

Test report No.: 27CPage: 1 ofIssued date: NovRevised date: NovFCC ID: HY

# EMI TEST REPORT

## Test Report No.: 27CE0103-HO-A-1

Applicant	:	DENSO CORPORATION
Type of Equipment	:	Remote Keyless Entry System (Receiver)
Model No.	:	13BZS
FCC ID	:	HYQ13BZS
Test standard	:	FCC Part 15 Subpart B 2006
Test Result	:	Complied

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

Date of test:

November 11, 2006 Tested by: Mitsuru Fujimura **EMC** Services Approved by : Naoki Sakamoto Group Leader of **EMC** Services



This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation. \*As for the range of Accreditation in NVLAP, you may refer to the WEB address, http://ulapex.jp/emc/nvlap.htm

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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.	:	13BZS
Serial No.	:	No.1
Rating	:	DC5.0V
Country of Manufacture	:	Japan
Receipt Date of Sample	:	October 27, 2006
Condition of EUT	:	Production model
Modification of EUT	:	No modification by the test lab.

#### 2.2 **Product Description**

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

Equipment Type	:	Receiver
Receiving frequency	:	314.35MHz
Local oscillator frequency	:	40.63125MHz * 8 = 325.05MHz
Intermediate Frequency	:	10.7MHz
ITU code	:	A1D
Type of Receiving system	:	Super Heterodyne
Antenna Type	:	Built-in type (Fixed)

**<u>\* FCC 15.111 (b)</u>** The receiving antenna is installed inside the EUT and cannot be removed. Therefore, the 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 2006
Title	: FCC 47CFR Part15 Radio Frequency Device
	Subpart B Unintentional Radiators

#### 3.2 Procedures and results

Item	Test Procedure	Test Procedure Limits Deviation Worst margin *		Worst margin *0)	Result
Conducted emission	ANSI C63.4: 2003 7. AC powerline conducted emission measurements	Except for Class A	N/A	N/A	N/A *1)
Radiated emission	ANSI C63.4: 2003 8. Radiated emission measurements	Except for Class A	N/A	13.1dB 325.013MHz, Vert., QP	Complied
*Note: UL Apex's EMI Work Procedure QPM05.					

\*0) The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result. \*1) The test was not performed since the EUT does not have AC power port.

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

#### 3.3 Confirmation

UL Apex Co., Ltd. hereby confirms that E.U.T., in the configuration tested, complies with the specifications, FCC Part15 Subpart B 2006.

#### 3.4 Uncertainty

#### Radiated Emission

The measurement uncertainty (with a 95% confidence level) for this test using Loop antenna is  $\pm 4.41$ dB(3m). The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is  $\pm 4.59$ dB(3m). The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is  $\pm 4.62$ dB(3m). The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is  $\pm 5.27$ dB. 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	IC Registration	Width x Depth x	Size of	Other
	Registration	Number	Height (m)	reference ground plane (m) /	rooms
	Number			horizontal conducting plane	
No.1 semi-anechoic	313583	IC4247A	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation
chamber					room
No.2 semi-anechoic	655103	IC4247A-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
chamber					
No.3 semi-anechoic	148738	IC4247A-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	
chamber					
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic	134570	IC4247A-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	-
chamber					
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic	-	-	6.0 x 6.0 x 3.9m	N/A	-
chamber					
No.6 shielded	-	-	4.0 x 4.5 x 2.7m	2.0 x 2.0 m	-
room					
No.6 measurement	-	-	4.75 x 5.4 x 3.0m	4.75 x 5.4 m	-
room					
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement	-	-	3.1 x 5.0 x 2.7m	N/A	-
room					

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\* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3 and No.4 semianechoic chambers and No.7 shielded room.

#### 3.6 Test set up, Data of EMI, and 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 mode is used : 314.35MHz Receiving mode

#### 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
А	Remote Keyless Entry System (Receiver)	13BZS	No.1	DENSO	EUT
В	Checker box	-	-	DENSO	-
С	Car Battery	40B19L	-	YUASA	-
D	DC power supply	PW18-1.3AT	08016530	KENWOOD	-
				TMI	

#### List of cables used

No	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC / Signal Cable	2.5	Unshielded	Unshielded	-
2	DC Cable	2.0	Unshielded	Unshielded	With twelve ferrite cores
3	DC Cable	2.0	Unshielded	Unshielded	With twelve ferrite cores
4	AC Cable	2.3	Unshielded	Unshielded	-

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#### **SECTION 5: Radiated Emission**

#### 5.1 Operating environment

Test place: No.3 semi anechoic chamberTemperature: See dataHumidity: See data

#### 5.2 Test configuration

EUT was placed on a wooden table of nominal size, 1.0m by 1.5m, 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. A drawing of the set up is shown in the photos of APPENDIX 1.

#### 5.3 Test conditions

Frequency range	: 30MHz - 300MHz (Biconical antenna) / 300MHz - 1000MHz (Logperiodic anten	
	1000-2000MHz (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 (in linear mode).

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
IF Bandwidth	QP: BW 120kHz	PK: RBW:1MHz/VBW: 1MHz
		AV: RBW:1MHz/VBW:10Hz

The carrier level and 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: November 11, 2006

Test engineer: Mitsuru Fujimura

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