FCC SAR

TEST REPORT

of

PDA

Model Name: OT-200
Trade Name: Partner
Report No.: SH10070019S01
FCC ID: NDPOT-200

prepared for

Partner Tech Corp.
10F, No 233-2, Pao Chiao Rd., Shin Tien, Taipei, Taiwan 231

prepared by

Shenzhen Electronic Product Quality Testing Center
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LAB CODE 20081223-00

GENERAL SUMMARY

Product Name	PDA	Model	OT-200
Brand Name	Partner	Carrier	Fang Weizhong
Quantity of EUT	One	Manufacturer	Partner Tech Corp.
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 Xmiter and Ant, v01r05:** SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas. **KDB248227:** SAR measurement procedures for 802.112abg transmitters.		
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: Aug . 4 . 2010**		
Comment	TX Freq. Band: 824.2MHz–848.8MHz(GSM850) 1850.2MHz-1909.8MHz(PCS1900) 2412MHz–2462MHz（wifi 802.11b/g） RX Freq. Band: 869.2MHz–893.8MHz(GSM850) 1930.2MHz-1989.8MHz(PCS1900) 2412MHz–2462MHz（wifi 802.11b/g） Antenna Character : build inside The test result only responds to the measured sample.		

Tested by: Shi Feng, Date: Aug. 4. 2010

Checked by: Zhang Jun Date: Aug. 4. 2010.

Approved by: Wei Bei Date: Aug. 4. 2010.

TABLE OF CONTENT

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.

This document is only valid if complete; no partial reproduction can be made without written approval of Shenzhen Morlab Communications Technology Co., Ltd.

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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:	3Fl, 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:	3Fl, Electronic Testing Building, ShaHe Road, NanShan District, Shenzhen, P. R. China

2.3 Organization Item

Morlab Report No.:	SH10070019S01
Morlab Project Leader:	Mr. Zhang Jun
Morlab Responsible for Accreditation scope:	Mrs.Wei Bei
Start of Testing:	2010-7-26
End of Testing:	2010-8-4

2.4 Identification of Applicant

Company Name:	Partner Tech Corp.
Address:	10F, No 233-2, Pao Chiao Rd., Shin Tien, Taipei, Taiwan 231
Contact person:	Mr.Fang Weizhong
Telephone:	+886-2-29188500
Fax:	010 62978242

2.5.Identification of Manufacture

Company Name:	Partner Tech Corp.
Address:	10F, No 233-2, Pao Chiao Rd., Shin Tien, Taipei, Taiwan 231

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:	Handheld Terminal	
Brand name:	Partner	
Model No:	OT-200	
General description:	Test frequency	GSM 850 / PCS 1900 / WiFi
	Accessories	Charger, Battery,
	Battery Model	OT Series Battery
	Battery specification	3.7V 2300mAh
	Battery Manufacture	Formosan United Corporation
	Antenna type	GSM GPRS /EDGE.WiFi,Bluetooth
	Modulation mode	GPRS /EGPRS Classs 10
	Buletooth Information	Modulation Mode: GFSK, π /4DQPSK,8-DPSK Frequency Range: 2400-2483.5MHz Occupied Bandwidth: ≤1.5MHz Transmitting Power: ≤ 4dBm
	RFID Information	Modulation Mode: FSK Frequency Range: 13.56MHZ Occupied Bandwidth: ≤0.05MHz Transmitting Power: ≤1dBm

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	N.A	Windows Mobil 6.5	358477022002710

NOTE:

1. The EUT consists of Hand Telephone 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.

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.

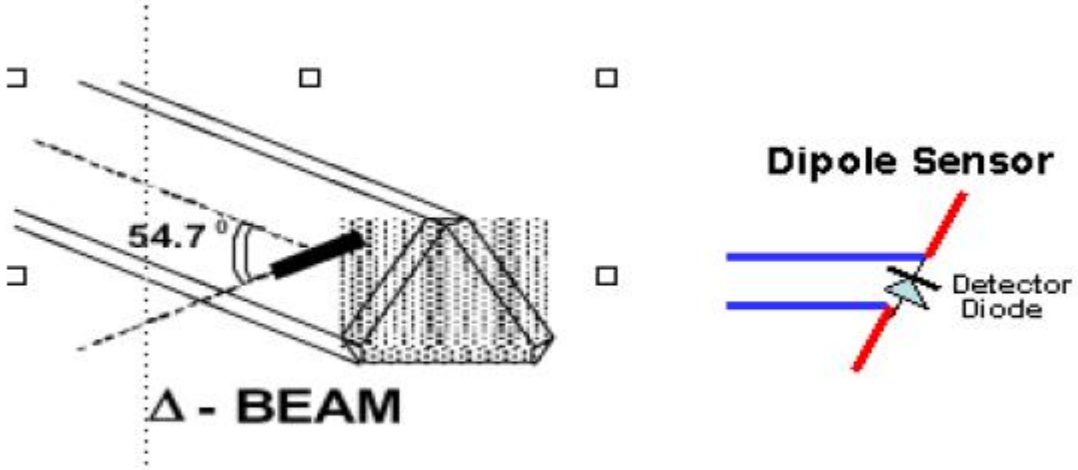
Robot/Controller Manufacturer	Thermo CRS
Number of Axis	Six independently controlled axis
Positioning Repeatability	0.05mm
Controller Type	Single phase Pentium based C500C
Robot Reach	710mm
Communication	RS232 and LAN compatible

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:

Calibration Frequency	Air Calibration	Tissue Calibration
850MHZ	TEM Cell	Temperature
1900MHZ	TEM Cell	Temperature
2450 MHZ	Waveguide	Waveguide

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

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

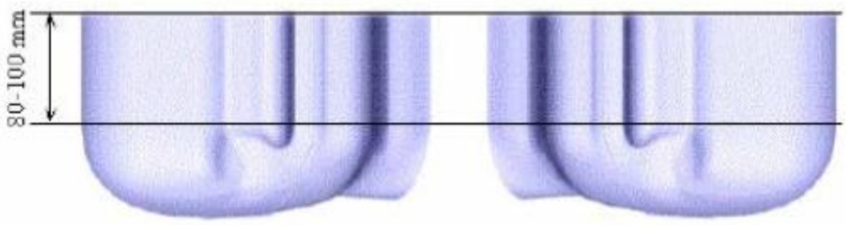
ALSAS-10U incorporates a fully calibrated Daq-Paq (analog to digital conversion system) which has a 4 channel input stage, sent via a 2 stage auto-set amplifier module. The input signal is amplified accordingly so as to offer a dynamic range from 5μV to 800mV. Integration of the fields measured is carried 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.

ADC	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° 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.

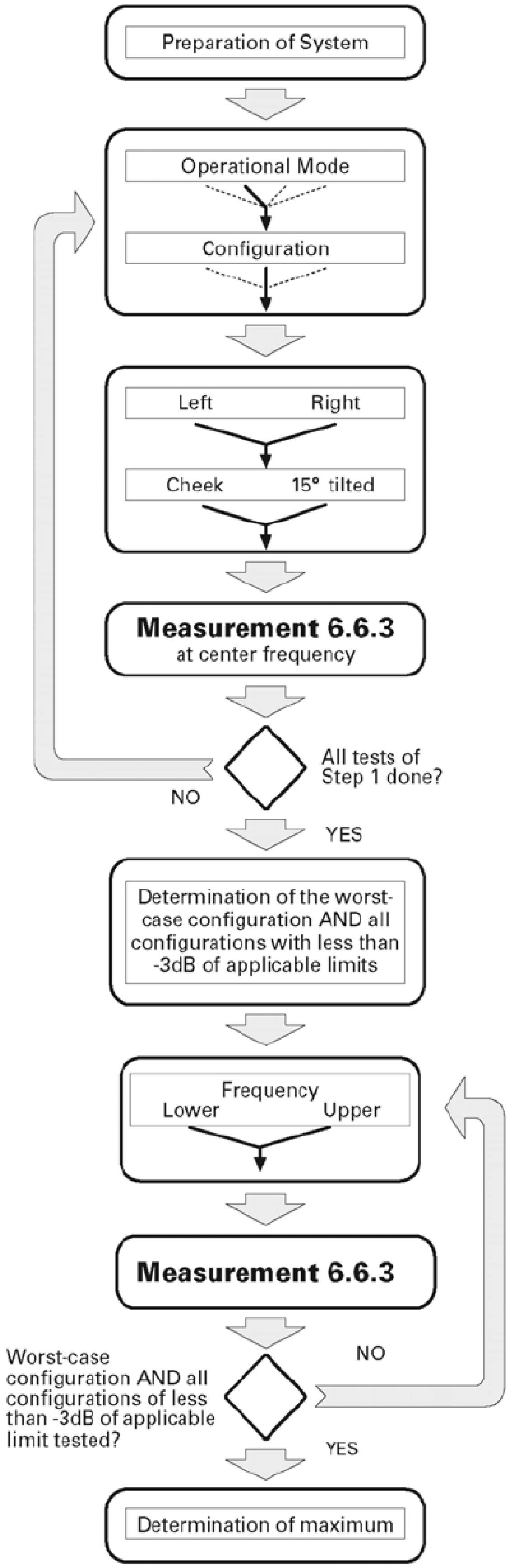
GSM liquid: is made of Sugar, de-ionized water and NaCl, reconstituting the electric properties of human tissues at 850MHz.

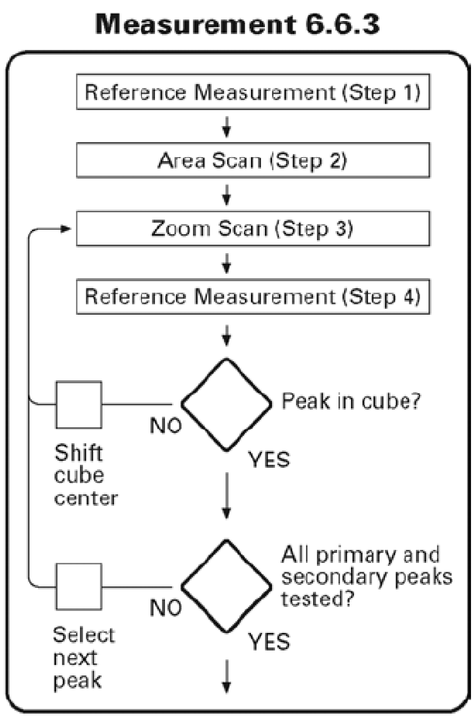
PCS Liquid: is made of de-ionized water, Glycol monobutyl and NaCl, reconstituting the electric properties of human tissues at 1900MHz.

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





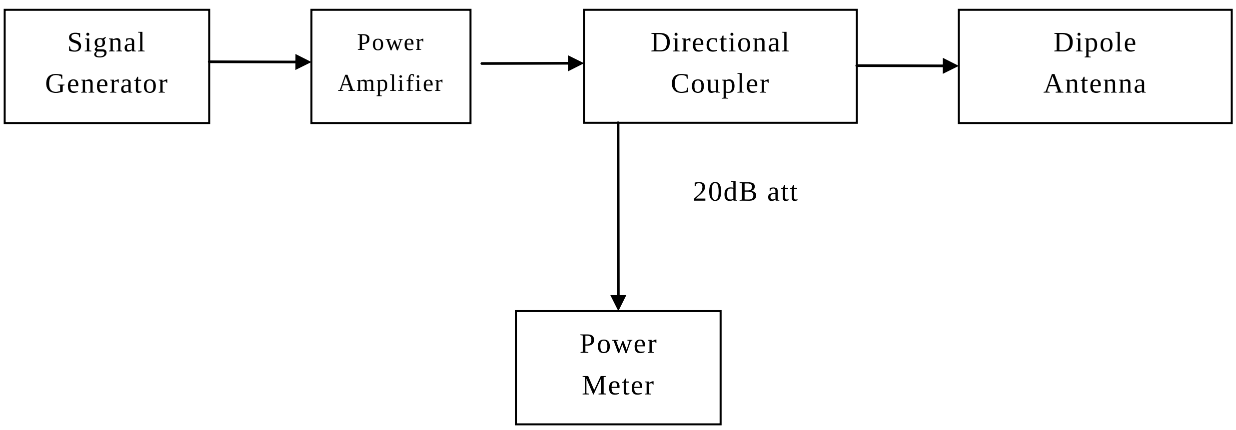
Channel	Left				Right			
	Cheek		Tilt		Cheek		Tilt	
	Retracted	Extended	Retracted	Extended	Retracted	Extended	Retracted	Extended
Mode 1:								
High			S2(-1.4dB)	S2(-0.4dB)			S2(-2.2dB)	S2(-1.4dB)
Middle	S1(-4dB)	S1(-4dB)	S1(-1.5dB)	S1(-0.5dB)	S1(-5dB)	S1(-5dB)	S1(-2.5dB)	S1(-1.5dB)
Low			S2(-1.3dB)	S2(-0.7dB)			S2(-2.7dB)	S2(-0.6dB)
Mode 2:								
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.

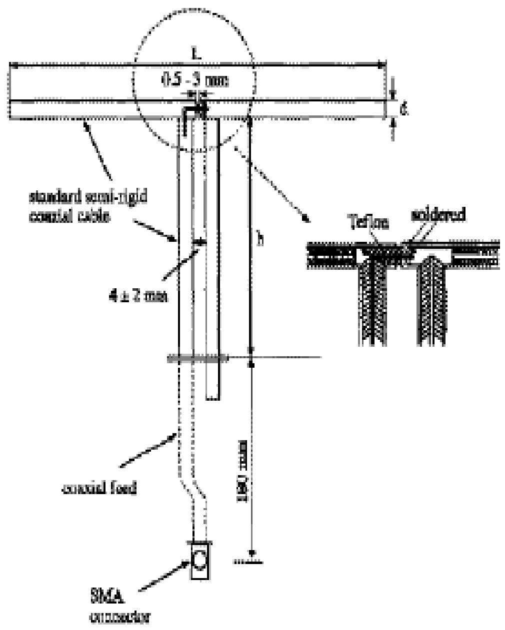
4.2.5 Validation Test Using Flat Phantom

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)
850MHZ	160	89.8	3.6
1900MHZ	73	39.5	3.6
2450 MHZ	54	30.4	3.6

Validation Result

System Performance Check at 850MHz & 1900MHz&2450MHz				
Validation Kit: ASL-D-850-S-2				
Frequency(MHz)	Description	SAR(W/Kg) 1g	SAR(W/Kg) 10g	Tissue Temp.(℃)
850MHz	Reference result	9.5	6.2	N/A
	+/-5%window	9.025 to 9.975	5.89 to 6.51	
	25-July10	9.71	6.33	20.7

Validation Kit: ASL-D-1900-S-2				
Frequency(MHz)	Description	SAR(W/Kg) 1g	SAR(W/Kg) 10g	Tissue Temp.(℃)
1900MHz	Reference result	39.7	20.5	N/A
	+/-5%window	37.715 to 41.685	19.475 to 21.525	
	25-July10	40.11	20.54	20.7
Validation Kit: ASL-D-2450-S-2				
Frequency(MHz)	Description	SAR(W/Kg) 1g	SAR(W/Kg) 10g	Tissue Temp.(℃)
2450MHz	Reference result	52.4	20.0	N/A
	+/-5%window	49.78 to 55.02	19 to 21	
	25-July10	54.32	20.71	20.3
Note: All 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

5.1.1 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.

5.1.2 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 Xmiter and Ant, v01r05: SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas.

KDB248227: SAR measurement procedures for 802.11abg transmitters.

It specifies the measurement method for demonstration of compliance with the SAR limits for such equipments.

KDB941225: Provides the SAR test procedures for 3G devices that operate under rule Parts 22H, 24E, 27L.

6 LABORATORY ENVIRONMENT

Table: The Ambient Conditions during SAR Test

Temperature	Min. =15 ℃, Max. =30 ℃
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 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: Dielectric Performance of Body Tissue Simulating Liquid

Temperature: 23.0~23.8 ℃, humidity: 54~60%.			
/	Frequency	Permittivity ε	Conductivity σ (S/m)
Target value	835 MHz	55.2	0.97
Validation value (Mar 10)	835 MHz	54.53	0.99
Target value	1900 MHz	53.30	1.52
Validation value (Mar 10)	1900 MHz	51.34	1.56
Target value	2450 MHz	52.70	1.95
Validation value (Mar 10)	2450 MHz	53.11	1.91

7.3 Conducted Power

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

GSM 850 GPRS		Averaged Power (dBm)					
	128	190	251		128	190	251
1 Txslot	31.90	32.20	32.50	-9.03 dBm	22.87	23.17	23.47
2 Txslots	31.92	32.20	32.50	-6.02dBm	22.89	23.17	23.47
GSM 850 EGPRS		**Averaged Power (dBm)**					
	128	**190**	**251**		**128**	**190**	**251**
1 Txslot	25.40	25.20	25.20	-9.03 dBm	16.37	16.17	16.17
2 Txslots	25.50	25.20	25.30	-6.02dBm	16.47	16.17	16.17
GSM 1900 GPRS		**Averaged Power (dBm)**					
	512	**661**	**810**		**128**	**190**	**251**
1 Txslot	29.50	29.80	30.00	-9.03 dBm	20.47	20.77	20.97

2 Txslots	29.60	29.90	30.00	-6.02dBm	20.57	20.77	20.97
GSM 1900 EGPRS		**Averaged Power (dBm)**					
	512	**661**	**810**		**128**	**190**	**251**
1 Txslot	25.00	24.70	24.90	-9.03 dBm	15.97	15.67	15.87
2 Txslots	25.10	24.70	24.90	-6.02dBm	16.07	15.67	15.87

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 Txslots for GPRS and EGPRS.

7.4 Summary of Measurement Results (GPRS/EGPRS 850/1900)

Table 1: SAR Values (850MHz-Body)

Temperature: 21.0~23.5 ℃, 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(dB)**
Body, Towards Ground,Mid Channel with GPRS	0.223	-0.011
Body, Towards Phantom, Low Channel with GPRS	0.235	0.101
Body, Towards Phantom,Mid Channel with GPRS	0.325	-0.085
Body, Towards Phantom, High Channel with GPRS	0.273	0.139
Body, Towards Phantom,Mid Channel with EGPRS	0.111	-0.047

Table2: SAR Values (1900MHz-Body)

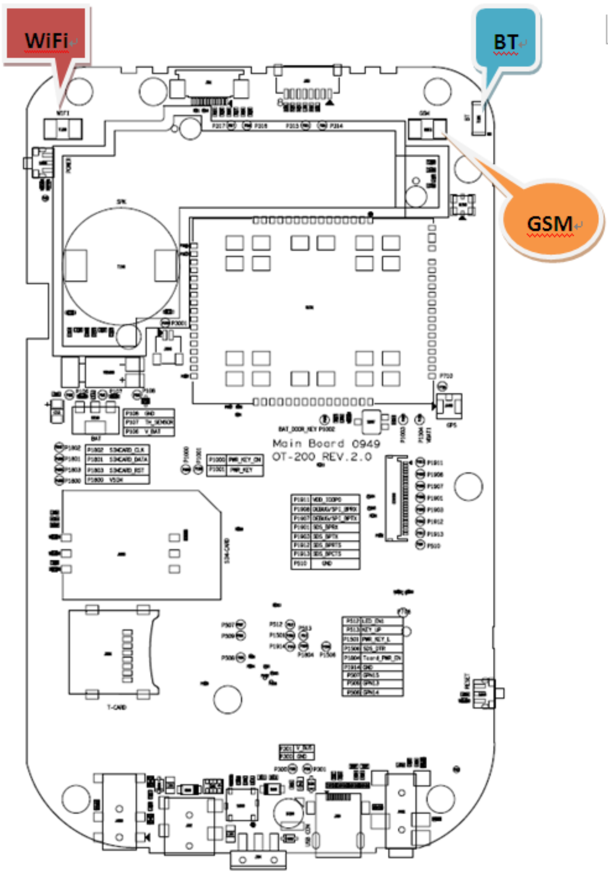
Temperature: 21.0~23.5 ℃, Relative Humidity: 60~65%.		
Limit of SAR (W/kg)	**1 g Average**	
	1.6	
Test Configuration	**Measurement Result (W/kg)**	
	1 g Average(W/kg)	**Power Drift(dB)**
Body, Towards Ground, Low Channel with GPRS	0.371	0.143
Body, Towards Ground,Mid Channel with GPRS	0.412	-0.077
Body, Towards Ground, High Channel with GPRS	0.367	-0.184

Body, Towards Phantom,Mid Channel with GPRS	0.014	0.061
Body, Towards Ground,Mid Channel with EGPRS	0.049	0.170

7.5 Summary of Measurement Results (WiFi and Bluetooth function)

The distance between BT antenna and GSM antenna is 0.25cm<2.5cm. And BT antenna and GSM antenna can Simultaneous Transmission. Because of 'Stand-alone SAR is not required for an unlicensed transmitter with output power ≤ PRef mW when either the output power or 1-g SAR for each of the other antennas within 2.5 cm of that unlicensed transmitting antenna is ≤ PRef mW or < 1.2 W/kg.' in KDB 648474, SAR for BT is not required.

The distance between WiFi antenna and GSM antenna is 1.94cm<2.5cm. And WiFi antenna and GSM antenna can't Simultaneous Transmission. The location of the antennas inside mobile phone is shown below:



The conducted power for WiFi is as following:

802.11b（dBm）

Channel\data rate	1Mbps	11Mbps
1	12.06	11.97
6	13.22	13.00
11	13.55	13.23

802.11g（dBm）

Channel\data rate	6Mbps	54Mbps
1	12.28	12.13
6	13.28	13.04
11	13.73	13.43

Because the conducted power for WiFi transmitter is ＞2PRef, stand-alone SAR for WiFi should be performed. Then, simultaneous transmission SAR for WiFi is considered with measurement results of GSM and WiFi.

Because SAR is not required for 802.11g channels since the output power is less than 0.25dB higher than that measured on the corresponding 802.11b channels,and for each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 0.25dB higher than those measured at the lowest data rate. According to the above conducted power, the EUT should be tested for “802.11b, 1Mbps, channel 11”. If SAR for highest output channel is ＞ 50% of SAR limit, test all channels.

Table3: SAR Values (WiFi 802.11b -Body)

Temperature: 21.0~23.5 ℃, Relative m 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(dB)**
Body, Towards Ground, 1Mbps, channel 11	0.032	-0.033

According to the above tables, the sum of SAR values for GSM and WiFi ＜1.6W/kg. So simultaneous transmission SAR are not required for WiFi transmitter.

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	√3	(1-cp)1/2	(1-cp)1/2	1.5	1.5
Hemispherical Isotropy	10.9	rectangular	√3	√cp	√cp	4.4	4.4
Boundary Effect	1.0	rectangular	√3	1	1	0.6	0.6
Linearity	4.7	rectangular	√3	1	1	2.7	2.7
Detection Limit	1.0	rectangular	√3	1	1	0.6	0.6
Readout Electronics	1.0	normal	1	1	1	1.0	1.0
Response Time	0.8	rectangular	√3	1	1	0.5	0.5
Integration Time	1.7	rectangular	√3	1	1	1.0	1.0
RF Ambient Condition	3.0	rectangular	√3	1	1	1.7	1.7
Probe Positioner Mech.	0.4	rectangular	√3	1	1	0.2	0.2
Restriction							
Probe Positioning with respect to Phantom Shell	2.9	rectangular	√3	1	1	1.7	1.7
Extrapolation	3.7	rectangular	√3	1	1	2.1	2.1

and Integration							
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	√3	1	1	0.3	0.3
Phantom and Setup							
Phantom Uncertainty(shape & thickness tolerance)	3.4	rectangular	√3	1	1	2.0	2.0
Liquid Conductivity(target)	5.0	rectangular	√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	√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	Aprel	ALS-UWS	100-00154	Jun.2010
Data Acquisition Package	Aprel	ALS-DAQ-PAQ-3	110-00215	Jun.2010
Probe Mounting Device and Boundary Detection Sensor System	Aprel	ALS-PMDPS-3	120-00265	Jun.2010
Miniature E-Field Probe	Aprel	ALS-E-020	273,274	Dec.2009
Left ear SAM Phontom	Aprel	ALS-P-SAM-L	130-00312	N/A
Right ear SAM Phontom	Aprel	ALS-P-SAM-R	140-00362	N/A
Universal SAM Phontom	Aprel	ALS-P-SU-1	150-00410	N/A
Reference Validation Dipole 900MHz	Aprel	ALS-D-900-S-2	190-00607	N/A
Reference Validation Dipole 1800MHz	Aprel	ALS-D-1800-S-2	200-00657	N/A
Dielectric Probe Kit	Aprel	ALS-PR-DIEL	260-00955	N/A
Device Holder 2.0	Aprel	ALS-H-E-SET-2	170-00506	N/A
SAR software	Aprel	ALS-SAR-AL-10	Ver.2.3.6	N/A
CRS C500C Controller	Thermo	ALS-C500	RCF0504291	N/A
CRS F3 Robot	Aprel	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.10
Vector Network	Anritsu	MS4623B	N/A	Nov.09
Signal Generator	Agilent	E8257D	N/A	Jan.10
Power Meter	Rohde&Schwarz	NRP	N/A	Jan.10

ANNEX A- Accreditation Certificate

of

Shenzhen Morlab Communications Technology Co.,Ltd.

CONFORMANCE TEST REPORT FOR
HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

Handheld Terminal

REPORT NO: SH10070019S01
Type Name: OT-200
Hardware Version： Main board 0949 OT-200 Rev.2.0
Software Version： Windows Mobil 6.5

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

of

Shenzhen Morlab Communications Technology Co.,Ltd.

CONFORMANCE TEST REPORT FOR
HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

Handheld Terminal

REPORT NO: SH10070019S01
Type Name: OT-200
Hardware Version: Main board 0949 OT-200 Rev.2.0
Software Version: Windows Mobil 6.5

Test Layout

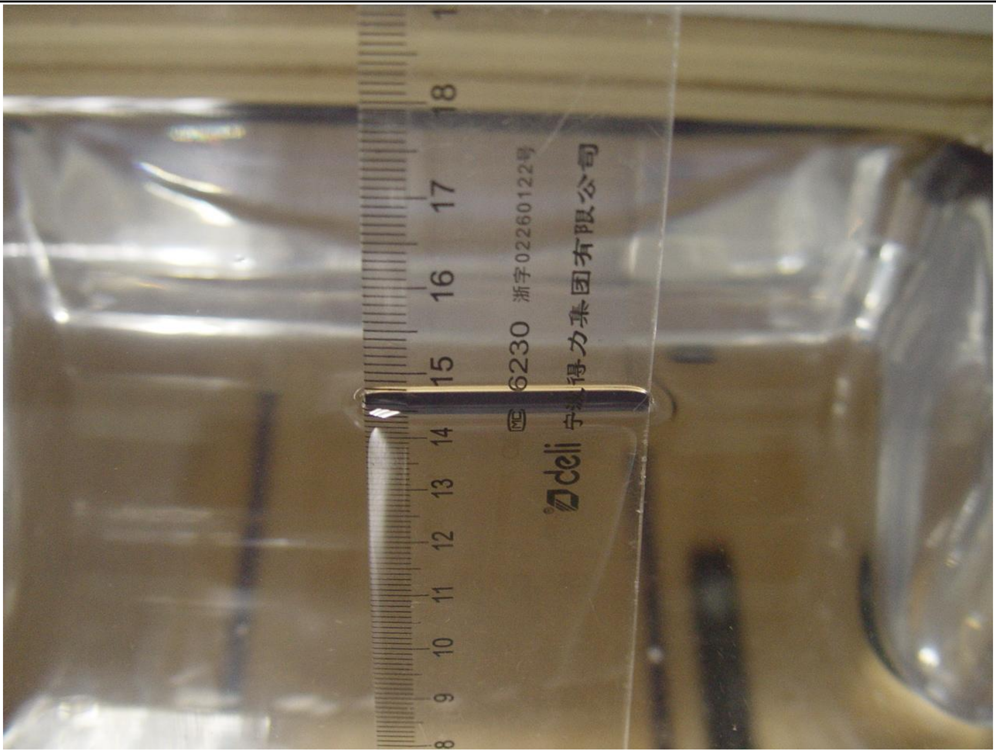


Figure B.1 Depth of Simulating Liquid in SAM Head Phantom

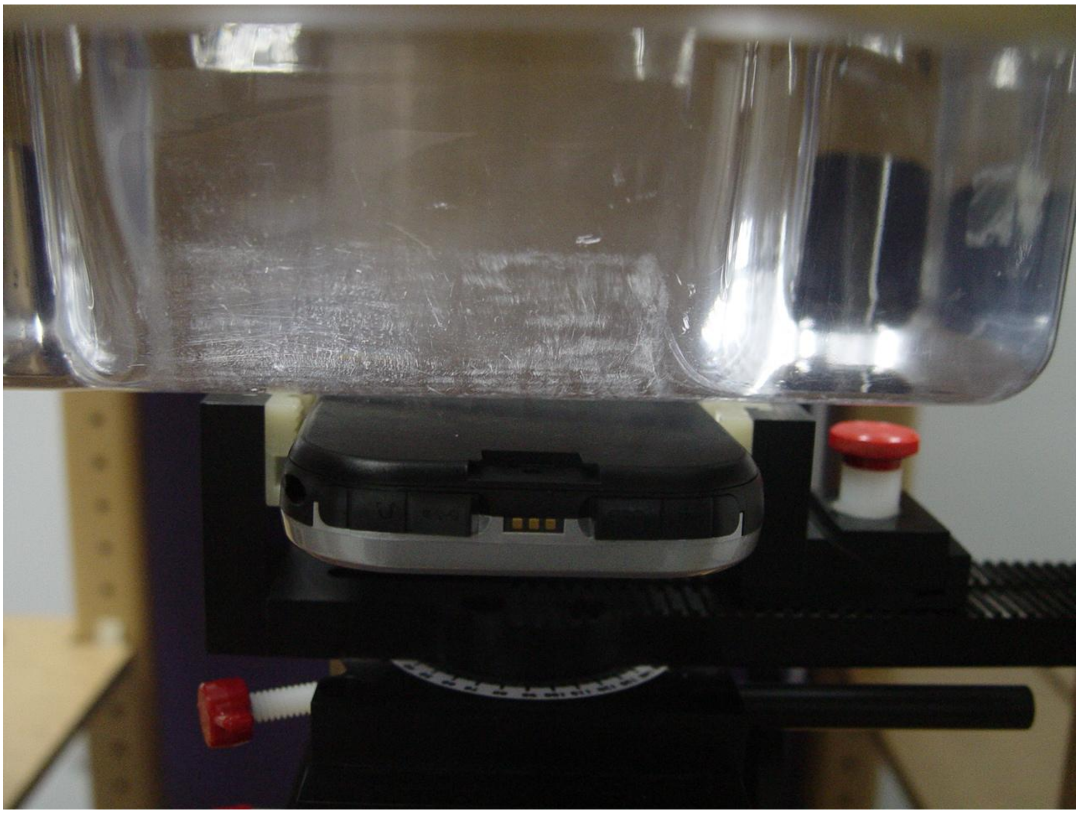


Figure B.2 EUT Towards Ground

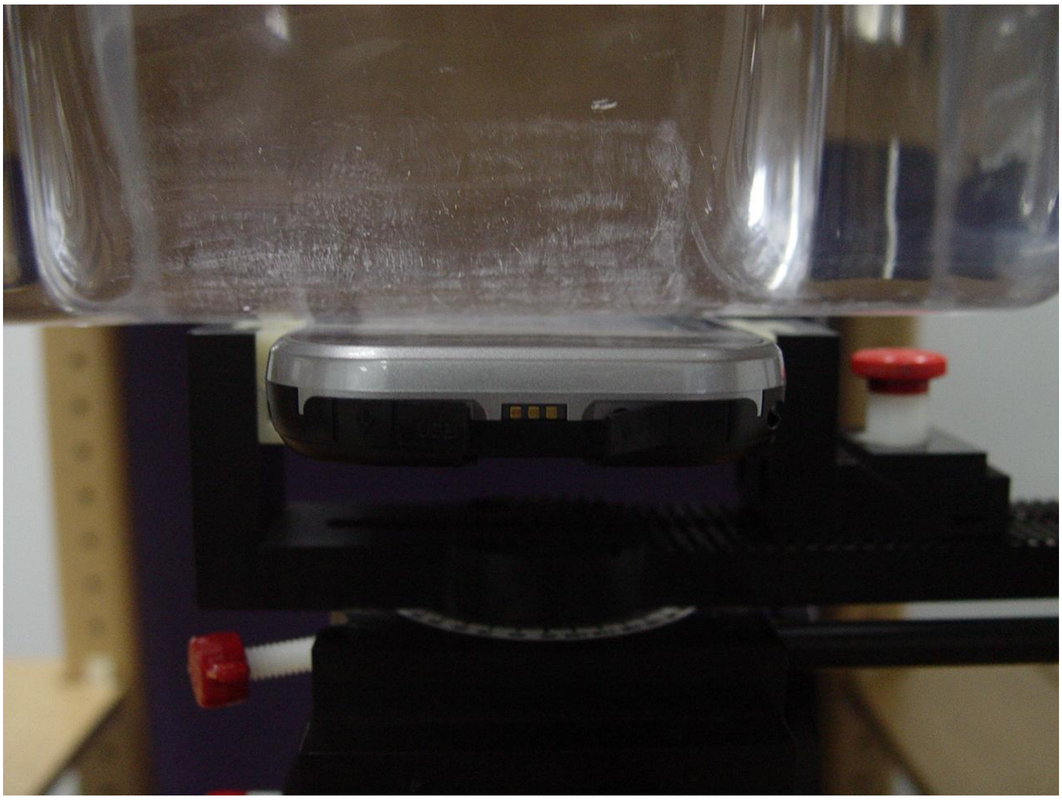


Figure B.3 EUT Towards Phantom

ANNEX C- Sample Photographs

of

Shenzhen Morlab Communications Technology Co.,Ltd.

CONFORMANCE TEST REPORT FOR
HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

Handheld Terminal

REPORT NO: SH10070019S01
Type Name: OT-200
Hardware Version： Main board 0949 OT-200 Rev.2.0
Software Version： Windows Mobil 6.5

Photograph of the Equipment under Test

ANNEX D- Graph Test Results

of

Shenzhen Morlab Communications Technology Co.,Ltd.

CONFORMANCE TEST REPORT FOR
HUMAN EXPOSURE TO ELECTROMAGNETIC FIELDS

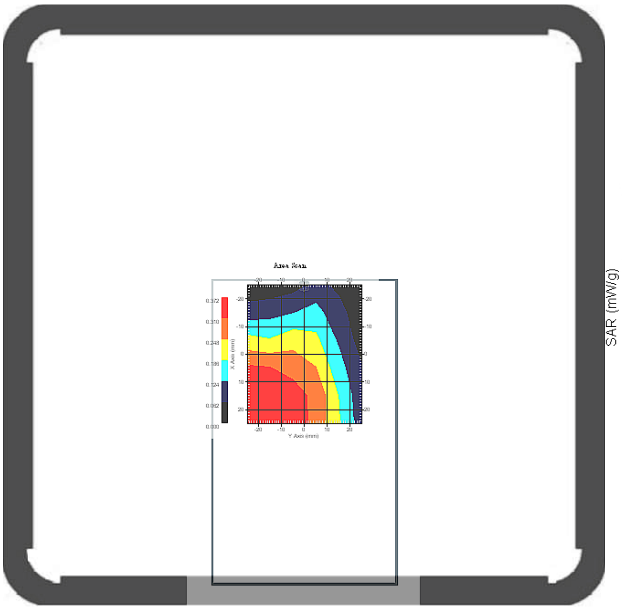
Handheld Terminal

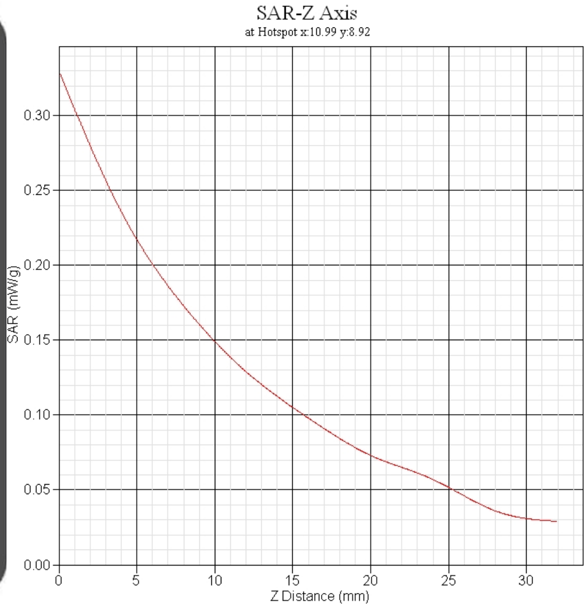
REPORT NO: SH10070019S01
Type Name: OT-200
Hardware Version: Main board 0949 OT-200 Rev.2.0
Software Version: Windows Mobil 6.5

Graph Test Results

GSM850 Towards Ground CH190 with GPRS

Frequency (MHz)	**836.599976**
Relative permitivity (real part)	**55.709999**
Relative permitivity (imaginary part)	**21.709999**
Conductivity (S/m)	**1.009033**
Variation (%)	**0.950000**

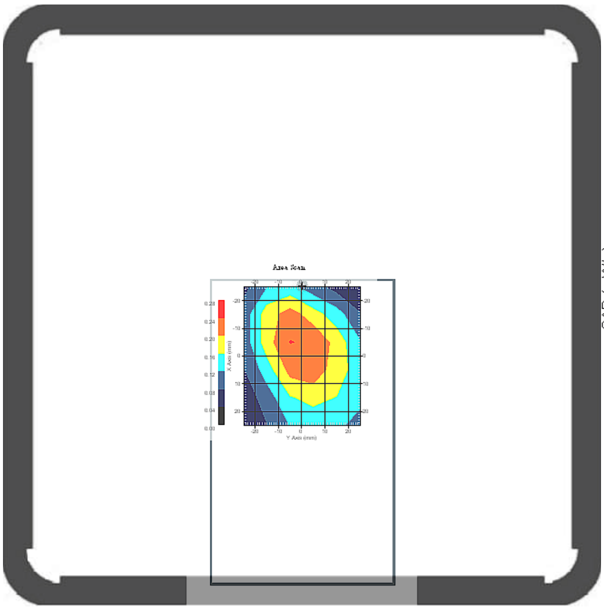


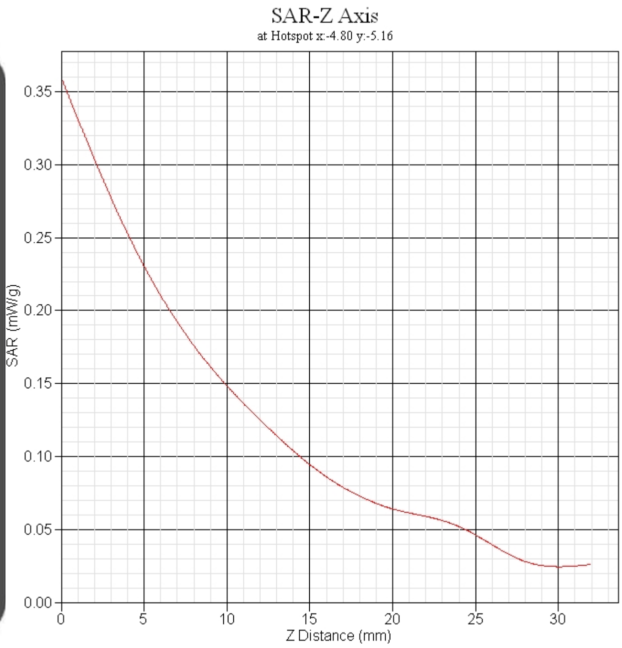


SAR 10g (W/Kg)	**0.154**
SAR 1g (W/Kg)	**0.223**

GSM850 Towards Phantom CH128 with GPRS

Frequency (MHz)	824.200012
Relative permitivity (real part)	55.116001
Relative permitivity (imaginary part)	21.284550
Conductivity (S/m)	0.974596
Variation (%)	-1.120000

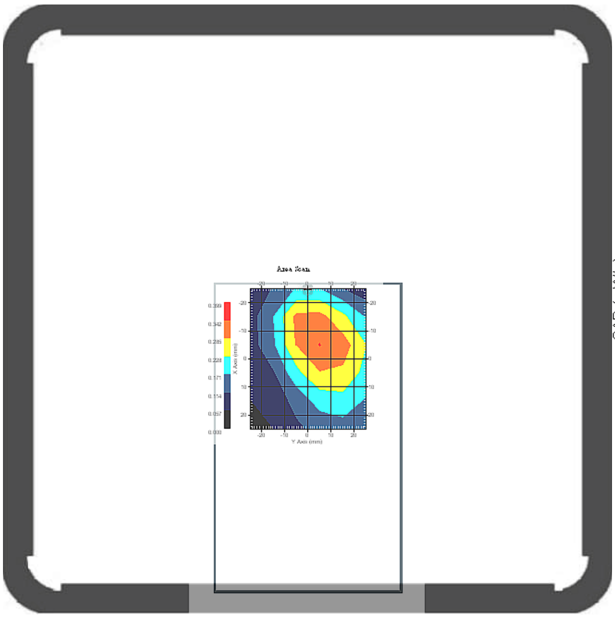


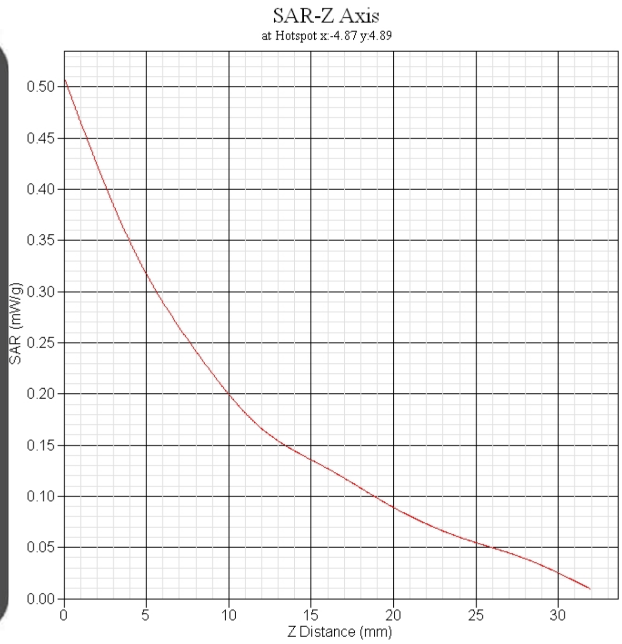


SAR 10g (W/Kg)	0.143
SAR 1g (W/Kg)	0.235

GSM850 Towards Phantom CH190 with GPRS

Frequency (MHz)	836.599976
Relative permitivity (real part)	55.129999
Relative permitivity (imaginary part)	21.709999
Conductivity (S/m)	1.009033
Variation (%)	0.120000

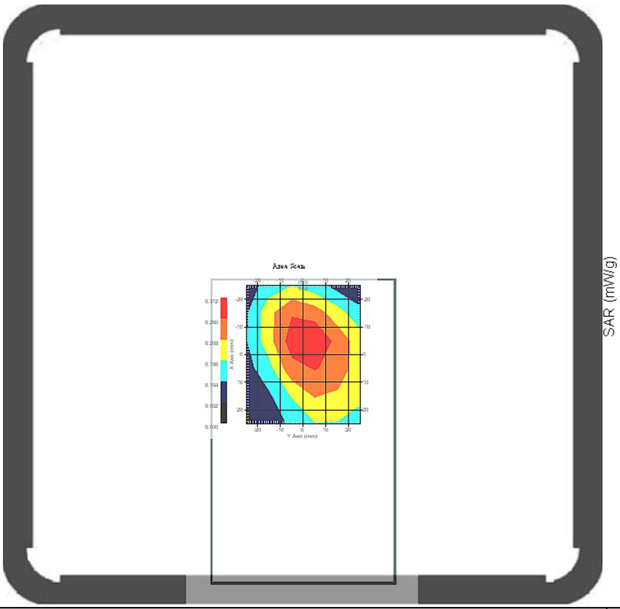


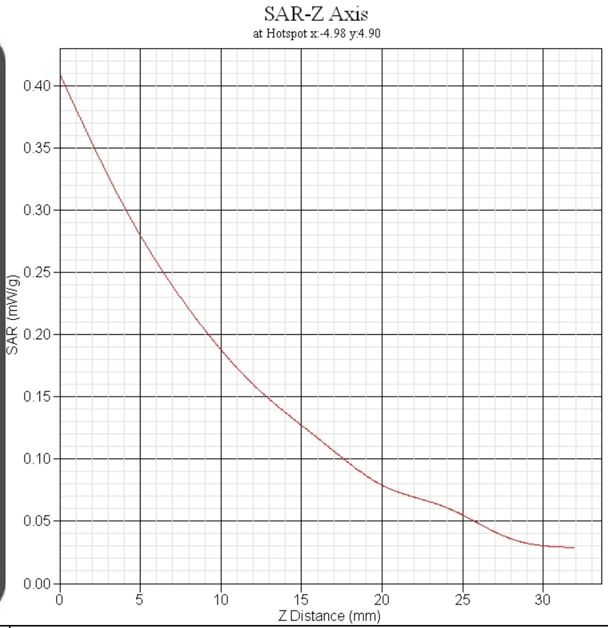


SAR 10g (W/Kg)	0.197
SAR 1g (W/Kg)	0.325

GSM850 Towards Phantom CH251 with GPRS

Frequency (MHz)	**848.799988**
Relative permitivity (real part)	**55.014999**
Relative permitivity (imaginary part)	**21.332850**
Conductivity (S/m)	**1.015962**
Variation (%)	**-1.610000**

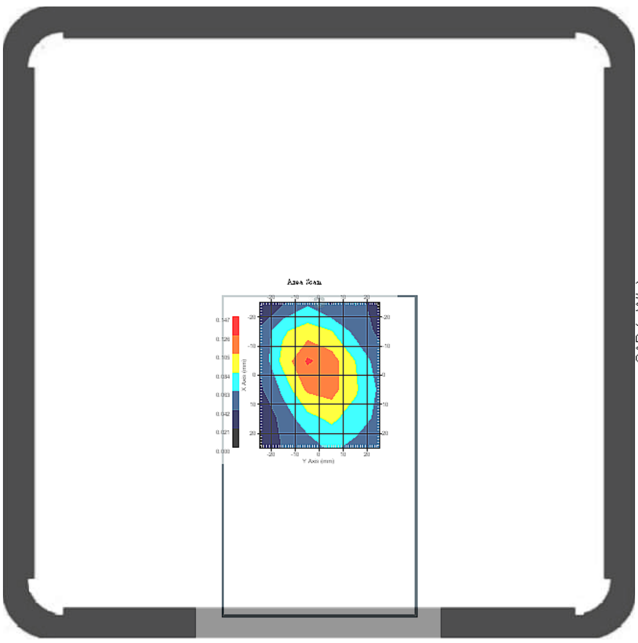


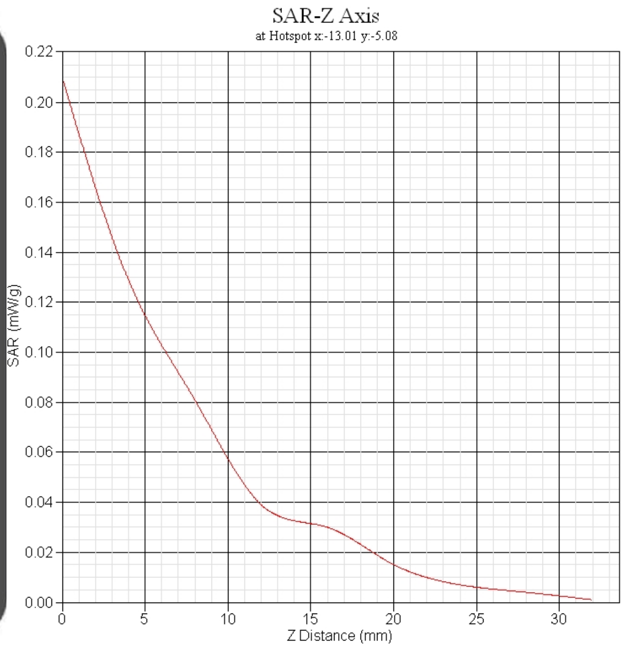


SAR 10g (W/Kg)	**0.162**
SAR 1g (W/Kg)	**0.273**

GSM850 Towards Phantom CH190with EGPRS

Frequency (MHz)	**848.799988**
Relative permitivity (real part)	**55.014999**
Relative permitivity (imaginary part)	**21.332850**
Conductivity (S/m)	**1.015962**
Variation (%)	**-1.610000**

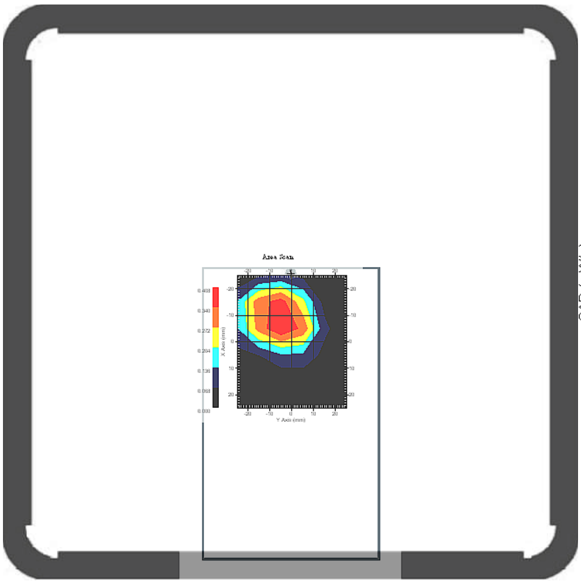


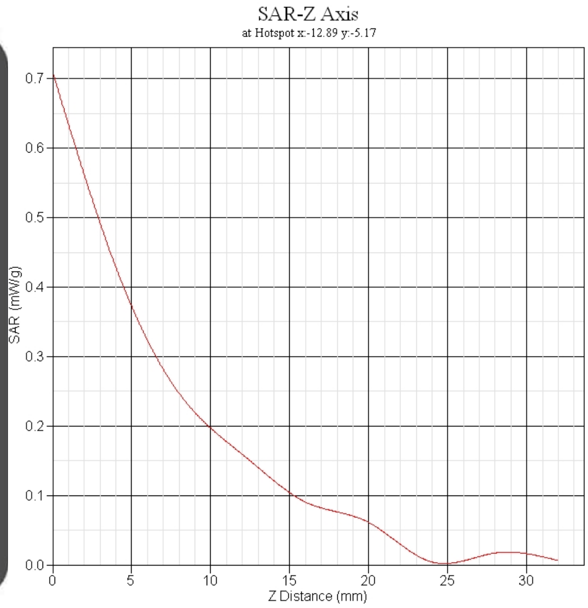


SAR 10g (W/Kg)	**0.056**
SAR 1g (W/Kg)	**0.111**

GSM1900 Towards Ground CH512 With GPRS

Frequency (MHz)	**1850.199951**
Relative permitivity (real part)	**53.414999**
Relative permitivity (imaginary part)	**21.332850**
Conductivity (S/m)	**1.505962**
Variation (%)	**-1.520000**

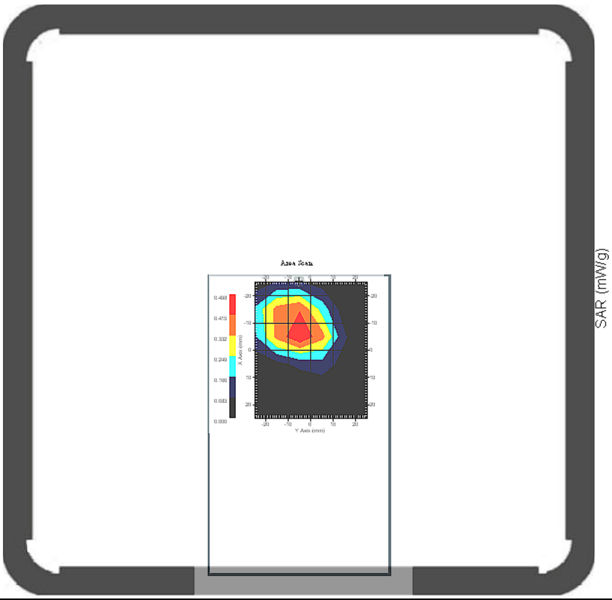


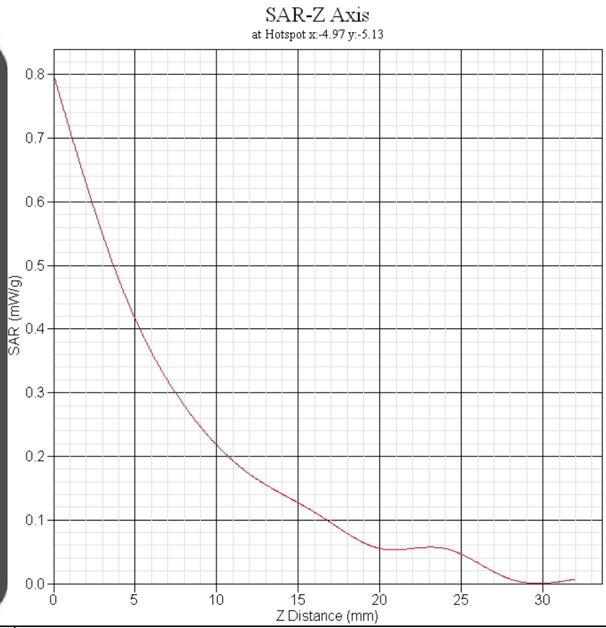


SAR 10g (W/Kg)	**0.175**
SAR 1g (W/Kg)	**0.371**

GSM1900 Towards Ground CH661 With GPRS

Frequency (MHz)	**1880.000000**
Relative permitivity (real part)	**53.340001**
Relative permitivity (imaginary part)	**15.070000**
Conductivity (S/m)	**1.5073975**
Variation (%)	**-1.710000**

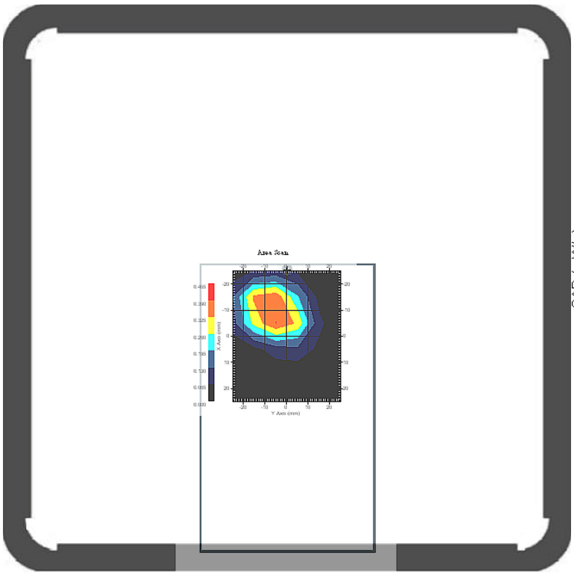


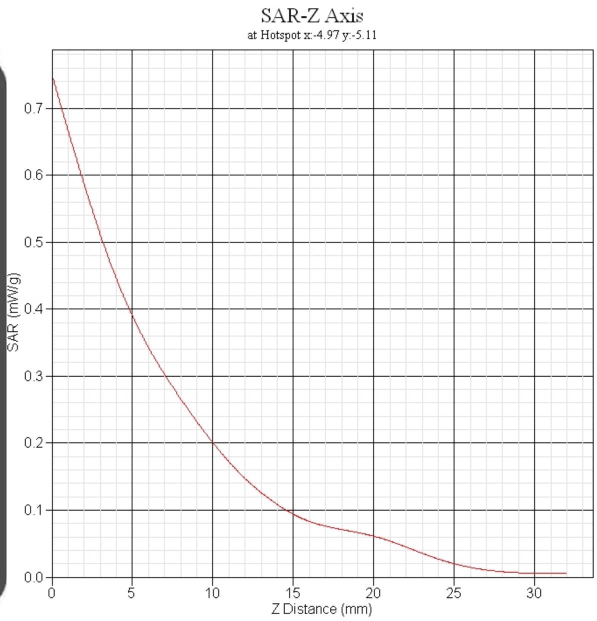


SAR 10g (W/Kg)	**0.190**
SAR 1g (W/Kg)	**0.412**

GSM1900 Towards Ground CH810 With GPRS

Frequency (MHz)	**1909.800049**
Relative permitivity (real part)	**52.980001**
Relative permitivity (imaginary part)	**15.070000**
Conductivity (S/m)	**1.573978**
Variation (%)	**-1.710000**

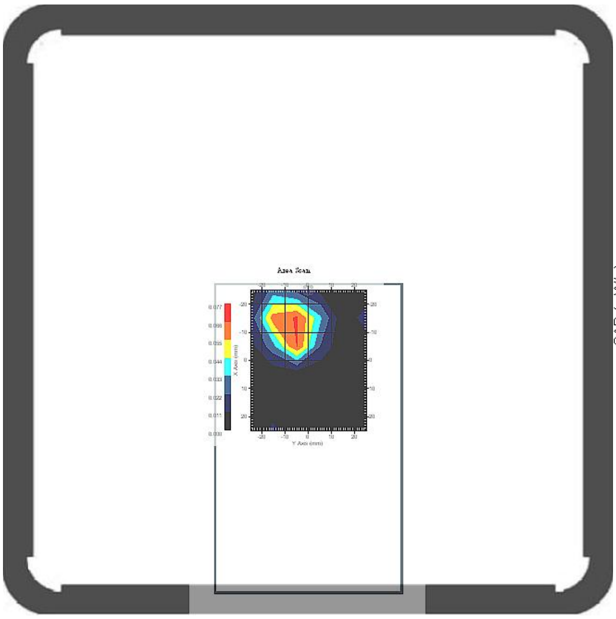


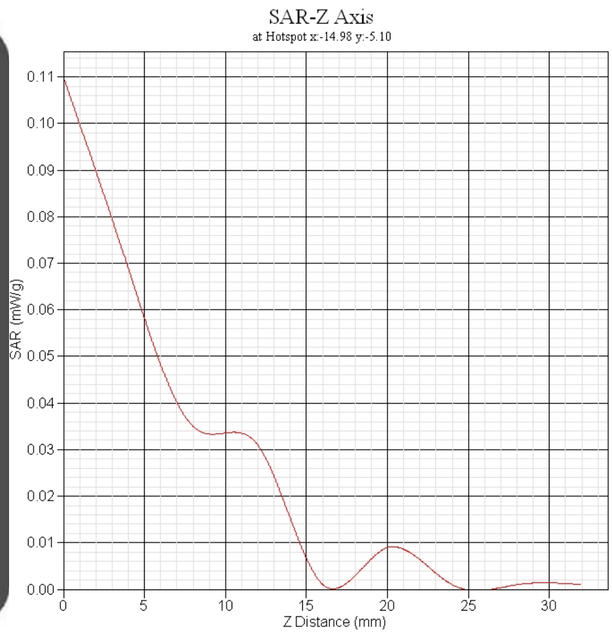


SAR 10g (W/Kg)	**0.164**
SAR 1g (W/Kg)	**0.367**

GSM1900 Towards Phantom CH661 With GPRS

Frequency (MHz)	**1880.000000**
Relative permitivity (real part)	**53.340001**
Relative permitivity (imaginary part)	**15.070000**
Conductivity (S/m)	**1.5073975**
Variation (%)	**-1.710000**

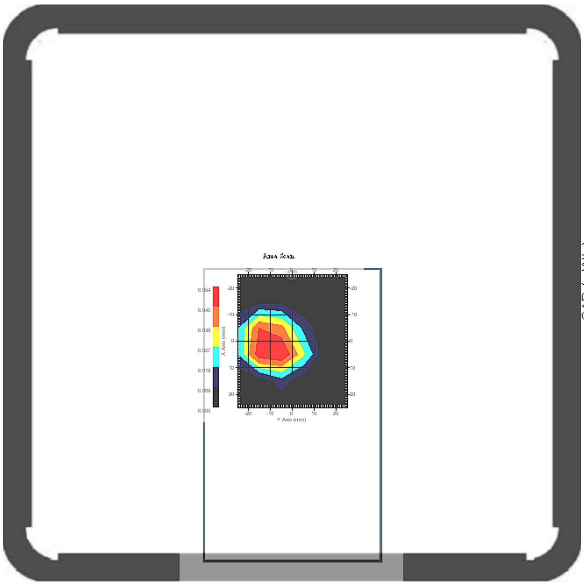


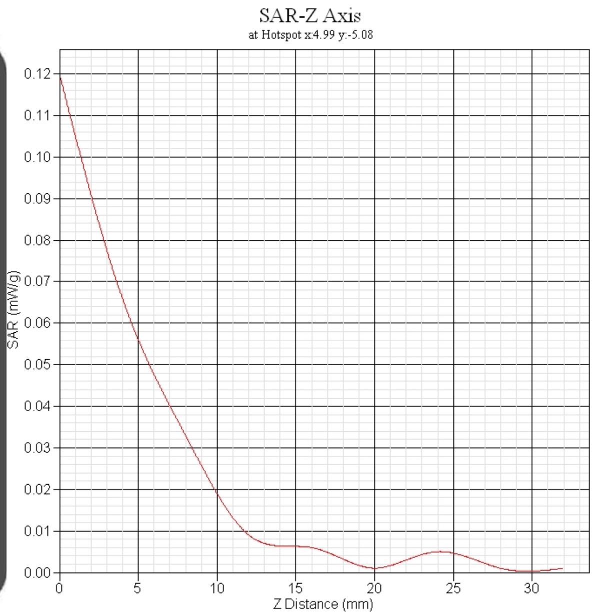


SAR 10g (W/Kg)	**0.011**
SAR 1g (W/Kg)	**0.014**

GSM1900 Towards Ground CH661 With EGPRS

Frequency (MHz)	1880.000000
Relative permitivity (real part)	53.340001
Relative permitivity (imaginary part)	15.070000
Conductivity (S/m)	1.5073975
Variation (%)	-1.710000

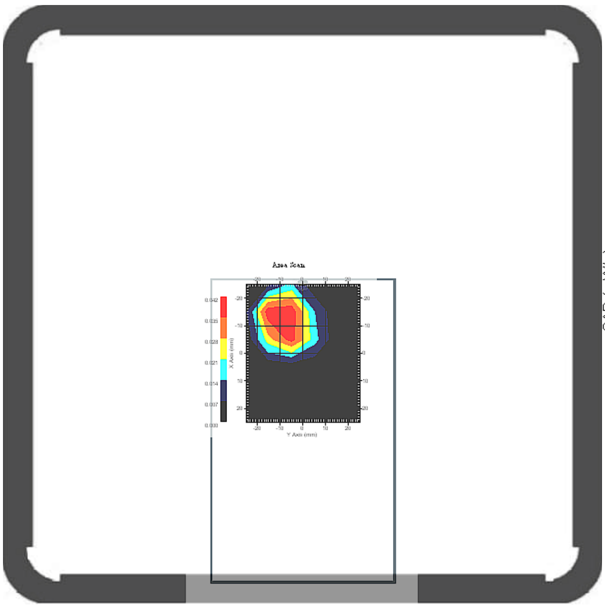


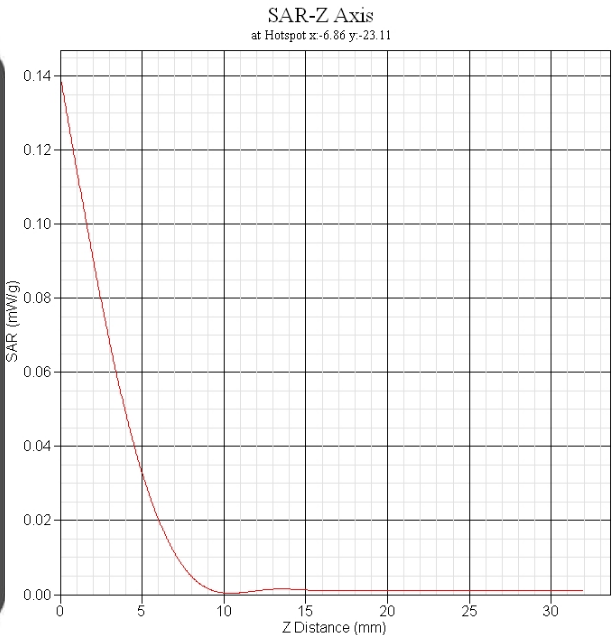


SAR 10g (W/Kg)	0.017
SAR 1g (W/Kg)	0.049

Body, Towards Ground, 1Mbps, channel 1

Frequency (MHz)	2412.000000
Relative permitivity (real part)	53.240001
Relative permitivity (imaginary part)	15.070000
Conductivity (S/m)	1.9673975
Variation (%)	-1.745060





SAR 10g (W/Kg)	0.009
SAR 1g (W/Kg)	0.032

** END OF REPORT **