

# TEST RESULT SUMMARY

## FCC PART 15 SUBPART B Class B Limit

MANUFACTURER'S NAME	Denso Corp
NAME OF EQUIPMENT	Superregenerative Receiver for Remote Keyless Entry System
MODEL NUMBER	<b>13BBA</b>
MANUFACTURER'S ADDRESS	1-1 Showa-cho, Kariya-shi Aichi-ken, 448-8661 Japan
TEST REPORT NUMBER	W9398.2
TEST DATE	31 August 1999

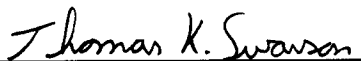
According to testing performed at TÜV Product Service Inc, the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in FCC Part 15.


It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

TÜV Product Service Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the requirements of FCC Part 15.

Date: 16 September 1999

Location: Taylors Falls MN  
USA

  
 T. K. Swanson  
 Test Technician

  
 J. T. Schneider  
 NVLAP Signatory

# EMC EMISSION - TEST REPORT

Test Report File No. : **WC1H939801.2** Date of issue: 16 September 1999

Model / Serial No. : **13BBA /**

Product Type : **Superregenerative Receiver for Remote Keyless Entry System**

Applicant : **Denso Corp**

Manufacturer : **Denso Corp**

License holder : **Denso Corp**

Address : **1-1 Showa-cho, Kariya-shi**  
 : **Aichi-ken, 448-8661 Japan**

Test Result :  **Positive**     **Negative**

Test Project Number Reference(s) : **W9398.2**

Total pages including Appendices **22**

*TÜV Product Service Inc is a subcontractor to TÜV Product Service, GmbH according to the principles outlined in ISO/IEC Guide 25 and EN 45001.*

*TÜV Product Service Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV Product Service Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV Product Service Inc issued reports.*

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*TÜV Product Service Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NVLAP, and VCCI*

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**EMISSIONS TEST REGULATIONS :**

The emissions tests were performed according to following regulations:

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> - EN 50081-1 / 1991  | <input type="checkbox"/> - Group 1                          | <input type="checkbox"/> - Group 2            |
| <input type="checkbox"/> - EN 55011 / 1991    | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input type="checkbox"/> - EN 55013 / 1990    | <input type="checkbox"/> - Household appliances and similar |   |
| <input type="checkbox"/> - EN 55014 / 1987    | <input type="checkbox"/> - Portable tools                   |   |
|   | <input type="checkbox"/> - Semiconductor devices            |   |
| <input type="checkbox"/> - EN 55014 / A2:1990 | <input type="checkbox"/> - Household appliances and similar |   |
| <input type="checkbox"/> - EN 55014 / 1993    | <input type="checkbox"/> - Portable tools                   |   |
|   | <input type="checkbox"/> - Semiconductor devices            |   |
| <input type="checkbox"/> - EN 55015 / 1987    |   |   |
| <input type="checkbox"/> - EN 55015 / A1:1990 |   |   |
| <input type="checkbox"/> - EN 55015 / 1993    |   |   |
| <input type="checkbox"/> - EN 55022 / 1987    | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input type="checkbox"/> - EN 55022 / 1994    | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input type="checkbox"/> - BS                 |   |   |
| <input type="checkbox"/> - VCCI               | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input checked="" type="checkbox"/> - FCC     | <input type="checkbox"/> - Class A                          | <input checked="" type="checkbox"/> - Class B |
| <input type="checkbox"/> - AS 3548 (1992)     | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input type="checkbox"/> - CISPR 11 (1990)    | <input type="checkbox"/> - Group 1                          | <input type="checkbox"/> - Group 2            |
|   | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |
| <input type="checkbox"/> - CISPR 22 (1993)    | <input type="checkbox"/> - Class A                          | <input type="checkbox"/> - Class B            |

**Environmental conditions in the lab:**

	<u>Actual</u>
Temperature	: 23 °C
Relative Humidity	: 57 %
Atmospheric pressure	: 99.2 kPa
Power supply system	: 12 VDC

**Sign Explanations:**

- not applicable
- applicable

**Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)**

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)* measurements were performed at the following test location:

■ - Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)
- Wild River Lab Screen Room
- New Brighton Lab Shielded Room

**Test equipment used :**

Model Number	Manufacturer	Description	Serial Number	Cal Date
--------------	--------------	-------------	---------------	----------

**Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)**

The *RADIATED EMISSIONS (MAGNETIC FIELD)* measurements were performed at the following test location:

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)

**at a test distance of :**

- 3 meters
- 30 meters

■ - Test not applicable

**Test equipment used :**

Model Number	Manufacturer	Description	Serial Number	Cal Date
--------------	--------------	-------------	---------------	----------

**Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)**

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location :

- Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)

**at a test distance of :**

- 3 meters
- 10 meters
- 30 meters

**Test equipment used :**

Model Number	Manufacturer	Description	Serial Number	Cal Date
■ - 3146	Electro-Mechanics (EMCO)	Log Periodic Antenna	9103-3075	11-98
■ - 3108	Electro-Mechanics (EMCO)	Biconical Antenna	2118	11-98
■ - 8566B	Hewlett-Packard	Spectrum Analyzer	2221A01596	4-99
■ - 85662A	Hewlett-Packard	Analyzer Display	2152A03640	4-99
■ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2811A01127	4-99
■ - ZHL-1042J	Mini-Circuits	Preamplifier	H072294-11	3-99

Use of the calibrated equipment on this list ensures traceability to national and international standards.

**Emissions Test Conditions: INTERFERENCE POWER**

The *INTERFERENCE POWER* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location :

- Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)
- Wild River Lab Screen Room
- New Brighton Lab Shielded Room

**Test equipment used :**

Model Number	Manufacturer	Description	Serial Number	Cal Date
--------------	--------------	-------------	---------------	----------

**Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)**

The *EQUIVALENT RADIATED EMISSIONS* measurements in the frequency range 1 GHz - 2 GHz were performed in a horizontal and vertical polarization at the following test location :

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)
- Wild River Lab Screen Room

**at a test distance of:**

- 1 meters
- 3 meters
- 10 meters

- Test not applicable

**Test equipment used :**

	<b>Model Number</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Serial Number</b>	<b>Cal Date</b>
<input checked="" type="checkbox"/> -	3115	Electro-Mechanics (EMCO)	Horn Antenna	9001-3275	9-98
<input checked="" type="checkbox"/> -	8566B	Hewlett-Packard	Spectrum Analyzer	2221A01596	4-99
<input checked="" type="checkbox"/> -	85662A	Hewlett-Packard	Analyzer Display	2152A03640	4-99
<input checked="" type="checkbox"/> -	85650A	Hewlett-Packard	Quasi-Peak Adapter	2811A01127	4-99
<input checked="" type="checkbox"/> -	ZHL-1042J	Mini-Circuits	Preamplifier	H072294-11	3-99

Use of the calibrated equipment on this list ensures traceability to national and international standards.



**Equipment Under Test (EUT) Test Operation Mode - Emission tests :**

The device under test was operated under the following conditions during emissions testing:

- Standby
- Test program (H - Pattern)
- Test program (color bar)
- Test program (customer specific)
- Practice operation
- Normal Operating Mode
- \_\_\_\_\_

**Configuration of the device under test:**

- See Constructional Data Form in Appendix B - Page B2
- See Product Information Form in Appendix B - beginning on Page B3

The following peripheral devices and interface cables were connected during the measurement:

- |                                  |              |
|----------------------------------|--------------|
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |
| <input type="checkbox"/> - _____ | Type : _____ |

- unshielded power cable
- unshielded cables
- shielded cables

MPS.No.: \_\_\_\_\_

- customer specific cables
- \_\_\_\_\_
- \_\_\_\_\_

**Emission Test Results:**

**Conducted emissions 450 kHz - 30 MHz**

The requirements are  - MET  - NOT MET  
 Minimum limit margin \_\_\_\_\_ dB at \_\_\_\_\_ MHz  
 Maximum limit exceeding \_\_\_\_\_ dB at \_\_\_\_\_ MHz  
 Remarks: \_\_\_\_\_

**Radiated emissions (magnetic field) 10 kHz - 30 MHz**

The requirements are  - MET  - NOT MET  
 Minimum limit margin \_\_\_\_\_ dB at \_\_\_\_\_ MHz  
 Maximum limit exceeding \_\_\_\_\_ dB at \_\_\_\_\_ MHz  
 Remarks: \_\_\_\_\_

**Radiated emissions (electric field) 30 MHz - 1000 MHz**

The requirements are  - MET  - NOT MET  
 Minimum limit margin \_\_\_\_\_ >10 dB at \_\_\_\_\_ MHz  
 Maximum limit exceeding \_\_\_\_\_ dB at \_\_\_\_\_ MHz  
 Remarks: \_\_\_\_\_

**Interference Power at the mains and interface cables 30 MHz - 300 MHz**

The requirements are  - MET  - NOT MET  
 Minimum limit margin \_\_\_\_\_ dB at \_\_\_\_\_ MHz  
 Maximum limit exceeding \_\_\_\_\_ dB at \_\_\_\_\_ MHz  
 Remarks: \_\_\_\_\_

**Equivalent Radiated emissions 1 GHz - 2 GHz**

The requirements are  - MET  - NOT MET  
 Minimum limit margin \_\_\_\_\_ >10 dB at \_\_\_\_\_ MHz  
 Maximum limit exceeding \_\_\_\_\_ dB at \_\_\_\_\_ MHz  
 Remarks: \_\_\_\_\_

**DEVIATIONS FROM STANDARD:**

None.

**GENERAL REMARKS:**

**SUMMARY:**

The requirements according to the technical regulations are

- met

- **not** met.

The device under test does

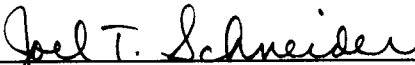
- fulfill the general approval requirements mentioned on page 3.


- **not** fulfill the general approval requirements mentioned on page 3.

Testing Start Date: 31 August 1999

Testing End Date: 31 August 1999

- TÜV PRODUCT SERVICE INC -

  
\_\_\_\_\_  
J. T. Schneider  
NVLAP Signatory

  
\_\_\_\_\_  
Tested By:  
T. K. Swanson

Test-setup photo(s):  
Conducted emission 10/150 kHz - 30 MHz

Not Applicable