



# **RADIO TEST REPORT**

**Test Report No.: 26JE0237-HO-A**

**Applicant** : **BRIDGESTONE Co., Ltd.**  
**Type of Equipment** : **HAND READER**  
**Model No.** : **H211**  
**Test standard** : **FCC Part 15 Subpart B Class B: 2006**  
**FCC Part 15 Subpart C: 2006**  
**FCC ID** : **SBDH211**  
**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:**

July 11, 2006

**Tested by:**

Yasuyuki Fukui  
EMC Services

**Approved by :**

Naoki Sakamoto  
Group Leader of  
EMC Services



NVLAP LAB CODE: 200572-0

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>

**UL Apex Co., Ltd.**

**Head Office EMC Lab.**

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

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## **SECTION 1: Client information**

Company Name : BRIDGESTONE Co., Ltd.  
Address : 3-1-1, Ogawahigashi-Cho, Kodaira-Shi, Tokyo, 187-8531 Japan  
Telephone Number : +81-42-342-6326  
Facsimile Number : +81-42-342-6596  
Contact Person : Toshihiro Miyazaki

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

### **2.1 Identification of E.U.T.**

Type of Equipment : HAND READER  
Model No. : H211  
Sample No. : 000013  
Country of Manufacture : Japan  
Rating : DC4.8V, 0.25A  
Receipt Date of Sample : July 10, 2006  
Condition of EUT : Production model  
Modification of EUT : No modification by the test lab.

### **2.2 Product Description**

Model No: H211 (referred to as the EUT in this report) is the HAND READER

Clock frequency : CPU Clock: 10MHz  
CPU Sub Clock: 32.768kHz  
Transmission Frequency Dividing Clock: 8MHz  
Receiving Local Clock: 40.7125MHz  
Equipment type : Transceiver

#### **[Transmitter part]**

Frequency of Operation : 125kHz  
Type of Modulation : ASK  
Mode of Operation : Simplex  
Method of Frequency Generation : Crystal  
Antenna : Ferrite Bar Antenna

#### **[Receiver part]**

Receiving frequency : 315MHz  
Intermediate frequency : 10.7MHz  
Antenna : Loop Antenna

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### **SECTION 3: Test specification, procedures & results**

#### **3.1 Test Specification**

Test Specification : FCC Part15 Subpart B: 2006  
FCC Part15 Subpart C: 2006

Title : FCC 47CFR Part15 Radio Frequency Device  
Subpart B Unintentional Radiators

FCC 47CFR Part15 Radio Frequency Device  
Subpart C Intentional Radiators  
Section 15.205 Restricted bands of operation  
Section 15.209 Radiated emission limits, general requirements

#### **FCC 15.31 (e)**

The test was performed with the New Battery (DC 4.8V) and the constant voltage was supplied to the EUT during the test. Therefore, the EUT complies with the requirement of Section 15.31 (e).

#### **FCC 15.111(b)**

The receiving antenna is mounted inside of the EUT and it is not removable. Therefore, the EUT complies with the requirement of Section 15.111(b).

#### **FCC Part 15.203**

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the EUT complies with the antenna requirement of Section 15.203.

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### 3.2 Procedures and results

#### [FCC Part 15 Subpart B]

| Item               | Test Procedure  | Limits  | Deviation | Worst margin *0)              | Result   |
|--------------------|---|---------|-----------|-------------------------------|----------|
| Conducted emission | ANSI C63.4: 2003<br>7. AC powerline<br>conducted emission<br>measurements | Class B | N/A *1)   | N/A                           | N/A      |
| Radiated emission  | ANSI C63.4: 2003<br>8. Radiated<br>emission measurements                  | Class B | N/A       | 18.7dB<br>49.148MHz, Vertical | Complied |

\*Note: UL Apex's EMI Work Procedure QPM05.

\*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 is not the device that is designed to be connected to the public utility (AC) power line.

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

#### [FCC Part 15 Subpart C]

| No. | Item  | Test Procedure   | Specification  | Remarks  | Deviation | Worst margin *0)                 | Results  |
|-----|---|--|--|----------|-----------|----------------------------------|----------|
| 1   | Conducted Emission                                    | <FCC><br>ANSI C63.4:2003<br>7. AC powerline<br>conducted emission<br>measurements<br><IC><br>RSS-Gen 7.2.2 | <FCC><br>Section 15.207<br><IC><br>RSS-Gen 7.2.2               | -        | N/A *1)   | N/A                              | N/A      |
| 2   | Electric Field Strength<br>of Fundamental<br>Emission | <FCC><br>ANSI C63.4:2003<br>13. Measurement of<br>intentional radiators<br><IC><br>RSS-Gen 4.6, 4.9        | <FCC><br>Section 15.209<br><IC><br>RSS-210 2.6, 2.7            | Radiated | N/A       | 37.0dB<br>0 deg. AV<br>(Ant-Max) | Complied |
| 3   | Electric Field Strength<br>of Spurious Emission       | <FCC><br>ANSI C63.4:2003<br>13. Measurement of<br>intentional radiators<br><IC><br>RSS-Gen 4.7, 4.9        | <FCC><br>Section 15.205,<br>15.209<br><IC><br>RSS-210 2.6, 2.7 | Radiated | N/A       | 15.4dB<br>49.146MHz,<br>Vertical | Complied |
| 4   | -26dB Bandwidth                                       | <FCC><br>ANSI C63.4:2003<br>13. Measurement of<br>intentional radiators<br><IC><br>-                       | <FCC><br>Reference data<br><IC><br>-                           | 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.

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

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**Head Office EMC Lab.**

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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### 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     |

### 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 test report has enough margin, more than the site margin.

#### 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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4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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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.

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### 3.6 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

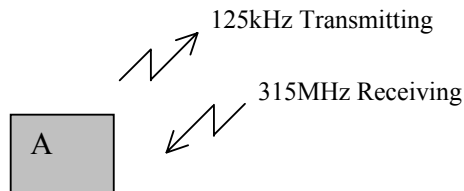
## **SECTION 4: Operation of E.U.T. during testing**

### **4.1 Operating Modes**

The mode is used :  
1. 315MHz Receiving mode (FCC Part 15 Subpart B)  
2. 125kHz Transmitting mode (FCC Part 15 Subpart C)

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

### **4.2 Configuration and peripherals**



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

#### **Description of EUT**

| No. | Item        | Model number | Serial number | Manufacturer     | Remarks |
|-----|-------------|--------------|---------------|------------------|---------|
| A   | HAND READER | H211         | 000013        | YOKOWO CO., Ltd. | EUT     |

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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 3 semi anechoic chamber with a ground plane and at a distance of 3m.

Frequency : From 9kHz to 30MHz at distance 3m

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) and the spectrum analyzer (above 1GHz).

|               | From 9kHz to 90kHz<br>and<br>From 110kHz to<br>150kHz | From<br>90kHz to<br>110kHz | From<br>150kHz<br>to 490kHz | From<br>490kHz to<br>30MHz | From<br>30MHz to<br>1GHz | From<br>1GHz to<br>2GHz |
|---------------|---|----------------------------|-----------------------------|----------------------------|--------------------------|-------------------------|
| Detector Type | PK/AV   | QP                         | PK/AV                       | QP                         | QP                       | PK/AV                   |
| IF Bandwidth  | 200Hz   | 200Hz                      | 9kHz                        | 9kHz                       | 120kHz                   | 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.

\* 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 3**

**Test result : Pass**

Date: July 11, 2006

Test engineer: Yasuyuki Fukui

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