FCC SAR TEST REPORT

No. 150540-SAR

For

Logic Mark LLC

Product Name: 3G mobile phone only call 911

Model Name: 30711

Trade Name: Guardian Alert 911 PLUS

Issued Date: 2015-07-28

Test Laboratory:

GCCT, *Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center*

Technology Road, High-tech Zone, He Yuan, Guang Dong, PR China 517001

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GENERAL SUMMARY

Product Name	3G mobile phone only call 911
Model Name	30711
Applicant	LogicMark LLC
Manufacturer	APEX Global Electronics CO. Limited
Test laboratory	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
Reference Standards	**IEEE Std C95.1, 2005:** IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz **IEEE 1528-2003:** Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques **FCC KDB 447498 D01 v05r02:** Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies **FCC KDB 865664 D01 v01r03:** SAR Measurement Requirements for 100 MHz to 6 GHz **FCC KDB 941225 D01 3G SAR Procedures v03:** 3G SAR Measurement Procedures
Test Conclusion	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 8 of this test report are below limits specified in the relevant standards. General Judgment: **Pass** **Date of issue:2015.07.28**
Comment:	The test results in this report apply only to the tested sample of the stated device/equipment.

Approved by:	*Reviewed by:*	*Tested by:*
Luo Jian	Dong Xiaobo	Li Linqiang
Manager	Manager	Test Engineer

1 Test Laboratory

1.1 Testing Location

Company Name:	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
Address:	Technology Road, High-tech Zone, Heyuan, Guangdong Province, PR.China
Postal Code:	517001
Telephone:	+86-762-3607221
Fax:	+86-762-3603336

1.2 Testing Environment

Temperature	Min. = 20°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

1.3 Project Data

Project Leader:	Wen Xiaoyong
Project Engineer	Li Linqiang
Testing Start Date:	2015-06-10
Testing End Date:	2015-06-11

2. Client Information

2.1 Applicant Information

Company Name:	LogicMark LLC
Address:	10106 Bluegrass Pkwy, Louisville KY, 40299
City:	KY
Postal Code:	40299
Country:	United States
Telephone:	703-934-7934
Fax:	703-934-7934

2.2 Manufacturer Information

Company Name:	APEX Global Electronics CO. Limited
Address:	Unit M, 17/F, Block 2, Kin Ho Industrial Building, 14-24 Au Pui Wan Street, Fo Tan, N.T. Hong Kong
City:	Hong Kong
Postal Code:	/
Country:	China
Telephone:	(852) 23344535
Fax:	(852) 23344535

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1 About EUT

Product Name	3G mobile phone only call 911		
Model Name	30711		
Trade Mark	Guardian Alert 911 PLUS		
FCC ID	TYD-GA30711		
Exposure Category	Uncontrolled Environment / General Population		
Device Type	Portable Device		
Supporting modes	WCDMA Band II(tested) WCDMA Band V(tested)		
Operating Frequency Range(s)	Mode	Tx(MHz)	Rx(MHz)
	WCDMA Band V	824 ~849	869 ~ 894
	WCDMA Band II	1850 ~ 1910	1930 ~ 1990
Max. SAR (1g)	Mode	1g SAR(W/Kg)	
	WCDMA Band II	1.40	
	WCDMA Band V	0.543	
Antenna Type	Fixed Internal Antenna		
Form factor	6.5cm*4.5cm*1.9cm		
Comment	The above EUT's information was declared by manufacture.		

Note: Photographs of EUT are shown in ANNEX A of this test report.

3.2 Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version
150540-M03	/	M8_V1.0	M8_V1.0

*EUT ID: is used to identify the test sample in the lab internally.

3.3 Internal Identification of AE

AE ID*	Description	Type	SN	Manufacture
150540-C03	Charger	/	/	/

*AE ID: is used to identify the test sample in the lab internally.

4. EUT Operational Conditions during Test

4.1 General Description of Test Procedures

A communication link is set up with a System Simulator (SS) by air link, and a call is established. The Absolute Radio Frequency Channel Number (ARFCN) is allocated to 4132, 4183 and 4233 in the case of WCDMA Band V, allocated to 9262, 9400 and 9538 in the case of WCDMA Band II. The EUT is commanded to operate at maximum transmitting power by CMU200.

When we test, the EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. The antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the EUT. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the EUT by at least 30 dB.

4.2 WCDMA Test Configuration

For the SAR body tests for WCDMA Band V and WCDMA Band II, a communication link is set up with a System Simulator (SS) by air link. We established the radio link with 12.2kbps RMC and the power control “all bits up” in test loop mode 1.

HSDPA:

SAR for body exposure configurations is measured according to the “Body SAR Measurements” procedures of 3G device. In addition, body SAR is also measured for HSDPA when the maximum average output of each RF channel with HSDPA active is at least 0.25 dB higher than that measured without HSDPA using 12.2kbps RMC or the highest reported SAR of 12.2kbps RMC mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is above 1.2 W/kg.

HSPA:

Body SAR is also measured for HSPA when the maximum average output of each RF channel with HSPA active is at least 0.25 dB higher than that measured without HSPA using 12.2 kbps RMC or the highest reported SAR of 12.2kbps RMC mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is above 1.2 W/kg. 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.

5. SAR Measurements System Configuration

These measurements were performed with the automated near-field scanning system DASY5 from SPEAG. The system is based on a high precision robot, which positions the probes with a positional repeatability of better than ± 0.02 mm. Special E-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit. The SAR measurements were conducted with the dosimetric probe manufactured by SPEAG, designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure described in with accuracy of better than ±10%. The spherical isotropy was evaluated and found to be better than ±0.3 dB. The phantom used was the SAM Twin Phantom and ELI4 Phantom as described in IEC 62209-1, IEEE1528 and EN 62209-1.

5.1 Measurement System Diagram

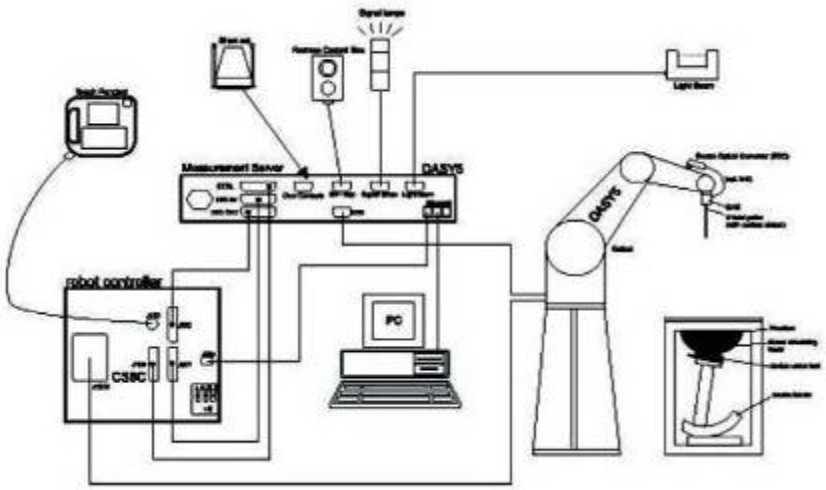


Figure 1 System Diagram

The DASY5 system consists of the following items:

1. A standard high precision 6-axis robot (TX90XL) with St¨aubli CS8c robot controllers.
2. DASY5 Measurement Server.
3. Data Acquisition Electronics.
4. 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.
5. Light Beam Unit.
6. The SAM phantom enabling testing left-hand right-hand and the ELI4 phantom for body usage.
7. The Position device for handheld EUT.
8. Tissue simulating liquid mixed according to the given recipes.
9. System validation dipoles to validate the proper functioning of the system.
10. A computer operating Windows XP.

5.2 System Components

The mobile phone under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The DASY5 software computes the results to give a SAR value in a 1g or 10 g mass.

5.2.1 TX90XL

The TX90XL robot has six axes. The six axes are controlled by the St¨aubli CS8c robot controllers. It offers the features important for our application:

• High precision (repeatability 0.02mm)
• High reliability (industrial design)
• Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
• Jerk-free straight movements (brushless synchrony motors; no stepper motors)
• Low ELF

5.2.2 DASY5 Measurement Server

The DASY5 measurement server is based on a PC/104 CPU board with a 400MHz Intel ULV Celeron, 128MB chip disk and 128MB RAM. The necessary circuits for communication with either the DAE4 electronics box as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY5 I/O board, which is directly connected to the PC/104 bus of the CPU board.

Figure 2 TX90XL

Figure 3 Measurement Server

5.2.3 Probe

For the measurements the specific dosimetric E-Field Probe ES3DV3 and EX3DV4 with following specifications is used.

Frequency: 10 MHz to 3 GHz; Linearity: ± 0.2 dB

Directivity: ± 0.3 dB in HSL (rotation around probe axis)

± 0.5 dB in tissue material (rotation normal to probe axis)

Dynamic Range: 10 μW/g to > 100 mW/g; Linearity: ± 0.2 dB

Tip Diameter: 5 mm; Distance between probe tip and sensor center: 2.5 mm

Probe linearity: ±0.3 dB

Calibration range: 835 to 2500 MHz for head & body simulating liquid

5.2.4 Device holder

The DASY device holder is designed to cope with the different positions given in the standard.

It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles. The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity =3 and loss tangent =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.

Figure 4 Probe

Figure 5 Device Holder

5.2.5 Phantom

The SAM Twin Phantom and the ELI4 Phantom are constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is in compliance with the specification set in IEEE P1528 and CENELEC EN62209-1. The SAM Twin phantom enables the dosimetric evaluation of left and right hand phone usage and the ELI4 phantom enables the dosimetric evaluation of body mounted usage. A cover prevents the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

Shell thickness: 2 mm +/-0.2 mm

Filling Volume: Approx. 25 liters

Dimensions (H x L x W): 850 x 1000 x 500 mm

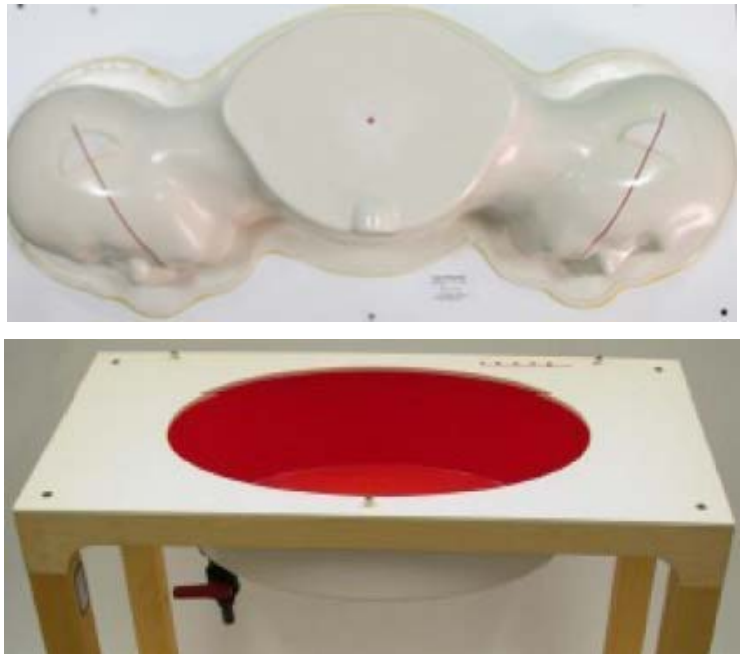


Figure 6 SAM Twin Phantom and ELI Phantom

5.2.6 Data Acquisition Electronics

DAE4 consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock. The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.
Input impedance: 200MOhm, symmetrical and floating.
Common mode rejection: > 80 dB.

5.2.7 Validation dipoles

SPEAG has a full range of dipoles corresponding to the frequencies defines by the standards: 835, 900, 1800, 1900, 2000, 2450MHz
Maximum input Power: 100W
Connectors: SMA
Dimensions: (depends on the dipole frequency)

Figure 7 DAE4

Figure 8 Validation Dipoles

5.3 Equivalent Tissues

The relative permittivity and conductivity of the tissue material should be within ±5% of the values given in the table below recommended by the FCC KDB 865664 D01 v01r03.

Target Frequency	Head		Body	
(MHz)	εr	σ (S/m)	εr	σ (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

(εr = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

6. Evaluation Procedures

6.1 Data Evaluation

The DASY5 software 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 Normi, ai0, ai1, ai2
- Conversion factor ConvFi
- Diode compression point dcpi

Device parameters: - Frequency f
- Crest factor cf

Media parameters: - Conductivity σ
- Density ρ

These parameters must be set correctly in the software. They can be found in the component documents or be imported into the software from the configuration files issued for the DASY5 components. 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:

$$V_i = U_i + U_i^2 \bullet \frac{cf}{dcpi}$$

with Vi = Compensated signal of channel i (i = x, y, z)

Ui = Input signal of channel i (i = x, y, z)

cf = Crest factor of exciting field (DASY5 parameter)

dcpi = Diode compression point (DASY5 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-field probes: $H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$

With Vi = Compensated signal of channel i (i = x, y, z)

Normi = Sensor sensitivity of channel i (i = x, y, z)

ConvF= Sensitivity enhancement in solution

aij = Sensor sensitivity factors for H-field probes

f = Carrier frequency (GHz)

Ei = Electric field strength of channel i in V/m

Hi = Magnetic field strength of channel i in A/m

The RSS value of the field components give the total field strength:

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

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

Etot = total field strength in V/m

σ= conductivity in [mho/m] or [Siemens/m]

ρ= equivalent tissue density in g/cm^3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field as a free space field.

$$P_{pwe}=E_{tot}^2/3770 \quad \text{Or} \quad P_{pwe}=H_{tot}^2\cdot 37.7$$

With P_{pwe} = Equivalent power density of a plane wave in mW/cm^2

E_{tot} = total electric field strength in V/m

H_{tot} = total magnetic field strength in A/m

6.2 SAR Evaluation Procedures

The procedure for assessing the peak spatial-average SAR value consists of the following steps:

• Power Reference Measurement

The reference and drift jobs are useful jobs for monitoring the power drift of the device under test in the batch process. Both jobs measure the field at a specified reference position, at a selectable distance from the phantom surface. The reference position can be either the selected section's grid reference point or a user point in this section. The reference job projects the selected point onto the phantom surface, orients the probe perpendicularly to the surface, and approaches the surface using the selected detection method.

• Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hot spot. The sophisticated interpolation routines implemented in DASY5 software can find the maximum locations even in relatively coarse grids. The scan area is defined by an editable grid. This grid is anchored at the grid reference point of the selected section in the phantom. When the area scan's property sheet is brought-up, grid was at to 15 mm by 15 mm and can be edited by a user.

• **Zoom Scan**

Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default zoom scan measures 7 x 7 x 7 points within a cube whose base faces are centered around the maximum found in a preceding area scan job within the same procedure. If the preceding Area Scan job indicates more then one maximum, the number of Zoom Scans has to be enlarged accordingly (The default number inserted is 1).

• **Power Drift Measurement**

The drift job measures the field at the same location as the most recent reference job within the same procedure, and with the same settings. The drift measurement gives the field difference in dB from the reading conducted within the last reference measurement. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under test within a batch process. In the properties of the Drift job, the user can specify a limit for the drift and have DASY5 software stop the measurements if this limit is exceeded.

6.3 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the IEC62209-1 standard. It can be conducted for 1 g and 10 g. The DASY5 system allows evaluations that combine measured data and robot positions, such as:

maximum search
extrapolation
boundary correction

Peak search for averaged SAR

During a maximum search, global and local maximum searches are automatically performed in 2-D after each Area Scan measurement with at least 6 measurement points. It is based on the evaluation of the local SAR gradient calculated by the Quadratic Shepard's method. The algorithm will find the global maximum and all local maxima within -2 dB of the global maxima for all SAR distributions.

Extrapolation

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. Several measurements at different distances are necessary for the extrapolation.
Extrapolation routines require at least 10 measurement points in 3-D space. They are used in the Cube Scan to obtain SAR values between the lowest measurement points and the inner phantom surface. The routine uses the modified Quadratic Shepard's method for extrapolation. For a grid using 7x7x7 measurement points with 5mm resolution amounting to 343 measurement points, the uncertainty of the extrapolation routines is less than 1% for 1 g and 10 g cubes.

Boundary effect

For measurements in the immediate vicinity of a phantom surface, the field coupling effects between the probe and the boundary influence the probe characteristics. Boundary effect errors of different dosimetric probe types

have been analyzed by measurements and using a numerical probe model. As expected, both methods showed an enhanced sensitivity in the immediate vicinity of the boundary. The effect strongly depends on the probe dimensions and disappears with increasing distance from the boundary. The sensitivity can be approximately given as:

$$S \approx S_o + S_b \exp(-\frac{z}{a}) \cos(\pi \frac{z}{\lambda})$$

Since the decay of the boundary effect dominates for small probes ($a<<\lambda$), the cos-term can be omitted. Factors Sb (parameter Alpha in the DASY5 software) and a (parameter Delta in the DASY5 software) are assessed during probe calibration and used for numerical compensation of the boundary effect. Several simulations and measurements have confirmed that the compensation is valid for different field and boundary configurations. This simple compensation procedure can largely reduce the probe uncertainty near boundaries. It works well as long as:

the boundary curvature is small

the probe axis is angled less than 30° to the boundary normal

the distance between probe and boundary is larger than 25% of the probe diameter

the probe is symmetric (all sensors have the same offset from the probe tip)

Since all of these requirements are fulfilled in a DASY5 system, the correction of the probe boundary effect in the vicinity of the phantom surface is performed in a fully automated manner via the measurement data extraction during post processing.

7. Conducted Output Power Measurement

The following procedures had been used to prepare the EUT for the SAR test. To setup the desire channel frequency and the maximum output power. A Radio Communication Tester CMU200 was used to program the EUT.

WCDMA Band II

Band/Time slot configuration	Frequency(MHz)	Channel	Power(dBm)
RMC（12.2kbps）	1852.4	9262	22.94
	1880.0	9400	22.86
	1907.6	9538	22.81

WCDMA Band V

Band/Time slot configuration	Frequency(MHz)	Channel	Power(dBm)
RMC（12.2kbps）	826.4	4132	23.03
	836.6	4183	23.02
	846.6	4233	22.98

8. SAR Measurement Results

8.1 Liquid Measurement Results

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectric parameters are within the tolerances of the specified target values.

Freq. [MHz]	Date	Liquid Type	Liquid Temp. [°C]	Ambient Temp. [°C]	Relative Humidity	Para.	Target Value	Measured Value	Deviation [%]	Limit [%]
835	June 11, 2015	Body	21.5	21	58%	εr	55.2	55.87	1.21	±5
						σ	0.97	0.96	-1.03	±5
1900	June 10, 2015	Body	21.5	21	58%	εr	53.3	51.05	-4.22	±5
						σ	1.52	1.57	3.29	±5

8.2 System Performance Check

System Performance Check Measurement conditions

- The measurements were performed in the flat section of the SAM twin phantom filled with head and body simulating liquid of the following parameters.
- The DASY5 system with an E-field probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the

phantom). The standard measuring distance was 15 mm (below 1 GHz) and 10 mm (above 1 GHz) from dipole center to the simulating liquid surface.

- The coarse grid with a grid spacing of 10mm was aligned with the dipole.
- Special 5x5x7 fine cube was chosen for cube integration (dx= 8 mm, dy= 8 mm, dz= 5 mm).
- Distance between probe sensors and phantom surface was set to 2.5 mm.

The depth of Liquid must above 15cm

System Performance Check Results

Freq. [MHz]	Date	Liquid Type	Liquid Temp. [°C]	Amb. Temp. [°C]	Input Power (mW)	Measured SAR_1g (W/Kg)	250mW Target SAR_1g (W/Kg)	Dev. [%]	Limit [%]
835	June 11, 2015	Body	21.5	21	250	2.46	2.52	-2.38	±10
1900	June 10, 2015	Body	21.5	21	250	10.5	10.3	1.94	±10

8.3 Measurement Results

Band	Test configuration		Mode	Ch#.	Freq. [MHz]	Power (dBm)		1g SAR (W/Kg)		Power Drift (dB)
						Tune-up limit	Measured	Measured	Scaled	
WCDMA Band II	Body	Back	RMC 12.2 kbps	9538	1907.6	23	22.81	1.34	1.400	0.08
	Body	Back	RMC 12.2 kbps	9538	1907.6	23	22.81	1.34	**1.400**	0.05
	Body	Back	RMC 12.2 kbps	9400	1880	23	22.86	1.16	1.198	0.14
	Body	Back	RMC 12.2 kbps	9262	1852.4	23	22.94	1.33	1.349	0.03
	Body	Front	RMC 12.2 kbps	9538	1907.6	23	22.81	0.693	0.724	0.10
	Body	Front	RMC 12.2 kbps	9400	1880	23	22.86	0.786	0.812	0.06
	Body	Front	RMC 12.2 kbps	9262	1852.4	23	22.94	0.786	0.797	0.06
	Body	Left	RMC 12.2 kbps	9538	1907.6	23	22.81	0.537	0.561	0.14
	Body	Left	RMC 12.2 kbps	9400	1880	23	22.86	0.796	0.822	0.08
	Body	Left	RMC 12.2 kbps	9262	1852.4	23	22.94	0.748	0.758	0.01
	Body	Right	RMC 12.2 kbps	9262	1852.4	23	22.86	0.567	0.586	0.07
	Body	Bottom	RMC 12.2 kbps	9262	1852.4	23	22.86	0.194	0.200	0.15
	Body	Top	RMC 12.2 kbps	9262	1852.4	23	22.86	0.487	0.503	0.01
WCDMA Band V	Body	Back	RMC 12.2 kbps	4132	826.4	24	23.09	0.440	**0.543**	-0.13
	Body	Front	RMC 12.2 kbps	4132	826.4	24	23.09	0.374	0.462	-0.02
	Body	Left	RMC 12.2 kbps	4132	826.4	24	23.09	0.309	0.381	0.05

Band	Test configuration		Mode	Ch#.	Freq. [MHz]	Power (dBm)		1g SAR (W/Kg)		Power Drift (dB)
						Tune-up limit	Measured	Measured	Scaled	
	Body	Right	RMC 12.2 kbps	4132	826.4	24	23.09	0.349	0.431	0.00
	Body	Bottom	RMC 12.2 kbps	4132	826.4	24	23.09	0.033	0.041	-0.03
	Body	Top	RMC 12.2 kbps	4132	826.4	24	23.09	0.139	0.172	-0.04

Note:

1) The body SAR was tested with separation distance 10mm.

2) Blue entries represent repeated test.

Measurement variability consideration

According to KDB 865664 D01v01r03 section 2.8.1, repeated measurements are required following the procedures as below:

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) 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 ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Band	Test configuration		Mode	Ch#.	Freq. (MHz)	Measured SAR (W/Kg)				
						Original	1st Repeated		2nd Repeated	
							Value	Ratio	Value	Ratio
WCDMA Band II	Body	Back	RMC 12.2 kbps	9538	1907.6	1.34	1.34	1.00	NA	NA

9. Equipment List & Calibration Status

Name of Equipment	Manufacturer	Type/Model	Serial Number	Cal. Date	Cal.Due Date
PC	HP	d7900eC	CZC9312JJ4	N/A	N/A
E-field Probe	SPEAG	ES3DV3	SN 3221	2015-1-31	2016-1-30
DAE	SPEAG	DAE4-SD 000 D04 BJ	SN 893	2015-1-23	2016-1-22
Device Holder	Stäubli	N/A	N/A	N/A	N/A
SAM Phantom	SPEAG	SAM Twin Phantom	TP-1545/TP-1548	N/A	N/A
6 Axis Robot	Stäubli	Robot TX90XL	F09/5B9UA1/A/01	N/A	N/A
Dipole 835MHz	SPEAG	D835V2	4d150	2013-3-18	2016-3-17
Dipole 1900MHz	SPEAG	D1900V2	5d070	2012-10-1	2015-9-30
Wireless Communication Test Set	Anritsu	MT8820C	6201060976	2014-8-13	2015-8-12
Wireless Communication Test Set	R&S	CMU200	120574	2014-8-13	2015-8-12
Signal Generator	Agilent	5183A	MY49060563	2014-8-13	2015-8-12
Power Meter	Agilent	E4419B	MY45104719	2014-8-13	2015-8-12
Power Sensor	Agilent	N8481H	MY48100148	2014-8-13	2015-8-12
Directional couplers	Agilent	778D	MY48220223	N/A	N/A
Power amplifier	mini-circuits	ZHL-42W	QA0940002	N/A	N/A
Power supply	Topward	3303d	796708	2014-8-13	2015-8-12
Network Analyzer	Agilent	E5071C	MY46108263	2014-8-13	2015-8-12
Liquid Calibration Kit	Agilent	85070E	N/A	N/A	N/A

Note: Per KDB 450824 Dipole SAR Validation Verification, GCCT Lab has adopted 3 years calibration intervals. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss is within 20% of calibrated measurement;
4. Impedance is within 5Ω of calibrated measurement.

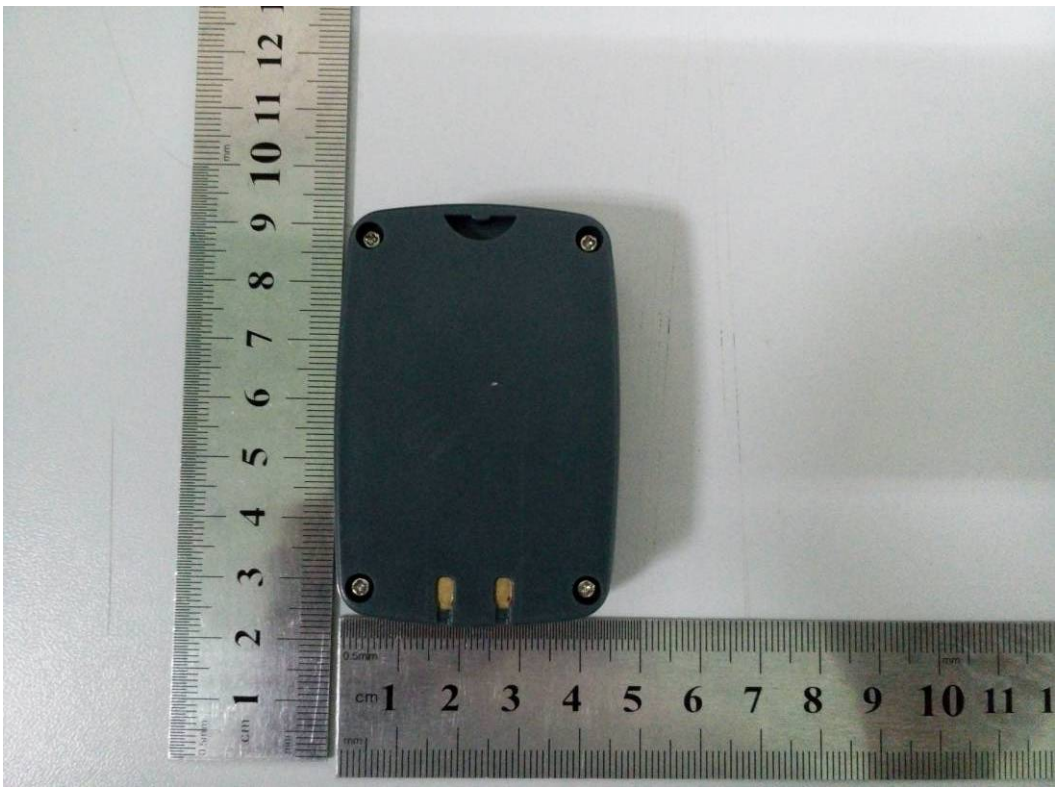
10. Measurement Uncertainty

Uncertainty Component	Sec.	Tol (+-%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Vi
Measurement System									
Probe calibration	E.2.1	6.55	N	1.0	1.0	1.0	6.55	6.55	∞
Axial Isotropy	E.2.2	0.5	R	$\sqrt{3}$	1.0	1.0	0.29	0.29	∞
Hemispherical Isotropy	E.2.2	2.6	R	$\sqrt{3}$	1.0	1.0	1.5	1.5	∞
Boundary effect	E.2.3	0.8	R	$\sqrt{3}$	1.0	1.0	0.46	0.46	∞
Linearity	E.2.4	0.6	R	$\sqrt{3}$	1.0	1.0	0.35	0.35	∞
System detection limits	E.2.5	0.25	R	$\sqrt{3}$	1.0	1.0	0.14	0.14	∞
Readout Electronics	E.2.6	0.35	N	1	1.0	1.0	0.35	0.35	∞
Reponse Time	E.2.7	0	R	$\sqrt{3}$	1.0	1.0	0	0	∞
Integration Time	E.2.8	2.6	R	$\sqrt{3}$	1.0	1.0	1.5	1.5	∞
RF ambient Conditions-Noise	E.6.1	0	R	$\sqrt{3}$	1.0	1.0	0	0	∞
RF ambient Conditions-Reflections	E.6.1	3.0	R	$\sqrt{3}$	1.0	1.0	1.7	1.7	∞
Probe positioner Mechanical Tolerance	E.6.2	1.5	R	$\sqrt{3}$	1.0	1.0	0.87	0.87	∞
Probe positioning with respect to Phantom Shell	E.6.3	2.9	R	$\sqrt{3}$	1.0	1.0	1.67	1.67	∞
Extrapolation, interpolation and integration Algoritms for Max. SAR	E.5	1.0	R	$\sqrt{3}$	1.0	1.0	0.58	0.58	∞
Test sample Related									
Test Sample Positioning	E.4.2	4.6	N	1.0	1.0	1.0	4.6	4.6	N-1
Device Holder Uncertainty	E.4.1	5.2	N	1.0	1.0	1.0	5.2	5.2	N-1
Output Power Variation - SAR drift measurement	6.6.2	5	R	$\sqrt{3}$	1.0	1.0	2.89	2.89	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (Shape and thickness tolerances)	E.3.1	4.0	R	$\sqrt{3}$	1.0	1.0	2.31	2.31	∞
Liquid conductivity - deviation from target value	E.3.2	5.0	R	$\sqrt{3}$	0.64	0.43	1.85	1.24	∞
Liquid conductivity - measurement uncertainty	E.3.3	2.5	N	1.0	0.64	0.43	1.60	1.08	M
Liquid permitivity - deviation from target value	E.3.2	5.0	R	$\sqrt{3}$	0.6	0.49	1.73	1.42	∞
Liquid permitivity - measurement uncertainty	E.3.3	2.5	N	1.0	0.6	0.49	1.5	1.23	M
Combined Standard Uncertainty			RSS				11.3	11.0	
Expanded Uncertainty (95% Confidence interval)			K				23	22	

ANNEX A: EUT Photos and Test Positions

EUT Photos:

Mobile Phone

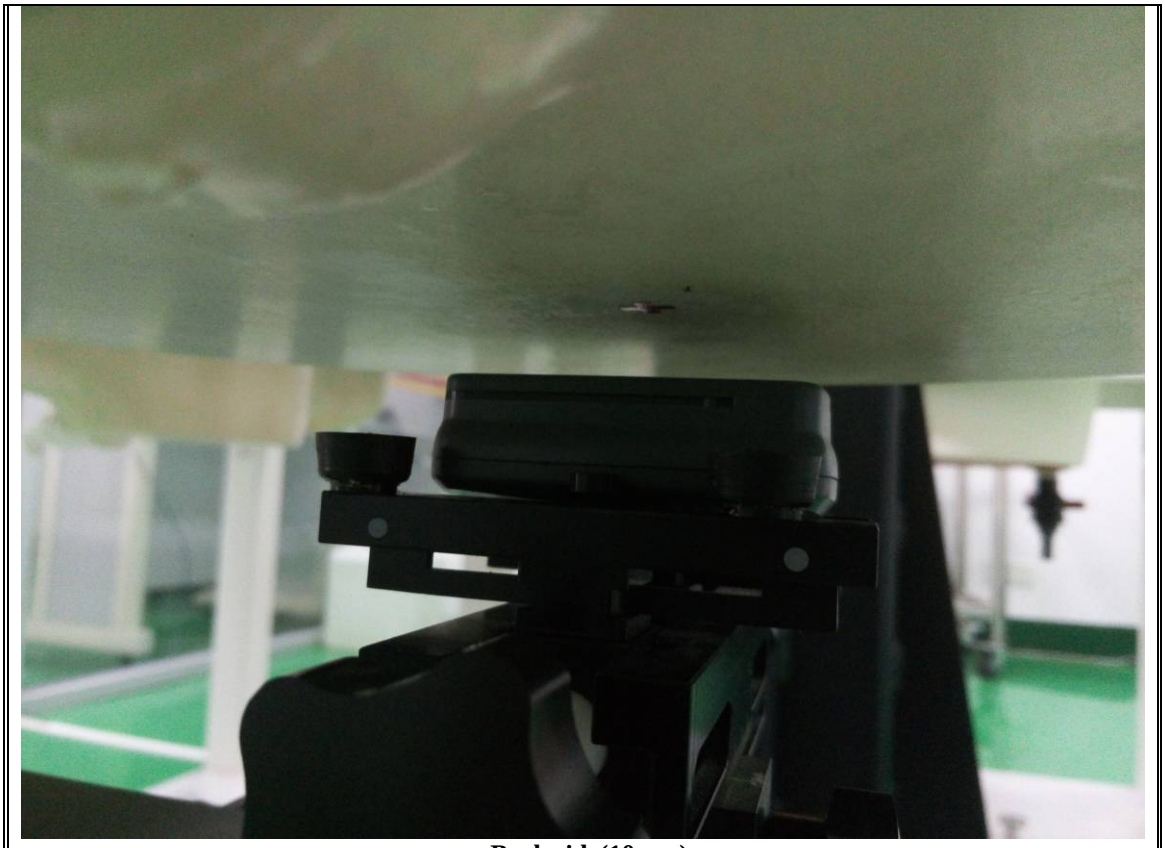


Mobile Phone

Mobile Phone

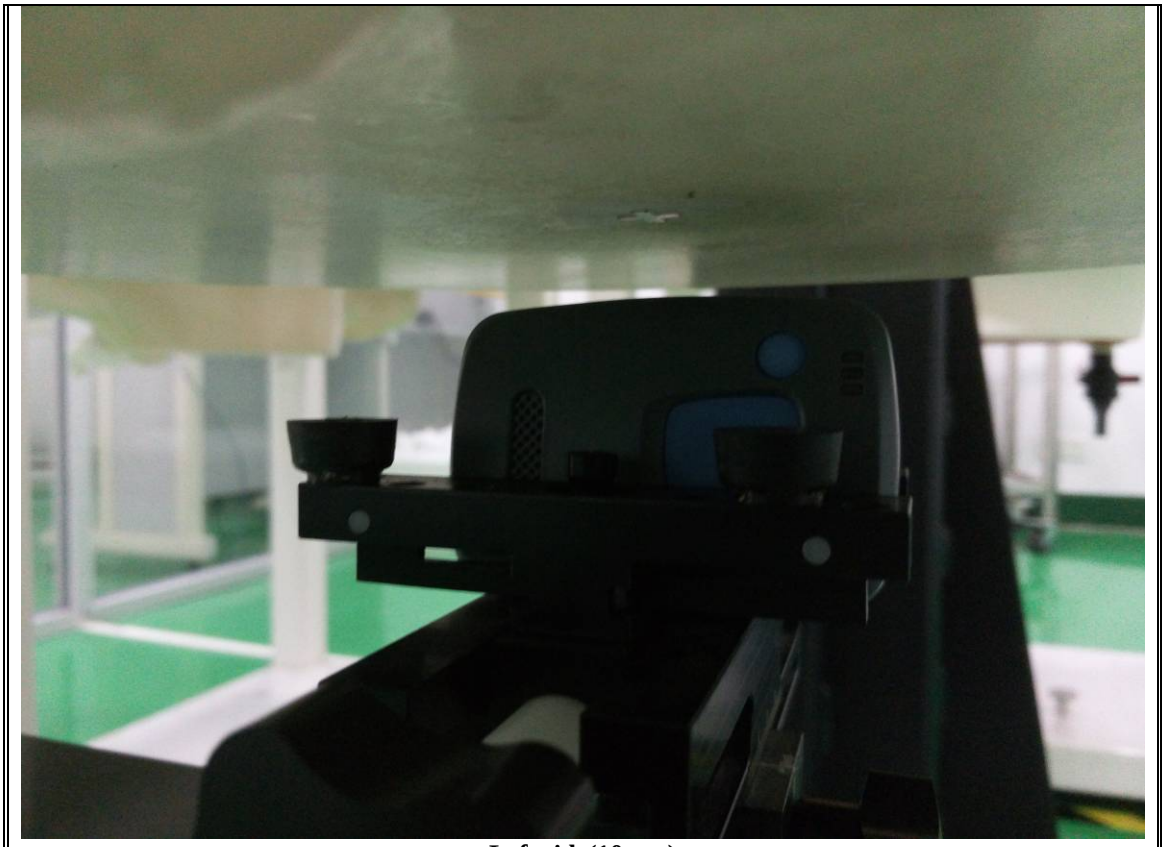
Mobile Phone

Test Positions:

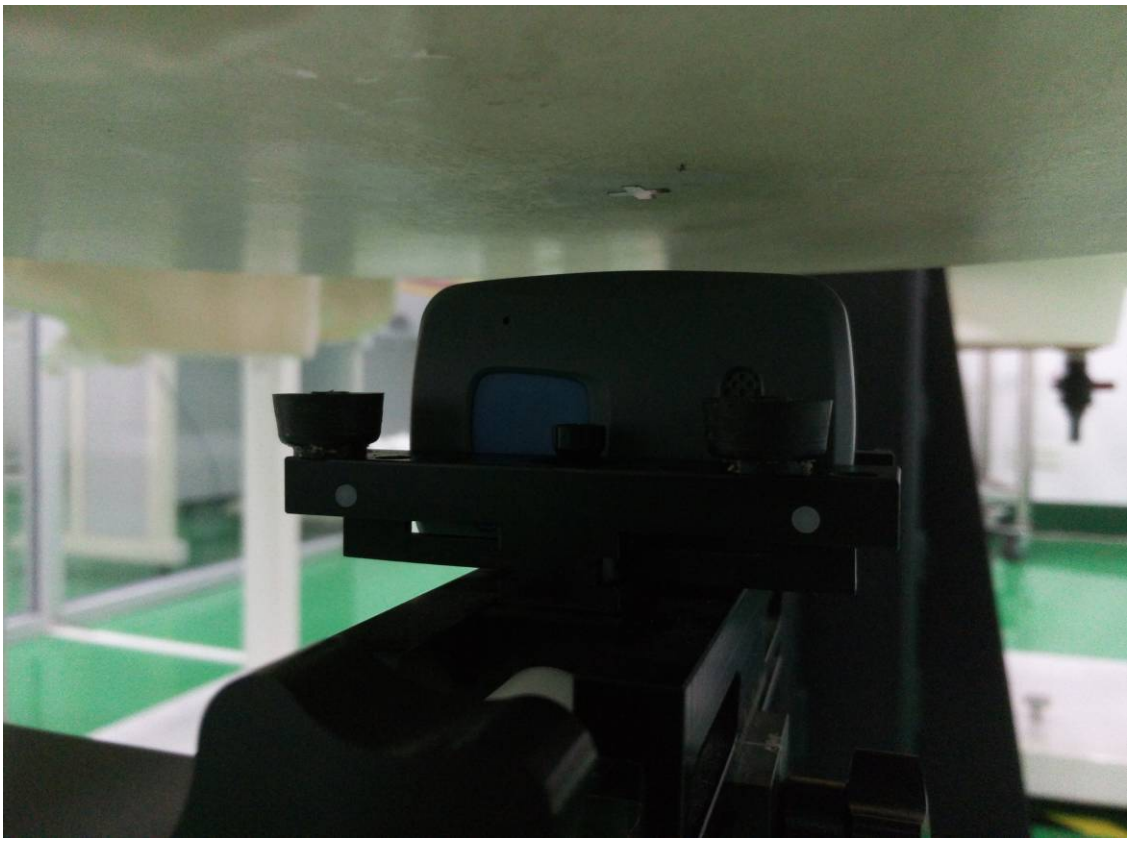


Back side(10mm)

Front side(10mm)



Left side(10mm)



Right side(10mm)

Bottom side(10mm)

Top side(10mm)

ANNEX B: System Performance Check Plots

Test Laboratory: GCCT Test Date: June. 11, 2015

System 835 MHz dipole (Head)

DUT: Dipole 835 MHz D835V2; Type: D835V2

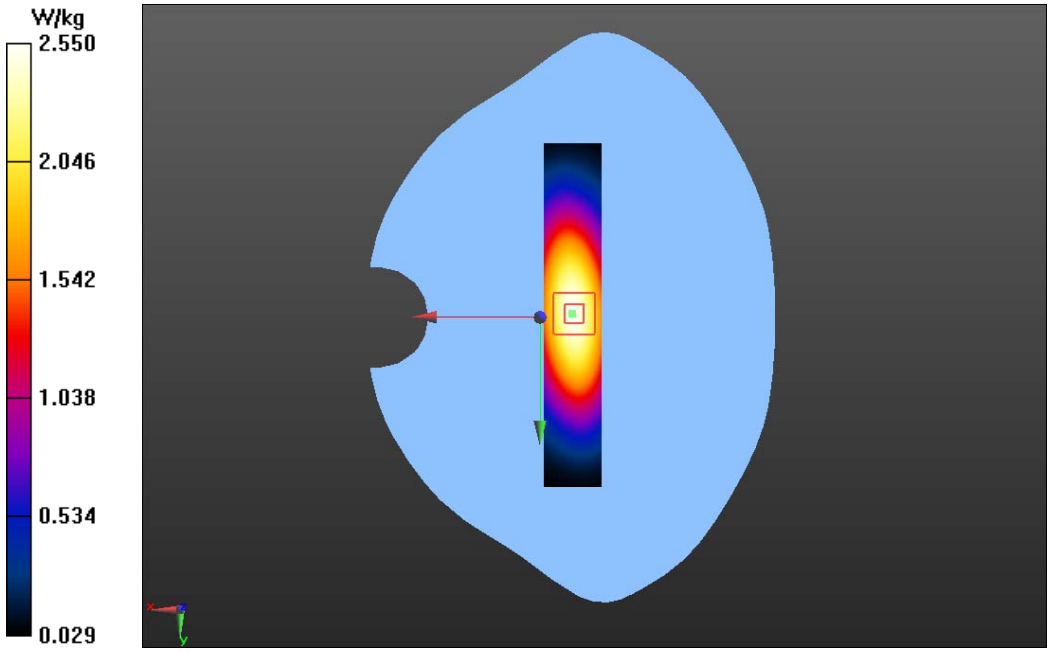
Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;
Communication System PAR: 0 dB
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(6.25, 6.25, 6.25); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

835Head/System/Area Scan (31x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 54.685 V/m; Power Drift = -0.10 dB
Maximum value of SAR (interpolated) = 2.55 W/kg

835Head/System/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 54.685 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 3.500 mW/g
SAR(1 g) = 2.37 mW/g; SAR(10 g) = 1.56 mW/g
Maximum value of SAR (measured) = 2.56 W/kg



Test Laboratory: GCCT Test Date: June. 11, 2015

System 835 MHz dipole (Body)

DUT: Dipole 835 MHz D835V2; Type: D835V2

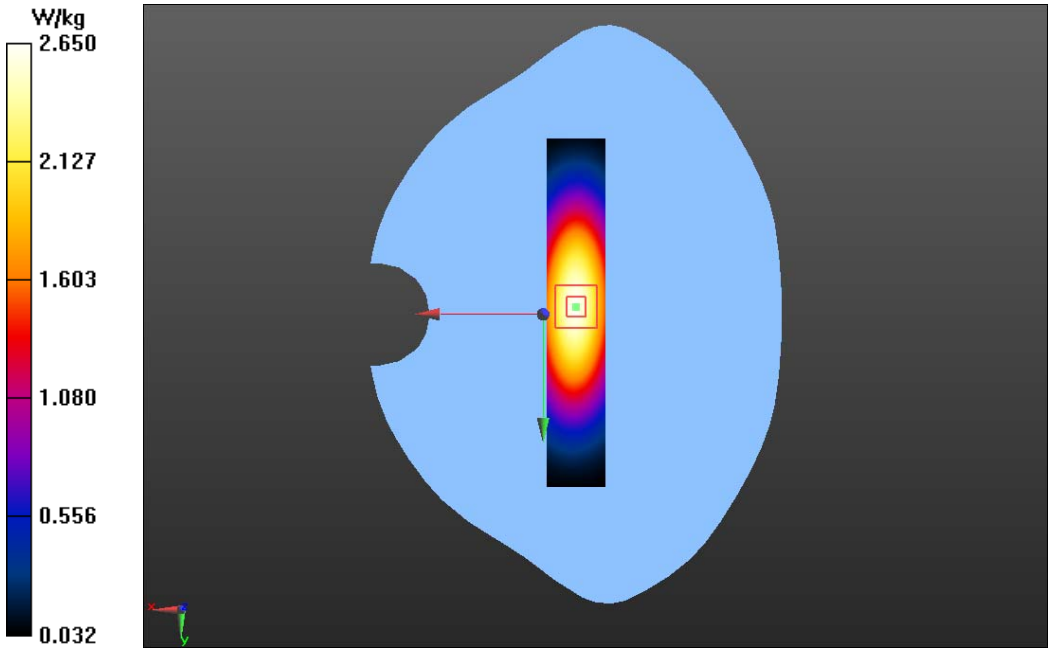
Communication System: CW; Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz;
Communication System PAR: 0 dB
Medium parameters used: f = 835 MHz; σ = 0.96 mho/m; ε_r = 55.87; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(6.29, 6.29, 6.29); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_2with CRP v4.0; Type: QD000P40CC; Serial: TP:1548
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

835Body/System/Area Scan (31x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 53.231 V/m; Power Drift = 0.01 dB
Maximum value of SAR (interpolated) = 2.65 W/kg

835Body/System/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 53.231 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.564 mW/g
SAR(1 g) = 2.46 mW/g; SAR(10 g) = 1.63 mW/g
Maximum value of SAR (measured) = 2.67 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

System 1900 MHz dipole (head)

DUT: Dipole 1900 MHz D1900V2; Type: D1900V2

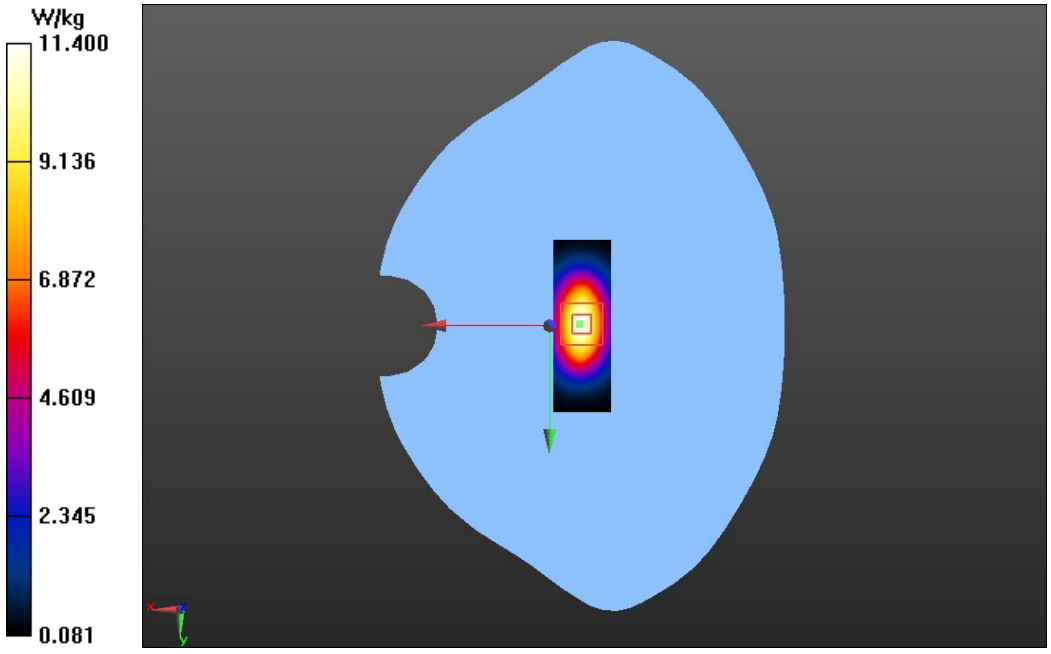
Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz;
Communication System PAR: 0 dB
Medium parameters used: f = 1900 MHz; σ = 1.422 mho/m; ε_r = 40.328; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(5.2, 5.2, 5.2); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

1900Head/System 20140621/Area Scan (31x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 92.733 V/m; Power Drift = -0.41 dB
Maximum value of SAR (interpolated) = 11.4 W/kg

1900Head/System 20140621/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 92.733 V/m; Power Drift = -0.41 dB
Peak SAR (extrapolated) = 18.316 mW/g
SAR(1 g) = 9.83 mW/g; SAR(10 g) = 5.11 mW/g
Maximum value of SAR (measured) = 11.0 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

System 1900 MHz dipole (Body)

DUT: Dipole 1900 MHz D1900V2; Type: D1900V2

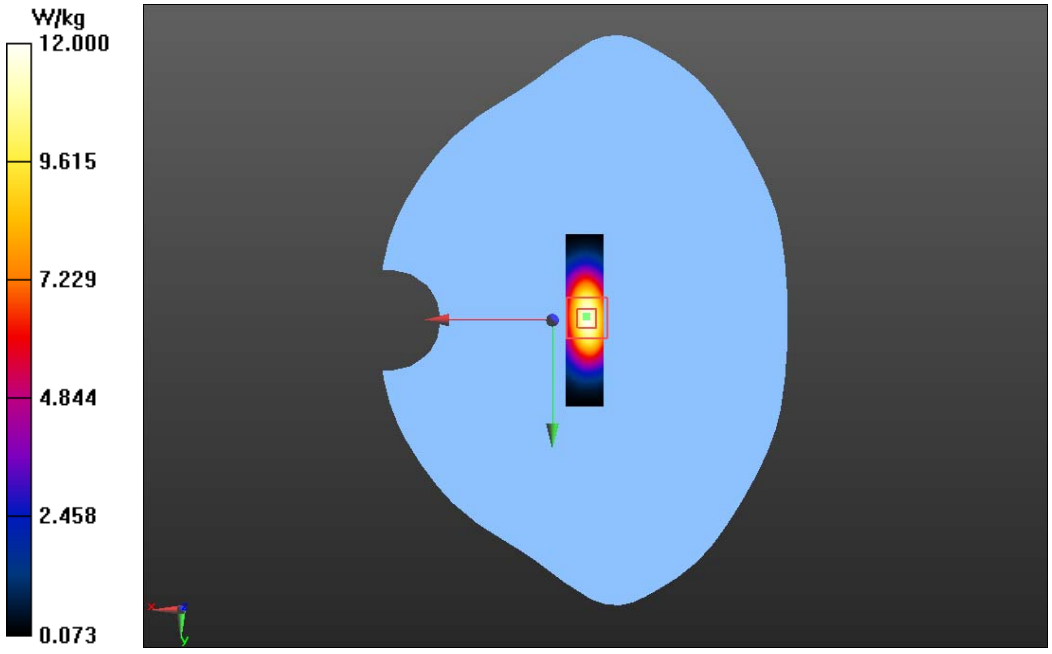
Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz;
Communication System PAR: 0 dB
Medium parameters used: f = 1900 MHz; σ = 1.57 mho/m; ε_r = 51.05; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

1900Body/System/Area Scan (21x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 88.532 V/m; Power Drift = -0.10 dB
Maximum value of SAR (interpolated) = 12.0 W/kg

1900Body/System/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 88.532 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 19.107 mW/g
SAR(1 g) = 10.5 mW/g; SAR(10 g) = 5.51 mW/g
Maximum value of SAR (measured) = 11.8 W/kg



ANNEX C: SAR Test Plots

Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II Body/Back side-High

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

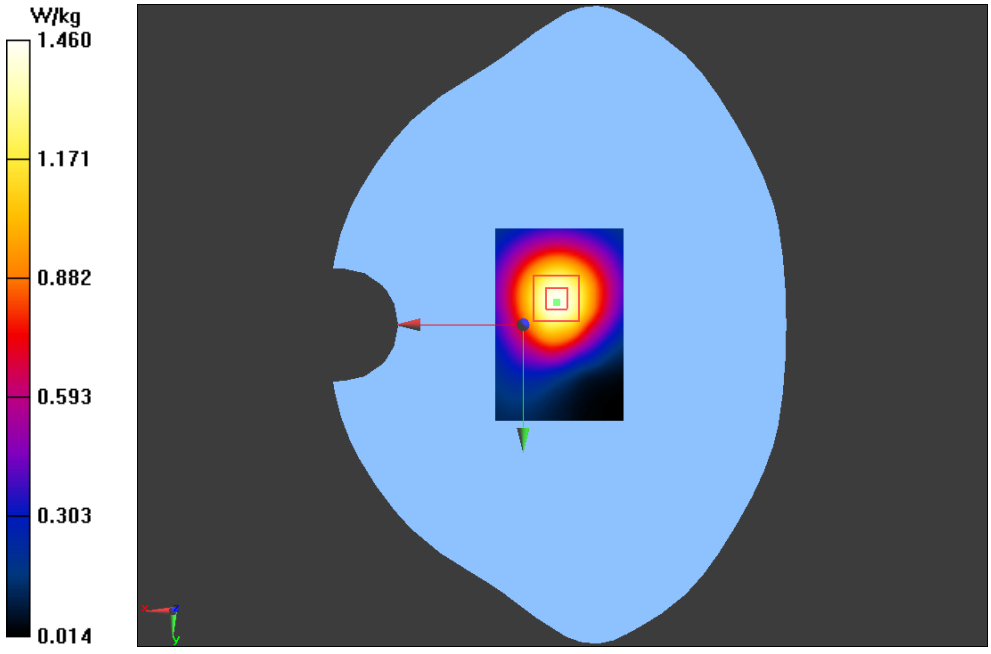
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1907.6 MHz;
Communication System PAR: 0 dB
Medium parameters used: f = 1908 MHz; σ = 1.577 mho/m; ε_r = 52.361; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

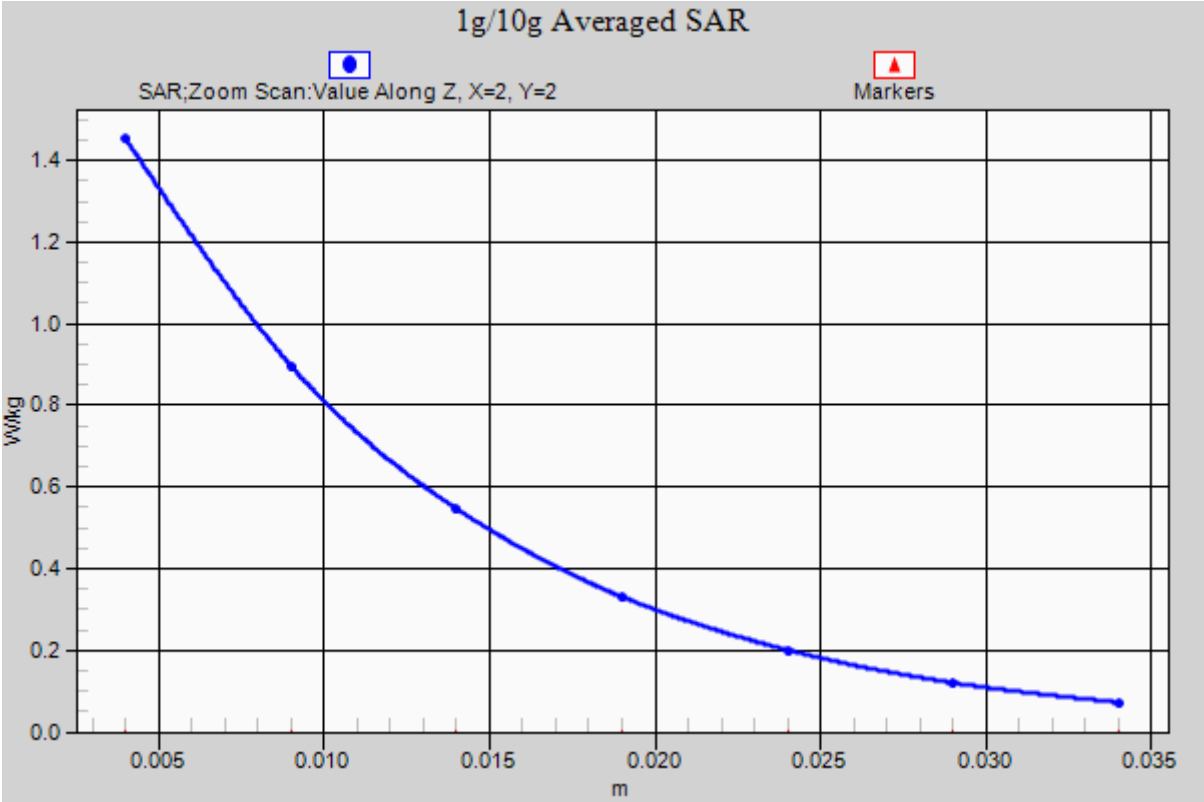
- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II Body/Back side-High/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 27.678 V/m; Power Drift = 0.08 dB
Maximum value of SAR (interpolated) = 1.46 W/kg

WCDMA Band II Body/Back side-High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.678 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 2.113 mW/g
SAR(1 g) = 1.34 mW/g; SAR(10 g) = 0.804 mW/g
Maximum value of SAR (measured) = 1.45 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015



WCDMA Band II Body/Back side-High- axis scan axis

Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II Body/Back side-High

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

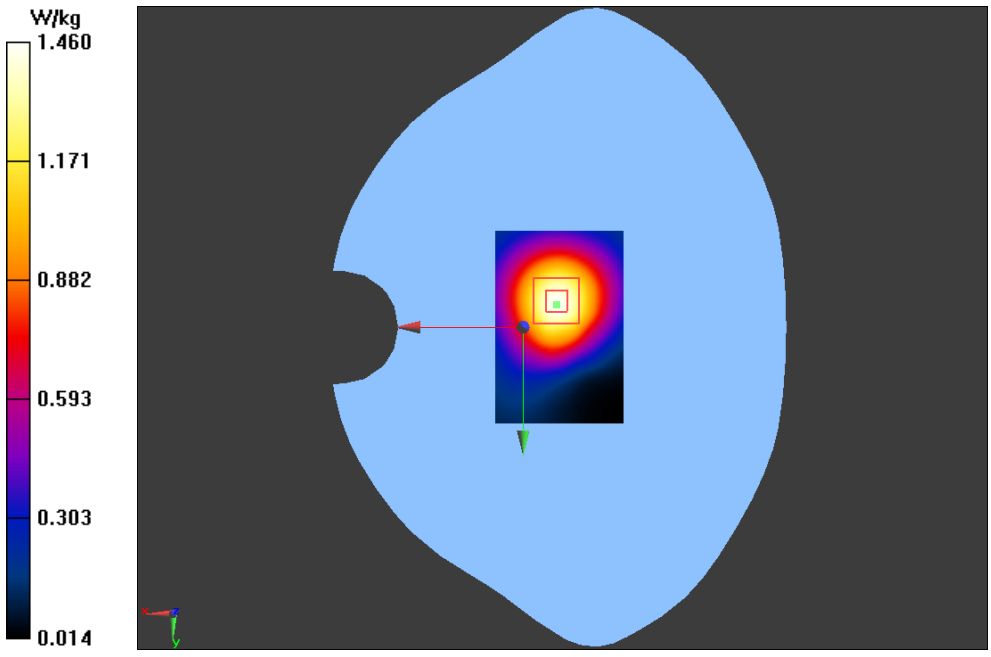
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1907.6 MHz;
Communication System PAR: 0 dB
Medium parameters used: f = 1908 MHz; σ = 1.577 mho/m; ε_r = 52.361; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II Body/Back side-High 2/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 27.469 V/m; Power Drift = 0.05 dB
Maximum value of SAR (interpolated) = 1.46 W/kg

WCDMA Band II Body/Back side-High 2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.469 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 2.113 mW/g
SAR(1 g) = 1.34 mW/g; SAR(10 g) = 0.803 mW/g
Maximum value of SAR (measured) = 1.45 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II Body/Back side-Mid

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

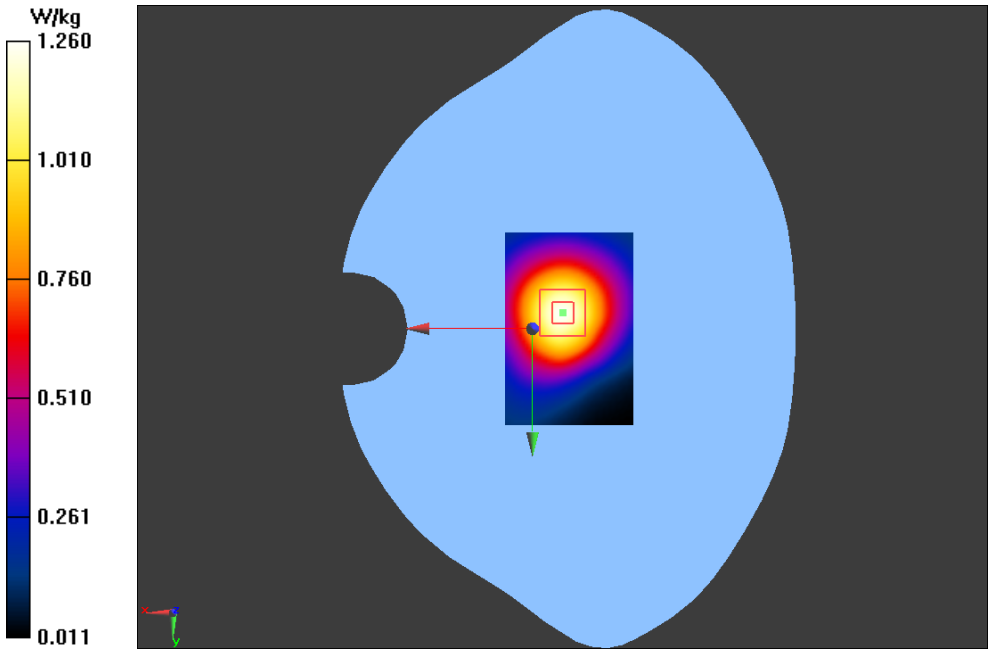
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1880 MHz;
Communication System PAR: 0 dB
Medium parameters used: f = 1880 MHz; σ = 1.552 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II Body/Back side-Mid/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 27.239 V/m; Power Drift = 0.14 dB
Maximum value of SAR (interpolated) = 1.26 W/kg

WCDMA Band II Body/Back side-Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.239 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 1.803 mW/g
SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.704 mW/g
Maximum value of SAR (measured) = 1.26 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II Body/Back side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

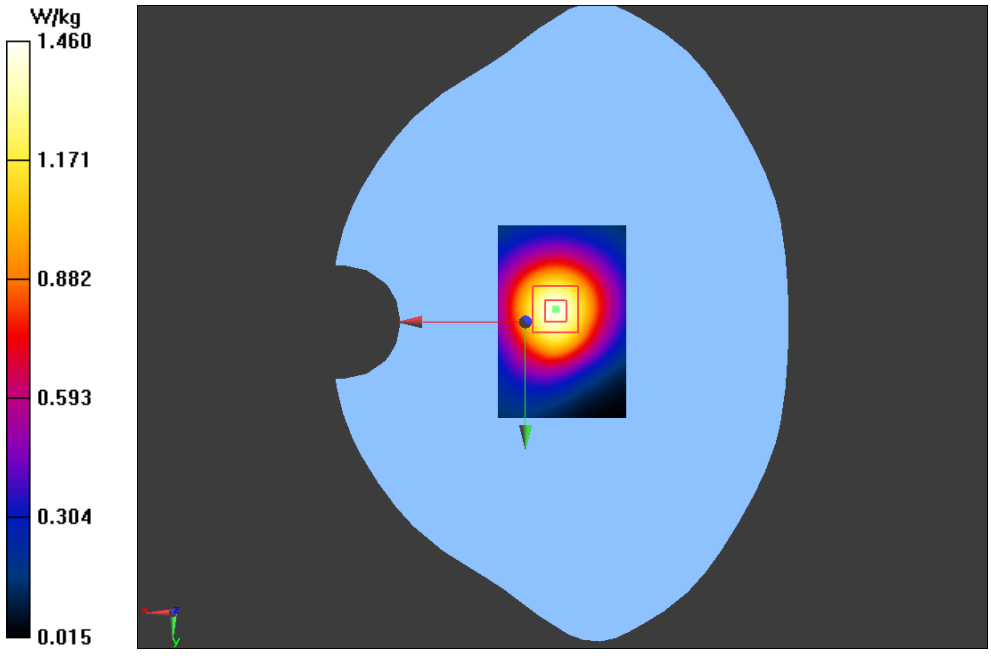
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1852.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.527 mho/m; ε_r = 52.48; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II Body/Back side-Low/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 30.309 V/m; Power Drift = 0.03 dB
Maximum value of SAR (interpolated) = 1.46 W/kg

WCDMA Band II Body/Back side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.309 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 2.046 mW/g
SAR(1 g) = 1.33 mW/g; SAR(10 g) = 0.809 mW/g
Maximum value of SAR (measured) = 1.45 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II Body/Front side-High

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

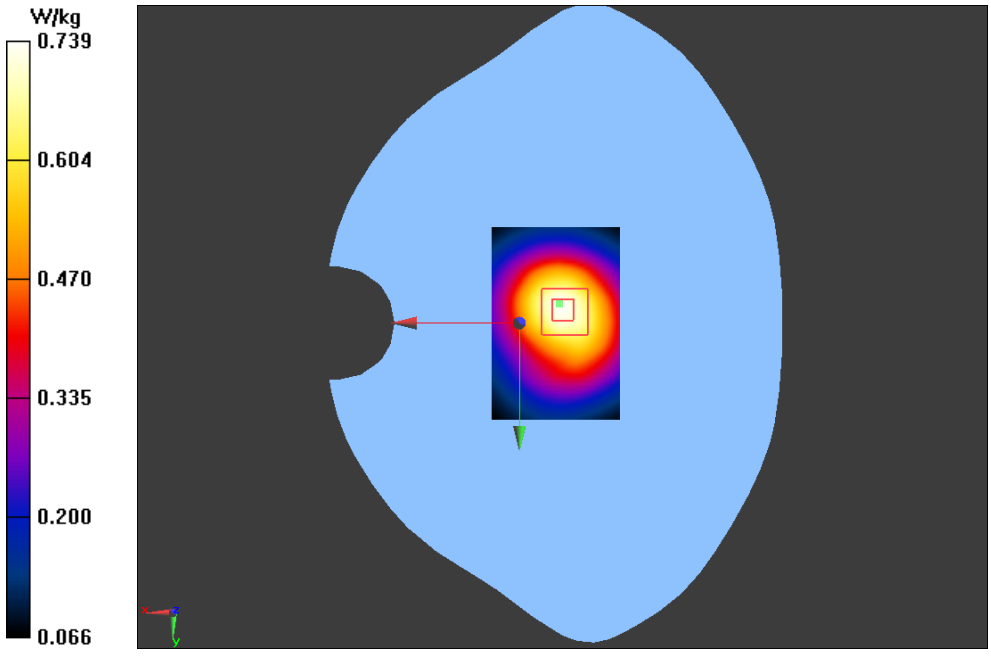
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1907.6 MHz;
Communication System PAR: 0 dB
Medium parameters used: f = 1908 MHz; σ = 1.577 mho/m; ε_r = 52.361; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II Body/Front side-High/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 21.329 V/m; Power Drift = 0.10 dB
Maximum value of SAR (interpolated) = 0.739 W/kg

WCDMA Band II Body/Front side-High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.329 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.096 mW/g
SAR(1 g) = 0.693 mW/g; SAR(10 g) = 0.423 mW/g
Maximum value of SAR (measured) = 0.742 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II Body/Front side-Mid

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

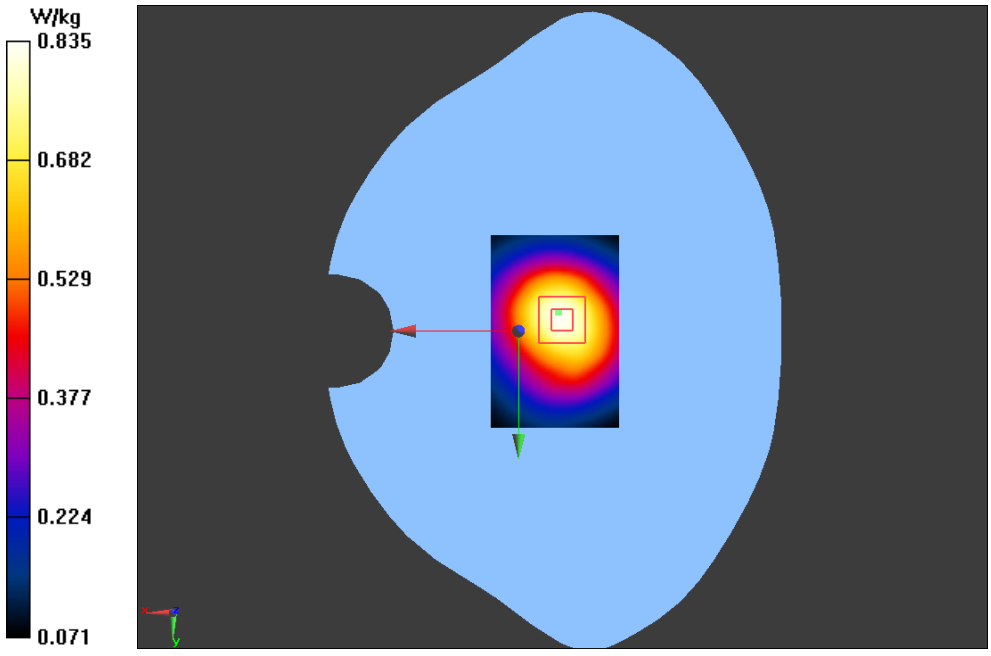
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1880 MHz;
Communication System PAR: 0 dB
Medium parameters used: f = 1880 MHz; σ = 1.552 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II Body/Front side-Mid/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 23.094 V/m; Power Drift = 0.06 dB
Maximum value of SAR (interpolated) = 0.835 W/kg

WCDMA Band II Body/Front side-Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.094 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.226 mW/g
SAR(1 g) = 0.786 mW/g; SAR(10 g) = 0.483 mW/g
Maximum value of SAR (measured) = 0.838 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II Body/Front side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

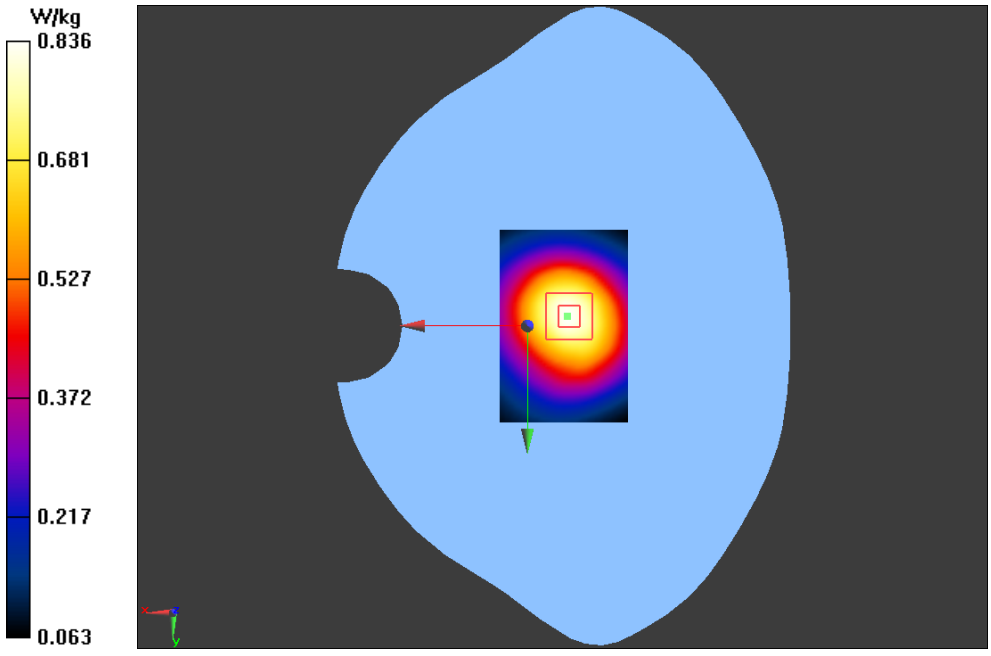
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1852.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.527 mho/m; ε_r = 52.48; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II Body/Front side-Low/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 23.401 V/m; Power Drift = 0.06 dB
Maximum value of SAR (interpolated) = 0.836 W/kg

WCDMA Band II Body/Front side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.401 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.216 mW/g
SAR(1 g) = 0.786 mW/g; SAR(10 g) = 0.487 mW/g
Maximum value of SAR (measured) = 0.847 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II-Left side-High

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

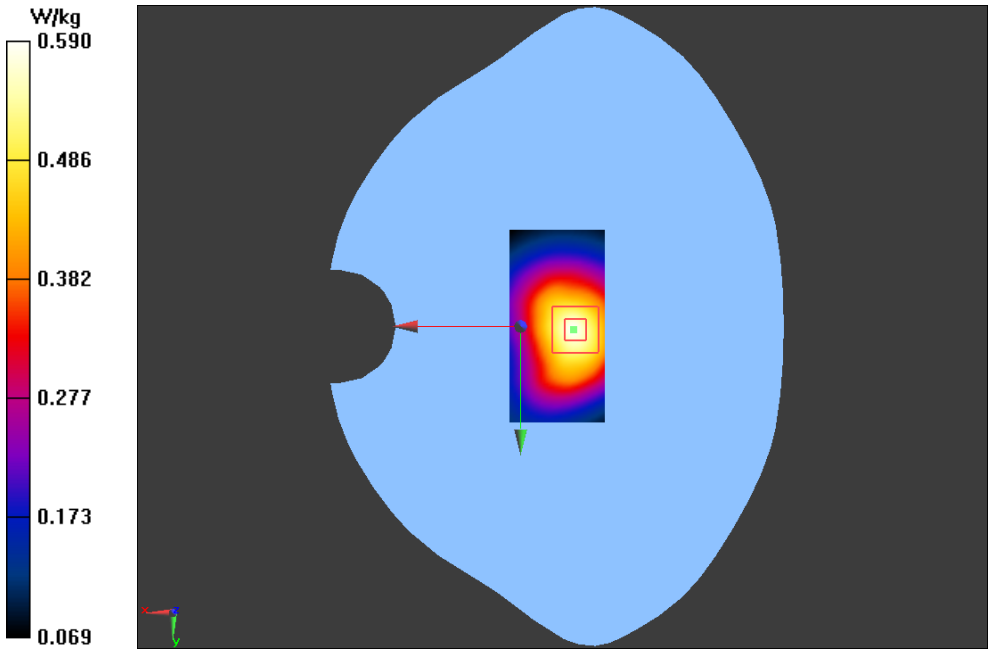
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1907.6 MHz;
Communication System PAR: 0 dB
Medium parameters used: f = 1908 MHz; σ = 1.577 mho/m; ε_r = 52.361; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II-Left side-High/Area Scan (31x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 18.161 V/m; Power Drift = 0.14 dB
Maximum value of SAR (interpolated) = 0.590 W/kg

WCDMA Band II-Left side-High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.161 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.850 mW/g
SAR(1 g) = 0.537 mW/g; SAR(10 g) = 0.327 mW/g
Maximum value of SAR (measured) = 0.584 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II-Left side-Mid

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

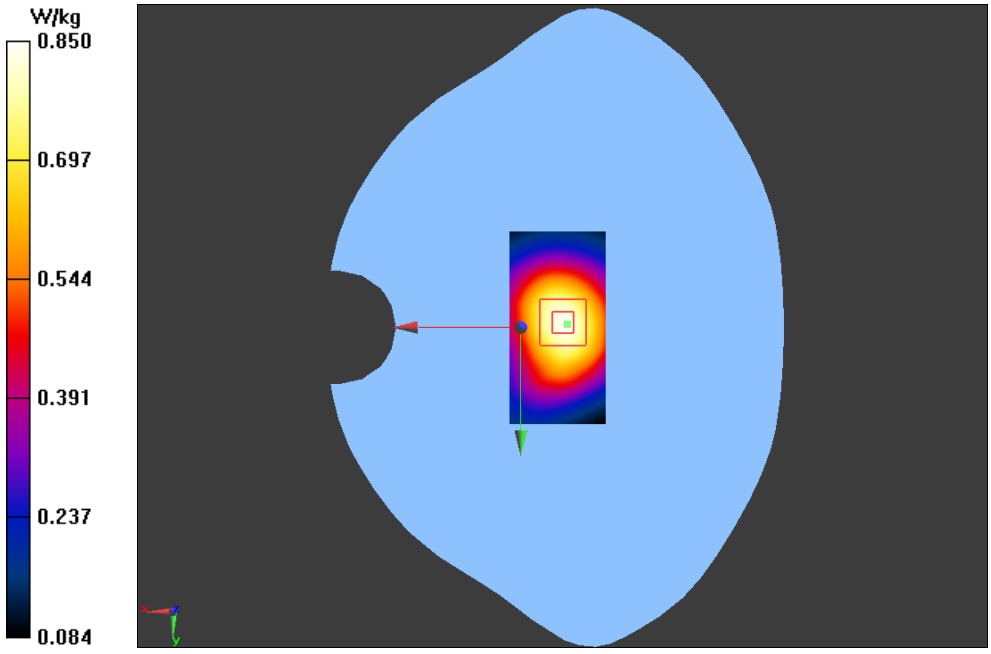
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1880 MHz;
Communication System PAR: 0 dB
Medium parameters used: f = 1880 MHz; σ = 1.552 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II-Left side-Mid/Area Scan (31x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 23.631 V/m; Power Drift = 0.08 dB
Maximum value of SAR (interpolated) = 0.850 W/kg

WCDMA Band II-Left side-Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.631 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.259 mW/g
SAR(1 g) = 0.796 mW/g; SAR(10 g) = 0.487 mW/g
Maximum value of SAR (measured) = 0.858 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II-Left side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

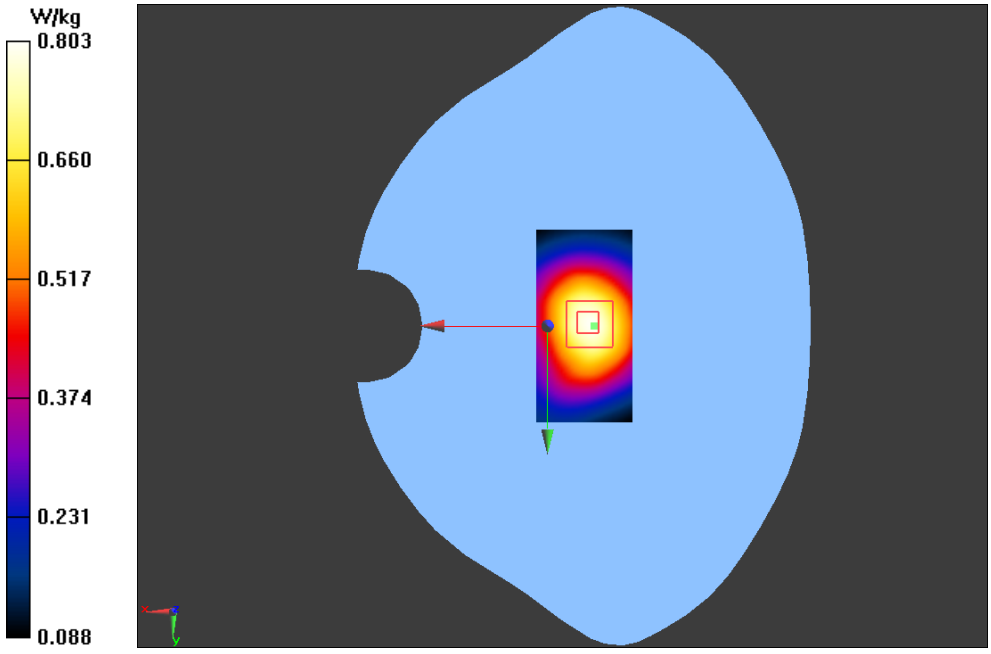
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1852.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.527 mho/m; ε_r = 52.48; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II-Left side-Low/Area Scan (31x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 23.324 V/m; Power Drift = 0.01 dB
Maximum value of SAR (interpolated) = 0.803 W/kg

WCDMA Band II-Left side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.324 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.178 mW/g
SAR(1 g) = 0.748 mW/g; SAR(10 g) = 0.458 mW/g
Maximum value of SAR (measured) = 0.804 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II-Right side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

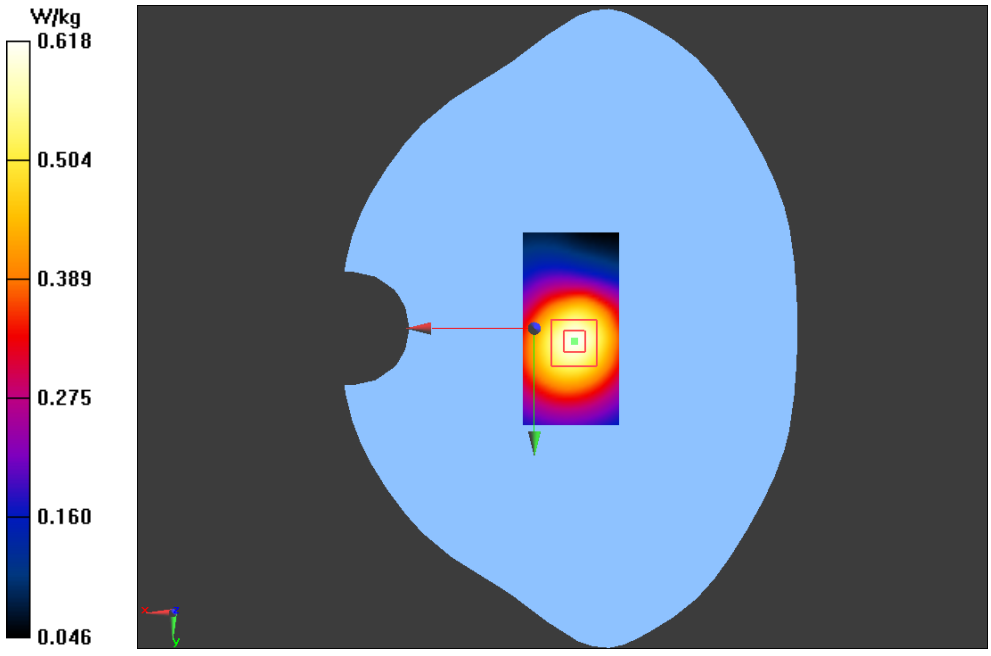
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1852.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.527 mho/m; ε_r = 52.48; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II-Right side-Low/Area Scan (31x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 19.808 V/m; Power Drift = 0.07 dB
Maximum value of SAR (interpolated) = 0.618 W/kg

WCDMA Band II-Right side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.808 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.906 mW/g
SAR(1 g) = 0.567 mW/g; SAR(10 g) = 0.347 mW/g
Maximum value of SAR (measured) = 0.614 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II-Bottom side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

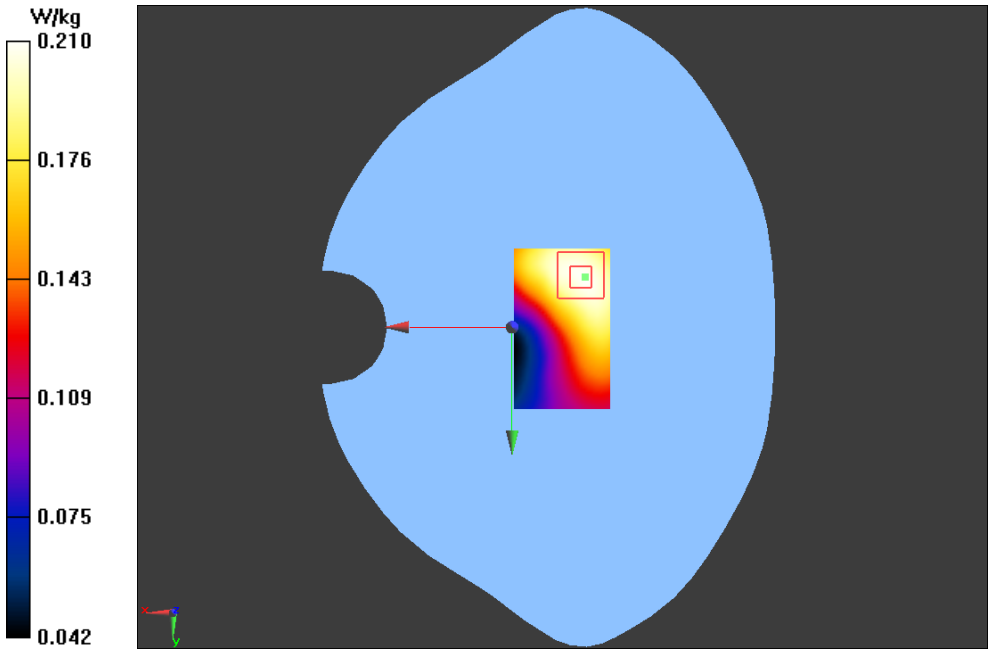
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1852.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.527 mho/m; ε_r = 52.48; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II-Bottom side-Low/Area Scan (31x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 8.606 V/m; Power Drift = 0.15 dB
Maximum value of SAR (interpolated) = 0.210 W/kg

WCDMA Band II-Bottom side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.606 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.299 mW/g
SAR(1 g) = 0.194 mW/g; SAR(10 g) = 0.125 mW/g
Maximum value of SAR (measured) = 0.207 W/kg



Test Laboratory: GCCT Test Date: June. 10, 2015

WCDMA Band II-Top side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

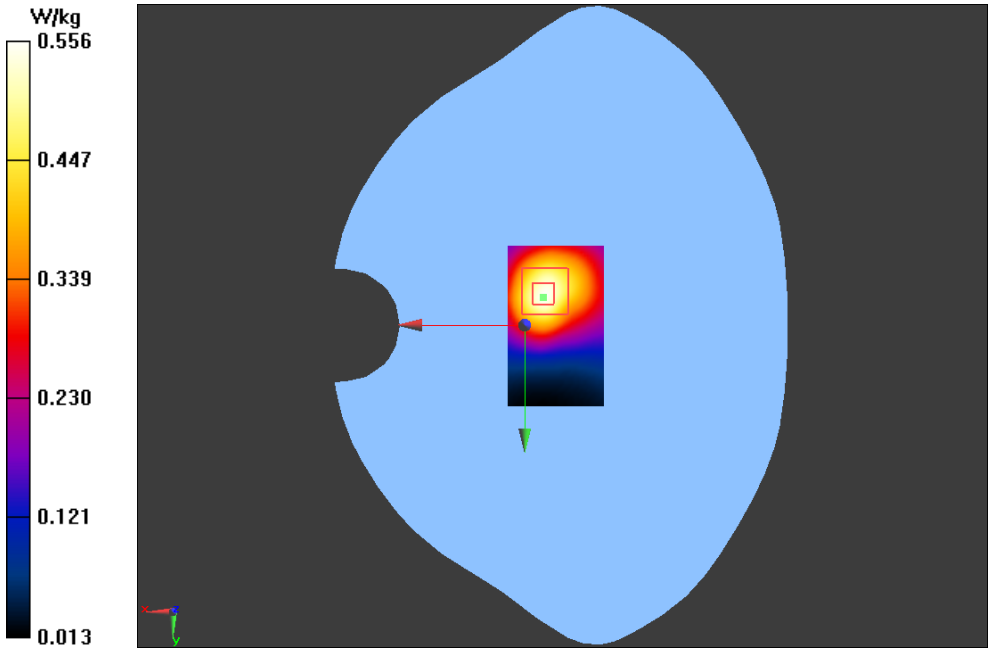
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band2; Frequency: 1852.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.527 mho/m; ε_r = 52.48; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_1 with CRP v4.0; Type: QD000P40CC; Serial: TP:1586
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band II-Top side-Low/Area Scan (31x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 14.010 V/m; Power Drift = 0.01 dB
Maximum value of SAR (interpolated) = 0.556 W/kg

WCDMA Band II-Top side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.010 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.824 mW/g
SAR(1 g) = 0.487 mW/g; SAR(10 g) = 0.281 mW/g
Maximum value of SAR (measured) = 0.532 W/kg



Test Laboratory: GCCT Test Date: June. 11, 2015

WCDMA Band V Body/Back side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

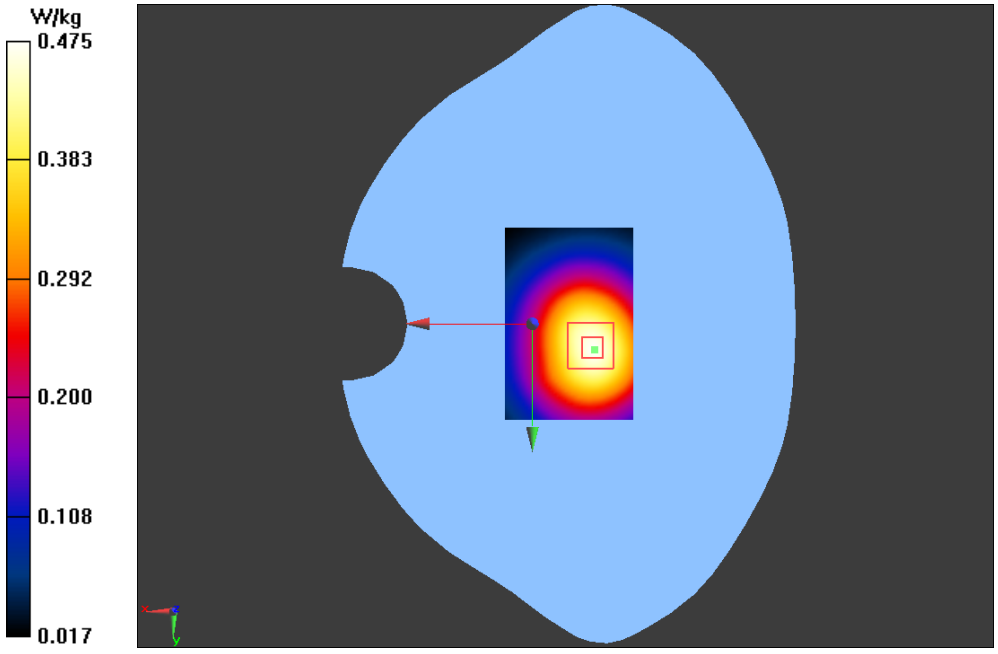
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band 5; Frequency: 826.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.929 mho/m; ε_r = 53.813; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

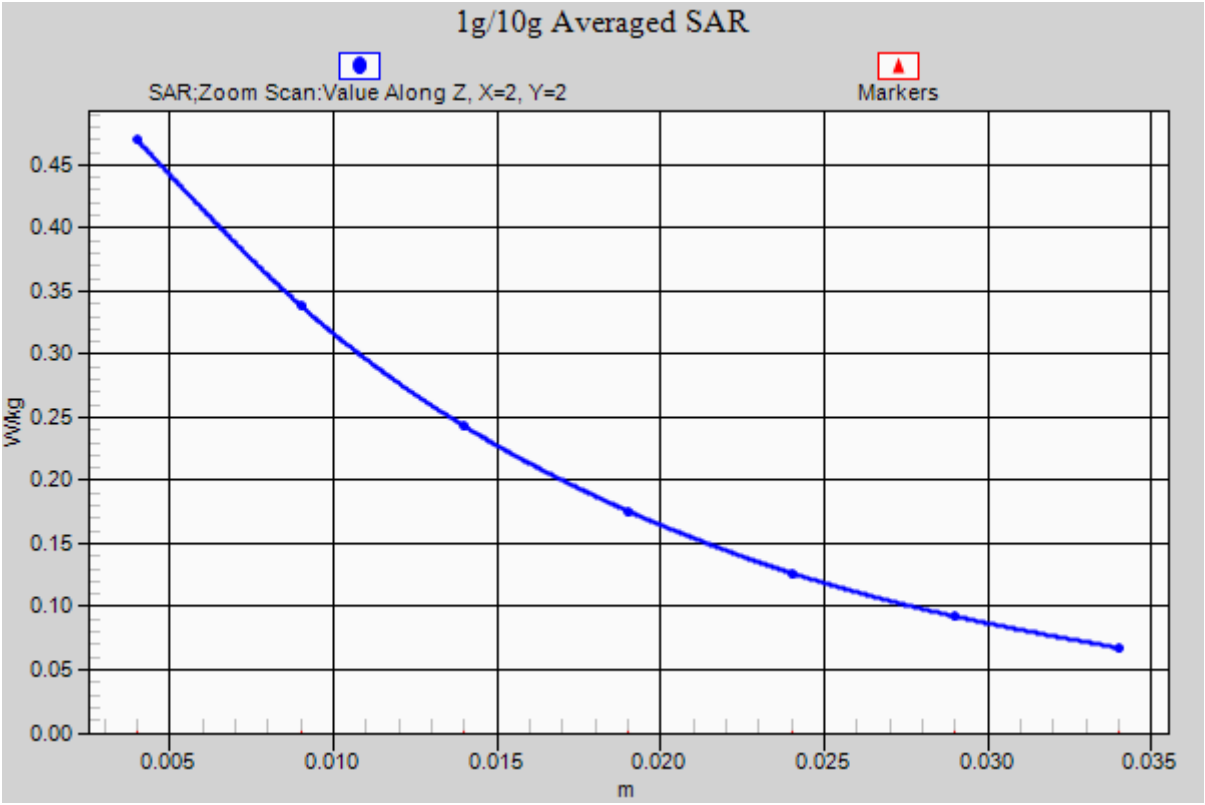
- Probe: ES3DV3 - SN3221; ConvF(6.29, 6.29, 6.29); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_2with CRP v4.0; Type: QD000P40CC; Serial: TP:1548
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band V Body/Back side-Low/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 20.934 V/m; Power Drift = -0.13 dB
Maximum value of SAR (interpolated) = 0.475 W/kg

WCDMA Band V Body/Back side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.934 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.601 mW/g
SAR(1 g) = 0.440 mW/g; SAR(10 g) = 0.305 mW/g
Maximum value of SAR (measured) = 0.470 W/kg



Test Laboratory: GCCT Test Date: June. 11, 2015



WCDMA Band V Body/Back side-Low- axis scan

Test Laboratory: GCCT Test Date: June. 11, 2015

WCDMA Band V Body/Front side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

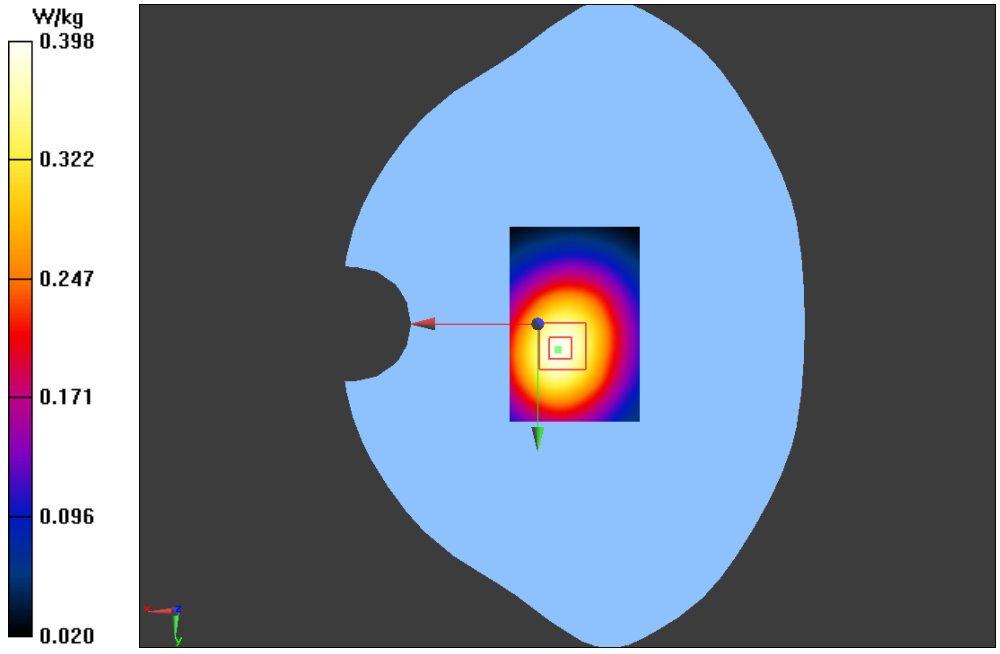
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band 5; Frequency: 826.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.929 mho/m; ε_r = 53.813; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(6.29, 6.29, 6.29); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_2with CRP v4.0; Type: QD000P40CC; Serial: TP:1548
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band V Body/Front side-Low/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 19.888 V/m; Power Drift = -0.02 dB
Maximum value of SAR (interpolated) = 0.398 W/kg

WCDMA Band V Body/Front side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.888 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.510 mW/g
SAR(1 g) = 0.374 mW/g; SAR(10 g) = 0.261 mW/g
Maximum value of SAR (measured) = 0.400 W/kg



Test Laboratory: GCCT Test Date: June. 11, 2015

WCDMA Band V-Left side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

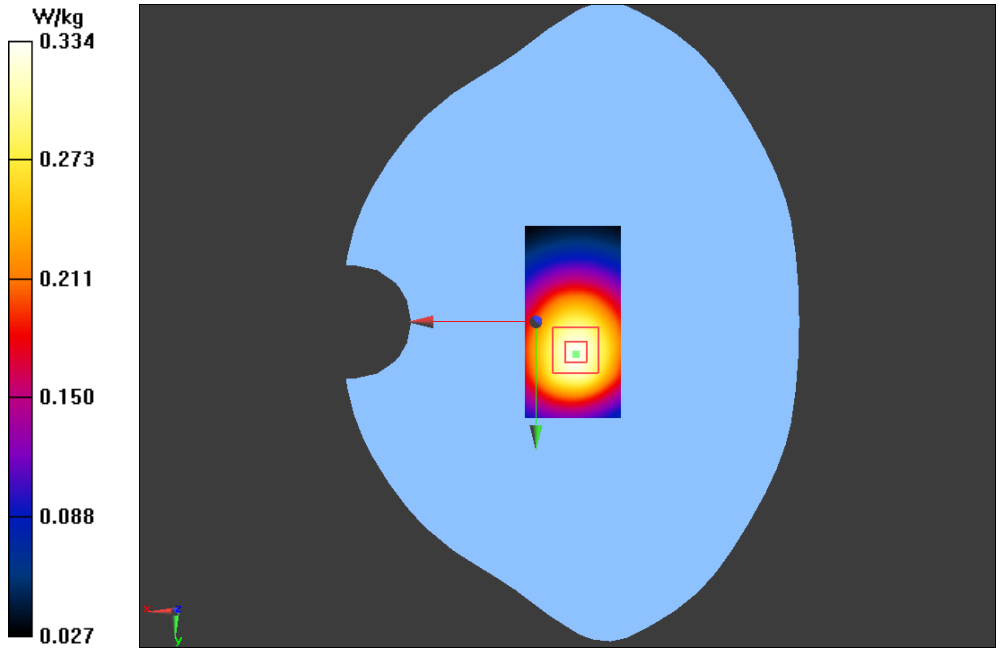
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band 5; Frequency: 826.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.929 mho/m; ε_r = 53.813; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(6.29, 6.29, 6.29); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_2with CRP v4.0; Type: QD000P40CC; Serial: TP:1548
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band V-Left side-Low/Area Scan (31x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 17.914 V/m; Power Drift = 0.05 dB
Maximum value of SAR (interpolated) = 0.334 W/kg

WCDMA Band V-Left side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.914 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.409 mW/g
SAR(1 g) = 0.309 mW/g; SAR(10 g) = 0.219 mW/g
Maximum value of SAR (measured) = 0.329 W/kg



Test Laboratory: GCCT Test Date: June. 11, 2015

WCDMA Band V-Right side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

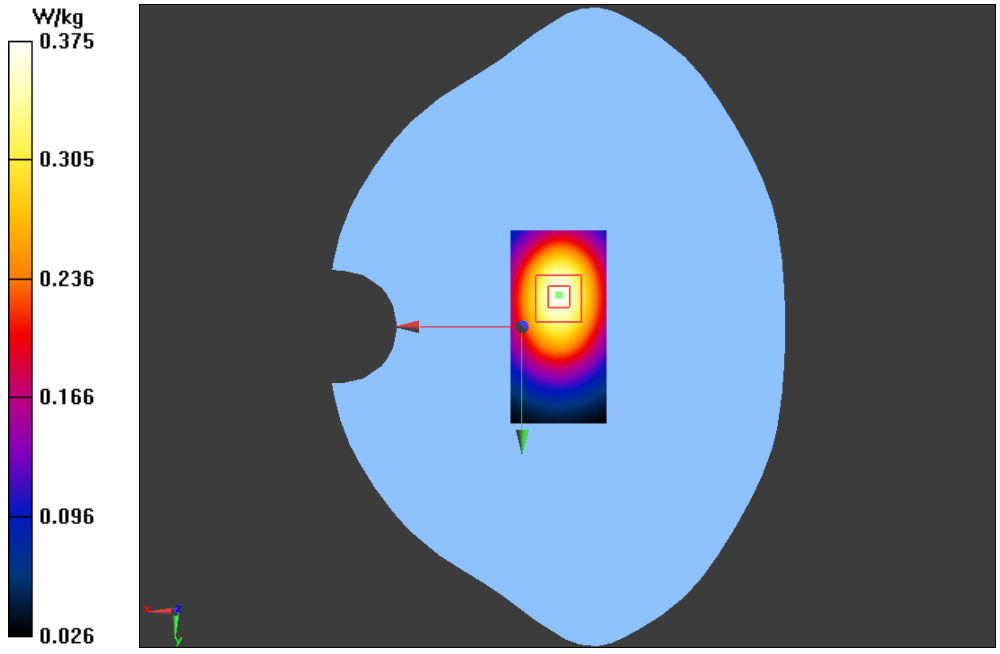
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band 5; Frequency: 826.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.929 mho/m; ε_r = 53.813; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(6.29, 6.29, 6.29); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_2with CRP v4.0; Type: QD000P40CC; Serial: TP:1548
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band V-Right side-Low/Area Scan (31x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 18.893 V/m; Power Drift = 0.00 dB
Maximum value of SAR (interpolated) = 0.375 W/kg

WCDMA Band V-Right side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.893 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.489 mW/g
SAR(1 g) = 0.349 mW/g; SAR(10 g) = 0.237 mW/g
Maximum value of SAR (measured) = 0.375 W/kg



Test Laboratory: GCCT Test Date: June. 11, 2015

WCDMA Band V-Bottom side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

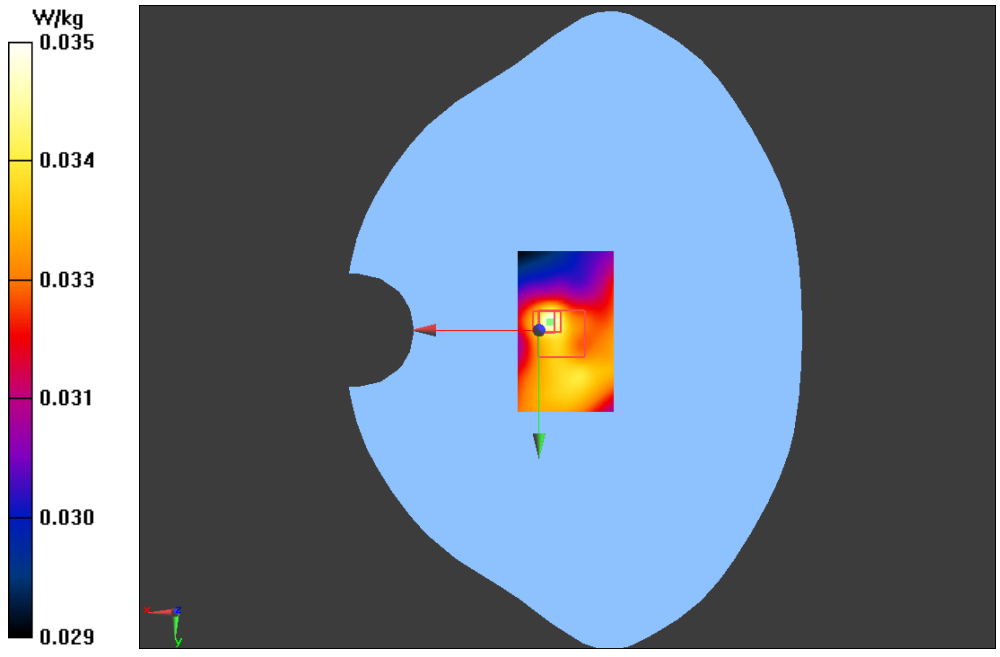
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band 5; Frequency: 826.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.929 mho/m; ε_r = 53.813; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(6.29, 6.29, 6.29); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_2with CRP v4.0; Type: QD000P40CC; Serial: TP:1548
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band V-Bottom side-Low/Area Scan (31x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 6.084 V/m; Power Drift = -0.03 dB
Fast SAR: SAR(1 g) = 0.033 mW/g
Maximum value of SAR (interpolated) = 0.0354 W/kg

WCDMA Band V-Bottom side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.084 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.054 mW/g
SAR(1 g) = 0.033 mW/g; SAR(10 g) = 0.023 mW/g
Maximum value of SAR (measured) = 0.0353 W/kg



Test Laboratory: GCCT Test Date: June. 11, 2015

WCDMA Band V-Top side-Low

DUT: 3G mobile phone only call 911; Type: Guardian Alert 911 PLUS

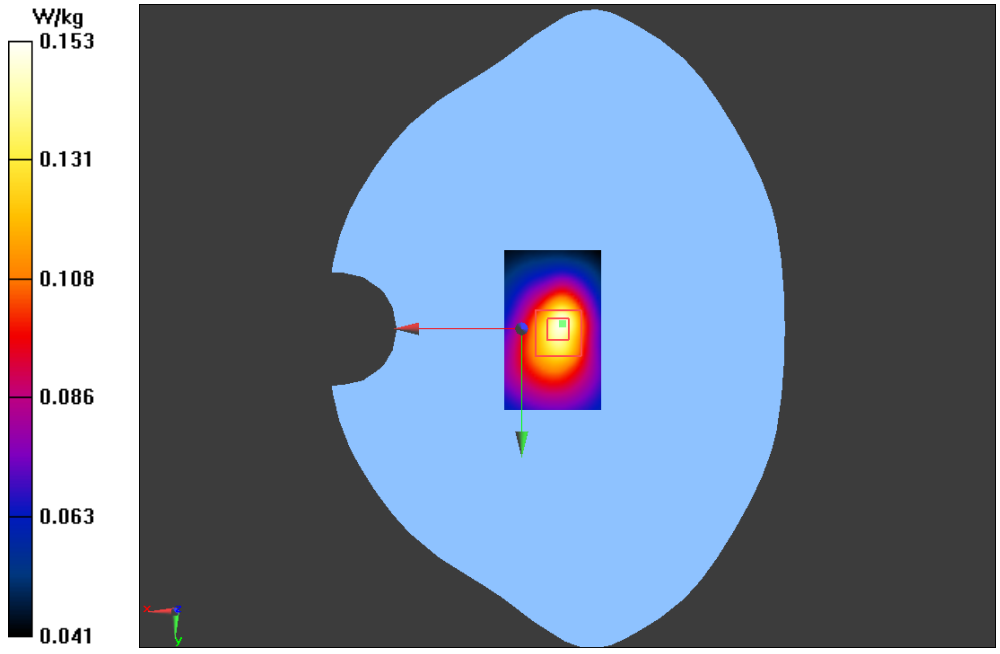
Communication System: UMTS-FDD(WCDMA); Communication System Band: Band 5; Frequency: 826.4 MHz;
Communication System PAR: 0 dB
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.929 mho/m; ε_r = 53.813; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3221; ConvF(6.29, 6.29, 6.29); Calibrated: 1/31/2015;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn893; Calibrated: 1/23/2015
- Phantom: SAM_2with CRP v4.0; Type: QD000P40CC; Serial: TP:1548
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

WCDMA Band V-Top side-Low/Area Scan (31x51x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Reference Value = 13.066 V/m; Power Drift = -0.04 dB
Maximum value of SAR (interpolated) = 0.153 W/kg

WCDMA Band V-Top side-Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.066 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.238 mW/g
SAR(1 g) = 0.139 mW/g; SAR(10 g) = 0.084 mW/g
Maximum value of SAR (measured) = 0.152 W/kg



ANNEX D: Probe Calibration Report

In Collaboration with
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CALIBRATION
No. L0570

Client GCCT Certificate No: Z15-97014

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3221

Calibration Procedure(s) FD-Z11-2-004-01
Calibration Procedures for Dosimetric E-field Probes

Calibration date: January 31, 2015

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	01-Jul-14 (CTTL, No.J14X02146)	Jun-15
Power sensor NRP-Z91	101547	01-Jul-14 (CTTL, No.J14X02146)	Jun-15
Power sensor NRP-Z91	101548	01-Jul-14 (CTTL, No.J14X02146)	Jun-15
Reference10dBAttenuator	18N50W-10dB	13-Mar-14(TMC,No.JZ14-1103)	Mar-16
Reference20dBAttenuator	18N50W-20dB	13-Mar-14(TMC,No.JZ14-1104)	Mar-16
Reference Probe EX3DV4	SN 3617	28-Aug-14(SPEAG,No.EX3-3617_Aug14)	Aug-15
DAE4	SN 777	17-Sep-14 (SPEAG, DAE4-777_Sep14)	Sep -15
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGeneratorMG3700A	6201052605	01-Jul-14 (CTTL, No.J14X02145)	Jun-15
Network Analyzer E5071C	MY46110673	15-Feb-14 (TMC, No.JZ14-781)	Feb-15

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: February 02, 2015

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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i θ=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 300MHz to 3GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z* frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (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.
- *Ax,y,z; Bx,y,z; Cx,y,z;VRx,y,z:*A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- *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 *NORMx* (no uncertainty required).

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Probe ES3DV3

SN: 3221

Calibrated: January 31, 2015

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3221

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(μV/(V/m)^2)^A	1.08	1.39	1.06	±10.8%
DCP(mV)^B	103.1	100.5	103.7	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	261.1	±2.6%
		Y	0.0	0.0	1.0		292.6	
		Z	0.0	0.0	1.0		262.2	

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

^{A} The uncertainties of Norm X, Y, Z do not affect the E^2-field uncertainty inside TSL (see Page 5 and Page 6).
^{B} Numerical linearization parameter: uncertainty not required.
^{E} Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3221

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	41.9	0.89	6.36	6.36	6.36	0.41	1.42	±12%
835	41.5	0.90	6.25	6.25	6.25	0.41	1.47	±12%
900	41.5	0.97	6.13	6.13	6.13	0.35	1.63	±12%
1750	40.1	1.37	5.33	5.33	5.33	0.46	1.55	±12%
1900	40.0	1.40	5.20	5.20	5.20	0.71	1.25	±12%
2000	40.0	1.40	5.12	5.12	5.12	0.70	1.25	±12%
2300	39.5	1.67	4.77	4.77	4.77	0.59	1.45	±12%
2450	39.2	1.80	4.50	4.50	4.50	0.85	1.16	±12%
2600	39.0	1.96	4.35	4.35	4.35	0.76	1.26	±12%

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

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

[G] 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 the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3221

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz][C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha[G]	Depth[G] (mm)	Unct. (k=2)
750	55.5	0.96	6.28	6.28	6.28	0.38	1.63	±12%
835	55.2	0.97	6.29	6.29	6.29	0.44	1.54	±12%
900	55.0	1.05	6.16	6.16	6.16	0.49	1.45	±12%
1750	53.4	1.49	5.00	5.00	5.00	0.61	1.34	±12%
1900	53.3	1.52	4.79	4.79	4.79	0.61	1.36	±12%
2000	53.3	1.52	4.75	4.75	4.75	0.48	1.62	±12%
2300	52.9	1.81	4.65	4.65	4.65	0.63	1.48	±12%
2450	52.7	1.95	4.49	4.49	4.49	0.88	1.16	±12%
2600	52.5	2.16	4.37	4.37	4.37	0.71	1.32	±12%

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

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

[G] 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 the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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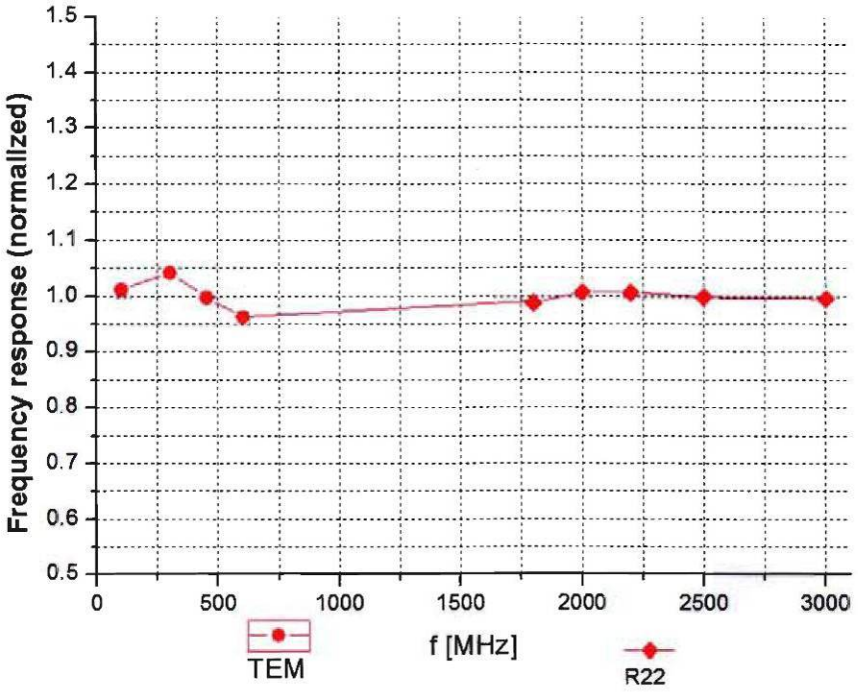
Frequency Response of E-Field
(TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ±7.5% (k=2)

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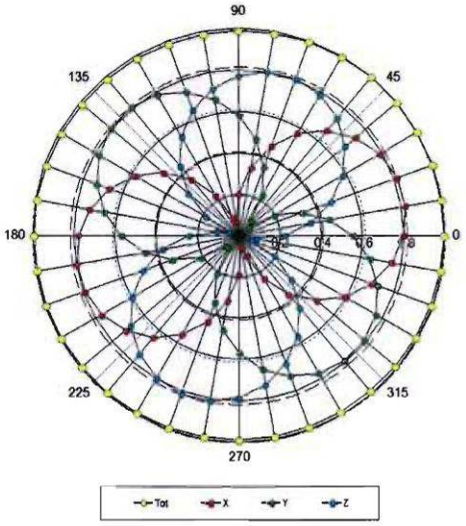
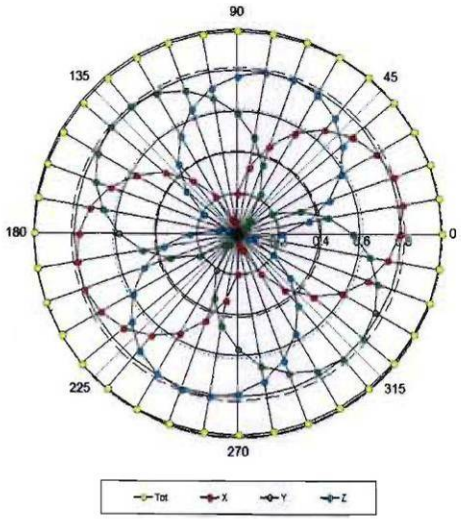
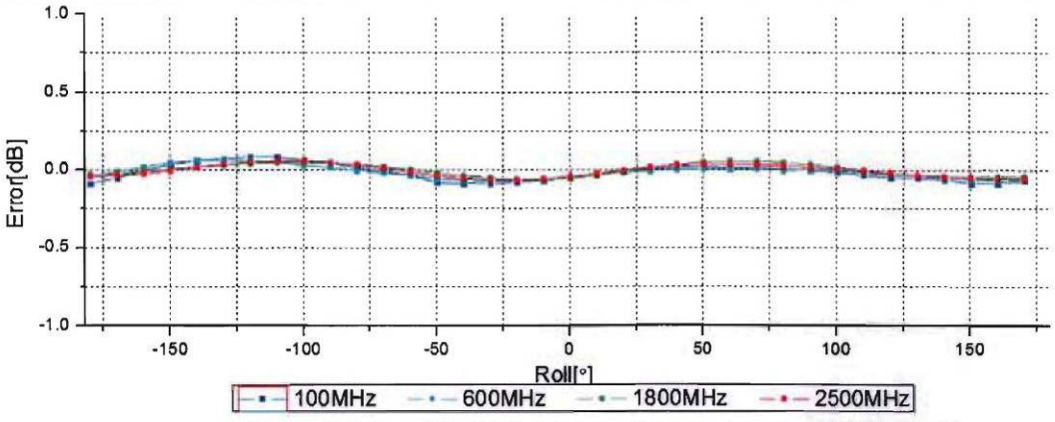
Receiving Pattern (Φ), θ=0°

f=600 MHz, TEM



f=1800 MHz, R22





Uncertainty of Axial Isotropy Assessment: ±0.9% (k=2)

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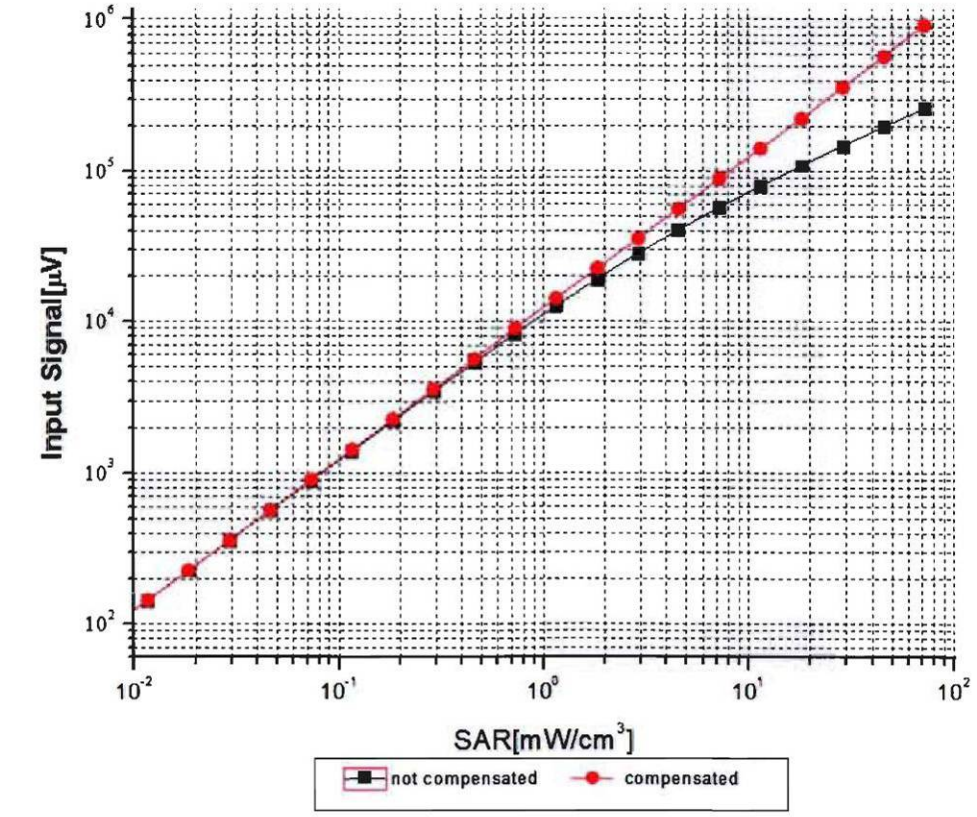
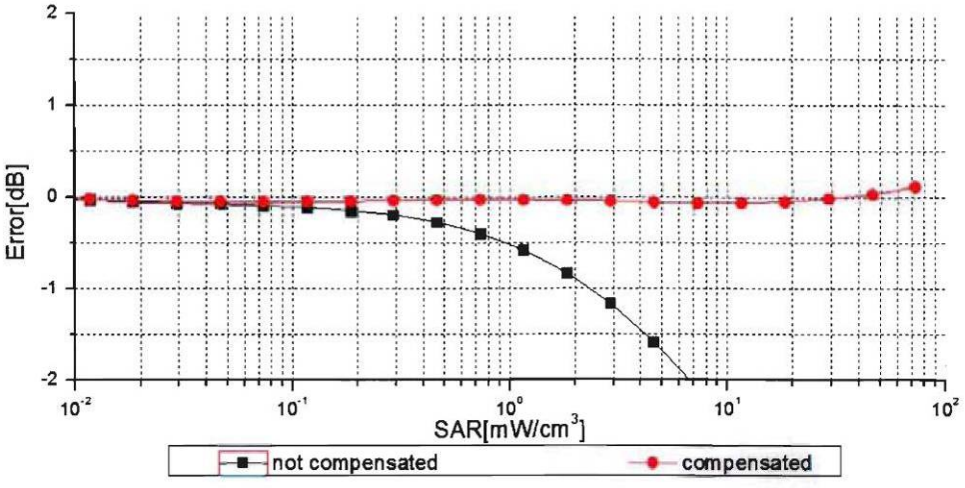
Dynamic Range f(SAR_{head})
(TEM cell, f = 900 MHz)





Uncertainty of Linearity Assessment: ±0.9% (k=2)

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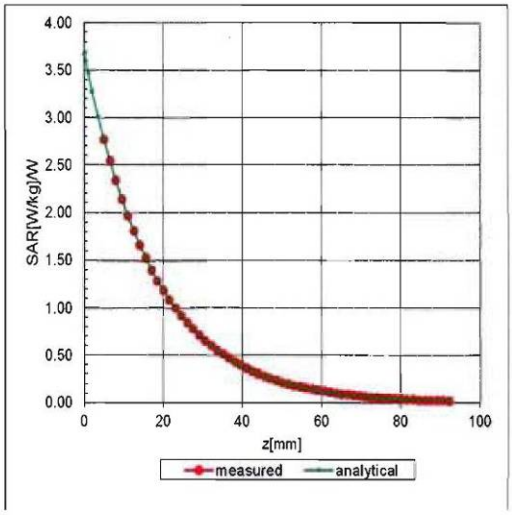
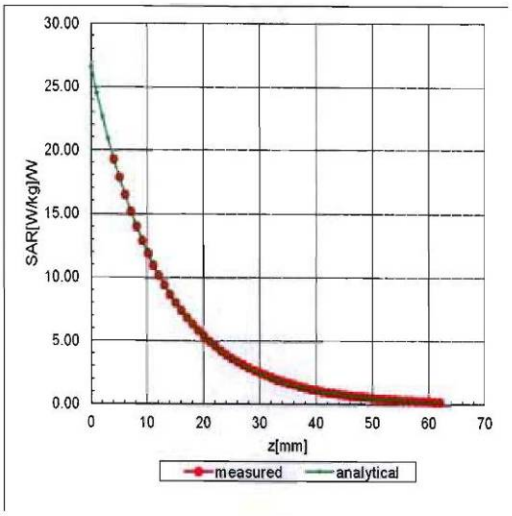
Conversion Factor Assessment

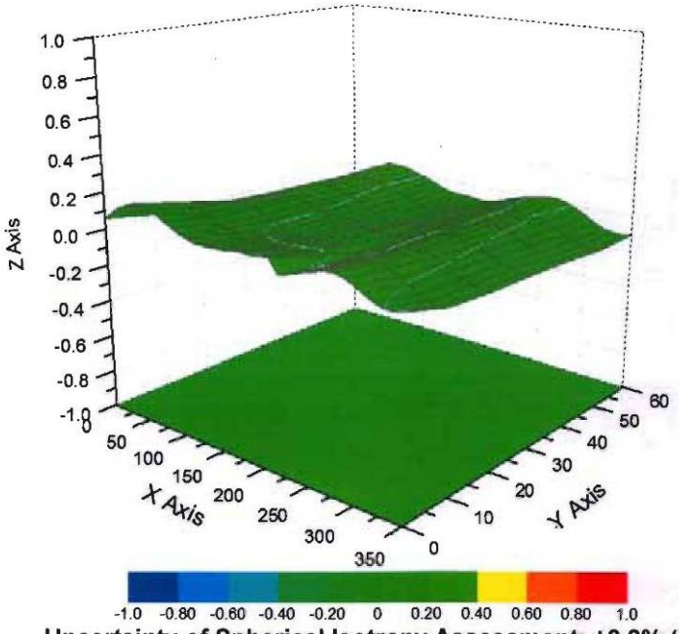
f=900 MHz, WGLS R9(H_convF)



f=1750 MHz, WGLS R22(H_convF)



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: ±2.8% (K=2)

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DASY/EASY – Parameters of Probe: ES3DV3 - SN: 3221

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	36.5
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	10mm
Tip Diameter	4mm
Probe Tip to Sensor X Calibration Point	2mm
Probe Tip to Sensor Y Calibration Point	2mm
Probe Tip to Sensor Z Calibration Point	2mm
Recommended Measurement Distance from Surface	3mm