

SAR TEST REPORT

Equipment Under Test	: Intel Centrino Advanced-N6235
Model No.	: 6235ANHMW
Applicant	: Samsung Electronics Co., Ltd.
Address of Applicant	: 416, Maetan-dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, Korea
FCC ID	: A3L6235ANH
IC ID	: 649E-6235ANH
Device Category	: Portable Device
Exposure Category	: General Population / Uncontrolled Exposure
Date of Receipt	: 2012-04-19
Date of Test(s)	: 2012-04-25 ~ 2012-05-08
Date of Issue	: 2012-05-08
Max. SAR	: 1.06 W/kg (WLAN_2.4 GHz), 0.577 W/kg (WLAN_5.2 GHz) 0.477 W/kg (WLAN_5.3 GHz), 1.13 W/kg (WLAN_5.5 GHz) 1.12 W/kg (WLAN_5.8 GHz)

Standards: **FCC OET Bulletin 65 supplement C**
 RSS-102 (Issue 4)
 IEEE 1528, 2003
 ANSI/IEEE C95.1, C95.3
 IEC 62209 : 2006 / IEC 62209-2 : 2010

In the configuration tested, the EUT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
 This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Korea Co., Ltd. (Gunpo Laboratory) or testing done by SGS Korea Co., Ltd. (Gunpo Laboratory) in connection with distribution or use of the product described in this report must be approved by SGS Korea Co., Ltd. (Gunpo Laboratory) in writing.

Tested by	: Fred Jeong		2012-05-08
Approved by	: Charles Kim		2012-05-08

Contents

1. General Information

1.1	Testing Laboratory.....	3
1.2	Details of Applicant.....	3
1.3	Version of Report.....	3
1.4	Description of EUT(s).....	3
1.5	Test Environment.....	4
1.6	Operation description.....	4
1.7	Host PC Information.....	4
1.8	SAR Measurement Procedure.....	5
1.9	The SAR Measurement System.....	5
1.10	System Components.....	7
1.11	SAR System Verification.....	8
1.12	Tissue Simulant Fluid for the Frequency Band.....	10
1.13	Test Standards and Limits.....	11
1.14	Justification for Extended SAR Dipole Calibrations.....	13

2. Instruments List..... 14

3. Summary of Results..... 15

3.1	FCC Power Measurement Procedures.....	15
3.2	RF Conducted Average Power.....	15
3.3	SAR Test Configuration.....	21
3.4	SAR Data Summary.....	23

APPENDIX

A. DASY4 SAR Report

B. Uncertainty Analysis

C. Calibration certificate

1. General Information

1.1 Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, 435-040, Korea
Telephone : +82 +31 428 5700
FAX : +82 +31 427 2371
Homepage : www.kr.sgs.com/ee

1.2 Details of Applicant

Applicant : Samsung Electronics Co., Ltd.
Address : 416, Maetan-dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, Korea
Contact : Mr. John Lee
Email : johnlee@samsung.com
Phone No. : 82-31-277-4784

1.3 Version of Report

Version Number	Date	Revision
00	2012-05-08	Initial issue

1.4 Description of EUT(s)

EUT Type	Intel Centrino Advanced-N6235
Model	6235ANHMW
FCC ID	A3L6235ANH
IC ID	649E-6235ANH
Serial Number	HR5591GC300038T
Mode of Operation	WLAN
Duty Cycle	1(WLAN)
Body worn Accessory	None
Tx Frequency Range	2412 MHz~ 2462 MHz (WLAN_11b/g/n) 5180 MHz ~ 5240 MHz, 5260 MHz ~ 5320 MHz (WLAN_11a/n) 5500 MHz ~ 5700 MHz, 5745 MHz ~ 5825 MHz (WLAN_11a/n)
Conducted Max Power	16.98 dB m (WLAN_2.4 GHz), 16.39 dB m (WLAN_5.2 GHz) 16.56 dB m (WLAN_5.3 GHz), 16.71 dB m (WLAN_5.5 GHz) 16.44 dB m (WLAN_5.8 GHz)

1.5 Test Environment

Ambient temperature	: $(22 \pm 2) ^\circ \text{C}$
Tissue Simulating Liquid	: $(22 \pm 2) ^\circ \text{C}$
Relative Humidity	: $(55 \pm 5) \% \text{ R.H.}$

1.6 Operation Configuration

The client provided a special driver and test program which can control the frequency and power of the WLAN. Measurements were performed at the lowest, middle and highest channels of the operating band. The EUT was set to maximum power level during all tests and at the beginning of each test the battery was fully charged. The DASY4 system measures power drift during SAR testing by comparing e-field in the same location at the beginning and at the end of measurement.

1.7 Host PC Information

Model Name	NP900X4C, NP900X4D
Serial No.	HR5591GC300038T
Manufacturer	Samsung Electronics Co., Ltd.

1.8 SAR Measurement Procedures

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures 7x7x9 (above 4.5 GHz) or 5x5x7 (below 3 GHz) points within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation, the extrapolated distance should not be larger than the step size in Z-direction.

1.9 The SAR Measurement System

A photograph of the SAR measurement System is given in Fig. a. This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (Speag Dasy 4 professional system). A Model ET3DV6

1782/Ex3DV4 3791 E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|E|^2) / \rho$ where σ and ρ are the conductivity and mass density of the tissue-simulant. The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimeter probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

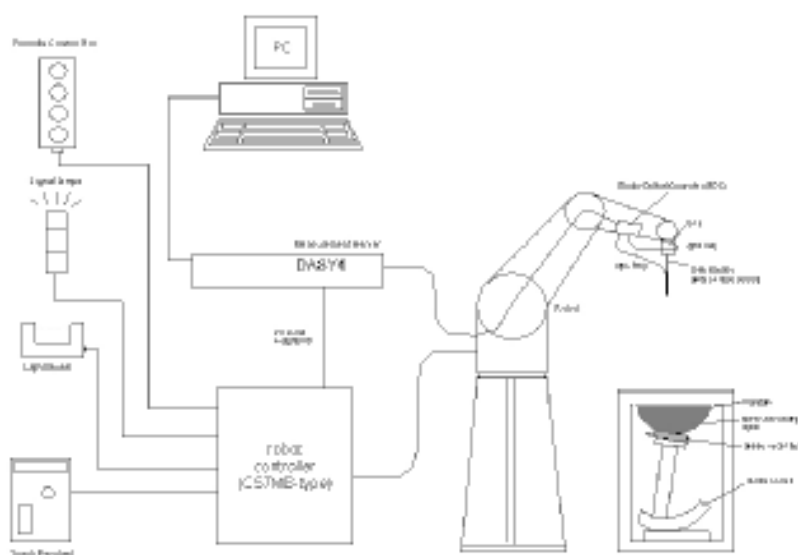


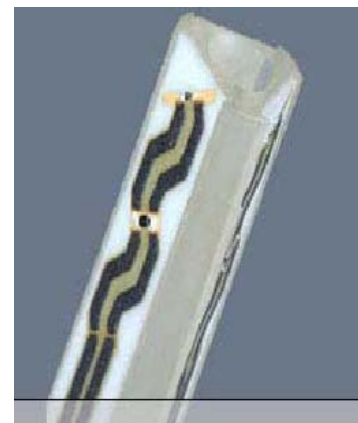
Fig a. The microwave circuit arrangement used for SAR system verification

- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing body usage.
- The device holder for flat phantom.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.

1.10 System Components

ET3DV6 E-Field Probe

Construction	: Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g. glycol).
Calibration	: In air from 10 MHz to 2.5 GHz In brain simulating tissue (accuracy $\pm 8\%$)
Frequency	: 10 MHz to >6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity	: ± 0.2 dB in brain tissue (rotation around probe axis) ± 0.4 dB in brain tissue (rotation normal to probe axis)
Dynamic Range	: 5 $\mu\text{W/g}$ to >100 mW/g; Linearity: ± 0.2 dB
Srfce. Detect	: ± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions	: Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application	: General dosimetry up to 3 GHz Compliance tests of mobile phone



ET3DV6 E-Field Probe

EX3DV4 E-Field Probe

Construction	: Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	: Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 2600 and HSL5800. Additional CF-Calibration for other liquids and frequencies upon request.
Frequency	: 10 MHz to 6 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	: ± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	: 10 $\mu\text{W/g}$ to > 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 $\mu\text{W/g}$)
Dimensions	: Overall length: 337 mm (Tip length: 20 mm) Tip diameter: 2.5 mm (Body diameter: 12 mm) Distance from probe tip to dipole centers: 1 mm
Application	: High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%



EX3DV4 E-Field Probe

NOTE:

1. The Probe parameters have been calibrated by the SPEAG. Please reference "APPENDIX D" for the Calibration Certification Report.

SAM Phantom

Construction:

The SAM Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90 % of all users. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot

Shell Thickness: 2.0 mm $\pm$ 0.1 mm

Filling Volume: Approx. 25 liters



SAM Phantom

DEVICE HOLDER

Construction

In combination with the Twin SAM PhantomV4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).



Device Holder

1.11 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within ± 10 % from the target SAR values. These tests were done at 2450 MHz, 5200 MHz, 5500 MHz and 5800 MHz. The tests for EUT were conducted within 24 hours after each validation. The obtained results from the system accuracy verification are displayed in the table 1. During the tests, the ambient temperature of the laboratory was in the range $(22 \pm 2)^\circ\text{C}$, the relative humidity was in the range $(55 \pm 5) \%$ R.H. and the liquid depth above the ear reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

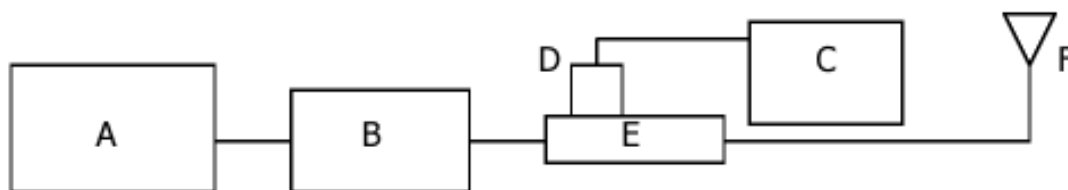


Fig b. The microwave circuit arrangement used for SAR system verification

- A. Agilent Model E4421B Signal Generator
- B. EMPOWER Model (2001-BBS3Q7ECK), (2057-BBS3Q5KCK) Amplifier
- C. Agilent Model E4419B Power Meter
- D. Agilent Model 9300H Power Sensor
- E. Agilent Model 778D/86205A Dual directional coupler
- F. Reference dipole Antenna



Photo of the dipole Antenna

System Validation Results

Validation Kit	Tissue	Target SAR 1 g from Calibration Certificate (1 W)	Measured SAR 1 g (0.1 W)	Measured SAR 1 g (1 W)	Deviation (%)	Date	Liquid Temp. (°C)
D2450V2 S/N: 734	2450 MHz Body	53.5 W/kg	5.50 W/kg	55.0 W/kg	2.80	2012-05-08	21.9
D5 GHz V2 S/N: 1023	5200 MHz Body	77.5 W/kg	8.22 W/kg	82.2 W/kg	6.06	2012-05-05	22.1
D5 GHz V2 S/N: 1106	5500 MHz Body	82.3 W/kg	8.11 W/kg	81.1 W/kg	-1.46	2012-04-27	22.1
D5 GHz V2 S/N: 1106	5800 MHz Body	73.8 W/kg	7.57 W/kg	75.7 W/kg	2.57	2012-04-25	22.0

Table 1. Results system validation

1.12 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this simulant fluid were measured by using the Agilent Model 85070B Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with Agilent E5071B Network Analyzer (300 kHz - 6 GHz) by using a procedure detailed in Section V.

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters			
			Permittivity	Conductivity	Simulated Tissue Temp(℃)	
2450	Body	Measured, 2012-05-07	52.3	1.93	21.9	
		Recommended Limits	52.7	1.95	21.0 ~ 23.0	
		Deviation(%)	-0.76	-1.03	-	
2412		Measured, 2012-05-07	52.3	1.89	21.9	
		Deviation(%)	-0.76	-3.08	-	
2462		Measured, 2012-05-07	52.3	1.95	21.9	
		Deviation(%)	-0.76	0.00	-	
5200		Body	Measured, 2012-05-03	48.6	5.21	22.1
			Recommended Limits	49.0	5.30	21.0 ~ 23.0
			Deviation(%)	-0.82	-1.70	-
5180	Measured, 2012-05-03		48.6	5.18	22.1	
	Deviation(%)		-0.82	-2.26	-	
5300	Measured, 2012-05-03		48.5	5.32	22.1	
	Deviation(%)		-1.03	0.35	-	
5500	Body		Measured, 2012-05-01	48.4	5.52	22.1
			Recommended Limits	48.6	5.65	21.0 ~ 23.0
			Deviation(%)	-0.41	-2.30	-
5520		Measured, 2012-05-01	48.3	5.54	22.1	
		Deviation(%)	-0.62	-2.43	-	
5580	Body	Measured, 2012-05-01	48.2	5.63	22.1	
		Recommended Limits	48.5	5.77	21.0 ~ 23.0	
		Deviation(%)	-0.62	-2.89	-	
5660	Body	Measured, 2012-05-01	48.0	5.71	22.1	
		Recommended Limits	48.3	5.88	21.0 ~ 23.0	
		Deviation(%)	-0.62	-2.38	-	
5680		Measured, 2012-05-01	48.0	5.74	22.1	
		Deviation(%)	-0.62	-2.38	-	
5700		Measured, 2012-05-01	48.0	5.77	22.1	
		Deviation(%)	-0.62	-1.87	-	
5800	Body	Measured, 2012-04-02	47.7	5.98	22.0	
		Recommended Limits	48.2	6.00	21.0 ~ 23.0	
		Deviation(%)	-1.04	-0.33	-	
5745		Measured, 2012-05-02	48.0	5.83	22.0	
		Deviation(%)	-0.41	-2.83	-	
5825		Measured, 2012-05-02	47.7	5.99	22.0	
		Deviation(%)	-1.04	-0.17	-	

The composition of the tissue simulating liquid

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Diethylenglycol monohexylether	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Simulating Liquids for 5 GHz, Manufactured by SPEAG

Water	Mineral oil	Emulsifiers	Additives and Salt
78	11	9	2

Salt: 99 +% Pure Sodium Chloride

Sugar: 98 +% Pure Sucrose

Water: De-ionized, 16 MΩ⁺ resistivity

HEC: Hydroxyethyl Cellulose

DGBE: 99 +% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

1.13 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (“SAR”) in Section 4.2 of “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz,” ANSI/IEEE C95.3–2003, Copyright 2003 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in “Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields,” NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter. Measurements and calculations to

demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

(1) Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over an 10 grams of tissue (defined as a tissue volume in the shape of a cube). Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.(Table .1)

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Partial Peak SAR (Partial)	1.60 m W/g	8.00 m W/g
Partial Average SAR (Whole Body)	0.08 m W/g	0.40 m W/g
Partial Peak SAR (Hands/Feet/Ankle/Wrist)	4.00 m W/g	20.00 m W/g

Table .1 RF exposure limits

1.14 Justification for Extended SAR Dipole Calibrations

Usage of SAR dipoles calibrated less than 2 years ago but more than 1 year ago were confirmed in maintaining return loss (< -20 dB, within 20 % of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB publication 450824:

D2450V2_Body (SN : 734)				
Measurement Date	Return Loss (dB)	$\Delta\%$	Impedence (Ω)	$\Delta\Omega$
2010-05-27	-27.1	-	49.8	-
2011-06-07	-26.2	-3.32	48.3	-3.01

2. Instruments List

Maunfacturer	Device	Type	Serial Number	Due date of Calibration
Stäubli	Robot	RX90BL	F03/5W05A1/A/01	N/A
Schmid& Partner Engineering AG	Dosimetric E-Field Probe	ET3DV6	1782	April 27, 2013
Schmid& Partner Engineering AG	Dosimetric E-Field Probe	EX3DV4	3791	June 21, 2012
Schmid& Partner Engineering AG	2450 Mhz System Validation Dipole	D2450V2	734	May 27, 2012
Schmid& Partner Engineering AG	5000 Mhz System Validation Dipole	D5 GHz V2	1106	June 21, 2013
Schmid& Partner Engineering AG	Data acquisition Electronics	DAE3	567	January 20, 2013
Schmid& Partner Engineering AG	Software	DASY 4 V4.7	-	N/A
Schmid& Partner Engineering AG	Phantom	SAM Phantom V4.0	TP-1645 TP-1300	N/A
Agilent	Network Analyzer	E5071C	MY46111535	July 5, 2012
Agilent	Dielectric Probe Kit	85070D	2184	N/A
Agilent	Power Meter	E4419B	GB43311125	July 05, 2012
Agilent	Power Sensor	E9300H	MY41495314	September 29, 2012
			MY41495307	September 29, 2012
Agilent	Signal Generator	E4421B	MY42082477	March 29, 2013
Empower RF Systems	Power Amplifier	2001-BBS3Q7ECK	1032 D/C 0336	March 31, 2013
Empower RF Systems	Power Amplifier	2092-BBS5K8CAJ	1010	September 06, 2012
Agilent	Directional RF Bridges	86205A	MY31402302	July 12, 2012
Microlab	LP Filter	LA-30N	N/A	September 29, 2012
Microlab	LP Filter	LA-60N	N/A	September 29, 2012
Agilent	Attenuator	8491B	50566	September 29, 2012
R & S	Spectrum Analyzer	FSV30	100768	March 29, 2013

3. Summary of Results

3.1 FCC Power Measurement Procedures

Power measurements were performed using a power meter under digital average mode.

In order to verify that the device was tested and maintained at full power, this was configured with the base station simulator. The SAR measurement Software calculates a reference point at the start and end of the test to check for power drifts. If conducted power deviations of more than 5 % occurred, the tests were repeated.

3.2 RF Conducted Average Power

WLAN

2.4 GHz

Mode	Freq. (MHz)	Ch. #	Rate	Measured Power [dB m]	
				Main	AUX
802.11b	2412	1	1	16.75	16.68
	2437	6	1	16.92	15.39
	2462	11	1	16.98	16.38
802.11g	2412	1	6	14.04	13.82
	2437	6	6	16.31	16.41
	2462	11	6	14.18	13.87
802.11n HT20	2412	1	HT0	13.16	12.56
	2437	6	HT0	16.22	16.37
	2462	11	HT0	12.66	12.74
802.11n HT40	2422	3	HT7	10.93	9.19
	2437	6	HT7	13.37	12.45
	2452	9	HT7	10.08	10.03
802.11n HT20_MIMO	2412	1	HT8	11.48	11.26
	2437	6	HT8	13.04	12.90
	2462	11	HT8	11.23	10.21
802.11n HT40_MIMO	2422	3	HT8	7.12	6.43
	2437	6	HT8	12.45	12.48
	2452	9	HT8	6.30	6.41

Note:

1. The modes with highest output power channel were chosen for the conducted output power.
2. Original target power is from EMC report R84672. Please refer to original report (FCC ID:PD96235ANH) for Average Power information as documented in 10/11/2011 original filing.

5.2 GHz

Mode	Freq. (MHz)	Ch. #	Rate	Measured Power [dB m]	
				Main	AUX
802.11a	5180	36	6	16.16	16.25
	5200	40	6	16.39	16.09
	5220	44	6	16.05	15.72
	5240	48	6	15.96	15.60
802.11n HT20	5180	36	HT0	16.18	16.17
	5200	40	HT0	16.32	16.11
	5220	44	HT0	16.16	16.04
	5240	48	HT0	16.25	15.95
802.11n HT40	5190	38	HT7	12.62	12.34
	5230	46	HT7	16.29	15.71
802.11n HT20_MIMO	5180	36	HT8	13.42	13.15
	5200	40	HT8	12.26	12.97
	5220	44	HT8	12.67	13.04
	5240	48	HT8	13.19	12.84
802.11n HT40_MIMO	5190	38	HT8	9.78	10.89
	5230	46	HT8	13.13	13.16

Note:

1. The modes with highest output power channel were chosen for the conducted output power.
2. Original target power is from EMC report R84672. Please refer to original report (FCC ID:PD96235ANH) for Average Power information as documented in 10/11/2011 original filing.

5.3 GHz

Mode	Freq. (MHz)	Ch. #	Rate	Measured Power [dB m]	
				Main	AUX
802.11a	5260	52	6	16.03	15.42
	5280	56	6	15.92	15.40
	5300	60	6	16.56	15.55
	5320	64	6	16.24	15.78
802.11n HT20	5260	52	HT0	16.26	15.35
	5280	56	HT0	16.18	15.28
	5300	60	HT0	16.20	15.43
	5320	64	HT0	16.24	15.65
802.11n HT40	5270	54	HT7	15.75	15.03
	5310	62	HT7	11.52	12.44
802.11n HT20_MIMO	5260	52	HT8	13.03	12.75
	5280	56	HT8	12.87	12.62
	5300	60	HT8	13.01	12.58
	5320	64	HT8	13.19	13.26
802.11n HT40_MIMO	5270	54	HT8	12.37	12.19
	5310	62	HT8	12.20	12.03

Note :

1. The modes with highest output power channel were chosen for the conducted output power.
2. Original target power is from EMC report R84672. Please refer to original report (FCC ID:PD96235ANH) for Average Power information as documented in 10/11/2011 original filing.

5.5 GHz

Mode	Freq. (MHz)	Ch. #	Rate	Measured Power [dB m]	
				Main	AUX
802.11a	5500	100	6	16.11	15.30
	5520	104	6	<u>16.42</u>	<u>15.38</u>
	5540	108	6	16.38	15.32
	5560	112	6	16.30	15.35
	5580	116	6	<u>16.32</u>	<u>15.45</u>
	5660	132	6	16.62	15.86
	5680	136	6	<u>16.71</u>	<u>15.98</u>
	5700	140	6	16.41	15.80
802.11n HT20	5500	100	HT0	16.19	15.30
	5520	104	HT0	16.05	15.62
	5540	108	HT0	16.06	15.95
	5560	112	HT0	16.12	15.92
	5580	116	HT0	16.24	15.78
	5660	132	HT0	16.25	15.66
	5680	136	HT0	16.31	15.77
	5700	140	HT0	16.24	15.63
802.11n HT40	5510	102	HT7	15.28	14.67
	5550	110	HT7	16.21	15.81
	5590	118	HT7	16.18	15.69
	5670	134	HT7	16.28	15.36
802.11n HT20_MIMO	5500	100	HT8	12.83	12.85
	5520	104	HT8	12.91	13.01
	5540	108	HT8	12.78	12.92
	5560	112	HT8	12.93	12.99
	5580	116	HT8	12.98	13.10
	5660	132	HT8	12.91	12.91
	5680	136	HT8	12.78	12.55
	5700	140	HT8	12.63	12.31

Mode	Freq. (MHz)	Ch. #	Rate	Measured Power [dB m]	
				Main	AUX
802.11n HT40_MIMO	5510	102	HT8	<u>12.94</u>	<u>13.02</u>
	5550	110	HT8	<u>13.14</u>	<u>13.11</u>
	5590	118	HT8	12.90	12.94
	5670	134	HT8	<u>12.86</u>	<u>12.99</u>

Note :

1. The modes with highest output power channel were chosen for the conducted output power.
2. Original target power is from EMC report R84672. Please refer to original report (FCC ID:PD96235ANH) for Average Power information as documented in 10/11/2011 original filing.

5.8 GHz

Mode	Freq. (MHz)	Ch. #	Rate	Measured Power [dB m]	
				Main	AUX
802.11a	5745	149	6	16.13	16.22
	5765	153	6	<u>16.17</u>	<u>16.26</u>
	5785	157	6	<u>16.24</u>	<u>16.31</u>
	5805	161	6	16.12	16.23
	5825	165	6	<u>16.28</u>	<u>16.44</u>
802.11n HT20	5745	149	HT0	16.18	16.24
	5765	153	HT0	16.23	16.34
	5785	157	HT0	16.21	16.22
	5805	161	HT0	16.18	16.29
	5825	165	HT0	16.14	16.26
802.11n HT40	5755	151	HT7	16.12	16.23
	5795	159	HT7	16.09	16.37
11n_20 MIMO	5745	149	HT8	13.17	13.09
	5765	153	HT8	13.26	13.26
	5785	157	HT8	13.21	13.2
	5805	161	HT8	13.15	13.34
	5825	165	HT8	<u>13.38</u>	<u>13.42</u>
11n_40 MIMO	5755	151	HT8	13.23	13.18
	5795	159	HT8	13.07	13.07

Note :

1. The modes with highest output power channel were chosen for the conducted output power.
2. Original target power is from EMC report R84672. Please refer to original report (FCC ID:PD96235ANH) for Average Power information as documented in 10/11/2011 original filing.

3.3 SAR Test Configuration

Notebook Testing for SAR

Devices are to be setup according to KDB 447498 requirements and are configured with maximum output power during SAR assessment for a worst-case SAR evaluation.

SAR Testing for Notebook per KDB 447498 & KDB 616217

Per KDB 447498 4) a), the Base is required to be tested touching the flat phantom.

SAR is required for each antenna located within 5 cm of the edge closest to the user for the applicable display orientation. For antenna(s) located ≥ 5 cm from this edge, the test reduction and exclusion procedures for laptop computers in KDB 616217 are applied.

IEEE 802.11 Transmitters

802.11 a/b/g and 4.9 GHz operating modes are tested independently according to the service requirements in each frequency band. 802.11 b/g modes are tested on channel 1, 6, and 11. 802.11a is tested for UNII operations on channels 36 and 48 in the 5.15 ~ 5.25 GHz band, channels 52 and 64 in the 5.25 ~ 5.35 GHz band, channels 104, 116, 124 and 136 in the 5.470 ~ 5.725 GHz band, and channels 149 and 161 in the 5.8 GHz band. When 5.8 GHz §15.247 is also available, channels 149, 157 and 165 should be tested instead of the UNII channels. 802.11g mode was evaluated only if the output power was 0.25 dB higher than the 802.11b mode.

Mode	GHz	Channel	Turbo Channel	“Default Test Channels”			
				§15.247		UNII	
				802.11b	802.11g		
802.11 b/g	2.412	1 [#]		✓	▽		
	2.437	6	6	✓	▽		
	2.462	11 [#]		✓	▽		
802.11a	5.18	36	42 (5.21 GHz)			✓	
	5.20	40					*
	5.22	44					*
	5.24	48	50 (5.25 GHz)			✓	
	5.26	52					
	5.28	56	58 (5.29 GHz)				*
	5.30	60					*
	5.32	64				✓	
	5.500	100	Unknown				*
	5.520	104				✓	
	5.540	108					*
	5.560	112					*
	5.580	116				✓	
	5.600	120					*
	5.620	124				✓	
	5.640	128					*
	5.660	132					*
	5.680	136				✓	
UNII or §15.247	5.700	140					*
	5.745	149		✓		✓	
	5.765	153	152 (5.76 GHz)		*		*
	5.785	157		✓			*
	5.805	161	160 (5.80 GHz)		*	✓	
§15.247	5.825	165		✓			

- ✓ = “default test channels”
- * = possible 802.11 a channels with maximum average output > the “default test channels”
- ▽ = possible 802.11 g channels with maximum average output ¼ dB ≥ the “default test channels”
- # = when output power is reduced for channel 1 and/or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested

According to KDB 616217, the WWAN and WLAN antenna are required to be tested for SAR as below.

Mode	Front Screen	Back Screen	Left Screen	Right Screen	Top Screen	Base
WLAN	X	O	X	X	X	O

<The Distance information of Antenna to Edges of EUT>



3.4 SAR Data Summary

2.4 GHz Body Test

Ambient Temperature (°C)	22.4
Liquid Temperature (°C)	21.9
Date	2012-05-08

Mode	Freq. (MHz)	Ch. #	Rate	Position	Measured Power [dB m]		SAR 1g (W/kg)	
					Main	AUX	Main	AUX
802.11b	2412	1	1	Base	16.75	16.68	0.882	0.829
	2437	6	1		16.92	15.39	1.01	0.571
	2462	11	1		16.98	16.38	1.06	0.662
	2462	11	1	Back Screen	16.98		0.010	Note:8
	2412	1	1			16.68	Note:8	0.016
802.11n HT20 MIMO	2437	6	HT8	Base	13.04	12.90	0.481	
802.11n HT20 MIMO	2437	6	HT8	Back Screen	13.04	12.90	0.012	

<Note>

- The test data reported are the worst-case SAR value with the position set in a typical configuration.
- All modes of operation were investigated, and worst-case results are reported.
- Liquid tissue depth was at least 15 cm.
- The distance from EUT to flat phantom for testing Back position is 15 mm and Base position is no gap.
- The EUT is tested 2nd hot-spot peak, if it is less than 2 dB below the highest peak.
- Justification for reduced test configuration for WIFI channels per KDB Publication 248227 and April 2010
FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n and higher data rates) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a modes. For MIMO operation both HT20 and HT40 were tested (at their lowest data rates).
- Other position was not tested since the antenna distance to edge was greater than 5 cm per KDB616217.
- KDB 447498 exclusion: SAR for highest power channel was < 0.8 W/kg and the frequency range is < 100 MHz.
- The modes with highest output power channel were chosen for the conducted output power.
- Base position and Back screen Position tested according to RSS-102 (Issue 4) standard.

5.2 GHz Body Test

Ambient Temperature (°C)	22.5
Liquid Temperature (°C)	21.9
Date	2012-05-05

Mode	Freq. (MHz)	Ch. #	Rate	Position	Measured Power [dB m]		SAR 1g (W/kg)	
					Main	AUX		
802.11a	5180	36	6	Base	16.16	16.25	Note:8	0.554
	5200	40	6		16.39	16.09	0.577	Note:8
	5180	36	6	Back Screen	16.16	16.25	Note:8	0.079
	5200	40	6		16.39	16.09	0.029	Note:8
802.11n HT20_MIMO	5180	36	HT8	Base	13.42	13.15	0.308	
802.11n HT20_MIMO	5180	36	HT8	Back Screen	13.42	13.15	0.038	

<Note>

1. The test data reported are the worst-case SAR value with the position set in a typical configuration.

2. All modes of operation were investigated, and worst-case results are reported.

3. Liquid tissue depth was at least 15 cm.

4. The distance from EUT to flat phantom for testing Back position is 15 mm and Base position is no gap.

5. The EUT is tested 2nd hot-spot peak, if it is less than 2 dB below the highest peak.

6. Justification for reduced test configuration for WIFI channels per KDB Publication 248227 and April 2010

FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n and higher data rates) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a modes. For MIMO operation both HT20 and HT40 were tested (at their lowest data rates).

7. Other position was not tested since the antenna distance to edge was greater than 5 cm per KDB616217.

8. KDB 447498 exclusion: SAR for highest power channel was < 0.8 W/kg and the frequency range is < 100 MHz.

9. The modes with highest output power channel were chosen for the conducted output power.

10. Base position and Back screen Position tested according to RSS-102 (Issue 4) standard.

5.3 GHz Body Test

Ambient Temperature (°C)	22.5
Liquid Temperature (°C)	21.9
Date	2012-05-05

Mode	Freq. (MHz)	Ch. #	Rate	Position	Measured Power [dB m]		SAR 1g (W/kg)			
					Main	AUX				
802.11a	5300	60	6	Base	16.56	15.55	0.477	Note:8		
	5320	64	6		16.24	15.78	Note:8	0.438		
	5300	60	6	Back Screen	16.56	15.55	0.031	Note:8		
	5320	64	6		16.24	15.78	Note:8	0.058		
802.11n HT20_MIMO	5260	52	HT8	Base	13.19	13.26	Cube 0	0.281	Cube 1	0.273
802.11n HT20_MIMO	5260	52	HT8	Back Screen	13.19	13.26	0.039			

<Note>

1. The test data reported are the worst-case SAR value with the position set in a typical configuration.
2. All modes of operation were investigated, and worst-case results are reported.
3. Liquid tissue depth was at least 15 cm.
4. The distance from EUT to flat phantom for testing Back position is 15 mm and Base position is no gap.
5. The EUT is tested 2nd hot-spot peak, if it is less than 2 dB below the highest peak.
6. Justification for reduced test configuration for WIFI channels per KDB Publication 248227 and April 2010 FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n and higher data rates) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a modes (refer to original filing which explains output power is highest at the lowest data rate for each mode). For MIMO operation both HT20 and HT40 were tested (at their lowest data rates).
7. Other position was not tested since the antenna distance to edge was greater than 5 cm per KDB616217.
8. KDB 447498 exclusion: SAR for highest power channel was < 0.8 W/kg and the frequency range is < 100 MHz.
9. The modes with highest output power channel were chosen for the conducted output power.
10. Base position and Back screen Position tested according to RSS-102 (Issue 4) standard.

5.5 GHz Body Test

Ambient Temperature (°C)	22.8
Liquid Temperature (°C)	22.1
Date	2012-04-27

Mode	Freq. (MHz)	Ch. #	Rate	Position	Measured Power [dB m]		SAR 1g (W/kg)			
					Main	AUX	Main		AUX	
802.11a	5520	104	6	Base	16.42	15.38	0.472		0.291	
	5580	116	6		16.32	15.45	0.673		0.368	
	5660	124	6		16.62	15.82	0.853		0.474	
	5680	136	6		16.71	15.98	1.13		0.716	
	5680	136	6	Back Screen	16.71	15.98	0.143		0.124	
802.11n HT40 MIMO	5510	102	HT8	Base	12.94	13.02	Cube 0	0.487	Cube 1	0.330
	5550	110	HT8		13.14	13.11	Cube 0	0.527	Cube 1	0.375
	5670	134	HT8		12.86	12.99	Cube 0	0.406	Cube 1	0.267
802.11n HT40 MIMO	5550	110	HT8	Back Screen	13.14	13.11	0.054			

<Note>

1. The test data reported are the worst-case SAR value with the position set in a typical configuration.
2. All modes of operation were investigated, and worst-case results are reported.
3. Liquid tissue depth was at least 15 cm.
4. The distance from EUT to flat phantom for testing Back position is 15 mm and Base position is no gap.
5. The EUT is tested 2nd hot-spot peak, if it is less than 2 dB below the highest peak.
6. Justification for reduced test configuration for WIFI channels per KDB Publication 248227 and April 2010

FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n and higher data rates) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a modes. For MIMO operation both HT20 and HT40 were tested (at their lowest data rates).

7. Other position was not tested since the antenna distance to edge was greater than 5 cm per KDB616217.
8. KDB 447498 exclusion: SAR for highest power channel was < 0.4 W/kg and the frequency range is < 200 MHz.
9. The modes with highest output power channel were chosen for the conducted output power.
10. Base position and Back screen Position tested according to RSS-102 (Issue 4) standard.

5.8 GHz Body Test

Ambient Temperature (°C)	22.4
Liquid Temperature (°C)	22.0
Date	2012-04-25

Mode	Freq. (MHz)	Ch. #	Rate	Position	Measured Power [dB m]		SAR 1g (W/kg)			
					Main	AUX	Main		AUX	
802.11a	5765	153	6	Base	16.17	16.26	1.01		0.901	
	5785	157	6		16.24	16.31	1.04		1.07	
	5825	165	6		16.28	16.44	1.12		1.10	
	5825	165	6	Back Screen	16.28	16.44	0.164		0.156	
802.11n HT20 MIMO	5825	165	HT8	Base	13.38	13.42	Cube 0	0.639	Cube 1	0.521
802.11n HT20 MIMO	5825	165	HT8	Back Screen	13.38	13.42	0.083			

<Note>

1. The test data reported are the worst-case SAR value with the position set in a typical configuration.
2. All modes of operation were investigated, and worst-case results are reported.
3. Liquid tissue depth was at least 15 cm.
4. The distance from EUT to flat phantom for testing Back position is 15 mm and Base position is no gap.
5. The EUT is tested 2nd hot-spot peak, if it is less than 2 dB below the highest peak.
6. Justification for reduced test configuration for WIFI channels per KDB Publication 248227 and April 2010
FCC/TCB Meeting Notes: Highest average RF output power channel for the lowest data rate were selected for SAR evaluation. Other IEEE 802.11 modes (including 802.11n and higher data rates) were not investigated since the average output powers were not greater than 0.25 dB than that of the corresponding channel in the lowest data rate IEEE 802.11a modes. For MIMO operation both HT20 and HT40 were tested (at their lowest data rates).
7. Other position was not tested since the antenna distance to edge was greater than 5 cm per KDB616217.
8. KDB 447498 exclusion: SAR for highest power channel was < 0.8 W/kg and the frequency range is < 100 MHz.
9. The modes with highest output power channel were chosen for the conducted output power.
10. Base position and Back screen Position tested according to RSS-102 (Issue 4) standard.

Appendix

List

Appendix A	DASY4 Report (Plots of the SAR Measurements)	- 2450 MHz Validation Test - 5200 MHz Validation Test - 5500 MHz Validation Test - 5800 MHz Validation Test - WLAN Test
Appendix B	Uncertainty Analysis	
Appendix C	Calibration Certificate	- PROBE - DAE3 - DIPOLE



Report File No. : F690501/RF-SAR002002
Date of Issue : 2012-05-08
Page : 29 / 154

Appendix A

Test Plot - DASY4 Report

2450 MHz Validation Test_Body

Date: 2012-05-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [Validation 2450 MHz_Body.da4](#)

Ambient Temp : 22.4 °C Tissue Temp : 21.9 °C

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:734
Program Name: Validation 2450 MHz_Body

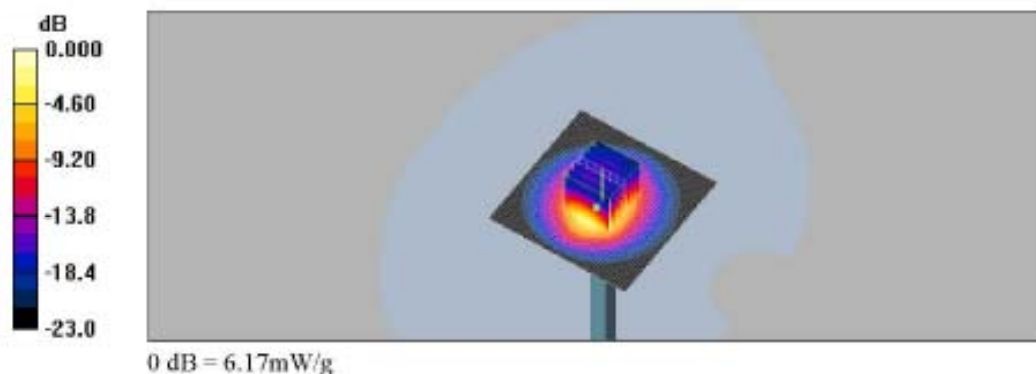
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.93$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY4 Configuration:

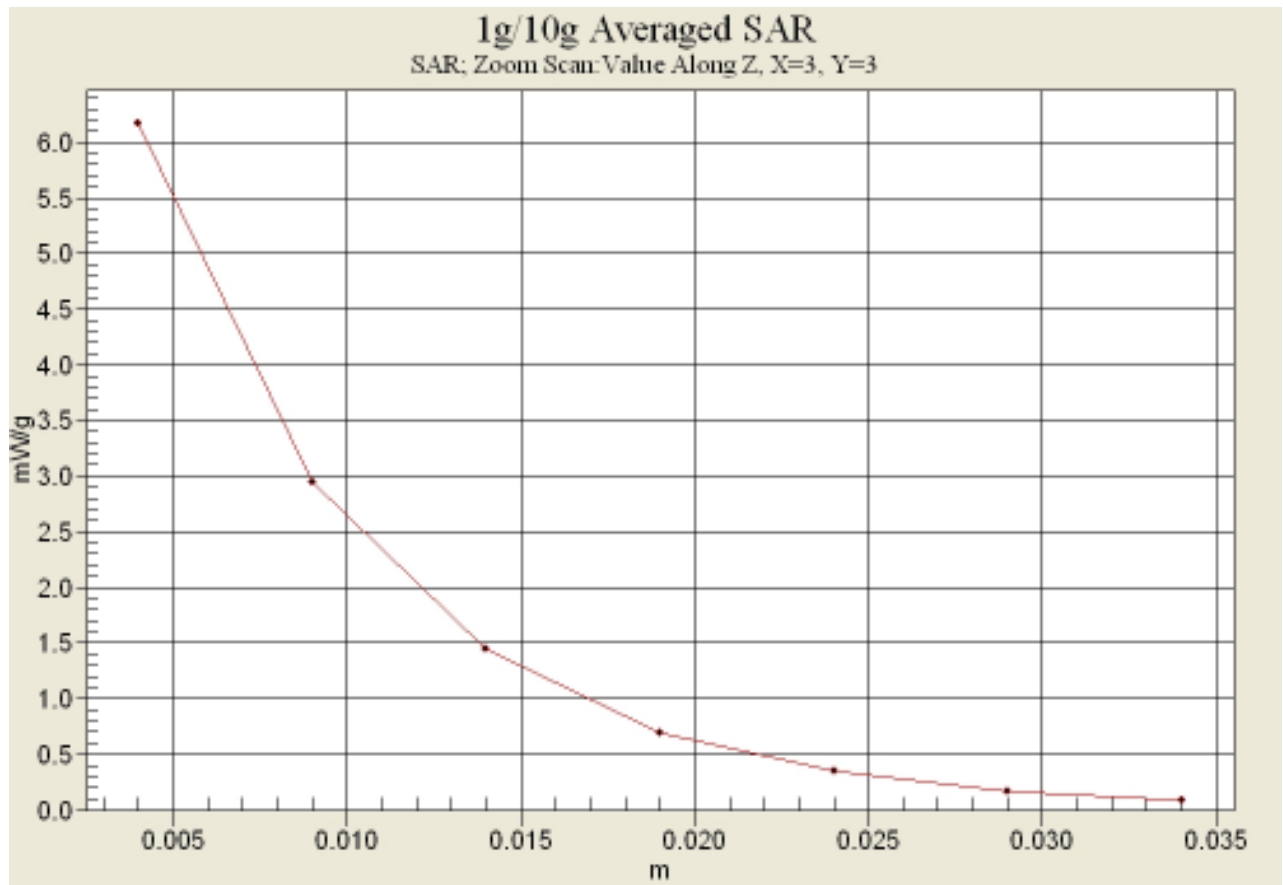
- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Validation 2450 MHz_Body/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 6.42 mW/g

Validation 2450 MHz_Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 60.2 V/m; Power Drift = -0.008 dB
 Peak SAR (extrapolated) = 11.8 W/kg
SAR(1 g) = 5.5 mW/g; SAR(10 g) = 2.51 mW/g
 Maximum value of SAR (measured) = 6.17 mW/g



Z-Scan



5200 MHz Validation Test_Body

Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [Validation 5200 MHz_Body.da4](#)

Input Power : 100 mW

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1106
Program Name: Body Validation

Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5200$ MHz; $\sigma = 5.21$ mho/m; $\epsilon_r = 48.6$; $\rho = 1000$ kg/m³

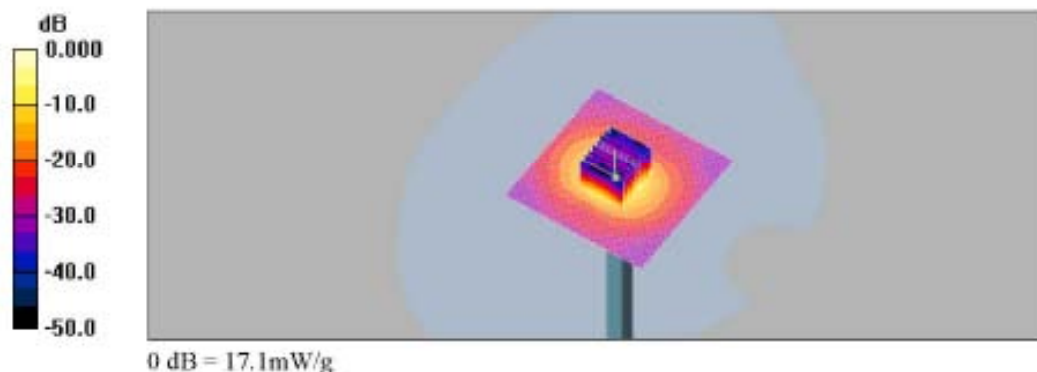
Phantom section: Flat Section

DASY4 Configuration:

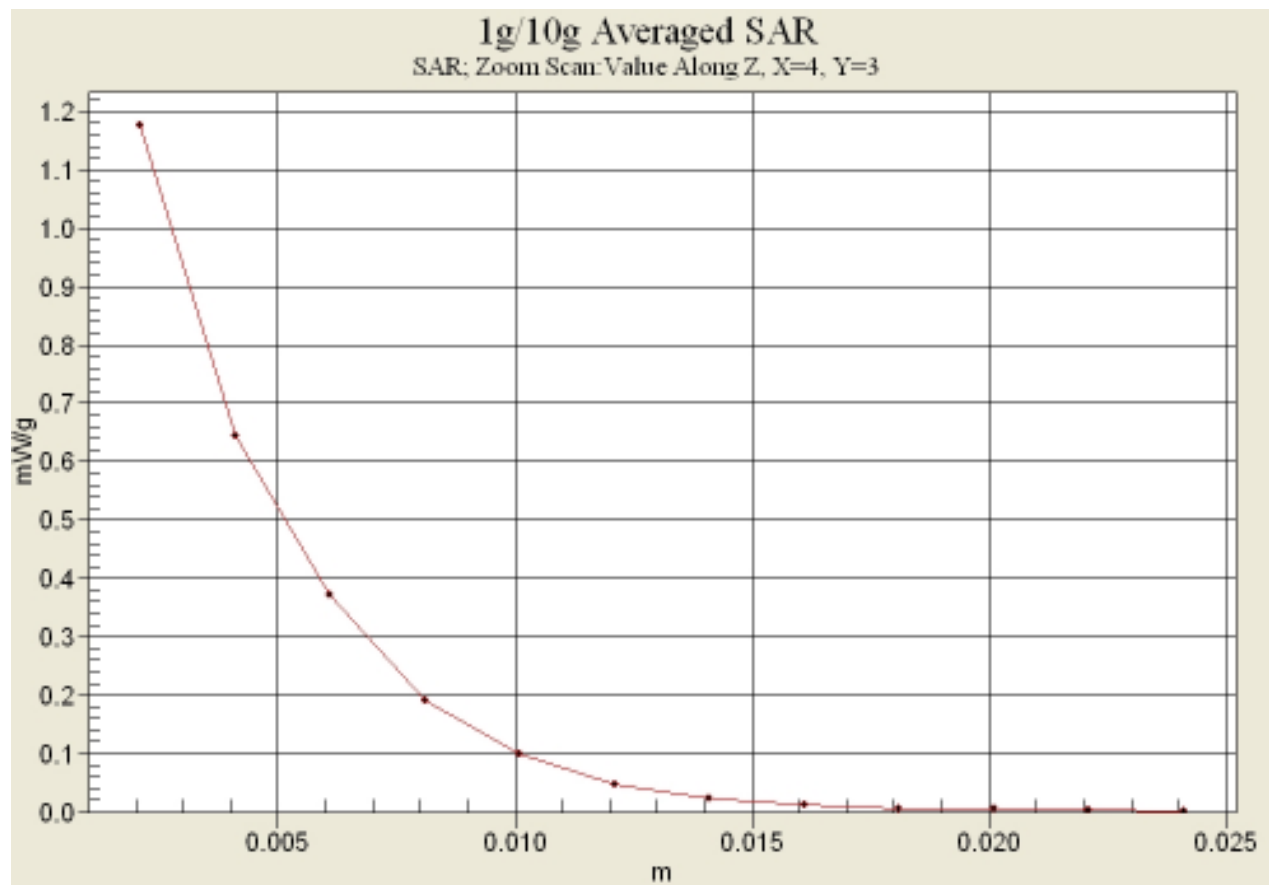
- Probe: EX3DV4 - SN3791; ConvF(3.96, 3.96, 3.96); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Validation/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 18.1 mW/g

Validation/Zoom Scan (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
 Reference Value = 50.0 V/m; Power Drift = -0.081 dB
 Peak SAR (extrapolated) = 36.2 W/kg
SAR(1 g) = 8.22 mW/g; SAR(10 g) = 2.26 mW/g
 Maximum value of SAR (measured) = 17.1 mW/g



Z-Scan



5500 MHz Validation Test_Body

Date: 2012-04-27

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [Validation 5500 MHz_Body.da4](#)

Input Power : 100 mW

Ambient Temp : 22.8 °C Tissue Temp : 22.1 °C

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1106
Program Name: Body Validation

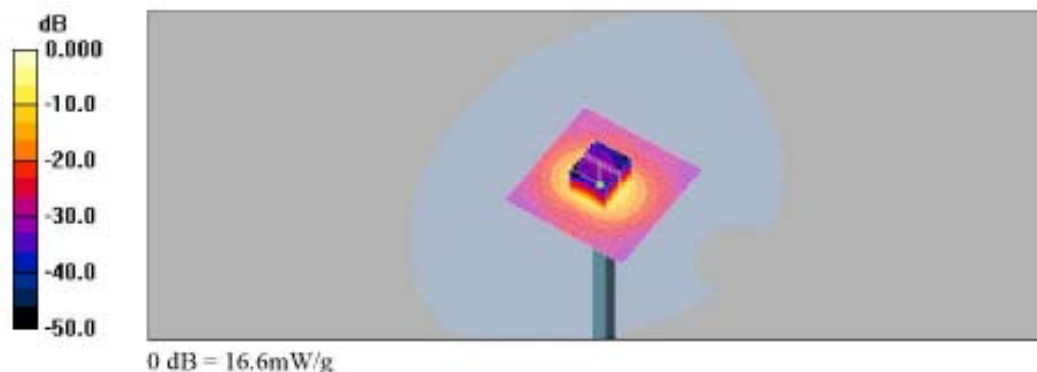
Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5500$ MHz; $\sigma = 5.52$ mho/m; $\epsilon_r = 48.4$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY4 Configuration:

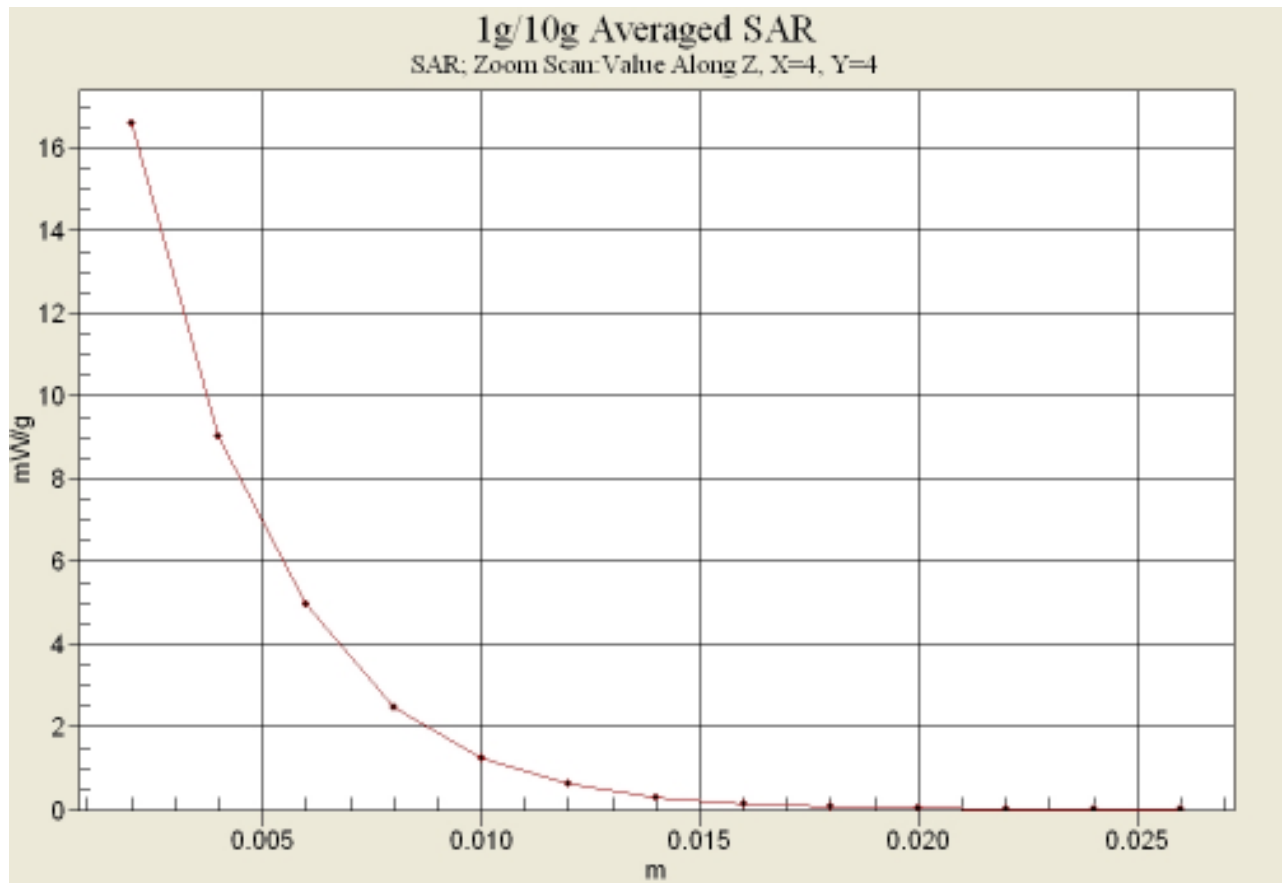
- Probe: EX3DV4 - SN3791; ConvF(3.48, 3.48, 3.48); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Validation/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 16.9 mW/g

Validation/Zoom Scan (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
 Reference Value = 48.8 V/m; Power Drift = 0.037 dB
 Peak SAR (extrapolated) = 34.2 W/kg
SAR(1 g) = 8.11 mW/g; SAR(10 g) = 2.22 mW/g
 Maximum value of SAR (measured) = 16.6 mW/g



Z Scan



5800 MHz Validation Test_Body

Date: 2012-04-25

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [Validation 5800 MHz_Body.da4](#)

Input Power : 100 mW

Ambient Temp : 22.4 °C Tissue Temp : 22.0 °C

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1106
Program Name: Body Validation

Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5800$ MHz; $\sigma = 5.98$ mho/m; $\epsilon_r = 47.7$; $\rho = 1000$ kg/m³

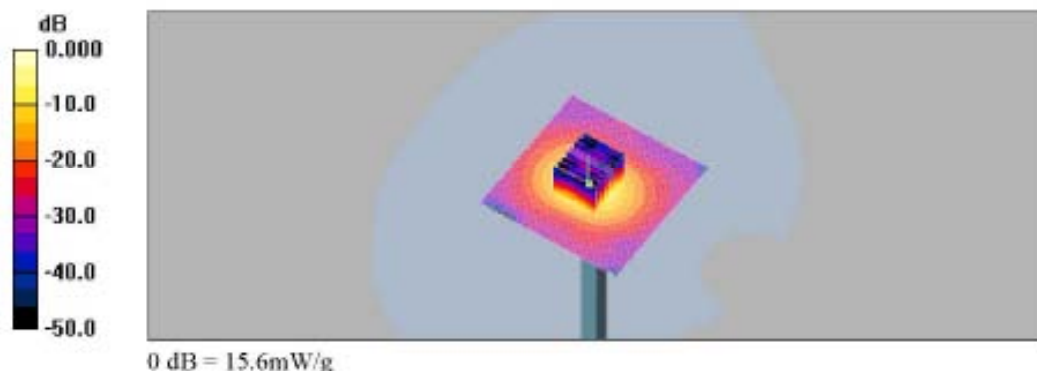
Phantom section: Flat Section

DASY4 Configuration:

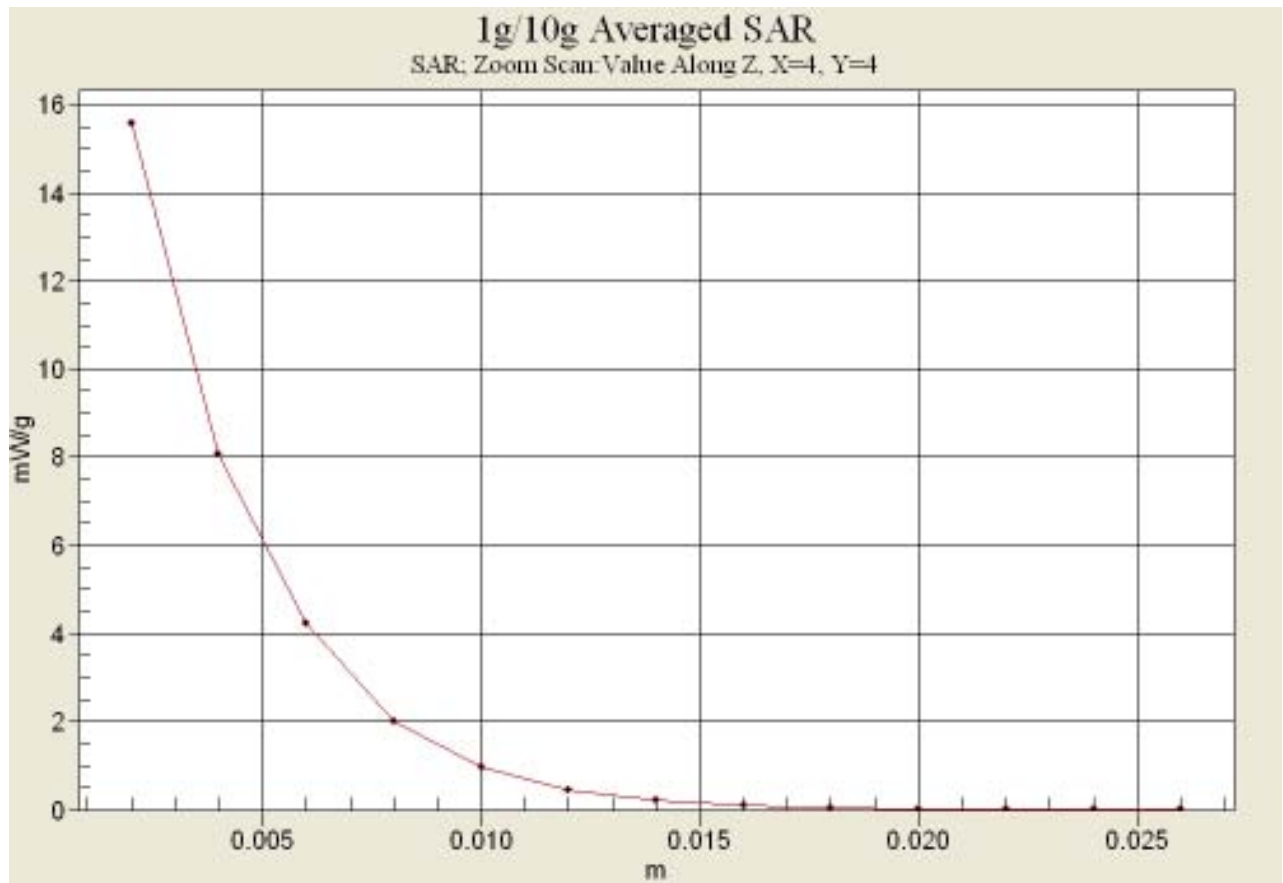
- Probe: EX3DV4 - SN3791; ConvF(3.66, 3.66, 3.66); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Validation/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 16.3 mW/g

Validation/Zoom Scan (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
 Reference Value = 44.2 V/m; Power Drift = -0.052 dB
 Peak SAR (extrapolated) = 33.5 W/kg
SAR(1 g) = 7.57 mW/g; SAR(10 g) = 2.09 mW/g
 Maximum value of SAR (measured) = 15.6 mW/g



Z-Scan



2.45 GHz WLAN Body SAR

Date: 2012-05-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11b_1Mbps_CH1_Main ANT.da4](#)

Ambient Temp : 22.4 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN; Frequency: 2412 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2412$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11b_CH1_Base_Main ANT/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.844 mW/g

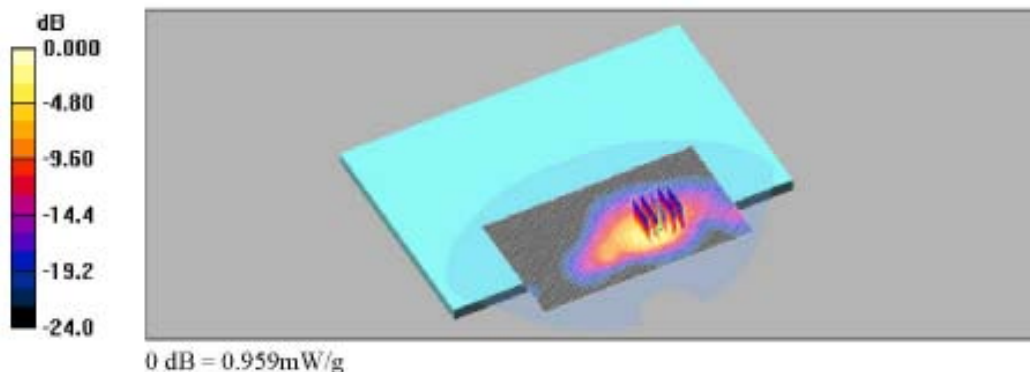
WLAN_11b_CH1_Base_Main ANT/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.2 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 2.16 W/kg

SAR(1 g) = 0.882 mW/g; SAR(10 g) = 0.370 mW/g

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



Date: 2012-05-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11b_1Mbps_CH1_AUX ANT.da4](#)

Ambient Temp : 22.4 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

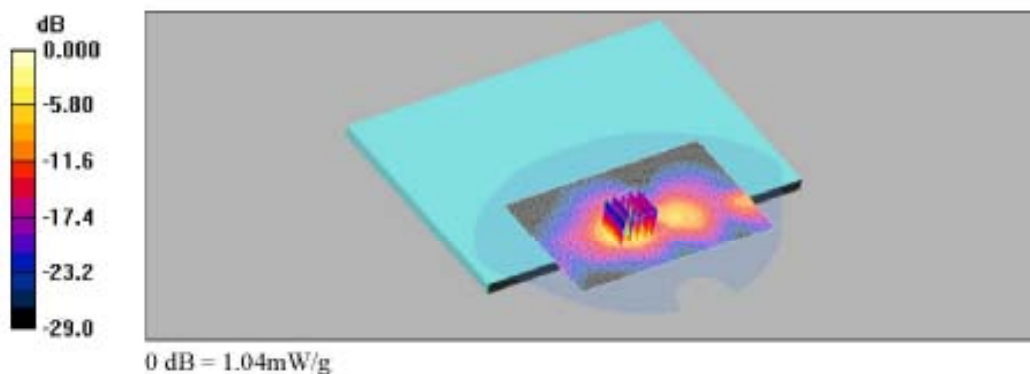
Communication System: WLAN; Frequency: 2412 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2412 \text{ MHz}$; $\sigma = 1.89 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11b_CH1_Base_AUX ANT/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.903 mW/g

WLAN_11b_CH1_Base_AUX ANT/Zoom Scan (5x5x7)/Cube 0: Measurement grid:
 dx=8mm, dy=8mm, dz=5mm
 Reference Value = 14.0 V/m; Power Drift = -0.026 dB
 Peak SAR (extrapolated) = 2.12 W/kg
SAR(1 g) = 0.829 mW/g; SAR(10 g) = 0.332 mW/g
 Maximum value of SAR (measured) = 1.04 mW/g



Date: 2012-05-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11b_1Mbps_CH6_Main_ANT.da4](#)

Ambient Temp : 22.4 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

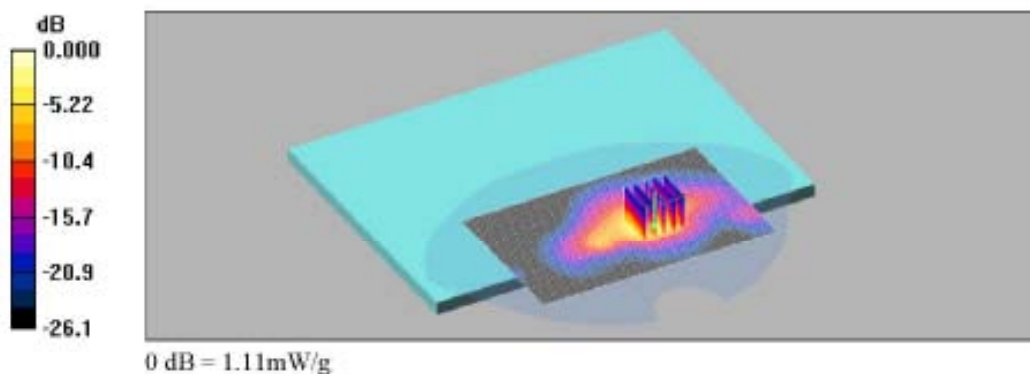
Communication System: WLAN; Frequency: 2437 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2437 \text{ MHz}$; $\sigma = 1.92 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11b_CH6_Base_Main ANT/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.948 mW/g

WLAN_11b_CH6_Base_Main ANT/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 12.4 V/m; Power Drift = -0.013 dB
 Peak SAR (extrapolated) = 2.55 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.405 mW/g
 Maximum value of SAR (measured) = 1.11 mW/g



Date: 2012-05-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11b_1Mbps_CH6_AUX ANT.da4](#)

Ambient Temp : 22.4 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

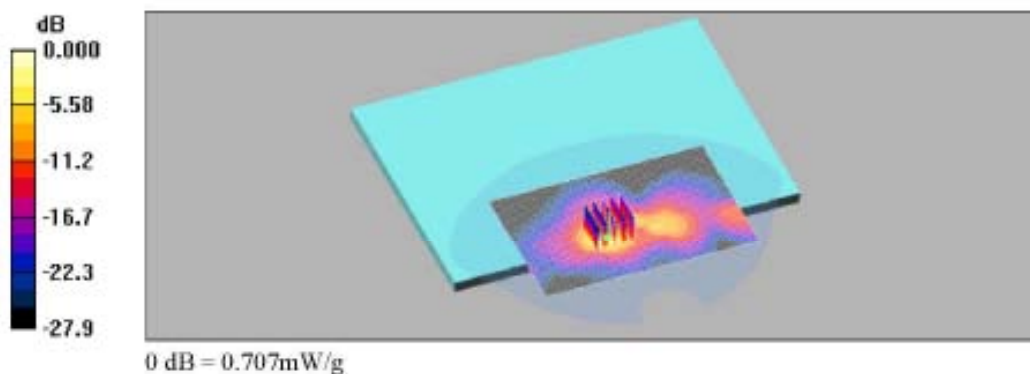
Communication System: WLAN; Frequency: 2437 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2437 \text{ MHz}$; $\sigma = 1.92 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11b_CH6_Base_AUX ANT/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.615 mW/g

WLAN_11b_CH6_Base_AUX ANT/Zoom Scan (5x5x7)/Cube 0: Measurement grid:
 dx=8mm, dy=8mm, dz=5mm
 Reference Value = 11.8 V/m; Power Drift = -0.028 dB
 Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.571 mW/g; SAR(10 g) = 0.226 mW/g
 Maximum value of SAR (measured) = 0.707 mW/g



Date: 2012-05-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11b_1Mbps_CH11_Main_ANT.da4](#)

Ambient Temp : 22.4 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.95 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11b_CH11_Base_Main ANT/Area Scan (81x131x1): Measurement grid:

$dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.934 mW/g

WLAN_11b_CH11_Base_Main ANT/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

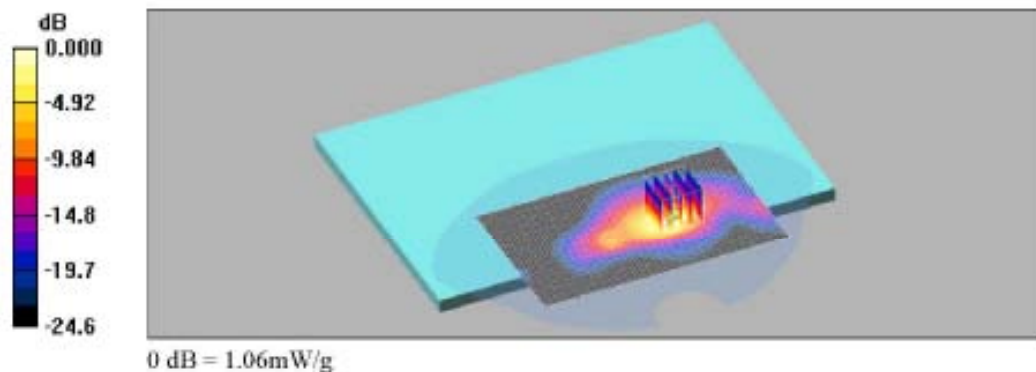
$dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.4 V/m; Power Drift = -0.082 dB

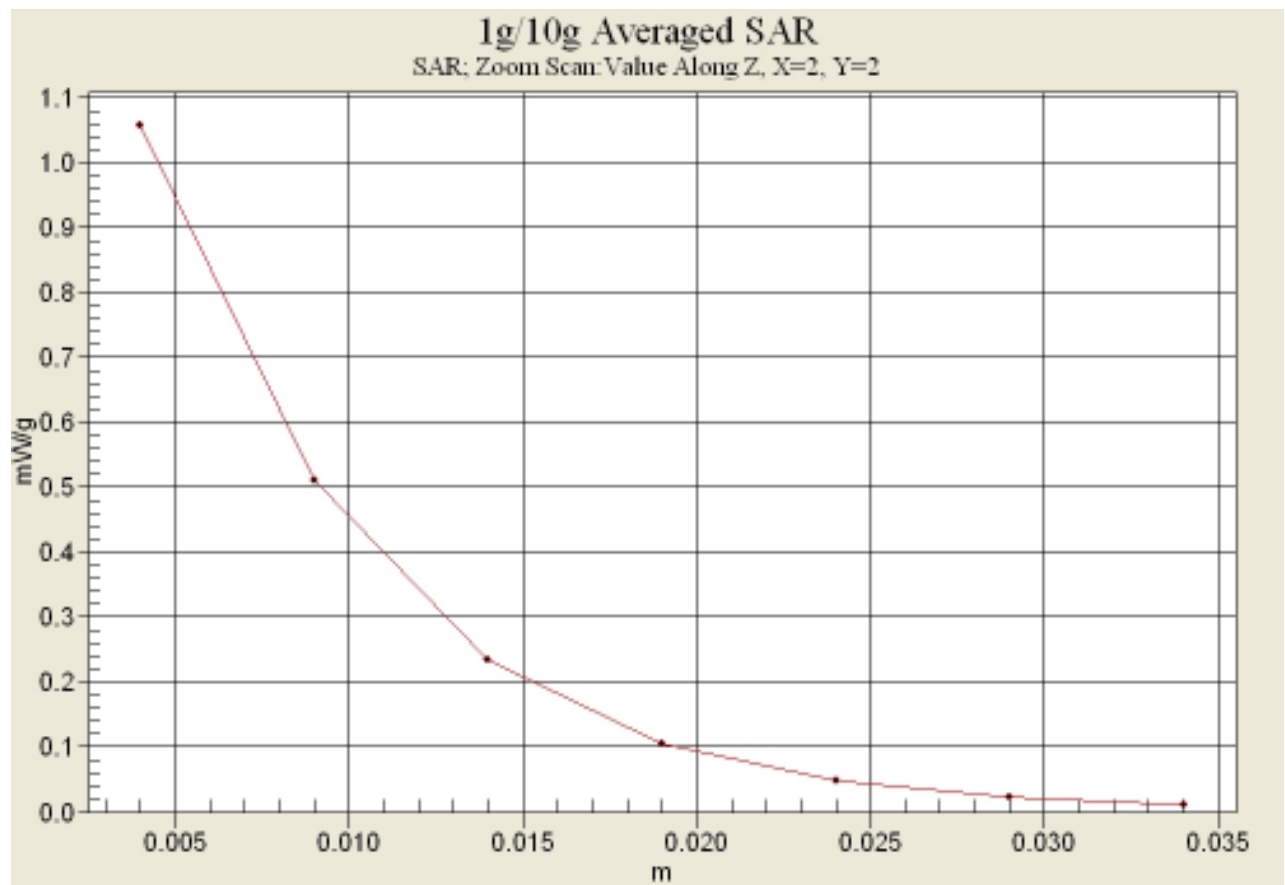
Peak SAR (extrapolated) = 2.74 W/kg

SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.423 mW/g

Maximum value of SAR (measured) = 1.06 mW/g



Z-Scan



Date: 2012-05-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11b_1Mbps_CH11_AUX ANT.da4](#)

Ambient Temp : 22.4 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

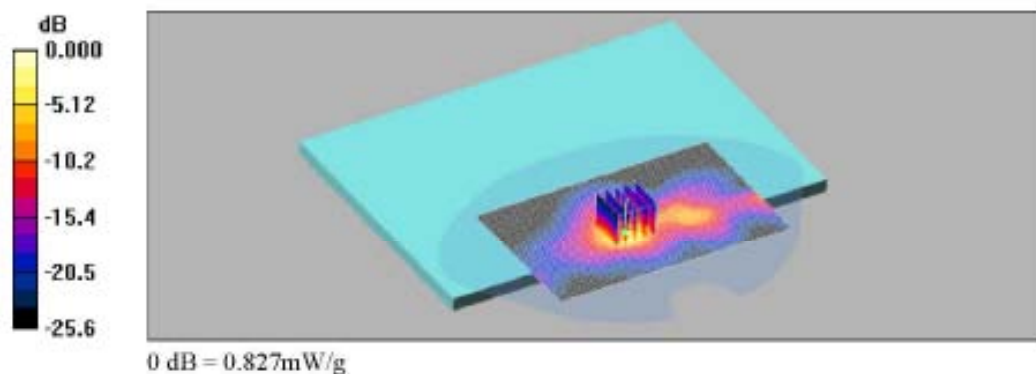
Communication System: WLAN; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.95 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11b_CH11_Base_AUX ANT/Area Scan (81x131x1): Measurement grid:
 $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.597 mW/g

WLAN_11b_CH11_Base_AUX ANT/Zoom Scan (5x5x7)/Cube 0: Measurement grid:
 $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 17.0 V/m; Power Drift = -0.034 dB
 Peak SAR (extrapolated) = 1.74 W/kg
SAR(1 g) = 0.662 mW/g; SAR(10 g) = 0.262 mW/g
 Maximum value of SAR (measured) = 0.827 mW/g



Date: 2012-05-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Back Screen_11b_1Mbps_CH11_Main ANT.da4](#)

Ambient Temp : 22.4 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

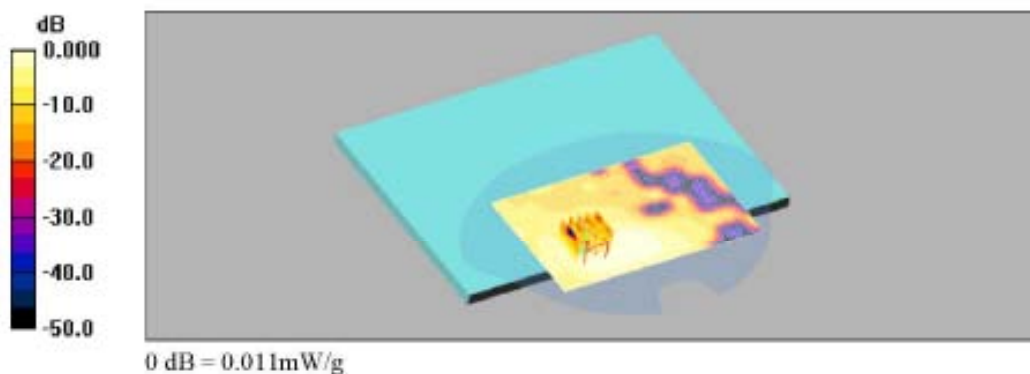
Communication System: WLAN; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.95 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11b_CH11_Back Screen_Main ANT/Area Scan (81x131x1): Measurement grid:
 $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.011 mW/g

WLAN_11b_CH11_Back Screen_Main ANT/Zoom Scan (5x5x7)/Cube 0:
 Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 1.13 V/m; Power Drift = 0.083 dB
 Peak SAR (extrapolated) = 0.020 W/kg
SAR(1 g) = 0.010 mW/g; SAR(10 g) = 0.00554 mW/g
 Maximum value of SAR (measured) = 0.011 mW/g



Date: 2012-05-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Back Screen_11b_1Mbps_CH1_AUX ANT.da4](#)

Ambient Temp : 22.4 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

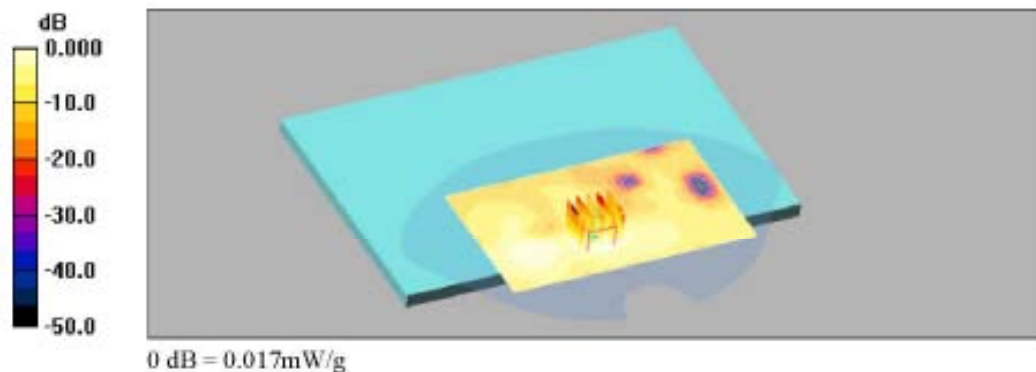
Communication System: WLAN; Frequency: 2412 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2412 \text{ MHz}$; $\sigma = 1.89 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11b_CH1_Back Screen_AUX ANT/Area Scan (81x131x1): Measurement grid:
 $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.018 mW/g

WLAN_11b_CH1_Back Screen_AUX ANT/Zoom Scan (5x5x7)/Cube 0: Measurement
 grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 1.89 V/m; Power Drift = -0.042 dB
 Peak SAR (extrapolated) = 0.032 W/kg
SAR(1 g) = 0.016 mW/g; SAR(10 g) = 0.00823 mW/g
 Maximum value of SAR (measured) = 0.017 mW/g



Date: 2012-05-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11nHT20_HT8_CH6_MIMO ANT.da4](#)

Ambient Temp : 22.4 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

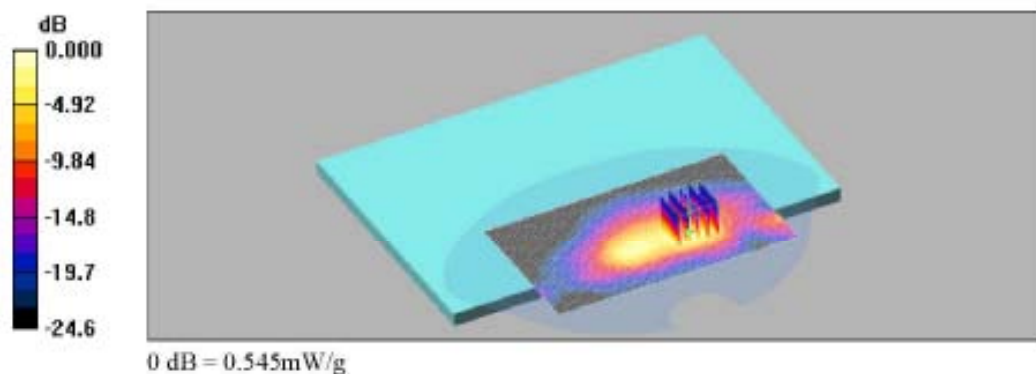
Communication System: WLAN; Frequency: 2437 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2437 \text{ MHz}$; $\sigma = 1.92 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11nHT20_CH6_Base_MIMO ANT/Area Scan (81x131x1): Measurement grid:
 $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.487 mW/g

WLAN_11nHT20_CH6_Base_MIMO ANT/Zoom Scan (5x5x7)/Cube 0: Measurement
 grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 11.1 V/m; Power Drift = -0.054 dB
 Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.481 mW/g; SAR(10 g) = 0.201 mW/g
 Maximum value of SAR (measured) = 0.545 mW/g



Date: 2012-05-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Back Screen_11nHT20_HT8_CH6_MIMO ANT.da4](#)

Ambient Temp : 22.4 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN; Frequency: 2437 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2437 \text{ MHz}$; $\sigma = 1.92 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

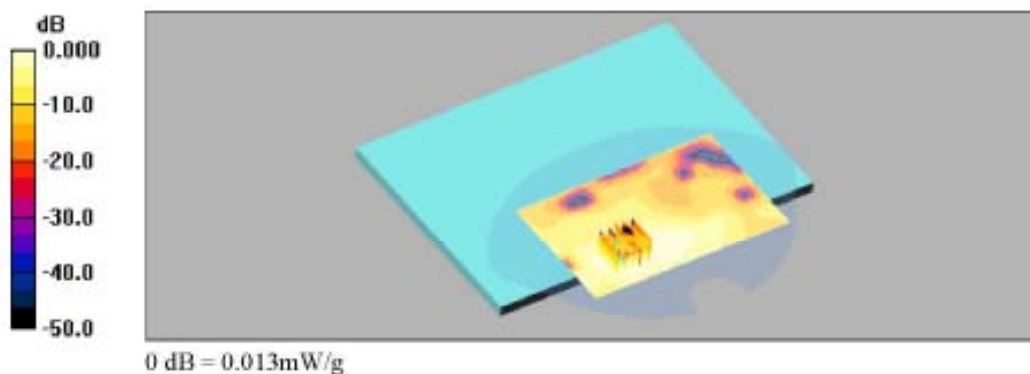
- Probe: ET3DV6 - SN1782; ConvF(4.11, 4.11, 4.11); Calibrated: 2012-04-27
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11nHT20_CH6_Back Screen_MIMO ANT/Area Scan (81x131x1):

Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.014 mW/g

WLAN_11nHT20_CH6_Back Screen_MIMO ANT/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 1.39 V/m; Power Drift = 0.188 dB
 Peak SAR (extrapolated) = 0.025 W/kg
SAR(1 g) = 0.012 mW/g; SAR(10 g) = 0.00638 mW/g
 Maximum value of SAR (measured) = 0.013 mW/g



5.2 GHz WLAN Body SAR

Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
File Name: WLAN_Base_11a_6Mbps_CH36_AUX.ANT.da4

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11a_U-NII Low); Frequency: 5180 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5180$ MHz; $\sigma = 5.18$ mho/m; $\epsilon_r = 48.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.96, 3.96, 3.96); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH36_Base_AUX/Area Scan (81x151x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.17 mW/g

WLAN_11a_CH36_Base_AUX/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

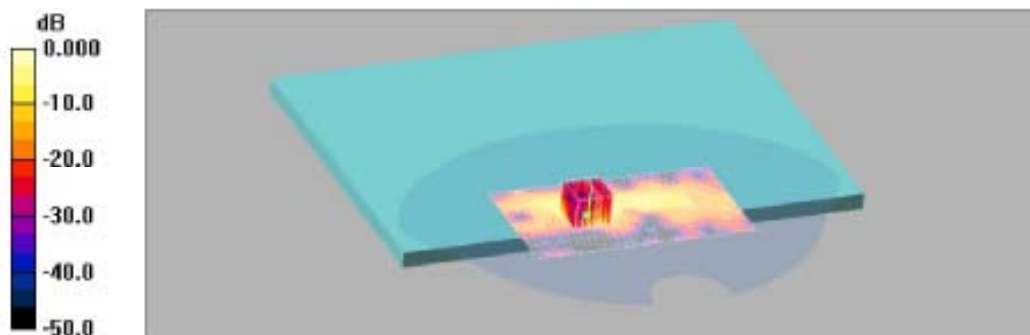
dx=4mm, dy=4mm, dz=2mm

Reference Value = 1.70 V/m; Power Drift = 0.038 dB

Peak SAR (extrapolated) = 2.61 W/kg

SAR(1 g) = 0.554 mW/g; SAR(10 g) = 0.129 mW/g

Maximum value of SAR (measured) = 1.27 mW/g



0 dB = 1.27mW/g

Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: WLAN_Base_11a_6Mbps_CH40_Main ANT.da4

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11a_U-NII Low); Frequency: 5200 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.21 \text{ mho/m}$; $\epsilon_r = 48.6$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.96, 3.96, 3.96); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH40_Base_Main ANT/Area Scan (81x151x1): Measurement grid:

$dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 1.35 mW/g

WLAN_11a_CH40_Base_Main ANT/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

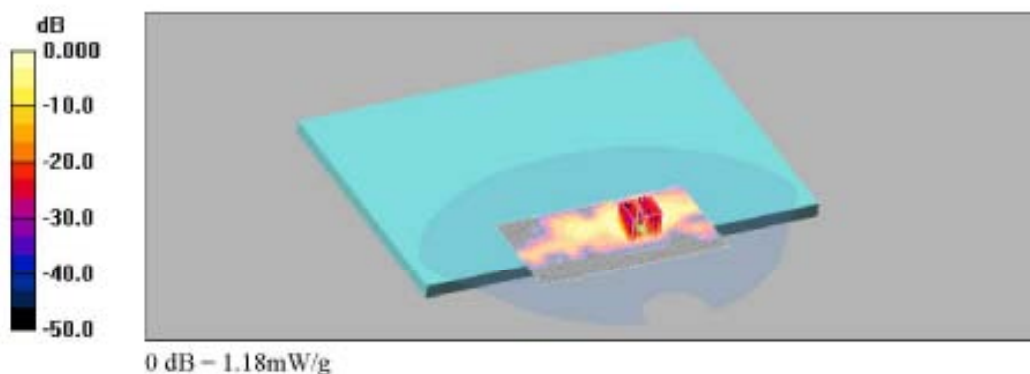
$dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

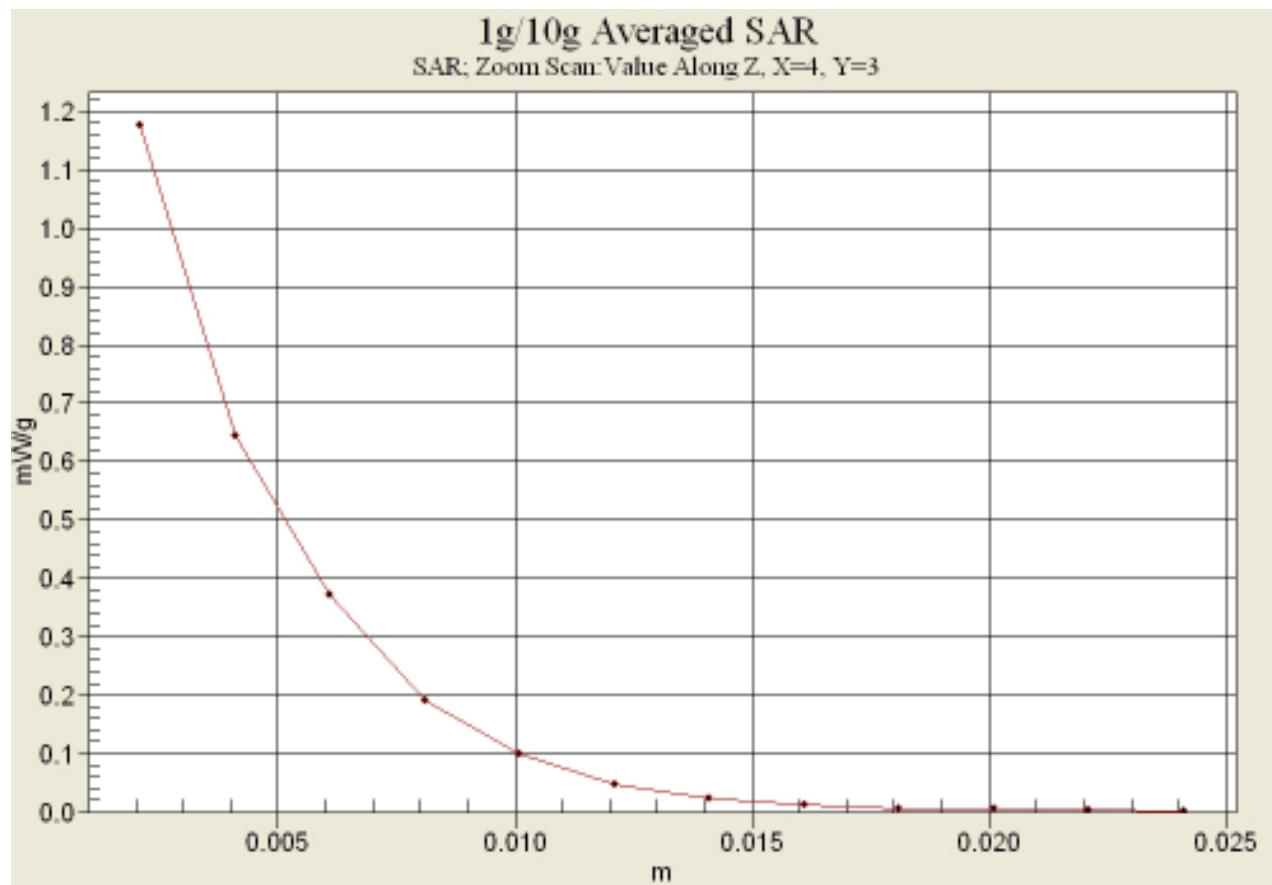
Reference Value = 4.52 V/m; Power Drift = 0.074 dB

Peak SAR (extrapolated) = 2.56 W/kg

SAR(1 g) = 0.577 mW/g; SAR(10 g) = 0.149 mW/g

Maximum value of SAR (measured) = 1.18 mW/g



Z-Scan

Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Back Screen_11a_6Mbps_CH36_AUX ANT.da4](#)

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

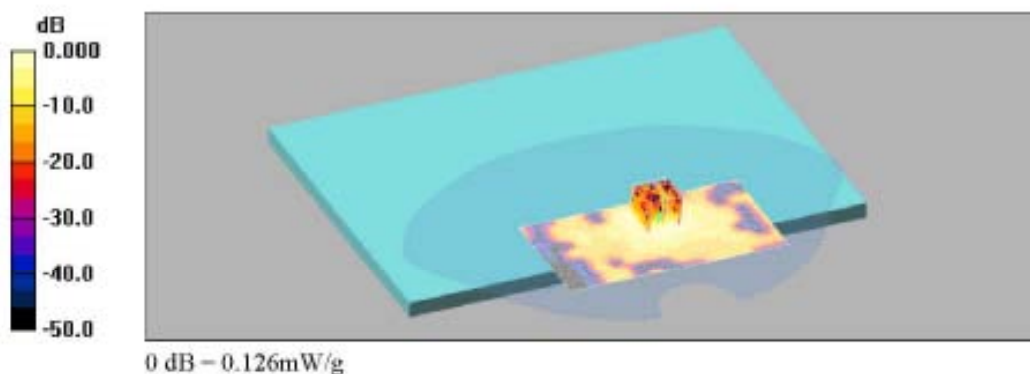
Communication System: WLAN(11a_U-NII Low); Frequency: 5180 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5180 \text{ MHz}$; $\sigma = 5.18 \text{ mho/m}$; $\epsilon_r = 48.6$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.96, 3.96, 3.96); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH36_Back Screen_AUX ANT/Area Scan (81x151x1): Measurement grid:
 $dx=10\text{mm}$, $dy=10\text{mm}$
 Maximum value of SAR (interpolated) = 0.133 mW/g

WLAN_11a_CH36_Back Screen_AUX ANT/Zoom Scan (7x7x12)/Cube 0:
 Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
 Reference Value = 3.82 V/m; Power Drift = -0.066 dB
 Peak SAR (extrapolated) = 0.256 W/kg
SAR(1 g) = 0.072 mW/g; SAR(10 g) = 0.026 mW/g
 Maximum value of SAR (measured) = 0.126 mW/g



Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: WLAN_Back Screen_11a_6Mbps_CH36_Main ANT.da4

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

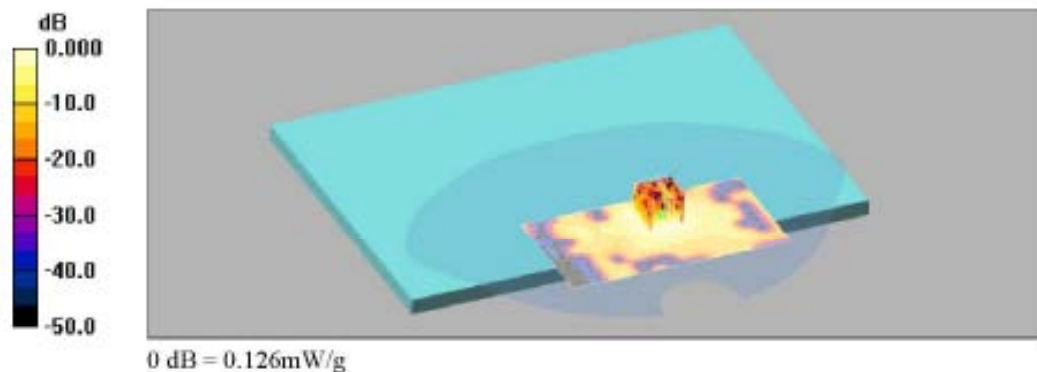
Communication System: WLAN(11n_U-NII Low); Frequency: 5180 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 5180 \text{ MHz}$; $\sigma = 5.18 \text{ mho/m}$; $\epsilon_r = 48.6$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.96, 3.96, 3.96); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH36_Back Screen_Main ANT/Area Scan (81x151x1): Measurement grid:
 dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.133 mW/g

WLAN_11a_CH36_Back Screen_Main ANT/Zoom Scan (7x7x12)/Cube 0:
 Measurement grid: dx=4mm, dy=4mm, dz=2mm
 Reference Value = 3.82 V/m; Power Drift = -0.066 dB
 Peak SAR (extrapolated) = 0.256 W/kg
SAR(1 g) = 0.072 mW/g; SAR(10 g) = 0.026 mW/g
 Maximum value of SAR (measured) = 0.126 mW/g



Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11nHT20_HT8_CH40_MIMO_ANT.da4](#)

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11n_U-NII Low); Frequency: 5180 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 5180 \text{ MHz}$; $\sigma = 5.18 \text{ mho/m}$; $\epsilon_r = 48.6$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

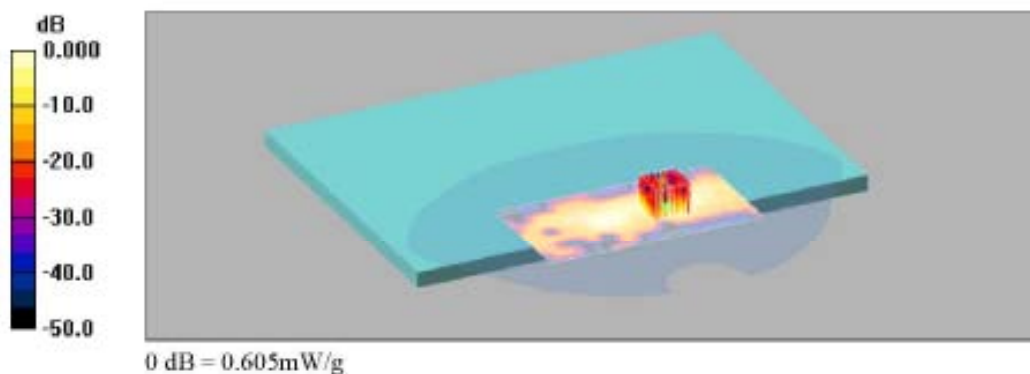
DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.96, 3.96, 3.96); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11nHT20_CH36_Base_MIMO ANT/Area Scan (81x151x1): Measurement grid:
 dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.619 mW/g

WLAN_11nHT20_CH36_Base_MIMO ANT/Zoom Scan (7x7x12)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm
 Reference Value = 4.69 V/m; Power Drift = -0.014 dB
 Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.308 mW/g; SAR(10 g) = 0.091 mW/g
 Maximum value of SAR (measured) = 0.605 mW/g



Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Back Screen_11nHT20_HT8_CH36_MIMO ANT.da4](#)

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11n_U-NII Low); Frequency: 5180 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 5180 \text{ MHz}$; $\sigma = 5.18 \text{ mho/m}$; $\epsilon_r = 48.6$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

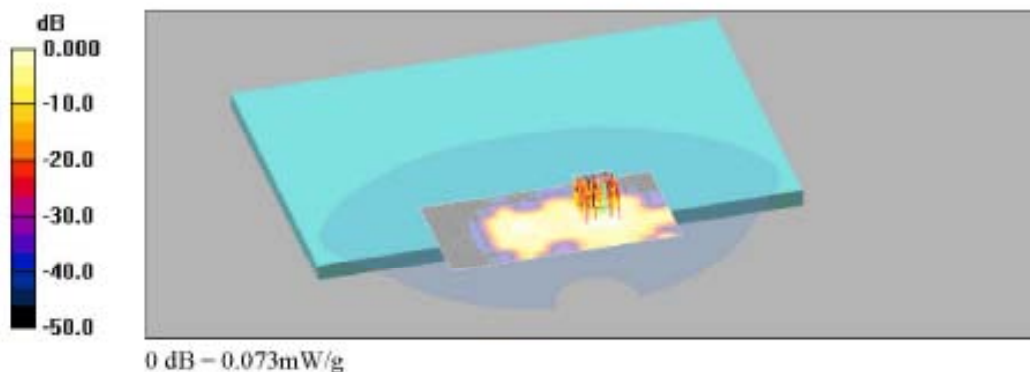
- Probe: EX3DV4 - SN3791; ConvF(3.96, 3.96, 3.96); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11nHT20_CH36_Back Screen_MIMO ANT/Area Scan (81x151x1):

Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
 Maximum value of SAR (interpolated) = 0.082 mW/g

WLAN_11nHT20_CH36_Back Screen_MIMO ANT/Zoom Scan (7x7x12)/Cube 0:

Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
 Reference Value = 2.06 V/m; Power Drift = -0.157 dB
 Peak SAR (extrapolated) = 0.133 W/kg
SAR(1 g) = 0.038 mW/g; SAR(10 g) = 0.012 mW/g
 Maximum value of SAR (measured) = 0.073 mW/g



5.3 GHz WLAN Body SAR

Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11a_6Mbps_CH60_Main ANT.da4](#)

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11a_U-NII Low); Frequency: 5300 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5300$ MHz; $\sigma = 5.32$ mho/m; $\epsilon_r = 48.5$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.79, 3.79, 3.79); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH60_Base_Main ANT/Area Scan (81x151x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.09 mW/g

WLAN_11a_CH60_Base_Main ANT/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

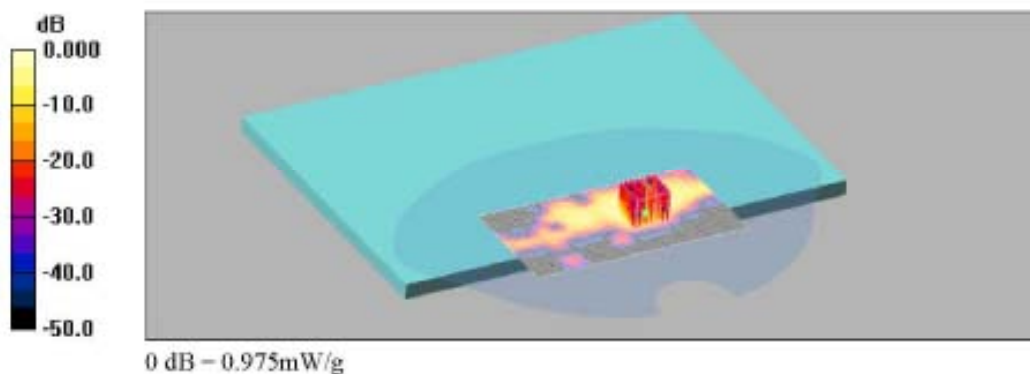
dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.94 V/m; Power Drift = -0.145 dB

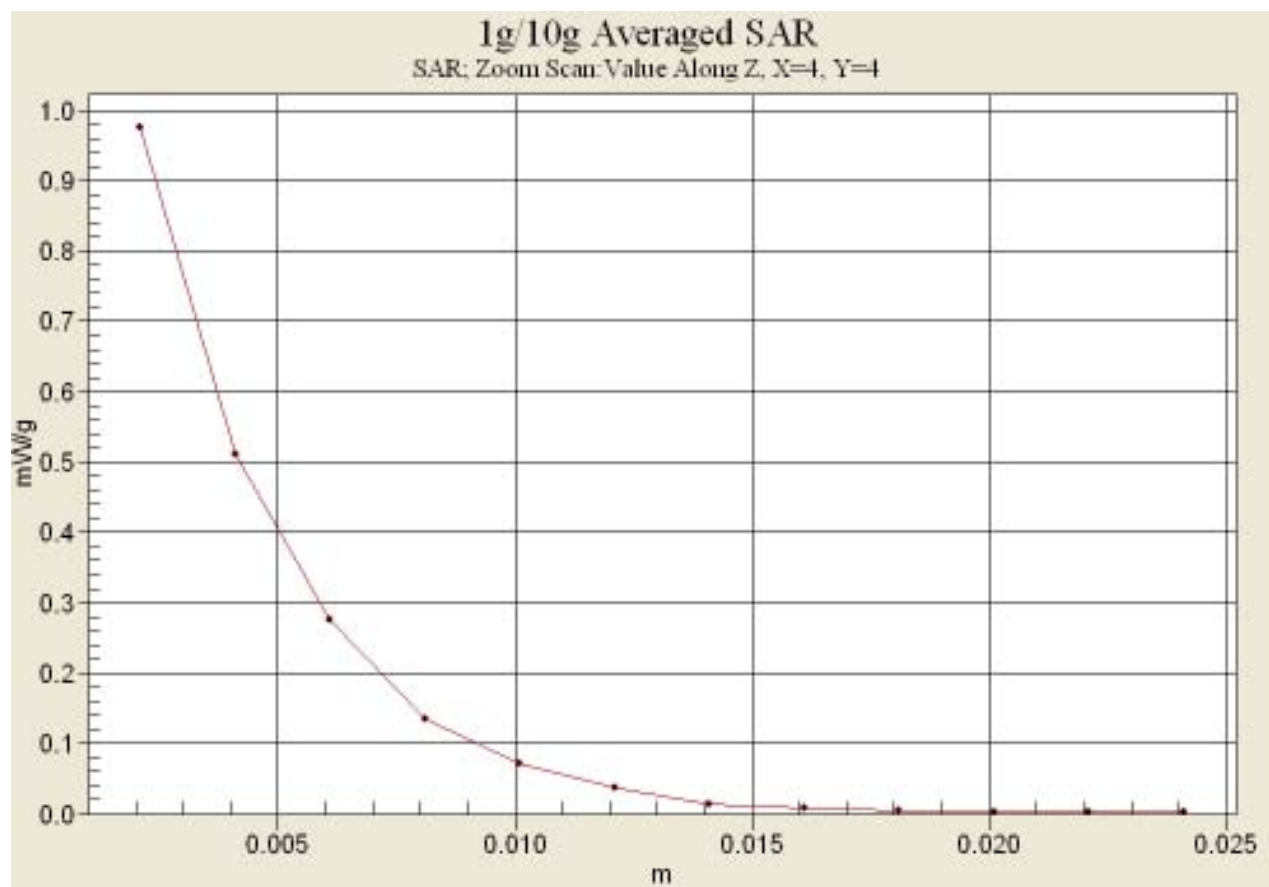
Peak SAR (extrapolated) = 2.20 W/kg

SAR(1 g) = 0.477 mW/g; SAR(10 g) = 0.122 mW/g

Maximum value of SAR (measured) = 0.975 mW/g



Z-Scan



Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: WLAN_Base_11a_6Mbps_CH64_AUX.ANT.da4

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11a_U-NII Low); Frequency: 5320 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5320 \text{ MHz}$; $\sigma = 5.35 \text{ mho/m}$; $\epsilon_r = 48.4$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.79, 3.79, 3.79); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH64_Base_AUX/Area Scan (81x151x1): Measurement grid:

$dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.939 mW/g

WLAN_11a_CH64_Base_AUX/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

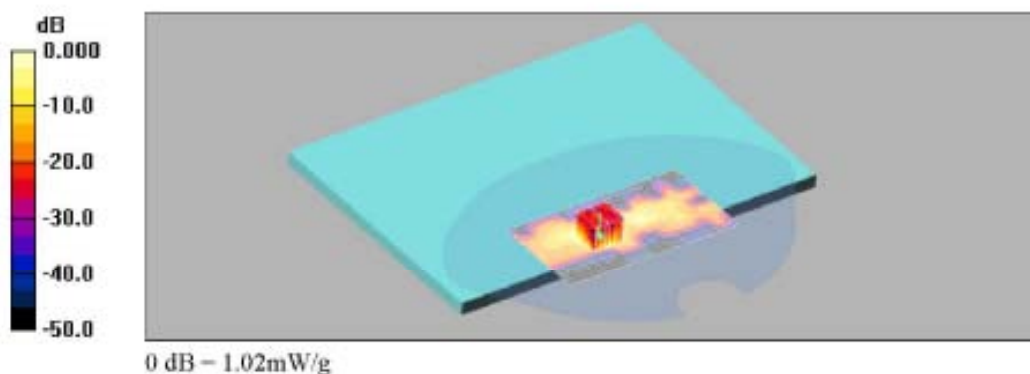
$dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.56 V/m; Power Drift = -0.089 dB

Peak SAR (extrapolated) = 2.06 W/kg

SAR(1 g) = 0.438 mW/g; SAR(10 g) = 0.130 mW/g

Maximum value of SAR (measured) = 1.02 mW/g



Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Back Screen_11a_6Mbps_CH60_Main ANT.da4](#)

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHWMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

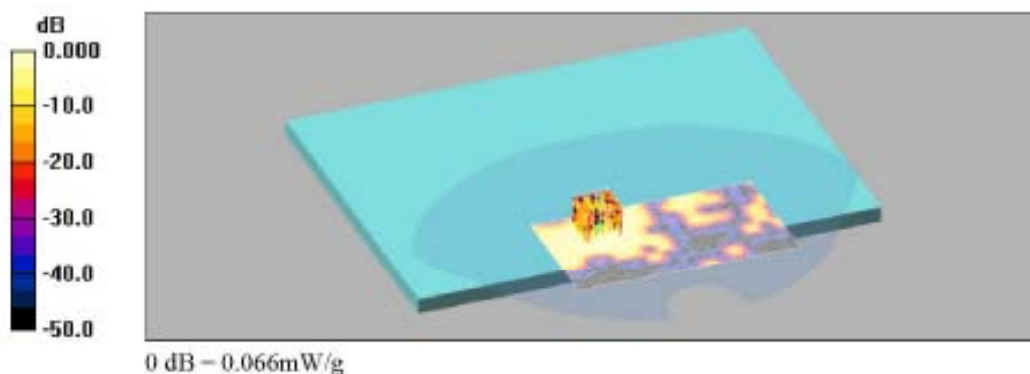
Communication System: WLAN(11a_U-NII Low); Frequency: 5300 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5300 \text{ MHz}$; $\sigma = 5.32 \text{ mho/m}$; $\epsilon_r = 48.5$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.79, 3.79, 3.79); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH60_Back Screen_Main ANT/Area Scan (81x151x1): Measurement grid:
 $dx=10\text{mm}$, $dy=10\text{mm}$
 Maximum value of SAR (interpolated) = 0.072 mW/g

WLAN_11a_CH60_Back Screen_Main ANT/Zoom Scan (7x7x12)/Cube 0: Measurement grid:
 Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
 Reference Value = 1.54 V/m; Power Drift = -0.079 dB
 Peak SAR (extrapolated) = 0.145 W/kg
SAR(1 g) = 0.031 mW/g; SAR(10 g) = 0.010 mW/g
 Maximum value of SAR (measured) = 0.066 mW/g



Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Back Screen_11a_6Mbps_CH64_AUX ANT.da4](#)

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

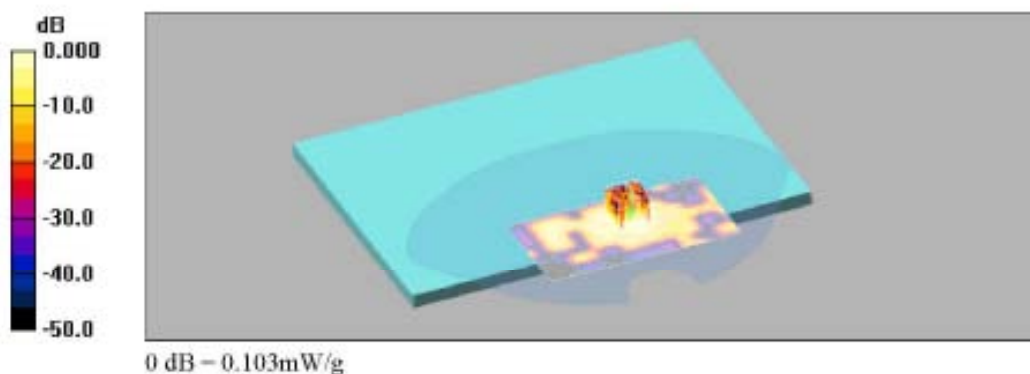
Communication System: WLAN(11a_U-NII Low); Frequency: 5320 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5320 \text{ MHz}$; $\sigma = 5.35 \text{ mho/m}$; $\epsilon_r = 48.4$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.79, 3.79, 3.79); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH64_Back Screen_AUX ANT/Area Scan (81x151x1): Measurement grid:
 $dx=10\text{mm}$, $dy=10\text{mm}$
 Maximum value of SAR (interpolated) = 0.108 mW/g

WLAN_11a_CH64_Back Screen_AUX ANT/Zoom Scan (7x7x12)/Cube 0:
 Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
 Reference Value = 3.37 V/m; Power Drift = 0.083 dB
 Peak SAR (extrapolated) = 0.210 W/kg
SAR(1 g) = 0.058 mW/g; SAR(10 g) = 0.022 mW/g
 Maximum value of SAR (measured) = 0.103 mW/g



Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11nHT20_HT8_CH52_MIMO_ANT.da4](#)

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11n_U-NII Low); Frequency: 5260 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 5260 \text{ MHz}$; $\sigma = 5.28 \text{ mho/m}$; $\epsilon_r = 48.5$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

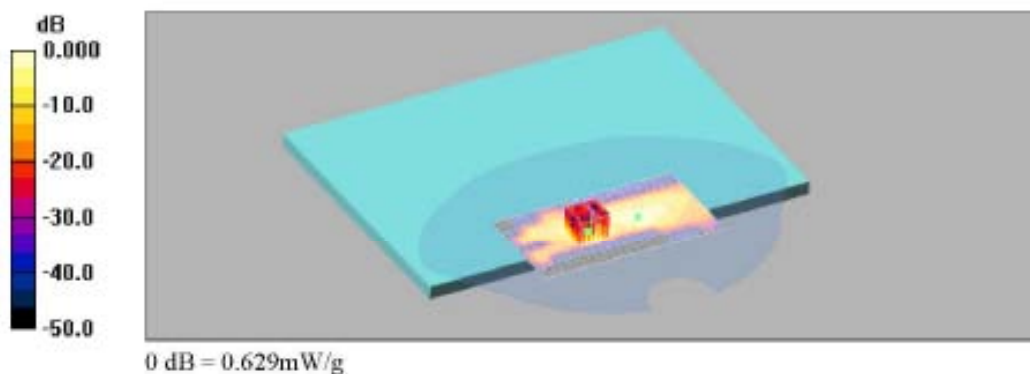
DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.79, 3.79, 3.79); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11nHT20_CH52_Base_MIMO ANT/Area Scan (81x151x1): Measurement grid:
 dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.549 mW/g

WLAN_11nHT20_CH52_Base_MIMO ANT/Zoom Scan (7x7x12)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm
 Reference Value = 4.69 V/m; Power Drift = 0.150 dB
 Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.281 mW/g; SAR(10 g) = 0.084 mW/g
 Maximum value of SAR (measured) = 0.629 mW/g



Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11nHT20_HT8_CH52_MIMO_ANT.da4](#)

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11n_U-NII Low); Frequency: 5260 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 5260 \text{ MHz}$; $\sigma = 5.28 \text{ mho/m}$; $\epsilon_r = 48.5$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

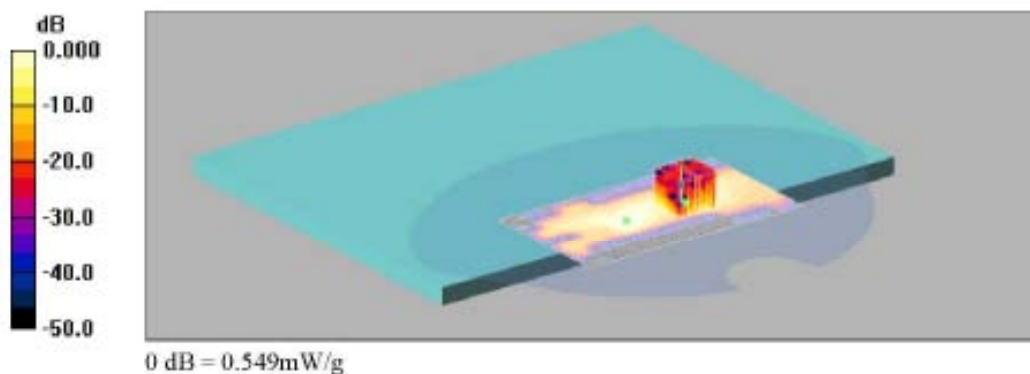
DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.79, 3.79, 3.79); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11nHT20_CH52_Base_MIMO ANT/Area Scan (81x151x1): Measurement grid:
 $dx=10\text{mm}$, $dy=10\text{mm}$
 Maximum value of SAR (interpolated) = 0.549 mW/g

WLAN_11nHT20_CH52_Base_MIMO ANT/Zoom Scan (7x7x12)/Cube 1:

Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
 Reference Value = 4.69 V/m; Power Drift = 0.150 dB
 Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.273 mW/g; SAR(10 g) = 0.079 mW/g
 Maximum value of SAR (measured) = 0.549 mW/g



Date: 2012-05-05

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Back Screen_11nHT20_HT8_CH52_MIMO ANT.da4](#)

Ambient Temp : 22.5 °C Tissue Temp : 21.9 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11n_U-NII Low); Frequency: 5260 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 5260 \text{ MHz}$; $\sigma = 5.28 \text{ mho/m}$; $\epsilon_r = 48.5$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

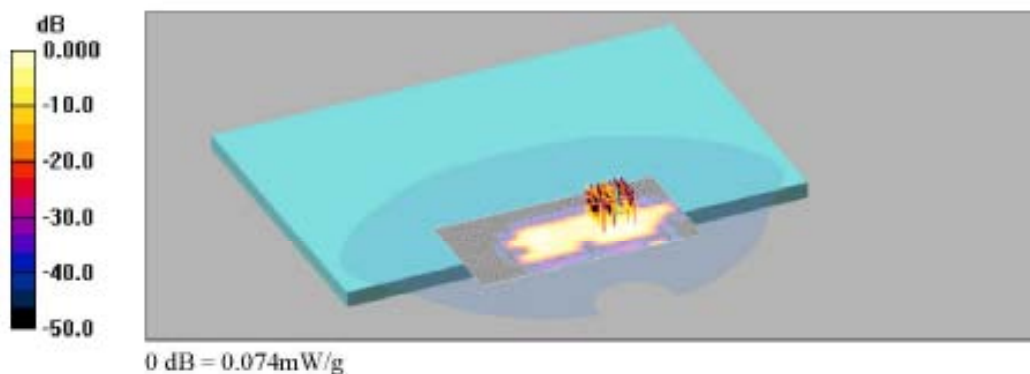
- Probe: EX3DV4 - SN3791; ConvF(3.79, 3.79, 3.79); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11nHT20_CH52_Back Screen_MIMO ANT/Area Scan (81x151x1):

Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 0.100 mW/g

WLAN_11nHT20_CH52_Back Screen_MIMO ANT/Zoom Scan (7x7x12)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm
 Reference Value = 2.13 V/m; Power Drift = 0.169 dB
 Peak SAR (extrapolated) = 0.131 W/kg
SAR(1 g) = 0.039 mW/g; SAR(10 g) = 0.014 mW/g
 Maximum value of SAR (measured) = 0.074 mW/g



5.5GHz WLAN Body SAR

Date: 2012-04-27

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11a_6Mbps_CH104_Main ANT.da4](#)

Ambient Temp : 22.8 °C Tissue Temp : 22.1 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11a_H or CEPT); Frequency: 5520 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5520$ MHz; $\sigma = 5.54$ mho/m; $\epsilon_r = 48.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.48, 3.48, 3.48); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH104_Base_Main ANT/Area Scan (81x151x1): Measurement grid:

$dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 1.16 mW/g

WLAN_11a_CH104_Base_Main ANT/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

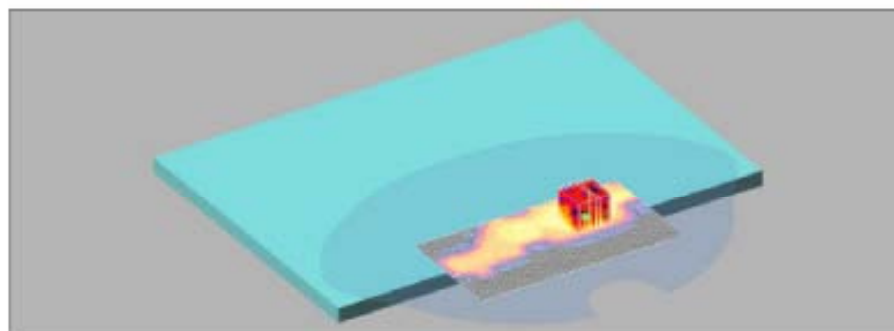
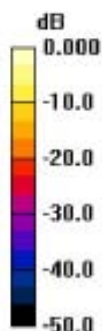
$dx=4$ mm, $dy=4$ mm, $dz=2$ mm

Reference Value = 2.76 V/m; Power Drift = 0.141 dB

Peak SAR (extrapolated) = 2.30 W/kg

SAR(1 g) = 0.472 mW/g; SAR(10 g) = 0.124 mW/g

Maximum value of SAR (measured) = 0.987 mW/g



0 dB = 0.987mW/g

Date: 2012-04-27

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11a_6Mbps_CH104_AUX ANT.da4](#)

Ambient Temp : 22.8 °C Tissue Temp : 22.1 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11a_H or CEPT); Frequency: 5520 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 5520 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.48, 3.48, 3.48); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH104_Base_AUX ANT/Area Scan (81x151x1): Measurement grid:

$dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.740 mW/g

WLAN_11a_CH104_Base_AUX ANT/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

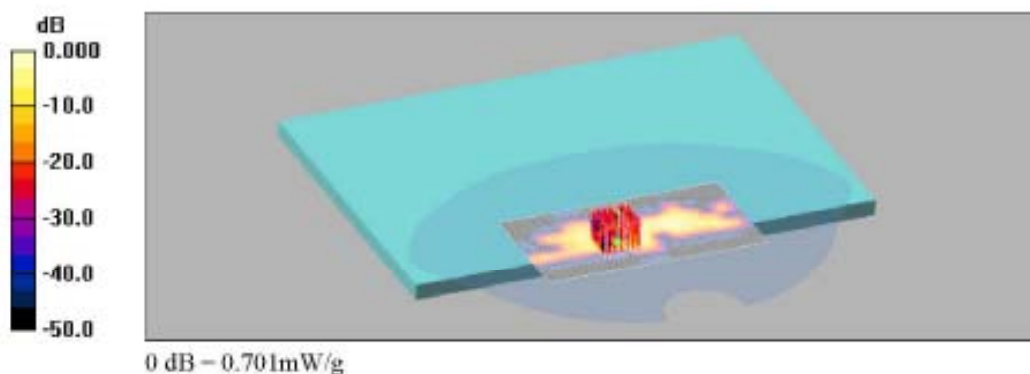
$dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 7.34 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 1.47 W/kg

SAR(1 g) = 0.291 mW/g; SAR(10 g) = 0.065 mW/g

Maximum value of SAR (measured) = 0.701 mW/g



Date: 2012-04-27

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11a_6Mbps_CH116_Main ANT.da4](#)

Ambient Temp : 22.8 °C Tissue Temp : 22.1 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

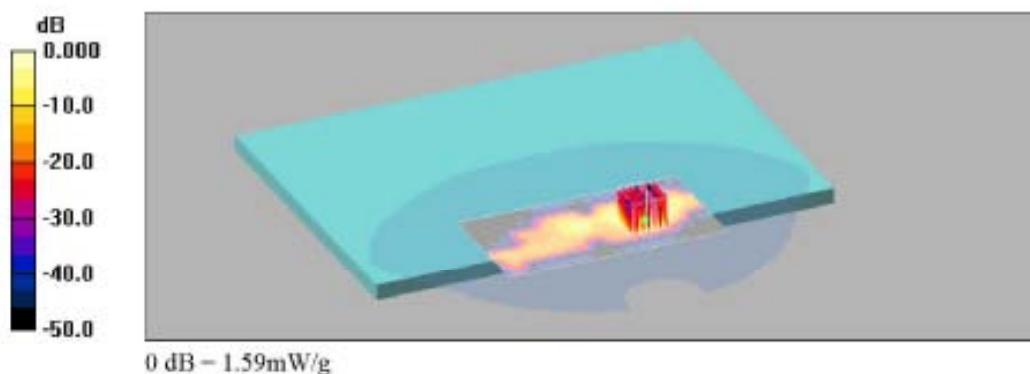
Communication System: WLAN(11a_H or CEPT); Frequency: 5580 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 5580 \text{ MHz}$; $\sigma = 5.63 \text{ mho/m}$; $\epsilon_r = 48.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.26, 3.26, 3.26); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH116_Base_Main ANT/Area Scan (81x151x1): Measurement grid:
 $dx=10\text{mm}$, $dy=10\text{mm}$
 Maximum value of SAR (interpolated) - 0.979 mW/g

WLAN_11a_CH116_Base_Main ANT/Zoom Scan (7x7x12)/Cube 0: Measurement grid:
 $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
 Reference Value = 3.27 V/m; Power Drift = -0.199 dB
 Peak SAR (extrapolated) = 3.49 W/kg
SAR(1 g) = 0.673 mW/g; SAR(10 g) = 0.160 mW/g
 Maximum value of SAR (measured) - 1.59 mW/g



Date: 2012-04-27

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: WLAN_Base_11a_6Mbps_CH116_AUX ANT.da4

Ambient Temp : 22.8 °C Tissue Temp : 22.1 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11a_H or CEPT); Frequency: 5580 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 5580 \text{ MHz}$; $\sigma = 5.63 \text{ mho/m}$; $\epsilon_r = 48.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.26, 3.26, 3.26); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH116_Base_AUX ANT/Area Scan (81x151x1): Measurement grid:

$dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.756 mW/g

WLAN_11a_CH116_Base_AUX ANT/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

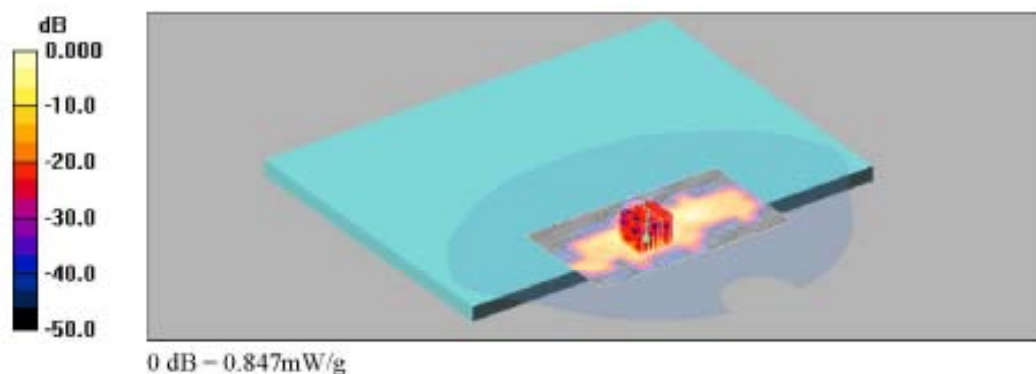
$dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 8.16 V/m; Power Drift = -0.160 dB

Peak SAR (extrapolated) = 1.78 W/kg

SAR(1 g) = 0.368 mW/g; SAR(10 g) = 0.088 mW/g

Maximum value of SAR (measured) = 0.847 mW/g



Date: 2012-04-27

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11a_6Mbps_CH124_Main ANT.da4](#)

Ambient Temp : 22.8 °C Tissue Temp : 22.1 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

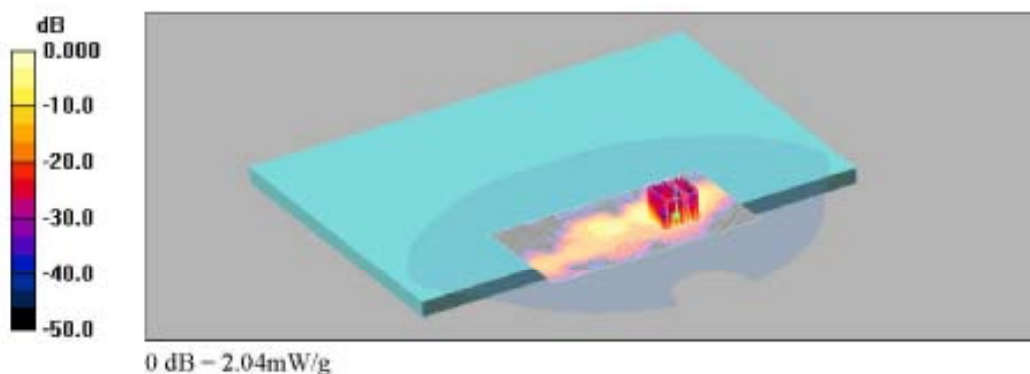
Communication System: WLAN(11a_H or CEPT); Frequency: 5620 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 5620 \text{ MHz}$; $\sigma = 5.67 \text{ mho/m}$; $\epsilon_r = 48.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.26, 3.26, 3.26); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH124_Base_Main ANT/Area Scan (81x151x1): Measurement grid:
 $dx=10\text{mm}$, $dy=10\text{mm}$
 Maximum value of SAR (interpolated) = 1.23 mW/g

WLAN_11a_CH124_Base_Main ANT/Zoom Scan (7x7x12)/Cube 0: Measurement grid:
 $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
 Reference Value = 3.51 V/m; Power Drift = -0.182 dB
 Peak SAR (extrapolated) = 4.43 W/kg
SAR(1 g) = 0.853 mW/g; SAR(10 g) = 0.201 mW/g
 Maximum value of SAR (measured) = 2.04 mW/g



Date: 2012-04-27

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: WLAN_Base_11a_6Mbps_CH124_AUX ANT.dat

Ambient Temp : 22.8 °C Tissue Temp : 22.1 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

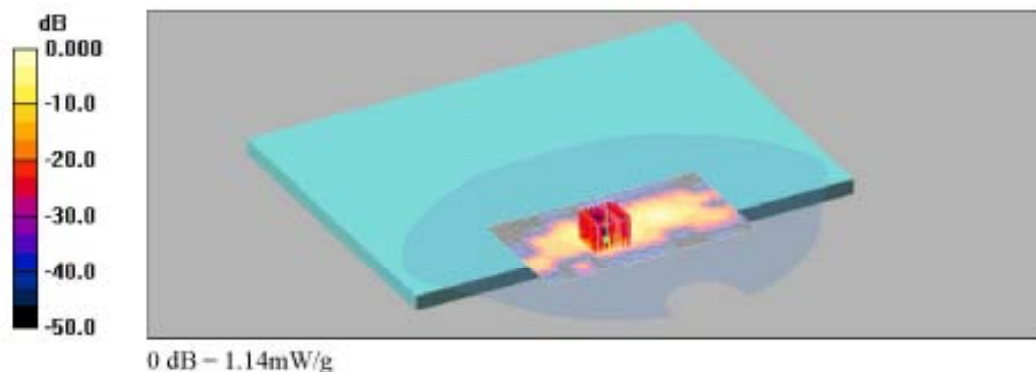
Communication System: WLAN(11a_H or CEPT); Frequency: 5620 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5620 \text{ MHz}$; $\sigma = 5.67 \text{ mho/m}$; $\epsilon_r = 48.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.26, 3.26, 3.26); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH124_Base_AUX ANT/Area Scan (81x151x1): Measurement grid:
 $dx=10\text{mm}$, $dy=10\text{mm}$
 Maximum value of SAR (interpolated) - 0.973 mW/g

WLAN_11a_CH124_Base_AUX ANT/Zoom Scan (7x7x12)/Cube 0: Measurement grid:
 $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
 Reference Value = 8.81 V/m; Power Drift = 0.008 dB
 Peak SAR (extrapolated) = 2.50 W/kg
SAR(1 g) = 0.474 mW/g; SAR(10 g) = 0.105 mW/g
 Maximum value of SAR (measured) - 1.14 mW/g



Date: 2012-04-27

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [WLAN_Base_11a_6Mbps_CH136_Main ANT.da4](#)

Ambient Temp : 22.8 °C Tissue Temp : 22.1 °C

DUT: 6235ANHMW(NP900X4C,NP900X4D); Type: Module(Note PC);
Serial:HR5591GC300038T
Program Name: WLAN_Body

Communication System: WLAN(11a_H or CEPT); Frequency: 5680 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 5680 \text{ MHz}$; $\sigma = 5.74 \text{ mho/m}$; $\epsilon_r = 48$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(3.26, 3.26, 3.26); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM MIC #2000-93 with CRP_Right; Type: SAM MIC #2000-93; Serial: TP-1300
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

WLAN_11a_CH136_Base_Main ANT/Area Scan (81x151x1): Measurement grid:
 $dx=10\text{mm}$, $dy=10\text{mm}$
 Maximum value of SAR (interpolated) = 1.66 mW/g

WLAN_11a_CH136_Base_Main ANT/Zoom Scan (7x7x12)/Cube 0: Measurement grid:
 $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
 Reference Value = 4.16 V/m; Power Drift = -0.060 dB
 Peak SAR (extrapolated) = 6.08 W/kg
SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.251 mW/g
 Maximum value of SAR (measured) = 2.64 mW/g

