

# A Test Lab Techno Corp.

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## SAR EVALUATION REPORT



Test Report No.	: 1408FS15
Applicant	: Sky Phone LLC
Product Type	: WCDMA Mobile Phone
Trade Name	: SKY DEVICE
Model Number	: SKY 5.0S
Date of Received	: Aug. 04, 2014
Test Period	: Aug. 11 ~ Aug. 15, 2014
Date of Issued	: Aug. 20, 2014
Test Environment	: Ambient Temperature : $22 \pm 2^{\circ} \text{C}$ Relative Humidity : 40 - 70 %
Standard	: KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03 KDB 865664 D02 RF Exposure Reporting v01r01 ANSI/IEEE C95.1-1999 IEEE Std. 1528-2013 IEEE Std. 1528a-2005 47 CFR Part §2.1093; KDB 447498 D01 KDB 248227 D01 KDB 941225 D01 / KDB 941225 D02 / KDB 941225 D03 KDB 941225 D06 KDB 648474 D03 / KDB 648474 D04
Test Lab Location	: Chang-an Lab



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Approved By : Bill Hu  
(Bill Hu)

Tested By : Sky Chou  
(Sky Chou)



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## 1. Summary of Maximum Reported SAR Value

Band	Max. Reported Head SAR1g(W/Kg)
GSM/GPRS 850	0.463
GSM/GPRS 1900	0.455
WCDMA Band II	0.320
WCDMA Band IV	0.259
WCDMA Band V	0.260
2.4G WLAN	1.013
Bluetooth	N/A
Simultaneous Transmission	1.552

Band	Max. Reported Body SAR1g(W/Kg)
GSM/GPRS 850	0.894
GSM/GPRS 1900	0.493
WCDMA Band II	0.383
WCDMA Band IV	0.386
WCDMA Band V	0.424
2.4G WLAN	0.175
Bluetooth	0.076
Simultaneous Transmission	1.104

Note: The SAR limit (Head & Body: SAR1g 1.6 W/kg) for general population / uncontrolled exposure is specified in ANSI/IEEE C95.1-1991.



## 2. Description of Equipment under Test (EUT)

Applicant	Sky Phone LLC	
Applicant Address	1348 Washington Av., Miami Beach	
Manufacture	Shenzhen Malata Mobile Communication CO.,LTD	
Manufacture Address	25/F, Malata Technology Building, NO9998 Shennan Rd., Hi-tech Park, Nanshan, Shenzhen, P.R. China 518057.	
Product Type	WCDMA Mobile Phone	
Trade Name	SKY DEVICE	
Model Number	SKY 5.0S	
FCC ID	2ABOSGCSKY50S	
IMEI No.	IMEI 1: 863772029997780, IMEI 2: 863772029998101	
RF Function	GSM/GPRS/EGPRS 850 GSM/GPRS/EGPRS 1900 WCDMA(RMC 12.2K) / HSDPA / HSUPA Band II WCDMA(RMC 12.2K) / HSDPA / HSUPA Band IV WCDMA(RMC 12.2K) / HSDPA / HSUPA Band V IEEE 802.11b / 802.11g / 802.11n (2.4GHz) 20MHz IEEE 802.11n (2.4GHz) 40MHz Bluetooth v3.0 Bluetooth v4.0 LE GPRS / EGPRS Multi Class: 12	
Tx Frequency	Band	Operate Frequency (MHz)
	GSM/GPRS/EGPRS 850	824.2 - 848.8
	GSM/GPRS/EGPRS 1900	1850.2 - 1909.8
	WCDMA(RMC 12.2K) / HSDPA / HSUPA Band II	1852.4 - 1907.6
	WCDMA (RMC 12.2K) / HSDPA / HSUPA Band IV	1712.4 -1752.6
	WCDMA (RMC 12.2K) / HSDPA / HSUPA Band V	826.4 - 846.6
	IEEE 802.11b / 802.11g / 802.11n (2.4GHz) 20MHz	2412 - 2462
	IEEE 802.11n (2.4GHz) 40MHz	2422 - 2452
	Bluetooth v3.0	2402 - 2480
	Bluetooth v4.0 LE	2402 - 2480
RF Conducted Power (Avg.)	Band	Power (W / dBm)
	GSM/GPRS/EGPRS 850	1.862 / 32.70
	GSM/GPRS/EGPRS 1900	0.912 / 29.60
	WCDMA(RMC 12.2K) / HSDPA / HSUPA Band II	0.183 / 22.62
	WCDMA (RMC 12.2K) / HSDPA / HSUPA Band IV	0.192 / 22.84
	WCDMA (RMC 12.2K) / HSDPA / HSUPA Band V	0.224 / 23.51
	IEEE 802.11b	0.037 / 15.71
	IEEE 802.11g	0.018 / 12.47
	IEEE 802.11n (2.4GHz) 20MHz	0.018 / 12.51
	IEEE 802.11n (2.4GHz) 40MHz	0.012 / 10.69
Bluetooth v3.0	0.002 / 3.25	
Bluetooth v4.0 LE	0.001 / -1.97	



Antenna Type	PIFA Antenna
Device Category	Portable Device (Production Unit)
RF Exposure Environment	General Population / Uncontrolled
Battery Option	Standard
	Trade Name: MALATA Model: M-BATX500 Spec: DC 3.8V / 2250mAh
Application Type	Certification

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment / general population exposure limits specified in Standard C95.1-1999 and had been tested in accordance with the measurement procedures specified in IEEE Std. 1528-2013 and IEEE Std. 1528a-2005.



### 3. Introduction

The A Test Lab Techno Corp. has performed measurements of the maximum potential exposure to the user of **Sky Phone LLC Trade Name : SKY DEVICE Model(s) : SKY 5.0S**. The test procedures, as described in American National Standards, Institute C95.1-1999 [ 1 ] , FCC/OET Bulletin 65 Supplement C [July 2001] were employed and they specify the maximum exposure limit of 1.6mW/g as averaged over any 1 gram of tissue for portable devices being used within 20cm between user and EUT in the uncontrolled environment. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the equipment used are included within this test report.

#### 3.1 SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative (rate) of the incremental energy (dw) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density ( $\rho$ ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Figure 2).

$$\text{SAR} = \frac{d}{dt} \left( \frac{dw}{dm} \right) = \frac{d}{dt} \left( \frac{dw}{\rho dv} \right)$$

Figure 2. SAR Mathematical Equation

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

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

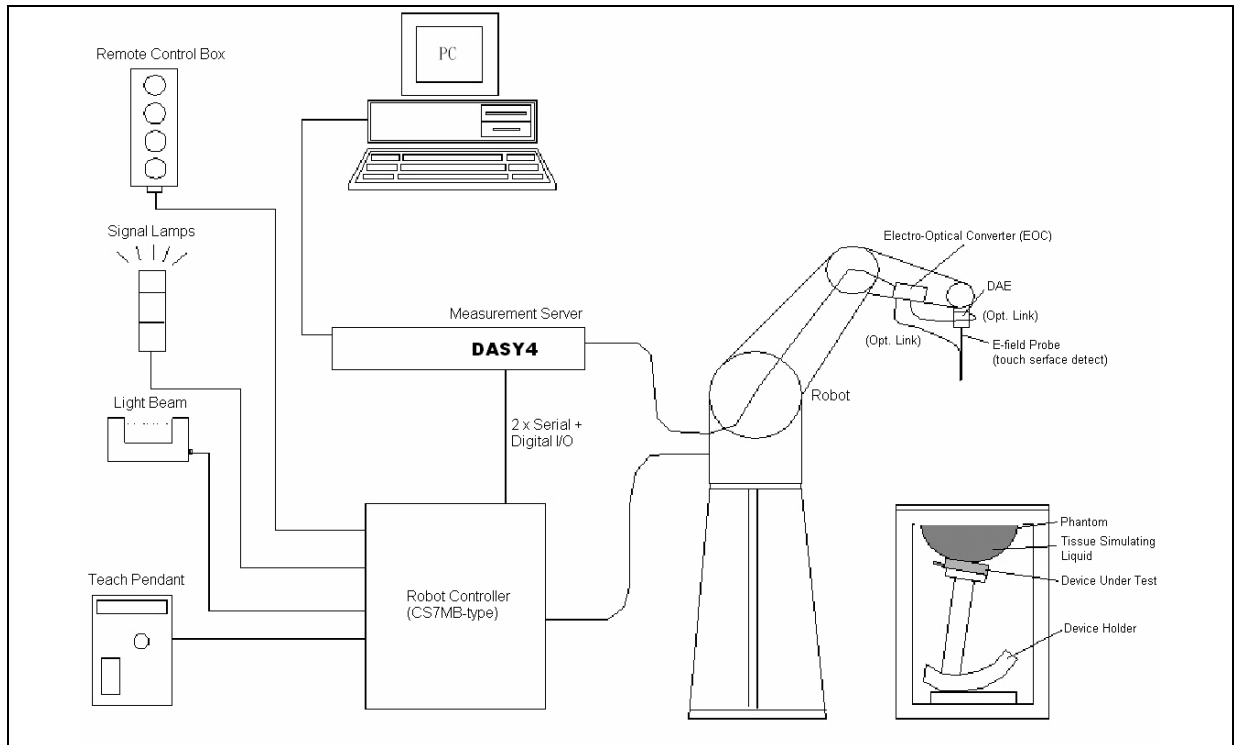
Where :

- $\sigma$  = conductivity of the tissue (S/m)
- $\rho$  = mass density of the tissue (kg/m<sup>3</sup>)
- $E$  = 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 ]

## 4. SAR Measurement Setup



The DASY4 system for performing compliance tests consists of the following items:

1. A standard high precision 6-axis robot (Stäubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
4. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
5. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
6. A computer operating Windows 2000 or Windows XP.
7. DASY4 software.
8. Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
9. The SAM twin phantom enabling testing left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. Validation dipole kits allowing validating the proper functioning of the system.





## 4.1 DASYS E-Field Probe System

The SAR measurements were conducted with the dosimetric probe (manufactured by SPEAG), designed in the classical triangular configuration [3] 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 multi-fiber 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 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 DASYS software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped when reaching the maximum.

#### 4.1.1 E-Field Probe Specification

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection System Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.q., glycol)
Calibration	In air from 10 MHz to 6 GHz In brain and muscle simulating tissue at frequencies of 835MHz, 1750MHz, 1900MHz and 2450MHz (accuracy $\pm 8\%$ ) Calibration for other liquids and frequencies upon request
Frequency	$\pm 0.2$ dB (30 MHz to 6 GHz)
Directivity	$\pm 0.3$ dB in brain tissue (rotation around probe axis) $\pm 0.5$ dB in brain tissue (rotation normal probe axis) Dynamic Range 10 $\mu$ W/g to > 100mW/g; Linearity: $\pm 0.2$ dB
Dimensions	Overall length: 337mm Tip length: 9mm Body diameter: 10mm Tip diameter: 2.5mm Distance from probe tip to dipole centers: 1.0mm
Application	General dosimetry up to 6GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms



Figure 3. E-field Probe



Figure 4. Probe setup on robot



#### 4.1.2 E-Field Probe Calibration process

##### Dosimetric Assessment Procedure

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm<sup>2</sup>) using an RF Signal generator, TEM cell, and RF Power Meter.

##### Free Space Assessment

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies 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 rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm<sup>2</sup>.

##### Temperature Assessment

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

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

Where :

$\Delta t$  = Exposure time (30 seconds),

C = Heat capacity of tissue (head or body),

$\Delta T$  = Temperature increase due to RF exposure.

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

Where :

$\sigma$  = Simulated tissue conductivity,

$\rho$  = Tissue density (kg/m<sup>3</sup>).



## 4.2 Data Acquisition Electronic (DAE) System

### Cell Controller

Processor : Intel Pentium 4  
Clock Speed : 2.4GHz  
Operating System : Windows XP Professional

### Data Converter

Features : Signal Amplifier, multiplexer, A/D converter, and control logic  
Software : DASY4 v4.7 (Build 80) & SEMCAD v1.8 (Build 186)  
Connecting Lines : Optical downlink for data and status info  
Optical uplink for commands and clock

## 4.3 Robot

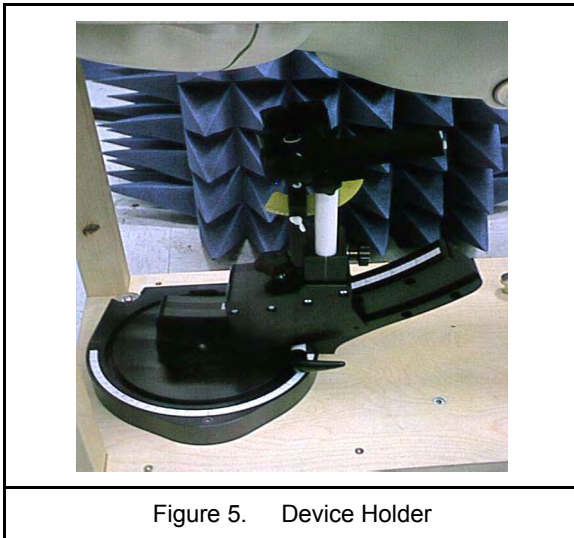
Positioner : Stäubli Unimation Corp. Robot Model: RX90L  
Repeatability :  $\pm 0.025$  mm  
No. of Axis : 6

## 4.4 Measurement Server

Processor : PC/104 with a 166MHz low-power Pentium  
I/O-board : Link to DAE4 (or DAE3)  
16-bit A/D converter for surface detection system  
Digital I/O interface  
Serial link to robot  
Direct emergency stop output for robot

#### 4.5 Device Holder

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity  $\epsilon=3$  and loss tangent  $\delta=0.02$ . The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.



#### 4.6 Phantom - SAM v4.0

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209. 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 manually teaching three points with the robot.

Shell Thickness	2 ±0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	1000x500 mm (LxW)
Table 1. Specification of SAM v4.0	



Figure 6. SAM Twin Phantom

## 4.7 Oval Flat Phantom - ELI 4.0

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (Oval Flat) phantom defined in IEEE 1528-2013, IEEE Std. 1528a-2005, CENELEC 50361 and IEC 62209. It enables the dosimetric evaluation of wireless portable device 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 manually teaching three points with the robot.

Shell Thickness	2 ±0.2 mm
Filling Volume	Approx. 30 liters
Dimensions	190×600×400 mm (H×L×W)
Table 2. Specification of ELI 4.0	

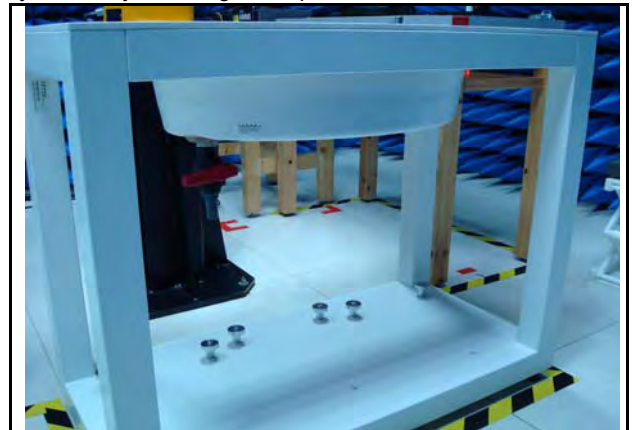


Figure 7. Oval Flat Phantom

## 4.8 Data Storage and Evaluation

### 4.8.1 Data Storage

The DASY software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension DA4 or DA5. The post processing software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of erroneous parameter settings. For example, if a measurement has been performed with an incorrect crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be reevaluated.



#### 4.8.2 Data Evaluation

The DASY post processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software :

- Probe parameters : - Sensitivity  $Norm_i, ai0, ai1, ai2$   
- Conversion factor  $ConvFi$   
- Diode compression point  $dcp_i$
- Device parameters : - Frequency  $f$   
- Crest factor  $cf$
- Media parameters : - Conductivity  $\sigma$   
- Density  $\rho$

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

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 as :

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

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



$$H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1}f + a_{i2}f^2}{f}$$

H-field probes :

- with  $V_i$  = compensated signal of channel i (i = x, y, z)  
*Normi* = sensor sensitivity of channel i (i = x, y, z)  
 $\mu V/(V/m)^2$  for E-field Probes  
*ConvF* = sensitivity enhancement in solution  
 $a_{ij}$  = sensor sensitivity factors for H-field probes  
 $f$  = carrier frequency [GHz]  
 $E_i$  = electric field strength of channel i in V/m  
 $H_i$  = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian 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 mW/g  
 $E_{tot}$  = total field strength in V/m  
 $\sigma$  = conductivity in [mho/m] or [Siemens/m]  
 $\rho$  = equivalent tissue density in g/cm<sup>3</sup>

\* Note : That the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

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

$$P_{pwe} = \frac{E_{tot}^2}{3770} \quad \text{or} \quad P_{pwe} = \frac{H_{tot}^2}{37.7}$$

- with  $P_{pwe}$  = equivalent power density of a plane wave in mW/cm<sup>2</sup>  
 $E_{tot}$  = total electric field strength in V/m  
 $H_{tot}$  = total magnetic field strength in A/m





## 5. Tissue Simulating Liquids

The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an E5071B Network Analyzer.

### IEEE SCC-34/SC-2 in 1528 recommended Tissue Dielectric Parameters

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in human head. Other head and body tissue parameters that have not been specified in 1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equation and extrapolated according to the head parameter specified in 1528.

Target Frequency	Head		Body	
(MHz)	$\epsilon_r$	$\sigma$ (S/m)	$\epsilon_r$	$\sigma$ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 - 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00
( $\epsilon_r$ = relative permittivity, $\sigma$ = conductivity and $\rho = 1000$ kg/m <sup>3</sup> )				

Table 3. Tissue dielectric parameters for head and body phantoms



## 5.1 Ingredients

The following ingredients are used:

- Water: deionized water (pure H<sub>2</sub>O), resistivity  $\geq 16 \text{ M } \Omega$  -as basis for the liquid
- Sugar: refined white sugar (typically 99.7 % sucrose, available as crystal sugar in food shops)  
-to reduce relative permittivity
- Salt: pure NaCl -to increase conductivity
- Cellulose: Hydroxyethyl-cellulose, medium viscosity (75-125 mPa.s, 2% in water, 20 °C), CAS # 54290 -to increase viscosity and to keep sugar in solution.
- Preservative: Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS # 55965-84-9 -to prevent the spread of bacteria and molds
- DGBE: Diethylenglycol-monobutyl ether (DGBE), Fluka Chemie GmbH, CAS # 112-34-5 -to reduce relative permittivity

## 5.2 Recipes

The following tables give the recipes for tissue simulating liquids to be used in different frequency bands.

Note: The goal dielectric parameters (at 22 °C) must be achieved within a tolerance of  $\pm 5\%$  for  $\epsilon$  and  $\pm 5\%$  for  $\sigma$ .

Ingredients (% by weight)	Frequency (MHz)											
	750		835		1750		1900		2450		2600	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	39.28	51.30	41.45	52.40	54.50	40.20	54.90	40.40	62.70	73.20	60.30	71.40
Salt (NaCl)	1.47	1.42	1.45	1.50	0.17	0.49	0.18	0.50	0.50	0.10	0.60	0.20
Sugar	58.15	46.18	56.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HEC	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bactericide	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Triton X-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DGBE	0.00	0.00	0.00	0.00	45.33	59.31	44.92	59.10	36.80	26.70	39.10	28.40
Dielectric Constant	41.88	54.60	42.54	56.10	40.10	53.60	39.90	54.00	39.80	52.50	39.80	52.50
Conductivity (S/m)	0.90	0.97	0.91	0.95	1.39	1.49	1.42	1.45	1.88	1.78	1.88	1.78

Salt: 99% Pure Sodium Chloride

Sugar: 98% Pure Sucrose

Water: De-ionized,  $16 \text{ M } \Omega$  resistivity

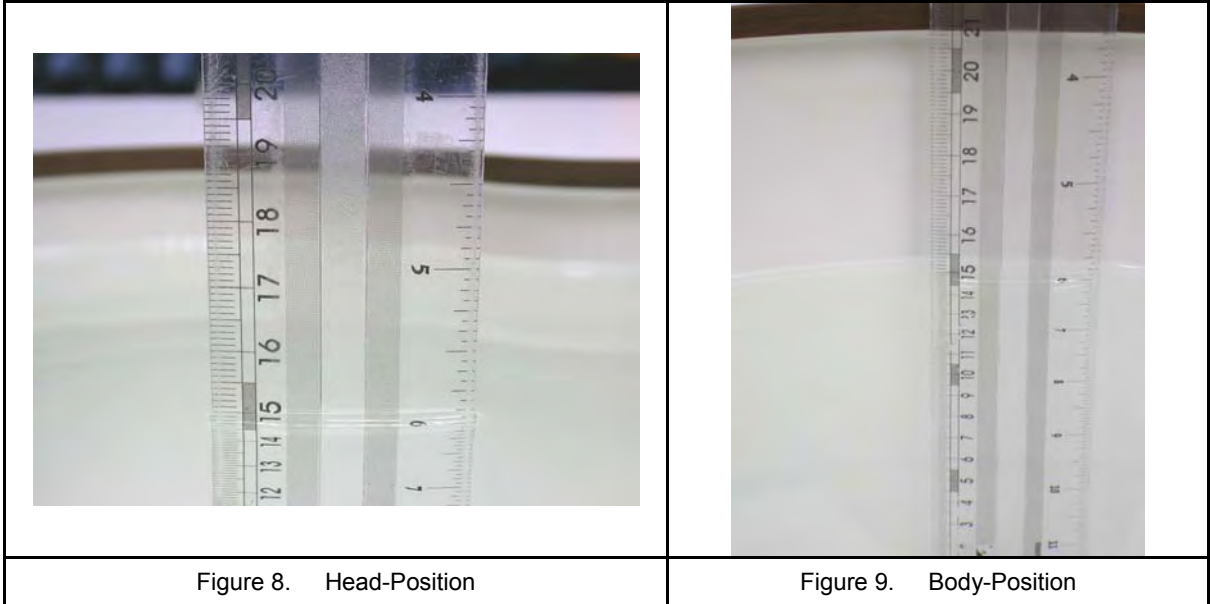
HEC: Hydroxyethyl Cellulose

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

### 5.3 Liquid Depth

According to KDB865664 ,the depth of tissue-equivalent liquid in a phantom must be  $\geq 15.0$  cm with  $\leq \pm 0.5$  cm variation for SAR measurements  $\leq 3$  GHz and  $\geq 10.0$  cm with  $\leq \pm 0.5$  cm variation for measurements  $> 3$  GHz.





## 6. SAR Testing with RF Transmitters

### 6.1 SAR Testing with GSM/GPRS Transmitters

Configure the basestation to support GMSK and 8PSK call respectively, and set timeslot transmission for GMSK GSM/GPRS and 8PSK EDGE. Measure and record power outputs for both modulations, that test is applicable.

### 6.2 SAR Testing with WCDMA Transmitters

Configure the basestation to support all WCDMA tests in respect to the 3GPP 34.121. Measure the power at Ch4132, 4183 and 4233 for US cell; Ch9262, 9400 and 9538 for US PCS Band.

- Step 1: set a Test Mode 1 loop back with a 12.2kbps Reference Measurement Channel (RMC).
- Step 2: set and send continuously up power control commands to the device.
- Step 3: measure the power at the device antenna connector using the power meter with average detector and test SAR

### 6.3 SAR Testing with HSDPA Transmitters

#### HSDPA Date Devices setup for SAR Measurement

HSDPA should be configured according to the UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors ( $\beta_c$ ,  $\beta_d$ ), and HS-DPCCH power offset parameters ( $\Delta_{ACK}$ ,  $\Delta_{NACK}$ ,  $\Delta_{CQI}$ ) should be set according to values indicated in the Table below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set.

Setup for Release 5 HSDPA							
Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{hs}^{(1,2)}$	CM <sup>(3)</sup> (dB)	MRP <sup>(3)</sup> (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15(4)	15/15(4)	64	12/15(4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note

1.  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
2. For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A and HSDPA EVM with phase discontinuity in clause 5.13.1AA,  $\Delta_{ACK}$  and  $\Delta_{NACK} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$  and  $\Delta_{CQI} = 24/15$  with  $\beta_{hs} = 24/15 * \beta_c$
3. CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
4. For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .



### **HSPA Data Devices setup for SAR Measurement.**

The following procedures are applicable to HSPA (HSUPA/HSDPA) data devices operating under 3GPP Release 6. Body exposure conditions generally apply to these devices, including handsets and data modems operating in various electronic devices. HSUPA operates in conjunction with WCDMA and HSDPA. SAR is initially measured in WCDMA test configurations without HSPA. The default test configuration is to establish a radio link between the DUT and a communication test set to configure a 12.2 kbps RMC (reference measurement channel) in Test Loop Mode 1. SAR for HSPA is selectively measured with HS-DPCCH, EDPCCH and E-DPDCH, all enabled, along with a 12.2 kbps RMC using the highest SAR configuration in WCDMA with 12.2 kbps RMC only. An FRC is configured according to HSDPCCH Sub-test 1 using H-set 1 and QPSK. HSPA is configured according to E-DCH Subtest 5 requirements. SAR for other HSPA sub-test configurations is also confirmed selectively according to output power, exposure conditions and E-DCH UE Category. Maximum output power is verified according to procedures in applicable versions of 3GPP TS 34.121 and SAR must be measured according to these maximum output conditions. The UE Categories for HSDPCCH and HSPA should be clearly identified in the SAR report. The following procedures are applicable only if Maximum Power Reduction (MPR) is implemented according to Cubic Metric (CM) requirements.

When voice transmission and head exposure conditions are applicable to a WCDMA/HSPA data device, head exposure is measured according to the 'Head SAR Measurements' procedures in the 'WCDMA Handsets' section of this document. SAR for body exposure configurations are measured according to the 'Body SAR Measurements' procedures in the 'WCDMA Handsets' section of this document. In addition, body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least ¼ dB higher than that measured without HSPA using 12.2 kbps RMC or the maximum SAR for 12.2 kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP is applicable for head exposure, SAR is not required when the maximum output of each RF channel with HSPA is less than ¼ dB higher than that measured using 12.2 kbps RMC; otherwise, the same HSPA configuration used for body measurements should be used to test for head exposure.

Due to inner loop power control requirements in HSPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA should be configured according to the  $\beta$  values indicated below as well as other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of this document.



The highest body SAR measured in Antenna Extended & Retracted configurations on a channel in 12.2 kbps RMC. The possible channels are the High, Middle & Low channel. Contact the FCC Laboratory for test and approval requirements if the maximum output power measured in E-DCH Sub-test 2 - 4 is higher than Sub-test 5.

Setup for Release 6 HSPA / Release 7 HSPA+													
Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{hs}^{(1)}$	$\beta_{ec}$	$\beta_{ed}$	Bed (SF)	Bed (codes)	CM <sup>(2)</sup> (dB)	MPR (dB)	AG <sup>(4)</sup> Index	E-TFCI
1	11/15 <sup>(3)</sup>	15/15 <sup>(3)</sup>	64	11/15 <sup>(3)</sup>	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 <sup>(4)</sup>	15/15 <sup>(4)</sup>	64	15/15 <sup>(4)</sup>	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note

- $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$ .
- CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
- For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .
- For subtest 5 the  $\beta_c/\beta_d$  ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 14/15$  and  $\beta_d = 15/15$ .
- Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
- $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

## 6.4 Power reduction

No power reduction issue.



## 6.5 SAR Testing with 802.11 Transmitters

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

## 6.6 General Device Setup

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

### Frequency Channel Configurations

802.11 b/g operating modes are tested independently according to the service requirements in each frequency band. 802.11 b/g modes are tested on channels 1, 6 and 11. These are referred to as the "default test channels". 802.11g mode was evaluated only if the output power was 0.25 dB higher than the 802.11b mode.



IEEE 802.11 Test Channels per FCC Requirement								
Mode	GHz	Channel	Turbo Channel	Default Test "Channels"				
				§15.247		UNII		
				802.11b	802.11g			
IEEE 802.11 b/g	2412	1 <sup>#</sup>		✓	▽			
	2437	6	6	✓	▽			
	2462	11 <sup>#</sup>		✓	▽			
IEEE 802.11a	UNII	5.18	36				✓	
		5.20	40	42 (5.21 GHz)				*
		5.22	44					*
		5.24	48	50 (5.25 GHz)			✓	
		5.26	52				✓	
		5.28	56	58 (5.29 GHz)				*
		5.30	60					*
		5.32	64				✓	
		5.500	100	Unknown				*
		5.520	104				✓	
		5.540	108					*
		5.560	112					*
		5.580	116				✓	
		5.600	120					*
		5.620	124				✓	
		5.640	128					*
		5.660	132					*
		5.680	136				✓	
		5.700	140				*	
	UNII or §15.247	5.745	149		✓		✓	
		5.765	153	152 (5.76 GHz)		*		*
		5.785	157		✓			*
		5.805	161	160 (5.80 GHz)		*	✓	
§15.247	5.825	165		✓				

✓ = "default test channels"

\* = possible 802.11a channels with maximum average output > the "default test channels"

▽ = possible 802.11g channels with maximum average output ¼ dB ≥ the "default test channels"

# = when output power is reduced for channel 1 and/or 11 to meet restricted band requirements the





## 6.7 Conducted Power

Band	Modulation	Data Rate	CH	Frequency (MHz)	Average Power_SIM1 (dBm)	
					Time Average	Burst Average
GSM 850	GMSK	1Down1Up Duty factor 1/8	Lowest	824.2	23.47	32.50
			Middle	836.6	23.57	32.60
			Highest	848.8	23.67	32.70
GPRS 850 Multi Class :12 Max Up:4 Max Down:4 Sum:5	GMSK	4Down1Up Duty factor 1/8	Lowest	824.2	23.37	32.40
			Middle	836.6	23.47	32.50
			Highest	848.8	23.57	32.60
		3Down2Up Duty factor 2/8	Lowest	824.2	25.68	31.70
			Middle	836.6	25.78	31.80
			Highest	848.8	25.88	31.90
		2Down3Up Duty factor 3/8	Lowest	824.2	25.84	30.10
			Middle	836.6	25.94	30.20
			Highest	848.8	26.04	30.30
		1Down4Up Duty factor 4/8	Lowest	824.2	26.39	29.40
			Middle	836.6	26.49	29.50
			Highest	848.8	26.59	29.60
EGPRS 850 Multi Class :12 Max Up:4 Max Down:4 Sum:5	8PSK	4Down1Up Duty factor 1/8	Lowest	824.2	18.57	27.60
			Middle	836.6	18.57	27.60
			Highest	848.8	18.47	27.50
		3Down2Up Duty factor 2/8	Lowest	824.2	20.48	26.50
			Middle	836.6	20.38	26.40
			Highest	848.8	20.38	26.40
		2Down3Up Duty factor 3/8	Lowest	824.2	19.94	24.20
			Middle	836.6	19.94	24.20
			Highest	848.8	19.84	24.10
		1Down4Up Duty factor 4/8	Lowest	824.2	20.19	23.20
			Middle	836.6	20.19	23.20
			Highest	848.8	20.09	23.10

Note: 1. Time Average power slot duty cycle factor calculate:

1up: Average burst power+10\*LOG(1/8)

2up: Average burst power+10\*LOG(2/8)

3up: Average burst power+10\*LOG(3/8)

4up: Average burst power+10\*LOG(4/8)



Band	Modulation	Data Rate	CH	Frequency (MHz)	Average Power_SIM2 (dBm)	
					Time Average	Burst Average
GSM 850	GMSK	1Down1Up Duty factor 1/8	Lowest	824.2	23.37	32.40
			Middle	836.6	23.57	32.60
			Highest	848.8	23.57	32.60
GPRS 850 Multi Class :12 Max Up:4 Max Down:4 Sum:5	GMSK	4Down1Up Duty factor 1/8	Lowest	824.2	23.27	32.30
			Middle	836.6	23.47	32.50
			Highest	848.8	23.47	32.50
		3Down2Up Duty factor 2/8	Lowest	824.2	25.68	31.70
			Middle	836.6	25.78	31.80
			Highest	848.8	25.78	31.80
		2Down3Up Duty factor 3/8	Lowest	824.2	25.84	30.10
			Middle	836.6	25.94	30.20
			Highest	848.8	26.04	30.30
		1Down4Up Duty factor 4/8	Lowest	824.2	26.39	29.40
			Middle	836.6	26.49	29.50
			Highest	848.8	26.49	29.50
EGPRS 850 Multi Class :12 Max Up:4 Max Down:4 Sum:5	8PSK	4Down1Up Duty factor 1/8	Lowest	824.2	18.67	27.70
			Middle	836.6	18.57	27.60
			Highest	848.8	18.57	27.60
		3Down2Up Duty factor 2/8	Lowest	824.2	20.48	26.50
			Middle	836.6	20.38	26.40
			Highest	848.8	20.38	26.40
		2Down3Up Duty factor 3/8	Lowest	824.2	19.94	24.20
			Middle	836.6	19.84	24.10
			Highest	848.8	19.74	24.00
		1Down4Up Duty factor 4/8	Lowest	824.2	20.19	23.20
			Middle	836.6	20.09	23.10
			Highest	848.8	20.09	23.10

Note: 1. Time Average power slot duty cycle factor calculate:

1up: Average burst power+10\*LOG(1/8)

2up: Average burst power+10\*LOG(2/8)

3up: Average burst power+10\*LOG(3/8)

4up: Average burst power+10\*LOG(4/8)



Band	Modulation	Data Rate	CH	Frequency (MHz)	Average Power_SIM1 (dBm)	
					Time Average	Burst Average
GSM 1900	GMSK	1Down1Up Duty factor 1/8	Lowest	1850.2	20.57	29.60
			Middle	1880.0	20.47	29.50
			Highest	1909.8	20.47	29.50
GPRS 1900 Multi Class :12 Max Up:4 Max Down:4 Sum:5	GMSK	4Down1Up Duty factor 1/8	Lowest	1850.2	20.47	29.50
			Middle	1880.0	20.37	29.40
			Highest	1909.8	20.37	29.40
		3Down2Up Duty factor 2/8	Lowest	1850.2	22.78	28.80
			Middle	1880.0	22.68	28.70
			Highest	1909.8	22.68	28.70
		2Down3Up Duty factor 3/8	Lowest	1850.2	23.04	27.30
			Middle	1880.0	23.04	27.30
			Highest	1909.8	23.04	27.30
		1Down4Up Duty factor 4/8	Lowest	1850.2	23.59	26.60
			Middle	1880.0	23.49	26.50
			Highest	1909.8	23.49	26.50
EGPRS 1900 Multi Class :12 Max Up:4 Max Down:4 Sum:5	8PSK	4Down1Up Duty factor 1/8	Lowest	1850.2	17.27	26.30
			Middle	1880.0	17.17	26.20
			Highest	1909.8	17.17	26.20
		3Down2Up Duty factor 2/8	Lowest	1850.2	19.18	25.20
			Middle	1880.0	19.08	25.10
			Highest	1909.8	19.08	25.10
		2Down3Up Duty factor 3/8	Lowest	1850.2	18.74	23.00
			Middle	1880.0	18.64	22.90
			Highest	1909.8	18.64	22.90
		1Down4Up Duty factor 4/8	Lowest	1850.2	18.79	21.80
			Middle	1880.0	18.69	21.70
			Highest	1909.8	18.69	21.70

Note: 1. Time Average power slot duty cycle factor calculate:

1up: Average burst power+10\*LOG(1/8)

2up: Average burst power+10\*LOG(2/8)

3up: Average burst power+10\*LOG(3/8)

4up: Average burst power+10\*LOG(4/8)



Band	Modulation	Data Rate	CH	Frequency (MHz)	Average Power_SIM2 (dBm)	
					Time Average	Burst Average
GSM 1900	GMSK	1Down1Up Duty factor 1/8	Lowest	1850.2	20.47	29.50
			Middle	1880.0	20.37	29.40
			Highest	1909.8	20.47	29.50
GPRS 1900 Multi Class :12 Max Up:4 Max Down:4 Sum:5	GMSK	4Down1Up Duty factor 1/8	Lowest	1850.2	20.37	29.40
			Middle	1880.0	20.27	29.30
			Highest	1909.8	20.37	29.40
		3Down2Up Duty factor 2/8	Lowest	1850.2	22.78	28.80
			Middle	1880.0	22.68	28.70
			Highest	1909.8	22.68	28.70
		2Down3Up Duty factor 3/8	Lowest	1850.2	23.14	27.40
			Middle	1880.0	23.04	27.30
			Highest	1909.8	23.04	27.30
		1Down4Up Duty factor 4/8	Lowest	1850.2	23.49	26.50
			Middle	1880.0	23.39	26.40
			Highest	1909.8	23.49	26.50
EGPRS 1900 Multi Class :12 Max Up:4 Max Down:4 Sum:5	8PSK	4Down1Up Duty factor 1/8	Lowest	1850.2	17.17	26.20
			Middle	1880.0	17.07	26.10
			Highest	1909.8	17.17	26.20
		3Down2Up Duty factor 2/8	Lowest	1850.2	19.18	25.20
			Middle	1880.0	18.98	25.00
			Highest	1909.8	19.08	25.10
		2Down3Up Duty factor 3/8	Lowest	1850.2	18.74	23.00
			Middle	1880.0	18.64	22.90
			Highest	1909.8	18.64	22.90
		1Down4Up Duty factor 4/8	Lowest	1850.2	18.69	21.70
			Middle	1880.0	18.59	21.60
			Highest	1909.8	18.69	21.70

Note: 1. Time Average power slot duty cycle factor calculate:

- 1up: Average burst power+10\*LOG(1/8)
- 2up: Average burst power+10\*LOG(2/8)
- 3up: Average burst power+10\*LOG(3/8)
- 4up: Average burst power+10\*LOG(4/8)



Band	Modulation	Sub-test	CH	Frequency (MHz)	Burst Average Power (dBm)	
					SIM1	SIM2
WCDMA Band II	RMC12.2K	---	Lowest	1852.4	22.62	22.60
			Middle	1880.0	22.39	22.35
			Highest	1907.6	22.04	22.01
HSDPA Band II	QPSK	1	Lowest	1852.4	21.59	21.56
			Middle	1880.0	21.44	21.42
			Highest	1907.6	21.14	21.11
		2	Lowest	1852.4	21.57	21.53
			Middle	1880.0	21.40	21.36
			Highest	1907.6	21.12	21.07
		3	Lowest	1852.4	21.15	21.13
			Middle	1880.0	20.99	20.96
			Highest	1907.6	20.68	20.66
		4	Lowest	1852.4	21.12	21.09
			Middle	1880.0	20.96	20.92
			Highest	1907.6	20.65	20.63
HSUPABand II	QPSK	1	Lowest	1852.4	21.65	21.62
			Middle	1880.0	21.42	21.40
			Highest	1907.6	21.09	21.06
		2	Lowest	1852.4	19.71	19.67
			Middle	1880.0	19.46	19.42
			Highest	1907.6	19.12	19.07
		3	Lowest	1852.4	20.69	20.67
			Middle	1880.0	20.45	20.42
			Highest	1907.6	20.12	20.10
		4	Lowest	1852.4	19.68	19.65
			Middle	1880.0	19.44	19.40
			Highest	1907.6	19.10	19.08
		5	Lowest	1852.4	21.63	21.61
			Middle	1880.0	21.40	21.36
			Highest	1907.6	21.06	21.03



Band	Modulation	Sub-test	CH	Frequency (MHz)	Burst Average Power (dBm)	
					SIM1	SIM2
WCDMA Band IV	RMC12.2K	---	Lowest	1712.4	22.84	22.80
			Middle	1732.6	22.51	22.48
			Highest	1752.6	22.61	22.56
HSDPA Band IV	QPSK	1	Lowest	1712.4	21.52	21.49
			Middle	1732.6	21.23	21.19
			Highest	1752.6	21.33	21.29
		2	Lowest	1712.4	21.48	21.45
			Middle	1732.6	21.20	21.18
			Highest	1752.6	21.29	21.25
		3	Lowest	1712.4	21.06	21.04
			Middle	1732.6	20.76	20.72
			Highest	1752.6	20.87	20.84
		4	Lowest	1712.4	21.03	21.00
			Middle	1732.6	20.74	20.70
			Highest	1752.6	20.85	20.82
HSUPA Band IV	QPSK	1	Lowest	1712.4	21.89	21.85
			Middle	1732.6	21.56	21.53
			Highest	1752.6	21.66	21.62
		2	Lowest	1712.4	19.93	19.90
			Middle	1732.6	19.61	19.58
			Highest	1752.6	19.72	19.70
		3	Lowest	1712.4	20.93	20.91
			Middle	1732.6	20.61	20.57
			Highest	1752.6	20.72	20.69
		4	Lowest	1712.4	19.92	19.89
			Middle	1732.6	19.58	19.53
			Highest	1752.6	19.70	19.67
		5	Lowest	1712.4	21.85	21.81
			Middle	1732.6	21.54	21.51
			Highest	1752.6	21.63	21.59



Band	Modulation	Sub-test	CH	Frequency (MHz)	Burst Average Power (dBm)	
					SIM1	SIM2
WCDMA Band V	RMC12.2K	---	Lowest	826.4	23.51	23.48
			Middle	836.6	22.87	22.85
			Highest	846.6	23.02	22.99
HSDPA Band V	QPSK	1	Lowest	826.4	22.55	22.51
			Middle	836.6	21.86	21.82
			Highest	846.6	22.05	22.00
		2	Lowest	826.4	22.52	22.50
			Middle	836.6	21.81	21.78
			Highest	846.6	22.01	21.99
		3	Lowest	826.4	22.09	22.06
			Middle	836.6	21.38	21.34
			Highest	846.6	21.59	21.57
		4	Lowest	826.4	22.06	22.04
			Middle	836.6	21.36	21.32
			Highest	846.6	21.57	21.54
HSUPA Band V	QPSK	1	Lowest	826.4	22.55	22.53
			Middle	836.6	21.86	21.82
			Highest	846.6	22.05	22.02
		2	Lowest	826.4	20.59	20.56
			Middle	836.6	19.92	19.90
			Highest	846.6	20.12	20.09
		3	Lowest	826.4	21.58	21.54
			Middle	836.6	20.92	20.88
			Highest	846.6	21.09	21.04
		4	Lowest	826.4	20.57	20.55
			Middle	836.6	19.90	19.87
			Highest	846.6	20.08	20.06
		5	Lowest	826.4	22.51	22.48
			Middle	836.6	21.83	21.79
			Highest	846.6	22.01	21.99



Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)
IEEE 802.11b	1 M	1	2412.0	15.71
		6	2437.0	15.66
		11	2462.0	15.53
	2 M	1	2412.0	15.33
		6	2437.0	15.21
		11	2462.0	15.31
	5.5 M	1	2412.0	14.93
		6	2437.0	15.01
		11	2462.0	15.11
	11 M	1	2412.0	14.60
		6	2437.0	14.81
		11	2462.0	14.93
IEEE 802.11g	6 M	1	2412.0	11.35
		6	2437.0	12.47
		11	2462.0	11.31
	9 M	1	2412.0	11.01
		6	2437.0	12.05
		11	2462.0	11.03
	12 M	1	2412.0	10.63
		6	2437.0	11.67
		11	2462.0	10.69
	18 M	1	2412.0	10.12
		6	2437.0	11.23
		11	2462.0	10.15
	24 M	1	2412.0	9.73
		6	2437.0	10.67
		11	2462.0	9.77
	36 M	1	2412.0	9.21
		6	2437.0	10.37
		11	2462.0	9.36
	48 M	1	2412.0	9.03
		6	2437.0	10.01
		11	2462.0	9.11
	54 M	1	2412.0	8.77
		6	2437.0	9.79
		11	2462.0	8.86





Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)
IEEE 802.11n 20MHz (2.4 GHz)	6.5 M	1	2412.0	11.22
		6	2437.0	12.51
		11	2462.0	11.27
	13.0 M	1	2412.0	10.97
		6	2437.0	12.03
		11	2462.0	10.93
	19.5 M	1	2412.0	10.52
		6	2437.0	10.55
		11	2462.0	10.49
	26.0 M	1	2412.0	10.13
		6	2437.0	11.12
		11	2462.0	10.09
	39.0 M	1	2412.0	9.87
		6	2437.0	10.91
		11	2462.0	9.81
	52.0 M	1	2412.0	9.46
		6	2437.0	10.47
		11	2462.0	9.43
	58.5 M	1	2412.0	9.03
		6	2437.0	10.01
		11	2462.0	9.01
65.0 M	1	2412.0	8.55	
	6	2437.0	9.73	
	11	2462.0	8.61	



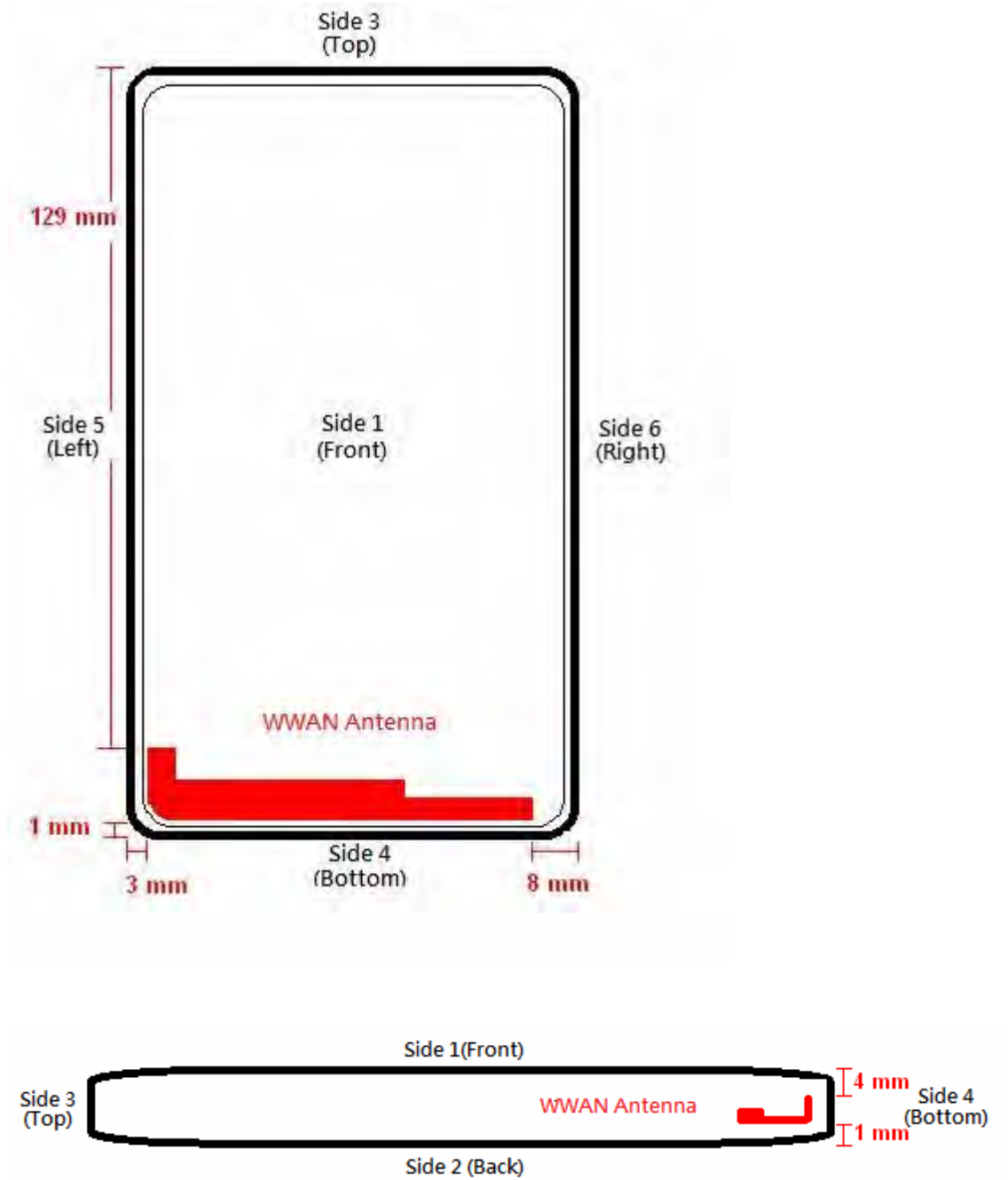
Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)
IEEE 802.11n 40MHz (2.4 GHz)	13.5 M	3	2422.0	8.48
		6	2437.0	10.69
		9	2452.0	8.46
	27.0 M	3	2422.0	8.03
		6	2437.0	10.01
		9	2452.0	8.01
	40.5 M	3	2422.0	7.78
		6	2437.0	9.69
		9	2452.0	7.76
	54.0 M	3	2422.0	7.45
		6	2437.0	9.37
		9	2452.0	7.39
	81.0 M	3	2422.0	7.01
		6	2437.0	8.97
		9	2452.0	6.98
	108.0 M	3	2422.0	6.55
		6	2437.0	8.35
		9	2452.0	6.51
	121.5 M	3	2422.0	5.97
		6	2437.0	7.86
		9	2452.0	5.89
135.0 M	3	2422.0	5.66	
	6	2437.0	7.23	
	9	2452.0	5.31	

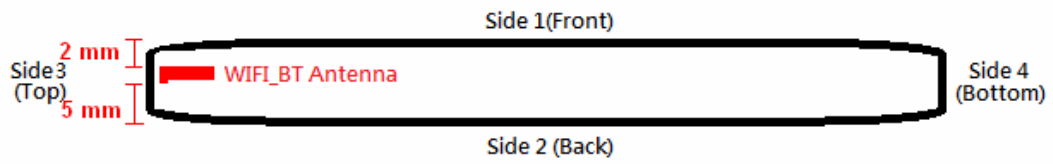
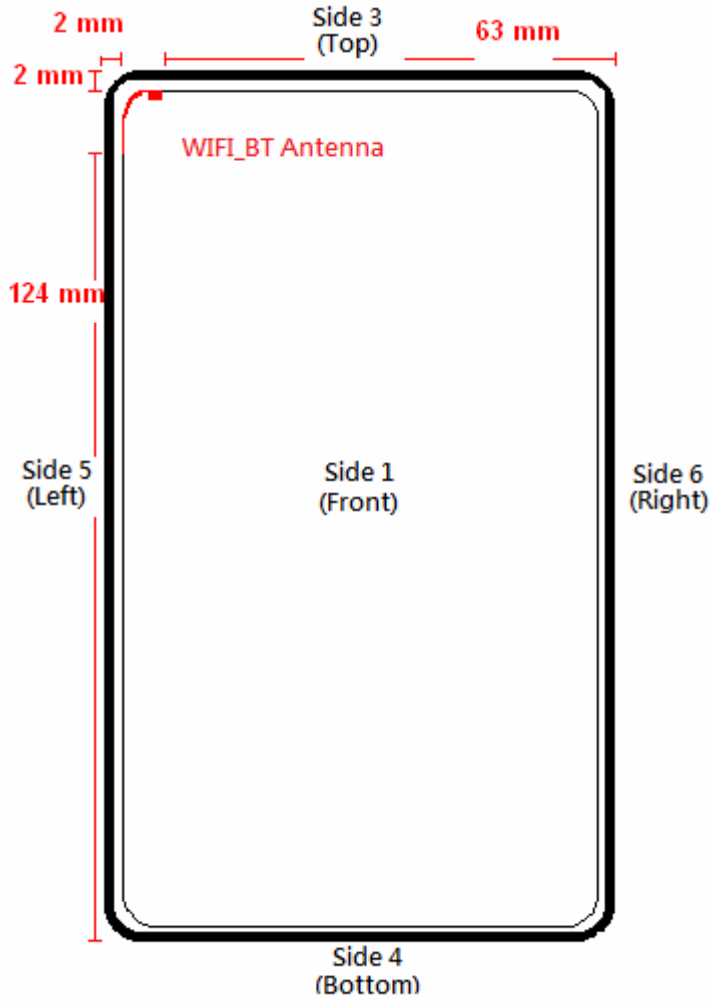
Band	CH	Frequency (MHz)	Packet Type	Average Power (dBm)
Bluetooth v3.0 GFSK	0	2402	DH1	-0.81
			DH3	0.78
			DH5	-0.75
	39	2441	DH1	2.09
			DH3	2.12
			DH5	2.13
	78	2480	DH1	3.20
			DH3	3.22
			DH5	3.25
Bluetooth v3.0 $\pi/4$ -DQPSK	0	2402	DH1	-0.89
			DH3	-0.87
			DH5	-0.86
	39	2441	DH1	1.94
			DH3	1.98
			DH5	1.98
	78	2480	DH1	2.32
			DH3	2.34
			DH5	2.35
Bluetooth v3.0 8DPSK	0	2402	DH1	-1.45
			DH3	-1.42
			DH5	-1.41
	39	2441	DH1	1.69
			DH3	1.67
			DH5	1.66
	78	2480	DH1	1.98
			DH3	1.99
			DH5	2.01
Bluetooth v4.0 LE	0	2402	---	-2.05
	19	2440	---	-2.07
	39	2480	---	-1.97

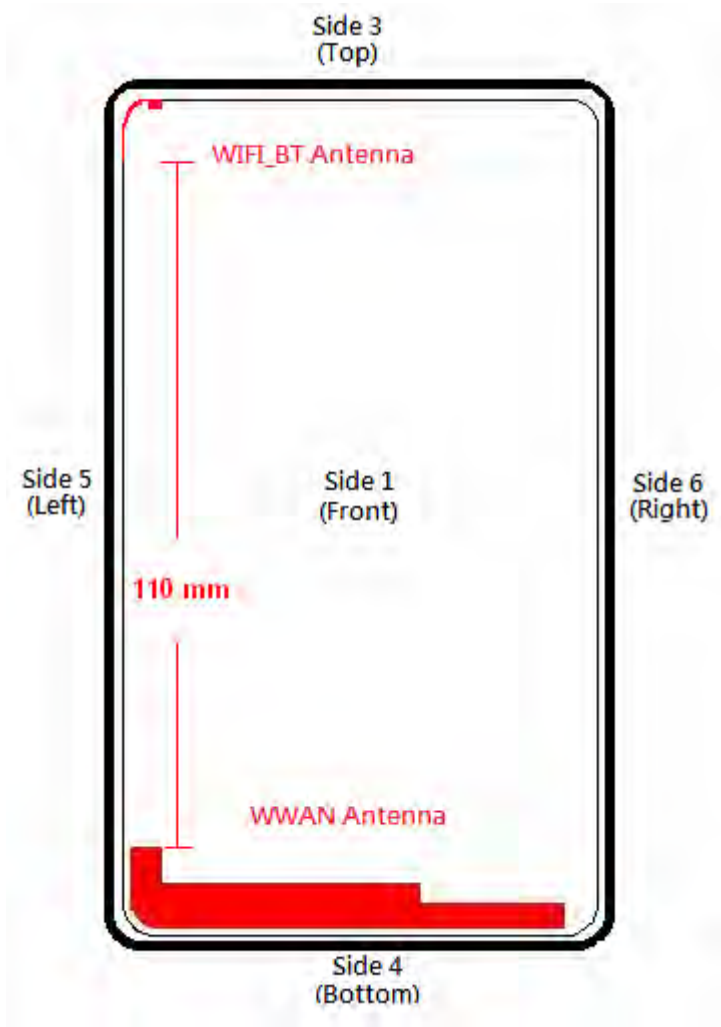


## 6.8 Antenna location

Antenna-User			
Distance of WWAN to edge		Distance of WLAN and Bluetooth to edge	
WWAN to Side 1	4mm	WLAN and Bluetooth to Side 1	2mm
WWAN to Side 2	1mm	WLAN and Bluetooth to Side 2	5mm
WWAN to Side 3	129mm	WLAN and Bluetooth to Side 3	2mm
WWAN to Side 4	1mm	WLAN and Bluetooth to Side 4	124mm
WWAN to Side 5	3mm	WLAN and Bluetooth Side 5	2mm
WWAN to Side 6	8mm	WLAN and Bluetooth Side 6	63mm
Antenna-Antenna			
Antenna account		Distance (mm)	
WWAN to WLAN and Bluetooth		110	









## 6.9 Stand-alone SAR Evaluate

Transmitter and antenna implementation as below:

Band	WWAN antenna	WLAN and Bluetooth antenna
WWAN	V	-
WLAN	-	V
Bluetooth	-	V

Stand-alone transmission configurations as below:

Band	RC	RT	LC	LT	Side 1	Side 2	Side 3	Side 4	Side 5	Side 6
GSM 850	V	V	V	V	V	V	-	-	-	-
GPRS 850	V	V	V	V	V	V	-	V	V	V
GSM 1900	V	V	V	V	V	V	-	-	-	-
GPRS 1900	V	V	V	V	V	V	-	V	V	V
WCDMA/HSDPA/HSUPA Band II	V	V	V	V	V	V	-	V	V	V
WCDMA/HSDPA/HSUPA Band IV	V	V	V	V	V	V	-	V	V	V
WCDMA/HSDPA/HSUPA Band V	V	V	V	V	V	V	-	V	V	V
IEEE 802.11b	V	V	V	V	V	V	V	-	V	-
Bluetooth v3.0	-	-	-	-	V	V	-	-	-	-
Bluetooth v4.0 LE	-	-	-	-	V	V	-	-	-	-

Note: The "-" on behalf of Stand-alone SAR is not required (Refer to KDB447498 D01 4.3.1 for the Standalone SAR test exclusion considerations)

## 6.10 Simultaneous Transmitting Evaluate

Simultaneous transmission configurations as below:

Condition	Side	Frequency Band	
		WWAN Antenna	WLAN and Bluetooth Antenna
1	RC	V	V
2	RT	V	V
3	LC	V	V
4	LT	V	V
5	1	V	V
6	2	V	V
7	3	V	V
8	4	V	V
9	5	V	V
10	6	V	V





### 6.10.1 Estimated SAR

#### Estimated SAR for test separation distances ≤ 50 mm

Antenna	Side	Band	Channel	Power-Tune up (dBm)	Frequency (GHz)	Distance (mm)	Power (mW)	Estimated SAR <sup>19</sup> (W/Kg)
Bluetooth_Antenna	RC	Bluetooth v3.0	78	3.5	2.4800	5	2	0.084
	RT		78	3.5	2.4800	5	2	0.084
	LC		78	3.5	2.4800	5	2	0.084
	LT		78	3.5	2.4800	5	2	0.084
Bluetooth_Antenna	RC	Bluetooth v4.0 LE	39	-1.5	2.4800	5	1	0.042
	RT		39	-1.5	2.4800	5	1	0.042
	LC		39	-1.5	2.4800	5	1	0.042
	LT		39	-1.5	2.4800	5	1	0.042
Bluetooth_Antenna	Side 3	Bluetooth v3.0	78	3.5	2.4800	5	2	0.084
		Bluetooth v4.0 LE	39	-1.5	2.4800	5	1	0.042
Bluetooth_Antenna	Side 4	Bluetooth v3.0	78	3.5	2.4800	50	2	0.008
		Bluetooth v4.0 LE	39	-1.5	2.4800	50	1	0.004
WLAN_Antenna		IEEE 802.11b	1	15.8	2.4120	50	38	0.157
Bluetooth_Antenna	Side 5	Bluetooth v3.0	78	3.5	2.4800	5	2	0.084
		Bluetooth v4.0 LE	39	-1.5	2.4800	5	1	0.042
Bluetooth_Antenna	Side 6	Bluetooth v3.0	78	3.5	2.4800	50	2	0.008
		Bluetooth v4.0 LE	39	-1.5	2.4800	50	1	0.004
WLAN_Antenna		IEEE 802.11b	1	15.8	2.4120	50	38	0.157

Note : 1. The side 4 Wi-Fi and Bluetooth is an antenna which test separation distances is 124mm, and the test distance replace 50mm for 124mm assessment for estimated SAR.

2. The side 6 Wi-Fi and Bluetooth is an antenna which test separation distances is 63mm, and the test distance replace 50mm for 63mm assessment for estimated SAR.

#### Estimated SAR for test separation distances > 50 mm

Antenna	Side	Band	Estimated SAR <sup>19</sup> (W/Kg)
WWAN_Antenna	Side 3	GPRS 850	0.4
		GPRS 1900	0.4
		WCDMA Band II	0.4
		WCDMA Band IV	0.4
		WCDMA Band V	0.4



### 6.10.2 Sum of 1-g SAR of all simultaneously transmitting

When the sum of 1-g SAR of all simultaneously transmitting antennas in and operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.

Sum of 1-g SAR of summary as below:

Phantom Position	Spacing (mm)	ASSY	WWAN Antenna		WLAN Antenna		Bluetooth Antenna		$\Sigma$ SAR <sup>1g</sup> (W/Kg)	Event
			Band	SAR <sup>1g</sup> (W/Kg)	Band	SAR <sup>1g</sup> (W/Kg)	Band	SAR <sup>1g</sup> (W/Kg)		
Head	RC	N/A	GSM 850	0.254	IEEE 802.11b	0.369	Bluetooth	*0.084	0.707	<1.6
		N/A	GPRS 850	0.463	IEEE 802.11b	0.369	Bluetooth	*0.084	0.916	<1.6
		N/A	GSM 1900	0.155	IEEE 802.11b	0.369	Bluetooth	*0.084	0.608	<1.6
		N/A	GPRS 1900	0.280	IEEE 802.11b	0.369	Bluetooth	*0.084	0.733	<1.6
		N/A	WCDMA Band II	0.242	IEEE 802.11b	0.369	Bluetooth	*0.084	0.695	<1.6
		N/A	WCDMA Band IV	0.171	IEEE 802.11b	0.369	Bluetooth	*0.084	0.624	<1.6
		N/A	WCDMA Band V	0.260	IEEE 802.11b	0.369	Bluetooth	*0.084	0.713	<1.6
	RT	N/A	GSM 850	0.161	IEEE 802.11b	0.493	Bluetooth	*0.084	0.738	<1.6
		N/A	GPRS 850	0.293	IEEE 802.11b	0.493	Bluetooth	*0.084	0.870	<1.6
		N/A	GSM 1900	0.066	IEEE 802.11b	0.493	Bluetooth	*0.084	0.643	<1.6
		N/A	GPRS 1900	0.126	IEEE 802.11b	0.493	Bluetooth	*0.084	0.703	<1.6
		N/A	WCDMA Band II	0.107	IEEE 802.11b	0.493	Bluetooth	*0.084	0.684	<1.6
		N/A	WCDMA Band IV	0.120	IEEE 802.11b	0.493	Bluetooth	*0.084	0.697	<1.6
		N/A	WCDMA Band V	0.166	IEEE 802.11b	0.493	Bluetooth	*0.084	0.743	<1.6
	LC	N/A	GSM 850	0.199	IEEE 802.11b	1.013	Bluetooth	*0.084	1.296	<1.6
		N/A	GPRS 850	0.356	IEEE 802.11b	1.013	Bluetooth	*0.084	1.453	<1.6
		N/A	GSM 1900	0.208	IEEE 802.11b	1.013	Bluetooth	*0.084	1.305	<1.6
		N/A	GPRS 1900	0.455	IEEE 802.11b	1.013	Bluetooth	*0.084	1.552	<1.6
		N/A	WCDMA Band II	0.320	IEEE 802.11b	1.013	Bluetooth	*0.084	1.417	<1.6
		N/A	WCDMA Band IV	0.259	IEEE 802.11b	1.013	Bluetooth	*0.084	1.356	<1.6
		N/A	WCDMA Band V	0.194	IEEE 802.11b	1.013	Bluetooth	*0.084	1.291	<1.6
	LT	N/A	GSM 850	0.145	IEEE 802.11b	0.621	Bluetooth	*0.084	0.850	<1.6
		N/A	GPRS 850	0.289	IEEE 802.11b	0.621	Bluetooth	*0.084	0.994	<1.6
		N/A	GSM 1900	0.091	IEEE 802.11b	0.621	Bluetooth	*0.084	0.796	<1.6
		N/A	GPRS 1900	0.179	IEEE 802.11b	0.621	Bluetooth	*0.084	0.884	<1.6
		N/A	WCDMA Band II	0.142	IEEE 802.11b	0.621	Bluetooth	*0.084	0.847	<1.6
		N/A	WCDMA Band IV	0.114	IEEE 802.11b	0.621	Bluetooth	*0.084	0.819	<1.6
		N/A	WCDMA Band V	0.135	IEEE 802.11b	0.621	Bluetooth	*0.084	0.840	<1.6

Note: \*=Estimated SAR



Phantom Position		Spacing (mm)	ASSY	WWAN Antenna		WLAN Antenna		Bluetooth Antenna		$\Sigma$ SAR <sup>1g</sup> (W/Kg)	Event
				Band	SAR <sup>1g</sup> (W/Kg)	Band	SAR <sup>1g</sup> (W/Kg)	Band	SAR <sup>1g</sup> (W/Kg)		
Flat	Side 1	10	N/A	GSM 850	0.333	IEEE 802.11b	0.175	Bluetooth	0.070	0.578	<1.6
		10	N/A	GPRS 850	0.564	IEEE 802.11b	0.175	Bluetooth	0.070	0.809	<1.6
		10	N/A	GSM 1900	0.227	IEEE 802.11b	0.175	Bluetooth	0.070	0.472	<1.6
		10	N/A	GPRS 1900	0.493	IEEE 802.11b	0.175	Bluetooth	0.070	0.738	<1.6
		10	N/A	WCDMA Band II	0.383	IEEE 802.11b	0.175	Bluetooth	0.070	0.628	<1.6
		10	N/A	WCDMA Band IV	0.360	IEEE 802.11b	0.175	Bluetooth	0.070	0.605	<1.6
		10	N/A	WCDMA Band V	0.326	IEEE 802.11b	0.175	Bluetooth	0.070	0.571	<1.6
	Side 2	10	N/A	GSM 850	0.420	IEEE 802.11b	0.134	Bluetooth	0.076	0.630	<1.6
		10	N/A	GPRS 850	0.894	IEEE 802.11b	0.134	Bluetooth	0.076	1.104	<1.6
		10	N/A	GSM 1900	0.177	IEEE 802.11b	0.134	Bluetooth	0.076	0.387	<1.6
		10	N/A	GPRS 1900	0.401	IEEE 802.11b	0.134	Bluetooth	0.076	0.611	<1.6
		10	N/A	WCDMA Band II	0.314	IEEE 802.11b	0.134	Bluetooth	0.076	0.524	<1.6
		10	N/A	WCDMA Band IV	0.386	IEEE 802.11b	0.134	Bluetooth	0.076	0.596	<1.6
		10	N/A	WCDMA Band V	0.424	IEEE 802.11b	0.134	Bluetooth	0.076	0.634	<1.6
Flat	Side 3	10	N/A	GPRS 850	**0.400	IEEE 802.11b	0.125	Bluetooth	*0.084	0.609	<1.6
		10	N/A	GPRS 1900	**0.400	IEEE 802.11b	0.125	Bluetooth	*0.084	0.609	<1.6
		10	N/A	WCDMA Band II	**0.400	IEEE 802.11b	0.125	Bluetooth	*0.084	0.609	<1.6
		10	N/A	WCDMA Band IV	**0.400	IEEE 802.11b	0.125	Bluetooth	*0.084	0.609	<1.6
		10	N/A	WCDMA Band V	**0.400	IEEE 802.11b	0.125	Bluetooth	*0.084	0.609	<1.6
	Side 4	10	N/A	GPRS 850	0.141	IEEE 802.11b	*0.157	Bluetooth	*0.084	0.382	<1.6
		10	N/A	GPRS 1900	0.280	IEEE 802.11b	*0.157	Bluetooth	*0.084	0.521	<1.6
		10	N/A	WCDMA Band II	0.235	IEEE 802.11b	*0.157	Bluetooth	*0.084	0.476	<1.6
		10	N/A	WCDMA Band IV	0.159	IEEE 802.11b	*0.157	Bluetooth	*0.084	0.400	<1.6
		10	N/A	WCDMA Band V	0.049	IEEE 802.11b	*0.157	Bluetooth	*0.084	0.290	<1.6

Note 1: \*=Estimated SAR

2: \*\*The Estimated SAR 0.4W/Kg for 1g SAR when the WWAN Antenna for side 3 test separation distances is > 50 mm.



Phantom Position		Spacing (mm)	ASSY	WWAN Antenna		WLAN Antenna		Bluetooth Antenna		$\Sigma$ SAR <sup>1g</sup> (W/Kg)	Event
				Band	SAR <sup>1g</sup> (W/Kg)	Band	SAR <sup>1g</sup> (W/Kg)	Band	SAR <sup>1g</sup> (W/Kg)		
Flat	Side 5	10	N/A	GPRS 850	0.306	IEEE 802.11b	0.025	Bluetooth	*0.084	0.415	<1.6
		10	N/A	GPRS 1900	0.204	IEEE 802.11b	0.025	Bluetooth	*0.084	0.313	<1.6
		10	N/A	WCDMA Band II	0.152	IEEE 802.11b	0.025	Bluetooth	*0.084	0.261	<1.6
		10	N/A	WCDMA Band IV	0.155	IEEE 802.11b	0.025	Bluetooth	*0.084	0.264	<1.6
		10	N/A	WCDMA Band V	0.207	IEEE 802.11b	0.025	Bluetooth	*0.084	0.316	<1.6
	Side 6	10	N/A	GPRS 850	0.518	IEEE 802.11b	*0.157	Bluetooth	*0.084	0.759	<1.6
		10	N/A	GPRS 1900	0.087	IEEE 802.11b	*0.157	Bluetooth	*0.084	0.328	<1.6
		10	N/A	WCDMA Band II	0.079	IEEE 802.11b	*0.157	Bluetooth	*0.084	0.320	<1.6
		10	N/A	WCDMA Band IV	0.066	IEEE 802.11b	*0.157	Bluetooth	*0.084	0.307	<1.6
		10	N/A	WCDMA Band V	0.266	IEEE 802.11b	*0.157	Bluetooth	*0.084	0.507	<1.6

Note: \*=Estimated SAR

### 6.10.3 SAR to peak location separation ratio (SPLSR)

When the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio. The ratio is determined by  $(SAR1 + SAR2)^{1.5}/R_i$ , rounded to two decimal digits, and must be  $\leq 0.04$  for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

**All of sum of SAR < 1.6 W/Kg, therefore SPLSR is not required.**



## 6.11 SAR test reduction according to KDB

General:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used were according to IEEE1528-2013 and IEEE Std. 1528a-2005.
- All modes of operation were investigated, and worst-case results are reported.
- Tissue parameters and temperatures are listed on the SAR plots.
- Batteries are fully charged for all readings.
- When the Channel's SAR 1g of maximum conducted power is  $> 0.8$  mW/g, low, middle and high channel are supposed to be tested.

KDB 447498:

- The test data reported are the worst-case SAR value with the position set in a typical configuration. Test procedures used were according to FCC, Supplement C [June 2001], IEEE1528-2013 and IEEE Std. 1528a-2005.

KDB 865664:

- Repeated measurement is not required when the original highest measured SAR is  $< 0.80$  W/kg.
- When the original highest measured SAR is  $\geq 0.80$  W/kg, repeat that measurement once.
- Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is  $> 1.20$  or when the original or repeated measurement is  $\geq 1.45$  W/kg.
- Perform a third repeated measurement only if the original, first or second repeated measurement is  $\geq 1.5$  W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .

KDB 941225:

- In order to qualify for the above test reduction, the maximum burst-averaged output power for each mode (GMS/GPRS/EDGE) and the corresponding multi-slot class must be clearly identified in the SAR report for each frequency band. We perform worst case SAR with maximum time-average power on GMS/GPRS/EDGE mode.
- When HSDPA & (HSUPA / HSPA+ uplink with QPSK) power are not more than WCDMA 12.2K RMC 0.25dB and the SAR value of WCDMA BII/BV  $< 1.2$  mW/g, therefore HSDPA & HSUPA / HSPA+ Stand-alone SAR is not required.
- SAR must be measured for all sides and surfaces with a transmitting antenna located within 25 mm from that surface or edge.

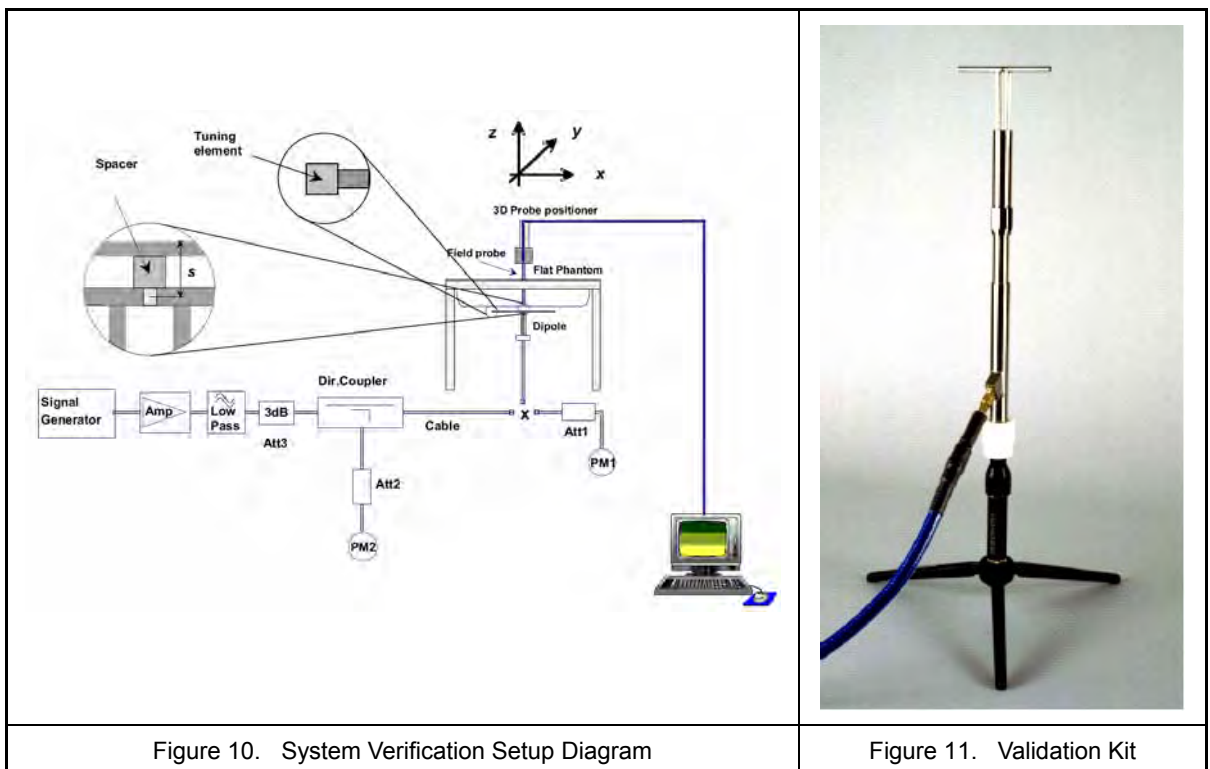
KDB 248227:

- If the conducted power of (802.11g and 802.11n) are higher than 802.11b 0.25dB, (802.11g and 802.11n) are supposed to be tested.

## 7. System Verification and Validation

### 7.1 Symmetric Dipoles for System Verification

Construction	Symmetrical dipole with 1/4 balun enables measurement of feed point impedance with NWA matched for use near flat phantoms filled with head simulating solutions Includes distance holder and tripod adaptor Calibration Calibrated SAR value for specified position and input power at the flat phantom in head simulating solutions.
Frequency	835, 1750, 1900 and 2450 MHz
Return Loss	> 20 dB at specified verification position
Power Capability	> 100 W (f < 1GHz); > 40 W (f > 1GHz)
Options	Dipoles for other frequencies or solutions and other calibration conditions are available upon request
Dimensions	D835V2: dipole length 161 mm; overall height 340 mm D1750V2: dipole length 75.2 mm; overall height 301.5 mm D1900V2: dipole length 67.7 mm; overall height 300 mm D2450V2: dipole length 51.5 mm; overall height 300 mm





## 7.2 Liquid Parameters

Liquid Verify								
Ambient Temperature : 22 ± 2 °C ; Relative Humidity : 40 -70%								
Liquid Type	Frequency	Temp (°C)	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)	Measured Date
835MHz (Head)	820MHz	22.0	$\epsilon_r$	41.57	43.18	3.87%	± 5	2014/08/11
			$\sigma$	0.898	0.895	-0.33%	± 5	
	835MHz	22.0	$\epsilon_r$	41.50	43.01	3.64%	± 5	
			$\sigma$	0.900	0.912	1.33%	± 5	
	850MHz	22.0	$\epsilon_r$	41.50	42.80	3.13%	± 5	
			$\sigma$	0.916	0.929	1.42%	± 5	
835MHz (Body)	820MHz	22.0	$\epsilon_r$	55.26	57.83	4.65%	± 5	2014/08/12
			$\sigma$	0.969	0.981	1.24%	± 5	
	835MHz	22.0	$\epsilon_r$	55.20	57.79	4.69%	± 5	
			$\sigma$	0.970	0.998	2.89%	± 5	
	850MHz	22.0	$\epsilon_r$	55.15	57.69	4.61%	± 5	
			$\sigma$	0.988	1.017	2.94%	± 5	
1750MHz (Head)	1700MHz	22.0	$\epsilon_r$	40.14	40.62	1.20%	± 5	2014/08/13
			$\sigma$	1.343	1.379	2.68%	± 5	
	1750MHz	22.0	$\epsilon_r$	40.07	40.48	1.02%	± 5	
			$\sigma$	1.371	1.416	3.28%	± 5	
	1800MHz	22.0	$\epsilon_r$	40.00	40.37	0.93%	± 5	
			$\sigma$	1.400	1.458	4.14%	± 5	
1750MHz (Body)	1700MHz	22.0	$\epsilon_r$	53.56	54.35	1.48%	± 5	2014/08/13
			$\sigma$	1.457	1.491	2.33%	± 5	
	1750MHz	22.0	$\epsilon_r$	53.43	54.36	1.74%	± 5	
			$\sigma$	1.488	1.530	2.82%	± 5	
	1800MHz	22.0	$\epsilon_r$	53.30	54.24	1.76%	± 5	
			$\sigma$	1.520	1.571	3.36%	± 5	

Table 4. Measured Tissue dielectric parameters for body phantoms -1



Liquid Verify								
Ambient Temperature : 22 ± 2 °C ; Relative Humidity : 40 -70%								
Liquid Type	Frequency	Temp (°C)	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)	Measured Date
1900MHz (Head)	1850MHz	22.0	$\epsilon_r$	40.00	40.76	1.90%	± 5	2014/08/12
			$\sigma$	1.400	1.336	-4.57%	± 5	
	1900MHz	22.0	$\epsilon_r$	40.00	40.59	1.48%	± 5	
			$\sigma$	1.400	1.391	-0.64%	± 5	
	1950MHz	22.0	$\epsilon_r$	40.00	40.43	1.08%	± 5	
			$\sigma$	1.400	1.441	2.93%	± 5	
1900MHz (Body)	1850MHz	22.0	$\epsilon_r$	53.30	52.11	-2.23%	± 5	2014/08/13
			$\sigma$	1.520	1.466	-3.55%	± 5	
	1900MHz	22.0	$\epsilon_r$	53.30	52.18	-2.10%	± 5	
			$\sigma$	1.520	1.475	-2.96%	± 5	
	1950MHz	22.0	$\epsilon_r$	53.30	51.81	-2.80%	± 5	
			$\sigma$	1.520	1.587	4.41%	± 5	
2450MHz (Head)	2400MHz	22.0	$\epsilon_r$	39.29	38.48	-2.06%	± 5	2014/08/14
			$\sigma$	1.756	1.779	1.31%	± 5	
	2450MHz	22.0	$\epsilon_r$	39.20	38.36	-2.14%	± 5	
			$\sigma$	1.800	1.840	2.22%	± 5	
	2500MHz	22.0	$\epsilon_r$	39.13	38.16	-2.48%	± 5	
			$\sigma$	1.853	1.884	1.67%	± 5	
2450MHz (Body)	2400MHz	22.0	$\epsilon_r$	52.77	51.97	-1.52%	± 5	2014/08/14
			$\sigma$	1.902	1.886	-0.84%	± 5	
	2450MHz	22.0	$\epsilon_r$	52.70	52.19	-0.97%	± 5	
			$\sigma$	1.950	1.957	0.36%	± 5	
	2500MHz	22.0	$\epsilon_r$	52.64	51.56	-2.05%	± 5	
			$\sigma$	2.021	2.017	-0.20%	± 5	

Table 5. Measured Tissue dielectric parameters for body phantoms -2





### 7.3 Verification Summary

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of  $\pm 7\%$ . The verification was performed at 835, 1750, 1900 and 2450MHz.

Mixture Type	Frequency (MHz)	Power	SAR <sub>1g</sub> (W/Kg)	SAR <sub>10g</sub> (W/Kg)	Drift (dB)	Difference percentage		Probe Model / Serial No.	Dipole Model / Serial No.	1W Target		Date
						1g	10g			SAR <sub>1g</sub> (W/Kg)	SAR <sub>10g</sub> (W/Kg)	
Head	835	250 mW	2.35	1.54	-0.014	1.00%	2.20%	EX3DV4 SN:3977	D835V2 SN:4d082	9.31	6.03	Aug. 11, 2014
		Normalize to 1 Watt	9.40	6.16								
Body	835	250 mW	2.31	1.53	0.004	-2.70%	-2.40%	EX3DV4 SN:3977	D835V2 SN:4d082	9.50	6.27	Aug. 12, 2014
		Normalize to 1 Watt	9.24	6.12								
Head	1750	250 mW	9.42	4.93	-0.005	2.70%	1.10%	EX3DV4 SN:3977	D1750V2 SN:1023	36.70	19.50	Aug. 13, 2014
		Normalize to 1 Watt	37.68	19.72								
Body	1750	250 mW	9.93	5.20	0.002	4.80%	2.00%	EX3DV4 SN:3977	D1750V2 SN:1023	37.90	20.40	Aug. 13, 2014
		Normalize to 1 Watt	39.72	20.80								
Head	1900	250 mW	10.20	5.40	0	0.50%	1.90%	EX3DV4 SN:3977	D1900V2 SN:5d111	40.60	21.20	Aug. 12, 2014
		Normalize to 1 Watt	40.80	21.60								
Body	1900	250 mW	10.50	5.50	-0.044	4.00%	2.30%	EX3DV4 SN:3977	D1900V2 SN:5d111	40.40	21.50	Aug. 13, 2014
		Normalize to 1 Watt	42.00	22.00								
Head	2450	250 mW	12.60	5.81	0.024	-3.10%	-4.40%	EX3DV4 SN:3977	D2450V2 SN:712	52.00	24.30	Aug. 14, 2014
		Normalize to 1 Watt	50.40	23.24								
Body	2450	250 mW	12.00	5.62	0.017	-4.60%	-4.30%	EX3DV4 SN:3977	D2450V2 SN:712	50.30	23.50	Aug. 14, 2014
		Normalize to 1 Watt	48.00	22.48								



## 7.4 Validation Summary

Per FCC KDB 865664 D02v01, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in IEEE 1528-2013 and FCC KDB 865664 D01v01r03. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters as below.

Probe Type Model / Serial No.	Prob Cal. Point (MHz)	Head / Body	Cond.		CW Validation			Mod. Validation			Date
			$\epsilon_r$	$\sigma$	Sensitivity	Probe	Probe	Mod. Type	Duty Factor	PAR	
						Linearity	Isotropy				
EX3DV4 SN:3977	835	Head	43.01	0.912	Pass	Pass	Pass	GMSK	Pass	N/A	Aug. 11, 2014
EX3DV4 SN:3977	835	Body	57.79	0.998	Pass	Pass	Pass	GMSK	Pass	N/A	Aug. 12, 2014
EX3DV4 SN:3977	1750	Head	40.48	1.416	Pass	Pass	Pass	GMSK	Pass	N/A	Aug. 13, 2014
EX3DV4 SN:3977	1750	Body	54.36	1.530	Pass	Pass	Pass	GMSK	Pass	N/A	Aug. 13, 2014
EX3DV4 SN:3977	1900	Head	40.59	1.391	Pass	Pass	Pass	GMSK	Pass	N/A	Aug. 12, 2014
EX3DV4 SN:3977	1900	Body	52.18	1.475	Pass	Pass	Pass	GMSK	Pass	N/A	Aug. 13, 2014
EX3DV4 SN:3977	2450	Head	38.36	1.840	Pass	Pass	Pass	OFDM	N/A	Pass	Aug. 14, 2014
EX3DV4 SN:3977	2450	Body	52.19	1.957	Pass	Pass	Pass	OFDM	N/A	Pass	Aug. 14, 2014



## 8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	835MHz System Validation Kit	D835V2	4d082	Jul. 23, 2014	Jul. 22, 2015
SPEAG	1750MHz System Validation Kit	D1750V2	1023	Jun. 17, 2014	Jun. 16, 2015
SPEAG	1900MHz System Validation Kit	D1900V2	5d111	Jul. 23, 2014	Jul. 22, 2015
SPEAG	2450MHz System Validation Kit	D2450V2	712	Mar. 04, 2014	Mar. 03, 2015
SPEAG	Dosimetric E-Field Probe	EX3DV4	3977	Feb. 17, 2014	Feb. 16, 2015
SPEAG	Data Acquisition Electronics	DAE4	779	Feb. 25, 2014	Feb. 24, 2015
SPEAG	Device Holder	N/A	N/A	NCR	
SPEAG	Measurement Server	SE UMS 001 BA	1021	NCR	
SPEAG	Phantom	SAM V4.0	1009	NCR	
SPEAG	Robot	Staubli RX90L	F00/589B1/A/01	NCR	
SPEAG	Software	DASY4 V4.7 Build 80	N/A	NCR	
SPEAG	Software	SEMCAD V1.8 Build 186	N/A	NCR	
Agilent	Dielectric Probe Kit	85070C	US99360094	NCR	
Agilent	ENA Series Network Analyzer	E5071B	MY42404655	Apr. 10, 2014	Apr. 09, 2015
R&S	Power Sensor	NRP-Z22	100179	May 20, 2014	May 19, 2015
Agilent	MXF-G-B RF Vector Signal Generator	N5182B	MY53050382	May 30, 2014	May 29, 2015
Agilent	Dual Directional Coupler	778D	50334	NCR	
Mini-Circuits	Power Amplifier	ZHL-42W-SMA	D111103#5	NCR	
Mini-Circuits	Power Amplifier	ZVE-8G-SMA	D042005 671800514	NCR	
Aisi	Attenuator	IEAT 3dB	N/A	NCR	

Table 6. Test Equipment List



## 9. **Measurement Uncertainty**

Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environmental. However, we estimate the measurement uncertainties in SAR to be less than  $\pm 19.62\%$  [ 8 ] . The frequency range of the measurement uncertainty is 750 ~ 5800MHz  $\pm 10.1\%$

According to Std. C95.3 [ 9 ] , the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy's of  $\pm 1$  to 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least  $\pm 2$ dB can be expected.



Item	Uncertainty Component	Uncertainty Value	Prob. Dist	Div.	$c_i$ (1g)	$c_i$ (10g)	Std. Unc. (1-g)	Std. Unc. (10-g)	$V_i$ or $V_{eff}$
Measurement System									
u1	Probe Calibration ( $k=1$ )	$\pm 5.05\%$	Normal	1	1	1	$\pm 5.05\%$	$\pm 5.05\%$	$\infty$
u2	Probe Isotropy	$\pm 7.6\%$	Rectangular	$\sqrt{3}$	0.7	0.7	$\pm 3.1\%$	$\pm 3.1\%$	$\infty$
u3	Boundary Effect	$\pm 1.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.6\%$	$\pm 0.6\%$	$\infty$
u4	Linearity	$\pm 4.7\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.7\%$	$\pm 2.7\%$	$\infty$
u5	System Detection Limit	$\pm 1.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.58\%$	$\pm 0.58\%$	$\infty$
u6	Readout Electronics	$\pm 0.3\%$	Normal	1	1	1	$\pm 0.3\%$	$\pm 0.3\%$	$\infty$
u7	Response Time	$\pm 0.8\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.5\%$	$\pm 0.5\%$	$\infty$
u8	Integration Time	$\pm 2.6\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.5\%$	$\pm 1.5\%$	$\infty$
u9	RF Ambient Conditions	$\pm 0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0\%$	$\pm 0\%$	$\infty$
u10	RF Ambient Reflections	$\pm 0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0\%$	$\pm 0\%$	$\infty$
u11	Probe Positioner Mechanical Tolerance	$\pm 0.4\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.2\%$	$\pm 0.2\%$	$\infty$
u12	Probe Positioning with respect to Phantom Shell	$\pm 2.9\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 1.7\%$	$\pm 1.7\%$	$\infty$
u13	Extrapolation, interpolation and integration Algorithms for Max. SAR Evaluation	$\pm 1.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 0.6\%$	$\pm 0.6\%$	$\infty$
Test sample Related									
u14	Test sample Positioning	$\pm 3.6\%$	Normal	1	1	1	$\pm 3.6\%$	$\pm 3.6\%$	89
u15	Device Holder Uncertainty	$\pm 3.5\%$	Normal	1	1	1	$\pm 3.5\%$	$\pm 3.5\%$	5
u16	Output Power Variation - SAR drift measurement	$\pm 5.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.9\%$	$\pm 2.9\%$	$\infty$
Phantom and Tissue Parameters									
u17	Phantom Uncertainty ( shape and thickness tolerances)	$\pm 4.0\%$	Rectangular	$\sqrt{3}$	1	1	$\pm 2.3\%$	$\pm 2.3\%$	$\infty$
u18	Liquid Conductivity - deviation from target values	$\pm 5.0\%$	Rectangular	$\sqrt{3}$	0.64	0.43	$\pm 1.8\%$	$\pm 1.2\%$	$\infty$
u19	Liquid Conductivity - measurement uncertainty	$\pm 1.93\%$	Normal	1	0.64	0.43	$\pm 1.24\%$	$\pm 0.83\%$	69
u20	Liquid Permittivity - deviation from target values	$\pm 5.0\%$	Rectangular	$\sqrt{3}$	0.6	0.49	$\pm 1.7\%$	$\pm 1.4\%$	$\infty$
u21	Liquid Permittivity - measurement uncertainty	$\pm 1.4\%$	Normal	1	0.6	0.49	$\pm 0.84\%$	$\pm 1.69\%$	69
Combined standard uncertainty			RSS				$\pm 9.81\%$	$\pm 9.62\%$	313
Expanded uncertainty (95% CONFIDENCE LEVEL )			$k=2$				$\pm 19.62\%$	$\pm 19.24\%$	

Table 7. Uncertainty Budget of DASY



## 10. **Measurement Procedure**

The measurement procedures are as follows:

1. For WLAN function, engineering testing software installed on Notebook can provide continuous transmitting signal.
2. Measure output power through RF cable and power meter
3. Set scan area, grid size and other setting on the DASY software
4. Find out the largest SAR result on these testing positions of each band
5. Measure SAR results for other channels in worst SAR testing position if the SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

1. Power reference measurement
2. Area scan
3. Zoom scan
4. Power drift measurement

### 10.1 **Spatial Peak SAR Evaluation**

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

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

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



## 10.2 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures points and step size follow as below. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

Grid Type	Frequency		Step size (mm)			X*Y*Z (Point)	Cube size			Step size		
			X	Y	Z		X	Y	Z	X	Y	Z
uniform grid	≤ 3GHz	≤ 2GHz	≤ 8	≤ 8	≤ 5	5*5*7	32	32	30	8	8	5
		2G - 3G	≤ 5	≤ 5	≤ 5	7*7*7	30	30	30	5	5	5
	3 - 6GHz	3 - 4GHz	≤ 5	≤ 5	≤ 4	7*7*8	30	30	28	5	5	4
		4 - 5GHz	≤ 4	≤ 4	≤ 3	8*8*10	28	28	27	4	4	3
		5 - 6GHz	≤ 4	≤ 4	≤ 2	8*8*12	28	28	22	4	4	2

(Our measure settings are refer KDB Publication 865664 D01v01)

## 10.3 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the DUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

## 10.4 SAR Averaged Methods

In DASYS, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation. Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

## 10.5 Power Drift Monitoring

All SAR testing is under the DUT install full charged battery and transmit maximum output power. In DASYS measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of DUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.



## 11. SAR Test Results Summary

### 11.1 Head Measurement SAR

Index	Position	Band	Ch.	Data Rate or Sub-Test	SIM	Spacing (mm)	SAR <sub>1g</sub> (W/Kg)	Power Drift	Burst-Avg power (dBm)	Time-Avg Tune-Up	Reported SAR <sub>1g</sub> (W/Kg)
#1	RC	GSM 850	251	1D1U	1	0	0.237	-0.154	32.70	33	0.254
#2	RT	GSM 850	251	1D1U	1	0	0.150	0.028	32.70	33	0.161
#3	LC	GSM 850	251	1D1U	1	0	0.186	-0.033	32.70	33	0.199
#4	LT	GSM 850	251	1D1U	1	0	0.135	0.052	32.70	33	0.145
#5	RC	GPRS 850	251	1D4U	1	0	0.422	0.141	29.60	30	0.463
#6	RT	GPRS 850	251	1D4U	1	0	0.267	-0.037	29.60	30	0.293
#7	LC	GPRS 850	251	1D4U	1	0	0.325	0.093	29.60	30	0.356
#8	LT	GPRS 850	251	1D4U	1	0	0.264	0.110	29.60	30	0.289
#28	RC	GSM 1900	512	1D1U	1	0	0.141	0.123	29.60	30	0.155
#29	RT	GSM 1900	512	1D1U	1	0	0.060	0.026	29.60	30	0.066
#30	LC	GSM 1900	512	1D1U	1	0	0.190	0.073	29.60	30	0.208
#31	LT	GSM 1900	512	1D1U	1	0	0.083	0.063	29.60	30	0.091
#32	RC	GPRS 1900	512	1D4U	1	0	0.255	0.017	26.60	27	0.280
#33	RT	GPRS 1900	512	1D4U	1	0	0.115	0.006	26.60	27	0.126
#34	LC	GPRS 1900	512	1D4U	1	0	0.415	0.096	26.60	27	0.455
#35	LT	GPRS 1900	512	1D4U	1	0	0.163	0.069	26.60	27	0.179

- Note:
1. According KDB 447498 D01 V05r02 section 4.1.4, the "Reported" explanation as below:  
 "When SAR or MPE is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported."
  2. If the Channel's Reported SAR<sub>1g</sub> of maximum conducted power is > 0.8 W/Kg, low, middle and high channel are supposed to be tested.





Index.	Position	Band	Ch.	Data Rate or Sub-Test	SIM	Spacing (mm)	SAR <sub>1g</sub> (W/Kg)	Power Drift	Burst Avg Power	Max tune-up	Reported SAR <sub>1g</sub> (W/Kg)
#36	RC	WCDMA Band II	9262	RMC12.2K	1	0	0.222	-0.032	22.62	23	0.242
#37	RT	WCDMA Band II	9262	RMC12.2K	1	0	0.098	0.064	22.62	23	0.107
#38	LC	WCDMA Band II	9262	RMC12.2K	1	0	0.293	0.103	22.62	23	0.320
#39	LT	WCDMA Band II	9262	RMC12.2K	1	0	0.130	0.020	22.62	23	0.142
#52	RC	WCDMA Band IV	1312	RMC12.2K	1	0	0.165	0.035	22.84	23	0.171
#53	RT	WCDMA Band IV	1312	RMC12.2K	1	0	0.116	0.009	22.84	23	0.120
#54	LC	WCDMA Band IV	1312	RMC12.2K	1	0	0.250	0.015	22.84	23	0.259
#55	LT	WCDMA Band IV	1312	RMC12.2K	1	0	0.110	0.045	22.84	23	0.114
#9	RC	WCDMA Band V	4132	RMC12.2K	1	0	0.232	-0.058	23.51	24	0.260
#10	RT	WCDMA Band V	4132	RMC12.2K	1	0	0.148	0.047	23.51	24	0.166
#11	LC	WCDMA Band V	4132	RMC12.2K	1	0	0.173	0.027	23.51	24	0.194
#12	LT	WCDMA Band V	4132	RMC12.2K	1	0	0.121	0.016	23.51	24	0.135

Index.	Position	Band	Ch.	Data Rate or Sub-Test	Side	Spacing (mm)	SAR <sub>1g</sub> (W/Kg)	Power Drift	Burst Avg Power	Max tune-up	Reported SAR <sub>1g</sub> (W/Kg)
#62	RC	IEEE 802.11b	1	1M	1	0	0.361	0.018	15.71	15.8	0.369
#63	RT	IEEE 802.11b	1	1M	1	0	0.483	0.013	15.71	15.8	0.493
#64	LC	IEEE 802.11b	1	1M	1	0	0.829	-0.023	15.71	15.8	0.846
#66	LC	IEEE 802.11b	6	1M	1	0	0.948	0.001	15.66	15.8	0.979
#67	LC	IEEE 802.11b	11	1M	1	0	0.952	0.003	15.53	15.8	1.013
#65	LT	IEEE 802.11b	1	1M	1	0	0.608	0.002	15.71	15.8	0.621

- Note: 1. According KDB 447498 D01 V05r02 section 4.1.4, the "Reported" explanation as below:  
 "When SAR or MPE is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported."  
 3. If the Channel's Reported SAR 1g of maximum conducted power is > 0.8 W/Kg, low, middle and high channel are supposed to be tested.  
 4. HSDPA & HSUPA power are not more than WCDMA 0.25dB and the SAR value of WCDMA <1.2 W/Kg therefore HSDPA & HSUPA Stand-alone SAR is not required.  
 5. The conducted power of (IEEE 802.11g / 802.11n) are not higher than IEEE 802.11b 0.25dB, (IEEE 802.11g / 802.11n) are not supposed to be tested.



## 11.2 Body Measurement SAR

Evaluated body SAR is not available.

## 11.3 Hot-spot mode Measurement SAR

Index.	Position	Band	Ch.	Data Rate or Sub-Test	Side to Phantom	SIM	Spacing (mm)	ASSY.	SAR <sub>1g</sub> (W/Kg)	Power Drift	Burst-Avg power (dBm)	Time-Avg Tune-Up	Reported SAR <sub>1g</sub> (W/Kg)
#13	Flat	GSM 850	251	1D1U	1	1	10	Headset	0.311	0.136	32.7	33	0.333
#14	Flat		251	1D1U	2	1	10	Headset	0.392	-0.007	32.7	33	0.420
#20	Flat	GPRS 850	128	1D4U	2	1	10	---	0.775	0.004	29.4	30	0.890
#21	Flat		190	1D4U	2	1	10	---	0.768	-0.031	29.5	30	0.862
#15	Flat		251	1D4U	1	1	10	---	0.514	0.098	29.6	30	0.564
#16	Flat		251	1D4U	2	1	10	---	0.815	0.123	29.6	30	0.894
#17	Flat		251	1D4U	4	1	10	---	0.129	0.040	29.6	30	0.141
#18	Flat		251	1D4U	5	1	10	---	0.279	0.022	29.6	30	0.306
#19	Flat		251	1D4U	6	1	10	---	0.472	0.048	29.6	30	0.518
#40	Flat		GSM 1900	512	1D1U	1	1	10	Headset	0.207	0.002	29.6	30
#41	Flat	512		1D1U	2	1	10	Headset	0.161	-0.026	29.6	30	0.177
#42	Flat	GPRS 1900	512	1D4U	1	1	10	---	0.450	-0.014	26.6	27	0.493
#43	Flat		512	1D4U	2	1	10	---	0.366	0.010	26.6	27	0.401
#44	Flat		512	1D4U	4	1	10	---	0.255	-0.117	26.6	27	0.280
#45	Flat		512	1D4U	5	1	10	---	0.186	0.016	26.6	27	0.204
#46	Flat		512	1D4U	6	1	10	---	0.079	-0.059	26.6	27	0.087

- Note: 1. According KDB 447498 D01 V05r02 section 4.1.4, the "Reported" explanation as below:  
 "When SAR or MPE is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported."  
 2. If the Channel's Reported SAR 1g of maximum conducted power is > 0.8 W/Kg, low, middle and high channel are supposed to be tested.  
 3. For hot-spot mode, the WWAN antenna location to edge >2.5 cm therefore test Side 3 is not required.



Index.	Position	Band	Ch.	Data Rate or Sub-Test	Side to Phantom	SIM	Spacing (mm)	SAR <sub>1g</sub> (W/Kg)	Power Drift	Burst Avg Power	Max tune-up	Reported SAR <sub>1g</sub> (W/Kg)
#47	Flat	WCDMA Band II	9262	RMC12.2K	1	1	10	0.351	0.011	22.62	23	0.383
#48	Flat	WCDMA Band II	9262	RMC12.2K	2	1	10	0.288	-0.020	22.62	23	0.314
#49	Flat	WCDMA Band II	9262	RMC12.2K	4	1	10	0.215	0.010	22.62	23	0.235
#50	Flat	WCDMA Band II	9262	RMC12.2K	5	1	10	0.139	0.030	22.62	23	0.152
#51	Flat	WCDMA Band II	9262	RMC12.2K	6	1	10	0.072	-0.057	22.62	23	0.079
#57	Flat	WCDMA Band IV	1312	RMC12.2K	1	1	10	0.347	0.087	22.84	23	0.360
#58	Flat	WCDMA Band IV	1312	RMC12.2K	2	1	10	0.372	-0.020	22.84	23	0.386
#59	Flat	WCDMA Band IV	1312	RMC12.2K	4	1	10	0.153	0.002	22.84	23	0.159
#60	Flat	WCDMA Band IV	1312	RMC12.2K	5	1	10	0.149	0.013	22.84	23	0.155
#61	Flat	WCDMA Band IV	1312	RMC12.2K	6	1	10	0.064	0.186	22.84	23	0.066
#23	Flat	WCDMA Band V	4132	RMC12.2K	1	1	10	0.291	-0.016	23.51	24	0.326
#24	Flat	WCDMA Band V	4132	RMC12.2K	2	1	10	0.379	0.015	23.51	24	0.424
#25	Flat	WCDMA Band V	4132	RMC12.2K	4	1	10	0.044	-0.013	23.51	24	0.049
#26	Flat	WCDMA Band V	4132	RMC12.2K	5	1	10	0.185	0.003	23.51	24	0.207
#27	Flat	WCDMA Band V	4132	RMC12.2K	6	1	10	0.238	0.023	23.51	24	0.266

- Note: 1. According KDB 447498 D01 V05r02 section 4.1.4, the "Reported" explanation as below:  
 "When SAR or MPE is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported."
2. If the Channel's Reported SAR 1g of maximum conducted power is > 0.8 W/Kg, low, middle and high channel are supposed to be tested.
  3. For hot-spot mode, the WWAN antenna location to edge >2.5 cm therefore test Side 3 is not required.
  4. HSDPA & HSUPA power are not more than WCDMA 0.25dB and the SAR value of WCDMA <1.2 W/Kg therefore HSDPA & HSUPA Stand-alone SAR is not required.



Index.	Position	Band	Ch.	Data Rate or Sub-Test	Side to Phantom	Spacing (mm)	SAR <sub>1g</sub> (W/Kg)	Power Drift	Burst Avg Power	Max tune-up	Reported SAR <sub>1g</sub> <sup>1</sup> (W/Kg)
#69	Flat	IEEE 802.11b	1	1M	1	10	0.171	-0.045	15.71	15.8	0.175
#70	Flat	IEEE 802.11b	1	1M	2	10	0.131	0.014	15.71	15.8	0.134
#71	Flat	IEEE 802.11b	1	1M	3	10	0.122	0.017	15.71	15.8	0.125
#72	Flat	IEEE 802.11b	1	1M	5	10	0.024	-0.077	15.71	15.8	0.025
#73	Flat	Bluetooth v 3.0	78	1M	1	10	0.066	0.180	3.25	3.5	0.070
#74	Flat	Bluetooth v 3.0	78	1M	2	10	0.072	-0.029	3.25	3.5	0.076
#75	Flat	Bluetooth v 4.0 LE	39	---	1	10	0.010	0.143	-1.97	-1.5	0.011
#76	Flat	Bluetooth v 4.0 LE	39	---	2	10	0.009	0.161	-1.97	-1.5	0.010

- Note: 1. According KDB 447498 D01 V05r02 section 4.1.4, the "Reported" explanation as below:  
 "When SAR or MPE is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported."  
 2. If the Channel's Reported SAR 1g of maximum conducted power is > 0.8 W/Kg, low, middle and high channel are supposed to be tested.  
 3. The conducted power of (IEEE 802.11g / 802.11n) are not higher than IEEE 802.11b 0.25dB, (IEEE 802.11g / 802.11n) are not supposed to be tested.  
 4. For hot-spot mode, the WLAN antenna location to edge >2.5 cm therefore test Side 4 and Side 6 are not required.

## 11.4 Extremity Measurement SAR

Evaluated extremity SAR is not available.

## 11.5 SAR Measurement Variability

Detailed evaluations please refer KDB 865664 on "SAR test reduction according to KDB" section.

Index.	Position	Band	Ch.	Side to Phantom	Spacing (mm)	Number of times	SAR <sub>1g</sub> (W/Kg)	Power Drift	Burst Avg Power	Max. Tune-Up	Reported SAR <sub>1g</sub> (W/Kg)	Repeated measure-ment Ratio
#68	LC	IEEE 802.11b (1M)	11	1	0	1	0.954	0.003	15.53	15.8	1.015	1.00 < 1.2

Index.	Position	Band	Ch.	Side to Phantom	SIM	Spacing (mm)	Number of times	SAR <sub>1g</sub> (W/Kg)	Power Drift	Burst Avg Power	Time-Avg Tune-Up	Reported SAR <sub>1g</sub> (W/Kg)	Repeated measure-ment Ratio
#22	Flat	GPRS 850 (1D4U)	251	2	1	10	1	0.766	-0.023	29.6	30	0.840	1.06 < 1.2

- Note: 1. The original highest measured SAR is  $\geq 0.8$  W/kg, repeat that measurement once.



## 11.6 Std. C95.1-1999 RF Exposure Limit

Human Exposure	Population Uncontrolled Exposure ( W/kg ) or (mW/g)	Occupational Controlled Exposure ( W/kg ) or (mW/g)
Spatial Peak SAR* (head)	1.60	8.00
Spatial Peak SAR** (Whole Body)	0.08	0.40
Spatial Peak SAR*** (Partial-Body)	1.60	8.00
Spatial Peak SAR**** (Hands / Feet / Ankle / Wrist )	4.00	20.00

### 3. Safety Limits for Partial Body Exposure

#### Notes :

- \* The Spatial Peak value of the SAR averaged over any 1 gram 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 Average value of the SAR averaged over the partial – body.
- \*\*\*\* The Spatial Peak value of the SAR averaged over any 10 grams of tissue.  
( defined as a tissue volume in the shape of a cube ) and over the appropriate averaging time.

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

**Occupational / 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).



## 12. Conclusion

The SAR test values found for the portable mobile phone **Sky Phone LLC Trade Name : SKY DEVICE Model(s) : SKY 5.0S** is below the maximum recommended level of 1.6 W/kg (mW/g).

## 13. References

- [1] Std. C95.1-1999, "American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300KHz to 100GHz", New York.
- [2] NCRP, National Council on Radiation Protection and Measurements, "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields", NCRP report NO. 86, 1986.
- [3] T. Schmid, O. Egger, and N. Kuster, "Automatic E-field scanning system for dosimetric assessments", IEEE Transactions on Microwave Theory and Techniques, vol. 44, pp, 105-113, Jan. 1996.
- [4] K. Pokovi<sup>c</sup>, T. Schmid, and N. Kuster, "Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequency", in ICECOM'97, Dubrovnik, October 15-17, 1997, pp.120-124.
- [5] K. Pokovi<sup>c</sup>, T. Schmid, and N. Kuster, "E-field probe with improved isotropy in brain simulating liquids", in Proceedings of the ELMAR, Zadar, Croatia, 23-25 June, 1996, pp.172-175.
- [6] N. Kuster, and Q. Balzano, "Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300MHz", IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.
- [7] Robert J. Renka, "Multivariate Interpolation Of Large Sets Of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988 , pp. 139-148.
- [8] N. Kuster, R. Kastle, T. Schmid, Dosimetric evaluation of mobile communications equipment with known precision, IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.
- [9] Std. C95.3-1991, "IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave, New York: IEEE, Aug. 1992.
- [10] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), Human Exposure to Electromagnetic Fields High-frequency: 10KHz-300GHz, Jan. 1995.
- [11] IEEE Std 1528™-2013 - IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head From Wireless Communications Devices: Measurement Techniques
- [12] IEEE Std 1528a™-2005 (Amendment to IEEE Std 1528™-2013), IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques



## **14. SAR Measurement Guidance**

- [1] KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03
- [2] KDB 865664 D02 RF Exposure Reporting v01r01
- [3] KDB 447498 D01 General RF Exposure Guidance v05r02
- [4] KDB 248227 D01 SAR meas for 802 11 a b g v01r02.
- [5] KDB 941225 D01 SAR test for 3G devices v02
- [6] KDB 941225 D02 HSPA and 1x Advanced v02r02
- [7] KDB 941225 D03 SAR Test Reduction GSM GPRS EDGE vo1
- [8] KDB 941225 D06 Hotspot Mode SAR v01r01
- [9] KDB 648474 D03 Wireless Chargers Battery Cover v01r02
- [10] KDB 648474 D04 Handset SAR v01r02



## Appendix A - System Performance Check

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/11/2014 05:25:04 PM

**System Performance Check at 835MHz\_20140811\_Head**

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082**

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.912 \text{ mho/m}$ ;  $\epsilon_r = 43$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DAS4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

### System Performance Check at 835MHz/Area Scan (61x121x1):

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.97 W/Kg

### System Performance Check at 835MHz/Zoom Scan (7x7x7)/Cube 0:

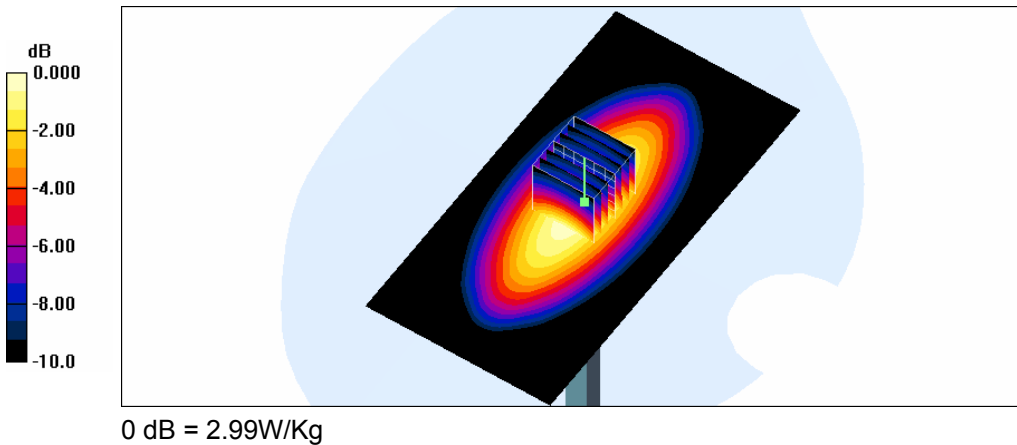
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 58.2 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 3.55 W/kg

**SAR(1 g) = 2.35 W/Kg; SAR(10 g) = 1.54 W/Kg**

Maximum value of SAR (measured) = 2.99 W/Kg







Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/12/2014 12:57:55 AM

**System Performance Check at 835MHz\_20140812\_Body**

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082**

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.998 \text{ mho/m}$ ;  $\epsilon_r = 57.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**System Performance Check at 835MHz/Area Scan (61x121x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.91 W/Kg

**System Performance Check at 835MHz/Zoom Scan (7x7x7)/Cube 0:**

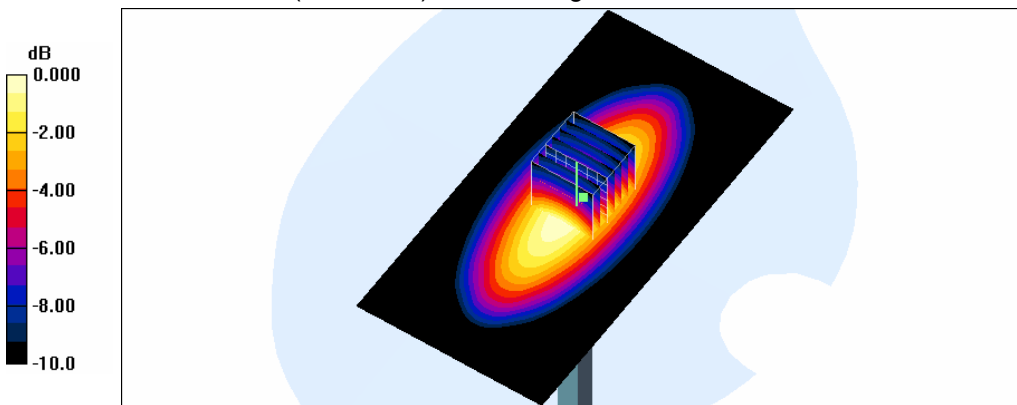
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 55.1 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 3.40 W/kg

**SAR(1 g) = 2.31 W/Kg; SAR(10 g) = 1.53 W/Kg**

Maximum value of SAR (measured) = 2.91 W/Kg



0 dB = 2.91W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 08:57:01 PM

**System Performance Check at 1750MHz\_20140813\_Head**

**DUT: Dipole D1750V2\_SN1023; Type: D1750V2; Serial: D1750V2 - SN:1023**

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1750 \text{ MHz}$ ;  $\sigma = 1.42 \text{ mho/m}$ ;  $\epsilon_r = 40.5$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**System Performance Check at 1750MHz/Area Scan (61x61x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 14.1 W/Kg

**System Performance Check at 1750MHz/Zoom Scan (7x7x7)/Cube 0:**

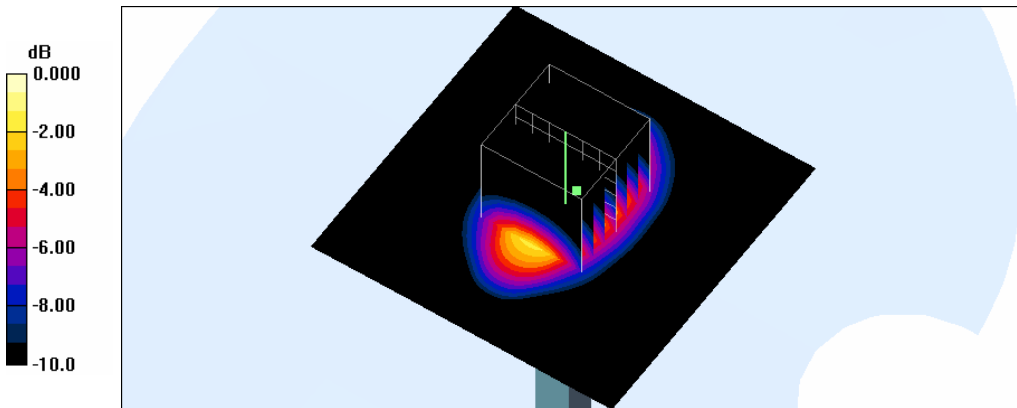
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 99.0 V/m; Power Drift = -0.005 dB

Peak SAR (extrapolated) = 17.5 W/kg

**SAR(1 g) = 9.42 W/Kg; SAR(10 g) = 4.93 W/Kg**

Maximum value of SAR (measured) = 13.6 W/Kg



0 dB = 13.6W/Kg



Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/13/2014 11:48:50 PM

**System Performance Check at 1750MHz\_20140813\_Body**

**DUT: Dipole D1750V2\_SN1023; Type: D1750V2; Serial: D1750V2 - SN:1023**

Communication System: CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1750 \text{ MHz}$ ;  $\sigma = 1.53 \text{ mho/m}$ ;  $\epsilon_r = 54.4$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**System Performance Check at 1750MHz/Area Scan (61x61x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 14.4 W/Kg

**System Performance Check at 1750MHz/Zoom Scan (7x7x7)/Cube 0:**

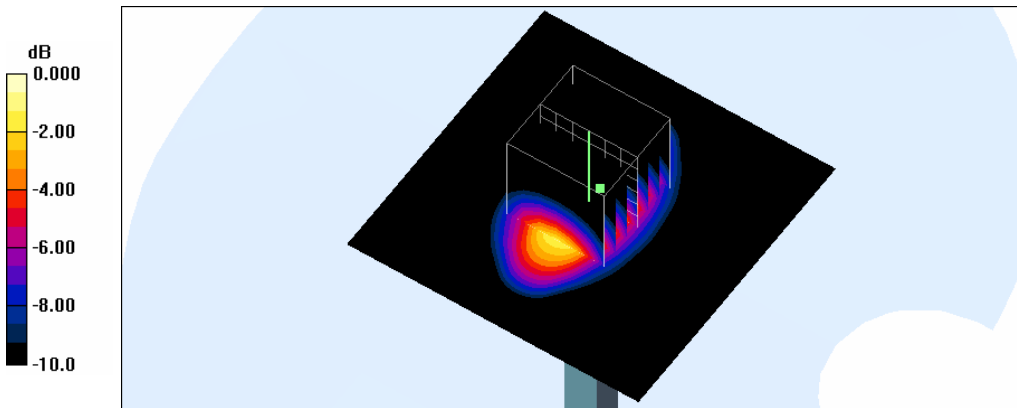
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 98.1 V/m; Power Drift = 0.002 dB

Peak SAR (extrapolated) = 17.9 W/kg

**SAR(1 g) = 9.93 W/Kg; SAR(10 g) = 5.2 W/Kg**

Maximum value of SAR (measured) = 14.3 W/Kg



0 dB = 14.3W/Kg



Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/12/2014 06:18:45 PM

**System Performance Check at 1900MHz\_20140812\_Head**

**DUT: Dipole D1900V2\_SN5d111; Type: D1900V2; Serial: D1900V2 - SN:5d111**

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

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.39 \text{ mho/m}$ ;  $\epsilon_r = 40.6$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**System Performance Check at 1900MHz/Area Scan (61x61x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 15.2 W/Kg

**System Performance Check at 1900MHz/Zoom Scan (7x7x7)/Cube 0:**

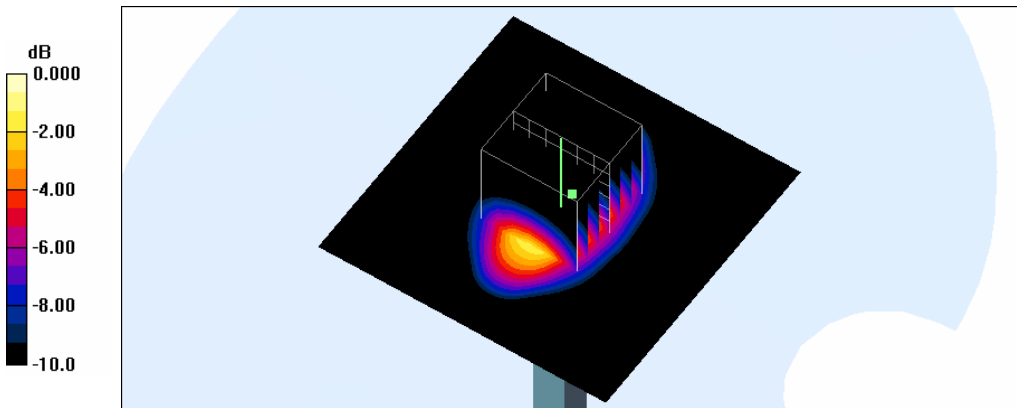
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 103.9 V/m; Power Drift = 0.000 dB

Peak SAR (extrapolated) = 18.5 W/kg

**SAR(1 g) = 10.2 W/Kg; SAR(10 g) = 5.4 W/Kg**

Maximum value of SAR (measured) = 14.6 W/Kg



0 dB = 14.6W/Kg



Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/13/2014 02:00:52 AM

**System Performance Check at 1900MHz\_20140813\_Body**

**DUT: Dipole D1900V2\_SN5d111; Type: D1900V2; Serial: D1900V2 - SN:5d111**

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

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.48 \text{ mho/m}$ ;  $\epsilon_r = 52.2$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**System Performance Check at 1900MHz/Area Scan (61x61x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 10.5 W/Kg

**System Performance Check at 1900MHz/Zoom Scan (7x7x7)/Cube 0:**

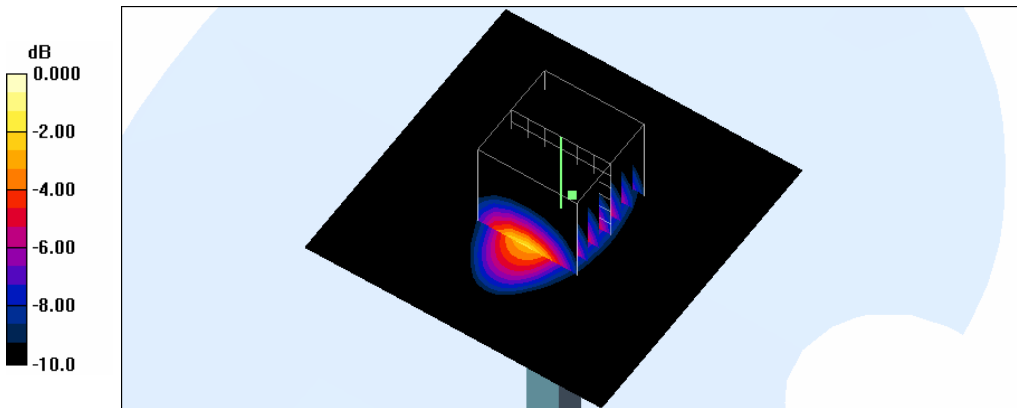
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 85.2 V/m; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 18.8 W/kg

**SAR(1 g) = 10.5 W/Kg; SAR(10 g) = 5.5 W/Kg**

Maximum value of SAR (measured) = 14.8 W/Kg



0 dB = 14.8W/Kg



Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/14/2014 10:55:48 AM

**System Performance Check at 2450MHz\_20140814\_Head**

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:712**

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

Medium parameters used:  $f = 2450 \text{ MHz}$ ;  $\sigma = 1.84 \text{ mho/m}$ ;  $\epsilon_r = 38.4$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**System Performance Check at 2450MHz/Area Scan (61x61x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 20.0 W/Kg

**System Performance Check at 2450MHz/Zoom Scan (7x7x7)/Cube 0:**

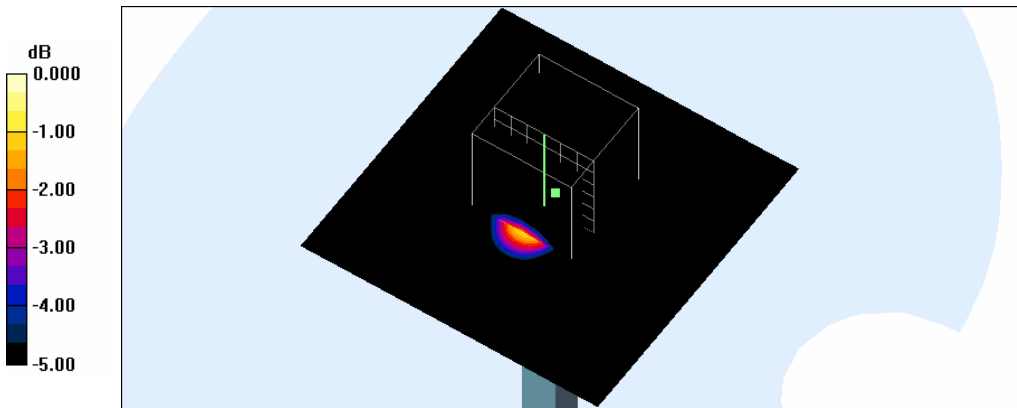
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 104.2 V/m; Power Drift = 0.024 dB

Peak SAR (extrapolated) = 26.0 W/kg

**SAR(1 g) = 12.6 W/Kg; SAR(10 g) = 5.81 W/Kg**

Maximum value of SAR (measured) = 19.2 W/Kg





Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/14/2014 09:06:38 PM

**System Performance Check at 2450MHz\_20140814\_Body**

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:712**

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

Medium parameters used:  $f = 2450 \text{ MHz}$ ;  $\sigma = 1.96 \text{ mho/m}$ ;  $\epsilon_r = 52.2$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**System Performance Check at 2450MHz/Area Scan (61x61x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 18.6 W/Kg

**System Performance Check at 2450MHz/Zoom Scan (7x7x7)/Cube 0:**

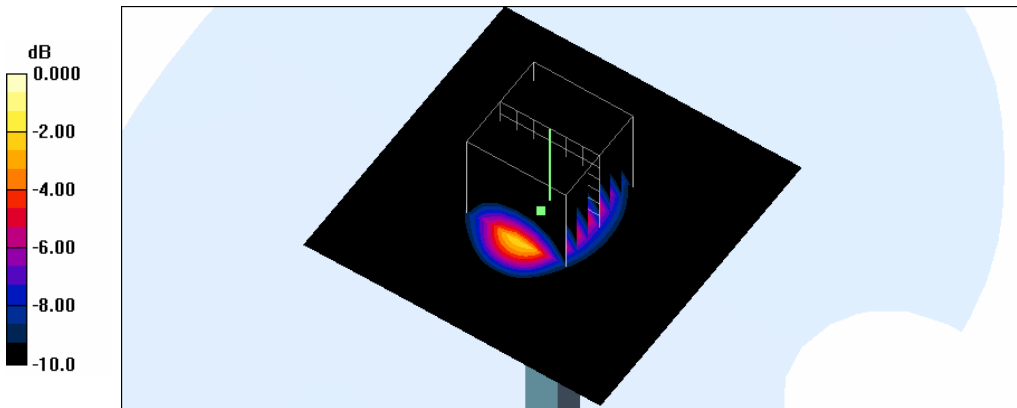
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 97.2 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 24.9 W/kg

**SAR(1 g) = 12 W/Kg; SAR(10 g) = 5.62 W/Kg**

Maximum value of SAR (measured) = 18.3 W/Kg



0 dB = 18.3W/Kg



## Appendix B - SAR Measurement Data

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/11/2014 07:43:50 PM

#1\_RC\_GSM 850 CH251\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GSM850; Frequency: 848.8 MHz; Duty Cycle: 1:8

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.928$  mho/m;  $\epsilon_r = 42.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DAS4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

### Right Cheek/Area Scan (71x131x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.271 W/Kg

### Right Cheek/Zoom Scan (5x5x7)/Cube 0:

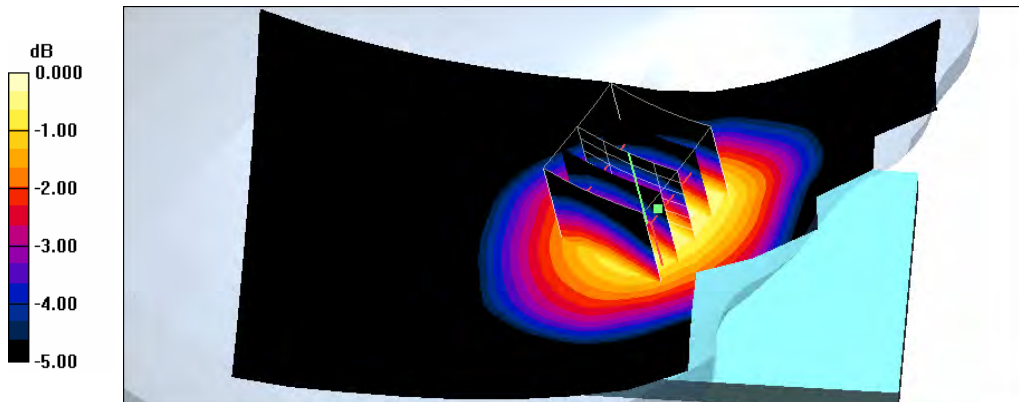
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.22 V/m; Power Drift = -0.154 dB

Peak SAR (extrapolated) = 0.295 W/kg

**SAR(1 g) = 0.237 W/Kg; SAR(10 g) = 0.184 W/Kg**

Maximum value of SAR (measured) = 0.271 W/Kg



0 dB = 0.271W/Kg



Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/11/2014 08:11:41 PM

#2\_RT\_GSM 850 CH251\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GSM850; Frequency: 848.8 MHz; Duty Cycle: 1:8

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 0.928 \text{ mho/m}$ ;  $\epsilon_r = 42.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Tilted/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.172 W/Kg

**Right Tilted/Zoom Scan (5x5x7)/Cube 0:**

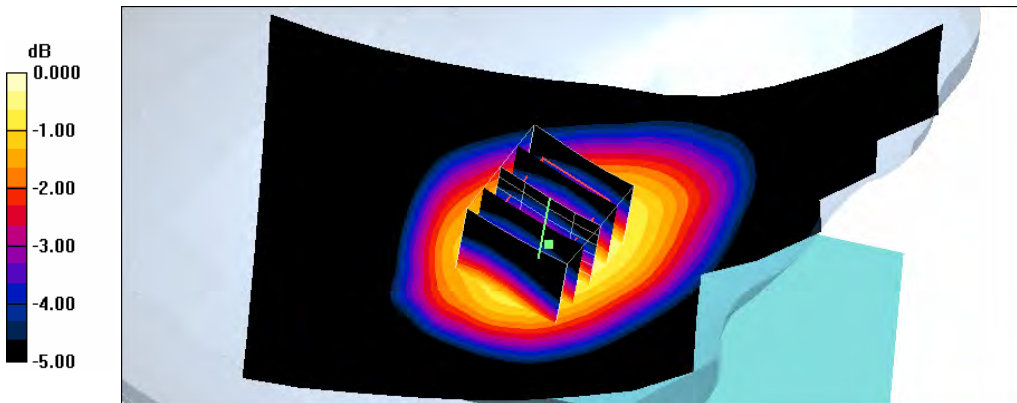
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 9.29 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 0.186 W/kg

**SAR(1 g) = 0.150 W/Kg; SAR(10 g) = 0.116 W/Kg**

Maximum value of SAR (measured) = 0.169 W/Kg



0 dB = 0.169W/Kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/11/2014 08:33:57 PM

#3\_LC\_GSM 850 CH251\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GSM850; Frequency: 848.8 MHz; Duty Cycle: 1:8

Medium parameters used:  $f = 849$  MHz;  $\sigma = 0.928$  mho/m;  $\epsilon_r = 42.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Cheek/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.213 W/Kg

**Left Cheek/Zoom Scan (5x5x7)/Cube 0:**

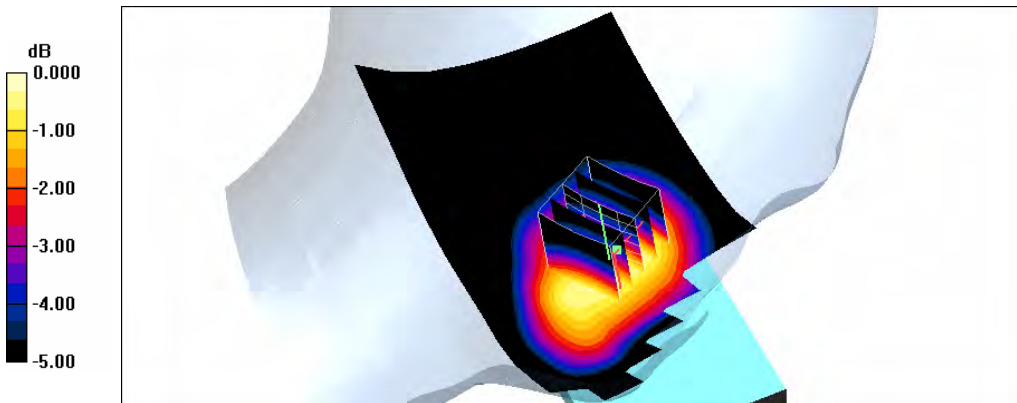
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.11 V/m; Power Drift = -0.033 dB

Peak SAR (extrapolated) = 0.232 W/kg

**SAR(1 g) = 0.186 W/Kg; SAR(10 g) = 0.144 W/Kg**

Maximum value of SAR (measured) = 0.212 W/Kg



0 dB = 0.212W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/11/2014 08:54:02 PM

**#4\_LT\_GSM 850 CH251\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GSM850; Frequency: 848.8 MHz; Duty Cycle: 1:8

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 0.928 \text{ mho/m}$ ;  $\epsilon_r = 42.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Tilted/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.153 W/Kg

**Left Tilted/Zoom Scan (5x5x7)/Cube 0:**

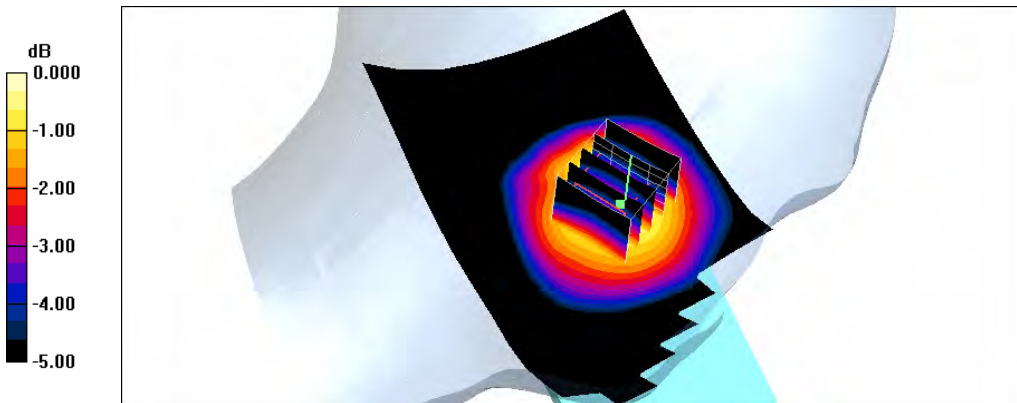
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 9.21 V/m; Power Drift = 0.052 dB

Peak SAR (extrapolated) = 0.171 W/kg

**SAR(1 g) = 0.135 W/Kg; SAR(10 g) = 0.103 W/Kg**

Maximum value of SAR (measured) = 0.154 W/Kg



0 dB = 0.154W/Kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/11/2014 09:21:01 PM

#5\_RC\_GPRS 850 CH251\_1D4U\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS 850 (1Down, 4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 0.928 \text{ mho/m}$ ;  $\epsilon_r = 42.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Cheek/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.485 W/Kg

**Right Cheek/Zoom Scan (5x5x7)/Cube 0:**

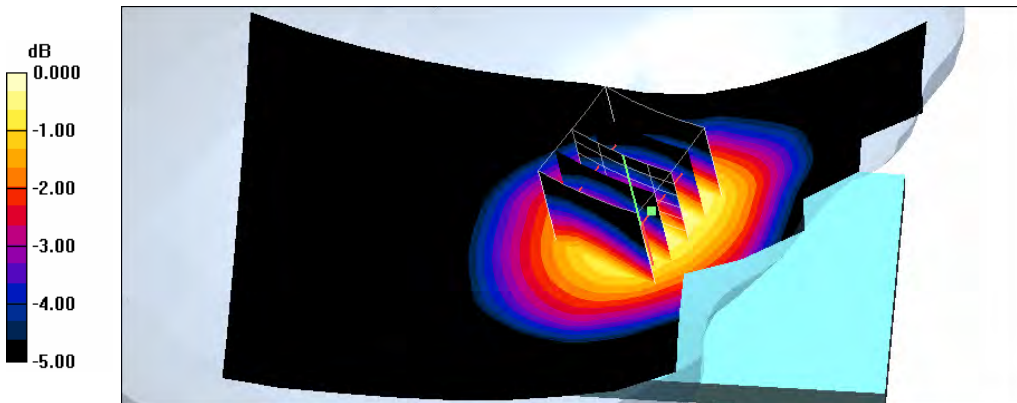
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 7.90 V/m; Power Drift = 0.141 dB

Peak SAR (extrapolated) = 0.525 W/kg

**SAR(1 g) = 0.422 W/Kg; SAR(10 g) = 0.327 W/Kg**

Maximum value of SAR (measured) = 0.478 W/Kg



0 dB = 0.478W/Kg

Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/11/2014 09:40:02 PM

#6\_RT\_GPRS 850 CH251\_1D4U\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS 850 (1Down, 4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 0.928 \text{ mho/m}$ ;  $\epsilon_r = 42.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Tilted/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.306 W/Kg

**Right Tilted/Zoom Scan (5x5x7)/Cube 0:**

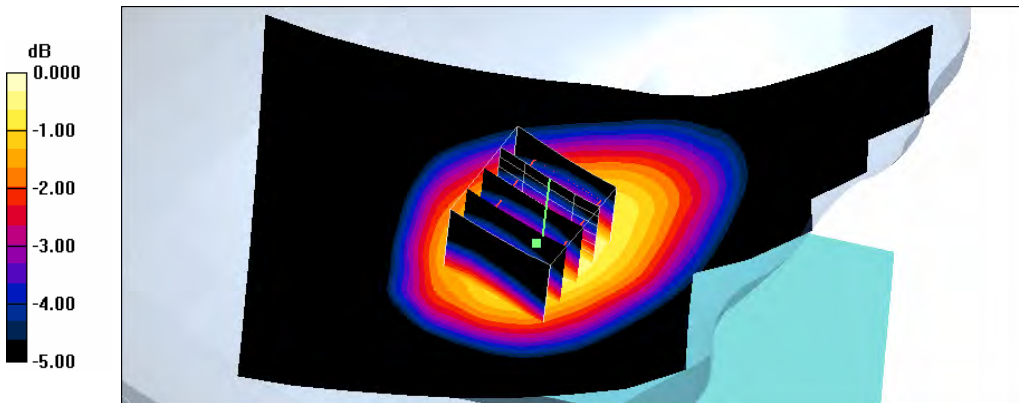
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 12.5 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 0.334 W/kg

**SAR(1 g) = 0.267 W/Kg; SAR(10 g) = 0.206 W/Kg**

Maximum value of SAR (measured) = 0.307 W/Kg



0 dB = 0.307W/Kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/11/2014 10:03:47 PM

#7\_LC\_GPRS 850 CH251\_1D4U\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS 850 (1Down, 4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 0.928 \text{ mho/m}$ ;  $\epsilon_r = 42.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Cheek/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.378 W/Kg

**Left Cheek/Zoom Scan (5x5x7)/Cube 0:**

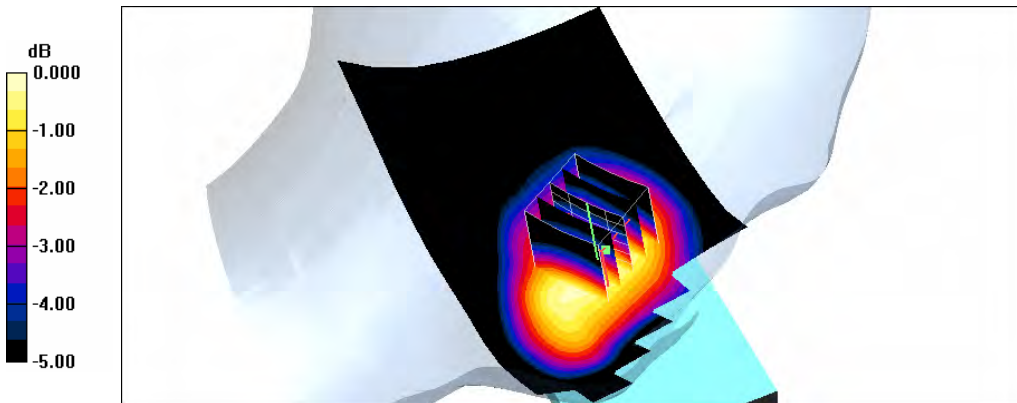
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.22 V/m; Power Drift = 0.093 dB

Peak SAR (extrapolated) = 0.409 W/kg

**SAR(1 g) = 0.325 W/Kg; SAR(10 g) = 0.252 W/Kg**

Maximum value of SAR (measured) = 0.373 W/Kg



0 dB = 0.373W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/11/2014 10:23:52 PM

**#8\_LT\_GPRS 850 CH251\_1D4U\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS 850 (1Down, 4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 0.928 \text{ mho/m}$ ;  $\epsilon_r = 42.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Tilted/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.305 W/Kg

**Left Tilted/Zoom Scan (5x5x7)/Cube 0:**

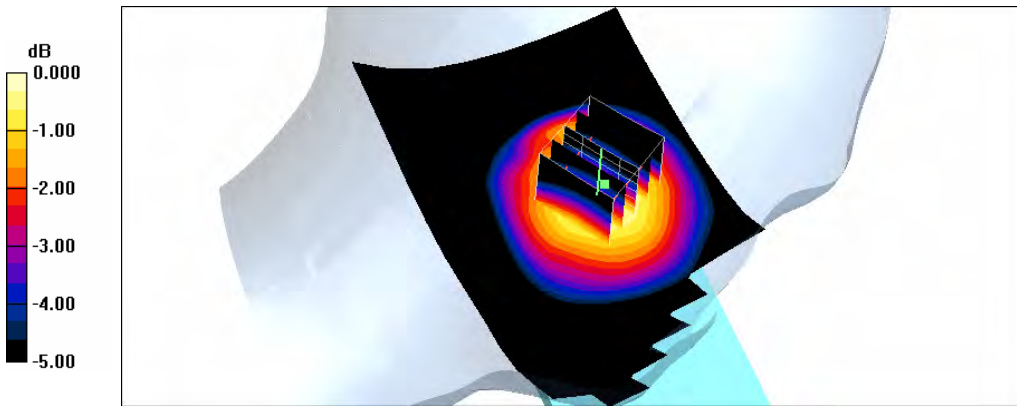
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 13.9 V/m; Power Drift = 0.110 dB

Peak SAR (extrapolated) = 0.332 W/kg

**SAR(1 g) = 0.264 W/Kg; SAR(10 g) = 0.200 W/Kg**

Maximum value of SAR (measured) = 0.304 W/Kg



0 dB = 0.304W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 08:28:23 PM

**#28\_RC\_PCS CH512\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: PCS; Frequency: 1850.2 MHz; Duty Cycle: 1:8

Medium parameters used (interpolated):  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.34 \text{ mho/m}$ ;  $\epsilon_r = 40.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Cheek/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.167 W/Kg

**Right Cheek/Zoom Scan (5x5x7)/Cube 0:**

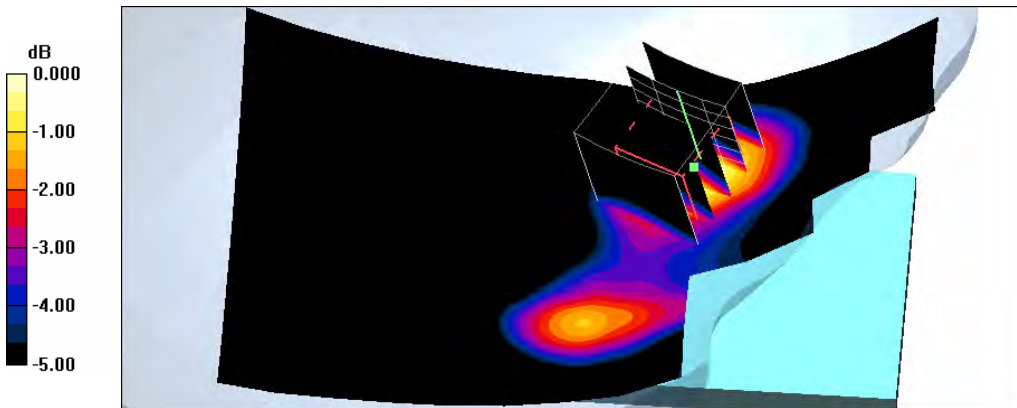
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 4.80 V/m; Power Drift = 0.123 dB

Peak SAR (extrapolated) = 0.209 W/kg

**SAR(1 g) = 0.141 W/Kg; SAR(10 g) = 0.090 W/Kg**

Maximum value of SAR (measured) = 0.171 W/Kg



0 dB = 0.171W/Kg





Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/12/2014 08:57:16 PM

#29\_RT\_PCS CH512\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: PCS; Frequency: 1850.2 MHz; Duty Cycle: 1:8

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.34$  mho/m;  $\epsilon_r = 40.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Tilted/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.084 W/Kg

**Right Tilted/Zoom Scan (5x5x7)/Cube 0:**

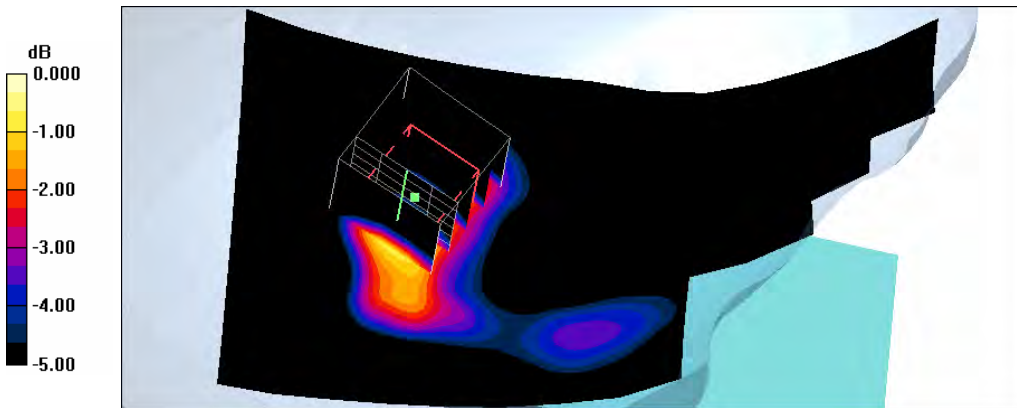
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.29 V/m; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 0.090 W/kg

**SAR(1 g) = 0.060 W/Kg; SAR(10 g) = 0.038 W/Kg**

Maximum value of SAR (measured) = 0.076 W/Kg



0 dB = 0.076W/Kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/12/2014 09:18:04 PM

#30\_LC\_PCS CH512\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: PCS; Frequency: 1850.2 MHz; Duty Cycle: 1:8

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.34$  mho/m;  $\epsilon_r = 40.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Cheek/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.240 W/Kg

**Left Cheek/Zoom Scan (5x5x7)/Cube 0:**

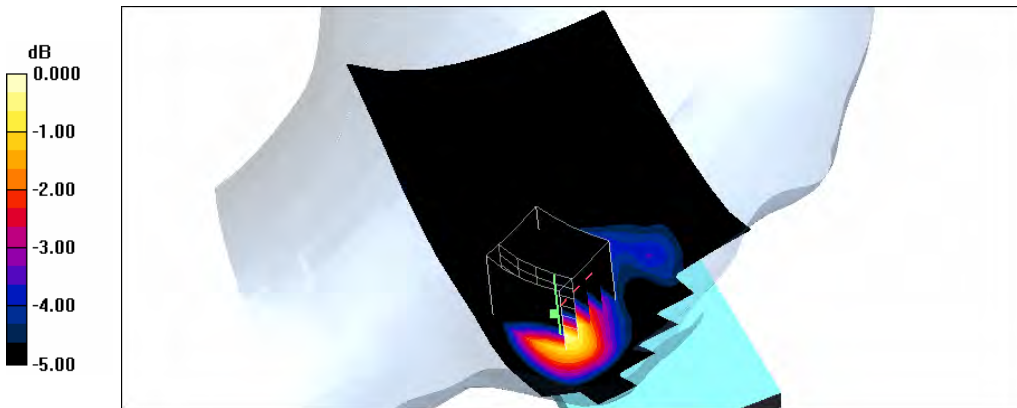
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.30 V/m; Power Drift = 0.073 dB

Peak SAR (extrapolated) = 0.288 W/kg

**SAR(1 g) = 0.190 W/Kg; SAR(10 g) = 0.122 W/Kg**

Maximum value of SAR (measured) = 0.236 W/Kg



0 dB = 0.236W/Kg



Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/12/2014 09:37:13 PM

#31\_LT\_PCS CH512\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: PCS; Frequency: 1850.2 MHz; Duty Cycle: 1:8

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.34$  mho/m;  $\epsilon_r = 40.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Tilted/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.122 W/Kg

**Left Tilted/Zoom Scan (5x5x7)/Cube 0:**

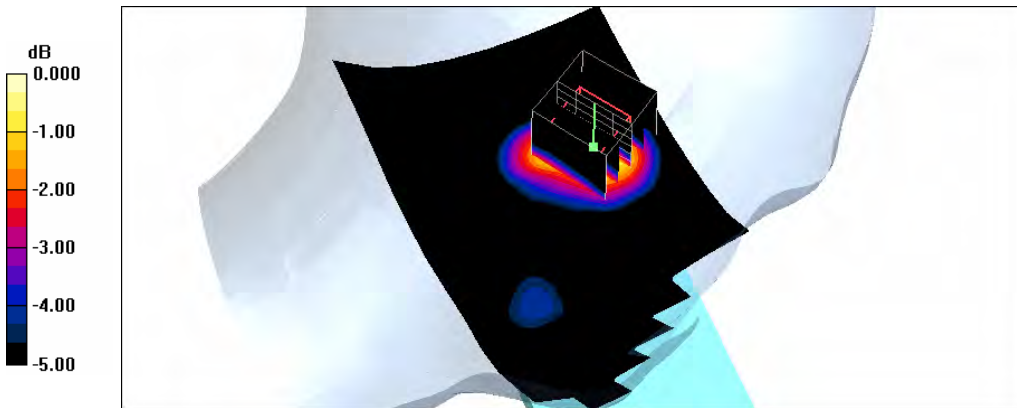
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.82 V/m; Power Drift = 0.063 dB

Peak SAR (extrapolated) = 0.121 W/kg

**SAR(1 g) = 0.083 W/Kg; SAR(10 g) = 0.053 W/Kg**

Maximum value of SAR (measured) = 0.103 W/Kg



0 dB = 0.103W/Kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/12/2014 10:00:36 PM

#32\_RC\_GPRS\_PCS\_CH512\_1D4U\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS PCS (1Down,4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:2

Medium parameters used (interpolated):  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.34 \text{ mho/m}$ ;  $\epsilon_r = 40.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Cheek/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.300 W/Kg

**Right Cheek/Zoom Scan (5x5x7)/Cube 0:**

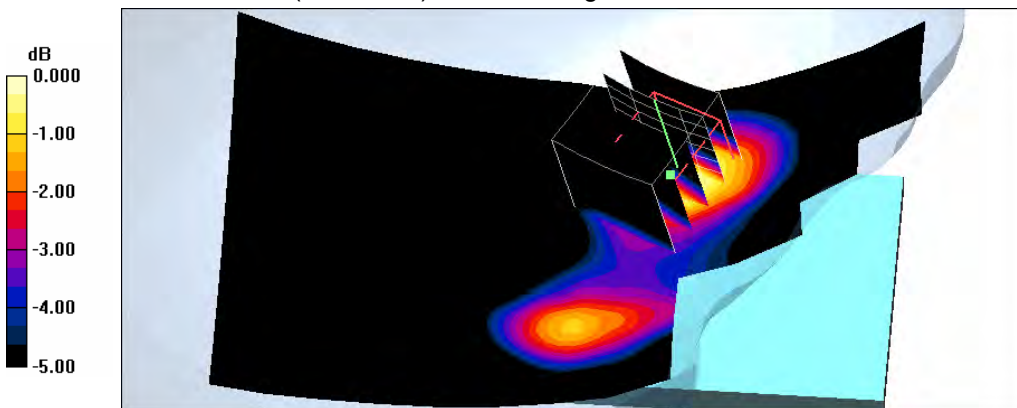
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.71 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 0.374 W/kg

**SAR(1 g) = 0.255 W/Kg; SAR(10 g) = 0.163 W/Kg**

Maximum value of SAR (measured) = 0.314 W/Kg



0 dB = 0.314W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 10:19:47 PM

#33\_RT\_GPRS\_PCS\_CH512\_1D4U\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS PCS (1Down,4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:2  
 Medium parameters used (interpolated):  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.34 \text{ mho/m}$ ;  $\epsilon_r = 40.8$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Tilted/Area Scan (71x131x1):**

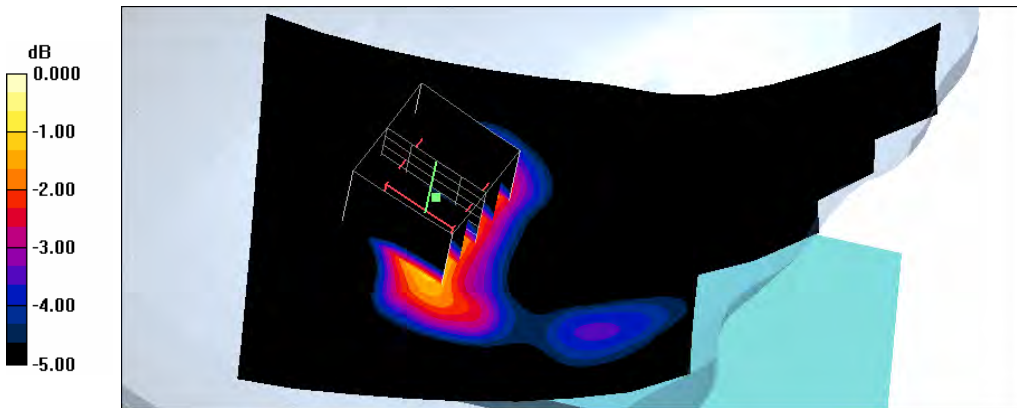
Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.157 W/Kg

**Right Tilted/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 9.86 V/m; Power Drift = 0.006 dB  
 Peak SAR (extrapolated) = 0.170 W/kg

**SAR(1 g) = 0.115 W/Kg; SAR(10 g) = 0.073 W/Kg**

Maximum value of SAR (measured) = 0.145 W/Kg



0 dB = 0.145W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 10:40:31 PM

**#34\_LC\_GPRS\_PCS\_CH512\_1D4U\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS PCS (1Down,4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:2  
 Medium parameters used (interpolated):  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.34 \text{ mho/m}$ ;  $\epsilon_r = 40.8$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DAS4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Cheek/Area Scan (71x131x1):**

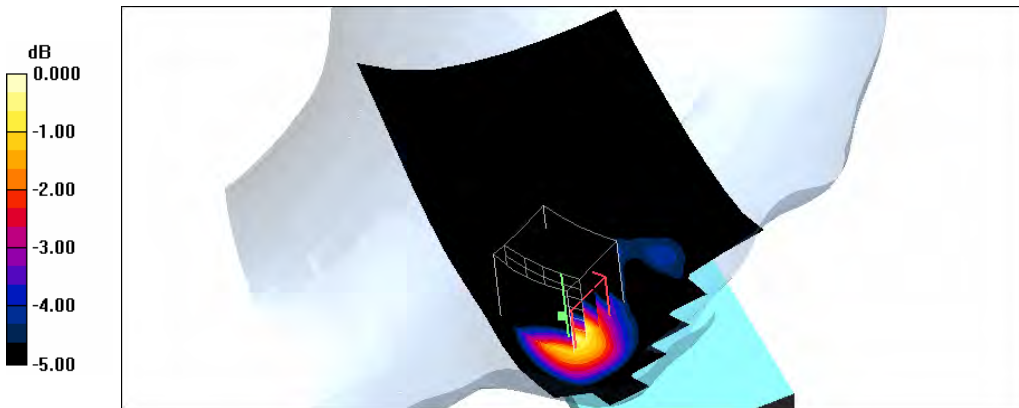
Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.515 W/Kg

**Left Cheek/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 5.95 V/m; Power Drift = 0.096 dB  
 Peak SAR (extrapolated) = 0.633 W/kg

**SAR(1 g) = 0.415 W/Kg; SAR(10 g) = 0.265 W/Kg**

Maximum value of SAR (measured) = 0.529 W/Kg



0 dB = 0.529W/Kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/12/2014 11:00:25 PM

#35\_LT\_GPRS PCS CH512\_1D4U\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS PCS (1Down,4Up); Frequency: 1850.2 MHz;Duty Cycle: 1:2

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.34$  mho/m;  $\epsilon_r = 40.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Tilted/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.239 W/Kg

**Left Tilted/Zoom Scan (5x5x7)/Cube 0:**

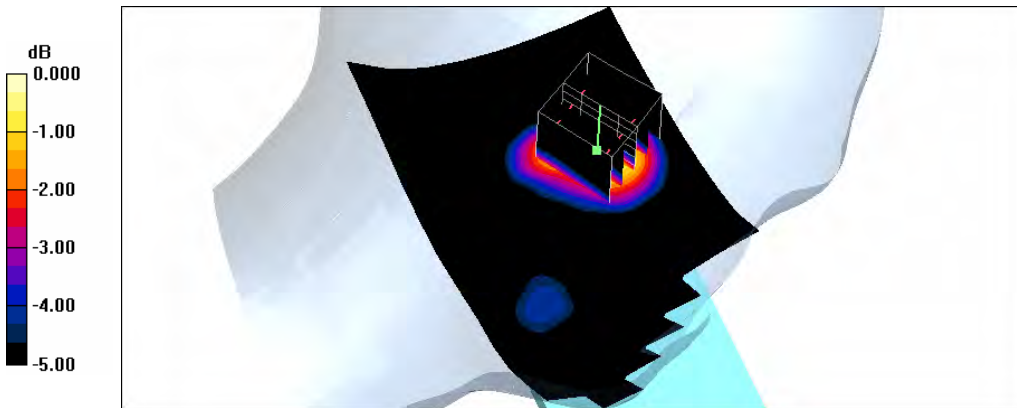
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.67 V/m; Power Drift = 0.069 dB

Peak SAR (extrapolated) = 0.239 W/kg

**SAR(1 g) = 0.163 W/Kg; SAR(10 g) = 0.102 W/Kg**

Maximum value of SAR (measured) = 0.203 W/Kg



0 dB = 0.203W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 12:17:05 AM

**#36\_RC\_WCDMA Band II CH9262\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.34$  mho/m;  $\epsilon_r = 40.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Cheek/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.261 W/Kg

**Right Cheek/Zoom Scan (5x5x7)/Cube 0:**

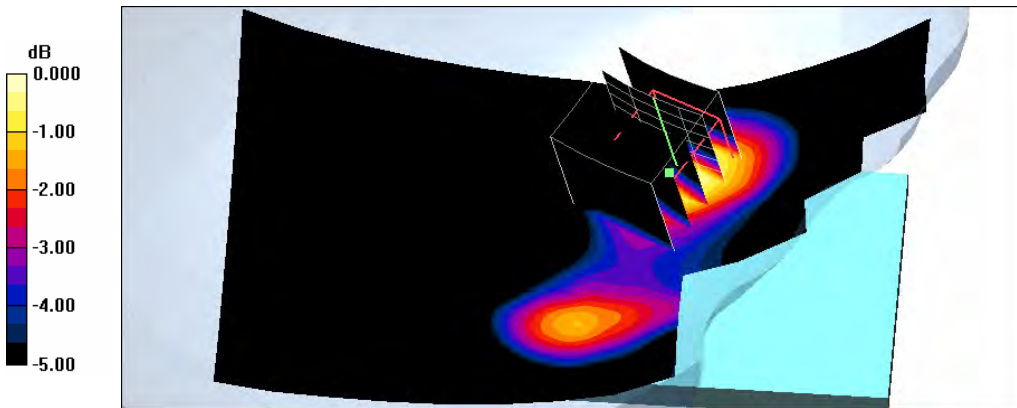
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.30 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 0.328 W/kg

**SAR(1 g) = 0.222 W/Kg; SAR(10 g) = 0.142 W/Kg**

Maximum value of SAR (measured) = 0.276 W/Kg



0 dB = 0.276W/Kg



Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 12:38:48 AM

**#37\_RT\_WCDMA Band II CH9262\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4 \text{ MHz}$ ;  $\sigma = 1.34 \text{ mho/m}$ ;  $\epsilon_r = 40.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DAS4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Tilted/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.131 W/Kg

**Right Tilted/Zoom Scan (5x5x7)/Cube 0:**

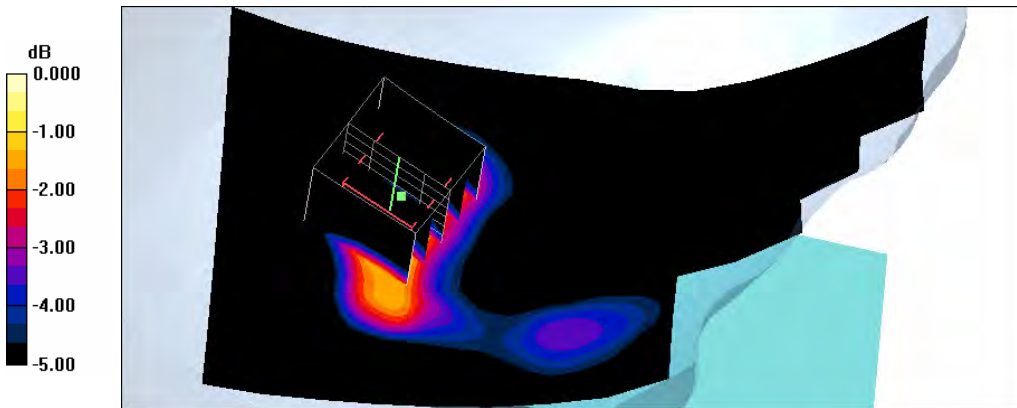
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 9.31 V/m; Power Drift = 0.064 dB

Peak SAR (extrapolated) = 0.144 W/kg

**SAR(1 g) = 0.098 W/Kg; SAR(10 g) = 0.062 W/Kg**

Maximum value of SAR (measured) = 0.123 W/Kg



0 dB = 0.123W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 12:59:18 AM

**#38\_LC\_WCDMA Band II CH9262\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4 \text{ MHz}$ ;  $\sigma = 1.34 \text{ mho/m}$ ;  $\epsilon_r = 40.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Cheek/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.369 W/Kg

**Left Cheek/Zoom Scan (5x5x7)/Cube 0:**

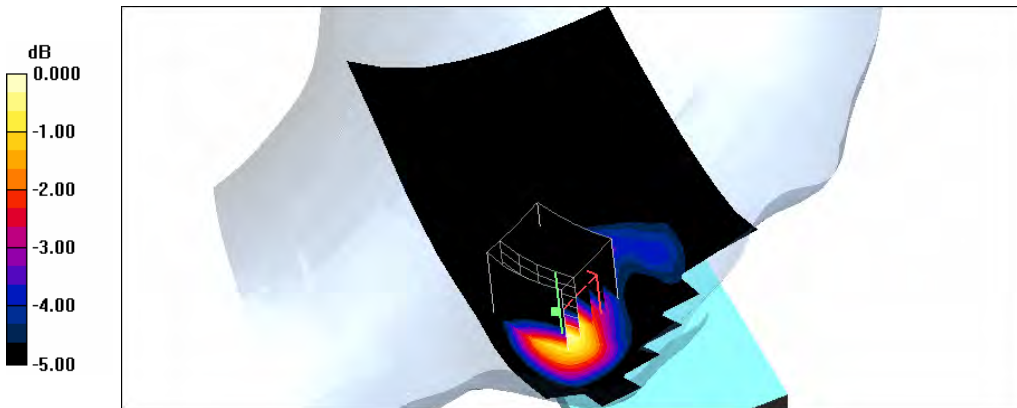
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 5.21 V/m; Power Drift = 0.103 dB

Peak SAR (extrapolated) = 0.441 W/kg

**SAR(1 g) = 0.293 W/Kg; SAR(10 g) = 0.188 W/Kg**

Maximum value of SAR (measured) = 0.366 W/Kg



0 dB = 0.366W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 01:20:29 AM

**#39\_LT\_WCDMA Band II CH9262\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4 \text{ MHz}$ ;  $\sigma = 1.34 \text{ mho/m}$ ;  $\epsilon_r = 40.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.97, 7.97, 7.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Tilted/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.188 W/Kg

**Left Tilted/Zoom Scan (5x5x7)/Cube 0:**

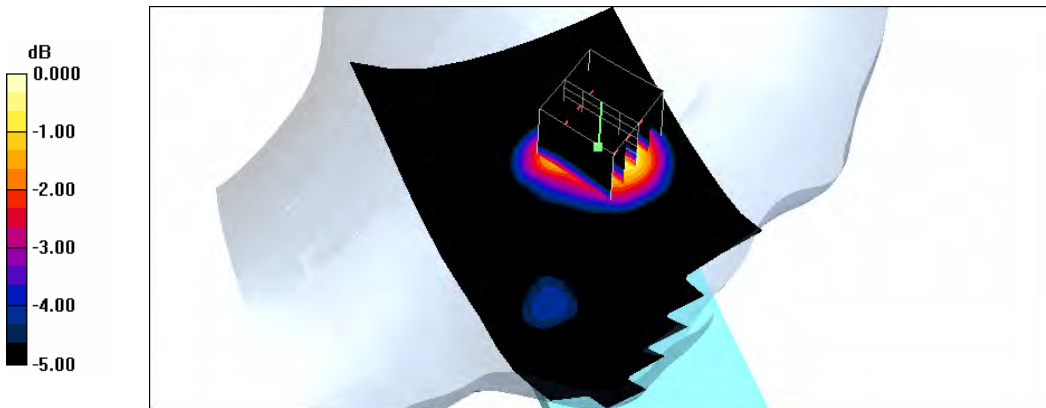
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 8.63 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 0.189 W/kg

**SAR(1 g) = 0.130 W/Kg; SAR(10 g) = 0.082 W/Kg**

Maximum value of SAR (measured) = 0.160 W/Kg



0 dB = 0.160W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 09:40:20 PM

**#52\_RC\_WCDMA Band IV CH1312\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4 \text{ MHz}$ ;  $\sigma = 1.39 \text{ mho/m}$ ;  $\epsilon_r = 40.6$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Cheek/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.202 W/Kg

**Right Cheek/Zoom Scan (5x5x7)/Cube 0:**

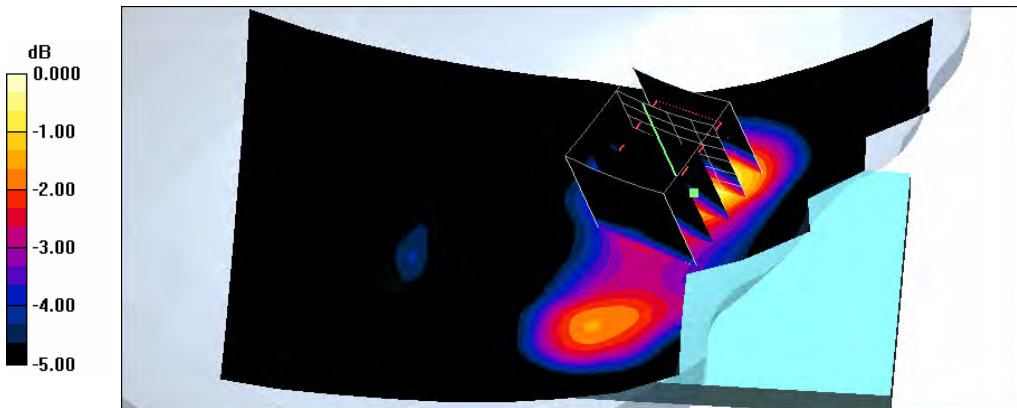
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 6.94 V/m; Power Drift = 0.035 dB

Peak SAR (extrapolated) = 0.247 W/kg

**SAR(1 g) = 0.165 W/Kg; SAR(10 g) = 0.105 W/Kg**

Maximum value of SAR (measured) = 0.205 W/Kg



0 dB = 0.205W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 10:00:09 PM

**#53\_RT\_WCDMA Band IV CH1312\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4 \text{ MHz}$ ;  $\sigma = 1.39 \text{ mho/m}$ ;  $\epsilon_r = 40.6$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Tilted/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.150 W/Kg

**Right Tilted/Zoom Scan (5x5x7)/Cube 0:**

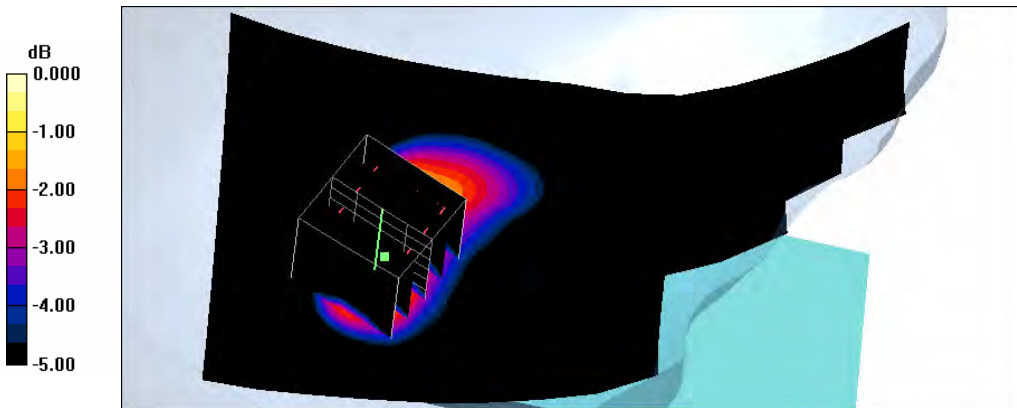
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 10.4 V/m; Power Drift = 0.009 dB

Peak SAR (extrapolated) = 0.184 W/kg

**SAR(1 g) = 0.116 W/Kg; SAR(10 g) = 0.069 W/Kg**

Maximum value of SAR (measured) = 0.150 W/Kg



0 dB = 0.150W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 10:23:18 PM

**#54\_LC\_WCDMA Band IV CH1312\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4 \text{ MHz}$ ;  $\sigma = 1.39 \text{ mho/m}$ ;  $\epsilon_r = 40.6$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Cheek/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.317 W/Kg

**Left Cheek/Zoom Scan (5x5x7)/Cube 0:**

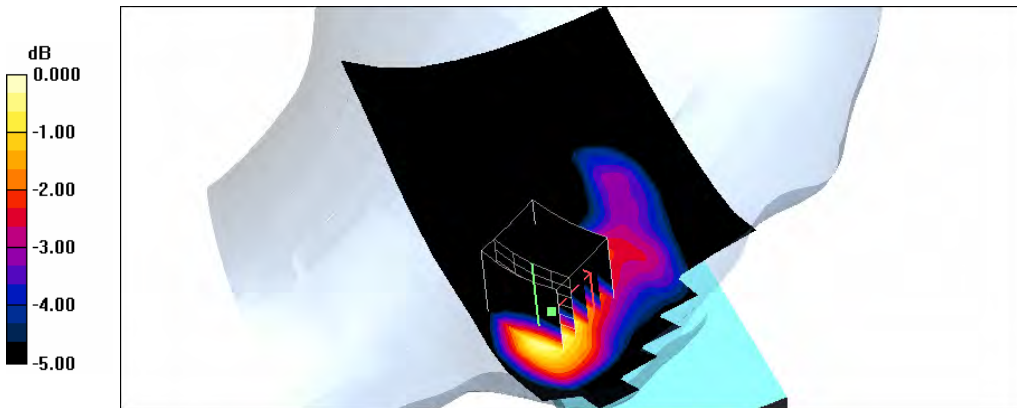
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 7.61 V/m; Power Drift = 0.015 dB

Peak SAR (extrapolated) = 0.367 W/kg

**SAR(1 g) = 0.250 W/Kg; SAR(10 g) = 0.166 W/Kg**

Maximum value of SAR (measured) = 0.309 W/Kg



0 dB = 0.309W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 10:42:59 PM

**#55\_LT\_WCDMA Band IV CH1312\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4 \text{ MHz}$ ;  $\sigma = 1.39 \text{ mho/m}$ ;  $\epsilon_r = 40.6$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(8.14, 8.14, 8.14); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Tilted/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.147 W/Kg

**Left Tilted/Zoom Scan (5x5x7)/Cube 0:**

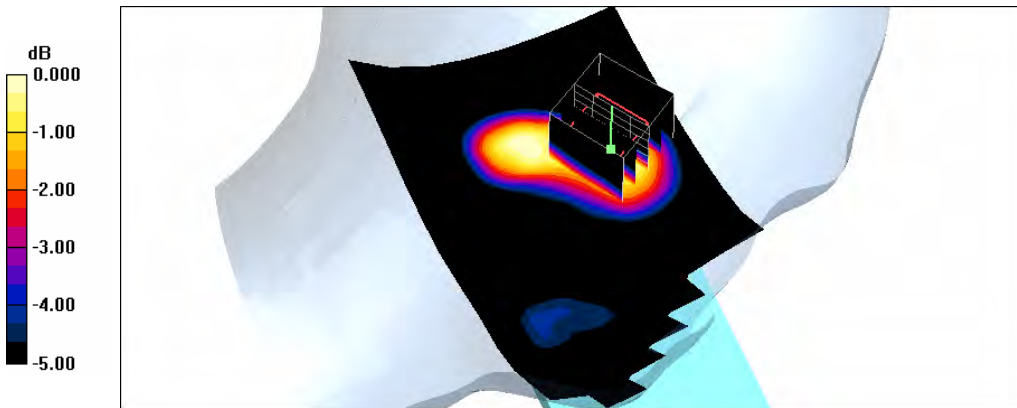
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 9.95 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 0.164 W/kg

**SAR(1 g) = 0.110 W/Kg; SAR(10 g) = 0.071 W/Kg**

Maximum value of SAR (measured) = 0.136 W/Kg



0 dB = 0.136W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/11/2014 10:47:55 PM

**#9\_RC\_WCDMA Band V CH4132\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.902$  mho/m;  $\epsilon_r = 43.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Cheek/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.264 W/Kg

**Right Cheek/Zoom Scan (5x5x7)/Cube 0:**

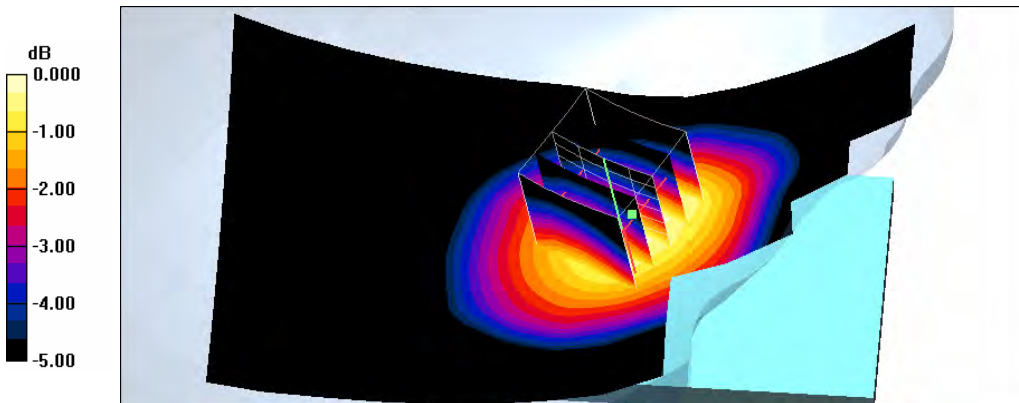
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.32 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 0.286 W/kg

**SAR(1 g) = 0.232 W/Kg; SAR(10 g) = 0.180 W/Kg**

Maximum value of SAR (measured) = 0.263 W/Kg



0 dB = 0.263W/Kg



Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/11/2014 11:06:09 PM

**#10\_RT\_WCDMA Band V CH4132\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.902$  mho/m;  $\epsilon_r = 43.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Tilted/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.168 W/Kg

**Right Tilted/Zoom Scan (5x5x7)/Cube 0:**

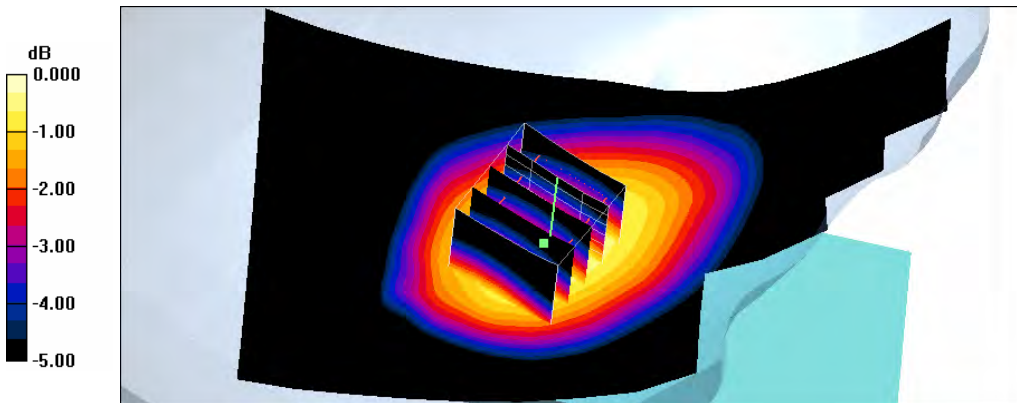
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.52 V/m; Power Drift = 0.047 dB

Peak SAR (extrapolated) = 0.183 W/kg

**SAR(1 g) = 0.148 W/Kg; SAR(10 g) = 0.115 W/Kg**

Maximum value of SAR (measured) = 0.168 W/Kg



0 dB = 0.168W/Kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/11/2014 11:28:21 PM

#11\_LC\_WCDMA Band V CH4132\_SIM1

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.902$  mho/m;  $\epsilon_r = 43.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Cheek/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.195 W/Kg

**Left Cheek/Zoom Scan (5x5x7)/Cube 0:**

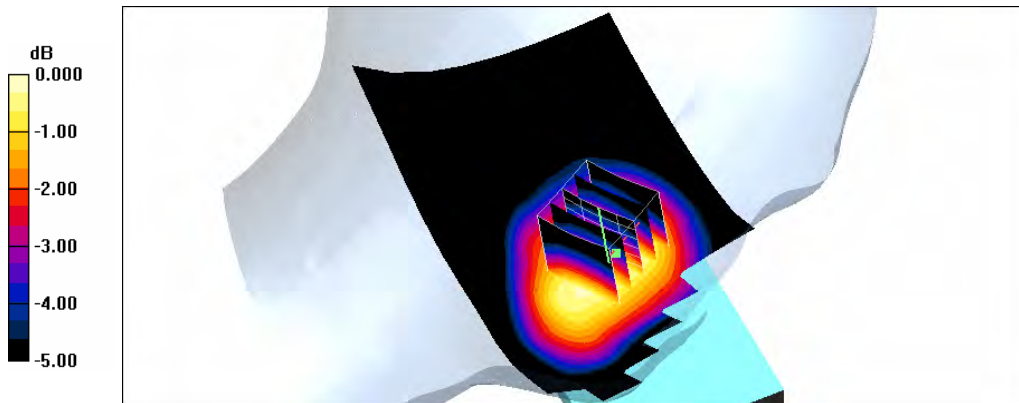
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.34 V/m; Power Drift = 0.027 dB

Peak SAR (extrapolated) = 0.212 W/kg

**SAR(1 g) = 0.173 W/Kg; SAR(10 g) = 0.136 W/Kg**

Maximum value of SAR (measured) = 0.196 W/Kg



0 dB = 0.196W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/11/2014 11:48:38 PM

**#12\_LT\_WCDMA Band V CH4132\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 826.4 \text{ MHz}$ ;  $\sigma = 0.902 \text{ mho/m}$ ;  $\epsilon_r = 43.1$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.62, 9.62, 9.62); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Tilted/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.137 W/Kg

**Left Tilted/Zoom Scan (5x5x7)/Cube 0:**

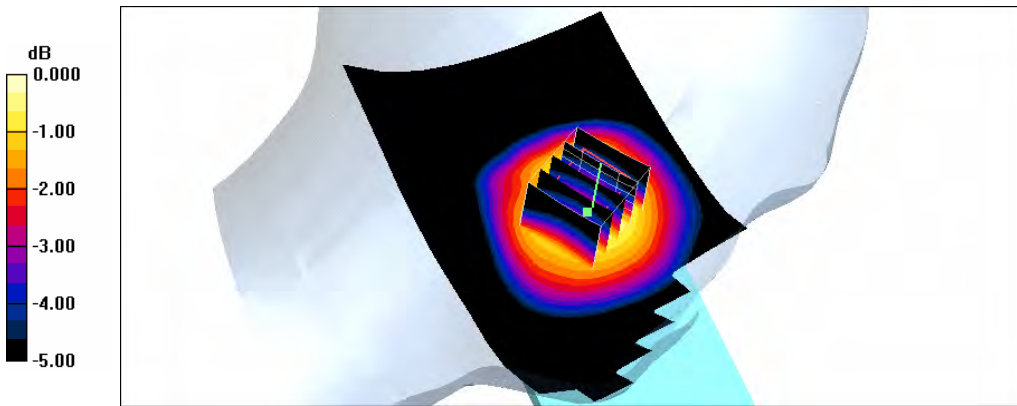
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 8.78 V/m; Power Drift = 0.016 dB

Peak SAR (extrapolated) = 0.149 W/kg

**SAR(1 g) = 0.121 W/Kg; SAR(10 g) = 0.094 W/Kg**

Maximum value of SAR (measured) = 0.137 W/Kg



0 dB = 0.137W/Kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/14/2014 02:34:22 PM

#62\_RC\_802.11b CH1\_1M

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.79$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DASy4 (High Precision Assessment)

DASy4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASy4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Cheek/Area Scan (101x191x1):**

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.516 W/Kg

**Right Cheek/Zoom Scan (7x7x7)/Cube 0:**

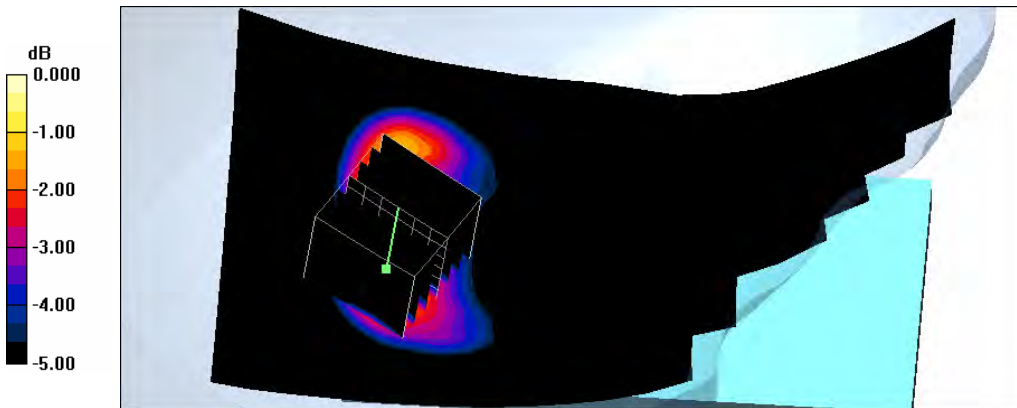
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.6 V/m; Power Drift = 0.018 dB

Peak SAR (extrapolated) = 0.656 W/kg

**SAR(1 g) = 0.361 W/Kg; SAR(10 g) = 0.195 W/Kg**

Maximum value of SAR (measured) = 0.506 W/Kg



0 dB = 0.506W/Kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/14/2014 03:16:50 PM

#63\_RT\_802.11b\_CH1\_1M

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.79$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Right Tilted/Area Scan (101x191x1):**

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.705 W/Kg

**Right Tilted/Zoom Scan (7x7x7)/Cube 0:**

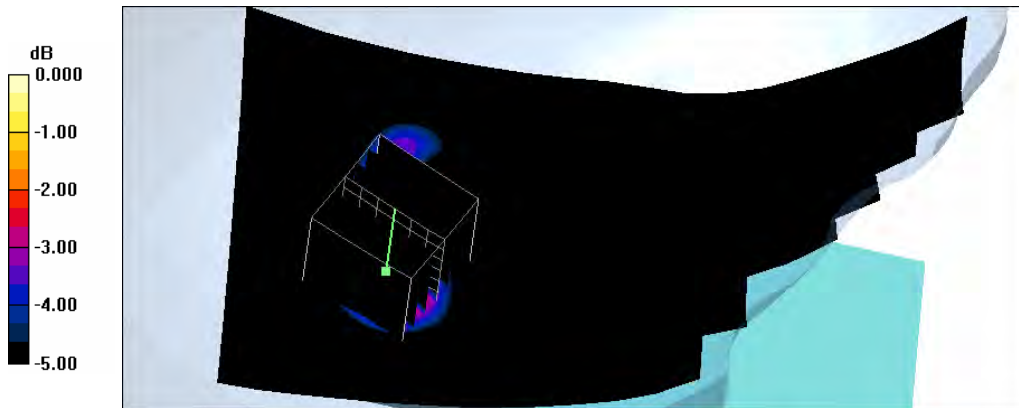
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.4 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 0.898 W/kg

**SAR(1 g) = 0.483 W/Kg; SAR(10 g) = 0.240 W/Kg**

Maximum value of SAR (measured) = 0.695 W/Kg



0 dB = 0.695W/Kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/14/2014 04:44:58 PM

#64\_LC\_802.11b\_CH1\_1M

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.79$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Cheek/Area Scan (111x191x1):**

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.45 W/Kg

**Left Cheek/Zoom Scan (7x7x7)/Cube 0:**

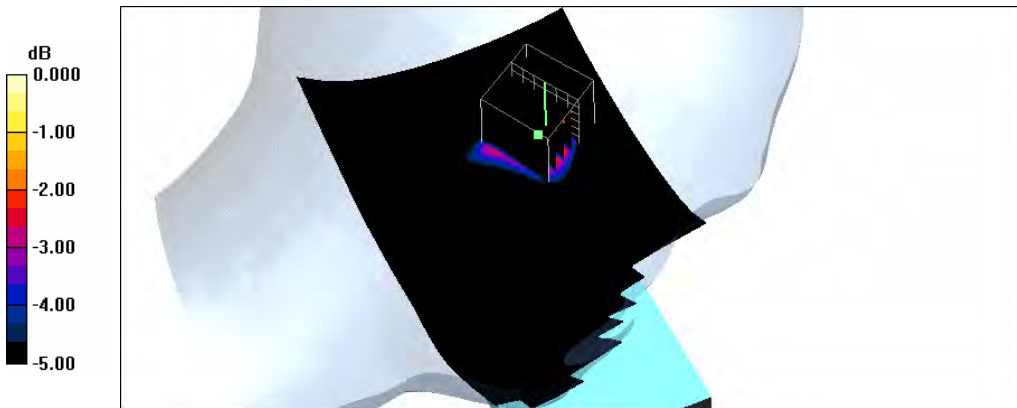
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.1 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 1.92 W/kg

**SAR(1 g) = 0.829 W/Kg; SAR(10 g) = 0.395 W/Kg**

Maximum value of SAR (measured) = 1.29 W/Kg



0 dB = 1.29W/Kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/14/2014 06:06:29 PM

#66\_LC\_802.11b\_CH6\_1M

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.82$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Cheek/Area Scan (111x191x1):**

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.61 W/Kg

**Left Cheek/Zoom Scan (7x7x7)/Cube 0:**

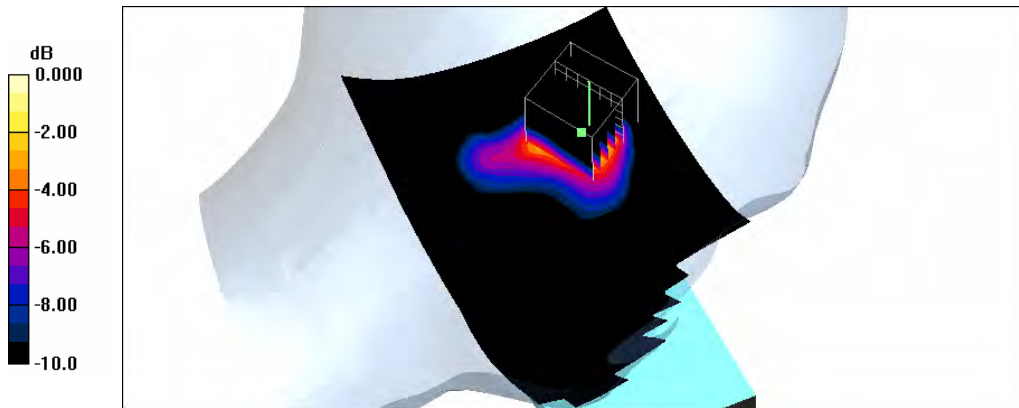
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.4 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 2.27 W/kg

**SAR(1 g) = 0.948 W/Kg; SAR(10 g) = 0.444 W/Kg**

Maximum value of SAR (measured) = 1.53 W/Kg



0 dB = 1.53W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/14/2014 06:46:25 PM

#67\_LC\_802.11b\_CH11\_1M

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462 \text{ MHz}$ ;  $\sigma = 1.85 \text{ mho/m}$ ;  $\epsilon_r = 38.3$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Cheek/Area Scan (111x191x1):**

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.61 W/Kg

**Left Cheek/Zoom Scan (7x7x7)/Cube 0:**

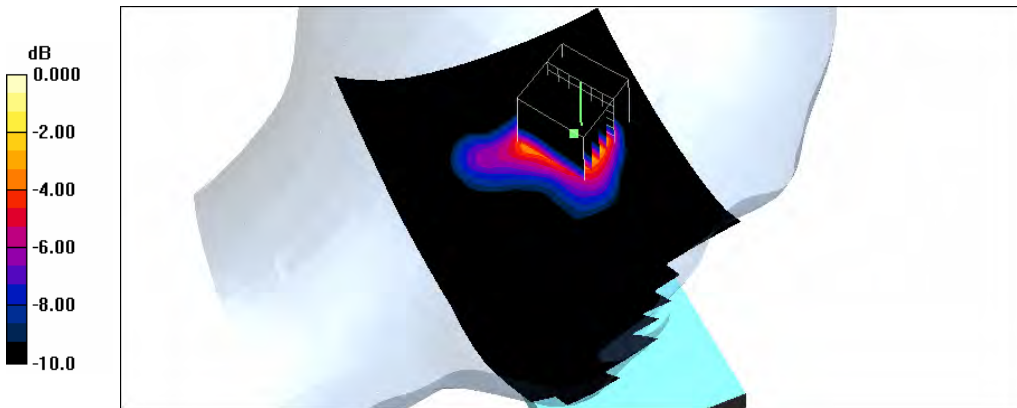
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.1 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 2.27 W/kg

**SAR(1 g) = 0.952 W/Kg; SAR(10 g) = 0.445 W/Kg**

Maximum value of SAR (measured) = 1.55 W/Kg



0 dB = 1.55W/Kg





Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/14/2014 05:25:47 PM

#65\_LT\_802.11b\_CH1\_1M

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2412$  MHz;  $\sigma = 1.79$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Tilted/Area Scan (111x191x1):**

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.996 W/Kg

**Left Tilted/Zoom Scan (7x7x7)/Cube 0:**

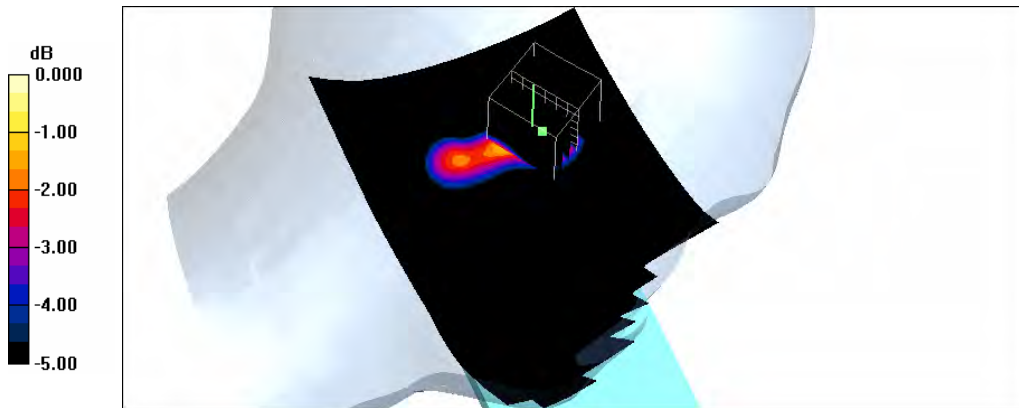
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.5 V/m; Power Drift = 0.002 dB

Peak SAR (extrapolated) = 1.38 W/kg

**SAR(1 g) = 0.608 W/Kg; SAR(10 g) = 0.296 W/Kg**

Maximum value of SAR (measured) = 0.939 W/Kg



0 dB = 0.939W/Kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/14/2014 07:27:46 PM

**#68\_LC\_802.11b\_CH11\_1M\_Original #67\_measurement once**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2462 \text{ MHz}$ ;  $\sigma = 1.85 \text{ mho/m}$ ;  $\epsilon_r = 38.3$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.24, 7.24, 7.24); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Left Cheek/Area Scan (111x191x1):**

Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 1.61 W/Kg

**Left Cheek/Zoom Scan (7x7x7)/Cube 0:**

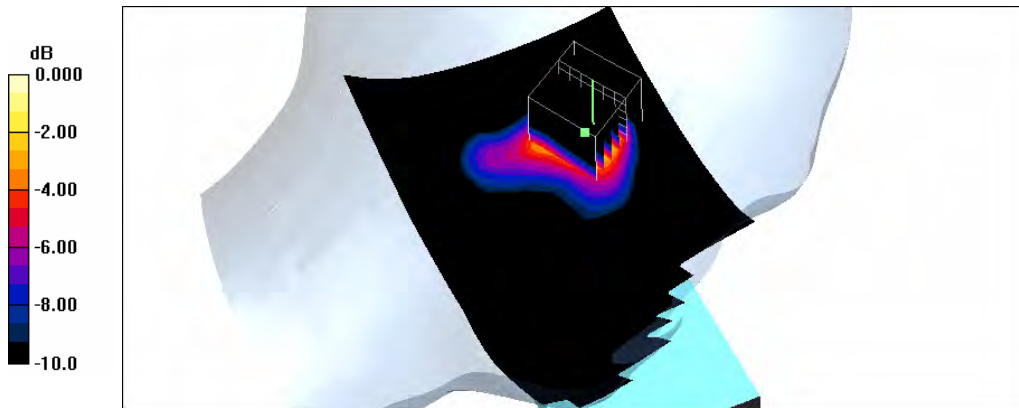
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 15.2 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 2.26 W/kg

**SAR(1 g) = 0.954 W/Kg; SAR(10 g) = 0.446 W/Kg**

Maximum value of SAR (measured) = 1.53 W/Kg



0 dB = 1.53W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 01:33:09 AM

**#13 Flat GSM 850 CH251 headset Side1 surface to phantom 10mm SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GSM850; Frequency: 848.8 MHz; Duty Cycle: 1:8

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 1.02 \text{ mho/m}$ ;  $\epsilon_r = 57.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.384 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

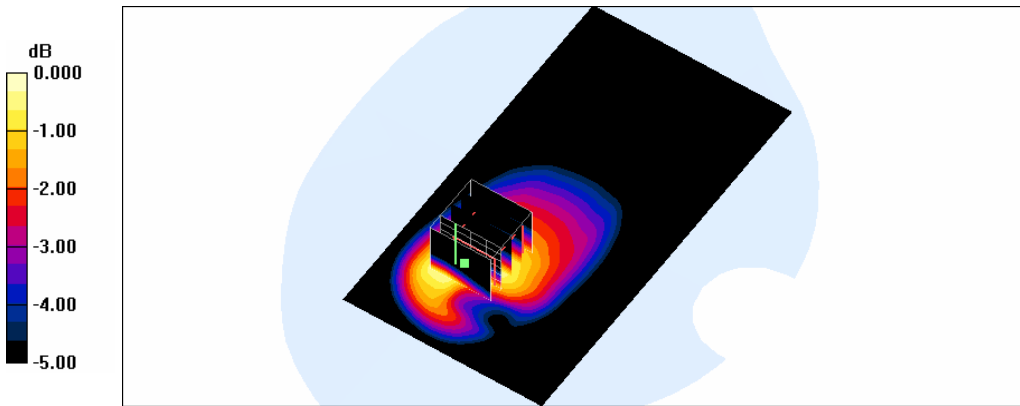
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 13.9 V/m; Power Drift = 0.136 dB

Peak SAR (extrapolated) = 0.439 W/kg

**SAR(1 g) = 0.311 W/Kg; SAR(10 g) = 0.218 W/Kg**

Maximum value of SAR (measured) = 0.377 W/Kg



0 dB = 0.377W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 02:02:29 AM

**#14\_Flat\_GSM 850 CH251\_headset\_Side2 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GSM850; Frequency: 848.8 MHz; Duty Cycle: 1:8

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 1.02 \text{ mho/m}$ ;  $\epsilon_r = 57.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.526 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

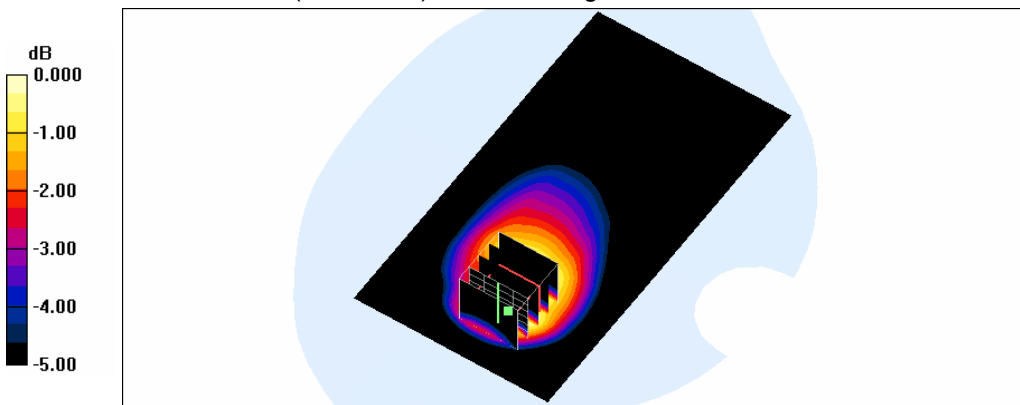
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 16.0 V/m; Power Drift = -0.007 dB

Peak SAR (extrapolated) = 0.653 W/kg

**SAR(1 g) = 0.392 W/Kg; SAR(10 g) = 0.233 W/Kg**

Maximum value of SAR (measured) = 0.521 W/Kg



0 dB = 0.521W/Kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/12/2014 12:04:00 PM

#20 Flat\_GPRS 850 CH128\_1D4U\_Side2 surface to phantom 10mm\_SIM1

DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780

Communication System: GPRS 850 (1Down, 4Up); Frequency: 824.2 MHz; Duty Cycle: 1:2

Medium parameters used (interpolated):  $f = 824.2$  MHz;  $\sigma = 0.986$  mho/m;  $\epsilon_r = 57.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

#### Flat/Area Scan (71x131x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.884 W/Kg

#### Flat/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.3 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 0.982 W/kg

**SAR(1 g) = 0.775 W/Kg; SAR(10 g) = 0.602 W/Kg**

Maximum value of SAR (measured) = 0.897 W/Kg

#### Flat/Zoom Scan (5x5x7)/Cube 1:

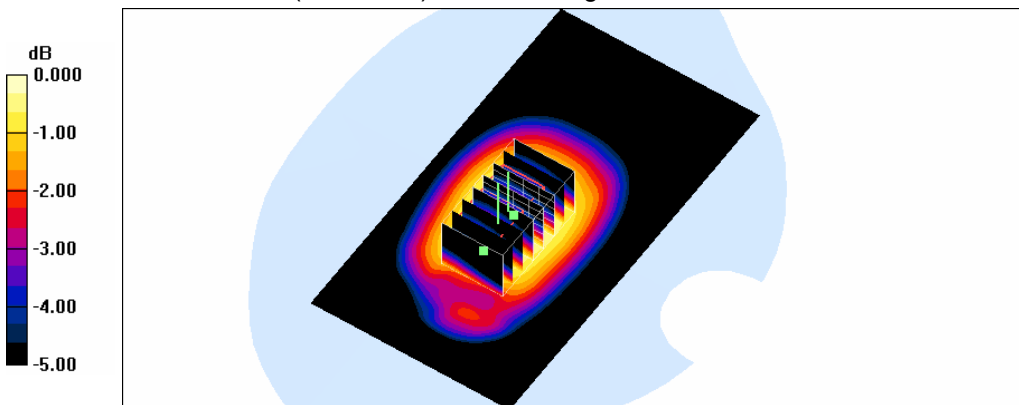
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.3 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 0.965 W/kg

**SAR(1 g) = 0.764 W/Kg; SAR(10 g) = 0.582 W/Kg**

Maximum value of SAR (measured) = 0.876 W/Kg



0 dB = 0.876W/Kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/12/2014 12:29:53 PM

**#21 Flat\_GPRS 850 CH190\_1D4U\_Side2 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS 850 (1Down, 4Up); Frequency: 836.6 MHz; Duty Cycle: 1:2

Medium parameters used:  $f = 837 \text{ MHz}$ ;  $\sigma = 1 \text{ mho/m}$ ;  $\epsilon_r = 57.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.880 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.1 V/m; Power Drift = -0.031 dB

Peak SAR (extrapolated) = 0.978 W/kg

**SAR(1 g) = 0.768 W/Kg; SAR(10 g) = 0.596 W/Kg**

Maximum value of SAR (measured) = 0.883 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 1:**

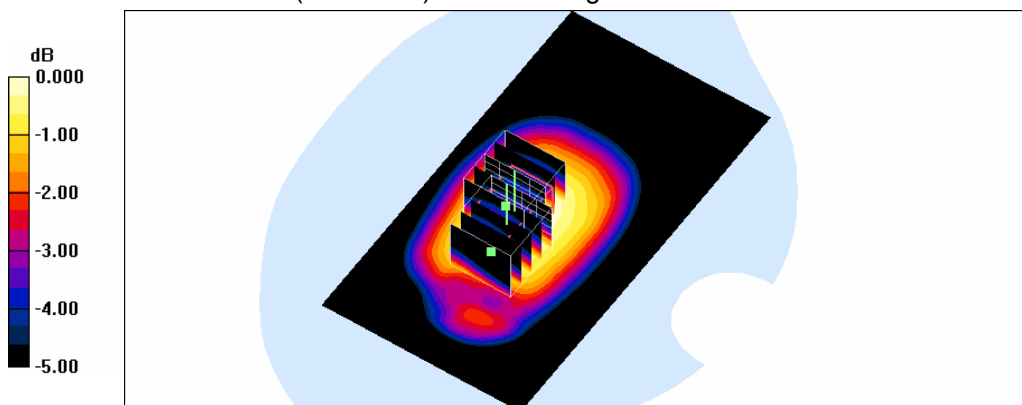
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.1 V/m; Power Drift = -0.031 dB

Peak SAR (extrapolated) = 0.953 W/kg

**SAR(1 g) = 0.758 W/Kg; SAR(10 g) = 0.580 W/Kg**

Maximum value of SAR (measured) = 0.867 W/Kg



0 dB = 0.867W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 02:25:20 AM

**#15 Flat\_GPRS 850 CH251\_1D4U\_Side1 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS 850 (1Down, 4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 1.02 \text{ mho/m}$ ;  $\epsilon_r = 57.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.603 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 24.6 V/m; Power Drift = 0.098 dB

Peak SAR (extrapolated) = 0.656 W/kg

**SAR(1 g) = 0.514 W/Kg; SAR(10 g) = 0.398 W/Kg**

Maximum value of SAR (measured) = 0.593 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 1:**

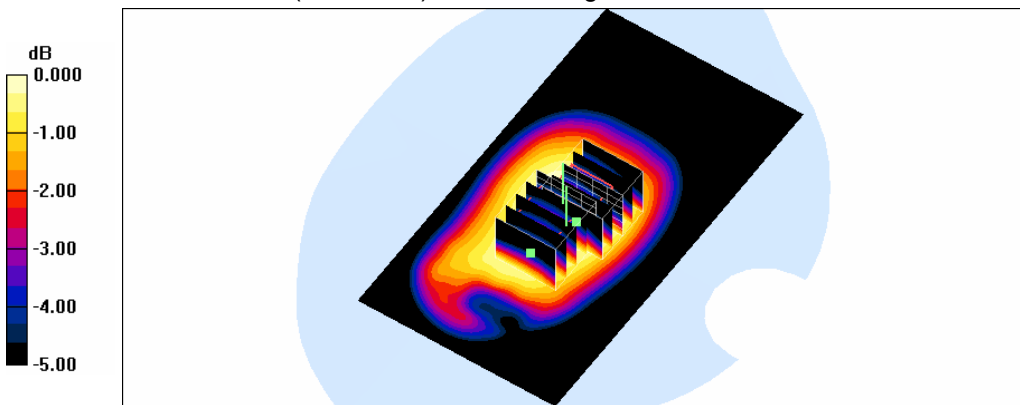
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 24.6 V/m; Power Drift = 0.098 dB

Peak SAR (extrapolated) = 0.638 W/kg

**SAR(1 g) = 0.502 W/Kg; SAR(10 g) = 0.389 W/Kg**

Maximum value of SAR (measured) = 0.582 W/Kg



0 dB = 0.582W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 02:53:05 AM

**#16 Flat\_GPRS 850 CH251\_1D4U\_Side2 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS 850 (1Down, 4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 1.02 \text{ mho/m}$ ;  $\epsilon_r = 57.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.958 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

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

Reference Value = 29.8 V/m; Power Drift = 0.123 dB

Peak SAR (extrapolated) = 1.04 W/kg

**SAR(1 g) = 0.815 W/Kg; SAR(10 g) = 0.624 W/Kg**

Maximum value of SAR (measured) = 0.946 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 1:**

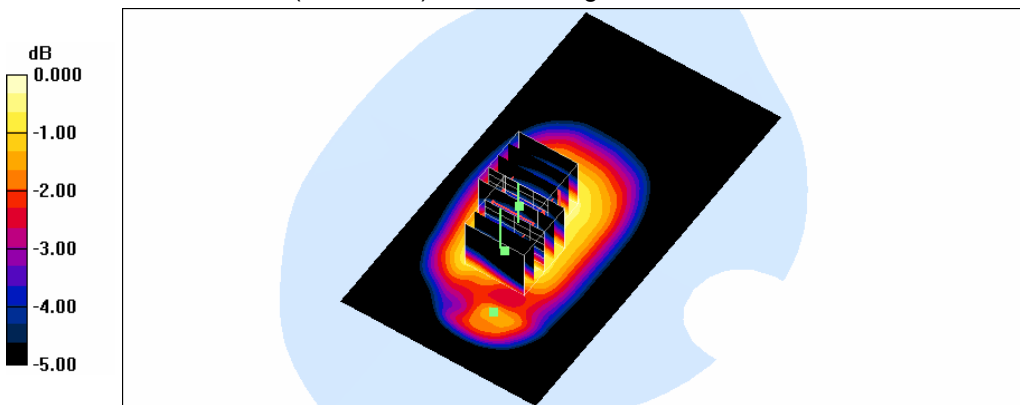
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 29.8 V/m; Power Drift = 0.123 dB

Peak SAR (extrapolated) = 1.03 W/kg

**SAR(1 g) = 0.797 W/Kg; SAR(10 g) = 0.618 W/Kg**

Maximum value of SAR (measured) = 0.925 W/Kg



0 dB = 0.925W/Kg



Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 10:03:48 AM

**#17 Flat\_GPRS 850 CH251\_1D4U\_Side4 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS 850 (1Down, 4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 1.02 \text{ mho/m}$ ;  $\epsilon_r = 57.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x81x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.170 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

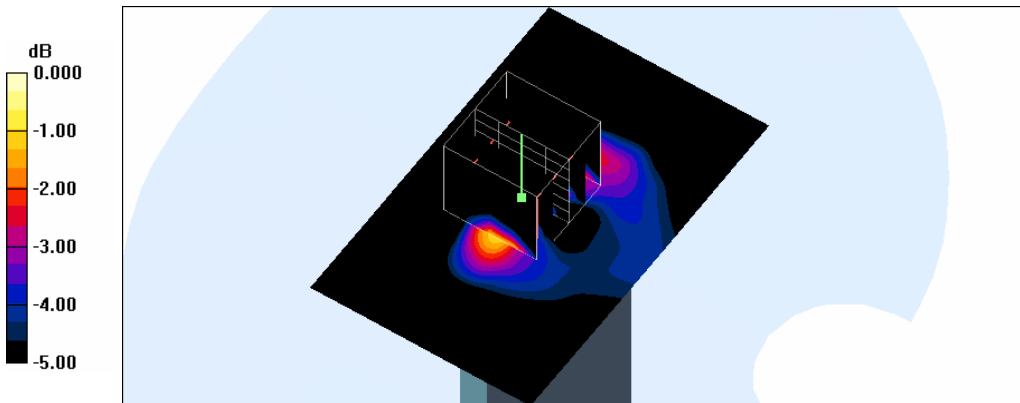
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 10.4 V/m; Power Drift = 0.040 dB

Peak SAR (extrapolated) = 0.212 W/kg

**SAR(1 g) = 0.129 W/Kg; SAR(10 g) = 0.074 W/Kg**

Maximum value of SAR (measured) = 0.171 W/Kg



0 dB = 0.171W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 10:25:49 AM

**#18 Flat\_GPRS 850 CH251\_1D4U\_Side5 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS 850 (1Down, 4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 1.02 \text{ mho/m}$ ;  $\epsilon_r = 57.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.339 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

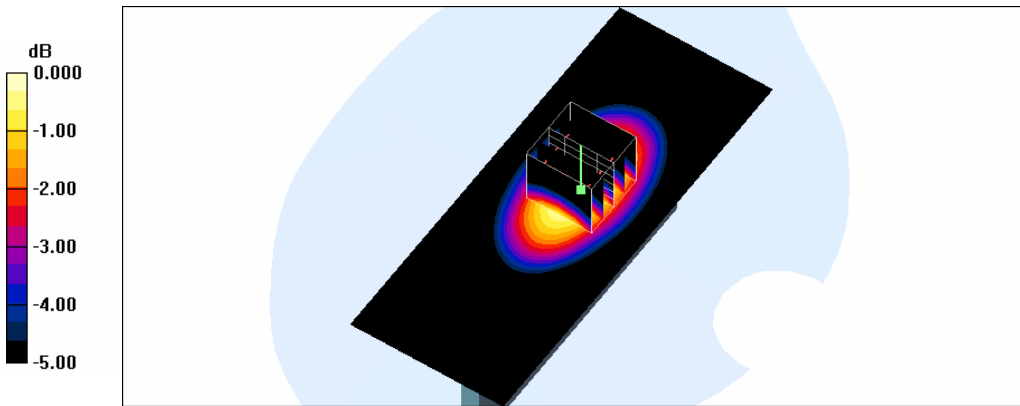
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 18.4 V/m; Power Drift = 0.022 dB

Peak SAR (extrapolated) = 0.390 W/kg

**SAR(1 g) = 0.279 W/Kg; SAR(10 g) = 0.194 W/Kg**

Maximum value of SAR (measured) = 0.339 W/Kg



0 dB = 0.339W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 10:48:57 AM

**#19 Flat\_GPRS 850 CH251\_1D4U\_Side6 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS 850 (1Down, 4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2

Medium parameters used:  $f = 849 \text{ MHz}$ ;  $\sigma = 1.02 \text{ mho/m}$ ;  $\epsilon_r = 57.7$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.576 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

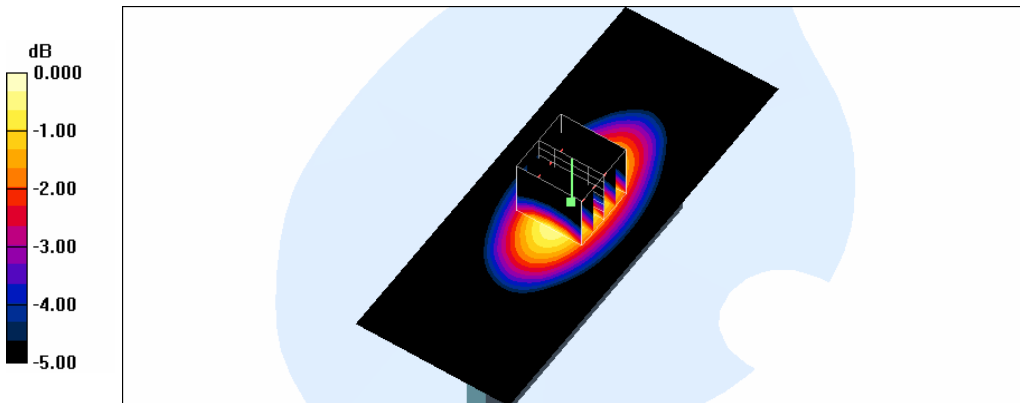
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 24.2 V/m; Power Drift = 0.048 dB

Peak SAR (extrapolated) = 0.668 W/kg

**SAR(1 g) = 0.472 W/Kg; SAR(10 g) = 0.330 W/Kg**

Maximum value of SAR (measured) = 0.582 W/Kg



0 dB = 0.582W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 10:19:43 AM

**#40\_Flat\_PCS CH512\_headset\_Side1 surface to phantom 10mm\_SIM1**  
**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: PCS; Frequency: 1850.2 MHz; Duty Cycle: 1:8  
 Medium parameters used (interpolated):  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.47 \text{ mho/m}$ ;  $\epsilon_r = 52.1$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)  
 DAS4 Configuration:

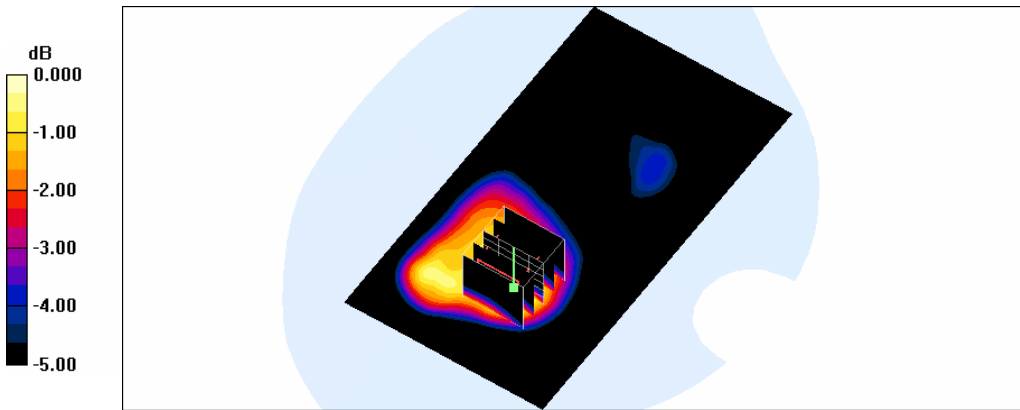
- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.270 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 7.44 V/m; Power Drift = 0.002 dB  
 Peak SAR (extrapolated) = 0.306 W/kg  
**SAR(1 g) = 0.207 W/Kg; SAR(10 g) = 0.135 W/Kg**  
 Maximum value of SAR (measured) = 0.260 W/Kg



0 dB = 0.260W/Kg

Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/13/2014 10:41:43 AM

**#41\_Flat\_PCS CH512\_headset\_Side2 surface to phantom 10mm\_SIM1**  
**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: PCS; Frequency: 1850.2 MHz; Duty Cycle: 1:8

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.222 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

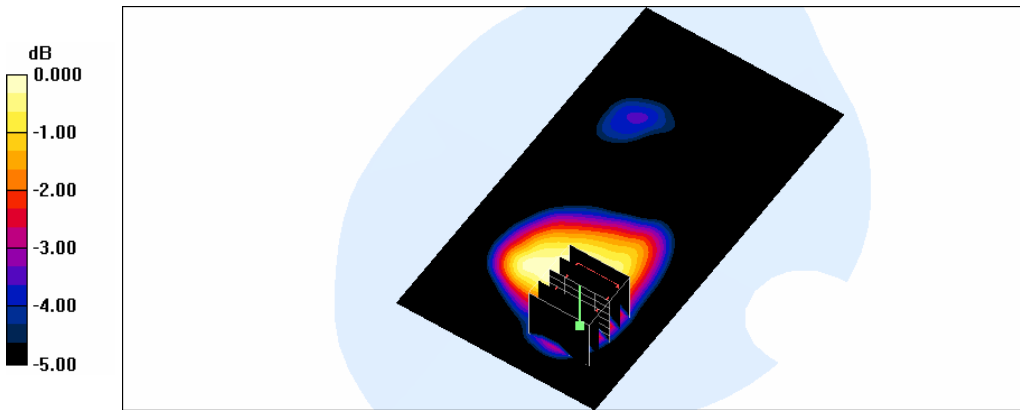
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.33 V/m; Power Drift = -0.026 dB

Peak SAR (extrapolated) = 0.270 W/kg

**SAR(1 g) = 0.161 W/Kg; SAR(10 g) = 0.096 W/Kg**

Maximum value of SAR (measured) = 0.216 W/Kg



0 dB = 0.216W/Kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/13/2014 11:07:23 AM

#42 Flat\_GPRS PCS CH512\_1D4U\_Side1 surface to phantom 10mm\_SIM1

DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780

Communication System: GPRS PCS (1Down,4Up); Frequency: 1850.2 MHz;Duty Cycle: 1:2

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80;Postprocessing SW: SEMCAD, V1.8 Build 186

#### Flat/Area Scan (71x131x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.587 W/Kg

#### Flat/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.4 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 0.679 W/kg

**SAR(1 g) = 0.450 W/Kg; SAR(10 g) = 0.291 W/Kg**

Maximum value of SAR (measured) = 0.566 W/Kg

#### Flat/Zoom Scan (5x5x7)/Cube 1:

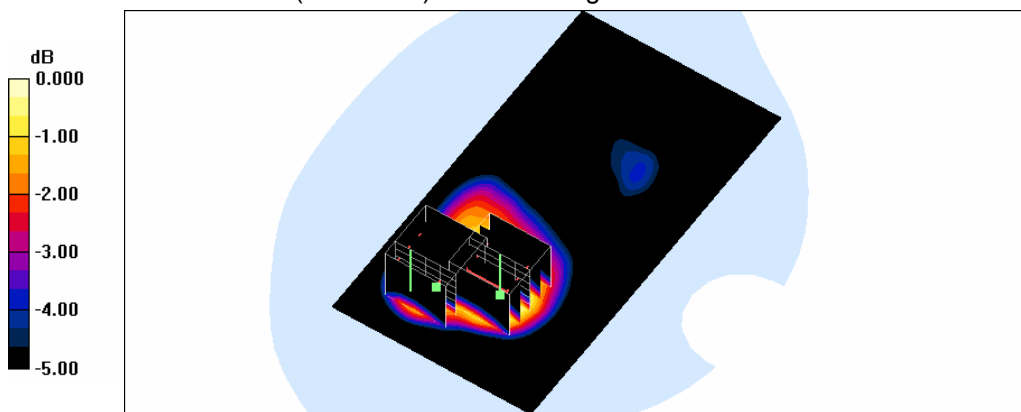
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.4 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 0.680 W/kg

**SAR(1 g) = 0.397 W/Kg; SAR(10 g) = 0.236 W/Kg**

Maximum value of SAR (measured) = 0.520 W/Kg



Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 11:38:41 AM

**#43\_Flat\_GPRS PCS CH512\_1D4U\_Side2 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS PCS (1Down,4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:2  
 Medium parameters used (interpolated):  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.47 \text{ mho/m}$ ;  $\epsilon_r = 52.1$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DAS4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

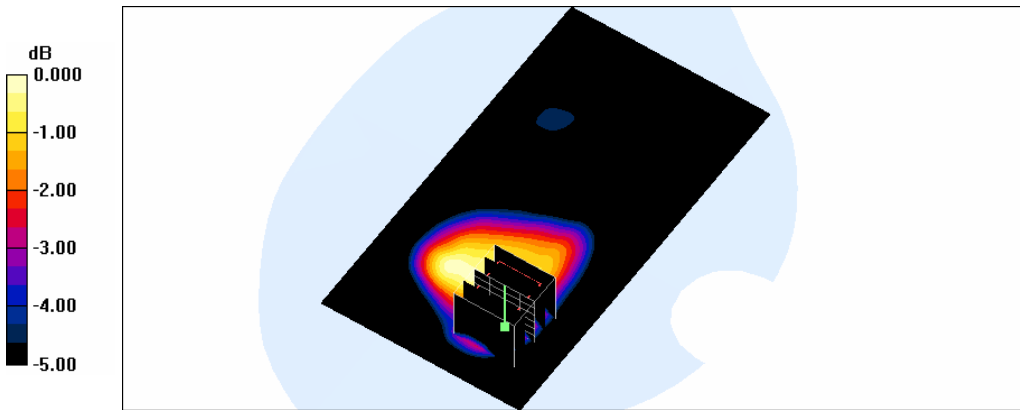
Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.511 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 10.5 V/m; Power Drift = 0.010 dB  
 Peak SAR (extrapolated) = 0.628 W/kg

**SAR(1 g) = 0.366 W/Kg; SAR(10 g) = 0.215 W/Kg**

Maximum value of SAR (measured) = 0.498 W/Kg



0 dB = 0.498W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 12:09:47 PM

**#44\_Flat\_GPRS PCS CH512\_1D4U\_Side4 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS PCS (1Down,4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:2  
 Medium parameters used (interpolated):  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.47 \text{ mho/m}$ ;  $\epsilon_r = 52.1$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x81x1):**

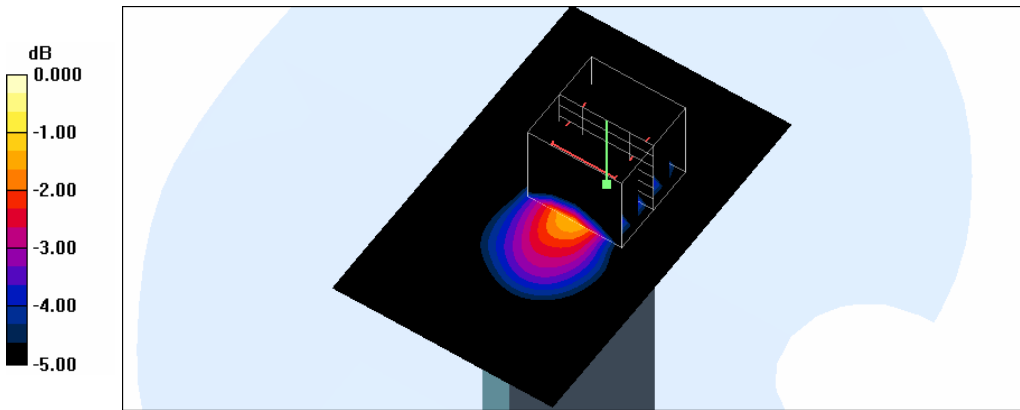
Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.322 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 14.1 V/m; Power Drift = -0.117 dB  
 Peak SAR (extrapolated) = 0.432 W/kg

**SAR(1 g) = 0.255 W/Kg; SAR(10 g) = 0.141 W/Kg**

Maximum value of SAR (measured) = 0.339 W/Kg



0 dB = 0.339W/Kg



Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 01:09:58 PM

**#45\_Flat\_GPRS PCS CH512\_1D4U\_Side5 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS PCS (1Down,4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:2  
 Medium parameters used (interpolated):  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.47 \text{ mho/m}$ ;  $\epsilon_r = 52.1$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x131x1):**

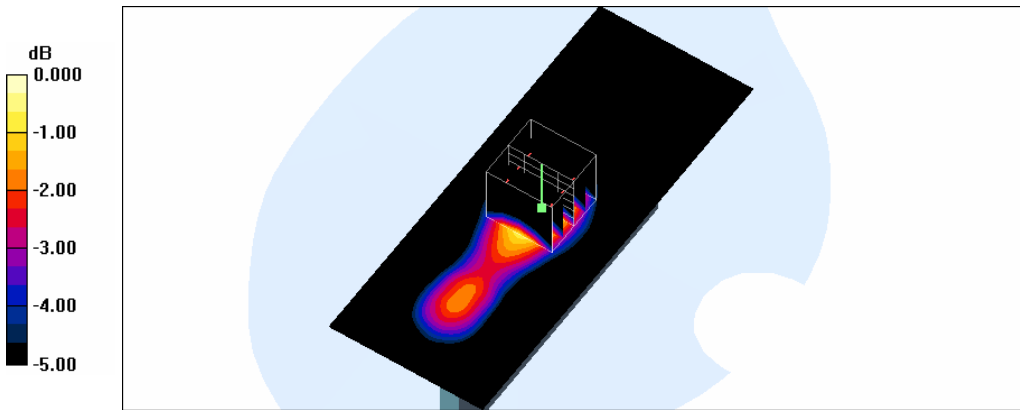
Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.245 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 12.8 V/m; Power Drift = 0.016 dB  
 Peak SAR (extrapolated) = 0.287 W/kg

**SAR(1 g) = 0.186 W/Kg; SAR(10 g) = 0.115 W/Kg**

Maximum value of SAR (measured) = 0.241 W/Kg



0 dB = 0.241 W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 01:32:41 PM

**#46 Flat\_GPRS PCS CH512\_1D4U\_Side6 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS PCS (1Down,4Up); Frequency: 1850.2 MHz; Duty Cycle: 1:2  
 Medium parameters used (interpolated):  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.47 \text{ mho/m}$ ;  $\epsilon_r = 52.1$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within:2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x131x1):**

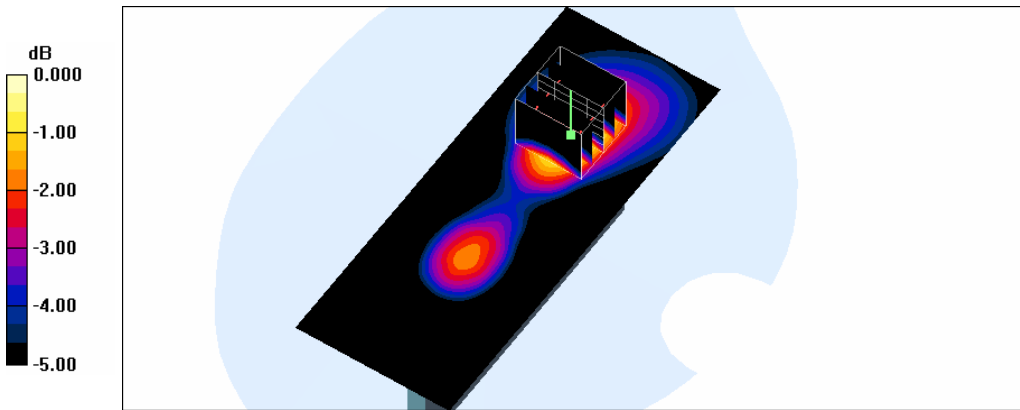
Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (interpolated) = 0.101 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 5.46 V/m; Power Drift = -0.059 dB  
 Peak SAR (extrapolated) = 0.122 W/kg

**SAR(1 g) = 0.079 W/Kg; SAR(10 g) = 0.050 W/Kg**

Maximum value of SAR (measured) = 0.102 W/Kg



0 dB = 0.102W/Kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/12/2014 11:19:24 AM

#22\_Flat\_GPRS 850 CH251\_1D4U\_Original #16\_Side2 surface to phantom 10mm\_SIM1\_measurement once

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: GPRS 850 (1Down, 4Up); Frequency: 848.8 MHz; Duty Cycle: 1:2

Medium parameters used:  $f = 849$  MHz;  $\sigma = 1.02$  mho/m;  $\epsilon_r = 57.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.865 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.5 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 0.984 W/kg

**SAR(1 g) = 0.766 W/Kg; SAR(10 g) = 0.588 W/Kg**

Maximum value of SAR (measured) = 0.893 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 1:**

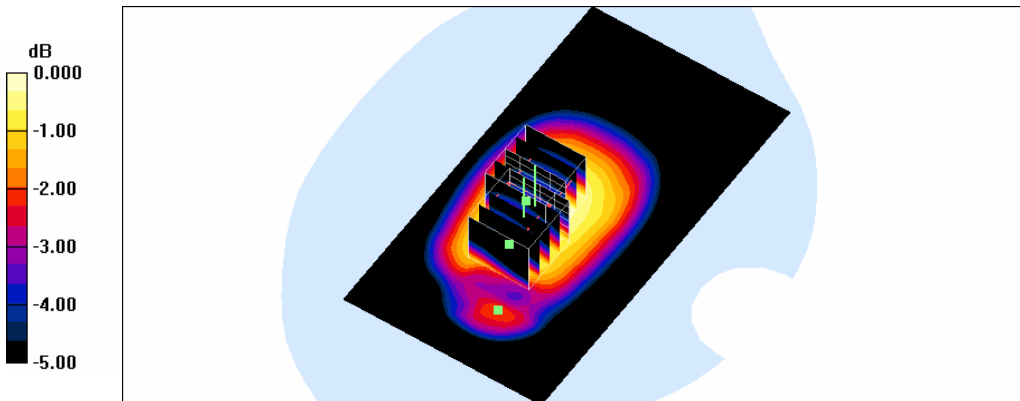
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.5 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 0.958 W/kg

**SAR(1 g) = 0.752 W/Kg; SAR(10 g) = 0.577 W/Kg**

Maximum value of SAR (measured) = 0.870 W/Kg



0 dB = 0.870W/Kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/13/2014 02:19:22 PM

**#47\_Flat\_WCDMA Band II CH9262\_Side1 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.460 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

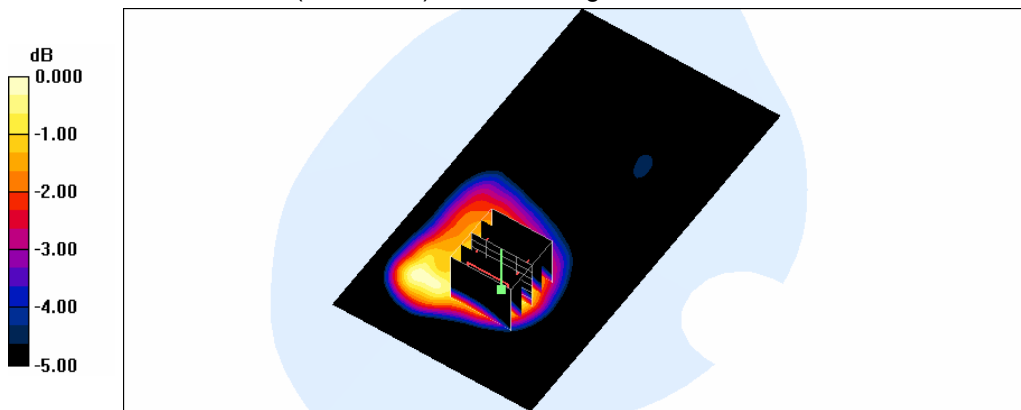
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.96 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 0.527 W/kg

**SAR(1 g) = 0.351 W/Kg; SAR(10 g) = 0.227 W/Kg**

Maximum value of SAR (measured) = 0.443 W/Kg



0 dB = 0.443W/Kg



Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/13/2014 02:41:13 PM

**#48\_Flat\_WCDMA Band II CH9262\_Side2 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.403 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

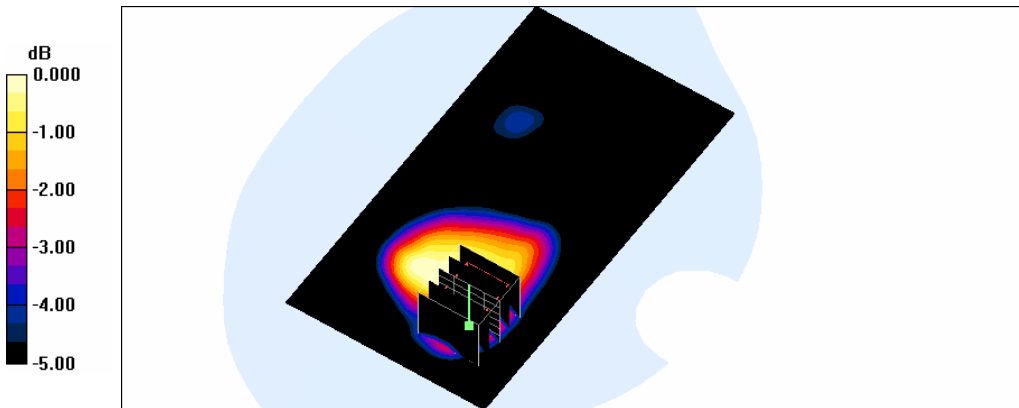
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.54 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 0.487 W/kg

**SAR(1 g) = 0.288 W/Kg; SAR(10 g) = 0.169 W/Kg**

Maximum value of SAR (measured) = 0.391 W/Kg



0 dB = 0.391W/Kg

Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/13/2014 03:18:56 PM

**#49\_Flat\_WCDMA Band II CH9262\_Side4 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x81x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.277 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

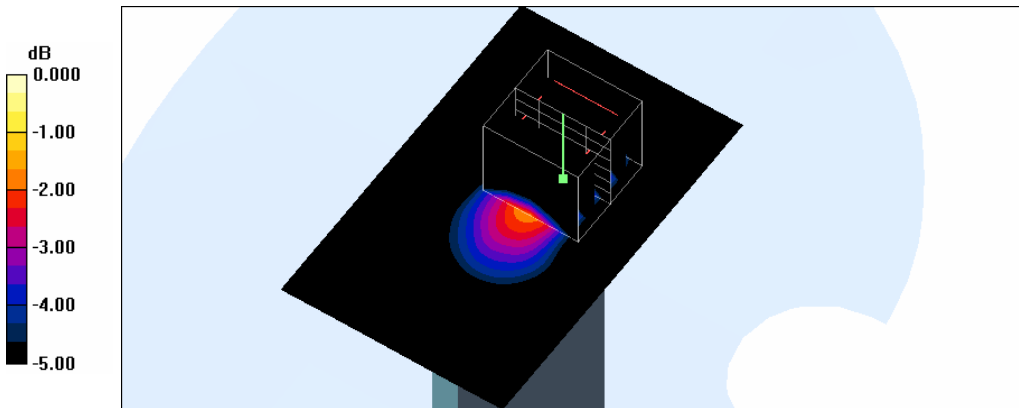
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.9 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 0.367 W/kg

**SAR(1 g) = 0.215 W/Kg; SAR(10 g) = 0.119 W/Kg**

Maximum value of SAR (measured) = 0.294 W/Kg



0 dB = 0.294W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 03:50:04 PM

**#50\_Flat\_WCDMA Band II CH9262\_Side5 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.178 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

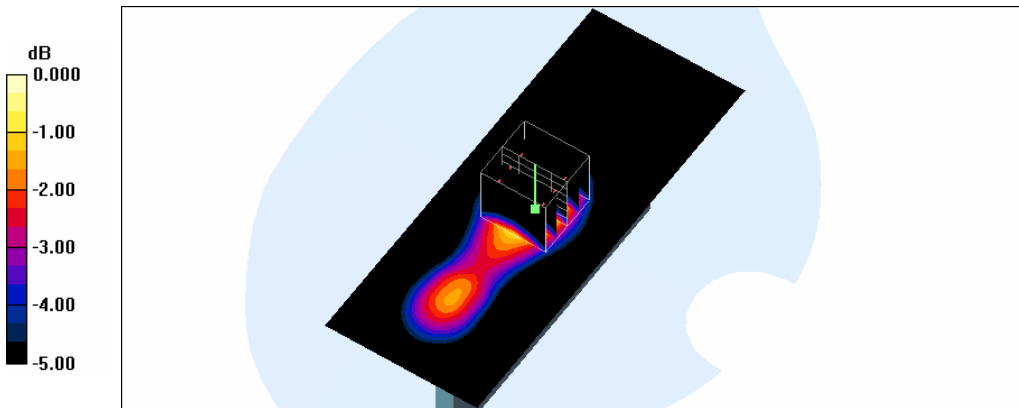
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.0 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 0.215 W/kg

**SAR(1 g) = 0.139 W/Kg; SAR(10 g) = 0.086 W/Kg**

Maximum value of SAR (measured) = 0.180 W/Kg



0 dB = 0.180W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/13/2014 04:12:27 PM

**#51\_Flat\_WCDMA Band II CH9262\_Side6 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band II; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 52.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.37, 7.37, 7.37); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.091 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

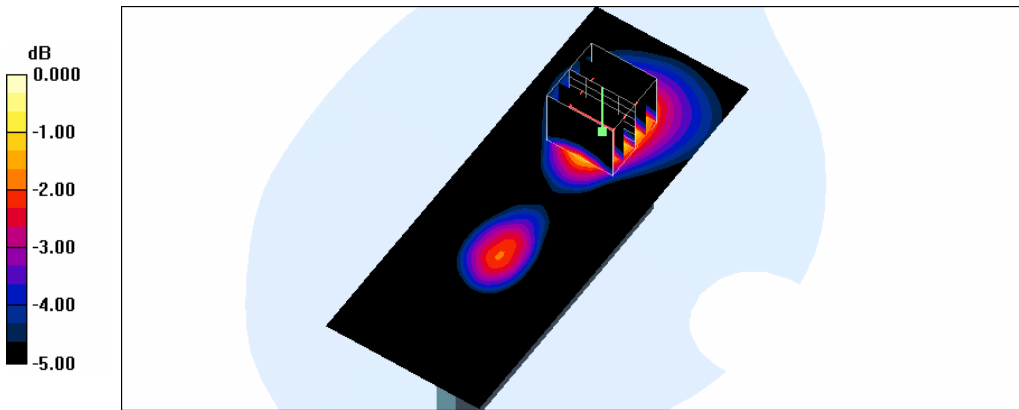
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.80 V/m; Power Drift = -0.057 dB

Peak SAR (extrapolated) = 0.112 W/kg

**SAR(1 g) = 0.072 W/Kg; SAR(10 g) = 0.045 W/Kg**

Maximum value of SAR (measured) = 0.094 W/Kg



0 dB = 0.094W/Kg



Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/14/2014 12:17:43 AM

**#57\_Flat\_WCDMA Band IV CH1312\_Side1 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4 \text{ MHz}$ ;  $\sigma = 1.5 \text{ mho/m}$ ;  $\epsilon_r = 54.3$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.494 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

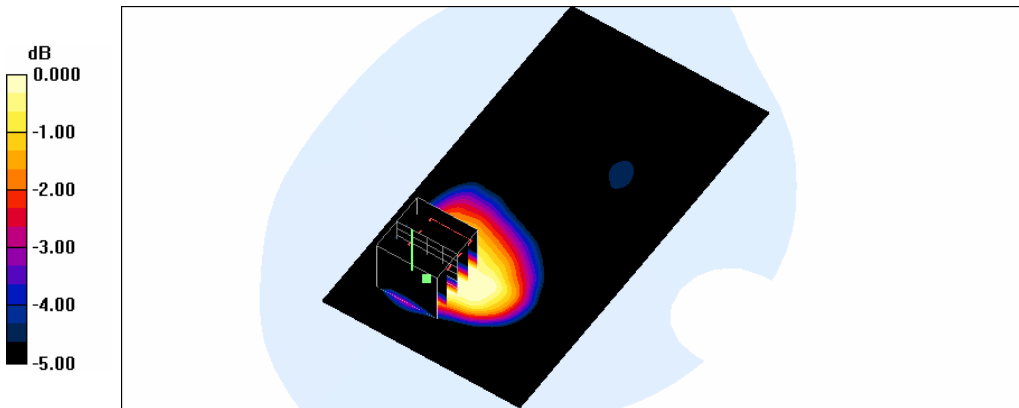
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 8.17 V/m; Power Drift = 0.087 dB

Peak SAR (extrapolated) = 0.565 W/kg

**SAR(1 g) = 0.347 W/Kg; SAR(10 g) = 0.223 W/Kg**

Maximum value of SAR (measured) = 0.451 W/Kg



0 dB = 0.451W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/14/2014 12:38:09 AM

**#58 Flat\_WCDMA Band IV CH1312\_Side2 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4 \text{ MHz}$ ;  $\sigma = 1.5 \text{ mho/m}$ ;  $\epsilon_r = 54.3$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.498 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

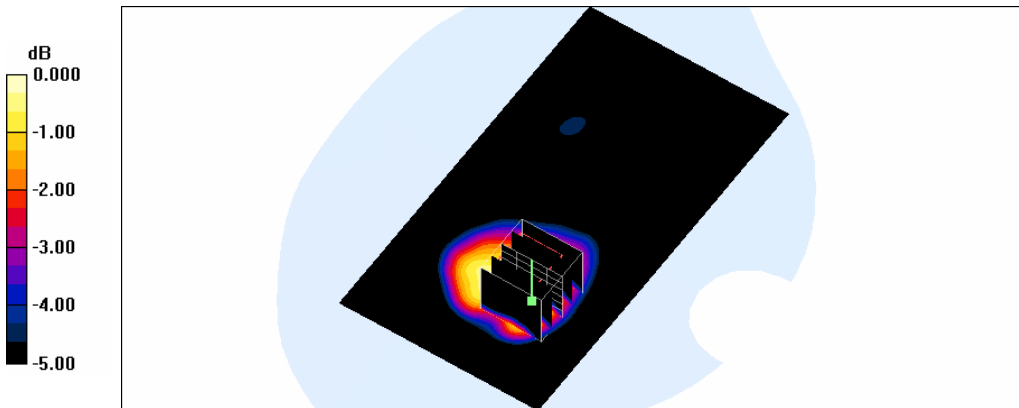
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 8.65 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 0.578 W/kg

**SAR(1 g) = 0.372 W/Kg; SAR(10 g) = 0.240 W/Kg**

Maximum value of SAR (measured) = 0.469 W/Kg



0 dB = 0.469W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/14/2014 01:03:33 AM

**#59 Flat\_WCDMA Band IV CH1312\_Side4 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4 \text{ MHz}$ ;  $\sigma = 1.5 \text{ mho/m}$ ;  $\epsilon_r = 54.3$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x81x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.204 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

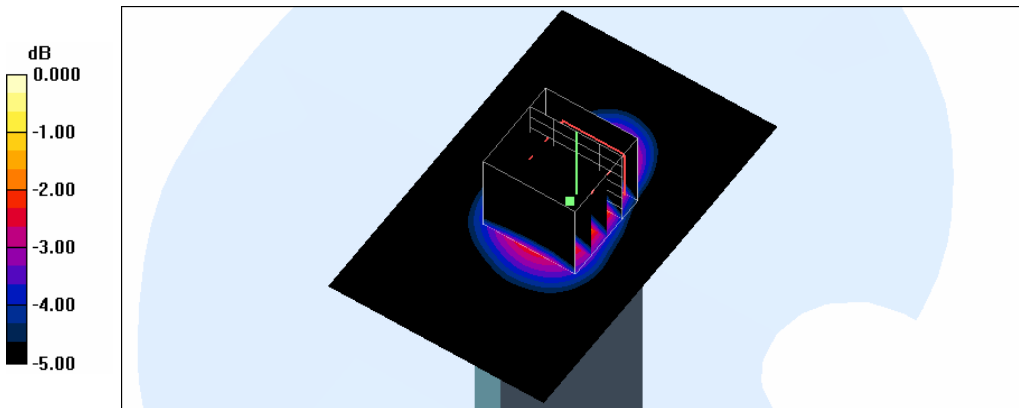
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 11.9 V/m; Power Drift = 0.002 dB

Peak SAR (extrapolated) = 0.261 W/kg

**SAR(1 g) = 0.153 W/Kg; SAR(10 g) = 0.087 W/Kg**

Maximum value of SAR (measured) = 0.213 W/Kg



0 dB = 0.213W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/14/2014 01:19:26 AM

**#60 Flat\_WCDMA Band IV CH1312\_Side5 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4 \text{ MHz}$ ;  $\sigma = 1.5 \text{ mho/m}$ ;  $\epsilon_r = 54.3$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.197 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

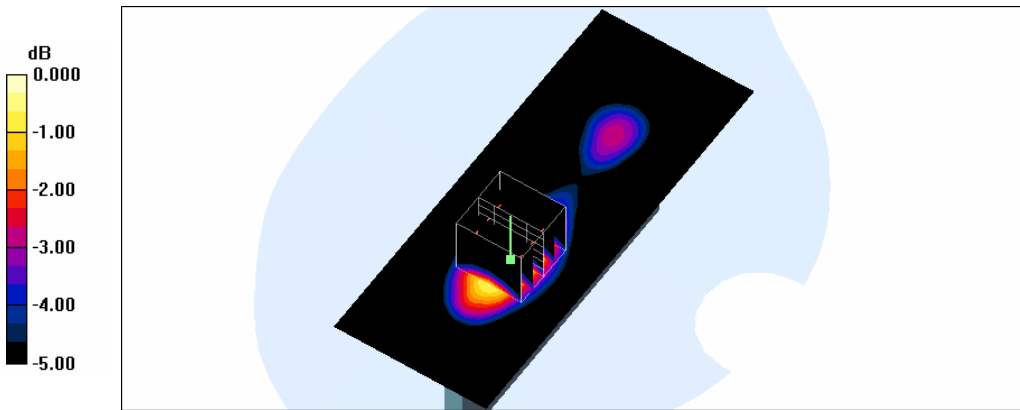
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 8.29 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 0.235 W/kg

**SAR(1 g) = 0.149 W/Kg; SAR(10 g) = 0.091 W/Kg**

Maximum value of SAR (measured) = 0.196 W/Kg



0 dB = 0.196W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/14/2014 01:36:39 AM

**#61\_Flat\_WCDMA Band IV CH1312\_Side6 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band IV; Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1712.4 \text{ MHz}$ ;  $\sigma = 1.5 \text{ mho/m}$ ;  $\epsilon_r = 54.3$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(7.69, 7.69, 7.69); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x131x1):**

Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.084 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

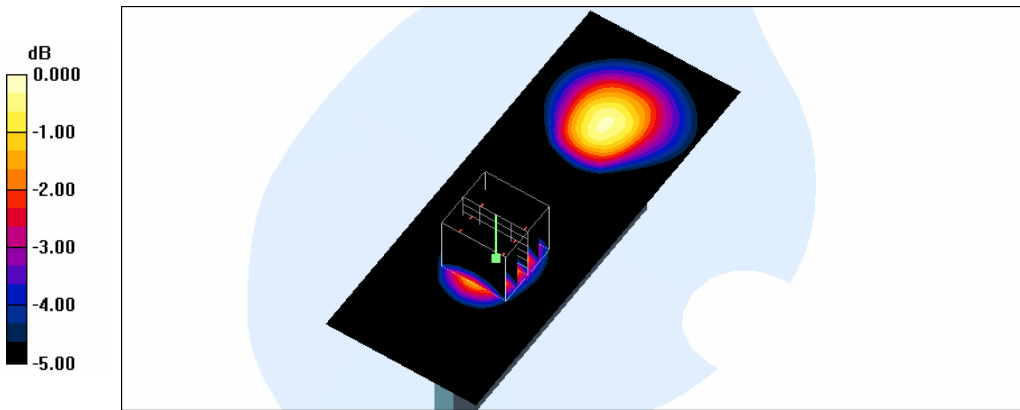
Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 3.90 V/m; Power Drift = 0.186 dB

Peak SAR (extrapolated) = 0.101 W/kg

**SAR(1 g) = 0.064 W/Kg; SAR(10 g) = 0.039 W/Kg**

Maximum value of SAR (measured) = 0.084 W/Kg



0 dB = 0.084W/Kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/12/2014 02:56:08 PM

**#23\_Flat\_WCDMA Band V CH4132\_Side1 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.988$  mho/m;  $\epsilon_r = 57.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.336 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

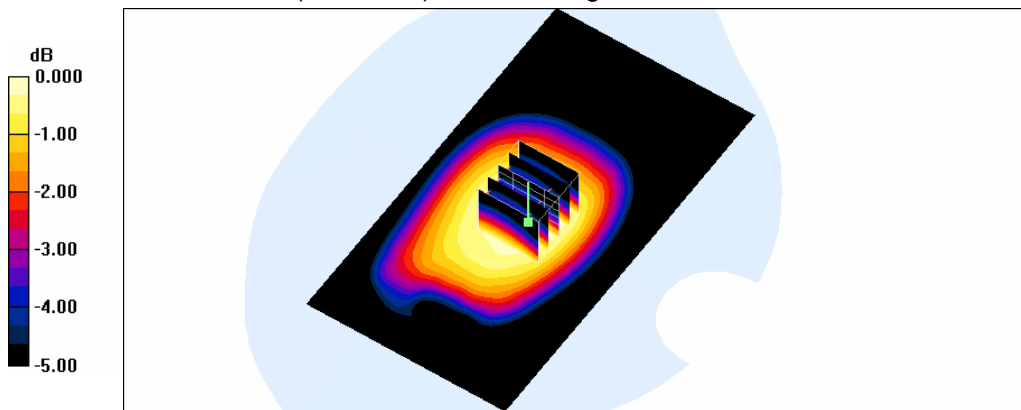
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.8 V/m; Power Drift = -0.016 dB

Peak SAR (extrapolated) = 0.364 W/kg

**SAR(1 g) = 0.291 W/Kg; SAR(10 g) = 0.227 W/Kg**

Maximum value of SAR (measured) = 0.331 W/Kg



0 dB = 0.331W/Kg

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 8/12/2014 03:21:11 PM

**#24\_Flat\_WCDMA Band V CH4132\_Side2 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.988$  mho/m;  $\epsilon_r = 57.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.435 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

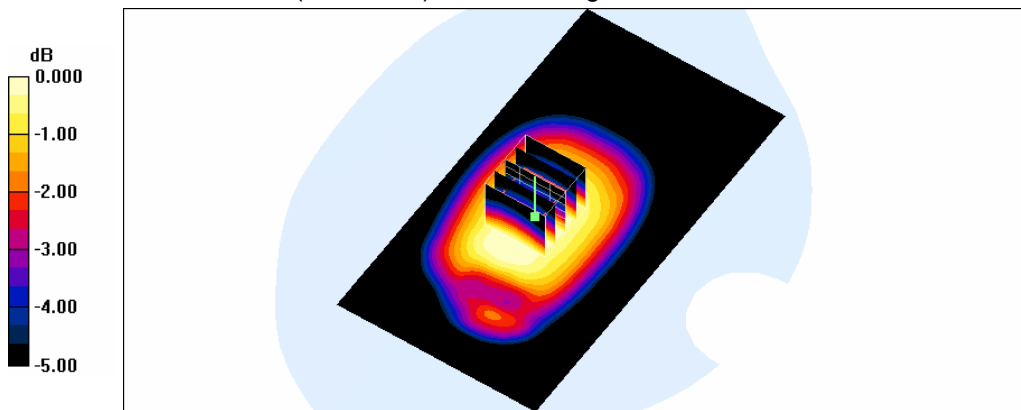
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.3 V/m; Power Drift = 0.015 dB

Peak SAR (extrapolated) = 0.476 W/kg

**SAR(1 g) = 0.379 W/Kg; SAR(10 g) = 0.295 W/Kg**

Maximum value of SAR (measured) = 0.434 W/Kg



0 dB = 0.434W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 04:07:21 PM

**#25\_Flat\_WCDMA Band V CH4132\_Side4 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.988$  mho/m;  $\epsilon_r = 57.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x81x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.060 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

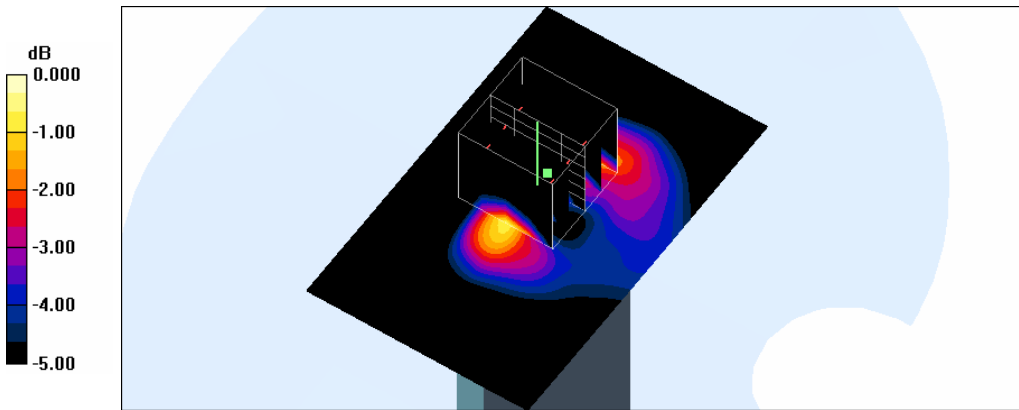
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.37 V/m; Power Drift = -0.013 dB

Peak SAR (extrapolated) = 0.073 W/kg

**SAR(1 g) = 0.044 W/Kg; SAR(10 g) = 0.026 W/Kg**

Maximum value of SAR (measured) = 0.059 W/Kg



0 dB = 0.059W/Kg



Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 04:35:29 PM

**#26 Flat\_WCDMA Band V CH4132\_Side5 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.988$  mho/m;  $\epsilon_r = 57.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.226 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

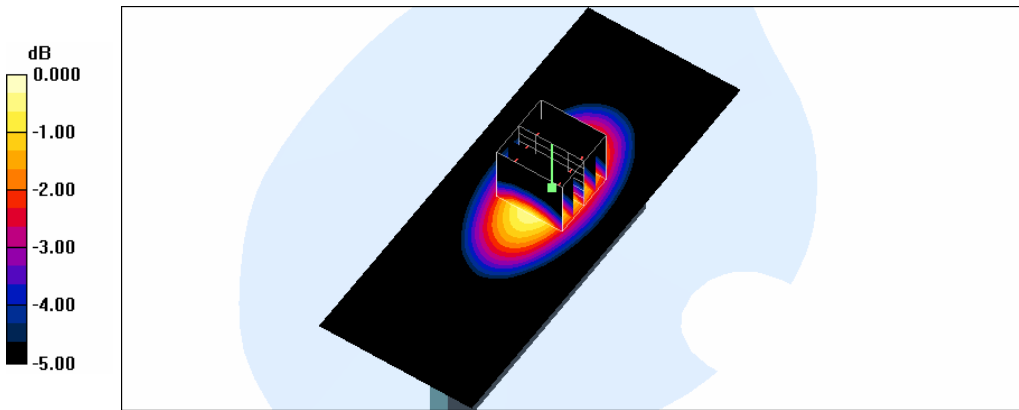
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.2 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 0.260 W/kg

**SAR(1 g) = 0.185 W/Kg; SAR(10 g) = 0.128 W/Kg**

Maximum value of SAR (measured) = 0.227 W/Kg



0 dB = 0.227W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/12/2014 04:54:23 PM

**#27\_Flat\_WCDMA Band V CH4132\_Side6 surface to phantom 10mm\_SIM1**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: WCDMA Band V; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 826.4$  MHz;  $\sigma = 0.988$  mho/m;  $\epsilon_r = 57.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(9.74, 9.74, 9.74); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (51x131x1):**

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.287 W/Kg

**Flat/Zoom Scan (5x5x7)/Cube 0:**

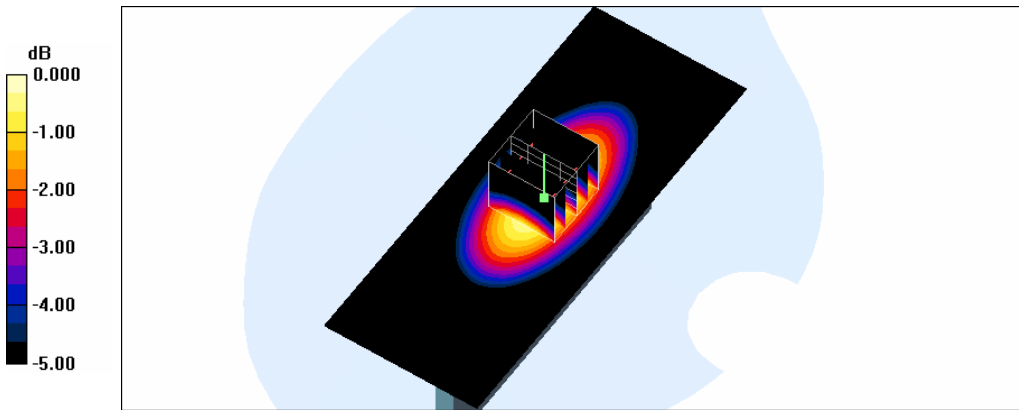
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.4 V/m; Power Drift = 0.023 dB

Peak SAR (extrapolated) = 0.332 W/kg

**SAR(1 g) = 0.238 W/Kg; SAR(10 g) = 0.166 W/Kg**

Maximum value of SAR (measured) = 0.290 W/Kg



0 dB = 0.290W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/15/2014 03:36:23 AM

**#69 Flat\_802.11b CH1\_1M\_Side1 surface to phantom 10mm**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2412 \text{ MHz}$ ;  $\sigma = 1.93 \text{ mho/m}$ ;  $\epsilon_r = 52$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (101x191x1):**

Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.235 W/Kg

**Flat/Zoom Scan (7x7x7)/Cube 0:**

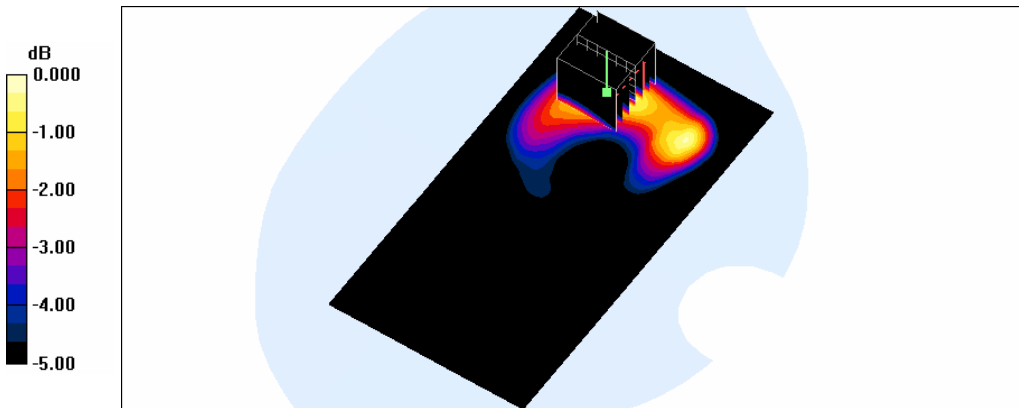
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 6.41 V/m; Power Drift = -0.045 dB

Peak SAR (extrapolated) = 0.303 W/kg

**SAR(1 g) = 0.171 W/Kg; SAR(10 g) = 0.098 W/Kg**

Maximum value of SAR (measured) = 0.233 W/Kg



0 dB = 0.233W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/15/2014 04:12:13 AM

**#70 Flat\_802.11b CH1\_1M\_Side2 surface to phantom 10mm**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2412 \text{ MHz}$ ;  $\sigma = 1.93 \text{ mho/m}$ ;  $\epsilon_r = 52$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (101x191x1):**

Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.199 W/Kg

**Flat/Zoom Scan (7x7x7)/Cube 0:**

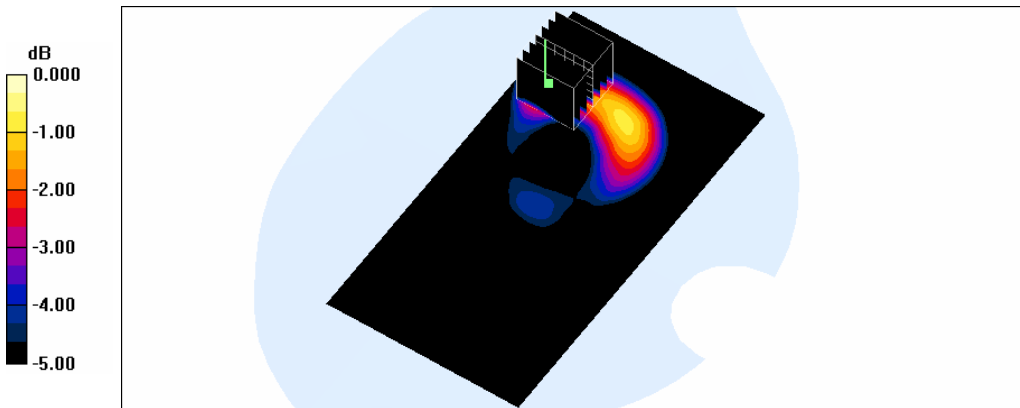
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 6.37 V/m; Power Drift = 0.014 dB

Peak SAR (extrapolated) = 0.275 W/kg

**SAR(1 g) = 0.131 W/Kg; SAR(10 g) = 0.066 W/Kg**

Maximum value of SAR (measured) = 0.195 W/Kg



0 dB = 0.195W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/15/2014 04:52:26 AM

**#71\_Flat\_802.11b CH1\_1M\_Side3 surface to phantom 10mm**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2412 \text{ MHz}$ ;  $\sigma = 1.93 \text{ mho/m}$ ;  $\epsilon_r = 52$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x121x1):**

Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.168 W/Kg

**Flat/Zoom Scan (7x7x7)/Cube 0:**

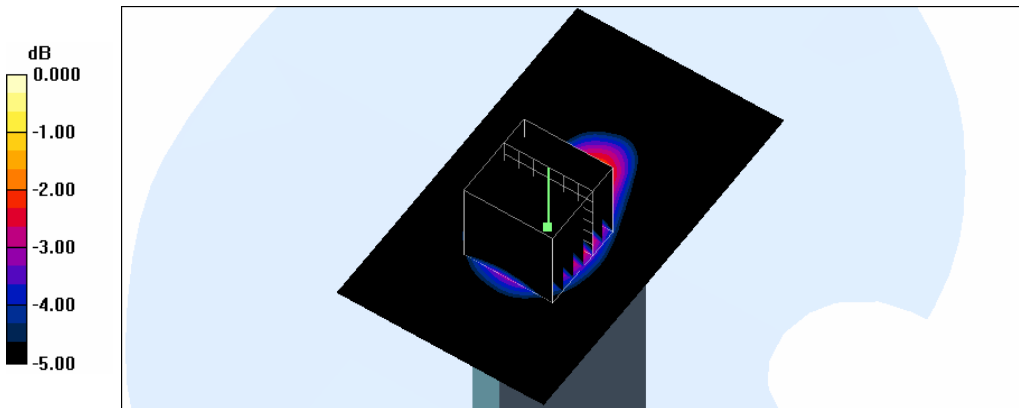
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 8.97 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 0.221 W/kg

**SAR(1 g) = 0.122 W/Kg; SAR(10 g) = 0.067 W/Kg**

Maximum value of SAR (measured) = 0.169 W/Kg



0 dB = 0.169W/Kg

Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/15/2014 05:18:12 AM

**#72 Flat\_802.11b CH1\_1M\_Side5 surface to phantom 10mm**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2412 \text{ MHz}$ ;  $\sigma = 1.93 \text{ mho/m}$ ;  $\epsilon_r = 52$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASy4 (High Precision Assessment)

DASy4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DASy4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (71x191x1):**

Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.033 W/Kg

**Flat/Zoom Scan (7x7x7)/Cube 0:**

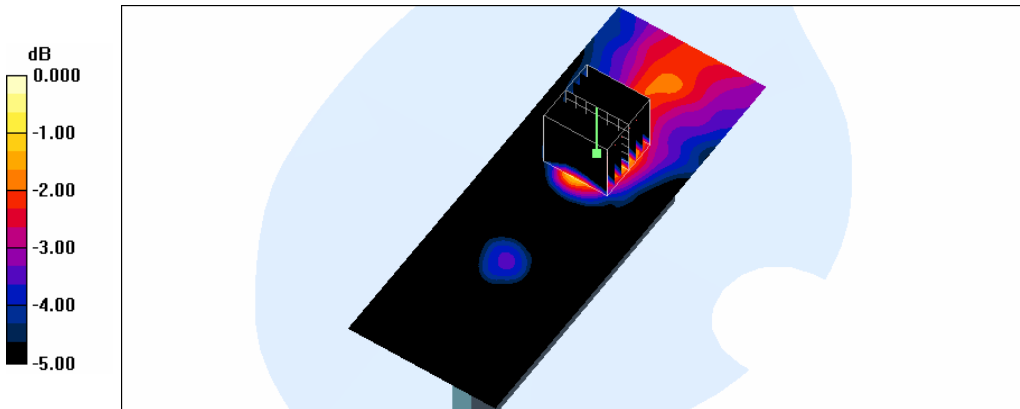
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 2.57 V/m; Power Drift = -0.077 dB

Peak SAR (extrapolated) = 0.044 W/kg

**SAR(1 g) = 0.024 W/Kg; SAR(10 g) = 0.014 W/Kg**

Maximum value of SAR (measured) = 0.033 W/Kg



0 dB = 0.033W/Kg



Test Laboratory: A Test Lab Techno Corp.  
Date/Time: 8/15/2014 09:41:45 AM

**#73\_Flat\_BT3.0\_CH78\_1M\_DH5\_Side1 surface to phantom 10mm**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2480$  MHz;  $\sigma = 1.95$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (101x191x1):**

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.127 W/Kg

**Flat/Zoom Scan (7x7x7)/Cube 0:**

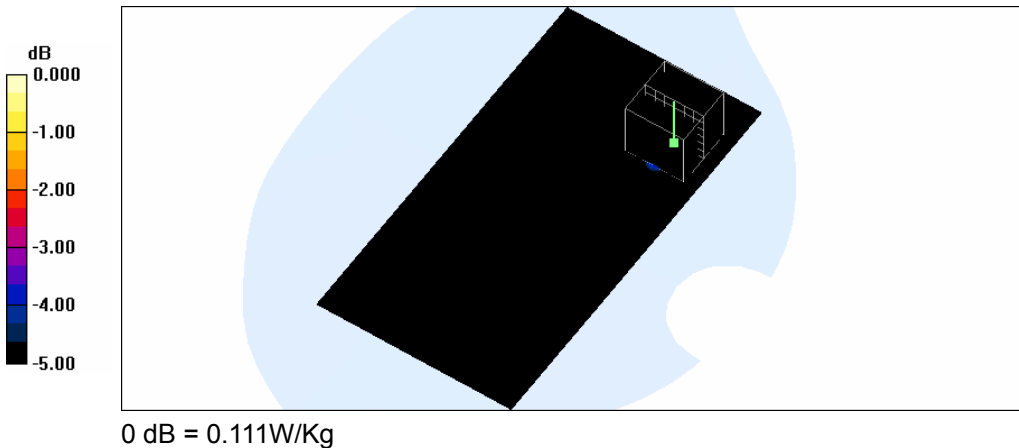
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.876 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.176 W/kg

**SAR(1 g) = 0.066 W/Kg; SAR(10 g) = 0.028 W/Kg**

Maximum value of SAR (measured) = 0.111 W/Kg



Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/15/2014 11:40:05 AM

**#74\_Flat\_BT3.0 CH78\_1M\_DH5\_Side2 surface to phantom 10mm**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2480 \text{ MHz}$ ;  $\sigma = 1.95 \text{ mho/m}$ ;  $\epsilon_r = 51.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (111x181x1):**

Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.134 W/Kg

**Flat/Zoom Scan (7x7x7)/Cube 0:**

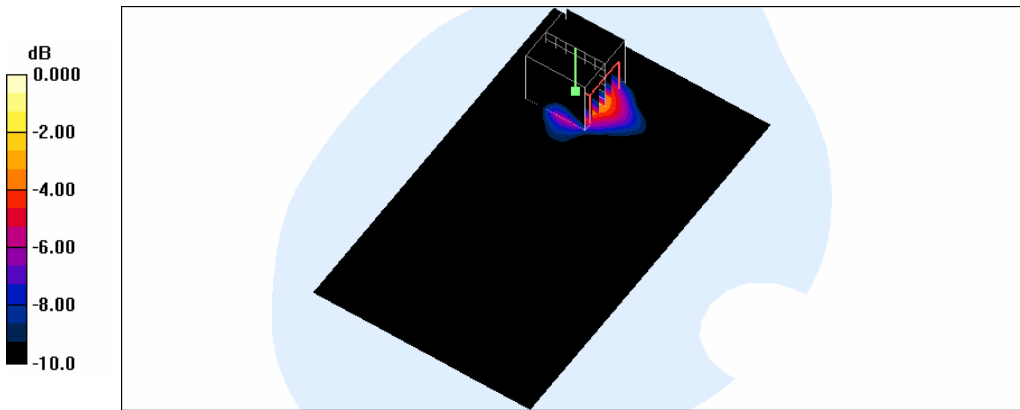
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 0.896 V/m; Power Drift = -0.029 dB

Peak SAR (extrapolated) = 0.200 W/kg

**SAR(1 g) = 0.072 W/Kg; SAR(10 g) = 0.030 W/Kg**

Maximum value of SAR (measured) = 0.129 W/Kg



0 dB = 0.129W/Kg



Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/15/2014 12:25:38 PM

**#75 Flat\_BT\_LE CH39\_Side1 surface to phantom 10mm**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: Bluetooth 4.0; Frequency: 2480 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2480 \text{ MHz}$ ;  $\sigma = 1.95 \text{ mho/m}$ ;  $\epsilon_r = 51.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (101x191x1):**

Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.015 W/Kg

**Flat/Zoom Scan (7x7x7)/Cube 0:**

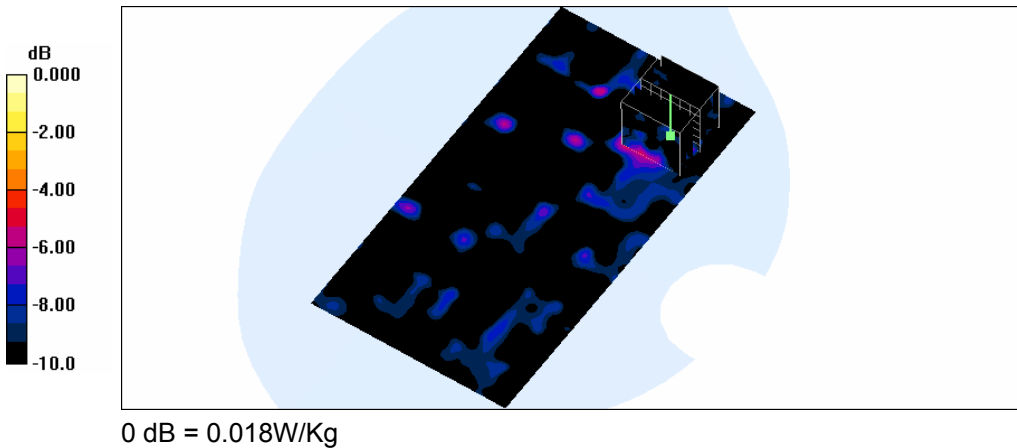
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 0.762 V/m; Power Drift = 0.143 dB

Peak SAR (extrapolated) = 0.030 W/kg

**SAR(1 g) = 0.00986 W/Kg; SAR(10 g) = 0.00451 W/Kg**

Maximum value of SAR (measured) = 0.018 W/Kg



Test Laboratory: A Test Lab Techno Corp.  
 Date/Time: 8/15/2014 01:03:36 PM

**#76 Flat\_BT\_LE CH39\_Side2 surface to phantom 10mm**

**DUT: SKY 5.0S; Type: WCDMA Mobile Phone; Serial: 863772029997780**

Communication System: Bluetooth 4.0; Frequency: 2480 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2480 \text{ MHz}$ ;  $\sigma = 1.95 \text{ mho/m}$ ;  $\epsilon_r = 51.8$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DAS4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0dB and with a peak SAR value greater than 0.5 W/Kg
- Probe: EX3DV4 - SN3977; ConvF(6.97, 6.97, 6.97); Calibrated: 2/17/2014
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 2/25/2014
- Phantom: SAM; Type: SAM v4.0; Serial: TP:1009
- Measurement SW: DAS4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Flat/Area Scan (111x191x1):**

Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.026 W/Kg

**Flat/Zoom Scan (7x7x7)/Cube 0:**

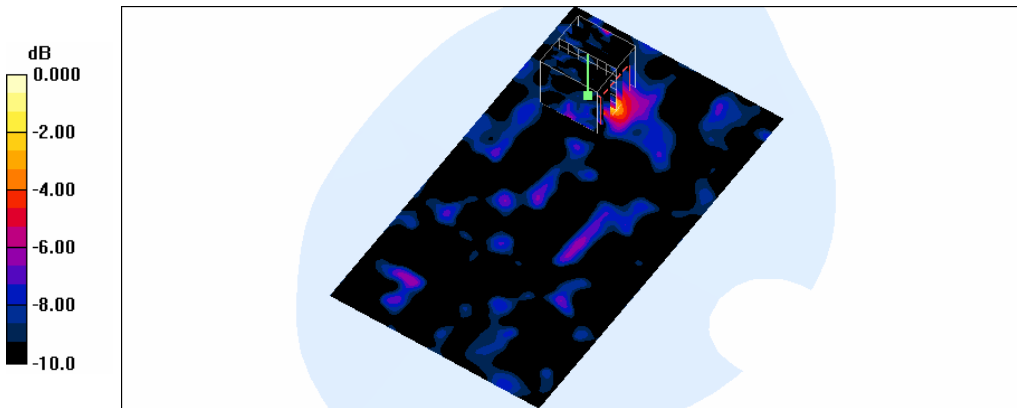
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 0.710 V/m; Power Drift = 0.161 dB

Peak SAR (extrapolated) = 0.024 W/kg

**SAR(1 g) = 0.00922 W/Kg; SAR(10 g) = 0.00402 W/Kg**

Maximum value of SAR (measured) = 0.015 W/Kg



0 dB = 0.015W/Kg



## **Appendix C - Calibration**

All of the instruments Calibration information are listed below.

- Dipole \_ D835V2 SN:4d082 Calibration No.D835V2-4d082\_Jul14
- Dipole \_ D1750V2 SN:1023 Calibration No.D1750V2-1023\_Jun14
- Dipole \_ D1900V2 SN:5d111 Calibration No.D1900V2-5d111\_Jul14
- Dipole \_ D2450V2 SN:712 Calibration No.D2450V2-712\_Mar14
- Probe \_ EX3DV4 SN:3977 Calibration No.EX3-3977\_Feb14
- DAE \_ DAE4 SN:779 Calibration No.DAE4-779\_Feb14

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Accreditation No.: **SCS 108**

Client **ATL (Auden)**

Certificate No: **D835V2-4d082\_Jul14**

### CALIBRATION CERTIFICATE

Object: **D835V2 - SN: 4d082**

Calibration procedure(s): **QA CAL-05.v9  
Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **July 24, 2014**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°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	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	30-Apr-14 (No. DAE4-601_Apr14)	Apr-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

Calibrated by: **Name: Claudio Leubler, Function: Laboratory Technician, Signature: [Signature]**

Approved by: **Name: Katja Pokovic, Function: Technical Manager, Signature: [Signature]**

Issued: July 24, 2014

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Accreditation No.: **SCS 108**

Accredited by the Swiss Accreditation Service (SAS)  
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**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:**

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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
- c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

**Additional Documentation:**

- d) 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	V52.8.8
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	41.1 ± 6 %	0.94 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	<b>9.31 W/kg ± 17.0 % (k=2)</b>

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.55 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	<b>6.03 W/kg ± 16.5 % (k=2)</b>

### 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	53.8 ± 6 %	1.02 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

### SAR result with Body TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.48 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	<b>9.50 W/kg ± 17.0 % (k=2)</b>

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.62 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	<b>6.27 W/kg ± 16.5 % (k=2)</b>



## Appendix (Additional assessments outside the scope of SCS108)

### Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.9 $\Omega$ - 2.6 j $\Omega$
Return Loss	- 31.3 dB

### Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.6 $\Omega$ - 6.0 j $\Omega$
Return Loss	- 23.6 dB

### General Antenna Parameters and Design

Electrical Delay (one direction)	1.389 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	October 17, 2008

**DASY5 Validation Report for Head TSL**

Date: 24.07.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d082**

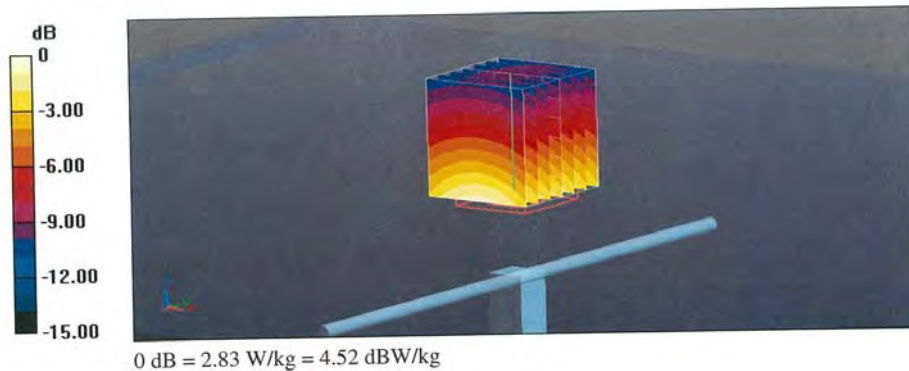
Communication System: UID 0 - CW; Frequency: 835 MHz  
 Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.94 \text{ S/m}$ ;  $\epsilon_r = 41.1$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Flat Section  
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.22, 6.22, 6.22); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

**Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:**

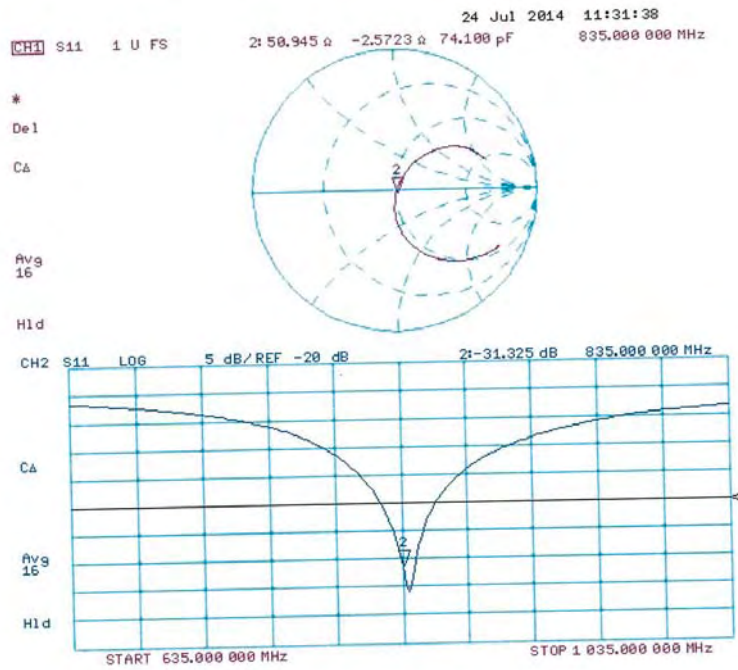
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 56.65 V/m; Power Drift = -0.01 dB  
 Peak SAR (extrapolated) = 3.64 W/kg  
**SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.55 W/kg**  
 Maximum value of SAR (measured) = 2.83 W/kg







### Impedance Measurement Plot for Head TSL



**DASY5 Validation Report for Body TSL**

Date: 17.07.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d082**

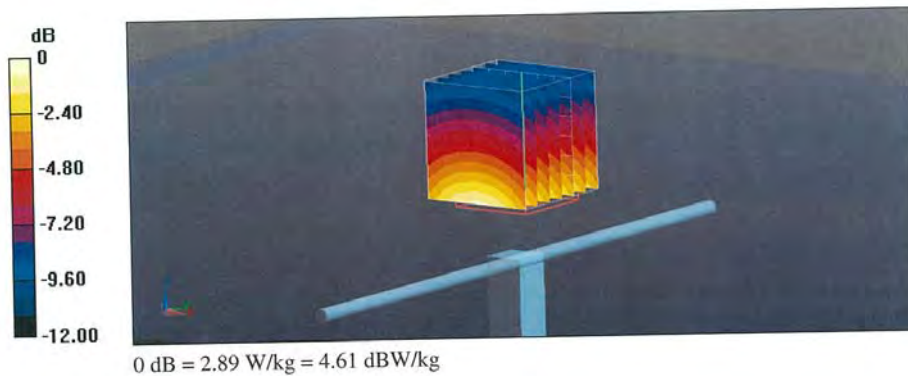
Communication System: UID 0 - CW; Frequency: 835 MHz  
 Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 1.02 \text{ S/m}$ ;  $\epsilon_r = 53.8$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Flat Section  
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

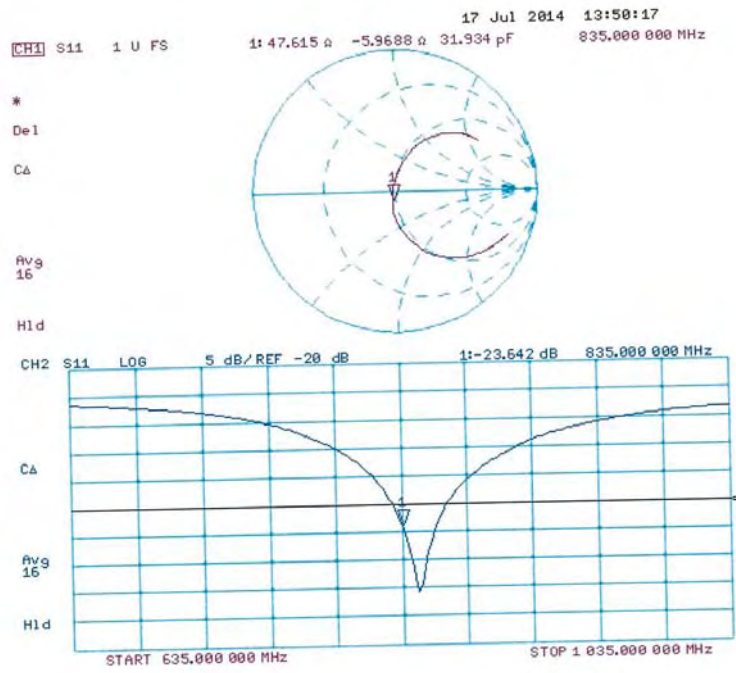
- Probe: ES3DV3 - SN3205; ConvF(6.09, 6.09, 6.09); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

**Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 55.08 V/m; Power Drift = 0.01 dB  
 Peak SAR (extrapolated) = 3.65 W/kg  
**SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.62 W/kg**  
 Maximum value of SAR (measured) = 2.89 W/kg



### Impedance Measurement Plot for Body TSL





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Accreditation No.: **SCS 108**

Client **Auden**

Certificate No: **D1750V2-1023\_Jun14**

## CALIBRATION CERTIFICATE

Object **D1750V2 - SN: 1023**

Calibration procedure(s) **QA CAL-05.v9  
Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **June 17, 2014**

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	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	30-Apr-14 (No. DAE4-601_Apr14)	Apr-15
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

Calibrated by:	Name Leif Klysner	Function Laboratory Technician	Signature 
Approved by:	Katja Pokovic	Technical Manager	

Issued: June 18, 2014

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Certificate No: D1750V2-1023\_Jun14

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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 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

**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	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz $\pm$ 1 MHz	

### Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	39.3 $\pm$ 6 %	1.37 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.21 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	<b>36.7 W/kg <math>\pm</math> 17.0 % (k=2)</b>

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.88 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	<b>19.5 W/kg <math>\pm</math> 16.5 % (k=2)</b>

### Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	52.0 $\pm$ 6 %	1.49 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

### SAR result with Body TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.54 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	<b>37.9 W/kg <math>\pm</math> 17.0 % (k=2)</b>

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.12 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	<b>20.4 W/kg <math>\pm</math> 16.5 % (k=2)</b>



**Appendix (Additional assessments outside the scope of SCS108)**

**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	51.2 $\Omega$ - 0.4 j $\Omega$
Return Loss	- 38.0 dB

**Antenna Parameters with Body TSL**

Impedance, transformed to feed point	46.4 $\Omega$ + 0.4 j $\Omega$
Return Loss	- 28.4 dB

**General Antenna Parameters and Design**

Electrical Delay (one direction)	1.217 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	August 20, 2009

**DASY5 Validation Report for Head TSL**

Date: 17.06.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1023**

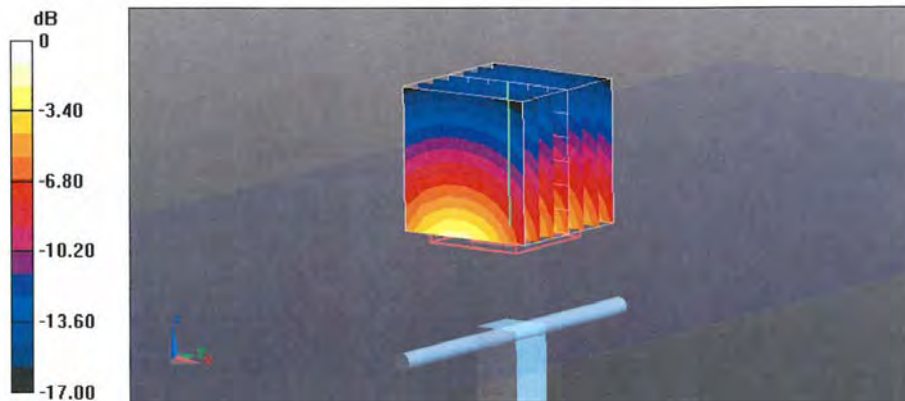
Communication System: UID 0 - CW; Frequency: 1750 MHz  
 Medium parameters used:  $f = 1750 \text{ MHz}$ ;  $\sigma = 1.37 \text{ S/m}$ ;  $\epsilon_r = 39.3$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Flat Section  
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.23, 5.23, 5.23); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

**Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

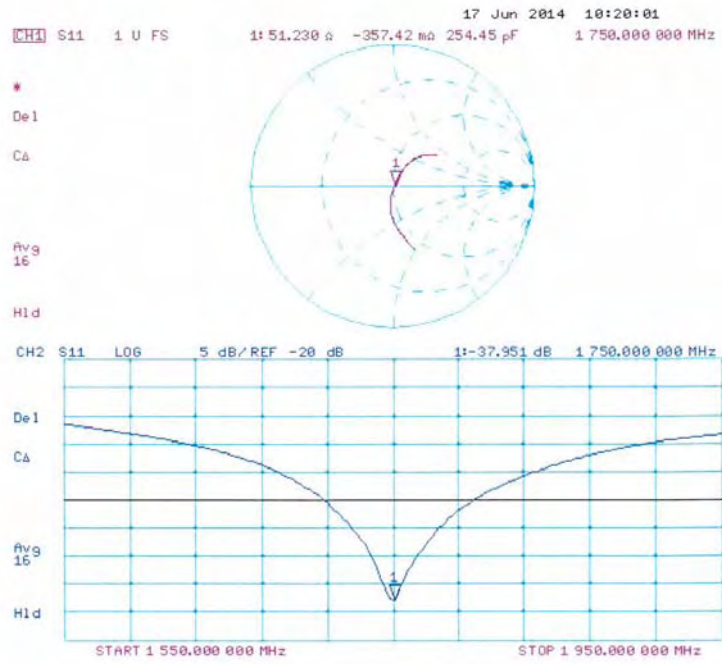
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 94.67 V/m; Power Drift = 0.01 dB  
 Peak SAR (extrapolated) = 16.6 W/kg  
**SAR(1 g) = 9.21 W/kg; SAR(10 g) = 4.88 W/kg**  
 Maximum value of SAR (measured) = 11.5 W/kg







### Impedance Measurement Plot for Head TSL



**DASY5 Validation Report for Body TSL**

Date: 17.06.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1023**

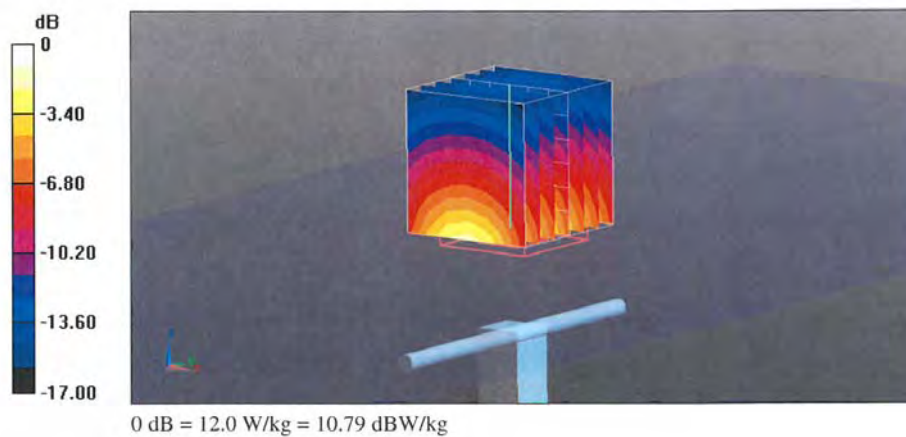
Communication System: UID 0 - CW; Frequency: 1750 MHz  
 Medium parameters used:  $f = 1750$  MHz;  $\sigma = 1.49$  S/m;  $\epsilon_r = 52$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section  
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.89, 4.89, 4.89); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

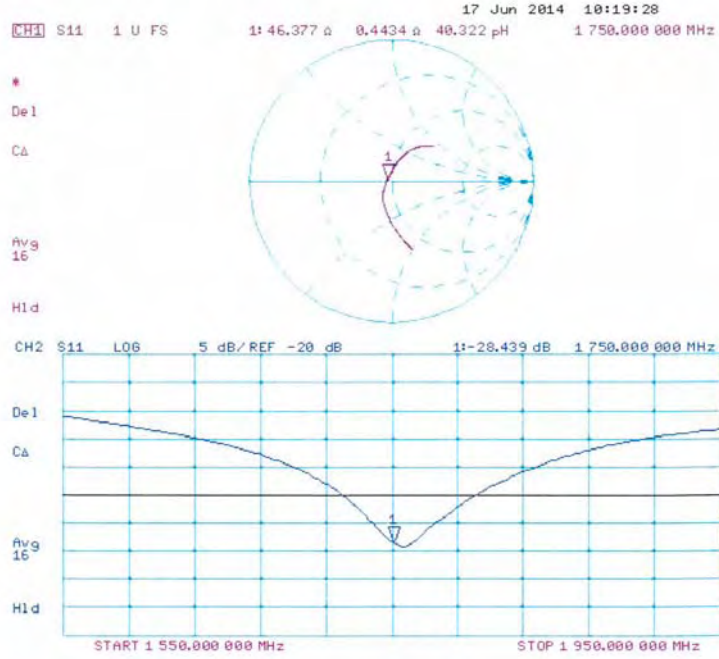
**Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid: dx=5mm, dy=5mm, dz=5mm  
 Reference Value = 93.68 V/m; Power Drift = 0.01 dB  
 Peak SAR (extrapolated) = 16.4 W/kg  
**SAR(1 g) = 9.54 W/kg; SAR(10 g) = 5.12 W/kg**  
 Maximum value of SAR (measured) = 12.0 W/kg





### Impedance Measurement Plot for Body TSL





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Accreditation No.: **SCS 108**

Client **ATL (Auden)**

Certificate No: **D1900V2-5d111\_Jul14**

### CALIBRATION CERTIFICATE

Object: **D1900V2 - SN: 5d111**

Calibration procedure(s): **QA CAL-05.v9  
Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **July 23, 2014**

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	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	30-Apr-14 (No. DAE4-601_Apr14)	Apr-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

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

Issued: July 23, 2014

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

Certificate No: D1900V2-5d111\_Jul14

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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:**

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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
- c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

**Additional Documentation:**

- d) 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	V52.8.8
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	39.5 ± 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 <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.1 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	<b>40.6 W/kg ± 17.0 % (k=2)</b>

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.28 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	<b>21.2 W/kg ± 16.5 % (k=2)</b>

**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	52.5 ± 6 %	1.51 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

**SAR result with Body TSL**

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.1 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	<b>40.4 W/kg ± 17.0 % (k=2)</b>

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.37 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	<b>21.5 W/kg ± 16.5 % (k=2)</b>



## Appendix (Additional assessments outside the scope of SCS108)

### Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.5 $\Omega$ + 6.3 j $\Omega$
Return Loss	- 24.0 dB

### Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.2 $\Omega$ + 6.5 j $\Omega$
Return Loss	- 22.2 dB

### General Antenna Parameters and Design

Electrical Delay (one direction)	1.202 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 28, 2008

**DASY5 Validation Report for Head TSL**

Date: 23.07.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d111**

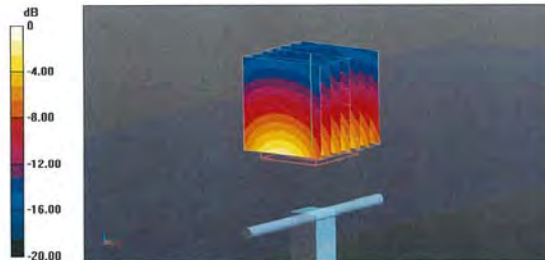
Communication System: UID 0 - CW; Frequency: 1900 MHz  
 Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.38 \text{ S/m}$ ;  $\epsilon_r = 39.5$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Flat Section  
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.06, 5.06, 5.06); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

**Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 99.09 V/m; Power Drift = 0.03 dB  
 Peak SAR (extrapolated) = 18.6 W/kg  
**SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.28 W/kg**  
 Maximum value of SAR (measured) = 12.8 W/kg

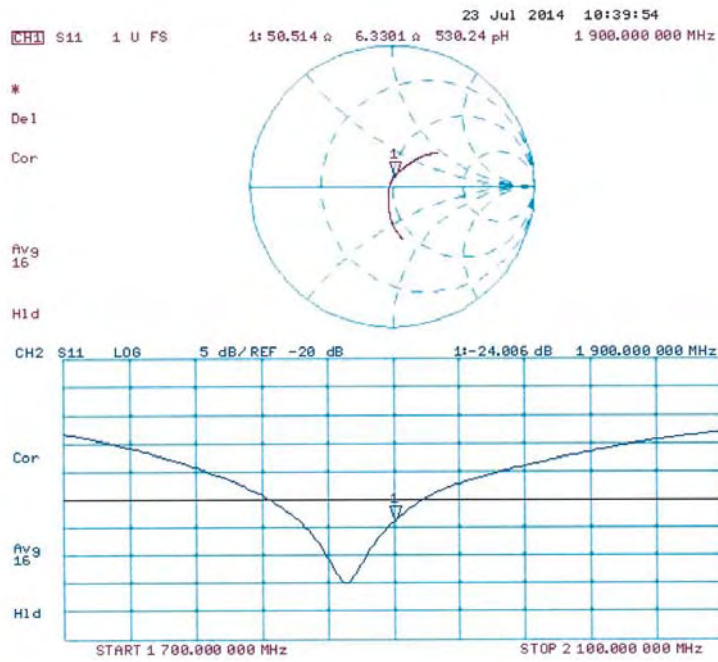


0 dB = 12.8 W/kg = 11.07 dBW/kg





### Impedance Measurement Plot for Head TSL



**DASY5 Validation Report for Body TSL**

Date: 23.07.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d111**

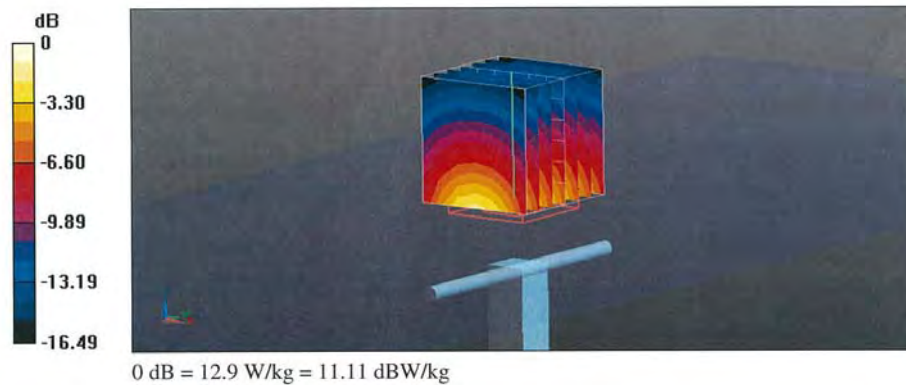
Communication System: UID 0 - CW; Frequency: 1900 MHz  
 Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.51 \text{ S/m}$ ;  $\epsilon_r = 52.5$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Flat Section  
 Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

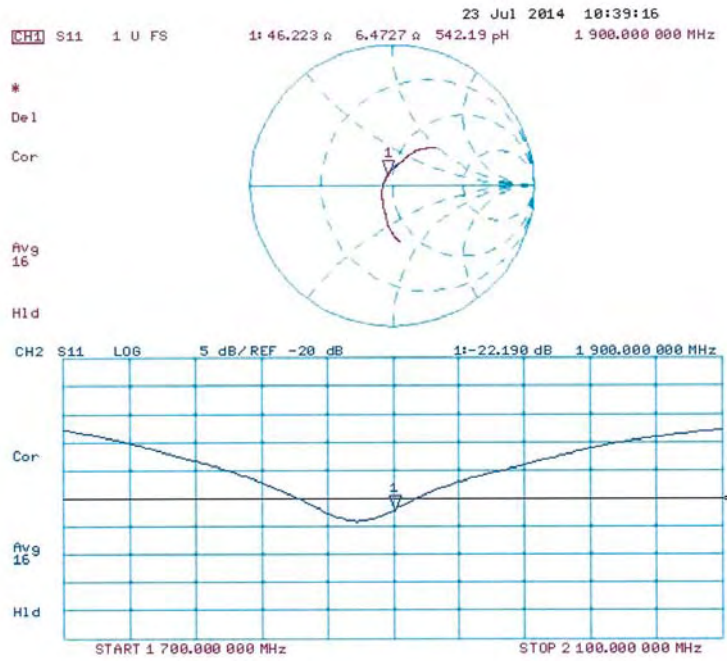
- Probe: ES3DV3 - SN3205; ConvF(4.76, 4.76, 4.76); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

**Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 96.08 V/m; Power Drift = -0.02 dB  
 Peak SAR (extrapolated) = 17.7 W/kg  
**SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.37 W/kg**  
 Maximum value of SAR (measured) = 12.9 W/kg



### Impedance Measurement Plot for Body TSL





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Accreditation No.: **SCS 108**

Client **ATL (Auden)**

Certificate No: **D2450V2-712\_Mar14**

**CALIBRATION CERTIFICATE**

Object **D2450V2 - SN: 712**

Calibration procedure(s) **QA CAL-05.v9  
 Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **March 04, 2014**

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	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-13 (No. 217-01736)	Apr-14
Type-N mismatch combination	SN: 5047.3 / 06327	04-Apr-13 (No. 217-01739)	Apr-14
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	25-Apr-13 (No. DAE4-601_Apr13)	Apr-14
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 4, 2014

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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:**

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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
- c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

**Additional Documentation:**

- d) 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	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz $\pm$ 1 MHz	

### Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	38.1 $\pm$ 6 %	1.86 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	<b>52.0 W/kg <math>\pm</math> 17.0 % (k=2)</b>

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.16 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	<b>24.3 W/kg <math>\pm</math> 16.5 % (k=2)</b>

### Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	50.7 $\pm$ 6 %	2.02 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

### SAR result with Body TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.9 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	<b>50.3 W/kg <math>\pm</math> 17.0 % (k=2)</b>

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.96 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	<b>23.5 W/kg <math>\pm</math> 16.5 % (k=2)</b>



## Appendix

### Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.7 $\Omega$ + 3.2 j $\Omega$
Return Loss	- 25.4 dB

### Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.3 $\Omega$ + 5.0 j $\Omega$
Return Loss	- 25.9 dB

### General Antenna Parameters and Design

Electrical Delay (one direction)	1.150 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	July 05, 2002

**DASY5 Validation Report for Head TSL**

Date: 04.03.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 712**

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.86$  S/m;  $\epsilon_r = 38.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

**Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

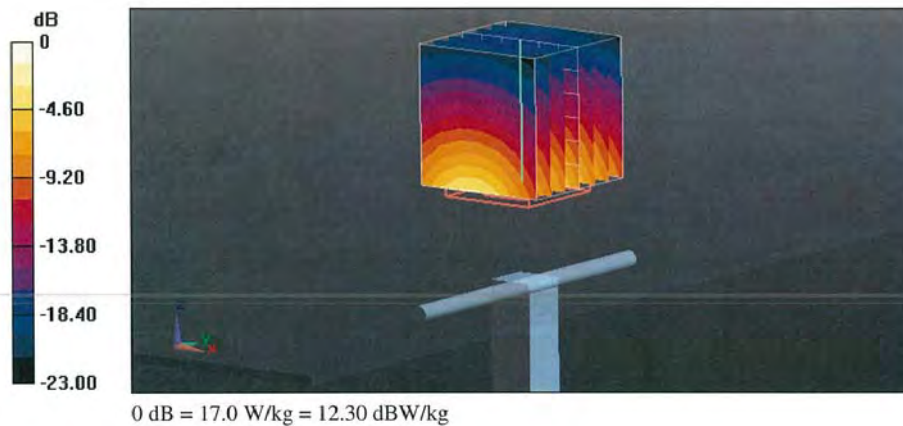
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.26 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 27.5 W/kg

**SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.16 W/kg**

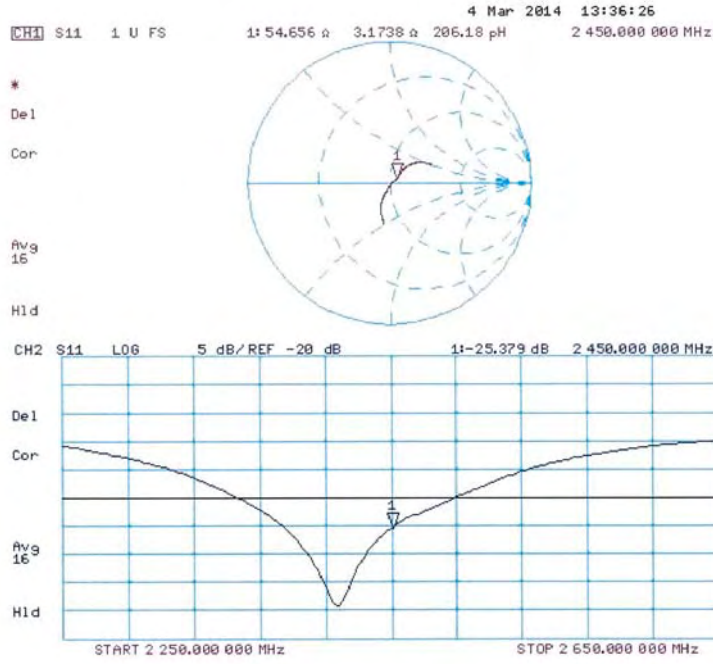
Maximum value of SAR (measured) = 17.0 W/kg







Impedance Measurement Plot for Head TSL



**DASY5 Validation Report for Body TSL**

Date: 04.03.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 712**

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 2.02$  S/m;  $\epsilon_r = 50.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.35, 4.35, 4.35); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

**Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

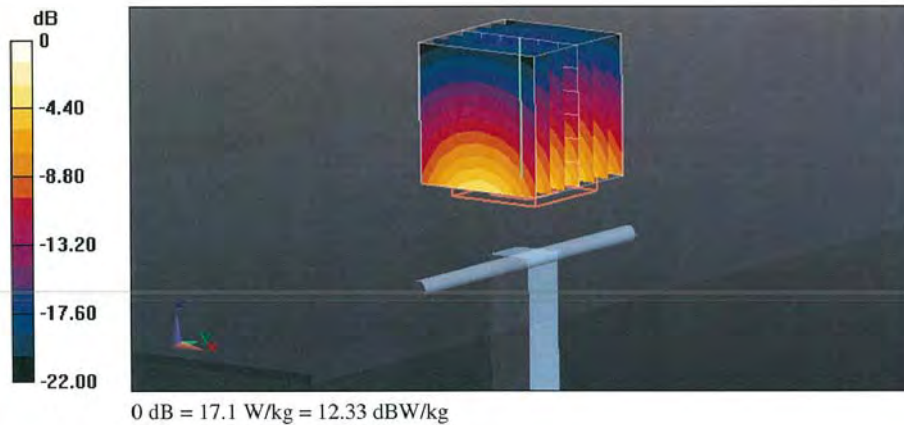
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.771 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 27.0 W/kg

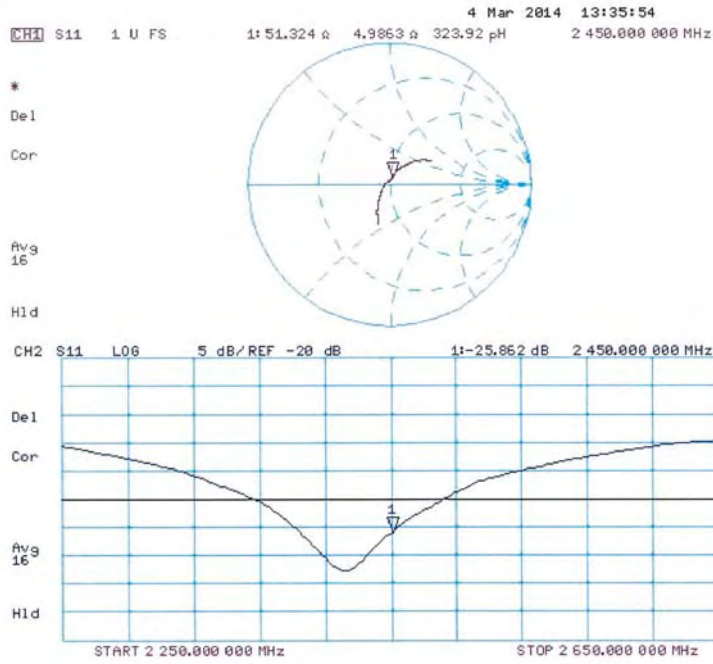
**SAR(1 g) = 12.9 W/kg; SAR(10 g) = 5.96 W/kg**

Maximum value of SAR (measured) = 17.1 W/kg





### Impedance Measurement Plot for Body TSL



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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **ATL (Auden)**

Certificate No: **EX3-3977\_Feb14**

### CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3977**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5,  
QA CAL-25.v6  
Calibration procedure for dosimetric E-field probes**



Calibration date: **February 17, 2014**

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	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	04-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	30-Dec-13 (No. ES3-3013_Dec13)	Dec-14
DAE4	SN: 660	13-Dec-13 (No. DAE4-660_Dec13)	Dec-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

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

Issued: February 19, 2014

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
NORM <sub>x,y,z</sub>	sensitivity in free space
ConvF	sensitivity in TSL / NORM <sub>x,y,z</sub>
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization $\varphi$	$\varphi$ rotation around probe axis
Polarization $\vartheta$	$\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

**Calibration is Performed According to the Following Standards:**

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- 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<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below *ConvF*).
- **NORM(f)<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* *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<sub>x,y,z</sub>**: 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<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: A, B, C, D 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<sub>x,y,z</sub> \* *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  $\pm 50$  MHz to  $\pm 100$  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.
- **Connector Angle**: The angle is assessed using the information gained by determining the NORM<sub>x</sub> (no uncertainty required).



EX3DV4 – SN:3977

February 17, 2014

# Probe EX3DV4

## SN:3977

Manufactured: November 5, 2013  
Calibrated: February 17, 2014

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



EX3DV4-- SN:3977

February 17, 2014

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

### Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup>	0.54	0.57	0.54	$\pm 10.1 \%$
DCP (mV) <sup>B</sup>	99.5	100.0	99.7	

### Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Unc <sup>E</sup> (k=2)
0	CW	X	0.0	0.0	1.0	0.00	133.3	$\pm 3.3 \%$
		Y	0.0	0.0	1.0		134.9	
		Z	0.0	0.0	1.0		146.5	

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%.

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

<sup>B</sup> Numerical linearization parameter: uncertainty not required.

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



EX3DV4- SN:3977

February 17, 2014

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

### Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m) <sup>F</sup>	ConvF X	ConvF Y	ConvF Z	Alpha <sup>G</sup>	Depth (mm) <sup>G</sup>	Unct. (k=2)
450	43.5	0.87	11.72	11.72	11.72	0.18	1.10	± 13.3 %
750	41.9	0.89	9.98	9.98	9.98	0.36	0.88	± 12.0 %
835	41.5	0.90	9.62	9.62	9.62	0.61	0.69	± 12.0 %
900	41.5	0.97	9.48	9.48	9.48	0.77	0.63	± 12.0 %
1750	40.1	1.37	8.14	8.14	8.14	0.78	0.60	± 12.0 %
1900	40.0	1.40	7.97	7.97	7.97	0.48	0.75	± 12.0 %
2000	40.0	1.40	7.93	7.93	7.93	0.69	0.63	± 12.0 %
2300	39.5	1.67	7.59	7.59	7.59	0.37	0.83	± 12.0 %
2450	39.2	1.80	7.24	7.24	7.24	0.27	1.10	± 12.0 %
2600	39.0	1.96	7.07	7.07	7.07	0.41	0.84	± 12.0 %
5200	36.0	4.66	5.09	5.09	5.09	0.35	1.80	± 13.1 %
5300	35.9	4.76	4.82	4.82	4.82	0.35	1.80	± 13.1 %
5500	35.6	4.96	4.76	4.76	4.76	0.35	1.80	± 13.1 %
5600	35.5	5.07	4.55	4.55	4.55	0.40	1.80	± 13.1 %
5800	35.3	5.27	4.52	4.52	4.52	0.40	1.80	± 13.1 %

<sup>C</sup> 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.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) 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 ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.





EX3DV4- SN:3977

February 17, 2014

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

### Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m) <sup>F</sup>	ConvF X	ConvF Y	ConvF Z	Alpha <sup>G</sup>	Depth (mm) <sup>G</sup>	Unct. (k=2)
450	56.7	0.94	12.47	12.47	12.47	0.11	1.10	± 13.3 %
750	55.5	0.96	9.78	9.78	9.78	0.45	0.86	± 12.0 %
835	55.2	0.97	9.74	9.74	9.74	0.48	0.83	± 12.0 %
900	55.0	1.05	9.46	9.46	9.46	0.41	0.89	± 12.0 %
1750	53.4	1.49	7.69	7.69	7.69	0.41	0.88	± 12.0 %
1900	53.3	1.52	7.37	7.37	7.37	0.34	0.89	± 12.0 %
2000	53.3	1.52	7.41	7.41	7.41	0.24	1.14	± 12.0 %
2300	52.9	1.81	7.12	7.12	7.12	0.66	0.64	± 12.0 %
2450	52.7	1.95	6.97	6.97	6.97	0.80	0.50	± 12.0 %
2600	52.5	2.16	6.68	6.68	6.68	0.80	0.50	± 12.0 %
5200	49.0	5.30	4.50	4.50	4.50	0.45	1.90	± 13.1 %
5300	48.9	5.42	4.28	4.28	4.28	0.45	1.90	± 13.1 %
5500	48.6	5.65	4.02	4.02	4.02	0.45	1.90	± 13.1 %
5600	48.5	5.77	3.87	3.87	3.87	0.45	1.90	± 13.1 %
5800	48.2	6.00	4.12	4.12	4.12	0.50	1.90	± 13.1 %

<sup>C</sup> 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.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) 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 ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

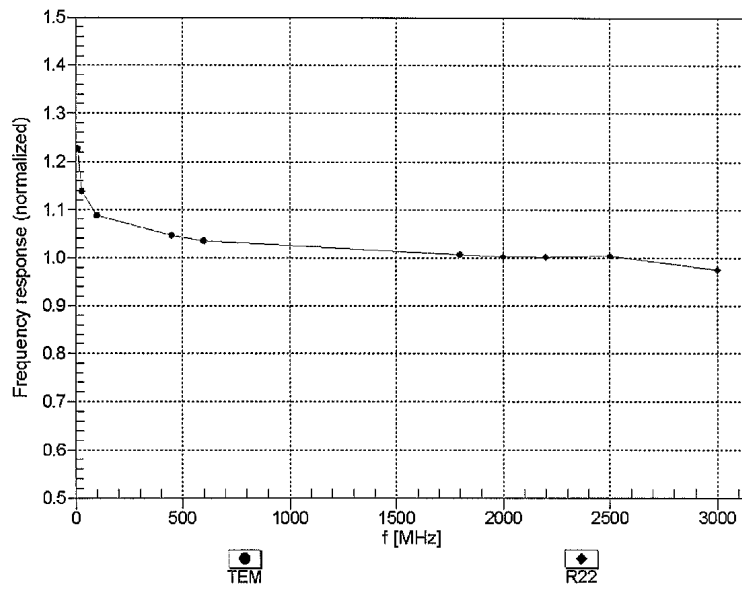
<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



EX3DV4- SN:3977

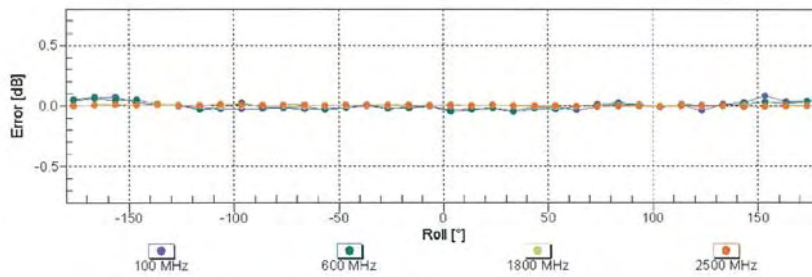
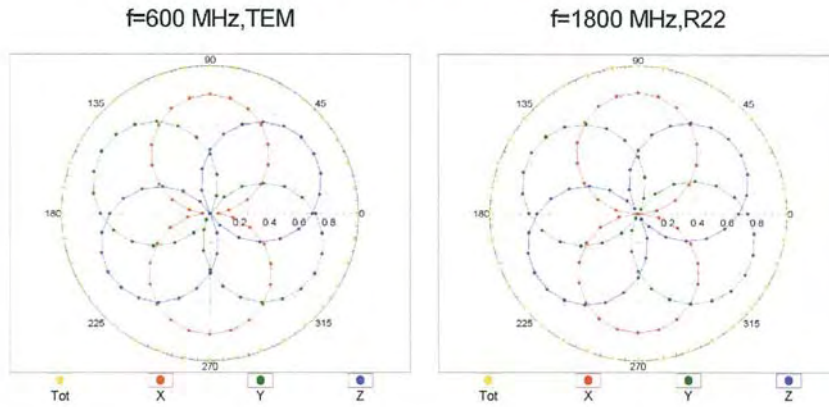
February 17, 2014

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



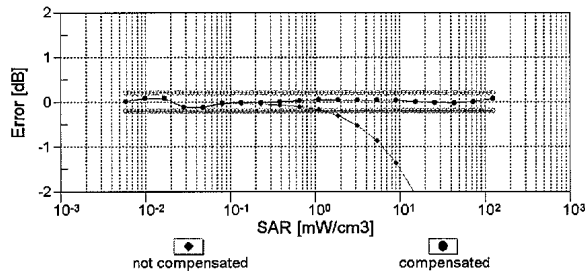
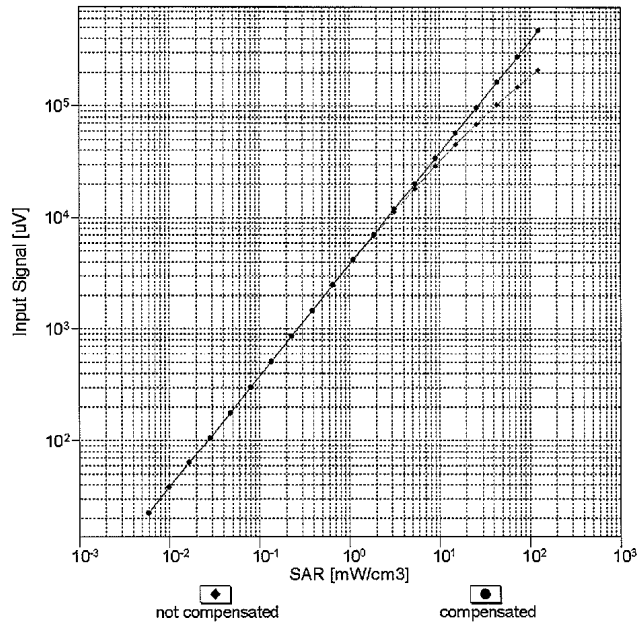
Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  (k=2)

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



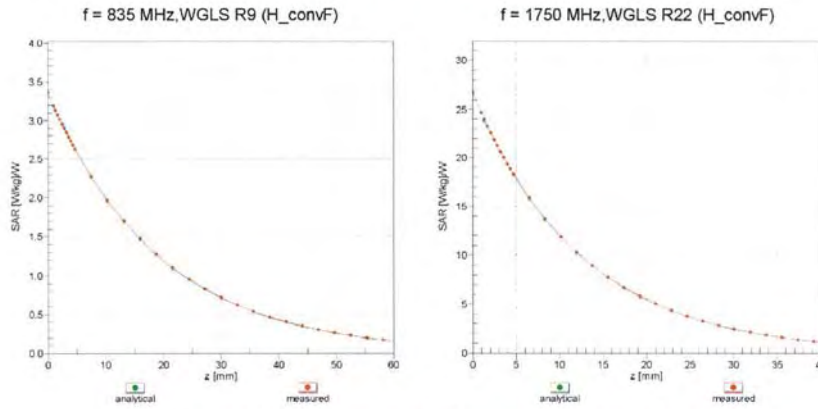
Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  (k=2)

### Dynamic Range f(SAR<sub>head</sub>) (TEM cell , f<sub>eval</sub>= 1900 MHz)

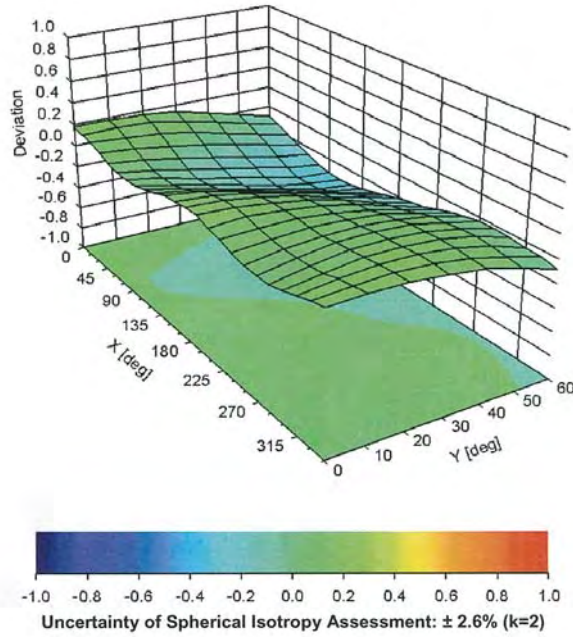


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

### Conversion Factor Assessment



### Deviation from Isotropy in Liquid Error ( $\phi, \theta$ ), f = 900 MHz





EX3DV4- SN:3977

February 17, 2014

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3977

### Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	23.6
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm



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Accreditation No.: **SCS 108**

Client **ATL (Auden)**

Certificate No: **DAE4-779\_Feb14**

### CALIBRATION CERTIFICATE

Object: **DAE4 - SD 000 D04 BM - SN: 779**

Calibration procedure(s): **QA CAL-06.v26  
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **February 25, 2014**

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
Keithley Multimeter Type 2001	SN: 0810278	01-Oct-13 (No:13976)	Oct-14
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Auto DAE Calibration Unit	SE UWS 053 AA 1001	07-Jan-14 (in house check)	In house check: Jan-15
Calibrator Box V2.1	SE UMS 006 AA 1002	07-Jan-14 (in house check)	In house check: Jan-15

Calibrated by:	Name	Function	Signature
	R.Mayoraz	Technician	<i>R. Mayoraz</i>
Approved by:	Name	Function	Signature
	Fin Bomholt	Deputy Technical Manager	<i>F. Bomholt</i>

Issued: February 25, 2014

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Accreditation No.: **SCS 108**

### Glossary

DAE data acquisition electronics  
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

### Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement:* Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.





### DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 $\mu$ V, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.515 $\pm$ 0.02% (k=2)	403.757 $\pm$ 0.02% (k=2)	403.978 $\pm$ 0.02% (k=2)
Low Range	3.96916 $\pm$ 1.50% (k=2)	3.98125 $\pm$ 1.50% (k=2)	3.99560 $\pm$ 1.50% (k=2)

### Connector Angle

Connector Angle to be used in DASY system	157.5 $^{\circ}$ $\pm$ 1 $^{\circ}$
---	-------------------------------------



**Appendix**

**1. DC Voltage Linearity**

High Range	Reading ( $\mu\text{V}$ )	Difference ( $\mu\text{V}$ )	Error (%)
Channel X + Input	199997.74	1.65	0.00
Channel X + Input	20001.89	1.21	0.01
Channel X - Input	-19997.69	3.10	-0.02
Channel Y + Input	199997.92	2.13	0.00
Channel Y + Input	20001.37	0.80	0.00
Channel Y - Input	-19999.57	1.35	-0.01
Channel Z + Input	199997.09	1.06	0.00
Channel Z + Input	20000.80	0.22	0.00
Channel Z - Input	-19999.23	1.60	-0.01

Low Range	Reading ( $\mu\text{V}$ )	Difference ( $\mu\text{V}$ )	Error (%)
Channel X + Input	2001.24	0.10	0.01
Channel X + Input	202.08	0.59	0.29
Channel X - Input	-198.10	0.23	-0.11
Channel Y + Input	2001.05	-0.03	-0.00
Channel Y + Input	200.92	-0.52	-0.26
Channel Y - Input	-199.30	-0.92	0.46
Channel Z + Input	2001.25	0.24	0.01
Channel Z + Input	200.66	-0.81	-0.40
Channel Z - Input	-198.77	-0.44	0.22

**2. Common mode sensitivity**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading ( $\mu\text{V}$ )	Low Range Average Reading ( $\mu\text{V}$ )
Channel X	200	-3.03	-4.58
	-200	6.11	4.63
Channel Y	200	13.34	13.05
	-200	-15.36	-15.98
Channel Z	200	3.32	2.92
	-200	-3.98	-4.66

**3. Channel separation**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X ( $\mu\text{V}$ )	Channel Y ( $\mu\text{V}$ )	Channel Z ( $\mu\text{V}$ )
Channel X	200	-	-1.70	-3.37
Channel Y	200	10.69	-	-1.19
Channel Z	200	7.92	8.10	-



**4. AD-Converter Values with inputs shorted**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15606	14291
Channel Y	15844	15955
Channel Z	16208	16276

**5. Input Offset Measurement**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	-0.06	-2.42	1.10	0.60
Channel Y	-0.79	-2.62	0.91	0.68
Channel Z	-0.58	-2.53	0.84	0.57

**6. Input Offset Current**

Nominal Input circuitry offset current on all channels: <25fA

**7. Input Resistance** (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

**8. Low Battery Alarm Voltage** (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

**9. Power Consumption** (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9