SAR TEST REPORT

Report Reference No.................... :	**JTT20160112**
FCC ID... :	**AUJPXDZPX800S**
IC .... :	**11334A-PXDZPX800S**
Compiled by (position+printed name+signature)..:	File administrators Kevin Liu
Supervised by (position+printed name+signature)..:	Project Engineer Kevin Liu
Approved by (position+printed name+signature)..:	RF Manager Eric Wang
Date of issue....................................:	March 01, 2016
Testing Laboratory Name ....:	**Shenzhen Yidajietong Test Technology Co., Ltd.**
Address ....:	3/F., Building 12, Shangsha Innovation & Technology Park, Futian District, Shenzhen, Guangdong, China
Applicant's name............................:	**Xiamen Puxing Electronics Science & Technology Co.,Ltd.**
Address ....:	FL3-4 NO.11, XiangHong Road, Xiang'An District, Xiamen China
Test specification .... :	
Standard ....:	**IEEE 1528:2013** **RSS-102** **47CFR §2.1093**
TRF Originator..................................:	Shenzhen Yidajietong Test Technology Co., Ltd.
Master TRF......................................:	Dated 2014-01

Test item description ....:	**GSM Radio**
Trade Mark ....:	PUXING
Manufacturer ....:	**Xiamen Puxing Electronics Science & Technology Co., Ltd.**
Model/Type reference.......................:	PX-800S
Listed Models ....:	/
Ratings ....:	DC 7.40V
EUT Type ....:	Production Unit
Exposure category............................:	General population / Uncontrolled environment
Result..:	**PASS**

TEST REPORT

Test Report No. :	JTT201601012	Jan 25, 2016 Date of issue

Equipment under Test	:	GSM Radio
Model /Type	:	PX-800S
Listed Models	:	/
Applicant	:	**Xiamen Puxing Electronics Science & Technology Co., Ltd.**
Address	:	FL3-4 NO.11, XiangHong Road, Xiang'An District, Xiamen China
Manufacturer	:	**Xiamen Puxing Electronics Science & Technology Co., Ltd.**
Address	:	FL3-4 NO.11, XiangHong Road, Xiang'An District, Xiamen China

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

** Modifited History **

Revison	Description	Issued Data	Remark
Revsion 1.0	Initial Test Report Release	2016-01-25	Eric Wang
Revsion 1.1	1. Renew test data from 2015 into 2016 by mistake 2. Revised modulation type into GXW 3. Delete GPRS description	2016-03-01	Eric Wang
Revsion 1.2	1. Revised SAR Duty Cycle from 50% into 100%	2016-03-23	Eric Wang

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

IEEE 1528-2013 (2014-06): Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
IEEE Std. C95-3 (2002): IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave
IEEE Std. C95-1 (1992): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
IEC 62209-2 (2010): Human exposure to radio frequency fields from hand-held and bodymounted wireless communication devices. Human models, instrumentation, and procedures. Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)
KDB 865664D01v01r04 (August 7, 2015): SAR Measurement Requirements for 100 MHz to 6 GHz
KDB 865664D02v01r02 (October 23, 2015): RF Exposure Compliance Reporting and Documentation Considerations
447498 D01 General RF Exposure Guidance v06 (October 23, 2015): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
RSS-102 Issue 5 (March 2015): Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
KDB941225 D01 3G SAR Procedures v03r01: 3G SAR MEAUREMENT PROCEDURES
KDB648474 D04, Handset SAR v01r03: SAR Evaluation Considerations for Wireless Handsets

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Jan 13, 2016
Testing commenced on	:	Jan 18, 2016
Testing concluded on	:	Jan 19, 2016

2.2. Product Description

EUT Name	:	GSM Radio
Model Number	:	PX-800S
Trade Mark	:	PUXING
EUT function description	:	Please reference user manual of this device
Power supply	:	DC 7.40V from battery
Operation frequency range	:	GSM850: 824.2MHz – 848.8MHz PCS1900: 1850.2MHz – 1908.8MHz
Modulation type	:	GMSK
Power Level	:	GSM850:Power Class 4/ PCS1900:Power Class 1
Emission type	:	GXW
Antenna Type	:	External
Date of Receipt	:	2016/01/13
Device Type	:	Portable
Sample Type	:	Prototype Unit
Exposure category:	:	General population / Uncontrolled environment

2.3. Summary SAR Results

FCC/IC			
Classment Class	**Frequency Band**	**Position**	**Maximum Report SAR Results (W/Kg)**
			100% duty cycle
PCE	GSM850	Face-held	0.0060
		Body-Worn	0.7661
	PCS1900	Face-held	0.3019
		Body-Worn	**0.9029**

2.4. Equipment under Test

Power supply system utilised

Power supply voltage	:	○	120V / 60 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 7.40 V

2.5. EUT operation mode

The spatial peak SAR values were assessed for GSM Radio. Battery and accessories shell be specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output.

2.6. TEST Configuration

Face-Held Configuration

Face-held Configuration- per FCC KDB447498 page 22: "A test separation distance of 25 mm must be applied for in-front-of the face SAR test exclusion and SAR measurements."
Per RSS-102 Section 3.1: If the device is designed to operate in front of the mouth, such as PTT radio, it shall be evaluated with the front of the device positioned at 2.5 cm from a flat phantom;
Per RSS-102 Section 3.1: If a device has push-to-talk capability,15 a minimum duty cycle of 50% (on-time) shall be used in the evaluation. A duty cycle lower than 50% is permitted only if the transmission duty cycle is an inherent property of the technology or of the design of the equipment and is not under user control. Proof of the various on-off durations and a detailed method of calculation of the average power shall be included in the RF exposure technical brief. Maximum average power levels shall be used to determine compliance

Body-worn Configuration

Body-worn measurements-per FCC KDB447498 page 22 "When body-worn accessory SAR testing is required, the body-worn accessory requirements in section 4.2.2 should be applied. PTT two-way radios that support held-to-ear operating mode must also be tested according to the exposure configurations required for handsets. This generally does not apply to cellphones with PTT options that have already been tested in more conservative configurations in applicable wireless modes for SAR compliance at 100% duty factor."
Per RSS-102 Section 3.1.1: Body-worn accessories (e.g. belt clips and holsters) shall be attached to the device and positioned against the flat phantom in normal use configurations
Per KDB648474 D04, Handset SAR v01r03: Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. 2 The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative test separation distance configuration may be used to support both SAR conditions. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.

2.7. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

Accessory name	Internal Identification	Model	Description	Remark
Antenna	A1	N/A	External Antenna	performed
Battery	B2	N/A	Intrinsically Safe Li-ion Battery	performed

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

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Yidajietong Test Technology Co., Ltd.
3/F., Building 12, Shangsha Innovation & Technology Park, Futian District, Shenzhen, Guangdong, China

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L7547

The Testing and Technology Center for Shenzhen Yidajietong Test Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: March, 2015. Valid time is until March, 2018.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	18-25 ° C
Humidity:	40-65 %
Atmospheric pressure:	950-1050mbar

3.4. SAR Limits

FCC Limit (1g Tissue)

Exposure Limits	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

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

Occupational/Controlled Environments are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure (i.e. as a result of employment or occupation).

3.5. Equipments Used during the Test

Test Equipment	Manufacturer	Type/Model	Serial Number	Calibration	
				Last Calibration	Calibration Interval
Data Acquisition Electronics DAEx	SPEAG	DAE4	876	2015/03/09	1
E-field Probe	SPEAG	ES3DV3	3221	2015/01/31	1
System Validation Dipole D835V2	SPEAG	D835V2	4d141	2015/09/24	3
System Validation Dipole D1900V2	SPEAG	D1900V2	5d162	2015/09/16	3
Network analyzer	Agilent	8753E	US37390562	2015/03/18	1
Dielectric Probe Kit	Agilent	85070E	US44020288	/	/
Power meter	Agilent	E4417A	GB41292254	2015/12/15	1
Power sensor	Agilent	8481H	MY41095360	2015/12/15	1
Power sensor	Agilent	8481H	MY41095361	2015/12/15	1
Signal generator	IFR	2032	203002/100	2015/10/12	1
Amplifier	AR	75A250	302205	2015/10/12	1
Universal Radio Communication Tester	ROHDE & SCHWARZ	CMU200	100122	2015/10/12	1

Note:
1) Per KDB865664D01 requirements for dipole calibration, the test laboratory has adopted three year extended calibration interval. Each measured dipole is expected to evalute with following criteria at least on annual interval.
   a) There is no physical damage on the dipole;
   b) System check with specific dipole is within 10% of calibrated values;
   c) The most recent return-loss results,measued at least annually,deviates by no more than 20% from the previous measurement;
   d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 50 Ω from the provious measurement.
2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

4. SAR Measurements System configuration

4.1. SAR Measurement Set-up

The DASY5 system for performing compliance tests consists of the following items:

A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).

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.

A data acquisition electronic (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

A unit to operate the optical surface detector which is connected to the EOC.

The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.

The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003.

DASY5 software and SEMCAD data evaluation software.

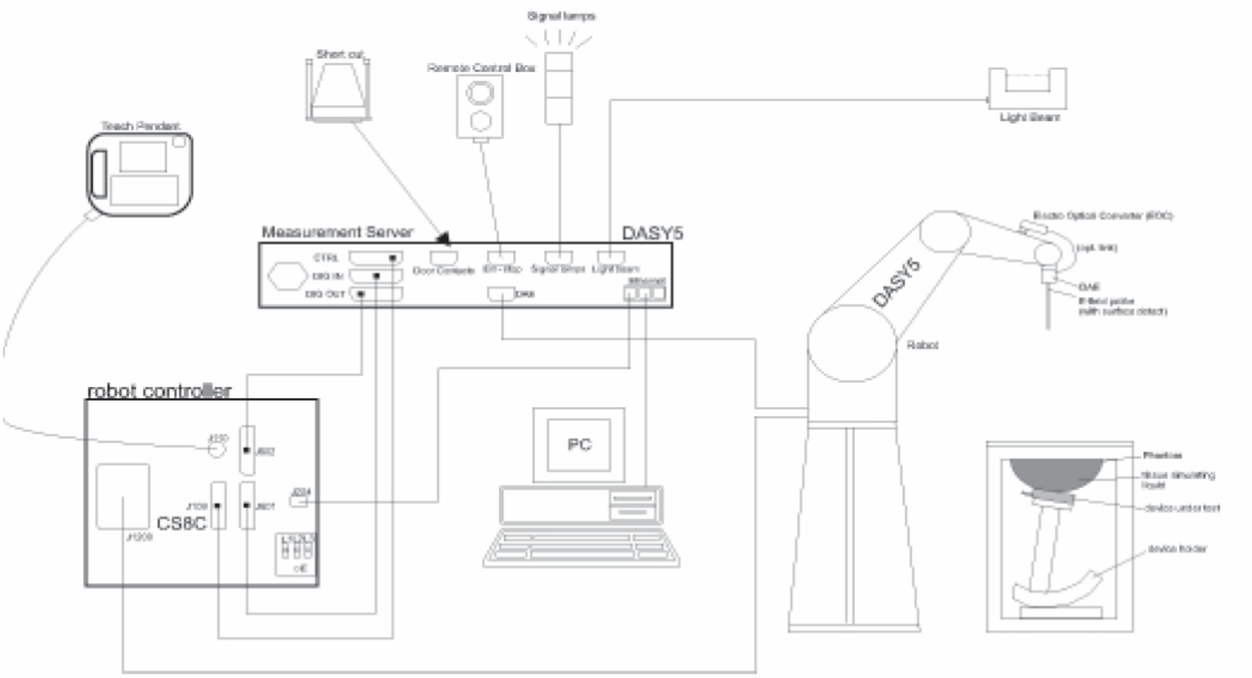
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

The generic twin phantom enabling the testing of left-hand and right-hand usage.

The device holder for handheld Mobile Phones.

Tissue simulating liquid mixed according to the given recipes.

System validation dipoles allowing to validate the proper functioning of the system.



4.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe ES3DV3 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

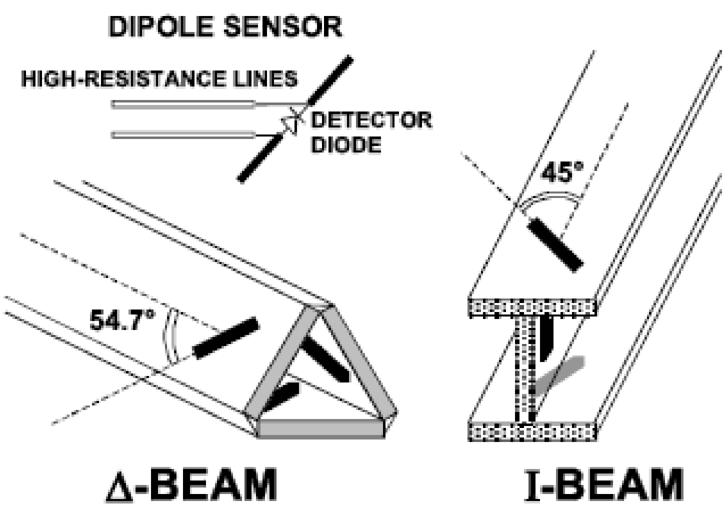
Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 μW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of Mobile Phones
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

Isotropic E-Field Probe

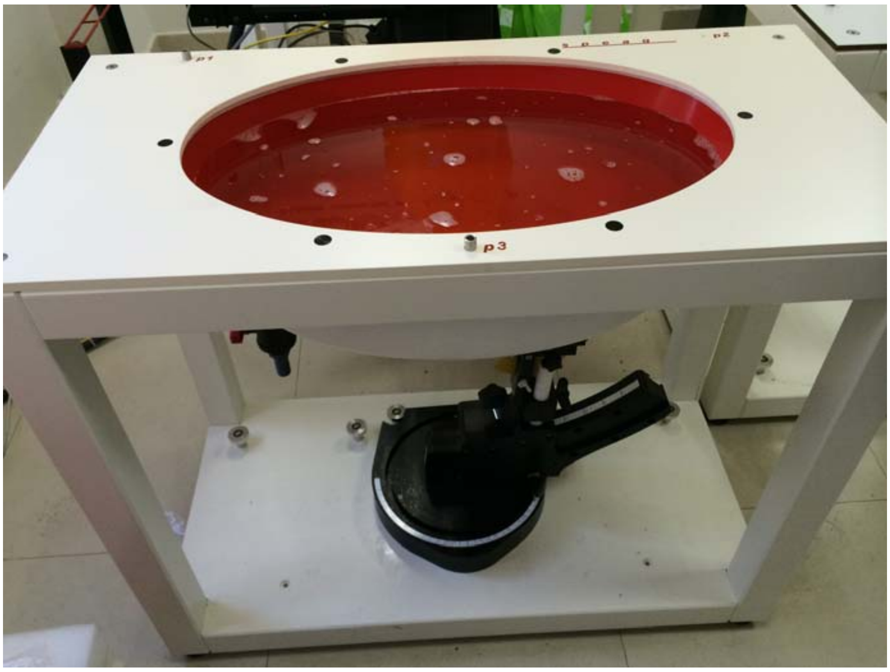
The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



4.3. Phantoms

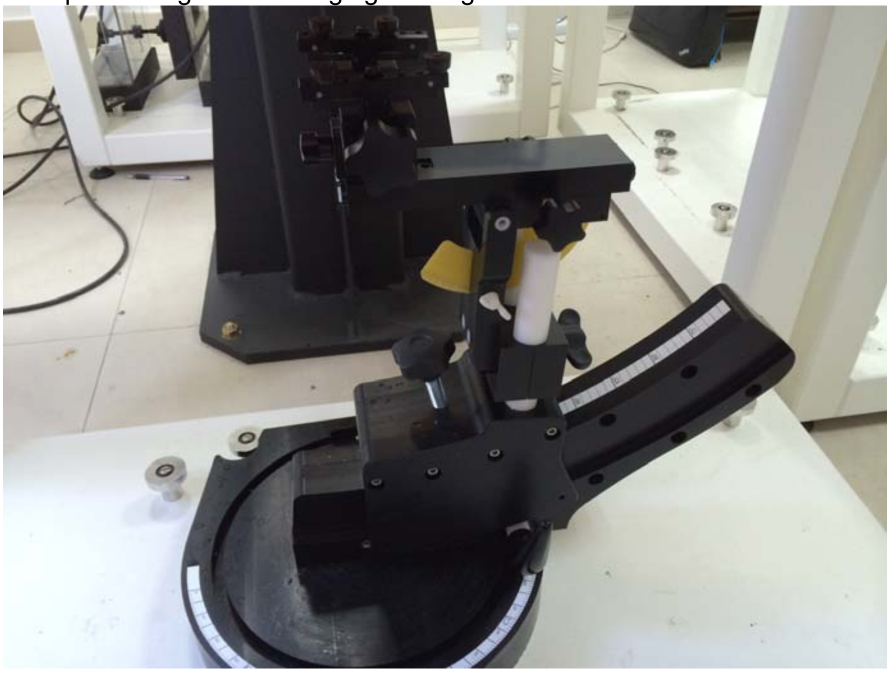
Phantom for compliance testing of handheld andbody-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI isfully compatible with the IEC 62209-2 standard and all known tissuesimulating liquids. ELI has been optimized regarding its performance and can beintegrated into our standard phantom tables. A cover prevents evaporation ofthe liquid. Reference markings on the phantom allow installation of thecomplete setup, including all predefined phantom positions and measurementgrids, by teaching three points. The phantom is compatible with all SPEAGdosimetric probes and dipoles.



ELI Phantom

4.4. Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the DASY system.
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 is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.



Device holder supplied by SPEAG

4.5. Scanning Procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the DUT’s output power and should vary max. ± 5 %.

The "surface check" measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot.Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 mm ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2)$ mm ± 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.	

Zoom Scan

Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centered around the maxima found in the preceding area scan.

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	≤ $1.5 \cdot \Delta z_{Zoom}(n-1)$ mm	
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 IEEE Std 1528-2013 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB Publication 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.

Spatial Peak Detection

The procedure for spatial peak SAR evaluation has been implemented and can determine values of massesof 1g and 10g, as well as for user-specific masses.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 maxima 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 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 Zoom 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 1g and 10g cubes.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube 7x7x7 scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 5mm steps.

4.6. Data Storage and Evaluation

Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DA4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation

The SEMCAD 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 they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

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

With 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 (DASY parameter)
dcpi = diode compression point (DASY parameter)

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

$$\mathrm{E-fieldprobes:}\qquad E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

$$\mathrm{H-fieldprobes:}\qquad H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)2] for E-field Probes
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 gives the total field strength (Hermitian magnitude):

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

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

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

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/cm3

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.

4.7. SAR Measurement System

The SAR measurement system being used is the DASY5 system, the system is controlled remotely from a PC, which contains the software to control the robot and data acquisition equipment. The software also displays the data obtained from test scans.

In operation, the system first does an area (2D) scan at a fixed depth within the liquid from the inside wall of the phantom. When the maximum SAR point has been found, the system will then carry out a 3D scan centred at that point to determine volume averaged SAR level.

4.7.1 Tissue Dielectric Parameters for Head and Body Phantoms

The liquid is consisted of water,salt,Glycol,Sugar,Preventol and Cellulose.The liquid has previously been proven to be suited for worst-case.It's satisfying the latest tissue dielectric parameters requirements proposed by the KDB865664.

The composition of the tissue simulating liquid

Ingredient	835MHz		1900MHz		1750 MHz		2450MHz		2600MHz	
(% Weight)	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	41.45	52.5	55.242	69.91	55.782	69.82	62.7	73.2	62.3	72.6
Salt	1.45	1.40	0.306	0.13	0.401	0.12	0.50	0.10	0.20	0.10
Sugar	56	45.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Preventol	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HEC	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DGBE	0.00	0.00	44.452	29.96	43.817	30.06	36.8	26.7	37.5	27.3

Target Frequency (MHz)	**Head**		**Body**	
	ε_r	σ(S/m)	ε_r	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
2600	39.0	1.96	52.5	2.16
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

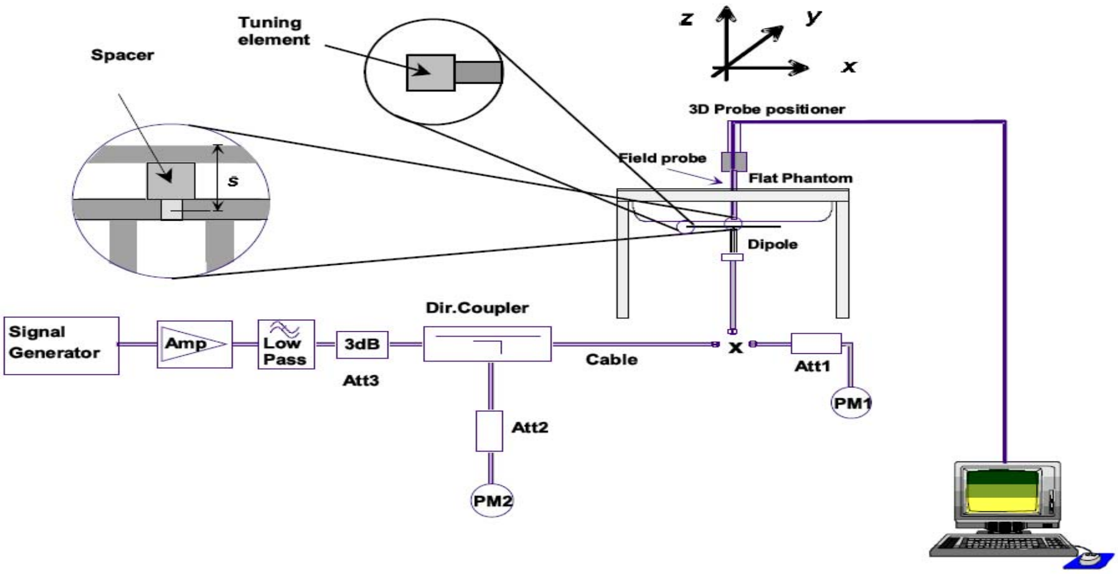
4.8. Tissue equivalent liquid properties

Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue				Liquid Temp.	Test Data
		ε_r	σ	ε_r	Dev. %	σ	Dev. %		
850H	824	41.56	0.90	41.60	0.10%	0.88	-2.22%	22.2 degree	2016-01-18
	825	41.56	0.90	41.60	0.10%	0.88	-2.22%		
	835	41.50	0.90	41.80	0.72%	0.91	1.11%		
	836	41.50	0.90	41.80	0.72%	0.91	1.11%		
	837	41.50	0.90	41.80	0.72%	0.91	1.11%		
	848	41.50	0.90	41.80	0.72%	0.91	1.11%		
	849	41.50	0.92	41.70	0.48%	0.92	0.00%		
1900H	1850	40.00	1.40	40.20	0.50%	1.38	-1.43%	22.2 degree	2016-01-18
	1851	40.00	1.40	40.20	0.50%	1.38	-1.43%		
	1880	40.00	1.40	40.20	0.50%	1.42	1.43%		
	1900	40.00	1.40	40.10	0.25%	1.42	1.43%		
	1909	40.00	1.40	40.00	0.00%	1.43	2.14%		
	1910	40.00	1.40	40.00	0.00%	1.43	2.14%		
850B	824	55.24	0.97	53.40	-3.33%	0.98	1.03%	22.1 degree	2016-01-19
	825	55.24	0.97	53.40	-3.33%	0.98	1.03%		
	835	55.20	0.97	53.50	-3.08%	0.99	2.06%		
	836	55.20	0.97	53.50	-3.08%	0.99	2.06%		
	837	55.19	0.97	53.50	-3.06%	1.00	3.09%		
	848	55.16	0.99	53.20	-3.55%	1.02	3.03%		
	849	55.16	0.99	53.20	-3.55%	1.02	3.03%		
1900B	1850	53.30	1.52	53.50	0.38%	1.53	0.66%	22.1 degree	2016-01-19
	1851	53.30	1.52	53.50	0.38%	1.53	0.66%		
	1880	53.30	1.52	53.30	0.00%	1.55	1.97v		
	1900	53.30	1.52	53.20	-0.19%	1.55	1.97%		
	1909	53.30	1.52	53.20	-0.19%	1.56	2.63%		
	1910	53.30	1.52	53.20	-0.19%	1.56	2.63%		

4.9. System Check

The purpose of the system check is to verify that the system operates within its specifications at the decice test frequency.The system check is simple check of repeatability to make sure that the system works correctly at the time of the compliance test;

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10 %).
System check is performed regularly on all frequency bands where tests are performed with the DASY5 system.



The output power on dipole port must be calibrated to 30 dBm (1000mW) before dipole is connected.

Justification for Extended SAR Dipole Calibrations
Referring to KDB 865664D01V01r03, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended. While calibration intervals not exceed 3 years.

System Check in Head Tissue Simulating Liquid

Frequency	Test Date	Dielectric Parameters		Temp	1W Measured SAR_{1g}	1W Normalized SAR_{1g}	1W Target SAR_{1g}	Limit (±10% Deviation)
		ε_r	σ(s/m)	(℃)	(W/Kg)			
835MHz	2015/01/18	41.80	0.91	22.2	9.80	9.80	9.45	3.70%
1900MHz	2015/01/18	40.10	1.42	22.2	41.60	41.60	40.40	2.97%

System Check in Body Tissue Simulating Liquid

Frequency	Test Date	Dielectric Parameters		Temp	1W Measured SAR_{1g}	1W Normalized SAR_{1g}	1W Target SAR_{1g}	Limit (±10% Deviation)
		ε_r	σ(s/m)	(℃)	(W/Kg)			
835MHz	2015/01/19	53.50	0.99	22.1	9.90	9.90	9.51	4.10%
1900MHz	2015/01/19	53.20	1.55	22.1	41.30	41.30	41.20	0.24%

Note:
1. The graph results see system check.
2. Target Values used derive from the calibration certificate

4.10. Measurement Procedures

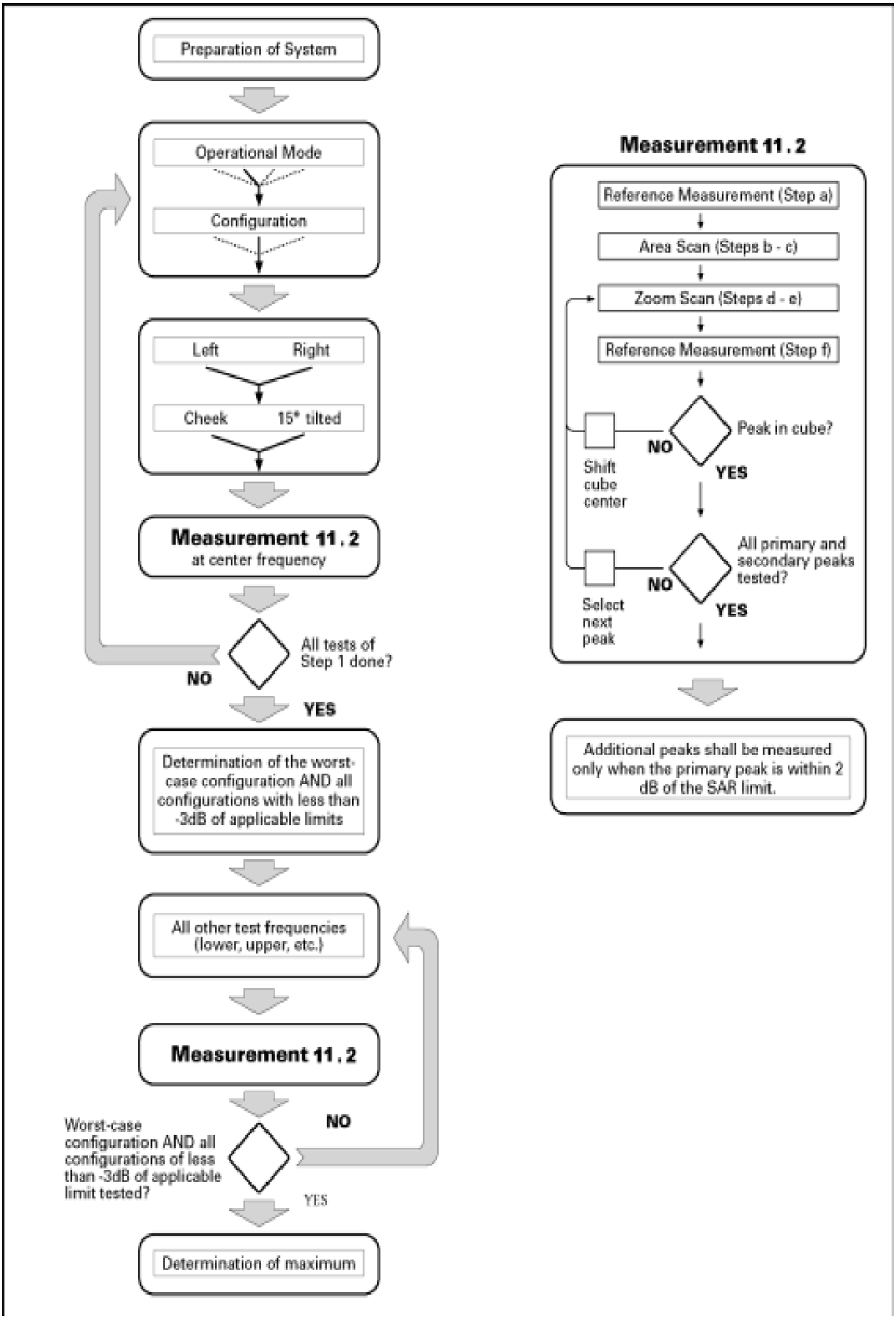
The procedure for assessing the average SAR value consists of the following steps:

- Power Reference Measurement
  The Power Reference Measurement and Power Drift Measurement 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 DASY4 software can find the maximum locations even in relatively coarse grids. The scanning 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 settings 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 (5mmE545mmE545mm) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure.

- Power Drift Measurement
  The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job 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 last Power Reference Measurement.



Picture 11 Block diagram of the tests to be performed

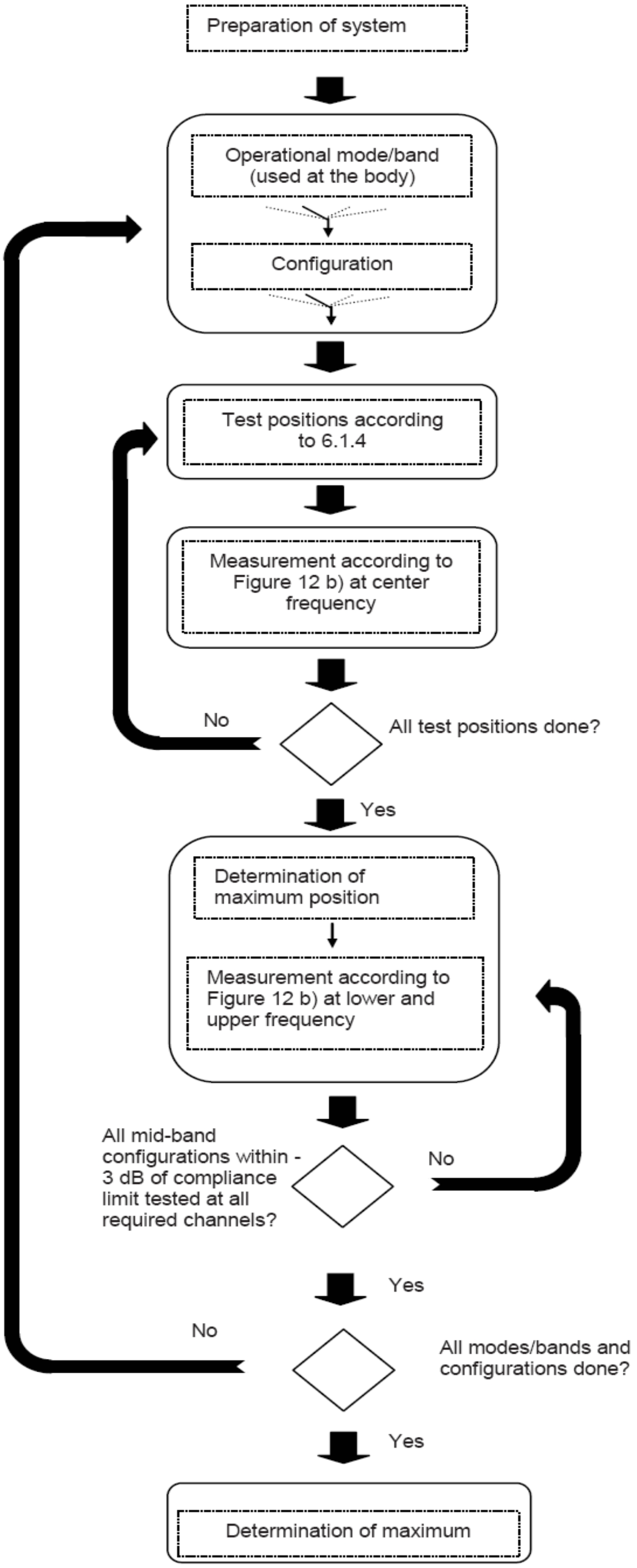


Figure 12a – Tests to be performed

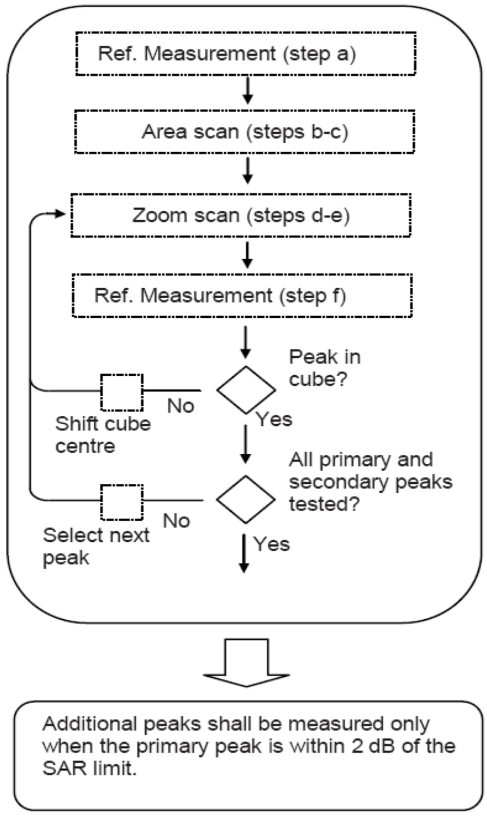


Figure 12b – General procedure

Picture 12 Block diagram of the tests to be performed

Measurement procedure

The following procedure shall be performed for each of the test conditions (see Picture 11) described in 11.1:

a) Measure the local SAR at a test point within 8 mm or less in the normal direction from the inner surface of the phantom.

b) Measure the two-dimensional SAR distribution within the phantom (area scan procedure). The boundary of the measurement area shall not be closer than 20 mm from the phantom side walls. The distance between the measurement points should enable the detection of the location of local maximum with an accuracy of better than half the linear dimension of the tissue cube after interpolation. A maximum grip spacing of 20 mm for frequencies below 3 GHz and (60/f [GHz]) mm for frequencies of 3GHz and greater is recommended. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz andδIn(2)/2 mm for frequencies of 3 GHz and greater, whereδis the plane wave skin depth and In(x) is the natural logarithm. The maximum variation of the sensor-phantom surface shall be ±1 mm for frequencies below 3 GHz and ±0.5 mm for frequencies of 3 GHz and greater. At all measurement points the angle of the probe with respect to the line normal to the surface should be less than 5°. If this cannot be achieved for a measurement distance to the phantom inner surface shorter than the probe diameter, additional measurement distance to the phantom inner surface shorter than the probe diameter, additional

c) From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that are not within the zoom-scan volume; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR limit. This is consistent with the 2 dB threshold already stated;
d) Measure the three-dimensional SAR distribution at the local maxima locations identified in step
e) The horizontal grid step shall be (24 / f[GHz]) mm or less but not more than 8 mm. The minimum zoom size of 30 mm by 30 mm and 30 mm for frequencies below 3 GHz. For higher frequencies, the minimum zoom size of 22 mm by 22 mm and 22 mm. The grip step in the vertical direction shall be (8-f[GHz]) mm or less but not more than 5 mm, if uniform spacing is used. If variable spacing is used in the vertical direction, the maximum spacing between the two closest measured points to the phantom shell shall be (12 / f[GHz]) mm or less but not more than 4 mm, and the spacing between father points shall increase by an incremental factor not exceeding 1.5. When variable spacing is used, extrapolation routines shall be tested with the same spacing as used in measurements. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz and δIn(2)/2 mm for frequencies of 3 GHz and greater, where δis the plane wave skin depth and In(x) is the natural logarithm. Separate grids shall be centered on each of the local SAR maxima found in step c). Uncertainties due to field distortion between the media boundary and the dielectric enclosure of the probe should also be minimized, which is achieved is the distance between the phantom surface and physical tip of the probe is larger than probe tip diameter. Other methods may utilize correction procedures for these boundary effects that enable high precision measurements closer than half the probe diameter. For all measurement points, the angle of the probe with respect to the flat phantom surface shall be less than 5. If this cannot be achieved an additional uncertainty evaluation is needed.
f) Use post processing(e.g. interpolation and extrapolation) procedures to determine the local SAR values at the spatial resolution needed for mass averaging.

Measurement procedure

The following procedure shall be performed for each of the test conditions (see Picture 11) described in 11.1:

g) Measure the local SAR at a test point within 8 mm or less in the normal direction from the inner surface of the phantom.
h) Measure the two-dimensional SAR distribution within the phantom (area scan procedure). The boundary of the measurement area shall not be closer than 20 mm from the phantom side walls. The distance between the measurement points should enable the detection of the location of local maximum with an accuracy of better than half the linear dimension of the tissue cube after interpolation. A maximum grip spacing of 20 mm for frequencies below 3 GHz and (60/f [GHz]) mm for frequencies of 3GHz and greater is recommended. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz andδIn(2)/2 mm for frequencies of 3 GHz and greater, whereδis the plane wave skin depth and In(x) is the natural logarithm. The maximum variation of the sensor-phantom surface shall be ±1 mm for frequencies below 3 GHz and ±0.5 mm for frequencies of 3 GHz and greater. At all measurement points the angle of the probe with respect to the line normal to the surface should be less than 5°. If this cannot be achieved for a measurement distance to the phantom inner surface shorter than the probe diameter, additional measurement distance to the phantom inner surface shorter than the probe diameter, additional
i) From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that are not within the zoom-scan volume; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR limit. This is consistent with the 2 dB threshold already stated;
j) Measure the three-dimensional SAR distribution at the local maxima locations identified in step
k) The horizontal grid step shall be (24 / f[GHz]) mm or less but not more than 8 mm. The minimum zoom size of 30 mm by 30 mm and 30 mm for frequencies below 3 GHz. For higher frequencies, the minimum zoom size of 22 mm by 22 mm and 22 mm. The grip step in the vertical direction shall be (8-f[GHz]) mm or less but not more than 5 mm, if uniform spacing is used. If variable spacing is used in the vertical direction, the maximum spacing between the two closest measured points to the phantom shell shall be (12 / f[GHz]) mm or less but not more than 4 mm, and the spacing between father points shall increase by an incremental factor not exceeding 1.5. When variable spacing is used, extrapolation routines shall be tested with the same spacing as used in measurements. The maximum distance between the geometrical

centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz and δln(2)/2 mm for frequencies of 3 GHz and greater, where δis the plane wave skin depth and ln(x) is the natural logarithm. Separate grids shall be centered on each of the local SAR maxima found in step c). Uncertainties due to field distortion between the media boundary and the dielectric enclosure of the probe should also be minimized, which is achieved is the distance between the phantom surface and physical tip of the probe is larger than probe tip diameter. Other methods may utilize correction procedures for these boundary effects that enable high precision measurements closer than half the probe diameter. For all measurement points, the angle of the probe with respect to the flat phantom surface shall be less than 5. If this cannot be achieved an additional uncertainty evaluation is needed.

l) Use post processing(e.g. interpolation and extrapolation) procedures to determine the local SAR values at the spatial resolution needed for mass averaging.

4.11. Operational Conditions during Test

4.11.1. 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 EUT is commanded to operate at maximum transmitting power.
Connection to the EUT is established via air interface with CMU 200, and the EUT is set to maximum output power by CMU 200. 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.

4.11.2. Test Positions

4.11.2.1 Face-Held Configuration

Face-held Configuration- per FCC KDB447498 page 22: “A test separation distance of 25 mm must be applied for in-front-of the face SAR test exclusion and SAR measurements.”
Per RSS-102 Section 3.1: If the device is designed to operate in front of the mouth, such as PTT radio, it shall be evaluated with the front of the device positioned at 2.5 cm from a flat phantom;
Per RSS-102 Section 3.1: If a device has push-to-talk capability,15 a minimum duty cycle of 50% (on-time) shall be used in the evaluation. A duty cycle lower than 50% is permitted only if the transmission duty cycle is an inherent property of the technology or of the design of the equipment and is not under user control. Proof of the various on-off durations and a detailed method of calculation of the average power shall be included in the RF exposure technical brief. Maximum average power levels shall be used to determine compliance

4.11.2.2. Body-worn Configuration

Body-worn measurements-per FCC KDB447498 page 22 “When body-worn accessory SAR testing is required, the body-worn accessory requirements in section 4.2.2 should be applied. PTT two-way radios that support held-to-ear operating mode must also be tested according to the exposure configurations required for handsets. This generally does not apply to cellphones with PTT options that have already been tested in more conservative configurations in applicable wireless modes for SAR compliance at 100% duty factor.”
Per RSS-102 Section 3.1.1: Body-worn accessories (e.g. belt clips and holsters) shall be attached to the device and positioned against the flat phantom in normal use configurations
Per KDB648474 D04, Handset SAR v01r03: Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. 2 The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative test separation distance configuration may be used to support both SAR conditions. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.

4.12. Measurement Variability

Per FCC KDB Publication 865664 D01, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest

measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.
SAR Measurement Variability was assessed using the following procedures for each frequency band:
1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
3) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg.
The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

4.13. Test Configuration

4.13.1. GSM Test Configuration

SAR tests for GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. Using E5515C the power level is set to “5” for GSM 850, set to “0” for GSM 1900.

4.14. Power Drift

To control the output power stability during the SAR test, DASY5 system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. These drift values can be found in Table 14.1 to Table 14.11 labeled as: (Power Drift [dB]). This ensures that the power drift during one measurement is within 5%.

4.15. Power Reduction

The product without any power reduction.

5. TEST CONDITIONS AND RESULTS

5.1. Conducted Power Results

<GSM Conducted Power>

General Note:

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. As the sample onlt support Voice and cannot support data exchange, we need only test Voice;

Conducted Power Measurement Results(GSM 850/1900)

GSM 850	Burst Conducted power (dBm)			/	Average power (dBm)		
	Channel/Frequency(MHz)				Channel/Frequency(MHz)		
	128/824.2	190/836.6	251/848.8		128/824.2	190/836.6	251/848.8
GSM	32.27	32.45	32.36	-9.03dB	23.24	**23.42**	23.33
GSM 1900	Burst Conducted power (dBm)			/	Average power (dBm)		
	Channel/Frequency(MHz)				Channel/Frequency(MHz)		
	512/ 1850.2	661/ 1880	810/ 1909.8		512/ 1850.2	661/ 1880	810/ 1909.8
GSM	30.29	30.61	30.38	-9.03dB	21.26	**21.58**	21.35

Notes:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

Manufacturing tolerance

GSM Speech

GSM 850 (Burst Average)			
Channel	Channel 128	Channel 190	Channel 251
Target (dBm)	32.0	32.0	32.0
Tolerance ±(dB)	1	1	1
GSM 1900 (Peak)			
Channel	Channel 512	Channel 661	Channel 810
Target (dBm)	30.0	30.0	30.0
Tolerance ±(dB)	1	1	1

5.2. Standalone SAR Test Exclusion Considerations

Per KDB447498 for standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by::

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] ·[√ f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

Standalone SAR test exclusion considerations							
Communication system	Frequency (MHz)	Configuration	Maximum Time Average Power (dBm)	Separation Distance (mm)	Calculation Result	SAR Exclusion Thresholds	Standalone SAR Exclusion
GSM850	835	Head	23.97	25	9.1	3.0	no
		Body	23.97	5	45.6	3.0	no
GSM1900	1900	Head	21.97	25	8.7	3.0	no
		Body	21.97	5	34.5	3.0	no

Remark:
1. Maximum average power including tune-up tolerance;
2. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

5.3. SAR Measurement Results

SAR Values [GSM 850]

Test Frequency		Mode	Maximum Allowed Power (dBm)	Conduceted Power (dBm)	Test Configuration	Measurement SAR_{1-g} (W/Kg)	Power drift	Scaling Factor	Reported SAR_{1-g} (W/kg)	SAR_{1g} limit (W/kg)	Ref. Plot
Channel	MHz					100% Duty Cycle			100% Duty Cycle		
The EUT display towards ground (face held)											
128	824.2	PTT	33.00	32.27	Face Held	0.0024	-0.11	1.18	0.0028	1.60	1
190	836.6	PTT	33.00	32.45	Face Held	0.0053	0.03	1.14	**0.0060**	1.60	2
251	848.8	PTT	33.00	32.36	Face Held	0.0021	-0.02	1.16	0.0024	1.60	3
The EUT display towards ground with A1, B1 (Body-Worn)											
128	824.2	PTT	33.00	32.27	Body Worn	0.4060	0.01	1.18	0.4791	1.60	4
190	836.6	PTT	33.00	32.45	Body Worn	0.6620	-0.16	1.14	**0.7547**	1.60	5
251	848.8	PTT	33.00	32.36	Body Worn	0.3350	-0.02	1.16	0.3886	1.60	6

SAR Values [GSM 1900]

Test Frequency		Mode	Maximum Allowed Power (dBm)	Conduceted Power (dBm)	Test Configuration	Measurement SAR_{1-g} (W/Kg)	Power drift	Scaling Factor	Reported SAR_{1-g} (W/kg)	SAR_{1g} limit (W/kg)	Ref. Plot
Channel	MHz					100% Duty Cycle			100% Duty Cycle		
The EUT display towards ground (face held)											
512	1850.2	PTT	31.00	30.29	Face Held	0.0780	0.02	1.18	0.0920	1.60	7
661	1880.0	PTT	31.00	30.61	Face Held	0.2770	-0.15	1.09	**0.3019**	1.60	8
810	1909.8	PTT	31.00	30.38	Face Held	0.0730	0.13	1.15	0.0840	1.60	9
The EUT display towards ground with A1, B1 (Body-Worn)											
512	1850.2	PTT	31.00	30.29	Body Worn	0.7240	-0.01	1.18	0.8543	1.60	10
661	1880.0	PTT	31.00	30.61	Body Worn	0.7920	0.05	1.09	**0.9029**	1.60	11
810	1909.8	PTT	31.00	30.38	Body Worn	0.7680	-0.05	1.15	0.8909	1.60	12

Note:
1. The value with black color is the maximum Reported SAR Value of each test band.
2. Per KDB 648474 D04, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
3. The PPT mode is operate at Voice mode.

5.4. Simultaneous TX SAR Considerations

5.6.1 Introduction

If transmitter operate difference transmitter modular, it should be conisder simultaneous transmission
The sample only with GSM modular, so not need consider simultaneous transmission

5.5. Measurement Uncertainty (300-3GHz)

Not required as SAR measurement uncertainty analysis is required in SAR reports only when the highest measured SAR in a frequency band is ≥ 1.5 W/kg for 1-g SAR accoridng to KDB865664D01.

5.6. System Check Results

System Performance Check at 835 MHz Head TSL

DUT: Dipole835 MHz; Type: D835V2; Serial: 4d141

Date/Time: 01/18/2016 02:31:31 PM

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

Medium parameters used (interpolated): f = 835 MHz; σ = 0.91 S/m; ε_r = 41.80; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

Probe: ES3DV3 - SN3221; ConvF(6.25, 6.25, 6.25); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x51x1): Interpolated grid: dx=1.500 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 10.6 W/Kg

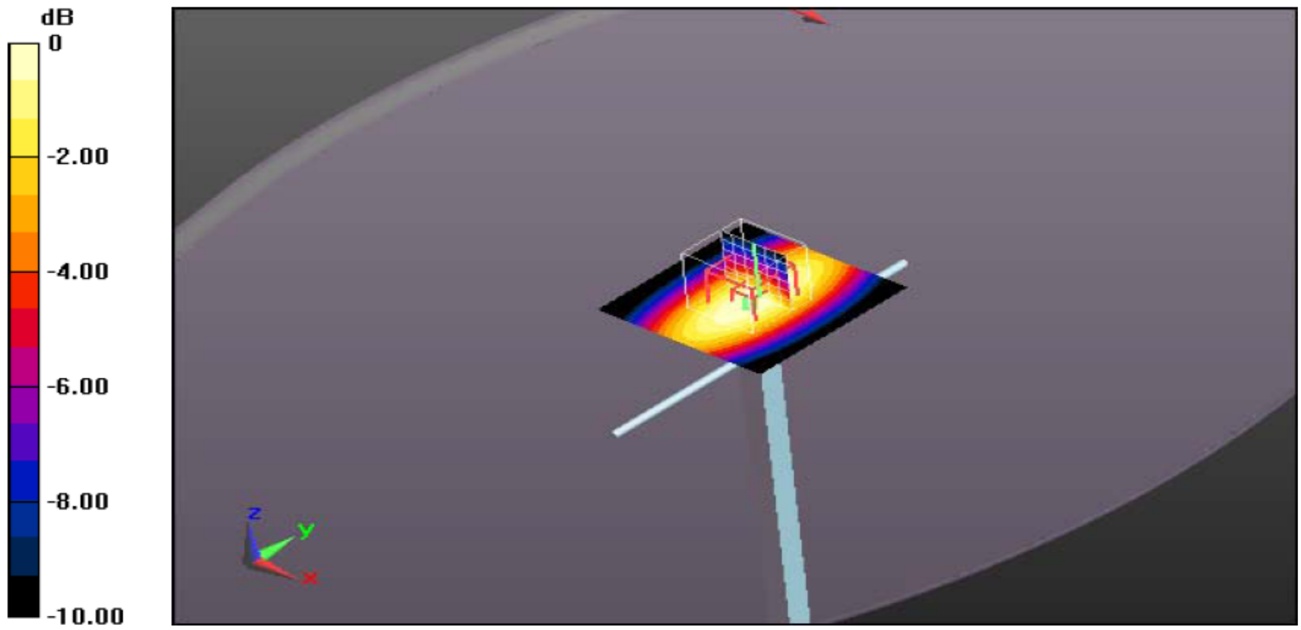
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 110.6 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 14.26 W/Kg

SAR(1 g) = 9.80 W/Kg; SAR(10 g) = 6.03 W/Kg

Maximum value of SAR (measured) = 10.8 W/Kg



0 dB = 10.8 W/Kg = 10.33 dB W/Kg

System Performance Check 835MHz 1W

System Performance Check at 835 MHz Body TSL

DUT: Dipole835 MHz; Type: D835V2; Serial: 4d141

Date/Time: 01/19/2016 08:05:26 AM

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

Medium parameters used (interpolated): f = 835 MHz; σ = 0.99 S/m; ε_r = 53.50; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

Probe: ES3DV3 - SN3221; ConvF(6.29, 6.29, 6.29); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x51x1): Interpolated grid: dx=1.50 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 10.70 W/Kg

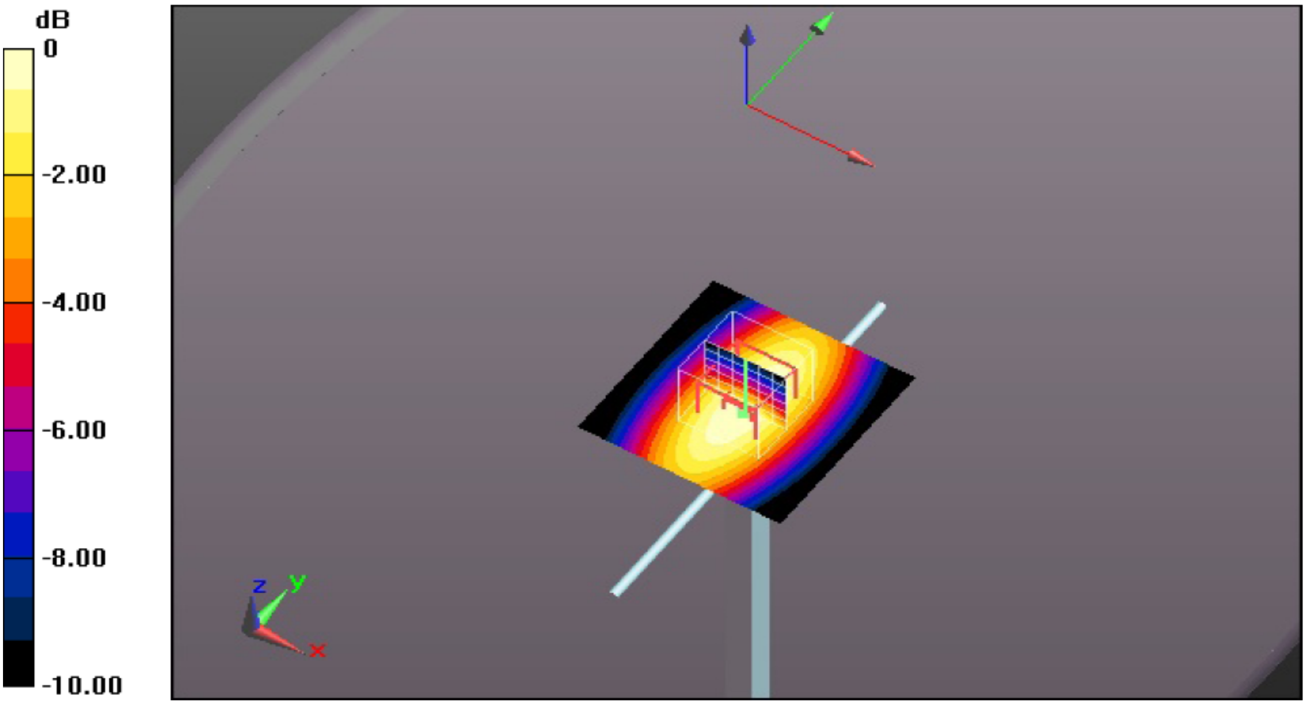
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 110.0 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 15.02 W/Kg

SAR(1 g) = 9.90 W/Kg; SAR(10 g) = 6.07 W/Kg

Maximum value of SAR (measured) = 10.8 W/Kg



0 dB = 10.8 W/Kg = 10.33 dB W/Kg

System Performance Check 835MHz 1W

System Performance Check at 1900 MHz Head TSL

DUT: Dipole1900 MHz; Type: D1900V2; Serial: 5d162

Date/Time: 01/18/2016 08:20:21 AM

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

Medium parameters used (interpolated): f = 1900 MHz; σ = 1.42 S/m; ε_r = 40.10; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

Probe: ES3DV3 - SN3221; ConvF(5.20, 5.20, 5.20); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x51x1): Interpolated grid: dx=1.500 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 60.20 W/Kg

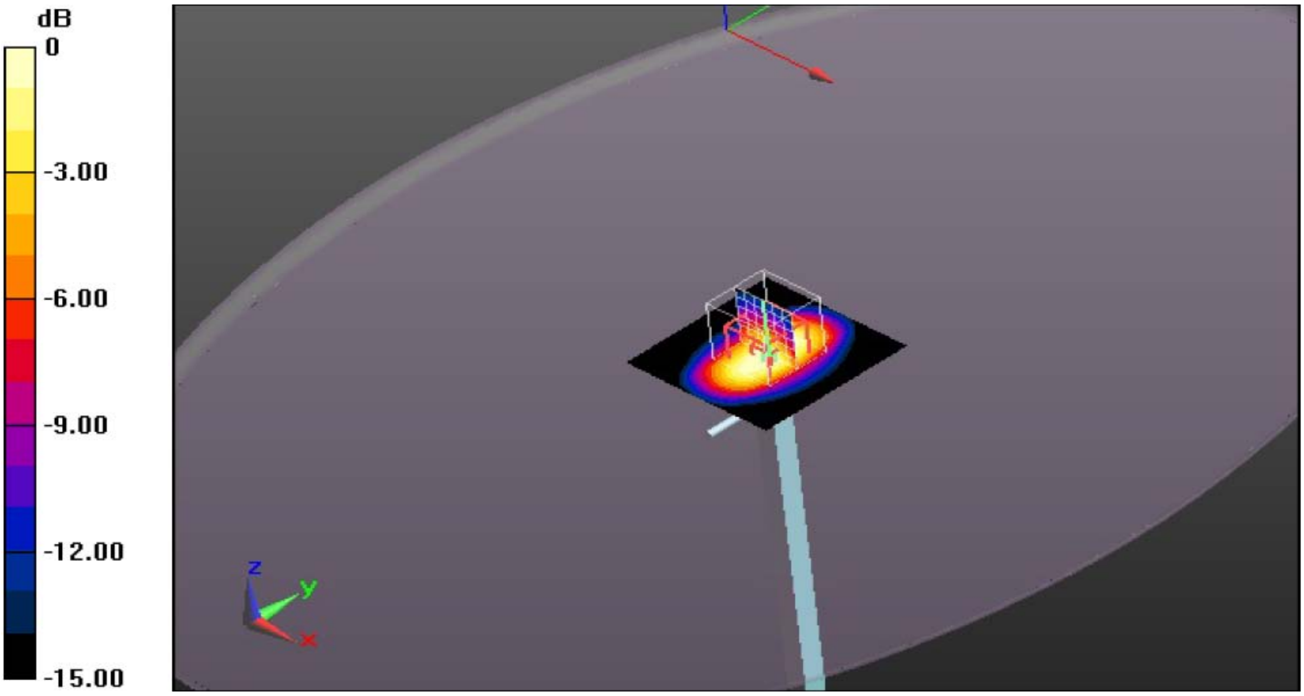
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 182.6 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 68.04 W/Kg

SAR(1 g) = 41.60 W/Kg; SAR(10 g) = 22.40 W/Kg

Maximum value of SAR (measured) = 47.8 W/Kg



0 dB = 47.80 W/Kg = 16.79 dB W/Kg

System Performance Check 1900MHz 1W

System Performance Check at 1900 MHz Body TSL

DUT: Dipole1900 MHz; Type: D1900V2; Serial: 5d162

Date/Time: 01/19/2016 07:20:26 AM

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

Medium parameters used (interpolated): f = 1900 MHz; σ = 1.55 S/m; ε_r = 53.20; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY5 Configuration:

Probe: ES3DV3 - SN3221; ConvF(4.79, 4.79, 4.79); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x51x1): Measurement grid: dx=15.00 mm, dy=15.00 mm

Maximum value of SAR (interpolated) = 57.60 W/Kg

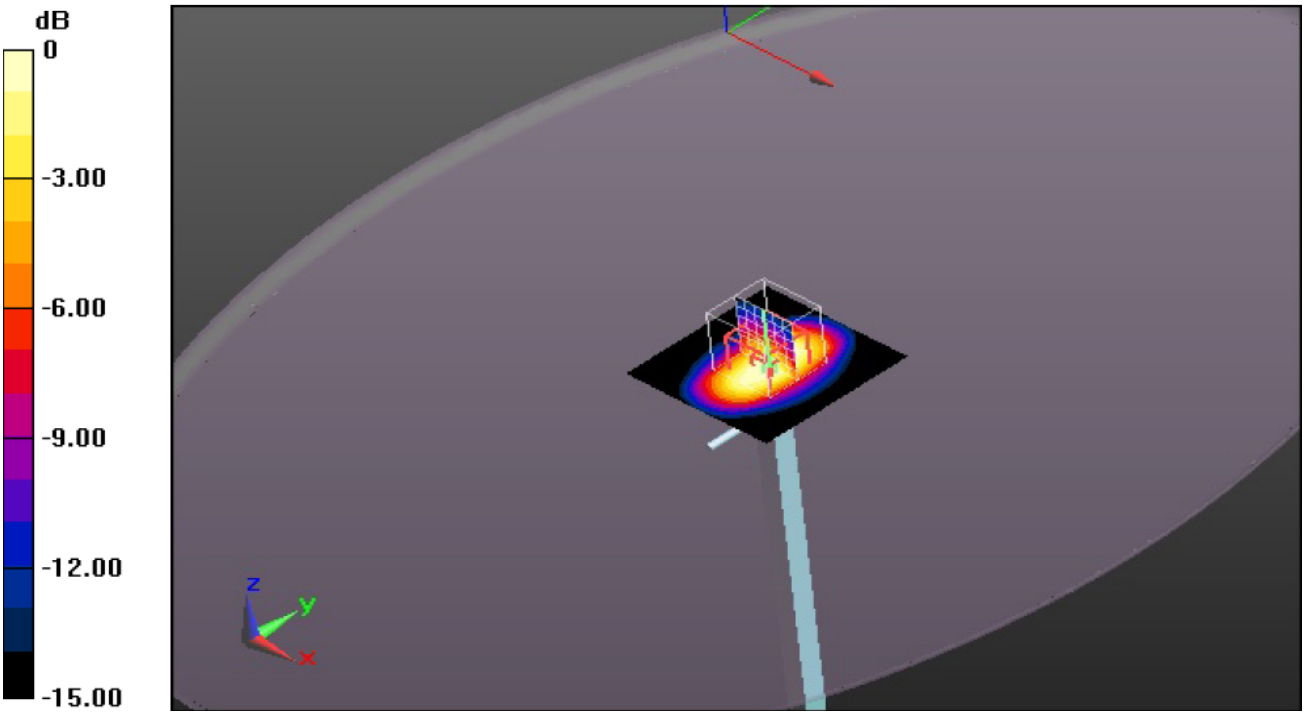
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 182.4 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 70.70 W/Kg

SAR(1 g) = 41.30 W/Kg; SAR(10 g) = 22.40 W/Kg

Maximum value of SAR (measured) = 46.6 W/Kg



0 dB = 46.60 W/Kg = 16.68 dB W/Kg

System Performance Check 1900MHz 1W

5.7. SAR Test Graph Results

Face Held for GSM850, Front towards Phantom 824.2MHz

Communication System: PTT 850; Frequency: 824.2 MHz;Duty Cycle:1:8

Medium parameters used (interpolated): f = 824.0 MHz; σ = 0.88 S/m; ε_r = 41.60; ρ = 1000 kg/m^3

Phantom section: Flat Section

Probe: ES3DV3 - SN3221; ConvF(6.25, 6.25, 6.25); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.00399 W/Kg

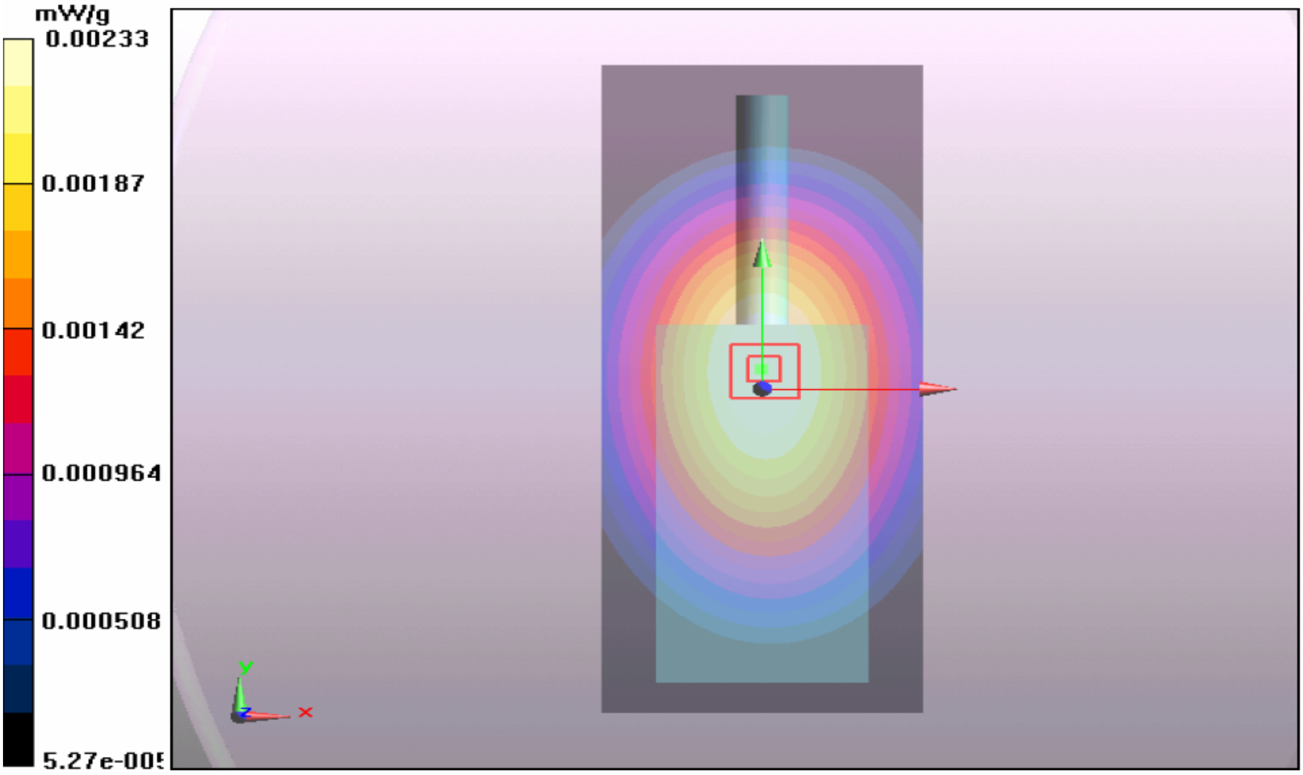
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.295 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.00465 W/Kg

SAR(1 g) = 0.0024 W/Kg; SAR(10 g) = 0.00133 W/Kg

Maximum value of SAR (measured) = 0.00233 W/Kg



Date/Time: 01/18/2016 5:28:19 PM

Figure 1: Face held for GSM850 Front towards Phantom 824.2 MHz

Face Held for GSM850, Front towards Phantom 836.6MHz

Communication System: PTT 850; Frequency: 836.6 MHz;Duty Cycle:1:8

Medium parameters used (interpolated): f = 836.0 MHz; σ = 0.91 S/m; ε_r = 41.80; ρ = 1000 kg/m^3

Phantom section: Flat Section

Probe: ES3DV3 - SN3221; ConvF(6.25, 6.25, 6.25); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.00498 W/Kg

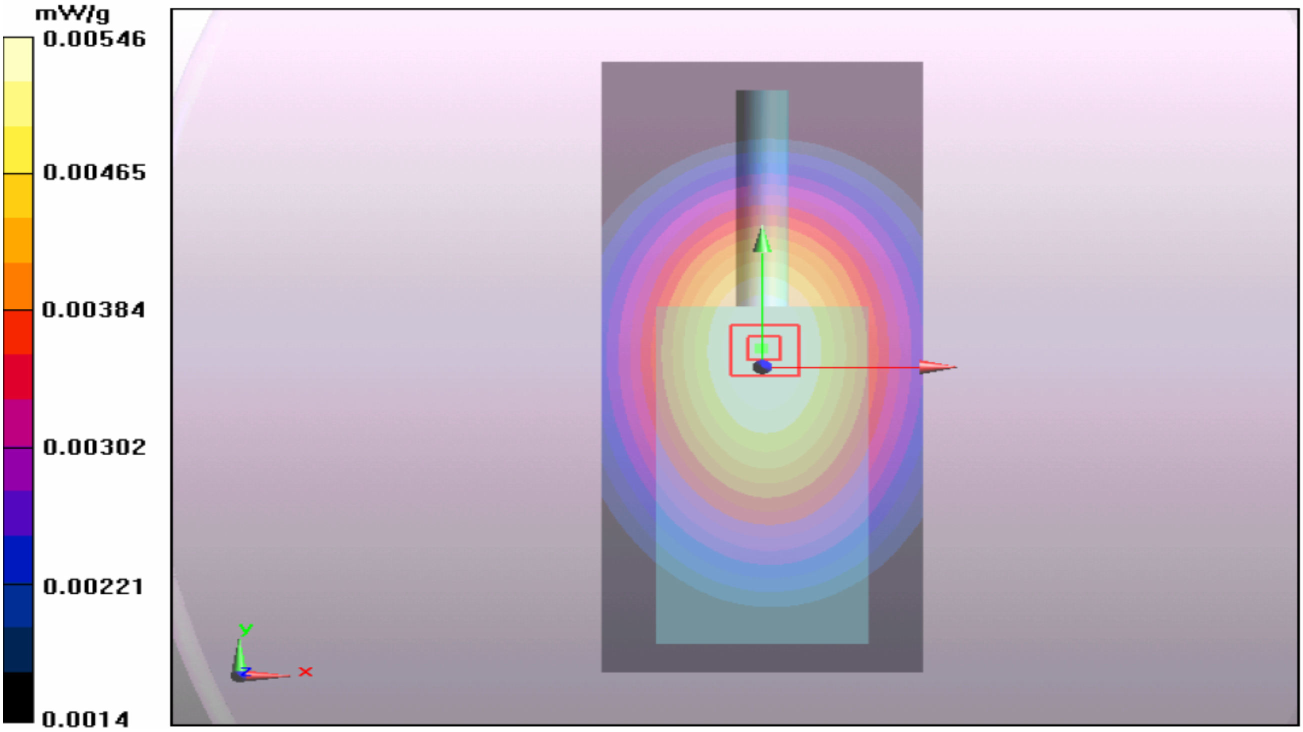
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.755 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.00888 W/Kg

SAR(1 g) = 0.0053 W/Kg; SAR(10 g) = 0.00389 W/Kg

Maximum value of SAR (measured) = 0.00546 W/Kg



Date/Time: 01/18/2016 5:45:10 PM

Figure 2: Face held for GSM850 Front towards Phantom 836.6 MHz

Face Held for GSM850, Front towards Phantom 848.8MHz

Communication System: PTT 850; Frequency: 848.8 MHz;Duty Cycle:1:8

Medium parameters used (interpolated): f = 849.0 MHz; σ = 0.92 S/m; ε_r = 41.70; ρ = 1000 kg/m^3

Phantom section: Flat Section

Probe: ES3DV3 - SN3221; ConvF(6.25, 6.25, 6.25); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0077 W/Kg

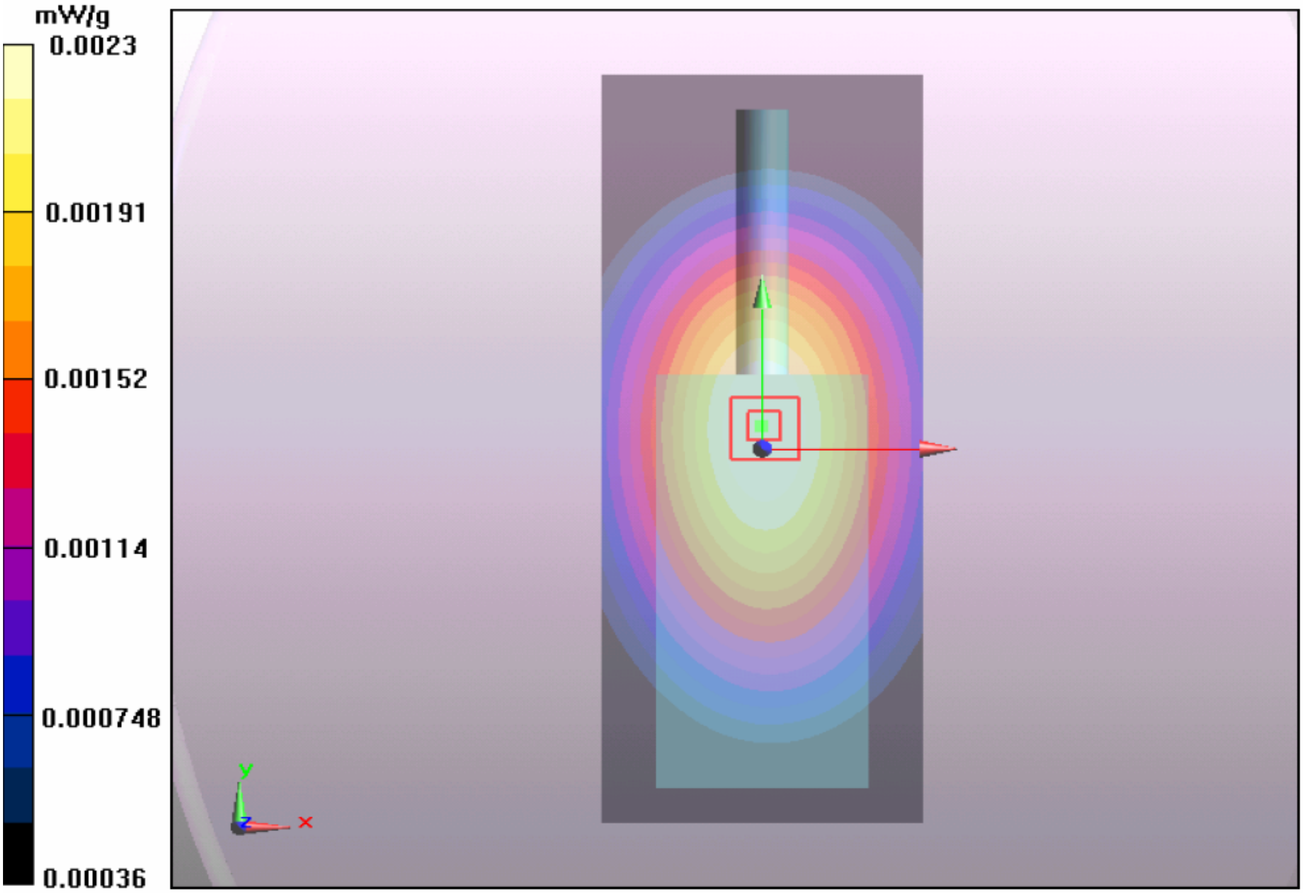
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.162 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.00646 W/Kg

SAR(1 g) = 0.0021 W/Kg; SAR(10 g) = 0.00144 W/Kg

Maximum value of SAR (measured) = 0.00230 W/Kg



Date/Time: 01/18/2016 4:52:40 PM

Figure 3: Face held for GSM850 Front towards Phantom 848.8 MHz

Body- Worn GSM850 With A1, B1, Front towards Ground 824.2 MHz

Communication System: PTT850; Frequency: 824.2 MHz;Duty Cycle:1:8

Medium parameters used (interpolated): f = 824.0 MHz; σ = 0.98 S/m; ε_r = 53.40; ρ = 1000 kg/m^3

Phantom section : Flat Section

Probe: ES3DV3 - SN3221; ConvF(6.29, 6.29, 6.29); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.431 W/Kg

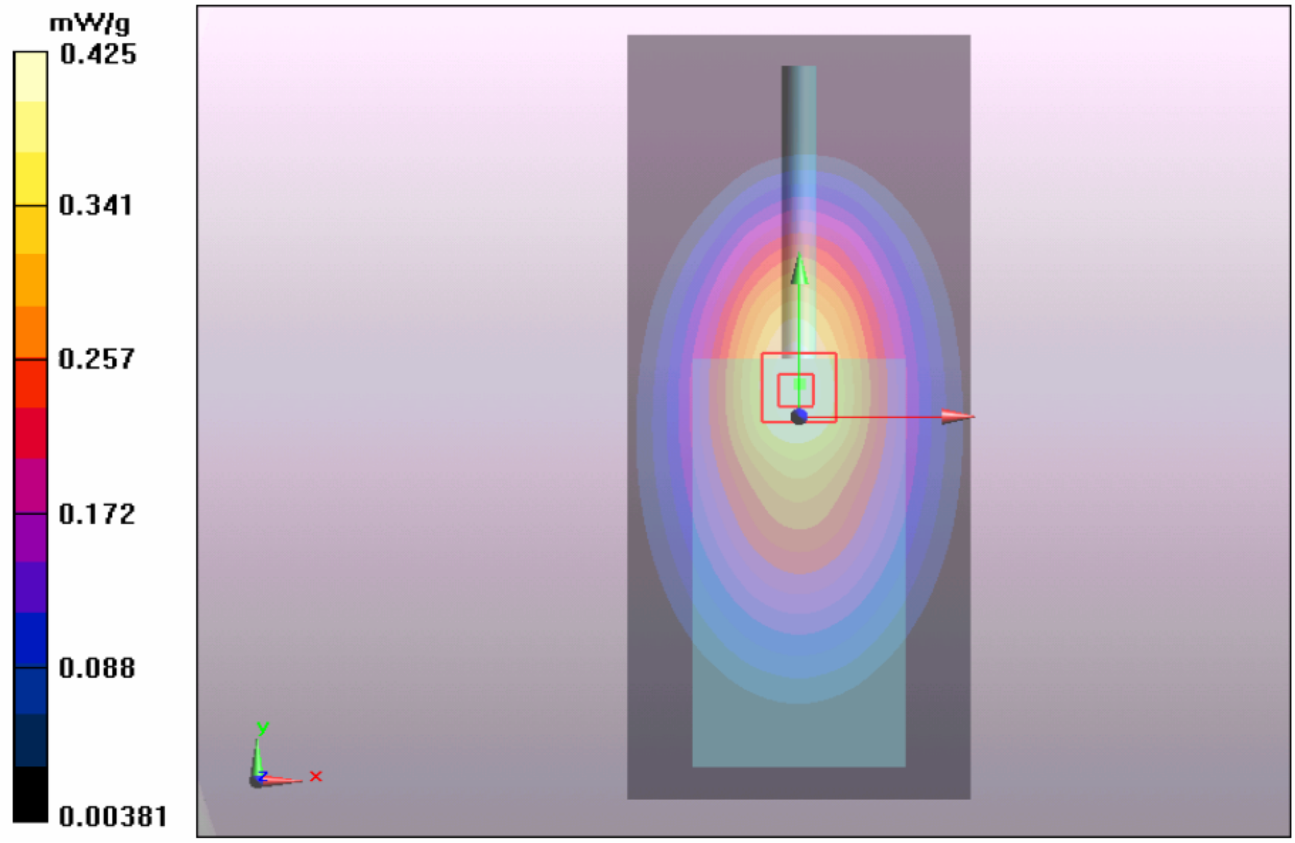
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.06 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.812 W/Kg

SAR(1 g) = 0.4060 W/Kg; SAR(10 g) = 0.218 W/Kg

Maximum value of SAR (measured) = 0.425 W/Kg



Date/Time: 01/19/2016 10:49:11 AM

Plot 4: Body-worn for GSM850 With A1, B1; Front towards Ground 824.2 MHz

Body- Worn GSM850 With A1, B1, Front towards Ground 836.6 MHz

Communication System: PTT850; Frequency: 836.6 MHz;Duty Cycle:1:8

Medium parameters used (interpolated): f = 836.0 MHz; σ = 0.99 S/m; ε_r = 53.50; ρ = 1000 kg/m^3

Phantom section : Flat Section

Probe: ES3DV3 - SN3221; ConvF(6.29, 6.29, 6.29); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.759 W/Kg

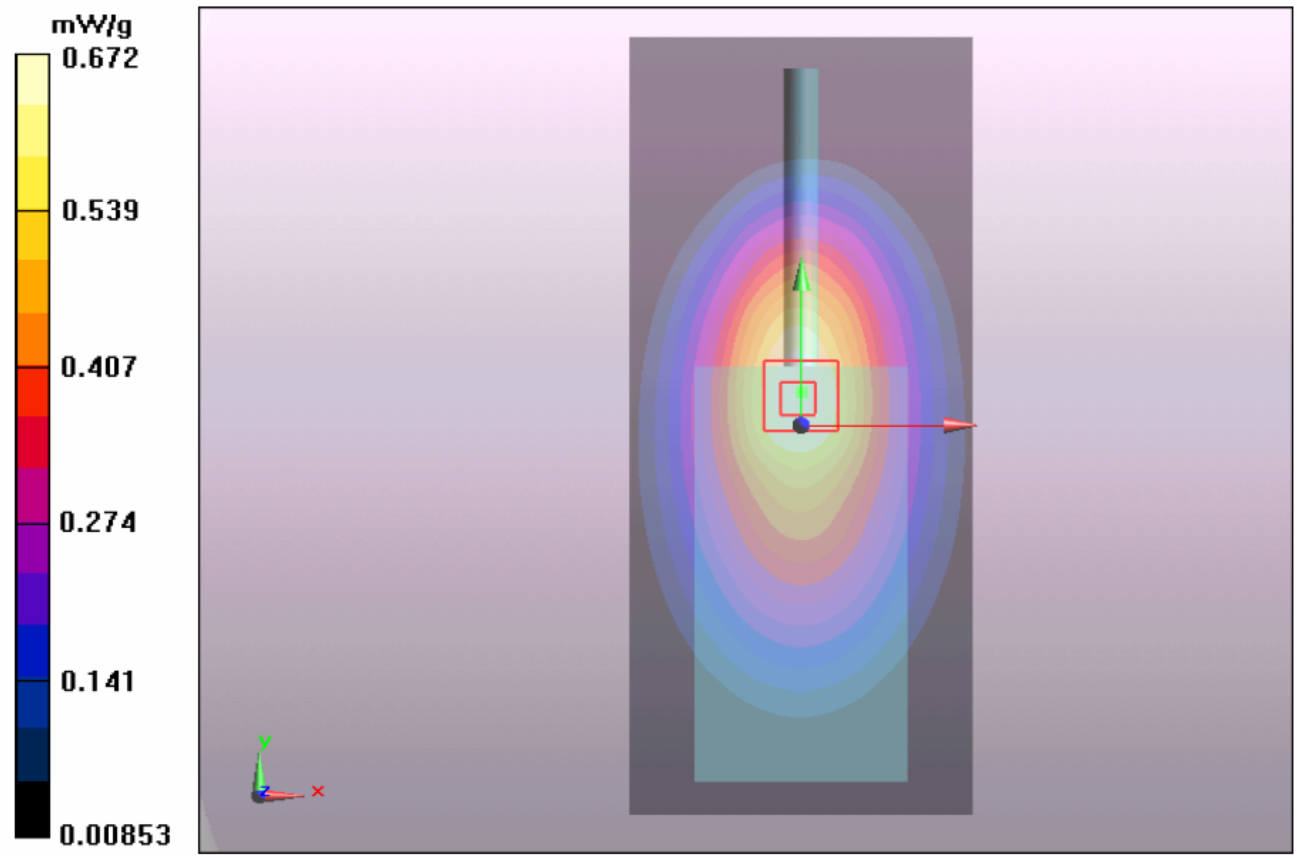
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.1 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 1.3910 W/Kg

SAR(1 g) = 0.6620 W/Kg; SAR(10 g) = 0.3380 W/Kg

Maximum value of SAR (measured) = 0.672 W/Kg



Date/Time: 01/19/2016 10:10:26 AM

Plot 5: Body-worn for GSM850 With A1, B1; Front towards Ground 836.6 MHz

Body- Worn GSM850 With A1, B1, Front towards Ground 848.8 MHz

Communication System: PTT850; Frequency: 848.8 MHz;Duty Cycle:1:8

Medium parameters used (interpolated): f = 849.0 MHz; σ = 1.02 S/m; ε_r = 53.20; ρ = 1000 kg/m^3

Phantom section : Flat Section

Probe: ES3DV3 - SN3221; ConvF(6.29, 6.29, 6.29); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.360 W/Kg

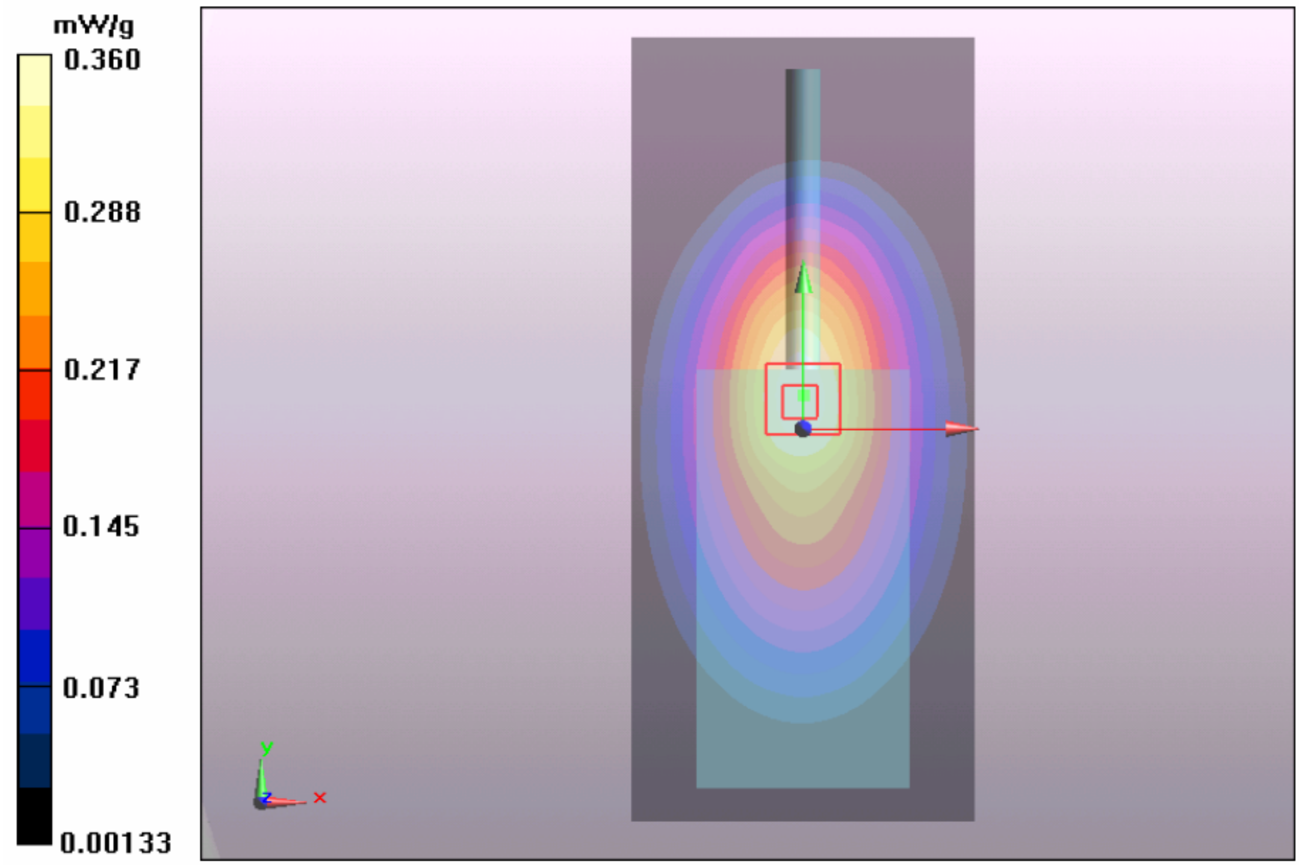
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.41 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.600 W/Kg

SAR(1 g) = 0.3350 W/Kg; SAR(10 g) = 0.1862 W/Kg

Maximum value of SAR (measured) = 0.360 W/Kg



Date/Time: 01/19/2016 10:31:53 AM

Plot 6: Body-worn for GSM850 With A1, B1; Front towards Ground 848.8 MHz

Face Held for GSM1900, Front towards Phantom 1850.2MHz

Communication System: PTT 1900; Frequency: 1850.2 MHz;Duty Cycle:1:8

Medium parameters used (interpolated): f = 1850.0 MHz; σ = 1.38 S/m; ε_r = 40.20; ρ = 1000 kg/m^3

Phantom section: Flat Section

Probe: ES3DV3 - SN3221; ConvF(5.20, 5.20, 5.20); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0742 W/Kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.515 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.122 W/Kg

SAR(1 g) = 0.0780 W/Kg; SAR(10 g) = 0.048 W/Kg

Maximum value of SAR (measured) = 0.0824 W/Kg

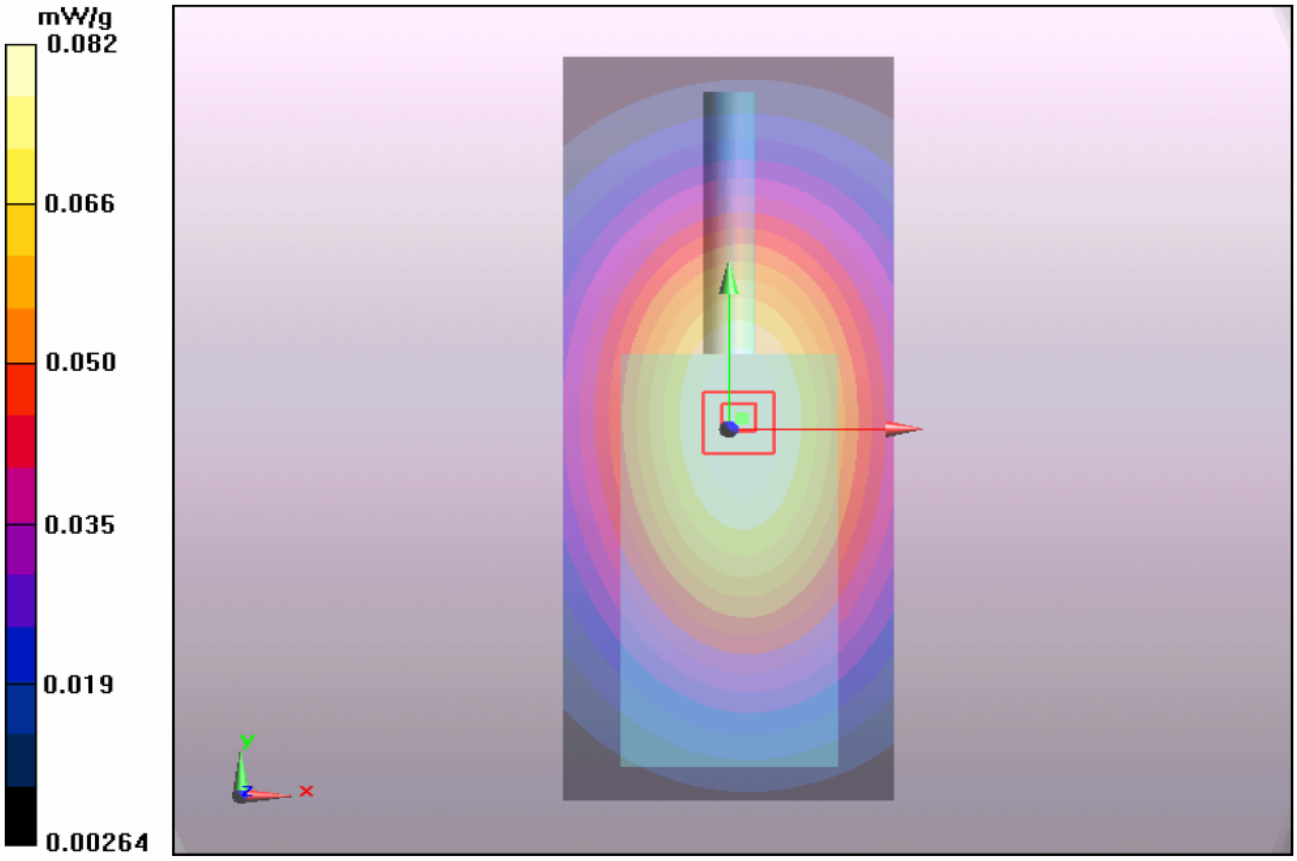


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Figure 7: Face held for GSM1900 Front towards Phantom 1850.2 MHz

Face Held for GSM1900, Front towards Phantom 1880.0MHz

Communication System: PTT 1900; Frequency: 1880.0 MHz;Duty Cycle:1:8

Medium parameters used (interpolated): f = 1880.0 MHz; σ = 1.42 S/m; ε_r = 40.20; ρ = 1000 kg/m^3

Phantom section: Flat Section

Probe: ES3DV3 - SN3221; ConvF(5.20, 5.20, 5.20); Calibrated: 1/31/2015;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn876; Calibrated: 03/09/2015

Phantom: ELI4; Type: Triple Modular;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (51x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.259 W/Kg

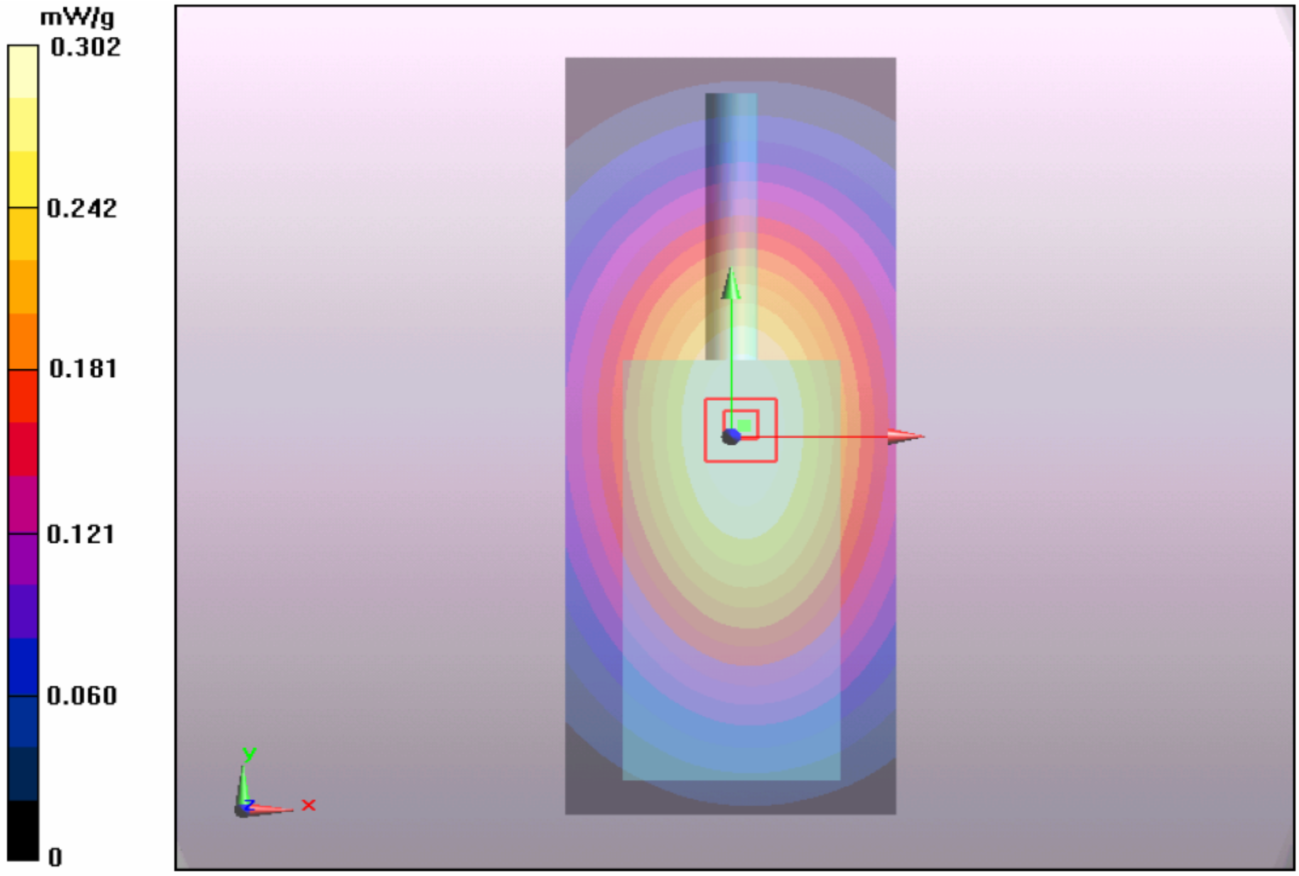
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.536 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.419 W/Kg

SAR(1 g) = 0.2770 W/Kg; SAR(10 g) = 0.1710 W/Kg

Maximum value of SAR (measured) = 0.3020 W/Kg



Date/Time: 01/18/2016 5:32:34 AM

Figure 8: Face held for GSM1900 Front towards Phantom 1880.0 MHz