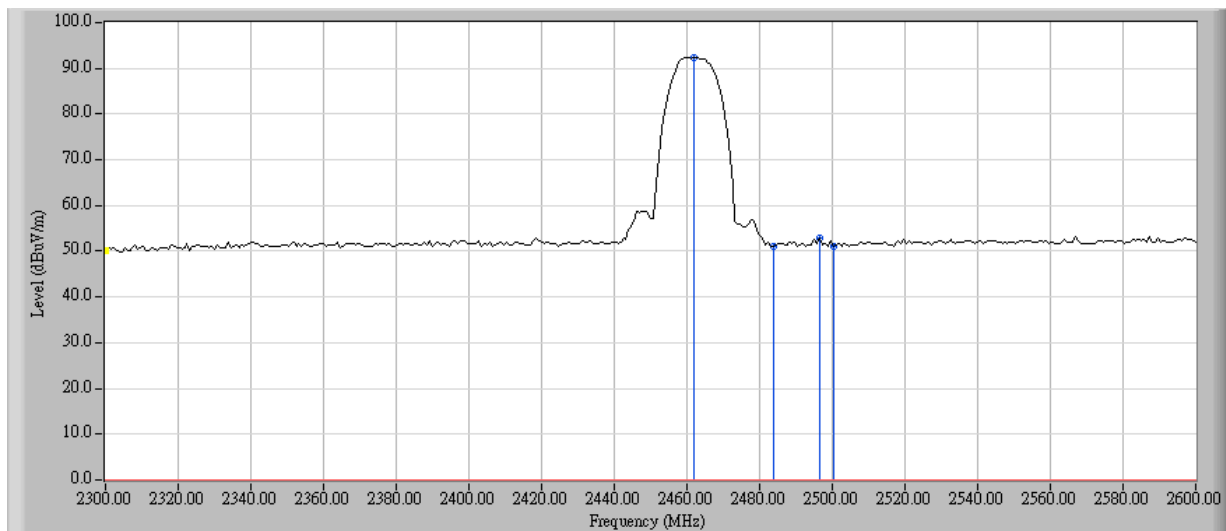
### RF Radiated Measurement:

| Channel No.     | Frequency (MHz) | Required Limit (dBc) | Result |
|-----------------|-----------------|----------------------|--------|
| 11 (Horizontal) | <2400           | >20                  | Pass   |

### RF Radiated Measurement (Horizontal):

| Channel No.  | Frequency (MHz) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|--------------|-----------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)    | 2496.500        | 43.312               | 52.820                  | 74.00               | 54.00                  | Pass   |
| 11 (Average) | --              | --                   | --                      | 74.00               | 54.00                  | Pass   |

Figure Channel 11: (Horizontal)



Product : Projector  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 802.11b

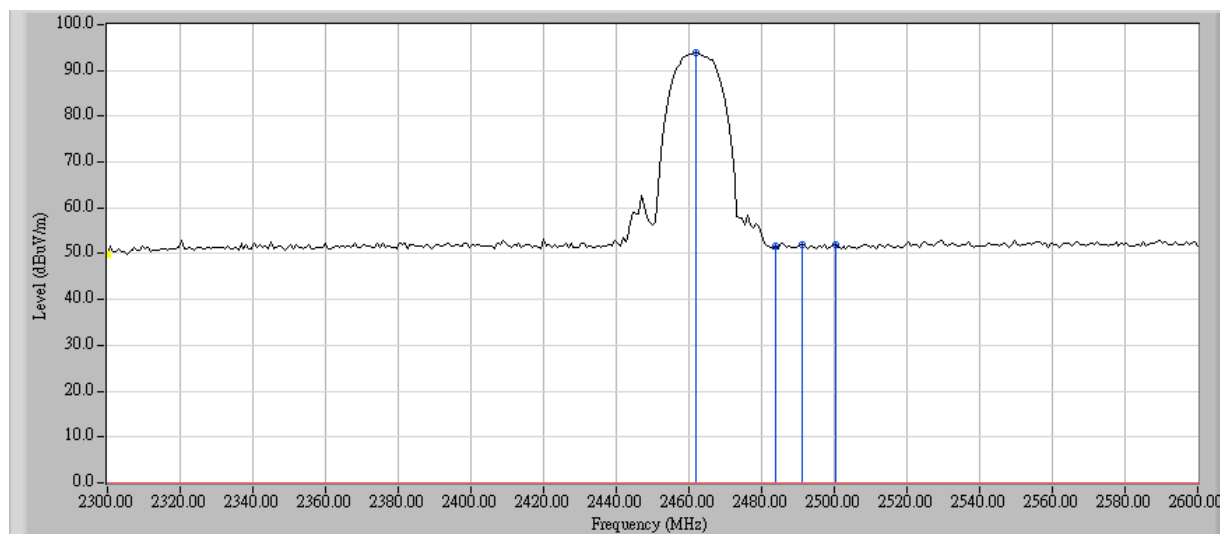
**RF Radiated Measurement:**

| Channel No.   | Frequency (MHz) | Required Limit (dBc) | Result |
|---------------|-----------------|----------------------|--------|
| 11 (Vertical) | <2400           | >20                  | Pass   |

**RF Radiated Measurement (Vertical):**

| Channel No.  | Frequency (MHz) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|--------------|-----------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)    | 2491.250        | 42.376               | 51.900                  | 74.00               | 54.00                  | Pass   |
| 11 (Average) | --              | --                   | --                      | 74.00               | 54.00                  | Pass   |

**Figure Channel 11:** (Vertical)

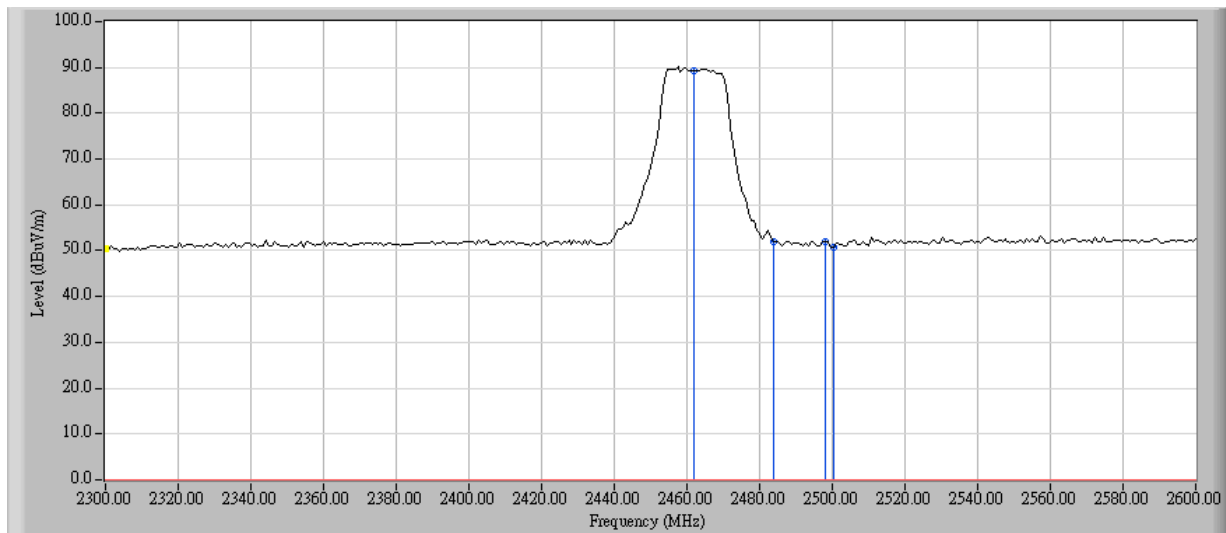


Product : Projector  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter 802.11g

**RF Radiated Measurement (Horizontal):**

| Channel No. | Frequency (MHz) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|-------------|-----------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)   | 2498.000        | 42.527               | 52.030                  | 74.00               | 54.00                  | Pass   |
| 11(Average) | --              | --                   | --                      | 74.00               | 54.00                  | Pass   |

**Figure Channel 11:** (Horizontal)

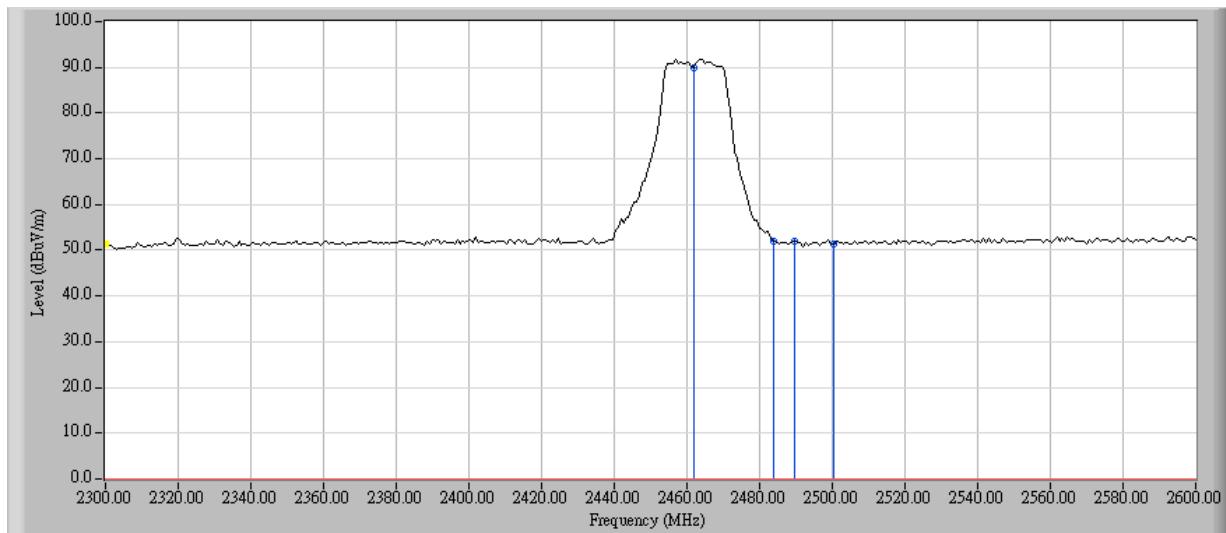


Product : Projector  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter 802.11g

**RF Radiated Measurement (Vertical):**

| Channel No. | Frequency (MHz) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Average Limit (dBuV/m) | Result |
|-------------|-----------------|----------------------|-------------------------|---------------------|------------------------|--------|
| 11 (Peak)   | 2489.750        | 42.371               | 51.900                  | 74.00               | 54.00                  | Pass   |
| 11(Average) | --              | --                   | --                      | 74.00               | 54.00                  | Pass   |

**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

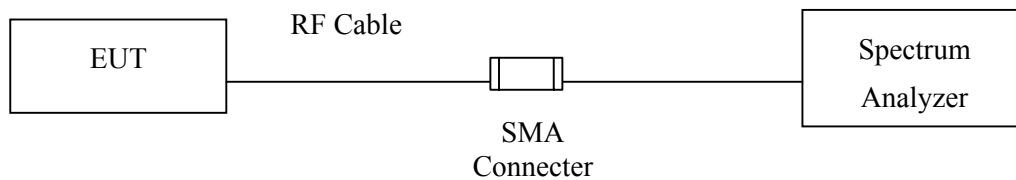
### 6.1. Test Equipment

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

| Equipment       | Manufacturer | Model No./Serial No. | Last Cal. |
|-----------------|--------------|----------------------|-----------|
| X Test Receiver | R & S        | ESI26 / 838786/004   | May, 2005 |

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 : Projector  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 802.11b

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11 (11Mbps) | 2462            | 11423                   | >500                 | Pass   |

Figure Channel 11: 11Mbps

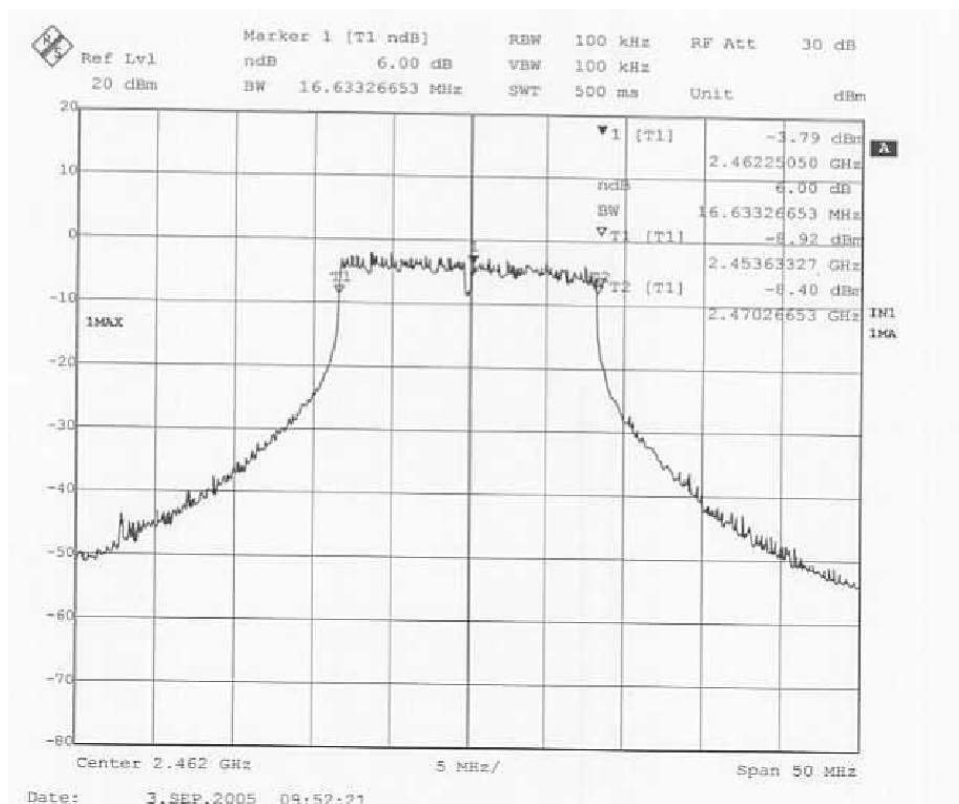


Product : Projector  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter 802.11g

| Channel No. | Frequency (MHz) | Measurement Level (kHz) | Required Limit (kHz) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11 (54Mbps) | 2462            | 16633                   | >500                 | Pass   |

Figure Channel 11:

54Mbps



## 7. Power Density

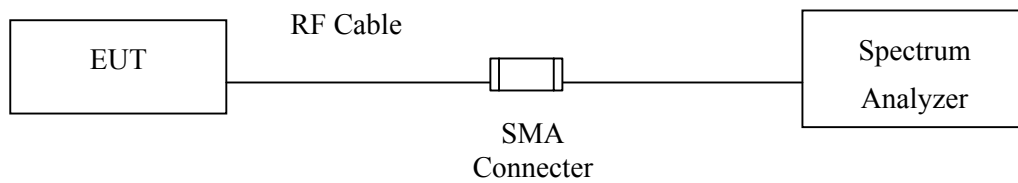
### 7.1. Test Equipment

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

|   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal. |
|---|-------------------|--------------|----------------------|-----------|
| X | Spectrum Analyzer | HP           | E4407B / US39440758  | May, 2005 |

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

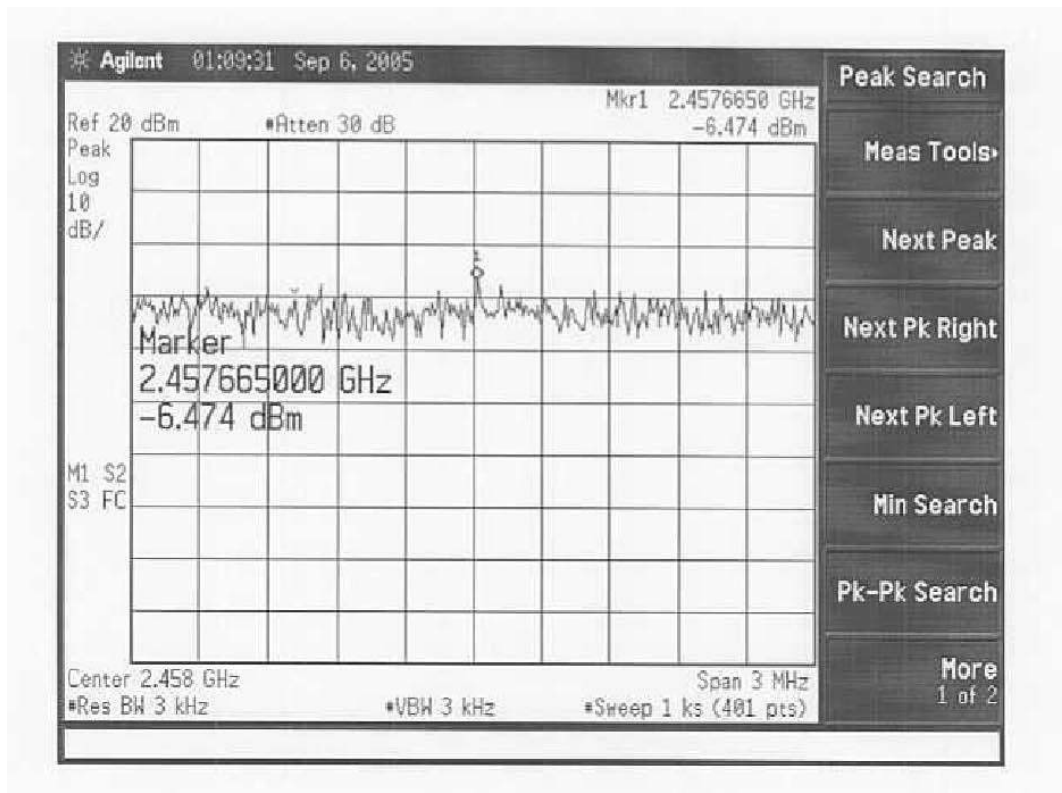
The measurement uncertainty is defined as  $\pm 1.27$  dB

## 7.5. Test Result of Power Density

Product : Projector  
 Test Item : Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmitter 802.11b

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11 (11Mbps) | 2462            | -6.474                  | < 8dBm               | Pass   |

**Figure Channel 11:** 11Mbps

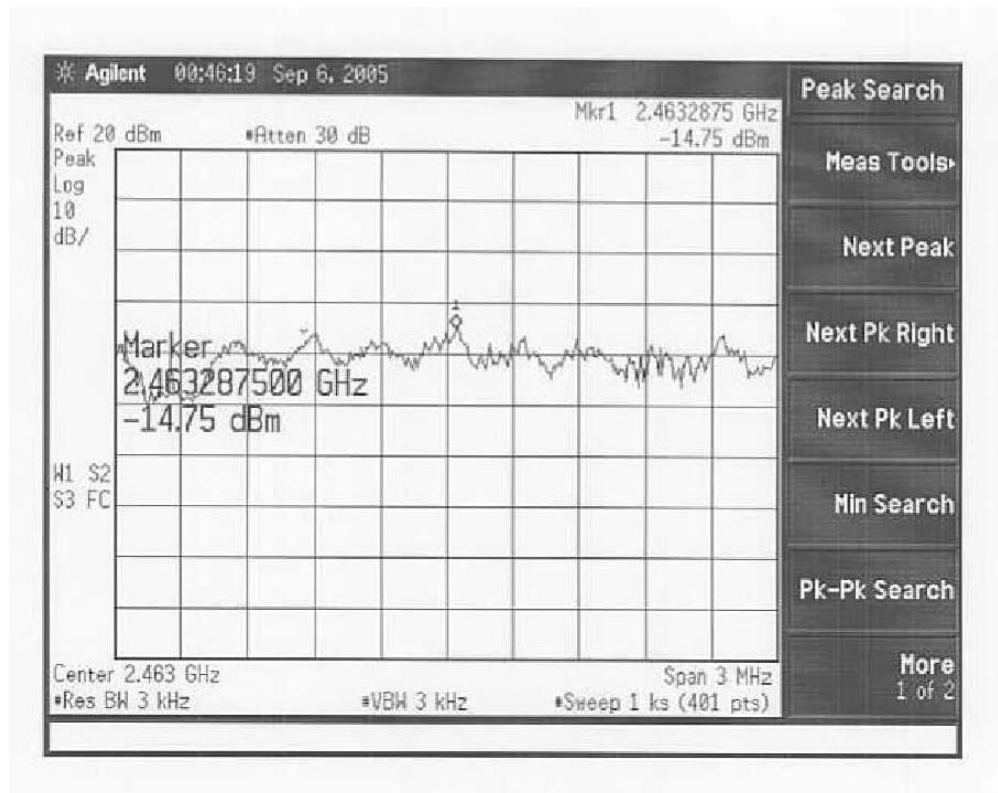


Product : Projector  
 Test Item : Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmitter 802.11g

| Channel No. | Frequency (MHz) | Measurement Level (dBm) | Required Limit (dBm) | Result |
|-------------|-----------------|-------------------------|----------------------|--------|
| 11 (54Mbps) | 2462            | -14.75                  | < 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



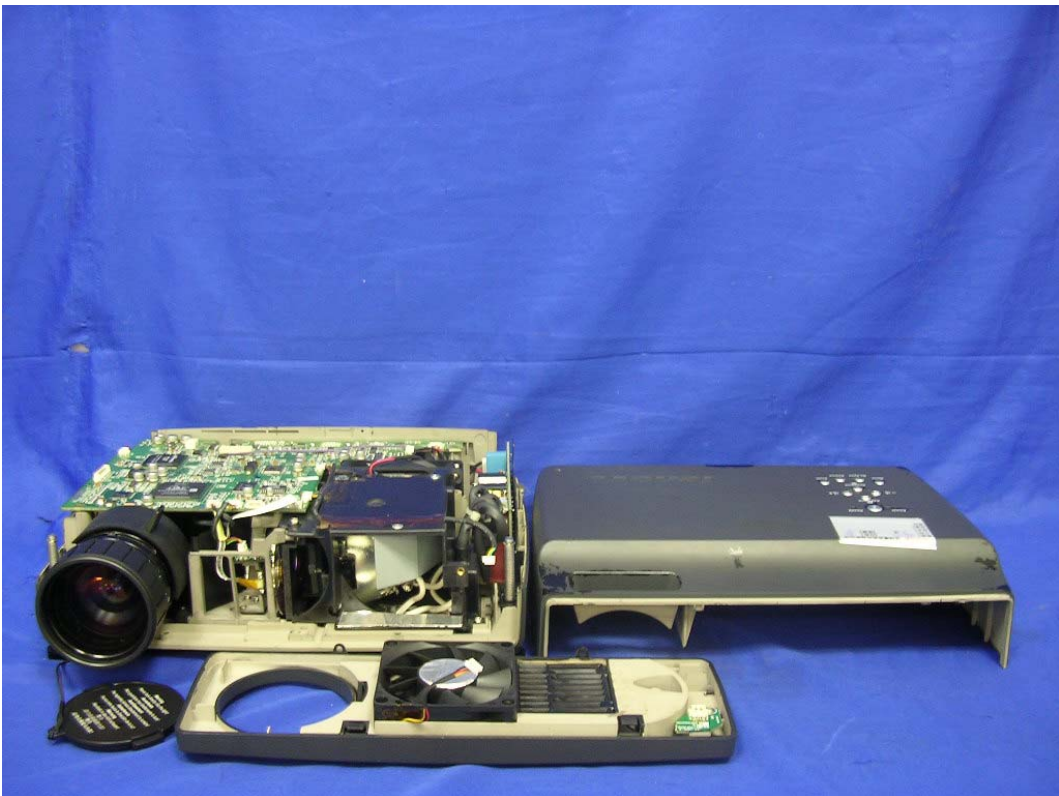
### (2) EUT Photo



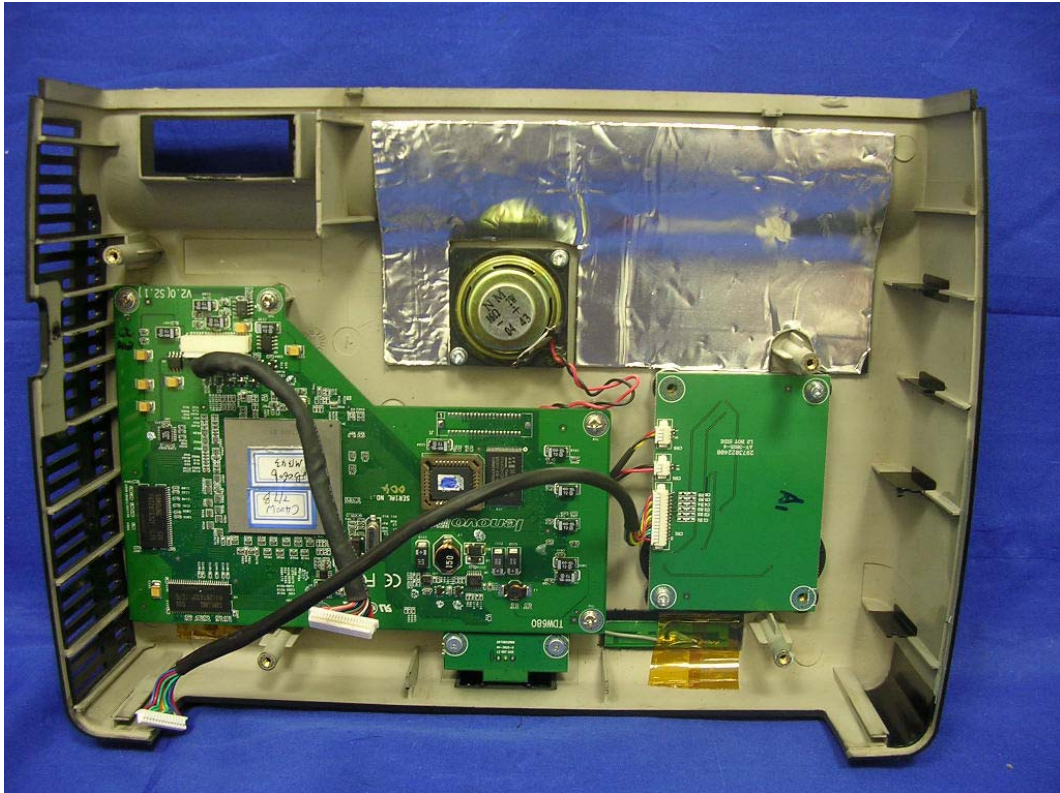
(3) EUT Photo



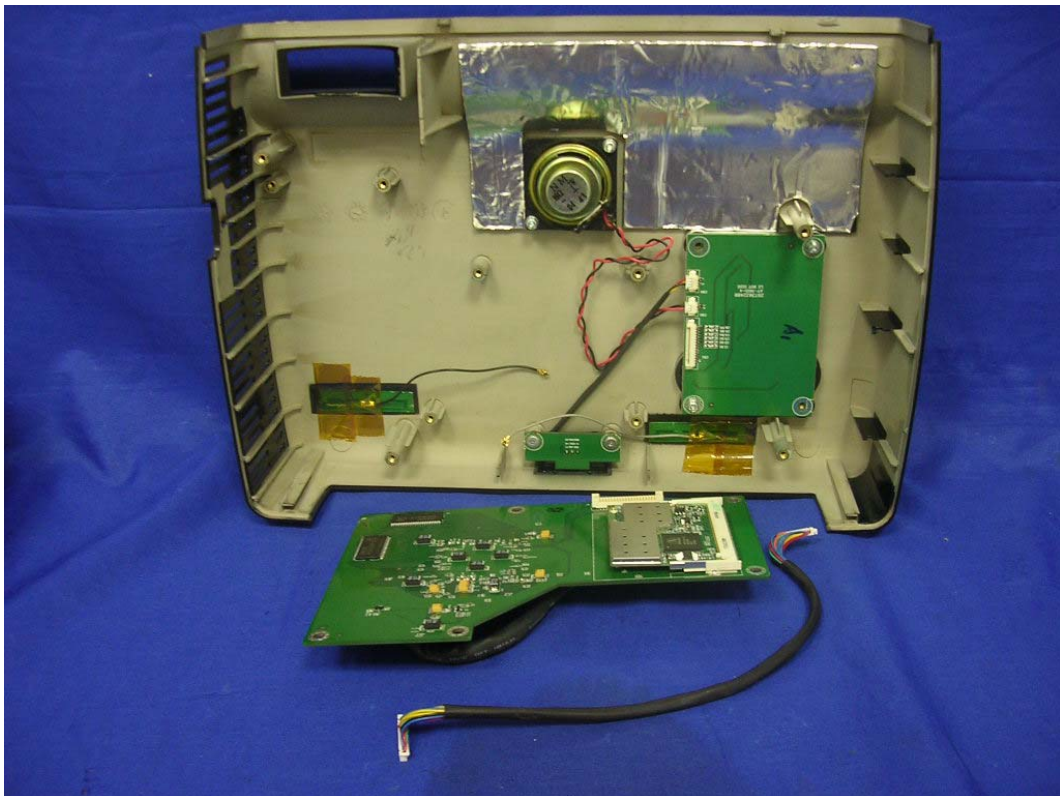
(4) EUT Photo



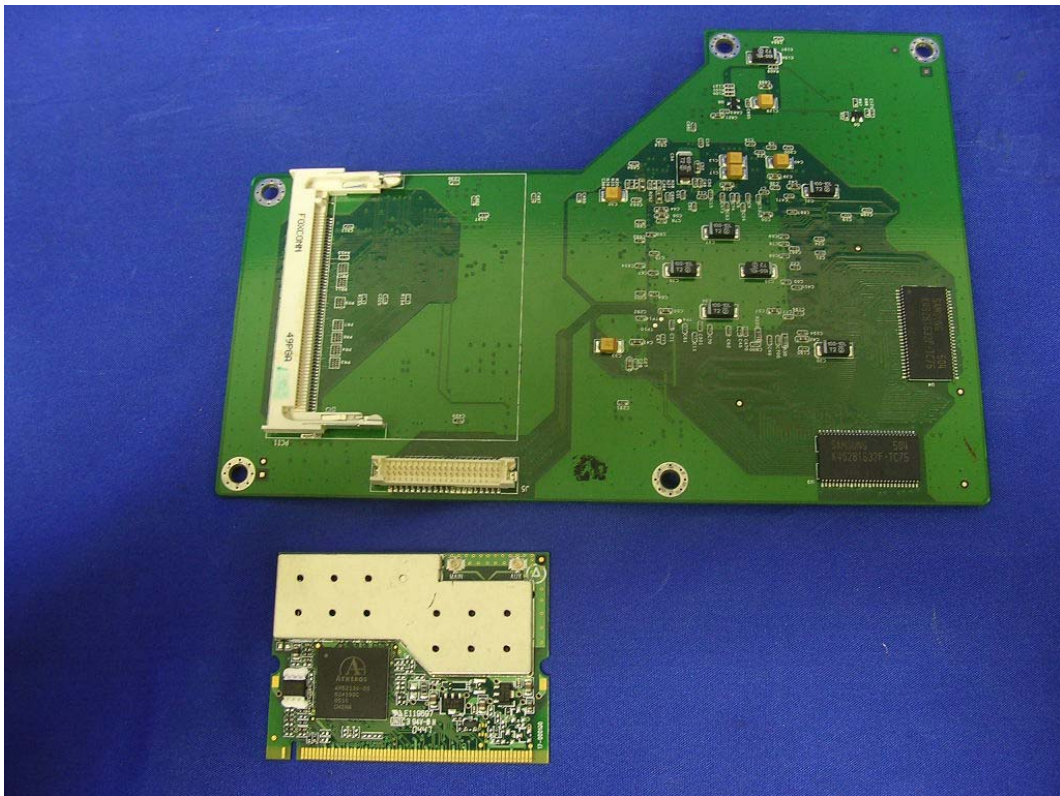
(5) EUT Photo



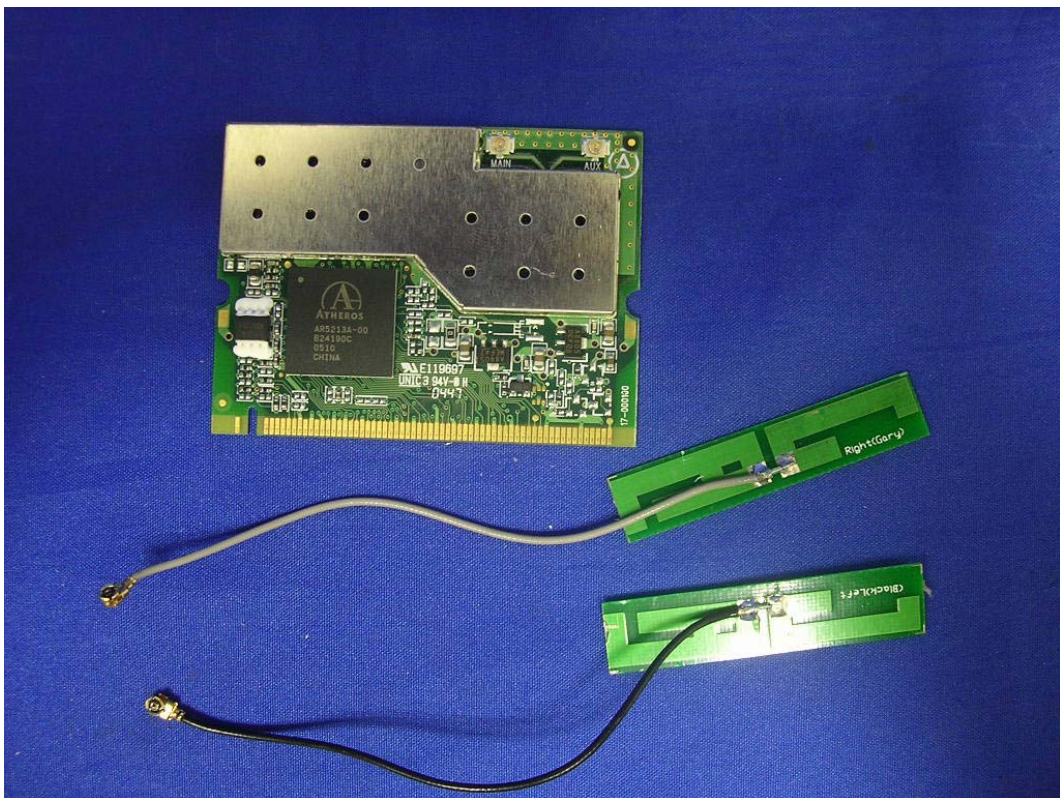
(6) EUT Photo



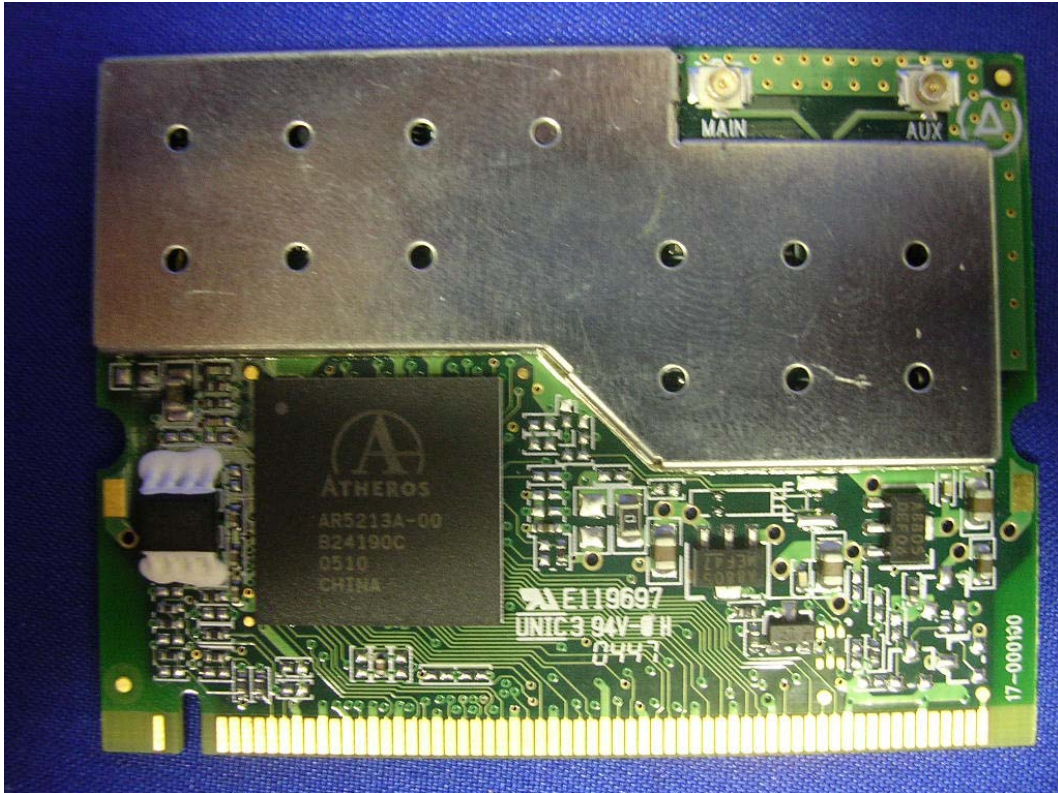
(7) EUT Photo



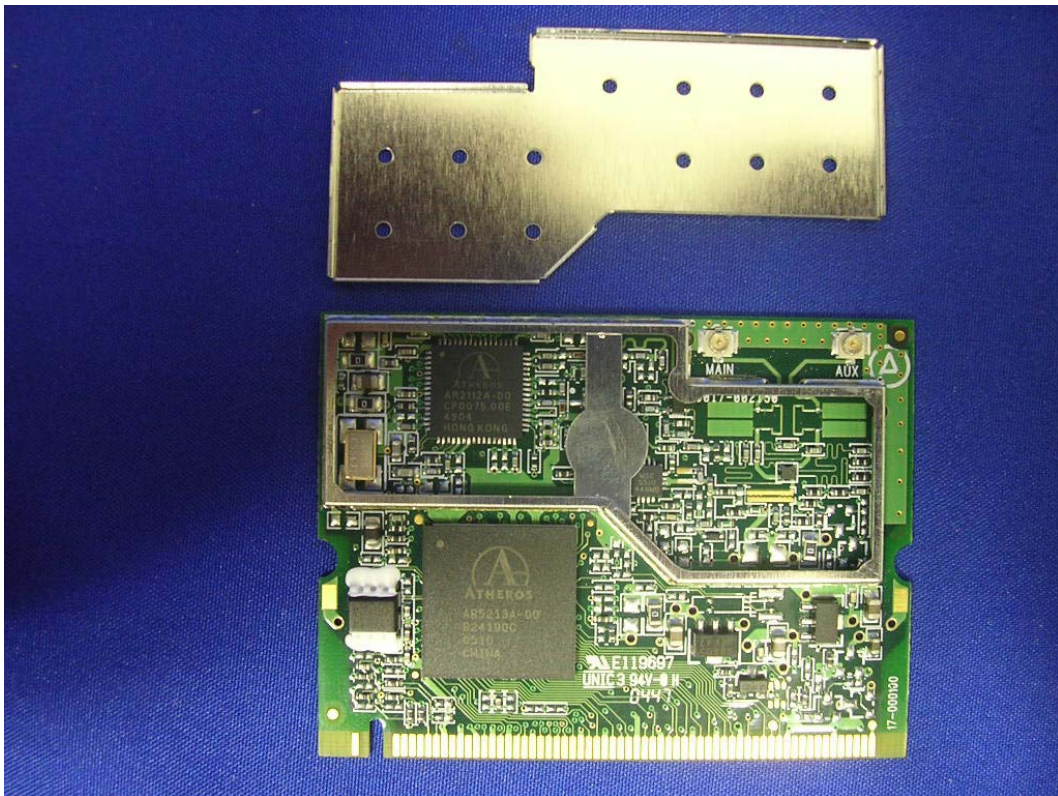
(8) EUT Photo



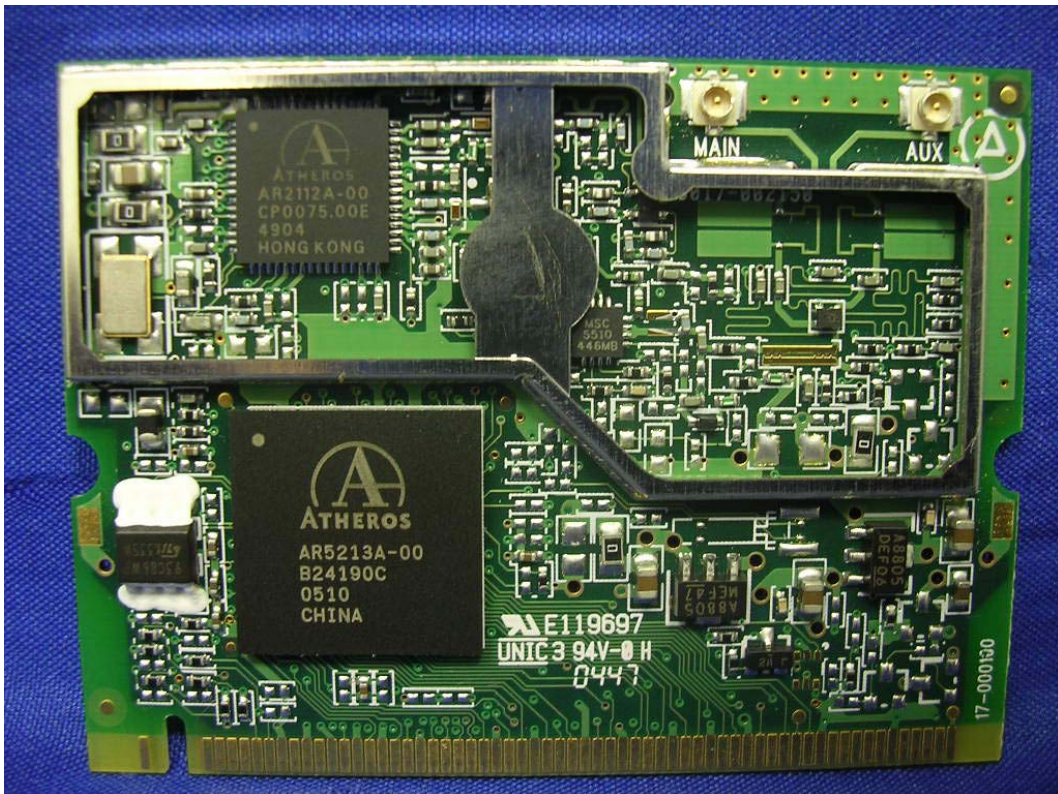
(9) EUT Photo



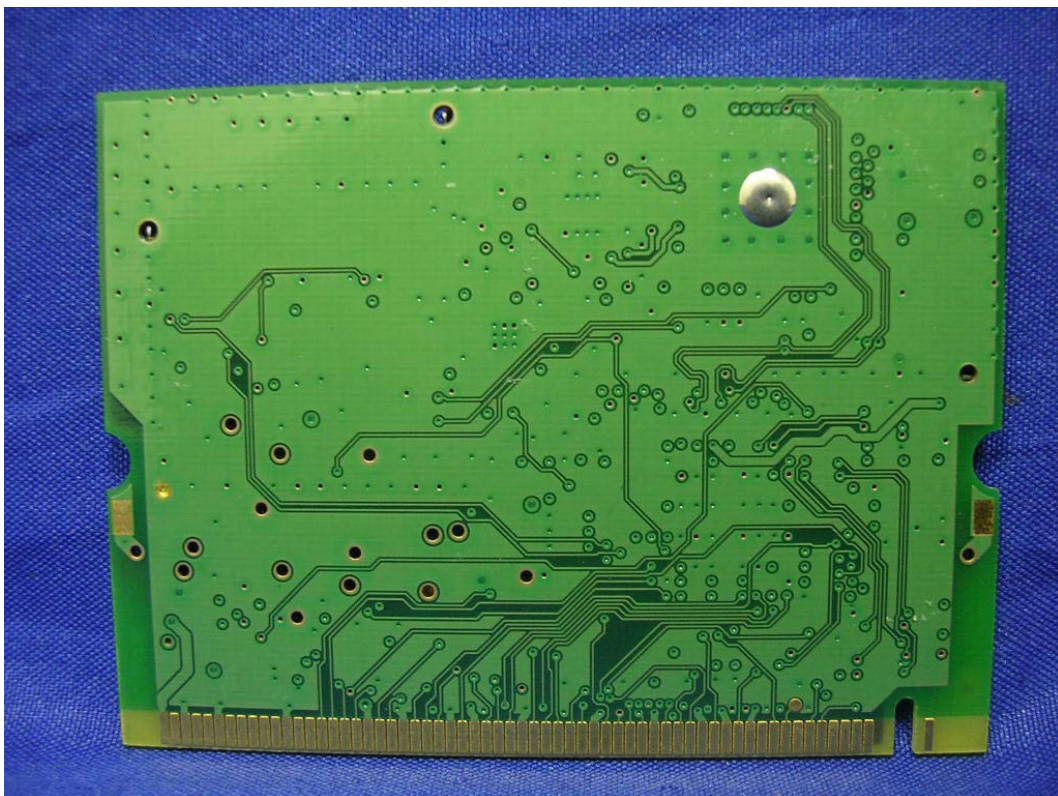
(10) EUT Photo



(11) EUT Photo



(12) EUT Photo



(13) EUT Photo

