



RADIO TEST REPORT

Test Report No. : 32EE0044-SH-01-B

Applicant : Honda Lock Mfg. Co., Ltd.
Type of Equipment : Integrate Immobilizer System with RKE
Model No. : HLIK6-1R
FCC ID : MLBHLIK6-1R
Test regulation : FCC Part 15 Subpart C 2011
Section 15.207, Section 15.209
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

Date of test:

December 29, 2011 – January 8, 2012

**Representative
test engineer:**

Tatsuya Arai
Engineer of WiSE Japan, UL Verification
Service

Approved by:

Go Ishiwata
Manager of WiSE Japan, UL Verification
Service

- ☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".



UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone: +81 463 50 6400

Facsimile: +81 463 50 6401

Table of Contents	Page
SECTION 1: Customer information	3
SECTION 2: Equipment under test (E.U.T.)	3
SECTION 3: Test specification, procedures & results	4
SECTION 4: Operation of E.U.T. during testing	7
SECTION 5: Radiated emission (Fundamental and Spurious Emission)	8
SECTION 6: -26dB Bandwidth	10
SECTION 7: 99% Occupied Bandwidth	10
APPENDIX 1: Data of EMI test	11
Radiated Emission below 30MHz (Fundamental and Spurious Emission)	11
Radiated Emission above 30MHz (Spurious Emission)	13
-26dB Bandwidth	14
99% Occupied Bandwidth	14
APPENDIX 2: Test instruments	15
APPENDIX 3: Photographs of test setup	16
Radiated Emission	16
Worst Case Position	18

SECTION 1: Customer information

Company Name : Honda Lock Mfg. Co., Ltd.
Address : 3700,Shimonaka Sadowara-Cho,Miyazaki-Shi Miyazaki Pref., 880-0293 Japan
Telephone Number : +81 50-3757-5619
Contact Person : Mitsunori Suyama

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

2.1 Identification of E.U.T.

Type of Equipment : Integrate Immobilizer System with RKE
Model No. : HLIK6-1R
Serial No. : Refer to Clause 4.2
Rating : DC12.0V
Receipt Date of Sample : December 26, 2011
Country of Mass-production : Japan
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

Model No: HLIK6-1R (referred to as the EUT in this report) is the Integrate Immobilizer System with RKE.

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

[Transmitter part]
Frequency of Operation : 125kHz
Type of modulation : ASK
Mode of Operation : Simplex
Antenna Type : Loop Antenna

[Receiver part] *1)
Receiving frequency : 313.85MHz
Antenna Type : Monopole Antenna

*1) Please refer to UL Japan, Inc. Test Report No. 32EE0044-SH-01-C for Receiver part test (FCC 15 Subpart B test)

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400
Facsimile: +81 463 50 6401

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C 2011, final revised on November 21, 2011 and effective December 21, 2011

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted Emission
Section 15.209 Radiated emission limits, general requirements

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.

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone: +81 463 50 6400

Facsimile: +81 463 50 6401

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
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	35.9dB 0.125MHz 0 deg. AV	Complied
3	Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.20	Radiated	N/A	10.2dB 71.988MHz, QP, Vertical	Complied
4	-26dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Reference data	Radiated	N/A	N/A	N/A

Note: UL Japan, Inc.'s EMI Work Procedures No.13-EM-W0420 and 13-EM-W0422.

*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.

3.3 Addition to standard

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-Gen 4.6.1	RSS-Gen 4.6.1	Radiated	N/A	N/A	N/A

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Item	Frequency range	No.1 SAC ^{*1} /SR ^{*2} (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
Conducted emission (AC Mains) AMN/LISN	9kHz-150kHz	4.0 dB	4.0 dB	3.9 dB
	150kHz-30MHz	3.6 dB	3.6 dB	3.6 dB
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.7 dB	3.7 dB	3.6 dB
	30MHz-300MHz	4.9 dB	5.1 dB	5.0 dB
	300MHz-1GHz	5.0 dB	5.2 dB	5.0 dB
	1GHz-18GHz	4.8 dB	4.8 dB	4.9 dB
	18GHz-26.5GHz	5.0 dB	4.5 dB	4.5 dB

*1: SAC=Semi-Anechoic Chamber

*2: SR= Shielded Room is applied besides radiated emission

Radiated emission test(3m)

The data listed in this test report has enough margin, more than the site margin.

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone: +81 463 50 6400

Facsimile: +81 463 50 6401

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.

1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN

Telephone number : +81 463 50 6400

Facsimile number : +81 463 50 6401

JAB Accreditation No. : RTL02610

No.1/ No.2/ No.3 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on April 17, 2009 (Registration No.: 697847).

IC Registration No. : 2973D-1 (No1 anechoic chamber)
2973D-2 (No2 anechoic chamber)
2973D-3 (No3 anechoic chamber)

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
No.1 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	No.1 Shielded room	6.8 x 4.1 x 2.7
No.2 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	No.2 Shielded room	6.8 x 4.1 x 2.7
No.3 Semi-anechoic chamber	12.7 x 7.7 x 5.35 Maximum measurement distance: 5m	No.3 Shielded room	6.3 x 4.7 x 2.7
No.4 Semi-anechoic chamber	8.1 x 5.1 x 3.55	No.4 Shielded room	4.4 x 4.7 x 2.7
		No.5 Shielded room	7.8 x 6.4 x 2.7
		No.6 Shielded room	7.8 x 6.4 x 2.7

3.6 Test set up, Data of EMI, and Test instruments

Refer to APPENDIX 1 to 3.

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone: +81 463 50 6400

Facsimile: +81 463 50 6401

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

4.1 Operating Modes

The mode is used : Transmitting mode

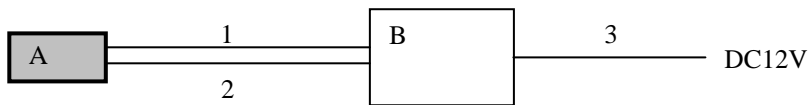
*Setting to continuous transmitting mode by updating the firmware of EUT

Power settings: Fixed (The setting is not controlled by the software and it is equivalent to that of mass-produced items.)

Above setting of software is the worst case.

Any conditions under the normal use do not exceed the condition of setting.

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	Remark
A	Integrate Immobilizer System with RKE	HLIK6-1R	2	Honda Lock Mfg. Co., Ltd.	EUT
B	Checker	-	-	Honda Lock Mfg. Co., Ltd.	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Signal Cable (IG1)	0.5	Unshielded	Unshielded	-
2	DC Cable	0.5	Unshielded	Unshielded	-
3	DC Cable	1.2	Unshielded	Unshielded	-

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone: +81 463 50 6400

Facsimile: +81 463 50 6401

SECTION 5: Radiated emission (Fundamental and Spurious Emission)

Test Procedure

The Radiated Electric Field Strength intensity has been measured on No 1 and No.3 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 vertical polarization and horizontal polarization.

*Refer to Figure 1 about Direction of the Loop Antenna.

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 (or, noise levels) was (or were) measured at each position of all three axes X, Y and Z, and the position that has the maximum noise was determined.

With the position, the noise levels of all the frequencies were measured.

* 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 2

Test result : Pass

Date: December 29, 2011 and January 8, 2012

Test engineer: Kenichi Adachi, Tatsuya Arai

UL Japan, Inc.

Shonan EMC Lab.

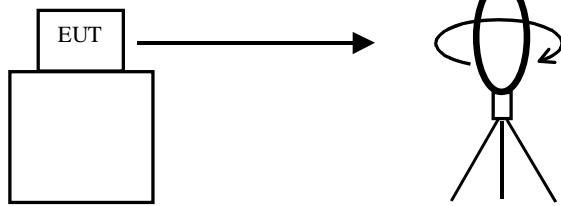
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone: +81 463 50 6400

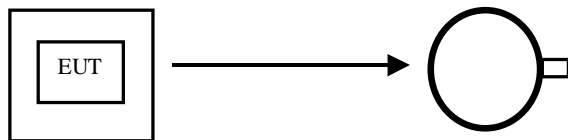
Facsimile: +81 463 50 6401

Figure 1: Direction of the Loop Antenna

Side View (Vertical)

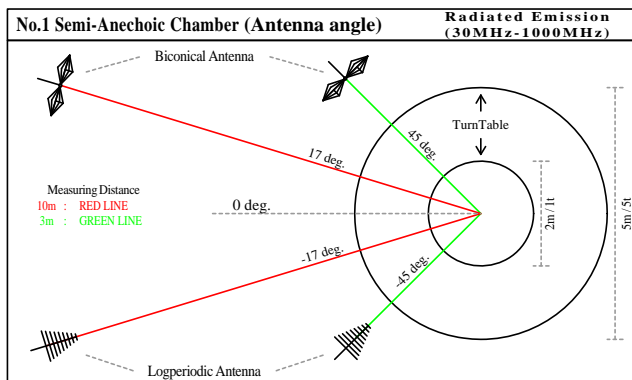
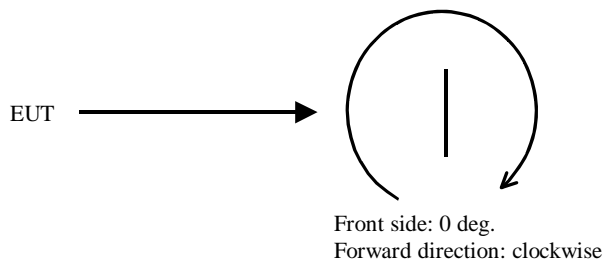


Top View (Horizontal)



Antenna was not rotated.

Top View (Vertical)



UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone: +81 463 50 6400

Facsimile: +81 463 50 6401

SECTION 6: -26dB Bandwidth

Test Procedure

The bandwidth was measured with a spectrum analyzer and a search coil placed by the EUT.

Test data	: APPENDIX 2
Test result	: Pass

SECTION 7: 99% Occupied Bandwidth

Test Procedure

The bandwidth was measured with a spectrum analyzer and a search coil placed by the EUT.

Test data	: APPENDIX 2
Test result	: Pass

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone: +81 463 50 6400

Facsimile: +81 463 50 6401