



EMI TEST REPORT

Test Report No. : 28BE0010-HO-A

Applicant : DENSO CORPORATION
Type of Equipment : Remote Keyless Entry System (Receiver)
Model No. : 13CZD
FCC ID : HYQ13CZD
Test standard : FCC Part15 Subpart B: 2007
Test Result : Complied

1. This test report shall not be reproduced except in full or partial, without the written approval of UL Japan, Inc.
2. This sample tested is in compliance with the limits of the above regulation.
3. This equipment is in compliance with the above regulation.
4. The test results in this test report are traceable to the national or international standards.

Date of test: September 18, 2007

Tested by: J. Arai
Tatsuya Arai

Approved by: O. Watatani
Osamu Watatani
Manager of Yamakita EMC Lab.

UL Japan, Inc.

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CONTENTS

	PAGE
SECTION 1 : Client information	3
SECTION 2 : Equipment under test (E.U.T.)	3
SECTION 3 : Test specification, procedures and results	4
SECTION 4 : Operation of E.U.T. during testing	6
SECTION 5 : Radiated emission	7
<u>Contents of Appendixes</u>	8
APPENDIX 1: Photographs of test setup	9
APPENDIX 2: Data of EMI test	11
APPENDIX 3: Test instruments	15

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SECTION 1: Client information

Company Name : DENSO CORPORATION
Address : 1-1 Showa-cho, Kariya-shi, Aichi-ken, 448-8661 Japan

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. : 13CZD
Serial No. : 13CZD-001
Rating : DC5V (Normal supply voltage)
Country of Manufacture : Japan
Receipt Date of Sample : September 18, 2007
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: 13CZD (referred to as the EUT in this report) is a Remote Keyless Entry System (Receiver).

Equipment type : Receiver
Frequency of operation : 314.35MHz
Oscillator frequency : 39.28125MHz (Crystal)
Type of demodulation : FSK
Type of receiving system : Super-heterodyne
Antenna type : Built-in

FCC15.111(b)

The receiving antenna (of this EUT) is installed inside the EUT and cannot be removed. Therefore, this EUT complies with the requirement in section 15.111(b).

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SECTION 3: Test specification, procedures and results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B: 2007
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	ANSI C63.4: 2003 7. AC powerline conducted emission measurements	CISPR Pub.22	N/A *1	N/A	N/A
Radiated emission	ANSI C63.4: 2003 8. Radiated emission measurements	FCC§15.109 (a)	N/A	17.5dB (942.75MHz, Horizontal, QP)	Complied
Antenna power conduction for receivers	ANSI C63.4: 2003 12.1.5 Antenna-conducted power measurements	FCC §15.111(a)	N/A *2	N/A	N/A
Note: UL Japan's EMI Work Procedures No. QPM05 *1) The test is not applicable to the EUT since the EUT has no AC mains. *2) The test is not applicable to the EUT since the EUT does not have antenna port.					

3.3 Addition from standards

No addition, exclusion or deviation has been made from the standards.

3.4 Confirmation

UL Japan, Inc. hereby confirms that E.U.T., in the configuration tested, complies with the specifications FCC Part 15 Subpart B: 2007.

3.5 Uncertainty

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

	No.1 open site	No.2 open site	No.1 anechoic chamber
Radiated emission (3m)			
30-300MHz	4.5 dB	4.4 dB	4.5 dB
300-1000MHz	4.3 dB	4.3 dB	4.3 dB
1GHz<	5.7 dB	5.7 dB	5.7 dB

Radiated Emission Test

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

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3.6 Test location

UL Japan, Inc. Yamakita EMC Lab.

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Telephone number : +81 465 77 1011
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NVLAP Lab. code : 200441-0

No. 1 test site has been fully described in a report submitted to FCC office, and accepted on August 26, 2005 (Registration No.: 95486).

IC Registration No. : 2973B-1

No. 2 test site has been fully described in a report submitted to FCC office, and accepted on April 4, 2005 (Registration No.: 466226).

IC Registration No. : 2973B-3

No. 1 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on November 2, 2005 (Registration No.: 95967).

IC Registration No. : 2973B-2

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
No.1 shielded room	8.0 x 5.0 x 2.5	No.1	10.0 x 7.5 x 5.7
No.2 shielded room	5.0 x 4.0 x 2.5	Semi-anechoic chamber	
No.3 shielded room	4.0 x 5.0 x 2.7		

Open test site	Maximum measurement distance
No.1 open test site	30m
No.2 open test site	10m

3.7 Test Setup, Data of EMI & Test instruments

Refer to Appendix 1 to 3.

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

4.1 Operating modes

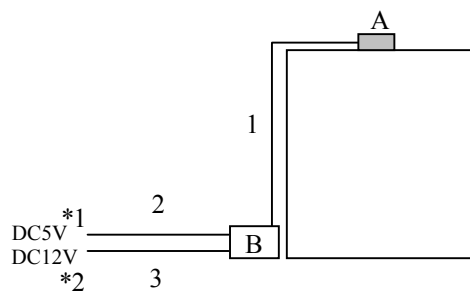
The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

Operation: Receiving

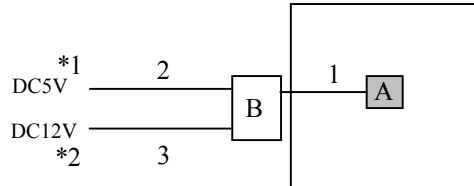
Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2 Configuration of Tested System

Front View



Top View



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID (Remarks)
A	Remote Keyless Entry System (Receiver)	13CZD	13CZD-001	DENSO	HYQ13CZD (EUT)
B	Checker bench	-	-	DENSO	-

*1) DC power supply (Model No.: PAN35-10A) was used for DC 5V input.

*2) DC power supply (Model No.: PAN55-20A) was used for DC 12V input.

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Signal & DC power cable	1.5	Unshielded	Unshielded	-
2	DC power cable	0.95	Unshielded	Unshielded	-
3	DC power cable	0.95	Unshielded	Unshielded	-

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SECTION 5: Radiated emission

5.1 Operating environment

The test was carried out in No.2 open site.

Temperature : See test data
Humidity : See test data

5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 0.5m, raised 80cm above the conducting ground plane. 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. A drawing of the set up is shown in the photos of Appendix 1.

5.3 Test conditions

Frequency range : 30 - 2000MHz
Test distance : 3m
EUT position : Table top
EUT operation : Receiving

5.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on an open test site with a ground plane and at a distance of 3m. Pre check measurements were performed in a screened room with a search coil at 30-1000MHz to distinguish disturbances of EUT from the ambient noise. Measurements were performed with a quasi-peak detector. 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.

Frequency	: 30-1000MHz	1000-2000MHz
Detector Type	: Quasi-Peak	Peak Average
IF Bandwidth	: 120kHz	RBW:1MHz/VBW:1MHz RBW:1MHz/VBW:10Hz

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.
No pulse noise was detected.

The equipment and its antenna were previously checked at each position of three axes X, Y and Z. The position in which the maximum noise occurred was chosen to put into measurement. See the table below and photographs in page 10. With the position, the noise levels of all the frequencies were measured.

	30-1000MHz	1000-2000MHz
Horizontal	Y	Y
Vertical	Y	Y

5.5 Results

Summary of the test results : Pass

Date : September 18, 2007 Test engineer : Tatsuya Arai

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APPENDIX 1: Photographs of test setup

Page 9 : Radiated emission

Page 10 : Pre-check of the worst position

APPENDIX 2: Data of EMI test

Page 11 - 14 : Radiated emission

APPENDIX 3: Test instruments

Page 15 : Test instruments

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