



FCC SAR EVALUATION REPORT

For

Networking Group SAS

Tr. 19A No. 98-28 Of. 204, Bogota, Colombia

Product Name: Smartphone

Model No. : Live Era, TCB-723

Date of Receipt: 24th June. 2014

Date of Test: 26th ~28th June. 2014

Issued Date: 28th June. 2014

Report No.: TS201406020

Report Version: V1.0

Issue By

Shenzhen Sunway Communication CO.,LTD Testing Center
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SAR Evaluation compliance

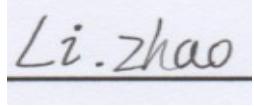
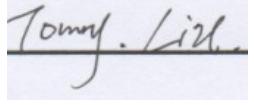
Product Name:	Smartphone
Brand Name:	NWG
Model Name:	Live Era, TCB-723
Applicant:	Networking Group SAS
Address:	Tr. 19A No. 98-28 Of. 204, Bogota, Colombia
Manufacturer:	Tecomax Electronics Technology Co., Ltd
Address:	Units 2202-2203, 22/F, Changxing Building, Futian , Shenzhen, Guangdong 518000, China.
Applicable Standard:	IEEE Std. 1528-2013,FCC 47 CFR § 2.1093 KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03 KDB 447498 D01 General RF Exposure Guidance v05r02
Test Result:	Max. SAR Report: Body (1g): 1.205W/kg Head(1g): 1.353W/kg
Performed Date:	26 th ~28 th June. 2014
Test Engineer:	 28 th June. 2014
Reviewed By	 28 th June. 2014
Performed Location:	Shenzhen Sunway Communication CO.,LTD Testing Center 1/F, BuildingA, SDG Info Port, KefengRoad, Hi-Tech Park, Nanshan District, Shenzhen , Guangdong, China 518104 Tel: +86-755- 36615880 Fax: +86-755- 86525532



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**1. General Information:****1.1 EUT Description:**

EUT Information	
Product Name	Smartphone
Brand Name	NWG
Model Name	Live Era, TCB-723
Device Category	MobilePhone
Antenna Type	Integral Antenna
Headset	/
Battery	Type: Rechargeable lithium-ion battery 3.7V
Dimensions (L*W*H):	145mm (L)× 75mm (W)×10mm (H)
Weight:	-
Power Source:	Rechargeable lithium-ion battery 3.7V
Normal Operation:	Head & Body
GSM-2G	
Support Band	GSM850/PCS1900
GPRS Type	GPRS850/GPRS1900
GPRS Class	12
Frequency Bands:	GSM 850: UL: 824-850 MHz DL: 869-894 MHz PCS 1900: UL: 1850-1910 MHz DL: 1930-1990 MHz
Release Version	R99
Type of modulation	GMSK for GSM
Antenna locations	GSM antenna is located on the top of the mobile phone (page 22)
Antenna Gain	1.5dBi



WCDMA-3G	
Support Band	WCDMA Band II
Frequency Bands:	WCDMA Band II: UL: 1850 ~ 1910MHz DL: 1930 ~ 1988MHz
Release Version	Rel-5
Type of modulation	QPSK
Antenna Gain	1.5dBi
Max. Output Power (Conducted)	
GSM850:	32.30 dBm
PCS1900:	29.30 dBm
WCDMA Band II	24.50 dBm

Note: the device can't support DTM/Hotspot mode

**1.2 Test Environment:**

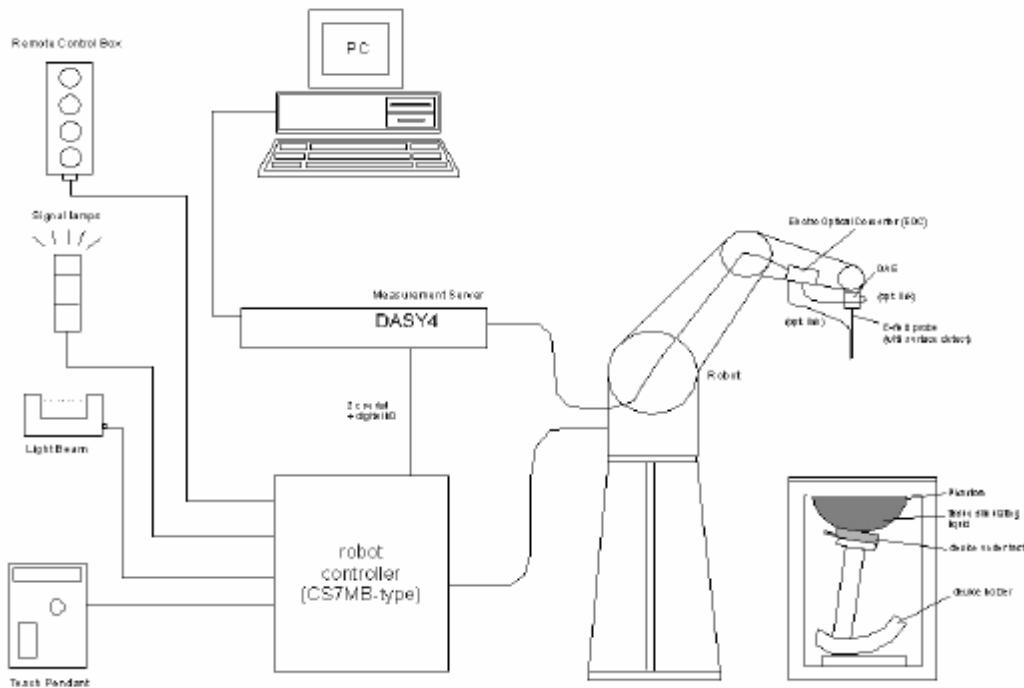
Ambient conditions in the SAR laboratory:

Items	Required	Actual
Temperature (°C)	18-25	21~23
Humidity (%RH)	30-70	50~65



2. SAR Measurement System:

2.1 Dasy4 System Description:



The DASY4 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 dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc.
- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.



3. System Components:

- DAsY4 Measurement Server:



Calibration: No calibration required.

The DASY4 measurement server is based on a PC/104 CPU board with a 166MHz low-power pentium, 32MB chipdisk and 64MB RAM. The necessary circuits for communication with either the DAE4 (or DAE3) electronic box as well as the 16-bit AD-converter system for optical detection and digital I/O interface are contained on the DASY4 I/O-board, which is directly connected to the PC/104 bus of the CPU board.

- DATA Acquisition Electronics (DAE):



Calibration: Recommended once a year

The data acquisition electronics 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.

- Dosimetric Probes:



Model: ES3DV3,
Frequency: 10MHz to 3G, Linearity: $\pm 0.2\text{dB}$,
Dynamic Range: 10 $\mu\text{W/g}$ to 100 mW/g
Directivity:
 $\pm 0.3 \text{ dB}$ in HSL (rotation around probe axis)
 $\pm 0.5 \text{ dB}$ in tissue material (rotation normal to probe axis)

These probes are specially designed and calibrated for use in liquids with high permittivities. They should not be used in air, since the spherical isotropy in air is poor ($\pm 2 \text{ dB}$). The dosimetric probes have special calibrations in various liquids at different frequencies.

Calibration: Recommended once a year



➤ Light Beam unit:



Calibration: No calibration required.

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.

➤ 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 hand
- Right hand
- 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.

➤ Device Holder for SAM Twin Phantom:



The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity " $\epsilon_r = 3$ " and loss tangent $\tan \delta = 0.02$. 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.



4. Tissue Simulating Liquid

4.1 The composition of the tissue simulating liquid:

INGREDIENT (% Weight)	835MHz Head	835MHz Body	1900MHz Head	1900MHz Body
Water	40.45	52.4	54.9	40.4
Salt	1.525	1.52	0.18	0.5
Sugar	57.6	45.0	0.00	58.0
HEC	0.40	1.0	0.00	1.0
Preventol	0.10	0.1	0.00	0.1
DGBE	0.00	0	44.92	0

4.2 Tissue Calibration Result:

Dielectric Probe Kit: Speag DAK 3.5mm probe -S/N:1038					
Head Tissue Simulate Measurement:					
Frequency (MHz)	Description	Dielectric Parameters		Tissue Temp. (°C)	Date
		ϵ_r	σ [s/m]		
835MHz	Reference	$41.50 \pm 5\%$ (39.425~43.574)	$0.90 \pm 5\%$ (0.9215~1.0185)	N/A	2014.06.26
	Measurement	42.27	0.91	22.1	
1900MHz	Reference	$40 \pm 5\%$ (38~42)	$1.40 \pm 5\%$ (1.33~1.47)	N/A	2014.06.26
	Measurement	39.27	1.42	21.8	
Body Tissue Simulate Measurement:					
Frequency (MHz)	Description	Dielectric Parameters		Tissue Temp. (°C)	Date
		ϵ_r	σ [s/m]		
835MHz	Reference	$55.2 \pm 5\%$ (52.45~57.96)	$0.97 \pm 5\%$ (0.93~1.01)	N/A	2014.06.26
	Measurement	54.73	0.98	22.5	
1900MHz	Reference	$53.3 \pm 5\%$ (50.64~55.96)	$1.52 \pm 5\%$ (1.45~1.59)	N/A	2014.06.26
	Measurement	52.45	1.54	22.5	

**4.3 Tissue Dielectric Parameters for Head and Body Phantoms:**

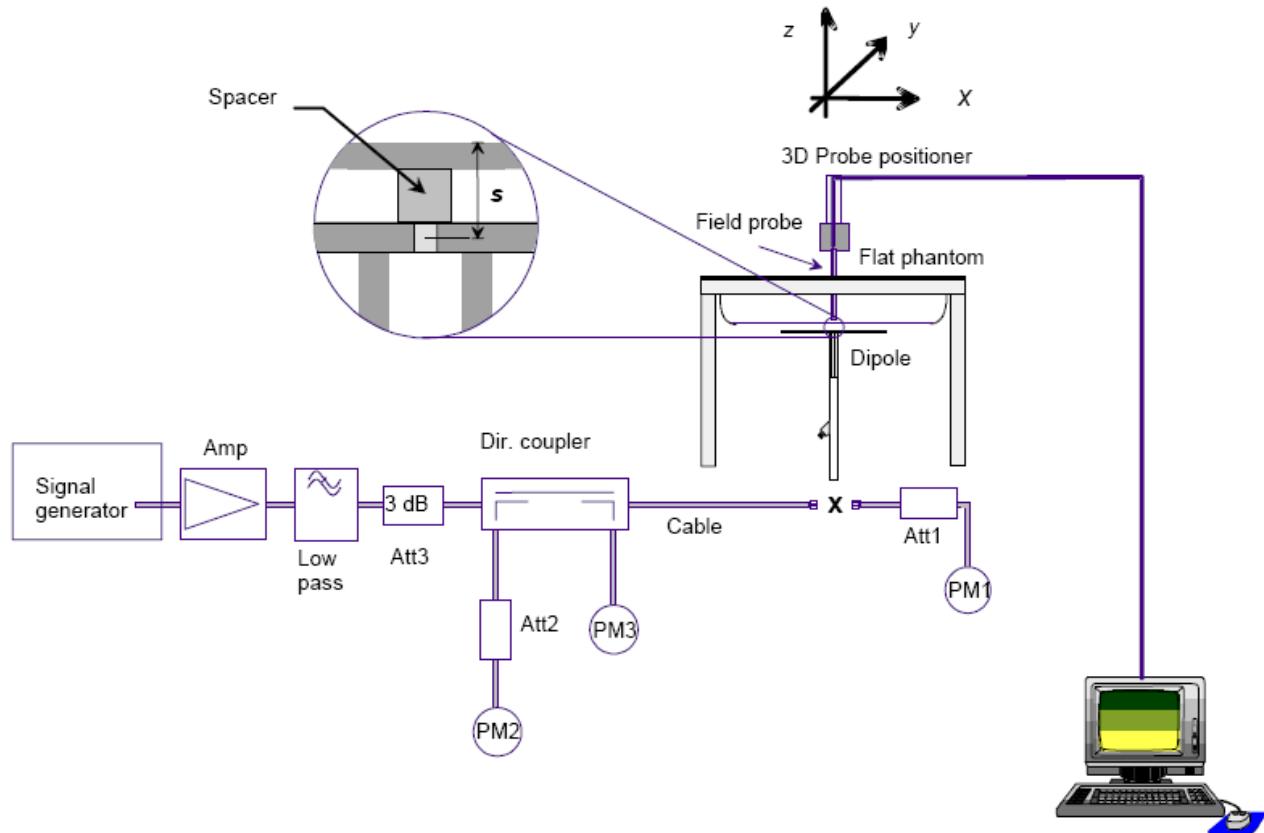
The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in KDB 865664 have been incorporated in the following table

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



5. SAR System Validation

5.1 Validation System:



5.2 Validation Dipoles:

The dipoles used is based on the IEEE-1528/EN62209-1 standard, and is complied with mechanical and electrical specifications in line with the requirements of both IEEE-1528/EN62209-1 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	89.8	3.6
1900MHz	68	39.5	3.6



5.3 Validation Result:

System performance check for Head at 835MHz,1900MHz						
Validation Dipole: D835V2-SN:4d154						
Frequency (MHz)	Description	SAR(1g) W/Kg	SAR(10g) W/Kg	Tissue Temp. (°C)	Date	
835MHz	Reference	9.51±10% (8.56~10.46)	6.17±10% (5.56~6.78)	N/A	2014.06.26	
	Validation	10.04	6.56	22.5		
Validation Dipole: D1900V2-SN:5d142						
1900MHz	Reference	40.2±10% (36.18~44.22)	21±10% (18.9~23.1)	N/A	2014.06.26	
	Validation	42.0	21.44	22.5		
System performance check for Body at 835MHz,1900MHz						
Validation Dipole: D835V2-SN:4d154						
Frequency (MHz)	Description	SAR(1g) W/Kg	SAR(10g) W/Kg	Tissue Temp. (°C)	Date	
835MHz	Reference	9.51±10% (8.56~10.46)	6.23±10% (5.61~6.85)	N/A	2014.06.26	
	Validation	9.68	6.24	22.5		
Validation Dipole: D1900V2-SN:5d142						
1900MHz	Reference	40.8±10% (36.72~44.88)	21.8±10% (19.62~23.98)	N/A	2014.06.26	
	Validation	42.40	21.60	22.5		
Note: All system validation SAR values are measured at 24dBm and normalized to 1W forward power.						



6. SAR Evaluation Procedures:

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

➤ Power Reference Measurement

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

➤ Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hot spot. The sophisticated interpolation routines implemented in DASY4 software can find the maximum locations even in relatively coarse grids. The scanning area is defined by an editable grid. This grid is anchored at the grid reference point of the selected section in the phantom. When the Area Scan's property sheet is brought-up, grid settings can be edited by a user.

➤ Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan measures 7 x 7 x 7 points (5mmx5mmx5mm) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure.

➤ Power Drift Measurement

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement.



7. SAR Exposure Limits

SAR assessments have been made in line with the requirements of IEEE-15288,FCC Supplement C ,and comply with ANSI/IEEE C95.1-1992"Uncontrolled Environments" limits.

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

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

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

**8. Measurement Uncertainty:**

Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram / 10 gram.

NO	Source	Uncert. ai (%)	Prob. Dist.	Div. k	ci (1g)	ci (10g)	Stand. Uncert. ui (1g)	Stand. Uncert. ui (10g)	V _{eff}
1	Repeat	0.04	N	1	1	1	0.04	0.04	9
Instrument									
2	Probe calibration	7	N	2	1	1	3.5	3.5	∞
3	Axial isotropy	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
4	Hemispherical isotropy	9.6	R	$\sqrt{3}$	0.7	0.7	3.9	3.9	∞
5	Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Linearity	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
7	Detection limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
8	Readout electronics	0.3	N	1	1	1	0.3	0.3	∞
9	Response time	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
10	Integration time	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
11	Ambient noise	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
12	Ambient reflections	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Probe positioner mech. restrictions	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
14	Probe positioning with respect to phantom shell	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
15	Max.SAR evaluation	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞



Test sample related									
16	Device positioning	3.8	N	1	1	1	3.8	3.8	99
17	Device holder	5.1	N	1	1	1	5.1	5.1	5
18	Drift of output power	5.0	R	✓ ^b	1	1	2.9	2.9	∞
Phantom and set-up									
19	Phantom uncertainty	4.0	R	✓ ^b	1	1	2.3	2.3	∞
20	Liquid conductivity (target)	5.0	R	✓ ^b	0.64	0.43	1.8	1.2	∞
21	Liquid conductivity (meas)	2.5	N	1	0.64	0.43	1.6	1.2	∞
22	Liquid Permittivity (target)	5.0	R	✓ ^b	0.6	0.49	1.7	1.5	∞
23	Liquid Permittivity (meas)	2.5	N	1	0.6	0.49	1.5	1.2	∞
Combined standard		RSS		$U_c = \sqrt{\sum_{i=1}^n C_i^2 U_i^2}$			12.2%	11.9%	236
Expanded uncertainty (P=95%)		$U = k U_c, k=2$				24.4%	23.8%		

**9. Conducted Power Measurement:**

Band	Channel	Frequency (MHz)	Avg.Burst Power(dBm)
Maximum Power <SIM 1>			
GSM850	CH128	824.20	32.12
	CH190	836.60	32.14
	CH251	848.80	32.30
PCS1900	Ch512	1850.20	29.30
	CH661	1880.00	29.14
	CH810	1909.80	29.21
Maximum Power <SIM 2>			
GSM850	CH128	824.20	32.03
	CH190	836.60	32.09
	CH251	848.80	32.12
PCS1900	Ch512	1850.20	29.11
	CH661	1880.00	29.07
	CH810	1909.80	29.13



Band	Channel	Frequency (MHz)	Avg.Burst Power(dBm)
GPRS850 Slot1	CH128	824.20	32.03
	CH190	836.60	32.12
	CH251	848.80	32.14
GPRS850 Slot2	CH128	824.20	31.67
	CH190	836.60	31.43
	CH251	848.80	31.15
GPRS850 Slot3	CH128	824.20	29.67
	CH190	836.60	29.42
	CH251	848.80	29.21
GPRS850 Slot4	CH128	824.20	27.69
	CH190	836.60	27.85
	CH251	848.80	27.13
GPRS1900 Slot1	CH512	1850.20	29.27
	CH661	1880.00	29.21
	CH810	1909.80	29.20
GPRS1900 Slot2	CH512	1850.20	28.31
	CH661	1880.00	28.75
	CH810	1909.80	28.64
GPRS1900 Slot3	CH512	1850.20	26.29
	CH661	1880.00	26.73
	CH810	1909.80	26.62
GPRS1900 Slot4	CH512	1850.20	24.23
	CH661	1880.00	24.67
	CH810	1909.80	24.56



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Band	Channel	Frequency (MHz)	Output Power(dBm)
WCDMA Band II	ch9262	1852.40	24.34
	ch9400	1880.00	24.50
	ch9538	1907.60	24.12
HSDPA Band II Sub-Type 1	ch9262	1852.40	24.22
	ch9400	1880.00	24.28
	ch9538	1907.60	24.10
HSDPA Band II Sub-Type 2	ch9262	1852.40	24.19
	ch9400	1880.00	24.30
	ch9538	1907.60	24.23
HSDPA Band II Sub-Type 3	ch9262	1852.40	24.16
	ch9400	1880.00	24.38
	ch9538	1907.60	24.37
HSDPA Band II Sub-Type 4	ch9262	1852.40	24.28
	ch9400	1880.00	24.24
	ch9538	1907.60	24.24



10. Test photos and results:

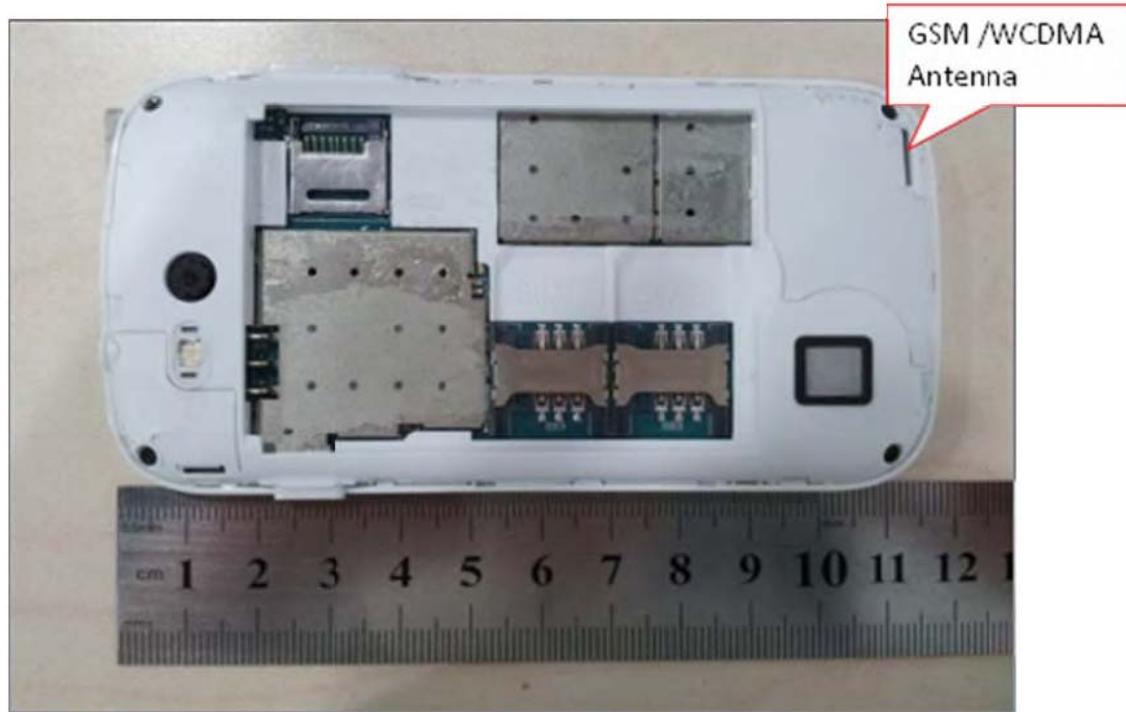
10.1 DUT photos:



Front side



Back side



Antenna Location



10.2 Setup photos:



Left Touch Cheek



Left Tilt(15°)



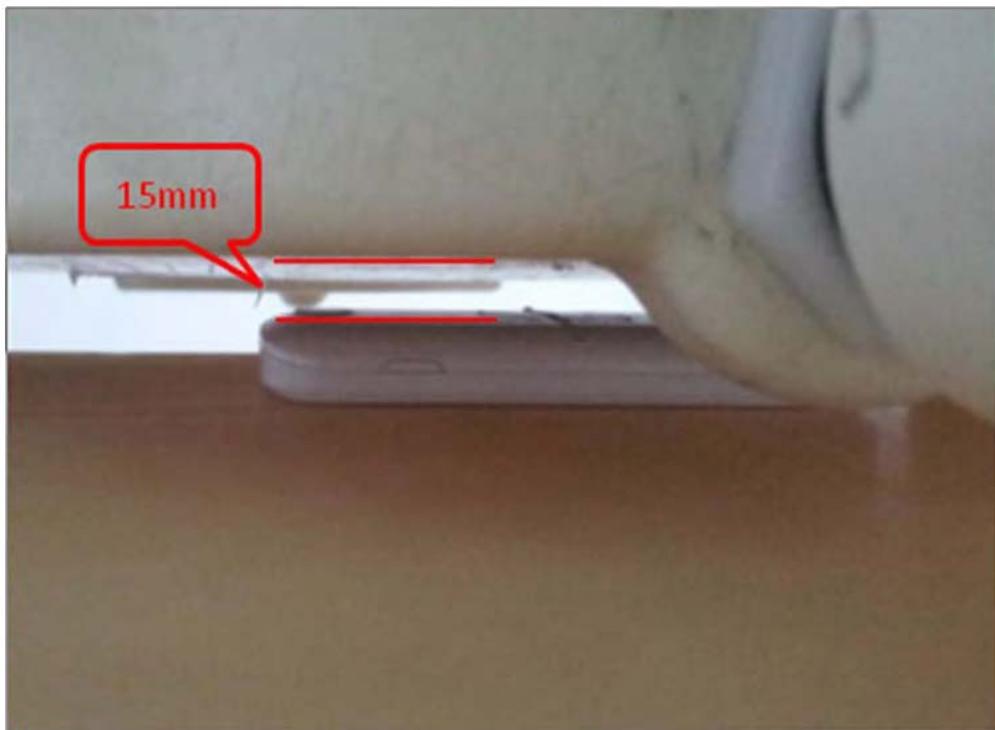
Right Touch Cheek



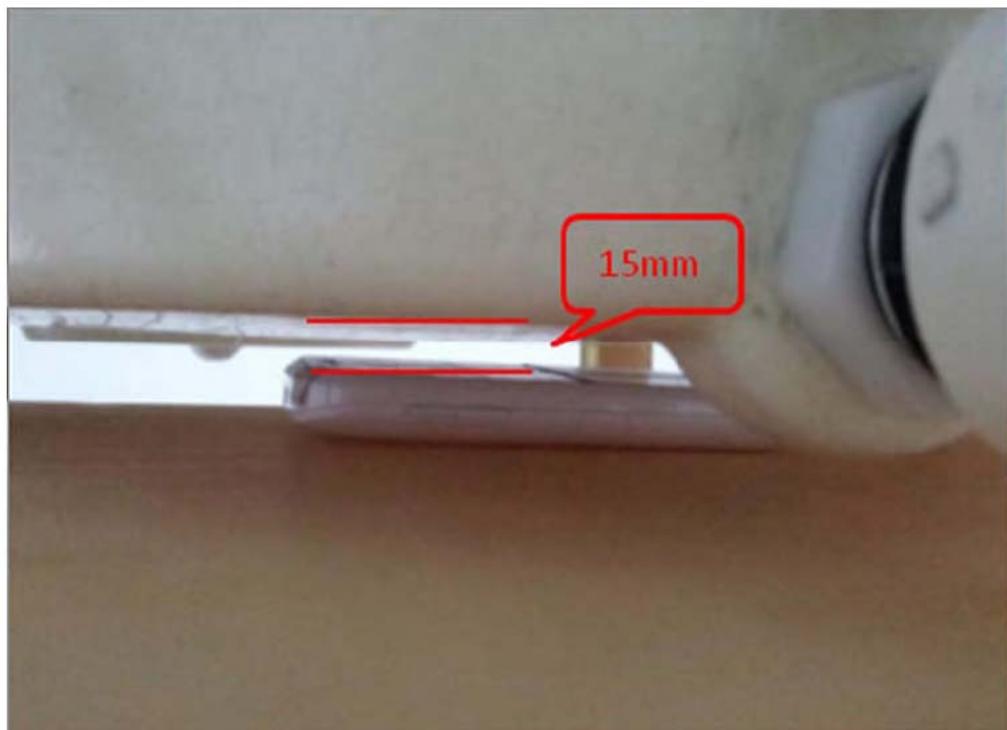
Right Tilt(15°)



Body:



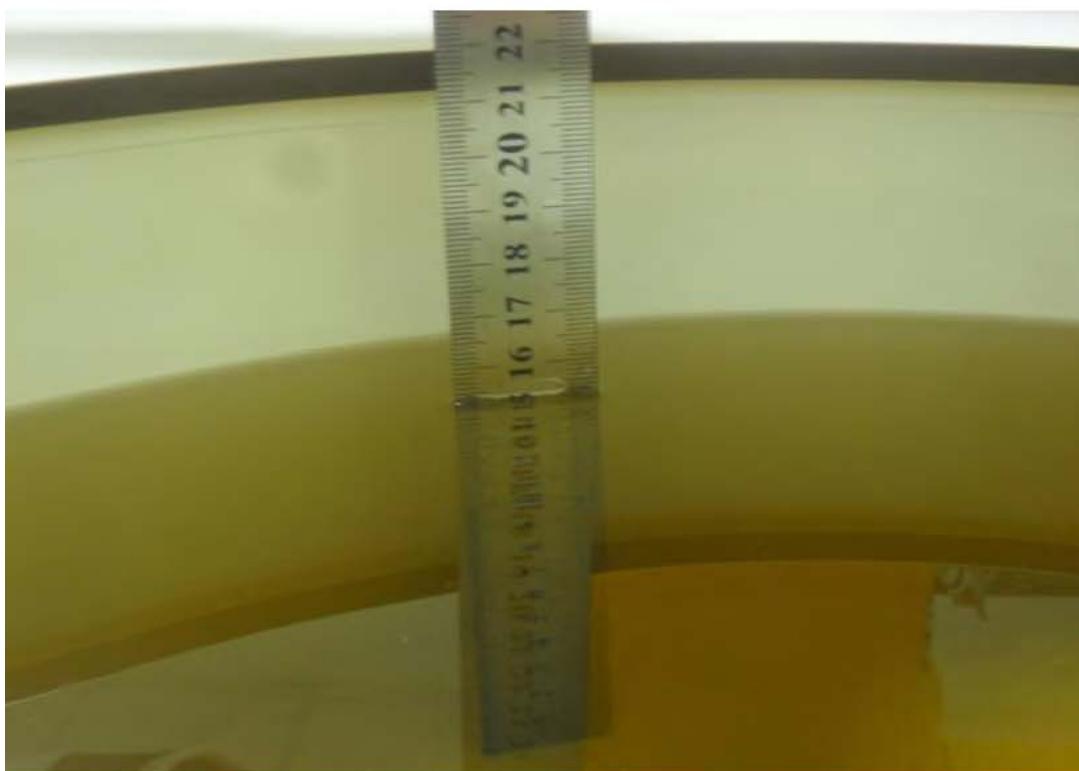
Body Worn



Body Front



Body Worn with Headset



Liquid depth (15cm)



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10.3 SAR result summary:

Scale Factor=Target Power/Measurement Power

Scale SAR=Measurement SAR*Scale Factor

Head

Test Case of Head			Meas. Power (dBm)	Target Power (dBm)	Factor	Meas. SAR (W/kg) 1g Avg.	Scale SAR (W/kg)	Power Drift <± 0.2 dB	Data Slot
Band	Test Position	CH							

SIM1,Liquid: Head

GSM 850	Right Cheek	CH190	32.14	32.5	1.12	0.593	0.664	-0.092	Plot 1
	Right Tilt	CH190	32.14	32.5	1.12	0.353	0.395	-0.029	Plot 2
	Left Cheek	CH190	32.14	32.5	1.12	0.685	0.767	-0.164	Plot 3
	Left Tilt	CH190	32.14	32.5	1.12	0.361	0.404	-0.046	Plot 4

SIM2,Liquid: Head

GSM 850	Left Cheek	CH190	32.14	32.5	1.12	0.694	0.777	-0.032	Plot 5
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SIM1,Liquid: Head

GSM 1900	Right Cheek	CH661	29.14	30.0	1.34	0.479	0.642	0.136	Plot 6
	Right Tilt	CH661	29.14	30.0	1.34	0.164	0.220	-0.127	Plot 7
	Left Cheek	CH661	29.14	30.0	1.34	0.725	0.972	-0.064	Plot 8
	Left Tilt	CH661	29.14	30.0	1.34	0.176	0.236	-0.103	Plot 9

SIM2,Liquid: Head

GSM 1900	Left Cheek	CH661	29.14	30.0	1.34	0.446	0.598	-0.020	Plot 10
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SIM1,Liquid: Head

WCDM A Band II	Right Cheek	CH9400	24.38	25.0	1.29	0.793	1.023	-0.024	Plot 11
	Right Tilt	CH9400	24.38	25.0	1.29	0.338	0.436	0.007	Plot 12
	Left Cheek	CH9262	24.16	25.0	1.41	0.911	1.285	0.036	Plot 13
	Left Cheek	CH9400	24.38	25.0	1.29	1.041	1.343	-0.034	Plot 14
	Left Cheek Repeat-1	CH9400	24.38	25.0	1.29	1.049	1.353	0.040	Plot 15
	Left Cheek	CH9538	24.30	25.0	1.33	0.905	1.204	0.038	Plot 16
	Left Tilt	CH9400	24.38	25.0	1.29	0.323	0.417	0.020	Plot 17



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SIM2,Liquid: Head

WCDM A Band II	Left Cheek	CH9400	24.38	25.0	1.29	0.798	1.029	-0.145	Plot 18
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Body

Test Case of Head			Meas. Power (dBm)	Target Power (dBm)	Fact or	Meas. SAR (W/kg) 1g Avg.	Scale SAR (W/kg)	Power Drift <±0.2 dB	Data Slot
Band	Test Position	CH							
Liquid: Body, Separator: 15mm									
GPRS 850	Worn-1Slot	CH190	32.12	32.5	1.12	0.798	0.894	0.048	Plot 19
	Worn-2Slot	CH190	31.43	31.7	1.09	0.735	0.801	0.039	Plot 20
	Worn-3Slot	CH190	29.42	30.0	1.22	0.783	0.955	0.027	Plot 21
	Worn-4Slot	CH128	27.69	28.5	1.33	0.751	0.999	0.014	Plot 22
	Worn-4Slot	CH190	27.85	28.5	1.26	0.803	1.012	0.061	Plot 23
	Worn-4Slot Repeat-1	CH190	27.85	28.5	1.26	0.814	1.026	0.014	Plot 24
	Worn-4Slot	CH251	27.13	28.5	1.64	0.735	1.205	0.021	Plot 25
	Front-4Slot	CH190	27.85	28.5	1.26	0.474	0.597	-0.044	Plot 26
	Worn with HS	CH190	32.14	32.5	1.12	0.538	0.603	-0.039	Plot 27
GPRS 1900	Worn-1Slot	CH661	29.21	30.0	1.31	0.268	0.351	0.026	Plot 28
	Worn-2Slot	CH661	29.14	29.0	1.09	0.461	0.502	-0.019	Plot 29
	Worn-3Slot	CH661	26.73	27.0	1.11	0.555	0.616	-0.004	Plot 30
	Worn-4Slot	CH661	24.67	25.5	1.39	0.599	0.833	-0.011	Plot 31
	Front-4Slot	CH661	24.67	25.5	1.39	0.558	0.776	-0.022	Plot 32
	Worn with HS	CH661	29.14	30.0	1.34	0.255	0.342	-0.055	Plot 33
HSDPA Band II	Worn	CH9400	24.38	25.0	1.29	0.552	0.712	0.015	Plot 34
	Front	CH9400	24.38	25.0	1.29	0.539	0.695	0.022	Plot 35
	Worn with HS	CH9400	24.38	25.0	1.29	0.524	0.676	0.028	Plot 36

Note:

- When the 1g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional.
- $0.8\text{W/kg} \leq \text{SAR}$ of WCDMA Band II ≤ 1.45 W/kg. The rate of Higher valve and lower valve is < 1.2 , So only 1 time repeat measurement is performed.
- $0.8\text{W/kg} \leq \text{SAR}$ of GPRS850 ≤ 1.45 W/kg. The rate of Higher valve and lower valve is < 1.2 , So only 1 time repeat measurement is performed.

**11. Equipment List:**

NO.	Instrument	Manufacture	Model	S/N	Cal. Date	Cal. Due Date
1	Communication Tester	Agilent	E5515C	MY50267264	Dec 27 th 2013	Dec 27 th 2014
2	E-field Probe	Speag	ES3DV3	3028	August 5 th 2013	August 4 th 2014
3	Dielectric Probe Kit	Speag	DAK 3.5mm Probe	1038	N/A	N/A
4	DAE	Speag	DAE4	689	July 20 th 2013	July 19 th 2014
5	SAM TWIN phantom	Speag	SAM	1360/1432	N/A	N/A
6	Robot	Stabuli	TX60L	N/A	N/A	N/A
7	Device Holder	Speag	SD000H01HA	N/A	N/A	N/A
8	Vector Network	Agilent	E5071C	MY46107615	Jan 6 th 2014	Jan 7 th 2015
9	Signal Generator	Agilent	E4438C	MY49072279	Nov 27 th 2013	Nov 27 th 2014
10	Amplifier	Mini-circuit	ZHL-42W	QA098002	N/A	N/A
11	Power Meter	Agilent	N1419A	MY50001563	Nov 27 th 2013	Nov 27 th 2014
12	Power Sensor	Agilent	N8481H	MY51020010	Nov 27 th 2013	Nov 27 th 2014
13	Directional Coupler	Agilent	772D	MY46151275	Nov 27 th 2013	Nov 27 th 2014
14	Directional Coupler	Agilent	778D	MY48220607	Nov 27 th 2013	Nov 27 th 2014
15	Dipole 835MHz	Speag	D835V2	4d154	Jun 6 th 2013	Jun 6 th 2015
16	Dipole 1900MHz	Speag	D1900V2	5d142	Jun 10 th 2013	Jun 10 th 2015

**Appendix A. System validation plots:****DUT: Dipole 835MHz; Type: D835V2; Serial: D835V2 - SN:4d154****Program Name: System Performance Check Head at 835 MHz**

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

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.91 \text{ mho/m}$; $\epsilon_r = 42.27$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.26, 6.26, 6.26); Calibrated: 8/5/2013
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn689; Calibrated: 7/20/2013
 - Phantom: SAM with TP1432; Type: SAM
 - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- d=10mm, Pin=250mW/Area Scan (61x61x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.59 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:

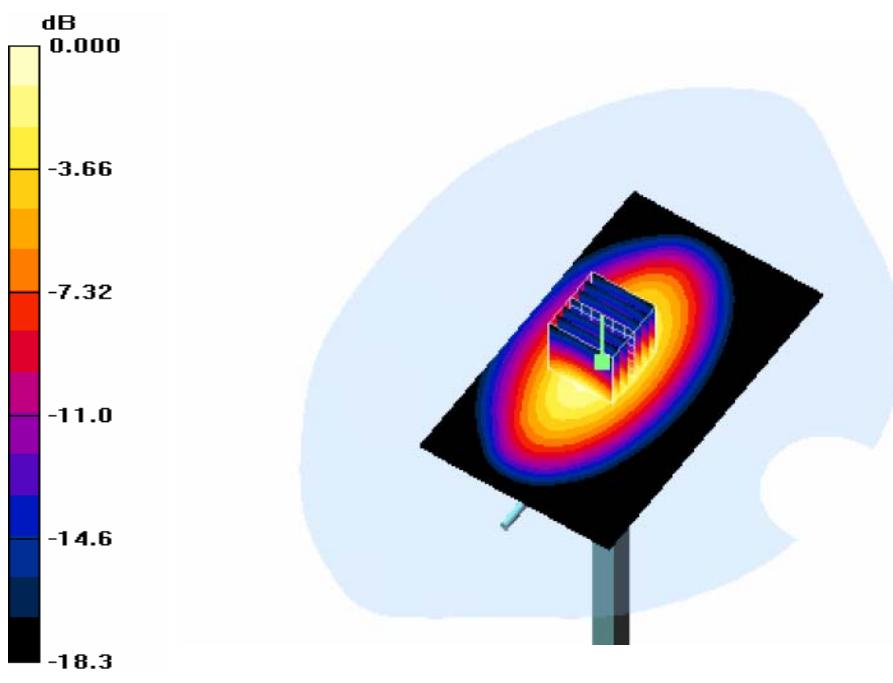
dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.7 V/m; Power Drift = -0.078dB

Peak SAR (extrapolated) = 3.8 W/kg

SAR(1 g) = 2.51 mW/g; SAR(10 g) = 1.64 mW/g

Maximum value of SAR (measured) = 2.71 mW/g





DUT: Dipole 835MHz; Type: D835V2; Serial: D835V2 - SN:4d154

Program Name: System Performance Check Body at 835 MHz

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

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 54.73$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.28, 6.28, 6.28); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=10mm, Pin=250mW/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 2.49 mW/g

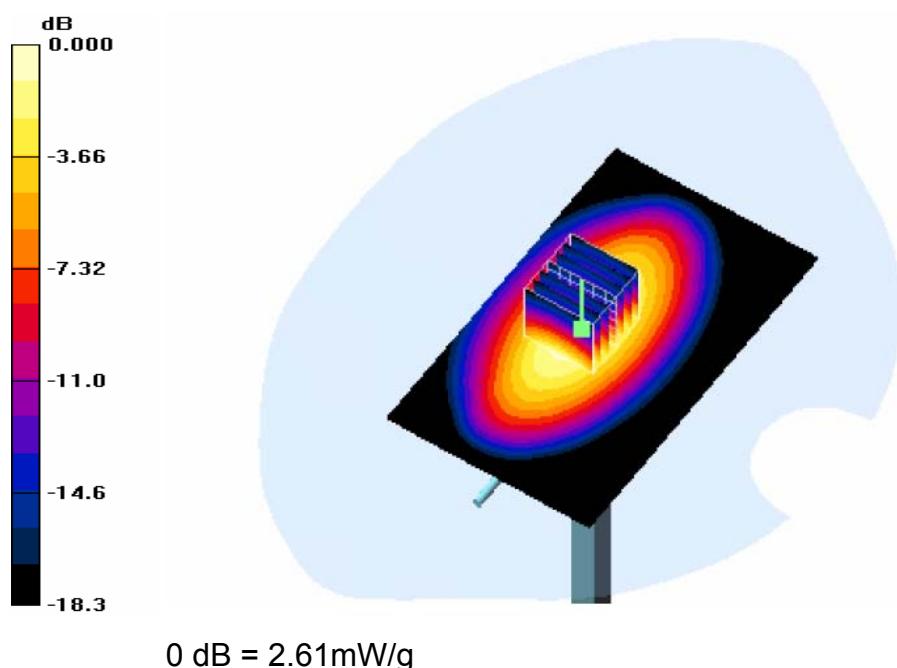
d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:
 $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 52.1 V/m; Power Drift = -0.027dB

Peak SAR (extrapolated) = 3.68 W/kg

SAR(1 g) = 2.42 mW/g; SAR(10 g) = 1.56 mW/g

Maximum value of SAR (measured) = 2.61 mW/g





DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d142

Program Name: System Performance Check Head at 1900 MHz

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

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.42 \text{ mho/m}$; $\epsilon_r = 39.27$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21,5.21,5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=15mm, Pin=250mW/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 11.1 mW/g

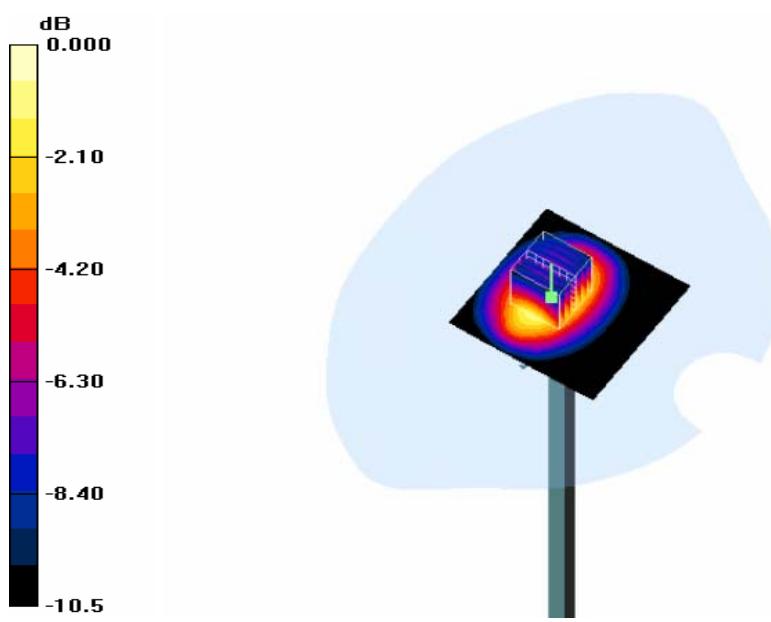
d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 90.8 V/m; Power Drift = -0.099dB

Peak SAR (extrapolated) = 20 W/kg

SAR(1 g) = 10.5 mW/g; SAR(10 g) = 5.36 mW/g

Maximum value of SAR (measured) = 12 mW/g



0 dB = 12mW/g



DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d142

Program Name: System Performance Check Body at 1900 MHz

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

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 52.45$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(4.96,4.96,4.96); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=15mm, Pin=250mW/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 12 mW/g

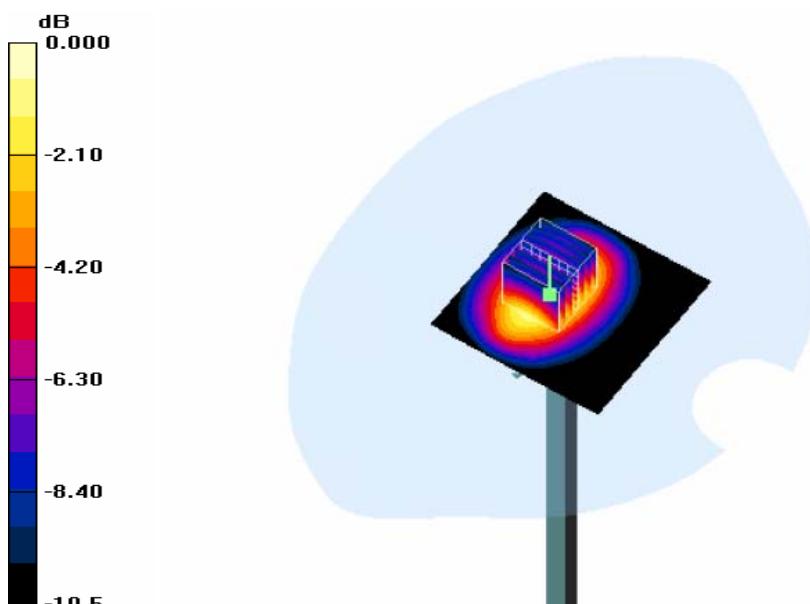
d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 88.6 V/m; Power Drift = 0.025dB

Peak SAR (extrapolated) = 19.7 W/kg

SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.4 mW/g

Maximum value of SAR (measured) = 12 mW/g



0 dB = 12mW/g

**Appendix B. SAR Test plots:**

Plot 1: 6/26/2014 7:11:55 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number**Program Name: TCB-723**

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.892 \text{ mho/m}$; $\epsilon_r = 41.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.26, 6.26, 6.26); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Right touch/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.630 mW/g

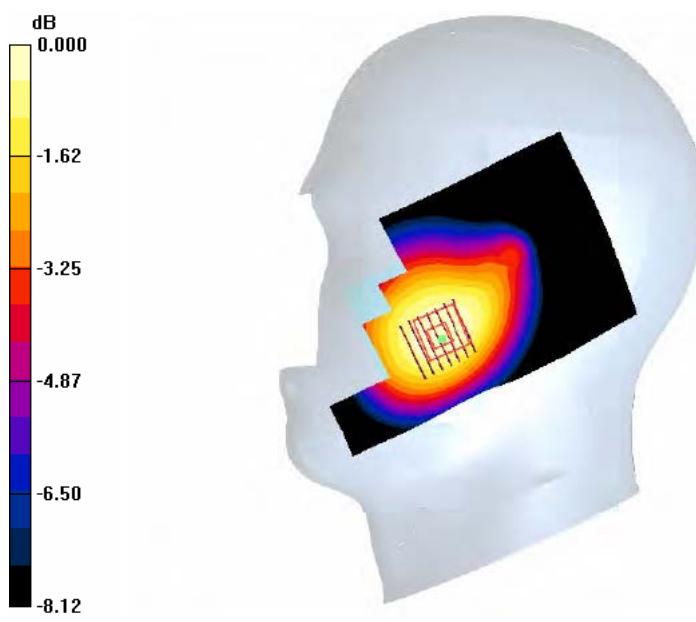
Right touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.83 V/m; Power Drift = -0.092 dB

Peak SAR (extrapolated) = 0.730 W/kg

SAR(1 g) = 0.593 mW/g; SAR(10 g) = 0.452 mW/g

Maximum value of SAR (measured) = 0.625 mW/g



0 dB = 0.625mW/g



Plot 2: Date/Time: 6/26/2014 7:45:04 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.892 \text{ mho/m}$; $\epsilon_r = 41.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.26, 6.26, 6.26); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Right tilt/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.365 mW/g

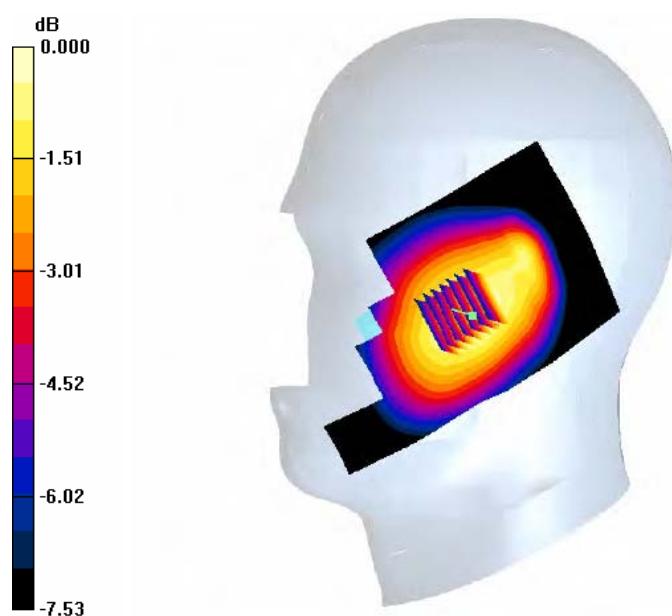
Right tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.9 V/m; Power Drift = -0.029 dB

Peak SAR (extrapolated) = 0.422 W/kg

SAR(1 g) = 0.353 mW/g; SAR(10 g) = 0.277 mW/g

Maximum value of SAR (measured) = 0.374 mW/g



0 dB = 0.374mW/g



Plot 3: Date/Time: 6/26/2014 8:22:00 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.892 \text{ mho/m}$; $\epsilon_r = 41.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.26, 6.26, 6.26); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left touch/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.760 mW/g

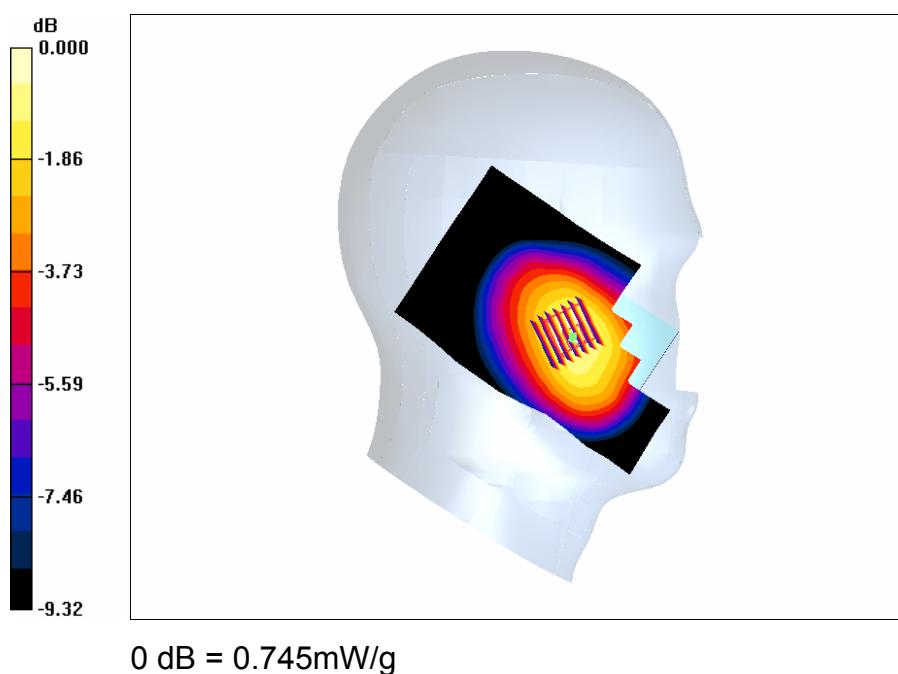
Left touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 13.5 V/m; Power Drift = -0.0164 dB

Peak SAR (extrapolated) = 0.930 W/kg

SAR(1 g) = 0.685 mW/g; SAR(10 g) = 0.497 mW/g

Maximum value of SAR (measured) = 0.745 mW/g





Plot 4: Date/Time: 6/26/2014 8:45:55 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.892 \text{ mho/m}$; $\epsilon_r = 41.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.26, 6.26, 6.26); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left tilt/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.367 mW/g

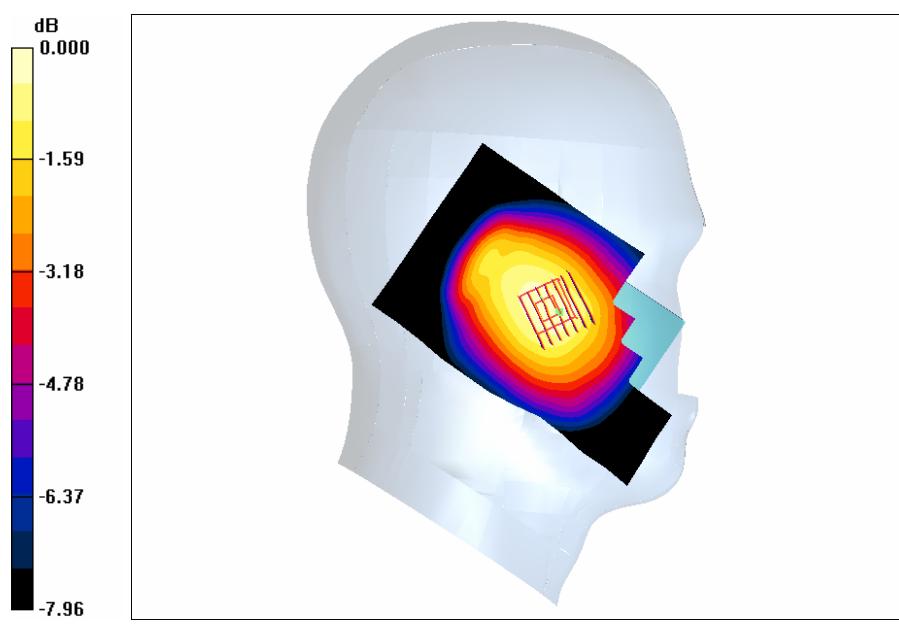
Left tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.4 V/m; Power Drift = -0.046 dB

Peak SAR (extrapolated) = 0.438 W/kg

SAR(1 g) = 0.361 mW/g; SAR(10 g) = 0.285 mW/g

Maximum value of SAR (measured) = 0.379 mW/g





Plot 5: 6/26/2014 9:20:57 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.892 \text{ mho/m}$; $\epsilon_r = 41.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.26, 6.26, 6.26); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;

- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left touch SIM2/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.759 mW/g

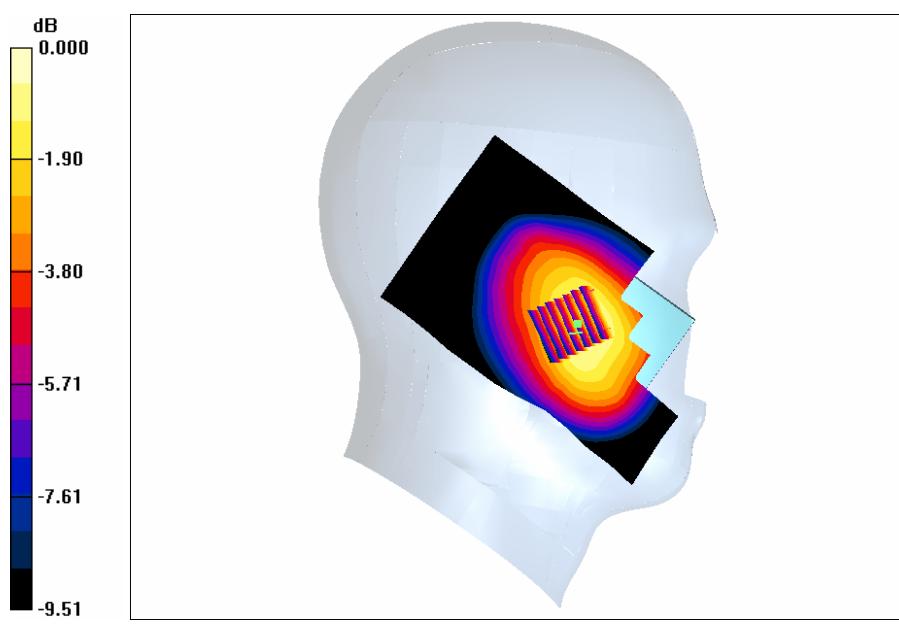
Left touch SIM2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.9 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 0.970 W/kg

SAR(1 g) = 0.694 mW/g; SAR(10 g) = 0.499 mW/g

Maximum value of SAR (measured) = 0.739 mW/g



0 dB = 0.739mW/g



Plot 6: Date/Time: 6/26/2014 9:43:35 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Right touch/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.515 mW/g

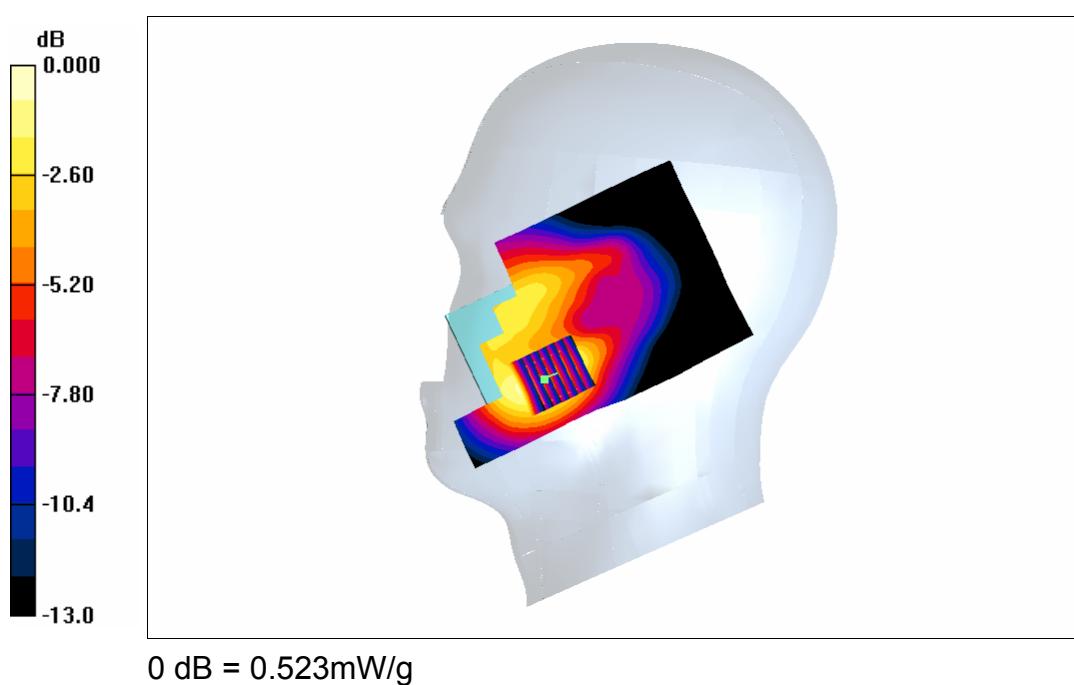
Right touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 7.28 V/m; Power Drift = 0.136 dB

Peak SAR (extrapolated) = 0.677 W/kg

SAR(1 g) = 0.479 mW/g; SAR(10 g) = 0.295 mW/g

Maximum value of SAR (measured) = 0.523 mW/g





Plot 7: Date/Time: 6/26/2014 10:10:14 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Right tilt/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.181 mW/g

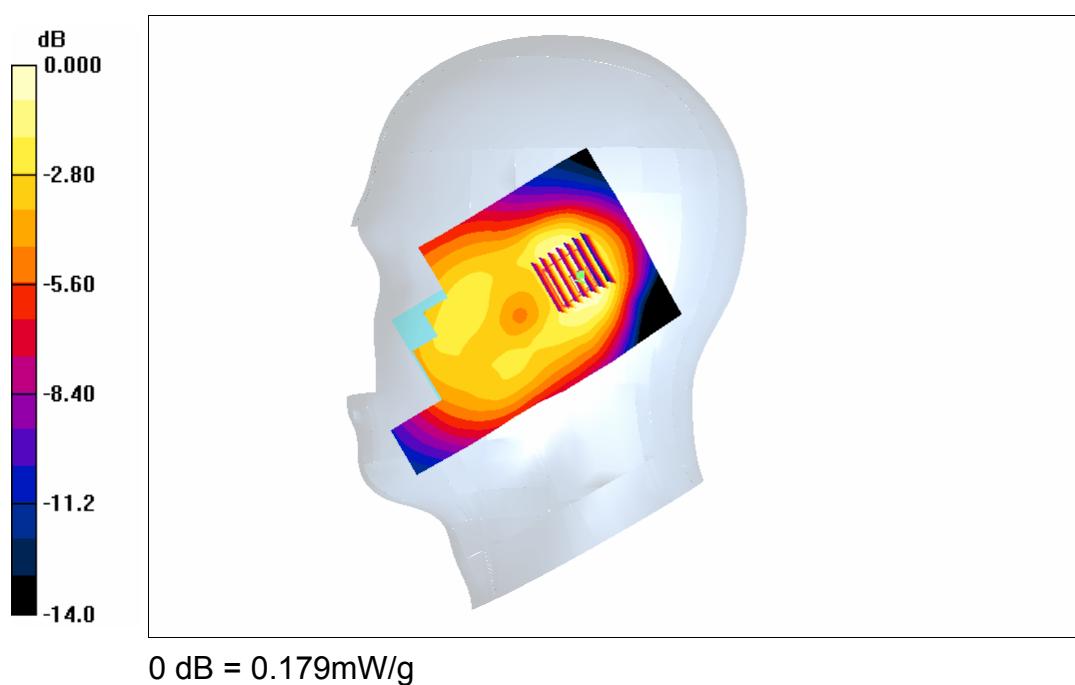
Right tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.5 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 0.225 W/kg

SAR(1 g) = 0.164 mW/g; SAR(10 g) = 0.111 mW/g

Maximum value of SAR (measured) = 0.179 mW/g





Plot 8: Date/Time: 6/26/2014 10:28:24 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;

- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left touch/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.765 mW/g

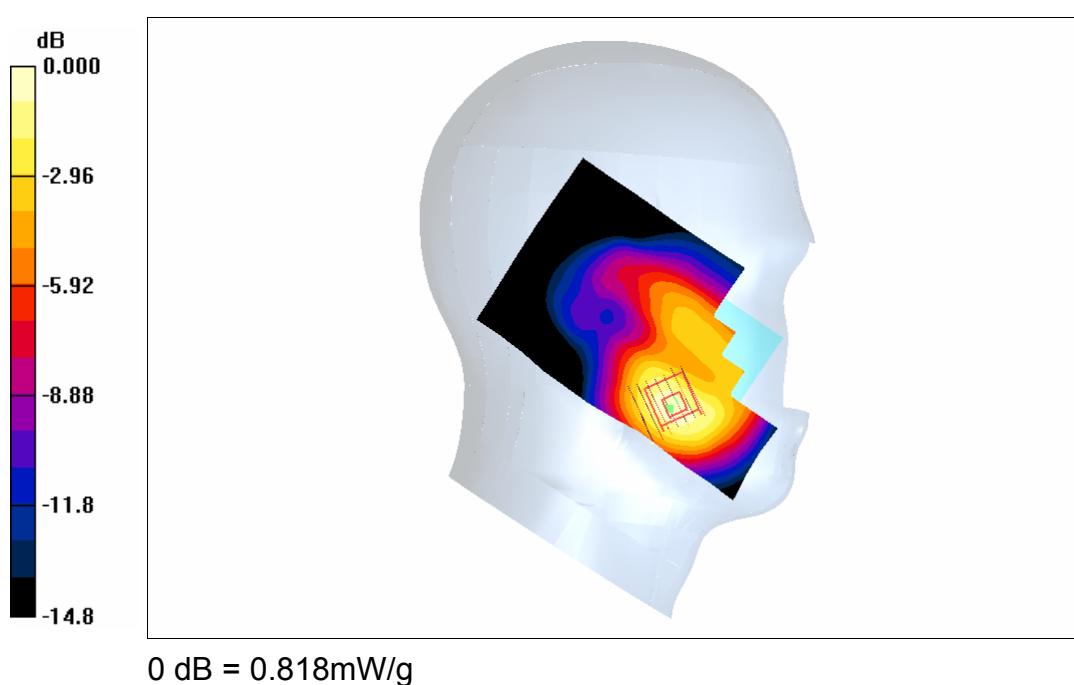
Left touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 7.60 V/m; Power Drift = -0.064 dB

Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.725 mW/g; SAR(10 g) = 0.422 mW/g

Maximum value of SAR (measured) = 0.818 mW/g





Plot 9: Date/Time: 6/26/2014 10:34:07 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left tilt/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.187 mW/g

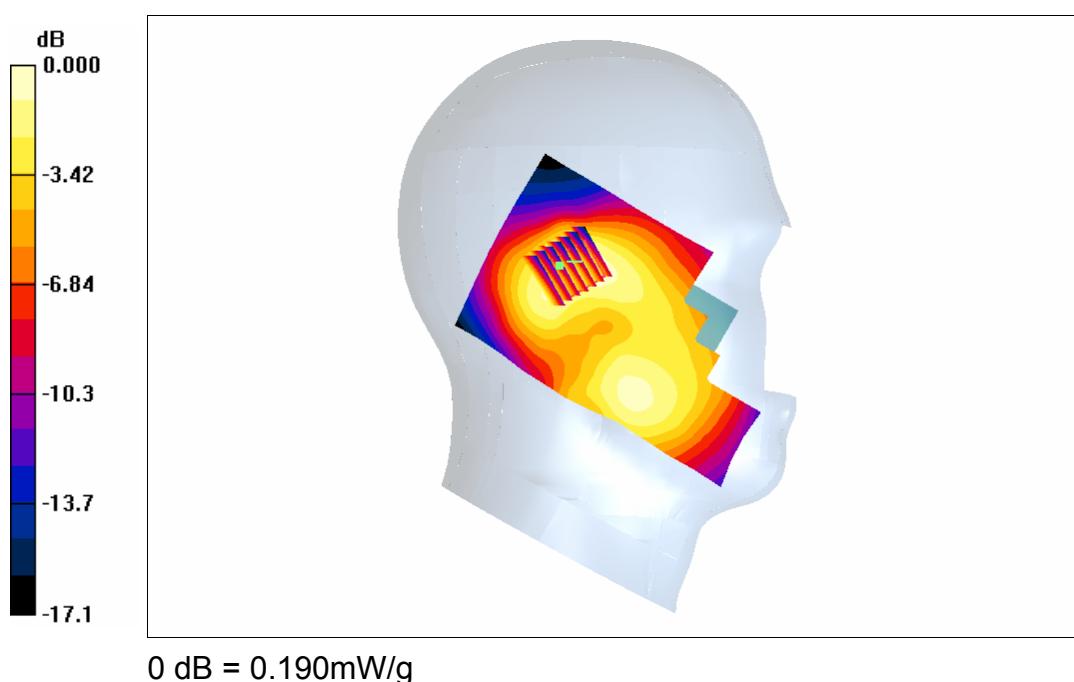
Left tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.7 V/m; Power Drift = -0.103 dB

Peak SAR (extrapolated) = 0.283 W/kg

SAR(1 g) = 0.176 mW/g; SAR(10 g) = 0.114 mW/g

Maximum value of SAR (measured) = 0.190 mW/g





Plot 10: Date/Time: 6/26/2014 10:58:07 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM; Serial:
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left touch -SIM2/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.485 mW/g

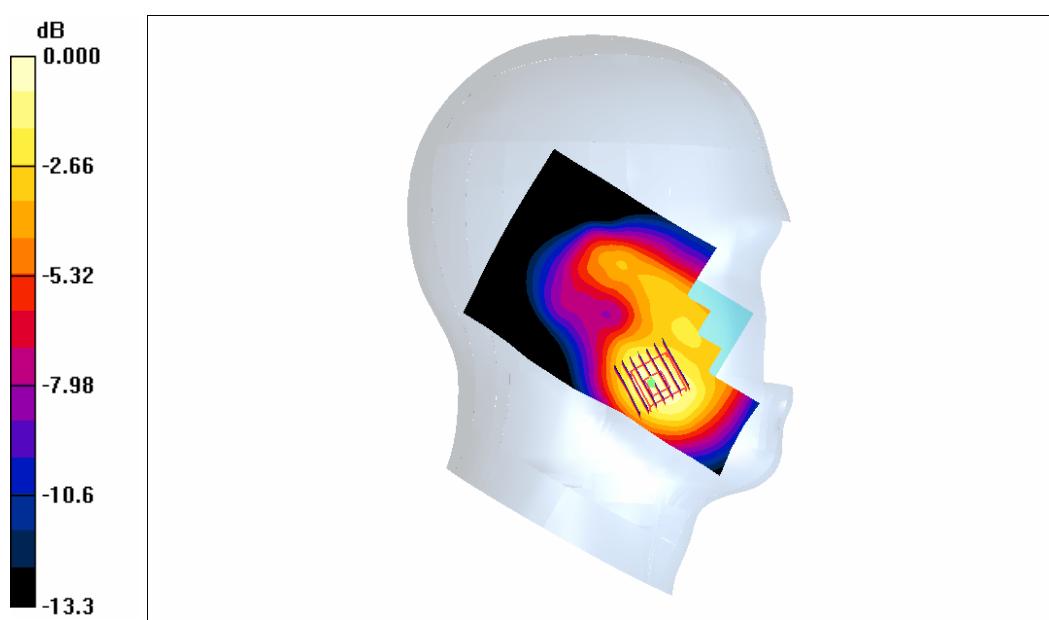
Left touch -SIM2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 7.10 V/m; Power Drift = -0.021 dB

Peak SAR (extrapolated) = 0.629 W/kg

SAR(1 g) = 0.446 mW/g; SAR(10 g) = 0.280 mW/g

Maximum value of SAR (measured) = 0.495 mW/g



0 dB = 0.495mW/g



Plot 11: Date/Time: 6/26/2014 11:18:22 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: W1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Right touch/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.36 mW/g

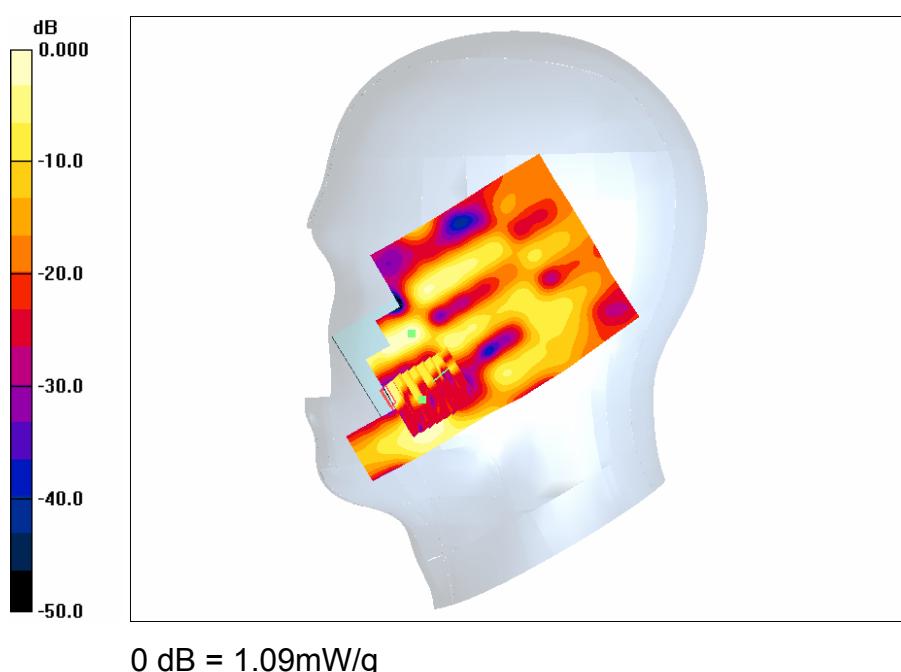
Right touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 1.13 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 1.93 W/kg

SAR(1 g) = 0.793 mW/g; SAR(10 g) = 0.268 mW/g

Maximum value of SAR (measured) = 1.09 mW/g





Plot 12: Date/Time: 6/26/2014 11:24:01 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: W1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;

- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Right tilt/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.379 mW/g

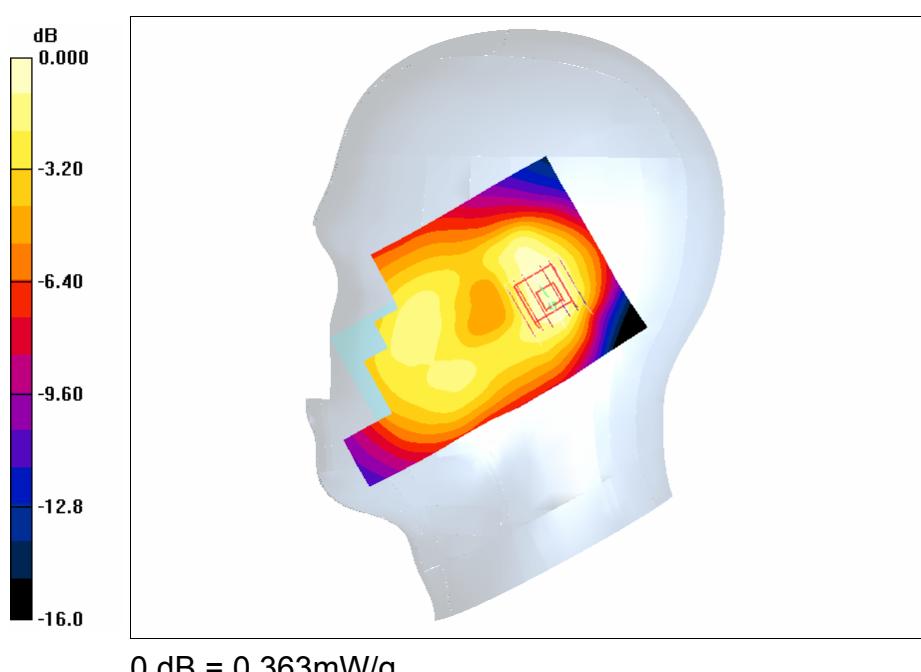
Right tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 16.2 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 0.458 W/kg

SAR(1 g) = 0.338 mW/g; SAR(10 g) = 0.222 mW/g

Maximum value of SAR (measured) = 0.363 mW/g





Plot 13: Date/Time: 6/26/2014 11:46:01 AM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: W1900; Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³ Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left touch 2/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.988 mW/g

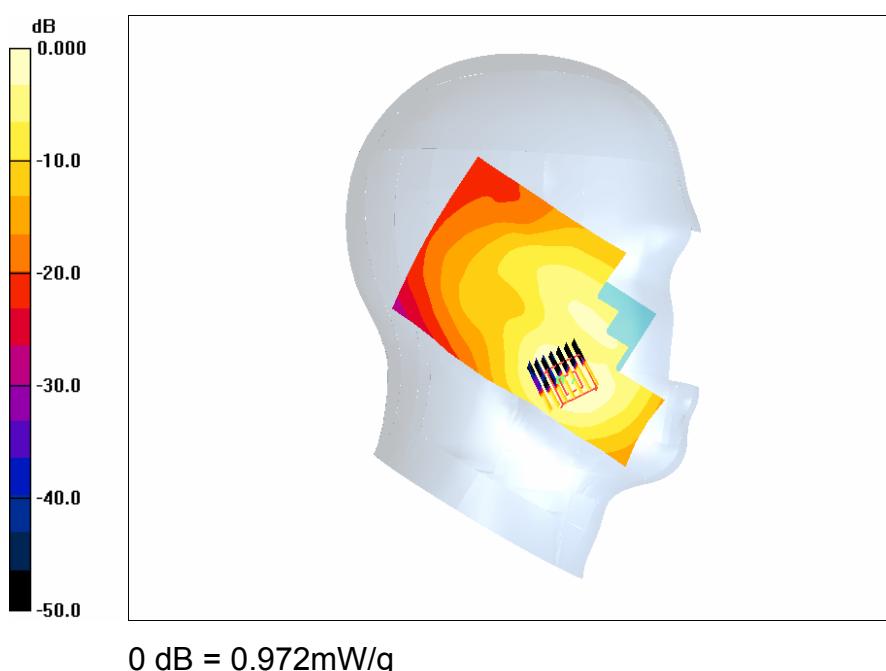
Left touch 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.19 V/m; Power Drift = 0.036 dB

Peak SAR (extrapolated) = 1.94 W/kg

SAR(1 g) = 0.911 mW/g; SAR(10 g) = 0.373 mW/g

Maximum value of SAR (measured) = 0.972 mW/g





Plot 14: Date/Time: 6/26/2014 12:10:01 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: W1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;

- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left touch/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.31 mW/g

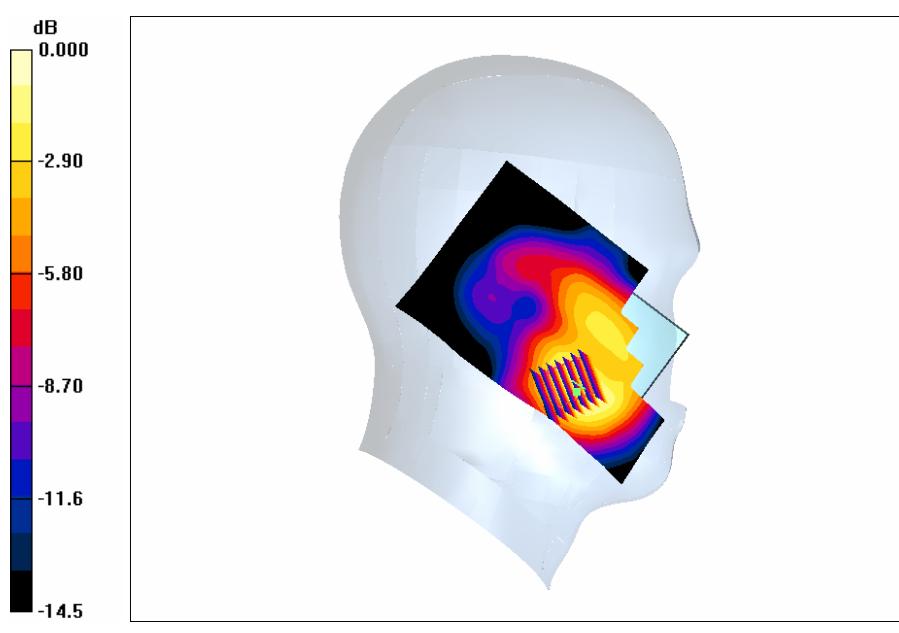
Left touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.4 V/m; Power Drift = -0.034 dB

Peak SAR (extrapolated) = 1.78 W/kg

SAR(1 g) = 1.041 mW/g; SAR(10 g) = 0.638 mW/g

Maximum value of SAR (measured) = 1.16 mW/g



0 dB = 1.16mW/g



Plot 15: Date/Time: 6/26/2014 12:22:21 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: W1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.43 \text{ mho/m}$; $\epsilon_r = 40.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left touch/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.20 mW/g

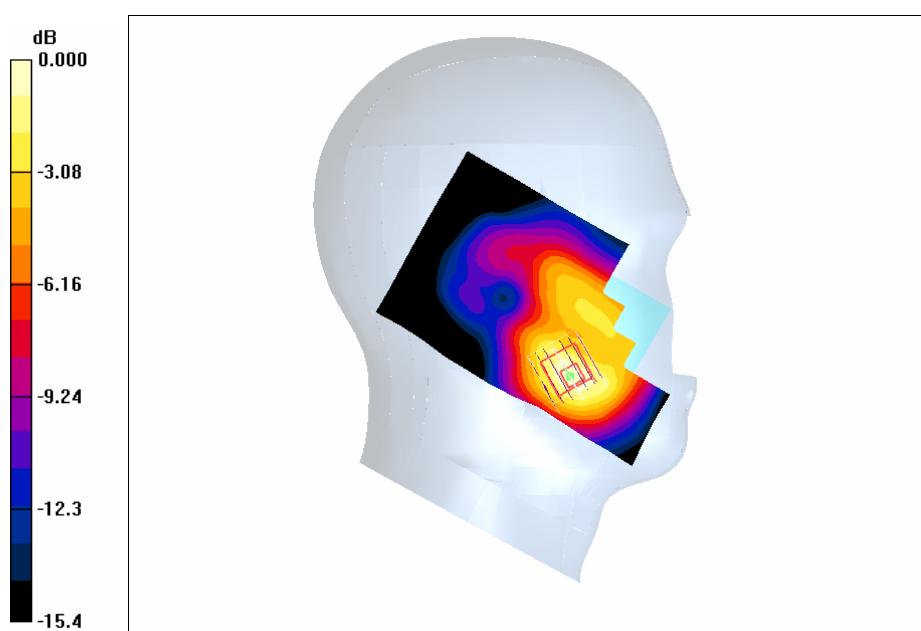
Left touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.0 V/m; Power Drift = -0.040 dB

Peak SAR (extrapolated) = 1.95 W/kg

SAR(1 g) = 1.049 mW/g; SAR(10 g) = 0.703 mW/g

Maximum value of SAR (measured) = 1.180 mW/g



0 dB = 1.180mW/g



Plot 16: Date/Time: 6/26/2014 12:36:21 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: W1900; Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1908 \text{ MHz}$; $\sigma = 1.43 \text{ mho/m}$; $\epsilon_r = 40.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;

- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left touch/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.12 mW/g

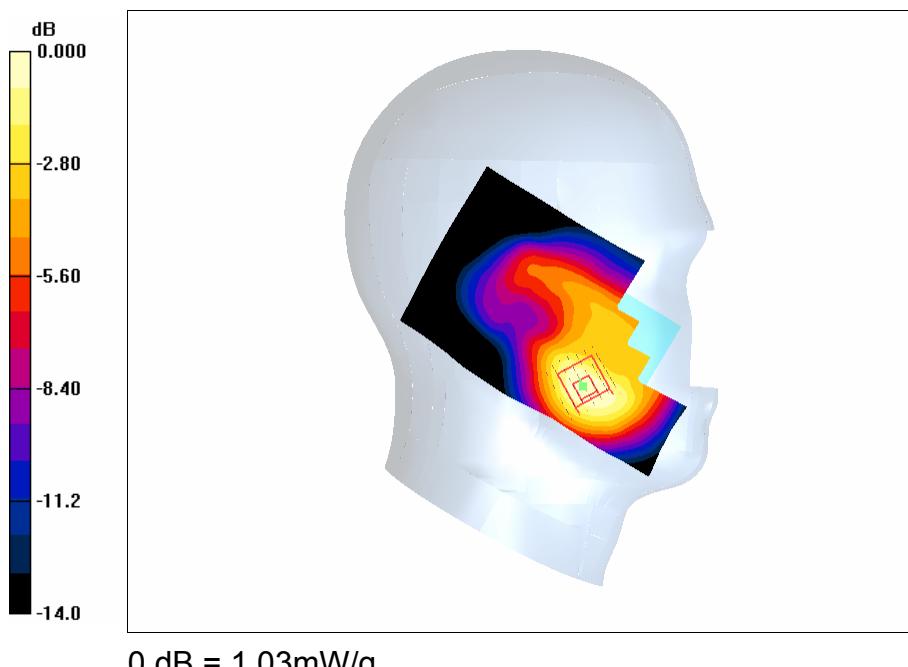
Left touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.8 V/m; Power Drift = 0.037 dB

Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.905 mW/g; SAR(10 g) = 0.458 mW/g

Maximum value of SAR (measured) = 1.03 mW/g





Plot 17: Date/Time: 6/26/2014 12:52:21 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: W1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;

- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left tilt/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.598 mW/g

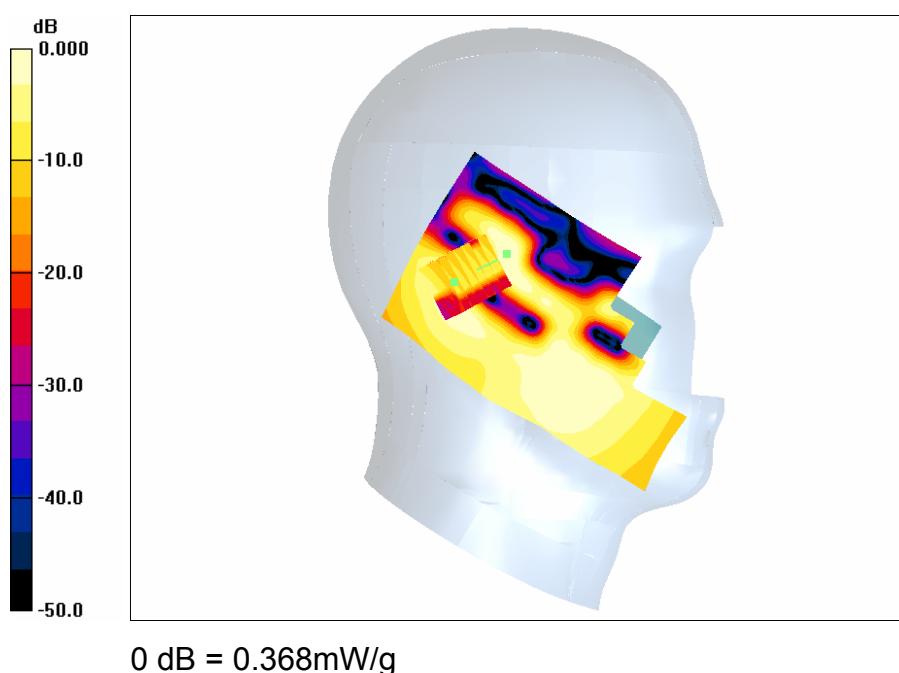
Left tilt/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 16.8 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 0.512 W/kg

SAR(1 g) = 0.323 mW/g; SAR(10 g) = 0.168 mW/g

Maximum value of SAR (measured) = 0.368 mW/g





Plot 18: Date/Time: 6/26/2014 13:18:11 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: W1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(5.21, 5.21, 5.21); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left touch/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.51 mW/g

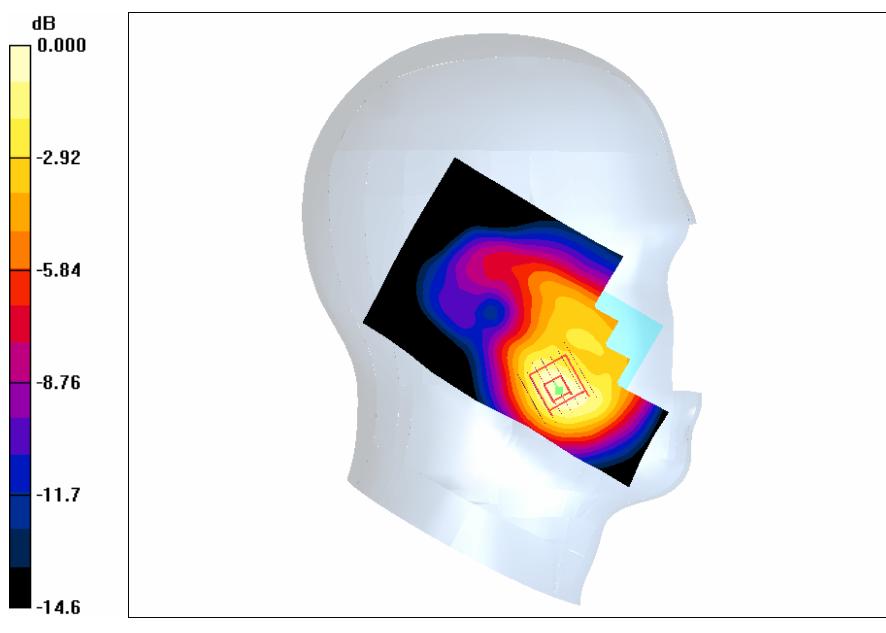
Left touch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.2 V/m; Power Drift = -0.145 dB

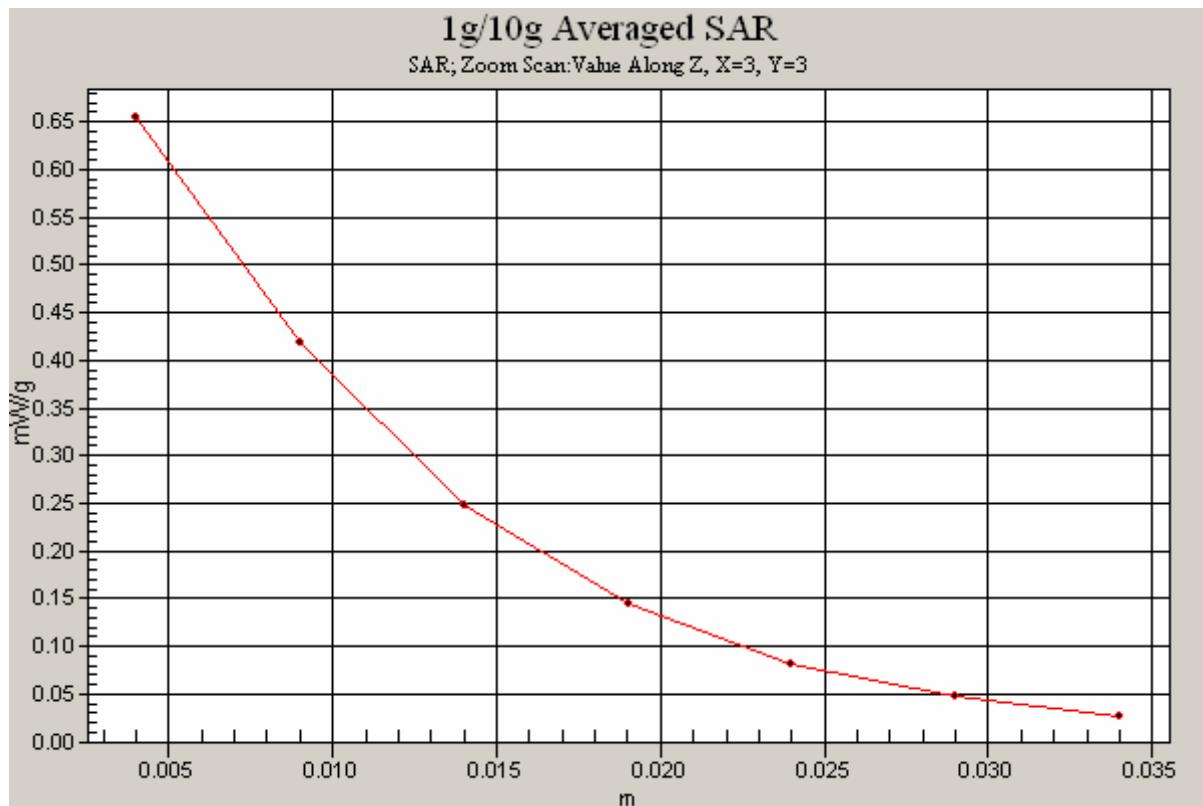
Peak SAR (extrapolated) = 1.89 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.601 mW/g

Maximum value of SAR (measured) = 1.51 mW/g



0 dB = 1.51mW/g





Plot 19: Date/Time: 6/26/2014 14:17:28 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS850; Frequency: 836.6 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.992 \text{ mho/m}$; $\epsilon_r = 55.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.28, 6.28, 6.28); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;

- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn 1slot/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.840 mW/g

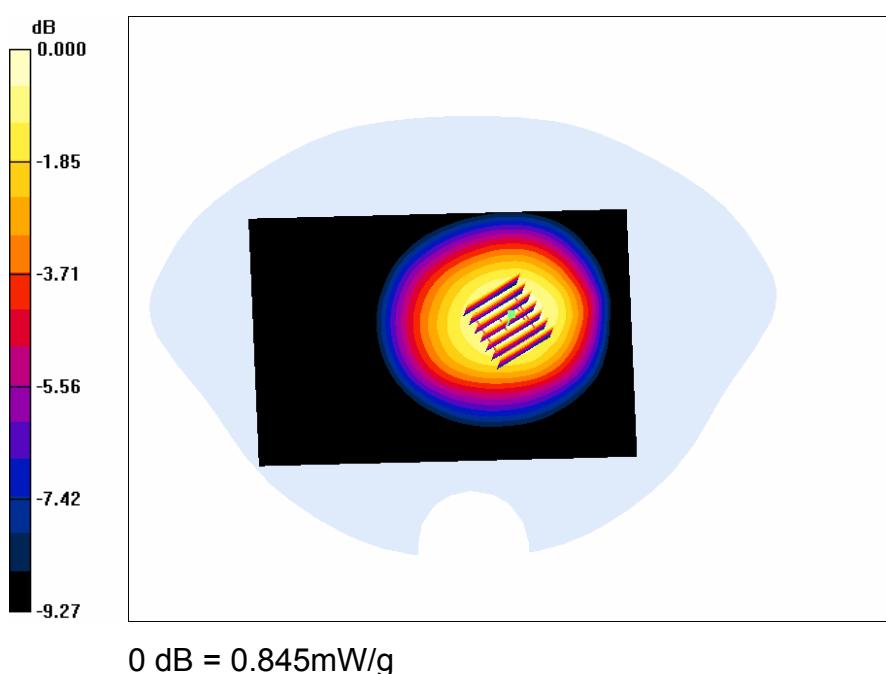
Worn 1slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 25.7 V/m; Power Drift = 0.048 dB

Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.798 mW/g; SAR(10 g) = 0.589 mW/g

Maximum value of SAR (measured) = 0.845 mW/g





Plot 20: Date/Time: 6/26/2014 14:26:28 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS850; Frequency: 836.6 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.992 \text{ mho/m}$; $\epsilon_r = 55.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.28, 6.28, 6.28); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;

- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn 2slot/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.769 mW/g

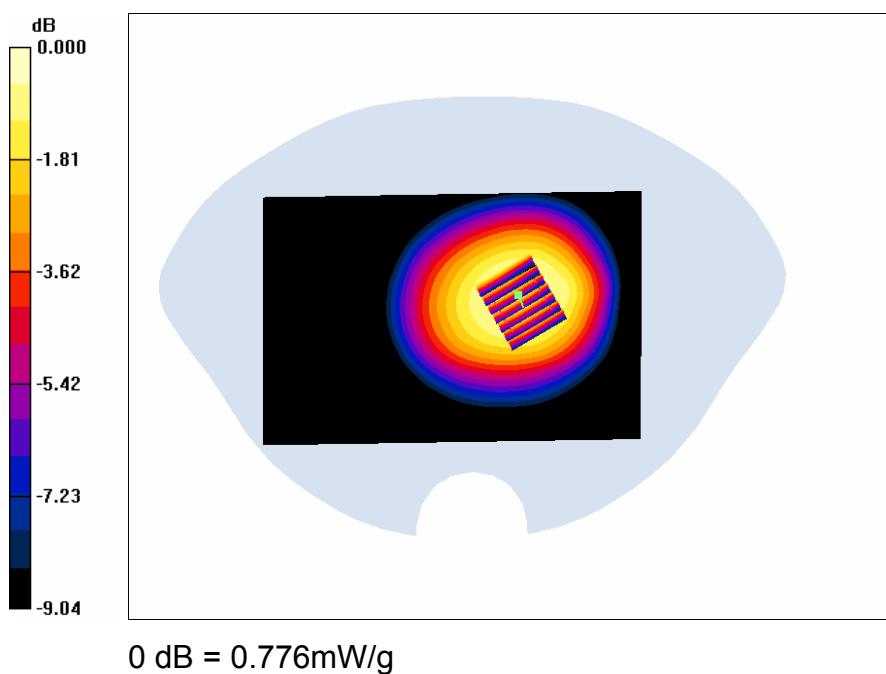
Worn 2slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 24.8 V/m; Power Drift = 0.039 dB

Peak SAR (extrapolated) = 0.930 W/kg

SAR(1 g) = 0.735 mW/g; SAR(10 g) = 0.548 mW/g

Maximum value of SAR (measured) = 0.776 mW/g





Plot 21: Date/Time: 6/26/2014 14:41:11 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS850; Frequency: 836.6 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.992 \text{ mho/m}$; $\epsilon_r = 55.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.28, 6.28, 6.28); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn 3slot/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.816 mW/g

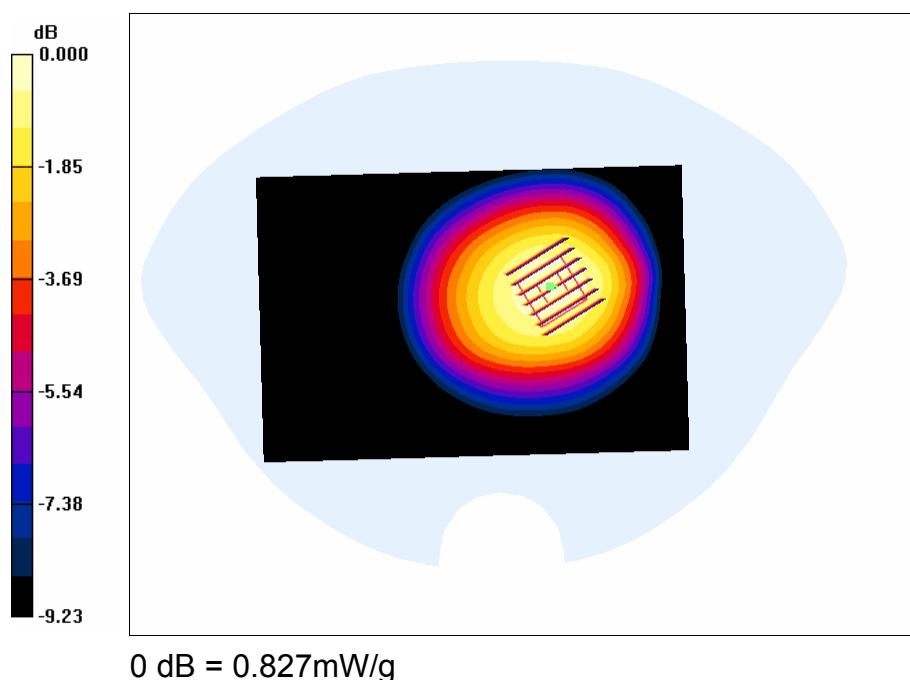
Worn 3slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 25.5 V/m; Power Drift = 0.027 dB

Peak SAR (extrapolated) = 1.00 W/kg

SAR(1 g) = 0.783 mW/g; SAR(10 g) = 0.578 mW/g

Maximum value of SAR (measured) = 0.827 mW/g





Plot 22: Date/Time: 6/26/2014 15:09:21 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS850; Frequency: 824.2 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 825 \text{ MHz}$; $\sigma = 0.992 \text{ mho/m}$; $\epsilon_r = 55.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.28, 6.28, 6.28); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn 4slot/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.978 mW/g

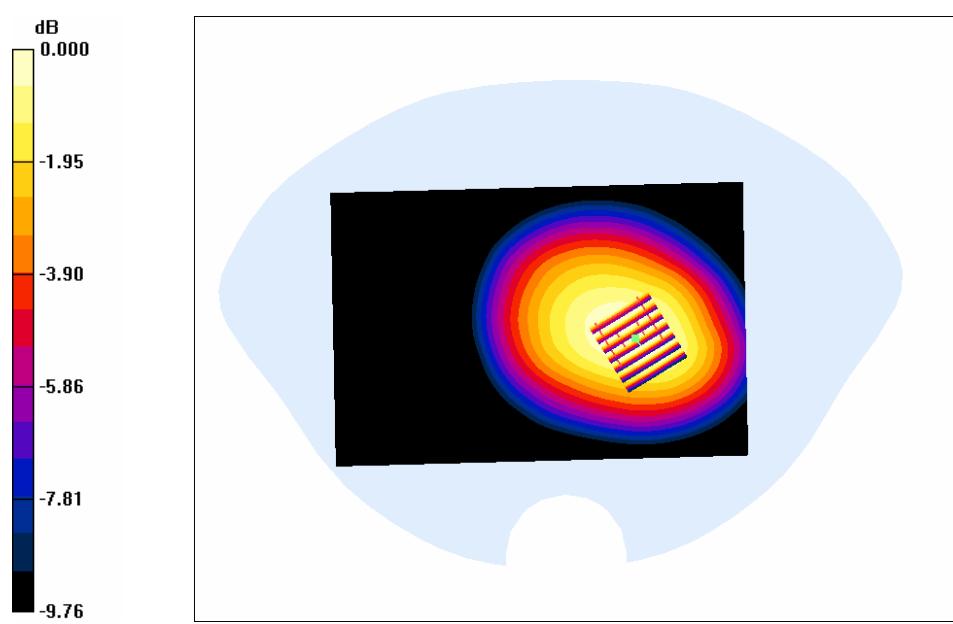
Worn 4slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 24.9 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 0.970 W/kg

SAR(1 g) = 0.751 mW/g; SAR(10 g) = 0.526 mW/g

Maximum value of SAR (measured) = 0.866 mW/g





Plot 23: Date/Time: 6/26/2014 15:22:10 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS850; Frequency: 836.6 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.992 \text{ mho/m}$; $\epsilon_r = 55.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.28, 6.28, 6.28); Calibrated: 8/5/2013
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn689; Calibrated: 7/20/2013
 - Phantom: SAM with TP1432; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn 4slot/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.832 mW/g

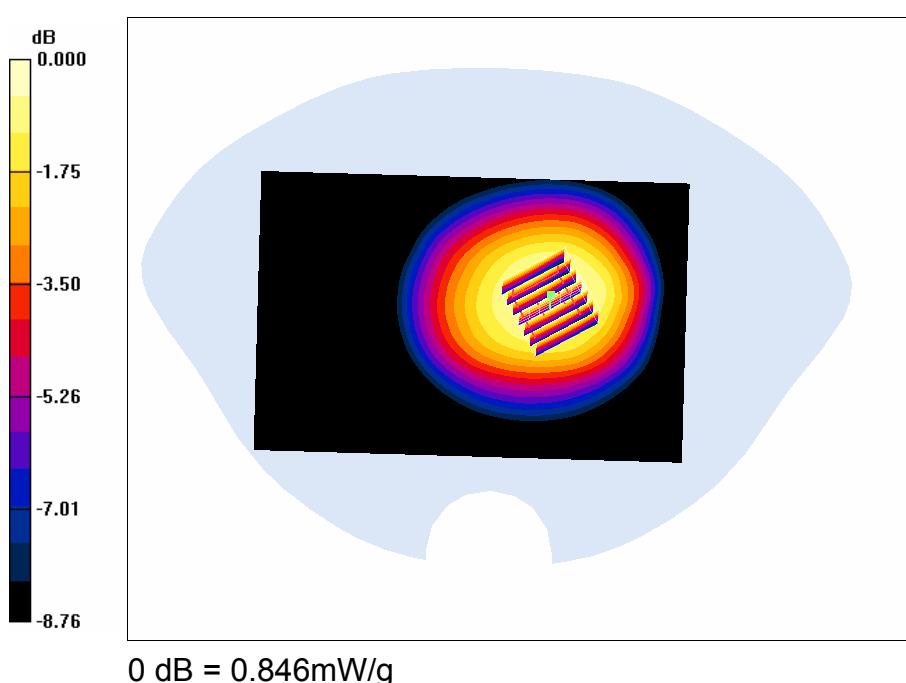
Worn 4slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 25.9 V/m; Power Drift = 0.061 dB

Peak SAR (extrapolated) = 0.988 W/kg

SAR(1 g) = 0.803 mW/g; SAR(10 g) = 0.605 mW/g

Maximum value of SAR (measured) = 0.846 mW/g





Plot 24: Date/Time: 6/26/2014 15:42:32 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS850; Frequency: 836.6 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.992 \text{ mho/m}$; $\epsilon_r = 55.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.28, 6.28, 6.28); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn 4slot/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.920 mW/g

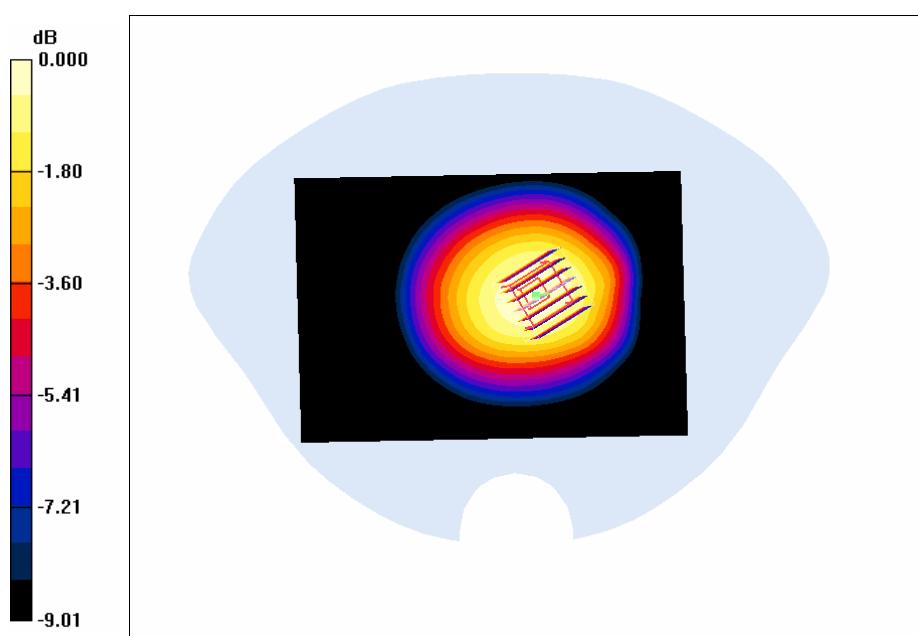
Worn 4slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 30.5 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 1.10 W/kg

SAR(1 g) = 0.814 mW/g; SAR(10 g) = 0.652 mW/g

Maximum value of SAR (measured) = 0.924 mW/g



$$0 \text{ dB} = 0.924 \text{ mW/g}$$



Plot 25: Date/Time: 6/26/2014 15:58:12 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS850; Frequency: 848.8 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 850 \text{ MHz}$; $\sigma = 0.992 \text{ mho/m}$; $\epsilon_r = 55.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.28, 6.28, 6.28); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn 4slot /Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.908 mW/g

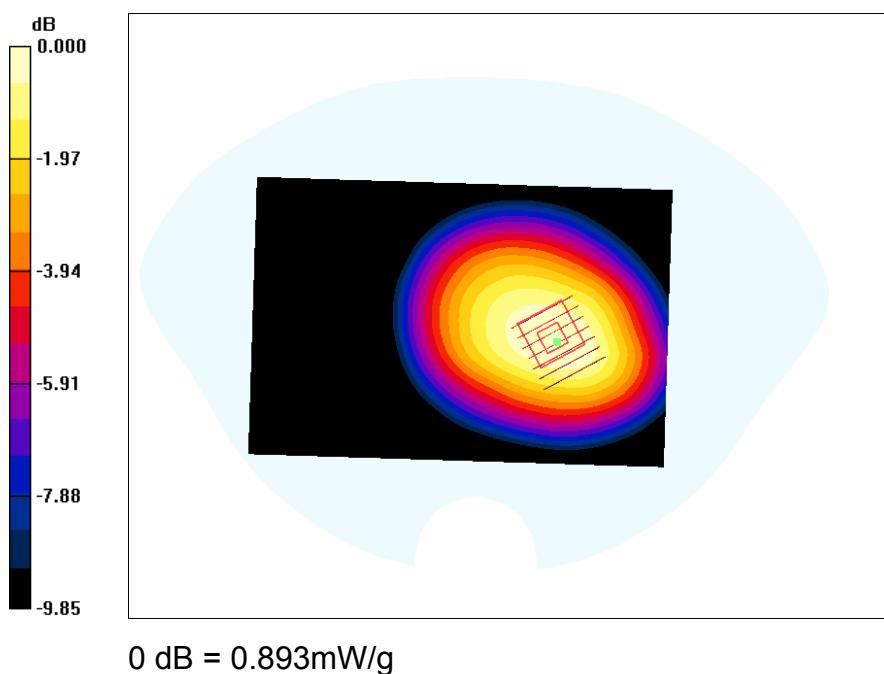
Worn 4slot /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 24.4 V/m; Power Drift = -0.021 dB

Peak SAR (extrapolated) = 0.907 W/kg

SAR(1 g) = 0.735 mW/g; SAR(10 g) = 0.545 mW/g

Maximum value of SAR (measured) = 0.893 mW/g





Plot 26: Date/Time: 6/26/2014 16:15:41 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS850; Frequency: 836.6 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.992 \text{ mho/m}$; $\epsilon_r = 55.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.28, 6.28, 6.28); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Front 4slot/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.513 mW/g

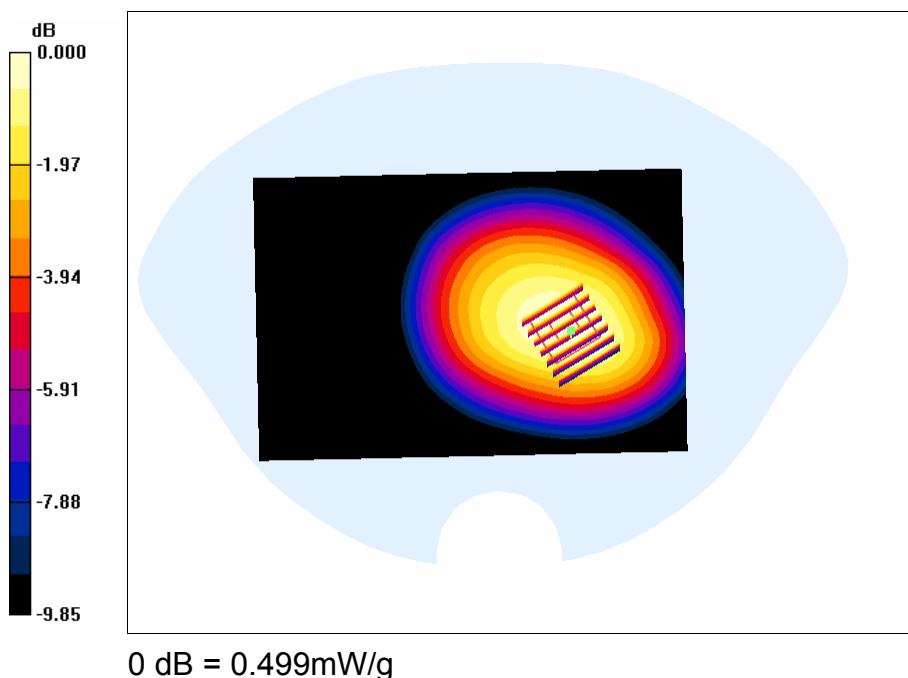
Front 4slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.5 V/m; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 0.612 W/kg

SAR(1 g) = 0.474 mW/g; SAR(10 g) = 0.349 mW/g

Maximum value of SAR (measured) = 0.499 mW/g





Plot 27: Date/Time: 6/26/2014 16:26:01 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.992 \text{ mho/m}$; $\epsilon_r = 55.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(6.28, 6.28, 6.28); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1432; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn -HS/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.566 mW/g

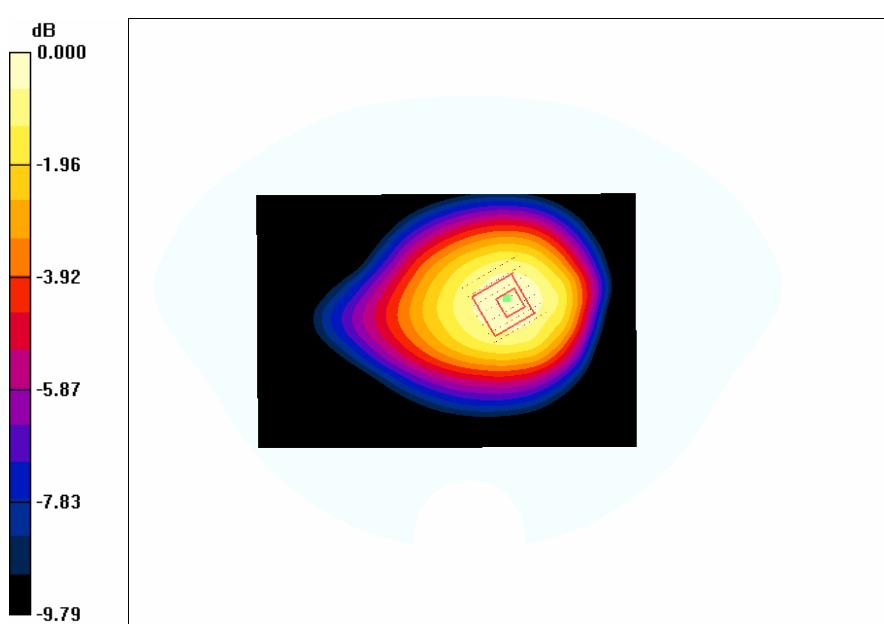
Worn -HS/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 21.9 V/m; Power Drift = -0.039 dB

Peak SAR (extrapolated) = 0.697 W/kg

SAR(1 g) = 0.538 mW/g; SAR(10 g) = 0.393 mW/g

Maximum value of SAR (measured) = 0.568 mW/g



0 dB = 0.568mW/g



Plot 28: Date/Time: 6/26/2014 16:45:31 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS1900; Frequency: 1880 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 53.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(4.96, 4.96, 4.96); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn 1slot/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.293 mW/g

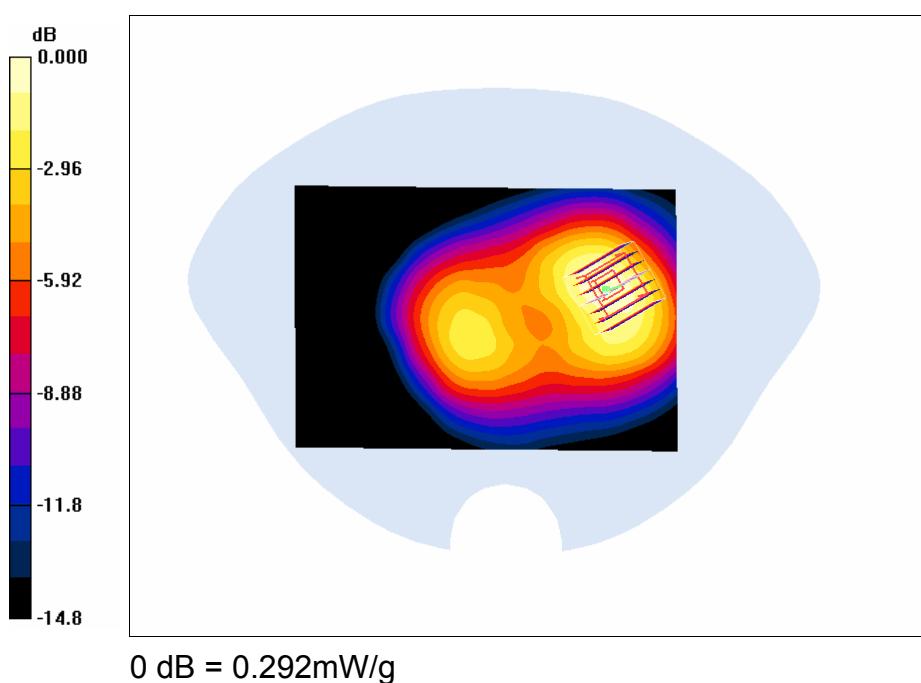
Worn 1slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.88 V/m; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 0.390 W/kg

SAR(1 g) = 0.268 mW/g; SAR(10 g) = 0.165 mW/g

Maximum value of SAR (measured) = 0.292 mW/g





Plot 29: Date/Time: 6/26/2014 16:58:11 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS1900; Frequency: 1880 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 53.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(4.96, 4.96, 4.96); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn 2slot/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.517 mW/g

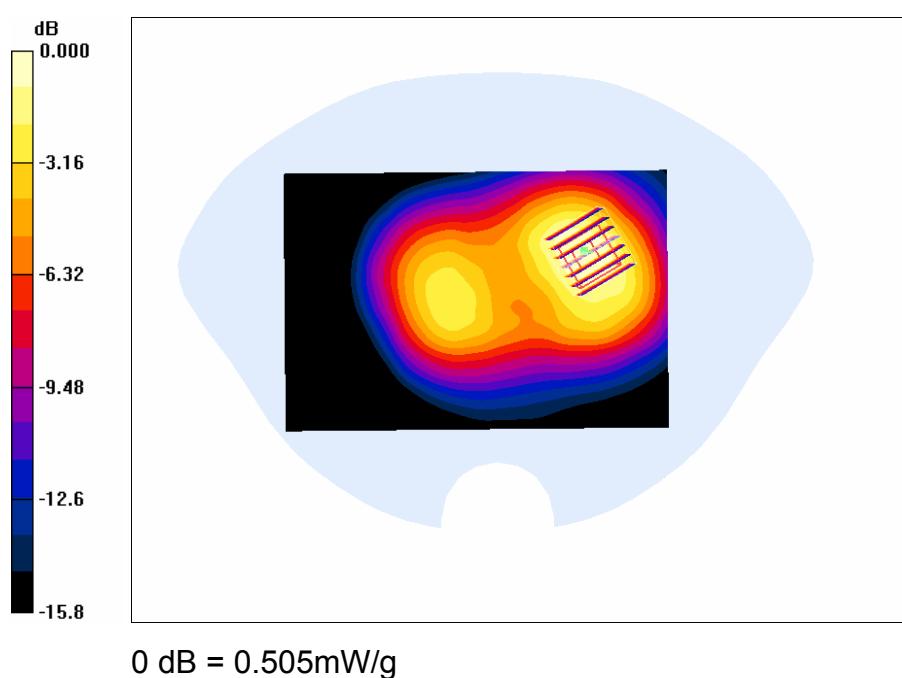
Worn 2slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.2 V/m; Power Drift = -0.019 dB

Peak SAR (extrapolated) = 0.687 W/kg

SAR(1 g) = 0.461 mW/g; SAR(10 g) = 0.282 mW/g

Maximum value of SAR (measured) = 0.505 mW/g





Plot 30: Date/Time: 6/26/2014 17:12:31 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS1900; Frequency: 1880 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 53.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(4.96, 4.96, 4.96); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn 3slot/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.609 mW/g

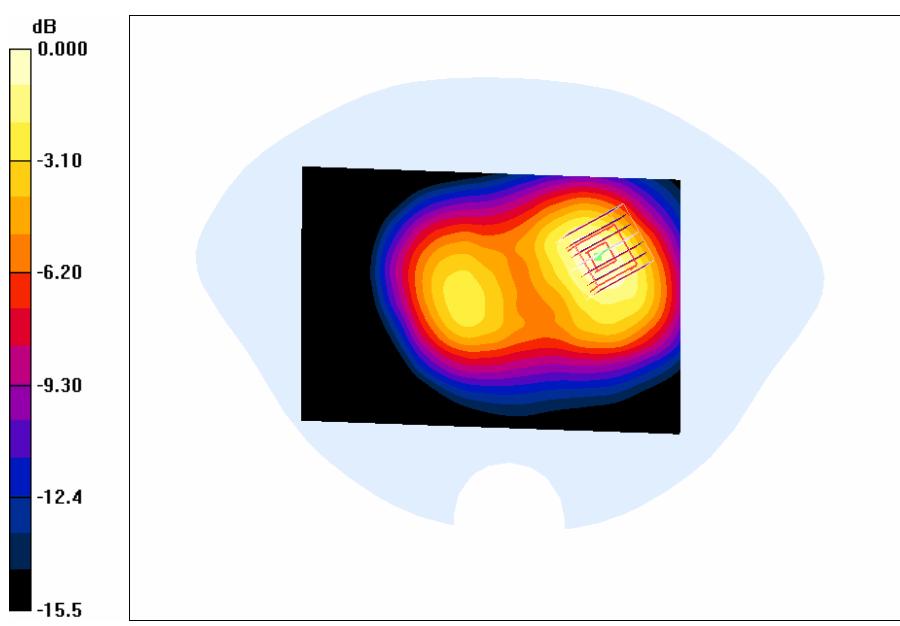
Worn 3slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.0 V/m; Power Drift = -0.004 dB

Peak SAR (extrapolated) = 0.836 W/kg

SAR(1 g) = 0.555 mW/g; SAR(10 g) = 0.338 mW/g

Maximum value of SAR (measured) = 0.612 mW/g





Plot 31: Date/Time: 6/26/2014 17:28:25 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS1900; Frequency: 1880 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 53.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(4.96, 4.96, 4.96); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn 4slot/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.664 mW/g

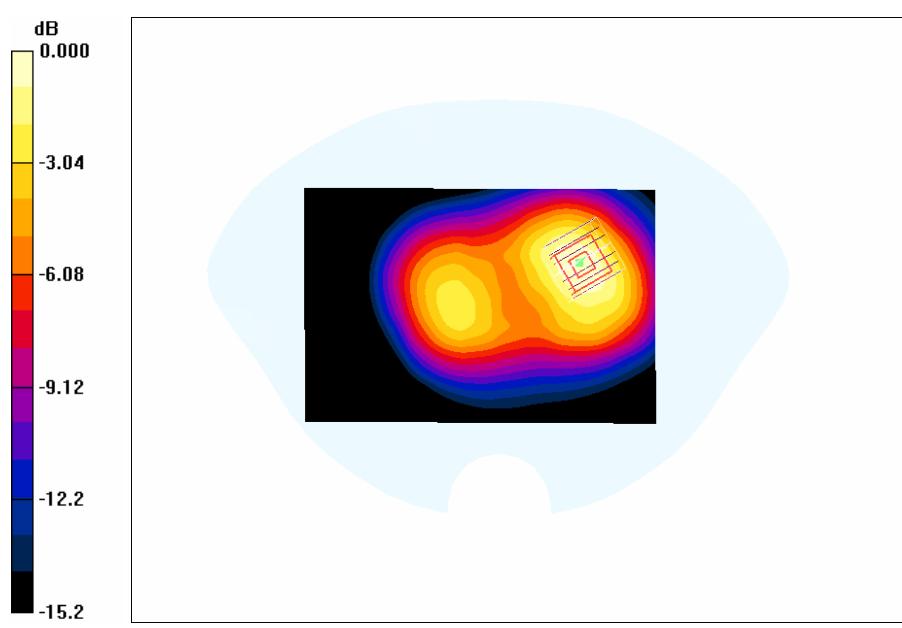
Worn 4slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.7 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 0.891 W/kg

SAR(1 g) = 0.599 mW/g; SAR(10 g) = 0.367 mW/g

Maximum value of SAR (measured) = 0.657 mW/g



0 dB = 0.657mW/g



Plot 32: Date/Time: 6/26/2014 17:53:15 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GPRS1900; Frequency: 1880 MHz; Duty Cycle: 1:2

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 53.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(4.96, 4.96, 4.96); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Front 4slot/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.667 mW/g

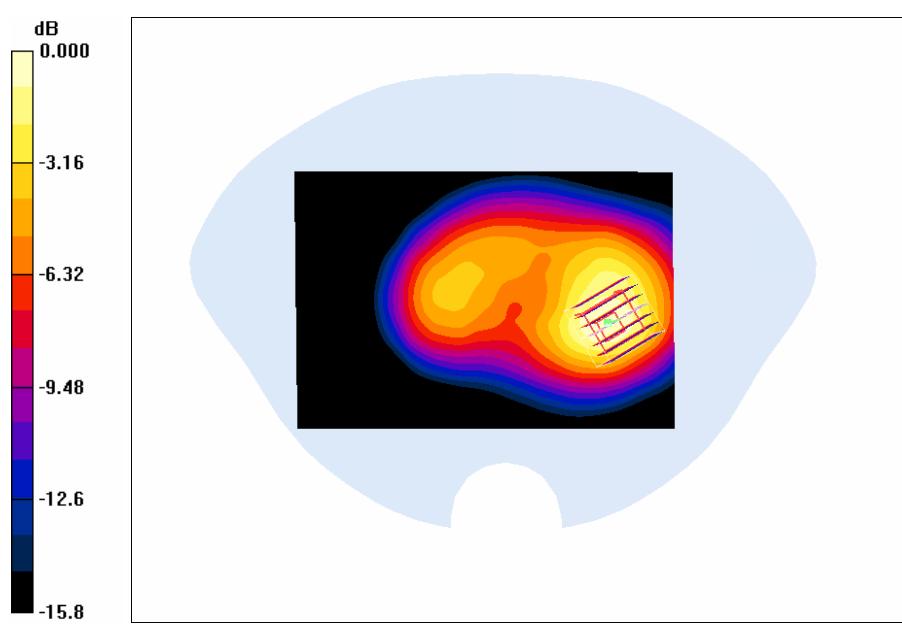
Front 4slot/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.6 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 0.887 W/kg

SAR(1 g) = 0.558 mW/g; SAR(10 g) = 0.329 mW/g

Maximum value of SAR (measured) = 0.610 mW/g





Plot 33: Date/Time: 6/26/2014 18:15:13 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 53.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(4.96, 4.96, 4.96); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn HS/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.284 mW/g

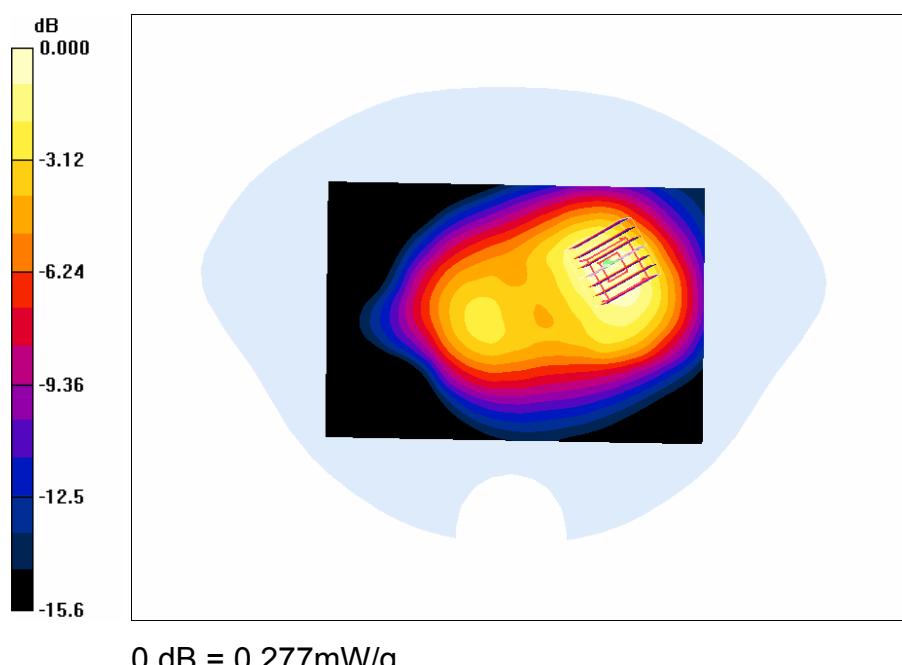
Worn HS/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.30 V/m; Power Drift = -0.055 dB

Peak SAR (extrapolated) = 0.387 W/kg

SAR(1 g) = 0.255 mW/g; SAR(10 g) = 0.156 mW/g

Maximum value of SAR (measured) = 0.277 mW/g





Plot 34: Date/Time: 6/26/2014 18:31:19 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: W1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 53.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(4.96, 4.96, 4.96); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.605 mW/g

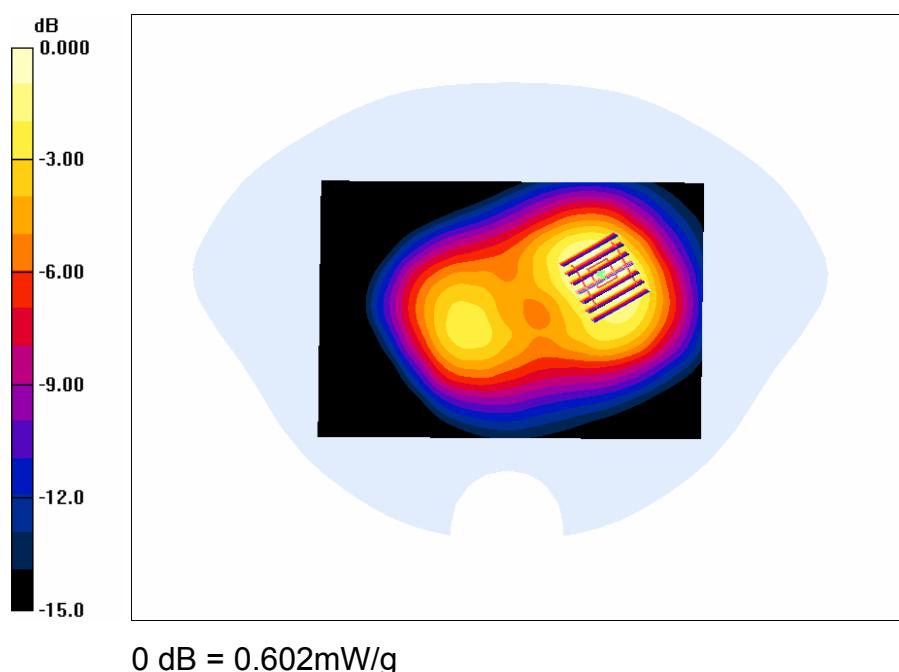
Worn/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.1 V/m; Power Drift = 0.015 dB

Peak SAR (extrapolated) = 0.825 W/kg

SAR(1 g) = 0.552 mW/g; SAR(10 g) = 0.336 mW/g

Maximum value of SAR (measured) = 0.602 mW/g





Plot 35: Date/Time: 6/26/2014 18:59:23 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: W1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 53.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(4.96, 4.96, 4.96); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Front/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.637 mW/g

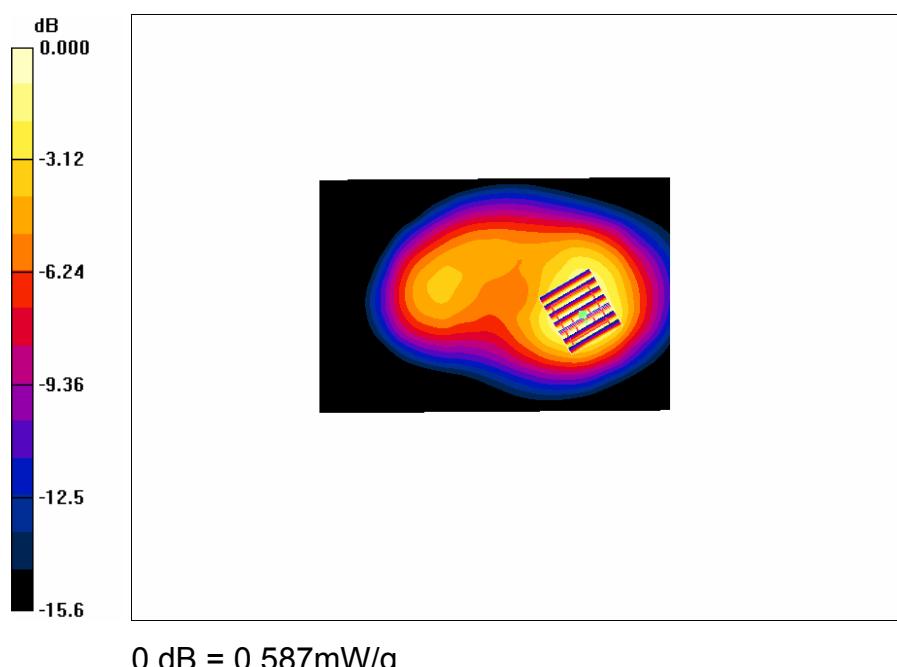
Front/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.3 V/m; Power Drift = 0.022 dB

Peak SAR (extrapolated) = 0.860 W/kg

SAR(1 g) = 0.539 mW/g; SAR(10 g) = 0.316 mW/g

Maximum value of SAR (measured) = 0.587 mW/g





Plot 36: Date/Time: 6/26/2014 19:18:15 PM

Test Laboratory: SUNWAY COMMUNICATION CO.,LTD.

DUT: TCB-723; Type: SI PIN; Serial: IMEI Number

Program Name: TCB-723

Communication System: W1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 53.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3028; ConvF(4.96, 4.96, 4.96); Calibrated: 8/5/2013
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn689; Calibrated: 7/20/2013
- Phantom: SAM with TP1360; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Worn HS/Area Scan (81x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.587 mW/g

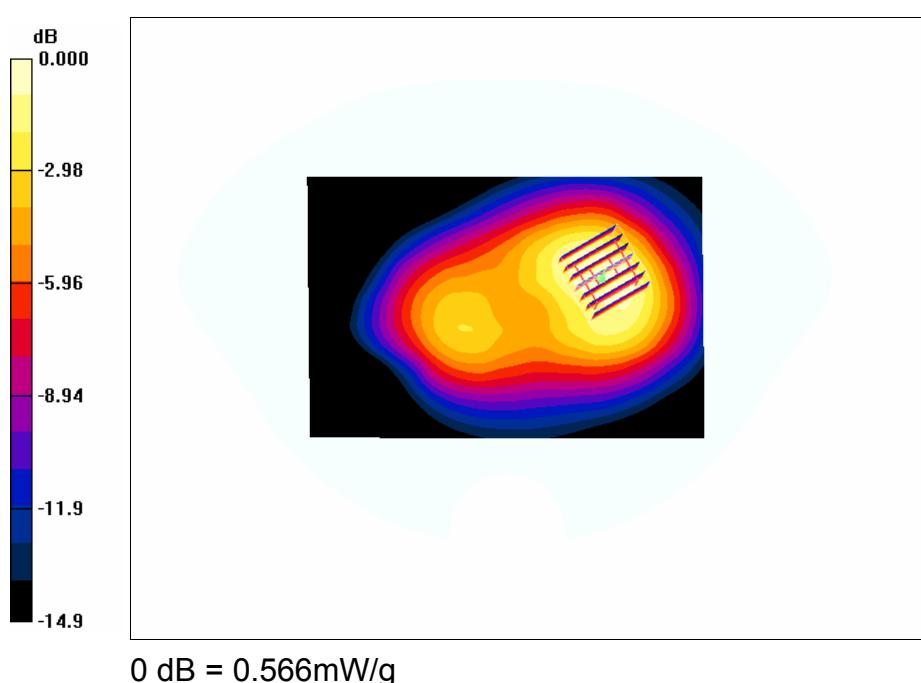
Worn HS/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.0 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 0.785 W/kg

SAR(1 g) = 0.524 mW/g; SAR(10 g) = 0.323 mW/g

Maximum value of SAR (measured) = 0.566 mW/g





SHENZHEN SUNWAY COMMUNICATION CO., LTD

Report NO.: TS201406020

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In Collaboration with
s p e a g
CALIBRATION LABORATORY

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E-mail: Info@emcite.com Http://www.emcite.com

Client

Sunway

Certificate No: J13-2-2186

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3028

Calibration Procedure(s) TMC-OS-E-02-195
Calibration Procedures for Dosimetric E-field Probes

Calibration date: August 5, 2013

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(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	01-Jul-13 (TMC, No.JW13-044)	Jun-14
Power sensor NRP-Z91	101547	01-Jul-13 (TMC, No.JW13-044)	Jun-14
Power sensor NRP-Z91	101548	01-Jul-13 (TMC, No.JW13-044)	Jun-14
Reference10dBAttenuator	BT0520	12-Dec-12(TMC, No.JZ12-867)	Dec-14
Reference20dBAttenuator	BT0267	12-Dec-12(TMC, No.JZ12-866)	Dec-14
Reference Probe EX3DV4	SN 3846	20-Dec-12(SPEAG, No.EX3-3846_Dec12)	Dec-13
DAE4	SN 777	22-Feb-13 (SPEAG, DAE4-777_Feb13)	Feb-14
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGeneratorMG3700A	6201052605	01-Jul-13 (TMC, No.JW13-045)	Jun-14
Network Analyzer E5071C	MY46110673	15-Feb-13 (TMC, No.JZ13-781)	Feb-14

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Xiao Li	Deputy Director of the laboratory	

Issued: August 7, 2013

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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	,modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i $\theta=0$ 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 300MHz to 3GHz)", February 2005

Methods Applied and Interpretation of Parameters:

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



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Probe ES3DV3

SN: 3028

Calibrated: August 5, 2013

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)



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DASY – Parameters of Probe: ES3DV3 - SN: 3028

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(μ V/(V/m) ²) ^A	1.06	1.17	1.14	±10.8%
DCP(mV) ^B	105.6	104.6	98.9	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB· μ V	C	D dB	VR mV	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	193.3	±6.7%
		Y	0.0	0.0	1.0		205.8	
		Z	0.0	0.0	1.0		198.3	

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

^A The uncertainties of Norm X, Y, Z do not affect the E²-field uncertainty inside TSL (see Page 5 and Page 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.



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DASY – Parameters of Probe: ES3DV3 - SN: 3028

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)
850	41.5	0.92	6.26	6.26	6.26	0.27	1.90	±12%
900	41.5	0.97	6.28	6.28	6.28	0.26	1.88	±12%
1750	40.1	1.37	5.62	5.62	5.62	0.27	3.08	±12%
1900	40.0	1.40	5.21	5.21	5.21	0.28	3.03	±12%
2000	40.0	1.40	5.14	5.14	5.14	0.27	2.99	±12%
2450	39.2	1.80	4.84	4.84	4.84	0.46	1.72	±12%

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

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



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DASY – Parameters of Probe: ES3DV3 - SN: 3028

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)
850	55.2	0.99	6.28	6.28	6.28	0.30	1.91	± 12%
900	55.0	1.05	6.29	6.29	6.29	0.37	1.61	± 12%
1750	53.4	1.49	5.15	5.15	5.15	0.30	2.92	± 12%
1900	53.3	1.52	4.96	4.96	4.96	0.29	2.93	± 12%
2000	53.3	1.52	4.99	4.99	4.99	0.29	2.86	± 12%
2450	52.7	1.95	4.36	4.36	4.36	0.52	1.71	± 12%

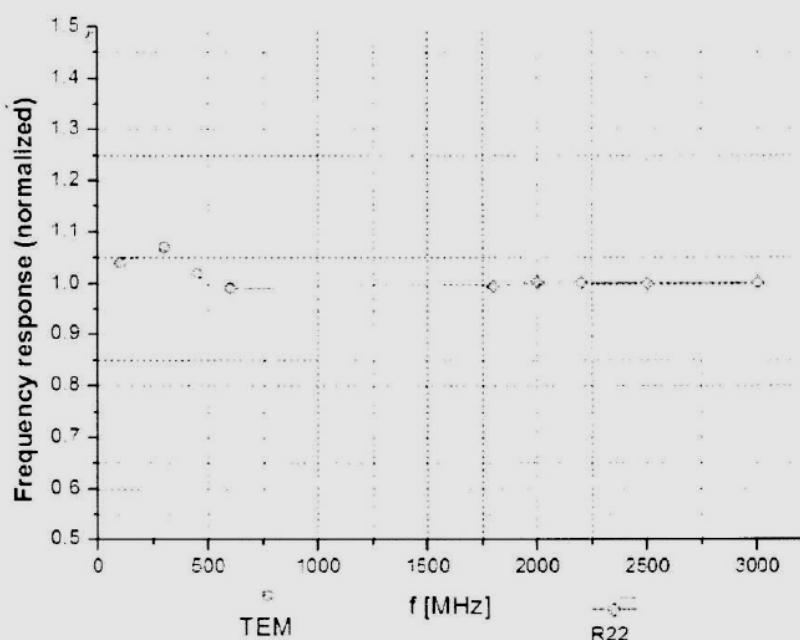
^C Frequency validity of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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



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



Uncertainty of Frequency Response of E-field: $\pm 7.5\%$ ($k=2$)

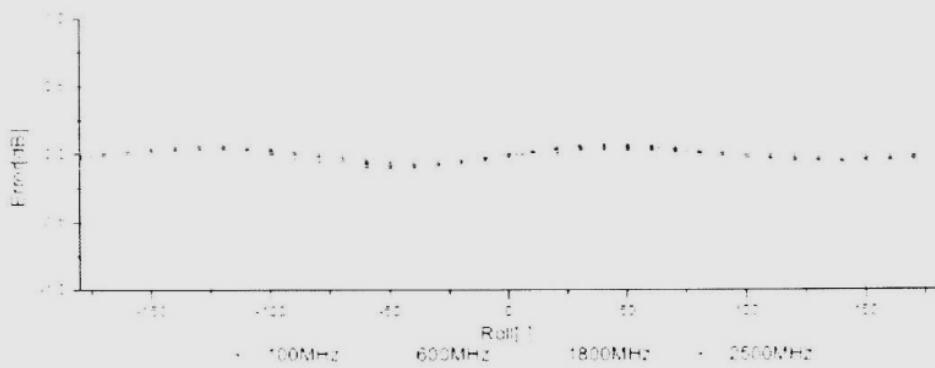
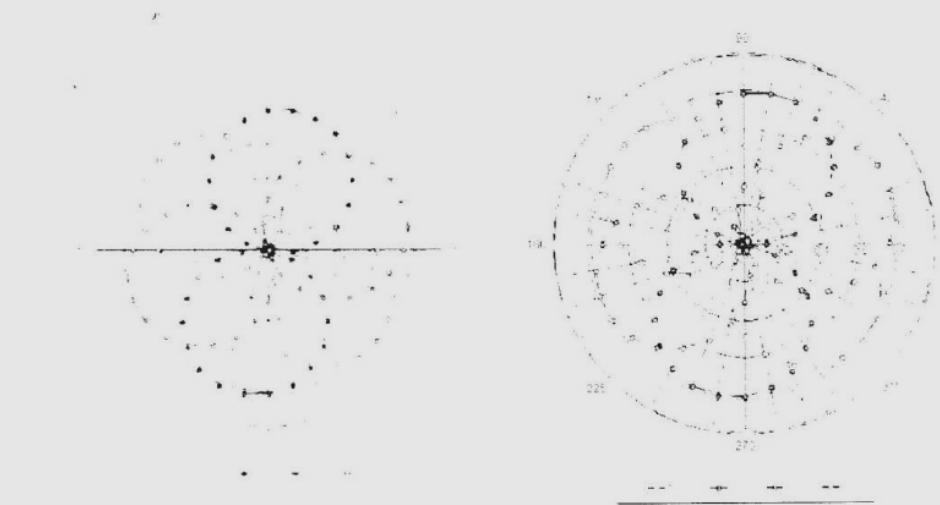


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Receiving Pattern (Φ), $\theta=0^\circ$

f=600 MHz, TEM

f=1800 MHz, R22

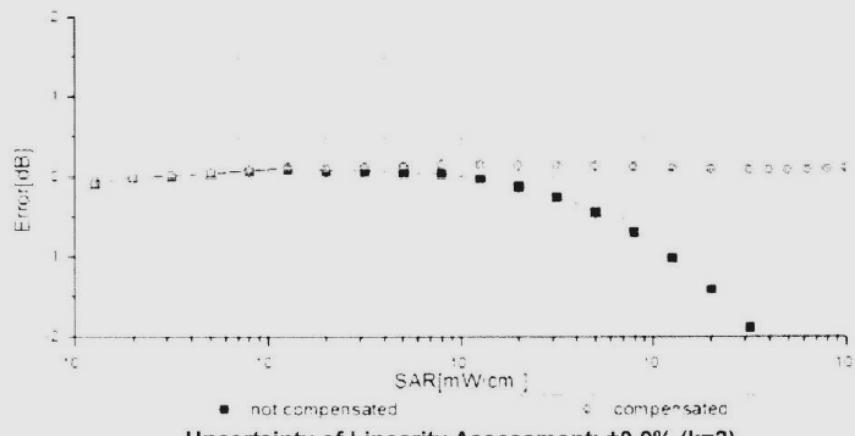
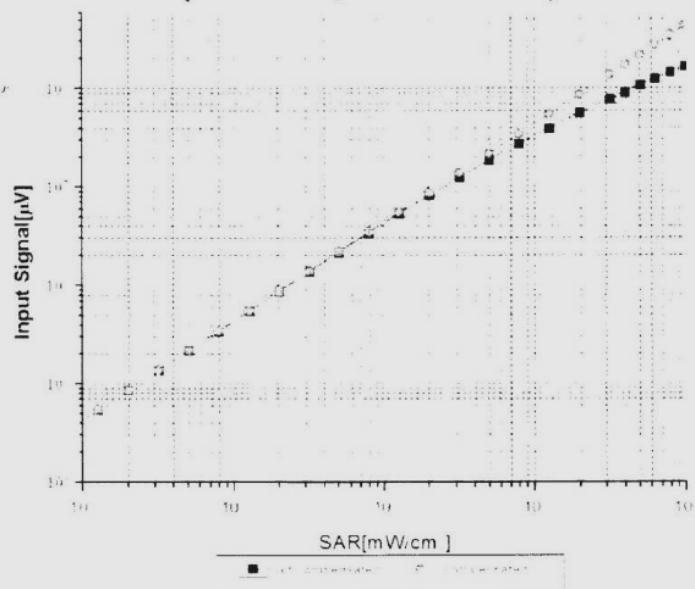


Uncertainty of Axial Isotropy Assessment: $\pm 0.9\% (k=2)$



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



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

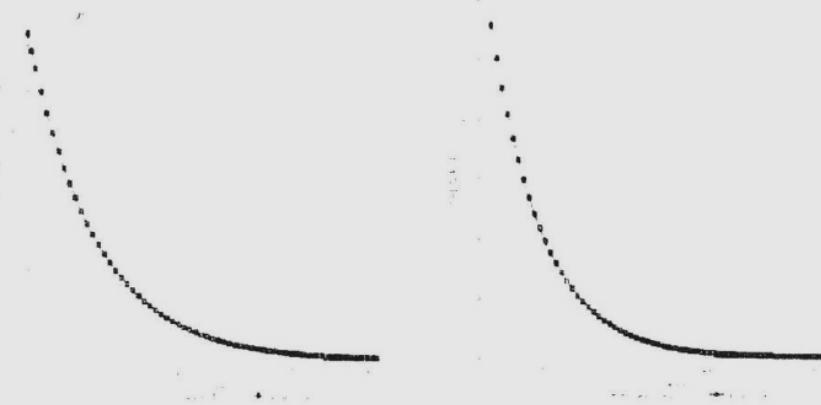


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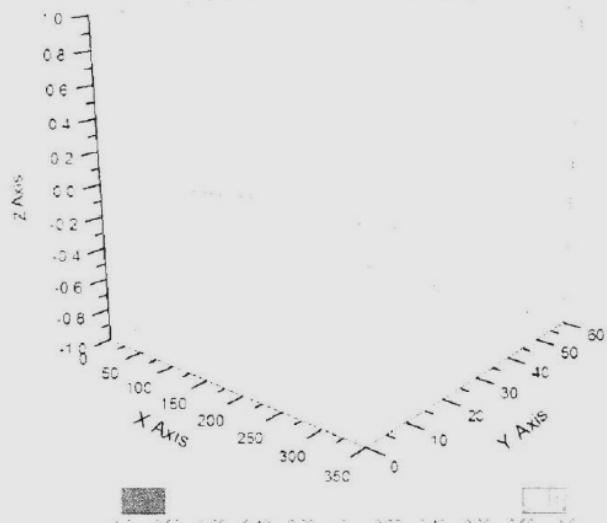
Conversion Factor Assessment

f=900 MHz, WGLS R9(H_convF)

f=2450 MHz, WGLS R26(H_convF)



Deviation from Isotropy in Liquid



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