



RADIO TEST REPORT

Test Report No. : 26LE0004-HO-A-2

Applicant : Mitsubishi Electric Corporation
Himeji Works

Type of Equipment : KIPASS SYSTEM

Model No. : SKEB7A-01 (Smart Unit)

Test standard : FCC Part 15 Subpart C
Section 15.209, Section 15.205: 2006

FCC ID : BGBF8T735SKEB7A01

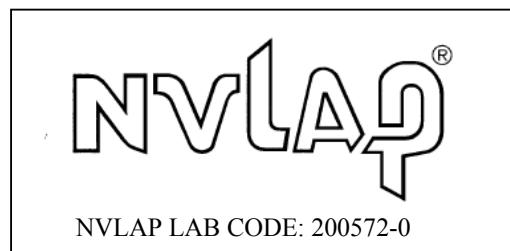
Test Result : Complied

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.
4. The test results in this report are traceable to the national or international standards.

Date of test: August 22, 2006

Tested by: 
Takumi Shimada
EMC Services

Approved by : 
Naoki Sakamoto
Group Leader of EMC Services



This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://ulapex.jp/emc/nvlap.htm>

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SECTION 1: Client information

Company Name : Mitsubishi Electric Corporation Himeji Works
 Address : 840 Chiyoda-machi Himeji Hyogo, 670-8677 Japan
 Telephone Number : +81-79-298-9143
 Facsimile Number : +81-79-298-8879
 Contact Person : Toshiaki Hata

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

2.1 Identification of E.U.T.

Type of Equipment : KIPASS SYSTEM
 Model No. : SKEB7A-01 (Smart Unit)
 Serial No. : 1 (Smart Unit)
 Country of Manufacture : Japan
 Receipt Date of Sample : August 11, 2006
 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

Mitsubishi Electric Corporation Himeji Works Model No: SKEB7A-01 is the KIPASS SYSTEM.
 The system is mainly used as a Smart Keyless Entry System for Motorcycles.
 The clock frequency of EUT is 5 MHz, 10 MHz and 20MHz

[Smart Unit : SKEB7A-01]

LF Part

Equipment Type : Transmitter
 Frequency band : 132.45kHz
 Type of modulation : Pulse Position Mod.
 Bandwidth : -
 Frequency of operation : 132.45kHz
 Other clock frequency : 10MHz, 32.768kHz
 Antenna Type : Coil Antenna
 Method of Frequency Generation : Synthesizer
 Operating voltage (inner) : DC +5.0V

UHF Part

Type of Receiver : Receiver
 Frequency of operation : 315MHz
 Other clock frequency : 10.178125MHz
 Intermediate frequency : 10.7MHz
 Antenna Type : Bar Antenna
 Method of Frequency Generation : Crystal
 Operating voltage (inner) : DC +5.0V

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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 15.205 Restricted bands of operation: 2006
Section 15.209 Radiated emission limits, general requirements: 2006

FCC 15.31 (e)

This test was performed with the New Battery (DC 12V) and the constant voltage was supplied to this EUT during the tests. 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.

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3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin *0)	Results
1	Conducted Emission	<FCC> ANSI C63.4:2003 7. AC powerline conducted emission measurements <IC> RSS-Gen 7.2.2	<FCC> Section 15.207 <IC> RSS-Gen 7.2.2	-	N/A *1)	N/A	N/A
2	Electric Field Strength of Fundamental Emission	<FCC> ANSI C63.4:2003 13. Measurement of intentional radiators <IC> RSS-Gen 4.6, 4.9	<FCC> Section 15.209 <IC> RSS-210 2.6, 2.7	Radiated	N/A	29.7dB 132.45kHz 0 deg. PEAK (Ant-Max)	Complied
3	Electric Field Strength of Spurious Emission	<FCC> ANSI C63.4:2003 13. Measurement of intentional radiators <IC> RSS-Gen 4.7, 4.9	<FCC> Section 15.205, 15.209 <IC> RSS-210 2.6, 2.7	Radiated	N/A	19.2dB 1.3245MHz 0 deg. QP *2)	Complied
4	-26dB Bandwidth	<FCC> ANSI C63.4:2003 13. Measurement of intentional radiators <IC> -	<FCC> Reference data <IC> -	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) The test is not applicable since the EUT does not have AC Mains.

*2) As for the test of Receiver part, please refer to Test report No. 26LE0004-HO-C.

*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-Gen 4.4.1	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 $\pm 4.41\text{dB}(3\text{m})/ \pm 4.39\text{dB}(10\text{m})$.
 The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is $\pm 4.59\text{dB}(3\text{m})/ \pm 4.58\text{dB}(10\text{m})$.
 The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is $\pm 4.62\text{dB}(3\text{m})/ \pm 4.60\text{dB}(10\text{m})$.
 The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is $\pm 5.27\text{dB}$.
 The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is $\pm 3.0\text{dB}$.

3.5 Test Location

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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	655103	IC4247A-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	IC4247A-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	IC4247A-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	-
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	N/A	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	2.0 x 2.0 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 5.4 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 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, No.2, No.3 and No.4 semi-anechoic chambers and No.7 shielded room.

3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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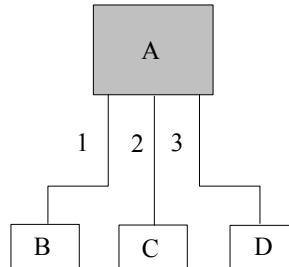
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SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The mode is used : 1) Continuous Transmitting mode (132.45kHz)
 Justification : The system was configured in typical fashion (as a customer would normally use it) for testing.

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	Smart Unit	SKEB7A-01	1	Mitsubishi Electric Corporation Himeji Works	EUT
B	Battery	STRIKER II	A030402	YUASA	-
C	REQ Switch	-	-	-	-
D	Answer Back Lamp	-	-	-	-

List of cables used

No.	Name	Length (m)	Shield
1	DC Cable	0.9	Unshielded
2	SW Cable	0.9	Unshielded
3	LAMP Cable	0.9	Unshielded

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SECTION 5: Radiated emission (Fundamental and Spurious Emission and -26dB Bandwidth)

Test Procedure

The Radiated Electric Field Strength intensity has been measured on No 1 and 2 semi anechoic chamber with a ground plane and at a distance of 3m and 10m.

Frequency : From 9kHz to 30MHz at distance 10m

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 (below 1GHz).

	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: August 22, 2006 Test engineer: Takumi Shimada

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