



Underwriters
Laboratories UL Japan, Inc.

Test report No. : 29BE0051-HO-01-A
Page : 1 of 14
Issued date : September 19, 2008
FCC ID : HYQ13CZN

EMI TEST REPORT

Test Report No. : 29BE0051-HO-01-A

Applicant : DENSO CORPORATION
Type of Equipment : Remote Keyless Entry System (Receiver)
Model No. : 13CZN
FCC ID : HYQ13CZN
Test regulation : FCC Part 15 Subpart B 2008
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
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Date of test:

September 10, 2008

Tested by:

Kazuya Yoshioka
EMC Services

Approved by :

Makoto Kosaka
EMC Services

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SECTION 1: Customer information

Company Name : DENSO CORPORATION
Address : 1-1 Showa-cho, Kariya-shi, Aichi-ken, 448-8661, Japan
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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 Keyless Entry System (Receiver)
Model No. : 13CZN
Serial No. : No.1
Receipt Date of Sample : September 9, 2008
Country of Manufacturer : Japan and United States
Condition of EUT : Production prototype
(Not for Sale: This sample is not mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

Model No: 13CZN (referred to as the EUT in this report) is the Remote Keyless Entry System (Receiver).

Equipment Type : Super-heterodyne
Frequency of Operation : 312.15MHz
Oscillator frequency : 39.00625MHz (Crystal)
Local Oscillator frequency : 312.05MHz (39.00625MHz x 8)
Intermediate frequency : 100kHz
Antenna Type : Built-in
Operating voltage (inner) : DC 5V (Nominal supply voltage)

FCC15.111(b)

The receiving antenna (of this EUT) is installed inside the EUT and cannot be removed (permanently attached). Therefore, Radiated emission test was performed.

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SECTION 3: Test specification, procedures & results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B 2008, final revised on May 19, 2008
Title : FCC 47CFR Part15 Radio Frequency Device
Subpart B Unintentional Radiators

3.2 Procedures and results

Item	Test Procedure	Limits	Deviation	Worst margin	Result
Conducted emission	FCC: ANSI C63.4: 2003 7. AC powerline conducted emission measurements IC: RSS-Gen 7.2.2	Receiver	N/A*1)	N/A	N/A
Radiated emission	FCC: ANSI C63.4: 2003 8. Radiated emission measurements IC: RSS-Gen 4.10	Receiver	N/A	15.9dB 312.050MHz Horizontal, QP	Complied

*Note: UL Japan, Inc's EMI Work Procedure QPM05.

*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 Additions or deviations to standards

No addition, deviation, nor exclusion has been made from standards.

3.4 Uncertainty

EMI

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.

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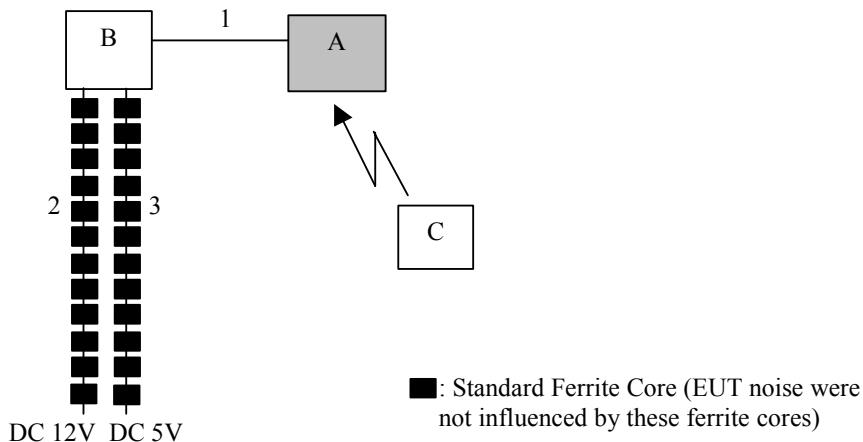
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SECTION 4: Operation of E.U.T. during testing

4.1 Operating modes

The mode is used : Receiving mode (312.15MHz)
 * Remote Keyless Entry System (Transmitter) was operated manually by a test engineer and the test was performed with the EUT receiving 312.15MHz.

4.2 Configuration and peripherals



*Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Remote Keyless Entry System (Receiver)	13CZN	No.1	DENSO CORPORATION	EUT
B	Checker	-	-	DENSO CORPORATION	-
C	Remote Keyless Entry System (Transmitter)	-	-	DENSO CORPORATION	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC & Signal Cable	2.5	Unshielded	Unshielded	-
2	DC Cable	2.0	Unshielded	Unshielded	Standard Ferrite Core x 12
3	DC Cable	2.0	Unshielded	Unshielded	Standard Ferrite Core x 12

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SECTION 5: Radiated 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 80cm above the conducting ground plane. The EUT was set on the edge 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-300MHz (Biconical antenna) / 300MHz-1000MHz (Logperiodic antenna)
1000MHz -2000MHz (Horn antenna)
Test distance : 3m
EUT position : Table top
EUT operation mode : See Clause 4.1

5.4 Test procedure

The height of the measuring 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 with the Test Receiver, or the Spectrum Analyzer. The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer *1)
IF Bandwidth	QP: BW 120kHz	PK: RBW:1MHz/VBW: 1MHz AV: RBW:1MHz/VBW:10Hz

*1) The Spectrum Analyzer was used in 3dB resolution bandwidth.

- The noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

5.5 Test result

Summary of the test results: Pass

Date: September 10, 2008

Test engineer: Kazuya Yoshioka

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