

## FCC TEST REPORT

**Product** : R/C Toys  
**Trade mark** : MaxTech  
**Model/Type reference** : MT24  
**Serial Number** : N/A  
**Ratings** : DC 9.6V  
**FCC ID** : XLA48500RX49  
**Report Number** : EESZE06140007-2  
**Date** : July 04, 2012  
**Regulations** : See below

Test Standards	Results
<input checked="" type="checkbox"/> 47 CFR FCC Part 15 Subpart B:2011	PASS

Prepared for:  
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Date:

Jun. 04, 2012

Lab manager



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(Note: N/A means not applicable)

## 1. GENERAL INFORMATION

**Applicant:** The Maya Group, Inc.  
 19823 Hamilton Ave, Torrance, California, 90502, USA

**Manufacturer:** The Maya Group, Inc.  
 19823 Hamilton Ave, Torrance, California, 90502, USA

**Equipment Authorization:** FCC Part 15 Certification

**FCC ID:** XLA48500RX49

**Product:** R/C Toys

**Trade mark:** MaxTech

**Model/Type reference:** MT24

**Serial Number:** Not Applicable

**Report Number:** EESZE06140007-2

**Date of Test:** June 14, 2012 to July 04, 2012

## 2. TEST SUMMARY

The EUT has been tested according to the following specifications:

Standard	Test Item	Test
FCC 15.107	Conducted Emission	Yes
FCC 15.109	Radiated Emission	Yes

## 3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted Emission	3.2
Radiated Emission	4.5

## 4. PRODUCT INFORMATION AND TEST SETUP

### 4.1. PRODUCT INFORMATION

**Ratings:** DC 9.6V

**Adapter information:** Model No.: HJ-UL-096250  
Input: AC120V 60Hz  
Output: DC 9.6V 250mA

**Product Description:** The equipment under test (EUT) is a receiver for a RC Car operating at 49.860 MHz. The EUT is powered by 9.6V DC. The EUT has a power switch. When the power switch is "ON", the EUT can be controlled to run forward, backward, turning left and right directions by the corresponding controller.

**Related Submittal(s) Grants:** This is a single application for certification of a receiver. The transmitter for this receiver is authorized by Certification procedure with FCC ID: XLA48500TX49.

### 4.2. TEST SETUP CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

**Notes:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

## 5. FACILITIES AND ACCREDITATIONS

### 5.1. TEST FACILITY

All test facilities used to collect the test data are located at Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4, CISPR 16-1-1 and other equivalent standards.

### 5.2. TEST EQUIPMENT LIST

**Instrumentation:** The following list contains equipments used at CTI for testing.

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

**Equipment used during the tests:**

Shielding Room No. 1 - Conducted Emission Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
Receiver	R&S	ESCI	100009	07/06/2012
LISN	R&S	ENV216	100098	07/06/2012

3M Semi-anechoic Chamber - Radiated Emission Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2012
Spectrum Analyzer	Agilent	E4440A	MY46185649	03/07/2013
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	401	07/06/2012
Multi device Controller	ETS-LINGREN	2090	00057230	N/A

**Support Equipment List:**

3M Semi-anechoic Chamber - Radiated Emission Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
Signal Generator	IFR	2023B	202307/883	03/07/2013

## 6. SYSTEM TEST CONFIGURATION

### 6.1. JUSTIFICATION

The system was configured for testing in a typical fashion (as a customer would normally use it), The EUT was placed on a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes in receiving mode and in the confines as outlined in ANSI C63.4 (2003).

The EUT was powered by 9.6V DC during test.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed.

The unit was operated standalone and placed in the center of the turntable when it works in receiving mode, and placed at the rear edge of the turntable when it works in charging mode (please see the setup photo).

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

### 6.2. EUT EXERCISING SOFTWARE

No Software was used during testing.

## 7. CONDUCTED EMISSION TEST

### 7.1. LIMITS

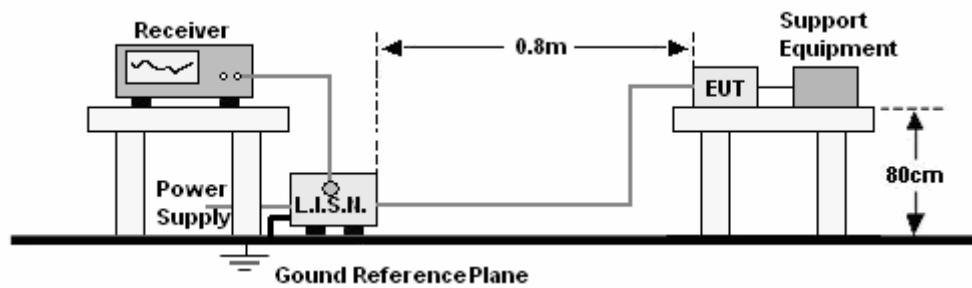
Limits for Class B digital devices

Frequency range (MHz)	Limits dB( $\mu$ V)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

NOTE: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

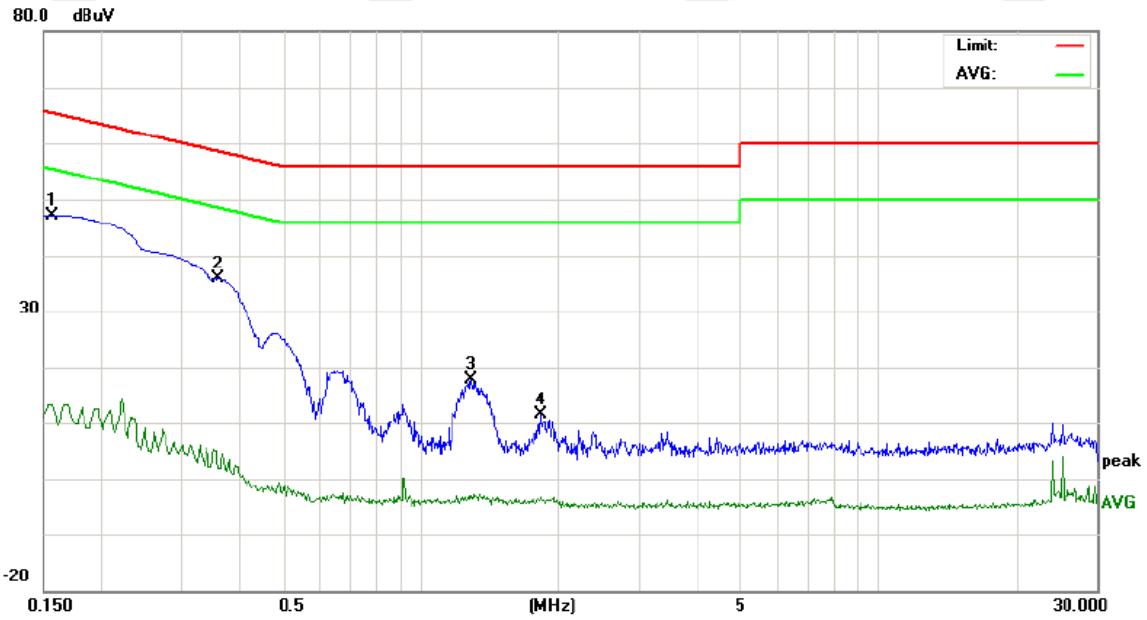
### 7.2. BLOCK DIAGRAM OF TEST SETUP



### 7.3. PROCEDURE OF CONDUCTED EMISSION TEST

- The EUT was placed on a nonconductive table above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N.).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from EUT in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

## 7.4. GRAPHS AND DATA



Site site #1 Phase: **L1** Temperature: 24

Limit: FCC Class B CE (QP) Power: AC 120V/60Hz Humidity: 58 %

EUT: R/C Toys

M/N: MT24

Mode: Charging

Note:

No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)			Margin (dB)		
		MHz	Peak	QP	Avg	Peak	QP	Avg	QP	Avg	QP	Avg	P/F	Comment
1	0.1580	37.25		3.32	10.00	47.25		13.32	65.56	55.56	-18.31	-42.24	P	
2	0.3620	25.97		-8.09	10.00	35.97		1.91	58.68	48.68	-22.71	-46.77	P	
3	1.2940	7.87		-13.0	9.90	17.77		-3.15	56.00	46.00	-38.23	-49.15	P	
4	1.8300	1.78		-13.6	9.90	11.68		-3.70	56.00	46.00	-44.32	-49.70	P	



Site site #1 Phase: **N** Temperature: 24

Limit: FCC Class B CE (QP) Power: AC 120V/60Hz Humidity: 58 %

EUT: R/C Toys

M/N: MT24

Mode: Charging

Note:

No.	Freq.	Reading Level (dBuV)			Correct Factor			Measurement (dBuV)			Limit (dBuV)			Margin (dB)	
		MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	0.1620	38.43		0.66	10.00	48.43		10.66	65.36	55.36	-16.93	-44.70	P		
2	0.3660	31.35		-4.78	10.00	41.35		5.22	58.59	48.59	-17.24	-43.37	P		
3	0.6660	23.13		-8.16	10.00	33.13		1.84	56.00	46.00	-22.87	-44.16	P		
4	1.2620	16.76		-11.7	9.90	26.66		-1.84	56.00	46.00	-29.34	-47.84	P		
5	1.7900	12.71		-12.7	9.90	22.61		-2.82	56.00	46.00	-33.39	-48.82	P		

## 8. RADIATED EMISSION TEST

### 8.1. LIMITS

**Limits for Class B digital devices**

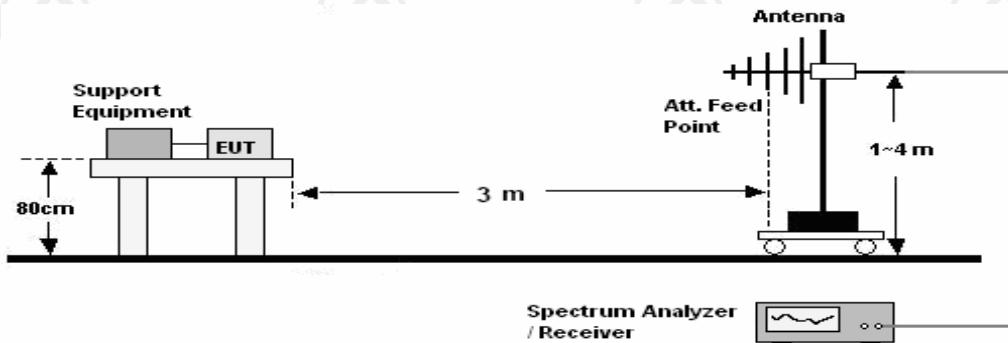
Frequency (MHz)	limits at 3m dB( $\mu$ V/m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

**NOTE:**

1. The lower limit shall apply at the transition frequency.
2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

### 8.2. BLOCK DIAGRAM OF TEST SETUP .

**30MHz ~ 1GHz:**



### 8.3. PROCEDURE OF RADIATED EMISSION TEST

#### FOR CHARGING MODE:

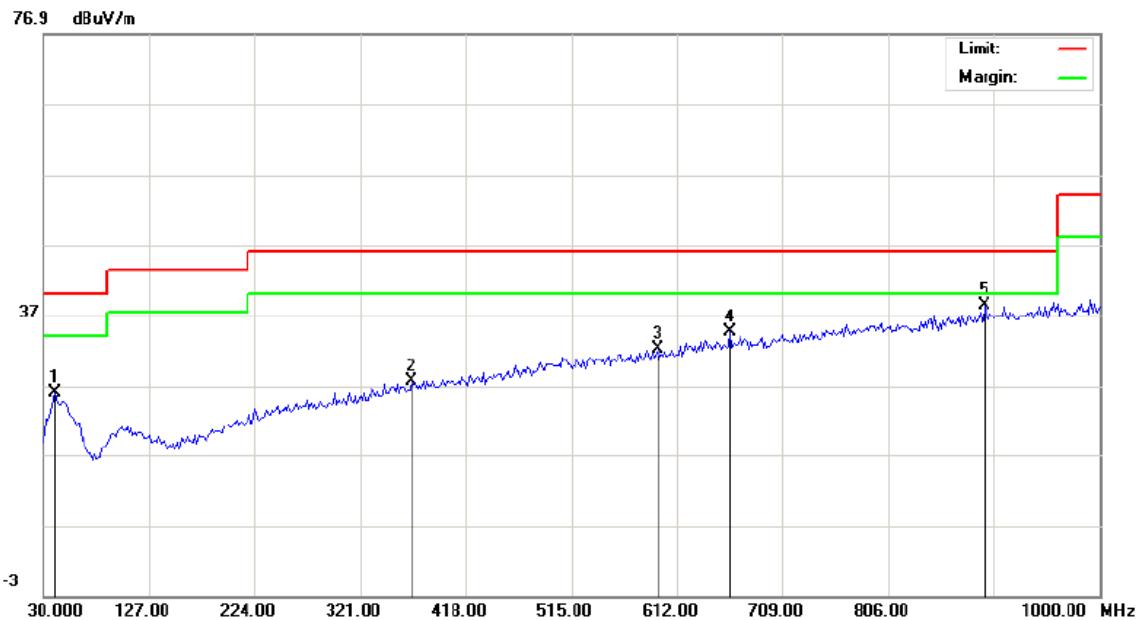
- a. The EUT was placed on the non-conductive turntable 0.8m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 100 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where EUT radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

### FOR RECEIVING MODE:

- a. The EUT was placed on the non-conductive turntable 0.8m above the ground at a chamber.
- b. Use a signal Generator to generate a 49.86MHz un-modulated CW signal to the super-regenerative receiver. And the signal level is from low signal about -80dBm up to -10dBm to sure the emission level which observed on the test receiver is not increased any more. Then begin testing.
- c. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 100 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- d. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where EUT radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

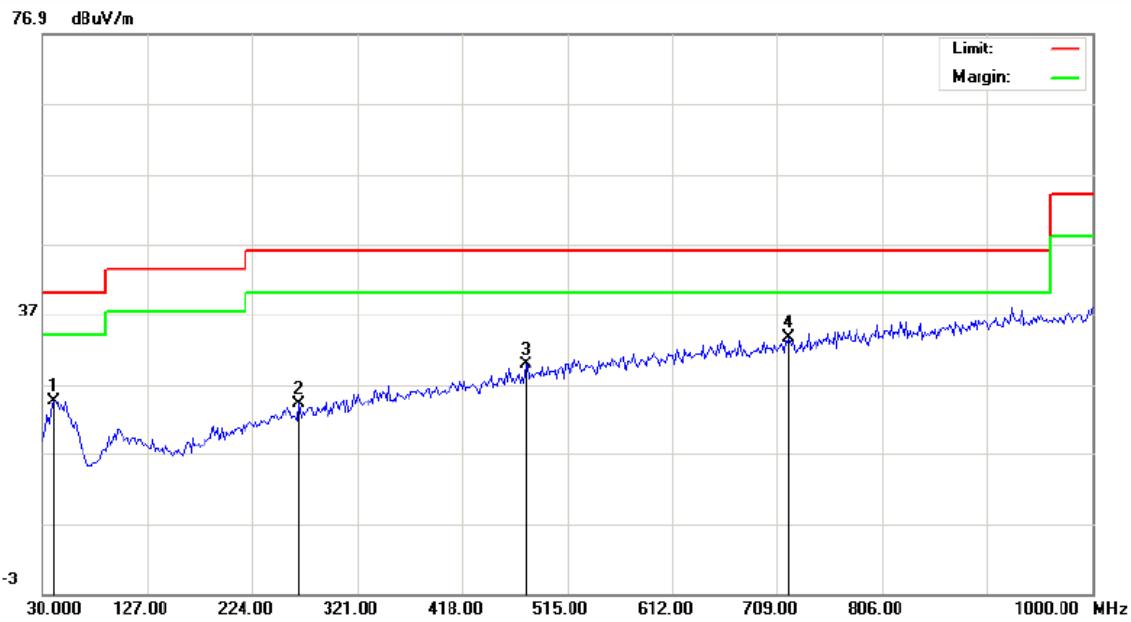
## 8.4. GRAPHS AND DATA

### FOR CHARGING DATA:



Site site #1  
 Polarization: **Horizontal** Temperature: 25  
 Limit: FCC PART15 B Power: AC 120V/60Hz Humidity: 58 %  
 EUT: R/C Toys  
 M/N: MT24  
 Mode: Charging  
 Note:

No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)			
		MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F
1	41.3167	8.88				17.16	26.04			40.00		-13.96		P
2	367.8833	9.41				18.12	27.53			46.00		-18.47		P
3	594.2167	9.30				22.85	32.15			46.00		-13.85		P
4	660.5000	10.49				24.09	34.58			46.00		-11.42		P
5	894.9167	10.99				27.40	38.39			46.00		-7.61		P



Site site #1 Polarization: **Vertical** Temperature: 25

Limit: FCC PART15 B Power: AC 120V/60Hz Humidity: 58 %

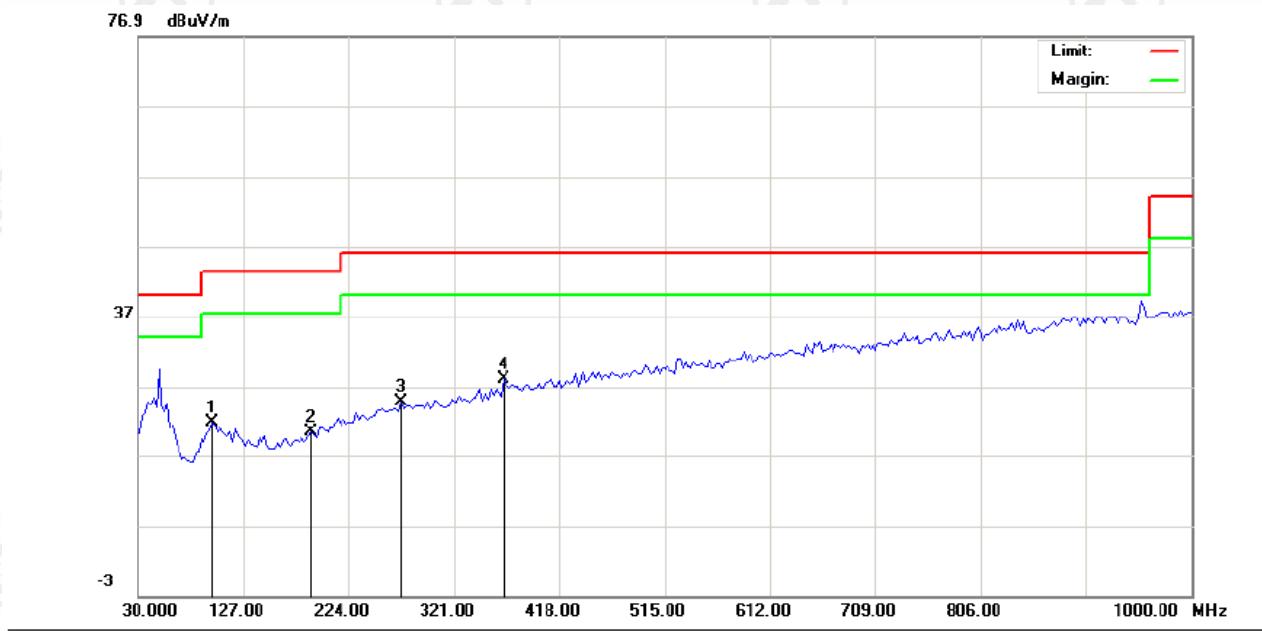
EUT: R/C Toys

M/N: MT24

Mode: Charging

Note:

No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		MHz	Peak	QP	Avg	dB	peak	QP	Avg	QP	Avg	QP	Avg	
1	41.3167	7.50				17.16	24.66			40.00		-15.34		P
2	267.6500	8.76				15.42	24.18			46.00		-21.82		P
3	476.2000	9.35				20.50	29.85			46.00		-16.15		P
4	720.3167	8.87				24.82	33.69			46.00		-12.31		P

**FOR RECEIVING DATA:**

Site site #1

Polarization: **Horizontal**

Temperature: 23

Limit: FCC PART15 B

Power: DC 9.6V

Humidity: 58 %

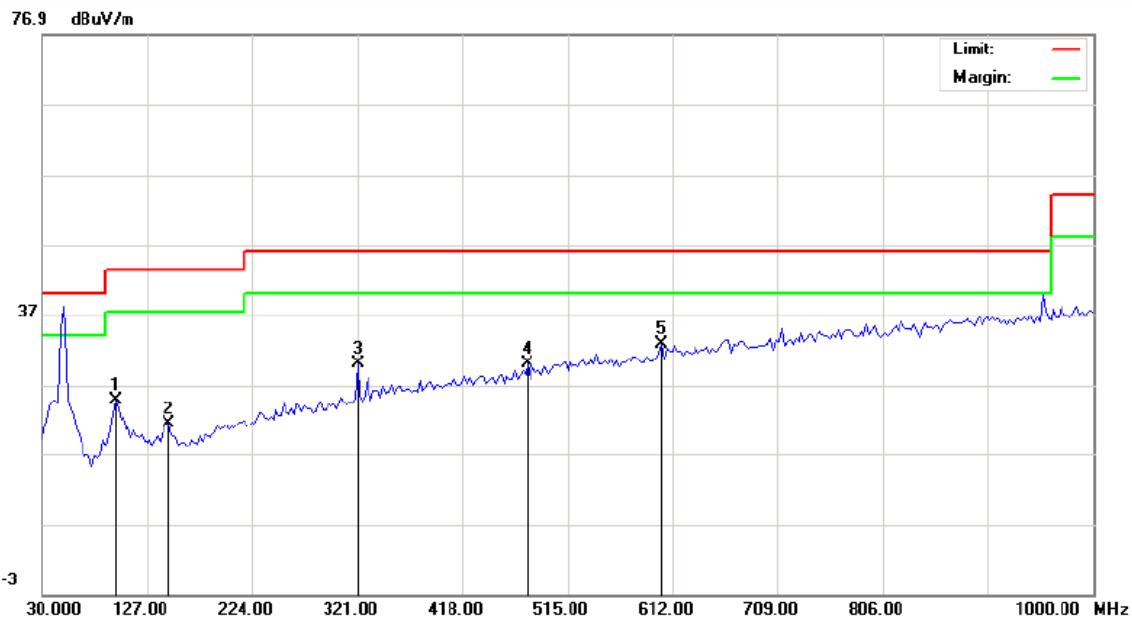
EUT: R/C Toys

M/N: MT24

Mode: RX

Note:

No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		MHz	Peak	QP		peak	QP	Avg	QP	Avg	QP	Avg		
1	97.9000	9.20			12.60	21.80			43.50		-21.70		P	
2	190.0500	8.25			12.20	20.45			43.50		-23.05		P	
3	272.5000	9.35			15.54	24.89			46.00		-21.11		P	
4	367.0750	9.90			18.11	28.01			46.00		-17.99		P	



Site site #1 Polarization: **Vertical** Temperature: 23

Limit: FCC PART15 B Power: DC 9.6V Humidity: 58 %

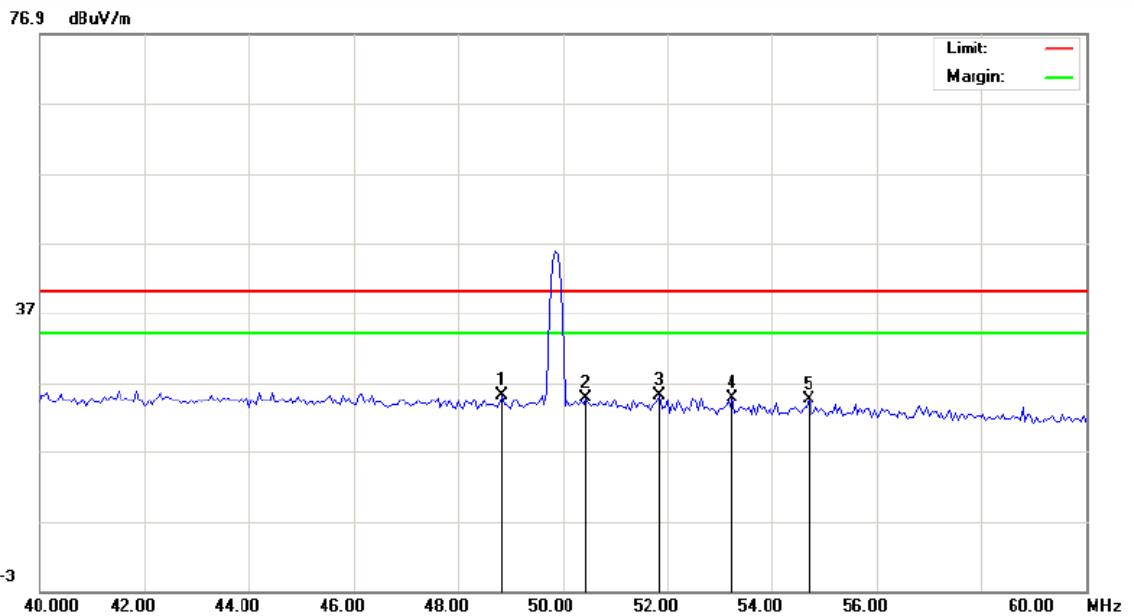
EUT: R/C Toys

M/N: MT24

Mode: RX

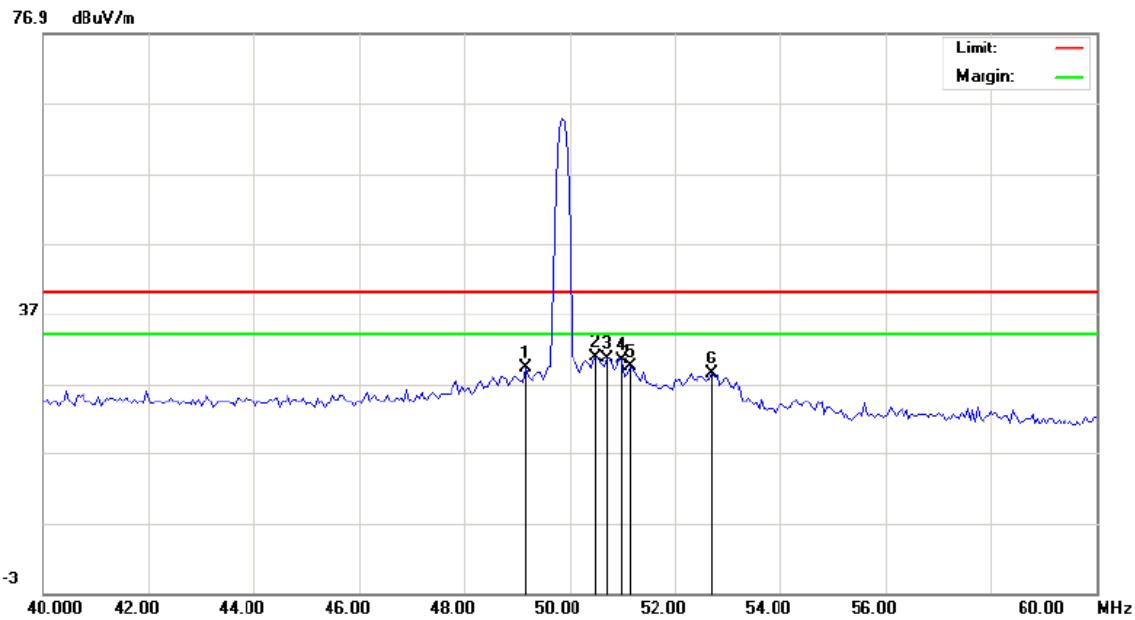
Note:

No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)	
		MHz	Peak	QP	AVG	peak	QP	AVG	QP	AVG	P/F	Comment
1	97.9000	12.15				12.60	24.75		43.50		-18.75	P
2	146.4000	11.17				10.22	21.39		43.50		-22.11	P
3	321.0000	13.10				16.86	29.96		46.00		-16.04	P
4	478.6250	9.43				20.56	29.99		46.00		-16.01	P
5	602.3000	9.87				23.02	32.89		46.00		-13.11	P



Site: site #1 Polarization: **Horizontal** Temperature: 23  
Limit: FCC PART15 B Power: DC 9.6V Humidity: 58 %  
EUT: R/C Toys  
M/N: MT24  
Mode: RX  
Note:

No.	Freq.	Reading_Level (dBuV)		Correct Factor	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)			
		MHz	Peak		QP	AVG	dB	peak	QP	Avg	QP	Avg	P/F
1	48.8500	8.74		16.46	25.20			40.00		-14.80		P	
2	50.4500	8.48		16.25	24.73			40.00		-15.27		P	
3	51.8500	9.31		15.94	25.25			40.00		-14.75		P	
4	53.2500	9.18		15.63	24.81			40.00		-15.19		P	
5	54.7000	9.38		15.30	24.68			40.00		-15.32		P	



Site site #1 Polarization: **Vertical** Temperature: 23

Limit: FCC PART15 B

Power: DC 9.6V

Humidity: 58 %

EUT: R/C Toys

M/N: MT24

Mode: RX

Note:

No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)	
		MHz	Peak	QP	AVG	peak	QP	AVG	QP	AVG	P/F	Comment
1	49.1500	12.79			16.43	29.22			40.00	-10.78		P
2	50.5000	14.50			16.24	30.74			40.00	-9.26		P
3	50.7000	14.44			16.19	30.63			40.00	-9.37		P
4	51.0000	14.24			16.13	30.37			40.00	-9.63		P
5	51.1500	13.34			16.09	29.43			40.00	-10.57		P
6	52.7000	12.60			15.75	28.35			40.00	-11.65		P

**Note 1:** The peak data of the fundamental frequency is below the average limit (please refer to the test graph as above), so the average data is deemed to fulfill the average limits and not reported.

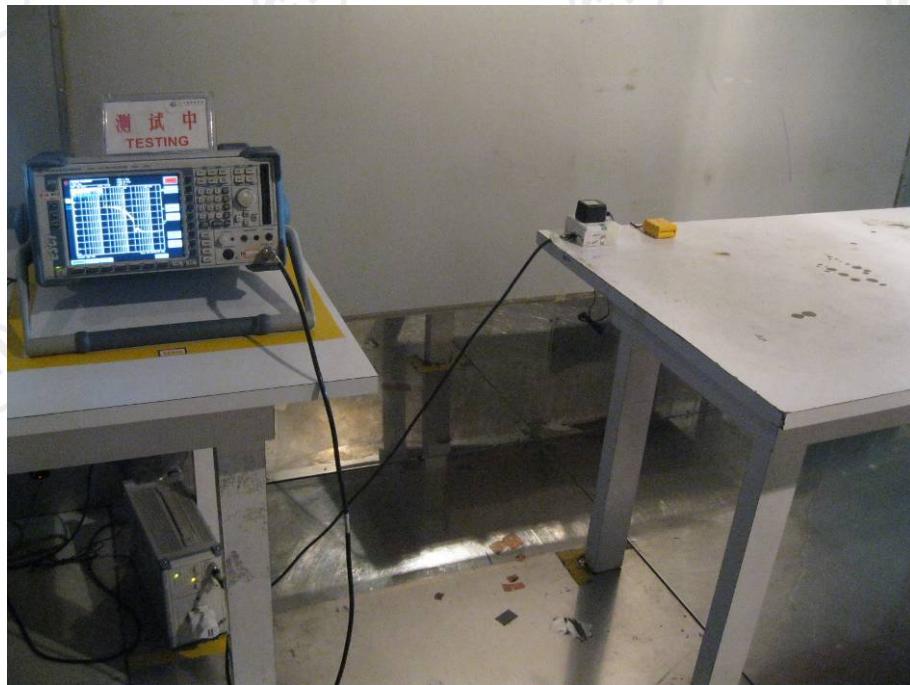
**Note 2:** The highest emission in the plot is from the signal generator, not from the EUT.

**Note 3:** The total factor = cable loss+ antenna factor.

Final Emission \_PK = Reading Level\_ PK+ total factor.

For example: The cable loss of 50.5MHz is 1.2dB and the antenna factor is 15.04dB, So, the Total factor=1.2+15.04=16.24dB

## APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



**CONDUCTED EMISSION TEST SETUP (FOR CHARGING MODE)**



**RADIATED EMISSION TEST SETUP (FOR CHARGING MODE)**



**RADIATED EMISSION TEST SETUP (FOR RECEIVING MODE)**

## APPENDIX 2 EXTERNAL PHOTOGRAPHS OF EUT



View of EUT-1

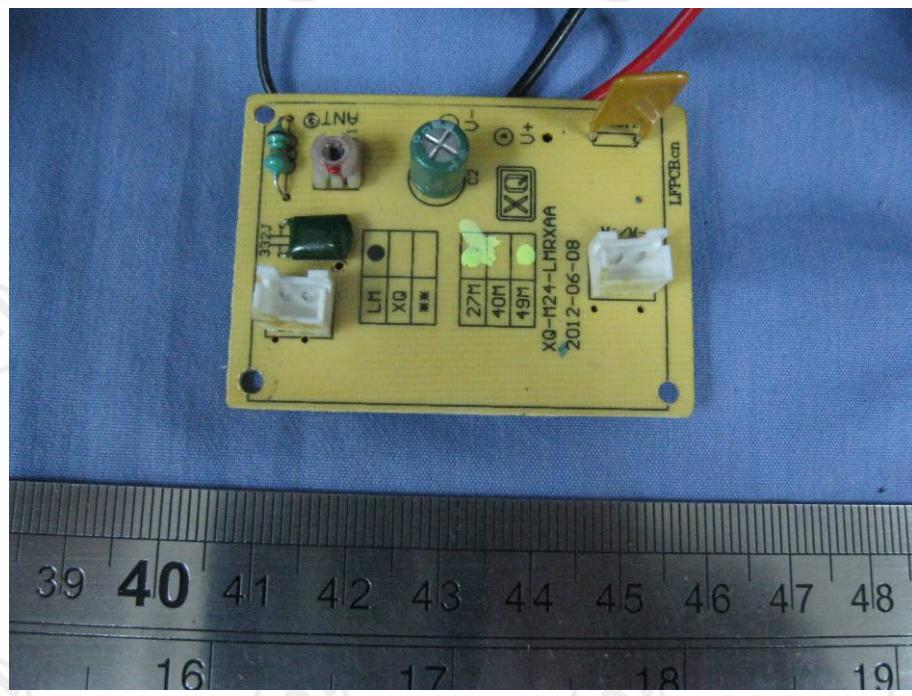


View of EUT-2

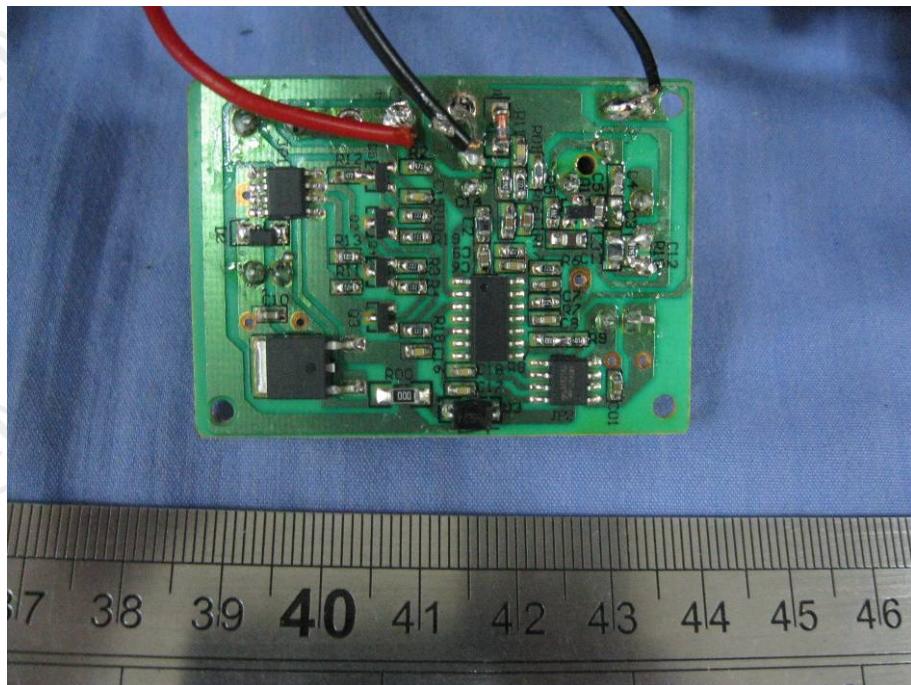
### APPENDIX 3 INTERNAL PHOTOGRAPHS OF EUT



View of EUT-1



View of EUT-2



View of EUT-3

\*\*\* End of report \*\*\*

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.