CMA Testing and Certification Laboratories
廠商會檢定中心

TEST REPORT

Report No. : AE006552-1 Date : 2004 May 13

Applicant : Lung Cheong Toys Limited
Lung Cheong Building, 1 Lok Yip Road,
On Lok Tsuen, Fanling, N. T., Hong Kong.

Sample Description : One(1) submitted sample stated to be R/C Spymobile (Car) of Model No. D389.
Rating : 3 x 1.5 V AA size battery
No. of sample(s) : Two(2) pieces ***

Date Received : 2004 April 28.

Test Period : 2004 April 28 – 2004 May 03.

Test Requested : FCC Part 15 Certification

Test Method : FCC Rules and Regulations Part 15 – Dec 2003
ANSI C63.4 – 2001

Test Result : See attached sheet(s) from page 2 to 12.

Conclusion : The submitted sample of the composite device was found to comply with requirement of FCC Part 15 Subpart C for transmitter part and Subpart B for receiver part.

For and on behalf of
CMA Testing and Certification Laboratories

Authorized Signature : _____
Danny Chui
EMC Engineer - EL. Division

FCC ID : P73-D389-RX

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

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1 General Information

1.1 General Description

The equipment under test (EUT) is an R/C Spymobile (vehicle part) which contains a transmitter operating at 27.145 MHz and a receiver operating at 49.860 MHz. The transmitter is controlled by a crystal. The receiver is controlled by a crystal. The car is powered by 3 x 1.5V AAA size batteries. When forward/backward signal is received, it will move forward or backward. When left/right signal is received it will turn left or right. When it receive signals from the controller. The vehicle part can also transmit audio signal from the microphone through the transmission circuit to the controller. If the vehicle is idle for 10 minutes, it will automatically shut off and the red LED indicator will turn off.

Referring to the circuit design, the circuit description is listed as follows:

- U4 and associated circuit act as the decoder
- Q7, Q9 – Q19 and associated circuit act as the motor driver
- Y1, U2 and associated circuit act as the oscillator for the receiver
- Q3, Y2, C11, C13, Q2, T1, C7 and associated circuit act as the oscillator for the transmitter and as 3 times frequency multiplier
- Q1, L6, C4 and associated circuit act as the transmitter RF amplifier
- L1, L3, L4, the antenna coil, C42, C43 and associated circuit act as the antenna matching network
- U3 and associated circuit act as the encoder
- C31, D1 and associated circuit act as the “Bi-Bi” signal circuit processor
- L7, C46 and associated circuit modulate the RF signal
- U1, Q8 and associated circuit act as the microphone signal amplifier and control

The brief circuit description is saved with filename: OpDes.pdf

1.2 Related Submittal Grants

This is an application of a composite device for certification of a transmitter at 27.145 MHz and a receiver at 49.435 MHz under the same FCC ID.

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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 – 2001. 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 – 2001. 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	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

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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 – 2001.

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.

For receiver part, a signal generator was used to radiate an unmodulated continuous wave (CW) signal to the EUT (superregenerative receiver) at its operating frequency in order to "cohere" the characteristic broadband emissions from the receiver.

2.2 Test Result

For transmitter part :

Peak Detector data was measured unless otherwise stated.

* Emissions appearing within the restricted bands shall follow the requirement of section 15.205.

For receiver part :

The emissions meeting the requirement of section 15.109 are based on measurements employing the CISPR qusai-peak detector.

It was found that the EUT meets 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

Mode : 27 MHz Tx

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV/m)	Antenna and Cable factor (dB)	Field Strength (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
27.145	V	30.8	16.4	47.2	80.0	-32.8
54.290	H	13.9	8.7	22.6	40.0	-17.4
81.435	H	14.8	8.0	22.8	40.0	-17.2
*108.580	H	11.3	11.8	23.1	43.5	-20.4
*135.725	H	10.3	13.1	23.4	43.5	-20.1
*162.870	H	13.2	11.0	24.2	43.5	-19.3
190.015	H	13.5	10.5	24.0	43.5	-19.5
217.160	H	14.4	10.1	24.5	46.0	-21.5
*244.305	H	15.5	10.1	25.6	46.0	-20.4
*271.450	H	12.5	14.2	26.7	46.0	-19.3

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2.3 Radiated Emission Measurement Data

Radiated emission

pursuant to

the requirement of FCC Part 15 subpart B

Mode : 49 MHz Rx

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV/m)	Antenna and Cable factor (dB)	Field Strength (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
49.434	V	12.3	11.1	23.4	40.0	-16.6
98.868	V	12.8	10.0	22.8	43.5	-20.7
148.302	V	10.6	12.4	23.0	43.5	-20.5
197.736	V	13.1	10.5	23.6	43.5	-19.9
247.170	V	13.9	10.1	24.0	46.0	-22.0
296.604	V	10.0	14.2	24.2	46.0	-21.8
346.038	V	10.5	15.6	26.1	46.0	-19.9
395.472	V	10.9	15.6	26.5	46.0	-19.5
444.906	V	9.5	18.7	28.2	46.0	-17.8
494.340	V	11.3	18.7	30.0	46.0	-16.0

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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 – 2001. 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 InPho4.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.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. It also shows that the band edge met the 15.209 requirement at 26.9599 and 27.2801 MHz.

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6 Appendices

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A3.	Photos of Internal Configurations	2 pages
A4.	ID Label/Location	1 page
A5.	Bandwidth Plot	1 page
A6.	Block Diagram	1 page
A7.	Schematics	1 page
A8.	User Manual	1 page

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

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