



RADIO TEST REPORT

Test Report No.: 29LE0155-SH-A

Applicant : Sony Corporation
Type of Equipment : TransferJet Module
Model No. : CXN5000
FCC ID : AK8CXN5000
Test regulation : FCC Part15 Subpart F: 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: July 21, 23 and 24, 2009

Tested by: T. Arai
Tatsuya Arai

Approved by: Osamu Watatani
Osamu Watatani
Assistant Manager of Shonan EMC Lab.

UL Japan, Inc.

SHONAN EMC LAB.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone: +81 463 50 6400 Facsimile: +81 463 50 6401

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1 Applicant information

Company Name : Sony Corporation
Address : 4-14-1 Asahi-cho, Atsugi-shi, Kanagawa-ken, 243-0014 Japan
Telephone Number : +81-46-202-8997
Facsimile Number : +81-46-202-6230
Contact Person : Katsuya Kameoka

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

2.1 Identification of E.U.T.

Type of Equipment : TransferJet Module
Model No. : CXN5000
Serial No. : 5000-01
Rating : DC3.3V / 0.45A
Country of Mass-production : Japan
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 17, 2009

2.2 Product description

Model: CXN5000 (referred to as the EUT in this report) is a TransferJet Module.

The EUT has some similar model, BB00-1, AA00-1 and AAA0-1.

The differences between BB00-1 and AA00-1 are belows.

1. AA00-1 is eliminated two Logic ICs.

2. AA00-1 is put the 0ohm resistance differ from BB00-1.

AAA0-1 bundled items for AA00-1 and CXN5000CPRMPS (WHA9400-1632F/ WHA9400-1632E).

*) BB00-1 was used for the test.

Equipment type : Transceiver
Frequency of operation : 4480MHz
Clock frequency : 20MHz
Effective Bandwidth : 560MHz
(not 10dB Bandwidth)
Type of modulation : DSSS
Antenna type : TransferJet Coupler
Antenna connector type : U-FL
Antenna gain : CXN5000CPRMPS (WHA9400-1632F / WHA9400-1632E): -6.0dBi@4.48GHz
RC-S629: -4.9dBi@4.48GHz
AJC-L08-02: -7.1dBi@4.48GHz
ITU code : Q7D
Operation temperature range : -20 ~ +70 deg.C.

FCC 15.31 (e)

The RF Module has its own regulator.

The RF Module is constantly provided voltage (DC3.3V, DC1.8V) through its own regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203

The EUT has a unique coupling/antenna connector U-FL. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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3 Test specification, procedures and results

3.1 Test specification

Test specification : FCC Part 15 Subpart F: 2009, final revised on February 27, 2009
 Title : FCC 47CFR Part15 Radio Frequency Device
 Subpart F Ultra-Wideband Operation
 Section 15.519 Technical requirements for hand held UWB systems

* The EUT complies with FCC Part 15 Subpart B: 2009, final revised on February 27, 2009.

3.2 Procedures & Results (Hand held UWB systems)

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted Emission	ANSI C63.4:2003	FCC 15.505(a) FCC 15.207	-	N/A	11.5dB 0.22816MHz, L1, QP	Complied
UWB Bandwidth	ANSI C63.4:2003 FCC 15.503 (a)	FCC 15.503 (d) FCC 15.519 (b)	Conducted	N/A	-	Complied
Radiated Emission	ANSI C63.4:2003 FCC 15.521 (d)	15.519 (c) (d)	Radiated	N/A	10.5dB 13440.00MHz, Horizontal	Complied
Peak level of the Emission	ANSI C63.4:2003 FCC 15.521 (e) (g)	FCC 15.209 FCC 15.519 (e)	Radiated	N/A	34.0dB 4494.00MHz, Horizontal	Complied
Transmitter Timeout	ANSI C63.4:2003	FCC 15.519 (a) (1)	Conducted	N/A	-	Complied

Note: UL Japan's EMI Work Procedures No.QPM05.

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.4:2003 RSS-Gen 4.6.1	RSS-Gen 4.6.1	Conducted	-	N/A

* 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 anechoic chamber (±)	No.2 anechoic chamber (±)	No.3 anechoic chamber (±)
Conducted emission			
150kHz-30MHz	3.0 dB	2.7 dB	2.8 dB
Radiated emission (3m)			
30-300MHz	4.4 dB	4.3 dB	4.5 dB
300-1000MHz	4.3 dB	4.2 dB	4.5 dB
1GHz<	5.7 dB	5.6 dB	5.6 dB

Conducted emission test

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

Radiated emission test

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

3.5 Test location

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

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 anechoic chamber)
 2973D-2 (No2 anechoic chamber)
 2973D-3 (No3 anechoic chamber)

Test room	Width x Depth x Height (m)	Test room	Width x Depth x Height (m)
No.1 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	No.1 Shielded room	6.8 x 4.1 x 2.7
No.2 Semi-anechoic chamber	20.6 x 11.3 x 7.65 Maximum measurement distance: 10m	No.2 Shielded room	6.8 x 4.1 x 2.7
No.3 Semi-anechoic chamber	12.7 x 7.7 x 5.35 Maximum measurement distance: 5m	No.3 Shielded room	6.3 x 4.7 x 2.7
No.4 Semi-anechoic chamber	8.1 x 5.1 x 3.55	No.4 Shielded room	4.4 x 4.7 x 2.7
		No.5 Shielded room	7.8 x 6.4 x 2.7
		No.6 Shielded room	7.8 x 6.4 x 2.7

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4 System test configuration

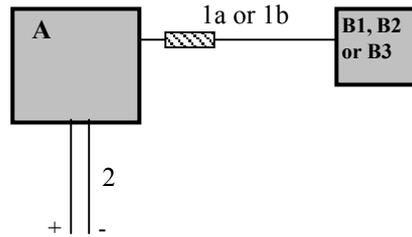
4.1 Justification

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

Test item	Operating mode	Tested frequency
All Item	Transmitting (Data system: M18)	4480MHz

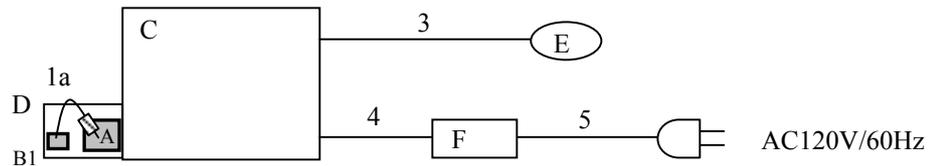
4.2 Configuration of tested system

Radiated Emission



 : Radio Wave Containment Sheet 40(L)x7.5(W)mm KG1510 series Sony Chemical & Information Device Corporation

Conducted Emission



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID (Remarks)
A	TransferJet Module	CXN5000	5000-01	SONY	AK8CXN5000 (EUT)
B1	TransferJet coupler (Antenna Type A)	CXN5000CPRMPS (WHA9400-1632F/WHA9400-1632E)	-	SMK Corporation	(EUT)
B2	TransferJet coupler (Antenna Type B)	RC-S629	-	SMK Corporation	(EUT)
B3	TransferJet coupler (Antenna Type C)	AJC-L08-02	-	ADVANEX INC.	(EUT)
C	Note PC	PCG-5N1N	J003GZ7Z	SONY	-
D	Express Card to mini PCI Express Adapter	EC-PEM-ENG	-	ALLION	-
E	Mouse	MOCZUL	H19000GB	DELL	D.o.C
F	AC Adaptor	VGP-AC19V25	0363443	SONY	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1a	U-FL Cable (Type A)	0.134	Shielded	Shielded	U.FL-2LP-068-A-134
1b	U-FL Cable (Type B)	0.536	Shielded	Shielded	U.FL-2LP-068-A-536
2	DC Cable	1.5	Unshielded	Unshielded	-
3	USB Cable	1.8	Shielded	Shielded	-
4	DC Cable	1.8	Unshielded	Unshielded	-
5	AC Cable	0.7	Unshielded	Unshielded	-

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5 Conducted emissions

5.1 Operating environment

The test was carried out in No.3 Shield Room.

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 table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.

The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT 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.

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source.

Photographs of the set up are shown in Appendix 1.

5.3 Test conditions

Frequency range : 0.15 - 30MHz
EUT position : Table top
EUT operation mode: Transmitting

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT within a screened room.

The AC adapter of the PC 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 detector of the test receiver.

Detector Type : Quasi-Peak/ Average
IF Bandwidth : 9kHz

5.5 Results

Summary of the test results : Pass

Date : July 24, 2009

Test engineer : Tatsuya Arai

6 UWB bandwidth & Occupied bandwidth (99%)

Test procedure

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

Summary of the test results: Pass

Date : July 23, 2009

Test engineer : Tatsuya Arai

UL Japan, Inc.

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7 Radiated Emission and Peak level of the Emission

7.1 Operating environment

The test was carried out in No.3 anechoic chamber.

7.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.25m by 0.25m, raised 0.8m(below 960MHz) and 1.0m (above 960MHz) above the conducting ground plane. Photographs of the set up are shown in Appendix 1.

7.3 Test conditions

Frequency range : 30MHz - 40GHz
 Test distance : 3m (30-960MHz), 0.5m (960MHz-10.6GHz), 0.3m (10.6-26.5GHz),
 0.1m (26.5-40GHz)

7.4 Test procedure

The Radiated Emission has been measured with a ground plane and at a distance of 3m, 0.5m, 0.3m and 0.1m. 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, RMS and Peak detector.

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

Frequency	:	30-960MHz	960MHz-40GHz
Detector Type	:	Quasi-Peak	RMS Peak
IF Bandwidth	:	120kHz	RBW:1MHz/VBW:1MHz RBW:3MHz/VBW:3MHz RBW:1kHz/VBW:1kHz (15.519(d))

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.

Combinations of the worst position

Model	Worst position	
	Below 1GHz	Above 1GHz
Module	Horizontal: Y, Vertical: Y	Horizontal: Y, Vertical: Y
Antenna	Horizontal: Y, Vertical: Y	Horizontal: Y, Vertical: X

The carrier level and noise levels were confirmed at each case of Antenna Type A Type B and TypeC, Cable Type A, and Type B of EUT to see the case of maximum noise, and the test was made at the case that has the maximum noise.

Combinations of the worst case

Model	Worst case
Antenna	Type A
Cable	Type A

7.6 Results

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

Date : July 21 and 23, 2009 Test engineer : Tatsuya Arai

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8 Transmitter Timeout

Test procedure

The Transmitter Timeout was measured with a spectrum analyzer connected to the antenna port.

Summary of the test results: Pass

Date : July 23, 2009

Test engineer : Tatsuya Arai

APPENDIX 1: Photographs of test setup

Page 11	:	Conducted emission
Page 12	:	Radiated emission
Page 13-16	:	Pre-check of the worst position and case

APPENDIX 2: Test data

Page 17	:	Conducted emission
Page 18	:	USB bandwidth and Occupied Bandwidth (99%)
Page 19 - 20	:	Radiated Emission
Page 21	:	Peak level of the Emission
Page 22	:	Transmitter Timeout
Page 23	:	Pre-check worst case

APPENDIX 3: Test instruments

Page 24	:	Test instruments
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