



RADIO TEST REPORT

Test Report No. : 26DE0207-HO-1a

Applicant : Honda Lock Mfg. Co., Ltd.
Type of Equipment : System: Integrate Immobilizer system with RKE
Product: Transmitter of Keyless system
Model No. : System: HLIK-1
Product: HLIK-1T
Test standard : FCC Part 15 Subpart C Section 15.231:2006
FCC ID : MLBHLIK-1T
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 : February 8, 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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MF060b(01.06.05)

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SECTION 1: Client information

Company Name : Honda Lock Mfg.Co., Ltd.
Address : 535-14 Oaza-Ishizue, Takanezawamachi, Shioya-Gun, Tochigi, Japan
Telephone Number : +81- (0)28-680-1661
Facsimile Number : +81- (0)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: Transmitter of Keyless system
Model No. : System: HLIK-1
Product: HLIK-1T
Serial No. : 0001 for all other tests than Automatically deactivate
0005 for Automatically deactivate test
Rating : DC3.0V
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-1T (referred to as the EUT in this report) is the Transmitter of Keyless system.

Equipment Type : Transceiver
Power Supply : DC3.0V

[Tx section]
Frequency of Operation : 313.85MHz
Type of modulation : FSK
Power Control : No
Mode of Operation : Simplex
Antenna Type : Loop Antenna
Mehod of Frequency Generation : Crystal

[Rx section]
Receiving frequency : 125kHz

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C : 2006
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.231 Periodic operation in the band 40.66 - 40.70MHz
and above 70MHz

FCC 15.31 (e)

The test was performed with the New Battery (DC 3.0V) and the constant voltage was supplied to the EUT during the tests. Therefore, the 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	Deviation	Worst margin	Results
1	Automatically Deactivate	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.231(a)(1)	N/A	-	Complied
2	Electric Field Strength of Fundamental Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.231(b)	N/A	2.1dB 313.86MHz Horizontal	Complied
3	Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.205 Section 15.209 Section 15.231(b)	N/A	1.3dB 2824.58MHz Horizontal, AV	Complied
4	-20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.231(c)	N/A	-	Complied
5	Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A*1)	N/A

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

*1) The test is not applicable since the EUT does not have AC Mains.

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-210 A1.1.3	Radiated	N/A	N/A	N/A

3.4 Uncertainty

Radiated Emission Test

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ± 4.5 dB.

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ± 5.2 dB.

The measurement uncertainty (with a 95% confidence level) for this test using Horn Antenna is ± 6.6 dB.

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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3.5 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	FCC Registration Number	IC 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

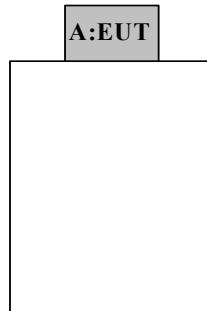
4.1 Operating Modes

The mode is used : Transmitting mode

*RF output power of Door Lock button, Unlock button, and Panic button are identical, and thus tests were performed with that of Door Lock button as a representative.

Justification : The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2 Configuration and peripherals



Description of EUT

No	Item	Model number	Serial number	Manufacturer	Remarks
A	Transmitter of Keyless system	HLIK-1T	0001 for all other tests than Automatically deactivate 0005 for Automatically deactivate test	Honda Lock Mfg.Co., Ltd.	EUT

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SECTION 5: Radiated emission (Fundamental and Spurious Emission)

5.1 Operating environment

Test place : No.1 semi anechoic chamber
Temperature : See data
Humidity : See data

5.2 Test configuration

EUT was placed on a platform of nominal size, 0.5m by 1.0m, raised 80cm above the conducting ground plane.

The EUT was set on the center of the tabletop.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

A drawing of the set up is shown in the photos of APPENDIX 1.

5.3 Test conditions

Frequency range : 30MHz-3200MHz
Test distance : 3m
EUT position : Table top
EUT operation mode : Transmitting

5.4 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.

The measuring antenna height was 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.

	Below or equal to 1GHz	Above 1GHz (FCC15.205)	Above 1GHz (FCC15.231)
Detector Type	QP	Peak and AV(=Peak with Duty factor)	Peak with Duty factor
IF Bandwidth	120kHz	PK: S/A:RBW 1MHz, VBW:1MHz, AV: S/A:RBW 1MHz, VBW:1MHz with Duty factor	PK: S/A:RBW 1MHz, VBW:1MHz

- 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.

5.5 Results

Summary of the test results: Pass

Date: February 8, 2006

Tested by: Kenichi Adachi

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APPENDIX 1: Photographs of test setup

This test 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-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	RE	2005/11/14 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	RE	2005/11/10 * 12
MBA-01	Biconical Antenna	Schwarzbeck	BBA9106	RE	2005/10/10 * 12
MLA-01	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2005/10/14 * 12
MCC-01	Coaxial Cable 0.1-3000MHz	Suhner/storm/Agilent/TSJ	-	RE	2005/12/18 * 12
MPA-04	Pre Amplifier	Agilent	8447D	RE	2005/05/24 * 12
MHA-05	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2006/01/09 * 12
MCC-18	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	RE	2006/02/02 * 12
MPA-01	Pre Amplifier	Agilent	8449B	RE	2006/02/09 * 12
MOS-01	Digital Humidity Indicator	N.T	NT-1800	RE	2004/11/25 * 24
MHF-03	High pass Filter	Mini-Circuit	VHF-1320	RE	2005/12/09 * 12
MCC-22	Microwave Cable 1G-50GHz	Storm	421-011 (90-011-080)	RE	2005/04/29 * 12
MAT-06	Attenuator(6dB)	Weinschel Corp	2	RE	2005/12/16 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	RE	2005/09/16 * 12

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

Test Item:

RE: Radiated emission

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APPENDIX 3: Data of EMI test

Radiated Emission (Electric Field Strength of Fundamental and Spurious Emission)

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : Honda Lock Mfg. Co.,Ltd.
EQUIPMENT : Transmitter of Keyless system
MODEL : HLIK-1T
S/N : 0001
POWER : DC 3.0V
Mode : Continuous Transmitting (313.85MHz)
Axis : Hor.: X-axis, Ver.: Z-axis

REPORT NO : 26DE0207-HO
REGULATION : Fcc Part15 Subpart C 231(b) / 15.205 / 15.209
TEST DISTANCE : 3m
DATE : 02/08/2006
TEMPERATURE : 22 deg.C.
HUMIDITY : 23 %
ENGINEER : Kenichi Adachi

Det.	FREQ [MHz]	T/R READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR	VER				HOR	VER		HOR	VER
		[dBuV]					[dBuV/m]			[dB]	[dB]
QP	313.86	75.7	71.8	14.7	27.2	10.2	73.4	69.5	75.5	2.1	6.0

(below 1GHz) **QP DETECT**

No.	FREQ [MHz]	T/R READING : QP		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR	VER				HOR	VER		HOR	VER
		[dBuV]					[dBuV/m]			[dB]	[dB]
2	627.70	22.3	24.7	19.5	28.6	12.0	25.2	27.6	46.0	20.8	18.4
3	941.58	20.5	20.4	22.1	27.7	10.3	25.2	25.1	46.0	20.8	20.9

(above 1GHz)

PK DETECT (RBW: 1MHz, VBW: 1MHz)

(Inside Restricted bands (PK))

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR	VER				HOR	VER		HOR	VER
		[dBuV]					[dBuV/m]			[dB]	[dB]
5	1569.10	49.1	47.3	25.5	36.6	2.8	40.8	39.0	73.9	33.1	34.9
9	2824.58	57.0	56.6	31.4	36.5	4.2	56.1	55.7	73.9	17.8	18.2

AV MEASUREMENT Result = Reading (RBW: 1MHz, VBW: 1MHz) + Duty Factor

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	[dB]
4	1255.47	44.9	47.6	23.9	36.8	2.6	-3.5	31.1	33.8	55.5	24.4	21.7
5	1569.10	49.1	47.3	25.5	36.6	2.8	-3.5	37.3	35.5	53.9	16.6	18.4
6	1883.16	42.8	42.9	29.8	32.5	2.2	-3.5	38.8	38.9	55.5	16.7	16.6
7	2196.94	50.7	49.0	30.9	36.4	3.8	-3.5	45.5	43.8	55.5	10.0	11.7
8	2510.73	54.7	53.4	30.3	36.4	4.0	-3.5	49.1	47.8	55.5	6.4	7.7
9	2824.58	57.0	56.6	31.4	36.5	4.2	-3.5	52.6	52.2	53.9	1.3	1.7
10	3138.43	54.7	50.8	31.7	36.5	4.4	-3.5	50.8	46.9	55.5	4.7	8.6

REMARKS

ANTENNA TYPE:30-300MHz Biconical / 300-1000MHz Logperiodic / 1-3.2GHz Horn

CALCULATION RESULT=Reading + ANT Factor - Amp Gain + LOSS (Cable+ ATTEN.)+Duty factor

Duty cycle Factor Measurement : The duty cycle factor = $20 \log (\text{On time}[\text{sec.}] / 1 \text{ cycle time}[\text{sec.}])$:-3.5dB

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

*Except for the above table : All other spurious emissions were less than 20dB for the limit.

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.

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-20dB Bandwidth

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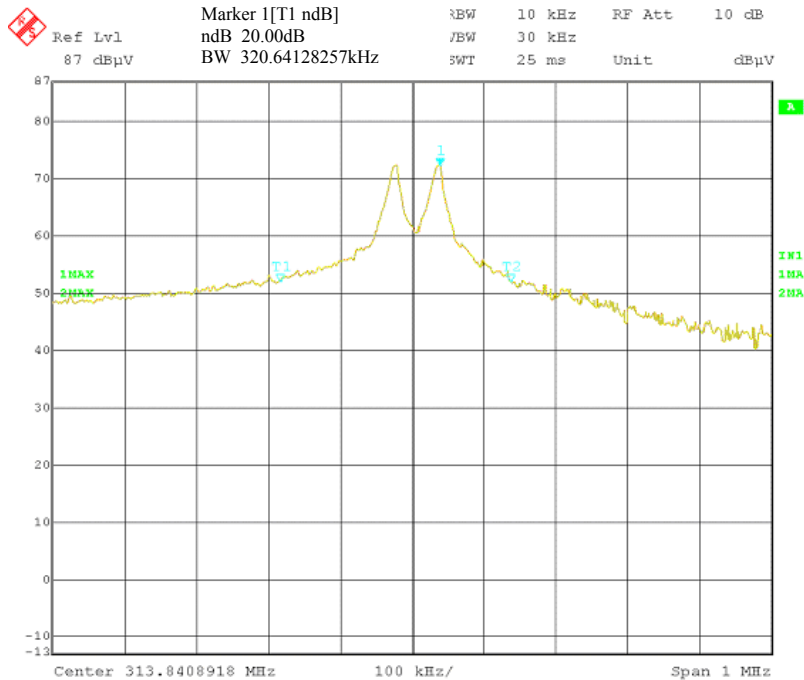
COMPANY : Honda Lock Mfg Co., Ltd.
EQUIPMENT : Transmitter of Keyless system
MODEL : HLIK-1T
S/N : 0001
POWER : DC 3.0V
Mode : Continuous Transmitting (313.85MHz)

REPORT NO : 26DE0207-HO
REGULATION : Fcc Part15 Subpart C 15.231 (c)
TEST DISTANCE : 3m
DATE : 02/08/2006
TEMPERATURE : 22°C
HUMIDITY : 23%

ENGINEER : Kenichi Adachi

Bandwidth Limit : Fundamental Frequency 313.85 MHz X 0.25% = 784.625 kHz

-20dB Bandwidth	Bandwidth Limit	Result
[kHz]	[kHz]	
320.64	784.63	Pass



Automatically deactivate

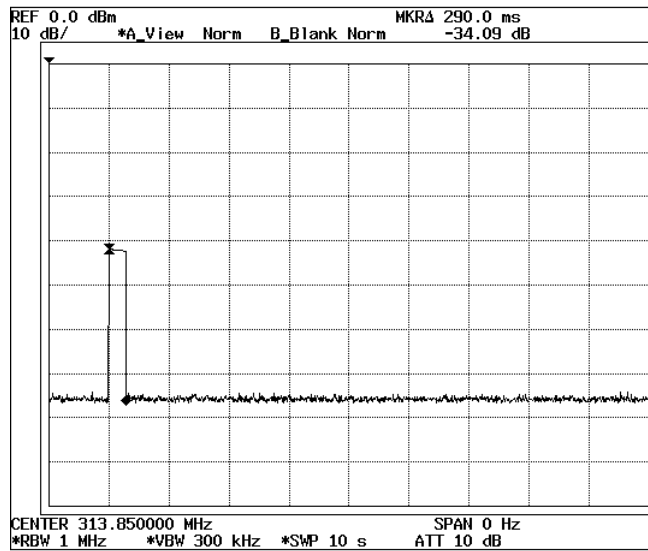
UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : Honda Lock Mfg Co., Ltd.
EQUIPMENT : Transmitter of Keyless system
MODEL : HLIK-1T
S/N : 0005
POWER : DC 3.0V
Mode : Transmitting (313.85MHz)

REPORT NO : 26DE0207-HO
REGULATION : Fcc Part15 Subpart C15. 231(a)
TEST DISTANCE : 3m
DATE : 02/08/2006
TEMPERATURE : 22°C
HUMIDITY : 23%

ENGINEER : Kenichi Adachi

Time of Transmitting [sec]	Limit [sec]	Result
0.29	5.00	Pass



99% Occupied Bandwidth

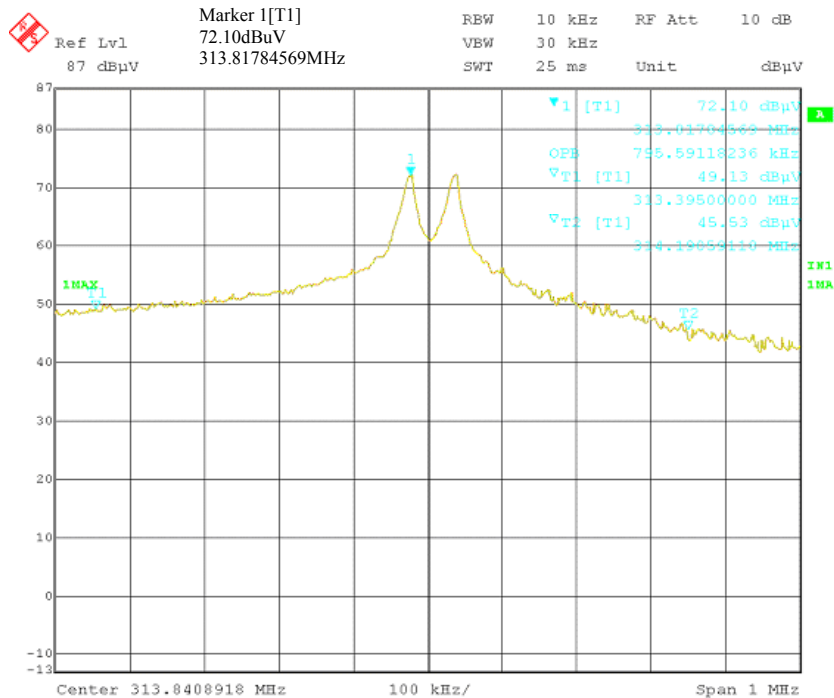
UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : Honda Lock Mfg Co., Ltd.
EQUIPMENT : Transmitter of Keyless system
MODEL : HLIK-1T
S/N : 0001
POWER : DC 3.0V
Mode : Continuous Transmitting (313.85MHz)

REPORT NO : 26DE0207-HO
REGULATION : RSS-210 A1.1.3
TEST DISTANCE : 3m
DATE : 02/08/2006
TEMPERATURE : 22°C
HUMIDITY : 23%

ENGINEER : Kenichi Adachi

99% Occupied Bandwidth (RSS-210)



* 99% Occupied Bandwidth : 795.59 kHz

Data of Duty cycle

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY	: Honda Lock Mfg. Co.,Ltd.	REPORT NO	: 26DE0207-HO
EQUIPMENT	: Transmitter of Keyless system	REGULATION	: Fcc Part15 Subpart C 231(b) / 15.205 / 15.209
MODEL	: HLIK-1T	TEST DISTANCE	: -
S/N	: 0005	DATE	: 02/08/2006
POWER	: DC 3.0V	TEMPERATURE	: 23deg.C.
Mode	: Transmitting (313.85MHz)	HUMIDITY	: 34 %
		ENGINEER	: Kenichi Adachi

Time of Transmitting [ms]	Cycle total time [ms]	Duty cycle	Duty Factor [dB]
67.00	100.00	0.67	-3.48

