

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C REQUIREMENT**

*OF*

**Security wireless CCD camera**

**MODEL No.: CM-WX3134C**

**BRAND NAME: CAMERAY**

**FCC ID: UWZCMWX**

**REPORT NO: E0612128F**

**ISSUE DATE: January 18, 2007**

*Prepared for*

**Shenzhen Cameray Electronic Co., Ltd.  
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*Prepared by*

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## VERIFICATION OF COMPLIANCE

Applicant:	Shenzhen Cameray Electronic Co., Ltd. 2/FI, Building No.541, Bagua 3rd, Bagualing Industrial Zone, Futian District, Shenzhen, China
Product Description:	Security wireless CCD camera
Brand Name:	CAMERAY
Model Number:	CM-WX3134C
Serial Number:	CM-WX4400C, CM-WXL373CW
File Number:	E0612128F
Date of Test:	January 04 to January 18, 2007

### We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249.

The test results of this report relate only to the tested sample identified in this report.

*Approved By*



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**David Lee / Q.A. Manager**  
**SHENZHEN EMTEK CO., LTD.**

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## **1. GENERAL INFORMATION**

### **1.1 Product Description**

The Shenzhen Cameray Electronic Co., Ltd. Model: CM-WX3134C (referred to as the EUT in this report) The EUT is an short range, lower power, Security wireless CCD camera designed as an " Input Device. It is designed by way of utilizing the ASK/FSK modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: CH1=2414MHz, CH2=2432MHz, CH3=2450MHz, CH4=2468MHz
- B). Modulation: ASK/FSK
- C). Number of Channel: 4
- D). Operation modes: simplex
- E). Duty cycle: 50%
- F). Power Supply: 12VDC/1A With AC/DC Adaptor

### **1.2 Related Submittal(s) / Grant (s)**

This submittal(s) (test report) is intended for FCC ID: UWZCMWX filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules. The composite system (receiver) is compliance with Subpart B is authorized under a DoC procedure.

### **1.3 Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

### **1.4 Special Accessories**

Not available for this EUT intended for grant.

### **1.5 Equipment Modifications**

Not available for this EUT intended for grant.

## 1.6 Test Facility

### Site Description

#### EMC Lab.

: Accredited by CNAL, 2005.11.02  
The certificate is valid until 2010.11  
The Laboratory has been assessed and proved to be in compliance  
with CNAL/AC01:2003(identical to ISO/IEC17025:1999)  
The Certificate Registration Number is L2291

Accredited by TUV Rheinland Guangzhou, 2005.1

The certificate is valid until 2008.2

The Laboratory has been assessed according to the requirements  
ISO/IEC 17025:1999

Accredited by FCC, July 07, 2005

The Certificate Registration Number is 709623.

Accredited by Industry Canada, August 30, 2005

The Certificate Registration Number is 46405-4480

#### Name of Firm

: SHENZHEN EMTEK CO., LTD

#### Site Location

: Bldg 69, Majialong Industry Zone,  
Nanshan District, Shenzhen, Guangdong, China

## 2. System Test Configuration

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the **frequency range between 0.15 MHz and 30MHz** using **CISPR Quasi-Peak and average detector mode**.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

### 2.4 Limitation

#### (1) Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

**Note:**

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

## (2) Radiated Emissions

### FCC Rule: 15.249(d)(e)

FCC Part 15, Subpart C Section 15.209 limit of radiated emission for frequency below 1000GHz. The emissions from an intentional radiator shall not exceed the field strength level specified in the following table:

Frequency (MHz)	Field strength $\mu\text{V/m}$	Distance(m)	Field strength at 3m $\text{dB}\mu\text{V/m}$
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Rem 1. Emission level in  $\text{dB}\mu\text{V/m}=20 \log (\text{uV/m})$

ark: 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

### FCC Part 15, Section 15.35(b) limit of radiated emission for frequency above 1000MHz

Frequency(MHz)	Class A( $\text{dB}\mu\text{V/m}$ )(at 3m)		Class B( $\text{dB}\mu\text{V/m}$ )(at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

### Peak Output Power(Transmitter)

FCC Part 15, Subpart C Section 15.249. The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency(MHz)	Filed Strength of Fundamental(at 3m)		Filed Strength of Harmonics(at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
902-928	114	94	74.0	54.0
2400-2483.5	114	94	74.0	54.0
5725-5875	114	94	74.0	54.0
24000-24250	128	108	88.0	68.0

**(3) Band edge**

Emission 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 section 15.209, whichever is the lesser attenuation.

<b>Frequency</b>	<b>Limit(dBuV/m)</b>	
<b>Range(MHz)</b>	<b>Peak</b>	<b>AV</b>
902-928		
2400-2483.5	74	54
5725-5850		
24000-24250		



## 2.5 Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**

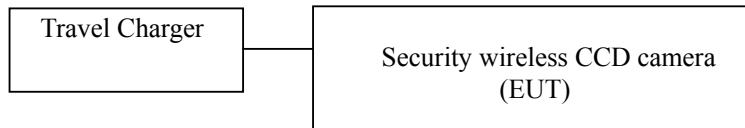


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
1.	Security wireless CCD camera	CAMERAY	CM-WX3134C	UWZCMWX	N/A	<b>EUT</b>
2.	Travel Charger	N/A	SME-2C	N/A	N/A	

**Note:**

- (1) Unless otherwise denoted as EUT in 『Remark』 column , device(s) used in tested system is a support equipment.

### 3. Summary Of Test Results

FCC Rules	Description Of Test	Result
§ 15.249(d)	Band edge test	Compliant
§ 15.207	AC Power Conducted Emission	Compliant
§ 15.249(e), (b), § 15.209	Radiated Emission	Compliant
§ 15.203	Antenna Requirement	Compliant

### 4. Description of test modes

The EUT (Bluetooth Headset) has been tested under normal operating condition.

This EUT is a FHSS system, we use blue test to control the EUT with RS232, Let EUT hopping on and transmit at every channel with highest power, Only output power use conducted method, others are using radiated method. After sirfdemo330R1 send the command to EUT, it can be removed, and the EUT keep hopping. 4 Channels are provided by EUT. The 3 channels of lower, medium and higher were chosen for best.

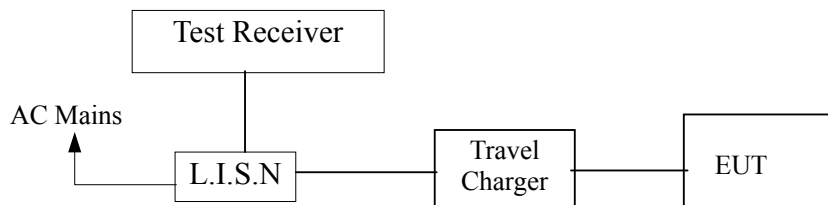
Channel	Frequency(MHz)
1	2414
3	2450
4	2468

## 5. Conducted Emissions Test

### 5.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

### 5.2 Test SET-UP (Block Diagram of Configuration)



### 5.3 Measurement Equipment Used:

Conducted Emission Test Site # 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2006	05/29/2007
L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	05/29/2006	05/29/2007
L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	05/29/2006	05/29/2007
50ΩCoaxial Switch	Anritsu	MP59B	M20531	005/29/2006	05/29/2007

#### 5.4 Measurement Result:

Date of Test:	<u>January 08, 2007</u>	Temperature:	<u>22°C</u>
Frequency Detector:	<u>0.15~30MHz</u>	Humidity:	<u>50%</u>
Test Result:	<u>PASS</u>	Test Mode:	<u>Charging</u>

Test Line	Frequency MHz	Emission Level QP dB(μV)	Emission Level AV dB(μV)	Limits QP dB(μV)	Limits AV dB(μV)	Margin QP dB(μV)	Margin AV dB(μV)
Neutral	0.450	39.80	23.95	56.87	46.87	-17.07	-22.92
	0.730	31.39	22.74	56.00	46.00	-24.61	-23.26
	2.370	34.10	25.20	56.00	46.00	-21.90	-20.80
Line	0.470	42.76	22.38	56.51	46.51	-13.75	-24.13
	1.070	29.99	22.88	56.00	46.00	-26.01	-23.12
	1.560	35.10	24.60	56.00	46.00	-20.90	-21.40

### 5.5 Conducted Measurement Photos:



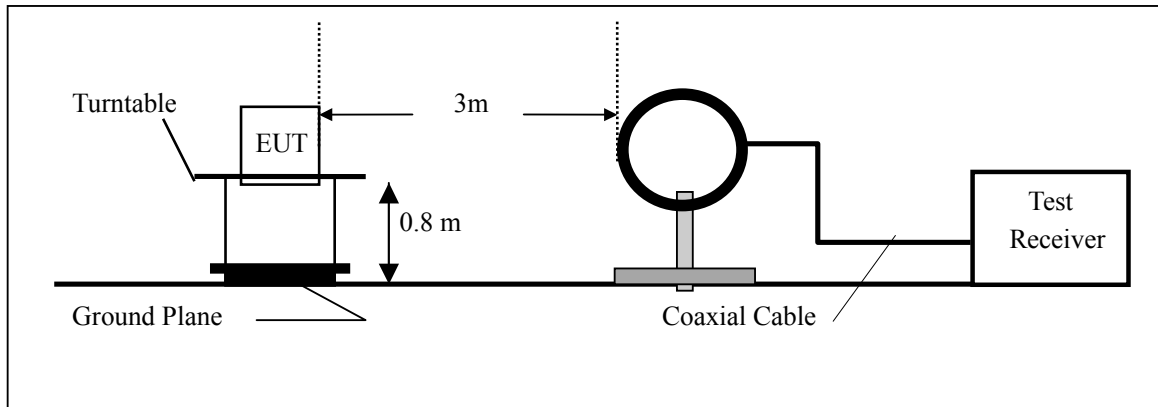
## **6. Radiated Emission Test**

### **6.1 Measurement Procedure**

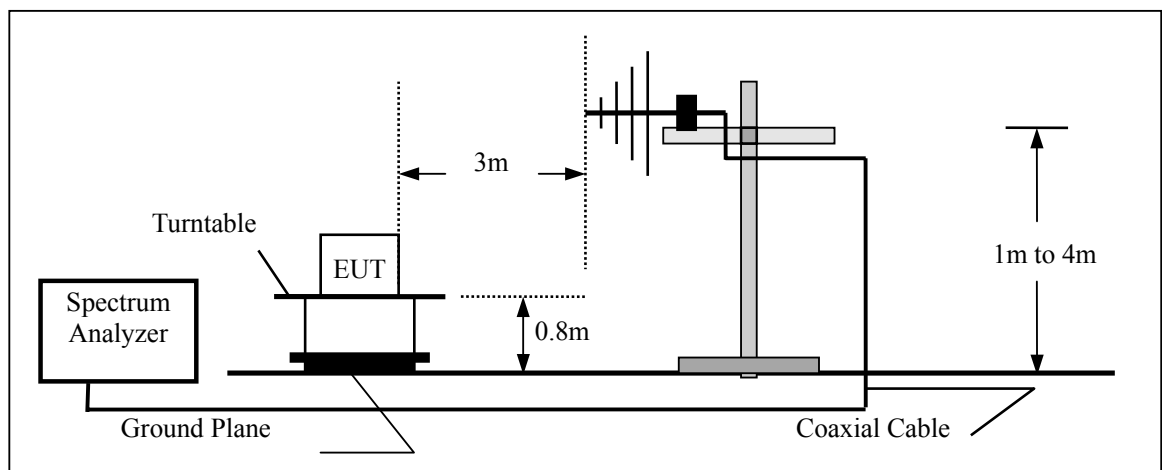
- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

## 6.2 Test SET-UP (Block Diagram of Configuration)

### (A) Radiated Emission Test Set-Up, Frequency Below 30MHz



### (B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



### 6.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	FSP7	839511/010	05/29/2006	05/29/2007
EMI Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/29/2006	05/29/2007
Pre-Amplifier	HP	8447D	2944A07999	05/29/2006	05/29/2007
Bilog Antenna	Schwarzbeck	VULB9163	142	05/29/2006	05/29/2007
Loop Antenna	ARA	PLA-1030/B	1029	05/29/2006	05/29/2007

### 6.4 Out of Band Radiated Measurement Result

Operation Mode: RX Mode(CH1 2414)      Test Date : January 10, 2007  
Frequency Range: 30~1000MHz      Temperature : 28 °C  
Test Result: PASS      Humidity : 65 %  
Measured Distance: 3m      Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
37.640	V	30.12	40.00	-9.88	PK
48.320	V	32.12	40.00	-7.88	PK
260.860	V	31.22	46.00	-14.78	PK
670.500	V	33.28	46.00	-12.72	PK
37.612	H	28.12	40.00	-11.88	PK
48.120	H	30.21	40.00	-9.79	PK
261.120	H	36.21	46.00	-9.79	PK
671.510	H	34.22	46.00	-11.78	PK

**Note:** (1) All Readings are Peak 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.



Operation Mode: RX Mode(CH3 2450)      Test Date : January 10, 2007  
Frequency Range: 30~1000MHz      Temperature : 28 °C  
Test Result: PASS      Humidity : 65 %  
Measured Distance: 3m      Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
36.120	V	31.56	40.00	-8.44	PK
49.520	V	33.20	40.00	-6.80	PK
261.200	V	33.58	46.00	-12.42	PK
669.800	V	31.87	46.00	-14.13	PK
37.150	H	29.15	40.00	-10.85	PK
48.960	H	31.38	40.00	-8.62	PK
260.260	H	35.21	46.00	-10.79	PK
670.875	H	33.27	46.00	-12.73	PK

**Note:** (1) All Readings are Peak 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.

Operation Mode: RX Mode(CH4 2468) Test Date : January 10, 2007  
Frequency Range: 30~1000MHz Temperature : 28 °C  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV)	Limit 3m (dBuV/m)	Margin (dB)	Note
36.121	V	32.48	40.00	-7.52	PK
49.518	V	32.30	40.00	-7.70	PK
262.120	V	32.28	46.00	-13.72	PK
668.885	V	31.89	46.00	-14.11	PK
36.151	H	26.75	40.00	-13.25	PK
49.908	H	31.63	40.00	-8.37	PK
262.200	H	38.87	46.00	-7.13	PK
668.870	H	33.93	46.00	-12.07	PK

**Note:** (1) All Readings are Peak 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.

Operation Mode: TX(CH1: 2414MHz) Test Date : January 10, 2007  
Frequency Range: 1-25GHz Temperature : 28 °C  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: Andy

Freq. (GHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2.414(F)	V	95.50	89.60	114	94	-18.50	-4.40
4.828	V	48.50	45.60	74	54	-25.50	-8.40
7.242	V	47.12	44.80	74	54	-26.88	-9.20
9.656	V	44.50	43.50	74	54	-29.50	-10.50
12.070	V	42.10	40.20	74	54	-31.90	-13.80
14.484	V	38.90	37.10	74	54	-35.10	-16.90
2.414(F)	H	93.50	86.80	114	94	-20.50	-7.20
4.828	H	49.50	46.20	74	54	-24.50	-7.80
7.242	H	46.42	43.60	74	54	-27.58	-10.40
9.656	H	45.20	42.50	74	54	-28.80	-11.50
12.070	H	43.12	40.00	74	54	-30.88	-14.00
14.484	H	40.30	37.50	74	54	-33.70	-16.50

- Note:**
- (1) All Readings are Peak Value and AV.
  - (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.

Operation Mode: TX(CH3: 2450MHz) Test Date : January 10, 2007  
Frequency Range: 1-25GHz Temperature : 28 °C  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: Andy

Freq. (GHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2.450(F)	V	97.66	92.16	114.00	94.00	-16.34	-1.84
4.900	V	54.20	50.100	74.00	54.00	-19.80	-3.90
7.350	V	49.82	46.15	74.00	54.00	-24.18	-7.85
9.800	V	47.20	45.50	74.00	54.00	-26.80	-8.50
12.250	V	45.20	43.10	74.00	54.00	-28.80	-10.90
14.700	V	43.20	41.10	74.00	54.00	-30.80	-12.90
2.450(F)	H	95.36	90.06	114.00	94.00	-18.64	-3.94
4.900	H	53.00	51.20	74.00	54.00	-21.00	-2.80
7.350	H	50.12	47.20	74.00	54.00	-23.88	-6.80
9.800	H	48.20	44.12	74.00	54.00	-25.80	-9.88
12.250	H	46.10	43.20	74.00	54.00	-27.90	-10.80
14.700	H	43.00	41.02	74.00	54.00	-31.00	-12.98

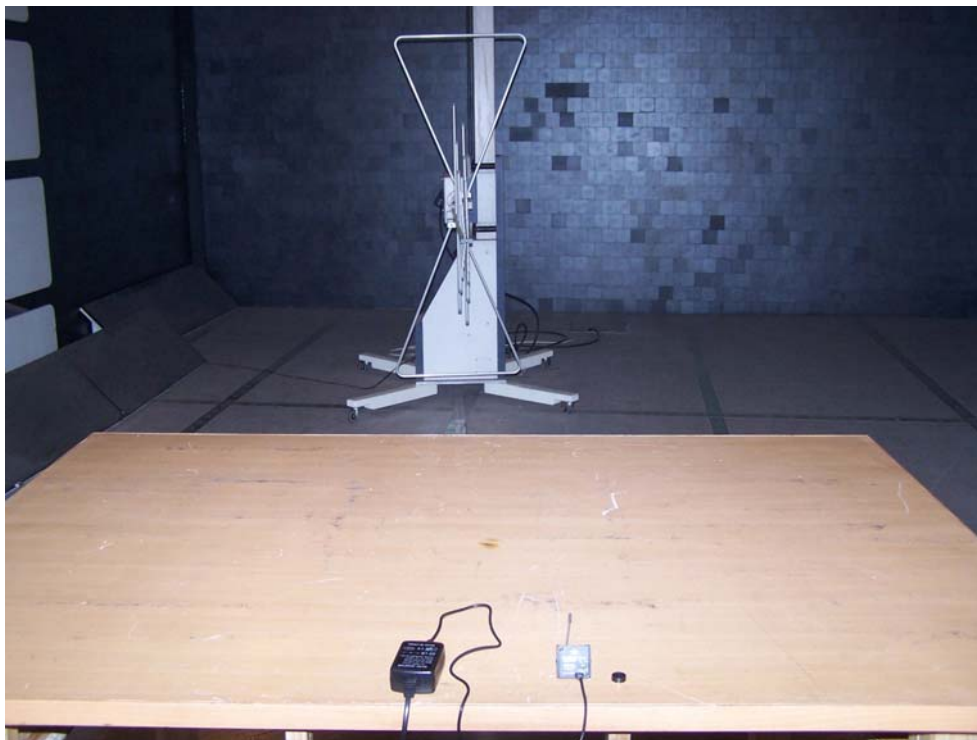
- Note:**
- (1) All Readings are Peak Value and AV.
  - (2) Emission Level= Reading Level+Probe Factor +Cable Loss
  - (3) The average measurement was not performed when the peak measured data under the limit of average detection.

Operation Mode: TX(CH3: 2468MHz) Test Date : January 10, 2007  
Frequency Range: 1-25GHz Temperature : 28 °C  
Test Result: PASS Humidity : 65 %  
Measured Distance: 3m Test By: Andy

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
2.468(F)	V	92.60	87.800	114.00	94.00	-21.40	-6.20
4.936	V	50.12	46.20	74.00	54.00	-23.88	-7.80
7.404	V	48.25	45.30	74.00	54.00	-25.75	-8.70
9.872	V	48.52	44.50	74.00	54.00	-25.48	-9.50
12.340	V	47.20	43.60	74.00	54.00	-26.80	-10.40
14.808	V	46.02	43.20	74.00	54.00	-27.98	-10.80
2.468(F)	H	83.34	79.64	114.00	94.00	-30.66	-14.36
4.936	H	48.60	45.60	74.00	54.00	-25.40	-8.40
7.404	H	47.90	45.30	74.00	54.00	-26.10	-8.70
9.872	H	46.30	44.30	74.00	54.00	-27.70	-9.70
12.340	H	45.80	43.50	74.00	54.00	-28.20	-10.50
14.808	H	45.60	42.60	74.00	54.00	-28.40	-11.40

**Note:** (1) All Readings are Peak Value and AV.  
(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.

### 6.5 Radiated Measurement Photos:

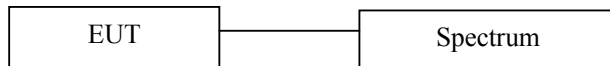


## 7. Band EDGE test

### 7.1 Measurement Procedure

1. The EUT was Operating in hopping mode or could be controlled its channel. Printed out test result from the spectrum by hard copy function.
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Repeat above procedures until all frequency measured were complete.

### 7.2 Test SET-UP (Block Diagram of Configuration)



### 7.3 Measurement Equipment Used:

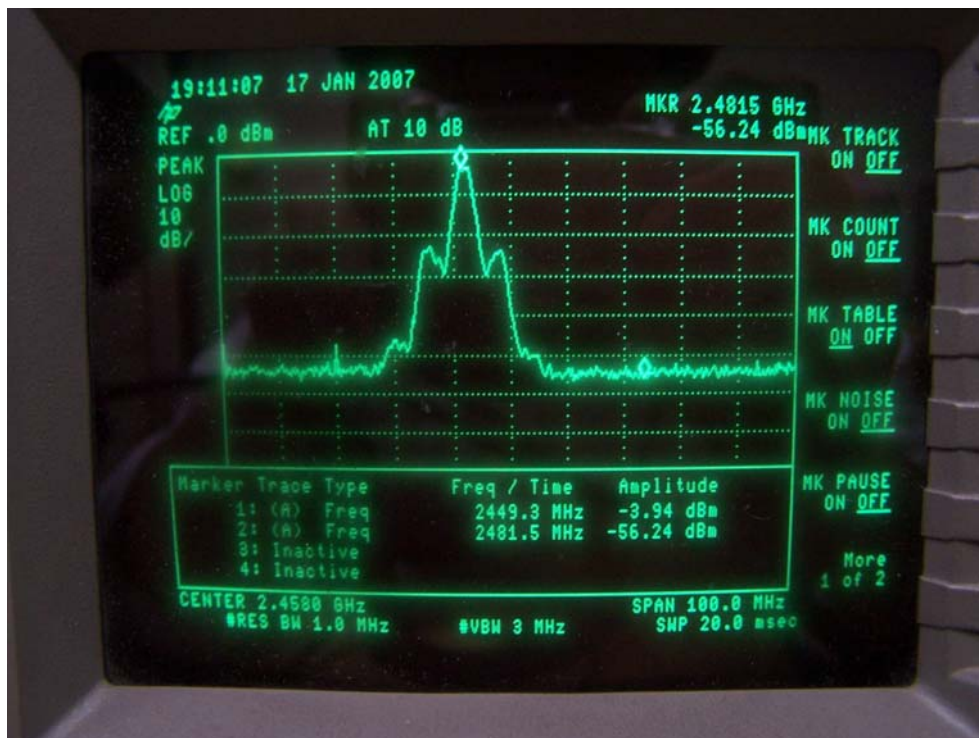
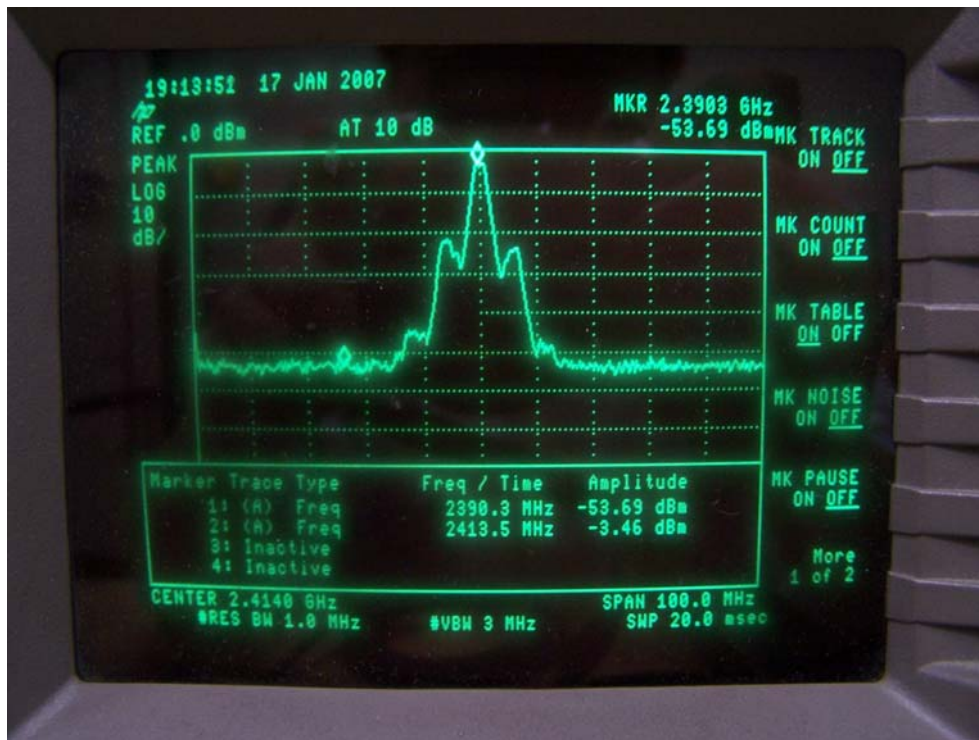
Same as 4.3 Radiated Emission Measurement.

### 7.4 Measurement Results:

PSSS

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

Refer to attached data chart.







## **8. Antenna Application**

### **8.1 Antenna requirement**

The EUT'S antenna is met the requirement of FCC part 15C section 15.203 and 15.240.an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The EUT has a built in antenna which is a short wire solder wire solder on the PCB, this is permanently attached antenna and meets the requirements of this section.

## **APPENDIX 1**

### **PHOTOGRAPHS OF EUT**

***UP View of EUT***



***Bottom View of EUT***





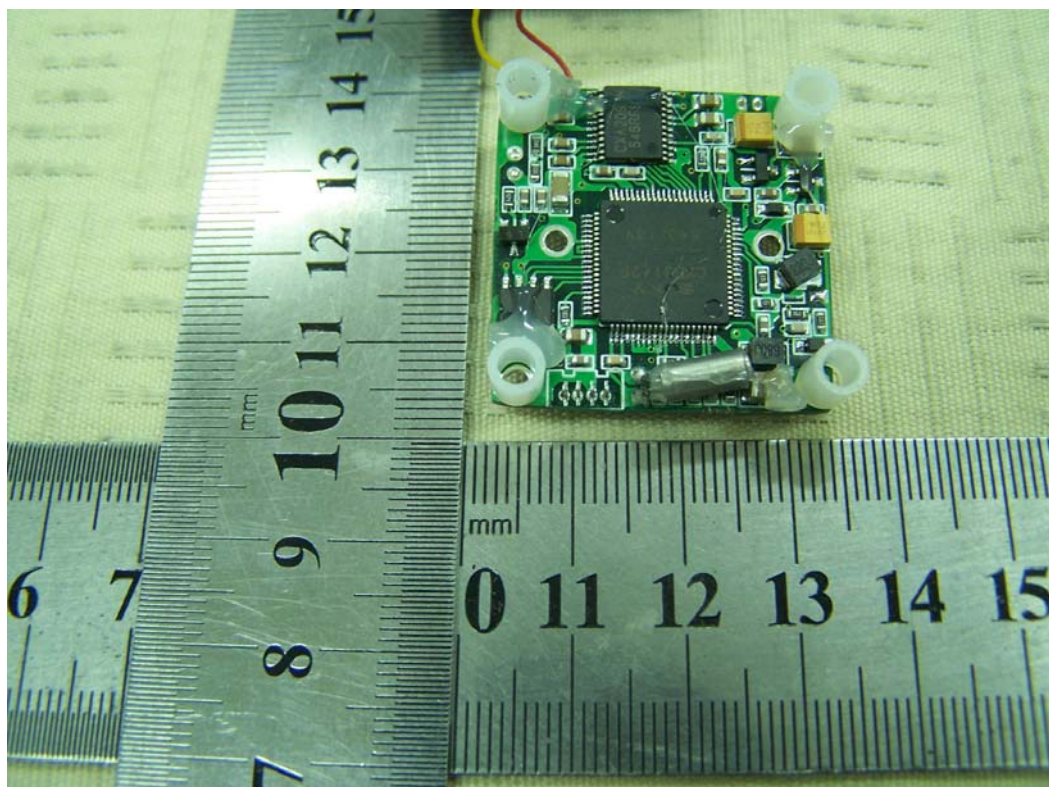
*View of TX*



*View of TX*



### Internal of TX



### Internal of TX

