

SAR TEST REPORT

HCT CO., LTD

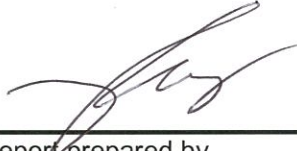
EUT Type:	Cellular/PCS CDMA & LTE Portable Router with WLAN		
FCC ID:	RB2-R772		
Model:	R772	Trade Name	Franklin Wireless Corp
Date of Issue:	Oct.17 , 2012		
Test report No.:	HCTA1210FS04		
Test Laboratory:	HCT CO., LTD. 105-1, Jangam-ri, Majang-myeon, Icheon-si, Gyeonggi-do, Korea 467-811 TEL: +82 31 645 6300 FAX: +82 31 645 6401		
Applicant :	Franklin Wireless Corp. 6205 Lusk Blvd, San Diego CA 92121 Tel: 858-623-0000 ext 330 Fax: 858-775-5314		
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.		
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. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C 01-01, IEEE Standard 1528-2003 & IEEE 1528a-2005 and the following published KDB procedures.

- . 248227 D01 SAR Measurement Procedures for 802.11 a/b/g Transmitters
- . 447498 D01 General RF Exposure Guidance v04
- . 450824 D01 SAR Prob Cal and Ver Meas v01r01
- . 450824 D02 Dipole SAR Validation Verification v01
- . 648474 D01 SAR Handsets Multi Xmitter and Ant, v01r05
- . 865664 SAR measurement Requirements for 3 to 6 GHz
- . 941225 D01 SAR test for 3G devices v02
- . 941225 D05 SAR for LTE Devices v01
- . 941225 D06 Hotspot SAR v01

3. 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	Cellular/PCS CDMA & LTE Portable Router with WLAN		
FCC ID	RB2-R772	Model(s)	R772
Trade Name	Franklin Wireless Corp	Serial Number(s)	#1
Application Type	Certification		
Operation Band(s)	BC0 / BC1 / BC10 / 802.11bgn/ LTE Band 25		
Tx Frequency	816.0 – 824.0 MHz (BC10) / 824.70 – 848.31 MHz (CDMA835) 1 851.25 – 1 908.75 MHz (PCS CDMA) 1 852.5 – 1 912.5 MHz (LTE Band 25) 2 412.0 – 2 462.0 MHz (802.11b/g/n)		
Rx Frequency	861.0 – 869.0 MHz (BC10) / 869.70 – 893.31 MHz (CDMA835) 1 931.25 – 1 988.75 MHz (PCS CDMA) 1 932.5 – 1 992.5 MHz (LTE Band 25) 2 412.0 – 2 462.0 MHz (802.11b/g/n)		
FCC Classification	PCS Licensed Transmitter (PCB)		
Production Unit	Prototype		
Max SAR	Band	1g SAR (W/kg)	
		Body SAR	
	BC10	1.24	
	CDMA835	1.14	
	PCS1900	1.32	
	LTE Band 25	0.761	
	802.11b	0.102	
Simultaneous SAR per KDB 690783 D01			1.336
Date(s) of Tests	Oct.08 , 2012 ~ Oct.11 , 2012		
Antenna Type	Integral Antenna		
EVDO	Rev.0, A		
Key Feature(s)	-. This device supports Hotspot mode. -. The device was tested only EVDO Rev.0 mode, because 1xRTT and EVDO Rev.A output power is not greater than 0.25 dB of EVDO Rev.0		

3.1 KDB 941225 LTE information

Frequency Range:	Band 25: 1852.5MHz – 1912.5MHz	
Channel Bandwidth:	5 MHz	
Channel Number & Frequency:	Band 25	
	5 MHz	
	Ch.	Freq.(MHz)
	26065	1852.5
	26365	1882.5
	26665	1912.5
UE Category & Uplink Modulation	UE Category 3 QPSK, 16QAM	
Power Class	UE Power Class 3	
Description of the LTE Transmitter & antenna	This model has two Transmitter -. Ant.1: BC0, BC1, BC10, and LTE. It can not transmit simultaneously. -. Ant.2: WiFi. It can transmit simultaneously with Ant.1	
LTE voice/data requirements	Data Only	
Identify if MPR is optional or mandatory	The EUT incorporates MPR as per 3GPP TS36.101. The MPR is permanently built-in by design as a mandatory. A-MPR is not implemented. During SAR testing, A-MPR was disabled by setting NS=01 on the R&S CMW500.	
Maximum average conducted output power (dBm)	See section 9. RF conducted power measurement in the SAR report.	
Identify all other U.S. wireless operating modes, device exposure configurations and frequency bands	-. BC0, BC1, BC10, LTE Band 25 and WiFi 2.4 GHz : Body SAR is required.	
Maximum average conducted output power for other wireless mode and frequency	See section 9. RF output power measurement in the SAR report.	
Simultaneous Transmission condition	This device supports simultaneous transmission.	
Power reduction explanation	Power reduction implement. Please find the section 9.	
Description of the test equipment, software, etc.	LTE SAR Testing was performed using a CMW500. UE transmits with maximum output power during SAR testing.	

4. DESCRIPTION OF TEST EQUIPMENT

4.1 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.4.1).

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.

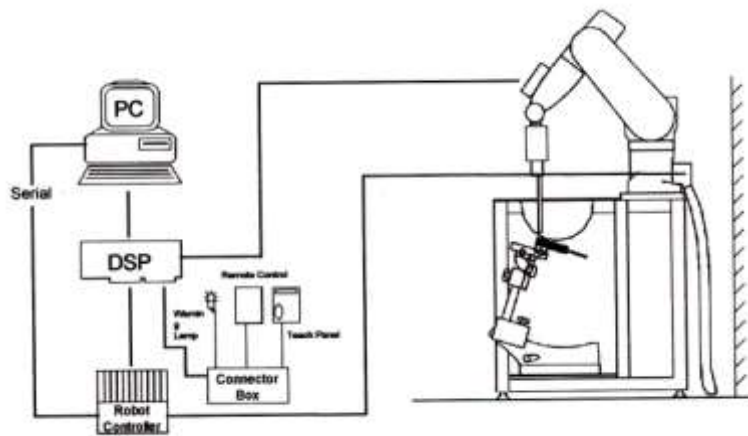


Figure 4.1 HCT SAR Lab. Test Measurement Set-up

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.

4.2 DASY E-FIELD PROBE SYSTEM

4.2.1 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: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application	General dissymmetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms



Figure 4.2 Photograph of the probe and the Phantom

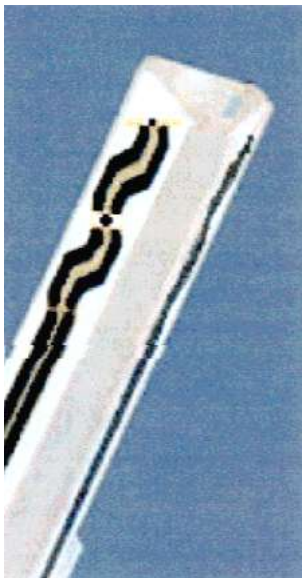


Figure 4.3 ET3DV6 E-field Probe

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.

4.3 PROBE CALIBRATION PROCESS

4.3.1 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)

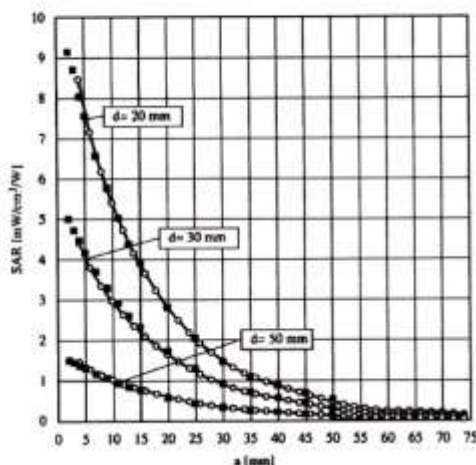


Figure 4.4 E-Field and Temperature measurements at 900 MHz

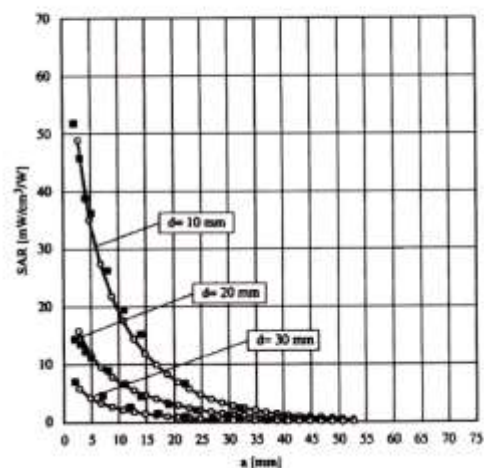


Figure 4.5 E-Field and temperature measurements at 1.8 GHz

4.3.2 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.

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

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

4.4 Flat Phantom

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.

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



Figure 4.6 MFP V5.1 Triple Modular Phantom

4.5 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 infinite number of configurations.

To produce the Worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.



Figure 4.7 Device Holder

4.6 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 4.1). 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)										
	450		750	835		915		1 900		2 450	
Tissue Type	Head	Body	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	54.7	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.38	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	42.8	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7

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 4.1 Composition of the Tissue Equivalent Matter

4.7 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	912	Nov. 17, 2011	Annual	Nov. 17, 2012
SPEAG	E-Field Probe ET3DV6	1609	Mar. 19, 2012	Annual	Mar. 19, 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
R&S	Base Station CMW500	1201.0002K50_116858	Jan. 17, 2012	Annual	Jan. 17, 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.

5. 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 device was measured at a distance of 3.0 mm from the inner surface of the shell. The area covered the entire dimension of the device 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.

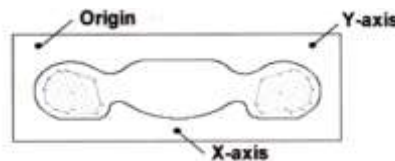


Figure 5.1 SAR Measurement Point in Area Scan

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 (750 MHz- 2450 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

Band	Date	Liquid	Liquid Temp.[°C]	Parameters	Target Value	Measured Value	Deviation [%]	Limit [%]
850 MHz	Oct.08 , 2012	Body	21.2	ϵ_r	55.2	53.3	- 3.44	± 5
				σ	0.97	0.996	+ 2.68	± 5
1900 MHz	Oct.09 , 2012	Body	21.1	ϵ_r	53.3	51.9	- 2.63	± 5
				σ	1.52	1.54	+ 1.32	± 5
2450 MHz	Oct.11 , 2012	Body	21.1	ϵ_r	52.7	54.4	+ 3.23	± 5
				σ	1.95	1.93	- 1.03	± 5
LTE Band 25	Oct.10 , 2012	Body	21.2	ϵ_r	53.3	52.1	- 2.25	± 5
				σ	1.52	1.55	+ 1.97	± 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

Band	Probe (SN)	Dipole (SN)	Date	Liquid	Liquid Temp. [°C]	1 W Target SAR _{1g} (mW/g)	Measured SAR _{1g} (mW/g)	1 W Normalized SAR _{1g} (mW/g)	Deviation [%]	Limit [%]
850	1605	441	Oct.08 , 2012	Body	21.2	9.50	0.993	9.93	+ 4.53	± 10
1900		5d032	Oct.09 , 2012	Body	21.1	39.9	4.16	41.6	+ 4.26	± 10
2450		743	Oct.11 , 2012	Body	21.1	51.2	5.2	52	+ 1.56	± 10
LTE 25		5d032	Oct.10 , 2012	Body	21.2	39.9	3.88	38.8	- 2.76	± 10

8.3 System Validation Procedure

SAR measurement was Prior to assessment, the system is verified to the ± 10 % of the specifications at target frequency 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.

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



SAR Test for WWAN & LTE were performed with a base station simulator Agilent E5515C & CMW500. 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.

9.1 SAR Measurement Conditions for 1x Ev-Do Devices

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 evaluating SAR. 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 then 5% occurred, the tests were repeated.

These procedures were followed according to FCC "SAR Measurement Procedures for 3G Devices",

9.1.1 1xEv-Do Data Devices

The following procedures apply to Access Terminals (AT) operating under CDMA 2000 High Rate packer Data, Rev.0 and Rev.A, 1x Ev-Do protocols. SAR for body exposure conditions are typically required devices with Ev-Do Capabilities, including handsets and data modems. operating in various electronic devices. When VOIP is available for Ev-Do devices to operate in configurations next to the ear, head exposure conditions are applicable. The default test configuration is to measure SAR with an established radio ling between the AT and a communication test set according to 3GPP2 Test Application Protocols(TAP), FTAT/RTAP for Rev.0 and FETAP/RETAP for Rev.A. The code channel power levels, RF channel output power (ALL Bits Up) and other operating parameters should be actively monitored and controlled by the communications test set during the SAR measurement. The use of FTM should be avoided. Maximum output power is verified according to procedures defined in 3 GPP2 C.S0033 and TIA-866, and SAR must be measured according to these maximum output conditions.

9.1.2 Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to procedures in section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rev.0 and section 4.3.4 of 3GPP2 C.S0033-A for Rev.A For Rev.A, maximum outpour for both Subtype 0/1 and subtype 2 Physical Layer configurations should be measured. The device operating configurations under TAP/ETAP should be documented in the test report; including power control, code channel and RF channel output power levels. The measurement results should be tabulated in the SAR report with any measurement difficulties and equipment limitations clearly identified.

9.1.3 SAR Measurements

SAR is measured using FTAP/RTAP and FETAP/RETAP respectively for Rev.0 and Rev.A device. The AT is Tested with a Reverse Data Channel rate of 153.6kbps in Subtype 0/1 and Subtype 2 Physical Layer configurations should be measured. The device operating configurations under TAP/ETAP should be documented in the test report; including power Control, code channel and RF channel output power levels, The measurement results should be tabulated in the SAR report with any measurement difficulties and equipment limitations clearly identified. output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. otherwise, SAR is measured on the maximum output channel for Rev.A using the exposure configuration that results in the highest SAR for that RF channels in Rev.0. Head SAR is required for Ev-Do devices that support operations next to the ear; for example, with VOIP, using Subtype 2 Physical Layer configurations according to the required handset test configurations.

9.1.4 1x RTT Support

For Ev-Do device that also support 1xRTT voice and/or data operations ,SAR is not required for 1xRTT when the maximum average output of each channel is less than 1/4dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev.0

9.2 CDMA2000 1xRTT

Agilent 8960 base station was used for output power verification.

Following is the detail set-up configuration.

Protocol Rev.> 6

Radio Config (RC): Body SAR in RC1 is not required when the maximum average output of each channel is less than 1/4 dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1; with Loopback Service Option SO55, at full rate, using the body exposure configuration that results in the highest SAR for that channel in RC3.

FCH SO: Body-Worn SAR was tested under RC3/SO32 with FCH Only since FCH+SCH modes are not greater than 0.25 dB of the FCH only mode per KDB publication 941225.

Traffic Data Rate > Full

Power: All Up bits

9.3 CDMA2000 1xEv-Do

Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev.0. SAR for subtype 2 Physical layer configurations is not required for Rev.A when the maximum average output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. Otherwise, SAR is measured on the maximum output channel for Rev.A using the exposure configuration that results in the highest SAR for that RF channels in Rev.0.

9.3.1 EVDO Release 0 (RTAP)

Application Config > Enhanced Test Application Protocol > RTAP

RTAP Rate > 153.6 kbps

Protocol Rev > 0 (1x EVDO)

Power: All Up bits

9.3.2 EVDO Release 0 (FTAP)

Application Config > Enhanced Test Application Protocol > FTAP

RTAP Rate > 307.2 kbps

Protocol Rev > 0 (1x EVDO)

Power: All Up bits

9.3.3 EVDO Release A (RETAP)

Protocol Rev > A (1x EVDO A)

Application Config > Enhanced Test Application Protocol > RETAP

R-Data Pkt Size > 4096

Power: All Up bits

9.3.4 EVDO Release A (FETAP)

Protocol Rev > A (1x EVDO A)

Application Config > Enhanced Test Application Protocol > FETAP

F-Traffic Format > 4 (1024, 2, 128) Canonical (307.2k, QPSK)

Power: All Up bits

Maximum Average Output Power Measurement for FCC ID: RB2-R772

BC10 / CDMA835

Target Power : 24.0 dBm

Tune-up Tolerance : - 1.0dB/ + 0.5dB

PCS1900

Target Power : 23.7 dBm

Tune-up Tolerance : - 1.0dB/ + 0.5dB

Band	Channel	SO2	SO2	SO55	SO55	TDSO SO32	1xEvDO Rev.0	1xEvDO Rev.0	1xEvDO Rev.A	1xEvDO Rev.A
		RC1/1 (dBm)	RC3/3 (dBm)	RC1/1 (dBm)	RC3/3 (dBm)	RC3/3 (dBm)	(FTAP)	(RTAP)	(FETAP)	(RETAP)
BC10	476	23.85	23.96	23.89	23.94	23.83	23.93	23.90	24.07	24.05
	580	23.84	23.90	23.87	23.92	23.84	23.92	23.88	24.06	24.00
	684	23.94	24.03	23.97	24.03	23.97	24.00	24.07	24.10	24.11
CDMA	1013	24.00	24.03	23.98	24.06	23.97	24.07	24.09	24.10	24.12
	384	23.93	23.95	23.86	23.96	23.89	23.93	23.96	23.98	24.04
	777	23.65	23.72	23.62	23.69	23.63	23.71	23.70	23.77	23.79
PCS	25	23.71	23.80	23.75	23.81	23.81	23.70	23.69	23.63	23.65
	600	23.61	23.68	23.59	23.69	23.67	23.55	23.57	23.53	23.50
	1175	23.85	23.87	23.84	23.89	23.90	23.79	23.80	23.76	23.79

CDMA Average Conducted output powers (dBm)

9.4 LTE

SAR testing was performed according to the FCC KDB 941225 D05 publication.

The RB2-R772 developed base on MPR. The MPR is mandatory.

The device will not operate with any other MPR setting than that stated in the table as indicated.

SAR Testing was performed using a CMW500. UE transmits with Maximum output power during SAR testing.

A-MPR has been disabled for all SAR tests by setting NS=01 on the R&S CMW500.

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 -6.2.5 under Table 6.2.3-1. The differences noted are not cases of implemented MPR but rather associated with measurement uncertainty and allowable tolerances per 3 GPP standard and the manufacturer. See section 0 For MPR targets.

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks	A-MPR (dB)
NS_01	NA	NA	NA	NA	NA
NS_03	6.6.2.2.1	2, 4,10, 35, 36	3	>5	≤ 1
	6.6.2.2.1	2, 4,10, 35,36	5	>6	≤ 1
	6.6.2.2.1	2, 4,10, 35,36	10	>6	≤ 1
	6.6.2.2.1	2, 4,10,35,36	15	>8	≤ 1
	6.6.2.2.1	2, 4,10,35, 36	20	>10	≤ 1
NS_04	6.6.2.2.2	TBD	TBD	TBD	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50 for QPSK	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	n/a	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
..					
NS_32	-	-	-	-	-

Target Power : 22.5 dBm

Tune -up Tolerance : - 1.0dB/ + 0.5dB

B25 Low

Bandwidth	UL Channel	UL Freq.(MHz)	Modulation	RB Size	RB Offset	Max.Average Power (dBm)	Target MPR (dB)	Measured Power reduction (dB)
5 MHz	26065	1852.5	QPSK	1	0	22.28	0	0.00
				1	24	22.26	0	0.02
				12	6	21.26	1	1.02
				25	0	21.10	1	1.18
			16QAM	1	0	21.27	1	1.01
				1	24	21.38	1	0.90
				12	6	20.24	2	2.04
				25	0	20.10	2	2.18

B25 Middle

Bandwidth	UL Channel	UL Freq.(MHz)	Modulation	RB Size	RB Offset	Max.Average Power (dBm)	Target MPR (dB)	Measured Power reduction (dB)
5 MHz	26365	1882.5	QPSK	1	0	22.06	0	0.00
				1	24	21.96	0	0.10
				12	6	20.88	1	1.18
				25	0	20.73	1	1.33
			16QAM	1	0	21.03	1	1.03
				1	24	21.00	1	1.06
				12	6	19.85	2	2.21
				25	0	19.87	2	2.19

B25 High

Bandwidth	UL Channel	UL Freq.(MHz)	Modulation	RB Size	RB Offset	Max.Average Power (dBm)	Target MPR (dB)	Measured Power reduction (dB)
5 MHz	26665	1912.5	QPSK	1	0	22.22	0	0.00
				1	24	22.17	0	0.05
				12	6	21.25	1	0.97
				25	0	21.11	1	1.11
			16QAM	1	0	21.13	1	1.09
				1	24	21.24	1	0.98
				12	6	20.33	2	1.89
				25	0	20.18	2	2.04

Note;

The EUT enables maximum power reduction in accordance with 3GPP 36.101. The MPR settings are configured during the manufacture process and are not configurable by the network, carrier, or end user.

9.5 WiFi

9.5.1 SAR Testing for 802.11a/b/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”		
				§15.247 802.11b	802.11g	UNII
802.11 b/g	2.412	1		✓	▽	
	2.437	6	6	✓	▽	
	2.462	11		✓	▽	
802.11a	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				+
	5.520	104				✓
	5.540	108				+
	5.560	112				+
	5.580	116				✓
	5.600	120	Unknown			+
	5.620	124				✓
	5.640	128				+
	5.660	132				+
	5.680	136				✓
	5.700	140				+
	5.745	149		✓		✓
UNII or §15.247	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

802.11b/g/n Target Power : 15 dBm/ 12 dBm/ 11 dBm

Tune -up Tolerance : - 1.0dB/ + 0.5dB

Band	Channel	Conducted Power (dBm)			
		Data Rate (Mbps)			
		1	2	5.5	11
IEEE 802.11b	1	14.92	14.85	14.95	14.87
	6	15.07	15.09	15.17	15.05
	11	14.88	14.81	14.90	14.84

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	12.25	12.23	12.21	11.96	10.22	10.28	7.87	7.80
	6	12.37	12.34	12.32	12.30	10.52	10.21	8.30	8.30
	11	12.20	12.10	12.07	12.05	10.31	9.99	8.11	8.12

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	11.03	10.89	10.95	9.23	9.14	9.17	9.19	9.03
	6	11.10	10.94	10.98	8.85	8.78	8.79	8.78	8.73
	11	10.88	10.75	10.80	9.17	9.13	9.05	9.06	9.02

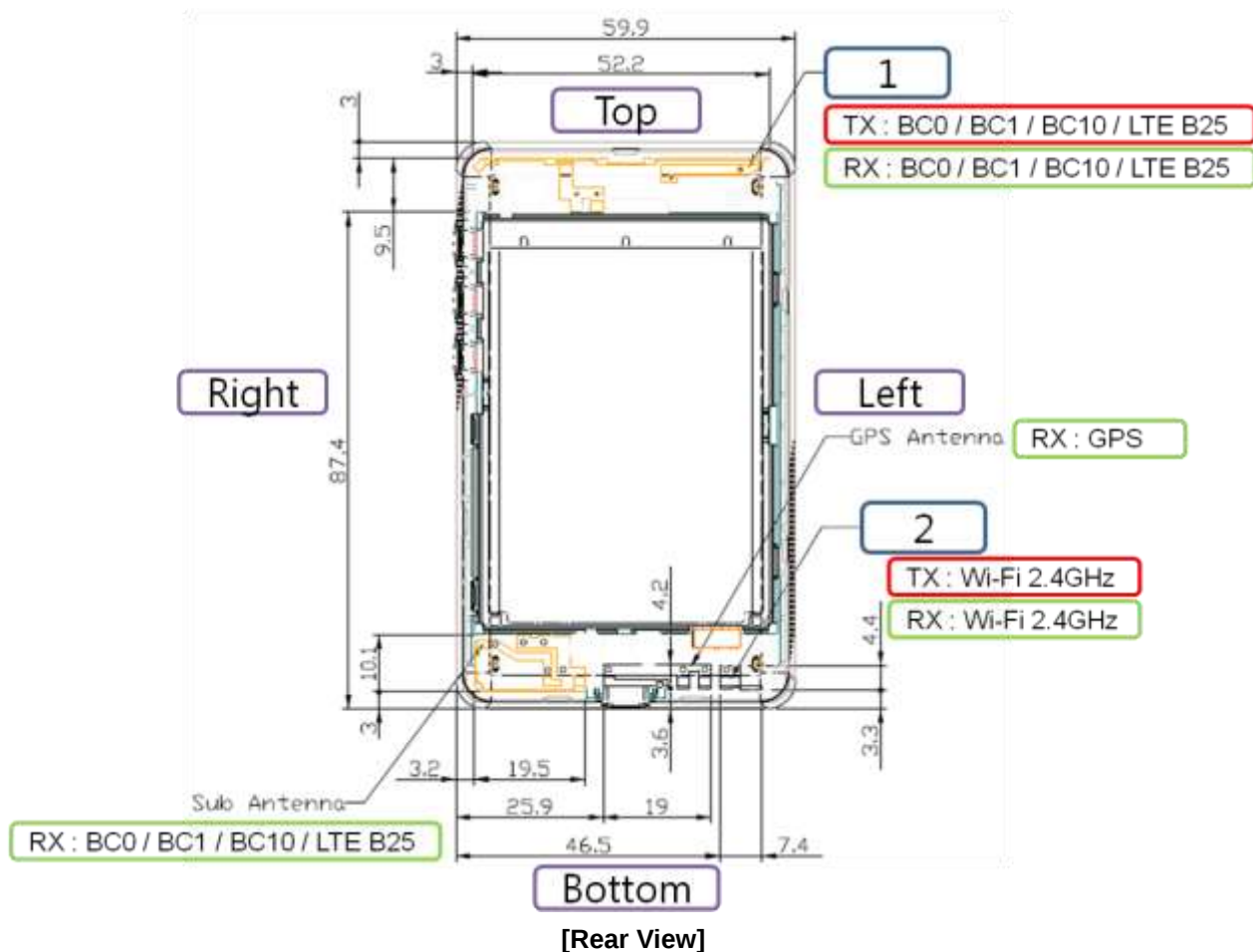
Average IEEE 802.11n Conducted output power

10. SAR Test configuration & Antenna information

10.1 SAR Test configurations

Mode	Back	Front	Left	Right	Bottom	Top
BC10/ CDMA835 PCS1900/ LTE Band 25	Yes	Yes	Yes	Yes	No	Yes
WLAN	Yes	Yes	Yes	No	Yes	No

10.2 Antenna and Device Information



Antenna	Band
1	BC0 / BC1 / BC10 / LTE Band 25
2	Wi-Fi 2.4 GHz

Definition of Antennas

Note;

-. Ant. 1 can transmit simultaneously with Ant.2

10.3 SAR Summation Scenario

Simultaneous Transmission Summation for Hotspot				
Simultaneous TX	configuration	BC10 SAR(W/kg)	WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Rear	1.140	0.102	1.242
	Front	1.240	0.096	1.336
	Body Left	0.533	0.044	0.577
	Body Right	0.609	-	0.609
	Top	0.148	-	0.148
	Bottom	-	0.069	0.069
Simultaneous TX	configuration	CDMA835 SAR(W/kg)	WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Rear	0.768	0.102	0.870
	Front	1.140	0.096	1.236
	Body Left	0.452	0.044	0.496
	Body Right	0.515	-	0.515
	Top	0.163	-	0.163
	Bottom	-	0.069	0.069
Simultaneous TX	configuration	PCS1900 SAR(W/kg)	WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Rear	0.909	0.102	1.011
	Front	1.080	0.096	1.176
	Body Left	0.087	0.044	0.131
	Body Right	0.370	-	0.370
	Top	1.320	-	1.320
	Bottom	-	0.069	0.069
Simultaneous TX	configuration	LTE B25 SAR(W/kg)	WIFI SAR (W/kg)	Σ SAR (W/kg)
Body SAR	Rear	0.537	0.102	0.639
	Front	0.638	0.096	0.734
	Body Left	0.050	0.044	0.094
	Body Right	0.284	-	0.284
	Top	0.761	-	0.761
	Bottom	-	0.069	0.069

SAR scaling consideration for Simultaneous Transmission				
Simultaneous TX	configuration	BC10 Scaled SAR(W/kg)	2.4G WIFI Scaled SAR (W/kg)	$\sum$ Scaled SAR (W/kg)
Body SAR	Rear	1.309	0.113	1.422
	Front	1.424	0.106	1.53
Simultaneous TX	configuration	CDMA835 Scaled SAR(W/kg)	2.4G WIFI Scaled SAR (W/kg)	$\sum$ Scaled SAR (W/kg)
Body SAR	Front	1.253	0.106	1.359
Simultaneous TX	configuration	PCS1900 Scaled SAR(W/kg)	2.4G WIFI Scaled SAR (W/kg)	$\sum$ Scaled SAR (W/kg)
Body SAR	Top	1.484	-	1.484

Note;

-. The greatest deviation in measured output power below the maximum of output power tune-up limit across all transmit modes is 1.27 dBm. Applying a scale-down based on this value to the SAR limit of 1.6 W/kg results in a value of 1.194 W/kg and used as the criteria to applying scaled SAR on simultaneous transmission condition. In other words, for Simultaneous Transmission Cases with Sum of SAR values < 1.194 W/kg, SAR scaling was not applied.

11. SAR TEST DATA SUMMARY

11.1 Measurement Results (BC10 Body SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	SAR(mW/g)
MHz	ch.						
817.9	476 (low)	EVDO	23.90	0.046	Rear	10 mm	1.14
820.5	580 (Mid)	EVDO	23.88	-0.111	Rear		1.06
823.1	684 (High)	EVDO	24.07	0.003	Rear		1.03
817.9	476 (low)	EVDO	23.90	-0.105	Front		1.24
820.5	580 (Mid)	EVDO	23.88	-0.007	Front		1.09
823.1	684 (High)	EVDO	24.07	-0.082	Front		1.10
820.5	580 (Mid)	EVDO	23.88	-0.003	Left		0.533
820.5	580 (Mid)	EVDO	23.88	-0.006	Right		0.609
820.5	580 (Mid)	EVDO	23.88	0.072	Top		0.148
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 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 ± 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
- EVDO Body SAR was tested under EVDO Rev.0 RTAP.
- 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).

11.2 Measurement Results (CDMA835 Body SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	SAR(mW/g)
MHz	ch.						
836.52	384 (Mid)	EVDO	23.96	0.053	Rear	10 mm	0.768
824.7	1013 (low)	EVDO	24.09	-0.167	Front		1.14
836.52	384 (Mid)	EVDO	23.96	-0.148	Front		0.868
848.31	777 (High)	EVDO	23.70	-0.003	Front		0.643
836.52	384 (Mid)	EVDO	23.96	-0.067	Left		0.452
836.52	384 (Mid)	EVDO	23.96	0.026	Right		0.515
836.52	384 (Mid)	EVDO	23.96	-0.095	Top		0.163
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 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 ± 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
- EVDO Body SAR was tested under EVDO Rev.0 RTAP.
- 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).

11.3 Measurement Results (PCS1900 Body SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	SAR(mW/g)
MHz	ch.						
1 851.25	25 (Low)	EVDO	23.69	0.005	Rear	10 mm	0.838
1 880.00	600 (Mid)	EVDO	23.57	0.008	Rear		0.818
1 908.75	1175 (High)	EVDO	23.80	-0.045	Rear		0.909
1 851.25	25 (Low)	EVDO	23.69	-0.046	Front		0.961
1 880.00	600 (Mid)	EVDO	23.57	0.106	Front		0.894
1 908.75	1175 (High)	EVDO	23.80	-0.004	Front		1.08
1 880.00	600 (Mid)	EVDO	23.57	0.106	Left		0.087
1 880.00	600 (Mid)	EVDO	23.57	0.021	Right		0.370
1 851.25	25 (Low)	EVDO	23.69	-0.162	Top		1.32
1 880.00	600 (Mid)	EVDO	23.57	-0.021	Top		1.10
1 908.75	1175 (High)	EVDO	23.80	-0.018	Top		1.23
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 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 ± 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
- EVDO Body SAR was tested under EVDO Rev.0 RTAP.
- 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).

11.4 Measurement Results (LTE Band 25 5MHz SAR QPSK)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	RB Size	RB Offset	Separation Distance	SAR (mW/g)	MP R
MHz	ch.									
1882.5	26365	QPSK	20.88	-0.052	Rear	12	6	10 mm	0.407	1
		QPSK	22.06	-0.028	Rear	1	0		0.512	0
		QPSK	21.96	-0.187	Rear	1	24		0.537	0
		QPSK	20.88	-0.138	Front	12	6		0.507	1
		QPSK	22.06	-0.008	Front	1	0		0.634	0
		QPSK	21.96	0.068	Front	1	24		0.638	0
		QPSK	20.88	-0.022	Left	12	6		0.037	1
		QPSK	22.06	-0.071	Left	1	0		0.046	0
		QPSK	21.96	-0.118	Left	1	24		0.048	0
		QPSK	20.88	-0.039	Right	12	6		0.224	1
		QPSK	22.06	-0.008	Right	1	0		0.283	0
		QPSK	21.96	-0.019	Right	1	24		0.284	0
		QPSK	20.88	-0.052	Top	12	6		0.602	1
		QPSK	22.06	-0.004	Top	1	0		0.761	0
		QPSK	21.96	-0.035	Top	1	24		0.756	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 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 ± 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
- KDB 941225 D05 SAR for LTE Devices v01 was followed.
 - QPSK with 50% RB is required for the largest channel Bandwidth.
 - QPSK with 1 RB for both channel edges are required for the largest channel Bandwidth.
 - 16QAM with 50% RB is required for the largest channel Bandwidth.
 - 16QAM with 1 RB for both channel edges are required for the largest channel Bandwidth.
 - 100% RB allocation is not required since SAR is not > 1.45 W/kg.
 - The Low & High channel were not required since the power variation across all channels is 1/2 dB and SAR is ≤ 1.45 W/kg.

11.5 Measurement Results (LTE Band 25 5MHz SAR 16QAM)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	RB Size	RB Offset	Separation Distance	SAR (mW/g)	MPR
MHz	ch.									
1882.5	26365	16QAM	19.85	-0.039	Rear	12	6	10 mm	0.327	2
		16QAM	21.03	0.124	Rear	1	0		0.398	1
		16QAM	21.00	-0.007	Rear	1	24		0.406	1
		16QAM	19.85	-0.003	Front	12	6		0.394	2
		16QAM	21.03	0.036	Front	1	0		0.487	1
		16QAM	21.00	0.007	Front	1	24		0.498	1
		16QAM	19.85	-0.059	Left	12	6		0.03	2
		16QAM	21.03	0.069	Left	1	0		0.035	1
		16QAM	21.00	-0.032	Left	1	24		0.050	1
		16QAM	19.85	-0.063	Right	12	6		0.177	2
		16QAM	21.03	-0.046	Right	1	0		0.215	1
		16QAM	21.00	-0.094	Right	1	24		0.207	1
		16QAM	19.85	0.006	Top	12	6		0.468	2
		16QAM	21.03	0.109	Top	1	0		0.583	1
		16QAM	21.00	-0.118	Top	1	24		0.586	1
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 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 ± 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
- KDB 941225 D05 SAR for LTE Devices v01 was followed.
 - QPSK with 50% RB is required for the largest channel Bandwidth.
 - QPSK with 1 RB for both channel edges are required for the largest channel Bandwidth.
 - 16QAM with 50% RB is required for the largest channel Bandwidth.
 - 16QAM with 1 RB for both channel edges are required for the largest channel Bandwidth.
 - 100% RB allocation is not required since SAR is not > 1.45 W/kg.
 - The Low & High channel were not required since the power variation across all channels is 1/2 dB and SAR is ≤ 1.45 W/kg.

11.6 Measurement Results (802.11b/g/n Hotspot SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	Data Rate	SAR(mW/g)
MHz	Channel							
2437	6 (Mid)	802.11b	15.07	0.106	Rear	10 mm	1 Mbps	0.102
2437	6 (Mid)	802.11b	15.07	0.052	Front		1 Mbps	0.096
2437	6 (Mid)	802.11b	15.07	0.129	Left		1 Mbps	0.044
2437	6 (Mid)	802.11b	15.07	0.044	Bottom		1 Mbps	0.069
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 ± 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. Scaled SAR Values to the Maximum tune-up tolerances

The following measured results were scaled to the maximum tune-up tolerances, according to the output power of the channel tested for the highest measured results in each frequency band

Test Configuration	Mode	Ch #	Freq (MHz)	Power(dBm)		SAR(W/kg)	
				Max. Tune-up limit	Measured	Measured	Scaled
Front	BC10	476	817.9	24.50	23.90	1.240	1.424
Front	CDMA835	1013	824.7	24.50	24.09	1.140	1.253
Top	PCS1900	25	1 851.25	24.20	23.69	1.320	1.484
Top	LTE 25	26365	1 882.5	23.00	22.06	0.761	0.945
Rear	WLAN	6	2 437	15.50	15.07	0.102	0.113

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

- [1] Federal Communications Commission, OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01), Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields, July 2001.
- [2] IEEE Standards Coordinating Committee 34 – IEEE Std. 1528-2003, IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body from Wireless Communications Devices.
- [3] Federal Communications Commission, ET Docket 93-62, Guidelines for Evaluating the Environmental Effects of Radio frequency Radiation, Aug. 1996.
- [4] ANSI/IEEE C95.1 - 1992, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300 kHz to 100 GHz, New York: IEEE, Aug. 1992
- [5] ANSI/IEEE C95.3 - 1992, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave, New York: IEEE, 1992.
- [6] NCRP, National Council on Radiation Protection and Measurements, Biological Effects and Exposure Criteria for Radio Frequency Electromagnetic Fields, NCRP Report No. 86, 1986. Reprinted Feb. 1995.
- [7] T. Schmid, O. Egger, N. Kuster, Automated E-field scanning system for dosimetric assessments, IEEE Transaction on Microwave Theory and Techniques, vol. 44, Jan. 1996, pp. 105-113.
- [8] K. Pokovic, T. Schmid, N. Kuster, Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies, ICECOM97, Oct. 1997, pp. 120-124.
- [9] K. Pokovic, T. Schmid, and N. Kuster, E-field Probe with improved isotropy in brain simulating liquids, Proceedings of the ELMAR, Zadar, Croatia, June 23-25, 1996, pp. 172-175.
- [10] Schmid & Partner Engineering AG, Application Note: Data Storage and Evaluation, June 1998, p2.
- [11] V. Hombach, K. Meier, M. Burkhardt, E. Kuhn, N. Kuster, The Dependence of EM Energy Absorption upon Human Head Modeling at 900 MHz, IEEE Transaction on Microwave Theory and Techniques, vol. 44 no. 10, Oct. 1996, pp. 1865-1873.
- [12] N. Kuster and Q. Balzano, Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300 MHz, IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.
- [13] G. Hartsgrrove, A. Kraszewski, A. Surowiec, Simulated Biological Materials for Electromagnetic Radiation Absorption Studies, University of Ottawa, Bioelectromagnetics, Canada: 1987, pp. 29-36.
- [14] Q. Balzano, O. Garay, T. Manning Jr., Electromagnetic Energy Exposure of Simulated Users of Portable Cellular Telephones, IEEE Transactions on Vehicular Technology, vol. 44, no.3, Aug. 1995.
- [15] W. Gander, Computer mathematics, Birkhaeuser, Basel, 1992.
- [16] W.H. Press, S.A. Teukolsky, W.T. Vetterling, and B.P. Flannery, Numerical Recipes in C, The Art of Scientific Computing, Second edition, Cambridge University Press, 1992.
- [17] Federal Communications Commission, OET Bulletin 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields. Supplement C, Dec. 1997.
- [18] N. Kuster, R. Kastle, T. Schmid, Dosimetric evaluation of mobile communications equipment with known precision, IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.
- [19] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), Human Exposure to Electromagnetic Fields High-frequency: 10 kHz-300 GHz, Jan. 1995.
- [20] Prof. Dr. Niels Kuster, ETH, Eidgenössische Technische Hochschule Zürich, Dosimetric Evaluation of the Cellular Phone.
- [21] Mobile and Portable Device RF Exposure Equipment Authorization Procedures #447498.

Attachment 1. – SAR Test Plots

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.08 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA800(BC10); Frequency: 817.9 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 817.9$ MHz; $\sigma = 0.982$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear EVDO 476/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.21 mW/g

Body Rear EVDO 476/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

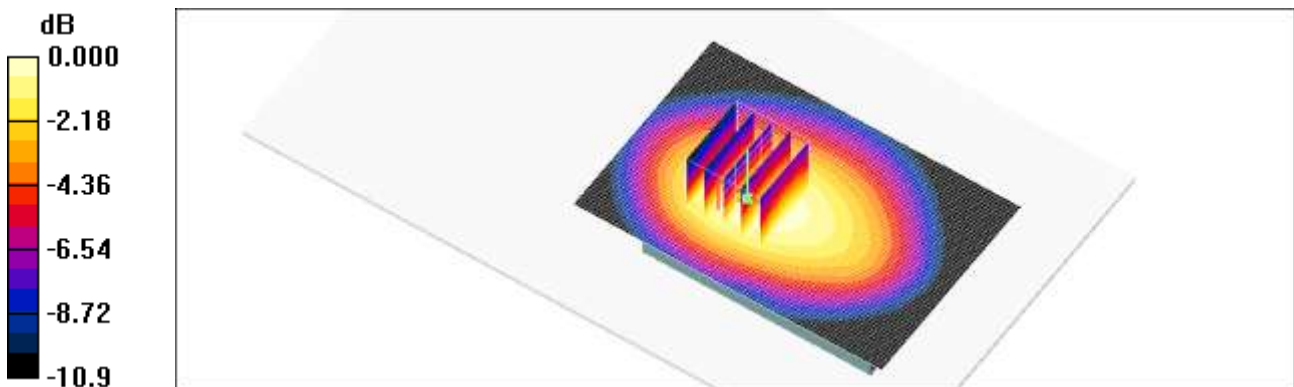
Reference Value = 24.2 V/m; Power Drift = 0.046 dB

Peak SAR (extrapolated) = 1.50 W/kg

SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.814 mW/g

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

Maximum value of SAR (measured) = 1.22 mW/g



0 dB = 1.22mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.08 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA800(BC10); Frequency: 820.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 820.5 \text{ MHz}$; $\sigma = 0.984 \text{ mho/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear EVDO 580/Area Scan (61x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

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

Body Rear EVDO 580/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

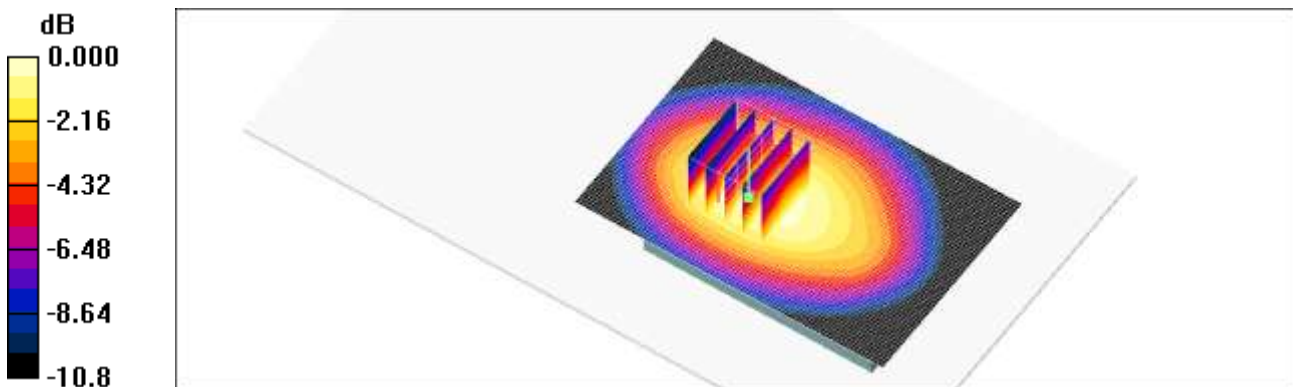
Reference Value = 24.6 V/m; Power Drift = -0.111 dB

Peak SAR (extrapolated) = 1.44 W/kg

SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.756 mW/g

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

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



0 dB = 1.14mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.08 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA800(BC10); Frequency: 823.1 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 823.1 \text{ MHz}$; $\sigma = 0.987 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear EVDO 684/Area Scan (61x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

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

Body Rear EVDO 684/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

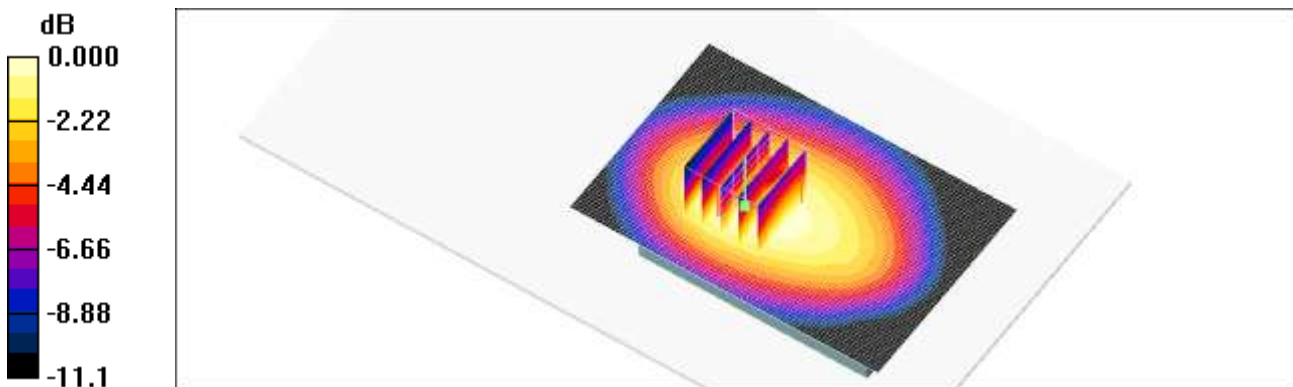
Reference Value = 22.7 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 1.37 W/kg

SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.729 mW/g

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

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



0 dB = 1.10mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.08 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA800(BC10); Frequency: 817.9 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 817.9$ MHz; $\sigma = 0.982$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front EVDO 476/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.32 mW/g

Body Front EVDO 476/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

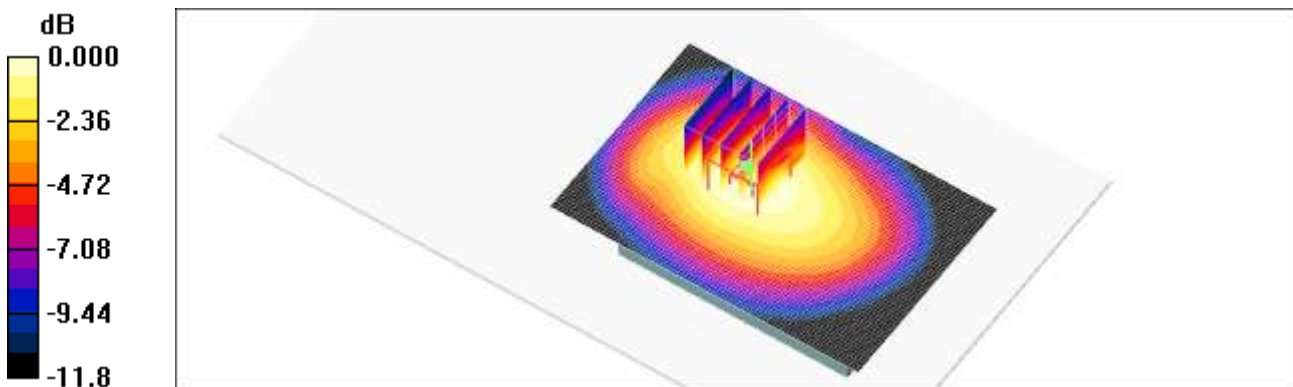
Reference Value = 28.7 V/m; Power Drift = -0.105 dB

Peak SAR (extrapolated) = 1.84 W/kg

SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.875 mW/g

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

Maximum value of SAR (measured) = 1.29 mW/g



0 dB = 1.29mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.08 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA800(BC10); Frequency: 820.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 820.5 \text{ MHz}$; $\sigma = 0.984 \text{ mho/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front EVDO 580/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.19 mW/g

Body Front EVDO 580/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

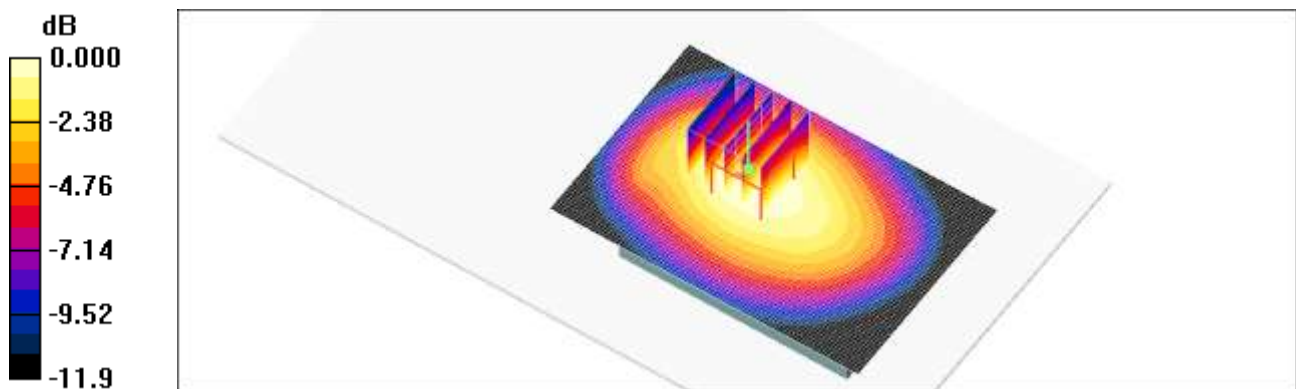
Reference Value = 25.8 V/m; Power Drift = -0.007 dB

Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.787 mW/g

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

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



0 dB = 1.16mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.08 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA800(BC10); Frequency: 823.1 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 823.1 \text{ MHz}$; $\sigma = 0.987 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front EVDO 684/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

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

Body Front EVDO 684/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

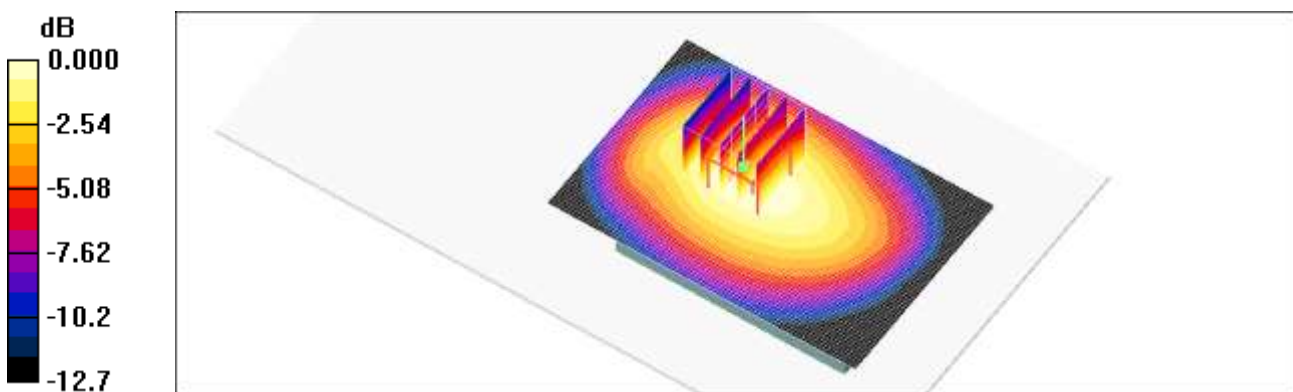
Reference Value = 26.7 V/m; Power Drift = -0.082 dB

Peak SAR (extrapolated) = 1.44 W/kg

SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.788 mW/g

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

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



0 dB = 1.16mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.08 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA800(BC10); Frequency: 820.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 820.5 \text{ MHz}$; $\sigma = 0.984 \text{ mho/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Left EVDO 580/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.574 mW/g

Body Left EVDO 580/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

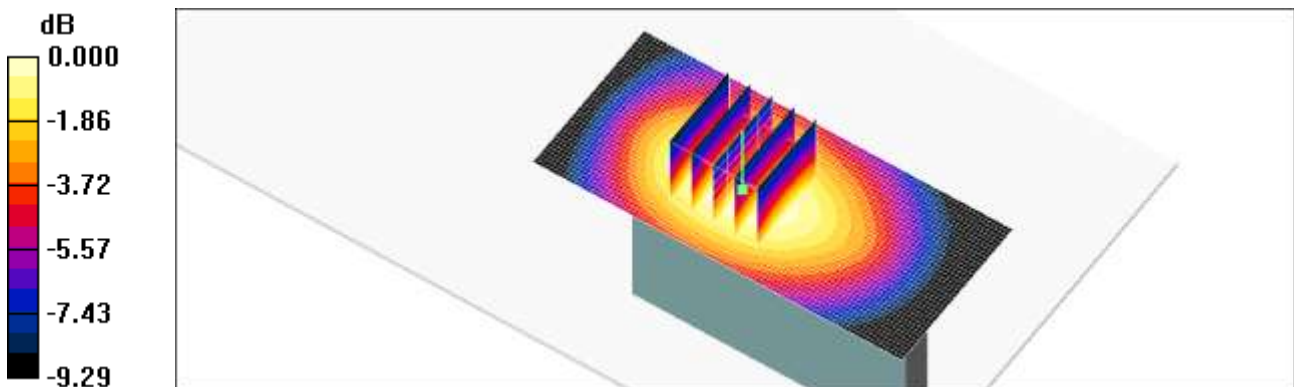
Reference Value = 16.3 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 0.749 W/kg

SAR(1 g) = 0.533 mW/g; SAR(10 g) = 0.368 mW/g

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

Maximum value of SAR (measured) = 0.563 mW/g



0 dB = 0.563mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.08 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA800(BC10); Frequency: 820.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 820.5 \text{ MHz}$; $\sigma = 0.984 \text{ mho/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Right EVDO 580/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.653 mW/g

Body Right EVDO 580/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

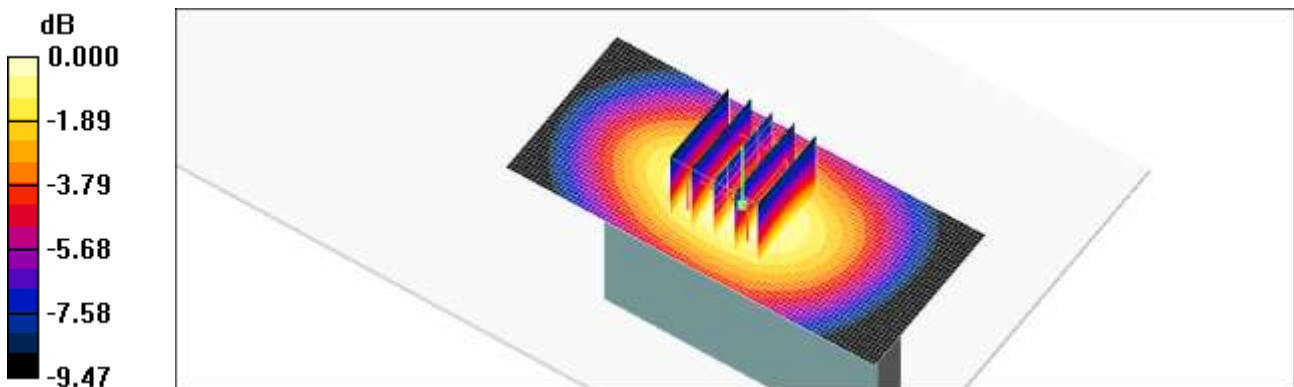
Reference Value = 16.1 V/m; Power Drift = -0.006 dB

Peak SAR (extrapolated) = 0.850 W/kg

SAR(1 g) = 0.609 mW/g; SAR(10 g) = 0.419 mW/g

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

Maximum value of SAR (measured) = 0.647 mW/g



0 dB = 0.647mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.08 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA800(BC10); Frequency: 820.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 820.5 \text{ MHz}$; $\sigma = 0.984 \text{ mho/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top EVDO 580/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.171 mW/g

Body Top EVDO 580/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

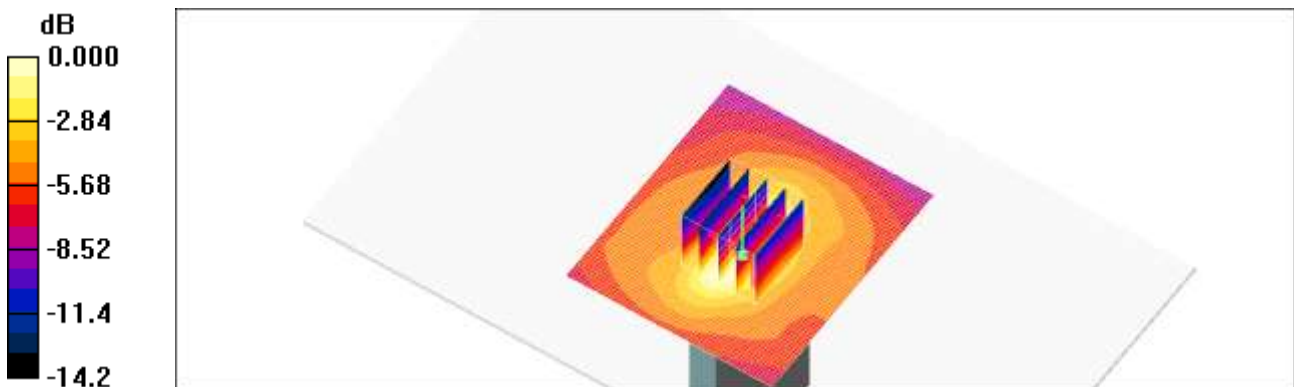
Reference Value = 13.0 V/m; Power Drift = 0.072 dB

Peak SAR (extrapolated) = 0.298 W/kg

SAR(1 g) = 0.148 mW/g; SAR(10 g) = 0.082 mW/g

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

Maximum value of SAR (measured) = 0.160 mW/g



0 dB = 0.160mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.08 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 836.52 \text{ MHz}$; $\sigma = 0.997 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear EVDO 384/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.814 mW/g

Body Rear EVDO 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

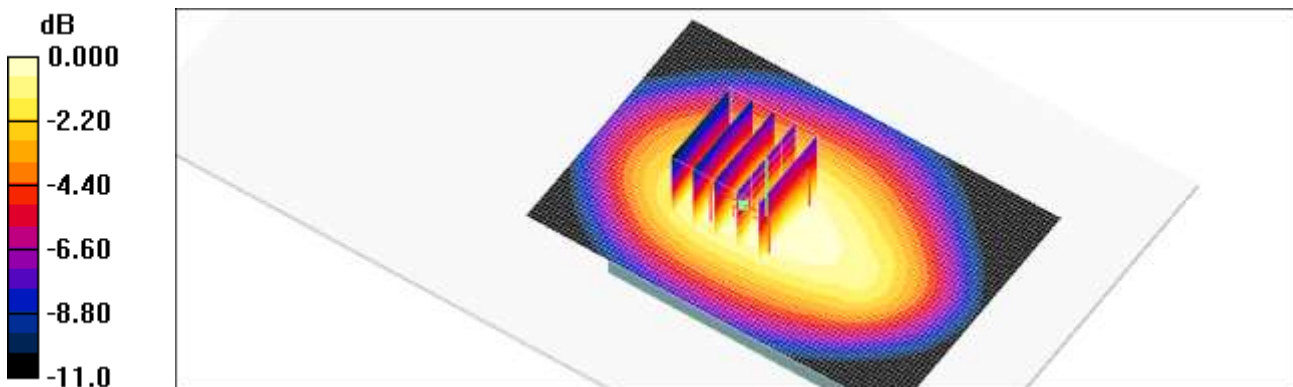
Reference Value = 20.1 V/m; Power Drift = 0.053 dB

Peak SAR (extrapolated) = 0.999 W/kg

SAR(1 g) = 0.768 mW/g; SAR(10 g) = 0.558 mW/g

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

Maximum value of SAR (measured) = 0.808 mW/g



0 dB = 0.808mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.08 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

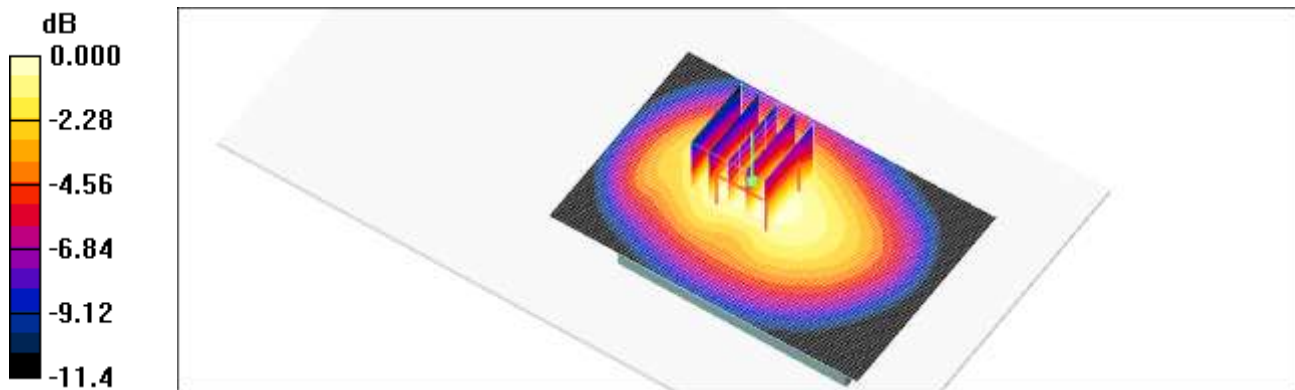
Communication System: CDMA 835MHz FCC; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: $f = 825$ MHz; $\sigma = 0.988$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front EVDO 1013/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.22 mW/g

Body Front EVDO 1013/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.5 V/m; Power Drift = -0.167 dB
Peak SAR (extrapolated) = 1.52 W/kg
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.821 mW/g
Maximum value of SAR (measured) = 1.22 mW/g



0 dB = 1.22mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.08 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.997$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front EVDO 384/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.914 mW/g

Body Front EVDO 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

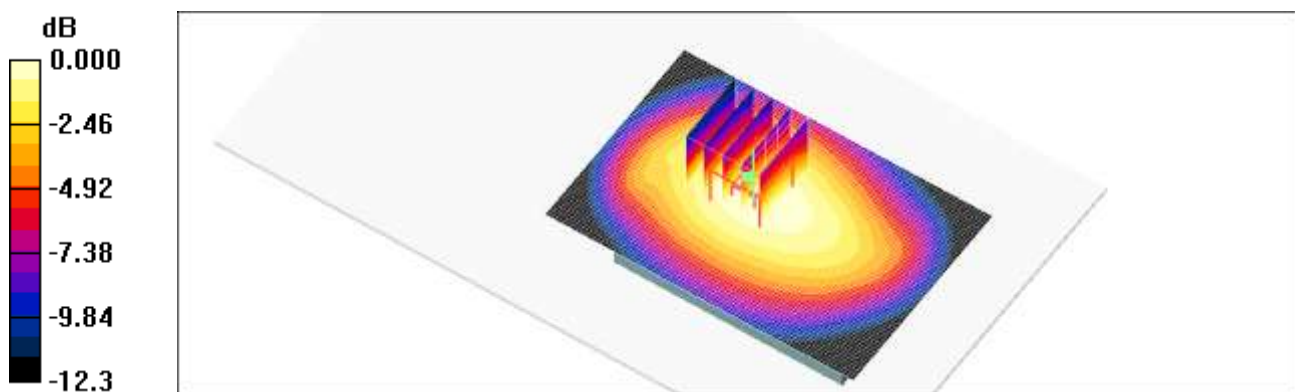
Reference Value = 23.6 V/m; Power Drift = -0.148 dB

Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.868 mW/g; SAR(10 g) = 0.619 mW/g

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

Maximum value of SAR (measured) = 0.917 mW/g



0 dB = 0.917mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.08 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 848.31 \text{ MHz}$; $\sigma = 1.01 \text{ mho/m}$; $\epsilon_r = 53.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front EVDO 777/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.685 mW/g

Body Front EVDO 777/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

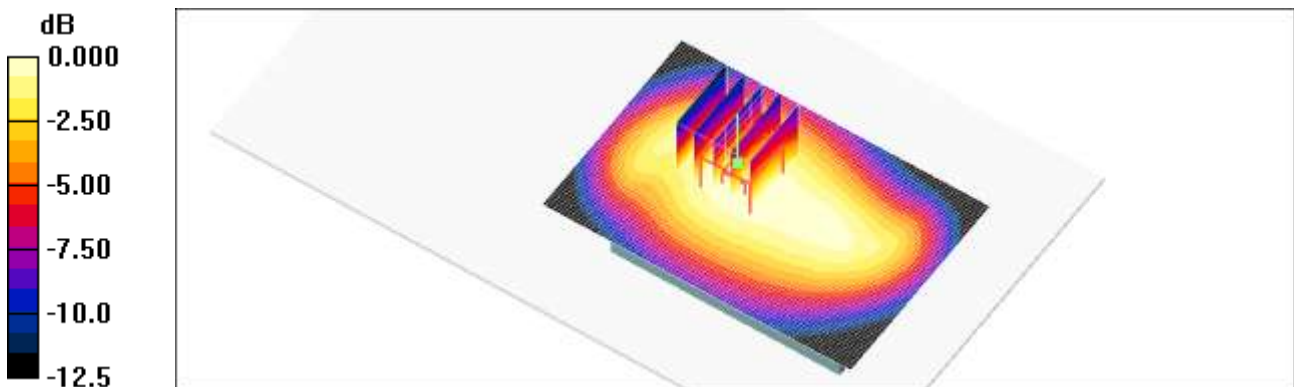
Reference Value = 22.3 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 0.886 W/kg

SAR(1 g) = 0.643 mW/g; SAR(10 g) = 0.452 mW/g

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

Maximum value of SAR (measured) = 0.676 mW/g



0 dB = 0.676mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.08 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 836.52 \text{ MHz}$; $\sigma = 0.997 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Left EVDO 384/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.483 mW/g

Body Left EVDO 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

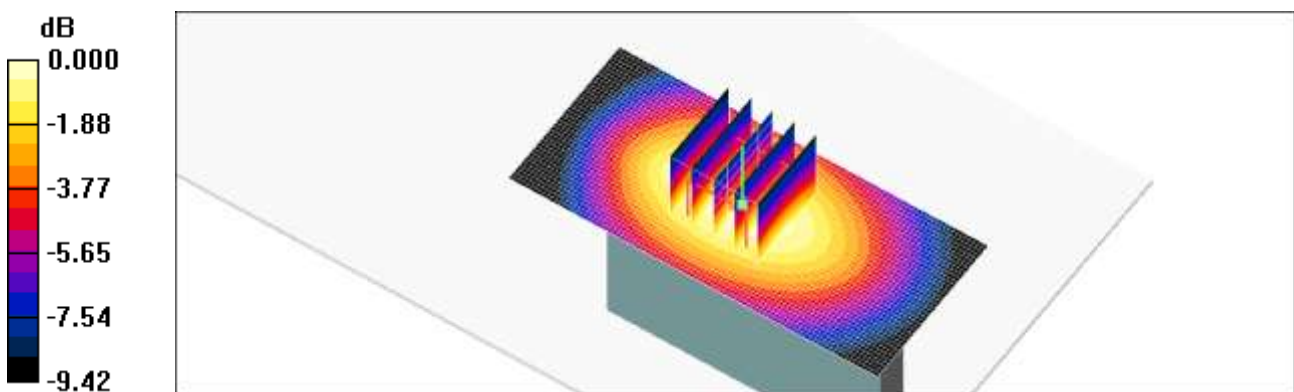
Reference Value = 13.6 V/m; Power Drift = -0.067 dB

Peak SAR (extrapolated) = 0.611 W/kg

SAR(1 g) = 0.452 mW/g; SAR(10 g) = 0.311 mW/g

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

Maximum value of SAR (measured) = 0.482 mW/g



0 dB = 0.482mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.08 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz;Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 836.52 \text{ MHz}$; $\sigma = 0.997 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Right EVDO 384/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.553 mW/g

Body Right EVDO 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

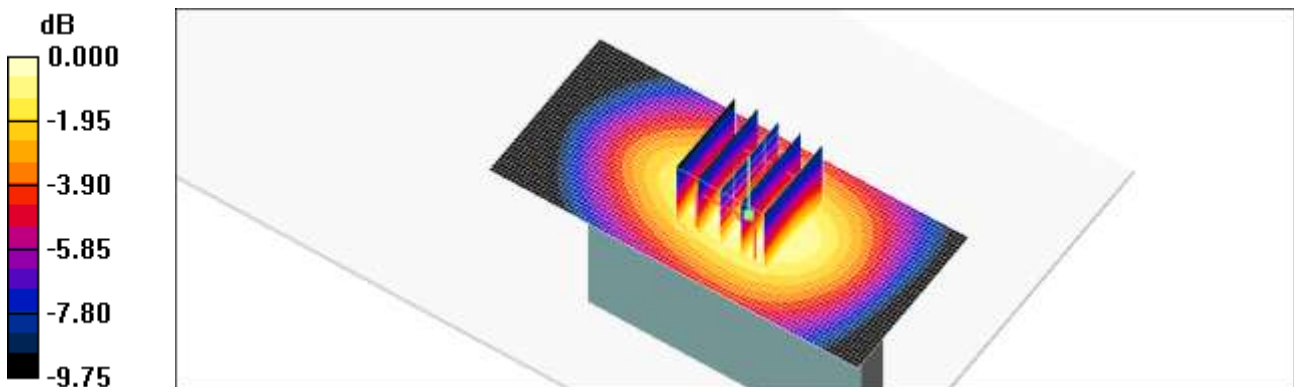
Reference Value = 11.8 V/m; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 0.700 W/kg

SAR(1 g) = 0.515 mW/g; SAR(10 g) = 0.352 mW/g

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

Maximum value of SAR (measured) = 0.552 mW/g



0 dB = 0.552mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.08 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz;Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 836.52 \text{ MHz}$; $\sigma = 0.997 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top EVDO 384/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.190 mW/g

Body Top EVDO 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

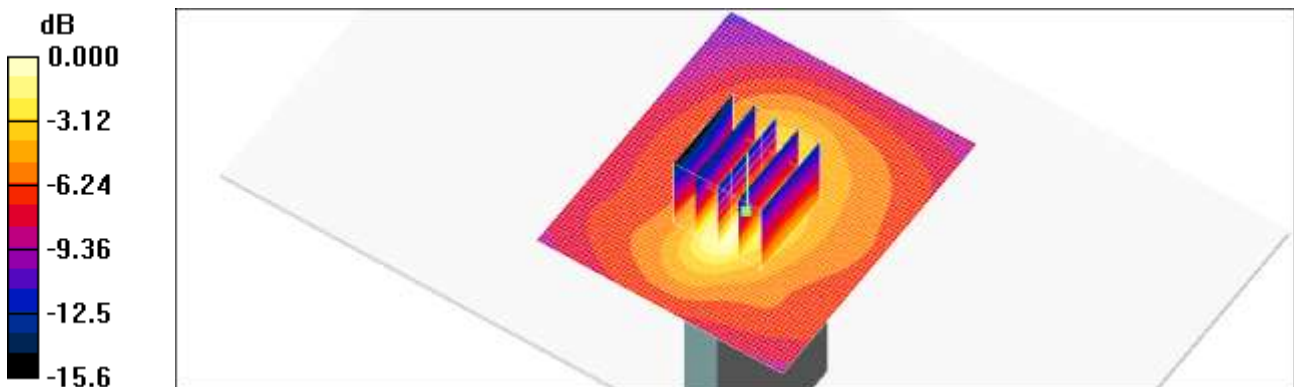
Reference Value = 13.7 V/m; Power Drift = -0.095 dB

Peak SAR (extrapolated) = 0.335 W/kg

SAR(1 g) = 0.163 mW/g; SAR(10 g) = 0.087 mW/g

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

Maximum value of SAR (measured) = 0.182 mW/g



0 dB = 0.182mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.1 °C
 Ambient Temperature: 21.3 °C
 Test Date: Oct.09 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1851.25 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1851.25 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear EVDO 25/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

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

Body Rear EVDO 25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

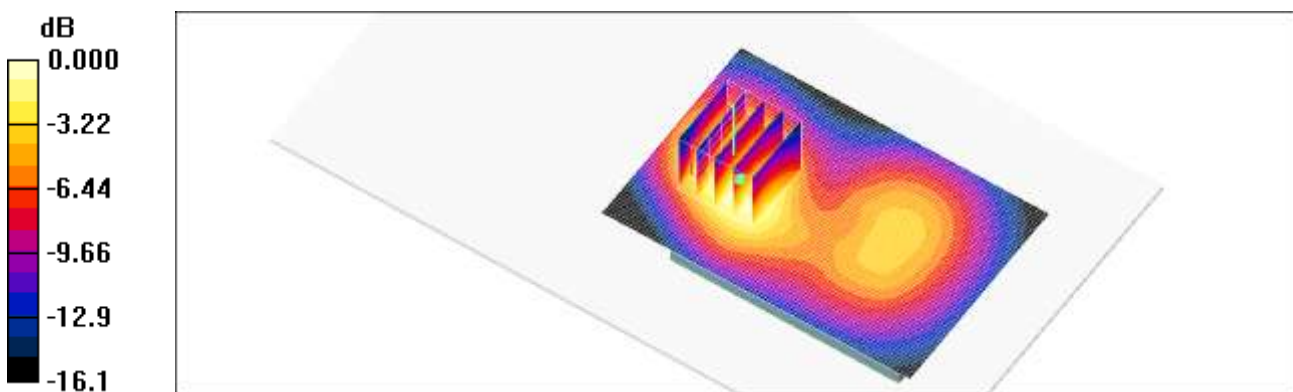
Reference Value = 26.1 V/m; Power Drift = 0.005 dB

Peak SAR (extrapolated) = 1.27 W/kg

SAR(1 g) = 0.838 mW/g; SAR(10 g) = 0.509 mW/g

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

Maximum value of SAR (measured) = 0.920 mW/g



0 dB = 0.920mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.09 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

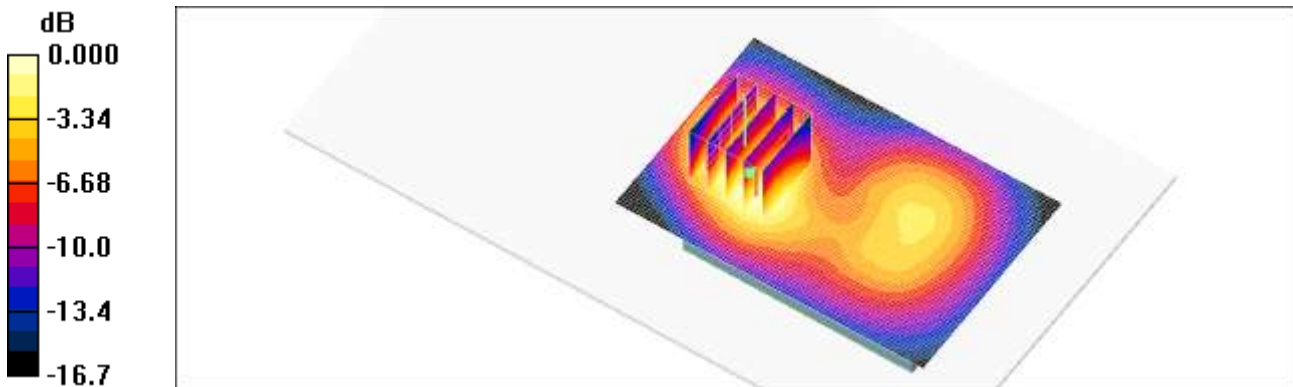
Communication System: PCS 1900MHz FCC; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 52$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear EVDO 600/Area Scan (61x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 1.02 mW/g

Body Rear EVDO 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 24.8 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.818 mW/g; SAR(10 g) = 0.501 mW/g
Maximum value of SAR (measured) = 0.882 mW/g



0 dB = 0.882mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.09 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear EVDO 1175/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.15 mW/g

Body Rear EVDO 1175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

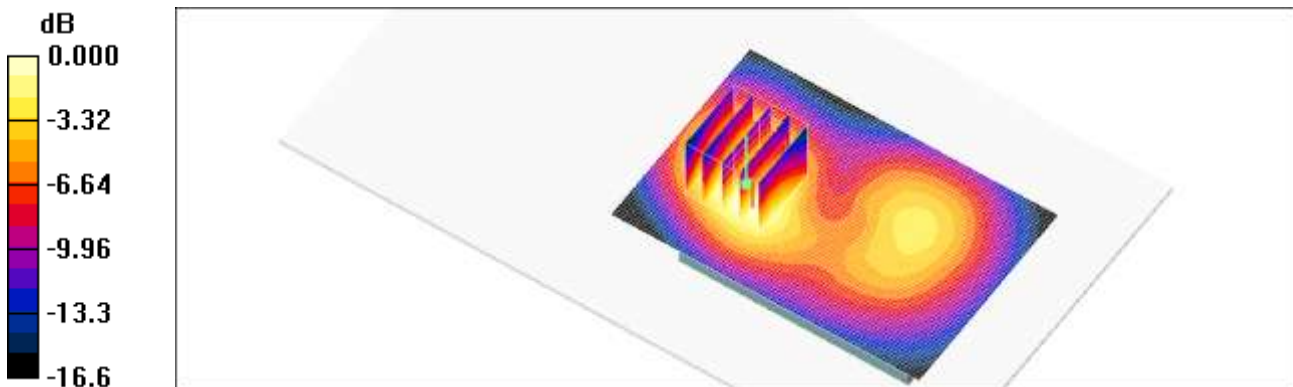
Reference Value = 25.6 V/m; Power Drift = -0.045 dB

Peak SAR (extrapolated) = 1.41 W/kg

SAR(1 g) = 0.909 mW/g; SAR(10 g) = 0.555 mW/g

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

Maximum value of SAR (measured) = 0.955 mW/g



0 dB = 0.955mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.1 °C
 Ambient Temperature: 21.3 °C
 Test Date: Oct.09 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1908.75 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1908.75 \text{ MHz}$; $\sigma = 1.55 \text{ mho/m}$; $\epsilon_r = 51.9$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front EVDO 25/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

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

Body Front EVDO 25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

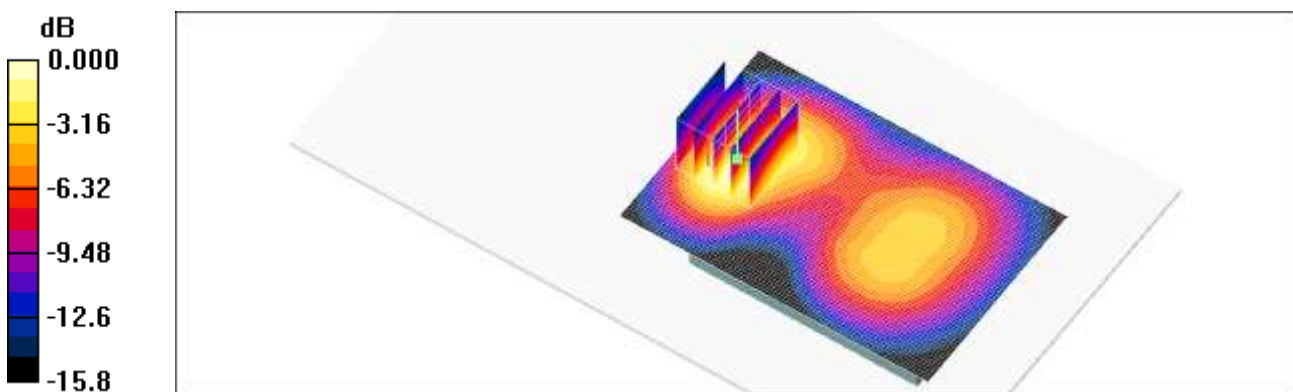
Reference Value = 28.6 V/m; Power Drift = -0.046 dB

Peak SAR (extrapolated) = 1.44 W/kg

SAR(1 g) = 0.961 mW/g; SAR(10 g) = 0.577 mW/g

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

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



0 dB = 1.06mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.1 °C
 Ambient Temperature: 21.3 °C
 Test Date: Oct.09 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

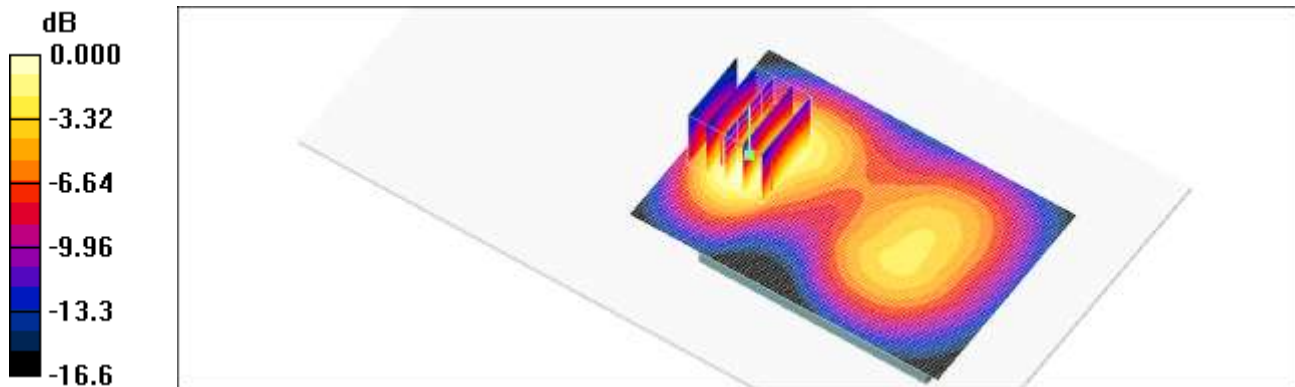
Communication System: PCS 1900MHz FCC; Frequency: 1880 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 52$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front EVDO 600/Area Scan (61x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 1.00 mW/g

Body Front EVDO 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 27.3 V/m; Power Drift = 0.106 dB
 Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.894 mW/g; SAR(10 g) = 0.541 mW/g
 Maximum value of SAR (measured) = 0.960 mW/g



0 dB = 0.960mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.1 °C
 Ambient Temperature: 21.3 °C
 Test Date: Oct.09 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1908.75 MHz;Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1908.75 \text{ MHz}$; $\sigma = 1.55 \text{ mho/m}$; $\epsilon_r = 51.9$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front EVDO 1175/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.20 mW/g

Body Front EVDO 1175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

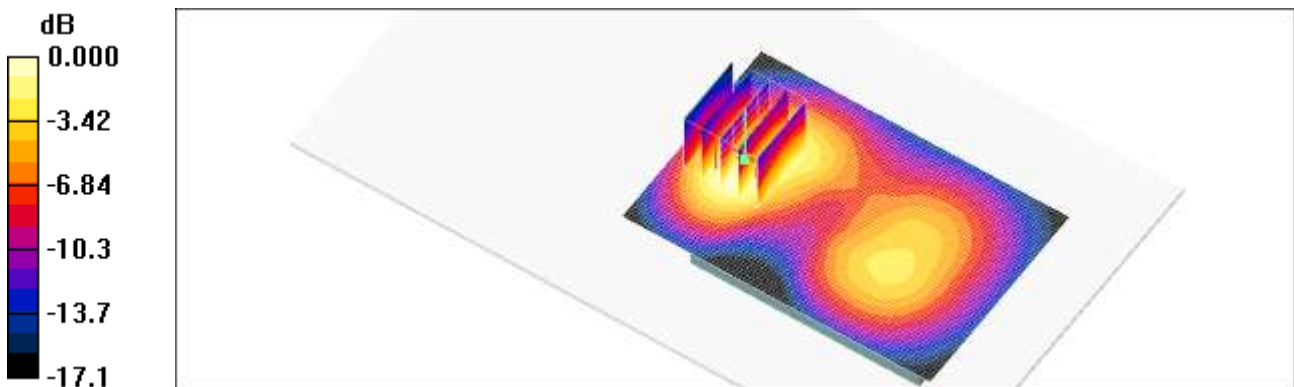
Reference Value = 29.3 V/m; Power Drift = -0.004 dB

Peak SAR (extrapolated) = 1.65 W/kg

SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.650 mW/g

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

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



0 dB = 1.16mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.09 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

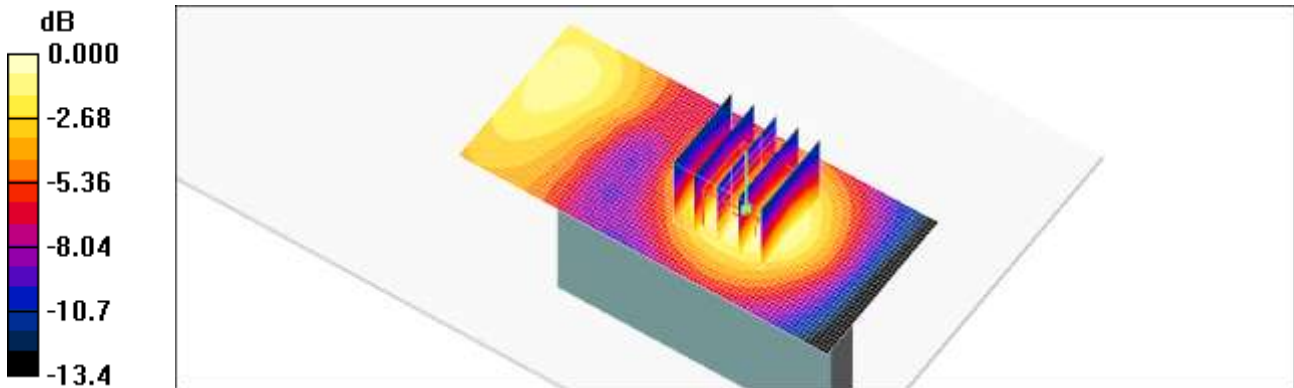
Communication System: PCS 1900MHz FCC; Frequency: 1880 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 52$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Left EVDO 600/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.097 mW/g

Body Left EVDO 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 6.66 V/m; Power Drift = 0.106 dB
 Peak SAR (extrapolated) = 0.127 W/kg
SAR(1 g) = 0.087 mW/g; SAR(10 g) = 0.055 mW/g
 Maximum value of SAR (measured) = 0.093 mW/g



0 dB = 0.093mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.1 °C
 Ambient Temperature: 21.3 °C
 Test Date: Oct.09 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

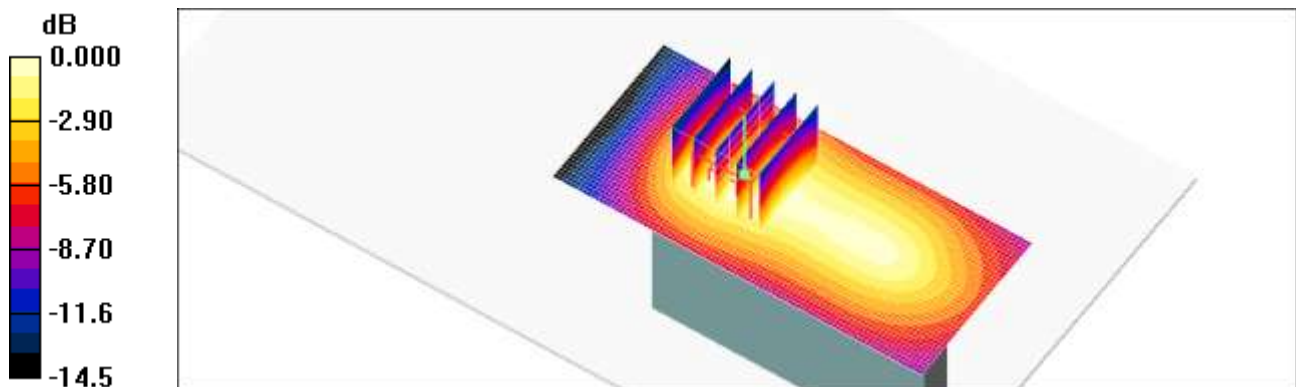
Communication System: PCS 1900MHz FCC; Frequency: 1880 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 52$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Right EVDO 600/Area Scan (41x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.405 mW/g

Body Right EVDO 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 9.52 V/m; Power Drift = 0.021 dB
 Peak SAR (extrapolated) = 0.546 W/kg
SAR(1 g) = 0.370 mW/g; SAR(10 g) = 0.234 mW/g
 Maximum value of SAR (measured) = 0.389 mW/g



0 dB = 0.389mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.09 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1851.25 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top EVDO 25/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.58 mW/g

Body Top EVDO 25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

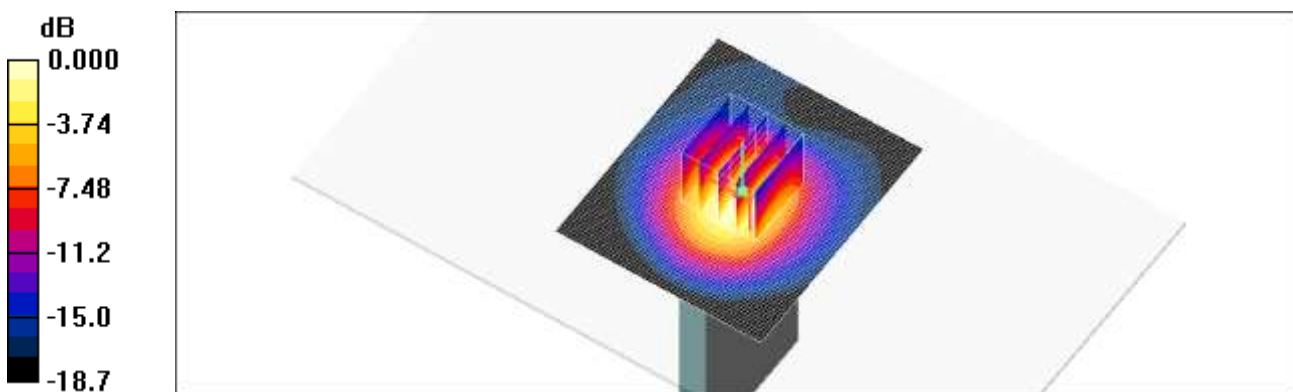
Reference Value = 34.9 V/m; Power Drift = -0.162 dB

Peak SAR (extrapolated) = 2.17 W/kg

SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.716 mW/g

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

Maximum value of SAR (measured) = 1.48 mW/g



0 dB = 1.48mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.1 °C
 Ambient Temperature: 21.3 °C
 Test Date: Oct.09 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

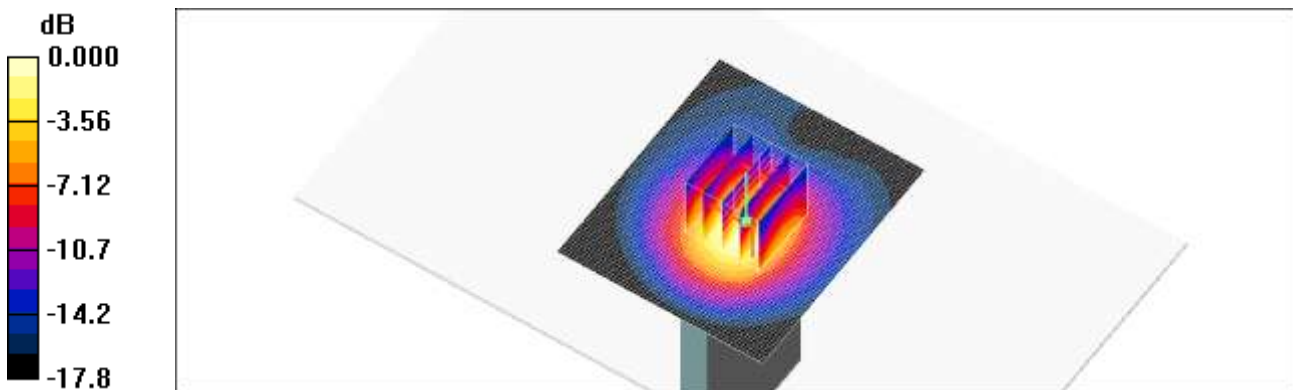
Communication System: PCS 1900MHz FCC; Frequency: 1880 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 52$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top EVDO 600/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 1.30 mW/g

Body Top EVDO 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 29.9 V/m; Power Drift = -0.021 dB
 Peak SAR (extrapolated) = 1.80 W/kg
SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.604 mW/g
 Maximum value of SAR (measured) = 1.24 mW/g



0 dB = 1.24mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.09 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top EVDO 1175/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.46 mW/g

Body Top EVDO 1175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

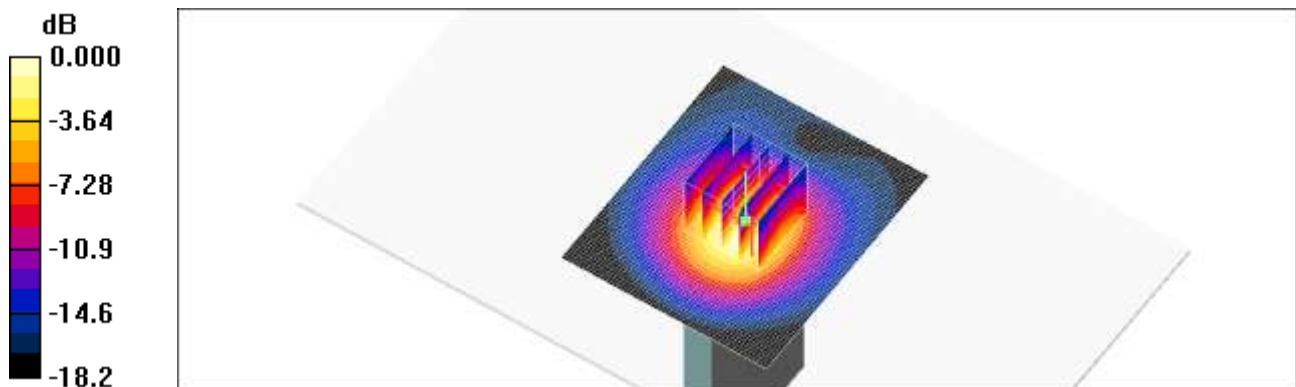
Reference Value = 32.6 V/m; Power Drift = -0.018 dB

Peak SAR (extrapolated) = 2.07 W/kg

SAR(1 g) = 1.23 mW/g; SAR(10 g) = 0.663 mW/g

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

Maximum value of SAR (measured) = 1.39 mW/g



0 dB = 1.39mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear QPSK 5MHz 12RB 6 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.503 mW/g

Body Rear QPSK 5MHz 12RB 6 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

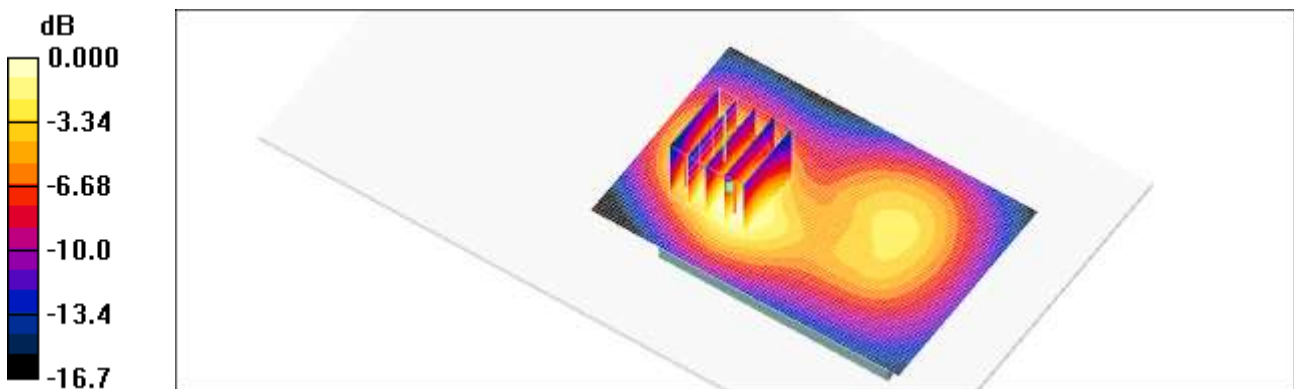
Reference Value = 16.9 V/m; Power Drift = -0.052 dB

Peak SAR (extrapolated) = 0.635 W/kg

SAR(1 g) = 0.407 mW/g; SAR(10 g) = 0.252 mW/g

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

Maximum value of SAR (measured) = 0.445 mW/g



0 dB = 0.445mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear QPSK 5MHz 1RB 0 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.636 mW/g

Body Rear QPSK 5MHz 1RB 0 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

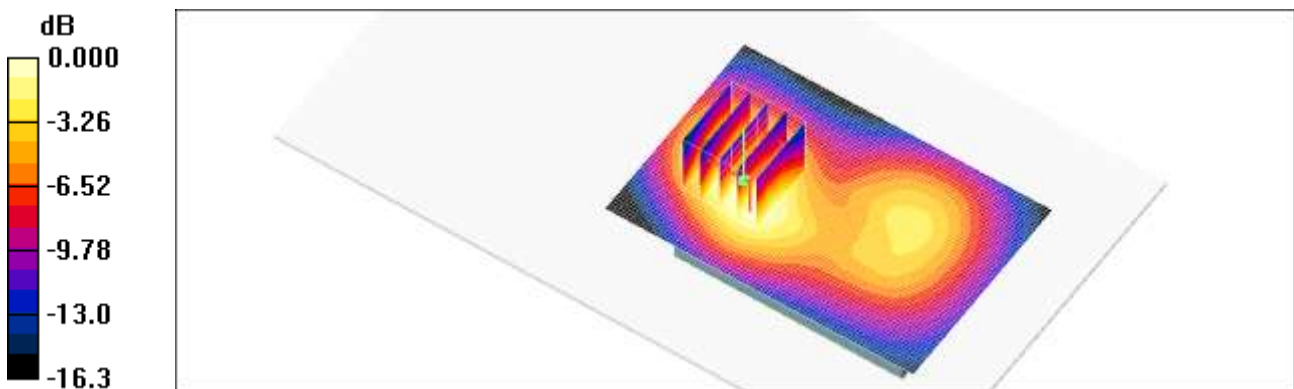
Reference Value = 18.9 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 0.784 W/kg

SAR(1 g) = 0.512 mW/g; SAR(10 g) = 0.317 mW/g

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

Maximum value of SAR (measured) = 0.553 mW/g



0 dB = 0.553mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear QPSK 5MHz 1RB 24 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.681 mW/g

Body Rear QPSK 5MHz 1RB 24 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

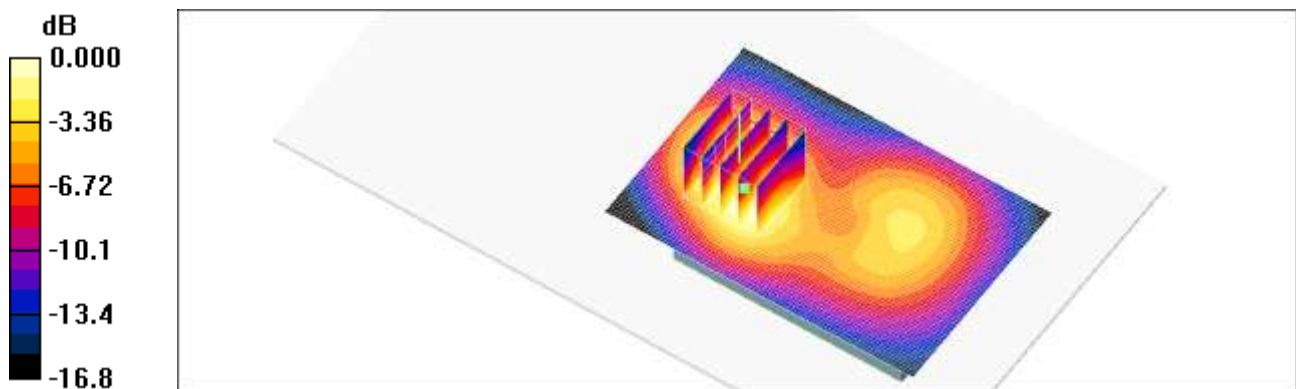
Reference Value = 20.3 V/m; Power Drift = -0.187 dB

Peak SAR (extrapolated) = 0.835 W/kg

SAR(1 g) = 0.537 mW/g; SAR(10 g) = 0.321 mW/g

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

Maximum value of SAR (measured) = 0.580 mW/g



0 dB = 0.580mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front QPSK 5MHz 12RB 6 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.561 mW/g

Body Front QPSK 5MHz 12RB 6 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

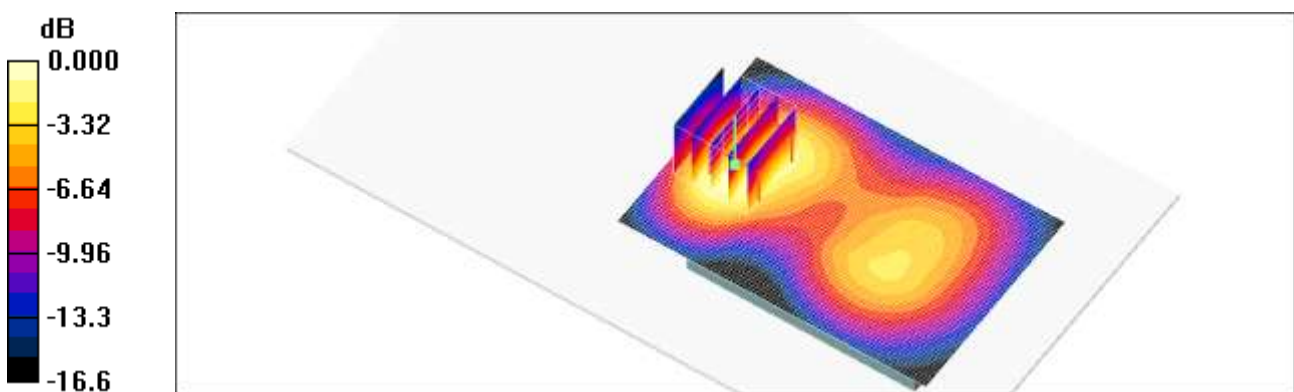
Reference Value = 20.6 V/m; Power Drift = -0.138 dB

Peak SAR (extrapolated) = 0.764 W/kg

SAR(1 g) = 0.507 mW/g; SAR(10 g) = 0.308 mW/g

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

Maximum value of SAR (measured) = 0.537 mW/g



0 dB = 0.537mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front QPSK 5MHz 1RB 0 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.697 mW/g

Body Front QPSK 5MHz 1RB 0 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

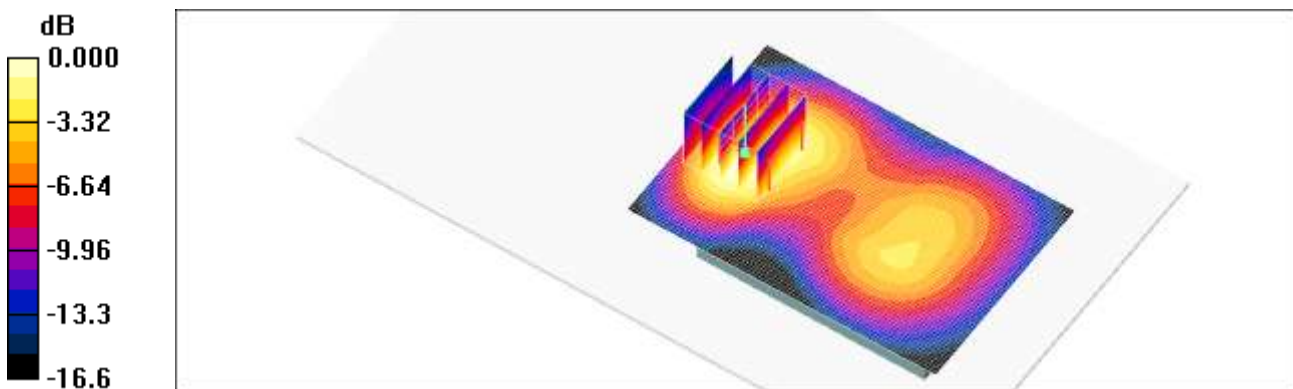
Reference Value = 22.7 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 0.950 W/kg

SAR(1 g) = 0.634 mW/g; SAR(10 g) = 0.388 mW/g

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

Maximum value of SAR (measured) = 0.672 mW/g



0 dB = 0.672mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front QPSK 5MHz 1RB 24 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.697 mW/g

Body Front QPSK 5MHz 1RB 24 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

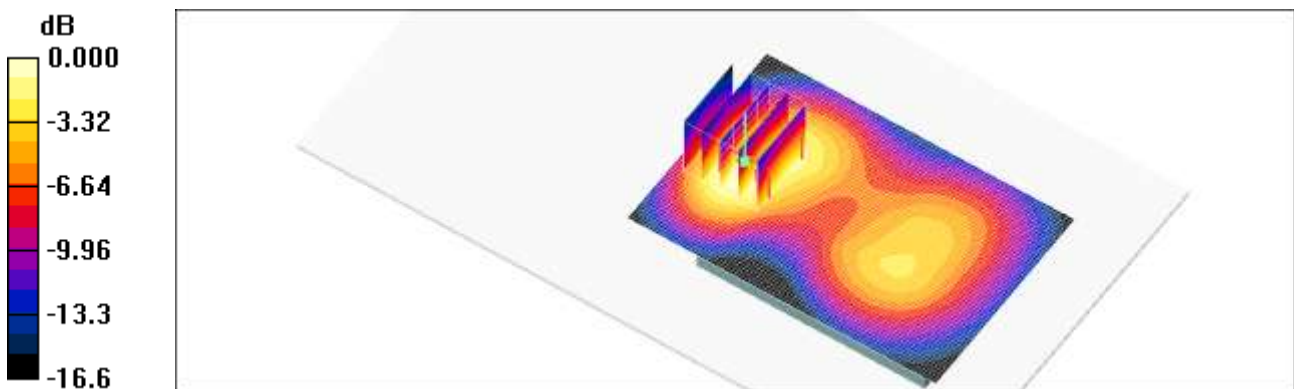
Reference Value = 22.8 V/m; Power Drift = 0.068 dB

Peak SAR (extrapolated) = 0.967 W/kg

SAR(1 g) = 0.638 mW/g; SAR(10 g) = 0.388 mW/g

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

Maximum value of SAR (measured) = 0.686 mW/g



0 dB = 0.686mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Left QPSK 5MHz 12RB 6 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.040 mW/g

Body Left QPSK 5MHz 12RB 6 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

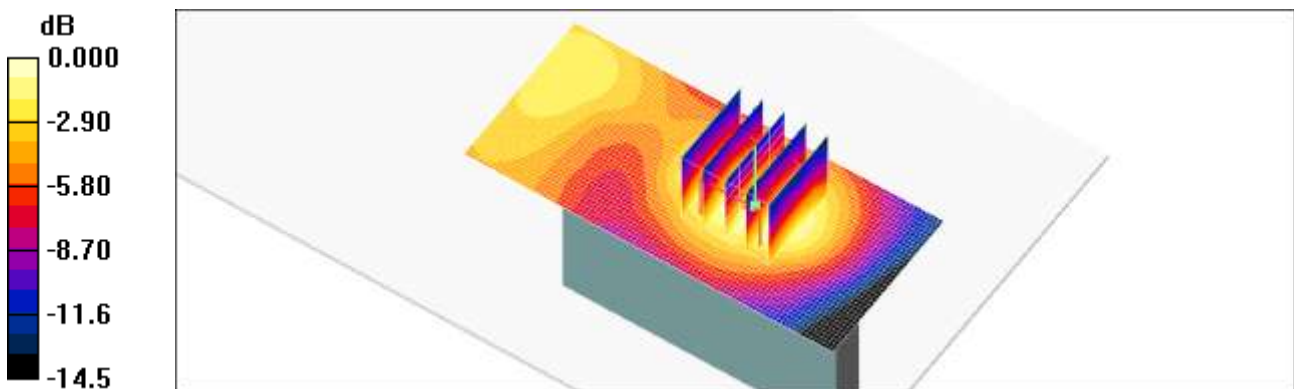
Reference Value = 4.07 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 0.055 W/kg

SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.023 mW/g

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

Maximum value of SAR (measured) = 0.040 mW/g



0 dB = 0.040mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Left QPSK 5MHz 1RB 0 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.051 mW/g

Body Left QPSK 5MHz 1RB 0 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

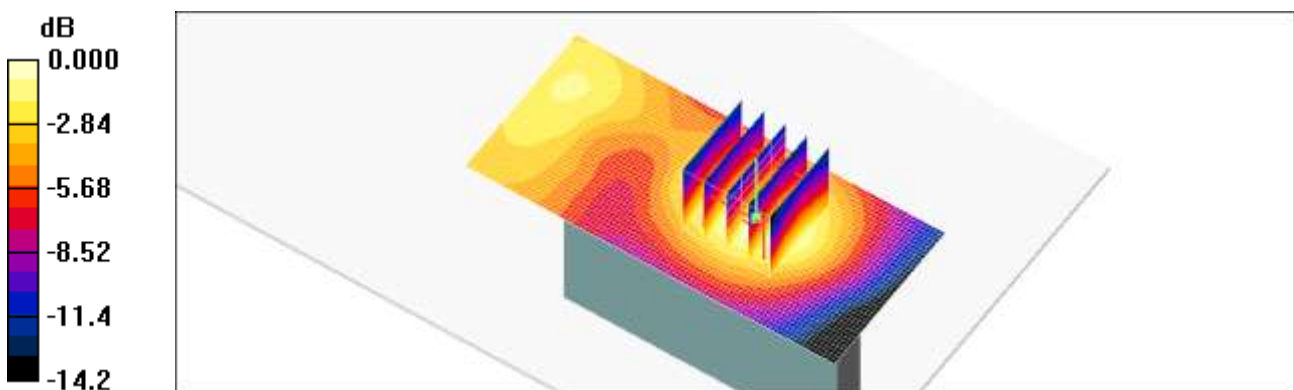
Reference Value = 4.59 V/m; Power Drift = -0.071 dB

Peak SAR (extrapolated) = 0.067 W/kg

SAR(1 g) = 0.046 mW/g; SAR(10 g) = 0.029 mW/g

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

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



0 dB = 0.050mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Left QPSK 5MHz 1RB 24 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.053 mW/g

Body Left QPSK 5MHz 1RB 24 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

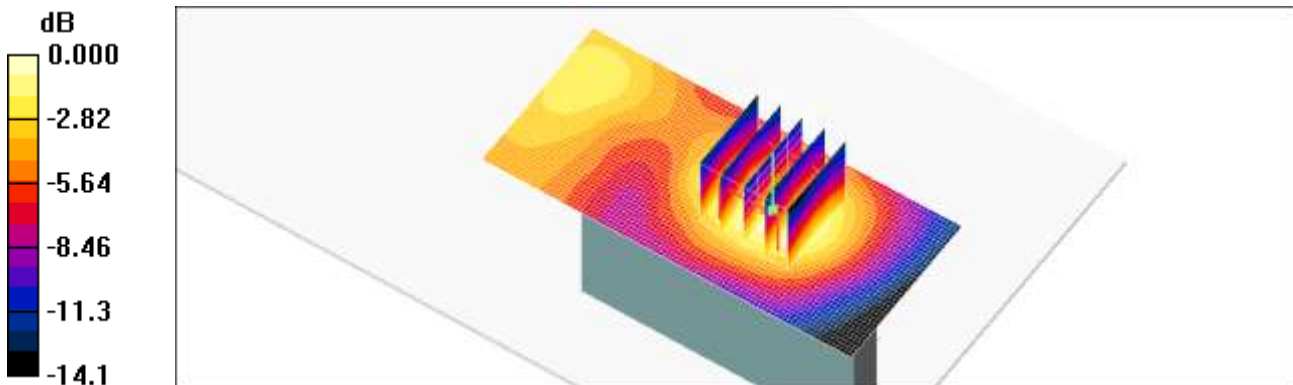
Reference Value = 4.46 V/m; Power Drift = -0.118 dB

Peak SAR (extrapolated) = 0.074 W/kg

SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.030 mW/g

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

Maximum value of SAR (measured) = 0.053 mW/g



0 dB = 0.053mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Right QPSK 5MHz 12RB 6 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.254 mW/g

Body Right QPSK 5MHz 12RB 6 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

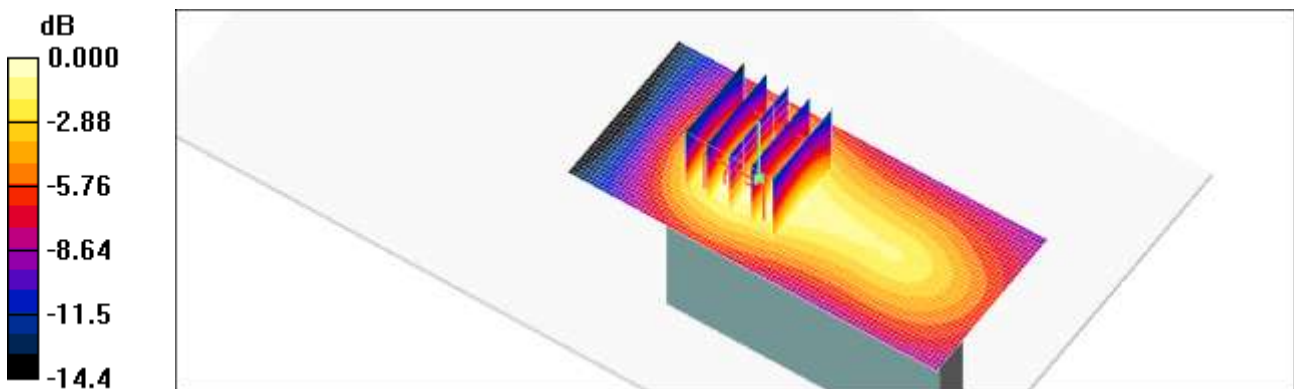
Reference Value = 7.21 V/m; Power Drift = -0.039 dB

Peak SAR (extrapolated) = 0.333 W/kg

SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.141 mW/g

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

Maximum value of SAR (measured) = 0.239 mW/g



0 dB = 0.239mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Right QPSK 5MHz 1RB 0 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.308 mW/g

Body Right QPSK 5MHz 1RB 0 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

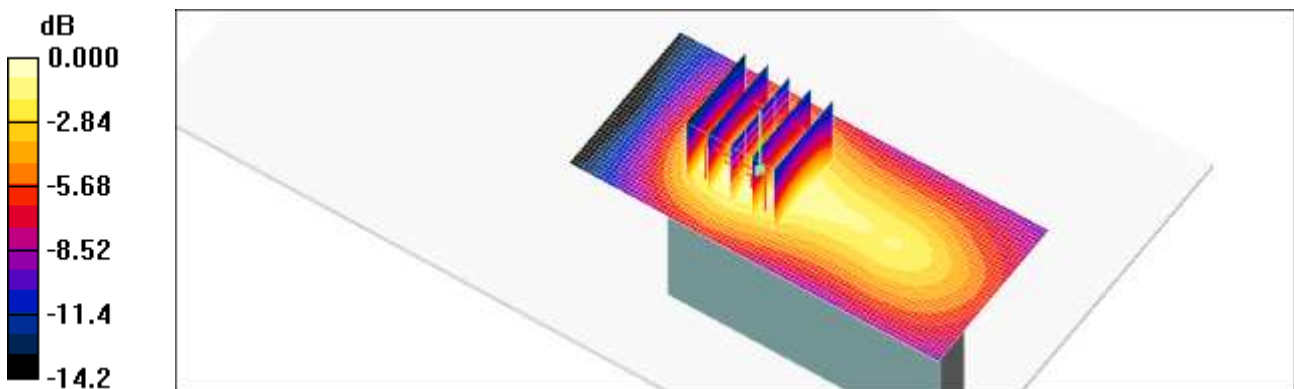
Reference Value = 8.03 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 0.424 W/kg

SAR(1 g) = 0.283 mW/g; SAR(10 g) = 0.176 mW/g

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

Maximum value of SAR (measured) = 0.300 mW/g



0 dB = 0.300mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Right QPSK 5MHz 1RB 24 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.319 mW/g

Body Right QPSK 5MHz 1RB 24 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

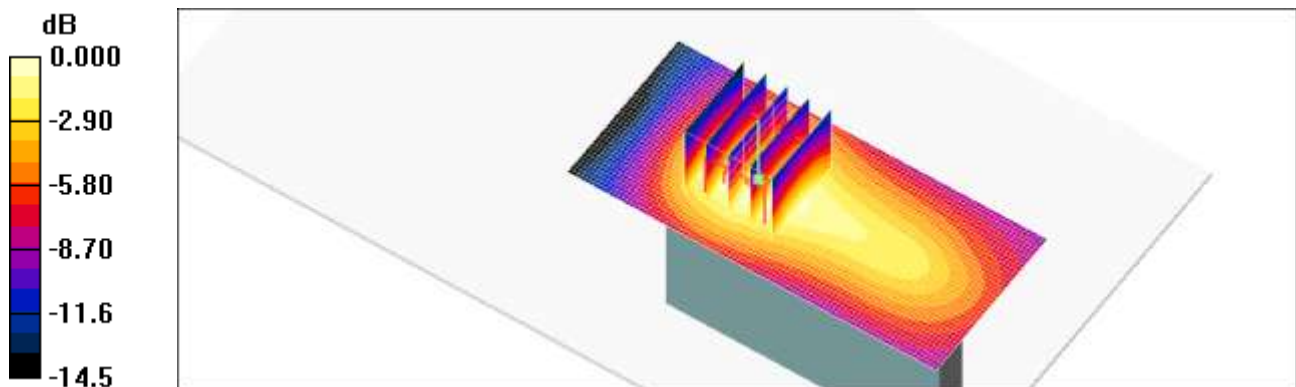
Reference Value = 7.91 V/m; Power Drift = -0.019 dB

Peak SAR (extrapolated) = 0.420 W/kg

SAR(1 g) = 0.284 mW/g; SAR(10 g) = 0.178 mW/g

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

Maximum value of SAR (measured) = 0.301 mW/g



0 dB = 0.301mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top QPSK 5MHz 12RB 6 offset 26365ch/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.706 mW/g

Body Top QPSK 5MHz 12RB 6 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

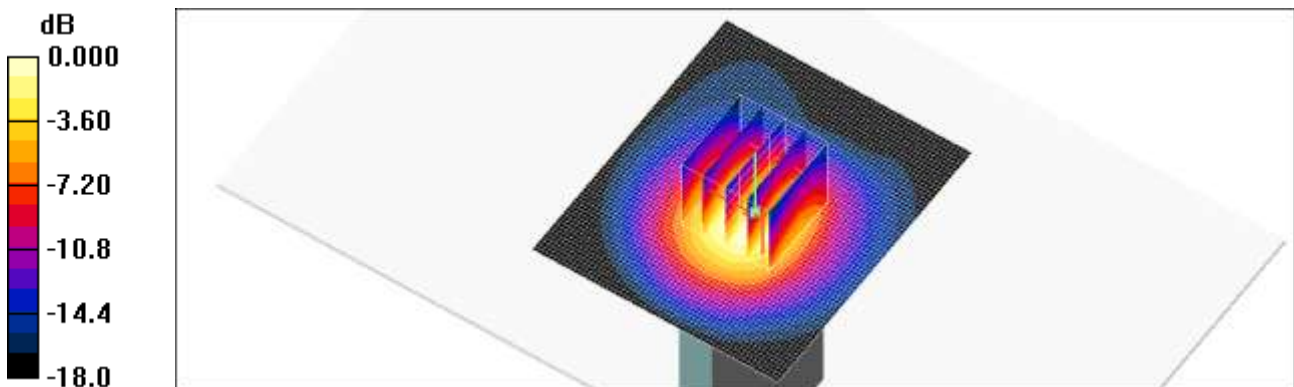
Reference Value = 22.3 V/m; Power Drift = -0.052 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.602 mW/g; SAR(10 g) = 0.328 mW/g

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

Maximum value of SAR (measured) = 0.676 mW/g



0 dB = 0.676mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top QPSK 5MHz 1RB 0 offset 26365ch/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.895 mW/g

Body Top QPSK 5MHz 1RB 0 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

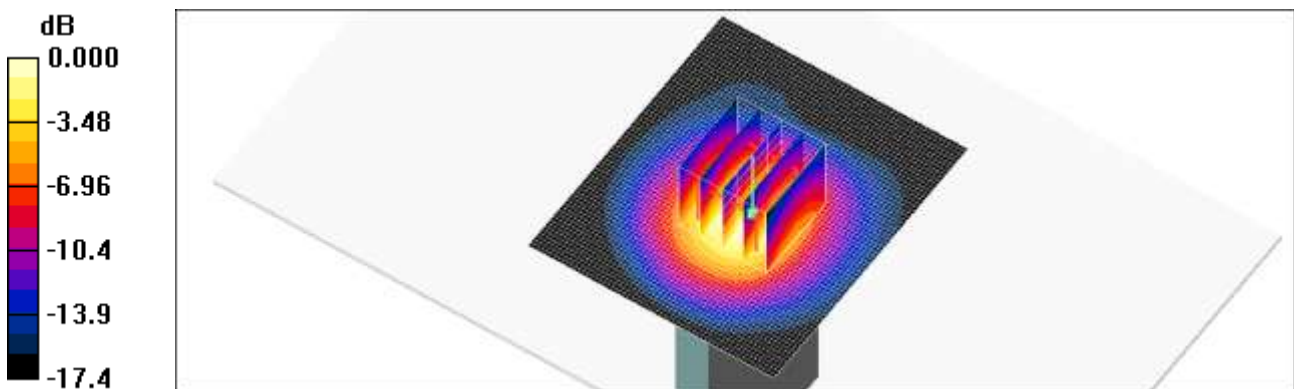
Reference Value = 25.0 V/m; Power Drift = -0.004 dB

Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.761 mW/g; SAR(10 g) = 0.415 mW/g

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

Maximum value of SAR (measured) = 0.851 mW/g



0 dB = 0.851mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top QPSK 5MHz 1RB 24 offset 26365ch/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.897 mW/g

Body Top QPSK 5MHz 1RB 24 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

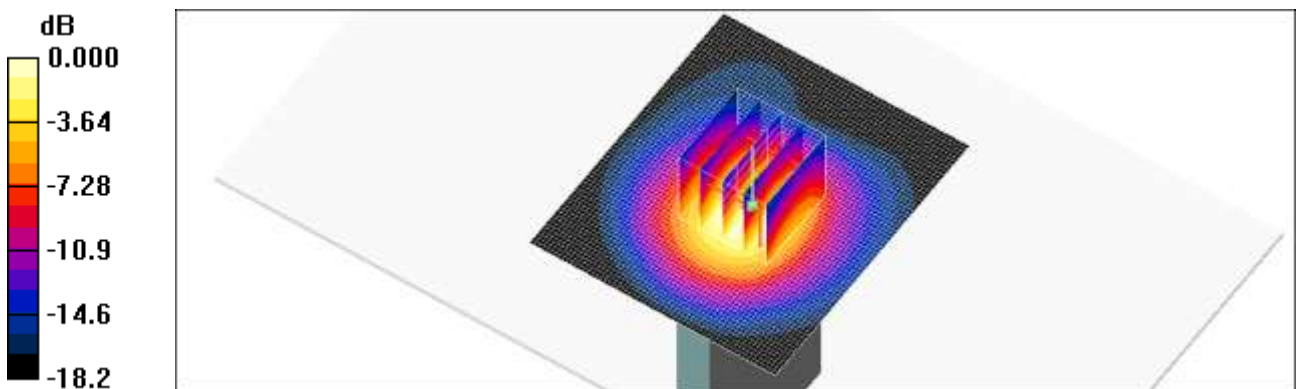
Reference Value = 25.0 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.756 mW/g; SAR(10 g) = 0.412 mW/g

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

Maximum value of SAR (measured) = 0.852 mW/g



0 dB = 0.852mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear 16QAM 5MHz 12RB 6 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.404 mW/g

Body Rear 16QAM 5MHz 12RB 6 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

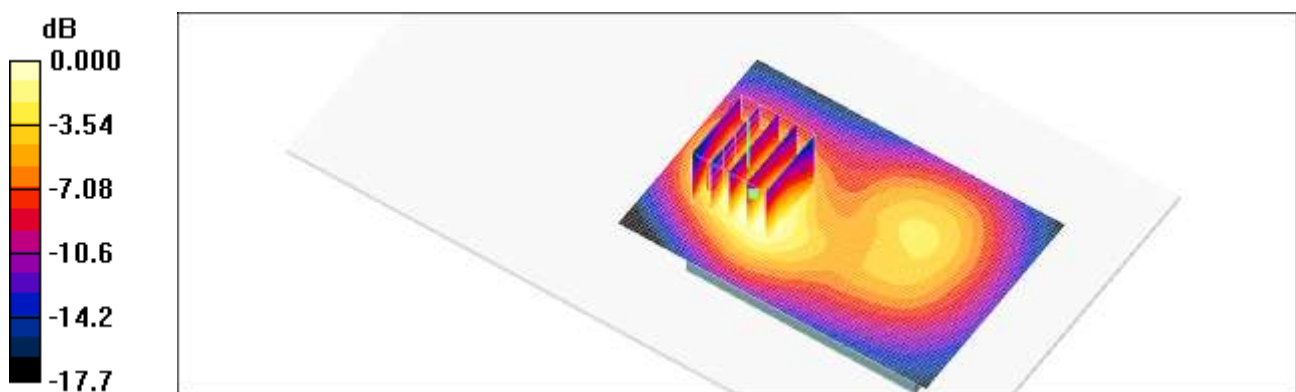
Reference Value = 15.7 V/m; Power Drift = -0.039 dB

Peak SAR (extrapolated) = 0.517 W/kg

SAR(1 g) = 0.327 mW/g; SAR(10 g) = 0.196 mW/g

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

Maximum value of SAR (measured) = 0.352 mW/g



0 dB = 0.352mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear 16QAM 5MHz 1RB 0 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.456 mW/g

Body Rear 16QAM 5MHz 1RB 0 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

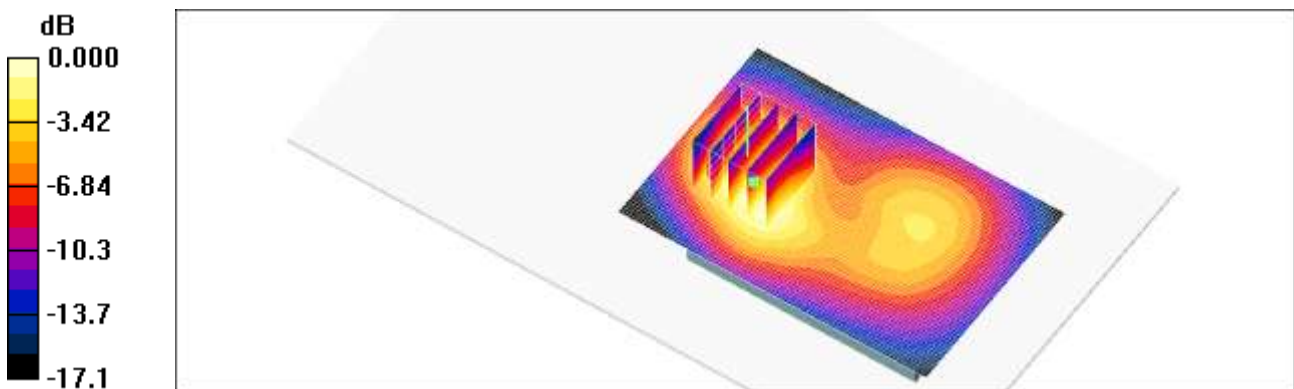
Reference Value = 16.9 V/m; Power Drift = 0.124 dB

Peak SAR (extrapolated) = 0.623 W/kg

SAR(1 g) = 0.398 mW/g; SAR(10 g) = 0.239 mW/g

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

Maximum value of SAR (measured) = 0.431 mW/g



0 dB = 0.431mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear 16QAM 5MHz 1RB 24 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.494 mW/g

Body Rear 16QAM 5MHz 1RB 24 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

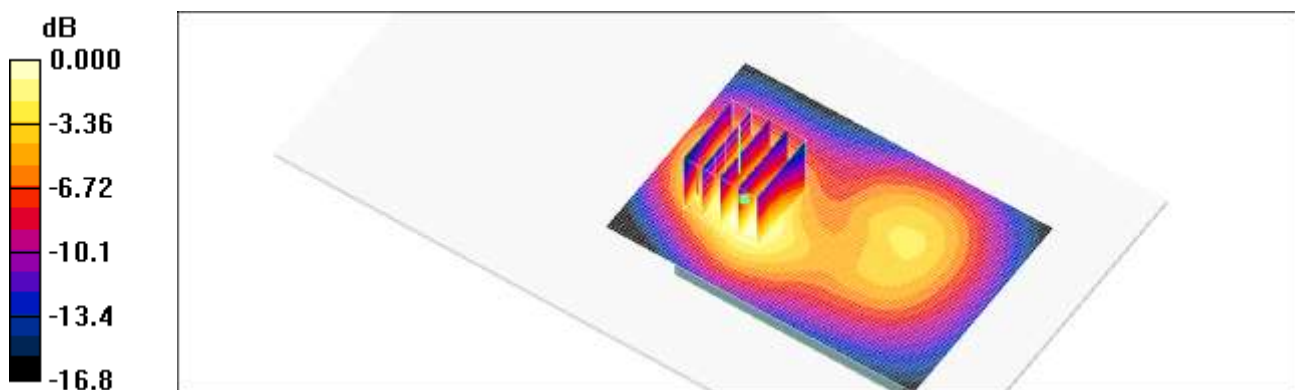
Reference Value = 17.2 V/m; Power Drift = -0.007 dB

Peak SAR (extrapolated) = 0.637 W/kg

SAR(1 g) = 0.406 mW/g; SAR(10 g) = 0.246 mW/g

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

Maximum value of SAR (measured) = 0.438 mW/g



0 dB = 0.438mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front 16QAM 5MHz 12RB 6 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.431 mW/g

Body Front 16QAM 5MHz 12RB 6 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

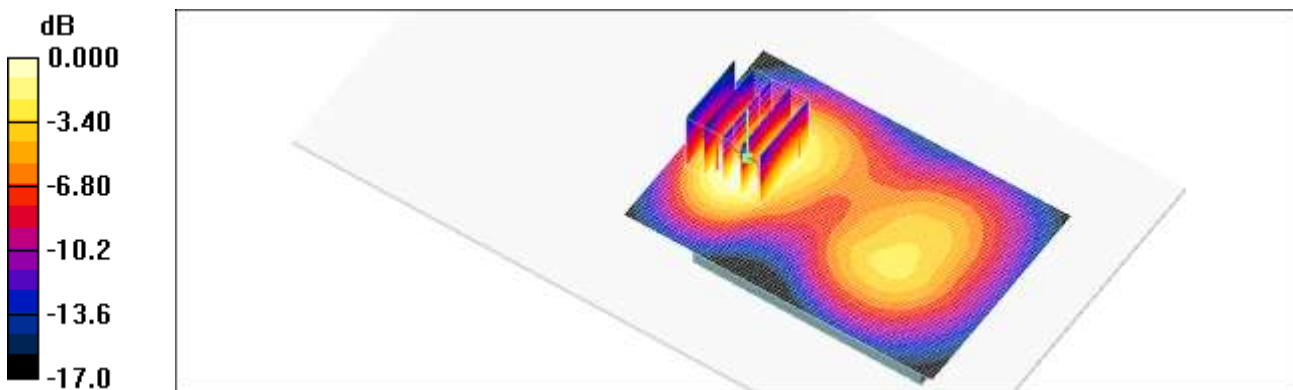
Reference Value = 17.6 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 0.610 W/kg

SAR(1 g) = 0.394 mW/g; SAR(10 g) = 0.237 mW/g

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

Maximum value of SAR (measured) = 0.416 mW/g



0 dB = 0.416mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front 16QAM 5MHz 1RB 0 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.523 mW/g

Body Front 16QAM 5MHz 1RB 0 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

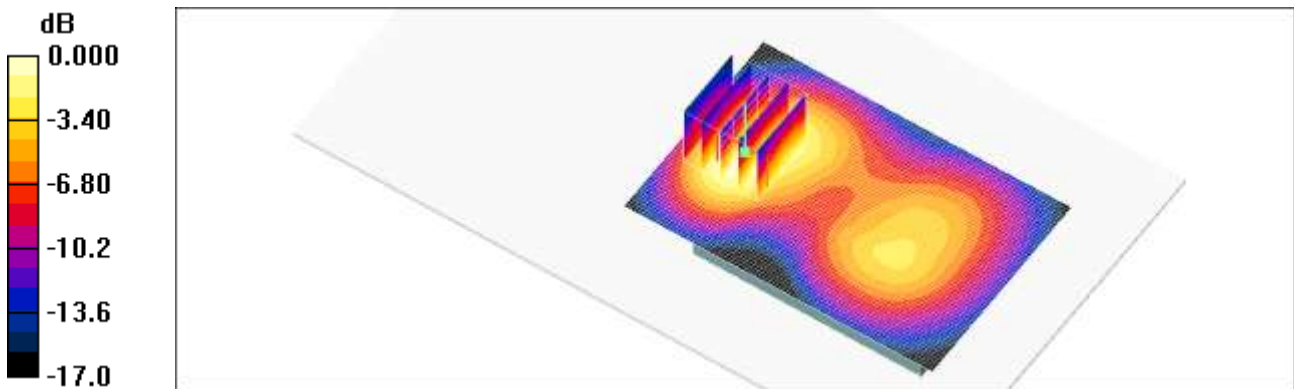
Reference Value = 19.7 V/m; Power Drift = 0.036 dB

Peak SAR (extrapolated) = 0.731 W/kg

SAR(1 g) = 0.487 mW/g; SAR(10 g) = 0.294 mW/g

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

Maximum value of SAR (measured) = 0.527 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front 16QAM 5MHz 1RB 24 offset 26365ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.538 mW/g

Body Front 16QAM 5MHz 1RB 24 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

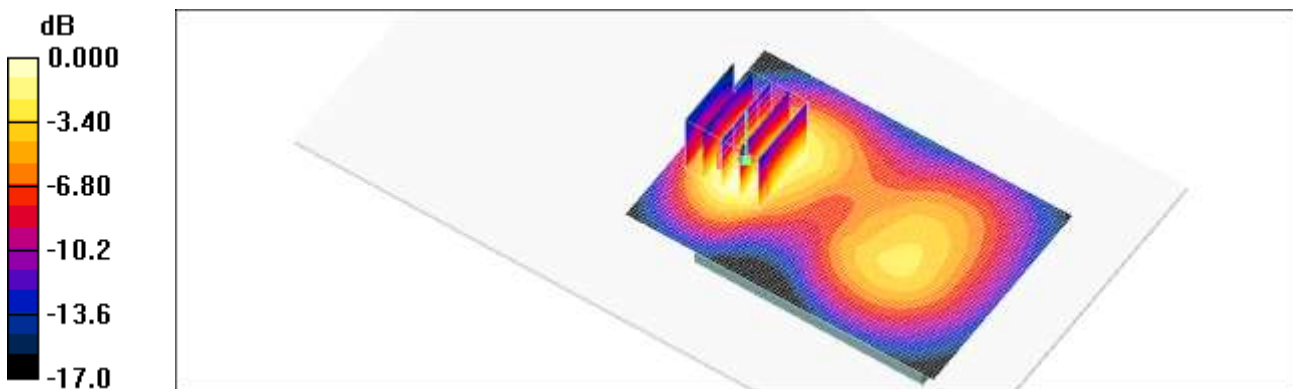
Reference Value = 19.8 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 0.771 W/kg

SAR(1 g) = 0.498 mW/g; SAR(10 g) = 0.299 mW/g

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

Maximum value of SAR (measured) = 0.535 mW/g



0 dB = 0.535mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Left 16QAM 5MHz 12RB 6 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.033 mW/g

Body Left 16QAM 5MHz 12RB 6 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

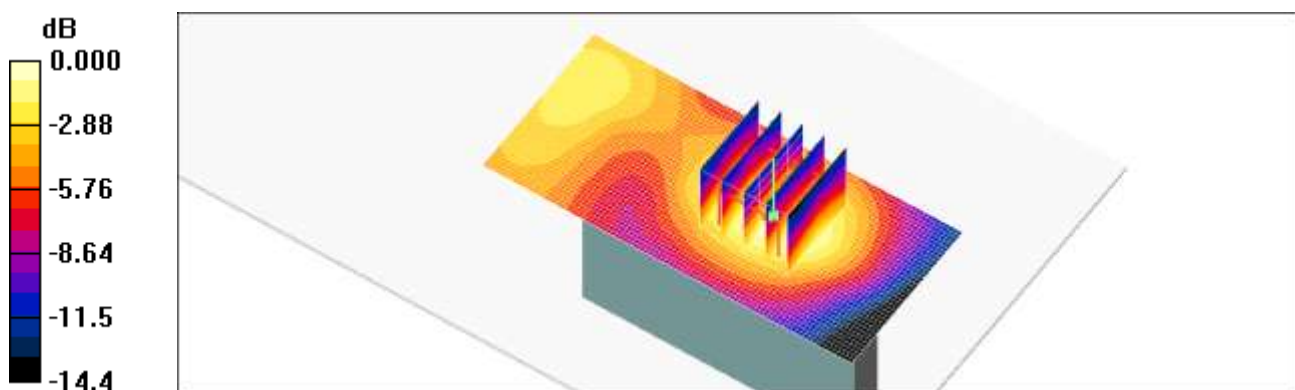
Reference Value = 3.53 V/m; Power Drift = -0.059 dB

Peak SAR (extrapolated) = 0.044 W/kg

SAR(1 g) = 0.030 mW/g; SAR(10 g) = 0.018 mW/g

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

Maximum value of SAR (measured) = 0.033 mW/g



0 dB = 0.033mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Left 16QAM 5MHz 1RB 0 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.040 mW/g

Body Left 16QAM 5MHz 1RB 0 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

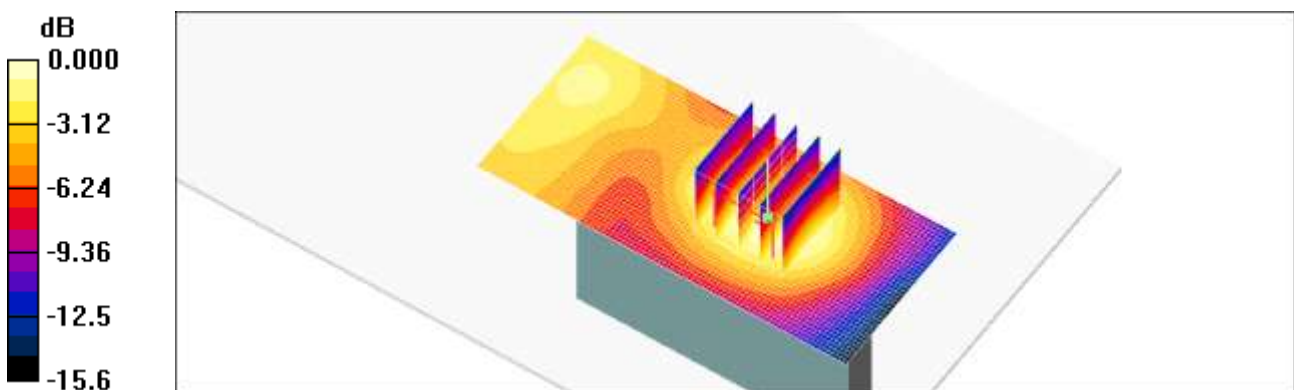
Reference Value = 3.95 V/m; Power Drift = 0.069 dB

Peak SAR (extrapolated) = 0.052 W/kg

SAR(1 g) = 0.035 mW/g; SAR(10 g) = 0.022 mW/g

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

Maximum value of SAR (measured) = 0.038 mW/g



0 dB = 0.038mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Left 16QAM 5MHz 1RB 24 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

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

Body Left 16QAM 5MHz 1RB 24 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

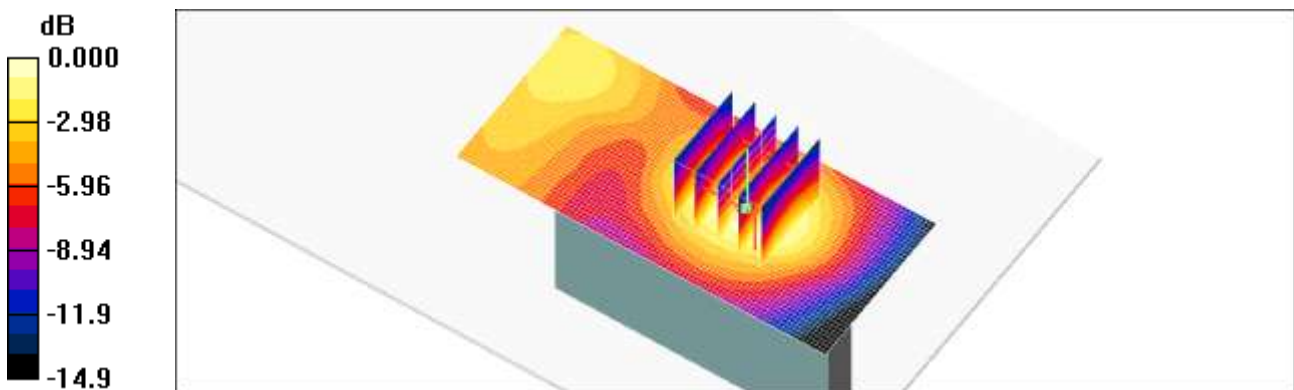
Reference Value = 4.28 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 0.076 W/kg

SAR(1 g) = 0.050 mW/g; SAR(10 g) = 0.031 mW/g

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

Maximum value of SAR (measured) = 0.054 mW/g



0 dB = 0.054mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Right 16QAM 5MHz 12RB 6 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.192 mW/g

Body Right 16QAM 5MHz 12RB 6 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

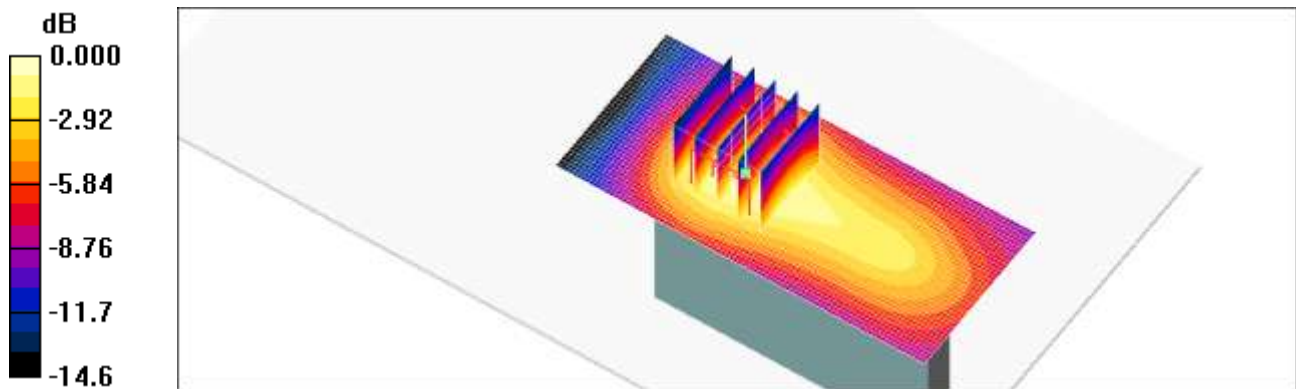
Reference Value = 6.25 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 0.269 W/kg

SAR(1 g) = 0.177 mW/g; SAR(10 g) = 0.109 mW/g

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

Maximum value of SAR (measured) = 0.193 mW/g



0 dB = 0.193mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Right 16QAM 5MHz 1RB 0 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.239 mW/g

Body Right 16QAM 5MHz 1RB 0 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

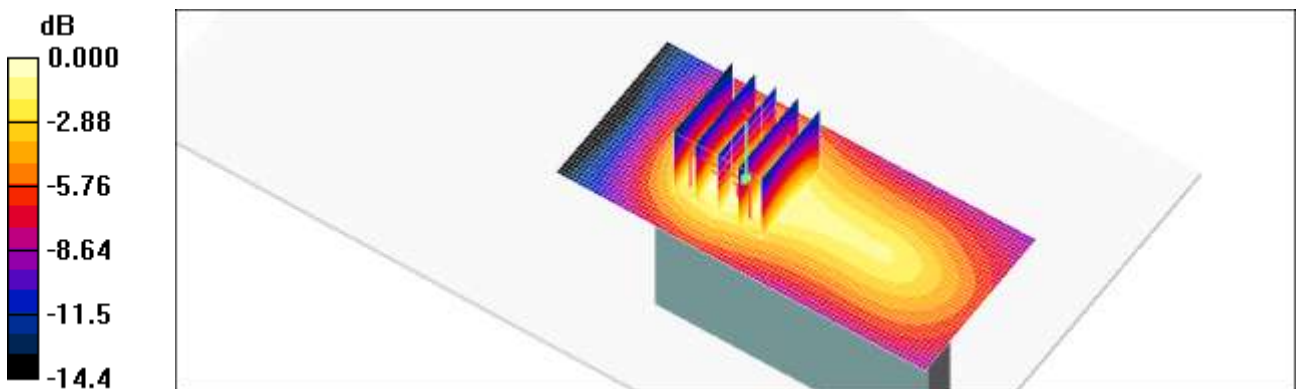
Reference Value = 7.07 V/m; Power Drift = -0.046 dB

Peak SAR (extrapolated) = 0.320 W/kg

SAR(1 g) = 0.215 mW/g; SAR(10 g) = 0.134 mW/g

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

Maximum value of SAR (measured) = 0.230 mW/g



0 dB = 0.230mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Right 16QAM 5MHz 1RB 24 offset 26365ch/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.239 mW/g

Body Right 16QAM 5MHz 1RB 24 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

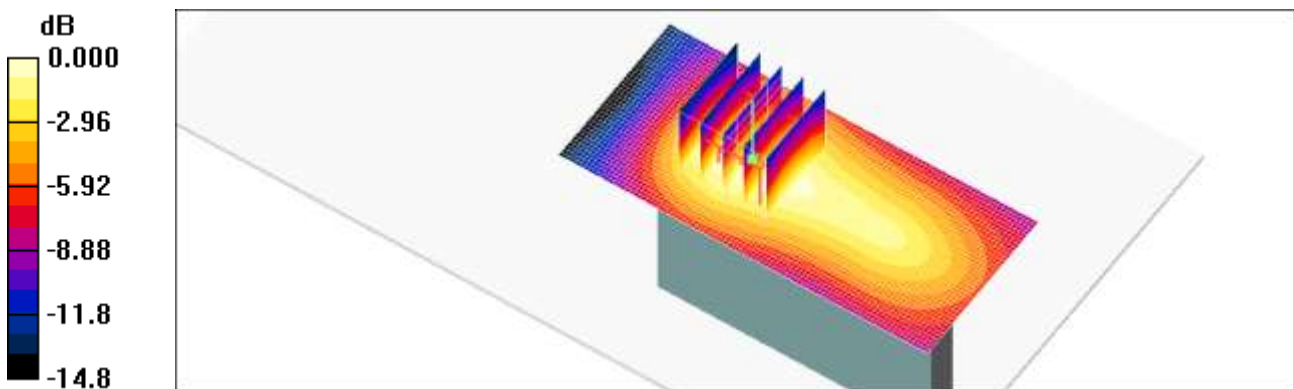
Reference Value = 6.77 V/m; Power Drift = -0.094 dB

Peak SAR (extrapolated) = 0.304 W/kg

SAR(1 g) = 0.207 mW/g; SAR(10 g) = 0.131 mW/g

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

Maximum value of SAR (measured) = 0.220 mW/g



0 dB = 0.220mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top 16QAM 5MHz 12RB 6 offset 26365ch/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.554 mW/g

Body Top 16QAM 5MHz 12RB 6 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

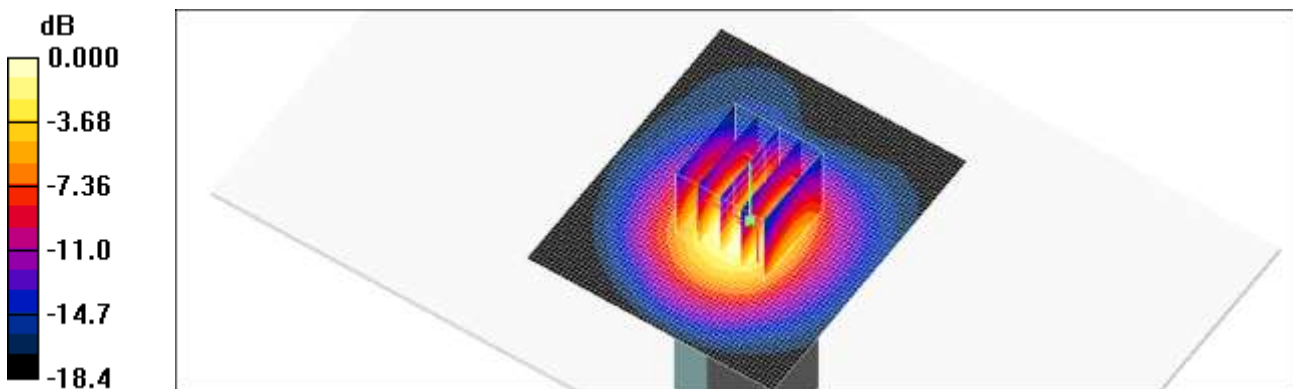
Reference Value = 19.6 V/m; Power Drift = 0.006 dB

Peak SAR (extrapolated) = 0.782 W/kg

SAR(1 g) = 0.468 mW/g; SAR(10 g) = 0.255 mW/g

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

Maximum value of SAR (measured) = 0.529 mW/g



0 dB = 0.529mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top 16QAM 5MHz 1RB 0 offset 26365ch/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.685 mW/g

Body Top 16QAM 5MHz 1RB 0 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

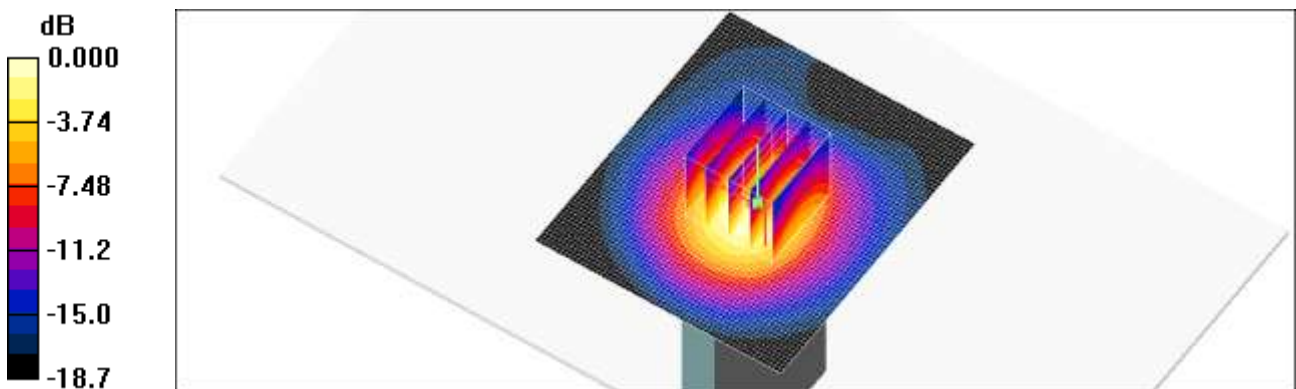
Reference Value = 21.6 V/m; Power Drift = 0.109 dB

Peak SAR (extrapolated) = 0.969 W/kg

SAR(1 g) = 0.583 mW/g; SAR(10 g) = 0.317 mW/g

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

Maximum value of SAR (measured) = 0.657 mW/g



0 dB = 0.657mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.10 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top 16QAM 5MHz 1RB 24 offset 26365ch/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.680 mW/g

Body Top 16QAM 5MHz 1RB 24 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

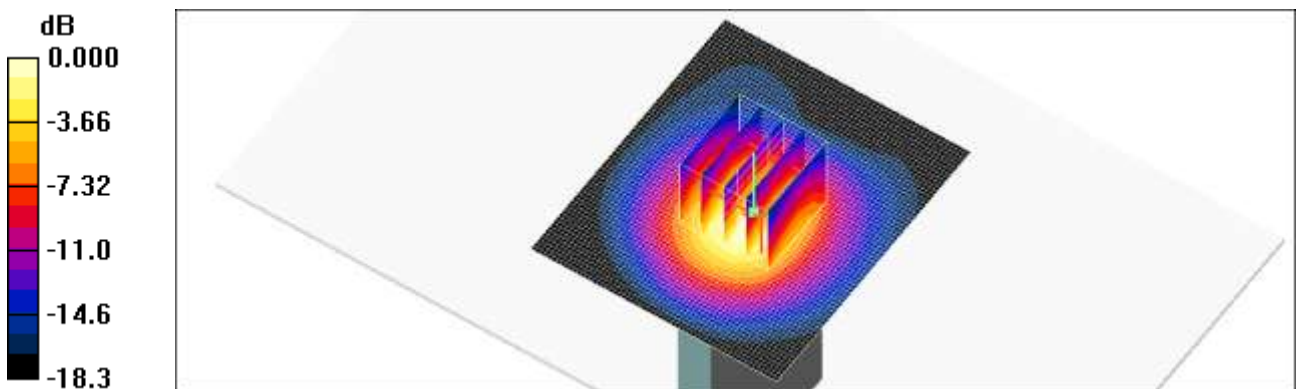
Reference Value = 22.0 V/m; Power Drift = -0.118 dB

Peak SAR (extrapolated) = 0.990 W/kg

SAR(1 g) = 0.586 mW/g; SAR(10 g) = 0.318 mW/g

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

Maximum value of SAR (measured) = 0.665 mW/g



0 dB = 0.665mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.11 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2437 MHz;Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.91 \text{ mho/m}$; $\epsilon_r = 54.5$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.01, 4.01, 4.01); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear 802.11b 1Mbps 6ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.113 mW/g

Body Rear 802.11b 1Mbps 6ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

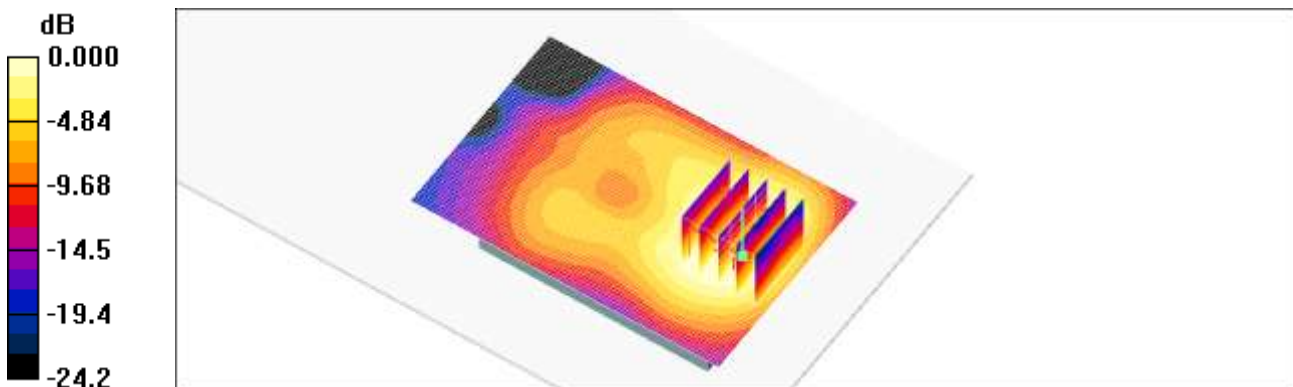
Reference Value = 1.58 V/m; Power Drift = 0.106 dB

Peak SAR (extrapolated) = 0.223 W/kg

SAR(1 g) = 0.102 mW/g; SAR(10 g) = 0.056 mW/g

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

Maximum value of SAR (measured) = 0.104 mW/g



0 dB = 0.104mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.1 °C
 Ambient Temperature: 21.3 °C
 Test Date: Oct.11 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2437 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.91 \text{ mho/m}$; $\epsilon_r = 54.5$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.01, 4.01, 4.01); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front 802.11b 1Mbps 6ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.108 mW/g

Body Front 802.11b 1Mbps 6ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

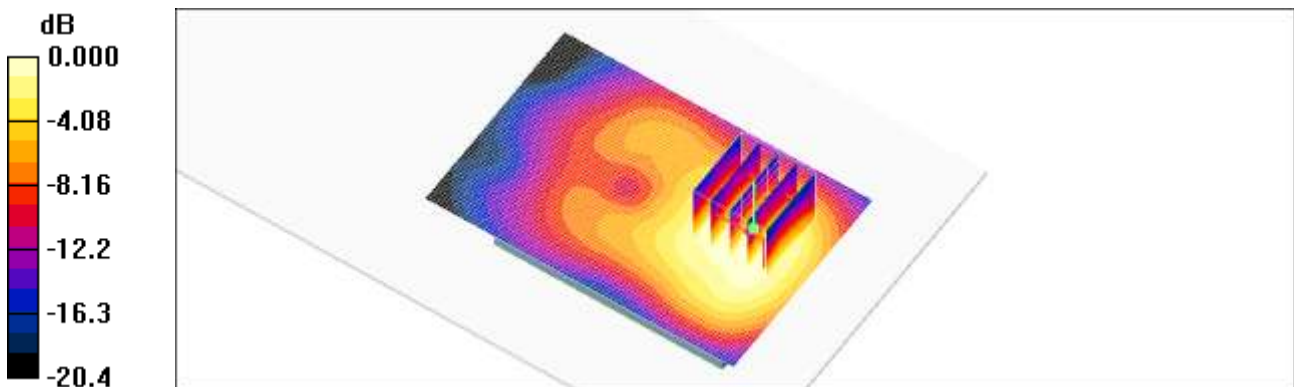
Reference Value = 1.56 V/m; Power Drift = 0.052 dB

Peak SAR (extrapolated) = 0.218 W/kg

SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.052 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: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.11 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2437 MHz;Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.91 \text{ mho/m}$; $\epsilon_r = 54.5$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.01, 4.01, 4.01); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Left 802.11b 1Mbps 6ch/Area Scan (41x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Maximum value of SAR (interpolated) = 0.049 mW/g

Body Left 802.11b 1Mbps 6ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

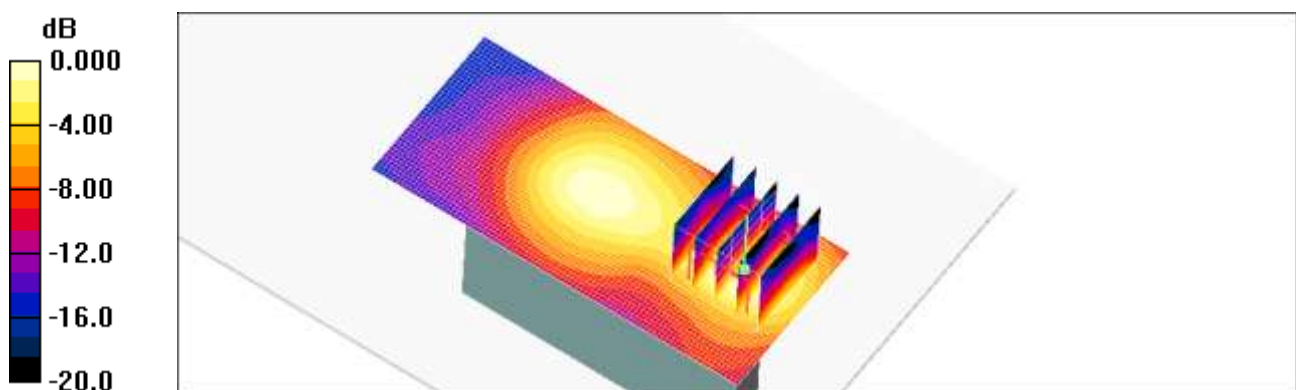
Reference Value = 1.19 V/m; Power Drift = 0.129 dB

Peak SAR (extrapolated) = 0.112 W/kg

SAR(1 g) = 0.044 mW/g; SAR(10 g) = 0.021 mW/g

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

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



0 dB = 0.047mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.1 °C
 Ambient Temperature: 21.3 °C
 Test Date: Oct.11 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2437 MHz;Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.91 \text{ mho/m}$; $\epsilon_r = 54.5$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.01, 4.01, 4.01); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Bottom 802.11b 1Mbps 6ch/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

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

Body Bottom 802.11b 1Mbps 6ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

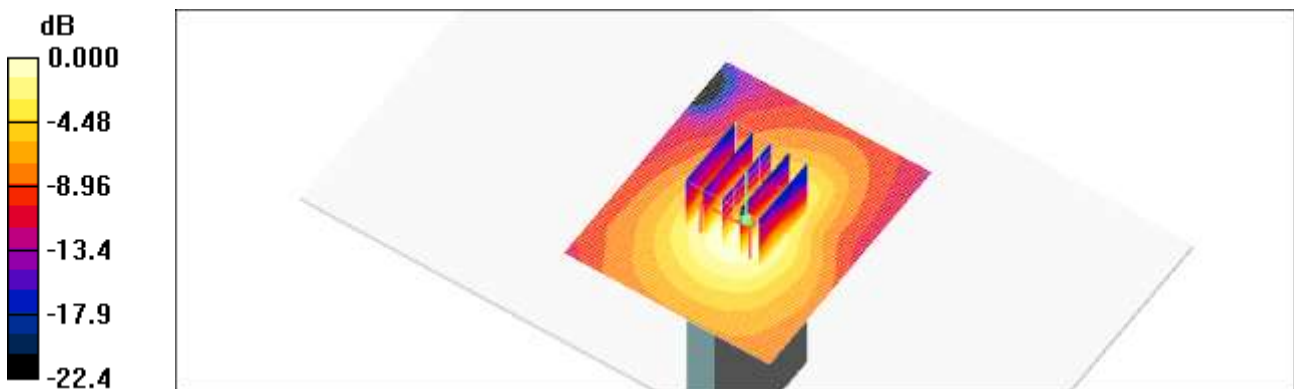
Reference Value = 6.45 V/m; Power Drift = 0.044 dB

Peak SAR (extrapolated) = 0.166 W/kg

SAR(1 g) = 0.069 mW/g; SAR(10 g) = 0.037 mW/g

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

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



0 dB = 0.072mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.08 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA800(BC10); Frequency: 817.9 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 817.9$ MHz; $\sigma = 0.982$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³
 Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front EVDO 476/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.32 mW/g

Body Front EVDO 476/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.7 V/m; Power Drift = -0.105 dB

Peak SAR (extrapolated) = 1.84 W/kg

SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.875 mW/g

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

Maximum value of SAR (measured) = 1.29 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Oct.08 , 2012
 Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 824.7 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 825$ MHz; $\sigma = 0.988$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Front EVDO 1013/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 1.22 mW/g

Body Front EVDO 1013/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 26.5 V/m; Power Drift = -0.167 dB
 Peak SAR (extrapolated) = 1.52 W/kg
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.821 mW/g
 Maximum value of SAR (measured) = 1.22 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.09 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1851.25 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top EVDO 25/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.58 mW/g

Body Top EVDO 25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 34.9 V/m; Power Drift = -0.162 dB

Peak SAR (extrapolated) = 2.17 W/kg

SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.716 mW/g

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

Maximum value of SAR (measured) = 1.48 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Oct.10 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
 Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Top QPSK 5MHz 1RB 0 offset 26365ch/Area Scan (71x61x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.895 mW/g

Body Top QPSK 5MHz 1RB 0 offset 26365ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.0 V/m; Power Drift = -0.004 dB

Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.761 mW/g; SAR(10 g) = 0.415 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.851 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE Portable Router with WLAN
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Oct.11 , 2012
Separation Distance: 10 mm

DUT: R772; Type: Bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.91$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.01, 4.01, 4.01); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Body Rear 802.11b 1Mbps 6ch/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.113 mW/g

Body Rear 802.11b 1Mbps 6ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

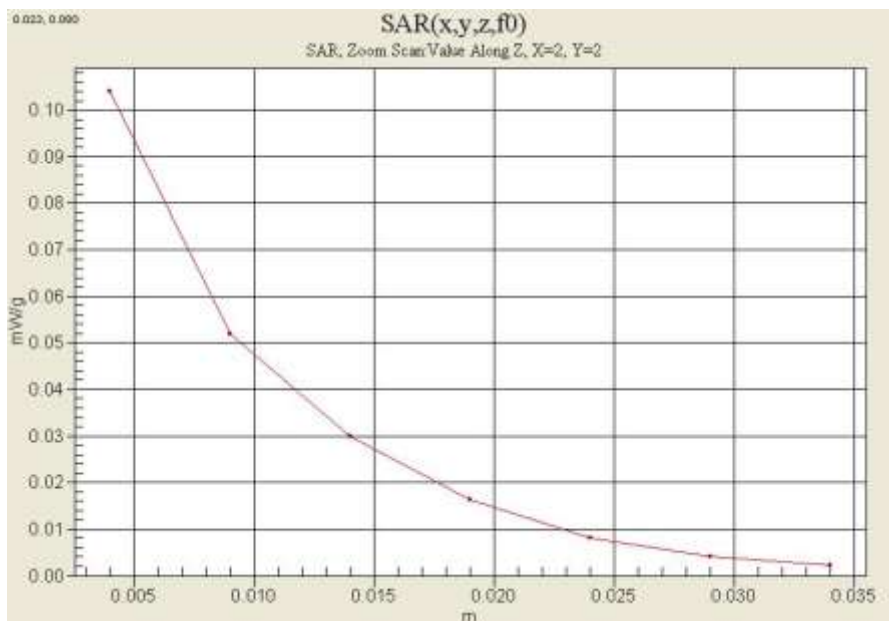
Reference Value = 1.58 V/m; Power Drift = 0.106 dB

Peak SAR (extrapolated) = 0.223 W/kg

SAR(1 g) = 0.102 mW/g; SAR(10 g) = 0.056 mW/g

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

Maximum value of SAR (measured) = 0.104 mW/g



Attachment 2. – Dipole Validation Plots

■ Validation Data (835 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.2 °C

Test Date: Oct. 08 , 2012

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 – SN:441

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.996 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$

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

DASY4 Configuration:

- Probe: ET3DV6 – SN1609; ConvF(6.24, 6.24, 6.24); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Validation 835 MHz/Area Scan (111x61x1): Measurement grid: dx=15mm, dy=15mm

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

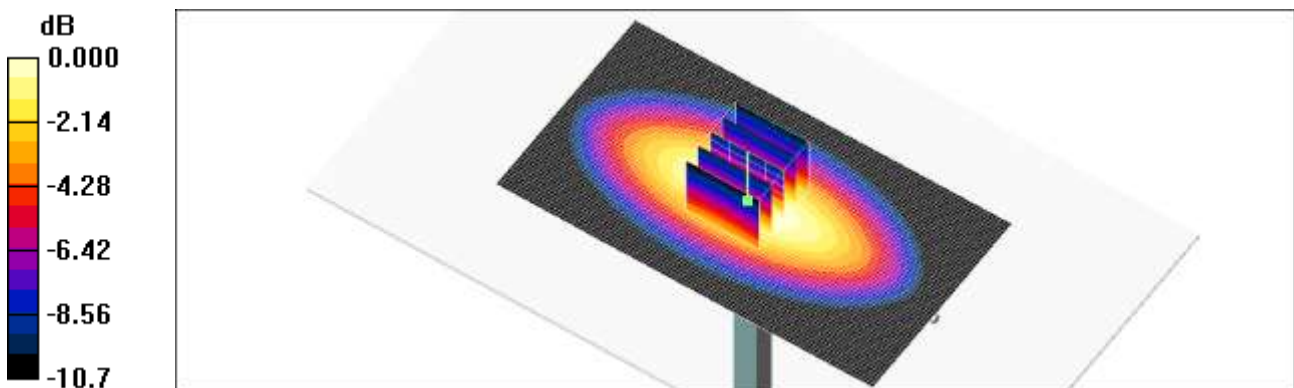
Validation 835 MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 34.2 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 1.44 W/kg

SAR(1 g) = 0.993 mW/g; SAR(10 g) = 0.646 mW/g

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



0 dB = 1.08mW/g

■ Validation Data (1900 MHz Body)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.1 °C
Test Date: Oct. 09 , 2012

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

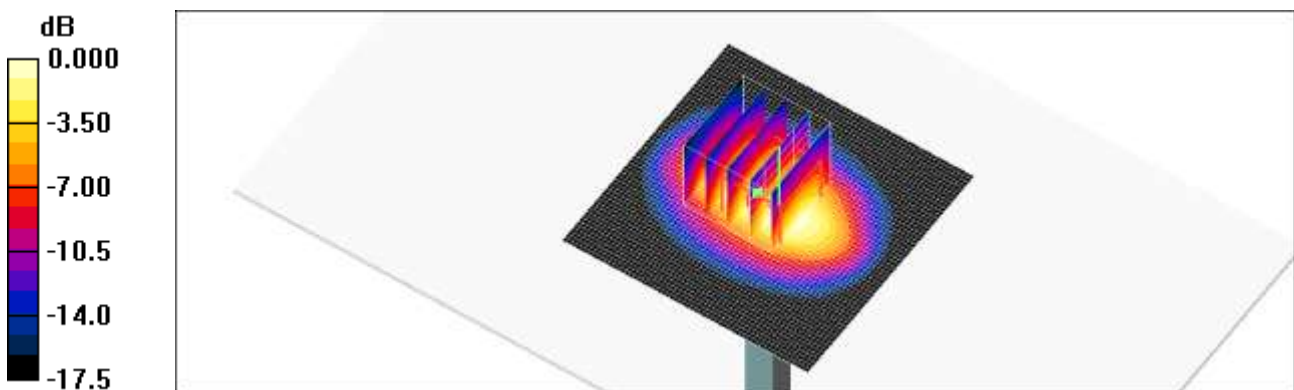
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1900$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 – SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

Validation1900 MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.88 mW/g

Validation1900 MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 59.1 V/m; Power Drift = -0.026 dB
Peak SAR (extrapolated) = 6.63 W/kg
SAR(1 g) = 4.16 mW/g; SAR(10 g) = 2.27 mW/g
Maximum value of SAR (measured) = 4.66 mW/g



0 dB = 4.66mW/g

■ Validation Data (LTE 25 Body)

Test Laboratory: HCT CO., LTD
Input Power: 100 mW (20 dBm)
Liquid Temp: 21.2 °C
Test Date: Oct. 10 , 2012

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

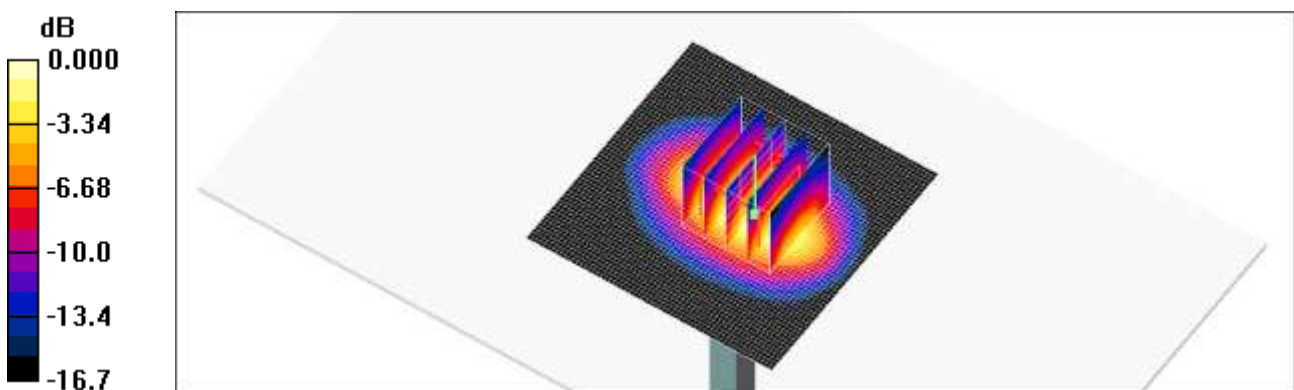
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.55 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 – SN1609; ConvF(4.55, 4.55, 4.55); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

Validation1900 MHz/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 4.81 mW/g

Validation1900 MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 56.0 V/m; Power Drift = -0.033 dB
Peak SAR (extrapolated) = 6.17 W/kg
SAR(1 g) = 3.88 mW/g; SAR(10 g) = 2.12 mW/g
Maximum value of SAR (measured) = 4.34 mW/g



0 dB = 4.34mW/g

Validation Data (2450 Body)

Test Laboratory: HCT CO., LTD
Input Power: 100 mW (20 dBm)
Liquid Temp: 21.1 °C
Test Date: Oct. 11 , 2012

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

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

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.93$ 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 – SN1609; ConvF(4.01, 4.01, 4.01); Calibrated: 2012-03-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn912; Calibrated: 2011-11-17
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

Validation 2450MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 6.24 mW/g

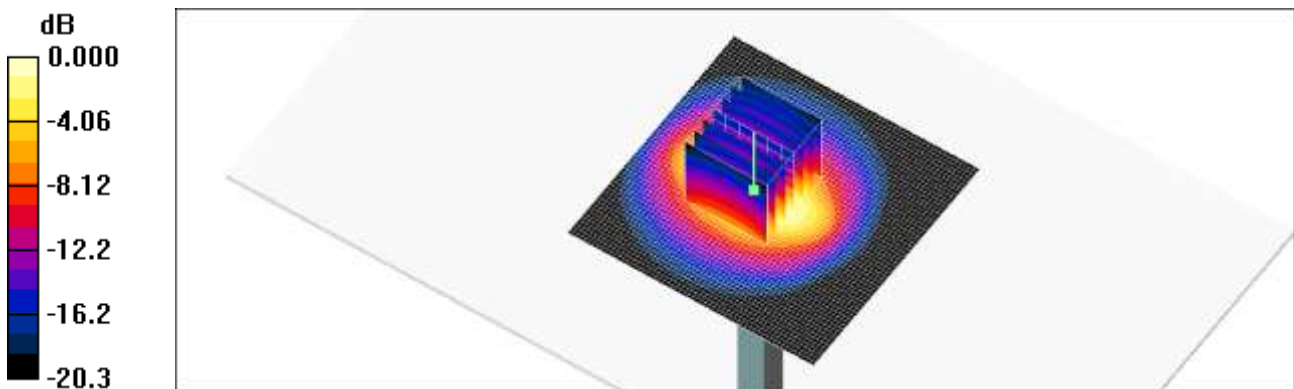
Validation 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.4 V/m; Power Drift = -0.019 dB

Peak SAR (extrapolated) = 13.0 W/kg

SAR(1 g) = 5.2 mW/g; SAR(10 g) = 2.47 mW/g

Maximum value of SAR (measured) = 5.61 mW/g



0 dB = 5.61mW/g

■ Dielectric Parameter (835 MHz Body)

Title R772
SubTitle BC10 / CDMA835(Body)
Test Date Oct. 08 , 2012

Frequency	e'	e''
800000000.0000	53.4553	21.7755
805000000.0000	53.4351	21.7236
810000000.0000	53.4152	21.6549
815000000.0000	53.3647	21.6255
820000000.0000	53.3781	21.5683
825000000.0000	53.3275	21.5340
830000000.0000	53.3011	21.5026
835000000.0000	53.2910	21.4379
840000000.0000	53.2451	21.4249
845000000.0000	53.2082	21.4034
850000000.0000	53.1796	21.4171
855000000.0000	53.1200	21.3879
860000000.0000	53.0690	21.3936
865000000.0000	53.0231	21.4244
870000000.0000	52.9942	21.4112
875000000.0000	52.9275	21.4655
880000000.0000	52.8876	21.4458
885000000.0000	52.9252	21.4604
890000000.0000	52.9087	21.4424
895000000.0000	52.8833	21.3858
900000000.0000	52.8677	21.3938

■ Dielectric Parameter (1900 MHz Body)

Title R772
SubTitle PCS1900 (Body)
Test Date Oct. 09 , 2012

Frequency	e'	e''
1850000000.0000	52.0668	14.5036
1855000000.0000	52.0611	14.5211
1860000000.0000	52.0384	14.5317
1865000000.0000	52.0308	14.5525
1870000000.0000	52.0088	14.5626
1875000000.0000	52.0054	14.5466
1880000000.0000	51.9916	14.5616
1885000000.0000	51.9807	14.5727
1890000000.0000	51.9702	14.5835
1895000000.0000	51.9489	14.5865
1900000000.0000	51.9290	14.6036
1905000000.0000	51.9220	14.6183
1910000000.0000	51.8975	14.6151
1915000000.0000	51.8906	14.6262
1920000000.0000	51.8642	14.6345
1925000000.0000	51.8479	14.6682
1930000000.0000	51.8315	14.6663
1935000000.0000	51.8417	14.6655
1940000000.0000	51.8198	14.6806
1945000000.0000	51.7896	14.7005
1950000000.0000	51.7894	14.7077

■ Dielectric Parameter (LTE Band 25 Body)

Title R772
SubTitle LTE Band 25 (Body)
Test Date Oct. 10 , 2012

Frequency	e'	e''
1850000000.0000	52.2484	14.5553
1855000000.0000	52.2416	14.5662
1860000000.0000	52.2362	14.5832
1865000000.0000	52.2387	14.6052
1870000000.0000	52.2266	14.6165
1875000000.0000	52.2287	14.6316
1880000000.0000	52.2203	14.6223
1885000000.0000	52.2193	14.6344
1890000000.0000	52.1961	14.6471
1895000000.0000	52.1608	14.6538
1900000000.0000	52.1303	14.6578
1905000000.0000	52.0739	14.6602
1910000000.0000	52.0007	14.6398
1915000000.0000	51.9453	14.6420
1920000000.0000	51.8407	14.6132
1925000000.0000	51.8320	14.6357
1930000000.0000	51.9309	14.6954
1935000000.0000	52.0466	14.7385
1940000000.0000	52.1068	14.7597
1945000000.0000	52.1013	14.7742
1950000000.0000	52.1074	14.7958

■ Dielectric Parameter (2 450 MHz Body)

Title R772
SubTitle 2 450 MHz (Body)
Test Date Oct. 11 , 2012

Frequency	e'	e''
2400000000.0000	54.6012	13.9291
2405000000.0000	54.5930	13.9361
2410000000.0000	54.5675	13.9507
2415000000.0000	54.5466	13.9712
2420000000.0000	54.5204	13.9992
2425000000.0000	54.5082	14.0284
2430000000.0000	54.5028	14.0242
2435000000.0000	54.4585	14.0498
2440000000.0000	54.4391	14.0814
2445000000.0000	54.4228	14.1091
2450000000.0000	54.4143	14.1422
2455000000.0000	54.3970	14.1395
2460000000.0000	54.3705	14.1821
2465000000.0000	54.3437	14.2010
2470000000.0000	54.3336	14.2372
2475000000.0000	54.3178	14.2576
2480000000.0000	54.3099	14.2832
2485000000.0000	54.2948	14.2947
2490000000.0000	54.2755	14.3002
2495000000.0000	54.2576	14.3406
2500000000.0000	54.2457	14.3564

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: ET3-1609_Mar12

CALIBRATION CERTIFICATE

Object: ET3DV6 - SN:1609

Calibration procedure(s): QA CAL-01.v8, QA CAL-12.v7, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: March 19, 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&E critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: SS054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: SS086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: SS129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
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

Calibrated by:	Name	Function	Signature
	Jefon Kastrali	Laboratory Technician	
Approved by:	Name	Function	Signature
	Katja Pokorec	Technical Manager	
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Issued: March 19, 2012			

Certificate No: ET3-1609_Mar12

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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 β	β rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\beta = 0$ 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 $\beta = 0$ ($f \leq 900$ 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:1609

March 19, 2012

Probe ET3DV6

SN:1609

Manufactured: July 27, 2001
Calibrated: March 19, 2012

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

ET3DV6- SN:1609

March 19, 2012

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1609

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V/m})^{\frac{1}{2}}$) ^A	2.01	1.81	1.82	$\pm 10.1 \%$
DCP (mV) ^B	97.7	97.4	98.1	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^C (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	112.2	$\pm 2.2 \%$
			Y	0.00	0.00	1.00	107.9	
			Z	0.00	0.00	1.00	109.9	

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.

^C 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:1609

March 19, 2012

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1609

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^c	Relative Permittivity ^d	Conductivity (S/m) ^d	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
450	43.5	0.87	7.32	7.32	7.32	0.21	2.26	± 13.4 %
750	41.9	0.89	6.68	6.68	6.68	0.39	2.46	± 12.0 %
835	41.5	0.90	6.36	6.36	6.36	0.32	2.79	± 12.0 %
900	41.5	0.97	6.25	6.25	6.25	0.33	3.00	± 12.0 %
1450	40.5	1.20	5.46	5.48	5.48	0.44	3.00	± 12.0 %
1750	40.1	1.37	5.50	5.50	5.50	0.74	2.42	± 12.0 %
1900	40.0	1.40	5.26	5.26	5.26	0.80	2.18	± 12.0 %
1950	40.0	1.40	5.04	5.04	5.04	0.80	2.09	± 12.0 %
2450	39.2	1.80	4.52	4.52	4.52	0.80	1.90	± 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.

^d 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:1609

March 19, 2012

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1609

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^c	Relative Permittivity ^d	Conductivity (S/m) ^e	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
450	56.7	0.94	7.73	7.73	7.73	0.15	2.32	± 13.4 %
750	55.5	0.96	6.38	6.38	6.38	0.29	3.00	± 12.0 %
835	55.2	0.97	6.24	6.24	6.24	0.39	2.51	± 12.0 %
1750	53.4	1.49	4.80	4.80	4.80	0.80	2.57	± 12.0 %
1900	53.3	1.52	4.55	4.55	4.55	0.80	2.50	± 12.0 %
2450	52.7	1.95	4.01	4.01	4.01	0.70	1.23	± 12.0 %

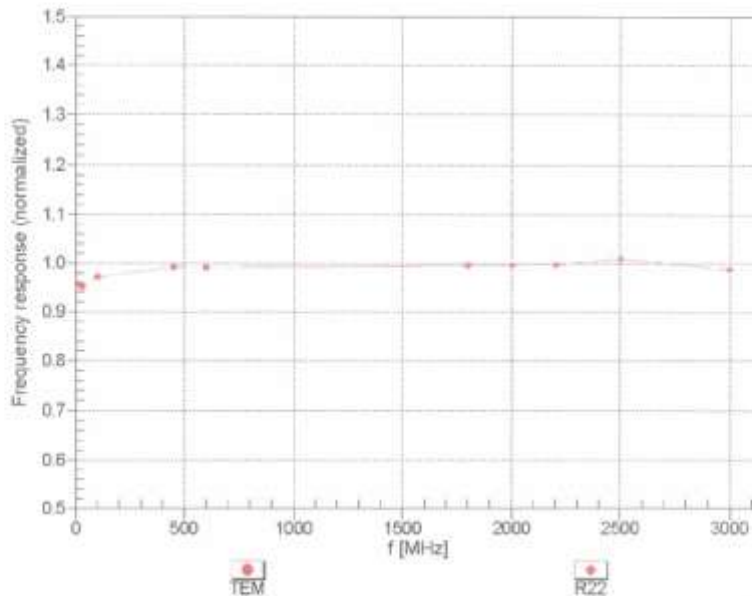
^c Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^d 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:1609

March 19, 2012

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

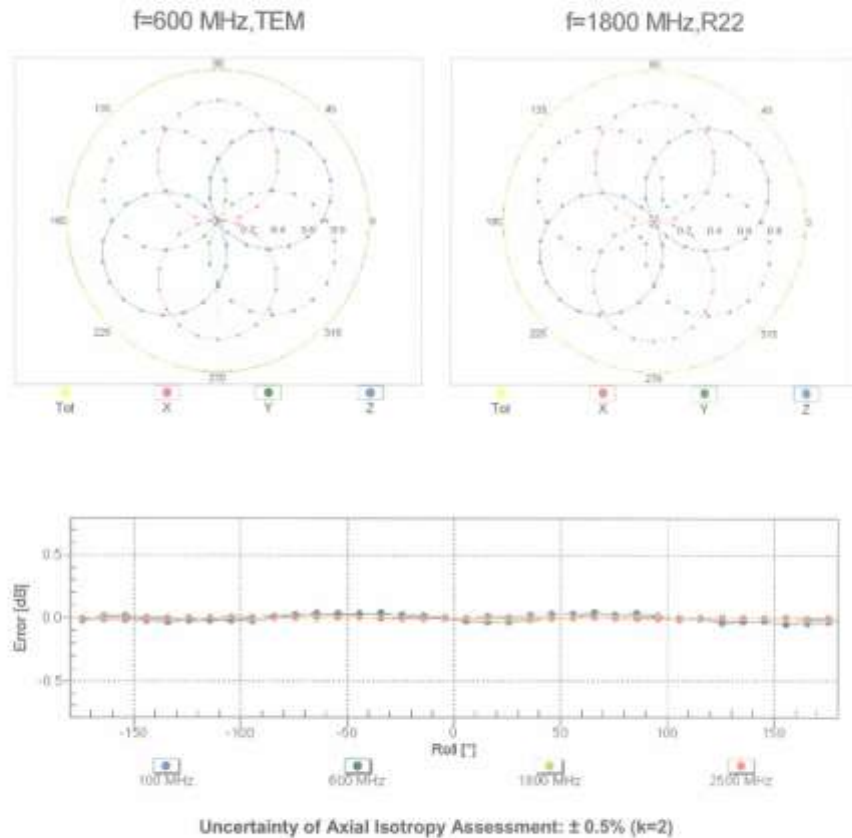


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

ET3DV6-SN:1609

March 19, 2012

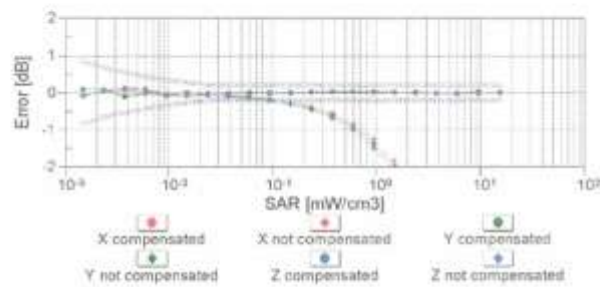
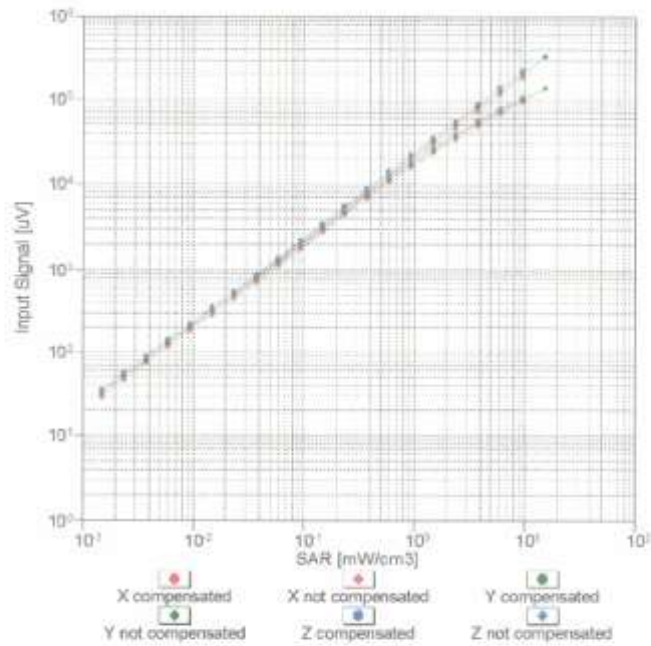
Receiving Pattern (ϕ), $\theta = 0^\circ$



ET3DV6- SN:1809

March 19, 2012

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

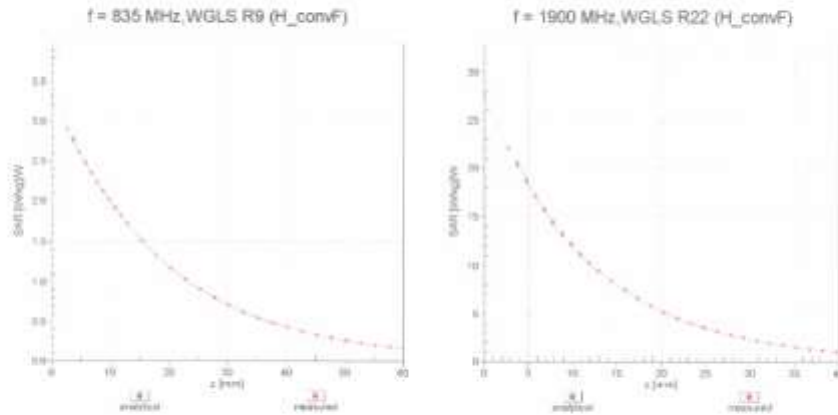


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

ET3DV6-SN:1609

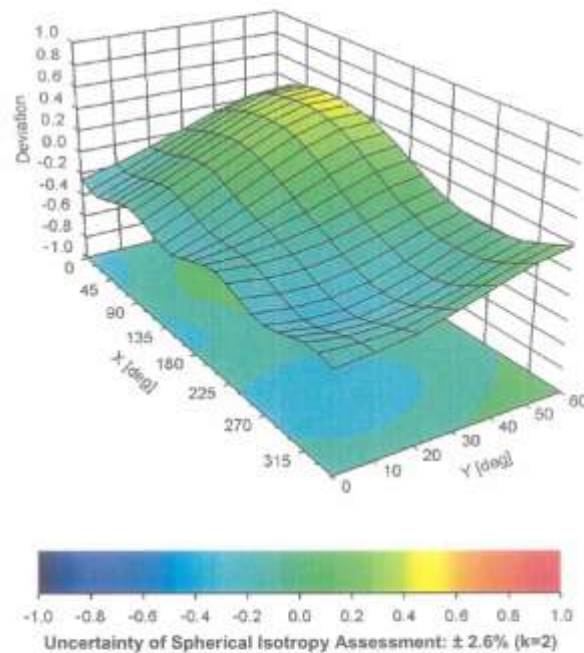
March 19, 2012

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ , θ), $f = 900 \text{ MHz}$



ET3DV6- SN:1609

March 19, 2012

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1609

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
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

Attachment 4. – Dipole Calibration Data

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Client **HCT (Dymstec)**

Certificate No: D835V2-441_May12

CALIBRATION CERTIFICATE

Object: D835V2 - SN: 441

Calibration procedure(s): QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: May 16, 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 EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41082317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

Calibrated by: Name: Israa El-Naouq Function: Laboratory Technician Signature:

Approved by: Katja Pokovic Technical Manager Signature:

Issued: May 16, 2012

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Certificate No: D835V2-441_May12

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

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
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	40.6 $\pm$ 6 %	0.89 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.35 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.43 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.54 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.18 mW / g $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	54.3 $\pm$ 6 %	1.00 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.44 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	9.50 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.60 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	6.27 mW / g $\pm$ 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.1 Ω - 5.8 j Ω
Return Loss	- 24.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.0 Ω - 8.1 j Ω
Return Loss	- 21.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.372 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 09, 2001

DASY5 Validation Report for Head TSL

Date: 16.05.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 441

Communication System: CW; Frequency: 835 MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm 2/Zoom Scan (7x7x7)/Cube 0:

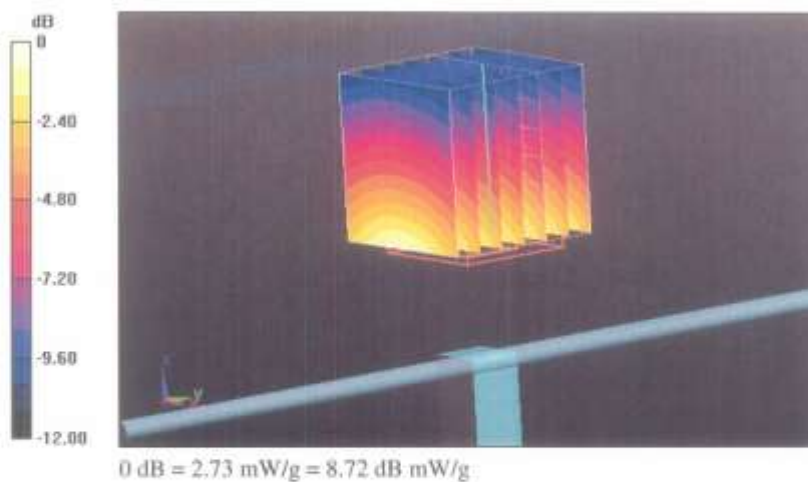
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.129 V/m; Power Drift = 0.00 dB

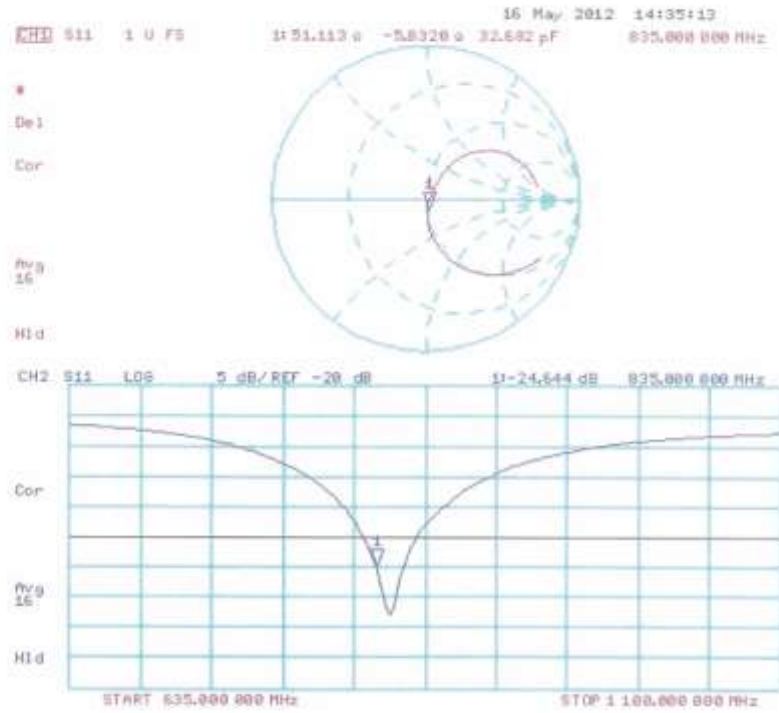
Peak SAR (extrapolated) = 3.474 mW/g

SAR(1 g) = 2.35 mW/g; SAR(10 g) = 1.54 mW/g

Maximum value of SAR (measured) = 2.73 mW/g



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 16.05.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 441

Communication System: CW; Frequency: 835 MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

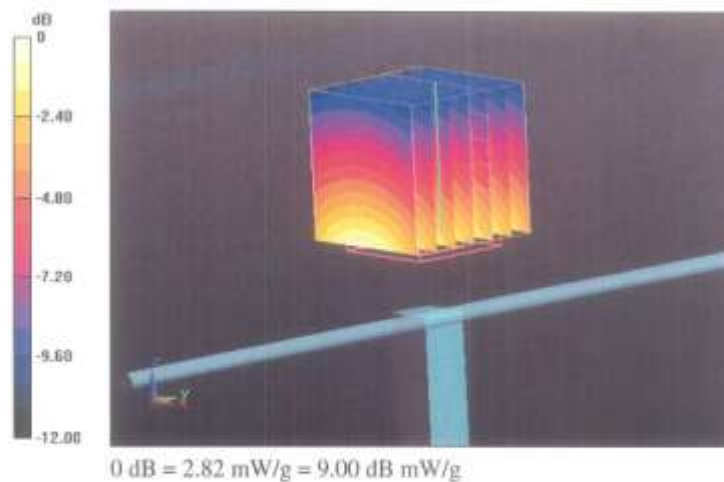
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.054 V/m; Power Drift = 0.03 dB

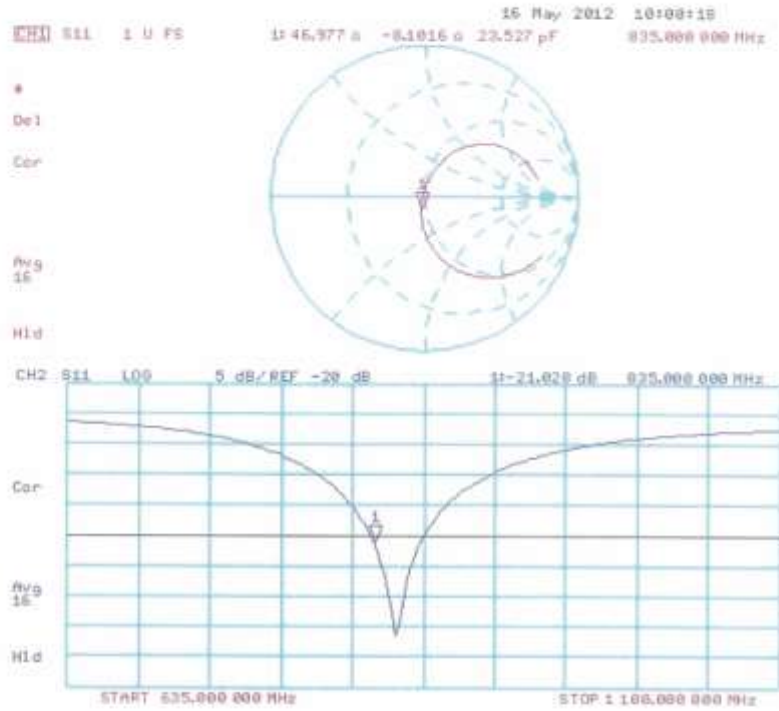
Peak SAR (extrapolated) = 3.533 mW/g

SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.6 mW/g

Maximum value of SAR (measured) = 2.82 mW/g



Impedance Measurement Plot for Body TSL



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Client HCT (Dymstec)

Certificate No: D1900V2-5d032_Jul12

CALIBRATION CERTIFICATE

Object D1900V2 - SN: 5d032

Calibration procedure(s) QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: July 20, 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 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&E critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	G837480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292793	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 001	27-Jun-12 (No. DAE4-001_Jun12)	Jun-13
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41082317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
HP generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

Calibrated by: Name Dimce Iliev Function Laboratory Technician

Approved by: Katja Pokovic Technical Manager

Signature

Issued: July 20, 2012

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: D1900V2-5d032_Jul12

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Zeughausstrasse 43, 8004 Zurich, Switzerland



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Accreditation No.: **SCS 108**

Glossary:

TSL tissue simulating liquid
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

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
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	39.9 $\pm$ 6 %	1.38 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	—	—

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.68 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	39.0 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.11 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	20.5 mW / g $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	52.6 $\pm$ 6 %	1.52 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	—	—

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.0 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	39.9 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.30 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	21.2 mW / g $\pm$ 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$50.0 \Omega + 3.1 j\Omega$
Return Loss	- 30.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$46.2 \Omega + 3.7 j\Omega$
Return Loss	- 25.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.194 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 17, 2003

DASY5 Validation Report for Head TSL

Date: 20.07.2012

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 39.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

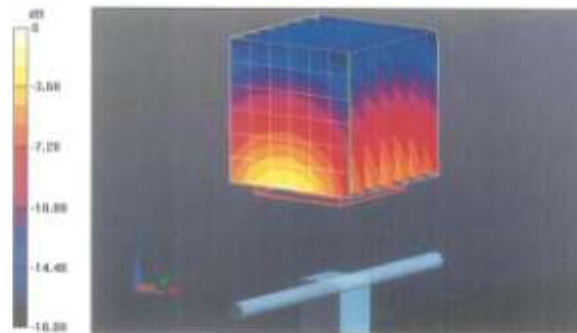
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.864 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 17.209 mW/g

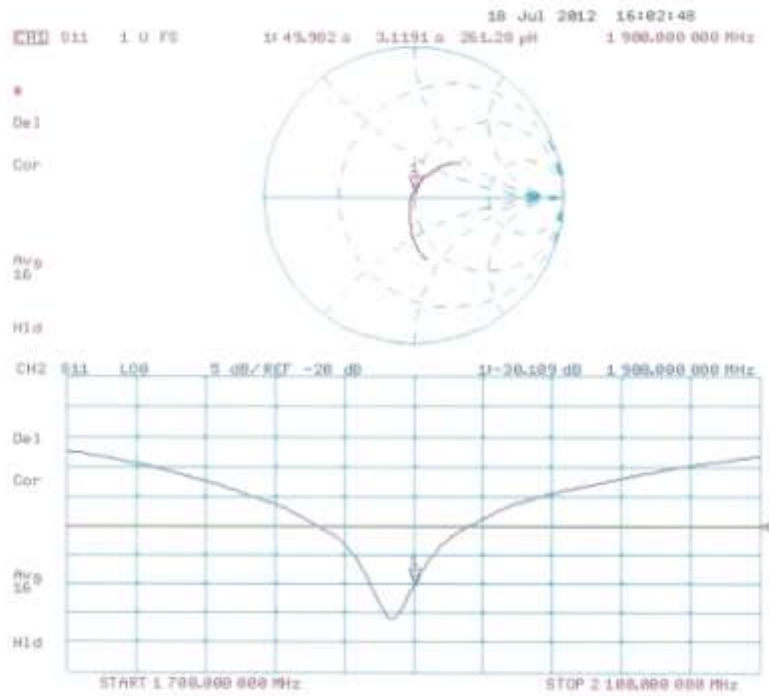
SAR(1 g) = 9.68 mW/g; SAR(10 g) = 5.11 mW/g

Maximum value of SAR (measured) = 12.1 mW/g



0 dB = 12.1 mW/g = 21.66 dB mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 20.07.2012

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

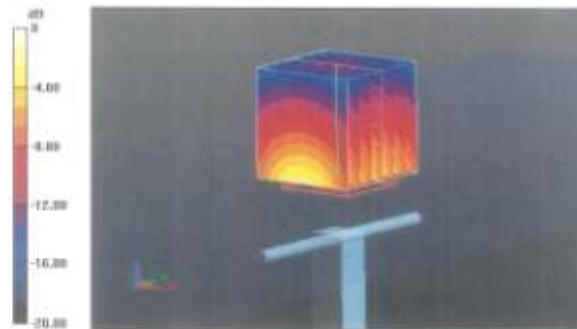
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.470 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 17.332 mW/g

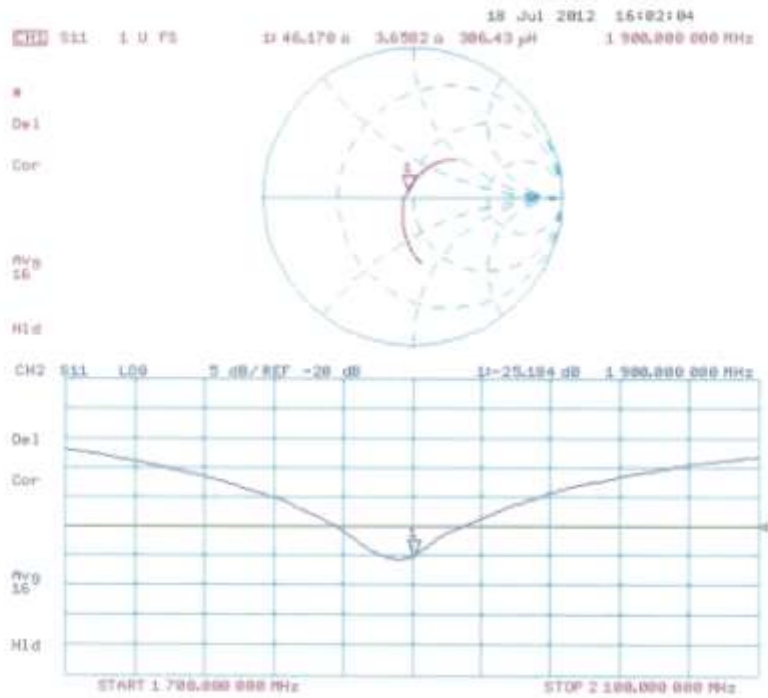
SAR(1 g) = 10 mW/g; SAR(10 g) = 5.3 mW/g

Maximum value of SAR (measured) = 12.6 mW/g



0 dB = 12.6 mW/g = 22.01 dB mW/g

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client HCT (Dymstec)

Certificate No: D2450V2-743_Aug12

CALIBRATION CERTIFICATE

Object D2450V2 - SN: 743

Calibration procedure(s) QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: August 23, 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 ± 3 °C and humidity < 70%.

Calibration Equipment used (M&T critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5056 (20K)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	27-Jun-12 (No. DAE4-601_Jun12)	Jun-13
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4205	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

Calibrated by: Name Israe El-Nasouq
Funktioh Laboratory Technician

Approved by: Katja Pokovic Technical Manager

Signature
Israe El-Nasouq
Katja Pokovic

Issued: August 23, 2012

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Accreditation No.: SCS 108

Glossary:

TSL tissue simulating liquid
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

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
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

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%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	39.2 $\pm$ 6 %	1.81 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	52.7 mW / g $\pm$ 17.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.18 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	24.7 mW / g $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	51.3 $\pm$ 6 %	1.99 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	---	---

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.0 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	51.2 mW / g $\pm$ 17.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.10 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	24.2 mW / g $\pm$ 16.5 % (k=2)

Appendix**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	$54.0 \Omega + 4.7 j\Omega$
Return Loss	-24.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	$50.9 \Omega + 6.5 j\Omega$
Return Loss	-23.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.158 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 01, 2003

DASY5 Validation Report for Head TSL

Date: 23.08.2012

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.81$ mho/m; $\epsilon_r = 39.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

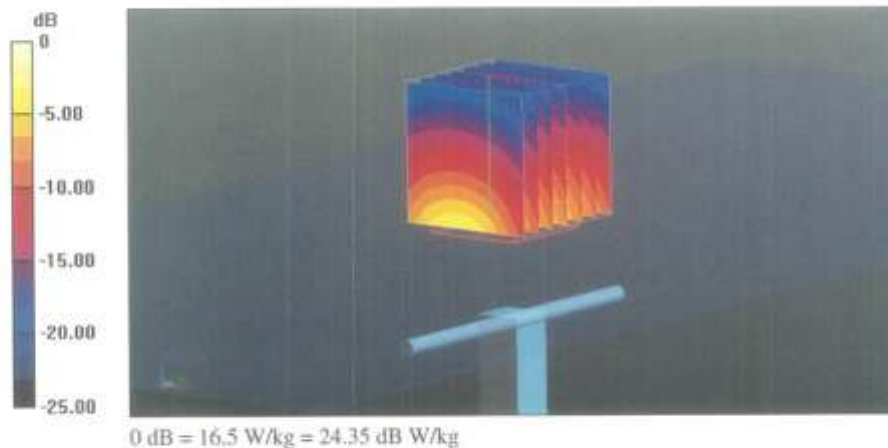
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 98.554 V/m; Power Drift = 0.01 dB

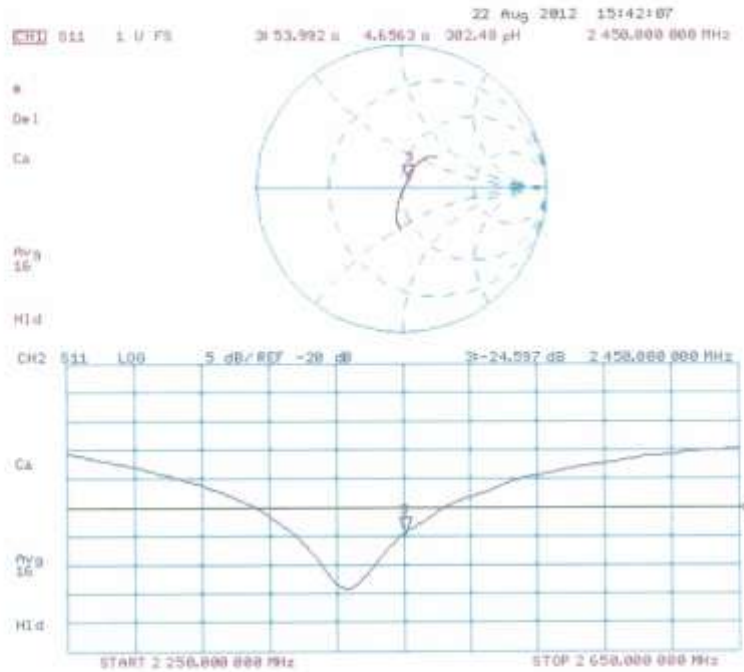
Peak SAR (extrapolated) = 26.584 mW/g

SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.18 mW/g

Maximum value of SAR (measured) = 16.5 W/kg



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 22.08.2012

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.99$ mho/m; $\epsilon_r = 51.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

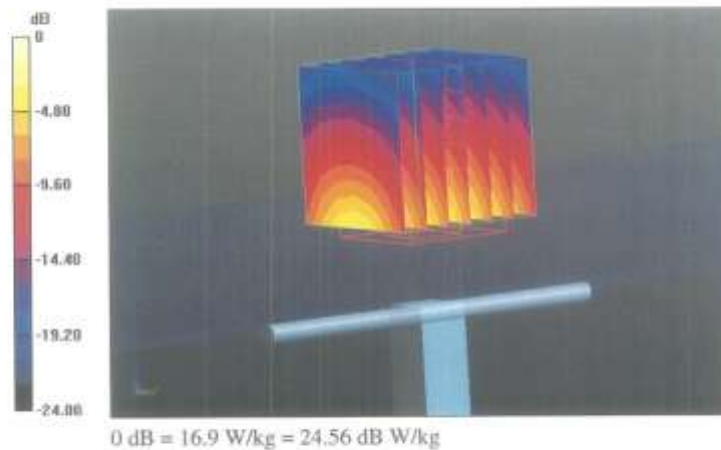
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.699 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 26.489 mW/g

SAR(1 g) = 13 mW/g; SAR(10 g) = 6.1 mW/g

Maximum value of SAR (measured) = 16.9 W/kg



Impedance Measurement Plot for Body TSL

