



## **TEST REPORT**

Report No. : AF000682-001 Date : 2005 January 05

Applicant No. : LE203382(7)

Applicant : Apple Toys Development Co Ltd  
Rm 1709, 17/F, Rise Comm. Bldg,  
5-11 Granville Circuit,  
TST, KLN, HK

Sample Description : One(1) submitted sample stated to be R/C Car of Model No. TX001  
Rating : 2 x 1.5V "AA" size battery  
No. of sample(s) : One (1) piece \*\*\*

Date Received : 2004 December 07

Test Period : 2004 December 07 – 2005 January 04

Test Requested : FCC Part 15 Certification

Test Method : FCC Rules and Regulations Part 15 – April 2004  
ANSI C63.4 – 2003

Test Result : See attached sheet(s) from page 2 to 11.

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

*For and on behalf of*  
CMA Testing and Certification Laboratories

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

Danny Chui  
EMC Engineer - EL. Division

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## **TEST REPORT**

FCC ID : SUJ9008-9900

Report No. : AF000682-001

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### **1 General Information**

#### **1.1 General Description**

The equipment under test (EUT) is a transmitter for R/C Car. Operating at 27.145 MHz which is controlled by a crystal. The EUT is powered by 2 x 1.5V "AA" size battery. There are two control sticks in the front of EUT. When the forward or backward stick pressed once, it will transmit a radio frequency for receiver go forward or backward. When the turn left or turn right stick pressed once, it will transmit a radio frequency for receiver go left or right.

The brief circuit description is listed as follows :

- IC1 and associated circuit act as encoder
- XT1, Q1 and associated circuit act as oscillator
- Q2 and associated circuit act as amplifier

#### **1.2 Related Submittal Grants**

This is a single application for certification of a transmitter.

The receiver for this transmitter is exempted from the Part 15 technical rules per 15.101(b).



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### **1.3 Location of the test site**

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. An Open Area Testing Site is set up for investigation and located at :

Top of the Roof, 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 double shielded room is located at :

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



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### **1.4 List of measuring equipment**

| Equipment         | Manufacturer | Model No. | Serial No. | Calibration Certification No. |
|-------------------|--------------|-----------|------------|-------------------------------|
| EMI Test Receiver | R&S          | ESCS30    | 100001     | S43284                        |
| Broadband Antenna | Schaffner    | CBL6112B  | 2718       | AC1753                        |
| Signal Generator  | IFR          | 2023B     | 202302/938 | S43098                        |
| LISN              | R&S          | ESH3-Z5   | 100010     | S43101                        |
| Pulse Limiter     | R&S          | ESH3-Z2   | 100001     | S43325                        |
| Biconical Antenna | R&S          | HK116     | 837414/004 | 4000.7752.02                  |



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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.

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.

\* 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**

| 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              | 50.9                         | 16.4                          | -4.8                | 62.5                          | 80.0                       | -17.5       |
| 54.289          | V              | 24.2                         | 8.8                           | -                   | 33.0                          | 40.0                       | -7.0        |
| 81.434          | V              | 14.9                         | 7.9                           | -                   | 22.8                          | 40.0                       | -17.2       |
| * 108.578       | H              | 9.6                          | 11.9                          | -                   | 21.5                          | 43.5                       | -22.0       |
| * 135.723       | H              | 7.7                          | 13.1                          | -                   | 20.8                          | 43.5                       | -22.7       |
| * 162.868       | H              | 11.6                         | 11.4                          | -                   | 23.0                          | 43.5                       | -20.5       |
| 190.013         | H              | 15.8                         | 10.1                          | -                   | 25.9                          | 43.5                       | -17.6       |
| 217.158         | H              | 19.8                         | 10.8                          | -                   | 30.6                          | 46.0                       | -15.4       |
| * 244.303       | H              | 25.5                         | 10.8                          | -                   | 36.3                          | 46.0                       | -9.7        |
| * 271.448       | H              | 21.7                         | 14.3                          | -                   | 36.0                          | 46.0                       | -10.0       |



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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:

| Document                | Filename     |
|-------------------------|--------------|
| 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 TestRpt 2.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 The duty cycle is simply the on-time divided by the period :

$$\begin{aligned} \text{The duration of one cycle} &= 20.0 \text{ ms} \\ \text{Effective period of the cycle} &= (1.62 \text{ ms} \times 4) + (0.5 \text{ ms} \times 10) \\ &= 11.48 \text{ ms} \\ \text{Duty Cycle} &= 11.48 \text{ ms} / 20.0 \text{ ms} \\ &= 0.574 \end{aligned}$$

Therefore, the average factor is found by  $20 \log_{10} 0.574 = -4.8 \text{ dB}$



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### **6 Appendices**

|     |  |         |
|-----|--|---------|
| A1  | Photos of the set-up of Radiated Emissions | 1 page  |
| A2  | Photos of External Configurations          | 1 page  |
| A3  | Photos of Internal Configurations          | 1 page  |
| A4  | ID Label/Location                          | 1 page  |
| A5  | Bandwidth Plot                             | 1 page  |
| A6  | Average Factor                             | 2 pages |
| A7  | Block Diagram                              | 1 page  |
| A8  | Schematics                                 | 1 page  |
| A9  | User Manual                                | 1 page  |
| A10 | Operation Description                      | 1 page  |

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