



# RADIO TEST REPORT

Test Report No.: 29LE0210-YK-A

Applicant : Sony EMCS Corporation Kisarazu TEC  
Type of Equipment : Wireless Audio Receiver  
Model No. : DRC-BT30  
FCC ID : AK8DRCBT30  
Test regulation : FCC Part15 Subpart C: 2009  
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 the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.

Date of test: July 30 and August 3, 7, 17, 2009

Tested by:

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## 1 Applicant information

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Contact Person : Kikuo Murata

## 2 Equipment under test (E.U.T.)

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

Type of Equipment : Wireless Audio Receiver  
Model No. : DRC-BT30  
Serial No. : Refer to 4.2 in this report.  
Rating : DC3.7V  
Country of Mass-production : Thailand  
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.  
Receipt Date of Sample : July 30, 2009

### 2.2 Product description

Model: DRC-BT30 (referred to as the EUT in this report) is a Wireless Audio Receiver.

Clock frequency : DD converter: 1.333MHz,  
Module controller clock: 24MHz

Equipment type : Transceiver  
Frequency of operation : 2402-2480MHz  
Bandwidth & channel spacing : 79MHz & 1MHz  
Type of modulation : FHSS  
Antenna type : Chip helical antenna  
Antenna gain with cable loss : +2.0dBi  
Antenna connector type : Integral  
ITU code : F1D, G1D  
Operation temperature range : 0 to +45 deg.C.

#### FCC Part15.31 (e)

The Bluetooth transmitter is provided with stable power supply (DC 1.5 V), therefore, the equipment complies power supply regulation.

#### FCC Part15.203 Antenna requirement

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

#### FCC Part15.207 Conducted emission

The EUT is not supplied via AUX and other port is used for charging. During charging, the EUT doesn't perform BT operation. Although the AUX was insulated from the power supply, leakage of disturbance power was checked and it was not detected. Therefore, the EUT is not applicable to the test since it is considered as DC supplied equipment.

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### 3 Test specification, procedures and results

#### 3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2009, final revised on February 27, 2009  
 Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
 Section 15.207 Conducted limits  
 Section 15.209 Radiated emission limits, general requirements  
 Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,  
 and 5725-5850MHz

The EUT complies with FCC Part 15 Subpart B: 2009, final revised on February 27, 2009. Refer to the test report 29LE0210-YK-C.

#### 3.2 Procedures & Results

| Item  | Test Procedure   | Specification                             | Remarks                | Deviation  | Worst Margin | Results   |
|---|--|---|------------------------|------------|--------------|---|
| Conducted emission  | ANSI C63.4:2003<br>7. AC powerline<br>conducted emission<br>measurements                           | FCC Section<br>15.207                     | -                      | N/A<br>*1) | N/A          | N/A   |
| Carrier frequency separation  | FCC Public Notice DA<br>00-705 &<br>ANSI C63.4:2003<br>13. Measurement of<br>intentional radiators | FCC Section15.247<br>(a)(1)               | Conducted              | N/A        | *See data.   | Complied  |
| 20dB bandwidth  | FCC Public Notice DA<br>00-705 &<br>ANSI C63.4:2003<br>13. Measurement of<br>intentional radiators | FCC Section15.247<br>(a)(1)               | Conducted              | N/A        |              | Complied  |
| Number of hopping frequency   | FCC Public Notice DA<br>00-705 &<br>ANSI C63.4:2003<br>13. Measurement of<br>intentional radiators | FCC Section15.247<br>(a)(1)(iii)          | Conducted              | N/A        |              | Complied  |
| Dwell time  | FCC Public Notice DA<br>00-705 &<br>ANSI C63.4:2003<br>13. Measurement of<br>intentional radiators | FCC Section15.247<br>(a)(1)(iii)          | Conducted              | N/A        |              | Complied  |
| Maximum peak output power   | FCC Public Notice DA<br>00-705 &<br>ANSI C63.4:2003<br>13. Measurement of<br>intentional radiators | FCC Section15.247<br>(b)(1)               | Conducted              | N/A        |              | Complied  |
| Band edge compliance & Spurious emission  | FCC Public Notice<br>DA 00-705 &<br>ANSI C63.4:2003<br>13. Measurement of<br>intentional radiators | FCC<br>Section15.247 (d)<br>Section15.209 | Conducted/<br>Radiated | N/A        |              | 5.7dB (9920.00MHz,<br>Vertical,<br>Tx 2480MHz, DH5) |
| Note: UL Japan's EMI Work Procedures No.QPM05 and QPM15.<br>*1) The test is not applicable since the EUT has no AC mains. |  |   |                        |            |              |   |

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### 3.3 Addition to standard

| Item                     | Test Procedure   | Specification | Remarks   | Worst Margin | Results  |
|--------------------------|--|---------------|-----------|--------------|----------|
| Occupied bandwidth (99%) | ANSI C63.4:2003<br>13. Measurement of intentional radiators<br>RSS-Gen 4.6.1 | RSS-Gen 4.6.1 | Conducted | -            | Complied |

\* Other than above, no addition, exclusion nor deviation has been made from the standard.

### 3.4 Uncertainty

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

|                               | No.1 open site (±) | No.2 open site (±) | No.1 anechoic chamber (±) |
|-------------------------------|--------------------|--------------------|---------------------------|
| <b>Radiated emission (3m)</b> |                    |                    |                           |
| <30MHz                        | 2.4 dB             | 2.4 dB             | 2.7 dB                    |
| 30-300MHz                     | 4.3 dB             | 4.3 dB             | 4.6 dB                    |
| 300-1000MHz                   | 4.3 dB             | 4.3 dB             | 4.5 dB                    |
| 1GHz<                         | 5.7 dB             | 5.8 dB             | 5.7 dB                    |

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

| Antenna port conducted test | (±)   |
|-----------------------------|-------|
| Below 1GHz                  | 0.4dB |
| 1GHz and above              | 0.7dB |

### 3.5 Test location

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JAB Accreditation No. : RTL02610

No. 1 test site has been fully described in a report submitted to FCC office, and accepted on July 23, 2008 (Registration No.: 95486).

IC Registration No. : 2973B-1

No. 2 test site has been fully described in a report submitted to FCC office, and accepted on February 27, 2008 (Registration No.: 466226).

IC Registration No. : 2973B-3

No. 1 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on October 22, 2008 (Registration No.: 95967).

IC Registration No. : 2973B-2

| Test room          | Width x Depth x Height (m) | Test room                     | Width x Depth x Height (m) |
|--------------------|----------------------------|-------------------------------|----------------------------|
| No.1 shielded room | 8.0 x 5.0 x 2.5            | No.1<br>Semi-anechoic chamber | 10.0 x 7.5 x 5.7           |
| No.2 shielded room | 5.0 x 4.0 x 2.5            |                               |                            |
| No.3 shielded room | 4.0 x 5.0 x 2.7            |                               |                            |

| Open test site      | Maximum measurement distance |
|---------------------|------------------------------|
| No.1 open test site | 30m                          |
| No.2 open test site | 10m                          |

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## 4 System test configuration

### 4.1 Justification

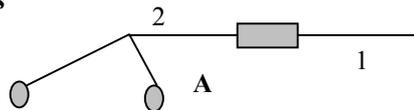
The system was configured in typical fashion (as a customer would normally use it) for testing.

| Test item  | Operating mode  | Tested frequency                                |
|--|---|---|
| Carrier frequency separation                         | Transmitting Hopping ON (DH5/3DH5)/Inquiry, Payload: PRBS9                            | -   |
| 20dB bandwidth                                       | Transmitting Hopping OFF (DH5/3DH5)/Inquiry, Payload: PRBS9                           | 2402MHz, 2441MHz, 2480MHz                       |
| Number of hopping frequency                          | Transmitting Hopping ON (DH5/3DH5)/Inquiry, Payload: PRBS9                            | -   |
| Dwell time   | Transmitting (Hopping ON)<br>-DH1, -DH3, -DH5<br>-3DH1, -3DH3, -3DH5<br>-Inquiry      | -   |
| Maximum peak output power                            | Transmitting Hopping OFF (DH5/3DH5)/Inquiry, Payload: PRBS9<br>-DH5<br>-2DH5<br>-3DH5 | 2402MHz, 2441MHz, 2480MHz                       |
| Band edge compliance & Spurious emission (Conducted) | Transmitting (DH5/3DH5), Payload: PRBS9<br>-Hopping ON/Inquiry<br>-Hopping OFF        | Band edge compliance:<br>2402MHz, 2480MHz       |
| (Radiated)   | Transmitting (DH5/3DH5), Payload: PRBS9   | Spurious emission:<br>2402MHz, 2441MHz, 2480MHz |
| 99% occupied bandwidth                               | Transmitting (DH5/3DH5), Payload: PRBS9<br>-Hopping ON<br>-Hopping OFF                | 2402MHz, 2441MHz, 2480MHz                       |

\*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload (except Dwell time test)

\*Remarks: Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT. However, the limit level 125mW of AFH mode was used for the test.

### 4.2 Configuration and peripherals



\* Test data was taken under worse case conditions.

### Description of EUT and support equipment

| No. | Item                    | Model number | Serial number | Manufacturer | Remarks |
|-----|-------------------------|--------------|---------------|--------------|---------|
| A   | Wireless Audio Receiver | DRC-BT30     | *1)           | SONY         | -       |

\*1) Radiated emission test: 0000120, Antenna port conducted test: 11 (Inquiry mode), 12 (other mode)

### List of cables used

| No. | Name            | Length (m) | Shield     |            | Remark |
|-----|-----------------|------------|------------|------------|--------|
|     |                 |            | Cable      | Connector  |        |
| 1   | USB cable       | 1.0        | Shielded   | Shielded   | -      |
| 2   | Headphone cable | 1.6        | Unshielded | Unshielded | -      |

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## 5 Carrier frequency separation

### Test procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

## 6 20dB bandwidth & Occupied bandwidth (99%)

### Test procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.  
The channel separation in Hopping mode and Inquiry mode was separated by 25kHz and 2/3 of the 20dB bandwidth.

Summary of the test results: Pass

## 7 Number of hopping frequency

### Test procedure

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

## 8 Dwell time

### Test procedure

The Dwell time was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

## 9 Maximum peak output power

### Test procedure

The Maximum Peak Output Power was measured with a power meter connected to the antenna port.

Summary of the test results: Pass

## 10 Out of band emissions (Antenna port conducted)

### Test procedure

The Out of Band Emissions was measured with a spectrum analyzer connected to the antenna port.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a conducted measurement.

Summary of the test results: Pass

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## 11 Out of band emissions (Radiated)

### 11.1 Operating environment

The test was carried out in No.1 anechoic chamber.

### 11.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.8m by 0.9m, raised 80cm above the conducting ground plane to prevent the reflection influence. The configuration was set in accordance with ANSI C63.4: 2003. Photographs of the set up are shown in Appendix 1.

### 11.3 Test conditions

Frequency range : 30MHz - 26GHz  
 Test distance : 3m

### 11.4 Test procedure

The Radiated Electric Field Strength intensity has been measured 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.

Measurements were performed with QP, PK, and AV detector.

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

| Frequency             | Below 1GHz   | Above 1GHz   |
|-----------------------|--|--|
| Instrument used       | Test Receiver                                      | Spectrum Analyzer  |
| Detector IF Bandwidth | QP: BW 120kHz                                      | PK: RBW: 1MHz/VBW: 1MHz,<br>AV*1): RBW: 1MHz/VBW: See data |
| Measuring antenna     | Biconical (30-300MHz)<br>Logperiodic (300MHz-1GHz) | Horn   |

\*1) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

|            | Below 1GHz | Above 1GHz |
|------------|------------|------------|
| Horizontal | Y          | X          |
| Vertical   | Y          | Y          |

### 11.5 Band edge

Band edge level at 2390MHz and 2483.5MHz is below the limits of FCC 15.209 and band edge level at 2400MHz is below the 20dBc. Refer to the data.

### 11.6 Results

Summary of the test results : Pass \*No noise was detected above the 5<sup>th</sup> order harmonics.

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### **APPENDIX 1: Photographs of test setup**

|              |   |                                 |
|--------------|---|---------------------------------|
| Page 10 - 11 | : | Radiated emission               |
| Page 12      | : | Pre-check of the worst position |

### **APPENDIX 2: Test data**

|              |   |  |
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| Page 14 - 16 | : | 20dB bandwidth                                 |
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| Page 55 - 72 | : | Out of band emissions (Radiated)               |
| Page 73      | : | Duty cycle                                     |
| Page 74 - 76 | : | Occupied bandwidth                             |

### **APPENDIX 3: Test instruments**

|         |   |                  |
|---------|---|------------------|
| Page 77 | : | Test instruments |
|---------|---|------------------|

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