



SAR TEST REPORT

HCT CO., LTD

EUT Type:	Cellular/PCS CDMA & LTE USB Dongle with WLAN		
FCC ID:	RB2-U772		
Model:	U772	Trade Name	Franklin Wireless Corp
Date of Issue:	Aug.16 , 2012		
Test report No.:	HCTA1208FS03		
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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	<div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <hr style="width: 100%;"/> Report prepared by : Young-Soo Jang Test Engineer of SAR Part </div> <div style="text-align: center;">  <hr style="width: 100%;"/> Approved by : Jae-Sang So Manager of SAR Part </div> </div>		

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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).

where:

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

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

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

2. DESCRIPTION OF DEVICE

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

EUT Type	Cellular/PCS CDMA & LTE USB Dongle with WLAN		
FCC ID	RB2-U772	Model(s)	U772
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)		
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)		
FCC Classification	PCS Licensed Transmitter (PCB)		
Production Unit	Prototype		
Max SAR	Band	1g SAR (W/kg)	
		Body SAR	
	BC10	1.32	
	CDMA835	1.32	
	PCS1900	1.38	
	LTE Band 25	1.14	
Date(s) of Tests	Jul.30, 2012 ~ Aug. 14, 2012		
Antenna Type	Integral Antenna		
EVDO	Rev.0, A		
Key Feature(s)	<ul style="list-style-type: none"> - . WiFi is not operated when connected to a computer's USB port. - . WiFi is operated when connected to the USB port of the AC USB adapter. - . Please see section 10. note. - . This is a USB Dongle. Therefore, there is no voice transmission. <p>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</p>		

2.1 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	<p>This model has two Transmitter</p> <ul style="list-style-type: none"> - Ant.1: BC0, BC1, BC10, and LTE . It can not transmit simultaneously. - Ant.2: WiFi. It can transmit simultaneously with Ant.1 when the USB dongle is connected to the AC Adaptor 	
LTE voice/data requirements	Data Only	
Identify if MPR is optional or mandatory	<p>The EUT incorporates MPR as per 3GPP TS36.101.</p> <p>The MPR is permanently built-in by design as a mandatory.</p> <p>A-MPR is not implemented.</p> <p>During SAR testing, A-MPR was disabled by setting NS=01 on the R&S CMW500.</p>	
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	<p>BC0, BC1, BC10 and LTE Band 25 WiFi 2.4 GHz</p> <p>2.4GHz WiFi is only operated as a Access Point when connected to the AC Adaptor.</p> <p>Therefore, 2.4GHz WiFi SAR test is not required.</p>	
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.	<p>LTE SAR Testing was performed using a CMW500.</p> <p>UE transmits with maximum output power during SAR testing.</p>	

3. DESCRIPTION OF TEST EQUIPMENT

3.1 SAR MEASUREMENT SETUP

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

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

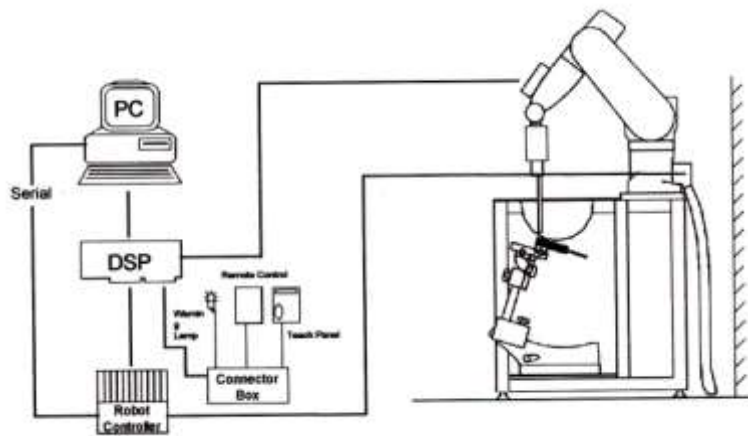


Figure 3.1 HCT SAR Lab. Test Measurement Set-up

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

3.2 DASY E-FIELD PROBE SYSTEM

3.2.1 ET3DV6 Probe Specification

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection System Built-in shielding against static charges
Calibration	In air from 10 MHz to 2.5 GHz In brain and muscle simulating tissue at Frequencies of 450 MHz, 900 MHz and 1.8 GHz (accuracy: 8 %)
Frequency	10 MHz to > 3 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity	± 0.2 dB in brain tissue (rotation around probe axis) ± 0.4 dB in brain tissue (rotation normal probe axis)
Dynamic	5 μ W/g to > 100 mW/g;
Range Linearity:	± 0.2 dB
Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces.
Dimensions	Overall length: 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 3.2 Photograph of the probe and the Phantom

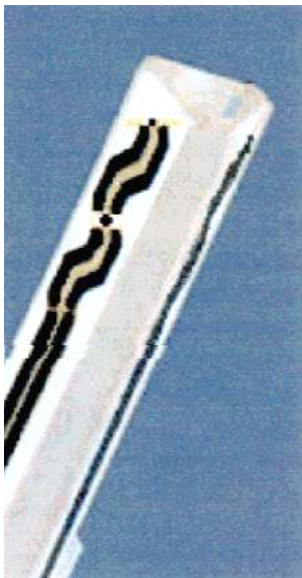


Figure 3.3 ET3DV6 E-field Probe

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

3.3 PROBE CALIBRATION PROCESS

3.3.1 E-Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with an accuracy better than ± 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 bellow 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 ΔT/ Δt, the initial rate of tissue heating, before thermal diffusion takes place. Now it's possible to quantify the electric field in the simulated tissue by equating the thermally derived SAR to the E- field;

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

where:

- σ = simulated tissue conductivity,
- ρ = Tissue density (1.25 g/cm³ for brain tissue)

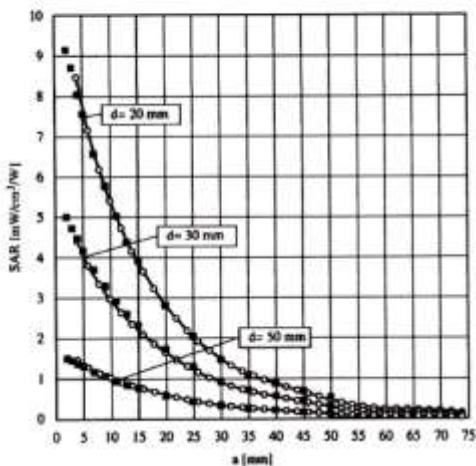


Figure 3.4 E-Field and Temperature measurements at 900 MHz

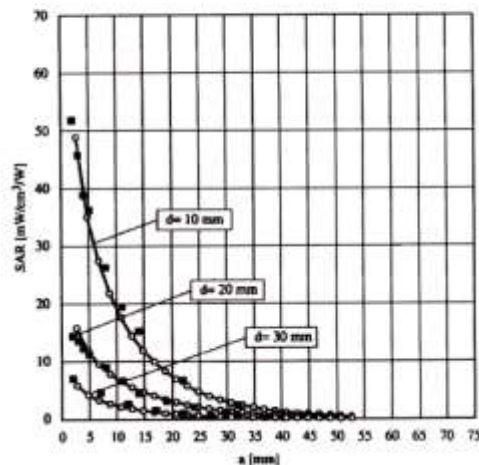


Figure 3.5 E-Field and temperature measurements at 1.8 GHz

3.3.2 Data Extrapolation

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

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

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

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

E-field probes:

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

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

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

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

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

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

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

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

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

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

3.4 SAM Phantom

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.



Figure 3.6 SAM Phantom

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

3.5 Device Holder for Transmitters

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



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

Figure 3.7 Device Holder

3.6 Brain & Muscle Simulating Mixture Characterization

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

Ingredients (% by weight)	Frequency (MHz)										
	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 3.1 Composition of the Tissue Equivalent Matter

3.7 SAR TEST EQUIPMENT

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
Staubli	Robot RX90L	F01/5K09A1/A/01	N/A	N/A	N/A
Staubli	Robot ControllerCS7MB	F99/5A82A1/C/01	N/A	N/A	N/A
HP	Pavilion t000_puffer	KRJ51201TV	N/A	N/A	N/A
SPEAG	Light Alignment Sensor	265	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D221340.01	N/A	N/A	N/A
SPEAG	DAE4	869	Sep. 22, 2011	Annual	Sep. 22, 2012
SPEAG	E-Field Probe ET3DV6	1605	Apr. 26, 2012	Annual	Apr. 26, 2013
SPEAG	Validation Dipole D835V2	441	May. 16, 2012	Annual	May 16, 2013
SPEAG	Validation Dipole D1900V2	5d032	July 20, 2012	Annual	July 20, 2013
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	16072	Nov. 04, 2011	Annual	Nov. 04, 2012
Agilent	Base Station E5515C	GB44400269	Feb. 10, 2012	Annual	Feb. 10, 2013
HP	Signal Generator E4438C	MY42082646	Nov. 11, 2011	Annual	Nov. 11, 2012
HP	Network Analyzer 8753ES	JP39240221	Apr. 3, 2012	Annual	Apr. 3, 2013
R&S	Base Station CMW500	1201.0002K50_116858	Jan. 17,2012	Annual	Jan. 17,2013

NOTE:

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

4. SAR MEASUREMENT PROCEDURE

The evaluation was performed with the following procedure:

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

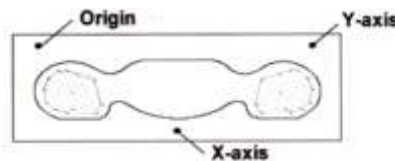


Figure 4.1 SAR Measurement Point in Area Scan

5. DESCRIPTION OF TEST POSITION

The device is a USB Dongle for Body SAR. In all cases SAR measurements are performed to investigate the worst-case positioning. Worstcase positioning is documented and used to perform Body SAR testing.

5.1 Body Test Configurations

According to KDB 447498, the device that can be connected to a host through a cable must be tested with the device positioned in all applicable orientations against the flat phantom. And a separation distance ≤ 0.5 cm is required for USB-dongle transmitters.

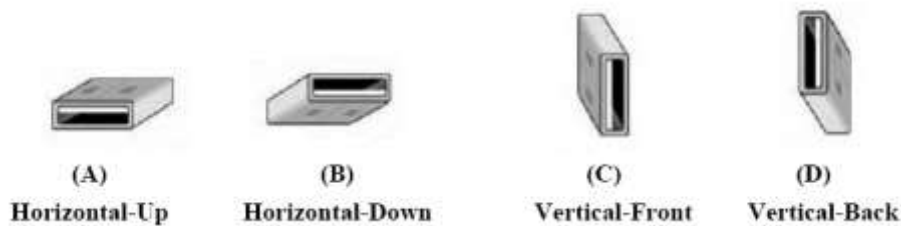


Figure 5.1 USB Connector Orientations Implemented on Laptop Computers

Therefore, the EUT was tested in following orientations;

- 1) Configuration 1:** Front side of the EUT was tested with the **direct-connection** to the host device with **Horizontal-Up (A)**, and separation distance between EUT and Phantom is 5 mm.
- 2) Configuration 2:** Back side of the EUT was connected to the host device with **Horizontal-Down (B)** using a **USB cable**, and separation distance between EUT and Phantom is 5 mm.
- 3) Configuration 3:** Right side of the EUT was connected to the host device with **Vertical-Front (C)** using a **USB cable**, and separation distance between EUT and Phantom is 5 mm.
- 4) Configuration 4:** Left side of the EUT was tested with the **direct-connection** to the host device with **Vertical-Back (D)**, and separation distance between EUT and Phantom is 5 mm.
- 5) Configuration 5:** **Top** side of the EUT was tested with the **direct-connection** to the host device, and separation distance between EUT and Phantom is 5 mm.

Note;

This USB cable was used to operate this unit in the highest RF performance capability for SAR testing.

6. MEASUREMENT UNCERTAINTY

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

Table 6.1 Uncertainty (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	Jul.30 , 2012	Body	21.3	ϵ_r	55.2	54.5	- 1.27	± 5
				σ	0.97	1.01	+ 4.12	± 5
1900 MHz	Aug.1 , 2012	Body	21.3	ϵ_r	53.3	51.8	- 2.81	± 5
				σ	1.52	1.52	0.00	± 5
LTE Band 25	Aug.8 , 2012	Body	21.3	ϵ_r	53.3	51.8	- 2.81	± 5
				σ	1.52	1.52	0.00	± 5

The dielectronic parameters of the liquids 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	Jul.30 , 2012	Body	21.3	9.50	0.966	9.66	+ 1.68	± 10
1900		5d032	Aug.1 , 2012	Body	21.3	39.9	4.05	40.5	+ 1.50	± 10
LTE 25		5d032	Aug.8 , 2012	Body	21.3	39.9	3.86	38.6	- 3.26	± 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-U772

Target Power : 23.5 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	23.66	23.59	23.56	23.56	23.62	23.62	23.80	23.79	23.70
	580	23.67	23.67	23.65	23.71	23.72	23.70	23.83	23.77	23.65
	684	23.98	23.93	24.00	23.99	23.97	23.92	24.00	23.95	23.90
CDMA	1013	23.80	23.85	23.85	23.86	23.88	23.67	24.00	23.56	23.59
	384	23.60	23.58	23.57	23.56	23.67	23.56	23.83	23.77	23.69
	777	23.51	23.53	23.52	23.54	23.59	23.61	23.63	23.49	23.52
PCS	25	23.71	23.52	23.71	23.51	23.51	23.63	23.84	23.65	23.71
	600	23.74	23.72	23.72	23.62	23.66	23.79	24.00	23.73	23.71
	1175	23.79	23.68	23.62	23.57	23.57	23.76	23.82	23.68	23.65

CDMA Average Conducted output powers (dBm)

9.4 LTE

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

The RB2-U772 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	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
..					
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	22.27	0	0.09
				1	24	22.36	0	0.00
				12	6	21.48	1	0.88
				25	0	21.39	1	0.97
			16QAM	1	0	21.19	1	1.17
				1	24	21.26	1	1.10
				12	6	20.45	2	1.91
				25	0	20.37	2	1.99

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	22.71	0	0.14
				1	24	22.85	0	0.00
				12	6	21.64	1	1.21
				25	0	21.55	1	1.30
			16QAM	1	0	21.50	1	1.35
				1	24	21.57	1	1.28
				12	6	20.62	2	2.23
				25	0	20.55	2	2.30

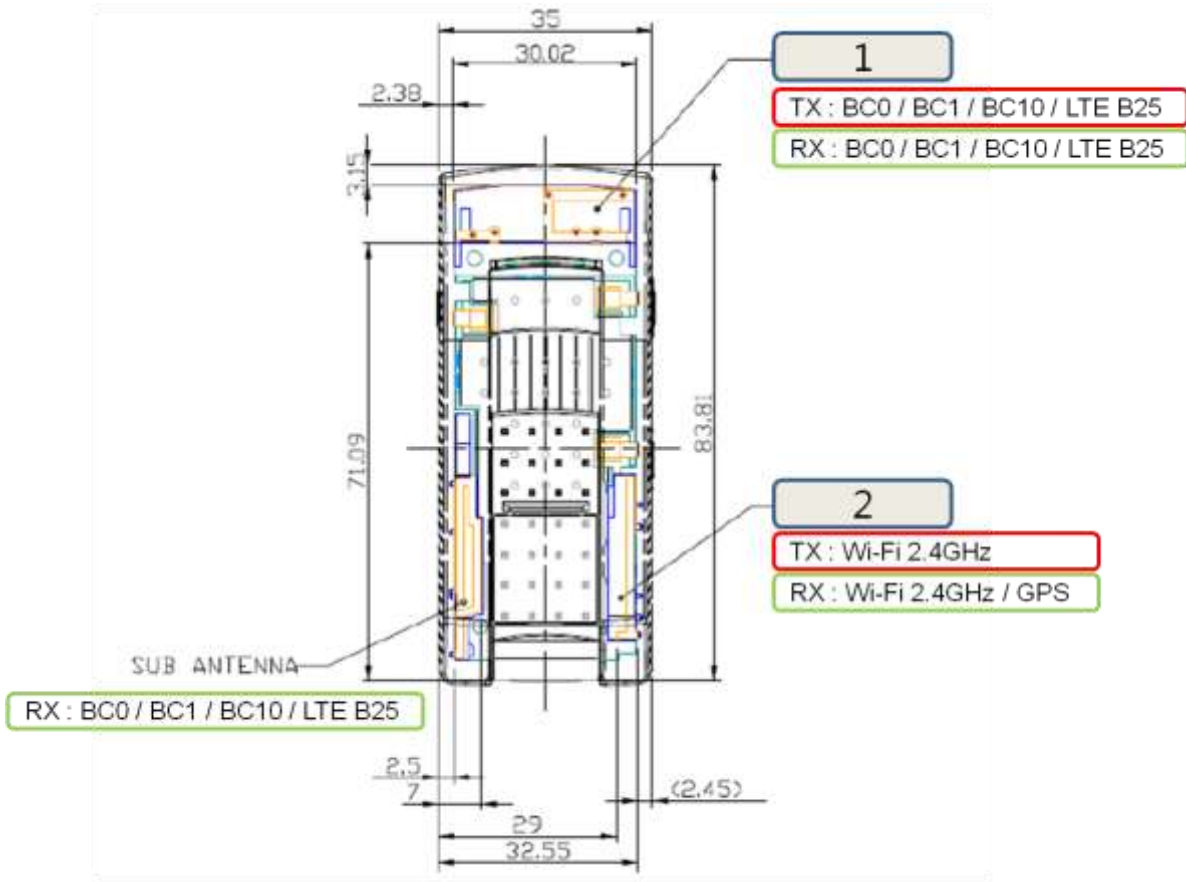
B25 High

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	22.23	0	0.00
				1	24	22.23	0	0.00
				12	6	21.04	1	1.19
				25	0	20.87	1	1.36
			16QAM	1	0	21.00	1	1.23
				1	24	21.02	1	1.21
				12	6	19.99	2	2.24
				25	0	19.98	2	2.25

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.

10. ANTENNA AND DEVICE INFORMATION



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

Definition of Antennas

Note;

USB dongle is only operated as a Access Point when connected to the AC Adaptor. For WiFi, if the USB dongle is connected to the PC, it cannot transmit the WiFi since below reason.

How to operate Wi-Fi mode : Normally, there are D+/D- signal path in the USB port which is for data communication like in the laptop or other electric devices. But no D+/D- signal path in the AC adapter which use USB connection. Using this general specification, When our device is plugged in the laptop thru USB then as D+/D- are detected we programmed to turn off Wi-Fi function. However, when it connected to AC adapter no D+/D- are detected and we programmed to turn on the Wi-Fi in reverse.

Therefore, WiFi SAR test is not required. Please find separated WLAN Operational Description.

11. SAR TEST DATA SUMMARY

11.1 Measurement Results (BC10 Body SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Configuration	Separation Distance	SAR(mW/g)
MHz	ch.							
817.9	476 (low)	EVDO	23.80	-0.006	Horizontal Up	Laptop	5 mm	1.03
820.5	580 (Mid)	EVDO	23.83	0.046	Horizontal Up	Laptop	5 mm	1.14
823.1	684 (High)	EVDO	24.00	0.118	Horizontal Up	Laptop	5 mm	1.32
820.5	580 (Mid)	EVDO	23.83	0.177	Horizontal Down	USB Cable	5 mm	0.575
820.5	580 (Mid)	EVDO	23.83	0.027	Vertical Front	USB Cable	5 mm	0.526
820.5	580 (Mid)	EVDO	23.83	-0.035	Vertical Back	Laptop	5 mm	0.516
820.5	580 (Mid)	EVDO	23.83	-0.028	Top	Laptop	5 mm	0.335
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:

- 1 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].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 6 Test Signal Call Mode Manual Test cord Base Station Simulator
- 7 All side of the EUT were tested and the worst-case side is reported.
- 8 The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
- 9 EVDO Body SAR was tested under EVDO Rev.0 RTAP.
- 10 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	Configuration	Separation Distance	SAR(mW/g)
MHz	ch.							
824.7	1013 (low)	EVDO	24.00	-0.075	Horizontal Up	Laptop	5 mm	1.32
836.52	384 (Mid)	EVDO	23.83	-0.017	Horizontal Up	Laptop	5 mm	1.05
848.31	777 (High)	EVDO	23.63	-0.060	Horizontal Up	Laptop	5 mm	1.11
836.52	384 (Mid)	EVDO	23.83	-0.014	Horizontal Down	USB Cable	5 mm	0.683
836.52	384 (Mid)	EVDO	23.83	-0.140	Vertical Front	USB Cable	5 mm	0.602
836.52	384 (Mid)	EVDO	23.83	0.136	Vertical Back	Laptop	5 mm	0.589
836.52	384 (Mid)	EVDO	23.83	-0.185	Top	Laptop	5 mm	0.341
ANSI/ IEEE C95.1 1992 – Safety Limit							Body	
Spatial Peak							1.6 W/kg (mW/g)	
Uncontrolled Exposure/ General Population							<small>Averaged over 1 gram</small>	

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.
- Power Supply Power supplied through host device (TOSHIBA)
- Test Signal Call Mode Manual Test cord Base Station Simulator
- All side of the EUT were tested and the worst-case side is reported.
- The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
- 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	Configuration	Separation Distance	SAR(mW/g)
MHz	ch.							
1 851.25	25 (Low)	EVDO	23.84	-0.080	Horizontal Up	Laptop	5 mm	1.31
1 880.00	600 (Mid)	EVDO	24.00	-0.048	Horizontal Up	Laptop	5 mm	1.38
1 908.75	1175 (High)	EVDO	23.82	0.198	Horizontal Up	Laptop	5 mm	0.787
1 880.00	600 (Mid)	EVDO	24.00	-0.168	Horizontal Down	USB Cable	5 mm	0.762
1 851.25	25 (Low)	EVDO	23.84	0.024	Vertical Front	USB Cable	5 mm	0.750
1 880.00	600 (Mid)	EVDO	24.00	-0.159	Vertical Front	USB Cable	5 mm	0.873
1 908.75	1175 (High)	EVDO	23.82	0.045	Vertical Front	USB Cable	5 mm	0.459
1 880.00	600 (Mid)	EVDO	24.00	-0.193	Vertical Back	Laptop	5 mm	0.421
1 880.00	600 (Mid)	EVDO	24.00	-0.007	Top	Laptop	5 mm	0.725
ANSI/ IEEE C95.1 1992 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population							Body 1.6 W/kg (mW/g) <small>Averaged over 1 gram</small>	

NOTES:

- 1 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].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 6 Test Signal Call Mode Manual Test cord Base Station Simulator
- 7 All side of the EUT were tested and the worst-case side is reported.
- 8 The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
- 9 EVDO Body SAR was tested under EVDO Rev.0 RTAP.
- 10 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	Configuration	RB Size	RB Offset	Separation Distance	SAR (mW/g)	MPR
MHz	ch.										
1882.5	26365	QPSK	21.64	-0.063	Horizontal Up	Laptop	12	6	5 mm	0.657	1
		QPSK	22.71	-0.005	Horizontal Up	Laptop	1	0	5 mm	1.14	0
		QPSK	22.85	0.074	Horizontal Up	Laptop	1	24	5 mm	0.659	0
		QPSK	21.64	-0.019	Horizontal Down	USB Cable	12	6	5 mm	0.382	1
		QPSK	22.71	-0.097	Horizontal Down	USB Cable	1	0	5 mm	0.699	0
		QPSK	22.85	0.179	Horizontal Down	USB Cable	1	24	5 mm	0.383	0
		QPSK	21.64	-0.062	Vertical Front	USB Cable	12	6	5 mm	0.432	1
		QPSK	22.71	0.127	Vertical Front	USB Cable	1	0	5 mm	0.780	0
		QPSK	22.85	0.035	Vertical Front	USB Cable	1	24	5 mm	0.431	0
		QPSK	21.64	0.079	Vertical Back	Laptop	12	6	5 mm	0.213	1
		QPSK	22.71	-0.084	Vertical Back	Laptop	1	0	5 mm	0.386	0
		QPSK	22.85	0.050	Vertical Back	Laptop	1	24	5 mm	0.224	0
		QPSK	21.64	0.088	Top	Laptop	12	6	5 mm	0.317	1
		QPSK	22.71	0.132	Top	Laptop	1	0	5 mm	0.544	0
		QPSK	22.85	0.055	Top	Laptop	1	24	5 mm	0.320	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:

- 1 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].
- 2 All modes of operation were investigated and the worst-case are reported.
- 3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
- 4 Tissue parameters and temperatures are listed on the SAR plot.
- 5 Power Supply Power supplied through host device (TOSHIBA)
- 6 Test Signal Call Mode Manual Test cord Base Station Simulator
- 7 All side of the EUT were tested and the worst-case side is reported.
- 8 The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
- 9 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.

12. 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.

13. REFERENCES

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Attachment 1. – SAR Test Plots

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA800(BC10); Frequency: 817.9 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 817.9$ MHz; $\sigma = 0.986$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

BC10 EVDO Horizontal Up 476/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

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

BC10 EVDO Horizontal Up 476/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

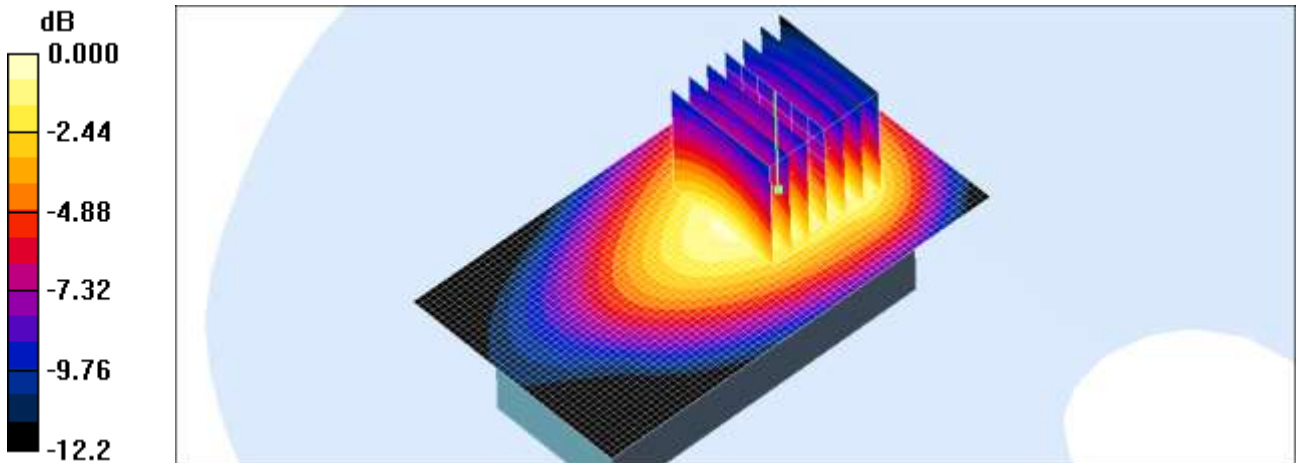
Reference Value = 28.1 V/m; Power Drift = -0.006 dB

Peak SAR (extrapolated) = 1.46 W/kg

SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.677 mW/g

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

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



0 dB = 1.11mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA800(BC10); Frequency: 820.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 54.6$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

BC10 EVDO Horizontal Up 580/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.23 mW/g

BC10 EVDO Horizontal Up 580/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

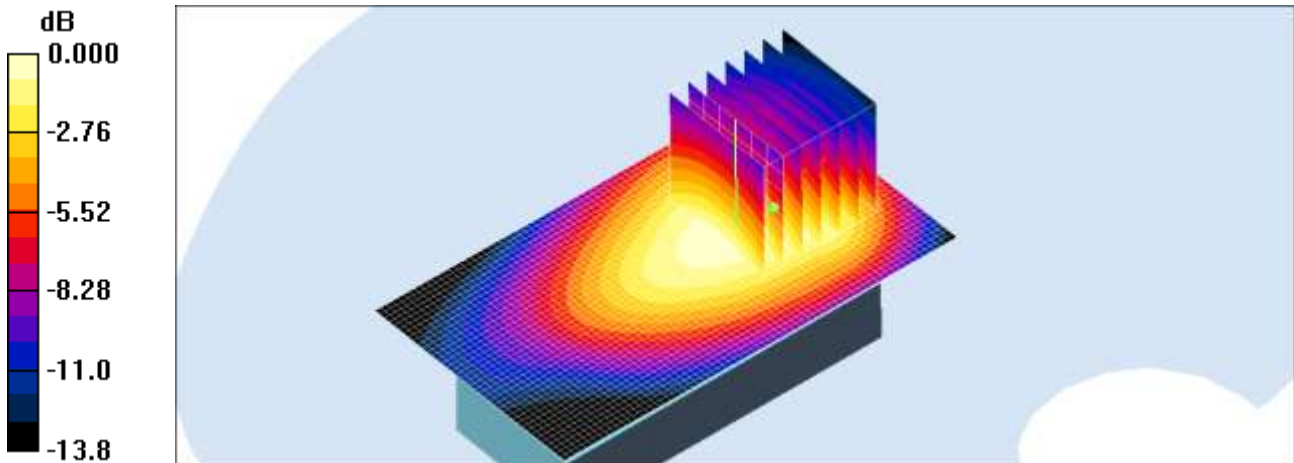
Reference Value = 29.3 V/m; Power Drift = 0.046 dB

Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.720 mW/g

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

Maximum value of SAR (measured) = 1.23 mW/g



0 dB = 1.23mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA800(BC10); Frequency: 823.1 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 823.1$ MHz; $\sigma = 0.993$ mho/m; $\epsilon_r = 54.6$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

BC10 EVDO Horizontal Up 684/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.43 mW/g

BC10 EVDO Horizontal Up 684/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

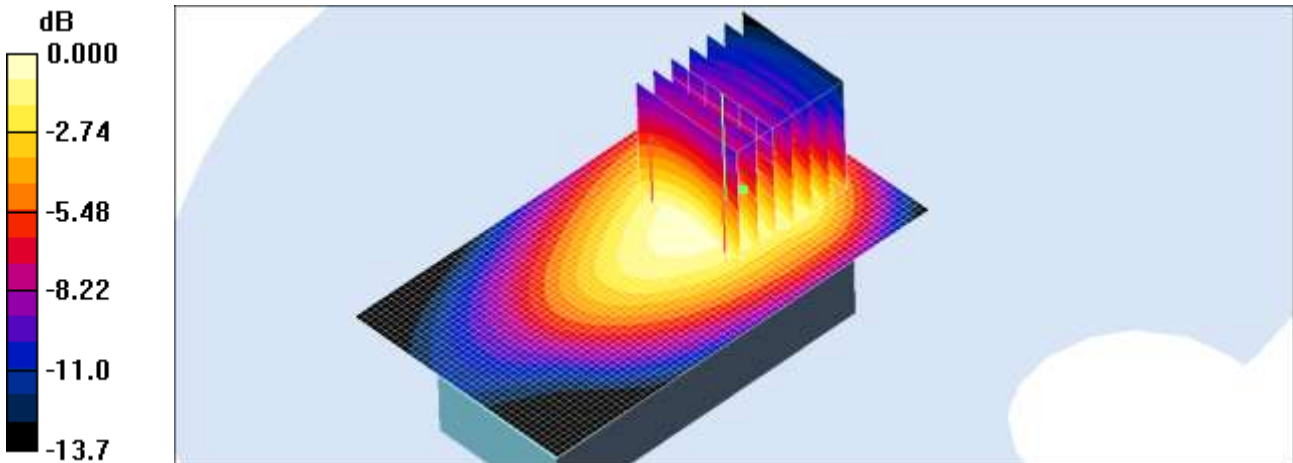
Reference Value = 31.1 V/m; Power Drift = 0.118 dB

Peak SAR (extrapolated) = 1.89 W/kg

SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.846 mW/g

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

Maximum value of SAR (measured) = 1.43 mW/g



0 dB = 1.43mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA800(BC10); Frequency: 820.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 54.6$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

CDMA835 EVDO Horizontal Down 580/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.668 mW/g

CDMA835 EVDO Horizontal Down 580/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

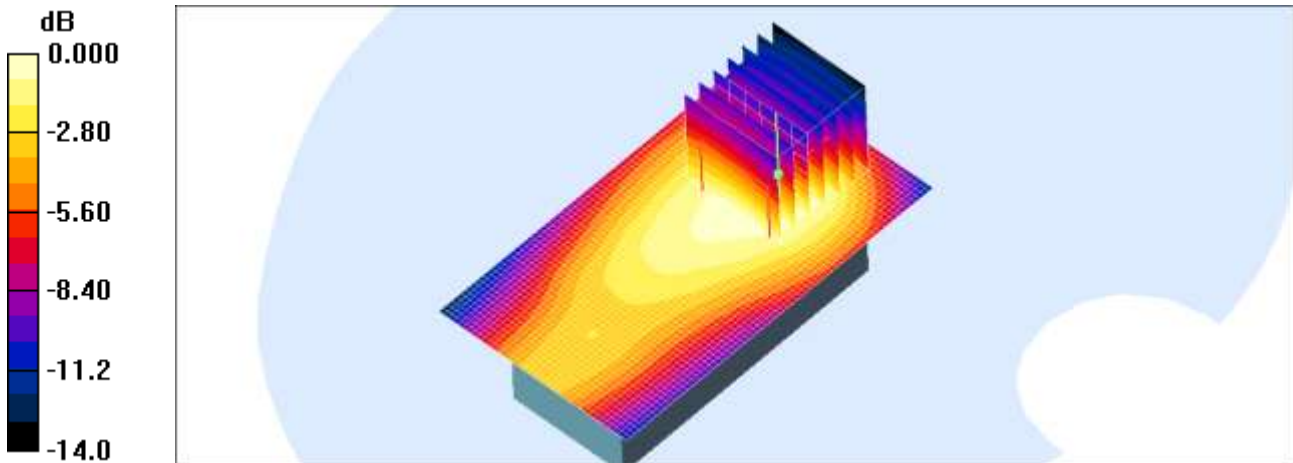
Reference Value = 20.6 V/m; Power Drift = 0.177 dB

Peak SAR (extrapolated) = 0.909 W/kg

SAR(1 g) = 0.575 mW/g; SAR(10 g) = 0.361 mW/g

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

Maximum value of SAR (measured) = 0.621 mW/g



0 dB = 0.621mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA800(BC10); Frequency: 820.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 54.6$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

BC10 EVDO Vertical Front 580/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.720 mW/g

BC10 EVDO Vertical Front 580/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

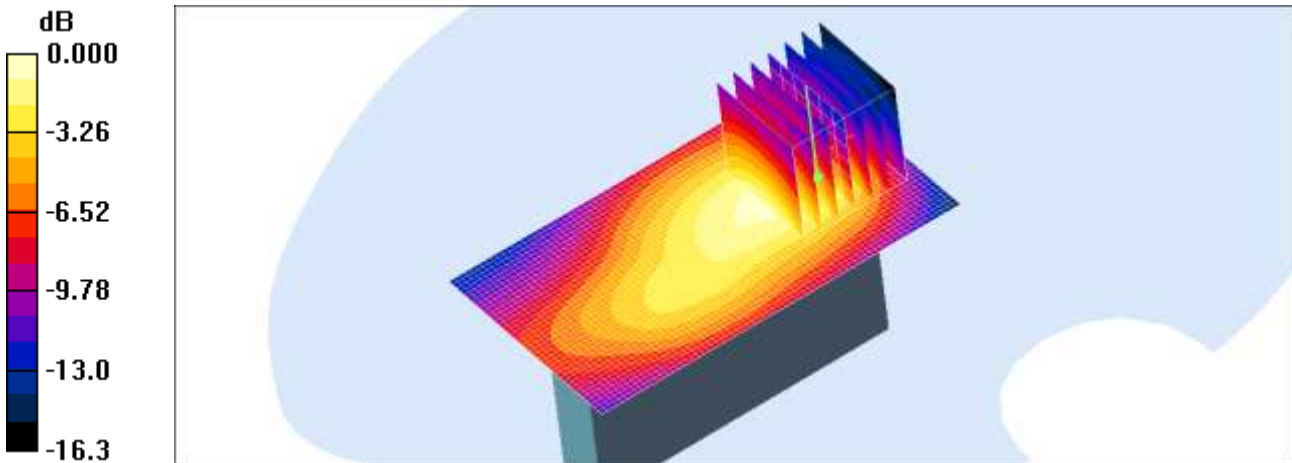
Reference Value = 18.5 V/m; Power Drift = 0.027 dB

Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.526 mW/g; SAR(10 g) = 0.290 mW/g

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

Maximum value of SAR (measured) = 0.603 mW/g



0 dB = 0.603mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA800(BC10); Frequency: 820.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 54.6$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

BC10 EVDO Vertical Back 580/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.598 mW/g

BC10 EVDO Vertical Back 580/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

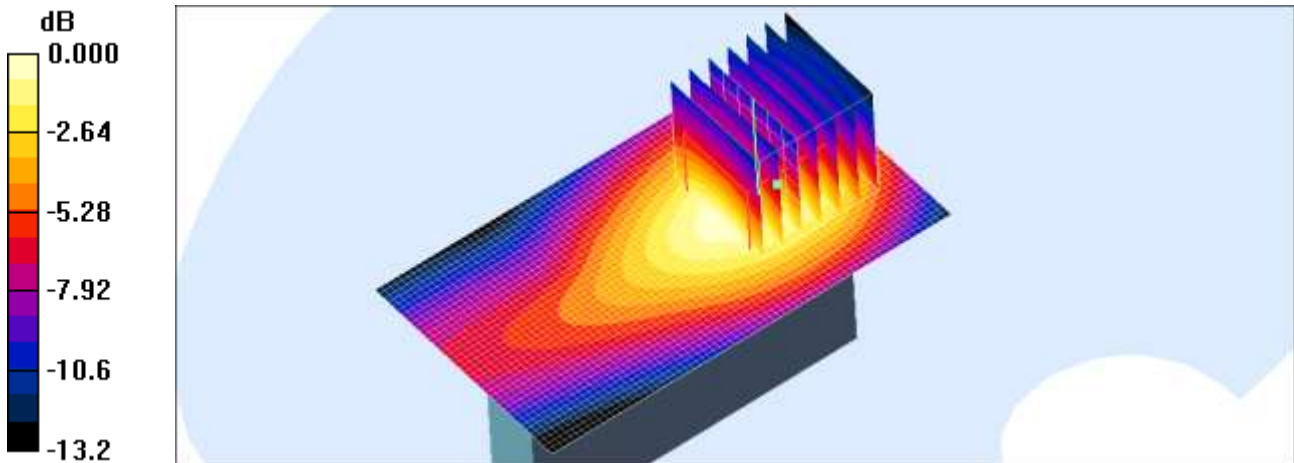
Reference Value = 21.0 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 0.780 W/kg

SAR(1 g) = 0.516 mW/g; SAR(10 g) = 0.321 mW/g

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

Maximum value of SAR (measured) = 0.565 mW/g



0 dB = 0.565mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA800(BC10); Frequency: 820.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 820.5$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 54.6$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

BC10 EVDO Body Top 580/Area Scan (41x51x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.368 mW/g

BC10 EVDO Body Top 580/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

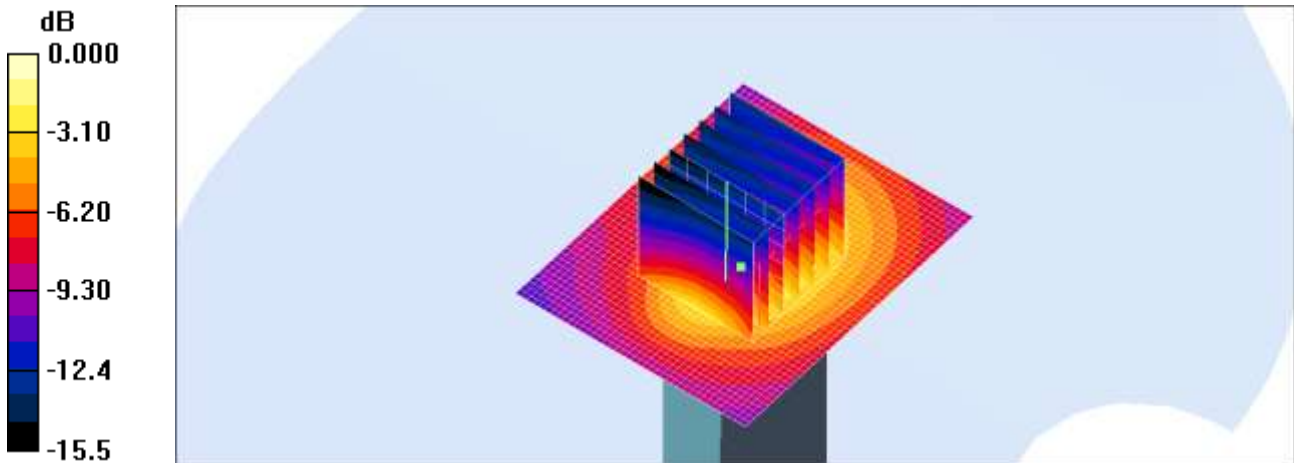
Reference Value = 19.3 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 0.842 W/kg

SAR(1 g) = 0.335 mW/g; SAR(10 g) = 0.167 mW/g

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

Maximum value of SAR (measured) = 0.361 mW/g



0 dB = 0.361mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

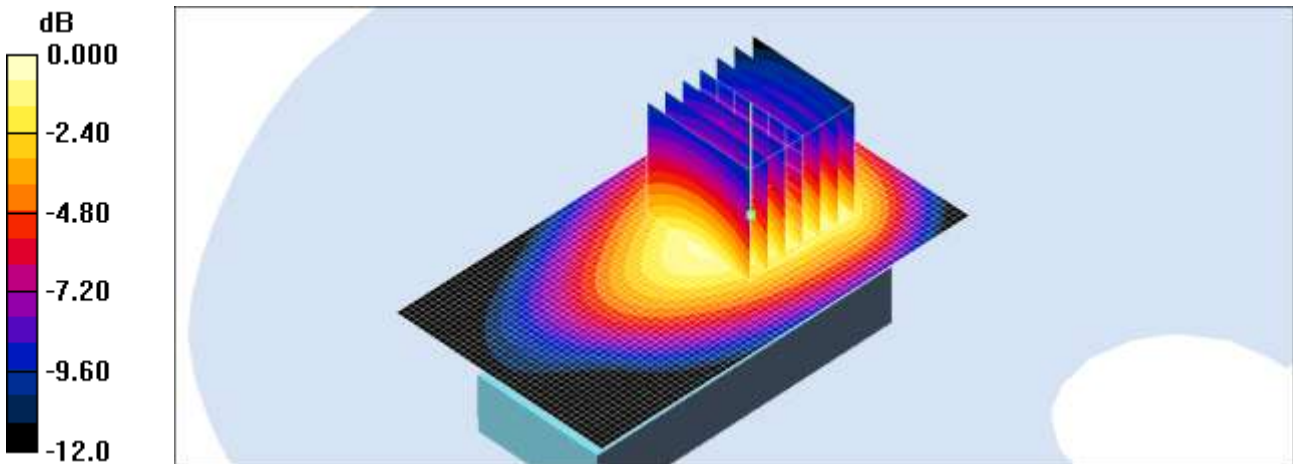
Communication System: CDMA 835MHz FCC; Frequency: 824.7 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 825$ MHz; $\sigma = 0.995$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

CDMA835 EVDO Horizontal Up 1013/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.49 mW/g

CDMA835 EVDO Horizontal Up 1013/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.9 V/m; Power Drift = -0.075 dB
Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.867 mW/g
Maximum value of SAR (measured) = 1.43 mW/g



0 dB = 1.43mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

CDMA835 EVDO Horizontal Up 384/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

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

CDMA835 EVDO Horizontal Up 384/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

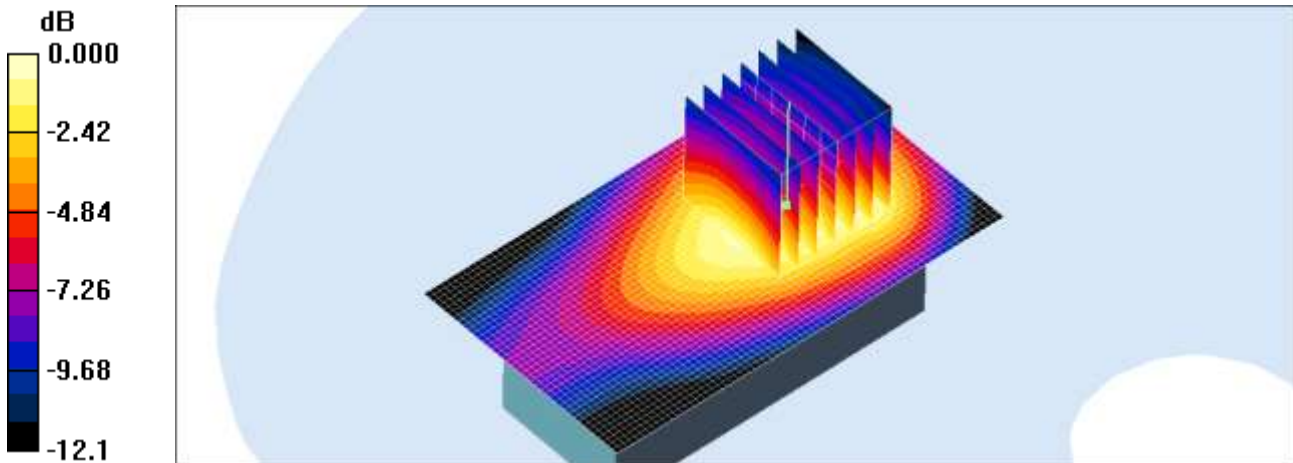
Reference Value = 27.3 V/m; Power Drift = -0.017 dB

Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.690 mW/g

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

Maximum value of SAR (measured) = 1.13 mW/g



0 dB = 1.13mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 848.31$ MHz; $\sigma = 1.03$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

CDMA835 EVDO Horizontal Up 777/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.24 mW/g

CDMA835 EVDO Horizontal Up 777/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

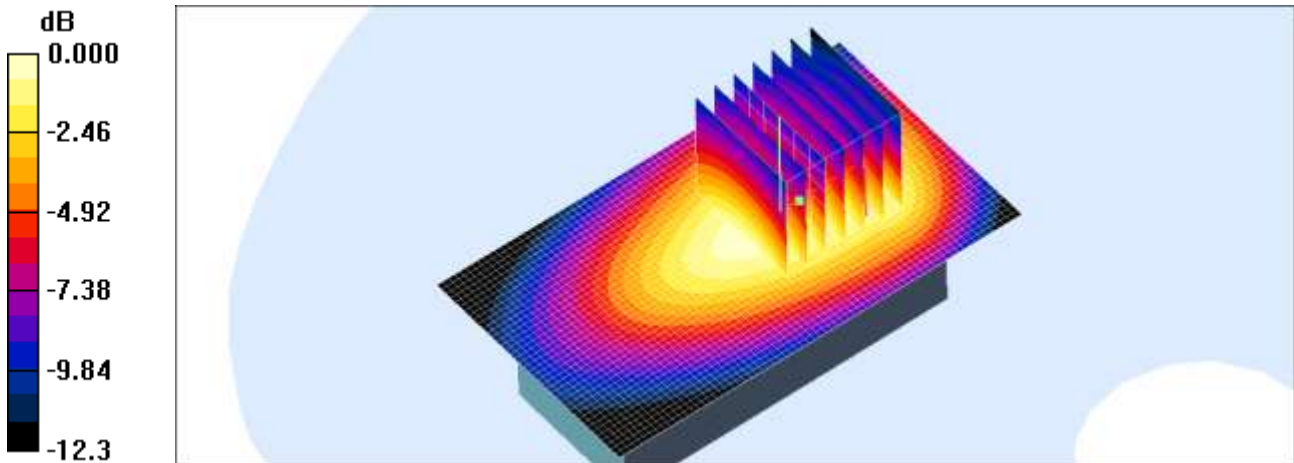
Reference Value = 27.7 V/m; Power Drift = -0.060 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.739 mW/g

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

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



0 dB = 1.20mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

CDMA835 EVDO Horizontal Down 384/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

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

CDMA835 EVDO Horizontal Down 384/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 21.5 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 1.04 W/kg

SAR(1 g) = 0.677 mW/g; SAR(10 g) = 0.423 mW/g

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

Maximum value of SAR (measured) = 0.735 mW/g

CDMA835 EVDO Horizontal Down 384/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

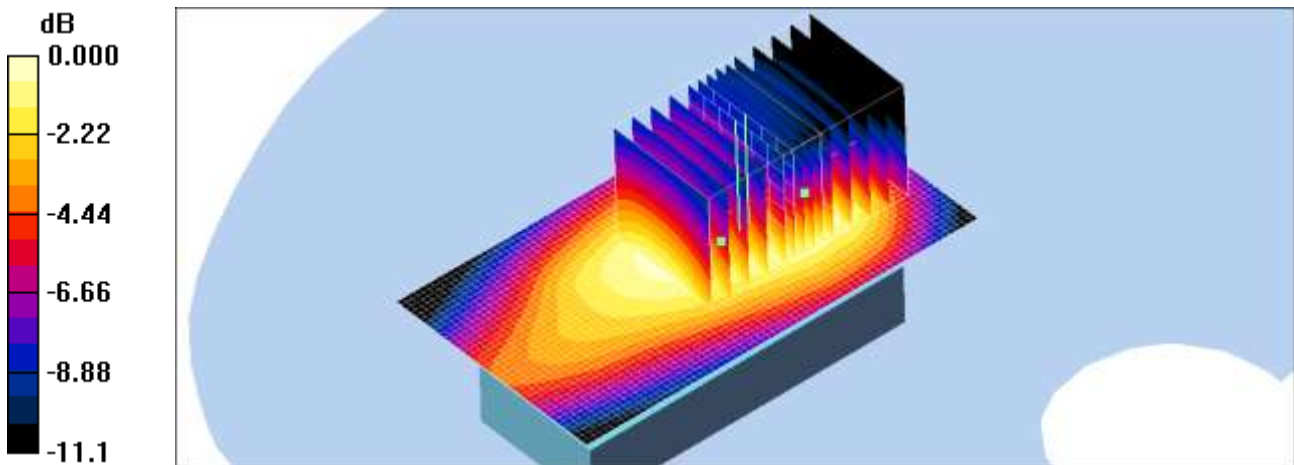
Reference Value = 21.5 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.683 mW/g; SAR(10 g) = 0.468 mW/g

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

Maximum value of SAR (measured) = 0.730 mW/g



0 dB = 0.730mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

CDMA835 EVDO Vertical Front 384/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.831 mW/g

CDMA835 EVDO Vertical Front 384/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

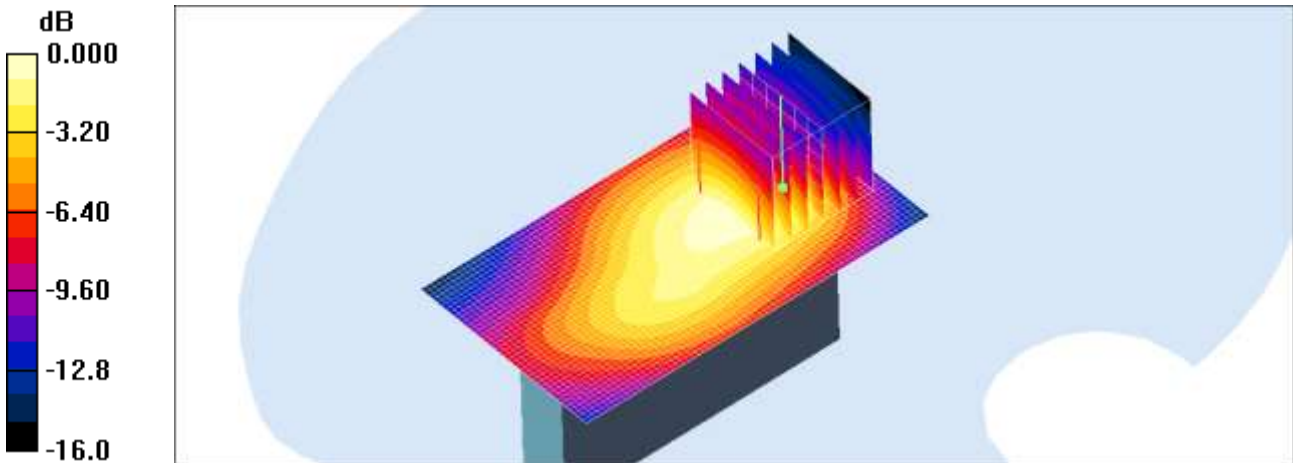
Reference Value = 19.7 V/m; Power Drift = -0.140 dB

Peak SAR (extrapolated) = 1.29 W/kg

SAR(1 g) = 0.602 mW/g; SAR(10 g) = 0.346 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 USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

CDMA835 EVDO Vertical Back 384/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.666 mW/g

CDMA835 EVDO Vertical Back 384/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

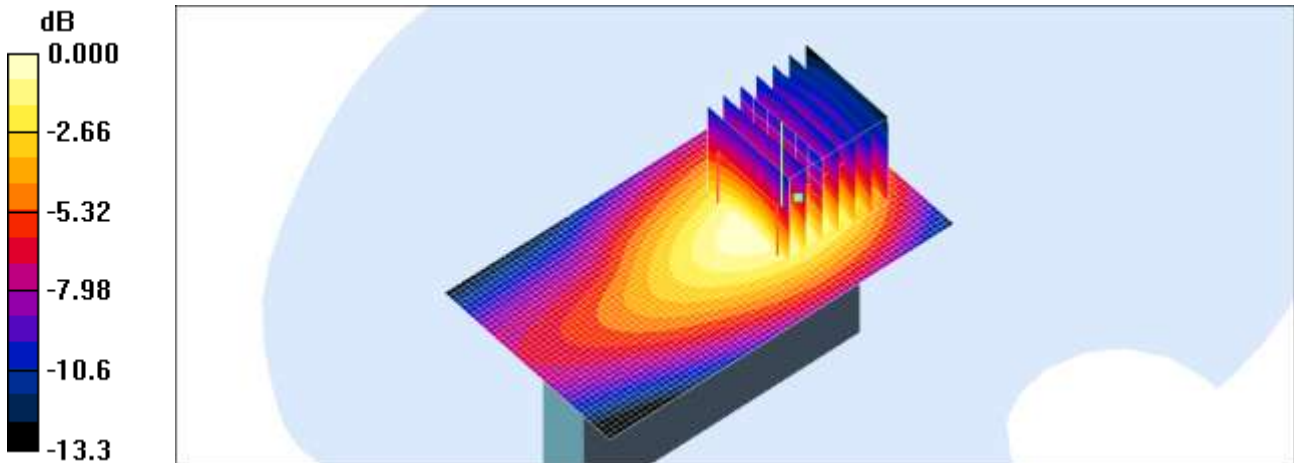
Reference Value = 21.4 V/m; Power Drift = 0.136 dB

Peak SAR (extrapolated) = 0.892 W/kg

SAR(1 g) = 0.589 mW/g; SAR(10 g) = 0.366 mW/g

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

Maximum value of SAR (measured) = 0.642 mW/g



0 dB = 0.642mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Jul. 30, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 1800/1900 Phantom; Type: SAM

CDMA835 EVDO Body Top 384/Area Scan (41x51x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.392 mW/g

CDMA835 EVDO Body Top 384/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

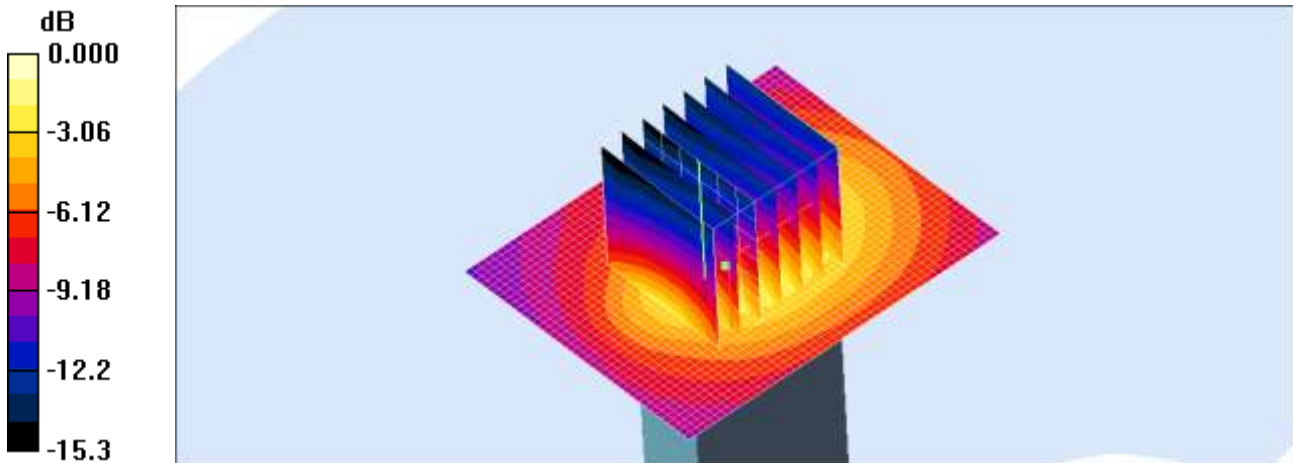
Reference Value = 19.6 V/m; Power Drift = -0.185 dB

Peak SAR (extrapolated) = 0.883 W/kg

SAR(1 g) = 0.341 mW/g; SAR(10 g) = 0.169 mW/g

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

Maximum value of SAR (measured) = 0.365 mW/g



0 dB = 0.365mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 1, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 835/900 Phantom ; Type: SAM

PCS1900 EVDO Horizontal Up 25/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.70 mW/g

PCS1900 EVDO Horizontal Up 25/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

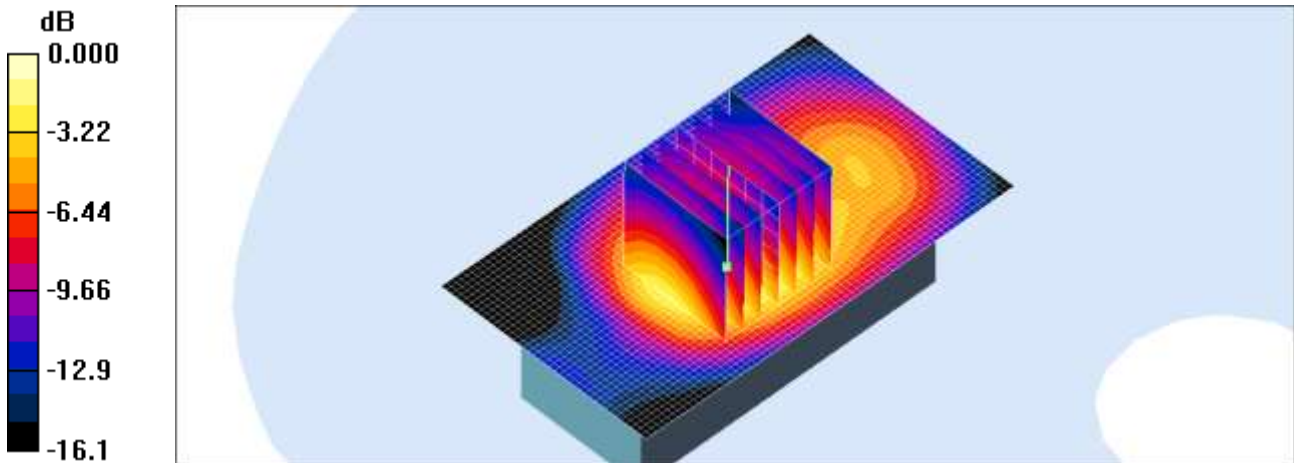
Reference Value = 19.2 V/m; Power Drift = -0.080 dB

Peak SAR (extrapolated) = 1.90 W/kg

SAR(1 g) = 1.31 mW/g; SAR(10 g) = 0.777 mW/g

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

Maximum value of SAR (measured) = 1.45 mW/g



0 dB = 1.45mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 1, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

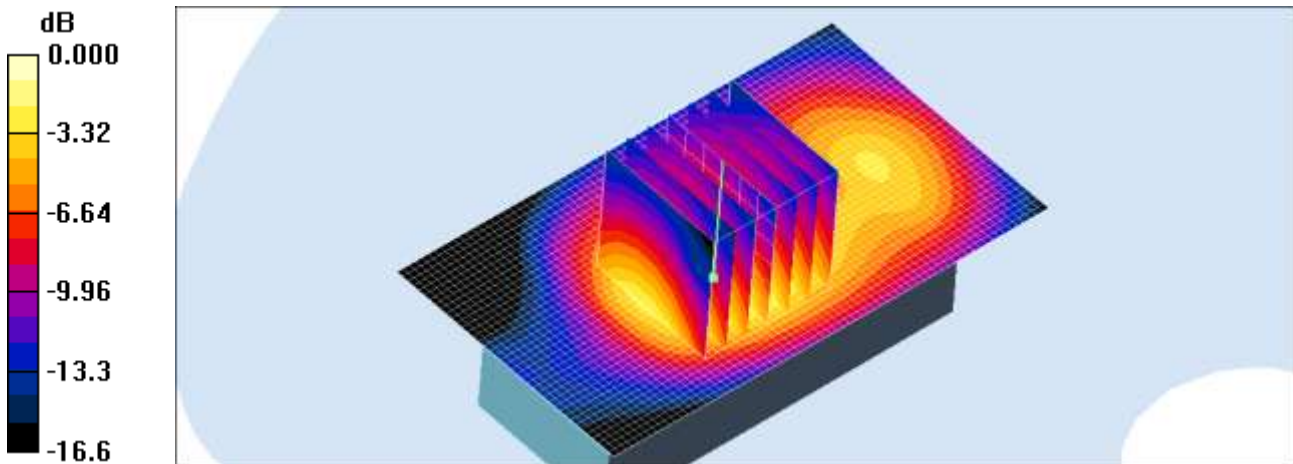
Communication System: PCS 1900MHz FCC; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 835/900 Phantom ; Type: SAM

PCS1900 EVDO Horizontal Up 600/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.68 mW/g

PCS1900 EVDO Horizontal Up 600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.0 V/m; Power Drift = -0.048 dB
Peak SAR (extrapolated) = 2.06 W/kg
SAR(1 g) = 1.38 mW/g; SAR(10 g) = 0.800 mW/g
Maximum value of SAR (measured) = 1.54 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 1, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1908.75 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 835/900 Phantom ; Type: SAM

PCS1900 EVDO Horizontal Up 1175/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.942 mW/g

PCS1900 EVDO Horizontal Up 1175/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

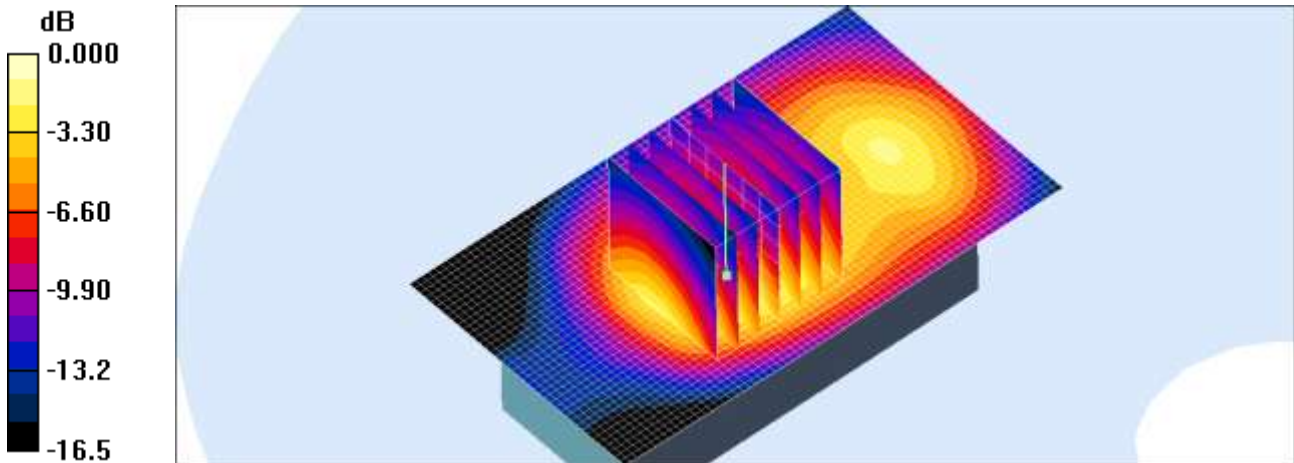
Reference Value = 19.0 V/m; Power Drift = 0.198 dB

Peak SAR (extrapolated) = 1.17 W/kg

SAR(1 g) = 0.787 mW/g; SAR(10 g) = 0.453 mW/g

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

Maximum value of SAR (measured) = 0.868 mW/g



0 dB = 0.868mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 1, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

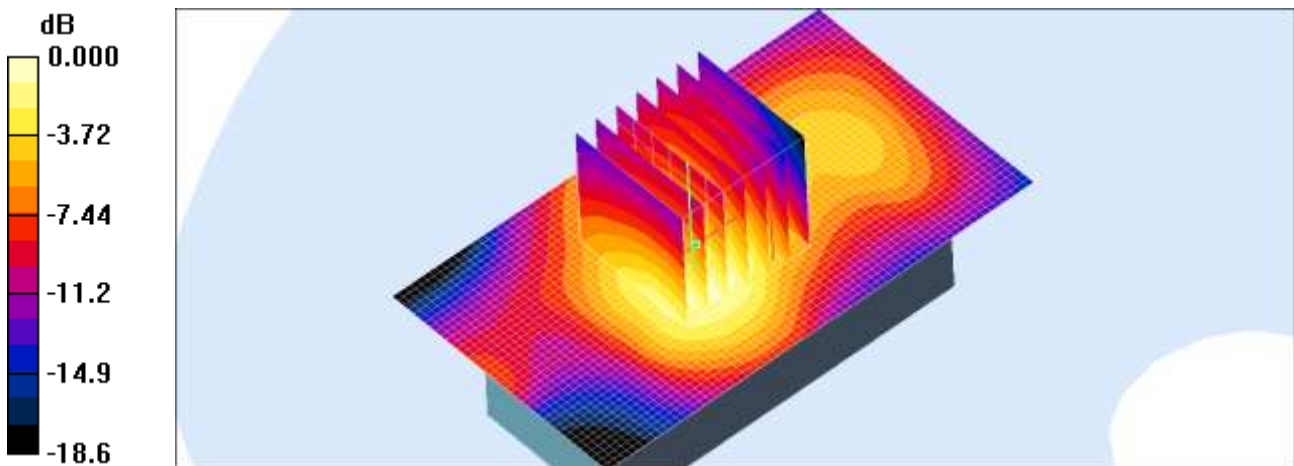
Communication System: PCS 1900MHz FCC; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

PCS1900 EVDO Horizontal Down 600/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.861 mW/g

PCS1900 EVDO Horizontal Down 600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.7 V/m; Power Drift = -0.168 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.762 mW/g; SAR(10 g) = 0.471 mW/g
Maximum value of SAR (measured) = 0.831 mW/g



0 dB = 0.831mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 1, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

PCS1900 EVDO Vertical Front 25/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.940 mW/g

PCS1900 EVDO Vertical Front 25/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

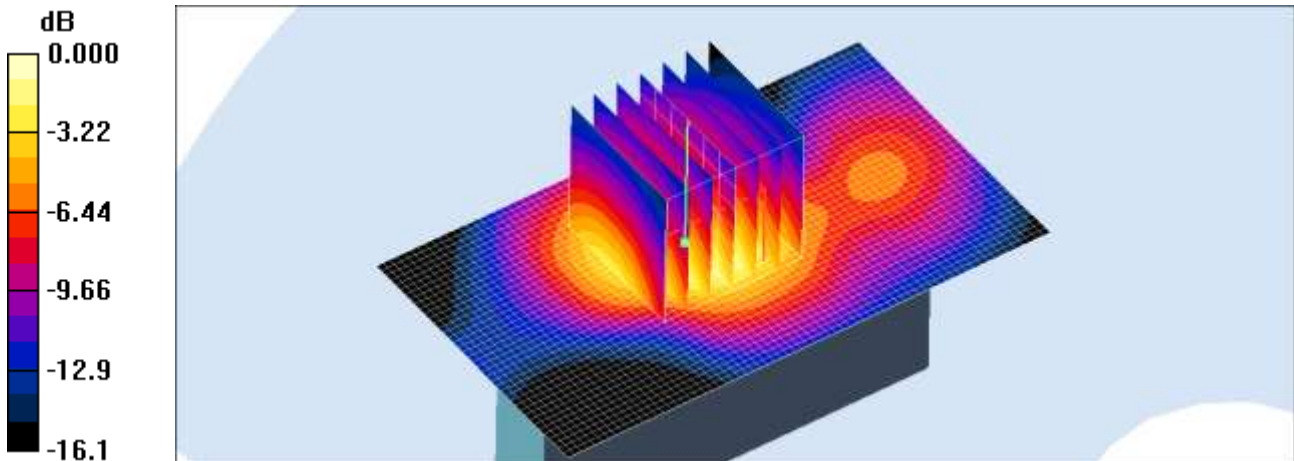
Reference Value = 12.8 V/m; Power Drift = 0.024 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.750 mW/g; SAR(10 g) = 0.426 mW/g

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

Maximum value of SAR (measured) = 0.837 mW/g



0 dB = 0.837mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 1, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

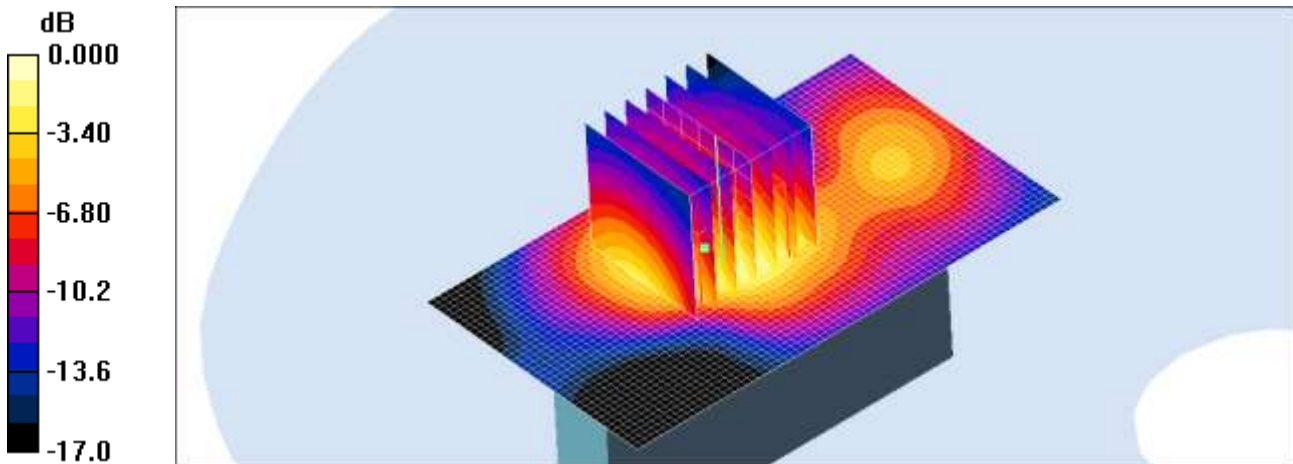
Communication System: PCS 1900MHz FCC; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.5 \text{ mho/m}$; $\epsilon_r = 52$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

PCS1900 EVDO Vertical Front 600/Area Scan (41x71x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 1.12 mW/g

PCS1900 EVDO Vertical Front 600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$
Reference Value = 16.4 V/m; Power Drift = -0.159 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.873 mW/g; SAR(10 g) = 0.491 mW/g
Maximum value of SAR (measured) = 0.954 mW/g



0 dB = 0.954mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 1, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1908.75 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1908.75$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

PCS1900 EVDO Vertical Front 1175/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

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

PCS1900 EVDO Vertical Front 1175/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

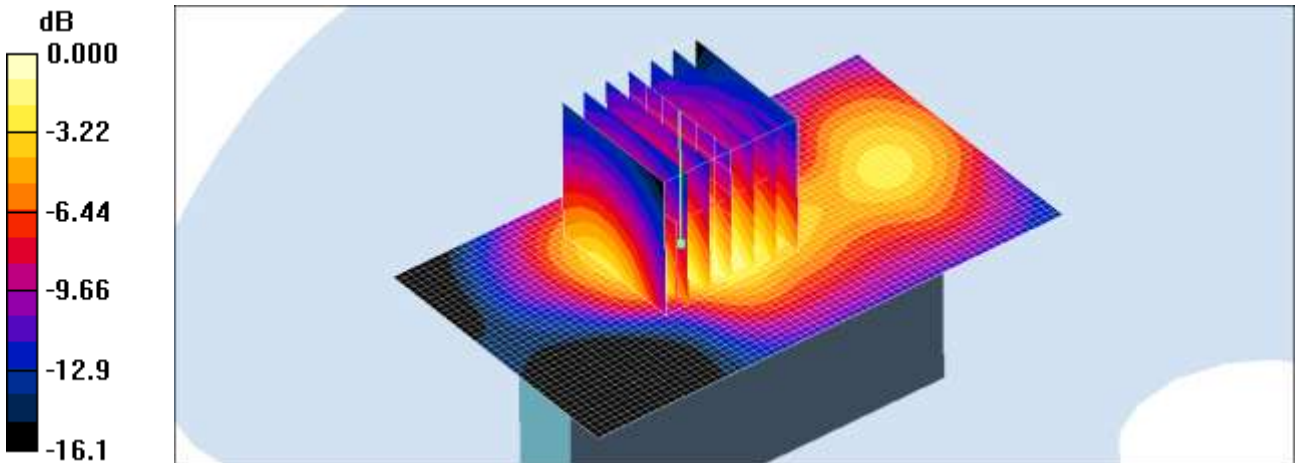
Reference Value = 13.5 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 0.695 W/kg

SAR(1 g) = 0.459 mW/g; SAR(10 g) = 0.263 mW/g

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

Maximum value of SAR (measured) = 0.506 mW/g



0 dB = 0.506mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 1, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

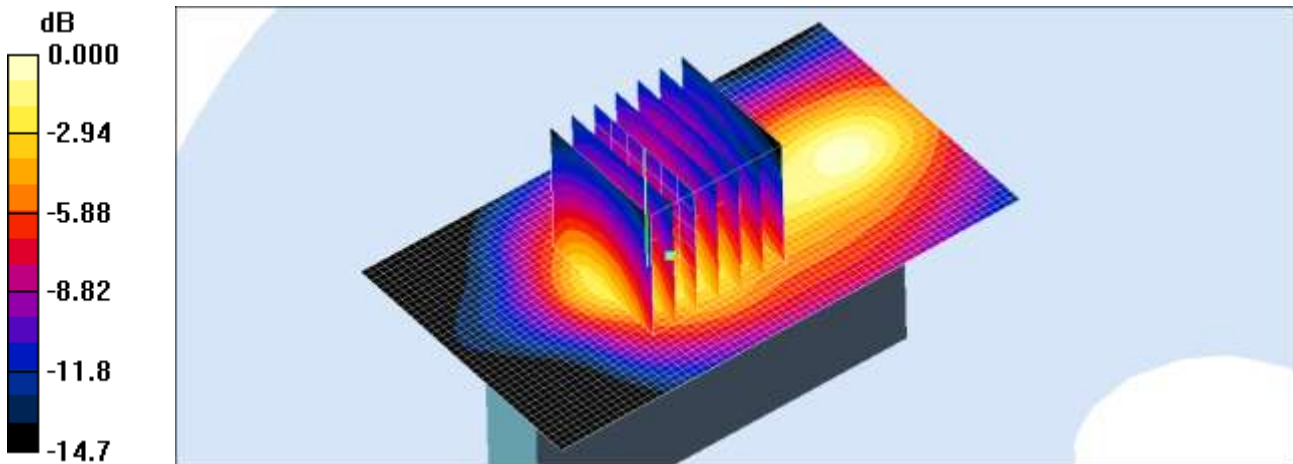
Communication System: PCS 1900MHz FCC; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.5 \text{ mho/m}$; $\epsilon_r = 52$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

PCS1900 EVDO Vertical Back 600/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.498 mW/g

PCS1900 EVDO Vertical Back 600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.2 V/m; Power Drift = -0.193 dB
Peak SAR (extrapolated) = 0.677 W/kg
SAR(1 g) = 0.421 mW/g; SAR(10 g) = 0.239 mW/g
Maximum value of SAR (measured) = 0.470 mW/g



0 dB = 0.470mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 1, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

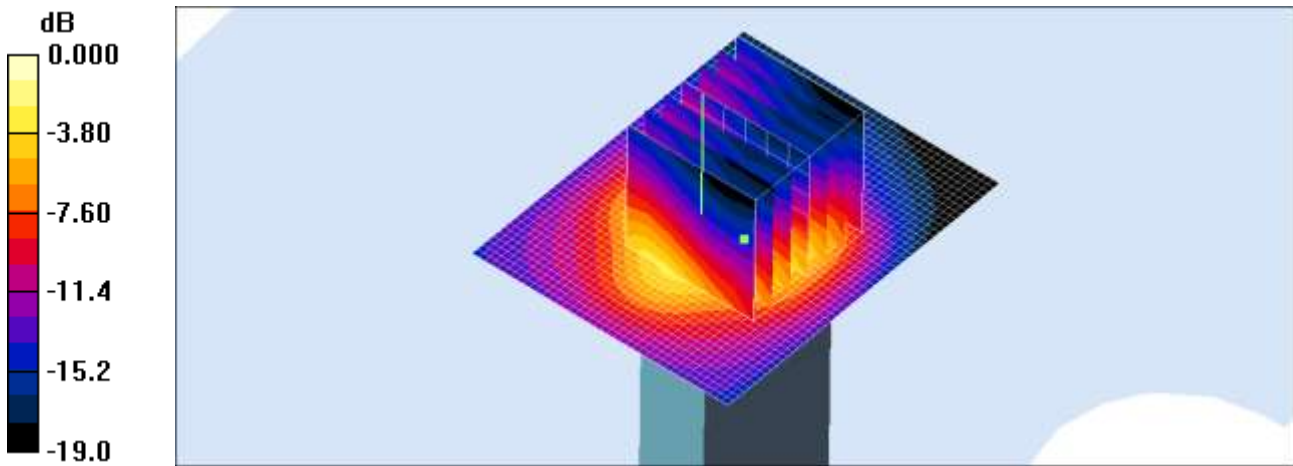
Communication System: PCS 1900MHz FCC; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.5 \text{ mho/m}$; $\epsilon_r = 52$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

PCS1900 EVDO Body Top 600/Area Scan (41x51x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.724 mW/g

PCS1900 EVDO Body Top 600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.4 V/m; Power Drift = -0.007 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.725 mW/g; SAR(10 g) = 0.332 mW/g
Maximum value of SAR (measured) = 0.889 mW/g



0 dB = 0.889mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Up QPSK 5MHz 12RB 6 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.826 mW/g

Horizontal Up QPSK 5MHz 12RB 6 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

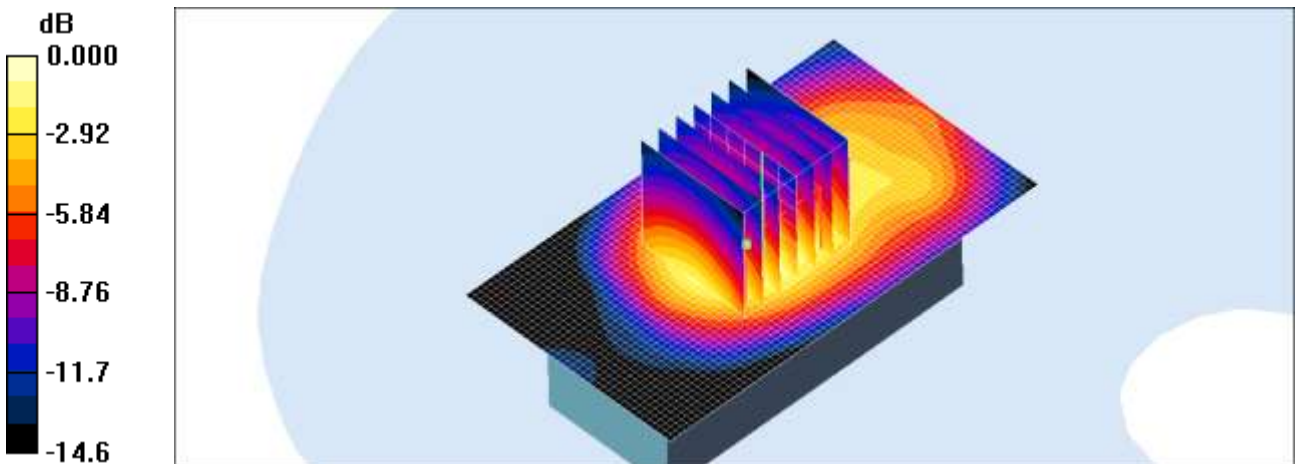
Reference Value = 18.5 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 0.953 W/kg

SAR(1 g) = 0.657 mW/g; SAR(10 g) = 0.398 mW/g

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

Maximum value of SAR (measured) = 0.717 mW/g



0 dB = 0.717mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Up QPSK 5MHz 1RB 0 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

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

Horizontal Up QPSK 5MHz 1RB 0 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

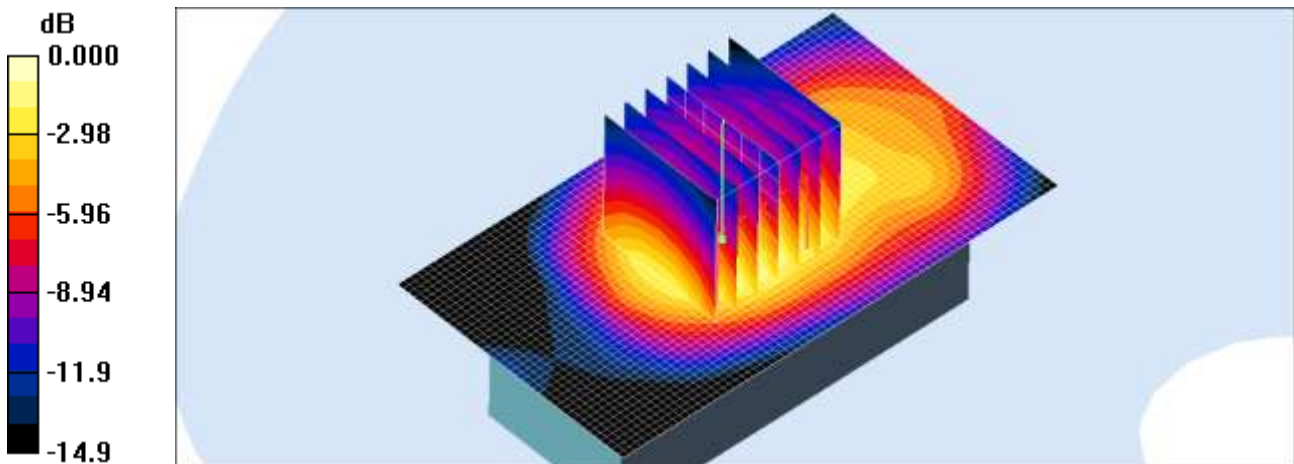
Reference Value = 22.9 V/m; Power Drift = -0.005 dB

Peak SAR (extrapolated) = 1.67 W/kg

SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.687 mW/g

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

Maximum value of SAR (measured) = 1.23 mW/g



0 dB = 1.23mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Dongle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Up QPSK 5MHz 1RB 24 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.793 mW/g

Horizontal Up QPSK 5MHz 1RB 24 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

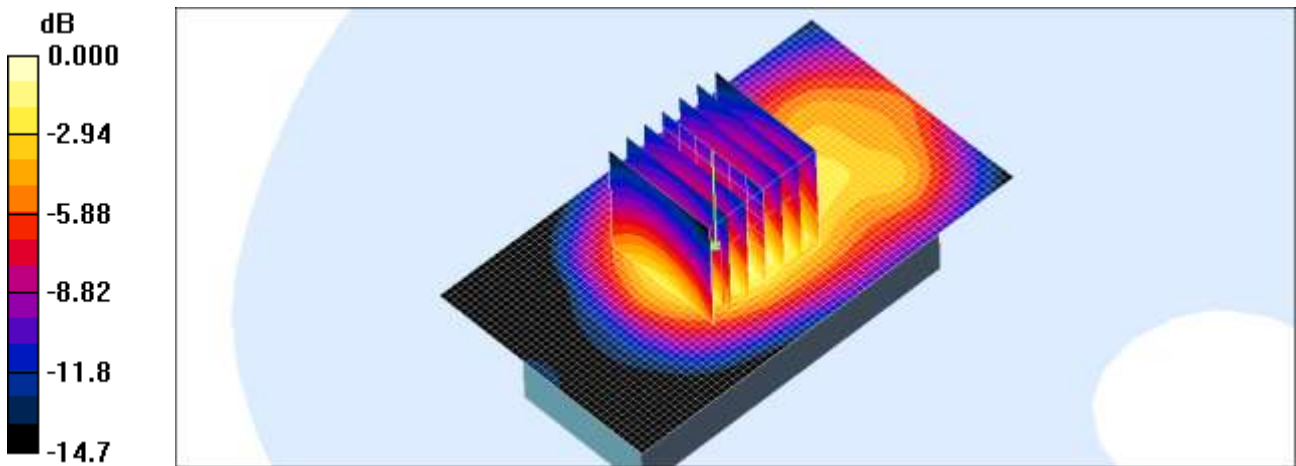
Reference Value = 17.4 V/m; Power Drift = 0.074 dB

Peak SAR (extrapolated) = 0.961 W/kg

SAR(1 g) = 0.659 mW/g; SAR(10 g) = 0.398 mW/g

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

Maximum value of SAR (measured) = 0.714 mW/g



0 dB = 0.714mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Down QPSK 5MHz 12RB 6 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.415 mW/g

Horizontal Down QPSK 5MHz 12RB 6 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

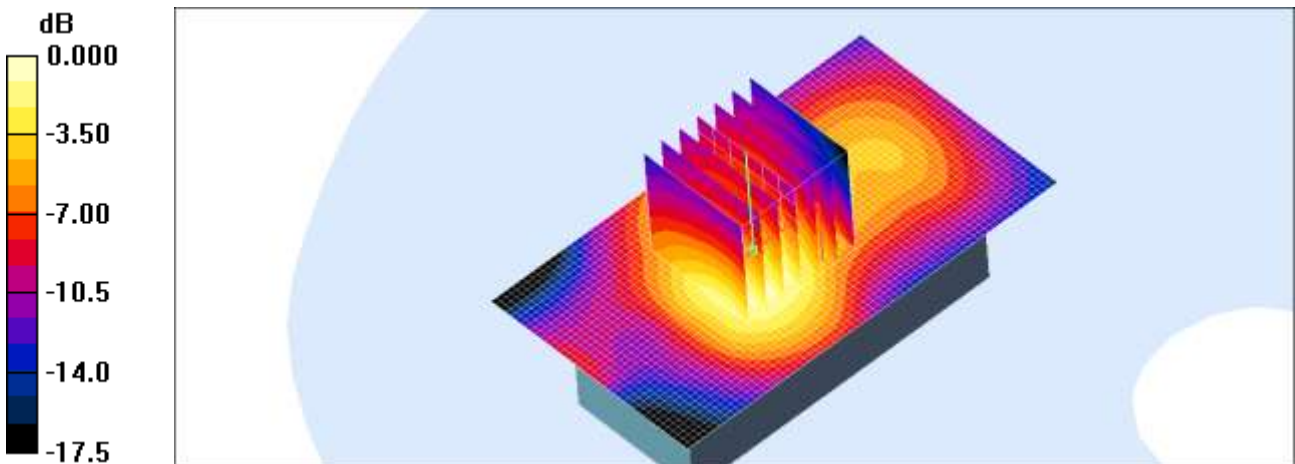
Reference Value = 8.30 V/m; Power Drift = -0.019 dB

Peak SAR (extrapolated) = 0.566 W/kg

SAR(1 g) = 0.382 mW/g; SAR(10 g) = 0.234 mW/g

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

Maximum value of SAR (measured) = 0.415 mW/g



0 dB = 0.415mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Down QPSK 5MHz 1RB 0 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.788 mW/g

Horizontal Down QPSK 5MHz 1RB 0 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

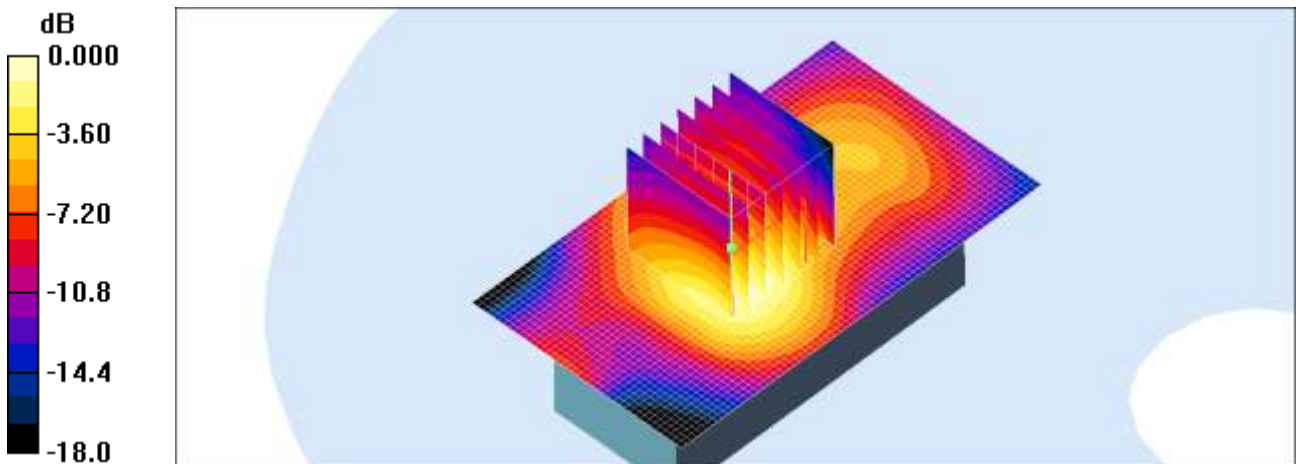
Reference Value = 11.0 V/m; Power Drift = -0.097 dB

Peak SAR (extrapolated) = 1.04 W/kg

SAR(1 g) = 0.699 mW/g; SAR(10 g) = 0.428 mW/g

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

Maximum value of SAR (measured) = 0.762 mW/g



0 dB = 0.762mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Down QPSK 5MHz 1RB 24 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.428 mW/g

Horizontal Down QPSK 5MHz 1RB 24 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

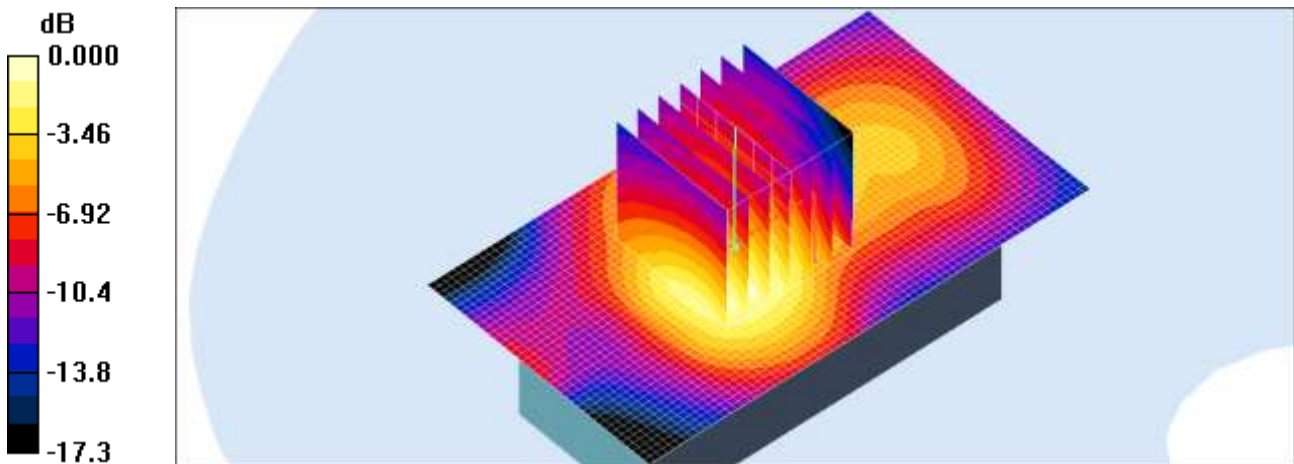
Reference Value = 8.33 V/m; Power Drift = 0.179 dB

Peak SAR (extrapolated) = 0.564 W/kg

SAR(1 g) = 0.383 mW/g; SAR(10 g) = 0.236 mW/g

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

Maximum value of SAR (measured) = 0.417 mW/g



0 dB = 0.417mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Front QPSK 5MHz 12RB 6 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

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

Vertical Front QPSK 5MHz 12RB 6 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

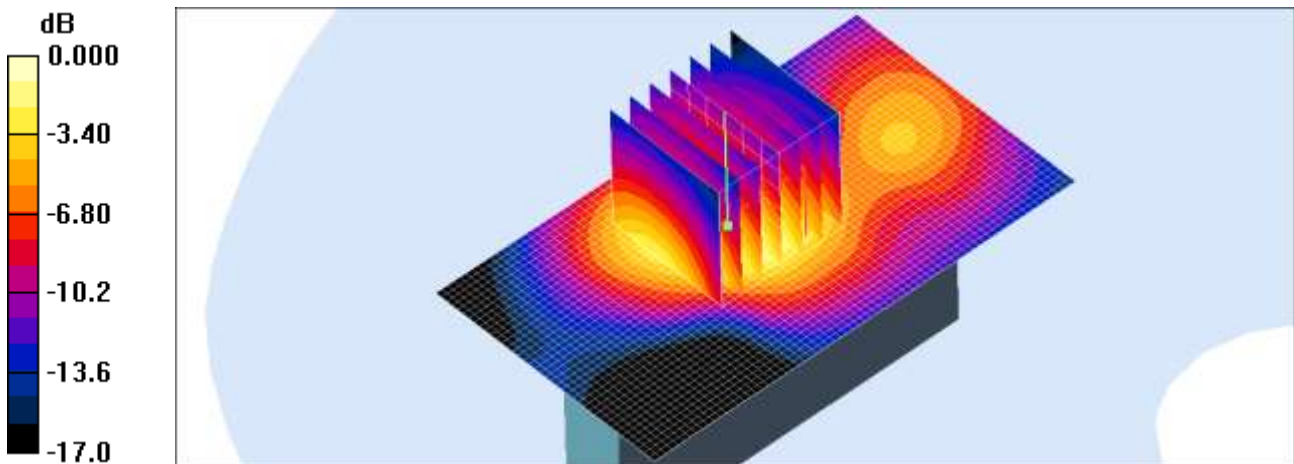
Reference Value = 11.6 V/m; Power Drift = -0.062 dB

Peak SAR (extrapolated) = 0.664 W/kg

SAR(1 g) = 0.432 mW/g; SAR(10 g) = 0.244 mW/g

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

Maximum value of SAR (measured) = 0.480 mW/g



0 dB = 0.480mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Front QPSK 5MHz 1RB 0 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.05 mW/g

Vertical Front QPSK 5MHz 1RB 0 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

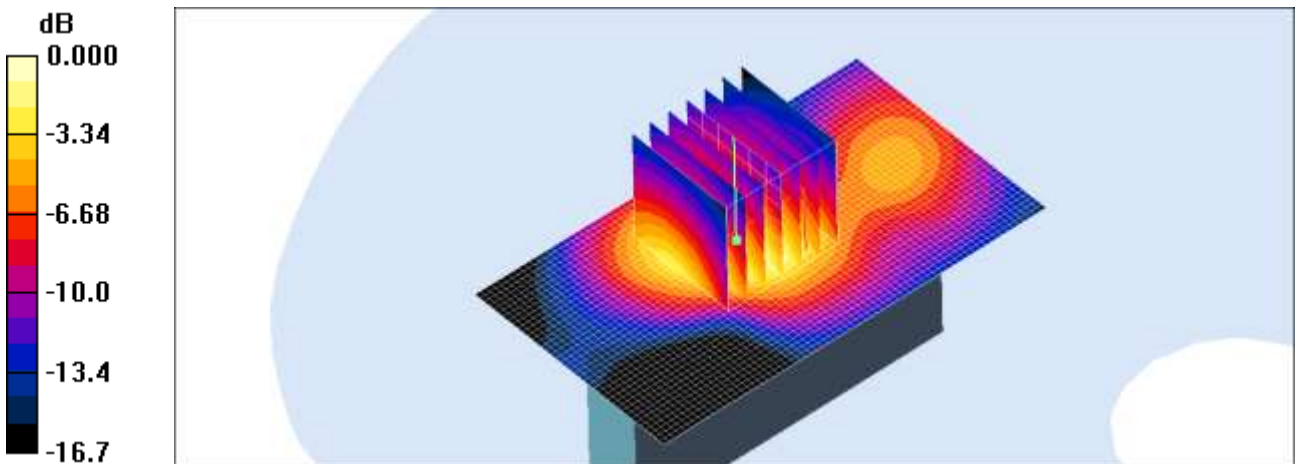
Reference Value = 15.1 V/m; Power Drift = 0.127 dB

Peak SAR (extrapolated) = 1.21 W/kg

SAR(1 g) = 0.780 mW/g; SAR(10 g) = 0.440 mW/g

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

Maximum value of SAR (measured) = 0.883 mW/g



0 dB = 0.883mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Front QPSK 5MHz 1RB 24 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

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

Vertical Front QPSK 5MHz 1RB 24 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

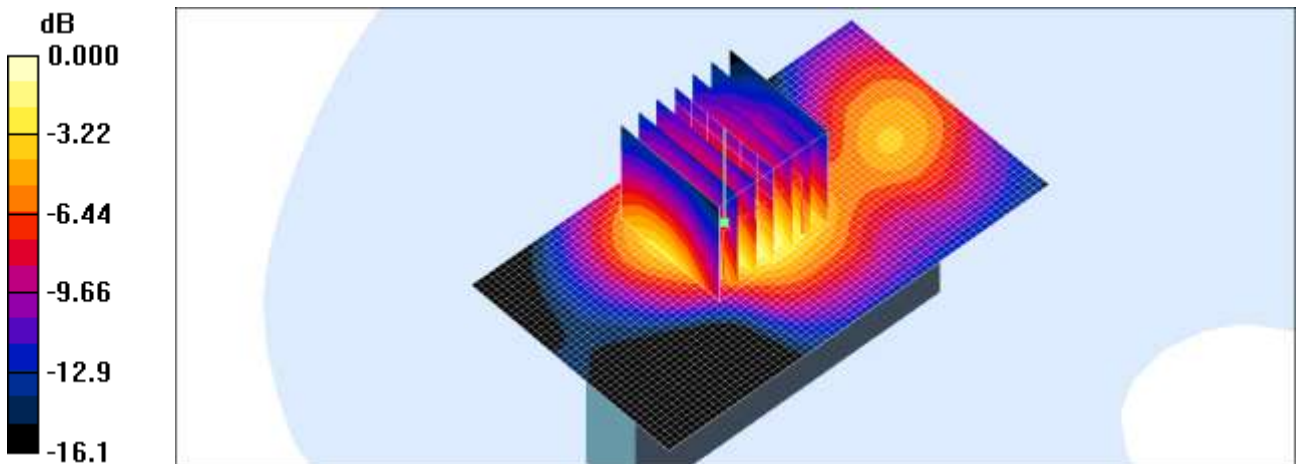
Reference Value = 11.4 V/m; Power Drift = 0.035 dB

Peak SAR (extrapolated) = 0.658 W/kg

SAR(1 g) = 0.431 mW/g; SAR(10 g) = 0.244 mW/g

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

Maximum value of SAR (measured) = 0.473 mW/g



0 dB = 0.473mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Back QPSK 5MHz 12RB 6 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.258 mW/g

Vertical Back QPSK 5MHz 12RB 6 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

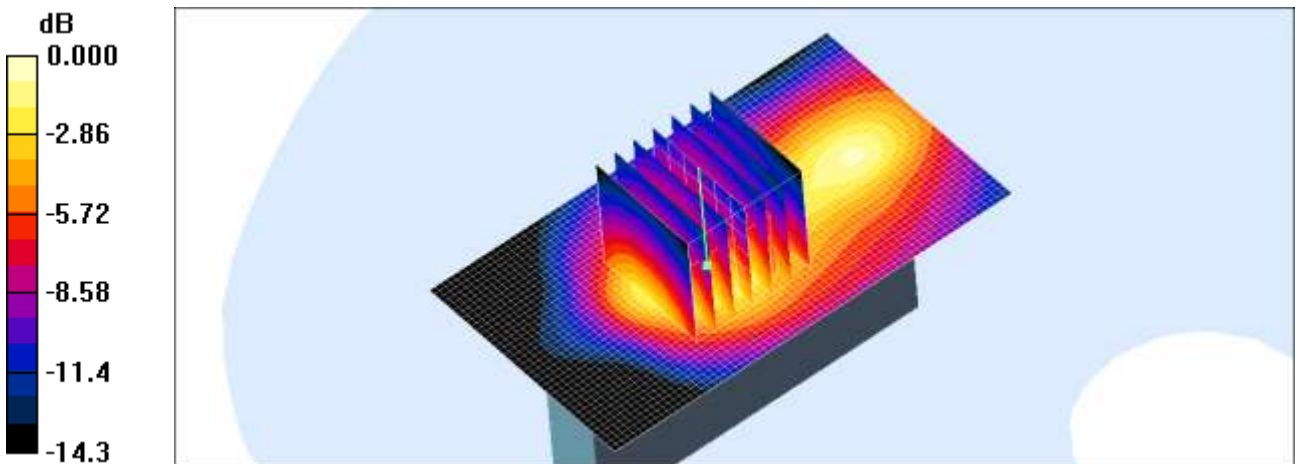
Reference Value = 10.8 V/m; Power Drift = 0.079 dB

Peak SAR (extrapolated) = 0.334 W/kg

SAR(1 g) = 0.213 mW/g; SAR(10 g) = 0.122 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 USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Back QPSK 5MHz 1RB 0 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.458 mW/g

Vertical Back QPSK 5MHz 1RB 0 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

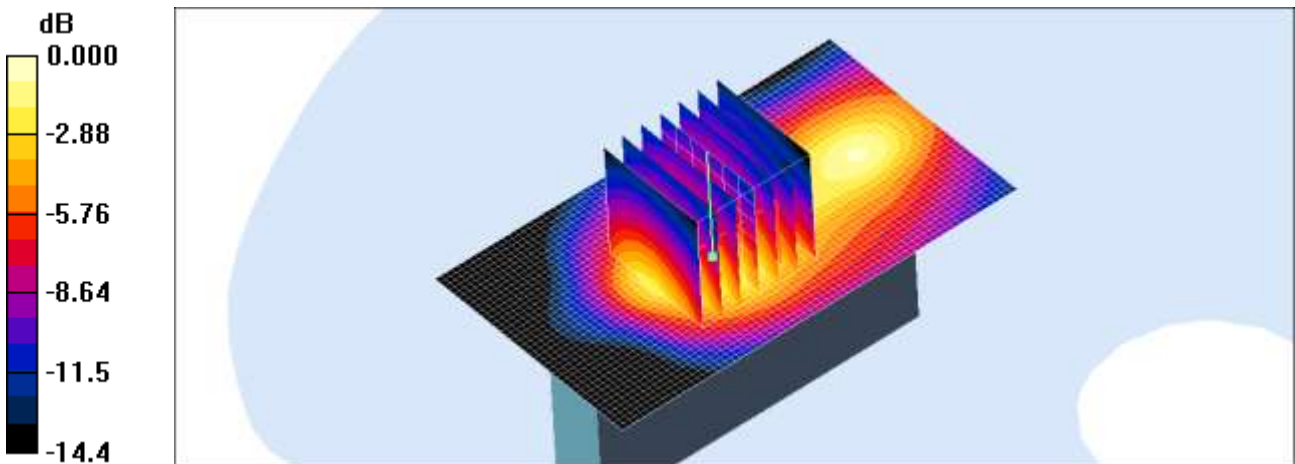
Reference Value = 14.5 V/m; Power Drift = -0.084 dB

Peak SAR (extrapolated) = 0.611 W/kg

SAR(1 g) = 0.386 mW/g; SAR(10 g) = 0.220 mW/g

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

Maximum value of SAR (measured) = 0.428 mW/g



0 dB = 0.428mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Back QPSK 5MHz 1RB 24 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.258 mW/g

Vertical Back QPSK 5MHz 1RB 24 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

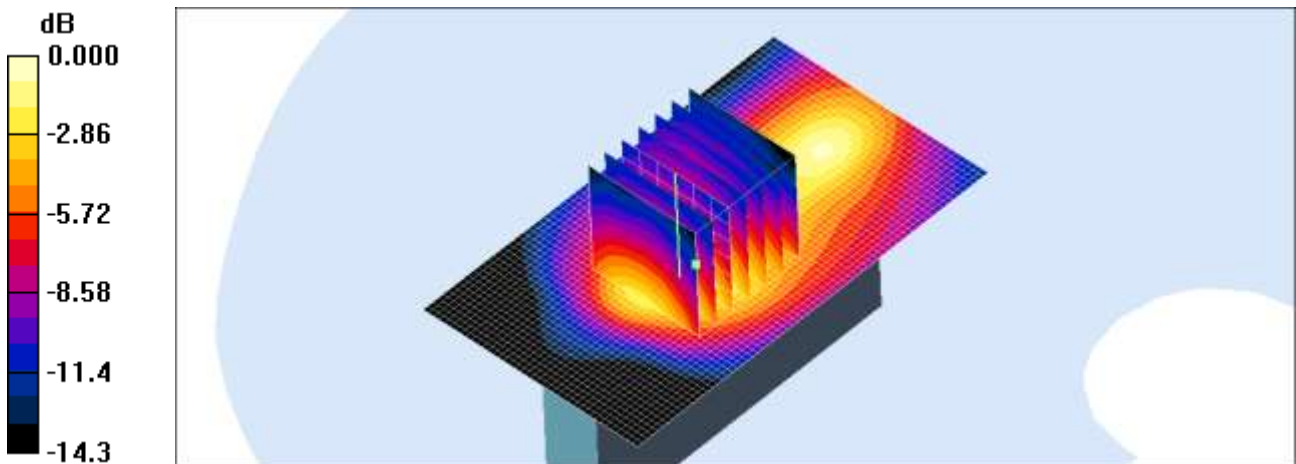
Reference Value = 10.8 V/m; Power Drift = 0.050 dB

Peak SAR (extrapolated) = 0.353 W/kg

SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.128 mW/g

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

Maximum value of SAR (measured) = 0.247 mW/g



0 dB = 0.247mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Body Top QPSK 5MHz 12RB 6 offset 26365/Area Scan (41x51x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.344 mW/g

Body Top QPSK 5MHz 12RB 6 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

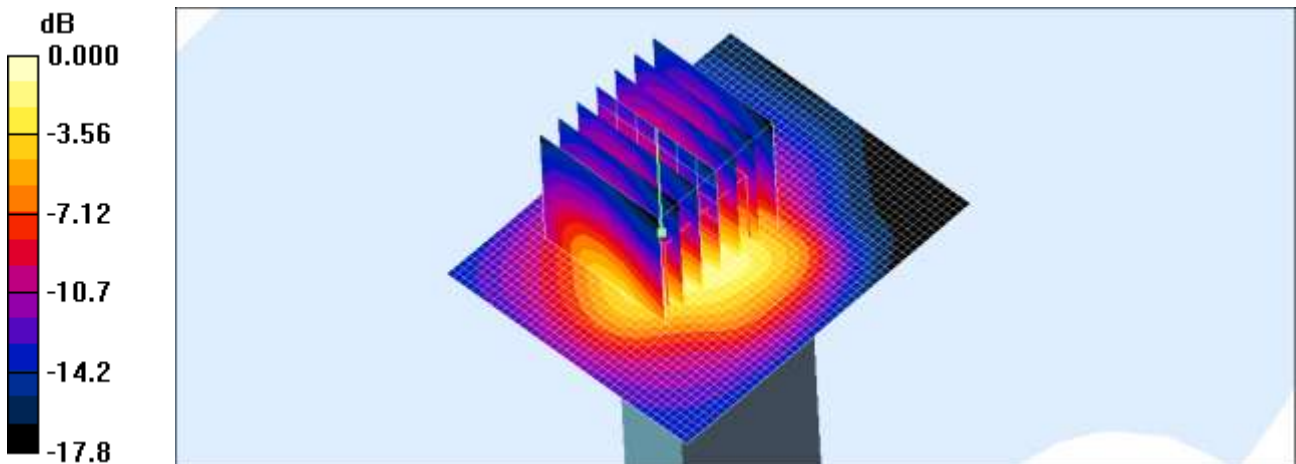
Reference Value = 12.4 V/m; Power Drift = 0.088 dB

Peak SAR (extrapolated) = 0.584 W/kg

SAR(1 g) = 0.317 mW/g; SAR(10 g) = 0.157 mW/g

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

Maximum value of SAR (measured) = 0.380 mW/g



0 dB = 0.380mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Body Top QPSK 5MHz 1RB 0 offset 26365/Area Scan (41x51x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.576 mW/g

Body Top QPSK 5MHz 1RB 0 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

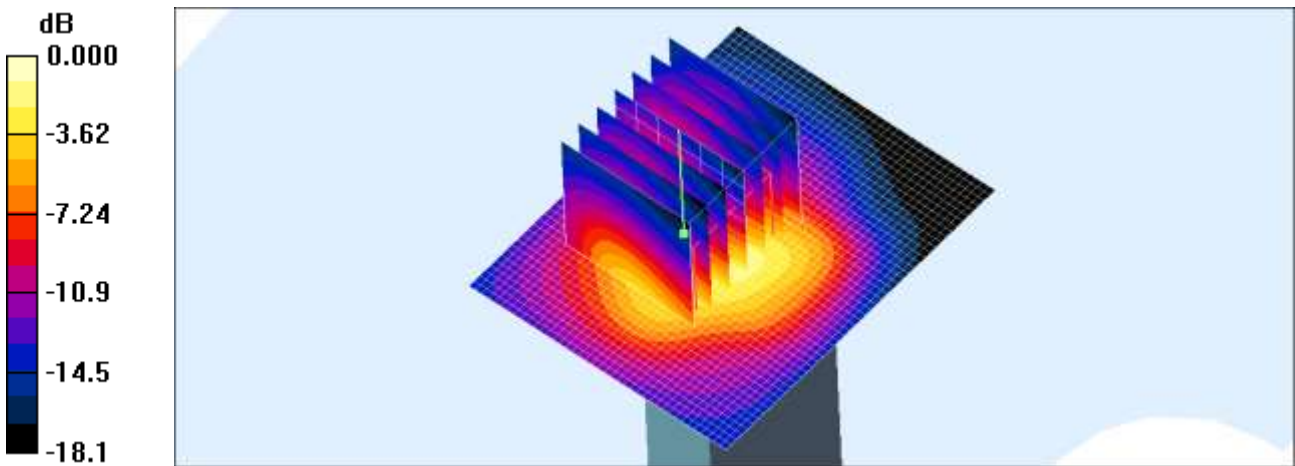
Reference Value = 15.8 V/m; Power Drift = 0.132 dB

Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.544 mW/g; SAR(10 g) = 0.262 mW/g

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

Maximum value of SAR (measured) = 0.664 mW/g



0 dB = 0.664mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Body Top QPSK 5MHz 1RB 24 offset 26365/Area Scan (41x51x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.349 mW/g

Body Top QPSK 5MHz 1RB 24 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

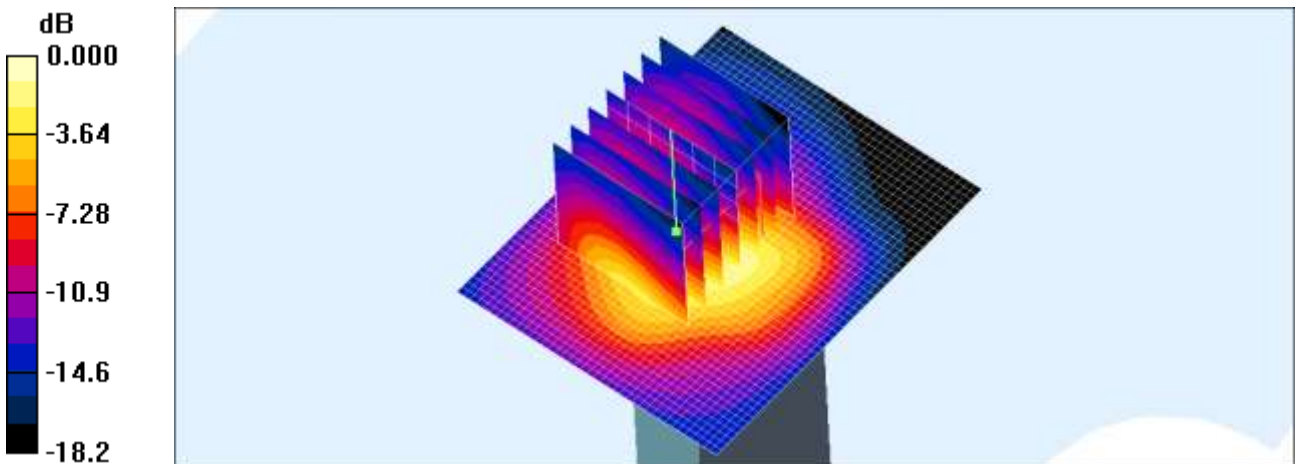
Reference Value = 11.9 V/m; Power Drift = 0.055 dB

Peak SAR (extrapolated) = 0.620 W/kg

SAR(1 g) = 0.320 mW/g; SAR(10 g) = 0.154 mW/g

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

Maximum value of SAR (measured) = 0.375 mW/g



0 dB = 0.375mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Up 16QAM 5MHz 12RB 6 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.797 mW/g

Horizontal Up 16QAM 5MHz 12RB 6 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

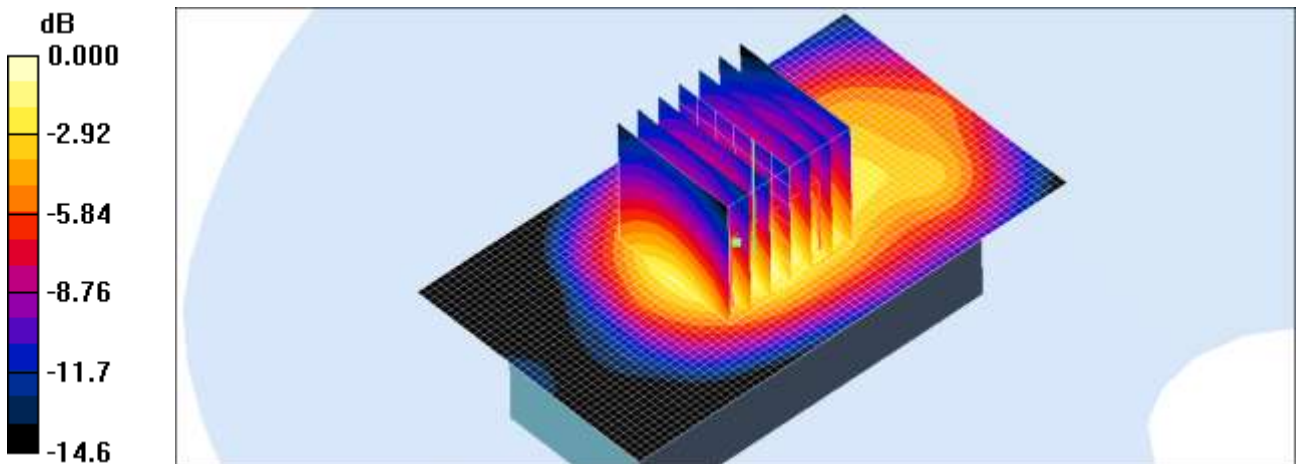
Reference Value = 17.8 V/m; Power Drift = -0.088 dB

Peak SAR (extrapolated) = 0.967 W/kg

SAR(1 g) = 0.656 mW/g; SAR(10 g) = 0.397 mW/g

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

Maximum value of SAR (measured) = 0.715 mW/g



0 dB = 0.715mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Up 16QAM 5MHz 1RB 0 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

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

Horizontal Up 16QAM 5MHz 1RB 0 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

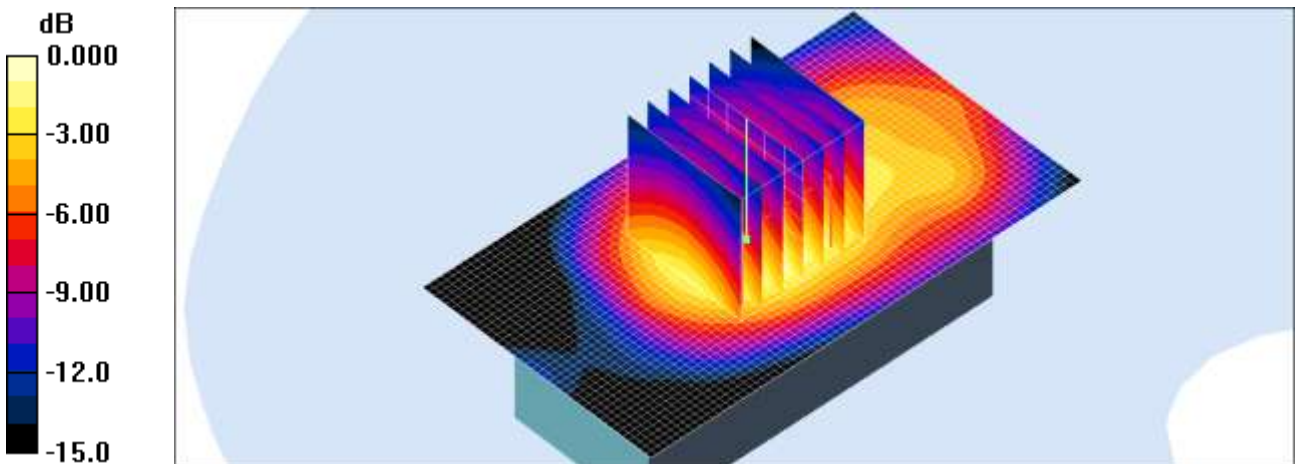
Reference Value = 22.6 V/m; Power Drift = 0.090 dB

Peak SAR (extrapolated) = 1.64 W/kg

SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.689 mW/g

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

Maximum value of SAR (measured) = 1.23 mW/g



0 dB = 1.23mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Up 16QAM 5MHz 1RB 24 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.794 mW/g

Horizontal Up 16QAM 5MHz 1RB 24 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

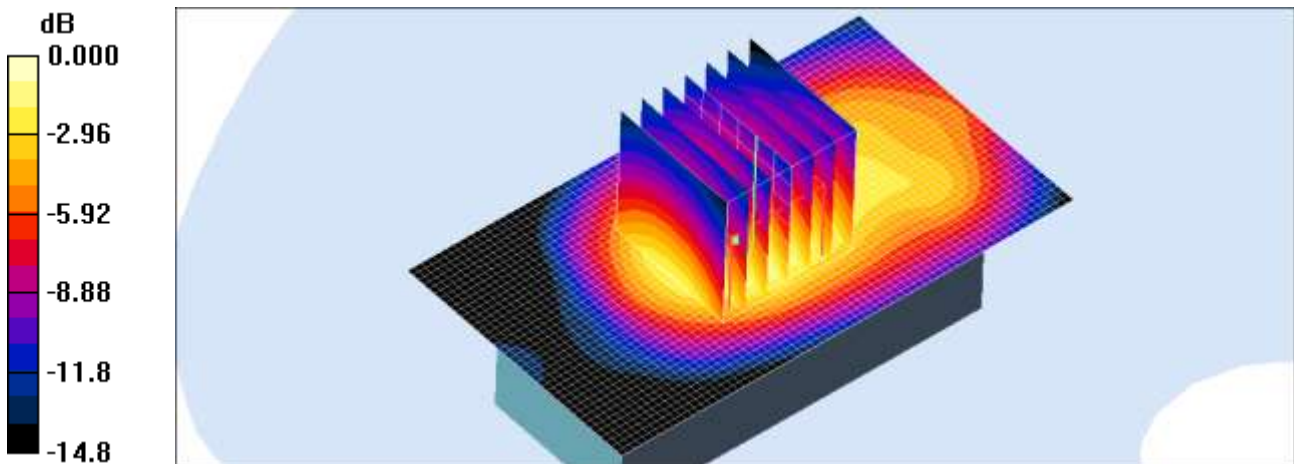
Reference Value = 17.7 V/m; Power Drift = 0.006 dB

Peak SAR (extrapolated) = 0.969 W/kg

SAR(1 g) = 0.665 mW/g; SAR(10 g) = 0.402 mW/g

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

Maximum value of SAR (measured) = 0.716 mW/g



0 dB = 0.716mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Down 16QAM 5MHz 12RB 6 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.341 mW/g

Horizontal Down 16QAM 5MHz 12RB 6 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

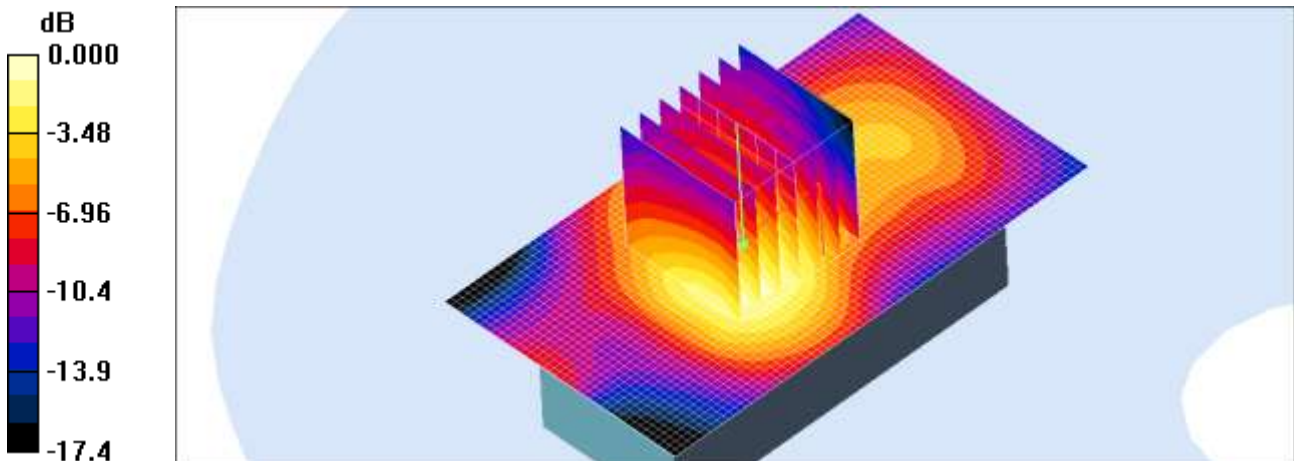
Reference Value = 7.45 V/m; Power Drift = -0.096 dB

Peak SAR (extrapolated) = 0.449 W/kg

SAR(1 g) = 0.303 mW/g; SAR(10 g) = 0.187 mW/g

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

Maximum value of SAR (measured) = 0.331 mW/g



0 dB = 0.331mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Down 16QAM 5MHz 1RB 0 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.617 mW/g

Horizontal Down 16QAM 5MHz 1RB 0 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

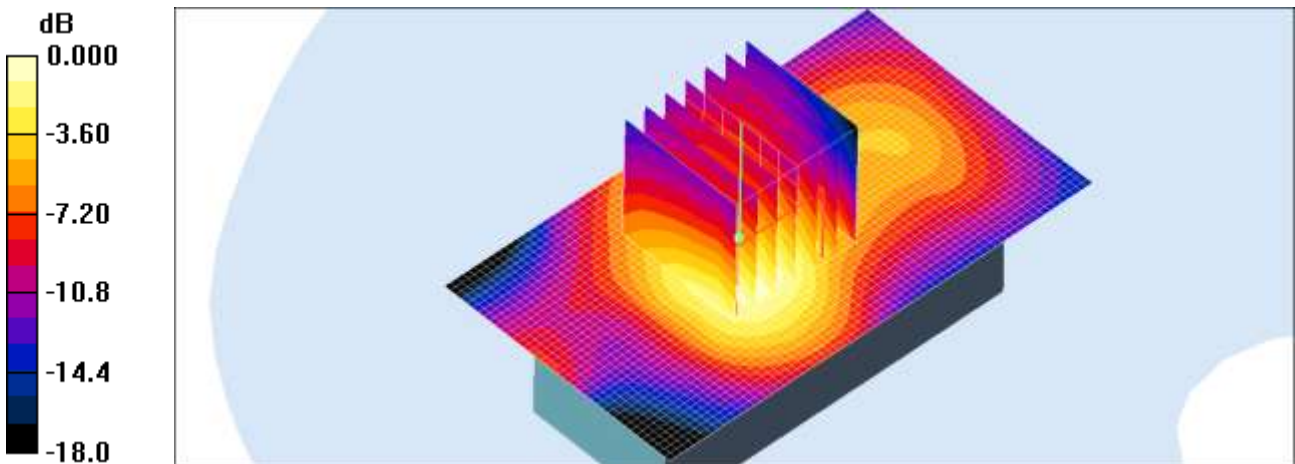
Reference Value = 9.78 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 0.811 W/kg

SAR(1 g) = 0.541 mW/g; SAR(10 g) = 0.336 mW/g

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

Maximum value of SAR (measured) = 0.606 mW/g



0 dB = 0.606mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Down 16QAM 5MHz 1RB 24 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.322 mW/g

Horizontal Down 16QAM 5MHz 1RB 24 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

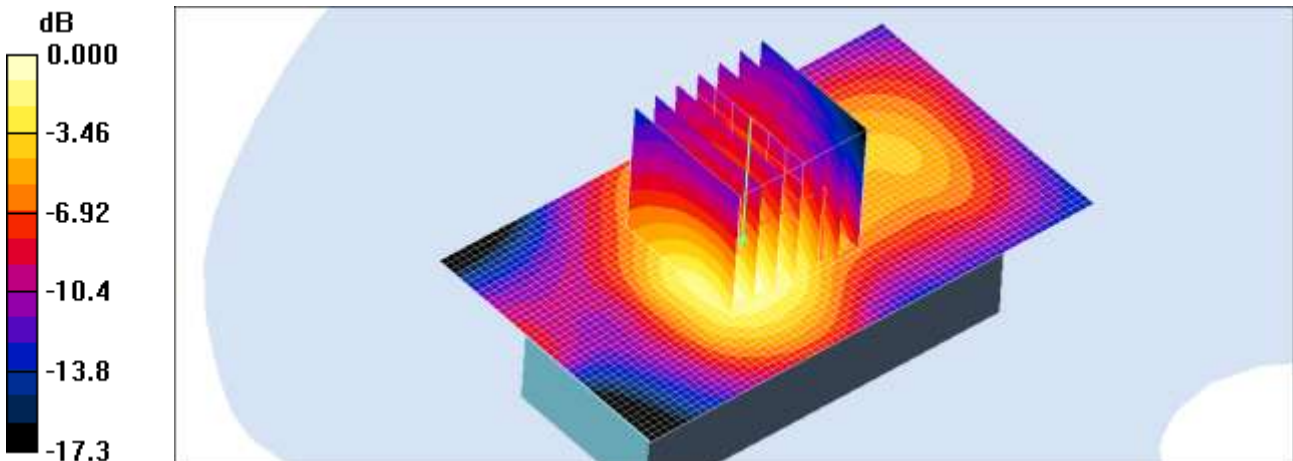
Reference Value = 7.43 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 0.456 W/kg

SAR(1 g) = 0.307 mW/g; SAR(10 g) = 0.189 mW/g

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

Maximum value of SAR (measured) = 0.333 mW/g



0 dB = 0.333mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Dongle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Front 16QAM 5MHz 12RB 6 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.433 mW/g

Vertical Front 16QAM 5MHz 12RB 6 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

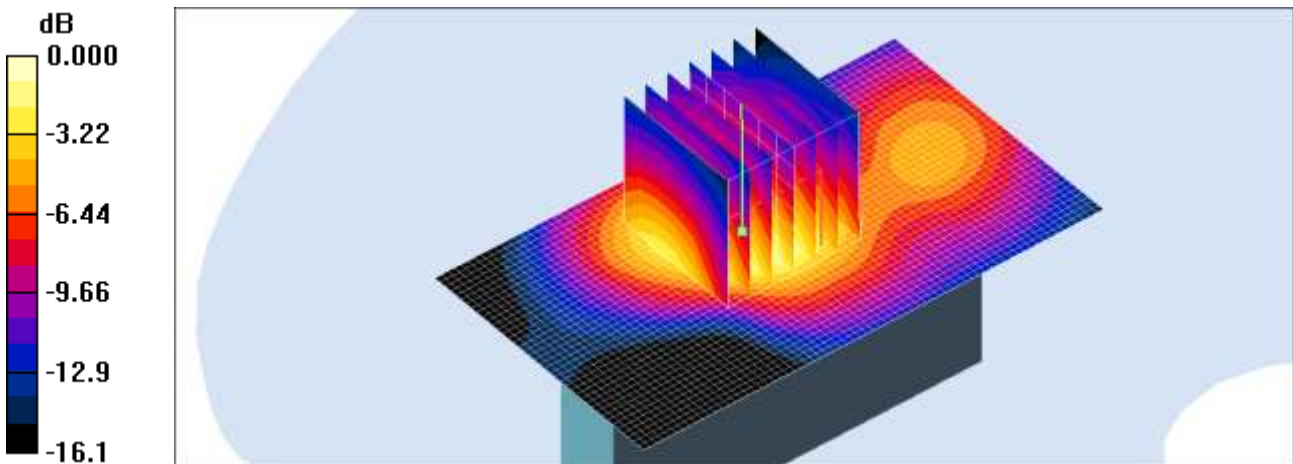
Reference Value = 10.5 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 0.523 W/kg

SAR(1 g) = 0.347 mW/g; SAR(10 g) = 0.197 mW/g

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

Maximum value of SAR (measured) = 0.378 mW/g



0 dB = 0.378mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Front 16QAM 5MHz 1RB 0 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.807 mW/g

Vertical Front 16QAM 5MHz 1RB 0 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

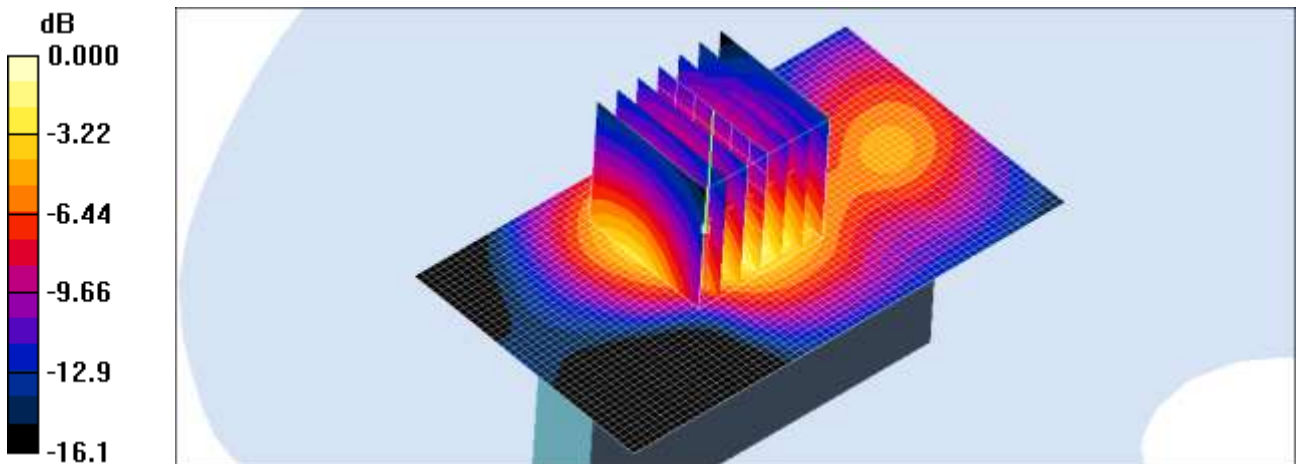
Reference Value = 13.7 V/m; Power Drift = -0.080 dB

Peak SAR (extrapolated) = 0.985 W/kg

SAR(1 g) = 0.637 mW/g; SAR(10 g) = 0.358 mW/g

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

Maximum value of SAR (measured) = 0.708 mW/g



0 dB = 0.708mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Front 16QAM 5MHz 1RB 24 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.421 mW/g

Vertical Front 16QAM 5MHz 1RB 24 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

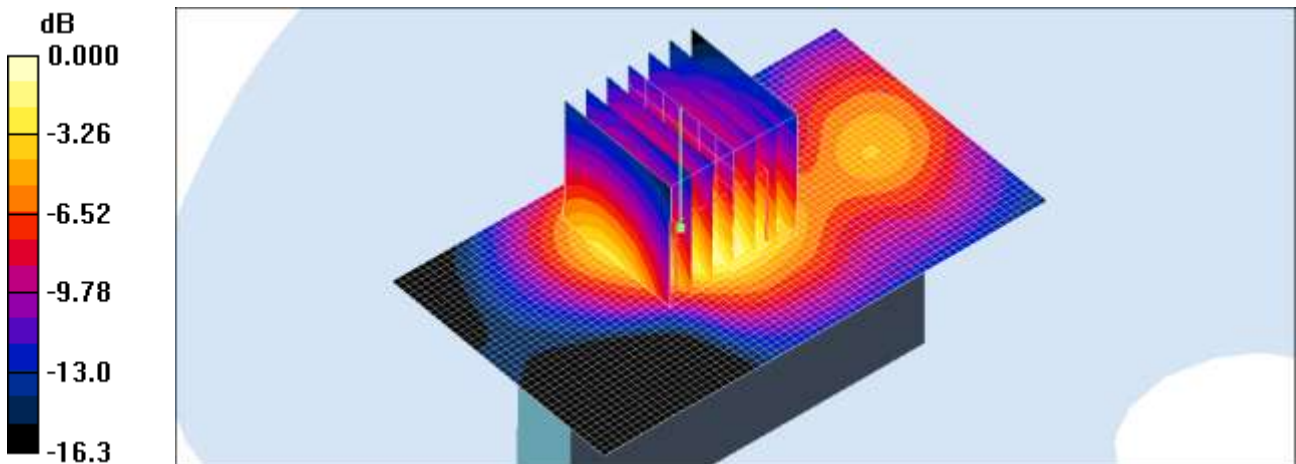
Reference Value = 10.3 V/m; Power Drift = 0.027 dB

Peak SAR (extrapolated) = 0.540 W/kg

SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.197 mW/g

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

Maximum value of SAR (measured) = 0.387 mW/g



0 dB = 0.387mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Dongle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Back 16QAM 5MHz 12RB 6 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.202 mW/g

Vertical Back 16QAM 5MHz 12RB 6 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

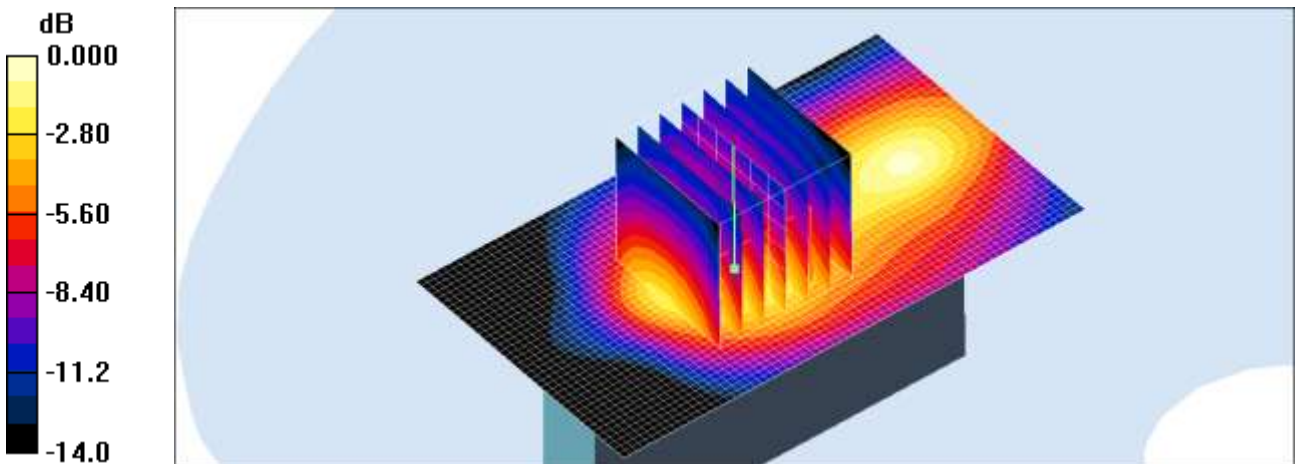
Reference Value = 9.71 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 0.269 W/kg

SAR(1 g) = 0.171 mW/g; SAR(10 g) = 0.098 mW/g

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

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



0 dB = 0.188mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Back 16QAM 5MHz 1RB 0 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.362 mW/g

Vertical Back 16QAM 5MHz 1RB 0 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

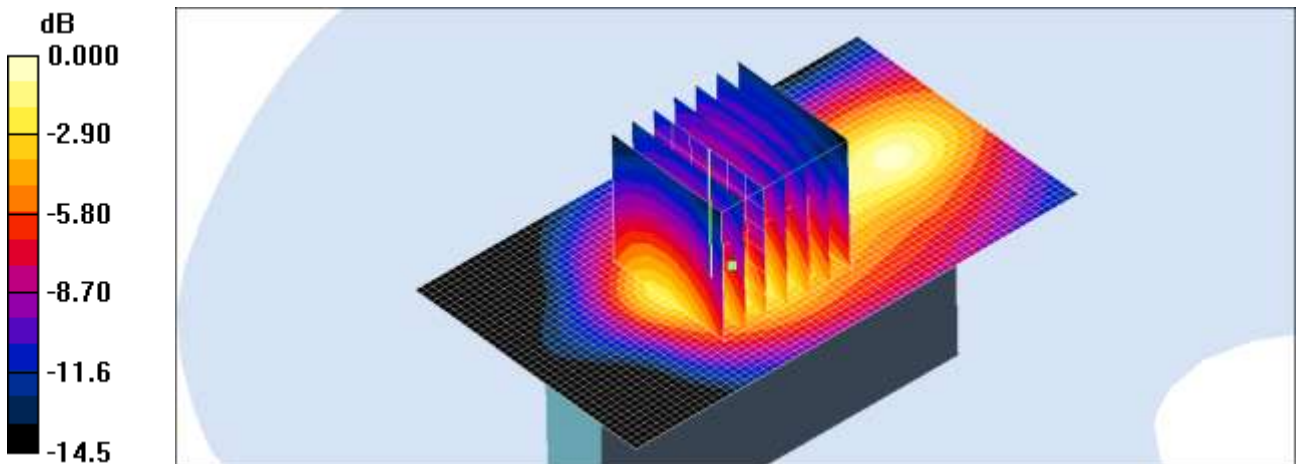
Reference Value = 12.9 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 0.454 W/kg

SAR(1 g) = 0.297 mW/g; SAR(10 g) = 0.171 mW/g

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

Maximum value of SAR (measured) = 0.331 mW/g



0 dB = 0.331mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Vertical Back 16QAM 5MHz 1RB 24 offset 26365/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.213 mW/g

Vertical Back 16QAM 5MHz 1RB 24 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

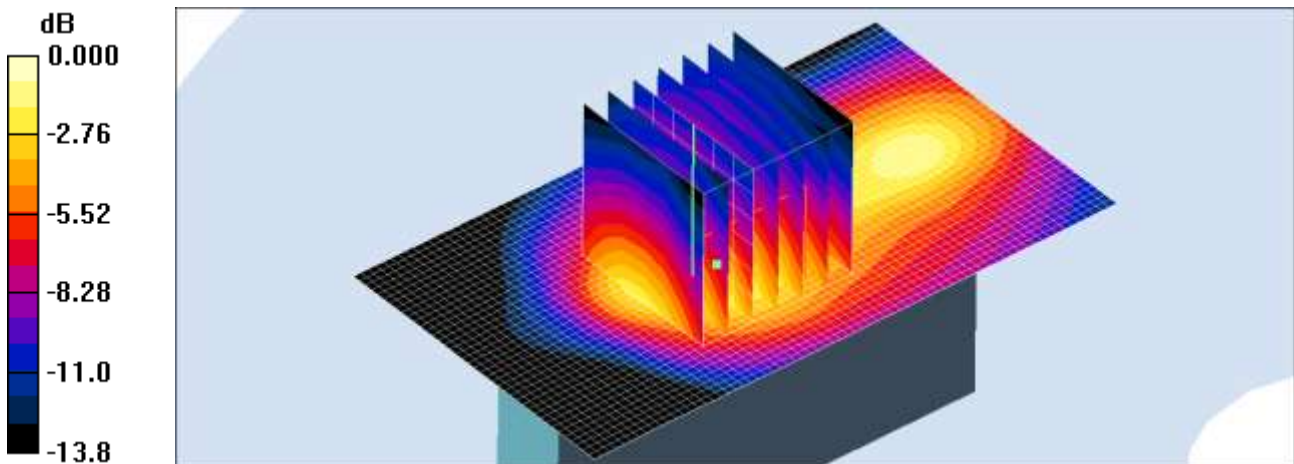
Reference Value = 9.59 V/m; Power Drift = 0.077 dB

Peak SAR (extrapolated) = 0.290 W/kg

SAR(1 g) = 0.180 mW/g; SAR(10 g) = 0.103 mW/g

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

Maximum value of SAR (measured) = 0.201 mW/g



0 dB = 0.201mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Body Top 16QAM 5MHz 12RB 6 offset 26365/Area Scan (41x51x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.268 mW/g

Body Top 16QAM 5MHz 12RB 6 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

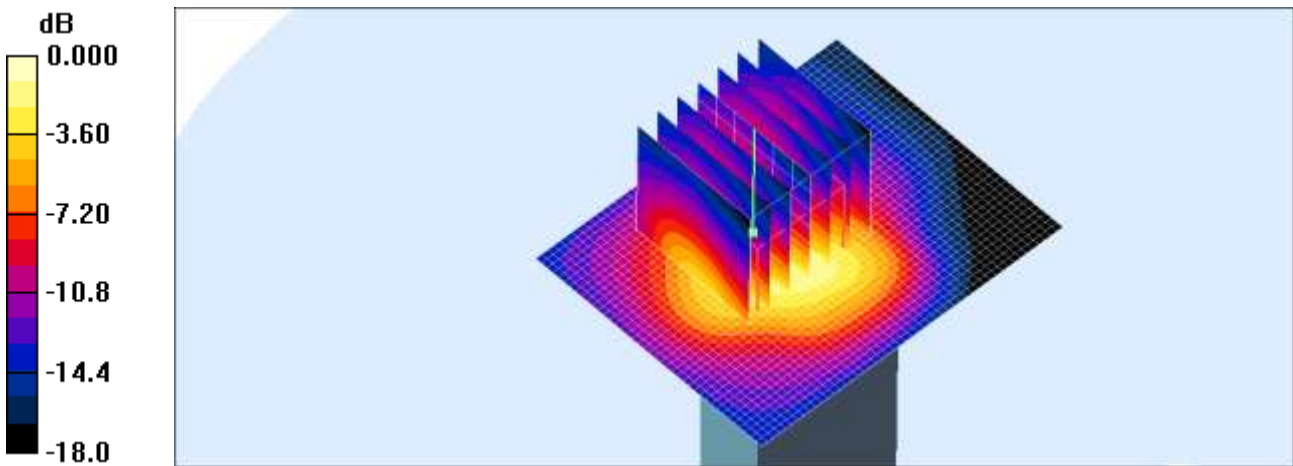
Reference Value = 10.9 V/m; Power Drift = -0.010 dB

Peak SAR (extrapolated) = 0.511 W/kg

SAR(1 g) = 0.260 mW/g; SAR(10 g) = 0.125 mW/g

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

Maximum value of SAR (measured) = 0.313 mW/g



0 dB = 0.313mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Body Top 16QAM 5MHz 1RB 0 offset 26365/Area Scan (41x51x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.473 mW/g

Body Top 16QAM 5MHz 1RB 0 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

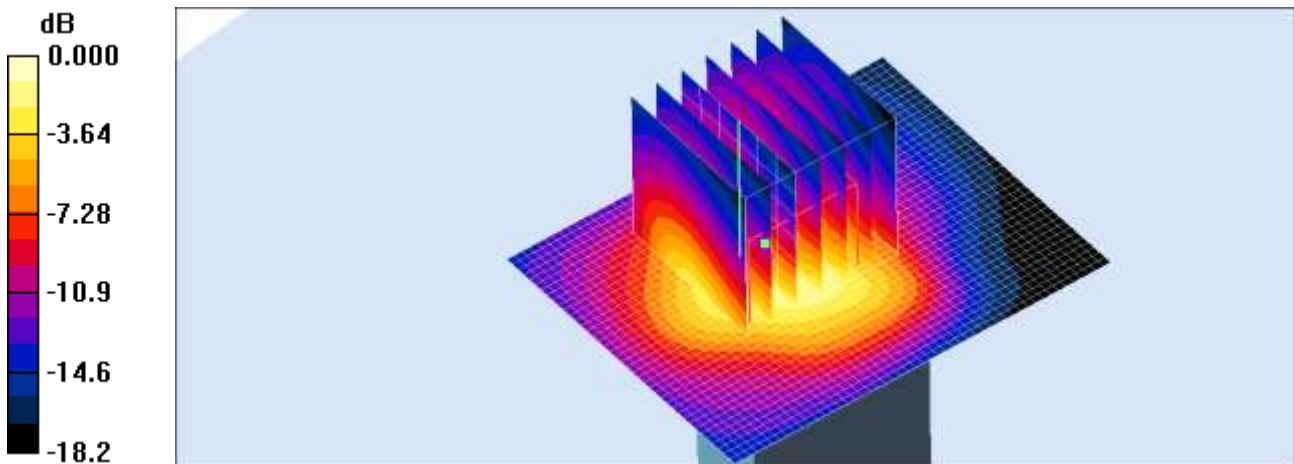
Reference Value = 14.9 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 0.863 W/kg

SAR(1 g) = 0.437 mW/g; SAR(10 g) = 0.210 mW/g

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

Maximum value of SAR (measured) = 0.525 mW/g



0 dB = 0.525mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Body Top 16QAM 5MHz 1RB 24 offset 26365/Area Scan (41x51x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.289 mW/g

Body Top 16QAM 5MHz 1RB 24 offset 26365/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

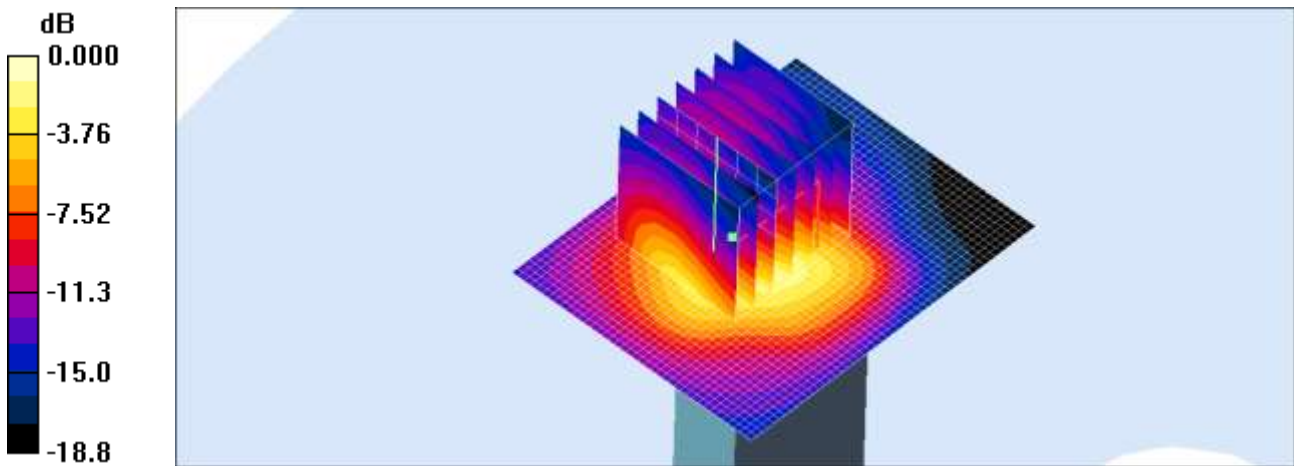
Reference Value = 11.1 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 0.549 W/kg

SAR(1 g) = 0.271 mW/g; SAR(10 g) = 0.129 mW/g

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

Maximum value of SAR (measured) = 0.322 mW/g



0 dB = 0.322mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
 Liquid Temperature: 21.3 °C
 Ambient Temperature: 21.5 °C
 Test Date: Jul. 30, 2012
 Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA800(BC10); Frequency: 823.1 MHz;Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 823.1$ MHz; $\sigma = 0.993$ mho/m; $\epsilon_r = 54.6$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
 - Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn869; Calibrated: 2011-09-22
 - Phantom: 1800/1900 Phantom; Type: SAM

BC10 EVDO Horizontal Up 684/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)
 Maximum value of SAR (interpolated) = 1.43 mW/g

BC10 EVDO Horizontal Up 684/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 31.1 V/m; Power Drift = 0.118 dB
 Peak SAR (extrapolated) = 1.89 W/kg
SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.846 mW/g

Info: [Interpolated medium parameters used for SAR evaluation.](#)
 Maximum value of SAR (measured) = 1.43 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
 Liquid Temperature: 21.3 °C
 Ambient Temperature: 21.5 °C
 Test Date: Jul. 30, 2012
 Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 824.7 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 825 \text{ MHz}$; $\sigma = 0.995 \text{ mho/m}$; $\epsilon_r = 54.5$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
 - Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn869; Calibrated: 2011-09-22
 - Phantom: 1800/1900 Phantom; Type: SAM

CDMA835 EVDO Horizontal Up 1013/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 1.49 mW/g

CDMA835 EVDO Horizontal Up 1013/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 31.9 V/m; Power Drift = -0.075 dB
 Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.867 mW/g
 Maximum value of SAR (measured) = 1.43 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 1, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Doggle; Serial: #1

Communication System: PCS 1900MHz FCC; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 835/900 Phantom ; Type: SAM

PCS1900 EVDO Horizontal Up 600/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.68 mW/g

PCS1900 EVDO Horizontal Up 600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.0 V/m; Power Drift = -0.048 dB
Peak SAR (extrapolated) = 2.06 W/kg
SAR(1 g) = 1.38 mW/g; SAR(10 g) = 0.800 mW/g
Maximum value of SAR (measured) = 1.54 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS CDMA & LTE USB Dongle with WLAN
Liquid Temperature: 21.3 °C
Ambient Temperature: 21.5 °C
Test Date: Aug. 8, 2012
Separation Distance: 5 mm

DUT: U772; Type: USB Dongle; Serial: #1

Communication System: LTE Band 25; Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1882.5$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: 800/900 Phantom; Type: SAM

Horizontal Up QPSK 5MHz 1RB 0 offset 26365ch/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

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

Horizontal Up QPSK 5MHz 1RB 0 offset 26365ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.9 V/m; Power Drift = -0.005 dB

Peak SAR (extrapolated) = 1.67 W/kg

SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.687 mW/g

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

Maximum value of SAR (measured) = 1.23 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: 21.3 °C
Test Date: Jul. 30, 2012

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:441

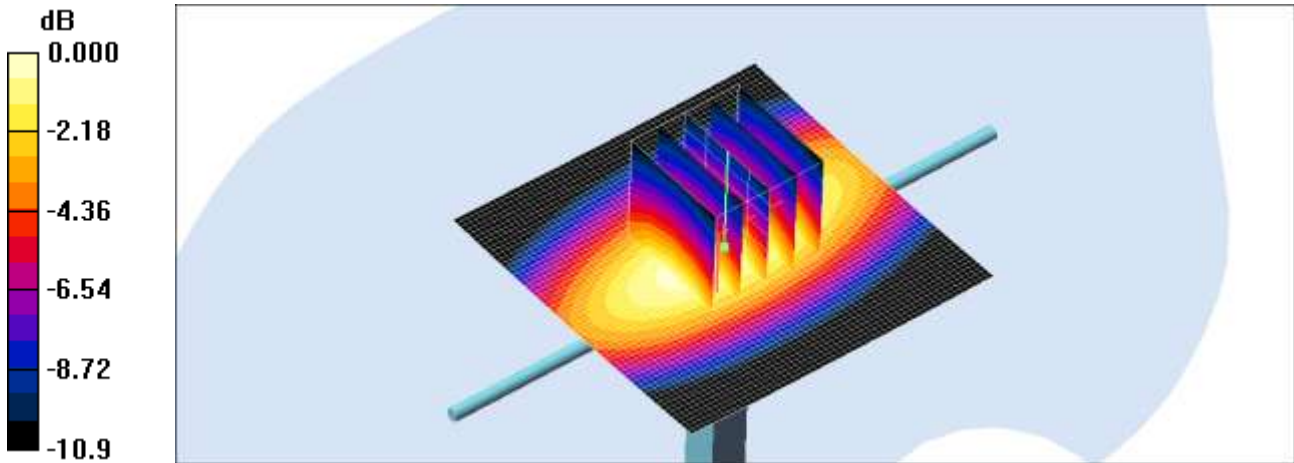
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 1.01 \text{ mho/m}$; $\epsilon_r = 54.5$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: SAM 1800/1900 MHz; Type: SAM

Validation 835MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.05 mW/g

Validation 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.6 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.966 mW/g; SAR(10 g) = 0.622 mW/g
Maximum value of SAR (measured) = 1.05 mW/g



0 dB = 1.05mW/g

■ Validation Data (1900 MHz Body)

Test Laboratory: HCT CO., LTD
 Input Power 100 mW (20 dBm)
 Liquid Temp: 21.3 °C
 Test Date: Aug. 01, 2012

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

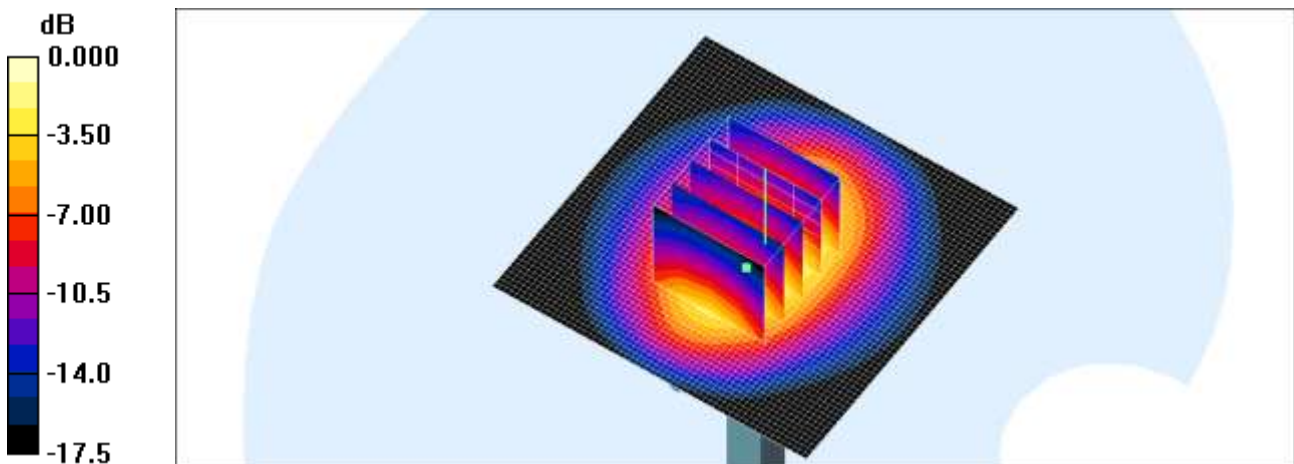
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 51.8$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: SAM 835/900 MHz; Type: SAM

Dipole 1900MHz Validation/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 4.53 mW/g

Dipole 1900MHz Validation/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 58.4 V/m; Power Drift = -0.018 dB
 Peak SAR (extrapolated) = 6.34 W/kg
SAR(1 g) = 4.05 mW/g; SAR(10 g) = 2.3 mW/g
 Maximum value of SAR (measured) = 4.50 mW/g



0 dB = 4.50mW/g

■ Validation Data (LTE 25 Body)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.3 °C
Test Date: Aug. 08, 2012

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

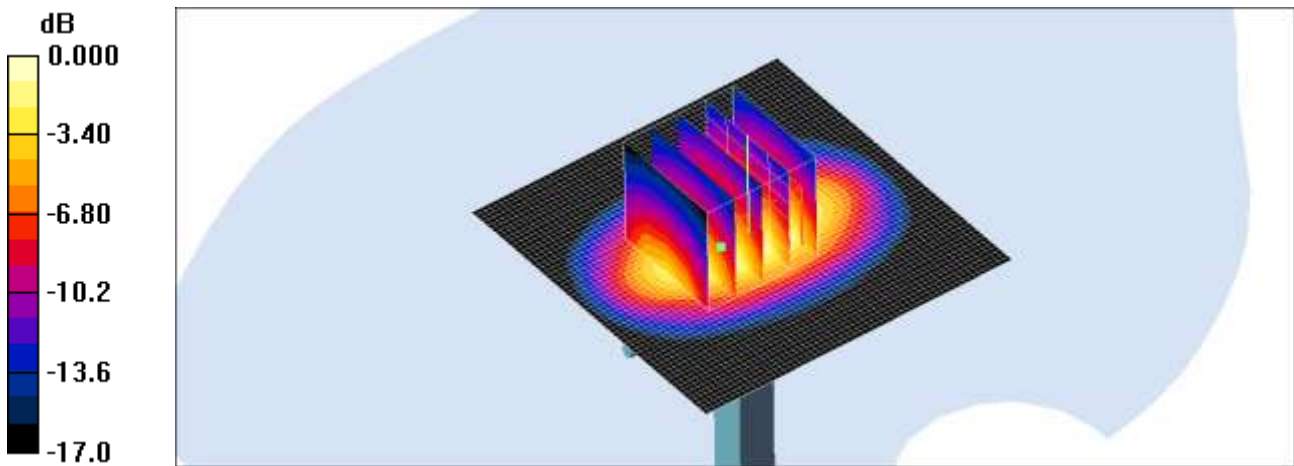
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1900$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2011-09-22
- Phantom: SAM 835/900 MHz; Type: SAM

Dipole 1900MHz Validation/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.58 mW/g

Dipole 1900MHz Validation/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 57.6 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 6.08 W/kg
SAR(1 g) = 3.86 mW/g; SAR(10 g) = 2.13 mW/g
Maximum value of SAR (measured) = 4.33 mW/g



0 dB = 4.33mW/g

■ Dielectric Parameter (835 MHz Body)

Title U772
SubTitle BC10 / CDMA835(Body)
Test Date Jul. 30, 2012

Frequency	e'	e''
800000000.0000	54.5544	21.6879
805000000.0000	54.5698	21.6877
810000000.0000	54.5662	21.6486
815000000.0000	54.5236	21.6406
820000000.0000	54.5618	21.6819
825000000.0000	54.5497	21.6904
830000000.0000	54.4821	21.6967
835000000.0000	54.4948	21.7068
840000000.0000	54.4397	21.7250
845000000.0000	54.3694	21.7433
850000000.0000	54.2933	21.7420
855000000.0000	54.2190	21.7130
860000000.0000	54.1115	21.6645
865000000.0000	54.0551	21.6191
870000000.0000	53.9380	21.5813
875000000.0000	53.8706	21.5574
880000000.0000	53.8164	21.4543
885000000.0000	53.8192	21.4150
890000000.0000	53.7714	21.3532
895000000.0000	53.7355	21.2663
900000000.0000	53.6900	21.2206

■ Dielectric Parameter (1900 MHz Body)

Title U772
 SubTitle PCS1900 (Body)
 Test Date Aug. 01, 2012

Frequency	e'	e''
1850000000.0000	52.1409	14.2795
1855000000.0000	52.1173	14.2973
1860000000.0000	52.0819	14.2969
1865000000.0000	52.0909	14.3508
1870000000.0000	52.0424	14.3549
1875000000.0000	52.0046	14.3462
1880000000.0000	51.9847	14.3290
1885000000.0000	51.9351	14.3062
1890000000.0000	51.8787	14.3397
1895000000.0000	51.8385	14.3626
1900000000.0000	51.8122	14.3446
1905000000.0000	51.7928	14.4136
1910000000.0000	51.7729	14.4615
1915000000.0000	51.7716	14.5214
1920000000.0000	51.7608	14.5899
1925000000.0000	51.7905	14.6075
1930000000.0000	51.8195	14.6434
1935000000.0000	51.8379	14.6710
1940000000.0000	51.8378	14.7012
1945000000.0000	51.8909	14.7147
1950000000.0000	51.9335	14.7124

■ Dielectric Parameter (LTE Band 25 Body)

Title U772
SubTitle LTE Band 25 (Body)
Test Date Aug. 08, 2012

Frequency	e'	e''
1850000000.0000	52.1817	14.2727
1855000000.0000	52.1525	14.2882
1860000000.0000	52.1375	14.2949
1865000000.0000	52.1208	14.3317
1870000000.0000	52.0384	14.3585
1875000000.0000	51.9990	14.3439
1880000000.0000	51.9881	14.3368
1885000000.0000	51.9258	14.3038
1890000000.0000	51.8637	14.3388
1895000000.0000	51.8154	14.3688
1900000000.0000	51.7915	14.3774
1905000000.0000	51.7326	14.4102
1910000000.0000	51.7450	14.4900
1915000000.0000	51.7435	14.5180
1920000000.0000	51.7551	14.5914
1925000000.0000	51.7576	14.6265
1930000000.0000	51.8003	14.6537
1935000000.0000	51.8532	14.6642
1940000000.0000	51.8298	14.7121
1945000000.0000	51.8980	14.7224
1950000000.0000	51.9270	14.6898

Attachment 3. – Probe Calibration Data

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



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

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

Accreditation No.: **SCS 108**

Client **HCT (Dymstec)**

Certificate No: **ET3-1605_Apr12**

CALIBRATION CERTIFICATE

Object: **ET3DV6 - SN:1805**

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

Calibration date: **April 26, 2012**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3813	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	10-Jan-12 (No. DAE4-660_Jan12)	Jan-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Jeton Kastati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 26, 2012

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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



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

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: SCS 108

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Glossary:

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

Calibration is Performed According to the Following Standards:

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

ET3DV6 - SN:1605

April 26, 2012

Probe ET3DV6

SN:1605

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

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

ET3DV6- SN:1605

April 26, 2012

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

Basic Calibration Parameters

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

Modulation Calibration Parameters

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

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

^a The uncertainties of NormX,Y,Z do not affect the E²-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:1605

April 26, 2012

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

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^c	Relative Permittivity ^f	Conductivity (Sim) ^f	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	7.03	7.03	7.03	0.25	3.00	± 12.0 %
835	41.5	0.90	6.64	6.64	6.64	0.29	3.00	± 12.0 %
900	41.5	0.97	6.52	6.52	6.52	0.23	3.00	± 12.0 %
1450	40.5	1.20	5.73	5.73	5.73	0.77	2.20	± 12.0 %
1750	40.1	1.37	5.51	5.51	5.51	0.80	1.78	± 12.0 %
1900	40.0	1.40	5.26	5.26	5.26	0.80	1.91	± 12.0 %
1950	40.0	1.40	5.08	5.08	5.08	0.60	1.62	± 12.0 %
2450	39.2	1.80	4.59	4.59	4.59	0.80	2.02	± 12.0 %

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

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

ET3DV6-- SN:1605

April 26, 2012

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

Calibration Parameter Determined in Body Tissue Simulating Media

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

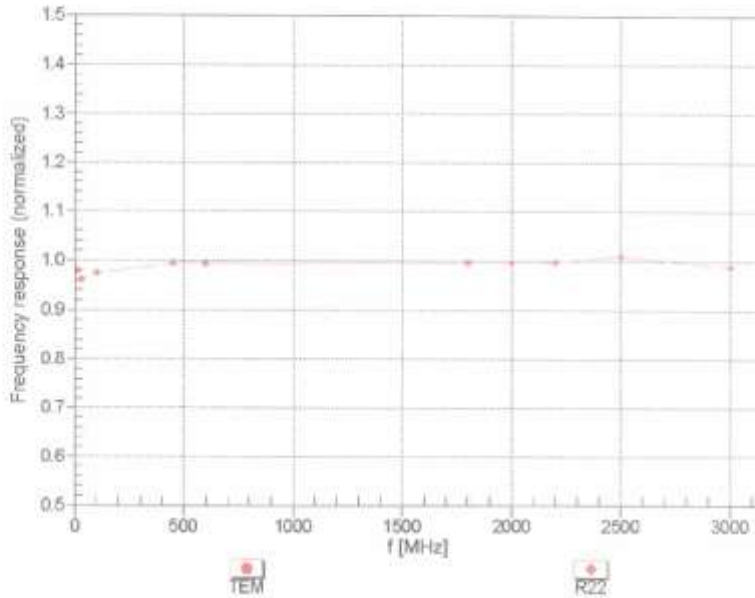
^c Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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

ET3DV6-SN:1605

April 26, 2012

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

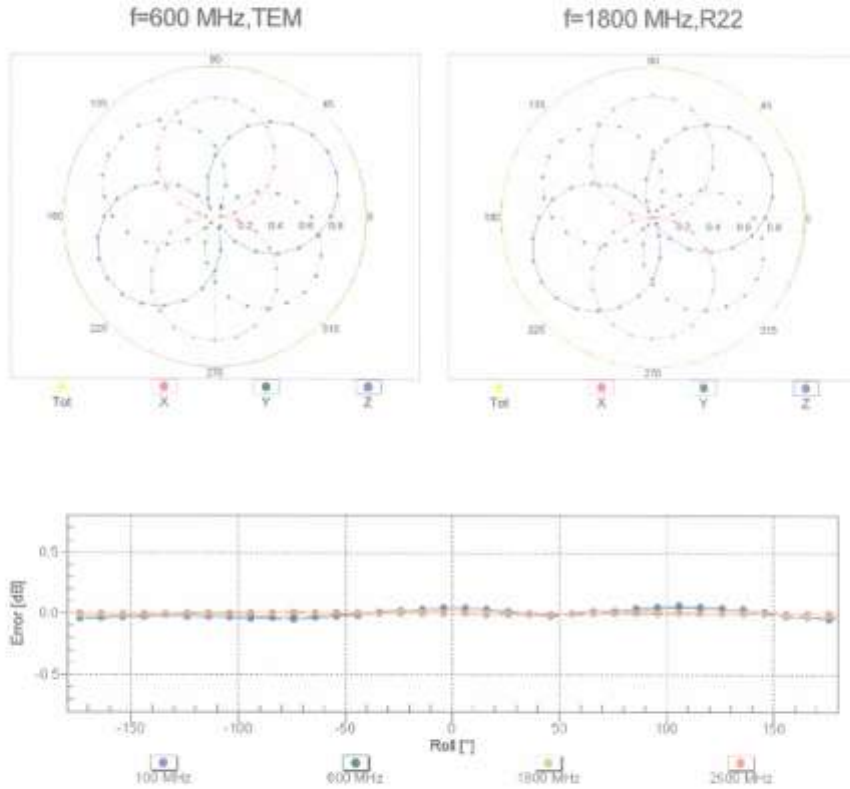


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

ET3DV6-SN:1605

April 26, 2012

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

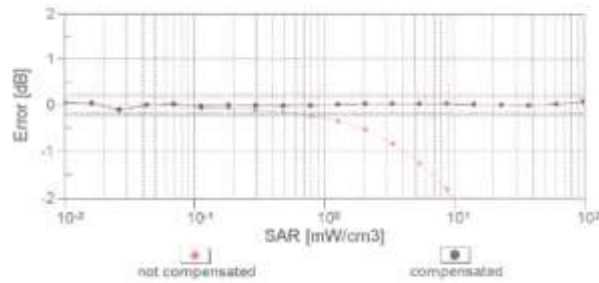
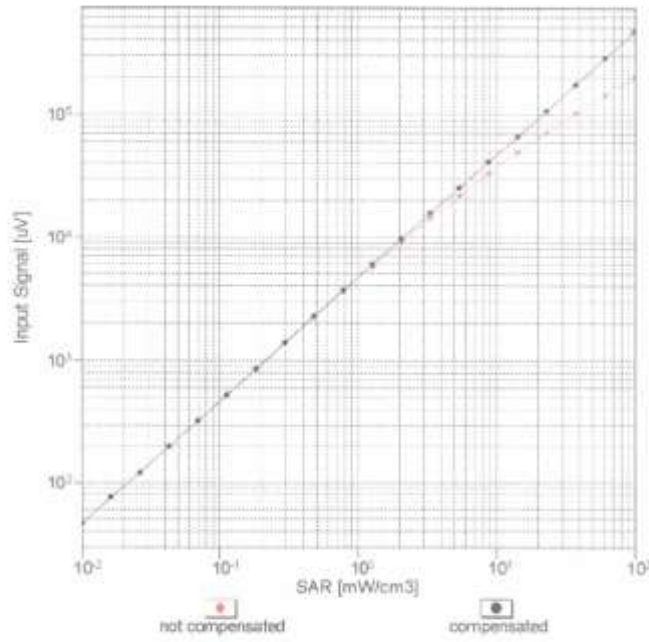


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

ET3DV6- SN:1605

April 26, 2012

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)

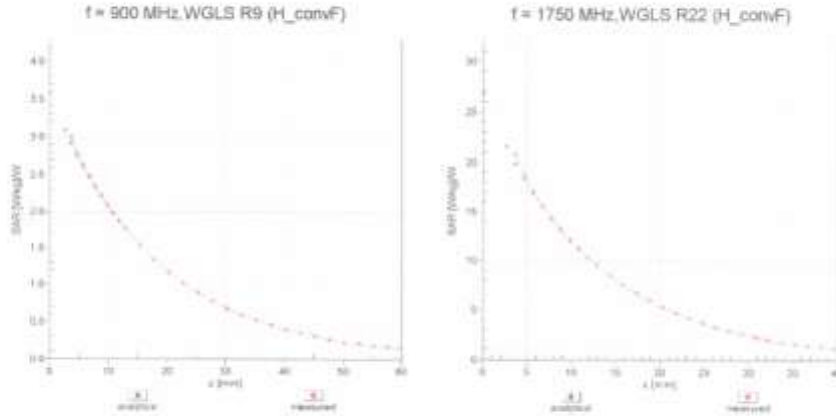


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

ET3DV6- SN:1605

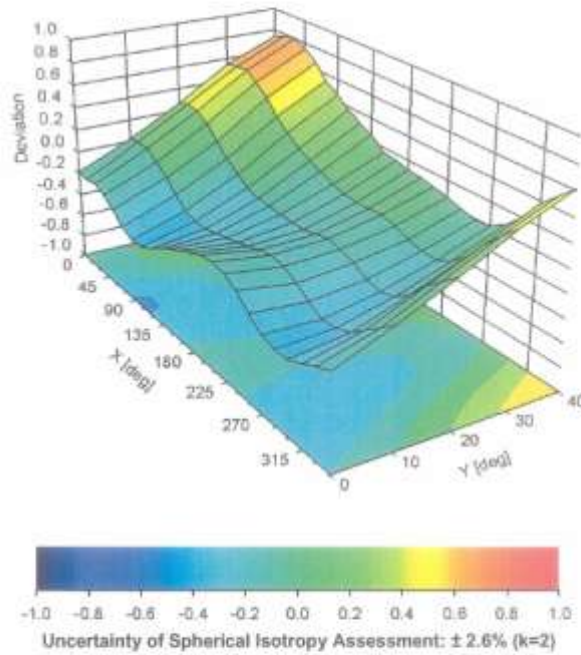
April 26, 2012

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, θ), $f = 900$ MHz



ET3DV6 - SN:1605

April 26, 2012

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

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

Attachment 4. – Dipole Calibration Data

**Calibration Laboratory of
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Accreditation No.: SCS 108

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 ± 3)°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

	Name	Function	Signature
Calibrated by:	Israa El-Naouq	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 16, 2012

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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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 ± 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 ± 0.2) °C	40.6 ± 6 %	0.89 mho/m ± 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 ± 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 ± 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 ± 0.2) °C	54.3 ± 6 %	1.00 mho/m ± 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 ± 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 ± 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

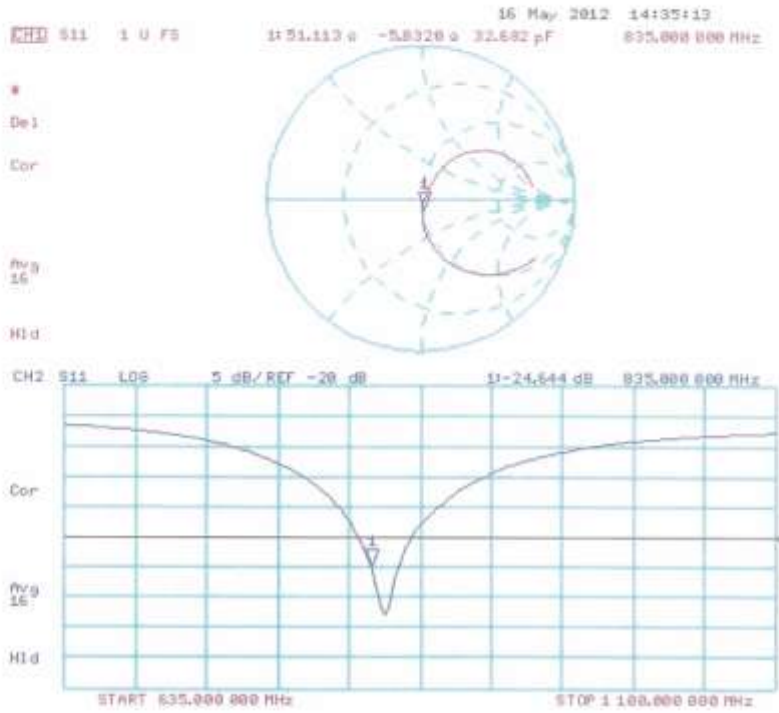
Peak SAR (extrapolated) = 3.474 mW/g

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:

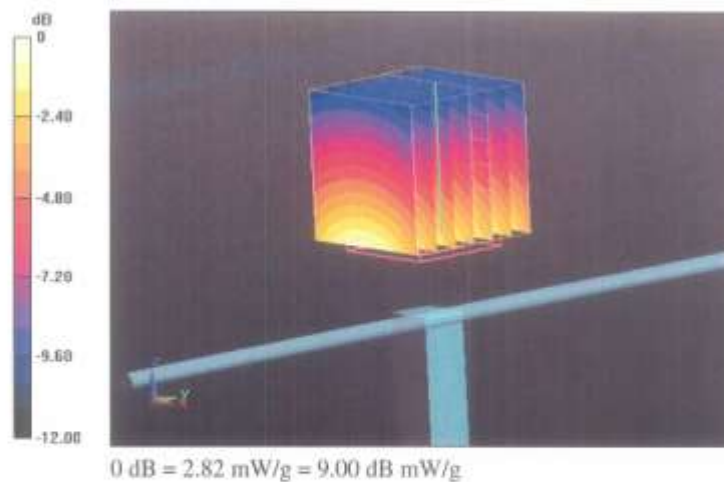
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.054 V/m; Power Drift = 0.03 dB

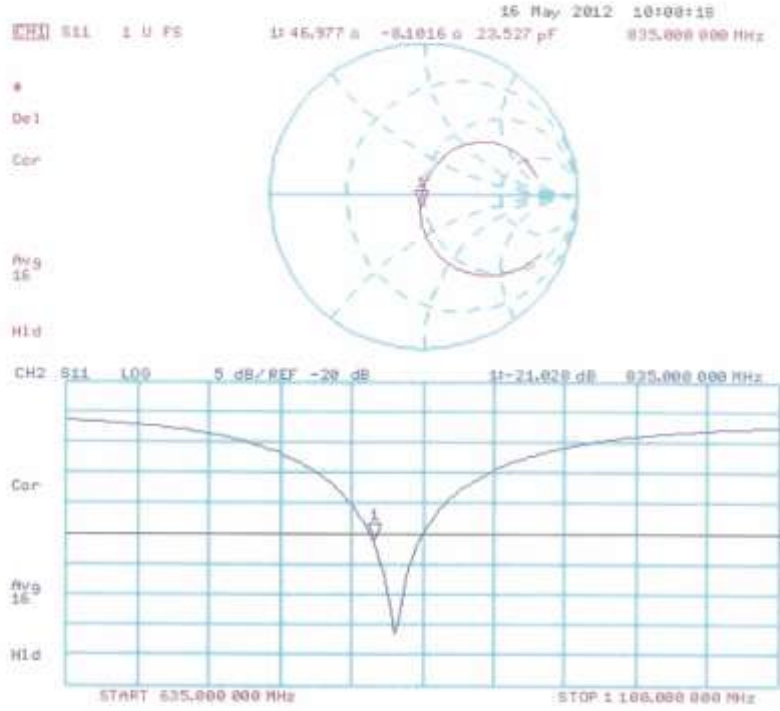
Peak SAR (extrapolated) = 3.533 mW/g

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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Accreditation No.: SCS 108

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 (MATE 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: 601	27-Jun-12 (No. DAE4-601_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	Signature
Approved by:	Kajla Pokovic	Technical Manager	

Issued: July 20, 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	V52.8.1
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 ± 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 ± 0.2) °C	39.9 ± 6 %	1.38 mho/m ± 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 ± 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 ± 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 ± 0.2) °C	52.6 ± 6 %	1.52 mho/m ± 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 ± 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 ± 16.5 % (k=2)

Appendix**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	50.0 Ω + 3.1 j Ω
Return Loss	- 30.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.2 Ω + 3.7 j Ω
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)

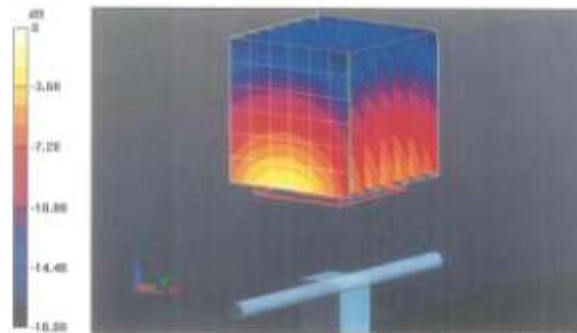
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 96.864 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 17.209 mW/g

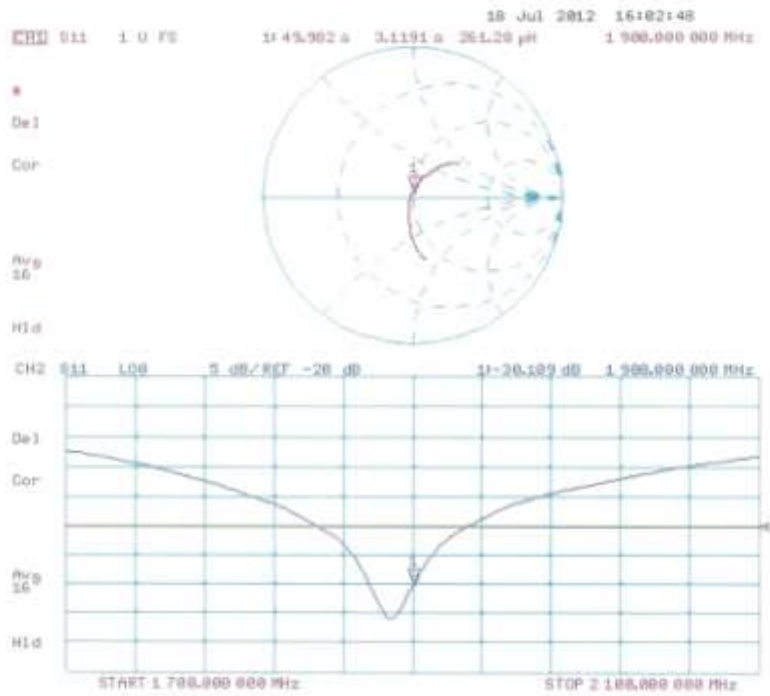
SAR(1 g) = 9.68 mW/g; SAR(10 g) = 5.11 mW/g

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:

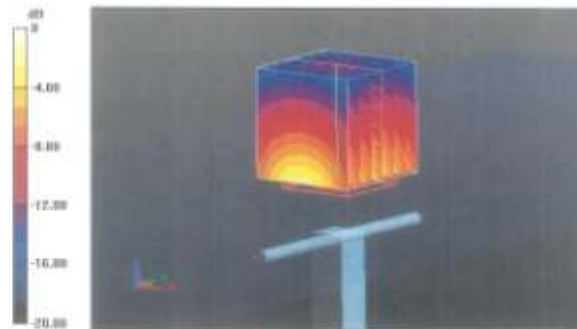
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

