




RADIO TEST REPORT

Test Report No.: 31HE0252-SH-A-R1

Applicant : Panasonic System Networks Co.,Ltd.
Type of Equipment : Center Module
Model No. : WX-C3010
FCC ID : ACJ9TAWX-C3010
Test regulation : FCC Part15 Subpart D: 2010
FCC Part15 Subpart B: 2010
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.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
7. This report is a revised version of 31HE0252-SH-A. 31HE0252-SH-A is replaced with this report.

Date of test: April 23 to May 11, 2011

Representative test engineer: 
Kenichi Adachi
Engineer of WiSE Japan, UL
Verification Service

Approved by : 
Toyokazu Imamura
Site manager of WiSE Japan, UL
Verification Service

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

Contents

	<u>Page</u>
SECTION 1: Customer information.....	3
SECTION 2: Equipment under test (E.U.T.)	3
SECTION 3: Test specification, procedures & results.....	4
SECTION 4: Operation of E.U.T. during testing.....	8
SECTION 5: Radiated emission (Unwanted emission, etc.)	10
SECTION 6: Conducted emission	12
SECTION 7: Peak Transmit Power	13
SECTION 8: 99% Occupied Bandwidth or 26dB Bandwidth	13
SECTION 9: Peak Power Spectrum Density.....	13
SECTION 10: Automatic Discontinuation of Transmission.....	13
SECTION 11: Monitoring Threshold and Least Interfered Channel procedure.....	13
SECTION 12: System Acknowledgement.....	14
SECTION 13: Selected Channel Confirmation	14
SECTION 14: Power Measurement Resolution Accuracy.....	14
SECTION 15: Monitor Bandwidth.....	14
SECTION 16: Monitoring Reaction Time.....	14
SECTION 17: Monitoring Threshold Relaxation	15
SECTION 18: Frame-Repetition Stability	15
SECTION 19: Frame Period and Jitter	15
SECTION 20: Frequency Stability	15
Contents of APPENDIXES.....	16

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

SECTION 1: Customer information

Company Name : Panasonic System Networks Co.,Ltd.
Brand Name : Panasonic
Address : 4-1-62 Minoshima, Hakata-ku, Fukuoka City 812-8531, Japan
Telephone Number : +81 050 3380 2463
Facsimile Number : N/A
Contact Person : Mr. Shouhei Taniguchi

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

2.1 Identification of E.U.T.

Type of Equipment : Center Module
Model Number : WX-C3010
Serial Number : HH0155
Rating : AC 120V / 60Hz
Country of Manufacture : Japan
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample : April 21, 2011
Modification of EUT : The test lab did not make the modification to the EUT supplied from the customer to have it pass the tests.

2.2 Product description

Model: WX-C3010 (referred to as the EUT in this report) is a Center Module.
The clock frequencies used in 10.368MHz, 4MHz, 8MHz.

<Radio part>

Equipment type : Transceiver
Frequency of operation : 1921.536MHz to 1928.448MHz
Radio part clock frequency : 10.368MHz,
Bandwidth & channel spacing : bandwidth: about 1.3MHz / spacing: about 1.73MHz
Type of modulation : GFSK
Antenna type : Dipole antenna
Antenna connector type : N or SMA
Antenna gain : [Antenna 0 / 1]: 3.42dBi , [Antenna 2]: 8dBi

FCC 15.31 (e)

The equipment provides the transmitter with stable power supply, therefore, the equipment complies power supply regulation.

FCC 15.203 Antenna requirement

The EUT is to be professionally installed (therefore complies with FCC 15.203).

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN
Telephone : +81 465 77 1011
Facsimile : +81 465 77 2112

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart B / D: 2010, final revised on December 6, 2010 and effective January 5, 2011.
Title : FCC 47CFR Part15 Radio Frequency Device
Subpart B Unintentional Radiators,
Subpart D Unlicensed Personal Communications Service Devices
Test method : ANSI C63.17: 2006 June 28, 2006

3.2 Procedures & Results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Result
1	Conducted emission (Transmitter / Receiver)	FCC: ANSI C63.4: 2003 7. AC powerline conducted emission measurements IC: RSS-Gen 7.2.4, ANSI C63.4: 2003 7. AC powerline conducted emission measurements	FCC part 15 Section 15.207, 15.315, Section 15.107 RSS-213 clause 2.1 RSS-310 clause 3.1	-	N/A	[QP] 16.8dB, 0.2690MHz, L [AV] 7.0dB, 0.2690MHz, L (mode C, Antenna 0)	Complied
2	Peak Transmit Power	FCC: ANSI C63.17 clause 6.1.2 IC: ANSI C63.17 clause 6.1.2	FCC part 15 Section 15.319(c) IC: RSS-213 clause 6.5	Radiated	N/A	-	Complied
3	Peak Power Spectrum Density	FCC: ANSI C63.17 clause 6.1.5 IC: ANSI C63.17 clause 6.1.5	FCC part 15 Section 15.319(d) IC: RSS-213 clause 6.6	Radiated	N/A	-	Complied
4	Power adjustment for Antenna gain	FCC: ANSI C63.17 clause 4.3.1 IC: ANSI C63.17 clause 4.3.1	FCC part 15 Section 15.319(e) IC: RSS-213 clause 4.1(e)	Radiated	N/A	-	Complied *1)
5	26dB Bandwidth	FCC: ANSI C63.17 clause 6.1.3 IC: RSS-Gen clause 4.6.1	FCC part 15 Section 15.323(d) IC: RSS-213 clause 6.4	Radiated	N/A	-	Complied
6	Unwanted Emission (In / Out of band of Transmitter / Receiver)	FCC: ANSI C63.17 clause 6.1.6, ANSI C63.4: 2003 8.Radiated emission Measurements IC: RSS-Gen clause 6.1, 7.2.2, 7.2.5, ANSI C63.17 clause 6.1.6, ANSI C63.4: 2003 8.Radiated emission Measurements	FCC part 15 Section 15.323(d), 15.319(g), 15.205, 15.209, Section 15.109 IC: RSS-213 clause 6.7, RSS-310 clause 3.1, RSS-Gen clause 4.10	Radiated	N/A	20.9dB, Vertical, QP, 114.050MHz, (mode A, Antenna 0) , 12.8dB, Vertical, QP, 435.44MHz, (mode D, Antenna 0),	Complied
7	Automatic Discontinuation of Transmission	Refer to Section 10 Refer to Section 10	FCC part 15 Section 15.319(f) IC: RSS-213 clause 4.3.4(a)	Radiated	N/A	-	Complied
8	Monitoring Time	FCC: ANSI C63.17 clause 7.3.4 IC: ANSI C63.17 clause 7.3.4	FCC part 15 Section 15.323(c)(1) IC: RSS-213 clause 4.3.4.(b)(1)	Radiated	N/A	-	N/A *2)

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Result
9	Monitoring Threshold	FCC: ANSI C63.17 clause 4.3.3, 4.3.4, 7.3.1	FCC part 15 Section 15.323(c)(2)	Radiated	N/A	-	Complied
		IC: ANSI C63.17 clause 4.3.3, 4.3.4, 7.3.1	IC: RSS-213 clause 4.3.4(b)(2)				
10	Least Interfered Channel procedure	FCC: ANSI C63.17 clause 4.3.3, 4.3.4, 7.3.2	FCC part 15 Section 15.323(c)(5)	Radiated	N/A	-	Complied
		IC: ANSI C63.17 clause 4.3.3, 4.3.4, 7.3.2	IC: RSS-213 clause 4.3.4(b)(5)				
11	Maximum Transmit Time (Period)	FCC: ANSI C63.17 clause 8.2.2	FCC part 15 Section 15.323(c)(1)	Radiated	N/A	-	N/A *3)
		IC: ANSI C63.17 clause 8.2.2	IC: RSS-213 clause 4.3.4(b)(1)				
12	System Acknowledgement	FCC: ANSI C63.17 clause 8.1.1, 8.1.2	FCC part 15 Section 15.323(c)(4)	Radiated	N/A	-	Complied
		IC: ANSI C63.17 clause 8.1.1, 8.1.2	IC: RSS-213 clause 4.3.4(b)(4)				
13	Selected Channel Confirmation	FCC: ANSI C63.17 clause 7.3.3, 7.3.4	FCC part 15 Section 15.323(c)(5)	Radiated	N/A	-	Complied
		IC: ANSI C63.17 clause 7.3.3, 7.3.4	IC: RSS-213 clause 4.3.4(b)(5)				
14	Power Measurement Resolution Accuracy	FCC: ANSI C63.17 clause 7.3	FCC part 15 Section 15.323(c)(5)	Radiated	N/A	-	Complied
		IC: ANSI C63.17 clause 7.3	IC: RSS-213 clause 4.3.4(b)(5)				
15	Random Waiting	FCC: ANSI C63.17 clause 8.1.3	FCC part 15 Section 15.323(c)(6)	Radiated	N/A	-	N/A *4)
		IC: ANSI C63.17 clause 8.1.3	IC: RSS-213 clause 4.3.4(b)(6)				
16	Monitor Bandwidth	FCC: ANSI C63.17 clause 7.4	FCC part 15 Section 15.323(c)(7)	Radiated	N/A	-	Complied
		IC: ANSI C63.17 clause 7.4	IC: RSS-213 clause 4.3.4(b)(7)				
17	Monitoring Reaction Time	FCC: ANSI C63.17 clause 7.5	FCC part 15 Section 15.323(c)(7)	Radiated	N/A	-	Complied
		IC: ANSI C63.17 clause 7.5	IC: RSS-213 clause 4.3.4(b)(7)				
18	Monitoring Antenna	FCC: ANSI C63.17 clause 4,5 to 4.10	FCC part 15 Section 15.323(c)(8)	Radiated	N/A	-	Complied *5)
		IC: ANSI C63.17 clause 4,5 to 4.10	IC: RSS-213 clause 4.3.4(b)(8)				
19	Monitoring Threshold Relaxation	FCC: ANSI C63.17 clause 7.3.2(a)	FCC part 15 Section 15.323(c)(9)	Radiated	N/A	-	Complied
		IC: ANSI C63.17 clause 7.3.2(a)	IC: RSS-213 clause 4.3.4(b)(9)				
20	Duplex System LBT	FCC: ANSI C63.17 clause 8.3.2	FCC part 15 Section 15.323(c)(10)	Radiated	N/A	-	N/A *4)
		IC: ANSI C63.17 clause 8.3.2	IC: RSS-213 clause 4.3.4(b)(10)				
21	Alternate Monitoring Interval	FCC: ANSI C63.17 clause 8.4	FCC part 15 Section 15.323(c)(11)	Radiated	N/A	-	N/A *4)
		IC: ANSI C63.17 clause 8.4	IC: RSS-213 clause 4.3.4(b)(11)				

UL Japan, Inc.**Yamakita EMC Lab.**

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Result
22	Fair Access	-	FCC part 15 Section 15.323(c)(12)	Radiated	N/A	-	N/A *6)
		-	IC: RSS-213 clause 4.3.4(b)(12)				
23	Frame Repetition Stability	FCC: ANSI C63.17 clause 6.2.2	FCC part 15 Section 15.323(e)	Radiated	N/A	-	Complied
		IC: ANSI C63.17 clause 6.2.2	IC: RSS-213 clause 4.3.4(c)				
24	Timing Jitter	FCC: ANSI C63.17 clause 6.2.3	FCC part 15 Section 15.323(e)	Radiated	N/A	-	Complied
		IC: ANSI C63.17 clause 6.2.3	IC: RSS-213 clause 4.3.4(c)				
25	Frequency Stability	FCC: ANSI C63.17 clause 6.2.1	FCC part 15 Section 15.323(f)	Radiated	N/A	-	Complied
		IC: ANSI C63.17 clause 6.2.1	IC: RSS-213 clause 6.2				

Note: UL Japan's EMI Work Procedures No.13-EM-W420.

- *1) The antenna gain is taken into account in the "Peak Transmitter Power" test item, therefore "Power adjustment for Antenna gain" is Complied.
*2) The EUT never initiates a communication link since the base station receives the request for communication from a companion device.
*3) This test is only for initiating devices that control which time slot is used (therefore not applicable).
*4) This option is not available on the EUT.
*5) Since the same antennas are used for transmission and for the monitoring system.
*6) The EUT does not use any mechanisms as allowed by FCC 15.323(c)(10) or (c)(11) and RSS-213 clause 4.3.4(b)(10) or (b)(11) to deny fair access to spectrum to other devices.

* These tests were performed without any deviations from the procedure except as described in relevant test procedures given in this test report.

3.3 Addition to standard

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

3.4 Uncertainty

(Yamakita EMC Lab.)

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

Item	Frequency range	No.1 OAT ^{*1} /SR ^{*3} (±)	No.2 OAT/SR (±)	No.1 SAC (±)
Conducted emission (AC Mains) LISN	150kHz-30MHz	3.5 dB	3.5 dB	3.5 dB
Radiated emission (Measurement distance: 3m)	30MHz-300MHz	4.4 dB	4.5 dB	4.6 dB
	300MHz-1GHz	4.6 dB	4.7 dB	4.7 dB
	1GHz-18GHz	3.8 dB	4.2 dB	4.5 dB
	18GHz-26.5GHz	4.4 dB	4.5 dB	4.5 dB
Radiated emission (Measurement distance: 10m)	30MHz-300MHz	4.2 dB	4.5 dB	-
	300MHz-1GHz	4.4 dB	4.7 dB	-
Radiated emission (Measurement distance: 1m)	1GHz-18GHz	4.4 dB		4.5 dB
	18GHz-40GHz	4.4 dB		4.3 dB
Antenna Terminal Voltage^{*4}	30MHz-1000MHz	3.6 dB		
	1GHz-26GHz	3.2 dB		

*1: OAT=Open-Area Test site

*2: SAC=Semi-Anechoic Chamber

*3: SR= Shielded Room is applied besides radiated emission

*4: Value of Antenna Terminal Voltage measurement is also applies to the No.5 and No.6 Shielded Room.

Conducted emission test

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

Radiated emission test

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

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

3.5 Test location

UL Japan, Inc. Yamakita EMC Lab.

907, Kawanishi, Yamakita-machi, Ashigara-gun, Kanagawa-ken 258-0124 JAPAN

Telephone number : +81 465 77 1011

Facsimile number : +81 465 77 2112

JAB Accreditation No. : RTL02610

No.1/ No.2/ No.3 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on April 17, 2009 (Registration No.: 95486(No.1 Test site), 466226(No.2 Test site), 95967 (No.1 Semi-Anechoic Chamber)).

IC Registration No. : 2973B-1 (No1 Test site)

2973B-3 (No2 Test site)

2973B-2 (No1 Semi-Anechoic Chamber)

	FCC Registration No.	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
<input checked="" type="checkbox"/> No.1 open area test site	95486	2973B-1	-	12.0 x 41.2	30m
<input type="checkbox"/> No.2 open area test site	466226	2973B-3	-	9.5 x 17.8	10m
<input type="checkbox"/> No.1 Semi-anechoic chamber	95967	2973B-2	10.0 x 7.5 x 5.7	10.0 x 7.5	3m
<input type="checkbox"/> No.2 Full-anechoic chamber	-	-	8.0 x 4.7 x 4.0	8.0 x 4.7	2.5m
<input checked="" type="checkbox"/> No.1 shielded room	-	-	8.0 x 5.0 x 2.5	8.0 x 5.0	-
<input type="checkbox"/> No.2 shielded room	-	-	5.0 x 4.0 x 2.5	5.0 x 4.0	-
<input type="checkbox"/> No.3 shielded room	-	-	4.0 x 5.0 x 2.7	4.0 x 5.0	-
<input type="checkbox"/> No.4 shielded room	-	-	5.0 x 4.0 x 2.7	5.0 x 4.0	-
<input type="checkbox"/> No.5 shielded room	-	-	4.5 x 4.3 x 2.7	4.5 x 4.3	-

UL Japan, Inc. Shonan EMC Lab.

1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN

Telephone number : +81 463 50 6400

Facsimile number : +81 463 50 6401

JAB Accreditation No. : RTL02610

No.1/ No.2/ No.3 anechoic chamber has been fully described in a report submitted to FCC office, and accepted on April 17, 2009 (Registration No.: 697847).

IC Registration No. : 2973D-1 (No1 Semi-Anechoic Chamber)

2973D-2 (No2 Semi-Anechoic Chamber)

2973D-3 (No3 Semi-Anechoic Chamber)

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
<input type="checkbox"/> No.1 Semi-Anechoic Chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	<input type="checkbox"/> No.1 Shielded room	6.8 x 4.1 x 2.7
<input type="checkbox"/> No.2 Semi-Anechoic Chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	<input type="checkbox"/> No.2 Shielded room	6.8 x 4.1 x 2.7
<input type="checkbox"/> No.3 Semi-Anechoic Chamber	12.7 x 7.7 x 5.35 Maximum measurement distance: 5m	<input type="checkbox"/> No.3 Shielded room	6.3 x 4.7 x 2.7
<input type="checkbox"/> No.4 Semi-Anechoic Chamber	8.1 x 5.1 x 3.55	<input type="checkbox"/> No.4 Shielded room	4.4 x 4.7 x 2.7
		<input checked="" type="checkbox"/> No.5 Shielded room	7.8 x 6.4 x 2.7
		<input type="checkbox"/> No.6 Shielded room	7.8 x 6.4 x 2.7

3.6 Test setup, Data of EMI & Test instruments

Refer to APPENDIX 1 to 3.

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

List of cables used

No.	Cable Name	Length (m)	Shield		Remark
			Cable	Connector	
1	AC	2.0	Unshielded	Unshielded	-
2	Signal	3.4	Unshielded	Unshielded	-
3	Signal	3.4	Unshielded	Unshielded	-
4	Signal	3.6	Unshielded	Unshielded	-
5	Signal	3.3	Unshielded	Unshielded	-
6	Signal	3.6	Unshielded	Unshielded	-
7	Signal	3.3	Unshielded	Unshielded	-
8	Signal	3.5	Unshielded	Unshielded	-
9	Signal	3.5	Unshielded	Unshielded	-
10	Signal	3.4	Unshielded	Unshielded	-
11	Signal	3.4	Unshielded	Unshielded	-
12	Signal	3.6	Unshielded	Unshielded	-
13	Signal	3.6	Unshielded	Unshielded	-
14	Signal	3.5	Unshielded	Unshielded	-
15	LAN	5.0	Unshielded	Unshielded	-
16	External antenna	30.0	Shielded	Shielded	-
17	AC	2.0	Unshielded	Unshielded	*1)
18	Antenna	10.0	Shielded	Shielded	*1)

*1) Used communication mode only.

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

SECTION 5: Radiated emission (Unwanted emission, etc.)

5.1 Operating environment

The test was carried out in No.1 Open-area test site.

Temperature : See test data (APPENDIX 2)

Humidity : See test data (APPENDIX 2)

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane to prevent the reflection influence. The table is made of Styrene foam . That has very low permittivity.

The EUT external antenna cable was extended on the ground of the test site and the antenna 2 was attached vertically to a mast.

The rear of EUT, including its peripherals was aligned and flushed with rear of tabletop. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 30cm to 40cm long and were hanged at a 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.

Photographs of the set up are shown in APPENDIX 1.

5.3 Test conditions

Frequency range : 9kHz to 20GHz
Test distance : 3m
EUT position : Table top
EUT operation mode : Refer to SECTION 4.1

5.4 Test procedure

(for Spurious emission)

(1) The Radiated Electric Field Strength intensity has been measured on an open-area test site with a ground plane and at a distance of 3m. Measurements were performed with quasi-peak, peak and average detector.

The measuring antenna was moved at different positions around the EUT structure and its height was varied between 1 and 4m, and the EUT main unit 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.

The radiated emission measurements were made with the following detection of the test receiver or spectrum analyzer.

(Transmitting mode) (Refer to Original test report No. 12604528 001 (TUV Rheinland Japan Ltd.)

Frequency : 9kHz-20GHz
Detection Type : Peak
IF Bandwidth : RBW:10kHz/VBW:30kHz

Spurious level calculaion:

$$10 \times \log(((10^{(S/A \text{ (PK) Reading [dBuV] + Ant, Cable, ATT factor[dB]} / 20)}) \times 10^{(-6)} \times 3[m])^2) / (30 \times (\text{gain} = 1) \times 10^3)$$

(Restrict bands or Receiving mode or digital part)

Frequency : 30M-1000MHz 1G-20GHz
Detection Type : Quasi-Peak Peak Average *1)
IF Bandwidth : 120kHz RBW:1MHz/VBW:1MHz RBW:1MHz/VBW:10Hz or 100Hz

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

*2) Transmitting mode , Average setting is VBW is 100Hz, refer to Appendix 2.

The EUT was tested in the direction normally used.

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

(for Peak transmit power and Peak power spectrum density)

(2) Substitution measurement

IF Bandwidth : RBW:3MHz/VBW:10MHz (for Peak transmit power)
 IF Bandwidth : RBW:3kHz/VBW:10kHz (for Peak power spectrum density)

(a) Measured by section 5.4 (1).

(b) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height 0.8m as the EUT.

The frequency above 1GHz of the Substitution Antenna was used Horn Antenna.

The Substitution Antenna was connected to the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in (a).

Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field strength is equal to the measured value in (a) by means of varying the measuring antenna height between 1 to 4m to obtain maximum receiving level. Its Output power of Signal Generator was recorded.

(c) Equivalent isotropic radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in (b). For the usage of the Antenna (Horn Antenna) for the Substitution Antenna, the Equivalent isotropic radiated power was calculated by compensating the finite difference in the Antenna gain of the isotropic antenna, and substitution antenna.

The EUT was tested in the direction normally used.

(Test site setup)

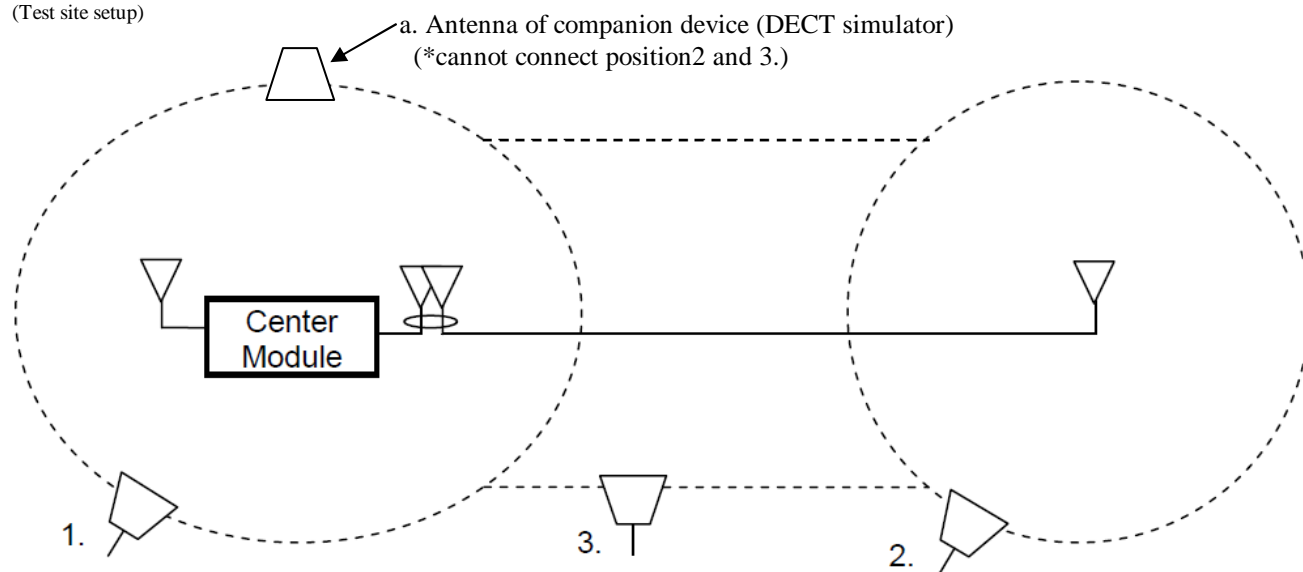


Figure 1

5.5 Pre-check

The transmit power level was checked at position 1, 2 and 3.

The power level at position 3 was found to be lower than the power level at position 1 and 2.

Therefore,

Section 5, 7, 8, 9, 11 to 17 and 20: final measurements were performed for position 1 and 2 only.

Section 6, 10, 18, 19: final measurements were performed for position 1 only.

5.6 Results

Summary of the test results : Pass *No noise was detected above the 3th order harmonics.

Refer to APPENDIX 2

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

SECTION 6: Conducted emission

5.1 Operating environment

The test was carried out in No.1 Shielded room

Temperature : Refer to the APPENDIX 2

Humidity : Refer to the APPENDIX 2

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.

The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals was aligned and was flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from LISN and excess AC cable was bundled in center. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. All unused 50 ohm connectors of the LISN were resistively terminated in 50 ohm when not connected to the measuring equipment.

Photographs of the set up are shown in APPENDIX 1.

This test was performed at position 1(at SECTION 5) only as the result is independent from the measurement position.

5.3 Test conditions

Frequency range : 0.15 - 30MHz

EUT position : Table top

EUT operation mode : Refer to Section 4.1

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT within a Shielded room or Open-area test site. The EUT was connected to a Line Impedance Stabilization Network (LISN).

An overview sweep with peak detection has been performed.

The measurements had been performed with a quasi-peak detector and if required, an average detector.

The conducted emission measurements were made with the following detection of the test receiver.

Detection Type : Quasi-Peak/ Average

IF Bandwidth : 9kHz

5.5 Results

Summary of the test results : Pass

Refer to APPENDIX 2.

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

SECTION 7: Peak Transmit Power

Test procedure

Refer to ANSI C63.17, Section 6.1.2 or FCC 15.319(c) / RSS-213, Section 6.5 and SECTION 5.

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 8: 99% Occupied Bandwidth or 26dB Bandwidth

Test procedure

Refer to RSS-Gen, Section 4.6.1. or ANSI C63.17, Section 6.1.3 and SECTION 5.

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 9: Peak Power Spectrum Density

Test procedure

Refer to ANSI C63.17, Section 6.1.5 or FCC 15.319(d) / RSS-213, Section 6.6 and SECTION 5.

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 10: Automatic Discontinuation of Transmission

Test procedure

The following tests simulate the reaction of the EUT in case of either absence of information to transmit or operational failure after a connection with the companion device is established. This may be met by reference to relevant portions of the DECT standards.

The following tests are performed after a connection is first established between the EUT and its companion device. Companion device was DECT simulator "CTS60" from customer.

This test was performed at position 1(at SECTION 5) only as the result is independent from the measurement position.

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 11: Monitoring Threshold and Least Interfered Channel procedure

Test procedure

Refer to ANSI C63.17, Section 7.3.2, 7.3.3 and SECTION 5.

Companion device was DECT simulator "CTS60" from customer.

Monitoring Threshold Limits:

Lower Threshold: $T(L) = -174 + 10 \log B + M(L) (=30) + P(\max) - P(EUT)$ [dBm]

* The lower threshold is not applicable since the EUT has more than 40 duplex access channels and implements the LIC procedure.

Upper Threshold: $T(U) = -174 + 10 \log B + M(U) (=50) + P(\max) - P(EUT)$ [dBm]

* T(U, pos1): T(U) of position 1 (at SECTION 5) , T(U, pos2): T(U) of position 2 (at SECTION 5)

Summary of the test results: Pass
Refer to APPENDIX 2

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

SECTION 12: System Acknowledgement

Test procedure

Refer to ANSI C63.17, Section 8.2.1 and 8.2.2 and SECTION 5.

During the initial transmission, the time/spectrum from the EUT to the companion device is monitored via a spectrum analyzer.

Companion device was DECT simulator "CTS60" from customer.

Summary of the test results: Pass

Refer to APPENDIX 2

SECTION 13: Selected Channel Confirmation

Test procedure

Refer to ANSI C63.17, Section 7.3.4 and SECTION 5.

Refer to SECTION 11 and SECTION 16.

Companion device was DECT simulator "CTS60" from customer.

Summary of the test results: Pass

Refer to APPENDIX 2

SECTION 14: Power Measurement Resolution Accuracy

Test procedure

Refer to ANSI C63.17, Section 7.3.

Refer to SECTION 11.

This test was complied, since the Monitoring Threshold test was complied

SECTION 15: Monitor Bandwidth

Test procedure

Refer to ANSI C63.17, Section 7.4 and SECTION 5.

Companion device was DECT simulator "CTS60" from customer.

Summary of the test results: Pass

Refer to APPENDIX 2

SECTION 16: Monitoring Reaction Time

Test procedure

Refer to ANSI C63.17, Section 7.5 and SECTION 5.

Companion device was DECT simulator "CMD60" from customer.

Summary of the test results: Pass

Refer to APPENDIX 2

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

SECTION 17: Monitoring Threshold Relaxation

Test procedure

Refer to ANSI C63.17, Section 4.
Refer to SECTION 11.

The EUT could increase the upper threshold limit T(U,pos1) by 2.23dB based on the maximum transmit power found at antenna position 1 (see "Peak Transmitter Power" test result in APPENDIX 2).

The limit T(U,pos2) already takes into account the measured maximum transmit power found at position 2.

Refer to "Monitoring Threshold and Least Interfered Channel procedure" test result in APPENDIX 2 for more details.

SECTION 18: Frame-Repetition Stability

Test procedure

Refer to ANSI C63.17, Section 6.2.2 and SECTION 5.
Companion device was DECT simulator "CTS60" from customer.

This test was performed at position 1(at SECTION 5) only as the result is independent from the measurement position.

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 19: Frame Period and Jitter

Test procedure

Refer to ANSI C63.17, Section 6.2.3 and SECTION 5.
This test was measurement by DECT simulator "CTS60" from customer.

This test was performed at position 1(at SECTION 5) only as the result is independent from the measurement position.

Summary of the test results: Pass
Refer to APPENDIX 2

SECTION 20: Frequency Stability

Test procedure

Refer to ANSI C63.17, Section 6.2.1.

Normal Temperature	: 20deg.C. , Normal voltage	: AC 120V / 60Hz
Lowest Temperature	: -20deg.C. , Lowest voltage	: AC 102V / 60Hz
Highest Temperature	: +50deg.C. , Highest voltage	: AC 138V / 60Hz

* After the temperature had been changed, it began to test after it had maintained the temperature for the about 1 hour.

Summary of the test results: Pass
Refer to APPENDIX 2

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

Contents of APPENDIXES

APPENDIX 1: Photographs of test setup

Radiated emission	Page 17
Conducted emission	Page 18

APPENDIX 2: Data of EMI test

Bandwidth	Page 19 - 20
Peak Transmit Power	Page 21 - 26
Peak power spectrum density	Page 27 - 29
In-band unwanted emission.....	Page 30 - 32
Unwanted radiated emission	Page 33 - 42
Access protocol tests	Page 43 - 45
Frequency Stability	Page 46 - 63
Conducted emission	Page 64 - 72

APPENDIX 3: Test instruments

Test instruments	Page 73 - 74
------------------------	--------------

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa-ken, 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112