



## **TEST REPORT**

Report No. : AJ021087-001 Date : 2007 August 27

Application No. : LJ217739(7)

Applicant : ENERTEC ENTERPRISES LTD.  
RM. 1017, CHINACHEM GOLDEN PLAZA,  
77 MODY ROAD,  
T.S.T. EAST, KLN.,  
HONG KONG.

Sample Description : One(1) submitted sample(s) stated to be R/C Rally Racer of Model No. 12371,1237, 7004, 70049 and 1249

Radio Frequency : 27.145 MHz Transmitter

Rating : 1 x 9V size battery

No. of submitted sample : One (1) piece(s) \*\*\*

Date Received : 2007 July 11

Test Period : 2007 July 11 – 2007 July 23

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 11.

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

Remark : All five models are the same in circuitry and components; and therefore model 12371 was chosen to be the representative of the test sample.

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

Authorized Signature :

Danny Chui  
Deputy Manager - EL. Division

FCC ID: OGM12371TX-27

Page 1 of 11

This document shall not be reproduced except in full or with written approval by the laboratory.

**CMA Industrial Development Foundation Limited**

Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, Hong Kong.

Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: [info@cmatcl.com](mailto:info@cmatcl.com) Web Site: <http://www.cmatcl.com>



## **TEST REPORT**

Report No. : AJ021087-001

Date : 2007 August 27

### **Table of Contents**

1	General Information .....	3
1.1	General Description .....	3
1.2	Location of the test site .....	4
1.3	List of measuring equipment.....	5
2	Description of the radiated emission test.....	6
2.1	Test Procedure.....	6
2.2	Test Result.....	6
2.3	Radiated Emission Measurement Data .....	7
3	Description of the Line-conducted Test.....	8
3.1	Test Procedure.....	8
3.2	Test Result.....	8
3.3	Graph and Table of Conducted Emission Measurement Data .....	8
4	Photograph .....	9
4.1	Photographs of the Test Setup for Radiated Emission and Conduction Emission .....	9
4.2	Photographs of the External and Internal Configurations of the EUT.....	9
5	Supplementary document .....	10
5.1	Bandwidth .....	10
5.2	Duty cycle .....	10
5.3	Transmission time .....	10
6	Appendices .....	11



## **TEST REPORT**

Report No. : AJ021087-001

Date : 2007 August 27

### **1 General Information**

#### **1.1 General Description**

The equipment under test (EUT) is a transmitter for R/C Rally Racer. 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 in the EUT. When it switched on and pressed the stick once, it transmits the radio control signal to receiver. The radio output power is unable to adjust and the antenna is permanently attached in the EUT.

The brief circuit description is listed as follows:

- Q2 and associated circuit act as RF amplifier.
- Q1, Y1 and associated circuit act as oscillator.
- IC1 and associated circuit act as encoder.

FCC ID: OGM12371TX-27

Page 3 of 11

This document shall not be reproduced except in full or with written approval by the laboratory.

**CMA Industrial Development Foundation Limited**

Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, Hong Kong.

Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: [info@cmatcl.com](mailto:info@cmatcl.com) Web Site: <http://www.cmatcl.com>



## **TEST REPORT**

Report No. : AJ021087-001

Date : 2007 August 27

### **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.



## **TEST REPORT**

Report No. : AJ021087-001

Date : 2007 August 27

### **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

FCC ID: OGM12371TX-27

Page 5 of 11

This document shall not be reproduced except in full or with written approval by the laboratory.

**CMA Industrial Development Foundation Limited**

Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, Hong Kong.

Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: [info@cmatcl.com](mailto:info@cmatcl.com) Web Site: <http://www.cmatcl.com>



## **TEST REPORT**

Report No. : AJ021087-001

Date : 2007 August 27

### **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.

All other measurements are well below the limit. Thus, those highest emissions were presented in next page.

# 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.

FCC ID: OGM12371TX-27

Page 6 of 11

This document shall not be reproduced except in full or with written approval by the laboratory.

**CMA Industrial Development Foundation Limited**

Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, Hong Kong.

Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: [info@cmatcl.com](mailto:info@cmatcl.com) Web Site: <http://www.cmatcl.com>



## **TEST REPORT**

Report No. : AJ021087-001

Date : 2007 August 27

### **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	66.8	10.6	-4.3	73.1	80.0	-6.9
54.294	H	13.2	8.4	-	21.6	40.0	-18.4
81.445	H	13.8	7.3	-	21.1	40.0	-18.9
#108.568	H	14.4	11.1	-	25.5	43.5	-18.0
#135.731	H	9.4	12.6	-	22.0	43.5	-21.5
#162.846	H	10.6	10.7	-	21.3	43.5	-22.2
190.027	H	14.5	9.5	-	24.0	43.5	-19.5
217.146	H	11.9	9.8	-	21.7	46.0	-24.3
#244.315	H	12.6	9.8	-	22.4	46.0	-23.6
#271.444	H	9.1	13.9	-	23.0	46.0	-23.0

FCC ID: OGM12371TX-27

Page 7 of 11

This document shall not be reproduced except in full or with written approval by the laboratory.

**CMA Industrial Development Foundation Limited**

Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, Hong Kong.

Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: [info@cmatcl.com](mailto:info@cmatcl.com) Web Site: <http://www.cmatcl.com>



## **TEST REPORT**

Report No. : AJ021087-001

Date : 2007 August 27

### **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

FCC ID: OGM12371TX-27

Page 8 of 11

This document shall not be reproduced except in full or with written approval by the laboratory.

**CMA Industrial Development Foundation Limited**

Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, Hong Kong.

Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: [info@cmatcl.com](mailto:info@cmatcl.com) Web Site: <http://www.cmatcl.com>



## **TEST REPORT**

Report No. : AJ021087-001

Date : 2007 August 27

### **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.



## **TEST REPORT**

Report No. : AJ021087-001

Date : 2007 August 27

### **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:

$$\text{The duration of one cycle} = 16.4\text{ms}$$

$$\begin{aligned}\text{Effective period of the cycle} &= (0.455 \times 10)\text{ms} + (1.38 \times 4)\text{ms} \\ &= 10.07\text{ms}\end{aligned}$$

$$\begin{aligned}\text{Duty Cycle} &= 10.07 / 16.4 \\ &= 0.614\end{aligned}$$

Therefore, the average factor is found by  $20 \log_{10} 0.614 = -4.3\text{dB}$

#### **5.3 Transmission time**

N/A

#### **5.4 Power Spectral Density**

N/A



## **TEST REPORT**

Report No. : AJ021087-001

Date : 2007 August 27

### **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 Diagram	1	page
A9.	User Manual	4	pages
A10.	Operation Description	1	page

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

FCC ID: OGM12371TX-27

Page 11 of 11

This document shall not be reproduced except in full or with written approval by the laboratory.

**CMA Industrial Development Foundation Limited**

Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, Hong Kong.

Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: [info@cmatcl.com](mailto:info@cmatcl.com) Web Site: <http://www.cmatcl.com>