EMI TEST REPORT

Test Report No. : 27KE0267-HO-A

Applicant	:	**DENSO CORPORATION**
Type of Equipment	:	**Remote Keyless Entry System (Receiver)**
Model No.	:	**13BDC**
FCC ID	:	**HYQ13BDC**
Test standard	:	**FCC Part 15 Subpart B 2007**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
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.

Date of test: June 25 and 26, 2007

Tested by: H. Sato
Hisayoshi Sato
EMC Services

Approved by : M. Fujimura
Mitsuru Fujimura
EMC Services

NVLAP®
NVLAP LAB CODE: 200572-0

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://uljapan.co.jp/emc/nvlap.htm

UL Japan, Inc.
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SECTION 1: Client information

Company Name	:	DENSO CORPORATION
Address	:	1-1 Showa-cho, Kariya-city, Aichi-prefecture, 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.	:	13BDC
Serial No.	:	001
Country of Manufacture	:	Japan
Receipt Date of Sample	:	June 25, 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 No. 13BDC is the Remote Keyless Entry System (Receiver).

Nominal frequency	:	314.35MHz
Oscillator frequency	:	40.63125MHz (Crystal)
Type of receiving system	:	Super-heterodyne
Power Supply	:	DC12V (Nominal supply voltage)
Antenna	:	Built-in type (Fixed)
Type of modulation	:	ASK

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).

SECTION 3: Test specification, procedures & 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	Receiver	N/A *1)	N/A	N/A
Radiated emission	ANSI C63.4: 2003 8. Radiated emission measurements	Receiver	N/A	17.3dB, QP 325.047MHz, Horizontal	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

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

Radiated Emission
The measurement uncertainty for this test using Loop antenna is ±4.41dB(3m).
The measurement uncertainty for this test using Biconical antenna is ±4.59dB(3m).
The measurement uncertainty for this test using Logperiodic antenna is ±4.62dB(3m).
The measurement uncertainty for this test using Horn antenna is ±5.27dB.
The data listed in this test report has enough margin, more than the site margin.

3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	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	IC4247A	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	655103	IC4247A-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	IC4247A-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	IC4247A-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	-
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	-

* 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, Test instruments, and Label & Label Location

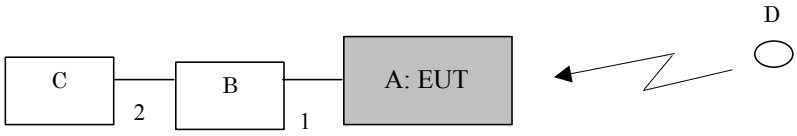
Refer to APPENDIX 1 to 4.

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

4.1 Operating modes

The mode is used : Receiving 314.35MHz 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
A	Remote Keyless Entry System (Receiver)	13BDC	001	DENSO CORPORATION	EUT
B	Checker bench	-	-	DENSO CORPORATION	-
C	Car Battery	40B19L	A030402	YUASA	-
D	Remote Keyless Entry System (Transmitter)	-	-	DENSO CORPORATION	-

List of cables used

No.	Name	Length (m)	Shield	
			Cable	Connector
1	DC & Signal Cable	1.6	Unshielded	Unshielded
2	DC Cable	1.0	Unshielded	Unshielded

SECTION 5: Radiated Emission

5.1 Operating environment

Test place : No.2 semi anechoic chamber
Temperature : See data
Humidity : 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 antenna)
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

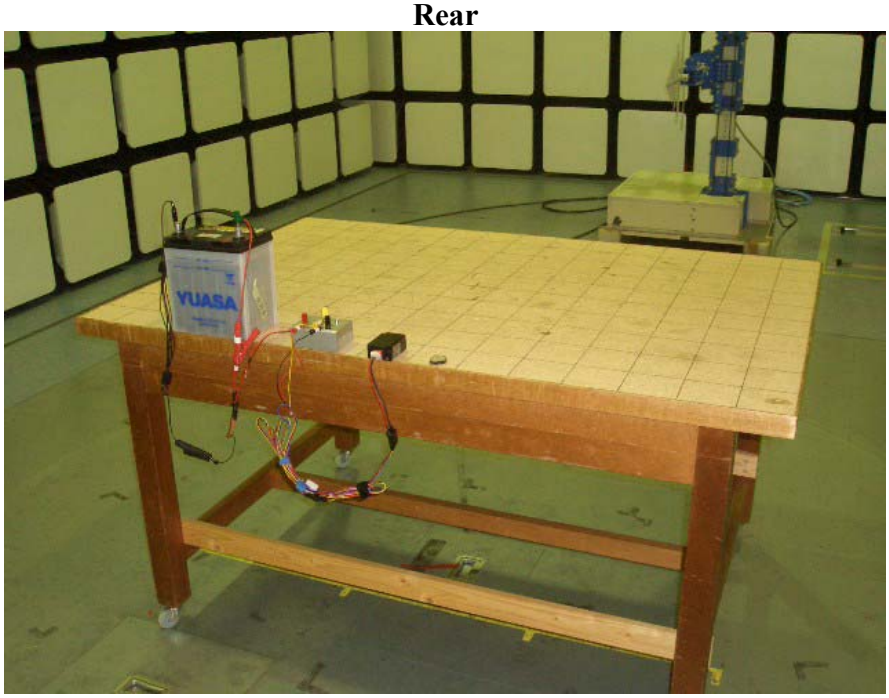
Date: June 25 and 26, 2007 Test engineer: Hisayoshi Sato

APPENDIX 1: Photographs of test setup

Radiated Emission

Front

Rear



Worst Case Position (Horizontal: X-axis /Vertical: X-axis)

EUT-X-axis

EUT-Y-axis

EUT-Z-axis

APPENDIX 2: Data of EMI test

Radiated Emission

DATA OF RADIATED EMISSION TEST

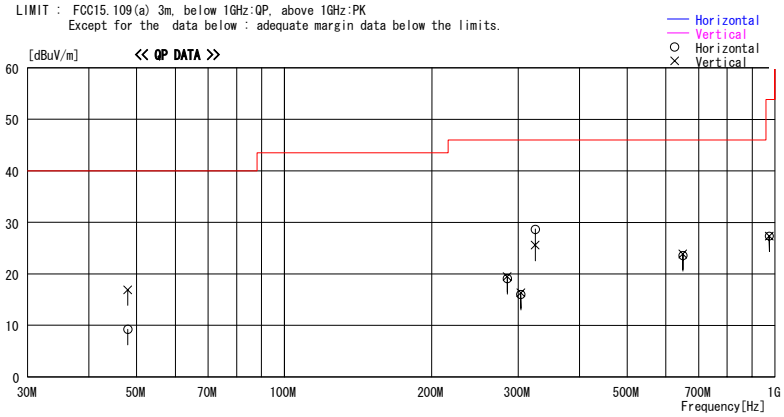
UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Date : 2007/06/25

Company	: DENSO CORPORATION	Report No.	: 27KE0267-HO
Kind of EUT	: Remote Keyless Entry System	Power	: DC 12.0V
Model No.	: 13BDC (Receiver)	Temp./Humi.	: 26deg.C / 63%
Serial No.	: 001	Operator	: Hisayoshi Sato

Mode / Remarks : Receiving 314.35MHz/ Local 325.05MHz/ EUT Position Hor: X-axis, Ver: X-axis

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
47.971	20.2	QP	10.9	-21.9	9.2	155	100	Hori.	40.0	30.8
47.971	27.9	QP	10.9	-21.9	16.9	0	100	Vert.	40.0	23.1
285.019	19.2	QP	19.1	-19.2	19.1	359	400	Hori.	46.0	26.9
285.019	19.6	QP	19.1	-19.2	19.5	0	100	Vert.	46.0	26.5
303.650	20.9	QP	14.6	-19.1	16.4	140	100	Vert.	46.0	29.7
303.650	20.5	QP	14.6	-19.1	16.0	155	100	Hori.	46.0	30.0
325.043	29.4	QP	15.4	-19.2	25.6	140	100	Vert.	46.0	20.4
325.047	32.5	QP	15.4	-19.2	28.7	155	100	Hori.	46.0	17.3
650.090	22.4	QP	19.9	-18.7	23.6	155	100	Hori.	46.0	22.4
650.090	22.7	QP	19.9	-18.7	23.9	140	100	Vert.	46.0	22.1
975.135	20.7	QP	23.1	-16.5	27.3	155	100	Hori.	53.9	26.6
975.135	20.7	QP	23.1	-16.5	27.3	140	100	Vert.	53.9	26.6

CHART:WITH FACTOR ANT TYPE : -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The limit is rounded down to one decimal place.
*The test result is round off to one or two decimal places, so some differences might be observed.

Radiated Emission

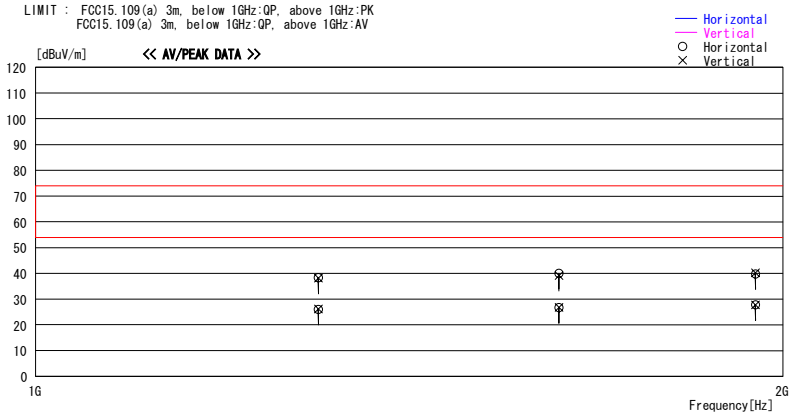
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2007/06/26

Company	: DENSO CORPORATION	Report No.	: 27KE0267-HO
Kind of EUT	: Remote Keyless Entry System	Power	: DC 12.0V
Model No.	: 13BDC (Receiver)	Temp./Humi.	: 26deg.C / 63%
Serial No.	: 001	Operator	: Hisayoshi Sato

Mode / Remarks : Receiving 314.35MHz/ Local 325.05MHz/ EUT Position Hor: X-axis, Ver: X-axis

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]
1300.180	44.5	PK	25.2	-31.4	38.3	0	100	Hori.	73.9	35.6
1300.180	44.3	PK	25.2	-31.4	38.1	0	100	Vert.	73.9	35.8
1300.180	32.4	AV	25.2	-31.4	26.2	0	100	Vert.	53.9	27.7
1300.180	32.2	AV	25.2	-31.4	26.0	0	100	Hori.	53.9	27.9
1625.225	43.9	PK	26.0	-30.7	39.2	0	100	Vert.	73.9	34.7
1625.225	31.4	AV	26.0	-30.7	26.7	0	100	Vert.	53.9	27.2
1625.225	44.7	PK	26.0	-30.7	40.0	0	100	Hori.	73.9	33.9
1625.225	31.4	AV	26.0	-30.7	26.7	0	100	Hori.	53.9	27.2
1950.270	31.3	AV	26.4	-30.0	27.7	0	100	Vert.	53.9	26.2
1950.270	43.4	PK	26.4	-30.0	39.8	0	100	Hori.	73.9	34.1
1950.270	43.9	PK	26.4	-30.0	40.3	0	100	Vert.	73.9	33.7
1950.270	31.4	AV	26.4	-30.0	27.8	0	100	Hori.	53.9	26.2

CHART:WITH FACTOR ANT TYPE : -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The limit is rounded down to one decimal place.
*The test result is round off to one or two decimal places, so some differences might be observed.

APPENDIX 3: Test instruments

EMI Test Instrument

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2007/04/02 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2007/02/27 * 12
MPA-09	Pre Amplifier	Agilent	8447D	RE	2006/09/07 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2006/10/07 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2006/10/07 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	RE	2006/09/13 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	RE	2007/05/31 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2006/12/27 * 12
MOS-02	Digital Humidity Indicator	N.T	NT-1800	RE	2006/11/27 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2007/01/30 * 12
MCC-47	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2006/08/29 * 12
MPA-10	Pre Amplifier	Agilent	8449B	RE	2006/09/11 * 12
MCC-25	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2006/08/29 * 12
MJM-05	Measure	PROMART	SEN1955	RE	-
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2006/12/27 * 12

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item:
RE: Radiated emission