SAR TEST REPORT

Test Report No. : 32GE0273-HO-01-I-R1

Applicant	:	**NEC Corporation of America**
Type of Equipment	:	**Digital Portable Cellular Telephone**
Model No.	:	**KMP7R4E1-2A**
FCC ID	:	**A98-ROV0164**
Test regulation	:	**FCC47CFR 2.1093** **FCC OET Bulletin 65, Supplement C (Edition 01-01)**
Test Result	:	**Complied**

FCC Part 22H	Head	: 0.516W/kg
	Body-hotspot	: 0.937W/kg (10mm distance)
FCC Part 24E	Head	: 0.548W/kg
	Body-hotspot	: 0.859W/kg (10mm distance)
FCC Part15.247	Head	: 0.463W/kg
	Body-hotspot	: 0.04W/kg (10mm distance)

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 32GE0273-HO-01-I. 32GE0273-HO-01-I is replaced with this report.

Date of test: April 7 to 16, 2012

Representative test engineer:

Hisayoshi Sato
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Approved by :

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NVLAP LAB CODE: 200572-0

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*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	:	NEC Corporation of America
Address	:	Radio Communications Systems Division 6535N. State Highway 161, Irving, TX 75039-2402 USA
Telephone Number	:	+1 214 262 4241
Facsimile Number	:	+1 214 262 4225
Contact Person	:	Sanjay Wadhwa

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

2.1 Identification of E.U.T.

Type of Equipment	:	Digital Portable Cellular Telephone
Model No.	:	KMP7R4E1-2A
Serial No.	:	004401200900039 004401200900062(Another sample: Chassis's color: Pink)
Rating	:	Li-ion Battery (M/N;N33) DC3.8V
Receipt Date of Sample	:	March 27, 2012
Country of Mass-production	:	Japan
Condition of EUT	:	Production prototype
Modification of EUT	:	No Modification by the test lab
Antenna to antenna separation distance	:	10.95cm from WWAN antenna to WLAN/BT antenna 0cm from WLAN antenna to Bluetooth antenna (shared with BT)
Simultaneous transmission	:	WWAN can transmit simultaneously with WLAN WWAN can transmit simultaneously with Bluetooth WLAN cannot transmit simultaneously with Bluetooth

Radio Specification [1/2]

Bluetooth (Ver.2.1 + EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Other Clock Frequency	48MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Connector Type	Integrated antenna

Low Energy (Ver.4.0)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Other Clock Frequency	48MHz
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Connector Type	Integrated antenna

WLAN (IEEE802.11b/g/n (SISO/HT20))

Equipment Type	Transceiver
Frequency of Operation	2412-2462MHz
Other Clock Frequency	48MHz
Type of Modulation	DSSS, OFDM
Antenna Connector Type	Integrated antenna

GSM

Equipment Type	Transceiver
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz
Other Clock Frequency	19.2MHz
Type of Modulation	GMSK
Channel spacing	200kHz
Antenna Connector Type	Integrated antenna

Radio Specification [2/2]

WCDMA

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band V: 824 – 849MHz [Down Link] Band V: 869 – 894MHz
Other Clock Frequency	19.2MHz
Type of Modulation	HPSK
Channel spacing	5MHz
Antenna Connector Type	Integrated antenna

GPS

Equipment Type	Receiver
Receiver Type	Direct Downconversion
Frequency of Operation	1575.42MHz
Other Clock Frequency	57.6MHz
Antenna Connector Type	Integrated antenna

RFID

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK
Antenna Connector Type	Integrated antenna

SECTION 3 : Test standard information

3.1 Test Specification

Title : **Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01):**

Supplement C (Edition 01-01) - Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions
OET Bulletin 65 (Edition 97-01) - Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

: **IEEE Std 1528-2003:**

IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques Supplement C

In additions;

☑ **KDB450824 D01**	SAR Prob Cal and Ver Meas v01r01
☑ **KDB450824 D01**	Dipole SAR Validation Verification v01
☑ **KDB447498D01(v04)**	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
☐ **KDB447498D02(v02)**	SAR Measurement Procedures for USB Dongle Transmitters
☑ **KDB648474D01**	SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas
☑ **KDB941225D01(v02)**	SAR Measurement Procedures for 3G Devices
☑ **KDB941225D02(v02v01)**	3GPP R6 HSPA and R7 HSPA+ SAR Guidance
☑ **KDB941225D03(v01)**	Recommended SAR Test Reduction Procedures for GSM/GPRS/EDGE
☑ **KDB941225D04(v01)**	Evaluating SAR for GSM/(E)GPRS Dual Transfer Mode
☐ **KDB941225D05(v01)**	SAR for LTE Devices
☑ **KDB941225D06(v01)**	SAR test procedures for devices incorporating SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities (Hot Spot SAR)
☐ **KDB941225D07(v01)**	SAR Evaluation Procedures for UMPC Mini-Tablet Devices
☐ **KDB 616217 D01(v01r01)**	SAR Evaluation Considerations for Laptop Computer with antennas Built-in on Display Screen
☐ **KDB 616217 D03(v01)**	SAR Evaluation Considerations for Laptop/Notebook/Netbook and Tablet
☐ **KDB865664**	SAR Measurement Requirements for 3 to 6 GHz
☑ **KDB248227(rev.1.2)**	SAR Measurement Procedures for 802.11a//b/g Transmitters

Reference

[1]ANSI, ANSI/IEEE C95.1-1992: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, The Institute of Electrical and Electronics Engineers, Inc., New York, NY 10017, 1992.
[2]SPEAG uncertainty document (AN 15-7/AN19-17) for DASY 5 System from SPEAG (Shimid & Partner Engineering AG).

3.2 Procedure

Transmitter	WWAN	WLAN	Bluetooth
Test Procedure	FCC OET BULLETIN 65, SUPPLEMENT C	FCC OET BULLETIN 65, SUPPLEMENT C	Exemption (Power < 12mW)
	SAR	SAR	
Category	FCC47CFR 2.1093	FCC47CFR 2.1093	FCC47CFR 2.1093
Note: UL Japan, Inc. 's SAR Work Procedures 13-EM-W0429 and 13-EM-W0430			

*Bluetooth mode is excluded from SAR test since power was less than1/2 *60/$f_{[GHz]}$[mW].

3.3 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

3.4 Test Location

*Shielded room for SAR testings
UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
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SECTION 4 : Test result

4.1 Stand-alone SAR result

No.	Capable Tx configrations		Head SAR	Body-worn SAR	Body SAR (HotSpot)	Note
1	WWAN	GSM/GPRS 850 MHz	Yes	Exemption*1	Yes	-
2		GSM/GPRS 1900 MHz	Yes	Exemption*1	Yes	-
3		12.2kRMC band V	Yes	Exemption*1	Yes	-
4	WLAN	WLAN 2.4G	Yes	Exemption*1	Yes	With VOIP
5	Bluetooth	Bluetooth BDR/EDR/Low Energy	Exemption*2			-

Note
*1 It is not necessary to test Body-worn SAR if the test separation distance(10mm) for hotspot mode is more conservative than Body-worn test(15mm),according to KDB 941225 D06 Hotspot SAR procedure.
*2 Bluetooth power is less than 1/2 *60/$f_{[GHz]}$[mW].

Mode	1g Head SAR [W/kg]	1g Body-worn SAR [W/kg]	1g BodySAR [W/kg]
GSM850	0.505	Exemption	0.908
PCS1900	0.548	Exemption	0.859
WCDMA band V	0.516	Exemption	0.937
WLAN 11b/g/n(2.4G)	0.463	Exemption	0.040
Bluetooth	Exemption		

4.2 Simultaneous transmission SAR result

<Simultaneous Procedure>
This EUT has the unlicensed transmitter such as WLAN (802.11b/g/n) & Bluetooth devices besides licensed transmitter WWAN (GSM/WCDMA), and the following simultaneous transmission is possible.

No.	Capable Tx configrations		Head SAR	Body SAR (HotSpot)	Note
6	WWAN+WLAN	GSM/GPRS + WLAN2.4G	Yes	Yes	-
7		WCDMA + WLAN2.4G	Yes	Yes	-
8	WWAN+Bluetooth		Yes (Exemption)		
9	WLAN+Bluetooth		No operating		

<WWAN + WLAN >
Simultaneous transmitter evaluation based on the KDB648474. Refer to the Section 8.

Step1.	WWAN antenna is >5cm from Wireless LAN antenna
Step2.	WLAN power > 2Pref (=60/$f_{[GHz]}$).
Step3.	Stand-alone SAR for WLAN
Step4.	Simultaneous transmission is possible (WWAN + WLAN)
Step5.	∑1g SAR (WWAN + WLAN) < 1.6W/kg Head: 0.979W/kg Body: 0.970W/kg
Step6.	No simultaneous transmission.

<WWAN + Bluetooth >
Simultaneous transmitter evaluation based on the KDB648474.

Step1.	WWAN antenna is >5cm from Bluetooth antenna
Step2.	Bluetooth power < Pref (=1/2 *60/$f_{[GHz]}$). Refer to the FCC 15.247 test report
Step3.	No stand-alone SAR for Bluetooth
Step4.	No simultaneous transmission SAR

SECTION 5 : Description of the operating mode

5.1 Output power operating modes

Band	Duty cycle or Multi class(GSM)	Test Frequency	Mode
GSM850	Multi class 8	824.2MHz (128ch) 836.6MHz(190ch) 848.8MHz(251ch)	GSM GPRS (CS-1)
PCS1900	Multi class 8	1850.2MHz(512ch) 1880.0MHz(661ch) 1909.8MHz(810ch)	
WCDMA V	100%	826.4MHz (4132ch) 836.6MHz(4183ch) 846.6MHz(4233ch)	AMR 12.2k RMC HSDPA HSUPA
WWAN			
The communication link was set up with the Wireless Communications Test Set (Agilent). The EUT was command to operate at maximum transmit power. GSM850 :PCL 5 PCS1900 :PCL 0 W-CDMA :All up bits			

Mode	Duty cycle	Frequency Band	Test Frequency	Modulation
IEEE802.11b	100%	2412-2462MHz	2412MHz (1ch) 2437MHz(6ch) 2462MHz(11ch)	DSSS (DBPSK.DQPSK.CCK)
IEEE802.11g	100%	2412-2462MHz	2412MHz (1ch) 2437MHz(6ch) 2462MHz(11ch)	OFDM (BPSK.QPSK.16QAM,64QAM) Long GI, Short GI
IEEE802.11n20 (2.4G)	100%	2412-2462MHz	2412MHz (1ch) 2437MHz(6ch) 2462MHz(11ch)	

5.2 Output power measurement results

Output power measurement for GSM

[GSM]
*Connection Type :AUTO
*Power control level :5(GSM850), 0(PCS1900)

[GPRS]
*Connection Type : Type B
*Power control level : 5(GSM850), 0(PCS1900)
*Coding Scheme : CS-1

1) GSM850

GSM850 SAR Power (Normal)											
Mode		Crest Factor (typical)	Ch	Frequency	Time-based AVG				Slotted-AVG		
				[MHz]	Reading [dBm] Time-AVG	Atten. [dB]	Cable Loss [dB]	Result [dBm] Time-AVG	Reading [dBm] slotted AVG	Cable Loss [dB]	Result [dBm] Slotted AVG
GSM	1slot	8.3	128	824.2	6.88	10.05	6.94	23.87	16.02	16.99	33.01
			190	836.6	6.89	10.05	6.94	23.88	16.00	16.99	32.99
			251	848.8	6.91	10.05	6.94	23.90	15.98	16.99	32.97
GPRS (CS1)	1slot	8.3	128	824.2	6.81	10.05	6.94	23.80	16.10	16.99	33.09
			190	836.6	6.66	10.05	6.94	23.65	15.95	16.99	32.94
			251	848.8	6.78	10.05	6.94	23.77	16.07	16.99	33.06

Time based AVG Results = P/M Reading + Atten.Loss + Cable Loss
Slotted AVG Results = Agilent Reading + Cable Loss
:Maximum time based AVG power mode

2) PCS1900

PCS1900 SAR Power (Normal)											
Mode		Crest Factor (typical)	Ch	Frequency	Time-based AVG				Slotted-AVG		
				[MHz]	Reading [dBm] Time-AVG	Atten. [dB]	Cable Loss [dB]	Result [dBm] Time-AVG	Reading [dBm] slotted AVG	Cable Loss [dB]	Result [dBm] Slotted AVG
GSM	1slot	8.3	512	1850.2	2.23	10.07	8.51	20.81	22.67	7.32	29.99
			661	1880.0	2.47	10.07	8.52	21.06	22.93	7.33	30.26
			810	1909.8	2.39	10.07	8.54	21.00	23.02	7.34	30.36
GPRS (CS1)	1slot	8.3	512	1850.2	2.11	10.07	8.51	20.69	22.71	7.32	30.03
			661	1880.0	2.35	10.07	8.52	20.94	22.96	7.33	30.29
			810	1909.8	2.25	10.07	8.54	20.86	23.06	7.34	30.40

Time based AVG Results = P/M Reading + Atten.Loss + Cable Loss
Slotted AVG Results = Agilent Reading + Cable Loss
:Maximum time based AVG power mode

Output power measurement for W-CDMA

Maximum output power for W-CDMA and HSPA was verified on the high, middle and low channels according to the procedures described in section 5.2 of 3GPP TS 34.121 and "KDB 941225 document".
The WCDMA and HSPA modes of EUT were verified each channel and "sub-tests" according to Release-6 procedures in section5.2 of 3GPP TS 34.121.
[Rel.99]
The communication test set was using a 12.2k RMC (reference measurement channel) with TPC (transmit power control) set to all "1's" configured in Test Loop Mode 1.
[HSDPA]
The communication test set was using an FRC (Fixed reference channel) with H-set 1 and 12.2kbps RMC with TPC (transmit power control) set to all "1's". Output power was measured according requirements for HS-DPCCH Sub-test 1-4.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Test Equipment Setting Summary Table

The following table is the key parameters that was configured in test equipment.

Subtest	Mode	Loopback Mode	Rel99 RMC	HSDPA FRC	HSUPA Test	Common Setting βc	Common Setting βd	βc/βd	MPR	Power Class 3 limit
	Rel99	Test Mode 1	12.2kbps RMC	-	-			8/15		24(+1.7/-3.7dB)
1	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (HPSK)	-	2/15	15/15	2/15	0	24(+1.7/-3.7dB)
2	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (HPSK)	-	12/15	15/15	12/15	0	24(+1.7/-3.7dB)
3	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (HPSK)	-	15/15	8/15	15/8	0.5	23.5(+2.2/-3.7dB)
4	Rel6 HSDPA	Test Mode 1	12.2kbps RMC	H-Set 1 (HPSK)	-	15/15	4/15	15/4	0.5	23.5(+2.2/-3.7dB)

Subtest	HSDPA Specific Settings						
	ΔACK	ΔNACK	ΔCQI	Ack-Nack repetition factor	CQI Feedback	CQI Repetition Factor	Ahs=βhs/βc
Rel 6 HSDPA							
1	8	8	8	3	4ms	2	30/15
2	8	8	8	3	4ms	2	30/15
3	8	8	8	3	4ms	2	30/15
4	8	8	8	3	4ms	2	30/15

3) WCDMA V

1.The 12.2k RMC mode was maximum average power. The AMR/HSDPA SAR is not required for other mode because the maximum average output power for other mode is less than 1/4dB higher than that measured 12.2k RMC mode.

WCDMA V band (Power class 3)					
Mode	Ch	Frequency [MHz]	Reading AVG [dBm]	Cable loss [dB]	Result [dBm]
AMR	4132	826.4	17.02	7.00	24.02
	4183	836.6	16.79	7.00	23.79
	4233	846.6	16.81	7.00	23.81
RMC 12.2kbps	4132	826.4	16.95	7.00	23.95
	4183	836.6	17.12	7.00	24.12
	4233	846.6	17.18	7.00	24.18
HSDPA Subtest1	4132	826.4	16.69	7.00	23.69
	4183	836.6	17.11	7.00	24.11
	4233	846.6	16.90	7.00	23.90
HSDPA Subtest2	4132	826.4	16.92	7.00	23.92
	4183	836.6	17.00	7.00	24.00
	4233	846.6	16.96	7.00	23.96
HSDPA Subtest3	4132	826.4	16.55	7.00	23.55
	4183	836.6	16.71	7.00	23.71
	4233	846.6	16.54	7.00	23.54
HSDPA Subtest4	4132	826.4	16.52	7.00	23.52
	4183	836.6	16.75	7.00	23.75
	4233	846.6	16.65	7.00	23.65
HSUPA Subtest1	4132	826.4	16.30	7.00	23.30
	4183	836.6	16.23	7.00	23.23
	4233	846.6	16.63	7.00	23.63
HSUPA Subtest2	4132	826.4	15.04	7.00	22.04
	4183	836.6	15.18	7.00	22.18
	4233	846.6	15.10	7.00	22.10
HSUPA Subtest3	4132	826.4	15.63	7.00	22.63
	4183	836.6	15.98	7.00	22.98
	4233	846.6	15.74	7.00	22.74
HSUPA Subtest4	4132	826.4	15.81	7.00	22.81
	4183	836.6	15.88	7.00	22.88
	4233	846.6	15.41	7.00	22.41
HSUPA Subtest5	4132	826.4	16.53	7.00	23.53
	4183	836.6	16.50	7.00	23.50
	4233	846.6	16.58	7.00	23.58

Results = Reading + Loss
: Maximum power

MPR Explanation

The product implements an Enhanced MPR (E-MPR) software algorithm that also considers power compression (Scaling), a requirement per 3GPP 25.214 section 5.1.2.6, to generate a more accurate Cubic Metric (CM) value that is used to determine the magnitude of power reduction for HSPA signals. The Enhanced MPR solution can introduce a deviation of the actual observed power reduction from the MPR target values configured for a device.

In the power scaling process defined by 3GPP TS 25.214, the channel beta values are modified as the transmitted signal approaches maximum power to ensure that the transmit power does not exceed the maximum rated transmit power and is also compliant with emissions requirements. The power scaling process considers the software-defined MPR target values based on the CM for the signal to be transmitted to determine the required power reduction for a given signal. The actual CM value of the signal transmitted after power scaling, however, is often different from the estimated CM value used in the power reduction algorithm.

An accurate CM value is desirable as the goal of power reduction is to maintain compliance with emissions limits. By using a more accurate CM value, the E-MPR process minimizes the magnitudes of power reduction required to maintain emissions compliance whereas the legacy MPR software may incorporate a magnitude of power reduction that is higher than is required for emissions compliance.

The enhanced power reduction may result in around 1dB of variance from the MPR target values depending on HSPA channel configuration (e.g. 34.121 subtest) and characteristics of hardware RF design.

Output power measurement for WLAN

4) WLAN (11b/g/n(2.4G))

Note:
1.The 11b mode was maximum average power. The 11g/n SAR is not required for other mode because the maximum average output power for other mode is less than 1/4dB higher than that measured 11b mode.
2.The other channels are measured if the SAR result at max. AVG power channel will be above 0.8W/kg

[IEEE802.11b] Rate Check

Rate	Freq.	P/M Reading [dBm]		Cable Loss	Atten.	Result [dBm]		Result [mW]	
[Mbps]	[MHz]	PK	AVG	[dB]	[dB]	PK	AVG	PK	AVG
1.0	2412	4.82	2.72	1.38	10.07	16.27	14.17	42.36	26.12
2.0	2412	5.24	2.61	1.38	10.07	16.69	14.06	46.67	25.47
5.5	2412	5.18	2.72	1.38	10.07	16.63	14.17	46.03	26.12
11.0	2412	5.21	2.60	1.38	10.07	16.66	14.05	46.34	25.41
1.0	2437	5.06	2.73	1.39	10.07	16.52	14.19	44.87	26.24
2.0	2437	5.02	2.42	1.39	10.07	16.48	13.88	44.46	24.43
5.5	2437	5.00	2.60	1.39	10.07	16.46	14.06	44.26	25.47
11.0	2437	5.01	2.44	1.39	10.07	16.47	13.90	44.36	24.55
1.0	2462	4.67	2.67	1.40	10.07	16.14	14.14	41.11	25.94
2.0	2462	5.00	2.46	1.40	10.07	16.47	13.93	44.36	24.72
5.5	2462	4.97	2.65	1.40	10.07	16.44	14.12	44.06	25.82
11.0	2462	4.98	2.45	1.40	10.07	16.45	13.92	44.16	24.66

:Worst data rate
Sample Calculation:
Result = Reading + Cable Loss + Attenuator

[IEEE802.11g] Rate Check

Rate	Frequency	P/M Reading [dBm]		Cable Loss	Atten.	Result [dBm]		Result [mW]	
[Mbps]	[MHz]	PK	AVG	[dB]	[dB]	PK	AVG	PK	AVG
6.0	2412	7.00	-1.83	1.38	10.07	18.45	9.62	69.98	9.16
9.0	2412	6.40	-2.09	1.38	10.07	17.85	9.36	60.95	8.63
12.0	2412	6.27	-1.98	1.38	10.07	17.72	9.47	59.16	8.85
18.0	2412	6.88	-2.01	1.38	10.07	18.33	9.44	68.08	8.79
24.0	2412	6.21	-2.06	1.38	10.07	17.66	9.39	58.34	8.69
36.0	2412	6.15	-2.11	1.38	10.07	17.60	9.34	57.54	8.59
48.0	2412	6.12	-2.27	1.38	10.07	17.57	9.18	57.15	8.28
54.0	2412	6.22	-2.04	1.38	10.07	17.67	9.41	58.48	8.73
6.0	2437	6.55	-2.11	1.39	10.07	18.01	9.35	63.24	8.61
9.0	2437	6.37	-2.12	1.39	10.07	17.83	9.34	60.67	8.59
12.0	2437	5.96	-2.12	1.39	10.07	17.42	9.34	55.21	8.59
18.0	2437	6.61	-2.17	1.39	10.07	18.07	9.29	64.12	8.49
24.0	2437	5.95	-2.18	1.39	10.07	17.41	9.28	55.08	8.47
36.0	2437	5.89	-2.22	1.39	10.07	17.35	9.24	54.33	8.39
48.0	2437	5.84	-2.37	1.39	10.07	17.30	9.09	53.70	8.11
54.0	2437	5.80	-2.32	1.39	10.07	17.26	9.14	53.21	8.20
6.0	2462	6.68	-1.86	1.40	10.07	18.15	9.61	65.31	9.14
9.0	2462	6.44	-1.95	1.40	10.07	17.91	9.52	61.80	8.95
12.0	2462	5.99	-1.94	1.40	10.07	17.46	9.53	55.72	8.97
18.0	2462	6.63	-1.99	1.40	10.07	18.10	9.48	64.57	8.87
24.0	2462	5.94	-2.03	1.40	10.07	17.41	9.44	55.08	8.79
36.0	2462	5.84	-2.09	1.40	10.07	17.31	9.38	53.83	8.67
48.0	2462	5.85	-2.21	1.40	10.07	17.32	9.26	53.95	8.43
54.0	2462	5.85	-2.11	1.40	10.07	17.32	9.36	53.95	8.63

:Worst data rate

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

[IEEE802.11n-20] Rate Check Long GI

Rate	Frequency	P/M Reading [dBm]		Cable Loss	Atten.	Result [dBm]		Result [mW]	
	[MHz]	PK	AVG	[dB]	[dB]	PK	AVG	PK	AVG
MCS0	2412	6.40	-1.98	1.38	10.07	17.85	9.47	60.95	8.85
MCS1	2412	6.36	-1.99	1.38	10.07	17.81	9.46	60.39	8.83
MCS2	2412	7.09	-2.01	1.38	10.07	18.54	9.44	71.45	8.79
MCS3	2412	6.92	-2.06	1.38	10.07	18.37	9.39	68.71	8.69
MCS4	2412	6.47	-2.09	1.38	10.07	17.92	9.36	61.94	8.63
MCS5	2412	6.68	-2.10	1.38	10.07	18.13	9.35	65.01	8.61
MCS6	2412	6.41	-2.21	1.38	10.07	17.86	9.24	61.09	8.39
MCS7	2412	6.18	-2.19	1.38	10.07	17.63	9.26	57.94	8.43
MCS0	2437	6.15	-2.02	1.39	10.07	17.61	9.44	57.68	8.79
MCS1	2437	6.14	-2.04	1.39	10.07	17.60	9.42	57.54	8.75
MCS2	2437	6.87	-2.10	1.39	10.07	18.33	9.36	68.08	8.63
MCS3	2437	6.68	-2.13	1.39	10.07	18.14	9.33	65.16	8.57
MCS4	2437	6.16	-2.19	1.39	10.07	17.62	9.27	57.81	8.45
MCS5	2437	6.36	-2.22	1.39	10.07	17.82	9.24	60.53	8.39
MCS6	2437	6.10	-2.35	1.39	10.07	17.56	9.11	57.02	8.15
MCS7	2437	5.88	-2.32	1.39	10.07	17.34	9.14	54.20	8.20
MCS0	2462	6.10	-1.91	1.40	10.07	17.57	9.56	57.15	9.04
MCS1	2462	6.12	-1.96	1.40	10.07	17.59	9.51	57.41	8.93
MCS2	2462	6.85	-1.97	1.40	10.07	18.32	9.50	67.92	8.91
MCS3	2462	6.64	-2.01	1.40	10.07	18.11	9.46	64.71	8.83
MCS4	2462	6.20	-2.07	1.40	10.07	17.67	9.40	58.48	8.71
MCS5	2462	6.40	-2.08	1.40	10.07	17.87	9.39	61.24	8.69
MCS6	2462	6.13	-2.19	1.40	10.07	17.60	9.28	57.54	8.47
MCS7	2462	5.90	-2.15	1.40	10.07	17.37	9.32	54.58	8.55

:Worst data rate

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

[IEEE802.11n-20] Rate Check Short GI

Rate	Frequency	P/M Reading [dBm]		Cable Loss	Atten.	Result [dBm]		Result [mW]	
	[MHz]	PK	AVG	[dB]	[dB]	PK	AVG	PK	AVG
MCS0	2412	6.39	-1.94	1.38	10.07	17.84	9.51	60.81	8.93
MCS1	2412	6.38	-1.98	1.38	10.07	17.83	9.47	60.67	8.85
MCS2	2412	7.14	-2.00	1.38	10.07	18.59	9.45	72.28	8.81
MCS3	2412	6.92	-2.01	1.38	10.07	18.37	9.44	68.71	8.79
MCS4	2412	6.52	-2.08	1.38	10.07	17.97	9.37	62.66	8.65
MCS5	2412	6.71	-2.14	1.38	10.07	18.16	9.31	65.46	8.53
MCS6	2412	6.43	-2.20	1.38	10.07	17.88	9.25	61.38	8.41
MCS7	2412	6.13	-2.20	1.38	10.07	17.58	9.25	57.28	8.41
MCS0	2437	6.09	-2.07	1.39	10.07	17.55	9.39	56.89	8.69
MCS1	2437	6.08	-2.10	1.39	10.07	17.54	9.36	56.75	8.63
MCS2	2437	6.81	-2.13	1.39	10.07	18.27	9.33	67.14	8.57
MCS3	2437	6.42	-2.53	1.39	10.07	17.88	8.93	61.38	7.82
MCS4	2437	6.19	-2.21	1.39	10.07	17.65	9.25	58.21	8.41
MCS5	2437	6.36	-2.27	1.39	10.07	17.82	9.19	60.53	8.30
MCS6	2437	6.08	-2.33	1.39	10.07	17.54	9.13	56.75	8.18
MCS7	2437	5.89	-2.33	1.39	10.07	17.35	9.13	54.33	8.18
MCS0	2462	6.10	-1.93	1.40	10.07	17.57	9.54	57.15	8.99
MCS1	2462	6.17	-1.94	1.40	10.07	17.64	9.53	58.08	8.97
MCS2	2462	6.83	-1.96	1.40	10.07	18.30	9.51	67.61	8.93
MCS3	2462	6.65	-2.01	1.40	10.07	18.12	9.46	64.86	8.83
MCS4	2462	6.22	-2.07	1.40	10.07	17.69	9.40	58.75	8.71
MCS5	2462	6.40	-2.11	1.40	10.07	17.87	9.36	61.24	8.63
MCS6	2462	6.13	-2.17	1.40	10.07	17.60	9.30	57.54	8.51
MCS7	2462	5.86	-2.18	1.40	10.07	17.33	9.29	54.08	8.49

:Worst data rate

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

5.3 SAR testing operating modes

The operating mode for SAR testing was decided by the output power

SAR measurement for GSM and W-CDMA

Band	Crest factor	Mode	Test Frequency	Note
GSM850	8.3	GSM GPRS (CS-1) 1 slots	824.2MHz (128ch) 836.6MHz(190ch) 848.8MHz(251ch)	*4
PCS1900	8.3	GSM GPRS (CS-1) 1 slots	1880.0MHz(661ch)	*4
WCDMA V	1	12.2k RMC	826.4MHz(4132ch) 836.6MHz(4183ch) 846.6MHz (4233ch)	*1 *4
WWAN				
The communication link was set up with the Wireless Communications Test Set (Agilent). The EUT was command to operate at maximum transmit power. GSM850 :PCL 5 PCS1900 :PCL 0 W-CDMA :All up bits				

SAR measurement for WLAN

Mode	Crest factor	Modulation	Test Frequency	Note
IEEE802.11b	1	DBPSK(1Mbps)	2437MHz(6ch)	*4
IEEE802.11g	Not required			*2
IEEE802.11n20 (2.4G)	Not required			*2
Bluetooth	Exemption			*3

Decision of SAR test channel
The operating mode for SAR testing was decided by the output power

Mode	GHz	Channel	Turbo Channel	"Default Test Channel"	
				FCC 15.247	
				802.11b	802.11g
802.11 b/g	2.412	1		√	Δ
	2.437	6	6	√	Δ
	2.462	11		√	Δ

√ = "default test channels"
Δ = Possible 802.11g channels with maximum average output ¼ dB ≥ the "default test channels"

*1 The 12.2k RMC mode was maximum average power. The AMR/HSDPA/HSUPA SAR is not required for other mode because the maximum average output power for other mode is less than 1/4dB higher than that measured 12.2k RMC mode.

*2 The 11b mode was maximum average power. The 11g/n SAR is not required for other mode because the maximum average output power for other mode is less than 1/4dB higher than that measured 11b mode.

*3 Bluetooth mode is excluded from SAR Bluetooth power < Pref (=1/2 *60/$f_{[GHz]}$). Refer to the FCC 15.247 test report

*4 The other channel was not required since maximum average output power channel SAR value is less than 0.8W/kg.

5.4 Confirmation before SAR testing

Correlation of Output Power between EMC and SAR tests
It was checked that the antenna port power was correlated within 0~+5% (FCC requirements)
SAR power is equal to DATA of EMC test based on the following reason.

- EMC and SAR tests are performed with the same test sample under the same condition.
- EMC and SAR tests are performed at the same laboratory.

<Peak power result for maximum data rate in FCC 15.247 test>

IEEE802.11b 1Mbps

Ch	Frequency	P/M Reading [dBm]		Cable Loss	Atten.	Result [dBm]		Result [mW]	
	[MHz]	PK	AVG	[dB]	[dB]	PK	AVG	PK	AVG
1	2412	4.82	2.72	1.38	10.07	16.27	14.17	42.36	26.12
6	2437	5.06	2.73	1.39	10.07	16.52	14.19	44.87	26.24
11	2462	4.67	2.67	1.40	10.07	16.14	14.14	41.11	25.94

IEEE802.11g 18Mbps

Ch	Frequency	P/M Reading [dBm]		Cable Loss	Atten.	Result [dBm]		Result [mW]	
	[MHz]	PK	AVG	[dB]	[dB]	PK	AVG	PK	AVG
1	2412	6.88	-2.01	1.38	10.07	18.33	9.44	68.08	8.79
6	2437	6.61	-2.17	1.39	10.07	18.07	9.29	64.12	8.49
11	2462	6.63	-1.99	1.40	10.07	18.10	9.48	64.57	8.87

IEEE802.11n20 Long GI MCS2

Ch	Frequency	P/M Reading [dBm]		Cable Loss	Atten.	Result [dBm]		Result [mW]	
	[MHz]	PK	AVG	[dB]	[dB]	PK	AVG	PK	AVG
1	2412	7.09	-2.01	1.38	10.07	18.54	9.44	71.45	8.79
6	2437	6.87	-2.10	1.39	10.07	18.33	9.36	68.08	8.63
11	2462	6.85	-1.97	1.40	10.07	18.32	9.50	67.92	8.91

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

5.5 Confirmation after SAR testing

It was checked that the power drift [W] is within +/-5%.The verification of power drift during the SAR test is that DASY5 system calculates the power drift by measureing the e-filed at the same location at beginning and the end of the scan measurement for each test position.

DASY5 system calucation Power drift value[dB] =20log(Ea)/(Eb)
Before SAR testing : Eb[V/m]
After SAR testing : Ea[V/m]

Limit of power drift[W] =+/-5%
X[dB]=10log[P]=10log(1.05/1)=10log(1.05)-10log(1)=0.212dB

from E-filed relations with power.
p=E^2/η=E^2/
Therefore, The correlation of power and the E-filed
XdB=10log(P)=10log(E)^2=20log(E)

Therefore,
The calculated power drift of DASY5 System must be the less than +/-0.212dB.

SECTION6 : Description of the Head/ Body / Body-Worn setup

6.1 Test position for Head setup

i)Procedure for SAR testing

The EUT was tested in accordance with FCC OET Bulletin 65 Supplement C: 2001-01 and IEEE 1528: 2003 for both the "Cheek/Touch" and "Ear/Tilt" positions at the left and right sides of the SAM phantom head region. The FCC KDB 648474 D01 was also incorporated.

ii)Test mode

GSM850/PCS1900	**Voice mode (GSM)**
WCDMA V	**12.2k RMC**
WLAN	**VOIP mode (11b)**

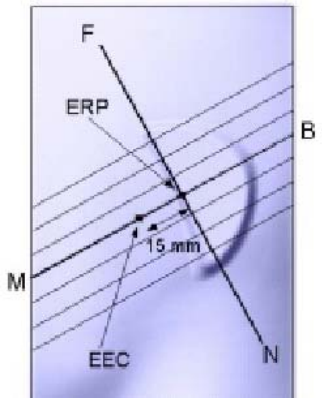
iii)Test position

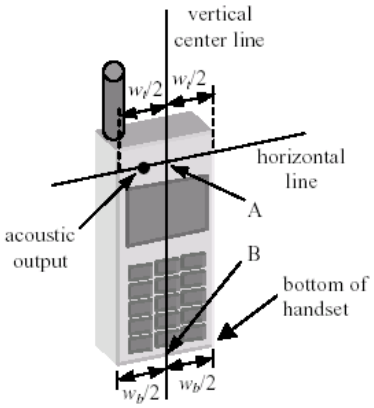
(1) Left cheek
(2) Left tilt
(3) Right cheek
(4) Right tilt

Initial ear position

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom.

The device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane".





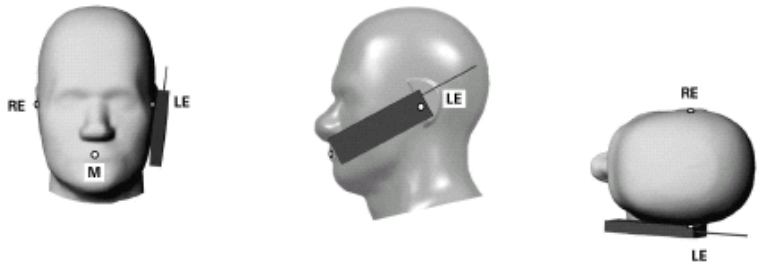
Cheek position

The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line.

This test position is established:

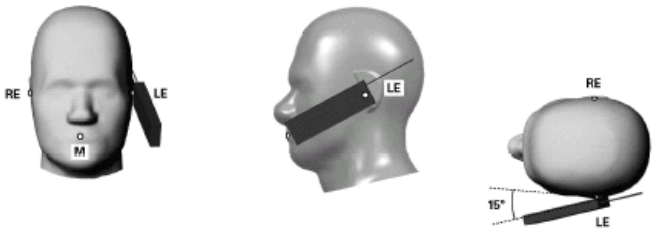
i) When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.

ii) (or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.



Tilt position

If the earpiece of the handset is not in full contact with the phantom's ear spacer and the peak SAR location for the "Cheek/Touch" position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer. Otherwise the handset should be moved away from the cheek perpendicular to the line passes through both "ear reference points" for approximate 2-3 cm. While it is in this position, the handset is tilted away from the mouth with respect to the "test device reference point" by 15°. After the tilt, it is then moved back toward the head perpendicular to the line passes through both "ear reference points" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously.



<Antenna position>

The antennas use for WWAN and WLAN are both separate in a single fixed position. The antennas are integral part of the device.

6.2 Description of the Body setup

i)Procedure for SAR testing

-The tested distance were performed according to the KDB941225 D06 v01 (SAR Evaluation Procedures for portable Devices with Wireless Router Capabilities).

ii)Test mode

GSM850/PCS1900	**Data transmission mode (GPRS)**
WCDMA V	**Data transmission mode (12.2kRMC)**
WLAN	**Data transmission mode (11b)**

Position	WWAN	WLAN
Front	Tested	Tested
Rear	Tested	Tested
Right edge	Tested	Not required
Left edge	Tested	Tested
Top edge	Not required	Tested
Bottom edge	Tested	Not required

NOTE: Test position is required to the edge within 2.5cm from antenna according to the KDB 941225 D06.

(1) Front (10mm) :
The measurement separated 10mm distance between the front face of EUT and flat section of SAM Twin Phantom.
(2) Rear (10mm) :
The measurement separated 10mm distance between the rear face of EUT and flat section of SAM Twin Phantom.
(3) Right edge (10mm) :
The measurement separated 10mm distance between the right edge of EUT and flat section of SAM Twin Phantom.
(4) Left edge (10mm) :
The measurement separated 10mm distance between the left edge of EUT and flat section of SAM Twin Phantom.
(5) Top edge (10mm) :
The measurement separated 10mm distance between the top edge of EUT and flat section of SAM Twin Phantom.
(6) Bottom edge (10mm) :
The measurement separated 10mm distance between the bottom edge of EUT and flat section of SAM Twin Phantom.

6.3 Description of the Body-worn setup

i)Procedure for SAR testing

According to KDB 941225 D06 Hotspot SAR procedure, test Body-worn for WWAN & WLAN2.4GHz not necessary since the test separation distance (10mm) for hotspot mode is more conservative than Body-worn test(15mm).

SECTION 7 : Test surrounding

7.1 Measurement uncertainty

The uncertainty budget has been determined for the DASY5 measurement system according to the SPEAG documents[2] and is given in the following Table.

Error Description	Uncertai value ±	Probability distribution	divisor	(ci) 1g	Standard (1g)	vi or veff
Measurement System						
Probe calibration	± 6.00	Normal	1	1	± 6.00	∞
Axial isotropy of the probe	± 4.7	Rectangular	√3	0.7	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	√3	0.7	± 3.9	∞
Boundary effects	± 1.0	Rectangular	√3	1	± 0.6	∞
Probe linearity	± 4.7	Rectangular	√3	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	√3	1	± 0.6	∞
Readout electronics	± 0.3	Normal	1	1	± 0.3	∞
Response time	± 0.8	Rectangular	√3	1	± 0.5	∞
Integration time	± 2.6	Rectangular	√3	1	± 1.5	∞
RF ambient Noise	± 3.0	Rectangular	√3	1	± 1.7	∞
RF ambient Reflections	± 3.0	Rectangular	√3	1	± 1.7	∞
Probe Positioner	± 0.4	Rectangular	√3	1	± 0.2	∞
Probe positioning	± 2.9	Rectangular	√3	1	± 1.7	∞
Max.SAR Eval.	± 1.0	Rectangular	√3	1	± 0.6	∞
Test Sample Related						
Device positioning	± 2.9	Normal	1	1	± 2.9	41
Device holder uncertainty	± 3.6	Normal	1	1	± 3.6	9
Power drift	± 5.0	Rectangular	√3	1	± 2.9	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	√3	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	√3	0.64	± 1.8	∞
Liquid conductivity (meas.)	- 4.5	Rectangular	1	0.64	+ 2.9	∞
Liquid permittivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (meas.)	- 4.8	Rectangular	1	0.6	- 2.9	∞
Combined Standard Uncertainty					± **11.516**	
Expanded Uncertainty (k=2)					± **23.0**	

SECTION 8 : Measurement results

8.1 GSM 850MHz HEAD SAR

(1)Method of measurement

Step1. The searching for the worst position

The test was performed in maximum average output power channel.

Note:

1) The other channel was not required since maximum average output power channel SAR value is less than 0.8W/kg.

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.

The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
9-Apr	24	37	HSL900	23.5	848.8	εr	41.5	41.5	0.0	+/-5
						σ [mho/m]	0.90	0.89	-1.6	+/-5

εr: Relative Permittivity / σ : Coductivity

*1 The Target value is a parameter defined in FCC OET65.

frequency [GHz]	e'	e"	σ [mho/m]	frequency [GHz]	e'	e"	σ [mho/m]
0.735	42.9611	19.1186	0.781	0.845	41.5559	18.7762	0.881
0.745	42.8289	19.0869	0.790	0.855	41.4410	18.7484	0.891
0.755	42.6967	19.0552	0.799	0.865	41.3329	18.7200	0.900
0.765	42.5645	19.0235	0.808	0.875	41.2360	18.6992	0.909
0.775	42.4323	18.9918	0.818	0.885	41.1354	18.6850	0.919
0.785	42.3001	18.9601	0.827	0.895	41.0249	18.6787	0.929
0.795	42.1679	18.9284	0.836	0.905	40.9020	18.6698	0.939
0.805	42.0357	18.8967	0.845	0.915	40.7756	18.6499	0.948
0.815	41.9035	18.8650	0.854	0.925	40.6608	18.6259	0.957
0.825	41.7791	18.8301	0.863	0.935	40.5605	18.5990	0.966
0.835	41.6647	18.7995	0.872				

σ [mho/m]=e"* frequency[GHz]/18

(3)Result of HEAD SAR

HEAD SAR MEASUREMENT RESULTS							
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Maximum value of multi-peak
Step.1 Position searching							
251	848.8	GSM	Left	Fixed	Cheek	0	**0.433**
251	848.8	GSM	Left	Fixed	Tilt	0	**0.342**
251	848.8	GSM	Right	Fixed	Cheek	0	**0.505**
251	848.8	GSM	Right	Fixed	Tilt	0	**0.340**

8.2 GSM 850MHz Body SAR

(1)Method of measurement

<Body (Hotspot mode)>

Step1. The searching for the worst position
The test was performed in maximum average output power channel.

Step2. The changing to the channels (Mid, High)
The test was performed at the worst condition of Step1.

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
9-Apr	24	37	MSL 900	23.5	824.2	εr	55.2	52.9	-4.2	+/-5
						σ [mho/m]	0.97	0.93	-4.5	+/-5
9-Apr	24	37	MSL 900	23.5	836.6	εr	55.2	52.7	-4.5	+/-5
						σ [mho/m]	0.97	0.94	-3.2	+/-5
9-Apr	24	37	MSL 900	23.5	848.8	εr	55.2	52.6	-4.7	+/-5
						σ [mho/m]	0.97	0.95	-2.0	+/-5

εr: Relative Permittivity / σ : Coductivity

*1 The Target value is a parameter defined in FCC OET65.

frequency [GHz]	e'	e"	σ [mho/m]	frequency [GHz]	e'	e"	σ [mho/m]
0.735	54.0023	20.6277	0.842	0.845	52.6311	20.1520	0.946
0.745	53.8787	20.5781	0.852	0.855	52.5187	20.1459	0.957
0.755	53.7550	20.5285	0.861	0.865	52.4177	20.1484	0.968
0.765	53.6314	20.4789	0.870	0.875	52.3333	20.1375	0.979
0.775	53.5077	20.4293	0.880	0.885	52.2700	20.1280	0.990
0.785	53.3841	20.3797	0.889	0.895	52.1999	20.1262	1.001
0.795	53.2604	20.3301	0.898	0.905	52.1054	20.1082	1.011
0.805	53.1368	20.2805	0.907	0.915	51.9937	20.0751	1.020
0.815	53.0131	20.2309	0.916	0.925	51.8796	20.0502	1.030
0.825	52.8841	20.1967	0.926	0.935	51.7675	20.0414	1.041
0.835	52.7542	20.1744	0.936				

σ [mho/m]=e"* frequency[GHz]/18

(3)Result of Body SAR

BODY SAR MEASUREMENT RESULTS							
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Maximum value of multi-peak
Step.1 Position searching							
128	824.2	GPRS 1slots	Flat	Fixed	Front	10	**0.664**
128	824.2	GPRS 1slots	Flat	Fixed	Rear	10	**0.809**
128	824.2	GPRS 1slots	Flat	Fixed	Right edge	10	**0.412**
128	824.2	GPRS 1slots	Flat	Fixed	Left edge	10	**0.389**
128	824.2	GPRS 1slots	Flat	Fixed	Bottom edge	10	**0.067**
Step.2 Channel change (SAR level in Step.1 > 0.8 w/kg)							
190	836.6	GPRS 1slots	Flat	Fixed	Rear	10	**0.908**
251	848.8	GPRS 1slots	Flat	Fixed	Rear	10	**0.847**

8.3 PCS1900 MHz HEAD SAR

(1)Method of measurement

Step1. The searching for the worst position

The test was performed in maximum average output power channel.

Note:

1) The other channel was not required since maximum average output power channel SAR value is less than 0.8W/kg.

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.

The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
7-Apr	24	42	HSL 1800	23.5	1880	εr	40.0	38.2	-4.6	+/-5
						σ [mho/m]	1.40	1.43	2.2	+/-5

εr: Relative Permittivity / σ : Coductivity

*1 The Target value is a parameter defined in FCC OET65.

frequency [GHz]	e'	e"	σ [mho/m]	frequency [GHz]	e'	e"	σ [mho/m]
1.8	38.4795	13.4963	1.350	1.91	38.0283	13.7865	1.463
1.81	38.4333	13.5201	1.360	1.92	37.9716	13.8091	1.473
1.82	38.394	13.5408	1.369	1.93	37.924	13.8294	1.483
1.83	38.3539	13.5634	1.379	1.94	37.8782	13.8553	1.493
1.84	38.3154	13.589	1.389	1.95	37.8345	13.8781	1.503
1.85	38.2739	13.6163	1.399	1.96	37.7913	13.9066	1.514
1.86	38.2311	13.6465	1.410	1.97	37.7495	13.9332	1.525
1.87	38.1934	13.6792	1.421	1.98	37.7077	13.9595	1.536
1.88	38.1555	13.7053	1.431	1.99	37.6681	13.985	1.546
1.89	38.1157	13.7354	1.442	2	37.6243	14.0062	1.556
1.9	38.0757	13.7598	1.452				

σ [mho/m]=e"* frequency[GHz]/18

(3)Result of HEAD SAR

HEAD SAR MEASUREMENT RESULTS							
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Maximum value of multi-peak
Step.1 Position searching							
661	1880.0	GSM	Left	Fixed	Cheek	0	**0.548**
661	1880.0	GSM	Left	Fixed	Tilt	0	**0.118**
661	1880.0	GSM	Right	Fixed	Cheek	0	**0.241**
661	1880.0	GSM	Right	Fixed	Tilt	0	**0.117**

8.4 PCS1900MHz Body SAR

(1)Method of measurement

<Body (Hotspot mode)>

Step1. The searching for the worst position
The test was performed in maximum average output power channel.

Step2. Additional measurement with Another sample: Chassis's color: Pink
The test was performed at the worst position of Step1.

Note:
1) The other channel was not required since maximum average output power channel SAR value is less than 0.8W/kg.

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
7-Apr	24	42	MSL 1800	23.0	1880	εr	53.3	51.1	-4.2	+/-5
						σ [mho/m]	1.52	1.55	2.2	+/-5

εr: Relative Permittivity / σ : Coductivity
*1 The Target value is a parameter defined in FCC OET65.

frequency [GHz]	e'	e"	σ [mho/m]	frequency [GHz]	e'	e"	σ [mho/m]
1.8	51.3079	14.6303	1.463	1.91	50.9602	14.9521	1.587
1.81	51.2592	14.6596	1.474	1.92	50.9093	14.9994	1.600
1.82	51.2307	14.6897	1.485	1.93	50.873	15.0461	1.613
1.83	51.2134	14.7263	1.497	1.94	50.8328	15.0858	1.626
1.84	51.2001	14.7682	1.510	1.95	50.8052	15.1097	1.637
1.85	51.1807	14.8141	1.523	1.96	50.7822	15.139	1.648
1.86	51.1463	14.8449	1.534	1.97	50.7628	15.155	1.659
1.87	51.1064	14.868	1.545	1.98	50.7277	15.1775	1.670
1.88	51.0697	14.8717	1.553	1.99	50.6858	15.1945	1.680
1.89	51.0322	14.8851	1.563	2	50.6242	15.2111	1.690
1.9	51.0016	14.9124	1.574				

σ [mho/m]=e"* frequency[GHz]/18

(3)Result of Body SAR

BODY SAR MEASUREMENT RESULTS							
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Maximum value of multi-peak
Step.1 Position searching							
661	1880.0	GPRS 1slots	Flat	Fixed	Front	10	**0.547**
661	1880.0	GPRS 1slots	Flat	Fixed	Rear	10	**0.778**
661	1880.0	GPRS 1slots	Flat	Fixed	Right edge	10	**0.056**
661	1880.0	GPRS 1slots	Flat	Fixed	Left edge	10	**0.307**
661	1880.0	GPRS 1slots	Flat	Fixed	Bottom edge	10	**0.410**
Step.2 Additional measurement with another sample							
661	1880.0	GPRS 1slots	Flat	Fixed	Rear	10	**0.859**

8.5 WCDMA Band V HEAD SAR

(1)Method of measurement

Step1. The searching for the worst position

The test was performed in maximum average output power channel.

Note:

1) The SAR is not required for handset with AMR mode because the maximum average output power with AMR is less than 1/4dB higher than that measured using 12.2kbps RMC.

2)The other channel was not required since middle channel SAR value is less than 0.8W/kg.

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.

The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
8-Apr	24	45	HSL900	23.5	846.6	εr	41.5	41.8	0.7	+/-5
						σ [mho/m]	0.90	0.93	2.8	+/-5

εr: Relative Permittivity / σ : Coductivity

*1 The Target value is a parameter defined in FCC OET65.

frequency [GHz]	e'	e"	σ [mho/m]	frequency [GHz]	e'	e"	σ [mho/m]
0.735	43.3702	19.9017	0.813	0.845	41.8068	19.6322	0.922
0.745	43.2414	19.8631	0.822	0.855	41.7013	19.6316	0.933
0.755	43.1098	19.8247	0.832	0.865	41.5786	19.6088	0.942
0.765	42.9473	19.7568	0.840	0.875	41.4492	19.5658	0.951
0.775	42.7727	19.6818	0.847	0.885	41.3107	19.5226	0.960
0.785	42.5892	19.6279	0.856	0.895	41.1622	19.4797	0.969
0.795	42.4116	19.5956	0.865	0.905	40.9927	19.4383	0.977
0.805	42.2529	19.5816	0.876	0.915	40.8329	19.4013	0.986
0.815	42.111	19.5859	0.887	0.925	40.6948	19.3799	0.996
0.825	41.9961	19.6059	0.899	0.935	40.5877	19.3738	1.006
0.835	41.9004	19.6298	0.911				

σ [mho/m]=e"* frequency[GHz]/18

(3)Result of HEAD SAR

HEAD SAR MEASUREMENT RESULTS							
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Maximum value of multi-peak
Step.1 Position searching							
4233	846.6	12.2k RMC	Left	Fixed	Cheek	0	**0.497**
4233	846.6	12.2k RMC	Left	Fixed	Tilt	0	**0.366**
4233	846.6	12.2k RMC	Right	Fixed	Cheek	0	**0.516**
4233	846.6	12.2k RMC	Right	Fixed	Tilt	0	**0.384**

8.6 WCDMA Band V Body SAR

(1)Method of measurement

<Body (Hotspot mode)>

Step1. The searching for the worst position
The test was performed in maximum average output power channel.
Step2. The changing to the channels (Low, Mid)
The test was performed at the worst position of from Step1.
Step3. Additional measurement with Another sample: Chassis's color: Pink
The test was performed at the worst condition of Step1 and Step2.

Note:
1) The SAR is not required for handset with AMR mode because the maximum average output power with AMR is less than 1/4dB higher than that measured using 12.2kbps RMC.
2)The other channel was not required since middle channel SAR value is less than 0.8W/kg.

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS

Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
8-Apr	24	45	MSL 900	23.5	826.4	εr	55.2	53.5	-3.0	+/-5
						σ [mho/m]	0.97	0.95	-2.2	+/-5
8-Apr	24	45	MSL 900	23.5	836.6	εr	55.2	53.5	-3.2	+/-5
						σ [mho/m]	0.97	0.96	-1.0	+/-5
8-Apr	24	45	MSL 900	23.5	846.6	εr	55.2	53.4	-3.3	+/-5
						σ [mho/m]	0.97	0.97	0.0	+/-5

εr: Relative Permittivity / σ : Coductivity
*1 The Target value is a parameter defined in FCC OET65.

frequency [GHz]	e'	e"	σ [mho/m]	frequency [GHz]	e'	e"	σ [mho/m]
0.735	54.4816	20.7777	0.848	0.845	53.3818	20.6027	0.967
0.745	54.3692	20.7173	0.857	0.855	53.2785	20.5629	0.977
0.755	54.3058	20.684	0.868	0.865	53.1755	20.5205	0.986
0.765	54.1947	20.6528	0.878	0.875	53.0728	20.4876	0.996
0.775	54.0731	20.6376	0.889	0.885	52.9657	20.4663	1.006
0.785	53.9558	20.639	0.900	0.895	52.8675	20.4593	1.017
0.795	53.8513	20.6485	0.912	0.905	52.7496	20.4556	1.028
0.805	53.7488	20.6529	0.924	0.915	52.651	20.4551	1.040
0.815	53.6507	20.6588	0.935	0.925	52.5612	20.4704	1.052
0.825	53.556	20.6532	0.947	0.935	52.4932	20.4735	1.063
0.835	53.4739	20.6266	0.957				

σ [mho/m]=e"* frequency[GHz]/18

(3)Result of Body SAR

BODY SAR MEASUREMENT RESULTS							
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Maximum value of multi-peak
Step.1 Position searching							
4233	846.6	12.2k RMC	Flat	Fixed	Front	10	**0.710**
4233	846.6	12.2k RMC	Flat	Fixed	Rear	10	**0.931**
4233	846.6	12.2k RMC	Flat	Fixed	Right edge	10	**0.394**
4233	846.6	12.2k RMC	Flat	Fixed	Left edge	10	**0.372**
4233	846.6	12.2k RMC	Flat	Fixed	Bottom edge	10	**0.082**
Step.2 Frequency change							
4132	826.4	12.2k RMC	Flat	Fixed	Rear	10	**0.881**
4183	836.6	12.2k RMC	Flat	Fixed	Rear	10	**0.923**
Step.3 Additional measurement with another sample							
4233	846.6	12.2k RMC	Flat	Fixed	Rear	10	**0.937**

8.7 WLAN HEAD SAR

(1)Method of measurement

Step1. The searching for the worst position

The test was performed in maximum average output power channel.

Note:

1) The SAR is not required for 11g/n mode because the maximum average output power for 11g/n mode is less than 1/4dB higher than that measured 11b mode.
2) The other channel was not required since maximum average output power channel SAR value is less than 0.8W/kg.

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
16-Apr	24	40	HSL 2450	23.5	2437	εr	39.2	37.5	-4.4	+/-5
						σ [mho/m]	1.79	1.81	1.2	+/-5

εr: Relative Permittivity / σ : Coductivity

*1 The Target value is a parameter defined in FCC OET65.

frequency [GHz]	e'	e"	σ [mho/m]	frequency [GHz]	e'	e"	σ [mho/m]
2.35	37.9299	13.1029	1.711	2.46	37.4396	13.468	1.841
2.36	37.9043	13.1962	1.730	2.47	37.4152	13.5195	1.855
2.37	37.874	13.2278	1.742	2.48	37.3869	13.5612	1.868
2.38	37.8319	13.2504	1.752	2.49	37.3549	13.5915	1.880
2.39	37.7776	13.2641	1.761	2.5	37.3188	13.6138	1.891
2.4	37.7158	13.2723	1.770	2.51	37.2682	13.6294	1.901
2.41	37.6497	13.2804	1.778	2.52	37.2078	13.6368	1.909
2.42	37.5879	13.3004	1.788	2.53	37.1421	13.6442	1.918
2.43	37.5342	13.3275	1.799	2.54	37.0785	13.6551	1.927
2.44	37.4935	13.3678	1.812	2.55	37.0179	13.6758	1.937
2.45	37.4644	13.415	1.826				

σ [mho/m]=e"* frequency[GHz]/18

(3)Result of HEAD SAR

HEAD SAR MEASUREMENT RESULTS							
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Maximum value of multi-peak
Step.1 Position searching							
6	2437	11b 1Mbps	Left	Fixed	Cheek	0	**0.133**
6	2437	11b 1Mbps	Left	Fixed	Tilt	0	**0.103**
6	2437	11b 1Mbps	Right	Fixed	Cheek	0	**0.263**
6	2437	11b 1Mbps	Right	Fixed	Tilt	0	**0.128**
Step.2 Additional measurement with another sample							
6	2437	11b 1Mbps	Right	Fixed	Cheek	0	**0.463**

8.8 WLAN Body SAR

(1)Method of measurement

Step1. The searching for the worst position

The test was performed in maximum average output power channel.

Note:

1) The BODY SAR is not required for 11g/n mode because the maximum average output power for 11g/n mode is less than 1/4dB higher than that measured 11b mode.
2) The other channel was not required since maximum average output power channel SAR value is less than 0.8W/kg.

(2)Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
10-Apr	24	43	MSL 2450	23.5	2437	εr	52.7	50.2	-4.8	+/-5
						σ [mho/m]	1.94	1.97	1.6	+/-5

εr: Relative Permittivity / σ : Coductivity

*1 The Target value is a parameter defined in FCC OET65.

frequency [GHz]	e'	e"	σ [mho/m]	frequency [GHz]	e'	e"	σ [mho/m]
2.35	50.4817	14.1808	1.851	2.46	50.1164	14.599	1.995
2.36	50.4466	14.218	1.864	2.47	50.0851	14.6337	2.008
2.37	50.4076	14.2512	1.876	2.48	50.0508	14.6735	2.022
2.38	50.3742	14.2895	1.889	2.49	50.0176	14.7129	2.035
2.39	50.3359	14.3269	1.902	2.5	49.9801	14.7545	2.049
2.4	50.3046	14.3628	1.915	2.51	49.941	14.7952	2.063
2.41	50.2735	14.4059	1.929	2.52	49.904	14.8353	2.077
2.42	50.2413	14.4486	1.943	2.53	49.8703	14.8728	2.090
2.43	50.2087	14.486	1.956	2.54	49.8309	14.9154	2.105
2.44	50.1827	14.524	1.969	2.55	49.7945	14.9514	2.118
2.45	50.1488	14.5604	1.982				

σ [mho/m]=e"* frequency[GHz]/18

(3)Result of Body SAR

BODY SAR MEASUREMENT RESULTS							
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Maximum value of multi-peak
Step.1 Position searching							
6	2437	11b 1Mbps	Flat	Fixed	Front	10	**0.040**
6	2437	11b 1Mbps	Flat	Fixed	Rear	10	**0.033**
6	2437	11b 1Mbps	Flat	Fixed	Left edge	10	**0.021**
6	2437	11b 1Mbps	Flat	Fixed	Top edge	10	**0.014**

8.9 Simultaneous transmission evaluation for HEAD

Result of SUM ΣSAR1g

SUM ΣSAR1g (WWAN +WLAN(2.4G))				
Position	Separation [mm]	Stand alone worst SAR(1g) [W/kg]		SUM SAR(1g)[W/kg]
		GSM850 Band	WLAN 2.4G	WWAN + WLAN(2.4G)
Right cheek	0	0.505	0.463	0.968
	[mm]	PCS1900 Band	WLAN 2.4G	WWAN + WLAN(2.4G)
Left cheek	0	0.548	0.133	0.681
	[mm]	WCDMA band	WLAN 2.4G	WWAN + WLAN(2.4G)
Right cheek	0	0.516	0.463	0.979

: Highest SUM ΣSAR1g Head simultaneous transmission

8.10 Simultaneous transmission evaluation for Body

Result of SUM ΣSAR1g

SUM ΣSAR1g (WWAN+WLAN(2.4G))				
Position	Separation [mm]	Stand alone SAR(1g) [W/kg]		SUM SAR(1g)[W/kg]
		GSM850 Band	WLAN 2.4G	WWAN + WLAN(2.4G)
Front	10	0.664	0.040	0.704
Rear	10	0.908	0.033	0.941
Right edge	10	0.412	-*1	0.412
Left edge	10	0.389	0.021	0.410
Top edge	10	-*1	0.014	0.014
Bottom edge	10	0.067	-*1	0.067
Position	Separation	PCS1900 Band	WLAN 2.4G	WWAN + WLAN(2.4G)
Front	10	0.547	0.040	0.587
Rear	10	0.859	0.033	0.892
Right edge	10	0.056	-*1	0.056
Left edge	10	0.307	0.021	0.328
Top edge	10	-*1	0.014	0.014
Bottom edge	10	0.410	-*1	0.410
Position	Separation	WCDMA Band	WLAN 2.4G	WWAN + WLAN(2.4G)
Front	10	0.710	0.040	0.750
Rear	10	0.937	0.033	0.970
Right edge	10	0.394	-*1	0.394
Left edge	10	0.372	0.021	0.393
Top edge	10	-*1	0.014	0.014
Bottom edge	10	0.082	-*1	0.082

: Highest SUM ΣSAR1g Body simultaneous transmission

*1: This position was excluded in stand-alone SAR,

SECTION 9 Test instruments

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date	Expiration date of the calibration
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	Power ,	2012/02/03	2013/02/28
MPM-12	Power Meter	Anritsu	ML2495A	0825002	Power	2011/08/09	2012/08/31
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	Power	2011/08/09	2012/08/31
MCC-67	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28635/2	Power	2011/04/22	2012/04/30
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	Power	2012/03/27	2013/03/31
MURC-02	Wireless Communication Test Set	Agilent	E5515C	GB47050683	Power	2011/11/26	2012/11/30
MPM-12	Power Meter	Anritsu	ML2495A	0825002	Power	2011/08/09	2012/08/31
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	Power	2011/08/09	2012/08/31
MCC-138	Microwave cable	HUBER+ SUHNER	SUCOFLEX 102	37953/2	Power	2011/10/28	2012/10/31
MCC-67	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28635/2	Power	2011/04/22	2012/04/30
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	Power	2012/03/27	2013/03/31
MPD-02	Power Divider DC-12.4GHz	SUHNER	4901.19.A	-		2011/05/23	2012/05/31
MSG-10	Signal Generator	Agilent	N5181A	MY47421098	SAR	2011/09/22	2012/09/30
MHDC-11	Dual Directional Coupler	Hewlett Packard	778D	16605	SAR	Pre Check	Pre Check
MHDC-12	Dual Directional Coupler	Hewlett Packard	772D	2839A0016	SAR	Pre Check	Pre Check
MNA-01	Network Analyzer	Agilent/HP	E8358A	US41080381	SAR	2011/08/22	2012/08/31
MDPK-01	Dielectric probe kit	Agilent	85070D	702	SAR	2010/10/25	2013/10/31
MNCK-01	Type N Calibration Kit	Agilent	85032F	MY41495257	SAR	2011/08/12	2012/08/31
MPB-07	Dosimetric E-Field Probe	Schmid&Partner Engineering AG	EX3DV4	3825	SAR	2011/12/16	2012/12/31
MDAE-01	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE4	509	SAR	2011/07/20	2012/07/31
COTS-MSAR-03	Dasy5	Schmid&Partner Engineering AG	DASY52.6.1.408	-	SAR	-	-
COTS-MSAR-02	S-Parameter Network Analyzer	Agilent	-	-	SAR	-	-
MDA-05	Dipole Antenna	Schmid&Partner Engineering AG	D900V2	155	SAR	2010/12/06	2013/12/31
MDA-06	Dipole Antenna	Schmid&Partner Engineering AG	D1800V2	2d040	SAR	2010/12/09	2013/12/31
MDA-07	Dipole Antenna	Schmid&Partner Engineering AG	D2450V2	713	SAR	2010/09/13	2013/09/30
MPSAM-02	SAM Phantom	Schmid&Partner Engineering AG	SAM Twin Phantom V4.0	1333	SAR	2011/04/01	2012/04/30
MDH-01	Device holder	Schmid&Partner Engineering AG	Mounting device for transmitter	-	SAR	Pre Check	Pre Check
MOS-26	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q29	SAR	2011/05/26	2012/05/31
MOS-10	Digtal thermometer	HANNA	Checktemp-2	MOS-10	SAR	2011/08/22	2012/08/31
MBM-13	Barometer	Sunoh	SBR121	837	SAR	2011/03/14	2013/03/31
HSL/MSL900				Daily check Target value ± 5%			
HSL/MSL1800				Daily check Target value ± 5%			
HSL/MSL2450				Daily check Target value ± 5%			
SAR room				Daily check Ambient Noise<0.012W/kg			

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.