EMI TEST REPORT

Test Report No. : 30CE0101-HO-01-A

Applicant	:	**DENSO CORPORATION**
Type of Equipment	:	**Tire Pressure Monitoring System (Receiver)**
Model No.	:	**13BDK**
FCC ID	:	**HYQ13BDK**
Test regulation	:	**FCC Part 15 Subpart B 2009**
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: October 26, 2009

Tested by: T. Nakagawa
Tomohisa Nakagawa
EMC Services

Approved by : S. Watanabe
Shinya Watanabe
Group Leader of EMC Services

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http://uljapan.co.jp/emc/nvlap.html

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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	:	+81-566-61-5234
Facsimile Number	:	+81-566-25-4837
Contact Person	:	Hideki Saitoh

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Tire Pressure Monitoring System (Receiver)
Model No.	:	13BDK
Serial No.	:	1
Receipt Date of Sample	:	October 21, 2009
Country of Mass-production	:	Japan
Condition of EUT	:	Production 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

Feature of EUT: Tire Pressure Monitoring System is used for monitoring and indicating information of air pressure in vehicle's tires.

Type of Receiver	:	Super-heterodyne
Frequency of Operation	:	314.98MHz
Oscillator Frequency	:	38.035MHz (Crystal)
Intermediate Frequency	:	10.7MHz
Type of Modulation	:	F2D
Antenna Type	:	ANT: Built-in type (Tire House ANT): FRAnt ANT: Built-in type (Tire House ANT): FLAnt ANT: Built-in type (Tire House ANT): RRAnt ANT: Built-in type (Tire House ANT): RLAnt
Power Supply	:	DC 12V

FCC15.111(b)
The receiving antenna (of this EUT) is installed inside the tire house so that it is impossible for end users to replace the antenna. The EUT has a particular antenna. Therefore, this EUT complies with the requirement in section 15.111(b) and the test for Conducted was excluded.

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test Specification : FCC Part 15 Subpart B 2009, final revised on February 27, 2009
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	19.7dB 912.840MHz 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.					

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

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 (semi-anechoic chamber)	Radiated emission (10m*)(±dB)			Radiated emission (3m*)(±dB)					
	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	1GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz
No.1	3.1dB	4.4dB	3.9dB	3.2dB	3.8dB	3.9dB	5.0dB	5.0dB	5.4dB
No.2	-	-	-	3.2dB	4.4dB	4.0dB	5.0dB	5.2dB	5.4dB
No.3	-	-	-	3.2dB	4.2dB	3.8dB	5.0dB	5.3dB	5.3dB
No.4	-	-	-	3.2dB	4.0dB	3.8dB	5.0dB	5.3dB	5.3dB

*10m/3m = Measurement distance

Radiated emission test (3m)
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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	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

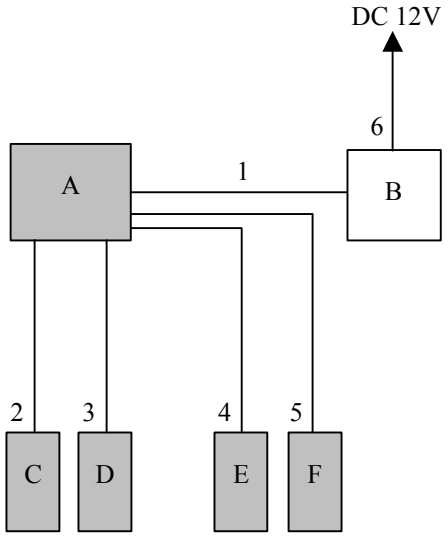
Refer to APPENDIX 1 to 3.

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

4.1 Operating modes

The mode is used : 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
A	Tire Pressure Monitoring System (Receiver)	13BDK	1	DENSO CORPORATION	EUT
B	Jig	-	-	DENSO CORPORATION	-
C	ANT	FRAnt	-	DENSO CORPORATION	EUT *1)
D	ANT	FLAnt	-	DENSO CORPORATION	EUT *1)
E	ANT	RRAnt	-	DENSO CORPORATION	EUT *1)
F	ANT	RLAnt	-	DENSO CORPORATION	EUT *1)

*1) EUT: "Tire Pressure Monitoring System (Receiver)" is composed with A, C, D, E and F.

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Signal Cable	2.0	Unshielded	Unshielded	-
2	Ant Cable	5.7	Shielded	Shielded	-
3	Ant Cable	2.4	Shielded	Shielded	-
4	Ant Cable	4.5	Shielded	Shielded	-
5	Ant Cable	3.5	Shielded	Shielded	-
6	DC Cable	0.8	Unshielded	Unshielded	-

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 0.8m 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 antenna 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 radiated emission measurements were made with the following detector function of the test receiver and the Spectrum analyzer.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer *1)
IF Bandwidth	QP: BW 120kHz	PK: RBW:1MHz/VBW: 1MHz AV *2): RBW:1MHz/VBW:10Hz

*1) The Spectrum Analyzer was used in 3dB resolution bandwidth.
*2) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

- The noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise. As the result there was no change in the noise levels. Therefore the test was performed at position of X as the representative.

5.5 Test result

Summary of the test results: Pass

Date: October 26, 2009 Test engineer: Tomohisa Nakagawa