



Underwriters
Laboratories UL Japan, Inc.

Test report No. : 28AE0239-HO-A-R1
Page : 1 of 18
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FCC ID : CWTWB1U751

RADIO TEST REPORT

Test Report No. : 28AE0239-HO-A-R1

Applicant : Alps Electric Co., Ltd.
Type of Equipment : Remote Keyless Entry
Model No. : TWB1U751
Test standard : FCC Part 15 Subpart C Section 15.231:2007
FCC ID : CWTWB1U751
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 above regulation.
4. The test results in this report are traceable to the national or international standards.
5. Original test report number of this report is 28AE0239-HO-A.

Date of test : August 30, 2007

Tested by : T. Shimada
Takumi Shimada
EMC Services

Approved by : M. Fujimura
Mitsuru Fujimura
EMC Services

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SECTION 1: Client information

Company Name : Alps Electric Co., Ltd.
Address : 6-3-36 Nakazato, Furukawa, Osaki-city, Miyagi-pref., 989-6181 Japan
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Contact Person : Yoshiaki Hayashi

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

2.1 Identification of E.U.T.

Type of Equipment : Remote Keyless Entry
Model No. : TWB1U751
Serial No. : 11, 13
Country of Manufacture : Japan
Receipt Date of Sample : August 30, 2007
Condition of EUT : Engineering 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: TWB1U751 is the Remote Keyless Entry.

Equipment Type : Transmitter
Frequency of Operation : 315MHz
Other Clock Frequency : 4MHz (CPU)
Type of Modulation : ASK
Antenna Type : Internal/PCB pattern (Loop)

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C : 2007
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)

This 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.

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3.2 Procedures and results

No.	Item	Test Procedure	Specification	Deviation	Worst margin	Results
1	Automatically Deactivate	<FCC> ANSI C63.4:2003 13. Measurement of intentional radiators <IC> -	<FCC> Section 15.231(a)(1) <IC> RSS-210 A1.1.1	N/A	-	Complied
2	Electric Field Strength of Fundamental Emission	<FCC> ANSI C63.4:2003 13. Measurement of intentional radiators <IC> RSS-Gen 4.8	<FCC> Section 15.231(b) <IC> RSS-210 A1.1.2	N/A	8.6dB 315.02MHz Horizontal	Complied
3	Electric Field Strength of Spurious Emission	<FCC> ANSI C63.4:2003 13. Measurement of intentional radiators <IC> RSS-Gen 4.9	<FCC> Section 15.205 Section 15.209 Section 15.231(b) <IC> RSS-210 A1.1.2, 2.6, 2.7	N/A	6.4dB 3150.25MHz Horizontal	Complied
4	-20dB Bandwidth	<FCC> ANSI C63.4:2003 13. Measurement of intentional radiators <IC> -	<FCC> Section 15.231(c) <IC> Reference data	N/A	-	Complied
5	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

Note: UL Japan, Inc.'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 4.6.1	<IC> RSS-210 A1.1.3	Radiated	N/A	-	N/A

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3.4 Uncertainty

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

Radiated Emission Test

The measurement uncertainty for this test using Biconical antenna is ± 4.59 dB.

The measurement uncertainty for this test using Logperiodic antenna is ± 4.62 dB.

The measurement uncertainty for this test using Horn Antenna is ± 5.27 dB.

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

3.5 Test Location

UL Japan, Inc. 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	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	IC4247-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	IC4247-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
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	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 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.3 and No.4 shielded rooms.

3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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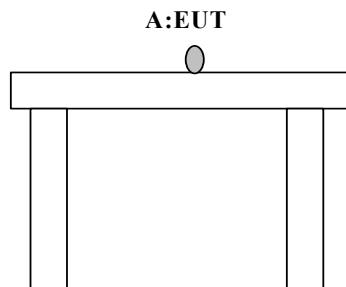
SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The mode is used : 1) Normal use mode (for Automatically deactivate test only)
 2) Transmitting mode (for the other tests)

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

4.2 Configuration and peripherals



* Test data was taken under worse case conditions.

Description of EUT

No	Item	Model number	Serial number	Manufacturer	Remark
A	Remote Keyless Entry	TWB1U751	13 *1), 11 *2)	Alps Electric Co., Ltd.	EUT

*1) Used for automatically deactivate test

*2) Used for the other tests

SECTION 5: Radiated emission (Fundamental and Spurious Emission)

5.1 Operating environment

Test place : No.4 semi anechoic chamber
 Temperature : See data
 Humidity : See data

5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0m by 0.5m, raised 0.8m 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 : Top of Polyurethane table
 EUT operation mode : Transmitting

5.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on No.4 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.

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

Pulse emissions		Other emissions		
	Below or equal to 1GHz	Above 1GHz (FCC15.205)/(FCC15.231)	Below or equal to 1GHz	Above 1GHz (FCC15.205)/(FCC15.209)
Detector Type	Peak with Duty factor	Peak and Peak with Duty factor	QP	Peak and Average
IF Bandwidth	T/R: BW 120kHz	PK: S/A: RBW 1MHz, VBW 1MHz	T/R: BW 120kHz	PK: S/A: RBW 1MHz, VBW 1MHz AV: S/A: RBW 1MHz, VBW 10Hz

- 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 was measured.

5.5 Results

Summary of the test results: Pass

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