



TEST REPORT

Report No. : AD017731-2 Date : 2003 October 21

Applicant : Enertec Enterprises Ltd.
Room 911, Chinachem Golden Plaza,
77 Mody Road, Tsim Sha Tsui East,
Kowloon, Hong Kong.

Sample Description : One(1) submitted sample stated to be Rally Champion R/C Car (49M)
of Model No. 11909.
Rating : 8 pcs x 1.5 V AA size batteries
No. of sample(s) : One(1) piece ***

Date Received : 2003 September 27.

Test Period : 2003 September 27 – 2003 October 19.

Test Requested : FCC Part 15 Certification

Test Method : FCC Rules and Regulations Part 15 – May 2002
ANSI C63.4 – 1992

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

Page 1 of 11

FCC ID : OGM1190-1-9-49

This document shall not be reproduced either in full or in part except with written approval by the Authorized Representative of CMA Testing.

Room 1401-3, 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 Web Site: <http://www.cmatcl.com>



TEST REPORT

Report No. : AD017731-2

Date : 2003 October 21

Table of Contents

1	General Information.....	3
1.1	General Description.....	3
1.2	Related Submittal Grants	3
1.3	Location of the test site.....	4
1.4	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
6	Appendices	11



TEST REPORT

Report No. : AD017731-2

Date : 2003 October 21

1 General Information

1.1 General Description

The equipment under test (EUT) is a transmitter for Rally Champion R/C Car (49M) operating at 49.860 MHz which is controlled by a crystal. The EUT is powered by 1.5 V x 8 pcs "AA" size battery. There are two-control key in the front of the transmitter, when the speed control trigger pressed once, it will transmit a radio frequency for receiver going forward or backward. When the steering wheel turned once, it will transmit a radio frequency for receiver turn left or right.

The brief circuit description is listed as follows :

- Q3, T1 and associated circuit act as oscillator
- U1 and associated circuit act as encoder
- Q4 and associated circuit act as amplifier
- Z1 and associated circuit act as voltage regulator

1.2 Related Submittal Grants

This is a single application for certification of a transmitter.



TEST REPORT

Report No. : AD017731-2

Date : 2003 October 21

1.3 Location of the test site

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 1992. 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 – 1992. 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.



TEST REPORT

Report No. : AD017731-2

Date : 2003 October 21

1.4 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibration Certification No.
EMI Test Receiver	R&S	ESCS30	100001	S21141
Broadband Antenna	Schaffner	CBL6113B	2718	AC1753
Signal Generator	IFR	2023B	202302/938	Nil
LISN	R&S	ESH3-Z5	100038	S21142
Pulse Limiter	R&S	ESH3-Z2	100001	20-73194
Biconical Antenna	R&S	HK116	837414/004	4000.7752.02



TEST REPORT

Report No. : AD017731-2

Date : 2003 October 21

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 – 1992.

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.



TEST REPORT

Report No. : AD017731-2

Date : 2003 October 21

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 (dBμV/m)	Antenna and Cable factor (dB)	Averaging factor (-dB)	Field Strength (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
49.861	V	64.7	11.4	5.3	70.8	80.0	-9.2
99.721	V	17.6	10.0	--	27.6	43.5	-15.9
149.585	H	22.3	12.2	--	34.5	43.5	-9.0
199.445	H	24.7	10.5	--	35.2	43.5	-8.3
*249.308	H	14.6	10.7	--	25.3	46.0	-20.7
299.164	H	11.7	13.9	--	25.6	46.0	-20.4
349.029	H	13.1	15.3	--	28.4	46.0	-17.6
398.891	H	20.8	15.3	--	36.1	46.0	-9.9
448.751	H	19.1	18.6	--	37.7	46.0	-8.3
498.611	H	22.9	18.6	--	41.5	46.0	-4.5



TEST REPORT

Report No. : AD017731-2

Date : 2003 October 21

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 – 1992. 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



TEST REPORT

Report No. : AD017731-2

Date : 2003 October 21

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 ExtPho1.jpg to ExtPho2.jpg and IntPho1.jpg to IntPho2.jpg.



TEST REPORT

Report No. : AD017731-2

Date : 2003 October 21

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	LabelSmpl.pdf
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. The field strength of any emission appearing between the band edges and up to 10 kHz above and below the band edges (49.81 and 49.91 MHz) is at least 26 dB below the carrier level. It meets the requirement of Section 15.235(b).

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

The duration of one cycle = 9.26 ms.

Effective period of the cycle = (0.74 ms. x 4) + (0.21 ms. x 10)
= 5.06 ms.

Duty Cycle = 5.06 ms. / 9.26 ms.
= 0.546 ms.

Therefore, the average factor is found by $20 \log_{10} 0.546 = -5.3$ dB



TEST REPORT

Report No. : AD017731-2

Date : 2003 October 21

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	2 pages
A10.	Operation Description	1 page

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