

SAR TEST REPORT

Equipment Under Test	: IntelCentrino Advanced-N6230,abgn+BT Half Minicard
Model No.	: 62230ANHMW
Applicant	: Samsung Electronics Co., Ltd.
Address of Applicant	: 416, Maetan-dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, Korea
FCC ID	: A3L62230ANH
IC ID	: 649E-62230ANH
Device Category	: Portable Device
Exposure Category	: General Population / Uncontrolled Exposure
Date of Receipt	: 2012-03-08
Date of Test(s)	: 2012-04-02 ~ 2012-04-08
Date of Issue	: 2012-04-12
Max. SAR	: 0.228W/kg (WLAN_2.4 GHz), 0.463W/kg (WLAN_5.2 GHz) 0.398W/kg (WLAN_5.3 GHz), 0.605W/kg (WLAN_5.5 GHz) 1.43 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

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**  **2012-04-12**

Approved by : **Charles Kim**  **2012-04-12**

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APPENDIX

A. DASY4 SAR Report

B. Uncertainty Analysis

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1. General Information

1.1 Testing Laboratory

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1.2 Details of Applicant

Applicant : Samsung Electronics Co., Ltd.
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Phone No. : 82-31-277-4784

1.3 Version of Report

Version Number	Date	Revision
00	2012-04-12	Initial issue

1.4 Description of EUT(s)

EUT Type	IntelCentrino Advanced-N6230,abgn+BT Half Minicard
Model	62230ANHMW
FCC ID	A3L62230ANH
IC ID	649E-62230ANH
Serial Number	HSP991GC200041R
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	16.60 dB m (WLAN_2.4 GHz), 16.41 dB m (WLAN_5.2 GHz) 16.30 dB m (WLAN_5.3 GHz), 16.49 dB m (WLAN_5.5 GHz) 16.58 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	NP900X4B
Serial No.	HSP991GC200041R
Manufacturer	Samsung Electronics Co., Ltd.

1.8 EVALUATION PROCEDURES

- Power Reference Measurement Procedures

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 4 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties (for example, 2.7 mm for an ET3DV6 probe type).

- The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the Zoom Scan.
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. The generation of a high-resolution mesh within the measured volume
4. The interpolation of all measured values from the measurement grid to the high-resolution grid
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. The calculation of the averaged SAR within masses of 1 g and 10 g.

The probe is calibrated at the center of the dipole sensors that is located 1 mm to 2.7 mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within -2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1 % for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

The maximum search is automatically performed after each area scan measurement. It is based on splines in

two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1 g and 10 g peak evaluations are only available for the predefined cube 7x7x7 scans. The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30 g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume. In the last step, a 1 g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is moved around until the highest averaged SAR is found. If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

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 $SAR = \sigma (|E_i|^2) / \rho$ 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.

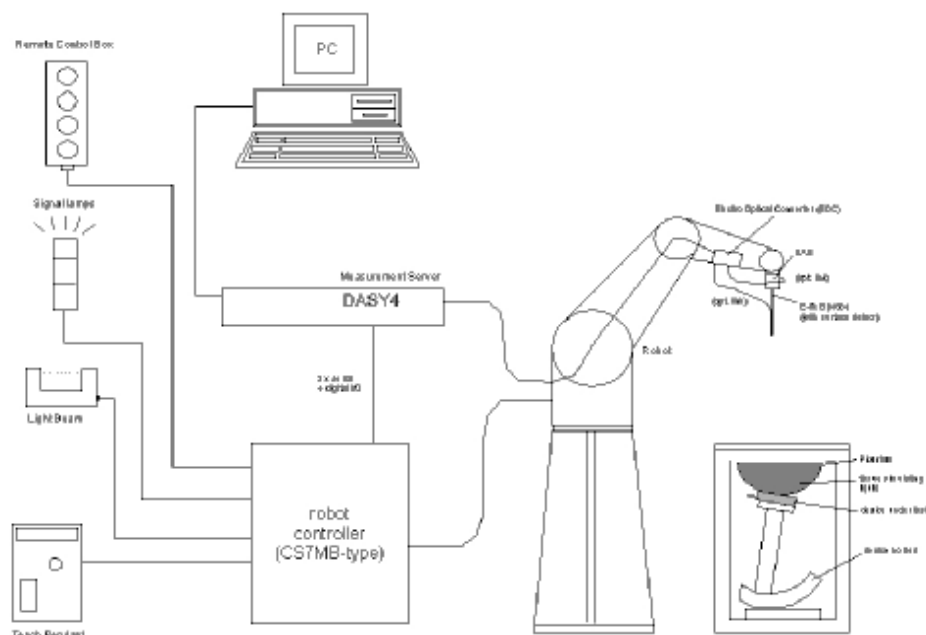


Fig a. The microwave circuit arrangement used for SAR system verification

- 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 μ 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 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 μ 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.

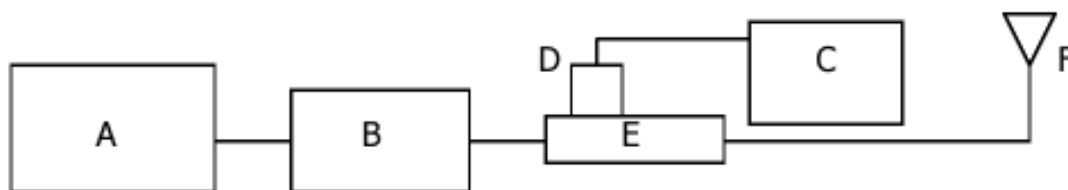


Fig b. The microwave circuit arrangement used for SAR system verification

- 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	5.67 W/kg	56.7 W/kg	5.98	2012-04-07	22.7
D5 GHz V2 S/N: 1023	5200 MHz Body	77.5 W/kg	7.89 W/kg	78.9 W/kg	1.81	2012-04-08	22.5
D5 GHz V2 S/N: 1106	5500 MHz Body	82.3 W/kg	8.68 W/kg	86.8 W/kg	5.47	2012-04-03	22.6
D5 GHz V2 S/N: 1106	5800 MHz Body	73.8 W/kg	7.77 W/kg	77.7 W/kg	5.28	2012-04-02	22.5

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(°C)
2450	Body	Measured, 2012-04-07	53.1	1.91	22.7
		Recommended Limits	52.7	1.95	21.0 ~ 23.0
		Deviation(%)	0.76	-2.05	-
5200	Body	Measured, 2012-04-08	48.2	5.44	22.5
		Recommended Limits	49.0	5.31	21.0 ~ 23.0
		Deviation(%)	-1.63	2.45	-
5500	Body	Measured, 2012-04-03	47.5	5.43	22.6
		Recommended Limits	48.6	5.66	21.0 ~ 23.0
		Deviation(%)	-2.26	-4.06	-
5800	Body	Measured, 2012-04-02	47.6	6.19	22.5
		Recommended Limits	48.2	6.01	21.0 ~ 23.0
		Deviation(%)	-1.24	3.00	-

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		5200-5800
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2	78.66
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04	0.0
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	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	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	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	10.67
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7	0.0
Diethylenglycol monohexylether	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.67

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 Tissue Parameters Check Results

2.45 GHz Body Parameters

Frequency(MHz)	e'	e''	Frequency(MHz)	e'	e''
2410	53.2404	1.86	2440	53.1574	1.90
2411	53.2396	1.86	2441	53.1534	1.90
2412	53.2334	1.86	2442	53.1497	1.90
2413	53.2323	1.86	2443	53.1486	1.90
2414	53.2300	1.86	2444	53.1435	1.90
2415	53.2277	1.87	2445	53.1411	1.91
2416	53.2227	1.87	2446	53.1356	1.91
2417	53.2216	1.87	2447	53.1348	1.91
2418	53.2195	1.87	2448	53.1276	1.91
2419	53.2176	1.87	2449	53.1249	1.91
2420	53.2144	1.87	2450	53.1215	1.91
2421	53.2125	1.88	2451	53.1172	1.91
2422	53.2092	1.88	2452	53.1153	1.91
2423	53.2070	1.88	2453	53.1137	1.91
2424	53.2049	1.88	2454	53.1069	1.91
2425	53.2014	1.88	2455	53.1025	1.92
2426	53.1980	1.88	2456	53.0999	1.92
2427	53.1932	1.88	2457	53.0966	1.92
2428	53.1948	1.89	2458	53.0919	1.92
2429	53.1922	1.89	2459	53.0883	1.92
2430	53.1868	1.89	2460	53.0827	1.92
2431	53.1821	1.89	2461	53.0805	1.92
2432	53.1823	1.89	2462	53.0775	1.93
2433	53.1798	1.89	2463	53.0708	1.93
2434	53.1723	1.89	2464	53.0689	1.93
2435	53.1715	1.89	2465	53.0663	1.93
2436	53.1691	1.90	2466	53.0604	1.93
2437	53.1666	1.90	2467	53.0554	1.93
2438	53.1612	1.90	2468	53.0517	1.93
2439	53.1568	1.90	2469	53.0470	1.93

5.2~5.3 GHz Body Parameters

Frequency(MHz)	e'	e''	Frequency(MHz)	e'	e''
5158	48.3161	5.40	5231	48.1162	5.49
5159	48.3181	5.40	5232	48.1153	5.49
5160	48.3177	5.40	5233	48.1115	5.49

5161	48.3187	5.40	5234	48.1089	5.49
5162	48.3193	5.40	5235	48.1068	5.49
5163	48.3201	5.40	5236	48.1041	5.49
5164	48.3210	5.40	5237	48.1016	5.49
5165	48.3207	5.40	5238	48.0989	5.49
5166	48.3199	5.40	5239	48.0958	5.49
5167	48.3200	5.40	5240	48.0931	5.50
5168	48.3180	5.40	5241	48.0904	5.50
5169	48.3170	5.40	5242	48.0882	5.50
5170	48.3134	5.40	5243	48.0862	5.50
5171	48.3115	5.40	5244	48.0839	5.50
5172	48.3091	5.40	5245	48.0818	5.50
5173	48.3070	5.40	5246	48.0805	5.51
5174	48.3046	5.40	5247	48.0783	5.51
5175	48.3024	5.40	5248	48.0767	5.51
5176	48.2990	5.40	5249	48.0753	5.51
5177	48.2950	5.40	5250	48.0745	5.51
5178	48.2909	5.41	5251	48.0728	5.51
5179	48.2901	5.41	5252	48.0730	5.52
5180	48.2852	5.41	5253	48.0717	5.52
5181	48.2814	5.41	5254	48.0707	5.52
5182	48.2770	5.41	5255	48.0700	5.52
5183	48.2708	5.41	5256	48.0698	5.52
5184	48.2681	5.41	5257	48.0694	5.52
5185	48.2658	5.41	5258	48.0696	5.52
5186	48.2635	5.41	5259	48.0698	5.52
5187	48.2585	5.41	5260	48.0688	5.53
5188	48.2565	5.41	5261	48.0682	5.53
5189	48.2531	5.42	5262	48.0677	5.53
5190	48.2491	5.42	5263	48.0702	5.53
5191	48.2461	5.42	5264	48.0713	5.53
5192	48.2417	5.42	5265	48.0719	5.53
5193	48.2384	5.42	5266	48.0716	5.53
5194	48.2350	5.42	5267	48.0729	5.53
5195	48.2320	5.43	5268	48.0723	5.53
5196	48.2290	5.43	5269	48.0722	5.53
5197	48.2258	5.43	5270	48.0710	5.53
5198	48.2230	5.43	5271	48.0701	5.53

5199	48.2184	5.43	5272	48.0703	5.54
5200	48.2147	5.44	5273	48.0702	5.54
5201	48.2114	5.44	5274	48.0687	5.54
5202	48.2081	5.44	5275	48.0664	5.54
5203	48.2039	5.44	5276	48.0645	5.54
5204	48.2009	5.44	5277	48.0635	5.54
5205	48.1979	5.44	5278	48.0611	5.54
5206	48.1956	5.44	5279	48.0590	5.54
5207	48.1909	5.44	5280	48.0563	5.54
5208	48.1887	5.45	5281	48.0538	5.54
5209	48.1867	5.45	5282	48.0499	5.54
5210	48.1827	5.45	5283	48.0478	5.54
5211	48.1793	5.45	5284	48.0454	5.54
5212	48.1762	5.45	5285	48.0416	5.54
5213	48.1723	5.45	5286	48.0379	5.54
5214	48.1696	5.45	5287	48.0327	5.54
5215	48.1657	5.46	5288	48.0306	5.54
5216	48.1619	5.46	5289	48.0265	5.54
5217	48.1596	5.46	5290	48.0246	5.54
5218	48.1572	5.46	5291	48.0205	5.54
5219	48.1550	5.46	5292	48.0172	5.55
5220	48.1506	5.47	5293	48.0144	5.55
5221	48.1478	5.47	5294	48.0110	5.55
5222	48.1446	5.47	5295	48.0069	5.55
5223	48.1410	5.47	5296	48.0029	5.55
5224	48.1370	5.47	5297	47.9990	5.55
5225	48.1351	5.47	5298	47.9986	5.56
5226	48.1320	5.47	5299	47.9971	5.56
5227	48.1290	5.47	5300	47.9942	5.57
5228	48.1246	5.48			
5229	48.1226	5.48			
5230	48.1194	5.49			

5.5 GHz Body Parameters

Frequency(MHz)	e'	e''	Frequency(MHz)	e'	e''
5500	47.5155	5.43	5606	47.3464	5.53
5501	47.5147	5.43	5607	47.3448	5.53
5502	47.5118	5.43	5608	47.3390	5.53
5503	47.5114	5.43	5609	47.3315	5.53
5504	47.5056	5.44	5610	47.3244	5.53
5505	47.4959	5.44	5611	47.3202	5.53
5506	47.4859	5.43	5612	47.3185	5.53
5507	47.4796	5.43	5613	47.3178	5.53
5508	47.4758	5.43	5614	47.3184	5.53
5509	47.4726	5.43	5615	47.3168	5.53
5510	47.4734	5.43	5616	47.3146	5.54
5511	47.4724	5.43	5617	47.3089	5.54
5512	47.4694	5.43	5618	47.2999	5.54
5513	47.4636	5.43	5619	47.2922	5.54
5514	47.4541	5.43	5620	47.2882	5.55
5515	47.4445	5.43	5621	47.2854	5.55
5516	47.4366	5.43	5622	47.2837	5.55
5517	47.4323	5.43	5623	47.2813	5.55
5518	47.4338	5.43	5624	47.2811	5.55
5519	47.4348	5.43	5625	47.2795	5.55
5520	47.4355	5.44	5626	47.2777	5.55
5521	47.4352	5.44	5627	47.2756	5.56
5522	47.4322	5.44	5628	47.2738	5.56
5523	47.4282	5.44	5629	47.2715	5.56
5524	47.4223	5.44	5630	47.2692	5.57
5525	47.4174	5.45	5631	47.2675	5.57
5526	47.4172	5.45	5632	47.2648	5.57
5527	47.4197	5.45	5633	47.2617	5.57
5528	47.4218	5.45	5634	47.2579	5.57
5529	47.4216	5.45	5635	47.2562	5.57
5530	47.4192	5.45	5636	47.2525	5.57
5531	47.4149	5.45	5637	47.2508	5.58
5532	47.4101	5.45	5638	47.2492	5.58
5533	47.4055	5.45	5639	47.2501	5.58
5534	47.4030	5.45	5640	47.2521	5.58

5535	47.4038	5.45	5641	47.2529	5.59
5536	47.4060	5.46	5642	47.2529	5.59
5537	47.4095	5.46	5643	47.2526	5.59
5538	47.4099	5.46	5644	47.2515	5.59
5539	47.4098	5.46	5645	47.2509	5.60
5540	47.4059	5.46	5646	47.2490	5.60
5541	47.3995	5.46	5647	47.2485	5.61
5542	47.3937	5.46	5648	47.2505	5.61
5543	47.3901	5.46	5649	47.2531	5.61
5544	47.3880	5.46	5650	47.2526	5.62
5545	47.3901	5.46	5651	47.2503	5.62
5546	47.3915	5.46	5652	47.2493	5.62
5547	47.3957	5.47	5653	47.2465	5.61
5548	47.3979	5.47	5654	47.2446	5.61
5549	47.4010	5.47	5655	47.2432	5.61
5550	47.4004	5.48	5656	47.2405	5.62
5551	47.3960	5.48	5657	47.2391	5.62
5552	47.3901	5.48	5658	47.2352	5.63
5553	47.3833	5.48	5659	47.2323	5.63
5554	47.3787	5.48	5660	47.2306	5.64
5555	47.3760	5.48	5661	47.2310	5.64
5556	47.3748	5.48	5662	47.2310	5.64
5557	47.3763	5.48	5663	47.2308	5.64
5558	47.3804	5.48	5664	47.2315	5.64
5559	47.3814	5.48	5665	47.2287	5.64
5560	47.3806	5.48	5666	47.2237	5.64
5561	47.3751	5.48	5667	47.2169	5.65
5562	47.3694	5.48	5668	47.2095	5.65
5563	47.3625	5.48	5669	47.2053	5.65
5564	47.3587	5.48	5670	47.2047	5.65
5565	47.3575	5.48	5671	47.2057	5.66
5566	47.3616	5.48	5672	47.2081	5.66
5567	47.3665	5.49	5673	47.2121	5.66
5568	47.3712	5.49	5674	47.2155	5.67
5569	47.3702	5.49	5675	47.2167	5.67
5570	47.3659	5.49	5676	47.2152	5.67
5571	47.3600	5.49	5677	47.2122	5.67
5572	47.3537	5.49	5678	47.2078	5.68

5573	47.3501	5.49	5601	47.3509	5.52
5574	47.3503	5.49	5602	47.3485	5.52
5575	47.3516	5.49	5603	47.3457	5.52
5576	47.3551	5.50	5604	47.3460	5.53
5577	47.3596	5.50	5605	47.3467	5.53
5578	47.3608	5.50	5679	47.2034	5.68
5579	47.3583	5.50	5680	47.2001	5.67
5580	47.3558	5.51	5681	47.1968	5.67
5581	47.3529	5.51	5682	47.1957	5.66
5582	47.3512	5.51	5683	47.1995	5.66
5583	47.3505	5.51	5684	47.2026	5.66
5584	47.3512	5.51	5685	47.2061	5.67
5585	47.3543	5.51	5686	47.2071	5.68
5586	47.3556	5.51	5687	47.2021	5.68
5587	47.3570	5.51	5688	47.1980	5.68
5588	47.3561	5.51	5689	47.1921	5.68
5589	47.3567	5.51	5690	47.1863	5.68
5590	47.3566	5.51	5691	47.1816	5.68
5591	47.3562	5.51	5692	47.1794	5.68
5592	47.3558	5.52	5693	47.1818	5.68
5593	47.3583	5.52	5694	47.1853	5.69
5594	47.3589	5.52	5695	47.1856	5.69
5595	47.3595	5.52	5696	47.1842	5.68
5596	47.3589	5.52	5697	47.1775	5.68
5597	47.3588	5.52	5698	47.1656	5.66
5598	47.3583	5.52	5699	47.1513	5.65
5599	47.3560	5.52	5700	47.1383	5.64
5600	47.3520	5.52			

5.8 GHz Body Parameters

Frequency(MHz)	e'	e''	Frequency(MHz)	e'	e''
5701	47.8260	6.06	5784	47.6339	6.16
5702	47.8271	6.06	5785	47.6320	6.17
5703	47.8260	6.06	5786	47.6300	6.17
5704	47.8257	6.06	5787	47.6281	6.17
5705	47.8233	6.06	5788	47.6246	6.17
5706	47.8228	6.06	5791	47.6188	6.17
5707	47.8204	6.06	5792	47.6169	6.17
5708	47.8181	6.06	5793	47.6144	6.17

5709	47.8167	6.06	5794	47.6138	6.17
5710	47.8152	6.06	5795	47.6126	6.17
5711	47.8117	6.06	5796	47.6116	6.18
5712	47.8087	6.06	5797	47.6105	6.18
5713	47.8056	6.07	5798	47.6099	6.18
5714	47.8031	6.07	5799	47.6079	6.18
5715	47.8009	6.07	5800	47.6086	6.19
5716	47.7968	6.07	5801	47.6086	6.19
5717	47.7919	6.07	5802	47.6074	6.19
5718	47.7884	6.07	5803	47.6060	6.19
5719	47.7862	6.07	5804	47.6067	6.19
5720	47.7832	6.07	5805	47.6084	6.20
5721	47.7802	6.07	5806	47.6082	6.20
5722	47.7755	6.07	5807	47.6076	6.20
5723	47.7719	6.07	5808	47.6070	6.20
5724	47.7679	6.08	5809	47.6063	6.20
5725	47.7651	6.08	5810	47.6069	6.20
5726	47.7608	6.08	5811	47.6054	6.20
5727	47.7569	6.08	5812	47.6049	6.20
5728	47.7539	6.08	5813	47.6029	6.20
5729	47.7495	6.08	5814	47.6019	6.20
5730	47.7472	6.08	5815	47.6002	6.20
5731	47.7439	6.09	5816	47.5998	6.20
5732	47.7405	6.09	5817	47.5967	6.20
5733	47.7387	6.09	5818	47.5954	6.20
5734	47.7372	6.09	5819	47.5942	6.20
5735	47.7345	6.09	5820	47.5918	6.20
5736	47.7323	6.09	5821	47.5889	6.20
5737	47.7298	6.10	5822	47.5853	6.20
5738	47.7299	6.10	5823	47.5830	6.20
5739	47.7281	6.10	5824	47.5799	6.21
5740	47.7254	6.10	5825	47.5773	6.22
5741	47.7232	6.10	5826	47.5763	6.22
5742	47.7213	6.10	5827	47.5703	6.22
5743	47.7200	6.11	5828	47.5682	6.22
5744	47.7188	6.11	5829	47.5649	6.22
5745	47.7167	6.12	5830	47.5622	6.22
5746	47.7156	6.12	5831	47.5604	6.22
5747	47.7141	6.12	5832	47.5567	6.22
5748	47.7124	6.12	5833	47.5543	6.22

5749	47.7110	6.12	5775	47.6574	6.14
5750	47.7103	6.12	5776	47.6545	6.14
5751	47.7088	6.12	5777	47.6538	6.14
5752	47.7076	6.12	5778	47.6504	6.15
5753	47.7062	6.12	5779	47.6476	6.15
5754	47.7047	6.12	5780	47.6440	6.15
5755	47.7028	6.13	5781	47.6426	6.15
5756	47.7013	6.13	5782	47.6393	6.15
5757	47.6986	6.13	5783	47.6369	6.15
5758	47.6976	6.13	5834	47.5526	6.22
5759	47.6957	6.13	5835	47.5492	6.22
5760	47.6929	6.13	5836	47.5459	6.22
5761	47.6919	6.13	5837	47.5434	6.22
5762	47.6909	6.13	5838	47.5403	6.22
5763	47.6882	6.13	5839	47.5371	6.23
5764	47.6862	6.13	5840	47.5338	6.23
5765	47.6838	6.14	5841	47.5317	6.23
5766	47.6820	6.14	5842	47.5301	6.23
5767	47.6793	6.14	5843	47.5268	6.23
5768	47.6766	6.14	5844	47.5269	6.23
5769	47.6745	6.13	5845	47.5242	6.23
5770	47.6717	6.14	5846	47.5221	6.24
5771	47.6683	6.14	5847	47.5200	6.24
5772	47.6657	6.14	5848	47.5183	6.24
5773	47.6643	6.14	5849	47.5165	6.24
5774	47.6607	6.14	5850	47.5140	6.24

1.14 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

1.15 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

Manufacturer	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 14, 2012
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	<u>16.44</u>	<u>16.60</u>
	2437	6	1	<u>16.33</u>	<u>15.23</u>
	2462	11	1	<u>16.41</u>	<u>16.03</u>
802.11n HT20	2412	1	HT0	13.44	12.35
	2437	6	HT0	16.40	16.66
	2462	11	HT0	12.21	12.60
802.11n HT40	2422	3	HT0	10.67	9.48
	2437	6	HT0	13.61	12.83
	2452	9	HT0	10.30	10.25
802.11g	2412	1	6	13.97	13.73
	2437	6	6	16.54	16.46
	2462	11	6	13.79	13.57
802.11n HT20_MIMO	2412	1	HT8	11.34	11.45
	2437	6	HT8	<u>13.08</u>	<u>12.77</u>
	2462	11	HT8	11.30	10.35
802.11n HT40_MIMO	2422	3	HT8	7.19	6.81
	2437	6	HT8	<u>12.35</u>	<u>12.28</u>
	2452	9	HT8	6.85	6.36

Note :

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

Please refer to original report (FCC ID: PD962230ANH and PD962230ANHU) for Average Power information as documented in 10/21/2010 original filing.

5.2 GHz

Mode	Freq. (MHz)	Ch. #	Rate	Measured Power [dB m]	
				Main	AUX
802.11a	5180	36	6	<u>16.17</u>	<u>16.13</u>
	5200	40	6	15.78	16.07
	5220	44	6	15.63	<u>15.87</u>
	5240	48	6	<u>15.77</u>	15.37
802.11n HT20	5180	36	HT0	15.65	16.00
	5200	40	HT0	16.41	15.86
	5220	44	HT0	16.27	15.72
	5240	48	HT0	16.35	15.59
802.11n HT40	5190	38	HT7	12.48	12.96
	5230	46	HT7	16.27	15.57
802.11n HT20_MIMO	5180	36	HT8	<u>13.31</u>	<u>13.15</u>
	5200	40	HT8	12.87	13.04
	5220	44	HT8	12.87	12.96
	5240	48	HT8	12.89	12.52
802.11n HT40_MIMO	5190	38	HT8	10.45	11.20
	5230	46	HT8	<u>13.41</u>	<u>13.18</u>

Note :

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

Please refer to original report (FCC ID: PD962230ANH and PD962230ANHU) for Average Power information as documented in 10/21/2010 original filing.

5.3 GHz

Mode	Freq. (MHz)	Ch. #	Rate	Measured Power [dB m]	
				Main	AUX
802.11a	5260	52	6	<u>15.88</u>	15.35
	5280	56	6	15.44	<u>15.55</u>
	5300	60	6	<u>16.25</u>	<u>15.63</u>
	5320	64	6	16.07	15.51
802.11n HT20	5260	52	HT0	16.01	15.21
	5280	56	HT0	15.99	14.99
	5300	60	HT0	16.15	15.49
	5320	64	HT0	16.30	15.54
802.11n HT40	5270	54	HT7	16.11	15.51
	5310	62	HT7	11.66	12.60
802.11n HT20_MIMO	5260	52	HT8	13.12	12.32
	5280	56	HT8	12.71	12.24
	5300	60	HT8	<u>13.28</u>	<u>12.94</u>
	5320	64	HT8	13.24	12.79
802.11n HT40_MIMO	5270	54	HT8	<u>12.33</u>	<u>12.79</u>
	5310	62	HT8	12.06	12.23

Note :

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

Please refer to original report (FCC ID: PD962230ANH and PD962230ANHU) for Average Power information as documented in 10/21/2010 original filing.

5.5 GHz

Mode	Freq. (MHz)	Ch. #	Rate	Measured Power [dB m]	
				Main	AUX
802.11a	5500	100	6	16.01	15.38
	5520	104	6	<u>16.30</u>	<u>15.52</u>
	5540	108	6	16.11	15.29
	5560	112	6	16.26	15.67
	5580	116	6	<u>16.46</u>	<u>15.87</u>
	5600	120	6	16.18	15.45
	5620	124	6	<u>16.27</u>	<u>15.55</u>
	5640	128	6	16.08	15.31
	5660	132	6	<u>16.10</u>	15.61
	5680	136	6	16.00	<u>15.75</u>
	5700	140	6	<u>16.16</u>	15.36
802.11n HT20	5500	100	HT0	16.25	15.30
	5520	104	HT0	16.22	15.39
	5540	108	HT0	16.12	15.26
	5560	112	HT0	16.14	15.15
	5580	116	HT0	16.15	15.37
	5600	120	HT0	16.32	15.42
	5620	124	HT0	16.26	15.53
	5640	128	HT0	16.12	15.32
	5660	132	HT0	16.24	15.60
	5680	136	HT0	15.96	15.68
	5700	140	HT0	16.15	15.89
802.11n HT40	5510	102	HT7	15.27	14.93
	5550	110	HT7	16.49	15.72
	5590	118	HT7	16.17	15.80

Mode	Freq. (MHz)	Ch. #	Rate	Measured Power [dB m]	
				Main	AUX
802.11n HT20_MIMO	5500	100	HT8	<u>12.88</u>	<u>13.38</u>
	5520	104	HT8	12.50	13.22
	5540	108	HT8	12.40	13.12
	5560	112	HT8	12.40	12.85
	5580	116	HT8	12.76	13.31
	5600	120	HT8	12.58	13.00
	5620	124	HT8	12.38	12.78
	5640	128	HT8	12.21	12.94
	5660	132	HT8	12.53	12.11
	5680	136	HT8	12.22	12.25
802.11n HT40_MIMO	5700	140	HT8	12.05	12.52
	5510	102	HT8	13.15	12.90
	5550	110	HT8	<u>13.26</u>	<u>13.03</u>
	5590	118	HT8	12.90	12.98
	5630	126	HT8	12.42	12.62
	5670	134	HT8	12.42	12.74

Note :

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

Please refer to original report (FCC ID: PD962230ANH and PD962230ANHU) for Average Power information as documented in 10/21/2010 original filing.

5.8 GHz

Mode	Freq. (MHz)	Ch. #	Rate	Measured Power [dB m]	
				Main	AUX
802.11a	5745	149	6	<u>16.49</u>	<u>16.62</u>
	5765	153	6	16.45	<u>16.45</u>
	5785	157	6	<u>16.48</u>	16.33
	5805	161	6	16.27	<u>16.39</u>
	5825	165	6	<u>16.53</u>	16.32
802.11n HT20	5745	149	HT0	16.51	16.32
	5765	153	HT0	16.43	16.21
	5785	157	HT0	16.42	15.94
	5805	161	HT0	16.19	15.78
	5825	165	HT0	16.37	15.96
802.11n HT40	5630	126	HT7	16.26	15.51
	5670	134	HT7	16.57	15.61
	5755	151	HT7	16.64	16.40
	5795	159	HT7	16.41	16.58
11n_20 MIMO	5745	149	HT8	<u>13.82</u>	<u>13.67</u>
	5765	153	HT8	13.78	13.11
	5785	157	HT8	13.75	13.62
	5805	161	HT8	13.59	13.08
	5825	165	HT8	13.58	13.67
11n_40 MIMO	5755	151	HT8	<u>13.27</u>	<u>13.44</u>
	5795	159	HT8	13.19	13.37

Note :

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

Please refer to original report (FCC ID: PD962230ANH and PD962230ANHU) for Average Power information as documented in 10/21/2010 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 closet 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				✓	
	5.700	140					•
	5.745	149		✓		✓	
	5.765	153	152 (5.76 GHz)		•		•
	5.785	157		✓			•
	5.805	161	160 (5.80 GHz)		•	✓	
	5.825	165		✓			

- ✓ = "default test channels"
- = possible 802.11a channels with maximum average output > the "default test channels"
- ▽ = possible 802.11g 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)	22.7
Liquid Temperature (°C)	22.7
Date	2012-04-07

Mode	Freq. (MHz)	Ch. #	Rate	Position	Measured Power [dB m]		SAR 1g (W/kg)	
					Main	AUX	Main	AUX
802.11b	2412	1	1	Base	16.44	16.60	0.082	0.116
	2437	6	1		16.33	15.23	0.115	0.079
	2462	11	1		16.41	16.03	0.117	0.103
	2462	11	1	Back Screen	16.41		0.008	
	2412	1	1			16.60		0.011
802.11n HT20 MIMO	2437	6	HT8	Base	13.08	12.77	0.228	
802.11n HT40 MIMO	2437	6	HT8		12.35	12.28	0.203	
802.11n HT20 MIMO	2437	6	HT8	Back Screen	13.08	12.77	0.008	

<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 (assume 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.

5.2 GHz Body Test

Ambient Temperature (°C)	22.5
Liquid Temperature (°C)	22.5
Date	2012-04-08

Mode	Freq. (MHz)	Ch. #	Rate	Position	Measured Power [dB m]		Cube	SAR 1g (W/kg)	
					Main	AUX			
802.11a	5180	36	6	Base	16.17	16.13	0	0.370	0.463
	5220	44	6			15.87	0		0.431
	5240	48	6		15.77		0	0.211	
	5180	36	6	Back Screen	16.17		0	0.059	
	5180	36	6			16.13	0		0.114
802.11n HT20_MIMO	5180	36	HT8	Base	13.31	13.15	0	0.241	
							1	0.230	
802.11n HT40_MIMO	5230	46	HT8		13.41	13.18	0	0.241	
802.11n HT40_MIMO	5230	46	HT8	Back Screen	13.41	13.18	0	0.056	

<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 (assume 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.

5.3 GHz Body Test

Ambient Temperature (°C)	22.5
Liquid Temperature (°C)	22.5
Date	2012-04-08

Mode	Freq. (MHz)	Ch. #	Rate	Position	Measured Power [dB m]		SAR 1g (W/kg)	
					Main	AUX		
802.11a	5260	52	6	Base	15.88		0.253	
	5280	56	6			15.55		0.398
	5300	60	6		16.25	15.63	0.252	0.366
	5260	52	6	Back Screen	15.88		0.050	
	5280	56	6			15.55		0.102
802.11n HT20_MIMO	5300	60	HT8	Base	13.28	12.94	0.167	
802.11n HT40_MIMO	5270	54	HT8		12.33	12.79	0.201	
802.11n HT40_MIMO	5270	54	HT8	Back Screen	12.33	12.79	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 (assume 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.

5.5 GHz Body Test

Ambient Temperature (°C)	22.6
Liquid Temperature (°C)	22.6
Date	2012-04-03

Mode	Freq. (MHz)	Ch. #	Rate	Position	Measured Power [dB m]		SAR 1g (W/kg)	
					Main	AUX	Main	AUX
802.11a	5520	104	6	Base	16.30	15.52	0.268	0.193
	5580	116	6		16.46	15.87	0.357	0.236
	5620	124	6		16.27	15.55	0.424	0.266
	5660	132	6		16.10		0.529	
	5680	136	6			15.75		0.605
	5700	140	6		16.16		0.543	
	5680	136	6	Back Screen		15.75		0.142
	5700	140	6		16.16		0.133	
802.11n HT20 MIMO	5500	100	HT8	Base	12.88	13.38	0.170	
802.11n HT40 MIMO	5550	110	HT8		13.26	13.03	0.166	
802.11n HT20 MIMO	5500	100	HT8	Back Screen	12.88	13.38	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 (assume 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.

5.8 GHz Body Test

Ambient Temperature (°C)	22.5
Liquid Temperature (°C)	22.5
Date	2012-04-02

Mode	Freq. (MHz)	Ch. #	Rate	Position	Measured Power [dB m]		Cube	SAR 1g (W/kg)	
					Main	AUX		Main	AUX
802.11a	5745	149	6	Base	16.49	16.62	0	0.783	1.400
	5765	153	6			16.45	0		1.410
	5785	157	6		16.48		0	0.846	
	5805	161	6			16.39	0		1.430
	5825	165	6		16.53		0	0.975	
	5745	149	6	Back Screen		16.62	0		0.280
	5825	165	6		16.53		0	0.258	
802.11n HT20 MIMO	5745	149	HT8	Base	13.82	13.67	0	0.502	
							1	0.474	
802.11n HT40 MIMO	5755	151	HT8		13.27	13.44	0	0.477	
							1	0.510	
802.11n HT20 MIMO	5755	151	HT8	Back Screen	13.82	13.67	0	0.147	

<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 (assume 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.

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



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Appendix A

Test Plot - DASY4 Report

2450 MHz Validation Test_Body

Date: 2012-04-07

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

Input Power: 100 mW

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; $\sigma = 1.91$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(3.94, 3.94, 3.94); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (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 2450 MHz_Body/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 6.56 mW/g

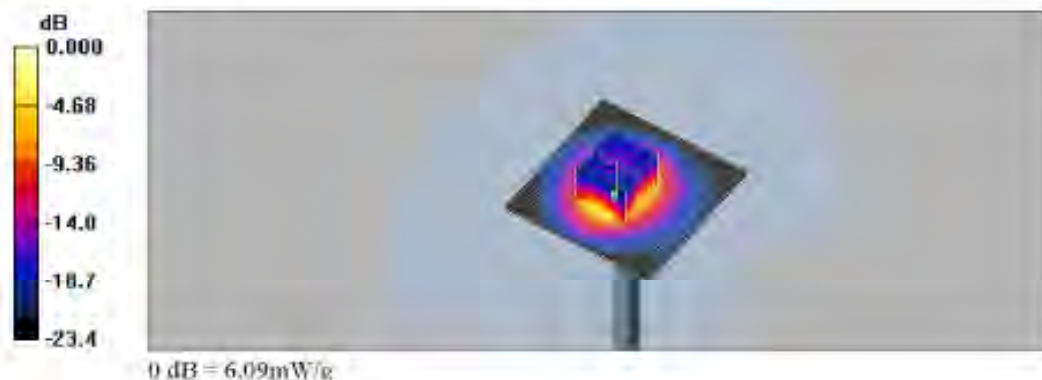
Validation 2450 MHz_Body/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.0 V/m; Power Drift = -0.018 dB

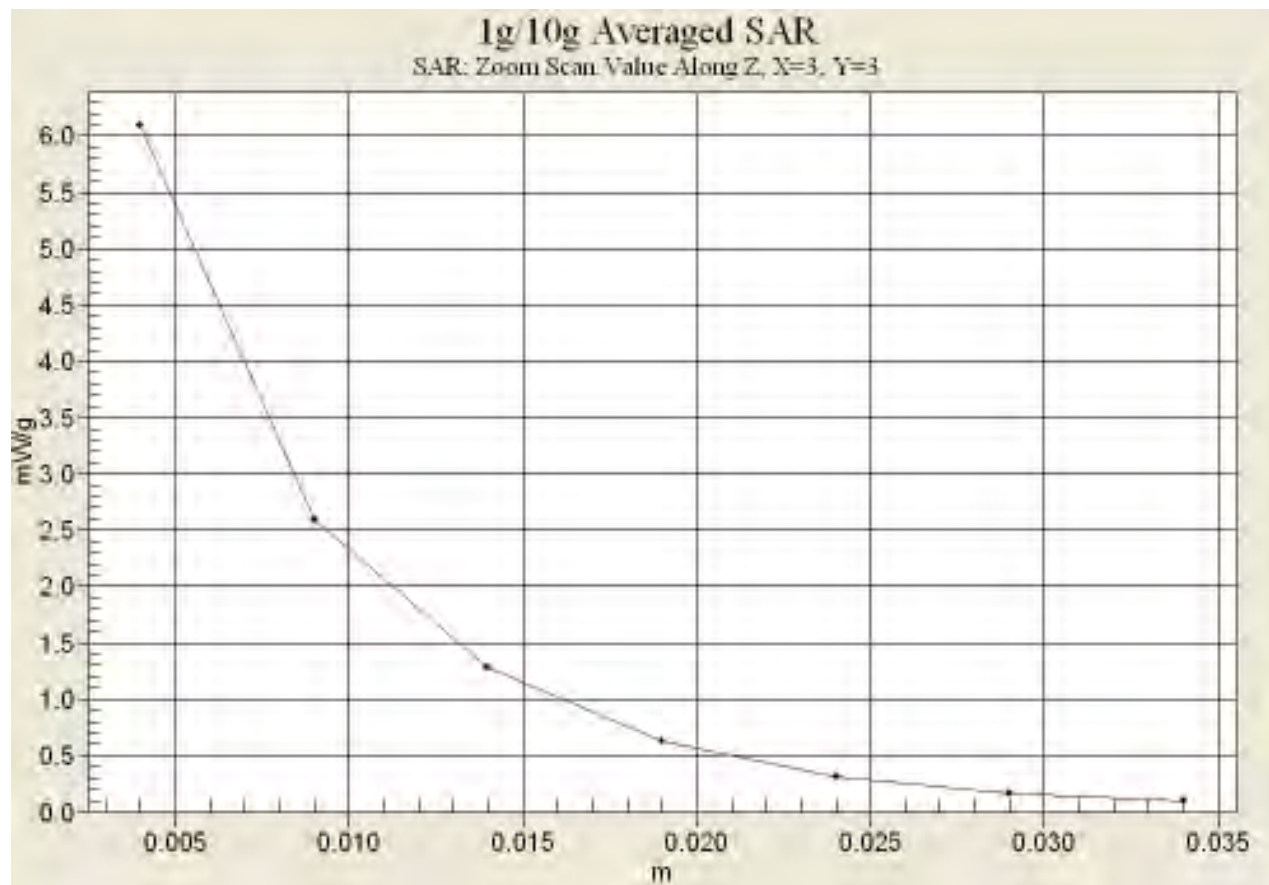
Peak SAR (extrapolated) = 15.3 W/kg

SAR(1 g) = 5.67 mW/g; SAR(10 g) = 2.46 mW/g

Maximum value of SAR (measured) = 6.09 mW/g



Z-Scan



5200 MHz Validation Test_Body

Date: 2012-04-08

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: [Validation_5200_MHz_Body.dat](#)

Input Power : 100 mW

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; $\sigma = 5.44$ mho/m; $\epsilon_r = 48.2$; $\rho = 1000$ kg/m³

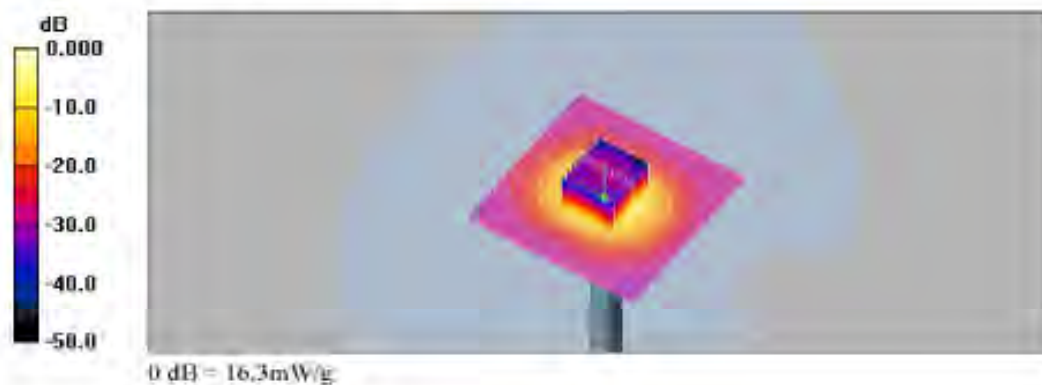
Phantom section: Flat Section

DASY4 Configuration:

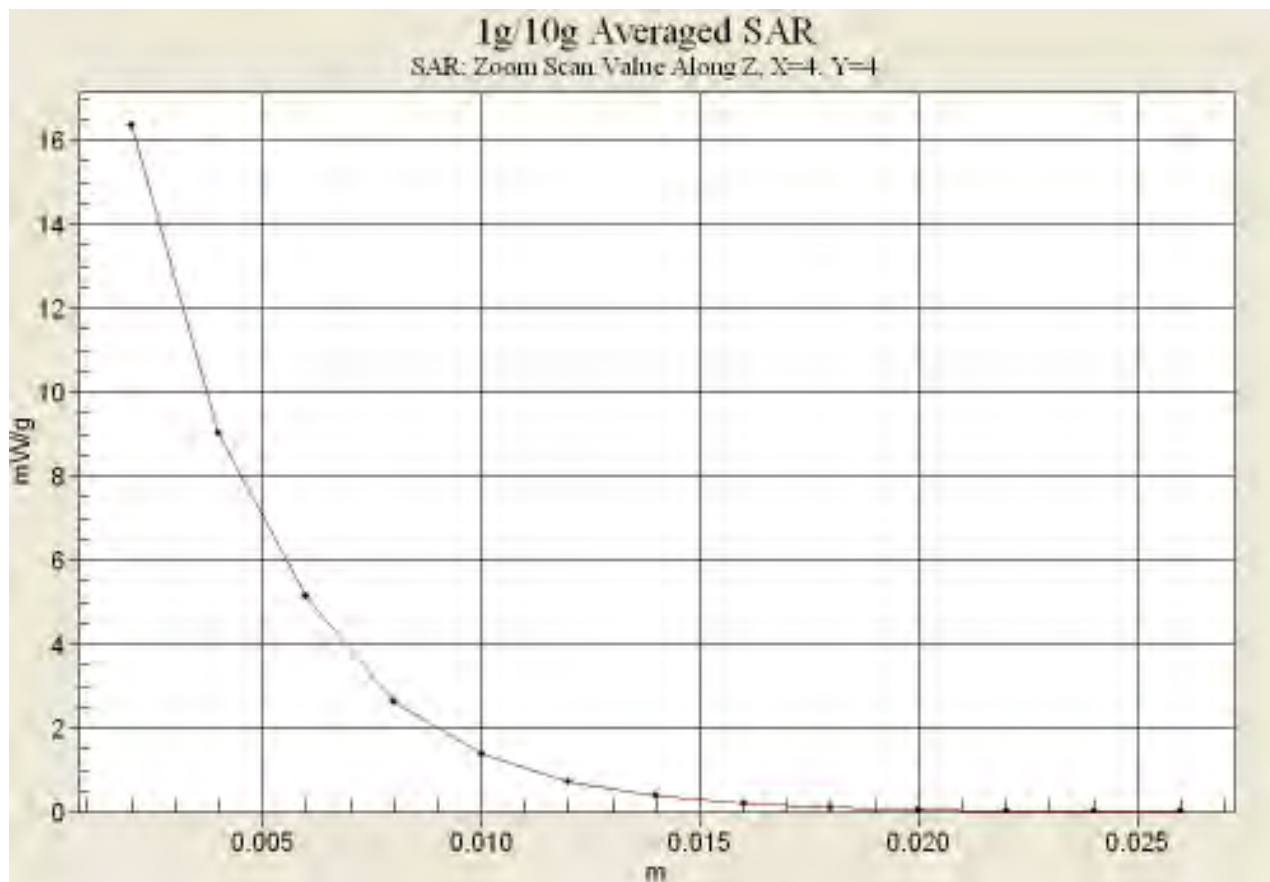
- Probe: EX3DV4 - SN3791; ConvF(3.96, 3.96, 3.96); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Validation/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 17.1 mW/g

Validation/Zoom Scan (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
 Reference Value = 49.9 V/m; Power Drift = 0.039 dB
 Peak SAR (extrapolated) = 31.9 W/kg
SAR(1 g) = 7.89 mW/g; SAR(10 g) = 2.22 mW/g
 Maximum value of SAR (measured) = 16.3 mW/g



Z-Scan



5500 MHz Validation Test_Body

Date: 2012-04-03

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: Validation_5500_MHz_Body.dad

Input Power : 100 mW

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

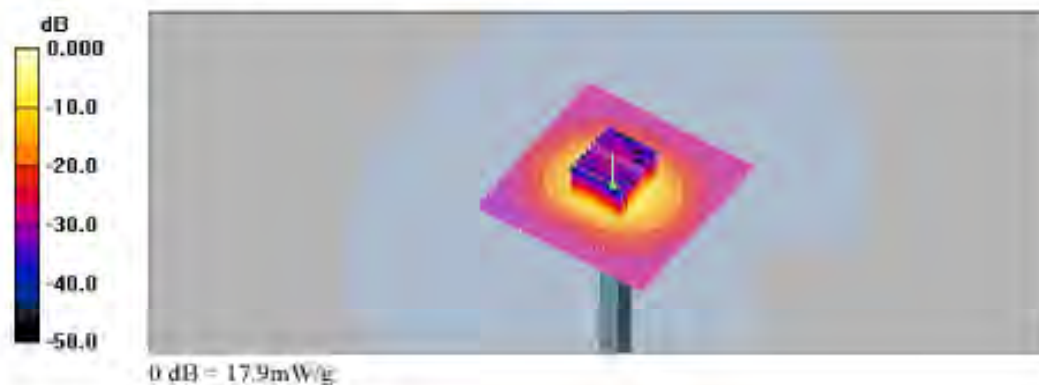
Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5500$ MHz; $\sigma = 5.43$ mho/m; $\epsilon_r = 47.5$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY4 Configuration:

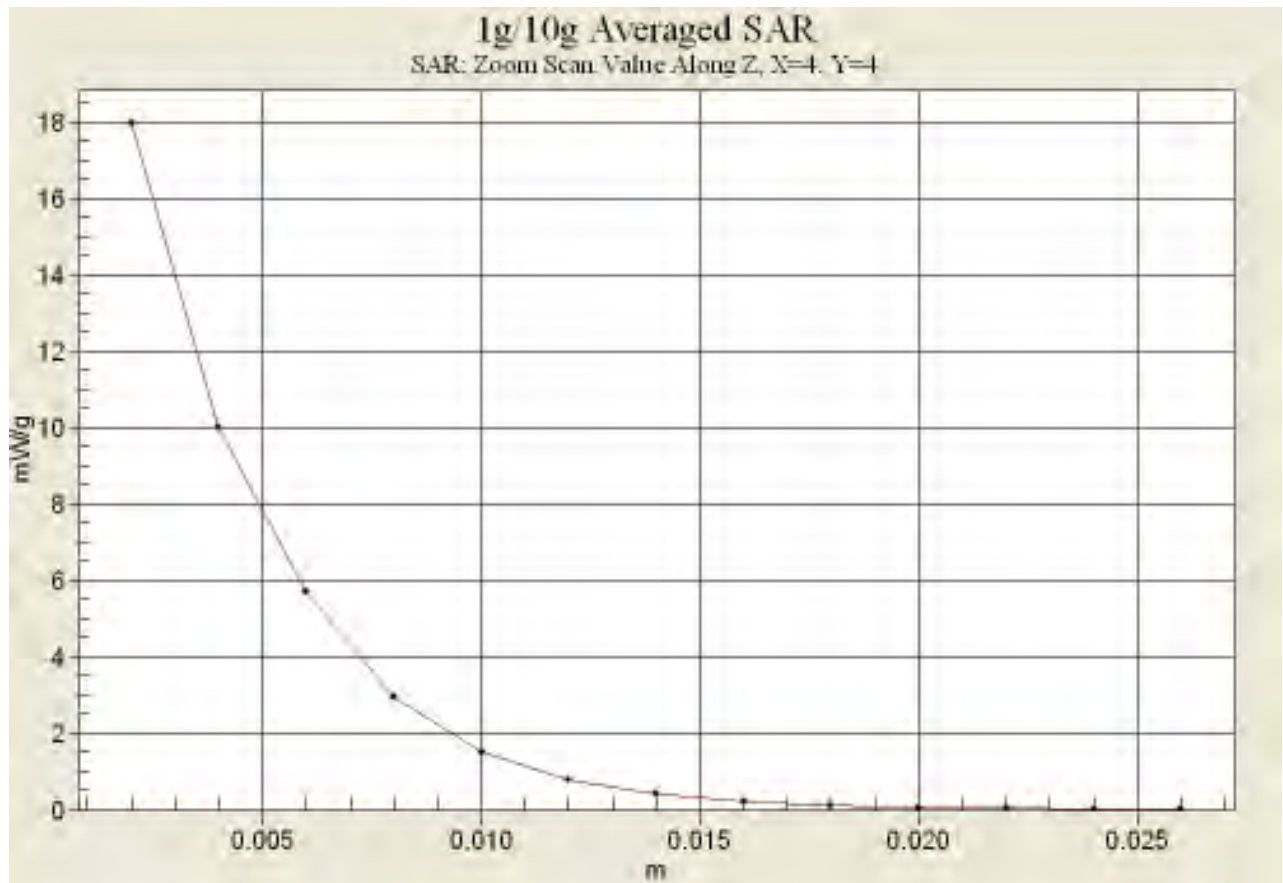
- Probe: EX3DV4 - SN3791; ConvF(3.48, 3.48, 3.48); Calibrated: 2011-06-21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn567; Calibrated: 2012-01-20
- Phantom: SAM with CRP_2011(left); Type: SAM; Serial: TP-1645
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Validation/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
 Maximum value of SAR (interpolated) = 18.5 mW/g

Validation/Zoom Scan (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
 Reference Value = 53.2 V/m; Power Drift = -0.106 dB
 Peak SAR (extrapolated) = 34.4 W/kg
SAR(1 g) = 8.68 mW/g; SAR(10 g) = 2.45 mW/g
 Maximum value of SAR (measured) = 17.9 mW/g



Z Scan



5800 MHz Validation Test_Body

Date: 2012-04-02

Test Laboratory: SGS Korea (Gunpo Laboratory)
 File Name: Validation 5800 MHz_Body.dad

Input Power : 100 mW

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

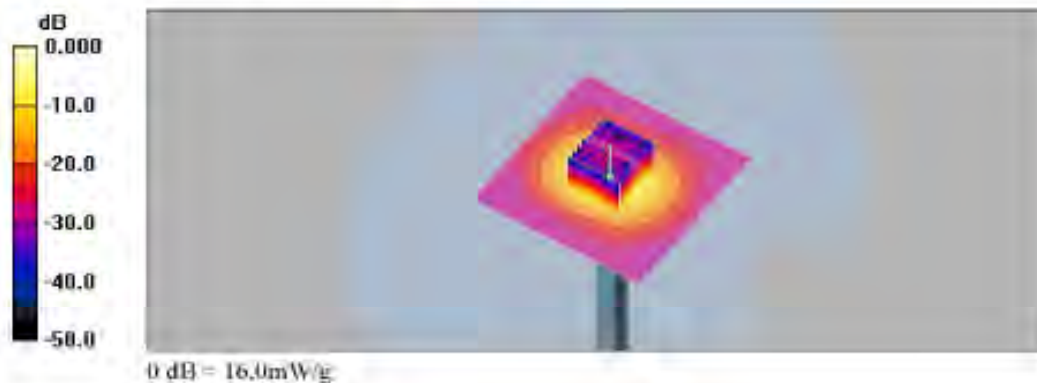
Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 5800$ MHz; $\sigma = 6.19$ mho/m; $\epsilon_r = 47.6$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

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 with CRP_2011(left); Type: SAM; Serial: TP-1645
- 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) = 16.2 mW/g

Validation/Zoom Scan (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
 Reference Value = 47.0 V/m; Power Drift = 0.045 dB
 Peak SAR (extrapolated) = 30.7 W/kg
SAR(1 g) = 7.77 mW/g; SAR(10 g) = 2.18 mW/g
 Maximum value of SAR (measured) = 16.0 mW/g



Z-Scan



2.45 GHz WLAN Body SAR

Date: 2012-04-07

Test Laboratory: SGS Korea (Gimpo Laboratory)
 File Name: WLAN_Base_11b_1Mbps_CBI_Main ANT.dsf

DUT: 62230ANIMW; Type: Module(Note PC); Serial: HSP991GC200041R
 Program Name: WLAN_Body

Communication System: WLAN; Frequency: 2412 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2412$ MHz; $\sigma = 1.86$ mho/m; $\epsilon_r = 53.2$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(3.94, 3.94, 3.94); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (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_11b_Low_Base_Main ANT/Area Scan (101x141x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.084 mW/g

WLAN_11b_Low_Base_Main ANT/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

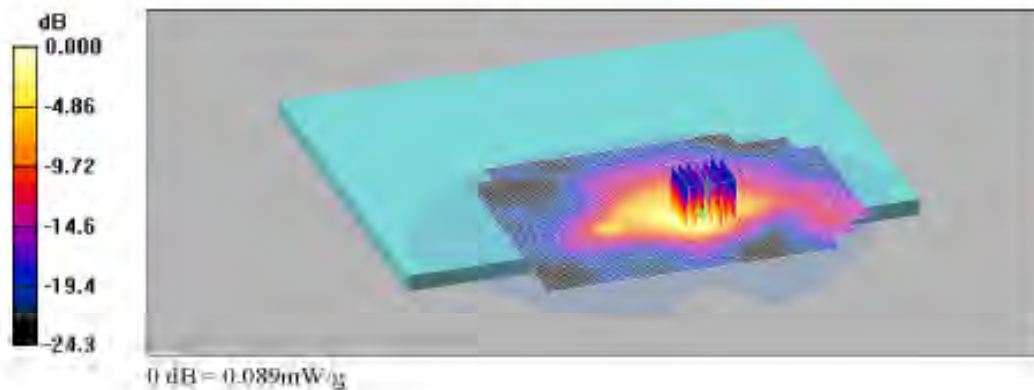
dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.25 V/m; Power Drift = -0.057 dB

Peak SAR (extrapolated) = 0.236 W/kg

SAR(1 g) = 0.082 mW/g; SAR(10 g) = 0.036 mW/g

Maximum value of SAR (measured) = 0.089 mW/g



Date: 2012-04-07

Test Laboratory: SGS Korea (Gimpo Laboratory)
 File Name: WLAN_Base_11b_1Mbps_CH6_Main ANT.diel

DUT: 62230ANIMW; Type: Module(Note PC); Serial: HSP991GC200041R
Program Name: WLAN_Body

Communication System: WLAN; Frequency: 2437 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2437 \text{ MHz}$; $\sigma = 1.9 \text{ mho/m}$; $\epsilon_r = 53.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(3.94, 3.94, 3.94); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (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_11b_Mid_Base_Main ANT/Area Scan (101x141x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 0.111 mW/g

WLAN_11b_Mid_Base_Main ANT/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

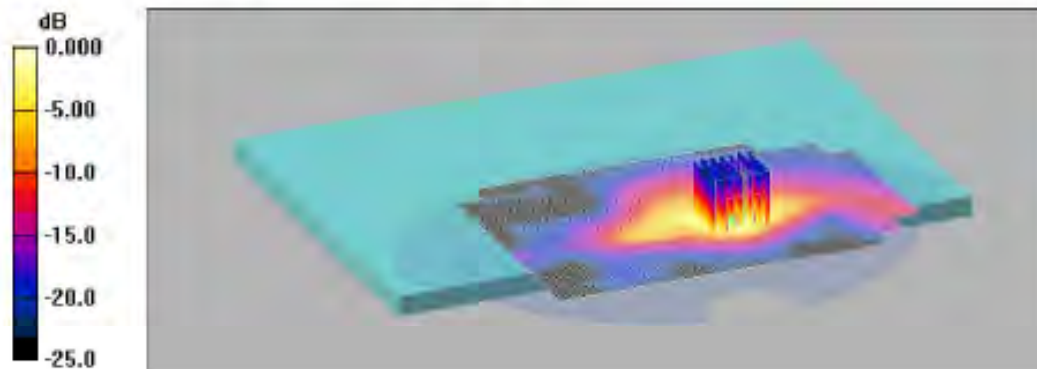
$dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 3.90 V/m; Power Drift = 0.380 dB

Peak SAR (extrapolated) = 0.339 W/kg

SAR(1 g) = 0.115 mW/g; SAR(10 g) = 0.049 mW/g

Maximum value of SAR (measured) = 0.125 mW/g



0 dB = 0.125mW/g

Date: 2012-04-07

Test Laboratory: SGS Korea (Gimpo Laboratory)
 File Name: WLAN_Base_11b_1Mbps_CH11_Main ANT.da4

DUT: 62230ANIMW; Type: Module(Note PC); Serial: HSP991GC200041R
Program Name: WLAN_Body

Communication System: WLAN; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.93 \text{ mho/m}$; $\epsilon_r = 53.1$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(3.94, 3.94, 3.94); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (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_11b_High_Base_Main ANT/Area Scan (101x141x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 0.125 mW/g

WLAN_11b_High_Base_Main ANT/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

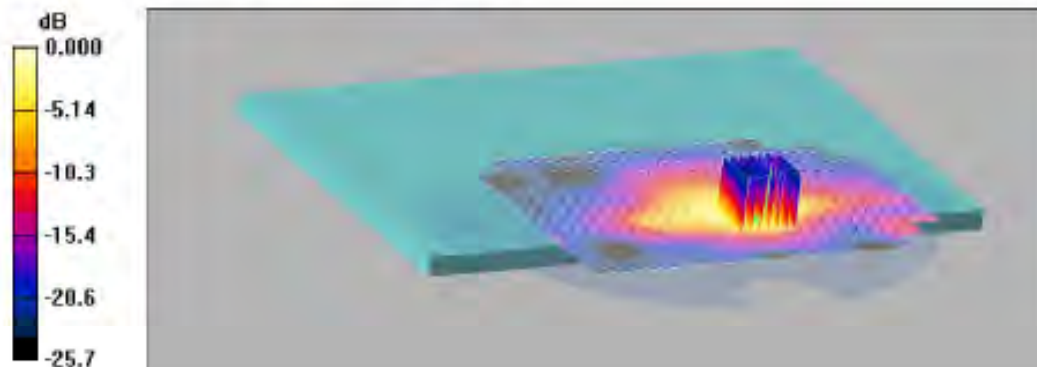
$dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.83 V/m; Power Drift = -0.335 dB

Peak SAR (extrapolated) = 0.350 W/kg

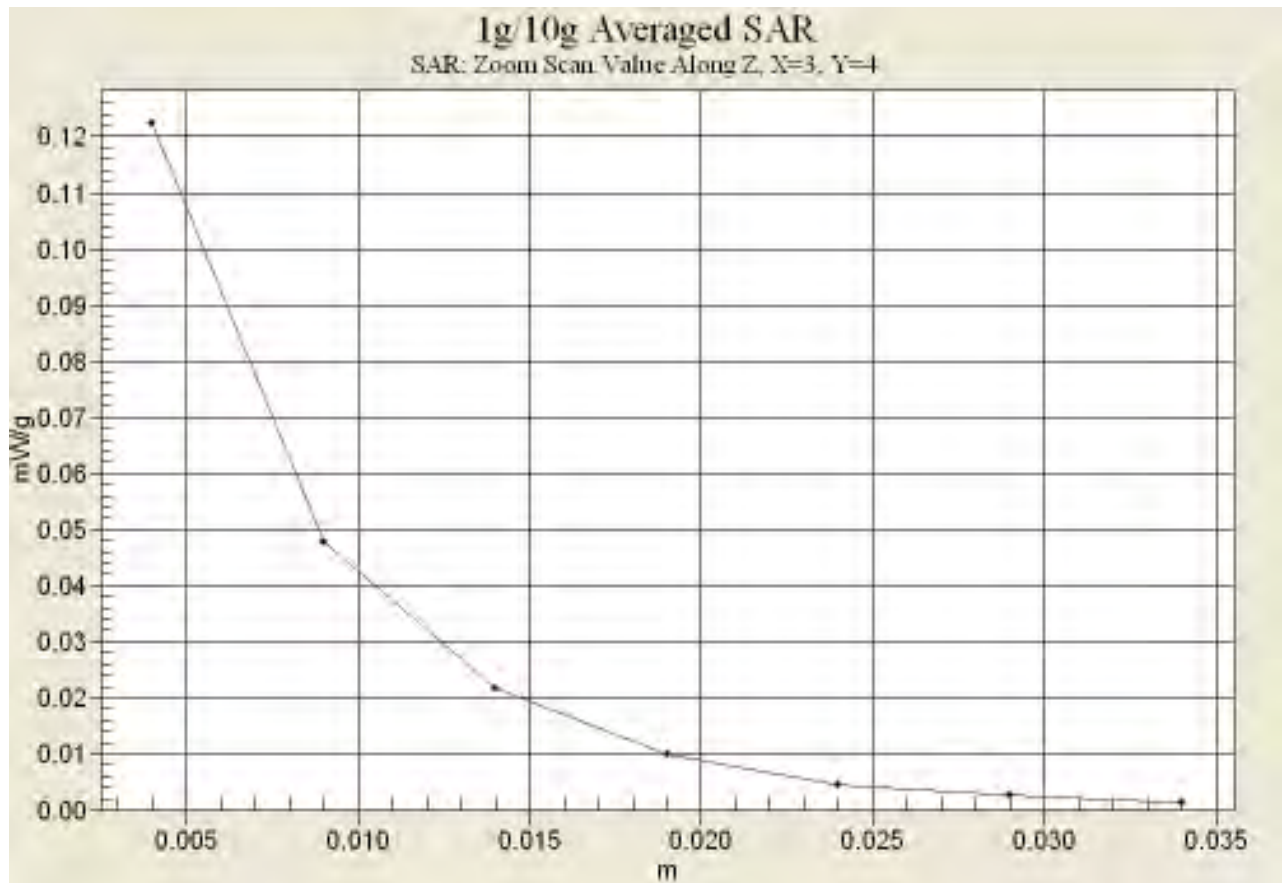
SAR(1 g) = 0.117 mW/g; SAR(10 g) = 0.050 mW/g

Maximum value of SAR (measured) = 0.122 mW/g



0 dB = 0.122mW/g

Z-Scan



Date: 2012-04-07

Test Laboratory: SGS Korea (Gimpo Laboratory)
 File Name: WLAN_Base_11b_1Mbps_CH1_AUX ANT.dae

DUT: 62230ANIMW; Type: Module(Note PC); Serial: HSP991GC200041R
Program Name: WLAN_Body

Communication System: WLAN; Frequency: 2412 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 2412 \text{ MHz}$; $\sigma = 1.86 \text{ mho/m}$; $\epsilon_r = 53.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1782; ConvF(3.94, 3.94, 3.94); Calibrated: 2011-04-14
- Sensor-Surface: 4mm (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_11b_Low_Base_AUX ANT/Area Scan (101x141x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 0.124 mW/g

WLAN_11b_Low_Base_AUX ANT/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

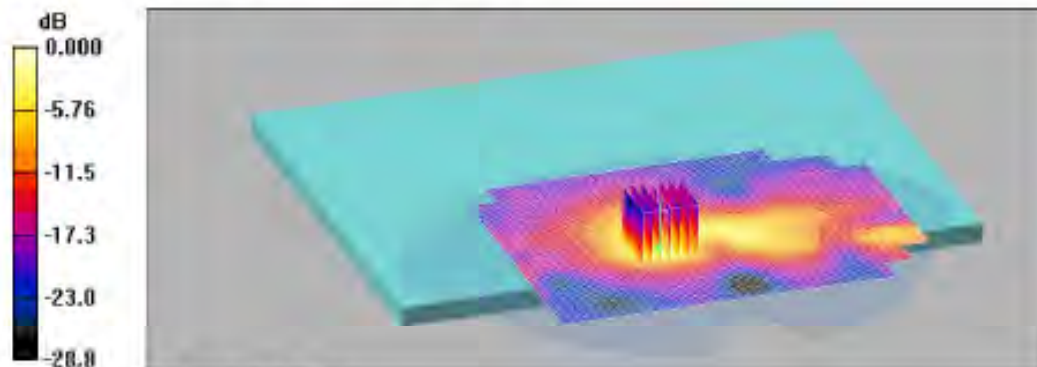
$dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.92 V/m; Power Drift = 0.135 dB

Peak SAR (extrapolated) = 0.376 W/kg

SAR(1 g) = 0.116 mW/g; SAR(10 g) = 0.048 mW/g

Maximum value of SAR (measured) = 0.122 mW/g



0 dB = 0.122mW/g