

MEASUREMENT REPORT of Wireless Audio Video Transmitter

Applicant : GRANDTEC ELECTRONIC CORP.
Product Name : 2.4GHz AV Sender built-in color CMOS video camera
Model No. : 6.8' LCD Monitor; Grand GT-6801;
Grand RF Guard CMOS; Grand RF Guard CCD
FCC ID : PVCGTP212
EUT : Audio/Video Transmitter
Report No. : GA215142
Followed by : 47 CFR, Part 15, Subpart C

Test by :

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CERTIFICATION

We here by verify that:

The test data, data evaluation, test procedures and equipment configurations shown in this report were made mainly in accordance with the procedures given in ANSI C63.4 (1992) as a reference. All test were conducted by *Training Research Co., Ltd.*, 2, Lane 194, Huan-Ho Street, Hsi-chih, Taipei Hsien 221, Taiwan, R.O.C. Also, we attest to the accuracy of each.

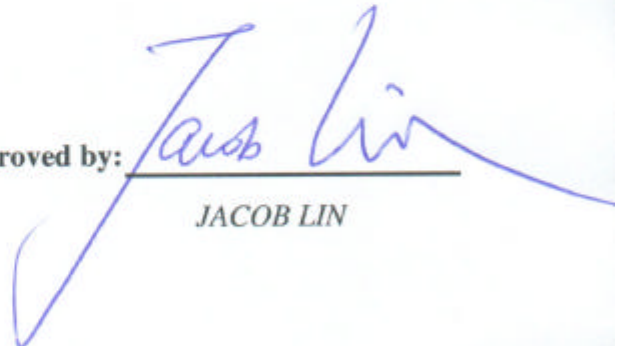
We further submit that the energy emitted by the sample EUT tested as described in the report is **in compliance with** the technical requirements set forth in the FCC Rules Part 15 Subpart C Section 15.249.

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Test Date : June 24, 2002

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Report No.: GA215142, FCC Part 15 Class B

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I. GENERAL

1.1 Introduction

The following measurement report is submitted on behalf of Applicant in support of audio/video transmitter certification in accordance with Part 2 Subpart J and Part 15 Subpart A and C of the Commission's Rules and Regulations.

1.2 Description of EUT

Product Name : 2.4GHz AV Sender built-in color CMOS video camera

Model No. : 6.8' LCD Monitor; Grand GT-6801;
Grand RF Guard CMOS; Grand RF Guard CCD

FCC ID : PVCGTP212

Frequency Range : 2400 – 2483 MHz

Support Channel : 4 Channel

Power Type : Powered by adaptor
Model: YAD-0600800C
I/P: 120Vac, 60Hz, 9.5W
O/P: 6Vdc, 800mA

Power Cable : 190cm long, non-shielded, no ferrite core

Audio/Video Cable : N/A

Applicant : GRANDTEC ELECTRONIC CORP.
8F, No. 268, Lian Cheng Rd., Chung Ho City,
Taipei Hsien 235, Taiwan, R.O.C.

Features :

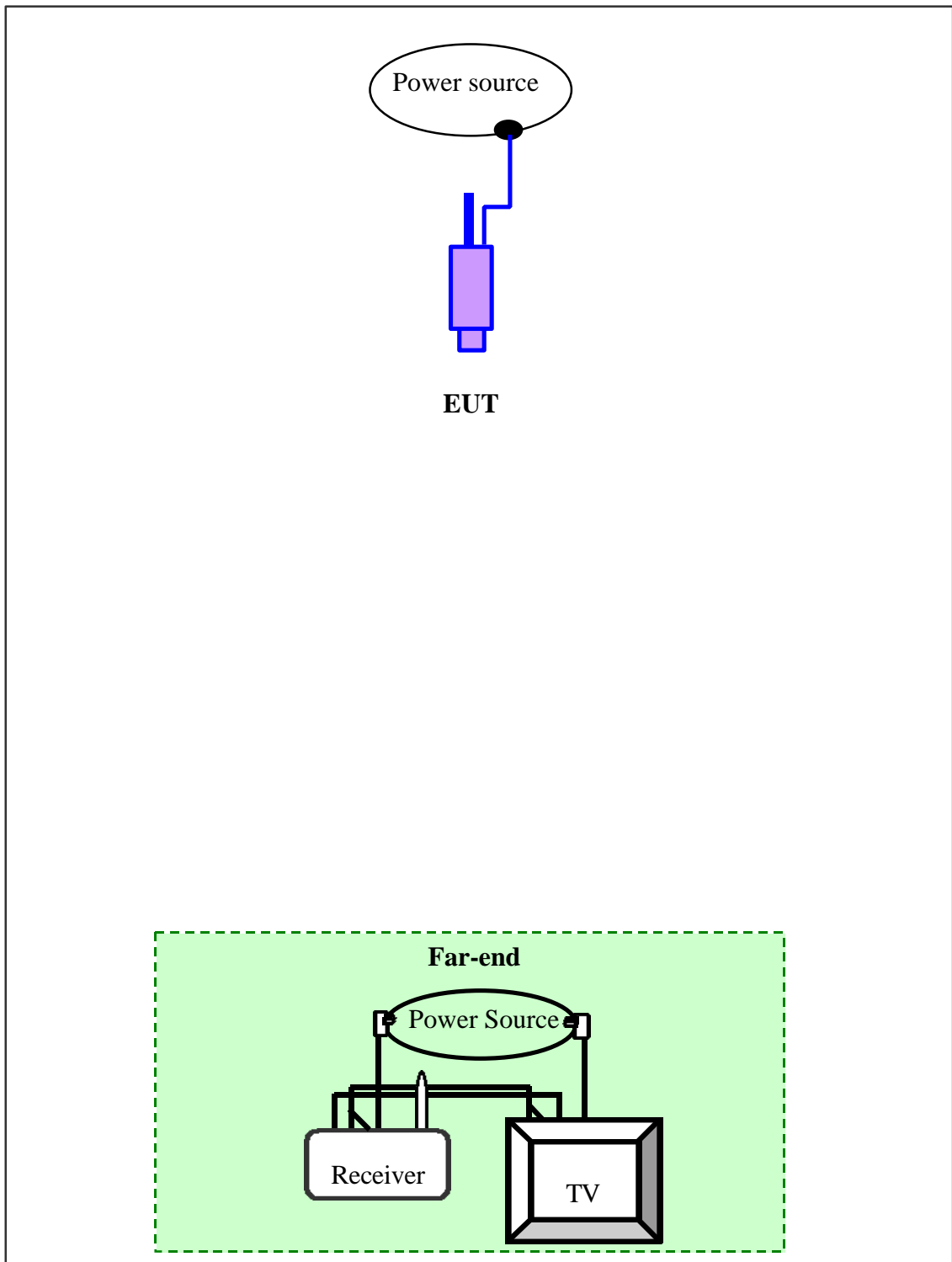
2.4GHz A/V Module uses FM modulation technology to provide ISM band wireless audio and video connection. Multi channels are specially designed to enhance the function of channel switching as well as digital PLL and uP Technology.

| ITEM | SPEC | REMARK |
|-----------------------|-----------------------|------------------------|
| Frequency | 2400MHz ~ 2483MHz | |
| Tx Power | 1dBm | Typical |
| Channel Number | 4 | 2410,2430,2450,2470MHz |
| Frequency Stability | ±100KHz | Typical |
| Video Input Level | 1Vp-p | Typical |
| Audio Input Level | 1Vrms | Typical |
| Supply Voltage | 3.3V | +/-0.05V |
| Current Consumption | 50mA | Typical |
| Antenna Port | Half Pitch Pin Header | 1.27mm Pitch |
| Baseband Interface | Half Pitch Pin Header | 1.27mm Pitch |
| Dimension (mm) | 44Wx17Dx6H | Unit is mm |
| Operating Temperature | 10 ~ 50 | |

1.3 Description of Support Equipment

Color TV : SANYO 20" COLOR TELEVISION
 Model No. : ST-20S1
 Serial No. : 0619202K92676
 Power type : AC110V 60Hz 75W
 Power cord : Non-shielded, 2.70m long, No ferrite core

1.4 Configuration of System Under Test



Connections

Transmitter (EUT):

*Power adaptor

--- Model: YAD-0600800C;

I/P: 120Vac, 60Hz, 9.5W; O/P: 6Vdc, 800mA

*Power cable of adaptor

--- 190cm long, non-shielded, no ferrite core

Receiver:

*Power adaptor

--- Model: YAD-0600800C;

I/P: 120Vac, 60Hz, 9.5W; O/P: 6Vdc, 800mA

*Power cable of adaptor

--- 190cm long, non-shielded, no ferrite core

*AV Cable

--- 150cm long, non-shielded, no ferrite core

Test Method:

1. Make the EUT operating and transmitting video and audio signal to the receiver.
2. See the TV connected with Receiver which is far away from the turn table and test antenna to make sure that the device is modulated with video and audio signal.

1.5 Test Procedure

All measurements contained in this report were performed mainly according to the techniques described in Measurement procedure ANSI C63.4 (1992).

1.6 Location of the Test Site

The radiated emissions measurements required by the rules were performed on the **three-meter, Anechoic Chamber (Registration Number: 93906)** maintained by *Training Research Co., Ltd.* 1F., No. 2, Lane 194, Huan-Ho Street, Hsichih, Taipei Hsien 221, Taiwan, R.O.C. Complete description and measurement data have been placed on file with the commission. The conducted power line emissions tests and other test items were performed in a anechoic chamber also located at Training Research Co., Ltd. 1F, No. 2, Lane 194, Huan-Ho Street, Hsichih, Taipei Hsien 221, Taiwan, R.O.C. *Training Research Co., Ltd.* is listed by the FCC as a facility available to do measurement work for others on a contract basis.

1.7 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions, which the EUT was considered likely to encounter in normal use were investigated.

In test, the base and handset are tested separately. They were set in Ch1, Ch3 and Ch4 of EUT and continuously transmitting mode that controlled by test mode of EUT.

II. Conducted Emissions Measurements

2.1 Test Condition & Setup

The power line conducted emission measurements were performed in an anechoic chamber. The EUT was assembled on a wooden table, which is 80 centimeters high, was placed 40 centimeters from the backwall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and Line Impedance Stabilization Networks (LISNs). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer (or EMI receiver) was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPER quasi-peak detection mode. The analyzer's 6dB bandwidth was set to 9kHz. No post-detector video filter was used.

The spectrum was scanned from 450kHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in test result.

2.2 List of Test Instruments

| Instrument Name | Model No. | Brand | Serial No. | Calibration Date | |
|-------------------|-----------|-----------|------------|------------------|-----------|
| | | | | Last time | Next time |
| Receiver | SCR3102 | SCHAFFNER | 012 | 03/29/02 | 03/28/03 |
| LISN (EUT) | 3825/2 | EMCO | 9411-2284 | 06/17/02 | 06/16/03 |
| LISN (Support E.) | 3825/2 | EMCO | 9210-2007 | 05/31/02 | 05/31/03 |
| Preamplifier | EQ3-006 | TRC | ----- | 05/15/02 | 05/15/03 |
| Line switch box | EQ3-007 | TRC | ----- | 05/15/02 | 05/15/03 |

2.3 Test configuration





2.4 Test Result of Conducted Emissions

EUT station transmit only

The following table shows a summary of the highest emissions of power line conducted emissions on the HOT and NATURAL conductors of the EUT power cord.

Table 1 Power Line Conducted Emissions (Channel 1)

| <i>Power Connected Emissions</i> | | | | <i>FCC Class B</i> | |
|----------------------------------|----------------------------|------------------------------------|----------------------------------|---------------------------|------------------------|
| <i>Conductor</i> | <i>Frequency (kHz)</i> | <i>Peak Amplitude (dB μ V)</i> | <i>QP Amplitude (dB μ V)</i> | <i>Limit (dB μ V)</i> | <i>Margin (dB)</i> |
| Line 1 | 470.00 | 34.72 | --- | 48.00 | -13.28 |
| | 499.00 | 33.29 | --- | 48.00 | -14.71 |
| | 534.00 | 32.19 | --- | 48.00 | -15.81 |
| | 564.00 | 33.49 | --- | 48.00 | -14.51 |
| | 582.00 | 31.68 | --- | 48.00 | -16.32 |
| | 601.00 | 31.57 | --- | 48.00 | -16.43 |
| | 615.00 | 30.76 | --- | 48.00 | -17.24 |
| | 641.00 | 31.09 | --- | 48.00 | -16.91 |
| | 667.00 | 31.56 | --- | 48.00 | -16.44 |
| | 818.00 | 31.21 | --- | 48.00 | -16.79 |
| Line 2 | 467.00 | 36.85 | --- | 48.00 | -11.15 |
| | 505.00 | 36.19 | --- | 48.00 | -11.81 |
| | 564.00 | 36.86 | --- | 48.00 | -11.14 |
| | 739.00 | 36.92 | --- | 48.00 | -11.08 |
| | 773.00 | 36.11 | --- | 48.00 | -11.89 |
| | 798.00 | 35.99 | --- | 48.00 | -12.01 |
| | 818.00 | 35.94 | --- | 48.00 | -12.06 |
| | 904.00 | 37.26 | --- | 48.00 | -10.74 |
| | 935.00 | 35.82 | --- | 48.00 | -12.18 |
| | 954.00 | 36.15 | --- | 48.00 | -11.85 |

NOTE:

1. Margin = Peak Amplitude – Limit
2. A "+" sign in the margin column means the emission is OVER the Class B Limit and "-" sign of means UNDER the Class B limit

Table 2 Power Line Conducted Emissions (Channel 3)

| <i>Power Connected Emissions</i> | | | | <i>FCC Class B</i> | |
|----------------------------------|----------------------------|------------------------------------|----------------------------------|---------------------------|------------------------|
| <i>Conductor</i> | <i>Frequency (kHz)</i> | <i>Peak Amplitude (dB μ V)</i> | <i>QP Amplitude (dB μ V)</i> | <i>Limit (dB μ V)</i> | <i>Margin (dB)</i> |
| Line 1 | 457.00 | 33.82 | --- | 48.00 | -14.18 |
| | 470.00 | 34.63 | --- | 48.00 | -13.37 |
| | 483.00 | 34.47 | --- | 48.00 | -13.53 |
| | 512.00 | 32.08 | --- | 48.00 | -15.92 |
| | 527.00 | 32.38 | --- | 48.00 | -15.62 |
| | 545.00 | 32.49 | --- | 48.00 | -15.51 |
| | 560.00 | 33.61 | --- | 48.00 | -14.39 |
| | 575.00 | 31.97 | --- | 48.00 | -16.03 |
| | 692.00 | 32.05 | --- | 48.00 | -15.95 |
| | 5390.00 | 34.69 | --- | 48.00 | -13.31 |
| Line 2 | 457.00 | 36.17 | --- | 48.00 | -11.83 |
| | 493.00 | 37.65 | --- | 48.00 | -10.35 |
| | 521.00 | 36.16 | --- | 48.00 | -11.84 |
| | 542.00 | 36.91 | --- | 48.00 | -11.09 |
| | 575.00 | 36.14 | --- | 48.00 | -11.86 |
| | 663.00 | 36.27 | --- | 48.00 | -11.73 |
| | 744.00 | 35.97 | --- | 48.00 | -12.03 |
| | 788.00 | 36.22 | --- | 48.00 | -11.78 |
| | 862.00 | 36.25 | --- | 48.00 | -11.75 |
| | 8390.00 | 36.61 | --- | 48.00 | -11.39 |

NOTE:

1. Margin = Peak Amplitude – Limit
2. A "+" sign in the margin column means the emission is OVER the Class B Limit and "-" sign of means UNDER the Class B limit

Table 3 Power Line Conducted Emissions (Channel 4)

| <i>Power Connected Emissions</i> | | | | <i>FCC Class B</i> | |
|----------------------------------|----------------------------|------------------------------------|----------------------------------|---------------------------|------------------------|
| <i>Conductor</i> | <i>Frequency (kHz)</i> | <i>Peak Amplitude (dB μ V)</i> | <i>QP Amplitude (dB μ V)</i> | <i>Limit (dB μ V)</i> | <i>Margin (dB)</i> |
| Line 1 | 464.00 | 33.82 | --- | 48.00 | -14.18 |
| | 477.00 | 33.13 | --- | 48.00 | -14.87 |
| | 493.00 | 34.29 | --- | 48.00 | -13.71 |
| | 508.00 | 32.94 | --- | 48.00 | -15.06 |
| | 521.00 | 32.70 | --- | 48.00 | -15.30 |
| | 538.00 | 32.42 | --- | 48.00 | -15.58 |
| | 549.00 | 32.46 | --- | 48.00 | -15.54 |
| | 586.00 | 33.15 | --- | 48.00 | -14.85 |
| | 658.00 | 32.62 | --- | 48.00 | -15.38 |
| | 10810.00 | 35.91 | --- | 48.00 | -12.09 |
| Line 2 | 464.00 | 37.17 | --- | 48.00 | -10.83 |
| | 502.00 | 37.25 | --- | 48.00 | -10.75 |
| | 549.00 | 37.03 | --- | 48.00 | -10.97 |
| | 586.00 | 36.61 | --- | 48.00 | -11.39 |
| | 754.00 | 36.55 | --- | 48.00 | -11.45 |
| | 813.00 | 37.50 | --- | 48.00 | -10.50 |
| | 857.00 | 36.83 | --- | 48.00 | -11.17 |
| | 880.00 | 38.41 | --- | 48.00 | -9.59 |
| | 954.00 | 37.66 | --- | 48.00 | -10.34 |
| | 1015.00 | 36.55 | --- | 48.00 | -11.45 |

NOTE:

1. Margin = Peak Amplitude – Limit
2. A "+" sign in the margin column means the emission is OVER the Class B Limit and "-" sign of means UNDER the Class B limit

. **Radiated Emissions Measurements**

3.1 Test Condition & Setup

The EUT was placed in an anechoic chamber and scanned at 3-meter distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration, which produced the highest emission was noted so it could be reproduced later during the final tests. This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

Final radiation measurement (frequency above 1GHz) was made in a three-meter anechoic chamber. The frequency below 1GHz was made in a three-meter OATS. The EUT system was placed on a nonconductive turntable, which is 0.8 meters height, top surface 1.0 x 1.5 meter.

The spectrum was examined from 30MHz to 1000MHz using an Hewlett Packard 8546A & 85460A EMI Receiver, CHASE whole range Bi-Log antenna (Model No.: CBL6141A) is used to measure frequency from 30 MHz to 1GHz. The final test is used the spectrum HP 8546A & 85460A and spectrum was examined from 1GHz to 24GHz using an Hewlett Packard 8564E Spectrum Analyzer, EMCO Horn Antenna for 1G to 24 G Hz.

At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. There are two spectrum analyzers use on this testing, HP 8546A & 85460A for frequency 30MHz to 1000MHz, and 8564E for frequency 1GHz to 24GHz. No post-detector video filters were used in the test. The spectrum analyzer's was set in the quasi-peak mode. (spectrum was examined from 30MHz to 1000MHz), the spectrum analyzer's bandwidth was set to 1MHz (spectrum was examined from 1GHz to 24GHz) and the analyzer was operated in the peak and average mode.

The actual field intensity in decibels referenced to 1 microvolt per meter ($\text{dB } \mu \text{V/m}$) is determined by algebraically adding the measured reading in $\text{dB } \mu \text{V}$, the antenna factor (dB), and cable loss (dB) at the appropriate frequency.

For frequency between 30MHz to 1000MHz

FIa (dB μ V/m) = FIr (dB μ V) – Correction Factors

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factor = Antenna Factor + (Cable Loss – Amplitude Gain)

For frequency between 1GHz to 24GHz

FIa (dB μ V/m) = FIr (dB μ V) + Correction Factor

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + Cable Loss – Amplifier Gain

3.2 List of Test Instruments

| <u>Instrument Name</u> | <u>Model No.</u> | <u>Brand</u> | <u>Serial No.</u> | <u>Calibration Date</u> | |
|--|------------------|--------------|-------------------|-------------------------|------------------|
| | | | | <u>Last time</u> | <u>Next time</u> |
| EMI Receiver | 8546A | H P | 3520A00242 | 06/29/01 | 06/29/02 |
| RF Filter Section | 85460A | H P | 3448A00217 | 06/29/01 | 06/29/02 |
| Bi-log Antenna | CBL6141A | SCHAFFNER | 4188 | 11/29/01 | 11/28/02 |
| Switch/Control Unit | 3488A | HP | N/A | 11/20/01 | 11/20/02 |
| (> 30MHz) | | | | | |
| Auto Switch Box | ASB-01 | TRC | 9904-01 | 11/20/01 | 11/20/02 |
| (> 30MHz) | | | | | |
| Spectrum Analyzer | 8564E | HP | US36433002 | 08/01/01 | 08/01/02 |
| Microwave Preamplifier | 83051A | HP | 3232A00347 | 08/01/01 | 08/01/02 |
| Horn Antenna | 3115 | EMCO | 9704 – 5178 | 08/01/01 | 08/01/02 |
| Anechoic Chamber (cable calibrated together) | | | | 05/20/02 | 05/20/03 |

3.3 Test Configuration of Radiated Emission



Picture 1 Front View of the Test Configuration



Picture 2 Rear View of the Test Configuration

The test configuration for frequency between 1GHz to 24GHz is same as above.

3.4 Test Result of Radiated Emissions

The peak values of fundamental emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following.

Product Name : 2.4GHz AV Sender built-in color CMOS video camera

Model No. : 6.8' LCD Monitor; Grand GT-6801; Grand RF Guard CMOS; Grand RF Guard CCD

Open Field Fundamental Emissions

| Channel | Frequency (MHz) | A. P. (H/V) | A.H. (m) | Table (degree) | Amplitude (Peak) (dB μ V/m) | Limit (dB μ V) | Margin (dB μ V) |
|---------|--------------------|----------------|-------------|-------------------|------------------------------------|-------------------|--------------------|
| 1 | 2412.63 | H | 1.00 | 74 | 85.28 | 94.00 | -8.72 |
| | 2412.68 | V | 1.00 | 137 | 85.05 | 94.00 | -8.95 |
| 3 | 2451.42 | H | 1.00 | 32 | 85.86 | 94.00 | -8.14 |
| | 2451.73 | V | 1.00 | 154 | 85.40 | 94.00 | -8.60 |
| 4 | 2470.43 | H | 1.00 | 190 | 85.92 | 94.00 | -8.08 |
| | 2470.24 | V | 1.00 | 128 | 86.07 | 94.00 | -7.93 |

Note:

1. A. P. means antenna polarization, horizontal and vertical.
2. A. H. means antenna height.
3. Table means turntable turning position.
4. Amplitude means the fundamental emission measured.
5. Margin = Amplitude-limit

3.5 Test Result of Spurious Radiated Emissions

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following.

Test Conditions:

Testing site : Temperature : 25° C Humidity : 85% RH

Table 4 Open Field Radiated Emissions for 30MHz ~ 1GHz [Channel 1, Horizontal]

| Radiated Emission | | | | Correction Factors (dB/m) | Corrected Amplitude (dB μ V/m) | FCC Class B (3 m) | |
|--------------------|-------------------------|----------------|----------------|------------------------------|-----------------------------------|------------------------|----------------|
| Frequency (MHz) | Amplitude (dB μ V/m) | Ant. H. (m) | Table (°) | | | Limit (dB μ V/m) | Margin (dB) |
| 200.4526 | 25.90 | 3.99 | 274 | -5.03 | 20.87 | 30.00 | -9.13 |
| 207.6150 | 29.45 | 2.51 | 327 | -4.79 | 24.66 | 30.00 | -5.34 |
| 221.9285 | 21.36 | 2.51 | 320 | -3.30 | 18.06 | 30.00 | -11.94 |
| 229.0890 | 21.68 | 3.99 | 0 | -3.63 | 18.05 | 30.00 | -11.95 |
| --- | | | | | | | |

Table 5 Open Field Radiated Emissions for 30MHz ~ 1GHz [Channel 1, Vertical]

| Radiated Emission | | | | Correction Factors (dB/m) | Corrected Amplitude (dB μ V/m) | FCC Class B (3 m) | |
|--------------------|-------------------------|----------------|----------------|------------------------------|-----------------------------------|------------------------|----------------|
| Frequency (MHz) | Amplitude (dB μ V/m) | Ant. H. (m) | Table (°) | | | Limit (dB μ V/m) | Margin (dB) |
| 157.4995 | 24.49 | 3.99 | 118 | -4.52 | 19.97 | 30.00 | -10.03 |
| 171.8165 | 26.93 | 1.01 | 265 | -5.49 | 21.44 | 30.00 | -8.56 |
| 186.1343 | 28.49 | 1.01 | 230 | -5.93 | 22.56 | 30.00 | -7.44 |
| 200.4515 | 28.40 | 1.01 | 219 | -5.03 | 23.37 | 30.00 | -6.63 |
| --- | | | | | | | |

Note:

1. Margin = Amplitude – limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude – Correction Factors
3. Correction factor = Antenna factor + (Cable Loss – Amplitude gain)
(For example: 30MHz correction factor = 15.5 + (-15.26) = 0.24 dB/m)
4. **The emissions of channel 3 and channel 4 are similar so we only recorded the data of channel 1.**

Table 6 Open Field Radiated Emissions for 1GHz ~ 24GHz [Channel 1, Horizontal]

| Radiated Emission | | | | Correction Factors (dB) | Corrected Amplitude (dB μ V/m) | | FCC Class B (3 m) | | |
|--------------------|-----------------------------|----------------|----------------|------------------------------|---------------------------------------|---------|------------------------|-------|---------|
| Frequency (GHz) | Amplitude (dB μ V/m) | Ant. H. (m) | Table (°) | | Limit | | Margin (dB) | | |
| | | | | | Peak | Average | | Peak | Average |
| *4.829 | --- | 1.00 | 114 | --- | 52.94 | --- | 74.0 | 54.00 | -1.06 |
| 7.245 | --- | 1.00 | 240 | --- | 48.27 | --- | 74.0 | 54.00 | -5.73 |
| --- | | | | | | | | | |

Note:

1. Margin = Corrected - Limit.
2. Peak Amplitude + Correction Factor = Corrected
3. The “ * “ means restricted bands.
4. Above emissions of 10GHz, passed by more than 20dB margin.

Table 7 Open Field Radiated Emissions for 1GHz ~ 24GHz [Channel 1, Vertical]

| Radiated Emission | | | | Correction Factors (dB) | Corrected Amplitude (dB μ V/m) | | FCC Class B (3 m) | | |
|--------------------|-----------------------------|----------------|----------------|------------------------------|---------------------------------------|---------|------------------------|-------|---------|
| Frequency (GHz) | Amplitude (dB μ V/m) | Ant. H. (m) | Table (°) | | Limit | | Margin (dB) | | |
| | | | | | Peak | Average | | Peak | Average |
| *4.832 | --- | 1.00 | 42 | --- | 52.61 | --- | 74.0 | 54.00 | -1.39 |
| *7.263 | --- | 1.00 | 34 | --- | 46.94 | --- | 74.0 | 54.00 | -7.06 |
| --- | | | | | | | | | |

Note:

1. Margin = Corrected - Limit.
2. Peak Amplitude + Correction Factor = Corrected.
3. The “ * “ means restricted bands.
4. Above emissions of 10GHz, passed by more than 20dB margin.

Table 8 Open Field Radiated Emissions for 1GHz ~ 24GHz [Channel 3 Horizontal]

| Radiated Emission | | | | Correction Factors (dB) | Corrected Amplitude (dB μ V/m) | | FCC Class B (3 m) | | Margin (dB) |
|---------------------------|--------------------------------|-----------------------|-----------------------|-------------------------------------|--|----------------|-------------------------------|----------------|-----------------------|
| Frequency (GHz) | Amplitude (dB μ V/m) | Ant. H. (m) | Table (°) | | Limit | | | | |
| | | | | | Peak | Average | Peak | Average | |
| *4.901.67 | --- | 1.00 | 90 | --- | 52.94 | --- | 74.0 | 54.00 | -1.06 |
| *7.348.54 | --- | 1.00 | 162 | --- | 49.61 | --- | 74.0 | 54.00 | -4.39 |
| --- | | | | | | | | | |

Note:

1. Margin = Corrected - Limit.
2. Peak Amplitude + Correction Factor = Corrected.
3. The “ * “ means restricted bands.
4. Above emissions of 10GHz, passed by more than 20dB margin.

Table 9 Open Field Radiated Emissions for 1GHz ~ 24GHz [Channel 3, Vertical]

| Radiated Emission | | | | Correction Factors (dB) | Corrected Amplitude (dB μ V/m) | | FCC Class B (3 m) | | Margin (dB) |
|---------------------------|--------------------------------|-----------------------|-----------------------|-------------------------------------|--|----------------|-------------------------------|----------------|-----------------------|
| Frequency (GHz) | Amplitude (dB μ V/m) | Ant. H. (m) | Table (°) | | Limit | | | | |
| | | | | | Peak | Average | Peak | Average | |
| *4.901 | --- | 1.00 | 215 | --- | 50.77 | --- | 74.0 | 54.00 | -3.23 |
| *7.348 | --- | 1.00 | 18 | --- | 48.94 | --- | 74.0 | 54.00 | -5.06 |
| --- | | | | | | | | | |

Note:

1. Margin = Corrected - Limit.
2. Peak Amplitude + Correction Factor = Corrected.
3. The “ * “ means restricted bands.
4. Above emissions of 10GHz, passed by more than 20dB margin.

Table 10 Open Field Radiated Emissions for 1GHz ~ 24GHz [Channel 4, Horizontal]

| Radiated Emission | | | | Correction Factors (dB) | Corrected Amplitude (dB μ V/m) | | FCC Class B (3 m) | | |
|--------------------|-------------------------|----------------|----------------|------------------------------|-----------------------------------|---------|------------------------|-------|---------|
| Frequency (GHz) | Amplitude (dB μ V/m) | Ant. H. (m) | Table (°) | | Limit | | Margin (dB) | | |
| | | | | | Peak | Average | | Peak | Average |
| *4.943 | --- | 1.00 | 170 | --- | 53.11 | --- | 74.0 | 54.00 | -0.89 |
| *7.408 | --- | 1.00 | 294 | --- | 50.11 | --- | 74.0 | 54.00 | -3.89 |
| 12.955 | --- | 1.00 | 170 | --- | 49.11 | --- | 74.0 | 54.00 | -4.89 |
| --- | | | | | | | | | |

Note:

1. Margin = Corrected - Limit.
2. Peak Amplitude + Correction Factor = Corrected.
3. The “ * “ means restricted bands.
4. Above emissions of 10GHz, passed by more than 20dB margin.

Table 11 Open Field Radiated Emissions for 1GHz ~ 24GHz [Channel 4, Vertical]

| Radiated Emission | | | | Correction Factors (dB) | Corrected Amplitude (dB μ V/m) | | FCC Class B (3 m) | | |
|--------------------|-------------------------|----------------|----------------|------------------------------|-----------------------------------|---------|------------------------|-------|---------|
| Frequency (GHz) | Amplitude (dB μ V/m) | Ant. H. (m) | Table (°) | | Limit | | Margin (dB) | | |
| | | | | | Peak | Average | | Peak | Average |
| *4.937 | --- | 1.00 | 230 | --- | 52.44 | --- | 74.0 | 54.00 | -1.56 |
| *7.408 | --- | 1.00 | 42 | --- | 49.11 | --- | 74.0 | 54.00 | -4.89 |
| *9.445 | --- | 1.00 | 7 | --- | 49.77 | --- | 74.0 | 54.00 | -4.23 |
| --- | | | | | | | | | |

Note:

1. Margin = Corrected - Limit.
2. Peak Amplitude + Correction Factor = Corrected.
3. The “ * “ means restricted bands.
4. Above emissions of 10GHz, passed by more than 20dB margin.

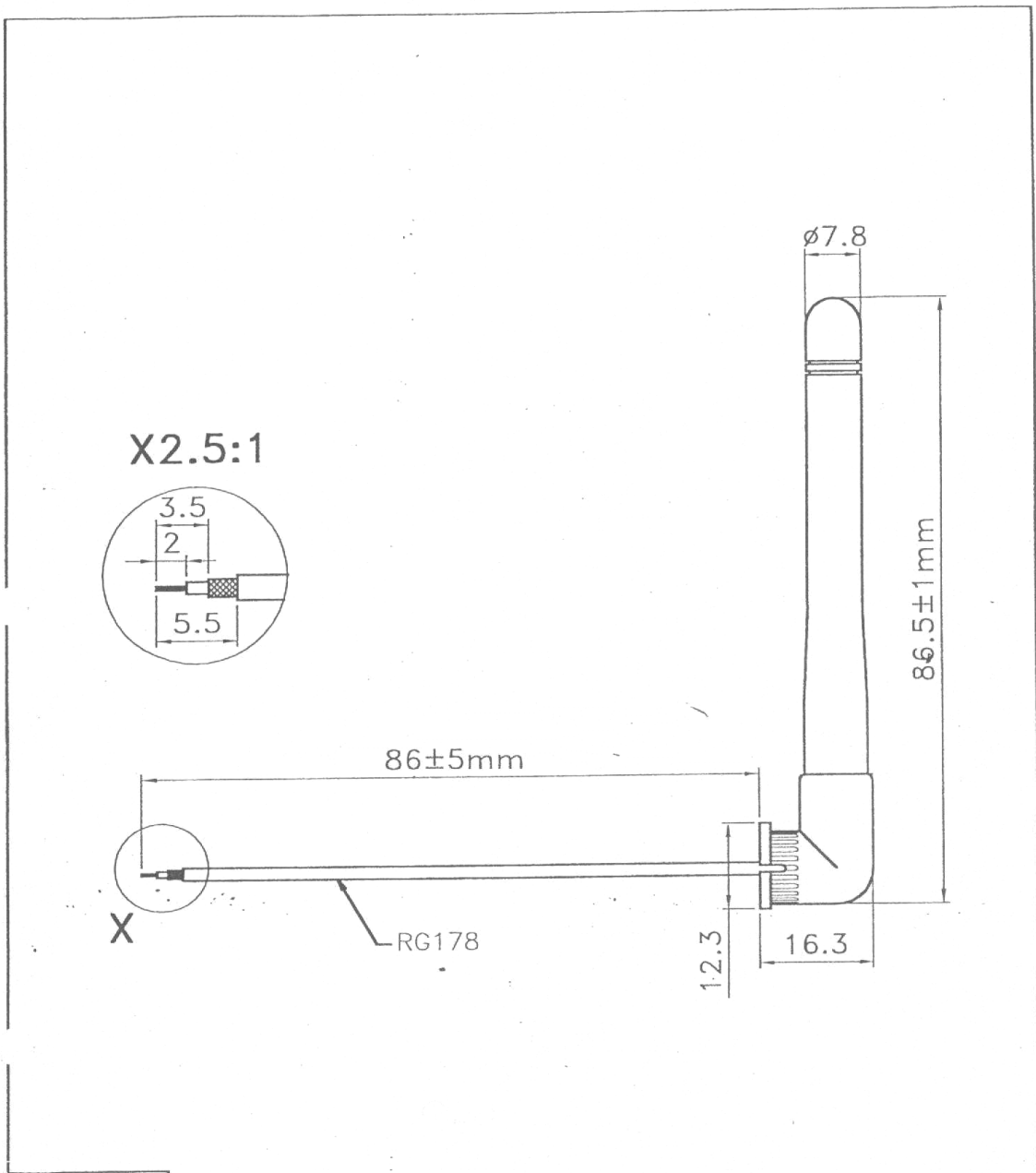
. Verify Frequencies and Channels

This is for sure that all frequencies are in 2410MHz to 2470MHz that verifies the frequency as follow.

| Channel | Frequency (MHz) |
|---------|-----------------|
| 1 | 2410 |
| 2 | 2430 |
| 3 | 2450 |
| 4 | 2470 |

Appendix A

The antenna of the device is solder inside the device, the user can not remove it freely without any tools from outside the device. This is comply with the FCC rules part 15.203



| TOLERANCES: | |
|-------------|--------|
| X | ± 1 |
| X.X | ± 0.5 |
| X.XX | ± 0.25 |
| ANG. | ± 0.5° |

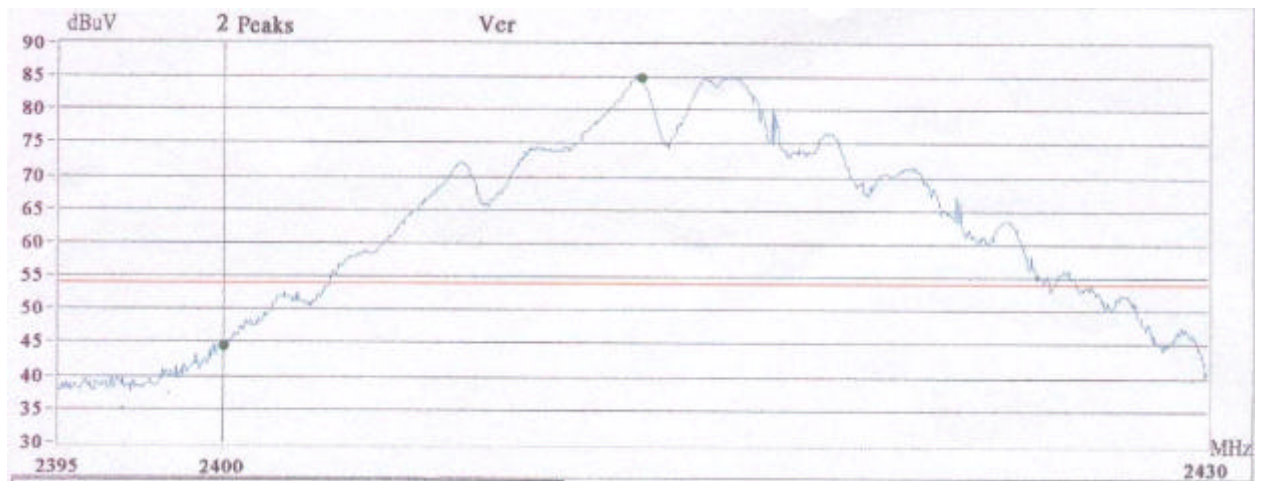
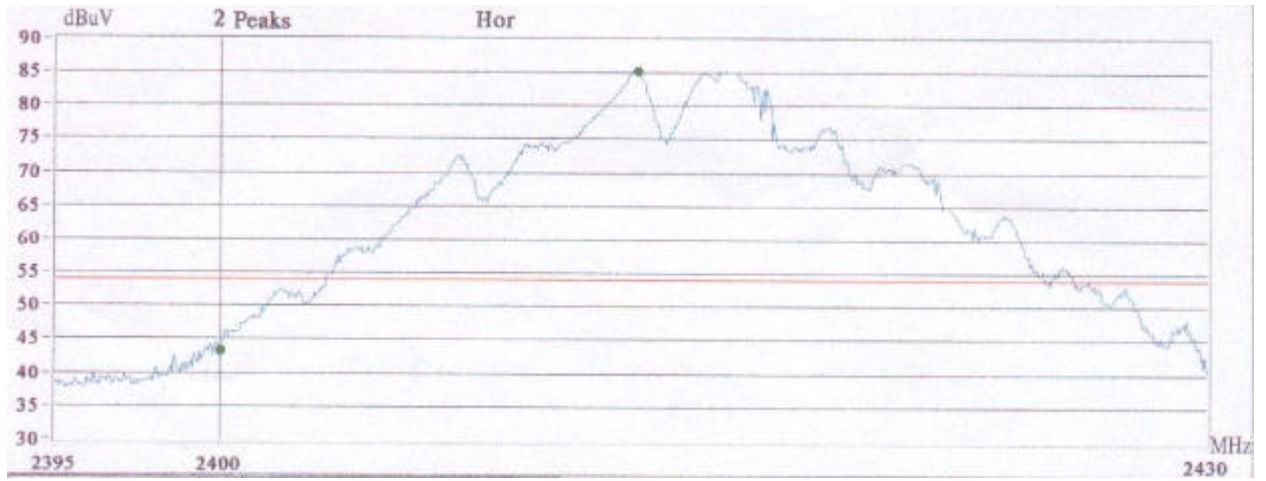
| | | | | |
|-----------------|--|---------------------------|-------------------------|-----|
| REV DESCRIPTION | MATERIAL | MODEL IM-243FL-118(GR) | | |
| | FINISH | NAME Right Angle Antenna | | |
| | UNIT: mm SCALE: 1=0.8 DATE: 10/13/2001 | PART No IM-243FL-118(GR) | | REV |
| | | DESIGN <i>J.F. Lin</i> | APPROVE 工程部部长 鄒美蘭 | |

士誼科技事業有限公司
SUNNY ELECTRONICS CORP.

Appendix B

§ 15.249 (d) 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 §15.209, whichever is the lesser attenuation. See as next page.

Channel 1



Channel 4

