



**CMA Testing
and Certification
Laboratories**
廠商會檢定中心

TEST REPORT

Report No. : AG031028-001 Date : 2006 December 14

Application No. : LG223463(9)

Applicant : Nikko (NICS Engineering Ltd.)
Unit 2701 & 2710-19, 27/F.,
The Metropolis Tower, The Metropolis Drive,
Hung Hom, Kowloon, Hong Kong

Sample Description : One(1) submitted sample(s) stated to be Enzo Ferrari
of Model No. 60-4453

Radio Frequency : 49.860 MHz Transmitter

Rating : 1 x 9V size battery

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

Date Received : 2006 December 01

Test Period : 2006 December 01 – 2006 December 08

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.

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature :

Danny Chui
Deputy Manager - EL. Division

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Page 1 of 11

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TEST REPORT

Report No. : AG031028-001

Date : 2006 December 14

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

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Page 2 of 11

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Date : 2006 December 14

1 General Information

1.1 General Description

The equipment under test (EUT) is a transmitter for Enzo Ferrari. It operates at 49.860MHz which is controlled by a crystal. The EUT is powered by 1 x 9V size battery. There are two control sticks in the EUT. When the stick is pressed once, it will transmit different radio control signal to receiver.

The brief circuit description is listed as follows:

- IC1 and associated circuit act as encoder.
- X1, TR2 and associated circuit act as oscillator.
- TR3 and associated circuit act as RF amplify.

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Page 3 of 11

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TEST REPORT

Report No. : AG031028-001

Date : 2006 December 14

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,
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FCC ID: CVTTP7761H

Page 4 of 11

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TEST REPORT

Report No. : AG031028-001

Date : 2006 December 14

1.3 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.
EMI Test Receiver	R&S	ESCI	100152
Broadband Antenna	Schaffner	CBL6112B	2718

FCC ID: CVTTP7761H

Page 5 of 11

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TEST REPORT

Report No. : AG031028-001

Date : 2006 December 14

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.

* 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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Page 6 of 11

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TEST REPORT

Report No. : AG031028-001

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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 μ V/m)	Antenna and Cable factor (dB)	Average Factor (dB)	Field Strength (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
49.860	V	66.2	10.6	-5.5	71.3	80.0	-8.7
99.708	H	23.3	9.5	-	32.8	43.5	-10.7
149.572	H	18.1	12.0	-	30.1	43.5	-13.4
199.190	H	14.2	9.5	-	23.7	43.5	-19.8
*249.295	H	19.7	9.8	-	29.5	46.0	-16.5
299.170	H	20.0	13.9	-	33.9	46.0	-12.1
349.023	H	12.3	14.9	-	27.2	46.0	-18.8
398.880	H	11.2	14.9	-	26.14	46.0	-19.9
448.740	H	6.4	17.9	-	24.3	46.0	-21.7
498.600	H	6.6	17.9	-	24.5	46.0	-21.5

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Page 7 of 11

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TEST REPORT

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Date : 2006 December 14

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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Page 8 of 11

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Report No. : AG031028-001

Date : 2006 December 14

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 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 26dB below the carrier level. It meets the requirement of Section 15.235(b).

5.2 Duty cycle

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

$$\text{The duration of one cycle} = 37.65\text{ms}$$

$$\begin{aligned}\text{Effective period of the cycle} &= (0.94 \times 4)\text{ms} + (0.31 \times 52)\text{ms} \\ &= 19.88\text{ms}\end{aligned}$$

$$\begin{aligned}\text{Duty Cycle} &= 19.88 / 37.65 \\ &= 0.528\end{aligned}$$

Therefore, the average factor is found by $20 \log_{10} 0.528 = -5.5\text{dB}$

5.3 Transmission time

N/A

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Page 10 of 11

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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 Diagram	1	page
A9.	User Manual	2	pages
A10.	Operation Description	1	page

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

FCC ID: CVTTP7761H

Page 11 of 11

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