



ESTECH Co., Ltd.
3rd Fl., Chungdam Bldg.,
119-1 Chungdam-dong,
Kangnamgu, Seoul



**Electromagnetic
Interference
Test Report**

Compliance Test Report for FCC

Report Number		ESTF150303-002				
Applicant	Company name	POONG HAN ENGINEERING CO., LTD.				
	Address	5-10, ONGJUNG-LI, TONGJIN-MYON, KIMPO-SI, KYOUNGGI-DO, KOREA				
	Telephone	82-31-988-9006				
Product	Product name	REMOTE CONTROL LIGHT				
	Model No.	PH-TL001	Manufacturer	Xiamen Poong Han Engineering Co.,Ltd.		
	Serial No.	NONE	Country of origin	China		
Test date	2003-03-17 ~ 2003-03-20	Date of issue	2003-03-24			
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea					
Standard	FCC PART 15.231 Subpart C –Intentional Radiator					
Test item	<input type="checkbox"/> Conducted Emission	<input type="checkbox"/> Class A	<input type="checkbox"/> Class B	Test result		
	<input checked="" type="checkbox"/> Radiated Emission	<input type="checkbox"/> Class A	<input checked="" type="checkbox"/> Class B	Test result		
Measurement facility registration number		94696				
Tested by	Senior Engineer J.M. Yang		(Signature)			
Reviewed by	Director T.K. Lee		(Signature)			
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable					
<p>* Note</p> <ul style="list-style-type: none">– This test report is not permitted to copy partly without our permission– This test result is dependent on only equipment to be used– This test result based on a single evaluation of one sample of the above mentioned						



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1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.

ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.

ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co. Ltd

Head Office : 3 rd Fl., Chungdam Bldg., 119-1 Chungdam-dong Kangnam-gu , Seoul, Korea
(Safety & Telecom. Test Lab)

EMC Test Lab : 58-1 Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea
97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

1.3 Official Qualification(s)

MIC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication

KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC requirements

FCC : Filed Laboratory at Federal Communications Commission

VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE



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2. Description of EUT

2.1 Summary of Equipment Under Test

Product : REMOTE CONTROL LIGHT

Model Number : PH-TL001

Serial Number : NONE

Manufacturer : Xiamen Poong Han Engineering Co.,Ltd.

Country of origin : China

Rating : 6V DC(Battery)

Output Frequency : 300 MHz

Receipt Date : 2003-02-05

2.2 General descriptions of EUT

Remote Control Light



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3. Test Standards

Test Standard : FCC PART 15 (2002)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (2001)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain devices that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment. These methods apply to the measurement of individual units or systems comprised of multiple units.



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4. Measurement Condition

4.1 EUT Operation.

- * The EUT was in the following operation mode during all testing
- * The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected highest level of emission
- * We test EUT under highest level of emission by pushing the button.

4.2 Configuration and Peripherals

LIGHT unit

Remote Control
Light
< EUT >

4.3 EUT and Support equipment

4.4 Cable Connecting



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5. Occupied Bandwidth Measurement

5.1 Test procedure

The bandwidth at 20dB below was measured in accordance to FCC Part 15 Section 15.231. The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. The bandwidth is determined at the point 20dB down from the modulated carrier.

$$301.510 \times 0.0025 = 0.75 \text{ MHz}$$

5.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

- . RBW= 100KHz
- . VBW= 300KHz
- . Span= 2MHz
- . Vertical Scale=10dB/div
- . Center Frequency=301.510MHz

20dB Bandwidth Test Instruments

Description	Model	Serial Number
Spectrum Analyzer	HP 8563E	3623A05297
Coax cables: -Spectrum Analyzer <=> EUT	Length: 87.3cm Loss: 2.3dB	-

5.3 Measurement results

The bandwidth at 20 dB is 580KHz which is within the allowable limit of 750 kHz at 301.510MHz.

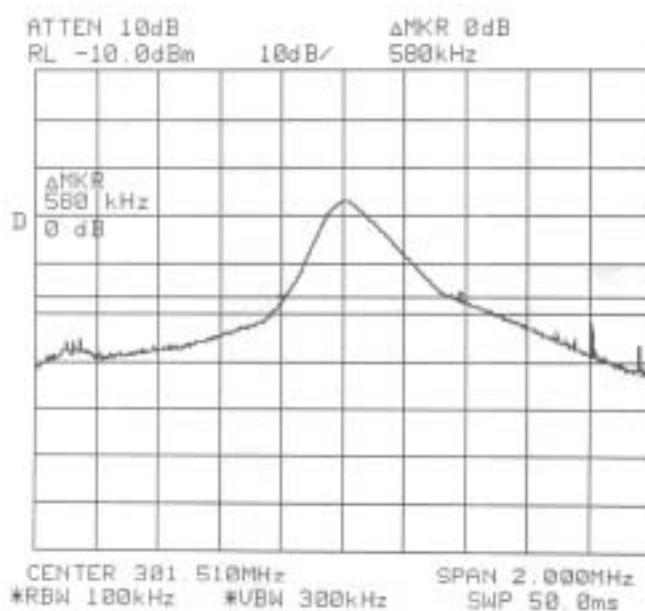
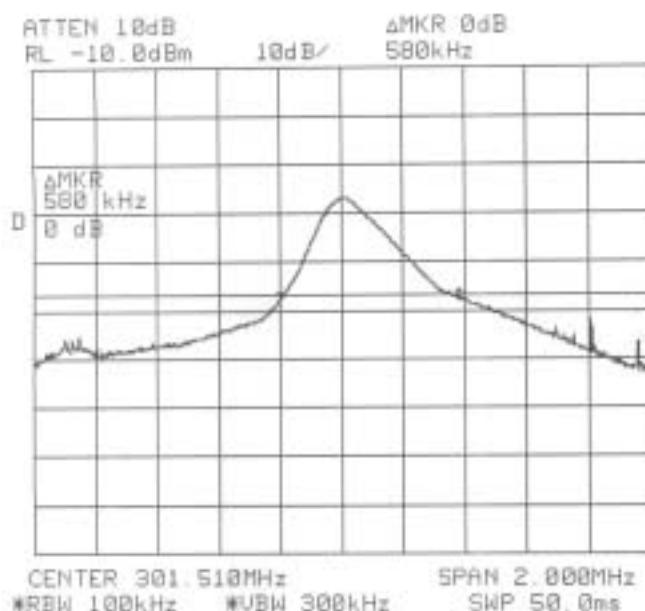


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5.4 Occupied Bandwidth Measurement Graph





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6. Measurement of radiated disturbance (30MHz – 3GHz)

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2002) & ANSI C 63.4 (2001). The test setup was made according to FCC Part 15 (2002) & ANSI C 63.4 (2001) on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test set-up.

6.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Receiver	ESPC	Rohde & Schwarz	845296/021	2003.6.21
Spectrum Analyzer	R3261B	ADVANTEST	1720302	2004.2.7
LogBicon Antenna	VULB 9160	S/B	3107	2003.6.7
Turn Table	2087	EMCO	2129	–
Antenna Mast	2070-01	EMCO	9702-203	–
ANT Mast Controller	2090	EMCO	1535	–
Turn Table Controller	2090	EMCO	1535	–

6.2 Environmental Condition

Test Place : Open site (3m)

Temperature (°C) : 18 °C

Humidity (%) : 55 %



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6.3 Test data

Measurement Distance : 3 m

* X axis

Frequency (MHz)	Level (dBm)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ /m)	Result (dB μ /m)	Margin (dB μ /m)
300.165	-66.50	H	1.5	13.19	2.7	69.8	56.39	-13.41
603.270	-81.80	H	1.3	19.17	4.0	54.0	48.32	-5.68
904.930	-100.50	H	1.0	22.66	4.9	54.0	36.04	-17.96
1206.560	-98.60	H	1.0	25.92	5.5	54.0	39.85	-14.15
Remark	H : Horizontal, V : Vertical							

* Y axis

Frequency (MHz)	Level (dBm)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ /m)	Result (dB μ /m)	Margin (dB μ /m)
300.165	-68.10	H	1.5	13.19	2.7	69.8	54.79	-15.01
603.270	-85.50	H	1.0	19.17	4.0	54.0	44.62	-9.38
904.930	-101.80	H	1.0	22.66	4.9	54.0	32.74	-21.26
1206.560	-101.10	H	1.0	25.92	5.5	54.0	37.35	-16.65
Remark	H : Horizontal, V : Vertical							

* Z axis

Frequency (MHz)	Level (dBm)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ /m)	Result (dB μ /m)	Margin (dB μ /m)
300.165	-67.20	H	1.6	13.19	2.7	69.8	55.69	-14.11
603.270	-82.50	H	1.2	19.17	4.0	54.0	47.62	-6.38
904.930	-98.50	H	1.0	22.66	4.9	54.0	36.04	-17.96
1206.560	-99.00	H	1.0	25.92	5.5	54.0	39.45	-14.55
Remark	H : Horizontal, V : Vertical							



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6.4 Setup for Radiated Test : 30 ~ 3 GHz

[Front]



[Rear]





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7. Photographs of EUT

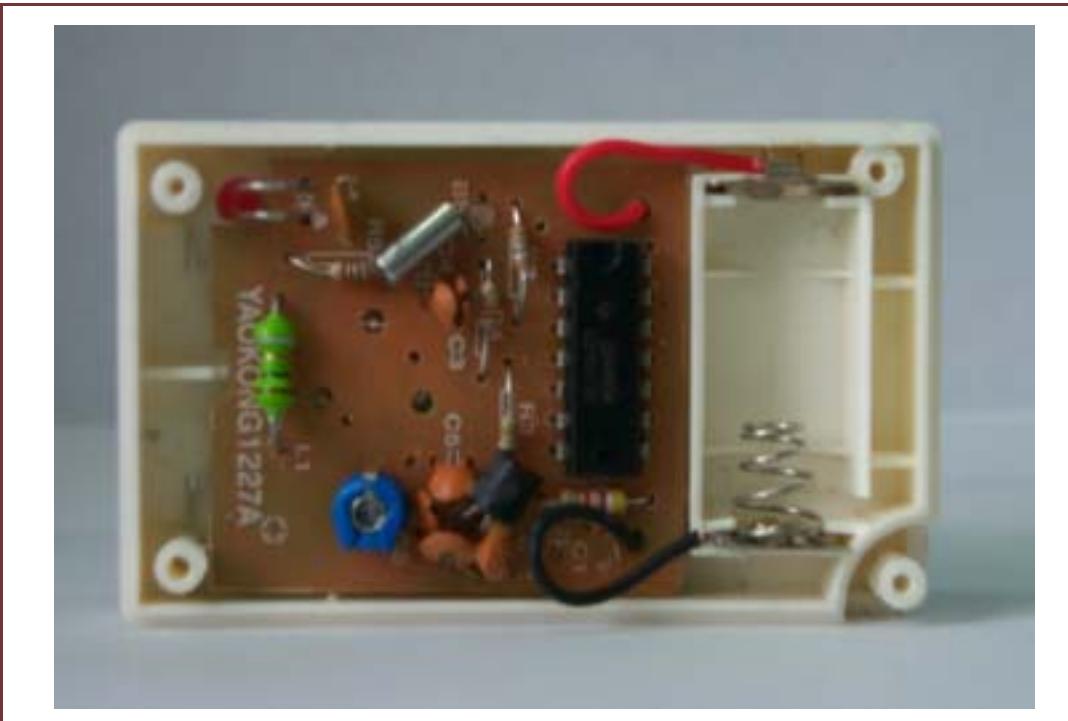
[Front]



[Rear]

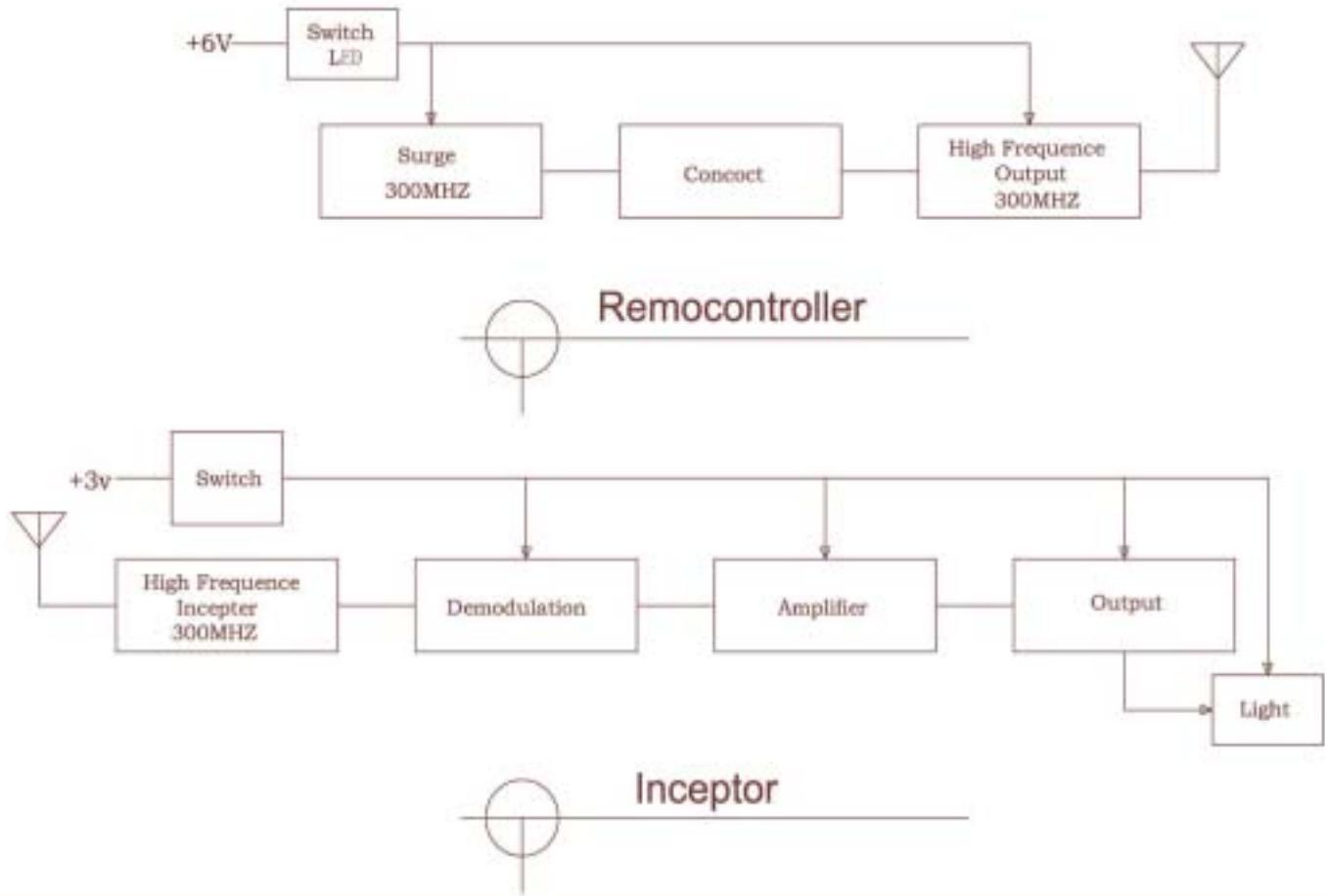


Appendix 1. Phorographs of EUT in side PCB



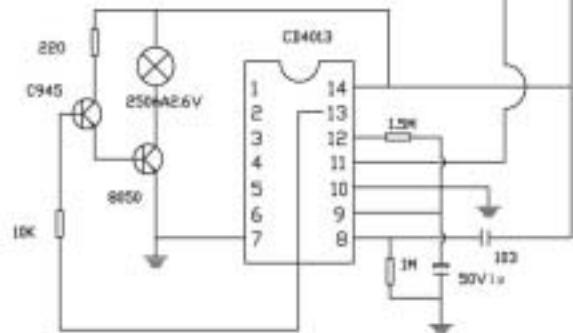
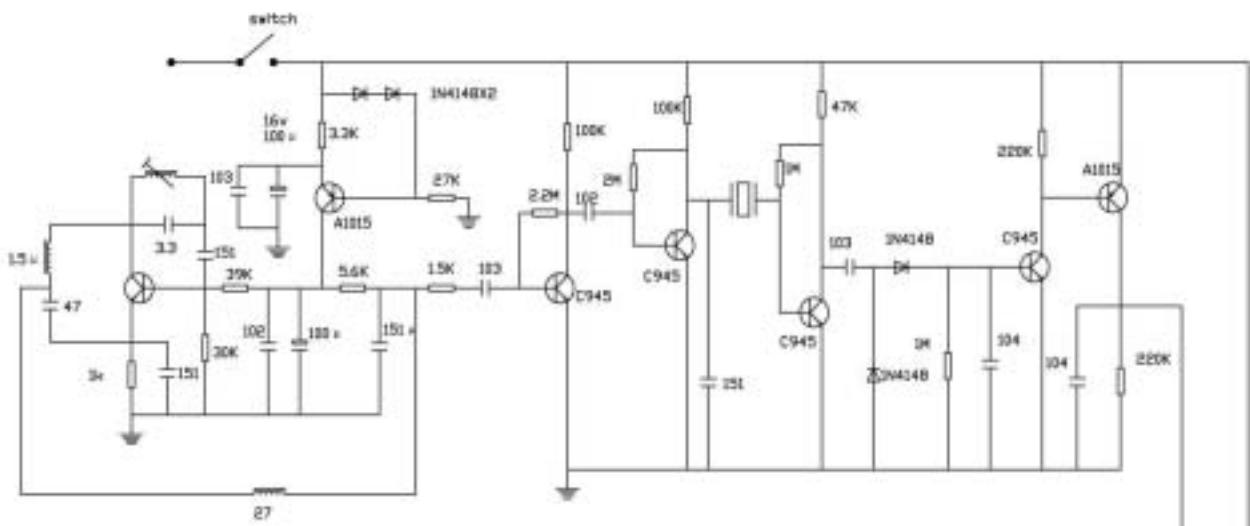
Appendix 2. Block diagram of EUT

Lamp Light Bubble Diagram



Appendix 3. Circuit Diagram – 1

LAMP LIGHT CIRCUIT



Circuit Diagram – 2

Remocontroller Circuit

