RADIO TEST REPORT

Test Report No.: 29KE0232-YK-01-A

Applicant	**:**	**Sony EMCS Corporation Kisarazu TEC**
Type of Equipment	**:**	**Bluetooth Audio System**
Model No.	**:**	**MEX-BT2800**
FCC ID	**:**	**AK8MEXBT2800**
Test regulation	**:**	**FCC Part15 Subpart C: 2009**
Test result	**:**	**Complied**

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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: August 28 and September 2, 2009

Tested by: Akira Sato & Hikaru Shirasawa

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1 Applicant information

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

2.1 Identification of E.U.T.

Type of Equipment	:	Bluetooth Audio System
Model No.	:	MEX-BT2800
Serial No.	:	EV09106
Rating	:	DC12V
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	:	August 17, 2009

2.2 Product description

Model: MEX-BT2800 (referred to as the EUT in this report) is a Bluetooth Audio System.
Clock frequencies: 32.768kHz, 4MHz, 11.06MHz, 12MHz, 16.9344MHz

Bluetooth specification:

Equipment type	:	Transceiver
Frequency of operation	:	2402-2480MHz
Bandwidth & channel spacing	:	79MHz & 1MHz
Type of modulation	:	FHSS
Antenna type	:	Monopole
Antenna connector type	:	U-FL
Antenna gain with cable loss	:	-0.98dBi
ITU code	:	F1D
Operation temperature range	:	-20 to +60 deg.C.

Model: MEX-BT2850 is a similar model of the EUT. The difference is as follows:

Model	Radio Receiving band
MEX-BT2800	FM, MW (Step Frequency: Fixed)
MEX-BT2850	FM, MW SW1: 2940-7735, SW2: 9500-10135, 11580-18135 (Step frequency: Switchable)

FCC Part15.31 (e)
The equipment provides the Bluetooth transmitter with stable power supply (DC 3.3 V), therefore, the equipment complies power supply regulation.

FCC Part15.203 Antenna requirement
The equipment and its antenna comply with this requirement since this antenna is built in the equipment and it cannot be replaced by end users.

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 29KE0232-YK-01-B.

3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	FCC Section 15.207	-	N/A *1)	N/A	N/A
Carrier frequency separation	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)	Conducted	N/A	*See data.	Complied
20dB bandwidth	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)	Conducted	N/A		Complied
Number of hopping frequency	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)(iii)	Conducted	N/A		Complied
Dwell time	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (a)(1)(iii)	Conducted	N/A		Complied
Maximum peak output power	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (b)(1)	Conducted	N/A		Complied
Band edge compliance & Spurious emission	FCC Public Notice DA 00-705 & ANSI C63.4:2003 13. Measurement of intentional radiators	FCC Section15.247 (d) Section15.209	Conducted/ Radiated	N/A	5.8dB (12400.00MHz, Horizontal, Tx 2480MHz)	Complied
Note: UL Japan's EMI Work Procedures No.QPM05 and QPM15. *1) The test is not applicable since the EUT has no AC mains.						

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied bandwidth (99%)	ANSI C63.4:2003 13. Measurement of intentional radiators 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 (±)
Radiated emission (3m)			
<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 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

4 System test configuration

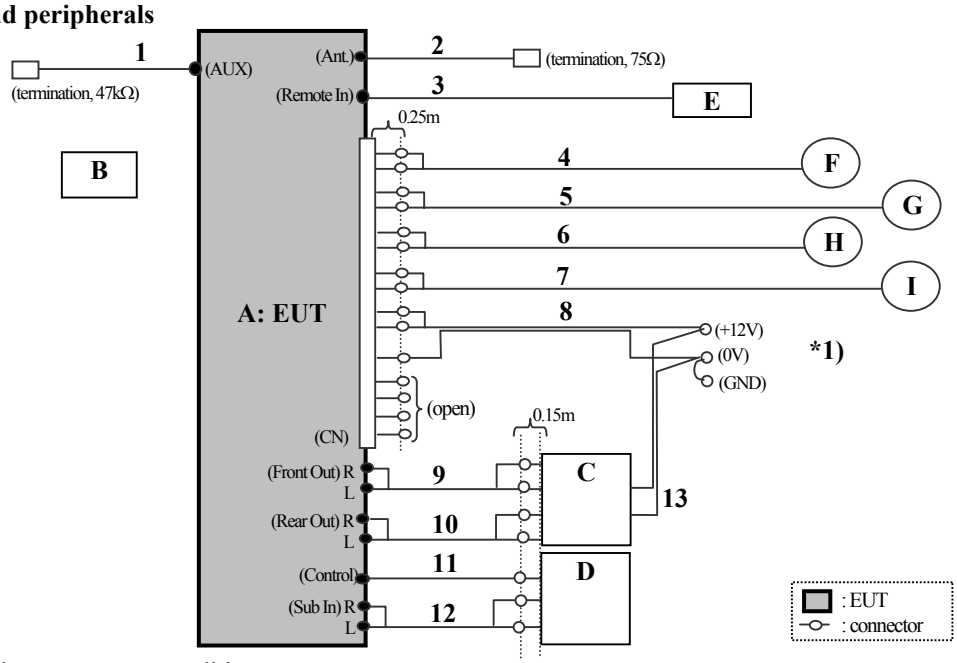
4.1 Justification

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/Inquiry, Payload: PRBS9	-
20dB bandwidth & Maximum peak output power	Transmitting Hopping OFF/Inquiry, Payload: PRBS9	2402MHz, 2441MHz, 2480MHz
Number of hopping frequency	Transmitting Hopping ON/Inquiry, Payload: PRBS9	-
Dwell time	Transmitting (Hopping ON) -DH1 -DH3 -DH5	-
	-Inquiry	
Spurious emission & Band edge compliance (Conducted)	Transmitting (DH5), Payload: PRBS9 -Hopping ON/Inquiry -Hopping OFF	Spurious emission: 2402MHz, 2441MHz, 2480MHz Band edge compliance: 2402MHz, 2480MHz
(Radiated)	Transmitting (DH5), Payload: PRBS9	
99% occupied bandwidth	Transmitting (DH5), Payload: PRBS9 -Hopping ON -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 125mWof 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	Bluetooth Audio System	MEX-BT2800	EV09106	Sony	**EUT**
B	Remote Controller	RM-X304	-	Sony	-
C	Stereo Power Amplifier	NW-A829	5017289	Sony	-
D	CD Player	DX-T67	22634	Sony	-
E	Wired Remote Controller	RM-X4S	-	Sony	-
F	Speaker 1	XS-F1611	-	Sony	-
G	Speaker 2	XS-F1611	-	Sony	-
H	Speaker 3	1-544-814-31	-	AIWA	-
I	Speaker 4	1-544-814-31	-	AIWA	-

*1) DC power supply (Model No.: PAN35-10A) was used for DC 12V input.

List of cables used

No.	Cable	Length (m)	Shield-Cable	Shield-Connector	Remarks
1	AUX cable	1.8	Unshielded	Unshielded	-
2	FM antenna cable	1.8	Shielded	Shielded	-
3	REMOTE IN cable	1.9	Unshielded	Unshielded	-
4	Speaker cable (1)	0.25+2	Unshielded	Unshielded	-
5	Speaker cable (2)	0.25+2	Unshielded	Unshielded	-
6	Speaker cable (3)	0.25+2	Unshielded	Unshielded	-
7	Speaker cable (4)	0.25+2	Unshielded	Unshielded	-
8	DC Power cable	0.25+3	Unshielded	Unshielded	-
9	Audio cable (Front Audio Out)	0.15+4	Unshielded	Unshielded	-
10	Audio cable (Rear Audio Out)	0.15+4	Unshielded	Unshielded	-
11	Control cable	0.15+5.5	Unshielded	Unshielded	-
12	Audio cable (Sub Audio In)	0.15+5.5	Unshielded	Unshielded	
13	DC cable	0.65+0.7	Unshielded	Unshielded	-

* All cables used for the measurement are exclusive use or marketed.

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

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, 0.9m by 1.8m, 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, AV*1): RBW: 1MHz/VBW: See data
Measuring antenna	Biconical (30-300MHz) Logperiodic (300MHz-1GHz)	Horn

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

The EUT was tested in the direction normally used.

11.5 Band edge

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

11.6 Results

Summary of the test results : Pass *No noise was detected above the 5th order harmonics.

APPENDIX 1: Photographs of test setup

APPENDIX 2: Test Data

APPENDIX 3: Test instruments