



## **TEST REPORT**

Report No. : AJ021978-001 Date : 2007 August 14

Application No. : LJ217764(5)

Applicant : Lung Cheong Toys Ltd.  
Lung Cheong Building,  
1 Lok Yip Road,  
Fanling, Hong Kong

Sample Description : One(1) submitted sample(s) stated to be Spidermen Monster Truck  
of Model No. 60-259  
Radio Frequency : 27.145MHz Transmitter  
Rating : 1 x 9V size battery  
No. of submitted sample : Two (2) piece(s) \*\*\*

Date Received : 2007 July 16

Test Period : 2007 July 18 – 2007 July 20

Test Requested : FCC Part 15 Certification.

Test Method : 47 CFR Part 15 (10-1-05 Edition)  
ANSI C63.4 – 2003

Test Result : See attached sheet(s) from page 2 to 14.

Conclusion : The submitted sample was found to comply with requirement of FCC Part 15  
Subpart C.

Remark : The transmitter contains three control bands and all bands were measured.

*For and on behalf of*  
CMA Industrial Development Foundation Limited

Authorized Signature : \_\_\_\_\_

Danny Chui  
Deputy Manager - EL. Division

FCC ID: P73SPIDERMEN7T

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### **1 General Information**

#### **1.1 General Description**

The equipment under test (EUT) is a transmitter for Spidermen Monster Truck. It operates at 27.145MHz and the oscillation of radio control is generated by a crystal. The EUT is powered by 1 x 9V size battery. There are two control sticks on the EUT. When the forward, backward, turn right or turn left stick is pressed, it will transmit different radio control signal to the receiver.

The brief circuit description is listed as follows:

- Q3 and associated circuit act as a RF amplifier.
- X1, Q2 and associated circuit act as an oscillator.
- X2, U1 and associated circuit act as an encoder.
- D2 and associated circuit act as a voltage regulator.



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### **1.2 Location of the test site**

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. A Semi-Anechoic Chamber Testing Site is set up for investigation and located at:

Ground Floor, Yan Hing Centre,  
9 – 13 Wong Chuk Yeung Street,  
Fo Tan, Shatin,  
New Territories,  
Hong Kong.

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2003. A shielded room is located at :

Ground Floor, Yan Hing Centre,  
9 – 13 Wong Chuk Yeung Street,  
Fo Tan, Shatin,  
New Territories,  
Hong Kong.



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### **1.3 List of measuring equipment**

Equipment	Manufacturer	Model No.	Serial No.	Calibration Due Date
EMI Test Receiver	R&S	ESCI	100152	2007 September 20
Broadband Antenna	Schaffner	CBL6112B	2718	2008 May 23
Loop Antenna	EMCO	6502	00056620	2008 April 18



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### **2 Description of the radiated emission test**

#### **2.1 Test Procedure**

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1 m above the ground.

The device was rotated through three orthogonal axes to determine which attitude and configuration produce the highest emission during measurement.

#### **2.2 Test Result**

Peak Detector data was measured unless otherwise stated.

“#” means emissions appearing within the restricted bands shall follow the requirement of section 15.205.

It was found that the EUT meet the FCC requirement.



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### **2.3 Radiated Emission Measurement Data**

#### **Radiated emission**

**pursuant to**

**the requirement of FCC Part 15 subpart C**

#### **Band A**

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB $\mu$ V/m)	Antenna and Cable factor (dB)	Average Factor (dB)	Field Strength (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
27.145	V	64.2	9.0	-14.5	58.7	80.0	-21.3
54.290	V	21.4	8.4	-	29.8	40.0	-10.2
81.435	H	9.2	7.3	-	16.5	40.0	-23.5
#108.580	H	9.3	11.1	-	20.4	43.5	-23.1
#135.725	H	9.2	12.6	-	21.8	43.5	-21.7
#162.870	H	8.2	10.7	-	18.9	43.5	-24.6
190.015	H	9.5	9.5	-	19.0	43.5	-24.5
217.160	H	8.6	9.8	-	18.4	46.0	-27.6
#244.305	H	15.8	9.8	-	25.6	46.0	-20.4
#271.450	H	7.8	13.9	-	21.7	46.0	-24.3



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### **2.3 Radiated Emission Measurement Data (Con't)**

#### **Radiated emission**

**pursuant to**

**the requirement of FCC Part 15 subpart C**

#### **Band B**

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB $\mu$ V/m)	Antenna and Cable factor (dB)	Average Factor (dB)	Field Strength (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
27.145	V	64.3	9.0	-22.5	50.8	80.0	-29.2
54.290	V	21.8	8.4	-	30.2	40.0	-9.8
81.435	H	8.0	7.3	-	15.3	40.0	-24.7
#108.580	H	9.1	11.1	-	20.2	43.5	-23.3
#135.725	H	7.9	12.6	-	20.5	43.5	-23.0
#162.870	H	9.8	10.7	-	20.5	43.5	-23.0
190.015	H	8.7	9.5	-	18.2	43.5	-25.3
217.160	H	9.6	9.8	-	19.4	46.0	-26.6
#244.305	H	10.9	9.8	-	20.7	46.0	-25.3
#271.450	H	8.3	13.9	-	22.2	46.0	-23.8





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### **2.3 Radiated Emission Measurement Data (Con't)**

#### **Radiated emission**

**pursuant to**

**the requirement of FCC Part 15 subpart C**

#### **Band C**

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB $\mu$ V/m)	Antenna and Cable factor (dB)	Average Factor (dB)	Field Strength (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
27.145	V	64.5	9.0	-22.9	50.6	80.0	-29.4
54.290	V	21.6	8.4	-	30.0	40.0	-10.0
81.435	H	10.6	7.3	-	17.9	40.0	-22.1
#108.580	H	9.1	11.1	-	20.2	43.5	-23.3
#135.725	H	6.3	12.6	-	18.9	43.5	-24.6
#162.870	H	7.8	10.7	-	18.5	43.5	-25.0
190.015	H	7.3	9.5	-	16.8	43.5	-26.7
217.160	H	10.6	9.8	-	20.4	46.0	-25.6
#244.305	H	13.2	9.8	-	23.0	46.0	-23.0
#271.450	H	7.6	13.9	-	21.5	46.0	-24.5



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### **3 Description of the Line-conducted Test**

#### **3.1 Test Procedure**

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2003. The EUT was setup as described in the procedures, and both lines were measured.

#### **3.2 Test Result**

No measurement is required as the EUT is a battery-operated product.

#### **3.3 Graph and Table of Conducted Emission Measurement Data**

Not Applicable



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### **4 Photograph**

#### **4.1 Photographs of the Test Setup for Radiated Emission and Conduction Emission**

For electronic filing, the photos are saved with filename TSup1.jpg to TSup2.jpg

#### **4.2 Photographs of the External and Internal Configurations of the EUT**

For electronic filing, the photos are saved with filename ExPho1.jpg to ExPho2.jpg and InPho1.jpg to InPho2.jpg.



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### **5 Supplementary document**

The following document were submitted by applicant, and for electronic filing, the document are saved with the following filenames:

<b>Document</b>	<b>Filename</b>
ID Label/Location	LabelSmp.jpg
Block Diagram	BlkDia.pdf
Schematic Diagram	Schem.pdf
Users Manual	UserMan.pdf
Operational Description	OpDes.pdf

#### **5.1 Bandwidth**

The plot on saved in TestRpt2.pdf shows the fundamental emission is confined in the specified band. It also shows that the band edge met the 15.209 requirement at 26.9599 and 27.2801 MHz.

#### **5.2 Duty cycle**

The duty cycle is simply the on-time divided by the period:

##### **Band A**

The duration of one cycle = 100.00ms

Effective period of the cycle =  $0.41\text{ms} \times 10 + 0.21\text{ms} \times 70$   
= 18.80ms

Duty Cycle =  $18.80\text{ms} / 100.00\text{ms}$   
= 0.19

Therefore, the average factor is found by  $20 \log_{10} 0.19 = -14.5\text{dB}$



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### **Band B**

The duration of one cycle = 100.00ms

Effective period of the cycle =  $0.41\text{ms} \times 4 + 0.21\text{ms} \times 28$   
= 7.52ms

Duty Cycle =  $7.52\text{ms} / 100.00\text{ms}$   
= 0.08

Therefore, the average factor is found by  $20 \log_{10} 0.08 = -22.5\text{dB}$

### **Band C**

The duration of one cycle = 50.76ms

Effective period of the cycle =  $0.41\text{ms} \times 4 + 0.20\text{ms} \times 10$   
= 3.64ms

Duty Cycle =  $3.64\text{ms} / 50.76\text{ms}$   
= 0.07

Therefore, the average factor is found by  $20 \log_{10} 0.07 = -22.9\text{dB}$

### **5.3 Transmission time**

Not Applicable

### **5.4 Power Spectral Density**

Not Applicable



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### **6 Appendices**

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A3.	Photos of Internal Configurations	1	page
A4.	ID Label/Location	1	page
A5.	Bandwidth Plot	2	pages
A6.	Average Factor	6	pages
A7.	Block Diagram	1	page
A8.	Schematics Diagram	1	page
A9.	User Manual	4	pages
A10.	Operation Description	1	page

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