



FCC TEST REPORT

Part 15 subpart C

Client Information:

Applicant: MEKBAO PLASTIC ELECTRONIC INDUSTRIAL CO.,LTD

Applicant add.: Jiaoxi Industry Areas Lianxia Chenghai Shantou City, GD CHINA

Product Information:

Product Name: 360 degree spins double-side car

Product Description: Remote controller for toy car

Model No.: 5588-602

Derivative model No.: Details refer to page 6

Brand Name: N/A

FCC ID: 2AGUM-5588-602

Standards: CFR 47 PART 15 Subpart C: 2015 section 15.227

Test procedure used: ANSI C63.10-2009

Prepared By:

UL-CCIC Company Limited

Add. : Electronic Building, Parage Electronic Industrial Park, No. 8
Nanyun Er Road, Guangzhou Science Park, Guangzhou, 510663 China

Date of Receipt: Dec. 06, 2015

Date of Test: Dec. 06~ Dec. 16, 2015

Date of Issue: Dec. 24, 2015

Test Result: Pass

This device described above has been tested by Dongguan Yaxu (AiT) Technology Limited, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

*This test report must not be used by the client to claim product endorsement by any agency of the U.S. government.

Reviewed by: Lambert Tang

Approved by: Richard Si



1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2015-12-24		Original



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3 Test Summary

TEST	TEST REQUIREMENT	TEST METHOD	RESULT
Radiated Emission	FCC PART 15 C section 15.227	ANSI C 63.10: Clasue 6.4, 6.5	PASS
Occupied Bandwidth	FCC PART 15 C section 15.215	ANSI C 63.10 Clasue 6.9	PASS

Remark:

N/A: not applicable. Refer to the relative section for the details.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radio Frequency.

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, the maximum value of the uncertainty as below:

No.	Item	Uncertainty
1	Conducted Emission Test	1.20dB
2	Radiated Emission Test	3.30dB
3	RF power,conducted	0.16dB
4	RF power density,conducted	0.24dB
5	Spurious emissions,conducted	0.21dB
6	All emissions,radiated(<1G)	4.68dB
7	All emissions,radiated(>1G)	4.89dB



4 Test Facility

The test facility is recognized, certified or accredited by the following organizations:

.CNAS- Registration No: L6177

Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2005 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on Apr. 18, 2013

.FCC- Registration No: 248337

The 3m Semi-Anechoic Chamber, 3m/10m Open Area Test Site and Shielding Room of Dongguan Yaxu (AiT) Technology Limited have been registered by Federal Communications Commission (FCC) on Aug.29, 2014.

.Industry Canada(IC)-Registration No: IC6819A-1

The 3m Semi-Anechoic Chamber and 3m of Dongguan Yaxu (AiT) Technology Limited have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing on Oct. 01, 2014.

.VCCI- Registration No: 2705

The 3m/10m Open Area Test Site, Shielding Room and 3m Chamber of Dongguan Yaxu (AiT) Technology Limited have been registered by Voluntary Control Council for Interference on Nov. 21, 2012. The Telecommunication Ports Conducted Disturbance Measurement of Dongguan Yaxu (AiT) Technology Limited have been registered by Voluntary Control Council for Interference on May. 13, 2013.

4.1 Deviation from standard

None

4.2 Abnormalities from standard conditions

None



5 General Information

5.1 General Description of EUT

Manufacturer:	MEKBAO PLASTIC ELECTRONIC INDUSTRIAL CO.,LTD
Manufacturer Address:	Jiaoxi Industry Areas Lianxia Chenghai Shantou City,GD CHINA
EUT Name:	360 degree spins double-side car
Product Description:	Remote controller for toy car
Model No.:	5588-602
Derivative model No.:	5588-601, 5588-603,5588-604,5588-605,5588-606,5588-07,5588-608, 5588-609,5588-610,5588-611,5588-612,5588-613,5588-14,5588-615, 5588-616,5588-617,5588-618,5588-619,5588-620,10306,10307
Modulation Type and Antenna Type:	The Tx is a ASK modulation by internal signal with a integral antenna.
Antenna Gain:	0 dBi
Power Supply Range:	DC 3.0 V (2 x 1.5 V 'AA' batteries)
Power Supply:	DC 3.0 V (2 x 1.5 V 'AA' batteries)
Power Cord:	N/A
Signal Cable:	N/A
Model description:	According to the confirmation from the applicant, since the electrical circuit design, layout, components used and internal wiring were identical for the above items, only difference being the model numbers and exterior. Therefore only one item 5588-602 was tested in this report.

5.2 Test Location

All tests were performed at:

Dongguan Yaxu (AiT) Technology Limited

No.22, Jinqianling Third Street, Jitigang, Huangjiang,Dongguan, Guangdong, China

Tel.: +86.769.82020499 Fax.: +86.769.82020495



6 Equipment Used during Test

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	EMI Measuring Receiver	R&S	ESR	101660	2015.06.29	2016.06.28
2	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2015.06.29	2016.06.28
3	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2015.06.29	2016.06.28
4	Loop Antenna	ETS	6512	00165355	2015.06.29	2016.06.28
5	Radiated Cable 1# (30MHz-1GHz)	FUJIKURA	5D-2W	01	2015.01.04	2016.01.03
6	Conducted Cable 1#(9KHz-30MHz)	FUJIKURA	1D-2W	01	2015.01.04	2016.01.03
7	SMA Antenna connector	Dosin	Dosin-SMA	N/A	N/A	N/A

Note: The SMA antenna connector is soldered on the PCB board in order to perform conducted tests and this SMA antenna connector is listed in the equipment list.



7 Test Results

7.1 E.U.T. test conditions

Test Voltage: DC 3.0 V (new battery)

Requirements: **15.31(e)**: For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

Operating Environment:

Temperature: 22-25.0 °C

Humidity: 48-55% RH

Atmospheric Pressure: 1001-1010 mbar

Test frequencies and frequency range:

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

According to the 15.33 (a) For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

Remark: Test frequency is 27.145 MHz.

7.2 Antenna Requirement

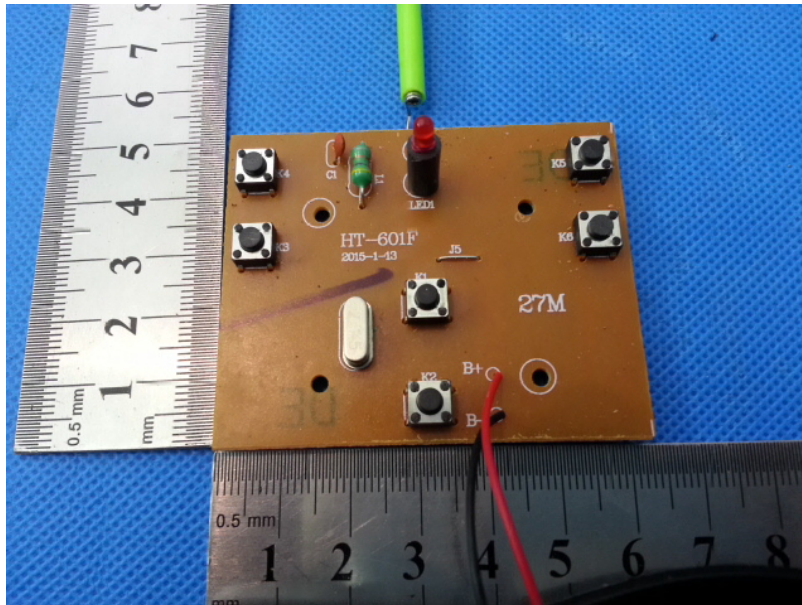
Standard requirement

15.203 requirement:

For intentional device. According to 15.203, 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.

EUT Antenna

The antenna is an integral Antenna integrated and no consideration of replacement. The best case gain of the antenna is 0 dBi.



Test result: The unit does meet the FCC requirements.



7.3 Radiated Emissions

Test Requirement: FCC Part 15 C section 15.227
Test Method: ANSI C63.10: Clause 6.4, 6.5 and 6.6
Measurement Distance: 3 m (Semi-Anechoic Chamber)
Test Status: Test in transmitting mode.

Requirements:

the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

15.227(a): The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

15.227(b) : The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

Out of band emissions shall not exceed:

Frequency range(MHz)	Quasi-peak limits dB ($\mu\text{V/m}$)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960	54
At transitional frequencies the lower limit applies.	

Test Procedure:

1) 9 kHz to 30 MHz emissions:

For testing performed with the loop antenna. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2) 30 MHz to 1 GHz emissions:

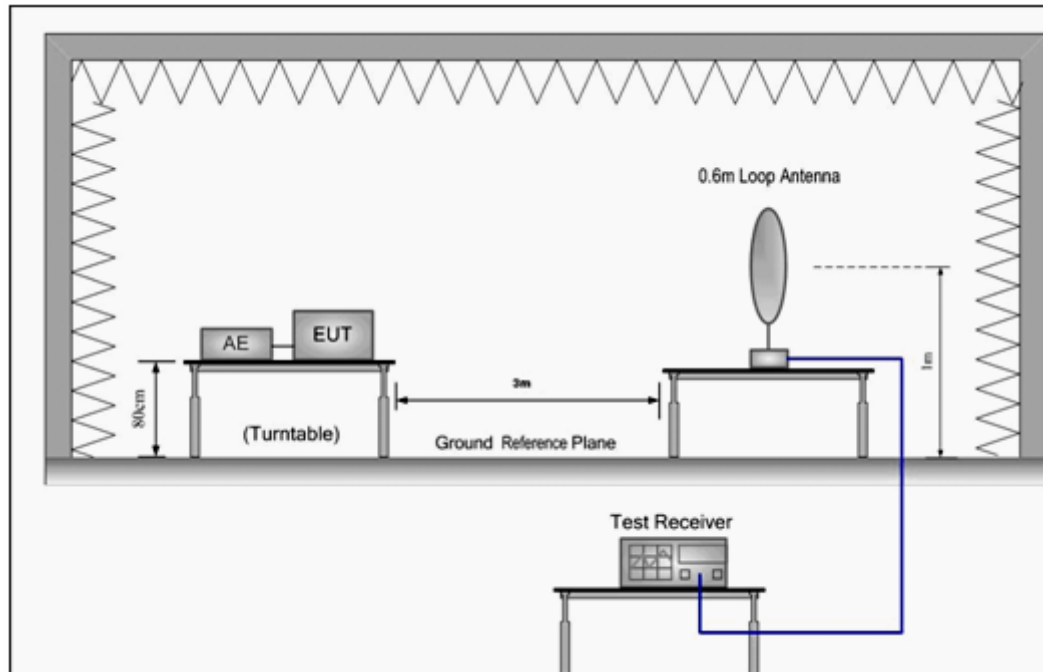
For testing performed with the bi-log type antenna. The measurement is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

Detector:

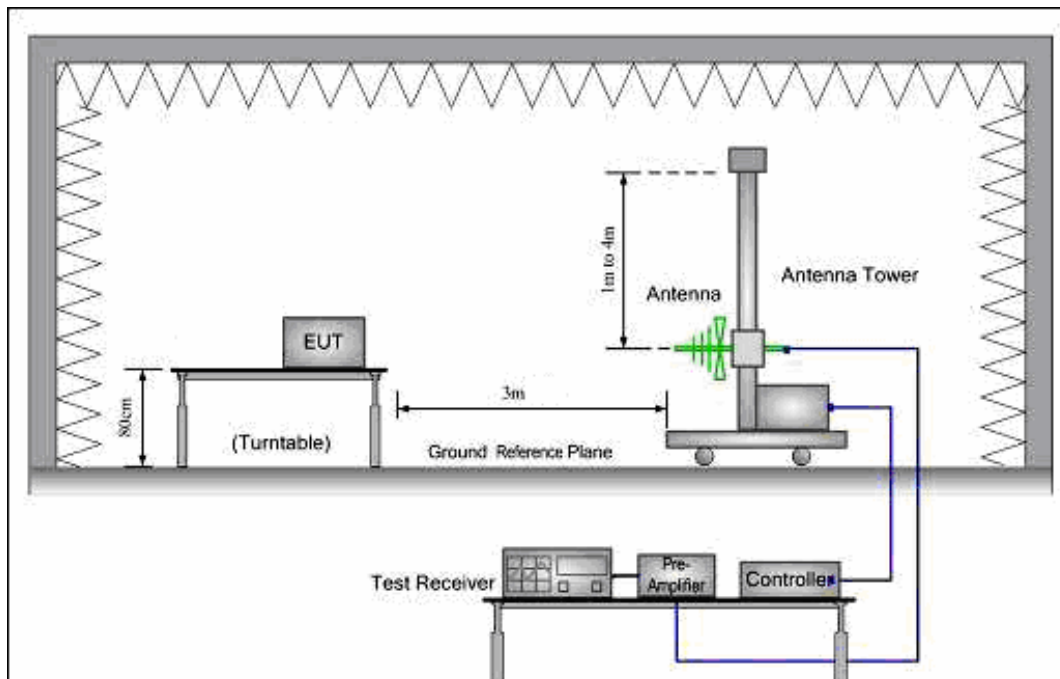
Test Receiver test setup	Detector	
	Peak	Average
RBW	120 kHz for $f < 1$ GHz	120 kHz for $f < 1$ GHz
VBW	$\geq$ RBW	$\geq$ RBW
Sweep	auto	auto
Detector function	peak	AV
Trace	max hold	max hold

Test Configuration:

- 1) 9 kHz to 30 MHz emissions:



- 2) 30 MHz to 1 GHz emissions:



**Fundamental emission:**

Antenna polarization: Vertical:						
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
27.145	95.85	-15.17	80.41	100.0	-19.59	Peak
27.145	83.62	-15.17	68.45	80.0	-11.55	Average
Antenna polarization: Horizontal:						
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
27.145	91.71	-15.17	76.54	100.0	-23.46	Peak
27.145	80.55	-15.17	65.38	80.0	-14.62	Average

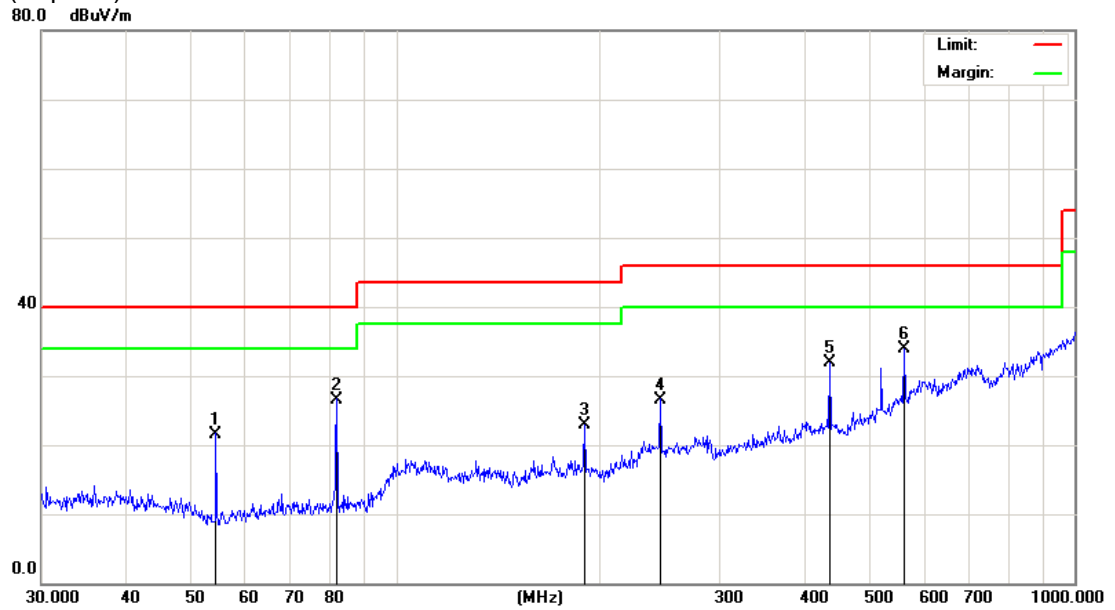
other emissions:**9 kHz~30 MHz Field Strength of Unwanted Emissions Measurement**

Antenna polarization: Vertical:						
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
0.0218	33.23	31.97	65.20	120.67	-55.47	Peak
0.2504	49.65	8.55	58.20	99.59	-41.39	Peak
0.3833	50.69	4.51	55.20	95.92	-40.72	Peak
0.8627	46.22	-1.92	44.30	68.89	-24.59	Peak
2.4267	50.48	-9.38	41.10	69.50	-28.40	Peak
11.5659	48.96	-16.36	32.60	69.50	-36.90	Peak
Antenna polarization: Horizontal:						
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
0.0412	30.28	28.62	58.90	115.17	-56.27	Peak
0.2172	51.14	10.06	61.20	100.82	-39.62	Peak
0.6626	47.46	0.24	47.70	71.18	-23.48	Peak
1.2942	48.44	-4.64	43.80	65.36	-21.56	Peak
3.3567	50.79	-12.19	38.60	69.50	-30.90	Peak
9.0677	49.68	-15.98	33.70	69.50	-35.80	Peak

**30 MHz~1 GHz Field Strength of Unwanted Emissions Measurement**

Vertical:

Peak scan

Level (dB μ V/m)

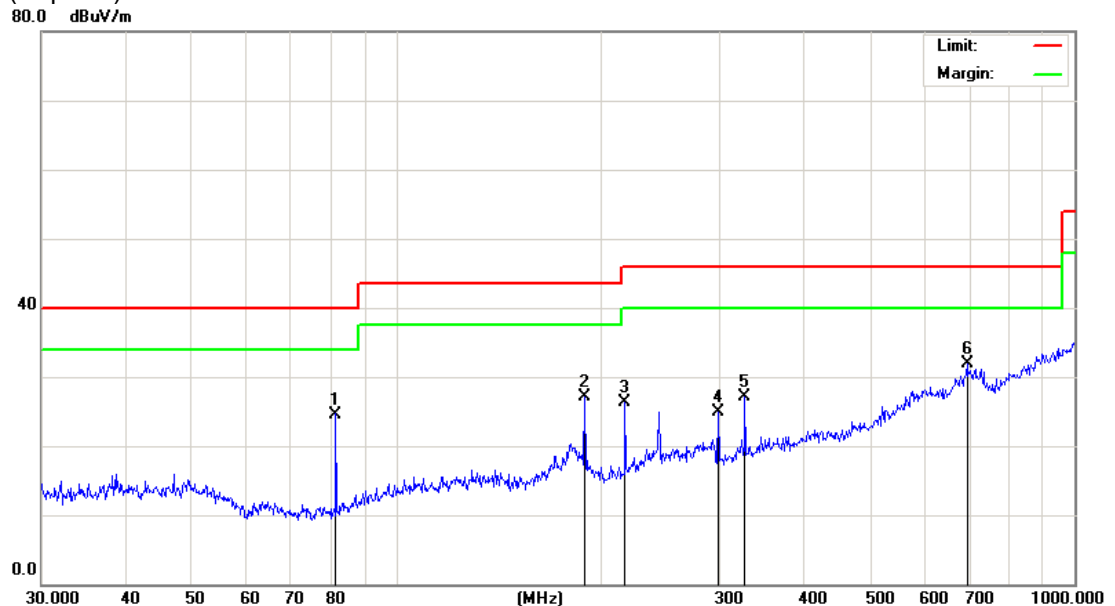
Quasi-peak measurement

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			
			dB μ V	dB	dB μ V/m	dB μ V/m	dB	Detector
1		54.2610	41.54	-19.94	21.60	40.00	-18.40	peak
2		81.7831	45.52	-18.92	26.60	40.00	-13.40	peak
3		189.7384	37.45	-14.55	22.90	43.50	-20.60	peak
4		245.0900	38.11	-11.51	26.60	46.00	-19.40	peak
5		435.5898	38.63	-6.63	32.00	46.00	-14.00	peak
6	*	560.6928	37.34	-3.44	33.90	46.00	-12.10	peak



Horizontal:

Peak scan

Level (dB μ V/m)

Quasi-peak measurement

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dB μ V	dB	dB μ V/m	dB μ V/m	dB	
1		81.4967	43.10	-18.50	24.60	40.00	-15.40	peak
2		189.7384	39.97	-12.77	27.20	43.50	-16.30	peak
3		217.5440	40.28	-13.98	26.30	46.00	-19.70	peak
4		298.2681	34.75	-9.75	25.00	46.00	-21.00	peak
5		326.7395	35.94	-8.74	27.20	46.00	-18.80	peak
6	*	694.4174	31.87	0.03	31.90	46.00	-14.10	peak

Remark:

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.



7.4 Occupied Bandwidth

Test Requirement: FCC Part 15 C section 15.215

Test Method: ANSI C63.10: Clause 6.9

Test Status: Test in transmitting mode.

Requirements:

15.215(c), Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Operation within the band: 26.96 – 27.28 MHz.

Test Procedure:

The useful radiated emission from the EUT was detected by the spectrum analyzer with peak detector. Record the 20 dB bandwidth of the carrier.

The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector. The vertical Scale is set to 10dB per division. The horizontal scale is set to 20KHz per division. Read the down 20dB bandwidth of the carrier.

Set the spectrum analyzer: start at 26.96MHz and stop at 27.28MHz

Set the spectrum analyzer: RBW = 1 kHz, VBW = 3 kHz

Sweep = auto; Detector Function = Peak. Trace = Max Hold.

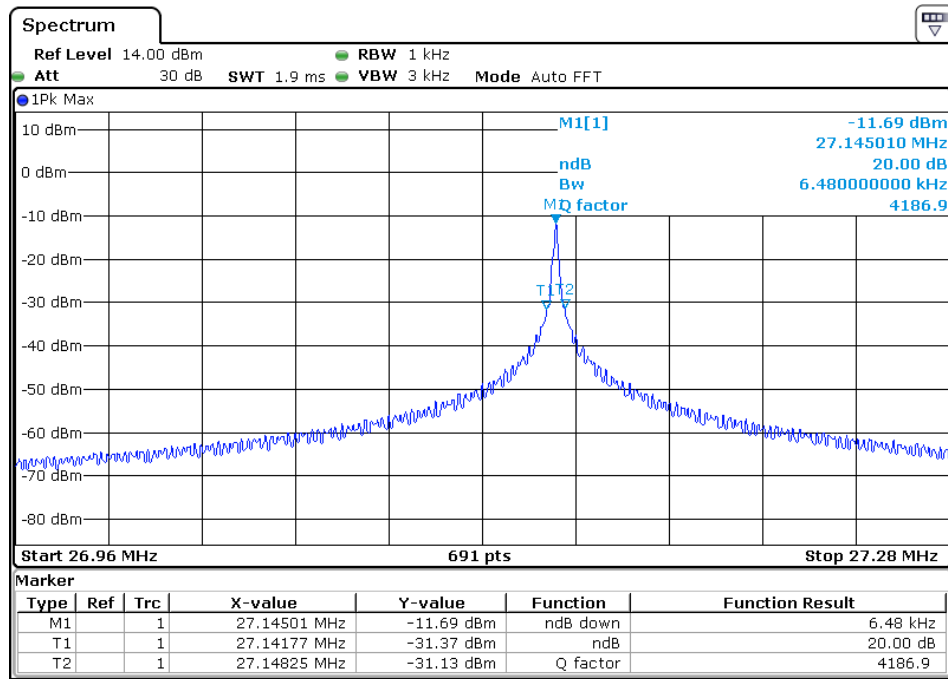
Mark the peak frequency and -20dB points bandwidth.



20dB bandwidth lower frequency: 27.14177MHz

20dB bandwidth upper frequency: 27.14825MHz

Test plot as below:

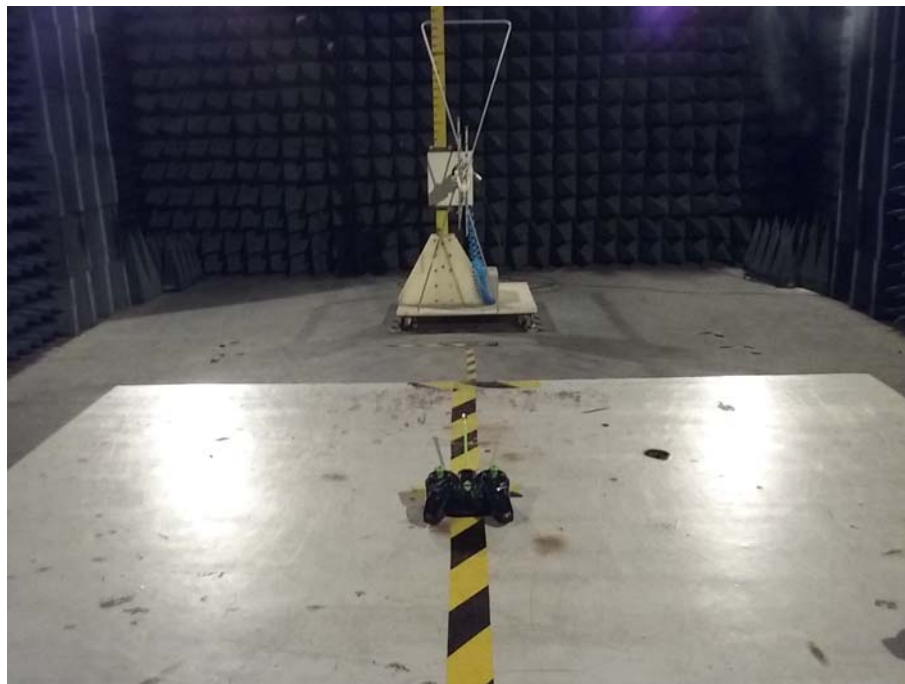


8 Photographs

8.1 Radiated Emission & Fundamental Emission (below 30 MHz)



8.2 Radiated Emission (30MHz-1GHz)



9 APPENDIX-Photographs of EUT Constructional Details

Model No.: 5588-602

Photo 1



Photo 2



Photo 3

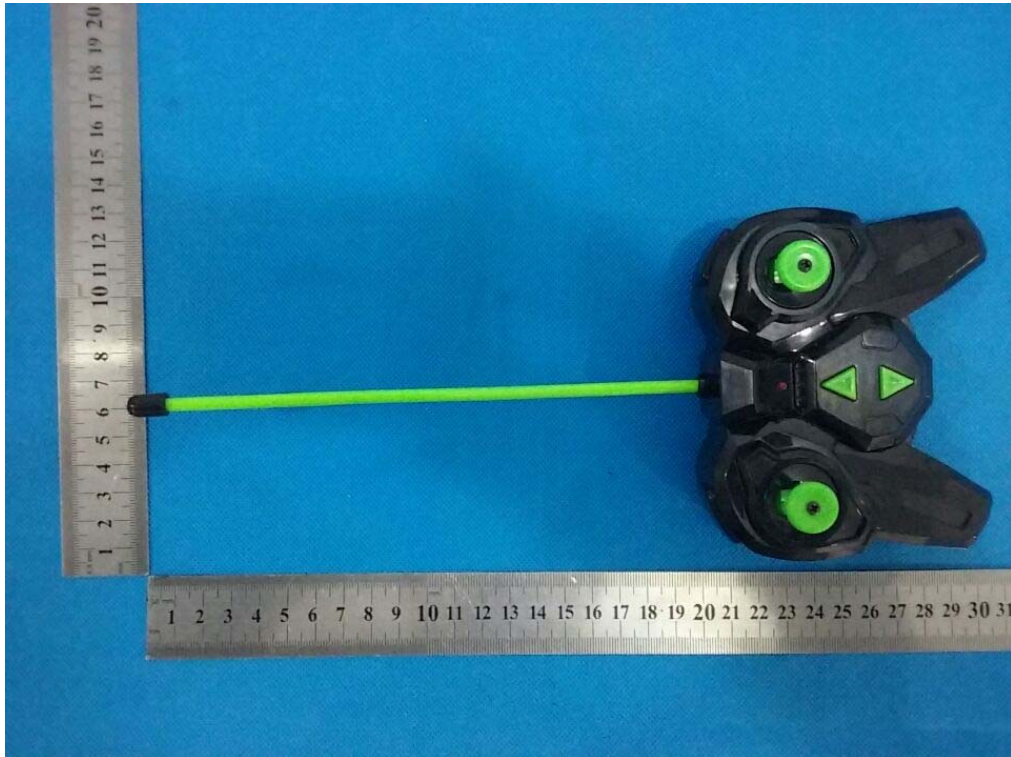


Photo 4



Photo 5



Photo 6

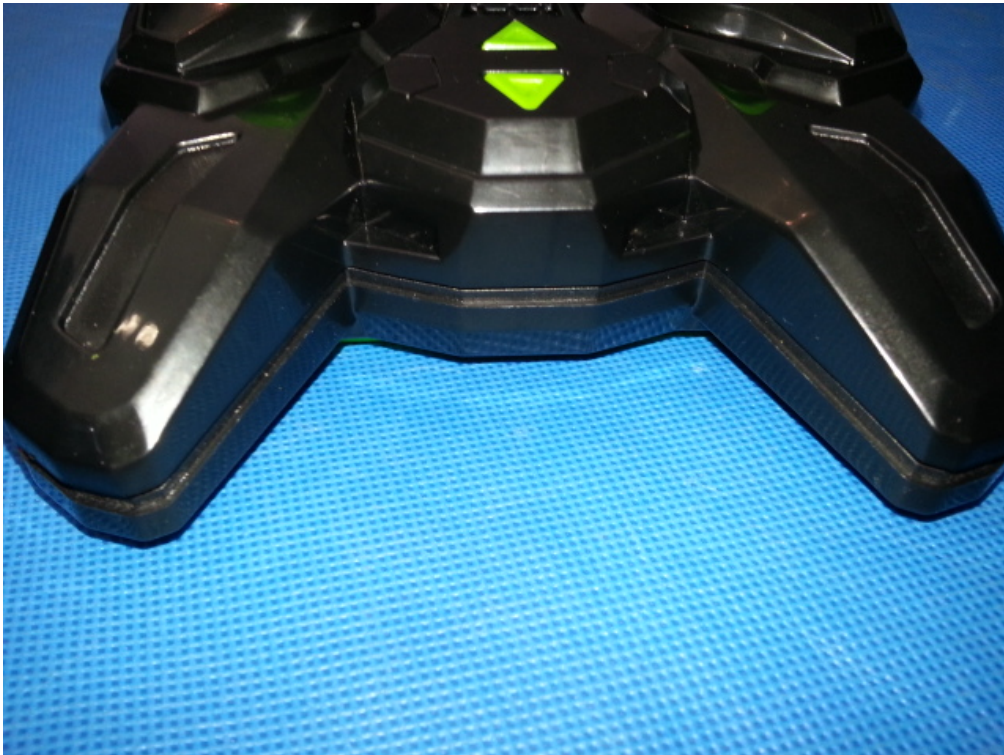


Photo 7



Photo 8



Photo 9

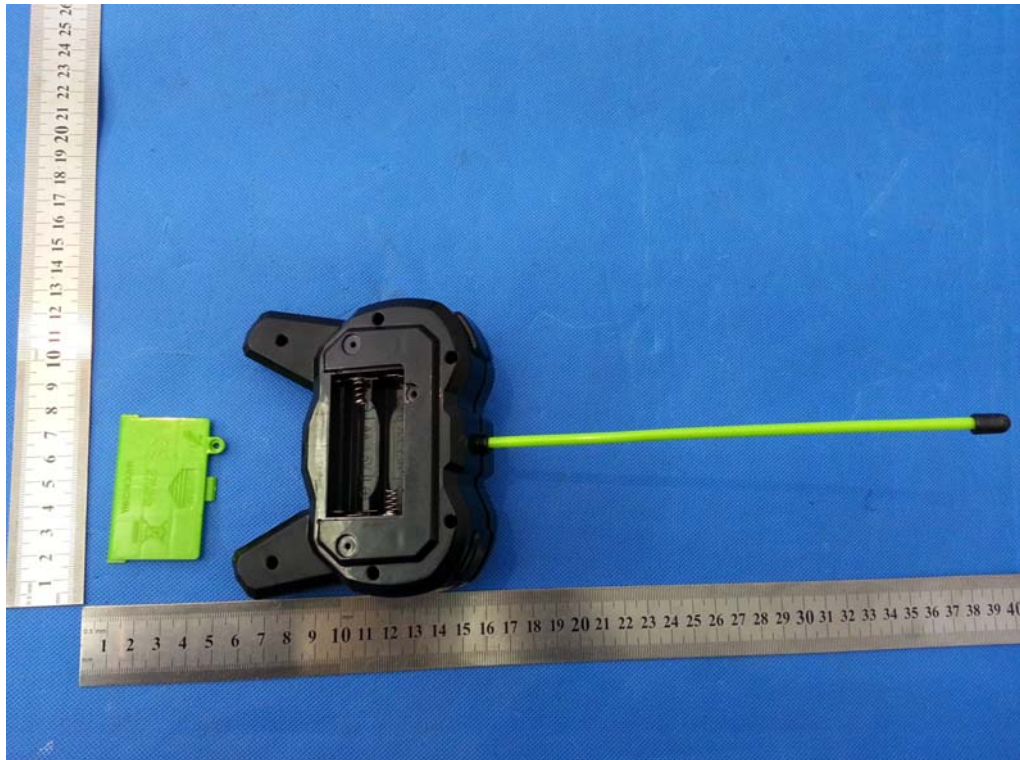


Photo 10



Photo 11

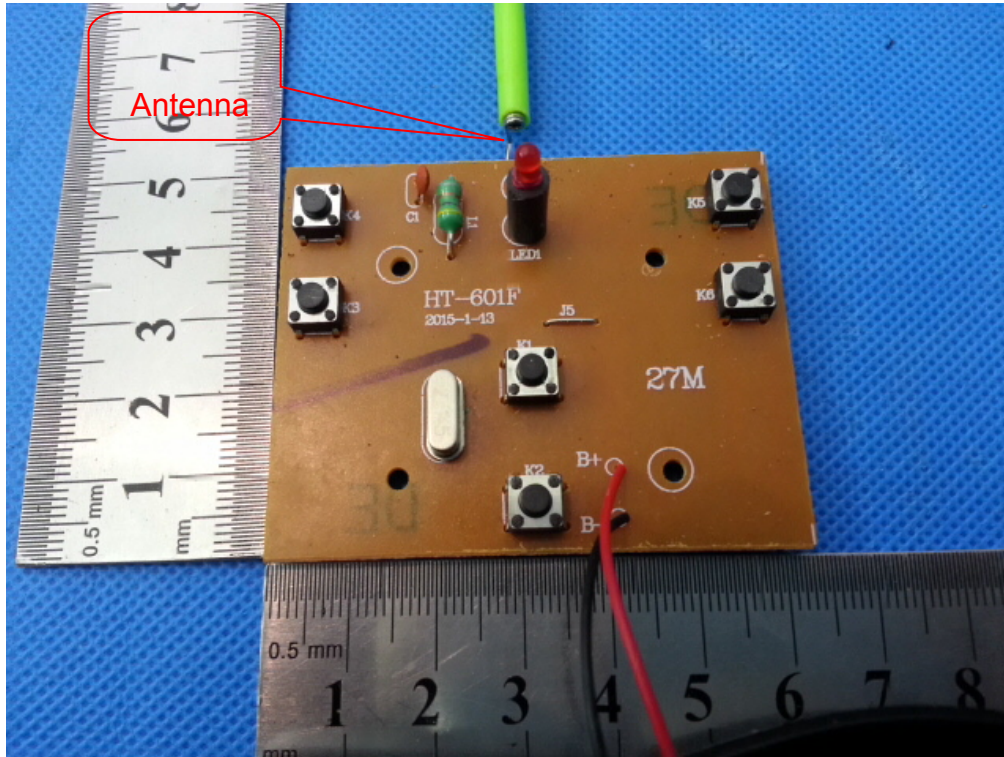
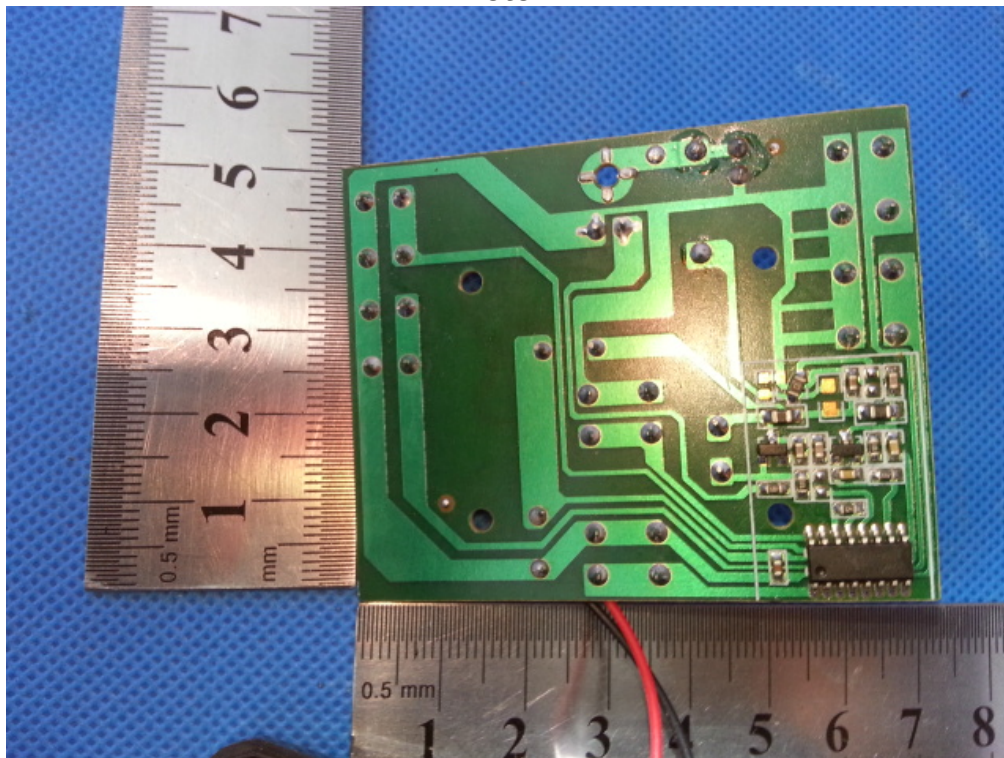


Photo 12



--The End of Report--