SAR TEST REPORT

Test Report No.: 10037057S-R02

Applicant : **Ricoh Company Ltd.**
Type of Equipment : **Wireless LAN module**
(*. Installed into the host device: Digital Camera.)
Model No. : **RS-WC-201**
FCC ID : **XF6-RSWC201**
Test Standard : **FCC 47CFR §2.1093**
Test Result : **Complied**

Highest SAR(1g) Value	Host device type	Host device model	Remarks
0.44 W/kg	Digital Camera	RICOH THETA	(DTS) 2437MHz, IEEE 802.11b, (1Mbps, DBPSK/DSSS)) *. Highest measured SAR(1g) value: 0.320 W/kg (output power: 17.63 dBm).

*. This test report applies for WLAN (IEEE802.11b/ 11g frequency band: 2412-2472MHz.

*. **Highest reported SAR (1g) across exposure conditions = 0.44 W/kg**

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Date of test: June 23-24, 2013

Test engineer: T. Sato
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JAB Testing RTL02610

REVISION HISTORY

Revision	Test report No.	Date	Page revised	Contents
Original	10037057S	August 20, 2013	-	-
R01	10037057S-R01	August 22, 2013	3, 4, 8, 9, 10, 23, 24, 30-37	3: Error correction and add WiFi Ch information / 4: Add WiFi Ch information 8: Add WiFi Ch information / 9: Error correction and add WiFi Ch information 10: Error correction and add WiFi Ch information / 23: Error correction 24: Add a page (WiFi Ch information) / 30-37: Error correction
R02	10037057S-R02	August 27, 2013	9	9: Corrected the table and added the text

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

CONTENTS PAGE

REVISION HISTORY 2
CONTENTS 2
SECTION 1: Customer information 3
SECTION 2: Equipment under test (EUT) 3
2.1 Identification of EUT 3
2.2 Product Description 3
2.3 Tx output power specification (antenna port terminal conducted) 4
2.4 Maximum output power which may possible 4
SECTION 3: Test specification, procedures and results 5
3.1 Test specification 5
3.2 Exposure limit 5
3.3 Procedure and result 5
3.4 Test location 5
3.5 Confirmation before SAR testing 6
3.6 Confirmation after SAR testing 6
3.7 Test setup of EUT, SAR test reduction and SAR measurement procedure 7
SECTION 4: Operation of EUT during testing 8
SECTION 5: Uncertainty assessment (SAR measurement) 8
SECTION 6: Confirmation before testing 9
6.1 Assessment for the conducted power of EUT 9
SECTION 7: Measurement results 10
7.1 SAR measurement results 10

Contents of appendixes

APPENDIX 1: Photographs of test setup 11
Appendix 1-1 Photograph of Host device 11
Appendix 1-2 EUT(installed into host device) 12
Appendix 1-3 Antenna position 13
Appendix 1-4 Photograph of test setup 14
APPENDIX 2: SAR Measurement data 15
Appendix 2-1 Evaluation procedure 15
Appendix 2-2 Measurement data 16
APPENDIX 3: Test instruments 24
Appendix 3-1 Equipment used 24
Appendix 3-2 Configuration and peripherals 25
Appendix 3-3 Test system specification 26
Appendix 3-4 Simulated tissues composition and parameter confirmation 27
Appendix 3-5 Daily check data 27
Appendix 3-6 Daily check measurement data 28
Appendix 3-7 Daily check uncertainty 28
Appendix 3-8 Calibration certificate: Dipole (D2450V2) 29
Appendix 3-9 Calibration certificate: E-Field Probe (EX3DV4) 37

SECTION 1: Customer information

Company Name	Ricoh Company Ltd.
Brand Name	RICOH
Address	810, Shimoizumi, Ebina, Kanagawa, 243-0460 JAPAN
Telephone Number	+81-46-292-2564
Facsimile Number	+81-3-6673-4430
Contact Person	Seiji Nakamura

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type of Equipment	Wireless LAN module *. Used host device: Digital Camera
Model Number	RS-WC-201 *. Used host device: RICOH THETA
Serial Number	EUT(1:Wireless LAN Module): 1 / Host Device(2:Digital Camera): XL00010026
Condition of EUT	Production model *. Used host device (RICOH THETA): Production prototype (*. Not for sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample	July 22, 2013 (*. No modification by the Lab.)
Country of Mass-production	Philippines / (*. Used host device (RICOH THETA): Japan / China)
Category Identified	Portable device (*. EUT and Host device) *. Since EUT which installed into the host device may operate within 20cm from a human body during Wi-Fi operation, the partial-body SAR (1g) shall be observed.
Rating	DC3.3V (3.1~3.6V) (*. The power of EUT is supplied from the host device via battery pack.
Feature of EUT	The EUT is a Wireless LAN module connected to the host device specified as the manufacturer.
SAR accessary	none

2.2 Product Description (RF)

Equipment type	Transceiver
Frequency of operation	2412-2472MHz (11b,11g)
Channel spacing	5MHz
Bandwidth	20MHz (11b,11g)
ITU code	G1D, D1D
Type of modulation	DSSS(11b): CCK, DQPSK, DBPSK OFDM(11g): 64QAM, 16QAM, QPSK, BPSK
Quantity of Antenna	1
Antenna type / connector	Type: Chip antenna / Connector: none (An antenna is soldered to a PCB (print circuit board).)
Transmit power and tolerance (Manufacture variation, Average)	11b: 17dBm ±2dBm 11g: 15dBm ±2dBm *. Refer to clause 2.3 for more detail. *. The measured output power (antenna port conducted) refers to section 6 in this report.
Maximum output power which may possible (Average)	11b: 19dBm, 11g: 17dBm *. Refer to clause 2.4 for more detail.
Power supply	DC 3.3V

*. The EUT do not use the special transmitting technique such as "beam-forming" and "time-space code diversity."
*. This wireless LAN module can be used only 1ch-13ch.
*. This wireless LAN module can be used only 11b and 11g.

2.3 Tx output power specification (antenna port terminal conducted)

		Target Power (Tx output power specification) [dBm] (average)											
		11b				11g							
[MHz]	CH	1	2	5.5	11	6	9	12	18	24	36	48	54
2412	1	17	17	17	17	15	15	15	15	15	15	15	15
2417	2	17	17	17	17	15	15	15	15	15	15	15	15
2422	3	17	17	17	17	15	15	15	15	15	15	15	15
2427	4	17	17	17	17	15	15	15	15	15	15	15	15
2432	5	17	17	17	17	15	15	15	15	15	15	15	15
2437	6	17	17	17	17	15	15	15	15	15	15	15	15
2442	7	17	17	17	17	15	15	15	15	15	15	15	15
2447	8	17	17	17	17	15	15	15	15	15	15	15	15
2452	9	17	1717	17	17	15	15	15	15	15	15	15	15
2457	10	17	17	17	17	15	15	15	15	15	15	15	15
2462	11	17	17	17	17	15	15	15	15	15	15	15	15
2467	12	17	17	17	17	15	15	15	15	15	15	15	15
2472	13	17	17	17	17	15	15	15	15	15	15	15	15

2.4. Maximum output power which may possible

		Maximum output power which may possible [dBm] (average)											
		11b				11g							
[MHz]	CH	1	2	5.5	11	6	9	12	18	24	36	48	54
2412	1	19	19	19	19	17	17	17	17	17	17	17	17
2417	2	19	19	19	19	17	17	17	17	17	17	17	17
2422	3	19	19	19	19	17	17	17	17	17	17	17	17
2427	4	19	19	19	19	17	17	17	17	17	17	17	17
2432	5	19	19	19	19	17	17	17	17	17	17	17	17
2437	6	19	19	19	19	17	17	17	17	17	17	17	17
2442	7	19	19	19	19	17	17	17	17	17	17	17	17
2447	8	19	19	19	19	17	17	17	17	17	17	17	17
2452	9	19	19	19	19	17	17	17	17	17	17	17	17
2457	10	19	19	19	19	17	17	17	17	17	17	17	17
2462	11	19	19	19	19	17	17	17	17	17	17	17	17
2467	12	19	19	19	19	17	17	17	17	17	17	17	17
2472	13	19	19	19	19	17	17	17	17	17	17	17	17

SECTION 3: Test specification, procedures and results

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

KDB 447498 D01 (v05r01): General RF exposure guidance
KDB 248227 D01 (v01r02): SAR Measurement Procedures for 802.11a/b/g Transmitters
KDB 865664 D01 (v01r01): SAR measurement 100MHz to 6GHz

In addition;

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

For the head/ body simulated tissue parameter;

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

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

	Wi-Fi (DTS)
Test Procedure	SAR Measurement
Category	FCC 47CFR §2.1093
Results (SAR(1g))	Complied
EUT No.	1
Reported SAR value (*. Scaled)	0.44 W/kg
Measured SAR value	0.320 W/kg
Operation mode	11b, 1Mbps, DSSS, 2437MHz (6ch)
Output power (scaled factor)	17.63 dBm (×1.37)

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

3.4 Test Location

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

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3.5 Confirmation before SAR testing

Average power for SAR tests

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.

*. The EUT transmission power was tuned within 2dB lower than the maximum tune-up tolerance limit. (Clause 4.1, KDB447498 D01(v05r01))
*. The power was measured by the calibrated power sensor and power meter (65MHz measurement bandwidth).

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 1dB higher than other operation mode (11g, 11n(20HT), 11n(40HT)), the average power related with all data rate were only measured for 11b mode.

11b		11g	
Modulation	Data rate [Mbps]	Modulation	Data rate [Mbps]
DBPSK/DSSS	1	BPSK/OFDM	6
DQPSK/DSSS	2	BPSK/OFDM	9
CCK/DSSS	5.5	QPSK/OFDM	12
CCK/DSSS	11	QPSK/OFDM	18
		16QAM/OFDM	24
		16QAM/OFDM	36
		64QAM/OFDM	48
		64QAM/OFDM	54

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/Reduced		Remarks
			11b/g	11b	11g	
802.11 b/g	2412	1 (*1)	√	**Tested**	Reduced (*2)	SAR test was only applied to 11b mode, in lowest data rate. (*2, *3)
	2437	6	√	**Tested**	Reduced (*2)	
	2462	11 (*1)	√	**Tested**	Reduced (*2)	

√ = "default test channels of requested by KDB248227"
*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 of power measurement and SAR test.
*2. Since the target average power of 11g was more than 1 dB lower than the corresponded 11b power, power measurement and SAR test were not applied to the 11g mode.
*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.)

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 DASY5 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.

*. DASY5 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 DASY5 system must be the less than ±0.21dB.

3.7 Test setup of EUT, SAR test reduction and SAR measurement procedure

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

Setup	Explanation of host device setup position	Antenna distance	SAR Tested /Reduced	SAR type
Top	The top portion of host device was touched to the Flat phantom.	44.7mm	**Tested**	Body (touch)
Bottom	The bottom portion of host device was touched to the Flat phantom.	84.6mm	**Tested**	
Front	The front portion of host device was touched to the Flat phantom.	13.66mm	**Tested**	
Rear	The rear portion of host device was touched to the Flat phantom. *. This section is the closest to the EUT.	7.88mm	**Tested**	
Right	The right portion of host device was touched to the Flat phantom.	22mm	**Tested**	
Left	The left portion of host device was touched to the Flat phantom.	20mm	**Tested**	

*. **Antenna distance**: this means the distance from the antenna inside a host device to the outer surface of the host device which an operator may touch.

***. Size of EUT: 35mm(width)×22mm(depth)×2.75mm(height)**

***. Size of host device: 129.3mm(width)×42mm(depth)×22.71mm(height)**

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

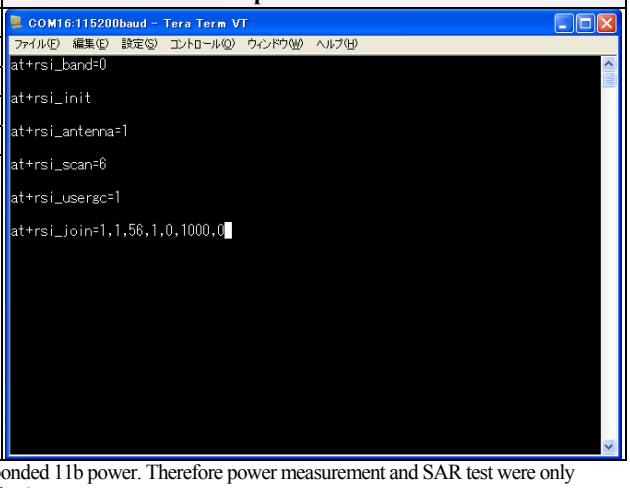
Step 1	Change the positions.
Step 2	Change the channels. (at the worst position.)

*. 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 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	2412-2472MHz	
Tested frequency	2412, 2437, 2462, 2472MHz (*2)	
Modulation	DBPSK/DSSS	
Data rate	1Mbps (*3)	
Crest factor	1.0 (100% duty cycle)	
Controlled software	Application: Tera Term Version 4.77 Before SAR test, the Tx type (data rate), channel and power were set by the software installed in the laptop PC via USB cable. The software screen is shown in the right.	

*1. The target average power of 11g was more than 1dB lower than the corresponded 11b power. Therefore power measurement and SAR test were only applied to 11b mode. (KDB248227) (Refer to Section 6 for the output power data.)
*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 for the output power data.)

SECTION 5: Uncertainty Assessment (SAR measurement)

Uncertainty of SAR measurement (v06) (*. Body tissue, ε & σ tolerance: ≤±5%, Tx: ≈100% duty cycle)	Under 3 GHz	
	1g SAR	10g SAR
Combined measurement uncertainty of the measurement system (k=1)	± 12.5%	± 12.2%
Expanded uncertainty (k=2)	± 25.0%	± 24.4%

	Error Description (Under 3GHz) (v06)	Uncertainty Value	Probability distribution	Divisor	ci (1g)	ci (10g)	ui (1g)	ui (10g)	Vi, veff
A	**Measurement System** (DASY5)						(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	Probe modulation response (CW)	±0.0 %	Rectangular	√3	1	1	±0.0 %	±0.0 %	∞
7	Sensitivity Error (detection limit)	±1.0 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
8	Response Time Error (<5ms/100ms wait)	±0.0 %	Normal	1	1	1	±0.0 %	±0.0 %	∞
9	Integration Time Error (100% duty cycle)	±0.0 %	Rectangular	√3	1	1	±0.0 %	±0.0 %	∞
10	Readout Electronics Error(DAE)	±0.3 %	Rectangular	√3	1	1	±0.3 %	±0.3 %	∞
11	RF ambient conditions-noise	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
12	RF ambient conditions-reflections	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
13	Probe positioner mechanical tolerance	±1.1 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
14	Probe Positioning with respect to phantom shell	±2.9 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
15	Errors: Extrapol., Interpol. & Integration Algorithms	±1.0 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
B	**Test Sample Related**								
16	Test Sample Positioning Error	±5.0 %	Normal	1	1	1	±5.0 %	±5.0 %	145
17	Device Holder or Positioner Tolerance	±3.6 %	Normal	1	1	1	±3.6 %	±3.6 %	5
18	Test Sample Output Power Drift Error	±5.0 %	Rectangular	√3	1	1	±2.9 %	±2.9 %	∞
C	**Phantom and Setup**								
19	Phantom uncertainty (shape, thickness tolerances)	±7.5 %	Rectangular	√3	1	1	±4.3 %	±4.3 %	∞
20	Target Liquid Conductivity Tolerance (≤5%)	±5.0 %	Rectangular	√3	0.64	0.43	±1.8 %	±1.2 %	∞
21	Measurement Liquid Conductivity Error	±2.9 %	Normal	1	0.64	0.43	±1.9 %	±1.2 %	3
22	Target Liquid Permittivity Tolerance (≤5%)	±5.0 %	Rectangular	√3	0.6	0.49	±1.7 %	±1.4 %	∞
23	Measurement Liquid Permittivity Error	±2.9 %	Normal	1	0.6	0.49	±1.7 %	±1.4 %	3
24	Liquid Conductivity-temp.uncertainty (≤2deg.C.)	±5.2 %	Rectangular	√3	0.78	0.71	±2.3 %	±2.1 %	∞
25	Liquid Permittivity-temp.uncertainty (≤2deg.C.)	±0.8 %	Rectangular	√3	0.23	0.26	±0.1 %	±0.1 %	∞
	Combined Standard Uncertainty						**±12.5 %**	**±12.2 %**	479
	Expanded Uncertainty (k=2)						**±25.0 %**	**±24.4 %**	

*. This measurement uncertainty budget is suggested by IEEE 1528, IEC 62209-2 and determined by Schmid & Partner Engineering AG (DASY5 Uncertainty Budget).
*. Table of uncertainties are listed for ISO/IEC 17025.

SECTION 6: Confirmation before testing

6.1 Assessment for the conducted power of EUT

6.1.1 SAR test reference: worst data rate / worst channel determination

Mode	Freq. [MHz]	D/R [Mbps]	Cable Loss [dB]	Att. [dB]	D/F [dB]	Average power			Power tolerance & correction				SAR Tested/ Reduced	Remarks
						P/M Reading	Result		Target & tolerance	Deviation from max..	Scaled Factor	≤2 dB from max.?		
						[dBm]	[dBm]	[mW]	[dBm]	[dB]	[-]			
11b	2437	1	0.98	10.00	0.00	6.65	**17.63**	**57.9**	17.0±2	-1.37	×1.37	Yes	Tested (*1)	*. Max.power setting.
	2437	2	0.98	10.00	0.00	6.51	17.49	56.1	17.0±2	-1.51	×1.42	Yes	-	-
	2437	5.5	0.98	10.00	0.00	6.47	17.45	55.6	17.0±2	-1.55	×1.43	Yes	-	-
	2437	11	0.98	10.00	0.00	6.35	17.33	54.1	17.0±2	-1.67	×1.47	Yes	-	-
	2412	**1**	0.98	10.00	0.00	6.03	17.01	50.2	17.0±2	-1.99	×1.58	Yes	Tested	-
	2462	**1**	0.98	10.00	0.00	6.45	17.43	55.3	17.0±2	-1.57	×1.44	Yes	Tested	-
	2472	**1**	0.98	10.00	0.00	6.12	17.10	51.3	17.0±2	-1.90	×1.55	Yes	Tested	-
11g	2437	6	0.98	10.00	0.00	4.81	15.79	37.9	15.0±2	-1.21	×1.32	Yes	-	-
	2437	9	0.98	10.00	0.00	4.71	15.69	37.1	15.0±2	-1.31	×1.35	Yes	-	-
	2437	12	0.98	10.00	0.00	4.80	15.78	37.8	15.0±2	-1.22	×1.32	Yes	-	-
	2437	18	0.98	10.00	0.00	4.69	15.67	36.9	15.0±2	-1.33	×1.36	Yes	-	-
	2437	24	0.98	10.00	0.00	4.59	15.57	36.1	15.0±2	-1.43	×1.39	Yes	-	-
	2437	36	0.98	10.00	0.00	4.58	15.56	36.0	15.0±2	-1.44	×1.39	Yes	-	-
	2437	48	0.98	10.00	0.00	3.91	15.30	33.9	15.0±2	-1.70-	×1.47	Yes	-	-
	2437	54	0.98	10.00	0.00	3.89	15.26	33.6	15.0±2	-1.74	×1.49	Yes	-	-
	2412	6	0.98	10.00	0.00	4.68	15.66	36.8	15.0±2	-1.34	×1.34	Yes	-	-
	2462	6	0.98	10.00	0.00	4.70	15.68	37.0	15.0±2	-1.32	×1.36	Yes	-	-
	2472	6	0.98	10.00	0.00	4.78	15.76	37.7	15.0±2	-1.24	×1.33	Yes	-	-

Peak power was confirmed that it was the equivalent level to the power at Radio measurement (Test Report No.:01200173).
As for average power, the equivalent value to the specification was confirmed.
Therefore, we judge the output power at SAR measurement was equivalent to the power at Radio measurement.

*. Freq.: Frequency, D/R: Data Rate, Att.: Attenuator loss, D/F: Duty Factor (0dB=100% duty cycle), n/a: not applied, P/M: Power Meter, PAR: Peak average ratio.
*. Calculating formula:
Results (Average, dBm) = (P/M Reading, dBm) + (Cable loss, dBm) + (Attenuator, dBm) + (duty factor, dBm), (duty factor, dBm)=10 × log (100 / (duty cycle,%)
Deviation form max.: (Power deviation, dB) = (results power (average, dBm)) - (Max.-specification output power (average, dBm))
*. The target average power of 11g was more than 1dB lower than the corresponded 11b power. Therefore power measurement and SAR test were only applied to 11b mode. (KDB248227) (Refer to Section 6 for the output power data.)
Scaled Factor: Power scaled factor for obtained SAR value, Scaled Factor [-] = 1 / (10 ^ ("Deviation from max." / 10))
*. Uncertainty of antenna port conducted test; Power measurement uncertainty above 1GHz for this test was: (±) 1.5dB
*. SAR reference; Date measured: July 22, 2013 / Measured by: Tomochika Sato / 25 deg.C. & 66 %RH

SECTION 7: Measurement results

7.1 SAR measurement results

Measurement date: July 23, 2013 Measurement by: Tomochika Sato

[Liquid measurement (Body simulated tissue)]

Target Frequency [MHz]	Liquid parameters							ΔSAR Coefficients		Remarks / Environment
	Permittivity (εr) [-]			Conductivity [S/m]			Temp. [deg.C.]	Depth [mm]	ΔSAR (1g) [%]	Correction required?	
	Target	Measured (Δεr)		Target	Measured (Δσ)						
2450	**52.7**	51.98	-1.4%	**1.95**	2.022	+3.7%	22.8	153	(+2.07) (*1)	not required.	July 23, 2013, before SAR test /ambient; 23.5 deg.C., 55%RH
2412 (1)	***52.75***	52.10	-1.2%	***1.914***	1.966	+2.7%			(+1.61) (*1)	not required.	
2437 (6)	***52.72***	52.03	-1.3%	***1.938***	2.007	+3.6%			(+2.03) (*1)	not required.	
2462 (11)	***52.68***	51.99	-1.3%	***1.967***	2.046	+3.6%			(+2.01) (*1)	not required.	
2472 (13)	***52.67***	51.97	-1.3%	***1.981***	2.056	+3.8%			(+2.10) (*1)	not required.	

*. 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 3000 and 5800MHz. As an intermediate solution, dielectric parameters for the frequencies between 3000 to 5800 MHz were obtained using linear interpolation. (Refer to Appendix 3-4)

*1. The number of ΔSAR(1g) of body simulated tissue was reference purpose only. ΔSAR coefficients are parameters defined in Annex F, IEC 62209-2:2010 (head tissue). In accordance with clause 6.1.1 of IEC62209-2; "If the correction ΔSAR has a negative sign, the measured SAR results shall not be corrected", the calculated ΔSAR values of the tested liquid had shown negative correction. Therefore the measured SAR was not required ΔSAR correction.
ΔSAR(1g)= Cεr ×Δεr + Cσ ×Δσ, Cεr=-7.854E-4×f^3+9.402E-3×f^2-2.742E-2×f-0.2026 / Cσ =9.804E-3×f^3-8.661E-2×f^2+2.981E-2×f+0.7829

[SAR measurement results (Partial-Body)]

SAR measurement results (Body simulated tissue)													Reported SAR		
Mode	[MHz] (CH)	Modulation /Data rate / Crest factor	Host device setup conditions: Position	Separation distance	Liquid temp. [deg.C.]: Before	After	Power drift [dB]	SAR (1g) [W/kg] maximum value of multi-peak: Observed	ΔSAR [%]	ΔSAR corrected	Data# in Appendix 2-2		SAR (1g) [W/kg]: Scaled factor	tune-up SAR	Remarks
Step 1: Changed the positions															
11b	2437(6)	BPSK &DSSS /1Mbps /1.0	**Top**	0mm	22.8	22.8	-0.15	**0.079**	-	-	Step 1-1		×1.37	**0.11**	
	2437(6)		**Front**	0mm	22.8	22.8	-0.13	**0.093**	-	-	Step 1-2		×1.37	**0.13**	
	2437(6)		**Rear**	0mm	22.8	22.8	-0.16	**0.320**	-	-	Step 1-3		×1.37	**0.44**	->Highest SAR.
	2437(6)		**Right**	0mm	22.8	22.8	0.04	**0.095**	-	-	Step 1-4		×1.37	**0.13**	
	2437(6)		**Left**	0mm	22.8	22.8	-0.11	**0.089**	-	-	Step 1-5		×1.37	**0.12**	
	2437(6)		**Bottom**	0mm	22.8	22.8	0.17	**0.067**	-	-	Step 1-6		×1.37	**0.09**	
Step 2: Changed the channels (at worst position)															
11b	2412(1)	BPSK &DSSS /1Mbps /1.0	**Rear**	0mm	22.8	22.8	-0.11	**0.225**	-	-	Step 2-1		×1.58	**0.36**	-
	2462(11)				22.8	22.8	-0.18	**0.255**	-	-	Step 2-2		×1.44	**0.37**	-
	2472(13)				22.8	22.8	0.13	**0.260**	-	-	Step 2-3		×1.55	**0.40**	

Notes:

*. Separation distance: It is the separation distance between the nearest position of host device outer surface and the bottom outer surface of phantom.

1. The target average power of 11g was more than 1dB lower than the corresponded 11b power. Therefore power measurement and SAR test were only applied to 11b mode. (KDB248227)

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

SAR test frequency	Probe calibration frequency	Validity [MHz]	Used conversion factor	Uncertainty
2412 MHz	2450 MHz	-38MHz, within ±50 of calibration frequency	7.72	±12.0%
2437 MHz	2450 MHz	-13MHz, within ±50 of calibration frequency	7.72	±12.0%
2462 MHz	2450 MHz	+12MHz, within ±50 of calibration frequency	7.72	±12.0%
2472 MHz	2450 MHz	+22MHz, within ±50 of calibration frequency	7.72	±12.0%

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