TEST RESULT SUMMARY

FCC PART 15 Subpart C
Section 15.231

MANUFACTURER'S NAME	Visteon Asia Pacific, Inc.
NAME OF EQUIPMENT	Keyless Entry System
MODEL NUMBER	**41788**
MANUFACTURER'S ADDRESS	Hiroshima Sangyo Bunka Center 9F 16-35, Hijiyama-honmachi, Minami-ku, Hiroshima 732-0816 Japan
TEST REPORT NUMBER	WC400072
TEST DATE	13 January 2004

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 Subpart C Section 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 Subpart C Section 15.231.

Date: 27 January 2004

Location:	Taylors Falls MN USA	R. M. Johnson Tested By
		T. K. Swanson Reviewed By

Not Transferable

EMC EMISSION - T E S T R E P O R T

Test Report File No.	:	**WC400072**	Date of issue:	27 January 2004

Model No.	:	**41788**
Product Type	:	Keyless Entry System
Applicant	:	Visteon Asia Pacific, Inc.
Address	:	Hiroshima Sangyo Bunka Center 9F
	:	16-35 Hijiyama-honmachi, Minami-ku, Hiroshima 732-0816 Japan
Manufacturer	:	Visteon Electronics Shanghai Plant
Address	:	300 Minolta Road
	:	Songjiang country Shanghai, China 201600
Test Result	:	■ **Positive** ☐ **Negative**
Test Project Number Reference(s)	:	**WC400072**
Total pages including Appendices		24

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.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval. This report shall not be used by the client to claim product endorsement by NVLAP or any agency of the US government.

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

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

D I R E C T O R Y - EMISSIONS

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

EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

☐ - EN 50081-1 / 1991

☐ - EN 55011 / 1991 ☐ - Group 1 ☐ - Group 2
☐ - Class A ☐ - Class B

☐ - EN 55013 / 1990

☐ - EN 55014 / 1987 ☐ - Household appliances and similar
☐ - Portable tools
☐ - Semiconductor devices

☐ - EN 55014 / A2:1990

☐ - EN 55014 / 1993 ☐ - Household appliances and similar
☐ - Portable tools
☐ - Semiconductor devices

☐ - EN 55015 / 1987

☐ - EN 55015 / A1:1990

☐ - EN 55015 / 1993

☐ - EN 55022 / 1987 ☐ - Class A ☐ - Class B

☐ - EN 55022 / 1994 ☐ - Class A ☐ - Class B

☐ - BS

☐ - VCCI ☐ - Class A ☐ - Class B

■ - FCC Part 15 Subpart C Section 15.231

☐ - AS 3548 (1992) ☐ - Class A ☐ - Class B

☐ - CISPR 11 (1990) ☐ - Group 1 ☐ - Group 2
☐ - Class A ☐ - Class B

☐ - CISPR 22 (1993) ☐ - Class A ☐ - Class B

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Environmental conditions in the lab:

	Actual
Temperature	: 17C
Relative Humidity	: 30 %
Atmospheric pressure	: 98.0 kPa
Power supply system	: Battery

Sign Explanations:

☐ - not applicable
■ - applicable

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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

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The *RADIATED EMISSIONS (MAGNETIC FIELD)* 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)

at a test distance of :

☐ - 3 meters
☐ - 30 meters

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Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-3200 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) – NSA measurements made 2-03, due 2-04.
☐ - Oakwood Lab (Open Area Test Site)

at a test distance of :

■ - 3 meters
☐ - 10 meters
☐ - 30 meters

Test equipment used:

	TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	2670	8447D	Electro-Mechanics (EMCO)	Preamplifier	2443A03954	10-08-04
■-	3959	ZHL-1042J	Mini-Circuits	Preamplifier	DP10150323	10-16-04
■ -	3203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	3-18-04
■ -	3229	3115	Electro-Mechanics (EMCO)	Ridge Guide Antenna	2483	3-25-04
■-	8052	8566B	Hewlett-Packard	Spectrum Analyzer	2115a00853	10-17-04
■ -	8051	85662A	Hewlett-Packard	Analyzer Display	2112A02220	10-17-04
■	2680	85650A	Hewlett-Packard	Quasi-Peak Adapter (Unit B)	2043A00343	2-08-04

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

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

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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

■ - Constant transmit.

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 B2

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

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - _____ Type : _____

☐ - unshielded power cable

☐ - unshielded cables

☐ - shielded cables MPS.No.: _____

☐ - customer specific cables

☐ - _____

☐ - _____

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Emission Test Results:

FCC 15.207 - Conducted emissions 10/150 kHz - 30 MHz

The requirements are ☐ - MET ☐ - NOT MET ■ - N/A

Minimum margin of compliance _____ dB at _____ kHz

Maximum margin of non-compliance _____ dB at _____ MHz

Remarks: Battery operated.

FCC 15.231 - Radiated emissions (electric field) 30 MHz - 3200 MHz

The requirements are ■ - MET ☐ - NOT MET

Minimum margin of compliance for fundamental 3 dB at 313.85 MHz [15.231(c)]

Minimum margin of compliance for spurious <1 GHz. 4 dB at 627.55 MHz [15.231(c)]

Minimum margin of compliance for spurious >1 GHz. 4 dB at 1255.0 MHz [15.209]

Remarks: The fundamental was measured to be 72.8 dBuV/m (4365.2 uV/m) in peak mode compared to an average limit of 75.5 dBuV/m (5993.75 uV/m). The 627.55 MHz signal was measured to be 50.8 dBuV/m (346.7 uV/m) in average mode compared to a limit of 55.5 dBuV/m (599.37 uV/m). At 1255.0 MHz, average receiver reading of 51.2 dBuV/m (363.0 uV/m), compared to a limit of 55.5 dBuV/m (599.37 uV/m). The duty cycle correction factor has not been applied. Peak readings are less than 20 dB above the average readings.

FCC 15.231 (c) - Emission Bandwidth

The requirements are ■ - MET ☐ - NOT MET

Remarks: The bandwidth of the fundamental must be less than 0.25% of the center frequency, or 784.35 kHz. Page A4 shows the bandwidth to be 260 kHz.

FCC 15.35 (c) – Duty Cycle

The requirements are ■ - MET ☐ - NOT MET

Remarks: The duty cycle correction factor has not been applied.

FCC 15.231 (a) – Signal Deactivation

The requirements are ■ - MET ☐ - NOT MET

Remarks: The duration of the transmission is 314 milliseconds each time the button is pushed which meets the requirement of ceasing transmission within 5 seconds of the button being released.

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: 13 January 2004

Testing End Date: 13 January 2004

- TÜV PRODUCT SERVICE INC -

T. K. Swanson
Reviewed By

Tested By:
R. M. Johnson

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Test-setup photo(s):
Radiated emission 30 MHz - 3.2 GHz - Transmitter

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Appendix A

Test Data Sheets

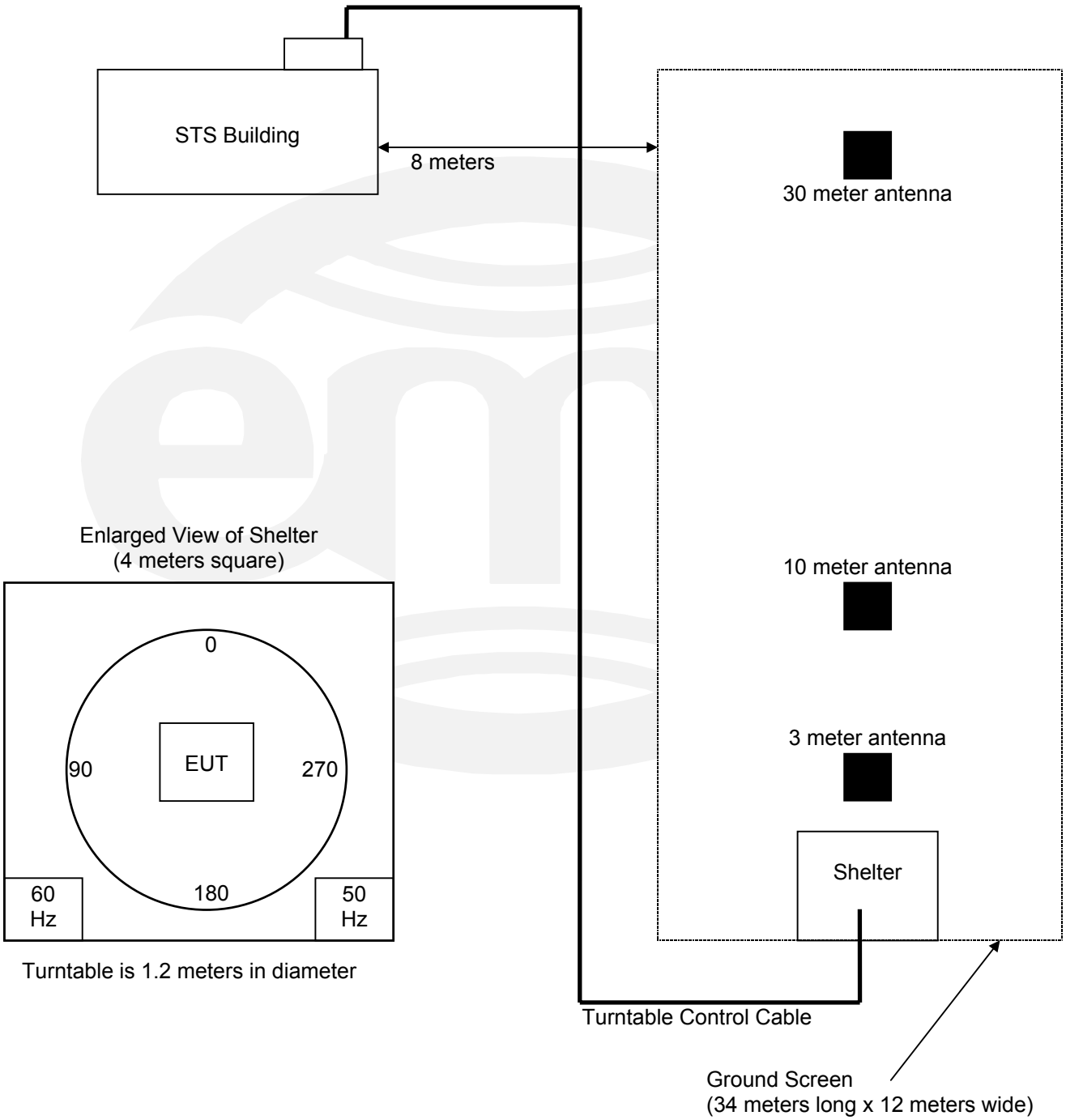
and

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

TEST SETUP FOR EMISSIONS TESTING

WILD RIVER LAB
Small Test Site (STS)



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

RADIATED EMISSIONS

Test Report #:	NC400072 Run 1	Test Area:	STS		
EUT Model #:	41788	Date:	1/13/04		
EUT Serial #:		EUT Power:	12VDC	Temperature:	17.0 °C
Test Method:	FCC 15.231			Air Pressure:	98.0 kPa
Customer:	VISTEON			Rel. Humidity:	30.0 %
EUT Description:	KEY FOB TRANSMITTER				
Notes:					
Data File Name:	0072.dat			Page:	1 of 1

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	15.231 Limit	DELTA 15.231
EUT MAXIMIZED ON IT'S SIDE.						
313.85 MHz	81.36 Av	2.6 / 13.73 / 27.77 / 0.0	69.92	V / 1.50 / 180	75.5	-5.6
313.88 MHz	81.02 Pk	2.6 / 13.73 / 27.77 / 0.0	69.58	V / 1.50 / 180	95.5	-25.92
EUT MAXIMIZED LAYING FLAT ON IT'S BACK.						
313.88 MHz	84.22 Pk	2.6 / 13.73 / 27.77 / 0.0	72.78	H / 1.00 / 180	95.5	-22.72
313.875 MHz	83.75 Av	2.6 / 13.73 / 27.77 / 0.0	72.31	H / 1.00 / 180	75.5	-3.19
EUT MAXIMIZED ON END.						
313.88 MHz	78.16 Pk	2.6 / 13.73 / 27.77 / 0.0	66.72	H / 1.60 / 200	95.5	-28.78
313.875 MHz	77.39 Av	2.6 / 13.73 / 27.77 / 0.0	65.95	H / 1.60 / 200	75.5	-9.55
ALL READINGS MAXIMIZED. 100KHZ RBW BELOW 1GHz AND 1MHz RBW ABOVE 1GHz.						
EUT WILL BE LAYING FLAT ON IT'S BACK FOR THE REMAINDER OF THE TEST.						
627.725 MHz	54.16 Av	3.74 / 20.2 / 27.31 / 0.0	50.79	H / 1.20 / 200	55.5	-4.71
941.575 MHz	42.33 Av	4.66 / 22.7 / 27.49 / 0.0	42.19	H / 1.40 / 90	55.5	-13.31
1.255 GHz	49.51 Av	5.34 / 24.02 / 27.66 / 0.0	51.21	H / 1.00 / 188	55.5	-4.29
1.569 GHz	40.75 Av	6.08 / 25.93 / 41.75 / 0.0	31.02	H / 1.00 / 228	54.0	-22.98
END OF SCAN TO 3.14GHz.						

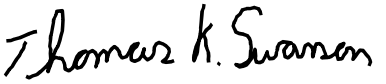
Tested by: RMJ

Printed

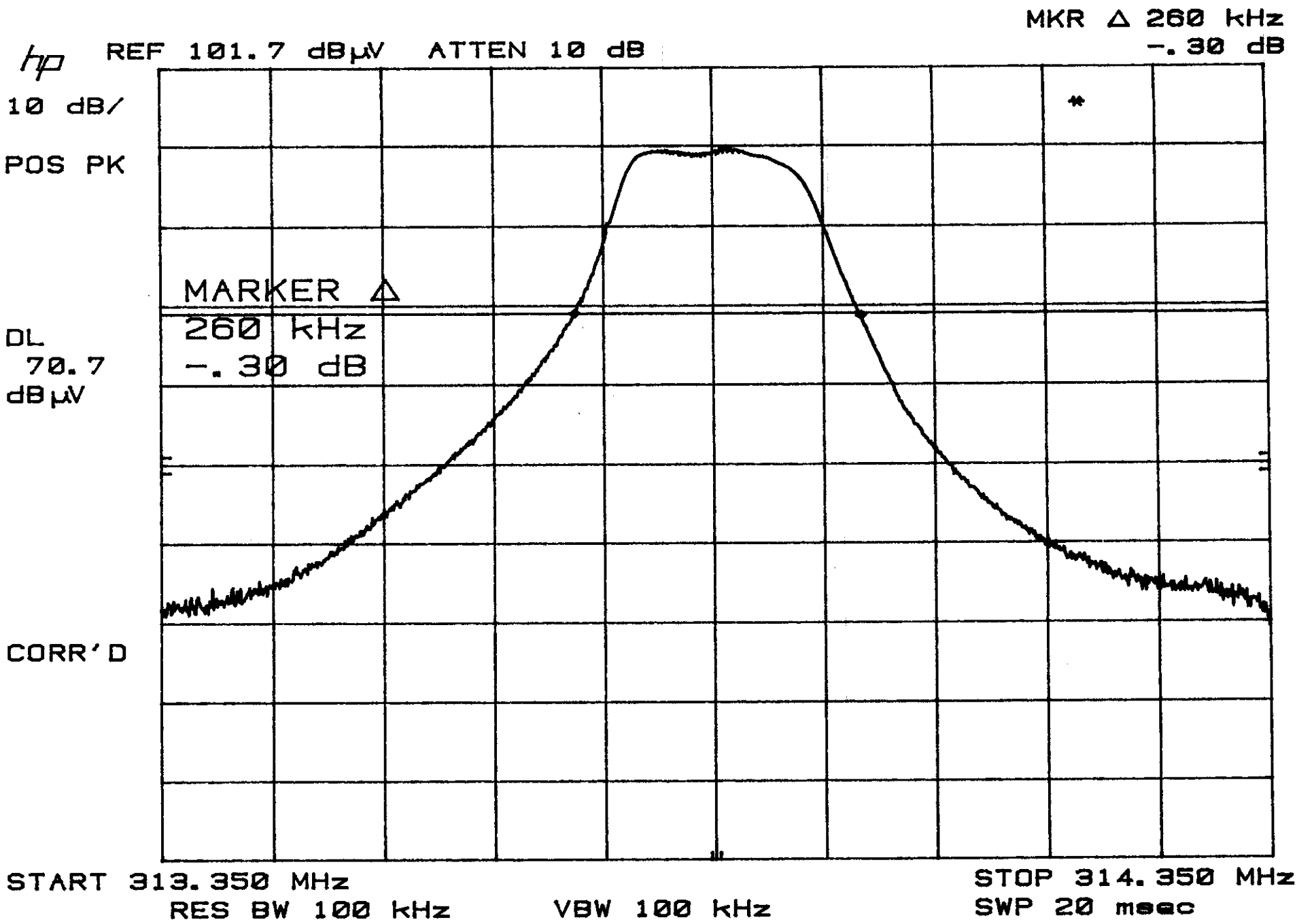
Signature

Reviewed by: TKS

Printed



Signature


MKR Δ 260 kHz
-.30 dB
REF 101.7 dBμV
ATTEN 10 dB
10 dB/
POS PK
MARKER Δ
260 kHz
-.30 dB
DL
70.7
dBμV
CORR'D
START 313.350 MHz
RES BW 100 kHz
VBW 100 kHz
STOP 314.350 MHz
SWP 20 msec

Appendix B

Constructional Data Form

And/or

Product Information Form

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 Construction File

Transmitter Model 41785

Transmitter Model 41788

Transmitter Model 41789

Dec. 26th, 2003

Visteon Japan, Ltd.

1. Directory

Ⅰ) Applicant ;

Visteon Japan, Ltd.

Hiroshima Sangyo Bunka Center 9F

16-35, Hijiyama-honmachi, Minami-ku, Hiroshima 732-0816, JAPAN

TEL: +81- 82- 250- 6600 FAX: +81-82- 250- 6809

Ⅱ) Manufacturer ;

Yang Feng Visteon Automotive Electronics Co. Ltd

300 Minolta Road, Songjiang country Shanghai, China 201600

TEL: +86- 21- 5774- 1278 FAX: +86- 21- 5774- 1271

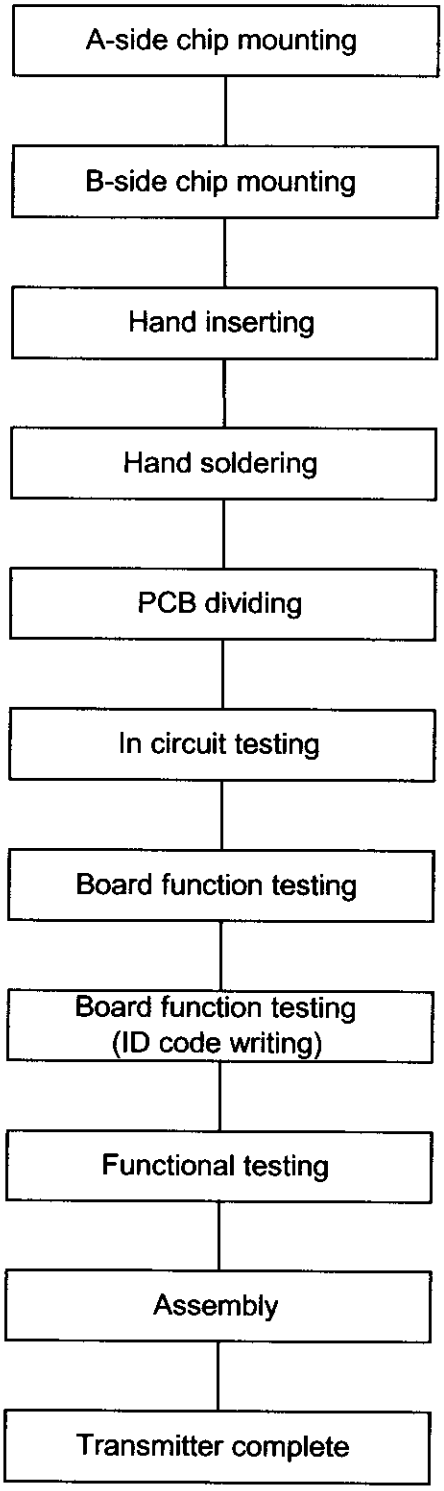
Ⅲ) Visteon delivers products to ;

MAZDA Motor Corporation

3-1, Shinchi, Fuchu-cho, Aki-gun, Hiroshima 730-8670, JAPAN

TEL: +81- 82- 282- 1111 (; representative)

2. Progress of Work



3. Transmitter (41785, 41788, 41789)

3-1. Model Name:

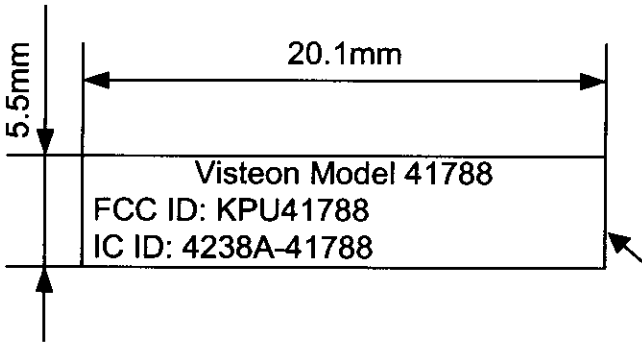
Transmitter

3-2. Product Number:

41785
41788
41789

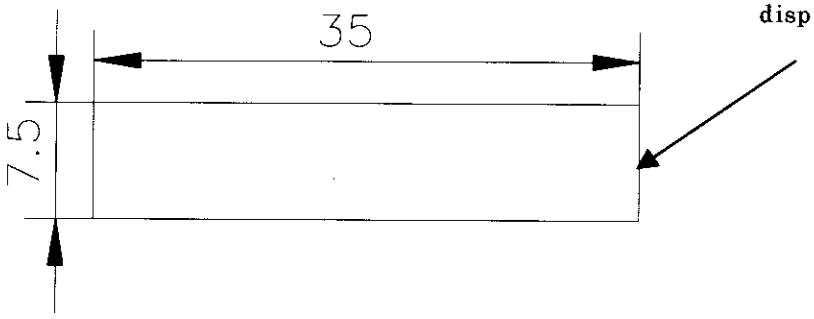
3-3. Label Art-Work

Punch mark



Each countries' approval numbers will be displayed.

Label

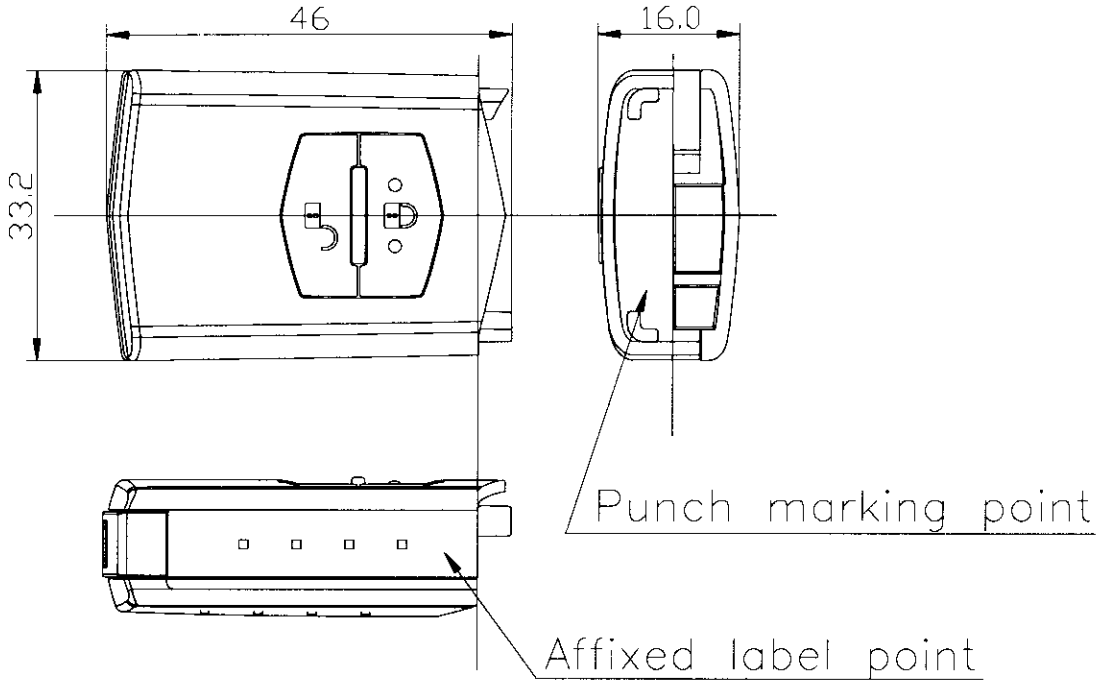


The following countries will be delivered.

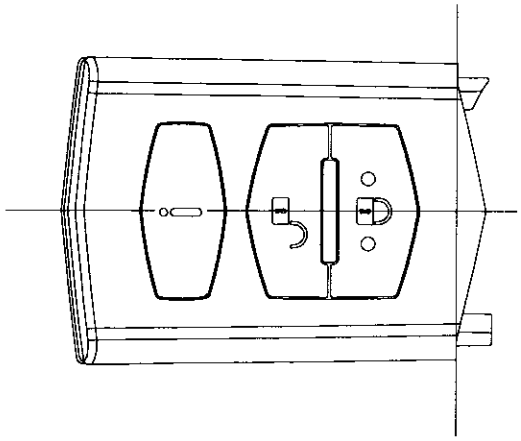
USA	Canada	Bermuda	Puerto Rico	Venezuela	American Samoa
Guam	Saipan	Colombia	Saudi Arabia	Indonesia	Malaysia
Taiwan	Thailand				

3-10. Appearance

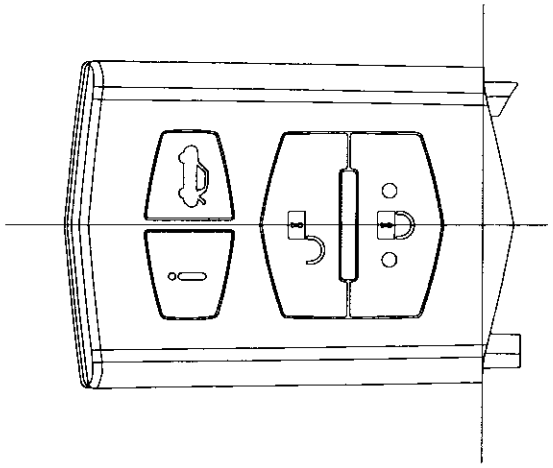
41789



41785



41788



			SHT	14／14

Visteon Japan, Ltd

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), adding the antenna correction factor and cable loss factor (Factor dB) to it, then subtracting the preamp gain. 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 A.

Example:

FREQ (MHz)	LEVEL (dBuV)		CABLE (dB)		ANT (dB/m)		PREAMP (dB)		FINAL (dBuV/m)	POL	HGT (m)	AZ (deg)		DELTA1 LIMIT
60.80	42.5Qp	+	1.2	+	10.9	-	25.5	=	29.1	V	1.0	0.0	-	-10.9

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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 3200 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 average 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.

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