



EMI TEST REPORT

Test Report No.: 28IE0089-YK-A-R1

Applicant : DENSO CORPORATION
Type of Equipment : Remote Keyless Entry System (Receiver)
Model No. : 13CZE
FCC ID : HYQ13CZE
Test regulation : FCC Part15 Subpart B: 2008
Test result : Complied

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7. Original test report number of this report is 28IE0089-YK-A.

Date of test:

April 14 and 15, 2008

Tested by:

Y. Owaki
Yasumasa Owaki

Approved by:

O. Watatani
Osamu Watatani
Manager of Yamakita EMC Lab.

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SECTION 1: Customer information

Company Name : DENSO CORPORATION
Address : 1-1 Showa-cho, Kariya-shi, Aichi-ken, 448-8661 Japan
Telephone Number : +81-566-25-5947
Facsimile Number : +81-566-25-4548
Contact Person : Michihira Iida

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. : 13CZE
Serial No. : 13CZE-001
Rating : DC5V (Normal supply voltage)
Country of Mass-Production : Japan, USA
Receipt Date of Sample : April 14, 2008
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: 13CZE (referred to as the EUT in this report) is a Remote Keyless Entry System (Receiver).

Equipment type : Receiver
Frequency of operation : 312.15MHz
Oscillator frequency : 39.00625MHz (Crystal)
Type of demodulation : FSK
Type of receiving system : Super-heterodyne
Antenna type : Built-in

FCC 15.111 (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 & results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B: 2008, final revised on March 24, 2008
 Title : FCC 47CFR Part 15 Radio Frequency Device
 Subpart B Unintentional Radiators

3.2 Procedures & Results

Item	Test Procedure	Limits	Deviation	Worst margin	Result
Conducted emission	ANSI C63.4: 2003 7. AC powerline conducted emission measurements	Section 15.107 (a) CISPR 22: 1997 Class B	N/A *1)	N/A	N/A
Radiated emission	ANSI C63.4: 2003 8. Radiated emission measurements	Section 15.109 (a) CISPR 22: 1997 Class B	N/A	18.7dB (936.45MHz, Horizontal & Vertical, QP)	Complied
Antenna power conduction for receivers	ANSI C63.4: 2003 12.1.5 Antenna-conducted power measurements	Section 15.111(a)	N/A *2)	N/A	N/A

*1) The test is not applicable since the EUT does not have AC Mains.

*2) The test is not applicable to the EUT since the EUT does not have antenna port.

Note: UL Japan's EMI Work Procedures No. QPM05

3.3 Additions to standards

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

3.4 Confirmation

UL Japan, Inc. hereby confirms the E.U.T., in the configuration tested, complies with the specifications FCC Part 15 Subpart B: 2008.

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 (\pm)	No.2 open site (\pm)	No.1 anechoic chamber (\pm)
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

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 Semi-anechoic chamber	10.0 x 7.5 x 5.7
No.2 shielded room	5.0 x 4.0 x 2.5		
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

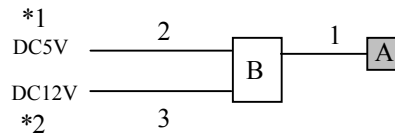
4.1 Operating mode

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

Test sequence is used : Receiving

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

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	FCC ID (Remarks)
A	Remote Keyless Entry System (Receiver)	13CZE	13CZE-001	DENSO	HYQ13CZE (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	2.5	Unshielded	Unshielded	-
2	DC power cable	2.0	Unshielded	Unshielded	-
3	DC power cable	2.0	Unshielded	Unshielded	-

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SECTION 5: Radiated emission

5.1 Operating environment

The test was carried out in No.1 anechoic chamber.

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 anechoic chamber with a ground plane and at a distance of 3m. Measurements were performed with quasi-peak, peak and average 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	Z	Z
Vertical	Z	Z

5.5 Results

Summary of the test results : Pass

Date : April 14 and 15, 2008 Test engineer : Yasumasa Owaki

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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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