# Test Report

Product Name : Wireless AV Sender with remote control extender

Model No. : TTA-23T, TTA-24T

FCC ID.: O6LTTA-23T

Applicant : TRANWO TECHNOLOGY CORP.

Address : 6F., No.49,Guangming 6th Rd.,JubeiCity, Hsinchu ,Taiwan ,R.O.C.

Date of Receipt : May. 21, 2002

Date of Test : Sep. 02, 2002

Report No. : 025H046FI

The Test Results relate only to the samples tested.
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This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

# Test Report Certification

Test Date : Sep. 02, 2002
Report No. : 025H046FI

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

| | |
|---|---|
| Product Name | : Wireless AV Sender with remote control extender |
| Applicant | : TRANWO TECHNOLOGY CORP. |
| Address | : 6F., No.49,Guangming 6th Rd.,JubeiCity, Hsinchu ,Taiwan ,R.O.C. |
| Manufacturer | : TRANWO TECHNOLOGY CORP. |
| Model No. | : TTA-23T, TTA-24T |
| FCC ID. | : O6LTTA-23T |
| Rated Voltage | : DC 9V |
| Trade Name | : TRANWO |
| Measurement Standard | : FCC Part 15 Subpart C Paragraph 15.249 |
| Measurement Procedure | : ANSI C63.4:1992 |
| Test Result | : Complied |

NVLAP®
NVLAP Lab Code : 200347-0

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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

# 1. GENERAL INFORMATION

## 1.1. EUT Description

| | | |
|---|---|---|
| Product Name | : | Wireless AV Sender with remote control extender |
| Trade Name | : | TRANWO |
| FCC ID. | : | O6LTTA-23T |
| Model No. | : | TTA-23T, TTA-24T |
| Frequency Range | : | 2434MHz to 2473MHz |
| Type of Modulation | : | FM |
| Antenna type | : | Soldered on PCB |
| IR Cable | : | Non-Shielded, 0.2m |
| Operator Selection of Operating Frequency | : | Manual Switch |
| Power Adapter (Mode1) | : | AC adapter, D9300<br>Cable Out: Non-Shielded, 3.4m |
| Power Adapter (Mode 2) | : | AHEAD, MW35-090030<br>Cable Out: Non-Shielded, 3.4m |
| RCA Cable | : | Non-Shielded, 1.4m |

Frequency of each Channel

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

Note:

1. This device is a 2.4GHz Wireless AV Sender with remote control extender included a 2.4GHz transmitting function, a 433MHz receiving function.
2. The variation of model number is for different case. The circuit of each model is identical.
3. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249.
4. 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.
5. QuieTek had verified the construction and function in typical operation, then shown in this test report.

   EMI Mode Mode 1: D9300
   Mode 2: MW35-0900300

## 1.2. Operation Description

The EUT is Wireless AV Sender with remote control extender. The operation frequency is from 2.432GHz to 2.473GHz with FM modulation. Three 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.

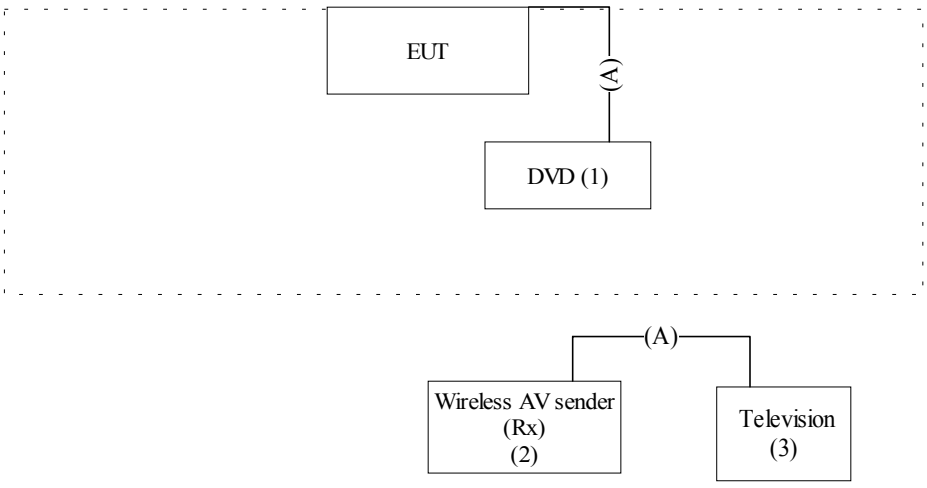
## 1.3. Tested System Details

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) | DVD | Panasonic | DVD-A120TN | 9542160 | Non-shielded, 1.7m |
| (2) | Wireless AV sender | TRANWO | TTA-23R | N/A | -- |
| (3) | Television | SONY | PWM-14M2U | 2018559 | Non-shielded, 1.8m |

| Signal Cable Type | | Signal cable Description |
|---|---|---|
| A. | RCA Cable | Non-shielded, 1.4m, 2 Pcs |

## 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.

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

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

## 2. Conducted Emission

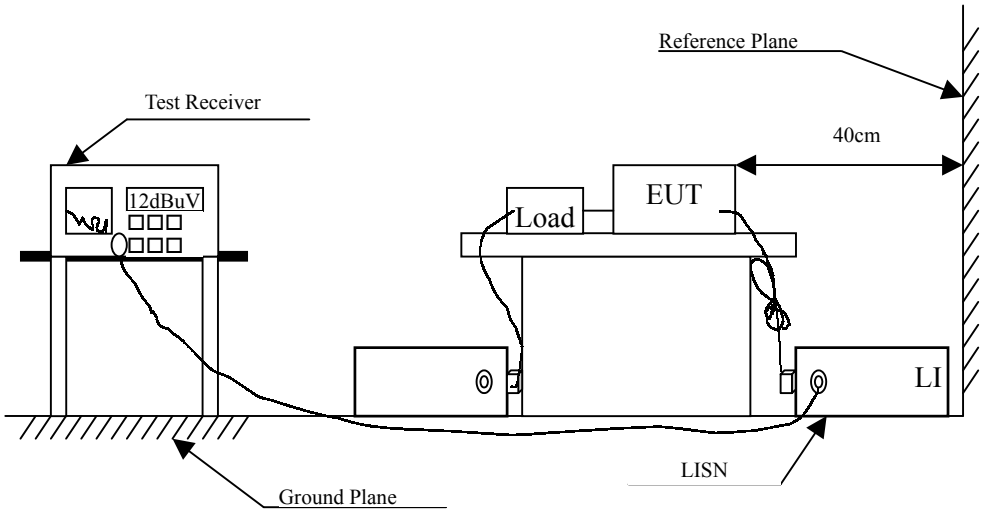
### 2.1. Test Equipment

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.2 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 Paragraph 15.207 (dBuV) | | |
|---|---|---|
| Frequency MHz | Limits | |
| | uV | dBuV |
| 0.45 - 30 | 250 | 48.0 |

## 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 invested over the frequency range from 0.45MHz to 30MHz using a receiver bandwidth of 9kHz.

## 2.5. Test Result of Conducted Emission

Product : Wireless AV Sender with remote control extender
Test Item : Conducted Emission Test
Test Mode : Mode 1: D9300

| | Frequency | Cable Loss | LISN Factor | Reading Level | Emission Level | Limits |
|---|---|---|---|---|---|---|
| | MHz | dB | dB | dBuV | dBuV | dBuV |
| **Line 1** | | | | | | |
| **Quasi-Peak:** | | | | | | |
| * | 0.450 | 0.06 | 0.20 | 30.89 | 31.15 | 48.00 |
| | 0.546 | 0.07 | 0.22 | 22.92 | 23.21 | 48.00 |
| | 0.594 | 0.07 | 0.23 | 21.18 | 21.48 | 48.00 |
| | 0.802 | 0.09 | 0.26 | 23.13 | 23.48 | 48.00 |
| | 0.856 | 0.09 | 0.26 | 23.36 | 23.72 | 48.00 |
| | 1.023 | 0.10 | 0.28 | 22.39 | 22.77 | 48.00 |
| **Line 2** | | | | | | |
| **Quasi-Peak:** | | | | | | |
| | 0.450 | 0.06 | 0.20 | 25.78 | 26.04 | 48.00 |
| | 0.655 | 0.08 | 0.24 | 25.29 | 25.61 | 48.00 |
| * | 0.743 | 0.08 | 0.25 | 29.31 | 29.65 | 48.00 |
| | 0.852 | 0.09 | 0.26 | 25.89 | 26.25 | 48.00 |
| | 0.927 | 0.10 | 0.27 | 23.97 | 24.34 | 48.00 |
| | 1.298 | 0.12 | 0.30 | 20.28 | 20.70 | 48.00 |

Remarks :

1. All Readings below 1GHz are Quasi-Peak value.
2. " * " means that this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Wireless AV Sender with remote control extender
Test Item : Conducted Emission Test
Test Mode : Mode 2: MW35-0900300

| | Frequency | Cable Loss | LISN Factor | Reading Level | Emission Level | Limits |
|---|---|---|---|---|---|---|
| | MHz | dB | dB | dBuV | dBuV | dBuV |
| **Line 1** | | | | | | |
| **Quasi-Peak:** | | | | | | |
| * | 0.450 | 0.06 | 0.20 | 31.19 | 31.45 | 48.00 |
| | 0.532 | 0.07 | 0.22 | 30.38 | 30.67 | 48.00 |
| | 0.578 | 0.07 | 0.23 | 27.31 | 27.61 | 48.00 |
| | 0.661 | 0.08 | 0.24 | 21.36 | 21.68 | 48.00 |
| | 0.805 | 0.09 | 0.26 | 24.27 | 24.62 | 48.00 |
| | 0.977 | 0.10 | 0.28 | 22.15 | 22.53 | 48.00 |
| **Line 2** | | | | | | |
| **Quasi-Peak:** | | | | | | |
| * | 0.454 | 0.06 | 0.20 | 29.81 | 30.07 | 48.00 |
| | 0.490 | 0.06 | 0.21 | 29.34 | 29.61 | 48.00 |
| | 0.578 | 0.07 | 0.23 | 24.86 | 25.16 | 48.00 |
| | 0.645 | 0.08 | 0.24 | 20.77 | 21.09 | 48.00 |
| | 0.771 | 0.09 | 0.26 | 21.25 | 21.59 | 48.00 |
| | 0.842 | 0.09 | 0.26 | 21.31 | 21.66 | 48.00 |

Remarks :

1 All Readings below 1GHz are Quasi-Peak value.
2. " * " means that this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

# 3. Radiated Emission

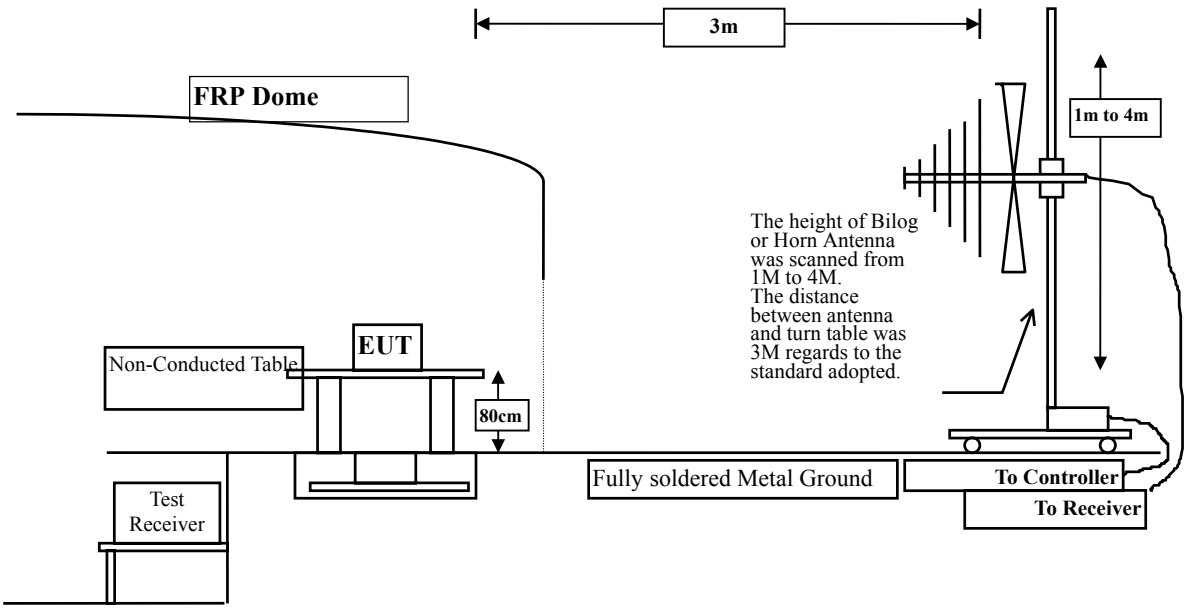
## 3.1. Test Equipment

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 | Sep., 2001 |
| | 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 | Sep.,2001 |
| | | 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

➢ **Fundamental and Harmonics Emission Limits**

| FCC Part 15 Subpart B Paragraph 15.249(a) Limits | | | | | | |
|---|---|---|---|---|---|---|
| Frequency | Field Strength of Fundamental | | | Field Strength of Harmonics | | |
| MHz | (mV/m @3m) | (dBuV/m @3m) | | (uV/m @3m) | (dBuV/m @3m) | |
| 902-928 | 50 | 94 (Average) | 114 (Peak) | 500 | 54 (Average) | 74 (Peak) |
| 2400-2483.5 | 50 | 94 (Average) | 114 (Peak) | 500 | 54 (Average) | 74 (Peak) |
| 5725-5875 | 50 | 94 (Average) | 114 (Peak) | 500 | 54 (Average) | 74 (Peak) |

➢ **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(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/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.

## 3.4. 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 invested over the frequency range from 30MHz to1GHz 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 harminics is checked.

## 3.5. Test Result of Radiated Emission

Product : Wireless AV Sender with remote control extender
Test Item : Fundamental Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Normal Operation

| Freq. | Cable Loss | Probe Factor | PreAMP | Reading Level | Emission Level | Margin | Limit |
|---|---|---|---|---|---|---|---|
| MHz | dB | dB/m | dB | dBuV | dBuV/m | dB | dBuV/m |
| **Peak Detector (Horizontal)** | | | | | | | |
| Channel 1 | | | | | | | |
| 2436.600 | 2.46 | 29.48 | 0.00 | 44.61 | 76.55 | 37.45 | 114.00 |
| Channel 2 | | | | | | | |
| 2455.600 | 2.47 | 29.52 | 0.00 | 44.72 | 76.71 | 37.29 | 114.00 |
| Channel 3 | | | | | | | |
| 2475.200 | 2.49 | 29.58 | 0.00 | 45.12 | 77.19 | 36.81 | 114.00 |
| **Peak Detector (Vertical)** | | | | | | | |
| Channel 1 | | | | | | | |
| 2435.800 | 2.46 | 29.48 | 0.00 | 54.38 | 86.32 | 27.68 | 114.00 |
| Channel 2 | | | | | | | |
| 2456.000 | 2.47 | 29.52 | 0.00 | 51.26 | 83.25 | 30.75 | 114.00 |
| Channel 3 | | | | | | | |
| 2475.200 | 2.49 | 29.58 | 0.00 | 52.69 | 84.76 | 29.24 | 114.00 |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Emission Level = Reading Level + Probe Factor + Cable loss.
3. 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 : Wireless AV Sender with remote control extender
Test Item : Harmonic Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Channel 1

| Freq. | Cable Loss | Probe Factor | PreAMP | Reading Level | | Emission Level | Margin | Limit |
|---|---|---|---|---|---|---|---|---|
| MHz | dB | dB/m | dB | dBuV | | dBuV/m | dB | dBuV/m |
| **Peak Detector (Horizontal)** | | | | | | | | |
| 4873.120 | 3.78 | 33.56 | 34.69 | 45.51 | | 48.16 | 25.84 | 74.00 |
| 7309.920 | 4.89 | 36.31 | 34.99 | 44.57 | | 50.77 | 23.23 | 74.00 |
| 9746.520 | 5.67 | 37.45 | 35.10 | 45.80 | < | 53.81 | 20.19 | 74.00 |
| 12183.12 | 6.45 | 39.18 | 34.48 | 41.93 | < | 53.08 | 20.92 | 74.00 |
| **Peak Detector (Vertical)** | | | | | | | | |
| 4873.360 | 3.78 | 33.56 | 34.69 | 44.32 | | 46.97 | 27.03 | 74.00 |
| 7310.080 | 4.89 | 36.31 | 34.99 | 44.87 | | 51.07 | 22.93 | 74.00 |
| 9746.480 | 5.67 | 37.45 | 35.10 | 45.81 | < | 53.82 | 20.18 | 74.00 |
| 12183.16 | 6.45 | 39.18 | 34.48 | 42.02 | < | 53.17 | 20.83 | 74.00 |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Emission Level = Reading Level + Probe Factor + Cable loss – PreAMP.
3. 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 : Wireless AV Sender with remote control extender
Test Item : Harmonic Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Channel 2

| Freq. | Cable Loss | Probe Factor | PreAMP | Reading Level | | Emission Level | Margin | Limit |
|---|---|---|---|---|---|---|---|---|
| MHz | dB | dB/m | dB | dBuV | | dBuV/m | dB | dBuV/m |
| **Peak Detector (Horizontal)** | | | | | | | | |
| 4909.080 | 3.80 | 33.59 | 34.69 | 44.76 | | 47.45 | 26.55 | 74.00 |
| 7363.600 | 4.90 | 36.36 | 35.01 | 46.25 | | 52.50 | 21.50 | 74.00 |
| 9817.960 | 5.70 | 37.46 | 35.10 | 45.61 | < | 53.66 | 20.34 | 74.00 |
| 12272.77 | 6.46 | 39.21 | 34.39 | 42.01 | < | 53.30 | 20.70 | 74.00 |
| **Peak Detector (Vertical)** | | | | | | | | |
| 4909.320 | 3.80 | 33.59 | 34.69 | 45.42 | | 48.11 | 25.89 | 74.00 |
| 7363.640 | 4.90 | 36.36 | 35.01 | 46.33 | | 52.58 | 21.42 | 74.00 |
| 9818.240 | 5.70 | 37.46 | 35.10 | 45.40 | < | 53.45 | 20.55 | 74.00 |
| 12272.64 | 6.46 | 39.21 | 34.39 | 42.10 | < | 53.39 | 20.61 | 74.00 |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Emission Level = Reading Level + Probe Factor + Cable loss – PreAMP.
3. 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 : Wireless AV Sender with remote control extender
Test Item : Harmonic Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Channel 3

| Freq. | Cable Loss | Probe Factor | PreAMP | Reading Level | | Emission Level | Margin | Limit |
|---|---|---|---|---|---|---|---|---|
| MHz | dB | dB/m | dB | dBuV | | dBuV/m | dB | dBuV/m |
| **Peak Detector (Horizontal)** | | | | | | | | |
| 4944.400 | 3.81 | 33.64 | 34.70 | 45.32 | | 48.07 | 25.93 | 74.00 |
| 7416.640 | 4.91 | 36.41 | 35.02 | 45.32 | | 51.61 | 22.39 | 74.00 |
| 9888.240 | 5.73 | 37.48 | 35.10 | 45.76 | < | 53.86 | 20.14 | 74.00 |
| 12360.52 | 6.48 | 39.24 | 34.30 | 42.16 | < | 53.58 | 20.42 | 74.00 |
| **Peak Detector (Vertical)** | | | | | | | | |
| 4944.520 | 3.81 | 33.64 | 34.70 | 47.89 | | 50.64 | 23.36 | 74.00 |
| 7416.720 | 4.91 | 36.41 | 35.02 | 45.58 | | 51.87 | 22.13 | 74.00 |
| 9888.520 | 5.73 | 37.48 | 35.10 | 44.95 | < | 53.05 | 20.95 | 74.00 |
| 12360.28 | 6.48 | 39.24 | 34.30 | 42.32 | < | 53.74 | 20.26 | 74.00 |

Note:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. Emission Level = Reading Level + Probe Factor + Cable loss – PreAMP.
3. 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 : Wireless AV Sender with remote control extender
Test Item : General Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Mode 1: D9300 (Channel 1)

| | Freq. | Cable Loss | Probe Factor | PreAMP | Reading Level | Emission Level | Margin | Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dB | dBuV/m |
| **Horizontal:** | | | | | | | | |
| | 321.000 | 2.21 | 19.35 | 26.92 | 35.80 | 30.44 | 15.56 | 46.00 |
| * | 338.460 | 2.28 | 18.75 | 26.89 | 40.80 | 34.94 | 11.06 | 46.00 |
| | 403.450 | 2.55 | 20.17 | 26.79 | 35.00 | 30.93 | 15.07 | 46.00 |
| | 438.370 | 2.69 | 19.99 | 26.73 | 33.60 | 29.55 | 16.45 | 46.00 |
| | 484.930 | 2.88 | 20.67 | 26.66 | 34.40 | 31.29 | 14.71 | 46.00 |
| | 652.740 | 3.57 | 22.12 | 26.40 | 34.00 | 33.30 | 12.70 | 46.00 |
| **Vertical:** | | | | | | | | |
| * | 53.280 | 1.11 | 21.17 | 26.86 | 36.40 | 31.82 | 8.18 | 40.00 |
| | 201.690 | 1.72 | 17.18 | 26.91 | 35.00 | 26.98 | 16.52 | 43.50 |
| | 321.970 | 2.22 | 19.35 | 26.91 | 38.20 | 32.85 | 13.15 | 46.00 |
| | 438.370 | 2.69 | 19.99 | 26.73 | 40.20 | 36.15 | 9.85 | 46.00 |
| | 537.310 | 3.10 | 21.58 | 26.58 | 35.40 | 33.50 | 12.50 | 46.00 |
| | 590.660 | 3.32 | 21.77 | 26.49 | 36.20 | 34.80 | 11.20 | 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- Pre Amp.

Product : Wireless AV Sender with remote control extender
Test Item : General Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Mode 1: D9300 (Channel 2)

| | Freq. | Cable Loss | Probe Factor | PreAMP | Reading Level | Emission Level | Margin | Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dB | dBuV/m |
| **Horizontal:** | | | | | | | | |
| | 113.420 | 1.36 | 17.39 | 26.88 | 39.00 | 30.87 | 12.63 | 43.50 |
| * | 336.520 | 2.28 | 18.63 | 26.89 | 42.80 | 36.81 | 9.19 | 46.00 |
| | 405.390 | 2.56 | 20.09 | 26.78 | 36.40 | 32.27 | 13.73 | 46.00 |
| | 483.960 | 2.88 | 20.65 | 26.66 | 39.00 | 35.87 | 10.13 | 46.00 |
| | 539.250 | 3.11 | 21.90 | 26.57 | 35.00 | 33.44 | 12.56 | 46.00 |
| | 590.660 | 3.32 | 21.77 | 26.49 | 35.60 | 34.20 | 11.80 | 46.00 |
| **Vertical:** | | | | | | | | |
| * | 44.550 | 1.08 | 20.64 | 26.86 | 38.20 | 33.06 | 6.94 | 40.00 |
| | 202.660 | 1.72 | 17.21 | 26.91 | 34.80 | 26.82 | 16.68 | 43.50 |
| | 321.970 | 2.22 | 19.35 | 26.91 | 39.40 | 34.05 | 11.95 | 46.00 |
| | 439.340 | 2.70 | 19.99 | 26.73 | 41.60 | 37.56 | 8.44 | 46.00 |
| | 470.380 | 2.82 | 20.36 | 26.68 | 37.20 | 33.70 | 12.30 | 46.00 |
| | 537.310 | 3.10 | 21.58 | 26.58 | 36.40 | 34.50 | 11.50 | 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- Pre Amp.

Product : Wireless AV Sender with remote control extender
Test Item : General Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Mode 1: D9300 (Channel 3)

| | Freq. | Cable Loss | Probe Factor | PreAMP | Reading Level | Emission Level | Margin | Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dB | dBuV/m |
| **Horizontal:** | | | | | | | | |
| | 202.660 | 1.72 | 15.21 | 26.91 | 34.80 | 24.82 | 18.68 | 43.50 |
| | 271.530 | 2.01 | 18.09 | 26.94 | 35.80 | 28.96 | 17.04 | 46.00 |
| | 321.970 | 2.22 | 19.35 | 26.91 | 35.80 | 30.45 | 15.55 | 46.00 |
| | 403.450 | 2.55 | 20.17 | 26.79 | 35.00 | 30.93 | 15.07 | 46.00 |
| * | 430.610 | 2.66 | 19.90 | 26.74 | 37.00 | 32.81 | 13.19 | 46.00 |
| | 483.960 | 2.88 | 20.65 | 26.66 | 34.60 | 31.47 | 14.53 | 46.00 |
| **Vertical:** | | | | | | | | |
| * | 43.580 | 1.07 | 20.74 | 26.86 | 35.80 | 30.75 | 9.25 | 40.00 |
| | 270.560 | 2.00 | 18.09 | 26.94 | 35.80 | 28.95 | 17.05 | 46.00 |
| | 321.970 | 2.22 | 19.35 | 26.91 | 38.20 | 32.85 | 13.15 | 46.00 |
| | 438.370 | 2.69 | 19.99 | 26.73 | 40.20 | 36.15 | 9.85 | 46.00 |
| | 470.380 | 2.82 | 20.36 | 26.68 | 36.40 | 32.90 | 13.10 | 46.00 |
| | 590.660 | 3.32 | 21.77 | 26.49 | 36.20 | 34.80 | 11.20 | 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- Pre Amp.

Product : Wireless AV Sender with remote control extender
Test Item : General Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Mode 2: MW35-0900300 (Channel 1)

| | Freq. | Cable Loss | Probe Factor | PreAMP | Reading Level | Emission Level | Margin | Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dB | dBuV/m |
| **Horizontal:** | | | | | | | | |
| | 320.960 | 2.21 | 19.35 | 26.92 | 35.95 | 30.59 | 15.41 | 46.00 |
| * | 338.450 | 2.28 | 18.75 | 26.89 | 40.60 | 34.74 | 11.26 | 46.00 |
| | 403.410 | 2.55 | 20.17 | 26.79 | 35.20 | 31.13 | 14.87 | 46.00 |
| | 438.350 | 2.69 | 19.99 | 26.73 | 33.80 | 29.75 | 16.25 | 46.00 |
| | 484.910 | 2.88 | 20.67 | 26.66 | 34.70 | 31.59 | 14.41 | 46.00 |
| | 652.710 | 3.57 | 22.12 | 26.40 | 34.50 | 33.80 | 12.20 | 46.00 |
| **Vertical:** | | | | | | | | |
| * | 53.310 | 1.11 | 21.17 | 26.86 | 36.75 | 32.17 | 7.83 | 40.00 |
| | 201.700 | 1.72 | 17.18 | 26.91 | 35.20 | 27.18 | 16.32 | 43.50 |
| | 321.990 | 2.22 | 19.35 | 26.91 | 37.90 | 32.55 | 13.45 | 46.00 |
| | 438.350 | 2.69 | 19.99 | 26.73 | 40.20 | 36.15 | 9.85 | 46.00 |
| | 537.300 | 3.10 | 21.58 | 26.58 | 35.80 | 33.90 | 12.10 | 46.00 |
| | 590.650 | 3.32 | 21.77 | 26.49 | 36.40 | 35.00 | 11.00 | 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- Pre Amp.

Product : Wireless AV Sender with remote control extender
Test Item : General Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Mode 2: MW35-0900300 (Channel 2)

| | Freq. | Cable Loss | Probe Factor | PreAMP | Reading Level | Emission Level | Margin | Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dB | dBuV/m |
| **Horizontal:** | | | | | | | | |
| | 113.370 | 1.36 | 17.39 | 26.88 | 39.20 | 31.07 | 12.43 | 43.50 |
| * | 336.500 | 2.28 | 18.63 | 26.89 | 42.85 | 36.86 | 9.14 | 46.00 |
| | 405.370 | 2.56 | 20.09 | 26.78 | 36.20 | 32.07 | 13.93 | 46.00 |
| | 483.950 | 2.88 | 20.65 | 26.66 | 39.10 | 35.97 | 10.03 | 46.00 |
| | 539.220 | 3.11 | 21.90 | 26.57 | 35.20 | 33.64 | 12.36 | 46.00 |
| | 590.680 | 3.32 | 21.77 | 26.49 | 35.80 | 34.40 | 11.60 | 46.00 |
| **Vertical:** | | | | | | | | |
| * | 44.520 | 1.08 | 20.64 | 26.86 | 38.50 | 33.36 | 6.64 | 40.00 |
| | 202.650 | 1.72 | 17.21 | 26.91 | 34.90 | 26.92 | 16.58 | 43.50 |
| | 321.950 | 2.22 | 19.35 | 26.91 | 39.10 | 33.75 | 12.25 | 46.00 |
| | 439.330 | 2.70 | 19.99 | 26.73 | 41.80 | 37.76 | 8.24 | 46.00 |
| | 470.370 | 2.82 | 20.36 | 26.68 | 37.30 | 33.80 | 12.20 | 46.00 |
| | 537.300 | 3.10 | 21.58 | 26.58 | 36.20 | 34.30 | 11.70 | 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- Pre Amp.

Product : Wireless AV Sender with remote control extender
Test Item : General Radiated Emission Data
Test Site : No.1 OATS
Test Mode : Mode 2: MW35-0900300 (Channel 3)

| | Freq. | Cable Loss | Probe Factor | PreAMP | Reading Level | Emission Level | Margin | Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dB | dBuV/m |
| **Horizontal:** | | | | | | | | |
| | 202.650 | 1.72 | 15.21 | 26.91 | 34.90 | 24.92 | 18.58 | 43.50 |
| | 271.510 | 2.01 | 18.09 | 26.94 | 35.50 | 28.66 | 17.34 | 46.00 |
| | 321.000 | 2.21 | 19.35 | 26.92 | 35.90 | 30.54 | 15.46 | 46.00 |
| | 403.440 | 2.55 | 20.17 | 26.79 | 35.30 | 31.23 | 14.77 | 46.00 |
| * | 430.600 | 2.66 | 19.90 | 26.74 | 37.20 | 33.01 | 12.99 | 46.00 |
| | 483.970 | 2.88 | 20.65 | 26.66 | 34.40 | 31.27 | 14.73 | 46.00 |
| **Vertical:** | | | | | | | | |
| * | 43.570 | 1.07 | 20.74 | 26.86 | 35.90 | 30.85 | 9.15 | 40.00 |
| | 270.550 | 2.00 | 18.09 | 26.94 | 35.60 | 28.75 | 17.25 | 46.00 |
| | 321.950 | 2.22 | 19.35 | 26.91 | 38.40 | 33.05 | 12.95 | 46.00 |
| | 438.350 | 2.69 | 19.99 | 26.73 | 40.00 | 35.95 | 10.05 | 46.00 |
| | 470.370 | 2.82 | 20.36 | 26.68 | 36.70 | 33.20 | 12.80 | 46.00 |
| | 590.660 | 3.32 | 21.77 | 26.49 | 36.30 | 34.90 | 11.10 | 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- Pre Amp.

# 4. Band Edge

## 4.1. Test Equipment

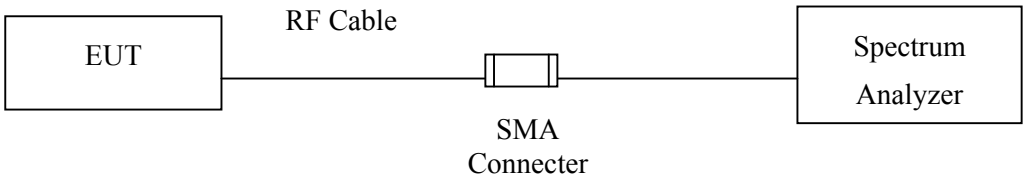
The following test equipments are used during the band edge tests:

| | 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 | Sep., 2001 |
| X | Horn Antenna | EM | EM6917 / 103325 | May, 2002 |

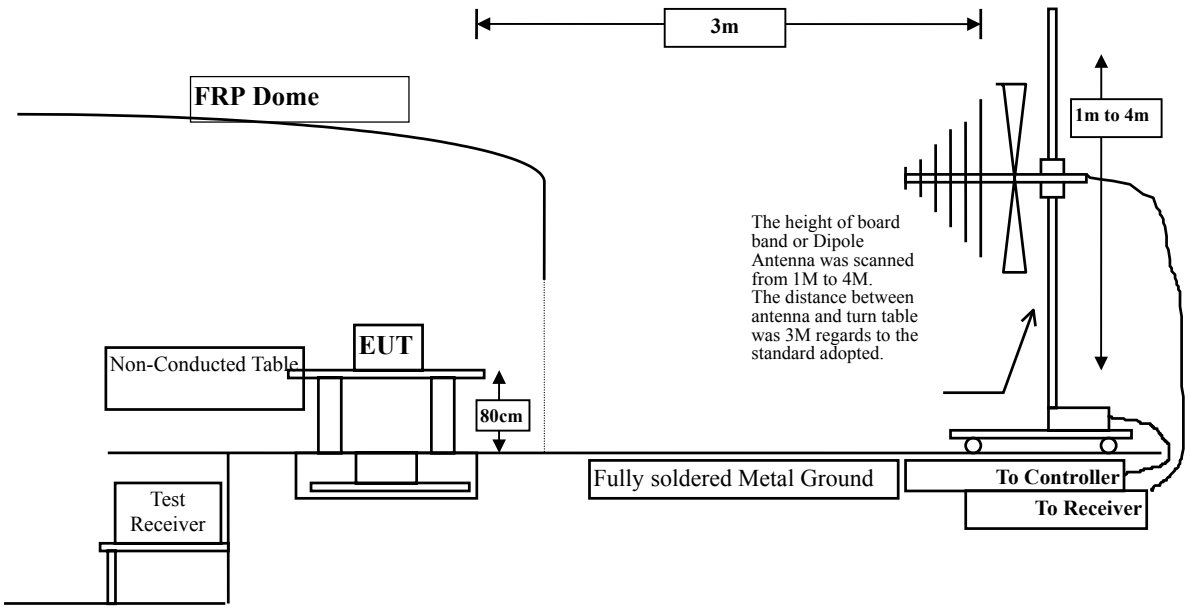
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
2. Mark "X" test instruments are used to measure the final test results.

## 4.2. Test Setup

**RF Conducted Measurement:**




**RF Radiated Measurement:**



## 4.3. Test Condition

Standard Temperature and Humidity, Standard Test Voltage

## 4.4. Standard Reqirement

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)).

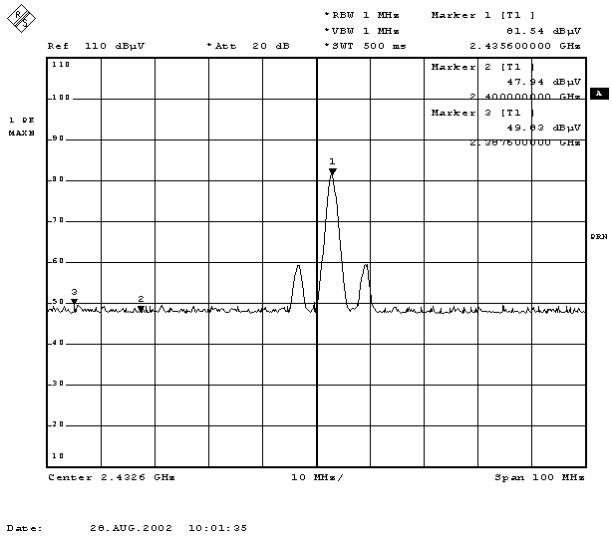
## 4.5. Test Result of Band Edge

Product : Wireless AV Sender with remote control extender
Test Item : Band Edge Data
Test Site : No.1 OATS
Test Mode : Channel 1

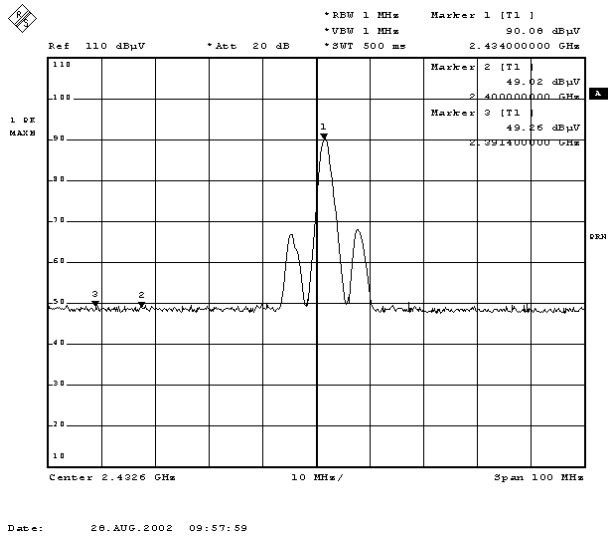
**RF Radiated Measurement: (Peak Detector)**

| Channel No. | Frequency (MHz) | Reading Level (dBuV) | Probe Factor (dB/m) | Cable Loss (dB) | PreAMP (dB) | Emission Level (dBuV/m) | Limit (dBuV/m) | Result |
|---|---|---|---|---|---|---|---|---|
| 11(Horizontal) | 2387.6 | 49.83 | 29.34 | 2.41 | 34.94 | 46.63 | 74 | Pass |
| 11 (Vertical) | 2391.4 | 49.26 | 29.36 | 2.43 | 34.94 | 46.10 | 74 | Pass |

Horizontal




Vertical



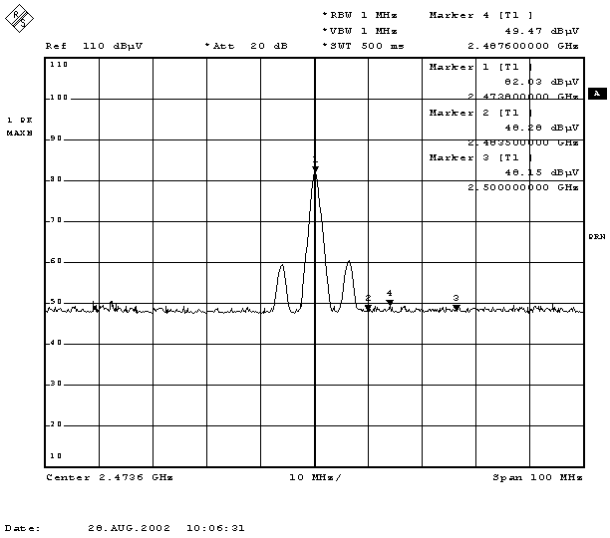

Note: The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : Wireless AV Sender with remote control extender
Test Item : Band Edge Data
Test Site : No.1 OATS
Test Mode : Channel 3

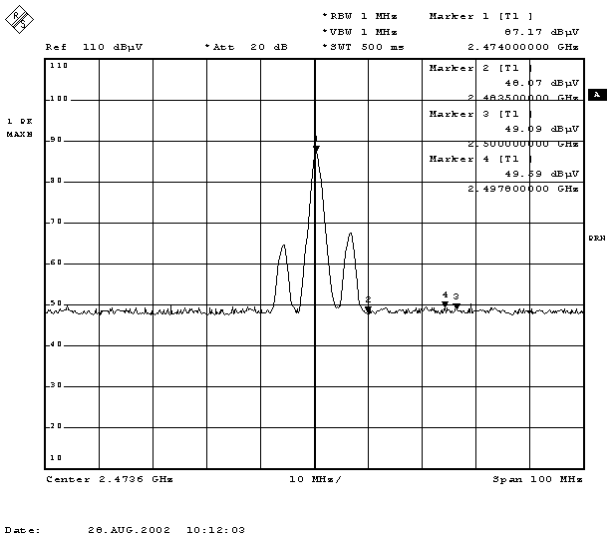
**RF Radiated Measurement: (Peak Detector)**

| Channel No. | Frequency (MHz) | Reading Level (dBuV) | Probe Factor (dB/m) | Cable Loss (dB) | PreAMP (dB) | Emission Level (dBuV/m) | Limit (dBuV/m) | Result |
|---|---|---|---|---|---|---|---|---|
| 11(Horizontal) | 2487.6 | 49.47 | 29.6 | 2.50 | 34.95 | 46.62 | 74 | Pass |
| 11 (Vertical) | 2497.8 | 49.59 | 29.62 | 2.52 | 34.95 | 46.78 | 74 | Pass |

Horizontal




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.

## 5. EMI Reduction Method During Compliance Testing

No modification was made during testing.

# Attachment 1 : EUT Test Photographs

## Attachment 1: EUT Test Setup Photographs

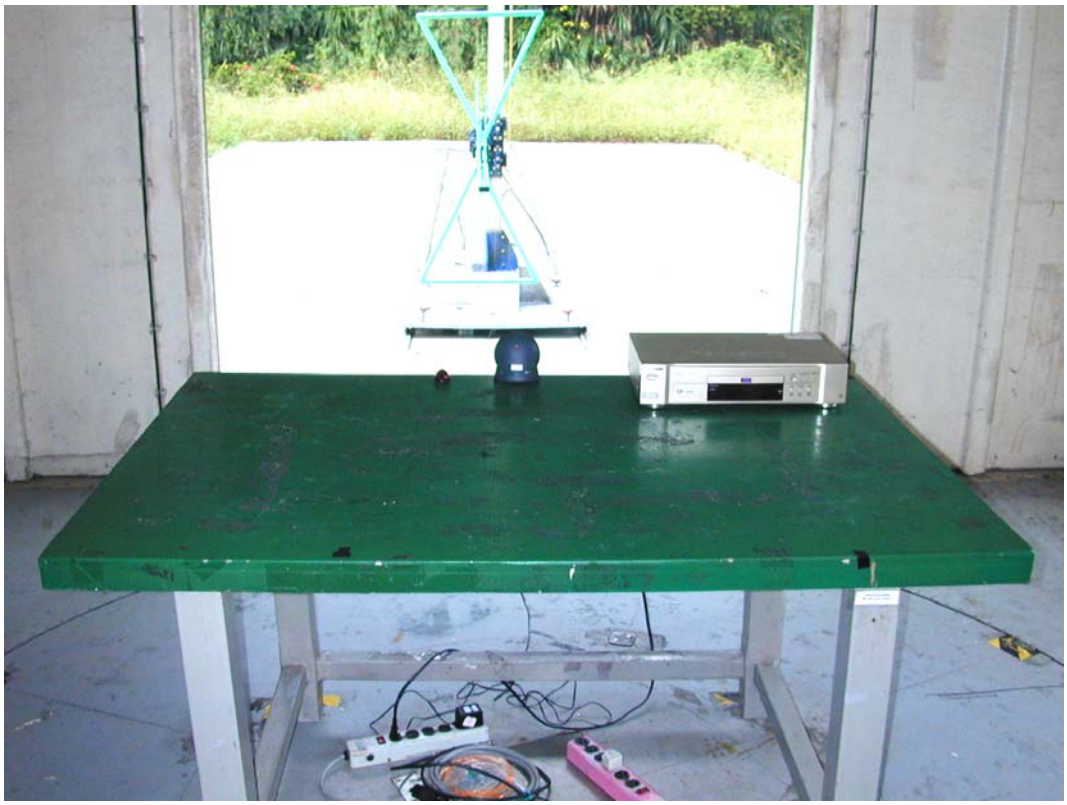
Front View of Conducted Test (Mode 1)

Back View of Conducted Test (Mode 1)

Front View of Conducted Test (Mode 2)

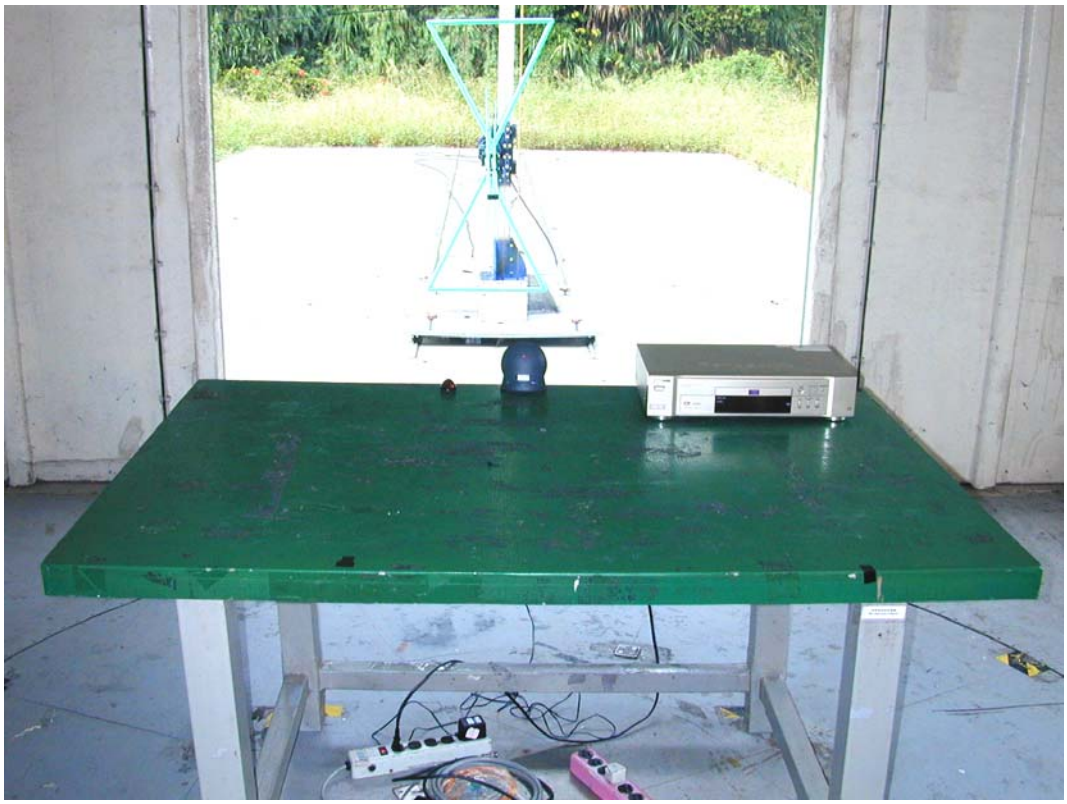
Back View of Conducted Test (Mode 2)

Front View of Radiated Test (Mode 1)



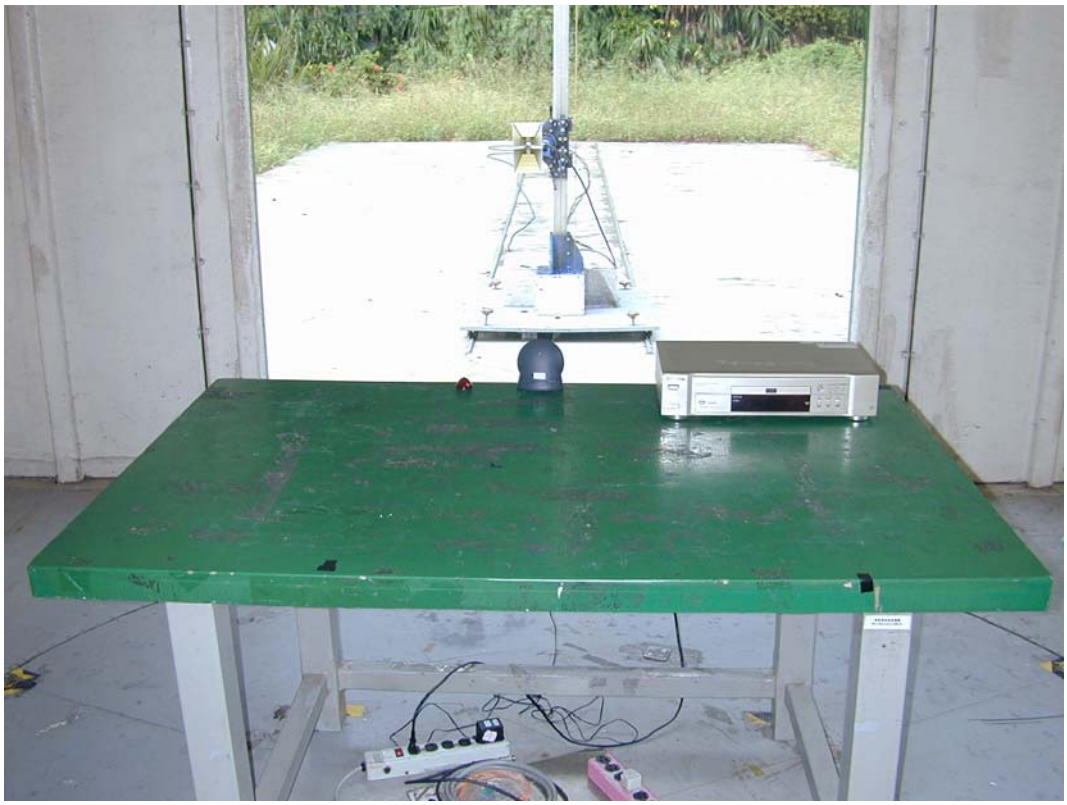
Back View of Radiated Test (Mode 1)

Front View of Radiated Test (Mode 2)



Back View of Radiated Test (Mode 2)

Front View of Radiated Test (Horn)



Attachment 2 : EUT Detailed Photographs

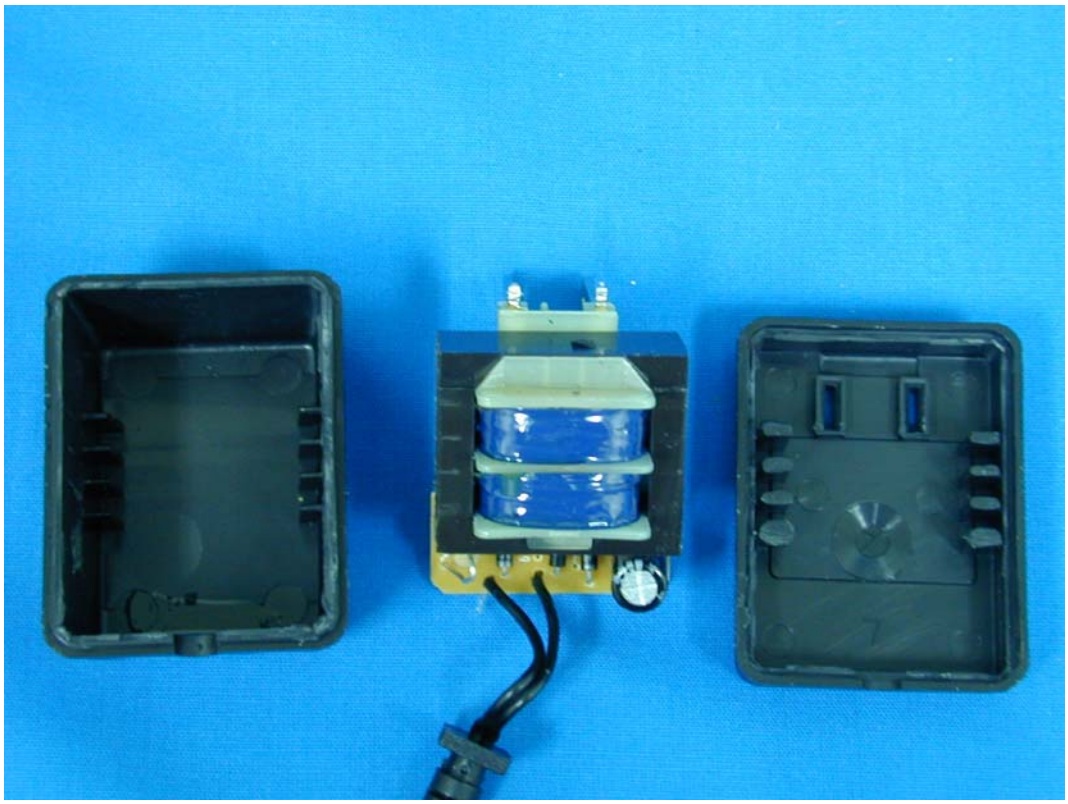
**Attachment 2 : EUT Detailed Photographs**

(1) EUT Photo—(Mode 1)

(2) EUT Photo—(Mode 1)

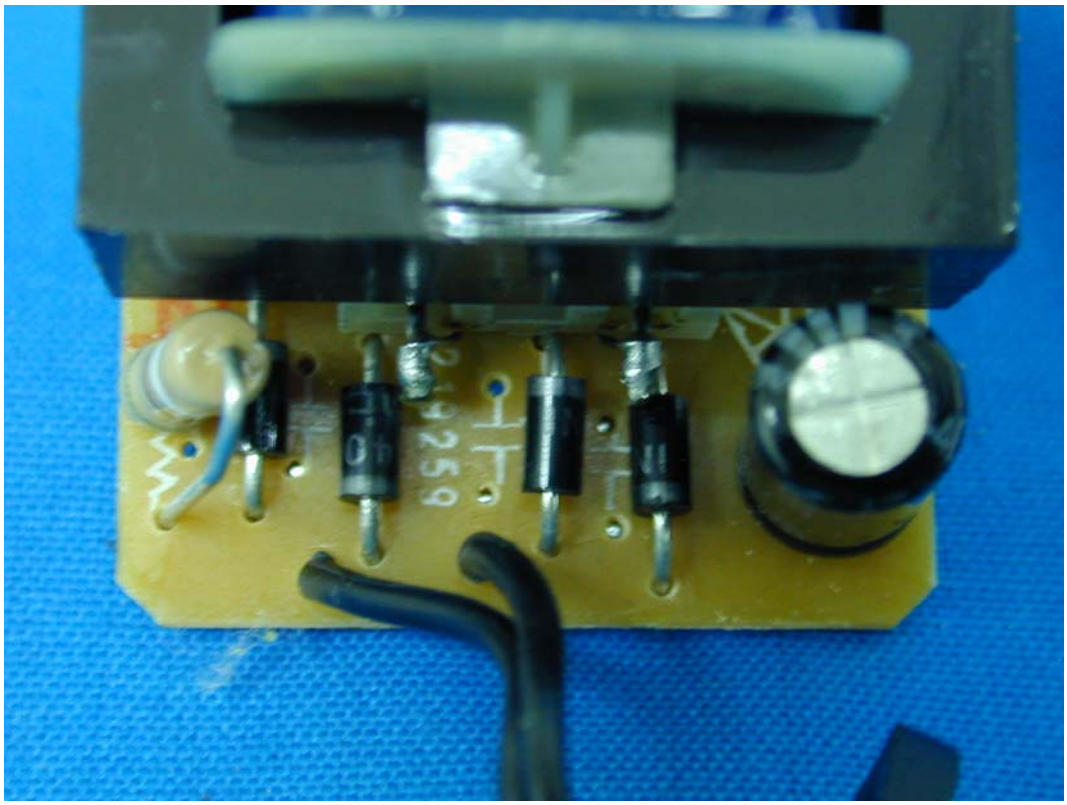
(3) EUT Photo—(Mode 1)

(4) EUT Photo—(Mode 1)



(5) EUT Photo—(Mode 1)

(6) EUT Photo—(Mode 1)



(7) EUT Photo—(Mode 2)

(8) EUT Photo—(Mode 2)

(9) EUT Photo—(Mode 2)