



RADIO TEST REPORT

Test Report No.: 28FE0217-HO-E

Applicant : SHARP CORPORATION
Type of Equipment : GSM Mobile Phone
Model No. : PV210
Test regulation : FCC Part 22 Subpart H: 2006
FCC ID : APYNAR0064
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 above regulation.
4. The test results in this report are traceable to the national or international standards.

Date of test:

March 4 to 19, 2008

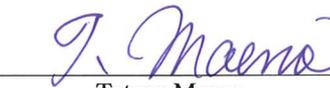
Tested by:


Yutaka Yoshida
EMC Services


Kazufumi Nakai
EMC Services


Satofumi Matsuyama
EMC Services

Approved by :


Tetsuo Maeno
Site Manager of EMC Services

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(09.01.08)

CONTENTS	PAGE
SECTION 1: Customer information	3
SECTION 2: Equipment under test (E.U.T.)	3
SECTION 3: Test specification, procedures & results	5
SECTION 4: Operation of E.U.T. during testing.....	8
SECTION 5: Peak Output Power (Conducted/Radiated).....	10
SECTION 6: Bandwidth and Band-Edge (Conducted).....	11
SECTION 7: Spurious Emission (Conducted)	11
SECTION 8: Spurious Radiation and Band-Edge (Radiated).....	11
SECTION 9: Frequency Stability	12
APPENDIX 1: Photographs of test setup.....	13
Spurious Radiation	13
Worst Case Position (Horizontal:X-axis:/ Vertical: Z-axis)	14
APPENDIX 2: Data of EMI test	15
Peak Output Power (Conducted)	15
Peak Output Power (Radiated)	16
Emission Bandwidth	17
99%Occupied Bandwidth	20
Band Edge(Conducted)	23
Band Edge (Radiated)	25
Spurious Emission (Conducted)	26
Spurious Radiation	33
Frequency Stability(Temperature/Voltage Variation).....	40
APPENDIX 3: Test instruments	42

SECTION 1: Customer information

Company Name : SHARP CORPORATION
Address : 492 Minosho-cho, Yamatokoriyama-city, NARA, 639-1186 JAPAN
Telephone Number : +81-743-55-4022
Facsimile Number : +81-743-55-2553
Contact Person : Juri Sugiyama

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

2.1 Identification of E.U.T.

Type of Equipment : GSM Mobile Phone
Model No. : PV210
Serial No. : 168
Rating : AC120V/60Hz (AC Adapter)
Country of Mass-production : Japan
Receipt Date of Sample : February 22, 2008
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.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

2.2 Product Description

Model No: PV210 (referred to as the EUT in this report) is the GSM Mobile Phone.

Equipment Type : Transceiver
Other Clock Frequency : 32.768kHz, 12MHz, 26MHz, 32MHz

[GSM Part]

Frequency Operation : 824.2-848.8MHz (GSM850)
Type of Modulation : GMSK / 8PSK
Bandwidth : 328kHz
Channel Spacing : 200kHz
Antenna Type : PIFA
Antenna Connector Type : Pin Contact
Antenna Gain : -4.3dBi
Power Supply : DC3.7 - 4.2V
Temperature of Operation : -10 deg. C. to + 55 deg. C.

[Bluetooth Part]

Frequency Operation : 2402-2480MHz
Type of Modulation : FHSS
Bandwidth & Channel spacing : 1MHz & 1MHz
Channel Number : 79
Antenna Type : PIFA
Antenna Connector Type : Pin Contact
Antenna Gain : -2.71dBi
Power Supply : DC1.8V
Temperature of Operation : -10 deg. C. to + 55 deg. C.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 22 Subpart H: 2006
Title : FCC 47CFR Part 22 Subpart H
Cellular Radiotelephones Services

3.2 Procedures and results

Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
Peak Output Power	FCC Part2 Section 2.1046	Section 22.913(a)	Conducted/ Radiated	N/A	[Conducted] 5.9dB 836.6MHz / 848.8MHz [Radiated] 10.9dB 848.800MHz Horizontal / Vertical	Complied
Emission Bandwidth, 99% Occupied Bandwidth	FCC Part2 Section 2.1049	Section 22.917(b)	Conducted	N/A	-	Complied
Band-Edge	FCC Part2 Section 2.1049	Section 22.917(b)	Conducted/ Radiated	N/A	[Conducted] 1.3dB 849.019MHz [Radiated] 5.6dB 849.02MHz Vertical	Complied
Spurious Emission	FCC Part2 Section 2.1051	Section 22.917(b)	Conducted	N/A	-	Complied
Spurious Radiation	FCC Part2 Section 2.1053	Section 22.917(b)	Radiated	N/A	15.0dB 6790.40MHz Horizontal	Complied
Frequency Stability (Temperature Variation)	FCC Part2 Section 2.1055(a) (1) and (b)	Section 22.355	Conducted	N/A	-	Complied
Frequency Stability (Voltage Variation)	FCC Part2 Section 2.1055(d)(1) and (2)	Section 22.355	Conducted	N/A	-	Complied

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

*These tests were also referred to TIA-603-B "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards."

*These tests were performed without any deviations from test procedure except for additions or exclusions.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

3.4 Uncertainty

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

Test room	Conducted emission	Radiated emission (10m*)			Radiated emission (3m*)			Radiated emission (3m*)	
	150kHz-30MHz	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	1GHz-18GHz	18GHz-40GHz
No.1 semi-anechoic Chamber (±)	3.7dB	3.1dB	4.7dB	4.4dB	3.2dB	3.7dB	4.4dB	5.9dB	6.1dB
No.2 semi-anechoic chamber (±)	3.7dB	-	-	-	3.2dB	4.3dB	3.9dB	5.9dB	6.1dB
No.3 semi-anechoic chamber (±)	3.7dB	-	-	-	3.2dB	4.2dB	4.4dB	5.9dB	6.1dB
No.4 semi-anechoic chamber (±)	3.7dB	-	-	-	3.2dB	4.2dB	4.4dB	5.9dB	6.1dB

*10m/3m = Measurement distance

Frequency Stability

The measurement uncertainty for this test is 1×10^{-5} .

Radiated Emission test (3m)

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

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

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	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	IC4247-3	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	IC4247-4	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, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

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

4.1 Operating Modes

The mode is used :

Test	Operating mode	Tested frequency	Channel	
Peak output Power (Conducted/Radiated), Emission Bandwidth, 99% Occupied bandwidth, Spurious Emission (Conducted)	Transmitting (Tx) (GSM, GMSK)	824.2MHz 836.6MHz 848.8MHz	128 190 251	
	Transmitting (Tx) (EGPRS, 8PSK)	824.2MHz 836.6MHz 848.8MHz	128 190 251	
	Band Edge (Conducted/Radiated)	Transmitting (Tx) (GSM, GMSK)	824.2MHz 848.8MHz	128 251
		Transmitting (Tx) (EGPRS, 8PSK)	824.2MHz 848.8MHz	128 251
		Spurious Radiation	Transmitting (Tx) (GSM, GMSK)	824.2MHz 836.6MHz 848.8MHz
	Transmitting (Tx) (EGPRS, 8PSK)		824.2MHz 836.6MHz 848.8MHz	128 190 251
Transmitting (Tx) (EGPRS, 8PSK) + Bluetooth (BT) Transmitting (Tx) 2441MHz	836.6MHz		190	
Frequency Stability (Temperature/Voltage Variation)	Transmitting (Tx) (GSM, GMSK)		836.6MHz	190
	Transmitting (Tx) (EGPRS, 8PSK)		836.6MHz	190

UL Japan, Inc.

Head Office EMC Lab.

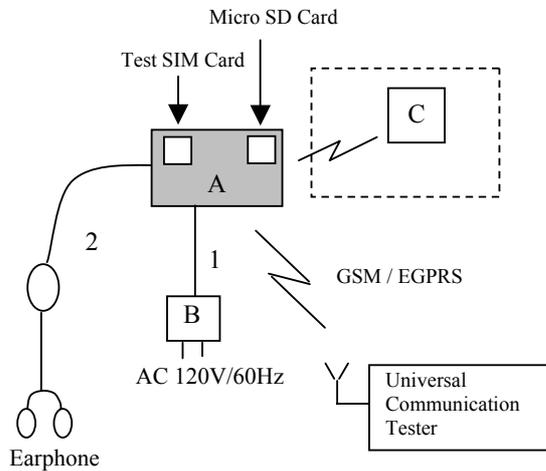
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

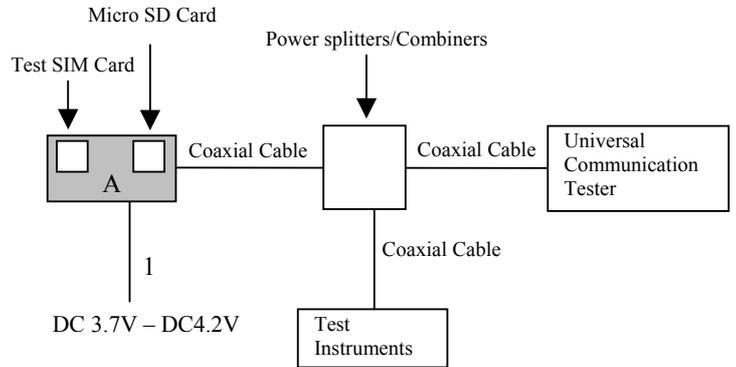
Facsimile : +81 596 24 8124

4.2 Configuration and peripherals

Radiated



Conducted



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

* [Dashed Box C]: Used for Transmitting (EGPRS, 8PSK) Mid Channel 836.6MHz (Ch 190) + Bluetooth Transmitting(2441MHz) mode only

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	GSM Mobile Phone	PV210	168	SHARP	EUT
B	AC Adapter	PV-AC41	RADPA1046YCPZ	SHARP	-
C	Bluetooth Headset	FS258	-	Jabra	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.5	Shielded	Shielded	-
2	Earphone Cable	1.5	Unshielded	Unshielded	-

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SECTION 5: Peak Output Power (Conducted/Radiated)

[Conducted]

Test Procedure

The peak output power (conducted) was measured with a power meter and an attenuator at the antenna port.

Test data : **APPENDIX 2**
Test result : **Pass**

[Radiated]

Test Procedure

- 1) EUT was placed on a platform of nominal size, 1.0 m by 0.5m, raised 80cm above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength intensity has been measured in No.4 semi anechoic chamber with a ground plane and at a distance of 3m (for the Peak Output Power for the Radiated). The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
- 2) Exchanged the EUT to the Substitution Antenna, the antenna was set for the same height as EUT on the table. The frequency below 1GHz of the Substitution Antenna was used as the Half wave dipole Antenna, which is harmonized with the measured frequency in 1). The Substitution Antenna was connected with 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 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field is equal to the measured value in 1). The measuring antenna height varied between 1 and 4m to obtain the maximum receiving level. Its Output power of Signal Generator was recorded.
- 3) Effective 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

Test data : **APPENDIX 2**
Test result : **Pass**

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SECTION 6: Bandwidth and Band-Edge (Conducted)

Test Procedure

The Emission Bandwidth, 99% Occupied Bandwidth and Band-Edge was measured with a spectrum analyzer and attenuator connected to the antenna port.

Test data : APPENDIX 2
Test result : Pass

SECTION 7: Spurious Emission (Conducted)

Test Procedure

The Spurious Emission was measured with a spectrum analyzer and attenuator connected to the antenna port.

Test data : APPENDIX 2
Test result : Pass

SECTION 8: Spurious Radiation and Band-Edge (Radiated)

Test Procedure

- 1) EUT was placed on a platform of nominal size, 1.0m by 0.5m, raised 80cm above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength intensity has been measured in No.4 semi anechoic chamber with a ground plane and at a distance of 3m. The measuring antenna height varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
- 2) Exchanged the EUT to the Substitution Antenna, the antenna was set for the same height as EUT on the table. The frequency below 1GHz of the Substitution antenna was used as the Half wave dipole antenna and Shorted dipole antenna calibrated with the Half wave dipole antenna, which is harmonized with the measured frequency in 1). The frequency above 1GHz of the Substitution antenna was used with Horn antenna calibrated with the Half wave dipole antenna. The Substitution antenna was connected with 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 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field is equal to the measured value in 1). The measuring antenna height varied between 1 and 4m to obtain the maximum receiving level. Its Output power of Signal Generator was recorded.
- 3) Effective 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 2). For the usage of the antenna (Shorted dipole and Horn antenna) except for the Half wave dipole antenna (2.15dBi) for the Substitution antenna, the Effective radiated power was calculated by compensating the finite difference in the antenna gain of the Half wave dipole antenna, and Substitution antenna.

Test data : APPENDIX 2
Test result : Pass

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SECTION 9: Frequency Stability

Test Procedure

The Frequency Stability was measured with a frequency counter and attenuator connected to the antenna port. The Frequency Drift was measured with the 10 deg. C. steps from -30 deg. C. to 50 deg. C., and it is presented as the ppm unit. The Frequency Drift was measured with the normal temperature (20 deg. C.) and Voltage tolerance (DC3.7V to DC4.2V), and it is presented as the ppm unit.

Temperature : -30deg.C to +50deg.C (10 deg. C. step)
Voltage : Vnom:DC3.9V, Vmin:DC3.7V, Vmax:DC4.2V : Operating voltage range of EUT *

*The voltage supply beyond DC 4.2V exceeds the operating voltage range of EUT.
In case of the voltage supply below 3.7V, the EUT stops operation by "low battery detection function."
Therefore, Frequency Stability test was performed under the above condition.

Test data : **APPENDIX 2**
Test result : **Pass**