SAR TEST REPORT

Test Report No.: 32IE0082-SH-04-A

Applicant : **Canon Inc.**

Type of Equipment : **Wireless Module**

Model No. : **WM219** (*. Installed into the WM219's platform (1))

FCC ID : **AZD219**

Test Standard : **FCC 47CFR §2.1093, Supplement C (Edition 01-01) to OET Bulletin 65**

Test Result : **Complied**

Highest SAR(1g) Value	Platform #	Platform type	Platform model	Remarks
0.78 W/kg	Platform (1)	Digital camera (1)	PC1953	(DTS) 2462MHz, IEEE 802.11b, (1Mbps, DBPSK/DSSS))

*. **Highest SAR(1g) across exposure conditions = 0.78 W/kg = grant listing.**
*. **The SAR(1g) was <0.8W/kg for all configurations tested.. In according to the KDB447498 D01, EUT was approved for used in multi-platform..**

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Date of test: August 22 and 23, 2012

Test engineer: H. Naka

Hiroshi Naka
Engineer of WiSE Japan, UL Verification Service

Approved by: T. Imamura

Toyokazu Imamura
Leader of WiSE Japan, UL Verification Service

JAB Testing RTL02610

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☒ There is no testing item of "Non-accreditation".

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REVISION HISTORY

Revision	Test report No.	Date	Page revised	Contents
Original	32IE0082-SH-04-A	September 5, 2012	-	-
-R01	32IE0082-SH-04-A	November 22, 2012	1, 2, 7, 31	(p1, 2) Revised to R01. (P7, 31) RF ambient was corrected.

***. By issue of new revision report, the report of an old revision becomes invalid.**

SECTION 1: Customer information

Company Name	Canon Inc.
Brand Name	Canon
Address	30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo 146-8501 Japan
Telephone Number	+81-3-3757-6218
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Contact Person	Ryoji Kon

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type of Equipment	Wireless Module
Model Number	WM219
Serial Number	D3A2
Condition of EUT	Engineering prototype *. Engineering proto type for the platform (1) (digital camera(1), model: PC1953)
Receipt Date of Sample	July 27, 2012 (*. EUT for the power measurement.) August 21, 2012 (*. EUT for the SAR test. The EUT that had been measured the power of SAR test reference, was installed into a platform(1)-digital camera(1) from the beginning.) *. After power measurement, the EUT was returned to the customer, and the RF wiring was changed to the original antenna line form the antenna conducted power measurement line of the SAR test. The EUT was installed in a platform (1) which SAR tested, by the customer. *. No modification by the Lab.
Country of Mass-production	China
Category Identified	Portable device *. This EUT is hand-held and hand-operated device with output power < 645 mW (1000×[2.4GHz]$^{-0.5}$). Therefore, the hand-SAR is not required (KDB447498). *. This EUT may contact a human body during Wi-fi operation.
Rating	DC3.3V supplied form the platform equipment. *. The EUT is installed into the specified the platform that was operated by the re-chargeable Li-ion battery. Therefore, each SAR test, the platform which had built-in EUT was operated with full-charged battery.
Feature of EUT	The EUT is a Wireless Module which installs into the multi-platform.
Platform model of EUT	Platform (1) - Digital camera (1), model: PC1953

2.2 Product Description (Wireless module: WM219)

Equipment type	Transceiver
Frequency of operation	2412-2462MHz (11b,11g,,11n(20HT)), 2422-2452MHz (11n(40HT))
Channel spacing	5MHz
Bandwidth	20MHz(11b,11g,,11n(20HT)), 40MHz(11n(40HT))
ITU code	G1D(11b), D1D(11g,11n(20HT),11n(40HT))
Type of modulation	DSSS(11b): CCK, DQPSK, DBPSK OFDM(11g,11n(20HT),11n(40HT)): 64QAM, 16QAM, QPSK, BPSK
Q'ty of Antenna	1 pc.
Antenna type	Monopole type chip antenna
Antenna gain (peak)	+1.3 dBi
Transmit power	Target power (in maximum): 14dBm (11b), 12dBm (11g, 11n(20HT), 11dBm (11n(40HT) *. The antenna terminal conducted power of 11b refers to section 6 in this report.
Power supply	DC 3.3V
Operation temperature range	-20 to +55 deg.C

*. The EUT do not use the special transmitting technique such as "beam-forming" and "time-space code diversity."

SECTION 3: Test specification, procedures and results

3.1 Requirements for compliance testing defined by the FCC / Test specification

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) (11/13/2009):** Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
☒ **KDB 248227 (rev.1.2) (5/29/2007):** SAR Measurement Procedures for 802.11a/b/g Transmitters
☒ **KDB 450824 D01 (v01r01) (Jan.2007):** SAR Probe Calibration and System Verification Considerations for Measurements at 150MHz-3GHz
☒ **KDB 450824 D02 (v01) (11/13/2009):** Dipole Requirements for SAR System Validation and Verification

3.2 Exposure limit

Environments of exposure limit	Whole-Body (averaged over the entire body)	Partial-Body (averaged over any 1g of tissue)	Hands, Wrists, Feet and Ankles (averaged over any 10g of tissue)
(A) Limits for Occupational /Controlled Exposure (W/kg)	0.4	8.0	20.0
(B) Limits for General population /Uncontrolled Exposure (W/kg)	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.

The limit applied in this test report is;

General population / uncontrolled exposure, Partial-Body (averaged over any 1g of tissue) limit: 1.6 W/kg

3.3 Procedures and Results

	WiFi (DTS) / Platform(1)
Test Procedure	FCC OET Bulletin 65, Supplement C
	SAR
Category	FCC 47CFR §2.1093
Results (SAR(1g)) (Built-in)	Complied (0.78W/kg)

Note: UL Japan's SAR Work Procedures No.13-EM-W0429 and 13-EM-W0430. No addition, deviation nor exclusion has been made from standards

Test outline:
This EUT is a limited module approval according to section 15.212 (b). The procedure of SAR was measured according to the KDB447498 2).

Consideration of the test results:
☒ **The SAR(1g) was <0.8W/kg for all configurations. EUT was approved for used in multiple host platforms. (KDB447498 D01)**

3.4 Test Location

No.7 shielded room (2.76(Width) × 3.76m(Depth) × 2.4m(Height)) for SAR testing.

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1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone number: +81 463 50 6400 / Facsimile number: +81 463 50 6401

3.5 Confirmation before SAR testing

3.5.1 Correlation of Output Power between EMC and SAR tests

It was checked that the antenna port power was correlated within 0~+5% (FCC requirements).
The result is shown in Section 6.

Test	Remarks	Serial number
SAR	Before SAR test, the RF wiring for the sample that was actually used for the SAR test, had been switched to the antenna conducted power measurement line from the antenna line, and then the average power was measured. The average and peak power of specified operation mode(s) were measured at default channel. After power measurement, the EUT was returned to the customer, and the RF wiring was changed to the original antenna line form the antenna conducted power measurement line of the SAR test. Then, the EUT was installed in a platform (1) which SAR tested, by the customer. *. Refer to the Section 6 in this report for the power measurement of SAR sample result. *. The power was measured by the calibrated power sensor and power meter (65MHz measurement bandwidth).	D3A2
EMC	The EUT of the EMC test was measured for the peak power. The average power that was reference of SAR test was also measured additionally.	D37E

3.5.2 Average power for SAR tests

Step.1 Data rate check

The EUT supported the following data rate in each operation mode.
Since the target power of 11b mode was more than 2dB higher than other operation mode (11g, 11n(20HT), 11n(40HT)), the average and peak powers related with all data rate were measured only on a channel of 11b mode.

11b		11g		11n(20HT)			11n(40HT)		
Modulation	Data rate [Mbps]	Modulation	Data rate [Mbps]	MCS Index	Spatial Stream	Modulation	MCS Index	Spatial Stream	Modulation
DBPSK/DSSS	1	BPSK/OFDM	6	MCS0	1	BPSK/OFDM	MCS0	1	BPSK/OFDM
DQPSK/DSSS	2	BPSK/OFDM	9	MCS1	1	QPSK/OFDM	MCS1	1	QPSK/OFDM
CCK/DSSS	5.5	QPSK/OFDM	12	MCS2	1	QPSK/OFDM	MCS2	1	QPSK/OFDM
CCK/DSSS	11	QPSK/OFDM	18	MCS3	1	16QAM/OFDM	MCS3	1	16QAM/OFDM
		16QAM/OFDM	24	MCS4	1	16QAM/OFDM	MCS4	1	16QAM/OFDM
		16QAM/OFDM	36	MCS5	1	64QAM/OFDM	MCS5	1	64QAM/OFDM
		64QAM/OFDM	48	MCS6	1	64QAM/OFDM	MCS6	1	64QAM/OFDM
		64QAM/OFDM	54	MCS7	1	64QAM/OFDM	MCS7	1	64QAM/OFDM

Step.2 Decision of SAR test channel

The following operation mode, data rate and channels were determined by the SAR reference power measured.

Mode	MHz	Channel	default	SAR tested channel				Remarks
			11b/g/n(20HT)	11b	11g	11n(20HT)	11n(40HT)	
802.11 b/g/n	2412	1 (*1)	√	#	n/a (*2)	n/a (*2)		SAR test was only applied to 11b mode, in lowest data rate. (*2)
	2422	3					n/a (*2)	
	2437	6	√	#	n/a (*2)	n/a (*2)	n/a (*2)	
	2452	9					n/a (*2)	
	2462	11 (*1)	√	#	n/a (*2)	n/a (*2)		

√ = "default test channels of requested by KDB248227", n/a: SAR test was not applied, # = SAR test was applied.

*1. Any output power reducing for channel 1 and 11 to meet restricted band requirements was not observed. Therefore channel 1 and 11 was selected for the default channels and SAR test was applied.

*2. Since the target average power of 11g, 11n(20HT) and 11n(40HT) were more than 2dB lower than the corresponded 11b power, SAR test was not applied to the 11g, 11n(20HT) and 11n(40HT) mode. In 11b mode, the average power of higher data rate was less than 0.25dB higher than the lowest data rate. Therefore, SAR test was only applied to the lowest data rate. (KDB248227) (Refer to Section 6.)

3.6 Confirmation after SAR testing

It was checked that the power drift [W] is within ±5% in the evaluation procedure of SAR testing. The verification of power drift during the SAR test is that DASY4 system calculates the power drift by measuring the e-filed at the same location at beginning and the end of the scan measurement for each test position.
The result is shown in APPENDIX 2.

*. DASY4 system calculation Power drift value[dB] =20log(Ea)/(Eb) (where, Before SAR testing: Eb[V/m] / After SAR testing: Ea[V/m])

Limit of power drift[W] = ±5%

Power drift limit (X) [dB] = 10log(P_drift)=10log(1.05/1)=10log(1.05)-10log(1)=0.21dB

from E-filed relations with power.

S=E×H=E^2/η=P/(4×π×r^2) (η: Space impedance) → P=(E^2×4×π×r^2)/η

Therefore, The correlation of power and the E-filed

Power drift limit (X) dB=10log(P_drift)=10log(E_drift)^2=20log(E_drift)

From the above mentioned, the calculated power drift of DASY4 system must be the less than ±0.21dB.

3.7 Test setup of EUT and SAR measurement procedure

After considering the outline of EUT, the SAR test was carried out on the following setup conditions.
*. Refer to Appendix 1 for test setup photographs.

Setup	Explanation of EUT setup position	Antenna to user distance	SAR test	SAR type
Left	The left surface of EUT was touched to the Flat phantom. *. This section is the closest to an antenna.	≈5mm	applied	Body(touch)
Bottom	The bottom surface of EUT was touched to the Flat phantom.	≈20mm	applied	
Top	The top surface of EUT was touched to the Flat phantom.	≈38mm	applied	
Rear(LCD)	The rear surface of EUT was touched to the Flat phantom.	≈15mm	applied	
Front(Lens)	The front surface of EUT was touched to the Flat phantom.	≈5mm	applied	
Right	The left surface of EUT was touched to the Flat phantom.	≈90mm	applied	

***. Size of EUT: 98 mm (width) × 20 mm (depth) × 58 mm (height)** (when lens was closed.)

By the determined test setup shown above, the SAR test was applied in the following procedures.

Step 1	Change the positions.
Step 2	Change the channels.
Step 3	Repeat worst SAR condition.

*. During SAR test, the radiated power is always monitored by Spectrum Analyzer.

SECTION 4: Operation of EUT during testing

4.1 Operating modes for SAR testing

This EUT has IEEE.802.11b, 11g, 11n(20HT) and 11n(40HT) continuous transmitting modes.
The frequency and the modulation used in the SAR testing are shown as a following.

Operation mode	11b (*1)	The example of a software screen
Tx frequency band	2412-2462MHz	
Tested frequency	2412, 2437, 2462MHz (*2)	
Modulation	DBPSK/DSSS	
Data rate	1Mbps (*3)	
Crest factor	1.0 (100% duty cycle)	
Controlled software	"RF TEST" mode; During SAR test, the EUT was operated by pre-installed "RF TEST" mode software. The operation screen of this software is shown in the right.	

*1. Since the target average power of 11g, 11n(20HT) and 11n(40HT) were more than 2dB lower than the corresponded 11b power, SAR test was not applied to the 11g, 11n(20HT) and 11n(40HT) mode. In 11b mode, the average power of higher data rate was less than 0.25dB higher than the lowest data rate. Therefore, SAR test was only applied to the lowest data rate. (KDB248227) (Refer to Section 6.)
*2. Any output power reducing for channel 1 and 11 to meet restricted band requirements was not observed. Therefore channel 1 and 11 was selected for the default channels and SAR test was applied.
*3. In 11b mode, the average power of higher data rate was less than 0.25dB higher than the lowest data rate. Therefore, SAR test was only applied to the lowest data rate. (KDB248227) (Refer to Section 6.)

SECTION 5: Uncertainty Assessment (SAR measurement)

Uncertainty of SAR measurement system (Body tissue, conductivity& permittivity tolerance: ≤ ± 5%, 100% duty cycle) (v04)	Under 3 GHz (v04)	
	1g SAR	10g SAR
combined measurement uncertainty of the measurement system (k=1)	± 12.3%	± 12.0%
expanded uncertainty (k=2)	± 24.6%	± 24.0%

	Error Description (Under 3GHz) (v04)	Uncertainty Value	Probability distribution	Divisor	ci (1g)	ci (10g)	ui (1g)	ui (10g)	Vi, veff
A	**Measurement System**						(std. uncertainty)	(std. uncertainty)	
1	Probe Calibration Error	±6.0 %	Normal	1	1	1	±6.0 %	±6.0 %	∞
2	Axial isotropy Error	±4.7 %	Rectangular	√3	0.7	0.7	±1.9 %	±1.9 %	∞
3	Hemispherical isotropy Error (<5deg, flat phantom)	±9.6 %	Rectangular	√3	0.7	0.7	±3.9 %	±3.9 %	∞
4	Boundary effects Error	±1.4 %	Rectangular	√3	1	1	±0.8 %	±0.8 %	∞
5	Linearity Error	±4.7 %	Rectangular	√3	1	1	±2.7 %	±2.7 %	∞
6	Sensitivity Error (detection limit)	±1.0 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
7	Response Time Error (<5ms/100ms wait)	±0.0 %	Normal	1	1	1	±0.0 %	±0.0 %	∞
8	Integration Time Error(100% duty cycle)	±0.0 %	Rectangular	√3	1	1	±0.0 %	±0.0 %	∞
9	Readout Electronics Error(DAE)	±0.3 %	Rectangular	√3	1	1	±0.3 %	±0.3 %	∞
10	RF ambient conditions-noise R01	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
11	RF ambient conditions-reflections R01	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
12	Probe positioner mechanical tolerance	±1.1 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
13	Probe Positioning with respect to phantom shell	±2.9 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
14	Errors: Extrapol., Interpol. & Integration Algorithms	±1.0 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
B	**Test Sample Related**								
15	Test Sample Positioning Error	±5.0 %	Normal	1	1	1	±5.0 %	±5.0 %	145
16	Device Holder or Positioner Tolerance	±3.6 %	Normal	1	1	1	±3.6 %	±3.6 %	5
17	Test Sample Output Power Drift Error	±5.0 %	Rectangular	√3	1	1	±2.9 %	±2.9 %	∞
C	**Phantom and Setup**								
18	Phantom uncertainty (shape, thickness tolerances)	±7.5 %	Rectangular	√3	1	1	±4.3 %	±4.3 %	∞
19	Target Liquid Conductivity Tolerance	±5.0 %	Rectangular	√3	0.64	0.43	±1.8 %	±1.2 %	∞
20	Measurement Liquid Conductivity Error	±2.9 %	Normal	1	0.64	0.43	±1.9 %	±1.2 %	3
21	Target Liquid Permittivity Tolerance	±5.0 %	Rectangular	√3	0.6	0.49	±1.7 %	±1.4 %	∞
22	Measurement Liquid Permittivity Error	±2.9 %	Normal	1	0.6	0.49	±1.7 %	±1.4 %	3
	Combined Standard Uncertainty						**±12.3** %	**±12.0** %	479
	Expanded Uncertainty (k=2)						**±24.6** %	**±24.0** %	

*. This measurement uncertainty budget is suggested by IEEE 1528 and determined by Schmid & Partner Engineering AG (DASY4 Uncertainty Budget). [6]

SECTION 6: Confirmation before testing

6.1 Assessment for the conducted power of EUT

6.1.1 Worst data rate & worst channel determination of SAR and correction of the power at SAR test and EMC test

⊿(sar-emc): must; 0< x <0.21dB

【Output power】			Tx mode:		11b		RF: WM219		RF sn: D3A2			Pwr.Set: 14dBm				*PAR=Peak-Ave[dB]		Power at EMC test (sn:D37E)			
Ch.	Freq. [MHz]	D/R [Mbps]	Ant. No.	Max.Ave. pwr.:o	Modulation		P/M Reading Ave.[dBm]	P/M Reading Pk[dB]	Cable Loss [dB]	Attenuator [dB]	duty factor [dB]	Power Results (SAR REF.) Ave[dBm]	Pk[dBm]	Ave[mW]	Pk[mW]	⊿worst ave.[dB]	PAR [dB]	Ave. [dB]	⊿Ave (sar-emc)	Pk [dB]	⊿Pk (sar-emc)
1	2412	1	1		DBPSK	DSSS	4.12	6.70	0.50	10.00	0.00	14.62	17.20	28.97	52.48	-0.11	2.58	14.48	0.14	17.09	0.11
6	2437	1	1	o	DBPSK	DSSS	4.23	6.75	0.50	10.00	0.00	14.73	17.25	29.72	53.09	(max.)	2.52	14.53	0.20	17.08	0.17
11	2462	1	1		DBPSK	DSSS	4.21	6.75	0.50	10.00	0.00	14.71	17.25	29.58	53.09	-0.02	2.54	14.52	0.19	17.05	0.20
																⊿low rate			⊿Ave		⊿Pk
1	2412	1	1		DBPSK	DSSS	4.12	6.70	0.50	10.00	0.00	14.62	17.20	28.97	52.48	ref(0)	2.58	14.48	0.14	17.09	0.11
1	2412	2	1		DQPSK	DSSS	4.20	6.73	0.50	10.00	0.00	14.70	17.23	29.51	52.84	0.08	2.53	14.56	0.14	17.07	0.16
1	2412	5.5	1	o	CCK/PBCC	DSSS	4.28	6.12	0.50	10.00	0.00	14.78	16.62	30.06	45.92	0.16	1.84	14.62	0.16	16.53	0.09
1	2412	11	1		CCK/PBCC	DSSS	4.25	6.74	0.50	10.00	0.00	14.75	17.24	29.85	52.97	0.13	2.49	14.58	0.17	17.05	0.19

*. EUT serial number: "D3A2" for SAR test / "D37E" for EMC test.
*. Since the target average power of 11g, 11n(20HT) and 11n(40HT) were more than 2dB lower than the corresponded 11b power, the power measurement and SAR test were not applied to the 11g, 11n(20HT) and 11n(40HT) mode. (KDB248227)
*. The average power of higher data rate was less than 0.25dB higher than the lowest data rate. Therefore, SAR test was only applied to the lowest data rate. (KDB248227)

*. Calculating formula:
Results (Ave) = ["P/M Reading"]+["Cable loss"]+["Attenuator"]+["duty factor"] / Results (Pk) = ["P/M Reading"]+["Cable loss"]+["Attenuator"]
*. The difference between the SAR reference power and the power of EMC test was not less than 0dB and not higher than 0.21dB.
Therefore it was judged that EUT that was used for SAR test was equivalent to the EUT used for EMC test.

SAR reference; Date tested: August 6, 2012 / Measured by: Hiroshi Naka / Place: preparation room of No. 7 shielded room. (23.6 deg.C / 58 %RH)
"Power of EMC test"; this reference is described in the test report of 32IE0082-SH-02-A.

SECTION 7: Measurement results

7.1 SAR (Body) in the platform(1)-Digital camera(1) (model: PC1953)

Measurement date: August 22 and 23, 2012 Measurement by: Hiroshi Naka

[Liquid measurement (Body tissue)]

Used Target Frequency [MHz]	Target		Measured				Environment		Remarks
	Permittivity [-]	Conductivity [S/m]	Permittivity (εr) [-]	Conductivity (σ) [S/m]	Temp. [deg.C.]	Depth [mm]	Temp. [deg.C.]	Humidity [%RH]	
2450	**52.7**	**1.95**	50.48 (-4.2%)	1.958 (+0.4%)	23.3	153	24.3	52	August 22, 2012, before SAR test.
2412	***52.75***	***1.914***	50.60 (-4.1%)	1.914 (0%)					
2437	***52.72***	***1.938***	50.46 (-4.3%)	1.942 (+0.2%)					
2462	***52.68***	***1.967***	50.44 (-4.3%)	1.980 (+0.7%)					
2450	**52.7**	**1.95**	50.31 (-4.5%)	1.962 (+0.6%)	23.1	152	23.9	53	August 23, 2012, before SAR test.
2412	***52.75***	***1.914***	50.50 (-4.3%)	1.910 (-0.2%)					
2437	***52.72***	***1.938***	50.34 (-4.5%)	1.940 (+0.1%)					
2462	***52.68***	***1.967***	50.33 (-4.5%)	1.980 (+0.7%)					

*. The target value is a parameter defined in OET65 Supplement C. In the current standards (e.g., IEEE 1528, OET 65 Supplement C), the dielectric parameters suggested for head and body tissue simulating liquid are given at 2450MHz. As an intermediate solution, dielectric parameters for the frequencies between 2000 to 2450 MHz and 2450 to 3000MHz were obtained using linear interpolation. (Refer to Appendix 3-7 in this report)

[SAR measurement results (Body tissue)]

SAR measurement results												
Frequency			Modulation / Data rate / crest factor	EUT setup conditions			Liquid temp. [deg.C]		Power drift [dB]	SAR(1g) [W/kg] max. value of multi-peak	Data# in Appendix 2-2	Remarks
Mode	Ch.	[MHz]		Position	Separation distance	Battery#	Before	After				
11b	**Step 1: Change the positions**											
	6	2437	DBPSK&DSSS / 1Mbps / 1.0	Left	0 mm	#2	23.4	23.4	0.043	**0.698**	Step 1-1	-
	6	2437		Bottom	0 mm	#3	23.2	23.2	0.111	**0.690**	Step 1-2	-
	6	2437		Top	0 mm	#3	23.1	23.1	-0.0642	**0.136**	Step 1-3	-
	6	2437		Rear(LCD)	0 mm	#1	23.0	23.0	0.20	**0.109**	Step 1-4	-
	6	2437		Front(Lens)	0 mm	#2	23.0	23.0	0.0304	**0.184**	Step 1-5	-
	6	2437		Right	0 mm	#1	23.0	23.0	-0.20	**0.025**	Step 1-6	-
	Step 2: Change the channels											
	1	2412	DBPSK&DSSS / 1Mbps / 1.0	Left	0 mm	#3	23.4	23.4	-0.12	**0.587**	Step 2-1	-
	11	2462		Left	0 mm	#1	23.4	23.4	0.172	**0.752**	Step 2-2	-
	1	2412		Bottom	0 mm	#1	23.2	23.1	-0.107	**0.621**	Step 2-3	-
	11	2462		Bottom	0 mm	#2	23.1	23.1	-0.177	**0.710**	Step 2-4	-
	Step 3: Repeat worst SAR condition											
	11	2462	DBPSK&DSSS / 1Mbps / 1.0	Left	0 mm	#2	23.0	23.0	-0.0314	**0.776**	Step 3-1	→Worst SAR.

Notes:

*. Battery No.#1 , #2 and #3 were same model.; Refer to Appendix 1.

*. Since the target average power of 11g, 11n(20HT) and 11n(40HT) were more than 2dB lower than the corresponded 11b power, the power measurement and SAR test were not applied to the 11g, 11n(20HT) and 11n(40HT) mode. (KDB248227)

*. During test, the EUT was operated with full-charged battery and without all signal interface cables.

*. Calibration frequency of the SAR measurement probe (and used conversion factors)

SAR test frequency[MHz]	Probe calibration frequency [MHz]	Validity [MHz]	Used conversion factor	Uncertainty
2412	2450	-38MHz, within ±50 of cal.frequency	6.77	±12.0%
2437	2450	-13MHz, within ±50 of cal.frequency	6.77	±12.0%
2462	2450	+12MHz, within ±50 of cal.frequency	6.77	±12.0%

*. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.