



## Test Report

Product Name : 2.4G Wireless Camera

Model No. : C125U

FCC ID : FU5C125U

Applicant : EVERSPRING INDUSTRY CO., LTD

Address : 6th fl. 609 Wan Shou Road Sec. 1, Kweishan, Taoyuan Hsien 333,  
Taiwan, R.O.C.

Date of Receipt : Jan. 17, 2003

Date of Test : Feb. 11, 2003

Report No. : 031L049FI

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

Test Date : Feb. 11, 2003

Report No. : 031L049FI



Accredited by NIST (NVLAP)  
NVLAP Lab Code: 200347-0

Product Name : 2.4G Wireless Camera

Applicant : EVERSPRING INDUSTRY CO., LTD

Address : 6th fl. 609 Wan Shou Road Sec. 1, Kweishan, Taoyuan Hsien 333,  
Taiwan, R.O.C.

Manufacturer : EVERSPRING INDUSTRY CO., LTD

Model No. : C125U

FCC ID. : FU5C125U

Rated Voltage : AC 120V/60Hz

Trade Name : EVERSPRING

Measurement Standard : FCC Part 15 Subpart C Paragraph 15.249

Measurement Procedure : ANSI C63.4:1992

Test Result : Complied



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

Documented By : Cordelia Huang  
( Cordelia Huang )

Tested By : Tom Hsieh  
( Tom Hsieh )

Approved By : Gene Chang  
( Gene Chang )

## TABLE OF CONTENTS

| Description   | Page      |
|---|-----------|
| <b>1. GENERAL INFORMATION .....</b>                           | <b>4</b>  |
| 1.1. EUT Description .....                                    | 4         |
| 1.2. Operation Description.....                               | 5         |
| 1.3. Tested System Details .....                              | 5         |
| 1.4. Configuration of Tested System.....                      | 5         |
| 1.5. EUT Exercise Software .....                              | 5         |
| 1.6. Test Facility .....                                      | 6         |
| <b>2. Conducted Emission .....</b>                            | <b>7</b>  |
| 2.1. Test Equipment .....                                     | 7         |
| 2.2. Test Setup.....  | 7         |
| 2.3. Limits.....  | 7         |
| 2.4. Test Procedure .....                                     | 8         |
| 2.5. Test Result of Conducted Emission .....                  | 9         |
| <b>3. Peak Power Output .....</b>                             | <b>11</b> |
| 3.1. Test Equipment .....                                     | 11        |
| 3.2. Test Setup.....  | 11        |
| 3.3. Limits.....  | 11        |
| 3.4. Test Result of Peak Power Output .....                   | 12        |
| <b>4. Radiated Emission .....</b>                             | <b>13</b> |
| 4.1. Test Equipment .....                                     | 13        |
| 4.2. Test Setup.....  | 13        |
| 4.3. Limits.....  | 14        |
| 4.4. Test Procedure .....                                     | 15        |
| 4.5. Test Result of Radiated Emission .....                   | 16        |
| <b>5. Band Edge .....</b>                                     | <b>22</b> |
| 5.1. Test Equipment .....                                     | 22        |
| 5.2. Test Setup.....  | 22        |
| 5.3. Limit .....  | 23        |
| 5.4. Test Procedure .....                                     | 23        |
| 5.5. Test Result of Band Edge.....                            | 24        |
| <b>6. EMI Reduction Method During Compliance Testing.....</b> | <b>28</b> |
| Attachment 1: EUT Test Photographs                            |           |
| Attachment 2: EUT Detailed Photographs                        |           |

## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name : 2.4G Wireless Camera  
Trade Name : EVERSPRING  
FCC ID. : FU5C125U  
Model No. : C125U  
Frequency Range : 2400MHz to 2483.5MHz  
Type of Modulation : FM  
Antenna type : Soldered on PCB  
Operator Selection of : Manual Switch  
Operating Frequency  
Power Adapter : TEAD-35-070200U, TECHNICS  
Cable Out: Non-Shielded, 1.8m  
Input: 120V AC/60Hz , 2W  
Output: 7.5V DC 200mA  
RCA Cable : Non-Shielded, 1.5m

#### Frequency of each Channel

| Channel    | Frequency | Channel    | Frequency | Channel    | Frequency | Channel    | Frequency |
|------------|-----------|------------|-----------|------------|-----------|------------|-----------|
| Channel 1: | 2411 MHz  | Channel 2: | 2434 MHz  | Channel 3: | 2453 MHz  | Channel 4: | 2473 MHz  |

#### Note:

1. This device is a 2.4GHz 2.4G Wireless Camera included a 2.4GHz transmitting function.
2. The variation of model number is for different case. The circuit of each model is identical.
3. Regards to the frequency band operation, the lowest 、 middle and highest frequency of channel were selected to perform the test, then shown on this report.
4. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249.
5. This device is a composite device in accordance with part 15 regulations. The function for the receiver was measured and made a test report that the report number is 025H046F, certified under verification.
6. Quietek had verified the construction and function in typical operation, then shown in this test report.

**1.2. Operation Description**

The EUT is wireless B/W Camera. The operation frequency is from 2.411GHz to 2.473GHz with FM modulation. Four manually selectable channels were built in the EUT. The signal will be transmitted through 2.4 GHz FM RF signal from the soldered on PCB antenna from EUT to receiver. DC 9V shall be provided for EUT operation.

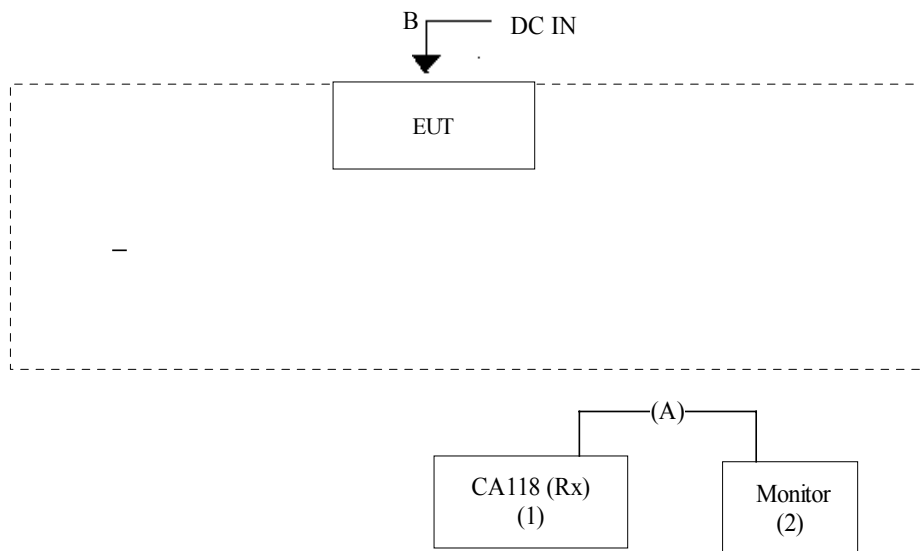
**1.3. Tested System Details**

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.       | Power Cord         |
|-----|----------|--------------|-----------|------------------|--------------------|
| (1) | RX CA118 | EVERSPRING   | CA118     | N/A              | Non-shielded, 1.8m |
| (2) | Monitor  | ADI          | CM703     | 038054T10204018A | Non-shielded, 1.8m |

| Signal Cable Type | Signal cable Description |
|-------------------|--------------------------|
| A. RCA Cable      | Non-shielded, 1.5m       |
| B. DC IN Cable    | Non-shielded, 1.8 m      |

**1.4. Configuration of Tested System**



**1.5. EUT Exercise Software**

- 1.5.1 Setup the EUT and display as shown on 1.4.
- 1.5.2 Turn on the power of all equipment.
- 1.5.3 The EUT will transmit the signal to receiver.
- 1.5.4 Repeat the above procedure 1.5.2 to 1.5.3

**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: November 3, 1998 File on  
 Federal Communications Commission  
 FCC Engineering Laboratory  
 7435 Oakland Mills Road  
 Columbia, MD 21046  
 Reference 31040/SIT1300F2  
 August 30, 2001 Accreditation on NVLAP  
 NVLAP Lab Code: 200347-0



Site Name: Quietek Corporation

Site Address: No. 75-1, Wang-Yeh Valley, Yung-Hsing,  
 Chiung-Lin, Hsin-Chu County,  
 Taiwan, R.O.C.  
 TEL : 886-3-592-8858 / FAX : 886-3-592-8859  
 E-Mail: [service@quietek.com](mailto:service@quietek.com)

## 2. Conducted Emission

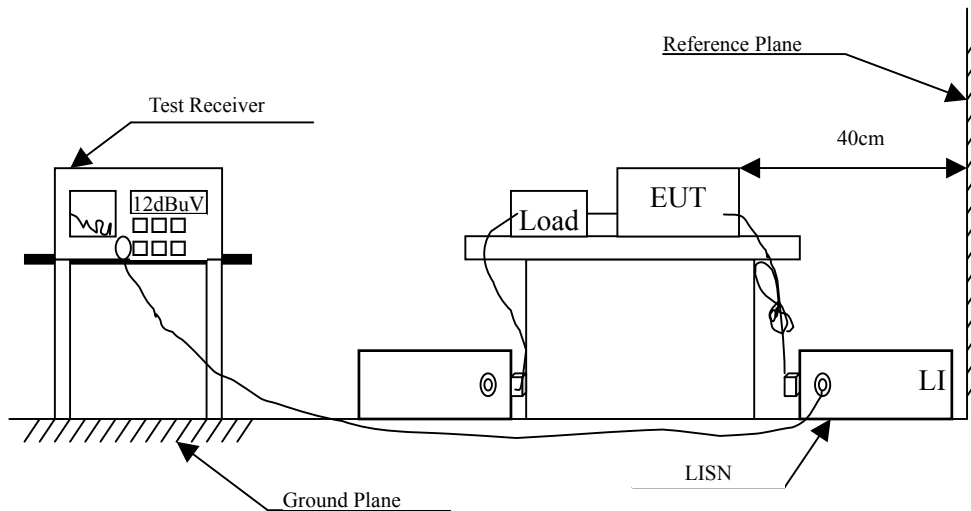
### 2.1. Test Equipment

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, 2002 |             |
| 2    | L.I.S.N.           | R & S        | ESH3-Z5/825016/6   | May, 2002 | EUT         |
| 3    | L.I.S.N.           | Kyoritsu     | KNW-407/8-1420-3   | May, 2002 | Peripherals |
| 4    | Pulse Limiter      | R & S        | ESH3-Z2            | N/A       |             |
| 5    | No.4 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 (MHz)                                     | QP        | AV        |
| 0.15 to 0.5   | 60 to 56* | 56 to 46* |
| 0.5 to 5  | 56        | 60        |
| 5 to 30   | 46        | 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 C63.4:1992 on conducted measurement.

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



## 2.5. Test Result of Conducted Emission

Product : 2.4G Wireless Camera  
 Test Item : Conducted Emission  
 Power Line : Line 1  
 Test Mode : Normal Operation

| Frequency<br>MHz | Cable<br>Loss<br>dB | LISN<br>Factor<br>dB | Reading<br>Level<br>dBuV | Emission<br>Level<br>dBuV | Limits<br>dBuV |
|------------------|---------------------|----------------------|--------------------------|---------------------------|----------------|
| Quasi-Peak       |                     |                      |                          |                           |                |
| 0.155            | 0.21                | 0.10                 | 27.09                    | 27.40                     | 65.70          |
| 0.186            | 0.21                | 0.10                 | 25.84                    | 26.15                     | 64.21          |
| 0.439            | 0.21                | 0.10                 | 25.66                    | 25.97                     | 57.08          |
| * 0.463          | 0.21                | 0.10                 | 26.67                    | 26.98                     | 56.65          |
| 11.828           | 0.15                | 0.26                 | 9.19                     | 9.60                      | 60.00          |
| 17.734           | 0.36                | 0.41                 | 20.84                    | 21.61                     | 60.00          |
| Average          |                     |                      |                          |                           |                |
| 0.155            | 0.21                | 0.10                 | 11.90                    | 12.21                     | 55.73          |
| 0.186            | 0.21                | 0.10                 | 6.40                     | 6.71                      | 54.21          |
| 0.439            | 0.21                | 0.10                 | 1.00                     | 1.31                      | 47.08          |
| 0.462            | 0.21                | 0.10                 | 1.50                     | 1.81                      | 46.66          |
| 11.820           | 0.15                | 0.26                 | 7.30                     | 7.71                      | 50.00          |
| 17.700           | 0.36                | 0.41                 | 20.00                    | 20.77                     | 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 : 2.4G Wireless Camera  
 Test Item : Conducted Emission  
 Power Line : Line 2  
 Test Mode : Normal Operation

| Frequency<br>MHz | Cable<br>Loss<br>dB | LISN<br>Factor<br>dB | Reading<br>Level<br>dBuV | Emission<br>Level<br>dBuV | Limits<br>dBuV |
|------------------|---------------------|----------------------|--------------------------|---------------------------|----------------|
| Quasi-Peak       |                     |                      |                          |                           |                |
| 0.155            | 0.21                | 0.10                 | 27.76                    | 28.07                     | 65.70          |
| 0.188            | 0.21                | 0.10                 | 28.12                    | 28.43                     | 64.14          |
| 0.222            | 0.21                | 0.10                 | 26.76                    | 27.07                     | 62.76          |
| 0.271            | 0.21                | 0.10                 | 25.33                    | 25.64                     | 61.08          |
| 0.439            | 0.21                | 0.10                 | 25.07                    | 25.38                     | 57.08          |
| * 0.466          | 0.21                | 0.10                 | 26.55                    | 26.86                     | 56.58          |
| Average          |                     |                      |                          |                           |                |
| 0.155            | 0.21                | 0.10                 | 11.40                    | 11.71                     | 55.73          |
| 0.187            | 0.21                | 0.10                 | 6.90                     | 7.21                      | 54.17          |
| 0.221            | 0.21                | 0.10                 | 3.60                     | 3.91                      | 52.78          |
| 0.271            | 0.21                | 0.10                 | 1.00                     | 1.31                      | 51.09          |
| 0.439            | 0.21                | 0.10                 | 0.70                     | 1.01                      | 47.08          |
| 0.466            | 0.21                | 0.10                 | 1.40                     | 1.71                      | 46.58          |

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

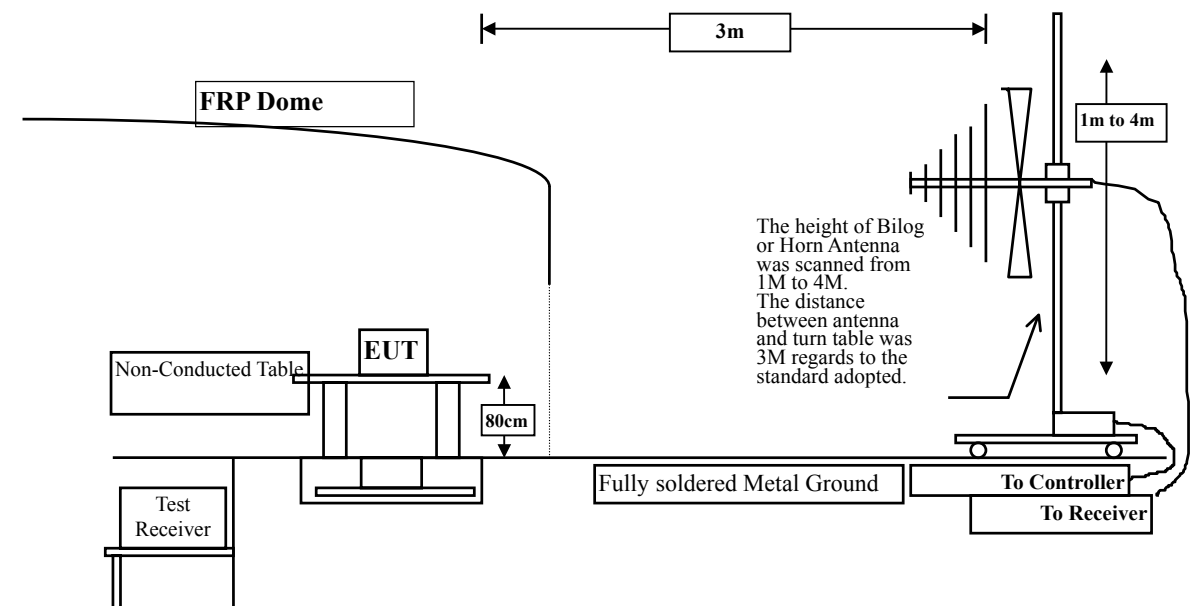
#### 3.1. Test Equipment

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

| Test Site |   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal.  |
|-----------|---|-------------------|--------------|----------------------|------------|
| Site # 1  | X | Test Receiver     | R & S        | ESCS 30 / 825442/14  | May, 2002  |
|           | X | Spectrum Analyzer | Advantest    | R3261C / 71720140    | May, 2002  |
|           | X | Pre-Amplifier     | HP           | 8447D/3307A01812     | May, 2002  |
|           | X | Bilog Antenna     | Chase        | CBL6112B / 12452     | Nov., 2002 |
|           | X | Horn Antenna      | EM           | EM6917 / 103325      | May, 2002  |
| Site # 2  |   | Test Receiver     | R & S        | ESCS 30 / 825442/17  | May, 2002  |
|           |   | Spectrum Analyzer | Advantest    | R3261C / 71720609    | May, 2002  |
|           |   | Pre-Amplifier     | HP           | 8447D/3307A01814     | May, 2002  |
|           |   | Bilog Antenna     | Chase        | CBL6112B / 2455      | May, 2002  |
|           |   | Horn Antenna      | EM           | EM6917 / 103325      | May, 2002  |

- 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.

#### 3.2. Test Setup



#### 3.3. Limits

The maximum peak power shall be less  $50 \text{ mV/m} = 93.9 \text{ dBuV/m}$ .

### 3.4. Test Result of Peak Power Output

Product : 2.4G Wireless Camera  
 Test Item : Peak Power Output  
 Test Site : No.1 OATS  
 Test Mode : Normal Operation

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

#### Horizontal

##### Peak Detector:

##### Channel 2411

|          |      |       |       |       |       |       |       |
|----------|------|-------|-------|-------|-------|-------|-------|
| 2411.090 | 4.03 | 28.53 | 29.82 | 48.86 | 51.61 | 42.29 | 93.90 |
|----------|------|-------|-------|-------|-------|-------|-------|

##### Channel 2453

|          |      |       |       |       |       |       |       |
|----------|------|-------|-------|-------|-------|-------|-------|
| 2451.400 | 4.05 | 28.63 | 29.81 | 48.52 | 51.39 | 42.51 | 93.90 |
|----------|------|-------|-------|-------|-------|-------|-------|

##### Channel 2473

|          |      |       |       |       |       |       |       |
|----------|------|-------|-------|-------|-------|-------|-------|
| 2470.830 | 4.08 | 28.63 | 29.81 | 48.61 | 51.51 | 42.39 | 93.90 |
|----------|------|-------|-------|-------|-------|-------|-------|

#### Vertical

##### Peak Detector:

##### Channel 2411

|          |      |       |       |       |       |       |       |
|----------|------|-------|-------|-------|-------|-------|-------|
| 2411.469 | 4.03 | 28.53 | 29.82 | 51.91 | 54.66 | 39.24 | 93.90 |
|----------|------|-------|-------|-------|-------|-------|-------|

##### Channel 2453

|          |      |       |       |       |       |       |       |
|----------|------|-------|-------|-------|-------|-------|-------|
| 2453.090 | 4.05 | 28.63 | 29.81 | 51.32 | 54.19 | 39.71 | 93.90 |
|----------|------|-------|-------|-------|-------|-------|-------|

##### Channel 2473

|          |      |       |       |       |       |       |       |
|----------|------|-------|-------|-------|-------|-------|-------|
| 2470.460 | 4.08 | 28.63 | 29.81 | 51.03 | 53.93 | 39.97 | 93.90 |
|----------|------|-------|-------|-------|-------|-------|-------|

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Probe Factor + Cable Loss – PreAMP.

## 4. Radiated Emission

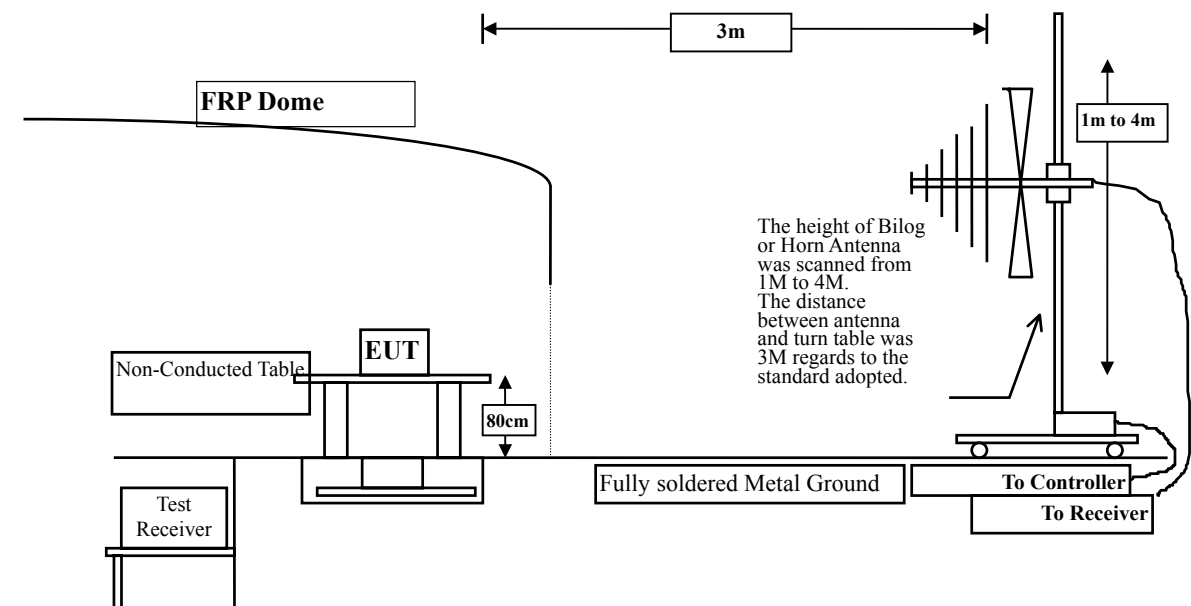
### 4.1. Test Equipment

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

| Test Site |   | Equipment         | Manufacturer | Model No./Serial No. | Last Cal.  |
|-----------|---|-------------------|--------------|----------------------|------------|
| Site # 1  | X | Test Receiver     | R & S        | ESCS 30 / 825442/14  | May, 2002  |
|           | X | Spectrum Analyzer | Advantest    | R3261C / 71720140    | May, 2002  |
|           | X | Pre-Amplifier     | HP           | 8447D/3307A01812     | May, 2002  |
|           | X | Bilog Antenna     | Chase        | CBL6112B / 12452     | Nov., 2002 |
|           | X | Horn Antenna      | EM           | EM6917 / 103325      | May, 2002  |
| Site # 2  |   | Test Receiver     | R & S        | ESCS 30 / 825442/17  | May, 2002  |
|           |   | Spectrum Analyzer | Advantest    | R3261C / 71720609    | May, 2002  |
|           |   | Pre-Amplifier     | HP           | 8447D/3307A01814     | May, 2002  |
|           |   | Bilog Antenna     | Chase        | CBL6112B / 2455      | May, 2002  |
|           |   | Horn Antenna      | EM           | EM6917 / 103325      | May, 2002  |

- 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

#### ➤ Fundamental and Harmonics Emission Limits

| FCC Part 15 Subpart B Paragraph 15.249 Limits |                               |              |                             |              |
|---|-------------------------------|--------------|-----------------------------|--------------|
| Frequency<br>MHz                              | Field Strength of Fundamental |              | Field Strength of Harmonics |              |
|   | (mV/m @3m)                    | (dBuV/m @3m) | (uV/m @3m)                  | (dBuV/m @3m) |
| 902-928                                       | 50                            | 94           | 500                         | 54           |
| 2400-2483.5                                   | 50                            | 94           | 500                         | 54           |
| 5725-5875                                     | 50                            | 94           | 500                         | 54           |

- Remarks :
1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
  2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

#### ➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB 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 B Paragraph 15.209 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/m) = 20 log RF Voltage (uV/m)
  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 C63.4:1992 on radiated measurement.

Radiated emissions were investigated over the frequency range from 30MHz to 1GHz using a receiver bandwidth of 120kHz. Radiated was performed at an antenna to EUT distance of 3 meters.

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

#### 4.5. Test Result of Radiated Emission

Product : 2.4G Wireless Camera  
 Test Item : Harmonic Radiated Emission  
 Test Site : No.1 OATS  
 Test Mode : Channel 2411

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

##### Horizontal

###### Peak Detector:

|            |       |       |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|-------|-------|
| 4820.600   | 6.17  | 33.60 | 28.93 | 41.64 | 52.47 | 21.53 | 74.00 |
| 7233.500   | 7.33  | 36.77 | 28.98 | 37.39 | 52.51 | 21.49 | 74.00 |
| 9643.890   | 8.73  | 38.24 | 28.26 | 33.97 | 52.67 | 21.33 | 74.00 |
| 12054.49   | 9.98  | 39.03 | 27.66 | 31.91 | 53.26 | 20.74 | 74.00 |
| * 14466.90 | 10.65 | 40.51 | 29.93 | 32.09 | 53.32 | 20.68 | 74.00 |

##### Vertical

###### Peak Detector:

|            |       |       |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|-------|-------|
| 4823.810   | 6.17  | 33.60 | 28.93 | 41.86 | 52.69 | 21.31 | 74.00 |
| 7233.700   | 7.33  | 36.77 | 28.98 | 37.59 | 52.71 | 21.29 | 74.00 |
| 9643.690   | 8.73  | 38.24 | 28.26 | 34.12 | 52.82 | 21.18 | 74.00 |
| 12055.70   | 9.98  | 39.03 | 27.66 | 31.77 | 53.12 | 20.88 | 74.00 |
| * 14466.50 | 10.65 | 40.51 | 29.93 | 31.98 | 53.21 | 20.79 | 74.00 |

##### Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
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 : 2.4G Wireless Camera  
 Test Item : Harmonic Radiated Emission  
 Test Site : No.1 OATS  
 Test Mode : Channel 2454

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

### Horizontal

#### Peak Detector:

|            |       |       |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|-------|-------|
| 4906.650   | 6.23  | 33.86 | 28.97 | 40.89 | 52.01 | 21.99 | 74.00 |
| 7361.890   | 7.40  | 37.06 | 28.95 | 36.70 | 52.21 | 21.79 | 74.00 |
| 9816.300   | 8.92  | 38.41 | 28.06 | 33.09 | 52.35 | 21.65 | 74.00 |
| 12270.30   | 10.24 | 39.12 | 27.29 | 30.55 | 52.61 | 21.39 | 74.00 |
| * 14724.10 | 10.68 | 39.69 | 29.87 | 32.31 | 52.81 | 21.19 | 74.00 |

### Vertical

#### Peak Detector:

|            |       |       |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|-------|-------|
| 4904.490   | 6.23  | 33.86 | 28.97 | 41.04 | 52.16 | 21.84 | 74.00 |
| 7361.400   | 7.40  | 37.06 | 28.95 | 36.74 | 52.25 | 21.75 | 74.00 |
| 9816.900   | 8.92  | 38.41 | 28.06 | 33.49 | 52.75 | 21.25 | 74.00 |
| 12270.70   | 10.24 | 39.12 | 27.29 | 31.22 | 53.28 | 20.72 | 74.00 |
| * 14723.89 | 10.68 | 39.69 | 29.87 | 32.84 | 53.34 | 20.66 | 74.00 |

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
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 : 2.4G Wireless Camera  
 Test Item : Harmonic Radiated Emission  
 Test Site : No.1 OATS  
 Test Mode : Channel 2473

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

### Horizontal

#### Peak Detector:

|            |       |       |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|-------|-------|
| 4869.250   | 6.20  | 33.73 | 28.96 | 38.94 | 49.91 | 24.09 | 74.00 |
| 7419.300   | 7.44  | 37.18 | 28.94 | 32.93 | 48.61 | 25.39 | 74.00 |
| 9892.100   | 9.03  | 38.51 | 27.93 | 27.55 | 47.16 | 26.84 | 74.00 |
| 12365.10   | 10.37 | 39.15 | 27.11 | 26.56 | 48.97 | 25.03 | 74.00 |
| * 14837.40 | 10.69 | 39.31 | 29.81 | 29.73 | 49.92 | 24.08 | 74.00 |

### Vertical

#### Peak Detector:

|            |       |       |       |       |       |       |       |
|------------|-------|-------|-------|-------|-------|-------|-------|
| 4868.840   | 6.20  | 33.73 | 28.96 | 41.14 | 52.11 | 21.89 | 74.00 |
| 7419.900   | 7.44  | 37.18 | 28.94 | 36.81 | 52.49 | 21.51 | 74.00 |
| 9892.500   | 9.03  | 38.51 | 27.93 | 31.53 | 51.14 | 22.86 | 74.00 |
| 12365.30   | 10.37 | 39.15 | 27.11 | 30.80 | 53.21 | 20.79 | 74.00 |
| * 14837.60 | 10.69 | 39.31 | 29.81 | 33.45 | 53.64 | 20.36 | 74.00 |

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
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 : 2.4G Wireless Camera  
 Test Item : General Radiated Emission  
 Test Site : No.1 OATS  
 Test Mode : Channel 2411

| Freq.              | Cable Loss | Probe Factor | PreAMP | Reading Level | Emission Level | Margin | Limit  |
|--------------------|------------|--------------|--------|---------------|----------------|--------|--------|
| MHz                | dB         | dB/m         | dB     | dBuV          | dBuV/m         | dB     | dBuV/m |
| <b>Horizontal:</b> |            |              |        |               |                |        |        |
| 169.600            | 1.59       | 8.96         | 0.00   | 8.35          | 18.90          | 24.60  | 43.50  |
| 540.200            | 3.49       | 17.47        | 0.00   | 6.84          | 27.80          | 18.20  | 46.00  |
| 549.900            | 3.54       | 18.34        | 0.00   | 7.51          | 29.40          | 16.60  | 46.00  |
| 576.900            | 3.69       | 17.62        | 0.00   | 8.29          | 29.60          | 16.40  | 46.00  |
| 676.900            | 4.21       | 18.52        | 0.00   | 6.87          | 29.60          | 16.40  | 46.00  |
| * 867.100          | 5.18       | 19.53        | 0.00   | 5.89          | 30.60          | 15.40  | 46.00  |

**Vertical:**

|          |      |       |      |       |       |       |       |
|----------|------|-------|------|-------|-------|-------|-------|
| * 40.600 | 0.92 | 12.68 | 0.00 | 20.10 | 33.70 | 6.30  | 40.00 |
| 105.600  | 1.26 | 10.29 | 0.00 | 12.55 | 24.10 | 19.40 | 43.50 |
| 478.100  | 3.18 | 16.60 | 0.00 | 5.11  | 24.90 | 21.10 | 46.00 |
| 548.900  | 3.54 | 18.84 | 0.00 | 3.98  | 26.37 | 19.63 | 46.00 |
| 641.100  | 4.01 | 18.21 | 0.00 | 6.48  | 28.70 | 17.30 | 46.00 |
| 654.600  | 4.09 | 17.84 | 0.00 | 6.18  | 28.10 | 17.90 | 46.00 |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss.

Product : 2.4G Wireless Camera  
 Test Item : General Radiated Emission  
 Test Site : No.1 OATS  
 Test Mode : Channel 2454

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

**Horizontal:**

|           |      |       |      |      |       |       |       |
|-----------|------|-------|------|------|-------|-------|-------|
| 40.670    | 0.92 | 13.11 | 0.00 | 1.57 | 15.60 | 24.40 | 40.00 |
| 58.100    | 1.01 | 5.72  | 0.00 | 6.07 | 12.80 | 27.20 | 40.00 |
| 391.800   | 2.73 | 14.24 | 0.00 | 7.13 | 24.10 | 21.90 | 46.00 |
| 411.200   | 2.84 | 15.64 | 0.00 | 5.82 | 24.30 | 21.70 | 46.00 |
| 527.600   | 3.44 | 16.57 | 0.00 | 7.39 | 27.40 | 18.60 | 46.00 |
| * 884.500 | 5.27 | 19.71 | 0.00 | 5.72 | 30.70 | 15.30 | 46.00 |

**Vertical:**

|           |      |       |      |       |       |       |       |
|-----------|------|-------|------|-------|-------|-------|-------|
| 105.660   | 1.26 | 10.29 | 0.00 | 12.85 | 24.40 | 19.10 | 43.50 |
| 141.550   | 1.44 | 10.00 | 0.00 | 11.16 | 22.60 | 20.90 | 43.50 |
| 248.250   | 1.99 | 11.53 | 0.00 | 8.47  | 22.00 | 24.00 | 46.00 |
| 503.360   | 3.31 | 16.48 | 0.00 | 5.21  | 24.99 | 21.01 | 46.00 |
| 548.950   | 3.54 | 18.84 | 0.00 | 2.63  | 25.02 | 20.98 | 46.00 |
| * 893.300 | 5.32 | 20.47 | 0.00 | 3.16  | 28.95 | 17.05 | 46.00 |

**Note:**

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. “ \* ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss.

Product : 2.4G Wireless Camera  
 Test Item : General Radiated Emission  
 Test Site : No.1 OATS  
 Test Mode : Channel 2473

| Freq.              | Cable Loss | Probe Factor | PreAMP | Reading Level | Emission Level | Margin | Limit  |
|--------------------|------------|--------------|--------|---------------|----------------|--------|--------|
| MHz                | dB         | dB/m         | dB     | dBuV          | dBuV/m         | dB     | dBuV/m |
| <b>Horizontal:</b> |            |              |        |               |                |        |        |
| 31.250             | 0.87       | 17.59        | 0.00   | 0.83          | 19.29          | 20.71  | 40.00  |
| 105.360            | 1.26       | 11.71        | 0.00   | 11.63         | 24.60          | 18.90  | 43.50  |
| 248.950            | 1.99       | 11.46        | 0.00   | 8.80          | 22.25          | 23.75  | 46.00  |
| 510.360            | 3.34       | 16.84        | 0.00   | 5.12          | 25.30          | 20.70  | 46.00  |
| 567.300            | 3.63       | 17.05        | 0.00   | 3.66          | 24.34          | 21.66  | 46.00  |
| * 893.150          | 5.32       | 19.46        | 0.00   | 3.79          | 28.57          | 17.43  | 46.00  |

|                  |      |       |      |       |       |       |       |
|------------------|------|-------|------|-------|-------|-------|-------|
| <b>Vertical:</b> |      |       |      |       |       |       |       |
| 105.660          | 1.26 | 10.29 | 0.00 | 12.41 | 23.96 | 19.54 | 43.50 |
| 548.950          | 3.54 | 18.84 | 0.00 | 3.59  | 25.98 | 20.02 | 46.00 |
| 561.560          | 3.60 | 19.04 | 0.00 | 1.80  | 24.44 | 21.56 | 46.00 |
| 567.380          | 3.63 | 19.19 | 0.00 | 3.14  | 25.96 | 20.04 | 46.00 |
| * 654.680        | 4.09 | 17.84 | 0.00 | 6.19  | 28.11 | 17.89 | 46.00 |
| 971.870          | 5.72 | 19.98 | 0.00 | 5.00  | 30.70 | 23.30 | 54.00 |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
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

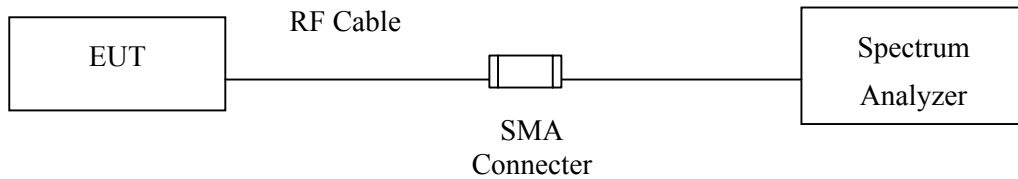
The following test equipments are used during the band edge tests:

| Equipment           | Manufacturer | Model No./Serial No. | Last Cal. |
|---------------------|--------------|----------------------|-----------|
| X Spectrum Analyzer | Advantest    | R3272 / 72421194     | May, 2002 |
| X Test Receiver     | R & S        | ESCS 30 / 825442/14  | May, 2002 |
| X Spectrum Analyzer | Advantest    | R3261C / 71720140    | May, 2002 |
| X Pre-Amplifier     | HP           | 8447D/3307A01812     | May, 2002 |
| X Bilog Antenna     | Chase        | CBL6112B / 12452     | May, 2002 |
| X Horn Antenna      | EM           | EM6917 / 103325      | May, 2002 |

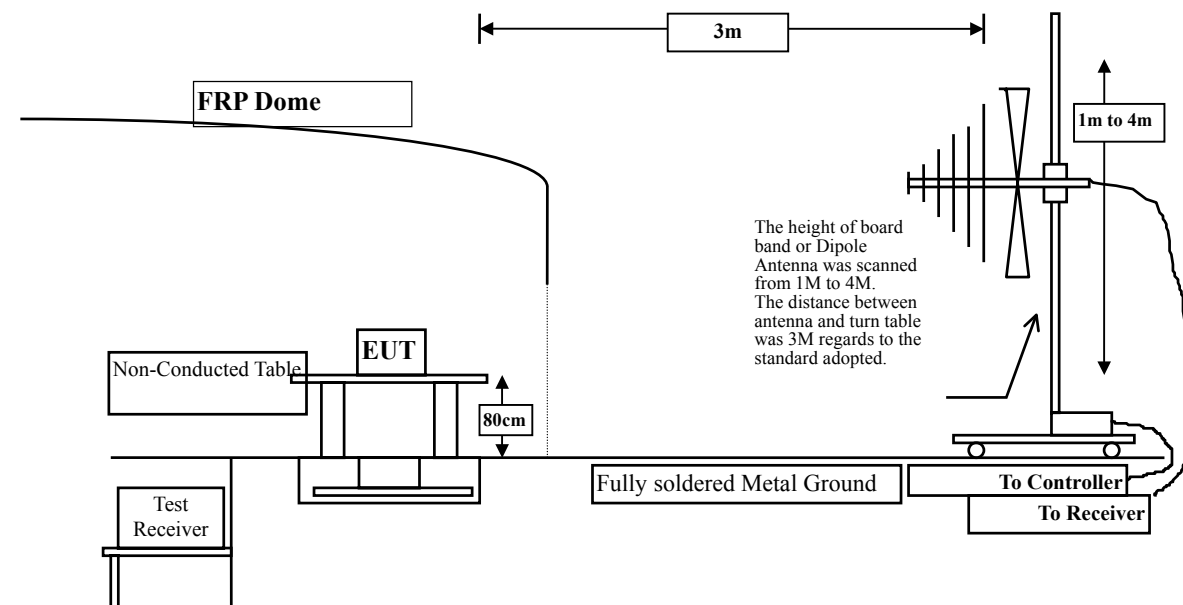
- Note: 1. All equipments that need to calibrate are with calibration period of 1 year.  
 2. Mark "X" test instruments are used to measure the final test results.

### 5.2. Test Setup

#### RF Conducted Measurement:



#### RF Radiated Measurement:



### 5.3. Limit

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 50 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 C63.4:1992 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.

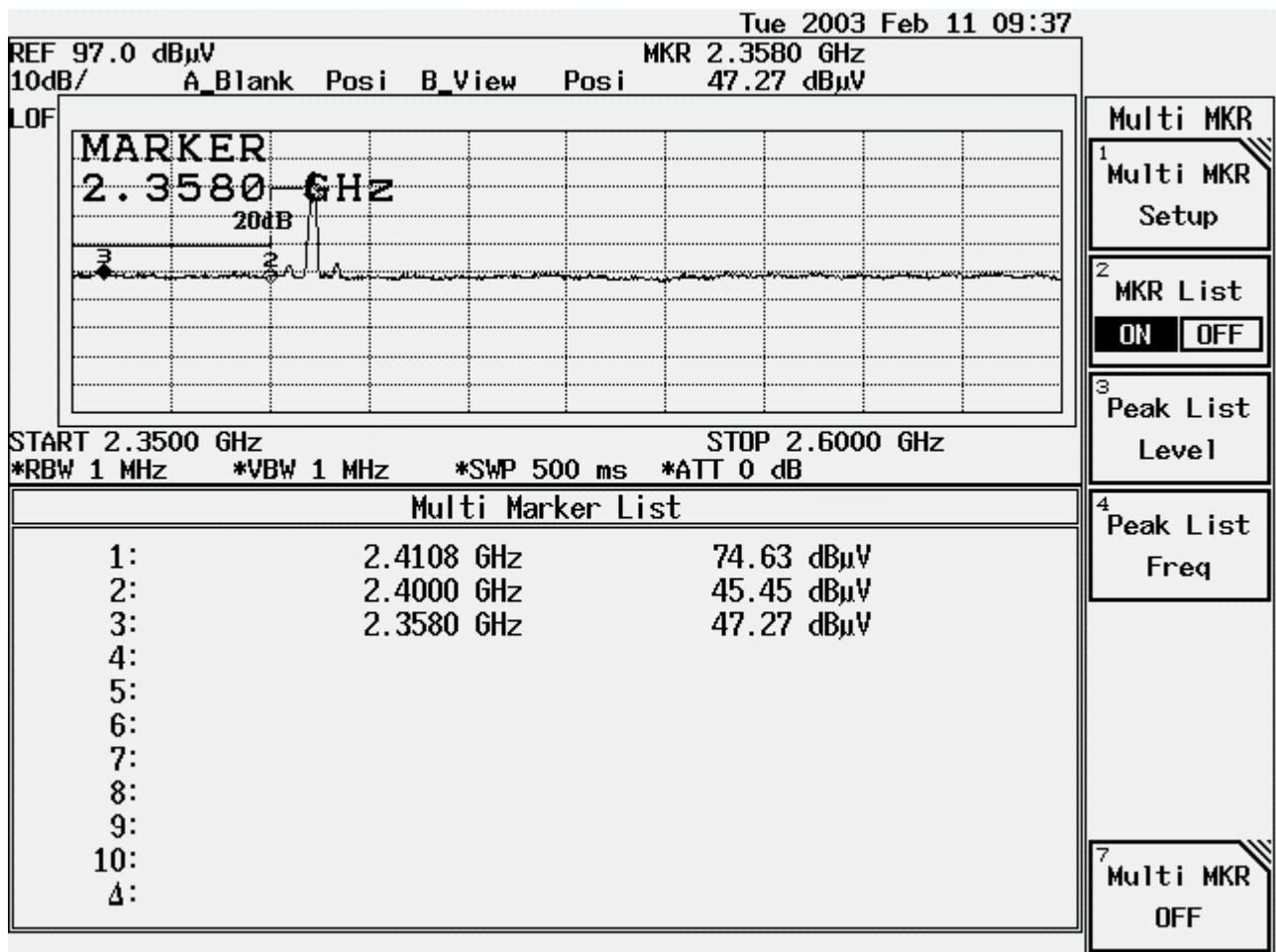
**5.5. Test Result of Band Edge**

Product : 2.4G Wireless Camera  
 Test Item : Band Edge  
 Test Site : No.1 OATS  
 Test Mode : Channel 1 (11Mbps)

**RF Radiated Measurement: (Peak Detector)**

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

Horizontal



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.

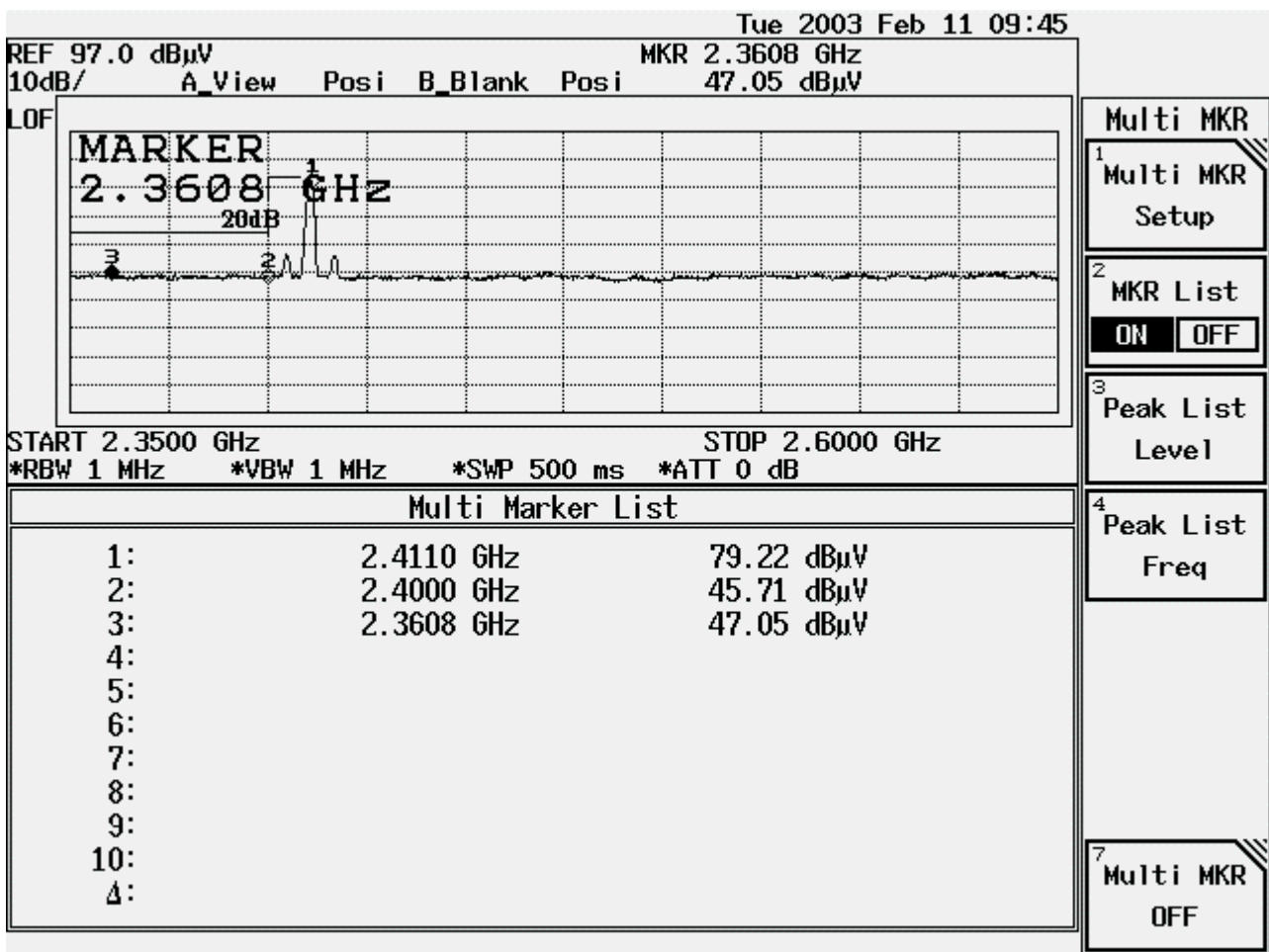


Product : 2.4G Wireless Camera  
 Test Item : Band Edge  
 Test Site : No.1 OATS  
 Test Mode : Channel 11 (1Mbps)

**RF Radiated Measurement: (Peak Detector)**

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

Vertical



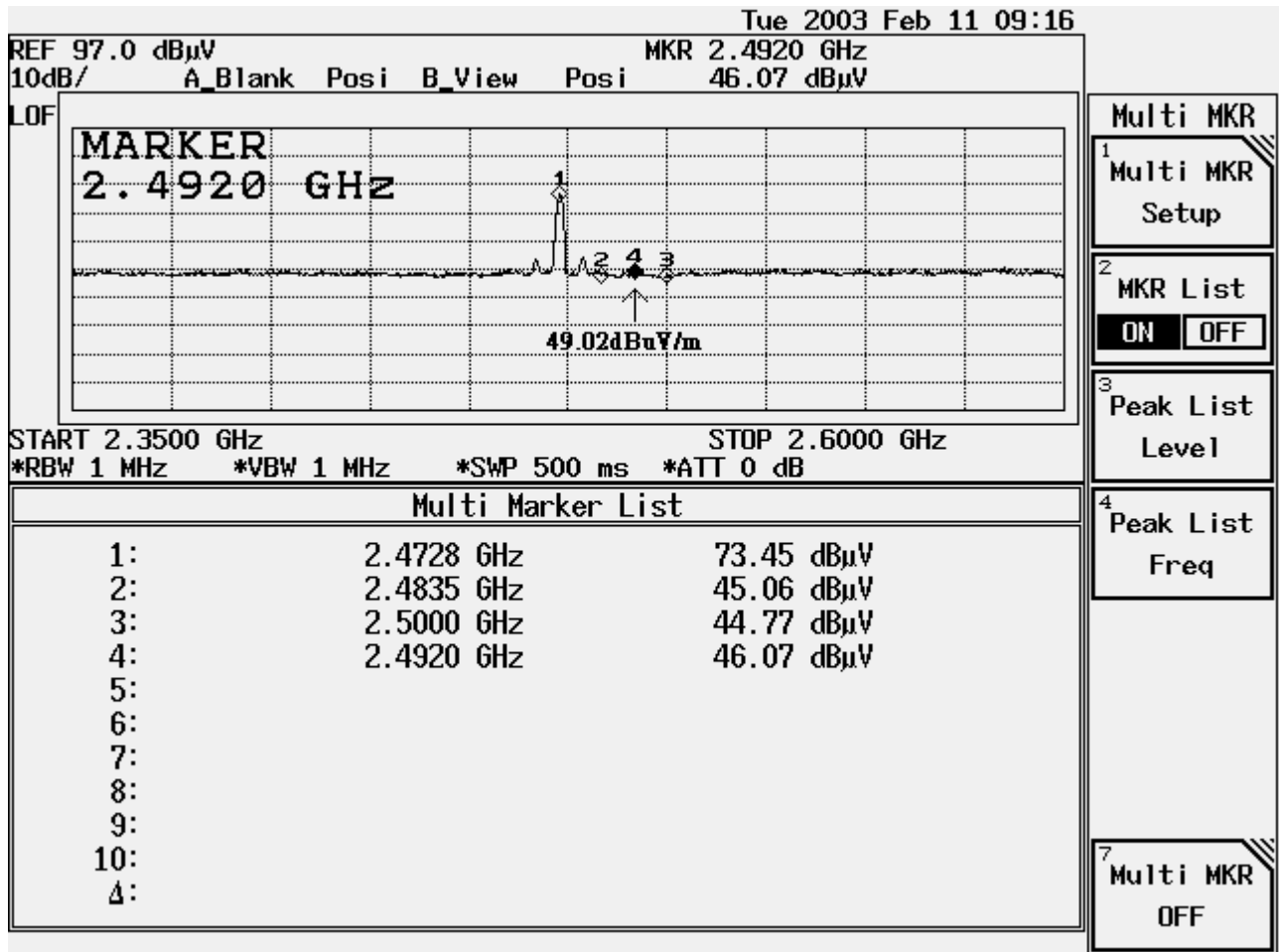
Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : 2.4G Wireless Camera  
 Test Item : Band Edge  
 Test Site : No.1 OATS  
 Test Mode : Channel 2473

**RF Radiated Measurement: (Peak Detector)**

| Channel No.    | Frequency (MHz) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Limit (dBuV/m) | Result |
|----------------|-----------------|----------------------|-------------------------|---------------------|----------------|--------|
| 11(Horizontal) | 2492.0          | 46.07                | 49.02                   | 74                  | 54             | Pass   |

Horizontal



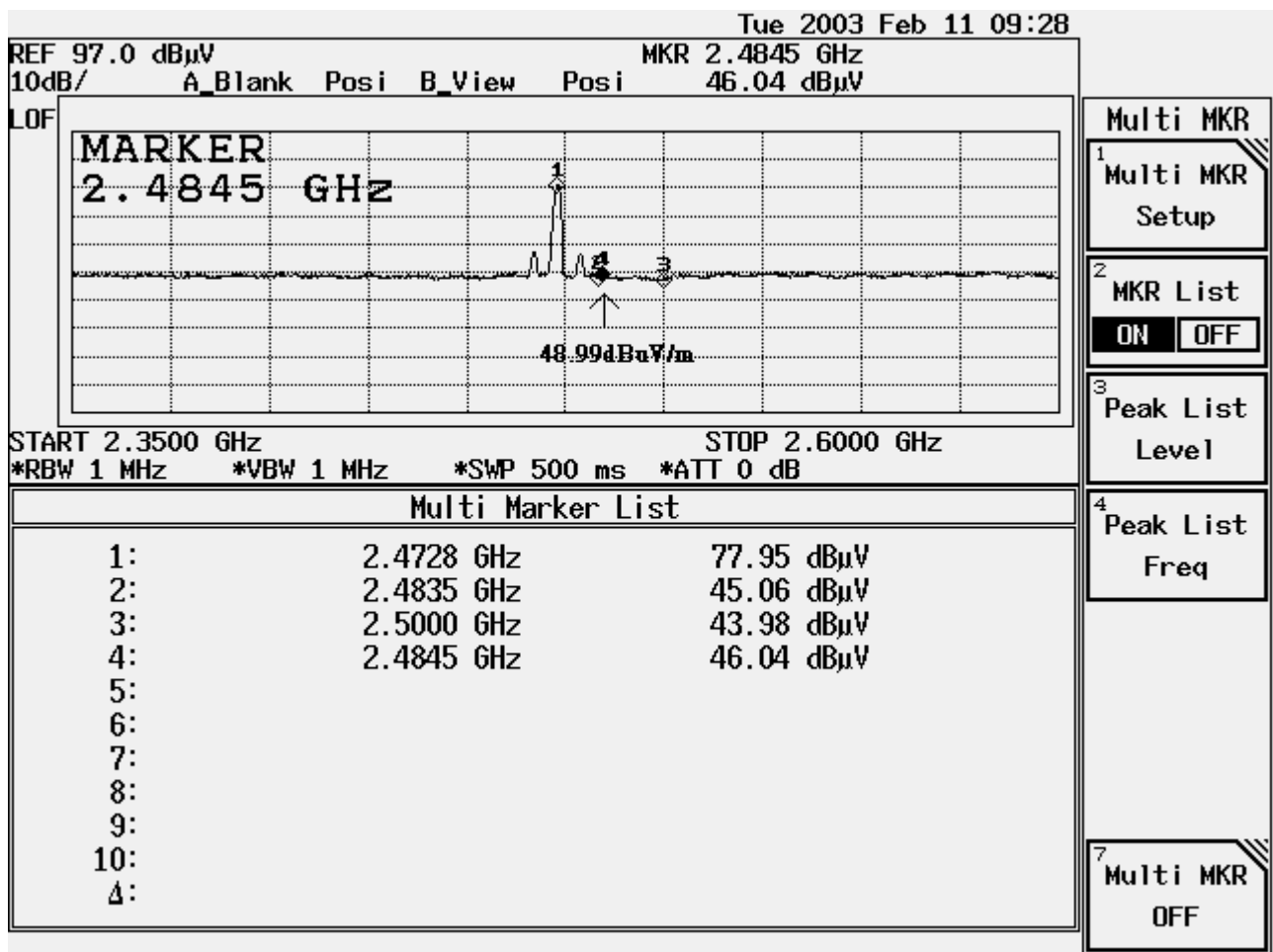
Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : 2.4G Wireless Camera  
 Test Item : Band Edge  
 Test Site : No.1 OATS  
 Test Mode : Channel 2473

**RF Radiated Measurement: (Peak Detector)**

| Channel No.   | Frequency (MHz) | Reading Level (dBuV) | Emission Level (dBuV/m) | Peak Limit (dBuV/m) | Limit (dBuV/m) | Result |
|---------------|-----------------|----------------------|-------------------------|---------------------|----------------|--------|
| 11 (Vertical) | 2484.5          | 46.04                | 48.99                   | 74                  | 54             | Pass   |

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. EMI Reduction Method During Compliance Testing

No modification was made during testing.

## Attachment 1 : EUT Test Photographs

**Attachment 1: EUT Test Setup Photographs**

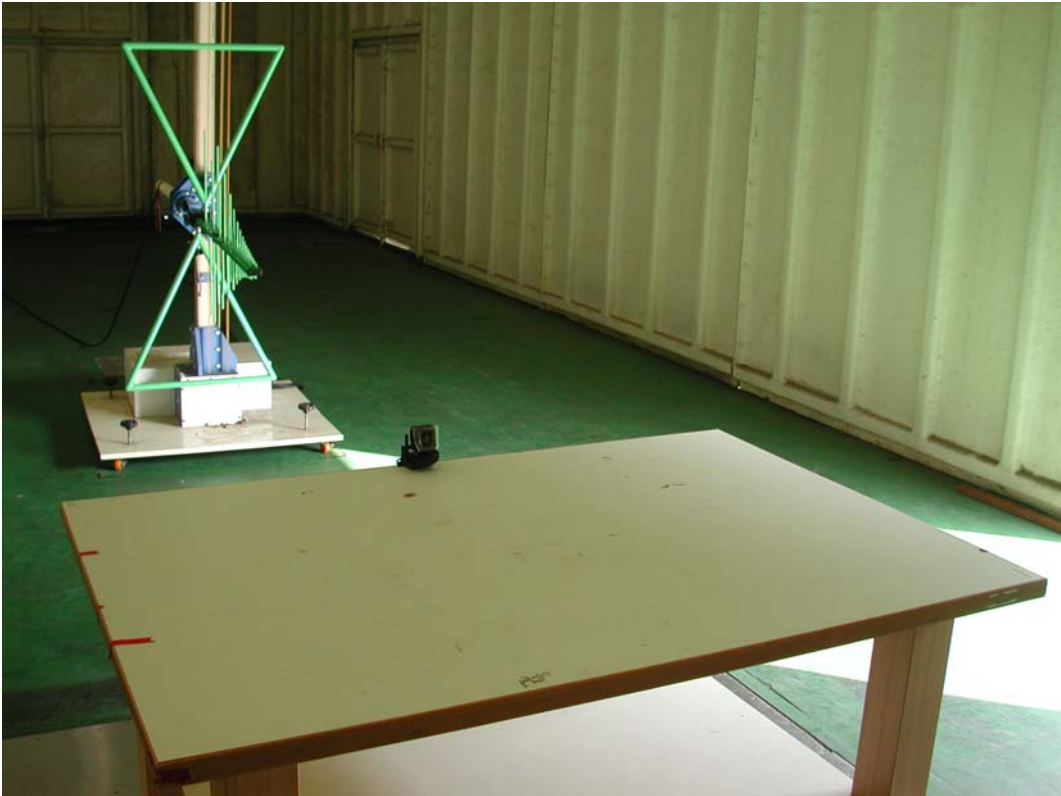
Front View of Conducted Test



Back View of Conducted Test



Front View of Radiated Test



Back View of Radiated Test



Front View of Radiated Test (Horn)





## Attachment 2 : EUT Detailed Photographs

**Attachment 2 : EUT Detailed Photographs**

(1) EUT Photo



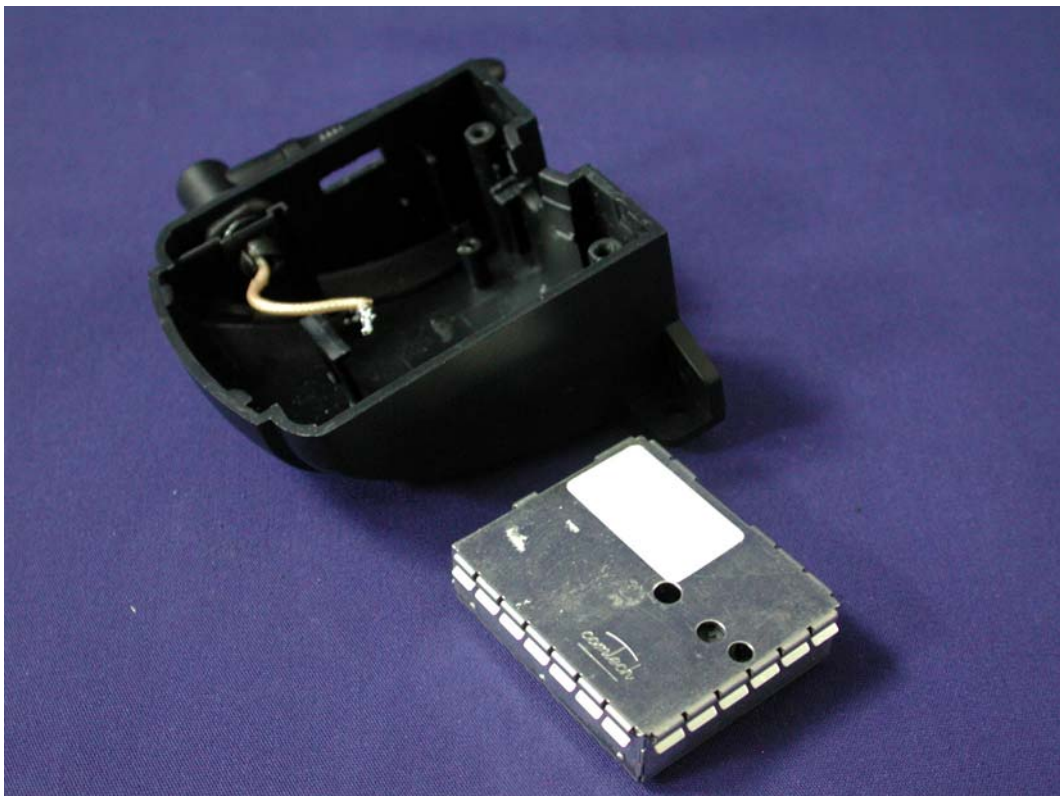
(2) EUT Photo



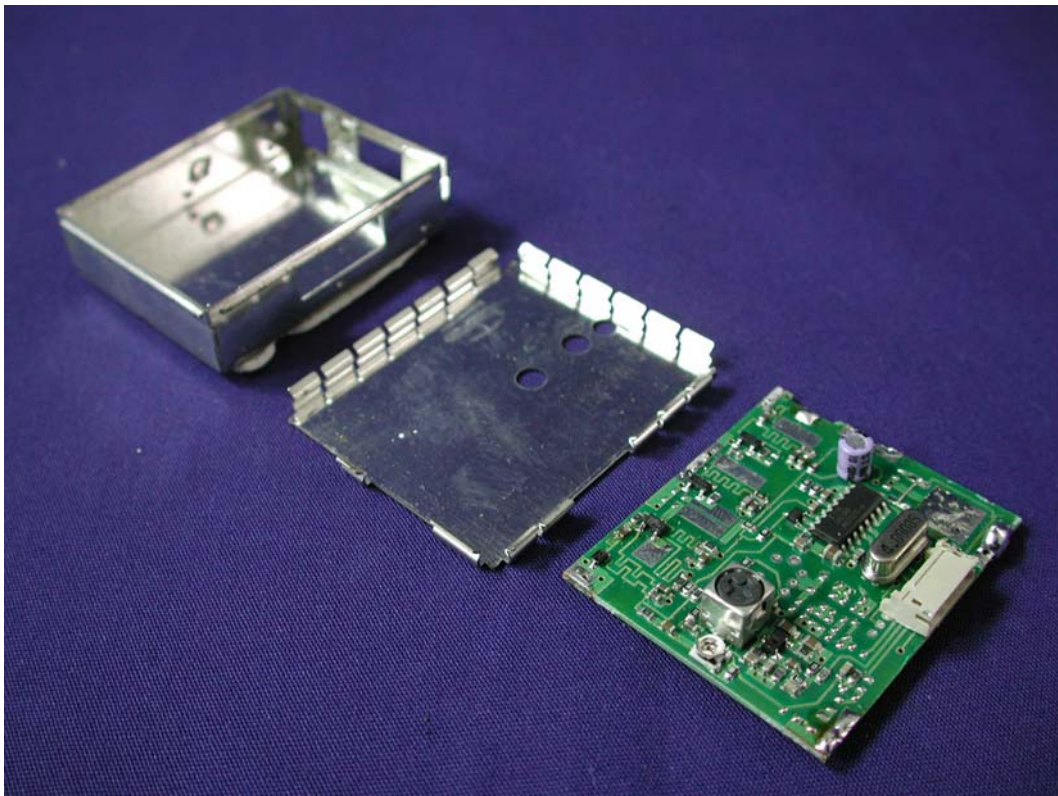
(3) EUT Photo



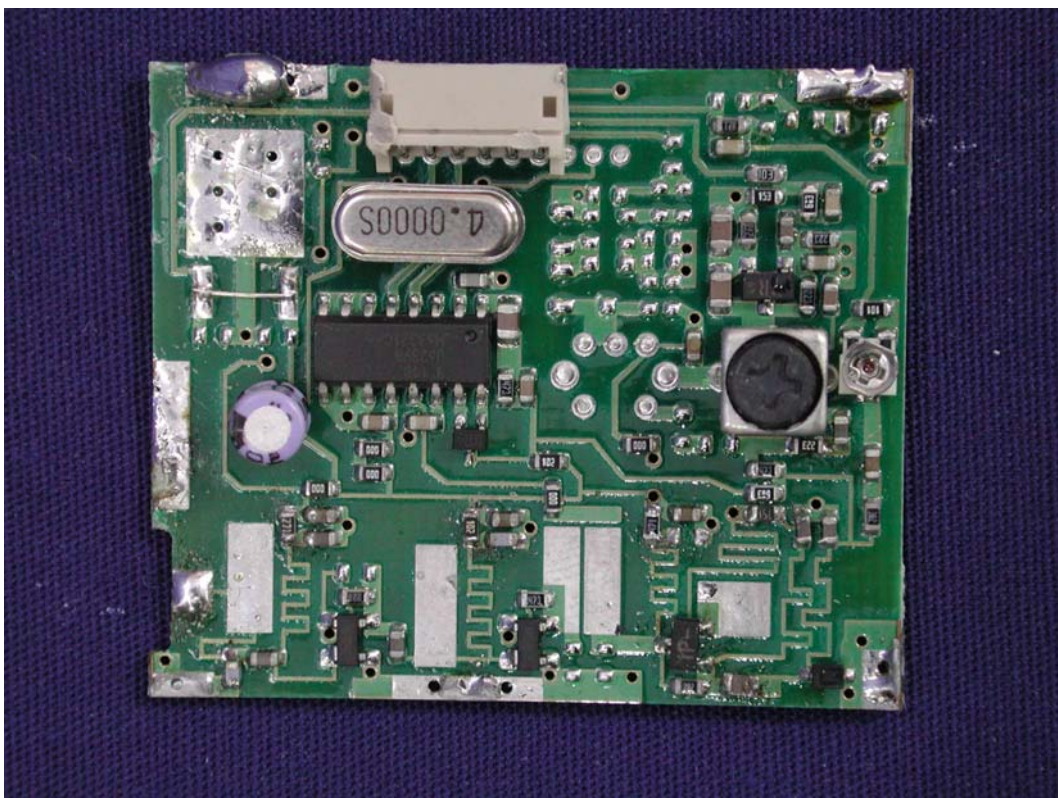
(4) EUT Photo



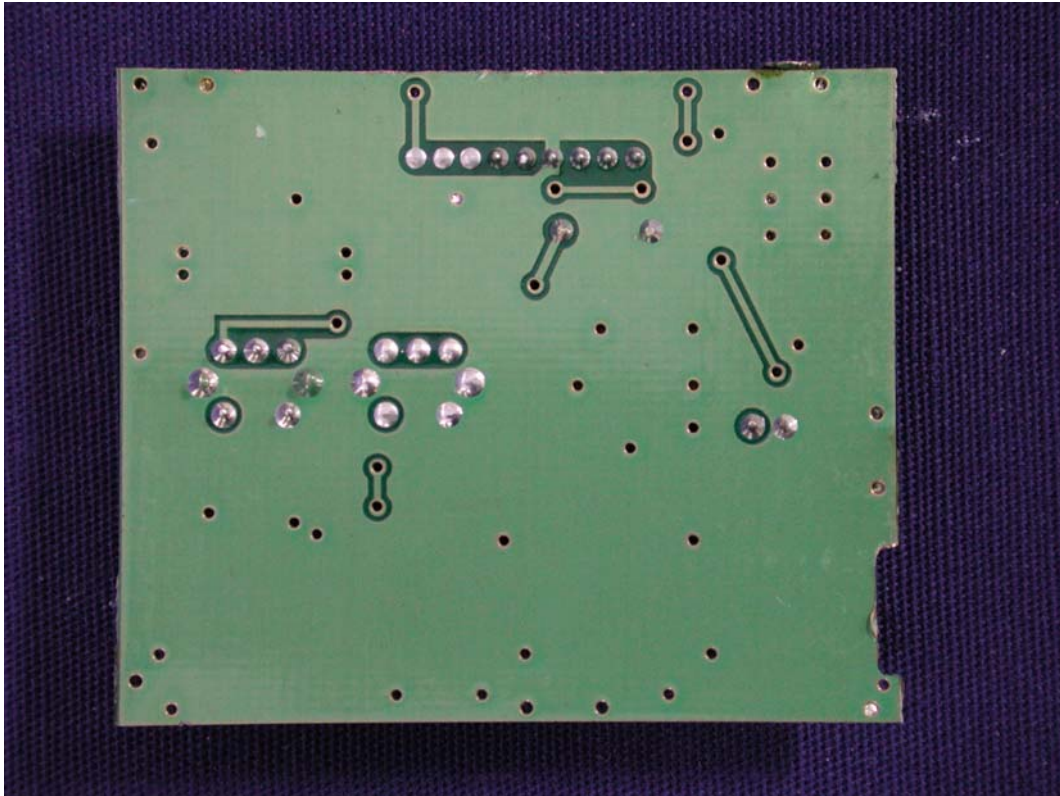
(5) EUT Photo



(6) EUT Photo



(7) EUT Photo



(8) EUT Photo

