



# EMI TEST REPORT

Test Report No. : 30GE0131-HO-B

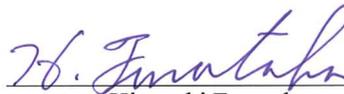
**Applicant** : Sharp Corporation, Communication Systems Group.  
**Type of Equipment** : Cellular Phone  
**Model No.** : SH-08B  
**FCC ID** : APYHRO00121  
**Test standard** : FCC Part 15 Subpart B 2010 Class B  
**Test Result** : Complied

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:

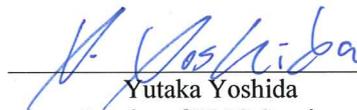
March 29, 2010

Tested by:



Hiruyuki Furutaka  
Engineer of EMC Service

Approved by:



Yutaka Yoshida  
Leader of EMC 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://uljapan.co.jp/emc/nvlap.html>

UL Japan, Inc.

Head Office EMC Lab.

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MF060b (06.08.09)

<b>CONTENTS</b>	<b>PAGE</b>
<b>SECTION 1: Customer information .....</b>	<b>3</b>
<b>SECTION 2: Equipment under test (E.U.T.) .....</b>	<b>3</b>
<b>SECTION 3: Test specification, procedures &amp; results .....</b>	<b>4</b>
<b>SECTION 4: Operation of E.U.T. during testing .....</b>	<b>7</b>
<b>SECTION 5: Conducted Emission .....</b>	<b>9</b>
<b>SECTION 6: Radiated Emission .....</b>	<b>10</b>
<b>APPENDIX 1: Photographs of test setup.....</b>	<b>11</b>
Conducted Emission .....	11
Radiated Emission .....	12
Worst Case Position (Horizontal: Y-axis/ Vertical:Y-axis) .....	13
<b>APPENDIX 2: Data of EMI test .....</b>	<b>14</b>
Conducted Emission .....	14
Radiated Emission .....	16
<b>APPENDIX 3: Test instruments .....</b>	<b>20</b>

## **SECTION 1: Customer information**

Company Name : Sharp Corporation, Communication Systems Group.  
Address : 2-13-1 Iida Hachihonmatsu HigashiHiroshima-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-08B  
Serial No. : Refer to Section 4, Clause 4.2  
Receipt Date of Sample : March 29, 2010  
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**

Model No: SH-08B (referred to as the EUT in this report) is the Cellular Phone.

Feature of EUT : WCDMA Cellular Phone / Felica  
& 1.5GHz Band Satellite Receiver (GPS) enable  
- WCDMA (EU:2000M, USA:850M, JPN: 800/1700/2000M)  
Clock frequency(ies) in the system : 48MHz (Oscillator), 500.5MHz (CPU Clock)

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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 January 22, 2010 and effective March 1, 2010

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	FCC: ANSI C63.4: 2003 7. AC powerline conducted emission measurements	Class B	N/A	[QP] 15.3dB 0.15000MHz, N [AV] 18.0dB 0.15000MHz, N	Complied
Radiated emission	FCC: ANSI C63.4: 2003 8. Radiated emission measurements	Class B	N/A	8.3dB 797.867MHz 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.

### 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	2.6dB
No.2	2.9dB
No.3	3.3dB
No.4	2.8dB

Test room (semi-anechoic chamber)	Radiated emission (10m*)(±dB)			Radiated emission (3m*)(±dB)						(1m*)(±dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	(3m*)(±dB)					(1m*)(±dB)	
				9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz	
No.1	2.7dB	4.8dB	5.0dB	2.9dB	4.8dB	5.0dB	3.9dB	4.5dB	4.4dB	
No.2	-	-	-	3.5dB	4.8dB	5.1dB	4.0dB	4.3dB	4.2dB	
No.3	-	-	-	3.8dB	4.6dB	4.7dB	4.0dB	4.5dB	4.4dB	
No.4	-	-	-	3.5dB	4.4dB	4.9dB	4.0dB	4.6dB	4.5dB	

\*10m/3m/1m = 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

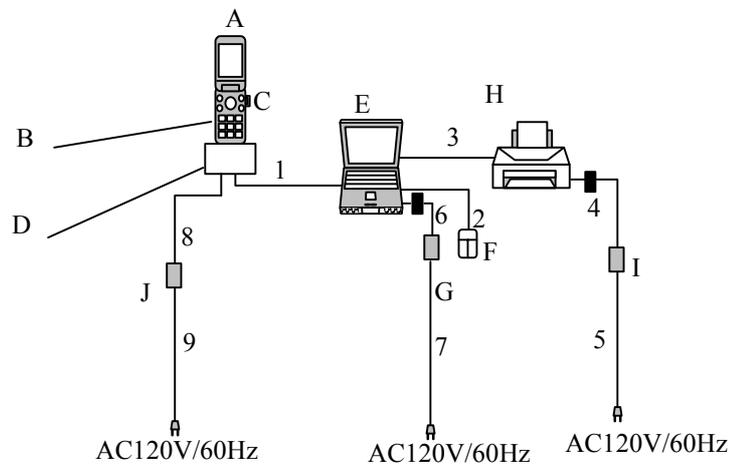
Refer to APPENDIX 1 to 3.

## **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**



■ : Standard Ferrite Core

\*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-08B	004401112435132	Sharp Corporation	EUT
B	Lithium-Ion Battery	Battery Pack SH23	-	Sharp Corporation	EUT
C	microSD Memory Card	SD-C08G	0831U49492Y	TOSHIBA	-
D	Desktop Holder	SH32	-	Sharp Corporation	EUT
E	Personal Computer	PP11L	CN-0D4571-48643-51T-0549	DELL	-
F	Mouse	M-UAG120	G83C0007F310	TOSHIBA	-
G	AC Adapter(PC)	PA-1650-05D	CN-0F7970-71615-77H-0D63	DELL	-
H	Printer	C6410A	SG8BA1W18J	Hewlett-Packard	-
I	AC Adapter (Printer)	AT3018A-0101	C4557-60004	Hewlett-Packard	-
J	AC Charger	MAS-BH0008-A002	-	NEC	-

**List of cables used**

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Data Cable	0.70	Shielded	Shielded	-
2	Mouse Cable	0.71	Shielded	Shielded	-
3	Printer Cable	2.00	Shielded	Shielded	-
4	DC Power Cable(Printer)	2.00	Unshielded	Unshielded	-
5	AC Power Cable(Printer)	1.75	Unshielded	Unshielded	-
6	DC Power Cable(PC)	1.80	Unshielded	Unshielded	-
7	AC Power Cable(PC)	0.90	Unshielded	Unshielded	-
8	DC Power Cable(set)	1.50	Unshielded	Unshielded	-
9	AC Power Cable(set)	0.56	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

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

Date: March 29, 2010

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 - 5000MHz (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 and Y axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

### **6.5 Test result**

Summary of the test results: Pass

\*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.

Date: March 29, 2010

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: Y-axis/ Vertical:Y-axis)**

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**APPENDIX 2: Data of EMI test**

**Conducted Emission**

**DATA OF CONDUCTED EMISSION TEST**

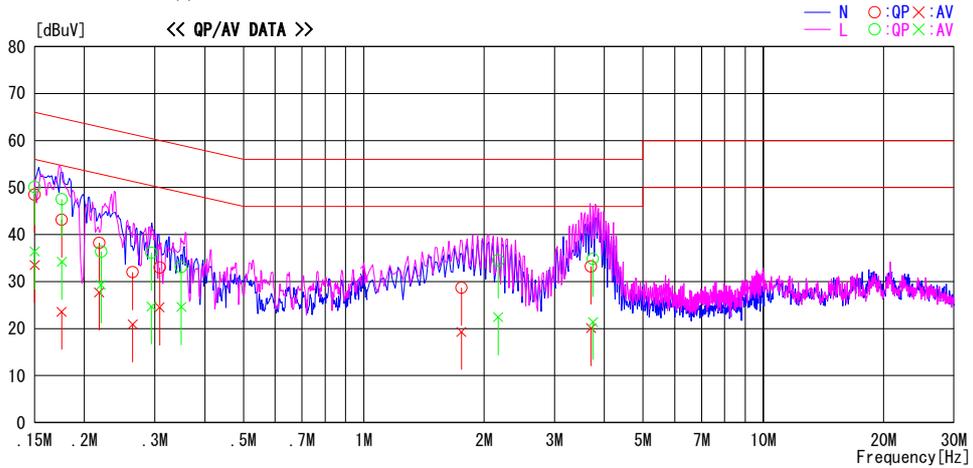
UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2010/03/29

Company : Sharp Corporation  
Kind of EUT : Cellular Phone  
Model No. : SH-08B  
Serial No. : 004401112435132

Report No. : 30GE0131-HO  
Power : AC 120V / 60Hz  
Temp./Humi. : 18deg. C. / 31%  
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	36.9	23.2	13.2	50.1	36.4	66.0	56.0	15.9	19.6	L	
0.15000	35.3	20.3	13.2	48.5	33.5	66.0	56.0	17.5	22.5	N	
0.17534	30.0	10.4	13.2	43.2	23.6	64.7	54.7	21.5	31.1	N	
0.17543	34.3	21.0	13.2	47.5	34.2	64.7	54.7	17.2	20.5	L	
0.21756	25.0	14.5	13.2	38.2	27.7	62.9	52.9	24.7	25.2	N	
0.21995	23.2	16.1	13.2	36.4	29.3	62.8	52.8	26.4	23.5	L	
0.26383	18.7	7.6	13.3	32.0	20.9	61.3	51.3	29.3	30.4	N	
0.29399	22.8	11.4	13.3	36.1	24.7	60.4	50.4	24.3	25.7	L	
0.30831	19.6	11.2	13.3	32.9	24.5	60.0	50.0	27.1	25.5	N	
0.34919	19.8	11.3	13.3	33.1	24.6	59.0	49.0	25.9	24.4	L	
1.75555	15.2	5.8	13.5	28.7	19.3	56.0	46.0	27.3	26.7	N	
2.16933	21.0	8.9	13.5	34.5	22.4	56.0	46.0	21.5	23.6	L	
3.70540	19.5	6.4	13.7	33.2	20.1	56.0	46.0	22.8	25.9	N	
3.74420	21.0	7.6	13.8	34.8	21.4	56.0	46.0	21.2	24.6	L	

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

## Conducted Emission

### DATA OF CONDUCTED EMISSION TEST

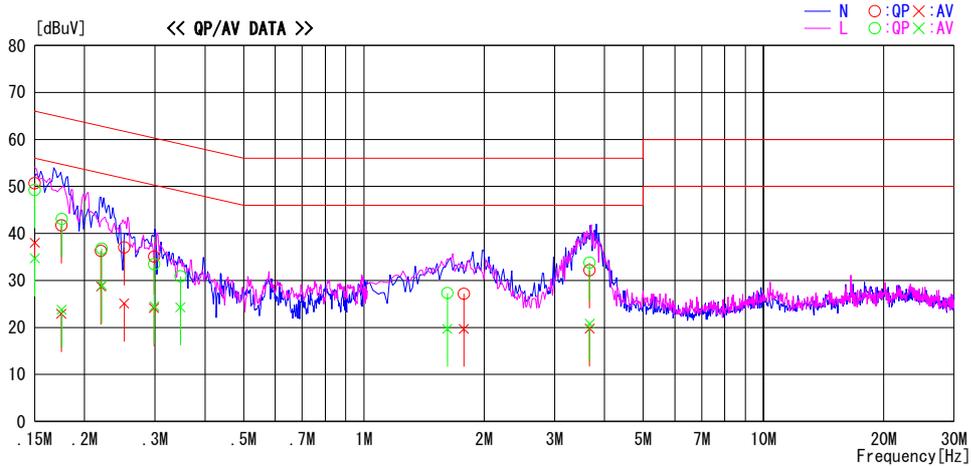
UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2010/03/29

Company : Sharp Corporation  
Kind of EUT : Cellular Phone  
Model No. : SH-08B  
Serial No. : 00440112435132

Report No. : 30GE0131-HO  
Power : AC 120V / 60Hz  
Temp./Humi. : 18deg. C. / 31%  
Engineer : Hiroyuki Furutaka

Mode / Remarks : Standby 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	37.5	24.8	13.2	50.7	38.0	66.0	56.0	15.3	18.0	N	
0.17497	28.5	9.7	13.2	41.7	22.9	64.7	54.7	23.0	31.8	N	
0.21990	23.1	15.5	13.2	36.3	28.7	62.8	52.8	26.5	24.1	N	
0.25110	23.7	11.8	13.3	37.0	25.1	61.7	51.7	24.7	26.6	N	
0.29839	21.8	10.8	13.3	35.1	24.1	60.3	50.3	25.2	26.2	N	
1.77755	13.7	6.2	13.5	27.2	19.7	56.0	46.0	28.8	26.3	N	
3.67334	18.5	6.1	13.7	32.2	19.8	56.0	46.0	23.8	26.2	N	
0.15000	36.0	21.5	13.2	49.2	34.7	66.0	56.0	16.8	21.3	L	
0.17524	29.9	10.6	13.2	43.1	23.8	64.7	54.7	21.6	30.9	L	
0.22086	23.6	15.8	13.2	36.8	29.0	62.8	52.8	26.0	23.8	L	
0.29881	20.2	11.2	13.3	33.5	24.5	60.3	50.3	26.8	25.8	L	
0.34753	17.6	11.0	13.3	30.9	24.3	59.0	49.0	28.1	24.7	L	
1.61795	13.8	6.2	13.5	27.3	19.7	56.0	46.0	28.7	26.3	L	
3.67334	20.1	7.1	13.7	33.8	20.8	56.0	46.0	22.2	25.2	L	

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

## Radiated Emission

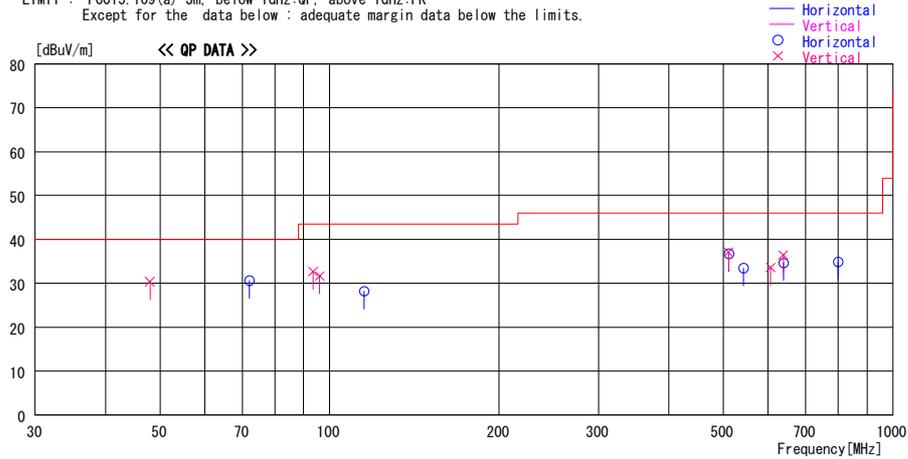
### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2010/03/29

Company : Sharp Corporation  
Kind of EUT : Cellular Phone  
Model No. : SH-08B  
Serial No. : 004401112435132  
Report No. : 30GE0131-HO  
Power : AC 120V / 60Hz  
Temp./Humi. : 18deg.C. / 31%  
Engineer : Hiroyuki Furutaka

Mode / Remarks : USB Data Com Mode Worst Axis(Hori:Y Vert:Y)

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		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit	
			Factor [dB/m]	Loss & Gain [dB]					[dBuV/m]	[dB]
47.997	52.4	QP	11.5	-33.6	30.3	82	100	Vert.	40.0	9.7
71.995	57.4	QP	6.5	-33.2	30.7	99	251	Hori.	40.0	9.3
93.494	56.7	QP	8.8	-32.8	32.7	145	100	Vert.	43.5	10.8
96.118	55.0	QP	9.3	-32.6	31.7	170	100	Vert.	43.5	11.9
115.186	48.3	QP	12.2	-32.3	28.2	350	280	Hori.	43.5	15.3
511.248	47.2	QP	18.4	-28.8	36.8	147	100	Hori.	46.0	9.2
511.253	47.5	QP	18.4	-28.8	37.1	325	118	Vert.	46.0	8.9
543.216	43.5	QP	18.6	-28.6	33.5	142	117	Hori.	46.0	12.5
607.115	42.8	QP	19.0	-28.2	33.6	13	106	Vert.	46.0	12.5
639.066	44.9	QP	19.5	-28.0	36.4	346	100	Vert.	46.0	9.6
639.069	43.2	QP	19.5	-28.0	34.7	319	132	Hori.	46.0	11.3
799.983	39.8	QP	22.0	-26.9	34.9	11	165	Hori.	46.0	11.1

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)

## Radiated Emission

### DATA OF RADIATED EMISSION TEST

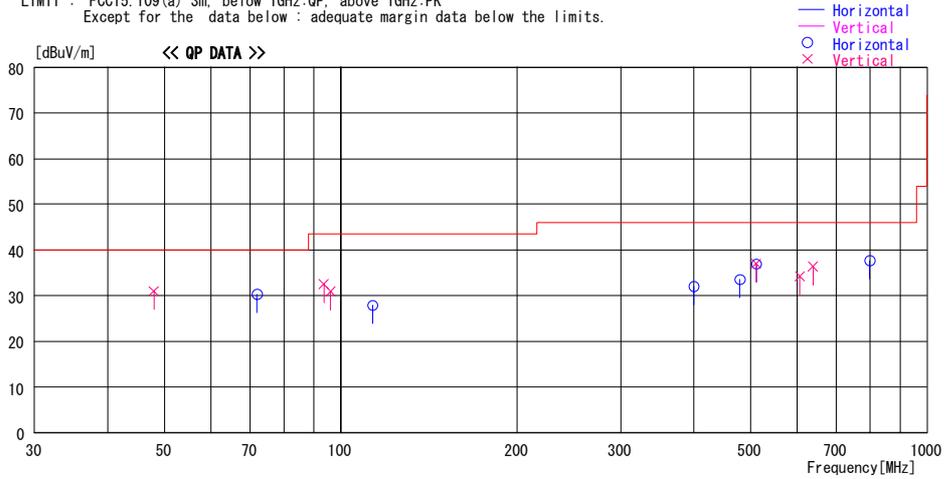
UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber  
Date : 2010/03/29

Company : Sharp Corporation  
Kind of EUT : Cellular Phone  
Model No. : SH-08B  
Serial No. : 004401112435132

Report No. : 30GE0131-HO  
Power : AC 120V / 60Hz  
Temp./Humi. : 18deg. C. / 31%  
Engineer : Hiroyuki Furutaka

Mode / Remarks : Standby Mode Worst Axis(Hori:Y Vert:Y)

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		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]
			Factor [dB/m]	Gain [dB]						
47.989	53.1	QP	11.5	-33.6	31.0	132	100	Vert.	40.0	9.0
71.992	57.0	QP	6.5	-33.2	30.3	100	245	Hori.	40.0	9.7
93.505	56.5	QP	8.8	-32.8	32.5	138	100	Vert.	43.5	11.0
96.112	54.2	QP	9.3	-32.6	30.9	162	100	Vert.	43.5	12.6
113.317	48.2	QP	12.0	-32.3	27.9	341	269	Hori.	43.5	15.6
399.979	45.5	QP	15.9	-29.4	32.0	13	100	Hori.	46.0	14.0
479.297	44.6	QP	17.9	-29.0	33.5	142	100	Hori.	46.0	12.5
511.246	47.3	QP	18.4	-28.8	36.9	156	100	Hori.	46.0	9.1
511.252	47.4	QP	18.4	-28.8	37.0	324	127	Vert.	46.0	9.0
607.112	43.4	QP	19.0	-28.2	34.2	189	139	Vert.	46.0	11.8
639.070	44.8	QP	19.5	-28.0	36.3	346	100	Vert.	46.0	9.7
797.867	42.7	QP	21.9	-26.9	37.7	150	100	Hori.	46.0	8.3

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)

**Radiated Emission**

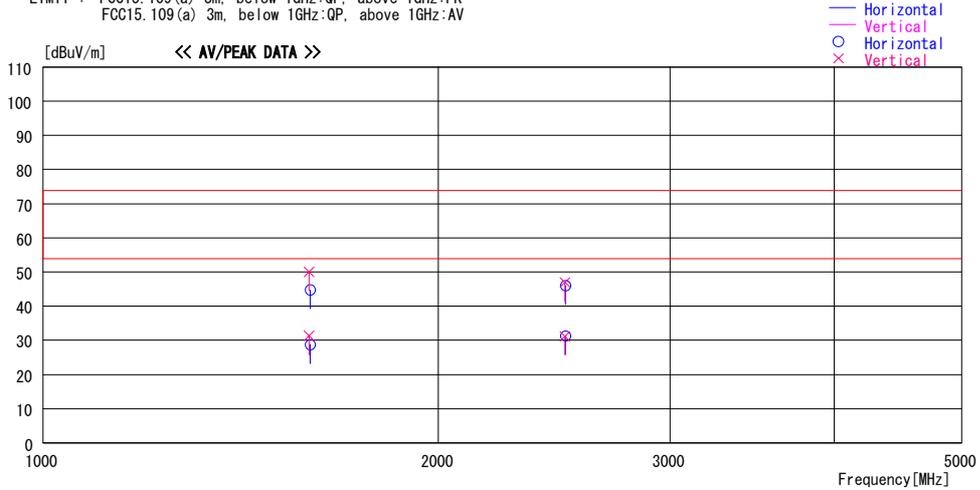
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Engineer : Hiroyuki Furutaka

Mode / Remarks : USB Date Com Mode Worst Axis(Hori:Y Vert:Y)

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	Margin	Comment
			Factor [dB/m]	Gain [dB]					[dBuV/m]	[dB]	
1594.100	58.3	PK	26.3	-34.6	50.0	190	100	Vert.	73.9	23.9	
1594.100	39.5	AV	26.3	-34.6	31.2	190	100	Vert.	53.9	22.7	
1596.600	53.1	PK	26.3	-34.6	44.8	331	117	Hori.	73.9	29.1	
1596.400	37.1	AV	26.3	-34.6	28.8	331	117	Hori.	53.9	25.1	
2496.100	37.8	AV	27.4	-34.0	31.2	69	100	Vert.	53.9	22.7	
2496.100	53.6	PK	27.4	-34.0	47.0	69	100	Vert.	73.9	26.9	
2498.720	37.9	AV	27.4	-34.0	31.3	160	120	Hori.	53.9	22.6	
2498.720	52.6	PK	27.4	-34.0	46.0	160	120	Hori.	73.9	27.9	

CHART: WITH FACTOR ANT TYPE: -30MHz: LOOP, 30-300MHz: BICONICAL, 300MHz-1000MHz: LOGPERIODIC, 1000MHz-: HORN  
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## Radiated Emission

### DATA OF RADIATED EMISSION TEST

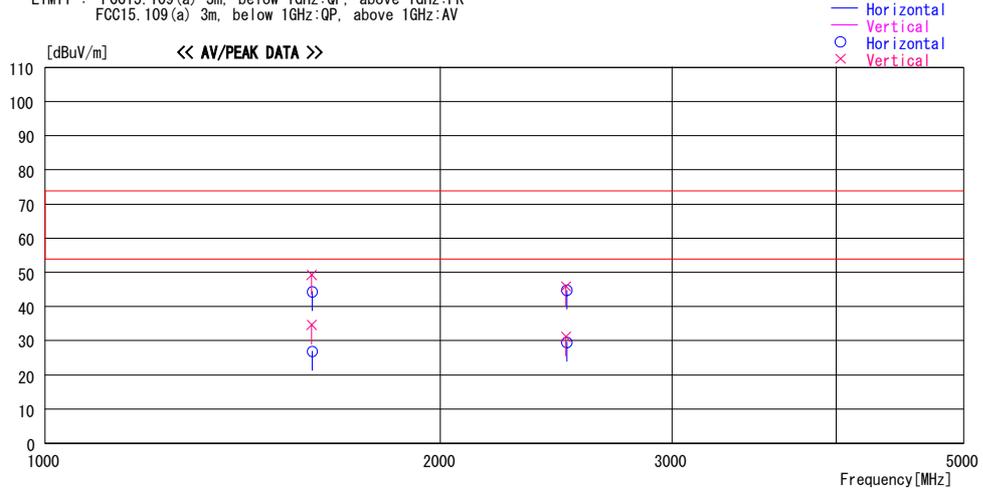
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LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK  
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss &	Level [dBuV/m]	Angle [Deg.]	Height [cm]	Polar.	Limit	Margin	Comment
			Factor [dB/m]	Gain [dB]					[dBuV/m]	[dB]	
1595.750	57.5	PK	26.3	-34.6	49.2	110	137	Vert.	73.9	24.8	
1595.750	42.9	AV	26.3	-34.6	34.6	110	137	Vert.	53.9	19.3	
1596.400	52.6	PK	26.3	-34.6	44.3	323	105	Hori.	73.9	29.6	
1596.400	35.2	AV	26.3	-34.6	26.9	323	105	Hori.	53.9	27.0	
2492.150	37.8	AV	27.3	-34.0	31.1	56	105	Vert.	53.9	22.8	
2492.150	52.5	PK	27.3	-34.0	45.8	56	105	Vert.	73.9	28.1	
2495.320	36.2	AV	27.4	-34.0	29.6	62	105	Hori.	53.9	24.3	
2495.320	51.4	PK	27.4	-34.0	44.8	62	105	Hori.	73.9	29.1	

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

#### **EMI test equipment**

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	2009/06/26 * 12
MOS-01	Digital Humidity Indicator	N.T	NT-1800	MOS01	RE/CE	2010/02/09 * 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	2009/12/17 * 12
MBA-01	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032007	RE	2009/10/03 * 12
MLA-09	Logperiodic Antenna	Schwarzbeck	USLP9143B	9143B006	RE	2009/10/03 * 12
MAT-08	Attenuator(6dB)	Weinschel Corp	2	BK7971	RE	2009/11/13 * 12
MCC-01	Coaxial Cable 0.1-3000MHz	Suhner/storm/Agilent /TSJ	-	-	RE	2009/10/09 * 12
MPA-20	Pre Amplifier	Elena	EPA-4020YA	030801	RE	2010/03/23 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2009/08/25 * 12
MHA-05	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	253	RE	2009/06/15 * 12
MCC-18	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	233010(1m) / 292410(5m)	RE	2009/09/16 * 12
MPA-01	Pre Amplifier	Agilent	8449B	3008A01671	RE	2010/02/12 * 12
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	8127383	CE(EUT)	2009/06/22 * 12
MLS-03	LISN(AMN)	Schwarzbeck	NSLK8127	8127384	CE(AE)	2009/07/16 * 12
MTA-06	Terminator	MCL	BTRM-50	1 9951	CE	2010/02/02 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/3D-2W(7.5m)/RG400u(1.5m)/RFM-E421(Switcher)	- /01068(Switcher)	CE	2010/01/05 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2010/02/04 * 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 emission**

**RE: Radiated emission**

**UL Japan, Inc.**

**Head Office EMC Lab.**

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