

SAR TEST REPORT

HCT CO., LTD

EUT Type:	1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN		
FCC ID:	A3LGTN7108	Model:	GT-N7108
Date of Issue:	Oct.10, 2012		
Test report No.:	HCTA1210FS02		
Test Laboratory:	HCT CO., LTD. 105-1, Jangam-ri, Majang-myeon, Icheon-si, Gyeonggi-do, Korea 467-811 TEL: +82 31 645 6300 FAX: +82 31 645 6401		
Applicant :	SAMSUNG Electronics Co., Ltd. 416 Maetan3-Dong, YeongTong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742		
Testing has been carried out in accordance with:	RSS-102 Issue 4; Health Canada Safety Code 6 47CFR §2.1093 FCC OET Bulletin 65(Edition 97-01), Supplement C (Edition 01-01) ANSI/ IEEE C95.1 – 1992 IEEE 1528-2003		
Test result:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		
Max SAR	Band	1g SAR (W/kg)	
		Head	Body-worn
	GSM1900	0.122	0.994
	802.11b	0.068	0.213
	802.11a/n	0.098	0.361
			Hotspot
			1.01
			0.213
			-
Simultaneous SAR per KDB 690783 D01		0.220	1.355
			1.207
Signature	Report prepared by : Young-Soo Jang Test Engineer of SAR Part Approved by : Jae-Sang So Manager of SAR Part		

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1. INTRODUCTION

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). 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 NCRP, 1986, Bethesda, MD 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.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.

$$SAR = \frac{d}{dt} \left(\frac{dU}{dm} \right) = \frac{d}{dt} \left(\frac{dU}{\rho dV} \right)$$

Figure 2. SAR Mathematical Equation

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \sigma E^2 / \rho$$

where:

σ	=	conductivity of the tissue-simulant material (S/m)
ρ	=	mass density of the tissue-simulant material (kg/m ³)
E	=	Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

2. DESCRIPTION OF DEVICE

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

EUT Type:	1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
FCC ID:	A3LGTN7108
Model:	GT-N7108
Trade Name	SAMSUNG Electronics Co., Ltd.
Application Type	Certification
Mode(s) of Operation	GSM1900/ 802.11Aa/b/g/n
Tx Frequency	1 850.20 – 1 909.80 MHz (GSM1900) 2 412 – 2462 MHz (WLAN) 802.11a/n: 5180-5240MHz/ 5260-5320 MHz/ 5500-5700 MHz/ 5745-5825 MHz
Rx Frequency	1 930.20 – 1 989.80 MHz (GSM1900) 2 412 – 2462 MHz (WLAN) 802.11a/n: 5180-5240MHz/ 5260-5320 MHz/ 5500-5700 MHz/ 5745-5825 MHz
FCC Classification	Licensed Portable Transmitter Held to Ear (PCE)
Production Unit or Identical Prototype	Prototype
Date(s) of Tests	Oct. 4, 2012 ~ Oct. 7, 2012
Antenna Type	Integral Antenna
GPRS	Multislot Class: 33, Mode Class: B
Key Feature(s)	This device support Mobile Hotspot.

3. DESCRIPTION OF TEST EQUIPMENT

3.1 SAR MEASUREMENT SETUP

These measurements are performed using the DASY4 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Staubli), robot controller, Pentium III computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Figure.3.1).

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the HP Pentium IV 3.0 GHz computer with Windows XP system and SAR Measurement Software DASY4, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

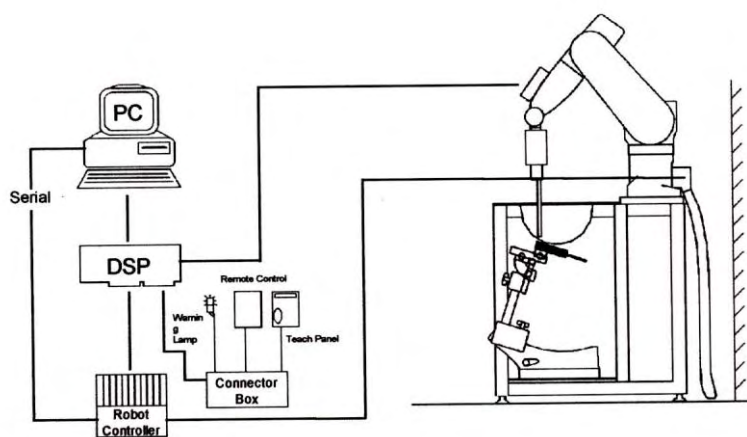


Figure 3.1 HCT SAR Lab. Test Measurement Set-up

The DAE4 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in.

3.2 DASY E-FIELD PROBE SYSTEM

3.2.1 ET3DV6 Probe Specification

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection System Built-in shielding against static charges
Calibration	In air from 10 MHz to 2.5 GHz In brain and muscle simulating tissue at Frequencies of 450 MHz, 900 MHz and 1.8 GHz (accuracy: 8 %)
Frequency	10 MHz to > 3 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 probe axis)
Dynamic	5 μ W/g to > 100 mW/g;
Range Linearity:	± 0.2 dB
Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces.
Dimensions	Overall length: 337 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 dissymmetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

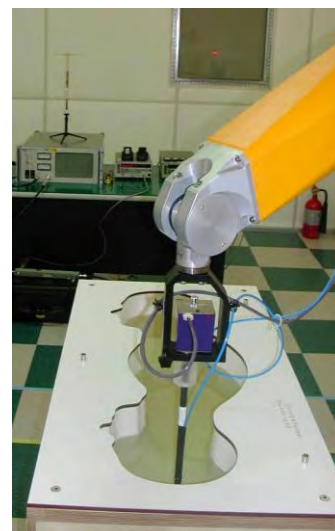


Figure 3.2 Photograph of the probe and the Phantom



Figure 3.3 ET3DV6 E-field Probe

The SAR measurements were conducted with the dosimetric probe ET3DV6, designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches a maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY4 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped at reaching the maximum.

3.3 PROBE CALIBRATION PROCESS

3.3.1 E-Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with an accuracy better than $\pm 10 \%$. The spherical isotropy was evaluated with the proper procedure and found to be better than ± 0.25 dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe is tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies below 1 GHz, and in a waveguide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C \frac{\Delta T}{\Delta t}$$

where:

Δt = exposure time (30 seconds),

C = heat capacity of tissue (brain or muscle),

ΔT = temperature increase due to RF exposure.

SAR is proportional to $\Delta T / \Delta t$, the initial rate of tissue heating, before thermal diffusion takes place. Now it's possible to quantify the electric field in the simulated tissue by equating the thermally derived SAR to the E-field;

$$SAR = \frac{|E|^2 \cdot \sigma}{\rho}$$

where:

σ = simulated tissue conductivity,

ρ = Tissue density (1.25 g/cm³ for brain tissue)

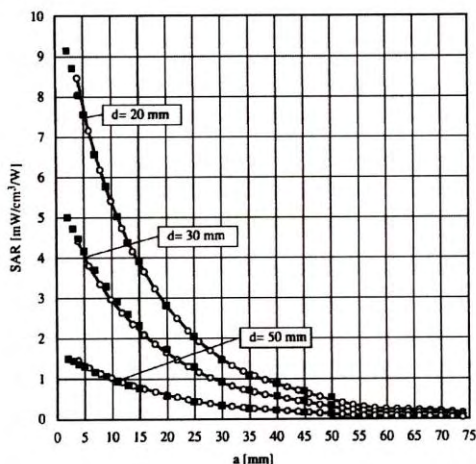


Figure 3.4 E-Field and Temperature measurements at 900 MHz

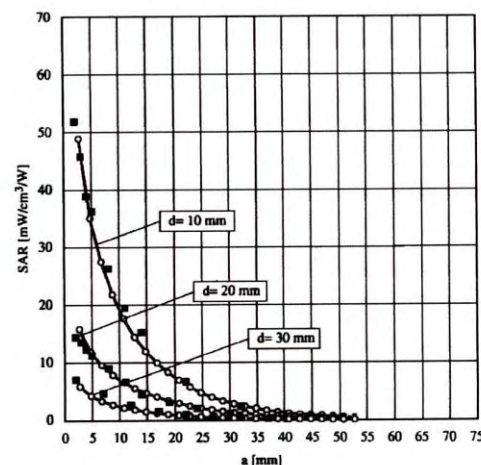


Figure 3.5 E-Field and temperature measurements at 1.8 GHz

3.3.2 Data Extrapolation

The DASY4 software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given like below;

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

with V_i = compensated signal of channel i (i=x,y,z)
 U_i = input signal of channel i (i=x,y,z)
 cf = crest factor of exciting field (DASY parameter)
 dcp_i = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:

$$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

with V_i = compensated signal of channel i (i = x,y,z)
 $Norm_i$ = sensor sensitivity of channel i (i = x,y,z)
 $\mu V/(V/m)^2$ for E-field probes
 $ConvF$ = sensitivity of enhancement in solution
 E_i = electric field strength of channel i in V/m

The RSS value of the field components gives the total field strength (Hermetian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1000}$$

with SAR = local specific absorption rate in W/g
 E_{tot} = total field strength in V/m
 σ = conductivity in [mho/m] or [Siemens/m]
 ρ = equivalent tissue density in g/cm³

The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = \frac{E_{tot}^2}{3770}$$

with P_{pwe} = equivalent power density of a plane wave in W/cm²
 E_{tot} = total electric field strength in V/m

3.4 SAM Phantom

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. 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 evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.



Figure 3.6 SAM Phantom

Shell Thickness	2.0 mm $\pm$ 0.2 mm (6 $\pm$ 0.2 mm at ear point)
Filling Volume	about 25 L
Dimensions	810 mm x 1 000 mm x 500 mm (H x L x W)

Triple Modular Phantom consists of three identical modules which can be installed and removed separately without emptying the liquid. It includes three reference points for phantom installation. Covers prevent evaporation of the liquid. Phantom material is resistant to DGBE based tissue simulating liquids. The MFP V5.1 will be delivered including wooden support only (**non**-standard SPEAG support).

Applicable for system performance check from 700 MHz to 6 GHz (MFP V5.1C) or 800 MHz - 6 GHz (MFP V5.1A) as well as dosimetric evaluations for body-worn operation.

Figure 3.6 MFP V5.1 Triple Modular Phantom

Shell Thickness	2.0 mm $\pm$ 0.2 mm
Filling Volume	approx. 9.2 L
Dimensions	830 mm x 500 mm (L x W)



3.5 Device Holder for Transmitters

In combination with the SAM Phantom V 4.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatably positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produce an infinite number of configurations. To produce the Worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.



Figure 3.7 Device Holder

3.6 Brain & Muscle Simulating Mixture Characterization

The brain and muscle mixtures consist of a viscous gel using hydrox-ethyl cellulose (HEC) gelling agent and saline solution (see Table 3.1). Preservation with a bactericide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The mixture characterizations used for the brain and muscle tissue simulating liquids are according to the data by C. Gabriel and G. Hartsgrove.

Ingredients (% by weight)	Frequency (MHz)											
	750		835		915		1 900		2 450		5200-5800	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	41.2	51.7	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2	65.52	78.66
Salt (NaCl)	1.4	1.0	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04	0.0	0.0
Sugar	57	47.2	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0	0.0	0.0
HEC	0.2	0.0	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.2	0.1	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0	0.0	0.0
Triton X-100	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0	17.24	10.67
DGBE	0.00	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7	0.0	0.0
Diethylene glycol hexyl ether											17.24	10.67

Salt:	99 % Pure Sodium Chloride	Sugar:	98 % Pure Sucrose
Water:	De-ionized, 16M 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		

Table 3.1 Composition of the Tissue Equivalent Matter

3.7 SAR TEST EQUIPMENT

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
Staubli	Robot RX90L	F01/5K09A1/A/01	N/A	N/A	N/A
Staubli	Robot ControllerCS7MB	F99/5A82A1/C/01	N/A	N/A	N/A
HP	Pavilion t000_puffer	KRJ51201TV	N/A	N/A	N/A
SPEAG	Light Alignment Sensor	265	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D221340.01	N/A	N/A	N/A
SPEAG	DAE4	479	Aug. 28, 2012	Annual	Aug. 28, 2013
SPEAG	E-Field Probe EX3DV4	3863	July 13, 2012	Annual	July 13, 2013
SPEAG	E-Field Probe ET3DV6	1605	Apr. 26, 2012	Annual	Apr. 26, 2013
SPEAG	Validation Dipole D835V2	441	May 16, 2012	Annual	May 16, 2013
SPEAG	Validation Dipole D1900V2	5d032	July 20, 2012	Annual	July 20, 2013
SPEAG	Validation Dipole D2450V2	743	Aug. 23, 2012	Annual	Aug. 23, 2013
SPEAG	Validation Dipole D5GHzV2	1107	Aug. 20, 2012	Annual	Aug. 20, 2013
Agilent	Power Meter(F) E4419B	MY41291386	Nov. 04, 2011	Annual	Nov. 04, 2012
Agilent	Power Sensor(G) 8481	MY41090870	Nov. 04, 2011	Annual	Nov. 04, 2012
HP	Dielectric Probe Kit 85070C	00721521	N/A	N/A	N/A
HP	Dual Directional Coupler 778D	16072	Nov. 04, 2011	Annual	Nov. 04, 2012
Agilent	Base Station E5515C	GB44400269	Feb. 10, 2012	Annual	Feb. 10, 2013
HP	Signal Generator E4438C	MY42082646	Nov. 11, 2011	Annual	Nov. 11, 2012
HP	Network Analyzer 8753ES	JP39240221	Apr. 3, 2012	Annual	Apr. 3, 2013

NOTE:

The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Validation measurement is performed by HCT Lab. before each test. The brain simulating material is calibrated by HCT using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain-equivalent material.

4. SAR MEASUREMENT PROCEDURE

The evaluation was performed with the following procedure:

1. The SAR value at a fixed location above the ear point was measured and was used as a reference value for assessing the power drop.
2. The SAR distribution at the exposed side of the head was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15 mm x 15 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.
3. Around this point, a volume of 32 mm x 32 mm x 30 mm was assessed by measuring 5 x 5 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:
 - a. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
 - b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
 - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR value, at the same location as procedure #1, was re-measured. If the value changed by more than 5 %, the evaluation is repeated.

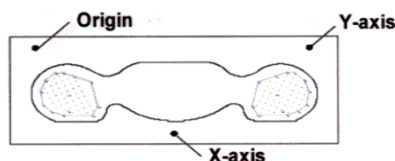


Figure 4.1 SAR Measurement Point in Area Scan

5. DESCRIPTION OF TEST POSITION

5.1 HEAD POSITION

The device was placed in a normal operating position with the Point A on the device, as illustrated in following drawing, aligned with the location of the RE(ERP) on the phantom. With the ear-piece pressed against the head, the vertical center line of the body of the handset was aligned with an imaginary plane consisting of the RE, LE and M. While maintaining these alignments, the body of the handset was gradually moved towards the cheek until any point on the mouth-piece or keypad contacted the cheek. This is a cheek/touch position. For ear/tilt position, while maintain the device aligned with the BM and FN lines, the device was pivot against ERP back for 15° or until the device antenna touch the phantom. Please refer to IEEE 1528-2003 illustration below.

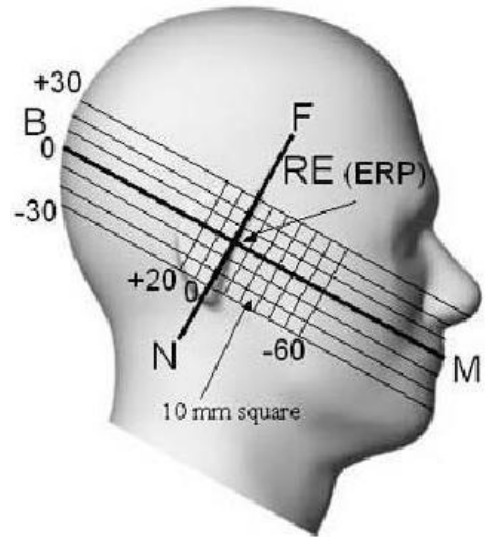


Figure 5.1 Side view of the phantom

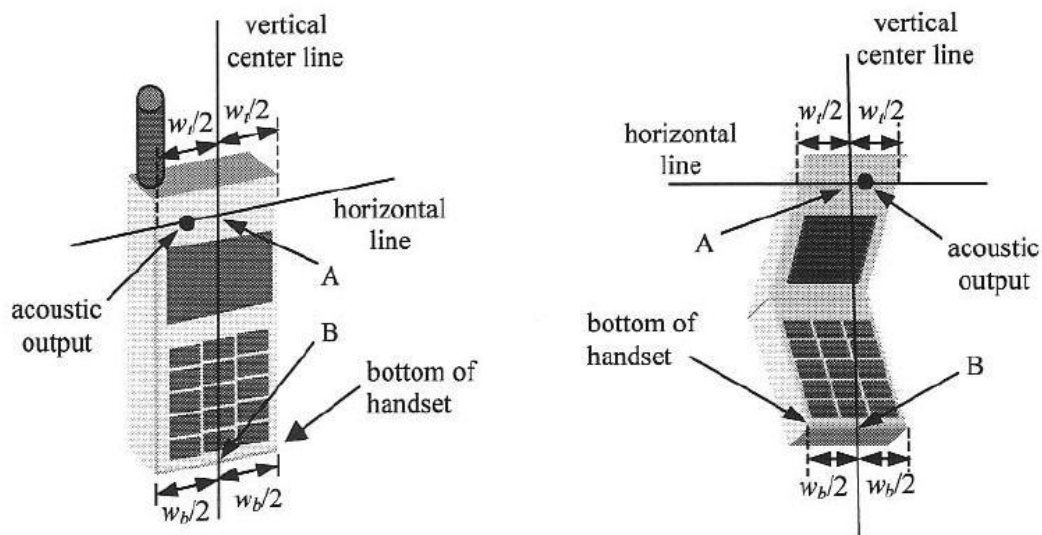


Figure 5.2 Handset vertical and horizontal reference lines

5.2 Body Holster/Belt Clip Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. A device with a headset output is tested with a headset connected to the device. Body dielectric parameters are used.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with each accessory. If multiple accessory share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some Devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used.

Since this EUT does not supply any body worn accessory to the end user a distance of 1.0 cm from the EUT back surface to the liquid interface is configured for the generic test.

"See the Test SET-UP Photo"

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessory(ies), Including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

In all cases SAR measurements are performed to investigate the worst-case positioning. Worstcase positioning is then documented and used to perform Body SAR testing.

6. MEASUREMENT UNCERTAINTY

Error Description	Tol (± %)	Prob. dist.	Div.	c _i	Standard Uncertainty (± %)	V _{eff}
1. Measurement System						
Probe Calibration	6.00	N	1	1	6.00	∞
Axial Isotropy	4.70	R	1.73	0.7	1.90	∞
Hemispherical Isotropy	9.60	R	1.73	0.7	3.88	∞
Boundary Effects	1.00	R	1.73	1	0.58	∞
Linearity	4.70	R	1.73	1	2.71	∞
System Detection Limits	1.00	R	1.73	1	0.58	∞
Readout Electronics	0.30	N	1.00	1	0.30	∞
Response Time	0.8	R	1.73	1	0.46	∞
Integration Time	2.6	R	1.73	1	1.50	∞
RF Ambient Conditions	3.00	R	1.73	1	1.73	∞
Probe Positioner	0.40	R	1.73	1	0.23	∞
Probe Positioning	2.90	R	1.73	1	1.67	∞
Max SAR Eval	1.00	R	1.73	1	0.58	∞
2. Test Sample Related						
Device Positioning	2.90	N	1.00	1	2.90	145
Device Holder	3.60	N	1.00	1	3.60	5
Power Drift	5.00	R	1.73	1	2.89	∞
3. Phantom and Setup						
Phantom Uncertainty	4.00	R	1.73	1	2.31	∞
Liquid Conductivity(target)	5.00	R	1.73	0.64	1.85	∞
Liquid Conductivity(meas.)	2.07	N	1	0.64	1.32	9
Liquid Permittivity(target)	5.00	R	1.73	0.6	1.73	∞
Liquid Permittivity(meas.)	5.02	N	1	0.6	3.01	9
Combine Standard Uncertainty					11.13	
Coverage Factor for 95 %					k=2	
Expanded STD Uncertainty					22.25	

Table 6.1 Uncertainty (800 MHz- 2450 MHz)

Error Description	Tol (± %)	Prob. dist.	Div.	C_i	Standard Uncertainty (± %)	V_{eff}
1. Measurement System						
Probe Calibration	6.55	N	1	1	6.55	∞
Axial Isotropy	4.70	R	1.73	0.7	1.90	∞
Hemispherical Isotropy	9.60	R	1.73	0.7	3.88	∞
Boundary Effects	1.00	R	1.73	1	0.58	∞
Linearity	4.70	R	1.73	1	2.71	∞
System Detection Limits	1.00	R	1.73	1	0.58	∞
Readout Electronics	0.30	N	1.00	1	0.30	∞
Response Time	0.8	R	1.73	1	0.46	∞
Integration Time	2.6	R	1.73	1	1.50	∞
RF Ambient Conditions	3.00	R	1.73	1	1.73	∞
Probe Positioner	0.40	R	1.73	1	0.23	∞
Probe Positioning	2.90	R	1.73	1	1.67	∞
Max SAR Eval	1.00	R	1.73	1	0.58	∞
2. Test Sample Related						
Device Positioning	2.90	N	1.00	1	2.90	145
Device Holder	3.60	N	1.00	1	3.60	5
Power Drift	5.00	R	1.73	1	2.89	∞
3. Phantom and Setup						
Phantom Uncertainty	4.00	R	1.73	1	2.31	∞
Liquid Conductivity(target)	5.00	R	1.73	0.64	1.85	∞
Liquid Conductivity(meas.)	2.07	N	1	0.64	1.32	9
Liquid Permittivity(target)	5.00	R	1.73	0.6	1.73	∞
Liquid Permittivity(meas.)	5.02	N	1	0.6	3.01	9
Combine Standard Uncertainty					11.43	
Coverage Factor for 95 %					$k = 2$	
Expanded STD Uncertainty					22.86	

Table 6.2 Uncertainty (5000-5900 MHz)

7. ANSI/ IEEE C95.1 - 1992 RF EXPOSURE LIMITS

HUMAN EXPOSURE	UNCONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT Occupational (W/kg) or (mW/g)
SPATIAL PEAK SAR * (Brain)	1.60	8.00
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.00

Table 7.1 Safety Limits for Partial Body Exposure

NOTES:

* The Spatial Peak value of the SAR averaged over any 1 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

** The Spatial Average value of the SAR averaged over the whole-body.

*** The Spatial Peak value of the SAR averaged over any 10 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e.as a result of employment or occupation).

8. SYSTEM VERIFICATION

8.1 Tissue Verification

Freq. [MHz]	Date	Liquid	Liquid Temp.[°C]	Parameters	Target Value	Measured Value	Deviation [%]	Limit [%]
1 900	Oct. 4, 2012	Head	21.1	ϵ_r	40.0	40.8	+ 2.00	± 5
σ				1.40	1.37	- 2.14	± 5	
1 900		Body		ϵ_r	53.3	52.1	- 2.25	± 5
				σ	1.52	1.55	+ 1.97	± 5
2 450	Oct. 5, 2012	Head	21.2	ϵ_r	39.2	40.2	+ 2.55	± 5
σ				1.80	1.83	+ 1.67	± 5	
2 450		Body		ϵ_r	52.7	54.5	+ 3.42	± 5
				σ	1.95	1.97	+ 1.03	± 5
5 200	Oct. 6, 2012	Head	21.2	ϵ_r	36.0	36.4	+ 1.11	± 5
				σ	4.66	4.48	- 3.86	± 5
5 200	Oct. 7, 2012	Body	21.3	ϵ_r	49.0	47.5	- 3.06	± 5
				σ	5.3	5.21	- 1.70	± 5
5 500	Oct. 6, 2012	Head	21.2	ϵ_r	35.6	35.7	+ 0.28	± 5
				σ	4.96	4.82	- 2.82	± 5
5 500	Oct. 7, 2012	Body	21.3	ϵ_r	48.6	46.5	- 4.32	± 5
				σ	5.65	5.56	- 1.59	± 5
5 800	Oct. 6, 2012	Head	21.2	ϵ_r	35.3	34.9	- 1.13	± 5
				σ	5.27	5.22	- 0.95	± 5
5 800	Oct. 7, 2012	Body	21.3	ϵ_r	48.2	46.2	- 4.15	± 5
				σ	6.00	6.13	+ 2.17	± 5

The Tissue dielectronic parameters were measured prior to the SAR evaluation using an Agilent 85070C Dielectronic Probe Kit and Agilent Network Analyzer.

8.2 System Validation

Prior to assessment, the system is verified to the $\pm 10\%$ of the specifications at 1 900 MHz/ 2 450 MHz/5GHz by using the system validation kit. (Graphic Plots Attached)

Freq. [MHz]	Date	Probe (SN)	Liquid	Liquid Temp. [°C]	Amb. Temp. [°C]	1 W Target SAR _{1g} (SPEAG) (mW/g)	Measured SAR _{1g} (mW/g)	1 W Normalized SAR _{1g} (mW/g)	Deviation [%]	Limit [%]
1 900	Oct. 4, 2012	1605	Head	21.1	21.3	39.0	40.2	40.2	+ 3.08	± 10
1 900			Body			39.9	3.94	39.4	- 1.25	± 10
2 450	Oct. 5, 2012		Head	21.2	21.4	52.7	5.4	54	+ 2.47	± 10
2 450			Body			51.2	5.15	51.5	+ 0.59	± 10
5 200	Oct. 6, 2012	3863	Head	21.2	21.4	78.9	7.97	79.7	+ 1.39	± 10
5 200	Oct. 7, 2012		Body	21.1	21.3	75.8	7.45	74.5	- 1.72	± 10
5 500	Oct. 6, 2012		Head	21.2	21.4	82.2	8.3	83	+ 0.97	± 10
5 500	Oct. 7, 2012		Body	21.1	21.3	78.5	7.94	79.4	+ 1.15	± 10
5 800	Oct. 6, 2012		Head	21.2	21.4	77.6	7.84	78.4	+ 1.03	± 10
5 800	Oct. 7, 2012		Body	21.1	21.3	74.6	7.52	75.2	+ 0.80	± 10

8.3 System Validation Procedure

SAR measurement was prior to assessment, the system is verified to the $\pm 10\%$ of the specifications at each frequency band by using the system validation kit. (Graphic Plots Attached)

- Cabling the system, using the validation kit equipments.
- Generate about 100 mW Input Level from the Signal generator to the Dipole Antenna.
- Dipole Antenna was placed below the Flat phantom.
- The measured one-gram SAR at the surface of the phantom above the dipole feed-point should be within 10 % of the target reference value.
- The results are normalized to 1 W input power.

Note;

SAR Verification was performed according to the FCC KDB 450824.

9. RF CONDUCTED POWER MEASUREMENT

Power measurements were performed using a base station simulator under digital average power. The handset was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing SAR and are recommended for evaluation SAR. SAR measurements were taken with a fully charged battery. 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.

9.1 GSM

Conducted output power measurements were performed using a base station simulator under digital average power.



SAR Test for WWAN were performed with a base station simulator Agilent E5515C. Communication between the device and the emulator was established by air link. Set base station emulator to allow DUT to radiate maximum output power during all tests. Please refer to the below worst case SAR operation setup.

- GSM voice: Head SAR
- GPRS Multi-slots : GPRS850/1900 Body SAR with GPRS Multi-slot Class33, 4Tx with CS 1 (GMSK)

Note;

CS1/MCS7 coding scheme was used in GPRS/EDGE output power measurements and SAR Testing, as a condition where GMSK/8PSK modulation was ensured. Investigation has shown that CS1 - CS4/ MCS5 – MCS9 settings do not have any impact on the output levels in the GPRS/EDGE modes.

GSM Conducted output powers (Burst-Average)

Band	Channel	Voice	GPRS(GMSK) Data – CS1				EDGE(8PSK) Data – MCS7			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)
GSM 1900	512	29.49	29.50	29.49	29.47	26.49	25.45	25.39	25.41	22.58
	661	29.52	29.51	29.52	29.50	26.55	25.88	25.44	25.57	22.90
	810	29.63	29.63	29.62	29.61	26.67	25.85	25.56	25.76	23.14

GSM Conducted output powers (Frame-Average)

Band	Channel	Voice	GPRS(GMSK) Data – CS1				EDGE(8PSK) Data – MCS7			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)
GSM 1900	512	20.46	20.47	23.47	25.21	23.48	16.42	19.37	21.15	19.57
	661	20.49	20.48	23.5	25.24	23.54	16.85	19.42	21.31	19.89
	810	20.6	20.6	23.6	25.35	23.66	16.82	19.54	21.5	20.13

Note:

Time slot average factor is as follows:

1 Tx slot = 9.03 dB, Frame-Average output power = Burst-Average output power – 9.03 dB

2 Tx slot = 6.02 dB, Frame-Average output power = Burst-Average output power – 6.02 dB

3 Tx slot = 4.26 dB, Frame-Average output power = Burst-Average output power – 4.26 dB

4 Tx slot = 3.01 dB, Frame-Average output power = Burst-Average output power – 3.01 dB

9.2 WiFi

9.2.1 SAR Testing for 802.11b/g/n modes

General Device Setup

Normal Network operating configurations are not suitable for measuring the SAR of 802.11 a/b/g transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable.

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

Frequency Channel Configurations

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 channels 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. 4.9 GHz is tested on channels 1, 10 and 5 or 6, whichever has the higher output power, for 5 MHz channels; channels 11,15 and 19 for 10 MHz channels; and channels 21 and 25 for 20 MHz channels. These are referred to as the “default test 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	UNII	5.18	36				✓		
		5.20	40	42 (5.21 GHz)					•
		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						•	
	UNII or §15.247	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		✓				

802.11 Test Channels per FCC Requirements

Band	Channel	Conducted Power (dBm)			
		Data Rate (Mbps)			
		1	2	5.5	11
IEEE 802.11b	1	15.11	15.03	14.87	14.73
	6	15.45	15.37	15.22	15.00
	11	15.68	15.67	15.67	15.53

Average IEEE 802.11b Conducted output power

Band	Channel	Conducted Power (dBm)							
		Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
IEEE 802.11g	1	10.61	10.44	10.29	10.03	9.82	9.36	9.05	8.90
	6	10.92	10.83	10.69	10.39	10.15	9.75	9.43	9.27
	11	11.11	11.01	10.95	10.64	10.7	10.00	9.73	9.46

Average IEEE 802.11g Conducted output power

Band	Channel	Conducted Power (dBm)							
		Data Rate (Mbps)							
		6.5	13	19.5	26	39	52	58.5	65
IEEE 802.11n (HT-20)	1	9.50	9.16	8.90	8.73	8.35	7.98	7.89	7.75
	6	9.88	9.60	9.36	9.10	8.72	8.41	8.23	8.07
	11	10.09	9.79	9.55	9.31	8.99	8.55	8.50	8.33

Average IEEE 802.11n Conducted output power

Note;
SAR testing was performed according to the FCC KDB 248227.

WLAN 5GHz Conducted Powers

802.11 a

Mode	Freq [MHz]	Channel	conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36	12.70	12.55	12.43	12.10	11.95	11.83	11.54	11.19
802.11a	5200	40	12.65	12.43	12.23	12.11	11.95	11.43	11.25	11.13
802.11a	5220	44	12.56	12.44	12.10	11.83	11.74	11.63	11.00	10.96
802.11a	5240	48	12.60	12.45	12.23	12.22	11.95	11.43	11.32	11.01
802.11a	5260	52	12.65	12.44	12.20	12.12	12.00	11.85	11.41	11.07
802.11a	5280	56	12.51	12.33	12.15	12.00	11.83	11.47	11.20	10.91
802.11a	5300	60	12.45	12.15	12.11	11.93	11.85	11.43	11.05	10.85
802.11a	5320	64	12.53	12.47	12.30	11.93	11.85	11.42	11.05	10.96
802.11a	5500	100	12.35	12.10	12.00	11.83	11.74	11.43	11.22	10.78
802.11a	5520	104	12.23	11.95	11.86	11.43	11.20	10.83	10.74	10.66
802.11a	5540	108	12.36	12.15	12.10	11.83	11.44	11.41	11.20	10.81
802.11a	5560	112	12.42	12.10	11.86	11.74	11.41	11.21	10.99	10.83
802.11a	5580	116	12.36	12.15	12.00	11.83	11.64	11.41	11.24	10.80
802.11a	5600	120	12.31	12.25	11.93	11.84	11.74	11.41	11.25	10.69
802.11a	5620	124	12.47	12.23	12.11	11.95	11.84	11.46	11.21	10.86
802.11a	5640	128	12.51	12.43	12.20	11.83	11.74	11.46	11.25	10.85
802.11a	5660	132	12.42	12.36	11.95	11.43	11.31	11.20	11.00	10.84
802.11a	5680	136	12.40	12.13	12.05	11.83	11.74	11.55	11.32	10.85
802.11a	5700	140	12.52	12.44	12.03	11.83	11.74	11.52	11.05	10.98
802.11a	5745	149	13.56	13.25	13.11	12.43	12.22	12.27	12.15	12.04
802.11a	5765	153	13.70	13.43	13.25	13.10	12.84	12.45	12.22	12.16
802.11a	5785	157	13.78	13.66	13.45	13.22	12.83	12.47	12.42	12.22
802.11a	5805	161	13.75	13.55	13.25	13.11	12.83	12.46	12.22	12.21
802.11a	5825	165	13.75	13.66	13.54	12.99	12.83	12.47	12.24	12.22

802.11 n

Mode	Freq [MHz]	Channel	conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5180	36	11.58	11.20	11.11	10.83	10.77	10.52	10.25	9.90
802.11a	5200	40	11.55	11.43	11.20	10.99	10.85	10.46	10.23	9.86
802.11a	5220	44	11.33	11.25	11.00	10.85	10.43	10.43	10.29	9.74
802.11a	5240	48	11.44	11.21	10.89	10.74	10.63	10.11	9.85	9.73
802.11a	5260	52	11.50	11.23	11.00	10.89	10.74	10.43	10.25	9.92
802.11a	5280	56	11.37	11.11	10.83	10.77	10.54	10.25	9.99	9.71
802.11a	5300	60	11.30	11.15	11.03	10.89	10.77	10.43	10.11	9.61
802.11a	5320	64	11.41	11.30	10.93	10.74	10.60	10.25	9.89	9.74
802.11a	5500	100	11.26	11.03	10.78	10.43	10.33	10.25	9.92	9.63
802.11a	5520	104	11.22	10.89	10.77	10.43	10.22	10.10	9.85	9.55
802.11a	5540	108	11.31	11.10	10.83	10.77	10.23	10.11	9.83	9.62
802.11a	5560	112	11.40	11.13	10.89	10.77	10.45	10.21	10.00	9.76
802.11a	5580	116	11.25	11.10	10.89	10.77	10.43	10.23	9.83	9.60
802.11a	5600	120	11.26	11.03	10.89	10.77	10.43	10.13	9.89	9.61
802.11a	5620	124	11.39	11.11	10.89	10.74	1.043	10.13	10.00	9.76
802.11a	5640	128	11.42	11.14	10.83	10.77	10.43	10.25	10.11	9.77
802.11a	5660	132	11.30	11.13	10.89	10.73	10.62	10.25	10.11	9.66
802.11a	5680	136	11.37	11.21	10.93	10.78	10.56	10.23	9.98	9.70
802.11a	5700	140	11.49	11.15	10.89	10.74	10.36	10.13	9.89	9.81
802.11a	5745	149	12.56	12.23	12.10	11.78	11.46	11.21	11.00	10.95
802.11a	5765	153	12.70	12.65	12.43	12.22	12.10	11.85	11.54	11.06
802.11a	5785	157	12.75	12.36	12.21	11.99	11.85	11.43	11.25	11.10
802.11a	5805	161	12.70	12.63	12.44	12.20	12.00	11.83	11.46	11.01
802.11a	5825	165	12.71	12.60	12.53	12.22	11.93	11.74	11.43	11.07

40 MHz

Conducted Output Power Measurements

802.11n Mode

Mode	Freq [MHz]	Channel	conducted Power [dBm]							
			Data Rate [Mbps]							
			13.5	27	40.5	54	81	108	121.5	135
802.11a	5190	38	9.31	9.25	9.11	8.43	8.21	8.11	7.83	7.02
802.11a	5230	46	9.24	9.11	8.46	8.33	8.21	7.63	7.43	6.85
802.11a	5270	54	9.31	9.11	8.88	8.57	8.22	8.10	7.59	6.93
802.11a	5310	62	9.19	9.00	8.74	8.43	8.22	8.10	7.69	6.83
802.11a	5510	102	9.15	9.00	8.83	8.46	8.22	7.83	7.45	6.85
802.11a	5550	110	9.33	9.11	9.00	8.73	8.46	8.22	7.63	6.93
802.11a	5590	118	9.25	9.11	8.63	8.25	8.11	7.64	7.23	6.84
802.11a	5630	126	9.37	8.99	8.46	8.23	8.11	7.65	7.23	7.02
802.11a	5670	134	9.28	9.11	8.88	8.43	8.25	8.11	7.56	6.94
802.11a	5755	151	10.62	10.23	10.11	9.74	9.41	9.11	8.88	8.24
802.11a	5795	159	10.67	10.56	10.23	9.65	9.23	9.11	8.56	8.33

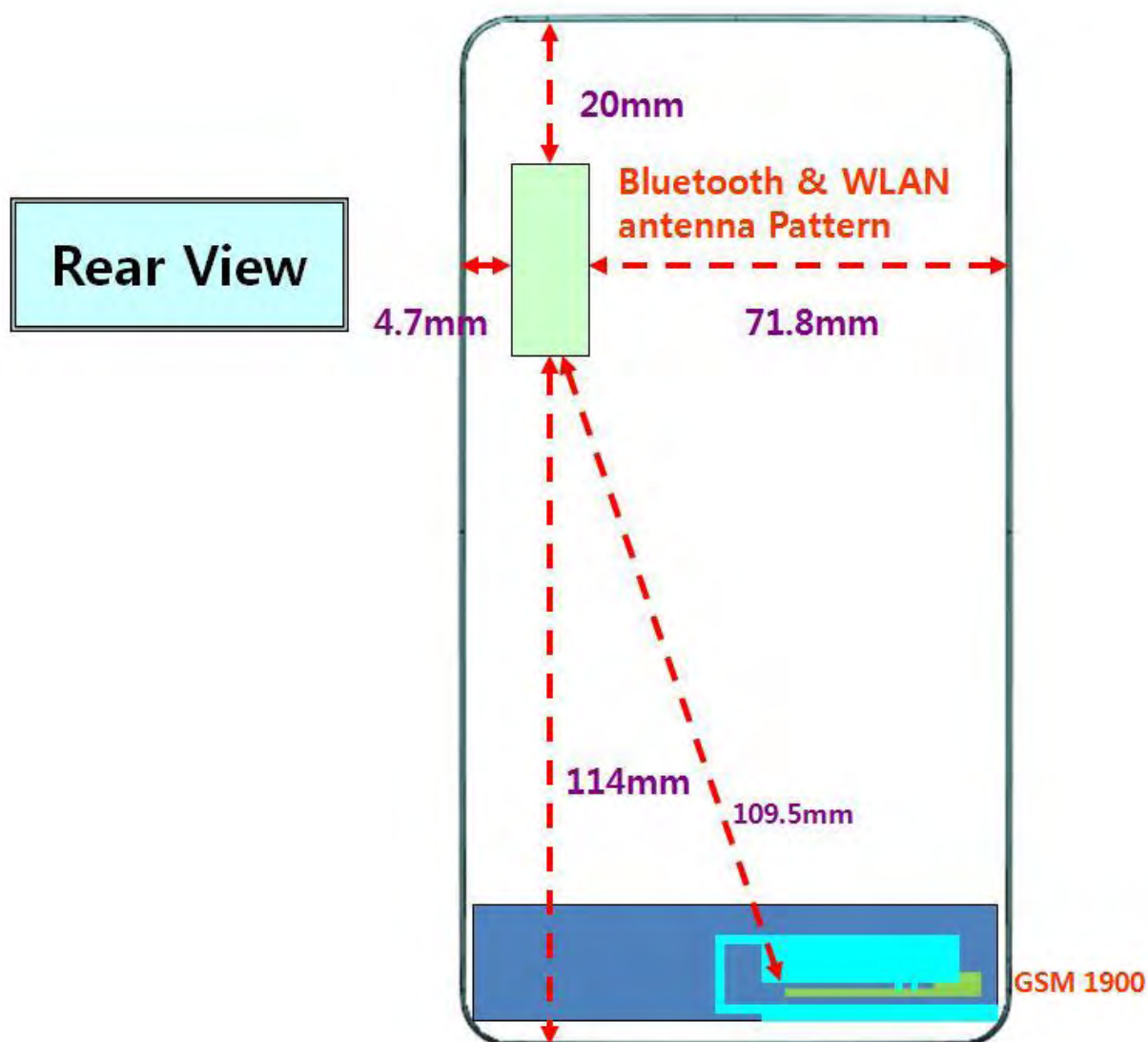
Note;
SAR testing was performed according to the FCC KDB 248227.

10. SAR Test configuration & Antenna Information

10.1 SAR Test configurations

Mode	Back	Front	Left	Right	Bottom	Top
1900 GPRS	Yes	Yes	Yes	Yes	Yes	No
WLAN	Yes	Yes	No	Yes	No	Yes

10.2 Antenna and Device Information



Note;

WLAN and BT transmitters cannot transmit simultaneously.

Please see the separate Antenna distance document.

11. SAR Considerations for Multiple Transmitters and Antennas

11.1 SAR Evaluation Considerations

These procedures were followed according to FCC "SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas", May 2008. The procedures are applicable to phones with built-in unlicensed transmitters, such as 802.11 a/b/g and Bluetooth devices.

	2.45	5.15 - 5.35	5.47 - 5.85	GHz
P_{Ref}	12	6	5	mW
Device output power should be rounded to the nearest mW to compare with values specified in this				

Table. 11.1 Output Power Thresholds for Unlicensed Transmitters

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	<u>Routine evaluation required</u>	SAR not required: <u>Unlicensed only</u> - when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas <u>Licensed & Unlicensed</u> - when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas - when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 SAR required: <u>Licensed & Unlicensed</u> antenna pairs with SAR to peak location separation ratio ≥ 0.3 ; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Unlicensed Transmitters	<u>When there is no simultaneous transmission –</u> - output ≤ 60 f: SAR not required - output > 60 f: stand-alone SAR required <u>When there is simultaneous transmission –</u> <u>Stand-alone SAR not required when</u> - output $\leq 2 \cdot P_{Ref}$ and antenna is ≥ 5.0 cm from other antennas - output $\leq P_{Ref}$ and antenna is ≥ 2.5 cm from other antennas - output $\leq P_{Ref}$ and antenna is < 2.5 cm from other antennas, each with either output power $\leq P_{Ref}$ or 1-g SAR < 1.2 W/kg <u>Otherwise stand-alone SAR is required</u> <u>When stand-alone SAR is required</u> - test SAR on highest output channel for each wireless mode and exposure condition - if SAR for highest output channel is $> 50\%$ of SAR limit, evaluate all channels according to normal procedures	
Jaw, Mouth and Nose	<u>Flat phantom SAR required</u> - when measurement is required in tight regions of SAM and it is not feasible or the results can be questionable due to probe tilt, calibration, positioning and orientation issues - position rectangular and clam-shell phones according to flat phantom procedures and conduct SAR measurements for these specific locations	When simultaneous transmission SAR testing is required, contact the FCC Laboratory for interim guidance.

SAR Evaluation Requirements for Multiple Transmitters Handsets

FCC ID: A3LGTN7108

BT Max. RF output power: (5.26 mW)

11.2 SAR Summation Scenario

Simultaneous Transmission Summation for Held to Ear

Simultaneous TX	configuration	GSM1900 SAR(W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simultaneous TX	configuration	GSM1900 SAR(W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Head SAR	Left Cheek	0.122	0.068	0.190	Head SAR	Left Cheek	0.122	0.098	0.220
	Left Tilt	0.051	0.051	0.102		Left Tilt	0.051	0.056	0.107
	Right Cheek	0.092	0.042	0.134		Right Cheek	0.092	0.022	0.114
	Right Tilt	0.081	0.032	0.113		Right Tilt	0.081	0.032	0.113

Simultaneous Transmission Summation for Body-Worn (1cm)

Simultaneous TX	configuration	GPRS1900 SAR(W/kg)	2.4 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)	Simultaneous TX	configuration	GPRS1900 SAR(W/kg)	5 GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.994	0.213	1.207	Body SAR	Back	0.994	0.361	1.355
	Front	0.938	0.025	0.963		Front	0.938	0.000801	0.939

Simultaneous Transmission Summation for Hotspot (1cm)

Simultaneous TX	configuration	GPRS1900 SAR(W/kg)	2.4GHz WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Back	0.994	0.213	1.207
	Front	0.938	0.025	0.963
	Left	0.431	-	0.431
	Right	0.211	0.065	0.276
	Bottom	1.01	-	1.010
	Top	-	0.021	0.021

Note;

- **Body-Worn SAR** : Although body-worn accessory conditions are typically for voice configurations, the GPRS slot frame averaged output power was more conservative and was included for the body-worn accessory SAR assessment.
- The EUT front body-worn configuration is provided to cover any potential accessory that will position the EUT in this manner.

11.3 Simultaneous Transmission Conclusion

The above numerical summed SAR was below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit. No volumetric SAR summation is required per FCC KDB Publication 648474.

The above tables represent the worst-case simultaneous transmission scenarios possibility with this device.

The conducted output power level of the BT transmitter is less than $2 \cdot P_{ref}$, the BT antenna is more than 5 cm from the other antenna, therefore, a stand-alone BT SAR evaluation is not required.

12. SAR TEST DATA SUMMARY

12.1 Measurement Results (GSM1900 Head SAR)

Frequency		Band	Conducted Power (dBm)	Power Drift (dB)	Battery	Phantom Position	SAR(mW/g)
MHz	Channel						
1 880.0	661 (Mid)	GSM1900	29.52	-0.01	Standard	Left Ear	0.122
			29.52	0.033	Standard	Left Tilt 15°	0.051
			29.52	-0.106	Standard	Right Ear	0.092
			29.52	0.036	Standard	Right Tilt 15°	0.081
ANSI/ IEEE C95.1 - 1992– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram	

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
- Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

12.2 Measurement Results (802.11b Head SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Battery	Phantom Position	Data Rate (Mbps)	SAR(mW/g)
MHz	Channel							
2 462	11 (High)	802.11b	15.68	-0.028	Standard	Left Ear	1	0.068
			15.68	-0.152	Standard	Left Tilt 15°	1	0.051
			15.68	0.189	Standard	Right Ear	1	0.042
			15.68	-0.062	Standard	Right Tilt 15	1	0.032
ANSI/ IEEE C95.1 - 1992– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☒ Manual Test cord ☐ Base Station Simulator
- IEEE 802.11g(including 802.11n) SAR testing is required when the conducted powers are equal to or greater than 0.25 dB Than the conducted powers in IEEE 802.11b.
- For 2.4GHz WLAN, Highest average power channel for the lowest data rate was selected for SAR evaluation based on KDB 248227. Other channels are not necessary because 1g-average SAR < 0.8 W/Kg and peak SAR < 1.6W/Kg per KDB 248227.

12.3 Measurement Results (802.11a/n 5GHz Head SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Battery	Phantom Position	Data Rate	SAR(mW/g)
MHz	Channel							
5180	36	802.11a	12.70	0	Standard	Left Ear	6Mbps	0
5180	36	802.11a	12.70	0.01	Standard	Left Tilt 15°	6Mbps	7.85E-005
5180	36	802.11a	12.70	0	Standard	Right Ear	6Mbps	0
5180	36	802.11a	12.70	0.04	Standard	Right Tilt 15	6Mbps	0.00395
5260	52	802.11a	12.65	0	Standard	Left Ear	6Mbps	0
5260	52	802.11a	12.65	0	Standard	Left Tilt 15°	6Mbps	0
5260	52	802.11a	12.65	0	Standard	Right Ear	6Mbps	0
5260	52	802.11a	12.65	0.05	Standard	Right Tilt 15	6Mbps	0.00471
5700	140	802.11a	12.52	0.04	Standard	Left Ear	6Mbps	0.064
5700	140	802.11a	12.52	0.04	Standard	Left Tilt 15°	6Mbps	0.056
5700	140	802.11a	12.52	-0.07	Standard	Right Ear	6Mbps	0.022
5700	140	802.11a	12.52	0.004	Standard	Right Tilt 15	6Mbps	0.021
5785	157	802.11a	13.78	0.059	Standard	Left Ear	6Mbps	0.098
5785	157	802.11a	13.78	0.073	Standard	Left Tilt 15°	6Mbps	0.00139
5785	157	802.11a	13.78	0.05	Standard	Right Ear	6Mbps	0.015
5785	157	802.11a	13.78	0.04	Standard	Right Tilt 15	6Mbps	0.032
ANSI/ IEEE C95.1 - 1992- Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☒ Manual Test cord ☐ Base Station Simulator
- Highest average RF output power channel for the lowest data rate were selected for SAR testing. IEEE 802.11(including 802.11n) SAR testing is required when the conducted powers are equal to or greater than 0.25 dB than the conducted powers in IEEE 802.11a.
- For 5 GHz WLAN, Highest average power channel for the lowest data rate was selected for SAR evaluation based on KDB 248227. Other channels are not necessary because 1g-average SAR < 0.8 W/Kg and peak SAR < 1.6W/Kg per KDB 248227.

12.4 Measurement Results (GSM1900 Hotspot SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	SAR(mW/g)
MHz	Channel						
1850.2	512 (Low)	GPRS 3Tx	29.47	-0.065	Rear	1.0 cm	0.994
1880.0	661 (Mid)	GPRS 3Tx	29.50	-0.122	Rear	1.0 cm	0.946
1909.8	810 (High)	GPRS 3Tx	29.61	-0.038	Rear	1.0 cm	0.898
1850.2	512 (Low)	GPRS 3Tx	29.47	-0.064	Front	1.0 cm	0.938
1880.0	661 (Mid)	GPRS 3Tx	29.50	0.077	Front	1.0 cm	0.87
1909.8	810 (High)	GPRS 3Tx	29.61	0.011	Front	1.0 cm	0.753
1 880.0	661 (Mid)	GPRS 3Tx	29.50	-0.091	Left	1.0 cm	0.431
1 880.0	661 (Mid)	GPRS 3Tx	29.50	0.02	Right	1.0 cm	0.211
1850.2	512 (Low)	GPRS 3Tx	29.50	-0.007	bottom	1.0 cm	0.994
1880.0	661 (Mid)	GPRS 3Tx	29.50	0.101	bottom	1.0 cm	0.994
1909.8	810 (High)	GPRS 3Tx	29.50	-0.072	bottom	1.0 cm	1.01
ANSI/ IEEE C95.1 - 1992– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram	

NOTES:

- The test data reported are the worst-case SAR value with the antenna-body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm $\pm$ 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
- Test Configuration ☐ With Holster ☒ Without Holster
- Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).
- For body SAR testing, the EUT was set in GPRS multi-slot class33 with 3uplink slots for GSM1900 due to maximum source-based time-averaged output power.
According to the KDB 941225 D03 SAR test reduction GSM/GPRS/EDGE, the maximum output power configuration were chosen for Body SAR testing.

12.5 Measurement Results (802.11b Hotspot SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	Data Rate	SAR(mW/g)
MHz	Channel							
2 462	11 (High)	802.11b	15.68	-0.094	Rear	1.0 cm	1 Mbps	0.213
		802.11b	15.68	0.071	Front	1.0 cm	1 Mbps	0.025
		802.11b	15.68	-0.033	Right	1.0 cm	1 Mbps	0.065
		802.11b	15.68	-0.166	Top	1.0 cm	1 Mbps	0.021
ANSI/ IEEE C95.1 1992 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm $\pm$ 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☒ Manual Test code ☐ Base Station Simulator
- IEEE 802.11g(including 802.11n) SAR testing is required when the conducted powers are equal to or greater than 0.25 dB Than the conducted powers in IEEE 802.11b.
- For 2.4GHz WLAN, Highest average power channel for the lowest data rate was selected for SAR evaluation based on KDB 248227. Other channels are not necessary because 1g-average SAR < 0.8 W/Kg and peak SAR < 1.6W/Kg per KDB 248227.

12.6 Measurement Results (802.11a/n 5GHz Body-Worn)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	Data Rate	SAR(mW/g)
MHz	Channel							
5 180	36	802.11a	12.70	0.01	Rear	1.0 cm	6Mbps	0.042
5 180	36	802.11a	12.70	0	Front	1.0 cm	6Mbps	0
5260	52	802.11a	12.65	-0.04	Rear	1.0 cm	6Mbps	0.044
5260	52	802.11a	12.65	-0.05	Front	1.0 cm	6Mbps	8.01E-005
5700	140	802.11a	12.52	0.01	Rear	1.0 cm	6Mbps	0.129
5700	140	802.11a	12.52	0.01	Front	1.0 cm	6Mbps	3.48E-006
5785	157	802.11a	13.78	0.03	Rear	1.0 cm	6Mbps	0.361
5785	157	802.11a	13.78	0	Rear	1.0 cm	6Mbps	0
ANSI/ IEEE C95.1 - 1992- Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm $\pm$ 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☒ Manual Test cord ☐ Base Station Simulator
- Highest average RF output power channel for the lowest data rate were selected for SAR testing. IEEE 802.11(including 802.11n) SAR testing is required when the conducted powers are equal to or greater than 0.25 dB than the conducted powers in IEEE 802.11a.
- For 5 GHz WLAN, Highest average power channel for the lowest data rate was selected for SAR evaluation based on KDB 248227. Other channels are not necessary because 1g-average SAR < 0.8 W/Kg and peak SAR < 1.6W/Kg per KDB 248227.

13. CONCLUSION

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the ANSI/IEEE C95.1 1992.

These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests.

14. REFERENCES

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Attachment 1. – SAR Test Plots

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

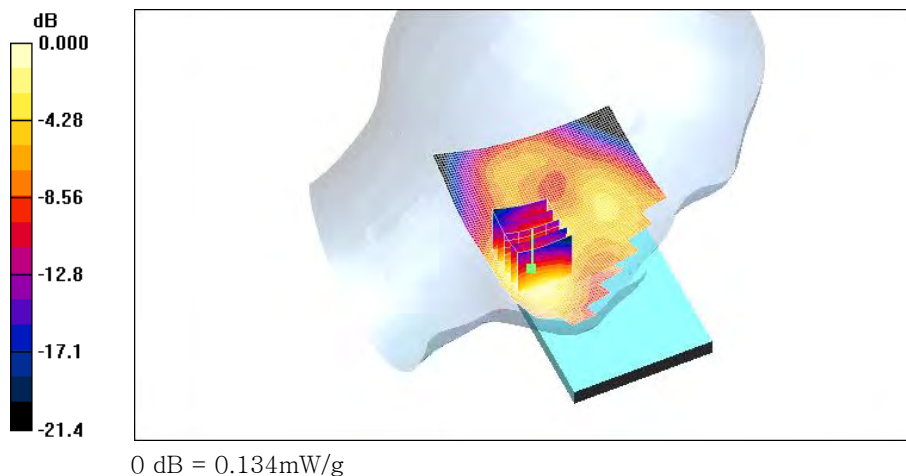
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(5.26, 5.26, 5.26); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 835/900 Phantom ; Type: SAM

Left Touch 661/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.129 mW/g

Left Touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.30 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.195 W/kg
SAR(1 g) = 0.122 mW/g; SAR(10 g) = 0.070 mW/g
Maximum value of SAR (measured) = 0.134 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

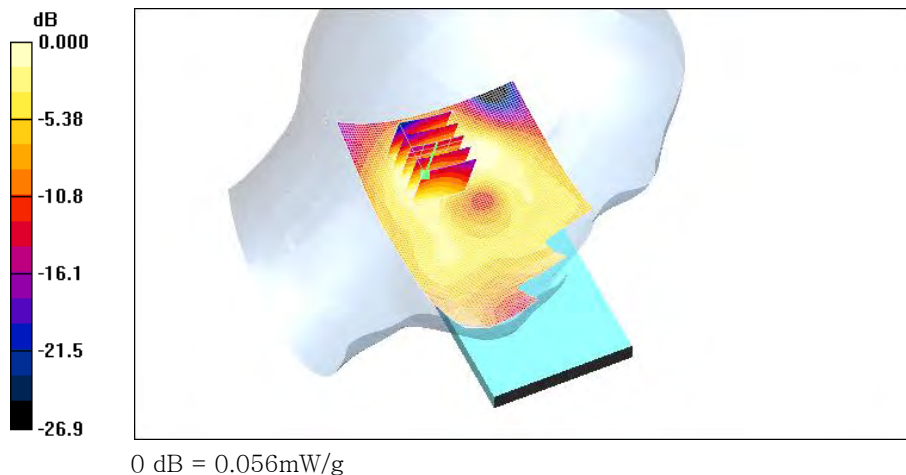
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(5.26, 5.26, 5.26); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 835/900 Phantom ; Type: SAM

Left Tilt 661/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.061 mW/g

Left Tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.65 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 0.087 W/kg
SAR(1 g) = 0.051 mW/g; SAR(10 g) = 0.030 mW/g
Maximum value of SAR (measured) = 0.056 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(5.26, 5.26, 5.26); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 835/900 Phantom ; Type: SAM

Right Touch 661/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.106 mW/g

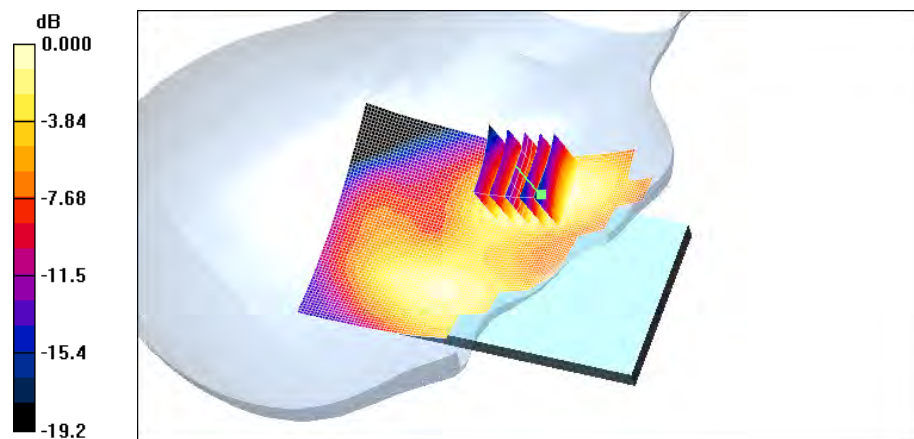
Right Touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.40 V/m; Power Drift = -0.106 dB

Peak SAR (extrapolated) = 0.139 W/kg

SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.056 mW/g

Maximum value of SAR (measured) = 0.101 mW/g



0 dB = 0.101mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(5.26, 5.26, 5.26); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 835/900 Phantom ; Type: SAM

Right Tilt 661/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.092 mW/g

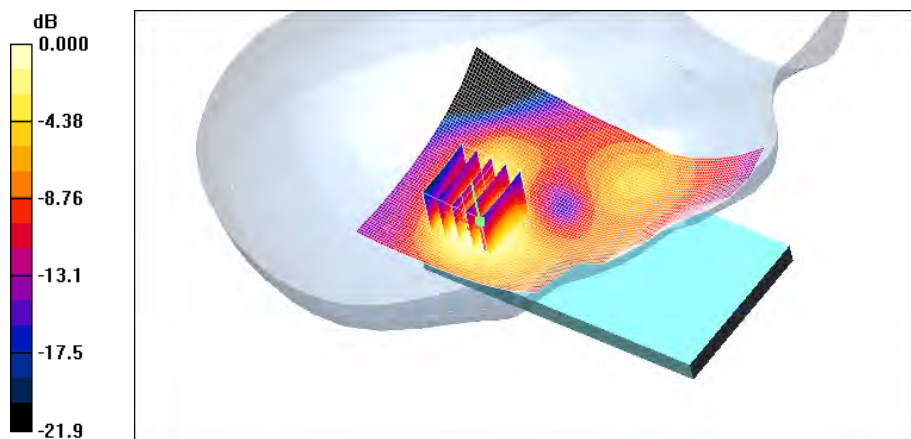
Right Tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.60 V/m; Power Drift = 0.036 dB

Peak SAR (extrapolated) = 0.137 W/kg

SAR(1 g) = 0.081 mW/g; SAR(10 g) = 0.046 mW/g

Maximum value of SAR (measured) = 0.086 mW/g



0 dB = 0.086mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.05, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: 2450MHz FCC; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.85$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.59, 4.59, 4.59); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 1800/1900 Phantom; Type: SAM

Left Touch 11ch 1Mbps/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.075 mW/g

Left Touch 11ch 1Mbps/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

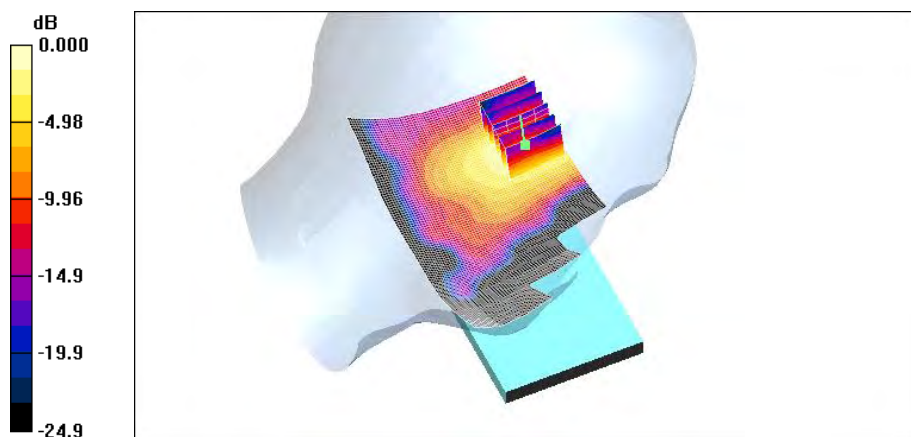
Reference Value = 3.40 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 0.145 W/kg

SAR(1 g) = 0.068 mW/g; SAR(10 g) = 0.034 mW/g

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

Maximum value of SAR (measured) = 0.072 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.05, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: 2450MHz FCC; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.85$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.59, 4.59, 4.59); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 1800/1900 Phantom; Type: SAM

Left Tilt 11ch 1Mbps/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.058 mW/g

Left Tilt 11ch 1Mbps/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

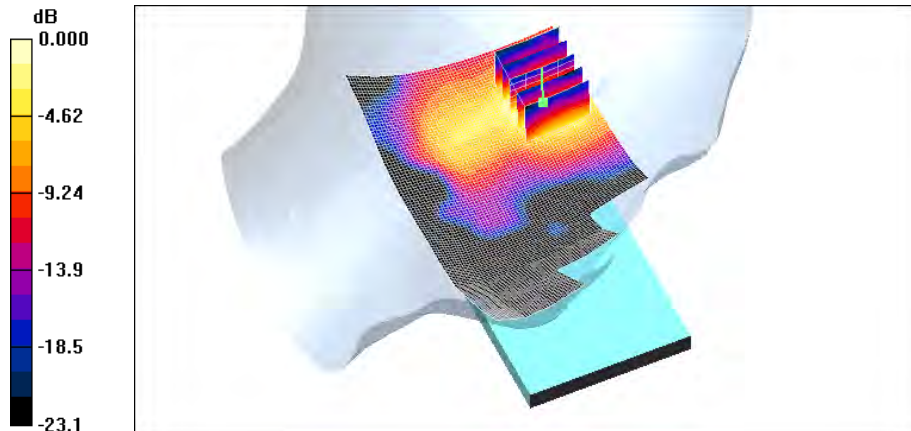
Reference Value = 3.54 V/m; Power Drift = -0.152 dB

Peak SAR (extrapolated) = 0.105 W/kg

SAR(1 g) = 0.051 mW/g; SAR(10 g) = 0.026 mW/g

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

Maximum value of SAR (measured) = 0.055 mW/g



0 dB = 0.055mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.05, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: 2450MHz FCC; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2462 \text{ MHz}$; $\sigma = 1.85 \text{ mho/m}$; $\epsilon_r = 40.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.59, 4.59, 4.59); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 1800/1900 Phantom; Type: SAM

Right Touch 11ch 1Mbps/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.047 mW/g

Right Touch 11ch 1Mbps/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

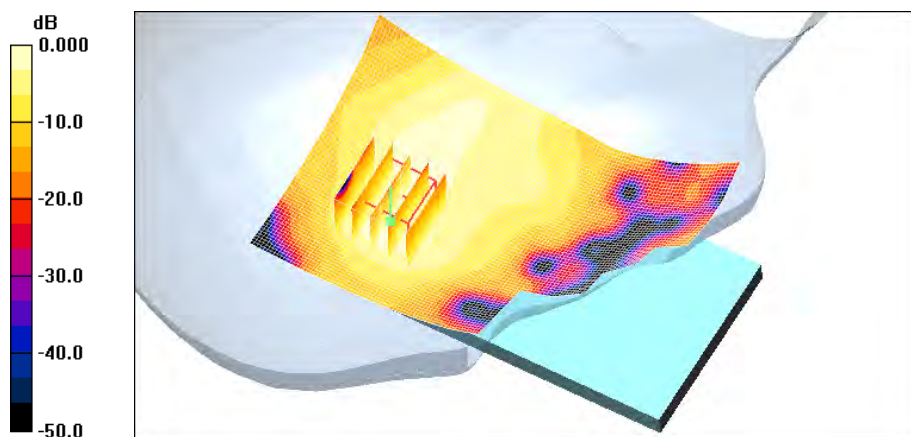
Reference Value = 4.20 V/m; Power Drift = 0.189 dB

Peak SAR (extrapolated) = 0.079 W/kg

SAR(1 g) = 0.042 mW/g; SAR(10 g) = 0.022 mW/g

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

Maximum value of SAR (measured) = 0.046 mW/g



0 dB = 0.046mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.05, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: 2450MHz FCC; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2462 \text{ MHz}$; $\sigma = 1.85 \text{ mho/m}$; $\epsilon_r = 40.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.59, 4.59, 4.59); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 1800/1900 Phantom; Type: SAM

Right Tilt 11ch 1Mbps/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.042 mW/g

Right Tilt 11ch 1Mbps/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

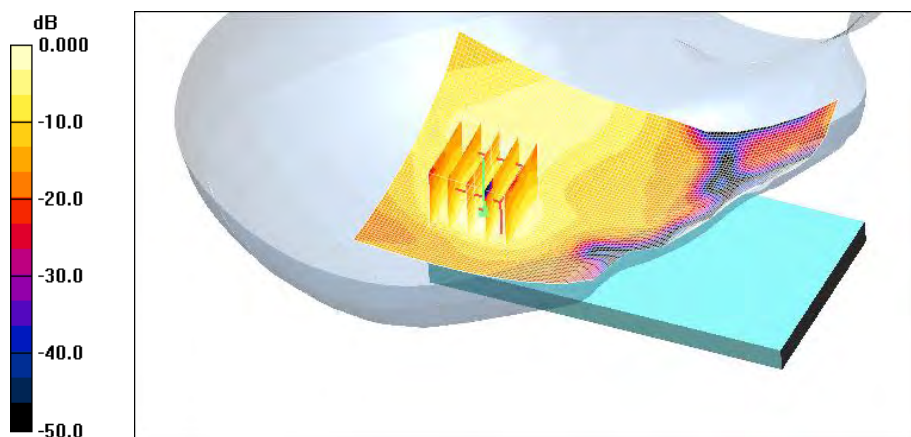
Reference Value = 3.66 V/m; Power Drift = -0.062 dB

Peak SAR (extrapolated) = 0.064 W/kg

SAR(1 g) = 0.032 mW/g; SAR(10 g) = 0.016 mW/g

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

Maximum value of SAR (measured) = 0.036 mW/g



0 dB = 0.036mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5180 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5180 \text{ MHz}$; $\sigma = 4.47 \text{ mho/m}$; $\epsilon_r = 36.4$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.96, 4.96, 4.96); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

802.11a Left touch 36ch 6Mbps/Area Scan (121x181x1): Measurement grid: dx=10mm, dy=10mm

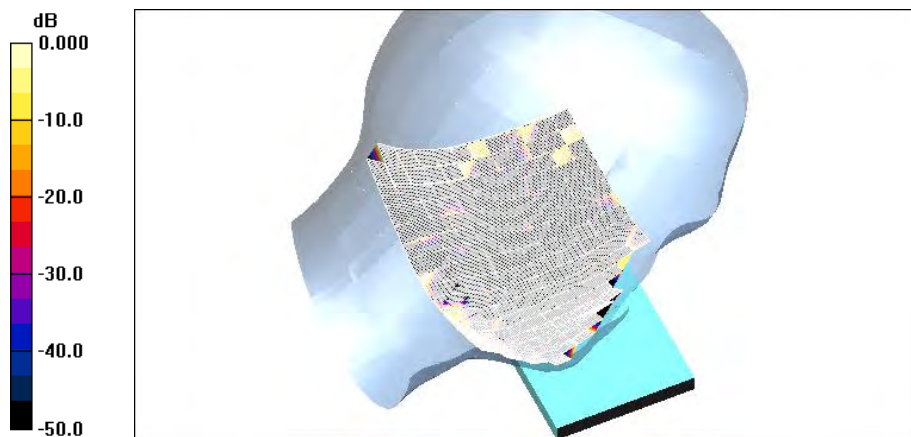
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.000 mW/g

802.11a Left touch 36ch 6Mbps/Area Scan (13x19x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (measured) = 0.008 mW/g



0 dB = 0.008mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5180 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5180$ MHz; $\sigma = 4.47$ mho/m; $\epsilon_r = 36.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.96, 4.96, 4.96); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

802.11a Left tilt 36ch 6Mbps/Area Scan (121x181x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (interpolated) = 0.001 mW/g

802.11a Left tilt 36ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

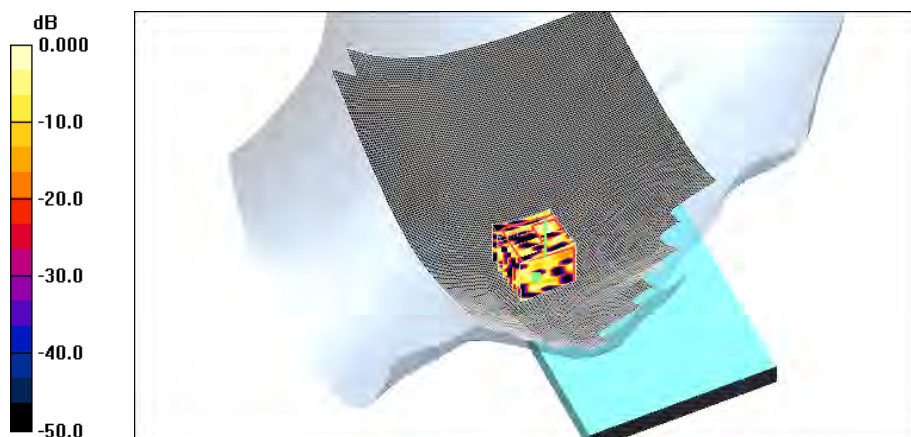
Reference Value = 0.897 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.010 W/kg

SAR(1 g) = 7.85e-005 mW/g; SAR(10 g) = 8.37e-006 mW/g

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

Maximum value of SAR (measured) = 0.011 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5180 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5180 \text{ MHz}$; $\sigma = 4.47 \text{ mho/m}$; $\epsilon_r = 36.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.96, 4.96, 4.96); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

802.11a Right touch 36ch 6Mbps/Area Scan (121x181x1): Measurement grid: dx=10mm, dy=10mm

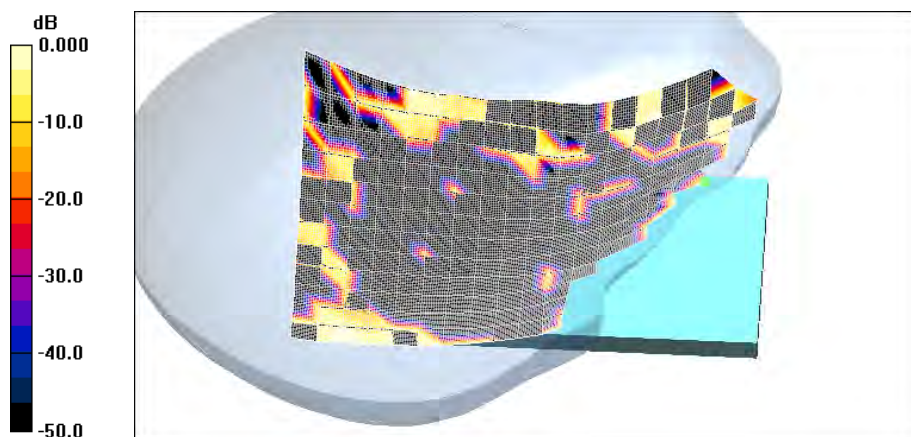
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.010 mW/g

802.11a Right touch 36ch 6Mbps/Area Scan (13x19x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (measured) = 0.010 mW/g



0 dB = 0.010mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5180 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5180 \text{ MHz}$; $\sigma = 4.47 \text{ mho/m}$; $\epsilon_r = 36.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.96, 4.96, 4.96); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

802.11a Right tilt 36ch 6Mbps/Area Scan (121x181x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (interpolated) = 0.016 mW/g

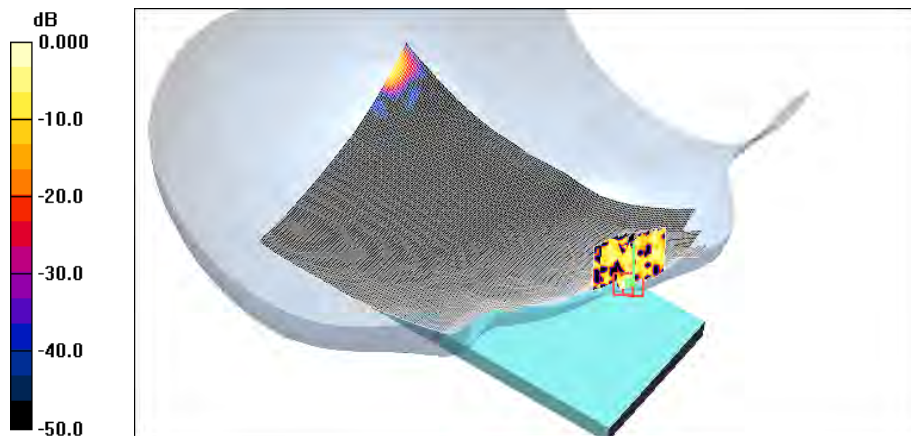
802.11a Right tilt 36ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0.613 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.062 W/kg

SAR(1 g) = 0.00395 mW/g; SAR(10 g) = n.a.

Maximum value of SAR (measured) = 0.016 mW/g



0 dB = 0.016mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5260 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5260$ MHz; $\sigma = 4.55$ mho/m; $\epsilon_r = 36.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

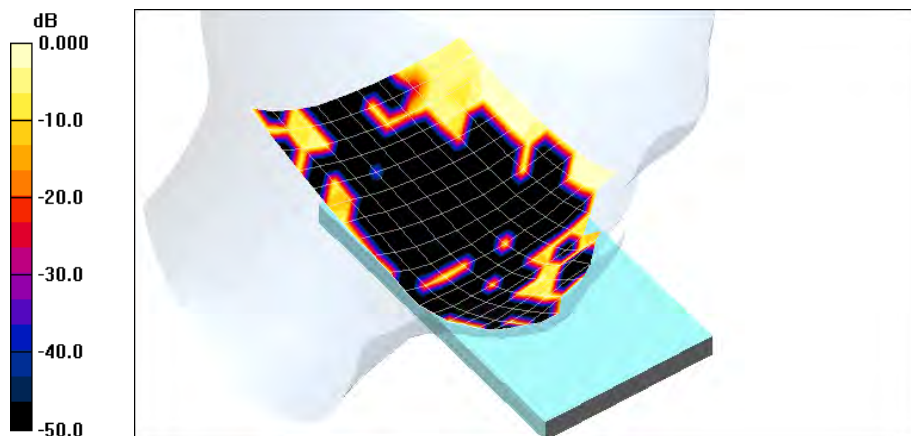
DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.79, 4.79, 4.79); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

802.11a Left touch 52ch 6Mbps/Area Scan (11x19x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.010 mW/g



0 dB = 0.010mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5260 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5260$ MHz; $\sigma = 4.55$ mho/m; $\epsilon_r = 36.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

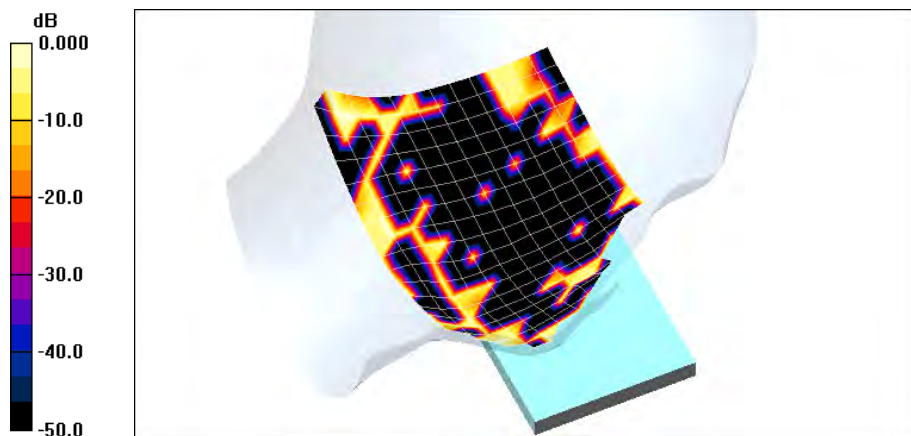
DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.79, 4.79, 4.79); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

802.11a Left tilt 52ch 6Mbps/Area Scan (13x19x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (measured) = 0.008 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5260 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5260$ MHz; $\sigma = 4.55$ mho/m; $\epsilon_r = 36.1$; $\rho = 1000$ kg/m³

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

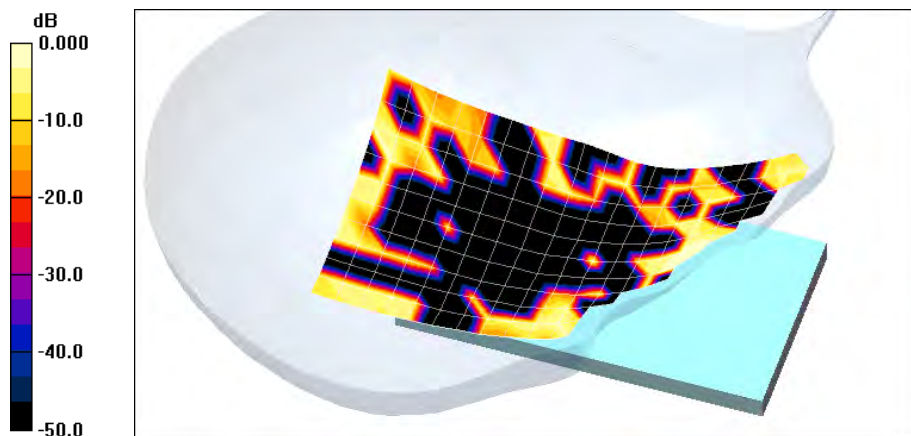
DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.79, 4.79, 4.79); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

802.11a Right touch 52 ch 6 Mbps/Area Scan (11x20x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.010 mW/g



0 dB = 0.010mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5260 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5260 \text{ MHz}$; $\sigma = 4.55 \text{ mho/m}$; $\epsilon_r = 36.1$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.79, 4.79, 4.79); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

802.11a Right tilt 52 ch 6 Mbps/Area Scan (101x191x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (interpolated) = 0.012 mW/g

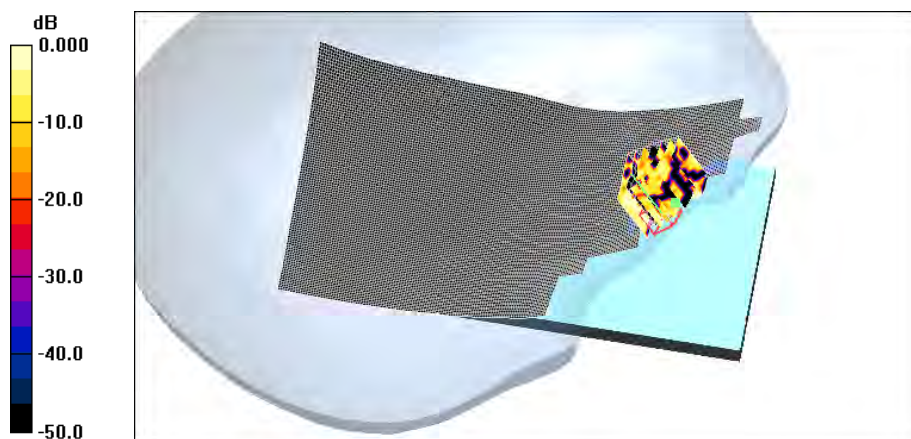
802.11a Right tilt 52 ch 6 Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0.712 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.092 W/kg

SAR(1 g) = 0.00471 mW/g; SAR(10 g) = n.a.

Maximum value of SAR (measured) = 0.014 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

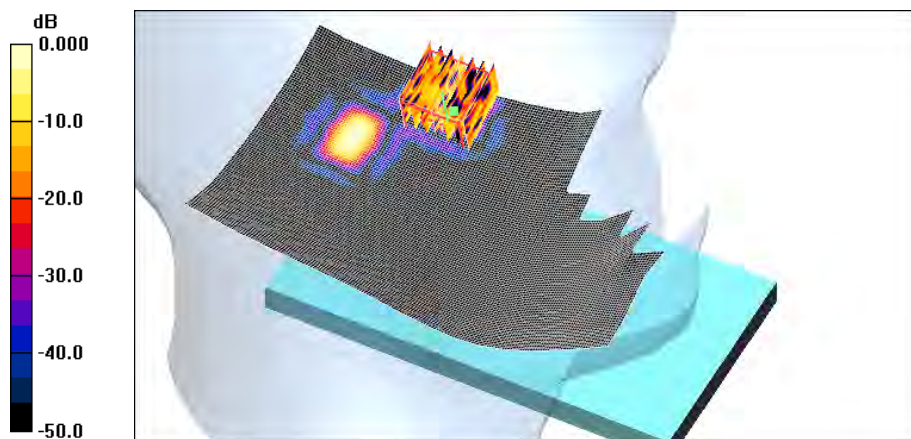
Communication System: WIFI 5GHz; Frequency: 5700 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5700 \text{ MHz}$; $\sigma = 5.06 \text{ mho/m}$; $\epsilon_r = 35.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.56, 4.56, 4.56); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

802.11a Left touch 140ch 6Mbps/Area Scan (101x161x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 0.072 mW/g

802.11a Left touch 140ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
Reference Value = 0.812 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.482 W/kg
SAR(1 g) = 0.063 mW/g; SAR(10 g) = 0.021 mW/g
Maximum value of SAR (measured) = 0.077 mW/g



0 dB = 0.077mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

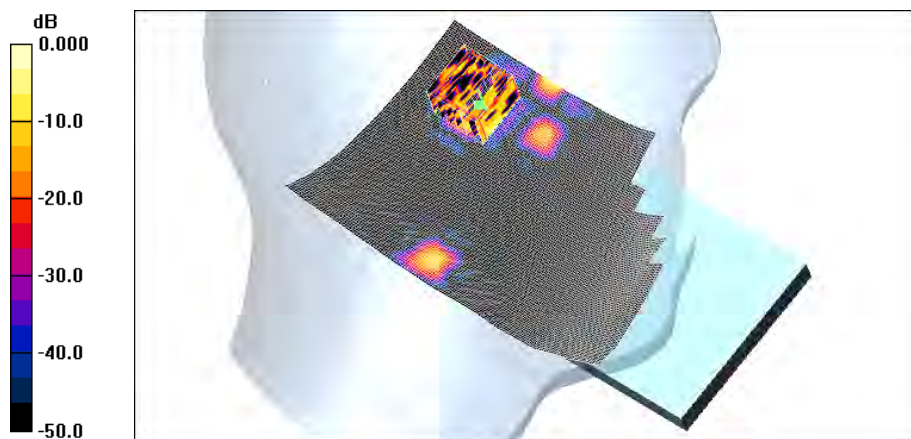
Communication System: WIFI 5GHz; Frequency: 5700 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5700 \text{ MHz}$; $\sigma = 5.06 \text{ mho/m}$; $\epsilon_r = 35.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.56, 4.56, 4.56); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

802.11a Left tilt 140ch 6Mbps/Area Scan (101x161x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 0.044 mW/g

802.11a Left tilt 140ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
Reference Value = 0.907 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.565 W/kg
SAR(1 g) = 0.056 mW/g; SAR(10 g) = 0.013 mW/g
Maximum value of SAR (measured) = 0.060 mW/g



0 dB = 0.060mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

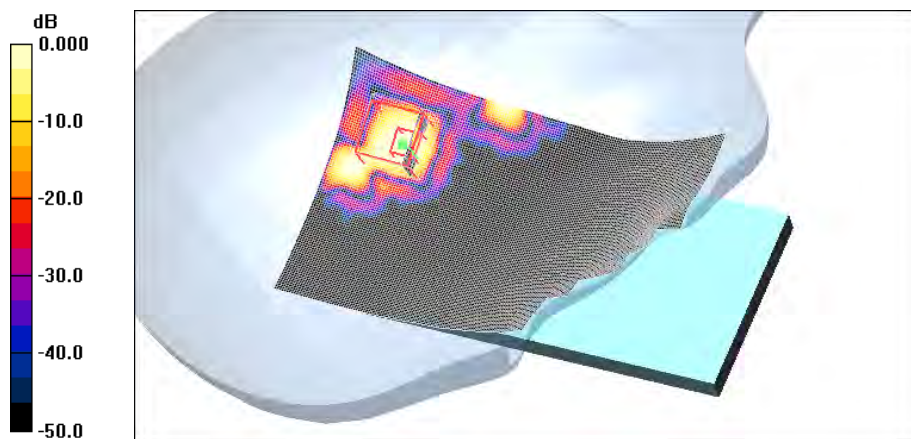
Communication System: WIFI 5GHz; Frequency: 5700 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5700 \text{ MHz}$; $\sigma = 5.06 \text{ mho/m}$; $\epsilon_r = 35.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.56, 4.56, 4.56); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

Right touch 802.11a 140ch 6Mbps/Area Scan (101x161x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 0.053 mW/g

Right touch 802.11a 140ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
Reference Value = 0.980 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.286 W/kg
SAR(1 g) = 0.022 mW/g; SAR(10 g) = 0.00631 mW/g
Maximum value of SAR (measured) = 0.041 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5700 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5700 \text{ MHz}$; $\sigma = 5.06 \text{ mho/m}$; $\epsilon_r = 35.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

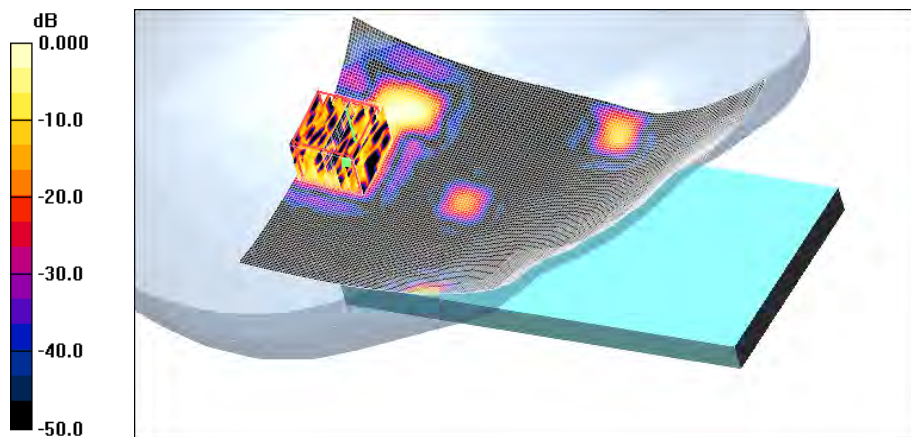
DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.56, 4.56, 4.56); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

Right tilt 802.11a 140ch 6Mbps/Area Scan (101x161x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 0.077 mW/g

Right tilt 802.11a 140ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
Reference Value = 0.882 V/m; Power Drift = 0.004 dB
Peak SAR (extrapolated) = 0.199 W/kg
SAR(1 g) = 0.021 mW/g; SAR(10 g) = 0.00573 mW/g

Maximum value of SAR (measured) = 0.056 mW/g



0 dB = 0.056mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5785 \text{ MHz}$; $\sigma = 5.2 \text{ mho/m}$; $\epsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.61, 4.61, 4.61); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

Left Touch 802.11a 157ch 6Mbps/Area Scan (101x161x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (interpolated) = 0.287 mW/g

Left Touch 802.11a 157ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

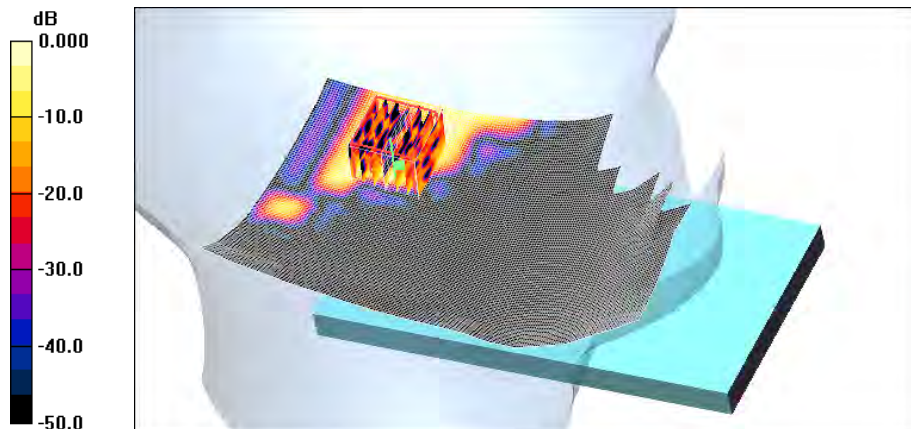
Reference Value = 2.14 V/m; Power Drift = 0.059 dB

Peak SAR (extrapolated) = 0.405 W/kg

SAR(1 g) = 0.098 mW/g; SAR(10 g) = 0.031 mW/g

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

Maximum value of SAR (measured) = 0.216 mW/g



0 dB = 0.216mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5785 \text{ MHz}$; $\sigma = 5.2 \text{ mho/m}$; $\epsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.61, 4.61, 4.61); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

Left Tilt 802.11a 157ch 6Mbps/Area Scan (121x161x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (interpolated) = 0.044 mW/g

Left Tilt 802.11a 157ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

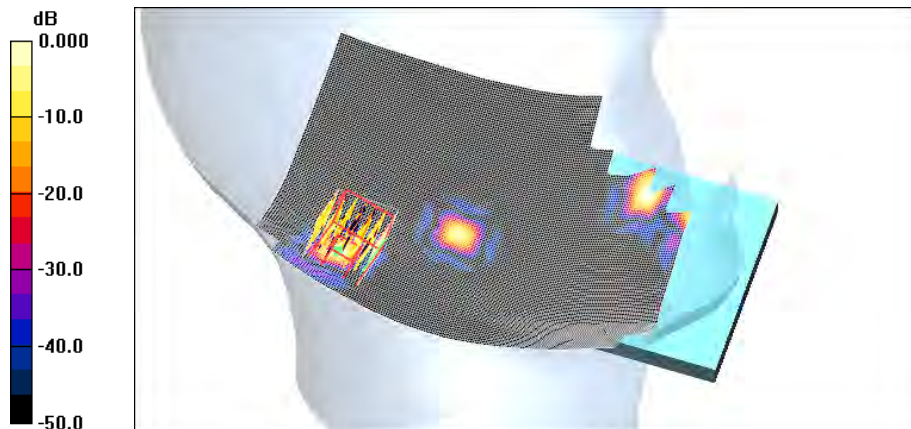
Reference Value = 0.813 V/m; Power Drift = 0.073 dB

Peak SAR (extrapolated) = 0.096 W/kg

SAR(1 g) = 0.00139 mW/g; SAR(10 g) = 0.00022 mW/g

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

Maximum value of SAR (measured) = 0.043 mW/g



0 dB = 0.043mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5785 \text{ MHz}$; $\sigma = 5.2 \text{ mho/m}$; $\epsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.61, 4.61, 4.61); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

Right touch 802.11a 157ch 6Mbps/Area Scan (121x181x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (interpolated) = 0.050 mW/g

Right touch 802.11a 157ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

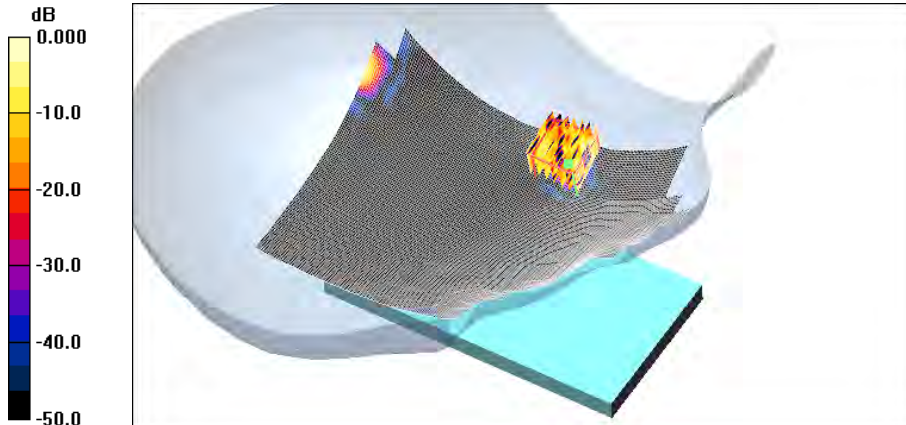
Reference Value = 0.752 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.581 W/kg

SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00392 mW/g

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

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



0 dB = 0.094mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5785 \text{ MHz}$; $\sigma = 5.2 \text{ mho/m}$; $\epsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.61, 4.61, 4.61); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

Right tilt 802.11a 157ch 6Mbps/Area Scan (121x181x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (interpolated) = 0.044 mW/g

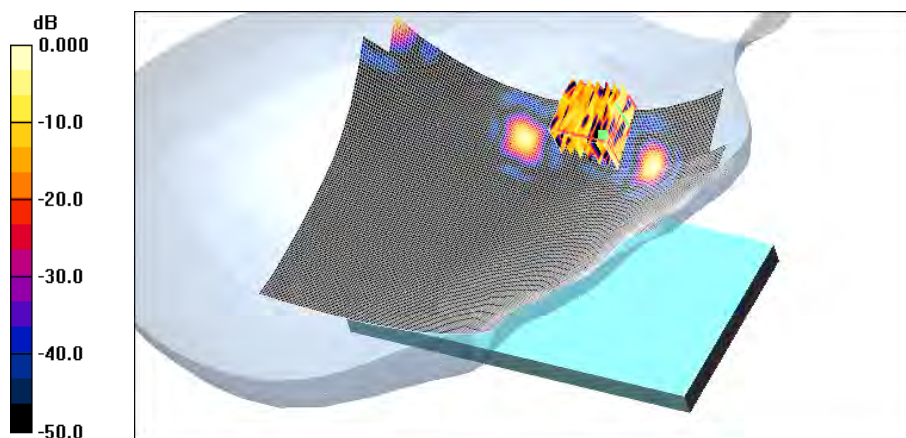
Right tilt 802.11a 157ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 0.941 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.702 W/kg

SAR(1 g) = 0.032 mW/g; SAR(10 g) = 0.00529 mW/g

Maximum value of SAR (measured) = 0.090 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:2.77
Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.5 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body rear 512 3Tx/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm

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

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

Body rear 512 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.97 V/m; Power Drift = -0.065 dB

Peak SAR (extrapolated) = 1.57 W/kg

SAR(1 g) = 0.994 mW/g; SAR(10 g) = 0.569 mW/g

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

Maximum value of SAR (measured) = 1.10 mW/g

Body rear 512 3Tx/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

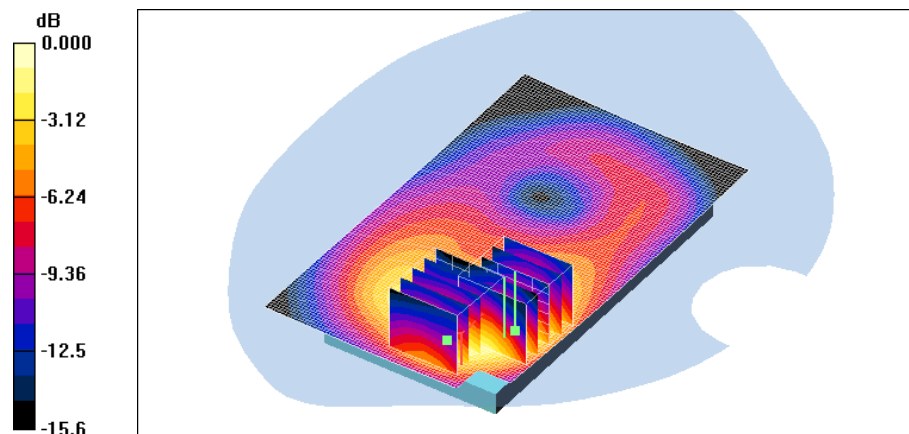
Reference Value = 5.97 V/m; Power Drift = -0.065 dB

Peak SAR (extrapolated) = 1.66 W/kg

SAR(1 g) = 0.943 mW/g; SAR(10 g) = 0.545 mW/g

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

Maximum value of SAR (measured) = 1.08 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2.77
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

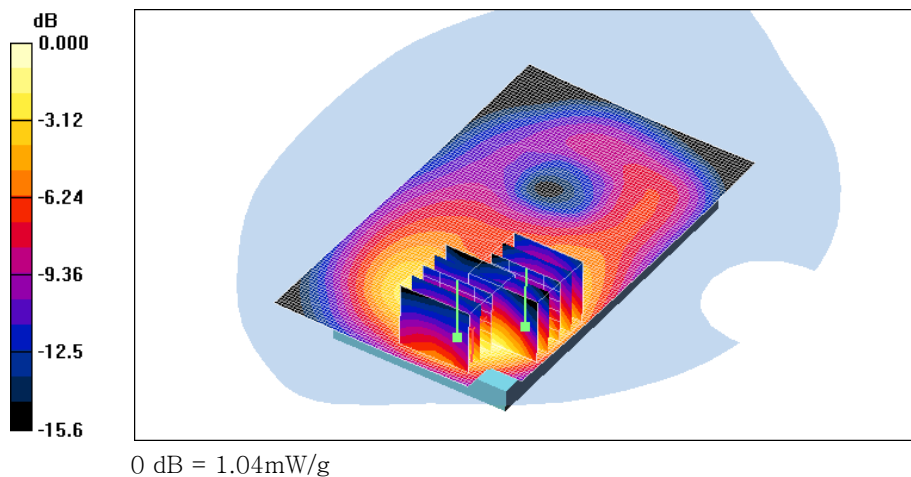
DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body rear 661 3Tx/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.01 mW/g

Body rear 661 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.09 V/m; Power Drift = -0.122 dB
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.946 mW/g; SAR(10 g) = 0.545 mW/g
Maximum value of SAR (measured) = 1.04 mW/g

Body rear 661 3Tx/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.09 V/m; Power Drift = -0.122 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.908 mW/g; SAR(10 g) = 0.522 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2.77
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

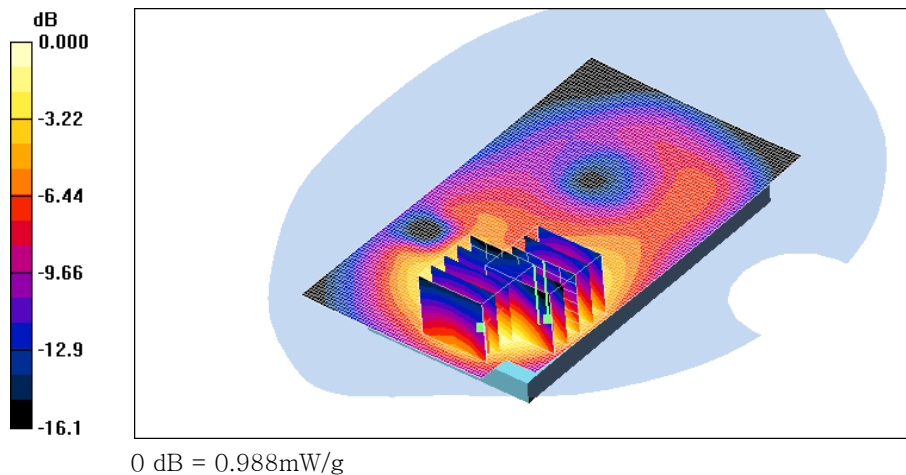
DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body rear 810 3Tx/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.967 mW/g

Body rear 810 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.94 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.898 mW/g; SAR(10 g) = 0.509 mW/g
Maximum value of SAR (measured) = 0.985 mW/g

Body rear 810 3Tx/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.94 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.876 mW/g; SAR(10 g) = 0.492 mW/g
Maximum value of SAR (measured) = 0.988 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:2.77
Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Front 512 3Tx/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm

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

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

Body Front 512 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.84 V/m; Power Drift = -0.064 dB

Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 0.938 mW/g; SAR(10 g) = 0.531 mW/g

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

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

Body Front 512 3Tx/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

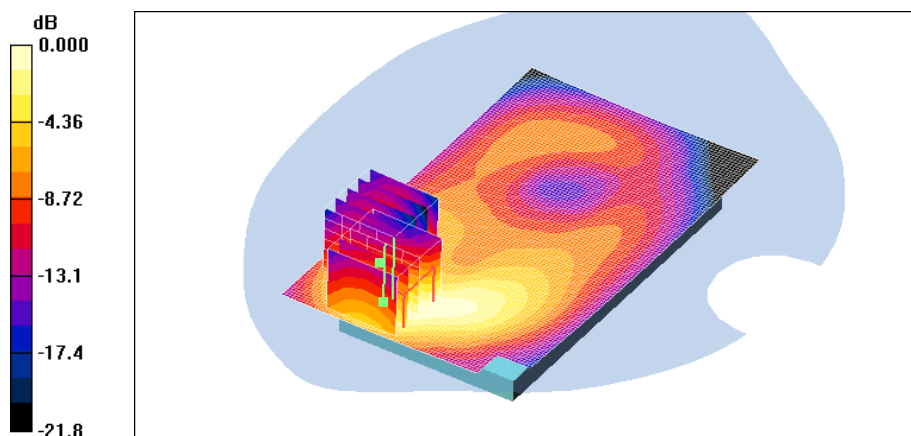
Reference Value = 4.84 V/m; Power Drift = -0.064 dB

Peak SAR (extrapolated) = 1.38 W/kg

SAR(1 g) = 0.705 mW/g; SAR(10 g) = 0.384 mW/g

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

Maximum value of SAR (measured) = 0.921 mW/g



0 dB = 0.921mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2.77
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

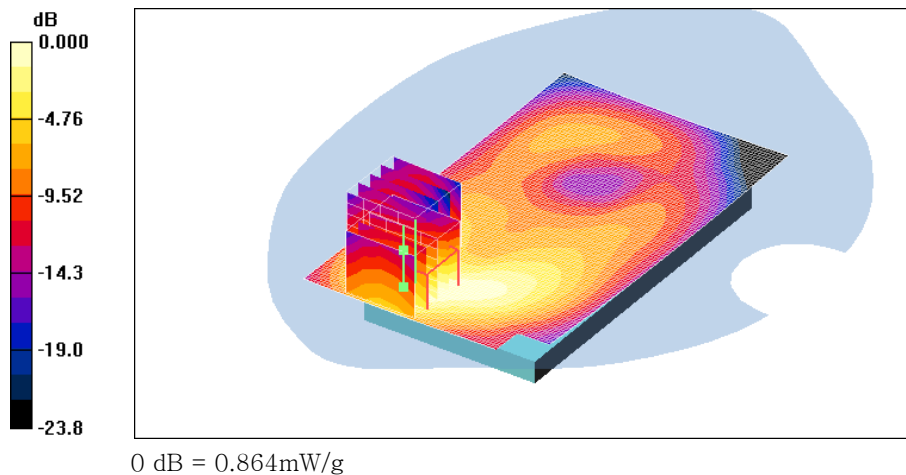
DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Front 661 3Tx/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.900 mW/g

Body Front 661 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.62 V/m; Power Drift = 0.077 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 0.870 mW/g; SAR(10 g) = 0.492 mW/g
Maximum value of SAR (measured) = 0.969 mW/g

Body Front 661 3Tx/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.62 V/m; Power Drift = 0.077 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.686 mW/g; SAR(10 g) = 0.366 mW/g
Maximum value of SAR (measured) = 0.864 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2.77
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

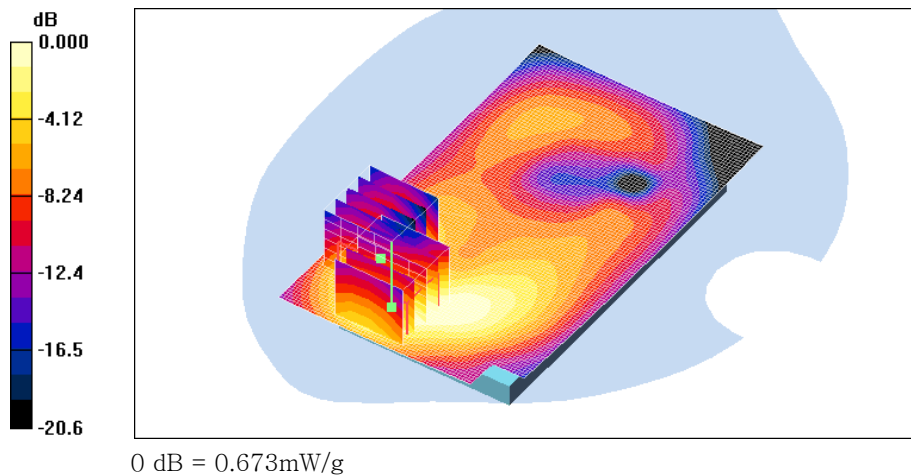
DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Front 810 3Tx/Area Scan (71x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.783 mW/g

Body Front 810 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.25 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.753 mW/g; SAR(10 g) = 0.431 mW/g
Maximum value of SAR (measured) = 0.854 mW/g

Body Front 810 3Tx/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.25 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.599 mW/g; SAR(10 g) = 0.317 mW/g
Maximum value of SAR (measured) = 0.673 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

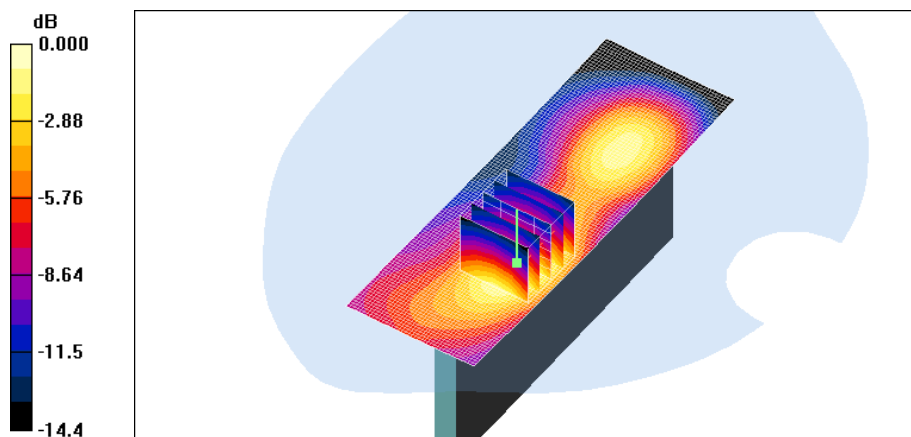
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2.77
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Hotspot Body Left side 661 3Tx/Area Scan (41x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.483 mW/g

Hotspot Body Left side 661 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.4 V/m; Power Drift = -0.091 dB
Peak SAR (extrapolated) = 0.661 W/kg
SAR(1 g) = 0.431 mW/g; SAR(10 g) = 0.258 mW/g
Maximum value of SAR (measured) = 0.470 mW/g



0 dB = 0.470mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

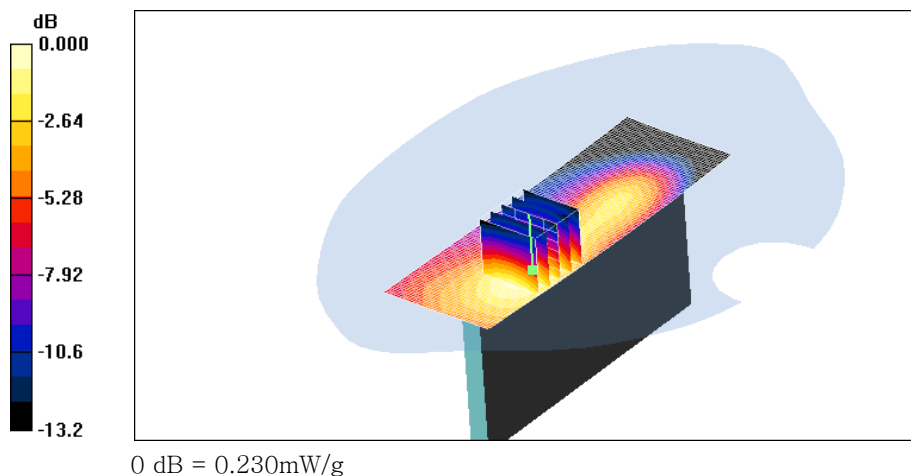
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2.77
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Hotspot Body Right side 661 3Tx/Area Scan (41x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.239 mW/g

Hotspot Body Right side 661 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.61 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 0.322 W/kg
SAR(1 g) = 0.211 mW/g; SAR(10 g) = 0.132 mW/g
Maximum value of SAR (measured) = 0.230 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:2.77
Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body bottom 512 3Tx/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.14 mW/g

Body bottom 512 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

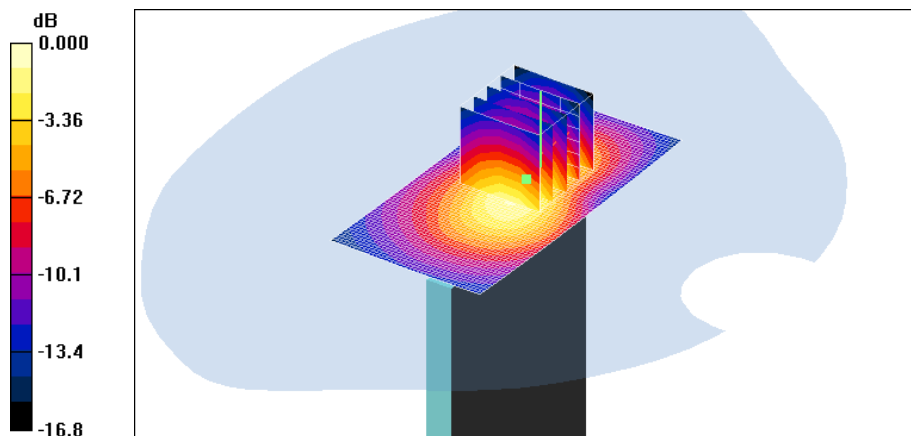
Reference Value = 25.9 V/m; Power Drift = -0.007 dB

Peak SAR (extrapolated) = 1.68 W/kg

SAR(1 g) = 0.994 mW/g; SAR(10 g) = 0.545 mW/g

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

Maximum value of SAR (measured) = 1.11 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

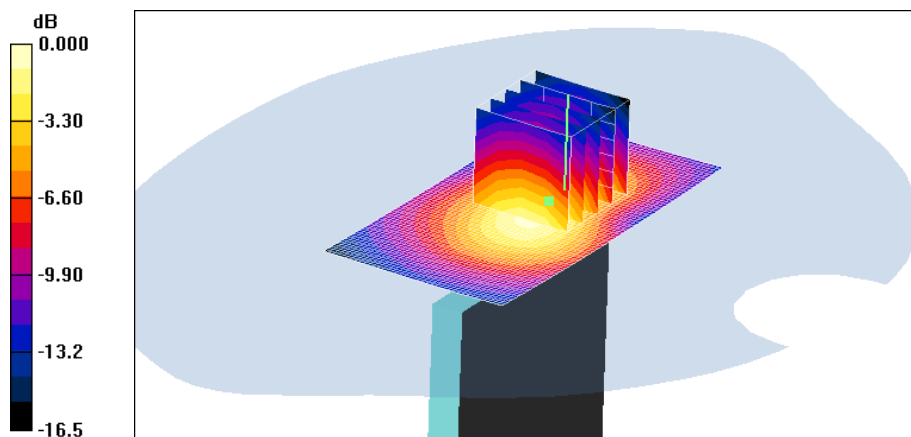
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2.77
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body bottom 661 3Tx/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.16 mW/g

Body bottom 661 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.0 V/m; Power Drift = 0.101 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.994 mW/g; SAR(10 g) = 0.563 mW/g
Maximum value of SAR (measured) = 1.11 mW/g



0 dB = 1.11mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

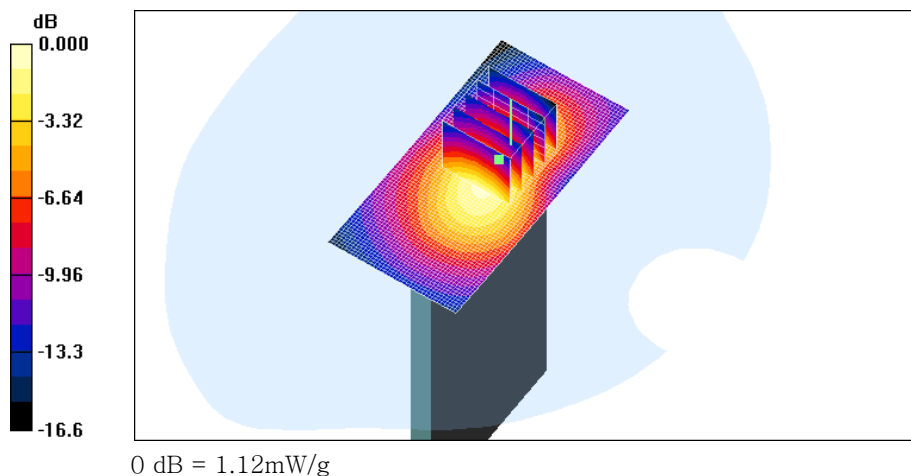
Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2.77
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body bottom 810 3Tx/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.16 mW/g

Body bottom 810 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.3 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 1.68 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.570 mW/g
Maximum value of SAR (measured) = 1.12 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.05, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: 2450MHz FCC; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2462 \text{ MHz}$; $\sigma = 1.99 \text{ mho/m}$; $\epsilon_r = 54.4$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.07, 4.07, 4.07); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

802.11b Hotspot Body rear 11ch 1Mbps/Area Scan (121x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.219 mW/g

802.11b Hotspot Body rear 11ch 1Mbps/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

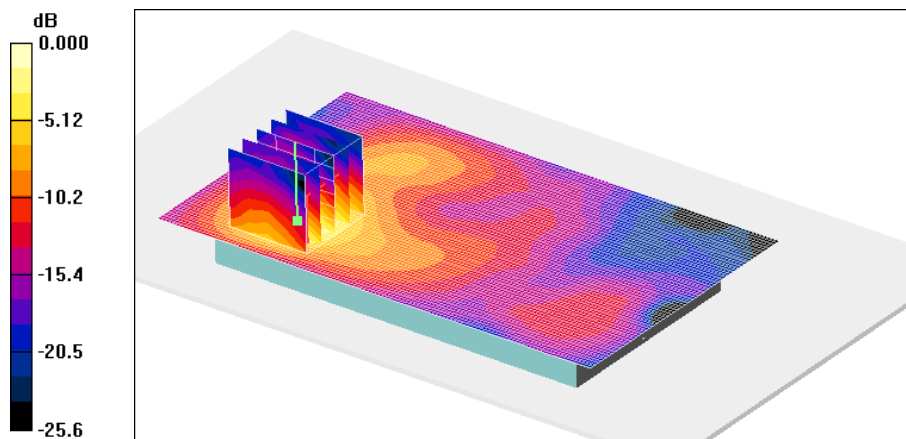
Reference Value = 3.49 V/m; Power Drift = -0.094 dB

Peak SAR (extrapolated) = 0.502 W/kg

SAR(1 g) = 0.213 mW/g; SAR(10 g) = 0.100 mW/g

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

Maximum value of SAR (measured) = 0.232 mW/g



0 dB = 0.232mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.05, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: 2450MHz FCC; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.99$ mho/m; $\epsilon_r = 54.4$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.07, 4.07, 4.07); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

802.11b Hotspot Body Front 11ch 1Mbps/Area Scan (121x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.027 mW/g

802.11b Hotspot Body Front 11ch 1Mbps/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

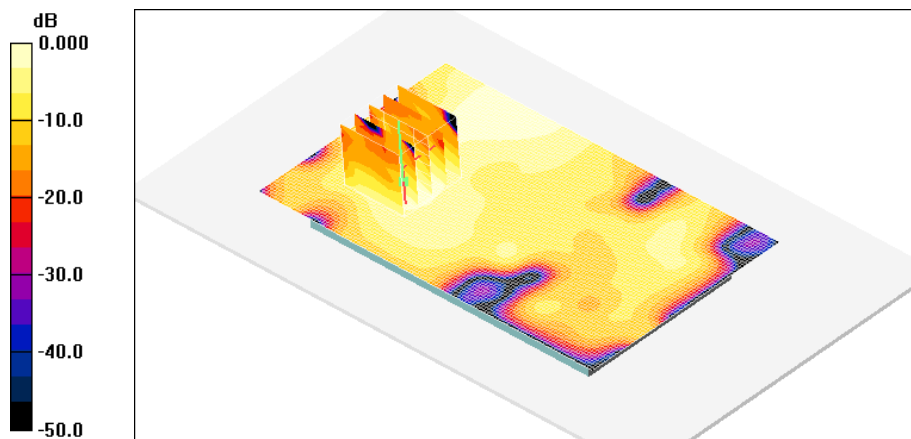
Reference Value = 1.79 V/m; Power Drift = 0.071 dB

Peak SAR (extrapolated) = 0.043 W/kg

SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.013 mW/g

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

Maximum value of SAR (measured) = 0.029 mW/g



0 dB = 0.029mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.05, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: 2450MHz FCC; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2462 \text{ MHz}$; $\sigma = 1.99 \text{ mho/m}$; $\epsilon_r = 54.4$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.07, 4.07, 4.07); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

802.11b Hotspot Body Right side 11ch 1Mbps/Area Scan (121x41x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Maximum value of SAR (interpolated) = 0.077 mW/g

802.11b Hotspot Body Right side 11ch 1Mbps/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

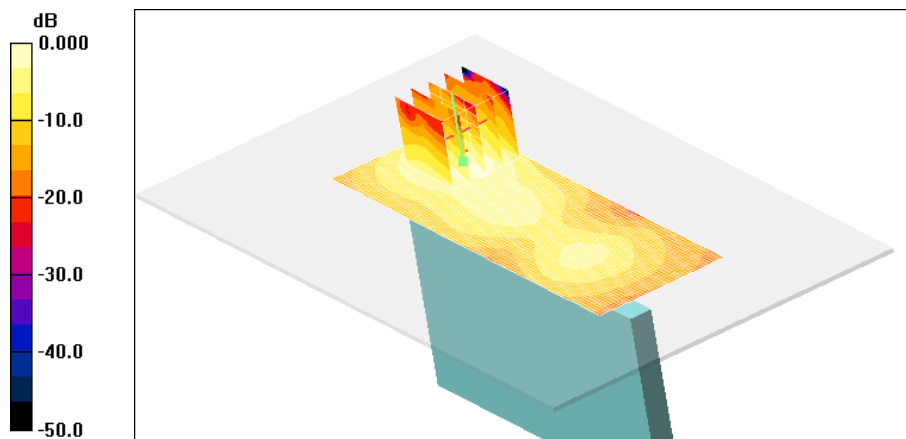
Reference Value = 4.19 V/m; Power Drift = -0.033 dB

Peak SAR (extrapolated) = 0.132 W/kg

SAR(1 g) = 0.065 mW/g; SAR(10 g) = 0.032 mW/g

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

Maximum value of SAR (measured) = 0.075 mW/g



0 dB = 0.075mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.05, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: 2450MHz FCC; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2462 \text{ MHz}$; $\sigma = 1.99 \text{ mho/m}$; $\epsilon_r = 54.4$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.07, 4.07, 4.07); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

802.11b Body Top 11ch 1Mbps/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

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

802.11b Body Top 11ch 1Mbps/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

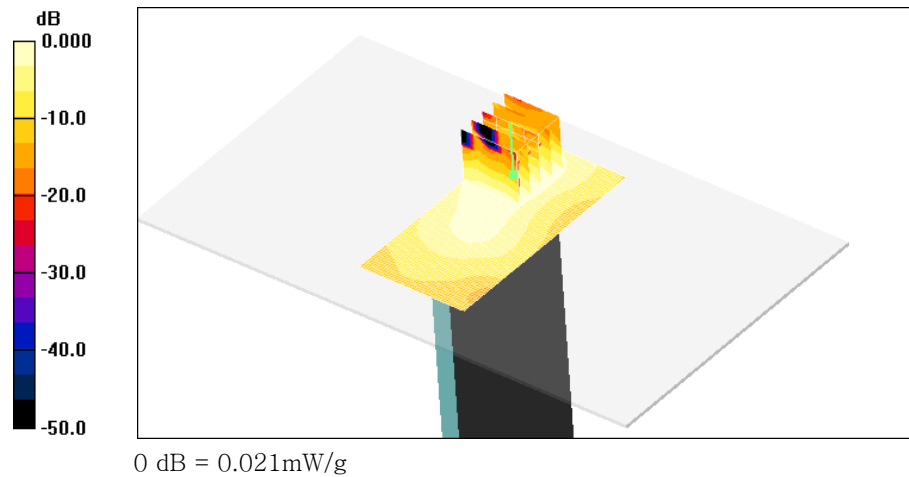
Reference Value = 2.71 V/m; Power Drift = -0.166 dB

Peak SAR (extrapolated) = 0.042 W/kg

SAR(1 g) = 0.021 mW/g; SAR(10 g) = 0.011 mW/g

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

Maximum value of SAR (measured) = 0.021 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Oct.07, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5180 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5180 \text{ MHz}$; $\sigma = 5.19 \text{ mho/m}$; $\epsilon_r = 47.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.35, 4.35, 4.35); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

WIFI 5GHz Body Rear 36ch 6Mbps/Area Scan (181x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

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

Maximum value of SAR (interpolated) = 0.236 mW/g

WIFI 5GHz Body Rear 36ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

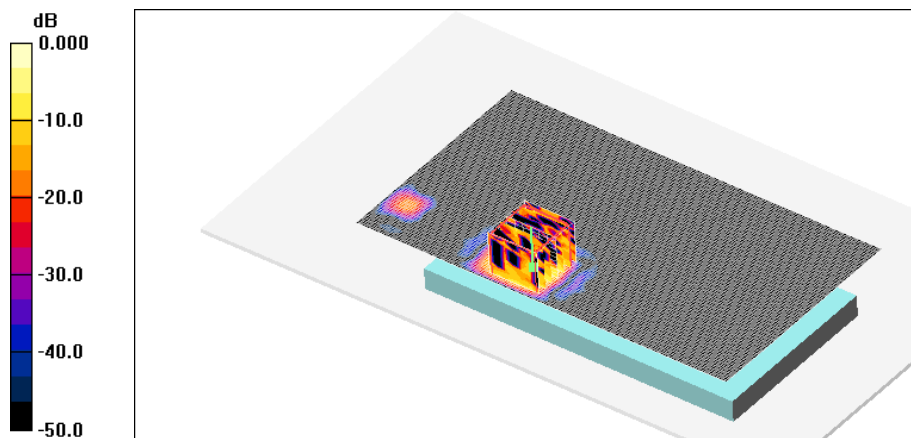
Reference Value = 0.927 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.167 W/kg

SAR(1 g) = 0.042 mW/g; SAR(10 g) = 0.011 mW/g

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

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



0 dB = 0.094mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Oct.07, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5180 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5180 \text{ MHz}$; $\sigma = 5.19 \text{ mho/m}$; $\epsilon_r = 47.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.35, 4.35, 4.35); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

WIFI 5GHz Body Front 36ch 6Mbps/Area Scan (181x131x1): Measurement grid: dx=10mm, dy=10mm

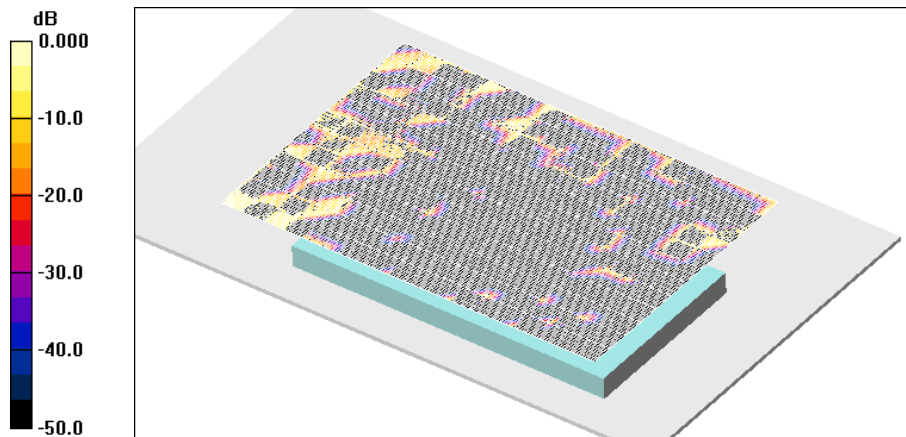
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.000 mW/g

WIFI 5GHz Body Front 36ch 6Mbps/Area Scan (19x14x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (measured) = 0.013 mW/g



0 dB = 0.013mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Oct.07, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5260 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5260$ MHz; $\sigma = 5.27$ mho/m; $\epsilon_r = 47.5$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.1, 4.1, 4.1); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

WIFI 5GHz Body Rear 52ch 6Mbps/Area Scan (181x101x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (interpolated) = 0.188 mW/g

WIFI 5GHz Body Rear 52ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

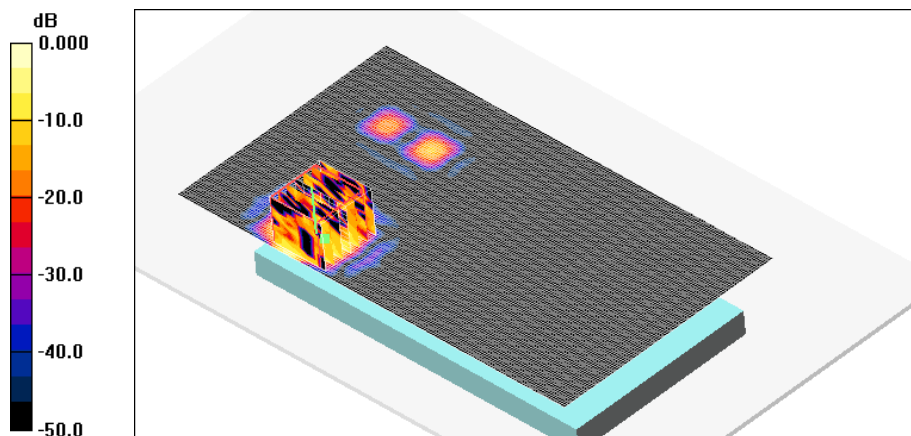
Reference Value = 0.617 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.192 W/kg

SAR(1 g) = 0.044 mW/g; SAR(10 g) = 0.011 mW/g

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

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



0 dB = 0.098mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Oct.07, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5260 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5260 \text{ MHz}$; $\sigma = 5.27 \text{ mho/m}$; $\epsilon_r = 47.5$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.1, 4.1, 4.1); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

WIFI 5GHz Body Front 52ch 6Mbps/Area Scan (181x131x1): Measurement grid: dx=10mm, dy=10mm

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

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

WIFI 5GHz Body Front 52ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

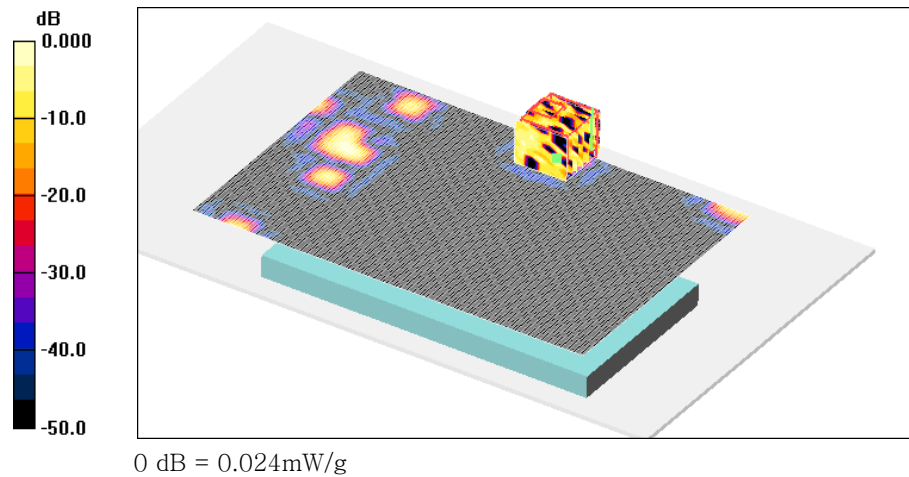
Reference Value = 1.17 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.024 W/kg

SAR(1 g) = 8.01e-005 mW/g; SAR(10 g) = 9.9e-006 mW/g

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

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



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Oct.07, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

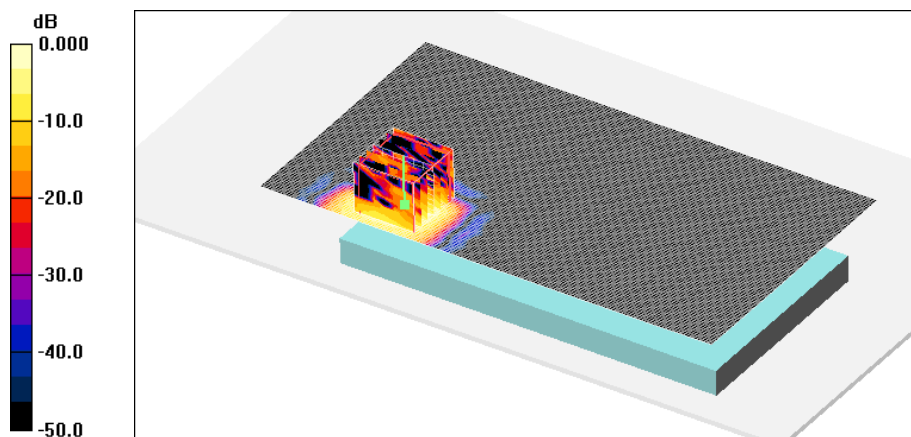
Communication System: WIFI 5GHz; Frequency: 5700 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5700$ MHz; $\sigma = 5.92$ mho/m; $\epsilon_r = 46.4$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(3.66, 3.66, 3.66); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

WIFI 5GHz Body Rear 140ch 6Mbps/Area Scan (181x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.452 mW/g

WIFI 5GHz Body Rear 140ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.786 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.503 W/kg
SAR(1 g) = 0.129 mW/g; SAR(10 g) = 0.033 mW/g
Maximum value of SAR (measured) = 0.277 mW/g



0 dB = 0.277mW/g

Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Oct.07, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5700 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5700 \text{ MHz}$; $\sigma = 5.92 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

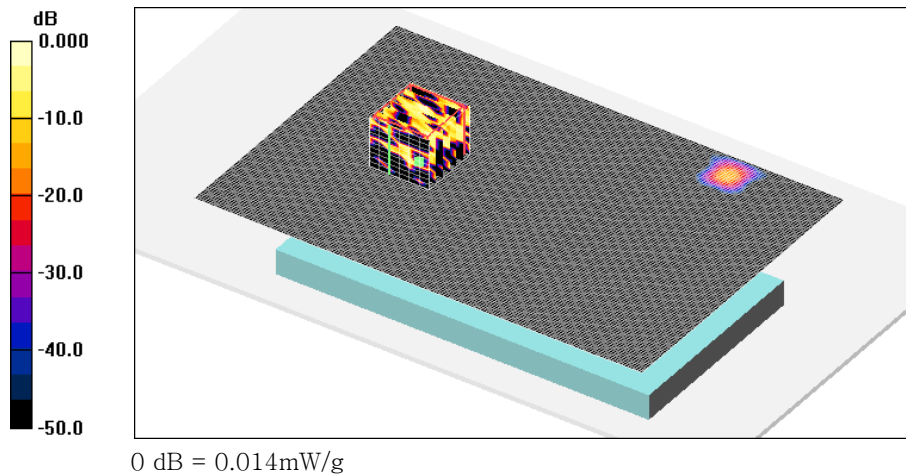
DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(3.66, 3.66, 3.66); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

WIFI 5GHz Body Front 140ch 6Mbps/Area Scan (181x131x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 0.001 mW/g

WIFI 5GHz Body Front 140ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
Reference Value = 0.824 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.002 W/kg
SAR(1 g) = 3.48e-006 mW/g; SAR(10 g) = 1.53e-007 mW/g

Maximum value of SAR (measured) = 0.014 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Oct.07, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5785 \text{ MHz}$; $\sigma = 6.15 \text{ mho/m}$; $\epsilon_r = 46.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(3.81, 3.81, 3.81); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

WIFI 5GHz Body Rear 157ch 6Mbps/Area Scan (181x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

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

Maximum value of SAR (interpolated) = 0.765 mW/g

WIFI 5GHz Body Rear 157ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

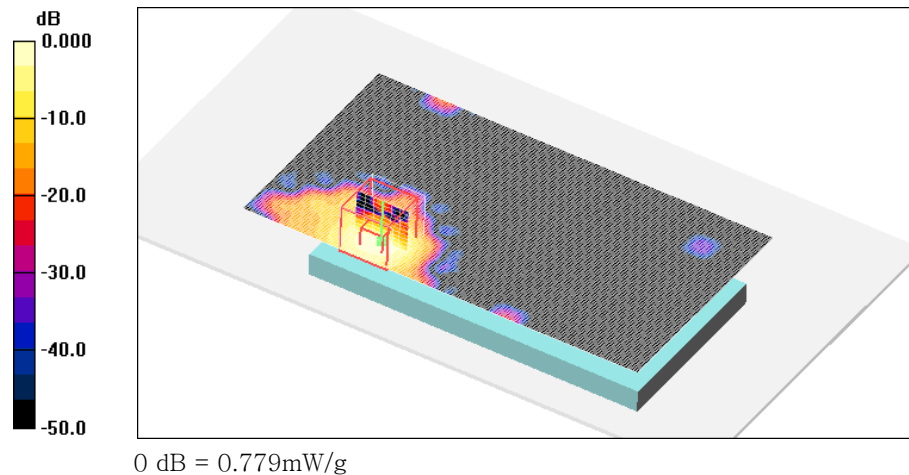
Reference Value = 0.905 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.50 W/kg

SAR(1 g) = 0.361 mW/g; SAR(10 g) = 0.103 mW/g

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

Maximum value of SAR (measured) = 0.779 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Oct.07, 2012
Separation Distance: 1.0 cm

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5785$ MHz; $\sigma = 6.15$ mho/m; $\epsilon_r = 46.2$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(3.81, 3.81, 3.81); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

WIFI 5GHz Body Front 157ch 6Mbps/Area Scan (181x131x1): Measurement grid: dx=10mm, dy=10mm

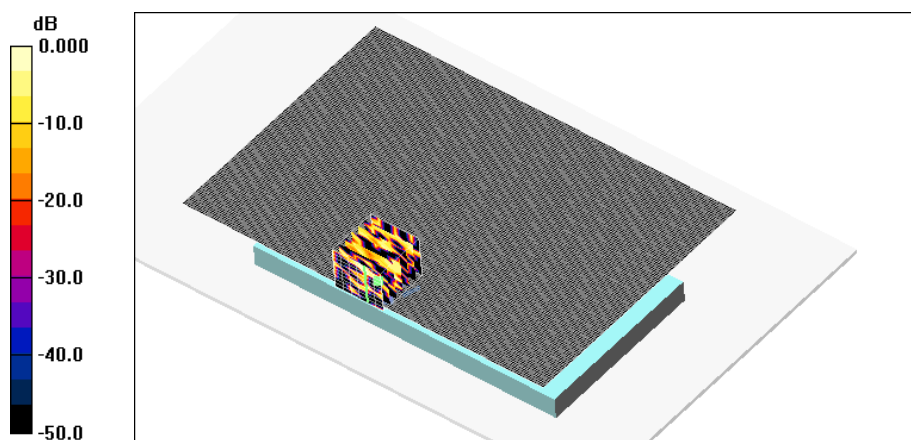
[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.003 mW/g

WIFI 5GHz Body Front 157ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.287 V/m; Power Drift = -0.01 dB

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

Maximum value of SAR (measured) = 0.017 mW/g



0 dB = 0.017mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
 Liquid Temperature: 21.1 °C
 Ambient Temperature: 21.3 °C
 Test Date: Oct.04, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

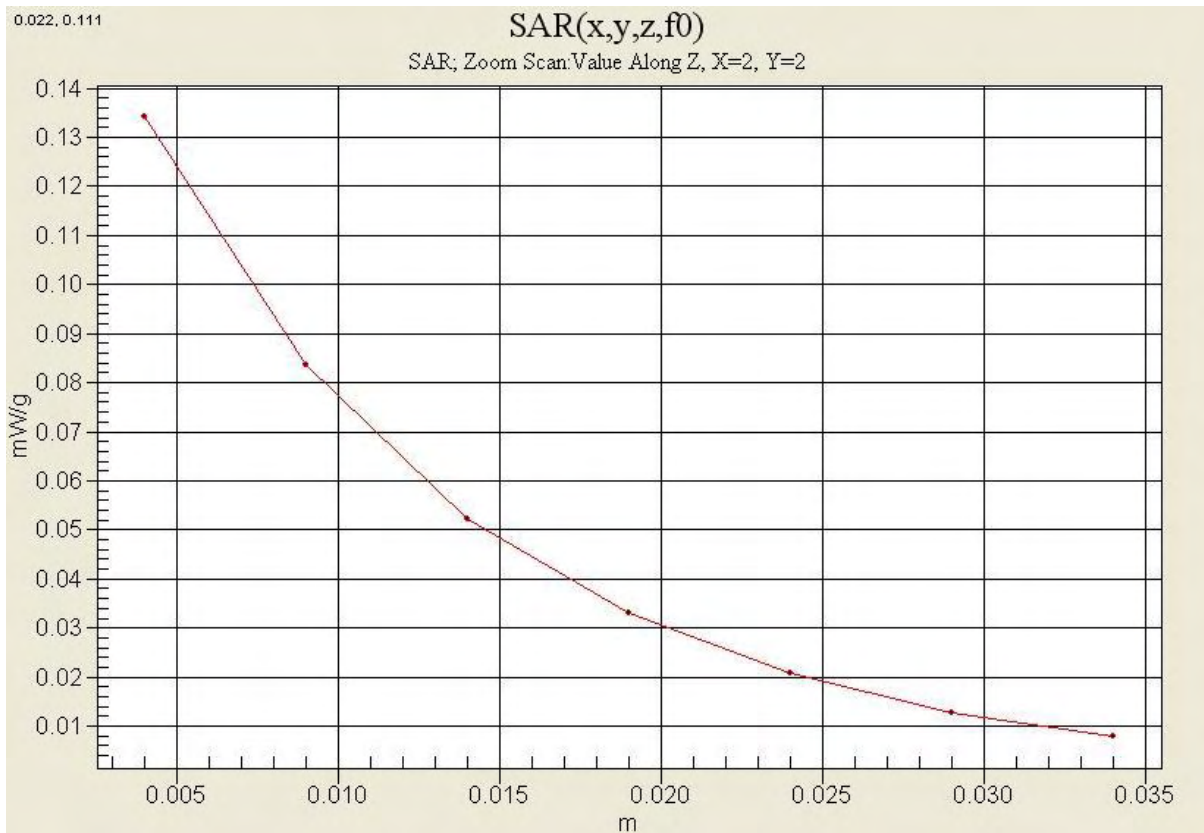
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.35 \text{ mho/m}$; $\epsilon_r = 40.9$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(5.26, 5.26, 5.26); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 835/900 Phantom ; Type: SAM

Left Touch 661/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.129 mW/g

Left Touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 5.30 V/m; Power Drift = -0.01 dB
 Peak SAR (extrapolated) = 0.195 W/kg
SAR(1 g) = 0.122 mW/g; SAR(10 g) = 0.070 mW/g
 Maximum value of SAR (measured) = 0.134 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.04, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2.77

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body bottom 810 3Tx/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

Body bottom 810 3Tx/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.3 V/m; Power Drift = -0.072 dB

Peak SAR (extrapolated) = 1.68 W/kg

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.570 mW/g

Maximum value of SAR (measured) = 1.12 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.05, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: 2450MHz FCC; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.85$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³
 Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.59, 4.59, 4.59); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 1800/1900 Phantom; Type: SAM

Left Touch 11ch 1Mbps/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.075 mW/g

Left Touch 11ch 1Mbps/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

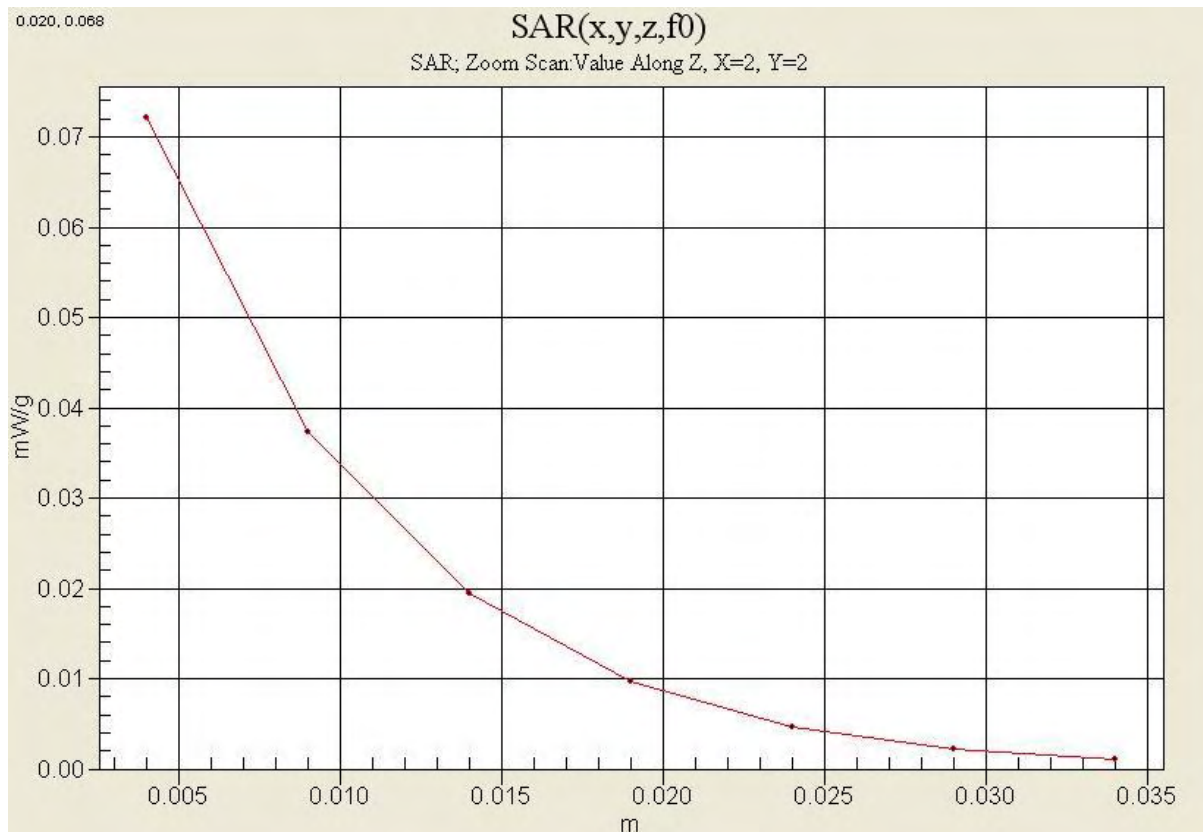
Reference Value = 3.40 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 0.145 W/kg

SAR(1 g) = 0.068 mW/g; SAR(10 g) = 0.034 mW/g

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

Maximum value of SAR (measured) = 0.072 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.05, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: 2450MHz FCC; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.99$ mho/m; $\epsilon_r = 54.4$; $\rho = 1000$ kg/m³
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.07, 4.07, 4.07); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

802.11b Hotspot Body rear 11ch 1Mbps/Area Scan (121x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.219 mW/g

802.11b Hotspot Body rear 11ch 1Mbps/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

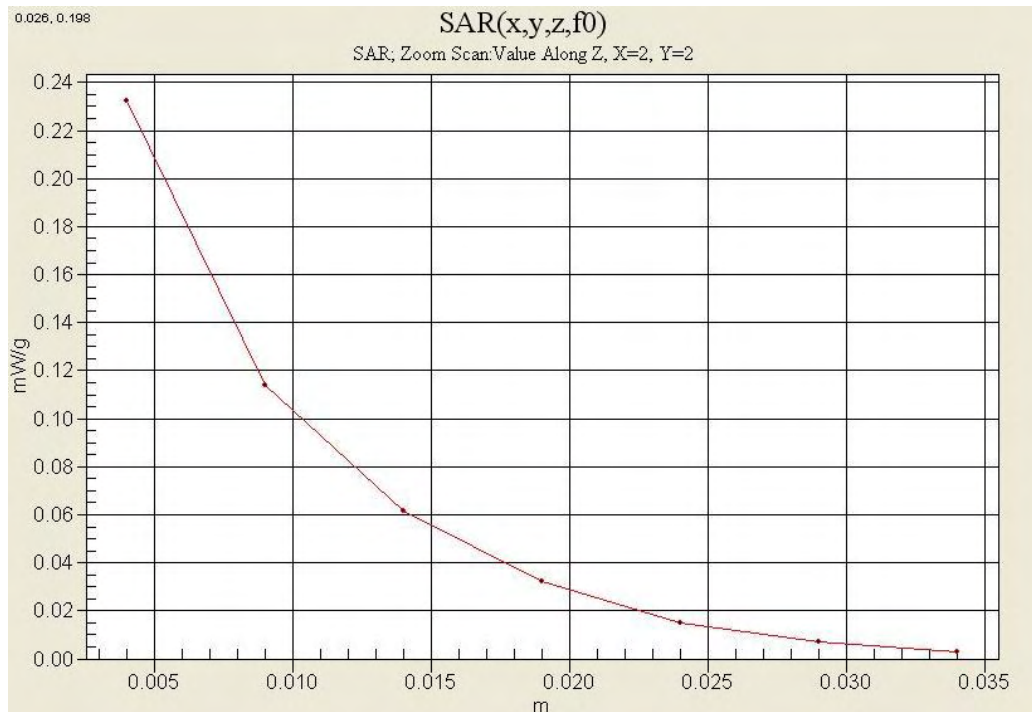
Reference Value = 3.49 V/m; Power Drift = -0.094 dB

Peak SAR (extrapolated) = 0.502 W/kg

SAR(1 g) = 0.213 mW/g; SAR(10 g) = 0.100 mW/g

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

Maximum value of SAR (measured) = 0.232 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.06, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5785 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 5785$ MHz; $\sigma = 5.2$ mho/m; $\epsilon_r = 34.9$; $\rho = 1000$ kg/m³
 Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.61, 4.61, 4.61); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 800/900 Phantom; Type: SAM

Left Touch 802.11a 157ch 6Mbps/Area Scan (101x161x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (interpolated) = 0.287 mW/g

Left Touch 802.11a 157ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

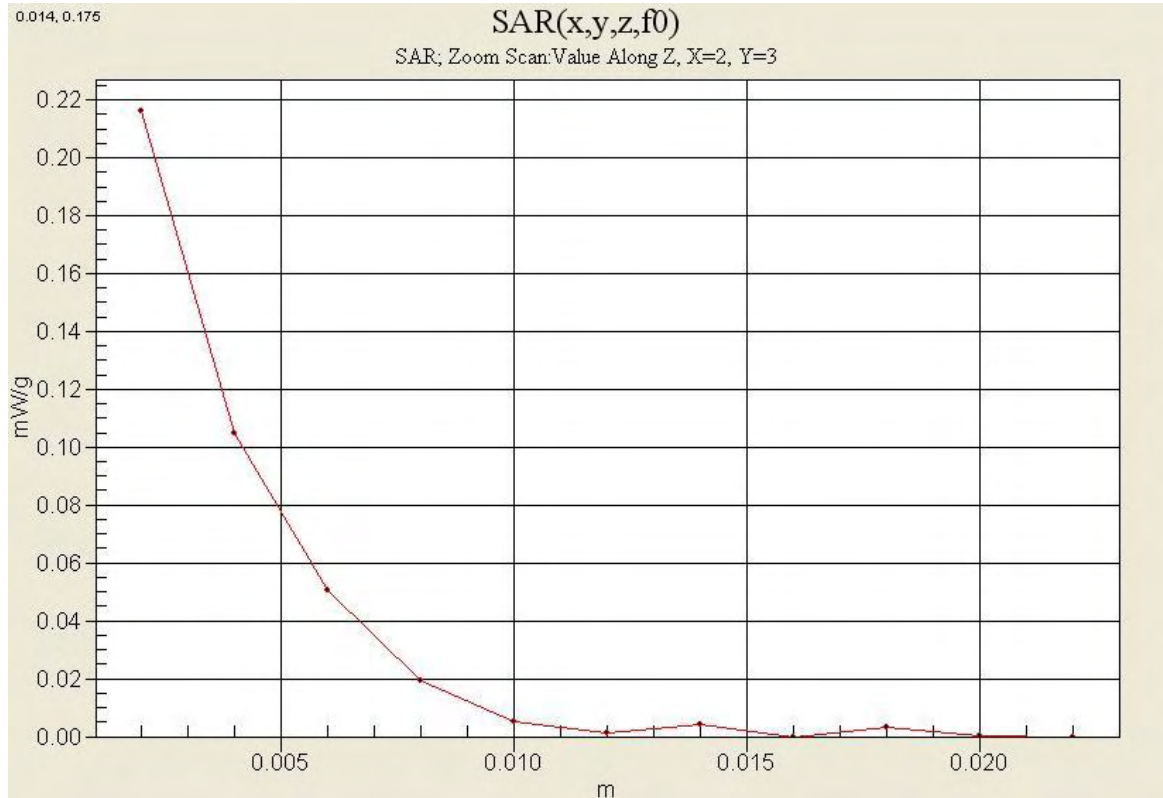
Reference Value = 2.14 V/m; Power Drift = 0.059 dB

Peak SAR (extrapolated) = 0.405 W/kg

SAR(1 g) = 0.098 mW/g; SAR(10 g) = 0.031 mW/g

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

maximum value of SAR (measured) = 0.216 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: 1900 GSM/GPRS/EDGE Phone with Bluetooth and WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Oct.07, 2012

DUT: GT-N7108; Type: bar; Serial: FJ-255-C

Communication System: WIFI 5GHz; Frequency: 5260 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 5260$ MHz; $\sigma = 5.27$ mho/m; $\epsilon_r = 47.5$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(4.1, 4.1, 4.1); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

WIFI 5GHz Body Rear 52ch 6Mbps/Area Scan (181x101x1): Measurement grid: dx=10mm, dy=10mm

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

Maximum value of SAR (interpolated) = 0.188 mW/g

WIFI 5GHz Body Rear 52ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

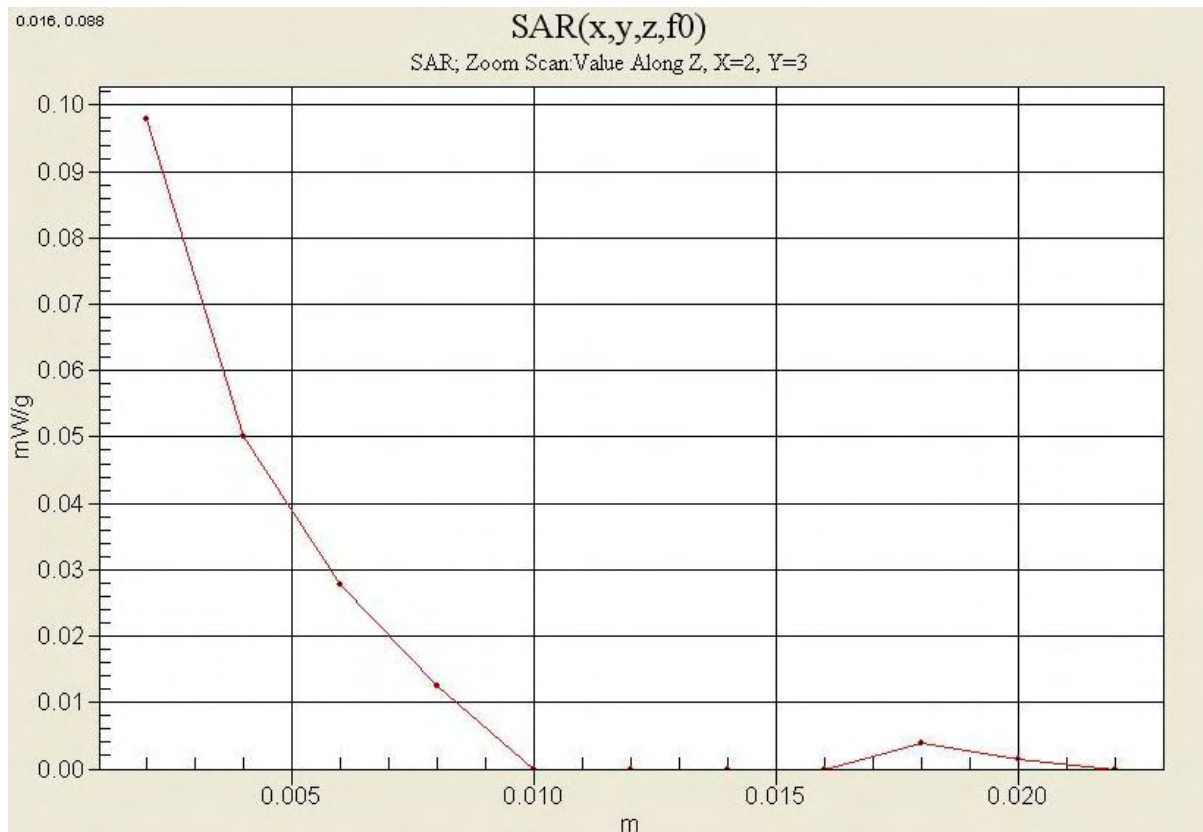
Reference Value = 0.617 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.192 W/kg

SAR(1 g) = 0.044 mW/g; SAR(10 g) = 0.011 mW/g

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

maximum value of SAR (measured) = 0.098 mW/g



Attachment 2. – Dipole Validation Plots

■ Validation Data (1 900 MHz Head)

Test Laboratory: HCT CO., LTD
Input Power: 100 mW (20 dBm)
Liquid Temp: 21.1 °C
Test Date: Oct.04, 2012

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 – SN:5d032

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 40.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 – SN1605; ConvF(5.26, 5.26, 5.26); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 835/900 Phantom ; Type: SAM

Dipole 1900MHz Validation/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 4.69 mW/g

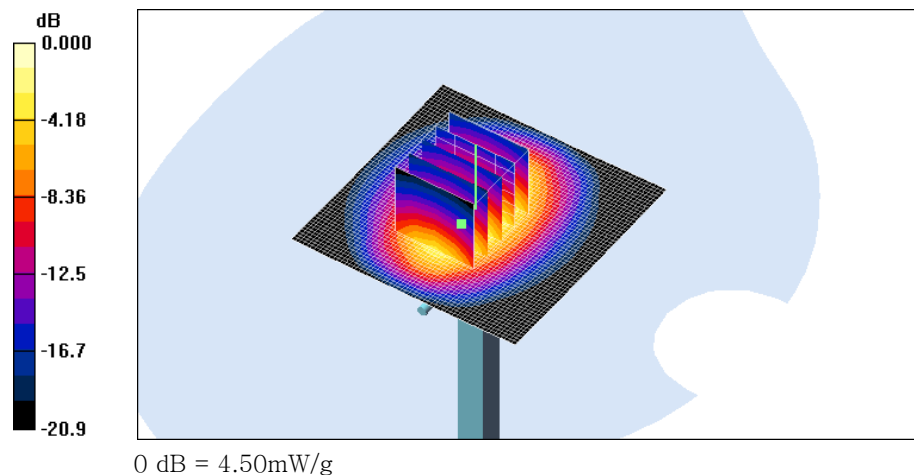
Dipole 1900MHz Validation/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 58.9 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 7.52 W/kg

SAR(1 g) = 4.02 mW/g; SAR(10 g) = 2.04 mW/g

Maximum value of SAR (measured) = 4.50 mW/g



■ Validation Data (1 900 MHz Body)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.1 °C
Test Date: Oct.04, 2012

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 – SN:5d032

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 – SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 1800/1900 MHz; Type: SAM

Dipole 1900MHz Validation/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 4.72 mW/g

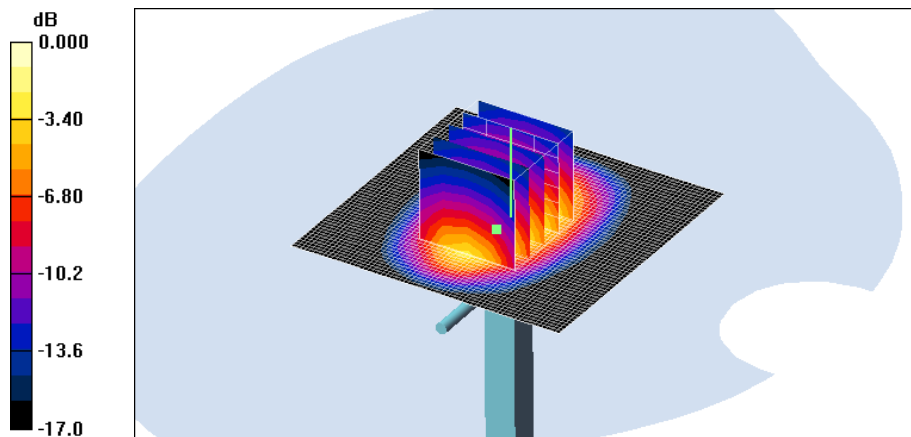
Dipole 1900MHz Validation/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 58.2 V/m; Power Drift = -0.021 dB

Peak SAR (extrapolated) = 6.21 W/kg

SAR(1 g) = 3.94 mW/g; SAR(10 g) = 2.17 mW/g

Maximum value of SAR (measured) = 4.43 mW/g



■ Validation Data (2 450 MHz Head)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.2 °C
Test Date: Oct.05, 2012

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 – SN:743

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.83 \text{ mho/m}$; $\epsilon_r = 40.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 – SN1605; ConvF(4.59, 4.59, 4.59); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: 1800/1900 Phantom; Type: SAM

Validation 2450MHz/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 6.89 mW/g

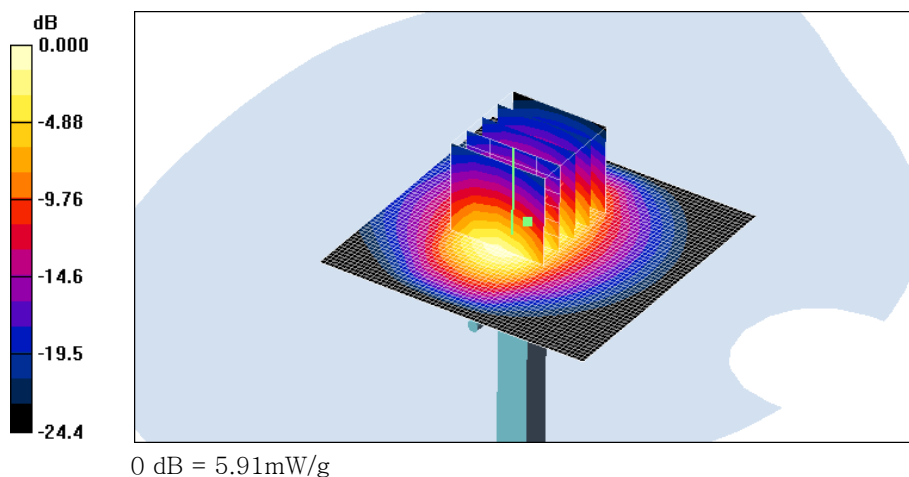
Validation 2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 59.8 V/m; Power Drift = -0.021 dB

Peak SAR (extrapolated) = 11.8 W/kg

SAR(1 g) = 5.4 mW/g; SAR(10 g) = 2.54 mW/g

Maximum value of SAR (measured) = 5.91 mW/g



■ Validation Data (2 450 MHz Body)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.2 °C
Test Date: Oct.05, 2012

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 – SN:743

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.97 \text{ mho/m}$; $\epsilon_r = 54.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 – SN1605; ConvF(4.07, 4.07, 4.07); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

Validation 2450MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 6.43 mW/g

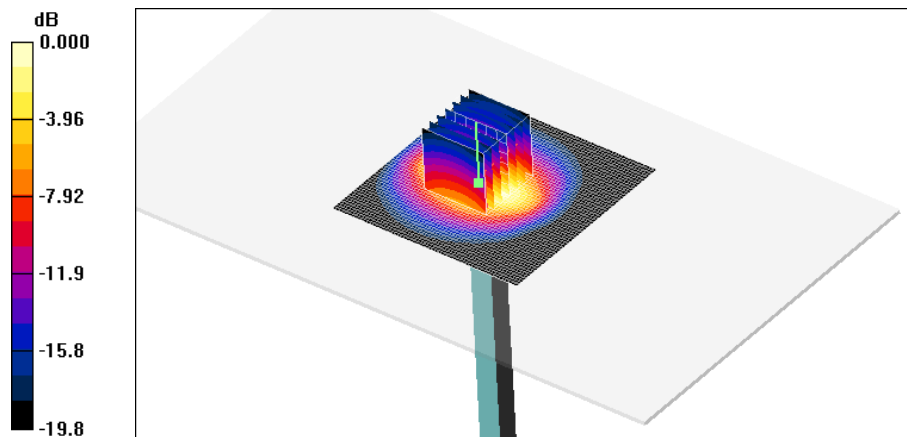
Validation 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.6 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 10.7 W/kg

SAR(1 g) = 5.15 mW/g; SAR(10 g) = 2.54 mW/g

Maximum value of SAR (measured) = 5.78 mW/g



0 dB = 5.78mW/g

■ Validation Data (5GHz Head)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.2 °C
Test Date: Oct.06, 2012

DUT: Dipole 5GHz; Type: D5000V2; Serial: D5000V2 – SN:1107

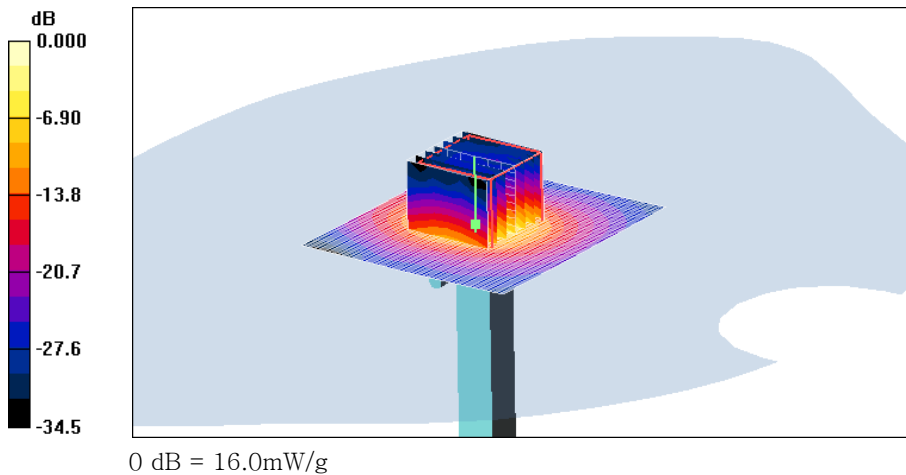
Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5200$ MHz; $\sigma = 4.48$ mho/m; $\epsilon_r = 36.4$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(4.96, 4.96, 4.96); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 835/900 MHz; Type: SAM

Validation 5200MHz/Area Scan (61x71x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 9.34 mW/g

Validation 5200MHz/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 42.5 V/m; Power Drift = 0.056 dB
Peak SAR (extrapolated) = 33.9 W/kg
SAR(1 g) = 7.97 mW/g; SAR(10 g) = 2.23 mW/g
Maximum value of SAR (measured) = 16.0 mW/g



■ Validation Data (5GHz Head)

Test Laboratory: HCT CO., LTD
Input Power: 100 mW (20 dBm)
Liquid Temp: 21.2 °C
Test Date: Oct.06, 2012

DUT: Dipole 5GHz; Type: D5000V2; Serial: D5000V2 – SN:1107

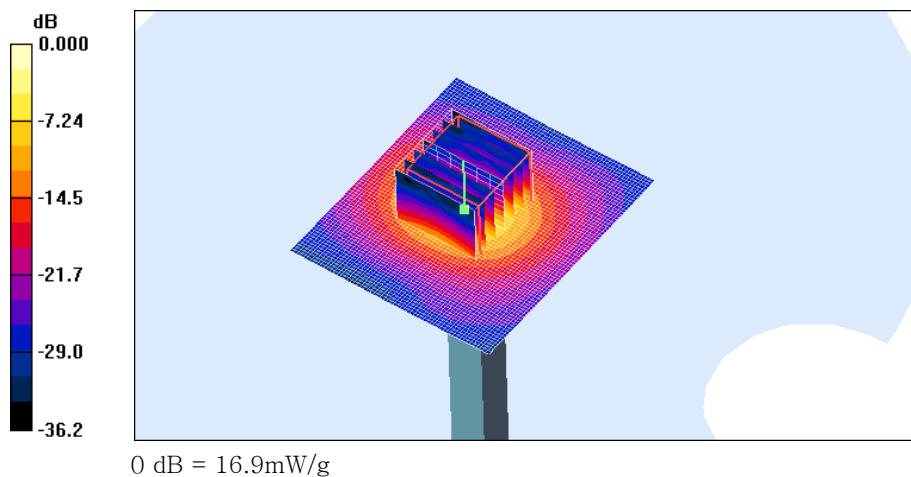
Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5500$ MHz; $\sigma = 4.82$ mho/m; $\epsilon_r = 35.7$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(4.66, 4.66, 4.66); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 835/900 MHz; Type: SAM

Validation 5500MHz/Area Scan (61x71x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 9.62 mW/g

Validation 5500MHz/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 41.0 V/m; Power Drift = 0.076 dB
Peak SAR (extrapolated) = 38.1 W/kg
SAR(1 g) = 8.3 mW/g; SAR(10 g) = 2.28 mW/g
Maximum value of SAR (measured) = 16.9 mW/g



■ Validation Data (5GHz Head)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.2 °C
Test Date: Oct.06, 2012

DUT: Dipole 5GHz; Type: D5000V2; Serial: D5000V2 – SN:1107

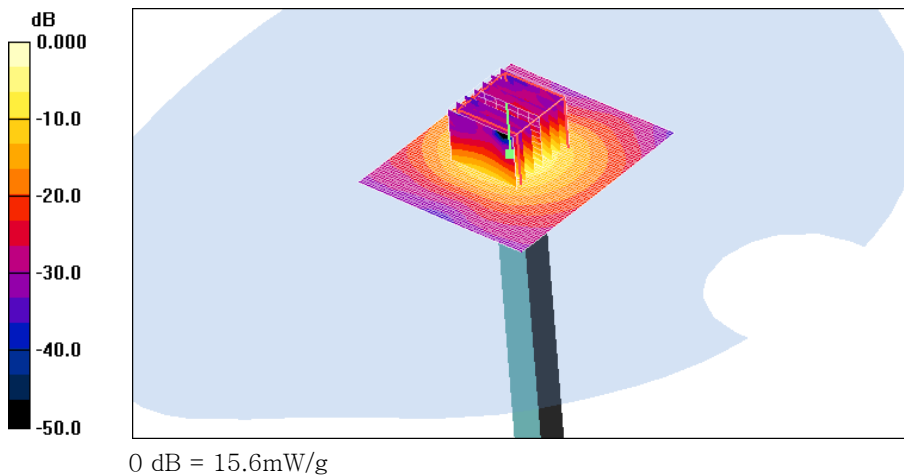
Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 5.22 \text{ mho/m}$; $\epsilon_r = 34.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(4.61, 4.61, 4.61); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: SAM 835/900 MHz; Type: SAM

Validation 5800MHz/Area Scan (61x71x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 8.76 mW/g

Validation 5800MHz/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
Reference Value = 38.0 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 36.5 W/kg
SAR(1 g) = 7.84 mW/g; SAR(10 g) = 2.18 mW/g
Maximum value of SAR (measured) = 15.6 mW/g



■ Validation Data (5GHz Body)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.3 °C
Test Date: Oct.07, 2012

DUT: Dipole 5GHz; Type: D5000V2; Serial: D5000V2 – SN:1107

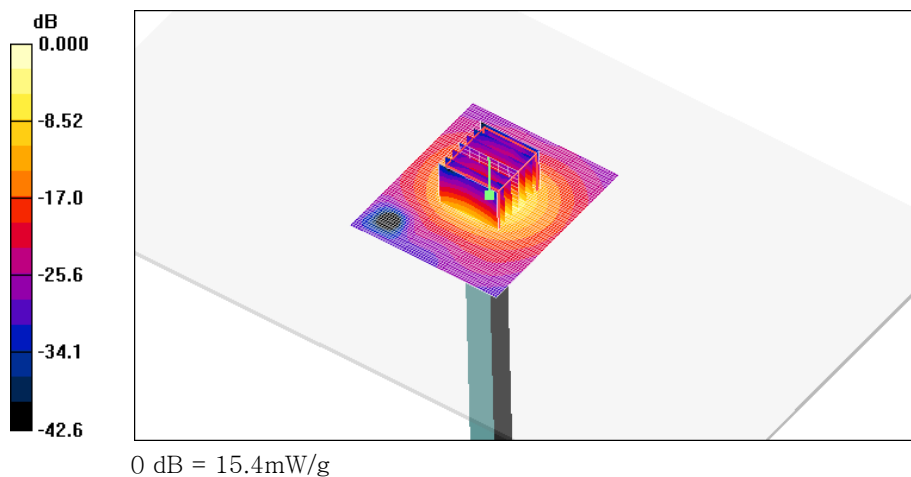
Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5200$ MHz; $\sigma = 5.21$ mho/m; $\epsilon_r = 47.5$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(4.35, 4.35, 4.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C ; Type: QD 000 P51 CA

Validation 5200MHz/Area Scan (61x71x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 8.51 mW/g

Validation 5200MHz/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 38.4 V/m; Power Drift = -0.029 dB
Peak SAR (extrapolated) = 30.9 W/kg
SAR(1 g) = 7.45 mW/g; SAR(10 g) = 2.12 mW/g
Maximum value of SAR (measured) = 15.4 mW/g



■ Validation Data (5GHzBody)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.3 °C
Test Date: Oct.07, 2012

DUT: Dipole 5GHz; Type: D5000V2; Serial: D5000V2 – SN:1107

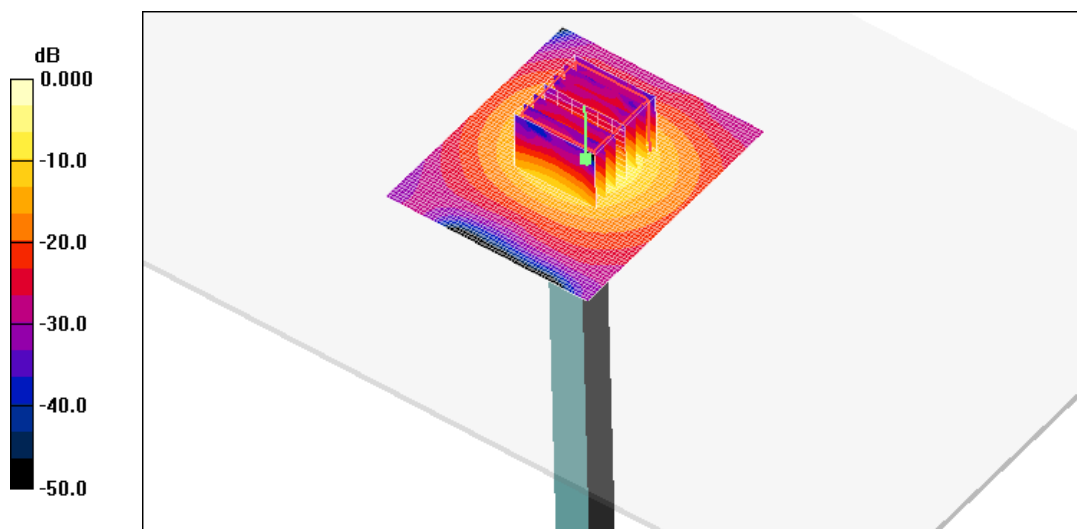
Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5500 \text{ MHz}$; $\sigma = 5.56 \text{ mho/m}$; $\epsilon_r = 46.5$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 – SN3863; ConvF(3.91, 3.91, 3.91); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

Validation 5500MHz/Area Scan (61x71x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 8.80 mW/g

Validation 5500MHz/Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$
Reference Value = 38.0 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 34.0 W/kg
SAR(1 g) = 7.94 mW/g; SAR(10 g) = 2.25 mW/g
Maximum value of SAR (measured) = 16.5 mW/g



0 dB = 16.5mW/g

■ Validation Data (5GHzBody)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.3 °C
Test Date: Oct.07, 2012

DUT: Dipole 5GHz; Type: D5000V2; Serial: D5000V2- SN:1107

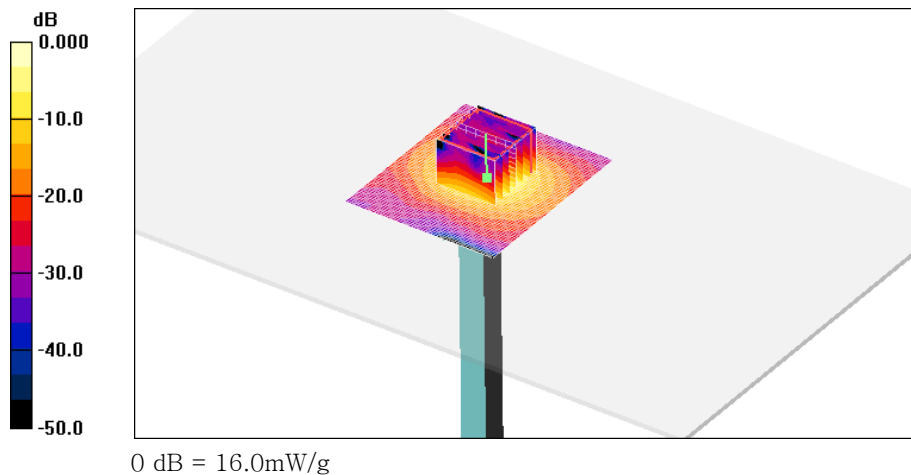
Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5800$ MHz; $\sigma = 6.13$ mho/m; $\epsilon_r = 46.2$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(3.81, 3.81, 3.81); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn479; Calibrated: 2012-08-28
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

Validation 5800MHz/Area Scan (61x71x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 8.34 mW/g

Validation 5800MHz/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 35.4 V/m; Power Drift = -0.025 dB
Peak SAR (extrapolated) = 33.2 W/kg
SAR(1 g) = 7.52 mW/g; SAR(10 g) = 2.12 mW/g
Maximum value of SAR (measured) = 16.0 mW/g



■ Dielectric Parameter (1 900 MHz Head)

Title	GT-N7108
SubTitle	1 900MHz
Test Date	Oct.04, 2012

Frequency	e'	e''
1800000000.0000	41.1960	12.6455
1810000000.0000	41.1571	12.6645
1820000000.0000	41.1237	12.6816
1830000000.0000	41.0854	12.7214
1840000000.0000	41.0398	12.7401
1850000000.0000	41.0039	12.7786
1860000000.0000	40.9764	12.8181
1870000000.0000	40.9443	12.8395
1880000000.0000	40.9019	12.8604
1890000000.0000	40.8693	12.9009
1900000000.0000	40.8462	12.9150
1910000000.0000	40.7945	12.9559
1920000000.0000	40.7524	12.9819
1930000000.0000	40.7159	13.0231
1940000000.0000	40.6916	13.0465
1950000000.0000	40.6546	13.0894
1960000000.0000	40.6264	13.0949
1970000000.0000	40.5858	13.1256
1980000000.0000	40.5574	13.1556
1990000000.0000	40.5201	13.1783
2000000000.0000	40.4703	13.2122

■ Dielectric Parameter (1 900 MHz Body)

Title GT-N7108
SubTitle 1 900MHz
Test Date Oct.04, 2012

Frequency	e'	e''
1850000000.0000	52.2861	14.5654
1855000000.0000	52.2639	14.5821
1860000000.0000	52.2458	14.6012
1865000000.0000	52.2461	14.6104
1870000000.0000	52.2292	14.6127
1875000000.0000	52.2354	14.6141
1880000000.0000	52.2103	14.6209
1885000000.0000	52.2018	14.6278
1890000000.0000	52.1912	14.6382
1895000000.0000	52.1653	14.6432
1900000000.0000	52.1453	14.6599
1905000000.0000	52.1531	14.6844
1910000000.0000	52.1253	14.6732
1915000000.0000	52.1158	14.6957
1920000000.0000	52.0880	14.6973
1925000000.0000	52.0680	14.7200
1930000000.0000	52.0553	14.7202
1935000000.0000	52.0466	14.7388
1940000000.0000	52.0358	14.7448
1945000000.0000	52.0204	14.7581
1950000000.0000	52.0003	14.7625

■ Dielectric Parameter (2 450 MHz Head)

Title GT-N7108
SubTitle 2 450MHz
Test Date Oct.05, 2012

Frequency	e'	e''
2400000000.0000	40.5212	13.3528
2405000000.0000	40.5097	13.3624
2410000000.0000	40.4855	13.3802
2415000000.0000	40.4644	13.3782
2420000000.0000	40.4370	13.3818
2425000000.0000	40.4154	13.3919
2430000000.0000	40.3760	13.3977
2435000000.0000	40.3442	13.4085
2440000000.0000	40.3125	13.4193
2445000000.0000	40.2799	13.4481
2450000000.0000	40.2337	13.4548
2455000000.0000	40.2023	13.4714
2460000000.0000	40.1767	13.4943
2465000000.0000	40.1570	13.5236
2470000000.0000	40.1403	13.5559
2475000000.0000	40.1334	13.5796
2480000000.0000	40.1551	13.6063
2485000000.0000	40.1317	13.6334
2490000000.0000	40.1324	13.6647
2495000000.0000	40.1465	13.6725
2500000000.0000	40.1368	13.6789

■ Dielectric Parameter (2 450 MHz Body)

Title	GT-N7108
SubTitle	2 450MHz
Test Date	Oct.05, 2012

Frequency	e'	e''
2400000000.0000	54.6599	14.2577
2405000000.0000	54.6421	14.2777
2410000000.0000	54.6232	14.2995
2415000000.0000	54.6092	14.3068
2420000000.0000	54.5827	14.3193
2425000000.0000	54.5724	14.3582
2430000000.0000	54.5468	14.3738
2435000000.0000	54.5226	14.3959
2440000000.0000	54.5032	14.4036
2445000000.0000	54.4684	14.4408
2450000000.0000	54.4565	14.4709
2455000000.0000	54.4532	14.4893
2460000000.0000	54.4182	14.5196
2465000000.0000	54.4077	14.5322
2470000000.0000	54.3930	14.5589
2475000000.0000	54.3693	14.5905
2480000000.0000	54.3505	14.6194
2485000000.0000	54.3468	14.6356
2490000000.0000	54.3068	14.6459
2495000000.0000	54.3061	14.6664
2500000000.0000	54.2910	14.6910

■ Dielectric Parameter (5GHz Head)

Title GT-N7108
SubTitle 5GHz
Test Date Oct.06, 2012

Frequency	e'	e''
5000000000.0000	36.6080	15.0373
5050000000.0000	36.6120	15.3918
5100000000.0000	36.5649	15.1522
5150000000.0000	36.2692	15.5401
5200000000.0000	36.4397	15.4921
5250000000.0000	36.1108	15.4950
5300000000.0000	36.1328	15.7390
5350000000.0000	36.1170	15.4744
5400000000.0000	35.8431	15.7510
5450000000.0000	35.9551	15.7059
5500000000.0000	35.6640	15.7379
5550000000.0000	35.6133	15.9061
5600000000.0000	35.5473	15.8166
5650000000.0000	35.3020	15.9985
5700000000.0000	35.2605	15.9623
5750000000.0000	34.9924	16.0794
5800000000.0000	34.8628	16.1800
5850000000.0000	34.7244	16.2212
5900000000.0000	34.5316	16.4170
5950000000.0000	34.4893	16.4337
6000000000.0000	34.2569	16.5400

■ Dielectric Parameter (5GHz Body)

Title GT-N7108
SubTitle 5GHz
Test Date Oct.07, 2012

Frequency	e'	e''
5000000000.0000	47.9458	17.8015
5050000000.0000	48.1177	17.7250
5100000000.0000	47.7691	17.8249
5150000000.0000	47.8337	17.9675
5200000000.0000	47.4928	18.0190
5250000000.0000	47.6001	18.0001
5300000000.0000	47.0442	18.1320
5350000000.0000	47.5309	18.1625
5400000000.0000	46.7083	18.1020
5450000000.0000	47.2683	18.5730
5500000000.0000	46.5465	18.1873
5550000000.0000	46.8510	18.8817
5600000000.0000	46.5384	18.4035
5650000000.0000	46.4420	19.0727
5700000000.0000	46.3542	18.6752
5750000000.0000	46.0469	19.3011
5800000000.0000	46.2321	19.0075
5850000000.0000	45.7062	19.3779
5900000000.0000	46.1044	19.4118
5950000000.0000	45.4403	19.4789
6000000000.0000	45.9230	19.7533

Attachment 3. – Probe Calibration Data

Calibration Laboratory of
Schmid & Partner
Engineering AG
 Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
 The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **HCT (Dymstec)**

Certificate No: ET3-1605_Apr12

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1605**

Calibration procedure(s) **QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4**
 Calibration procedure for dosimetric E-field probes

Calibration date: **April 26, 2012**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	10-Jan-12 (No. DAE4-660_Jan12)	Jan-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	
Issued: April 26, 2012			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

Calibration Laboratory of
Schmid & Partner
Engineering AG
 Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
 C Service suisse d'étalonnage
 S Servizio svizzero di taratura
 S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
 The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization ϕ	ϕ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z}** = NORM_{x,y,z} * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,y,z}**: A, B, C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

ET3DV6 – SN:1605

April 26, 2012

Probe ET3DV6

SN:1605

Manufactured: July 27, 2001
Calibrated: April 26, 2012

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

ET3DV6- SN:1605

April 26, 2012

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1605

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	1.60	1.96	1.67	$\pm 10.1 \%$
DCP (mV) ^B	98.4	97.0	98.0	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^E (k=2)
0	CW	0.00	X	0.00	0.00	1.00	166.8	$\pm 3.0 \%$
			Y	0.00	0.00	1.00	149.9	
			Z	0.00	0.00	1.00	177.8	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of NormX,Y,Z do not affect the E^2 -field uncertainty inside TSL (see Pages 5 and 6).

^B Numerical linearization parameter; uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

ET3DV6- SN:1605

April 26, 2012

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1605

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	7.03	7.03	7.03	0.25	3.00	± 12.0 %
835	41.5	0.90	6.64	6.64	6.64	0.29	3.00	± 12.0 %
900	41.5	0.97	6.52	6.52	6.52	0.23	3.00	± 12.0 %
1450	40.5	1.20	5.73	5.73	5.73	0.77	2.20	± 12.0 %
1750	40.1	1.37	5.51	5.51	5.51	0.80	1.76	± 12.0 %
1900	40.0	1.40	5.26	5.26	5.26	0.80	1.91	± 12.0 %
1950	40.0	1.40	5.08	5.08	5.08	0.60	1.62	± 12.0 %
2450	39.2	1.80	4.59	4.59	4.59	0.80	2.02	± 12.0 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

ET3DV6- SN:1605

April 26, 2012

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1605

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.61	6.61	6.61	0.22	3.00	± 12.0 %
835	55.2	0.97	6.52	6.52	6.52	0.28	3.00	± 12.0 %
1750	53.4	1.49	4.87	4.87	4.87	0.80	2.51	± 12.0 %
1900	53.3	1.52	4.64	4.64	4.64	0.78	2.32	± 12.0 %
2450	52.7	1.95	4.07	4.07	4.07	0.78	2.18	± 12.0 %

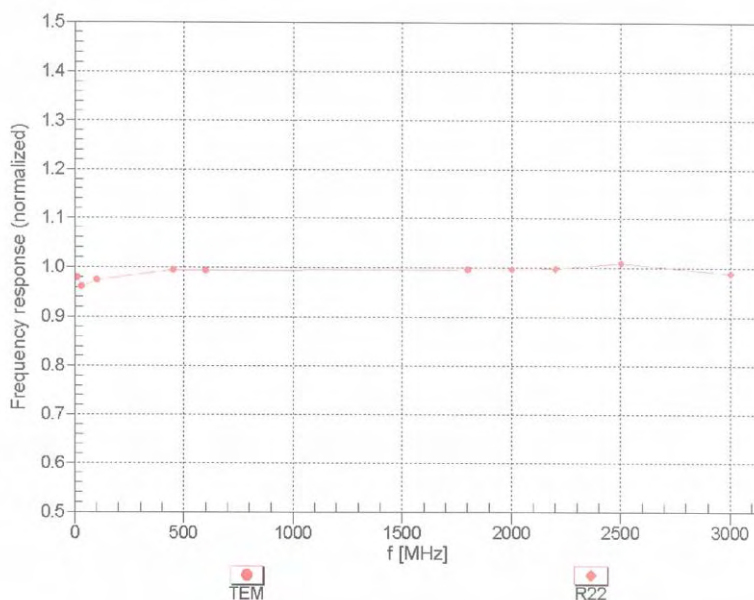
^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

ET3DV6-SN:1605

April 26, 2012

Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)

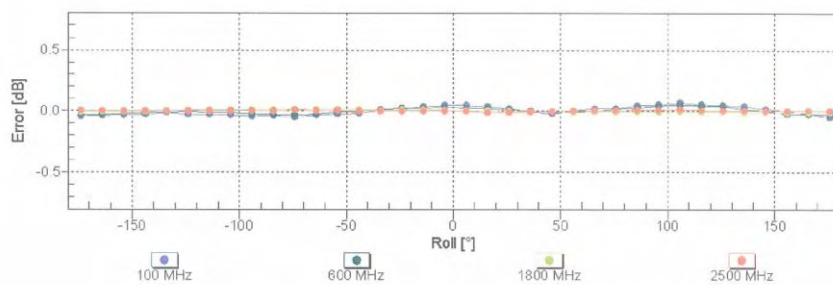
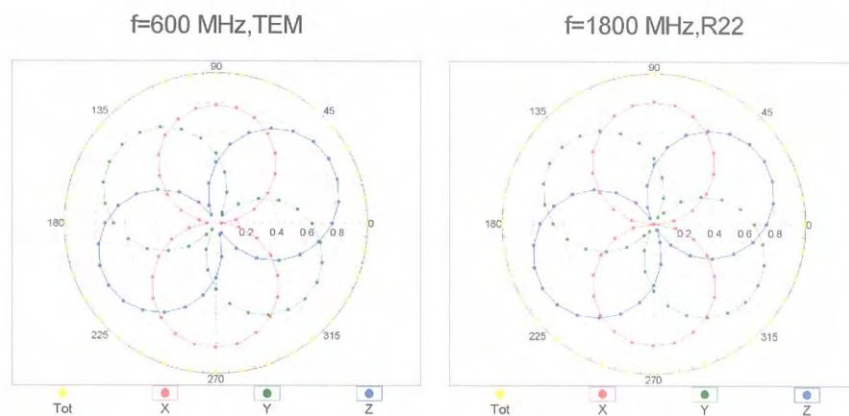


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

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Receiving Pattern (ϕ), $\theta = 0^\circ$

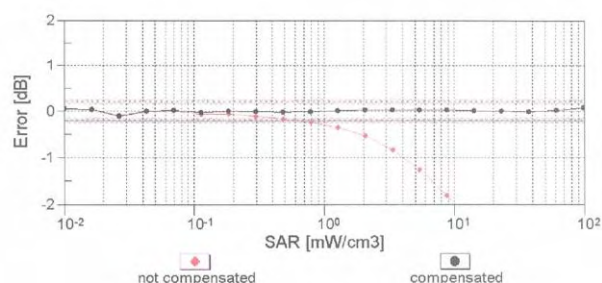
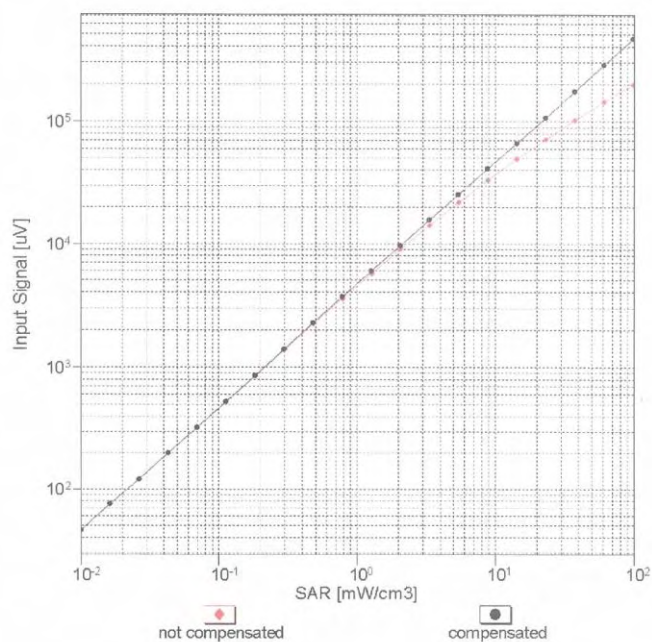


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f = 900 \text{ MHz}$)

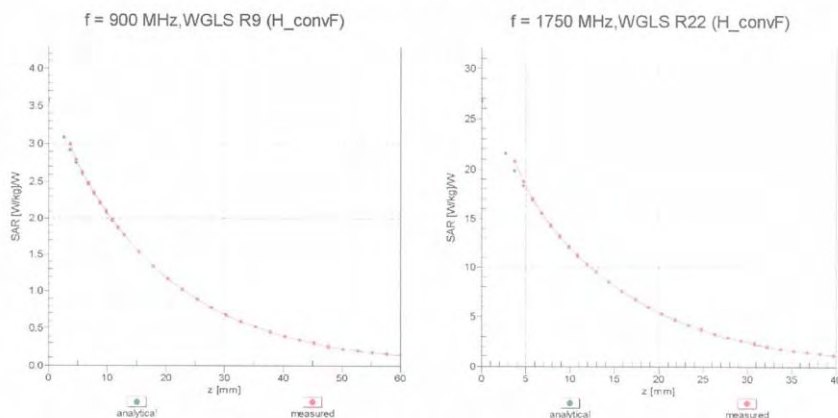


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

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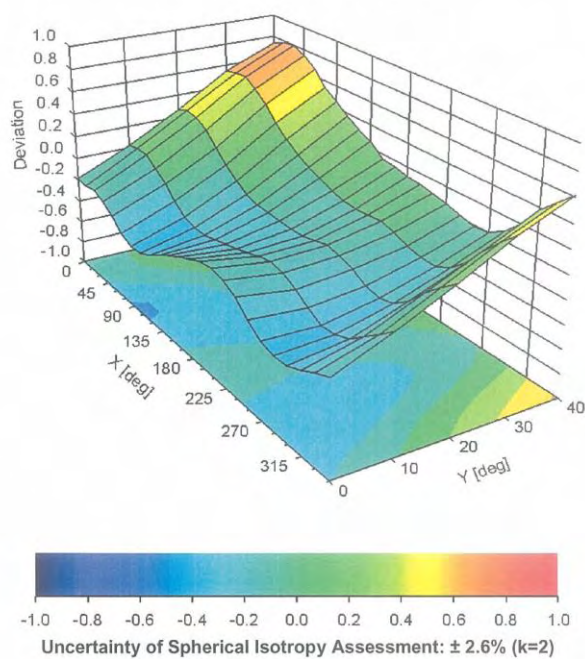
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Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ , θ), f = 900 MHz



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DASY/EASY - Parameters of Probe: ET3DV6 - SN:1605**Other Probe Parameters**

Sensor Arrangement	Triangular
Connector Angle (°)	56
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	6.8 mm
Probe Tip to Sensor X Calibration Point	2.7 mm
Probe Tip to Sensor Y Calibration Point	2.7 mm
Probe Tip to Sensor Z Calibration Point	2.7 mm
Recommended Measurement Distance from Surface	4 mm