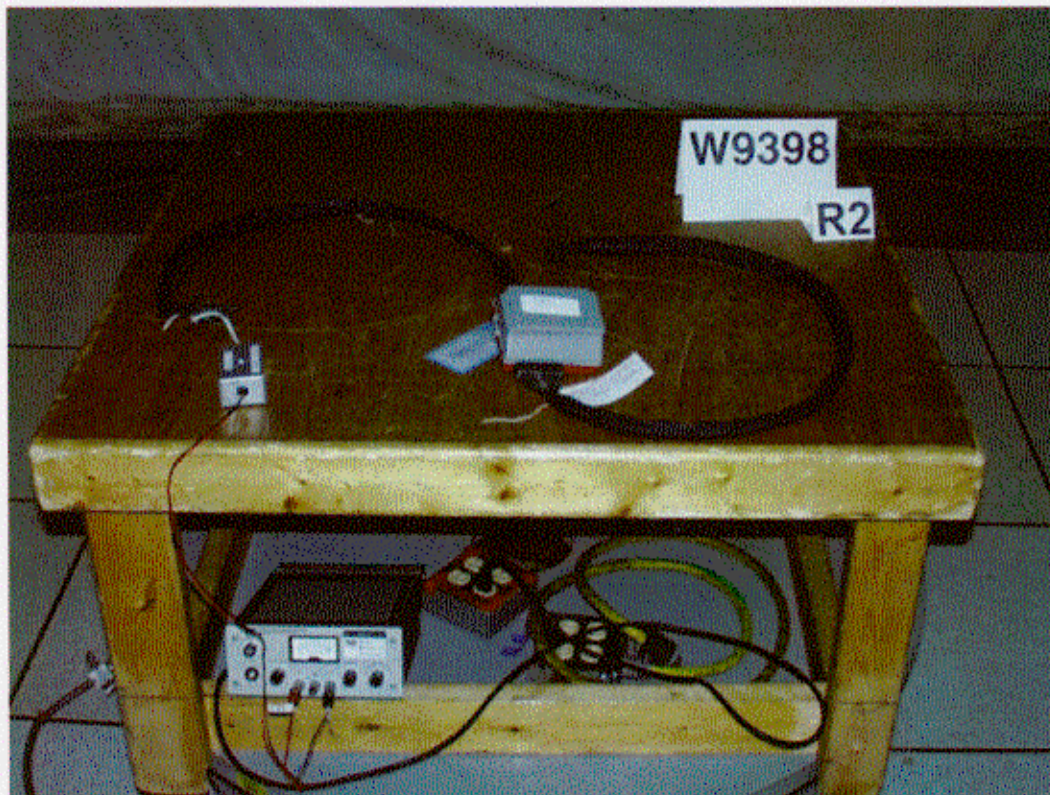


Test-setup photo(s):  
Radiated emission 30 MHz - 2000 MHz



FCC ID: HYQ13BBA



**Appendix A**

Test Data Sheets

and

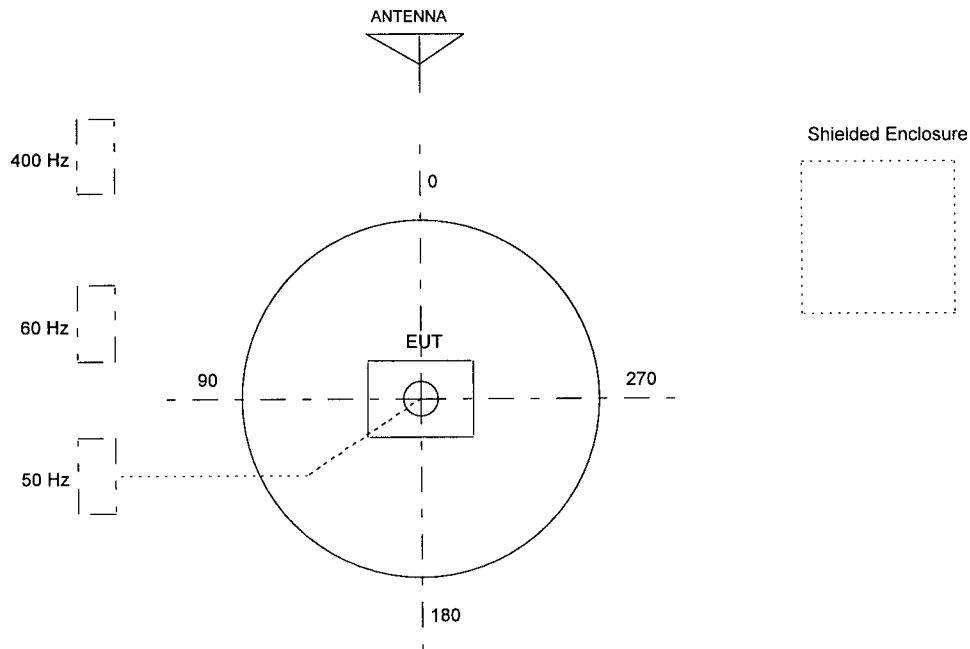
Test Setup Drawing(s)

**TEST SETUP FOR EMISSIONS TESTING**

WILD RIVER LAB  
Large Test Site

Notes:

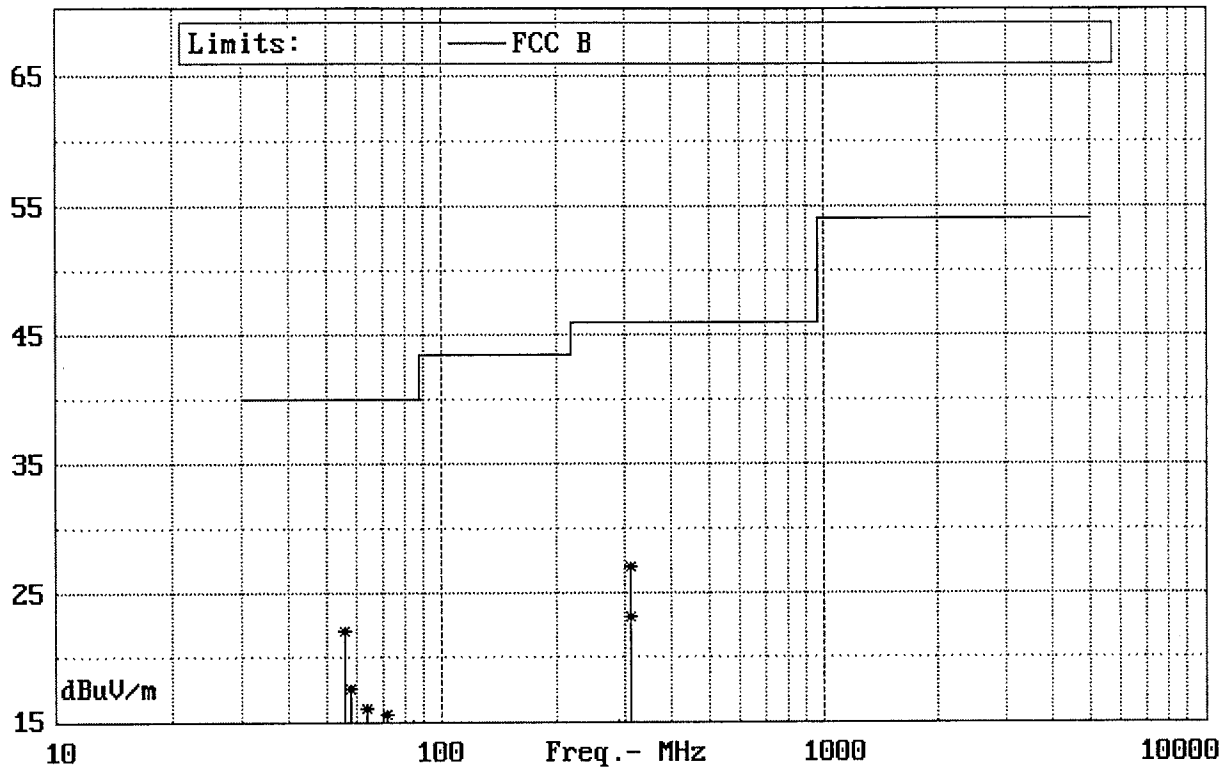
1. Items shown in dotted lines are located on the floor below the test area. It is 5 meters vertically from the ground floor to the test area.
2. 50 Hz, 60 Hz, and 400 Hz are power panels for alternating current.
3. The antenna may be positioned horizontally 3, 10 or 30 meters from the center of the turntable.
4. The circle is a 6.7 meter diameter turntable.
5. A ground plane is in the plane of this sheet.
6. The test sample is shown in the azimuthal position representing zero degrees.



TÜV PRODUCT SERVICE  
RADIATED EMISSIONS AT 3 METERS  
DENSO 13BBA RECEIVER

REPORT #W9398  
RUN 2

08/31/99



T U V P R O D U C T S E R V I C E

RADIATED EMISSIONS

Large Test Site  
 3 Meter Antenna Distance  
 Equipment Under Test:  
 DENSO  
 13BBA RECEIVER  
 Notes:

Report W9398 Run 2  
 Date 08/31/99 Page 1  
 Engineer \_\_\_\_\_  
 Tech: TKS TKS  
 Requester \_\_\_\_\_

Frequency MHz	Level dBuV	Factor dB	Cable dB	Final dBuV/m	Az deg	Polar\ Height	Delta FCC B	Delta
------------------	---------------	--------------	-------------	-----------------	-----------	------------------	----------------	-------

SCAN 200 TO 1000 MHZ

0 DEGREES - VERTICAL ANTENNA 1 METER HIGH

311.44	8.19	16.3	1.6	26.1	--	V --	-19.9	
291.99	-4.72	14.5	1.6	11.4	--	V --	-34.6	

311 MHZ MAXED AT 0 DEGREES - VERTICAL ANTENNA 1.4 METERS HIGH

311.44	9.24	16.3	1.6	27.1	--	V --	-18.9	
--------	------	------	-----	------	----	------	-------	--

NO HIGHER EMISSIONS DETECTED WITH HORIZONTAL ANTENNA 200 TO 1000 MHZ

311 MHZ MAXED AT 0 DEGREES - HORIZONTAL ANTENNA 4 M

311.29	5.28	16.3	1.6	23.2	--	H --	-22.8	
--------	------	------	-----	------	----	------	-------	--

SCAN 30 TO 200 MHZ

0 DEGREES - VERTICAL 1 M

56.016	10.05	10.3	.6	21	--	V --	-19	
58.02	7.02	9.9	.6	17.5	--	V --	-22.5	
64.024	6.15	9.1	.7	15.9	--	V --	-24.1	
72	6.48	8.2	.7	15.4	--	V --	-24.6	
84.054	5.46	7.8	.8	14.1	--	V --	-25.9	

56 MHZ MAXED AT 0 DEGREES - VERTICAL 1 M

56.016	11.05	10.3	.6	22	--	V --	-18	
--------	-------	------	----	----	----	------	-----	--

NO HIGHER EMISSIONS WITH HORIZONTAL ANTENNA 30 TO 200 MHZ

NO FURTHER EMISSIONS DETECTED - END OF SCAN 30 TO 1000 MHZ

T U V P R O D U C T S E R V I C E

RADIATED EMISSIONS

Large Test Site  
 3 Meter Antenna Distance  
 Equipment Under Test:  
 DENSO  
 13BBA RECEIVER  
 Notes:

Figure \_\_\_\_\_

Report W9398 Run 2  
 Date 08/31/99 Page 2  
 Engineer \_\_\_\_\_  
 Tech: TKS \_\_\_\_\_  
 Requester \_\_\_\_\_

Measurement Summary

Frequency MHz	----- Final dBuV/m	----- uV/m	Azimuth deg	Polar\ Height	Delta FCC B	Delta
56.016	22	12.589	--	V --	-18	
58.02	17.5	7.4989	--	V --	-22.5	
64.024	15.9	6.2373	--	V --	-24.1	
72	15.4	5.8884	--	V --	-24.6	
84.054	14.1	5.0699	--	V --	-25.9	
291.99	11.4	3.7153	--	V --	-34.6	
311.29	23.2	14.454	--	H --	-22.8	
311.44	27.1	22.646	--	V --	-18.9	

Minimum Passing Margin for FCC B is 18 dB at 56.016 MHz

File W9398 Run 2

FCC ID: HYQ13BBA



**Appendix B**

Constructional Data Form  
and  
Product Information Form(s)

Constructional Data Form

Not Applicable



Technical Description of the systemType number

- Receiver :13BBA

Specifications of receiver

- Nominal frequency :314.35 MHz  
- Micro computer clock frequency :4 MHz  
- Type of receiving system :Super regenerative  
- Power supply  
    - Nominal supply voltage :12 VDC (vehicle battery)  
- Antenna :Built-in type (fixed)

Description of the system operation

This system is mainly used for locking or unlocking the doors of the vehicle. The transmitter sends a radio wave signal while the button is pushed. The receiver becomes active in response to the signal from the transmitter.

Installation in vehicle

The receiver is installed inside the vehicle.

**Appendix C**

**MEASUREMENT PROTOCOL FOR FCC**

**GENERAL INFORMATION**

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-1992 procedures and using the CISPR 22 Limits.

**Measurement Uncertainty**

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. These test systems have a measurement uncertainty of ±4.5 dB. The equipment comprising the test systems are calibrated on an annual basis.

**Justification**

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into it's characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

**CONDUCTED EMISSIONS**

The final level, expressed in dBµV, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC limit.

To convert between dBµV and µV, the following conversions apply:

$$dB\mu V = 20(\log \mu V)$$

$$\mu V = \text{Inverse log}(dB\mu V/20)$$

**RADIATED EMISSIONS**

The final level, expressed in dBµV/m, is arrived at by taking the reading from the spectrum analyzer (Level dBµV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has the FCC limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets in Attachment B. The amplifier gain is automatically accounted for by using an analyzer offset.

Example:

Frequency (MHz)	Level (dBµV)	+	Factor & Cable (dB)	=	Final (dBµV/m)	-	FCC B Limit (dBµV/m)	=	Delta FCC B (dB)
32.21	13.9	+	16.3	=	30.2	-	40.0	=	-9.8

**DETAILS OF TEST PROCEDURES****General Standard Information**

The test methods used comply with ANSI C63.4-1992 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

**Conducted Emissions**

Conducted emissions on the 60 Hz power interface of the EUT are measured in the frequency range of 450 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50  $\Omega$ /50  $\mu$ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. In some cases, a pre-scan using a spectrum analyzer is initially performed on the units comprising the system under test to locate the highest emissions. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver or spectrum analyzer with quasi-peak and average detection and recorded on the data sheets.

**Radiated Emissions**

Radiated emissions from the EUT are measured in the frequency range of 30 to 1000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees.