FCC SAR Test Report

APPLICANT	:	**ZTE CORPORATION**
EQUIPMENT	:	**Tablet**
BRAND NAME	:	**ZTE**
MODEL NAME	:	**Vodafone Smart Tab 10**
FCC ID	:	**Q78-V11A**
STANDARD	:	**FCC 47 CFR Part 2 (2.1093)** **IEEE C95.1-1991** **IEEE 1528-2003** **FCC OET Bulletin 65 Supplement C (Edition 01-01)**

The product was received on Oct. 18, 2011 and completely tested on Nov. 04, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

ilac-MRA

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Table of Contents

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA182402-01	Rev. 01	This is a variant report for Vodafone Smart Tab 10. Based on original report, only the worst cases and conducted power were verified, the detail changes can be referred to the product equality declaration.	Nov. 10, 2011

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **ZTE CORPORATION Tablet, ZTE Vodafone Smart Tab 10,** are as follows (with expanded uncertainty 21.4 % for 300 MHz to 3 GHz).

< Test distance 0 cm to the phantom>

Band	Position	SAR_{1g} (W/kg)
GSM850	Body(0cm Gap)	0.628
GSM1900	Body(0cm Gap)	1.06
802.11 b/g/n, 2.4GHz	Body(0cm Gap)	0.454

<Test distance 0.4 cm to the phantom>

Band	Position	SAR_{1g} (W/kg)
GSM850	Body(0.4cm Gap)	1.03
GSM1900	Body(0.4cm Gap)	0.657

Note: The test records with distance 0.4 cm to the phantom are provided for verifying the SAR compliance when user is away from DUT and proximity sensor deactivated. 0.4 cm test results are for confirming operation of the power reduction scheme, and are not applicable for compliance demonstration for the FCC tablet PC SAR test procedures

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1991, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2003 and FCC OET Bulletin 65 Supplement C (Edition 01-01).

2 Administration Data

2.1 Testing Laboratory

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958

2.2 Applicant

Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District,Shenzhen, Guangdong, 518057, P.R.China

2.3 Manufacturer

Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District,Shenzhen, Guangdong, 518057, P.R.China

2.4 Application Details

Date of Receipt of Application	Oct. 18, 2011
Date of Start during the Test	Nov. 02, 2011
Date of End during the Test	Nov. 04, 2011

3 General Information

3.1 Description of Device Under Test (DUT)

Product Feature & Specification	
DUT Type	Tablet
Brand Name	ZTE
Model Name	Vodafone Smart Tab 10
FCC ID	Q78-V11A
Tx Frequency	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz 802.11b/g/n : 2400 MHz ~ 2483.5 MHz 802.11a/n : 5150 MHz ~ 5250 MHz; 5725 MHz ~ 5825 MHz Bluetooth : 2400 MHz ~ 2483.5 MHz
Rx Frequency	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz 802.11b/g/n : 2400 MHz ~ 2483.5 MHz 802.11a/n : 5150 MHz ~ 5250 MHz; 5725 MHz ~ 5825 MHz Bluetooth : 2400 MHz ~ 2483.5 MHz
Maximum Output Power to Antenna	GSM850 : 32.67 dBm GSM1900 : 29.60 dBm 802.11b : 13.45 dBm 802.11g : 13.42 dBm 802.11n (BW 20MHz) (2.4GHz) : 13.21 dBm 802.11a : 9.45 dBm 802.11n (BW 20MHz) (5 GHz) : 9.43 dBm Bluetooth: 2.06 dBm
Antenna Type	WWAN : Fixed Internal Antenna WLAN/BT : PIFA Antenna
HW Version	110403
SW Version	SmartTab10-MSM8260-V02c-Oct192011-Vodafone-DE
Type of Modulation	GPRS : GMSK EDGE : GMSK/ 8PSK 802.11b : DSSS (BPSK / QPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π/4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
DUT Stage	Identical Prototype

Remark:

1. The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. GSM voice call is not supported. DTM not supported.

3.2 Product Photos

Please refer to Appendix D.

3.3 Applied Standards

The Specific Absorption Rate (SAR) testing specification, method and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- IEEE C95.1-1991
- IEEE 1528-2003
- FCC OET Bulletin 65 Supplement C (Edition 01-01)
- FCC KDB 447498 D01 v04
- FCC KDB 648474 D01 v01r05
- FCC KDB 941225 D01 v02
- DCC KDB 941225 D03 v01
- FCC KDB 248227 D01 v01r02

3.4 Device Category and SAR Limits

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user. Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

3.5 Test Conditions

3.4.1 Ambient Condition

Ambient Temperature	20 to 24 ℃
Humidity	< 60 %

3.4.2 Test Configuration

The device was controlled by using a base station emulator. Communication between the device and the emulator was established by air link. The distance between the DUT and the antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of DUT. The DUT was set from the emulator to radiate maximum output power during all tests.

For WWAN SAR testing, the DUT is in GSM or GPRS or EDGE link mode.

For WLAN SAR testing, WLAN engineering testing software installed on the DUT can provide continuous transmitting RF signal. This RF signal utilized in SAR measurement has almost 100% duty cycle and its crest factor is 1.

The DUT implements power reduction scheme for SAR compliance, for specific device configuration and orientations, as described below. The complete description of the implementation and functionality is provided in the “Technical Description” exhibit.

Power reduction applied for each wireless mode and orientation

Exposure Position / wireless mode	GPRS/EGPRS 850	GPRS/EGPRS 1900
Secondary Landscape	##	##
Primary Landscape	#	#
Secondary Portrait	#	#
Primary Portrait	#	#
# Reduced maximum limit applied only by activation of proximity sensor. ## Reduced maximum limit applied by default.		

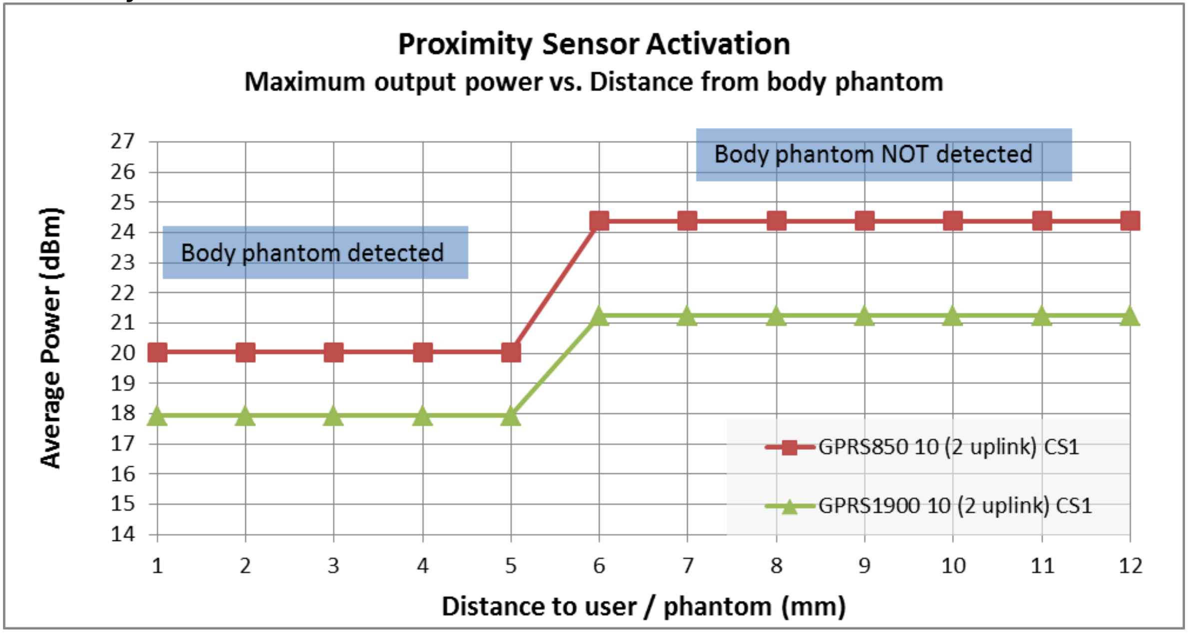
Remark:

1. EDGE (8PSK) output power is not reduced for SAR compliance.
2. WLAN, BT output power is not reduced for SAR compliance

Power reduction target specifications:

Mode(s) of Operation	GPRS/EGPRS 850	GPRS/EGPRS 1900
Target Reduction Level	4.5 dB	3.5 dB

<Proximity Sensor for Bottom Face detection>



Remark:

1. GPRS 850 class 10, CH128. Full power: 24.38dBm, Reduced power: 20.04dBm. The power reduction level is 4.22dB.
2. GPRS 1900 class 10, CH 810. Full power: 21.25dBm, Reduced power: 17.93dBm. The power reduction level is 3.24dB.

4 Specific Absorption Rate (SAR)

4.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an 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 general population/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.

4.2 SAR Definition

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 a given density (ρ). The equation description is as below:

$$\mathbf{SAR} = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\mathbf{dm}}\right) = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\boldsymbol{\rho}\mathbf{dv}}\right)$$

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

SAR measurement can be either related to the temperature elevation in tissue by

$$\mathbf{SAR} = \mathbf{C}\left(\frac{\boldsymbol{\delta}\mathbf{T}}{\boldsymbol{\delta}\mathbf{t}}\right)$$

Where: C is the specific heat capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

5 SAR Measurement System

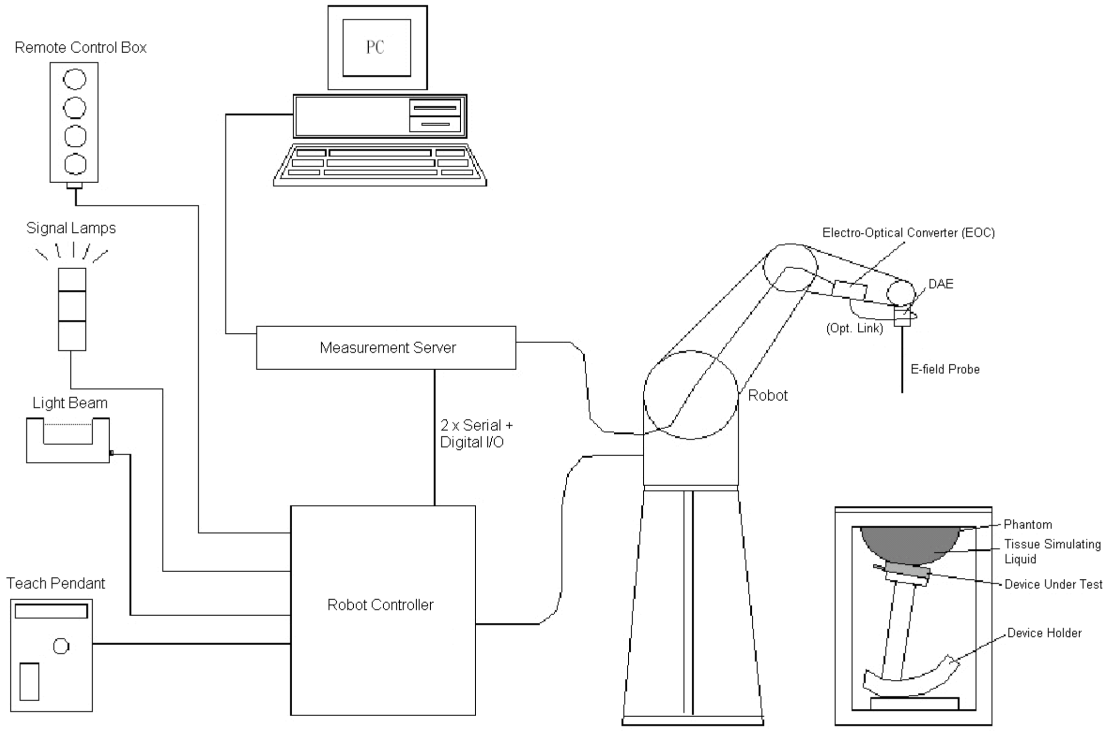


Fig 5.1 SPEAG DASY System Configurations

The DASY system for performance compliance tests is illustrated above graphically. This system consists of the following items:

- A standard high precision 6-axis robot with controller, a teach pendant and software
- A data acquisition electronic (DAE) attached to the robot arm extension
- A dosimetric probe equipped with an optical surface detector system
- The electro-optical converter (ECO) performs the conversion between optical and electrical signals
- A measurement server performs the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the accuracy of the probe positioning
- A computer operating Windows XP
- DASY software
- Remove control with teach pendant and additional circuitry for robot safety such as warming lamps, etc.
- The SAM twin phantom
- A device holder
- Tissue simulating liquid
- Dipole for evaluating the proper functioning of the system

Some of the components are described in details in the following sub-sections.

5.1 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. This probe has a built in optical surface detection system to prevent from collision with phantom.

5.1.1 E-Field Probe Specification

<EX3DV4 Probe>

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 µW/g to 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 µW/g)	
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	**Fig 5.2 Photo of EX3DV4**

5.1.2 E-Field Probe Calibration

Each probe needs to be calibrated according to a dosimetric assessment procedure with accuracy better than ± 10%. The spherical isotropy shall be evaluated and within ± 0.25 dB. The sensitivity parameters (NormX, NormY, and NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested. The calibration data can be referred to appendix C of this report.

5.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.3 Photo of DAE

5.3 Robot

The SPEAG DASY system uses the high precision robots (DASY5: TX90XL) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

Fig 5.4 Photo of DASY5

5.4 Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5: 128 MB), RAM (DASY5: 128 MB). 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 DASY 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.

Fig 5.1 Photo of Server for DASY5

5.5 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom

Fig 5.2 Photo of SAM 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>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)
Filling Volume	Approx. 30 liters
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm

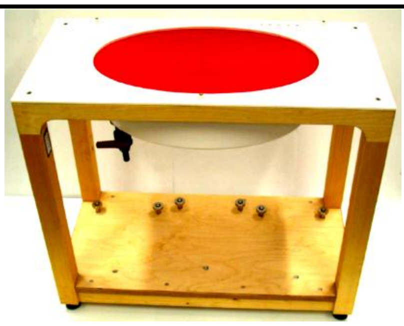


Fig 5.3 Photo of ELI4 Phantom

The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

5.6 Device Holder

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

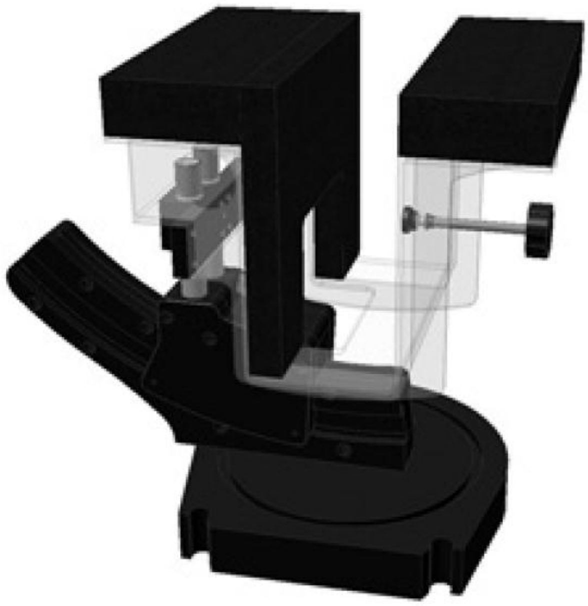


Fig 5.4 Laptop Extension Kit

5.7 Data Storage and Evaluation

5.7.1 Data Storage

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

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

5.7.2 Data Evaluation

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

Probe parameters：	- Sensitivity	$Norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion factor	$ConvF_i$
	- Diode compression point	dcp_i
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 DASY components. In the direct measuring mode of the multi-meter 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：

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

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

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

E-field Probes：$\mathbf{E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}}$

H-field Probes：$\mathbf{H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1}f + a_{i2}f^2}{f}}$

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

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

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

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

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

with SAR = local specific absorption rate in mW/g
E_{tot} = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm^3

Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

5.8 Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Dosimetric E-Field Probe	EX3DV4	3697	Sep. 02, 2011	Sep. 01, 2012
SPEAG	Data Acquisition Electronics	DAE4	679	Jun. 24, 2011	Jun. 23, 2012
SPEAG	835MHz System Validation Kit	D835V2	4d091	Nov. 23, 2009	Nov. 22, 2011
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	Nov. 24, 2009	Nov. 23, 2011
SPEAG	2450MHz System Validation Kit	D2450V2	840	Mar. 18, 2010	Mar. 17, 2012
SPEAG	ELI4 Phantom	QD OVA 001 BB	1079	NCR	NCR
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	Apr. 07, 2011	Apr. 06, 2012
Agilent	Wireless Communication Test Set	E5515C	MY50264165	Mar. 30, 2011	Mar. 29, 2012
Agilent	Dielectric Probe Kit	85070E	MY44300475	NCR	NCR
Agilent	Base Station	E5515C	GB47050646	Aug. 18, 2011	Aug. 17, 2012
AR	Amplifier	551G4	333096	NCR	NCR
R&S	Spectrum Analyzer	FSP30	101329	May. 03, 2011	May. 02, 2012
R&S	Signal Generator	SMR40	100455	Jan. 06, 2011	Jan. 05, 2012

Table 5.1 Test Equipment List

Note:

1. The calibration certificate of DASY can be referred to appendix C of this report.
2. Referring to KDB450824 D02, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole D835V2, SN: 4d091, D1900V2, SN: 5d118, can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

6 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 6.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 6.2.

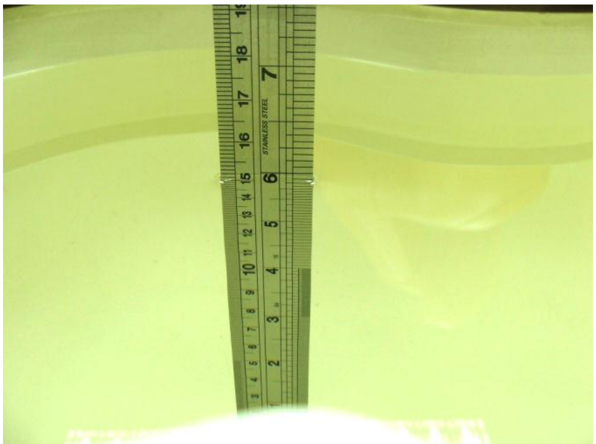


Fig 6.1 Photo of Liquid Height for Head SAR

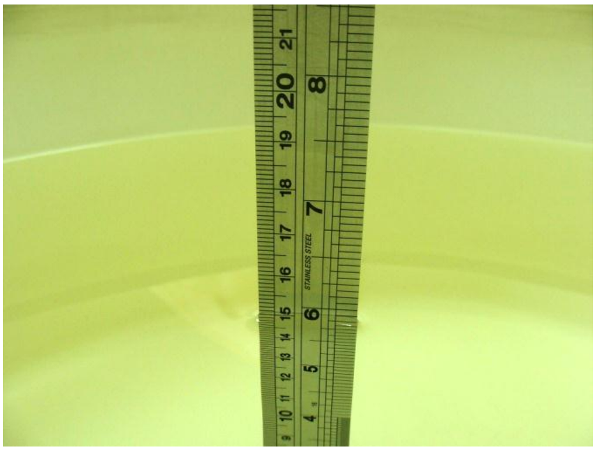


Fig 6.2 Photo of Liquid Height for Body SAR

The following table gives the recipes for tissue simulating liquid.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (ε_r)
For Head								
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
For Body								
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2450	68.6	0	0	0	0	31.4	1.95	52.7

Table 6.1 Recipes of Tissue Simulating Liquid

Simulating Liquid for 5G, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

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

The following table shows the measuring results for simulating liquid.

Freq. (MHz)	Liquid Type	Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
835	Body	21.3	0.973	54.088	0.97	55.2	0.31	-2.01	±5	Nov. 02, 2011
1900	Body	21.2	1.58	54.631	1.52	53.3	3.95	2.50	±5	Nov. 02, 2011
2450	Body	21.3	1.992	54.311	1.95	52.7	2.15	3.06	±5	Nov. 04, 2011

Table 6.2 Measuring Results for Simulating Liquid

Freq. (MHz)	Liquid Type	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
824.6	Body	0.963	54.162	0.97	55.2	-0.72	-1.88	±5	Nov. 02, 2011
836.4	Body	0.974	54.078	0.97	55.2	0.41	-2.03	±5	Nov. 02, 2011
848.8	Body	0.985	53.969	0.99	55.2	-0.51	-2.23	±5	Nov. 02, 2011
1850.2	Body	1.515	54.748	1.50	53.4	1.00	2.52	±5	Nov. 02, 2011
1880	Body	1.557	54.666	1.51	53.3	3.11	2.56	±5	Nov. 02, 2011
1909.8	Body	1.571	54.611	1.51	53.3	4.04	2.46	±5	Nov. 02, 2011
2412	Body	1.922	54.350	1.90	52.7	1.16	3.13	±5	Nov. 04, 2011
2437	Body	1.951	54.326	1.93	52.7	1.09	3.09	±5	Nov. 04, 2011
2462	Body	1.982	54.271	1.97	52.7	0.61	2.98	±5	Nov. 04, 2011

Table 6.3 Low/mid/High channel for liquid validation

7 Uncertainty Assessment

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 7.1

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 7.1 Standard Uncertainty for Assumed Distribution

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 showed in Table 7.2.

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Standard Uncertainty (1g)
Measurement System					
Probe Calibration	6.0	Normal	1	1	± 6.0 %
Axial Isotropy	4.7	Rectangular	√3	0.7	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	± 3.9 %
Boundary Effects	1.0	Rectangular	√3	1	± 0.6 %
Linearity	4.7	Rectangular	√3	1	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	± 0.6 %
Readout Electronics	0.3	Normal	1	1	± 0.3 %
Response Time	0.8	Rectangular	√3	1	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	± 1.7 %
Probe Positioner	0.4	Rectangular	√3	1	± 0.2 %
Probe Positioning	2.9	Rectangular	√3	1	± 1.7 %
Max. SAR Eval.	1.0	Rectangular	√3	1	± 0.6 %
Test Sample Related					
Device Positioning	2.9	Normal	1	1	± 2.9 %
Device Holder	3.6	Normal	1	1	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	± 2.9 %
Phantom and Setup					
Phantom Uncertainty	4.0	Rectangular	√3	1	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	± 1.8 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	± 1.6 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	± 1.7 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	± 1.5 %
Combined Standard Uncertainty					± 11.0 %
Coverage Factor for 95 %					K = 2
Expanded Uncertainty					**± 22.0 %**

Table 7.2 Uncertainty Budget of DASY for frequency range 300 MHz to 3 GHz

8 SAR Measurement Evaluation

Each DASY system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system performance check and system validation. System validation kit includes a dipole, tripod holder to fix it underneath the flat phantom and a corresponding distance holder.

8.1 Purpose of System Performance check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

8.2 System Setup

In the simplified setup for system evaluation, the DUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:

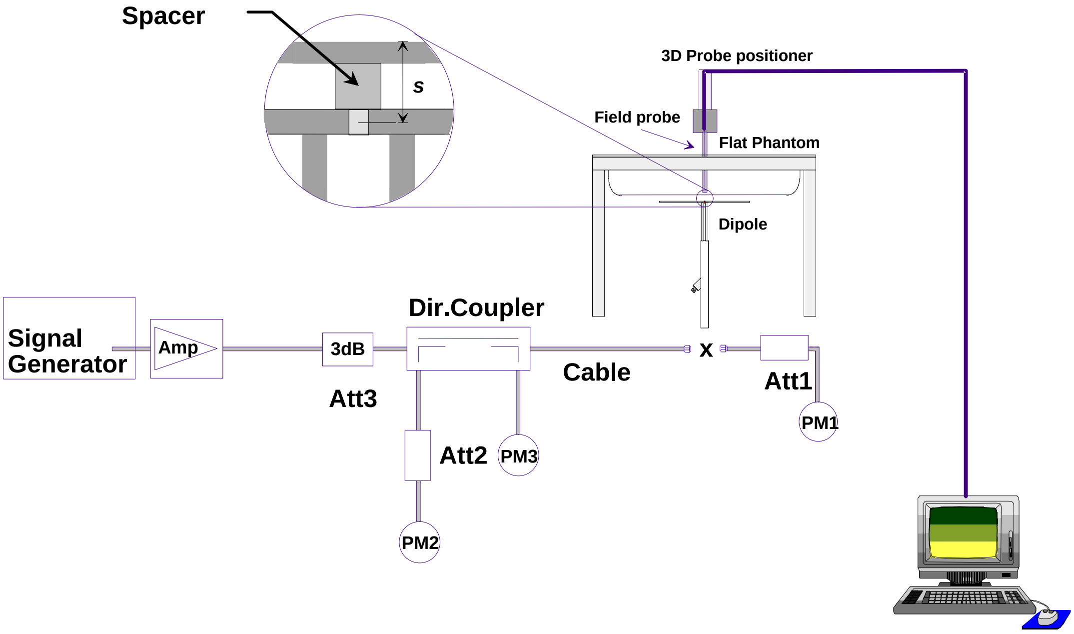


Fig 8.1 System Setup for System Evaluation

1. Signal Generator
2. Amplifier
3. Directional Coupler
4. Power Meter
5. Calibrated Dipole

The output power on dipole port must be calibrated to 24 dBm (250 mW) before dipole is connected.

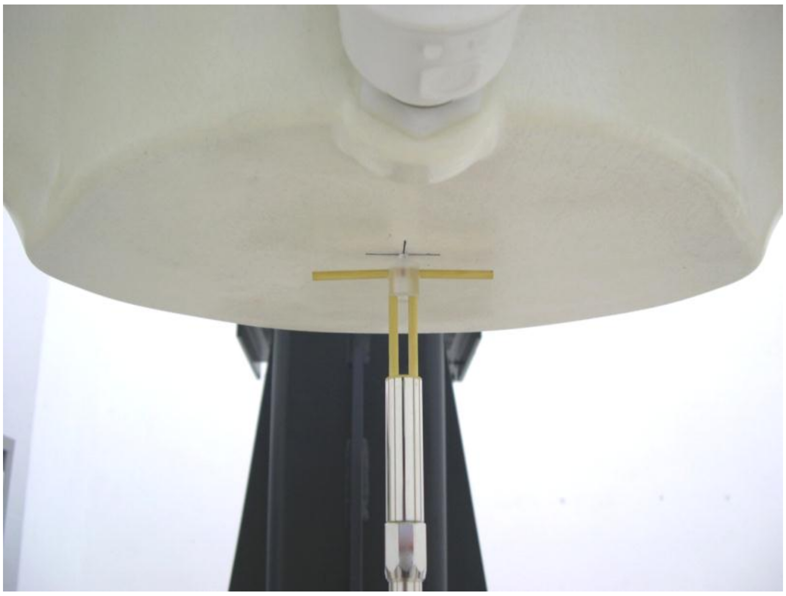


Fig 8.2 Photo of Dipole Setup

8.3 Validation Results

Comparing to the original SAR value provided by SPEAG, the validation data should be within its specification of 10 %. Table 8.1 shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Measurement Date	Frequency (MHz)	Targeted SAR_{1g} (W/kg)	Measured SAR_{1g} (W/kg)	Normalized SAR_{1g} (W/kg)	Deviation (%)
Nov. 02, 2011	835	9.80	2.41	9.64	-1.63
Nov. 02, 2011	1900	39.6	10.00	40.00	1.01
Nov. 04, 2011	2450	52.1	13.40	53.60	2.88

Table 8.1 Target and Measurement SAR after Normalized

9 DUT Testing Position

This DUT was tested in three different positions. They are bottom face of tablet PC, Primary Portrait and Secondary Landscape. In these positions, the surface of DUT is touching with phantom 0 or 0.4 cm gap. Please refer to Appendix E for the test setup photos.

10 Measurement Procedures

The measurement procedures are as follows:

(a) For WWAN function, link DUT with base station emulator in highest power channel
(b) Set base station emulator to allow DUT to radiate maximum output power
(c) For WLAN function, using engineering software to transmit RF power continuously (continuous Tx) in the highest power channel
(d) Measure output power through RF cable and power meter
(e) Place the DUT in the positions described in the last section
(f) Set scan area, grid size and other setting on the DASY software
(g) Taking data for the highest power channel on each testing position
(h) Find out the largest SAR result on these testing positions of each band
(i) Measure SAR results for other channels in worst SAR testing position if the SAR of highest power channel is larger than 0.8 W/kg

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

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

10.1 Spatial Peak SAR Evaluation

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

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

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

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

10.2 Area & Zoom Scan Procedures

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures 5x5x7 points with step size 8, 8 and 5 mm for 300 MHz to 3 GHz, and 8x8x8 points with step size 4, 4 and 2.5 mm for 3 GHz to 6 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

10.3 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the DUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing (step-size is 4, 4 and 2.5 mm). When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

10.4 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

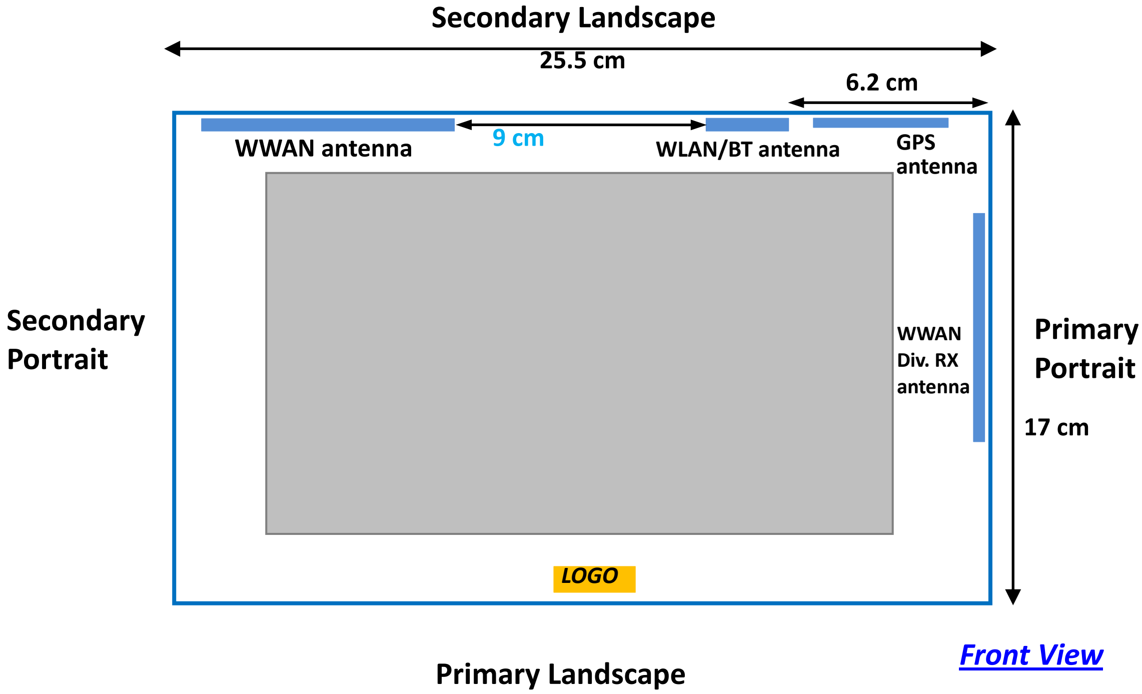
Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

10.5 Power Drift Monitoring

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

11 SAR Test Configuration

11.1 Exposure Position Consideration



Sides for SAR tests; Tablet (> 20cm diagonal)						
Exposure Position	Bottom Face	Front Face	Secondary Landscape	Primary Landscape	Primary Portrait	Secondary Portrait
GPRS/EDGE	0mm, 4mm	x	0mm	x	x	x
WLAN 11 b/g/n	0mm	x	0mm	x	0mm	x

11.2 Simultaneous Transmission Consideration

Simultaneous Transmission						
Exposure Position	Bottom Face	Front Face	Secondary Landscape	Primary Landscape	Primary Portrait	Secondary Portrait
GPRS/EDGE With power reduction	0mm	x	0mm	x	x	x
WLAN 11 a/b/g/n	0mm	x	0mm	x	x	x
GPRS/EDGE Full Power	4mm	x	x	x	x	x
WLAN 11 a/b/g/n	0mm	x	x	x	x	x

Note: For simultaneous SAR evaluation at Bottom Face, 4mm distance, since WLAN SAR value 0mm will be worse than 4mm data; therefore 0mm WLAN SAR data is used here.

12 SAR Test Results

12.1 Conducted Power (Unit: dBm)

<GPRS/EDGE – Full power>

Burst Average Power						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
GPRS 8 (1 Uplink) CS1	32.67	32.59	32.43	29.49	29.55	29.60
GPRS 10 (2 Uplink) CS1	30.38	30.22	30.11	27.00	27.21	27.25
GPRS 11 (3 Uplink) CS1	28.39	28.30	28.60	24.88	25.11	25.14
GPRS 12 (4 Uplink) CS1	27.26	27.13	26.96	23.35	23.44	23.54
EDGE 8 (GMSK, 1 Uplink) MCS1	32.66	32.58	32.43	29.42	29.54	29.55
EDGE 10 (GMSK, 2 Uplink) MCS1	30.37	30.21	30.09	27.00	27.20	27.17
EDGE 11 (GMSK, 3 Uplink) MCS1	28.38	28.28	28.59	24.87	25.03	25.04
EDGE 12 (GMSK, 4 Uplink) MCS1	27.18	27.13	26.95	23.34	23.44	23.53
EDGE 8 (8PSK, 1 Uplink) MCS9	26.45	26.42	26.32	25.18	25.30	25.28
EDGE 10 (8PSK, 2 Uplink) MCS9	24.37	24.26	24.16	23.05	23.24	23.38
EDGE 11 (8PSK, 3 Uplink) MCS9	22.40	22.36	22.17	21.01	21.22	21.30
EDGE 12 (8PSK, 4 Uplink) MCS9	21.47	21.48	21.26	20.41	20.58	20.61
Source-Based Time-Averaged Power						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
GPRS 8 (1 Uplink) CS1	23.67	23.59	23.43	20.49	20.55	20.60
GPRS 10 (2 Uplink) CS1	24.38	24.22	24.11	21.00	21.21	21.25
GPRS 11 (3 Uplink) CS1	24.13	24.04	24.34	20.62	20.85	20.88
GPRS 12 (4 Uplink) CS1	24.26	24.13	23.96	20.35	20.44	20.54
EDGE 8 (GMSK, 1 Uplink) MCS1	23.66	23.58	23.43	20.42	20.54	20.55
EDGE 10 (GMSK, 2 Uplink) MCS1	24.37	24.21	24.09	21.00	21.20	21.17
EDGE 11 (GMSK, 3 Uplink) MCS1	24.12	24.02	24.33	20.61	20.77	20.78
EDGE 12 (GMSK, 4 Uplink) MCS1	24.18	24.13	23.95	20.34	20.44	20.53
EDGE 8 (8PSK, 1 Uplink) MCS9	17.45	17.42	17.32	16.18	16.30	16.28
EDGE 10 (8PSK, 2 Uplink) MCS9	18.37	18.26	18.16	17.05	17.24	17.38
EDGE 11 (8PSK, 3 Uplink) MCS9	18.14	18.10	17.91	16.75	16.96	17.04
EDGE 12 (8PSK, 4 Uplink) MCS9	18.47	18.48	18.26	17.41	17.58	17.61

Remark:
The source-based time-averaged power is linearly scaled the maximum burst averaged power based on time slots. The calculated method are shown as below:
Source based time averaged power = Maximum burst averaged power (1 Uplink) - 9 dB
Source based time averaged power = Maximum burst averaged power (2 Uplink) - 6 dB
Source based time averaged power = Maximum burst averaged power (3 Uplink) - 4.26 dB
Source based time averaged power = Maximum burst averaged power (4 Uplink) - 3 dB

.

<With Power Reduction: GPRS/EDGE 850, 1900>

Burst Average Power												
Band	GSM850						GSM1900					
Channel	128		189		251		512		661		810	
Frequency (MHz)	824.2		836.4		848.8		1850.2		1880.0		1909.8	
	Output Power (dBm)	Reduction (dB)	Output Power (dBm)	Reduction (dB)	Output Power (dBm)	Reduction (dB)	Output Power (dBm)	Reduction (dB)	Output Power (dBm)	Reduction (dB)	Output Power (dBm)	Reduction (dB)
GPRS 8 (1 Uplink) CS1	28.45	4.22	28.40	4.19	28.33	4.10	26.26	3.23	26.35	3.20	26.36	3.24
GPRS 10 (2 Uplink) CS1	26.04	4.34	25.97	4.25	25.91	4.20	23.78	3.22	23.89	3.32	23.93	3.32
GPRS 11 (3 Uplink) CS1	24.10	4.29	23.99	4.31	24.22	4.38	21.70	3.18	22.00	3.11	22.04	3.10
GPRS 12 (4 Uplink) CS1	22.85	4.41	22.78	4.35	22.56	4.40	20.07	3.28	20.13	3.31	20.23	3.31
EDGE 8 (GMSK, 1 Uplink) MCS1	28.44	4.22	28.39	4.19	28.32	4.11	26.29	3.13	26.34	3.20	26.39	3.16
EDGE 10 (GMSK, 2 Uplink) MCS1	25.97	4.40	25.96	4.25	25.80	4.29	23.31	3.69	23.40	3.80	23.47	3.70
EDGE 11 (GMSK, 3 Uplink) MCS1	24.09	4.29	23.98	4.30	24.21	4.38	21.69	3.18	21.99	3.04	22.03	3.01
EDGE 12 (GMSK, 4 Uplink) MCS1	22.87	4.31	22.89	4.24	22.60	4.35	20.06	3.28	20.12	3.32	20.22	3.31
EDGE 8 (8PSK, 1 Uplink) MCS9	26.45	0.00	26.42	0.00	26.32	0.00	25.18	0.00	25.30	0.00	25.28	0.00
EDGE 10 (8PSK, 2 Uplink) MCS9	24.37	0.00	24.26	0.00	24.16	0.00	23.05	0.00	23.24	0.00	23.38	0.00
EDGE 11 (8PSK, 3 Uplink) MCS9	22.40	0.00	22.36	0.00	22.17	0.00	21.01	0.00	21.22	0.00	21.30	0.00
EDGE 12 (8PSK, 4 Uplink) MCS9	21.47	0.00	21.48	0.00	21.26	0.00	20.41	0.00	20.58	0.00	20.61	0.00

Source-Based Time-Averaged Power						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
GPRS 8 (1 Uplink) CS1	19.45	19.40	19.33	17.26	17.35	17.36
GPRS 10 (2 Uplink) CS1	20.04	19.97	19.91	17.78	17.89	17.93
GPRS 11 (3 Uplink) CS1	19.84	19.73	19.96	17.44	17.74	17.78
GPRS 12 (4 Uplink) CS1	19.85	19.78	19.56	17.07	17.13	17.23
EDGE 8 (GMSK, 1 Uplink) MCS1	19.44	19.39	19.32	17.29	17.34	17.39
EDGE 10 (GMSK, 2 Uplink) MCS1	19.97	19.96	19.80	17.31	17.40	17.47
EDGE 11 (GMSK, 3 Uplink) MCS1	19.83	19.72	19.95	17.43	17.73	17.77
EDGE 12 (GMSK, 4 Uplink) MCS1	19.87	19.89	19.60	17.06	17.12	17.22
EDGE 8 (8PSK, 1 Uplink) MCS9	17.45	17.42	17.32	16.18	16.30	16.28
EDGE 10 (8PSK, 2 Uplink) MCS9	18.37	18.26	18.16	17.05	17.24	17.38
EDGE 11 (8PSK, 3 Uplink) MCS9	18.14	18.10	17.91	16.75	16.96	17.04
EDGE 12 (8PSK, 4 Uplink) MCS9	18.47	18.48	18.26	17.41	17.58	17.61

Remark:
The source-based time-averaged power is linearly scaled the maximum burst averaged power based on time slots. The calculated method are shown as below:
Source based time averaged power = Maximum burst averaged power (1 Uplink) - 9 dB
Source based time averaged power = Maximum burst averaged power (2 Uplink) - 6 dB
Source based time averaged power = Maximum burst averaged power (3 Uplink) - 4.26 dB
Source based time averaged power = Maximum burst averaged power (4 Uplink) - 3 dB

<GPRS/EDGE Reduction Level>

Band	GSM850				GSM1900			
Channel	128	189	251	Target Reduction (dB)	512	661	810	Target Reduction (dB)
Frequency	824.2	836.4	848.8		1850.2	1880	1909.8	
GPRS 8 (1 Uplink) CS1	4.22	4.19	4.10	4.50	3.23	3.20	3.24	3.50
GPRS 10 (2 Uplink) CS1	4.34	4.25	4.20	4.50	3.22	3.32	3.32	3.50
GPRS 11 (3 Uplink) CS1	4.29	4.31	4.38	4.50	3.18	3.11	3.10	3.50
GPRS 12 (4 Uplink) CS1	4.41	4.35	4.40	4.50	3.28	3.31	3.31	3.50
EDGE 8 (GMSK, 1 Uplink) MCS1	4.22	4.19	4.11	4.50	3.13	3.20	3.16	3.50
EDGE 10 (GMSK, 2 Uplink) MCS1	4.40	4.25	4.29	4.50	3.69	3.80	3.70	3.50
EDGE 11 (GMSK, 3 Uplink) MCS1	4.29	4.30	4.38	4.50	3.18	3.04	3.01	3.50
EDGE 12 (GMSK, 4 Uplink) MCS1	4.31	4.24	4.35	4.50	3.28	3.32	3.31	3.50
EDGE 8 (8PSK, 1 Uplink) MCS9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EDGE 10 (8PSK, 2 Uplink) MCS9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EDGE 11 (8PSK, 3 Uplink) MCS9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EDGE 12 (8PSK, 4 Uplink) MCS9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

<WLAN>

Band	802.11b			802.11g		
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Average Power	13.45	13.27	13.29	13.35	13.18	13.42

Band	802.11n		
Channel	1	6	11
Frequency (MHz)	2412	2437	2462
Average Power	12.61	13.12	13.21

Band	802.11a						
Channel	36	40	44	149	153	157	161
Frequency (MHz)	5180	5200	5220	5745	5765	5785	5805
Average Power	9.49	9.42	9.45	9.19	9.28	9.36	9.40

Band	802.11n						
Channel	36	40	44	149	153	157	161
Frequency (MHz)	5180	5200	5220	5745	5765	5785	5805
Average Power	9.48	9.37	9.43	9.17	9.19	9.33	9.39

Note: Per KDB 447498, since 802.11 a/n average power is less than 60/f (10dBm), SAR is excluded.

Band	Bluetooth		
Channel	0	39	78
Frequency	2402	2441	2480
Average Power	0.48	1.80	2.06

Note: Per KDB 447498, since Bluetooth average power is less than 60/f (13.8dBm), SAR is excluded.

12.2 Test Records for Body SAR Test

<GPRS/EDGE>

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Ch.	Output power (dBm)	Power Drift (dB)	SAR_{1g} (W/kg)
10	GSM850	GPRS multi-slot class 10	Bottom Face	0	128	26.04	0.07	0.628
1	GSM850	GPRS multi-slot class 10	Bottom Face	0.4	251	30.11	-0.08	1.030
2	GSM850	GPRS multi-slot class 10	Bottom Face	0.4	128	30.38	-0.004	0.714
3	GSM850	GPRS multi-slot class 10	Bottom Face	0.4	189	30.22	0.06	0.828
4	GSM1900	GPRS multi-slot class 10	Secondary Landscape	0	512	23.78	0.01	1.02
5	GSM1900	GPRS multi-slot class 10	Secondary Landscape	0	661	23.89	0.05	1.06
6	GSM1900	GPRS multi-slot class 10	Secondary Landscape	0	810	23.93	-0.09	1.06
11	GSM1900	GPRS multi-slot class 10	Bottom Face	0.4	810	27.25	-0.0056	0.657

Note:

1. 0.4 cm test results are for confirming operation of the power reduction scheme, and are not applicable for compliance demonstration for the FCC tablet PC SAR test procedures. During 0.4cm SAR testing, proximity sensor power reduction is disabled by specific test SW, and it is not available to end users.
2. During SAR testing for positions other than Bottom Face, proximity sensor power reduction is disabled to avoid any unexpected trigger. This is done by specific test SW, and it is not available to end users.
3. Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
4. The SAR evaluation based on the similar configurations that obtained from the worst cases of original authorization is provided.

<WLAN>

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Ch.	Output power (dBm)	Power Drift (dB)	SAR_{1g} (W/kg)
7	802.11b	-	Bottom Face	0	1	13.45	-0.03	0.262
9	802.11b	-	Secondary Landscape	0	1	13.45	0.10	0.454

Note:

1. Per KDB 447498, if the highest output channel SAR for each exposure position ≤ 0.8 W/kg other channels SAR tests are not necessary.
2. The SAR evaluation based on the similar configurations that obtained from the worst cases of original authorization is provided.

12.3 Simultaneous Transmission Analysis

< Test distance 0 mm to the phantom >

Position	GSM 850	GSM 1900	802.11b/g/n	Max. SAR Summation	Volume Scan
Bottom Face	0.628	0	0.262	0.890	**No**
Secondary Landscape	0	1.06	0.454	1.514	**No**
Secondary Portrait	0	0	0	0	**No**
Primary Landscape	0	0	0	0	**No**
Primary Portrait	0	0	0.063	0.063	**No**

Note: If 1g-SAR scalar summation < 1.6W/kg, simultaneous SAR measurement is not necessary,

<Test distance 4 mm to the phantom; DUT with GPRS/EDGE Full Power >

Position	GSM 850	GSM 1900	802.11b/g	Max. SAR Summation	Volume Scan
Bottom Face	1.03	0.657	0.262	1.29	**No**

Note:

1. 0.4 cm test results are for confirming operation of the power reduction scheme, and are not applicable for compliance demonstration for the FCC tablet PC SAR test procedures
2. WLAN SAR data at 0mm is applied here, and it will represent more conservative situation than WLAN SAR data at 0.4cm.

Test Engineer : Suhe Yin

13 References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] IEEE Std. C95.1-1991, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, 1991

[3] IEEE Std. 1528-2003, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, December 2003

[4] FCC OET Bulletin 65 (Edition 97-01) Supplement C (Edition 01-01), “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields”, June 2001

[5] SPEAG DASY System Handbook

[6] FCC KDB 248227 D01 v01r02, “SAR Measurement Procedures for 802.11 a/b/g Transmitters”, May 2007

[7] FCC KDB 447498 D01 v04, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, November 2009

[8] FCC KDB 447498 D02 v02, “SAR Measurement Procedures for USB Dongle Transmitters”, November 2009

[9] FCC KDB 616217 D01 v01r01, “SAR Evaluation Considerations for Laptop Computers with Antennas Built-in on Display Screens”, November 2009

[10] FCC KDB 616217 D03 v01, “SAR Evaluation Considerations for Laptop/Notebook/Netbook and Tablet Computers”, November 2009

[11] FCC KDB 648474 D01 v01r05, “SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas”, September 2008

[12] FCC KDB 941225 D01 v02, “SAR Measurement Procedures for 3G Devices – CDMA 2000 / Ev-Do / WCDMA / HSDPA / HSPA”, October 2007

[13] FCC KDB 941225 D02 v02 "3GPP R6 HSPA and R7 HSPA+ SAR Guidance", December 2009.

[14] FCC KDB 941225 D03 v01, “Recommended SAR Test Reduction Procedures for GSM / GPRS / EDGE”, December 2008

[15] FCC KDB 941225 D04 v01, “Evaluating SAR for GSM/(E)GPRS Dual Transfer Mode”, January 27 2010

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Appendix B. Plots of SAR Measurement

The plots are shown as follows.

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.

System Check_Body_835MHz_111102

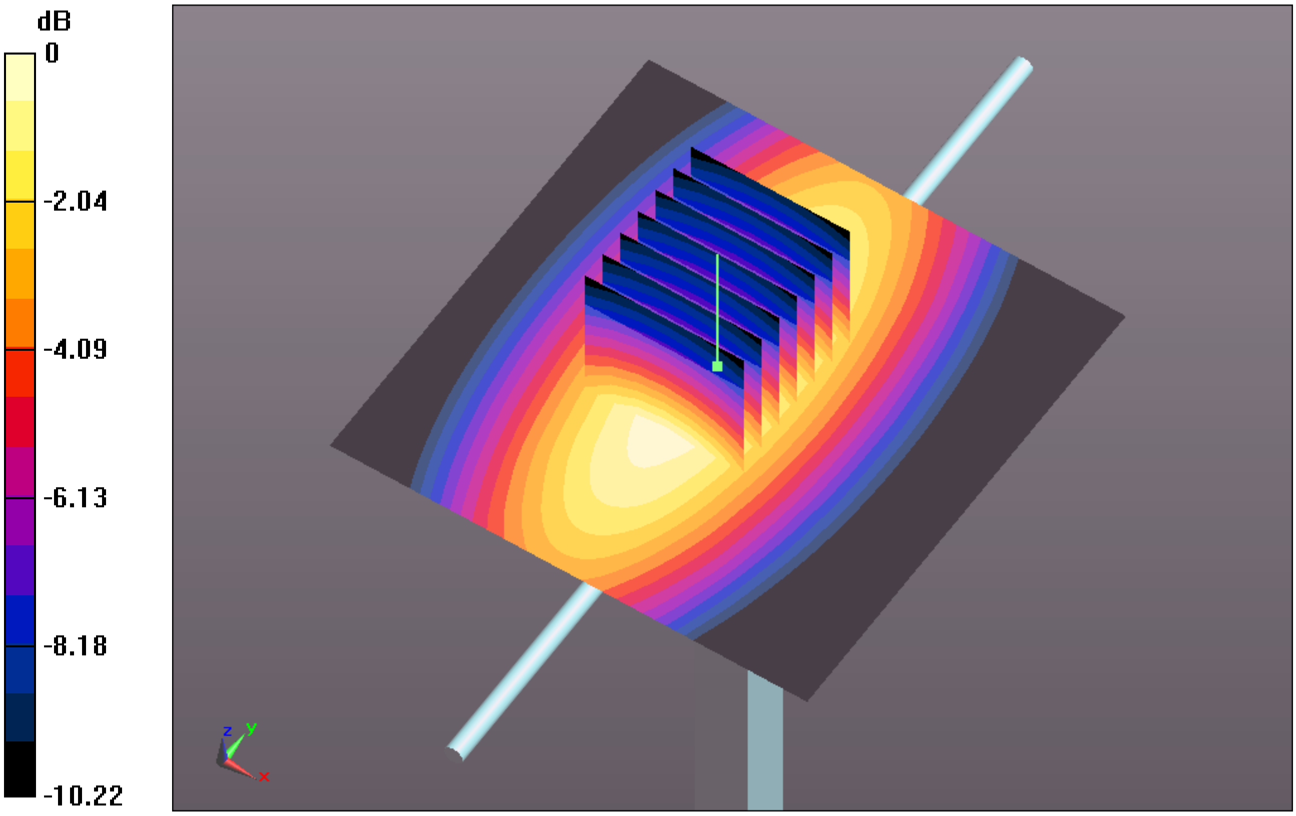
DUT: Dipole 835 MHz

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_835_111102 Medium parameters used: f = 835 MHz; σ = 0.973 mho/m; ε_r = 54.088; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(8.67, 8.67, 8.67); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.593 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.153 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.608 W/kg
SAR(1 g) = 2.41 mW/g; SAR(10 g) = 1.58 mW/g
Maximum value of SAR (measured) = 2.611 mW/g



0 dB = 2.610mW/g

System Check_Body_1900MHz_111102

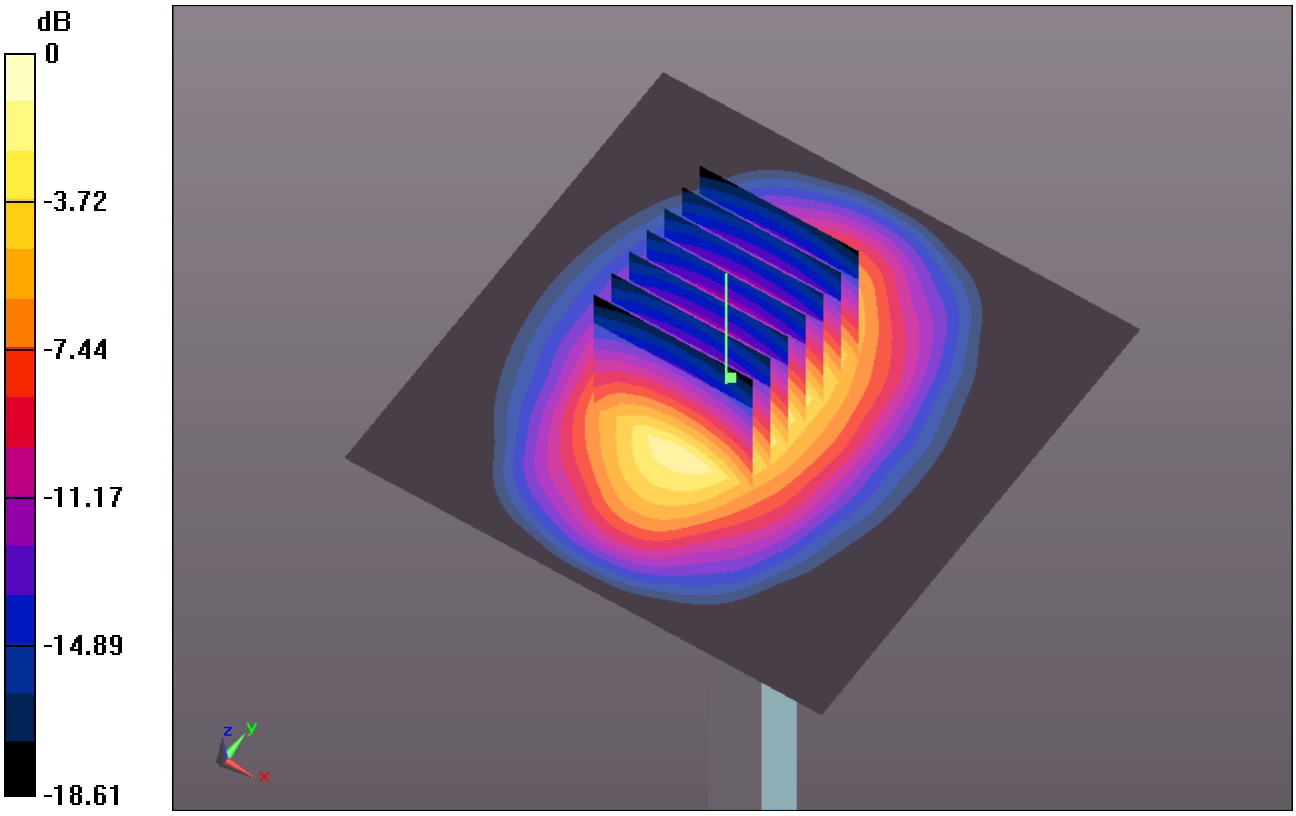
DUT: Dipole 1900 MHz

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900_111102 Medium parameters used: f = 1900 MHz; σ = 1.58 mho/m; ε_r = 54.631; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(6.96, 6.96, 6.96); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.378 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 83.706 V/m; Power Drift = 0.0029 dB
Peak SAR (extrapolated) = 19.529 W/kg
SAR(1 g) = 10 mW/g; SAR(10 g) = 5.07 mW/g
Maximum value of SAR (measured) = 11.171 mW/g



0 dB = 11.170mW/g

System Check_Body_2450MHz_111104

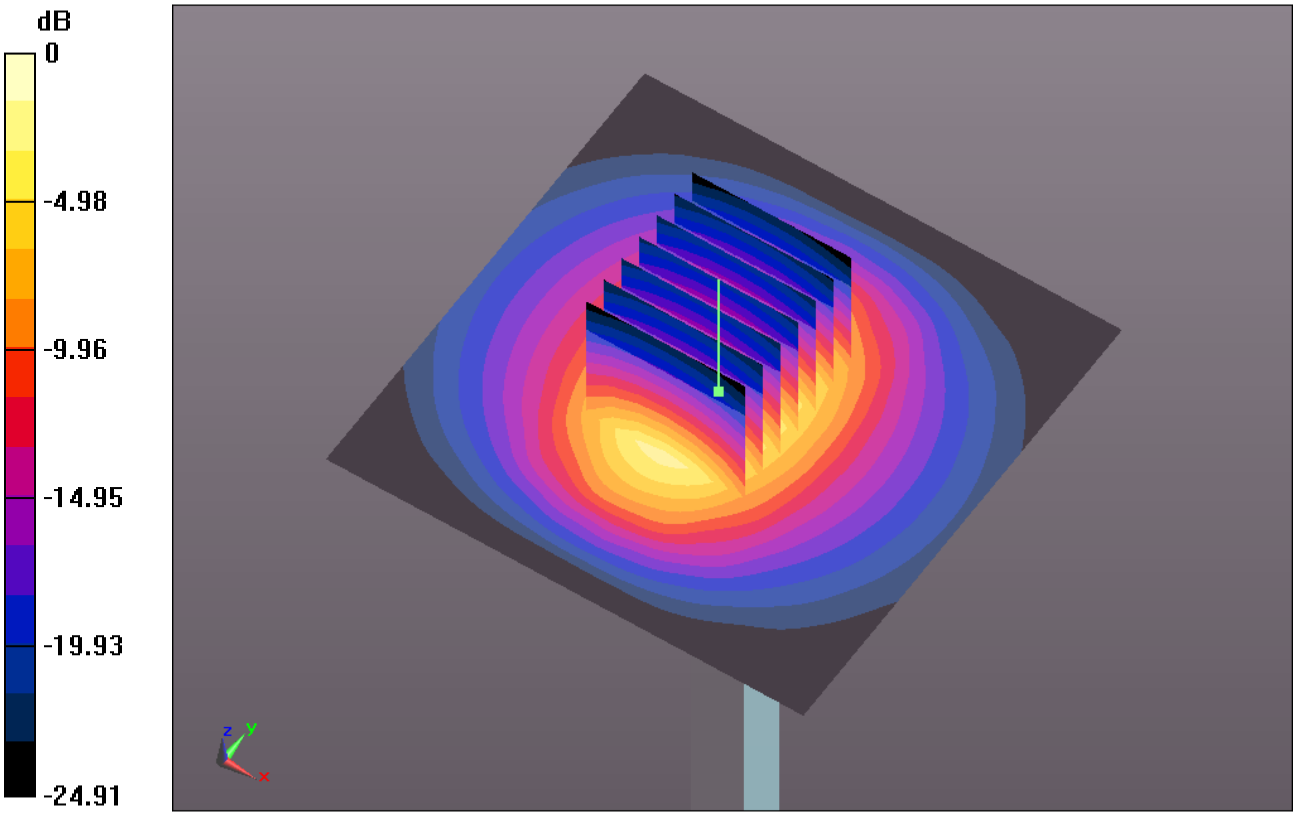
DUT: Dipole 2450 MHz

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_111104 Medium parameters used: f = 2450 MHz; σ = 1.992 mho/m; ε_r = 54.311; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(6.73, 6.73, 6.73); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 15.492 mW/g

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 86.712 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 31.398 W/kg
SAR(1 g) = 13.4 mW/g; SAR(10 g) = 5.88 mW/g
Maximum value of SAR (measured) = 15.176 mW/g



0 dB = 15.180mW/g

#10 GSM850_GPRS10_Bottom Face_0cm_Ch128_Earphone

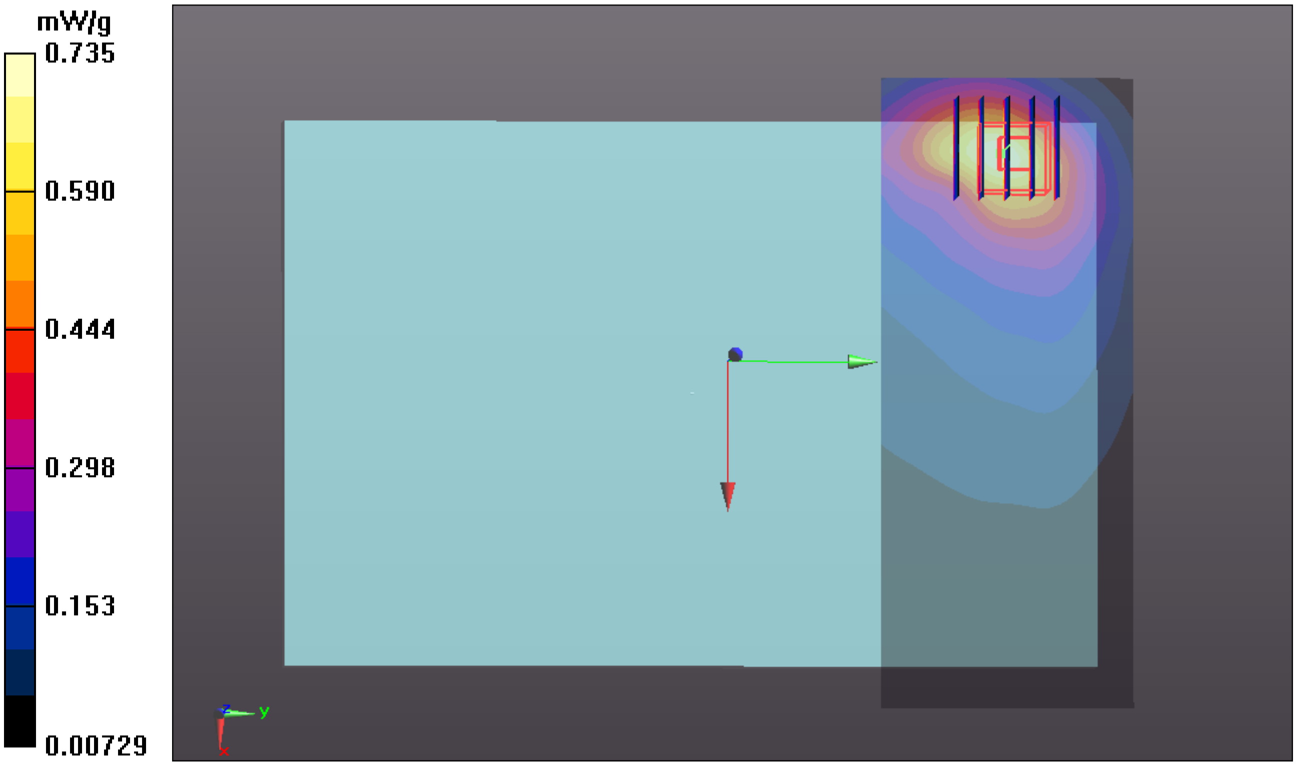
DUT: 182402-01

Communication System: GPRS/EDGE 10; Frequency: 824.6 MHz;Duty Cycle: 1:4
Medium: MSL_835_111102 Medium parameters used: f = 825 MHz; σ = 0.963 mho/m; ε_r = 54.162; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(8.67, 8.67, 8.67); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch128/Area Scan (131x51x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.735 mW/g

Ch128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.693 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.080 W/kg
SAR(1 g) = 0.628 mW/g; SAR(10 g) = 0.380 mW/g
Maximum value of SAR (measured) = 0.672 mW/g


mW/g
0.735
0.590
0.444
0.298
0.153
0.00729
z
y
x

#01 GSM850_GPRS10_Bottom Face_0.4cm_Ch251_Earphone

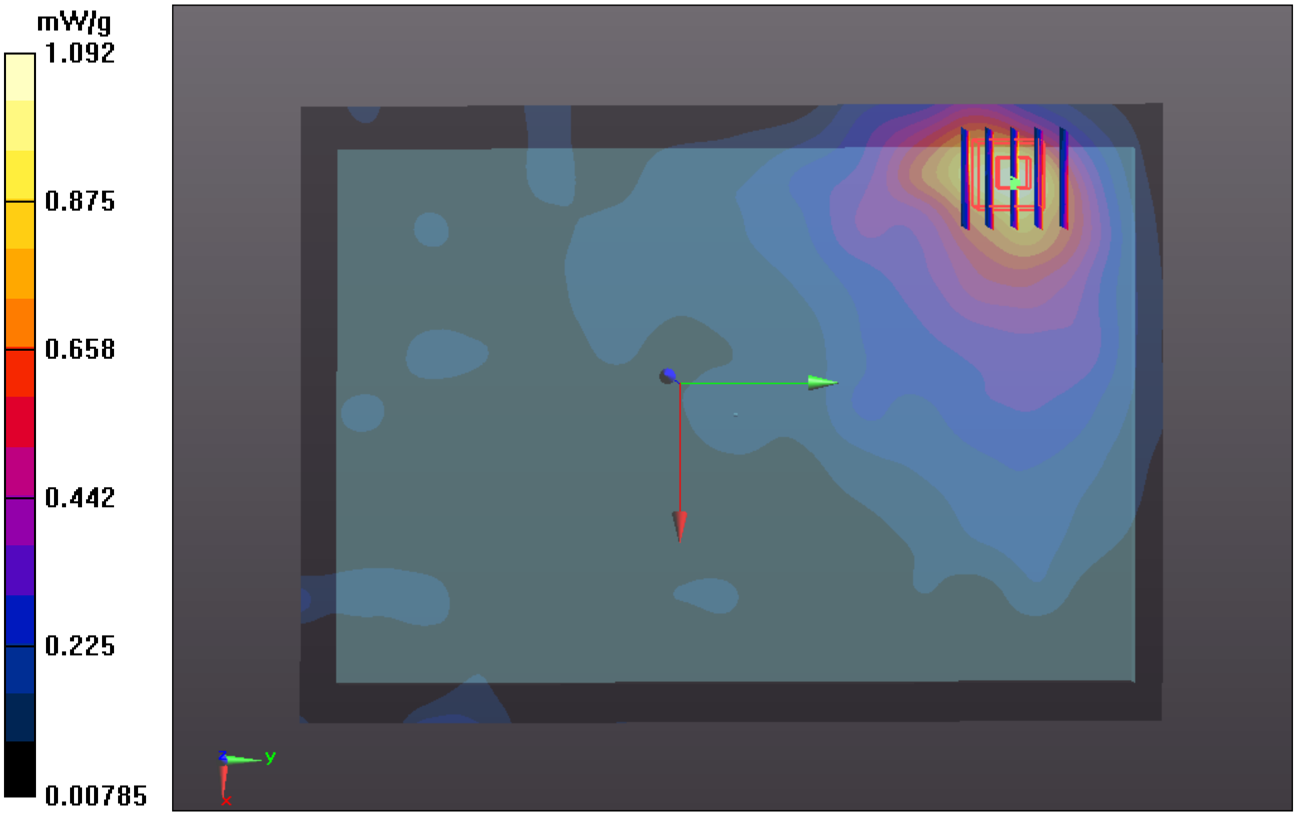
DUT: 182402-01

Communication System: GPRS/EDGE 10; Frequency: 848.8 MHz;Duty Cycle: 1:4
Medium: MSL_835_111102 Medium parameters used: f = 849 MHz; σ = 0.985 mho/m; ε_r = 53.969; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(8.67, 8.67, 8.67); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch251/Area Scan (131x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.092 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.406 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.819 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.654 mW/g
Maximum value of SAR (measured) = 1.155 mW/g


mW/g
1.092
0.875
0.658
0.442
0.225
0.00785
z
y
x

#01 GSM850_GPRS10_Bottom Face_0.4cm_Ch251_Earphone_2D

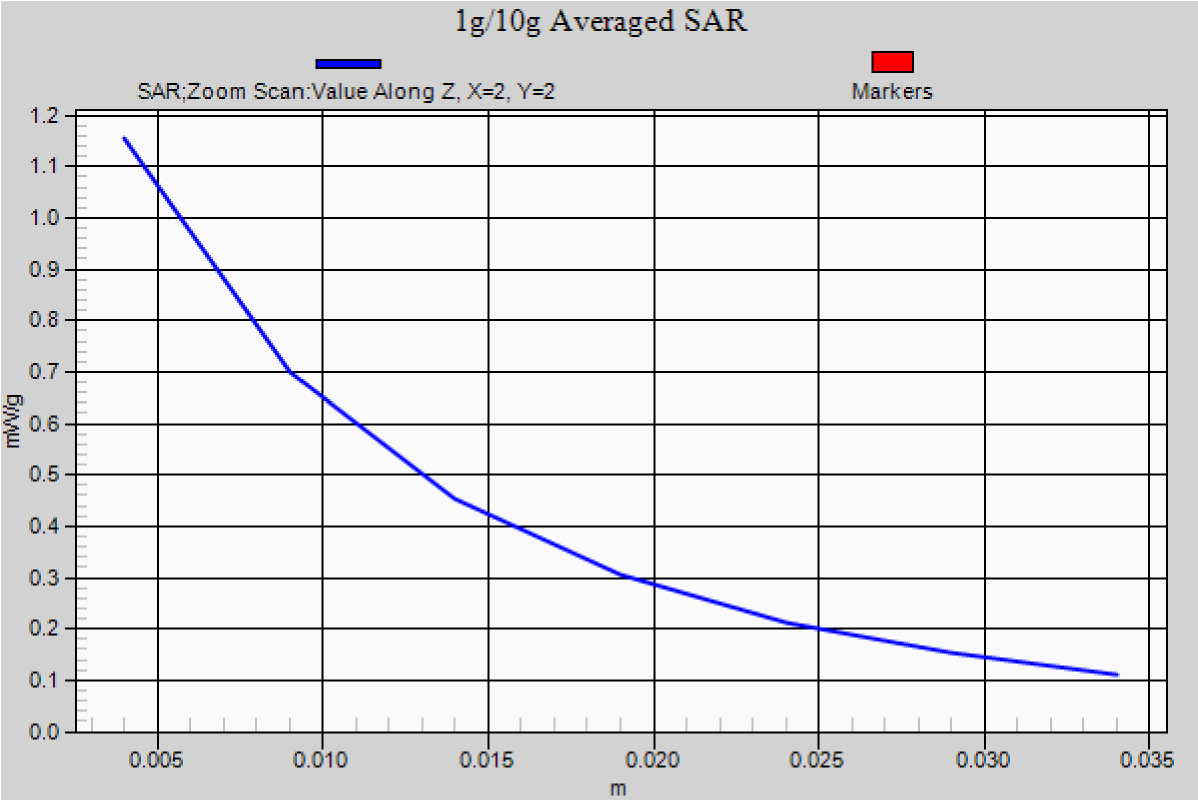
DUT: 182402-01

Communication System: GPRS/EDGE 10; Frequency: 848.8 MHz;Duty Cycle: 1:4
Medium: MSL_835_111102 Medium parameters used: f = 849 MHz; σ = 0.985 mho/m; ε_r = 53.969; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(8.67, 8.67, 8.67); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch251/Area Scan (131x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.092 mW/g

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.406 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.819 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.654 mW/g
Maximum value of SAR (measured) = 1.155 mW/g



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
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
mW/g
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

#02 GSM850_GPRS10_Bottom Face_0.4cm_Ch128_Earphone

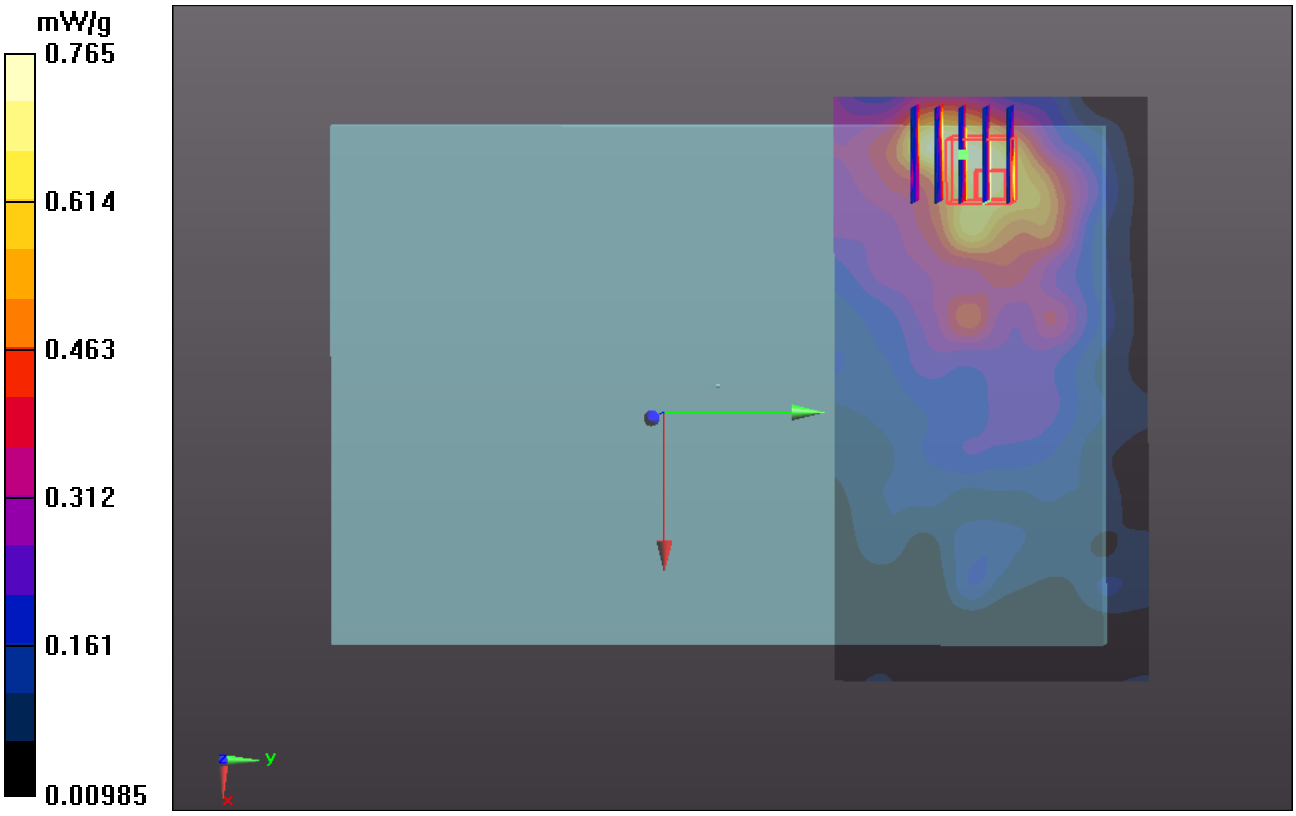
DUT: 182402-01

Communication System: GPRS/EDGE 10; Frequency: 824.6 MHz;Duty Cycle: 1:4
Medium: MSL_835_111102 Medium parameters used: f = 825 MHz; σ = 0.963 mho/m; ε_r = 54.162; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(8.67, 8.67, 8.67); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch128/Area Scan (131x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.765 mW/g

Ch128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.890 V/m; Power Drift = -0.004 dB
Peak SAR (extrapolated) = 1.418 W/kg
SAR(1 g) = 0.714 mW/g; SAR(10 g) = 0.464 mW/g
Maximum value of SAR (measured) = 0.784 mW/g


mW/g
0.765
0.614
0.463
0.312
0.161
0.00985
y
z
x

#03 GSM850_GPRS10_Bottom Face_0.4cm_Ch189_Earphone

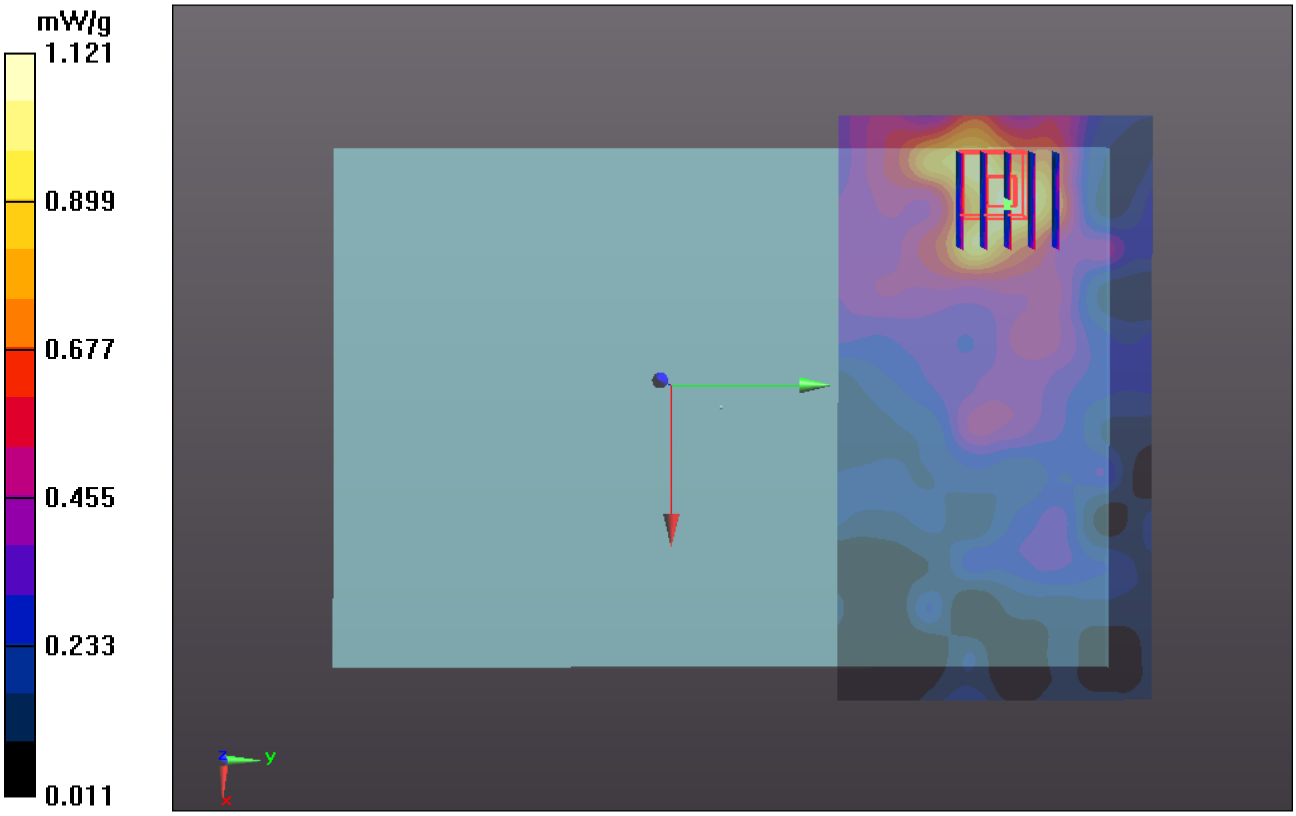
DUT: 182402-01

Communication System: GPRS/EDGE 10; Frequency: 836.4 MHz;Duty Cycle: 1:4
Medium: MSL_835_111102 Medium parameters used: f = 836.4 MHz; σ = 0.974 mho/m; ε_r = 54.078; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(8.67, 8.67, 8.67); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch189/Area Scan (131x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.121 mW/g

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.709 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.224 W/kg
SAR(1 g) = 0.828 mW/g; SAR(10 g) = 0.533 mW/g
Maximum value of SAR (measured) = 0.955 mW/g


mW/g
1.121
0.899
0.677
0.455
0.233
0.011
z
y
x

#04 GSM1900_GPRS10_Secondary Landscape_0cm_Ch512_Earphone

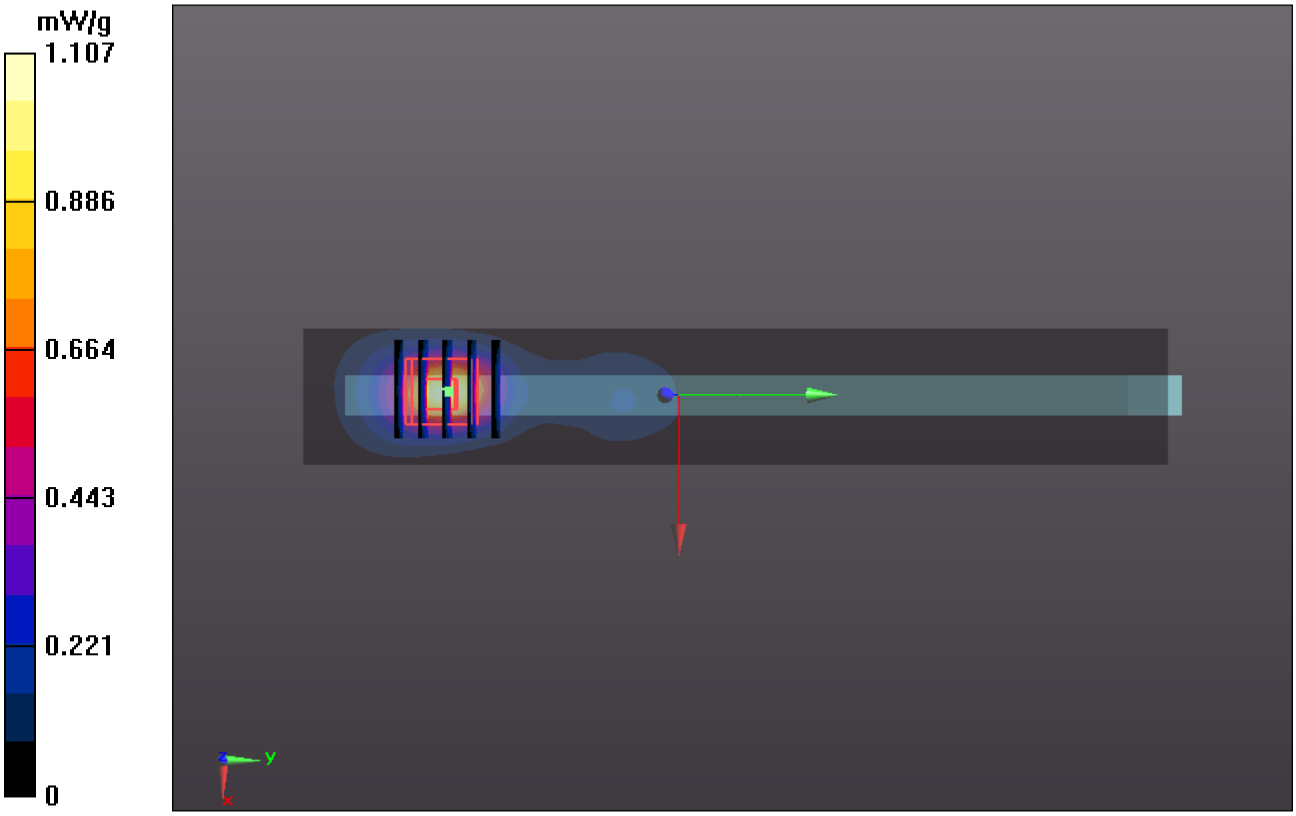
DUT: 182402-01

Communication System: GPRS/EDGE 10; Frequency: 1850.2 MHz;Duty Cycle: 1:4
Medium: MSL_1900_111102 Medium parameters used: f = 1850.2 MHz; σ = 1.515 mho/m; ε_r = 54.748; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(6.96, 6.96, 6.96); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch512/Area Scan (31x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.107 mW/g

Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.954 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.753 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.484 mW/g
Maximum value of SAR (measured) = 1.150 mW/g


mW/g
1.107
0.886
0.664
0.443
0.221
0
z
y
x

#05 GSM1900_GPRS10_Secondary Landscape_0cm_Ch661_Earphone

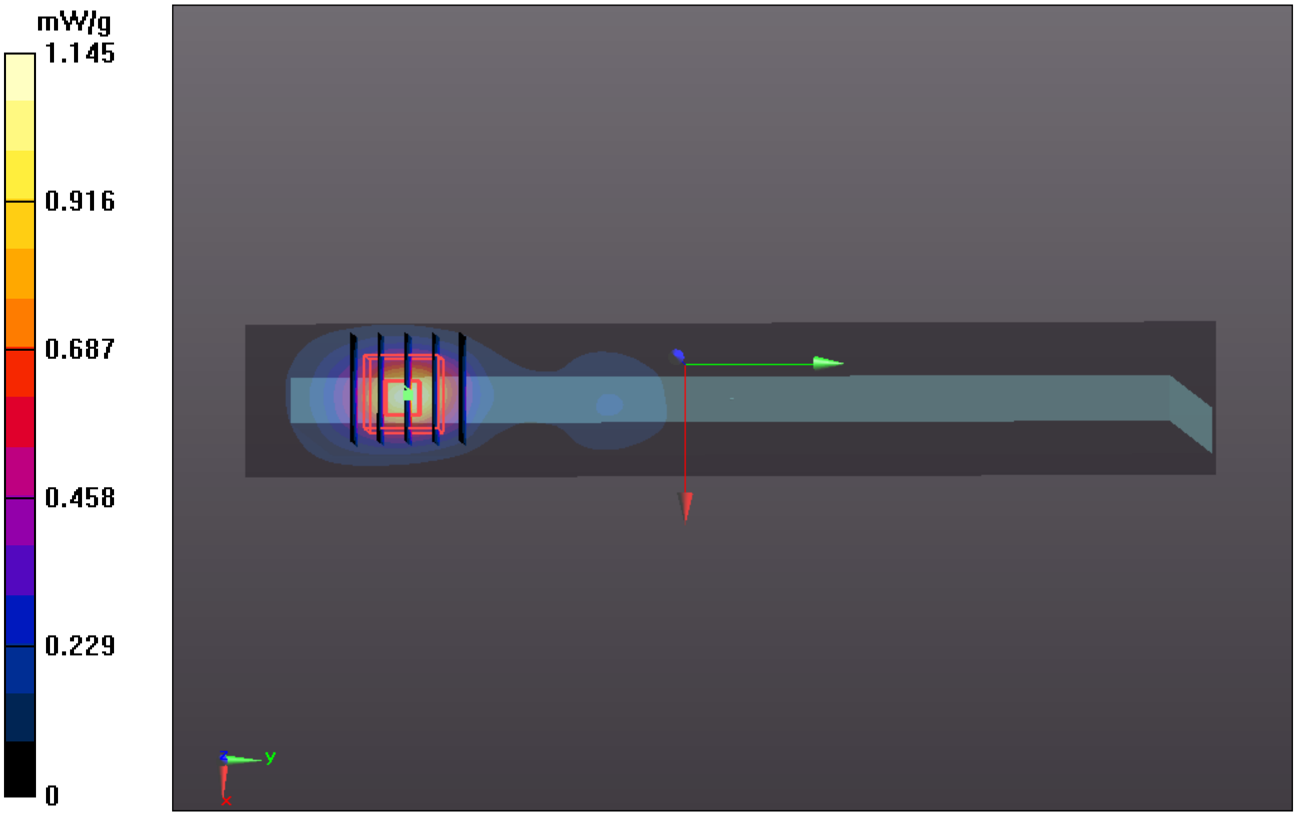
DUT: 182402-01

Communication System: GPRS/EDGE 10; Frequency: 1880 MHz;Duty Cycle: 1:4
Medium: MSL_1900_111102 Medium parameters used: f = 1880 MHz; σ = 1.557 mho/m; ε_r = 54.666; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(6.96, 6.96, 6.96); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch661/Area Scan (31x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.145 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.523 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 2.082 W/kg
SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.497 mW/g
Maximum value of SAR (measured) = 1.161 mW/g


mW/g
1.145
0.916
0.687
0.458
0.229
0
z
y
x

#06 GSM1900_GPRS10_Secondary Landscape_0cm_Ch810_Earphone

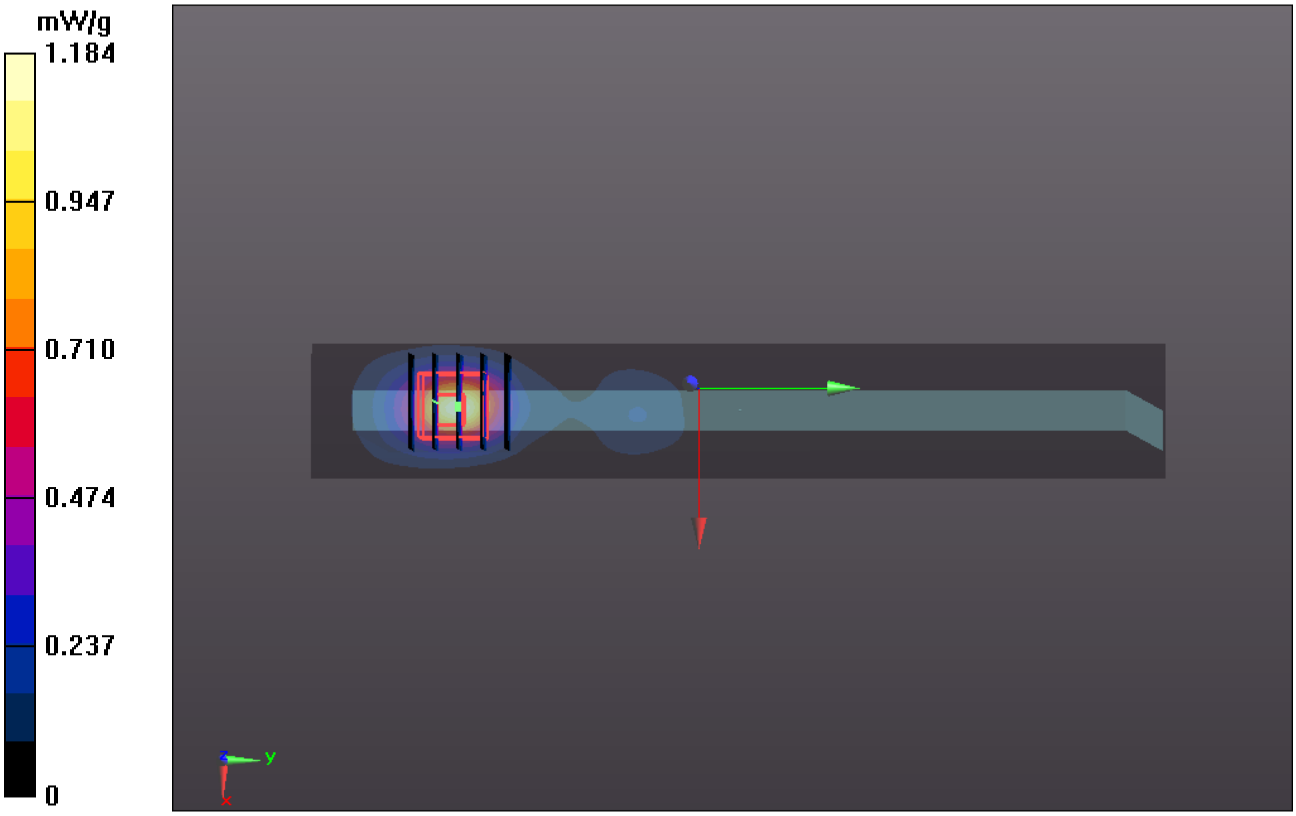
DUT: 182402-01

Communication System: GPRS/EDGE 10; Frequency: 1909.8 MHz;Duty Cycle: 1:4
Medium: MSL_1900_111102 Medium parameters used: f = 1910 MHz; σ = 1.589 mho/m; ε_r = 54.611; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(6.96, 6.96, 6.96); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (31x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.184 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.276 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 2.024 W/kg
SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.499 mW/g
Maximum value of SAR (measured) = 1.158 mW/g


mW/g
1.184
0.947
0.710
0.474
0.237
0
z
y
x

#06 GSM1900_GPRS10_Secondary Landscape_0cm_Ch810_Earphone_2D

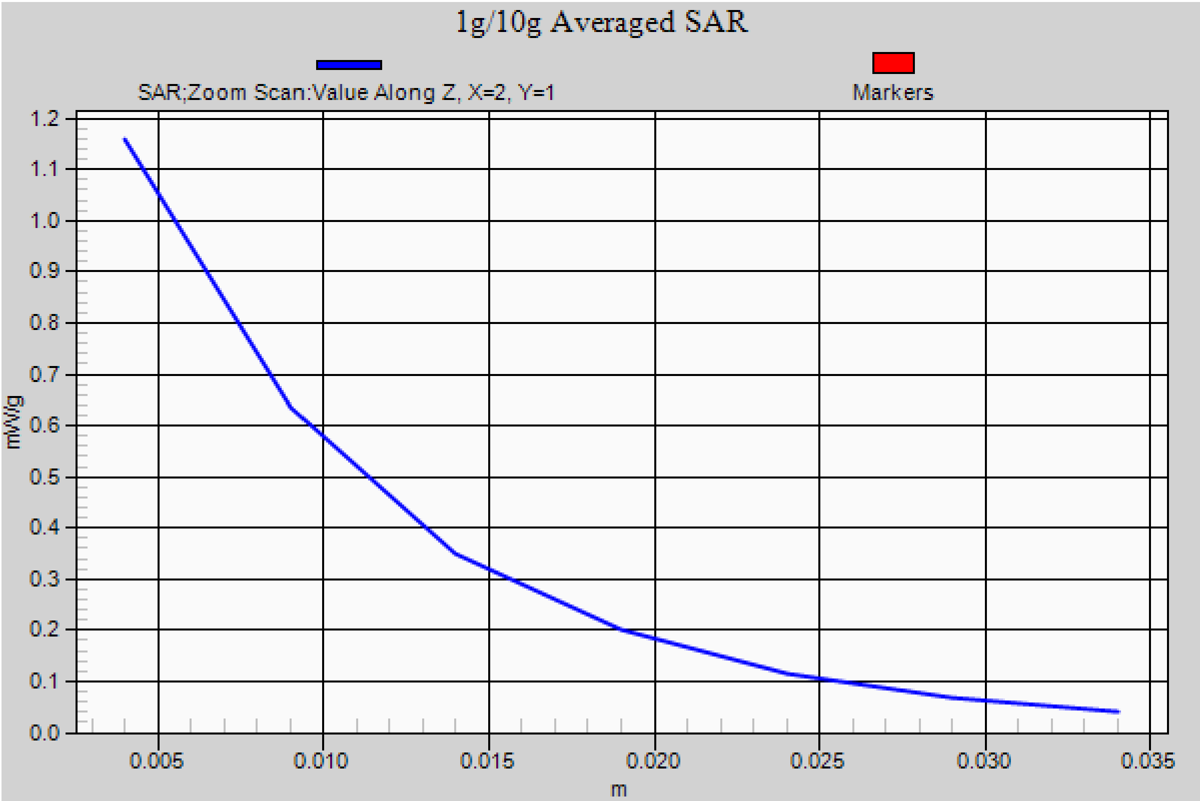
DUT: 182402-01

Communication System: GPRS/EDGE 10; Frequency: 1909.8 MHz;Duty Cycle: 1:4
Medium: MSL_1900_111102 Medium parameters used: f = 1910 MHz; σ = 1.589 mho/m; ε_r = 54.611; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(6.96, 6.96, 6.96); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (31x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.184 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.276 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 2.024 W/kg
SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.499 mW/g
Maximum value of SAR (measured) = 1.158 mW/g



1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=1
Markers
mW/g
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
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

#11 GSM1900_GPRS10_Bottom Face_0.4cm_Ch810_Earphone

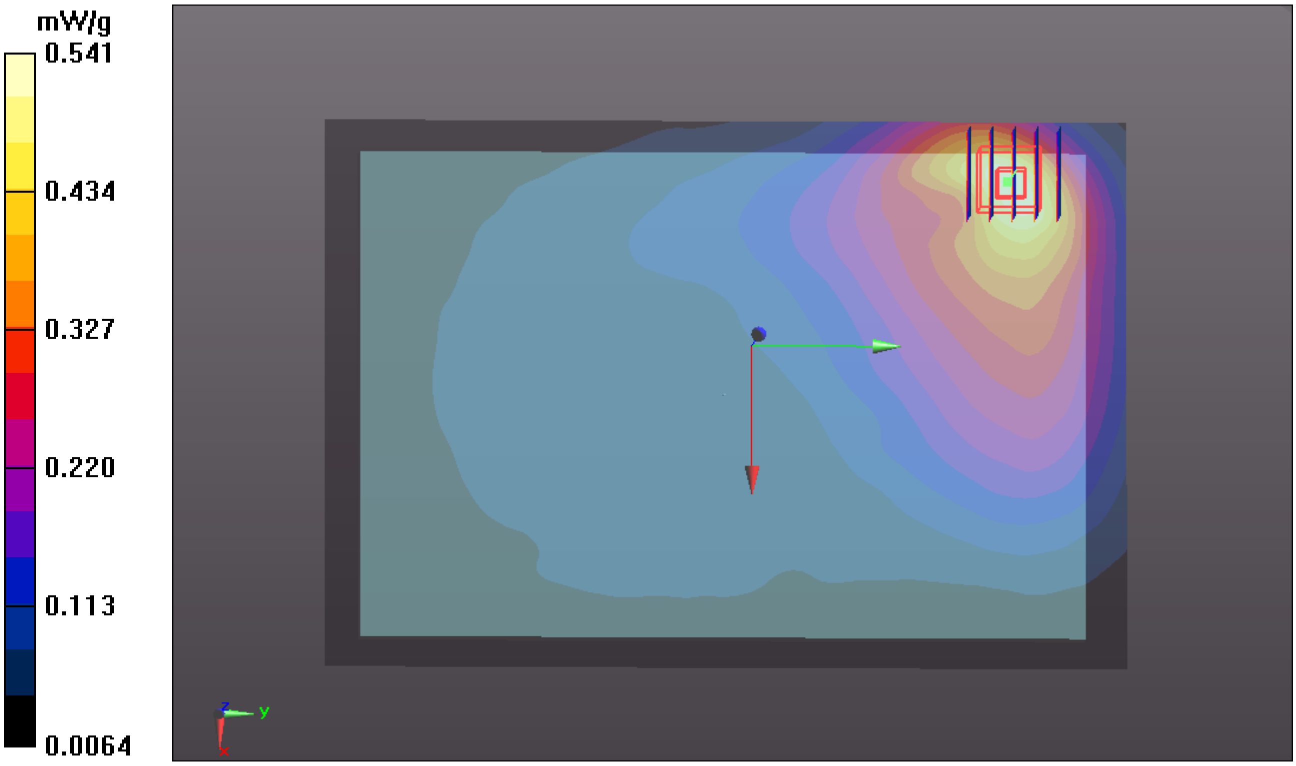
DUT: 182402-01

Communication System: GPRS/EDGE 10; Frequency: 1909.8 MHz;Duty Cycle: 1:4
Medium: MSL_1900_111102 Medium parameters used: f = 1910 MHz; σ = 1.589 mho/m; ε_r = 54.611; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(6.96, 6.96, 6.96); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch810/Area Scan (131x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.541 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.234 V/m; Power Drift = -0.0056 dB
Peak SAR (extrapolated) = 1.027 W/kg
SAR(1 g) = 0.657 mW/g; SAR(10 g) = 0.412 mW/g
Maximum value of SAR (measured) = 0.706 mW/g


mW/g
0.541
0.434
0.327
0.220
0.113
0.0064
z
y
x

#07 802.11b_Bottom Face_0cm_Ch1_Earphone

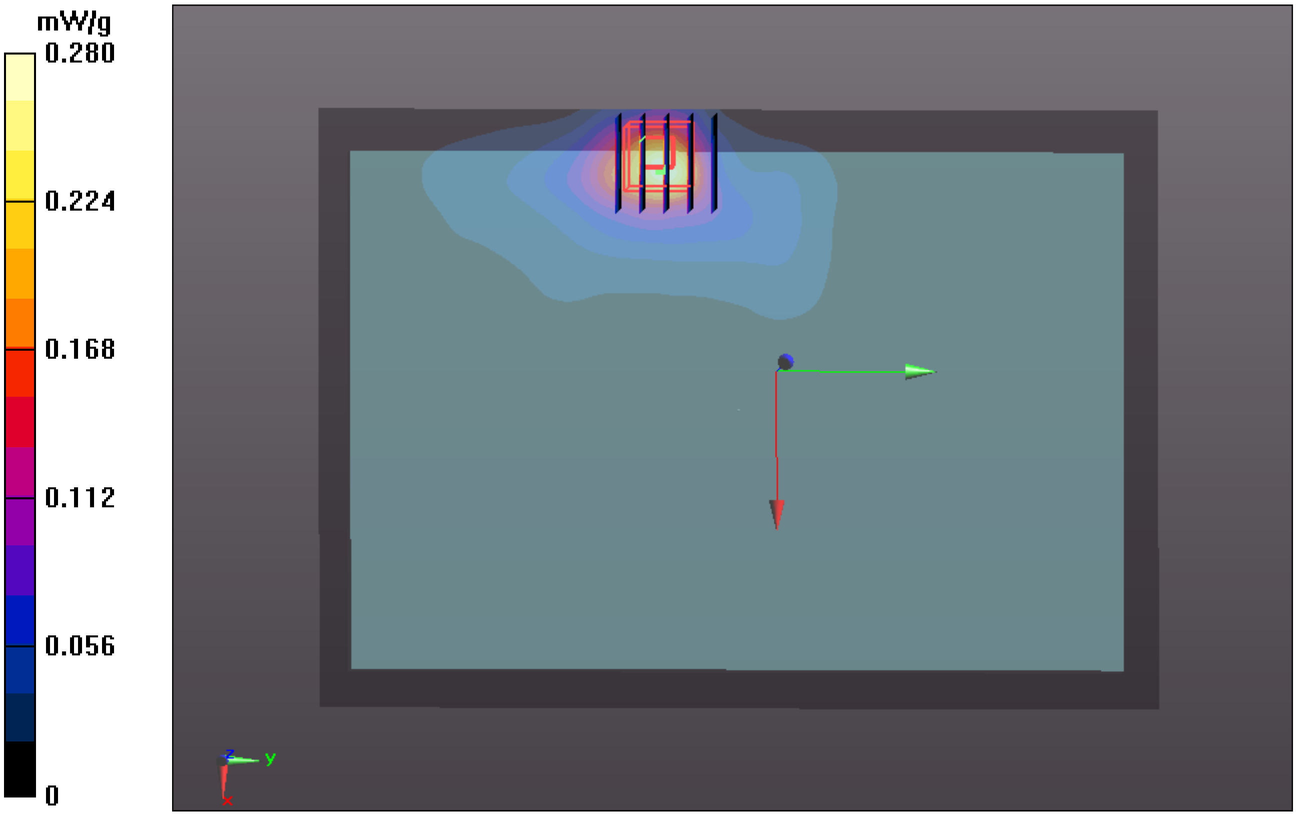
DUT: 182402-01

Communication System: WIFI; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_111104 Medium parameters used: f = 2412 MHz; σ = 1.922 mho/m; ε_r = 54.35; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(6.73, 6.73, 6.73); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch1/Area Scan (131x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.280 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.921 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.536 W/kg
SAR(1 g) = 0.262 mW/g; SAR(10 g) = 0.134 mW/g
Maximum value of SAR (measured) = 0.275 mW/g


mW/g
0.280
0.224
0.168
0.112
0.056
0
z
y
x

#09 802.11b_Secondary Landscape_0cm_Ch1_Earphone

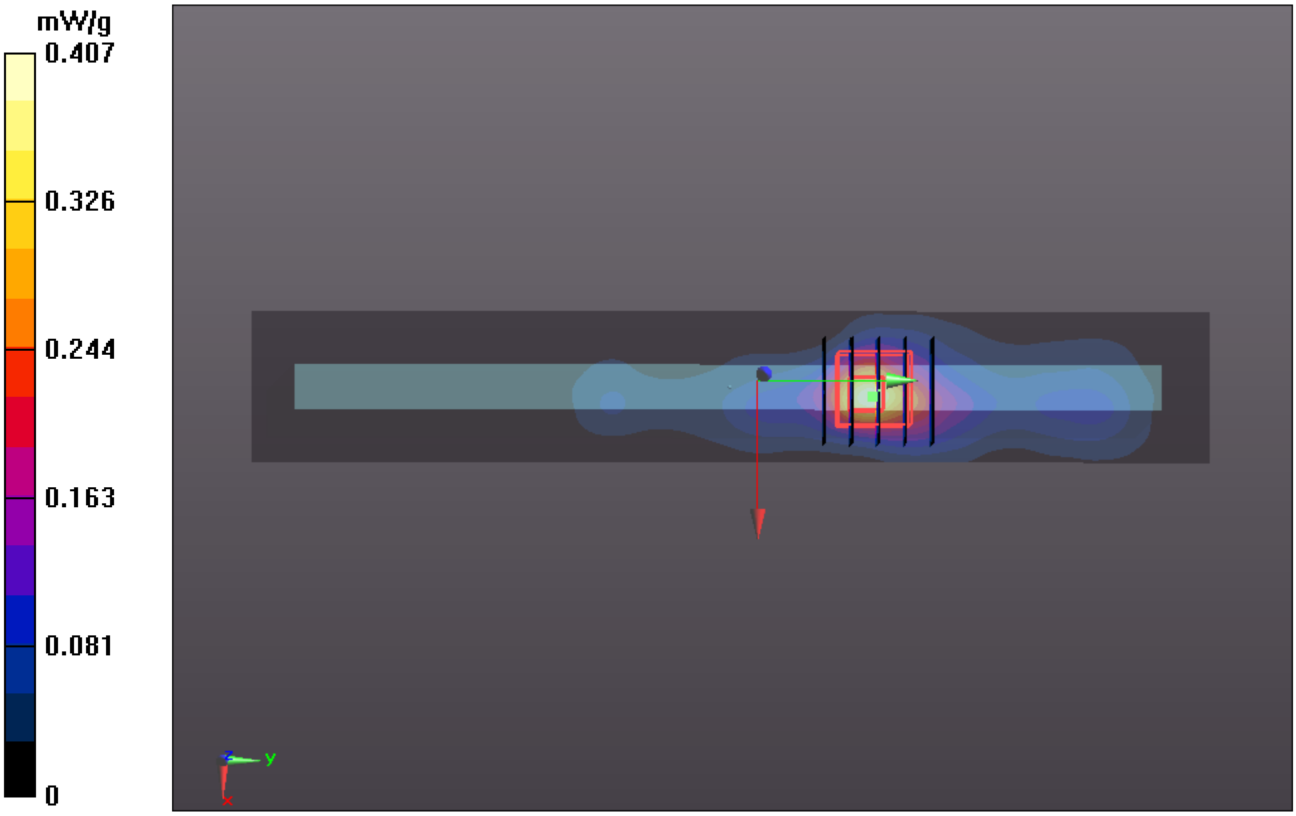
DUT: 182402-01

Communication System: WIFI; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_111104 Medium parameters used: f = 2412 MHz; σ = 1.922 mho/m; ε_r = 54.35; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(6.73, 6.73, 6.73); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch1/Area Scan (31x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.407 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.588 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.185 W/kg
SAR(1 g) = 0.454 mW/g; SAR(10 g) = 0.180 mW/g
Maximum value of SAR (measured) = 0.512 mW/g


mW/g
0.407
0.326
0.244
0.163
0.081
0
z
y
x

#09 802.11b_Secondary Landscape_0cm_Ch1_Earphone_2D

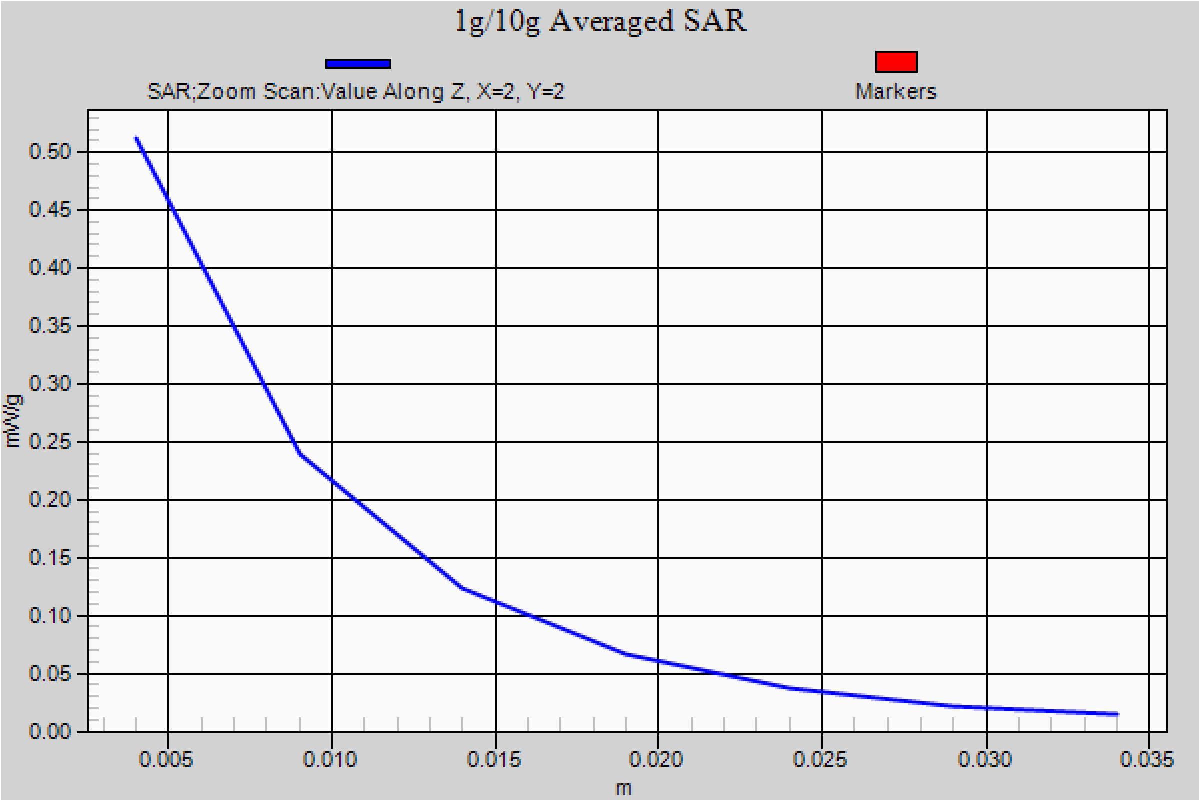
DUT: 182402-01

Communication System: WIFI; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_111104 Medium parameters used: f = 2412 MHz; σ = 1.922 mho/m; ε_r = 54.35; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(6.73, 6.73, 6.73); Calibrated: 2011-9-2
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn679; Calibrated: 2011-6-24
- Phantom: SAM3; Type: SAM; Serial: TP-1079
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Ch1/Area Scan (31x191x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.407 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.588 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 1.185 W/kg
SAR(1 g) = 0.454 mW/g; SAR(10 g) = 0.180 mW/g
Maximum value of SAR (measured) = 0.512 mW/g


1g/10g Averaged SAR
SAR;Zoom Scan:Value Along Z, X=2, Y=2
Markers
mW/g
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m