



SAR TEST REPORT

Test Report No. : 27KE0198-HO-F

Applicant : NEC INFRONTIA CORPORATION
Type of Equipment : Mobile Terminal EX
Model No. : S1613-01A
FCC ID : S4JS1613-01A
Test standard : FCC47CFR 2.1093
FCC OET Bulletin 65, Supplement C
Test Result : Complied

Max. SAR Value

IEEE802.11a (5180-5320MHz Band) : 0.213W/kg (Body, 5320MHz)

IEEE802.11a (5500-5700MHz Band) : 0.288W/kg (Body, 5500MHz)

IEEE802.11a (5745-5825MHz Band) : 0.475W/kg (Body, 5745MHz)

1. This test report shall not be reproduced except 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 standard. We hereby certify that the data contain a true representation of the SAR profile.
4. The test results in this test report are traceable to the national or international standards.

Date of test:

July 3 to 4, 2007

Tested by:

Miyo Kishimoto
EMC Services

Approved by :

Hironobu Shimoji
Assistant Manager of EMC Services



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.htm>

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 (18.06.07)

CONTENTS	PAGE
SECTION 1: Client information	3
SECTION 2: Equipment under test (E.U.T.).....	3
2.1 Identification of E.U.T.....	3
2.2 Product Description	4
SECTION 3 : Test standard information.....	5
3.1 Requirements for compliance testing defined by the FCC.....	5
3.2 Exposure limit.....	6
SECTION 4 : Test result.....	7
4.1 Result of Max. SAR value	7
4.2 Test Location	7
SECTION 5 : Operation of E.U.T. during testing	8
5.1 Confirmation before SAR testing	8
5.2 Confirmation after SAR testing	8
5.3 Operating modes for SAR testing	9
5.4 Test setup of EUT	11
SECTION 6 : Test surrounding	12
6.1 Measurement uncertainty	12
SECTION 7 : Confirmation before testing	13
7.1 EMC power and SAR power(WLAN IEEE802.11a)	13
7.2 Reference data of SAR test (Data rate determing)	15
SECTION 8 : Measurement results	16
8.1 Body SAR 5200MHz	16
8.2 Body SAR 5600MHz	17
8.3 Body SAR 5800MHz	18
APPENDIX 1 : Photographs of test setup	19
1. Photograph of EUT.....	20
2. Photograph of Battery	21
3. Photograph of set up	22
APPENDIX 2 : SAR Measurement data	29
1. Evaluation procedure	30
2. Measurement data	31
APPENDIX 3 : Test instruments	84
1. Equipment used	85
2. Dosimetry assessment setup	86
3. Configuration and peripherals	87
4. System components	88
5. Test system specifications	90
6. Simulated Tissues Composition of 5GHz.....	92
7. Validation Measurement.....	92
8. System validation data.....	94
9. Validation uncertainty	95
10. Validation Measurement data	96
11. System Validation Dipole (D5GHzV2,S/N: 1020).....	99
12. Dosimetric E-Field Probe Calibration (EX3DV4,S/N: 3540).....	110
13. References	119

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 1: Client information

Company Name : NEC INFRONTIA CORPORATION
Address : 2-6-1 Kitamikata, Takatsu-Ku, Kawasaki 213-8511, Japan
Telephone Number : +81- 44-820-3881
Facsimile Number : +81- 44-820-4534
Contact Person : Yoshihiro Hagiwara

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

2.1 Identification of E.U.T.

Type of Equipment : Mobile Terminal EX
Model No. : S1613-01A
Serial No. : #10
Rating : DC12V(AC Adapter input: AC100-240V)
Battery (small) : Model Name: S1597-05/BATI004/EF-3683H
Manufacturer : NEC INFRONTIA CORPORATION
7.4V/2400mAh
Battery (large) : Model Name: S1613-05/BATI013
Manufacturer : NEC INFRONTIA CORPORATION
7.4V/4800mAh
Size : W 288mm* L 39mm*H 214mm
Country of Manufacture : Japan
Receipt Date of Sample : June 22, 2007
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.
Category Identified : Portable device

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: S1613-01A (referred to as the EUT in this report) is the Mobile Terminal EX.
Clock frequency : CPU: 1GHz, 40MHz (Wireless LAN port)

Equipment Type	Transceiver		
Frequency of Operation	11b/11g	2412MHz - 2462MHz	
	11a	Low	5180MHz - 5240MHz
		Mid	5260MHz - 5320MHz
		Add	5500MHz - 5700MHz
		Upper	5745MHz - 5805MHz
		5825MHz	
Type of Modulation	11b	DSSS DBPSK : 1Mbps DQPSK : 2Mbps CCK : 5.5Mbps, 11Mbps	
	11a/11g	OFDM BPSK : 6Mbps, 9Mbps QPSK : 12Mbps, 18Mbps 16QAM : 24Mbps, 36Mbps 64QAM : 48Mbps, 54Mbps	
Channel spacing	11b/11g	5MHz	
	11a	20MHz	
Power Supply (inner)	DC3.3V, DC1.8V		
Antenna Type	Internal antenna		
Antenna Connector Type	U.FL (ANT-A and ANT-B)		
Antenna Gain	0dBi		
Max. Output Power (FCC 15.247 Peak)	20.09dBm (102.09mW)		

SECTION 3 : Test standard information

3.1 Requirements for compliance testing defined by the FCC

The US Federal Communications Commission has released the report and order "Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996. The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g for an uncontrolled environment and 8.0 mW/g for an occupational/controlled environment as recommended by the ANSI/IEEE standard C95.1-1992. According to the Supplement C of OET Bulletin 65 "Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

1 Specific Absorption Rate (SAR) is a measure of the rate of energy absorption due to exposure to an RF transmitting source (wireless portable device).

2 IEEE/ANSI Std. C95.1-1992 limits are used to determine compliance with FCC ET Docket 93-62.

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

3.2 Exposure limit

(A) Limits for Occupational/Controlled Exposure (W/kg)

Spatial Average (averaged over the whole body)	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.4	8.0	20.0

(B) Limits for General population/Uncontrolled Exposure (W/kg)

Spatial Average (averaged over the whole body)	Spatial Peak (averaged over any 1g of tissue)	Spatial Peak (hands/wrists/feet/ankles averaged over 10g)
0.08	1.6	4.0

Occupational/Controlled Environments: are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

General Population/Uncontrolled Environments: are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

NOTE:GENERAL POPULATION/UNCONTROLLED EXPOSURE SPATIAL PEAK(averaged over any 1g of tissue) LIMIT 1.6 W/kg

SECTION 4 : Test result

4.1 Result of Max. SAR value

Max. SAR Value

IEEE802.11a (5180-5320MHz Band) : 0.213W/kg (Body, 5320MHz)
IEEE802.11a (5500-5700MHz Band) : 0.288W/kg (Body, 5500MHz)
IEEE802.11a (5745-5825MHz Band) : 0.475W/kg (Body, 5745MHz)

4.2 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

SECTION 5 : Operation of E.U.T. during testing

5.1 Confirmation before SAR testing

EMC power and SAR power were measured for the same test sample(S/N: # 10).
Both tests were measured with a power meter connected to the antenna port.

5.1.1 Correlation between EMC power and SAR power

EMC power and SAR power were measured at average mode.
The test was performed to see the differences in the average power at the two tests.

<EMC power (Sample S/N: # 10)>

As for the average power, the data of EMC test (Test date :June 27 and August 1, 2007) is shown as a reference data.

< SAR power (Sample S/N: # 10)>

The test was performed before SAR test. (Test date :July 3, 2007)

The result is shown in section 7.1.

5.2 Confirmation after SAR testing

It was checked that the power drift is within $\pm 5\%$ in the evaluation procedure of SAR testing.
The result is shown in APPENDIX 2.

5.3 Operating modes for SAR testing

5.3.1 Setting of EUT

1. WLAN Transmitting (Tx) 11a Low band mode (Payload: PN9)
Tx frequency band : 5180 –5320MHz
Channel : 36ch(5180MHz),52ch(5260MHz),64ch(5320MHz)
Modulation : OFDM (BPSK,QPSK,16QAM,64QAM)
Crest factor : 1
2. WLAN Transmitting (Tx) 11a Additional band mode (Payload: PN9)
Tx frequency band : 5500 –5700MHz
Channel : 100ch(5500MHz),120ch(5600MHz),140ch(5700MHz)
Modulation : OFDM (BPSK,QPSK,16QAM,64QAM)
Crest factor : 1
3. WLAN Transmitting (Tx) 11a High band mode (Payload: PN9)
Tx frequency band : 5745 –5825MHz
Channel : 149ch(5745MHz),153ch(5765MHz),165ch(5825MHz)
Modulation : OFDM (BPSK,QPSK,16QAM,64QAM)
Crest factor : 1

5.3.2 SAR Measurement (Radiated power is always monitored by Spectrum Analyzer.)

1. IEEE 802.11a Low band

The tests from Step1 to Step4 were performed with antenna A and B respectively.

Step1. Search for the worst modulation

The data rate in the higher average power* of each modulation was decided, then the worst modulation was searched in the SAR testing.

Step2. Change to the battery (large battery)

This test was performed at the worst modulation of Step1.

Step3. Search for the worst position

This test was performed at the worst condition of Step1 and 2.

Step4. Change to the Low and High channels

This test was performed at the worst conditions of Step 3.

2. IEEE 802.11a Additional band

The tests from Step5 to Step7 were performed with antenna A and B respectively.

Step5. Search for the worst modulation

The data rate in the higher average power* of each modulation was decided, then the worst modulation was searched in the SAR testing.

Step6. Search for the worst position

This test was performed at the worst modulation of Step5.

Step7. Change to the Low and High channels

This test was performed at the worst conditions of Step6.

3. IEEE 802.11a High band

The tests from Step8 to Step10 were performed with antenna A and B respectively.

Step8. Search for the worst modulation

The data rate in the higher average power* of each modulation was decided, then the worst modulation was searched in the SAR testing.

Step9. Search for the worst position

This test was performed at the worst modulation of Step8.

Step10. Change to the Low and High channels

This test was performed at the worst conditions of Step9.

* Refer to the average power data in Section 7.2.

Change distance between EUT and SAM Twin Phantom

Step11. The measurement was performed with the distances, 5mm, 10mm and 15mm to check if the shortest distance may not have the worst value at the conditions of the highest SAR value. As a result, the shortest distance had the worst value.

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

5.4 Test setup of EUT

When users operate or carry the EUT, it could be considered to touch or get close to their bodies. Assuming this situation, we performed the test at the following positions. Please refer to "Appendix 1" for more details.

- (1) Ant.A Top : The test was performed in touch with Top edge of the EUT to the flat section of SAM Twin phantom.
- (2) Ant.A Rear : The test was performed in touch with Rear surface of the EUT to the flat section of SAM Twin phantom.
- (3) Ant.B Side : The test was performed in touch with Right side of the EUT to the flat section of SAM Twin phantom.
- (4) Ant.B Rear : The test was performed in touch with Rear surface of the EUT to the flat section of SAM Twin phantom.
- (5) Ant.B Top : The test was performed in touch with Top edge of the EUT to the flat section of SAM Twin phantom.
- (6) Ant.A Top (5mm): The measurement opened 5mm distance between EUT and flat section of SAM Twin Phantom.
- (7) Ant.A Top (10mm): The measurement opened 10mm distance between EUT and flat section of SAM Twin Phantom.
- (8) Ant.A Top (15mm): The measurement opened 15mm distance between EUT and flat section of SAM Twin Phantom.

SECTION 6 : Test surrounding

6.1 Measurement uncertainty

The uncertainty budget has been determined for the DASY4 measurement system according to the SPEAG documents[6][7] and is given in the following Table.

Error Description	Uncertainty value $\pm$ %	Probability distribution	divisor	(ci) 1g	Standard Uncertainty (1g)	vi or veff
Measurement System						
Probe calibration	± 6.8	Normal	1	1	± 6.8	∞
Axial isotropy of the probe	± 4.7	Rectangular	$\sqrt{3}$	$(1-cp)^{1/2}$	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	$\sqrt{3}$	$(cp)^{1/2}$	± 3.9	∞
Boundary effects	± 2.0	Rectangular	$\sqrt{3}$	1	± 1.2	∞
Probe linearity	± 4.7	Rectangular	$\sqrt{3}$	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	$\sqrt{3}$	1	± 0.6	∞
Readout electronics	± 0.3	Normal	1	1	± 0.3	∞
Response time	± 0.8	Rectangular	$\sqrt{3}$	1	± 0.5	∞
Integration time	± 2.6	Rectangular	$\sqrt{3}$	1	± 1.5	∞
RF ambient Noise	± 3.0	Rectangular	$\sqrt{3}$	1	± 1.7	∞
RF ambient Reflections	± 3.0	Rectangular	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.8	Rectangular	$\sqrt{3}$	1	± 0.5	∞
Probe positioning	± 9.9	Rectangular	$\sqrt{3}$	1	± 5.7	∞
Max.SAR Eval.	± 4.0	Rectangular	$\sqrt{3}$	1	± 2.3	∞
Test Sample Related						
Device positioning	± 2.9	Normal	1	1	± 2.9	49
Device holder uncertainty	± 3.6	Normal	1	1	± 3.6	7
Power drift	± 5.0	Rectangular	$\sqrt{3}$	1	± 5.8	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 5.0	Rectangular	1	0.64	± 3.2	∞
Liquid permittivity (target)	± 5.0	Rectangular	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 5.0	Rectangular	1	0.6	± 3.0	∞
Combined Standard Uncertainty					± 13.48	
Expanded Uncertainty (k=2)					± 26.96	

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 7 : Confirmation before testing

7.1 EMC power and SAR power(WLAN IEEE802.11a)

EMC power

This data is reference data of EMC test. (Report No. 27KE0198-HO-A, 27KE0198-HO-B)

FCC15.247 Maximum Peak Output Power

Date of test: June 27, 2007

11a/Ant.A/54Mbps					
Band/Ch	Freq.	P/M(PK) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
High/High	5825.0	6.80	3.23	10.06	20.09

11a/Ant.B/54Mbps					
Band/Ch	Freq.	P/M(PK) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
High/High	5825.0	6.06	3.23	10.06	19.35

Sample Calculation: Result = Reading + Cable Loss + Attenuator Loss

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

FCC15.407 Maximum Peak Output Power

Date of test: June 25,28 and August 1, 2007

11a/Ant.A/54Mbps					
Band/Ch	Freq.	S/A Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
Low/Low	5180.0	-7.15	2.97	10.09	5.91
Low/Mid	5260.0	-6.05	2.99	10.08	7.02
Low/High	5320.0	-4.59	3.00	10.08	8.49
Add/Low	5500.0	-5.16	3.05	10.08	7.97
Add/Mid	5600.0	-5.30	3.11	10.07	7.88
Add/High	5700.0	-5.42	3.16	10.07	7.81
High/Low	5745.0	-2.08	3.19	10.07	11.18
High/Mid	5785.0	-2.61	3.21	10.06	10.66
High/High	5805.0	-2.68	3.22	10.06	10.60

11a/Ant.B/54Mbps					
Band/Ch	Freq.	S/A Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
Low/Low	5180.0	-7.40	2.97	10.09	5.66
Low/Mid	5260.0	-6.08	2.99	10.08	6.99
Low/High	5320.0	-5.13	3.00	10.08	7.95
Add/Low	5500.0	-5.34	3.05	10.08	7.79
Add/Mid	5600.0	-5.51	3.11	10.07	7.67
Add/High	5700.0	-5.75	3.16	10.07	7.48
High/Low	5745.0	-2.11	3.19	10.07	11.15
High/Mid	5785.0	-2.74	3.21	10.06	10.53
High/High	5805.0	-2.86	3.22	10.06	10.42

Sample Calculation: Result = Reading + Cable Loss + Attenuator Loss

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

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

Reference data for SAR testing

Date of test: June 27 and August 1, 2007

11a/Ant.A/9Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
Low/Low	5180.0	-5.45	1.35	10.12	6.02
Low/Mid	5260.0	-4.03	1.35	10.14	7.46
Low/High	5320.0	-3.41	1.35	10.15	8.09

11a/Ant.B/9Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
Low/Low	5180.0	-5.29	1.35	10.12	6.18
Low/Mid	5240.0	-4.08	1.35	10.14	7.41
Low/High	5320.0	-3.50	1.35	10.15	8.00

11a/Ant.A/24Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
Add/Low	5500.0	-3.42	1.36	10.18	8.12
Add/Mid	5600.0	-3.37	1.38	10.20	8.21
Add/High	5700.0	-3.63	1.39	10.22	7.98

11a/Ant.B/24Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
Add/Low	5500.0	-3.45	1.36	10.18	8.09
Add/Mid	5600.0	-3.46	1.38	10.20	8.12
Add/High	5700.0	-3.54	1.39	10.22	8.07

11a/Ant.A/6Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
High/Low	5745.0	-0.54	1.40	10.22	11.08
High/Mid	5765.0	-0.60	1.40	10.23	11.03
High/High	5825.0	-1.01	1.41	10.24	10.64

11a/Ant.B/6Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
High/Low	5745.0	-0.51	1.40	10.22	11.11
High/Mid	5765.0	-0.61	1.40	10.23	11.02
High/High	5825.0	-1.04	1.41	10.24	10.61

Sample Calculation: Result = Reading + Cable Loss + Attenuator Loss

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

SAR power

Date of test: July 3, 2007

11a/Ant.A/9Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
Low/Low	5180.0	-5.25	1.35	10.12	6.22
Low/Mid	5260.0	-4.03	1.35	10.14	7.46
Low/High	5320.0	-3.31	1.35	10.15	8.19

11a/Ant.B/9Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
Low/Low	5180.0	-5.09	1.35	10.12	6.38
Low/Mid	5240.0	-4.08	1.35	10.14	7.41
Low/High	5320.0	-3.44	1.35	10.15	8.06

11a/Ant.A/24Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
Add/Low	5500.0	-3.41	1.36	10.18	8.13
Add/Mid	5600.0	-3.37	1.38	10.20	8.21
Add/High	5700.0	-3.54	1.39	10.22	8.07

11a/Ant.B/24Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
Add/Low	5500.0	-3.38	1.36	10.18	8.16
Add/Mid	5600.0	-3.45	1.38	10.20	8.13
Add/High	5700.0	-3.44	1.39	10.22	8.17

11a/Ant.A/6Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
High/Low	5745.0	-0.53	1.40	10.22	11.09
High/Mid	5765.0	-0.60	1.40	10.23	11.03
High/High	5825.0	-1.00	1.41	10.24	10.65

11a/Ant.B/6Mbps					
Band/Ch	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
	[MHz]	[dBm]	[dB]	[dB]	[dBm]
High/Low	5745.0	-0.50	1.40	10.22	11.12
High/Mid	5765.0	-0.61	1.40	10.23	11.02
High/High	5825.0	-0.99	1.41	10.24	10.66

Sample Calculation: Result = Reading + Cable Loss + Attenuator Loss

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

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

7.2 Reference data of SAR test (Data rate determing)

Date of test: July 3, 2007

11a/Ant.A					
Data rate	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
[Mbps]	[MHz]	[dBm]	[dB]	[dB]	[dBm]
6	5260.0	-4.03	1.35	10.14	7.46
9	5260.0	-4.03	1.35	10.14	7.46
12	5260.0	-4.06	1.35	10.14	7.43
18	5260.0	-4.08	1.35	10.14	7.41
24	5260.0	-4.11	1.35	10.14	7.38
36	5260.0	-4.14	1.35	10.14	7.35
48	5260.0	-5.09	1.35	10.14	6.40
54	5260.0	-4.19	1.35	10.14	7.30
6	5600.0	-3.47	1.38	10.20	8.11
9	5600.0	-3.45	1.38	10.20	8.13
12	5600.0	-3.44	1.38	10.20	8.14
18	5600.0	-3.42	1.38	10.20	8.16
24	5600.0	-3.37	1.38	10.20	8.21
36	5600.0	-3.38	1.38	10.20	8.20
48	5600.0	-4.31	1.38	10.20	7.27
54	5600.0	-3.44	1.38	10.20	8.14
6	5765.0	-0.60	1.40	10.23	11.03
9	5765.0	-0.61	1.40	10.23	11.02
12	5765.0	-0.63	1.40	10.23	11.00
18	5765.0	-0.70	1.40	10.23	10.93
24	5765.0	-0.76	1.40	10.23	10.87
36	5765.0	-0.77	1.40	10.23	10.86
48	5765.0	-0.73	1.40	10.23	10.90
54	5765.0	-0.69	1.40	10.23	10.94

11a/Ant.B					
Data rate	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Result
[Mbps]	[MHz]	[dBm]	[dB]	[dB]	[dBm]
6	5260.0	-4.33	1.35	10.14	7.16
9	5260.0	-4.08	1.35	10.14	7.41
12	5260.0	-4.34	1.35	10.14	7.15
18	5260.0	-4.39	1.35	10.14	7.10
24	5260.0	-4.26	1.35	10.14	7.23
36	5260.0	-4.42	1.35	10.14	7.07
48	5260.0	-4.61	1.35	10.14	6.88
54	5260.0	-4.38	1.35	10.14	7.11
6	5600.0	-3.53	1.38	10.20	8.05
9	5600.0	-3.51	1.38	10.20	8.07
12	5600.0	-3.55	1.38	10.20	8.03
18	5600.0	-3.56	1.38	10.20	8.02
24	5600.0	-3.45	1.38	10.20	8.13
36	5600.0	-3.46	1.38	10.20	8.12
48	5600.0	-4.13	1.38	10.20	7.45
54	5600.0	-3.47	1.38	10.20	8.11
6	5765.0	-0.61	1.40	10.23	11.02
9	5765.0	-0.67	1.40	10.23	10.96
12	5765.0	-0.77	1.40	10.23	10.86
18	5765.0	-0.79	1.40	10.23	10.84
24	5765.0	-0.78	1.40	10.23	10.85
36	5765.0	-0.81	1.40	10.23	10.82
48	5765.0	-0.77	1.40	10.23	10.86
54	5765.0	-0.69	1.40	10.23	10.94

Sample Calculation: Result = Reading + Cable Loss + Attenuator Loss

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

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 8 : Measurement results

8.1 Body SAR 5200MHz

Date : July 3, 2007
Liquid Depth (cm) : 15.0
Parameters : $\epsilon_r = 48.9, \sigma = 5.54$
Ambient temperature (deg.c.) : 25.0
Relative Humidity (%) : 55

Measured By : Miyo Kishimoto
Model : S1613-01A
Serial No. : 10
Modulation : OFDM
Crest factor : 1

BODY SAR MEASUREMENT RESULTS											
Frequency			Modulation	Phantom Section	EUT Set-up Conditions				Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Mode	Channel	[MHz]			Antenna	Battery	Position	Separation [mm]	Before	After	Maximum value of multi-peak
11a Low	Step1. Search for the worst modulation										
	52	5260.0	BPSK(9Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.136
	52	5260.0	QPSK(12Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.098
	52	5260.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.151
	52	5260.0	64QAM(54Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.128
	Step2. Change to the battery (large battery)										
	52	5260.0	16QAM(24Mbps)	Flat	Ant.A	Large	Top	0	24.3	24.3	0.022
	Step3. Search for the worst position										
	52	5260.0	16QAM(24Mbps)	Flat	Ant.A	Small	Rear	0	24.3	24.3	0.020
	Step4. Change to the Low and High channels										
	36	5180.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	0	24.1	24.1	0.133
	64	5320.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.213
ANTENNA CHANGE											
11a Low	Step1. Search for the worst modulation										
	52	5260.0	BPSK(9Mbps)	Flat	Ant.B	Small	Side	0	24.0	24.0	0.087
	52	5260.0	QPSK(12Mbps)	Flat	Ant.B	Small	Side	0	24.3	24.3	0.091
	52	5260.0	16QAM(24Mbps)	Flat	Ant.B	Small	Side	0	24.0	24.0	0.123
	52	5260.0	64QAM(54Mbps)	Flat	Ant.B	Small	Side	0	24.3	24.3	0.093
	Step2. Change to the battery (large battery)										
	52	5260.0	16QAM(24Mbps)	Flat	Ant.B	Large	Side	0	24.3	24.3	0.119
	Step3. Search for the worst position										
	52	5260.0	16QAM(24Mbps)	Flat	Ant.B	Small	Rear	0	24.3	24.3	0.021
	52	5260.0	16QAM(24Mbps)	Flat	Ant.B	Small	Top	0	24.3	24.3	0.017
	Step4. Change to the Low and High channels										
	36	5180.0	16QAM(24Mbps)	Flat	Ant.B	Small	Side	0	24.3	24.3	0.097
64	5320.0	16QAM(24Mbps)	Flat	Ant.B	Small	Side	0	24.3	24.3	0.181	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body SAR: 1.6 W/kg			
Spatial Peak Uncontrolled Exposure / General Population								(averaged over 1 gram)			

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

8.2 Body SAR 5600MHz

Date : July 3, 2007
Liquid Depth (cm) : 15.0
Parameters : $\epsilon_r = 47.1, \sigma = 6.03$
Ambient temperature (deg.c.) : 25.0
Relative Humidity (%) : 55

Measured By : Miyo Kishimoto
Model : S1613-01A
Serial No. : 10
Modulation : OFDM
Crest factor : 1

BODY SAR MEASUREMENT RESULTS											
Frequency			Modulation	Phantom Section	EUT Set-up Conditions				Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Mode	Channel	[MHz]			Antenna	Battery	Position	Separation [mm]	Before	After	Maximum value of multi-peak
11a Add	Step5. Search for the worst modulation										
	120	5600.0	BPSK(9Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.222
	120	5600.0	QPSK(18Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.152
	120	5600.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.224
	120	5600.0	64QAM(54Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.205
	Step6. Search for the worst position										
	120	5600.0	16QAM(24Mbps)	Flat	Ant.A	Small	Rear	0	24.3	24.3	0.022
	Step7. Change to the Low and High channels										
	100	5500.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.288
	140	5700.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.265
ANTENNA CHANGE											
11a Add	Step5. Search for the worst modulation										
	120	5600.0	BPSK(9Mbps)	Flat	Ant.B	Small	Side	0	24.3	24.3	0.147
	120	5600.0	QPSK(12Mbps)	Flat	Ant.B	Small	Side	0	24.3	24.3	0.133
	120	5600.0	16QAM(24Mbps)	Flat	Ant.B	Small	Side	0	24.3	24.3	0.176
	120	5600.0	64QAM(54Mbps)	Flat	Ant.B	Small	Side	0	24.3	24.3	0.144
	Step6. Search for the worst position										
	120	5600.0	16QAM(24Mbps)	Flat	Ant.B	Small	Rear	0	24.3	24.3	0.024
	120	5600.0	16QAM(24Mbps)	Flat	Ant.B	Small	Top	0	24.4	24.4	0.026
	Step7. Change to the Low and High channels										
	100	5500.0	16QAM(24Mbps)	Flat	Ant.B	Small	Side	0	24.3	24.4	0.144
140	5700.0	16QAM(24Mbps)	Flat	Ant.B	Small	Side	0	24.3	24.3	0.191	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Body SAR: 1.6 W/kg		
Spatial Peak Uncontrolled Exposure / General Population									(averaged over 1 gram)		

*Small battery was used for the test, because SAR value of small battery was higher than the one of large battery at 11a Low band (5.2GHz band) test.

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

8.3 Body SAR 5800MHz

Date : July 4, 2007
Liquid Depth (cm) : 15.0
Parameters : $\epsilon_r = 46.4, \sigma = 6.27$
Ambient temperature (deg.c.) : 25.0
Relative Humidity (%) : 57

Measured By : Miyo Kishimoto
Model : S1613-01A
Serial No. : 10
Modulation : OFDM
Crest factor : 1

BODY SAR MEASUREMENT RESULTS											
Frequency			Modulation	Phantom Section	EUT Set-up Conditions				Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Mode	Channel	[MHz]			Antenna	Battery	Position	Separation [mm]	Before	After	Maximum value of multi-peak
11a High	Step8. Search for the worst modulation										
	153	5765.0	BPSK(6Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.426
	153	5765.0	QPSK(12Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.462
	153	5765.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.469
	153	5765.0	64QAM(54Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.410
	Step9. Search for the worst position										
	153	5765.0	16QAM(24Mbps)	Flat	Ant.A	Small	Rear	0	24.3	24.3	0.027
	Step10. Change to the Low and High channels										
	149	5745.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.475
	165	5825.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	0	24.3	24.3	0.293
ANTENNA CHANGE											
11a High	Step8. Search for the worst modulation										
	153	5765.0	BPSK(6Mbps)	Flat	Ant.B	Small	Side	0	24.4	24.4	0.261
	153	5765.0	QPSK(12Mbps)	Flat	Ant.B	Small	Side	0	24.4	24.4	0.236
	153	5765.0	16QAM(24Mbps)	Flat	Ant.B	Small	Side	0	24.4	24.4	0.243
	153	5765.0	64QAM(54Mbps)	Flat	Ant.B	Small	Side	0	24.4	24.4	0.242
	Step9. Search for the worst position										
	153	5765.0	BPSK(6Mbps)	Flat	Ant.B	Small	Rear	0	24.4	24.4	0.022
	153	5765.0	BPSK(6Mbps)	Flat	Ant.B	Small	Top	0	24.4	24.4	0.022
	Step10. Change to the Low and High channels										
	149	5745.0	BPSK(6Mbps)	Flat	Ant.B	Small	Side	0	24.4	24.4	0.284
165	5825.0	BPSK(6Mbps)	Flat	Ant.B	Small	Side	0	24.4	24.4	0.144	
11a High	Step11. Change distance between EUT and SAM Twin Phantom										
	149	5745.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	5	24.1	24.1	0.214
	149	5745.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	10	24.1	24.1	0.122
	149	5745.0	16QAM(24Mbps)	Flat	Ant.A	Small	Top	15	24.3	24.3	0.036
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure / General Population									Body SAR: 1.6 W/kg (averaged over 1 gram)		

*Small battery was used for the test, because SAR value of small battery was higher than the one of large battery at 11a Low band (5.2GHz band) test.