EMISSION TEST REPORT

Test Report No. : 19C0029-02
TOHOKU ALPS CO., LTD.
Model:880*******
FCC Part 15 Subpart B
IC RSS-210 (Issue No. 2)

1. This test report shall not be reproduced except in full, without the written approval of A-Pex International Co., Ltd.

2. This test report does not constitute an endorsement by NIST/NVLAP or U.S. Government.

3. This equipment is in compliance with above regulation. We hereby certify that the data are contain a true representation of the emission profile.

4. The results in this report apply only to the sample tested.

5. This test report clearly shows that Keyless Entry Unit(Receiver), 880******* (88035FE020) is in compliance with FCC Part 15 Subpart B Class B and IC RSS-210 (Issue No. 2), specification.

6. IC RSS-210 (Issue No. 2) is based upon FCC Part 15.

Date of test: March 23, 2000 **Issued date:** March 27, 2000

Tested by: _____ **Approved by:** _____

Naoki Sakamoto
Engineer, EMC Dept.

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Group Leader of EMC section

Form Version No. 1

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1 GENERAL INFORMATION

APPLICANT	: TOHOKU ALPS CO., LTD.
ADDRESS	: 6-3-36, Nakazato, Furukawa-city, Miyagi-ken, 989-6181 Japan Tel: +81-229-23-5111 Fax: +81-229-22-3755
REGULATION(S)	: FCC Part 15 Subpart B
MODEL NUMBER	: 880******* (88035FE020)
SERIAL NUMBER	: -
KIND OF EQUIPMENT	: Keyless Entry Unit (Receiver)
TESTED DATE	: March 23, 2000
RECEIPT DATE OF SAMPLE	: March 22, 2000
REPORT FILE NUMBER	: 19C0029-02
TEST SITE	: A-PEX Yokowa NO.2 Open Test Site

1.1 Product Description

Model: 880******* (referred to as the EUT in this report) is a Keyless Entry Unit(Receiver). This device has some series models to enter the characters as like the numerals or the alphabet in [*******].
Model No.: 88035FE020 was measured in behalf of all series models since these models have the same electric characteristics.

The operation frequency is as following :
Main Clock : 4.19MHz
Sub Clock : 32.768kHz
Operation voltage : DC 12V

1.2 Tested System Details

The FCC IDs for all equipment, plus description of all cables used in the tested system are:

Model	FCC ID (CANADA Certification No.)	Description	Cable description	Backshell Material
(1) ALPS ELECTRONICS CO., LTD. M/N: 88035FE020 S/N: - (EUT)	NHVVG1U113	Keyless Entry Unit (Receiver)	Unshielded I/F Cable	P.V.C.
(2) ALPINE M/N: 88035AC230 S/N: H91056558	A269ZUA111 (700101672)	Transmitter	-	-
(3) ALPS ELECTRONICS CO., LTD. M/N: - S/N: -	N/A	Simulator	Unshielded I/F Cable	P.V.C.
(4) YUASA Corporation M/N: - S/N: -	N/A	Battery	Unshielded DC Power Cable	P.V.C.

1.3 Tested Methodology

Both conducted and radiated testing were performed according to the procedures in FCC/ANSI C63.4(1992).
Radiated testing was performed at a distance of 3 meters from the antenna to EUT.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 Japan.
This site has been fully described in a report dated May 27, 1997 submitted to FCC office, and Listed dated Aug. 18, 1997 (31040/SIT 1300F2).

2 SYSTEM TEST CONFIGURATION

2.1 Operation Environment

Radiation

Temperature : 23 Degree

Humidity : 32%

Power supply : DC 12V

2.2 Justification

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

2.3 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

The sequence is used:

Operation: Receiving mode

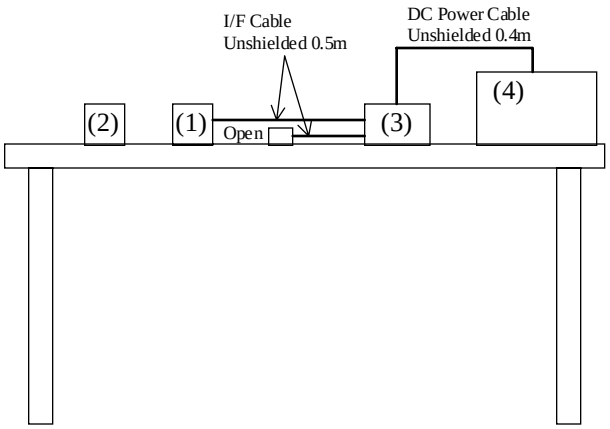
2.4 Test Procedure

2.4.1 Tabletop Equipment Radiated Emissions

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.
The rear of EUT, including peripherals was aligned and flush with rear of tabletop.
I/O cables that were connected to the peripherals were bundled in center.
They were folded back and forth forming a bundle 30cm to 40cm long and were hanged 40cm height to the ground plane.
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.
The measurement distance was 3m.

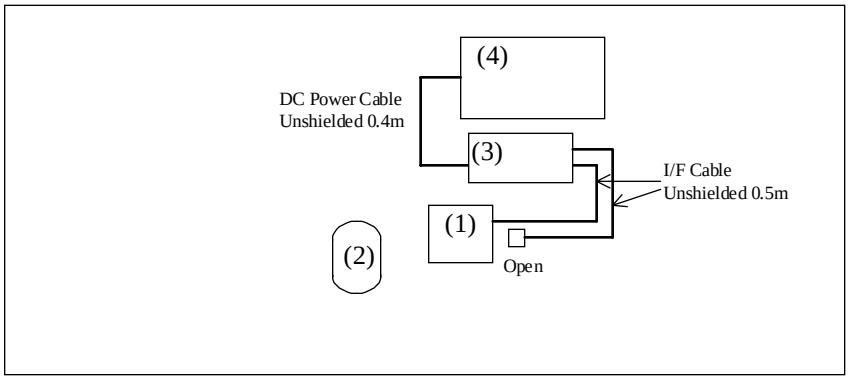
Figure2.1 Configuration of Tested System

Front View



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

Top View



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

3 RADIATED MEASUREMENT PHOTOS

Figure 3.1 Radiated Measurement Photos

3.1 Measurement Uncertainty

Radiated Emission Test

The measurement uncertainty (with a 95% confidence level) for this test was ±3.3dB.

The data listed in this test report has enough margin, more than 3.3dB.

4 RADIATED EMISSION DATA

The initial step in collecting radiated data was a spectrum analyzer peak scan of the measurement range(30MHz-1000MHz).
The final data was reported in the worst-case emissions.
The minimum margin to the limit is as follows :

Frequency (MHz)	Receiver Reading (dBuV)	Correction Factor (dBuV)	Field Strength (dBuV/m)	Limit (dBuV/m)	Margin (dBuV)
32.76	25.8	-4.1	21.7	40.0	18.3

* All readings are quasi-peak mode.

5.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, Cable Factor and Antenna Pad, and subtracting the Amplifier Gain from the measured reading. The sample calculation is as follows :

FS = RA + AF + CF + AT - AG

where FS = Field Strength
RA = Receiver Amplitude
AF = Antenna Factor
CF = Cable Factor
AT = Antenna Pad
AG = Amplifier Gain

Assume a receiver reading of 25.8 dBuV is obtained. The antenna Factor of 17.8 dB, Cable Factor of 1.9 dB and Antenna Pad of 5.9 dB is added. The Amplifier Gain of 29.7 dB is subtracted, giving a field strength of 21.7 dBuV/m.

FS = 25.8 + 17.8 + 1.9 + 5.9 - 29.7 = 21.7MHz

6 TEST EQUIPMENT USED

INSTRUMENTS	Mfr.	MODEL	C/N	Calibrated Until
Pre Amplifier	Anritsu	MH648A	AF3	November 16, 2000
Biconical Antenna	Schwarzbeck	BBA9106	BA5	June 18, 2000
Logperiodic Antenna	Schwarzbeck	UKLP9140-ALA7		April 30, 2000
Spectrum Analyzer	Hewlett Packard	8567A	SA3	May 16, 2000
Test Receiver	Rohde & Schwarz	ESVS-10	TR4	July 13, 2000

indicates EMI Test Equipment used.

*All measurement equipment is traceable to national standard.

APPENDIX

A : Test Data

Radiated emissions : A1 to A2

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