



RADIO TEST REPORT

Test Report No. : 26DE0207-HO-2

Applicant : Honda Lock Mfg. Co., Ltd.

Type of Equipment : System: Integrate Immobilizer system with RKE
Product: Immobilizer system

Model No. : System: HLIK-1
Product: HLIK-1R

Test standard : FCC Part 15 Subpart C
Section 15.209: 2006

FCC ID : MLBHLIK-1R

Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.

Date of test:

January 30 to 31, 2006

Tested by:



Kenichi Adachi
EMC Services

Approved by :


Naoki Sakamoto
Group Leader of
EMC Services

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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SECTION 1: Client information

Company Name : Honda Lock Mfg. Co., Ltd.
Address : 535-14 Oaza-Ishizue, Takanezawamachi, Shioya-Gun, Tochigi, 329-1225 Japan
Telephone Number : +81-28-680-1661
Facsimile Number : +81-28-680-1045
Contact Person : Mitsunori Suyama

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : System: Integrate Immobilizer system with RKE
Product: Immobilizer system
Model No. : System: HLIK-1
Product: HLIK-1R
Serial No. : 0005
Country of Manufacture : Japan
Receipt Date of Sample : January 26, 2006
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model No: HLIK-1R (referred to as the EUT in this report) is the Immobilizer system.

Equipment Type : Transceiver
Power Supply : DC12.0V
Operating Voltage : DC5.0V

[Tx section]
Frequency of Operation : 125kHz
Type of modulation : ASK
Mode of Operation : Simplex
Antenna Type : Loop Antenna
Mehod of Frequency Generation : Ceramic Resonator

[Rx section] *1)
Receiving frequency : 313.85MHz
Antenna Type : Monopole Antenna

*1) Please refer to UL Apex Test Report No. 26DE0207-HO-3 for Rx section test (FCC 15 Subpart B test)

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part15 Subpart C : 2006
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
		Section 15.209 Radiated emission limits, general requirements : 2006

FCC 15.31 (e)

The power supply of this EUT is transformed to DC5.0V and provides stable voltage (DC5.0V) constantly to Radio part. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin *0)	Result
1	Conducted Emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A *1)	N/A	N/A
2	Electric Field Strength of Fundamental Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.209	Radiated	N/A	<AV> 35.9dB, 0 deg <PK> 45.1dB, 0 deg. 0.12497MHz	Complied
3	Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.209	Radiated	N/A	16.9dB 72.019MHz, Horizontal, QP	Complied
4	-26dB bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	ANSI C63.4 13.1.7	Radiated	N/A	N/A	N/A

Note: UL Apex's EMI Work procedures No. QPM05 and QPM15.

*0) The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

*1) This test is not applicable since the EUT does not have AC power port.

3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	<IC> RSS-Gen 4.4.1	<IC> RSS-Gen 4.4.1	Radiated	N/A	N/A	N/A

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3.4 Uncertainty

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Loop antenna is $\pm 1.9\text{dB}(3\text{m})/\pm 1.8\text{dB}(10\text{m})$.
The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is $\pm 4.5\text{dB}(3\text{m})/\pm 4.7\text{dB}(10\text{m})$.
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is $\pm 5.2\text{dB}(3\text{m})/\pm 3.8\text{dB}(10\text{m})$.
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is $\pm 6.6\text{dB}$.
The data listed in this test report has enough margin, more than the site margin.

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is $\pm 3.0\text{dB}$.
These tests were performed without any deviations from test procedure except for additions or exclusions.

3.5 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	IC4247A	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	846015	IC4247A-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1 and No.2 semi-anechoic and No.3 shielded room.

3.6 Test set up, Test instruments and Data of EMI

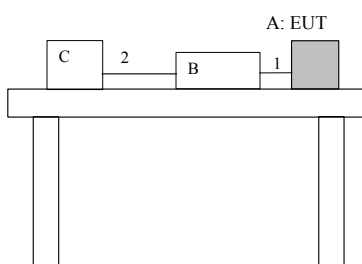
Refer to APPENDIX 1 to 3.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The mode is used : Transmitting mode (without Key)
(The EUT has same radiated emission level with or without Key)

4.2 Configuration and peripherals



* Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Immobilizer system	HLIK-1R	0005	Honda Lock Mfg. Co., Ltd.	EUT
B	Checker	-	-	Honda Lock Mfg. Co., Ltd.	-
C	Car Battery	40B19L	A030402	YUASA	-

List of cables used

No.	Name	Length (m)	Shield	Remarks
1	Signal Cable	0.5	N	-
2	DC Cable	0.5	N	-

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SECTION 5: Radiated emission (Fundamental and Spurious Emission)

Test Procedure

The Radiated Electric Field Strength intensity has been measured on No.2 semi anechoic chamber with a ground plane and at a distance of 3m.

Frequency : From 9kHz to 30MHz at distance 3m

The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for each antenna angle 0deg. , 45deg. and 90deg.

Frequency : From 30MHz to 1GHz at distance 3m

The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization.

Measurements were performed with a QP, PK, and AV detector.

The radiated emission measurements were made with the following detector function of the test receiver.

	From 9kHz to 90kHz and From 110kHz to 150kHz	From 90kHz to 110kHz	From 150kHz to 490kHz	From 490kHz to 30MHz	From 30MHz to 1GHz
Detector Type	PK/AV	QP	PK/AV	QP	QP
IF Bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz

- The carrier level and noise levels were confirmed at each position of X, Y, and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

* Part 15 Section 15.31 (f)(2) (9kHz-30MHz)

[Limit at 3m]=[Limit at 300m]-40 x log (3[m]/300[m])

[Limit at 3m]=[Limit at 30m]-40 x log (3[m]/30[m])

Test data : APPENDIX 3

Test result : Pass

Date: January 30 to 31, 2006

Test engineer: Kenichi Adachi

UL Apex Co., Ltd.

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APPENDIX 1: Photographs of test setup

This page has been submitted as a separate exhibit.

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APPENDIX 2:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE / ME	2005/04/11 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE / ME	2005/02/02 * 12
MRENT-23	Spectrum Analyzer	Advantest	R3273	RE / ME	2006/01/10 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2005/02/24 * 12
MPA-09	Pre Amplifier	Agilent	8447D	RE / ME	2005/09/07 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2005/12/16 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2005/10/10 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2005/10/14 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	ME	2005/02/24 * 12
MCC-31	Coaxial cable	ULApex	-	ME	2005/06/02 * 12
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	ME	2005/12/06 * 12
MCB-03	Car Battery	YUASA	40B19L	ME / RE	Pre Check
MOS-02	Digital Humidity Indicator	N.T	NT-1800	ME / RE	2004/11/25 * 24

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item:

ME: Magnetic Radiated emission

RE: Radiated emission

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APPENDIX 3: Data of EMI test

Radiated Emission below 30MHz (Fundamental and Spurious emission)

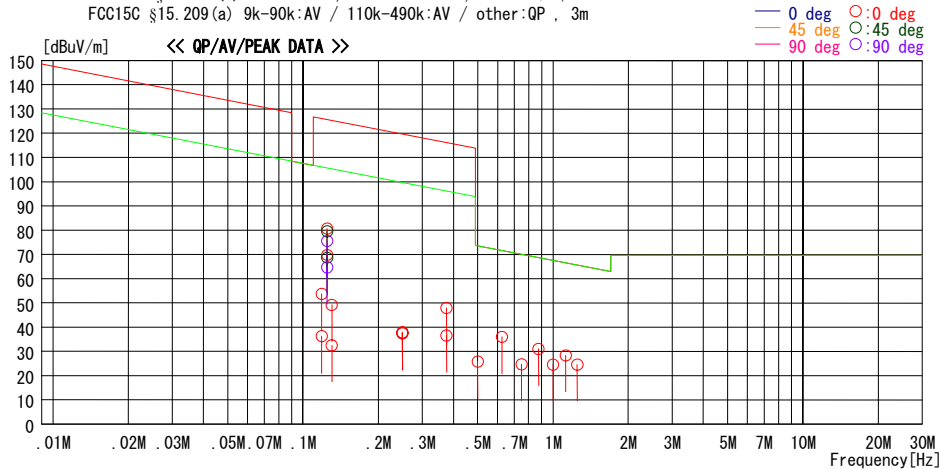
DATA OF MAGNETIC RADIATED EMISSION TEST

UL Apex Co.,LTD. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2006/01/31 02:31:39

Applicant : Honda Lock Mfg. Co.,Ltd. Report No. : 26DE0207-HO
Kind of EUT : Immobilizer system Power : DC 12V
Model No. : HLIK-1R Temp./Humi. : 24deg. C / 30%
Serial No. : 0005 Operator : Kenichi Adachi

Mode / Remarks : Transmitting , EUT-max-axis: Y-axis (MAX)

LIMIT : FCC15C §15.209(a) 9k-90k:PK / 110k-490k:PK / other:QP , 3m
FCC15C §15.209(a) 9k-90k:AV / 110k-490k:AV / other:QP , 3m



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]	
0.11869	61.9	PEAK	19.5	0.2	27.9	53.7	126.1	72.4	0deg	182	BW 200Hz
0.11869	44.5	AV	19.5	0.2	27.9	36.3	106.1	69.8	0deg	182	BW 200Hz
0.12497	88.8	PEAK	19.5	0.2	27.9	80.6	125.7	45.1	0deg	182	BW 200Hz, carrier
0.12497	78.0	AV	19.5	0.2	27.9	69.8	105.7	35.9	0deg	182	BW 200Hz, carrier
0.12497	87.8	PEAK	19.5	0.2	27.9	79.6	125.7	46.1	45deg	161	BW 200Hz, carrier
0.12497	76.9	AV	19.5	0.2	27.9	68.7	105.7	37.0	45deg	161	BW 200Hz, carrier
0.12497	83.8	PEAK	19.5	0.2	27.9	75.6	125.7	50.1	90deg	256	BW 200Hz, carrier
0.12497	72.9	AV	19.5	0.2	27.9	64.7	105.7	41.0	90deg	256	BW 200Hz, carrier
0.13031	57.5	PEAK	19.5	0.2	27.9	49.3	125.3	76.0	0deg	182	BW 200Hz
0.13031	40.7	AV	19.5	0.2	27.9	32.5	105.3	72.8	0deg	182	BW 200Hz
0.25002	47.0	PEAK	19.5	0.3	28.9	37.9	119.7	81.8	0deg	180	BW 9kHz
0.25002	46.5	AV	19.5	0.3	28.9	37.4	99.6	62.2	0deg	180	BW 9kHz
0.37499	57.2	PEAK	19.5	0.4	29.1	48.0	116.1	68.1	0deg	180	BW 9kHz
0.37499	45.7	AV	19.5	0.4	29.1	36.5	96.1	59.6	0deg	180	BW 9kHz
0.50000	35.0	QP	19.5	0.4	29.1	25.8	73.6	47.8	0deg	180	BW 9kHz
0.62509	45.4	QP	19.5	0.3	29.2	36.0	71.7	35.7	0deg	180	BW 9kHz
0.75000	33.8	QP	19.5	0.4	29.0	24.7	70.1	45.4	0deg	180	BW 9kHz
0.87505	40.0	QP	19.5	0.5	29.0	31.0	68.8	37.8	0deg	180	BW 9kHz
1.00000	33.7	QP	19.5	0.4	29.0	24.6	67.6	43.0	0deg	180	BW 9kHz
1.12532	37.5	QP	19.5	0.4	29.0	28.4	66.6	38.2	0deg	180	BW 9kHz
1.25000	33.4	QP	19.6	0.5	28.9	24.6	65.7	41.1	0deg	180	BW 9kHz

CHART : WITH FACTOR , ANT TYPE : LOOP , CALCULATION : READING + ANT FACTOR + LOSS (CABLE + ATTEN. -AMP.)
Except for the data below : adequate margin data below the limits.

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Radiated Emission above 30MHz (Spurious emission)

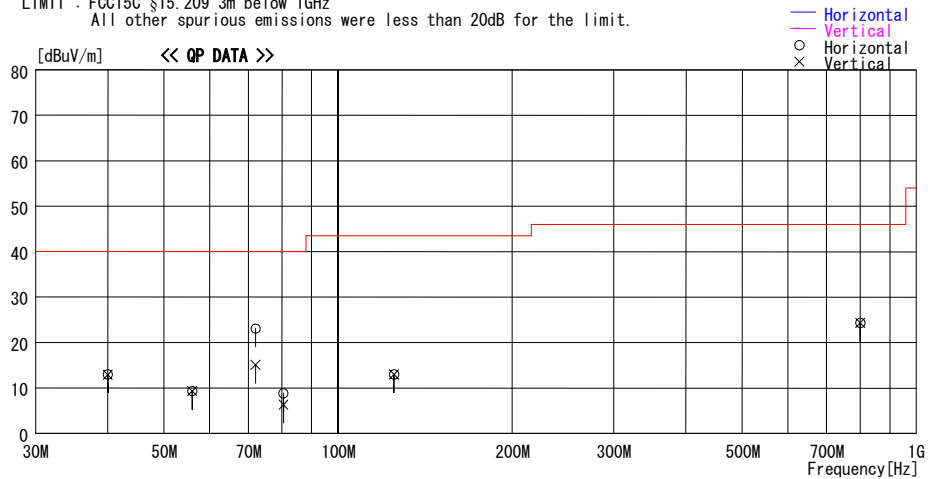
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2006/01/31 05:01:46

Company : Honda Lock Mfg Co.,Ltd.
Kind of EUT : Immobilizer system
Model No. : HLIK-1R
Serial No. : 0005
Report No. : 26DE0207-HO
Power : DC 12V
Temp./Humi. : 24deg. C. / 30%
Operator : Kenichi Adachi

Mode / Remarks : Transmitting / EUT Max-axis (Hor:Y, Ver:Y)

LIMIT : FCC15C §15.209 3m below 1GHz
All other spurious emissions were less than 20dB for the limit.



Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
40.000	21.9	QP	13.6	-22.5	13.0	0	240	Hori.	40.0	27.0
40.000	21.8	QP	13.6	-22.5	12.9	0	100	Vert.	40.0	27.1
55.976	22.8	QP	8.9	-22.4	9.3	205	232	Hori.	40.0	30.7
55.976	22.8	QP	8.9	-22.4	9.3	272	100	Vert.	40.0	30.7
72.019	38.6	QP	6.5	-22.0	23.1	205	232	Hori.	40.0	16.9
72.026	30.6	QP	6.5	-22.0	15.1	272	100	Vert.	40.0	24.9
80.483	22.1	QP	6.3	-22.1	6.3	270	100	Vert.	40.0	33.7
80.483	24.6	QP	6.3	-22.1	8.8	199	223	Hori.	40.0	31.2
125.000	21.5	QP	13.0	-21.5	13.0	0	230	Hori.	43.5	30.5
125.000	21.5	QP	13.0	-21.5	13.0	0	100	Vert.	43.5	30.5
800.000	20.7	QP	21.4	-17.8	24.3	0	100	Hori.	46.0	21.7
800.000	20.7	QP	21.4	-17.8	24.3	0	100	Vert.	46.0	21.7

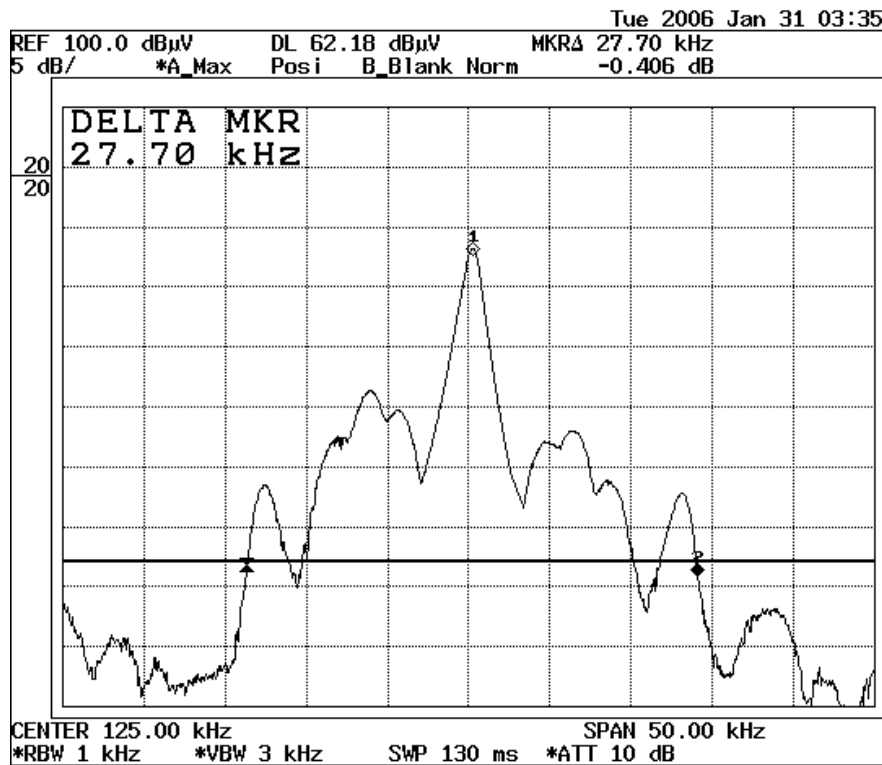
CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

-26dB Bandwidth

Company : Honda Lock Mfg. Co.,Ltd.
Equipment : Immobilizer system
Model : HLIK-1R
S/N : 0005
Power : DC12V
Mode : Transmitting

UL-Apex
Head Office EMC Lab. No.2 Semi Anechoic Chamber
Regulation : ANSI C63.4 13.1.7
Test Distance : -
Date : 01/30/2006
Temperature : 24 deg.C.
Humidity : 30 %
Engineer : Kenichi Adachi

FREQ [kHz]	-26dB Bandwidth [kHz]
125.0	27.70



99% Occpied Bandwidth

Company : Honda Lock Mfg. Co.,Ltd.
Equipment : Immobilizer system
Model : HLIK-1R
S/N : 0005
Power : DC12V
Mode : Transmitting

UL-Apex
Head Office EMC Lab. No.2 Semi Anechoic Chamber
Regulation : RSS-Gen 4.4.1
Test Distance : -
Date : 01/30/2006
Temperature : 24 deg.C.
Humidity : 30 %
Engineer : Kenichi Adachi

FREQ [kHz]	99% Occpied Bandwidth [kHz]
125.0	27.72

