

MPE TEST REPORT

FCC Per 47 CFR 2.1091(d)

Report Reference No.: **SKW1306010E-MPE**

FCC ID : **2AAMTLW-S101**

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Date of issue : June 30, 2013

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Applicant's name : **LongWin technology Co.,Ltd.**

Address : Ram802,8/F Xinzhou 11 Road,139#Intersection of Binhe Avenue and Shazui Road,Futian District,Shenzhen,China

Test specification:

Standard : **FCC Per 47 CFR 2.1091(b)**

TRF Originator : Shenzhen Sinco Testing Technology Co., Ltd.

Master TRF : Dated 2012-06

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Test item description : ipcamera

Trade Mark : /

Manufacturer : **LongWin technology Co.,Ltd.**

Model/Type reference : LW-S101

Listed Models : /

Operation Frequency : From 2412MHz to 2462MHz

Modulation Type : CCK,OFDM

Rating : DC 5.0 V Adapter from AC 120V/60Hz

Result : **Positive**

TEST REPORT

Test Report No. :	SKW1306010E-MPE	June 30, 2013
		Date of issue

Equipment under Test : ipcamera

Model /Type : LW-S101

Listed Models : /

Applicant : **LongWin technology Co.,Ltd.**

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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

<u>1.</u>	<u>SUMMARY</u>	4
1.1.	EUT configuration	4
1.2.	Power supply system utilised	4
1.3.	Description of the test mode	4
1.4.	NOTE	4
<u>2.</u>	<u>TEST ENVIRONMENT</u>	错误！未定义书签。
2.1.	Address of the test laboratory	错 误！未定义书签。
2.2.	Environmental conditions	错 误！未定义书签。
2.3.	Statement of the measurement uncertainty	错 误！未定义书签。
<u>3.</u>	<u>METHOD OF MEASUREMENT</u>	错误！未定义书签。
3.1.	Applicable Standard	错 误！未定义书签。
3.2.	Limit	错 误！未定义书签。
3.3.	MPE Calculation Method	错 误！未定义书签。
<u>4.</u>	<u>CONCLUSION</u>	错误！未定义书签。

1. SUMMARY

1.1. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

<input type="radio"/>	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
<input type="radio"/>	Multimeter	Manufacturer :	/
		Model No. :	/

1.2. Power supply system utilised

Power supply voltage	:	<input type="radio"/>	120V / 60 Hz	<input type="radio"/>	115V / 60Hz
		<input type="radio"/>	12 V DC	<input type="radio"/>	24 V DC
		<input checked="" type="radio"/>	Other (specified in blank below)		

DC 5.0V Adapter from AC 120V/60Hz

1.3. Description of the test mode

IEEE 802.11b/g/n: Eleven channels are provided to the EUT.

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432		
6	2437		
7	2442		

1.4. NOTE

1. The EUT is a ip camera with WLAN function, The functions of the EUT listed as below:

	Test Standards	Reference Report
Radio	FCC Part 15 Subpart C (Section15.247)	SKW1306010-E-RF
MPE	OET 65 C KDB447498	SKW1306010-E-MPE

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
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802.11b	✓	—	—	—
802.11g	✓	—	—	—
802.11n(20MHz)	✓	—	—	—
802.11n(40MHz)	✓	—	—	—

3. The EUT incorporates a SISO function, Physically, the EUT provides one completed transmitter and one completed receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

Bontek Compliance Testing Laboratory Ltd
1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

2.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Bontek Compliance Testing Laboratory Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Bontek Compliance Testing Laboratory Ltd is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

3. Method of measurement

3.1. Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §RSS-102, Devices that have a radiating element normally operating at separation distances greater than 20 cm between the user and the device shall undergo an RF exposure evaluation. SAR evaluation may be performed in lieu of an RF exposure evaluation for devices operating below 6 GHz with a separation distance of greater than 20 cm between the user and the device.

According to §1.1310 and §2.1091 RF exposure is calculated.

447498 D01 General RF Exposure Guidance v05r01: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

3.2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	(900/f)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

*=Plane-wave equivalent power density

F=frequency in GHz

3.3. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S=power density

P=power input to antenna

G=power gain of the antenna in the direction of interest relative to an isotropic radiator

R=distance to the center of radiation of the antenna

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the antenna is 3.0 dBi, and the power drift from Turn-up Procedure provide by manufacturer as following states, the RF power density can be obtained.

Power Drift					
Test Mode			802.11 b		
Channel Number	Frequency (MHz)	Power Drift	Channel Number	Frequency (MHz)	Power Drift
1	2412	16dBm±2dB	7	2442	16dBm±2dB
2	2417	16dBm±2dB	8	2447	16dBm±2dB
3	2422	16dBm±2dB	9	2452	16dBm±2dB
4	2427	16dBm±2dB	10	2457	16dBm±2dB
5	2432	16dBm±2dB	11	2462	16dBm±2dB
6	2437	16dBm±2dB			

Test Mode			802.11 g		
Channel Number	Frequency (MHz)	Power Drift	Channel Number	Frequency (MHz)	Power Drift
1	2412	21dBm±2dB	7	2442	21dBm±2dB
2	2417	21dBm±2dB	8	2447	21dBm±2dB
3	2422	21dBm±2dB	9	2452	21dBm±2dB
4	2427	21dBm±2dB	10	2457	21dBm±2dB
5	2432	21dBm±2dB	11	2462	21dBm±2dB
6	2437	21dBm±2dB			
Test Mode			802.11 n(20MHz)		
Channel Number	Frequency (MHz)	Power Drift	Channel Number	Frequency (MHz)	Power Drift
1	2412	21dBm±2dB	7	2442	21dBm±2dB
2	2417	21dBm±2dB	8	2447	21dBm±2dB
3	2422	21dBm±2dB	9	2452	21dBm±2dB
4	2427	21dBm±2dB	10	2457	21dBm±2dB
5	2432	21dBm±2dB	11	2462	21dBm±2dB
6	2437	21dBm±2dB			
Test Mode			802.11 n(40)		
Channel Number	Frequency (MHz)	Power Drift	Channel Number	Frequency (MHz)	Power Drift
3	2422	21dBm±2dB	7	2442	21dBm±2dB
4	2427	21dBm±2dB	8	2447	21dBm±2dB
5	2432	21dBm±2dB	9	2452	18dBm±2dB
6	2437				

TEST RESULTS

For 802.11 b

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 20 cm (mW/cm ²)	Scaling Factor	Power Density At 20 cm (mW/cm ²) Including Scaling	Power Density Limit (mW/cm ²)	Test Results
2412	20.00	14.92	31.0456	1.9953	0.0123	2.0324	0.0251	1.0000	PASS
2437	20.00	15.54	35.8096	1.9953	0.0142	1.7620	0.0251	1.0000	PASS
2462	20.00	16.09	40.6443	1.9533	0.0158	1.5524	0.0245	1.0000	PASS

For 802.11 g

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 20 cm (mW/cm ²)	Scaling Factor	Power Density At 20 cm (mW/cm ²) Including Scaling	Power Density Limit (mW/cm ²)	Test Results
2412	20.00	21.86	153.4700	1.9953	0.0610	1.3001	0.0792	1.0000	PASS
2437	20.00	22.47	176.6038	1.9953	0.0701	1.1298	0.0792	1.0000	PASS
2462	20.00	22.52	178.6488	1.9533	0.0695	1.1169	0.0776	1.0000	PASS

For 802.11 n(20MHz)

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 20 cm (mW/cm ²)	Scaling Factor	Power Density At 20 cm (mW/cm ²) Including Scaling	Power Density Limit (mW/cm ²)	Test Results
2412	20.00	21.95	156.6751	1.9953	0.0622	1.2735	0.0792	1.0000	PASS
2437	20.00	22.67	184.9269	1.9953	0.0734	1.0789	0.0792	1.0000	PASS
2462	20.00	22.87	193.6422	1.9533	0.0753	1.0304	0.0776	1.0000	PASS

For 802.11 n (40MHz)

Test	Minimum	Output	Output	Antenna	Power	Scaling	Power	Power	Test
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Frequency (MHz)	Separation Distance (cm)	Power (dBm)	Power (mW)	Gain (Numeric)	Density At 20 cm (mW/cm ²)	Factor	Density At 20 cm (mW/cm ²) Including Scaling	Density Limit (mW/cm ²)	Results
2422	20.00	21.33	135.8313	1.9953	0.0539	1.4689	0.0792	1.0000	PASS
2437	20.00	22.05	160.3245	1.9953	0.0637	1.2445	0.0792	1.0000	PASS
2452	20.00	17.08	51.005	1.9533	0.0198	1.9606	0.0389	1.0000	PASS

4. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 (b) for the uncontrolled RF Exposure.

.....End of Report.....