



**FCC CFR47 PART 15 SUBPART C
CERTIFICATION
TEST REPORT**

FOR

SATELLITE RADIO RECEIVER (FM TRANSMITTER)

MODEL NUMBER: SV4

FCC ID: O6ZSV4

REPORT NUMBER: 07U11303-1

ISSUE DATE: SEPTEMBER 12, 2007

Prepared for

**HUMAX CO., LTD
HUMAX BUILDING, 212-1, YUBANG-DONG
YONGIN CITY GYUNGGI DO
SOUTH KOREA 440-080.**

Prepared by

**COMPLIANCE CERTIFICATION SERVICES
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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
---	09/12/07	Initial Issue	T. Chan

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: HUMAX CO., LTD
HUMAX BUILDING, 212-1, YUBANG-DONG
YONGIN CITY GYUNGGI DO
SOUTH KOREA 440-080.

EUT DESCRIPTION: SATELLITE RADIO WITH BUILD IN FM TRANSMITTER WITH MOUNTED FM TRANSMITTING ANTENNA

MODEL: SV4

SERIAL NUMBER: N/A

DATE TESTED: SEPTEMBER 11-12, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

DOUGLAS ANDERSON
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission Above 2000 MHz	+/- 4.3 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Satellite radio products function to receive satellite radio channels, decode the modulation on the satellite signal and modulate the recovered base band signal onto a carrier in the FM radio band for reception by the FM radio in the vehicle. The remote radiator concept provides for better coupling to the car radio of the modulated FM signal from the satellite receiver.

5.2. SOFTWARE AND FIRMWARE

Not Applicable

5.3. WORST-CASE CONFIGURATION AND MODE

These tests were implemented to gather data on a remote radiator configuration with Sirius Satellite radio products. The data was taken on 8 radials with 3 different vehicles at a distance of 3 meters from the closest point of the vehicle.

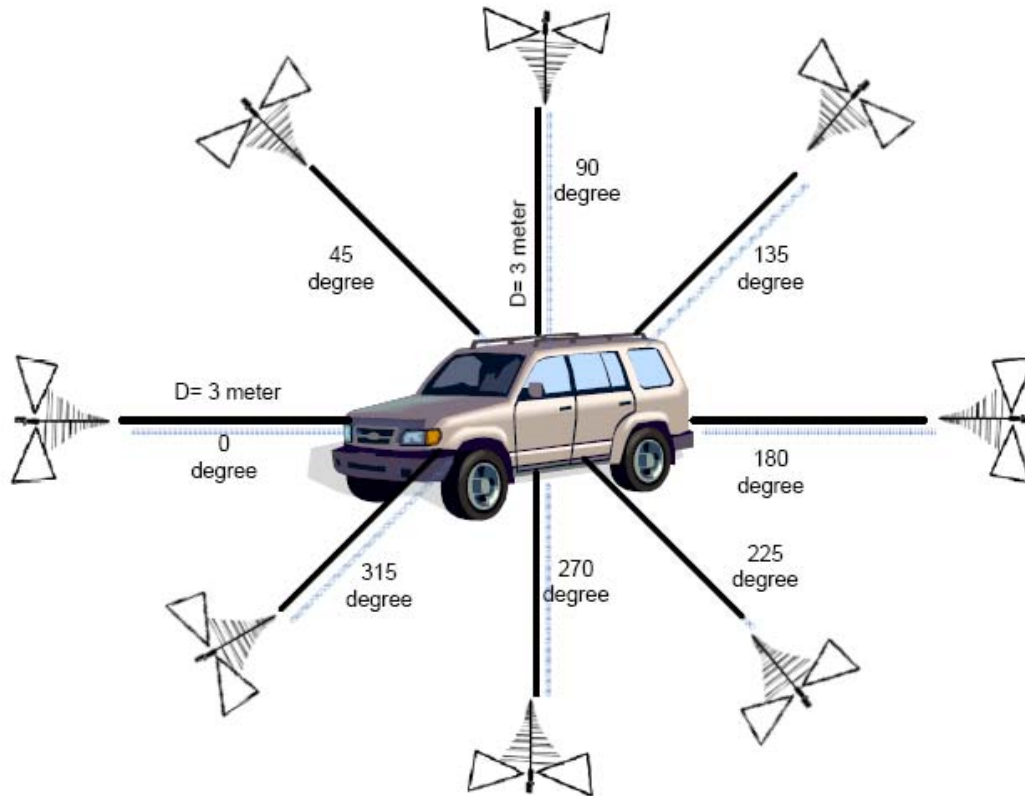
In situ testing was performed for three vehicles based on the following vehicle sizes; small, medium, and large. The selected vehicles were: Mitsubishi Galant, Lexus RX350, and Toyota Sienna Mini Van. The above vehicles have window mount antennas and the remote antenna was located adjacent to the window antenna in each case. Three frequencies in the FM band were measured: one near the low (88.3 MHz), middle (97.1 MHz) and high end (107.9 MHz) of the band in both horizontal and vertical polarizations.

88.1 MHz is the lowest channel that the FM transmitter is capable of tuning. However, 88.1 MHz is a licensed radio station in city of Fremont. The EUT was not able tune to 88.1 MHz during the tests.

Frequency	Radio Station Call Sign	Operator
88.1 MHz	KECG	El Cerrito High School

5.4. DESCRIPTION OF TEST SETUP

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	6/12/2008
RF Filter Section	Agilent / HP	85420E	3705A00256	6/12/2008
Antenna, Bilog 30 ~ 2000 MHz	Chase	CBL6112B	2586	10/13/2007

7. LIMITS AND RESULTS

7.1. RADIATED EMISSIONS

7.1.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

§ 15.239 Operation in the band 88–108 MHz.

(a) Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88–108 MHz.

(b) The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/ meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in § 15.35 for limiting peak emissions apply.

(c) The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in § 15.209.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The vehicle with satellite Radio (Model No: SV4) installed and connected to window mounted transmitter antenna is Equipment Under Test (EUT). The antenna to EUT distance is 3 meters. The EUT is configured based upon manufacturer suggested mounting position. During the tests, satellite radio was tuned to an active channel with maximum volume played through car stereo speakers.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak or average.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The frequency range of interest is monitored at a fixed antenna height and azimuth. The antenna mast is positioned at 8 various positions to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.


TEST RESULT

No non-compliance noted:

No other emissions were detected beside the fundamental frequency.

AUTO #1: MITSUBISHI GALANT (SMALL)

FUNDAMENTAL HARMONICS AND SPURIOUS EMISSIONS 30 – 1000 MHz

		Project #: 07U11303 Report #: 07U11303-1 Date & Time: 09/11/07 9:28 AM Test Engr: Doug Anderson									
		FCC, VCCI, CISPR, CE, AUSTEL, NZ UL, CSA, TUV, BSMI, DHHS, NVLAP 561F MONTEREY ROAD, SAN JOSE, CA 95037-9001 PHONE: (408) 463-0885 FAX: (408) 463-0888									
Company: Humax EUT Description: Sirius Satellite Radio (Model:SV4) Test Configuration: Auto #1: Mitsubishi Galant Type of Test: Radiated Emissions at High, Middle, and Low Channels Mode of Operation: Transmitting at Maximum Volume											
<input type="checkbox"/> A-Site <input type="checkbox"/> B-Site <input type="checkbox"/> C-Site <input type="checkbox"/> 3m Chamber <input type="checkbox"/> 6 Worst Data <input type="checkbox"/> Descending											
Freq. (MHz)	Reading (dBuV)	AF (dB)	Class (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit EN_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
EUT at Zero Degrees:											
Ambient too high to measure 88.3MHz at zero degees in the vertical orientation											
88.30	38.46	8.53	2.50	0.00	49.49	68.00	-18.51	3mH	0.00	2.00	P
88.30	27.40	8.53	2.50	0.00	38.43	48.00	-9.57	3mH	0.00	2.00	Av
97.10	20.78	10.27	2.61	0.00	33.66	68.00	-34.34	3mH	0.00	1.25	P
97.10	13.80	10.27	2.61	0.00	26.68	48.00	-21.32	3mH	0.00	1.25	Av
107.90	19.69	11.48	2.74	0.00	33.91	68.00	-34.09	3mH	0.00	2.00	P
107.90	8.10	11.48	2.74	0.00	22.32	48.00	-25.68	3mH	0.00	2.00	Av
107.90	24.93	11.48	2.74	0.00	39.15	68.00	-28.85	3mV	0.00	1.50	P
107.90	14.70	11.48	2.74	0.00	28.92	48.00	-19.08	3mV	0.00	1.50	Av
97.10	34.99	10.27	2.61	0.00	47.87	68.00	-20.13	3mV	0.00	1.50	P
97.10	25.80	10.27	2.61	0.00	38.68	48.00	-9.32	3mV	0.00	1.50	Av
EUT at 315 Degrees:											
97.10	32.27	10.27	2.61	0.00	45.15	68.00	-22.85	3mV	315.00	2.00	P
97.10	21.00	10.27	2.61	0.00	33.88	48.00	-14.12	3mV	315.00	2.00	Av
97.10	31.58	10.27	2.61	0.00	44.46	68.00	-23.54	3mH	315.00	2.00	P
97.10	19.80	10.27	2.61	0.00	32.68	48.00	-15.32	3mH	315.00	2.00	Av
107.90	20.19	11.48	2.74	0.00	34.41	68.00	-33.59	3mH	315.00	2.00	P
107.90	8.10	11.48	2.74	0.00	22.32	48.00	-25.68	3mH	315.00	2.00	Av
107.90	28.29	11.48	2.74	0.00	42.51	68.00	-25.49	3mV	315.00	2.25	P
107.90	17.10	11.48	2.74	0.00	31.32	48.00	-16.68	3mV	315.00	2.25	Av
88.30	39.66	8.53	2.50	0.00	50.69	68.00	-17.31	3mV	315.00	2.00	P
88.30	29.80	8.53	2.50	0.00	40.83	48.00	-7.17	3mV	315.00	2.00	Av
88.30	38.67	8.53	2.50	0.00	49.70	68.00	-18.30	3mH	315.00	2.00	P
88.30	32.10	8.53	2.50	0.00	43.13	48.00	-4.87	3mH	315.00	2.00	Av

DATA CONTINUE FROM AUTO #1: MITSUBISHI GALANT (SMALL)


EUT at 270 Degrees:												
88.30	36.60	8.53	2.50	0.00	47.63	68.00	-20.37	3mV	270.00	2.50		P
88.30	26.20	8.53	2.50	0.00	37.23	48.00	-10.77	3mV	270.00	2.50		Av
88.30	36.63	8.53	2.50	0.00	47.66	68.00	-20.34	3mH	270.00	2.00		P
88.30	25.20	8.53	2.50	0.00	36.23	48.00	-11.77	3mH	270.00	2.00		Av
97.10	24.15	10.27	2.61	0.00	37.03	68.00	-30.97	3mH	270.00	1.75		P
97.10	16.10	10.27	2.61	0.00	28.98	48.00	-19.02	3mH	270.00	1.75		Av
97.10	36.91	10.27	2.61	0.00	49.79	68.00	-18.21	3mV	270.00	2.50		P
97.10	26.20	10.27	2.61	0.00	39.08	48.00	-8.92	3mV	270.00	2.50		Av
107.90	29.76	11.48	2.74	0.00	43.98	68.00	-24.02	3mV	270.00	2.00		P
107.90	19.80	11.48	2.74	0.00	34.02	48.00	-13.98	3mV	270.00	2.00		Av
107.90	21.49	11.48	2.74	0.00	35.71	68.00	-32.29	3mH	270.00	2.00		P
107.90	9.70	11.48	2.74	0.00	23.92	48.00	-24.08	3mH	270.00	2.00		Av
EUT at 225 Degrees:												
107.90	30.91	11.48	2.74	0.00	45.13	68.00	-22.87	3mV	225.00	1.50		P
107.90	18.30	11.48	2.74	0.00	32.52	48.00	-15.48	3mV	225.00	1.50		Av
107.90	22.26	11.48	2.74	0.00	36.48	68.00	-31.52	3mH	225.00	1.50		P
107.90	18.70	11.48	2.74	0.00	32.92	48.00	-15.08	3mH	225.00	1.50		Av
97.10	27.53	10.27	2.61	0.00	40.41	68.00	-27.59	3mH	225.00	1.50		P
97.10	19.80	10.27	2.61	0.00	32.68	48.00	-15.32	3mH	225.00	1.50		Av
97.10	36.47	10.27	2.61	0.00	49.35	68.00	-18.65	3mV	225.00	2.00		P
97.10	22.40	10.27	2.61	0.00	35.28	48.00	-12.72	3mV	225.00	2.00		Av
88.30	38.32	8.53	2.50	0.00	49.35	68.00	-18.65	3mV	225.00	2.00		P
88.30	25.70	8.53	2.50	0.00	36.73	48.00	-11.27	3mV	225.00	2.00		Av
88.30	34.28	8.53	2.50	0.00	45.31	68.00	-22.69	3mH	225.00	2.00		P
88.30	21.90	8.53	2.50	0.00	32.93	48.00	-15.07	3mH	225.00	2.00		Av
EUT at 180 Degrees:												
88.30	42.85	8.53	2.50	0.00	53.88	68.00	-14.12	3mH	180.00	2.00		P
88.30	26.00	8.53	2.50	0.00	37.03	48.00	-10.97	3mH	180.00	2.00		Av
88.30	42.79	8.53	2.50	0.00	53.82	68.00	-14.18	3mV	180.00	2.00		P
88.30	30.10	8.53	2.50	0.00	41.13	48.00	-6.87	3mV	180.00	2.00		Av
97.10	34.54	10.27	2.61	0.00	47.42	68.00	-20.58	3mV	180.00	2.00		P
97.10	24.10	10.27	2.61	0.00	36.98	48.00	-11.02	3mV	180.00	2.00		Av
97.10	32.93	10.27	2.61	0.00	45.81	68.00	-22.19	3mH	180.00	2.00		P
97.10	20.50	10.27	2.61	0.00	33.38	48.00	-14.62	3mH	180.00	2.00		Av
107.90	24.41	11.48	2.74	0.00	38.63	68.00	-29.37	3mH	180.00	2.00		P
107.90	10.10	11.48	2.74	0.00	24.32	48.00	-23.68	3mH	180.00	2.00		Av
107.90	34.06	11.48	2.74	0.00	48.28	68.00	-19.72	3mV	180.00	3.00		P
107.90	21.10	11.48	2.74	0.00	35.32	48.00	-12.68	3mV	180.00	3.00		Av
EUT at 135 Degrees:												
107.90	33.74	11.48	2.74	0.00	47.96	68.00	-20.04	3mV	135.00	2.00		P
107.90	21.90	11.48	2.74	0.00	36.12	48.00	-11.88	3mV	135.00	2.00		Av
107.90	26.60	11.48	2.74	0.00	40.82	68.00	-27.18	3mH	135.00	1.50		P
107.90	12.30	11.48	2.74	0.00	26.52	48.00	-21.48	3mH	135.00	1.50		Av
97.10	34.68	10.27	2.61	0.00	47.56	68.00	-20.44	3mH	135.00	2.50		P
97.10	24.60	10.27	2.61	0.00	37.48	48.00	-10.52	3mH	135.00	2.50		Av
97.10	38.20	10.27	2.61	0.00	51.08	68.00	-16.92	3mV	135.00	2.50		P
97.10	21.90	10.27	2.61	0.00	34.78	48.00	-13.22	3mV	135.00	2.50		Av
88.30	44.20	8.53	2.50	0.00	55.23	68.00	-12.77	3mV	135.00	2.25		P
88.30	32.90	8.53	2.50	0.00	43.93	48.00	-4.07	3mV	135.00	2.25		Av
88.30	45.41	8.53	2.50	0.00	56.44	68.00	-11.56	3mH	135.00	2.50		P
88.30	33.00	8.53	2.50	0.00	44.03	48.00	-3.97	3mH	135.00	2.50		Av

DATA CONTINUE FROM AUTO #1: MITSUBISHI GALANT (SMALL)

EUT at 90 Degrees:											
88.30	35.52	8.53	2.50	0.00	46.55	68.00	-21.45	3mH	90.00	2.00	P
88.30	24.70	8.53	2.50	0.00	35.73	48.00	-12.27	3mH	90.00	2.00	Av
88.30	43.31	8.53	2.50	0.00	54.34	68.00	-13.66	3mV	90.00	1.50	P
88.30	32.30	8.53	2.50	0.00	43.33	48.00	-4.67	3mV	90.00	1.50	Av
97.10	31.00	10.27	2.61	0.00	43.88	68.00	-24.12	3mV	90.00	2.00	P
97.10	19.60	10.27	2.61	0.00	32.48	48.00	-15.52	3mV	90.00	2.00	Av
97.10	29.25	10.27	2.61	0.00	42.13	68.00	-25.87	3mH	90.00	2.00	P
97.10	24.30	10.27	2.61	0.00	37.18	48.00	-10.82	3mH	90.00	2.00	Av
107.90	25.20	11.48	2.74	0.00	39.42	68.00	-28.58	3mH	90.00	2.25	P
107.90	14.30	11.48	2.74	0.00	28.52	48.00	-19.48	3mH	90.00	2.25	Av
107.90	41.68	11.48	2.74	0.00	55.90	68.00	-12.10	3mV	90.00	2.00	P
107.90	13.50	11.48	2.74	0.00	27.72	48.00	-20.28	3mV	90.00	2.00	Av
EUT at 45 Degrees:											
107.90	22.05	11.48	2.74	0.00	36.27	68.00	-31.73	3mV	45.00	1.50	P
107.90	10.60	11.48	2.74	0.00	24.82	48.00	-23.18	3mV	45.00	1.50	Av
107.90	17.89	11.48	2.74	0.00	32.11	68.00	-35.89	3mH	45.00	1.50	P
107.90	9.40	11.48	2.74	0.00	23.62	48.00	-24.38	3mH	45.00	1.50	Av
97.10	22.97	10.27	2.61	0.00	35.85	68.00	-32.15	3mH	45.00	2.00	P
97.10	15.70	10.27	2.61	0.00	28.58	48.00	-19.42	3mH	45.00	2.00	Av
97.10	40.19	10.27	2.61	0.00	53.07	68.00	-14.93	3mV	45.00	1.00	P
97.10	17.50	10.27	2.61	0.00	30.38	48.00	-17.62	3mV	45.00	1.00	Av
88.30	39.41	8.53	2.50	0.00	50.44	68.00	-17.56	3mV	45.00	1.25	P
88.30	27.90	8.53	2.50	0.00	38.93	48.00	-9.07	3mV	45.00	1.25	Av
88.30	26.40	8.53	2.50	0.00	37.43	68.00	-30.57	3mH	45.00	2.00	P
88.30	14.40	8.53	2.50	0.00	25.43	48.00	-22.57	3mH	45.00	2.00	Av
Total data #: 106											
V.2b											

AUTO #2: LEXUS RX350 SUV (MEDIUM)

FUNDAMENTAL HARMONICS AND SPURIOUS EMISSIONS 30 – 1000 MHz



Project #: 07U11303
Report #: 07U11303-1
Date & Time: 09/12/07 8:31 AM
Test Engr: Doug Anderson

FCC, VCCI, CISPR, CE, AUSTEL, NZ
 UL, CSA, TUV, BSMI, DHHS, NVLAP

561F MONTEREY ROAD, SAN JOSE, CA 95037-9001
 PHONE: (408) 463-0885 FAX: (408) 463-0888

Company: Humax
EUT Description: Sirius Satellite Radio (Model:SV4)
Test Configuration: Auto #2: Lexus RX350
Type of Test: Radiated Emissions at High, Middle, and Low Channels
Mode of Operation: Transmitting at Maximum Volume

A-Site
 B-Site
 C-Site
 3m Chamber
 6 Worst Data
 Descending

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit EN_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
EUT at Zero Degrees:											
88.30	33.60	8.53	2.50	0.00	44.63	68.00	-23.37	3mV	0.00	1.50	P
88.30	24.30	8.53	2.50	0.00	35.33	48.00	-12.67	3mV	0.00	1.50	Av
88.30	37.49	8.53	2.50	0.00	48.52	68.00	-19.48	3mH	0.00	1.50	P
88.30	24.50	8.53	2.50	0.00	35.53	48.00	-12.47	3mH	0.00	1.50	Av
97.10	24.66	10.27	2.61	0.00	37.54	68.00	-30.46	3mH	0.00	2.00	P
97.10	12.50	10.27	2.61	0.00	25.38	48.00	-22.62	3mH	0.00	2.00	Av
97.10	34.66	10.27	2.61	0.00	47.54	68.00	-20.46	3mV	0.00	1.50	P
97.10	21.30	10.27	2.61	0.00	34.18	48.00	-13.82	3mV	0.00	1.50	Av
107.90	30.96	11.48	2.74	0.00	45.18	68.00	-22.82	3mV	0.00	2.50	P
107.90	18.90	11.48	2.74	0.00	33.12	48.00	-14.88	3mV	0.00	2.50	Av
107.90	18.43	11.48	2.74	0.00	32.65	68.00	-35.35	3mH	0.00	2.00	P
107.90	15.70	11.48	2.74	0.00	29.92	48.00	-18.08	3mH	0.00	2.00	Av
EUT at 315 Degrees:											
107.90	22.26	11.48	2.74	0.00	36.48	68.00	-31.52	3mH	315.00	1.50	P
107.90	13.90	11.48	2.74	0.00	28.12	48.00	-19.88	3mH	315.00	1.50	Av
107.90	30.55	11.48	2.74	0.00	44.77	68.00	-23.23	3mV	315.00	1.50	P
107.90	19.00	11.48	2.74	0.00	33.22	48.00	-14.78	3mV	315.00	1.50	Av
97.10	27.71	10.27	2.61	0.00	40.59	68.00	-27.41	3mV	315.00	1.50	P
97.10	15.40	10.27	2.61	0.00	28.28	48.00	-19.72	3mV	315.00	1.50	Av
97.10	29.05	10.27	2.61	0.00	41.93	68.00	-26.07	3mH	315.00	2.00	P
97.10	15.90	10.27	2.61	0.00	28.78	48.00	-19.22	3mH	315.00	2.00	Av
88.30	40.36	8.53	2.50	0.00	51.39	68.00	-16.61	3mH	315.00	2.00	P
88.30	29.20	8.53	2.50	0.00	40.23	48.00	-7.77	3mH	315.00	2.00	Av
88.30	38.60	8.53	2.50	0.00	49.63	68.00	-18.37	3mV	315.00	2.00	P
88.30	27.80	8.53	2.50	0.00	38.83	48.00	-9.17	3mV	315.00	2.00	Av

DATA CONTINUE FROM AUTO #2: LEXUS RX350 SUV (MEDIUM)


EUT at 270 Degrees:											
88.30	39.08	8.53	2.50	0.00	50.11	68.00	-17.89	3mV	270.00	2.50	P
88.30	25.40	8.53	2.50	0.00	36.43	48.00	-11.57	3mV	270.00	2.50	Av
88.30	33.97	8.53	2.50	0.00	45.00	68.00	-23.00	3mH	270.00	2.00	P
88.30	23.50	8.53	2.50	0.00	34.53	48.00	-13.47	3mH	270.00	2.00	Av
97.10	28.47	10.27	2.61	0.00	41.35	68.00	-26.65	3mH	270.00	2.00	P
97.10	16.30	10.27	2.61	0.00	29.18	48.00	-18.82	3mH	270.00	2.00	Av
97.10	37.20	10.27	2.61	0.00	50.08	68.00	-17.92	3mV	270.00	2.00	P
97.10	24.70	10.27	2.61	0.00	37.58	48.00	-10.42	3mV	270.00	2.00	Av
107.90	28.61	11.48	2.74	0.00	42.83	68.00	-25.17	3mV	270.00	2.00	P
107.90	17.10	11.48	2.74	0.00	31.32	48.00	-16.68	3mV	270.00	2.00	Av
107.90	21.57	11.48	2.74	0.00	35.79	68.00	-32.21	3mH	270.00	2.00	P
107.90	9.00	11.48	2.74	0.00	23.22	48.00	-24.78	3mH	270.00	2.00	Av
EUT at 225 Degrees:											
107.90	23.75	11.48	2.74	0.00	37.97	68.00	-30.03	3mH	225.00	2.50	P
107.90	14.30	11.48	2.74	0.00	28.52	48.00	-19.48	3mH	225.00	2.50	Av
107.90	32.20	11.48	2.74	0.00	46.42	68.00	-21.58	3mV	225.00	2.00	P
107.90	20.80	11.48	2.74	0.00	35.02	48.00	-12.98	3mV	225.00	2.00	Av
97.10	37.34	10.27	2.61	0.00	50.22	68.00	-17.78	3mV	225.00	2.50	P
97.10	23.80	10.27	2.61	0.00	36.68	48.00	-11.32	3mV	225.00	2.50	Av
97.10	26.70	10.27	2.61	0.00	39.58	68.00	-28.42	3mH	225.00	2.50	P
97.10	15.00	10.27	2.61	0.00	27.88	48.00	-20.12	3mH	225.00	2.50	Av
88.30	32.38	8.53	2.50	0.00	43.41	68.00	-24.59	3mH	225.00	2.00	P
88.30	20.70	8.53	2.50	0.00	31.73	48.00	-16.27	3mH	225.00	2.00	Av
88.30	34.84	8.53	2.50	0.00	45.87	68.00	-22.13	3mV	225.00	2.00	P
88.30	23.20	8.53	2.50	0.00	34.23	48.00	-13.77	3mV	225.00	2.00	Av
EUT at 180 Degrees:											
88.30	40.55	8.53	2.50	0.00	51.58	68.00	-16.42	3mV	180.00	2.00	P
88.30	29.30	8.53	2.50	0.00	40.33	48.00	-7.67	3mV	180.00	2.00	Av
88.30	37.24	8.53	2.50	0.00	48.27	68.00	-19.73	3mH	180.00	2.00	P
88.30	25.80	8.53	2.50	0.00	36.83	48.00	-11.17	3mH	180.00	2.00	Av
97.10	32.26	10.27	2.61	0.00	45.14	68.00	-22.86	3mH	180.00	2.25	P
97.10	19.40	10.27	2.61	0.00	32.28	48.00	-15.72	3mH	180.00	2.25	Av
97.10	33.88	10.27	2.61	0.00	46.76	68.00	-21.24	3mV	180.00	2.00	P
97.10	22.70	10.27	2.61	0.00	35.58	48.00	-12.42	3mV	180.00	2.00	Av
107.90	31.36	11.48	2.74	0.00	45.58	68.00	-22.42	3mV	180.00	1.00	P
107.90	23.90	11.48	2.74	0.00	38.12	48.00	-9.88	3mV	180.00	1.00	Av
107.90	23.35	11.48	2.74	0.00	37.57	68.00	-30.43	3mH	180.00	2.00	P
107.90	12.10	11.48	2.74	0.00	26.32	48.00	-21.68	3mH	180.00	2.00	Av
EUT at 135 Degrees:											
107.90	21.94	11.48	2.74	0.00	36.16	68.00	-31.84	3mH	135.00	1.00	P
107.90	8.40	11.48	2.74	0.00	22.62	48.00	-25.38	3mH	135.00	1.00	Av
107.90	32.65	11.48	2.74	0.00	46.87	68.00	-21.13	3mV	135.00	2.00	P
107.90	21.10	11.48	2.74	0.00	35.32	48.00	-12.68	3mV	135.00	2.00	Av
97.10	33.55	10.27	2.61	0.00	46.43	68.00	-21.57	3mV	135.00	2.50	P
97.10	21.80	10.27	2.61	0.00	34.68	48.00	-13.32	3mV	135.00	2.50	Av
97.10	25.63	10.27	2.61	0.00	38.51	68.00	-29.49	3mH	135.00	2.50	P
97.10	14.30	10.27	2.61	0.00	27.18	48.00	-20.82	3mH	135.00	2.50	Av
88.30	42.45	8.53	2.50	0.00	53.48	68.00	-14.52	3mH	135.00	1.50	P
88.30	31.40	8.53	2.50	0.00	42.43	48.00	-5.57	3mH	135.00	1.50	Av
88.30	41.91	8.53	2.50	0.00	52.94	68.00	-15.06	3mV	135.00	2.00	P
88.30	31.20	8.53	2.50	0.00	42.23	48.00	-5.77	3mV	135.00	2.00	Av

DATA CONTINUE FROM AUTO #2: LEXUS RX350 SUV (MEDIUM)

EUT at 90 Degrees:											
88.30	41.11	8.53	2.50	0.00	52.14	68.00	-15.86	3mV	90.00	2.50	P
88.30	30.10	8.53	2.50	0.00	41.13	48.00	-6.87	3mV	90.00	2.50	Av
88.30	34.95	8.53	2.50	0.00	45.98	68.00	-22.02	3mH	90.00	2.00	P
88.30	23.40	8.53	2.50	0.00	34.43	48.00	-13.57	3mH	90.00	2.00	Av
97.10	24.42	10.27	2.61	0.00	37.30	68.00	-30.70	3mH	90.00	1.50	P
97.10	11.60	10.27	2.61	0.00	24.48	48.00	-23.52	3mH	90.00	1.50	Av
97.10	29.37	10.27	2.61	0.00	42.25	68.00	-25.75	3mV	90.00	2.50	P
97.10	16.80	10.27	2.61	0.00	29.68	48.00	-18.32	3mV	90.00	2.50	Av
107.90	30.38	11.48	2.74	0.00	44.60	68.00	-23.40	3mV	90.00	2.50	P
107.90	18.30	11.48	2.74	0.00	32.52	48.00	-15.48	3mV	90.00	2.50	Av
107.90	22.95	11.48	2.74	0.00	37.17	68.00	-30.83	3mH	90.00	2.50	P
107.90	11.30	11.48	2.74	0.00	25.52	48.00	-22.48	3mH	90.00	2.50	Av
EUT at 45 Degrees:											
107.90	19.91	11.48	2.74	0.00	34.13	68.00	-33.87	3mH	45.00	2.00	P
107.90	10.50	11.48	2.74	0.00	24.72	48.00	-23.28	3mH	45.00	2.00	Av
107.90	31.46	11.48	2.74	0.00	45.68	68.00	-22.32	3mV	45.00	2.25	P
107.90	18.90	11.48	2.74	0.00	33.12	48.00	-14.88	3mV	45.00	2.25	Av
97.10	34.21	10.27	2.61	0.00	47.09	68.00	-20.91	3mV	45.00	2.50	P
97.10	21.90	10.27	2.61	0.00	34.78	48.00	-13.22	3mV	45.00	2.50	Av
97.10	27.22	10.27	2.61	0.00	40.10	68.00	-27.90	3mH	45.00	2.00	P
97.10	15.20	10.27	2.61	0.00	28.08	48.00	-19.92	3mH	45.00	2.00	Av
88.30	29.62	8.53	2.50	0.00	40.65	68.00	-27.35	3mH	45.00	1.50	P
88.30	18.90	8.53	2.50	0.00	29.93	48.00	-18.07	3mH	45.00	1.50	Av
88.30	40.58	8.53	2.50	0.00	51.61	68.00	-16.39	3mV	45.00	2.50	P
88.30	28.90	8.53	2.50	0.00	39.93	48.00	-8.07	3mV	45.00	2.50	Av
Total data #: 97											
V.2b											

AUTO #3: TOYOTA SIENNA MINI-VAN (LARGE)

FUNDAMENTAL HARMONICS AND SPURIOUS EMISSIONS 30 – 1000 MHz



Project #: 07U11303
Report #: 07U11303-1
Date & Time: 09/11/07 3:07 PM
Test Engr: Doug Anderson

FCC, VCCI, CISPR, CE, AUSTEL, NZ
 UL, CSA, TUV, BSMI, DHHS, NVLAP

561F MONTEREY ROAD, SAN JOSE, CA 95037-9001
 PHONE: (408) 463-0885 FAX: (408) 463-0888

Company: Humax
EUT Description: Sirius Satellite Radio (Model:SV4)
Test Configuration: Auto #3: Toyota Siena Mini-Van
Type of Test: Radiated Emissions at High, Middle, and Low Channels
Mode of Operation: Transmting at Maximum Volume

A-Site
 B-Site
 C-Site
 3m Chamber
 6 Worst Data
 Descending

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit EN_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
EUT at Zero Degrees:											
88.30	36.79	8.53	2.50	0.00	47.82	68.00	-20.18	3mV	0.00	2.00	P
88.30	25.00	8.53	2.50	0.00	36.03	48.00	-11.97	3mV	0.00	2.00	Av
88.30	38.49	8.53	2.50	0.00	49.52	68.00	-18.48	3mH	0.00	2.00	P
88.30	26.70	8.53	2.50	0.00	37.73	48.00	-10.27	3mH	0.00	2.00	Av
97.10	25.80	10.27	2.61	0.00	38.68	68.00	-29.32	3mH	0.00	2.00	P
97.10	14.00	10.27	2.61	0.00	26.88	48.00	-21.12	3mH	0.00	2.00	Av
97.10	33.02	10.27	2.61	0.00	45.90	68.00	-22.10	3mV	0.00	2.00	P
97.10	20.10	10.27	2.61	0.00	32.98	48.00	-15.02	3mV	0.00	2.00	Av
107.90	41.49	11.48	2.74	0.00	55.71	68.00	-12.29	3mV	0.00	2.50	P
107.90	12.10	11.48	2.74	0.00	26.32	48.00	-21.68	3mV	0.00	2.50	Av
107.90	21.15	11.48	2.74	0.00	35.37	68.00	-32.63	3mH	0.00	2.00	P
107.90	10.40	11.48	2.74	0.00	24.62	48.00	-23.38	3mH	0.00	2.00	Av
EUT at 315 Degrees:											
107.90	33.25	11.48	2.74	0.00	47.47	68.00	-20.53	3mV	315.00	2.50	P
107.90	21.40	11.48	2.74	0.00	35.62	48.00	-12.38	3mV	315.00	2.50	Av
107.90	19.67	11.48	2.74	0.00	33.89	68.00	-34.11	3mH	315.00	1.75	P
107.90	6.40	11.48	2.74	0.00	20.62	48.00	-27.38	3mH	315.00	1.75	Av
97.10	29.60	10.27	2.61	0.00	42.48	68.00	-25.52	3mH	315.00	3.00	P
97.10	16.30	10.27	2.61	0.00	29.18	48.00	-18.82	3mH	315.00	3.00	Av
97.10	34.60	10.27	2.61	0.00	47.48	68.00	-20.52	3mV	315.00	2.50	P
97.10	22.30	10.27	2.61	0.00	35.18	48.00	-12.82	3mV	315.00	2.50	Av
88.30	41.36	8.53	2.50	0.00	52.39	68.00	-15.61	3mV	315.00	3.00	P
88.30	32.00	8.53	2.50	0.00	43.03	48.00	-4.97	3mV	315.00	3.00	Av
88.30	45.14	8.53	2.50	0.00	56.17	68.00	-11.83	3mH	315.00	3.00	P
88.30	32.00	8.53	2.50	0.00	43.03	48.00	-4.97	3mH	315.00	3.00	Av

DATA CONTINUE FROM AUTO #3: TOYOTA SIENNA MINI-VAN (LARGE)

EUT at 270 Degrees:											
88.30	36.22	8.53	2.50	0.00	47.25	68.00	-20.75	3mH	270.00	2.50	P
88.30	24.30	8.53	2.50	0.00	35.33	48.00	-12.67	3mH	270.00	2.50	Av
88.30	39.63	8.53	2.50	0.00	50.66	68.00	-17.34	3mV	270.00	2.25	P
88.30	25.80	8.53	2.50	0.00	36.83	48.00	-11.17	3mV	270.00	2.25	Av
97.10	37.59	10.27	2.61	0.00	50.47	68.00	-17.53	3mV	270.00	3.00	P
97.10	25.30	10.27	2.61	0.00	38.18	48.00	-9.82	3mV	270.00	3.00	Av
97.10	24.40	10.27	2.61	0.00	37.28	68.00	-30.72	3mH	270.00	2.00	P
97.10	11.70	10.27	2.61	0.00	24.58	48.00	-23.42	3mH	270.00	2.00	Av
107.90	21.93	11.48	2.74	0.00	36.15	68.00	-31.85	3mH	270.00	2.00	P
107.90	9.10	11.48	2.74	0.00	23.32	48.00	-24.68	3mH	270.00	2.00	Av
107.90	31.19	11.48	2.74	0.00	45.41	68.00	-22.59	3mV	270.00	2.25	P
107.90	18.30	11.48	2.74	0.00	32.52	48.00	-15.48	3mV	270.00	2.25	Av
EUT at 225 Degrees:											
107.90	34.56	11.48	2.74	0.00	48.78	68.00	-19.22	3mV	225.00	3.00	P
107.90	21.20	11.48	2.74	0.00	35.42	48.00	-12.58	3mV	225.00	3.00	Av
107.90	27.01	11.48	2.74	0.00	41.23	68.00	-26.77	3mH	225.00	2.50	P
107.90	13.70	11.48	2.74	0.00	27.92	48.00	-20.08	3mH	225.00	2.50	Av
97.10	27.08	10.27	2.61	0.00	39.96	68.00	-28.04	3mH	225.00	1.50	P
97.10	15.00	10.27	2.61	0.00	27.88	48.00	-20.12	3mH	225.00	1.50	Av
97.10	34.95	10.27	2.61	0.00	47.83	68.00	-20.17	3mV	225.00	2.25	P
97.10	22.40	10.27	2.61	0.00	35.28	48.00	-12.72	3mV	225.00	2.25	Av
88.30	34.79	8.53	2.50	0.00	45.82	68.00	-22.18	3mV	225.00	1.75	P
88.30	22.40	8.53	2.50	0.00	33.43	48.00	-14.57	3mV	225.00	1.75	Av
88.30	25.30	8.53	2.50	0.00	36.33	68.00	-31.67	3mH	225.00	3.00	P
88.30	13.00	8.53	2.50	0.00	24.03	48.00	-23.97	3mH	225.00	3.00	Av
EUT at 180 Degrees:											
88.30	37.59	8.53	2.50	0.00	48.62	68.00	-19.38	3mH	180.00	2.25	P
88.30	26.30	8.53	2.50	0.00	37.33	48.00	-10.67	3mH	180.00	2.25	Av
88.30	42.42	8.53	2.50	0.00	53.45	68.00	-14.55	3mV	180.00	1.50	P
88.30	30.10	8.53	2.50	0.00	41.13	48.00	-6.87	3mV	180.00	1.50	Av
97.10	34.42	10.27	2.61	0.00	47.30	68.00	-20.70	3mV	180.00	2.50	P
97.10	21.10	10.27	2.61	0.00	33.98	48.00	-14.02	3mV	180.00	2.50	Av
97.10	30.94	10.27	2.61	0.00	43.82	68.00	-24.18	3mH	180.00	2.50	P
97.10	19.10	10.27	2.61	0.00	31.98	48.00	-16.02	3mH	180.00	2.50	Av
107.90	24.91	11.48	2.74	0.00	39.13	68.00	-28.87	3mH	180.00	2.00	P
107.90	16.10	11.48	2.74	0.00	30.32	48.00	-17.68	3mH	180.00	2.00	Av
107.90	33.17	11.48	2.74	0.00	47.39	68.00	-20.61	3mV	180.00	3.00	P
107.90	20.40	11.48	2.74	0.00	34.62	48.00	-13.38	3mV	180.00	3.00	Av
EUT at 135 Degrees:											
107.90	30.91	11.48	2.74	0.00	45.13	68.00	-22.87	3mV	135.00	2.00	P
107.90	18.80	11.48	2.74	0.00	33.02	48.00	-14.98	3mV	135.00	2.00	Av
107.90	27.22	11.48	2.74	0.00	41.44	68.00	-26.56	3mH	135.00	2.00	P
107.90	20.90	11.48	2.74	0.00	35.12	48.00	-12.88	3mH	135.00	2.00	Av
97.10	28.96	10.27	2.61	0.00	41.84	68.00	-26.16	3mH	135.00	2.00	P
97.10	18.80	10.27	2.61	0.00	31.68	48.00	-16.32	3mH	135.00	2.00	Av
97.10	37.70	10.27	2.61	0.00	50.58	68.00	-17.42	3mV	135.00	2.25	P
97.10	24.50	10.27	2.61	0.00	37.38	48.00	-10.62	3mV	135.00	2.50	Av
88.30	42.28	8.53	2.50	0.00	53.31	68.00	-14.69	3mV	135.00	1.00	P
88.30	30.00	8.53	2.50	0.00	41.03	48.00	-6.97	3mV	135.00	1.00	Av
88.30	43.21	8.53	2.50	0.00	54.24	68.00	-13.76	3mH	135.00	2.00	P
88.30	32.00	8.53	2.50	0.00	43.03	48.00	-4.97	3mH	135.00	2.00	Av

DATA CONTINUE FROM AUTO #3: TOYOTA SIENNA MINI-VAN (LARGE)

EUT at 90 Degrees:											
88.30	36.00	8.53	2.50	0.00	47.03	68.00	-20.97	3mH	90.00	1.50	P
88.30	24.50	8.53	2.50	0.00	35.53	48.00	-12.47	3mH	90.00	1.50	Av
88.30	40.44	8.53	2.50	0.00	51.47	68.00	-16.53	3mV	90.00	1.00	P
88.30	28.90	8.53	2.50	0.00	39.93	48.00	-8.07	3mV	90.00	1.00	Av
97.10	32.02	10.27	2.61	0.00	44.90	68.00	-23.10	3mV	90.00	2.50	P
97.10	19.70	10.27	2.61	0.00	32.58	48.00	-15.42	3mV	90.00	2.50	Av
97.10	28.30	10.27	2.61	0.00	41.18	68.00	-26.82	3mH	90.00	1.50	P
97.10	13.70	10.27	2.61	0.00	26.58	48.00	-21.42	3mH	90.00	1.50	Av
107.90	24.10	11.48	2.74	0.00	38.32	68.00	-29.68	3mH	90.00	1.50	P
107.90	12.90	11.48	2.74	0.00	27.12	48.00	-20.88	3mH	90.00	1.50	Av
107.90	30.77	11.48	2.74	0.00	44.99	68.00	-23.01	3mV	90.00	1.00	P
107.90	20.50	11.48	2.74	0.00	34.72	48.00	-13.28	3mV	90.00	1.00	Av
EUT at 45 Degrees:											
107.90	36.00	11.48	2.74	0.00	50.22	68.00	-17.78	3mV	45.00	2.50	P
107.90	22.70	11.48	2.74	0.00	36.92	48.00	-11.08	3mV	45.00	2.50	Av
107.90	25.33	11.48	2.74	0.00	39.55	68.00	-28.45	3mH	45.00	1.00	P
107.90	16.30	11.48	2.74	0.00	30.52	48.00	-17.48	3mH	45.00	1.00	Av
97.10	29.52	10.27	2.61	0.00	42.40	68.00	-25.60	3mH	45.00	2.00	P
97.10	17.40	10.27	2.61	0.00	30.28	48.00	-17.72	3mH	45.00	2.00	Av
97.10	38.98	10.27	2.61	0.00	51.86	68.00	-16.14	3mV	45.00	2.00	P
97.10	24.30	10.27	2.61	0.00	37.18	48.00	-10.82	3mV	45.00	2.00	Av
88.30	40.51	8.53	2.50	0.00	51.54	68.00	-16.46	3mV	45.00	2.00	P
88.30	29.20	8.53	2.50	0.00	40.23	48.00	-7.77	3mV	45.00	2.00	Av
88.30	31.10	8.53	2.50	0.00	42.13	68.00	-25.87	3mH	45.00	1.50	P
88.30	19.60	8.53	2.50	0.00	30.63	48.00	-17.37	3mH	45.00	1.50	Av

Total data #: 98
 V.2b

8. SETUP PHOTOS

RADIATED EMISSION

AUTO #1: MITSUBISHI GALANT (SMALL)

RADIATED EMISSIONS (SETUP)



RADIATED EMISSIONS (ANTENNA LOCATION)



AUTO #2: LEXUS RX350 SUV (MEDIUM)

RADIATED EMISSIONS (SETUP)



RADIATED EMISSIONS (ANTENNA LOCATION)



AUTO #3: TOYOTA SIENNA MINI-VAN (LARGE)

RADIATED EMISSIONS (SETUP)



RADIATED EMISSIONS (ANTENNA LOCATION)



END OF REPORT