



香 港 標 準 及 檢 定 中 心  
**Hong Kong Standards and Testing Centre**

Date : 2005-10-03  
No. : HM115118

**TEST REPORT**

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**Applicant:**

Shantou Chenghai Haizhixing Plastic Products  
Factory  
Taijiao Industrial area, Shanghua town, Chenghai  
city, Guangdong, China

**Description of Samples:**

Model name: R/C car  
Model no.: 3090  
Brand name: N/A  
FCC ID: TNK03090TOS27M

**Date Samples Received:**

2005-09-12

**Date Tested:**

2005-09-14 to 2005-09-23

**Investigation Requested:**

FCC Part 15 Subpart C

**Conclusions:**

The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remarks:**

For additional models details, see page 5.

\_\_\_\_\_  
K C Lee, EMD  
for Chief Executive

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**1.0 General Details**

**1.1 Test Laboratory**

The Hong Kong Standards and Testing Centre Ltd.  
EMC Laboratory  
10 Dai Wang Street, Taipo Industrial Estate  
New Territories, Hong Kong

Telephone: 852 2666 1888  
Fax: 852 2664 4353

**1.2 Applicant Details**  
**Applicant**

Shantou Chenghai Haizhixing Plastic Products Factory  
Taijiao Industrial area, Shanghua town, Chenghai city,  
Guangdong, China

**HKSTC Code Number for Applicant**

**STS002**

**Manufacturer**

Shantou Chenghai Haizhixing Plastic Products Factory  
Taijiao Industrial area, Shanghua town, Chenghai city,  
Guangdong, China

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10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong

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**1.3 Equipment Under Test [EUT]  
Description of Sample**

Model Name: R/C car  
Manufacturer: Shantou Chenghai Haizhixing Plastic Products Factory  
Brand Name: N/A  
Model Number: 3090  
Additional Model Number: 787, 797, 3091, 3092, 3093, 3095, 3096  
Rating: 9Vd.c ("6FF" size battery x 1) with Jack  
The AC/DC Adaptor used for the tests was a "Winstar" adaptor: Model Number: NA-12, Input: 100-120/220-240Va.c., Output: 3-15Vd.c. 1200mA max.

**1.3.1 Description of EUT Operation**

The Equipment Under Test (EUT) is a Shantou Chenghai Haizhixing Plastic Products Factory, R/C car. The transmitter is a 2 joystick transmitter. The EUT continues to transmit while joystick is being pressed, It is Pulse transmitter, Modulation by IC, and type is pulse modulation.

**1.4 Date of Order**

2005-09-12

**1.5 Submitted Sample(s):**

1 Samples per model

**1.6 Test Duration**

2005-09-14 to 2005-09-23

**1.7 Country of Origin**

CHINA

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**2.0 Technical Details**

**2.1 Investigations Requested**

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.4:2003 for FCC Certification.

**2.2 Test Standards and Results Summary Tables**

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.227	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2003	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	Class B	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

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**3.0 Test Results**

**3.1 Emission**

**3.1.1 Radiated Emissions (30 – 1000MHz)**

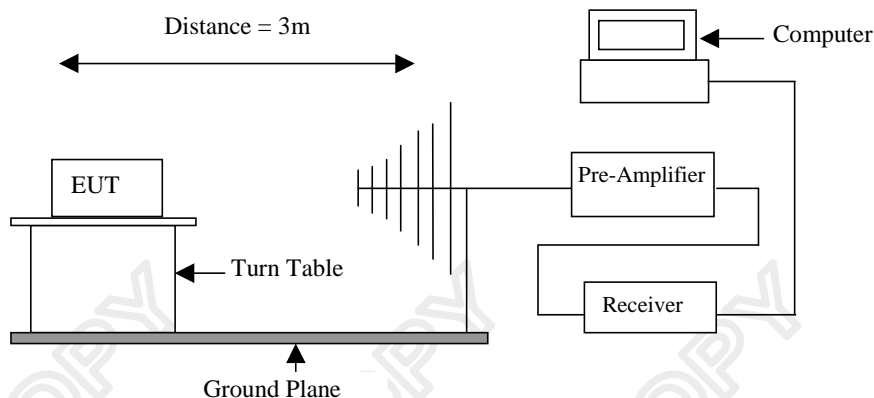
Test Requirement:	FCC 47CFR 15.227
Test Method:	ANSI C63.4:2003
Test Date:	2005-09-23
Mode of Operation:	Tx mode

**Test Method:**

The sample was placed 0.8m above the ground plane on the OATS \*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\*: OATS [Open Area Test Site] located at HKSTC with a metal ground plane filled with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: [607756](#).

**Test Setup:**



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**Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.227]:**

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [ $\mu\text{V}/\text{m}$ ]	Field Strength of Fundamental Emission [Average] [ $\mu\text{V}/\text{m}$ ]
26.96-27.28	100,000	10,000

**Results:**

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu\text{V}$	Correction Factor dB/m	Field Strength dB $\mu\text{V}/\text{m}$	Field Strength $\mu\text{V}/\text{m}$	Limit @3m $\mu\text{V}/\text{m}$	E-Field Polarity
27.15	33.90	19.2	53.1	451.9	100,000	Vertical

Field Strength of Fundamental Emissions Average							
Frequency MHz	Measured Level @3m dB $\mu\text{V}$	Adjusted by Duty Cycle dB	Correction Factor dB/m	Field Strength dB $\mu\text{V}/\text{m}$	Field Strength $\mu\text{V}/\text{m}$	Limit @3m $\mu\text{V}/\text{m}$	E-Field Polarity
27.15	26.4	-7.5	19.2	45.6	190.5	10,000	Vertical

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

**Remarks:**

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz  $\pm 4.1\text{dB}$

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**Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:**

Frequency Range [MHz]	Quasi-Peak Limits [μV/m]
30-88	100
88-216	150
216-960	200
Above 960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

**Results :**

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
54.28	29.1	8.9	38.0	79.4	100	Vertical
81.44	< 1.0	9.5	< 10.5	< 3.3	100	Vertical
108.58	< 1.0	10.7	< 11.7	< 3.8	150	Vertical
135.73	< 1.0	10.2	< 11.2	< 3.6	200	Vertical
162.87	< 1.0	11.9	< 12.9	< 4.4	200	Vertical
190.02	< 1.0	12.4	< 13.4	< 4.7	200	Vertical
217.16	< 1.0	13.2	< 14.2	< 5.1	200	Vertical
244.31	< 1.0	15.0	< 16.0	< 6.3	200	Vertical
271.45	< 1.0	16.1	< 17.1	< 7.2	200	Vertical

**Remarks:**

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz ±4.1dB

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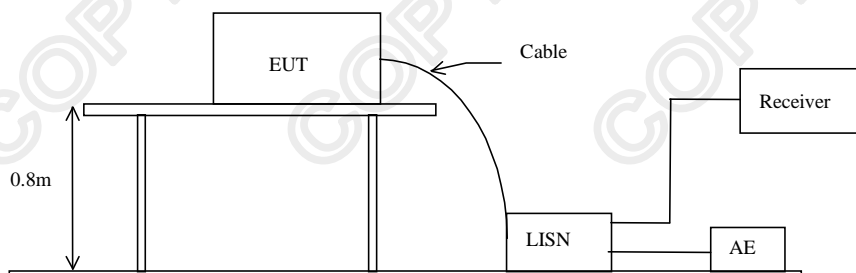
**3.1.1 Conducted Emissions (0.15MHz to 30MHz)**

Test Requirement:	FCC 47CFR 15.107
Test Method:	ANSI C63.4:2003
Test Date:	2005-09-14
Mode of Operation:	Charge Mode

**Test Method:**

The test was performed in accordance with ANSI C63.4: 2003, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

**Test Setup:**



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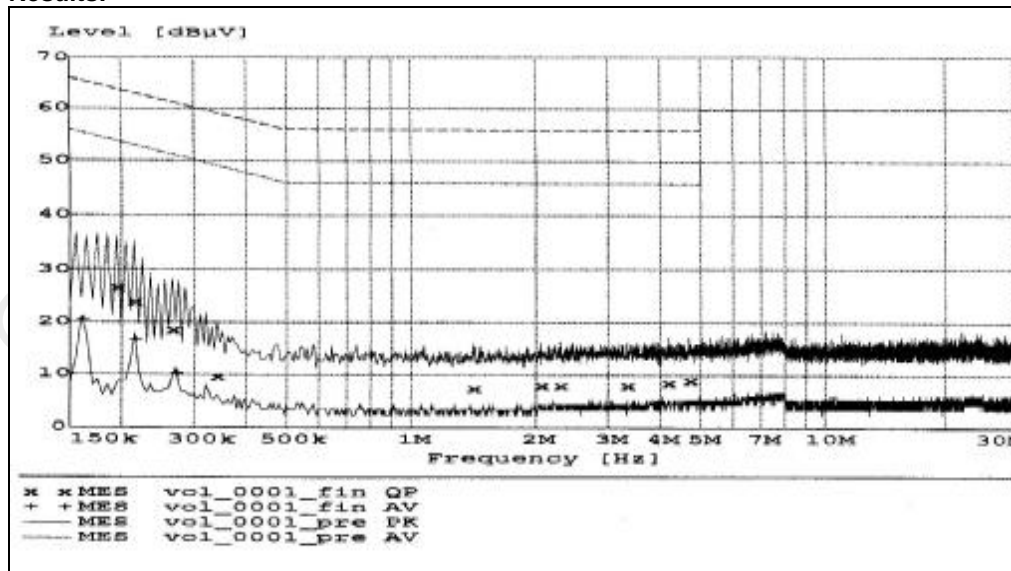
**Limits for Conducted Emissions (FCC 47 CFR 15.107):**

Frequency Range [MHz]	Quasi-Peak Limits [dB $\mu$ V]	Average [dB $\mu$ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

\* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram labelled as (QP and AV).

**Results:**



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**Results:**

Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dB $\mu$ V	Limit dB $\mu$ V	Level dB $\mu$ V	Limit dB $\mu$ V
Live	0.195	26.6	64	-*-	-*-
Live	0.215	23.9	63	16.6	53
Live	0.265	18.4	61	-*-	-*-
Live	0.270	-*-	-*-	10.2	51
Live	2.060	8.0	56	-*-	-*-
Live	2.295	8.0	56	-*-	-*-
Live	3.330	8.0	56	-*-	-*-
Live	4.065	-*-	-*-	4.4	46
Live	4.185	8.5	56	-*-	-*-
Live	4.710	9.0	56	-*-	-*-
Live	4.970	-*-	-*-	4.6	46
Neutral	0.160	-*-	-*-	20.6	56
Neutral	0.340	9.5	59	-*-	-*-
Neutral	1.415	7.4	56	-*-	-*-

**Remarks:**

Calculated measurement uncertainty:  $\pm 2.8$ dB

-\*- Emission(s) that is far below the corresponding limit line.

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**3.2 20dB Bandwidth of Fundamental Emission**

Test Requirement:	FCC 47 CFR 15.227
Test Method:	ANSI C63.4:2003 (Section 13.1.7)
Test Date:	2005-09-23
Mode of Operation:	On mode

**Test Method:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

**Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

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10 Dai Wang Street, Taiipo Industrial Estate, N.T., Hong Kong

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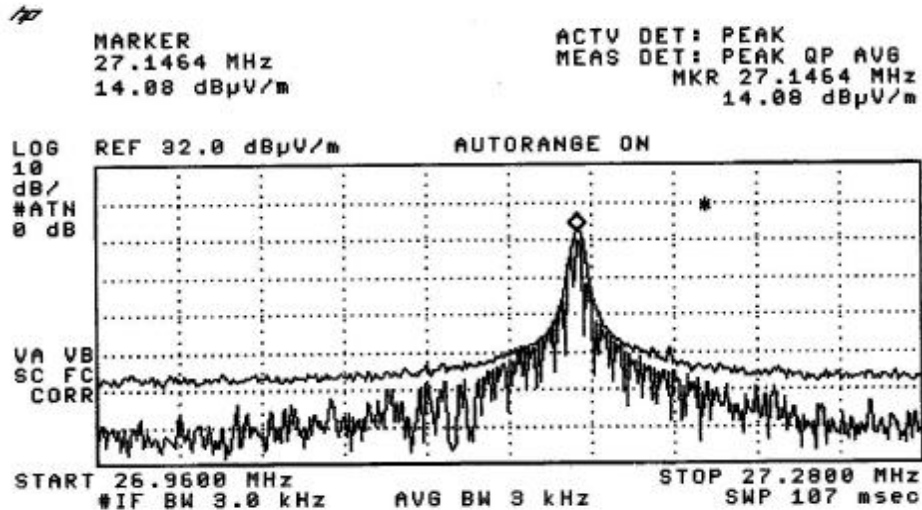
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**Limits for 20dB Bandwidth of Fundamental Emission:**

Frequency Range [MHz]	20dB Bandwidth [KHz]	FCC Limits [MHz]
27.145	18.6	within 26.96-27.28

**20dB Bandwidth of Fundamental Emission**



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**Appendix A**

**List of Measurement Equipment**

**Radiated Emission**

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192	15/06/04
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514	15/06/04
EM009	QUASI PEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702	15/06/04
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410	15/06/04
EM011	ATTENUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595	15/06/04
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262	15/06/04
EM020	HORN ANTENNA	ETS-Linggren	3115	4032	30/07/03
EM022	LOOP ANTENNA	ETS-Linggren	6502	1189-2424	19/09/03
EM072	SIGNAL GENERATOR	HEWLETT PACKARD	8640B	1948A11892	N/A
EM083	OPEN AREA TEST SITE	HKSTC	N/A	N/A	08/02/03
EM131	EMC ANALYZER	HEWLETT PACKARD	8595EM	3710A00155	13/01/04
EM145	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS 30	830245/021	04/10/04
EM195	ANTENNA POSITIONING MAST	ETS-Linggren	2075	2368	N/A
EM196	MULTI-DEVICE CONTROLLER	ETS-Linggren	2090	1662	N/A
EM215	MULTIDEVICE CONTROLER	ETS-Linggren	2090	00024676	N/A
EM216	MINI MAST SYSTEM	ETS-Linggren	2075	00026842	N/A
EM217	ELECTRIC POWERED TURNTABLE	ETS-Linggren	2088	00029144	N/A
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3	--	19/03/04
EM219	BICONILOG ANTENNA	ETS-Linggren	3142C	00029071	28/10/03
EM218	ETS ANECHOIC CHAMBER	EMCO	Fact-3	N/A	15/03/04
EM215	MULTI-DEVICE CONTROLLER	EMCO	2090	00024676	N/A
EM216	ANTENNA POSITIONING MAST	EMCO	2070	00024727	N/A

**Line Conducted**

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM078	VARIAC	SHANGHAI VOLTAGE	TDGC-3/0.5	N/A	CM
EM081	SMALL SCREENED ROOM	MIKO INST HK	N/A	N/A	27/01/05
EM119	LISN	ROHDE & SCHWARZ	ESH3-Z5	0831.5518.52	14/10/04
EM127	ISOLATION TRANSFORMER 220 TO 300V	WING SUN	N/A	N/A	CM
EM142	PULSE LIMITER	ROHDE & SCHWARZ	ESH3Z2	357.8810.52	04/08/04
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	06/01/04
EM154	SHIELDING ROOM	SIEMENA MATSUSHITA COMPONENTS	N/A	803-740-057-99A	27/01/05
EM197	LISN	ETS-Linggren	4825/2	1193	05/06/04
EM213	DIGITAL POWER METER	VICNOBL	VIP120	00277	14/09/04

**Remarks:-**

CM Corrective Maintenance  
N/A Not Applicable or Not Available  
TBD To Be Determined

香港新界大埔工業村大宏街 10 號

10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong

Tel: (852) 2666 1888 Fax: (852) 2664 4353 Homepage: [www.hkstc.org](http://www.hkstc.org) E-mail: [hkstc@hkstc.org](mailto:hkstc@hkstc.org)  
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**Appendix B**

**Duty Cycle Correction During 100msec**

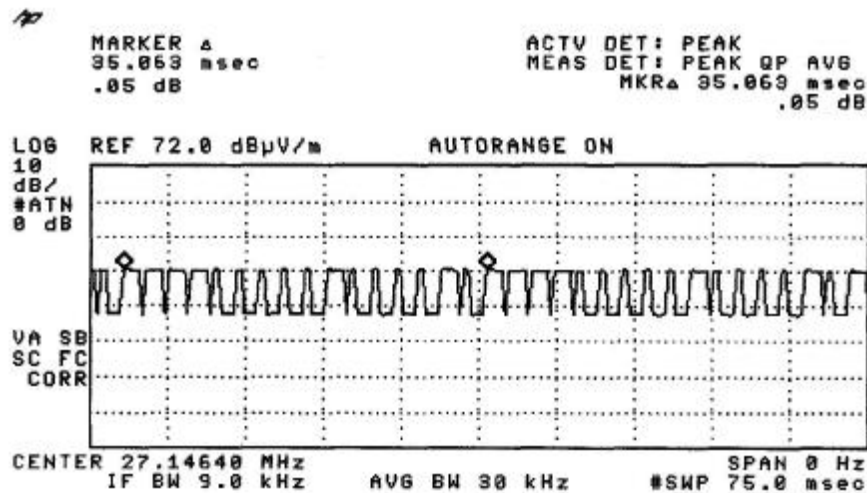
Each function key sends a different series of characters, but each packet period (35.063msec) never exceeds a series of 6 long (1.5msec) and 10 short (563µsec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered  $6 \times 1.5\text{msec} + 10 \times 563\mu\text{sec}$  per  $35.063\text{msec} = 41.7\%$  duty cycle. Figure A through C show the characteristics of the pulse train for one of these functions.

Remarks:

Duty Cycle Correction =  $20\text{Log}(0.417) = -7.5\text{dB}$

The following figures [Figure A to Figure C] show the characteristics of the pulse train for one of these functions.

Figure A [Pulse Train]



香港新界大埔工業村大宏街 10 號

10 Dai Wang Street, Tai Po Industrial Estate, N.T., Hong Kong

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Figure B [Long Pulse]

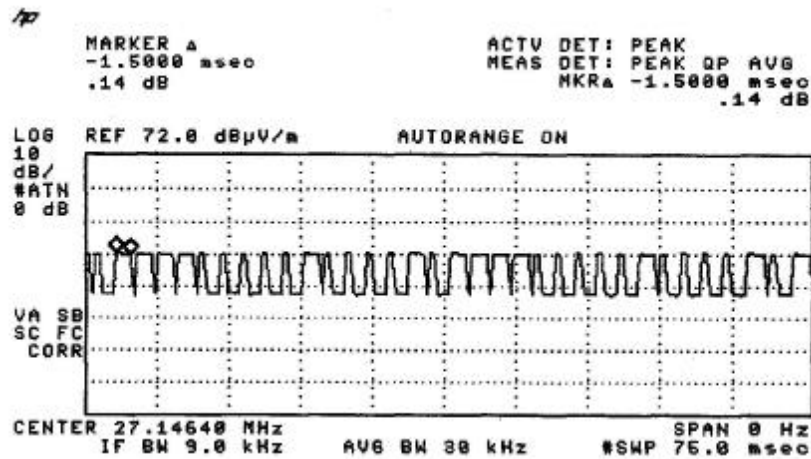
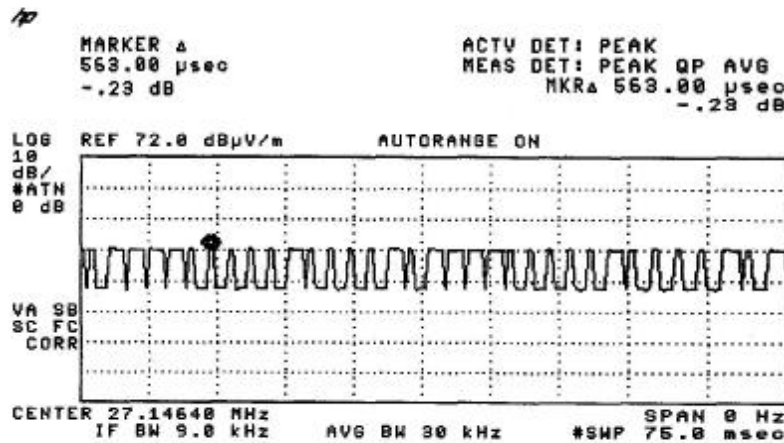


Figure C [Short Pulse]



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10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong

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**Appendix C**

**Photographs of EUT**

**Front View of the product**



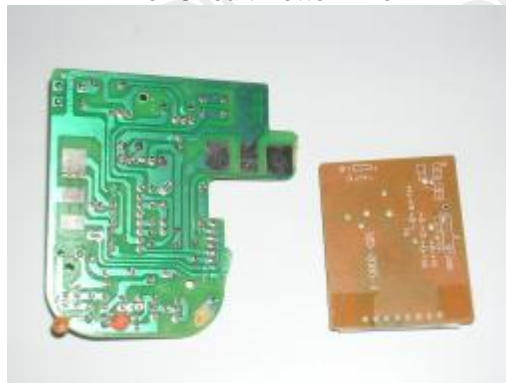
**Rear View of the product**



**Inner Circuit Top View**



**Inner Circuit Bottom View**



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10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong

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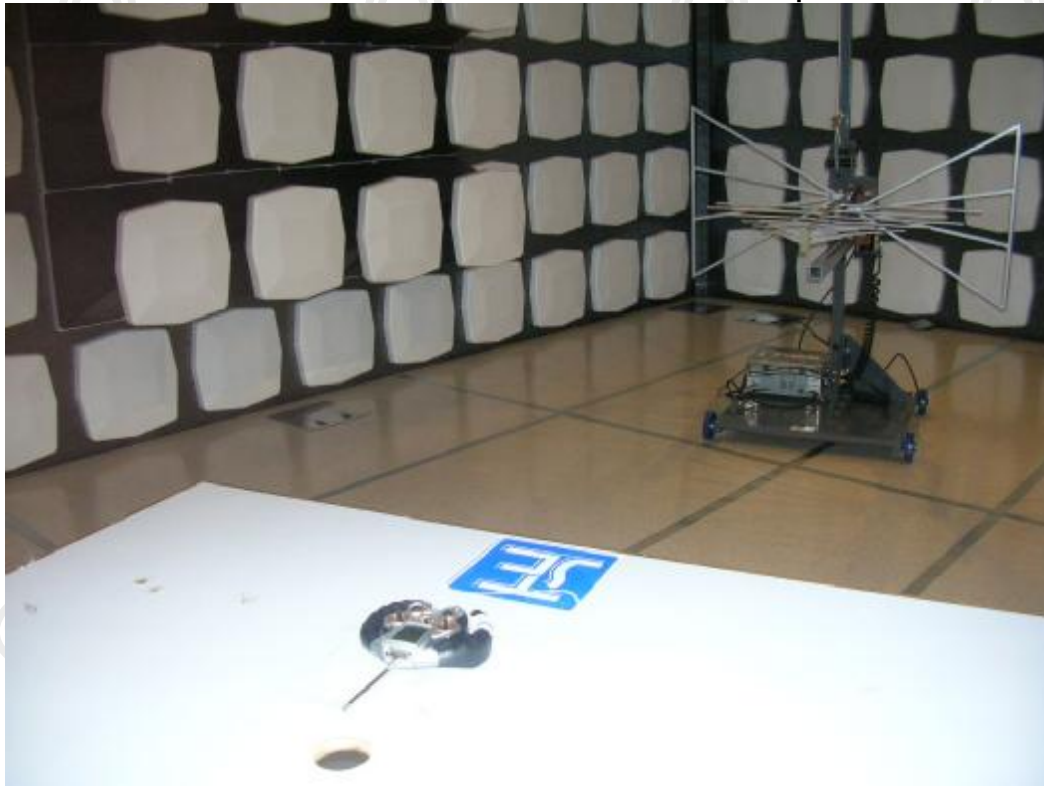
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Photographs of EUT

Measurement of Radiated Emission Test Set Up



\*\*\*\*\* End of Test Report \*\*\*\*\*

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