SAR TEST REPORT

Test Report No.: 31HE0102-SH-04-D

Applicant	:	**KONICA MINOLTA MEDICAL & GRAPHIC, INC.**
Type of Equipment	:	**AeroDR SYSTEM**
Model No.	:	**AeroDR P-21**
FCC ID	:	**YR7AERODRP2**
Test Standard	:	**FCC 47CFR §2.1093, Supplement C (Edition 01-01) to OET Bulletin 65**
Test Result	:	**Complied** *.The highest reported SAR(1g) for the device is 0.87 W/kg. (NII) *.The highest reported SAR(1g) for the device is 0.42 W/kg. (DTS)

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6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

Date of test: August 22, 23, 24, November 21, 22, 2011

Test engineer:

Hiroshi Naka
Engineer of WiSE Japan, UL Verification Service

Approved by:

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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SECTION 1: Customer information

Company Name	KONICA MINOLTA MEDICAL & GRAPHIC, INC.
Address	1 Sakura-Machi, Hino-Shi, Tokyo, 191-8511 Japan
Telephone Number	+81-42-589-8429
Facsimile Number	+81-42-589-8053
Contact Person	Masayoshi Inoue

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type of Equipment	AeroDR SYSTEM
Model Number	AeroDR P-21
Serial Number	19
Condition of EUT	Engineering prototype (Not for sale; This sample is equivalent to mass-production items) (*. Receipt date of sample: August 8, 2011 / *. No modification by the test lab.)
Accessary for SAR test	Any body-worn accessory was not applied.
Rated power	DC15V. The EUT has built-in rechargeable battery.
Feature of EUT, SAR tested consideration	Model: AeroDR P-21 (referred to as the EUT in this report) is a wireless digital radiography system used in the hospitality environment. Since this EUT is the medical device, the EUT is only used under the guidance of a doctor or a qualified person. The possibility of the maximum RF human exposure is only a body of the patient who comes in contact directly on the front surface side (patient side) of the EUT. Therefore, the SAR test was only applied to the front surface side (patient side) of the EUT.

2.2 Product Description

Equipment type	Transceiver
Frequency of operation	5180-5320MHz (W52/53 band), 5500-5700MHz (W56 band), 5745-5825MHz(W58 band)
Bandwidth / Channel spacing	18MHz / 20MHz
ITU code	D1D
Type of modulation	OFDM
Power rating	DC 3.3V, *.The dc power is supplied from the constant voltage circuit of the main body of the EUT.
Operation temperature range	+10 to +30 deg.C
Q'ty of Antenna	2 pcs. (Main antenna and Aux antenna) ***. Switched diversity. Single transmission at a time. During test, the each antenna was tested independently that was the most conservative condition.**

Antenna specification	Main antenna	Aux antenna
Antenna type	PIFA (Planar Inverted F Antenna)	PIFA (Planar Inverted F Antenna)
Model name	WLAN Main Ant. (P/N: A20H78901A00)	WLAN Aux Ant. (P/N: A20H78902A00)
Antenna connector type	Hiorse connector for 1.13 cable (P/N: U.FL-LP(P)-068) (*.antenna side: soldered)	Hiorse connector for 1.13 cable (P/N: U.FL-LP(P)-068) (*.antenna side: soldered)
Cable type	Sumitomo OD 1.13 RF cable (P/N: EW08-9100-0330)	Sumitomo OD 1.13 RF cable (P/N: EW08-9100-0342)
Cable length	431mm	302mm
Antenna gain (Peak) (*. including cable loss)	0.57 dBi (5220MHz), 1.67 dBi (5300MHz), 2.69 dBi (5500MHz), 3.55 dBi (5600MHz), 3.76 dBi (5700MHz), 3.32 dBi (5785MHz)	2.69 dBi (5220MHz), 2.89 dBi (5300MHz), 2.58 dBi (5500MHz), 3.24 dBi (5600MHz), 3.78 dBi (5700MHz), 2.36 dBi (5785MHz)
Transmit power	*. Refers to section 6 in this report.	*. Refers to section 6 in this report.

*. 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)(Nov.13, 2009): Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
KDB 248227 (rev.1.2)(May 29, 2007): SAR Measurement Procedures for 802.11a//b/g Transmitters

3.2 Exposure limit

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

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)
0.4	8.0	20.0

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

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)
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

Item	Test Procedure	Limit	Exclusion	Remarks	Result
Human exposure	FCC OET Bulletin 65, Supplement C	1.6 W/kg (FCC 47CFR §2.1093)	none	SAR measurement (in accordance with KDB447498, KDB248227)	**Complied** (*1)

Note: UL Japan's SAR Work Procedures No.13-EM-W0429 and 13-EM-W0430. Other than above, no addition, deviation nor exclusion has been made from standards
***1.** The maximum SAR(1g) of each frequency band was as follows;
0.67 W/kg (5180MHz, main antenna, IEEE 802.11a (6Mbps, BPSK/OFDM) /5180-5320MHz band)
0.87 W/kg (5620MHz, main antenna, IEEE 802.11a (6Mbps, BPSK/OFDM) /5500-5700MHz band)
0.42 W/kg (5825MHz, main antenna, IEEE 802.11a (6Mbps, BPSK/OFDM) /5745-5825MHz band)
The SAR(1g) was <1.2W/kg for all configuration. Therefore according to the KDB447498 D01, the EUT was approved for used in single-platform.

3.4 Test Location

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

UL Japan, Inc., Shonan EMC Lab.
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.

*. **Output power at SAR test:** SAR power was measured before SAR testing. (SAR sample was identical with EMC sample.)
For the SAR test reference, the average and peak output powers were measured on all channels of 802.11a (for W52/53, W56 and W58 band) by the calibrated power sensor and power meter (65MHz measurement bandwidth).
For 5GHz band, the average and the peak power of 802.11a mode were measured at all channel.
For the SAR vs. EMC power reference, the average and the peak power of 802.11a mode were measured at same channel of EMC measured.

*. **Output power at EMC radio test:** EMC power was measured during EMC testing.

3.5.2 Average power for SAR tests

Step.1 Data rate check

The data rate check was measurement on the specified channel of 802.11a mode.

11a			
Modulation	Data rate [Mbps]	Modulation	Data rate [Mbps]
BPSK/OFDM	6	16QAM/OFDM	24
BPSK/OFDM	9	16QAM/OFDM	36
QPSK/OFDM	12	64QAM/OFDM	48
QPSK/OFDM	18	64QAM/OFDM	54

Step.2 Decision of SAR test channel (*.Refer to KDB 248227)

Mode		GHz	Channel	"Default Test Channel"(KDB 248227)			
				FCC 15.247		UNII	
				802.11b	802.11g		
802.11a	UNII	5.18	36			√	
		5.20	40				*
		5.22	44				*
		5.24	48			√	
		5.26	52			√	
		5.28	56				*
		5.30	60				*
		5.32	64			√	
		5.50	100				*
		5.52	104			√	
		5.54	108				*
		5.56	112				*
		5.58	116			√	
		5.60	120				*
		5.62	124			√	
		5.64	128				*
		5.66	132				*
		5.68	136			√	
		5.70	140				*
	UNII or FCC 15.247	5.745	149	√		√	
		5.765	153		*		*
		5.785	157	√			*
		5.805	161		*	√	
	FCC 15.247	5.825	165	√			

√ = "default test channels"
* = Possible 802.11a channels with maximum average output > the "default test channels"

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 Measurement procedure

Operation mode: **IEEE 802.11a**

Step 1	Change the channels for the main antenna. (at the front side of EUT)
Step 2	Change the channels for the aux antenna. (at the front side of EUT)
Step 3	Change the frequency band and repeat step1 and step2.

*. Radiated power is monitored by Spectrum Analyzer during SAR test.

3.8 Test setup of EUT

Setup	Explanation
Front-touch	The front surface (patient side) of EUT touched to the flat phantom.
Rear surface	The SAR test was not applied. (*1)
Side surface	The SAR test was not applied. (*1)

*1. The SAR test was only applied to the front surface (patient side) of EUT.
Since this EUT is the medical device, the EUT is only used under the guidance of a doctor or a qualified person.
The possibility of the maximum RF human exposure is only a body of the patient who comes in contact directly on the front surface side (patient side) of the EUT. Therefore, the SAR test was only applied to the front surface side (patient side) of the EUT.

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

4.1 Operating modes for SAR testing

This EUT has IEEE.802.11a continuous transmitting modes.
The frequency and the modulation used in the SAR testing are shown as a following.

Operation mode	**802.11a**
Tx frequency band	5180-5320MHz (W52/53 band), 5500-5700MHz (W56 band), 5745-5825MHz (W58 band)
Tested frequency	Refer to tested frequency list in below. (*2)
Modulation	BPSK/OFDM
Data rate	6Mbps (*1)
Crest factor	1.0 (100% duty cycle)
Controlled software	ContinuousTransmit(modulated)2_0001 application. Before SAR test, the transmit condition was set by the AeroDR interface via remote control cable.

*1. It was lowest data rate.
*2. Decision of SAR tested channels are described in the below the "SAR test applied channel list.".

[SAR test applied channels list]

Mode	GHz	Channel	default	SAR tested channel	Remarks
			11a	11a	
802.11 a/n	5.18	36	√	✓	default channel
	5.20	40	*	-	-
	5.22	44	*	-	-
	5.24	48	√	✓	default channel
	5.26	52	√	✓	default channel
	5.28	56	*	-	-
	5.30	60	*	✓ (*3)	*3. Highest average power of main and aux antenna of W52/53 band.
	5.32	64	√	-	Replaced test channel to 60 from this default channel (64).
	5.50	100	*	-	-
	5.52	104	√	✓	default channel
	5.54	108	*	-	-
	5.56	112	*	-	-
	5.58	116	√	✓ (*4)	*4. Highest average power of aux antenna of W56 band. default channel
	5.60	120	*	✓ (*5)	*5. Highest average power of main antenna of W56 band. Added this channel for the test.
	5.62	124	√	✓	default channel
	5.64	128	*	-	-
	5.66	132	*	-	-
	5.68	136	√	✓	default channel
	5.70	140	*	-	-
	5.745	149	√	✓	default channel.
	5.765	153	*	-	-
	5.785	157	√	✓	default channel.
	5.805	161	*	-	-
	5.825	165	√	✓ (*6)	*6. Highest average power of main and aux antenna of W58 band. default channel.

√ = "default test channels of requested by KDB248227"
* = Possible 802.11a channels with maximum average output > the "default test channels"

SECTION 5: Uncertainty Assessment (SAR measurement)

Uncertainty of SAR measurement system	5~6 GHz	
	1g SAR	10g SAR
combined measurement uncertainty of the measurement system (k=1)	± 13.6%	± 13.3%
expanded uncertainty (k=2)	± 27.2%	± 26.7%

	Error Description	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	±6.8 %	Normal	1	1	1	±6.8 %	±6.8 %	∞
2	Axial isotropy	±4.7 %	Rectangular	√3	0.7	0.7	±1.9 %	±1.9 %	∞
3	Hemispherical isotropy (*flat phantom, <5°)	±2.6 %	Rectangular	√3	0.7	0.7	±1.1 %	±1.1 %	∞
4	Boundary effects	±2.0 %	Rectangular	√3	1	1	±1.2 %	±1.2 %	∞
5	Probe linearity	±4.7 %	Rectangular	√3	1	1	±2.7 %	±2.7 %	∞
6	System detection limit	±1.0 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
7	System readout electronics	±0.3 %	Normal	1	1	1	±0.3 %	±0.3 %	∞
8	Response time	±0.8 %	Rectangular	√3	1	1	±0.5 %	±0.5 %	∞
9	Integration time	±2.6 %	Rectangular	√3	1	1	±1.5 %	±1.5 %	∞
10	RF ambient - noise	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
11	RF ambient - reflections	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
12	Probe positioner mechanical tolerance	±0.8 %	Rectangular	√3	1	1	±0.5 %	±0.5 %	∞
13	Probe positioning with respect to phantom shell	±9.9 %	Rectangular	√3	1	1	±5.7 %	±5.7 %	∞
14	Max.SAR evaluation	±4.0 %	Rectangular	√3	1	1	±2.3 %	±2.3 %	∞
B	**Test Sample Related**								
15	Device positioning	±5.0 %	Normal	1	1	1	±5.0 %	±5.0 %	∞
16	Device holder uncertainty	±5.0 %	Normal	1	1	1	±5.0 %	±5.0 %	∞
17	Power drift	±5.0 %	Rectangular	√3	1	1	±5.0 %	±2.9 %	∞
C	**Phantom and Setup**								
18	Phantom uncertainty	±4.0 %	Rectangular	√3	1	1	±2.3 %	±2.3 %	∞
19	Liquid conductivity (target)	±5.0 %	Rectangular	√3	0.64	0.43	±1.8 %	±1.2 %	∞
20	Liquid conductivity (meas.)	±3.0 %	Normal	1	0.64	0.43	±1.9 %	±1.3 %	∞
21	Liquid permittivity (target)	±5.0 %	Rectangular	√3	0.6	0.49	±1.7 %	±1.4 %	∞
22	Liquid permittivity (meas.)	±3.2 %	Normal	1	0.6	0.49	±1.9 %	±1.6 %	∞
	Combined Standard Uncertainty						**±13.6** %	**±13.3** %	∞
	Expanded Uncertainty (k=2)						**±27.2** %	**±26.7** %	

*. This measurement uncertainty budget is suggested by Schmid & Partner Engineering AG. [6]

SECTION 6: Confirmation before testing

6.1 Assessment for the conducted power of EUT / Correction of the power at EMC test and at SAR test

6.1.1 5180-5320MHz band (W52/53 band) (802.11a)

Worst data rate and channel determination / vs. power at EMC test

【Output power】 Tx mode: 11a(W52/53) *.PAR=Peak(dB)-Ave(dB)[dB]

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]	SAR Power Reading Results Ave.[dBm]	SAR Power Reading Results Pk[dBm]	SAR Power Reading Results Ave.[mW]	SAR Power Reading Results Pk[mW]	⊿worst Ave. [dB]	PAR [dB]	[Power SAR vs. EMC] ⊿(sar-emc): 0< x <0.21dB Power at EMC test Ave. [dB]	⊿(sar-emc)(dB)	Pk [dB]	⊿(sar-emc)(dB)
36	5180	6	Main		BPSK OFDM	−0.31	8.55	1.98	10.06	11.73	20.59	14.89	114.55	−0.09	8.86				
40	5200	6	Main		BPSK OFDM	−0.49	8.05	2.02	10.06	11.59	20.13	14.42	103.04	−0.23	8.54				
44	5220	6	Main		BPSK OFDM	−0.57	8.14	2.03	10.06	11.52	20.23	14.19	105.44	−0.30	8.71				
48	5240	6	Main		BPSK OFDM	−0.35	8.32	2.03	10.06	11.74	20.41	14.93	109.90	−0.08	8.67				
52	5260	6	Main		BPSK OFDM	−0.39	8.25	2.02	10.06	11.69	20.33	14.76	107.89	−0.13	8.64				
56	5280	6	Main		BPSK OFDM	−0.24	8.24	1.99	10.06	11.81	20.29	15.17	106.91	−0.01	8.48				
60	5300	6	Main	o	BPSK OFDM	−0.21	8.15	1.97	10.06	11.82	20.18	15.21	104.23	0.00	8.36				
64	5320	6	Main		BPSK OFDM	−0.31	7.82	1.94	10.06	11.69	19.82	14.76	95.94	−0.13	8.13				
36	5180	6	Sub		BPSK OFDM	−1.79	5.85	2.04	10.06	10.31	17.95	10.74	62.37	−0.51	7.64				
40	5200	6	Sub		BPSK OFDM	−1.94	5.73	2.06	10.06	10.18	17.85	10.42	60.95	−0.64	7.67				
44	5220	6	Sub		BPSK OFDM	−1.97	5.71	2.07	10.06	10.16	17.84	10.38	60.81	−0.66	7.68				
48	5240	6	Sub		BPSK OFDM	−1.95	5.77	2.08	10.06	10.19	17.91	10.45	61.80	−0.63	7.72				
52	5260	6	Sub		BPSK OFDM	−1.52	6.14	2.06	10.06	10.60	18.26	11.48	66.99	−0.22	7.66				
56	5280	6	Sub		BPSK OFDM	−1.28	6.47	2.03	10.06	10.81	18.56	12.05	71.78	−0.01	7.75				
60	5300	6	Sub	o	BPSK OFDM	−1.24	6.51	2.00	10.06	10.82	18.57	12.08	71.94	0.00	7.75				
64	5320	6	Sub		BPSK OFDM	−1.50	6.21	1.97	10.06	10.53	18.24	11.30	66.68	−0.29	7.71				
36	5180	24	Main		16QAM OFDM	−0.36	8.77	1.98	10.06	11.68	20.81	14.72	120.50	–	9.13	11.54	0.14	20.74	0.07
44	5220	24	Main		16QAM OFDM	−0.59	8.47	2.03	10.06	11.50	20.56	14.13	113.76	–	9.06	11.49	0.01	20.38	0.18
48	5240	24	Main		16QAM OFDM	−0.36	8.25	2.03	10.06	11.73	20.34	14.89	108.14	–	8.61	11.54	0.19	20.31	0.03
52	5260	24	Main		16QAM OFDM	−0.28	8.42	2.02	10.06	11.80	20.50	15.14	112.20	–	8.70	11.67	0.13	20.31	0.19
60	5300	24	Main		16QAM OFDM	−0.22	8.43	1.97	10.06	11.81	20.46	15.17	111.17	–	8.65	11.67	0.14	20.31	0.15
64	5320	24	Main		16QAM OFDM	−0.29	8.36	1.94	10.06	11.71	20.36	14.83	108.64	–	8.65	11.67	0.04	20.19	0.17
														⊿low rate					
60	5300	6	Main	o	BPSK OFDM	−0.21	8.15	1.97	10.06	11.82	20.18	15.21	104.23	0.00	8.36	11.62	0.20	20.14	0.04
60	5300	9	Main		BPSK OFDM	−0.24	8.20	1.97	10.06	11.79	20.23	15.10	105.44	−0.03	8.44	11.64	0.15	20.04	0.19
60	5300	12	Main		QPSK OFDM	−0.35	8.19	1.97	10.06	11.68	20.22	14.72	105.20	−0.14	8.54	11.64	0.04	20.22	0.00
60	5300	18	Main		QPSK OFDM	−0.22	8.28	1.97	10.06	11.81	20.31	15.17	107.40	−0.01	8.50	11.63	0.18	20.17	0.14
60	5300	24	Main		16QAM OFDM	−0.22	8.43	1.97	10.06	11.81	20.46	15.17	111.17	−0.01	8.65	11.67	0.14	20.31	0.15
60	5300	36	Main		16QAM OFDM	−0.23	8.34	1.97	10.06	11.80	20.37	15.14	108.89	−0.02	8.57	11.61	0.19	20.27	0.10
60	5300	48	Main		64QAM OFDM	−0.25	8.19	1.97	10.06	11.78	20.22	15.07	105.20	−0.04	8.44	11.63	0.15	20.12	0.10
60	5300	54	Main		64QAM OFDM	−0.31	8.13	1.97	10.06	11.72	20.16	14.86	103.75	−0.10	8.44	11.61	0.11	20.07	0.09
60	5300	6	Sub	o	BPSK OFDM	−1.24	6.31	2.00	10.06	10.82	18.37	12.08	68.71	0.00	7.55	10.72	0.10	18.24	0.13
60	5300	9	Sub		BPSK OFDM	−1.25	6.24	2.00	10.06	10.81	18.30	12.05	67.61	−0.01	7.49	10.69	0.12	18.21	0.09
60	5300	12	Sub		QPSK OFDM	−1.35	6.38	2.00	10.06	10.71	18.44	11.78	69.82	−0.11	7.73	10.70	0.01	18.32	0.12
60	5300	18	Sub		QPSK OFDM	−1.28	6.29	2.00	10.06	10.78	18.35	11.97	68.39	−0.04	7.57	10.68	0.10	18.28	0.07
60	5300	24	Sub		16QAM OFDM	−1.29	6.40	2.00	10.06	10.77	18.46	11.94	70.15	−0.05	7.69	10.73	0.04	18.39	0.07
60	5300	36	Sub		16QAM OFDM	−1.27	6.40	2.00	10.06	10.79	18.46	11.99	70.15	−0.03	7.67	10.68	0.11	18.37	0.09
60	5300	48	Sub		64QAM OFDM	−1.36	6.24	2.00	10.06	10.70	18.30	11.75	67.61	−0.12	7.60	10.68	0.02	18.27	0.03
60	5300	54	Sub		64QAM OFDM	−1.26	6.32	2.00	10.06	10.80	18.38	12.02	68.87	−0.02	7.58	10.70	0.10	18.26	0.12

*. For the SAR test reference, the average and peak output powers were measured on all channels of 802.11a (for W52/53, W56 and W58 band) by the calibrated power sensor and power meter (65MHz measurement bandwidth) before SAR test was applied.

*. The average antenna terminal conducted power of lowest data rate was worst for the SAR reference.
The average power of higher data rate was less than 0.25dB higher than the lowest data rate for the EMC test.
Therefore, each channel was measured at lowest data rate.

*. Calculating formula: Results = ["P/M Reading"] + ["Cbl.loss"(Cable loss)] + ["Att.loss"(Attenuator)]

*. A red-letter figure shows the maximum power of SAR reference (in data rate, in channel) and of EMC test .

*. At the same sample, the difference between the SAR reference power and the power of EMC test was not less than 0dB and not higher than 0.21dB.
SAR reference; Date measured: August 22, 2011 / Measured by: Hiroshi Naka / Place: preparation room of No. 7 shielded room. (25 deg.C / 60 %RH)
The EMC test reference is described in the test report of 31HE0102-SH-04-A.

*. **The duty cycle of each mode and on each data rate were 100% (no off time) in the software used.**

6.1.2 5745-5825MHz band (W58 band) (802.11a)

Worst data rate and channel determination / vs. power at EMC test

【Output power】 Tx mode: 11a(W58) *.PAR=Peak(dB)-Ave(dB)[dB]

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]	SAR Power Reading Results Ave.[dBm]	SAR Power Reading Results Pk[dBm]	SAR Power Reading Results Ave[mW]	SAR Power Reading Results Pk[mW]	⊿worst ave.[dB]	PAR [dB]
149	5745	6	Main		BPSK	OFDM	-3.98	4.29	2.13	10.06	8.21	16.48	6.62	44.46	-0.72	8.27
153	5765	6	Main		BPSK	OFDM	-3.79	4.48	2.14	10.06	8.41	16.68	6.93	46.56	-0.52	8.27
157	5785	6	Main		BPSK	OFDM	-3.33	4.71	2.15	10.06	8.88	16.92	7.73	49.20	-0.05	8.04
161	5805	6	Main		BPSK	OFDM	-3.35	4.89	2.13	10.06	8.84	17.08	7.66	51.05	-0.09	8.24
165	5825	6	Main	o	BPSK	OFDM	-3.24	5.02	2.11	10.06	8.93	17.19	7.82	52.36	0.00	8.26
149	5745	6	Sub		BPSK	OFDM	-3.62	5.02	2.19	10.06	8.63	17.27	7.29	53.33	-0.58	8.64
153	5765	6	Sub		BPSK	OFDM	-3.61	5.14	2.20	10.06	8.65	17.40	7.33	54.95	-0.56	8.75
157	5785	6	Sub		BPSK	OFDM	-3.15	5.51	2.21	10.06	9.12	17.78	8.17	59.98	-0.09	8.66
161	5805	6	Sub		BPSK	OFDM	-3.14	5.54	2.18	10.06	9.10	17.78	8.13	59.98	-0.11	8.68
165	5825	6	Sub	o	BPSK	OFDM	-3.00	5.89	2.15	10.06	9.21	18.10	8.34	64.57	0.00	8.89
149	5745	36	Sub		16QAM	OFDM	-4.17	4.84	2.19	10.06	8.08	17.09	6.43	51.17	-	9.01
157	5785	36	Sub		16QAM	OFDM	-3.22	5.60	2.21	10.06	9.05	17.87	8.04	61.24	-	8.82
165	5825	36	Sub		16QAM	OFDM	-3.01	5.92	2.15	10.06	9.20	18.13	8.32	65.01	-	8.93
															⊿low rate	
157	5785	6	Main	o	BPSK	OFDM	-3.33	4.71	2.15	10.06	8.88	16.92	7.73	49.20	0.00	8.04
157	5785	9	Main		BPSK	OFDM	-3.34	4.69	2.15	10.06	8.87	16.90	7.71	48.98	-0.01	8.03
157	5785	12	Main		QPSK	OFDM	-3.34	4.77	2.15	10.06	8.87	16.98	7.71	49.89	-0.01	8.11
157	5785	18	Main		QPSK	OFDM	-3.37	4.70	2.15	10.06	8.84	16.91	7.66	49.09	-0.04	8.07
157	5785	24	Main		16QAM	OFDM	-3.41	4.83	2.15	10.06	8.80	17.04	7.59	50.58	-0.08	8.24
157	5785	36	Main		16QAM	OFDM	-3.41	4.85	2.15	10.06	8.80	17.06	7.59	50.82	-0.08	8.26
157	5785	48	Main		64QAM	OFDM	-3.46	4.65	2.15	10.06	8.75	16.86	7.50	48.53	-0.13	8.11
157	5785	54	Main		64QAM	OFDM	-3.49	4.63	2.15	10.06	8.72	16.84	7.45	48.31	-0.16	8.12
157	5785	6	Sub	o	BPSK	OFDM	-3.15	5.51	2.21	10.06	9.12	17.78	8.17	59.98	0.00	8.66
157	5785	9	Sub		BPSK	OFDM	-3.26	5.47	2.21	10.06	9.01	17.74	7.96	59.43	-0.11	8.73
157	5785	12	Sub		QPSK	OFDM	-3.17	5.59	2.21	10.06	9.10	17.86	8.13	61.09	-0.02	8.76
157	5785	18	Sub		QPSK	OFDM	-3.16	5.39	2.21	10.06	9.11	17.66	8.15	58.34	-0.01	8.55
157	5785	24	Sub		16QAM	OFDM	-3.23	5.57	2.21	10.06	9.04	17.84	8.02	60.81	-0.08	8.80
157	5785	36	Sub		16QAM	OFDM	-3.22	5.60	2.21	10.06	9.05	17.87	8.04	61.24	-0.07	8.82
157	5785	48	Sub		64QAM	OFDM	-3.16	5.51	2.21	10.06	9.11	17.78	8.15	59.98	-0.01	8.67
157	5785	54	Sub		64QAM	OFDM	-3.17	5.55	2.21	10.06	9.10	17.82	8.13	60.53	-0.02	8.72

[Power SAR vs. EMC]
⊿(sar-emc): 0< x <0.21dB

Power at EMC test			
Ave. [dB]	⊿(sar-emc)(dB)	Pk [dB]	⊿(sar-emc)(dB)
7.90	0.18	17.00	0.09
8.97	0.08	17.79	0.08
9.20	0.00	18.12	0.01
8.73	0.15	16.84	0.08
8.74	0.13	16.77	0.13
8.75	0.12	16.78	0.20
8.77	0.07	16.72	0.19
8.79	0.01	16.85	0.19
8.72	0.08	16.87	0.19
8.71	0.04	16.78	0.08
8.72	0.00	16.83	0.01
8.97	0.15	17.71	0.07
9.00	0.01	17.74	0.00
8.98	0.12	17.67	0.19
9.03	0.08	17.65	0.01
9.01	0.03	17.75	0.09
8.97	0.08	17.79	0.08
9.00	0.11	17.75	0.03
8.98	0.12	17.76	0.06

*. For the SAR test reference, the average and peak output powers were measured on all channels of 802.11a (for W52/53, W56 and W58 band) by the calibrated power sensor and power meter (65MHz measurement bandwidth) before SAR test was applied.

*. The average antenna terminal conducted power of lowest data rate was worst for the SAR reference.
The average power of higher data rate was less than 0.25dB higher than the lowest data rate for the EMC test.
Therefore, each channel was measured at lowest data rate.

*. Calculating formula: Results = ["P/M Reading"] +["Cbl.loss"(Cable loss)] + ["Att.loss"(Attenuator)]

*. A red-letter figure shows the maximum power of SAR reference (in data rate, in channel) and of EMC test .

*. At the same sample, the difference between the SAR reference power and the power of EMC test was not less than 0dB and not higher than 0.21dB.
SAR reference; Date measured: August 22, 2011 / Measured by: Hiroshi Naka / Place: preparation room of No. 7 shielded room. (25 deg.C / 60 %RH)
The EMC test reference is described in the test report of 31HE0102-SH-04-B.

*. **The duty cycle of each mode and on each data rate were 100% (no off time) in the software used.**

6.1.3 5500-5700MHz band (W56 band) (802.11a)

Worst data rate and channel determination

【Output power】 Tx mode: 11a(W56) *.PAR=Peak(dB)-Ave(dB)[dB]

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]	SAR Power Reading Results Ave[dBm]	SAR Power Reading Results Pk[dBm]	SAR Power Reading Results Ave[mW]	SAR Power Reading Results Pk[mW]	⊿worst ave.[dB]	PAR [dB]
100	5500	6	Main		BPSK	OFDM	−1.13	6.34	2.09	10.06	11.02	18.49	12.65	70.63	−0.85	7.47
104	5520	6	Main	defalut	BPSK	OFDM	−1.10	6.52	2.07	10.06	11.03	18.65	12.68	73.28	−0.84	7.62
108	5540	6	Main		BPSK	OFDM	−1.08	6.59	2.05	10.06	11.03	18.70	12.68	74.13	−0.84	7.67
112	5560	6	Main		BPSK	OFDM	−1.05	6.78	2.03	10.06	11.04	18.87	12.71	77.09	−0.83	7.83
116	5580	6	Main	defalut	BPSK	OFDM	−0.65	6.96	2.01	10.06	11.42	19.03	13.87	79.98	−0.45	7.61
120	5600	6	Main	o	BPSK	OFDM	−0.18	6.87	1.99	10.06	11.87	18.92	15.38	77.98	(ref)	7.05
124	5620	6	Main	defalut	BPSK	OFDM	−0.51	6.67	2.01	10.06	11.56	18.74	14.32	74.82	−0.31	7.18
128	5640	6	Main		BPSK	OFDM	−0.79	6.17	2.02	10.06	11.29	18.25	13.46	66.83	−0.58	6.96
132	5660	6	Main		BPSK	OFDM	−1.17	5.73	2.04	10.06	10.93	17.83	12.39	60.67	−0.94	6.90
136	5680	6	Main	defalut	BPSK	OFDM	−1.19	5.79	2.05	10.06	10.92	17.90	12.36	61.66	−0.95	6.98
140	5700	6	Main		BPSK	OFDM	−1.20	5.36	2.07	10.06	10.93	17.49	12.39	56.10	−0.94	6.56
100	5500	6	Sub		BPSK	OFDM	−2.06	5.85	2.15	10.06	10.15	18.06	10.35	63.97	−0.84	7.91
104	5520	6	Sub	defalut	BPSK	OFDM	−2.02	6.03	2.12	10.06	10.16	18.21	10.38	66.22	−0.83	8.05
108	5540	6	Sub		BPSK	OFDM	−1.91	6.28	2.10	10.06	10.25	18.44	10.59	69.82	−0.74	8.19
112	5560	6	Sub		BPSK	OFDM	−1.68	6.43	2.08	10.06	10.46	18.57	11.12	71.94	−0.53	8.11
116	5580	6	Sub	o:default	BPSK	OFDM	−1.12	6.63	2.05	10.06	10.99	18.74	12.56	74.82	(ref)	7.75
120	5600	6	Sub		BPSK	OFDM	−1.14	6.48	2.03	10.06	10.95	18.57	12.45	71.94	−0.04	7.62
124	5620	6	Sub	defalut	BPSK	OFDM	−1.38	6.10	2.05	10.06	10.73	18.21	11.83	66.22	−0.26	7.48
128	5640	6	Sub		BPSK	OFDM	−1.54	5.93	2.07	10.06	10.59	18.06	11.46	63.97	−0.40	7.47
132	5660	6	Sub		BPSK	OFDM	−1.67	5.72	2.09	10.06	10.48	17.87	11.17	61.24	−0.51	7.39
136	5680	6	Sub	defalut	BPSK	OFDM	−1.71	5.88	2.11	10.06	10.46	18.05	11.12	63.83	−0.53	7.59
140	5700	6	Sub		BPSK	OFDM	−1.85	5.80	2.12	10.06	10.33	17.98	10.79	62.81	−0.66	7.65
															⊿low rate	
116	5580	6	Main	o	BPSK	OFDM	−0.65	6.96	2.01	10.06	11.42	19.03	13.87	79.98	0 (ref)	7.61
116	5580	9	Main		BPSK	OFDM	−0.70	6.97	2.01	10.06	11.37	19.04	13.71	80.17	−0.05	7.67
116	5580	12	Main		QPSK	OFDM	−0.69	6.96	2.01	10.06	11.38	19.03	13.74	79.98	−0.04	7.65
116	5580	18	Main		QPSK	OFDM	−0.73	6.87	2.01	10.06	11.34	18.94	13.61	78.34	−0.08	7.60
116	5580	24	Main		16QAM	OFDM	−0.77	7.00	2.01	10.06	11.30	19.07	13.49	80.72	−0.12	7.77
116	5580	36	Main		16QAM	OFDM	−0.79	6.89	2.01	10.06	11.28	18.96	13.43	78.70	−0.14	7.68
116	5580	48	Main		64QAM	OFDM	−0.80	6.76	2.01	10.06	11.27	18.83	13.40	76.38	−0.15	7.56
116	5580	54	Main		64QAM	OFDM	−0.77	6.80	2.01	10.06	11.30	18.87	13.49	77.09	−0.12	7.57
116	5580	6	Sub		BPSK	OFDM	−1.12	6.63	2.05	10.06	10.99	18.74	12.56	74.82	0 (ref)	7.75
116	5580	9	Sub		BPSK	OFDM	−1.14	6.64	2.05	10.06	10.97	18.75	12.50	74.99	−0.02	7.78
116	5580	12	Sub	o	QPSK	OFDM	−1.08	6.63	2.05	10.06	11.03	18.74	12.68	74.82	0.04	7.71
116	5580	18	Sub		QPSK	OFDM	−1.09	6.71	2.05	10.06	11.02	18.82	12.65	76.21	0.03	7.80
116	5580	24	Sub		16QAM	OFDM	−1.10	6.77	2.05	10.06	11.01	18.88	12.62	77.27	0.02	7.87
116	5580	36	Sub		16QAM	OFDM	−1.13	6.83	2.05	10.06	10.98	18.94	12.53	78.34	−0.01	7.96
116	5580	48	Sub		64QAM	OFDM	−1.18	6.55	2.05	10.06	10.93	18.66	12.39	73.45	−0.06	7.73
116	5580	54	Sub		64QAM	OFDM	−1.08	6.52	2.05	10.06	11.03	18.63	12.68	72.95	0.04	7.60

*. For the SAR test reference, the average and peak output powers were measured on all channels of 802.11a (for W52/53, W56 and W58 band) by the calibrated power sensor and power meter (65MHz measurement bandwidth) before SAR test was applied.
*. The average power of higher data rate was less than 0.25dB higher than the lowest data rate.
Therefore, each channel was measured at lowest data rate. (KDB 248227)

*. Calculating formula: Results = ["P/M Reading"] +["Cbl.loss"(Cable loss)] + ["Att.loss"(Attenuator)]
*. A red-letter figure shows the maximum power of SAR reference (in data rate, in channel).

*. For W56 band, the same sample as the SAR test and the EMC test was used. Therefore, the measurement of the average power by using power meter was only performed before applying the SAR test.
SAR reference; Date measured: November 21, 2011 / Measured by: Hiroshi Naka / Place: preparation room of No. 7 shielded room. (24 deg.C / 49 %RH)

*. Before the power measurement of W56 band, previous power which was the worst value of W52/53 and W58 band was confirmed.

Band	Antenna	Freq. [MHz]	ch.	Mode	Data Rate [Mbps]	Average power [dBm] August 22, 2011	Average power [dBm] November 21, 2011
W52/53	Main	5300	60	11a	6	11.82	11.79
	Sub	5300	60	11a	6	10.82	10.75
W58	Main	5825	165	11a	6	8.93	9.08
	Sub	5825	165	11a	6	9.21	9.29

*. **The duty cycle of each mode and on each data rate were 100% (no off time) in the software used.**

SECTION 7: SAR measurement results

7.1 SAR for 5180-5320MHz band (W52/53 band)

Measurement date: August 23, 2011 Measurement by: Hiroshi Naka

[Liquid measurement (Body liquid)]

Used Target Frequency [MHz]	Target Body Tissue		Measured Body Tissue				Environment		Date measured
	Permittivity [-]	Conductivity [S/m]	Permittivity (εr) [-]	Conductivity (σ) [S/m]	Temp. [deg.C.]	Depth [mm]	Temp. [deg.C.]	Humidity [%]	
5180	**49.04**	**5.276**	49.61 (+1.2%)	5.447 (+3.2%)	24.0	149 ,in phantom	23.9	60	August 23, 2011 before SAR test
5240	**48.96**	**5.346**	49.54 (+1.2%)	5.523 (+3.3%)					
5260	**48.93**	**5.369**	49.52 (+1.2%)	5.581 (+3.9%)					
5300	**48.88**	**5.416**	49.47 (+1.2%)	5.618 (+3.7%)					

*. 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 3000MHz and 5800MHz. As an intermediate solution, dielectric parameters for the frequencies between 5180 to 5800 MHz were obtained using linear interpolation. Furthermore, dielectric parameters for the frequencies above 5800MHz were obtained using linear extrapolation. (Refer to Appendix 3-7 in this report)

[SAR measurement results (Body liquid)]

SAR measurement results											
Frequency			Modulation &Data rate [Mbps] / crest factor	EUT setup conditions			Liquid temp. [deg.C]		Power drift [dB]	SAR(1g) [W/kg] maximum value of multi-peak	Remarks
Mode	ch	[MHz]		Position	Separation gap [mm]	Antenna	Before	After			
11a	**Step 1: Change the channels (Main antenna)**										
	36	5180	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	23.4	23.4	-0.141	**0.67**	→Worst SAR of W52/53.
	48	5240	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	23.4	23.4	-0.123	**0.48**	-
	52	5260	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	23.4	23.4	-0.114	**0.49**	-
	60	5300	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	23.4	23.3	-0.171	**0.49**	-
	Step 2: Change the channels (Aux antenna)										
	36	5180	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Aux	23.4	23.3	0.119	**0.48**	-
	48	5240	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Aux	23.3	23.2	-0.20	**0.64**	-
	52	5260	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Aux	23.2	23.1	0.007	**0.61**	-
	60	5300	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Aux	23.1	23.1	-0.20	**0.51**	-

Notes:

*. The battery was fully charged before starting the SAR measurement.

*. 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
5180	**5200**	-20MHz, within ±50MHz of cal.frequency	4.10	±13.1%
5240	**5200**	+40MHz, within ±50MHz of cal.frequency	4.10	±13.1%
5260	**5300**	-40MHz, within ±50MHz of cal.frequency	3.88	±13.1%
5300	**5300**	- (calibrated frequency)	3.88	±13.1%

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

7.2 5745-5825MHz band (W58 band)

Measurement date: August 24, 2011 Measurement by: Hiroshi Naka

[Liquid measurement (Body liquid)]

Used Target Frequency [MHz]	Target Body Tissue		Measured Body Tissue				Environment		Date measured
	Permittivity [-]	Conductivity [S/m]	Permittivity (εr) [-]	Conductivity (σ) [S/m]	Temp. [deg.C.]	Depth [mm]	Temp. [deg.C.]	Humidity [%]	
5745	**48.27**	**5.936**	48.62 (+0.7%)	6.223 (+4.8%)	23.5	149 ,in phantom	23.6	60	August 24, 2011 before SAR test
5785	**48.22**	**5.982**	48.47 (+0.5%)	6.270 (+4.8%)					
5825	**48.17**	**6.029**	48.37 (+0.4%)	6.328 (+4.9%)					

*. 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 3000MHz and 5800MHz. As an intermediate solution, dielectric parameters for the frequencies between 5180 to 5800 MHz were obtained using linear interpolation. Furthermore, dielectric parameters for the frequencies above 5800MHz were obtained using linear extrapolation. (Refer to Appendix 3-7 in this report)

[SAR measurement results (Body liquid)]

SAR measurement results											
Frequency			Modulation &Data rate [Mbps] / crest factor	EUT setup conditions			Liquid temp. [deg.C]		Power drift [dB]	**SAR(1g) [W/kg]**	Remarks
Mode	ch	[MHz]		Position	Separation gap [mm]	Antenna	Before	After		maximum value of multi-peak	
11a	**Step 1: Change the channels (Main antenna).**										
	149	5745	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	23.2	23.2	0.20	**0.24**	-
	157	5785	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	23.1	23.0	0.20	**0.28**	-
	165	5825	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	23.0	22.9	-0.20	**0.42**	→Worst SAR of W58.
	Step 2: Change the channels (Aux antenna).										
	149	5745	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Aux	23.0	22.9	-0.20	**0.19**	
	157	5785	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Aux	22.9	22.8	-0.176	**0.23**	-
	165	5825	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Aux	22.8	22.7	-0.173	**0.25**	-

Notes:

*. The battery was fully charged before starting the SAR measurement.

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

SAR test frequency[MHz]	Probe calibration frequency [MHz]	Validity	Used conversion factor	Uncertainty
5745	5800	-55MHz, within ±100MHz of cal.frequency (*1)	3.94	±13.1%
5785	5800	-15MHz, within ±50MHz of cal.frequency	3.94	±13.1%
5825	5800	+25MHz, within ±50MHz of cal.frequency	3.94	±13.1%

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

*1. The validity of ±100MHz only applies for DASY V4.4 and higher software. The software used for SAR test was V4.7 and this was higher than V4.4.

7.3 5500-5700MHz band (W56 band)

Measurement date: November 21 and 22, 2011 Measurement by: Hiroshi Naka

[Liquid measurement (Body liquid)]

Used Target Frequency [MHz]	Target Body Tissue		Measured Body Tissue				Environment		Date measured
	Permittivity [-]	Conductivity [S/m]	Permittivity (εr) [-]	Conductivity (σ) [S/m]	Temp. [deg.C.]	Depth [mm]	Temp. [deg.C.]	Humidity [%]	
5520	**48.58**	**5.673**	49.17 (+1.2%)	5.906 (+4.1%)	23.0	145 ,in phantom	23.9	52	November 21, 2011 before SAR test
5580	**48.50**	**5.743**	49.22 (+1.5%)	5.965 (+3.9%)					
5600	**48.47**	**5.766**	49.18 (+1.5%)	5.985 (+3.8%)					
5620	**48.44**	**5.790**	49.10 (+1.4%)	6.045 (+4.4%)					
5680	**48.36**	**5.860**	49.05 (+1.4%)	6.102 (+4.1%)					

*. 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 3000MHz and 5800MHz. As an intermediate solution, dielectric parameters for the frequencies between 5180 to 5800 MHz were obtained using linear interpolation. Furthermore, dielectric parameters for the frequencies above 5800MHz were obtained using linear extrapolation. (Refer to Appendix 3-7 in this report)
*. On November 22, 2011, from the last measurement, since it was less than 24 hours, the same parameter was used.

[SAR measurement results (Body liquid)]

SAR measurement results											
Frequency			Modulation &Data rate [Mbps] / crest factor	EUT setup conditions			Liquid temp. [deg.C]		Power drift [dB]	SAR(1g) [W/kg] maximum value of multi-peak	Remarks
Mode	ch	[MHz]		Position	Separation gap [mm]	Antenna	Before	After			
11a	**Step 1: Change the channels (Main antenna).**										
	104	5520	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	22.6	22.6	0.107	**0.57**	-
	116	5580	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	22.6	22.6	0.118	**0.75**	-
	120	5600	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	22.6	22.6	-0.147	**0.74**	-
	124	5620	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	22.6	22.6	-0.049	**0.87**	→Worst SAR of W56.
	136	5680	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Main	22.6	22.6	0.038	**0.69**	-
	Step 2: Change the channels (Aux antenna).										
	104	5520	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Aux	22.2	22.1	0.068	**0.40**	-
	116	5580	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Aux	22.1	22.1	-0.20	**0.58**	-
	124	5620	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Aux	22.3	22.2	-0.20	**0.46**	-
	136	5680	BPSK&OFDM / 6Mbps / 1.0	Front-touch	0	Aux	22.1	22.1	-0.028	**0.41**	-

Notes:

*. The battery was fully charged before starting the SAR measurement.
*. Calibration frequency of the SAR measurement probe (and used conversion factors)

SAR test frequency [MHz]	Probe calibration frequency [MHz]	Validity	Used conversion factor	Uncertainty
5520	5500	+20MHz, within ±50MHz of cal.frequency	3.65	±13.1%
5580	5600	-20MHz, within ±50MHz of cal.frequency	3.45	±13.1%
5600	5600	- (calibrated frequency)	3.45	±13.1%
5620	5600	+20MHz, within ±50MHz of cal.frequency	3.45	±13.1%
5680	5600	+80MHz, within ±100MHz of cal.frequency (*1)	3.45	±13.1%

*. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
*1. The validity of ±100MHz only applies for DASY V4.4 and higher software. The software used for SAR test was V4.7 and this was higher than V4.4.