SAR Test Report

Product Name : GSM Mobile Phone

Model No. : HUAWEI G6151

FCC ID : QISG6151A

Applicant : HUAWEI TECHNOLOGIES CO., LTD.

Address : Bantian, Longgang District, Shenzhen, 518129 Guangdong, P. R. China

Date of Receipt : 02/03/2012

Date of Test : 19/09/2011~21/09/2011

Issued Date : 13/03/2012

Report No. : 123S012R-HPUSP03V01

Report Version : V2.0

Test Report Certification

Issued Date: 13/03/2012
Report No. : 123S012R-HP-US-P03V01

Product Name	:	GSM Mobile Phone
Applicant	:	HUAWEI TECHNOLOGIES CO., LTD.
Address	:	Bantian, Longgang District, Shenzhen, 518129 Guangdong, P. R. China
Manufacturer	:	HUAWEI TECHNOLOGIES CO., LTD.
Address	:	Bantian, Longgang District, Shenzhen, 518129 Guangdong, P. R. China
Model No.	:	HUAWEI G6151
FCC ID	:	QISG6151A
Brand Name	:	HUAWEI
EUT Voltage	:	DC 3.7V
Applicable Standard	:	FCC Oet65 Supplement C June 2001 IEEE Std. 1528-2003,47CFR § 2.1093
Test Result	:	Max. SAR Measurement (1g) GSM : Head: **1.090** W/kg; Body: **1.090** W/kg Wi-Fi: Head: **0.051** W/kg; Body: **0.020** W/Kg
Performed Location	:	Quietek Corporation (Linkou Laboratory) No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C. TEL:+866-2-8601-3788 / FAX:+886-2-8601-3789
Documented By	:	April Chen (Adm. Assistant / April Chen)
Reviewed By	:	wen Lee (Engineer / Wen Lee)
Approved By	:	 (Manager / Vincent Lin)

TABLE OF CONTENTS

Description **Page**

1. General Information 5

1.1. EUT Description 5
1.2. Test Procedure 7
1.3. Test Environment 8

2. SAR Measurement System 9

2.1. DASY5 System Description 9
2.1.1. Applications 10
2.1.2. Area Scans 10
2.1.3. Zoom Scan (Cube Scan Averaging) 10
2.1.4. Uncertainty of Inter-/Extrapolation and Averaging 10
2.2. DASY5 E-Field Probe 11
2.2.1. Isotropic E-Field Probe Specification 11
2.3. Boundary Detection Unit and Probe Mounting Device 12
2.4. DATA Acquisition Electronics (DAE) and Measurement Server 12
2.5. Robot 13
2.6. Light Beam Unit 13
2.7. Device Holder 14
2.8. SAM Twin Phantom 14

3. Tissue Simulating Liquid 15

3.1. The composition of the tissue simulating liquid 15
3.2. Tissue Calibration Result 16
3.3. Tissue Dielectric Parameters for Head and Body Phantoms 18

4. SAR Measurement Procedure 19

4.1. SAR System Validation 19
4.1.1. Validation Dipoles 19
4.1.2. Validation Result 20
4.2. SAR Measurement Procedure 22

5. SAR Exposure Limits 23

6. Test Equipment List 24

7. Measurement Uncertainty 33

8. Conducted Power Measurement 34

9. Test Results 36

9.1. SAR Test Results Summary 36

Appendix A. SAR System Validation Data 42

Appendix B. SAR measurement Data 48

Appendix C. Test Setup Photographs & EUT Photographs 94

Appendix D. Probe Calibration Data

Appendix E. Dipole Calibration Data

Appendix F. DAE Calibration Data

1. General Information

1.1. EUT Description

Product Name	GSM Mobile Phone
Model No.	HUAWEI G6151
IMEI 1	869945000005385
IMEI 2	869945000011383
Hardware Version	NICOLE-V2.0
Software Version	G6151SDW.P00.M41.00.10
Device Category	Portable
RF Exposure Environment	Uncontrolled
Antenna Type	monopole
2G	
Support Band	GSM850/GSM900/DCS1800/PCS1900
GPRS Type	Class B
GPRS Class	Class 12
Tx Frequency Range	GSM 850: 824~849MHz PCS 1900: 1850~1910MHz
Rx Frequency Range	GSM 850: 869~894MHz PCS 1900: 1930~1990MHz
Release Version	R99
Type of modulation	GMSK for GSM/GPRS
Antenna Gain	-2.4dBi for GSM850 -2.2dBi for PCS1900
Bluetooth	
Bluetooth Frequency	2402~2480MHz
Bluetooth Version	V2.1 + EDR
Type of modulation	FHSS
Data Rate	1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps (8DPSK)
Antenna Gain	-2dBi
Wi-Fi	
Wi-Fi Frequency	2412~2462MHz
Type of modulation	802.11b: CCK; 802.11g: OFDM
Data Rate	802.11b: 1/2/5.5/11 Mbps
	802.11g: 6/9/12/18/24/36/48/54 Mbps
Antenna Gain	-2dBi

Components	
Headset Model Number	HT-1350002-22K001
Battery	Brand Name: HUAWEI M/N: HB5A3 Rated Voltage and Capacitance: 3.7V/1000mAh
Adapter	Brand Name: HUAWEI M/N: HS-050040U6 Input: 100-240V~50/60Hz 0.2A Output: 5VDC, 400mA
Max. Output Power (Avg. Burst Power)	GSM850: 32.69 dBm PCS1900: 30.40 dBm Wi-Fi: 10.18 dBm

Note : This mobile phone has GSM,WIFI & BT which can simultaneous transmission.

(Reference document: KDB 447498 and KDB 648474, KDB 248227)

1. Bluetooth output power is 8.23dBm.

(1) The power is less than Pref.

(2) 1.2cm away from GSM antenna.

(3) 4.6cm away from WLAN antenna.

Therefore, standalone SAR for Bluetooth is not required and other antennas which Max SAR value are < 1.2 W/kg, so simultaneous transmission is not required.

2. The closest separation between GSM antenna and Wi-Fi antenna is 4.3cm.

(1)Head Max SAR value and the sum of the 1-g SAR for WLAN & GSM.

Max 1-g SAR (W/kg)		∑1-g SAR (W/kg)
WLAN	GSM	
0.051	1.090	1.141

(2)Body SAR value and the sum of the 1-g SAR for WLAN & GSM.

Max 1-g SAR (W/kg)		∑1-g SAR (W/kg)
WLAN	GSM	
0.020	1.090	1.110

(3)Conclusion:

Simultaneous Transmission	Require for Simultaneous Transmission SAR with Volume Scans
WLAN & GSM	No (The sum of the 1-g SAR is ＜ 1.6 W/kg)

3. This device can't support hot spot mode.

1.2. Test Procedure

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	EUT communicate with CMU 200, and test them respectively at GSM 850 & PCS1900.

1.3. Test Environment

Ambient conditions in the laboratory:

Test Date: Sep. 19, 2011

Items	Required	Actual
Temperature (°C)	18-25	22.6± 2
Humidity (%RH)	30-70	53

Test Date: Sep. 20, 2011

Items	Required	Actual
Temperature (°C)	18-25	22.0± 2
Humidity (%RH)	30-70	53

Test Date: Sep. 21, 2011

Items	Required	Actual
Temperature (°C)	18-25	22.9± 2
Humidity (%RH)	30-70	51

Test Date: Sep. 21, 2011

Items	Required	Actual
Temperature (°C)	18-25	22.5± 2
Humidity (%RH)	30-70	50

Site Description:

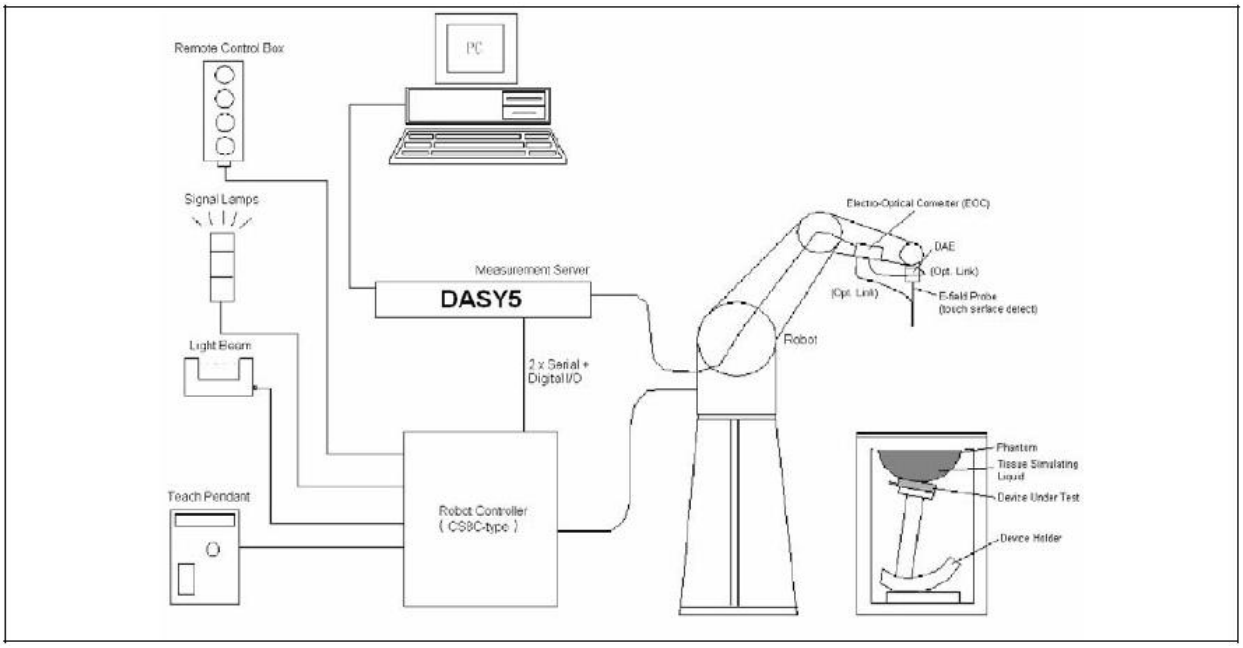
Accredited by TAF
Accredited Number: 0914
Effective through: December 12, 2011

Site Name: Quietek Corporation

Site Address: No. 5-22, Rueishu Keng, Linkou Dist.,
New Taipei City 24451,
Taiwan. R.O.C.
TEL: 886-2-8601-3788 / FAX: 886-2-8601-3789
E-Mail: service@quietek.com

2. SAR Measurement System

2.1. DASY5 System Description



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

- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

2.1.1. Applications

Predefined procedures and evaluations for automated compliance testing with all worldwide standards, e.g., IEEE 1528, OET 65, IEC 62209-1, IEC 62209-2, EN 50360, EN 50383 and others.

2.1.2. Area Scans

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a $10mm^2$ step integral, with 1mm interpolation used to locate the peak SAR area used for zoom scan assessments.

When an Area Scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE 1528-2003, EN 50361 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan).

2.1.3. Zoom Scan (Cube Scan Averaging)

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. A density of 1000 kg/m^3 is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1 g cube is 10mm, with the side length of the 10 g cube 21,5mm.

The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications utilize a physical step of 7x7x7 (5mmx5mmx5mm) providing a volume of 30mm in the X & Y axis, and 30mm in the Z axis.

2.1.4. Uncertainty of Inter-/Extrapolation and Averaging

In order to evaluate the uncertainty of the interpolation, extrapolation and averaged SAR calculation algorithms of the Postprocessor, DASY5 allows the generation of measurement grids which are artificially predefined by analytically based test functions. Therefore, the grids of area scans and zoom scans can be filled with uncertainty test data, according to the SAR benchmark functions of IEEE 1528.The three analytical functions shown in equations as below are used to describe the possible range of the expected SAR distributions for the tested handsets. The field gradients are covered by the spatially flat distribution f1, the spatially steep distribution f3 and f2 accounts for H-field cancellation on the phantom/tissue surface.

$$f_1(x,y,z) = Ae^{-\frac{z}{2a}}\cos^2\left(\frac{\pi}{2}\frac{\sqrt{x'^2+y'^2}}{5a}\right)$$

$$f_2(x,y,z) = Ae^{-\frac{z}{a}}\frac{a^2}{a^2+x'^2}\left(3-e^{-\frac{2z}{a}}\right)\cos^2\left(\frac{\pi}{2}\frac{y'}{3a}\right)$$

$$f_3(x,y,z) = A\frac{a^2}{\frac{a^2}{4}+x'^2+y'^2}\left(e^{-\frac{2z}{a}}+\frac{a^2}{2(a+2z)^2}\right)$$

2.2. DASY5 E-Field Probe

The SAR measurement is conducted with the dosimetric probe manufactured by SPEAG. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

SPEAG conducts the probe calibration in compliance with international and national standards (e.g. IEEE 1528, EN 62209-1, IEC 62209, etc.) under ISO 17025. The calibration data are in Appendix D**.**

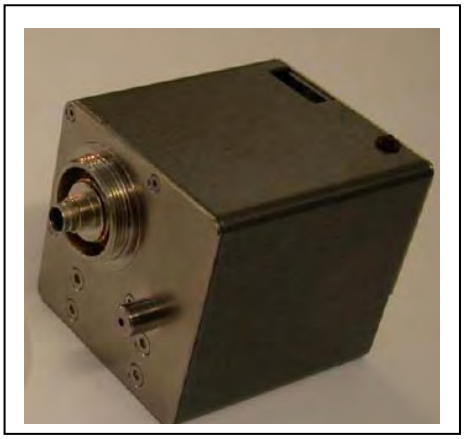
2.2.1. Isotropic E-Field Probe Specification

Model	EX3DV4	
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 (30 MHz to 6 GHz)	
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	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

2.3. Boundary Detection Unit and Probe Mounting Device

The DASY probes use a precise connector and an additional holder for the probe, consisting of a plastic tube and a flexible silicon ring to center the probe. The connector at the DAE is flexibly mounted and held in the default position with magnets and springs. Two switching systems in the connector mount detect frontal and lateral probe collisions and trigger the necessary software response.

2.4. DATA Acquisition Electronics (DAE) and Measurement Server



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 DAE4 is 200M Ohm; the inputs are symmetrical and floating. Common mode rejection is above 80dB.

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

2.5. Robot

The DASY5 system uses the high precision robots TX90 XL type out of the newer series from Stäubli SA (France). For the 6-axis controller DASY5 system, the CS8C robot controller version from Stäubli is used.
The XL robot series have many features that are important for our application:

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

2.6. Light Beam Unit

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

2.7. Device Holder

The DASY5 device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR).
Thus the device needs no repositioning when changing the angles.
The DASY5 device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity εr =3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

2.8. SAM Twin Phantom

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

- Left head
- Right head
- Flat phantom

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

3. Tissue Simulating Liquid

3.1. The composition of the tissue simulating liquid

INGREDIENT (% Weight)	835MHz Head	835MHz Body	1900MHz Head	1900MHz Body	2450MHz Head	2450MHz Body
Water	40.45	52.4	54.90	40.5	46.7	73.2
Salt	1.45	1.40	0.18	0.50	0.00	0.04
Sugar	57.6	45.0	0.00	58.0	0.00	0.00
HEC	0.40	1.00	0.00	0.50	0.00	0.00
Preventol	0.10	0.20	0.00	0.50	0.00	0.00
DGBE	0.00	0.00	44.92	0.00	53.3	26.7

3.2. Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using APREL Dielectric Probe Kit and Anritsu MS4623B Vector Network Analyzer.

Head Tissue Simulant Measurement				
Frequency [MHz]	Description	Dielectric Parameters		Tissue Temp. [°C]
		ε_r	σ [s/m]	
835 MHz	Reference result ± 5% window	41.5 39.425 to 43.575	0.92 0.874 to 0.966	N/A
	21-09-2011	42.04	0.90	21.4

Body Tissue Simulant Measurement				
Frequency [MHz]	Description	Dielectric Parameters		Tissue Temp. [°C]
		ε_r	σ [s/m]	
835 MHz	Reference result ± 5% window	55.2 52.44 to 57.96	0.99 0.9405 to 1.0395	N/A
	20-09-2011	56.71	0.99	20.8

Head Tissue Simulant Measurement				
Frequency [MHz]	Description	Dielectric Parameters		Tissue Temp. [°C]
		ε_r	σ [s/m]	
1900 MHz	Reference result ± 5% window	40 38 to 42	1.4 1.33 to 1.47	N/A
	21-09-2011	40.98	1.41	21.1

Body Tissue Simulant Measurement				
Frequency [MHz]	Description	Dielectric Parameters		Tissue Temp. [°C]
		ε_r	σ [s/m]	
1900 MHz	Reference result ± 5% window	53.3 50.635 to 55.965	1.52 1.444 to 1.596	N/A
	20-09-2011	53.93	1.54	20.8

Head Tissue Simulant Measurement				
Frequency [MHz]	Description	Dielectric Parameters		Tissue Temp. [°C]
		ε_r	σ [s/m]	
2450MHz	Reference result ± 5% window	39.2 37.24 to 41.16	1.8 1.71 to 1.89	N/A
	19-09-2011	39.38	1.78	21.2

Body Tissue Simulant Measurement				
Frequency [MHz]	Description	Dielectric Parameters		Tissue Temp. [°C]
		ε_r	σ [s/m]	
2450MHz	Reference result ± 5% window	52.7 50.065 to 55.335	1.95 1.8525 to 2.0475	N/A
	20-09-2011	53.03	1.94	20.8

3.3. Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

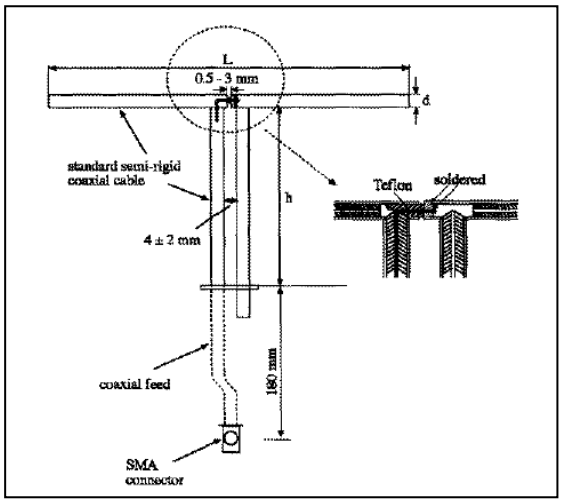
Target Frequency	Head		Body	
(MHz)	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	**41.5**	**0.90**	**55.2**	**0.97**
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	**40.0**	**1.40**	**53.3**	**1.52**
2450	**39.2**	**1.80**	**52.7**	**1.95**
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

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

4. SAR Measurement Procedure

4.1. SAR System Validation

4.1.1. Validation Dipoles



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

Frequency	L (mm)	h (mm)	d (mm)
835MHz	161.0	89.8	3.6
1900MHz	68.0	39.5	3.6
2450MHz	51.5	30.4	3.6

4.1.2. Validation Result

System Performance Check at 835MHz &1900MHz for Head

Validation Kit: ASL-D-835

Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
835 MHz	Reference result ± 10% window	9.22 8.298 to 10.142	6.01 5.409 to 6.611	N/A
	21-09-2011	9.72	6.2	21.4

Validation Kit: ASL-D-1900

Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
1900 MHz	Reference result ± 10% window	38.4 34.56 to 42.24	19.9 17.91 to 21.89	N/A
	21-09-2011	41.6	20.32	21.1

Note: 1. The power level is used 250mW
2. All SAR values are normalized to 1W forward power.

System Performance Check at 835MHz &1900MHz for Body

Validation Kit: ASL-D-835

Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
835 MHz	Reference result ± 10% window	9.72 8.748 to 10.692	6.39 5.751 to 7.029	N/A
	20-09-2011	10.24	6.44	20.8

Validation Kit: ASL-D-1900

Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
1900 MHz	Reference result ± 10% window	40.5 36.45 to 44.55	21.7 19.53 to 23.87	N/A
	20-09-2011	38.44	20.2	20.8

Note: 1. The power level is used 250mW
2. All SAR values are normalized to 1W forward power.

System Performance Check at 2450MHz for Head

Validation Dipole: D2450V2

Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
2450 MHz	Reference result ± 10% window	52.3 47.07 to 57.53	24.5 22.05 to 26.95	N/A
	19-09-2011	50.4	22.72	21.2

System Performance Check at 2450MHz for Body

Validation Dipole: D2450V2

Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
2450 MHz	Reference result ± 10% window	51.6 46.44 to 56.76	24.2 21.78 to 26.62	N/A
	20-09-2011	54.4	23.44	20.8

Note: 1. The power level is used 250mW
2. All SAR values are normalized to 1W forward power.

4.2. SAR Measurement Procedure

The DASY5 calculates SAR using the following equation,

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

σ: represents the simulated tissue conductivity

ρ: represents the tissue density

The EUT is set to transmit at the required power in line with product specification, at each frequency relating to the LOW, MID, and HIGH channel settings.

Pre-scans are made on the device to establish the location for the transmitting antenna, using a large area scan in either air or tissue simulation fluid.

The EUT is placed against the Universal Phantom where the maximum area scan dimensions are larger than the physical size of the resonating antenna. When the scan size is not large enough to cover the peak SAR distribution, it is modified by either extending the area scan size in both the X and Y directions, or the device is shifted within the predefined area.

The area scan is then run to establish the peak SAR location (interpolated resolution set at $1mm^2$) which is then used to orient the center of the zoom scan. The zoom scan is then executed and the 1g and 10g averages are derived from the zoom scan volume (interpolated resolution set at $1mm^3$).

5. SAR Exposure Limits

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

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

Type Exposure	Uncontrolled Environment Limit
Spatial Peak SAR (1g cube tissue for brain or body)	1.60 W/kg
Spatial Average SAR (whole body)	0.08 W/kg
Spatial Peak SAR (10g for hands, feet, ankles and wrist)	4.00 W/kg

6. Test Equipment List

Instrument	Manufacturer	Model No.	Serial No.	Last Calibration	Next Calibration
Stäubli Robot TX60L	Stäubli	TX60L	F09/5BL1A1/A06	May. 2009	only once
Controller	Speag	CS8c	N/A	May. 2009	only once
Aprel Reference Dipole 835Mhz	Aprel	ALS-D-835	QTK-315	May. 2010	May. 2012
Aprel Reference Dipole 1900Mhz	Aprel	ALS-D-1900	QTK-318	May. 2010	May. 2012
Reference Dipole 2450Mhz	Speag	D2450V2	839	Mar. 2010	Mar. 2012
SAM Twin Phantom	Speag	QD000 P40 CA	Tp 1515	N/A	N/A
Device Holder	Speag	N/A	N/A	N/A	N/A
Data Acquisition Electronic	Speag	DAE4	1207	May. 2011	May. 2012
E-Field Probe	Speag	EX3DV4	3698	Jul. 2011	Jul. 2012
SAR Software	Speag	DASY52	Version 52.6.2	N/A	N/A
Aprel Dipole Spaccer	Aprel	ALS-DS-U	QTK-295	N/A	N/A
Power Amplifier	Mini-Circuit	ZHL-42	D051404-20	N/A	N/A
Directional Coupler	Agilent	778D-012	50550	N/A	N/A
Universal Radio Communication Tester	R&S	CMU 200	104846	May. 2011	May. 2012
Vector Network	Anritsu	MS4623B	992801	Jul. 2011	Jul. 2012
Signal Generator	Anritsu	MG3692A	042319	Jun. 2011	Jun. 2012
Power Meter	Anritsu	ML2487A	6K00001447	Nov. 2010	Nov. 2011
Wide Bandwidth Sensor	Anritsu	MA2491	034457	Nov. 2010	Nov. 2011

Note:

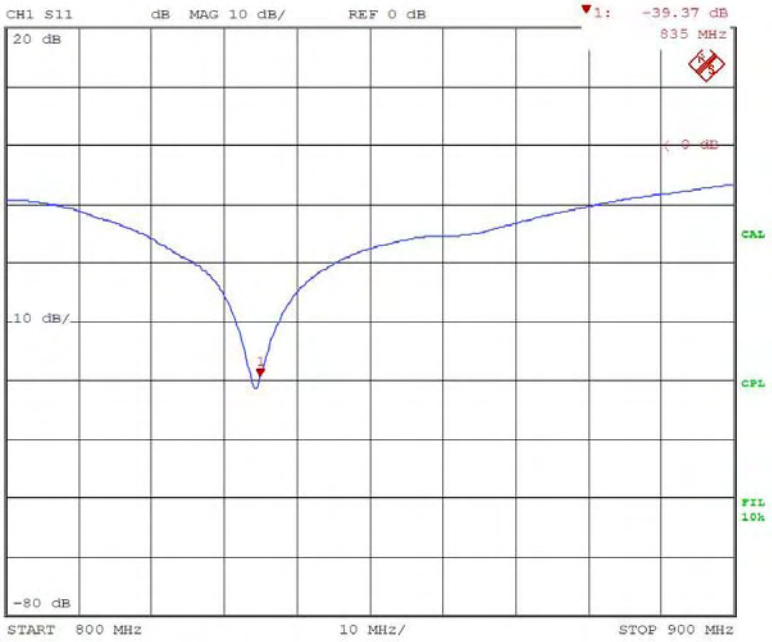
Per KDB 450824 D02 requirements for dipole calibration, the following are recommended FCC procedures for SAR dipole calibration.

1. After a dipole is damaged and properly repaired to meet required specifications

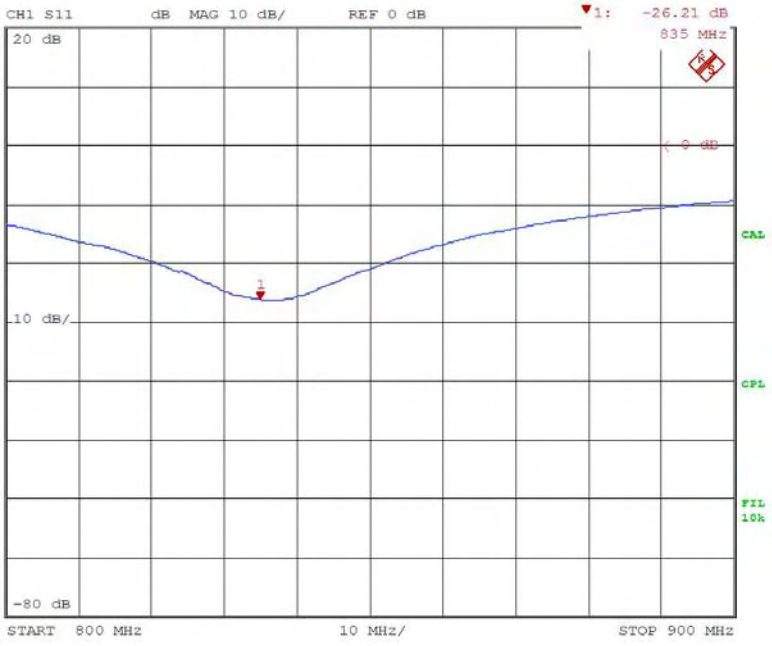
2. When the measured SAR deviates from the calibrated SAR value by more than 10% due to changes in physical, mechanical, electrical or other relevant dipole conditions;

3. When the most recent return-loss, measured at least annually, deviates by more than 20% from the previous measurement (i.e. 0.2 of the dB value) or not meeting the required -20 dB return-loss specification

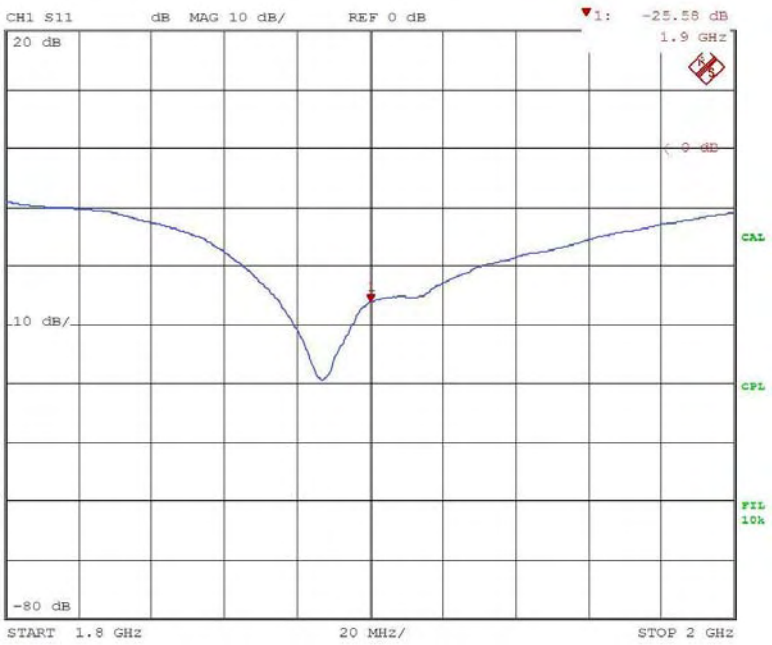
	Frequency	Tissue	Return loss	Limit	Verified Date
Calibration	835	Head	-40.3	Within 20%	2011.06.20
Measurement	835	Head	-39.37		



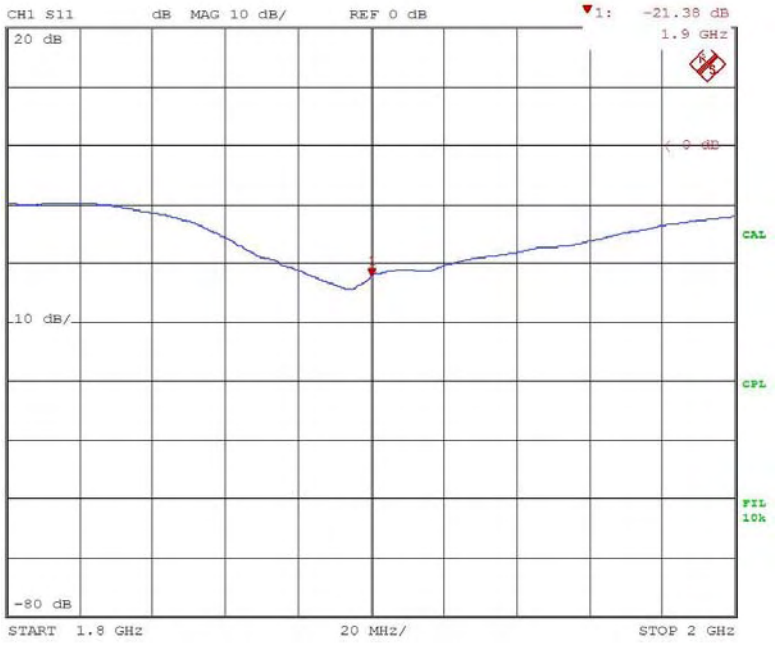
	Frequency	Tissue	Return loss	Limit	Verified Date
Calibration	835	Body	-24.8	Within 20%	2011.06.20
Measurement	835	Body	-26.21		



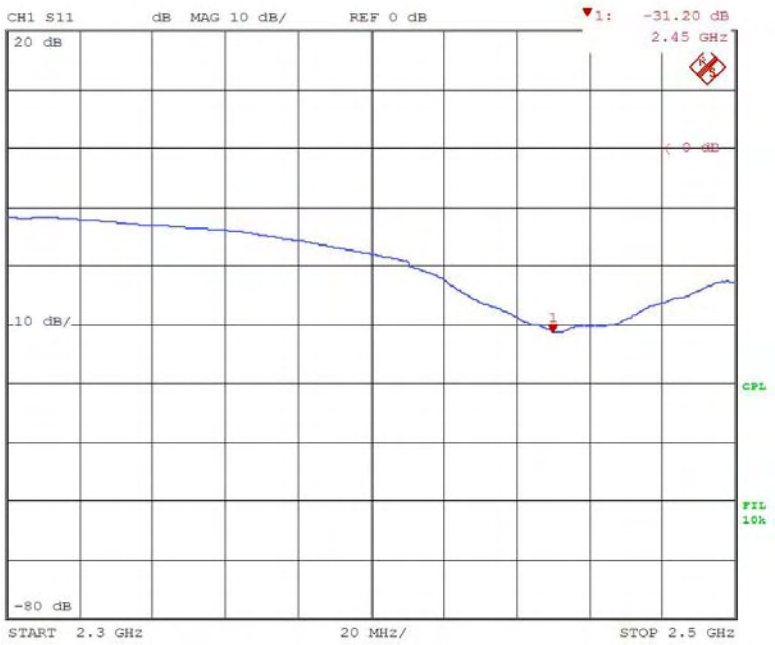
	Frequency	Tissue	Return loss	Limit	Verified Date
Calibration	1900	Head	-23.9	Within 20%	2011.06.20
Measurement	1900	Head	-25.58		



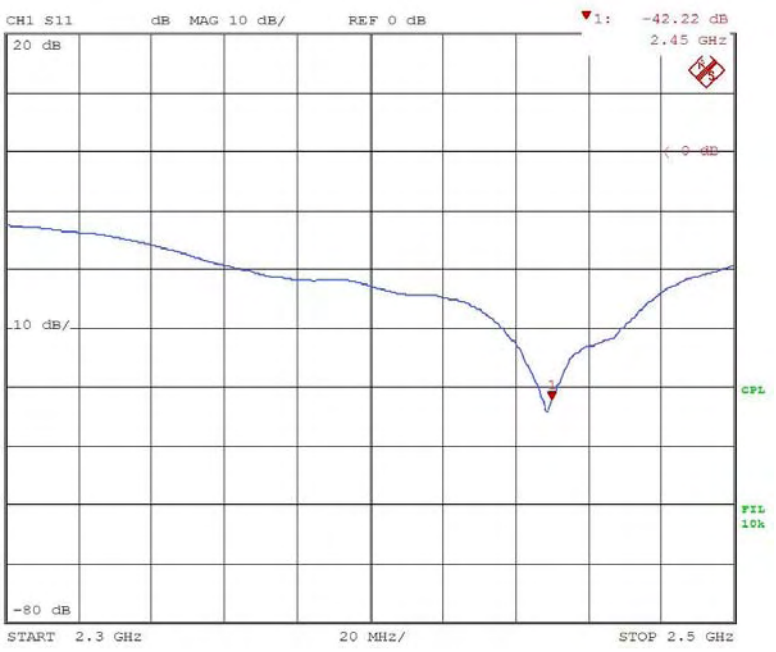
	Frequency	Tissue	Return loss	Limit	Verified Date
Calibration	1900	Body	-20.3	Within 20%	2011.06.20
Measurement	1900	Body	-21.38		



	Frequency	Tissue	Return loss	Limit	Verified Date
Calibration	2450	Head	-29.4	Within 20%	2011.06.20
Measurement	2450	Head	-31.2		

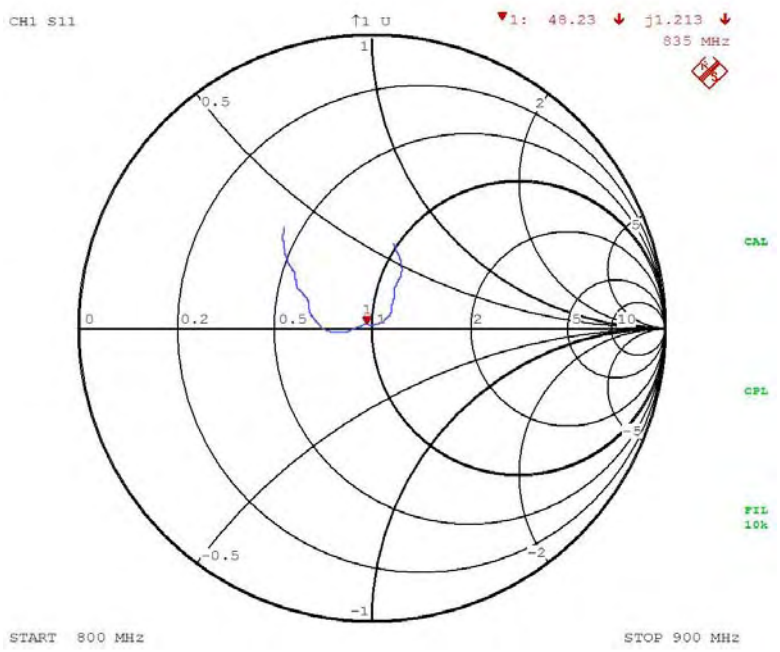


	Frequency	Tissue	Return loss	Limit	Verified Date
Calibration	2450	Body	-40.8	Within 20%	2011.06.20
Measurement	2450	Body	-42.22		

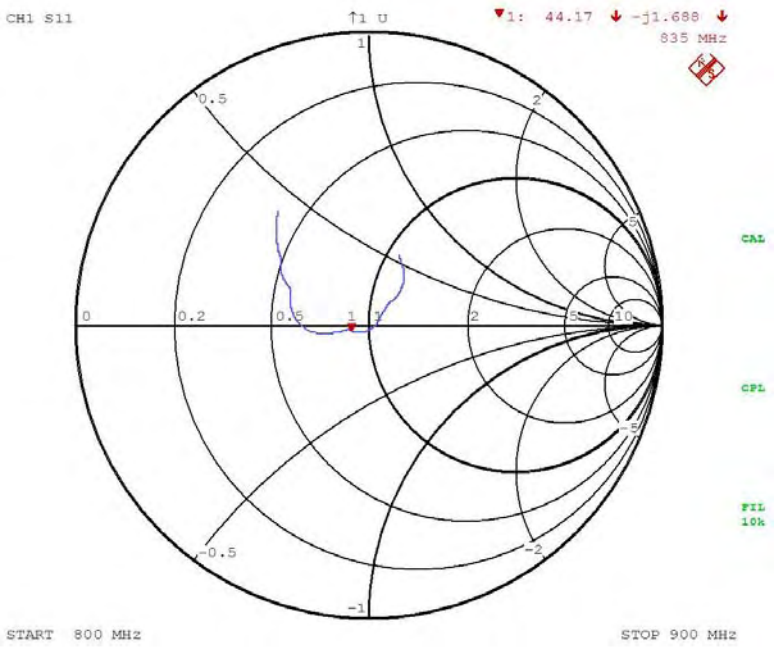


4. When the most recent measurement of the real or imaginary parts of the impedance, measured at least annually, deviates by more than 5 Ω from the previous measurement

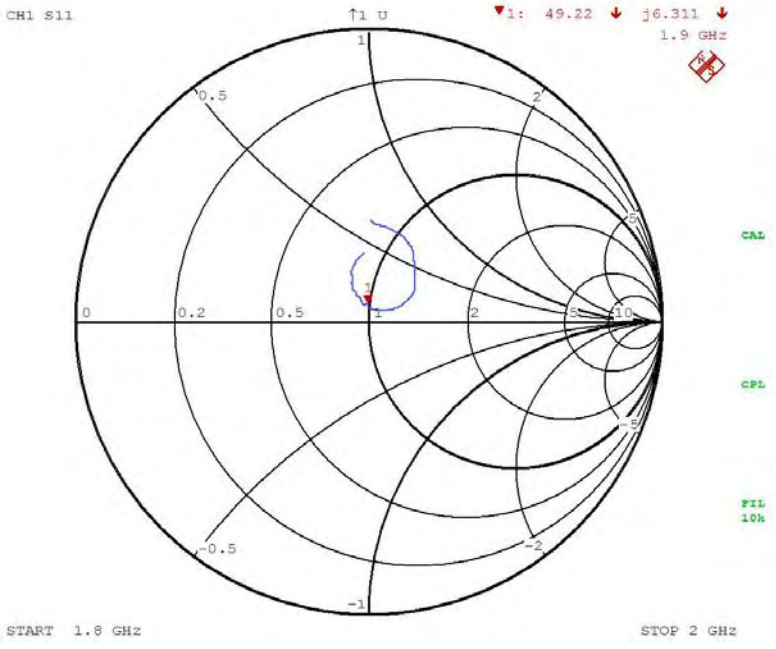
	Frequency	Tissue	Impedance	Limit	Verified Date
Calibration	835	Head	49.2	Within 5Ω	2011.06.20
Measurement	835	Head	48.23		



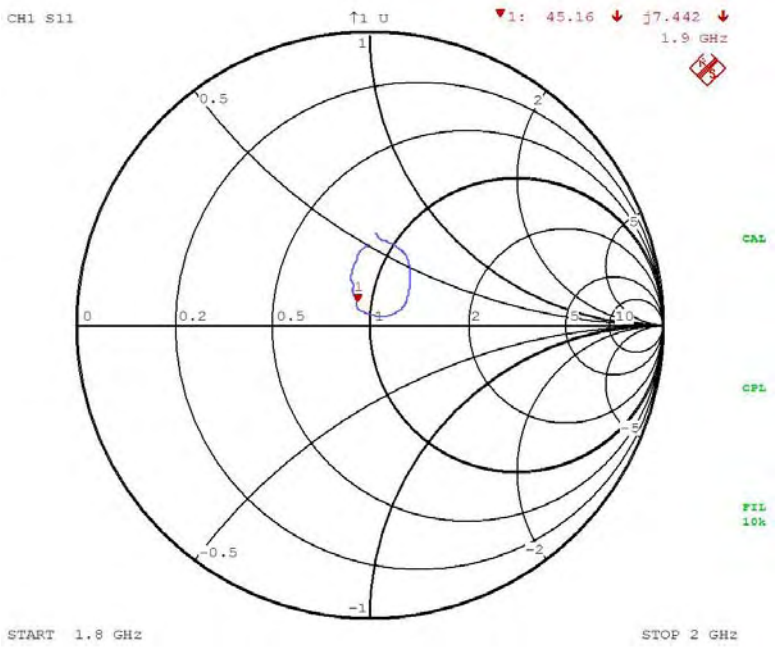
	Frequency	Tissue	Impedance	Limit	Verified Date
Calibration	835	Body	44.8	Within 5Ω	2011.06.20
Measurement	835	Body	44.17		



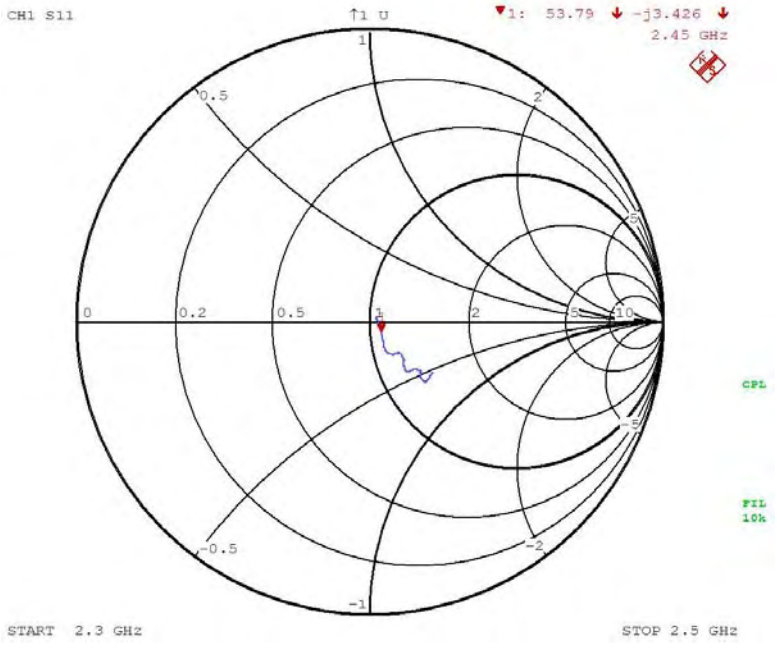
	Frequency	Tissue	Impedance	Limit	Verified Date
Calibration	1900	Head	49.2	Within 5Ω	2011.06.20
Measurement	1900	Head	49.22		



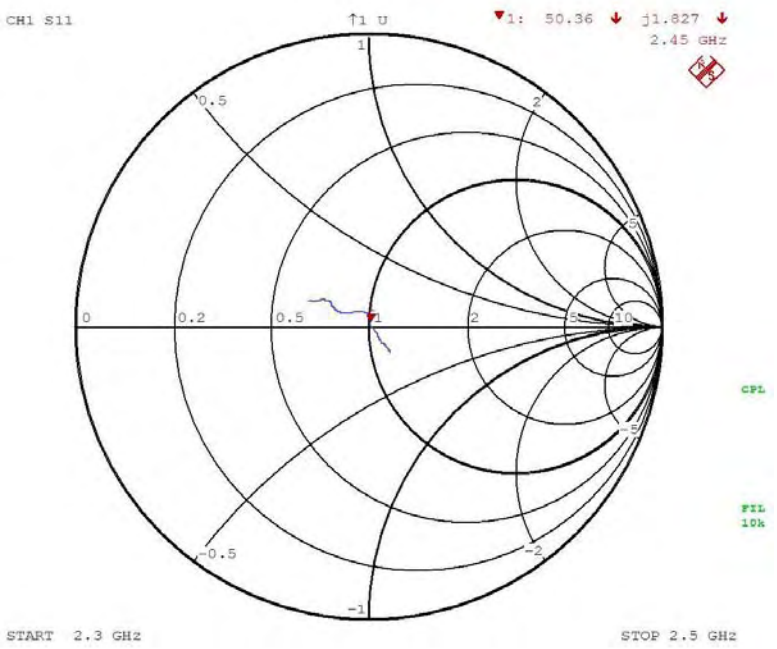
	Frequency	Tissue	Impedance	Limit	Verified Date
Calibration	1900	Body	45.2	Within 5Ω	2011.06.20
Measurement	1900	Body	45.16		



	Frequency	Tissue	Impedance	Limit	Verified Date
Calibration	2450	Head	53.5	Within 5Ω	2011.06.20
Measurement	2450	Head	53.79		



	Frequency	Tissue	Impedance	Limit	Verified Date
Calibration	2450	Body	50Ω	Within 5Ω	2011.06.20
Measurement	2450	Body	50.36Ω		



7. Measurement Uncertainty

DASY5 Uncertainty Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram / 10 gram.								
Error Description	Uncert. value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±6.0%	N	1	1	1	±6.0%	±6.0%	∞
Axial Isotropy	±4.7%	R	√3	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	√3	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	√3	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	√3	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	√3	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	√3	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	R	√3	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	R	√3	1	1	±1.7%	±1.7%	∞
Max. SAR Eval.	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Test Sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	√3	1	1	±2.9%	±2.9%	∞
Phantom and Setup								
Phantom Uncertainty	±4.0%	R	√3	1	1	±2.3%	±2.3%	∞
Liquid Conductivity (target)	±5.0%	R	√3	0.64	0.43	±1.8%	±1.2%	∞
Liquid Conductivity (meas.)	±2.5%	N	1	0.64	0.43	±1.6%	±1.1%	∞
Liquid Permittivity (target)	±5.0%	R	√3	0.6	0.49	±1.7%	±1.4%	∞
Liquid Permittivity (meas.)	±2.5%	N	1	0.6	0.49	±1.5%	±1.2%	∞
Combined Std. Uncertainty						±10.9%	±10.7%	387
Expanded STD Uncertainty						±21.9%	±21.4%	

8. Conducted Power Measurement

GSM Power

Mode	Frequency (MHz)	Avg. Burst Power (dBm)	Duty Cycle Factor (dB)	Frame Power (dBm)
Maximum Power <SIM 1>				
GSM850	824.2	32.69	-9	23.69
	836.4	32.67	-9	23.67
	848.8	32.66	-9	23.66
PCS1900	1850.2	30.17	-9	21.17
	1880.0	30.40	-9	21.4
	1909.8	30.30	-9	21.3
GPRS850(2 Slot)	824.2	31.97	-6	25.97
	836.4	31.91	-6	25.91
	848.8	31.83	-6	25.83
GPRS850(3 Slot)	824.2	29.94	-4.25	25.69
	836.4	29.90	-4.25	25.65
	848.8	29.83	-4.25	25.58
GPRS850(4 Slot)	824.2	29.18	-3	26.18
	836.4	29.09	-3	26.09
	848.8	29.03	-3	26.03
GPRS1900(2 Slot)	1850.2	28.57	-6	22.57
	1880.0	28.92	-6	22.92
	1909.8	28.65	-6	22.65
GPRS1900(3 Slot)	1850.2	26.51	-4.25	22.26
	1880.0	26.96	-4.25	22.71
	1909.8	26.70	-4.25	22.45
GPRS1900(4 Slot)	1850.2	25.45	-3	22.45
	1880.0	25.81	-3	22.81
	1909.8	25.67	-3	22.67
Maximum Power <SIM 2>				
GSM850	836.4	32.65	-9	23.65
PCS1900	1880.0	30.14	-9	21.14

WLAN output power

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Peak Power (dBm)	Average Power (dBm)
802.11b	11	01	2412	15.82	10.18
		06	2437	15.72	10.04
		11	2462	15.58	9.82
802.11g	54	01	2412	15.51	8.01
		06	2437	15.40	7.84
		11	2462	15.19	7.64

Note : According to the KDB 248227. SAR is not required for 802.11g channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.

9. Test Results

9.1. SAR Test Results Summary

SAR MEASUREMENT						
Ambient Temperature (°C) : 22.9 ±2				Relative Humidity (%): 51		
Liquid Temperature (°C) : 21.4 ±2				Depth of Liquid (cm):>15		
Product: GSM Mobile Phone						
Test Mode: GSM850 <SIM 1>						
Test Position Head	Antenna Position	Frequency		Conducted Power (dBm)	SAR 1g (W/kg)	Limit (W/kg)
		Channel	MHz			
Left-Cheek	Fixed	128	824.2	32.69	0.621	1.6
Left-Cheek	Fixed	189	836.4	32.67	0.727	1.6
Left-Cheek	Fixed	251	848.8	32.66	**0.881**	1.6
Left-Tilt	Fixed	189	836.4	32.67	0.411	1.6
Right-Cheek	Fixed	128	824.2	32.69	0.582	1.6
Right-Cheek	Fixed	189	836.4	32.67	0.727	1.6
Right-Cheek	Fixed	251	848.8	32.66	0.816	1.6
Right-Tilt	Fixed	189	836.4	32.67	0.435	1.6
Test Mode: GSM850 <SIM 2>						
Left-Cheek	Fixed	189	836.4	32.65	0.725	1.6
Note: (1)when the 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional, refer to KDB 447498.						

SAR MEASUREMENT

Ambient Temperature (°C) : 22.0 ±2 Relative Humidity (%): 53

Liquid Temperature (°C) : 20.8 ±2 Depth of Liquid (cm):>15

Product: GSM Mobile Phone

Test Mode: GSM850 Voice

Test Position Body	Antenna Position	Frequency		Conducted Power (dBm)	SAR 1g (W/kg)	Limit (W/kg)
		Channel	MHz			
Body-worn	Fixed	189	836.4	32.67	0.813	1.6
Test Mode: GPRS850 2slot						
Body-worn	Fixed	128	824.2	31.97	0.737	1.6
Body-worn	Fixed	189	836.4	31.91	**1.090**	1.6
Body-worn	Fixed	251	848.8	31.83	1.030	1.6
Body-front	Fixed	189	836.4	31.91	0.498	1.6
Body-worn (With Headset)	Fixed	189	836.4	31.91	0.574	1.6
Test Mode: GPRS850 3slot						
Body-worn	Fixed	189	836.4	29.90	0.913	1.6
Test Mode: GPRS850 4slot						
Body-worn	Fixed	189	836.4	29.09	0.904	1.6

Note: (1)when the 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional, refer to KDB 447498.

(2) Body SAR was performed with the device 15mm from the phantom

SAR MEASUREMENT

Ambient Temperature (°C) : 22.5 ±2 Relative Humidity (%): 50

Liquid Temperature (°C) : 21.1 ±2 Depth of Liquid (cm):>15

Product: GSM Mobile Phone

Test Mode: PCS1900 <SIM 1>

Test Position Head	Antenna Position	Frequency		Conducted Power (dBm)	SAR 1g (W/kg)	Limit (W/kg)
		Channel	MHz			
Left-Cheek	Fixed	512	1850.2	30.17	0.779	1.6
Left-Cheek	Fixed	661	1880.0	30.40	0.748	1.6
Left-Cheek	Fixed	810	1909.8	30.30	0.667	1.6
Left-Tilt	Fixed	661	1880.0	30.40	0.195	1.6
Right-Cheek	Fixed	512	1850.2	30.17	**1.090**	1.6
Right-Cheek	Fixed	661	1880.0	30.40	1.080	1.6
Right-Cheek	Fixed	810	1909.8	30.30	1.030	1.6
Right-Tilt	Fixed	661	1880.0	30.40	0.196	1.6
Test Mode: PCS1900 <SIM 2>						
Left-Cheek	Fixed	661	1880.0	30.40	0.731	1.6

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

SAR MEASUREMENT

Ambient Temperature (°C) : 22.0 ±2				Relative Humidity (%): 53		
Liquid Temperature (°C) : 20.8 ±2				Depth of Liquid (cm):>15		
Product: GSM Mobile Phone						
Test Mode: PCS1900 Voice						
Test Position Body	Antenna Position	Frequency		Conducted Power (dBm)	SAR 1g (W/kg)	Limit (W/kg)
		Channel	MHz			
Body-worn	Fixed	661	1880.0	30.40	0.382	1.6
Test Mode: GPRS1900 2slot						
Body-worn	Fixed	512	1850.2	28.57	0.555	1.6
Body-worn	Fixed	661	1880.0	28.92	0.595	1.6
Body-worn	Fixed	810	1909.8	28.65	**0.619**	1.6
Body-front	Fixed	661	1880.0	28.92	0.538	1.6
Body-worn (With Headset)	Fixed	661	1880.0	28.92	0.513	1.6
Test Mode: GPRS1900 3slot						
Body-worn	Fixed	661	1880.0	26.96	0.560	1.6
Test Mode: GPRS1900 4slot						
Body-worn	Fixed	661	1880.0	25.81	0.582	1.6

Note: (1)when the 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional, refer to KDB 447498.

(2) Body SAR was performed with the device 15mm from the phantom

SAR MEASUREMENT						
Ambient Temperature (°C): 22.6 ±2				Relative Humidity (%): 53		
Liquid Temperature (°C): 21.2 ±2				Depth of Liquid (cm):>15		
Product: GSM Mobile Phone						
Test Mode: 802.11b						
Test Position Head	Antenna Position	Frequency		Conducted Power (dBm)	SAR 1g (W/kg)	Limit (W/kg)
		Channel	MHz			
Left-Cheek	Fixed	1	2412	10.18	**0.051**	1.6
Left-Cheek	Fixed	6	2437	10.04	*	1.6
Left-Cheek	Fixed	11	2462	9.82	*	1.6
Left-Tilt	Fixed	1	2412	10.18	0.026	1.6
Right-Cheek	Fixed	1	2412	10.18	0.026	1.6
Right-Cheek	Fixed	6	2437	10.04	*	1.6
Right-Cheek	Fixed	11	2462	9.82	*	1.6
Right-Tilt	Fixed	1	2412	10.18	0.024	1.6
Note: When the SAR procedures require multiple channels to be tested and the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required, refer to KDB 447498.						

SAR MEASUREMENT						
Ambient Temperature (°C): 22.0 ± 2				Relative Humidity (%): 53		
Liquid Temperature (°C): 20.8 ± 2				Depth of Liquid (cm):>15		
Product: GSM Mobile Phone						
Test Mode: 802.11b						
Test Position Body	Antenna Position	Frequency		Conducted Power (dBm)	SAR 1g (W/kg)	Limit (W/kg)
		Channel	MHz			
Body-worn	Fixed	1	2412	10.18	**0.020**	1.6
Body-worn	Fixed	6	2437	10.04	*	1.6
Body-worn	Fixed	11	2462	9.82	*	1.6
Body-front	Fixed	1	2412	10.18	0.017	1.6
Note: (1)When the SAR procedures require multiple channels to be tested and the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required, refer to KDB 447498. (2) Body SAR was performed with the device 15mm from the phantom						

Appendix A. SAR System Validation Data

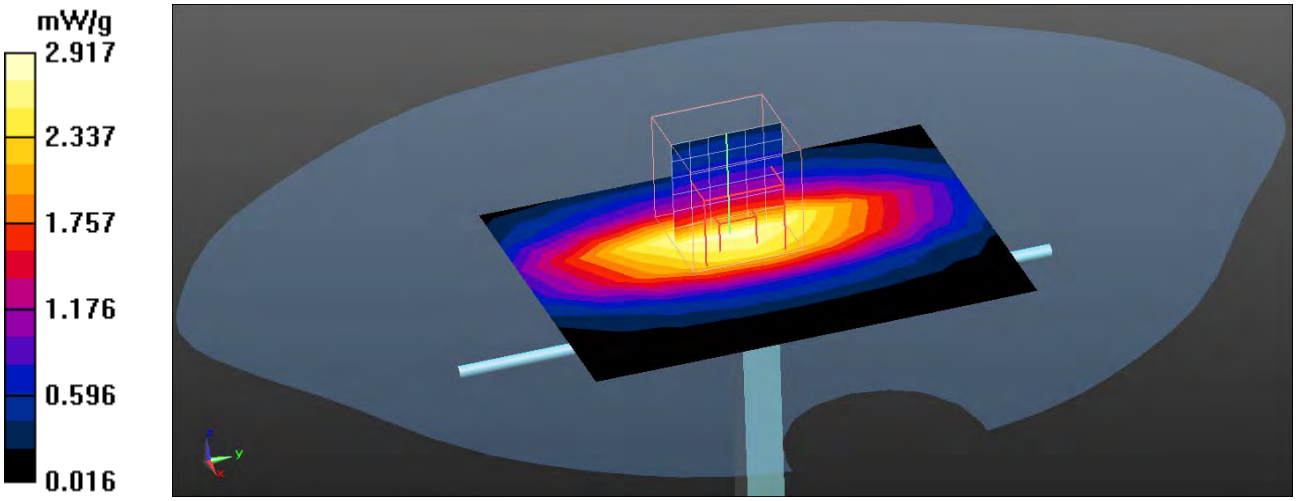
Test Laboratory: QuieTek Date/Time: 2011/9/21

SystemPerformanceCheck-835MHz_Head
DUT: Dipole 835 MHz; Type: ALS-D-835-S-2
Communication System: CW; Frequency: 835 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 42.04; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.9, Liquid Temperature (°C) : 21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.4, 8.4, 8.4); Calibrated: 2011/7/28
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/835MHz_Head/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.917 mW/g

Configuration/835MHz_Head/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.557 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.861 W/kg
SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.55 mW/g
Maximum value of SAR (measured) = 2.846 mW/g



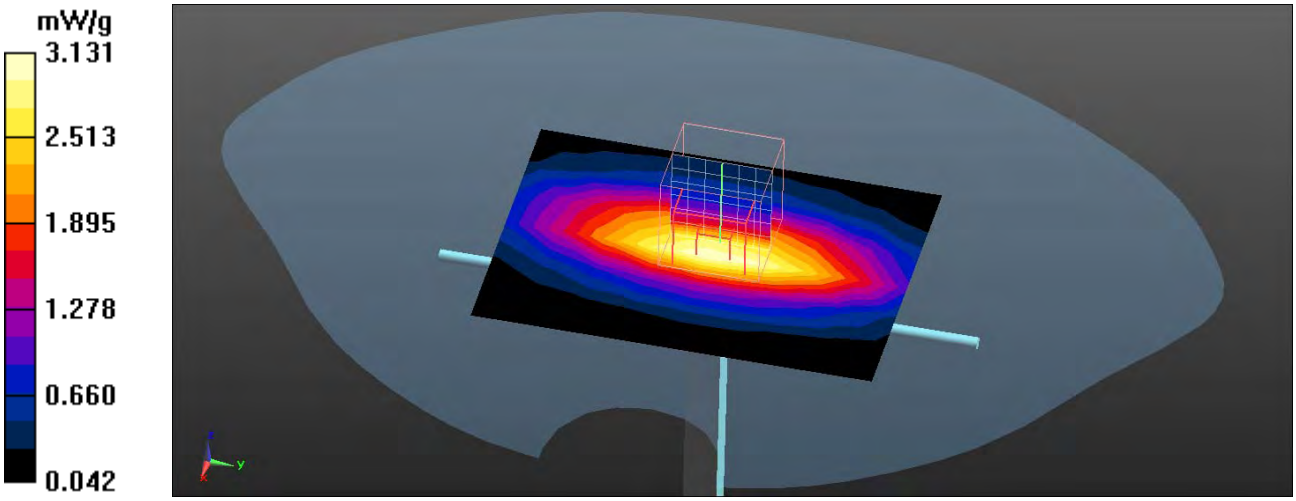
Test Laboratory: QuieTek Date/Time: 2011/9/20

SystemPerformanceCheck-835MHz_Body
DUT: Dipole 835 MHz; Type: ALS-D-835-S-2
Communication System: CW; Frequency: 835 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 835 MHz; σ = 0.99 mho/m; ε_r = 56.71; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.59, 8.59, 8.59); Calibrated: 2011/7/28
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/835MHz_Body/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.131 mW/g

Configuration/835MHz_Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.242 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 4.051 W/kg
SAR(1 g) = 2.56 mW/g; SAR(10 g) = 1.61 mW/g
Maximum value of SAR (measured) = 2.907 mW/g



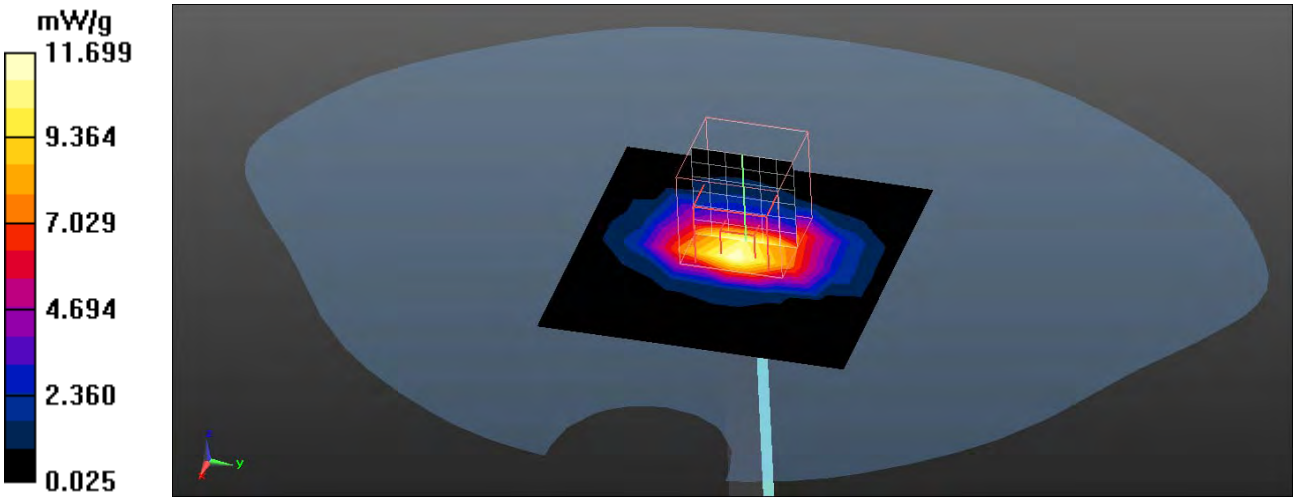
Test Laboratory: QuieTek Date/Time: 2011/9/21

System Performance Check_1900MHz-Head
DUT: Dipole 1900 MHz; Type: ALS-D-1900-S-2
Communication System: CW; Frequency: 1900 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 1900 MHz; σ = 1.41 mho/m; ε_r = 40.98; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.5, Liquid Temperature (°C) : 21.1
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(7.18, 7.18, 7.18); Calibrated: 2011/7/28
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/1900MHz_Head/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 11.699 mW/g

Configuration/1900MHz_Head/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 108.6 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 20.231W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.08 mW/g
Maximum value of SAR (measured) = 11.535mW/g



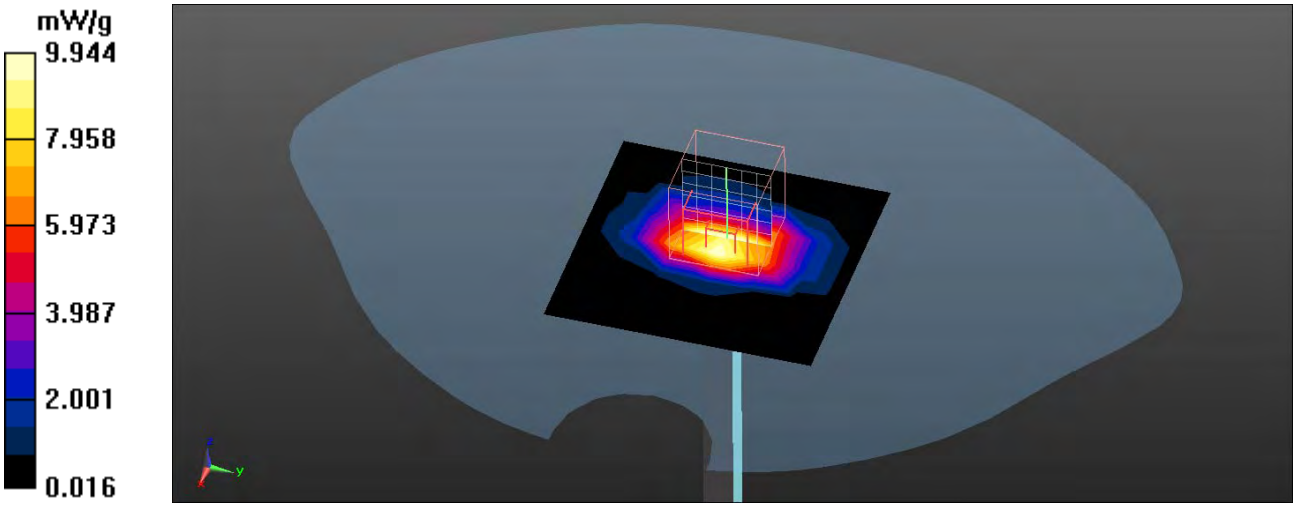
Test Laboratory: QuieTek Date/Time: 2011/9/20

System Performance Check_1900MHz-Body
DUT: Dipole 1900 MHz; Type: ALS-D-1900-S-2
Communication System: CW; Frequency: 1900 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 1900 MHz; σ = 1.54 mho/m; ε_r = 53.93; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.74, 6.74, 6.74); Calibrated: 2011/7/28
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/1900MHz_Body/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 9.944 mW/g

Configuration/1900MHz_Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.74 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 18.121 W/kg
SAR(1 g) = 9.61 mW/g; SAR(10 g) = 5.05 mW/g
Maximum value of SAR (measured) = 10.166 mW/g



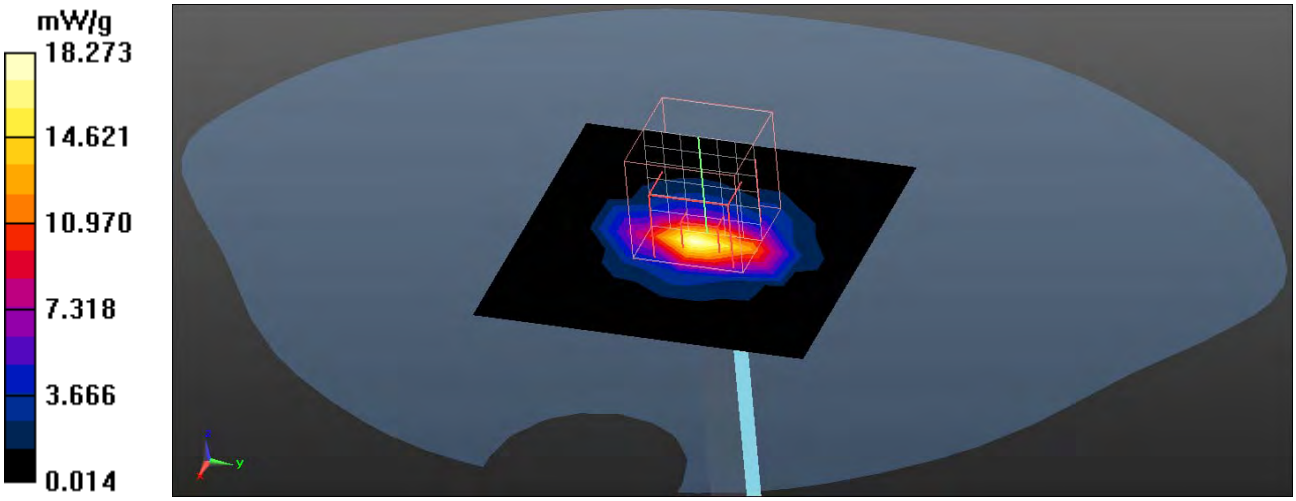
Test Laboratory: QuieTek Date/Time: 2011/9/19

System Performance Check_2450MHz-Head
DUT: Dipole 2450 MHz; Type: D2450V2
Communication System: CW; Frequency: 2450 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2450 MHz; σ = 1.78 mho/m; ε_r = 39.38; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.6, Liquid Temperature (°C) : 21.2
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.51, 6.51, 6.51); Calibrated: 2011/7/28
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/2450MHz_Head/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 18.273 mW/g

Configuration/2450MHz_Head/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.3 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 26.634 W/kg
SAR(1 g) = 12.6 mW/g; SAR(10 g) = 5.68 mW/g
Maximum value of SAR (measured) = 15.927 mW/g



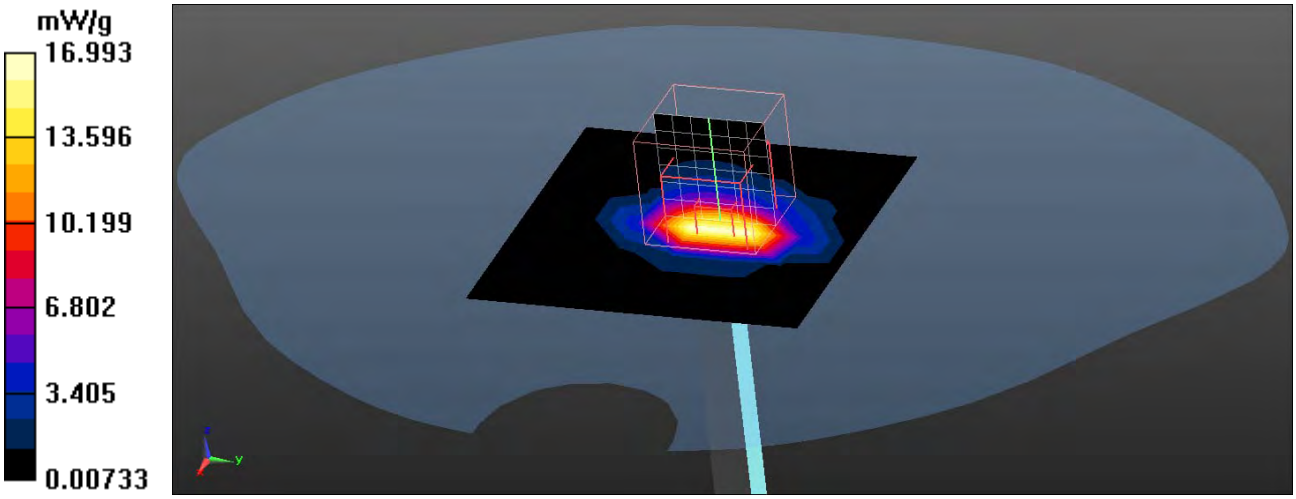
Test Laboratory: QuieTek Date/Time: 2011/9/20

System Performance Check_2450MHz-Body
DUT: Dipole 2450 MHz; Type: D2450V2
Communication System: CW; Frequency: 2450 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 53.03; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.6, 6.6, 6.6); Calibrated: 2011/7/28
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/2450MHz_Body/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 16.993 mW/g

Configuration/2450MHz_Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 100.9 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 29.008 W/kg
SAR(1 g) = 13.6 mW/g; SAR(10 g) = 5.86 mW/g
Maximum value of SAR (measured) = 14.955 mW/g



Appendix B. SAR measurement Data

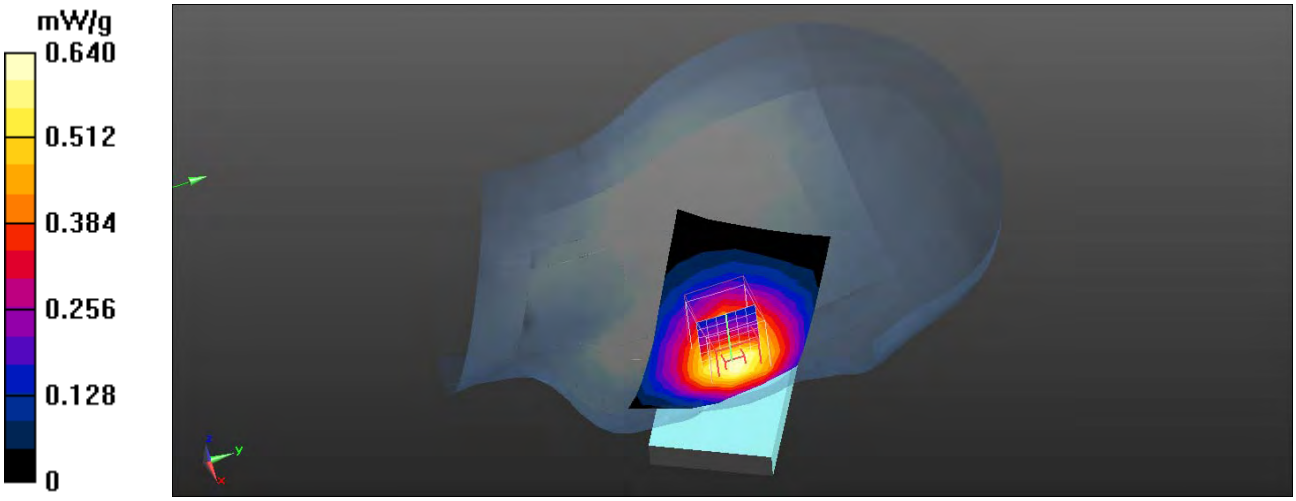
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 850_Left-Cheek_SIM1_128
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz; Frequency: 824.2 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 824.2 MHz; σ = 0.89 mho/m; ε_r = 42.88; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.9, Liquid Temperature (°C) : 21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.4, 8.4, 8.4); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.640 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.734 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.779 W/kg
SAR(1 g) = 0.621 mW/g; SAR(10 g) = 0.465 mW/g
Maximum value of SAR (measured) = 0.656 mW/g



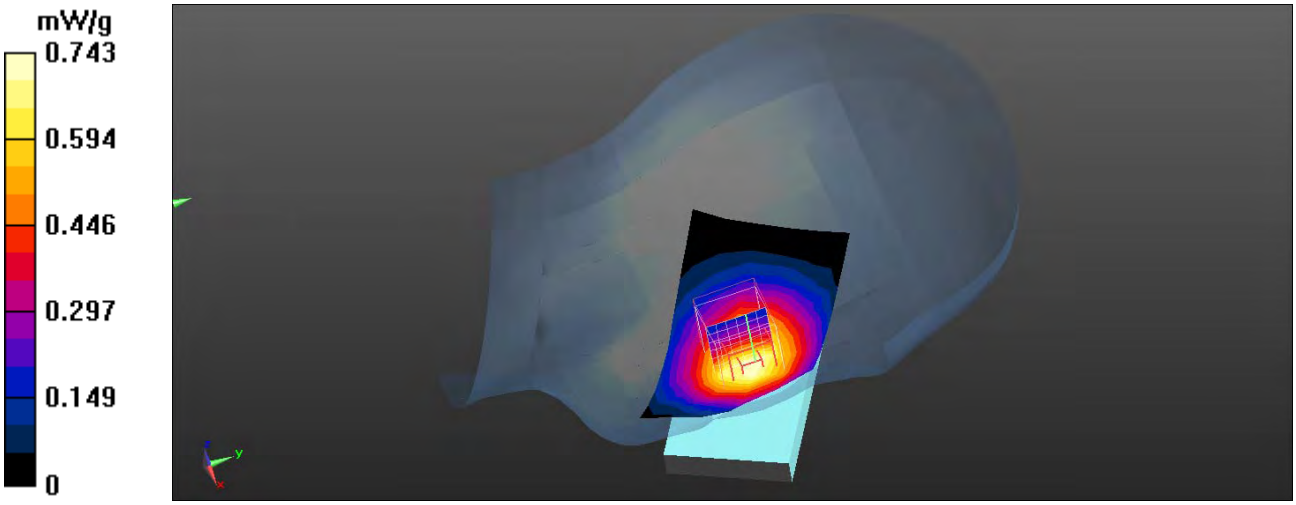
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 850_Left-Cheek_SIM1_189
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz; Frequency: 836.4 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 836.4 MHz; σ = 0.91 mho/m; ε_r = 41.96; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.9, Liquid Temperature (°C) : 21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.4, 8.4, 8.4); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.743 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.740 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.909 W/kg
SAR(1 g) = 0.727 mW/g; SAR(10 g) = 0.545 mW/g
Maximum value of SAR (measured) = 0.763 mW/g



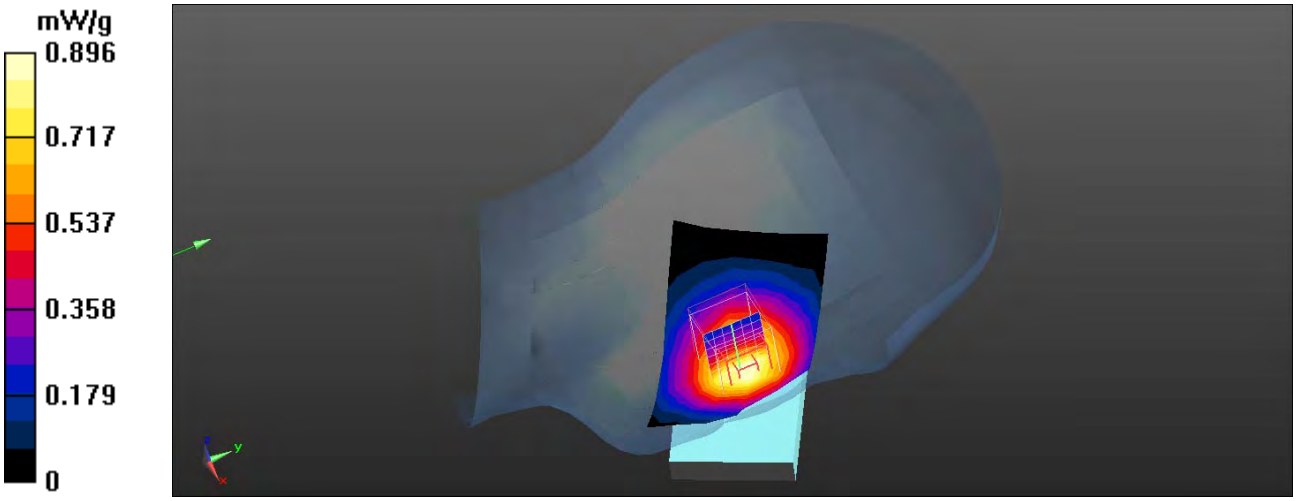
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 850_Left-Cheek_SIM1_251
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz; Frequency: 848.8 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 848.8 MHz; σ = 0.93 mho/m; ε_r = 41.13; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.9, Liquid Temperature (°C) : 21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.4, 8.4, 8.4); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.896 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.659 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.115 W/kg
SAR(1 g) = 0.881 mW/g; SAR(10 g) = 0.656 mW/g
Maximum value of SAR (measured) = 0.928 mW/g



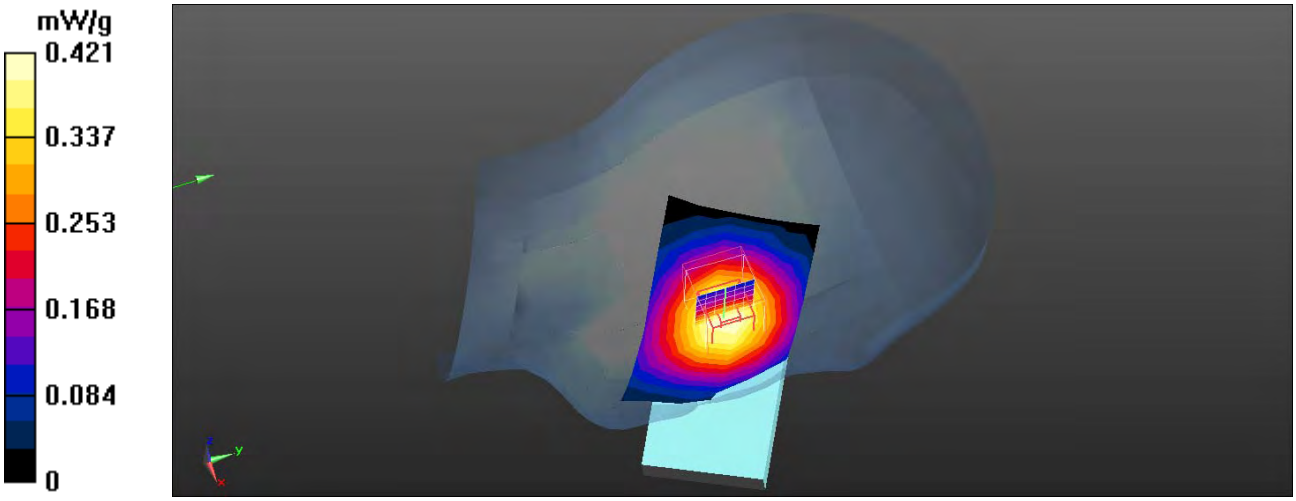
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 850_Left-Tilt_SIM1_189
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz; Frequency: 836.4 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 836.4 MHz; σ = 0.91 mho/m; ε_r = 41.96; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.9, Liquid Temperature (°C) : 21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.4, 8.4, 8.4); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.421 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.385 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.516 W/kg
SAR(1 g) = 0.411 mW/g; SAR(10 g) = 0.309 mW/g
Maximum value of SAR (measured) = 0.432 mW/g



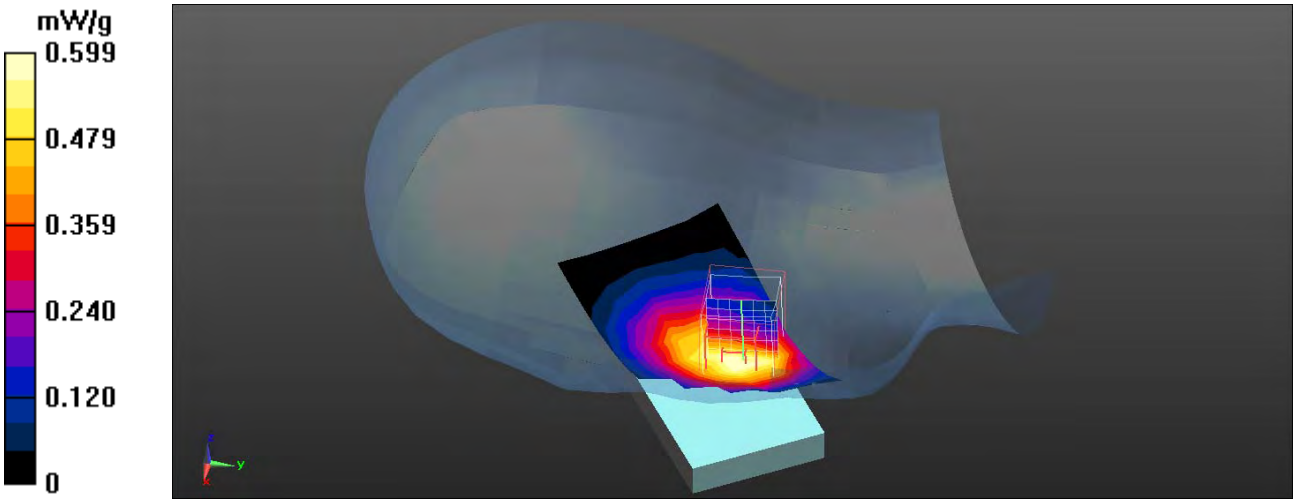
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 850_Right-Cheek_SIM1_128
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz; Frequency: 824.2 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 824.2 MHz; σ = 0.89 mho/m; ε_r = 42.88; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient Temperature (°C) : 22.9, Liquid Temperature (°C) : 21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.4, 8.4, 8.4); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.599 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.986 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.826 W/kg
SAR(1 g) = 0.582 mW/g; SAR(10 g) = 0.416 mW/g
Maximum value of SAR (measured) = 0.615 mW/g



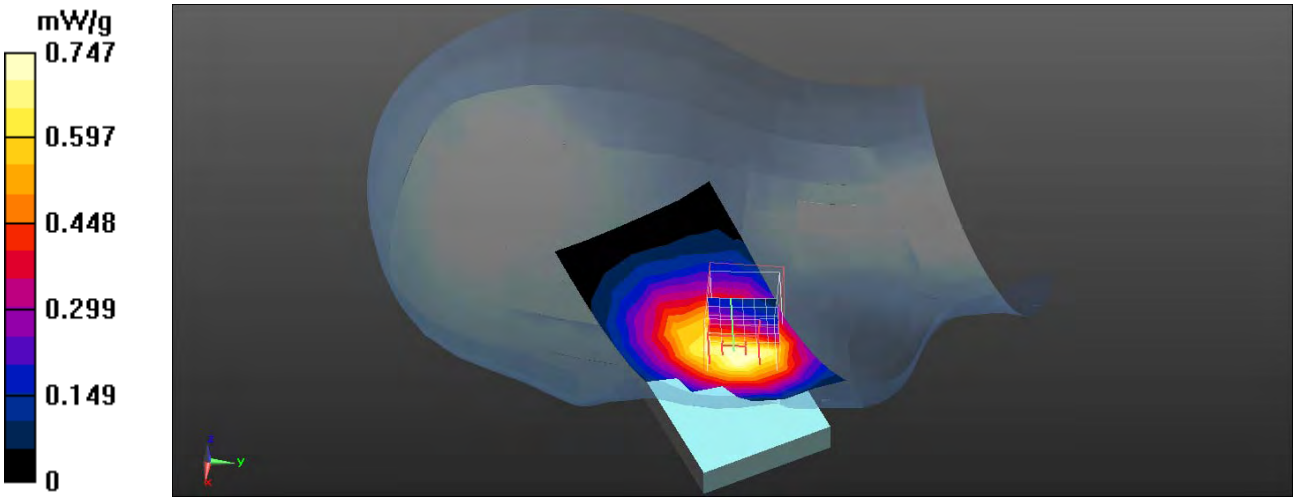
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 850_Right-Cheek_SIM1_189
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz; Frequency: 836.4 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 836.4 MHz; σ = 0.91 mho/m; ε_r = 41.96; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient Temperature (°C) : 22.9, Liquid Temperature (°C) : 21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.4, 8.4, 8.4); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.747 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.066 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 1.019 W/kg
SAR(1 g) = 0.727 mW/g; SAR(10 g) = 0.519 mW/g
Maximum value of SAR (measured) = 0.772 mW/g



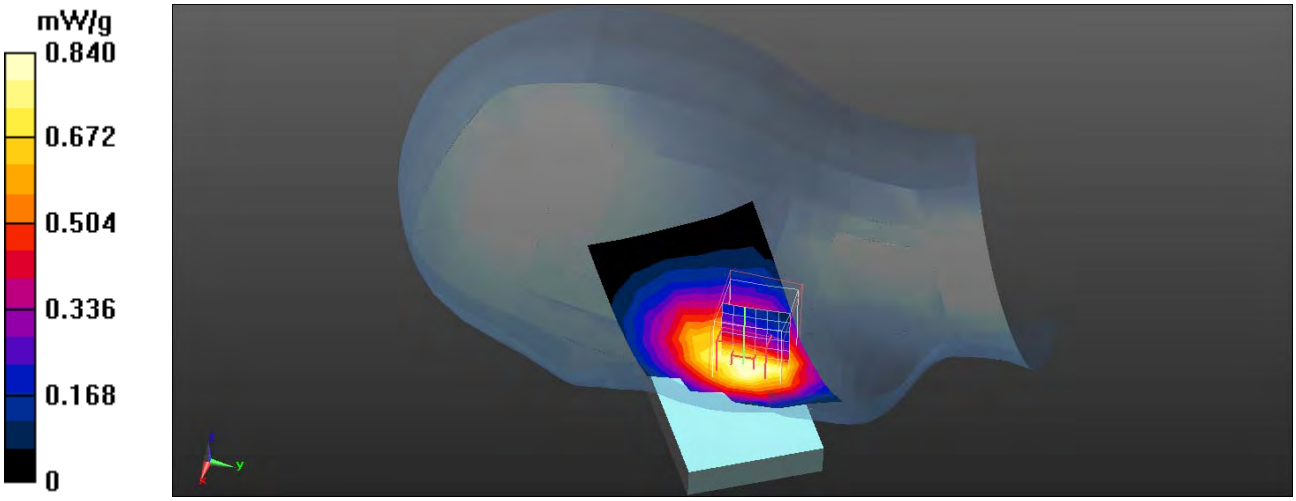
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 850_Right-Cheek_SIM1_251
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz; Frequency: 848.8 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 848.8 MHz; σ = 0.93 mho/m; ε_r = 41.13; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient Temperature (°C) : 22.9, Liquid Temperature (°C) : 21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.4, 8.4, 8.4); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.840 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.529 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.139 W/kg
SAR(1 g) = 0.816 mW/g; SAR(10 g) = 0.581 mW/g
Maximum value of SAR (measured) = 0.862 mW/g



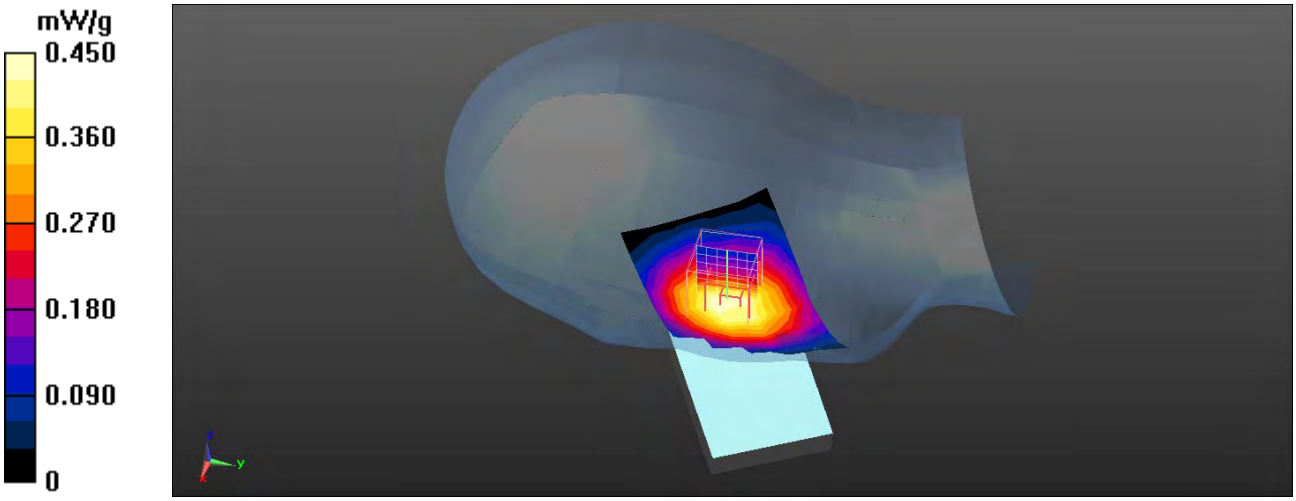
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 850_Right-Tilt_SIM1_189
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz; Frequency: 836.4 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 836.4 MHz; σ = 0.91 mho/m; ε_r = 41.96; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient Temperature (°C) : 22.9, Liquid Temperature (°C) : 21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.4, 8.4, 8.4); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.450 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.053 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.551 W/kg
SAR(1 g) = 0.435 mW/g; SAR(10 g) = 0.324 mW/g
Maximum value of SAR (measured) = 0.458 mW/g



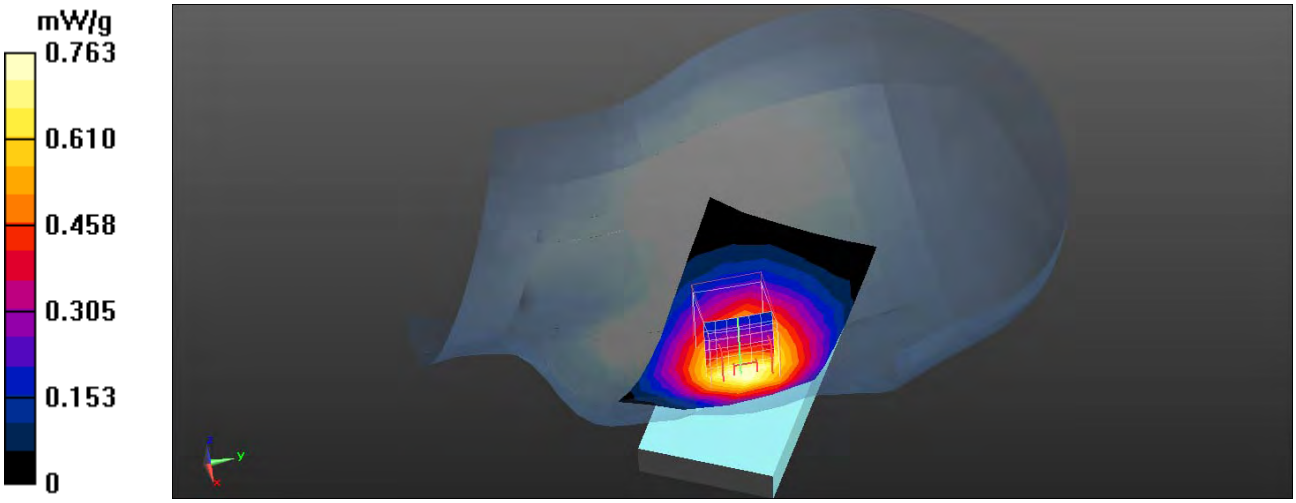
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 850_Left-Cheek_SIM2_189
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz; Frequency: 836.4 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 836.4 MHz; σ = 0.91 mho/m; ε_r = 41.96; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.9, Liquid Temperature (°C) : 21.4
DASY5 Configuration:

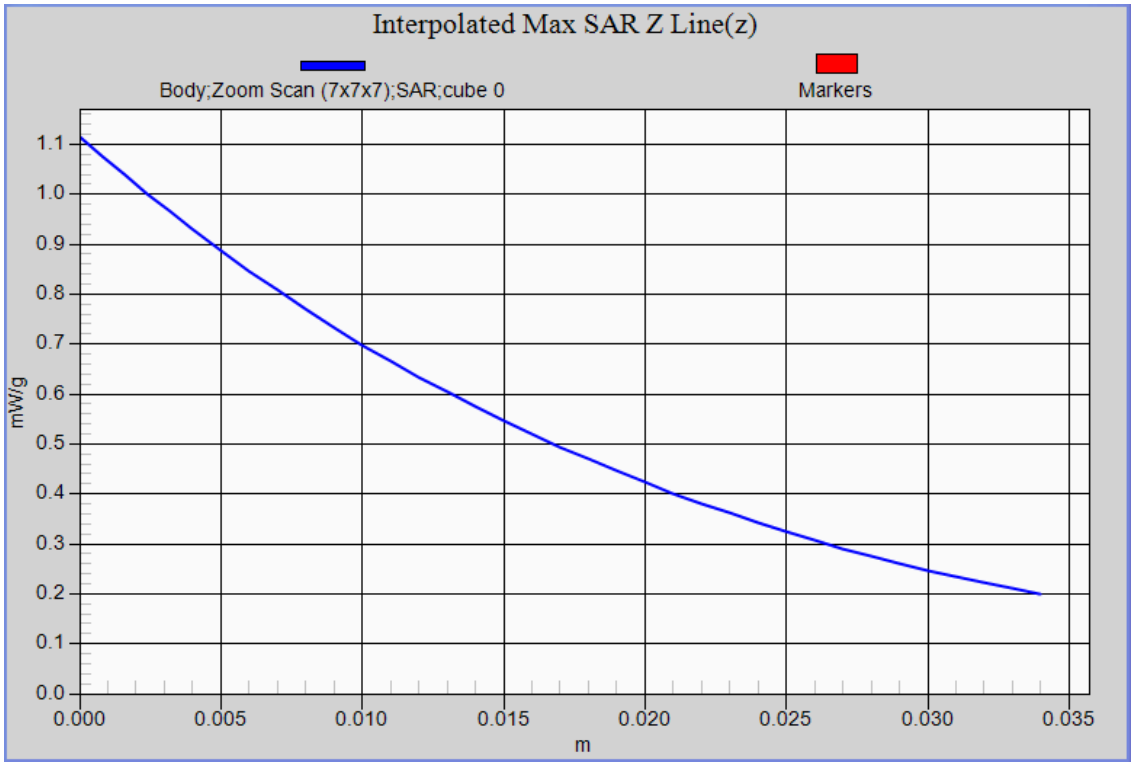
- Probe: EX3DV4 - SN3698; ConvF(8.4, 8.4, 8.4); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.763 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.842 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.904 W/kg
SAR(1 g) = 0.725 mW/g; SAR(10 g) = 0.542 mW/g
Maximum value of SAR (measured) = 0.761 mW/g



GSM 850 EUT Left-Cheek (SIM1) Z-Axis plot
Channel: 251



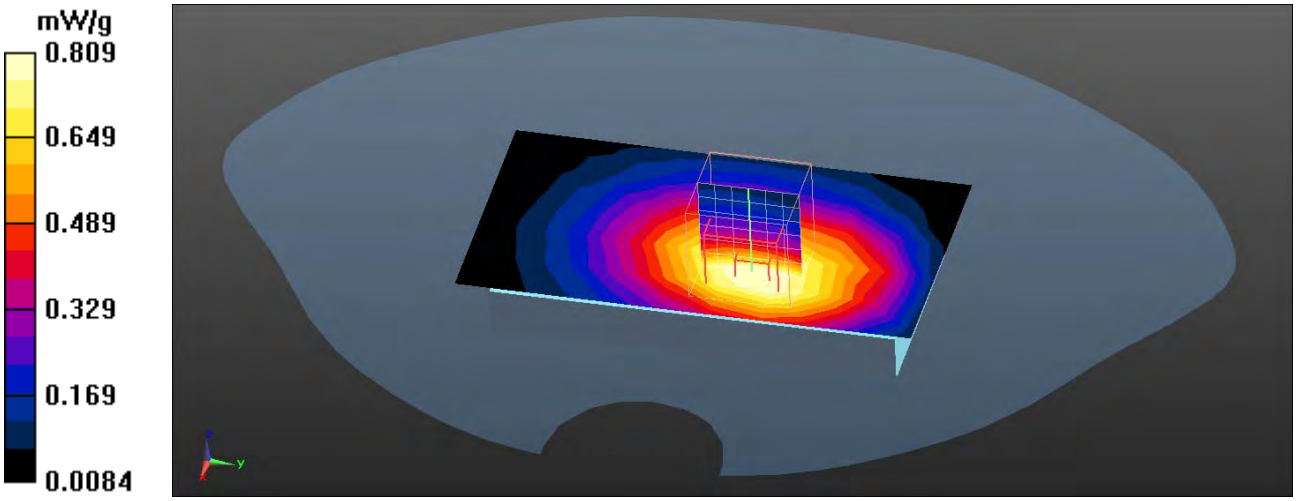
Test Laboratory: Quietek Date/Time: 2011/9/20

GSM850_Body-Worn_189
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz; Frequency: 836.4 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 836.4 MHz; σ = 1.01 mho/m; ε_r = 56.63; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.59, 8.59, 8.59); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.809 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.726 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.180 W/kg
SAR(1 g) = 0.813 mW/g; SAR(10 g) = 0.546 mW/g
Maximum value of SAR (measured) = 0.870 mW/g



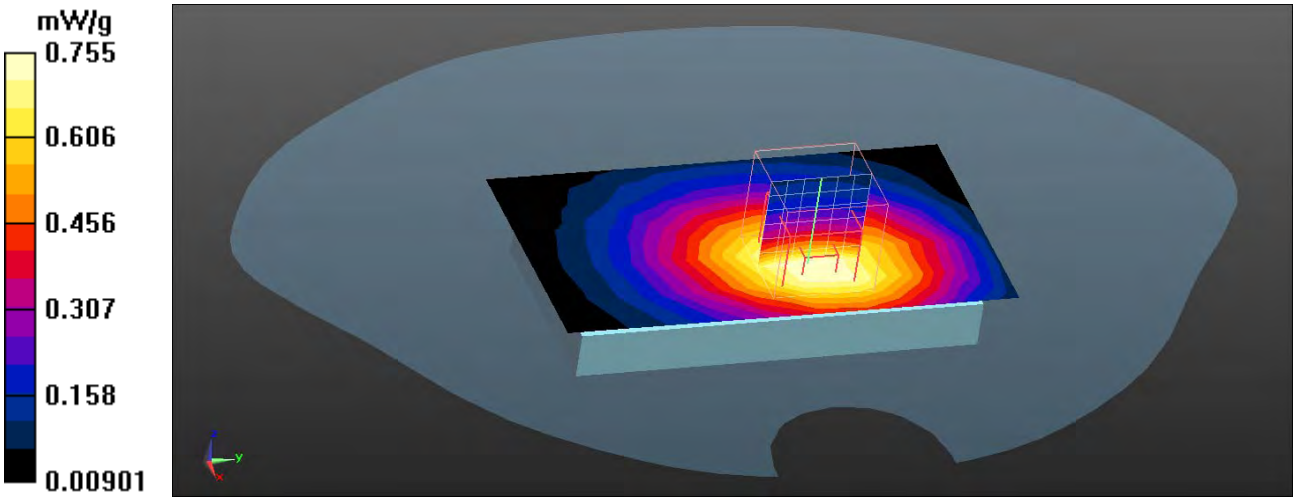
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS 850_Body-Worn_2slot_128
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz_GPRS&EGPRS-2 Slot; Frequency: 824.2 MHz;Communication System PAR: 6.128 dB
Medium parameters used: f = 824.2 MHz; σ = 0.98 mho/m; ε_r = 57.11; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.59, 8.59, 8.59); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.755 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.366 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.058 W/kg
SAR(1 g) = 0.737 mW/g; SAR(10 g) = 0.506 mW/g
Maximum value of SAR (measured) = 0.783 mW/g



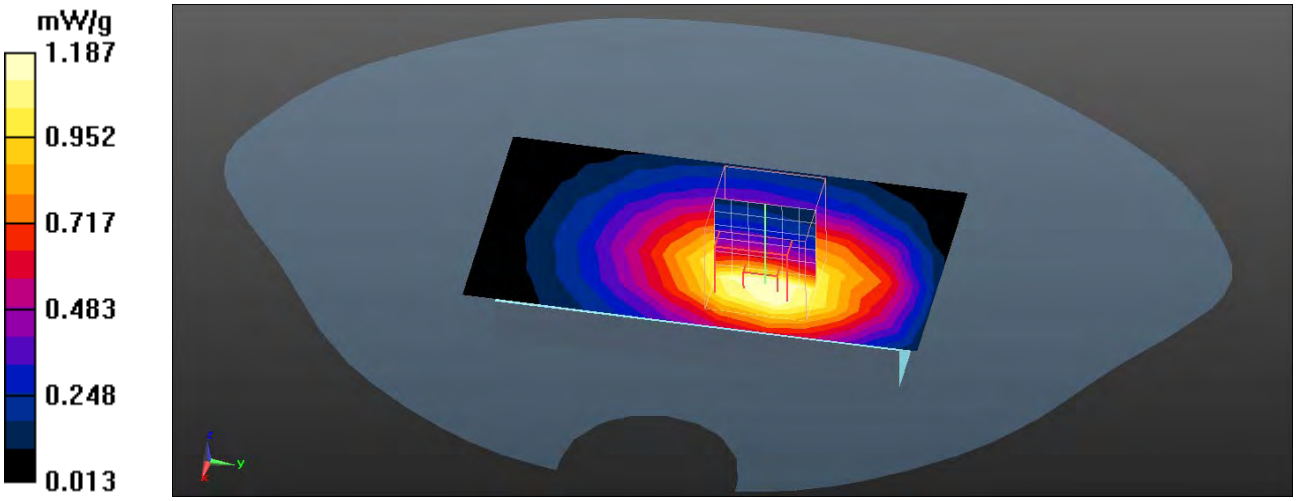
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS 850_Body-Worn_2slot_189
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz_GPRS&EGPRS-2 Slot; Frequency: 836.4 MHz;Communication System PAR: 6.128 dB
Medium parameters used: f = 836.4 MHz; σ = 1.01 mho/m; ε_r = 56.63; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.59, 8.59, 8.59); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.187 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 30.051 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 1.752 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.801 mW/g
Maximum value of SAR (measured) = 1.275 mW/g



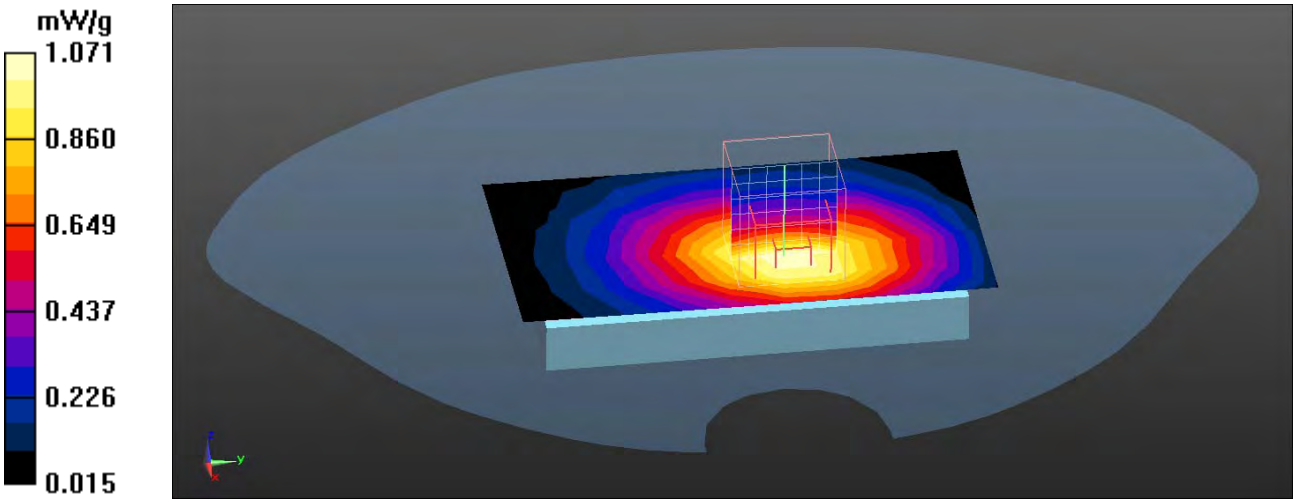
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS 850_Body-Worn_2slot_251
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz_GPRS&EGPRS-2 Slot; Frequency: 848.8 MHz;Communication System PAR: 6.128 dB
Medium parameters used: f = 848.8 MHz; σ = 1.02 mho/m; ε_r = 55.98; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.59, 8.59, 8.59); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.071 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.861 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.460 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.708 mW/g
Maximum value of SAR (measured) = 1.100 mW/g



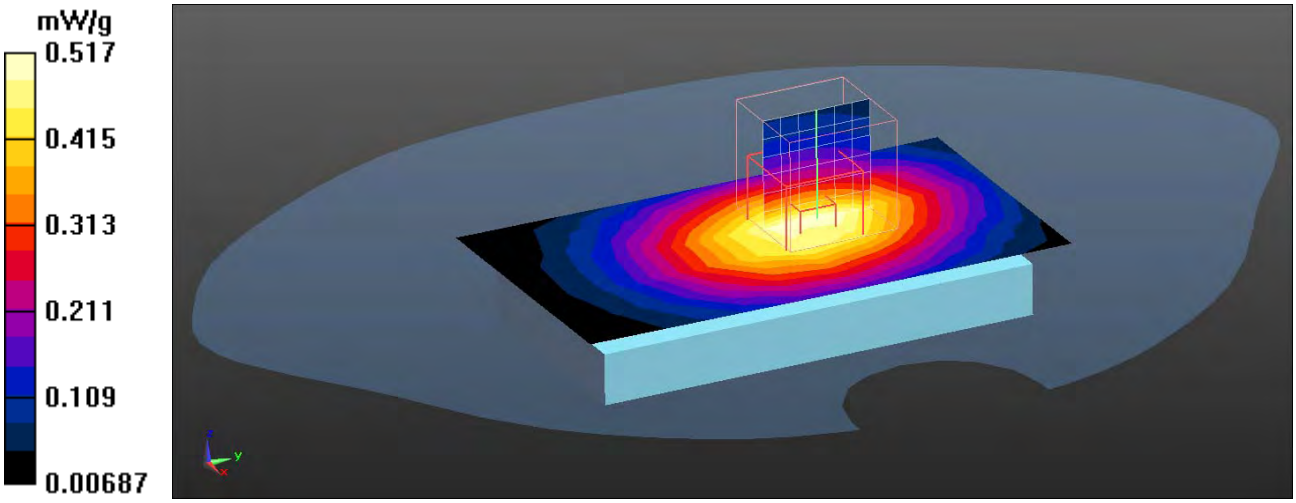
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS 850_Body-Front_2slot_189
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz_GPRS&EGPRS-2 Slot; Frequency: 836.4 MHz;Communication System PAR: 6.128 dB
Medium parameters used: f = 836.4 MHz; σ = 1.01 mho/m; ε_r = 56.63; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.59, 8.59, 8.59); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.517 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.066 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.687 W/kg
SAR(1 g) = 0.498 mW/g; SAR(10 g) = 0.350 mW/g
Maximum value of SAR (measured) = 0.526 mW/g



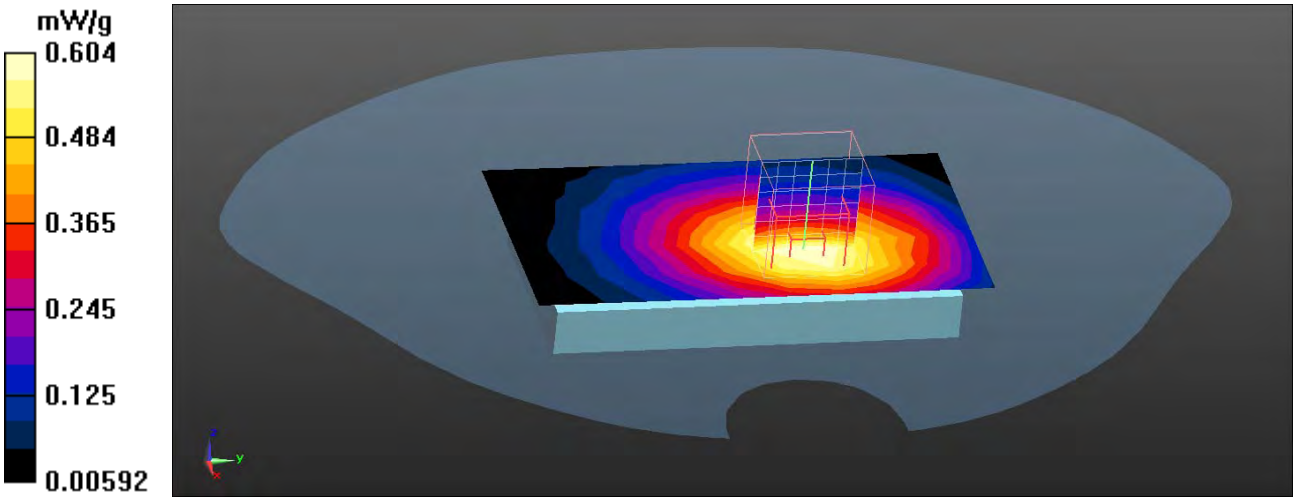
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS 850_Body-Worn(With Headset)_2slot_189
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz_GPRS&EGPRS-2 Slot; Frequency: 836.4 MHz;Communication System PAR: 6.128 dB
Medium parameters used: f = 836.4 MHz; σ = 1.01 mho/m; ε_r = 56.63; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.59, 8.59, 8.59); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.604 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.488 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.811 W/kg
SAR(1 g) = 0.574 mW/g; SAR(10 g) = 0.394 mW/g
Maximum value of SAR (measured) = 0.610 mW/g



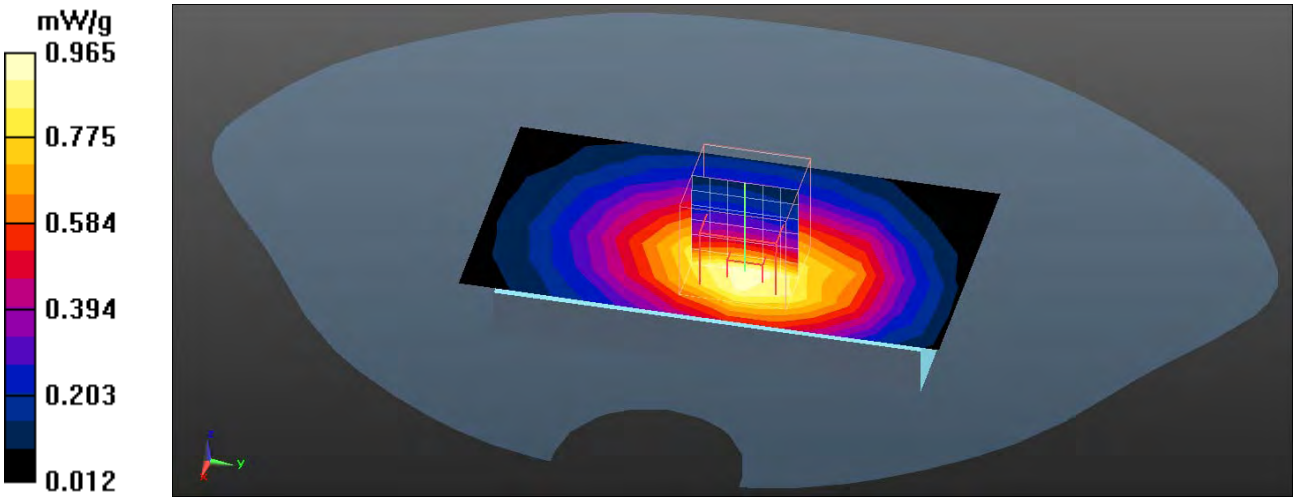
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS 850_Body-Worn_3slot_189
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz_GPRS&EGPRS-3 Slot; Frequency: 836.4 MHz;Communication System PAR: 4.314 dB
Medium parameters used: f = 836.4 MHz; σ = 1.01 mho/m; ε_r = 56.63; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(8.59, 8.59, 8.59); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.965 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 29.179 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 1.297 W/kg
SAR(1 g) = 0.913 mW/g; SAR(10 g) = 0.623 mW/g
Maximum value of SAR (measured) = 0.971 mW/g



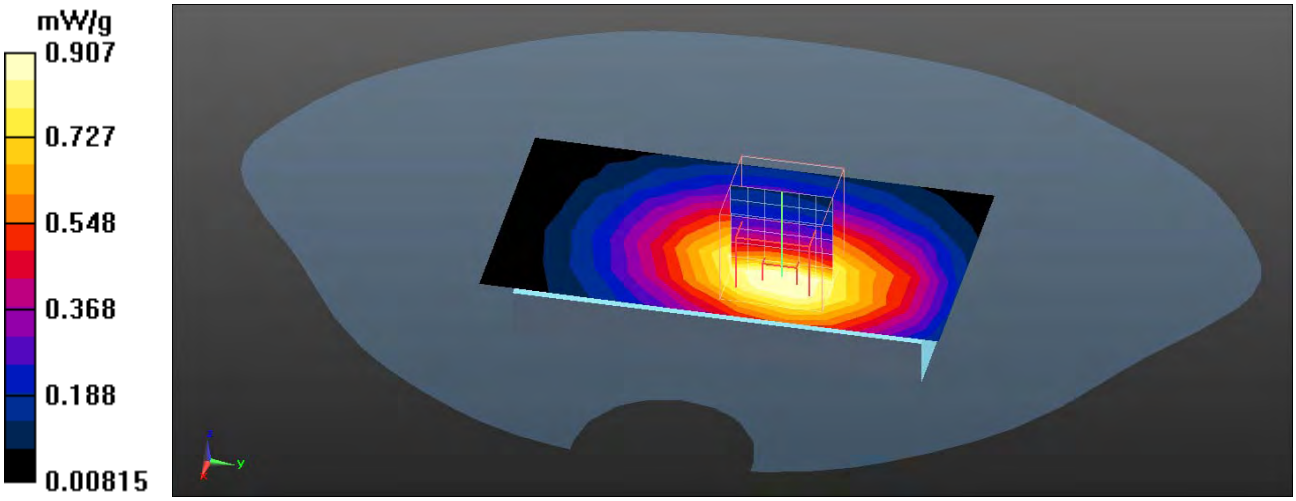
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS 850_Body-Worn_4slot_189
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC GSM_850MHz_GPRS&EGPRS-4 Slot; Frequency: 836.4 MHz;Communication System PAR: 3.01 dB
Medium parameters used: f = 836.4 MHz; σ = 1.01 mho/m; ε_r = 56.63; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

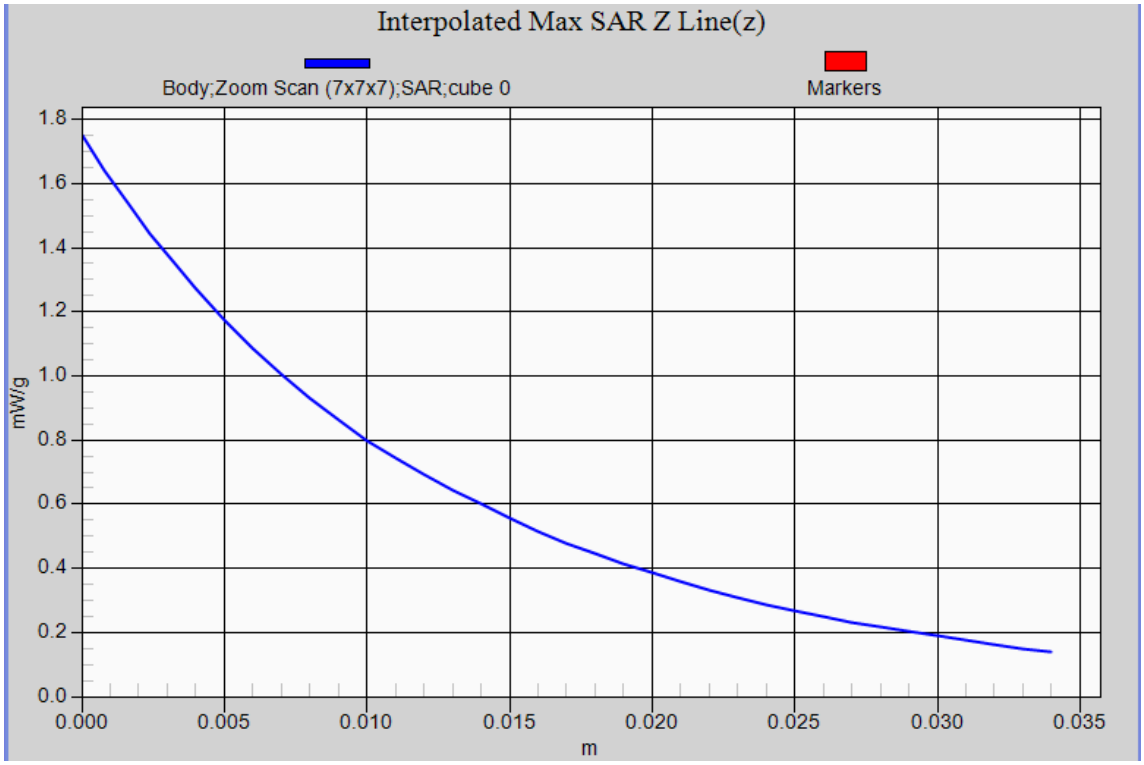
- Probe: EX3DV4 - SN3698; ConvF(8.59, 8.59, 8.59); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.907 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.743 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 1.289 W/kg
SAR(1 g) = 0.904 mW/g; SAR(10 g) = 0.623 mW/g
Maximum value of SAR (measured) = 0.960 mW/g



GPRS 850 EUT Body-worn (2slot) Z-Axis plot
Channel: 189



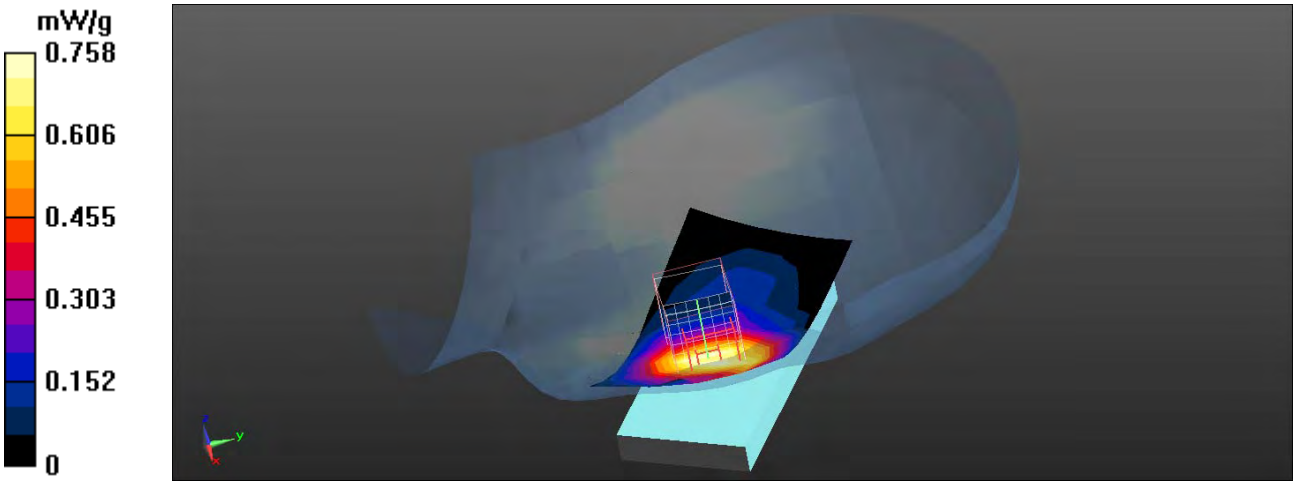
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 1900_Left-Cheek_SIM1_512
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz; Frequency: 1850.2 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1850.2 MHz; σ = 1.36 mho/m; ε_r = 41.6; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.5, Liquid Temperature (°C) : 21.1
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(7.18, 7.18, 7.18); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.758 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.494 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.147 W/kg
SAR(1 g) = 0.779 mW/g; SAR(10 g) = 0.480 mW/g
Maximum value of SAR (measured) = 0.855 mW/g



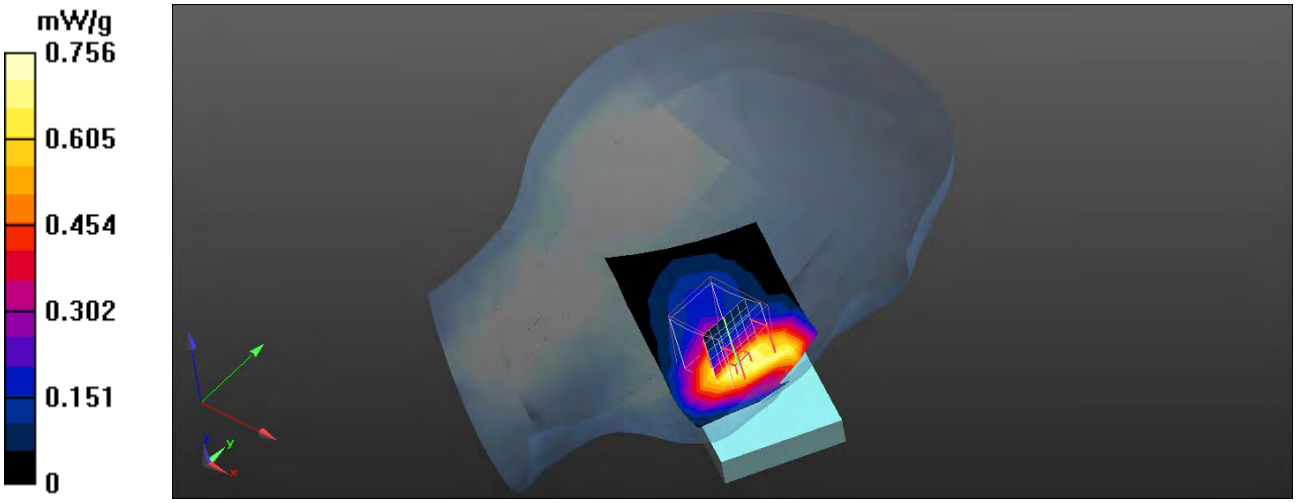
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 1900_Left-Cheek_SIM1_661
DUT: MOBILE PHONE; Type: G6151
Communication System: FCC PCS_1900MHz; Frequency: 1880 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1880 MHz; σ = 1.39 mho/m; ε_r = 41.29; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.5, Liquid Temperature (°C) : 21.1
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(7.18, 7.18, 7.18); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.756 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.762 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.103 W/kg
SAR(1 g) = 0.748 mW/g; SAR(10 g) = 0.467 mW/g
Maximum value of SAR (measured) = 0.809 mW/g



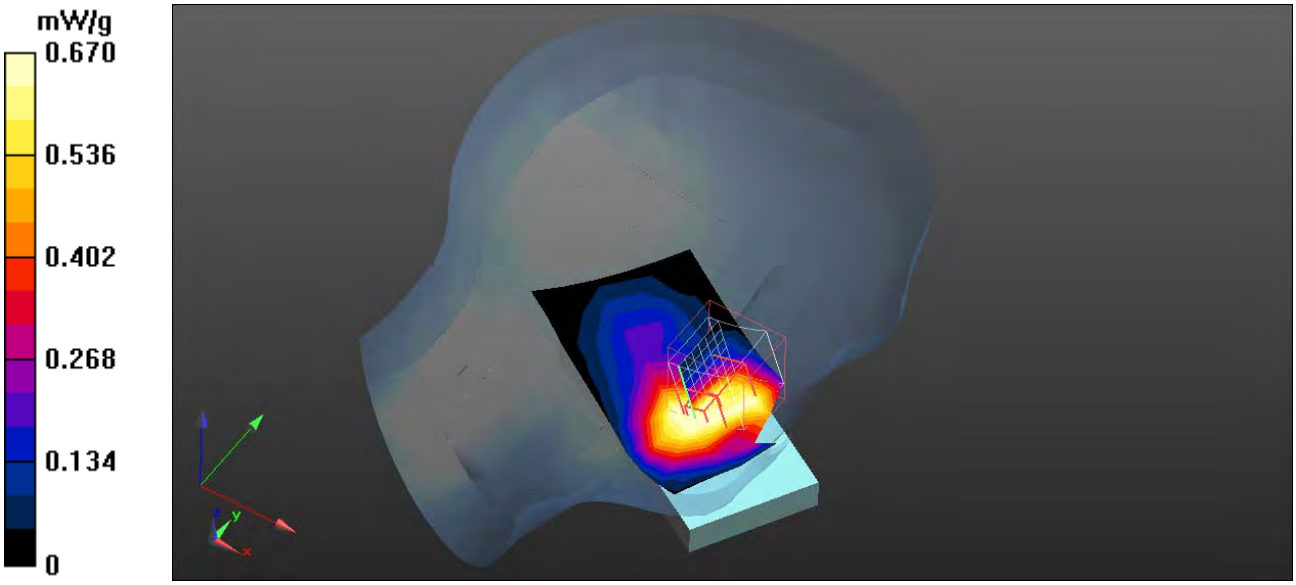
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 1900_Left-Cheek_SIM1_810
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz; Frequency: 1909.8 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1909.8 MHz; σ = 1.43 mho/m; ε_r = 40.86; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.5, Liquid Temperature (°C) : 21.1
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(7.18, 7.18, 7.18); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.670 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.832 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.030 W/kg
SAR(1 g) = 0.667 mW/g; SAR(10 g) = 0.418 mW/g
Maximum value of SAR (measured) = 0.722 mW/g



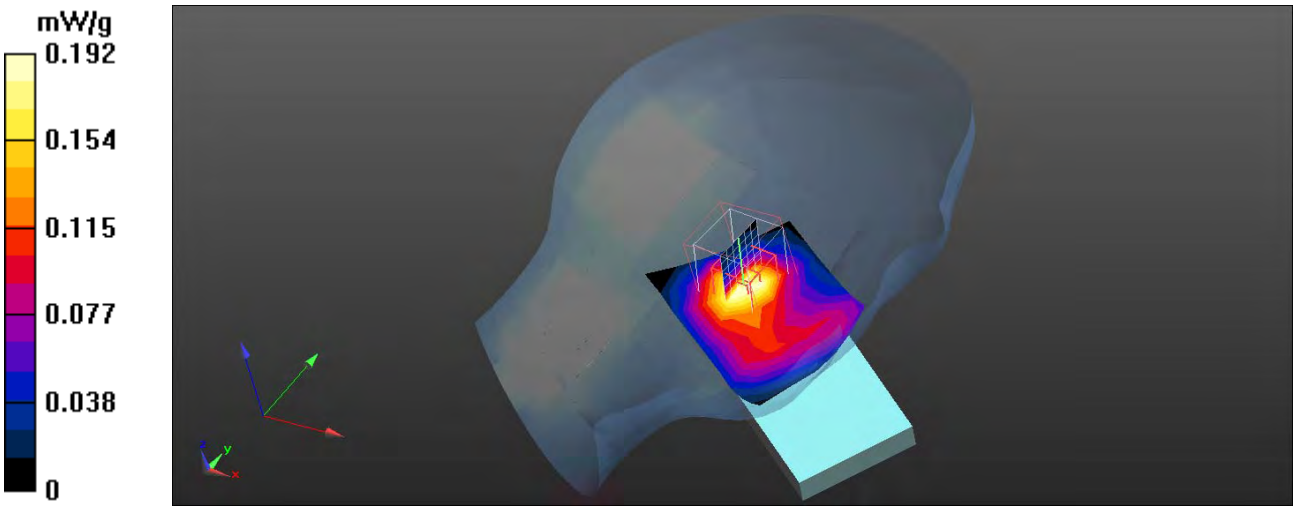
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 1900_Left-Tilt_SIM1_661
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz; Frequency: 1880 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1880 MHz; σ = 1.39 mho/m; ε_r = 41.29; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.5, Liquid Temperature (°C) : 21.1
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(7.18, 7.18, 7.18); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.192 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.808 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.313 W/kg
SAR(1 g) = 0.195 mW/g; SAR(10 g) = 0.115 mW/g
Maximum value of SAR (measured) = 0.214 mW/g



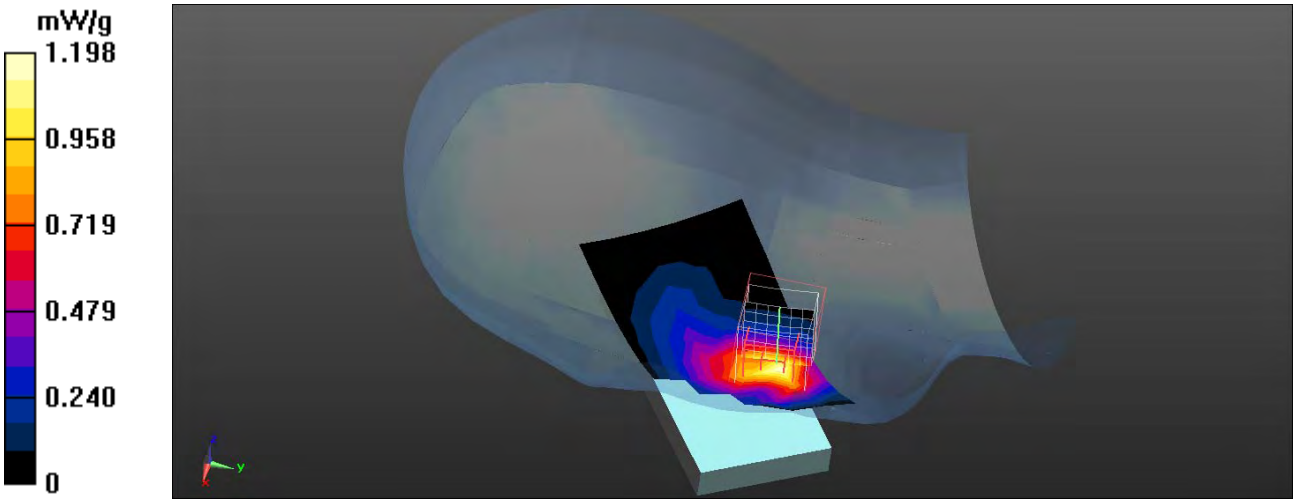
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 1900_Right-Cheek_SIM1_512
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz; Frequency: 1850.2 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1850.2 MHz; σ = 1.36 mho/m; ε_r = 41.6; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient Temperature (°C) : 22.5, Liquid Temperature (°C) : 21.1
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(7.18, 7.18, 7.18); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.198 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.358 V/m; Power Drift = 0.0004 dB
Peak SAR (extrapolated) = 1.732 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.624 mW/g
Maximum value of SAR (measured) = 1.179 mW/g



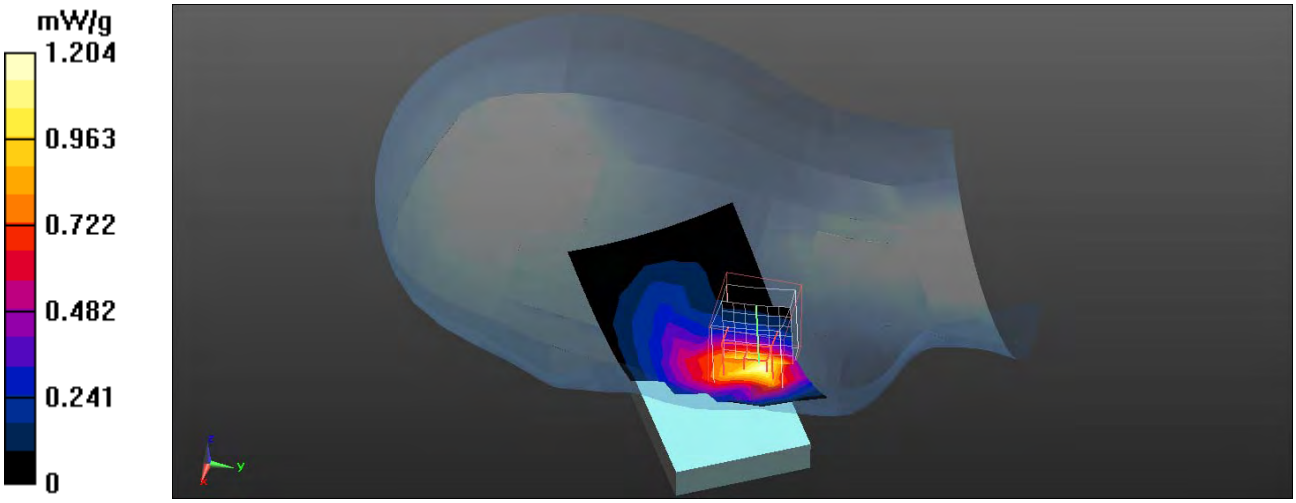
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 1900_Right-Cheek_SIM1_661
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz; Frequency: 1880 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1880 MHz; σ = 1.39 mho/m; ε_r = 41.29; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient Temperature (°C) : 22.5, Liquid Temperature (°C) : 21.1
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(7.18, 7.18, 7.18); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.204 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.522 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.768 W/kg
SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.617 mW/g
Maximum value of SAR (measured) = 1.187 mW/g



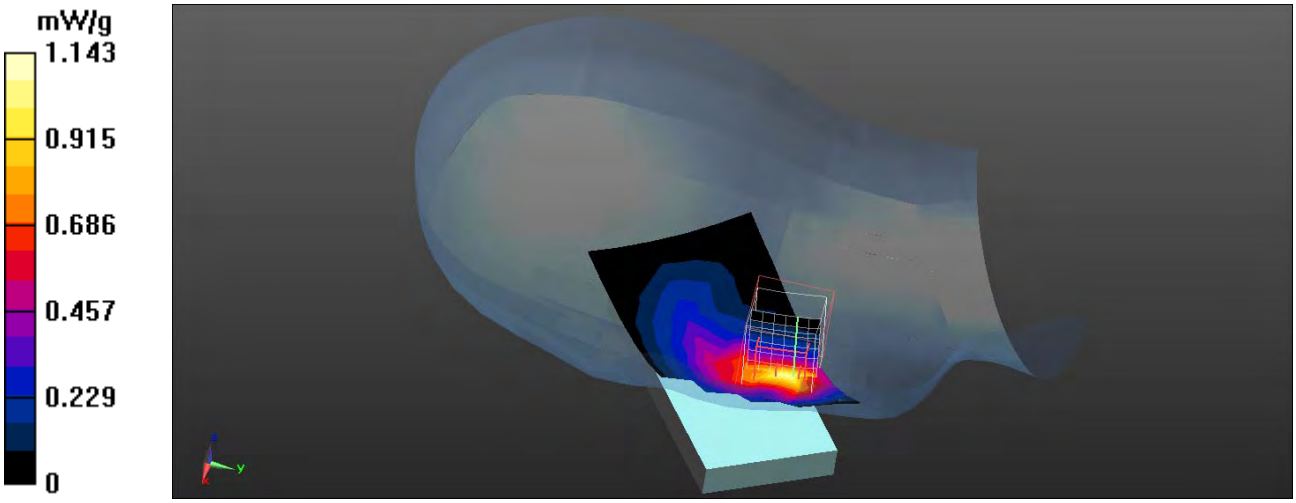
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 1900_Right-Cheek_SIM1_810
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz; Frequency: 1909.8 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1909.8 MHz; σ = 1.43 mho/m; ε_r = 40.86; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient Temperature (°C) : 22.5, Liquid Temperature (°C) : 21.1
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(7.18, 7.18, 7.18); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.143 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.359 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.731 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.569 mW/g
Maximum value of SAR (measured) = 1.122 mW/g



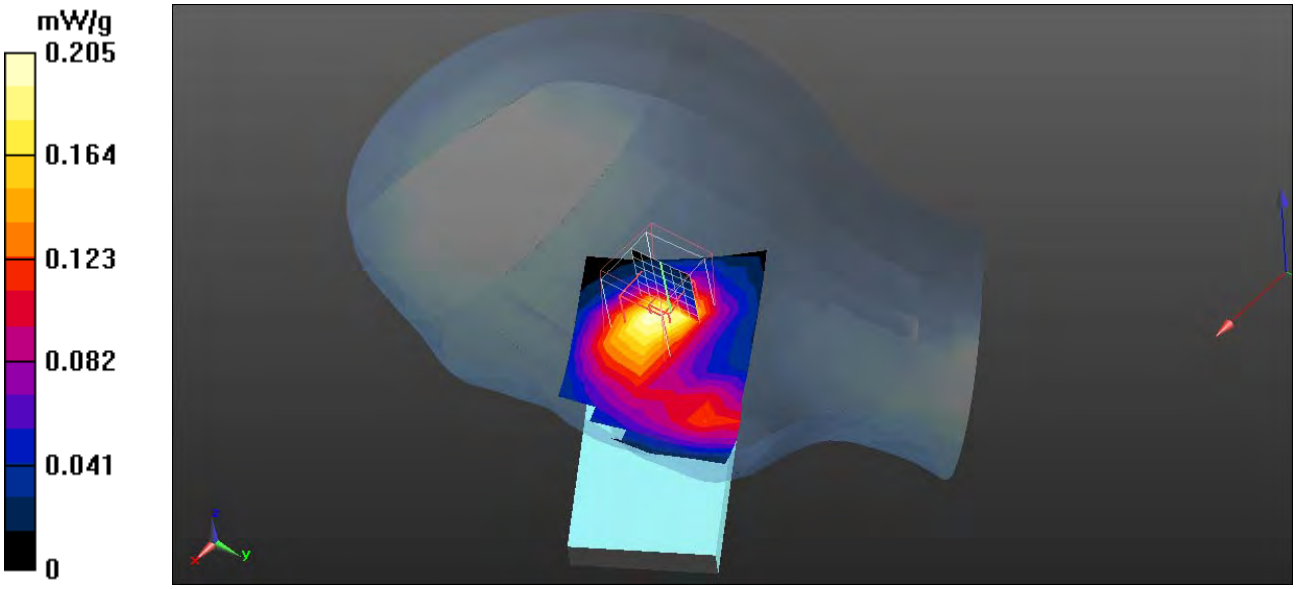
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 1900_Right-Tilt_SIM1_661
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz; Frequency: 1880 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1880 MHz; σ = 1.39 mho/m; ε_r = 41.29; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient Temperature (°C) : 22.5, Liquid Temperature (°C) : 21.1
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(7.18, 7.18, 7.18); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.205 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.045 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.308 W/kg
SAR(1 g) = 0.196 mW/g; SAR(10 g) = 0.118 mW/g
Maximum value of SAR (measured) = 0.212 mW/g



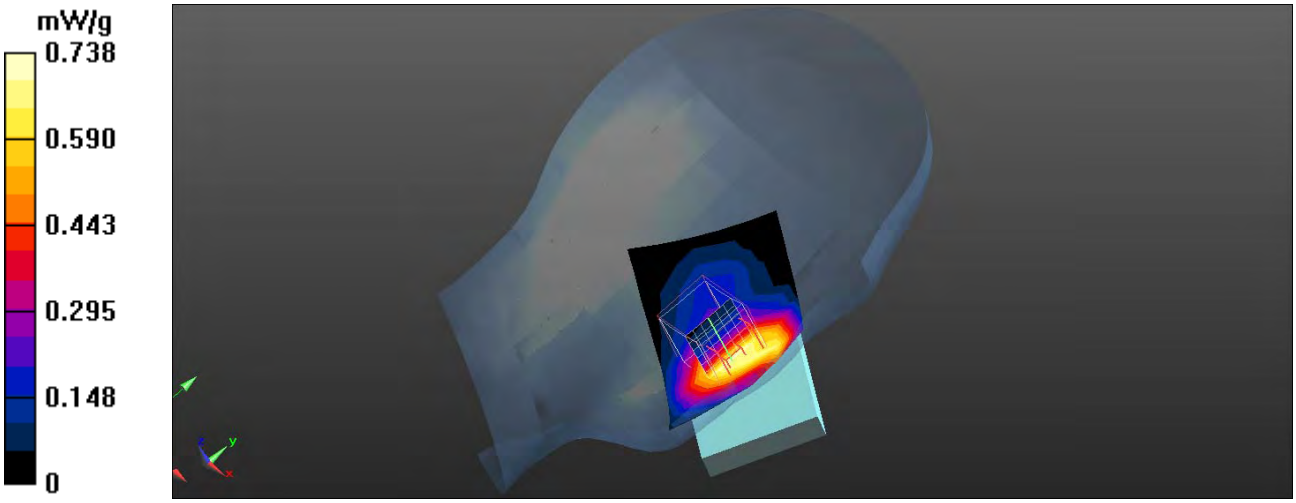
Test Laboratory: Quietek Date/Time: 2011/9/21

GSM 1900_Left-Cheek_SIM2_661
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz; Frequency: 1880 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1880 MHz; σ = 1.39 mho/m; ε_r = 41.29; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.5, Liquid Temperature (°C) : 21.1
DASY5 Configuration:

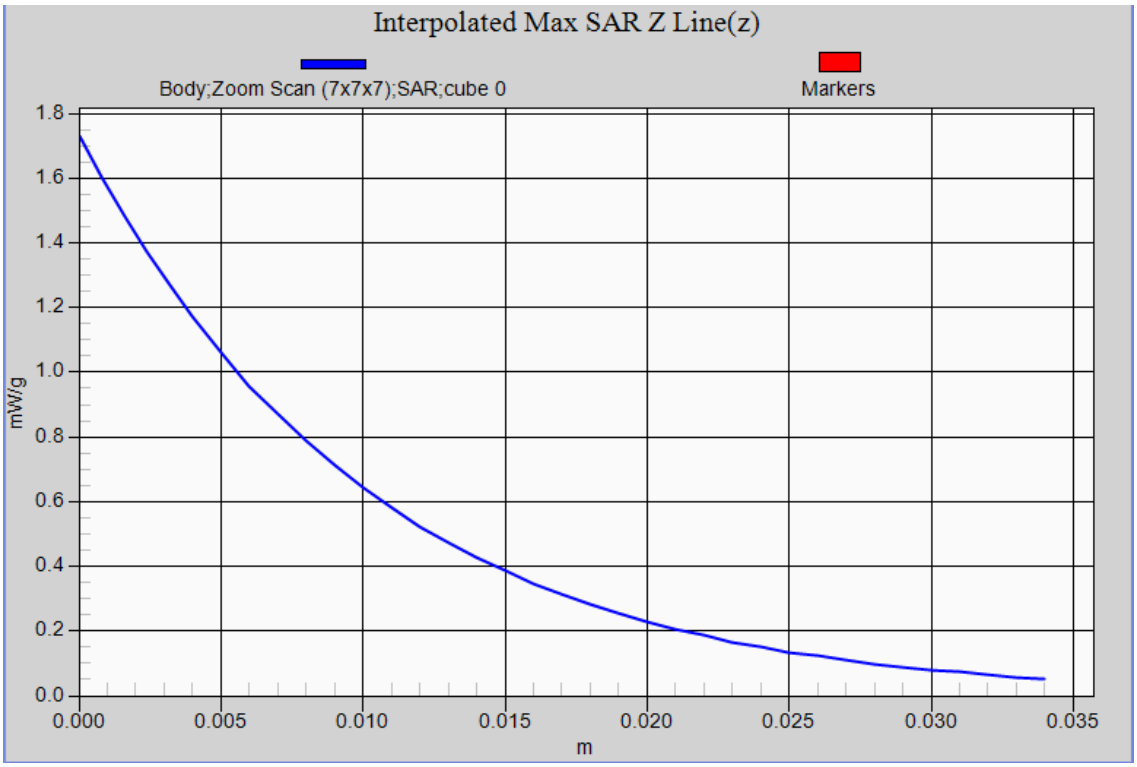
- Probe: EX3DV4 - SN3698; ConvF(7.18, 7.18, 7.18); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.738 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.911 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.076 W/kg
SAR(1 g) = 0.731 mW/g; SAR(10 g) = 0.458 mW/g
Maximum value of SAR (measured) = 0.796 mW/g



GSM 1900 EUT Right-Cheek (SIM1) Z-Axis plot
Channel: 512



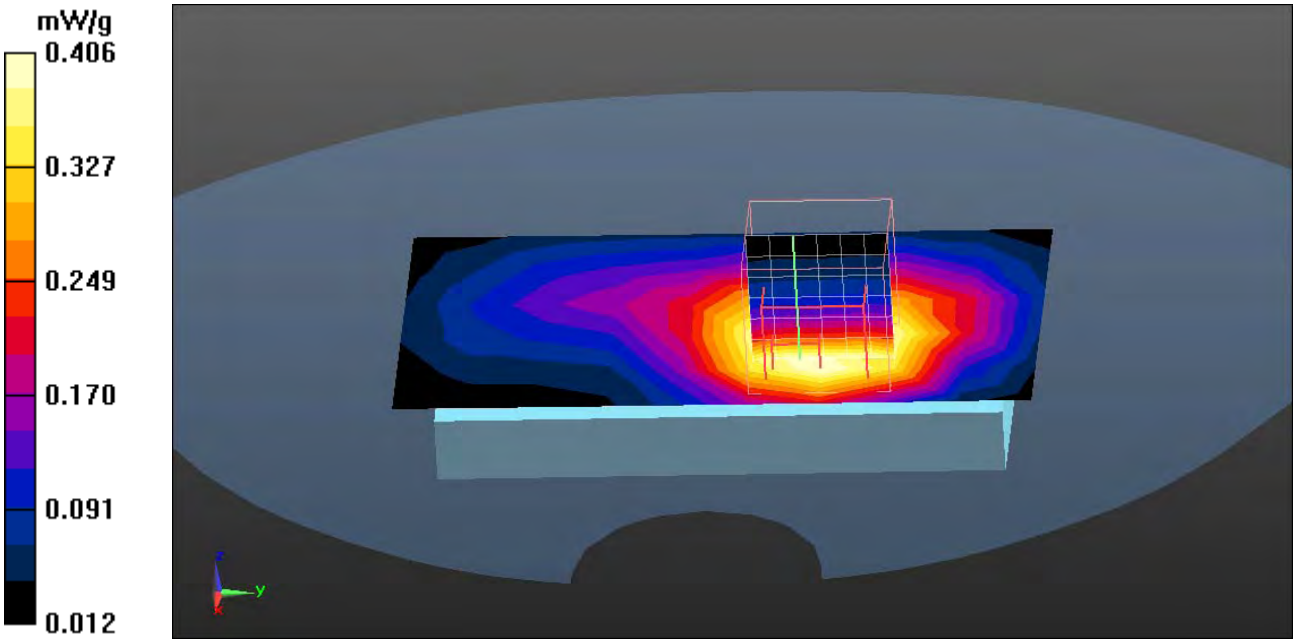
Test Laboratory: Quietek Date/Time: 2011/9/20

GSM1900_Body-Worn_661
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz; Frequency: 1880 MHz;Communication System PAR: 9.191 dB
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 54.34; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.74, 6.74, 6.74); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.406 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.890 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.620 W/kg
SAR(1 g) = 0.382 mW/g; SAR(10 g) = 0.238 mW/g
Maximum value of SAR (measured) = 0.407 mW/g



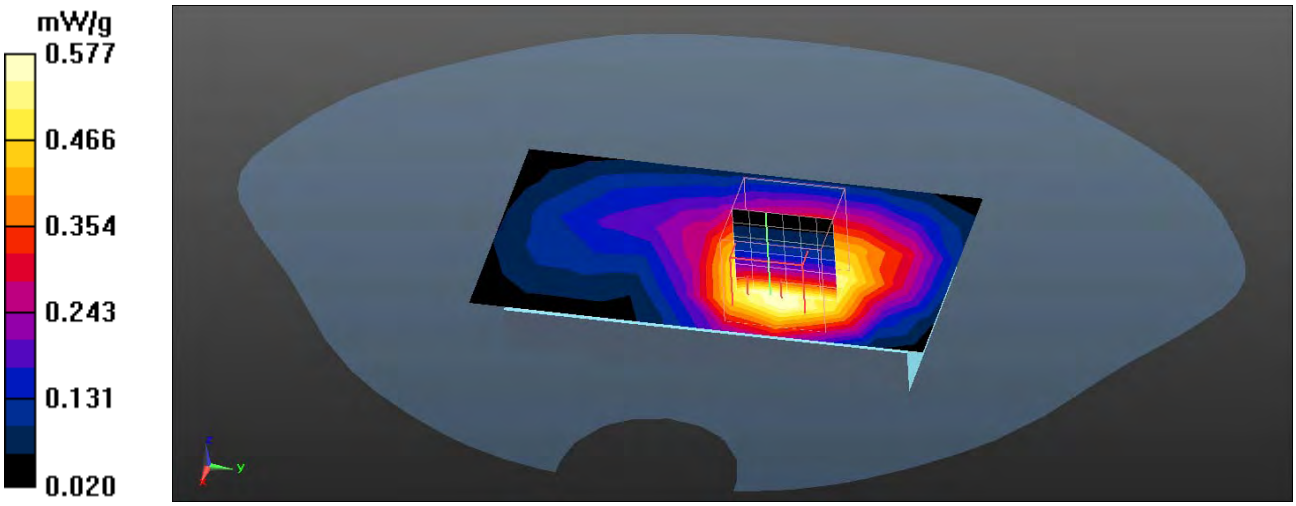
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS1900_Body-Worn_2slot_512
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz_GPRS&EGPRS-2 Slot; Frequency: 1850.2 MHz;Communication System PAR: 6.128 dB
Medium parameters used: f = 1850.2 MHz; σ = 1.47 mho/m; ε_r = 54.73; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.74, 6.74, 6.74); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.577 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.455 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.908 W/kg
SAR(1 g) = 0.555 mW/g; SAR(10 g) = 0.344 mW/g
Maximum value of SAR (measured) = 0.597 mW/g



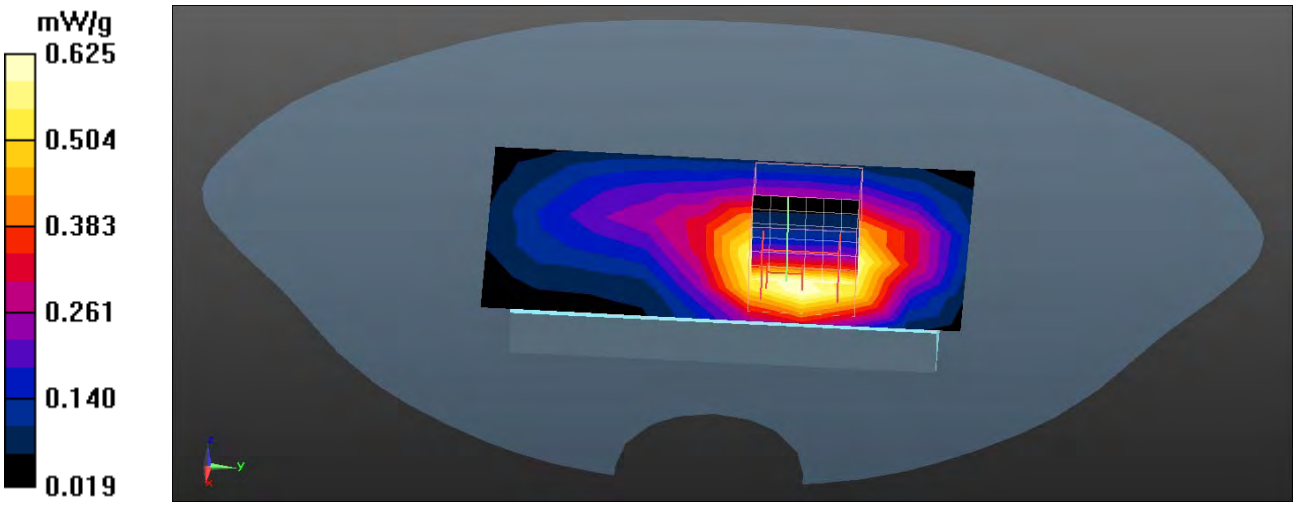
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS1900_Body-Worn_2slot_661
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz_GPRS&EGPRS-2 Slot; Frequency: 1880 MHz;Communication System PAR: 6.128 dB
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 54.34; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.74, 6.74, 6.74); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.625 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.125 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.979 W/kg
SAR(1 g) = 0.595 mW/g; SAR(10 g) = 0.370 mW/g
Maximum value of SAR (measured) = 0.641 mW/g



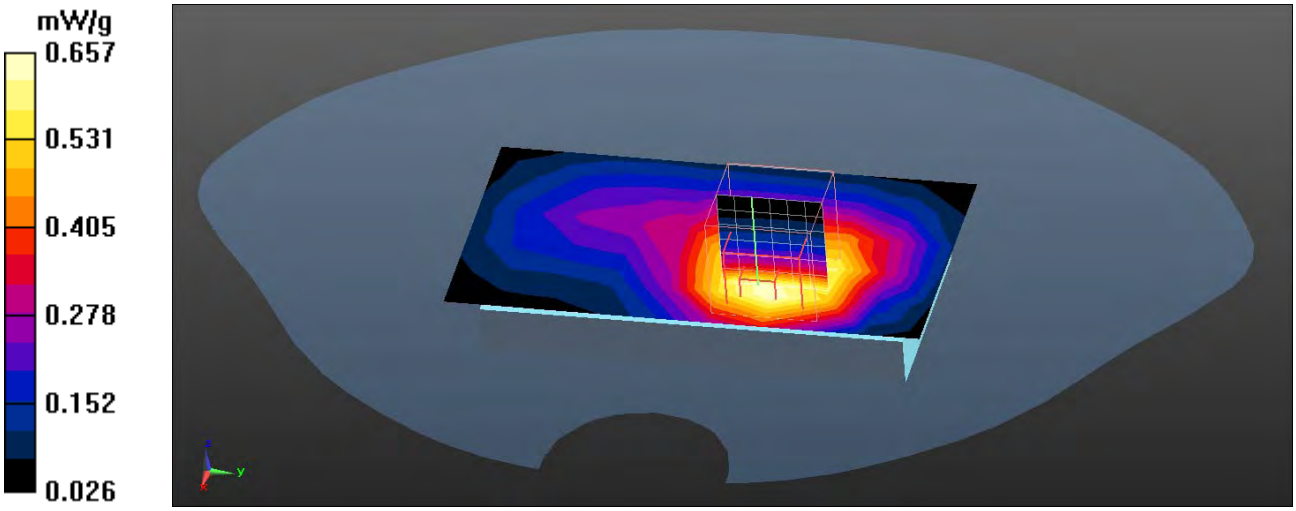
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS1900_Body-Worn_2slot_810
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz_GPRS&EGPRS-2 Slot; Frequency: 1909.8 MHz;Communication System PAR: 6.128 dB
Medium parameters used: f = 1909.8 MHz; σ = 1.55 mho/m; ε_r = 53.87; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.74, 6.74, 6.74); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.657 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.531 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.030 W/kg
SAR(1 g) = 0.619 mW/g; SAR(10 g) = 0.382 mW/g
Maximum value of SAR (measured) = 0.663 mW/g



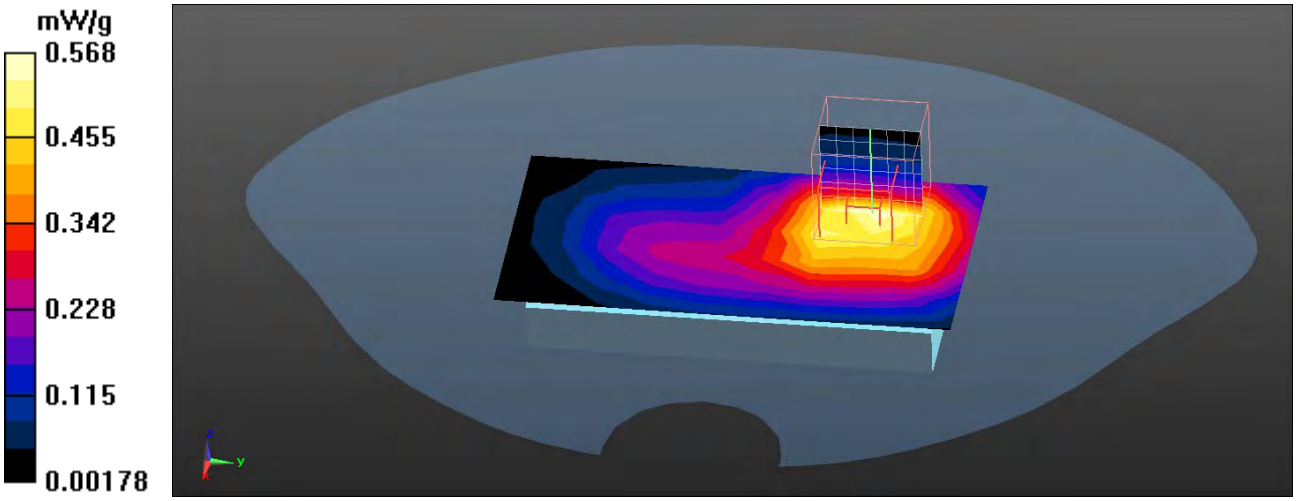
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS1900_Body-Front_2slot_661
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz_GPRS&EGPRS-2 Slot; Frequency: 1880 MHz;Communication System PAR: 6.128 dB
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 54.34; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.74, 6.74, 6.74); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.568 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.860 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.883 W/kg
SAR(1 g) = 0.538 mW/g; SAR(10 g) = 0.328 mW/g
Maximum value of SAR (measured) = 0.582 mW/g



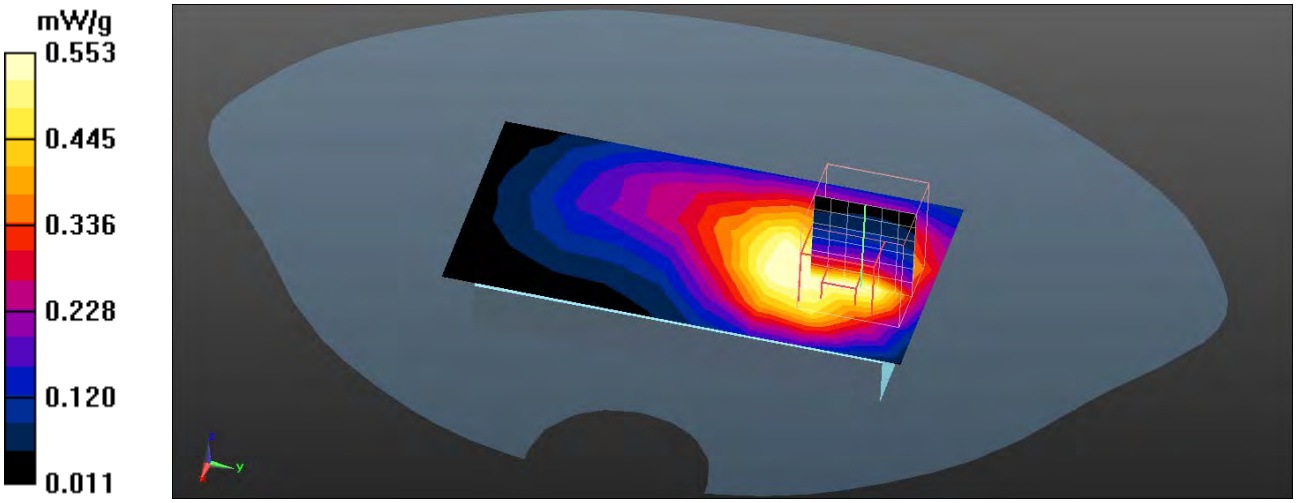
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS1900_Body-Worn(With Headset)_2slot_661
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz_GPRS&EGPRS-2 Slot; Frequency: 1880 MHz;Communication System PAR: 6.128 dB
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 54.34; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.74, 6.74, 6.74); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.553 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.875 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.836 W/kg
SAR(1 g) = 0.513 mW/g; SAR(10 g) = 0.320 mW/g
Maximum value of SAR (measured) = 0.552 mW/g



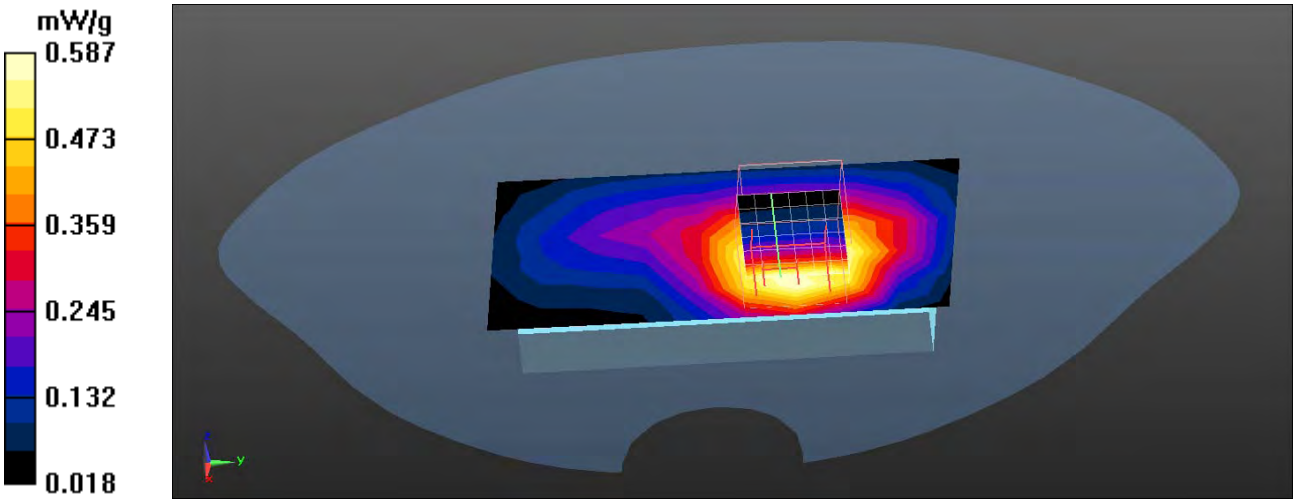
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS1900_Body-Worn_3slot_661
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz_GPRS&EGPRS-3 Slot; Frequency: 1880 MHz;Communication System PAR: 4.314 dB
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 54.34; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.74, 6.74, 6.74); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.587 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.574 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.922 W/kg
SAR(1 g) = 0.560 mW/g; SAR(10 g) = 0.348 mW/g
Maximum value of SAR (measured) = 0.604 mW/g



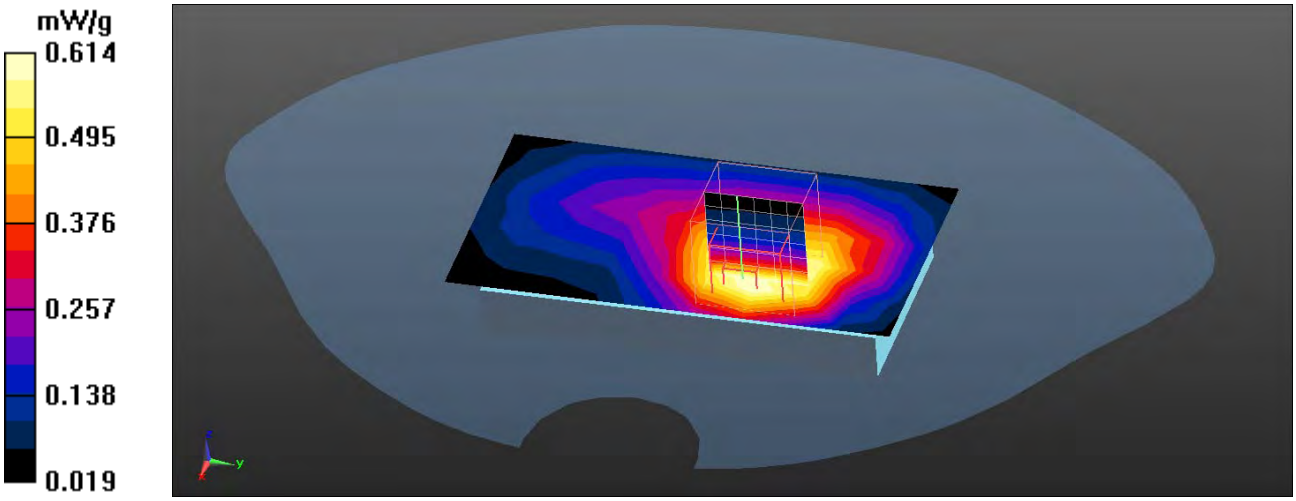
Test Laboratory: Quietek Date/Time: 2011/9/20

GPRS1900_Body-Worn_4slot_661
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: FCC PCS_1900MHz_GPRS&EGPRS-4 Slot; Frequency: 1880 MHz;Communication System PAR: 3.01 dB
Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 54.34; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

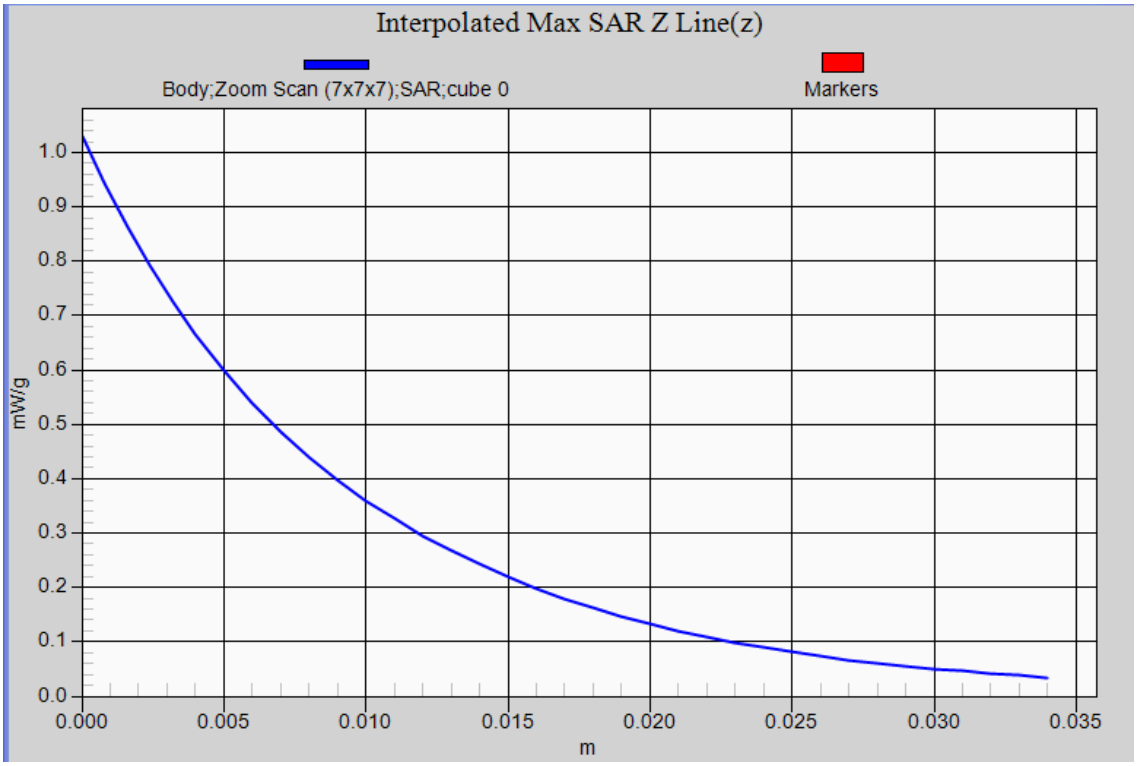
- Probe: EX3DV4 - SN3698; ConvF(6.74, 6.74, 6.74); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.614 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.853 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.965 W/kg
SAR(1 g) = 0.582 mW/g; SAR(10 g) = 0.363 mW/g
Maximum value of SAR (measured) = 0.629 mW/g



GPRS 1900 EUT Body-worn (2slot) Z-Axis plot
Channel: 810



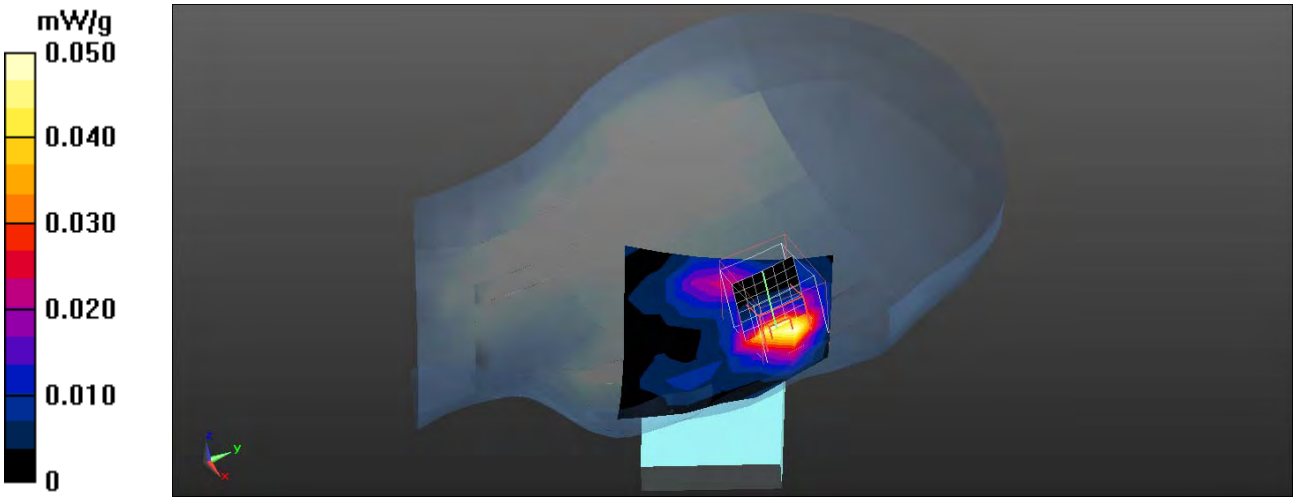
Test Laboratory: Quietek Date/Time: 2011/9/19

802.11b Left-Cheek_CH1
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: WLAN2.4G; Frequency: 2412 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2412 MHz; σ = 1.73 mho/m; ε_r = 40.73; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.6, Liquid Temperature (°C) : 21.2
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.51, 6.51, 6.51); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.050 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.834 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.121 W/kg
SAR(1 g) = 0.051 mW/g; SAR(10 g) = 0.021 mW/g
Maximum value of SAR (measured) = 0.059 mW/g



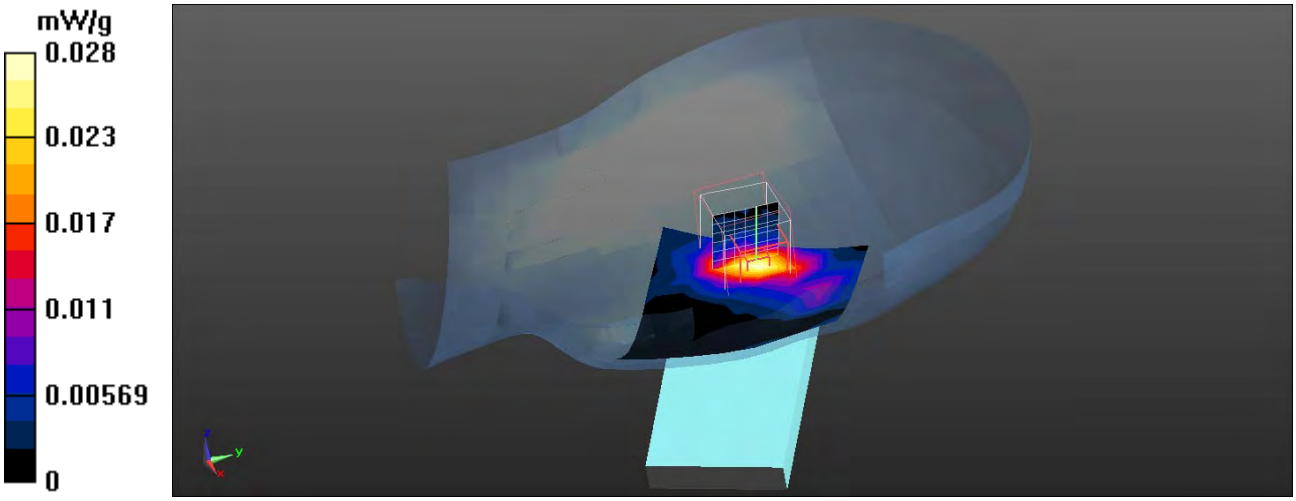
Test Laboratory: Quietek Date/Time: 2011/9/19

802.11b Left-Tilt_CH1
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: WLAN2.4G; Frequency: 2412 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2412 MHz; σ = 1.73 mho/m; ε_r = 40.73; ρ = 1000 kg/m^3
Phantom section: Left Section
Ambient Temperature (°C) : 22.6, Liquid Temperature (°C) : 21.2
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.51, 6.51, 6.51); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.028 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.151 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.046 W/kg
SAR(1 g) = 0.026 mW/g; SAR(10 g) = 0.014 mW/g
Maximum value of SAR (measured) = 0.039 mW/g



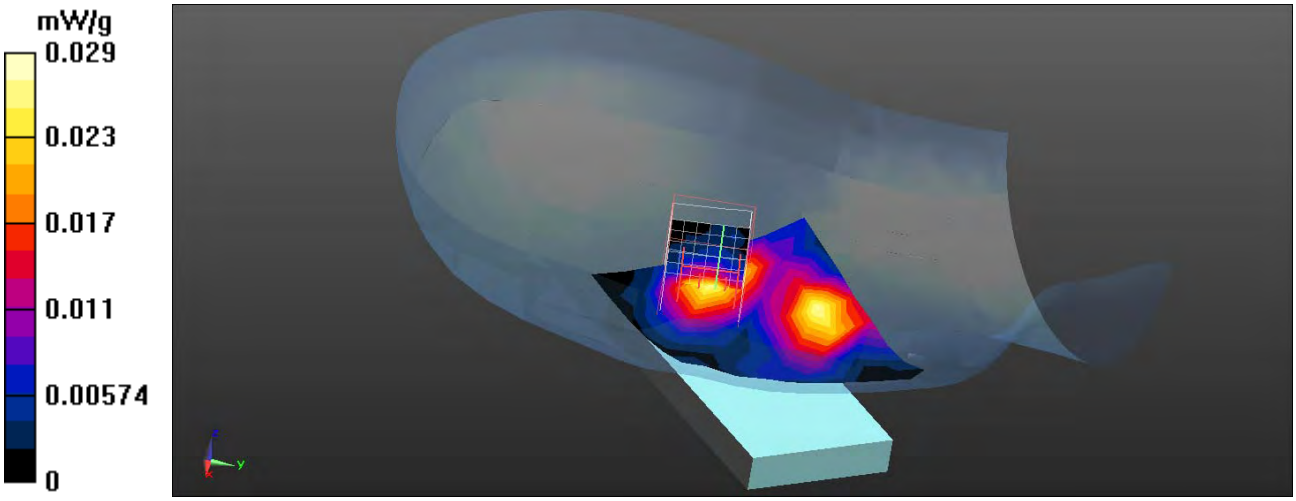
Test Laboratory: Quietek Date/Time: 2011/9/19

802.11b Right-Cheek_CH1
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: WLAN2.4G; Frequency: 2412 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2412 MHz; σ = 1.73 mho/m; ε_r = 40.73; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient Temperature (°C) : 22.6, Liquid Temperature (°C) : 21.2
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.51, 6.51, 6.51); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.029 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.672 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.045 W/kg
SAR(1 g) = 0.026 mW/g; SAR(10 g) = 0.014 mW/g
Maximum value of SAR (measured) = 0.031 mW/g



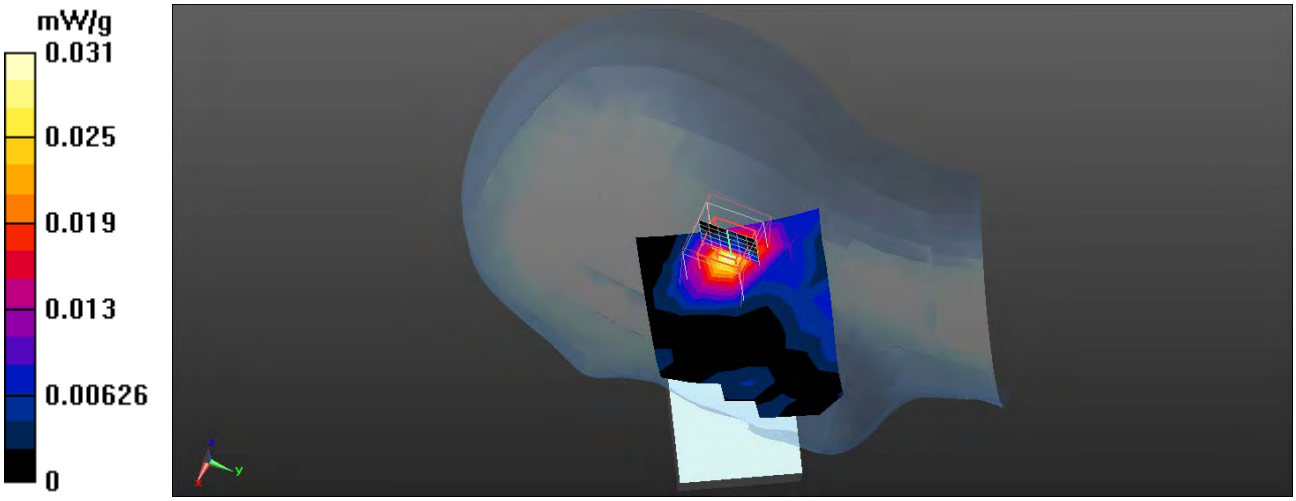
Test Laboratory: Quietek Date/Time: 2011/9/19

802.11b Right-Tilt_CH1
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: WLAN2.4G; Frequency: 2412 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2412 MHz; σ = 1.73 mho/m; ε_r = 40.73; ρ = 1000 kg/m^3
Phantom section: Right Section
Ambient Temperature (°C) : 22.6, Liquid Temperature (°C) : 21.2
DASY5 Configuration:

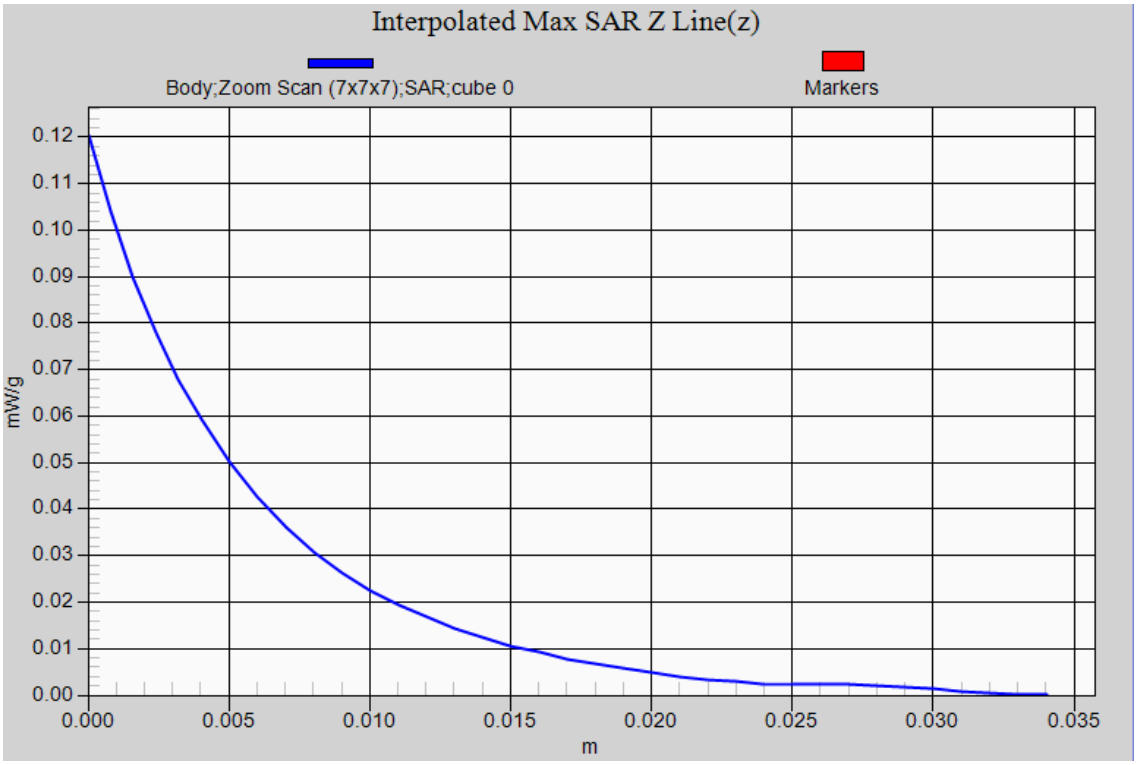
- Probe: EX3DV4 - SN3698; ConvF(6.51, 6.51, 6.51); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with right table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.031 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.832 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.054 W/kg
SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.012 mW/g
Maximum value of SAR (measured) = 0.033 mW/g



802.11b - Antenna Main 2.4GHz, EUT Left-Cheek Z-Axis plot
Channel: 1



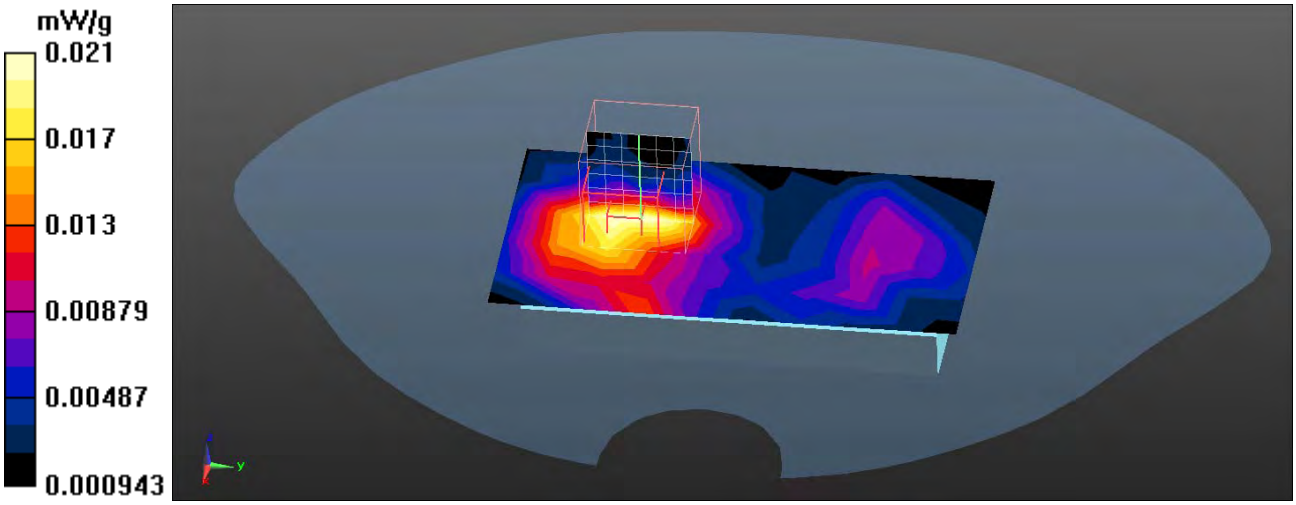
Test Laboratory: Quietek Date/Time: 2011/9/20

802.11b Body-Worn_CH1
DUT: MOBILE PHONE; HUAWEI G6151
Communication System: WLAN2.4G; Frequency: 2412 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2412 MHz; σ = 1.9 mho/m; ε_r = 54.62; ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

- Probe: EX3DV4 - SN3698; ConvF(6.6, 6.6, 6.6); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.021 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.545 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.038 W/kg
SAR(1 g) = 0.020 mW/g; SAR(10 g) = 0.012 mW/g
Maximum value of SAR (measured) = 0.022 mW/g



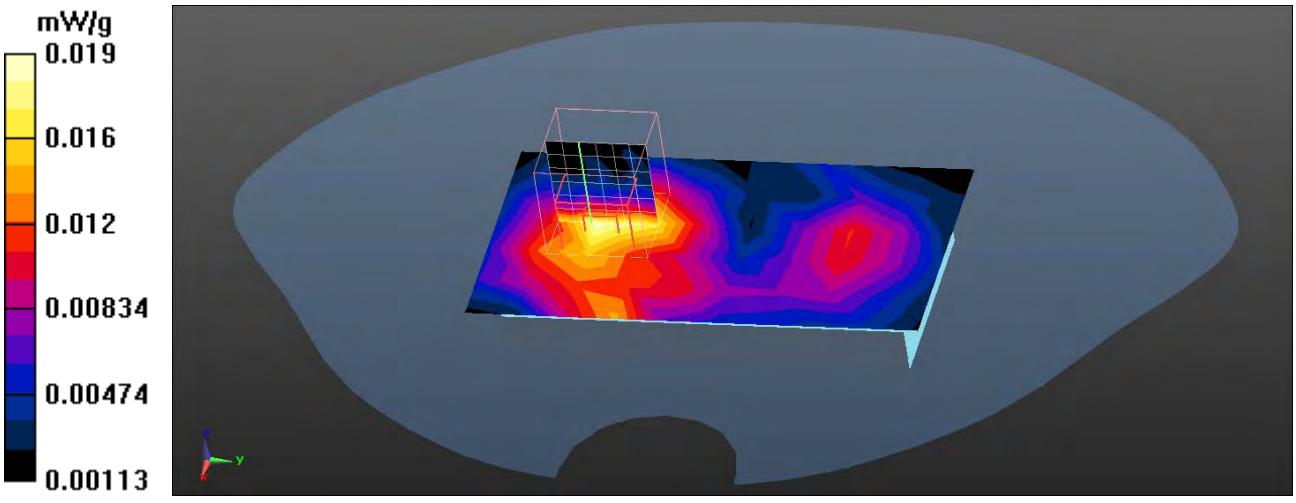
Test Laboratory: Quietek Date/Time: 2011/9/20

802.11b Body-Front_CH1
DUT: MOBILE PHONE; Type: G6151
Communication System: WLAN2.4G; Frequency: 2412 MHz;Communication System PAR: 0 dB
Medium parameters used: f = 2412 MHz; σ = 1.9 mho/m; ε_r = 54.62 ρ = 1000 kg/m^3
Phantom section: Flat Section
Ambient Temperature (°C) : 22.0, Liquid Temperature (°C) : 20.8
DASY5 Configuration:

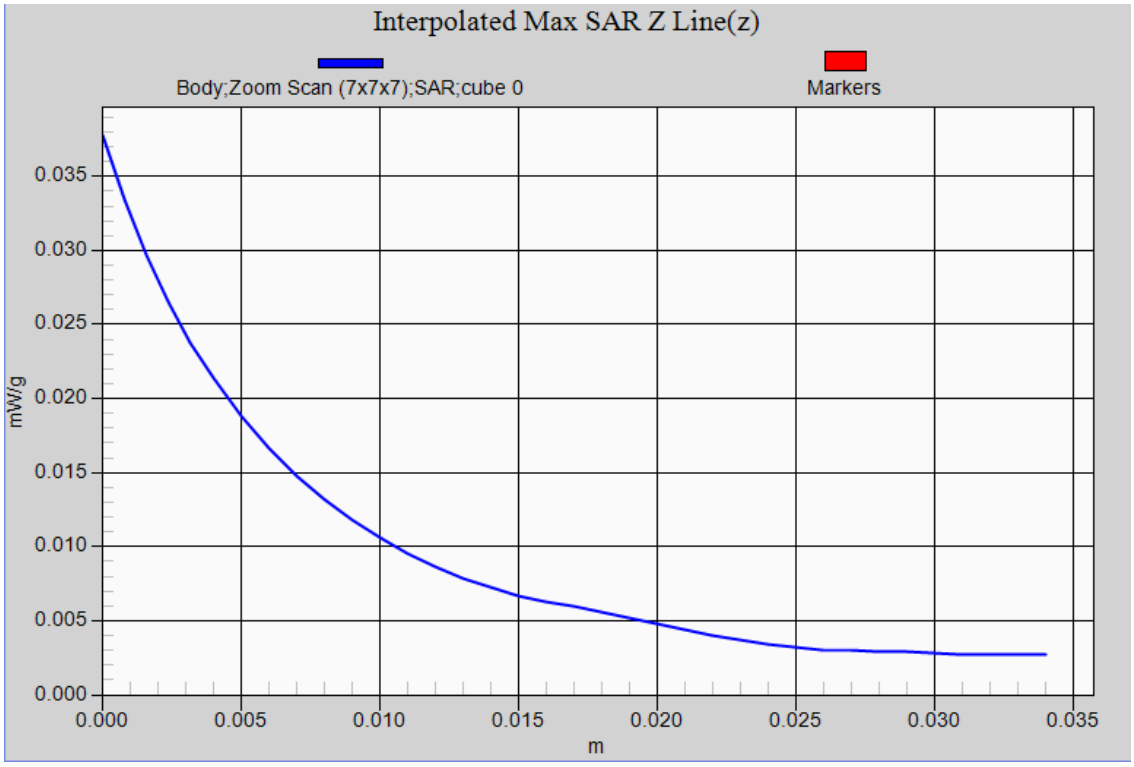
- Probe: EX3DV4 - SN3698; ConvF(6.6, 6.6, 6.6); Calibrated: 2011/7/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1207; Calibrated: 2011/5/19
- Phantom: SAM with left table; Type: SAM
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Configuration/Body/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.019 mW/g

Configuration/Body/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.624 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.030 W/kg
SAR(1 g) = 0.017 mW/g; SAR(10 g) = 0.010 mW/g
Maximum value of SAR (measured) = 0.021 mW/g



802.11b - Antenna Main 2.4GHz, EUT Body-worn Z-Axis plot
Channel: 1



Appendix D. Probe Calibration Data
Appendix E. Dipole Calibration Data
Appendix F. DAE Calibration Data

QuieTek

Appendix D. Probe Calibration Data

Object: EX3DV4- SN 3698

1155

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **Quietek (Auden)**

Certificate No: EX3-3698_Jul11

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3698

Calibration procedure(s) QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: July 28, 2011

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: July 28, 2011

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe EX3DV4

SN:3698

Manufactured: April 22, 2009
Calibrated: July 28, 2011

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3698

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.51	0.44	0.45	± 10.1 %
DCP (mV)[B]	99.1	98.8	101.0	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	115.2	±2.5 %
			Y	0.00	0.00	1.00	105.0	
			Z	0.00	0.00	1.00	108.1	

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

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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3698

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	8.77	8.77	8.77	0.80	0.67	± 12.0 %
835	41.5	0.90	8.40	8.40	8.40	0.69	0.74	± 12.0 %
900	41.5	0.97	8.29	8.29	8.29	0.64	0.76	± 12.0 %
1750	40.1	1.37	7.38	7.38	7.38	0.80	0.60	± 12.0 %
1900	40.0	1.40	7.18	7.18	7.18	0.80	0.60	± 12.0 %
2450	39.2	1.80	6.51	6.51	6.51	0.80	0.61	± 12.0 %
2600	39.0	1.96	6.39	6.39	6.39	0.74	0.63	± 12.0 %
3500	37.9	2.91	6.41	6.41	6.41	0.20	1.60	± 13.1 %
5200	36.0	4.66	4.80	4.80	4.80	0.35	1.80	± 13.1 %
5300	35.9	4.76	4.58	4.58	4.58	0.35	1.80	± 13.1 %
5500	35.6	4.96	4.48	4.48	4.48	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.16	4.16	4.16	0.45	1.80	± 13.1 %
5800	35.3	5.27	4.22	4.22	4.22	0.45	1.80	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

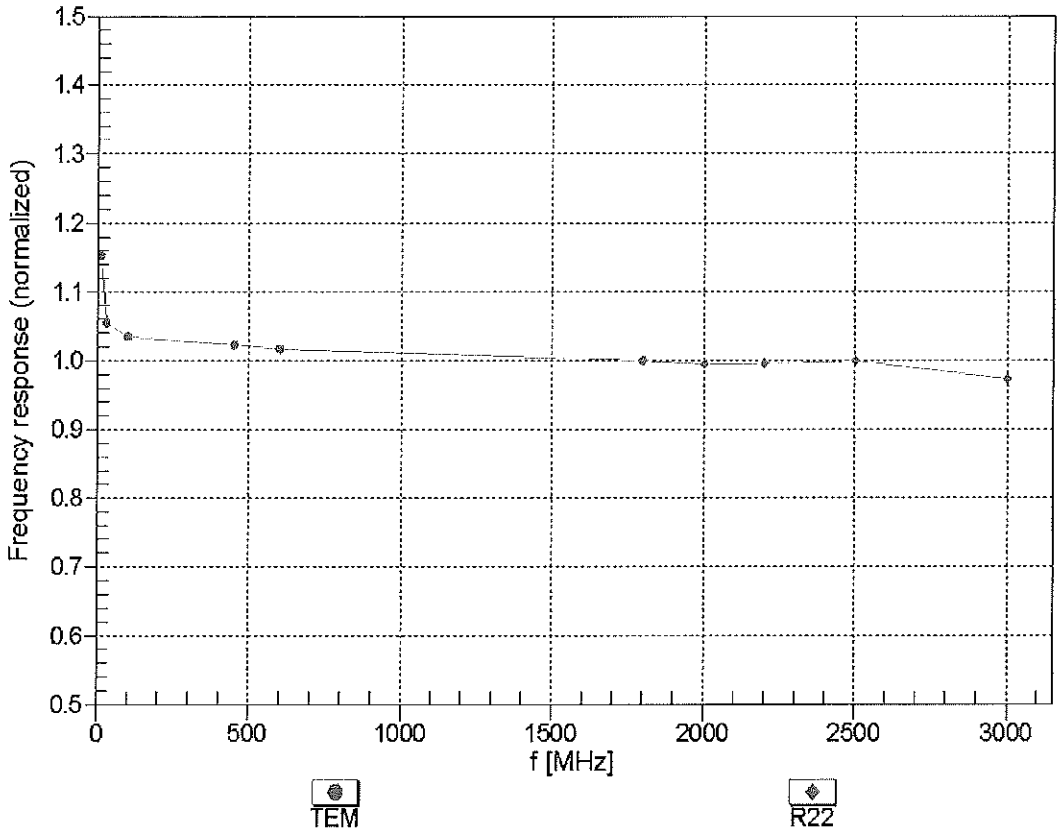
DASY/EASY - Parameters of Probe: EX3DV4- SN:3698

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	8.56	8.56	8.56	0.80	0.71	± 12.0 %
835	55.2	0.97	8.59	8.59	8.59	0.80	0.68	± 12.0 %
900	55.0	1.05	8.31	8.31	8.31	0.74	0.75	± 12.0 %
1750	53.4	1.49	7.09	7.09	7.09	0.80	0.68	± 12.0 %
1900	53.3	1.52	6.74	6.74	6.74	0.80	0.65	± 12.0 %
2450	52.7	1.95	6.60	6.60	6.60	0.80	0.60	± 12.0 %
2600	52.5	2.16	6.40	6.40	6.40	0.80	0.50	± 12.0 %
3500	51.3	3.31	5.73	5.73	5.73	0.23	1.90	± 13.1 %
5200	49.0	5.30	3.95	3.95	3.95	0.55	1.90	± 13.1 %
5300	48.9	5.42	3.74	3.74	3.74	0.55	1.90	± 13.1 %
5500	48.6	5.65	3.68	3.68	3.68	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.42	3.42	3.42	0.60	1.90	± 13.1 %
5800	48.2	6.00	3.74	3.74	3.74	0.60	1.90	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

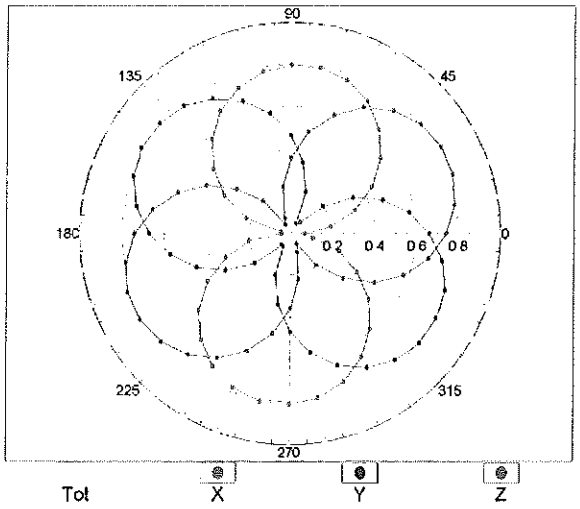
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



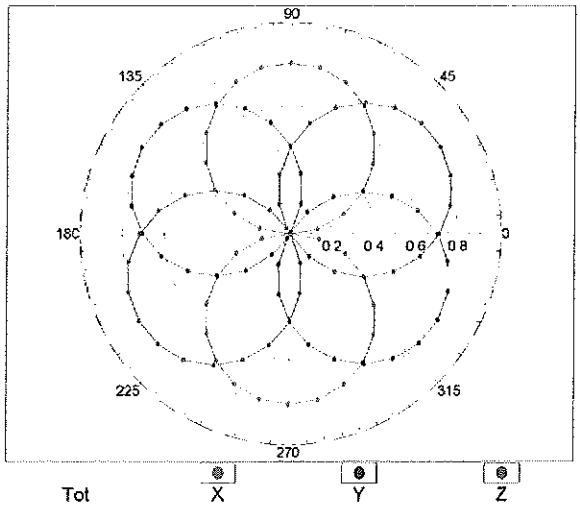
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

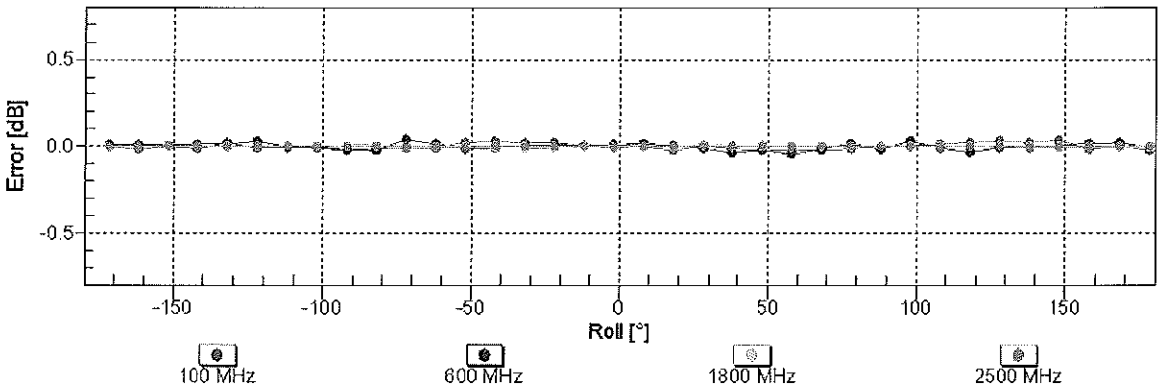
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



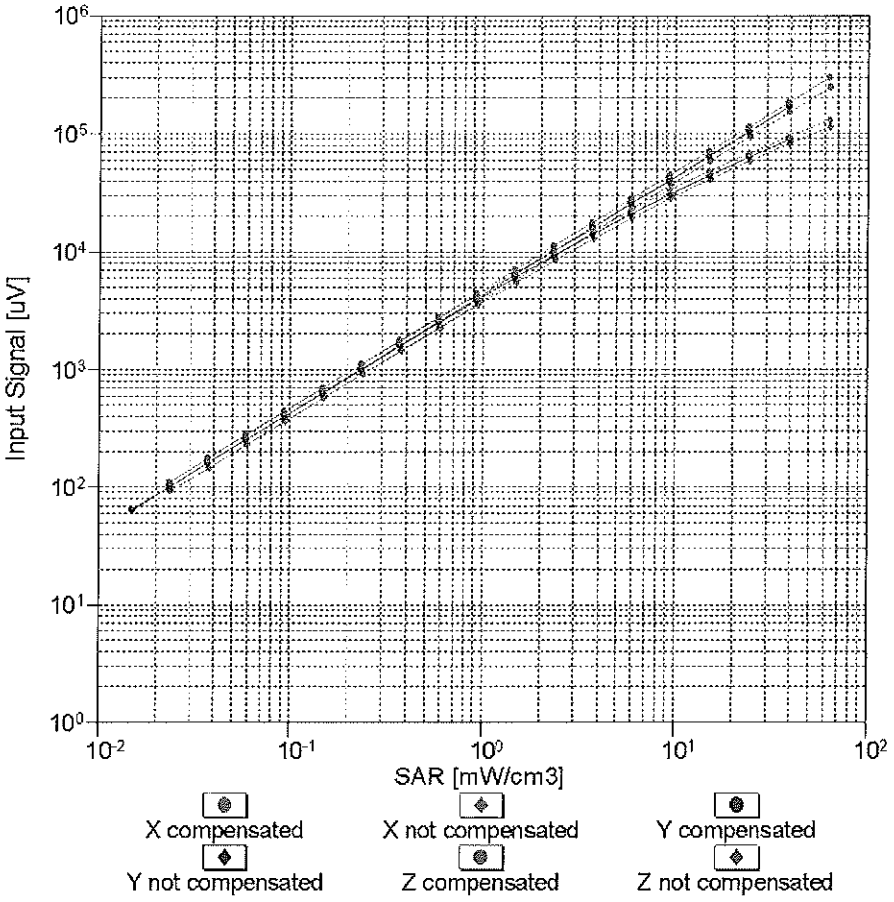
f=1800 MHz,R22

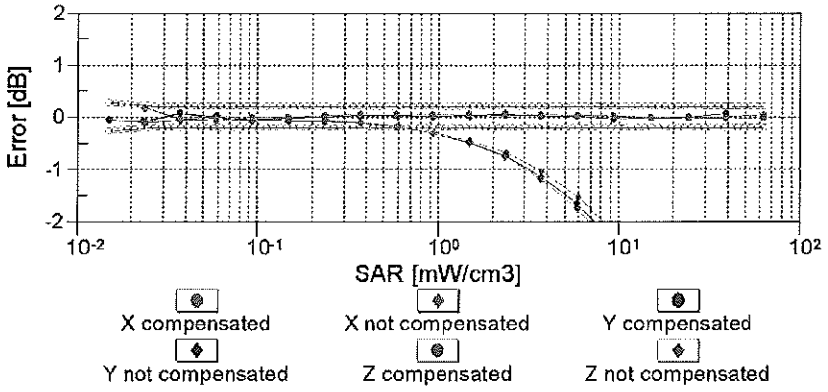




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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

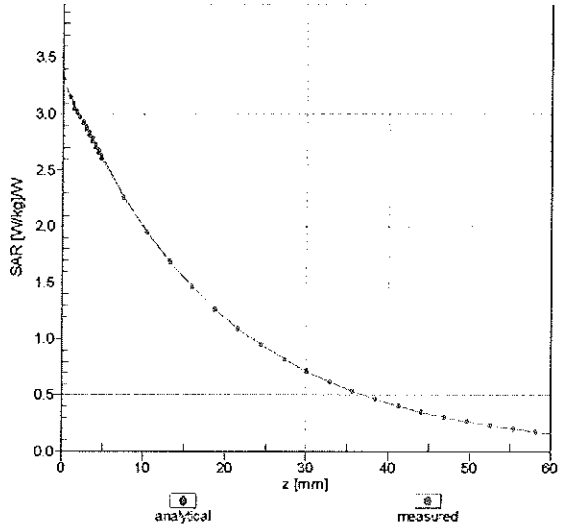




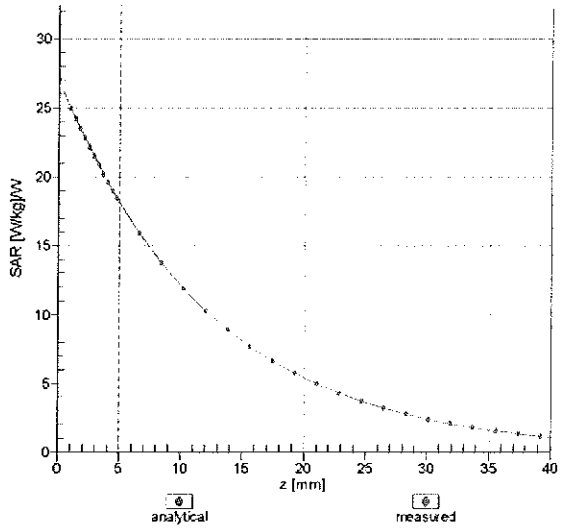
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

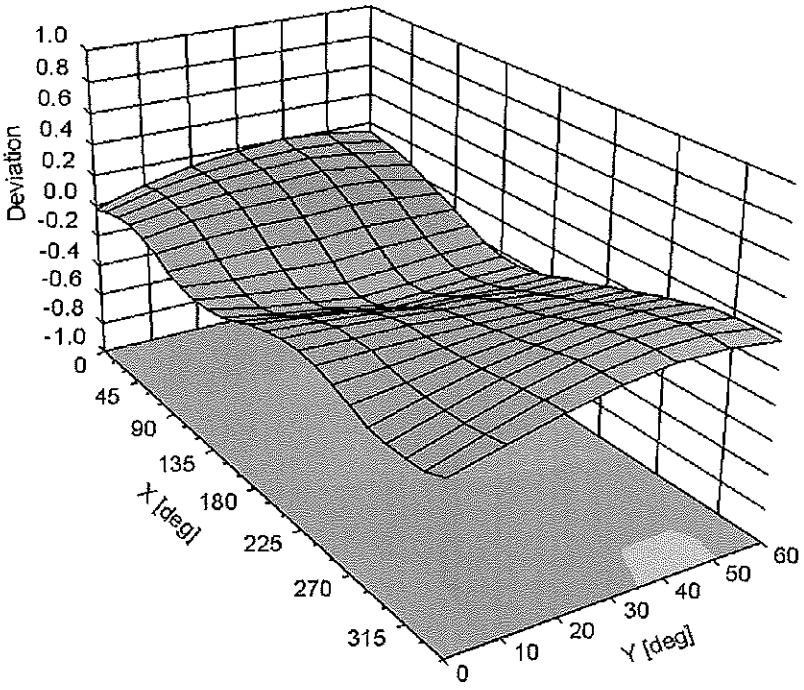


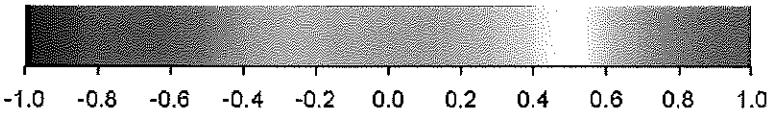
f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3698

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

Appendix E. Dipole Calibration

Validation Dipole 835 MHz
M/N: ALS-D-835
S/N: QTK-315

Validation Dipole 1900 MHz
M/N: ALS-D-1900
S/N: QTK-318

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **Quietek (Auden)**

Certificate No: ALS-835-QTK-315_May10

CALIBRATION CERTIFICATE

Object	ALS-D-835 - SN: QTK-315
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	May 21, 2010

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	02-Mar-10 (No. DAE4-601_Mar10)	Mar-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 26, 2010

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V5.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.7 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.32 mW / g
SAR normalized	normalized to 1W	9.28 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.22 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.51 mW / g
SAR normalized	normalized to 1W	6.04 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.01 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.2 ± 6 %	0.98 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.46 mW / g
SAR normalized	normalized to 1W	9.84 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**9.72 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.61 mW / g
SAR normalized	normalized to 1W	6.44 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.39 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.2 Ω + 0.5 jΩ
Return Loss	- 40.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	44.8 Ω - 1.4 jΩ
Return Loss	- 24.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.583 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	APREL
Manufactured on	Not available

DASY5 Validation Report for Head TSL

Date/Time: 21.05.2010 11:41:57

Test Laboratory: SPEAG, Zurich, Switzerland

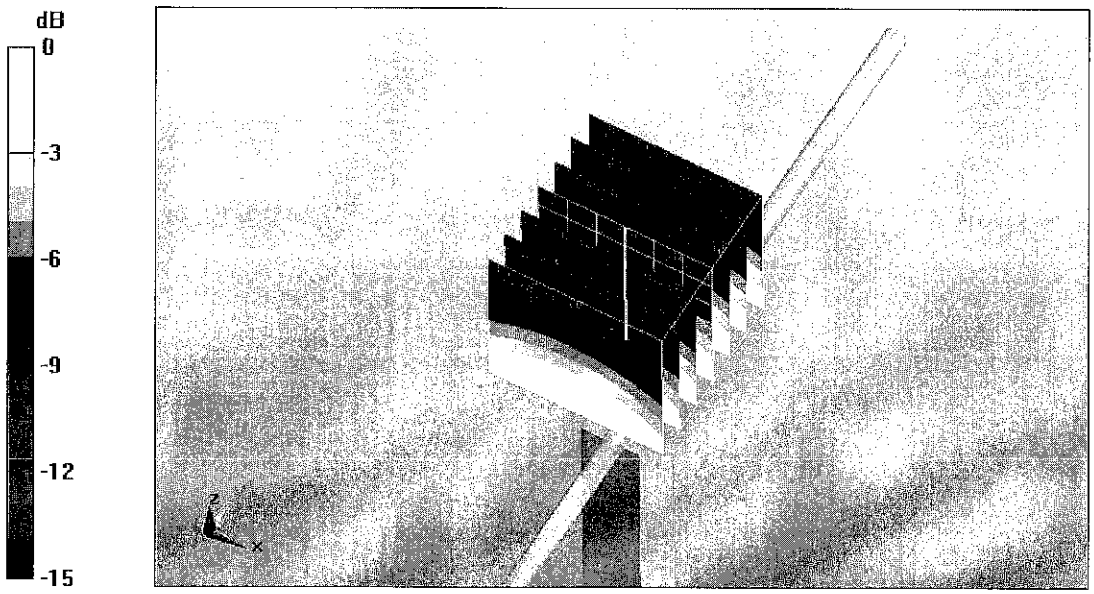
DUT: Dipole 835 MHz; Type: ALS-D-835; Serial: ALS-D-835 - SN:QTK-315

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL900
Medium parameters used: f = 835 MHz; σ = 0.91 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

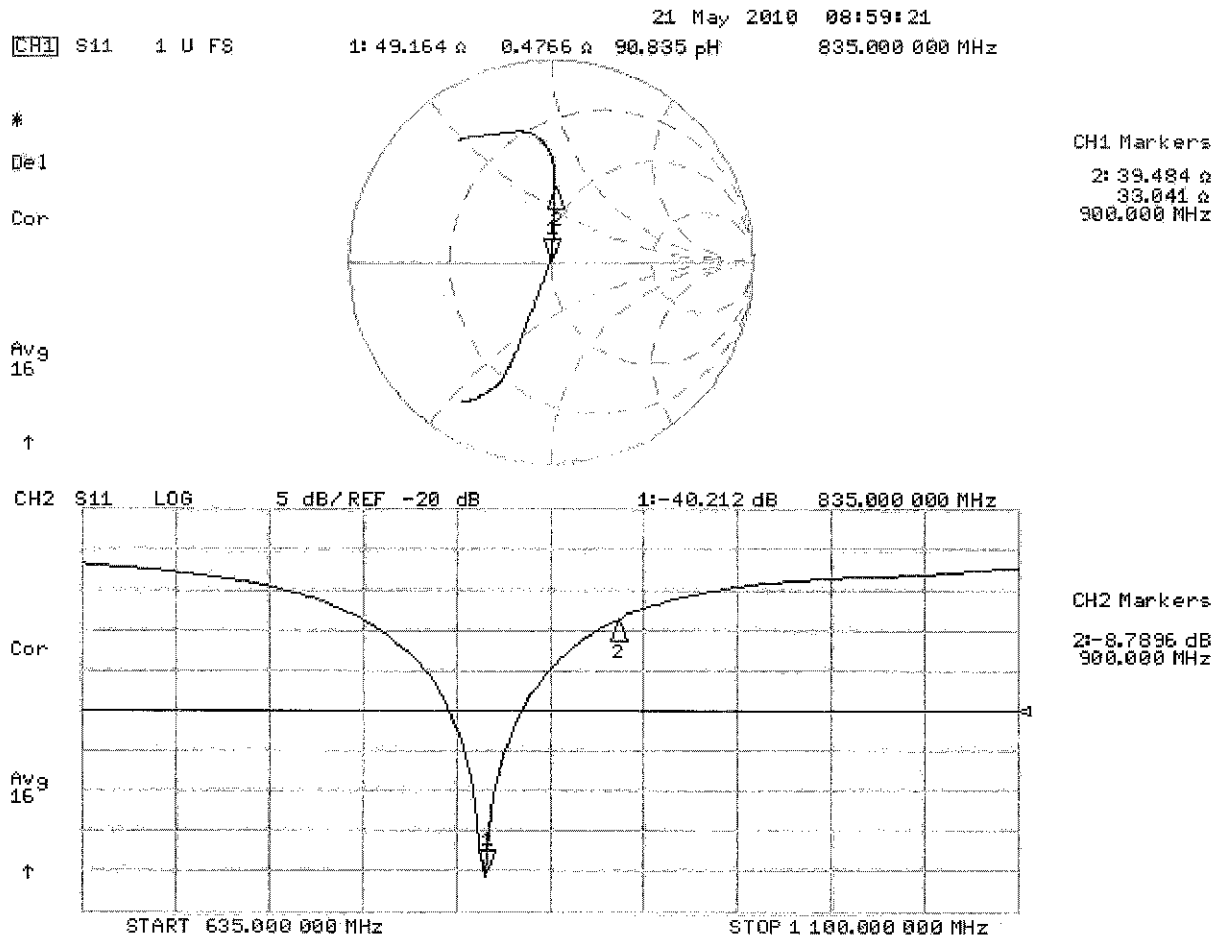
- Probe: ES3DV3 - SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.1 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 3.46 W/kg
SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.51 mW/g
Maximum value of SAR (measured) = 2.71 mW/g



0 dB = 2.71mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 21.05.2010 14:29:41

Test Laboratory: SPEAG, Zurich, Switzerland

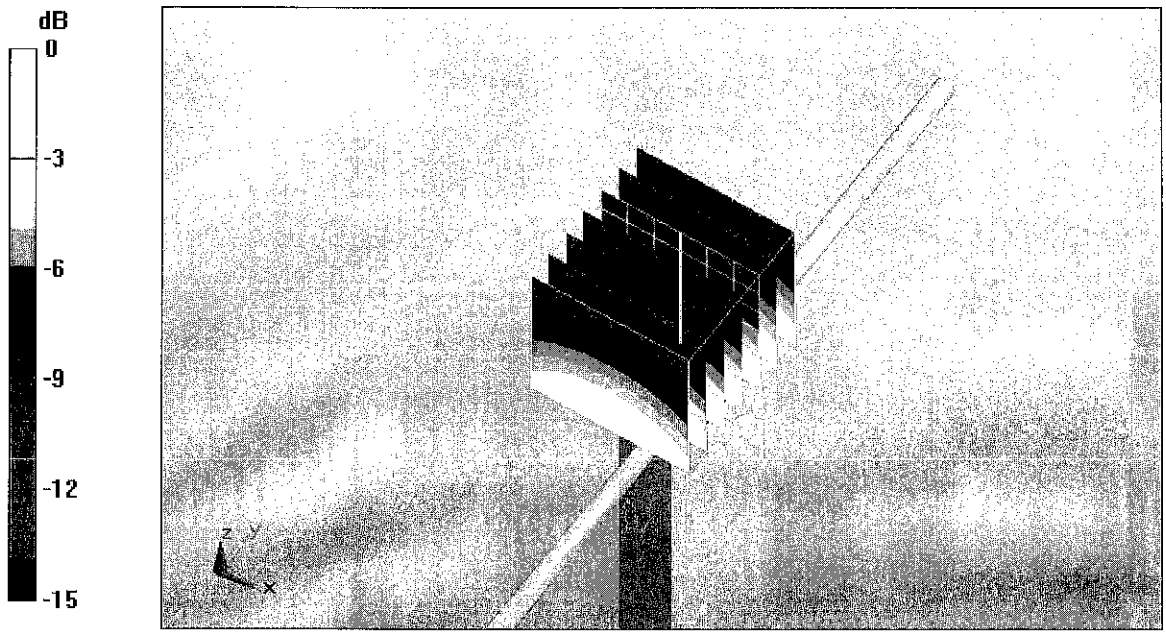
DUT: Dipole 835 MHz; Type: ALS-D-835; Serial: ALS-D-835 - SN:QTK-315

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: MSL900
Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

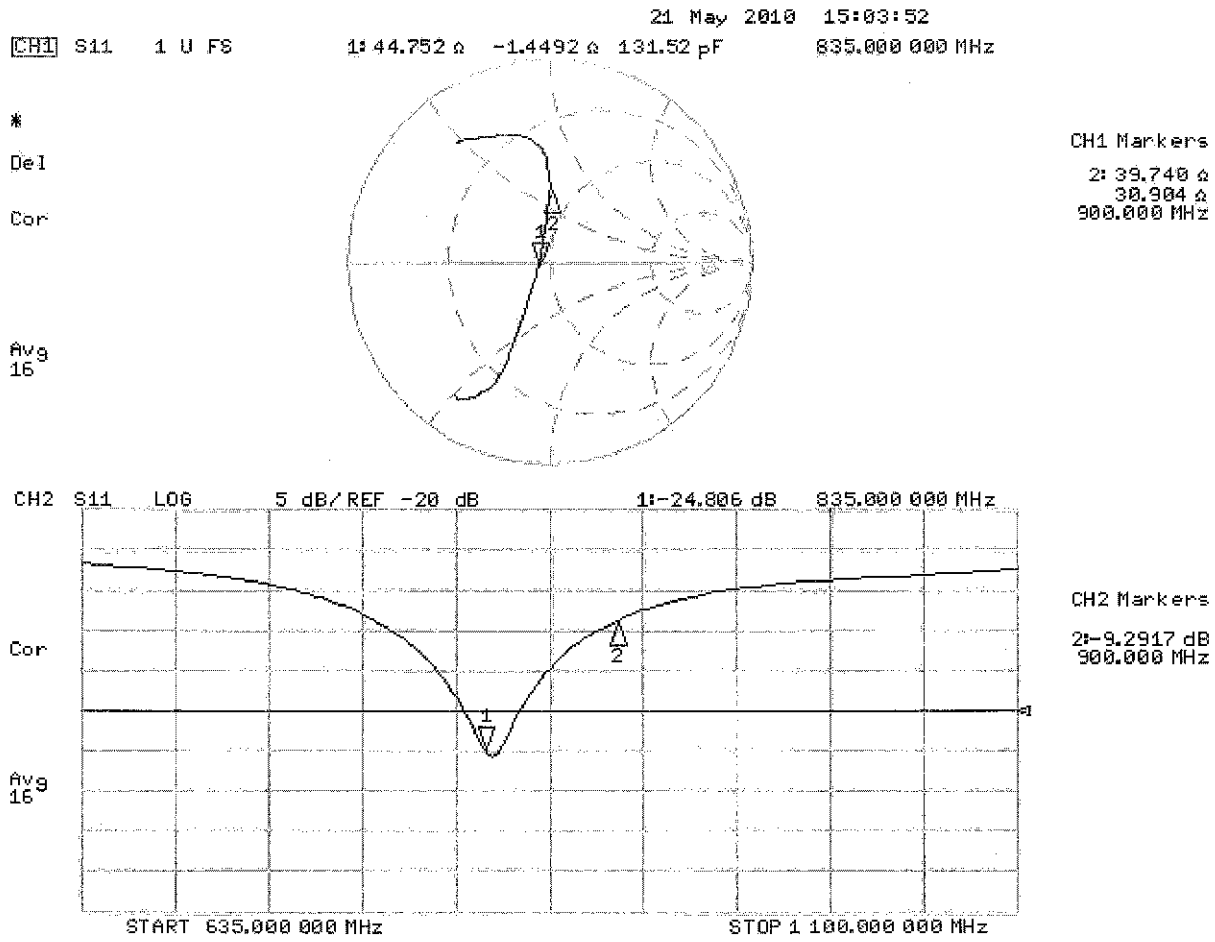
- Probe: ES3DV3 - SN3205; ConvF(5.86, 5.86, 5.86); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Pin250 mW/d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.7 V/m; Power Drift = 0.044 dB
Peak SAR (extrapolated) = 3.62 W/kg
SAR(1 g) = 2.46 mW/g; SAR(10 g) = 1.61 mW/g
Maximum value of SAR (measured) = 2.87 mW/g



0 dB = 2.87mW/g

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client Quietek (Auden)

Certificate No: ALS-1900-QTK-318_May10

CALIBRATION CERTIFICATE

Object: ALS-D-1900-SN: QTK-318

Calibration procedure(s): QA CAL-05.v7
Calibration procedure for dipole validation kits

Calibration date: May 26, 2010

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	02-Mar-10 (No. DAE4-601_Mar10)	Mar-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 28, 2010

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V5.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.7 ± 6 %	1.41 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.65 mW / g
SAR normalized	normalized to 1W	38.6 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**38.4 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.00 mW / g
SAR normalized	normalized to 1W	20.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**19.9 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.1 ± 6 %	1.52 mho/m ± 6 %
Body TSL temperature during test	(21.6 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.1 mW / g
SAR normalized	normalized to 1W	40.4 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**40.5 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.42 mW / g
SAR normalized	normalized to 1W	21.7 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.7 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.2 Ω + 6.3 jΩ
Return Loss	- 23.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.2 Ω + 7.9 jΩ
Return Loss	- 20.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.246 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	APREL
Manufactured on	Not available

DASY5 Validation Report for Head TSL

Date/Time: 25.05.2010 12:56:48

Test Laboratory: SPEAG, Zurich, Switzerland

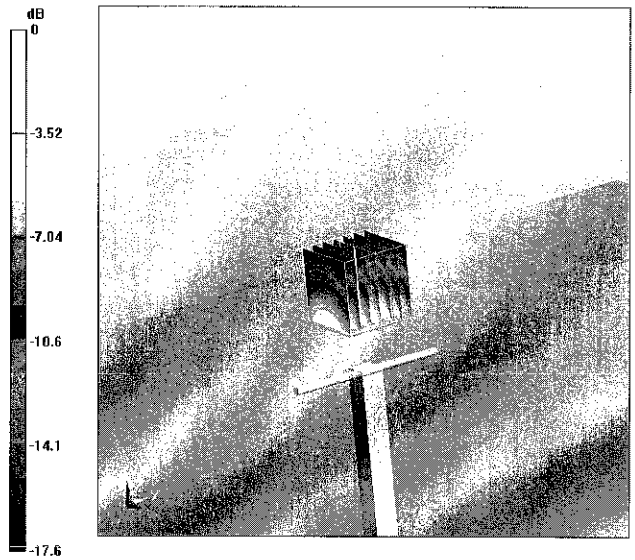
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:QTK-318

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL U11 BB
Medium parameters used: f = 1900 MHz; σ = 1.41 mho/m; ε_r = 39.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

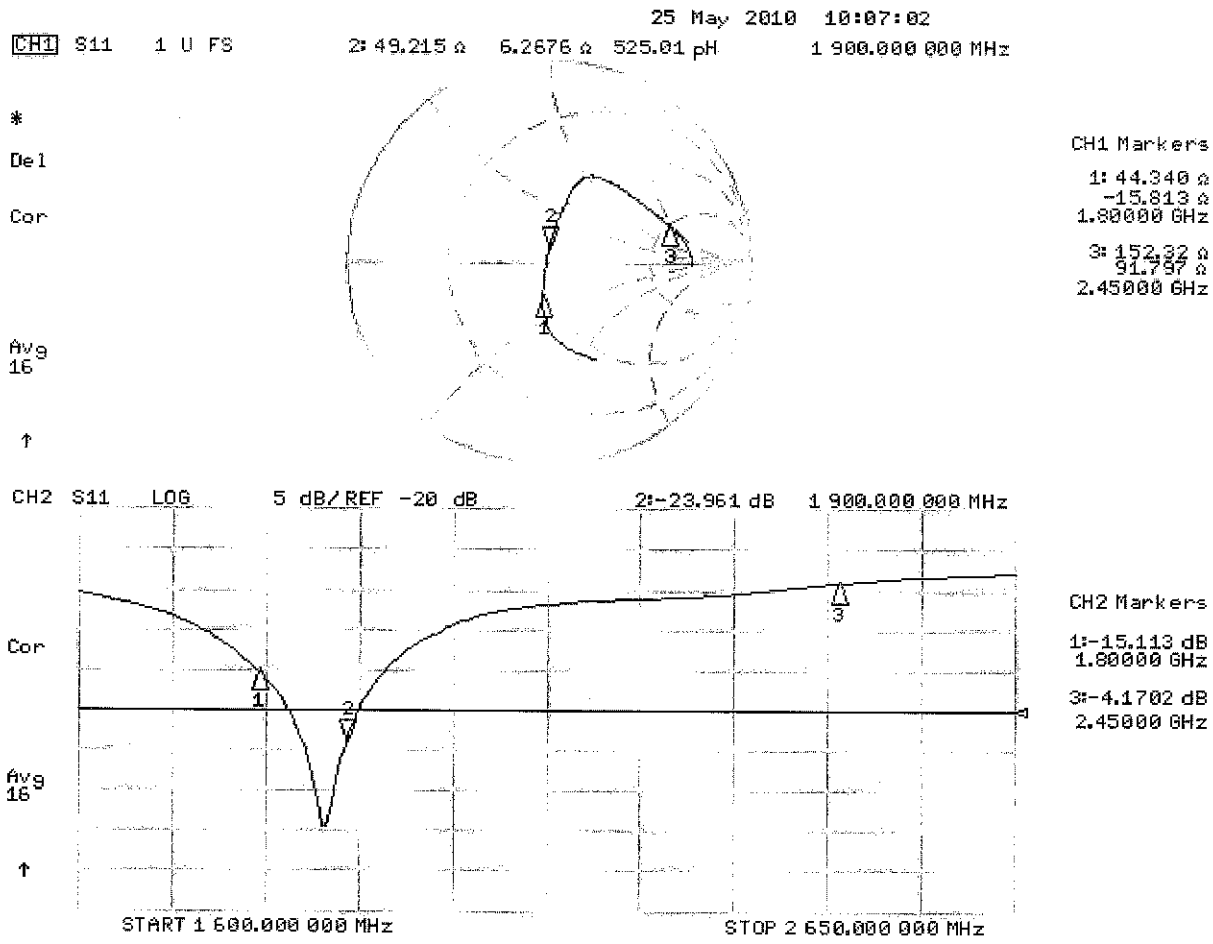
- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.8 V/m; Power Drift = 0.052 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.65 mW/g; SAR(10 g) = 5 mW/g
Maximum value of SAR (measured) = 12.1 mW/g



0 dB = 12.1mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 26.05.2010 15:36:22

Test Laboratory: SPEAG, Zurich, Switzerland

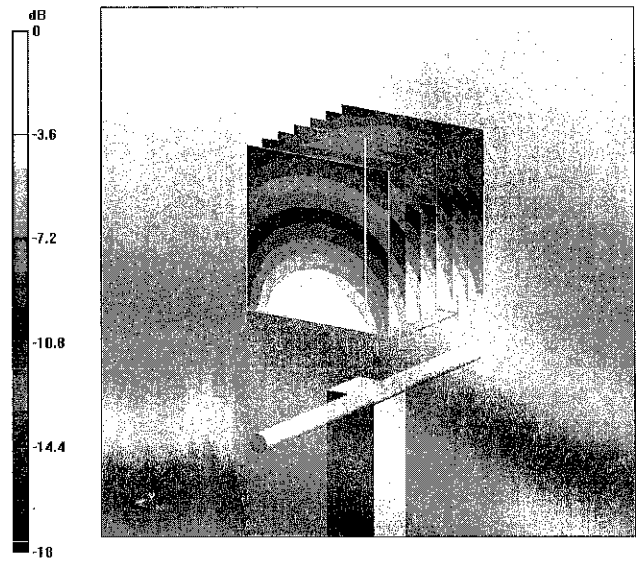
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:QTK-318

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: MSL U11 BB
Medium parameters used: f = 1900 MHz; σ = 1.52 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

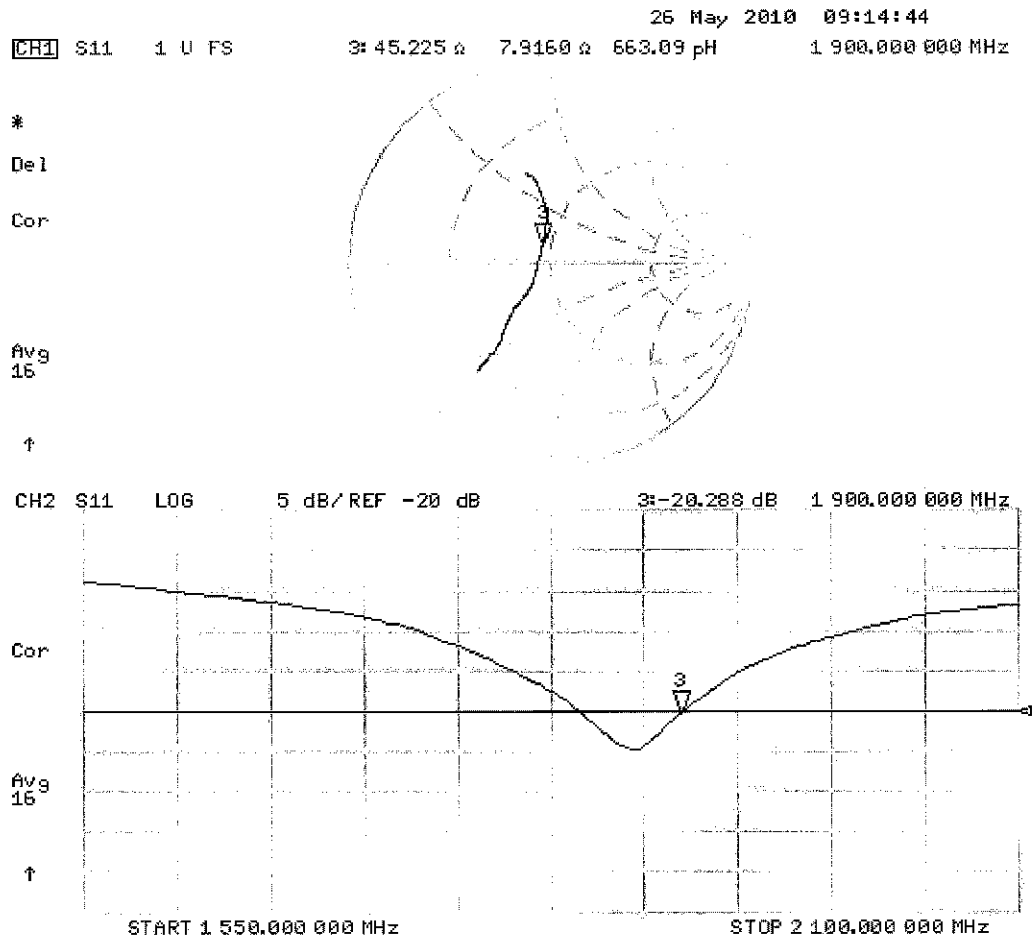
- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.5 V/m; Power Drift = -0.018 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.42 mW/g
Maximum value of SAR (measured) = 12.7 mW/g



0 dB = 12.7mW/g

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **Quietek (Auden)**

Certificate No: D2450V2-839_Mar10

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 839
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	March 12, 2010

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe ES3DV3	SN: 3205	26-Jun-09 (No. ES3-3205_Jun09)	Jun-10
DAE4	SN: 601	02-Mar-10 (No. DAE4-601_Mar10)	Mar-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

	Name	Function	Signature
Calibrated by:	Mike Meili	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 18, 2010

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V5.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.4 ± 6 %	1.80 mho/m ± 6 %
Head TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.0 mW / g
SAR normalized	normalized to 1W	52.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**52.3 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.11 mW / g
SAR normalized	normalized to 1W	24.4 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**24.5 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.4 ± 6 %	2.00 mho/m ± 6 %
Body TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.0 mW / g
SAR normalized	normalized to 1W	52.0 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**51.6 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.06 mW / g
SAR normalized	normalized to 1W	24.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**24.2 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.5 Ω - 0.6 jΩ
Return Loss	- 29.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.0 Ω + 0.9 jΩ
Return Loss	- 40.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.134 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 20, 2009

DASY5 Validation Report for Head TSL

Date/Time: 12.03.2010 13:24:52

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:839

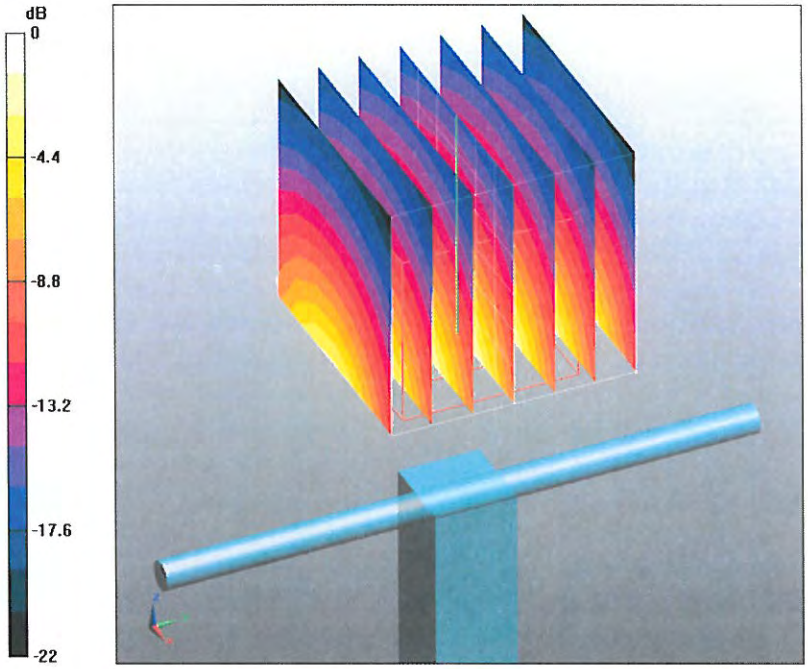
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: HSL U11 BB
Medium parameters used: f = 2450 MHz; σ = 1.81 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

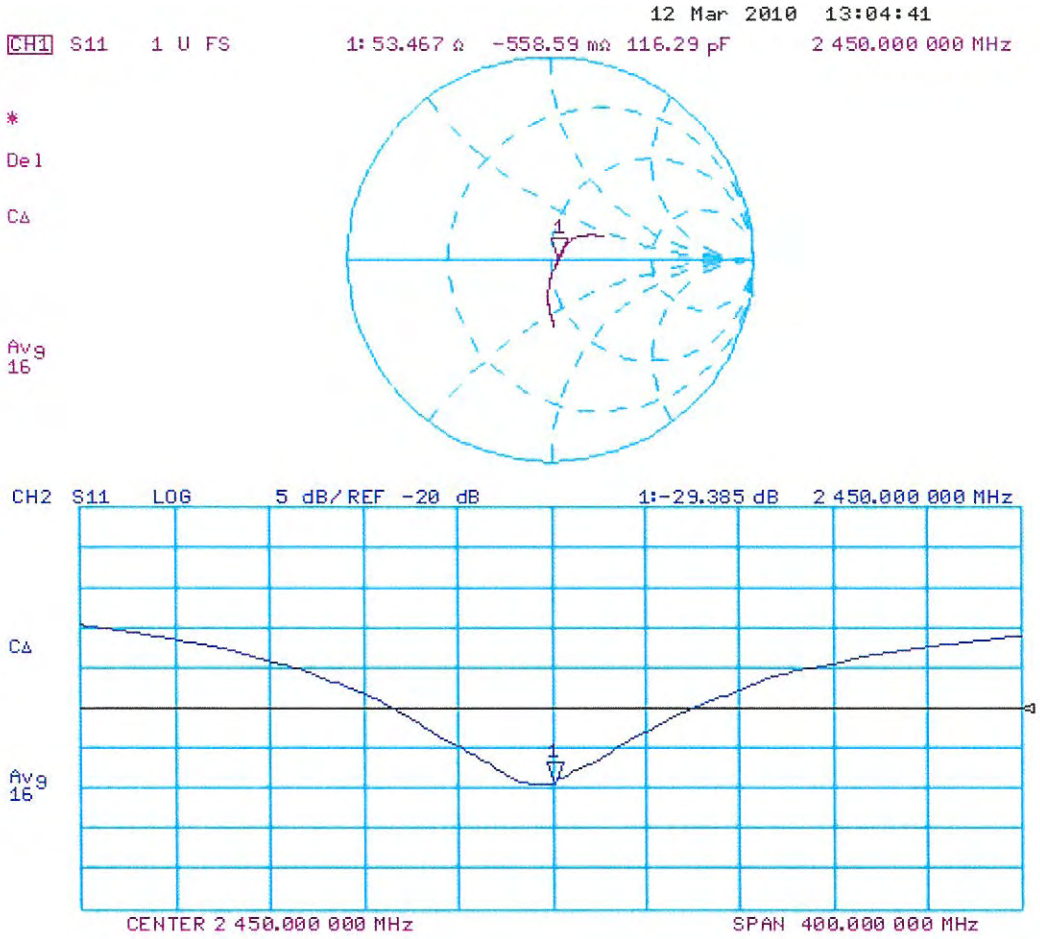
Head/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 99.1 V/m; Power Drift = 0.060 dB
Peak SAR (extrapolated) = 26.5 W/kg
SAR(1 g) = 13 mW/g; SAR(10 g) = 6.11 mW/g
Maximum value of SAR (measured) = 16.5 mW/g



0 dB = 16.5mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 12.03.2010 15:25:35

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:839

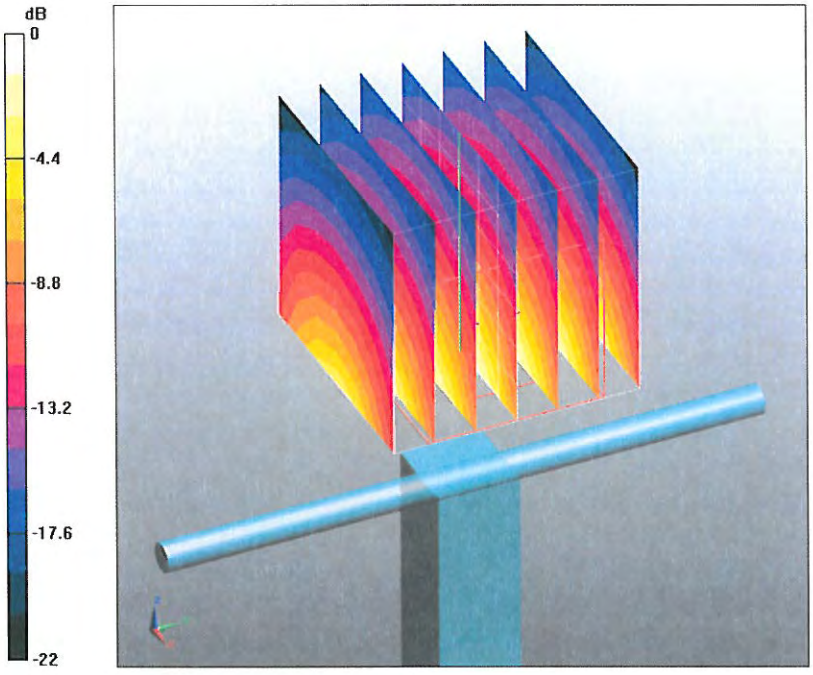
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: MSL U10 BB
Medium parameters used: f = 2450 MHz; σ = 2.01 mho/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.31, 4.31, 4.31); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

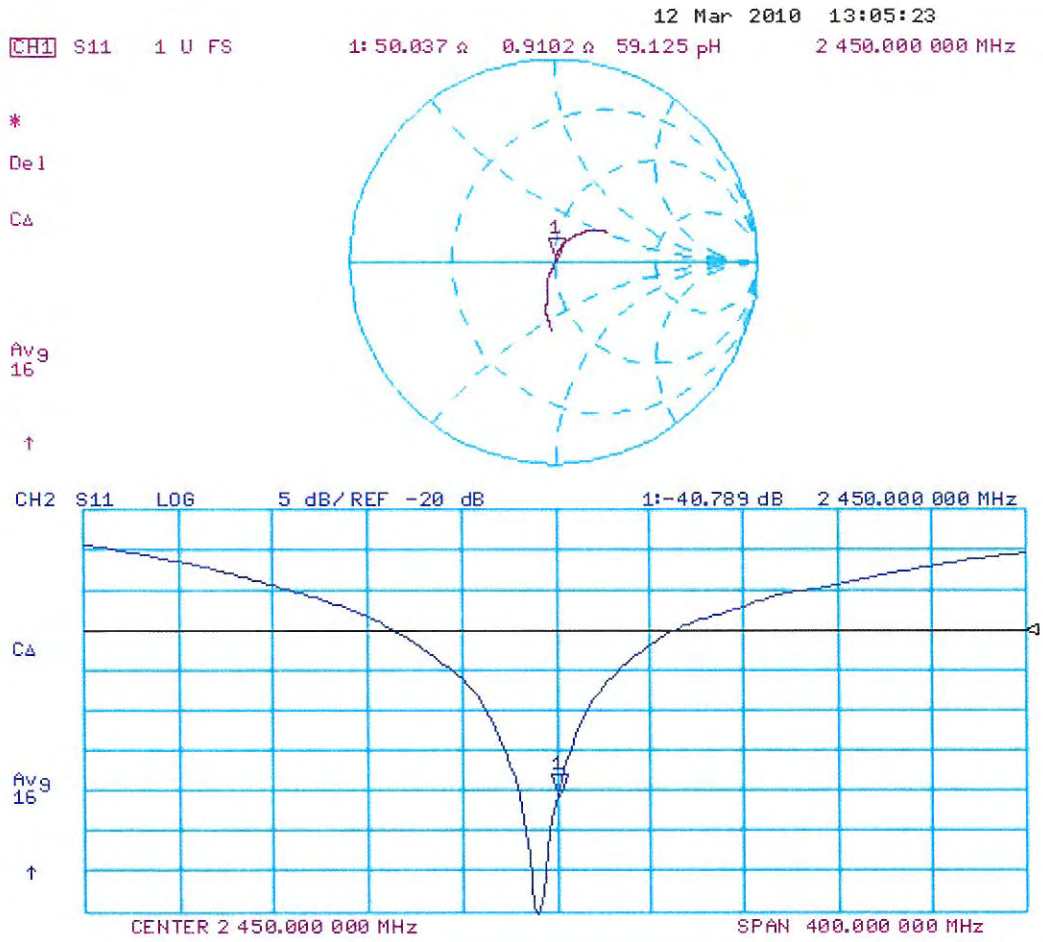
Body/d=10mm, Pin250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.9 V/m; Power Drift = -0.0047 dB
Peak SAR (extrapolated) = 27.1 W/kg
SAR(1 g) = 13 mW/g; SAR(10 g) = 6.06 mW/g
Maximum value of SAR (measured) = 17.2 mW/g



0 dB = 17.2mW/g

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **Quietek (Auden)**

Certificate No: DAE4-1207_May11

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D0 BJ - SN: 1207
Calibration procedure(s)	QA CAL-06.v23 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	May 19, 2011

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No:10376)	Sep-11
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

	Name	Function	Signature
Calibrated by:	Andrea Guntli	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: May 19, 2011

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	403.870 ± 0.1% (k=2)	404.137 ± 0.1% (k=2)	403.707 ± 0.1% (k=2)
Low Range	3.97902 ± 0.7% (k=2)	3.99298 ± 0.7% (k=2)	3.99487 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	161.0 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	199990.6	-2.44	-0.00
Channel X	+ Input	20001.49	2.19	0.01
Channel X	- Input	-19997.73	1.67	-0.01
Channel Y	+ Input	200001.4	-0.66	-0.00
Channel Y	+ Input	19998.67	-1.13	-0.01
Channel Y	- Input	-20000.23	-0.93	0.00
Channel Z	+ Input	199999.6	-1.70	-0.00
Channel Z	+ Input	19997.12	-2.68	-0.01
Channel Z	- Input	-20000.21	-0.81	0.00

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.4	0.47	0.02
Channel X	+ Input	199.13	-0.87	-0.43
Channel X	- Input	-199.24	0.66	-0.33
Channel Y	+ Input	2000.0	0.05	0.00
Channel Y	+ Input	198.77	-1.03	-0.51
Channel Y	- Input	-200.75	-0.65	0.32
Channel Z	+ Input	2000.3	0.39	0.02
Channel Z	+ Input	198.59	-1.51	-0.76
Channel Z	- Input	-201.53	-1.63	0.81

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	2.73	1.00
	- 200	-0.40	-2.24
Channel Y	200	4.08	3.30
	- 200	-4.60	-5.00
Channel Z	200	12.25	12.29
	- 200	-14.10	-14.06

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	4.77	1.16
Channel Y	200	1.31	-	5.16
Channel Z	200	3.75	0.51	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15816	13759
Channel Y	16013	16749
Channel Z	16215	16003

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	-0.12	-1.79	0.99	0.55
Channel Y	-0.70	-1.77	0.35	0.43
Channel Z	-1.07	-3.14	1.05	0.60

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	–0.01	-8	-9

Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

IMPORTANT NOTICE

USAGE OF THE DAE 4

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

Battery Exchange: The battery cover of the DAE4 unit is closed using a screw, over tightening the screw may cause the threads inside the DAE to wear out.

Shipping of the DAE: Before shipping the DAE to SPEAG for calibration, remove the batteries and pack the DAE in an antistatic bag. This antistatic bag shall then be packed into a larger box or container which protects the DAE from impacts during transportation. The package shall be marked to indicate that a fragile instrument is inside.

E-Stop Failures: Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, the customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

Repair: Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

DASY Configuration Files: Since the exact values of the DAE input resistances, as measured during the calibration procedure of a DAE unit, are not used by the DASY software, a nominal value of 200 MOhm is given in the corresponding configuration file.

Important Note:
Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.

Important Note:
Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure.

Important Note:
To prevent damage of the DAE probe connector pins, use great care when installing the probe to the DAE. Carefully connect the probe with the connector notch oriented in the mating position. Avoid any rotational movement of the probe body versus the DAE while turning the locking nut of the connector. The same care shall be used when disconnecting the probe from the DAE.