SAR TEST REPORT

Test Report No. : 31EE0214-HO-02-A-R1

Applicant	:	**NEC CASIO Mobile Communications, Ltd.**
Type of Equipment	:	**Digital Portable Cellular Telephone**
Model No.	:	**KMP7N4Y1-2A**
FCC ID	:	**A98-TBP4266**
Test regulation	:	**FCC47CFR 2.1093** **FCC OET Bulletin 65, Supplement C (Edition 01-01)**
Test Result	:	**Complied**

Max SAR Measured

Head SAR		**Body-Worn SAR**	
GSM850	: 0.476W/kg	GSM850	: 0.799W/kg
PCS1900	: 0.999W/kg	PCS1900	: 0.417W/kg
WCDMA Vband	: 0.535W/kg	WCDMA Vband	: 0.574W/kg
WLAN	: 0.343W/kg	WLAN	: 0.110W/kg

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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.
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6 This report is a revised version of 31EE0214-HO-02-A. 31EE0214-HO-02-A.is replaced with this report.

Date of test: January 26 to February 2, 2011

Representative test engineer:

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NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

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SECTION 1: Customer information

Company Name	:	NEC CASIO Mobile Communications, Ltd.
Address	:	1753 Shimonumabe, Nakahara-ku, Kawasaki, Kanagawa 211-8666 Japan
Telephone Number	:	+81-44-455-8045
Facsimile Number	:	+81-44-455-8025
Contact Person	:	Kazuhiro Kurihara

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

2.1 Identification of E.U.T.

Type of Equipment	:	Digital Portable Cellular Telephone
Model No.	:	KMP7N4Y1-2A
Serial No.	:	004401200620314 (GSM/WCDMA test) 004401200620322 (WLAN test)
Rating	:	Li-ion Battery (Model No.: N27) DC 3.8V/ 1230mAh 4.7Wh
Option Battery	:	N/A
Accessory	:	N/A
Receipt Date of Sample	:	January 22, 2011
Country of Mass-production	:	Japan
Condition of EUT	:	Production prototype
Modification of EUT	:	No Modification by the test lab

2.2 Product description

Model No: KMP7N4Y1-2A, (referred to as the EUT in this report), is the Digital Portable Cellular Telephone.

Radio Specification

Bluetooth (Ver.2.1 + EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Other Clock Frequency	19.2MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Connector Type	Integrated antenna

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

Equipment Type	Transceiver
Frequency of Operation	2400-2483.5MHz
Other Clock Frequency	19.2MHz
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

W-CDMA

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	QPSK
Channel spacing	5MHz
Antenna Connector Type	Integrated antenna

GPS

Equipment Type	Receiver
Receiver Type	Direct Downconversion
Frequency of Operation	1575.42MHz
Other Clock Frequency	19.2MHz
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 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.

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;

KDB 447498 D01(v04):	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
KDB941225	SAR Measurement Procedures for 3G Devices
	3GPP R6 HSPA and R7 HSPA+ SAR Guidance
	Recommended SAR Test Reduction Procedures for GSM/GPRS/EDGE
KDB 248227 (rev.1.2):	SAR Measurement Procedures for 802.11a//b/g Transmitters

3.2 Procedure and result

No.	Item	Test Procedure	Limit	Remarks	Exclusion	Result
1	Human Exposure	FCC OET BULLETIN 65, SUPPLEMENT C	FCC47CFR 2.1093	SAR Measurement	N/A	Complied
Note: UL Japan, Inc. 's SAR Work Procedures QPM46 and QPM47						

1. Stand-alone SAR result

Head SAR

GSM850 : 0.476W/kg (848.8MHz)
PCS1900 : 0.999W/kg (1880.0MHz)
WCDMA Vband : 0.535W/kg (846.6MHz)
WLAN : 0.343W/kg (2462MHz)

Body-Worn SAR

GSM850 : 0.799W/kg (824.2MHz)
PCS1900 : 0.417W/kg (1880.0MHz)
WCDMA Vband : 0.574W/kg (846.6MHz)
WLAN : 0.110W/kg (2437MHz)

2. Simultaneous transmission SAR result

<Simultaneous Procedure>

This EUT has the unlicensed transmitter such as Wireless LAN (802.11b/g/n) & Bluetooth devices besides licensed transmitter (GSM/WCDMA), and the following simultaneous transmission is possible.

a) GSM/WCDMA + Wireless LAN
b) GSM/WCDMA + Bluetooth

*The antennas of Wireless LAN and Bluetooth are shared.

a) GSM/WCDMA + Wireless LAN

Step1. WCDMA/GSM antenna is >5cm form Wireless LAN antenna
Step2. Wireless LAN power > 2Pref (=60/$f_{[GHz]}$).
Step3. Stand-alone SAR for Wireless LAN
Step4. Simultaneous transmission is possible (GSM/WCDMA + Wireless LAN)
Step5. ∑1g SAR (GSM/WCDMA + Wireless LAN) < 1.6W/kg
Max. Head SAR value = Max. Head SAR value (GSM/WCDMA) + Max.Head SAR value (WLAN)
Max. Head SAR Measured (GSM/WCDMA + WLAN) : 1.342W/kg
=0.999(from PCS1900) + 0.343 (WLAN)=1.342W/kg

Max. Body-worn SAR value = Max. Body-worn SAR value (GSM/WCDMA)
+ Max. Body-worn SAR value (WLAN)
Max. Body-worn SAR Measured (GSM/WCDMA + WLAN) :0.909W/kg
=0.799(from GSM850) + 0.110 (WLAN)=0.909W/kg
Step.6. No simultaneous transmission SAR

b) GSM/WCDMA + Bluetooth

Step1. WCDMA/GSM antenna is >5cm form Wireless antenna
Step2. Bluetooth power < Pref (=1/2 *60/$f_{[GHz]}$).
Refer to the FCC15.247 test report (31EE0214-HO-03-B)
Max.Power (BT) :-3.45dBm (0.45mW)
Step3. No stand-alone SAR for Bluetooth
Step4. No simultaneous transmission SAR

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
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4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

3.5 Confirmation before SAR testing

Output power measurement
Maximum output power for GSM/WCDMA 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.

Correlation of Output Power between EMC and SAR tests
It was checked that the antenna port power was correlated within 0~+5% (FCC requirements)

GSM850/PCS1900 power
- Power at EMC test
  EMC power was measured for EMC test sample (S/N: 004401200620322).
- Power at SAR test
  SAR power was measured for SAR test sample (S/N: 004401200620314).

WCDMA V power
SAR power is equal to DATA of EMC test. (January 27, 2011) based on the following reason.

- EMC and SAR tests are performed with the same test sample (S/N: 004401200620314) under the same condition.
- EMC and SAR tests are performed at the same laboratory.
- The test mode setting is simple, and there is no possibility that the power (value) is changed by the wrong setting.

Wireless LAN power
- Power at EMC test
  EMC power was measured for EMC test sample (S/N: 004401200620322).
- Power at SAR test
  SAR power was measured for SAR test sample (S/N: 004401200620322).

3.6 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 DASY4 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.

DASY4 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)

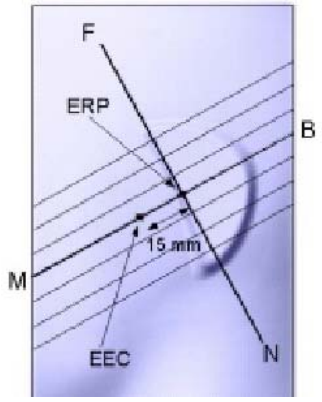
Therefore,
The calculated power drift of DASY5 System must be the less than +/-0.212dB.

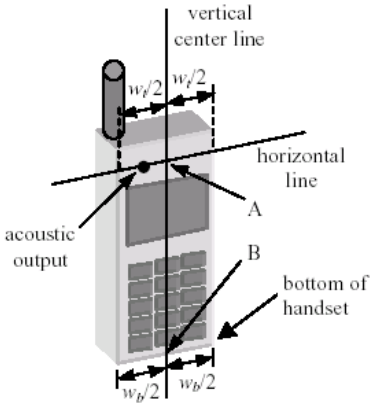
3.7 Description of the head test setup

According to the OET 65, and IEC62209-1 this EUT was tested on the "Cheek/Touch" and "Ear/Tilt" positions at the left head and right head section of the SAM phantom.

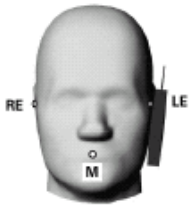
Initial ear position
A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom.

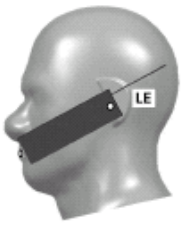
The device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference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

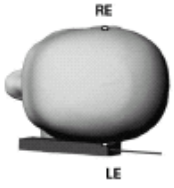




Cheek position
The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line.
This test position is established:
i) When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
ii) (or) When 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.

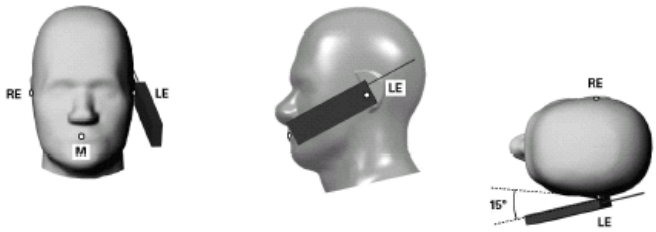






Tilt position

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 antenna of this EUT was built-in antenna. Refer to the Appendix1.

3.8 Method of measurement (Head SAR)

<GSM mode>
Step1. The searching for the worst position

Step2. The changing to the Low and High channels
The test was performed at the worst position of Step1.

<WCDMA mode>
Step1. The searching for the worst position
The test was performed in the 12.2kbps RMC.

Step2. The changing to the Low and High channels
The test was performed at the worst position of Step1.

Note: For the SAR test for 12.2k bps AMR with a 3.4kbps SRB
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.Refer to the result of power in the Section 6.

<Wireless LAN mode>
Step1. The searching for the worst position
The test was performed in the higher AVG power data rate (11b mode 5.5Mbps)

Step2. The changing to the lowest Data rate condition.(11b mode 1Mbps)
The test was performed at the worst position of Step1.

Step3. The changing to the Low and High channels
The test was performed at the worst condition of Step1 to Step.2.

Note: For the SAR for11g/n mode.The SAR is not required a 11g/n mode because the maximum average output power for 11g/n mode is less than 1/4dB higher than that measured in a 11b mode.
Refer to the result of power in the Section 6.

3.9 Description of the Body-worn setup

The tests were performed in the EUT with the earphone. (Refer to the Appendix1)

(1) Back (15mm) :
The measurement separated 15mm distance between the back face of EUT and flat section of SAM Twin Phantom.

3.10 Method of measurement (Body-worn SAR)

<GSM mode>
Step1. The changing to the channels (Low, Mid, High)

Note: For the SAR test for the GPRS mode
The body SAR is not required for GPRS mode because the maximum average output power for GPRS mode is less than 1/4dB higher than that measured GSM mode.

<WCDMA mode>

Step1. The changing to the channels (Low, Mid, High)

Note: For the SAR test for the HSPA mode
The body SAR is not required for handset with HSPA(HSDPA/HSUPA) because the maximum average output power with HSPA active is less than 1/4dB higher than that measured without HSPA using 12.2kbps RMC.

<Wireless LAN mode>
Step1. The changing to the Data rate (11b mode 1Mbps and 11b mode5.5Mbps)

Step2. The changing to the Low and High channels
The test was performed at the worst condition of Step1.

Note: For the SAR for11g/n mode.The SAR is not required a 11g/n mode because the maximum average output power for 11g/n mode is less than 1/4dB higher than that measured in a 11b mode.
Refer to the result of power in the Section 6.

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

4.1 Operating modes

Communication link for GSM/WCDMA was set up with the Wireless Communications Test Set.
The EUT was command to operate at maximum transmit power.
The frequency band and the modulation used in this test are shown as a following.

1. GSM850 (Power level 5 / Multi-slot class 8)

Frequency band	: UP Link 824.2MHz – 848.8MHz / Down Link 869.2MHz – 893.8MHz
Channel	: 128ch(UP Link: 824.2MHz)
	190ch(UP Link: 836.6MHz)
	251ch(UP Link: 848.8MHz)
Modulation	: GSM
Crest factor (PAR)	: 8.3 (Tx 1slot)

2. PCS1900 (Power level 0 / Multi-slot class 8)

Frequency band	: UP Link 1850.2MHz – 1909.8MHz / Down Link 1930.2MHz – 1989.8MHz
Channel	: 512ch(UP Link: 1850.2MHz)
	661ch(UP Link: 1880.0MHz)
	810ch(UP Link: 1909.8MHz)
Modulation	: GSM
Crest factor	: 8.3 (Tx 1slot)

3. WCDMA V (TPC all ones)

Frequency band	: UP Link 826.4MHz – 846.6MHz / Down Link 871.4MHz – 891.6MHz
Channel(Up link)	: 4132ch(826.4MHz)
	4183ch(836.6MHz)
	4233ch(846.6MHz)
Modulation	: QPSK (HSDPA category 10 / HSUPA category 6)
Crest factor	: 1 (Duty 100%)

4. Wireless LAN

(i) 802.11bmode

Frequency band	: 2412MHz – 2462MHz
Channel	: 1ch(2412MHz)
	6ch(2437MHz)
	11ch(2462MHz)
Modulation	: DBPSK CCK (11b)
Crest factor	: 1 (Duty 100%)

SECTION 5 : Test surrounding

5.1 Measurement uncertainty

The uncertainty budget has been determined for the DASY5 measurement system according to the SPEAG documents[6] and is given in the following Table.

Error Description	Uncertainty value ± %	Probability distribution	divisor	(ci) 1g	Standard Uncertainty (1g)	vi or veff
Measurement System						
Probe calibration	±6.55	Normal	1	1	±6.55	∞
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	±2.0	Rectangular	√3	1	±1.2	∞
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	±0.8	Rectangular	√3	1	±0.5	∞
Probe positioning	±9.9	Rectangular	√3	1	±5.7	∞
Max.SAR Eval.	±4.0	Rectangular	√3	1	±2.3	∞
Test Sample Related						
Device positioning	±2.9	Normal	1	1	±2.9	39
Device holder uncertainty	±3.6	Normal	1	1	±3.6	4
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.)	±5.0	Rectangular	1	0.64	±3.2	∞
Liquid permittivity (target)	±5.0	Rectangular	√3	0.6	±1.7	∞
Liquid permittivity (meas.)	±5.0	Rectangular	1	0.6	±3.0	∞
Combined Standard Uncertainty					**±13.356**	
Expanded Uncertainty (k=2)					**±26.7**	

SECTION 6 : Confirmation before testing

6.1 Output Power Measurement results

6.1.1 GSM 850

This data is reference data of FCC Part22 test report. (Report No. 31EE0214-HO-01-A)
Date of test: January 22, 2011

GSM850 EMC Power

Mode	Ch	Frequency [MHz]	P/M (PK) Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]
GSM (GMSK/1slot)	Low	824.2	0.51	29.81	3.35	33.67
	Mid	836.6	0.30	29.82	3.36	33.48
	High	848.8	0.40	29.82	3.36	33.58
GPRS (GMSK/1slot)	Low	824.2	0.40	29.81	3.35	33.56
	Mid	836.6	0.23	29.82	3.36	33.41
	High	848.8	0.27	29.82	3.36	33.45

Results = P/M Reading + Atten.Loss + Cable Loss

This DATA is a result of execution in before SAR testing.

GSM850 SAR Power

Mode	Ch	Frequency [MHz]	P/M Reading [dBm] PK	P/M Reading [dBm] AVG	Atten. [dB]	Cable Loss [dB]	Result [dBm] PK	Result [dBm] AVG
GSM (GMSK/1slot)	Low	824.2	9.97	0.50	23.38	0.52	33.87	24.40
	Mid	836.6	9.77	0.35	23.38	0.52	33.67	24.25
	High	848.8	9.81	0.56	23.38	0.52	33.71	24.46
GPRS (GMSK/1slot)	Low	824.2	9.84	0.37	23.38	0.52	33.74	24.27
	Mid	836.6	9.71	0.19	23.38	0.52	33.61	24.09
	High	848.8	9.67	0.41	23.38	0.52	33.57	24.31

Results = P/M Reading + Atten.Loss + Cable Loss

: Max.Peak power

<PCS1900>

This data is reference data of FCC Part 24 test report. (Report No. 31EE0214-HO-01-B)
Date of test: January 22, 2011

PCS1900 EMC Power

Mode	Ch	Frequency [MHz]	P/M(PK) Reading [dBm]	Atten. [dB]	Cable Loss [dB]	Result [dBm]
GSM (GMSK/1slot)	Low	1850.2	17.15	10.09	3.35	30.59
	Mid	1880.0	17.42	10.09	3.35	30.86
	High	1909.8	17.46	10.09	3.36	30.91
GPRS (GMSK/1slot)	Low	1850.2	16.86	10.09	3.35	30.30
	Mid	1880.0	17.18	10.09	3.35	30.62
	High	1909.8	17.20	10.09	3.36	30.65

Results = P/M Reading + Atten.Loss + Cable Loss

This DATA is a result of execution in before SAR testing.

PCS1900 SAR Power

Mode	Ch	Frequency [MHz]	P/M Reading [dBm] PK	P/M Reading [dBm] AVG	Atten. [dB]	Cable Loss [dB]	Result [dBm] PK	Result [dBm] AVG
GSM (GMSK/1slot)	Low	1850.2	6.43	-2.34	23.44	0.89	30.76	21.99
	Mid	1880.0	6.65	-2.18	23.44	0.89	30.98	22.15
	High	1909.8	6.61	-2.48	23.44	0.89	30.94	21.85
GPRS (GMSK/1slot)	Low	1850.2	6.15	-2.73	23.44	0.89	30.48	21.60
	Mid	1880.0	6.49	-2.43	23.44	0.89	30.82	21.90
	High	1909.8	6.35	-2.79	23.44	0.89	30.68	21.54

Results = P/M Reading + Atten.Loss + Cable Loss

: Max.Peak power

<WCDMA V band>

SAR power is equal to DATAof FCC Part22 test report. (Report No. 31EE0214-HO-01-A)
Date of test: January 27, 2011
This DATA is a result of execution in before SAR testing.

WCDMA V band Power			
Mode	**Ch**	**Frequency [MHz]**	**Result (AVG) [dBm]**
RMC 12.2kbps	Low	826.4	23.81
	Mid	836.6	24.22
	High	846.6	23.95
AMR 12.2kbps with 3.4kbps SRB	Low	826.4	23.63
	Mid	836.6	23.54
	High	846.6	23.56
HSDPA Subtest 1	Low	826.4	23.82
	Mid	836.6	24.00
	High	846.6	23.78
HSDPA Subtest 2	Low	826.4	23.92
	Mid	836.6	24.10
	High	846.6	23.91
HSDPA Subtest 3	Low	826.4	23.42
	Mid	836.6	23.63
	High	846.6	23.37
HSDPA Subtest 4	Low	826.4	23.42
	Mid	836.6	23.54
	High	846.6	23.35
HSUPA Subtest 1	Low	826.4	23.11
	Mid	836.6	23.34
	High	846.6	23.43
HSUPA Subtest 2	Low	826.4	22.48
	Mid	836.6	22.38
	High	846.6	22.37
HSUPA Subtest 3	Low	826.4	22.62
	Mid	836.6	22.35
	High	846.6	22.50
HSUPA Subtest 4	Low	826.4	22.46
	Mid	836.6	22.56
	High	846.6	22.70
HSUPA Subtest 5	Low	826.4	22.85
	Mid	836.6	23.23
	High	846.6	23.40

: Max.Peak 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.

<Wireless LAN>

i) Correlation of Output Power between EMC and SAR tests

This data is reference data of FCC 15.247 test report. (Report No. 31EE0214-HO-03-A)
Date of test: December 24, 2010

IEEE802.11b 11Mbps EMC Power						
Ch	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]
Low	2412.0	-2.99	1.25	20.03	18.29	67.46
Mid	2437.0	-2.83	1.25	20.03	18.46	70.08
High	2462.0	-3.43	1.26	20.03	17.86	61.12

Sample Calculation: Result = Reading Cable loss + Atten. Loss

This DATA is a result of execution in before SAR testing.

IEEE802.11b 11Mbps SAR Power						
Ch	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]
Low	2412.0	7.39	0.99	10.07	18.45	69.98
Mid	2437.0	7.41	0.99	10.07	18.47	70.31
High	2462.0	6.89	0.99	10.07	17.95	62.37

Sample Calculation: Result = Reading Cable loss + Atten. Loss
: Max.Peak power

ii) Datarate check for SAR testing

[DATA rate Pre check]							
Data Rate [Mbps]	Freq. [MHz]	P/M (AVG) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	
1	2437.0	4.92	0.99	10.07	15.98	39.63	*SAR test mode
2	2437.0	4.87	0.99	10.07	15.93	39.17	
5.5	**2437.0**	**5.43**	**0.99**	**10.07**	**16.49**	**44.57**	*SAR test mode
11	2437.0	5.16	0.99	10.07	16.22	41.88	

Sample Calculation: Result = Reading Cable loss + Atten. Loss

iii) Average power of 11b mode for SAR testing

IEEE802.11b 1Mbps							
Ch	Frequency [MHz]	P/M Reading [dBm] PK	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm] PK	Result [dBm] AVG
Low	2412.0	7.12	4.81	0.99	10.07	18.18	15.87
Mid	2437.0	7.16	4.92	0.99	10.07	18.22	15.98
High	2462.0	6.69	4.73	0.99	10.07	17.75	15.79

IEEE802.11b 5.5Mbps							
Ch	Frequency [MHz]	P/M Reading [dBm] PK	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm] PK	Result [dBm] AVG
Low	2412.0	7.08	5.15	0.99	10.07	18.14	16.21
Mid	2437.0	7.34	5.43	0.99	10.07	18.40	16.49
High	2462.0	6.79	4.92	0.99	10.07	17.85	15.98

Sample Calculation: Result = Reading Cable loss + Atten. Loss

iv) Average power of 11g/n mode

IEEE802.11g 6Mbps EMC Power						
Ch	Freq. [MHz]	P/M (AVG) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]
Low	2412.0	1.41	0.99	10.07	12.47	17.66
Mid	2437.0	1.39	0.99	10.07	12.45	17.58
High	2462.0	0.99	0.99	10.07	12.05	16.03

Sample Calculation: Result = Reading Cable loss + Atten. Loss

IEEE802.11n MCS0 HT20 EMC Power						
Ch	Freq. [MHz]	P/M (AVG) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]
Low	2412.0	0.49	0.99	10.07	11.55	14.29
Mid	2437.0	0.59	0.99	10.07	11.65	14.62
High	2462.0	0.15	0.99	10.07	11.21	13.21

Sample Calculation: Result = Reading Cable loss + Atten. Loss

Note: For the SAR for11g/n mode.The SAR is not required a 11g/n mode because the maximum average output power for 11g/n mode is less than 1/4dB higher than that measured in a 11b mode.
Refer to the result of power in the Section 6.

SECTION 7 : Measurement results

7.1 Head GSM 850MHz SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**KMP7N4Y1-2A**
Parameters	:	ε_r =**39.7**, σ =**0.88**	Serial No.	:	**004401200620314**
Ambient temperature (deg.c.)	:	**24.0**	Modulation	:	**GSM**
Relative Humidity (%)	:	**42**	Crest factor	:	**8.3**
Date	:	**January 28, 2011**	Measured By	:	**Miyo Kishimoto**

HEAD SAR MEASUREMENT RESULTS								
Frequency		Modulation	Phantom Section	EUT Set-up Conditions		Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Before	After	Maximum of multi-peak
Step1. Position search								
Mid	836.6	GSM	Left	Fixed	Cheek	21.5	21.5	**0.390**
Mid	836.6	GSM	Left	Fixed	Tilt	21.5	21.5	**0.244**
Mid	836.6	GSM	Right	Fixed	Cheek	21.5	21.5	**0.391**
Mid	836.6	GSM	Right	Fixed	Tilt	21.5	21.5	**0.283**
Step 2. Change to the Low and High channels								
Low	824.2	GSM	Right	Fixed	Cheek	21.5	21.5	**0.427**
High	848.8	GSM	Right	Fixed	Cheek	21.5	21.5	**0.476**

7.2 Head PCS 1900MHz SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**KMP7N4Y1-2A**
Parameters	:	ε_r =**39.7**, σ =**1.47**	Serial No.	:	**004401200620314**
Ambient temperature (deg.c.)	:	**24.0**	Modulation	:	**GSM**
Relative Humidity (%)	:	**40**	Crest factor	:	**8.3**
Date	:	**January 27, 2011**	Measured By	:	**Miyo Kishimoto**

HEAD SAR MEASUREMENT RESULTS								
Frequency		Modulation	Phantom Section	EUT Set-up Conditions		Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Before	After	Maximum value of multi-peak
Step 1. Search for the worst position								
Mid	1880.0	GSM	Left	Fixed	Cheek	22.0	22.0	**0.546**
Mid	1880.0	GSM	Left	Fixed	Tilt	22.0	22.0	**0.257**
Mid	1880.0	GSM	Right	Fixed	Cheek	22.0	22.0	**0.999**
Mid	1880.0	GSM	Right	Fixed	Tilt	22.0	22.0	**0.207**
Step 2. Change to the Low and High channels								
Low	1850.2	GSM	Right	Fixed	Cheek	22.0	22.0	**0.754**
High	1909.8	GSM	Right	Fixed	Cheek	22.0	22.0	**0.670**

7.3 Head WCDMA V band SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**KMP7N4Y1-2A**
Parameters	:	ε_r =**39.7**, σ =**0.88**	Serial No.	:	**004401200620314**
Ambient temperature (deg.c.)	:	**24.0**	Modulation	:	**QPSK**
Relative Humidity (%)	:	**42**	Crest factor	:	**1**
Date	:	**January 28, 2011**	Measured By	:	**Miyo Kishimoto**

HEAD SAR MEASUREMENT RESULTS								
Frequency		Mode	Phantom Section	EUT Set-up Conditions		Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Before	After	Maximum of multi-peak
Step1. Position search								
Mid	836.6	RMC 12.2k	Left	Fixed	Cheek	22.1	22.1	**0.466**
Mid	836.6	RMC 12.2k	Left	Fixed	Tilt	22.0	22.0	**0.322**
Mid	836.6	RMC 12.2k	Right	Fixed	Cheek	22.0	22.0	**0.499**
Mid	836.6	RMC 12.2k	Right	Fixed	Tilt	22.0	22.0	**0.411**
Step 2. Change to the Low and High channels								
Low	826.4	RMC 12.2k	Right	Fixed	Cheek	22.0	22.0	**0.476**
High	846.6	RMC 12.2k	Right	Fixed	Cheek	22.0	22.0	**0.535**

Note: For the SAR test for 12.2k bps RMC with a 3.4kbps SRB
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.Refer to the result of power in the Section 6.

7.4 Head WLAN SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**KMP7N4Y1-2A**
Parameters	:	ε_r =**38.0**, σ =**1.88**	Serial No.	:	**004401200620314**
Ambient temperature (deg.c.)	:	**24.0**	Modulation	:	**DBPSK,CCK**
Relative Humidity (%)	:	**40**	Crest factor	:	**1**
Date	:	**February 1, 2011**	Measured By	:	**Hisayoshi Sato**

HEAD SAR MEASUREMENT RESULTS

Frequency		Mode	Phantom Section	EUT Set-up Conditions		Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Before	After	Maximum of multi-peak
Step1. Position search								
Mid	2437.0	CCK 5.5Mbps	Left	Fixed	Cheek	23.2	23.2	**0.155**
Mid	2437.0	CCK 5.5Mbps	Left	Fixed	Tilt	23.2	23.2	**0.128**
Mid	2437.0	CCK 5.5Mbps	Right	Fixed	Cheek	23.2	23.2	**0.241**
Mid	2437.0	CCK 5.5Mbps	Right	Fixed	Tilt	23.2	23.2	**0.184**
Step 2. Change to the datarate								
Mid	2437.0	DBPSK 1Mbps	Right	Fixed	Cheek	23.2	23.2	**0.250**
Step 3. Change to the Low and High channels								
Low	2412.0	DBPSK 1Mbps	Right	Fixed	Cheek	23.2	23.2	**0.271**
High	2462.0	DBPSK 1Mbps	Right	Fixed	Cheek	23.2	23.2	**0.343**

Note: For the SAR for11g/n mode.The SAR is not required a 11g/n mode because the maximum average output power for 11g/n mode is less than 1/4dB higher than that measured in a 11b mode.
Refer to the result of power in the Section 6.

7.5 Body-worn GSM 850MHz SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**KMP7N4Y1-2A**
Parameters	:	ε_r =**52.9** σ =**0.95**	Serial No.	:	**004401200620314**
Ambient temperature (deg.c.)	:	**24.0**	Modulation	:	**GSM**
Relative Humidity (%)	:	**38**	Crest factor	:	**8.3**
Date	:	**January 26, 2011**	Measured By	:	**Miyo Kishimoto**

BODY SAR MEASUREMENT RESULTS

Frequency		Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum of multi-peak
Mid	836.6	GSM	Flat	Fixed	Back	15	22.3	22.3	**0.425**
Low	824.2	GSM	Flat	Fixed	Back	15	22.3	22.3	**0.799**
High	848.8	GSM	Flat	Fixed	Back	15	22.3	22.3	**0.798**

Note: For the SAR test for the GPRS mode
The body SAR is not required for GPRS mode because the maximum average output power for GPRS mode is less than 1/4dB higher than that measured GSM mode.

7.6 Body-worn PCS 1900MHz SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**KMP7N4Y1-2A**
Parameters	:	ε_r =**54.4**, σ =**1.57**	Serial No.	:	**004401200620314**
Ambient temperature (deg.c.)	:	**24.0**	Modulation	:	**GSM**
Relative Humidity (%)	:	**38**	Crest factor	:	**8.3**
Date	:	**January 26, 2011**	Measured By	:	**Miyo Kishimoto**

BODY SAR MEASUREMENT RESULTS

Frequency		Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum of multi-peak
Mid	1880.0	GSM	Flat	Fixed	Back	15	21.0	21.0	**0.417**
Low	1850.2	GSM	Flat	Fixed	Back	15	21.0	21.0	**0.407**
High	1909.8	GSM	Flat	Fixed	Back	15	21.0	21.0	**0.409**

Note: For the SAR test for the GPRS mode
The body SAR is not required for GPRS mode because the maximum average output power for GPRS mode is less than 1/4dB higher than that measured GSM mode.

7.7 Body-worn WCDMA V band SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**KMP7N4Y1-2A**
Parameters	:	**ε_r =53.0 σ =0.95**	Serial No.	:	**004401200620314**
Ambient temperature (deg.c.)	:	**24.0**	Modulation	:	**QPSK**
Relative Humidity (%)	:	**40**	Crest factor	:	**1**
Date	:	**January 27, 2011**	Measured By	:	**Miyo Kishimoto**

BODY SAR MEASUREMENT RESULTS									
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum of multi-peak
Mid	836.6	RMC 12.2k	Flat	Fixed	Back	15	21.8	21.8	**0.549**
Low	826.4	RMC 12.2k	Flat	Fixed	Back	15	21.8	21.8	**0.559**
High	846.6	RMC 12.2k	Flat	Fixed	Back	15	21.8	21.8	**0.574**

Note: For the SAR test for the HSPA mode
The body SAR is not required for handset with HSPA(HSDPA/HSUPA) because the maximum average output power with HSPA active is less than 1/4dB higher than that measured without HSPA using 12.2kbps RMC.

7.8 Body-worn WLAN SAR

Liquid Depth (cm)	:	**15.0**	Model	:	**KMP7N4Y1-2A**
Parameters	:	ε_r =**50.7** σ =**2.03**	Serial No.	:	**004401200620314**
Ambient temperature (deg.c.)	:	**24.0**	Modulation	:	**DBPSK, CCK**
Relative Humidity (%)	:	**41**	Crest factor	:	**1**
Date	:	**February 2, 2011**	Measured By	:	**Hisayoshi Sato**

BODY SAR MEASUREMENT RESULTS

Frequency		Modulation	Phantom Section	EUT Set-up Conditions			Liquid Temp.[deg.c]		SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Before	After	Maximum of multi-peak
Step 1. Change to the data rate									
Mid	2437	CCK 5.5Mbps	Flat	Fixed	Back	15	23.4	23.4	**0.110**
Mid	2437	DBPSK 1Mbps	Flat	Fixed	Back	15	23.4	23.4	**0.084**
Step 2. Change to the Low and High channels									
Low	2412	CCK 5.5Mbps	Flat	Fixed	Back	15	23.4	23.4	**0.062**
High	2462	CCK 5.5Mbps	Flat	Fixed	Back	15	23.4	23.4	**0.084**

Note: For the SAR for11g/n mode.The SAR is not required a 11g/n mode because the maximum average output power for 11g/n mode is less than 1/4dB higher than that measured in a 11b mode.
Refer to the result of power in the Section 6.