FCC CFR47 PART 15 SUBPART C
CERTIFICATION
TEST REPORT

FOR

IC TELE-INTERACTION CARD

MODEL NUMBER: 74110-QAB

FCC ID: T4S-74110-QAB

REPORT NUMBER: 06J10511-1B

ISSUE DATE: SEPTEMBER 6, 2006

Prepared for
HONDA R&D CO., LTD.
8-1 HONCHO, WAKO-SHI
SAITAMA-KEN, 351-0114
JAPAN

Prepared by
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LAB CODE:200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	9/5/06	Initial Release	A. Ilarina
B	9/6/06	Add Bandedge plots to section 7.2	A. Ilarina

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: HONDA R&D CO., LTD.
8-1 HONCHO, WAKO-SHI
SAITAMA-KEN, 351-0114 JAPAN

EUT DESCRIPTION: IC TELE-INTERACTION CARD

MODEL: 74110-QAB

SERIAL NUMBER: A3 & A4 (RF Conducted test), A2 & A5 (For Radiated Emission test)

DATE TESTED: AUGUST 23 TO 26, 2006

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:

ALVIN ILARINA
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

VIEN TRAN
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

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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 561F Monterey Road, Morgan Hill, 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
Power Line Conducted Emission	+/- 2.9 dB

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an IC Tele-Interaction Card transceiver, which transmitting in frequency range from 910 MHz to 918 MHz. and manufactured by Circuit Design, Inc.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBuV/m)	Output Power (mV/m)
910.44504 - 918.30936	FSK 19.2kbps	83.94	15.74

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral chip antenna , with a maximum gain of -4 dBi.

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was Sensor Tag Setup, rev. 3.1.10.

5.5. WORST-CASE CONFIGURATION AND MODE

All emissions tests were made in the FSK mode, 19.2 kb/s, on the High and Low Channels.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	IBM	ThinkPad X40	KV-GRX61 05/03	Doc
AC Adapter	IBM	X20	02K6808	N/A
DC Power Supply	HP	E3610A	N/A	N/A
DC Power Supply	HP	6235A	N/A	N/A

I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	1	US115	Shielded	.5m	No
2	DC	1	DC	Unshielded	1m	No
3	DC	2	DC	Unshielded	1m	No
4	USB	1	USB	Unshielded	3m	Yes
5	Serial	1	Serial	Unshielded	3m	No

TEST SETUP

The EUT (IC Card) is linked to sensor only when both of devices are set with the same channel. The channel is operated by test software in host laptop computer.

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SETUP DIAGRAM FOR TESTS

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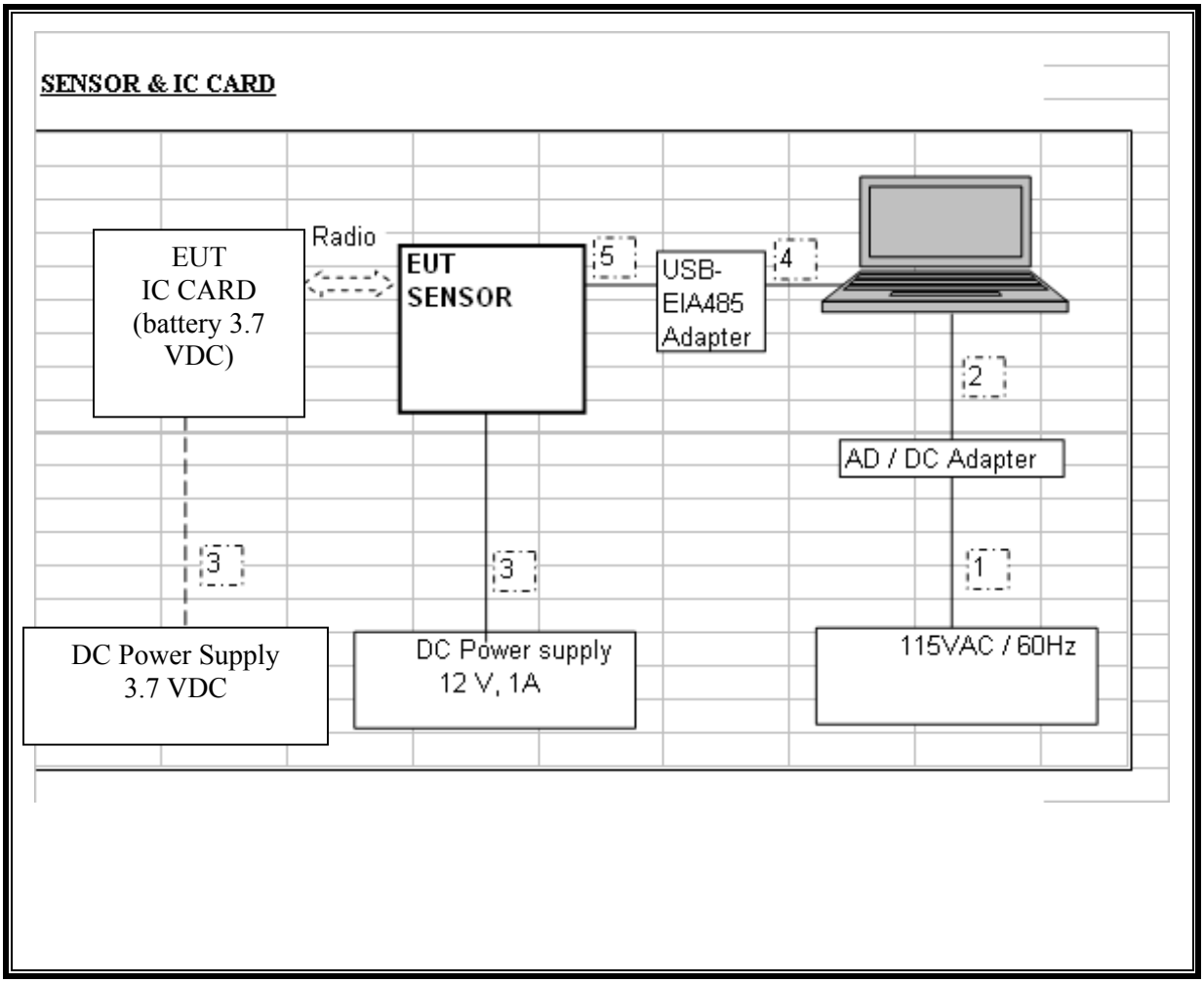

NOTE: The EUT (IC Card) either can be operated by the normal battery pack of 3.7 VDC or external DC Power Supply for testing purposes.

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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**
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY43360112	5/3/2007
Peak Power Meter	Agilent / HP	E4416A	GB41291160	12/2/2007
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	4/22/2007
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29310	4/22/2007
Preamplifier, 1 ~ 26 GHz	Miteq	NSP2600-SP	924342	9/2/2006
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00931	6/24/2007
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	2/4/2007
RF Filter Section	Agilent / HP	85420E	3705A00256	2/4/2007
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	9/3/2006
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	8/30/2006
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	8/30/2006
EMI Test Receiver	R & S	ESHS 20	827129/006	11/3/2006

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7. LIMITS AND RESULTS

7.1. DUTY CYCLE

LIMITS

None; for reporting purposes only.

RESULTS

Tx on = 18.75 ms
Tx on + Tx off = 313.8 ms
Duty Cycle x = 5.9 %
Duty Cycle Correction Factor = 10 * log (1/x) = 12.3 dB

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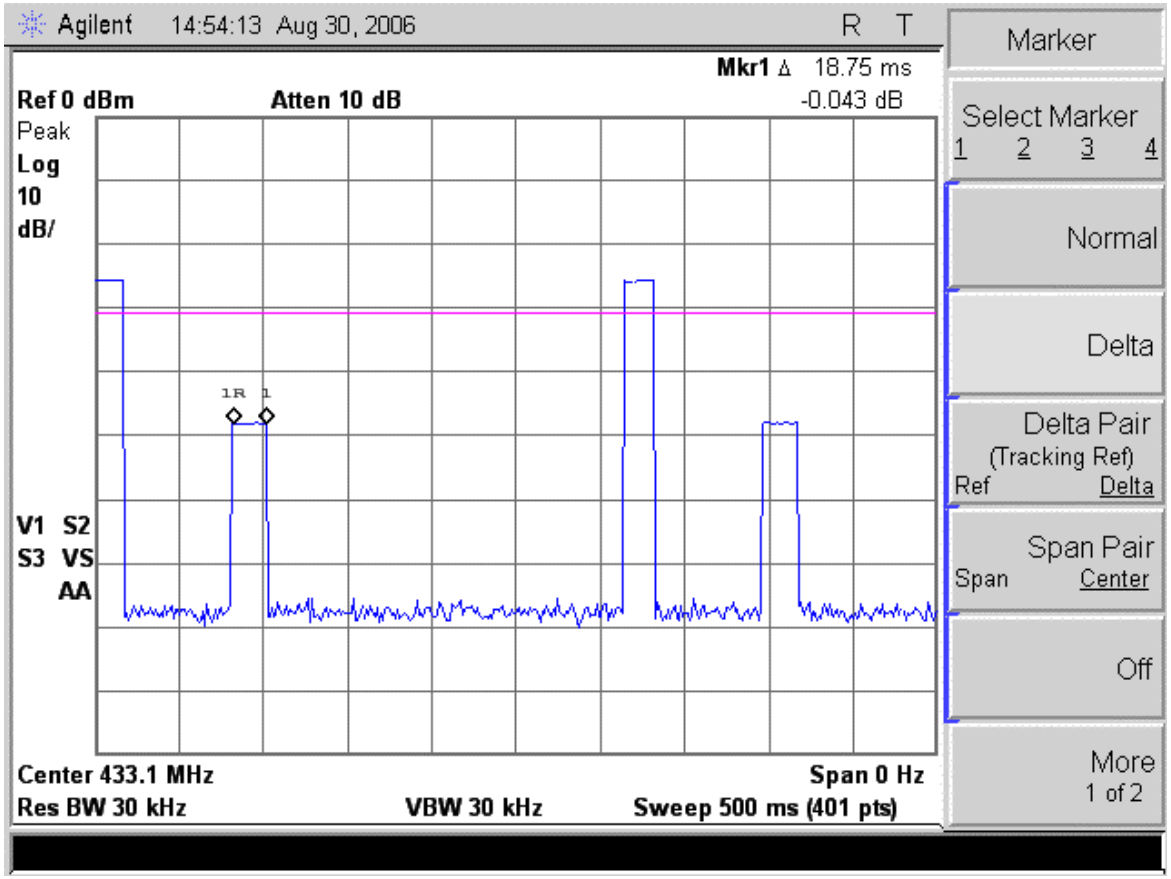
TIME ON



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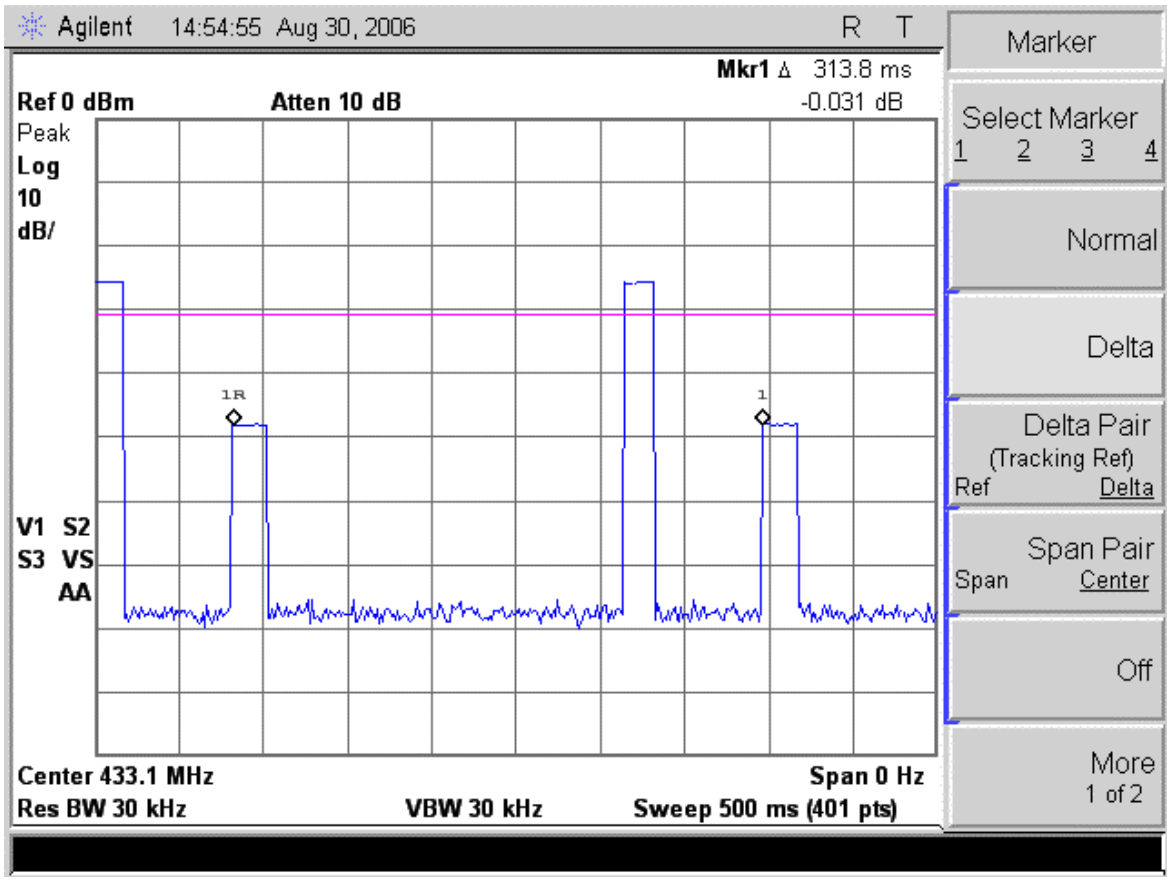
PERIOD



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7.2. RADIATED EMISSIONS

7.2.1. TRANSMITTER RADIATED EMISSIONS

LIMITS

§ 15.249 Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHZ, and 24.0–24.25 GHz.

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

(c) Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12

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8.41425 - 8.41475 12.29 - 12.293 12.51975 - 12.52025 12.57675 - 12.57725 13.36 - 13.41	162.0125 - 167.17 167.72 - 173.2 240 - 285 322 - 335.4	3260 - 3267 3332 - 3339 3345.8 - 3358 3600 - 4400	23.6 - 24.0 31.2 - 31.8 36.43 - 36.5 ([2])

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§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.

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TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

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.

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 EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

The EUT is investigated in the X, Y, and Z orientations with the worst case reported.

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FUNDAMENTAL, HARMONICS AND SPURIOUS EMISSIONS 30 – 1000 MHz

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

Project #: 06J10511
Report #:
Date& Time: 8/25/2006
Test Engr: Alvin Ilarina

Company: Honda
EUT Description: IC Card
Test Configuration : EUT
Type of Test: Fundamental Emissions
Mode of Operation: TX Continous Modulated

Freq. (MHz)	Reading (dBuV)	Factor (dB)	Duty Cycle (dB)	Level (dBuV/m)	Limit	Margin (dB)	Polarity H/V	Detector (P/Q/A)
High Channel - Y Position (Worst Case)								
918.28	67.91	26.07	-12.30	81.68	94.00	-12.32	H	PK
918.28	67.64	26.07	-12.30	81.41	94.00	-12.59	H	QP
918.28	70.22	26.07	-12.30	83.99	94.00	-10.01	V	PK
918.28	69.35	26.07	-12.30	83.12	94.00	-10.88	V	QP
Low Channel - Y Position (Worst Case)								
910.38	65.25	26.01	-12.30	78.96	94.00	-15.04	H	PK
910.38	64.91	26.01	-12.30	78.62	94.00	-15.38	H	QP
910.38	71.19	26.01	-12.30	84.90	94.00	-9.10	V	PK
910.38	70.23	26.01	-12.30	83.94	94.00	-10.06	V	QP

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HARMONICS AND SPURIOUS EMISSIONS 30 – 1000 MHz

LOW CHANNEL - HORIZONTAL

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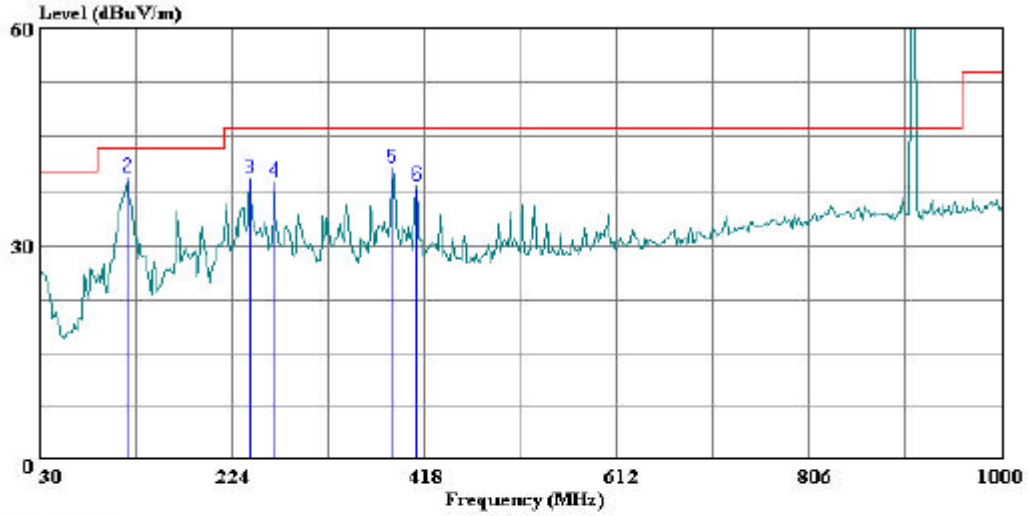

(Audix ATC)

Trace: 9 Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator : Vien Tran
Company : Honda
Project #: : 06J10511
Configuration: : EUT (IC Card) and Laptop
Mode of Operation: Continuous TX (Modulation)
Serial Number: : 00A2
Test Target : Tx Below 1 GHz_Low ch 910.445MHz
: Worst Case: EUT (IC card) at Y position

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	31.940	6.47	19.94	26.41	40.00	-13.59	Peak
2	119.240	24.11	15.05	39.16	43.50	-4.34	Peak
3	242.430	25.44	13.63	39.07	46.00	-6.93	Peak
4	266.680	24.16	14.45	38.61	46.00	-7.39	Peak
5	385.990	22.68	17.73	40.41	46.00	-5.59	Peak
6	410.240	19.68	18.31	37.99	46.00	-8.01	Peak

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LOW CHANNEL – VERTICAL

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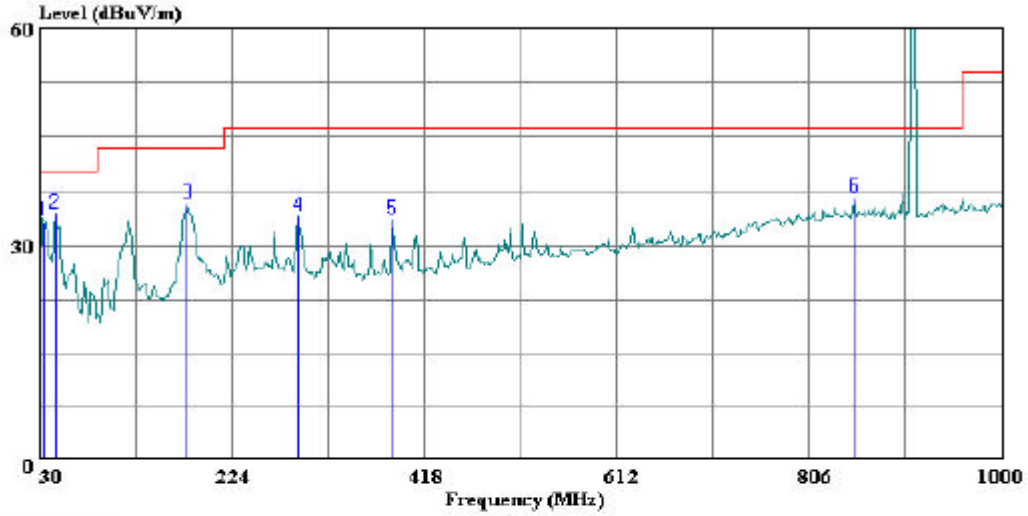

(Audix ATC)

Trace: 11 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator : Vien Tran
Company : Honda
Project #: : 06J10511
Configuration: : EUT (IC Card) and Laptop
Mode of Operation: Continuous TX (Modulation)
Serial Number: : 00A2
Test Target : Tx Below 1 GHz_Low ch 910.445MHz
: Worst Case: EUT (IC card) at Y position

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	34.850	14.47	19.05	33.53	40.00	-6.47	Peak
2	46.490	22.76	11.79	34.55	40.00	-5.45	Peak
3	179.380	22.62	13.03	35.65	43.50	-7.85	Peak
4	290.930	18.63	15.33	33.96	46.00	-12.04	Peak
5	385.990	15.96	17.73	33.69	46.00	-12.31	Peak
6	851.590	11.23	25.26	36.49	46.00	-9.51	Peak

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HIGH CHANNEL - HORIZONTAL

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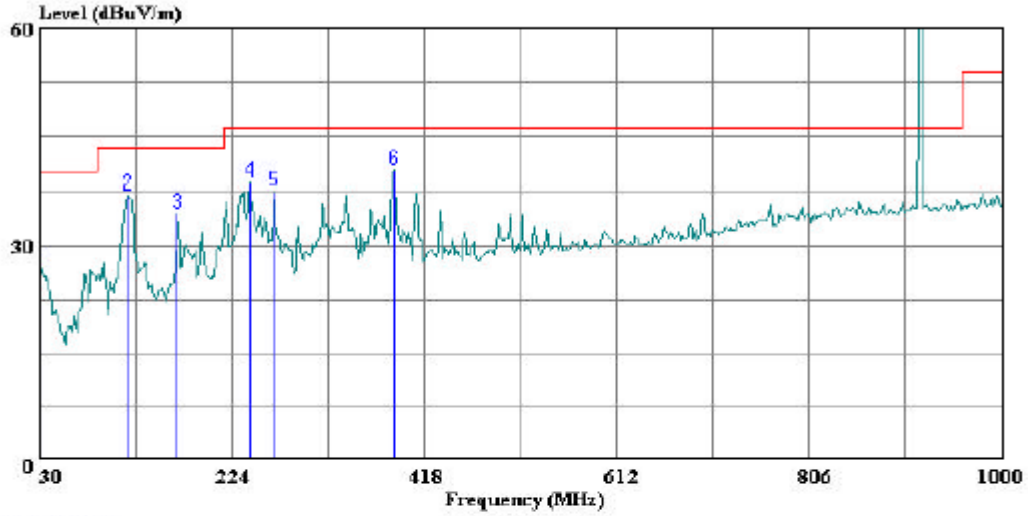

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Trace: 5 Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator : Vien Tran
Company : Honda
Project #: : 06J10511
Configuration: : EUT (IC Card) and Laptop
Mode of Operation: Continuous TX (Modulation)
Serial Number: : 00A2
Test Target : Tx Below 1 GHz_Hi ch 918.306MHz
: Worst Case: EUT (IC card) at Y position

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	31.940	7.10	19.94	27.04	40.00	-12.96	Peak
2	119.240	21.99	15.05	37.04	43.50	-6.46	Peak
3	169.680	21.11	13.40	34.51	43.50	-8.99	Peak
4	242.430	24.94	13.63	38.57	46.00	-7.43	Peak
5	266.680	22.99	14.45	37.44	46.00	-8.56	Peak
6	387.930	22.43	17.77	40.20	46.00	-5.80	Peak

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HIGH CHANNEL - VERTICAL

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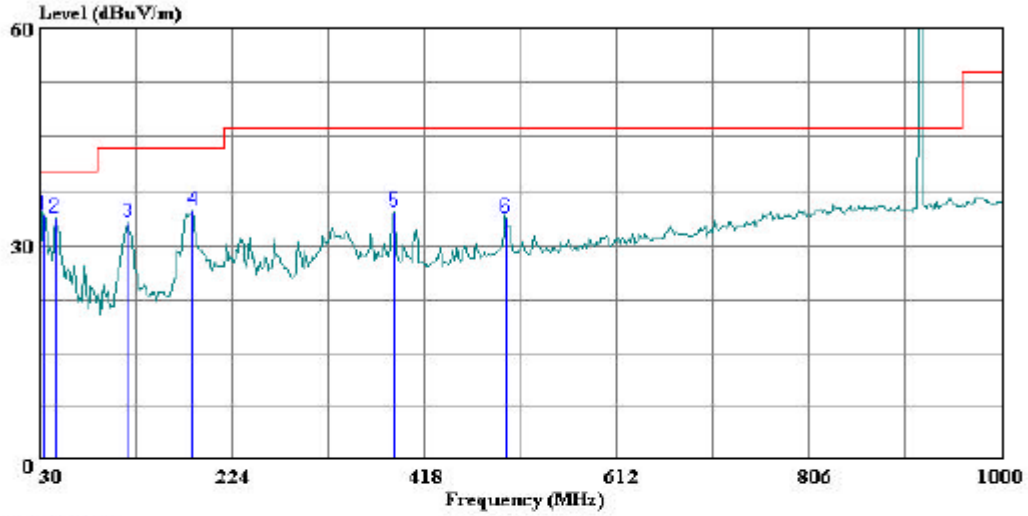

(Audix ATC)

Trace: 3 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator : Vien Tran
Company : Honda
Project #: : 06J10511
Configuration: : EUT (IC Card) and Laptop
Mode of Operation: Continuous TX (Modulation)
Serial Number: : 00A2
Test Target : Tx Below 1 GHz_Hi ch 918.306MHz
: Worst Case: EUT (IC card) at Y position

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	34.850	15.19	19.05	34.25	40.00	-5.75	Peak
2	46.490	22.06	11.79	33.85	40.00	-6.15	Peak
3	119.240	18.23	15.05	33.28	43.50	-10.22	Peak
4	184.230	21.94	12.86	34.80	43.50	-8.70	Peak
5	387.930	16.92	17.77	34.69	46.00	-11.31	Peak
6	500.450	13.56	20.23	33.79	46.00	-12.21	Peak

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BANDEDGE

BANDEDGE LOW

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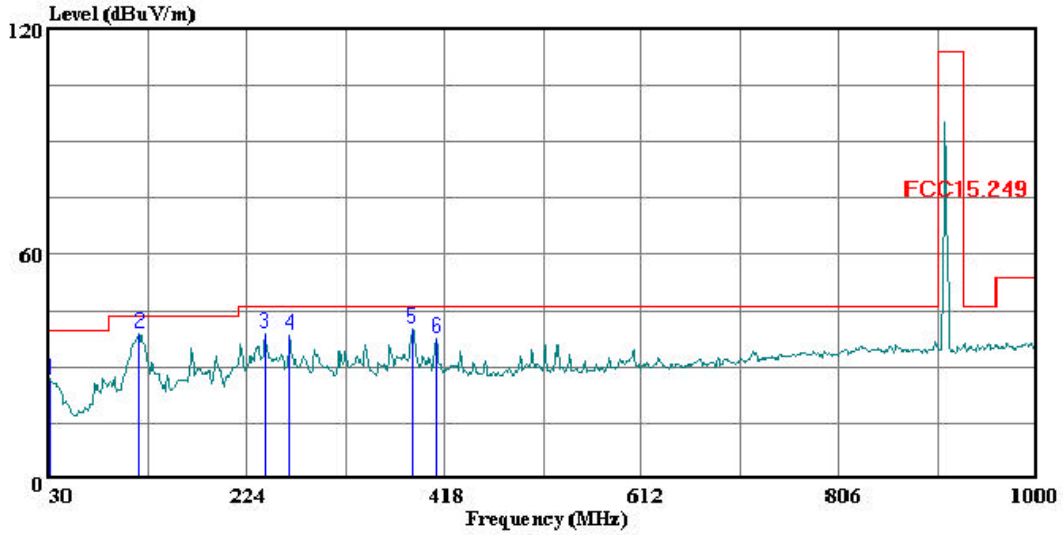

(Audix ATC)

Trace: 9 Ref Trace:

Condition: FCC15.249 HORIZONTAL
Test Operator : Vien Tran
Company : Honda
Project #: : 06J10511
Configuration: : EUT (IC Card) and Laptop
Mode of Operation: Continuous TX (Modulation)
Serial Number: : 00A2
Test Target : Tx Below 1 GHz_Low ch 910.445MHz
: Worst Case: EUT (IC card) at Y position
: Restricted Band

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	31.940	6.47	19.94	26.41	40.00	-13.59	Peak
2	119.240	24.11	15.05	39.16	43.50	-4.34	Peak
3	242.430	25.44	13.63	39.07	46.00	-6.93	Peak
4	266.680	24.16	14.45	38.61	46.00	-7.39	Peak
5	385.990	22.68	17.73	40.41	46.00	-5.59	Peak
6	410.240	19.68	18.31	37.99	46.00	-8.01	Peak

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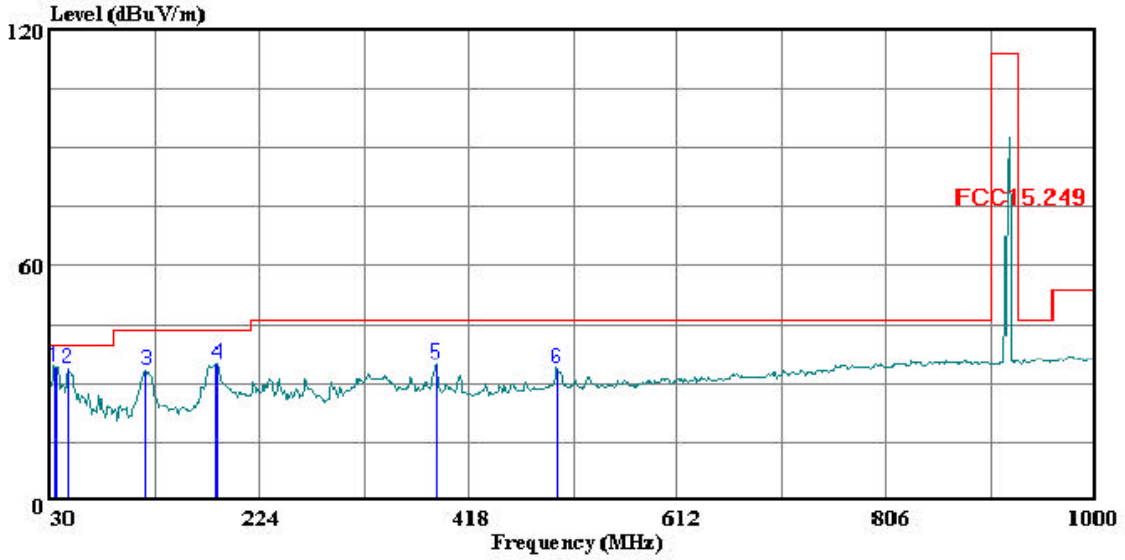
BANDEDGE HIGH

561F Monterey Road
Morgan Hill, CA 95037
Tel: (408) 463-0888
Fax: (408) 463-0885

Data#: 23 File#: IC CARD.EMI Date: 08-25-2006 Time: 12:10:03



(Audix ATC)

Trace: 3 Ref Trace:

Condition: FCC15.249 VERTICAL
Test Operator : Vien Tran
Company : Honda
Project #: : 06J10511
Configuration: : EUT (IC Card) and Laptop
Mode of Operation: Continuous TX (Modulation)
Serial Number: : 00A2
Test Target : Tx Below 1 GHz_Hi ch 918.306MHz
: Worst Case: EUT (IC card) at Y position
: Restricted Band

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	34.850	15.19	19.05	34.25	40.00	-5.75	Peak
2	46.490	22.06	11.79	33.85	40.00	-6.15	Peak
3	119.240	18.23	15.05	33.28	43.50	-10.22	Peak
4	184.230	21.94	12.86	34.80	43.50	-8.70	Peak
5	387.930	16.92	17.77	34.69	46.00	-11.31	Peak
6	500.450	13.56	20.23	33.79	46.00	-12.21	Peak

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HARMONICS AND SPURIOUS EMISSIONS ABOVE 1 GHz

High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Company: Honda R&D
Project #: 06J10511
Date: 08/25/2006
Test Engineer: Vien Tran
Configuration: EUT (IC Card)
Mode: Countinuous Tx Low & Hi channels

Test Equipment:

Horn 1-18GHz	Pre-amplifer 1-26GHz	Pre-amplifer 26-40GHz	Horn > 18GHz
T73; S/N: 6717 @3m	T87 Miteq 924342		

Hi Frequency Cables

2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter
	Vien 187215002	Vien 197209005	HPF_1.5GHz	

Peak Measurements
RBW=VBW=1MHz
Average Measurements
RBW=1MHz ; VBW=10Hz

f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
LOW CH, 910.445 MHz															
1.821	3.0	64.7	59.9	26.8	2.2	-44.8	0.0	0.3	49.2	44.4	74	54	-24.8	-9.6	V
2.731	3.0	54.7	50.1	29.2	2.5	-44.5	0.0	0.6	42.5	37.9	74	54	-31.5	-16.1	V
3.642	3.0	50.3	46.4	31.6	2.6	-44.6	0.0	0.6	40.6	36.7	74	54	-33.4	-17.3	V
1.821	3.0	61.2	58.1	26.8	2.2	-44.8	0.0	0.3	45.7	42.6	74	54	-28.3	-11.4	H
2.731	3.0	54.9	51.2	29.2	2.5	-44.5	0.0	0.6	42.7	39.0	74	54	-31.3	-15.0	H
3.642	3.0	51.2	48.1	31.6	2.6	-44.6	0.0	0.6	41.5	38.4	74	54	-32.5	-15.6	H
HI CH, 918.306 MHz															
1.837	3.0	64.1	62.2	26.8	2.2	-44.8	0.0	0.3	48.7	46.8	74	54	-25.3	-7.2	V
2.755	3.0	58.6	55.8	29.3	2.5	-44.4	0.0	0.6	46.5	43.7	74	54	-27.5	-10.3	V
3.673	3.0	55.4	47.8	31.7	2.7	-44.6	0.0	0.6	45.7	38.1	74	54	-28.3	-15.9	V
1.837	3.0	60.0	56.9	26.8	2.2	-44.8	0.0	0.3	44.6	41.5	74	54	-29.4	-12.5	H
2.755	3.0	57.5	51.5	29.3	2.5	-44.4	0.0	0.6	45.4	39.4	74	54	-28.6	-14.6	H
3.673	3.0	55.7	50.6	31.7	2.7	-44.6	0.0	0.6	46.0	40.9	74	54	-28.0	-13.1	H
		No other emissions were detected above system noise floor.													

f	Measurement Frequency	Amp	Preamp Gain	Avg Lim	Average Field Strength Limit
Dist	Distance to Antenna	D Corr	Distance Correct to 3 meters	Pk Lim	Peak Field Strength Limit
Read	Analyzer Reading	Avg	Average Field Strength @ 3 m	Avg Mar	Margin vs. Average Limit
AF	Antenna Factor	Peak	Calculated Peak Field Strength	Pk Mar	Margin vs. Peak Limit
CL	Cable Loss	HPF	High Pass Filter		

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8. SETUP PHOTOS

RADIATED EMISSION

RADIATED EMISSIONS X ORIENTATION

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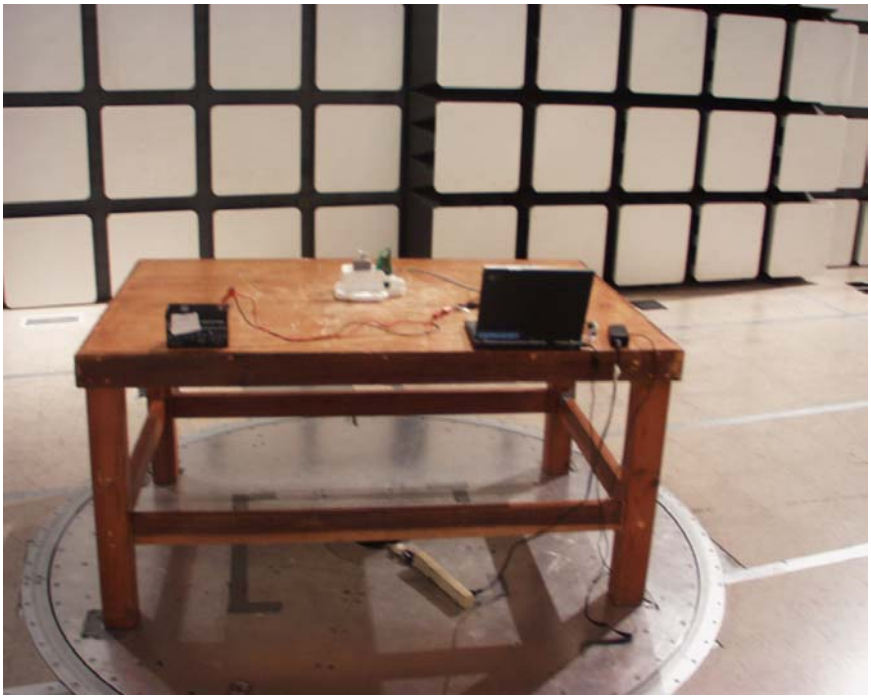
RADIATED EMISSIONS Y ORIENTATION



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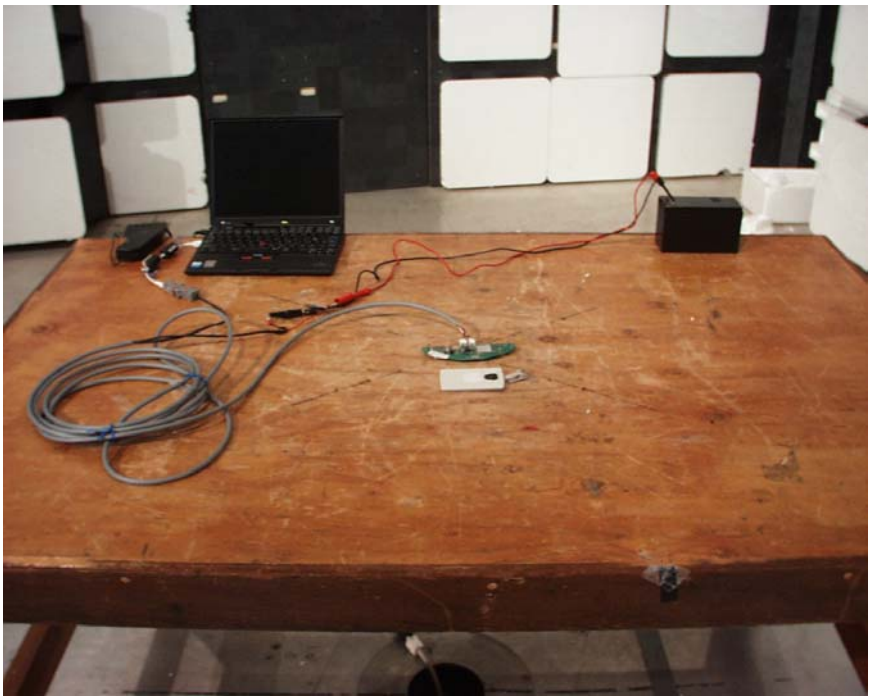
RADIATED EMISSIONS Z ORIENTATION



END OF REPORT

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