



Test report No. : 32EE0061-HO-A-R1
Page : 1 of 78
FCC ID : B3Q-WYSAGBUX7
Issued date : December 9, 2011
Revised date : December 13, 2011

SAR TEST REPORT

Test Report No. : 32EE0061-HO-A-R1

Applicant : BROTHER INDUSTRIES, LTD.
Type of Equipment : Wireless LAN Module
Model No. : WYSAGBUX7
FCC ID : B3Q-WYSAGBUX7
Test regulation : FCC47CFR 2.1093
FCC OET Bulletin 65, Supplement C (Edition 01-01)
Test Result : Complied
Body : 1.07W/kg

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3. This sample tested is in compliance with the limits of the above regulation.
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6. This report is a revised version of 32EE0061-HO-A. 32EE0061-HO-A is replaced with this report.

Date of test: December 6 to 7, 2011

Representative
test engineer:

Miyo Kishimoto
Engineer of WiSE Japan,
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Leader of WiSE Japan
UL Verification Service



NVLAP LAB CODE: 200572-0

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13-EM-F0429

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SECTION 1: Customer information

Company Name : BROTHER INDUSTRIES, LTD.
Address : 15-1, Naeshiro-cho, Mizuho-ku, Nagoya, Aichi-ken, 467-8561 Japan
Telephone Number : +81-52-824-2345
Facsimile Number : +81-52-821-1068
Contact Person : Shuhei Nohara

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

2.1 Identification of E.U.T.

Type of Equipment : Wireless LAN Module
Model No. : WYSAGBUX7
Serial No. : 00225858AEAC 1183
Receipt Date of Sample : December 6, 2011
Condition of EUT : Production model
Modification of EUT : No Modification by the test lab

2.2 Product description

This EUT is a limited module approval according to section 15.212(b).
The EUT is installed to Thermal Printer manufactured by BROTHER INDUSTRIES, LTD.

Radio Specification

Bluetooth

Frequency of Operation : 2412-2462MHz
Bandwidth & channel spacing : 20MHz & 5MHz
Modulation : DSSS, OFDM
Power Supply : DC 3.3V
Antenna type : Monopole
Antenna Gain : 2.1dBi (max)

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SECTION 3 : Test standard information

3.1 Test Specification

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

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

: **IEEE Std 1528-2003:**

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

In additions;

KDB447498D01(v04): Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
KDB248227(rev.1.2): SAR Measurement Procedures for 802.11a/b/g Transmitters

Reference

[1]ANSI, ANSI/IEEE C95.1-1992: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, The Institute of Electrical and Electronics Engineers, Inc., New York, NY 10017, 1992.

[2]SPEAG uncertainty document (AN 15-7/AN19-17) for DASY 5 System from SPEAG (Shimid & Partner Engineering AG).

3.2 Procedure

Transmitter	WLAN
Test Procedure	FCC OET BULLETIN 65, SUPPLEMENT C SAR
Category	FCC47CFR 2.1093
Note: UL Japan, Inc. 's SAR Work Procedures 13-EM-W0429 and 13-EM-W0430	

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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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SECTION 4 : Test result

4.1 Stand-alone SAR result

TEST Outline

This EUT is a limited module approval according to section 15.212(b).

The procedure of SAR was performed in that EUT installed to Thermal Printer, according to the KDB447498 2).

The detail for Thermal Printer is shown in Appendix4.

Mode	1g SAR [W/kg]
WLAN	1.07

The 1-g SAR was <1.2W/kg for all configurations.

Therefore according to the KDB447498 D01, the EUT was approved for used in a single host platform.

SECTION 5 : Description of the operating mode

5.1 Output power operating modes

Mode	Duty cycle	Frequency Band	Test Frequency	Modulation
IEEE802.11b	Close 100%	2412-2462MHz	2412MHz (1ch) 2437MHz(6ch) 2462MHz(11ch)	DSSS (DBPSK.DQPSK.CCK)
IEEE802.11g	Close 100%	2412-2462MHz	2412MHz (1ch) 2437MHz(6ch) 2462MHz(11ch)	OFDM (BPSK.QPSK.16QAM,64QA)
IEEE802.11n20 (2.4G)	Close100%	2412-2462MHz	2412MHz (1ch) 2437MHz(6ch) 2462MHz(11ch)	

WLAN

*Power of the EUT was set by the software as follows;
Power setting: 11b 17dBm, 11g 13dBm, 11n 12dBm
Software/version: pjltool / 1.0.0.2

*This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

5.2 SAR testing operating modes

Decision of SAR test channel

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

The average output power for 802.11a was measured on all channels in each frequency band.

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

√ = "default test channels"

Δ = Possible 802.11g channels with maximum average output $\frac{1}{4}$ dB \geq the "default test channels"

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

Test mode : 11b/1Mbps

Crest factor : 1

Note:

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

[IEEE802.11b] Rate Check Ant.0

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
1.0	2437	9.01	5.34	0.77	9.99	19.77	16.10	94.84	40.74
2.0	2437	7.83	4.74	0.77	9.99	18.59	15.50	72.28	35.48
5.5	2437	8.05	2.64	0.77	9.99	18.81	13.40	76.03	21.88
11.0	2437	7.49	-0.99	0.77	9.99	18.25	9.77	66.83	9.48

IEEE802.11b 1Mbps Ant.0

Ch	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
1	2412	8.76	5.96	0.77	9.99	19.52	16.72	89.54	46.99
6	2437	9.01	5.34	0.77	9.99	19.77	16.10	94.84	40.74
11	2462	8.99	5.14	0.77	9.99	19.75	15.90	94.41	38.90

: Worst data rate

: Maximum AVG power for 11b mode

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[IEEE802.11g] Rate Check Ant.0

Rate [Mbps]	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
6.0	2437	9.72	0.68	0.77	9.99	20.48	11.44	111.69	13.93
9.0	2437	10.03	0.51	0.77	9.99	20.79	11.27	119.95	13.40
12.0	2437	9.61	0.65	0.77	9.99	20.37	11.41	108.89	13.84
18.0	2437	9.56	0.61	0.77	9.99	20.32	11.37	107.65	13.71
24.0	2437	9.45	0.58	0.77	9.99	20.21	11.34	104.95	13.61
36.0	2437	9.23	0.51	0.77	9.99	19.99	11.27	99.77	13.40
48.0	2437	9.18	0.53	0.77	9.99	19.94	11.29	98.63	13.46
54.0	2437	9.12	0.38	0.77	9.99	19.88	11.14	97.27	13.00

IEEE802.11g 6Mbps Ant.0

Ch	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
1	2412	10.54	1.80	0.77	9.99	21.30	12.56	134.90	18.03
6	2437	9.72	0.68	0.77	9.99	20.48	11.44	111.69	13.93
11	2462	9.00	-0.12	0.77	9.99	19.76	10.64	94.62	11.59

[IEEE802.11n20] Rate Check Ant.0

Rate	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
MCS0	2437	9.63	0.77	0.77	9.99	20.39	11.53	109.40	14.22
MCS1	2437	9.28	0.69	0.77	9.99	20.04	11.45	100.93	13.96
MCS2	2437	9.75	0.64	0.77	9.99	20.51	11.40	112.46	13.80
MCS3	2437	9.59	0.68	0.77	9.99	20.35	11.44	108.39	13.93
MCS4	2437	9.21	0.46	0.77	9.99	19.97	11.22	99.31	13.24
MCS5	2437	9.16	0.44	0.77	9.99	19.92	11.20	98.17	13.18
MCS6	2437	9.42	0.50	0.77	9.99	20.18	11.26	104.23	13.37
MCS7	2437	9.12	0.42	0.77	9.99	19.88	11.18	97.27	13.12

IEEE802.11n20 MCS0 Ant.0

Ch	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
1	2412	10.63	1.81	0.77	9.99	21.39	12.57	137.72	18.07
6	2437	9.63	0.77	0.77	9.99	20.39	11.53	109.40	14.22
11	2462	8.99	-0.10	0.77	9.99	19.75	10.66	94.41	11.64

: Worst data rate

:Maximum AVG power

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[IEEE802.11b] Rate Check Ant.1

Rate [Mbps]	Freq. [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
1.0	2437	9.21	6.87	0.77	9.99	19.97	17.63	99.31	57.94
2.0	2437	9.21	6.73	0.77	9.99	19.97	17.49	99.31	56.10
5.5	2437	9.12	6.43	0.77	9.99	19.88	17.19	97.27	52.36
11.0	2437	9.09	6.32	0.77	9.99	19.85	17.08	96.61	51.05

IEEE802.11b 1Mbps

Ch	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
1	2412	9.24	6.91	0.77	9.99	20.00	17.67	100.00	58.48
6	2437	9.21	6.87	0.77	9.99	19.97	17.63	99.31	57.94
11	2462	8.89	5.67	0.77	9.99	19.65	16.43	92.26	43.95

[IEEE802.11g] Rate Check Ant.1

Rate [Mbps]	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
6.0	2437	13.12	3.63	0.77	9.99	23.88	14.39	244.34	27.48
9.0	2437	12.93	3.42	0.77	9.99	23.69	14.18	233.88	26.18
12.0	2437	12.23	3.31	0.77	9.99	22.99	14.07	199.07	25.53
18.0	2437	12.01	3.17	0.77	9.99	22.77	13.93	189.23	24.72
24.0	2437	11.99	3.19	0.77	9.99	22.75	13.95	188.36	24.83
36.0	2437	11.86	3.18	0.77	9.99	22.62	13.94	182.81	24.77
48.0	2437	12.07	3.15	0.77	9.99	22.83	13.91	191.87	24.60
54.0	2437	11.78	3.17	0.77	9.99	22.54	13.93	179.47	24.72

IEEE802.11g 6Mbps

Ch	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
1	2412	12.21	3.58	0.77	9.99	22.97	14.34	198.15	27.16
6	2437	13.12	3.63	0.77	9.99	23.88	14.39	244.34	27.48
11	2462	11.66	2.75	0.77	9.99	22.42	13.51	174.58	22.44

[IEEE802.11n20] Rate Check Ant.1

Rate	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
MCS0	2437	12.17	3.39	0.77	9.99	22.93	14.15	196.34	26.00
MCS1	2437	11.81	3.34	0.77	9.99	22.57	14.10	180.72	25.70
MCS2	2437	12.12	3.35	0.77	9.99	22.88	14.11	194.09	25.76
MCS3	2437	12.11	3.42	0.77	9.99	22.87	14.18	193.64	26.18
MCS4	2437	11.97	2.05	0.77	9.99	22.73	12.81	187.50	19.10
MCS5	2437	11.85	3.11	0.77	9.99	22.61	13.87	182.39	24.38
MCS6	2437	12.17	3.28	0.77	9.99	22.93	14.04	196.34	25.35
MCS7	2437	11.90	3.30	0.77	9.99	22.66	14.06	184.50	25.47

IEEE802.11n20 MCS0

Ch	Frequency [MHz]	P/M Reading [dBm]		Cable Loss [dB]	Atten. [dB]	Result			
		PK	AVG			[dBm]		[mW]	
1	2412	12.09	3.36	0.77	9.99	22.85	14.12	192.75	25.82
6	2437	12.17	3.39	0.77	9.99	22.93	14.15	196.34	26.00
11	2462	12.09	3.43	0.77	9.99	22.85	14.19	192.75	26.24

:Worst Data rate

:Maximum AVG power

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5.3 Confirmation before SAR testing

Correlation of Output Power between EMC and SAR tests

It was checked that the antenna port power was correlated within 0~+5% (FCC requirements)

Mode	Maximum EMC power [dBm]	Maximum SAR power [dBm]	Deviation [%]
11b	19.87	20.00	3.04
11g	23.86	23.88	0.46
11n	22.74	22.93	4.47

5.4 Confirmation after SAR testing

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

DASY5 system calculation Power drift value[dB] = $20\log(E_a)/(E_b)$

Before SAR testing : E_b [V/m]

After SAR testing : E_a [V/m]

Limit of power drift[W] = +/-5%

$X[\text{dB}] = 10\log[P] = 10\log(1.05/1) = 10\log(1.05) - 10\log(1) = 0.212\text{dB}$

from E-field relations with power.

$p = E^2/\eta = E^2/$

Therefore, The correlation of power and the E-field

$X_{\text{dB}} = 10\log(P) = 10\log(E^2) = 20\log(E)$

Therefore,

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

SECTION6 : Description of the Body setup

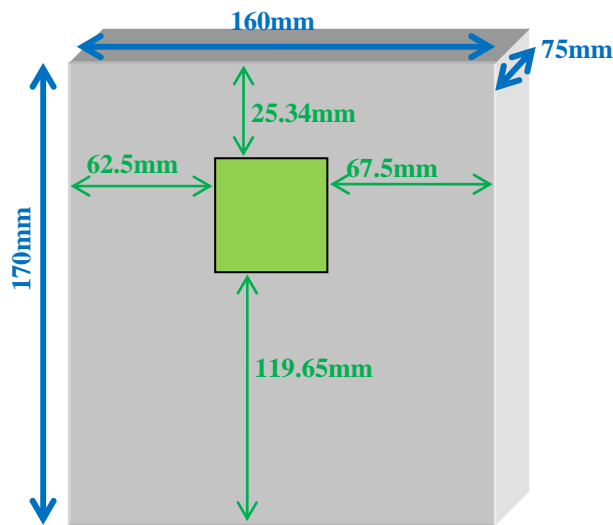
6.2 Description of the Body setup

i) Procedure for SAR testing

The EUT was tested in accordance with the KDB447498 2).

ii) Test mode

WLAN 2.4G	Data transmission mode (11b)
-----------	------------------------------



Front view

Position	WLAN
Front	Tested
Rear	Tested
Left	Tested
Right	Tested
Top	Tested
Bottom	Tested

(1) Front :

The measurement touched the front face of EUT and flat phantom.

(2) Rear :

The measurement touched the rear of EUT and flat phantom.

(3) Left :

The measurement touched the left of EUT and flat phantom.

(4) Right :

The measurement touched the right of EUT and flat phantom.

(5) Top :

The measurement touched the top of EUT and flat phantom.

(6) Bottom :

The measurement touched the bottom of EUT and flat phantom.

(7) Worst position (5mm) :

The measurement separated 5mm distance between the worst position of EUT and flat phantom.

(8) Worst position (10mm) :

The measurement separated 10mm distance between the worst position of EUT and flat phantom..

<Antenna position>

The antennas use for WLAN is two pattern antennas (Ant.0/Ant.1). The antennas are integral part of the device.

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SECTION 7 : Test surrounding

7.1 Measurement uncertainty

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

Error Description	Uncertainty value \pm %	Probability distribution	divisor	(ci) 1g	Standard Uncertainty (1g)	vi or veff
Measurement System						
Probe calibration	± 6.0	Normal	1	1	± 6.0	∞
Axial isotropy of the probe	± 4.7	Rectangular	$\sqrt{3}$	0.7	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	$\sqrt{3}$	0.7	± 3.9	∞
Boundary effects	± 1.0	Rectangular	$\sqrt{3}$	1	± 0.6	∞
Probe linearity	± 4.7	Rectangular	$\sqrt{3}$	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	$\sqrt{3}$	1	± 0.6	∞
Readout electronics	± 0.3	Normal	1	1	± 0.3	∞
Response time	± 0.8	Rectangular	$\sqrt{3}$	1	± 0.5	∞
Integration time	± 2.6	Rectangular	$\sqrt{3}$	1	± 1.5	∞
RF ambient Noise	± 3.0	Rectangular	$\sqrt{3}$	1	± 1.7	∞
RF ambient Reflections	± 3.0	Rectangular	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.4	Rectangular	$\sqrt{3}$	1	± 0.2	∞
Probe positioning	± 2.9	Rectangular	$\sqrt{3}$	1	± 1.7	∞
Max.SAR Eval.	± 1.0	Rectangular	$\sqrt{3}$	1	± 0.6	∞
Test Sample Related						
Device positioning	± 2.9	Normal	1	1	± 2.9	17
Device holder uncertainty	± 3.6	Normal	1	1	± 3.6	7
Power drift	± 5.0	Rectangular	$\sqrt{3}$	1	± 2.9	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 3.1	Rectangular	1	0.64	± 2.0	∞
Liquid permittivity (target)	± 5.0	Rectangular	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	-4.4	Rectangular	1	0.6	± 2.6	∞
Combined Standard Uncertainty						
					± 11.245	
Expanded Uncertainty (k=2)						
					± 22.49	

SECTION 8 : Measurement results

8.1 WLAN Body SAR (2.4G)

(1)Method of measurement

- Step1. The searching for the worst position
The test was performed in mode of the maximum average output power
- Step2. The change to other channels.
The test was performed at the condition that SAR value of Step1 is more than 0.8W/kg.
- Step3. The changing to the separation
It was performed to confirm of the separation testing.
The device is moved away from the phantom in 5mm increments from the touching.
A single-point SAR is measured until the SAR is less than 50% of that measured at the touching position.

Note:

- 1)The BODY SAR is not required for 11g/n mode because the maximum average output power for 11g/n mode is less than 1/4dB higher than that measured 11b mode.

(2)Simulated Tissue Liquid Parameter confirmation

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

The dielectric parameters measurement is reported in each correspondent section.

DIELECTRIC PARAMETERS MEASUREMENT RESULTS										
Date	Ambient Temp. [deg.c]	Relative Humidity [%]	Liquid type	Liquid Temp. [deg.c]	Measured Frequency [MHz]	Parameters	Target Value*1	Measured	Deviation [%]	Limit [%]
6-Dec	24	35	MSL 2450	23.5	2450	ϵ_r	52.7	50.4	-4.4	+/-5
						σ [mho/m]	1.95	2.01	3.1	+/-5
7-Dec	24	42	MSL 2450	23.5	2450	ϵ_r	52.7	50.4	-4.4	+/-5
						σ [mho/m]	1.95	1.97	1.0	+/-5

ϵ_r : Relative Permittivity / σ : Conductivity

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

frequency	December 6 ,2011			December 7 ,2011		
	ϵ'	ϵ''	σ	ϵ'	ϵ''	σ
2.35	50.6692	14.2773	1.864	50.6927	14.0708	1.837
2.36	50.6229	14.2952	1.874	50.6576	14.108	1.850
2.37	50.5937	14.3628	1.891	50.6186	14.1412	1.862
2.38	50.5594	14.4768	1.914	50.5852	14.1795	1.875
2.39	50.521	14.5914	1.937	50.5469	14.2169	1.888
2.4	50.479	14.684	1.958	50.5156	14.2528	1.900
2.41	50.4482	14.7323	1.972	50.4845	14.2959	1.914
2.42	50.4353	14.7414	1.982	50.4523	14.3386	1.928
2.43	50.4258	14.7286	1.988	50.4197	14.376	1.941
2.44	50.3991	14.7247	1.996	50.3937	14.414	1.954
2.45	50.3464	14.7283	2.005	50.3598	14.4504	1.967
2.46	50.2609	14.7453	2.015	50.3274	14.489	1.980
2.47	50.1712	14.7737	2.027	50.2961	14.5237	1.993
2.48	50.1012	14.8233	2.042	50.2618	14.5635	2.007
2.49	50.0562	14.9001	2.061	50.2286	14.6029	2.020
2.5	50.035	14.9888	2.082	50.1911	14.6445	2.034
2.51	50.026	15.0774	2.102	50.152	14.6852	2.048
2.52	50.0231	15.1397	2.120	50.115	14.7253	2.062
2.53	50.026	15.1697	2.132	50.0813	14.7628	2.075
2.54	50.0313	15.1633	2.140	50.0419	14.8054	2.089
2.55	50.033	15.1394	2.145	50.0055	14.8414	2.103

NOTE: σ (=e''*f[GHz]/18)

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3)Result of Body SAR

BODY SAR MEASUREMENT RESULTS							
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]	Maximum value of multi-peak
Ant.0							
Step.1 Position searching							
1	2412	11b 1Mbps	Flat	Ant.0	Front	0	0.895
1	2412	11b 1Mbps	Flat	Ant.0	Rear	0	0.097
1	2412	11b 1Mbps	Flat	Ant.0	Left	0	0.067
1	2412	11b 1Mbps	Flat	Ant.0	Right	0	0.027
1	2412	11b 1Mbps	Flat	Ant.0	Top	0	0.077
1	2412	11b 1Mbps	Flat	Ant.0	Bottom	0	0.015
Step.2 Channel change (SAR level in Step.1 > 0.8 w/kg)							
6	2437	11b 1Mbps	Flat	Ant.0	Front	0	0.731
11	2462	11b 1Mbps	Flat	Ant.0	Front	0	0.633
Ant.1							
Step.1 Position searching							
1	2412	11b 1Mbps	Flat	Ant.1	Front	0	1.07
1	2412	11b 1Mbps	Flat	Ant.1	Rear	0	0.081
1	2412	11b 1Mbps	Flat	Ant.1	Left	0	0.017
1	2412	11b 1Mbps	Flat	Ant.1	Right	0	0.011
1	2412	11b 1Mbps	Flat	Ant.1	Top	0	0.080
1	2412	11b 1Mbps	Flat	Ant.1	Bottom	0	0.016
Step.2 Channel change (SAR level in Step.1 > 0.8 w/kg)							
6	2437	11b 1Mbps	Flat	Ant.1	Front	0	0.894
11	2462	11b 1Mbps	Flat	Ant.1	Front	0	0.695

A single- point SAR evaluation was evaluated by the peak SAR (Extrapolated).

As the result, a single-point SAR at 5mm separation position is checked that it was less than 50% from SAR at the touching position

BODY SAR MEASUREMENT RESULTS								
Frequency		Modulation	Phantom Section	EUT Set-up Conditions			Single-SAR [W/kg]	SAR(1g) [W/kg]
Channel	[MHz]			Antenna	Position	Separation [mm]		
Step.3 Separation distance change								
1	2412	11b 1Mbps	Flat	Ant.1	Front	0	2.179	1.07
1	2412	11b 1Mbps	Flat	Ant.1	Front	5	1.306	0.675
1	2412	11b 1Mbps	Flat	Ant.1	Front	10	0.667	0.363

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SECTION 9 Test instruments

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	Power Measurement	2011/09/13 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	Power Measurement	2011/09/12 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	Power Measurement	2011/03/14 * 12
MCC-103	Microwave Cable	Hirose Electric	U.FL-2LP-066J1-A(200)	-	Power Measurement	2011/06/24 * 12
MPM-01	Power Meter	Agilent	E4417A	GB41290639	SAR	2011/02/01 * 12
MPSE-01	Power Sensor	Agilent	E9300B	US40010300	SAR	2011/01/28 * 12
MPSE-03	Power sensor	Agilent	E9327A	US40440576	SAR	2011/02/02 * 12
MAT-15	Attenuator(30dB)	Agilent	8498A	US40010300	SAR	2011/02/16 * 12
MSG-10	Signal Generator	Agilent	N5181A	MY47421098	SAR	2011/09/22 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	SAR	2011/03/10 * 12
MHDC-12	Dual Directional Coupler	Hewlett Packard	772D	2839A0016	SAR	Pre Check
MNA-01	Network Analyzer	Agilent/HP	E8358A	US41080381	SAR	2011/08/22 * 12
MDPK-01	Dielectric probe kit	Agilent	85070D	702	SAR	2010/10/25 * 36
MNCK-01	Type N Calibration Kit	Agilent	85032F	MY41495257	SAR	2011/08/12 * 12
MRENT-82	Dosimetric E-Field Probe	Schmid&Partner Engineering AG	EX3DV4	3540	SAR	2011/11/30 * 12
MDAE-01	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE4	509	SAR	2011/07/20 * 12
COTS-MSAR-03	Dasy5	Schmid&Partner Engineering AG	DASY52.6.1.408	-	SAR	-
COTS-MSAR-02	S-Parameter Network Analyzer	Agilent	-	-	SAR	-
MDA-07	Dipole Antenna	Schmid&Partner Engineering AG	D2450V2	713	SAR	2010/09/13 * 36
MPF-02	2mmOval Flat Phantom ERI 4.0	Schmid&Partner Engineering AG	QD VA 001B (ERI4.0)	1045	SAR	2011/04/01 * 12
MDH-02	Device Holder(HAC)	Schmid&Partner Engineering AG	Mounting device for transmitter	-	SAR	Pre Check
MOS-26	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q29	SAR	2011/05/26 * 12
MOS-10	Digital thermometer	HANNA	Checktemp-2	MOS-10	SAR	2011/08/22 * 12
MBM-13	Barometer	Sunoh	SBR121	837	SAR	2011/03/14 * 36
MSL2450				Daily check Target value \pm 5%		
SAR room				Daily check Ambient Noise<0.012W/kg		

The expiration date of the calibration is the end of the expired month.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

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APPENDIX 1 : SAR Measurement data

1. Evaluation procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the E-field at a fixed location above the ear point or central position of flat phantom was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of head or body position was measured at a distance of each device from the inner surface of the shell. The area covered the entire dimension of the antenna of EUT and the horizontal grid spacing was 15 mm x 15 mm (or 10mm x 10mm). Based on these data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Around this point found in the Step 2 (area scan) , a volume of 30mm x 30mm x 30mm or more was assessed by measuring 7 x 7 x 7 points at least. And for any secondary peaks found in the Step2 which are within 2dB of maximum peak and not with this Step3 (Zoom scan) is repeated. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

(1). The data at the surface were extrapolated, since the center of the dipoles is 1mm(EX3DV3) away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation was based on a least square algorithm [4]. A polynomial of the fourth order was calculated through the points in z-axes.

This polynomial was then used to evaluate the points between the surface and the probe tip.

(2). The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one-dimensional splines with the "Not a knot"-condition (in x, y and z-directions) [4], [5]. The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

(3). All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement of the E-field at the same location as in Step 1.

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2. Measurement data
i) WLAN Ant.0

WYSAGBUX7 Front 0mm WLAN 11b 1Mbps 2412MHz Ant.0

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.977$ mho/m; $\epsilon_r = 50.446$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (81x61x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.553 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.212 V/m; Power Drift = -0.20 dB

Peak SAR (extrapolated) = 1.881 W/kg

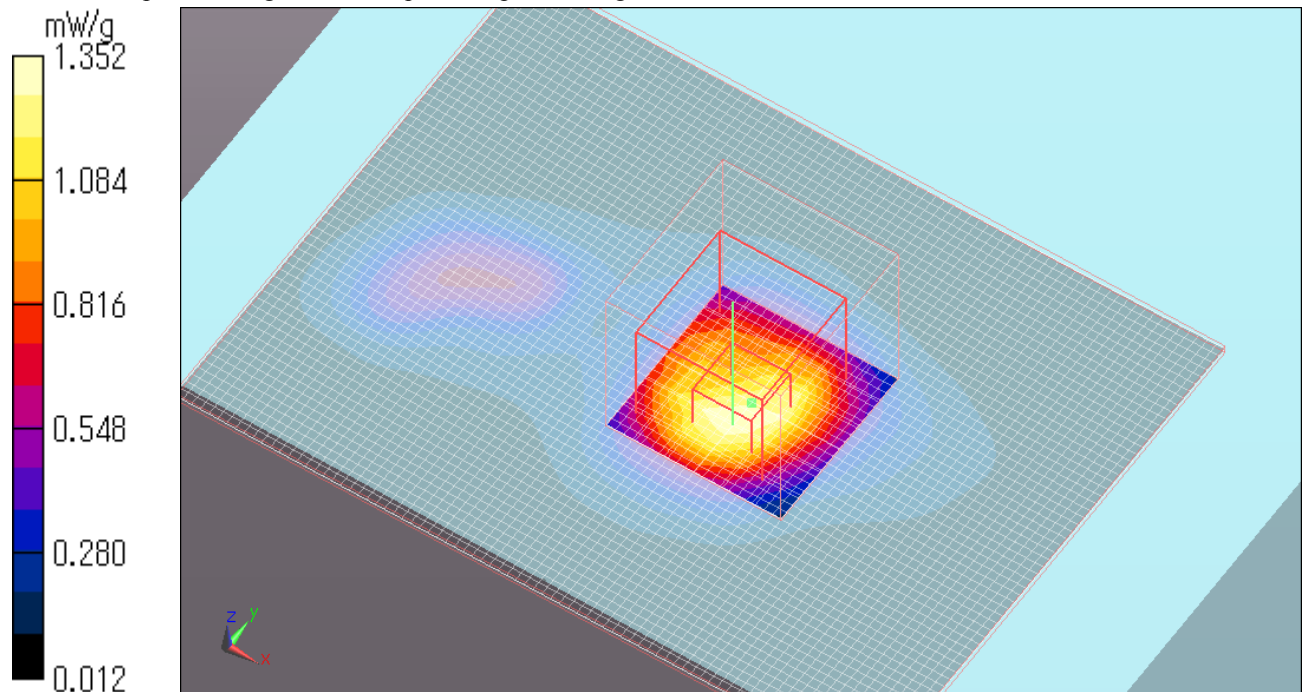
SAR(1 g) = 0.895 mW/g; SAR(10 g) = 0.467 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.352 mW/g

Date: 2011/12/06

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Rear 0mm WLAN 11b 1Mbps 2412MHz Ant.0

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.919$ mho/m; $\epsilon_r = 50.478$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan 2 (91x61x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.079 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.426 V/m; Power Drift = 0.20 dB

Peak SAR (extrapolated) = 0.179 W/kg

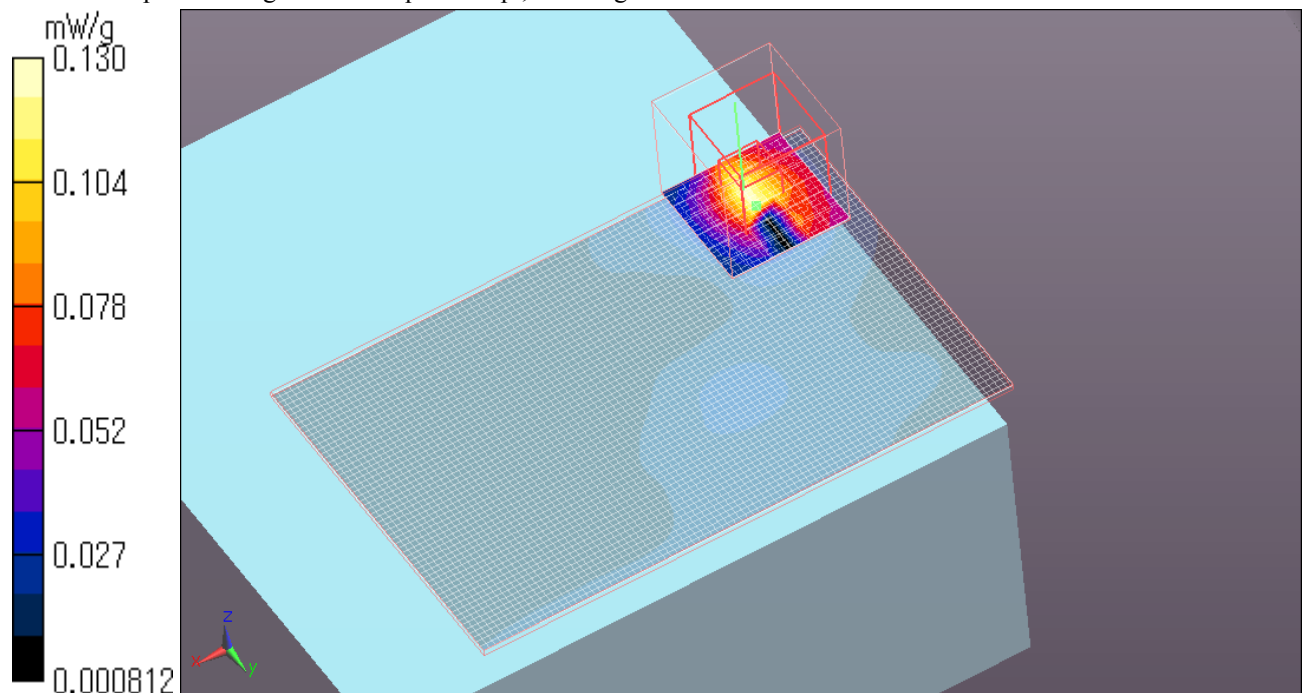
SAR(1 g) = 0.097 mW/g; SAR(10 g) = 0.058 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.130 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Left 0mm WLAN 11b 1Mbps 2412MHz Ant.0

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.919$ mho/m; $\epsilon_r = 50.478$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (91x101x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.098 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.752 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.123 W/kg

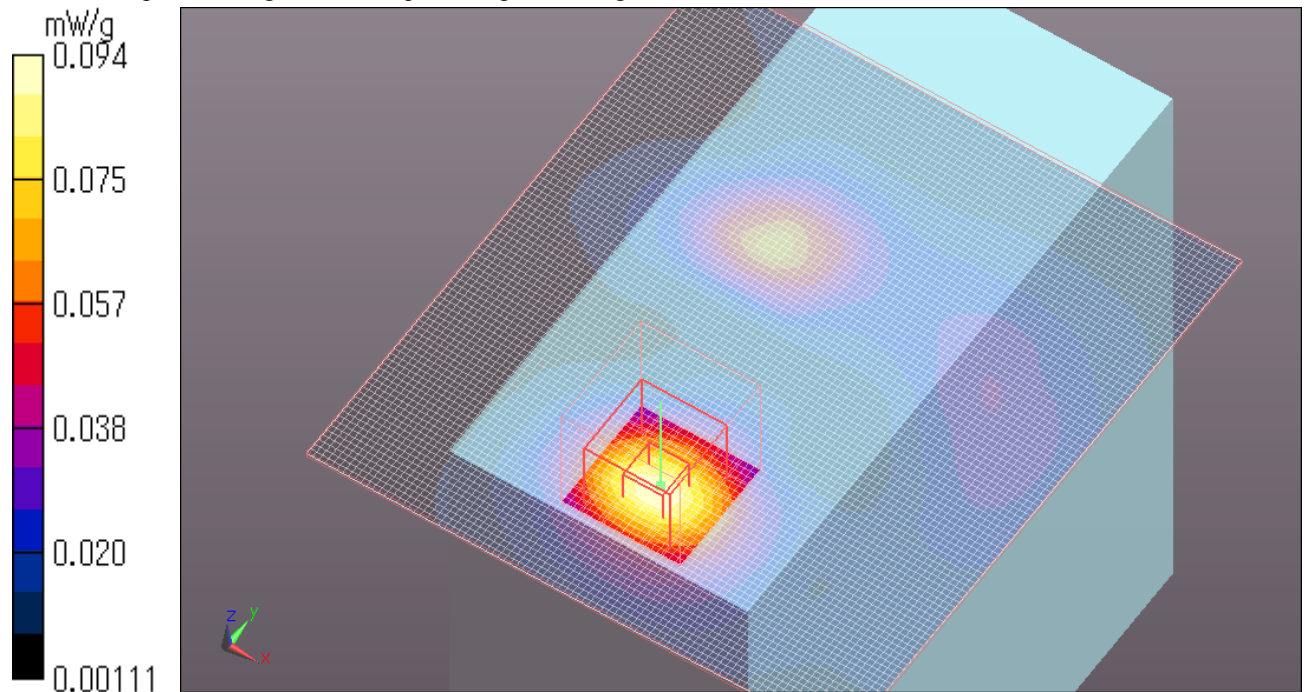
SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.036 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.094 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Right 0mm WLAN 11b 1Mbps 2412MHz Ant.0

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.919$ mho/m; $\epsilon_r = 50.478$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS5, Version 52.6 (2);

Area Scan (101x101x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.037 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.840 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.048 W/kg

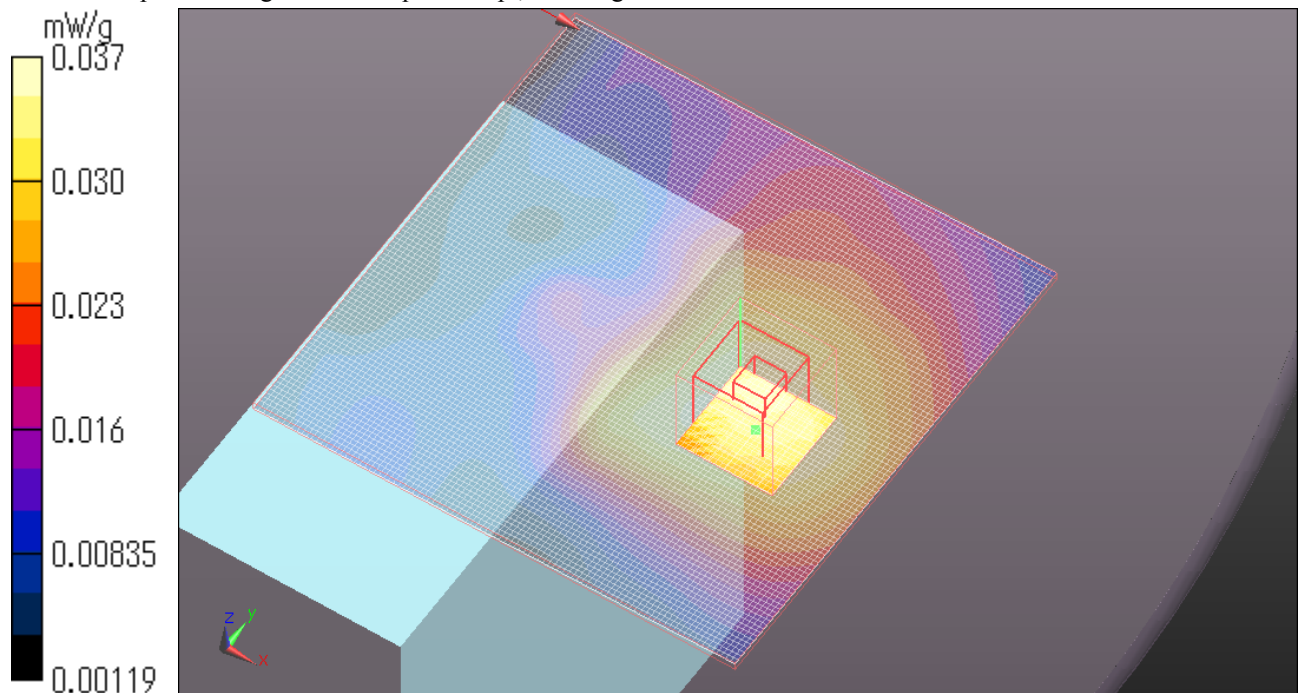
SAR(1 g) = 0.027 mW/g; SAR(10 g) = 0.016 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.037 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Top 0mm WLAN 11b 1Mbps 2412MHz Ant.0

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.919$ mho/m; $\epsilon_r = 50.478$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (91x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.105 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.956 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.157 W/kg

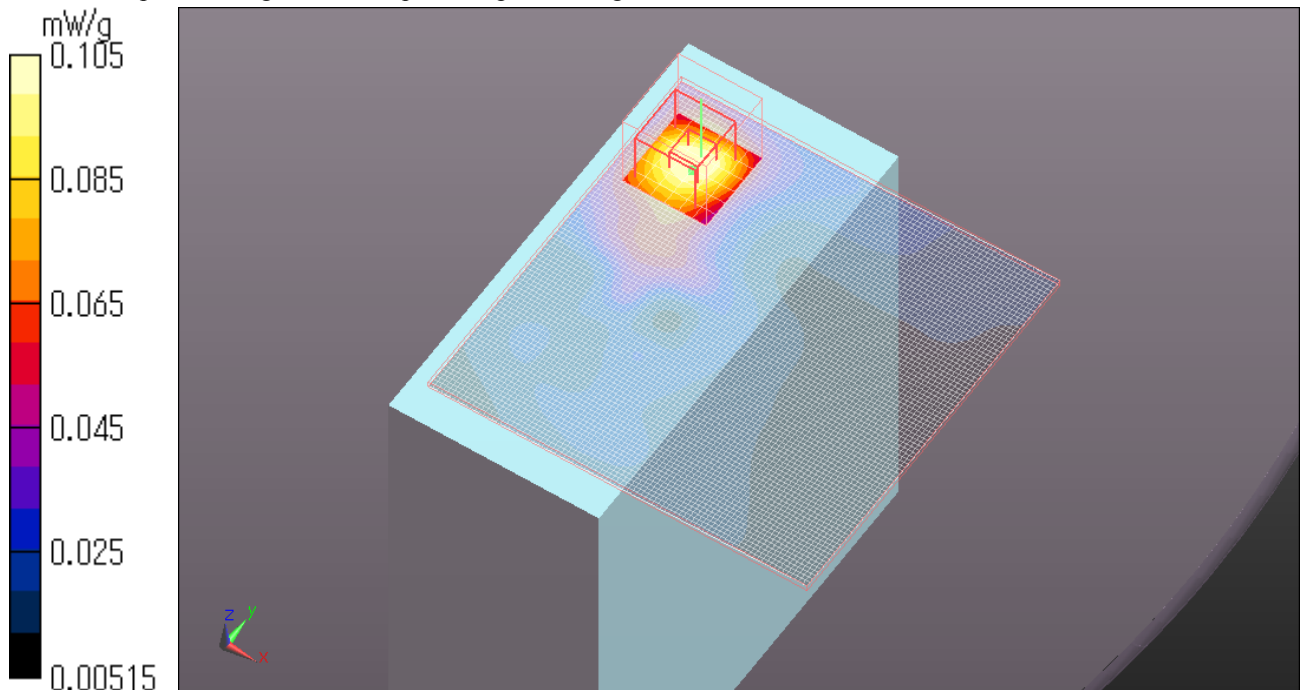
SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.041 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.110 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Bottom 0mm WLAN 11b 1Mbps 2412MHz Ant.0

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.919$ mho/m; $\epsilon_r = 50.478$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (101x121x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.022 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.246 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.032 W/kg

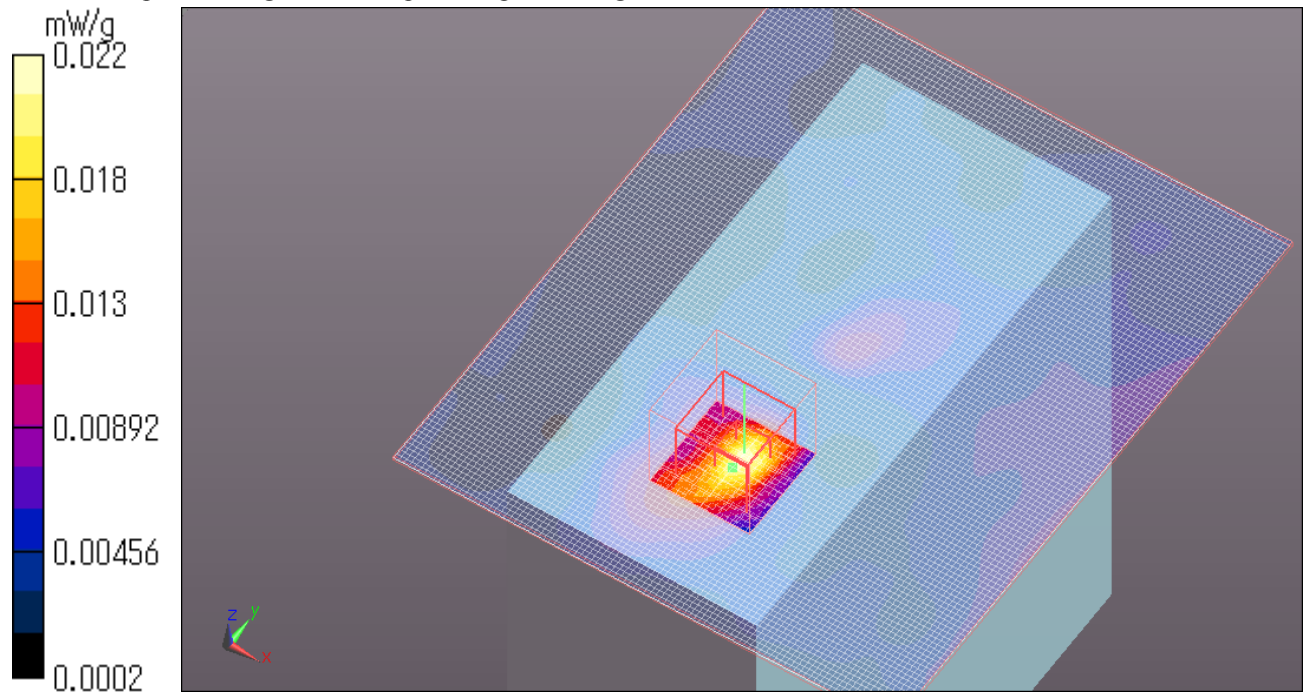
SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00722 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.022 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Front 0mm WLAN 11b 1Mbps 2437MHz Ant.0

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.953$ mho/m; $\epsilon_r = 50.401$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (81x61x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.414 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.165 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 1.912 W/kg

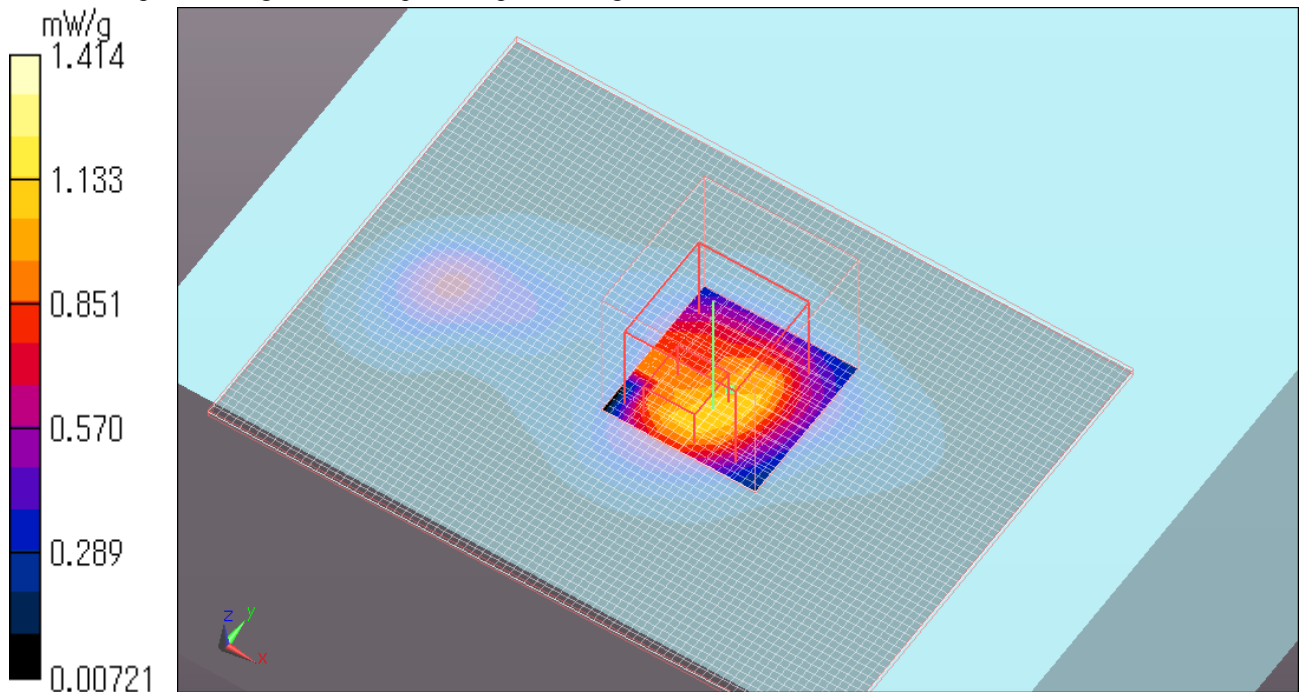
SAR(1 g) = 0.731 mW/g; SAR(10 g) = 0.379 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.103 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Front 0mm WLAN 11b 1Mbps 2462MHz Ant.0

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.985$ mho/m; $\epsilon_r = 50.321$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (81x61x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.250 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.575 V/m; Power Drift = -0.0083 dB

Peak SAR (extrapolated) = 1.457 W/kg

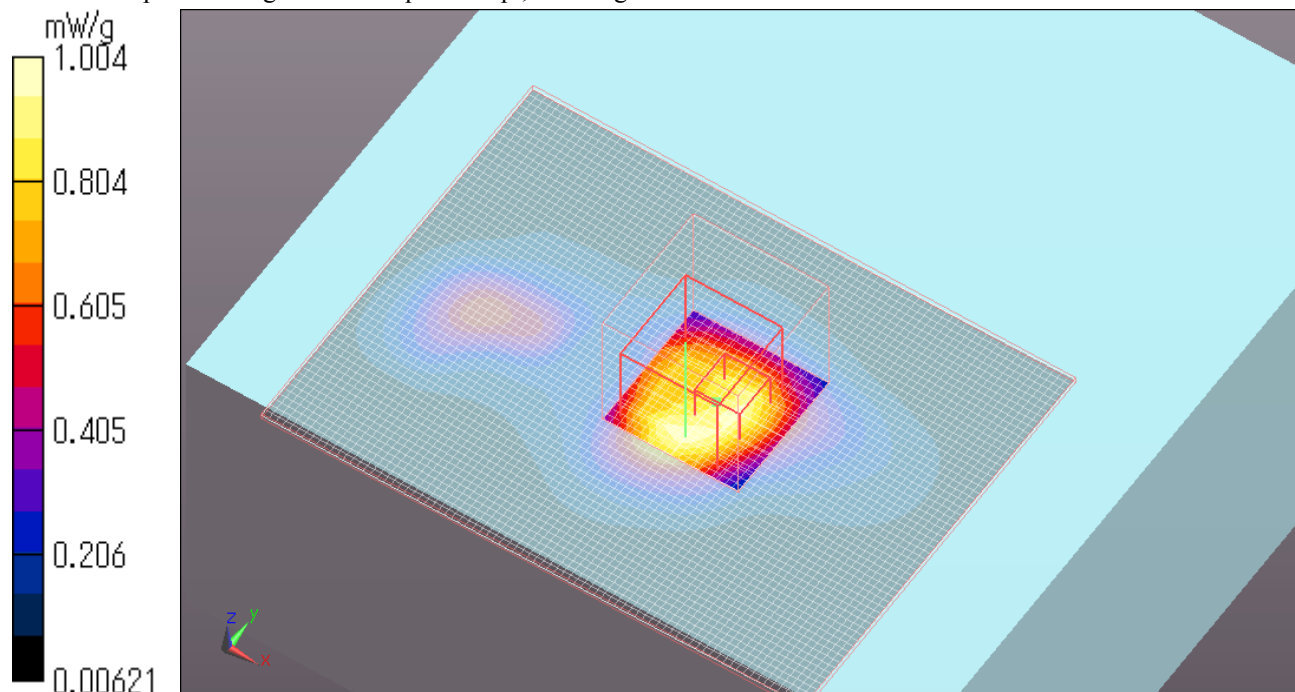
SAR(1 g) = 0.633 mW/g; SAR(10 g) = 0.343 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.004 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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ii) **WLAN Ant.1**

WYSAGBUX7 Front 0mm WLAN 11b 1Mbps 2412MHz Ant.1

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.977$ mho/m; $\epsilon_r = 50.446$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (81x61x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.915 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.793 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 2.179 W/kg

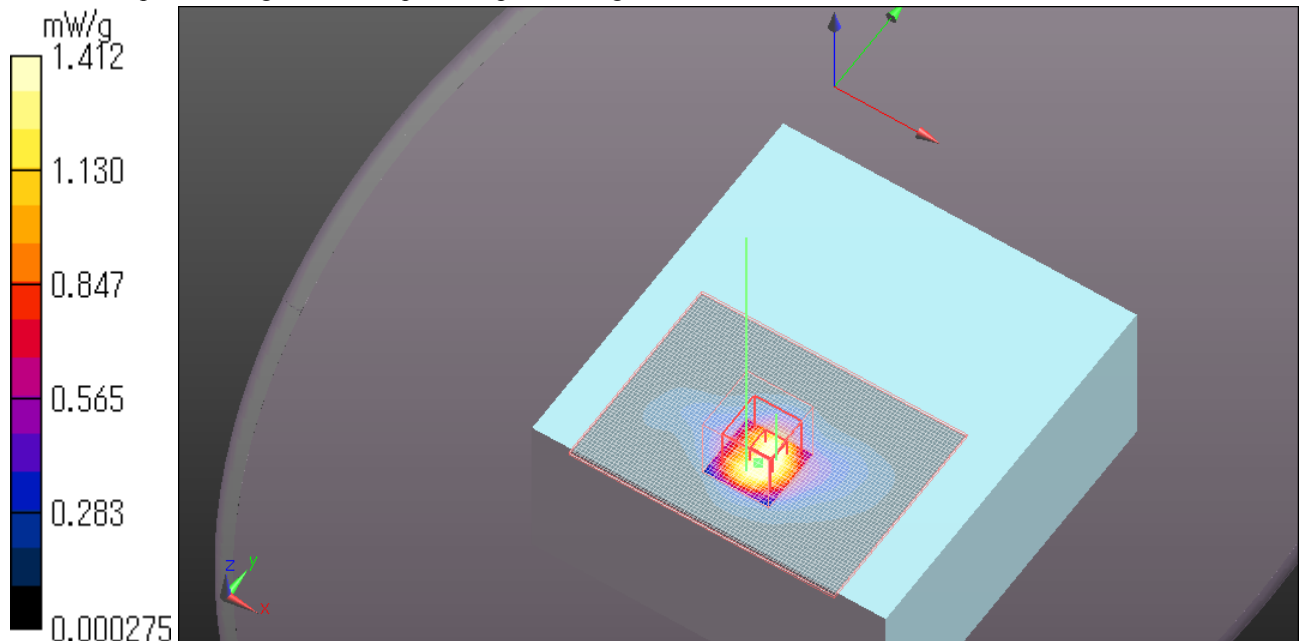
SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.551 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.558 mW/g

Date: 2011/12/06

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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ZScan at Maximum SAR Position

WYSAGBUX7 Front 0mm WLAN 11b 1Mbps 2412MHz Ant.1

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.977$ mho/m; $\epsilon_r = 50.446$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

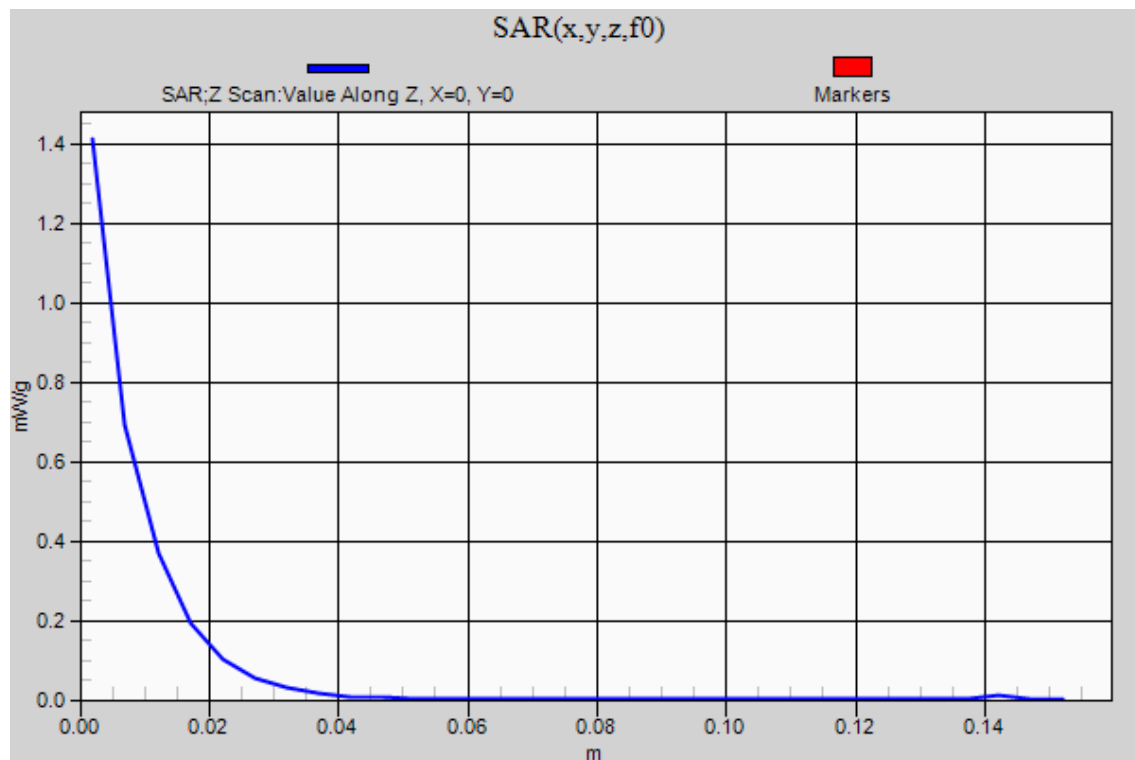
DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.412 mW/g



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WYSAGBUX7 Rear 0mm WLAN 11b 1Mbps 2412MHz Ant.1

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.919$ mho/m; $\epsilon_r = 50.478$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (101x81x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.095 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.513 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.127 W/kg

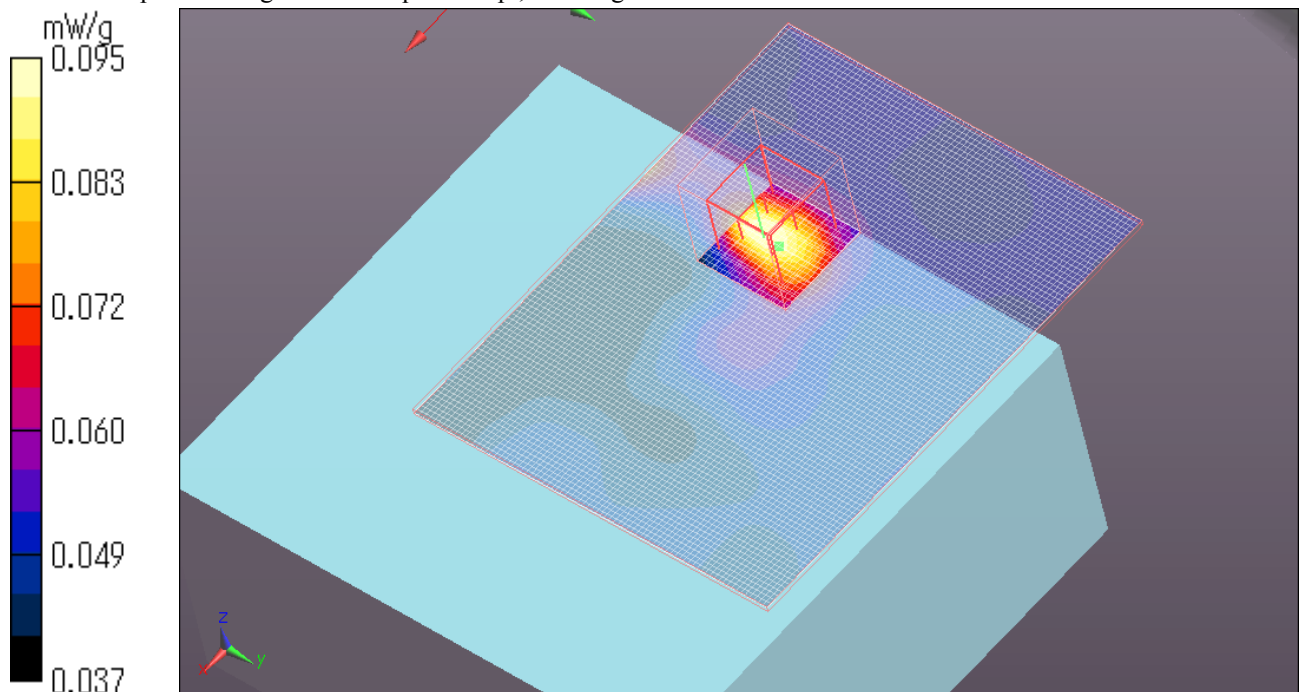
SAR(1 g) = 0.081 mW/g; SAR(10 g) = 0.063 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.100 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Left 0mm WLAN 11b 1Mbps 2412MHz Ant.1

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.919$ mho/m; $\epsilon_r = 50.478$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (91x101x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.020 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.915 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.031 W/kg

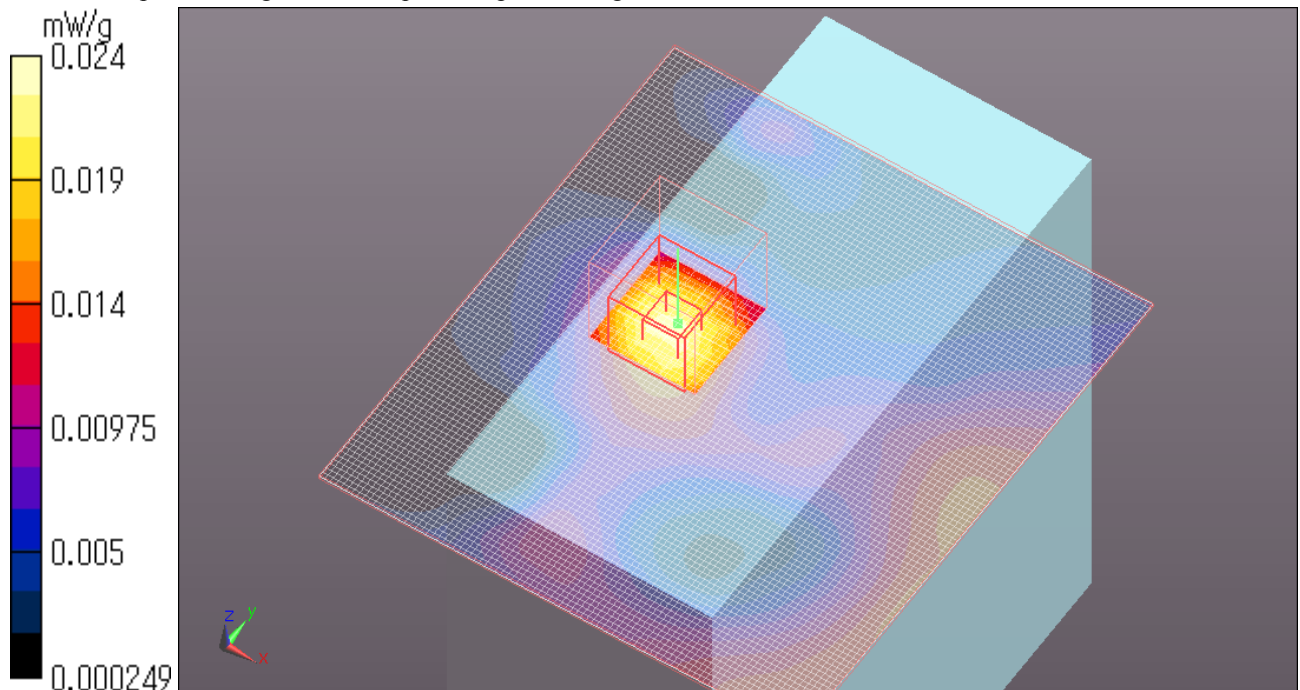
SAR(1 g) = 0.017 mW/g; SAR(10 g) = 0.00991 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.024 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Right 0mm WLAN 11b 1Mbps 2412MHz Ant.1

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.919$ mho/m; $\epsilon_r = 50.478$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (101x101x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.018 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.452 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 0.022 W/kg

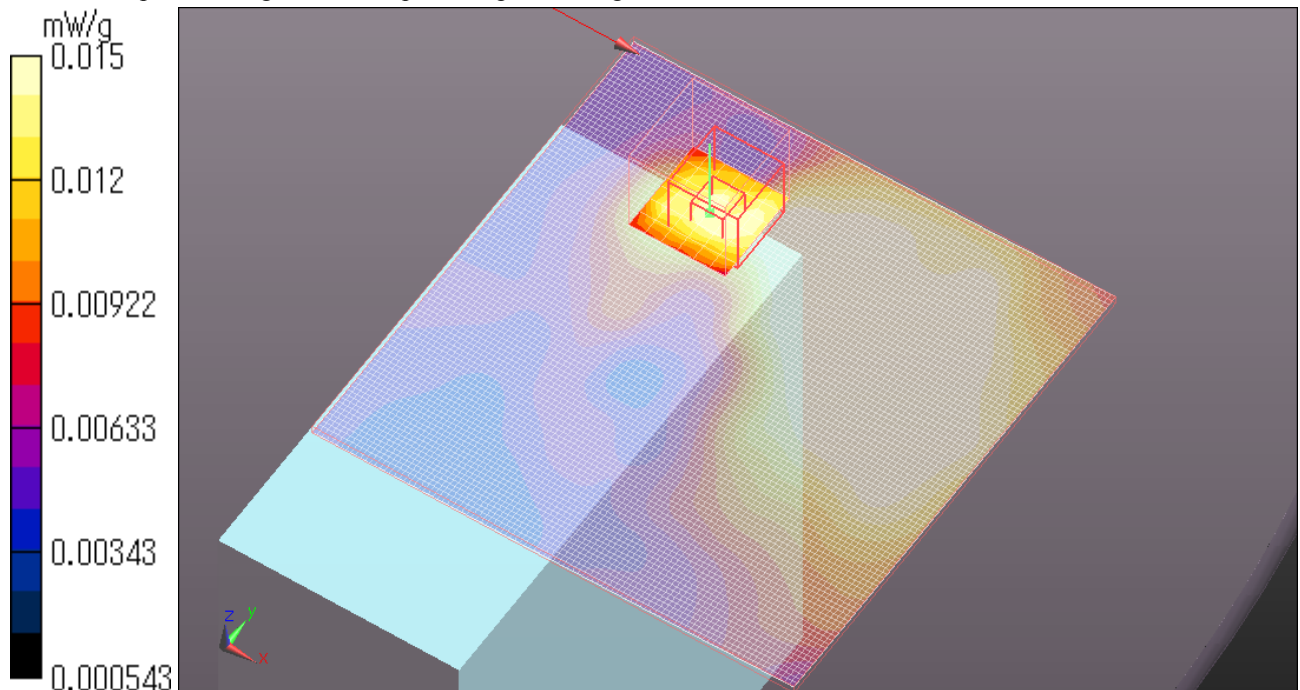
SAR(1 g) = 0.011 mW/g; SAR(10 g) = 0.00627 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.015 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Top 0mm WLAN 11b 1Mbps 2412MHz Ant.1

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz;Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.977$ mho/m; $\epsilon_r = 50.446$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: xxxx
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (91x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.132 mW/g

Flat-Section MSL/Flat 0mm Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.105 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.148 W/kg

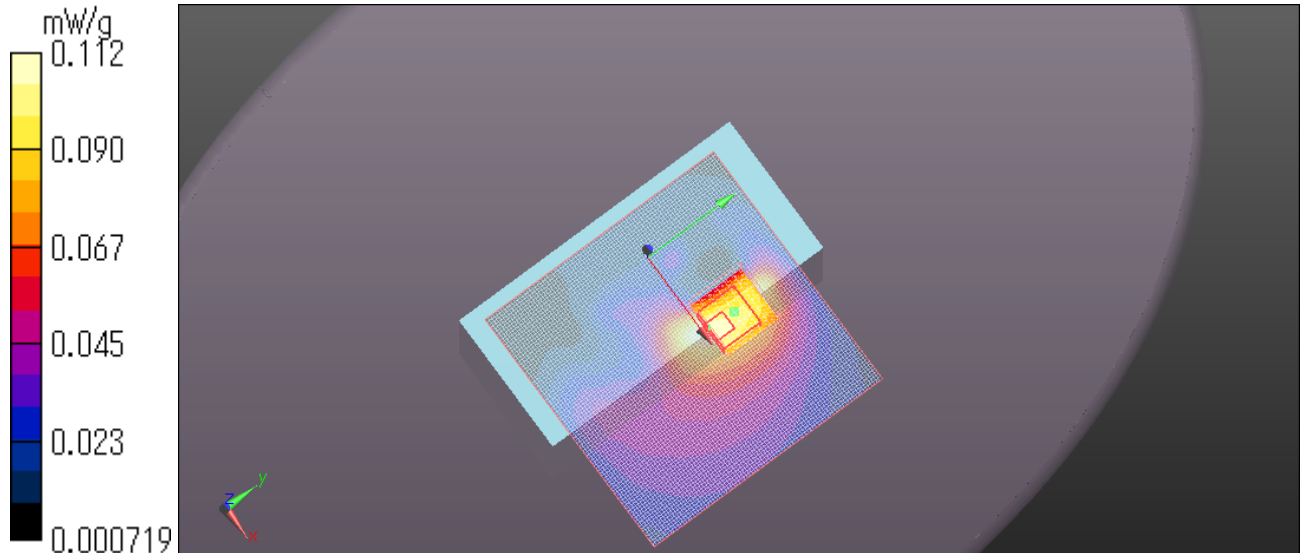
SAR(1 g) = 0.080 mW/g; SAR(10 g) = 0.047 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.112 mW/g

Date: 2011/12/06

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Bottom 0mm WLAN 11b 1Mbps 2412MHz Ant.1

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.919$ mho/m; $\epsilon_r = 50.478$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS5, Version 52.6 (2);

Area Scan (101x121x1): Measurement grid: dx=15mm, dy=15mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.019 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.551 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.029 W/kg

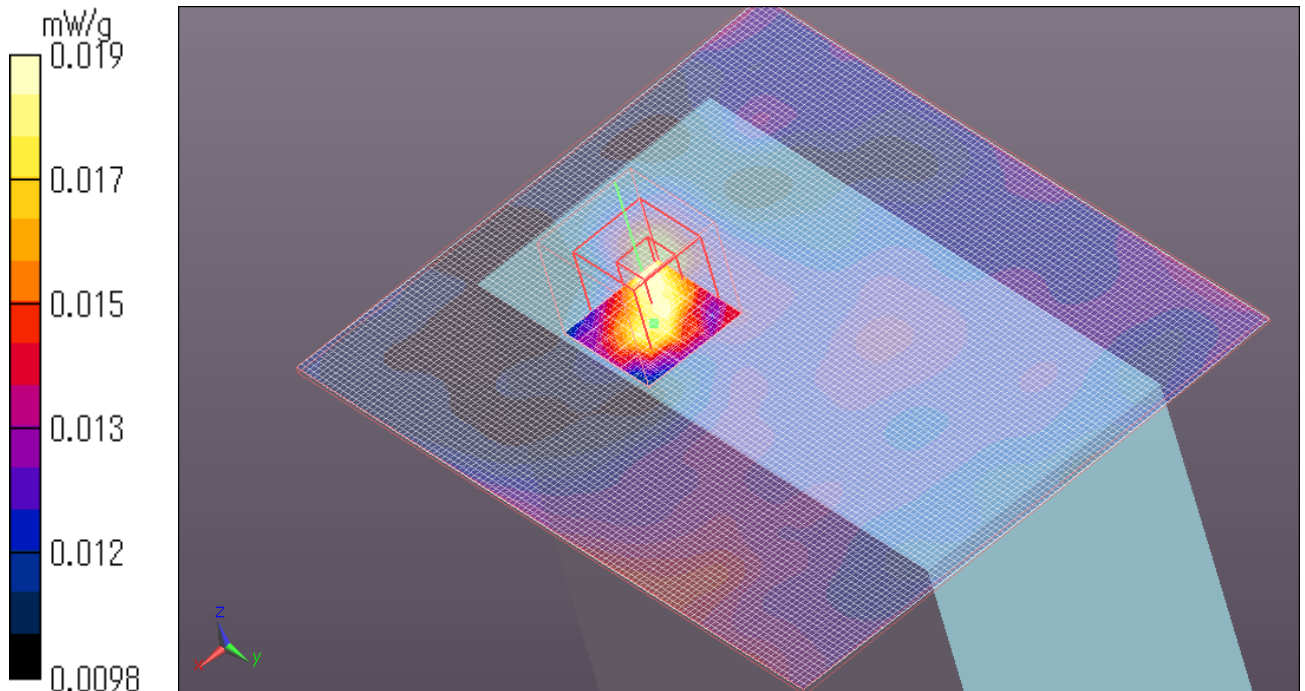
SAR(1 g) = 0.016 mW/g; SAR(10 g) = 0.014 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.019 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Front 0mm WLAN 11b 1Mbps 2437MHz Ant.1

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.996$ mho/m; $\epsilon_r = 50.407$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (81x61x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.558 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.030 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 1.827 W/kg

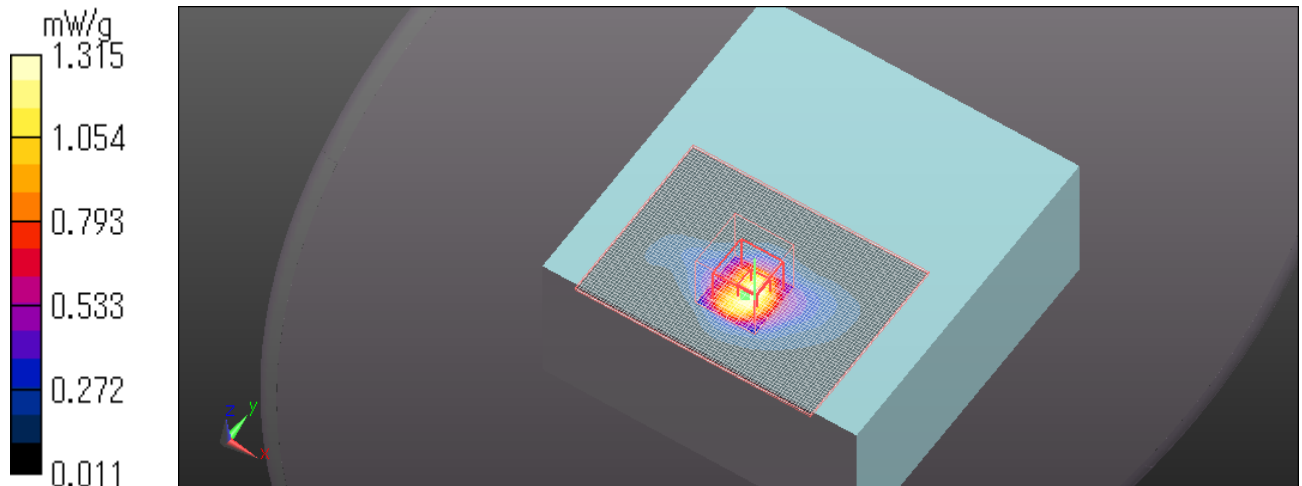
SAR(1 g) = 0.894 mW/g; SAR(10 g) = 0.463 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.315 mW/g

Date: 2011/12/06

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Front 0mm WLAN 11b 1Mbps 2462MHz Ant.1

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 2.02$ mho/m; $\epsilon_r = 50.243$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (81x61x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.272 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.835 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 1.422 W/kg

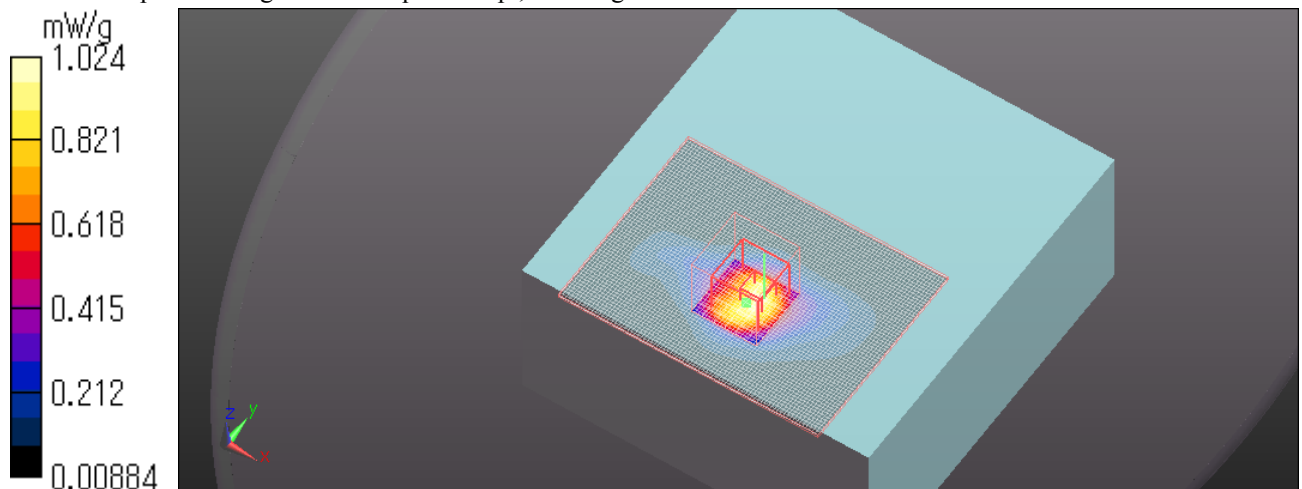
SAR(1 g) = 0.695 mW/g; SAR(10 g) = 0.360 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.024 mW/g

Date: 2011/12/06

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Front 5mm WLAN 11b 1Mbps 2412MHz Ant.1

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.919$ mho/m; $\epsilon_r = 50.478$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (81x61x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.974 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.153 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 1.306 W/kg

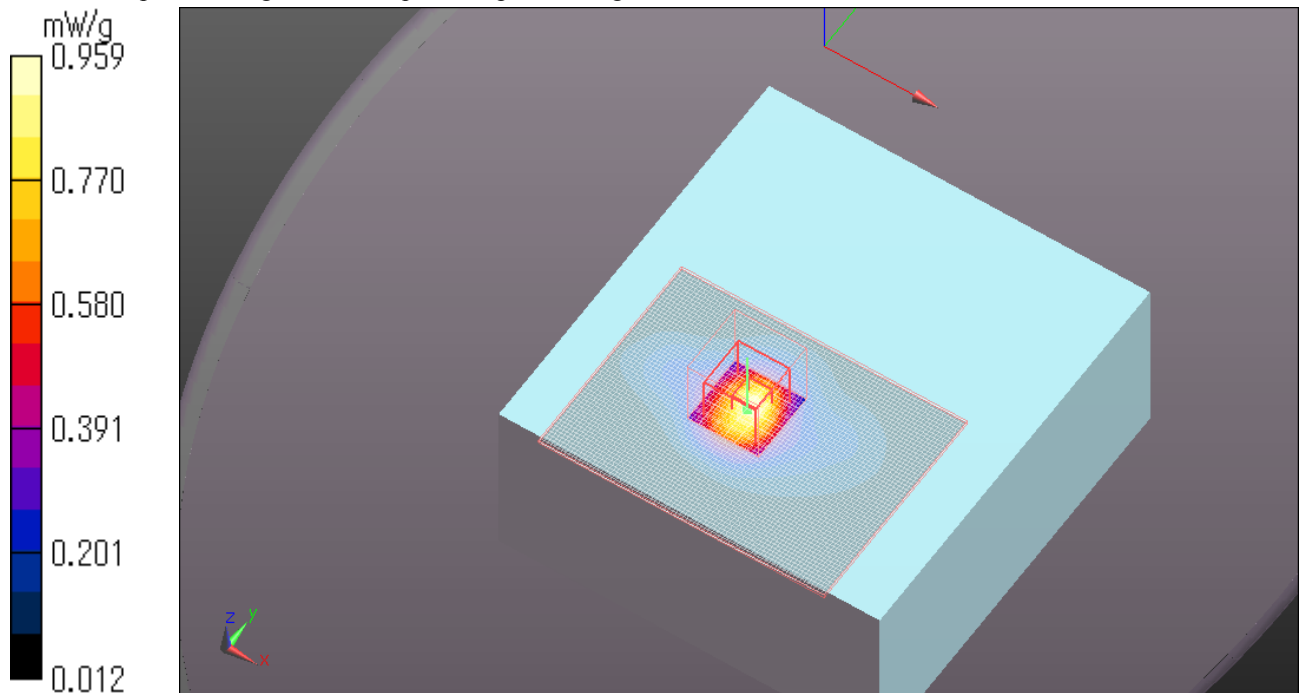
SAR(1 g) = 0.675 mW/g; SAR(10 g) = 0.350 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.959 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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WYSAGBUX7 Front 10mm WLAN 11b 1Mbps 2412MHz Ant.1

Communication System: WLAN 11a/b/g/n ; Communication System Band: WLAN 11b/g/n; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.919$ mho/m; $\epsilon_r = 50.478$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn509; Calibrated: 2011/07/20
- Phantom: ELI 4.0; Type: QDOVA001BA;
- Measurement SW: DASYS2, Version 52.6 (2);

Area Scan (81x61x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.462 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.611 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.667 W/kg

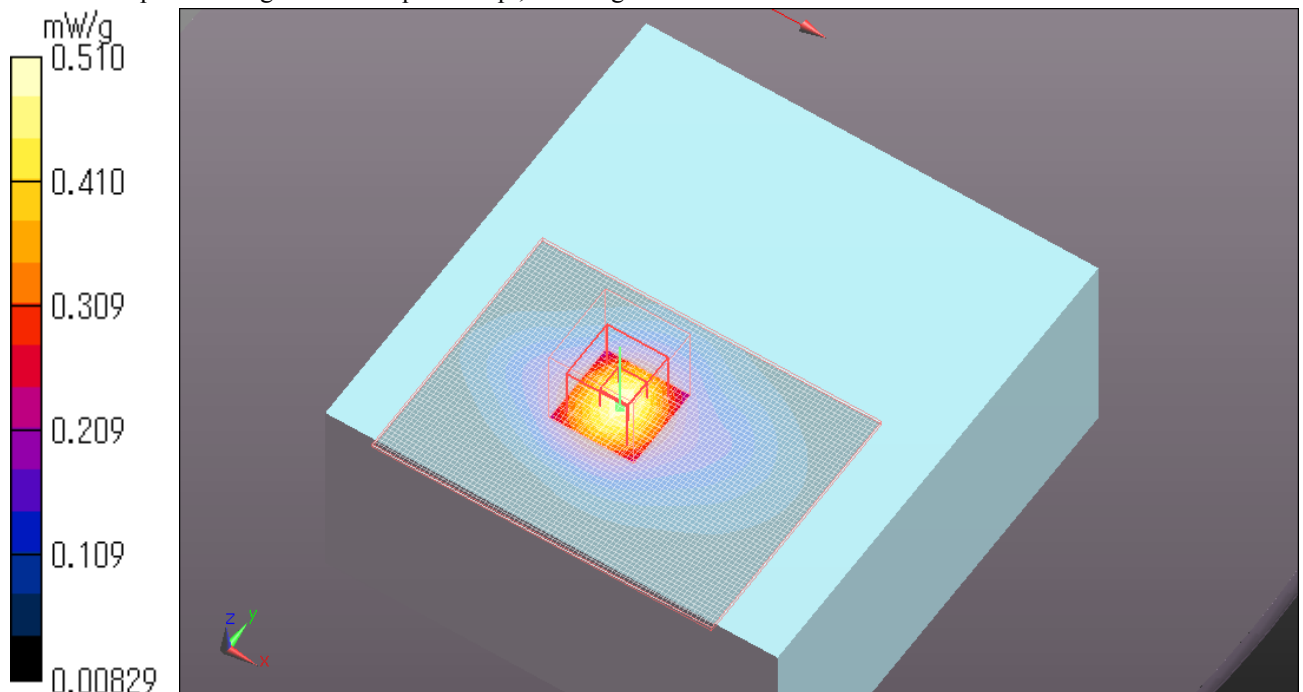
SAR(1 g) = 0.363 mW/g; SAR(10 g) = 0.200 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.510 mW/g

Date: 2011/12/07

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



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