Test-setup photo(s):
Radiated emission 30 MHz - 3.14 GHz

FCC ID: HYQ12BBA

Appendix A

Test Data Sheets

and

Test Setup Drawing(s)

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

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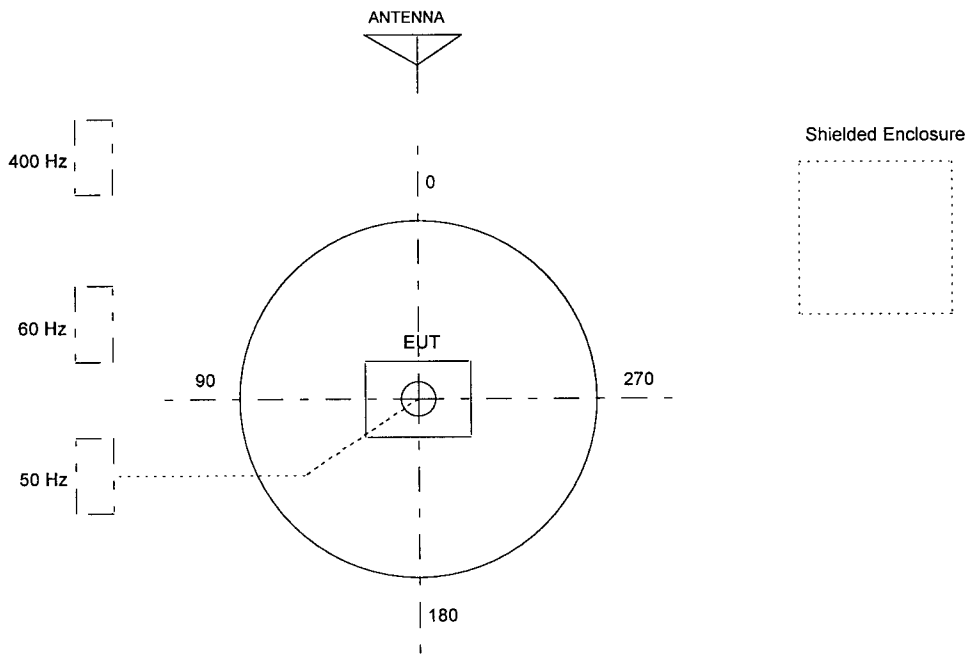
TEST SETUP FOR EMISSIONS TESTING

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.



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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 12BBA TRANSMITTER

Report W9398 Run 1
Date 08/29/99 Page 1
Engineer _____
Tech: JTS_____
Requester_____

Notes:

Frequency MHz	Level dBuV	Factor dB	Cable dB	Peak dBuV/m	Az deg	Polar\ Height	Average dBuV/m	Limit FCC 15.231
PEAK MODE, 100 KHZ, XMTR HORIZONTAL ON TABLE, MAXIMIZED.								
314.42	44.6	16	1.6	62.2	--	V --	54.2	75.5
314.42	59.5	16	1.6	77.1	--	H --	54.2	75.5
QUASI-PEAK								
314.47	59.94	16	1.6	77.5	--	H --	69.5	75.5
DUTY CYCLE IS 37/100 MSEC, AVERAGE RELAXATION = 8 DB.								
PEAK MODE, 100 KHZ, XMTR VERTICAL ON TABLE, MAXIMIZED.								
314.47	40.13	16	1.6	57.7	--	H --	49.7	75.5
314.42	56.58	16	1.6	74.2	--	V --	66.2	75.5
XMTR HORIZONTAL.								
0 DEGREES, VERTICAL POLARIZATION, 1 METER HIGH.								
628.8	9.08	20.2	2.4	31.7	--	V --	23.7	46
0 DEGREES, VERTICAL POLARIZATION, 1.5 METERS HIGH.								
628.8	12.71	20.2	2.4	35.3	--	V --	27.3	46
0 DEGREES, HORIZONTAL POLARIZATION, 1 METER HIGH.								
628.8	14.7	20.2	2.4	37.3	--	H --	29.3	46
105 DEGREES, HORIZONTAL POLARIZATION, 1.4 METERS HIGH.								
628.8	22.75	20.2	2.4	45.3	--	H --	37.3	46
80 DEGREES, HORIZONTAL POLARIZATION, 1 METER HIGH.								
314.03	28.63	16	1.6	46.3	--	H --	38.3	55.5
0 DEGREES, VERTICAL POLARIZATION, 1 METER HIGH.								
137.45	8.83	12	1	21.9	--	V --	13.9	43.5
84.025	7.32	7.8	.8	15.9	--	V --	7.9	55.5

NO OTHER SIGNALS DETECTED FROM 30-3150 MHZ.

Joel T. Schneider

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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 12BBA TRANSMITTER

Figure____

Report W9398 Run 1
Date 08/29/99 Page 2
Engineer _____
Tech: JTS_____
Requester_____

Notes:

Measurement Summary

Frequency MHz	Final dBuV/m	Final uV/m	Azimuth deg	Polar\ Height		Delta	Delta FCC 15.231
84.025	7.9	2.4831	--	V	--		-47.6
137.45	13.9	4.9545	--	V	--		-29.6
314.03	38.3	206.53	--	H	--		-17.2
314.47	69.5	2985.3	--	H	--		-6
628.8	37.3	73.282	--	H	--		-8.7

File W9398 Run 1

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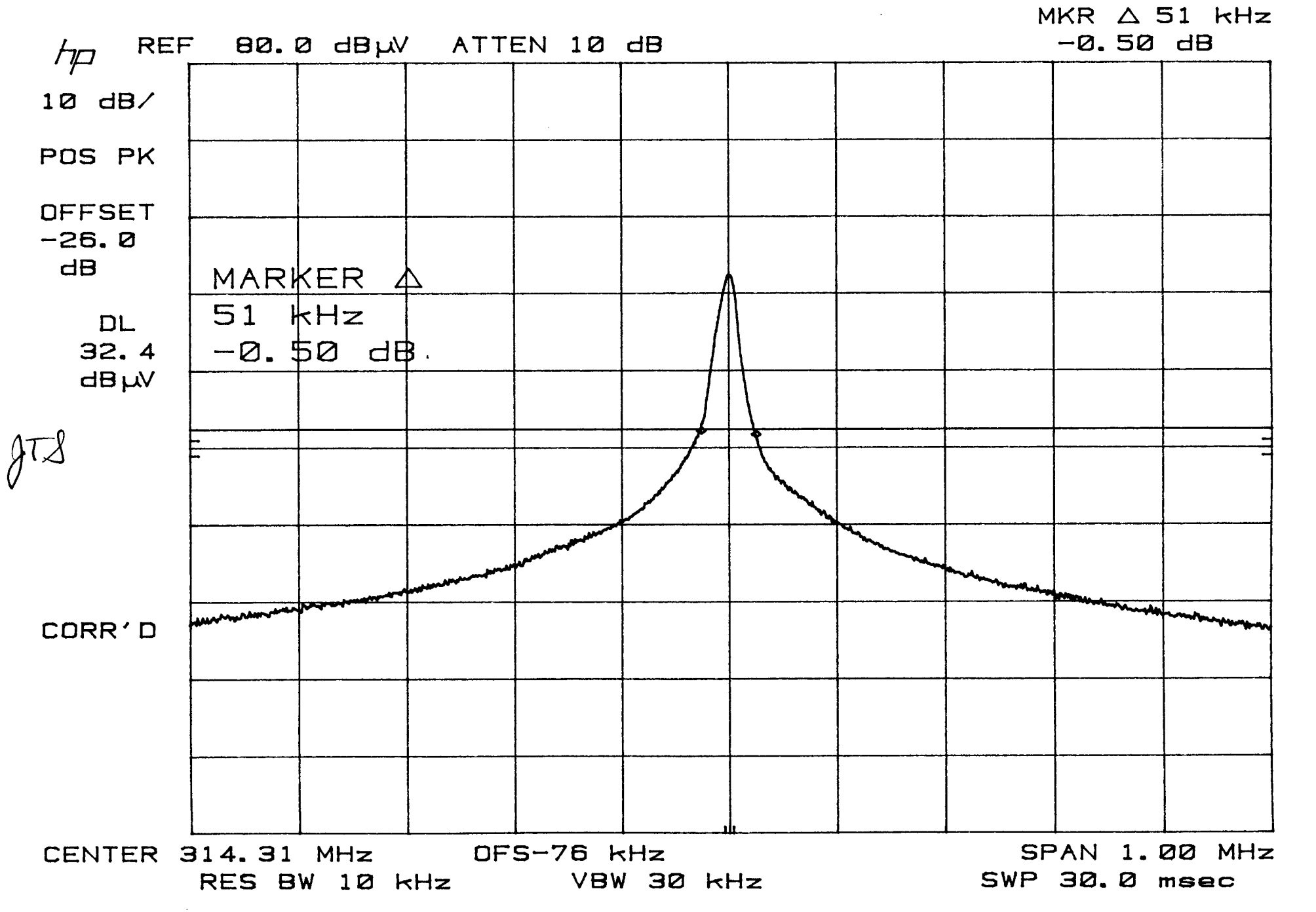
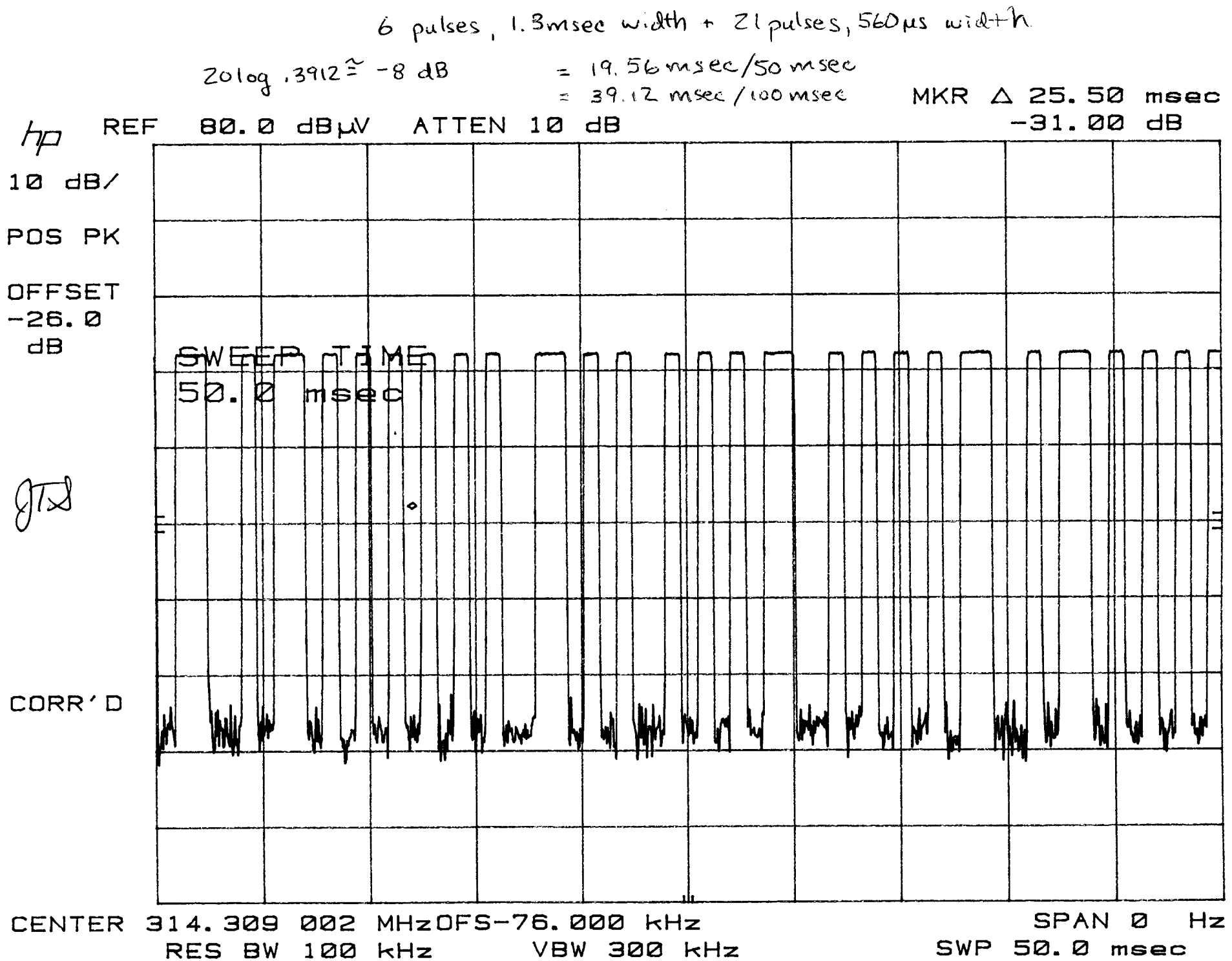

MKR Δ 51 kHz
-0.50 dB
REF 80.0 dBμV
ATTEN 10 dB
10 dB/
POS PK
OFFSET
-26.0
dB
MARKER Δ
51 kHz
-0.50 dB
DL
32.4
dBμV
JTS
CORR'D
CENTER 314.31 MHz
OFS-76 kHz
SPAN 1.00 MHz
RES BW 10 kHz
VBW 30 kHz
SWP 30.0 msec

6 pulses, 1.3msec width + 21 pulses, 560μs width

20log .3912 ≅ -8 dB = 19.56 msec/50 msec
= 39.12 msec/100 msec



FCC ID: HYQ12BBA

Appendix B

Constructional Data Form

and

Product Information Form(s)

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

Constructional Data Form

Not Applicable

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

Technical Description of the system

Type number

- Transmitter	:12BBA

Specifications of receiver

- Nominal frequency	:314.35 MHz
- Local oscillator frequency	:314.35 MHz SAW resonator circuit
	:1 MHz CR oscillator circuit
- Radio frequency output power	:75.6 dBuV/m or less
- Type of modulation	:A1D
- Power supply	
- Nominal supply voltage	:3 VDC
- Type of battery	:One lithium 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

GENERAL INFORMATION

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:

dBμV = 20(log μV)

μV = Inverse log(dBμV/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 Limit (dBμV/m)	=	Delta FCC (dB)
32.21	13.9	+	16.3	=	30.2	-	40.0	=	-9.8

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

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 Ω/50 μH (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. Intentional radiators are rotated through three orthogonal axes to determine the attitude that maximizes the emissions.