

# EMI TEST REPORT

**Test Report No. : 31GE0245-HO-B**

**Applicant** : SHARP CORPORATION  
**Type of Equipment** : Cellular Phone  
**Model No.** : SH-12C  
**FCC ID** : APYHRO00147  
**Test standard** : FCC Part 15 Subpart B 2010 Class B  
**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 product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

**Date of test:** March 28 and 29, 2011

**Representative test engineer:**



Hiroyuki Furutaka  
Engineer of WiSE Japan,  
UL Verification Service

**Approved by:**



Yutaka Yoshida  
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 : SHARP CORPORATION  
Address : 2-13-1 Iida, Hachihonmatsu, Higashi-Hiroshima City, Hiroshima, 739-0192 Japan  
Telephone Number : +81-82-420-1825  
Facsimile Number : +81-82-420-1829  
Contact Person : Kazuo Sugimoto

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

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

Type of Equipment : Cellular Phone  
Model No. : SH-12C  
Serial No. : Refer to Section 4, Clause 4.2  
Receipt Date of Sample : March 19, 2011  
Country of Mass-production : Japan  
Condition of EUT : Production 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**

Feature of EUT : Tri-band (800/850/2000)WCDMA & GSM Dual mode Cellular Phone / Bluetooth/W-LAN , Felica & 1.5GHz Band Satellite Receiver (GPS) enable  
- GSM (EU:900/1800M, 1900M)  
- WCDMA (EU:2000M, US:850M, JPN: 800/2000)  
Clock frequencies in the system : CPU: 1.4GHZ  
Source oscillation: 48MHz

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**Head Office EMC Lab.**

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### **SECTION 3: Test specification, procedures & results**

#### **3.1 Test specification**

Test Specification : FCC Part 15 Subpart B: 2010, final revised on December 6, 2010 and effective January 5, 2011

Title : FCC 47CFR Part15 Radio Frequency Device  
Subpart B Unintentional Radiators

#### **3.2 Procedures and results**

Item	Test Procedure	Limits	Deviation	Worst margin	Result
Conducted emission	ANSI C63.4: 2003 7. AC powerline conducted emission measurements	Class B	N/A	[QP] 16.0dB 0.16543MHz, N [AV] 17.6dB 0.16543MHz, N	Complied
Radiated emission	ANSI C63.4: 2003 8. Radiated emission measurements	Class B	N/A	7.9dB 639.079MHz, Horizontal, QP	Complied

\*Note: UL Japan, Inc's EMI Work Procedure QPM05.

#### **3.3 Addition to standard**

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

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### 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)	Conducted emission (+dB)
	150kHz-30MHz
No.1	3.1dB
No.2	3.3dB
No.3	3.7dB
No.4	3.2dB

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	3.5dB	5.1dB	5.2dB	4.8dB	5.1dB	4.4dB	4.3dB
No.2	4.0dB	5.1dB	5.2dB	4.8dB	5.0dB	4.3dB	4.2dB
No.3	4.2dB	4.7dB	5.2dB	4.8dB	5.0dB	4.5dB	4.2dB
No.4	4.0dB	5.0dB	5.1dB	4.8dB	5.0dB	5.1dB	4.2dB

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

#### Conducted Emission test

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

#### Radiated emission test(3m)

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

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### 3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. \*NVLAP Lab. code: 200572-0  
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN  
Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	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 Test set up, Data of EMI, and Test instruments

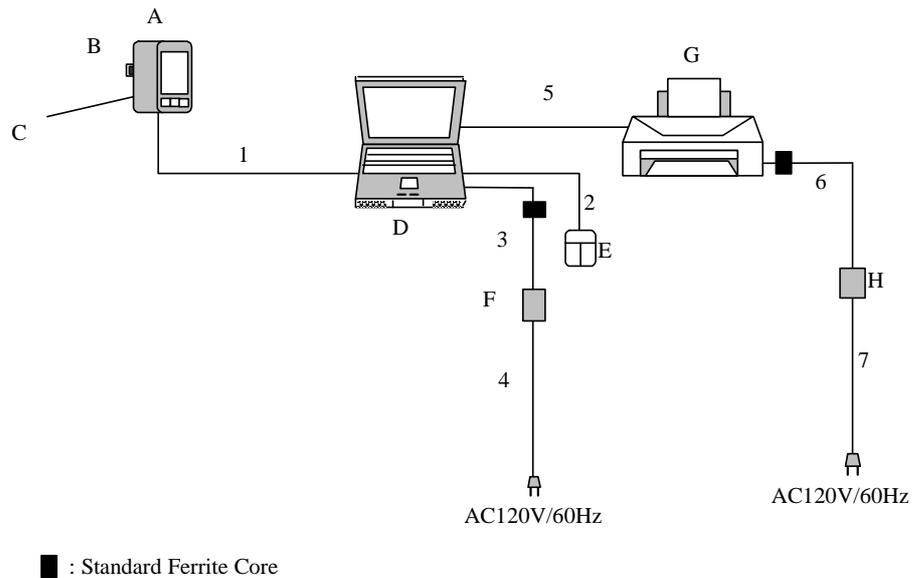
Refer to APPENDIX.

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

### 4.1 Operating modes

The mode(s) : 1) USB Data Com Mode  
The USB data is communicated between EUT and Personal computer (Pair of EUT).  
2) Standby Mode  
Standby state for USB communication.

### 4.2 Configuration and peripherals



\*Cabling and setup were taken into consideration and test data was taken under worse case conditions.

**Description of EUT and Support equipment**

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Cellular Phone	SH-12C	04401113265298	Sharp Corporation	EUT
B	microSD Memory Card	SD-C02G	1011CS75546	Toshiba	-
C	Lithium-Ion Battery	Battery Pack SH28	-	Sharp Corporation	EUT
D	Personal Computer	PP11L	CN-0D4571-48643-58P-1053	DELL	-
E	Mouse	M-UAG120	G83C0007F310	Toshiba	-
F	AC Adapter (PC)	PA-1650-O5D2	CN-0F7970-71615-77F-0D63	DELL	-
G	Printer	C6410A	8G8BA1W18J	Hewlett Packard	-
H	AC Adaptor	AT-3018A-0101	C4557-60004	Hewlett Packard	-

**List of cables used**

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Data Cable	0.80	Shielded	Shielded	-
2	Mouse Cable	0.71	Shielded	Shielded	-
3	DC Power Cable (PC)	1.80	Unshielded	Unshielded	-
4	AC Power Cable (PC)	0.90	Unshielded	Unshielded	-
5	Printer Cable	2.00	Shielded	Shielded	-
6	DC Power Cable (printer)	2.00	Unshielded	Unshielded	-
7	AC Power Cable (printer)	1.80	Unshielded	Unshielded	-

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## **SECTION 5: Conducted Emission**

### **5.1 Operating environment**

Test place : No.1 semi anechoic chamber.  
Temperature : See data  
Humidity : See data

### **5.2 Test configuration**

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT and its peripherals was aligned and 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 the LISN/AMN and excess AC cable was bundled in center. I/O cables that were connected to the other peripherals were bundled in center. They were folded back and forth 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/AMN to the input power source. All unused 50 ohm connectors of the LISN/AMN were resistivity terminated in 50 ohm when not connected to the measuring equipment. Photographs of the set up are shown in Appendix 1.

Frequency range : 0.15 MHz-30MHz  
EUT position : Table top  
EUT operation mode : See Clause 4.1

### **5.3 Test procedure**

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT within a semi anechoic chamber. The EUT was connected to a Line Impedance Stabilization Network (LISN)/ Artificial Mains network (AMN). An overview sweep with peak detection has been performed. The measurements have been performed with a quasi-peak detector and if required, with an average detector.

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

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

### **5.4 Test result**

Summary of the test results: Pass

Date: March 29, 2011

Test engineer: Hiroyuki Furutaka

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## **SECTION 6: Radiated Emission**

### **6.1 Operating environment**

Test place : No.1 semi anechoic chamber  
Temperature : See data  
Humidity : See data

### **6.2 Test configuration**

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

### **6.3 Test conditions**

Frequency range : 30MHz-300MHz (Biconical antenna) / 300MHz-1000MHz (Logperiodic antenna)  
1000MHz - 7000MHz (Horn antenna)  
Test distance : 3m  
EUT position : Table top  
EUT operation mode : See Clause 4.1

### **6.4 Test procedure**

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 intensity. The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer. The radiated emission measurements were made with the following detector function of the test receiver and the Spectrum analyzer.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
IF Bandwidth	QP: BW 120kHz	PK: RBW:1MHz/VBW: 3MHz AV *1): RBW:1MHz/VBW:10Hz

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

- The 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 representative X-axis since no difference was found among each position.

### **6.5 Test result**

Summary of the test results: Pass

Date: March 28, 2011

Test engineer: Hiroyuki Furutaka

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**APPENDIX 1: Photographs of test setup**

**Conducted Emission**

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**Radiated Emission**

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**Worst Case Position (Horizontal: X-axis/ Vertical:X-axis)**

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**APPENDIX 2: Data of EMI test**

**Conducted Emission**

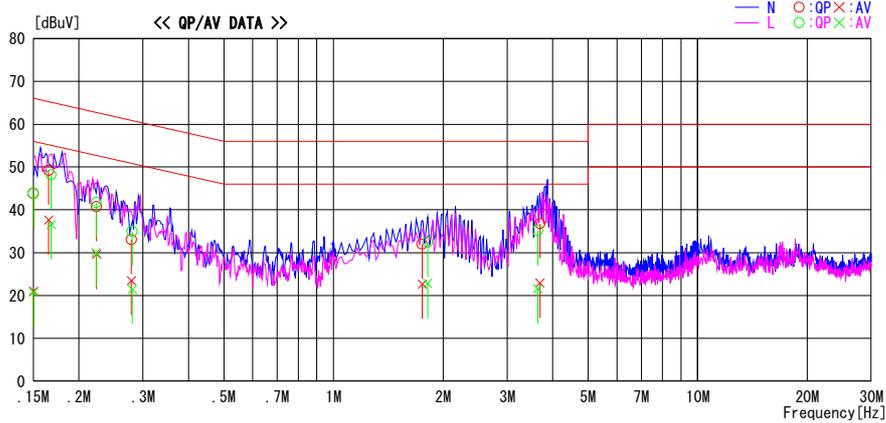
**DATA OF CONDUCTED EMISSION TEST**

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2011/03/29

Report No. : 31GE0245-H0  
Temp./Humi. : 23deg. C / 33% RH  
Engineer : Hiroyuki Furutaka

Mode / Remarks : USB Date Com Mode

LIMIT : FCC15.107(a) QP  
FCC15.107(a) AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	30.7	7.6	13.2	43.9	20.8	66.0	56.0	22.2	35.2	L	
0.15000	30.6	7.8	13.2	43.8	21.0	66.0	56.0	22.2	35.0	N	
0.16543	36.0	24.4	13.2	49.2	37.6	65.2	55.2	16.0	17.6	N	
0.16783	35.0	23.4	13.2	48.2	36.6	65.1	55.1	16.9	18.5	L	
0.22364	27.4	16.3	13.3	40.7	29.6	62.7	52.7	22.0	23.1	N	
0.22304	28.4	16.7	13.3	41.7	30.0	62.7	52.7	21.0	22.7	L	
0.28016	21.7	8.2	13.3	35.0	21.5	60.8	50.8	25.8	29.3	L	
0.27905	19.8	10.2	13.3	33.1	23.5	60.8	50.8	27.7	27.3	N	
1.81362	19.0	9.3	13.5	32.5	22.8	56.0	46.0	23.5	23.2	L	
1.75350	18.5	9.2	13.5	32.0	22.7	56.0	46.0	24.0	23.3	N	
3.69138	23.0	9.1	13.8	36.8	22.9	56.0	46.0	19.2	23.1	N	
3.63426	21.4	7.8	13.8	35.2	21.6	56.0	46.0	20.8	24.4	L	

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT[dBuV]=READING[dBuV]+C.F[dB] (L1SN LOSS+CABLE LOSS+ ATTENATOR LOSS)  
Except for the above table : adequate margin data below the limits.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

## Conducted Emission

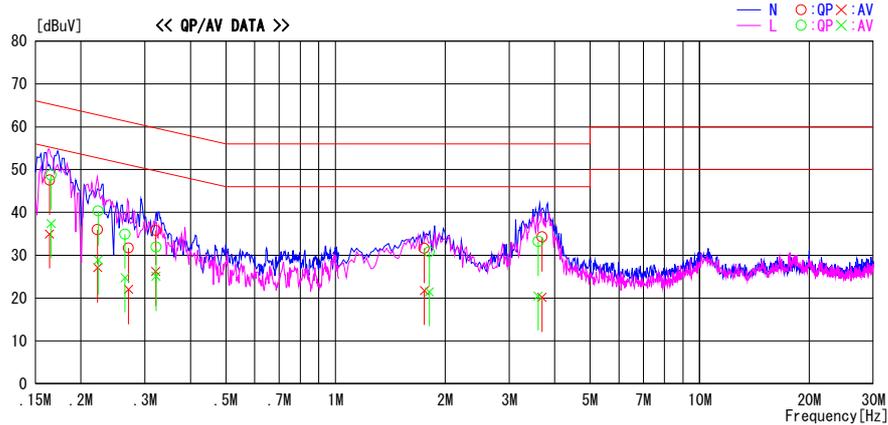
### DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2011/03/29

Report No. : 31GE0245-HO  
Temp./Humi. : 23deg. C / 33% RH  
Engineer : Hiroyuki Furutaka

Mode / Remarks : Standby Mode

LIMIT : FCC15.107(a) QP  
FCC15.107(a) AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.16402	34.3	21.8	13.2	47.5	35.0	65.3	55.3	17.8	20.3	N	
0.16578	35.5	24.2	13.2	48.7	37.4	65.2	55.2	16.5	17.8	L	
0.22214	22.7	13.8	13.3	36.0	27.1	62.7	52.7	26.7	25.6	N	
0.22314	27.0	15.6	13.3	40.3	28.9	62.7	52.7	22.4	23.8	L	
0.26462	21.6	11.5	13.3	34.9	24.8	61.3	51.3	26.4	26.5	L	
0.27034	18.4	8.7	13.3	31.7	22.0	61.1	51.1	29.4	29.1	N	
0.32074	22.5	12.9	13.3	35.8	26.2	59.7	49.7	23.9	23.5	N	
0.32144	18.6	11.8	13.3	31.9	25.1	59.7	49.7	27.8	24.6	L	
1.80961	17.3	8.0	13.5	30.8	21.5	56.0	46.0	25.2	24.5	L	
1.75375	18.1	8.3	13.5	31.6	21.8	56.0	46.0	24.4	24.2	L	
3.60280	19.4	6.7	13.8	33.2	20.5	56.0	46.0	22.8	25.5	L	
3.69338	20.5	6.4	13.8	34.3	20.2	56.0	46.0	21.7	25.8	N	

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT [dBuV] = READING [dBuV] + C.F [dB] (L1SN LOSS + CABLE LOSS + ATTENUATOR LOSS)  
Except for the above table : adequate margin data below the limits.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

## Radiated Emission

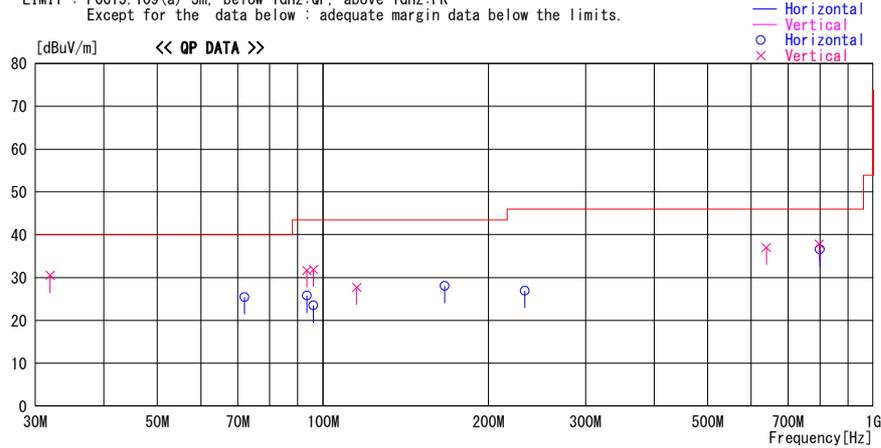
### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2011/03/28

Report No. : 31GE0245-HO  
Temp./Humi. : 22deg. C / 31% RH  
Engineer : Hiroyuki Furutaka

Mode / Remarks : USB Date Com Mode Worst Axis(Hor:X , Ver:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK  
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
31.943	46.9	QP	17.6	-34.0	30.5	202	100	Vert.	40.0	9.5	
72.058	52.3	QP	6.4	-33.2	25.5	113	262	Hori.	40.0	14.5	
93.549	50.0	QP	8.5	-32.7	25.8	248	188	Hori.	43.5	17.7	
93.526	55.9	QP	8.5	-32.7	31.7	89	100	Vert.	43.5	11.8	
96.121	47.1	QP	9.0	-32.6	23.5	80	196	Hori.	43.5	20.0	
96.123	55.5	QP	9.0	-32.6	31.9	174	100	Vert.	43.5	11.6	
115.185	48.2	QP	11.8	-32.3	27.7	151	100	Vert.	43.5	15.8	
166.251	44.0	QP	15.5	-31.5	28.0	102	192	Hori.	43.5	15.5	
232.805	40.7	QP	16.9	-30.7	26.9	45	160	Hori.	46.0	19.1	
639.078	44.6	QP	20.5	-28.0	37.1	24	100	Vert.	46.0	8.9	
798.132	42.6	QP	22.1	-26.8	37.9	71	100	Vert.	46.0	8.1	
799.995	41.3	QP	22.1	-26.8	36.6	120	100	Hori.	46.0	9.4	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN  
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

\*The limit is rounded down to one decimal place.  
\*The test result is rounded off to one or two decimal places, so some differences might be observed.

## Radiated Emission

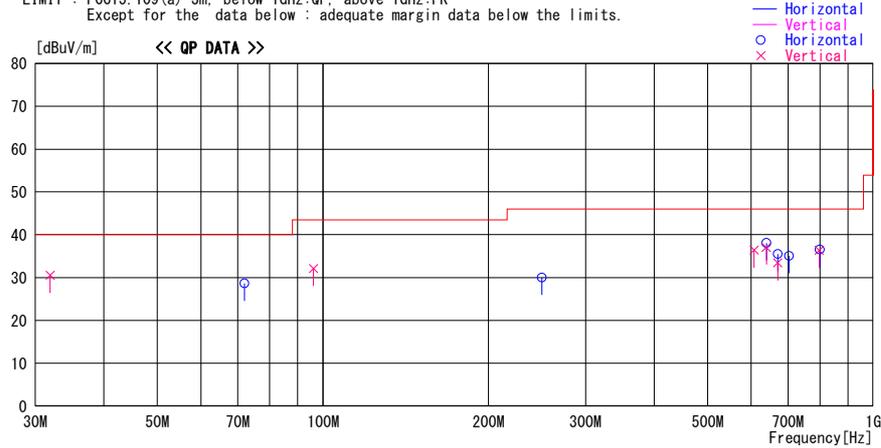
### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2011/03/28

Report No. : 31GE0245-HO  
Temp./Humi. : 22deg. C / 31% RH  
Engineer : Hiroyuki Furutaka

Mode / Remarks : Standby Mode Worst Axis(Hor:X , Ver:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK  
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor	Gain							
			[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
31.940	46.9	QP	17.6	-34.0	30.5	229	100	Vert.	40.0	9.5	
72.016	55.4	QP	6.4	-33.2	28.6	102	269	Hori.	40.0	11.4	
96.114	55.7	QP	9.0	-32.6	32.1	155	100	Vert.	43.5	11.4	
249.980	43.5	QP	17.1	-30.6	30.0	343	128	Hori.	46.0	16.0	
607.129	44.3	QP	20.3	-28.2	36.4	9	100	Vert.	46.0	9.6	
639.077	44.6	QP	20.5	-28.0	37.1	336	100	Vert.	46.0	8.9	
639.079	45.6	QP	20.5	-28.0	38.1	155	124	Hori.	46.0	7.9	
671.037	40.5	QP	20.7	-27.8	33.4	28	100	Vert.	46.0	12.6	
671.031	42.6	QP	20.7	-27.8	35.5	155	111	Hori.	46.0	10.5	
702.981	41.6	QP	21.0	-27.5	35.1	232	100	Hori.	46.0	10.9	
800.001	41.2	QP	22.1	-26.8	36.5	113	100	Hori.	46.0	9.5	
797.991	41.0	QP	22.1	-26.8	36.3	72	100	Vert.	46.0	9.7	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN  
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

\*The limit is rounded down to one decimal place.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

## Radiated Emission

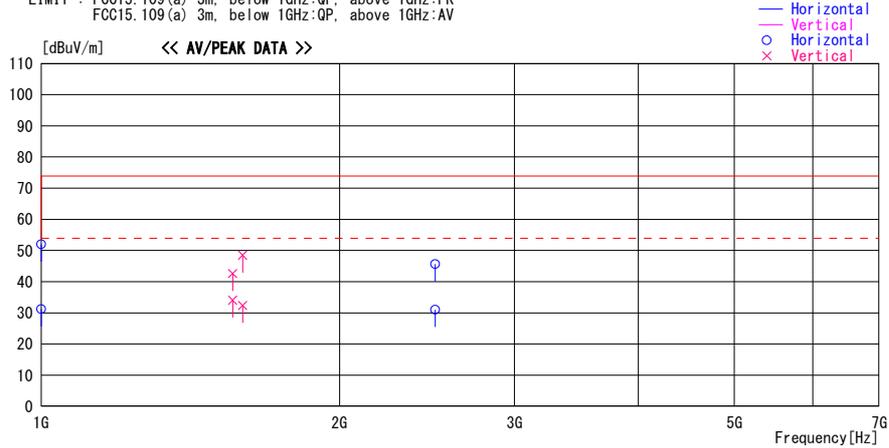
### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2011/03/28

Report No. : 31GE0245-H0  
Temp./Humi. : 22deg. C / 31% RH  
Engineer : Hiroyuki Furutaka

Mode / Remarks : USB Date Com Mode Worst Axis(Hor:X , Ver:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK  
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor [dB/m]	Gain [dB]							
1000.125	63.9	PK	23.9	-35.8	52.0	346	100	Hori.	73.9	21.9	
1000.125	43.1	AV	23.9	-35.8	31.2	346	100	Hori.	53.9	22.7	
1559.920	43.1	AV	25.5	-34.5	34.1	156	100	Vert.	53.9	19.8	
1559.920	51.6	PK	25.5	-34.5	42.6	156	100	Vert.	73.9	31.3	
1597.250	41.3	AV	25.6	-34.5	32.4	360	127	Vert.	53.9	21.5	
1597.250	57.4	PK	25.6	-34.5	48.5	360	127	Vert.	73.9	25.4	
2495.951	52.4	PK	26.9	-33.6	45.7	177	100	Hori.	73.9	28.2	
2495.951	37.7	AV	26.9	-33.6	31.0	177	100	Hori.	53.9	22.9	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN  
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

\*The limit is rounded down to one decimal place.  
\*The test result is rounded off to one or two decimal places, so some differences might be observed.

## Radiated Emission

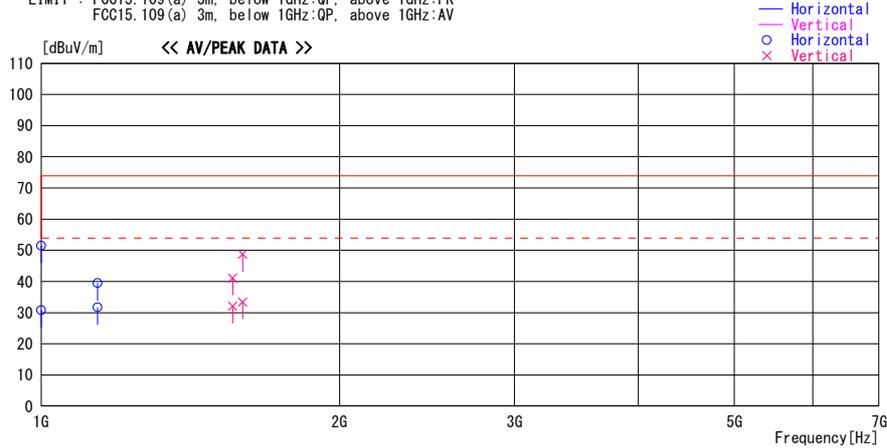
### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2011/03/28

Report No. : 31GE0245-HO  
Temp./Humi. : 22deg. C / 31% RH  
Engineer : Hiroyuki Furutaka

Mode / Remarks : Standby Mode Worst Axis(Hor:X , Ver:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK  
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
1000.123	63.4	PK	23.9	-35.8	51.5	350	100	Hori.	73.9	22.4	
1000.123	42.7	AV	23.9	-35.8	30.8	350	100	Hori.	53.9	23.1	
1139.980	50.4	PK	24.4	-35.3	39.5	17	100	Hori.	73.9	34.4	
1139.980	42.6	AV	24.4	-35.3	31.7	17	100	Hori.	53.9	22.2	
1559.920	41.1	AV	25.5	-34.5	32.1	154	100	Vert.	53.9	21.8	
1559.920	50.1	PK	25.5	-34.5	41.1	154	100	Vert.	73.9	32.8	
1597.250	42.3	AV	25.6	-34.5	33.4	360	125	Vert.	53.9	20.5	
1597.250	57.6	PK	25.6	-34.5	48.7	360	125	Vert.	73.9	25.2	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN  
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

\*The limit is rounded down to one decimal place.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

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

#### **EMI Test Instruments**

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-01	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	RE/CE	2010/07/02 * 12
MOS-01	Digital Humidity Indicator	N.T	NT-1800	MOS01	RE/CE	2011/02/23 * 12
MJM-01	Measure	KDS	ES19-55	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	100084	RE/CE	2010/12/07 * 12
KBA-05	Biconical Antenna	Schwarzbeck	BBA9106	2513	RE	2010/10/15 * 12
KLA-04	Logperiodic Antenna	Schwarzbeck	USLP9143	361	RE	2010/10/16 * 12
MAT-08	Attenuator(6dB)	Weinschel Corp	2	BK7971	RE	2010/11/05 * 12
MCC-01	Coaxial Cable 0.1-3000MHz	Suhner/storm/Agilent/T SJ	-	-	RE	2010/10/14 * 12
MPA-20	Pre Amplifier	Elena	EPA-4020YA	030801	RE	2011/03/27 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2011/02/15 * 12
MHA-05	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	253	RE	2010/06/29 * 12
MCC-18	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	148048-143(1m) / 292410(5m)	RE	2010/09/30 * 12
MPA-01	Pre Amplifier	Agilent	8449B	3008A01671	RE	2011/02/24 * 12
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	8127383	CE(AE)	2010/07/04 * 12
MLS-03	LISN(AMN)	Schwarzbeck	NSLK8127	8127384	CE(EUT)	2010/07/28 * 12
MTA-30	Terminator	TME	CT-01	-	CE	2011/01/05 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/3D-2W(7.5m)/RG400u(1.5m)/RFM-E421(Switcher)	- /01068(Switcher)	CE	2011/01/16 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2011/02/22 * 12

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

**All equipment is calibrated with traceable calibrations. Each calibration 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:**

**CE: Conducted Emissions**

**RE: Radiated Emissions**

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