SAR Test Report

Report No.: AGC00069150901FH01

FCC ID	:	2AE56S-WATCH
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Mobile Phone
BRAND NAME	:	KENXINDA
MODEL NAME	:	S-watch 2.0
CLIENT	:	KENXINDA TECHNOLOGY CO., LIMITED
DATE OF ISSUE	:	Sep. 22,2015
STANDARD(S)	:	IEEE Std. 1528:2003 IEEE Std. 1528a:2005 FCC47CFR § 2.1093 IEEE/ANSI C95.1:1992
REPORT VERSION	:	V1.0

Attestation of Global Compliance(Shenzhen) Co., Ltd.

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Sep. 22,2015	Valid	Original Report

Test Report Certification

Applicant Name :	KENXINDA TECHNOLOGY CO., LIMITED
Applicant Address :	UNIT B 13/F PRAT COMMERCIAL BUILDING 17-19 PRAT AVENUE TSIMSHATSUI KL HONGKONG
Manufacturer Name :	SHENZHEN KENXINDA TECHNOLOGY CO., LTD. (Longhua BRANCH)
Manufacturer Address :	1-6 Floor, No.105 Work Shop & 1-6Floor, No.104 Work Shop, Xinweihuaning Road, Dalang Community, Dalang Street, Longhua New District, Shenzhen, P.R.C
Product Designation :	Mobile Phone
Brand Name :	KENXINDA
Model Name :	S-watch 2.0
Different Description	N/A
EUT Voltage :	DC3.7V by battery
Applicable Standard :	IEEE Std. 1528:2003 IEEE Std. 1528a:2005 FCC47CFR § 2.1093 IEEE/ANSI C95.1:1992
Test Date :	Sep. 15,2015 to Sep. 16,2015
Performed Location	Attestation of Global Compliance(Shenzhen) Co., Ltd. 2 F, Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang Street, Bao'an District, Shenzhen, China
Report Template	AGCRT-US-2.5G/SAR (2015-05-01)

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1. SUMMARY OF MAXIMUM SAR VALUE

The maximum results of Specific Absorption Rate (SAR) found during testing for EUT are as follows:

Frequency Band	Highest Reported 1g-SAR(W/Kg)	
	Face up(with 10mm separation)	Body-worn(with 0mm separation)
GSM 850	0.132	0.756
PCS 1900	0.555	1.467
Simultaneous Reported SAR	1.483	

This device is compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6W/Kg) specified in IEEE Std. 1528:2003; IEEE1528a-2005;FCC47CFR § 2.1093; IEEE/ANSI C95.1:1992 and the following specific FCC Test Procedures:

- KDB 447498 D01 General RF Exposure Guidance v05r02
- KDB 648474 D04 Handset SAR v01r02
- KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- KDB 941225 D01 3G SAR Procedures v03

2. GENERAL INFORMATION

2.1. EUT Description

General Information	
Product Designation	Mobile Phone
Test Model	S-watch 2.0
Hardware Version	A950_MB_V3.0
Software Version	A950EA-3_64X64_176X220_V1.03
Device Category	Portable
RF Exposure Environment	Uncontrolled
Antenna Type	Internal
GSM and GPRS	
Support Band	☒GSM 850 ☒PCS 1900 ☒GSM 900 ☐DCS 1800
GPRS Type	Class B
GPRS Class	Class 12(1Tx+4Rx, 2Tx+3Rx, 3Tx+2Rx, 4Tx+1Rx)
TX Frequency Range	GSM 850 : 820-850MHz;; PCS 1900: 1850-1910MHz;
RX Frequency Range	GSM 850 : 869~894MHz; PCS 1900: 1930~1990MHz
Release Version	R99
Type of modulation	GMSK for GSM/GPRS;
Antenna Gain	1.0dBi
Max. Average Power (Max. Peak Power)	GSM850: 31.18dBm(32.46dBm) ;PCS1900: 28.24dBm(29.49dBm)
Bluetooth	
Bluetooth Version	☐V2.0 ☐V2.1 ☐V2.1+EDR ☒V3.0 ☐V3.0+HS ☐V4.0
Operation Frequency	2402~2480MHz
Type of modulation	☒GFSK ☒Π/4-DQPSK ☒8-DPSK
Avg. Burst Power	-5.09dBm
Antenna Gain	0.8dBi

EUT Description(Continue)

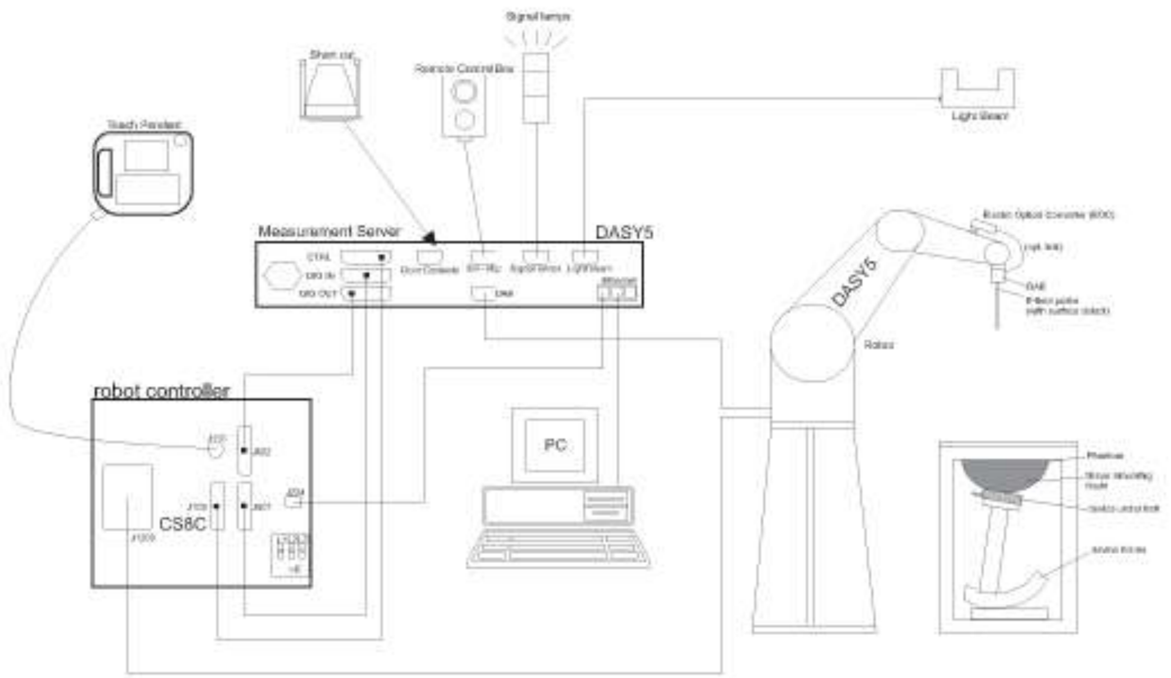
Accessories	
Battery	Brand name: KENXINDA Model No. : S-watch 2.0 Voltage and Capacitance: 3.7 V & 600mAh
Adapter	Brand name: KENXINDA Model No. : S-watch 2.0 Input: AC 100-240V, 50/60Hz, 100mA Output: DC 5V, 1000mA
Earphone	Brand name: N/A Model No. : N/A

Note:CMU200 can measure the average power and Peak power at the same time

Product	Type	
	☒ Production unit	☐ Identical Prototype

3. SAR MEASUREMENT SYSTEM

3.1. The DASY5 system used for performing compliance tests consists of following items



- A standard high precision 6-axis robot with controller, teach pendant and software.
- Data acquisition electronics (DAE) which attached to the robot arm extension. The DAE 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
- A dosimetric probe equipped with an optical surface detector system.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital Communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- A Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- Phantoms, device holders and other accessories according to the targeted measurement.

3.2. DASY5 E-Field Probe

The SAR measurement is conducted with the dosimetric probe manufactured by SPEAG. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. SPEAG conducts the probe calibration in compliance with international and national standards (e.g. IEEE 1528 and relevant KDB files.) The calibration data are in Appendix D.

Isotropic E-Field Probe Specification

Model	EX3DV4	
Manufacture	SPEAG	
frequency	0.3GHz-6 GHz Linearity:±0.2dB(300 MHz-6 GHz)	
Dynamic Range	0.01W/Kg-100W/Kg Linearity:±0.2dB	
Dimensions	Overall length:337mm Tip diameter:2.5mm Typical distance from probe tip to dipole centers:1mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

3.3. Data Acquisition Electronics description

The data acquisition electronics (DAE) consist if a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converte and a command decoder with a control logic unit. Transmission to the measurement sever is accomplished through an optical downlink fir 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.

DAE4

Input Impedance	200MOhm	
The Inputs	Symmetrical and floating	
Common mode rejection	above 80 dB	

3.4. Robot

The DASY system uses the high precision robots (DASY5:TX60) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from is used.
The XL robot series have many features that are important for our application:

- High precision (repeatability 0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)
- 6-axis controller

3.5. Light Beam Unit

The light beam switch allows automatic "tooling" of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip.
The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned prob.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position. e, the same position will be reached with another aligned probe within 0

3.6. Device Holder

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR).
Thus the device needs no repositioning when changing the angles.
The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ = 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.

3.7. Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY5: 400 MHz, Intel Celeron), chip-disk (DASY5: 128MB), RAM (DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DAYS I/O board, which is directly connected to the PC/104 bus of the CPU board.
The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.

3.8. PHANTOM

SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas: □ Left head □ Right head □ Flat phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

ELI4 Phantom

□ Flat phantom a fiberglass shell flat phantom with 2mm+/- 0.2 mm shell thickness. It has only one measurement area for Flat phantom	

4. SAR MEASUREMENT PROCEDURE

4.1. Specific Absorption Rate (SAR)

SAR is related to the rate at which energy is absorbed per unit mass in object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and occupational/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of given mass density (ρ). The equation description is as below:

$$\mathrm{SAR} = \frac{\mathrm{d}}{\mathrm{d}t}\left(\frac{\mathrm{d}W}{\mathrm{d}m}\right) = \frac{\mathrm{d}}{\mathrm{d}t}\left(\frac{\mathrm{d}W}{\rho \mathrm{d}V}\right)$$

SAR is expressed in units of Watts per kilogram (W/Kg)
SAR can be obtained using either of the following equations:

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

$$\mathrm{SAR} = c_h \left.\frac{\mathrm{d}T}{\mathrm{d}t}\right|_{t=0}$$

Where

SAR	is the specific absorption rate in watts per kilogram;
E	is the r.m.s. value of the electric field strength in the tissue in volts per meter;
σ	is the conductivity of the tissue in siemens per metre;
ρ	is the density of the tissue in kilograms per cubic metre;
c_h	is the heat capacity of the tissue in joules per kilogram and Kelvin;
$\frac{\mathrm{dT}}{\mathrm{dt}} \mid t=0$	is the initial time derivative of temperature in the tissue in kelvins per second

4.2. SAR Measurement Procedure

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurement are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface is 2.7mm This distance cannot be smaller than the distance os sensor calibration points to probe tip as `defined in the probe properties,

Step 2: 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 fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in db) is specified in the standards for compliance testing. For example, a 2db range is required in IEEE Standard 1528 and IEC62209 standards, whereby 3db is a requirement when compliance is assessed in accordance with the ARIB standard (Japan) If one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximum are detected, the number of Zoom Scan has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100MHz to 6GHz

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

Zoom Scan are used to assess the peak spatial SAR value within a cubic average volume containing 1g abd 10g of simulated tissue. The Zoom Scan measures points(refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1g and 10g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB865664 d01 SAR Measurement 100MHz to 6GHz

Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

Step 4: Power Drift Measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the same settings. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

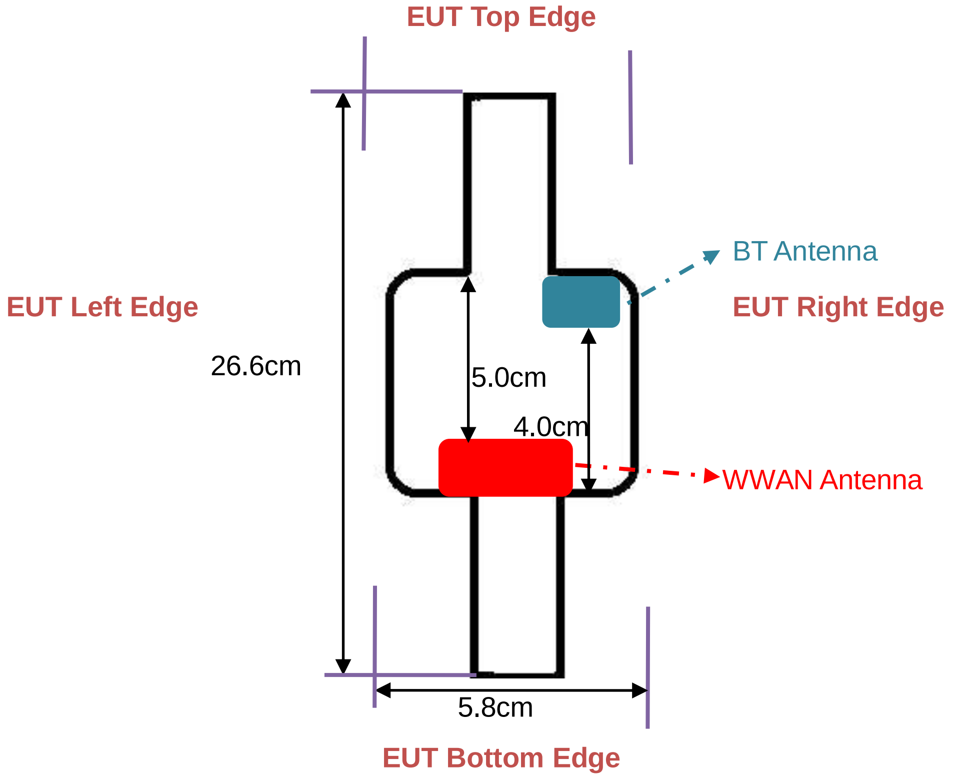
4.3. RF Exposure Conditions

Test Configuration and setting:

The EUT is a model of GSM Portable Mobile Station (MS). It supports GSM/GPRS, BT,

For WWAN SAR testing, the device was controlled by using a base station emulator. Communication between the device and the emulator were established by air link. The distance between the EUT and the antenna is larger than 50cm, and the output power radiated from the emulator antenna is at least 30db smaller than the output power of EUT.

Antenna Location: (the front view)



For WWAN mode:

Test Configurations	Antenna to edges/surface	SAR required	Note
Body			
Back	<25mm	Yes	
Front	<25mm	Yes	

5. TISSUE SIMULATING LIQUID

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15cm. For head SAR testing the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15cm For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm.The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in 4.2

5.1. The composition of the tissue simulating liquid

Ingredient	Water	Salt	Sugar	HEC	Preventol	DGBE	TWEEN
835MHz Head	√	√	√	√	√	--	--
835MHz Body	√	√	√	√	√	--	--
1900MHz Head	√	√	--	--	--	√	--
1900MHz Body	√	√	√	√	√	--	--

5.2. Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE 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 a human head. Other head and body tissue parameters that have not been specified in IEEE 1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in IEEE 1528.

Target Frequency (MHz)	head		body	
	εr	σ (S/m)	εr	σ (S/m)
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	1.01	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/m3)

5.3. Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using DASY5 Dielectric Probe Kit and R&S Network Analyzer ZVL6.

Tissue Stimulant Measurement for 835MHz					
Head	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [^{o}C]	Test time
		εr 41.5 (39.425-43.575)	δ[s/m] 0.90(0.855-0.945)		
	824.2	42.72	0.87	21.7	Sep. 15,2015
	835	42.31	0.89		
	836.6	42.00	0.90		
	848.8	41.84	0.91		
Body	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [^{o}C]	Test time
		εr 55.20(52.44-57-96)	δ[s/m]0.97(0.9215-1.0185)		
	824.2	55.69	0.95	21.9	Sep. 15,2015
	835	54.57	0.96		
	836.6	54.13	0.97		
	848.8	53.89	0.98		

Tissue Stimulant Measurement for 1900MHz					
Head	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [^{o}C]	Test time
		εr40.00(38.00-42.00)	δ[s/m]1.40(1.33-1.47)		
	1850.2	40.73	1.38	21.5	Sep. 16,2015
	1880	40.02	1.42		
	1900	39.89	1.44		
	1909.8	39.35	1.44		
Body	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [^{o}C]	Test time
		εr53.30(50.635-55.965)	δ[s/m]1.52(1.444-1.596)		
	1850.2	54.33	1.47	21.3	Sep. 16,2015
	1880	53.91	1.49		
	1900	53.14	1.53		
	1909.8	52.68	1.55		

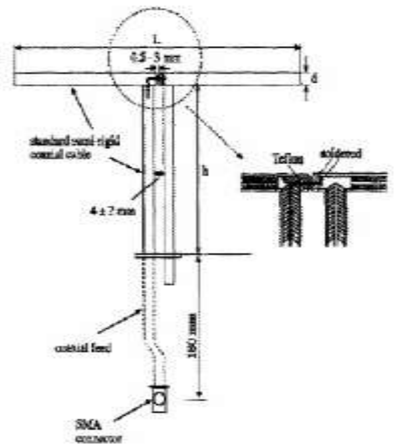
6. SAR SYSTEM CHECK PROCEDURE

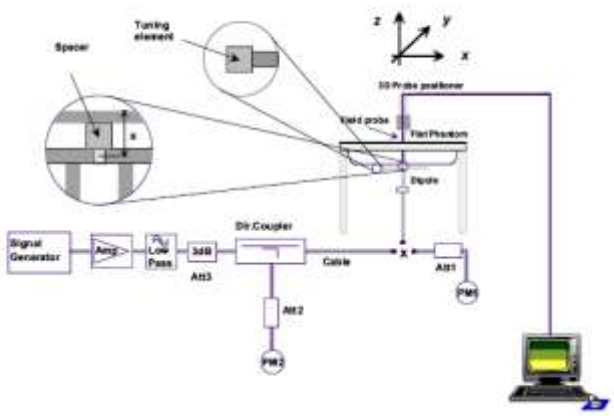
6.1. SAR System Check Procedures

SAR system check is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are remeasured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

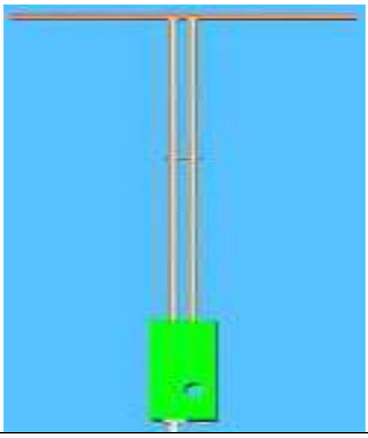
Each DASY system is equipped with one or more system check kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system check and system validation. System kit includes a dipole, and dipole device holder.

The system check verifies that the system operates within its specifications. It’s performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system check setup is shown as below.





6.2. SAR System Check
6.2.1. Dipoles



The dipoles used is based on the IEEE-1528 standard, and is complied with mechanical and electrical specifications in line with the requirements of both IEEE and FCC Supplement C. the table below provides details for the mechanical and electrical Specifications for the dipoles.

Frequency	L (mm)	h (mm)	d (mm)
835MHz	161.0	89.8	3.6
1900MHz	68	39.5	3.6

6.2.2. System Check Result

System Performance Check at 835MHz&1900MHz for Head								
Validation Kit: SN 46/11DIP 0G835-190 & SN 46/11DIP 1G900-187								
Frequency [MHz]	Target Value(W/Kg)		Reference Result (± 10%)		Tested Value(W/Kg)		Tissue Temp. [°C]	Test time
	1g	10g	1g	10g	1g	10g		
835	9.60	6.20	8.64-10.56	5.58-6.82	10.096	5.968	21.7	Sep. 15,2015
1900	39.65	20.24	35.685-43.615	18.216-22.264	38.720	20.480	21.5	Sep. 16,2015
System Performance Check at 835 MHz &1900MHz for Body								
Frequency [MHz]	Target Value(W/Kg)		Reference Result (± 10%)		Tested Value(W/Kg)		Tissue Temp. [°C]	Test time
	1g	10g	1g	10g	1g	10g		
835	9.90	6.39	8.91-10.89	5.75-7.03	10.304	6.704	21.9	Sep. 15,2015
1900	40.74	21.43	36.666-44.814	19.287-23.573	39.360	20.800	21.3	Sep. 16,2015

7. EUT TEST POSITION

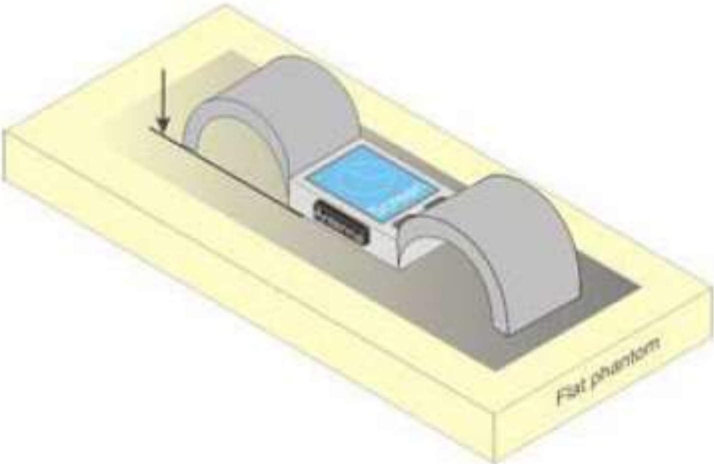
This EUT was tested in **Body back and Face up.**

7.4. Body Worn Position

(1) To position the EUT parallel to the phantom surface.

(2) To adjust the EUT parallel to the flat phantom.

(3) To adjust the distance between the EUT surface and the flat phantom to **10mm** while used in front of face and body back touch**.**



8. SAR EXPOSURE LIMITS

SAR assessments have been made in line with the requirements of IEEE-1528, FCC Supplement C, and comply with ANSI/IEEE C95.1-1992 “Uncontrolled Environments” limits. These limits apply to a location which is deemed as “Uncontrolled Environment” which can be described as a situation where the general public may be exposed to an RF source with no prior knowledge or control over their exposure.

Limits for General Population/Uncontrolled Exposure (W/kg)

Type Exposure	Uncontrolled Environment Limit (W/kg)
Spatial Peak SAR (1g cube tissue for brain or body)	1.60
Spatial Average SAR (Whole body)	0.08
Spatial Peak SAR (Limbs)	4.0

9. TEST EQUIPMENT LIST

Equipment description	Manufacturer/ Model	Identification No.	Current calibration date	Next calibration date
Stäubli Robot	Stäubli-TX60	F13/5Q2UD1/A/01	N/A	N/A
Robot Controller	Stäubli-CS8	139522	N/A	N/A
TISSUE Probe	SATIMO	SN 45/11 OCPG45	12/03/2014	12/02/2015
E-Field Probe	Speag-EX3DV4	3953	11/06/2014	11/05/2015
SAM Twin Phantom	Speag-SAM	1790	N/A	N/A
Device Holder	Speag-SD 000 H01 KA	SD 000 H01 KA	N/A	N/A
DAE4	Speag-SD 000 D04 BM	1398	03/11/2015	03/10/2016
SAR Software	Speag-DASY5	DASY52.8	N/A	N/A
Liquid	SATIMO	-	N/A	N/A
Radio Communication Tester	R&S-CMU200	069Y7-158-13-712	03/06/2015	03/05/2016
Dipole	SATIMO SID835	SN46/11 DIP 0G835-190	10/02/2014	10/01/2017
Dipole	SATIMO SID1900	SN46/11 DIP 1G900-187	11/14/2013	11/13/2016
Signal Generator	Agilent-E4438C	MY44260051	03/06/2015	03/05/2016
Spectrum Analyzer E4440	Agilent	US41421290	07/23/2015	07/22/2016
Network Analyzer	Rhode & Schwarz ZVL6	SN100132	03/06/2015	03/05/2016
Attenuator	Warison /WATT-6SR1211	N/A	N/A	N/A
Attenuator	Mini-circuits / VAT-10+	N/A	N/A	N/A
Amplifier	EM30180	SN060552	03/06/2015	03/05/2016
Directional Couple	Werlatone/ C5571-10	SN99463	07/29/2015	07/28/2016
Directional Couple	Werlatone/ C6026-10	SN99482	07/29/2015	07/28/2016
Power Sensor	NRP-Z23	US38261498	03/06/2015	03/05/2016
Power Sensor	NRP-Z21	1137.6000.02	10/22/2014	10/21/2015
Power Viewer	R&S	V2.3.1.0	N/A	N/A

Note: Per KDB 865664Dipole SAR Validation, AGC 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

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table as follow.

Uncertainty Distributions	**Normal**	**Rectangular**	**Triangular**	**U-Shape**
Multi-plying Factor(a)	1/k(b)	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) Standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) *κ* is the coverage factor

Table 13.1 Standard Uncertainty for Assumed Distribution (above table)

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

DAYS5 Measurement Uncertainty Measurement uncertainty for 30 MHz to 3GHz averaged over 1 gram / 10 gram.							
Error Description	Uncertainty value(±10%)	Probability Distribution	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g)	Standard Uncertainty (10g)
Measurement System							
Probe Calibration	6.53	Normal	1	1	1	6.53	6.53
Axial Isotropy	4.6	Rectangular	$\sqrt{3}$	1	1	2.66	2.66
Hemispherical Isotropy	9.3	Rectangular	$\sqrt{3}$	1	1	5.37	5.37
Linearity	4.5	Rectangular	$\sqrt{3}$	1	1	2.60	2.60
Probe Modulation Response	0.2	Rectangular	$\sqrt{3}$	1	1	0.12	0.12
System Detection Limits	0.9	Rectangular	$\sqrt{3}$	1	1	0.52	0.52
Boundary Effects	0.9	Rectangular	$\sqrt{3}$	0	0	0	0
Readout Electronics	0.2	Normal	$\sqrt{3}$	1	1	0.12	0.12
Response Time	0	Rectangular	$\sqrt{3}$	1	1	0	0
Integration Time	0	Rectangular	$\sqrt{3}$	1	1	0	0
RF Ambient Noise	0.9	Rectangular	$\sqrt{3}$	1	1	0.52	0.52
RF Ambient Reflection	0.9	Rectangular	$\sqrt{3}$	1	1	0.52	0.52
Probe Positioner	0.7	Rectangular	$\sqrt{3}$	1	1	0.40	0.40
Probe Positioning	6.5	Rectangular	$\sqrt{3}$	1	1	3.75	3.75
Post-processing	3.8	Rectangular	$\sqrt{3}$	1	1	2.19	2.19
Test Sample Related							
Device Positioning	3.6	Normal	1	1	1	3.6	3.6
Device Holder	2.9	Normal	1	1	1	2.9	2.9
Measurement SAR Drift	5.0	Rectangular	$\sqrt{3}$	1	1	2.89	2.89
Power Scaling	0.0	Rectangular	$\sqrt{3}$	1	1	0	0
Phantom and Setup							
Phantom Uncertainty	3.9	Rectangular	$\sqrt{3}$	1	1	2.25	2.25
Liquid Conductivity(Meas.)	2.4	Normal	1	0.78	0.71	1.87	1.70
Liquid Conductivity(Target)	4.9	Rectangular	$\sqrt{3}$	0.64	0.43	1.81	1.22
Liquid Permittivity(Meas.)	2.4	Normal	1	0.26	0.26	0.62	0.62
Liquid Permittivity((Target)	4.9	Rectangular	$\sqrt{3}$	0.6	0.49	1.70	1.39
Liquid Conductivity-temperature uncertainty	1.6	Rectangular	$\sqrt{3}$	0.78	0.71	0.72	0.66
Liquid Permittivity-temperature uncertainty	0.2	Rectangular	$\sqrt{3}$	0.23	0.26	0.026	0.03
Combined Standard Uncertainty						12.03	12.00
Coverage Factor for 95%						K=2	
Expanded Uncertainty						±24.06%	±24.00%

DAYS5 System Check Uncertainty for 30 MHz to 6GHz averaged range								
Error Description	Uncer. value (±10%)	Prob. Dist.	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) V_{eff}
Measurement System								
Probe Calibration	6.53	Normal	1	1	1	6.53	6.53	∞
Axial Isotropy	4.6	Rectangular	$\sqrt{3}$	1	1	2.66	2.66	∞
Hemispherical Isotropy	9.3	Rectangular	$\sqrt{3}$	1	1	5.37	5.37	∞
Boundary Effects	0.9	Rectangular	$\sqrt{3}$	0	0	0	0	∞
Linearity	4.5	Rectangular	$\sqrt{3}$	1	1	2.60	2.60	∞
System Detection Limits	0.9	Rectangular	$\sqrt{3}$	1	1	0.52	0.52	∞
Modulation Response	0	Rectangular	$\sqrt{3}$	1	1	0	0	∞
Readout Electronics	0.2	Normal	1	1	1	0.2	0.2	∞
Response Time	0	Rectangular	$\sqrt{3}$	1	1	0	0	∞
Integration Time	0	Rectangular	$\sqrt{3}$	1	1	0	0	∞
RF Ambient Noise	0.9	Rectangular	$\sqrt{3}$	1	1	0.52	0.52	∞
RF Ambient Reflection	0.9	Rectangular	$\sqrt{3}$	1	1	0.52	0.52	∞
Probe Positioner	0.7	Rectangular	$\sqrt{3}$	1	1	0.402	0.402	∞
Probe Positioning	6.5	Rectangular	$\sqrt{3}$	1	1	3.752	3.752	∞
Max. SAR Eval.	1.9	Rectangular	$\sqrt{3}$	1	1	1.10	1.10	∞
Dipole Related								
Deviation of exp. dipole	5.3	Rectangular	$\sqrt{3}$	1	1	3.06	3.06	∞
Dipole Axis to Liquid Dist.	2.0	Rectangular	$\sqrt{3}$	1	1	1.15	1.15	∞
Input power & SAR drift	3.3	Rectangular	$\sqrt{3}$	1	1	1.91	1.91	∞
Phantom and Setup								
Phantom Uncertainty	3.9	Rectangular	$\sqrt{3}$	1	1	2.25	2.25	∞
SAR correction	1.8	Rectangular	$\sqrt{3}$	1	0.84	1.04	0.87	∞
Liquid Conductivity(Meas.)	2.4	Normal	1	0.78	0.71	1.87	1.70	∞
Liquid Permittivity(Meas.)	2.4	Normal	1	0.26	0.26	0.62	0.62	∞
Temp. unc. - Conductivity	1.6	Rectangular	$\sqrt{3}$	0.78	0.71	0.72	0.66	∞
Temp. unc. - Permittivity	0.2	Rectangular	$\sqrt{3}$	0.23	0.26	0.02	0.03	∞
Combined Std. Uncertainty						11.16	11.10	
Expanded STD Uncertainty						±22.32%	±22.20%	

11. CONDUCTED POWER MEASUREMENT

GSM BAND

Mode	Frequency(MHz)	Avg. Burst Power(dBm)	Duty cycle Factor(dBm)	Frame Power(dBm)
Maximum Power <1>				
GSM 850	824.2	**31.18**	-9	22.18
	836.6	31.16	-9	22.16
	848.8	31.13	-9	22.13
GPRS 850 （1 Slot）	824.2	30.63	-9	21.63
	836.6	30.61	-9	21.61
	848.8	30.57	-9	21.57
GPRS 850 （2 Slot）	824.2	28.36	-6	**22.36**
	836.6	28.32	-6	22.32
	848.8	28.29	-6	22.29
GPRS 850 （3 Slot）	824.2	26.31	-4.26	22.05
	836.6	26.27	-4.26	22.01
	848.8	26.25	-4.26	21.99
GPRS 850 （4 Slot）	824.2	25.31	-3	22.31
	836.6	25.28	-3	22.28
	848.8	25.25	-3	22.25

GSM BAND CONTINUE

Mode	Frequency(MHz)	Avg. Burst Power(dBm)	Duty cycle Factor(dBm)	Frame Power(dBm)
PCS1900	1850.2	**28.24**	-9	19.24
	1880	28.19	-9	19.19
	1909.8	28.17	-9	19.17
GPRS1900（1 Slot）	1850.2	27.63	-9	18.63
	1880	27.59	-9	18.59
	1909.8	27.55	-9	18.55
GPRS1900（2 Slot）	1850.2	25.39	-6	**19.39**
	1880	25.37	-6	19.37
	1909.8	25.34	-6	19.34
GPRS1900（3 Slot）	1850.2	23.42	-4.26	19.16
	1880	23.41	-4.26	19.15
	1909.8	23.37	-4.26	19.11
GPRS1900（4 Slot）	1850.2	22.36	-3	19.36
	1880	22.34	-3	19.34
	1909.8	22.32	-3	19.32

Note 1:
The Frame Power (Source-based time-averaged Power) is scaled the maximum burst average power based on time slots. The calculated methods are show as following:
Frame Power = Max burst power (1 Up Slot) – 9 dB
Frame Power = Max burst power (2 Up Slot) – 6 dB
Frame Power = Max burst power (3 Up Slot) – 4.26 dB
Frame Power = Max burst power (4 Up Slot) – 3 dB

Bluetooth_V3.0

Modulation	Channel	Frequency(MHz)	Average Power (dBm)
GFSK	0	2402	**-5.09**
	39	2441	-6.39
	78	2480	-8.08
π /4-DQPSK	0	2402	-6.07
	39	2441	-7.23
	78	2480	-9.04
8-DPSK	0	2402	-5.86
	39	2441	-7.14
	78	2480	-8.92

12. TEST RESULTS

12.1. SAR Test Results Summary

12.1.1. Test position and configuration

Head SAR was performed with the front of the device positioned at 10 mm from a flat phantom filled with head tissue-equivalent medium, and Body SAR was performed with the device 0mm from the phantom.

12.1.2. Operation Mode

1. Per KDB 447498 D01 v05r02 ,for each exposure position, if the highest 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional.
2. Per KDB 865664 D01 v01r04,for each frequency band, if the measured SAR is ≥0.8W/Kg, testing for repeated SAR measurement is required , that the highest measured SAR is only to be tested. When the SAR results are near the limit, the following procedures are required for each device to verify these types of SAR measurement related variation concerns by repeating the highest measured SAR configuration in each frequency band.
   (1) When the original highest measured SAR is ≥0.8W/Kg, repeat that measurement once.
   (2) 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.
   (3) Perform a third repeated measurement only if the original, first and second repeated measurement is ≥1.5 W/Kg and ratio of largest to smallest SAR for the original, first and second measurement is ≥ 1.20.
3. Body-worn exposure conditions are intended to voice call operations, therefore GSM voice call mode is selected to be test.
4. Maximum Scaling SAR in order to calculate the Maximum SAR values to test under the standard Peak Power, Calculation method is as follows:
   Maximum Scaling SAR =tested SAR (Max.) ×[maximum turn-up power (mw)/ maximum measurement output power(mw)]

12.1.3. Test Result

SAR MEASUREMENT									
Depth of Liquid (cm):>15				Relative Humidity (%): 45.9					
Product: Mobile Phone									
Test Mode: GSM850 with GMSK modulation									
Position	**Mode**	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2db)**	**SAR (1g) (W/kg)**	**Max. Turn-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit W/kg**
SIM 1 Card									
Body back	voice	190	836.6	-0.02	0.623	32	31.16	0.756	1.6
Face up	voice	190	836.6	-0.08	0.109	32	31.16	0.132	1.6
Body back	GPRS-2 slot	190	836.6	0	0.625	29	28.32	0.731	1.6
Face up	GPRS-2 slot	190	836.6	0	0.109	29	28.32	0.127	1.6

Note:
· When the 1-g Reported SAR is ≤ 0.8 W/kg, testing for low and high channel is optional. Refer to KDB 447498.

SAR MEASUREMENT									
Depth of Liquid (cm):>15				Relative Humidity (%): 48.7					
Product: Mobile Phone									
Test Mode: PCS1900 with GMSK modulation									
Position	**Mode**	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2db)**	**SAR (1g) (W/kg)**	**Max. Turn-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit W/kg**
Body back	voice	661	1880.0	-0.16	0.627	29	28.19	0.756	1.6
Face up	voice	661	1880.0	-0.05	0.443	29	28.19	0.534	1.6
Body back	GPRS-2 slot	512	1850.2	-0.09	1.116	26	25.39	1.284	1.6
Body back	GPRS-2 slot	661	1880	-0.03	1.180	26	25.37	1.364	1.6
Body back	GPRS-2 slot	810	1909.8	0.14	1.260	26	25.34	**1.467**	1.6
Face up	GPRS-2 slot	661	1880.0	-0.01	0.480	26	25.37	0.555	1.6

Note:
· When the 1-g Reported SAR is ≤ 0.8 W/kg, testing for low and high channel is optional. Refer to KDB 447498.

Repeated SAR										
Product: Mobile Phone										
Test Mode: PCS1900 with GMSK modulation										
Position	**Mode**	**Ch.**	**Fr. (MHz)**	**Power Drift (<±5%)**	**Once SAR (1g) (W/kg)**	**Power Drift (<±5%)**	**Twice SAR (1g) (W/kg)**	**Power Drift (<±5%)**	**Third SAR (1g) (W/kg)**	**Limit W/kg**
Body back	GPRS-2 slot	810	1909.8	-0.09	1.070	-0.03	1.190	-	-	1.6

Simultaneous Multi-band Transmission Evaluation:

Application Simultaneous Transmission information:

NO	Simultaneous state	Portable Handset		
		Head	Body-worn	Hotspot
2	GSM(voice)+Bluetooth(data)	-	Yes	-
3	GSM (Data)+Bluetooth(data)	-	Yes	-

NOTE:

1. For simultaneous transmission at head and body exposure position, 1 transmitters simultaneous transmission was the worst state.
2. Based upon KDB 447498 D01, BT SAR is excluded as below table.
3. Based upon KDB 447498 D01,for handsets the test separation distance is determined by the smallest distance between the outer surface of the device and the user; which is 0mm for head SAR AND 10mm for body-worn SAR.
4. If the test separation distance is <5mm, 5mm is used for excluded SAR calculation.
5. According to KDB447497 D01 4.3.2, simultaneous transmission SAR test exclusion is as follow:
   (1) Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna.
   (2) Any transmitters and antennas should be considered when calculating simultaneous mode.
   (3) For mobile phone and PC, it's the sum of all transmitters and antennas at the same mode with same position in each applicable exposure condition
   (4) When the standalone SAR test exclusion of section 4.3.1 is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following to determine simultaneous transmission SAR test exclusion:

   (max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;

   where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
6. When the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio. The simultaneous transmitting antennas in each operating mode and exposure condition combination must be considered one pair at a time to determine the SAR to peak location separation ratio to qualify for test exclusion. The ratio is determined by (SAR1 + SAR2)1.5/Ri, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion.

Estimated SAR		Max Power including Tune-up Tolerance		Separation Distance (mm)	Estimated SAR (W/kg)
		dBm	mW		
BT	Head	-4	63.096	10	0.008
	Body			0	0.016

Maximum test results (WWAN) with BT SAR:
BT: Head (1.0 cm gap): 0.008 W/kg and Body (0cm gap): 0.008 W/kg

Sum of the SAR for GSM 850 &Wi-Fi & BT:

RF Exposure Conditions	Test Position	Simultaneous Transmission Scenario		Σ1-g SAR (W/Kg)	SPLSR (Yes/No)
		GSM 850 Band	Bluetooth		
Body-worn (voice)	Rear	0.756	0.016	0.772	No
	Face up	0.132	0.008	0.140	No
Body-worn(data)	Rear	0.731	0.016	0.747	No
	Face up	0.127	0.008	0.135	No

Note:

- According to KDB 447498 D01 General RF Exposure Guidance, when the simultaneous transmission SAR is less than1.6 W/Kg, SPLSR assessment is not required.
- SPLSR mean is "The SAR to Peak Location Separation Ratio "

Sum of the SAR for GSM 1900 &Wi-Fi & BT:

RF Exposure Conditions	Test Position	Simultaneous Transmission Scenario		Σ1-g SAR (W/Kg)	SPLSR (Yes/No)
		GSM 1900 Band	Bluetooth		
Body-worn (voice)	Rear	0.756	0.016	0.772	No
	Face up	0.534	0.008	0.542	No
Body-worn(data)	Rear	1.467	0.016	1.483	No
	Face up	0.555	0.008	0.563	No

Note:

- According to KDB 447498 D01 General RF Exposure Guidance, when the simultaneous transmission SAR is less than1.6 W/Kg, SPLSR assessment is not required.
- SPLSR mean is "The SAR to Peak Location Separation Ratio "

APPENDIX A. SAR SYSTEM CHECK DATA

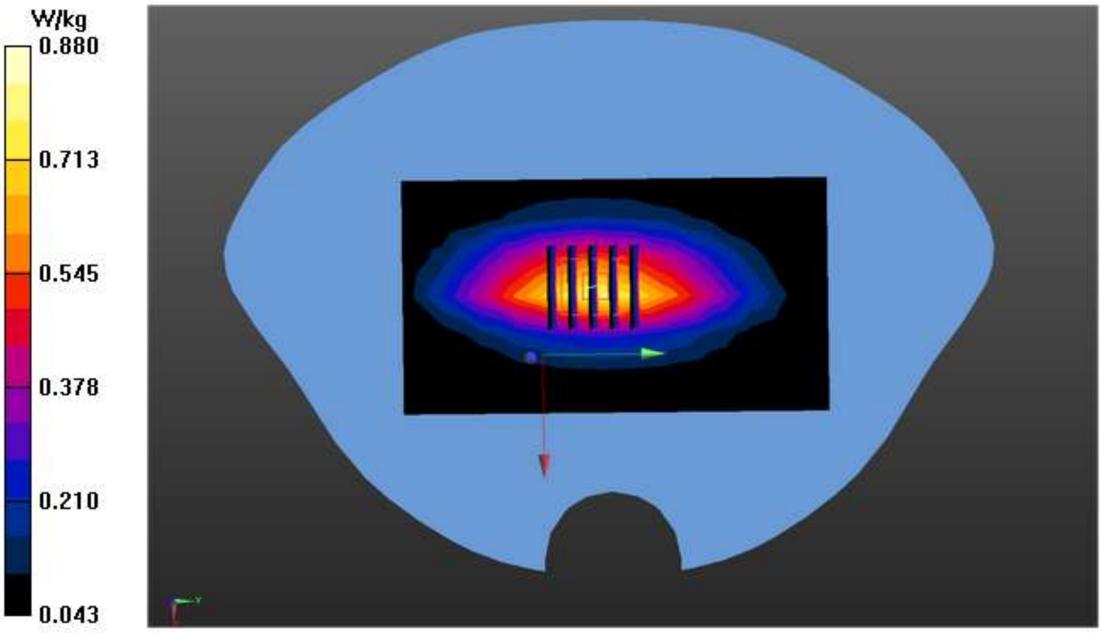
Test Laboratory: AGC Lab **Date: Sep. 15,2015**
System Check Head 835 MHz
DUT: Dipole 835MHz Type: SID 835
Communication System CW; Communication System Band: D835 (835.0 MHz); Duty Cycle: 1:1;
Frequency: 835 MHz; Medium parameters used: f = 835 MHz; σ=0.89 mho/m; εr =42.31; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃): 22.0, Liquid temperature (℃): 21.7

DASY Configuration:

- Probe: EX3DV4 - SN3953; ConvF(10.12, 10.12, 10.12); Calibrated:11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 835MHz Head/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.805 W/kg

Configuration/System Check 835MHz Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.344 V/m; Power Drift =0.07 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.631 W/kg; SAR(10 g) = 0.373 W/kg
Maximum value of SAR (measured) = 0.880 W/kg



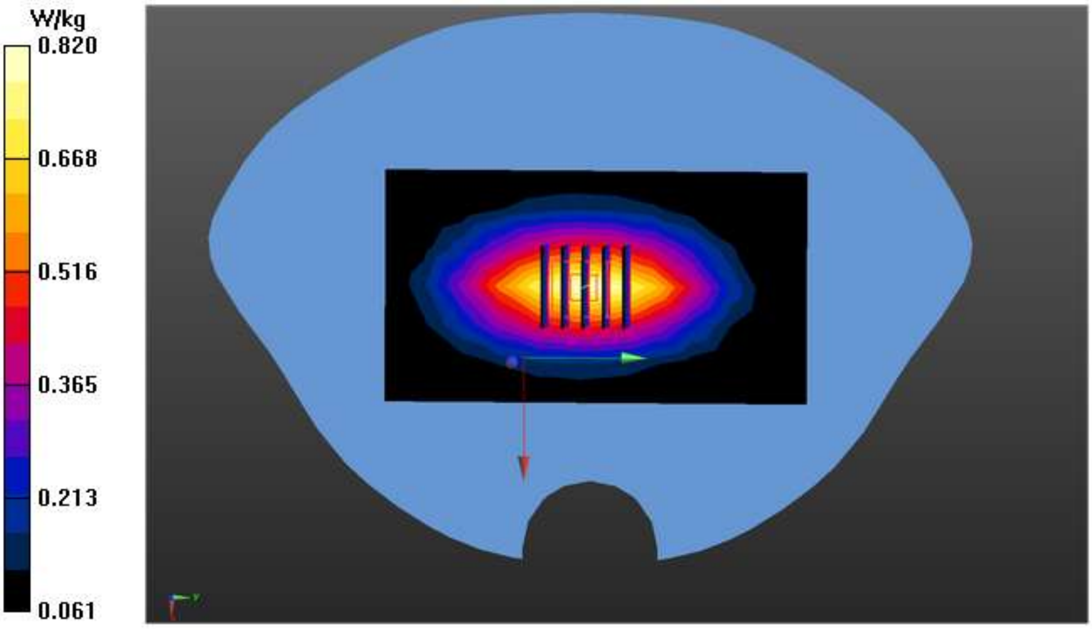
Test Laboratory: AGC Lab **Date: Sep. 15,2015**
System Check Body 835 MHz
DUT: Dipole 835 MHz Type: SID 835
Communication System CW; Communication System Band: D835 (835.0 MHz); Duty Cycle: 1:1;
Frequency: 835 MHz; Medium parameters used: f = 835 MHz; σ=0.96mho/m; εr =54.57; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃): 22.0, Liquid temperature (℃): 21.9

DASY Configuration:

- Probe: EX3DV4 - SN3953; ConvF(10.08,10.08, 10.08); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 835MHz Body/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.818 W/kg

Configuration/System Check 835MHz Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.968 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.969 W/kg
SAR(1 g) = 0.644 W/kg; SAR(10 g) = 0.419 W/kg
Maximum value of SAR (measured) = 0.820 W/kg

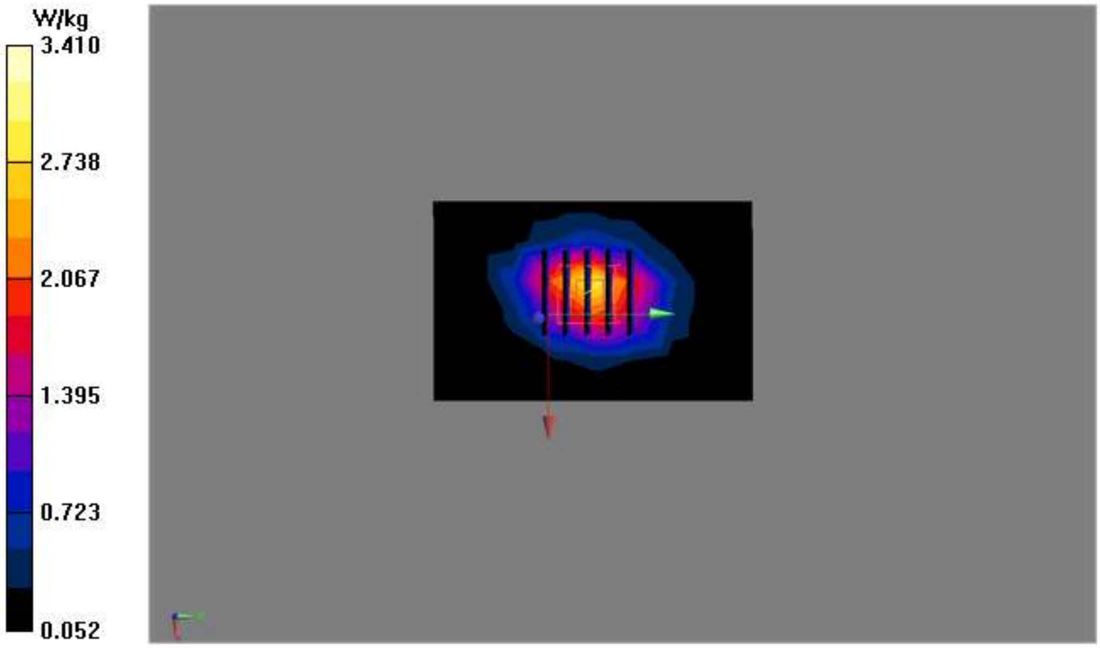


Test Laboratory: AGC Lab **Date: Sep. 16,2015**
System Check Head 1900MHz
DUT: Dipole 1900 MHz; Type: SID 1900
Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Duty Cycle:1:1;
Frequency: 1900 MHz; Medium parameters used: f = 1900 MHz; σ=1.44 mho/m; εr =39.89; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃):21.4, Liquid temperature (℃): 21.5

DASY Configuration:
- Probe: EX3DV4 - SN3953; ConvF(7.89, 7.89, 7.89); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 1900MHz Head/ Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.04 W/kg

Configuration/System Check 1900MHz Head/ Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.046 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 4.41 W/kg
SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.28 W/kg
Maximum value of SAR (measured) = 3.41 W/kg

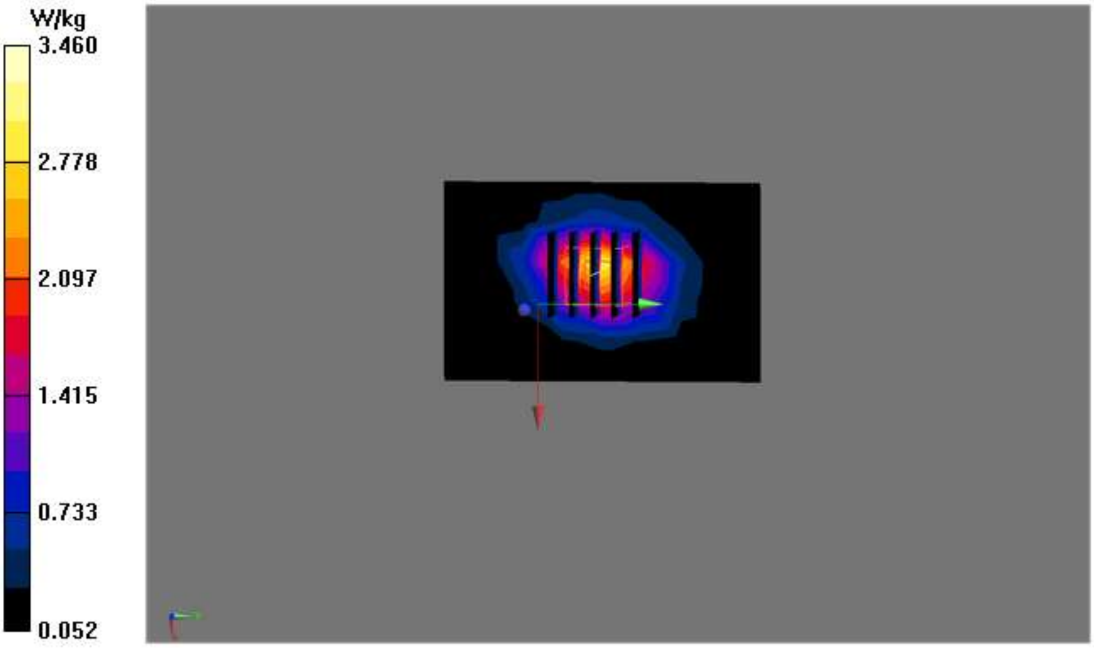


Test Laboratory: AGC Lab **Date: Sep. 16,2015**
System Check Body 1900MHz
DUT: Dipole 1900 MHz; Type: SID 1900
Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Duty Cycle:1:1;
Frequency: 1900 MHz; Medium parameters used: f = 1900 MHz; σ=1.53 mho/m; εr =53.14; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃):21.4, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 - SN3953; ConvF(7.79,7.79,7.79); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 1900MHz Body/ Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.08 W/kg

Configuration/System Check 1900MHz Body/ Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.119 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 4.50 W/kg
SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.3 W/kg
Maximum value of SAR (measured) = 3.46 W/kg



APPENDIX B. SAR MEASUREMENT DATA

Test Laboratory: AGC Lab **Date: Sep. 15,2015**
GSM 850 Mid- Body- Back(MS)<SIM 1>
DUT: Mobile Phone; Type: S-watch 2.0

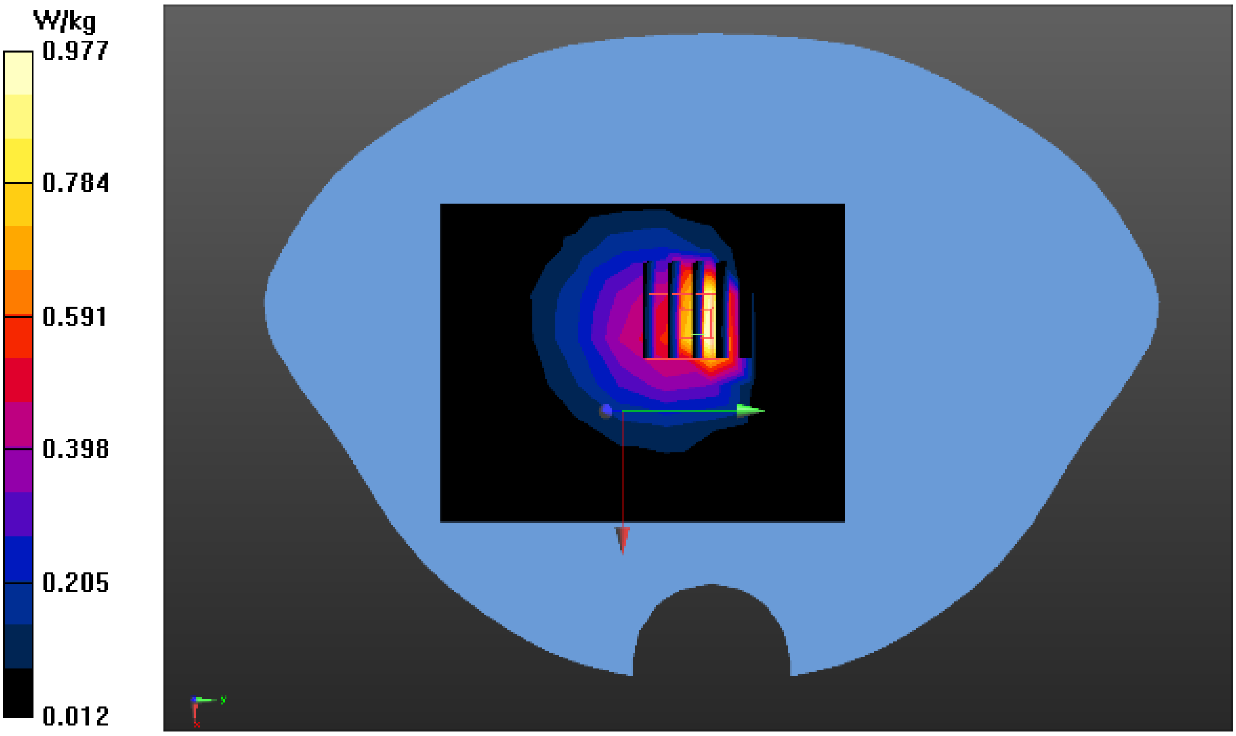
Communication System: UID 0, Generic GSM (0); Communication System Band: GSM 850 (824.2 – 848.8 MHz); Duty Cycle: 1:8.3;Frequency: 836.6 MHz; Medium parameters used: f = 835 MHz; σ= 0.97 mho/m; εr =54.13; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):22.0, Liquid temperature (℃): 21.9

DASY Configuration:

- Probe: EX3DV4 - SN3953; ConvF(10.08,10.08, 10.08); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QDOVA002AA;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Body back/Back/Area Scan (8x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.992 W/kg

Body back/Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.464 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.623 W/kg; SAR(10 g) = 0.339 W/kg
Maximum value of SAR (measured) = 0.977 W/kg



Test Laboratory: AGC Lab **Date: Sep. 15,2015**
GSM 850 Mid- Face up(MS)<SIM 1>
DUT: Mobile Phone; Type: S-watch 2.0

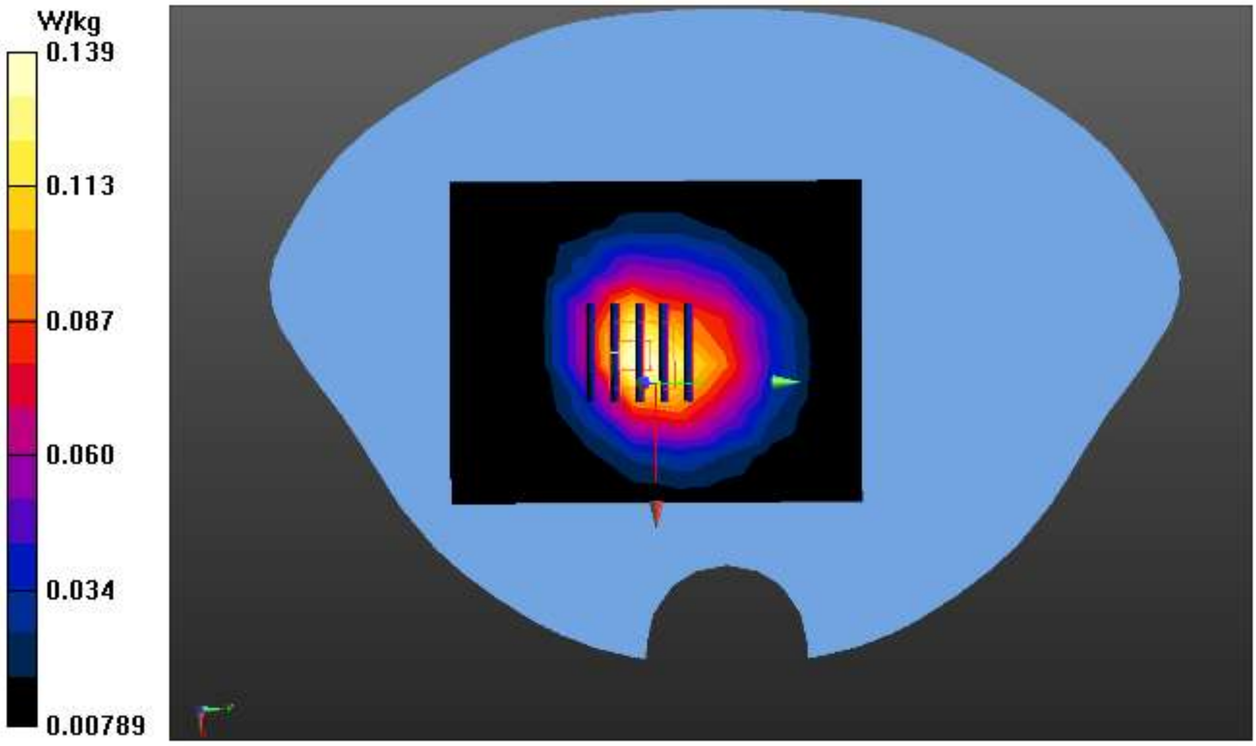
Communication System: UID 0, Generic GSM (0); Communication System Band: GSM 850 (824.2 – 848.8 MHz); Duty Cycle: 1:8.3;Frequency: 836.6 MHz; Medium parameters used: f = 835 MHz; σ= 0.90 mho/m; εr = 42.00; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):22.0, Liquid temperature (℃): 21.9

DASY Configuration:

- Probe: EX3DV4 - SN3953; ConvF(10.12, 10.12, 10.12); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QDOVA002AA;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Face up/Area Scan (8x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.145 W/kg

Face up/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.264 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.181 W/kg
SAR(1 g) = 0.109 W/kg; SAR(10 g) = 0.068 W/kg
Maximum value of SAR (measured) = 0.139 W/kg



Test Laboratory: AGC Lab **Date: Sep. 15,2015**
GPRS 850 Mid- Body- Back (2up) < SIM 1>
DUT: Mobile Phone; Type: S-watch 2.0

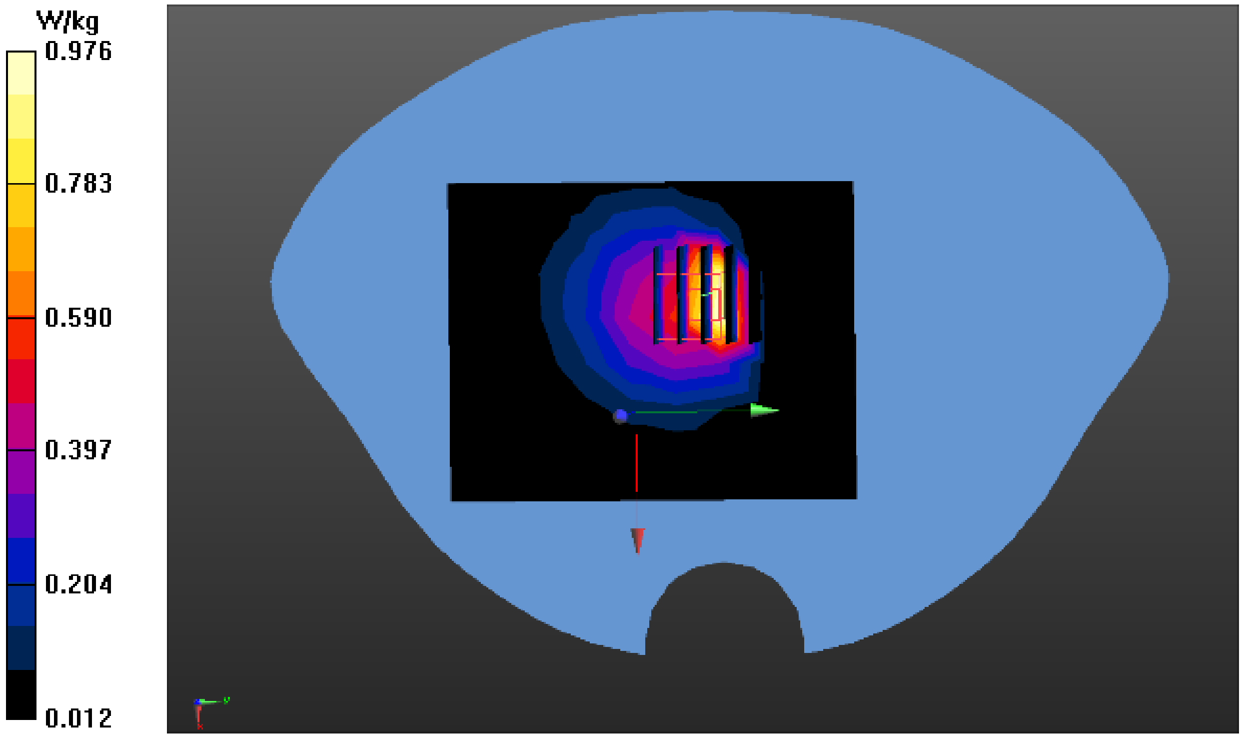
Communication System: GPRS-2 Slot; Communication System Band: GSM 850 (824.2 – 848.8 MHz); Duty Cycle: 1:4.2;;Frequency: 836.6 MHz; Medium parameters used: f = 835 MHz; σ= 0.97 mho/m; εr =54.13;;ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):22.0, Liquid temperature (℃): 21.9

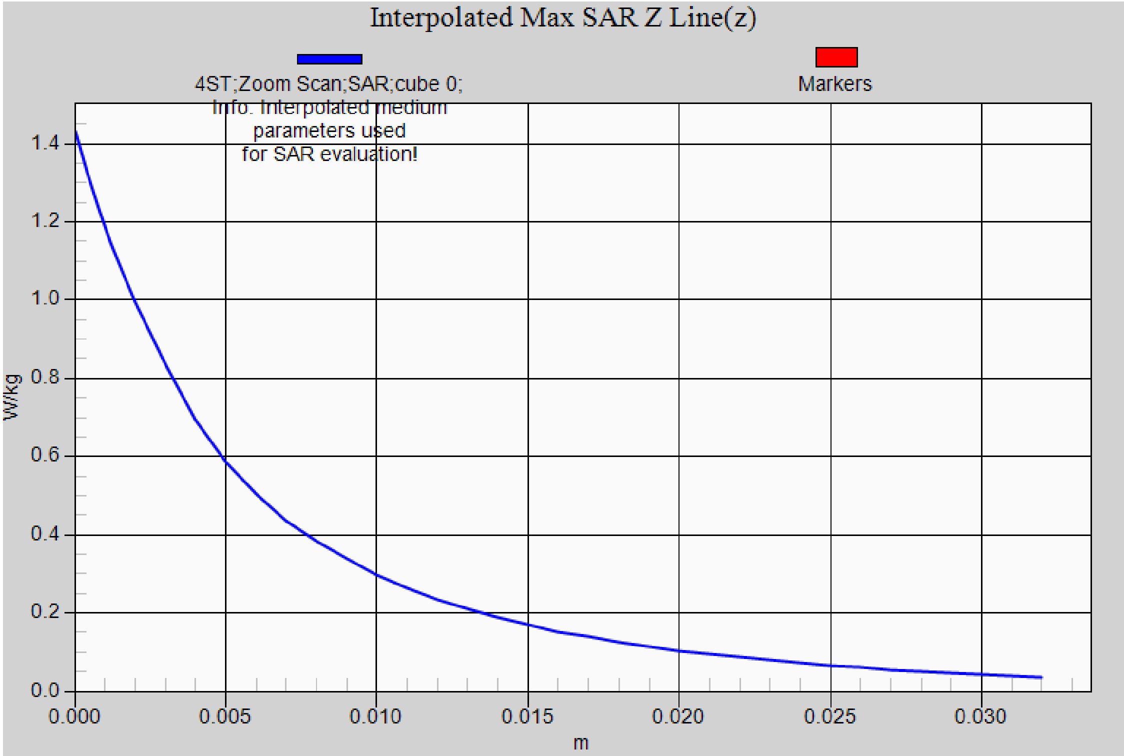
DASY Configuration:

- Probe: EX3DV4 - SN3953; ConvF(10.08,10.08, 10.08); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QDOVA002AA;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Body back/2ST/Area Scan (8x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.986 W/kg

Body back/2ST/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.135 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.625 W/kg; SAR(10 g) = 0.340 W/kg
Maximum value of SAR (measured) = 0.976 W/kg




Interpolated Max SAR Z Line(z)
4ST;Zoom Scan;SAR;cube 0;
Info: Interpolated medium
parameters used
for SAR evaluation!
Markers
W/kg
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

Test Laboratory: AGC Lab **Date: Sep. 15,2015**
GPRS 850 Mid- Face up(2up) < SIM 1>
DUT: Mobile Phone; Type: S-watch 2.0

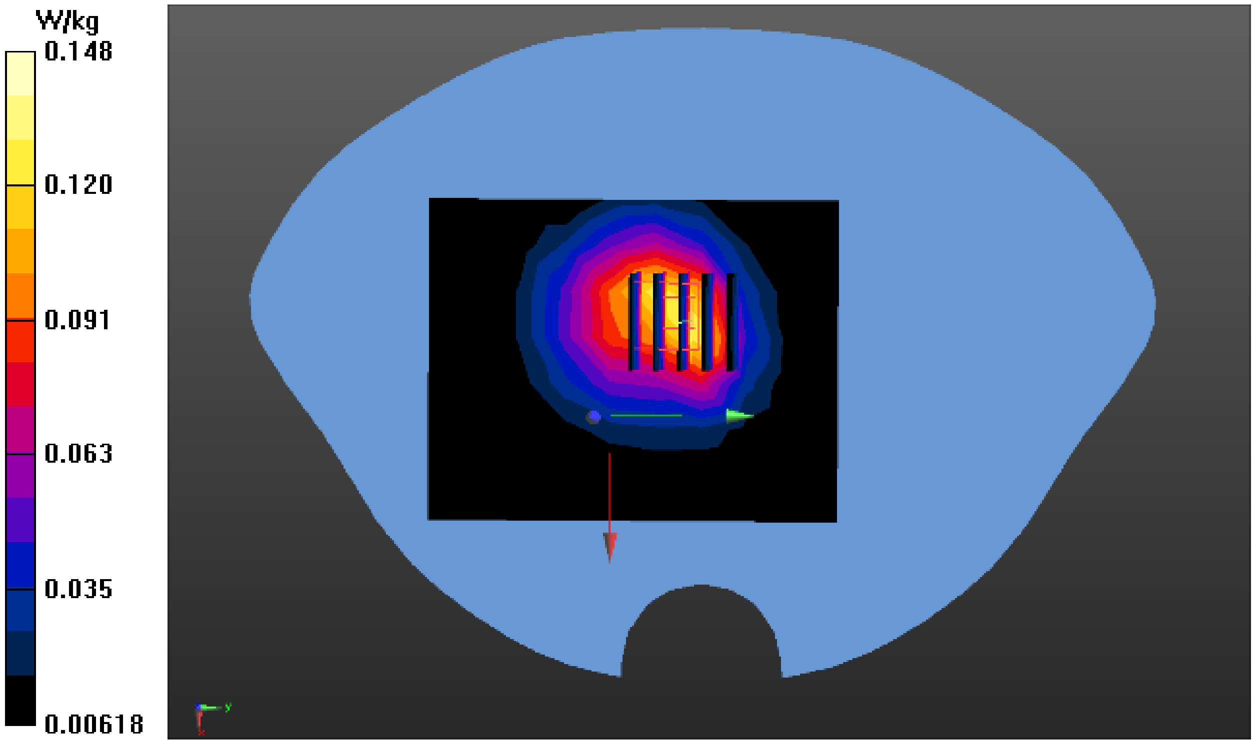
Communication System: GPRS-2 Slot; Communication System Band: GSM 850 (824.2 – 848.8 MHz); Duty Cycle: 1:4.2;Frequency: 836.6 MHz; Medium parameters used: f = 835 MHz; σ= 0.90 mho/m; εr = 42.00;;ρ= 1000 kg/m^3 ;
Phantom section: Flat Section
Ambient temperature (℃):22.0, Liquid temperature (℃): 21.9

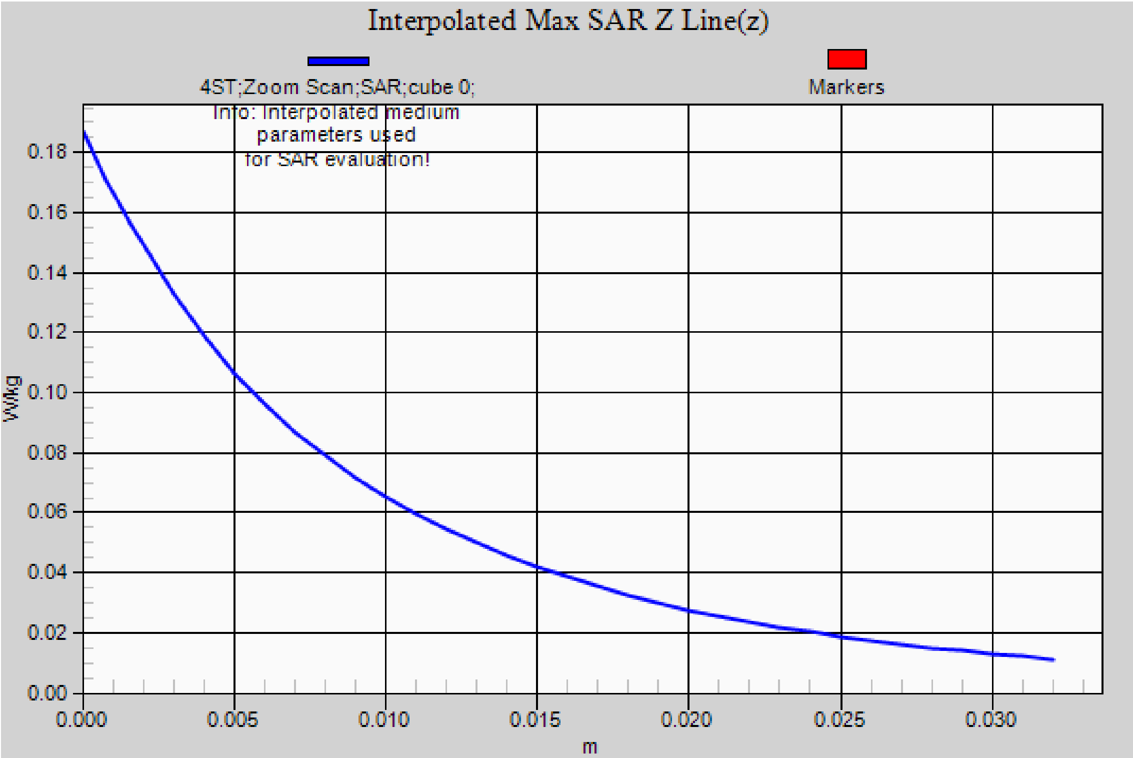
DASY Configuration:

- Probe: EX3DV4 - SN3953; ConvF(10.12, 10.12, 10.12); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QDOVA002AA;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Face up/2ST/Area Scan (8x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.129 W/kg

Face up/2ST/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.135 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.187 W/kg
SAR(1 g) = 0.109 W/kg; SAR(10 g) = 0.067 W/kg
Maximum value of SAR (measured) = 0.148 W/kg




Interpolated Max SAR Z Line(z)
4ST;Zoom Scan;SAR;cube 0;
Markers
Info: Interpolated medium
parameters used
for SAR evaluation!
W/kg
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

Test Laboratory: AGC Lab **Date: Sep. 16,2015**
PCS 1900 Mid-Body- Back(MS) <SIM1>
DUT: Mobile Phone; Type: S-watch 2.0

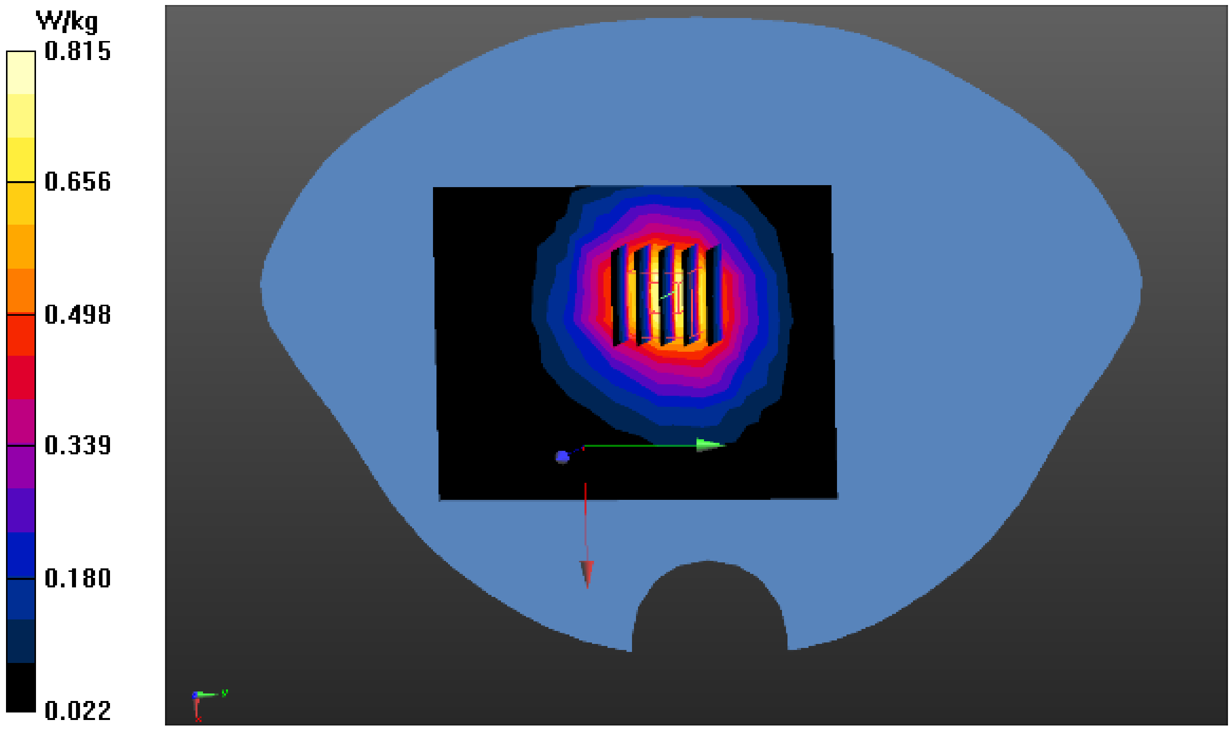
Communication System: UID 0, Generic GSM (0); Communication System Band: PCS 1900 (1850.2 – 1909.8 MHz); Duty Cycle: 1:8.3; Frequency: 1880 MHz; Medium parameters used: f = 1900 MHz; σ= 1.49 mho/m; εr =53.91; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):21.4, Liquid temperature (℃): 21.3

DASY Configuration:

- Probe: EX3DV4 - SN3953; ConvF(7.79,7.79,7.79); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Body back/Back/Area Scan (8x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.768 W/kg

Body back/Back/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.595 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.627 W/kg; SAR(10 g) = 0.372 W/kg
Maximum value of SAR (measured) = 0.815 W/kg



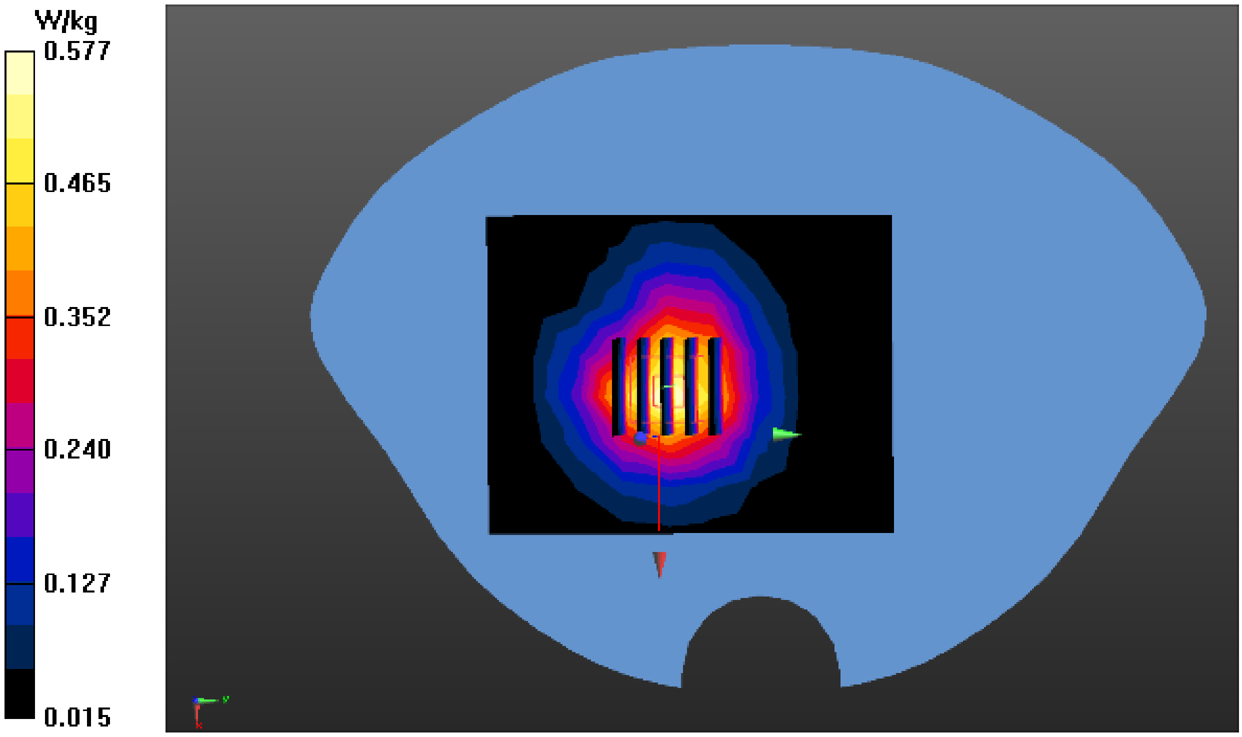
Test Laboratory: AGC Lab **Date: Sep. 16,2015**
PCS 1900 Mid- Face up(MS) <SIM1>
DUT: Mobile Phone; Type: S-watch 2.0

Communication System: UID 0, Generic GSM (0); Communication System Band: PCS 1900 (1850.2 – 1909.8 MHz); Duty Cycle: 1:8.3; Frequency: 1880 MHz; Medium parameters used: f = 1900 MHz; σ= 1.42 mho/m; εr =40.02; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):21.4, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 - SN3953; ConvF(7.89, 7.89, 7.89); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Face up/Area Scan (8x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.604 W/kg

Face up/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.339 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.699 W/kg
SAR(1 g) = 0.443 W/kg; SAR(10 g) = 0.266 W/kg
Maximum value of SAR (measured) = 0.577 W/kg



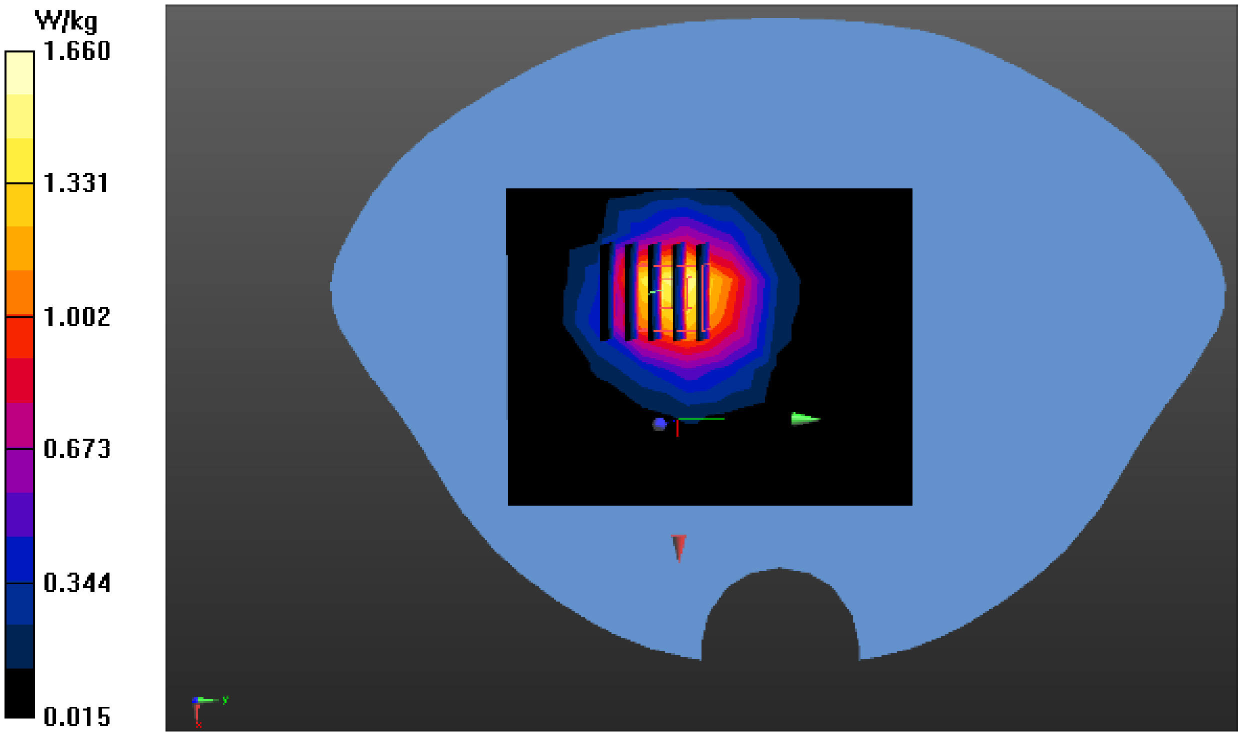
Test Laboratory: AGC Lab **Date: Sep. 16,2015**
GPRS 1900High-Body- Back (2up) < SIM 1>
DUT: Mobile Phone; Type: S-watch 2.0

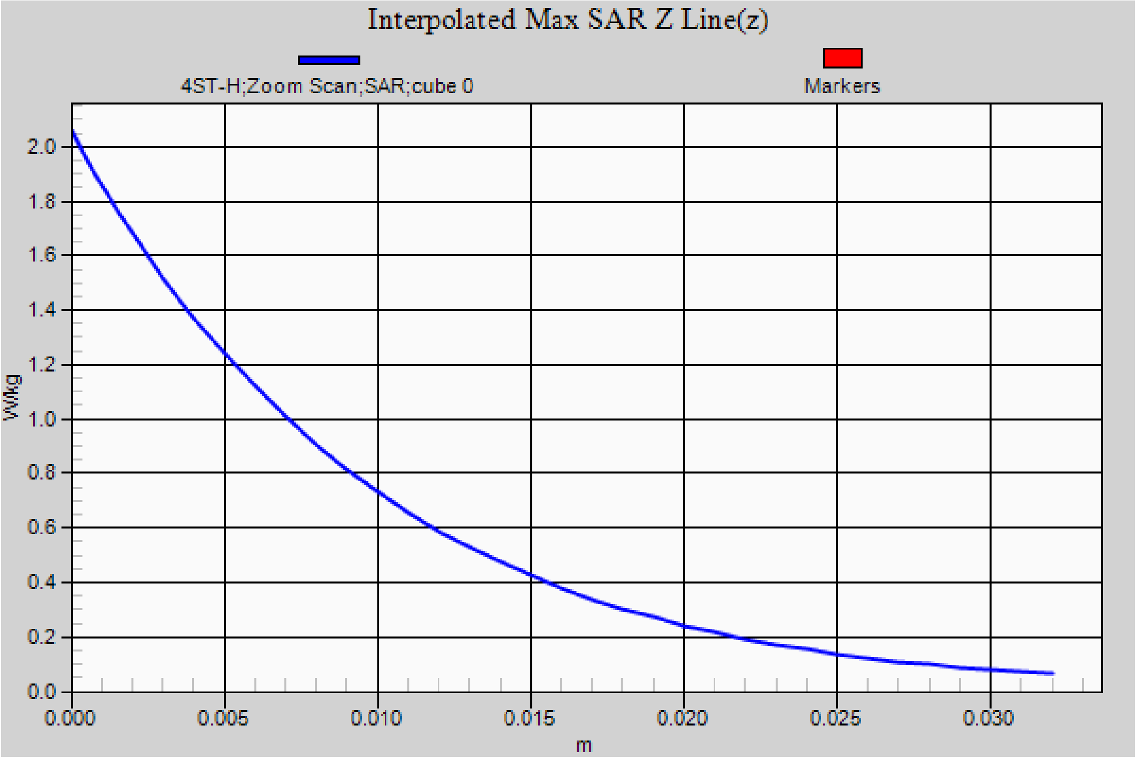
Communication System: GPRS-2 Slot; Communication System Band: PCS 1900 (1850.2 – 1909.8 MHz); Duty Cycle: 1:4.2; Frequency: 1909.8 MHz; Medium parameters used: f = 1900 MHz; σ= 1.55mho/m; εr =52.68; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):21.4, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 - SN3953; ConvF(7.79,7.79,7.79); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Body back/2ST-H/Area Scan (8x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.55 W/kg

Body back/2ST-H/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.331 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 2.06 W/kg
SAR(1 g) = 1.26 W/kg; SAR(10 g) = 0.731 W/kg
Maximum value of SAR (measured) = 1.66 W/kg




Interpolated Max SAR Z Line(z)
4ST-H;Zoom Scan;SAR;cube 0
Markers
W/kg
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

Test Laboratory: AGC Lab **Date: Sep. 16,2015**
GPRS 1900 Mid-Face up (2up) < SIM 1>
DUT: Mobile Phone; Type: S-watch 2.0

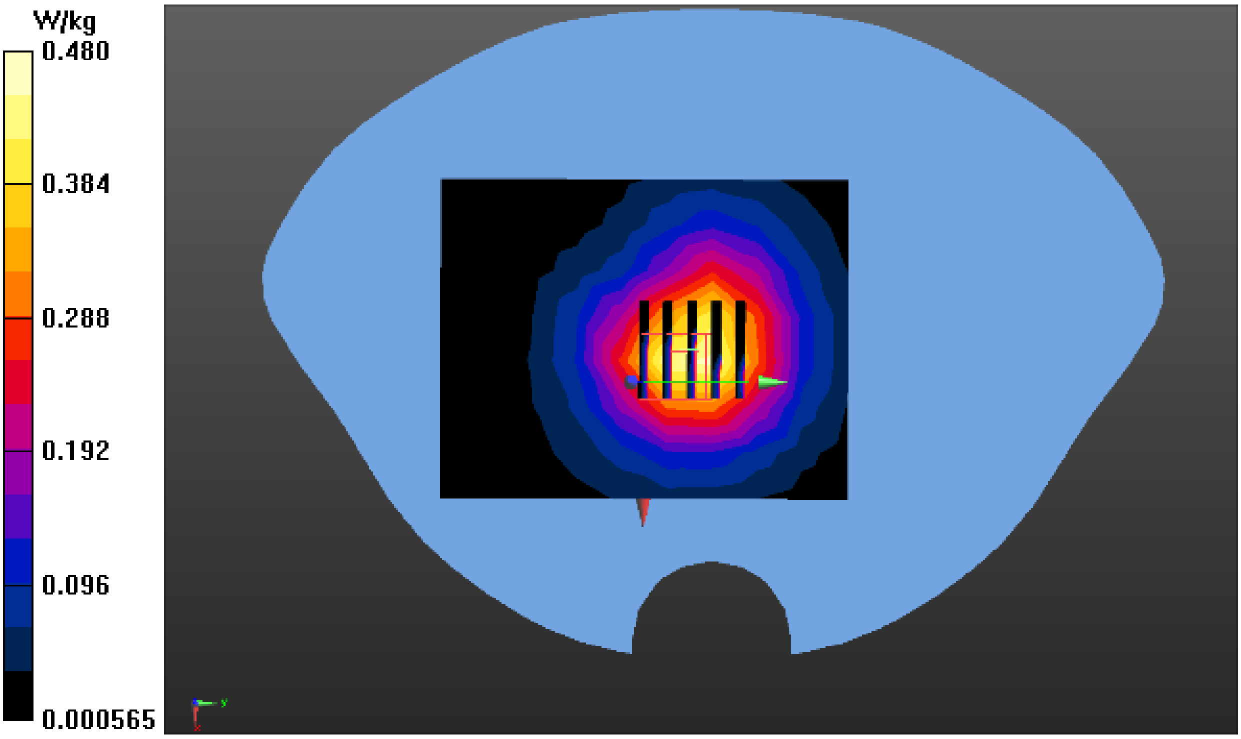
Communication System: GPRS-2 Slot; Communication System Band: PCS 1900 (1850.2 – 1909.8 MHz); Duty Cycle: 1:4.2; Frequency: 1880 MHz; Medium parameters used: f = 1900 MHz; σ= 1.42 mho/m; εr =40.02; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):21.4, Liquid temperature (℃): 21.3

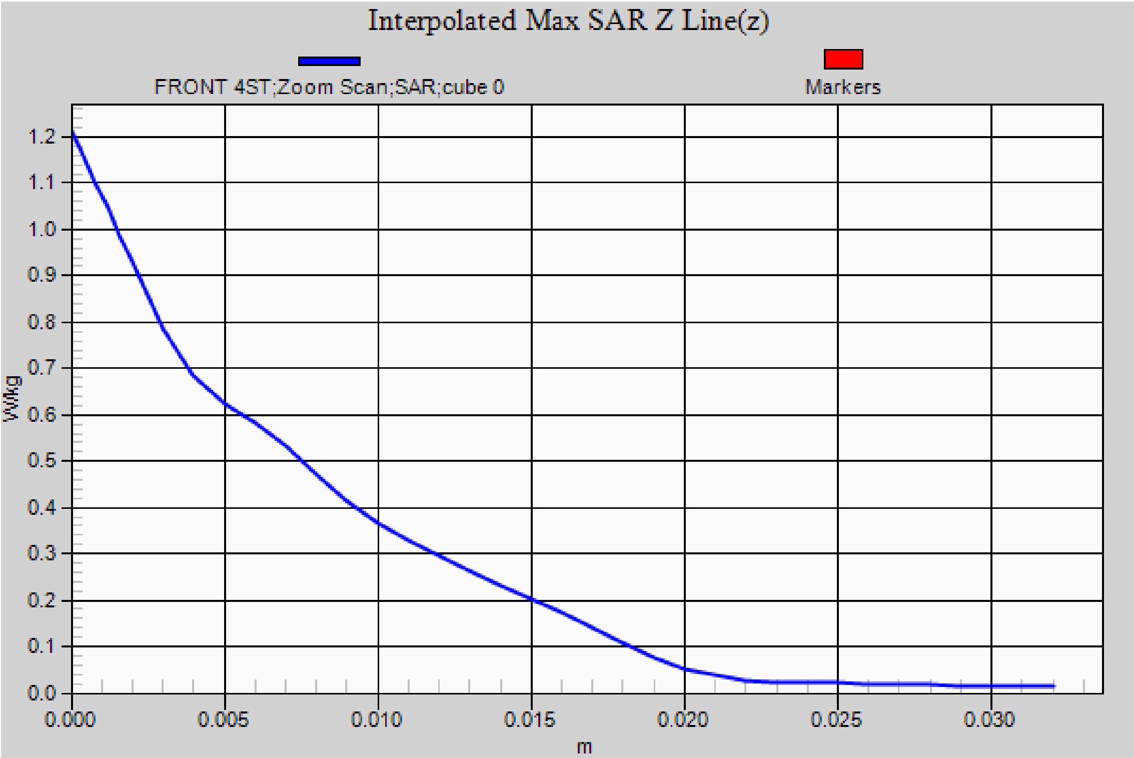
DASY Configuration:

- Probe: EX3DV4 - SN3953; ConvF(7.89, 7.89, 7.89); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Face up/2ST/Area Scan (8x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.459 W/kg

Face up/2ST/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.168 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.480 W/kg; SAR(10 g) = 0.193 W/kg
Maximum value of SAR (measured) = 0.480 W/kg




Interpolated Max SAR Z Line(z)
FRONT 4ST;Zoom Scan;SAR;cube 0
Markers
W/kg
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

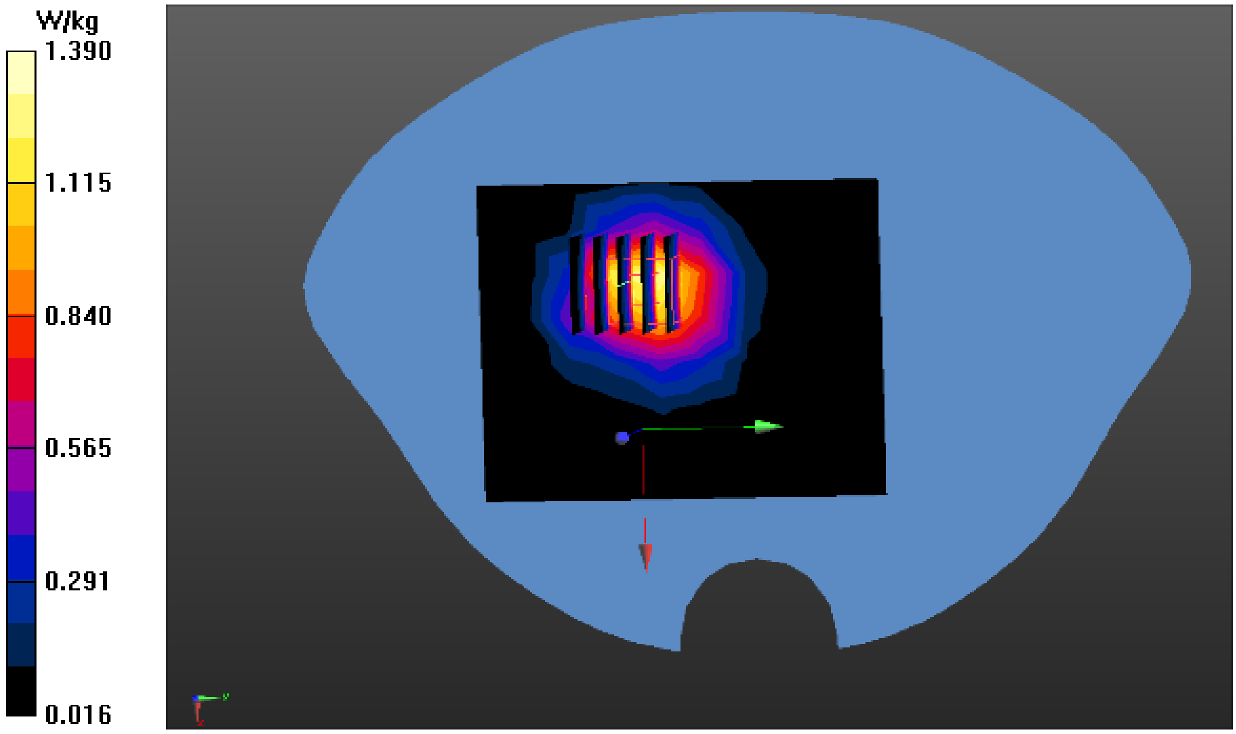
Repeated Once
Test Laboratory: AGC Lab **Date: Sep. 16,2015**
GPRS 1900High-Body- Back (2up) < SIM 1>
DUT: Mobile Phone; Type: S-watch 2.0

Communication System: GPRS-2 Slot; Communication System Band: PCS 1900 (1850.2 – 1909.8 MHz); Duty Cycle: 1:4.2; Frequency: 1909.8 MHz; Medium parameters used: f = 1900 MHz; σ= 1.55mho/m; εr =52.68; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):21.4, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 - SN3953; ConvF(7.79,7.79,7.79); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Body back/2ST-L/Area Scan (8x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.31 W/kg

Body back/2ST-L/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.468 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.623 W/kg
Maximum value of SAR (measured) = 1.39 W/kg



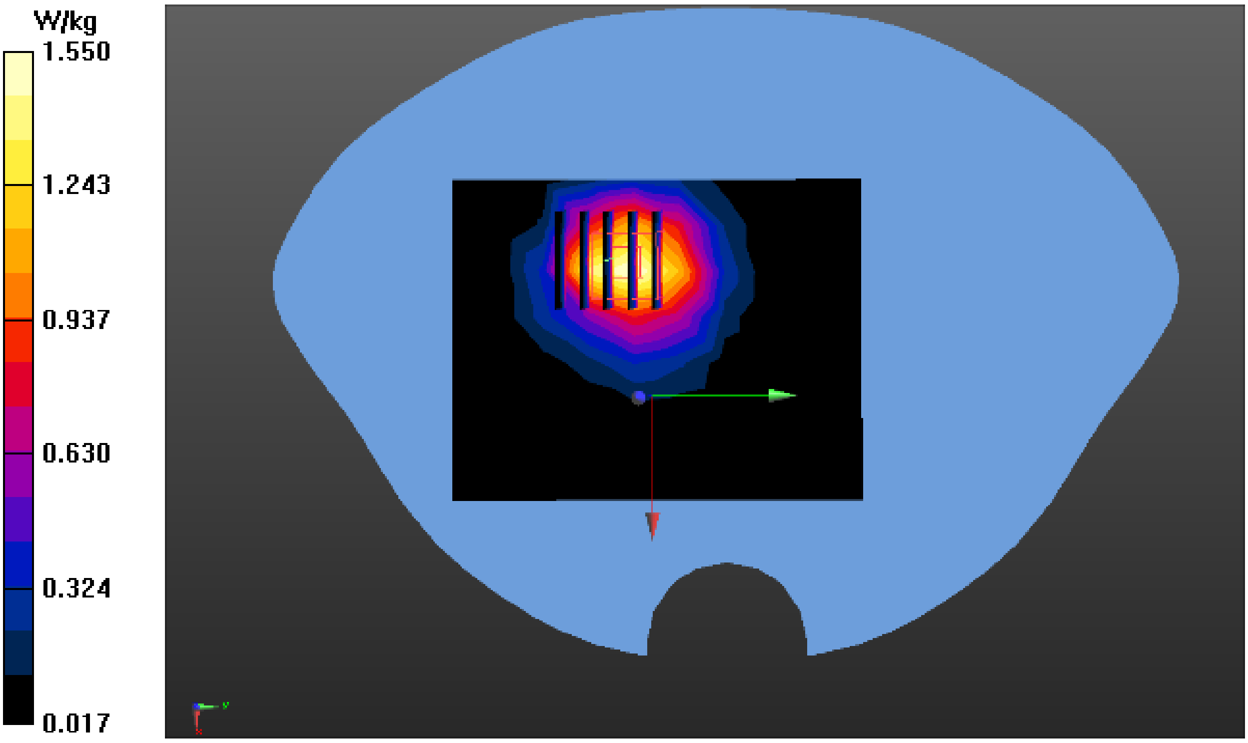
Repeated Twice
Test Laboratory: AGC Lab **Date: Sep. 16,2015**
GPRS 1900High-Body- Back (2up) < SIM 1>
DUT: Mobile Phone; Type: S-watch 2.0

Communication System: GPRS-2 Slot; Communication System Band: PCS 1900 (1850.2 – 1909.8 MHz); Duty Cycle: 1:4.2; Frequency: 1909.8 MHz; Medium parameters used: f = 1900 MHz; σ= 1.55mho/m; εr =52.68; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):21.4, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 - SN3953; ConvF(7.79,7.79,7.79); Calibrated: 11/06/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1398; Calibrated: 03/11/2015
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Body back/2ST/Area Scan (8x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.58 W/kg

Body back/2ST/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.348 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.91 W/kg
SAR(1 g) = 1.19 W/kg; SAR(10 g) = 0.694 W/kg
Maximum value of SAR (measured) = 1.55 W/kg



APPENDIX C. TEST SETUP PHOTOGRAPHS & EUT PHOTOGRAPHS

Refer to Attached files.

APPENDIX D. CALIBRATION DATA

Refer to Attached files.