



## **TEST REPORT**

Report No. : AG021378-001 Date : 2006 August 29

Application No. : LG219095(4)

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 Aston Martin DBS  
of Model No. 60-4458  
Radio Frequency : 27.145MHz Transmitter  
Rating : 1 x 9V size battery  
No. of submitted sample : One(1) piece(s) \*\*\*

Date Received : 2006 August 10

Test Period : 2006 August 14 – 2006 August 21

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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### **1 General Information**

#### **1.1 General Description**

The equipment under test (EUT) is a transmitter for Aston Martin DBS. It operates at 27.145MHz which is controlled by a crystal. The EUT is powered by 1 x 9V size battery and it has two control sticks in the EUT. When the forward, backward, turn left and turn right control stick is pushed once, it will transmit different radio control signal to receiver.

The brief circuit description is listed as follows:

- IC Tx2 and associated circuit act as encoder.
- Q1, Crystal 27.145MHz and associated circuit act as oscillator.
- Q2 and associated circuit act as RF amplify.



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### **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.



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### **1.3 List of measuring equipment**

| Equipment         | Manufacturer | Model No. | Serial No. |
|-------------------|--------------|-----------|------------|
| Broadband Antenna | Schaffner    | CBL6112B  | 2692       |
| Spectrum Analyzer | R&S          | FSP       | 100628     |



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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.

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.

The harmonic emissions meeting the requirement of section 15.209 are based on measurements employing the CISPR quasi-peak detector below 1000MHz and average detector for frequencies above 1000MHz.

\* 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<br>(MHz) | Polarity<br>(H/V) | Reading at<br>3m<br>(dB $\mu$ V/m) | Antenna and<br>Cable factor<br>(dB) | Average<br>Factor<br>(dB) | Field<br>Strength<br>(dB $\mu$ V/m) | Limit at 3m<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|-------------------|------------------------------------|-------------------------------------|---------------------------|-------------------------------------|-------------------------------|----------------|
| 27.145             | V                 | 64.0                               | 9.0                                 | -5.1                      | 67.9                                | 80.0                          | -12.1          |
| 54.290             | V                 | 14.7                               | 8.1                                 | -                         | 22.8                                | 40.0                          | -17.2          |
| 81.463             | H                 | 15.7                               | 7.2                                 | -                         | 22.9                                | 40.0                          | -17.1          |
| *108.560           | H                 | 12.2                               | 11.0                                | -                         | 23.2                                | 43.5                          | -20.3          |
| *135.709           | H                 | 12.4                               | 12.4                                | -                         | 24.8                                | 43.5                          | -18.7          |
| *162.888           | H                 | 12.4                               | 10.4                                | -                         | 22.8                                | 43.5                          | -20.7          |
| 190.079            | H                 | 13.9                               | 9.2                                 | -                         | 23.1                                | 43.5                          | -20.4          |
| 217.162            | H                 | 13.1                               | 9.7                                 | -                         | 22.8                                | 46.0                          | -23.2          |
| *244.305           | H                 | 13.4                               | 9.7                                 | -                         | 23.1                                | 46.0                          | -22.9          |
| *274.451           | H                 | 9.2                                | 13.9                                | -                         | 23.1                                | 46.0                          | -22.9          |



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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:

| <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:

The duration of one cycle = 39.28ms

Effective period of the cycle = (1.96ms x 4) + (0.64ms x 22)  
= 21.92ms

Duty Cycle = 21.92 / 39.28  
= 0.56

Therefore, the average factor is found by  $20 \log_{10} 0.56 = -5.1\text{dB}$

#### **5.3 Transmission time**

N/A



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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 \*\*\*\*\*