



RADIO TEST REPORT

Test Report No. : 29EE0180-HO-01-R1

Applicant : **DENSO CORPORATION**
Type of Equipment : **Remote Seat Control System(Transmitter)**
Model No. : **12BDF**
Test regulation : **FCC Part 15 Subpart C:2008
Section 15.231**
FCC ID : **HYQ12BDF**
Test Result : **Complied**

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3. This sample tested is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.
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6. Original test report number of this report is 29EE0180-HO-01.

Date of test: December 19 and 21, 2008

Tested by: *T. Nakagawa*
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NVLAP LAB CODE: 200572-0

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SECTION 1: Customer information

Company Name : DENSO CORPORATION
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Contact Person : Jun Namizaki

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Remote Seat Control System(Transmitter)
Model No. : 12BDF
Serial No. : 001
Rating : DC 3.0V
Receipt Date of Sample : December 19, 2008
Country of Mass-production : Japan
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

Model No: 12BDF (referred to as the EUT in this report) is the Remote Seat Control System(Transmitter).

Equipment Type : Transmitter
Frequency of Operation : 312.15MHz
Local oscillator frequency : 13.00625MHz crystal oscillator
Type of modulation : FSK
Power Supply : Norminal supply voltage: DC 3.0V (One lithium battery)
Antenna Type : Built-in type (Fixed)

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2008, final revised on May 19, 2008
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.231 Periodic operation in the band 40.66 - 40.70MHz
and above 70MHz

FCC 15.31 (e)

This test was performed with the New Battery (DC 3.0V) and the constant voltage was supplied to the EUT during the tests. Therefore, the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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3.2 Procedures and results

| No. | Item | Test Procedure | Specification | Deviation | Worst margin | Results |
|-----|---|---|--|-----------|------------------------------------|----------|
| 1 | Automatically Deactivate | <FCC> ANSI C63.4:2003 13. Measurement of intentional radiators | <FCC> Section 15.231(a)(1) | N/A | N/A | Complied |
| 2 | Electric Field Strength of Fundamental Emission | <FCC> ANSI C63.4:2003 13. Measurement of intentional radiators | <FCC> Section 15.231(b) | N/A | 11.6dB 312.15MHz Horizontal | Complied |
| 3 | Electric Field Strength of Spurious Emission | <FCC> ANSI C63.4:2003 13. Measurement of intentional radiators | <FCC> Section 15.205 Section 15.209 Section 15.231(b) | N/A | 11.1dB 2497.20MHz Horizontal | Complied |
| 4 | -20dB Bandwidth | <FCC> ANSI C63.4:2003 13. Measurement of intentional radiators | <FCC> Section 15.231(c) | N/A | N/A | Complied |
| 5 | Conducted emission | <FCC> ANSI C63.4:2003 7. AC powerline conducted emission measurements | <FCC> Section 15.207 | - | N/A*1) | N/A |

Note: UL Japan, Inc.'s EMI Work procedures No. QPM05 and QPM15

*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.

*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Addition to standards

No addition nor deviation has been made from standards.

3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

| Test room | Conducted emission | Radiated emission (10m*) | | | Radiated emission (3m*) | | | Radiated emission (3m*) | |
|--------------------------------|--------------------|--------------------------|--------------|-------------|-------------------------|--------------|-------------|-------------------------|-------------|
| | 150kHz-30MHz | 9kHz-30MHz | 30MHz-300MHz | 300MHz-1GHz | 9kHz-30MHz | 30MHz-300MHz | 300MHz-1GHz | 1GHz-18GHz | 18GHz-40GHz |
| No.1 semi-anechoic chamber (±) | 3.7dB | 3.1dB | 4.4dB | 4.2dB | 3.2dB | 3.8dB | 3.9dB | 5.9dB | 6.1dB |
| No.2 semi-anechoic chamber (±) | 3.7dB | - | - | - | 3.2dB | 4.4dB | 4.0dB | 5.9dB | 6.1dB |
| No.3 semi-anechoic chamber (±) | 3.7dB | - | - | - | 3.2dB | 4.6dB | 4.0dB | 5.9dB | 6.1dB |
| No.4 semi-anechoic chamber (±) | 3.7dB | - | - | - | 3.2dB | 3.9dB | 3.9dB | 5.9dB | 6.1dB |

*10m/3m = Measurement distance

Radiated emission test(3m)

The data listed in this test report has enough margin, more than the site margin.

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3.5 Test Location

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| | FCC Registration Number | IC Registration Number | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms |
|----------------------------|-------------------------|------------------------|----------------------------|--|------------------------|
| No.1 semi-anechoic chamber | 313583 | 2973C-1 | 19.2 x 11.2 x 7.7m | 7.0 x 6.0m | No.1 Power source room |
| No.2 semi-anechoic chamber | 655103 | 2973C-2 | 7.5 x 5.8 x 5.2m | 4.0 x 4.0m | - |
| No.3 semi-anechoic chamber | 148738 | 2973C-3 | 12.0 x 8.5 x 5.9m | 6.8 x 5.75m | No.3 Preparation room |
| No.3 shielded room | - | - | 4.0 x 6.0 x 2.7m | N/A | - |
| No.4 semi-anechoic chamber | 134570 | 2973C-4 | 12.0 x 8.5 x 5.9m | 6.8 x 5.75m | No.4 Preparation room |
| No.4 shielded room | - | - | 4.0 x 6.0 x 2.7m | N/A | - |
| No.5 semi-anechoic chamber | - | - | 6.0 x 6.0 x 3.9m | 6.0 x 6.0m | - |
| No.6 shielded room | - | - | 4.0 x 4.5 x 2.7m | 4.75 x 5.4 m | - |
| No.6 measurement room | - | - | 4.75 x 5.4 x 3.0m | 4.75 x 4.15 m | - |
| No.7 shielded room | - | - | 4.7 x 7.5 x 2.7m | 4.7 x 7.5m | - |
| No.8 measurement room | - | - | 3.1 x 5.0 x 2.7m | N/A | - |
| No.9 measurement room | - | - | 8.0 x 4.5 x 2.8m | 2.0 x 2.0m | - |
| No.10 measurement room | - | - | 2.6 x 2.8 x 2.5m | 2.4 x 2.4m | - |
| No.11 measurement room | - | - | 3.1 x 3.4 x 3.0m | 2.4 x 3.4m | - |

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test set up, Data of EMI, and Test instruments

Refer to APPENDIX 1 to 3.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The mode is used : Transmitting mode *
(As for the pulse train of sample used in this test, please refer to “Theory of Operation” in application document.)
* All the other tests except Automatically Deactivate test were performed with a switch pushed by a nonconductive Jig.

Justification : The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2 Configuration and peripherals

A

* Test data was taken under worse case conditions.

Description of EUT

| No | Item | Model number | Serial number | Manufacturer | Remarks |
|----|---|--------------|---------------|-------------------|---------|
| A | Remote Seat Control System(Transmitter) | 12BDF | 001 | DENSO CORPORATION | EUT |

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SECTION 5: Radiated emission (Electric Field Strength of Fundamental and Spurious Emission)

5.1 Operating environment

Test place : No.3 semi anechoic chamber
Temperature : See data
Humidity : See data

5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane. The EUT was set on the center of the tabletop.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Photographs of the set up are shown in Appendix 1.

5.3 Test conditions

Frequency range : 30MHz-3200MHz
Test distance : 3m
EUT position : Top of Polyurethane table
EUT operation mode : See Clause 4.1

5.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on No.3 semi anechoic chamber with a ground plane and at a distance of 3m.
The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization.
The radiated emission measurements were made with the following detector function of the test receiver/spectrum analyzer.

| | Below or equal to 1GHz | Above 1GHz (FCC15.205 and 15.231) |
|---------------|------------------------|-----------------------------------|
| Detector Type | Peak | Peak |
| IF Bandwidth | 120kHz | PK: S/A:RBW 1MHz, VBW:1MHz |

- The carrier level and noise levels were measured at each position of all three axes X, Y and Z, and the position that has the maximum noise was determined.
With the position, the noise levels of all the frequencies was measured.

5.5 Results

Summary of the test results: Pass