



FCC SAR

# TEST REPORT

of

## Mobile Phone

Model Name: Z11  
Trade Name: LANIX  
Report No.: SH11050009S01  
FCC ID: ZC4Z11

*prepared for*

**Corporativo Lanix S.A. de C.V.**  
Carretera Internacional Hermosillo-Nogales KM 8.5 Hermosillo Sonora Mexico



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**GENERAL SUMMARY**

<b>Product Name</b>	Mobile Phone	<b>Model</b>	Z11
<b>Trade Name</b>	LANIX	<b>Carrier</b>	Ai Xiaohui
<b>Quantity of EUT</b>	One	<b>Manufacturer</b>	Shanghai Huaqin Telecom Technology Co.,Ltd.

**Standard(s)**

**ANSI C95.1-1999:** IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fieldst.

**IEEE 1528-2003:** Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.

**OET Bulletin 65 (Edition 97-01) and Supplement C(Edition 01-01):** Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits.

**KDB648474 D01 SAR Handsets Multi Xmitter and Ant, v01r05:** SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas.

**KDB Publication 447498:** Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Polices

**Conclusion**

Localized Specific Absorption Rate (SAR) of this portable wireless equipment has been measured in all cases requested by the relevant standards cited in Clause 5.2 of this test report. Maximum localized SAR is below exposure limits specified in the relevant standards cited in Clause 5.1 of this test report.

General Judgment: Pass

Date of issue: May. 20. 2011

**Comment**

GSM850 TX Freq. Band: 824.2MHz-848.8 MHz  
 GSM1900 TX Freq. Band: 1850.2MHz-1909.8 MHz  
 Bluetooth TX Freq. Band: 2402MHz-2480 MHz  
 Antenna Character : build inside  
 The test result only responds to the measured sample.

Tested by: Shi Peng, Date: 2011.5.20

Checked by: Zhang Jun, Date: 2011.5.20

Approved by: Wei Bei, Date: 2011.5.20



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## **1 GENERAL CONDITIONS**

This report only refers to the item that has undergone the test. This report standalone does not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities.

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## 2 Administrative Date

### 2.1 Identification of the Responsible Testing Laboratory

**Company Name:** Shenzhen Morlab Communications Technology Co.,Ltd.  
**Department:** Testing Department  
**Address:** 3F1, Electronic Testing Building, ShaHe Road, NanShan District, Shenzhen, P. R. China  
**Telephone:** +86 755 86130268  
**Fax:** +86 755 86130218  
**Responsible Test Lab Managers:** Mr. Shu Luan

### 2.2 Identification of the Responsible Testing Location(s)

**Company Name:** Shenzhen Electronic Product Quality Testing Center Morlab Laboratory  
**Address:** 3F1, Electronic Testing Building, ShaHe Road, NanShan District, Shenzhen, P. R. China

### 2.3 Organization Item

**Morlab Report No.:** SH11050009S01  
**Morlab Project Leader:** Mr. Zhang Jun  
**Morlab Responsible for Accreditation scope:** Mrs. Wei Bei  
**Start of Testing:** 2011-05-20  
**End of Testing:** 2011-05-20

### 2.4 Identification of Applicant

**Company Name:** Corporativo Lanix S.A. de C.V.  
**Address:** Carretera Internacional Hermosillo- Nogales KM 8.5 Hermosillo Sonora Mexico  
**Contact person:** Ai Xiaohui  
**Telephone:** 021-61651266  
**Fax:** 021-61651265

### 2.5. Identification of Manufacture

**Company Name:** Shanghai Huaqin Telecom Technology Co.,Ltd.  
**Address:** Building1,399 Keyuan Road,Pudong district,Shanghai,China

**Notes:** This data is based on the information offered by the applicant.

### 3 Equipment Under Test (EUT)

#### 3.1. Identification of the Equipment under Test

**Product Name:** Mobile Phone  
**Brand name:** LANIX  
**Model No:** Z11  
**General description:** Test frequency GSM850/1900  
Accessories Battery, Charger  
Battery Model Z11  
Battery specification 3.7V 1000mAh  
Battery Manufacture SHENZHEN ZEALWIN ELECTRONIC CO.,LTD

Antenna type GSM/GPRS: Integrated;  
Bluetooth 2.1+EDR  
Modulation mode GMSK; GFSK,  $\pi/4$ -DQPSK, 8-DPSK

#### 3.2. Identification of all used Test Sample of the Equipment under Test

EUT Code	Serial Number	Hardware Version	Software Version	IMEI
#1	N.A	V2.0	ZL109B_45A0_V0_0_D	/

**NOTE:**

1. The EUT consists of Hand-Held Terminal Set and normal options: Charger, Lithium Battery as listed above.
2. Please refer to Appendix C for the photographs of the EUT. For a more detailed features description of the EUT, please refer to its User's Manual.
3. The EUT is production unit.
4. Testing for General Population/Uncontrolled limits.

## 4 OPERATIONAL CONDITIONS DURING TEST

### 4.1 Schematic Test Configuration

During SAR test, EUT is in Traffic Mode (Channel Allocated) at Normal Voltage Condition. A communication link is set up with a System Simulator (SS) by air link, and a call is established.

The TCH is allocated to is allocated to 125, 190 and 251 respectively in the case of GSM 850 MHz, or to 512, 661 and 810 respectively in the case of PCS 1900 MHz. The EUT is commanded to operate at maximum transmitting power.

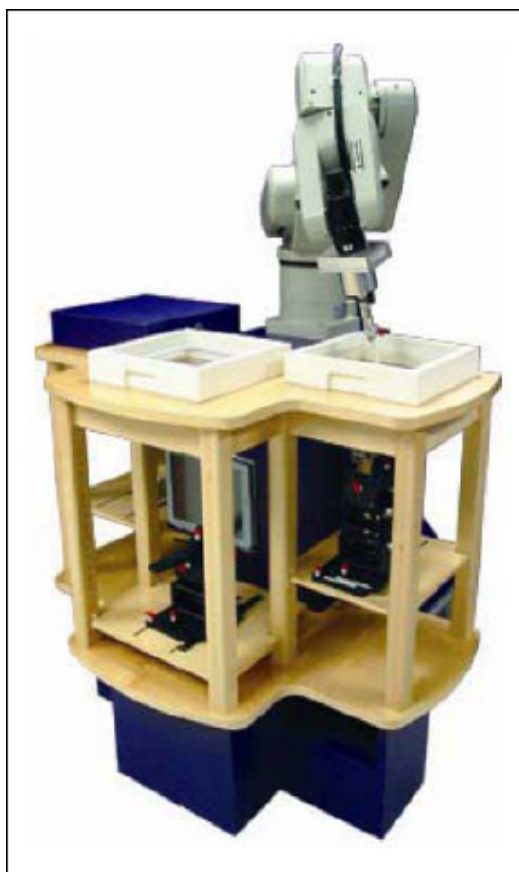
The EUT shall use its internal transmitter. The antenna(s), battery and accessories shall be those specified by the manufacturer. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. If a wireless link is used, the antenna connected to the output of the base station simulator shall be placed at least 50 cm away from the handset.

The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the handset by at least 35 dB.

### 4.2 SAR Measurement System

ALSAS-10-U is fully compliant with the technical and scientific requirements of IEEE 1528, IEC 62209, CENELEC, ARIB, ACA, and the Federal Communications Commission. The system comprises of a six axes articulated robot which utilizes a dedicated controller. ALSAS-10U uses the latest methodologies and FDTD order to provide a platform which is repeatable with minimum uncertainty.

Applications Predefined measurement procedures compliant with the guidelines of CENELEC, IEEE, IEC, FCC, etc are utilized during the assessment for the device. Automatic detection for all SAR maxima are embedded within the core architecture for the system, ensuring that peak locations used for centering the zoom scan are within a 1mm resolution and a 0.05mm repeatable position. System operation range currently is available up to 6 GHz in simulated tissue.





#### 4.2.1 Robot system specification

ALSAS-10U utilizes a six articulated robot, which is controlled using a Pentium based real-time movement controller. The movement kinematics engine utilizes proprietary (Thermo CRS) interpolation and extrapolation algorithms, which allow full freedom of movement for each of the six joints within the working envelop. Utilization of joint 6 allows for full probe rotation with a tolerance better than 0.05mm around the central axis.



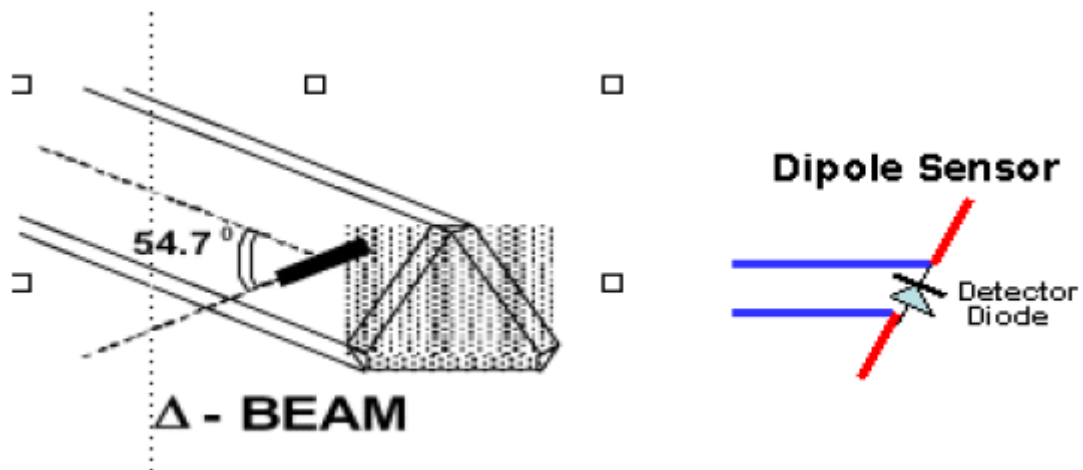
<b>Robot/Controller Manufacturer</b>	Thermo CRS
<b>Number of Axis</b>	Six independently controlled axis
<b>Positioning Repeatability</b>	0.05mm
<b>Controller Type</b>	Single phase Pentium based C500C
<b>Robot Reach</b>	710mm
<b>Communication</b>	RS232 and LAN compatible

#### 4.2.2 Probe Specification

The isotropic E-Field probe has been fully calibrated and assessed for isotropic, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change. A number of methods is used for calibrating probes, and these are outlined in the table below:

<b>Calibration Frequency</b>	<b>Air Calibration</b>	<b>Tissue Calibration</b>
<b>850MHZ</b>	<b>TEM Cell</b>	<b>Temperature</b>
<b>1900MHZ</b>	<b>TEM Cell</b>	<b>Temperature</b>

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



SAR is assessed with a calibrated probe which moves at a default height of 5mm from the center of the diode, which is mounted to the sensor, to the phantom surface (in the Z Axis). The 5mm offset height has been selected so as to minimize any resultant boundary effect due to the probe being in close proximity to the phantom surface.

The following algorithm is an example of the function used by the system for linearization of the output from the probe when measuring complex modulation schemes.

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



## Isotropic E-Field Probe Specification

<b>Calibration in Air</b>	Frequency Dependent Below 2GHz Calibration in air performed in a TEM Cell Above 2GHz Calibration in air performed in waveguide
<b>Sensitivity</b>	0.70 $\mu\text{V}/(\text{V}/\text{m})^2$ to 0.85 $\mu\text{V}/(\text{V}/\text{m})^2$
<b>Dynamic Range</b>	0.0005 W/kg to 100W/kg
<b>Isotropic Response</b>	Better than 0.2dB
<b>Diode Compression point (DCP)</b>	Calibration for Specific Frequency
<b>Probe Tip Radius</b>	< 5mm
<b>Sensor Offset</b>	1.56 (+/- 0.02mm)
<b>Probe Length</b>	290mm
<b>Video Bandwidth</b>	@ 500 Hz: 1dB @1.02 KHz: 3dB
<b>Boundary Effect</b>	Less than 2% for distance greater than 2.4mm
<b>Spatial Resolution</b>	Diameter less than 5mm Compliant with Standards

## Boundary detection Unit and Probe Mounting Device

ALSAS-10U incorporates a boundary detection unit with a sensitivity of 0.05mm for detecting all types of surfaces. The robust design allows for detecting during probe tilt (probe normalize) exercises, and utilizes a second stage emergency stop. The signal electronics are directly into the robot controller for high accuracy surface detection in lateral and axial detection modes (X, Y, &Z). The probe is mounted directly onto the Boundary Detection unit for accurate tooling and displacement calculations controlled by the robot kinematics. The probe is connected to an isolated probe interconnect where the output stage of the probe is fed directly into the amplifier stage of the Daq-Paq.

**Daq-Paq (Analog to Digital Electronics)**

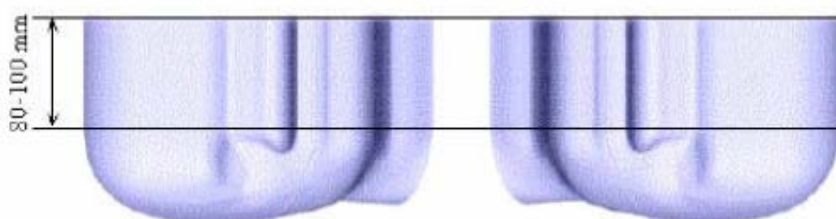
ALSAS-10U incorporates a fully calibrated Daq-Paq (analog to digital conversion system) which has a 4 channel input stage, sent via a 2 stage auto-set amplifier module. The input signal is amplified accordingly so as to offer a dynamic range from 5  $\mu$  V to 800mV. Integration of the fields measured is carried out at board level utilizing a Co-Processor which then sends the measured fields down into the main computational module in digitized form via a RS232 communications port. Probe linearity and duty cycle compensation is carried out within the main Daq-Paq module.

<b>ADC</b>	12 Bit
Amplifier Range	20mV to 200mV and 150mV to 800mV
Field Integration	Local Co-Processor utilizing proprietary integration algorithms
Number of Input Channels	4 in total 3 dedicated and 1 spare
Communication	Packet data via RS232

### 4.2.3 Phantoms, Device Holder and Simulant Liquid

#### 4.2.3.1 Sam Phantom

The SAM phantoms developed using the IEEE SAM CAD file. They are fully compliant with the requirements for both IEEE 1528 and FCC Supplement C. Both the left and right SAM phantoms are interchangeable, transparent and include the IEEE 1528 grid with visible NF and MB lines.



#### APREL Laboratories Universal Phantom

The Universal Phantom is used on the ALSAS-10U as a system validation phantom. The Universal Phantom has been fully validated both experimentally from 800MHz to 6GHz and numerically using XFDTD numerical software. The shell thickness is 2mm overall, with a 4mm spacer located at the NF/MB intersection providing an overall thickness of 6mm in line with the requirements of IEEE-1528.

The design allows for fast and accurate measurements, of handsets, by allowing the conservative SAR to be evaluated at on frequency for both left and right head experiments in one measurement.





## Device and Dipole Holder

### ALSAS Universal Workstation

ALSAS Universal workstation allows for repeatability and fast adaptability. It allows users to do calibration, testing and measurement using different types of phantoms with one set up, which significantly speeds up the measurement process.

### Universal Device Positioner

The universal device positioner allows complete freedom of movement of the EUT. Developed to hold a EUT in a free-space scenario any additional loading attributable to the material used in the construction of the positioner has been eliminated. Repeatability has been enhanced through the linear scales which form the design used to indicate positioning for any given test scenario in all major axes. A  $15^\circ$  tilt movements for head SAR analysis. Overall uncertainty for measurements has been reduced due to the design of the Universal device positioner, which allows positioning of a device in as near to a free-space scenario as possible, and by providing the means for complete repeatability.



### 4.2.3.2 Tissue Simulating Liquids

There is no simulating liquids that can cover all frequency bands. Therefore, our system is using different liquids for the measured band as explained bellows.

The parameters of the simulating solution strongly influence the SAR values. The different normalization organizations have defined adapted solutions for the each mobile system.

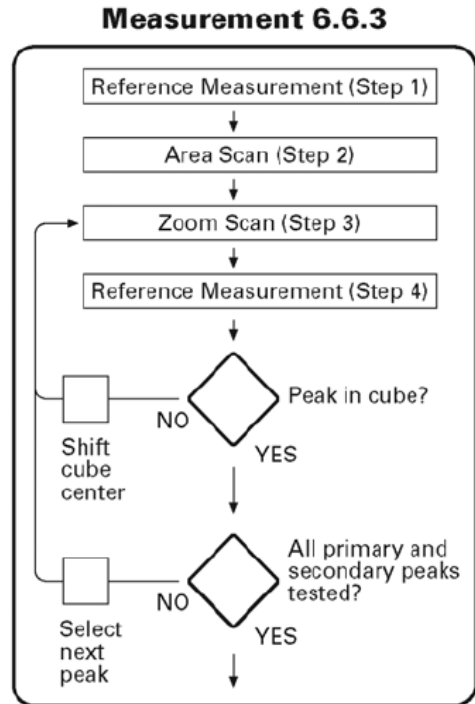
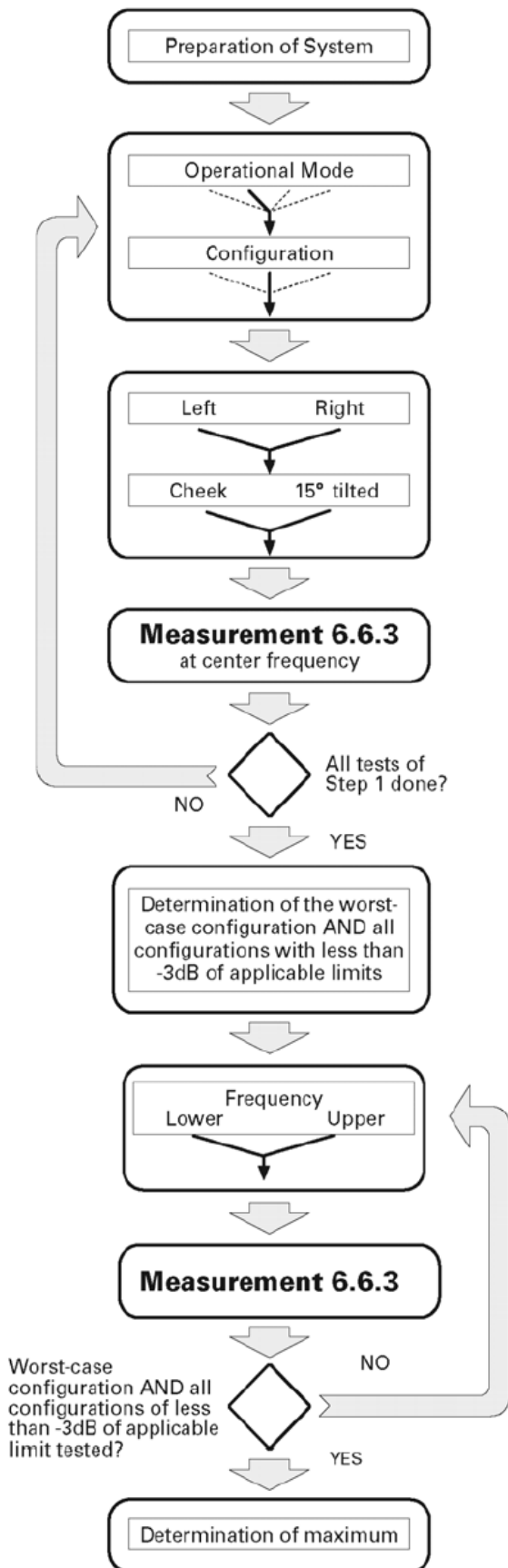
GSM liquid: is made of Sugar, de-ionized water and NaCl, reconstituting the electric properties of human tissues at 850MHz.

PCS Liquid: is made of de-ionized water, Glycol monobutyl and NaCl, reconstituting the electric properties of human tissues at 1900MHz.

Several measurement systems are available for measuring the dielectric parameters.

Antennessa has developed its own software, based on a coaxial probe. This method allows measurement of liquid permittivity between 300 MHz and 6GHz.

### 4.2.4 SAR measurement procedure



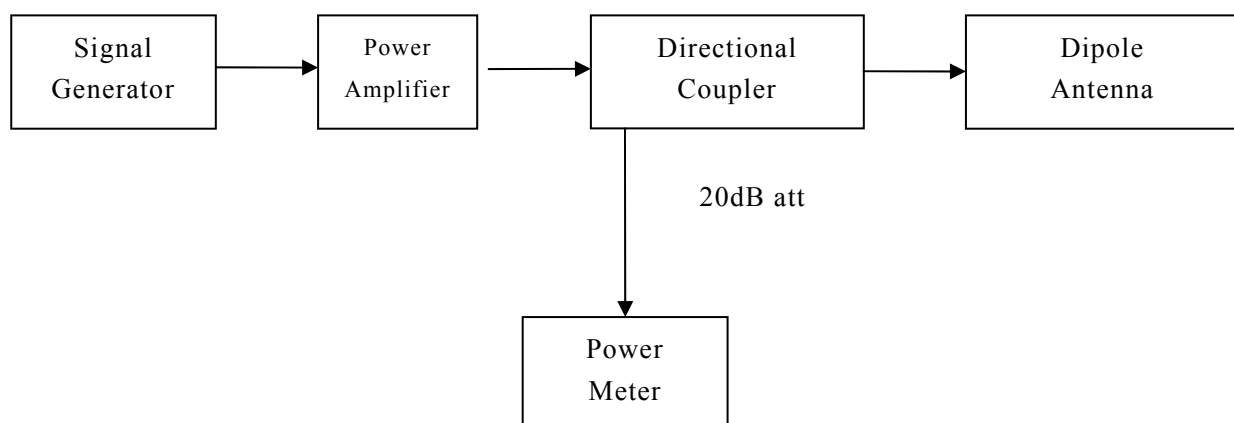
Channel	Left				Right			
	Check		Tilt		Check		Tilt	
	Retracted	Extended	Retracted	Extended	Retracted	Extended	Retracted	Extended
<b>Mode 1:</b>								
High			S2(-1.4dB)	S2(-0.4dB)			S2(-2.2dB)	S2(-1.4dB)
Middle	S1(-4dB)	S1(-4dB)	S1(-1.5dB)	S1(-0.5dB)	S1(-5dB)	S1(-5dB)	S1(-2.5dB)	S1(-1.5dB)
Low			S2(-1.3dB)	S2(-0.7dB)			S2(-2.7dB)	S2(-0.6dB)
<b>Mode 2:</b>								
High			S2(-2.7dB)	S2(-1.1dB)				
Middle	S1(-5dB)	S1(-5dB)	S1(-2.5dB)	S1(-1dB)	S1(-6dB)	S1(-6dB)	S1(-5dB)	S1(-5dB)
Low			S2(-2.2dB)	S2(-0.8dB)				

After an area scan has been done at a fixed distance of 8mm from the surface of the phantom on the source side, a 3D scan is set up around the location of the maximum spot SAR. First, a point within the scan area is visited by the probe and a SAR reading taken at the start of testing. At the end of testing, the probe is returned to the same point and a second reading is taken. Comparison between these start and end readings enables the power drift during measurement to be assessed.

Above is the scanning procedure flow chart and table from the IEEE P1528 standard. This is the procedure for which all compliant testing should be carried out to ensure that all variations of the device position and transmission behavior are tested.

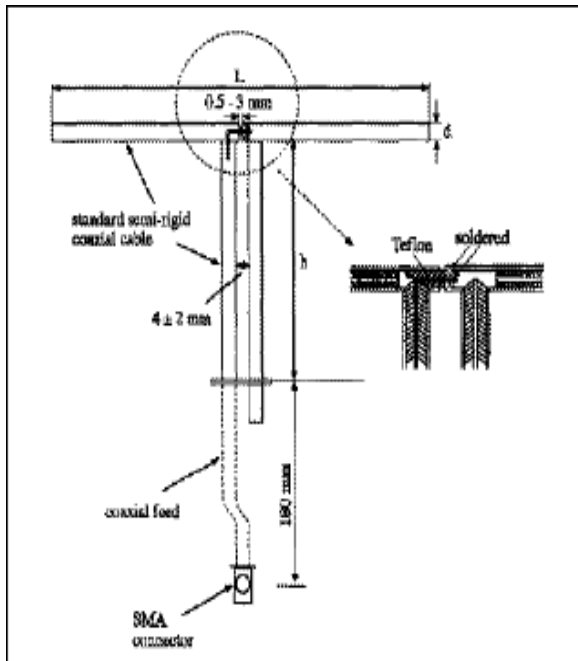
#### 4.2.5 Validation Test Using Flat Phantom

The following procedure, recommended for performing validation tests using flat phantom is based on the procedures described in the IEEE standard P1528. Setup according to the setup diagram below:



#### 4.2.5.1 Setting up the Box Phantom for Validation Testing

##### Validation Dipoles



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

Frequency	L(mm)	h(mm)	d(mm)
850 MHz	161	89.8	3.6
1900 MHz	67.1	38.9	3.6





<b>Validation Result</b>				
System Performance Check at 850MHz & 1900MHz				
Validation Kit: ASL-D-850-S-2				
Frequency(MHz)	Description	SAR(W/Kg) 1g	SAR(W/Kg) 10g	Tissue Temp.(°C)
835MHz Head	Reference result	9.590	6.003	N/A
	Value(1W) 2011-5-20	9.404	6.048	20.7
	Value(0.25W) 2011-5-20	2.351	1.512	20.7
Validation Kit: ASL-D-1900-S-2				
Frequency(MHz)	Description	SAR(W/Kg) 1g	SAR(W/Kg) 10g	Tissue Temp.(°C)
1900MHz Head	Reference result	39.378	19.668	N/A
	Value(1W) 2011-5-20	38.452	20.408	20.7
	Value(0.25W) 2011-5-20	9.613	5.102	20.7
Validation Kit: ASL-D-850-S-2				
Frequency(MHz)	Description	SAR(W/Kg) 1g	SAR(W/Kg) 10g	Tissue Temp.(°C)
835MHz body	Reference result	9.981	6.006	N/A
	Value(1W) 2011-5-20	9.780	6.348	20.7
	Value(0.25W) 2011-5-20	2.445	1.587	20.7
Validation Kit: ASL-D-1900-S-2				
Frequency(MHz)	Description	SAR(W/Kg) 1g	SAR(W/Kg) 10g	Tissue Temp.(°C)
1900MHz body	Reference result	39.654	19.668	N/A
	Value(1W) 2011-5-20	38.064	20.136	20.7
	Value(0.25W) 2011-5-20	9.516	5.034	20.7

Note: Validation SAR values are normalized to 1W forward power

#### **4.2.6 Measurement Procedure**

The following steps are used for each test position

Establish a call with the maximum output power with a base station simulator. The connection between the mobile phone and the base station simulator is established via air interface.

Measurement of the local E-field distribution is done with a grid of 8 to 16mm\*8 to 16mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolating scheme.

Around this point, a cube of 30\*30\*30mm or 32\*32\*32mm is assessed by measuring 5 or 8\*5 or 8\*4 or 5mm. With these data, the peak spatial-average SAR value can be calculated.

#### **4.2.7 Description of Interpolation/Extrapolation Scheme**

The local SAR inside the phantom is measured using small dipole sensing elements inside a probe body. The probe tip must not be in contact with the phantom surface in order to minimise measurements errors, but the highest local SAR will occur at the surface of the phantom.

An extrapolation is using to determinate this highest local SAR values. The extrapolation is base on a fourth-order least square polynomial fit of measured data. The local SAR value is then extrapolated from the liquid surface with a 1mm step.

The measurements have to be performed over a limited (due to the duration of the battery) so the step of measurement is high. It could vary between 5 and 8mm. to obtain an accurate assessment of the maximum SAR averaged over 10 grams and 1gram requires a very fine resolution in the three-dimensional scanned data array.



## **5 CHARACTERISTICS OF THE TEST**

### **5.1 Applicable Limit Regulations**

**ANSI C95.1–1999:** IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. It specifies the maximum exposure limit of 1.6 W/kg as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

### **5.2 Applicable Measurement Standards**

**IEEE 1528–2003:** Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques.

**OET Bulletin 65 (Edition 97-01) and Supplement C(Edition 01-01):** Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits.

**KDB648474 D01 SAR Handsets Multi Xmitter and Ant, v01r05:** SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas.

**KDB Publication 447498:** Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Polices



## 6 LABORATORY ENVIRONMENT

**Table: The Ambient Conditions during SAR Test**

Temperature	Min. =15°C, Max. =30°C
Relative humidity	Min. =30%, Max. =70%
Ground system resistance	<0.5Ω

Ambient noise is checked and found very low and in compliance with requirement of standards.

Reflection of surrounding objects is minimized and in compliance with requirement of standards.

## 7 TEST RESULTS

### 7.1 Explain

The EUT has been tested under the operating conditions.

### 7.2 Dielectric Performance

For head measurement, the device was tested at the lowest, middle and highest frequencies in the transmit band.

**Table 1: Dielectric Performance of Head Tissue Simulating Liquid**

Temperature: 23.0~23.8°C, humidity: 54~60%.

/	Frequency	Permittivity $\epsilon$	Conductivity $\sigma$ (S/m)
<b>Target value</b>	835 MHZ	41.5	0.90
<b>Validation value</b> (May 20)	835 MHZ	40.670	0.882
<b>Target value</b>	1900 MHZ	40	1.40
<b>Validation value</b> (May 20)	1900 MHZ	39.582	1.372

For body-worn measurements, the device was tested against flat phantom representing the user body. Under measurement phone was put on in the belt holder.

**Table 2: Dielectric Performance of Body Tissue Simulating Liquid**

Temperature: 23.0~23.8°C, humidity: 54~60%.

/	Frequency	Permittivity $\epsilon$	Conductivity $\sigma$ (S/m)
<b>Target value</b>	835 MHz	55.2	0.97
<b>Validation value</b> (May 20)	835 MHz	54.648	0.957
<b>Target value</b>	1900 MHz	53.30	1.52
<b>Validation value</b> (May 20)	1900 MHz	52.214	1.482



### 7.3 Conducted Power

The conducted power for GSM 850/1900 is as following:

GSM 850MHz	Conducted Power (dBm)				Average Power (dBm)		
	128	190	251		128	190	251
	31.74	31.96	32.21	-9.03 dBm	22.71	22.93	23.18
GSM 1900MHz	Conducted Power (dBm)				Average Power (dBm)		
	512	661	810		512	661	810
	29.09	29.34	29.73	-9.03 dBm	20.06	20.31	20.70

The conducted power for GPRS 850/1900 is as following:

GSM 850 GPRS	Conducted Power (dBm)				Average Power (dBm)		
	128	190	251		128	190	251
1 Txslot	31.22	31.45	31.59	-9.03 dBm	22.19	22.42	22.56
2 Txslots	30.72	30.98	31.15	-6.02 dBm	24.70	24.96	25.13
GSM 1900 GPRS	Conducted Power (dBm)				Average Power (dBm)		
	512	661	810		512	661	810
1 Txslot	28.57	28.82	29.31	-9.03 dBm	19.54	19.79	20.28
2 Txslots	28.15	28.39	28.94	-6.02 dBm	22.13	22.37	22.92

#### NOTES:

##### 1) Division Factors

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

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

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

**According to the conducted power as above, the body measurements are performed with 2 Tx slots for GPRS.**

### 7.4 Summary of Measurement Results(GSM/GPRS 850/1900)

**Table 1: SAR Values (GSM850 Head)**

Temperature: 21.0~23.5°C, Relative Humidity: 60~65%.		
Limit of SAR (W/kg)	1 g Average	
	1.6	
Test Configuration	Measurement Result (W/kg)	
	1 g Average(W/kg)	Power Drift(%)
Left head ,Touch cheek, Low Channel	0.528	-0.173
Left head ,Touch cheek, Middle Channel	0.802	-3.367
Left head ,Touch cheek, High Channel	0.637	-1.724

Left head ,Tilt 15 Degree, Middle Channel	0.687	-1.862
Right head ,Touch cheek, Middle Channel	0.707	-4.187
Right head ,Tilt 15 Degree, Middle Channel	0.675	-2.039

**Table 2: SAR Values (GSM1900 Head)**

<b>Temperature: 21.0~23.5°C, Relative Humidity: 60~65%.</b>		
<b>Limit of SAR (W/kg)</b>	<b>1 g Average</b>	
	<b>1.6</b>	
<b>Test Configuration</b>	<b>Measurement Result (W/kg)</b>	
	<b>1 g Average(W/kg)</b>	<b>Power Drift(%)</b>
Left head ,Touch cheek, Middle Channel	0.585	-3.731
Left head ,Touch cheek, Low Channel	0.533	1.406
Left head ,Tilt 15 Degree, Middle Channel	0.637	-1.251
Left head ,Touch cheek, High Channel	0.760	-2.959
Right head ,Touch cheek, Middle Channel	0.354	4.457
Right head ,Tilt 15 Degree, Middle Channel	0.500	-1.626

**Table 3: SAR Values (GPRS850 Body)**

<b>Temperature: 21.0~23.5°C, Relative Humidity: 60~65%.</b>		
<b>Limit of SAR (W/kg)</b>	<b>1 g Average</b>	
	<b>1.6</b>	
<b>Test Configuration</b>	<b>Measurement Result (W/kg)</b>	
	<b>1 g Average(W/kg)</b>	<b>Power Drift(%)</b>
Frontside Towards Phantom Middle Channel	0.533	-1.137
Backside Towards Phantom Low Channel	0.786	0.561
Backside Towards Phantom Middle Channel	0.726	-1.018
Backside Towards Phantom High Channel	0.459	0.119
Backside Towards Phantom Low Channel (GSM)	0.603	-1.958

**Table 4: SAR Values (GPRS1900 Body)**

<b>Temperature: 21.0~23.5°C, Relative Humidity: 60~65%.</b>		
<b>Limit of SAR (W/kg)</b>	<b>1 g Average</b>	
	<b>1.6</b>	
<b>Test Configuration</b>	<b>Measurement Result (W/kg)</b>	
	<b>1 g Average(W/kg)</b>	<b>Power Drift(%)</b>
Frontside Towards Phantom Middle Channel	0.190	0.565

<b>Backside Towards Phantom Low Channel</b>	0.261	1.983
<b>Backside Towards Phantom Middle Channel</b>	0.332	2.539
<b>Backside Towards Phantom High Channel</b>	0.443	-2.448
<b>Backside Towards Phantom High Channel (GSM)</b>	0.659	-0.045

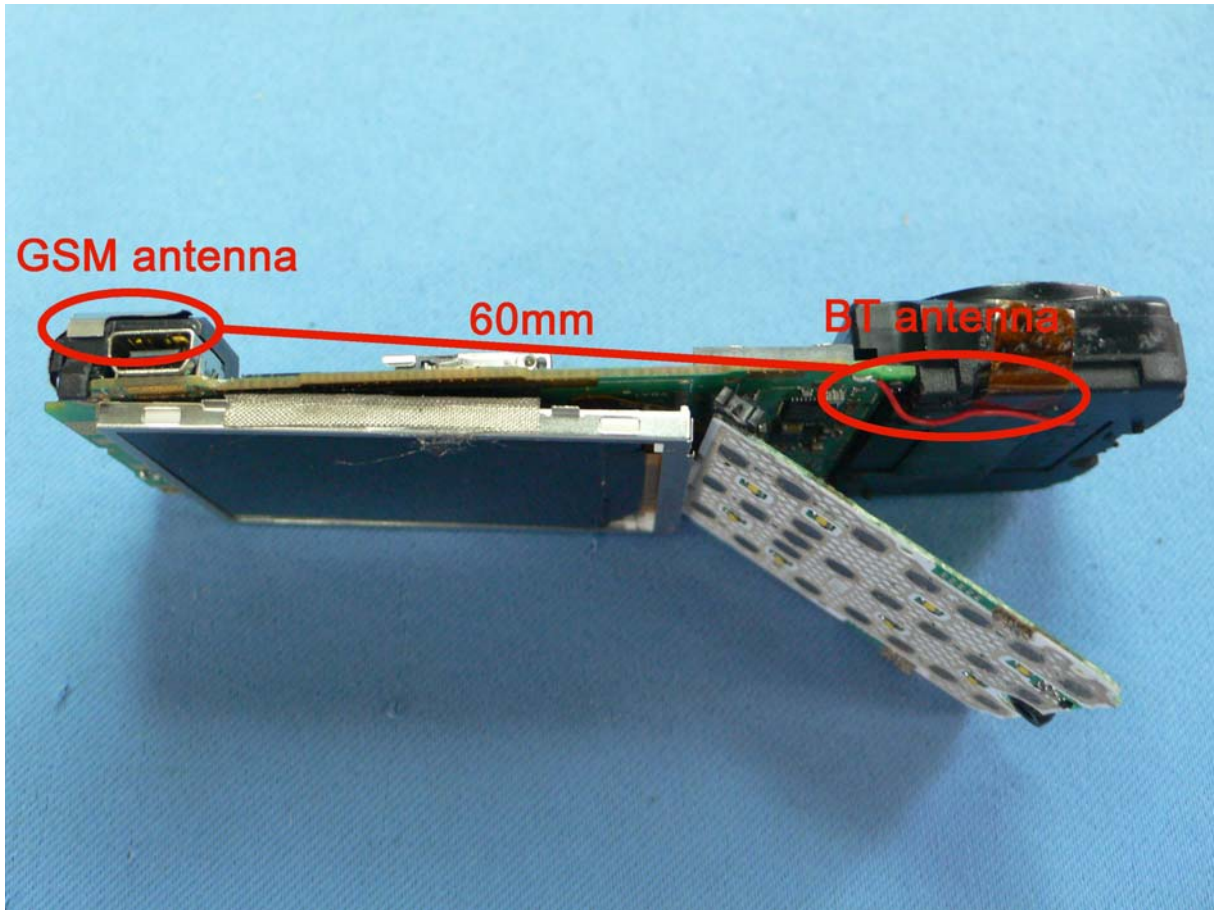
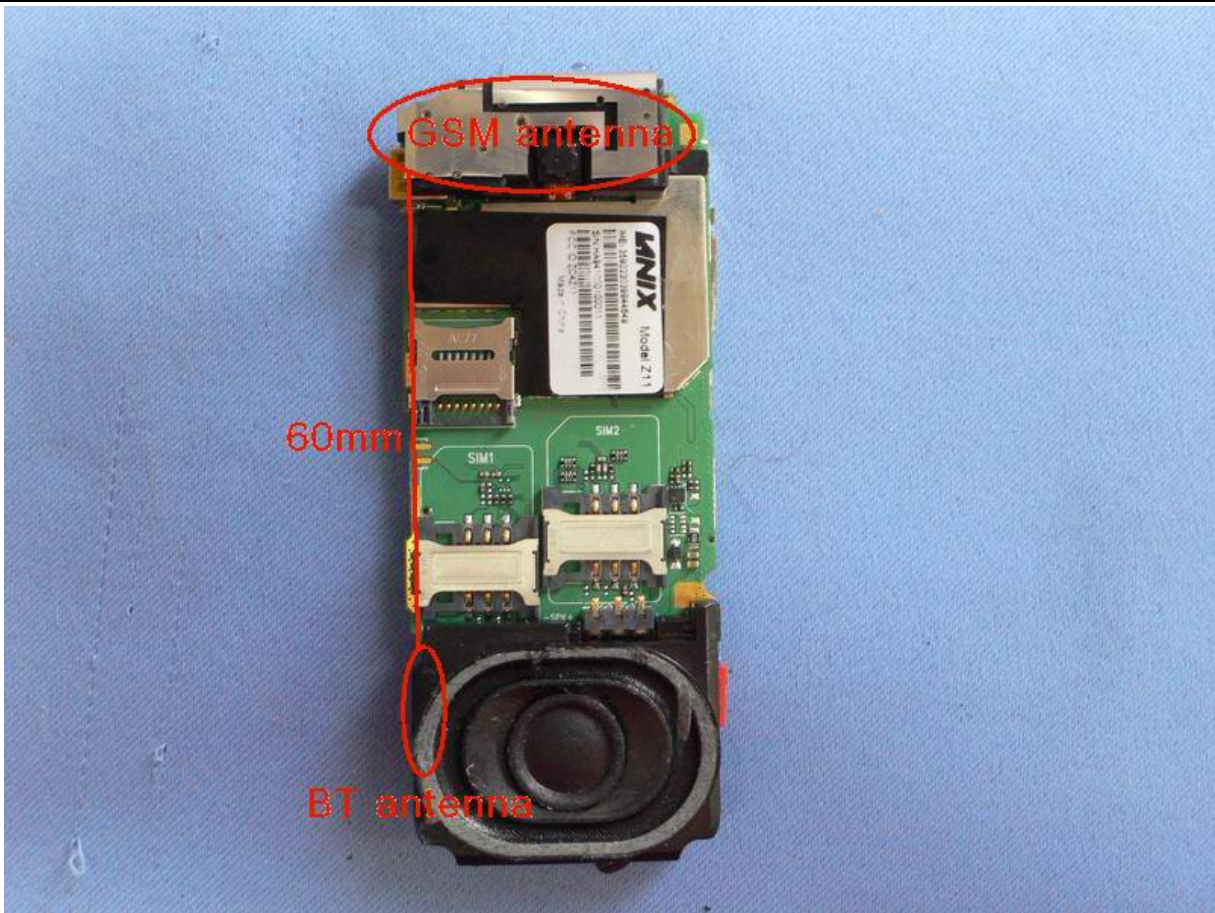
**NOTE:** The distance between the back of the DUT and the bottom of the flat phantom is 15mm.

### 7.5 Summary of Measurement Results (Bluetooth Function)

The location of the antennas inside mobile phone is shown below:







The conducted power for BT antenna is as following:

Frequency (MHz)	Conducted Power (dBm)		
	Data Rate/Modulation		
	GFSK 1Mbps	$\pi/4$ -DQPSK 2Mbps	8-DPSK 3Mbps
2402	-3.80	-6.18	-6.15
2441	<b>-3.65</b>	-5.84	-5.85
2480	-3.92	-6.27	-5.77

The max BT conduct Power is  $0.43\text{mW} < 12\text{mW}(\text{P}_{\text{Ref}})$ . The distance between BT antenna and GSM antenna is  $60\text{mm} > 5\text{cm}$ . And BT antenna and GSM antenna can Simultaneous Transmission. Because of ‘When the output of an unlicensed transmitter is  $\leq 2 \text{ P}_{\text{Ref}}$  and its antenna(s) is  $\geq 5.0 \text{ cm}$  from other antennas, stand-alone SAR evaluation is also not required for that unlicensed transmitter.’ and ‘When stand-alone SAR evaluation is not required and the antenna is  $\geq 5 \text{ cm}$  from other antennas, simultaneous transmission SAR evaluation is also not required for that antenna.’ in KDB 648474, SAR for BT is not required.

## 7.6 Conclusion

Peak Spatial-Average Specific Absorption Rate (SAR) of this portable wireless device has been measured in all configurations requested by the relevant standards cited in Clause 5.2 of this report. SAR values are below exposure limits specified in the relevant standards cited in Clause 5.1 of this test report.

## 8 Measurement Uncertainties

The following table includes the uncertainty table of the IEEE 1528. The values are determined by Antennessa.

UNCERTAINTY EVALUATION FOR HANDSET SAR TEST

Source of Uncertainty	Tolerance Value	Probability Distribution	Divisor	ci1 (1-g)	ci1 (10-g)	Standard Uncertainty (1-g) %	Standard Uncertainty (10-g) %
Measurement System							
Probe Calibration	3.5	normal	1	1	1	3.5	3.5
Axial Isotropy	3.7	rectangular	$\sqrt{3}$	$(1-cp)^{1/2}$	$(1-cp)^{1/2}$	1.5	1.5
Hemispherical Isotropy	10.9	rectangular	$\sqrt{3}$	$\sqrt{cp}$	$\sqrt{cp}$	4.4	4.4
Boundary Effect	1.0	rectangular	$\sqrt{3}$	1	1	0.6	0.6
Linearity	4.7	rectangular	$\sqrt{3}$	1	1	2.7	2.7
Detection Limit	1.0	rectangular	$\sqrt{3}$	1	1	0.6	0.6
Readout Electronics	1.0	normal	1	1	1	1.0	1.0
Response Time	0.8	rectangular	$\sqrt{3}$	1	1	0.5	0.5
Integration Time	1.7	rectangular	$\sqrt{3}$	1	1	1.0	1.0
RF Ambient Condition	3.0	rectangular	$\sqrt{3}$	1	1	1.7	1.7
Probe Positioner Mech.	0.4	rectangular	$\sqrt{3}$	1	1	0.2	0.2
Restriction							
Probe Positioning with respect to Phantom Shell	2.9	rectangular	$\sqrt{3}$	1	1	1.7	1.7
Extrapolation and Integration	3.7	rectangular	$\sqrt{3}$	1	1	2.1	2.1



Test Sample Positioning	4.0	normal	1	1	1	4.0	4.0
Device Holder Uncertainty	2.0	normal	1	1	1	2.0	2.0
Drift of Output Power	0.6	rectangular	$\sqrt{3}$	1	1	0.3	0.3
Phantom and Setup							
Phantom Uncertainty(shape & thickness tolerance)	3.4	rectangular	$\sqrt{3}$	1	1	2.0	2.0
Liquid Conductivity(target)	5.0	rectangular	$\sqrt{3}$	0.7	0.5	2.0	1.4
Liquid Conductivity(meas.)	0.0	normal	1	0.7	0.5	0.0	0.0
Liquid Permittivity(target)	5.0	rectangular	$\sqrt{3}$	0.6	0.5	1.7	1.4
Liquid Permittivity(meas.)	2.4	normal	1	0.6	0.5	1.4	1.2
Combined Uncertainty		RSS				9.3	9.2
Combined Uncertainty (coverage factor=2)		Normal(k=2)				18.7	18.3



## 9 MAIN TEST INSTRUMENTS

Instrument	Manufacture	Model No.	Serial No.	Last Calibration
Universal Work Station	Apral	ALS-UWS	100-00154	Jun.2010
Data Acquisition Package	Apral	ALS-DAQ-PAQ-3	110-00215	Jun.2010
Probe Mounting Device and Boundary Detection Sensor System	Apral	ALS-PMDPS-3	120-00265	Jun.2010
Miniature E-Field Probe	Apral	E-020	273-B	Sep.2010
Left ear SAM Phontom	Apral	ALS-P-SAM-L	130-00312	N/A
Right ear SAM Phontom	Apral	ALS-P-SAM-R	140-00362	N/A
Universal SAM Phontom	Apral	ALS-P-SU-1	150-00410	N/A
Reference Validation Dipole 835MHz	Apral	ALS-D-835-S-2	180-00565	Feb.2011
Reference Validation Dipole 1900MHz	Apral	ALS-D-1900-S-2	210-00716	Feb.2011
Dielectric Probe Kit	Apral	ALS-PR-DIEL	260-00955	N/A
Device Holder 2.0	Apral	ALS-H-E-SET-2	170-00506	N/A
SAR software	Apral	ALS-SAR-AL-10	Ver.2.3.6	N/A
CRS C500C Controller	Thermo	ALS-C500	RCF0504291	N/A
CRS F3 Robot	Apral	ALS-F3-SW	N/A	N/A
Power Amplifier	Mini-Circuit	SN0974	040306	N/A
Directional Coupler	Agilent	778D-012	N/A	N/A
Universal Radio Communication Tester	Rohde&Schwarz	CMU200	104845	Jan.2011
Vector Network	Anritsu	MS4623B	N/A	Nov.2010
Signal Generator	Agilent	E8257D	N/A	Jan.2011
Power Meter	Rohde&Schwarz	NRP	N/A	Jan.2011



**ANNEX A- Accreditation Certificate**

**China National Accreditation Service for Conformity Assessment**

**LABORATORY ACCREDITATION CERTIFICATE**

(No. CNAS L1659 )

*China National Accreditation Service for Conformity Assessment has accredited*

**Shenzhen Electronic Product Quality Testing Center**

Electronic Testing Building, Shahe Road, Xili, Nanshan District,  
Shenzhen, Guangdong, China

*to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing and calibration.*

*The scope of accreditation is detailed in the attached schedule bearing the same accreditation number as above. The schedule forms an integral part of this certificate.*

Date of Issue: 2009-09-29

Date of Expiry: 2012-09-28

Date of Initial Accreditation: 1999-08-03



Signed on behalf of China National Accreditation Service  
for Conformity Assessment

China National Accreditation Service for Conformity Assessment(CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation systems for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC MRA), and the signatory to Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC MRA).

## ANNEX B- Test Layout

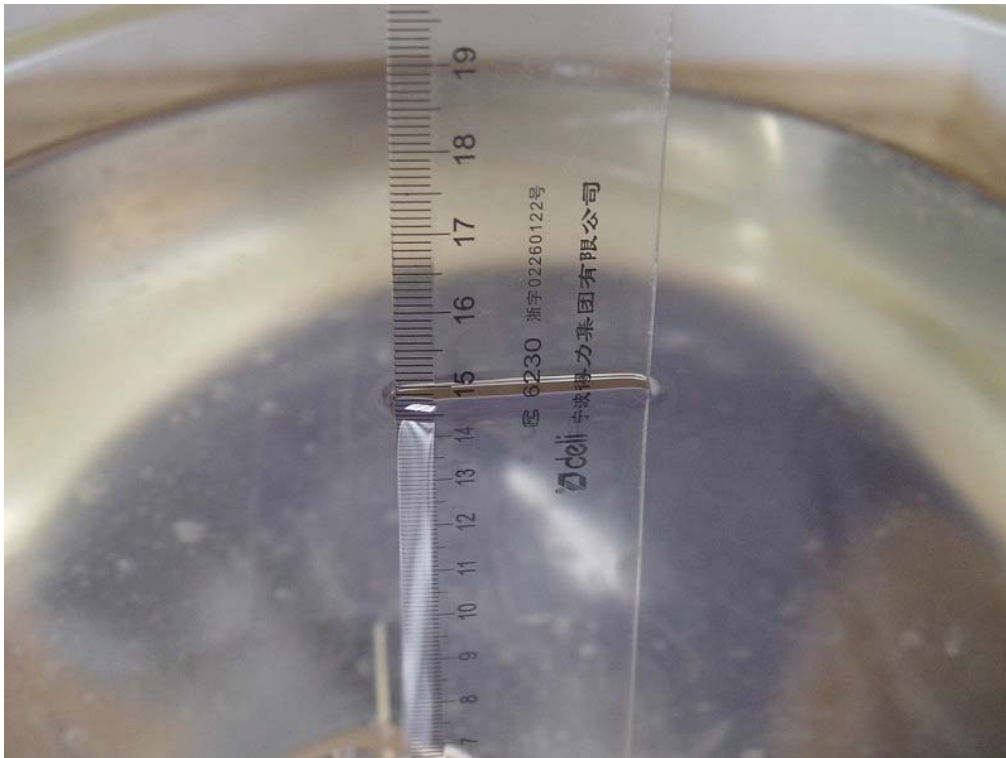


Figure B.1 Depth of Simulating Liquid in SAM Head Phantom

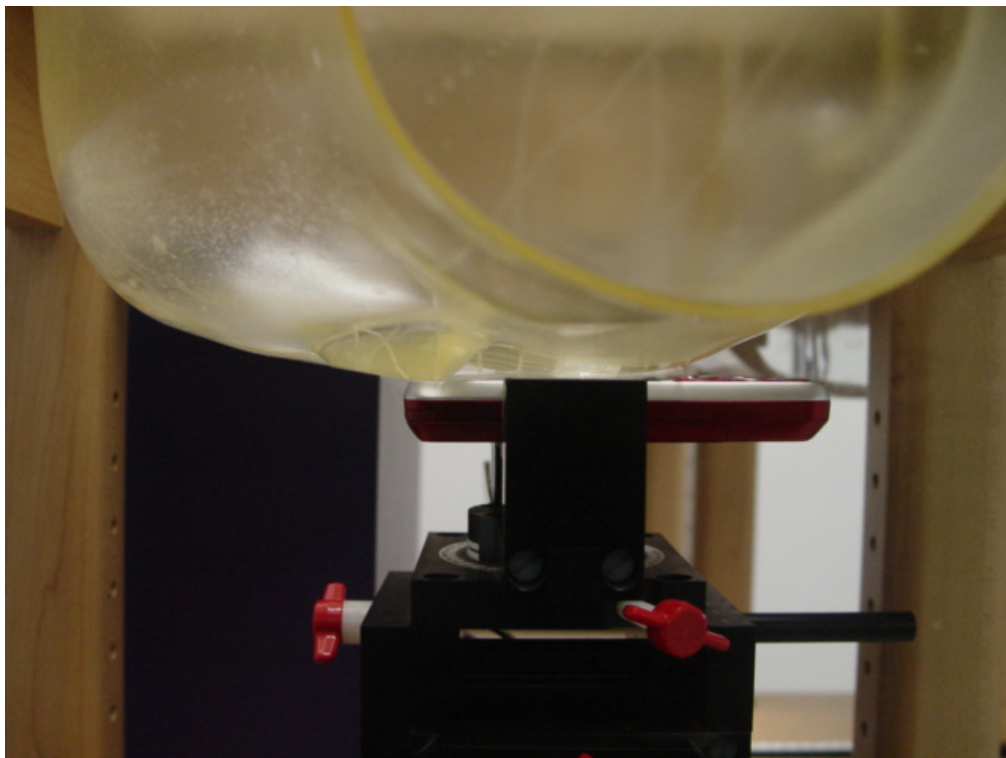


Figure B.2 EUT Left Cheek Position

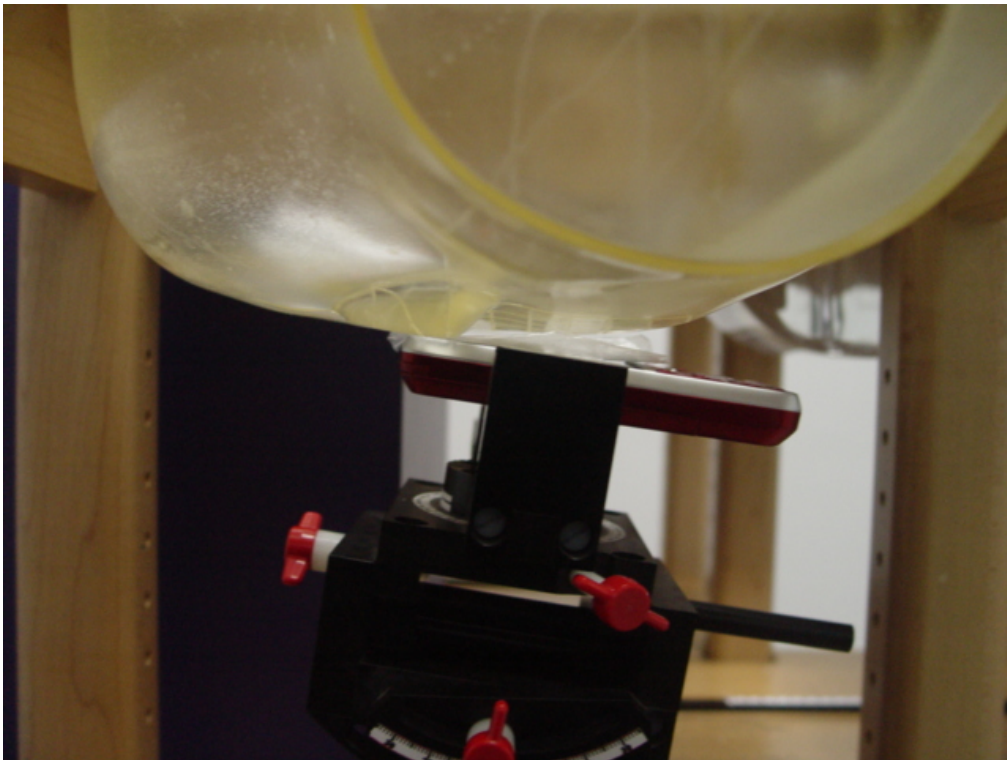


Figure B.3 EUT Left Tilt Position

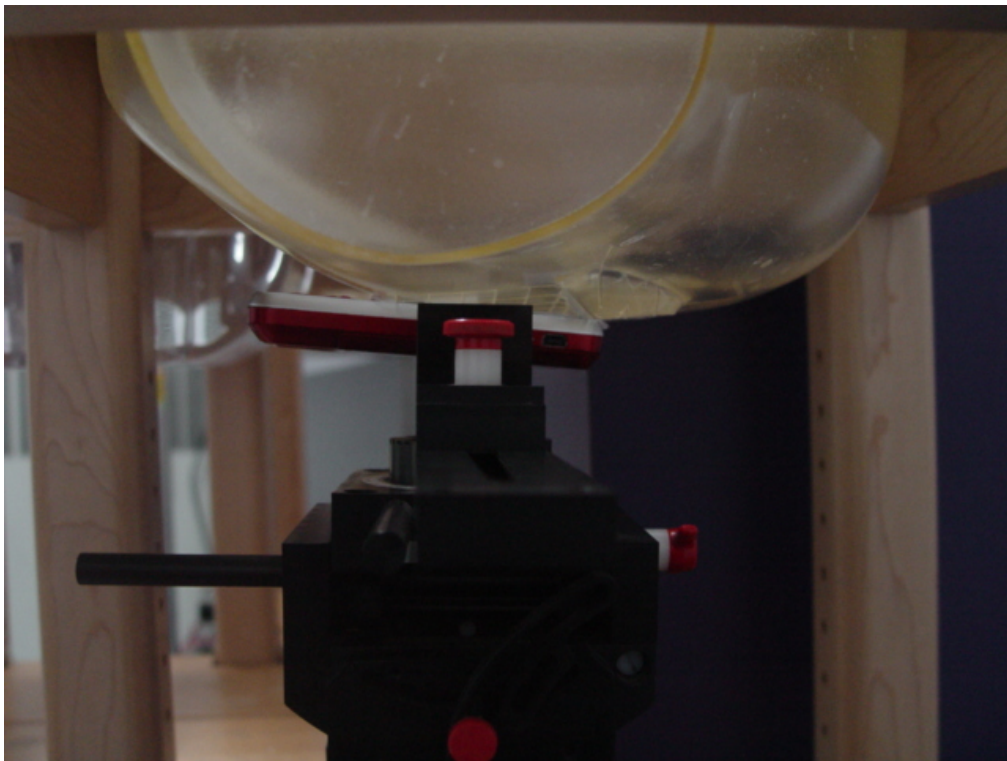


Figure B.4 EUT Right Cheek Position



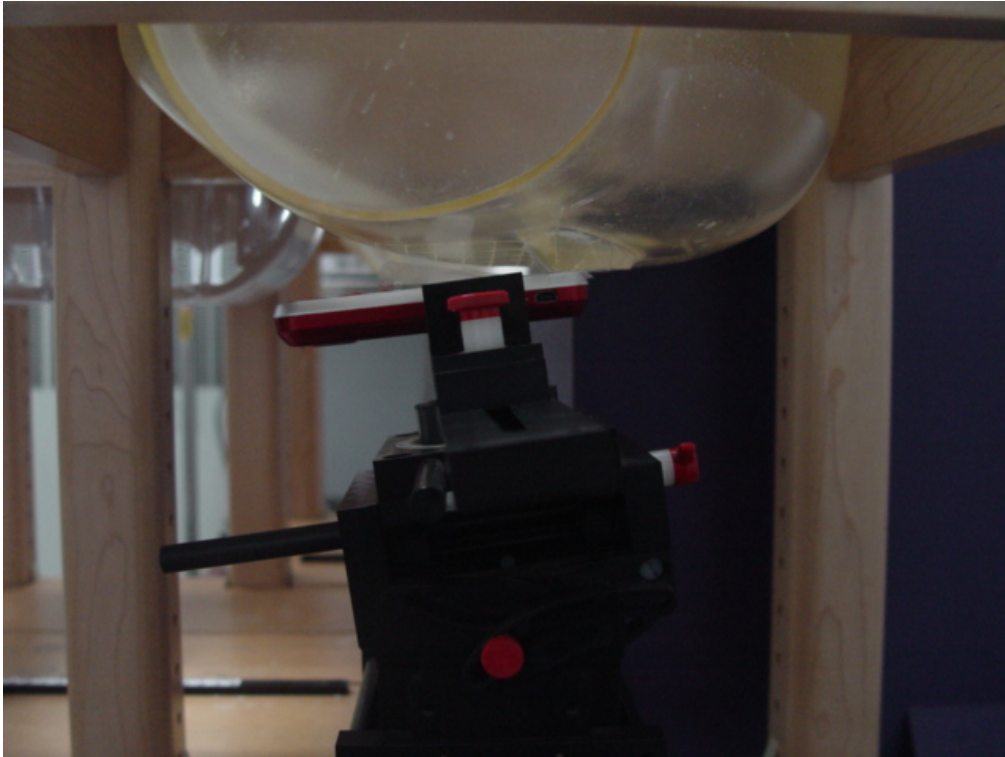
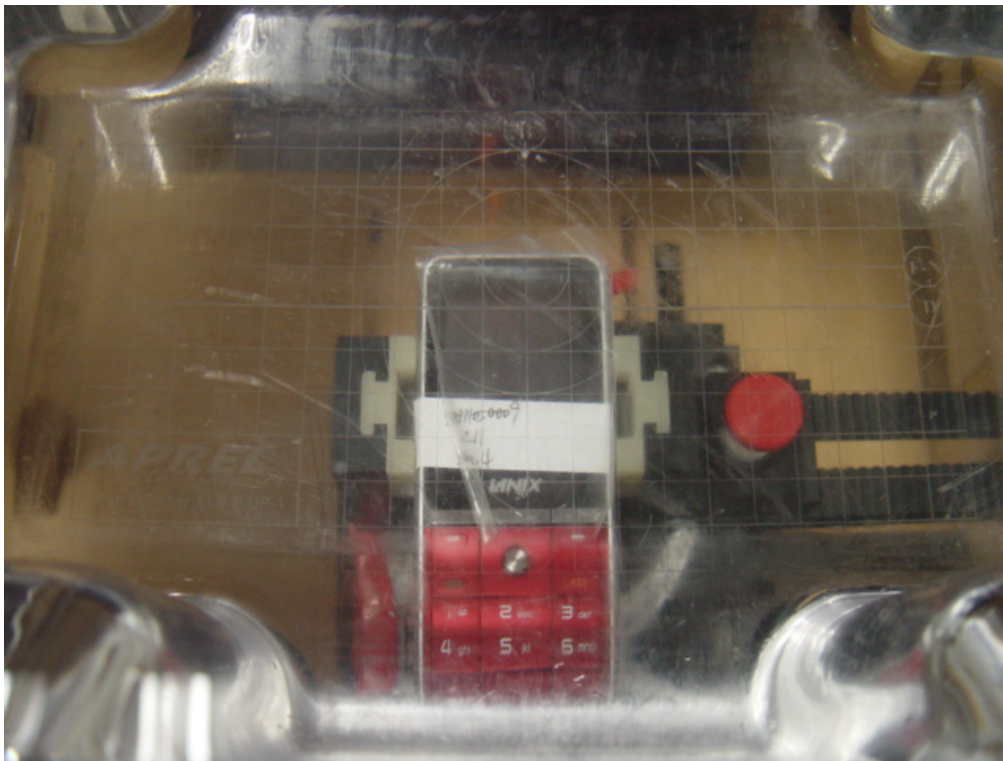


Figure B.5 EUT Right Tilt Position



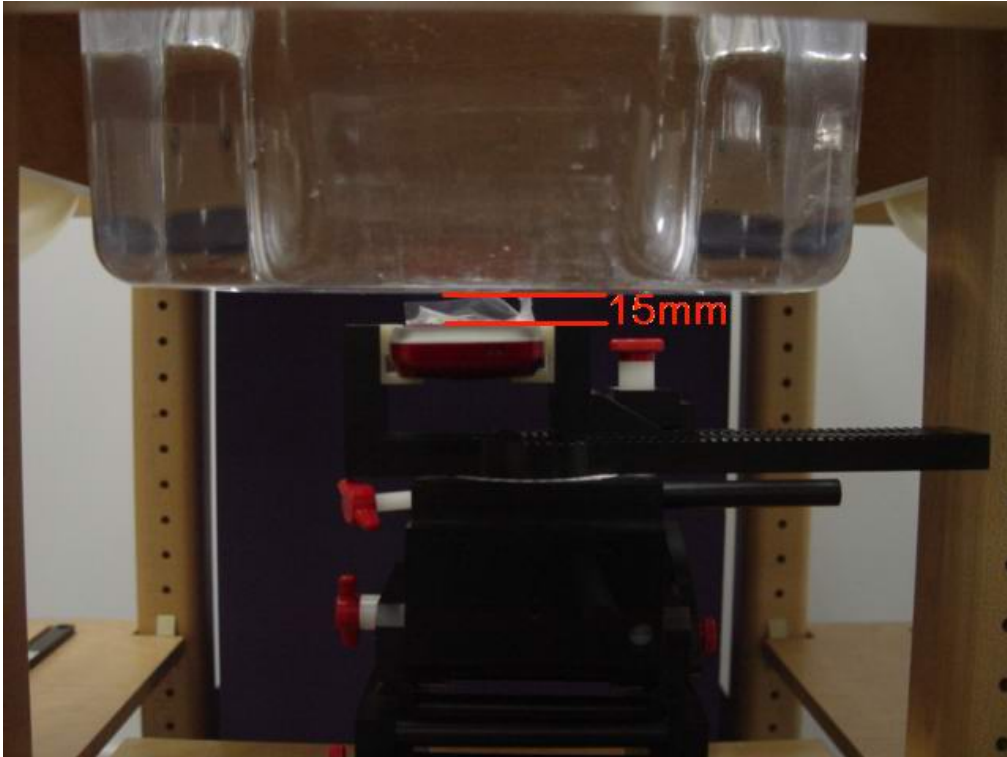
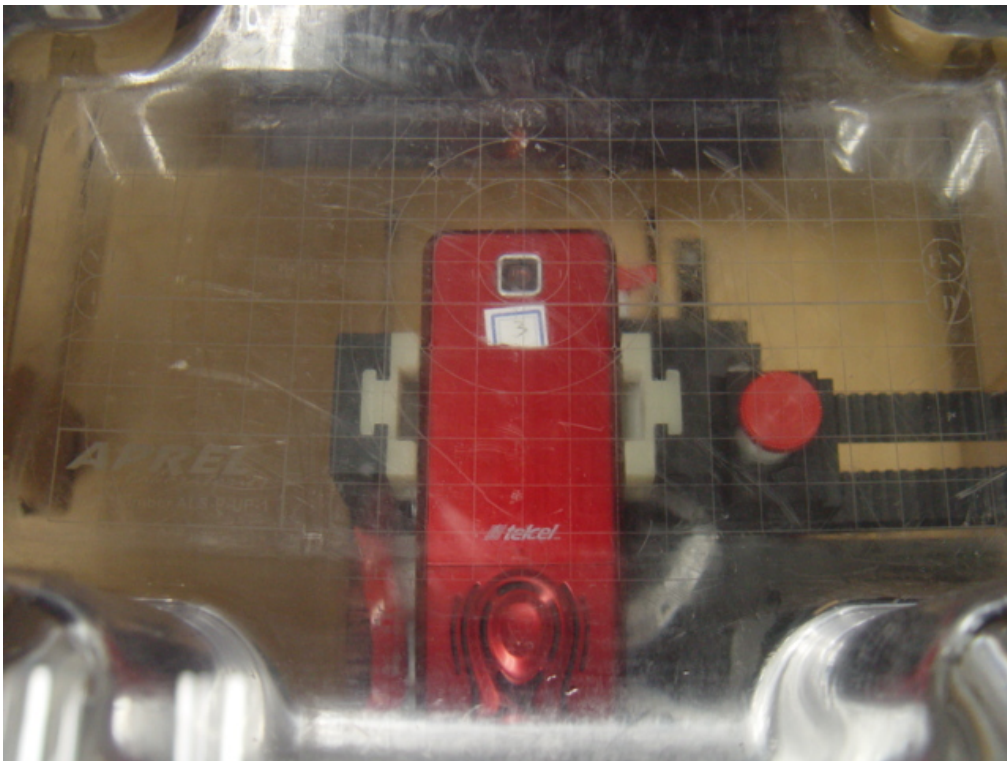


Figure B.6 EUT Body Frontside Position



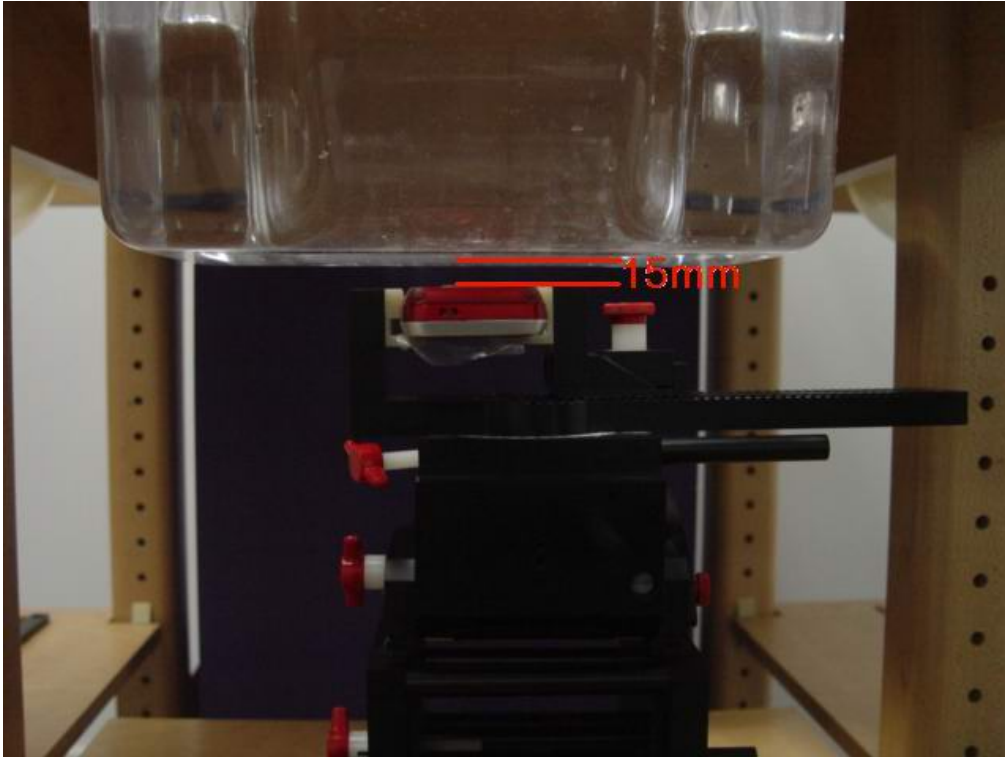


Figure B.7 EUT Body Backside Position



## ANNEX C- Sample Photographs

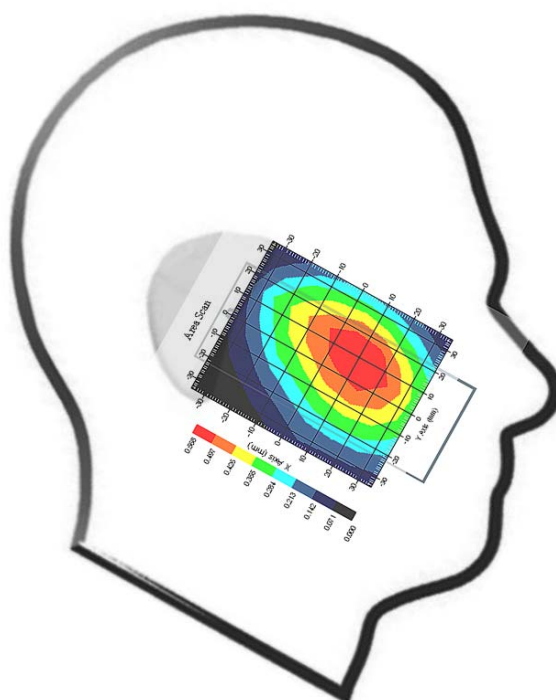


Photograph of the Equipment under Test

## ANNEX D- Graph Test Results

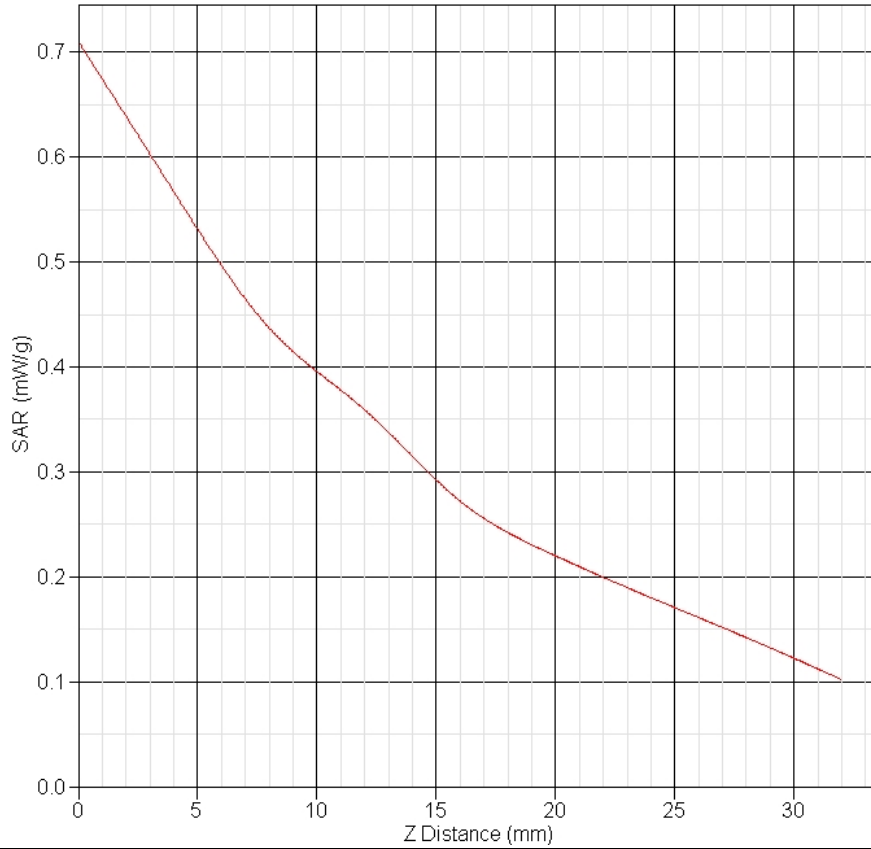
### GSM850 Left Cheek Low(128ch)

<b>Frequency (MHz)</b>	<b>824.200</b>
<b>Relative permittivity (real part)</b>	<b>40.833</b>
<b>Conductivity (S/m)</b>	<b>0.872</b>
<b>Variation (%)</b>	<b>-0.173</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>6.2</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V}/\text{m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>





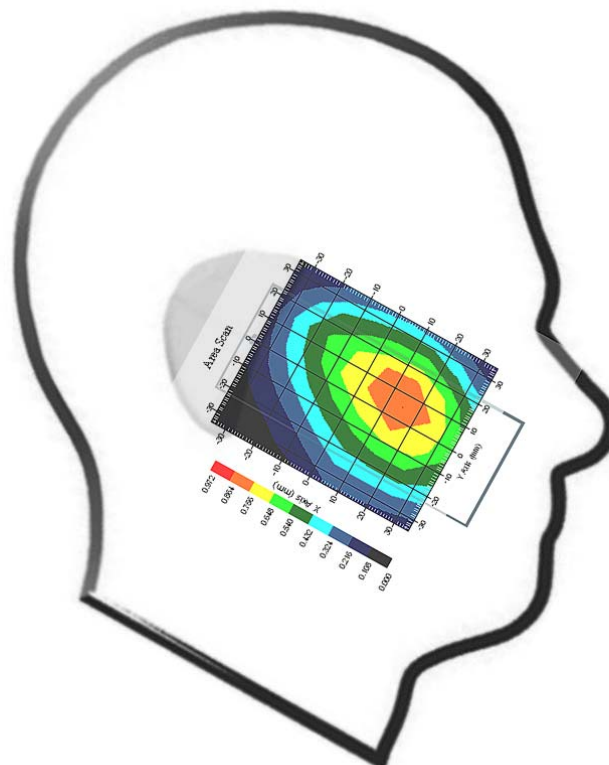
SAR-Z Axis  
at Hotspot x:30.13 y:4.94



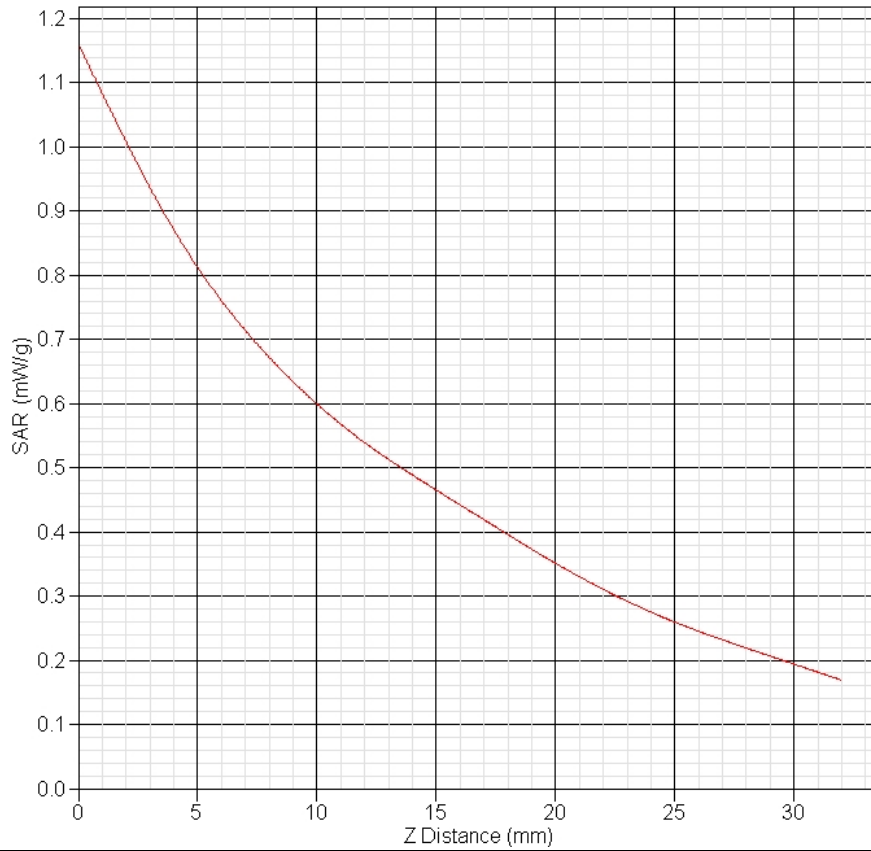
<b>SAR 10g (W/Kg)</b>	<b>0.347</b>
<b>SAR 1g (W/Kg)</b>	<b>0.528</b>

## GSM850 Left Cheek Middle(190ch)

<b>Frequency (MHz)</b>	<b>836.600</b>
<b>Relative permittivity (real part)</b>	<b>40.670</b>
<b>Conductivity (S/m)</b>	<b>0.882</b>
<b>Variation (%)</b>	<b>-3.367</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>6.2</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



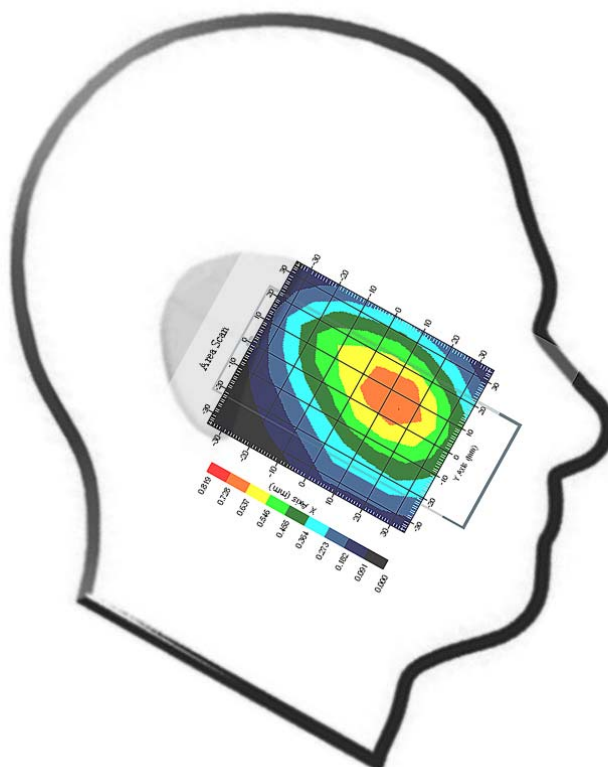
SAR-Z Axis  
at Hotspot x:30.15 y:4.88



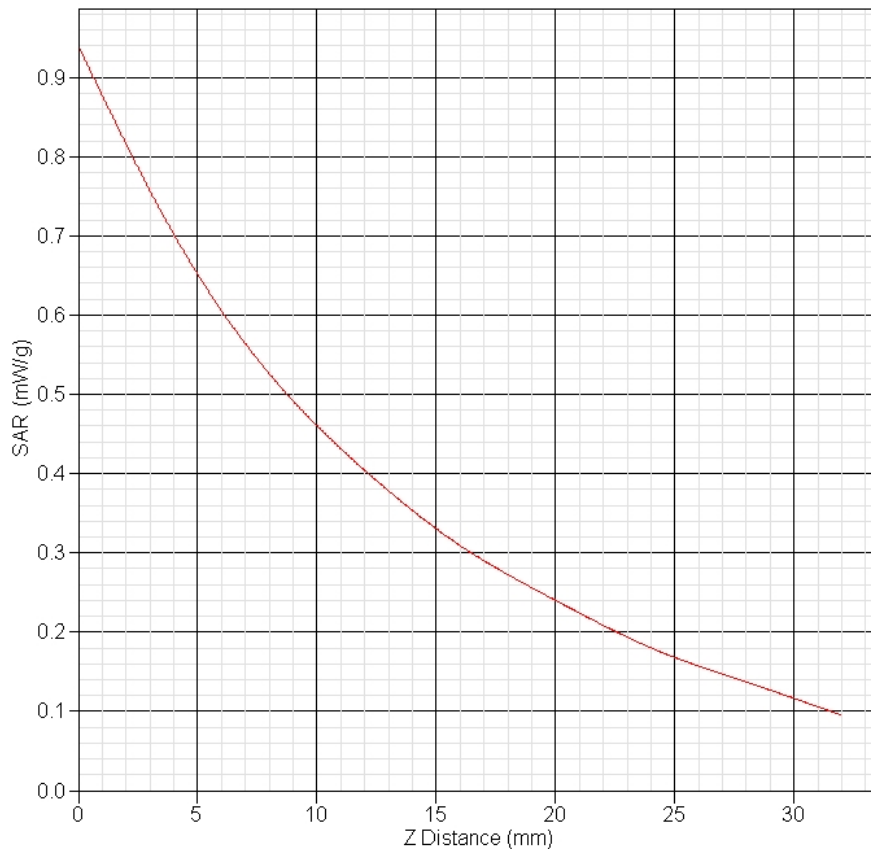
<b>SAR 10g (W/Kg)</b>	<b>0.524</b>
<b>SAR 1g (W/Kg)</b>	<b>0.802</b>

## GSM850 Left Cheek High(251ch)

<b>Frequency (MHz)</b>	<b>848.800</b>
<b>Relative permittivity (real part)</b>	<b>40.607</b>
<b>Conductivity (S/m)</b>	<b>0.891</b>
<b>Variation (%)</b>	<b>-1.724</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>6.2</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



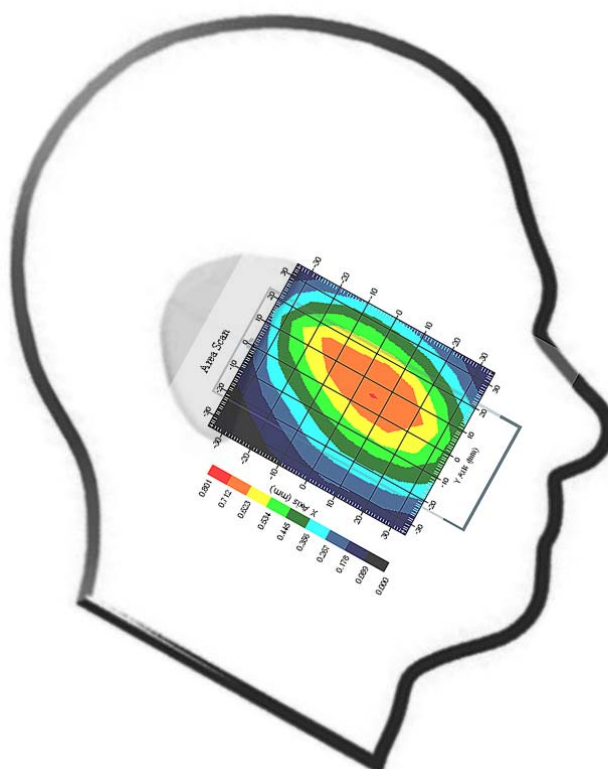
SAR-Z Axis  
at Hotspot x:22.11 y:12.94



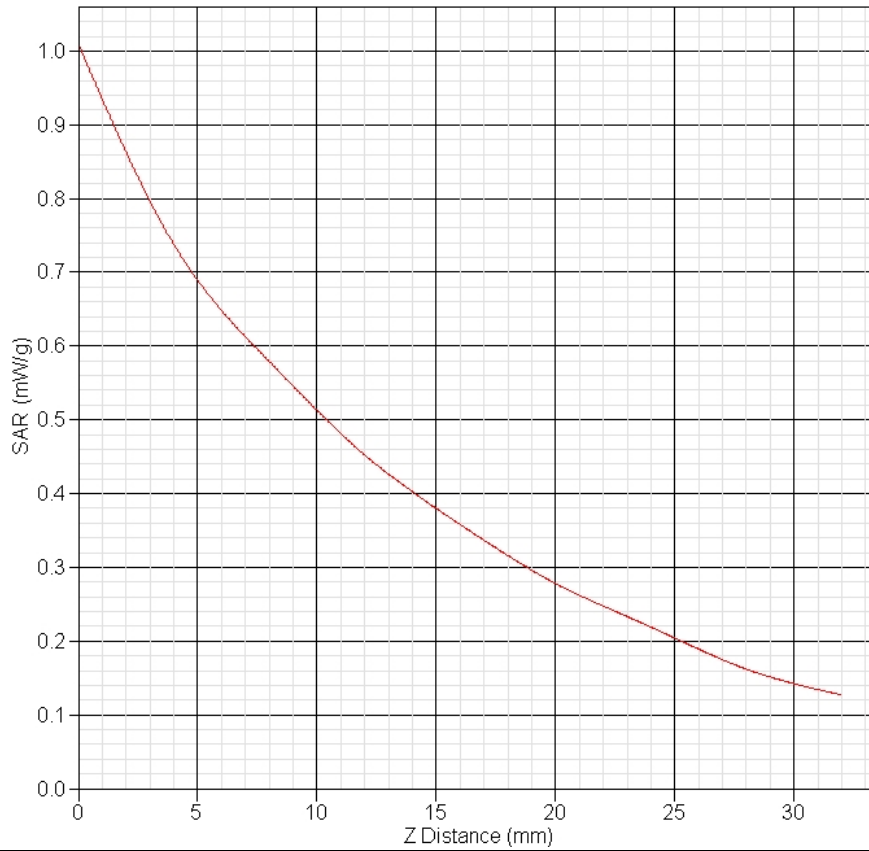
<b>SAR 10g (W/Kg)</b>	<b>0.410</b>
<b>SAR 1g (W/Kg)</b>	<b>0.637</b>

## GSM850 Left Tilt Middle(190ch)

<b>Frequency (MHz)</b>	<b>836.600</b>
<b>Relative permittivity (real part)</b>	<b>40.670</b>
<b>Conductivity (S/m)</b>	<b>0.882</b>
<b>Variation (%)</b>	<b>-1.862</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>6.2</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



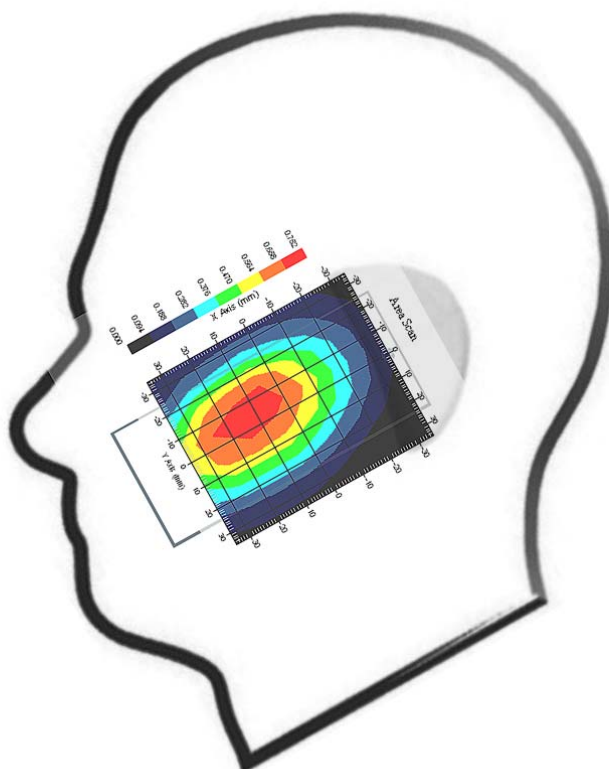
SAR-Z Axis  
at Hotspot x:20.10 y:4.95



<b>SAR 10g (W/Kg)</b>	<b>0.455</b>
<b>SAR 1g (W/Kg)</b>	<b>0.687</b>

## GSM850 Right Cheek Middle(190ch)

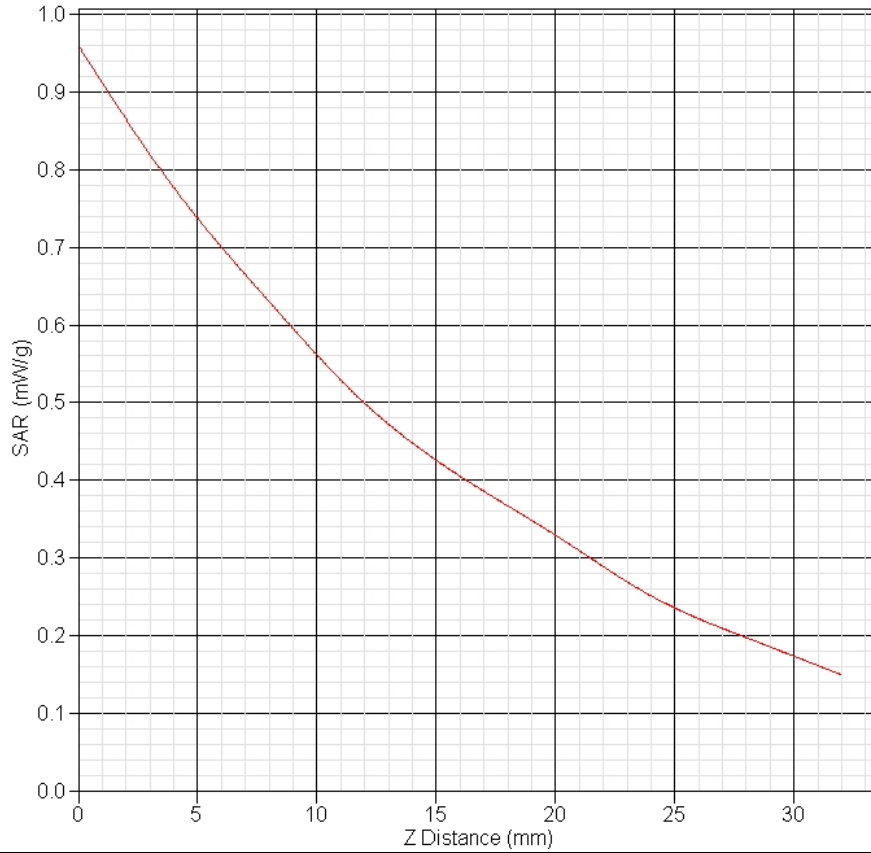
<b>Frequency (MHz)</b>	<b>836.600</b>
<b>Relative permittivity (real part)</b>	<b>40.670</b>
<b>Conductivity (S/m)</b>	<b>0.882</b>
<b>Variation (%)</b>	<b>-4.187</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>6.2</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V}/\text{m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>







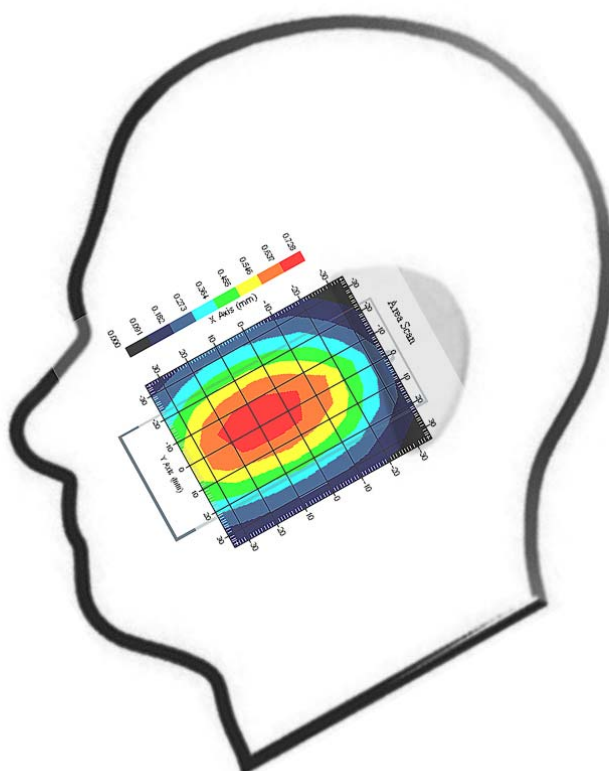
SAR-Z Axis  
at Hotspot x:30.06 y:-5.01



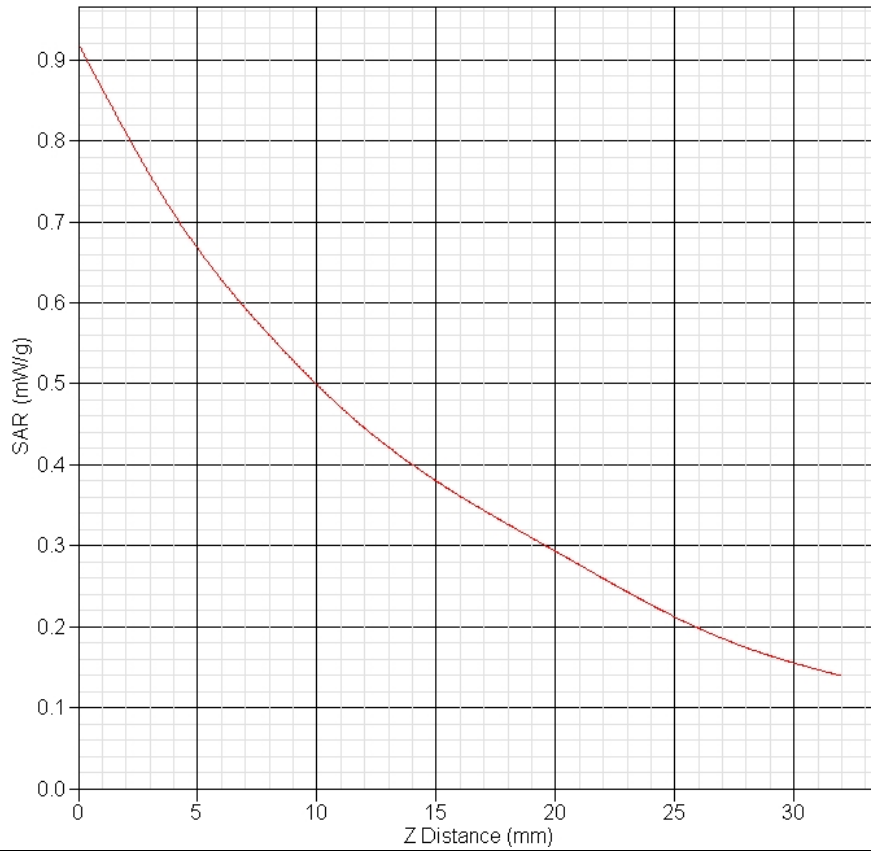
<b>SAR 10g (W/Kg)</b>	<b>0.486</b>
<b>SAR 1g (W/Kg)</b>	<b>0.707</b>

## GSM850 Right Tilt Middle(190ch)

<b>Frequency (MHz)</b>	<b>836.600</b>
<b>Relative permittivity (real part)</b>	<b>40.670</b>
<b>Conductivity (S/m)</b>	<b>0.882</b>
<b>Variation (%)</b>	<b>-2.039</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>6.2</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



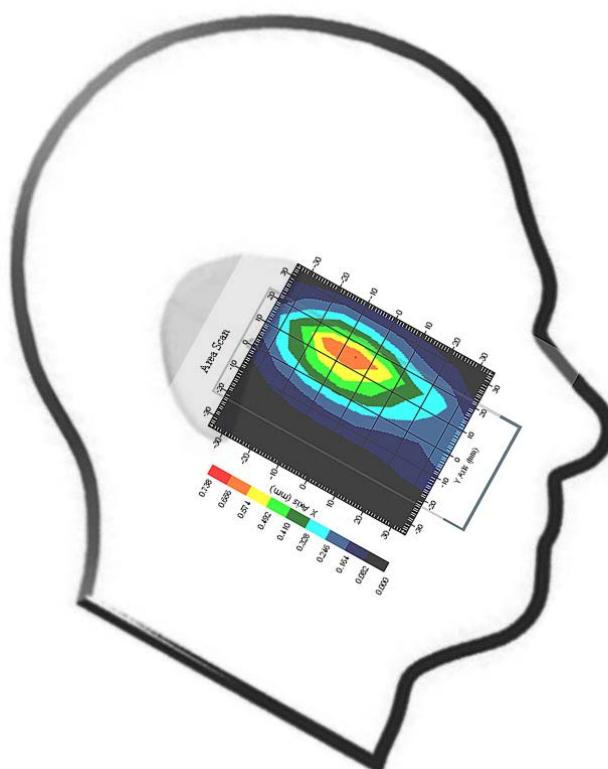
SAR-Z Axis  
at Hotspot x:22.07 y:-4.99



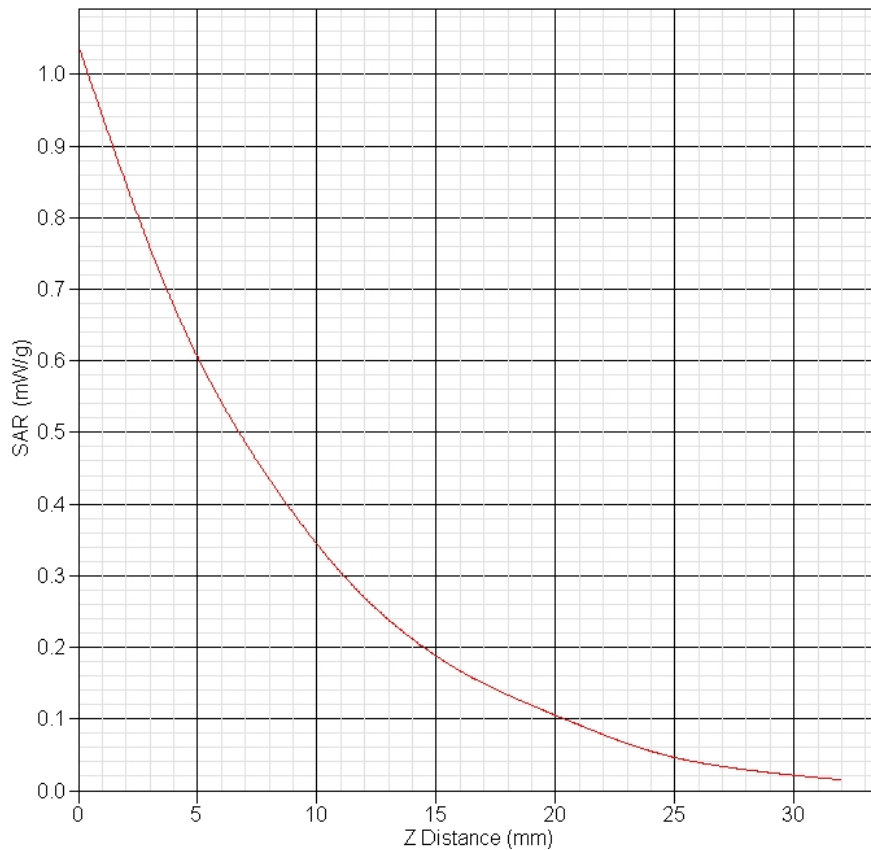
<b>SAR 10g (W/Kg)</b>	<b>0.475</b>
<b>SAR 1g (W/Kg)</b>	<b>0.675</b>

## GSM1900 Left Cheek Middle(661ch)

<b>Frequency (MHz)</b>	<b>1880.011</b>
<b>Relative permittivity (real part)</b>	<b>39.582</b>
<b>Conductivity (S/m)</b>	<b>1.372</b>
<b>Variation (%)</b>	<b>-3.731</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>4.9</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



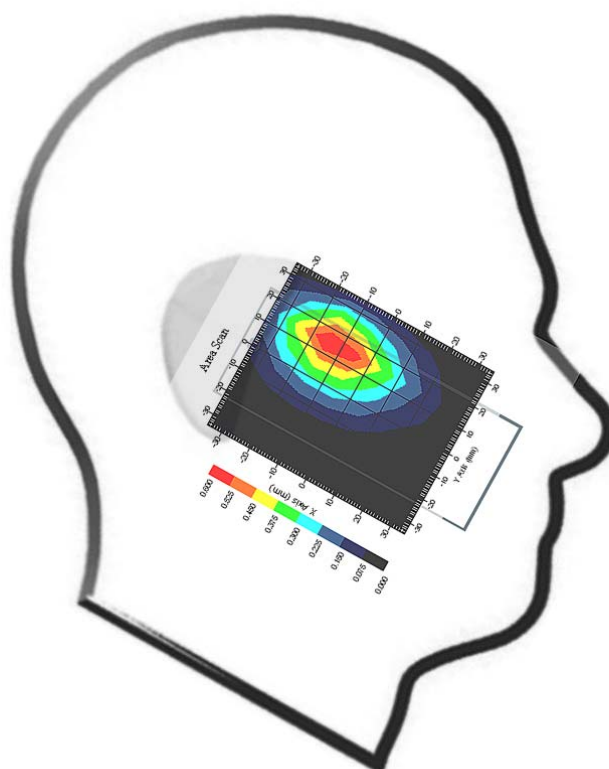
SAR-Z Axis  
at Hotspot x:10.13 y:14.91



<b>SAR 10g (W/Kg)</b>	<b>0.299</b>
<b>SAR 1g (W/Kg)</b>	<b>0.585</b>

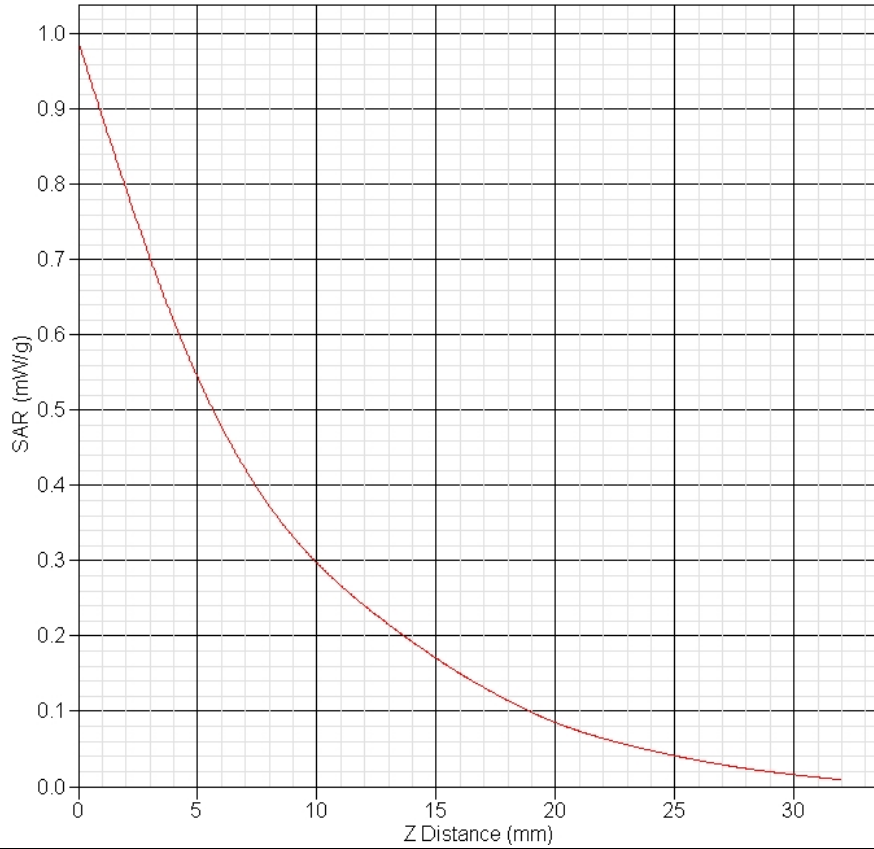
## GSM1900 Left Tilt Low(512ch)

<b>Frequency (MHz)</b>	<b>1850.200</b>
<b>Relative permittivity (real part)</b>	<b>39.630</b>
<b>Conductivity (S/m)</b>	<b>1.363</b>
<b>Variation (%)</b>	<b>1.406</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>4.9</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V}/\text{m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>





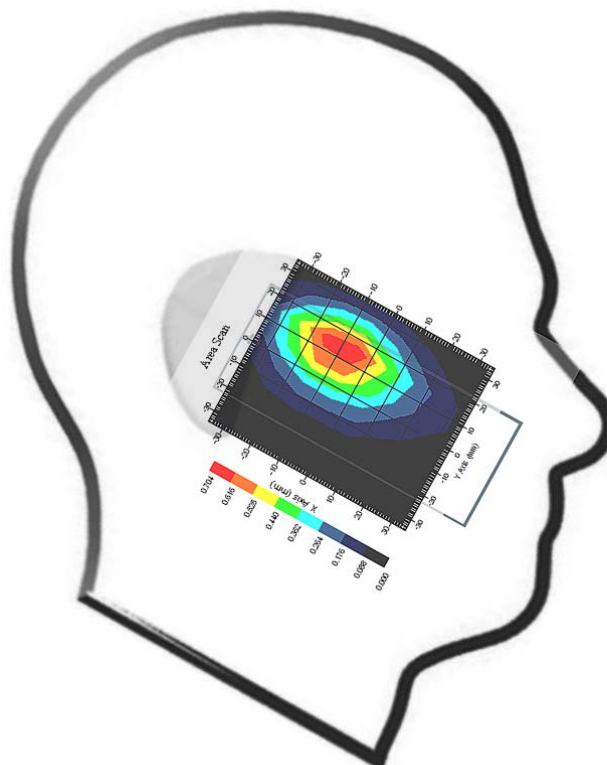
SAR-Z Axis  
at Hotspot x:8.09 y:14.96



<b>SAR 10g (W/Kg)</b>	<b>0.265</b>
<b>SAR 1g (W/Kg)</b>	<b>0.533</b>

## GSM1900 Left Tilt Middle(661ch)

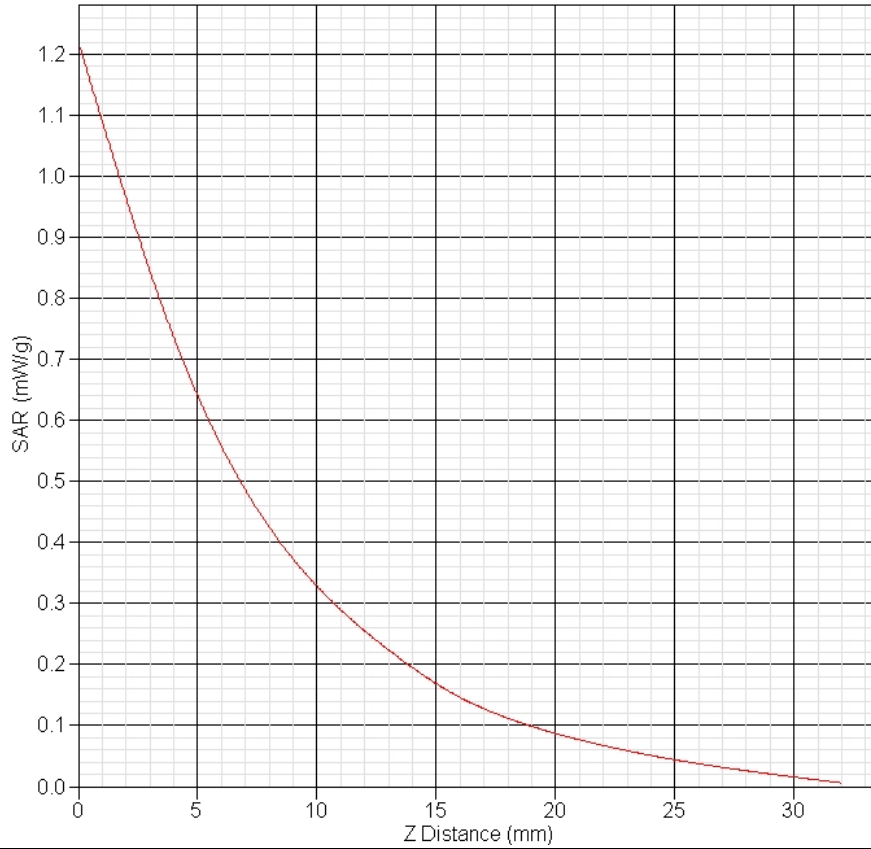
<b>Frequency (MHz)</b>	<b>1880.011</b>
<b>Relative permittivity (real part)</b>	<b>39.582</b>
<b>Conductivity (S/m)</b>	<b>1.372</b>
<b>Variation (%)</b>	<b>-1.251</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>4.9</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V}/\text{m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>







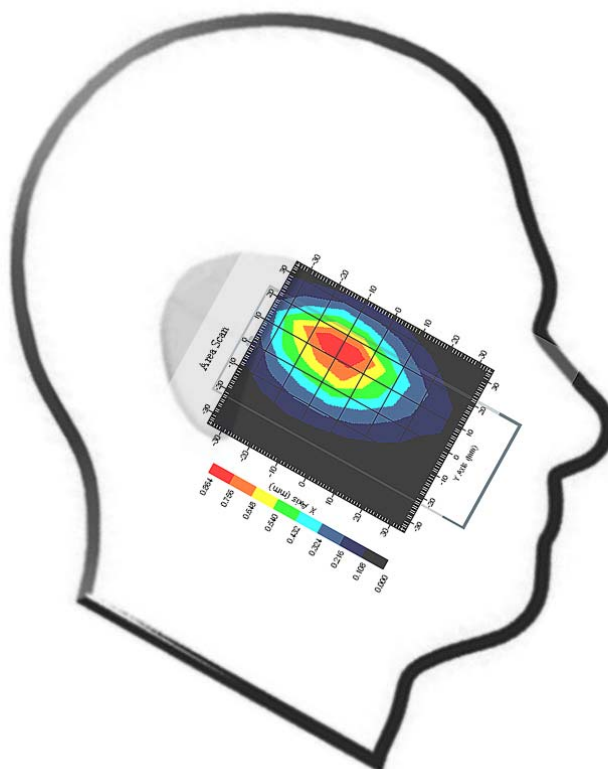
SAR-Z Axis  
at Hotspot x:2.12 y:14.92



<b>SAR 10g (W/Kg)</b>	<b>0.313</b>
<b>SAR 1g (W/Kg)</b>	<b>0.637</b>

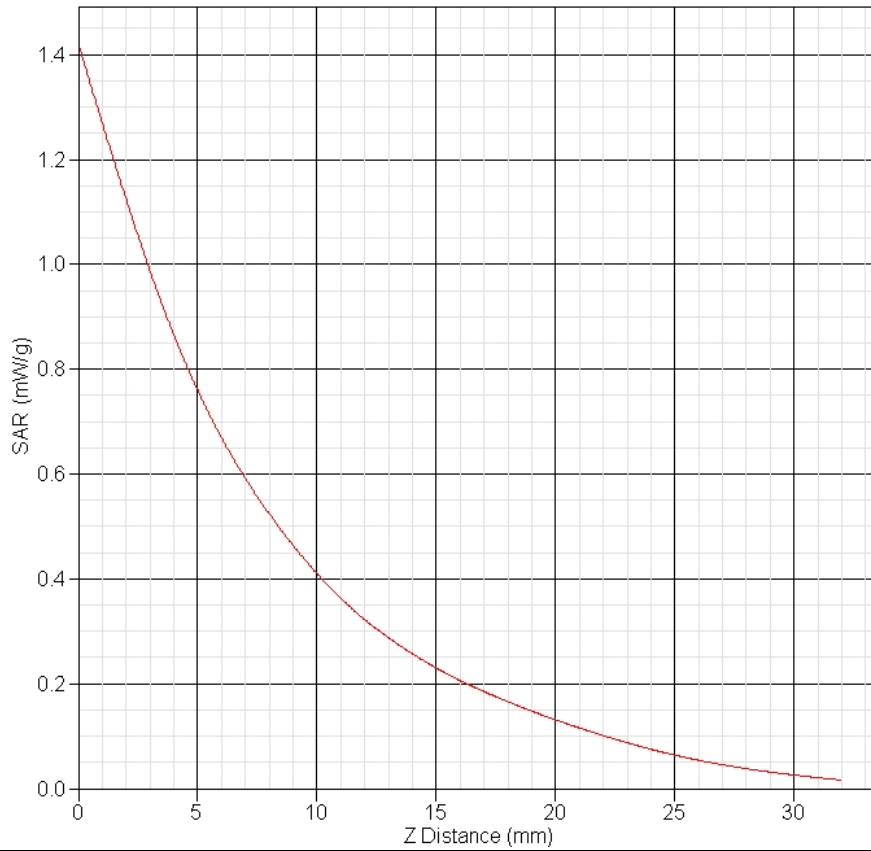
## GSM1900 Left Tilt High(810ch)

<b>Frequency (MHz)</b>	<b>1909.810</b>
<b>Relative permittivity (real part)</b>	<b>39.498</b>
<b>Conductivity (S/m)</b>	<b>1.385</b>
<b>Variation (%)</b>	<b>-2.959</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>4.9</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V}/\text{m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>





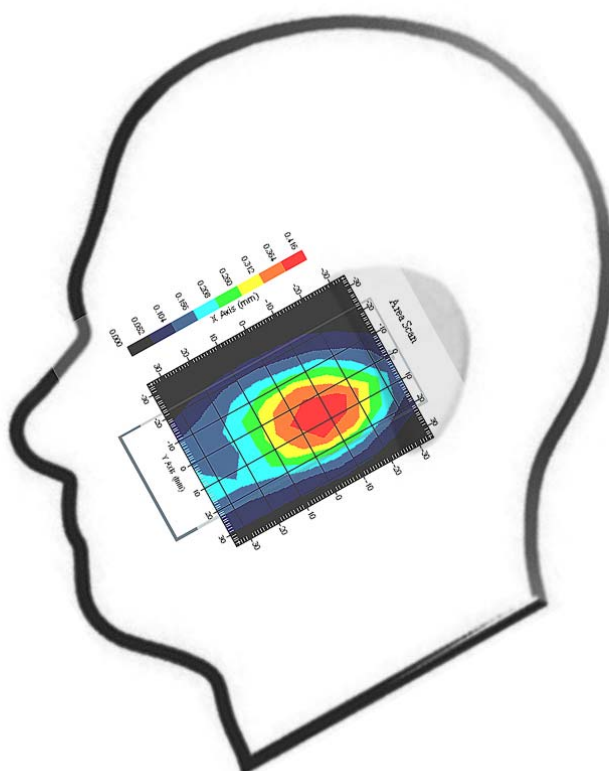
SAR-Z Axis  
at Hotspot x:8.08 y:14.95



<b>SAR 10g (W/Kg)</b>	<b>0.381</b>
<b>SAR 1g (W/Kg)</b>	<b>0.760</b>

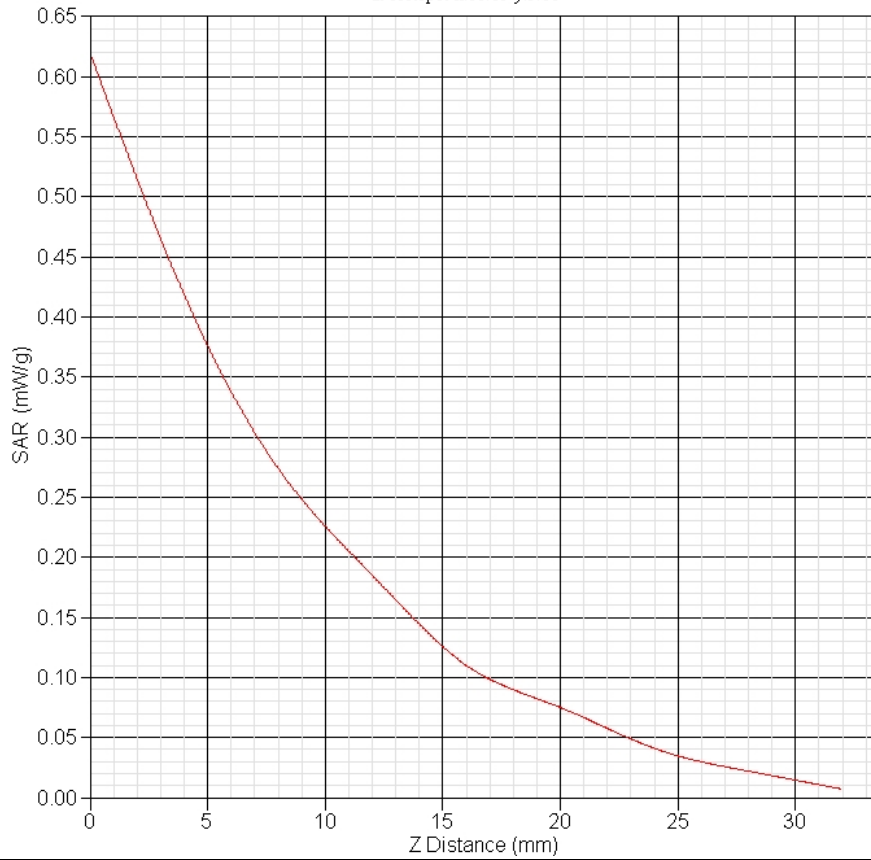
## GSM1900 Right Cheek Middle(661ch)

<b>Frequency (MHz)</b>	<b>1880.011</b>
<b>Relative permittivity (real part)</b>	<b>39.582</b>
<b>Conductivity (S/m)</b>	<b>1.372</b>
<b>Variation (%)</b>	<b>4.457</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>4.9</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V}/\text{m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>





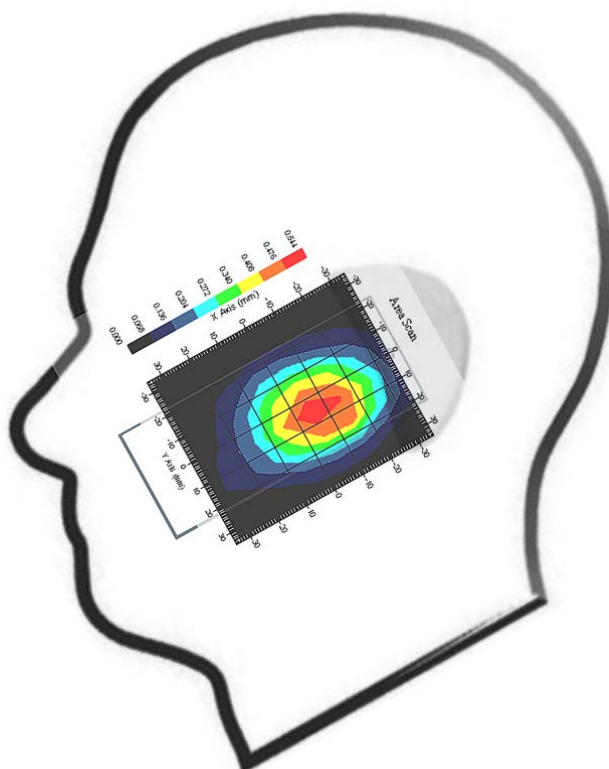
SAR-Z Axis  
at Hotspot x:10.05 y:5.01



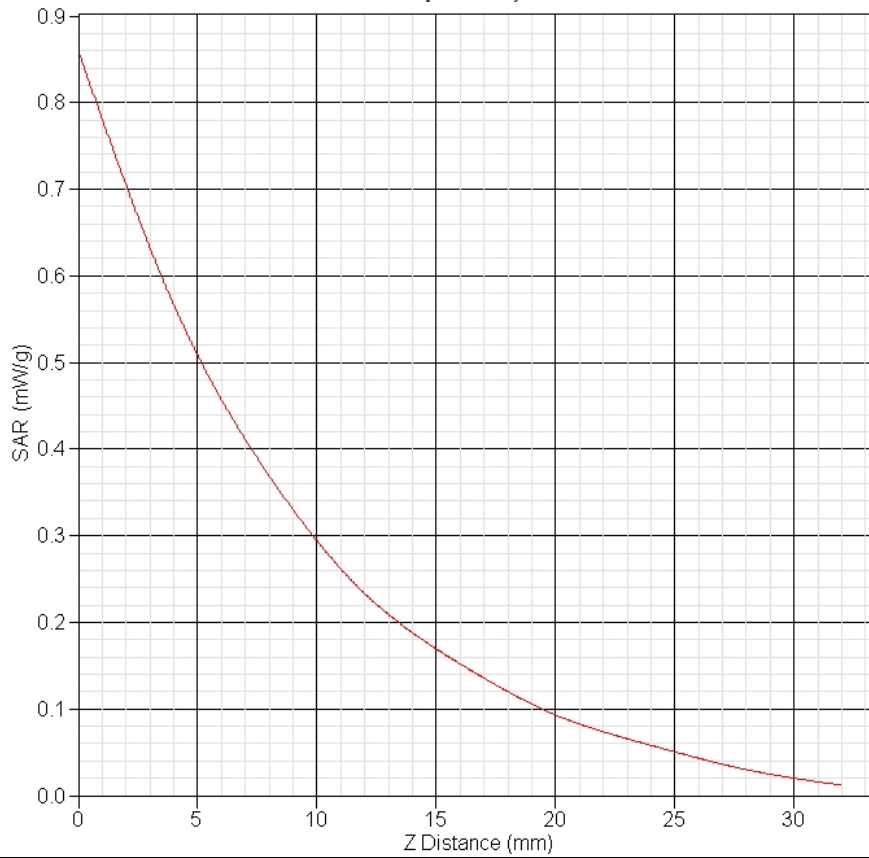
<b>SAR 10g (W/Kg)</b>	<b>0.174</b>
<b>SAR 1g (W/Kg)</b>	<b>0.354</b>

## GSM1900 Right Tilt Middle(661ch)

<b>Frequency (MHz)</b>	<b>1880.011</b>
<b>Relative permittivity (real part)</b>	<b>39.582</b>
<b>Conductivity (S/m)</b>	<b>1.372</b>
<b>Variation (%)</b>	<b>1.626</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>4.9</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



SAR-Z Axis  
at Hotspot x:10.07 y:5.01

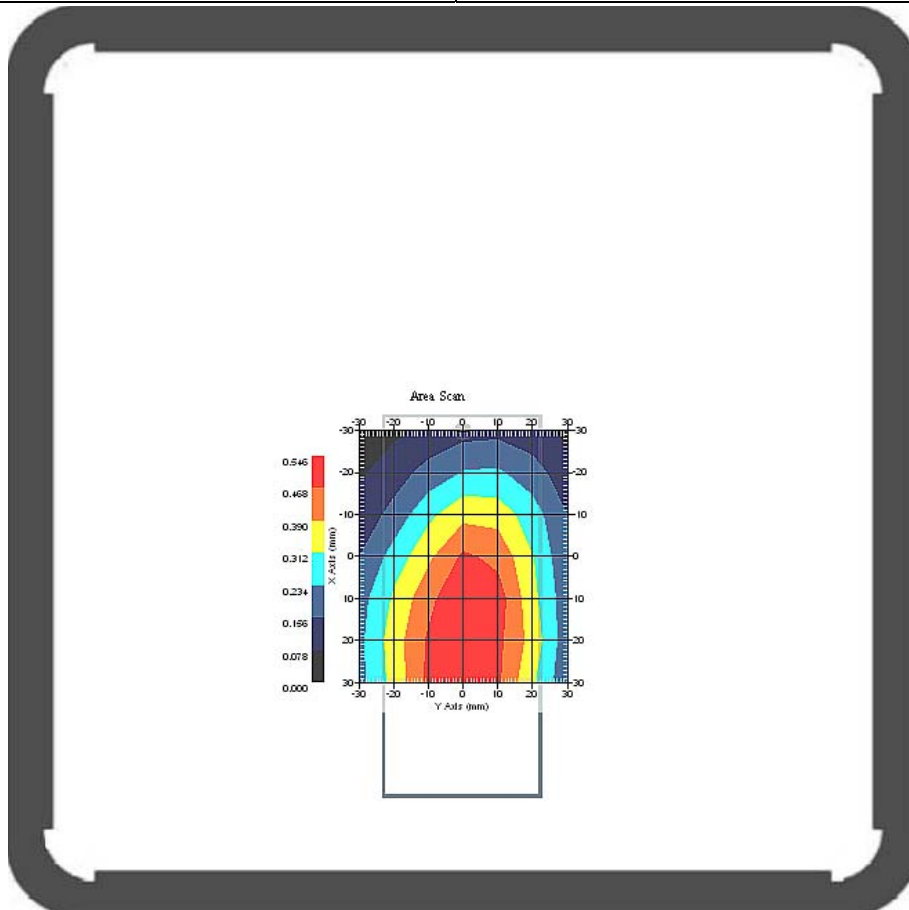


<b>SAR 10g (W/Kg)</b>	<b>0.263</b>
<b>SAR 1g (W/Kg)</b>	<b>0.500</b>



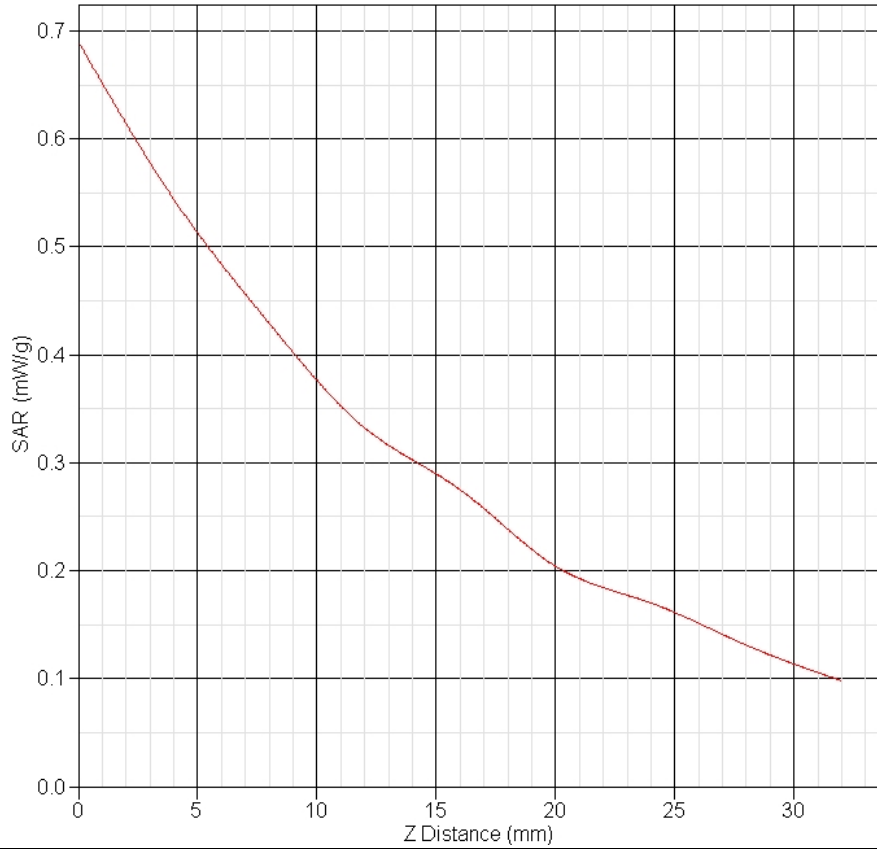
## GPRS850 Frontside Towards Phantom Middle(190ch)

<b>Frequency (MHz)</b>	<b>836.610</b>
<b>Relative permittivity (real part)</b>	<b>54.648</b>
<b>Conductivity (S/m)</b>	<b>0.957</b>
<b>Variation (%)</b>	<b>-1.137</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>4</b>
<b>Conversion Factor</b>	<b>6</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>





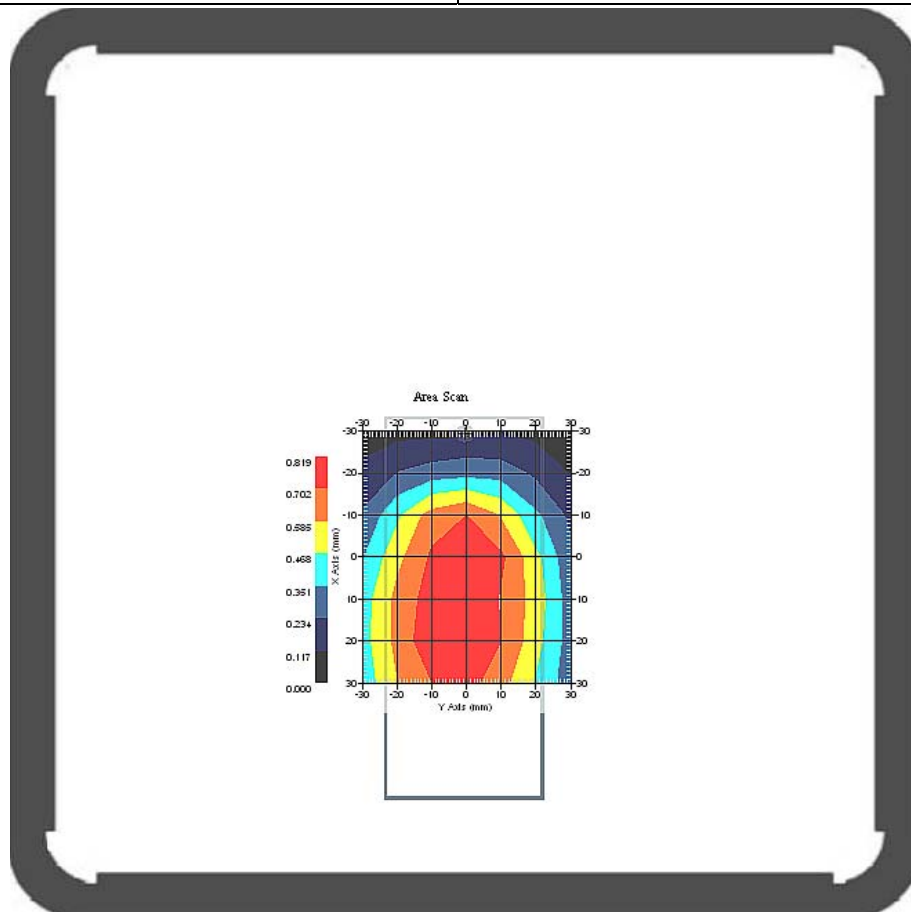
SAR-Z Axis  
at Hotspot x:18.02 y:-0.13



<b>SAR 10g (W/Kg)</b>	<b>0.405</b>
<b>SAR 1g (W/Kg)</b>	<b>0.533</b>

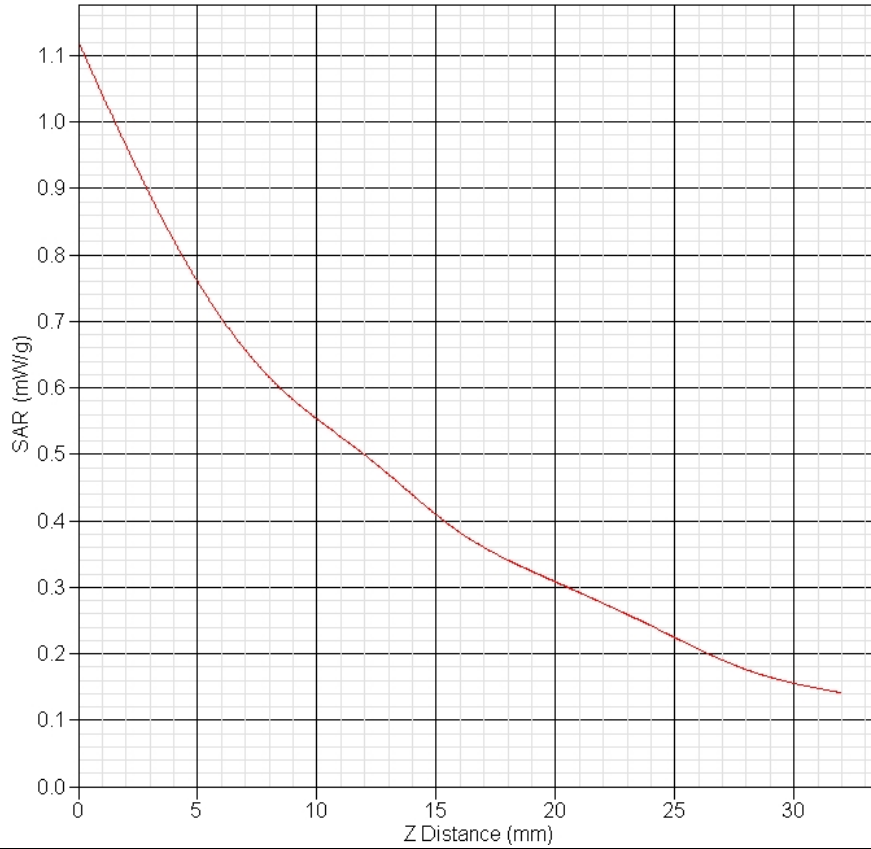
## GPRS850 Backside Towards Phantom Low(128ch)

<b>Frequency (MHz)</b>	<b>824.210</b>
<b>Relative permittivity (real part)</b>	<b>54.709</b>
<b>Conductivity (S/m)</b>	<b>0.944</b>
<b>Variation (%)</b>	<b>0.561</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>4</b>
<b>Conversion Factor</b>	<b>6</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>





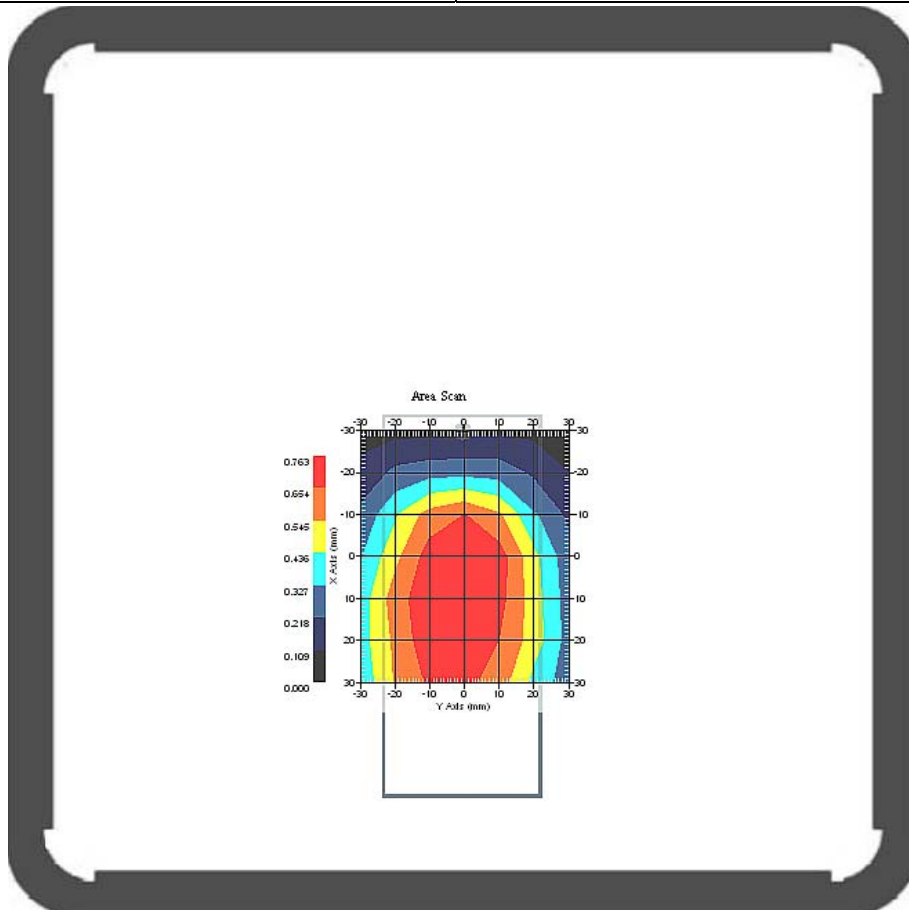
SAR-Z Axis  
at Hotspot x:4.04 y:-2.16



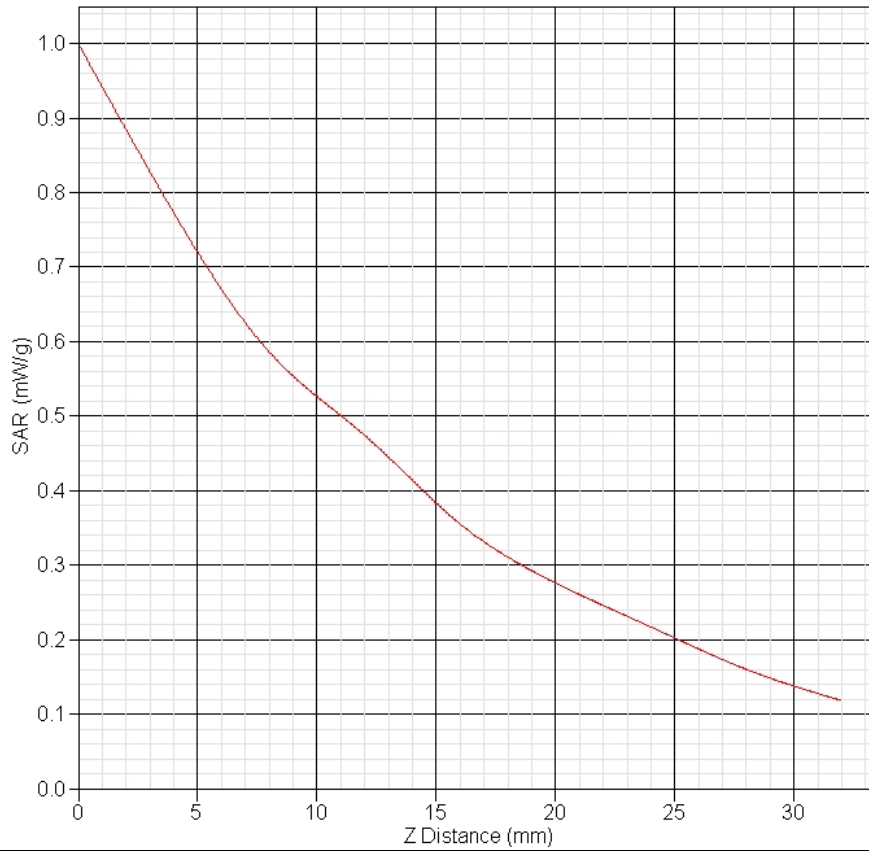
<b>SAR 10g (W/Kg)</b>	<b>0.549</b>
<b>SAR 1g (W/Kg)</b>	<b>0.786</b>

## GPRS850 Backside Towards Phantom Middle(190ch)

<b>Frequency (MHz)</b>	<b>836.610</b>
<b>Relative permittivity (real part)</b>	<b>54.648</b>
<b>Conductivity (S/m)</b>	<b>0.957</b>
<b>Variation (%)</b>	<b>-1.018</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>4</b>
<b>Conversion Factor</b>	<b>6</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



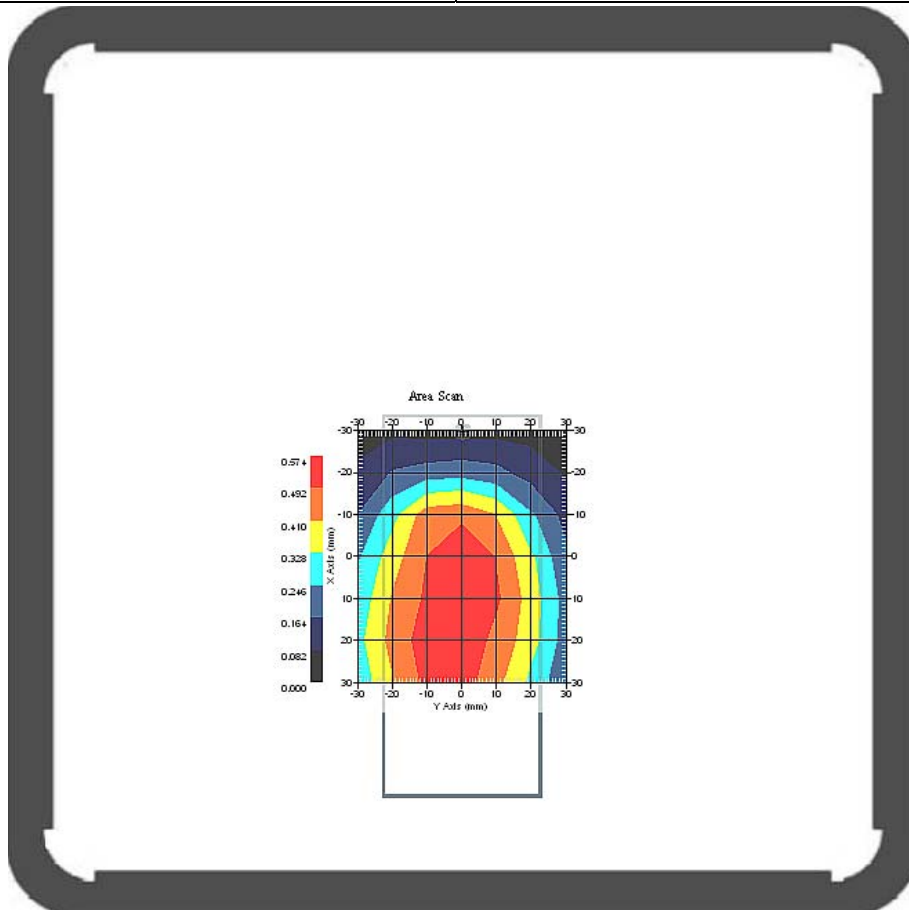
SAR-Z Axis  
at Hotspot x:2.05 y:-0.14



<b>SAR 10g (W/Kg)</b>	<b>0.508</b>
<b>SAR 1g (W/Kg)</b>	<b>0.726</b>

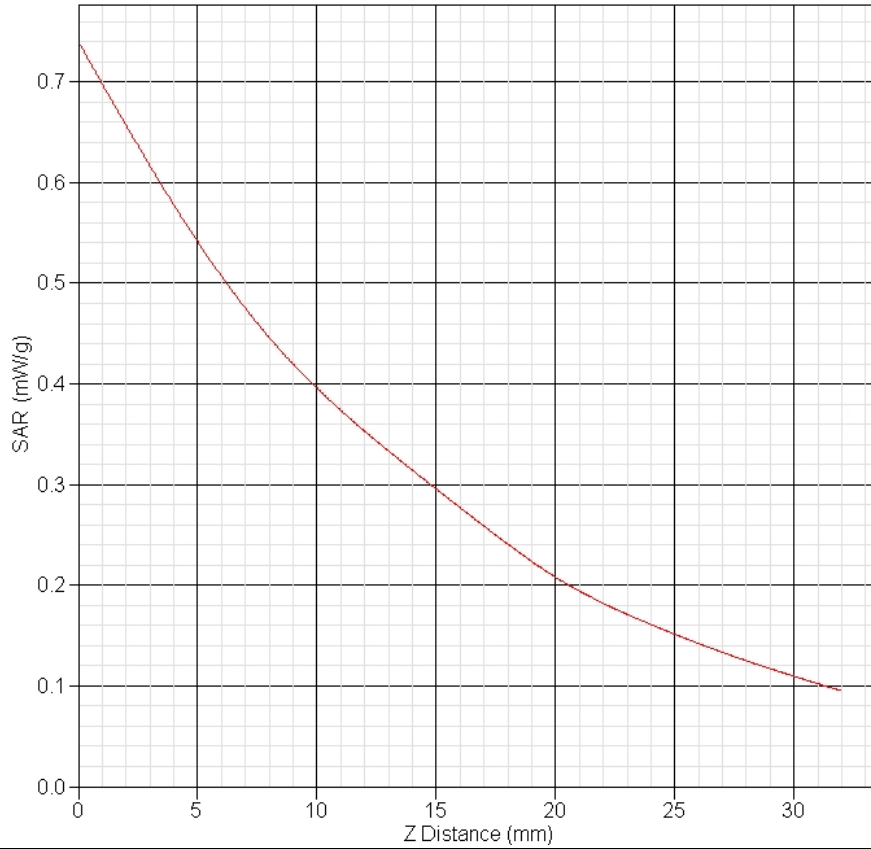
## GPRS850 Backside Towards Phantom High(251ch)

<b>Frequency (MHz)</b>	<b>848.810</b>
<b>Relative permittivity (real part)</b>	<b>54.593</b>
<b>Conductivity (S/m)</b>	<b>0.952</b>
<b>Variation (%)</b>	<b>0.119</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>4</b>
<b>Conversion Factor</b>	<b>6</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>





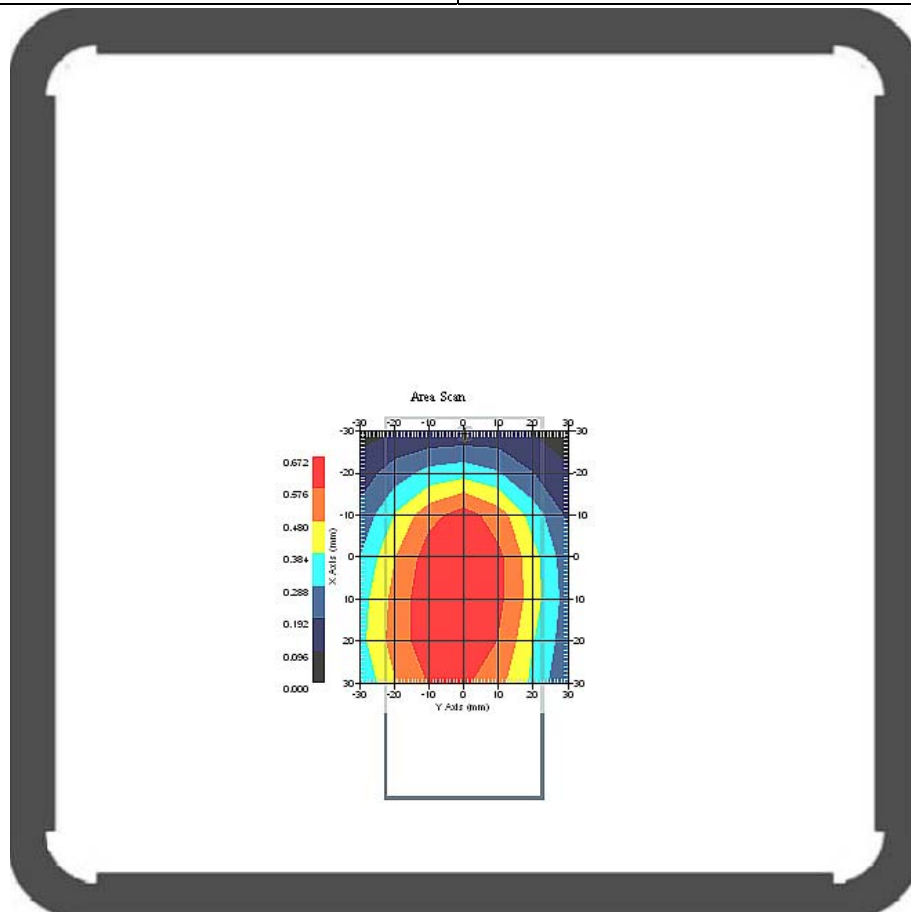
SAR-Z Axis  
at Hotspot x:8.02 y:-0.08



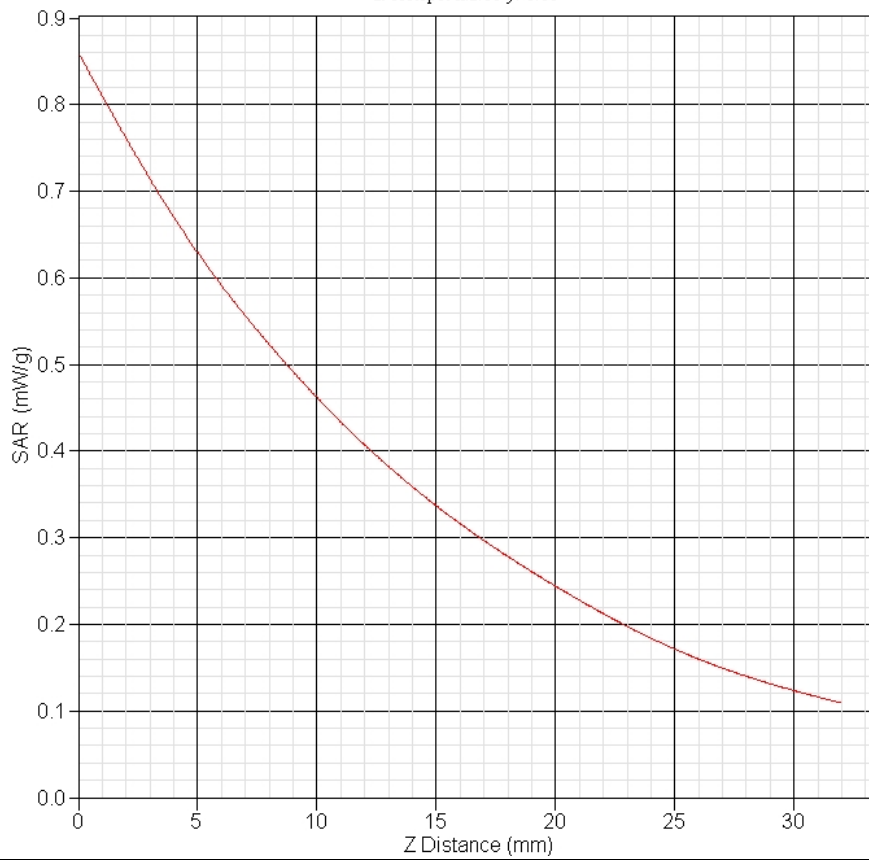
<b>SAR 10g (W/Kg)</b>	<b>0.288</b>
<b>SAR 1g (W/Kg)</b>	<b>0.459</b>

## GSM850 Backside Towards Phantom Low(128ch)

<b>Frequency (MHz)</b>	<b>824.210</b>
<b>Relative permittivity (real part)</b>	<b>54.709</b>
<b>Conductivity (S/m)</b>	<b>0.944</b>
<b>Variation (%)</b>	<b>-1.958</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>6</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



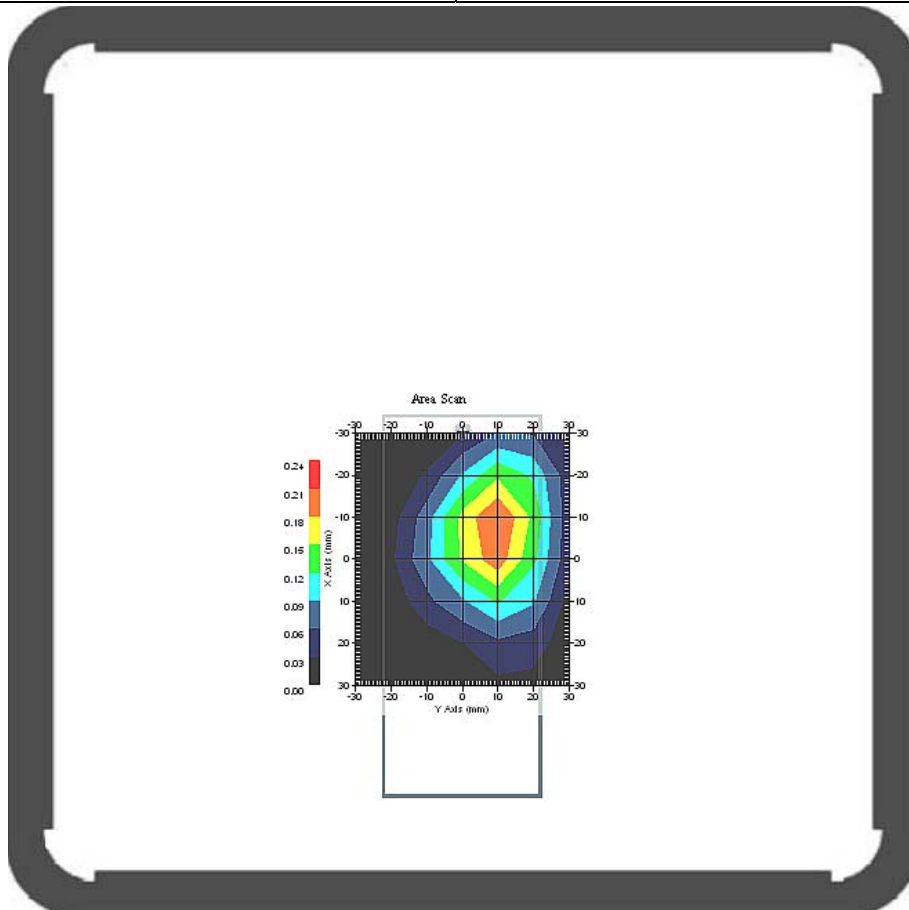
SAR-Z Axis  
at Hotspot x:2.00 y:-0.08



<b>SAR 10g (W/Kg)</b>	<b>0.408</b>
<b>SAR 1g (W/Kg)</b>	<b>0.603</b>

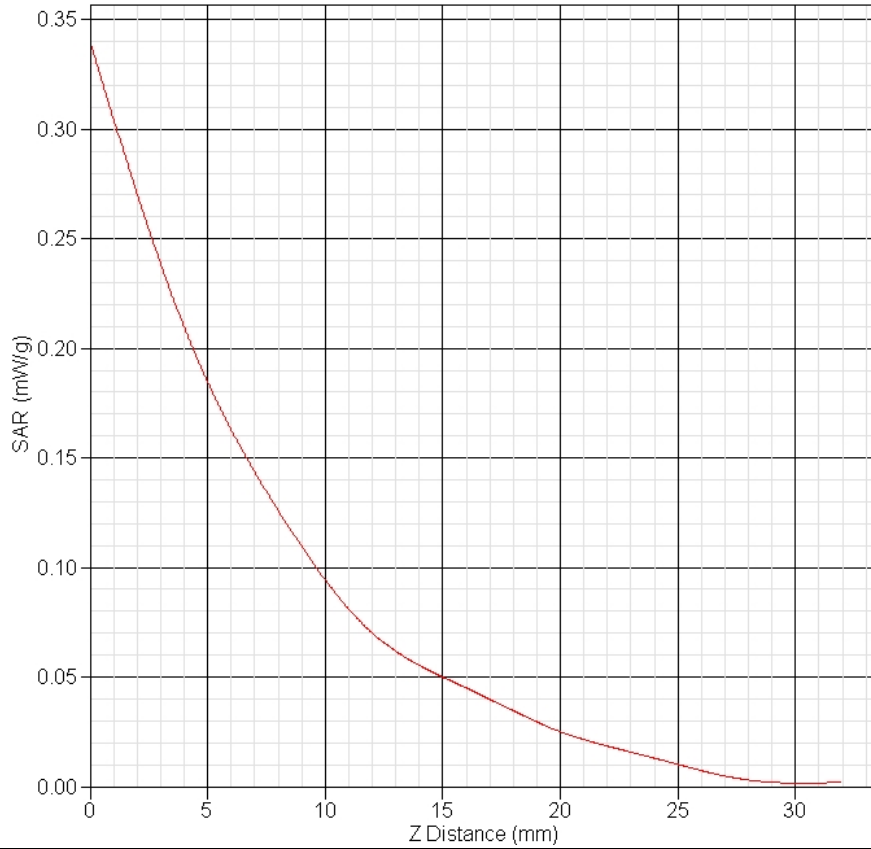
## GPRS1900 Frontside Towards Phantom Middle(661ch)

<b>Frequency (MHz)</b>	<b>1880.010</b>
<b>Relative permittivity (real part)</b>	<b>52.214</b>
<b>Conductivity (S/m)</b>	<b>1.482</b>
<b>Variation (%)</b>	<b>0.565</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>4</b>
<b>Conversion Factor</b>	<b>4.7</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>





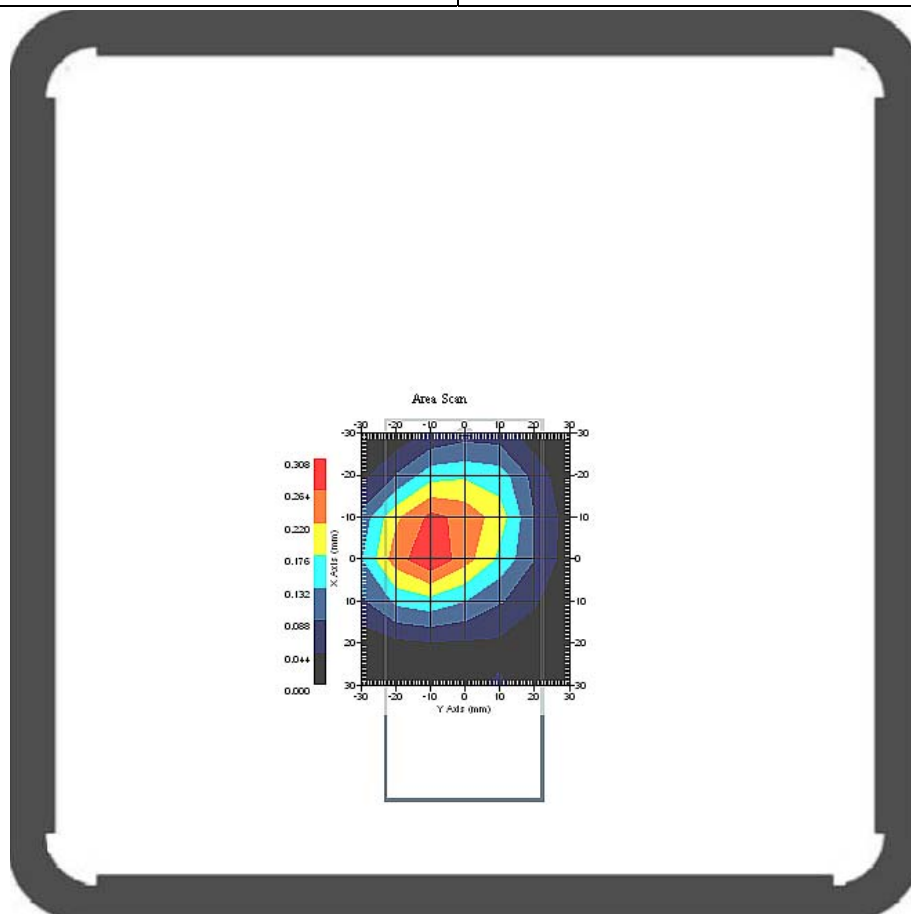
SAR-Z Axis  
at Hotspot x:-10.00 y:9.89



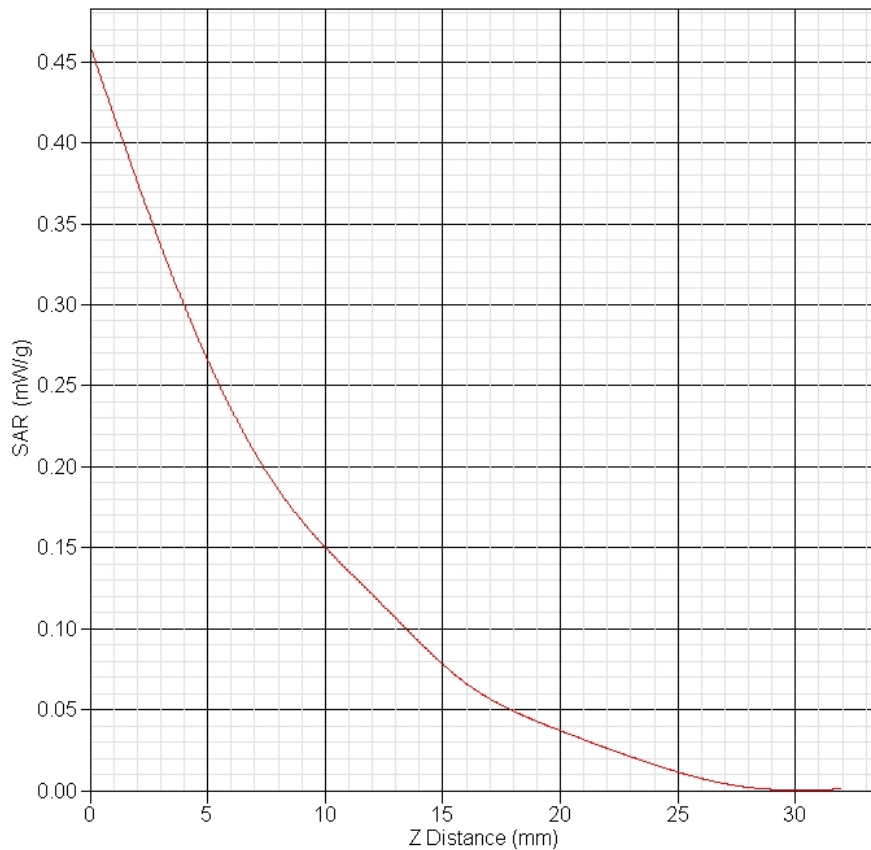
<b>SAR 10g (W/Kg)</b>	<b>0.094</b>
<b>SAR 1g (W/Kg)</b>	<b>0.190</b>

## GPRS1900 Backside Towards Phantom Low(512ch)

<b>Frequency (MHz)</b>	<b>1850.200</b>
<b>Relative permittivity (real part)</b>	<b>52.415</b>
<b>Conductivity (S/m)</b>	<b>1.468</b>
<b>Variation (%)</b>	<b>1.983</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>4</b>
<b>Conversion Factor</b>	<b>4.7</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



SAR-Z Axis  
at Hotspot x:0.01 y:-10.08

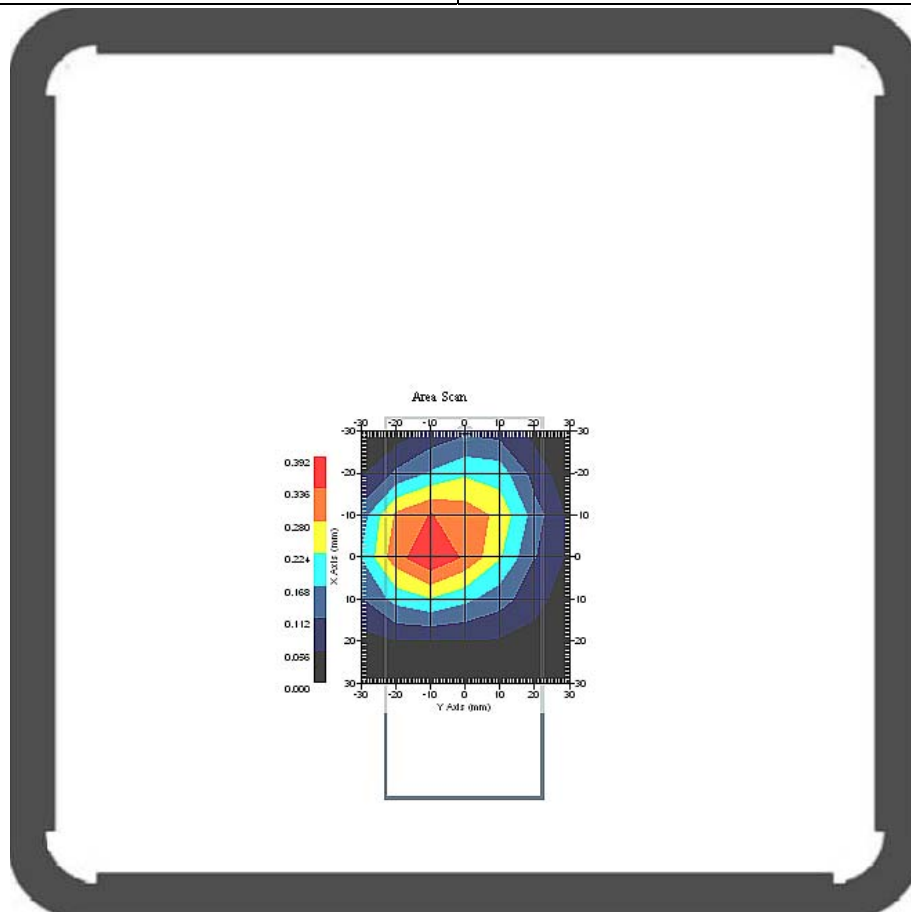


<b>SAR 10g (W/Kg)</b>	<b>0.135</b>
<b>SAR 1g (W/Kg)</b>	<b>0.261</b>

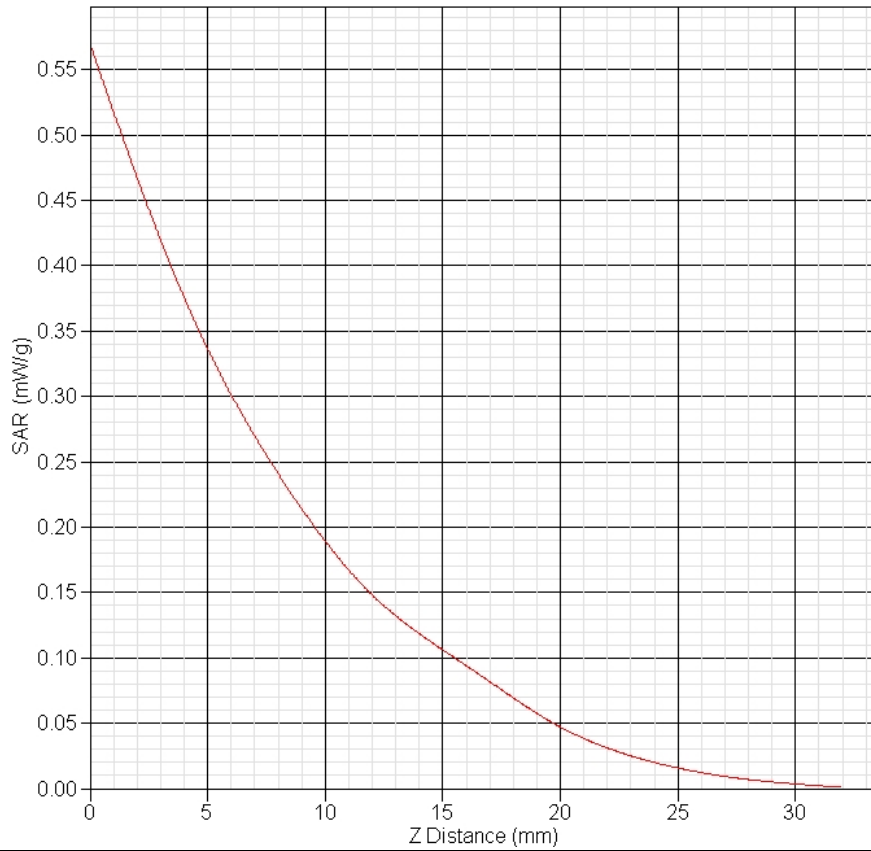


## GPRS1900 Backside Towards Phantom Middle(661ch)

<b>Frequency (MHz)</b>	<b>1880.010</b>
<b>Relative permittivity (real part)</b>	<b>52.214</b>
<b>Conductivity (S/m)</b>	<b>1.482</b>
<b>Variation (%)</b>	<b>2.539</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>4</b>
<b>Conversion Factor</b>	<b>4.7</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



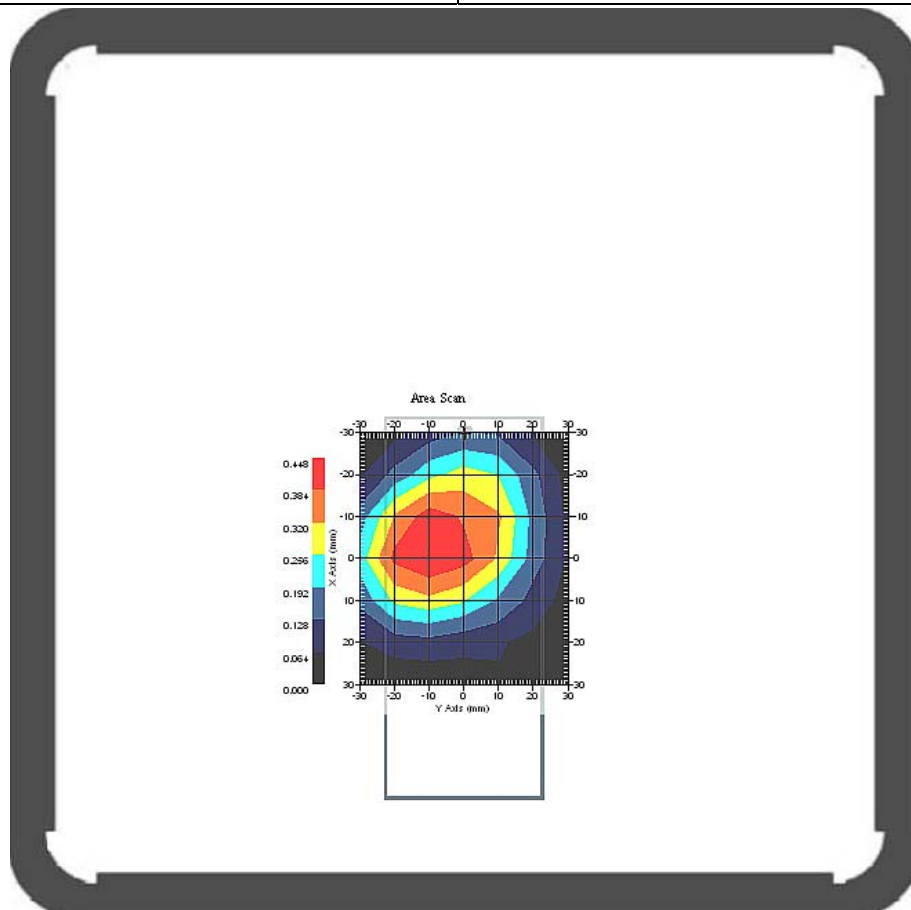
SAR-Z Axis  
at Hotspot x:-0.01 y:-10.08



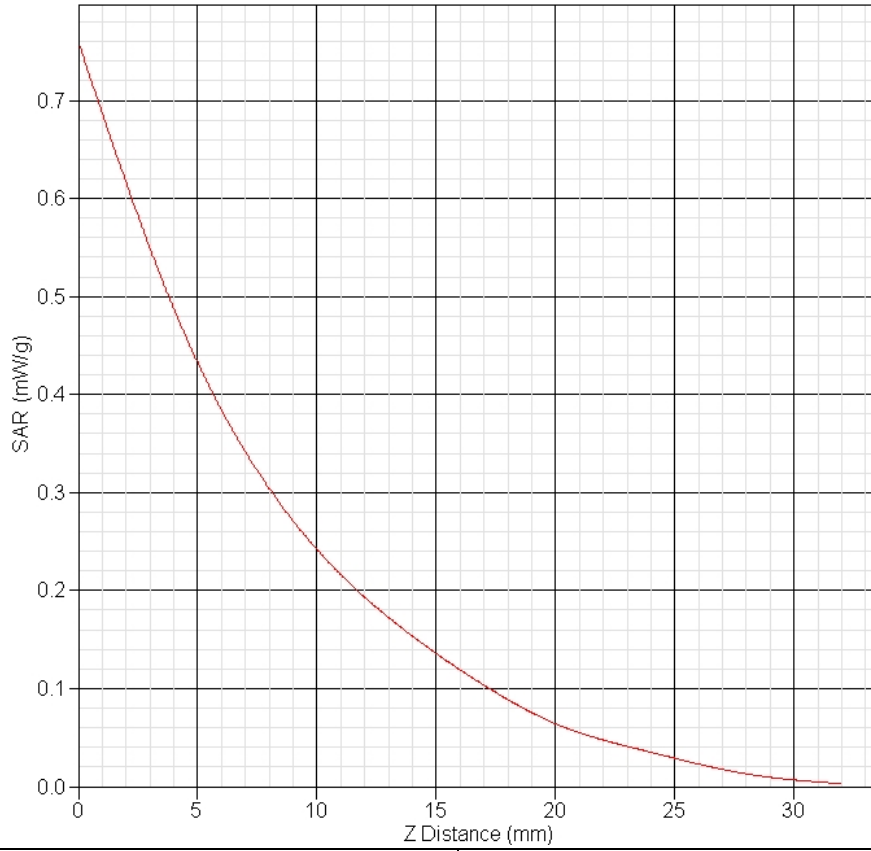
<b>SAR 10g (W/Kg)</b>	<b>0.174</b>
<b>SAR 1g (W/Kg)</b>	<b>0.332</b>

## GPRS1900 Backside Towards Phantom High(810ch)

<b>Frequency (MHz)</b>	<b>1909.810</b>
<b>Relative permittivity (real part)</b>	<b>52.185</b>
<b>Conductivity (S/m)</b>	<b>1.494</b>
<b>Variation (%)</b>	<b>-2.448</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>4</b>
<b>Conversion Factor</b>	<b>4.7</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



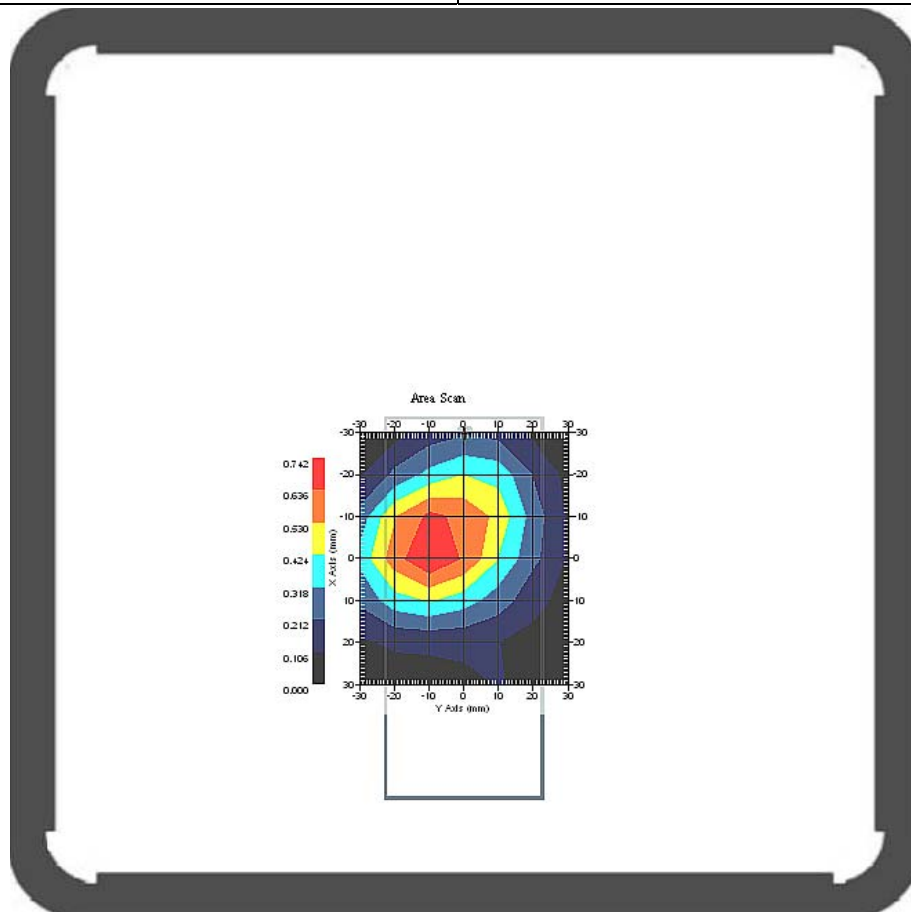
SAR-Z Axis  
at Hotspot x:-0.01 y:-10.08



<b>SAR 10g (W/Kg)</b>	<b>0.234</b>
<b>SAR 1g (W/Kg)</b>	<b>0.443</b>

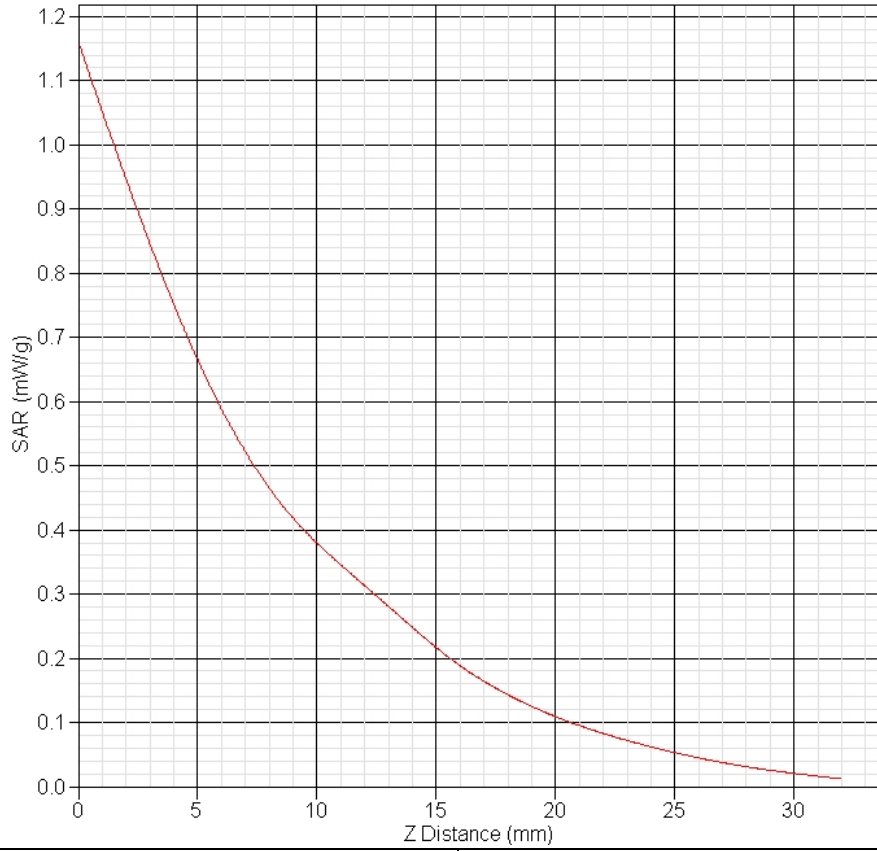
## GSM1900 Backside Towards Phantom High(810ch)

<b>Frequency (MHz)</b>	<b>1909.810</b>
<b>Relative permittivity (real part)</b>	<b>52.185</b>
<b>Conductivity (S/m)</b>	<b>1.494</b>
<b>Variation (%)</b>	<b>-0.045</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>8.3</b>
<b>Conversion Factor</b>	<b>4.7</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>





SAR-Z Axis  
at Hotspot x:-0.01 y:-10.08

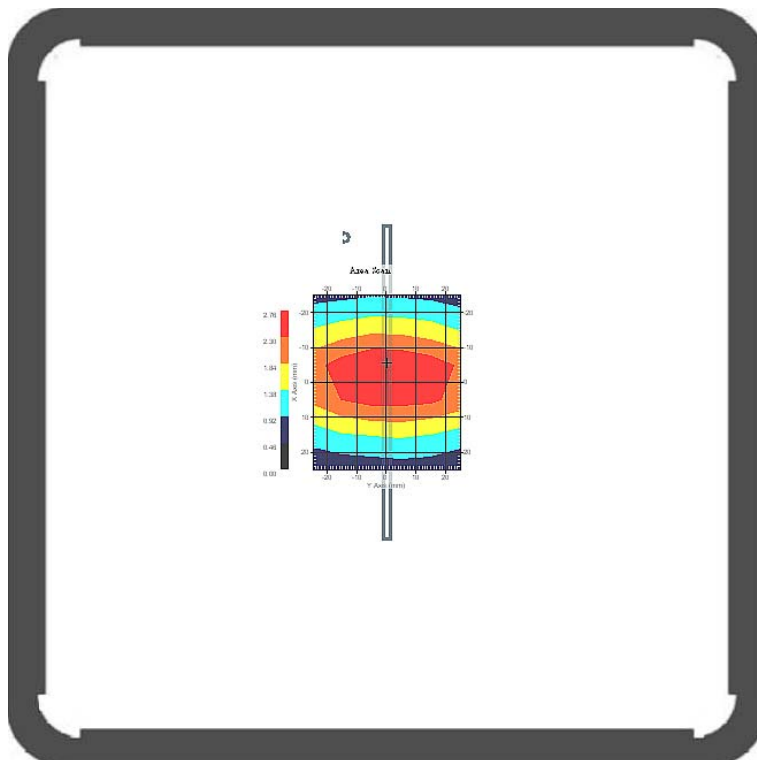


<b>SAR 10g (W/Kg)</b>	<b>0.352</b>
<b>SAR 1g (W/Kg)</b>	<b>0.659</b>

## ANNEX E- System Test Results

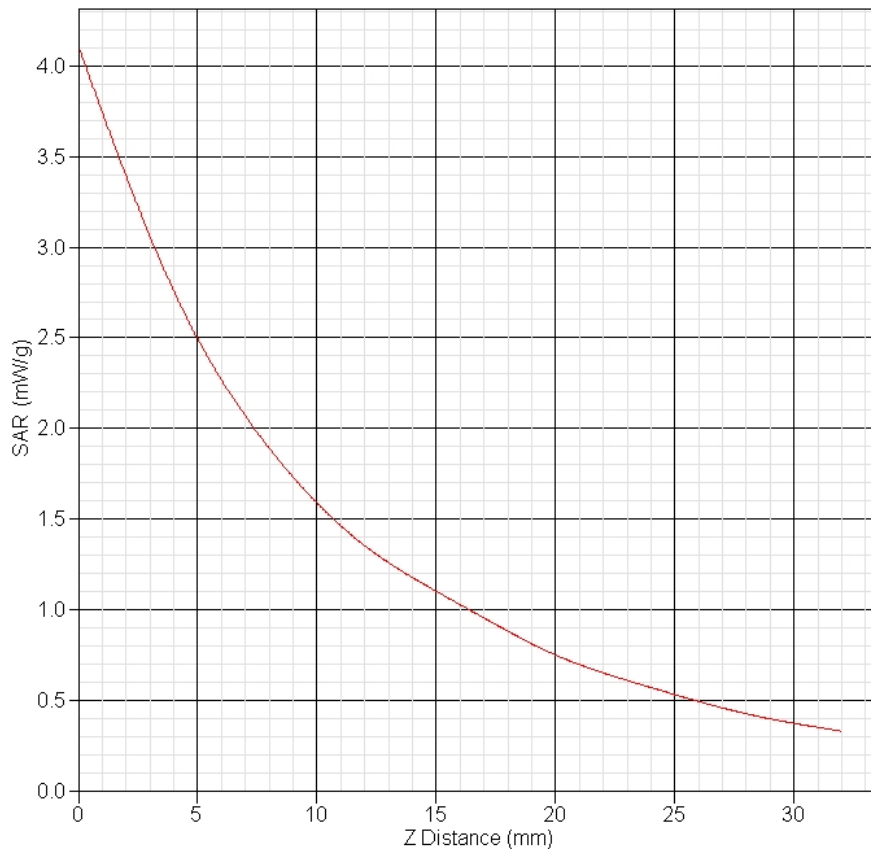
### System Performance Check at 835MHz Head

<b>Frequency (MHz)</b>	<b>835</b>
<b>Relative permittivity (real part)</b>	<b>40.670</b>
<b>Conductivity (S/m)</b>	<b>0.882</b>
<b>Variation (%)</b>	<b>-1.005</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>1</b>
<b>Conversion Factor</b>	<b>6.2</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V}/\text{m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>





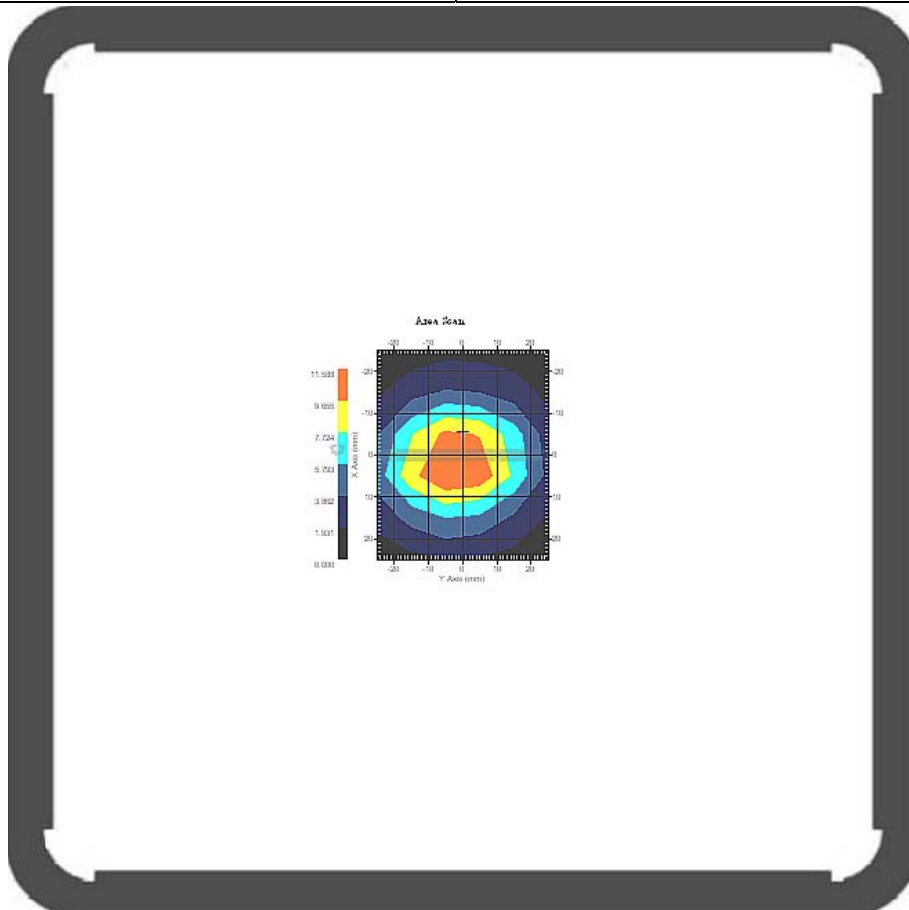
SAR-Z Axis  
at Hotspot x:-4.98 y:-5.11



<b>SAR 10g (W/Kg)</b>	<b>1.512</b>
<b>SAR 1g (W/Kg)</b>	<b>2.351</b>

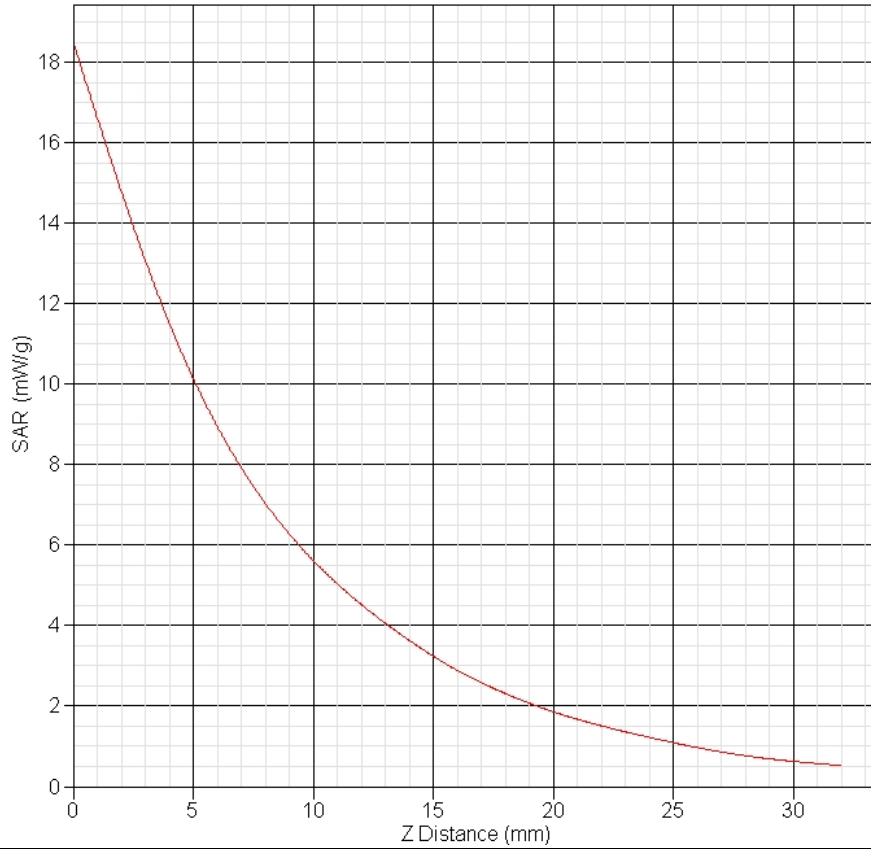
## System Performance Check at 1900MHz Head

<b>Frequency (MHz)</b>	<b>1900</b>
<b>Relative permittivity (real part)</b>	<b>39.582</b>
<b>Conductivity (S/m)</b>	<b>1.372</b>
<b>Variation (%)</b>	<b>-1.158</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>1</b>
<b>Conversion Factor</b>	<b>4.9</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V/m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>





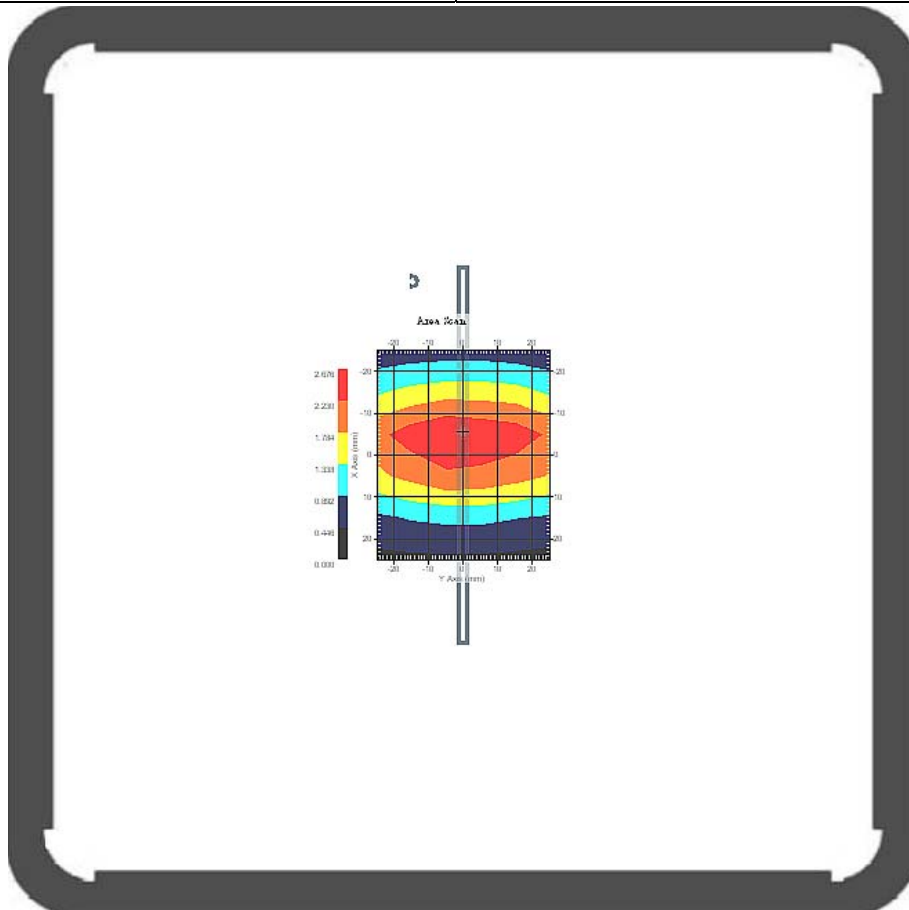
SAR-Z Axis  
at Hotspot x:5.00 y:-5.10



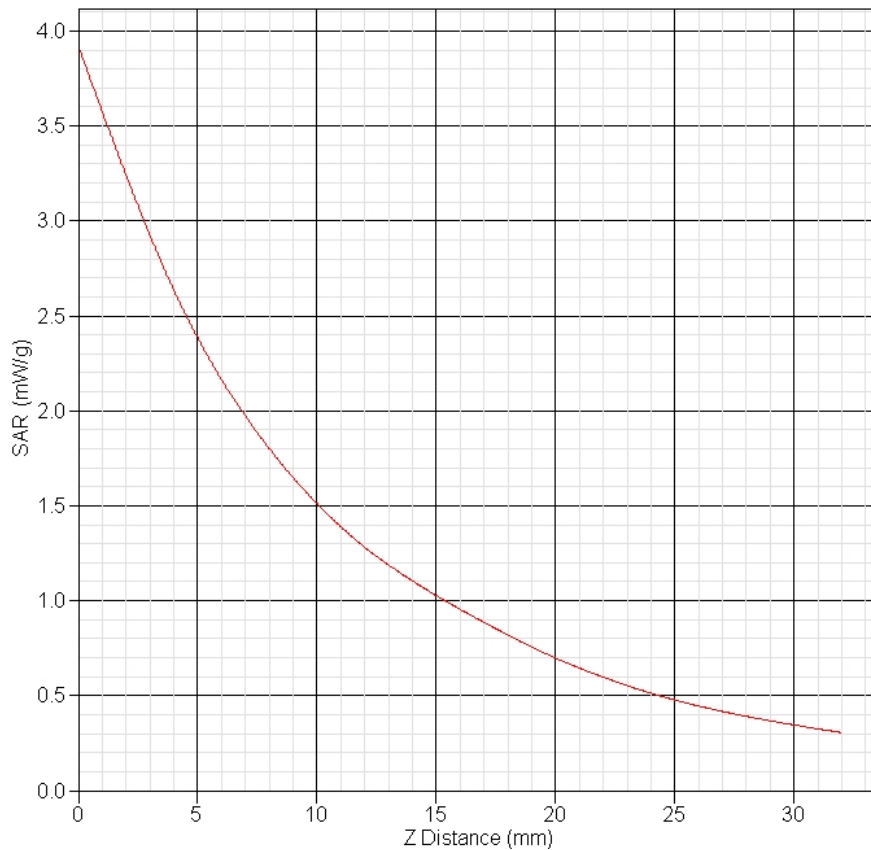
<b>SAR 10g (W/Kg)</b>	<b>5.102</b>
<b>SAR 1g (W/Kg)</b>	<b>9.613</b>

## System Performance Check at 835MHz Body

<b>Frequency (MHz)</b>	<b>835</b>
<b>Relative permittivity (real part)</b>	<b>54.648</b>
<b>Conductivity (S/m)</b>	<b>0.957</b>
<b>Variation (%)</b>	<b>-1.571</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>1</b>
<b>Conversion Factor</b>	<b>6</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V}/\text{m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



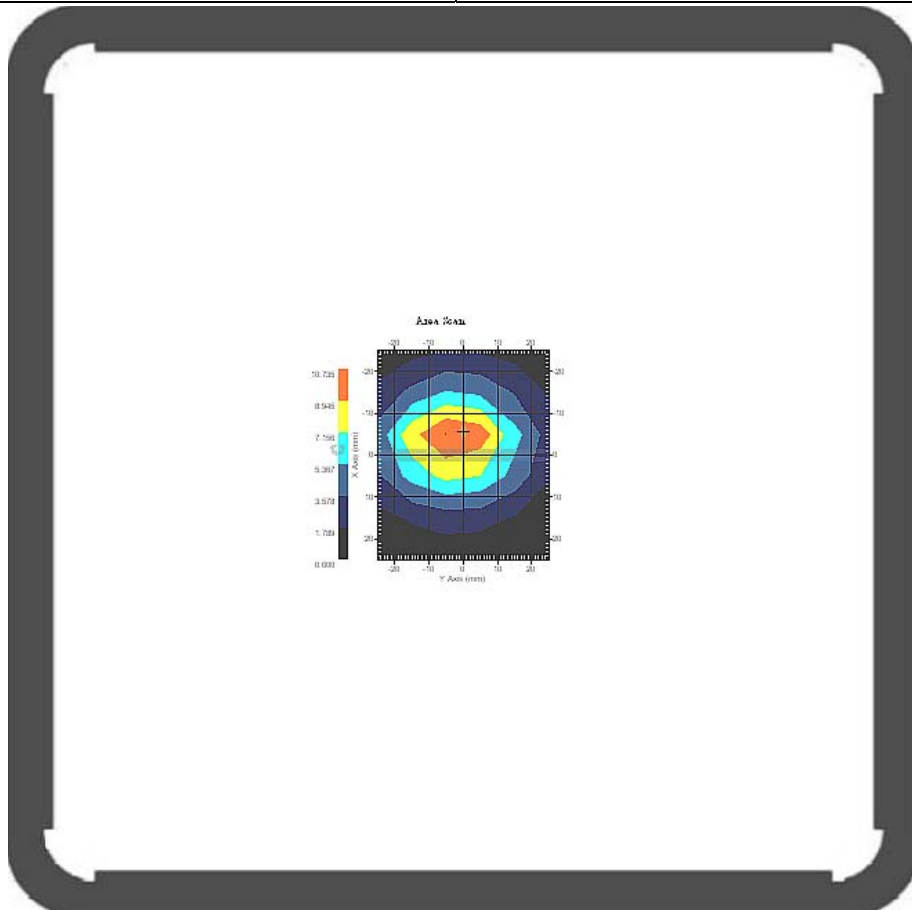
SAR-Z Axis  
at Hotspot x:-4.94 y:-5.14



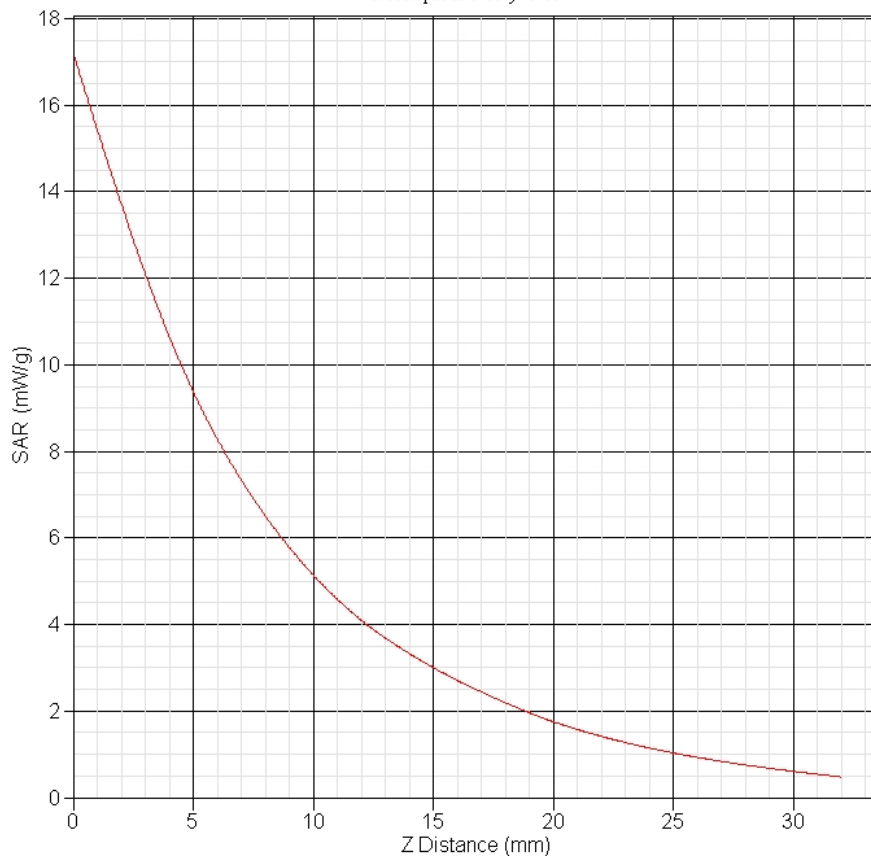
<b>SAR 10g (W/Kg)</b>	<b>1.587</b>
<b>SAR 1g (W/Kg)</b>	<b>2.445</b>

## System Performance Check at 1900MHz Body

<b>Frequency (MHz)</b>	<b>1900</b>
<b>Relative permittivity (real part)</b>	<b>52.214</b>
<b>Conductivity (S/m)</b>	<b>1.482</b>
<b>Variation (%)</b>	<b>-0.694</b>
<b>Duty Cycle Factor</b>	<b>1</b>
<b>Crest Factor</b>	<b>1</b>
<b>Conversion Factor</b>	<b>4.7</b>
<b>Probe Sensitivity</b>	<b>1.20 1.20 1.20 <math>\mu\text{V}/(\text{V}/\text{m})^2</math></b>
<b>Temperature</b>	<b>Ambient:22.1°C Liquid:20.7°C</b>
<b>Data</b>	<b>2011-5-20</b>



SAR-Z Axis  
at Hotspot x:-5.03 y:-5.08



<b>SAR 10g (W/Kg)</b>	<b>5.034</b>
<b>SAR 1g (W/Kg)</b>	<b>9.516</b>

**\*\* END OF REPORT \*\***