



CONFORMANCE TEST REPORT FOR HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

Report No.: SRTC2011-H024-E0078

Product Name: GSM Wireless Phone

Product Model: ZTE WP650

Applicant: ZTE Corporation

Manufacturer: ZTE Corporation

Specification: FCC OET Bulletin 65 (Edition 97-01)

Supplement C (Edition 01-01)

47CFR 2.1093

FCC ID: Q78-WP650

The State Radio_monitoring_center Testing Center (SRTC)

No.80 Beilishi Road Xicheng District Beijing, China

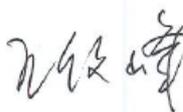
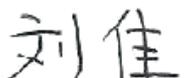
Tel: 86-10-68009202 Fax: 86-10-68009205

Executive summary

Test report no.:	SRTC2011-H024-E0078
Product Model:	ZTE WP650
Date of test:	2011.11.11
Date of report:	2011.12.02
Laboratory:	The State Radio_monitoring_center Testing Center (SRTC)
Test has been Carried out in accordance with:	<p>47CFR §2.1093</p> <p>Radiofrequency Radiation Exposure Evaluation: Portable Devices</p> <p>FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)</p> <p>Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields</p> <p>RSS-102</p> <p>Evaluation Procedure for Mobile and Portable Radio Transmitters with Respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields</p> <p>IEEE 1528 - 2003</p> <p>IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Technique</p>
Documentation:	The documentation of the testing performed on the tested devices is archived for 5 years at SRTC

Result summary:

Mode	CH/f(MHz)	Power (dBm)	Position	Sar Limit (1g avg) (mW/g)	Measured value (1g avg)(mW/g)	Result
GSM850	251/848.8	32.34	Right Cheek	1.6	1.320	PASS

<p>This Test Report Is Issued by:</p> <p>Mr. Song Qizhu Director of the test lab</p> 	<p>Checked by:</p> <p>Mr. Wang Junfeng Deputy director of the test lab</p> 
<p>Tested by:</p> <p>Ms. Liu Jia Test engineer</p> 	<p>Issued date:</p> <p>2011.12.12</p>

Tables of Contents

1. General information	3
1.1 Notes of the test report	3
1.2 Information about the testing laboratory	3
1.3 Applicant’s details.....	3
1.4 Manufacturer’s details.....	3
1.5 Test details	4
1.6 Maximum Results	4
1.6.1 Head Configuration	4
2. DESCRIPTION OF THE DEVICE UNDER TEST.....	4
2.1 Description of the Antenna	5
2.2 Picture of the EUT	5
2.3 Test Positions for the Device under test.....	5
2.4 Picture to demonstrate the required liquid depth.....	6
3 TEST CONDITIONS.....	6
3.1 Temperature and Humidity	6
3.2 Test Signal, Frequencies and Output Power	6
4. DESCRIPTION OF THE TEST EQUIPMENT	6
4.1 Measurement System and Components	6
4.1.1 Isotropic E-field Probe Type ES3DV3	7
4.2 Phantoms	8
4.3 Tissue Simulants	8
4.3.1 Tissue Simulant Recipes	8
4.3.2 System Checking.....	9
4.3.3 Tissue Simulants used in the Measurements	9
5. DESCRIPTION OF THE TEST PROCEDURE	10
5.1 Device Holder	10
5.2 Test positions	11
5.2.1 Against Phantom Head	11
5.3 scan procedure.....	11
5.4 SAR Averaging Methods	11
6. MEASUREMENT UNCERTAINTY.....	12
7. Test Results	13
7.1 Test result.....	13
7.2 Conducted power	14
APPENDIX A: SYSTEM CHECKING SCANS	15
APPENDIX B: MEASUREMENT SCANS	17
APPENDIX C: RELEVANT PAGES FROM PROBE CALIBRATION REPORT(S).....	35
APPENDIX D: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S).....	41

1. General information

1.1 Notes of the test report

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The test results relate only to individual items of the samples which have been tested.

1.2 Information about the testing laboratory

Company: The State Radio_monitoring_center Testing Center (SRTC)
Address: No.80 Beilishi Road, Xicheng District, Beijing China
City: Beijing
Country or Region: China
Contacted person: Wang Junfeng
Tel: +86 10 68009181 +86 10 68009202
Fax: +86 10 68009195 +86 10 68009205
Email: wangjf@srrc.org.cn / wangjunfeng@srtc.org.cn

1.3 Applicant's details

Company: ZTE Corporation
Address: ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,
Nanshan District, 518057
City: Shenzhen
Country or Region: P.R.China
Grantee Code: Q78
Contacted person: Min Zhang
Tel: +86-021-68897541
Fax: +86-021-50801070
Email: zhang.min13@zte.com.cn

1.4 Manufacturer's details

Company: ZTE Corporation
Address: Zhongxing Bldg, Hi-Tech Park, Nanshan District, 518057
City: Shenzhen
Country or Region: P.R.China
Contacted person: LI Dezi
Tel: +86-021-68895196
Fax: +86-021-50801070
Email: li.dezi@zte.com.cn

1.5 Test details

Period of test	2011.11.11
Batteries used in testing	Nickel cadmium/Ni3607T30P3S473211/ZTE
State of sample	production unit
Device class/Multislot class DTM	N/A N/A
H/W Version S/W Version	f87D HX_SPB_FM_WP650PV1.0.0B01
IMEI	355570042147713

1.6 Maximum Results

The maximum measured SAR values for Head configuration and Body Worn configuration are given in section 1.6.1 and 1.6.2 respectively. The device conforms to the requirements of the standard(s) when the maximum measured SAR value is less than or equal to the limit.

1.6.1 Head Configuration

Mode	CH/f(MHz)	Power (dBm)	Position	Sar Limit (1g avg) (mW/g)	Measured value (1g avg)(mW/g)	Result
GSM850	251/848.8	32.34	Right cheek	1.6	1.320	PASS
GSM1900	661/1880.0	29.63	Left cheek	1.6	1.220	PASS

2. DESCRIPTION OF THE DEVICE UNDER TEST

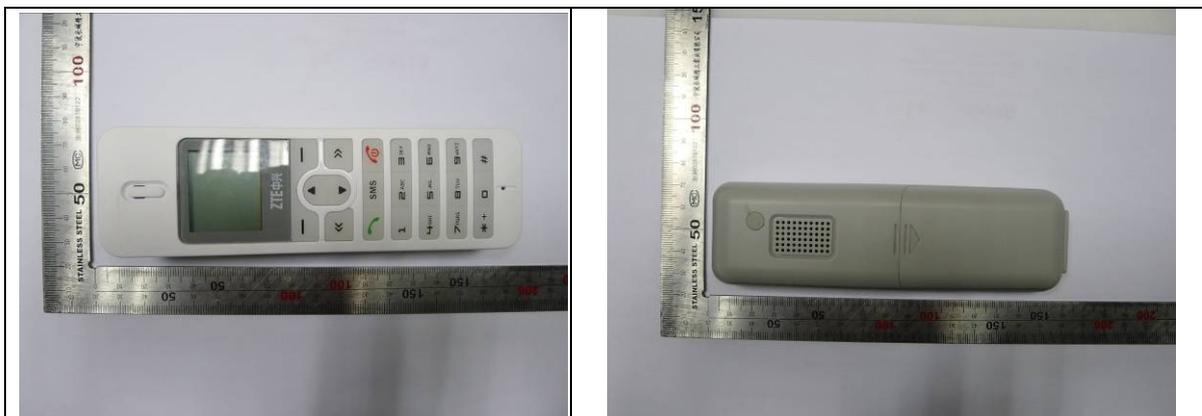
Device category	production unit
Exposure environment	General population/uncontrolled

Mode and bands of operation	GSM 850/1900
Modulation Mode	GMSK
Duty Cycle	1/8
Transmitter Frequency Range(MHz)	824-849 1850-1910

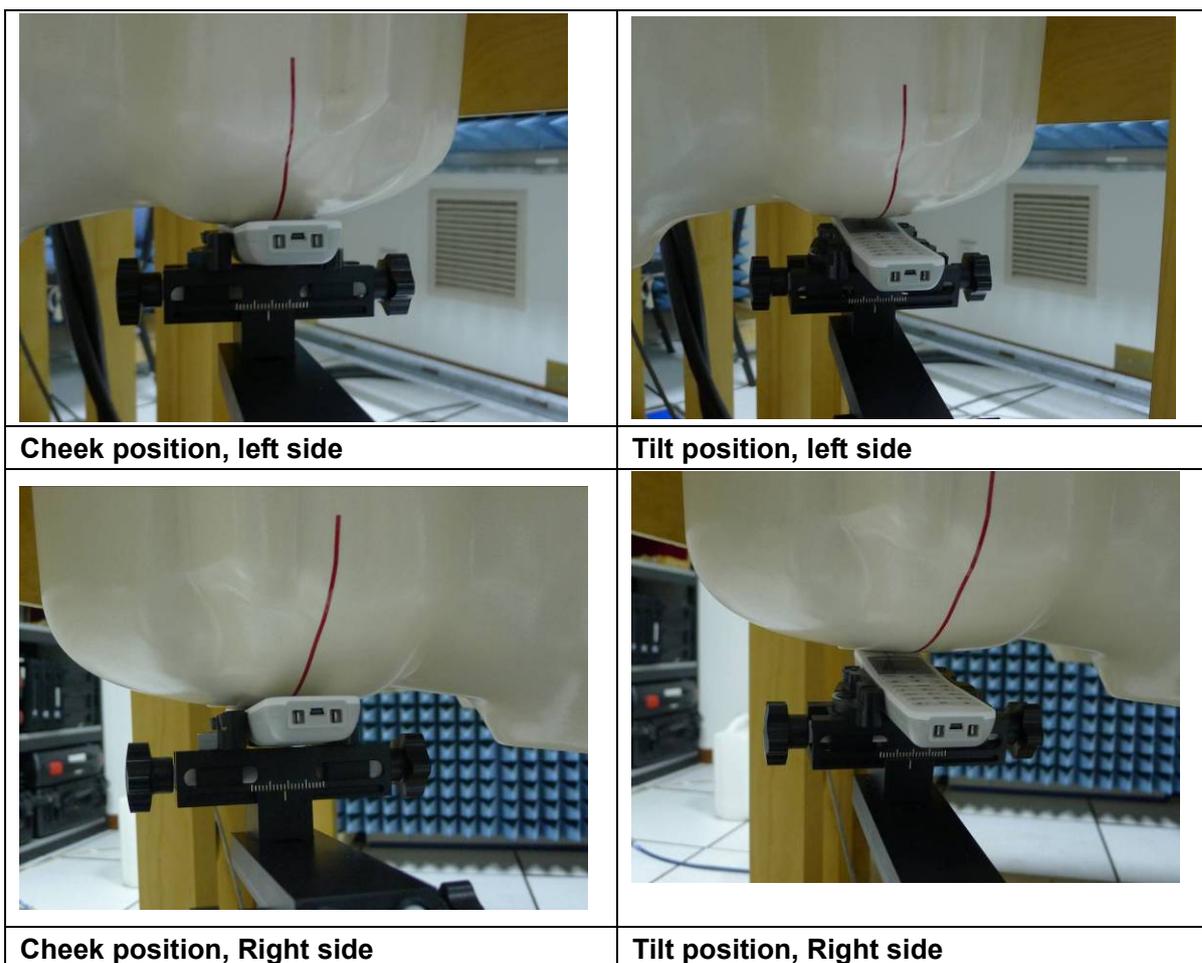
2.1 Description of the Antenna

The device has an internal antenna.

2.2 Picture of the EUT



2.3 Test Positions for the Device under test



2.4 Picture to demonstrate the required liquid depth

the liquid depth in the used SAM phantoms



Liquid depth for SAR Measurement

3 TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (° C)	21.0 to 23.0
Ambient humidity (RH %)	30 to 45

3.2 Test Signal, Frequencies and Output Power

The device was put into operation by using a call tester. Communication between the device and the call tester was established by air link.

The device output power was set to maximum power level for all tests; a fully charged battery was used for every test sequence.

In all operating bands the measurements were performed on lowest, middle and highest channels.

4. DESCRIPTION OF THE TEST EQUIPMENT

4.1 Measurement System and Components

The measurements were performed using an automated near-field scanning system, DASY4, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland. The SAR extrapolation algorithm used in all measurements was the 'advanced extrapolation' algorithm.

The following table lists calibration dates of SPEAG components:

Test Equipment	Serial Number	Calibration interval	Calibration expiry
DAE4	720	1year	2012.01
Dosimetric E-field Probe ES3DV3	3128	1year	2012.04
Dipole Validation Kit, D835V2	473	2 years	2012.06
Dipole Validation Kit, D1900V2	5d024	2 years	2012.06
DASY4 software Version	4.7	N/A	N/A

Note: the Dipole Calibration interval is 24 months

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration interval	Calibration expiry
Signal Generator	E4428C	MY45280865	1year	2012.08
Amplifier	5S1G4	0323472	N/A	N/A
Power meter	E4417A	MY45101004	1year	2012.08
Power Sensor	E9300B	MY41496001	1year	2012.08
Power Sensor	E9300B	MY41496003	1year	2012.08
Call Tester	8960	GB43194054	1year	2012.08
Network Analyzer	8714ET	US40372083	1year	2012.08
Dielectric Probe Kit	85070D	US33030365	N/A	N/A

4.1.1 Isotropic E-field Probe Type ES3DV3

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix C
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Optical Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Dynamic Range	5 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones

4.2 Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twinheaded "SAM Phantom", manufactured by SPEAG. The phantom conforms to the requirements of IEEE 1528 - 2003.

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

The SPEAG device holder (see Section 5.1) was used to position the device in all tests whilst a tripod was used to position the validation dipoles against the flat section of phantom.

4.3 Tissue Simulants

Recommended values for the dielectric parameters of the tissue simulants are given in IEEE 1528 - 2003 and FCC Supplement C to OET Bulletin 65. All tests were carried out using simulants whose dielectric parameters were within $\pm 5\%$ of the recommended values. All tests were carried out within 24 hours of measuring the dielectric parameters.

The depth of the tissue simulant was 15.0 ± 0.5 cm measured from the ear reference point during system checking and device measurements.

4.3.1 Tissue Simulant Recipes

The following recipe(s) were used for Head tissue stimulant(s):

800MHz band

Ingredient	Head (% by weight)
Water	40.29
Sugar	57.90
Nacl	1.38
Cellulose	0.24
Preventol	0.18

1900MHz band

Ingredient	Head (% by weight)
Water	44,45
DGBE	55.24
Nacl	0.31

4.3.2 System Checking

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyser. A system check measurement was made following the determination of the dielectric parameters of the simulant, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. The system checking results (dielectric parameters and SAR values) are given in the table below. Test Date is 2011.11.11

System checking,head tissue simulant

		SAR _{1g} [w/kg]	ϵ_r	σ [S/m]	Temperature	
					Ambient[°C]	Liquid[°C]
900MHz	Target Value	10.8	41.5±2.1	0.97±0.05	15-30	-
	Measured Value	10.9	40.7	0.95	24.0	22.3

All SAR values are normalized to 1W forward power

		SAR _{1g} [w/kg]	ϵ_r	σ [S/m]	Temperature	
					Ambient[°C]	Liquid[°C]
1800MHz	Target Value	38.1	40±1.9	1.40±0.07	15-30	-
	Measured Value	38.8	39.4	1.35	24.0	22.3

All SAR values are normalized to 1W forward power

Plots of the system checking scans are given in Appendix A.

4.3.3 Tissue Simulants used in the Measurements

For the measurement of the following parameters the HP 85070D dielectric probe kit is used, representing the open-ended coaxial probe measurement procedure. Liquid temperature during the test: 22.3° C. Tested date is 2011.11.11

Head		ϵ_r	σ [S/m]	Temperature	
				Ambient [°C]	Liquid [°C]
850MHz	Recommended Value	41.5±2.1	0.97±0.05	15-30	-
	Measured Value	41.5	0.98	24.0	22.3
1900MHz	Recommended Value	40±1.9	1.40±0.07	15-30	-
	Measured Value	39.0	1.44	24.0	22.3

5. DESCRIPTION OF THE TEST PROCEDURE

5.1 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the Dasy system.



Device holder supplied by SPEAG

5.2 Test positions

5.2.1 Against Phantom Head

Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 - 2003 "IEEE

Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

5.3 scan procedure

First, area scans were used for determination of the field distribution. Next, a zoom scan, a minimum of 7 x 7x7 points covering a volume of at least 30x30x30mm, was performed around the highest E-field value to determine the averaged SAR value. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan.

5.4 SAR Averaging Methods

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within Dasy4 are all based on the modified Quadratic Shepard's method (Robert J. Renka, "Multivariate Interpolation Of Large Sets Of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A trivariate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighbouring points by a least-square method. For the zoom scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the zoom scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

6. MEASUREMENT UNCERTAINTY

DASY4 Uncertainty Budget								
Error description	Uncertainty value	Prob. Dist.	Div.	(c_i) 1g	(c_i) 10g	Std.Unc (1g).	Std.Unc. (10g)	(v_i) V_{eff}
Measurement system								
Probe calibration	±5.9%	N	1	1	1	±5.9%	±5.9%	∞
Axial isotropy	±4.7%	R	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical isotropy	±9.6%	R	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%	∞
Boundary effects	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
System detection limits	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Readout electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response time	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Integration time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
RF ambient noise	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
RF ambient reflections	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Probe positioner	±0.4%	R	$\sqrt{3}$	1	1	±0.2%	±0.2%	∞
Probe positioning	±2.9%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Max.SAR Eval.	±1.0%	R	$\sqrt{3}$	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	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Phantom and Setup								
Phantom uncertainty	±4.0%	R	$\sqrt{3}$	1	1	±2.3%	±2.3%	∞
Liquid conductivity(target)	±5.0%	R	$\sqrt{3}$	0.64	0.43	±1.8%	±1.2%	∞
Liquid conductivity(meas.)	±2.5%	N	1	0.64	0.43	±1.6%	±1.1%	∞
Liquid conductivity(target)	±5.0%	R	$\sqrt{3}$	0.6	0.49	±1.7%	±1.4%	∞
Liquid onductivity(means.)	±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%	

Table 6.1 – Measurement uncertainty evaluation

7. Test Results

7.1 Test result

Mode: GSM 850

f_L (MHz)=824.2MHz f_M (MHz)=836.4 MHz f_H (MHz)= 848.8MHz

SAR Values (Head, 850MHz Band)

Limit of SAR (W/kg)	1 g Average
	1.6
Test Case	Measurement Result (mW/g)
	1 g Average
Left hand, Touch cheek, f_H	1.250
Left hand, Touch cheek, f_M	1.240
Left hand, Touch cheek, f_L	1.240
Left hand, Tilt 15 Degree, f_M	0.612
Right hand, Touch cheek, f_H	1.320
Right hand, Touch cheek, f_M	1.280
Right hand, Touch cheek, f_L	1.250
Right hand, Tilt 15 Degree, f_M	0.556

Mode: GSM1900

f_L (MHz)=1850.2MHz f_M (MHz)=1880.0MHz f_H (MHz)=1909.8MHz

SAR Values (Head, 1900MHz Band)

Limit of SAR (W/kg)	1 g Average
	1.6
Test Case	Measurement Result (mW/g)
	1 g Average
Left hand, Touch cheek , f_H	1.170
Left hand, Touch cheek, f_M	1.220
Left hand, Touch cheek , f_L	1.170
Left hand, Tilt 15 Degree, f_M	0.461
Right hand, Touch cheek , f_H	1.140
Right hand, Touch cheek, f_M	1.170
Right hand, Touch cheek f_L	1.080
Right hand, Tilt 15 Degree, f_M	0.444

7.2 Conducted power

Mode	GSM850(Head) Duty cycle: 1:8(12.5%)			GSM1900(Head) Duty cycle: 1:8(12.5%)		
	Channel	128	189	251	512	661
Frequency(MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
Measured Power(dBm)	32.33	32.32	32.34	29.49	29.63	29.74

APPENDIX A: SYSTEM CHECKING SCANS

SYSTEM CHECKING SCANS	900MHz
<p>DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:171 Medium parameters used (interpolated): $f = 900$ MHz; $\sigma = 0.95$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³</p> <p>DASY4 Configuration:</p> <ul style="list-style-type: none"> - Probe: ES3DV3 - SN3128; ConvF(9.03, 9.53, 9.2); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE4 - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1560; Type: SAM; Serial: 1560 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186 <p>d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5mm, dy=5mm, dz=5mm$</p> <p>Reference Value = 56.3V/m; Power Drift = -0.047 dB Peak SAR (extrapolated) = 4.08 W/kg SAR(1 g) = 2.72 mW/g; SAR(10 g) = 1.62 mW/g Maximum value of SAR (measured) = 2.9 mW/g</p> <div style="display: flex; align-items: flex-start;"> <div data-bbox="151 1193 271 1637" style="margin-right: 20px;"> <p>dB</p> <p>0.000 -3.62 -7.24 -10.9 -14.5 -18.1</p> </div> <div data-bbox="323 1193 1437 1637"> </div> </div> <p style="margin-top: 20px;">0 dB =2.9 mW/g</p>	

SYSTEM CHECKING SCANS

1800 MHz

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:2d084

Program Name: System Performance Check at 1800 MHz

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3128; ConvF(6.15, 6.5, 6.27); Calibrated: 4/21/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 - SN720; Calibrated: 1/19/2011
- Phantom: SAM 1559; Type: SAM; Serial: 1559
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

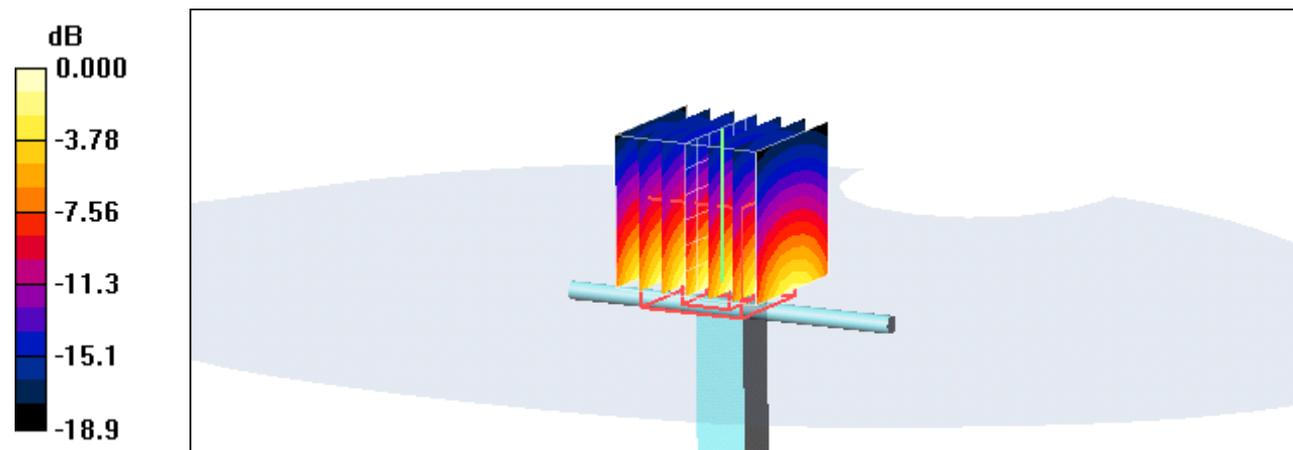
dx=5mm, dy=5mm, dz=5mm

Reference Value = 90.1 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 17.9 W/kg

SAR(1 g) = 9.71 mW/g; SAR(10 g) = 5.08 mW/g

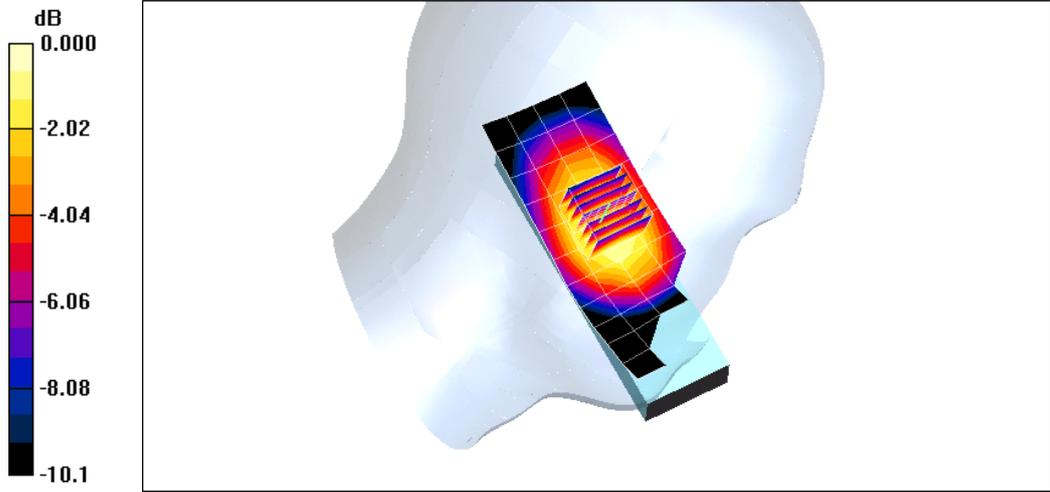
Maximum value of SAR (measured) = 10.9 mW/g

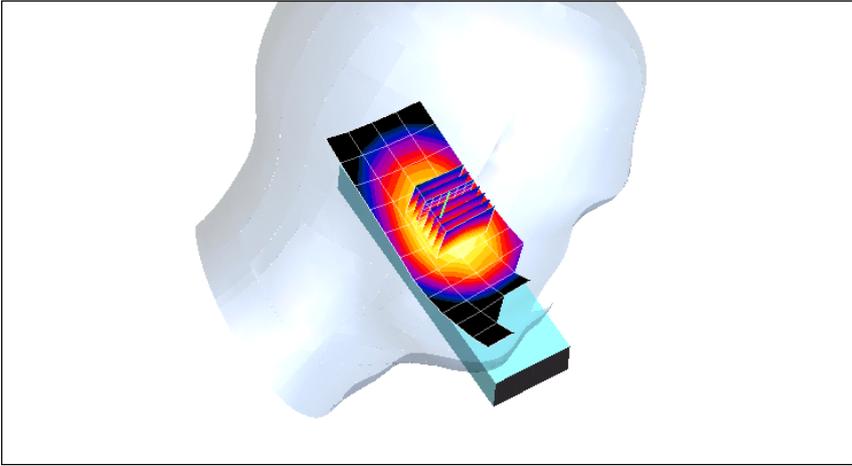


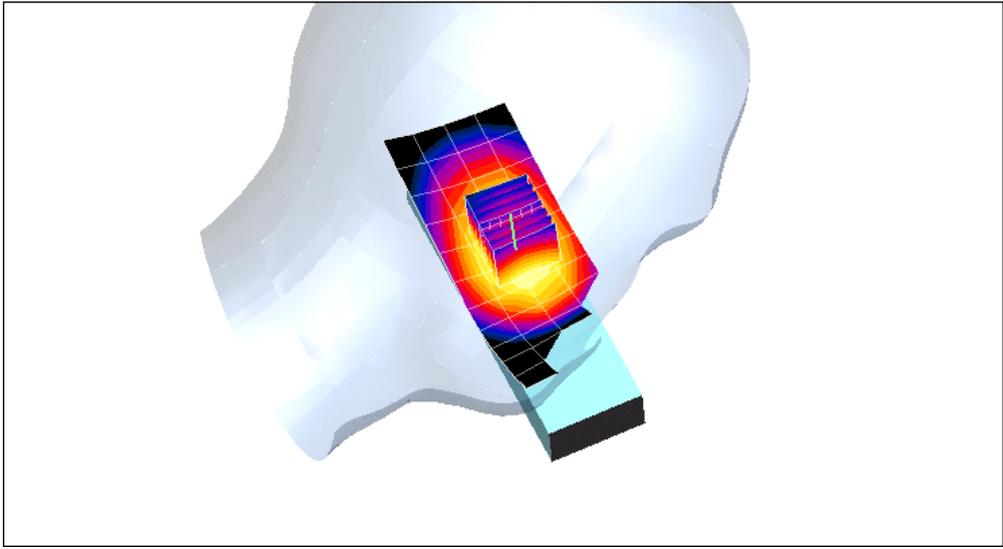
0 dB = 10.9 mW/g

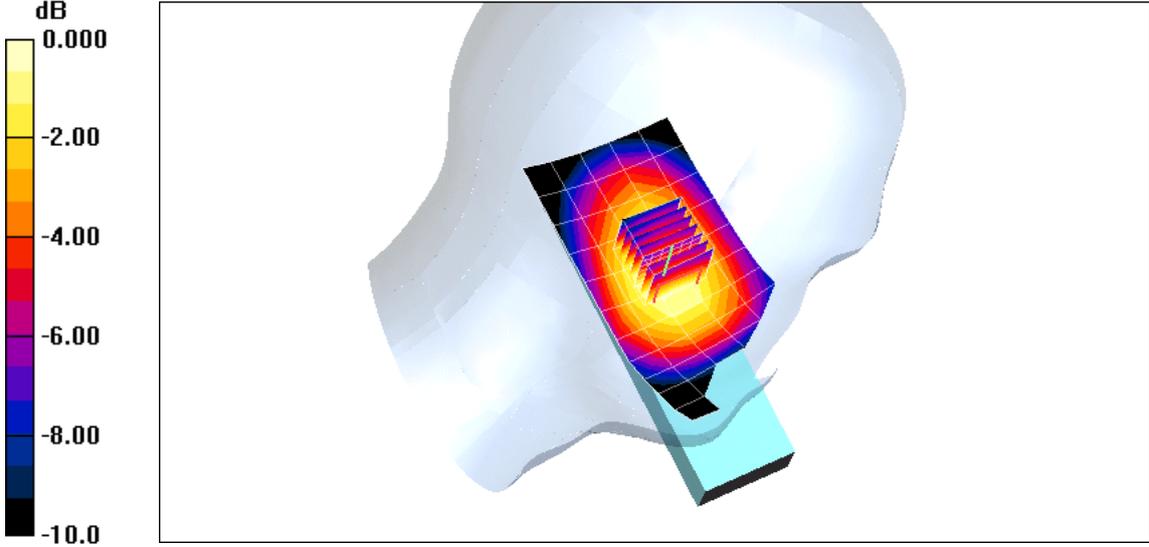
APPENDIX B: MEASUREMENT SCANS

GSM (850MHz/head)

Left Side	Cheek	824.2 MHz
<p>Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.887$ mho/m; $\epsilon_r = 43.3$; $\rho = 1000$ kg/m³ Phantom section: Left Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(7.88, 8.3, 8.05); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1560; Type: SAM; Serial: 1560 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - Low/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.28 mW/g</p> <p>Touch position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 24.7 V/m; Power Drift = 0.049 dB Peak SAR (extrapolated) = 1.66 W/kg SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.885 mW/g Maximum value of SAR (measured) = 1.32 mW/g</p>		
 <p>0 dB = 1.32mW/g</p>		

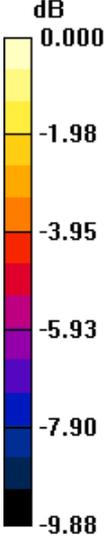
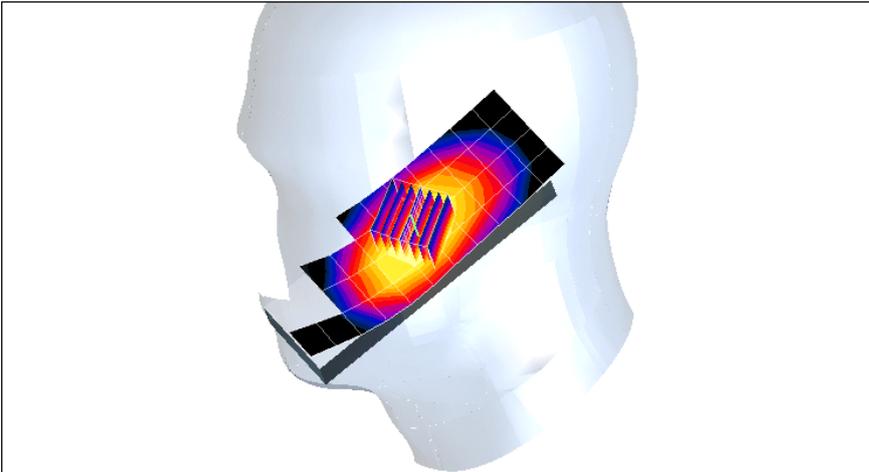
Left Side	Cheek	836.4 MHz
<p>Communication System: GSM 850; Frequency: 836.4 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.899$ mho/m; $\epsilon_r = 43.1$; $\rho = 1000$ kg/m³ Phantom section: Left Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(7.88, 8.3, 8.05); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1560; Type: SAM; Serial: 1560 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - Middle/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.29 mW/g</p> <p>Touch position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 25.0 V/m; Power Drift = -0.126 dB Peak SAR (extrapolated) = 1.64 W/kg SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.882 mW/g Maximum value of SAR (measured) = 1.31 mW/g</p>		
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>dB</p> <p>0.000</p> <p>-1.96</p> <p>-3.92</p> <p>-5.89</p> <p>-7.85</p> <p>-9.81</p> </div>  </div> <p style="text-align: center;">0 dB = 1.31mW/g</p>		

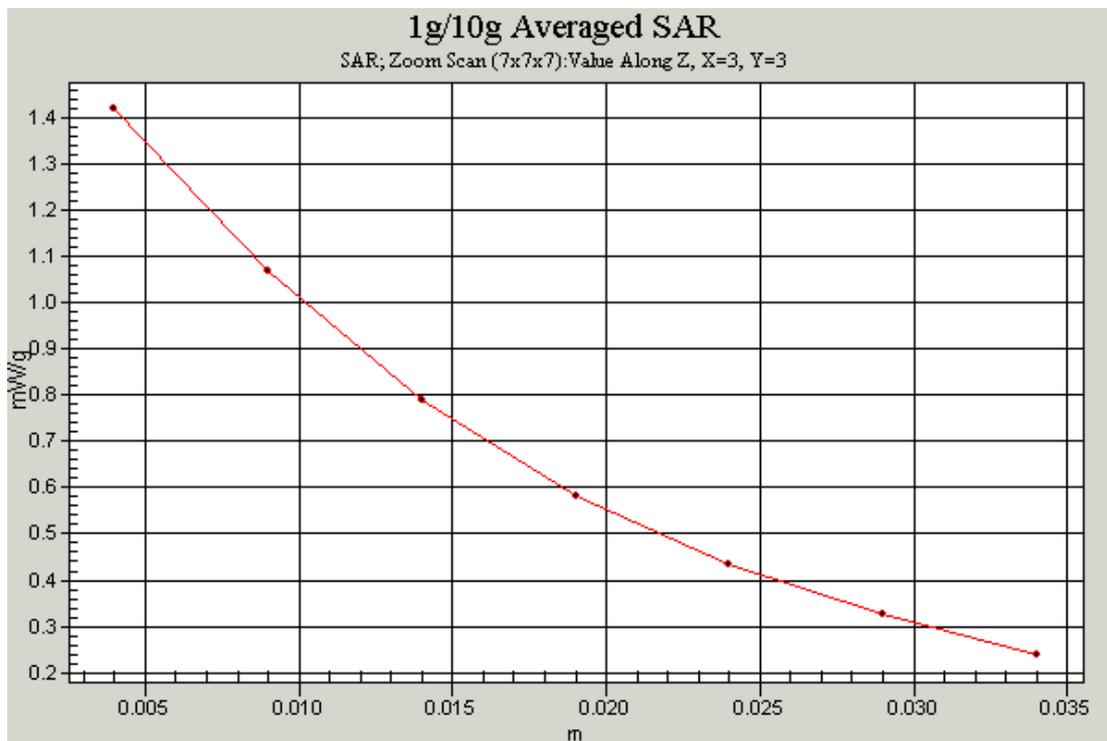
Left Side	Cheek	848.8 MHz
<p>Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.911$ mho/m; $\epsilon_r = 43$; $\rho = 1000$ kg/m³ Phantom section: Left Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(7.88, 8.3, 8.05); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1560; Type: SAM; Serial: 1560 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - High/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.30 mW/g</p> <p>Touch position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 24.2 V/m; Power Drift = -0.061 dB Peak SAR (extrapolated) = 1.67 W/kg SAR(1 g) = 1.25 mW/g; SAR(10 g) = 0.883 mW/g Maximum value of SAR (measured) = 1.34 mW/g</p>		
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>dB</p> <p>0.000</p> <p>-2.18</p> <p>-4.36</p> <p>-6.54</p> <p>-8.72</p> <p>-10.9</p> </div>  </div> <p style="text-align: center;">0 dB = 1.34mW/g</p>		

Left Side	Tilt	836.4 MHz
<p>Communication System: GSM 850; Frequency: 836.4 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.899$ mho/m; $\epsilon_r = 43.1$; $\rho = 1000$ kg/m³ Phantom section: Left Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(7.88, 8.3, 8.05); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1560; Type: SAM; Serial: 1560 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Tilt position - Middle/Area Scan (6x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.599 mW/g</p> <p>Tilt position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 18.8 V/m; Power Drift = 0.075 dB Peak SAR (extrapolated) = 0.771 W/kg SAR(1 g) = 0.612 mW/g; SAR(10 g) = 0.449 mW/g Maximum value of SAR (measured) = 0.646 mW/g</p>		
 <p style="text-align: center;">0 dB = 0.646mW/g</p>		

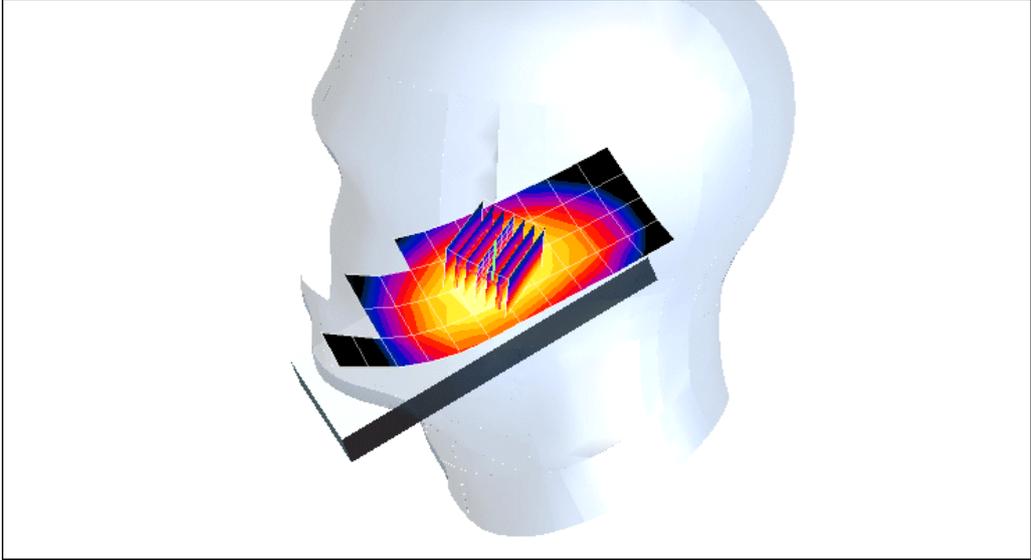
Right Side	Cheek	824.2 MHz
<p>Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.887$ mho/m; $\epsilon_r = 43.3$; $\rho = 1000$ kg/m³ Phantom section: Right Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(7.88, 8.3, 8.05); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1560; Type: SAM; Serial: 1560 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - Low/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.32 mW/g</p> <p>Touch position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 23.9 V/m; Power Drift = -0.056 dB Peak SAR (extrapolated) = 1.66 W/kg SAR(1 g) = 1.25 mW/g; SAR(10 g) = 0.883 mW/g Maximum value of SAR (measured) = 1.33 mW/g</p> <div data-bbox="255 1265 1332 1803"> </div> <p style="text-align: center;">0 dB = 1.33mW/g</p>		

Right Side	Cheek	836.4 MHz
<p>Communication System: GSM 850; Frequency: 836.4 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.899$ mho/m; $\epsilon_r = 43.1$; $\rho = 1000$ kg/m³ Phantom section: Right Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(7.88, 8.3, 8.05); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1560; Type: SAM; Serial: 1560 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - Middle/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.35 mW/g</p> <p>Touch position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 23.9 V/m; Power Drift = -0.115 dB Peak SAR (extrapolated) = 1.71 W/kg SAR(1 g) = 1.28 mW/g; SAR(10 g) = 0.902 mW/g Maximum value of SAR (measured) = 1.38 mW/g</p>		
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>dB</p> <p>0.000</p> <p>-1.95</p> <p>-3.90</p> <p>-5.85</p> <p>-7.80</p> <p>-9.75</p> </div> </div> <p style="text-align: center;">0 dB = 1.38 mW/g</p>		

Right Side	Cheek	848.8 MHz
<p>Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 848.8 \text{ MHz}$; $\sigma = 0.911 \text{ mho/m}$; $\epsilon_r = 43$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Right Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(7.88, 8.3, 8.05); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1560; Type: SAM; Serial: 1560 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - High/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm</p> <p>Maximum value of SAR (measured) = 1.38 mW/g</p> <p>Touch position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm</p> <p>Reference Value = 23.3 V/m; Power Drift = -0.003 dB Peak SAR (extrapolated) = 1.74 W/kg SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.924 mW/g Maximum value of SAR (measured) = 1.42 mW/g</p>		
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>dB</p>  <p>0.000 -1.98 -3.95 -5.93 -7.90 -9.88</p> </div> <div style="flex-grow: 1;">  </div> </div> <p style="text-align: center; margin-top: 10px;">0 dB = 1.42mW/g</p>		

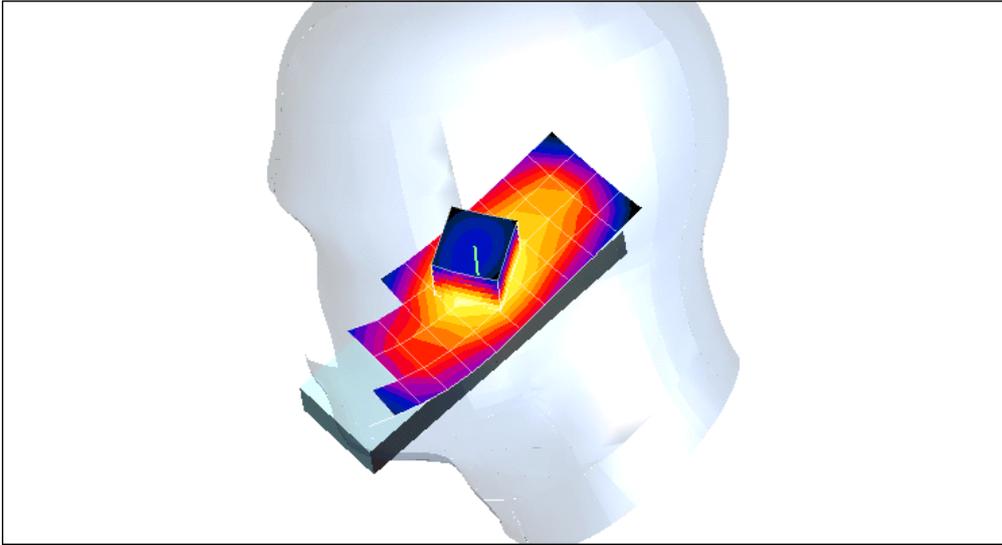


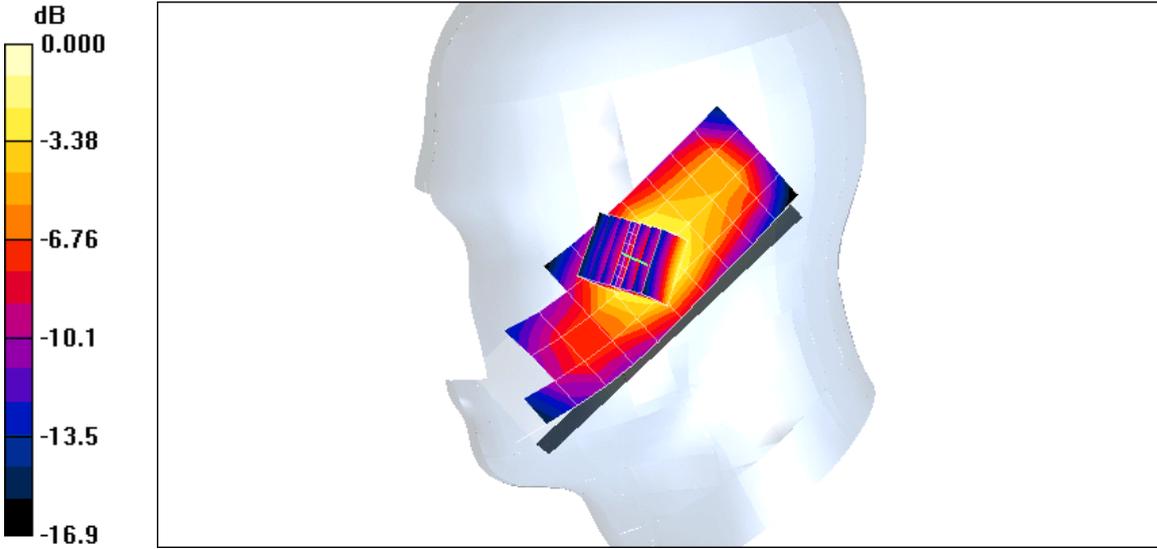
Z-Scan at power reference point (850 MHz CH251)

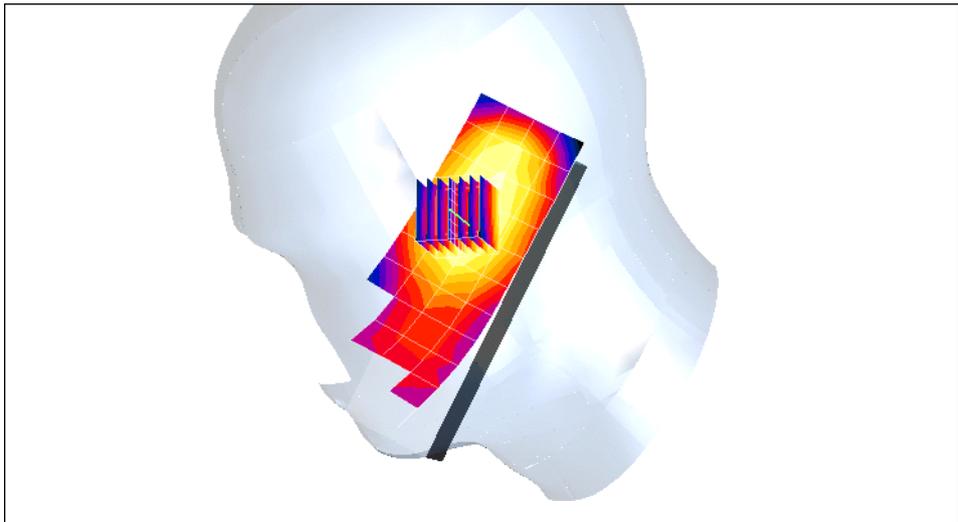
Right Side	Tilt	836.4MHz
<p>Communication System: GSM 850; Frequency: 836.4 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.899$ mho/m; $\epsilon_r = 43.1$; $\rho = 1000$ kg/m³ Phantom section: Right Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(7.88, 8.3, 8.05); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1560; Type: SAM; Serial: 1560 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Tilt position - Middle/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.571 mW/g</p> <p>Tilt position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 18.0 V/m; Power Drift = -0.050 dB Peak SAR (extrapolated) = 0.723 W/kg SAR(1 g) = 0.556 mW/g; SAR(10 g) = 0.404 mW/g Maximum value of SAR (measured) = 0.591 mW/g</p>		
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>dB</p> <p>0.000</p> <p>-1.76</p> <p>-3.52</p> <p>-5.27</p> <p>-7.03</p> <p>-8.79</p> </div>  </div> <p style="text-align: center;">0 dB = 0.591 mW/g</p>		

GSM (1900MHz/Head)

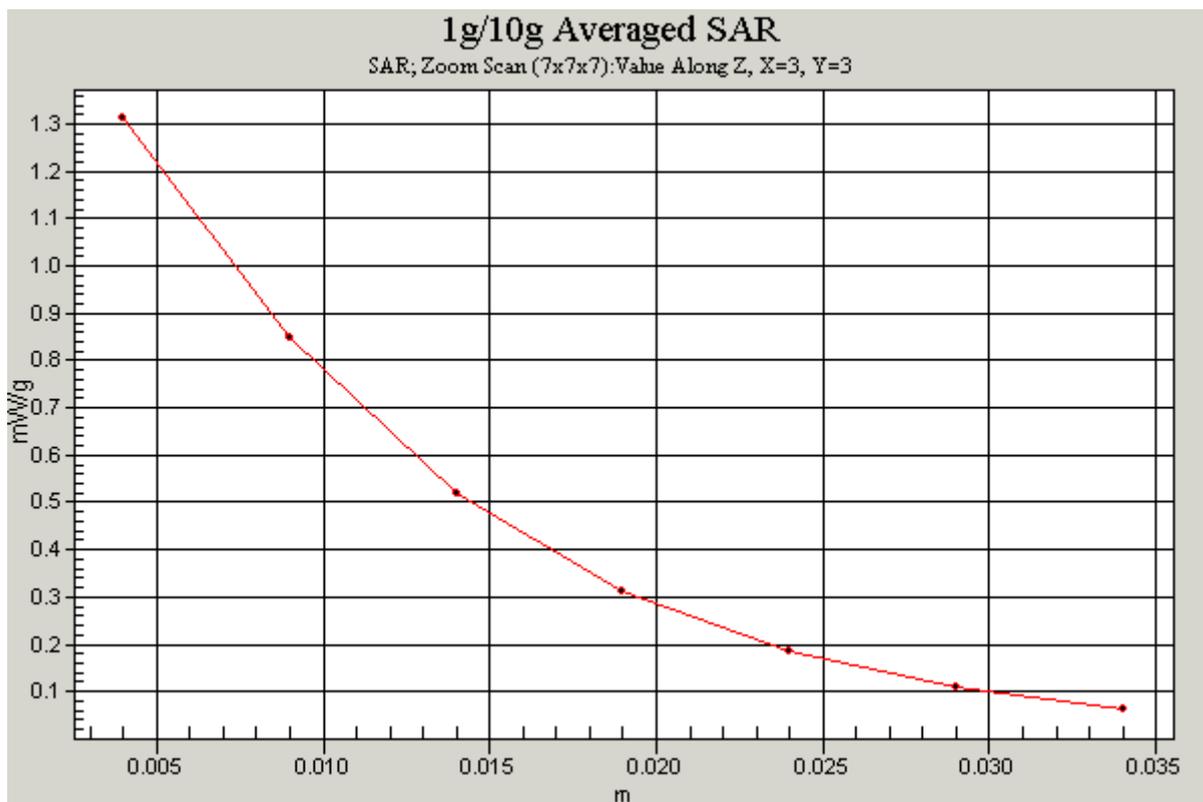
Right Side	Cheek	1850.2 MHz
<p>Communication System: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3 Medium parameters used: $f = 1851 \text{ MHz}$; $\sigma = 1.42 \text{ mho/m}$; $\epsilon_r = 38.6$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Right Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(4.95, 5.22, 5.06); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1559; Type: SAM; Serial: 1559 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - Low/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.13 mW/g</p> <p>Touch position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 18.2 V/m; Power Drift = -0.134 dB Peak SAR (extrapolated) = 1.55 W/kg SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.653 mW/g Maximum value of SAR (measured) = 1.18 mW/g</p> <div data-bbox="233 1317 1356 1859"> </div> <p style="text-align: center;">0 dB = 1.18mW/g</p>		

Right Side	Cheek	1880.0 MHz
<p>Communication System: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.3$; $\rho = 1000$ kg/m³ Phantom section: Right Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(4.95, 5.22, 5.06); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1559; Type: SAM; Serial: 1559 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - Middle/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm. Maximum value of SAR (measured) = 1.25 mW/g</p> <p>Touch position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 18.2 V/m; Power Drift = -0.064 dB Peak SAR (extrapolated) = 1.81 W/kg SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.688 mW/g Maximum value of SAR (measured) = 1.30 mW/g</p>		
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>dB</p> <p>0.000</p> <p>-3.50</p> <p>-7.00</p> <p>-10.5</p> <p>-14.0</p> <p>-17.5</p> </div>  </div> <p style="text-align: center;">0 dB = 1.30mW/g</p>		

Right Side	Cheek	1909.8 MHz
<p>Communication System: PCS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 1909.8$ MHz; $\sigma = 1.46$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³ Phantom section: Right Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(4.95, 5.22, 5.06); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1559; Type: SAM; Serial: 1559 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - High/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.23 mW/g</p> <p>Touch position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 18.0 V/m; Power Drift = -0.023 dB Peak SAR (extrapolated) = 1.65 W/kg SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.675 mW/g Maximum value of SAR (measured) = 1.24 mW/g</p>		
 <p>0 dB = 1.24mW/g</p>		

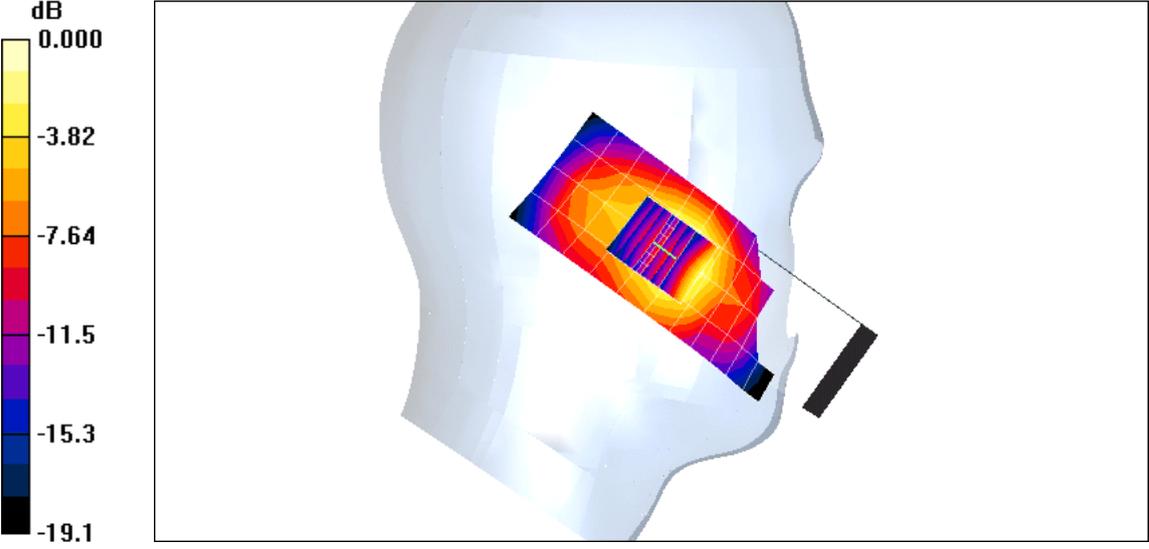
Right Side	tilt	1880.0 MHz
<p>Communication System: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.3$; $\rho = 1000$ kg/m³ Phantom section: Right Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(4.95, 5.22, 5.06); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1559; Type: SAM; Serial: 1559 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Tilt position - Middle/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.470 mW/g</p> <p>Tilt position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 16.7 V/m; Power Drift = 0.027 dB Peak SAR (extrapolated) = 0.701 W/kg SAR(1 g) = 0.444 mW/g; SAR(10 g) = 0.273 mW/g Maximum value of SAR (measured) = 0.479 mW/g</p>		
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>dB</p> <p>0.000</p> <p>-3.18</p> <p>-6.36</p> <p>-9.54</p> <p>-12.7</p> <p>-15.9</p> </div>  </div> <p style="text-align: center;">0 dB = 0.479mW/g</p>		

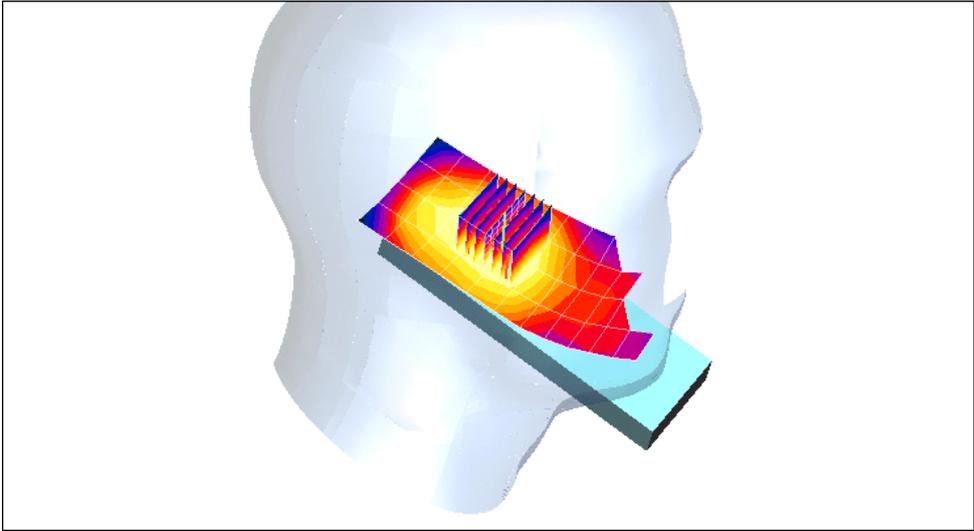
Left Side	Cheek	1880.0 MHz
<p>Communication System: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.3$; $\rho = 1000$ kg/m³ Phantom section: Left Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(4.95, 5.22, 5.06); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1559; Type: SAM; Serial: 1559 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - Middle/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.33 mW/g</p> <p>Touch position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 18.0 V/m; Power Drift = -0.036 dB Peak SAR (extrapolated) = 1.87 W/kg SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.709 mW/g Maximum value of SAR (measured) = 1.31 mW/g</p> <div data-bbox="220 1339 1369 1883"> </div>		



Z-Scan at power reference point (1900MHz CH810)

Left Side	Cheek	1850.2 MHz
<p>Communication System: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3 Medium parameters used: $f = 1851 \text{ MHz}$; $\sigma = 1.42 \text{ mho/m}$; $\epsilon_r = 38.6$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Left Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(4.95, 5.22, 5.06); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1559; Type: SAM; Serial: 1559 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - Low/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.26 mW/g</p> <p>Touch position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 17.2 V/m; Power Drift = 0.026 dB Peak SAR (extrapolated) = 1.78 W/kg SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.686 mW/g</p> <div data-bbox="225 1279 1362 1832"> </div>		

Left Side	Cheek	1909.8 MHz
<p>Communication System: PCS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 1909.8$ MHz; $\sigma = 1.46$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³ Phantom section: Left Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(4.95, 5.22, 5.06); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1559; Type: SAM; Serial: 1559 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Touch position - High/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.30 mW/g</p> <p>Touch position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 17.6 V/m; Power Drift = -0.149 dB Peak SAR (extrapolated) = 1.79 W/kg SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.669 mW/g</p>		
 <p>0 dB = 1.30mW/g</p>		

Left Side	tilt	1880.0 MHz
<p>Communication System: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3 Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.3$; $\rho = 1000$ kg/m³ Phantom section: Left Section</p> <p>DASY4 Configuration: - Probe: ES3DV3 - SN3128; ConvF(4.95, 5.22, 5.06); Calibrated: 4/21/2011 - Sensor-Surface: 4mm (Mechanical Surface Detection) - Electronics: DAE - SN720; Calibrated: 1/19/2011 - Phantom: SAM 1559; Type: SAM; Serial: 1559 - Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186</p> <p>Tilt position - Middle/Area Scan (5x12x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.507 mW/g</p> <p>Tilt position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 16.7 V/m; Power Drift = -0.012 dB Peak SAR (extrapolated) = 0.723 W/kg SAR(1 g) = 0.461 mW/g; SAR(10 g) = 0.279 mW/g Maximum value of SAR (measured) = 0.500 mW/g</p>		
<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>dB</p> <p>0.000</p> <p>-3.36</p> <p>-6.72</p> <p>-10.1</p> <p>-13.4</p> <p>-16.8</p> </div>  </div> <p style="text-align: center;">0 dB = 0.500mW/g</p>		

APPENDIX C: RELEVANT PAGES FROM PROBE CALIBRATION REPORT(S)

The State Radio_monitoring_center Testing Center

Calibration Certificate



Instrument Dosimetric E-field Probe

Type/Model ES3DV3

Manufacturer Schmid & Partner Engineering AG

Serial No SN:3128

Name of Client The State Radio_monitoring_center Testing Center

Address of Client No.80 Bei Lishi Road XiCheng District

Calibration Date 2011.4.21

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

Approved by



Tel: +86-10-68009202 68009203 Fax: +86-10-68009205 68009195
Add: No.80 Bei Lishi Road, Xi Cheng District Beijing 100037, P.R.China

The State Radio_monitoring_center Testing Center

Reference documents of the measurement(Code, Name)

SRTC3003-V1.0.0 Working procedure for calibration——SAR testing system

Place and environmental condition of the measurement

Temperature 23.1℃ Humidity 28.6%
Location SRTC226 room

Primary Calibration Equipment used	Model/Type	ID#	Cal Date	Scheduled Calibration
Power meter	E4417A	SN: MY45101004	2010.8	2011.8
Power sensor	E9300B	SN: MY41496001	2010.8	2011.8
Power sensor	E9300B	SN: MY41496003	2010.8	2011.8
Reference DAE	DAE4	SN: 720	2011.1	2012.1
Signal generator	SML03	SN:103514	2010.8	2011.8
Network analyzer	8714ET	SN:US40372083	2010.8	2011.8
Secondary Calibration Equipment used	Model/Type	ID#		
Waveguide	WGLS R9	SN:1006		
Waveguide	WGLS R14	SN:1003		
Waveguide	WGLS R22	SN:1006		

The State Radio_monitoring_center Testing Center

Note:

1. 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.
2. This calibration certificate is not permitted to be reproduced except in full without written the approval of the only laboratory.
3. SRTC is responsible for the whole of certificate only with stamp of SRTC.
4. The calibration results would be valid only for the items calibration.

Tel: +86-10-68009202 68009203 Fax: +86-10-68009205 68009195
Add: No.80 Bei Lishi Road, Xi Cheng District Beijing 100037, P.R.China

Page 3 of 6 Certificate No.SRTC2011-CAL002-003

The State Radio_monitoring_center Testing Center

Glossary

TSL	Tissue Simulating Liquid
NORM _{x, y, z}	The sensitivity in free space
ConvF	The sensitivity of the TSL/The sensitivity in free space
DCP	Diode Compression Point
Angle φ	φ rotation around probe axis
Angle θ	θ rotation around an axis that is in the plane normal to probe axis i.e. $\theta=0$, means that is normal to probe axis

Methods Applied and Interpretation of Parameters

- NORM_{x, y, z}: Assessed for E-field polarization $\theta=0$ for XY sensors and $\theta=90$ for Z sensor
- NORM(f)_{x, y, z} = NORM_{x, y, z} * frequency_response. And this linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the states uncertainty of ConvF.
- DCP_{x,y,z}: DCP are numerical linearization parameters assessed based on the data of power sweep(no uncertainty required). DCP does not depend on frequency and medium.
- ConvF and boundary effect: Assessed in flat phantom using E-field 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 values are given. 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: in a locally homogeneous field realized using an open waveguide setup.

The State Radio_monitoring_center Testing Center

Measurement Conditions

DASY versions	DSAY 5	V52.2.0.163
Model	Flat phantom	——

Probe Sensitivity Parameters

	Value	Unit
Axis X	1.00	$\mu V / (V / m)^2$
Axis Y	1.00	$\mu V / (V / m)^2$
Axis Z	1.00	$\mu V / (V / m)^2$

1. Diode Compression Point

	Value	Unit	Uncertainty (k=2)
Axis X	97.40	mV	10.82%
Axis Y	101.40	mV	10.82%
Axis Z	100.70	mV	10.82%

2. Probe Conversion Factors: Head Tissue Liquid

Frequency (MHz)	Validity (MHz)	Permittivity	Conductivity (mho/m)	Alpha	Depth (mm)	ConvFx/ ConvFy / ConvFz			Uncertainty (k = 2)
						$\mu V / (V / m)^2$			
835	±100	41.93	0.916	0.448	1.499	7.880	8.301	8.050	13.02%
900	±100	42.72	0.968	0.607	1.271	9.029	9.525	9.201	13.02%
1800	±100	39.61	1.354	0.312	2.126	6.154	6.495	6.273	13.02%
1900	±100	39.11	1.463	0.381	1.832	4.947	5.220	5.055	13.02%
2450	±100	38.30	1.890	0.394	1.808	3.308	3.487	3.402	13.02%

The State Radio_monitoring_center Testing Center

3. Probe Conversion Factors: Body Tissue Liquid

Frequency (MHz)	Validity (MHz)	Permittivity	Conductivity (mho/m)	Alpha	Depth (mm)	ConvFx/ ConvFy/ConvFz $\mu V/(V/m)^2$			Uncertainty (k=2)
835	±100	54.05	0.983	0.508	1.412	6.776	7.019	6.804	13.02%
900	±100	54.48	1.055	0.672	1.244	8.755	9.243	8.919	13.02%
1800	±100	53.74	1.567	0.316	2.446	5.702	6.018	5.816	13.02%
1900	±100	53.40	1.679	0.330	2.414	4.532	4.785	4.632	13.02%
2450	±100	52.70	1.950	0.623	1.368	4.580	4.859	4.673	13.02%

4. Probe Isotropy

	Value	Unit	Uncertainty(k=2)
Axial Isotropy	-0.071	dB	10.18%
Spherical Isotropy	-0.171	dB	10.18%

Calibrated by 张明远

Checked by 倪正