




RADIO TEST REPORT


Test Report No. : 33AE0152-HO-A-R1

Applicant : Sony Computer Entertainment Inc.
Type of Equipment : WIRELESS CONTROLLER
Model No. : CECHZC2U A
FCC ID : AK8CECHZC2UA1
Test regulation : FCC Part 15 Subpart C: 2012
Class II Permissive Change
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 above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 33AE0152-HO-A. 33AE0152-HO-A is replaced with this report.

Date of test: August 29 to 30, 2012

Representative test engineer: 
Takumi Shimada
Engineer of WiSE Japan,
UL Verification Service

Approved by: 
Masanori Nishiyama
Leader of WiSE Japan,
UL Verification Service



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://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

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SECTION 1: Customer information

Company Name	Sony Computer Entertainment Inc.
Brand Name	SONY
Address	1-7-1 Konan, Minato-ku, Tokyo, 108-0075 Japan
Telephone Number	+81-3-6748-6333
Facsimile Number	+81-3-6748-6383
Contact Person	Akiko Tsukada

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

2.1 Identification of E.U.T.

Type of Equipment	WIRELESS CONTROLLER
Model No	CECHZC2U A
Serial No	See Clause 4.2
Country of Manufacture	China
Receipt Date of Sample	August 21, 2012
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.

2.2 Product Description

Model No: CECHZC2U A is the WIRELESS CONTROLLER for game machine.

Product Specification

Clock frequency in the system	32MHz, 26MHz, 16MHz, 8MHz, 4MHz
Operating Temperature	5-35 deg. C
Power Supply	DC5V (USB Bus Power)
Battery Supply	DC3.7V
Size	93.5 x 156.5 x 62.2 mm
Weight	180 g

Radio Specification: Bluetooth (Ver. 2.0+EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK)
Bandwidth & Channel spacing	1MHz & 1MHz
Method of frequency generation	Crystal
Power Supply (inner)	DC2.8V/DC3.2V
Antenna Type	PWB Pattern Antenna
Antenna Gain	2.0dBi max

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2012, final revised on July 23, 2012 and effective August 22, 2012

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz
*Maximum Peak Output Power and Radiated Spurious Emission test only

* Maximum Peak Output Power and Radiated Spurious Emission was only tested according to KDB178919 as the antenna pattern of the EUT has been changed from the original model.
Radiated Spurious Emission test was only performed on EDR (3DH5) mode, which was the worst one in Maximum Peak Output Power test in Test Report No. 31FE0149-HO-01-A (issued by UL Japan, Inc.) of the original model.

* The EUT complies with FCC Part 15 Subpart B: 2012, final revised on July 23, 2012 and effective August 22, 2012.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Maximum Peak Output Power	FCC: FCC Public Notice DA 00-705	FCC: Section15.247(a)(b)(1)	See data	Complied	Conducted
	IC: RSS-Gen 4.8	IC: RSS-210 A8.4 (2)			
Spurious Emission & Band Edge Compliance	FCC: FCC Public Notice DA 00-705	FCC: Section15.247(d)	4.4dB 84.106MHz, QP, Hori.	Complied	Radiated
	IC: RSS-Gen 4.9	IC: RSS-210 A8.5 RSS-Gen 6 and 7.2.3			

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

FCC 15.31 (e)

This EUT provides stable voltage (DC2.8V/3.2V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI

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

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.2dB	5.0dB	5.1dB	4.7dB	5.7dB	4.4dB	4.3dB
No.2	4.1dB	5.2dB	5.1dB	4.8dB	5.6dB	4.3dB	4.2dB
No.3	4.5dB	5.0dB	5.2dB	4.8dB	5.6dB	4.5dB	4.2dB
No.4	4.7dB	5.2dB	5.2dB	4.8dB	5.6dB	5.1dB	4.2dB

*3m/1m/0.5m = Measurement distance

Power meter (+dB)	
Below 1GHz	Above 1GHz
1.0dB	1.0dB

Antenna terminal conducted emission and Power density (+dB)			Antenna terminal conducted emission (+dB)		Channel power (±dB)
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.0dB	1.1dB	2.7dB	3.2dB	3.3dB	1.5dB

Radiated emission test(3m)

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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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	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
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	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 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	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* 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.3 and No.4 shielded rooms.

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

Refer to APPENDIX.

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

4.1 Operating Mode(s)

Bluetooth (BT): Transmitting (Tx), Payload: PRBS9
Inquiry

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Maximum Peak Output Power	Tx (Hopping off) DH5, 3DH5 Inquiry	2402MHz 2441MHz 2480MHz
Spurious Emission (Radiated)	Tx (Hopping off) 3DH5	2402MHz 2441MHz 2480MHz
<p>*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)</p> <p>*EUT has the power settings by the software as follows; Power settings: BDR: Ext.=255, Int.=44(Radiated Emission), 46(Antenna Terminal) EDR: Ext.=255, Int.=48(Radiated Emission), 52(Antenna Terminal) Software: CSR BlueSuite BlueTest 3, Version 1.6.2573.28352 CSR BlueSuite BtCliCtrl Version 1.24.0.0 (Inquiry mode only)</p> <p>*This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.</p>		

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4.2 Configuration and peripherals

This page has been submitted for a separate exhibit.

SECTION 5: Radiated Spurious Emission

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.5m by 1.0m, raised 0.8m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

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

Test Antennas are used as below;

Frequency	Below 30MHz	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

In any 100kHz bandwidth outside the restricted 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 radiated measurement.

20dBc was applied to the frequency over the limit of FCC 15.209 / Table 5 of RSS-Gen 7.2.5 (IC) and outside the restricted band of FCC15.205 / Table 3 of RSS-Gen 7.2.2 (IC).

Frequency	Below 1GHz	Above 1GHz		20dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 10Hz	RBW: 100kHz VBW: 300kHz (S/A)
Test Distance	3m	3m (below 10GHz), 1m*1) (above 10GHz)		3m (below 10GHz), 1m*1) (above 10GHz)

*1) Distance Factor: $20 \times \log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

- 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.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range : 30M-25GHz
Test data : APPENDIX
Test result : Pass

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SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
Maximum Peak Output Power	-	-	-	Auto	Peak	-	Power Meter (Sensor: 50MHz BW)

The test results and limit are rounded off to two decimals place, so some differences might be observed.

Test data : APPENDIX

Test result : Pass

APPENDIX 1: Data of EMI test

Maximum Peak Output Power

Test place : Head Office EMC Lab. No.2 Measurement Room
 Report No. : 33AE0152-HO
 Date : 08/29/2012
 Temperature/ Humidity : 24 deg. C / 57% RH
 Engineer : Hiroshi Kukita
 Mode : Tx (Hopping off) DH5/3DH5/Inquiry

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-9.60	0.50	10.03	0.93	1.24	20.97	125	20.04
DH5	2441.0	-9.31	0.50	10.03	1.22	1.32	20.97	125	19.75
DH5	2480.0	-9.59	0.50	10.03	0.94	1.24	20.97	125	20.03
3DH5	2402.0	-7.34	0.50	10.03	3.19	2.08	20.97	125	17.78
3DH5	2441.0	-7.61	0.50	10.03	2.92	1.96	20.97	125	18.05
3DH5	2480.0	-8.51	0.50	10.03	2.02	1.59	20.97	125	18.95
Inquiry	2441.0	-10.69	0.50	10.03	-0.16	0.96	20.97	125	21.13

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied)+ Attenuator

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.

As this device had AFH mode and frequency separation could not meet the requirement of over 20dB BW without 2/3 relaxation, 125mW power limit was applied to it.

*Compared to the original test report 31FE0149-HO-01-A, difference in Maximum Peak Output Power is within +/- 0.5dB.

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33AE0152-HO-01
Date 08/30/2012 8/30/2012
Temperature/ Humidity 22 deg. C / 67% RH 23 deg. C / 67% RH
Engineer Takumi Shimada Keisuke Kawamura
(1-26.5GHz) (30-1000MHz)
Mode Tx, 3DH5 2402MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	76.904	QP	48.3	6.4	7.3	28.5	33.5	40.0	6.5	
Hori	79.907	QP	47.5	6.2	7.3	28.5	32.5	40.0	7.5	
Hori	84.113	QP	49.7	6.8	7.3	28.4	35.4	40.0	4.6	
Hori	96.124	QP	41.9	8.8	7.4	28.4	29.7	43.5	13.8	
Hori	480.087	QP	32.7	18.1	9.7	28.7	31.8	46.0	14.2	
Hori	492.086	QP	30.7	18.2	9.7	28.7	29.9	46.0	16.1	
Hori	2390.000	PK	45.3	27.4	2.2	34.8	40.1	73.9	33.8	
Hori	4804.000	PK	49.6	31.2	4.0	34.0	50.8	73.9	23.1	
Hori	7206.000	PK	42.9	35.9	4.6	34.2	49.2	73.9	24.7	NS
Hori	9608.000	PK	43.3	38.8	5.3	34.7	52.7	73.9	21.2	NS
Hori	2390.000	AV	33.0	27.4	2.2	34.8	27.8	53.9	26.1	
Hori	4804.000	AV	39.9	31.2	4.0	34.0	41.1	53.9	12.8	
Hori	7206.000	AV	30.9	35.9	4.6	34.2	37.2	53.9	16.8	NS
Hori	9608.000	AV	31.4	38.8	5.3	34.7	40.8	53.9	13.1	NS
Vert	76.904	QP	42.3	6.4	7.3	28.5	27.5	40.0	12.5	
Vert	79.907	QP	40.7	6.2	7.3	28.5	25.7	40.0	14.3	
Vert	84.113	QP	42.1	6.8	7.3	28.4	27.8	40.0	12.2	
Vert	432.076	QP	31.5	17.7	9.5	28.4	30.3	46.0	15.7	
Vert	480.087	QP	30.9	18.1	9.7	28.7	30.0	46.0	16.0	
Vert	572.735	QP	28.3	19.4	10.1	28.8	29.0	46.0	17.0	
Vert	2390.000	PK	46.9	27.4	2.2	34.8	41.7	73.9	32.2	
Vert	4804.000	PK	50.7	31.2	4.0	34.0	51.9	73.9	22.0	
Vert	7206.000	PK	42.9	35.9	4.6	34.2	49.2	73.9	24.7	NS
Vert	9608.000	PK	43.7	38.8	5.3	34.7	53.1	73.9	20.8	NS
Vert	2390.000	AV	34.0	27.4	2.2	34.8	28.8	53.9	25.1	
Vert	4804.000	AV	41.5	31.2	4.0	34.0	42.7	53.9	11.2	
Vert	7206.000	AV	31.1	35.9	4.6	34.2	37.4	53.9	16.5	NS
Vert	9608.000	AV	31.7	38.8	5.3	34.7	41.1	53.9	12.8	NS

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

NS: No Signal

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	103.8	27.5	2.2	34.8	98.7	-	-	Carrier
Hori	2400.000	PK	61.4	27.5	2.2	34.8	56.3	78.7	22.4	
Vert	2402.000	PK	103.9	27.5	2.2	34.8	98.8	-	-	Carrier
Vert	2400.000	PK	64.2	27.5	2.2	34.8	59.1	78.8	19.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Mode Tx, 3DH5 2441MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	76.904	QP	48.1	6.4	7.3	28.5	33.3	40.0	6.7	
Hori	79.907	QP	47.3	6.2	7.3	28.5	32.3	40.0	7.7	
Hori	84.106	QP	49.9	6.8	7.3	28.4	35.6	40.0	4.4	
Hori	96.122	QP	41.9	8.8	7.4	28.4	29.7	43.5	13.8	
Hori	480.087	QP	34.1	18.1	9.7	28.7	33.2	46.0	12.8	
Hori	492.086	QP	30.9	18.2	9.7	28.7	30.1	46.0	15.9	
Hori	4882.000	PK	49.6	31.4	3.9	34.0	50.9	73.9	23.0	
Hori	7323.000	PK	43.9	36.0	4.7	34.2	50.4	73.9	23.5	NS
Hori	9764.000	PK	43.8	39.0	5.3	34.7	53.4	73.9	20.5	NS
Hori	4882.000	AV	39.8	31.4	3.9	34.0	41.1	53.9	12.8	
Hori	7323.000	AV	33.3	36.0	4.7	34.2	39.8	53.9	14.1	NS
Hori	9764.000	AV	32.3	39.0	5.3	34.7	41.9	53.9	12.0	NS
Vert	76.898	QP	41.9	6.4	7.3	28.5	27.1	40.0	12.9	
Vert	79.907	QP	41.3	6.2	7.3	28.5	26.3	40.0	13.7	
Vert	84.109	QP	43.1	6.8	7.3	28.4	28.8	40.0	11.2	
Vert	432.076	QP	29.9	17.7	9.5	28.4	28.7	46.0	17.3	
Vert	480.087	QP	29.7	18.1	9.7	28.7	28.8	46.0	17.2	
Vert	572.735	QP	27.5	19.4	10.1	28.8	28.2	46.0	17.8	
Vert	4882.000	PK	49.4	31.4	3.9	34.0	50.7	73.9	23.2	
Vert	7323.000	PK	43.9	36.0	4.7	34.2	50.4	73.9	23.5	NS
Vert	9764.000	PK	44.5	39.0	5.3	34.7	54.1	73.9	19.8	NS
Vert	4882.000	AV	39.6	31.4	3.9	34.0	40.9	53.9	13.0	
Vert	7323.000	AV	32.4	36.0	4.7	34.2	38.9	53.9	15.0	NS
Vert	9764.000	AV	32.2	39.0	5.3	34.7	41.8	53.9	12.1	NS

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz $20\log(3.0\text{m}/1.0\text{m})=9.5\text{dB}$

26.5GHz-40GHz $20\log(3.0\text{m}/0.5\text{m})=15.6\text{dB}$

NS: No Signal

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33AE0152-HO-01
Date 08/30/2012 8/30/2012
Temperature/ Humidity 22 deg. C / 67% RH 23 deg. C / 67% RH
Engineer Takumi Shimada Keisuke Kawamura
(1-26.5GHz) (30-1000MHz)
Mode Tx, 3DH5 2480MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	76.900	QP	48.2	6.4	7.3	28.5	33.4	40.0	6.6	
Hori	79.902	QP	47.4	6.2	7.3	28.5	32.4	40.0	7.6	
Hori	84.106	QP	49.7	6.8	7.3	28.4	35.4	40.0	4.6	
Hori	96.122	QP	42.0	8.8	7.4	28.4	29.8	43.5	13.7	
Hori	480.087	QP	34.1	18.1	9.7	28.7	33.2	46.0	12.8	
Hori	492.086	QP	31.2	18.2	9.7	28.7	30.4	46.0	15.6	
Hori	2483.500	PK	56.8	27.5	2.3	34.8	51.8	73.9	22.1	
Hori	2484.239	PK	53.6	27.5	2.3	34.8	48.6	73.9	25.3	
Hori	4960.000	PK	46.9	31.6	4.0	34.0	48.5	73.9	25.4	
Hori	7440.000	PK	42.4	36.2	4.7	34.3	49.0	73.9	24.9	NS
Hori	9920.000	PK	43.8	39.1	5.4	34.7	53.6	73.9	20.3	NS
Hori	2483.500	AV	42.2	27.5	2.3	34.8	37.2	53.9	16.7	
Hori	2484.239	AV	40.3	27.5	2.3	34.8	35.3	53.9	18.6	
Hori	4960.000	AV	35.2	31.6	4.0	34.0	36.8	53.9	17.1	
Hori	7440.000	AV	33.1	36.2	4.7	34.3	39.7	53.9	14.2	NS
Hori	9920.000	AV	31.7	39.1	5.4	34.7	41.5	53.9	12.4	NS
Vert	76.898	QP	42.1	6.4	7.3	28.5	27.3	40.0	12.7	
Vert	79.903	QP	41.2	6.2	7.3	28.5	26.2	40.0	13.8	
Vert	84.109	QP	42.7	6.8	7.3	28.4	28.4	40.0	11.6	
Vert	432.076	QP	29.2	17.7	9.5	28.4	28.0	46.0	18.0	
Vert	480.085	QP	28.9	18.1	9.7	28.7	28.0	46.0	18.0	
Vert	572.735	QP	26.1	19.4	10.1	28.8	26.8	46.0	19.2	
Vert	2483.500	PK	55.3	27.5	2.3	34.8	50.3	73.9	23.6	
Vert	2484.239	PK	52.3	27.5	2.3	34.8	47.3	73.9	26.6	
Vert	4960.000	PK	47.5	31.6	4.0	34.0	49.1	73.9	24.8	
Vert	7440.000	PK	43.7	36.2	4.7	34.3	50.3	73.9	23.6	NS
Vert	9920.000	PK	43.9	39.1	5.4	34.7	53.7	73.9	20.2	NS
Vert	2483.500	AV	40.5	27.5	2.3	34.8	35.5	53.9	18.4	
Vert	2484.239	AV	39.0	27.5	2.3	34.8	34.0	53.9	19.9	
Vert	4960.000	AV	35.6	31.6	4.0	34.0	37.2	53.9	16.8	
Vert	7440.000	AV	31.6	36.2	4.7	34.3	38.2	53.9	15.7	NS
Vert	9920.000	AV	31.6	39.1	5.4	34.7	41.4	53.9	12.5	NS

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

NS: No Signal

APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	AT/RE	2012/02/06 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2012/06/01 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2012/06/01 * 12
MAT-25	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71642	AT	2012/06/27 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2011/11/23 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2012/02/22 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2011/09/06 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2012/05/30 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2012/04/03 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA9103200 8	RE	2011/10/23 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2011/10/23 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2012/02/16 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2011/11/02 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2011/09/26 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: RE: Radiated Emission

AT: Antenna Terminal Conducted test

UL Japan, Inc.

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