

# **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:** \_\_\_\_\_

Naoki Sakamoto  
Engineer, EMC Dept.

**Approved by:** \_\_\_\_\_

Kazutoyo Nakanishi  
Group Leader of EMC section

Form Version No. 1



This laboratory is registered by the NIST/NVLAP, U.S.A. The tests reported herein have been performed in accordance with its terms of registration.

Testing Laboratory

**A-pex International Co., Ltd.**

Telephone: +81 596 39 1485

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 JAPAN Facsimile: +81 596 39 0232

| <b>Table of Contents</b>                  | <b>Page</b>    |
|-------------------------------------------|----------------|
| <b>1 GENERAL INFORMATION</b>              | <b>3</b>       |
| 1.1 Product Description                   | 4              |
| 1.2 Tested System Details                 | 4              |
| 1.3 Tested Methodology                    | 5              |
| 1.4 Test Facility                         | 5              |
| <b>2 SYSTEM TEST CONFIGURATION</b>        | <b>6</b>       |
| 2.1 Operation Environment                 | 6              |
| 2.2 Justification                         | 6              |
| 2.3 EUT Exercise Software                 | 6              |
| 2.4 Test Procedure                        | 7              |
| Figure 2.1 Configuration of Tested System | 8              |
| <b>3 RADIATED MEASUREMENT PHOTOS</b>      | <b>10</b>      |
| Figure 3.1 Radiated Measurement Photos    | 10             |
| 3.1 Measurement Uncertainty               | 11             |
| <b>4 RADIATED EMISSION DATA</b>           | <b>12</b>      |
| 4.1 Field Strength Calculation            | 13             |
| <b>5 TEST EQUIPMENT USED</b>              | <b>14</b>      |
| <b>APPENDIX</b>                           | <b>15</b>      |
| A:Test Data                               | <b>A1 - A2</b> |

## 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

**Test report****FCC ID** : NHVVG1U113**Our reference** : 19C0029-02**Page** : 4 of 15**Issued date** : 2000-03-27

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

Testing Laboratory

**A-pex International Co., Ltd.**

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 JAPAN

Telephone: +81 596 39 1485

Facsimile: +81 596 39 0232

### 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).

Testing Laboratory

**A-pex International Co., Ltd.**

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 JAPAN

Telephone: +81 596 39 1485

Facsimile: +81 596 39 0232

## 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

**Test report**

**FCC ID** : NHVVG1U113

**Our reference** : 19C0029-02

**Page** : 7 of 15

**Issued date** : 2000-03-27

## **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.

Testing Laboratory

**A-pex International Co., Ltd.**

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 JAPAN

Telephone: +81 596 39 1485

Facsimile: +81 596 39 0232

**Test report**

**FCC ID** : NHVVG1U113

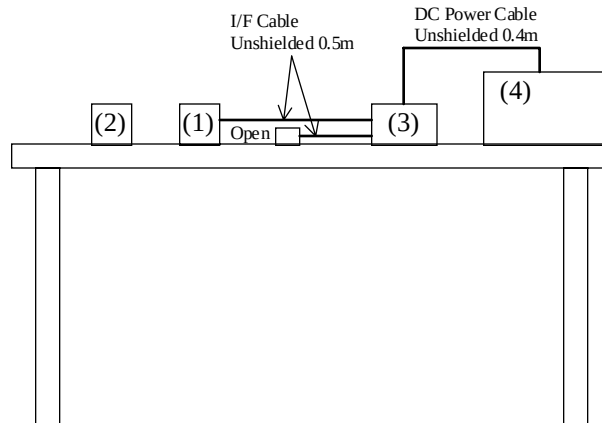
**Our reference** : 19C0029-02

**Page** : 8 of 15

**Issued date** : 2000-03-27

**Figure2.1 Configuration of Tested System**

Front View



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

Testing Laboratory

**A-pex International Co., Ltd.**

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 JAPAN

Telephone: +81 596 39 1485

Facsimile: +81 596 39 0232

**Test report**

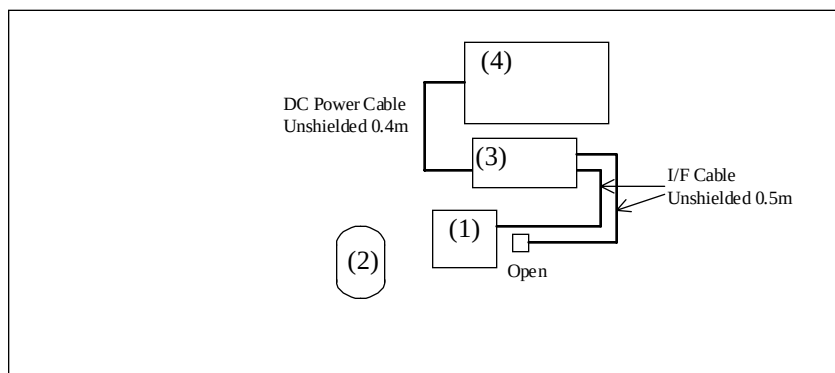
**FCC ID** : NHVVG1U113

**Our reference** : 19C0029-02

**Page** : 9 of 15

**Issued date** : 2000-03-27

Top View



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

Testing Laboratory

**A-pex International Co., Ltd.**

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 JAPAN

Telephone: +81 596 39 1485

Facsimile: +81 596 39 0232

**Test report**

**FCC ID** : NHVVG1U113

**Our reference** : 19C0029-02

**Page** : 10 of 15

**Issued date** : 2000-03-27

### **3 RADIATED MEASUREMENT PHOTOS**

#### **Figure 3.1 Radiated Measurement Photos**

Testing Laboratory

**A-pex International Co., Ltd.**

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 JAPAN

Telephone: +81 596 39 1485

Facsimile: +81 596 39 0232

### 3.1 Measurement Uncertainty

#### Radiated Emission Test

The measurement uncertainty (with a 95% confidence level) for this test was  $\pm 3.3\text{dB}$ .

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

**Test report****FCC ID** : NHVVG1U113**Our reference** : 19C0029-02**Page** : 12 of 15**Issued date** : 2000-03-27

## 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<br>(MHz) | Receiver<br>Reading<br>(dBuV) | Correction<br>Factor<br>(dBuV) | Field<br>Strength<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dBuV) |
|--------------------|-------------------------------|--------------------------------|-------------------------------|-------------------|------------------|
| 32.76              | 25.8                          | -4.1                           | 21.7                          | 40.0              | 18.3             |

\* All readings are quasi-peak mode.

Testing Laboratory

**A-pex International Co., Ltd.**

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 JAPAN

Telephone: +81 596 39 1485

Facsimile: +81 596 39 0232

**Test report****FCC ID** : NHVVG1U113**Our reference** : 19C0029-02**Page** : 13 of 15**Issued date** : 2000-03-27

## 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.

$$FS = 25.8 + 17.8 + 1.9 + 5.9 - 29.7 = 21.7 \text{ MHz}$$

Testing Laboratory

**A-pex International Co., Ltd.**

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 JAPAN

Telephone: +81 596 39 1485

Facsimile: +81 596 39 0232

## 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.

Testing Laboratory

**A-pex International Co., Ltd.**

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 JAPAN

Telephone: +81 596 39 1485

Facsimile: +81 596 39 0232

**Test report**

**FCC ID** : NHVVG1U113

**Our reference** : 19C0029-02

**Page** : 15 of 15

**Issued date** : 2000-03-27

## **APPENDIX**

### **A : Test Data**

Radiated emissions : A1 to A2

Testing Laboratory

**A-pex International Co., Ltd.**

108 Yokowa-cho, Ise-shi, Mie-ken 516-1106 JAPAN

Telephone: +81 596 39 1485

Facsimile: +81 596 39 0232