

EMC TEST REPORT

For

Portable Wireless Camera

Model Number: WW2000

FCC ID: SG2-WW2000

Report Number : KSZ2004082501J

Test Laboratory : Shenzhen Academy of Metrology and
Quality Inspection EMC Laboratory

Site Location : Bldg. of Metrology &Quality Inspection,
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CERTIFICATION

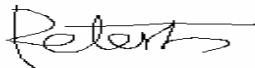
Applicant : Shenzhen Longway Technology Co., Ltd..
Address : 5/F, No.6 Bldg, Liuxian Dong Industrial District, Xili Shenzhen, China.
Manufacturer : Shenzhen Longway Technology Co., Ltd..
Address : 5/F, No.6 Bldg, Liuxian Dong Industrial District, Xili Shenzhen, China
EUT Description : Portable Wireless Camera
MODEL No : WW2000, WW2200

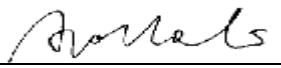
Test Standards:

FCC RULES AND REGULATIONS PART 15 :2002
ANSI C63.4 2000

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. Also, this report shows that the EUT technically complies with FCC requirements.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Tested by :  Date : August 16,2004
(Peter Lin)

Approved by :  Date : September 24,2004
(Apollo Liu)

1. TEST RESULTS

Table 1 Test Results

Test Items	Test Results
Conducted Disturbance	Pass
Radiated Disturbance	Pass
Band edge	Pass
Antenna requirement	Pass

2. GENERAL INFORMATION

2.1. Description of EUT

Description : Portable Wireless Camera
 Model Number : WW2000, WW2200
 Applicant : Shenzhen Longway Technology Co., Ltd.
 Manufacturer : Shenzhen Longway Technology Co., Ltd.
 Transmitter:
 Working Frequency : 2414MHz, 2432MHz, 2450MHz, 2468MHz
 Channel : 4
 Transmitting Power : 10mW
 Power Supply : DC10V, 300mA
 Adaptor: Input Power: AC110V 60Hz
 Output Power: DC10V 300mA

The system has a Wireless camera (Transmitter) and a wireless receiver (monitor). The system have Fixed and permanent antenna. The antenna have a plastic case. It is compliance with the 15.203 requirement.

2.2. Test Facility

Name of Facility : Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory

Site Location : Bldg. of Metrology & Quality Inspection, Longzhu Road, Shenzhen, Guangdong, China

Site Description : June 02, 2004 file on Federal Communications Commission Registration Number: 274801

Aug. 11, 2000 certificated by TUV Rheinland, Shenzhen.

3. TEST EQUIPMENT

3.1. For Conducted Disturbance Test

Table 2 Conducted Disturbance Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB2603	EMI Test Receiver	Rohde & Schwarz	ESCS30	Jan.31,2004	1 Year
SB3321	AMN	Rohde & Schwarz	ESH2-Z5	Jan.31,2004	1 Year
SB2589	L.I.S.N	KYROTISU	KNW-407	Jan.31,2004	1 Year

3.2. For Radiated Disturbance Test

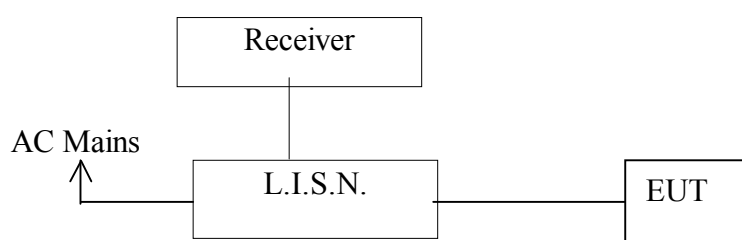
Table 3 Radiated Disturbance Test Equipment

NO.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB3436	EMI Test Receiver	Rohde & Schwarz	ESI26	Jan.31,2004	1 Year
SB3440	Bilog Antenna	Chase	CBL6112B	Jan.31,2004	1 Year
	Horn antenna	Rohde & Schwarz	HF906	Jan.31,2004	1 Year

4. CONDUCTED DISTURBANCE TEST

4.1. Block Diagram of Test Setup

Figure 1 Conducted Disturbance Test Setup



4.2. Conducted Disturbance Test Standard and Limit

4.2.1. Test Standard

FCC Part 15 :2002

4.2.2. Test Limit

Table 4 Conducted Disturbance Test Limit(Class B)

Frequency	Limits (dB μ V)	
	At mains terminals	
	Quasi-peak	Average
150kHz ~ 500kHz	66 ~ 56 *	59 ~ 46 *
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

* Decreasing linearly with logarithm of the frequency.

4.3. Test Procedure

The measurement is performed at the shielding room, using the setup per ANSI C63.4-2000 test procedure .

The EUT is put on a table of non-conducting material which is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The adaptor of the EUT is connected to the 120V/60Hz AC mains through a LISN. A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions form both sides of AC line. First, use the PK detector to do the pretest. And than use QP detector to do final test. Pretest result is shown in the curve, and the final test result is shown in table.

Setup of EMI Test Rceiver:

Start frequency 150kHz
 Stop frequency 30MHz
 IF bandwidth 9kHz.

4.4. Operating Condition of EUT

4.4.1. Setup the EUT as shown in section 4.1.

4.4.2. Turn on the power.

4.4.3 Let the Transmitter in each channel.

When the power on the Transmitter can change the video signal from camera and the audio signal form the microphone to RF signal.

4.5. Test Data

The emissions don't show in below are too low against the limits, the test curves are shown in the APPENDIX I

Table 5 Conducted Disturbance Test Data

Date of Test: 2004.7.19 Temperature: 23 °C
 EUT: Portable Wireless Camera Humidity: 61 %
 M/N: WW2000(Transmitter)

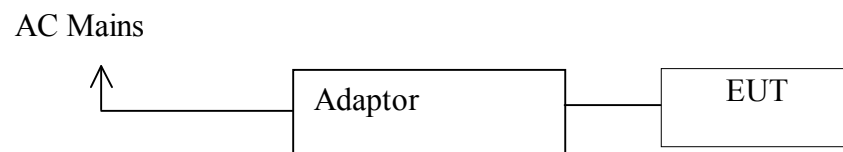
Line					Neutral				
Frequency (MHz)	Quasi-Peak		Average		Frequency (MHz)	Quasi-Peak		Average	
	Reading (dBμV)	Limits (dBμV)	Reading (dBμV)	Limits (dBμV)		Reading (dBμV)	Limits (dBμV)	Reading (dBμV)	Limits (dBμV)
0.150	33.4	66.0	9.5	56.0	0.150	33.4	66.0	9.4	56.0
0.255	30.9	61.6	7.7	51.6	0.255	29.7	61.6	7.3	51.6

5. RADIATED DISTURBANCE TEST

5.1. Block Diagram of Test Setup

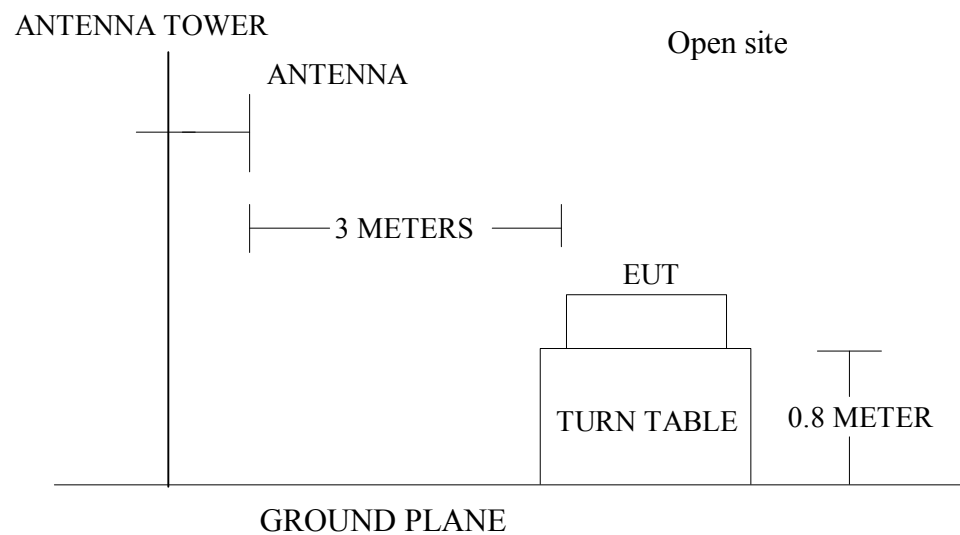
5.1.1. Block Diagram of the EUT

Figure 2 EUT



5.1.2. Test setup of Open Site Test

Figure 3 Test Setup(Open Site)



5.2. Test Standard and Limit

5.2.1. Test Standard

FCC Part 15:2002

5.2.2. Test Limit

Table 9 Radiated Disturbance Test Limit For Transmitter

FREQUENCY MHz	FIELD STRENGTHS LIMITS dB(μ V/m)
Fundamental	94.0(Average) 114.0(Peak)
Harmonics	54.0(Average) 74.0(Peak)
other	
30 ~ 88	40.0
88 ~ 216	43.5
216 ~ 960	46.0
960 ~ 1000	54.0

* The lower limit shall apply at the transition frequency.

* The test distance is 3m.

Table 10 Radiated Disturbance Test Limit For Receiver

FREQUENCY MHz	FIELD STRENGTHS LIMITS dB(μ V/m)
30 ~ 88	40.0
88 ~ 216	43.5
216 ~ 960	46.0
960 ~ 1000	54.0

* The lower limit shall apply at the transition frequency.

* The test distance is 3m.

5.3. Test Procedure

The measurement is performed at the shielding room, using the setup per ANSI C63.4-2000 test procedure

The EUT is placed on a turntable which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test. The pretest is processed in semi-anechoic chamber and do the final test in open area test site.

For 30~1000MHz, the detector of test receiver is QP. For 1~24GHz, the detector of the test receiver is AV.

5.4. Operating Condition of EUT

5.4.1. Setup the EUT as shown in section 5.1.

5.4.2. Turn on the power.

5.4.3 Let the Transmitter working in each channel.

When the power on the Transmitter can change the video signal from camera and the audio signal form the microphone to RF signal.

5.5. Test Data

The emissions don't show in below are too low against the limits, the test curves are shown in the APPENDIX I

Table 11 Radiated Disturbance Test Data

Date of Test 2004.7.22 Temperature 20 °C

EUT Portable Wireless Camera Humidity 58 %

Model Number WW2000 (Transmitter)

Channel 1:

Frequency GHz	Readings(dB μ V/m) Peak/Average	Polarization	Limits (dB μ V/m) Peak/Average
2.414	93.8/89.9	Horizontal	114.0/94.0
4.829	51.2/48.9	Horizontal	74.0/54.0
7.244	53.9/50.1	Horizontal	74.0/54.0
2.414	84.7/80.5	Vertical	114.0/94.0
4.829	50.6/48.6	Vertical	74.0/54.0
7.245	51.8/49.7	Vertical	74.0/54.0

Channel 2:

Frequency GHz	Readings(dB μ V/m) Peak/Average	Polarization	Limits (dB μ V/m) Peak/Average
2.432	93.6/90.0	Horizontal	114.0/94.0
4.864	51.9/49.8	Horizontal	74.0/54.0
7.296	52.7/50.0	Horizontal	74.0/54.0
2.432	84.1/79.5	Vertical	114.0/94.0
4.864	50.3/48.1	Vertical	74.0/54.0
7.296	50.6/48.5	Vertical	74.0/54.0

Channel 3

Frequency GHz	Readings(dB μ V/m) Peak/Average	Polarization	Limits (dB μ V/m) Peak/Average
2.450	94.3/90.6	Horizontal	114.0/94.0
4.901	52.6/49.5	Horizontal	74.0/54.0
7.354	50.7/48.6	Horizontal	74.0/54.0
2.450	80.6/78.1	Vertical	114.0/94.0
4.901	48.2/46.3	Vertical	74.0/54.0
7.351	49.9/48.5	Vertical	74.0/54.0

Channel 4

Frequency GHz	Readings(dB μ V/m) Peak/Average	Polarization	Limits (dB μ V/m) Peak/Average
2.467	92.6/89.8	Horizontal	114.0/94.0
4.939	51.3/49.0	Horizontal	74.0/54.0
7.409	53.6/50.6	Horizontal	74.0/54.0
2.467	79.6/76.0	Vertical	114.0/94.0
4.939	52.0/50.1	Vertical	74.0/54.0
7.409	53.9/51.0	Vertical	74.0/54.0

6. BAND EDGES TESTING

Requirements: FCC 15.249 (c), the emission power at the START and STOP frequencies shall be at least 50 dB below the level of the fundamental or to the general radiated emission limits in FCC 15.209, whichever is the lesser attenuation.

6.1 Test Procedure

The antenna was removed and a low loss RF cable was connected to the transmitter output. The other end of cable was connected to a spectrum analyzer with the START and STOP frequencies set to the operation band. Transmitter output was read off the spectrum analyzer in dBm. The power output at the transmitter was determined by adding the value of the attenuator to the spectrum analyzer reading. The test was performed for handset and the base respectively.

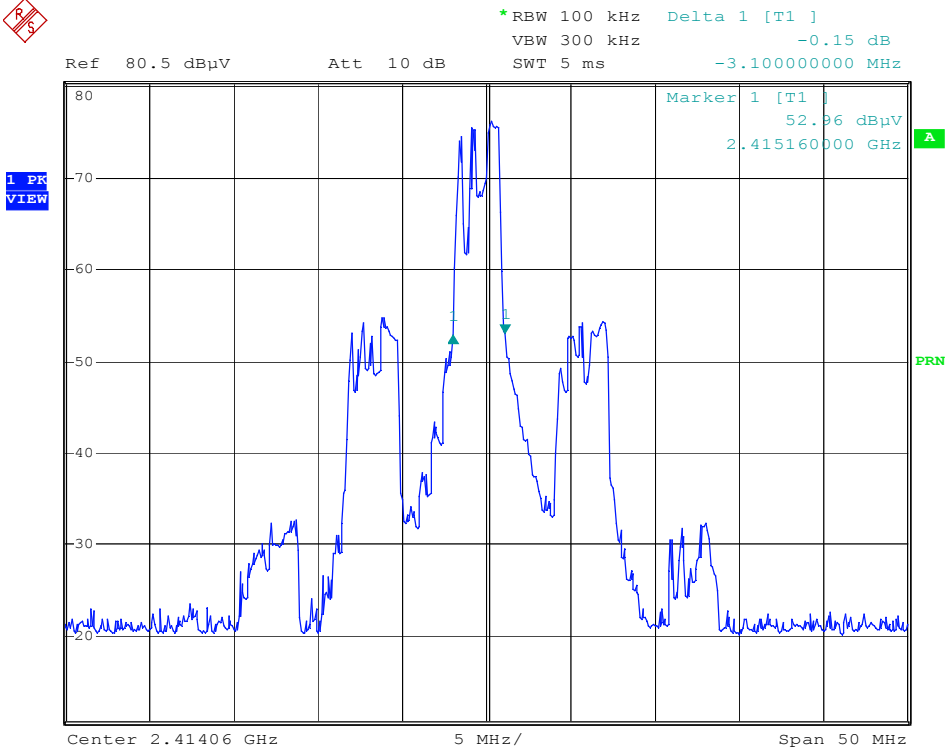
6.2 Test Equipment

RS ESI26 EMI Test Receiver
HP 930C printer

6.3 Test Results

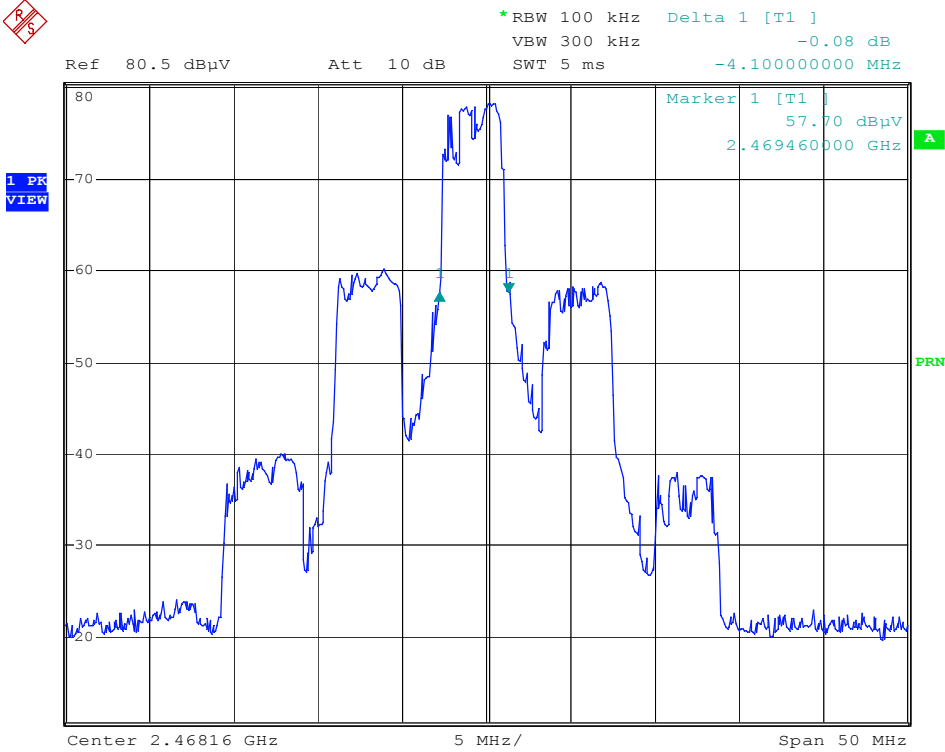
Please refer to the attached plots.

Lowest Frequency



Comment A: Conducted Disturbanc

Highest Frequency



Comment A: Conducted Disturbance
Date: 21.AUG.2004 16:36:39

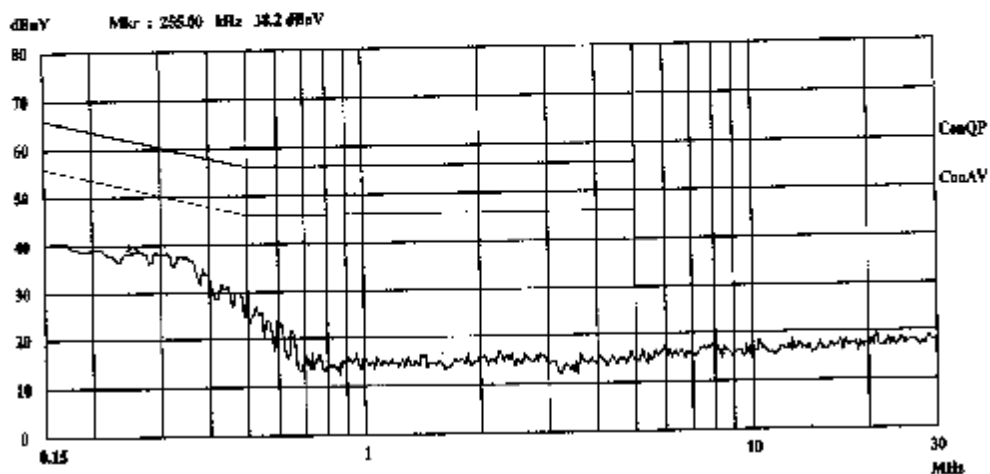
7. ANTENNA REQUIREMENTS

According to 15.203 requirement, the Transmitter is used a fixed and permanent antenna.

APPENDIX I

Conducted Disturbance**FCC Part 15****EUT:** M/N:WW2000**Manufacturer:****Operating Condition:** ON**Test Site:** SMQ EMC Lab**Operator:****Test Specification:** L&N**Comment:** AC120V/50Hz
Adaptor of Cam**Conducted Disturbance**

EUT: M/N:WW2000
 Op Cond: On
 Test Spec: L
 Comment: AC 120V/60Hz

**Conducted Disturbance**

EUT: M/N:WW2000
 Op Cond: On
 Test Spec: N
 Comment: AC 120V/60Hz

