# SAR

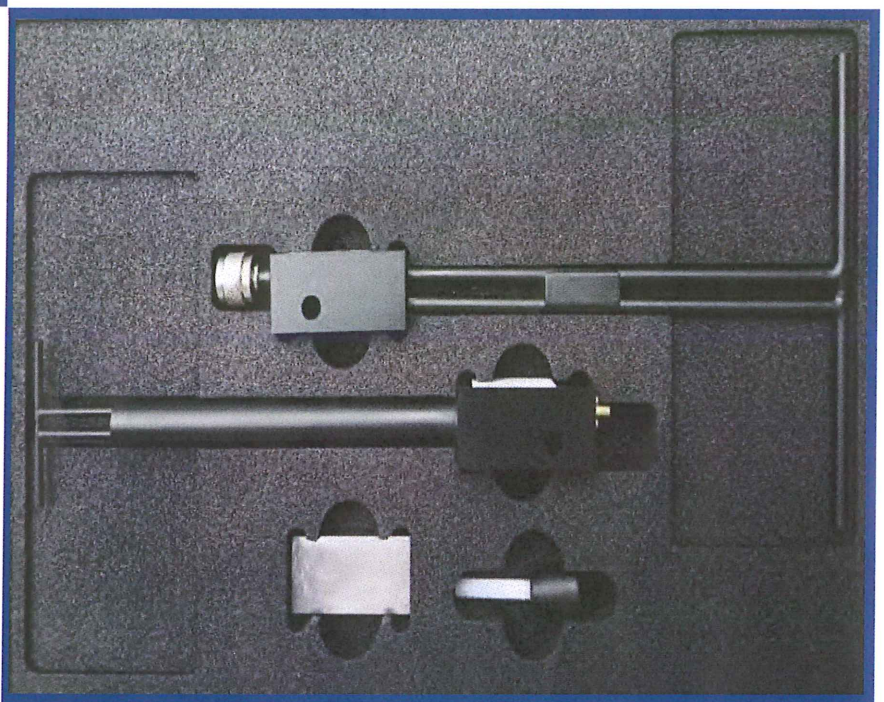
## *Dipole&Waveguide*

# Performance Measurement Report

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

## Validation Dipoles &Waveguide



Tested by: Zong Liyao
Zong Liyao
(Engineer)

Approved by:
Liao Jianming
(Technical Director)

| | |
|---|---|
| Report No.: | LW-SZ1830947 |
| EUT Type: | SAR Validation Dipole and Waveguide |
| Model Name: | DIP 0G750-446, DIP 0G835-447<br>DIP 0G900-448, DIP 1G800-449<br>DIP 1G900-450, DIP 2G000-451<br>DIP 2G450-452, DIP 2G600-453<br>SWG5500-WGA 42 |
| Brand Name: | SATIMO |
| Test Conclusion: | Pass |
| Test Date: | Mar. 17, 2018 ~ Mar. 19, 2018 |
| Date of Issue: | Mar. 25, 2018 |

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# 1 GENERAL INFORMATION

## 1.1 Introduction

This document contains a summary of the requirements set forth by the IEEE 1528, FCC KDB 865664 D01 for reference dipoles used for SAR measurement system validations. Instead of the typical annual calibration recommended by measurement standards, the reference dipoles were demonstrated that the SAR target, impedance and return loss have remain stable, so the longer calibration interval is acceptable.

## 1.2 General Description for Equipment under Test (EUT)

| Model | Frequency | Serial Number | Product Condition(New/ Used) | Last Cal. Date | Last Meas. Date |
|---|---|---|---|---|---|
| **Dipole** | | | | | |
| DIP 0G750 | 750 MHz | SN 11/17 DIP 0G750-446 | Used | 2017/03/22 | 2018/03/17 |
| DIP 0G835 | 835 MHz | SN 11/17 DIP 0G835-447 | Used | 2017/03/22 | 2018/03/17 |
| DIP 0G900 | 900 MHz | SN 11/17 DIP 0G900-448 | Used | 2017/03/22 | 2018/03/17 |
| DIP 1G800 | 1800 MHz | SN 11/17 DIP 1G900-449 | Used | 2017/03/22 | 2018/03/18 |
| DIP 1G900 | 1900 MHz | SN 11/17 DIP 1G900-450 | Used | 2017/03/22 | 2018/03/18 |
| DIP 2G000 | 2000 MHz | SN 11/17 DIP 2G000-451 | Used | 2017/03/22 | 2018/03/18 |
| DIP 2G450 | 2450 MHz | SN 11/17 DIP 2G450-452 | Used | 2017/03/22 | 2018/03/18 |
| DIP 2G600 | 2600 MHz | SN 11/17 DIP 2G600-453 | Used | 2017/03/22 | 2018/03/18 |
| **Waveguide** | | | | | |
| SWG5500 | 5GHz-6GHz | SN 49/16 WGA42 | Used | 2017/03/22 | 2017/03/19 |

## 1.3 Test Equipment List

| Description | Manufacturer | Model | Serial No. | Cal. Date | Cal. Due |
|---|---|---|---|---|---|
| PC | Dell | N/A | N/A | N/A | N/A |
| E-Field Probe | MVG | SSE2 | SN 08/16 SSE2 EPGO295 | 2017/03/22 | 2018/03/21 |
| Phantom1 | SATIMO | SAM | SN 30/13 SAM103 | N/A | N/A |
| Phantom2 | SATIMO | SAM | SN 30/13 SAM104 | N/A | N/A |
| MultiMeter | Keithley | MultiMeter 2000 | 4024022 | 2017/06/12 | 2018/06/11 |
| Signal Generator | R&S | SMBV100A | 260592 | 2017/06/12 | 2018/06/11 |
| Power Meter | Agilent | E4419B | GB40201833 | 2017/11/02 | 2018/11/01 |
| Power Sensor | Agilent | E9300A | MY41498012 | 2017/11/02 | 2018/11/01 |
| Power Sensor | Agilent | E9300A | MY41499891 | 2017/11/02 | 2018/11/01 |
| Network Analyzer | R&S | ZVL-6 | 101380 | 2017/06/12 | 2018/06/11 |
| Thermometer | Elitech | RC-4HC | N/A | 2017/11/13 | 2018/11/12 |
| Power Amplifier | SATIMO | 6552B | 22374 | N/A | N/A |
| Dielectric Probe Kit | SATIMO | SCLMP | SN 25/13 OCPG56 | N/A | N/A |
| Attenuator | COM-MW | ZA-S1-31 | 1305003187 | N/A | N/A |
| Directional coupler | AA-MCS | AAMCS-UDC | 000272 | N/A | N/A |

## 1.4 EUT Photos

| DIP 0G750-446 |
| --- |
| |

| DIP 0G835-447 |
| --- |
| |

| DIP 0G900-448 |
| --- |
| |
| DIP 1G800-449 |
| |

| DIP 1G900-450 |
| --- |
| |
| DIP 2G000-451 |
| |
| DIP 2G450-452 |

DIP 2G600-453

Waveguide SWG5500

# 2 DIPOLE IMPEDANCE AND RETURN LOSS

The dipoles are designed to have low return loss when presented against a flat phantom at the specified distance. A Vector Network Analyzer was used to perform a return loss measurement on the specific dipole when in the measurement location against the phantom and the distance was specified by the manufacturer with a special, low loss and low relative permittivity spacer.
The impedance was measured at the SMA-connector with the network analyzer.

The measurement of verification with return loss should not deviate by more than 20% and minimum of 20 dB of the return loss, and the impedance (real or imaginary parts) should not deviate by more than 5 Ohms from the previous measurement using network analyzer.

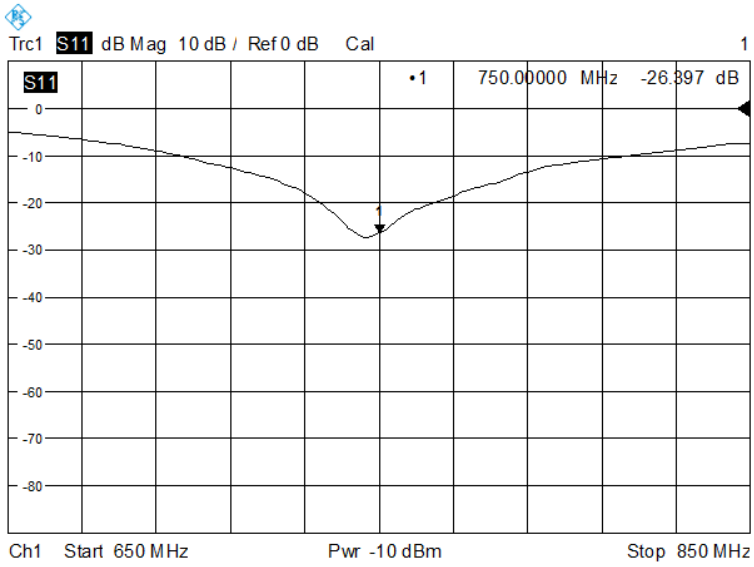
Note:
The “Previous Meas.” in the following table refer to dipoles or other equivalent RF sources calibration reports.

## 2.1 DIP 0G750

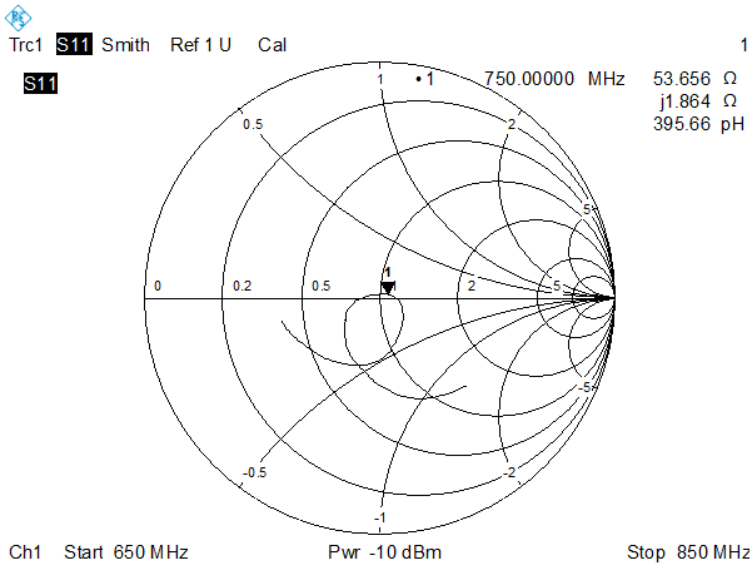
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -26.40 | -32.48 | 18.7 % |
| Impedance | 53.7 Ω + 1.9 jΩ | 51.6 Ω +1.7 jΩ | 2.1 Ω (Real part) |

Return Loss



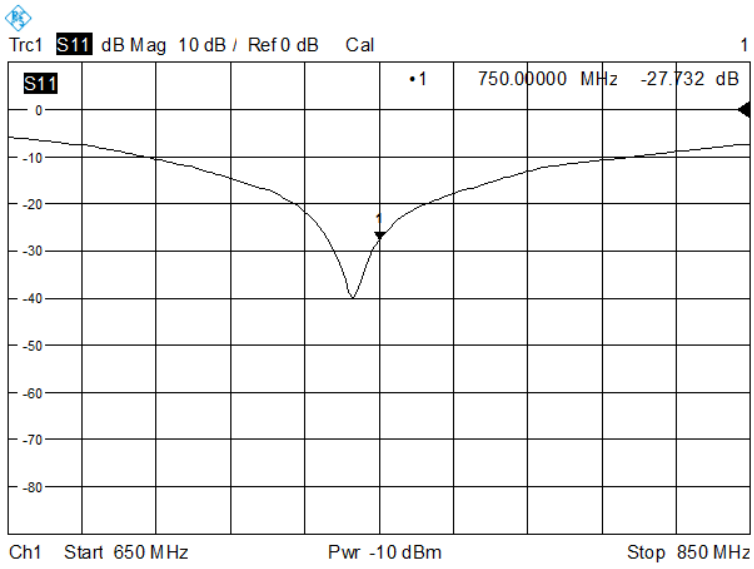

Impedance



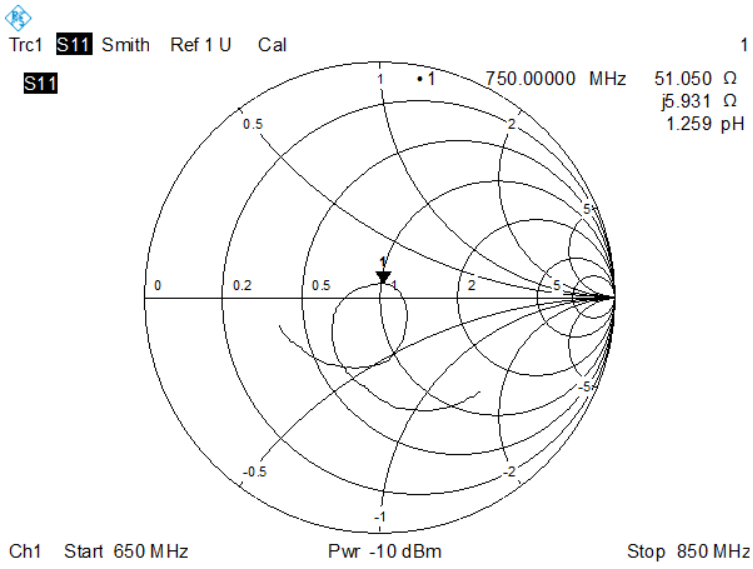
## ***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -27.73 | -23.50 | 18.0 % |
| Impedance | 51.1 Ω + 5.9 jΩ | 48.8 Ω + 6.6 jΩ | 2.3 Ω (Real part) |

Return Loss




Impedance

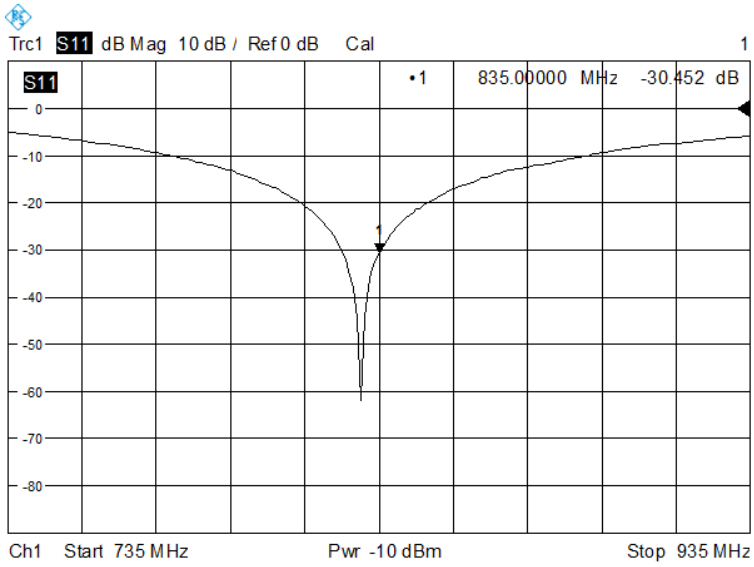


## 2.2 DIP 0G835

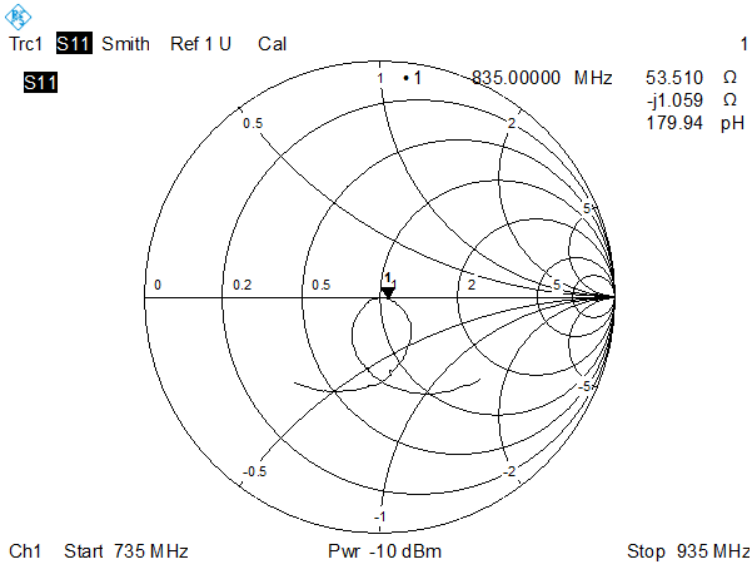
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -30.45 | -34.07 | 11.7% |
| Impedance | 53.5 Ω - 1.1 jΩ | 49.3 Ω + 1.8 jΩ | 4.2 Ω (Real part) |

Return Loss



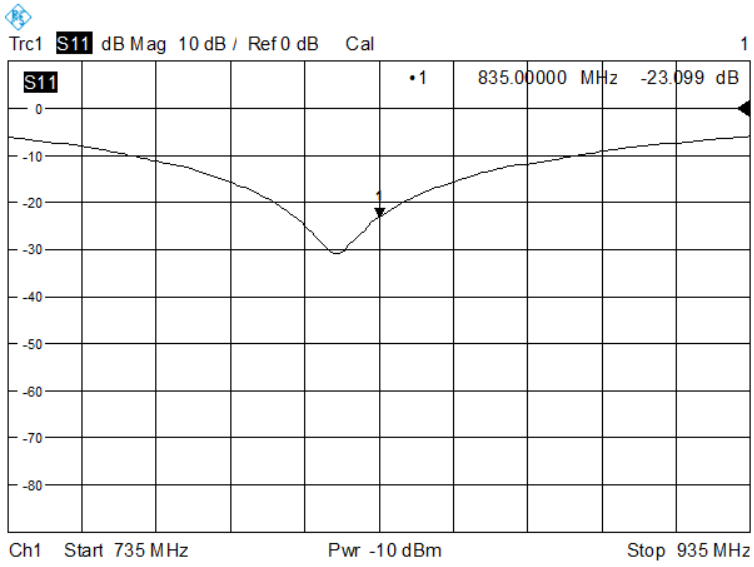

Impedance



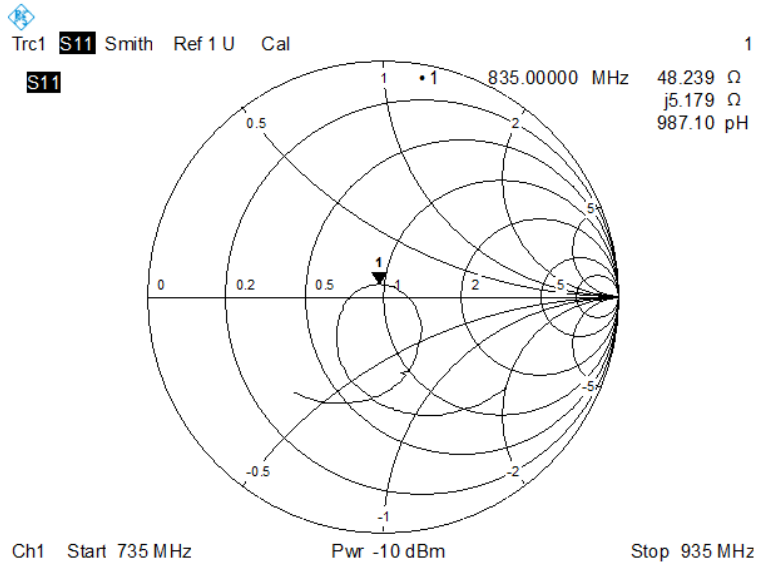
***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -23.10 | -22.96 | 0.6 % |
| Impedance | 48.2Ω+5.2 jΩ | 45.3 Ω +5.3 jΩ | 2.9 Ω (Real part) |

Return Loss




Impedance

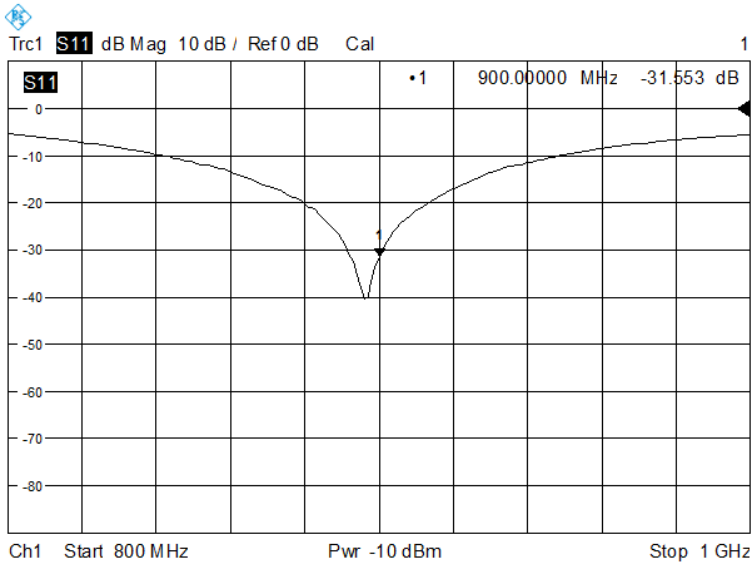


## 2.3 DIP 0G900

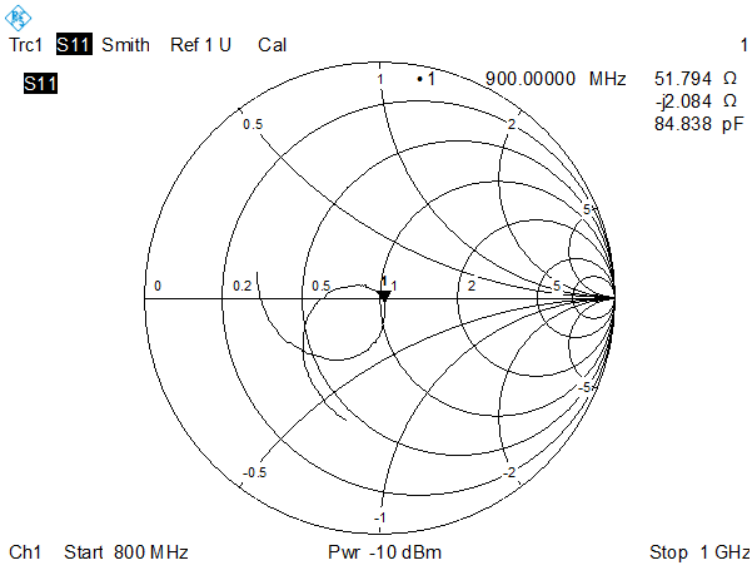
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -31.55 | -30.38 | 3.9% |
| Impedance | 51.8 Ω - 2.1 jΩ | 51.8 Ω - 2.4 jΩ | 0.3 Ω (Imaginary part) |

Return Loss



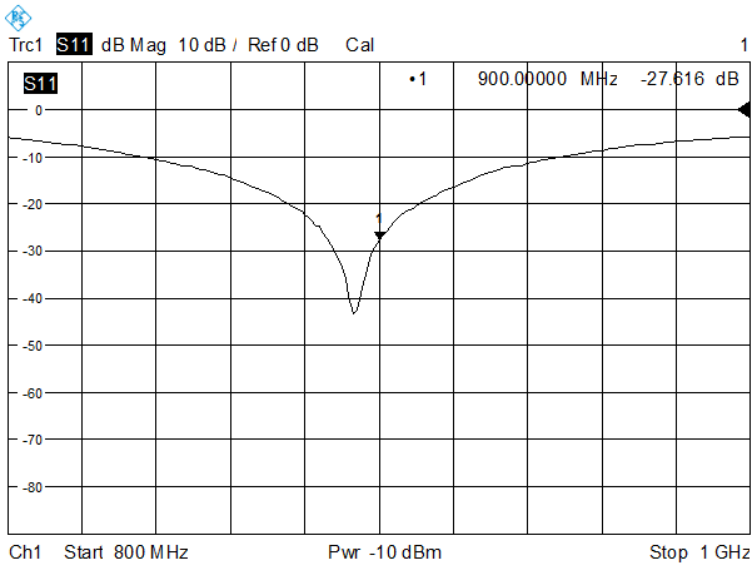

Impedance



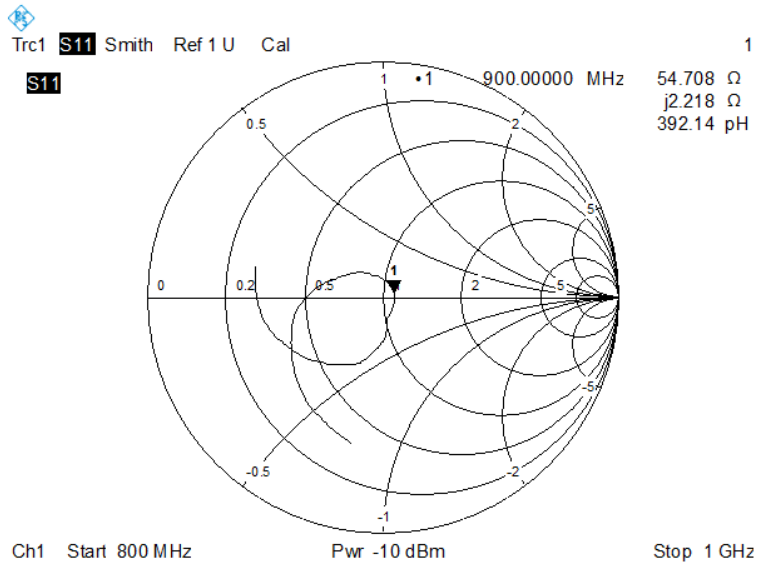
***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -27.62 | -27.29 | 1.2% |
| Impedance | 54.7 Ω + 2.2 jΩ | 53.4 Ω + 2.6 jΩ | 1.3 Ω (Real part) |

Return Loss




Impedance

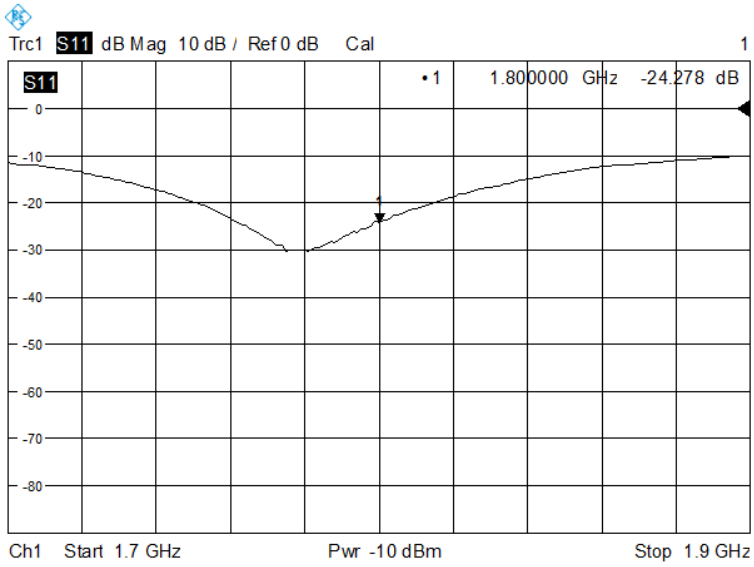


## 2.4 DIP 1G800

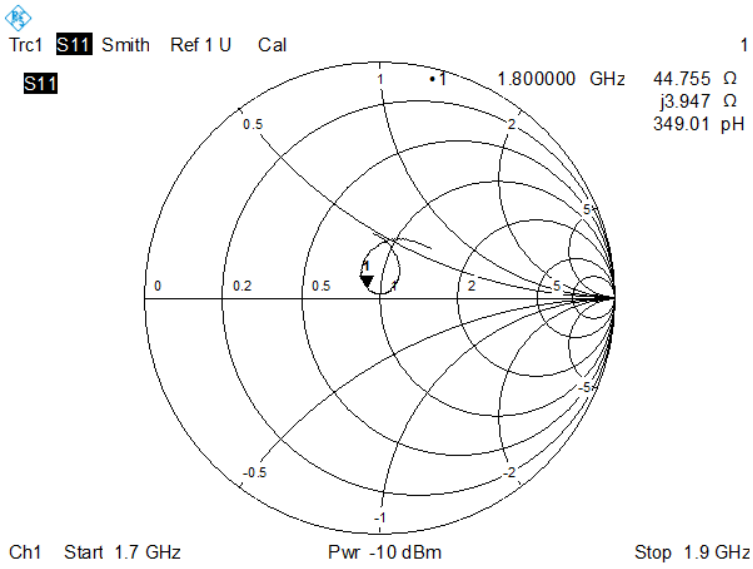
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -24.28 | -25.49 | 4.7% |
| Impedance | 44.8Ω + 3.9 jΩ | 45.4 Ω + 2.6 jΩ | 1.3 Ω (Imaginary part) |

Return Loss



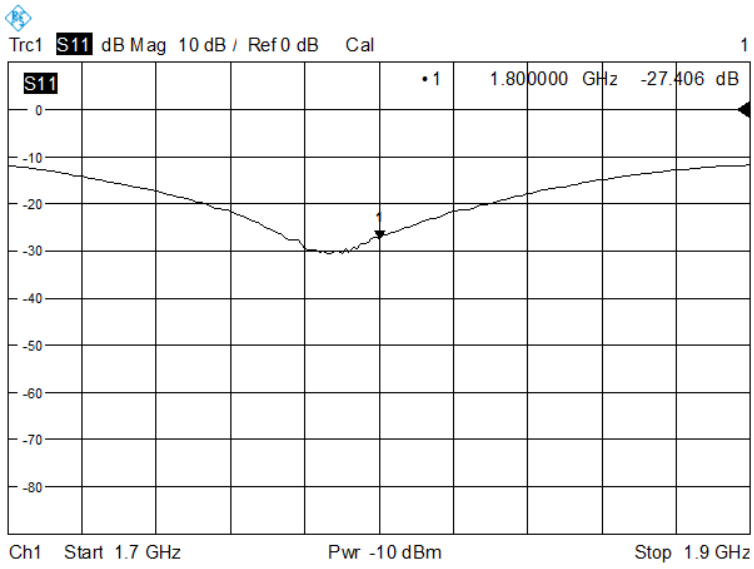

Impedance



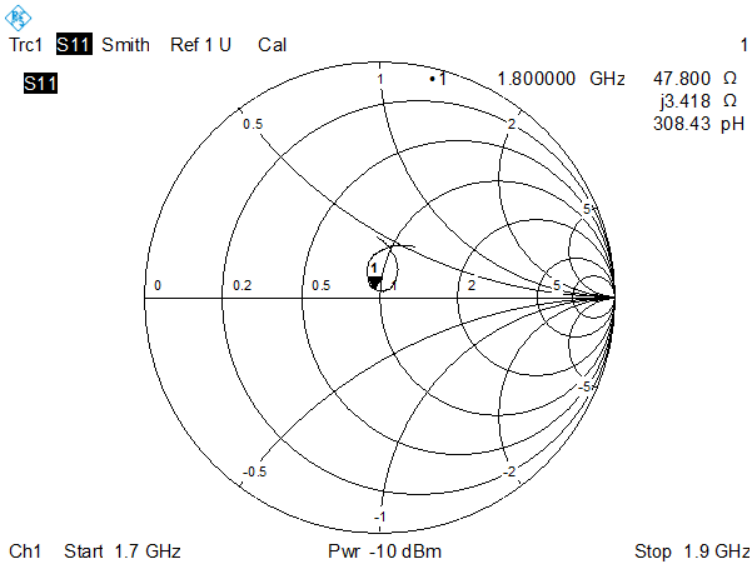
***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -27.41 | -26.35 | 4.1% |
| Impedance | 47.8Ω + 3.4 jΩ | 45.4Ω -1.5 jΩ | 4.9 Ω (Imaginary part) |

Return Loss




Impedance

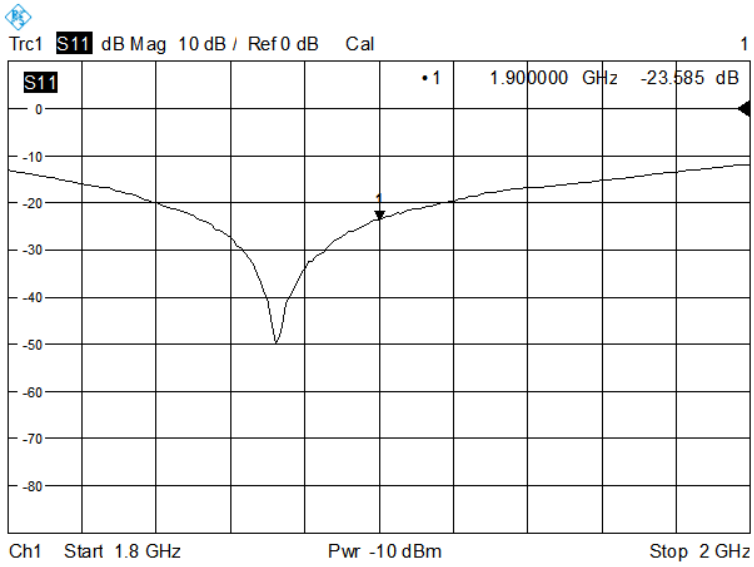


## 2.5 DIP 1G900

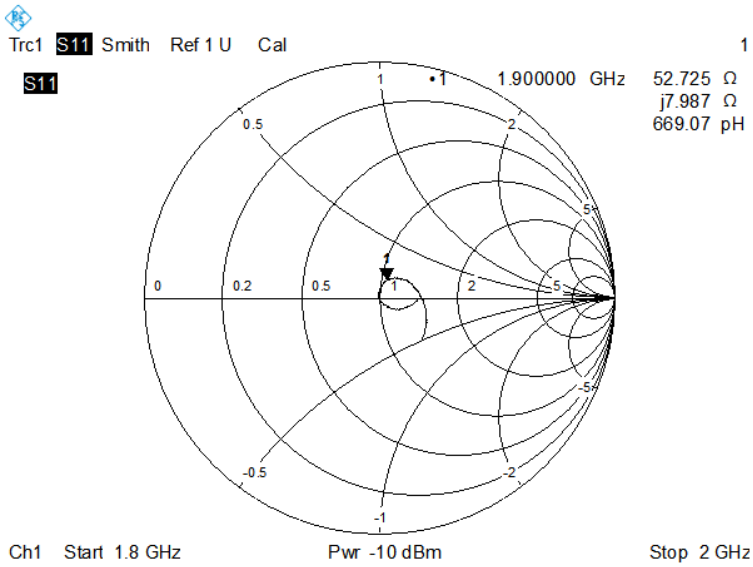
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -23.59 | -24.2 | 2.5 % |
| Impedance | 52.7Ω+8.0 jΩ | 51.2 Ω +6.0 jΩ | 2 Ω (Imaginary part) |

Return Loss



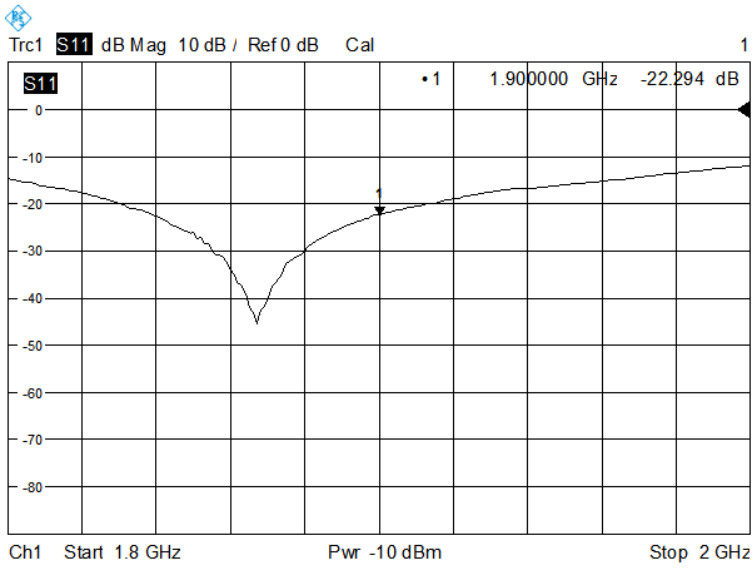

Impedance



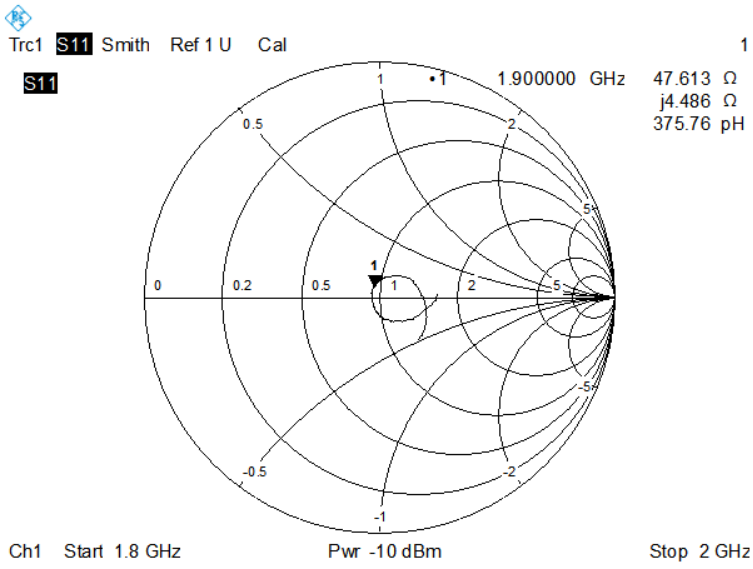
***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -22.29 | -22.45 | 0.7 % |
| Impedance | 47.6 Ω + 4.5 jΩ | 46.7 Ω + 6.7 jΩ | 2.2 Ω (Imaginary part) |

Return Loss




Impedance

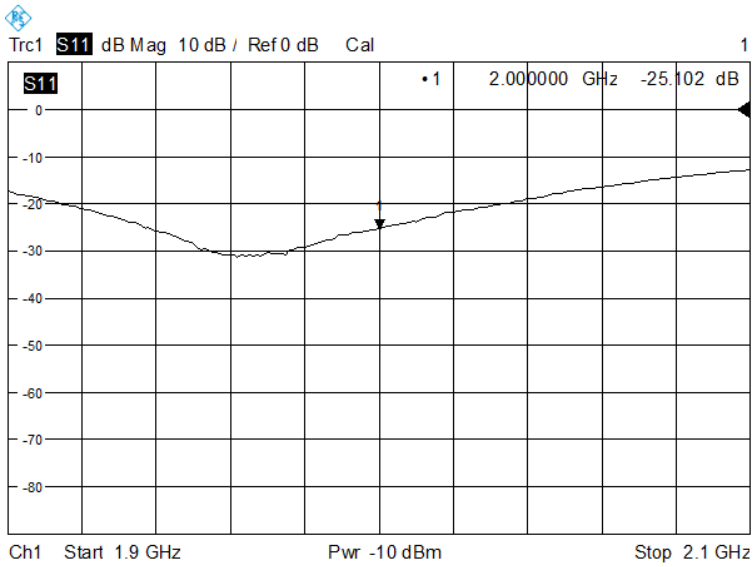


## 2.6 DIP 2G000

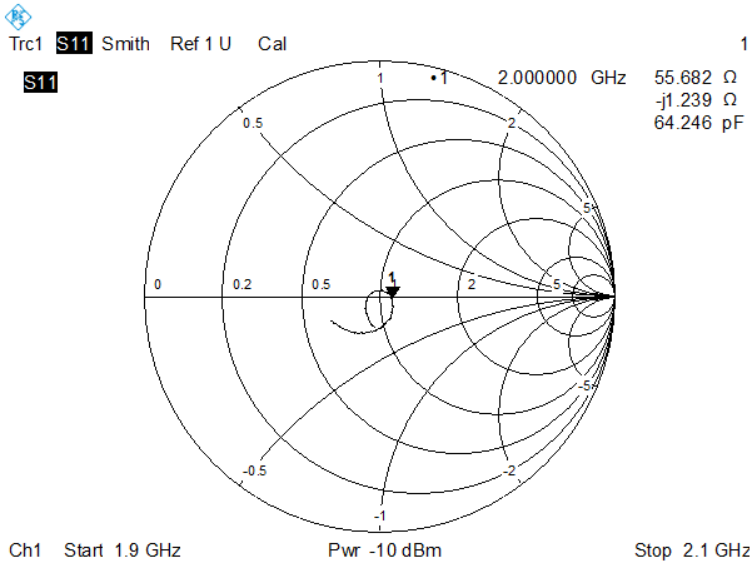
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -25.10 | -24.61 | 2.0 % |
| Impedance | 55.7Ω – 1.2 jΩ | 54.3 Ω - 4.0 jΩ | 2.8 Ω (Imaginary part) |

Return Loss



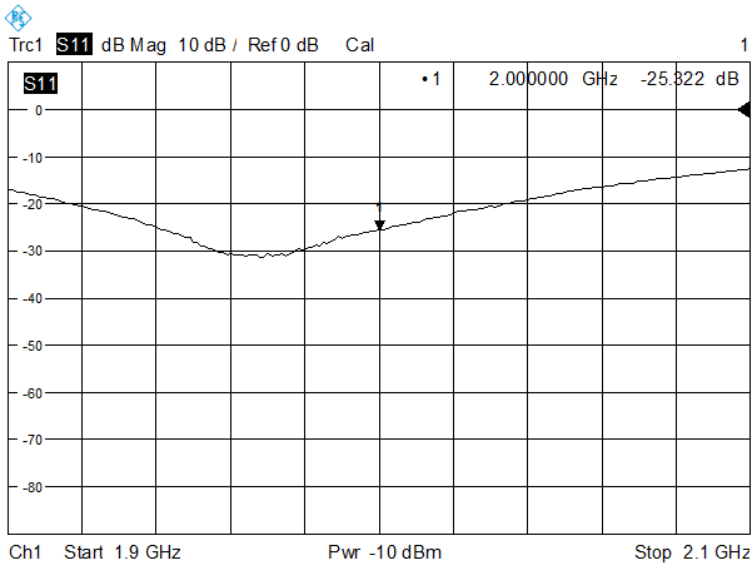

Impedance



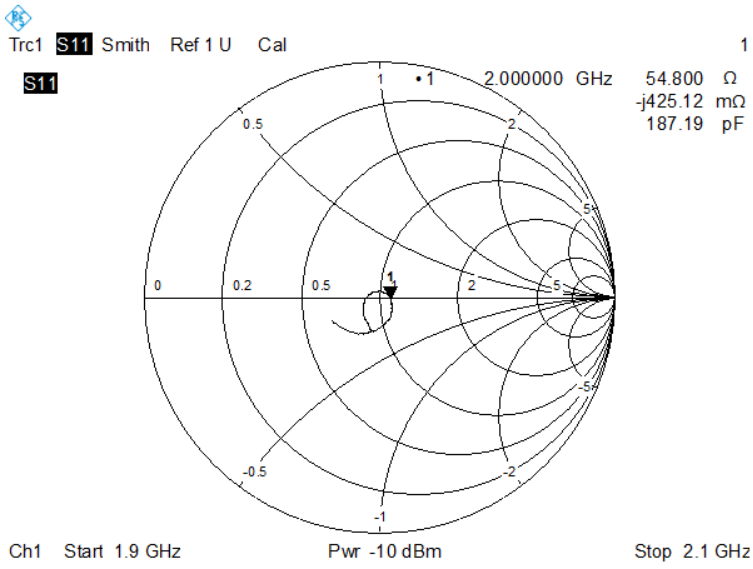
## ***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -25.32 | -24.74 | 2.3 % |
| Impedance | 54.8Ω-0.4 jΩ | 55.8 Ω - 0.3 jΩ | 1.0 Ω (Real part) |

Return Loss




Impedance

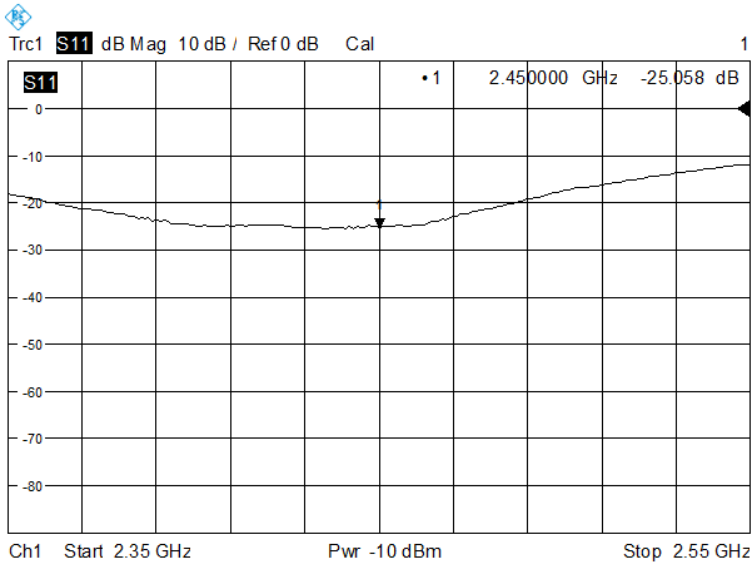


## 2.7 DIP 2G450

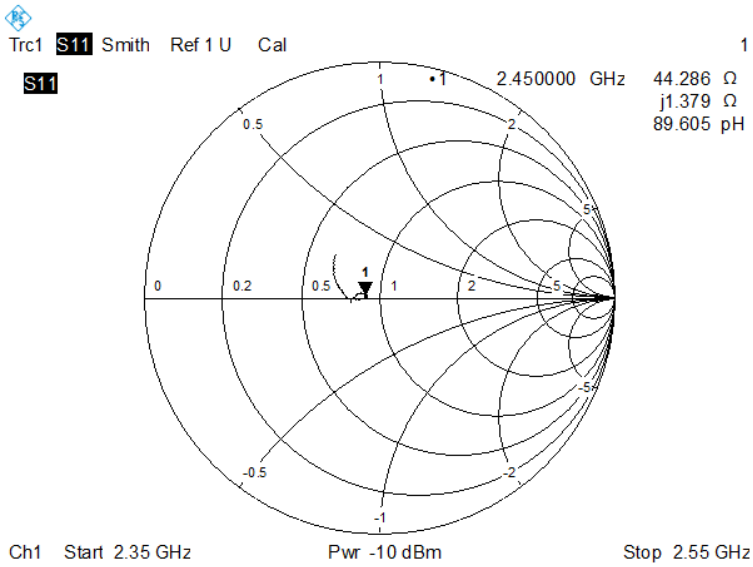
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -25.06 | -24.82 | 1.0 % |
| Impedance | 44.3 Ω + 1.4 jΩ | 44.3 Ω + 0.2 jΩ | 1.2 Ω (Imaginary part) |

Return Loss



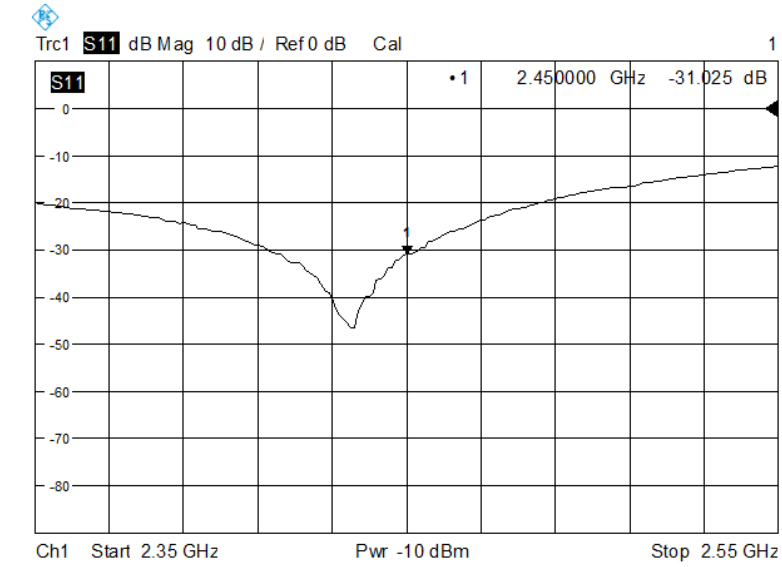

Impedance



***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -31.03 | -31.92 | 0.3% |
| Impedance | 48.7 Ω - 1.2 jΩ | 47.5 Ω – 0.4 jΩ | 1.2 Ω (Real part) |

Return Loss

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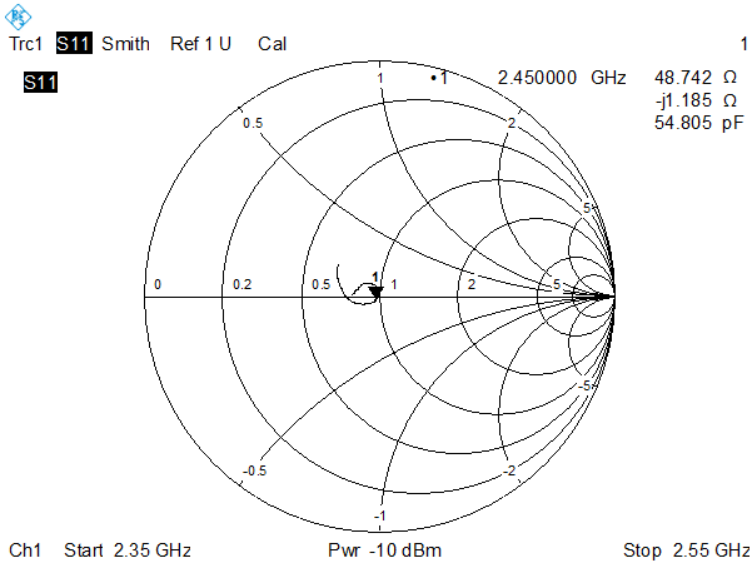
Impedance

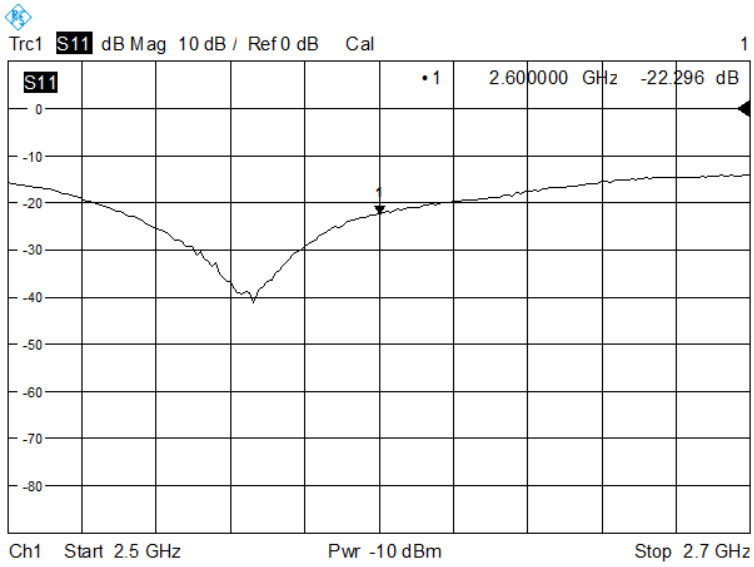


## 2.8 DIP 2G600

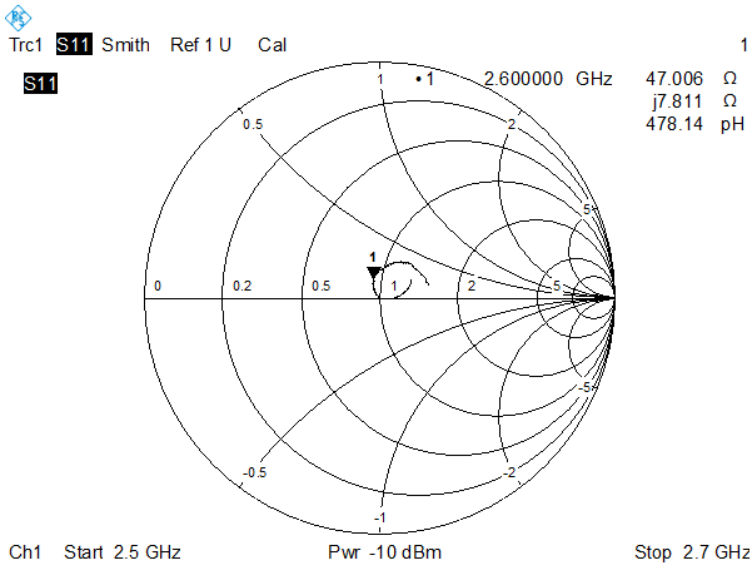
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -22.30 | -21.53 | 3.8% |
| Impedance | 47 Ω +7.8 jΩ | 46.1 Ω +7.4 jΩ | 0.9 Ω (Real part) |

Return Loss



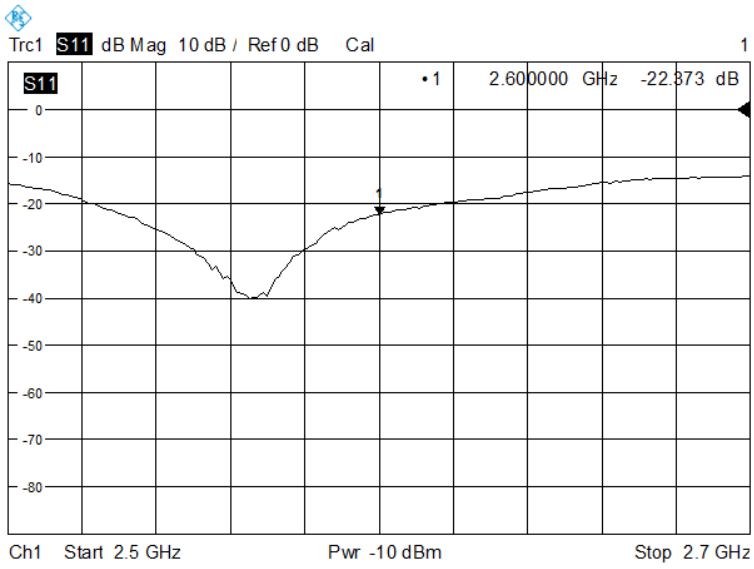

Impedance



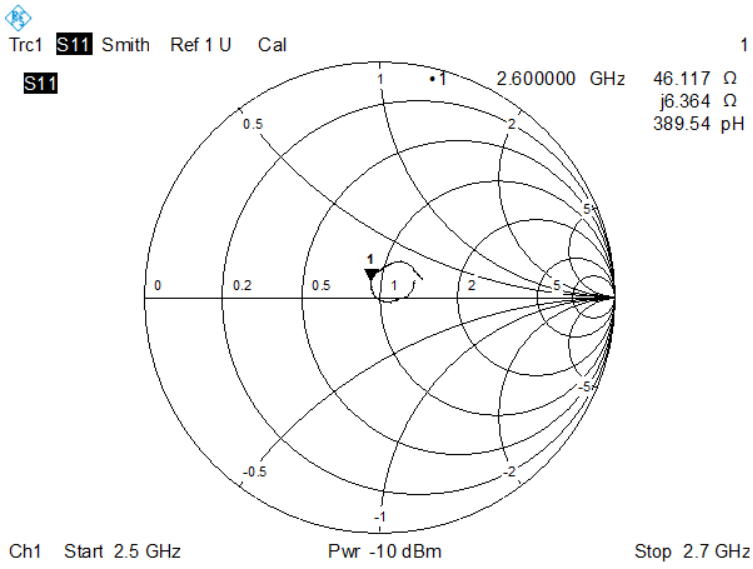
***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Meas. Results | Current Meas. | Previous Meas. | Max. Deviation |
|---|---|---|---|
| Return Loss(dB) | -22.37 | -21.76 | 2.8 % |
| Impedance | 46.1Ω + 6.4 jΩ | 44.2 Ω + 5.7 jΩ | 1.9 Ω (Real part) |

Return Loss




Impedance



# 3 WAVEGUIDE IMPEDANCE AND RETURN LOSS

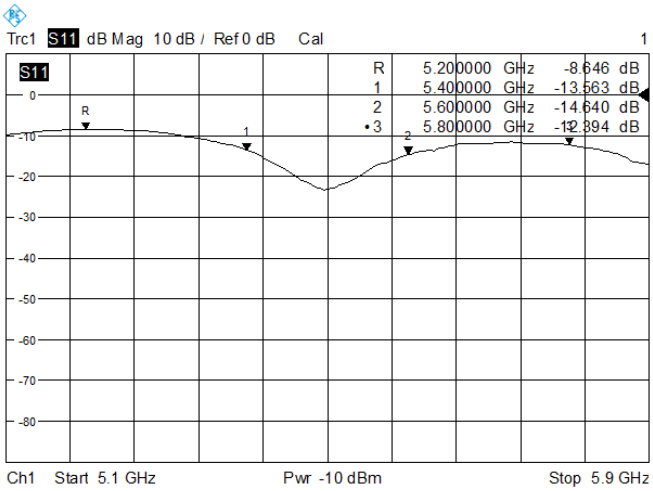
The waveguide are designed to have low return loss when presented against a flat phantom at the specified distance. A Vector Network Analyzer was used to perform a return loss measurement on the specific waveguide when in the measurement location against the phantom and the distance was specified by the manufacturer with a special, low loss and low relative permittivity spacer.
The impedance was measured at the SMA-connector with the network analyzer.

## 3.1 SWG5500

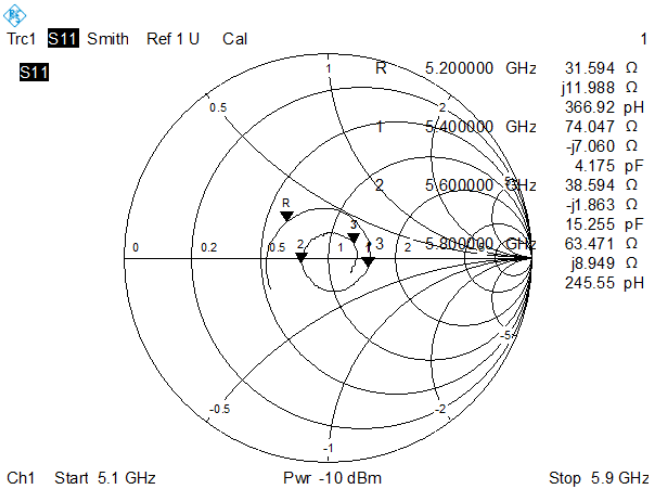
***RETURN LOSS AND IMPEDANCE IN HEAD LIQUID***

| Frequency (MHz) | Return Loss(dB) | Requirement (dB) | Impedance |
|---|---|---|---|
| 5200 | -8.6 | -8.0 | 31.6Ω+12jΩ |
| 5400 | -13.6 | -8.0 | 74.0Ω-7.1jΩ |
| 5600 | -14.6 | -8.0 | 38.6Ω-1.9jΩ |
| 5800 | -12.4 | -8.0 | 63.5Ω+8.9jΩ |

Return Loss



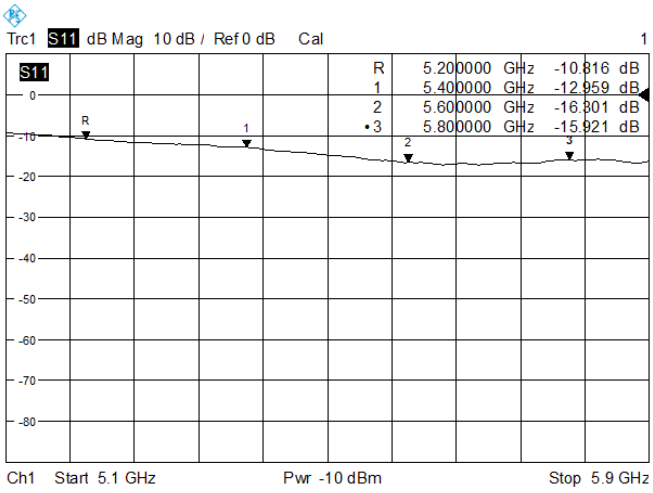

Impedance



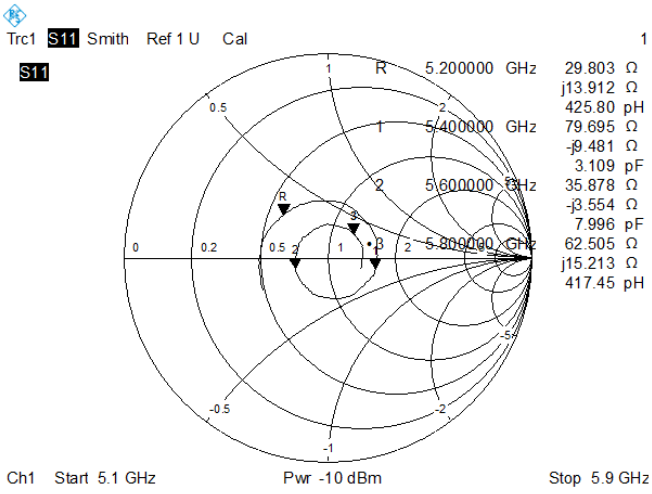
***RETURN LOSS AND IMPEDANCE IN BODY LIQUID***

| Frequency (MHz) | Return Loss(dB) | Requirement (dB) | Impedance |
|---|---|---|---|
| 5200 | -10.8 | -8.0 | 29.8Ω+13.9jΩ |
| 5400 | -13.0 | -8.0 | 79.7Ω-9.5jΩ |
| 5600 | -16.3 | -8.0 | 35.9Ω-3.6jΩ |
| 5800 | -15.9 | -8.0 | 62.5Ω+15.2jΩ |

Return Loss

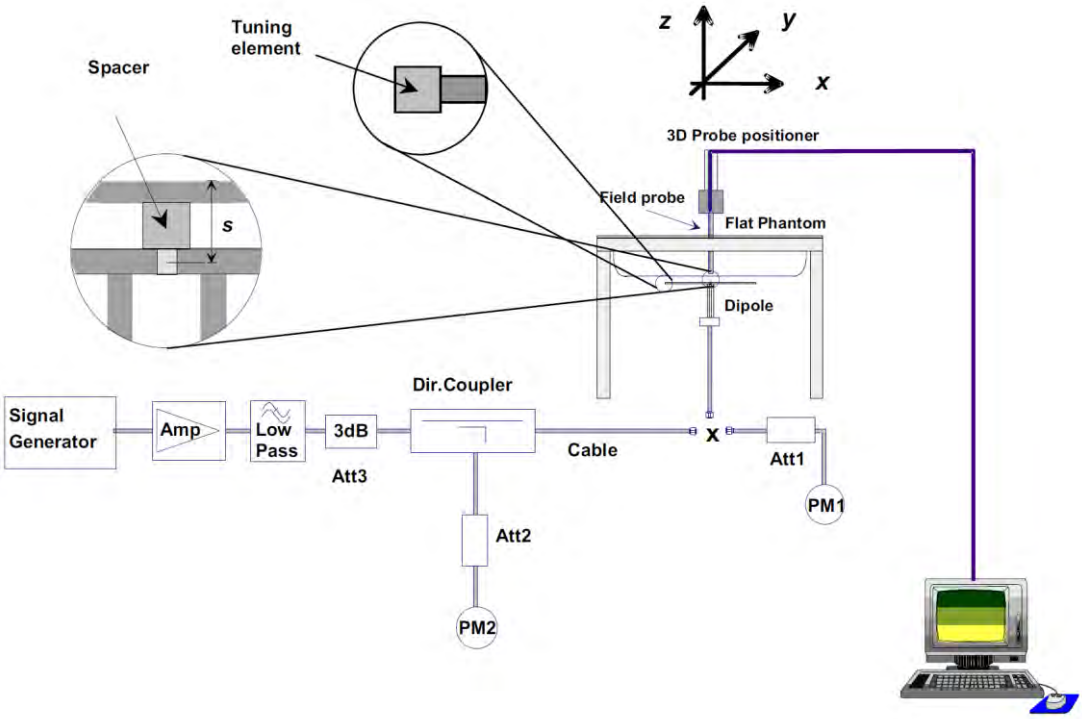



Impedance



# 4 VALIDATION MEASUREMENT

The IEEE Std. 1528, FCC KDBs and CEI/IEC 62209 standards state that the system validation measurements must be performed using a reference dipole meeting the fore mentioned return loss and mechanical dimension requirements. The validation measurement must be performed against a liquid filled flat phantom, with the phantom constructed as outlined in the fore mentioned standards. Per the standards, the dipole shall be positioned below the bottom of the phantom, with the dipole length centered and parallel to the longest dimension of the flat phantom, with the top surface of the dipole at the described distance from the bottom surface of the phantom.



## 4.1 Simulating Liquid Verification

| Liquid Type | Fre. (MHz) | Meas. Conductivity (σ) (S/m) | Meas. Permittivity (ε) | Target Conductivity (σ) (S/m) | Target Permittivity (ε) | Conductivity Tolerance (%) | Permittivity Tolerance (%) |
|---|---|---|---|---|---|---|---|
| Head | 750 | 0.90 | 40.98 | 0.89 | 41.94 | 1.12 | -2.29 |
| Body | | 0.96 | 56.87 | 0.96 | 55.53 | 0.00 | 2.41 |
| Head | 835 | 0.92 | 40.91 | 0.90 | 41.50 | 2.22 | -1.42 |
| Body | | 0.99 | 56.27 | 0.97 | 55.20 | 2.06 | 1.94 |
| Head | 900 | 0.98 | 40.70 | 0.97 | 41.50 | 1.03 | -1.93 |
| Body | | 1.08 | 55.36 | 1.05 | 55.00 | 2.86 | 0.65 |
| Head | 1800 | 1.37 | 40.91 | 1.40 | 40.00 | -2.14 | 2.27 |
| Body | | 1.54 | 52.63 | 1.52 | 53.30 | 1.32 | -1.26 |
| Head | 1900 | 1.39 | 40.89 | 1.40 | 40.00 | -0.71 | 2.23 |
| Body | | 1.52 | 52.28 | 1.52 | 53.30 | 0.00 | -1.91 |
| Head | 2000 | 1.44 | 40.63 | 1.40 | 40.00 | 2.86 | 1.58 |
| Body | | 1.55 | 51.98 | 1.52 | 53.30 | 1.97 | -2.48 |
| Head | 2450 | 1.84 | 38.64 | 1.80 | 39.20 | 2.22 | -1.43 |
| Body | | 1.97 | 52.54 | 1.95 | 52.70 | 1.03 | -0.30 |
| Head | 2600 | 1.89 | 38.19 | 1.96 | 39.01 | -3.57 | -2.10 |
| Body | | 2.13 | 52.14 | 2.16 | 52.51 | -1.39 | -0.70 |
| Head | 5200 | 4.74 | 36.41 | 4.66 | 35.99 | 1.72 | 1.17 |
| Body | | 5.49 | 48.08 | 5.30 | 49.01 | 3.58 | -1.90 |
| Head | 5400 | 5.01 | 35.84 | 4.86 | 35.76 | 3.09 | 0.22 |
| Body | | 5.61 | 47.46 | 5.53 | 48.74 | 1.45 | -2.63 |
| Head | 5600 | 5.18 | 34.92 | 5.07 | 35.53 | 2.17 | -1.72 |
| Body | | 5.92 | 47.36 | 5.77 | 48.47 | 2.60 | -2.29 |
| Head | 5800 | 5.30 | 34.13 | 5.27 | 35.30 | 0.57 | -3.31 |
| Body | | 6.13 | 47.31 | 6.00 | 48.20 | 2.17 | -1.85 |

## 4.2 Dipole and Waveguide SAR Validation Measurement Result

| Freq. (MHz) | Liquid Type | Power (mW) | 1 g Measured SAR (W/kg) | Normalized SAR (W/kg) | 10 g Measured SAR (W/kg) | Normalized SAR (W/kg) | 1 g Targeted SAR (W/kg) | Tolerance (%) | 10 g Targeted SAR (W/kg) | Tolerance (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| 750 | Head | 100 | 0.824 | 8.24 | 0.577 | 5.77 | 8.78 | -6.15 | 5.72 | 0.87 |
| | Body | 100 | 0.877 | 8.77 | 0.586 | 5.86 | 8.59 | 2.10 | 5.74 | 2.09 |
| 835 | Head | 100 | 0.909 | 9.09 | 0.593 | 5.93 | 9.58 | -5.11 | 6.10 | -2.79 |
| | Body | 100 | 1.040 | 10.40 | 0.676 | 6.76 | 9.78 | 6.34 | 6.39 | 5.79 |
| 900 | Head | 100 | 1.082 | 10.82 | 0.662 | 6.62 | 11.31 | -4.33 | 6.98 | -5.16 |
| | Body | 100 | 1.149 | 11.49 | 0.737 | 7.37 | 11.29 | 1.77 | 7.21 | 2.22 |
| 1800 | Head | 100 | 4.078 | 40.78 | 2.126 | 21.26 | 38.76 | 5.21 | 20.29 | 4.78 |
| | Body | 100 | 3.945 | 39.45 | 2.096 | 20.96 | 38.90 | 1.41 | 20.84 | 0.58 |
| 1900 | Head | 100 | 3.880 | 38.80 | 2.042 | 20.42 | 39.49 | -1.75 | 20.25 | 0.84 |
| | Body | 100 | 4.024 | 40.24 | 2.061 | 20.61 | 40.01 | 0.57 | 20.84 | -1.10 |
| 2000 | Head | 100 | 4.174 | 41.74 | 2.094 | 20.94 | 43.26 | -3.51 | 21.18 | -1.13 |
| | Body | 100 | 4.389 | 43.89 | 2.208 | 22.08 | 41.93 | 4.67 | 21.11 | 4.59 |
| 2450 | Head | 100 | 5.219 | 52.19 | 2.388 | 23.88 | 54.31 | -3.90 | 24.20 | -1.32 |
| | Body | 100 | 5.190 | 51.90 | 2.428 | 24.28 | 53.67 | -3.30 | 24.37 | -0.37 |
| 2600 | Head | 100 | 5.469 | 54.69 | 2.496 | 24.96 | 56.32 | -2.89 | 24.55 | 1.67 |
| | Body | 100 | 5.235 | 52.35 | 2.447 | 24.47 | 55.20 | -5.16 | 24.62 | -0.61 |
| 5200 | Head | 100 | 16.372 | 163.72 | 5.593 | 55.93 | 161.03 | 1.67 | 56.23 | -0.53 |
| | Body | 100 | 15.882 | 158.82 | 5.453 | 54.53 | 158.91 | -0.06 | 56.35 | -3.23 |
| 5400 | Head | 100 | 17.240 | 172.40 | 5.818 | 58.18 | 168.17 | 2.52 | 57.98 | 0.34 |
| | Body | 100 | 17.553 | 175.53 | 5.964 | 59.64 | 164.39 | 6.78 | 57.72 | 3.33 |
| 5600 | Head | 100 | 17.434 | 174.34 | 5.851 | 58.51 | 175.43 | -0.62 | 59.94 | -2.39 |
| | Body | 100 | 18.258 | 182.58 | 5.562 | 55.62 | 170.90 | 6.83 | 59.37 | -6.32 |
| 5800 | Head | 100 | 18.470 | 184.70 | 6.037 | 60.37 | 182.30 | 1.32 | 61.84 | -2.38 |
| | Body | 100 | 18.654 | 186.54 | 6.172 | 61.72 | 177.09 | 5.34 | 61.19 | 0.87 |

## 4.3 DIP 0G750

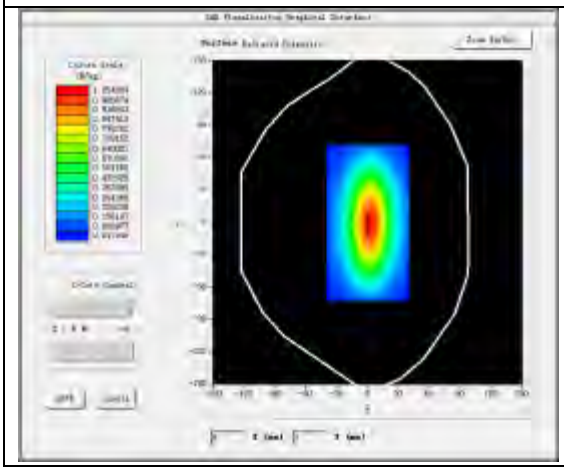
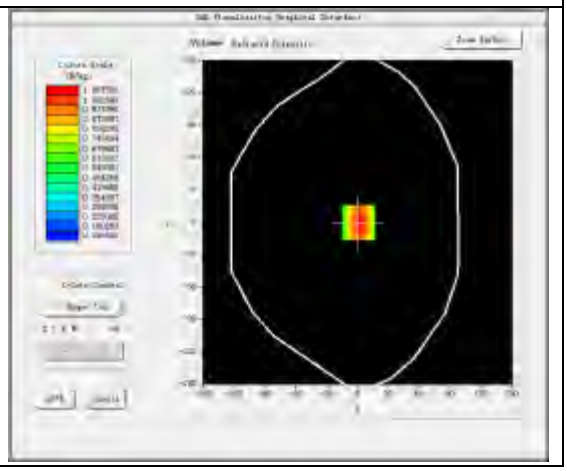
### 4.3.1 Dipole 750 MHz Validation Measurement for Head Tissue

# System Performance Check Data(750 MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018.03.17
Measurement duration: 13 minutes 28 seconds

## Experimental conditions.

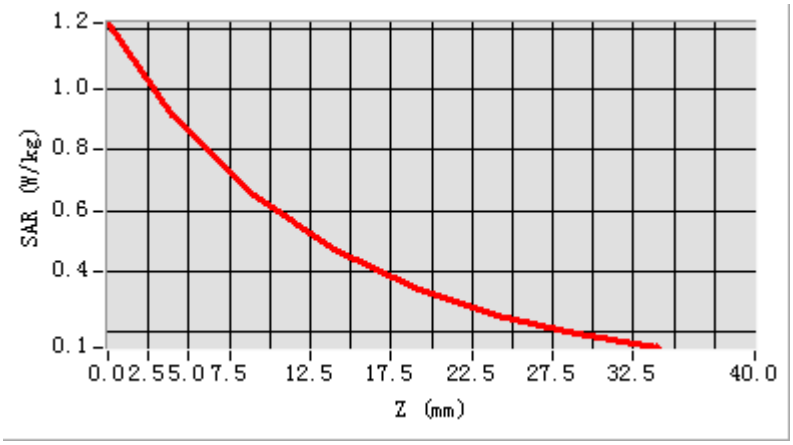
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 750MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 750MHz |
| **Relative permittivity (real part)** | 40.975182 |
| **Conductivity (S/m)** | 0.901352 |
| **Power drift (%)** | -0.200000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.8℃ |
| **ConvF:** | 1.52 |
| **Crest factor:** | 1:1 |

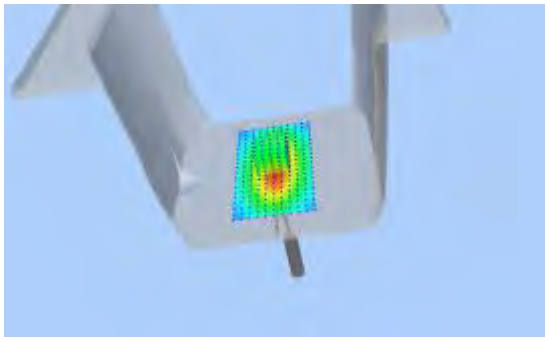
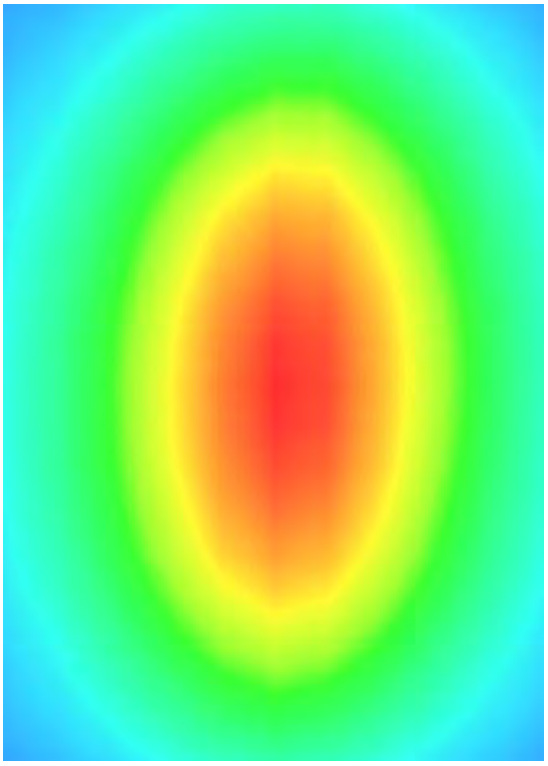
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=1.00, Y=0.00**
**SAR Peak: 1.17 W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 0.576947 |
| **SAR 1g (W/Kg)** | 0.824215 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

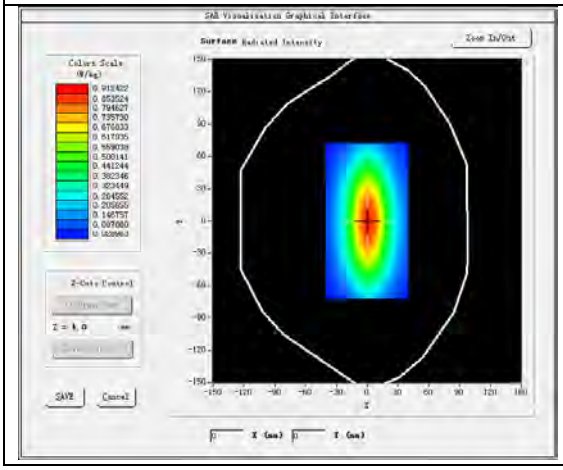
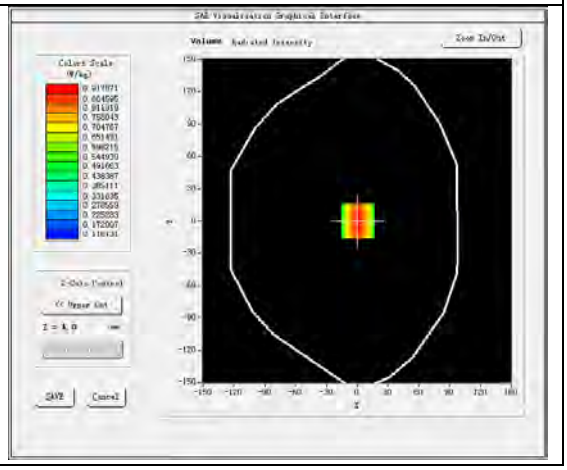
4.3.2 Dipole 750 MHz Validation Measurement for Body Tissue

# System Performance Check Data(750 MHz Body)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018.03.17
Measurement duration: 13 minutes 19 seconds

## Experimental conditions.

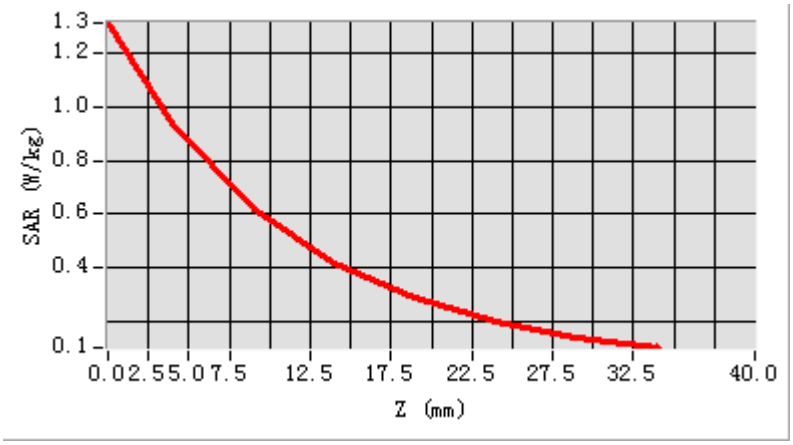
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 750MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 750MHz |
| **Relative permittivity (real part)** | 56.873354 |
| **Conductivity (S/m)** | 0.964528 |
| **Power drift (%)** | 0.250000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.4℃ |
| **ConvF:** | 1.56 |
| **Crest factor:** | 1:1 |

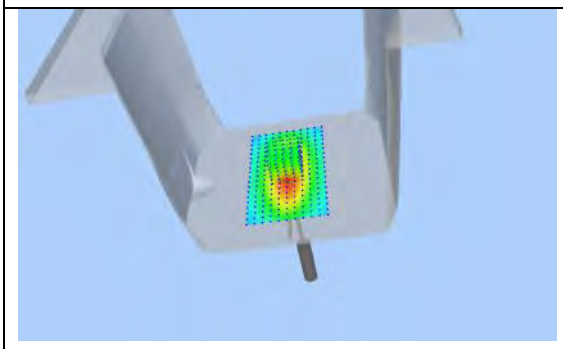
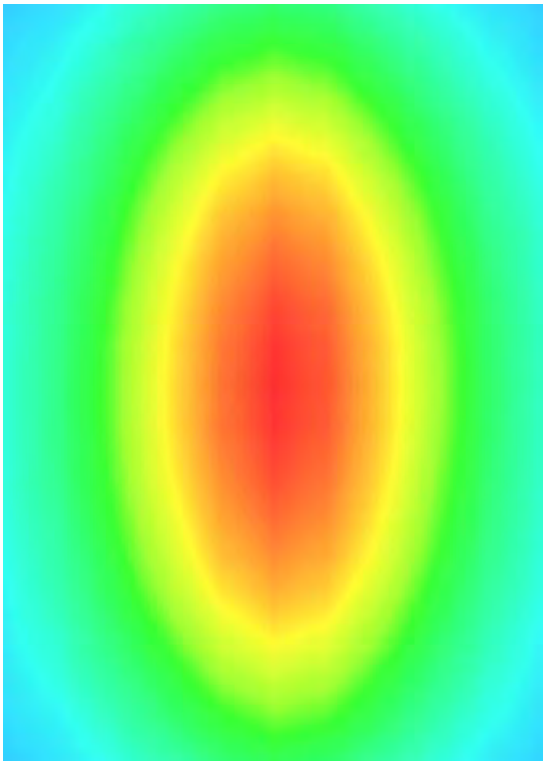
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=1.00, Y=0.00**
**SAR Peak: 1.27 W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 0.586138 |
| **SAR 1g (W/Kg)** | 0.876721 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

## 4.4 DIP 0G835

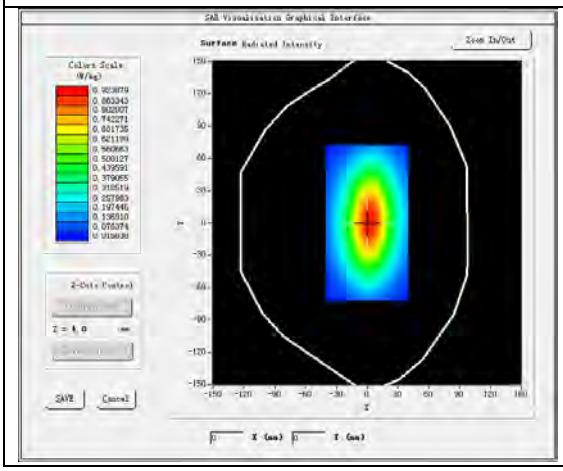
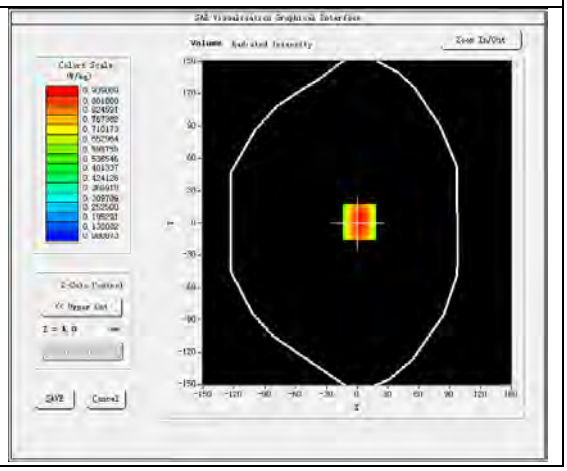
### 4.4.1 Dipole 835 MHz Validation Measurement for Head Tissue

# System Performance Check Data(835 MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018.03.17
Measurement duration: 14 minutes 17 seconds

## Experimental conditions.

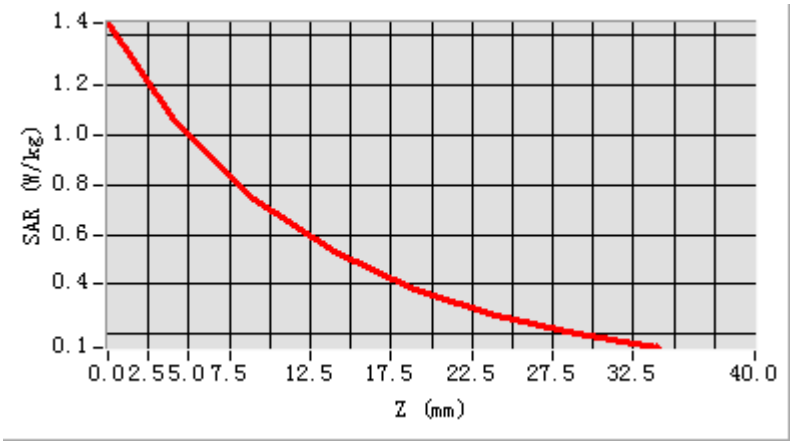
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 835 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 835.000000 |
| **Relative permittivity (real part)** | 40.906431 |
| **Conductivity (S/m)** | 0.917665 |
| **Power drift (%)** | 0.080000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.8℃ |
| **ConvF:** | 1.78 |
| **Crest factor:** | 1:1 |

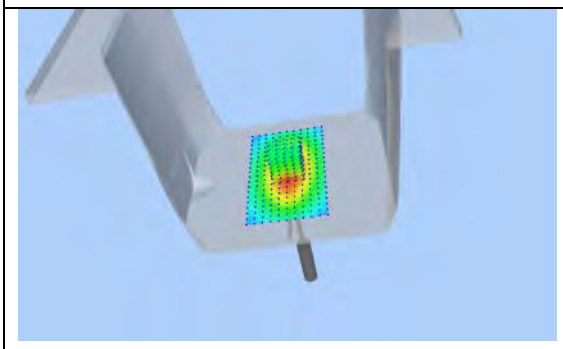
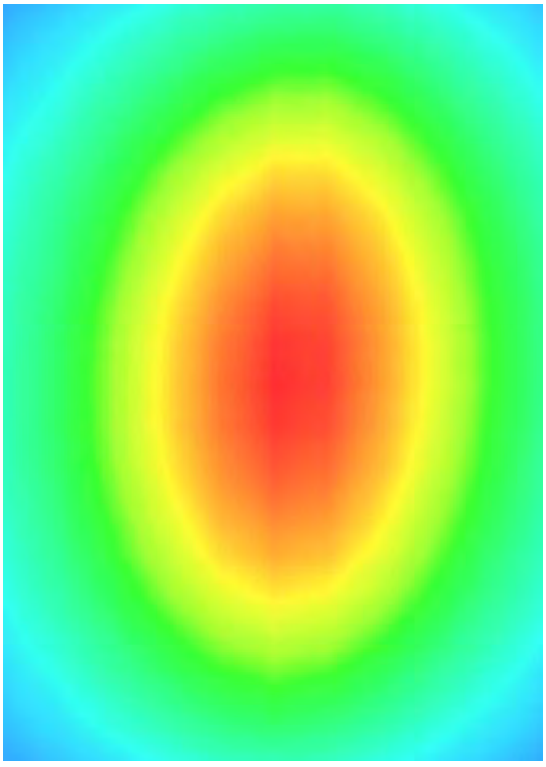
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 1.32 W/kg**

| | |
|---|---|
| **SAR 10 g (W/Kg)** | 0.592673 |
| **SAR 1g (W/Kg)** | 0.909439 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

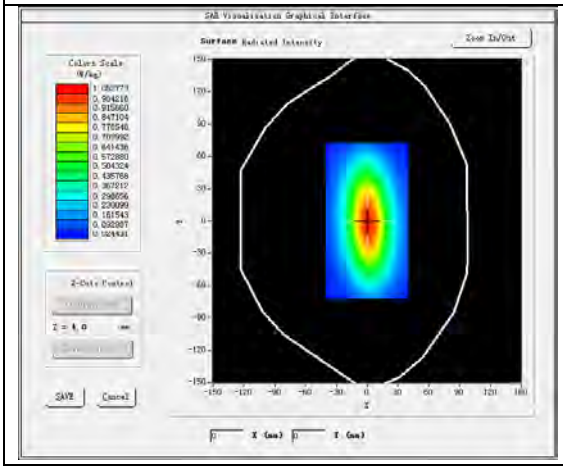
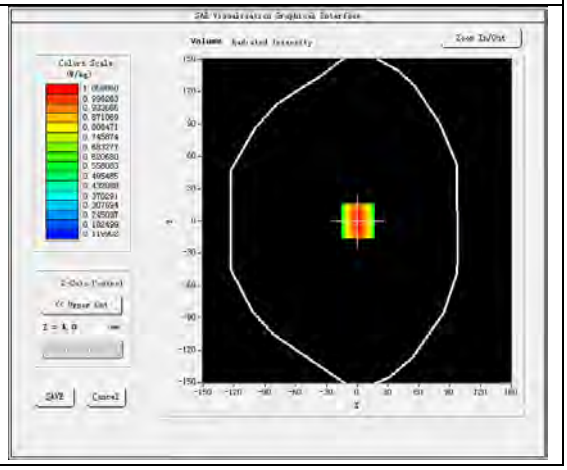
4.4.2 Dipole 835 MHz Validation Measurement for Body Tissue

# System Performance Check Data(835 MHz Body)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018.03.17
Measurement duration: 13 minutes 52 seconds

## Experimental conditions.

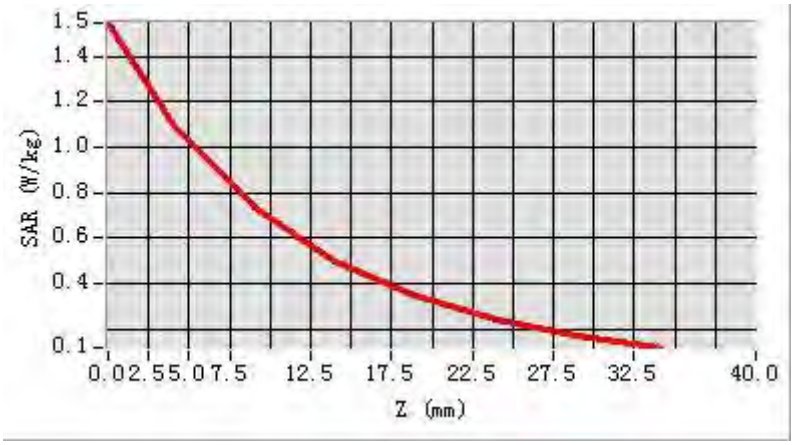
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 835 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 835.000000 |
| **Relative permittivity (real part)** | 56.274324 |
| **Conductivity (S/m)** | 0.986865 |
| **Power drift (%)** | 0.170000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.4℃ |
| **ConvF:** | 1.85 |
| **Crest factor:** | 1:1 |

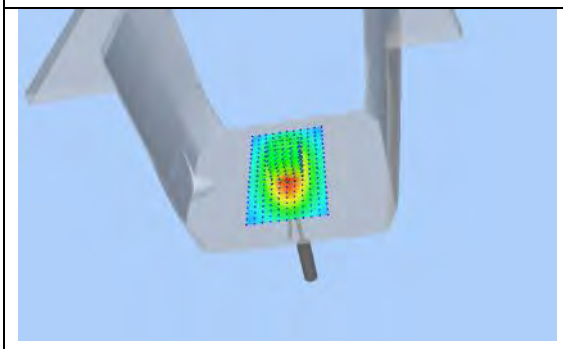
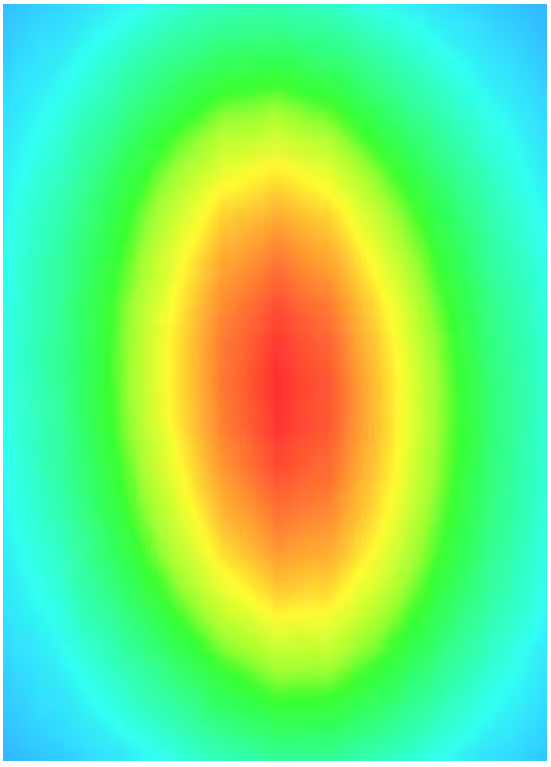
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 1.47 W/kg**

| | |
|---|---|
| **SAR 10 g (W/Kg)** | 0.675963 |
| **SAR 1g (W/Kg)** | 1.035769 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

## 4.5 DIP 0G900

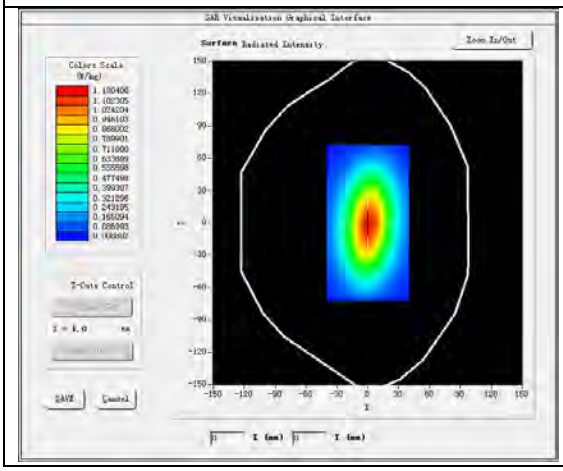
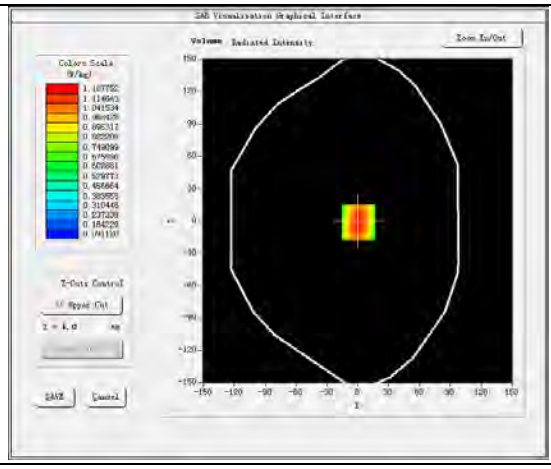
### 4.5.1 Dipole 900 MHz Validation Measurement for Head Tissue

# System Performance Check Data(900 MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018.03.17
Measurement duration: 14 minutes 17 seconds

## Experimental conditions.

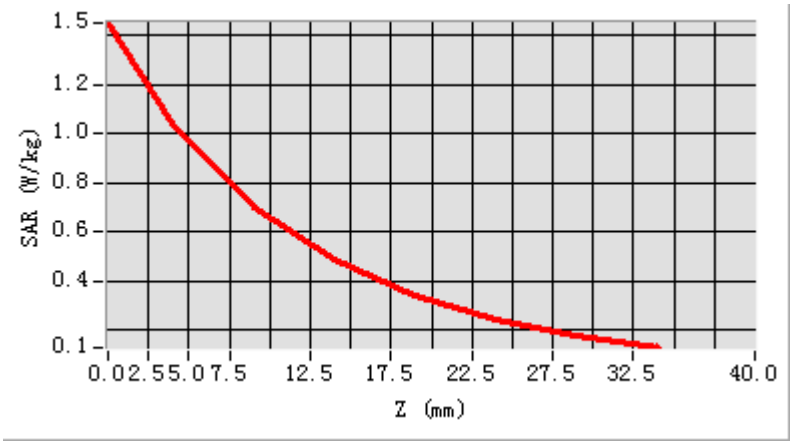
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 900 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 900.000000 |
| **Relative permittivity (real part)** | 40.702185 |
| **Conductivity (S/m)** | 0.982138 |
| **Power drift (%)** | -0.070000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.8℃ |
| **ConvF:** | 1.62 |
| **Crest factor:** | 1:1 |

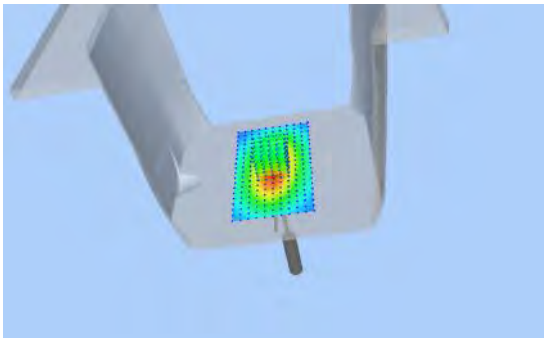
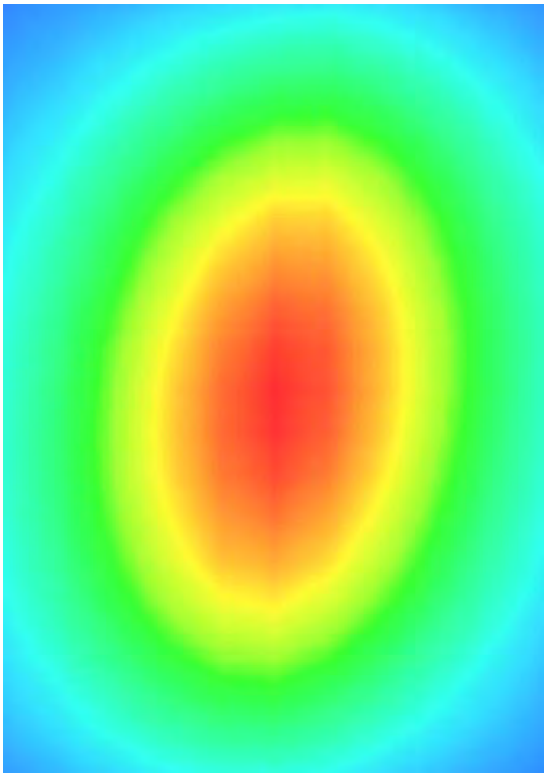
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 1.49 W/kg**

| | |
|---|---|
| **SAR 10 g (W/Kg)** | 0.662144 |
| **SAR 1g (W/Kg)** | 1.081505 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

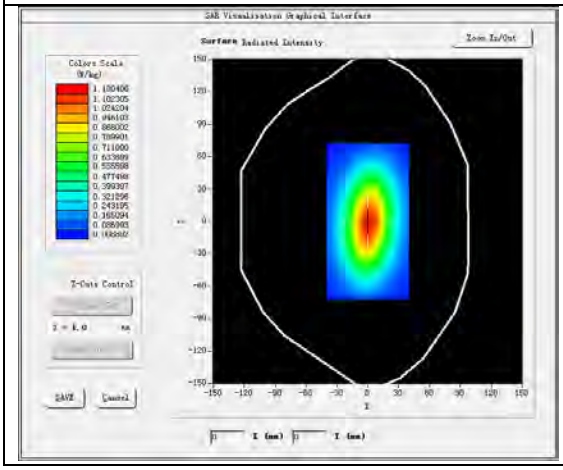
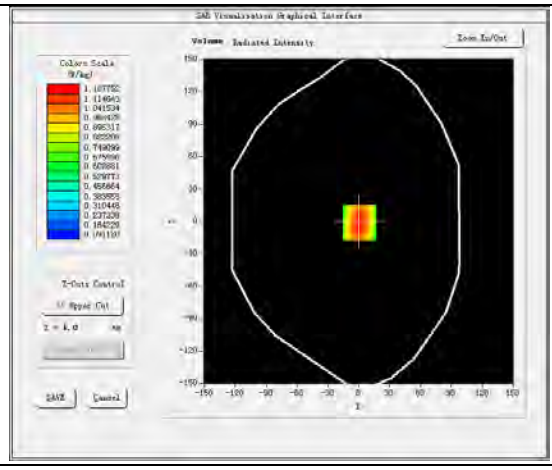
4.5.2 Dipole 900 MHz Validation Measurement for Body Tissue

# System Performance Check Data(900 MHz Body)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018.03.17
Measurement duration: 13 minutes 56 seconds

## Experimental conditions.

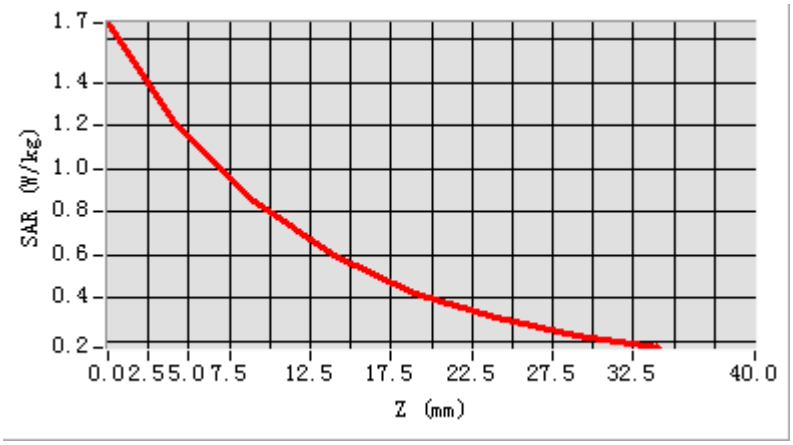
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 900 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 900.000000 |
| **Relative permittivity (real part)** | 55.362571 |
| **Conductivity (S/m)** | 1.08195 |
| **Power drift (%)** | -0.120000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.4℃ |
| **ConvF:** | 1.68 |
| **Crest factor:** | 1:1 |

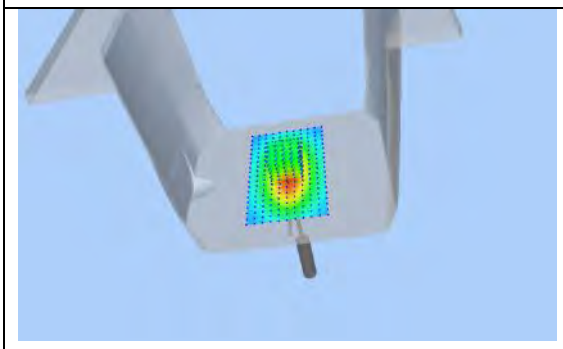
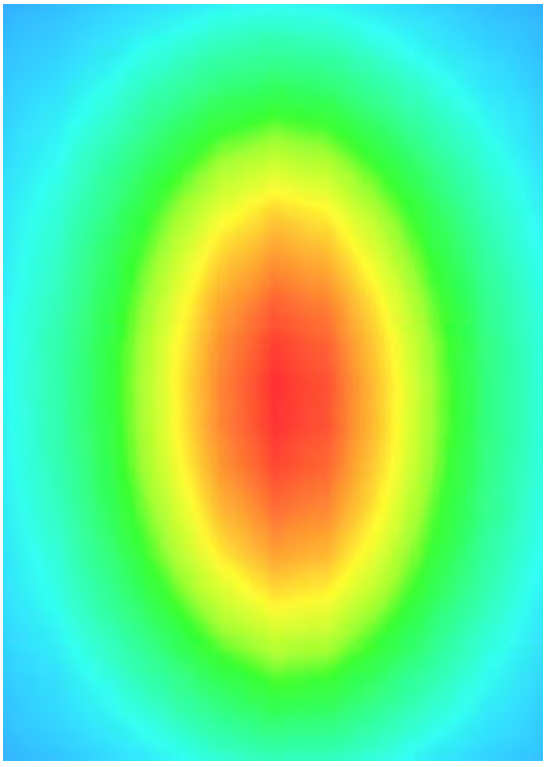
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 1.66 W/kg**

| | |
|---|---|
| **SAR 10 g (W/Kg)** | 0.736807 |
| **SAR 1g (W/Kg)** | 1.149340 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

## 4.6 DIP 1G800

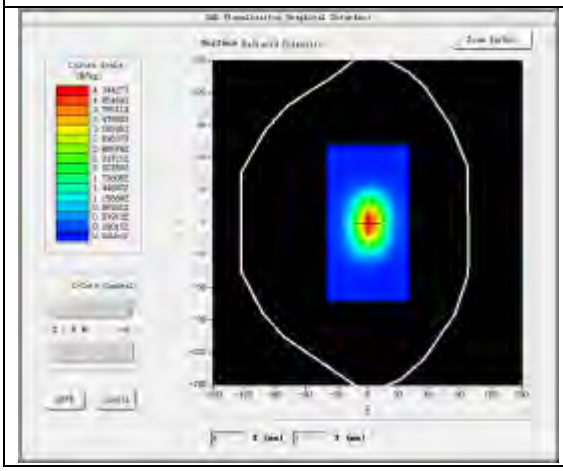
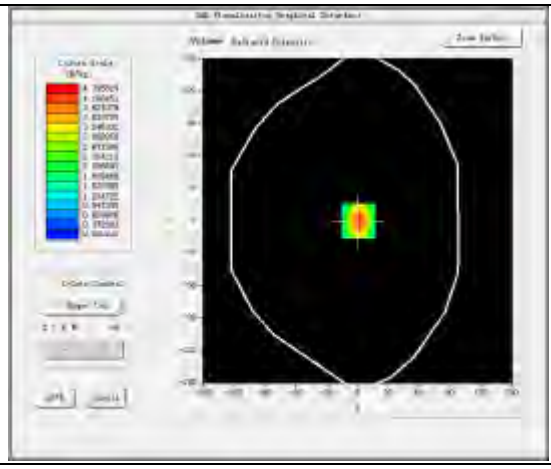
### 4.6.1 Dipole 1800 MHz Validation Measurement for Head Tissue

# System Performance Check Data(1800 MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement:2018.03.18
Measurement duration: 13 minutes 51 seconds

## Experimental conditions.

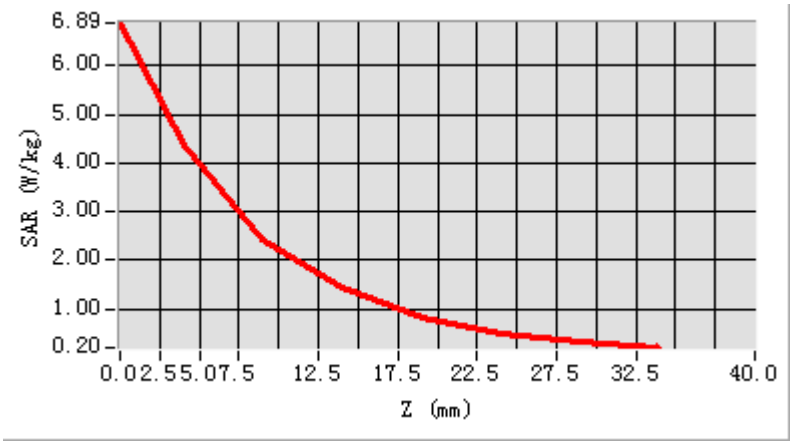
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 1800MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 1800.000000 |
| **Relative permittivity (real part)** | 40.914161 |
| **Conductivity (S/m)** | 1.374326 |
| **Power drift (%)** | 0.160000 |
| **Ambient Temperature:** | 22.7℃ |
| **Liquid Temperature:** | 21.6℃ |
| **ConvF:** | 1.88 |
| **Crest factor:** | 1:1 |

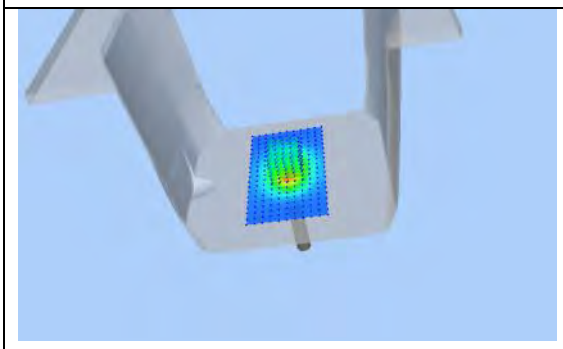
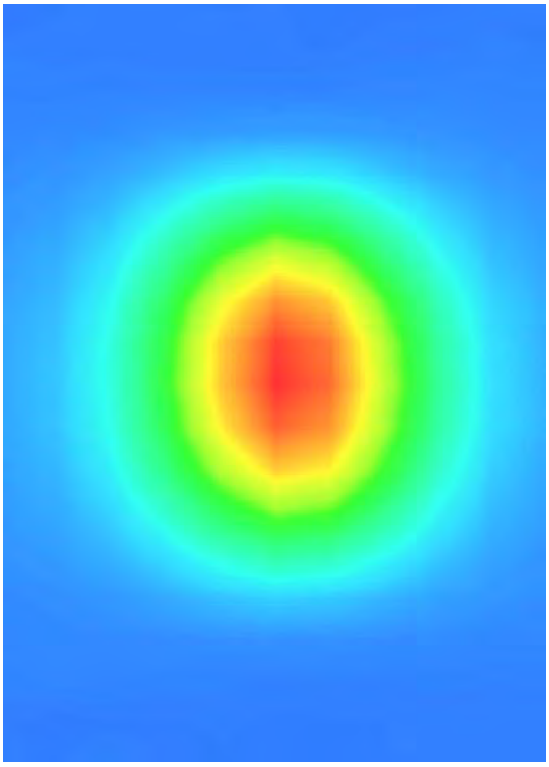
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 6.83 W/kg**

| | |
|---|---|
| **SAR 10 g (W/Kg)** | 2.126010 |
| **SAR 1g (W/Kg)** | 4.078166 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

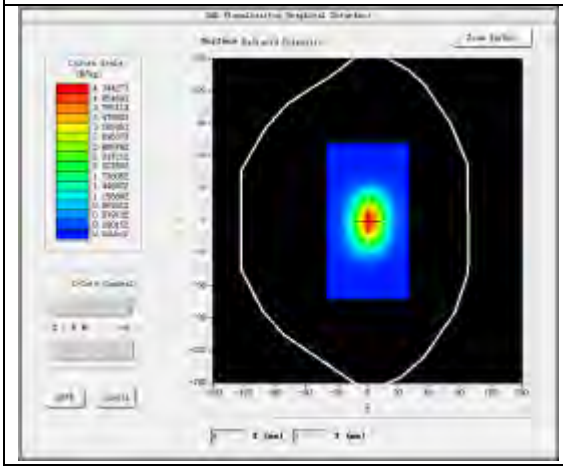
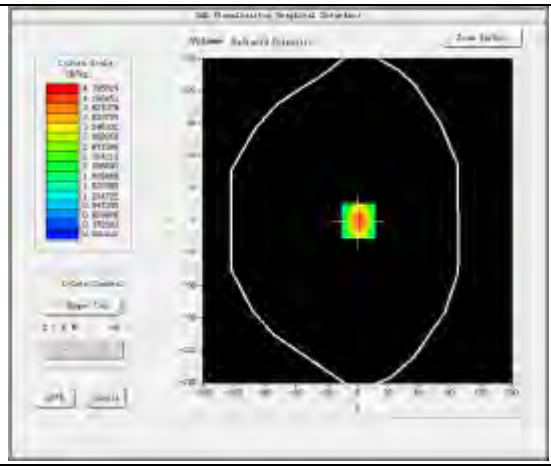
4.6.2 Dipole 1800 MHz Validation Measurement for Body Tissue

# System Performance Check Data(1800 MHz Body)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement:2018.03.18
Measurement duration: 13 minutes 47 seconds

## Experimental conditions.

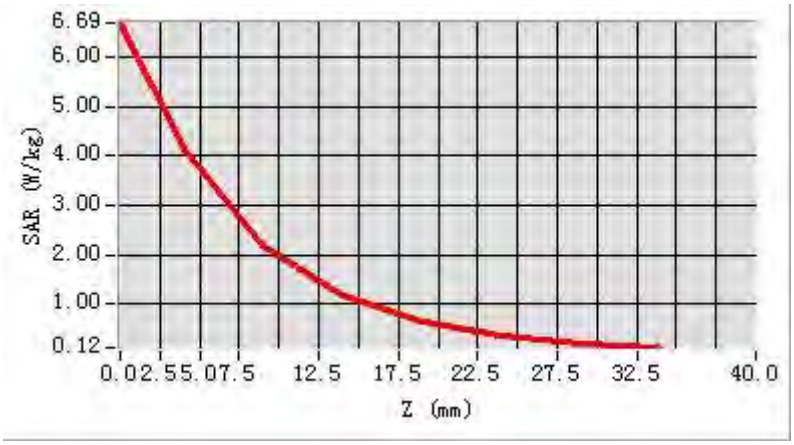
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 1800MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 1800.000000 |
| **Relative permittivity (real part)** | 52.634251 |
| **Conductivity (S/m)** | 1.535684 |
| **Power drift (%)** | -0.130000 |
| **Ambient Temperature:** | 22.7℃ |
| **Liquid Temperature:** | 21.2℃ |
| **ConvF:** | 1.94 |
| **Crest factor:** | 1:1 |

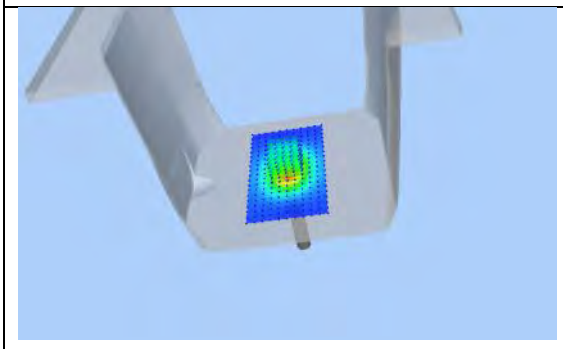
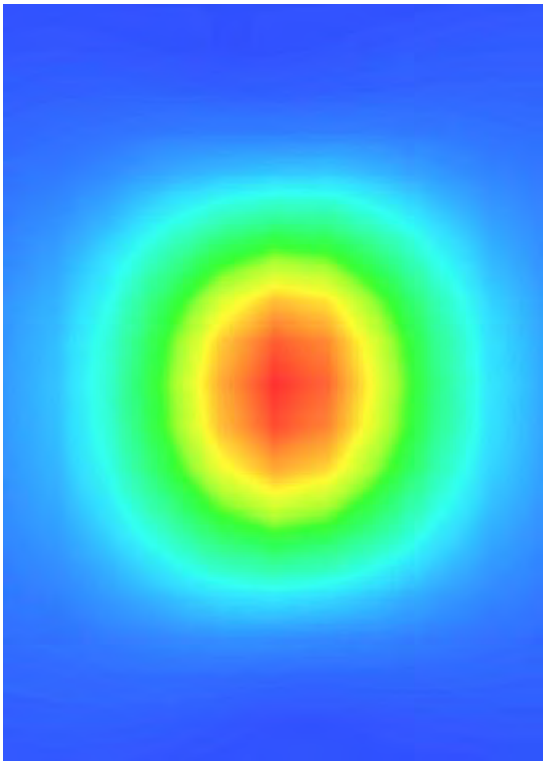
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 6.63 W/kg**

| | |
|---|---|
| **SAR 10 g (W/Kg)** | 2.096133 |
| **SAR 1g (W/Kg)** | 3.945247 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

## 4.7 DIP 1G900

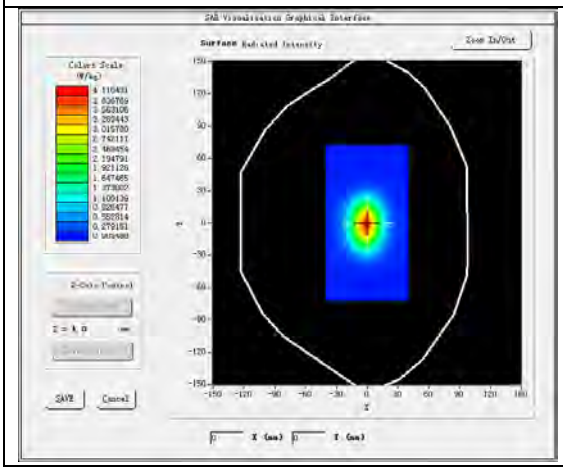
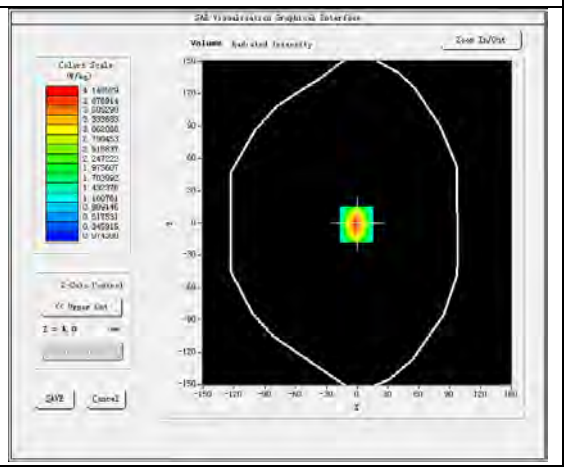
### 4.7.1 Dipole 1900 MHz Validation Measurement for Head Tissue

# System Performance Check Data(1900 MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018.03.18
Measurement duration: 13 minutes 57 seconds

## Experimental conditions.

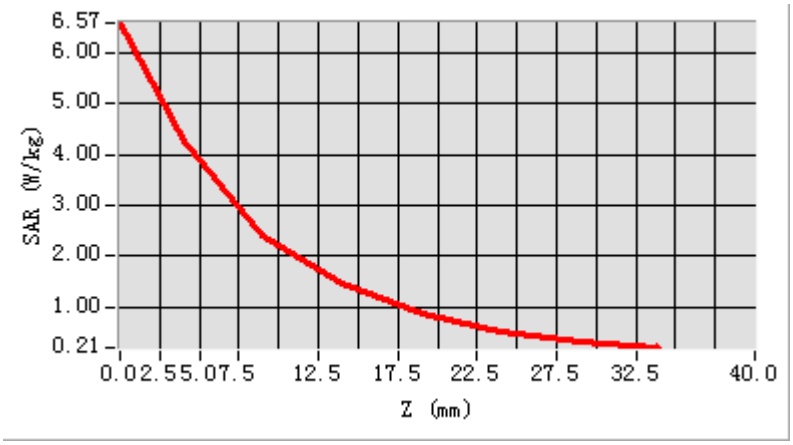
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 1900MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 1900.000000 |
| **Relative permittivity (real part)** | 40.887526 |
| **Conductivity (S/m)** | 1.394326 |
| **Power drift (%)** | 0.290000 |
| **Ambient Temperature:** | 22.7℃ |
| **Liquid Temperature:** | 21.0℃ |
| **ConvF:** | 2.19 |
| **Crest factor:** | 1:1 |

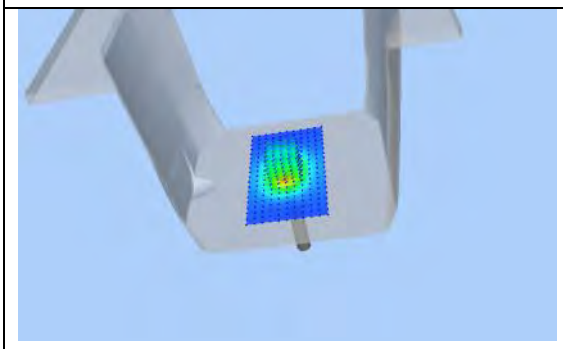
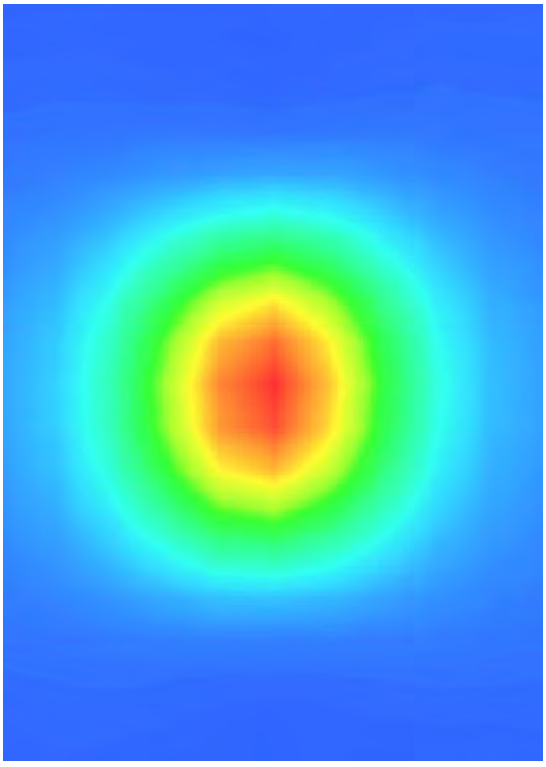
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 6.59W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 2.041917 |
| **SAR 1g (W/Kg)** | 3.880035 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

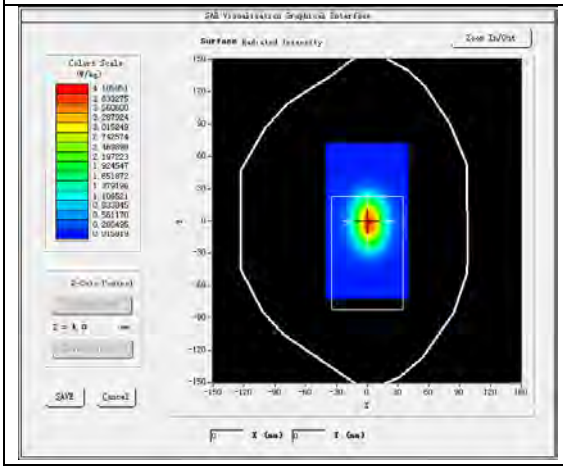
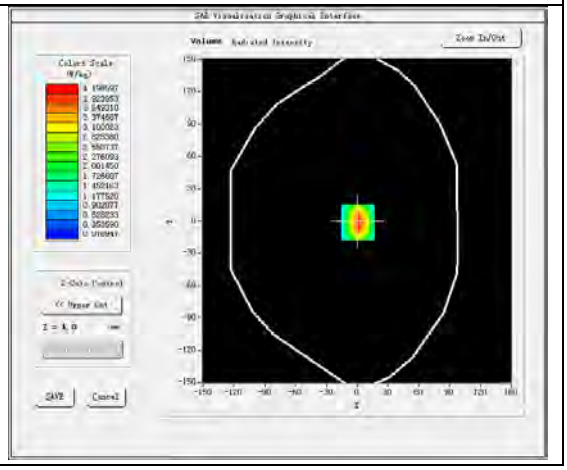
4.7.2 Dipole 1900 MHz Validation Measurement for Body Tissue

# System Performance Check Data(1900MHz Body)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018.03.18
Measurement duration: 13 minutes 51 seconds

## Experimental conditions.

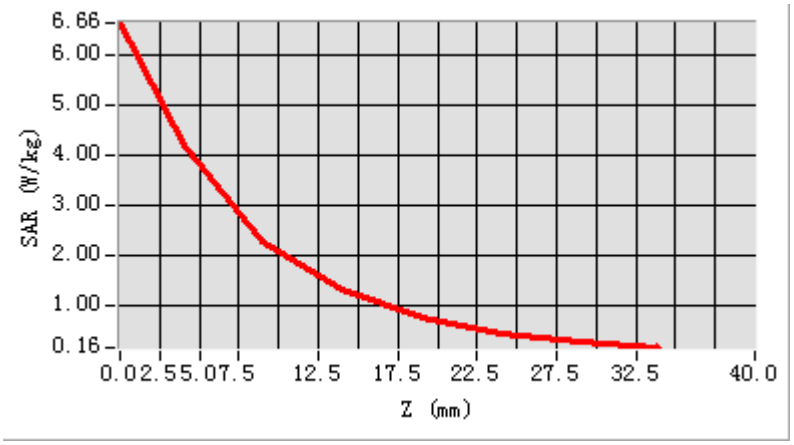
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 1900MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 1900.000000 |
| **Relative permittivity (real part)** | 52.284138 |
| **Conductivity (S/m)** | 1.521952 |
| **Power drift (%)** | 0.060000 |
| **Ambient Temperature:** | 22.7℃ |
| **Liquid Temperature:** | 21.4℃ |
| **ConvF:** | 2.24 |
| **Crest factor:** | 1:1 |

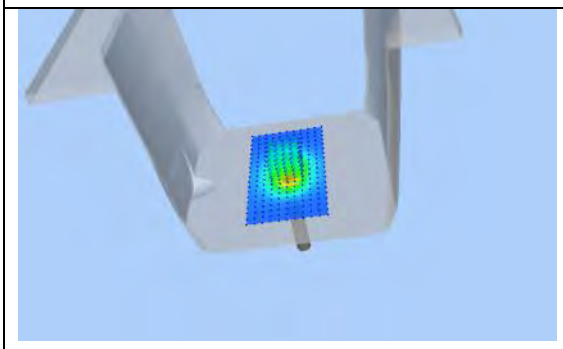
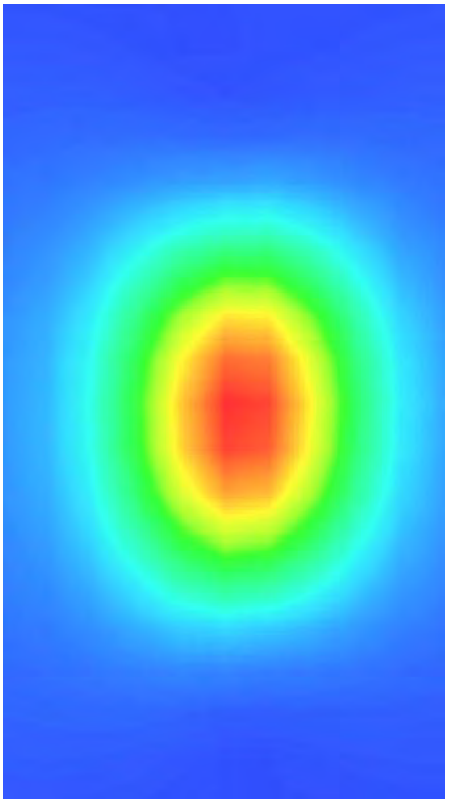
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 6.57W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 2.061345 |
| **SAR 1g (W/Kg)** | 4.024135 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

## 4.8 DIP 2G000

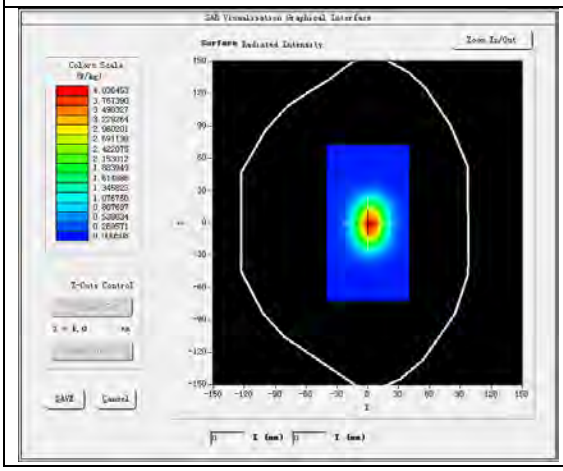
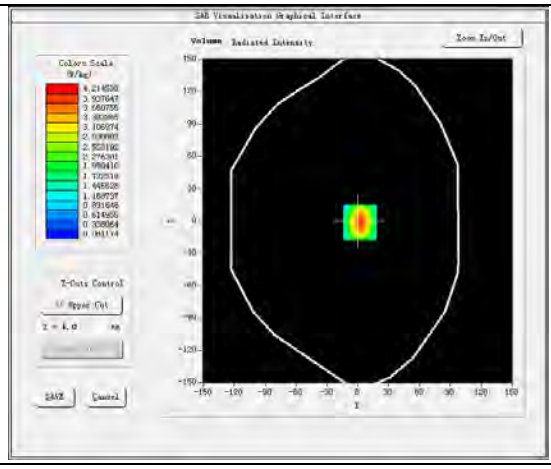
### 4.8.1 Dipole 2000 MHz Validation Measurement for Head Tissue

# System Performance Check Data(2000 MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018.03.18
Measurement duration: 14 minutes 7 seconds

## Experimental conditions.

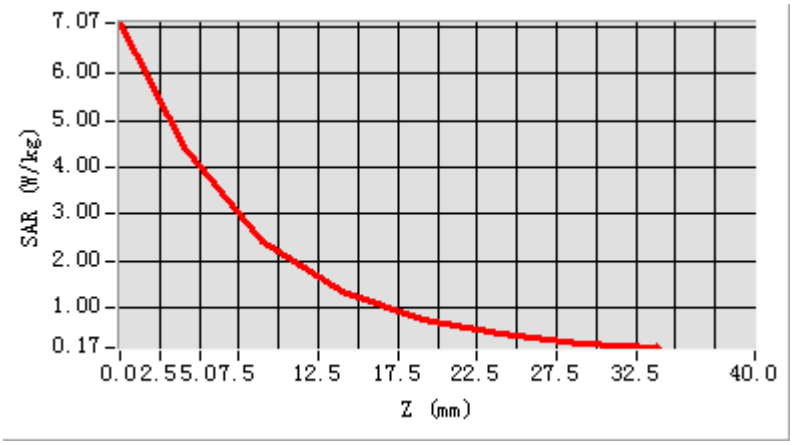
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 2000 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 2000.000000 |
| **Relative permittivity (real part)** | 40.628431 |
| **Conductivity (S/m)** | 1.435543 |
| **Power drift (%)** | -0.420000 |
| **Ambient Temperature:** | 22.7℃ |
| **Liquid Temperature:** | 21.6℃ |
| **ConvF:** | 1.97 |
| **Crest factor:** | 1:1 |

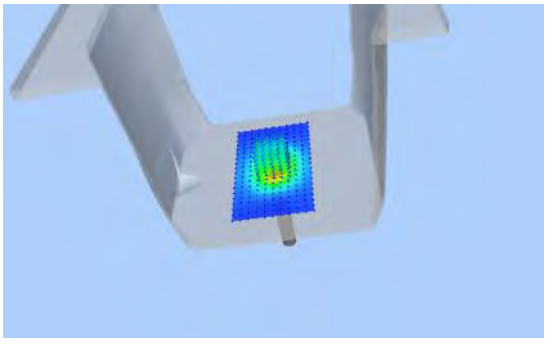
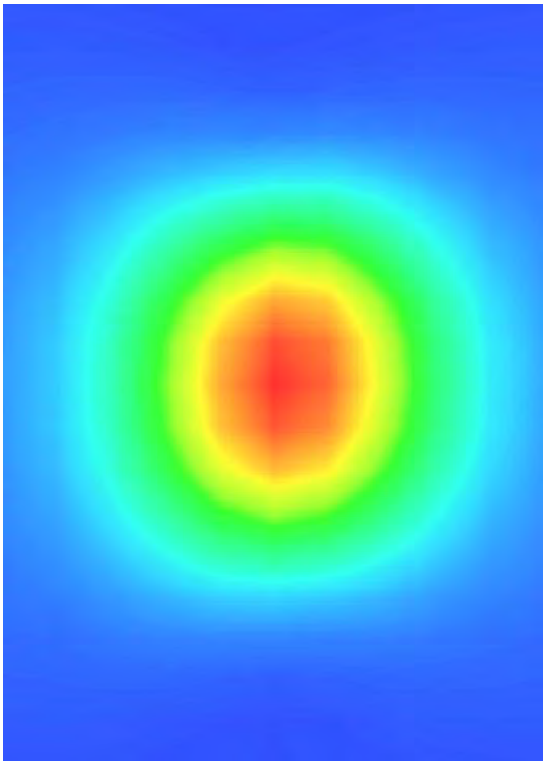
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 6.97 W/kg**

| | |
|---|---|
| **SAR 10 g (W/Kg)** | 2.094246 |
| **SAR 1g (W/Kg)** | 4.173987 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

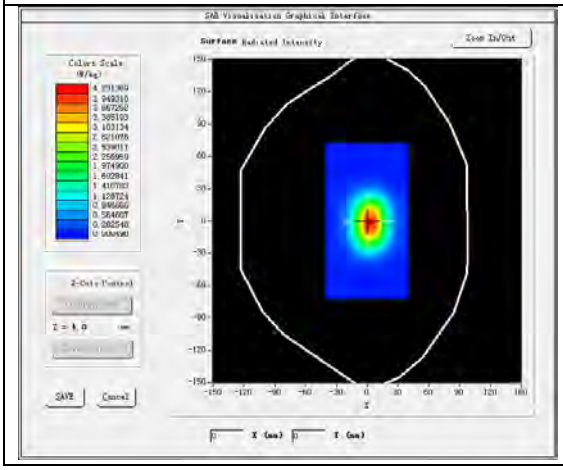
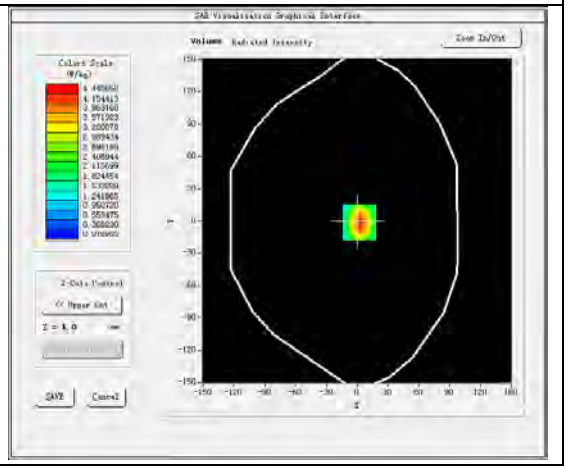
4.8.2 Dipole 2000 MHz Validation Measurement for Body Tissue

# System Performance Check Data(2000 MHz Body)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=8mm, dy=8mm, dz=5mm
Date of measurement: 2018.03.18
Measurement duration: 13 minutes 56 seconds

## Experimental conditions.

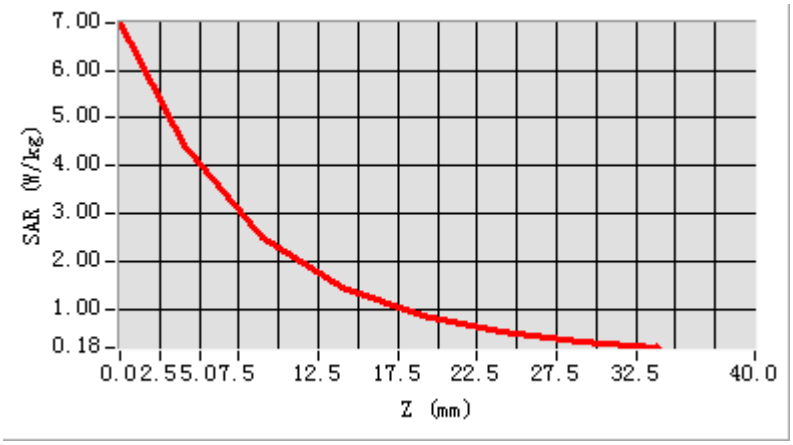
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 2000 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 2000.000000 |
| **Relative permittivity (real part)** | 51.981354 |
| **Conductivity (S/m)** | 1.549655 |
| **Power drift (%)** | 0.210000 |
| **Ambient Temperature:** | 22.7℃ |
| **Liquid Temperature:** | 21.3℃ |
| **ConvF:** | 2.03 |
| **Crest factor:** | 1:1 |

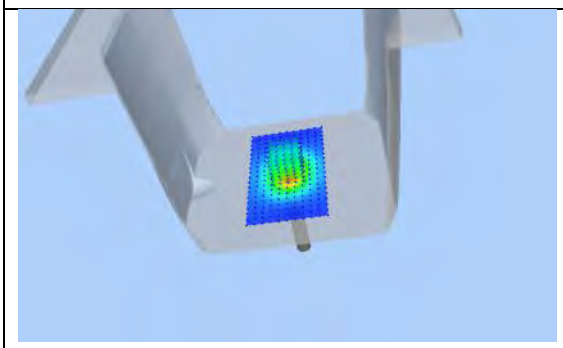
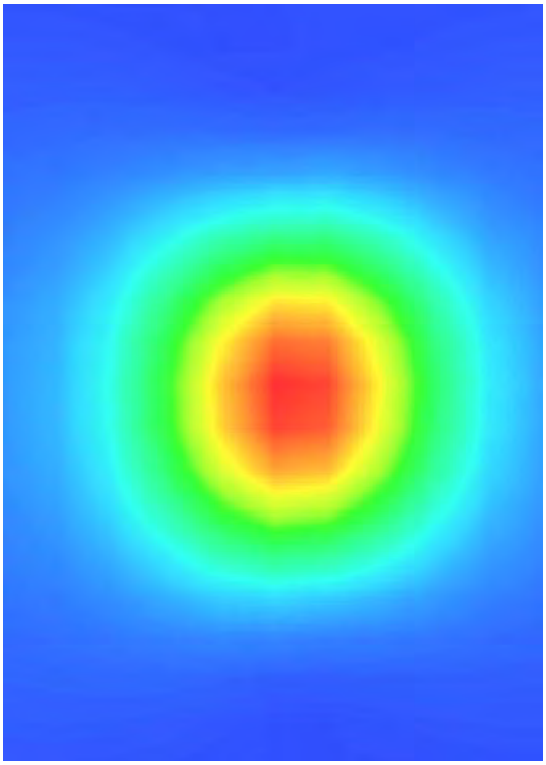
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 6.95 W/kg**

| | |
|---|---|
| **SAR 10 g (W/Kg)** | 2.208066 |
| **SAR 1g (W/Kg)** | 4.388941 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

## 4.9 DIP 2G450

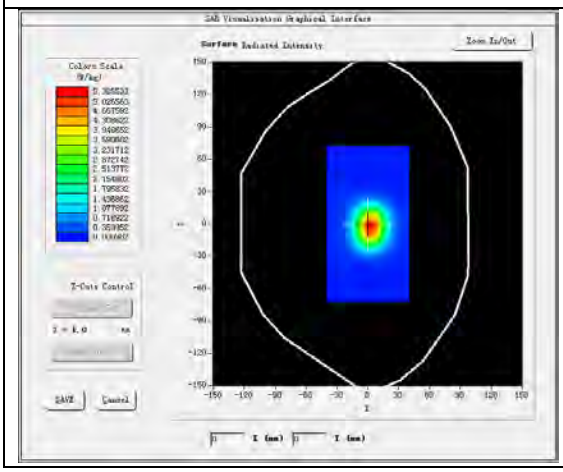
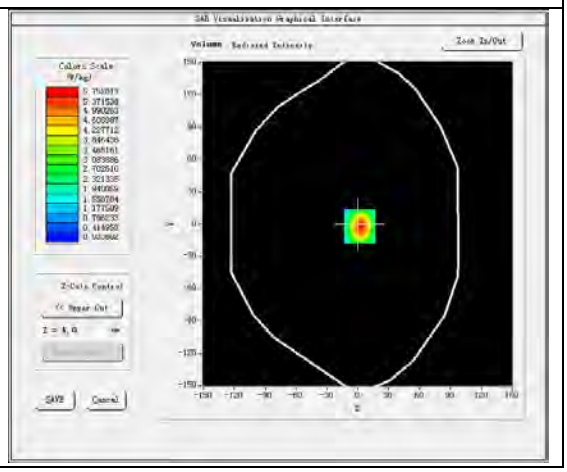
### 4.9.1 Dipole 2450 MHz Validation Measurement for Head Tissue

# System Performance Check Data(2450MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=5mm, dy=5mm, dz=5mm
Date of measurement: 2018.03.18
Measurement duration: 18 minutes 42 seconds

## Experimental conditions.

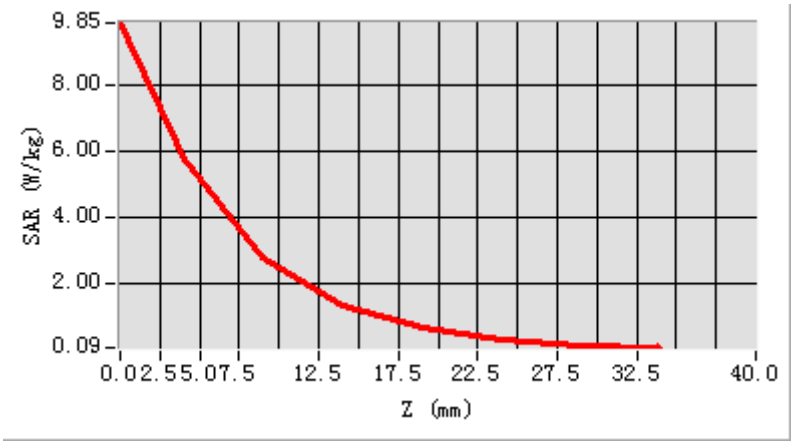
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 2450MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 2450.000000 |
| **Relative permittivity (real part)** | 38.641724 |
| **Conductivity (S/m)** | 1.841662 |
| **Power drift (%)** | -1.010000 |
| **Ambient Temperature:** | 22.1℃ |
| **Liquid Temperature:** | 21.4℃ |
| **ConvF:** | 2.21 |
| **Crest factor:** | 1:1 |

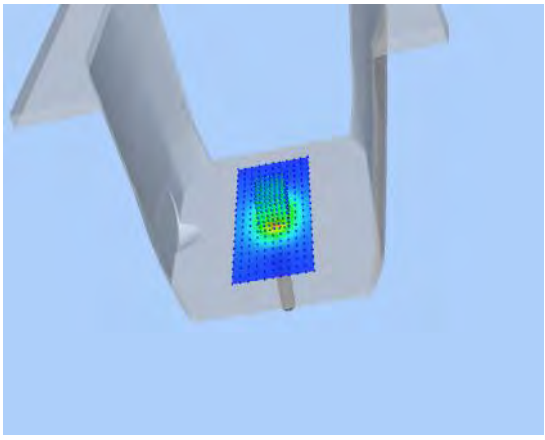
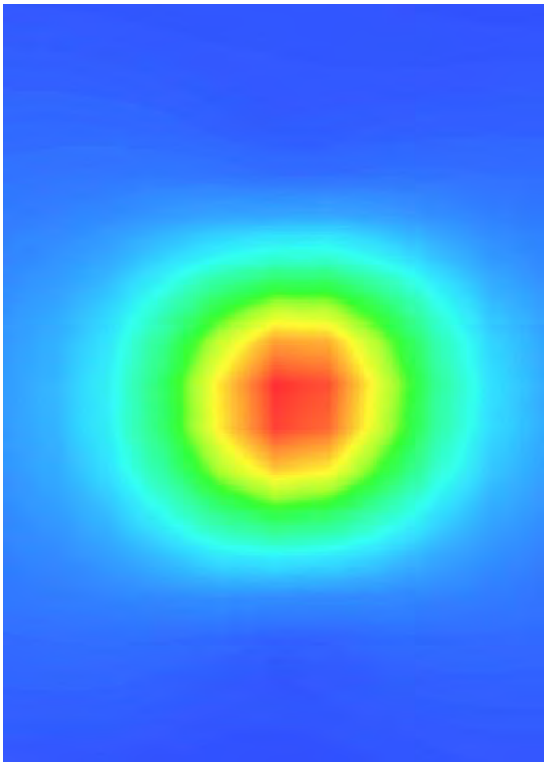
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 9.77 W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 2.387686 |
| **SAR 1g (W/Kg)** | 5.219030 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

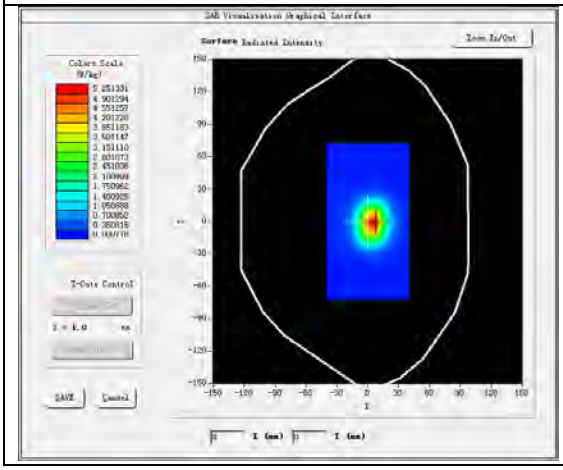
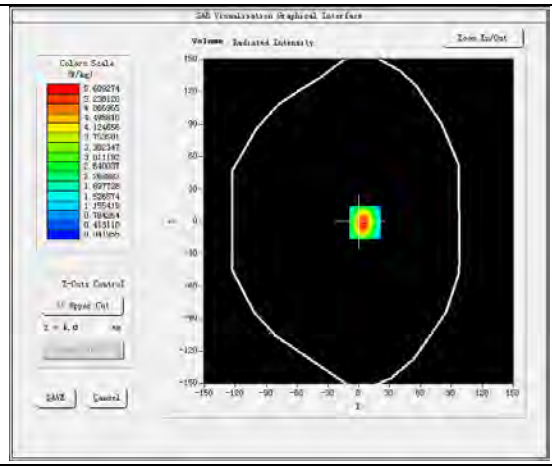
4.9.2 Dipole 2450 MHz Validation Measurement for Body Tissue

# System Performance Check Data(2450 MHz Body)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=5 mm, dy=5 mm, dz=5mm
Date of measurement: 2018.03.18
Measurement duration: 19 minutes 4 seconds

## Experimental conditions.

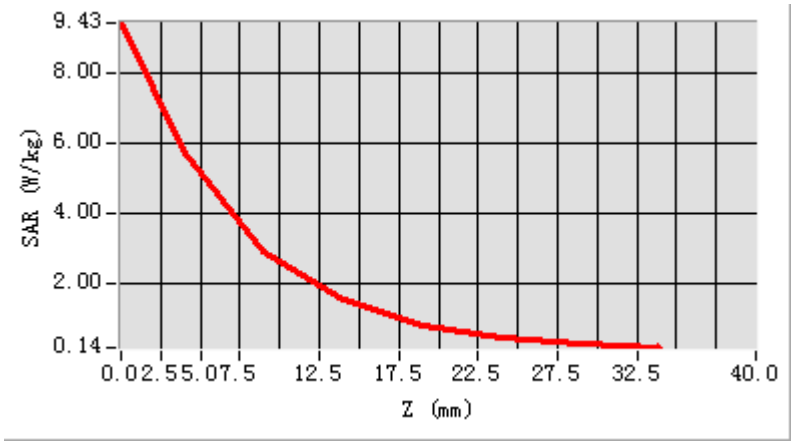
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 2450 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 2450.000000 |
| **Relative permittivity (real part)** | 52.536841 |
| **Conductivity (S/m)** | 1.974254 |
| **Power drift (%)** | -0.330000 |
| **Ambient Temperature:** | 22.1℃ |
| **Liquid Temperature:** | 21.5℃ |
| **ConvF:** | 2.30 |
| **Crest factor:** | 1:1 |

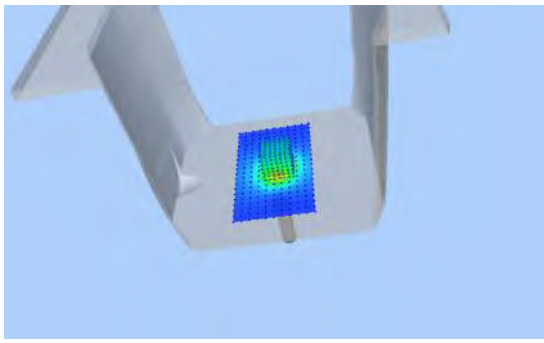
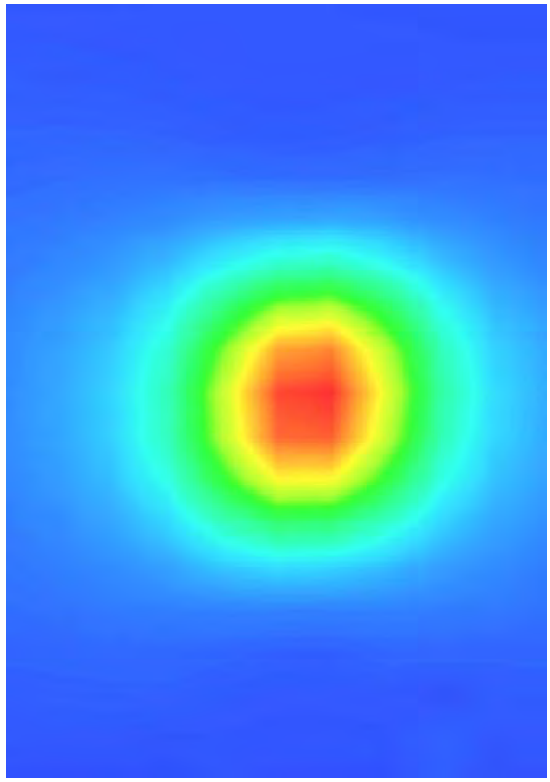
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 9.35 W/kg**

| | |
|---|---|
| **SAR 10 g (W/Kg)** | 2.427765 |
| **SAR 1g (W/Kg)** | 5.190488 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

## 4.10 DIP 2G600

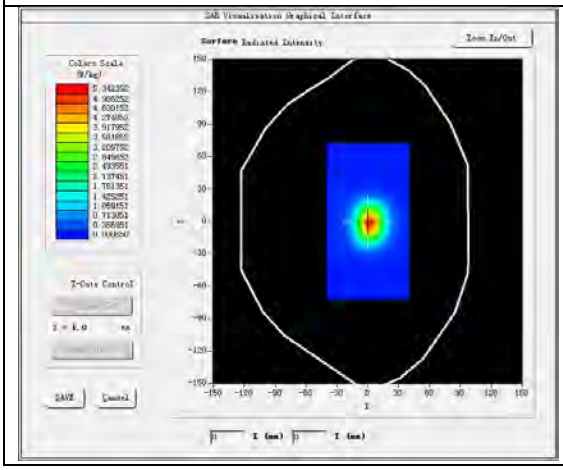
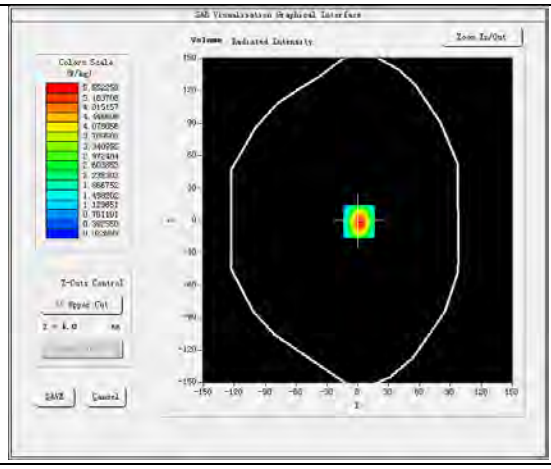
### 4.10.1 Dipole 2600 MHz Validation Measurement for Head Tissue

# System Performance Check Data(2600 MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=5 mm, dy=5 mm, dz=5mm
Date of measurement: 2018.03.18
Measurement duration: 19 minutes 11 seconds

## Experimental conditions.

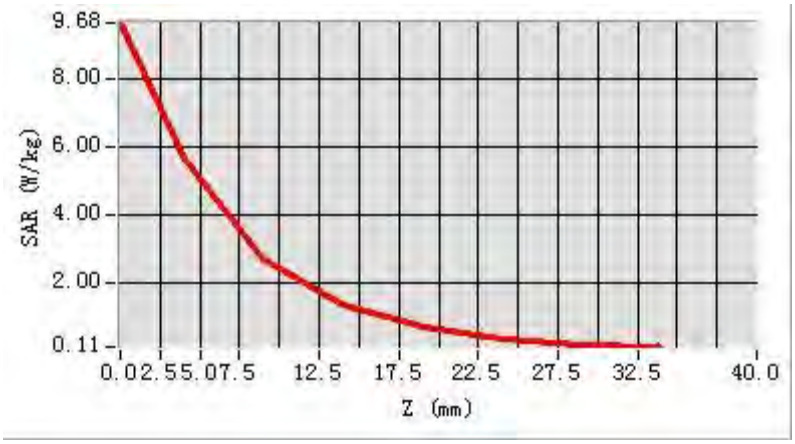
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 2600 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 2600.000000 |
| **Relative permittivity (real part)** | 38.187134 |
| **Conductivity (S/m)** | 1.886846 |
| **Power drift (%)** | 0.550000 |
| **Ambient Temperature:** | 22.1℃ |
| **Liquid Temperature:** | 21.4℃ |
| **ConvF:** | 2.20 |
| **Crest factor:** | 1:1 |

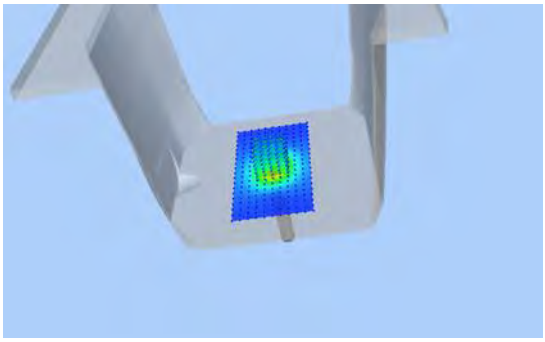
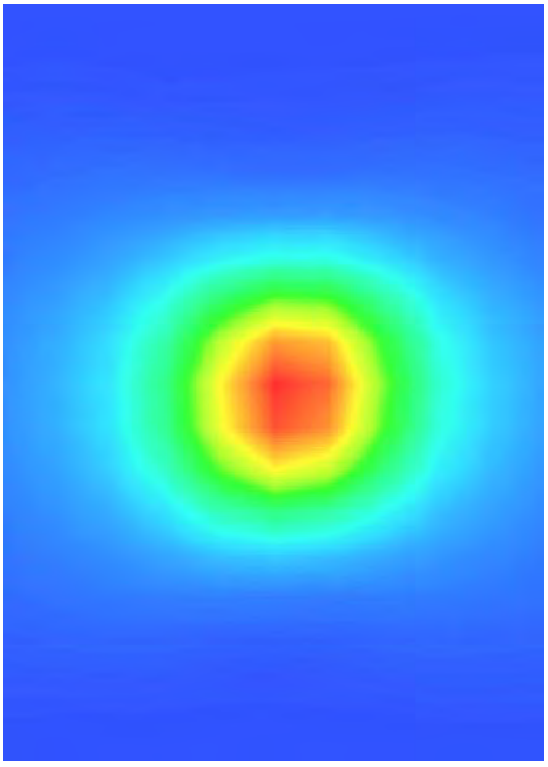
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 9.71 W/kg**

| | |
|---|---|
| **SAR 10 g (W/Kg)** | 2.495522 |
| **SAR 1g (W/Kg)** | 5.469008 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

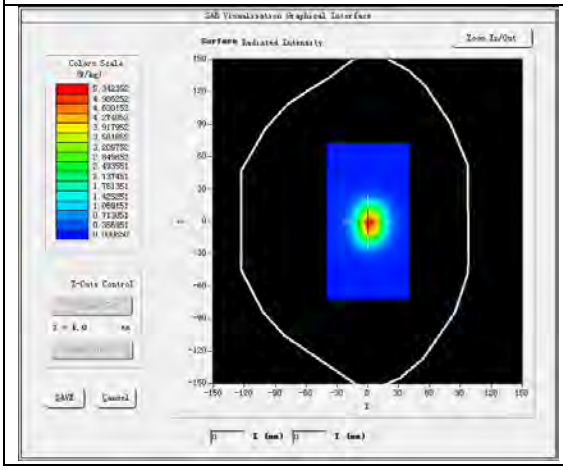
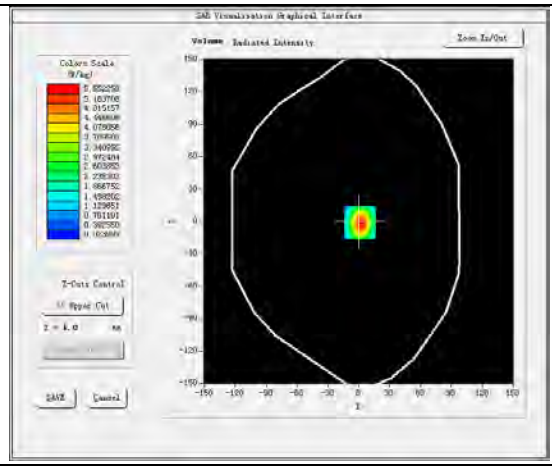
4.10.2 Dipole 2600 MHz Validation Measurement for Body Tissue

# System Performance Check Data(2600 MHz Body)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=5 mm, dy=5 mm, dz=5mm
Date of measurement: 2018.03.18
Measurement duration: 19 minutes 2 seconds

## Experimental conditions.

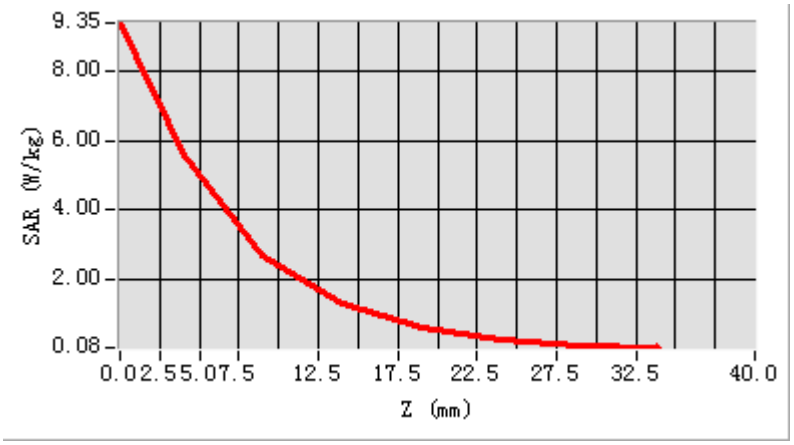
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 2600 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 2600.000000 |
| **Relative permittivity (real part)** | 52.141672 |
| **Conductivity (S/m)** | 2.134385 |
| **Power drift (%)** | 0.260000 |
| **Ambient Temperature:** | 22.1℃ |
| **Liquid Temperature:** | 21.5℃ |
| **ConvF:** | 2.27 |
| **Crest factor:** | 1:1 |

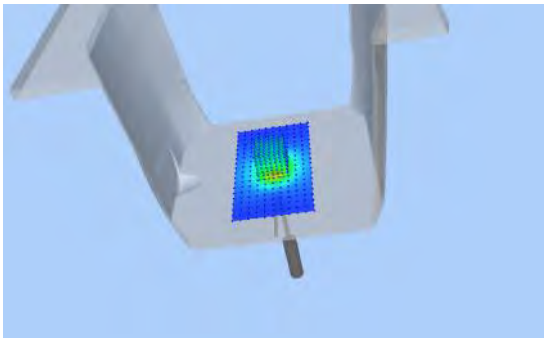
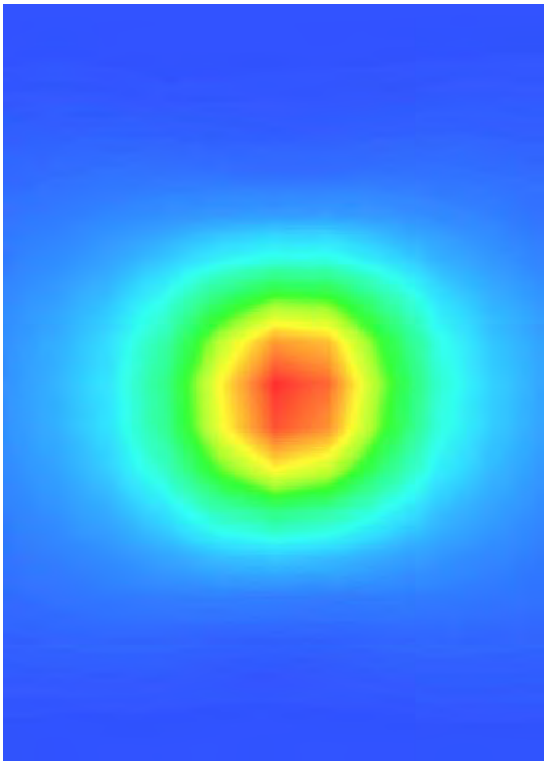
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 9.27 W/kg**

| | |
|---|---|
| **SAR 10 g (W/Kg)** | 2.447007 |
| **SAR 1g (W/Kg)** | 5.235320 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

## 4.11 SWG5500

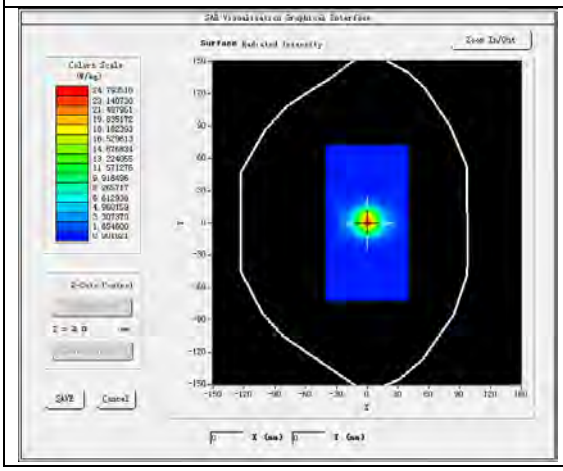
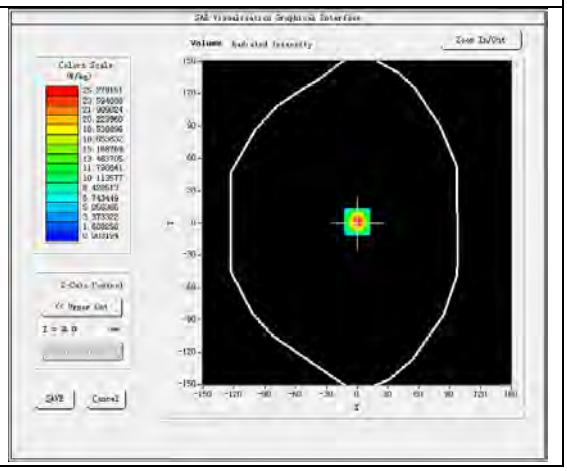
### 4.11.1 Waveguide 5 GHz Validation Measurement for Head Tissue

# System Performance Check Data(5200 MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2018.03.19
Measurement duration: 29 minutes 38 seconds

## Experimental conditions.

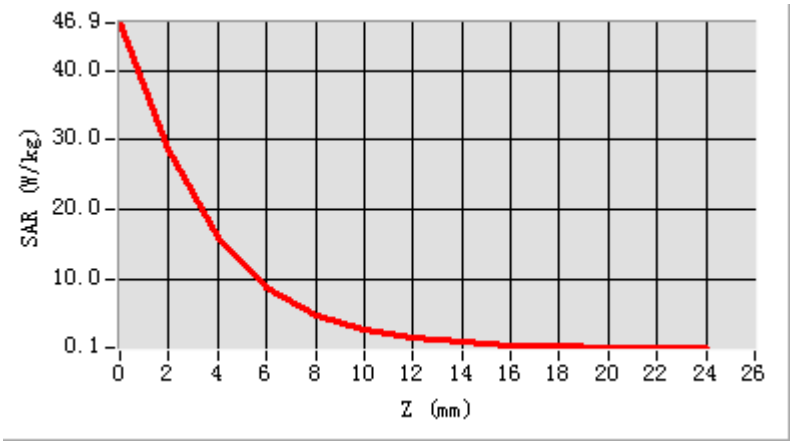
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 5200 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 5200.000000 |
| **Relative permittivity (real part)** | 36.408324 |
| **Conductivity (S/m)** | 4.744352 |
| **Power drift (%)** | -0.940000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.3℃ |
| **ConvF:** | 1.32 |
| **Crest factor:** | 1:1 |

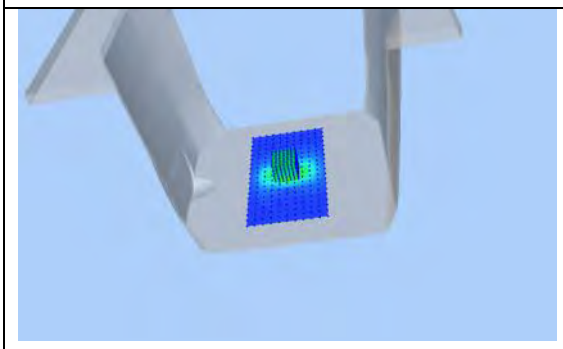
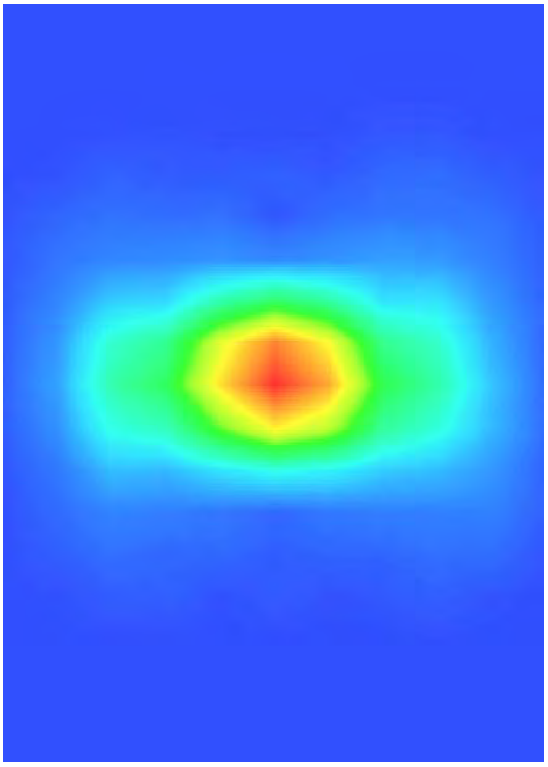
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=3.00, Y=1.00**
**SAR Peak: 46.84 W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 5.592867 |
| **SAR 1g (W/Kg)** | 16.372122 |

## Z Axis Scan



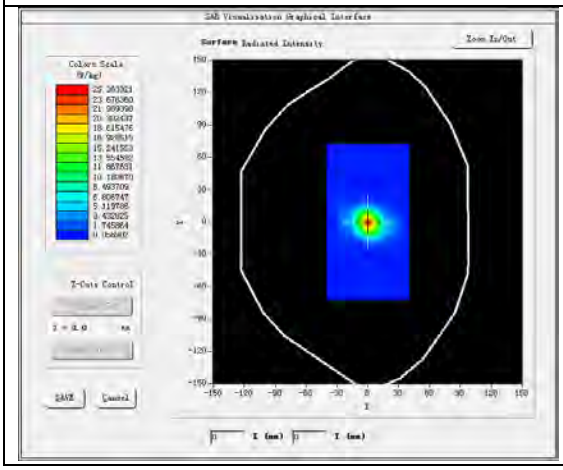
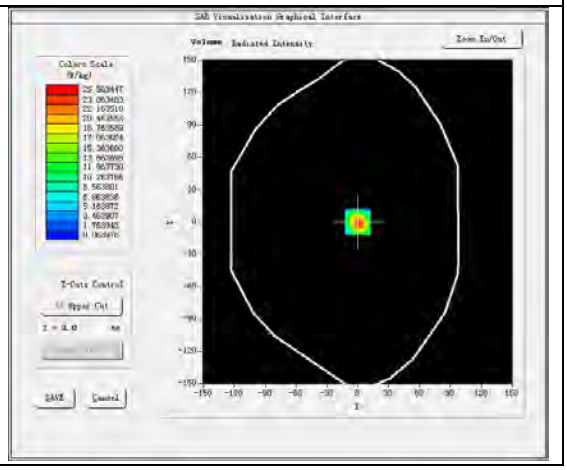

| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# System Performance Check Data(5400 MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2018.03.19
Measurement duration: 29 minutes 44 seconds

## Experimental conditions.

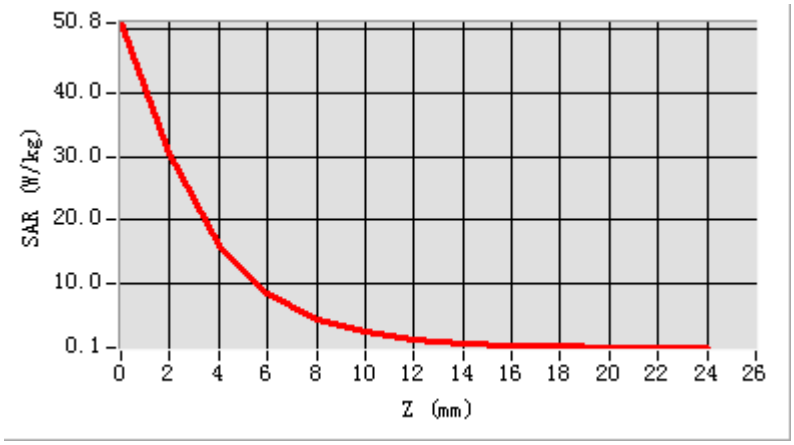
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 5400 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 5400.000000 |
| **Relative permittivity (real part)** | 35.837514 |
| **Conductivity (S/m)** | 5.014322 |
| **Power drift (%)** | -1.240000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.3℃ |
| **ConvF:** | 1.88 |
| **Crest factor:** | 1:1 |

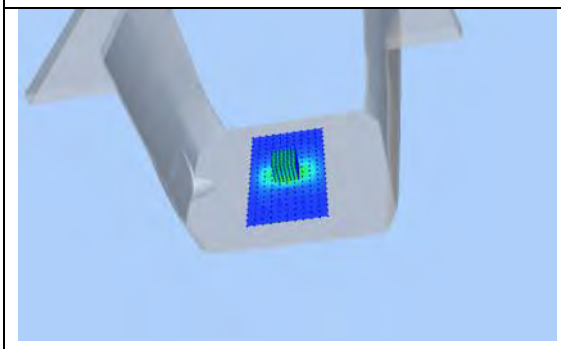
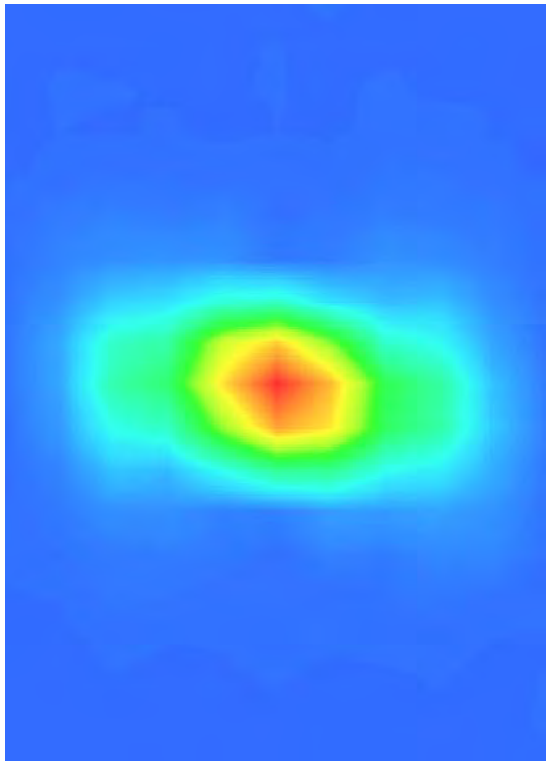
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 50.6 W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 5.818205 |
| **SAR 1g (W/Kg)** | 17.240731 |

## Z Axis Scan



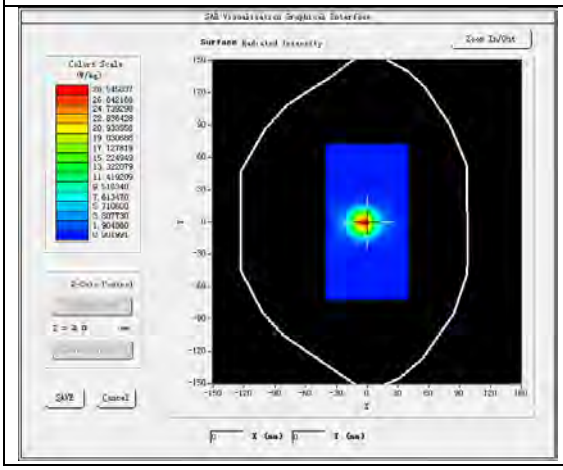
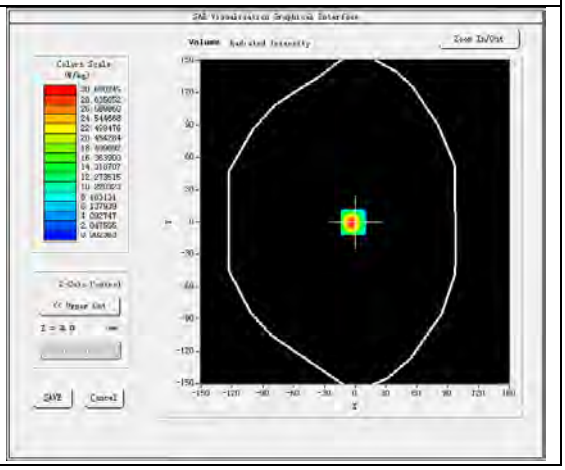

| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# System Performance Check Data(5600 MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2018.03.19
Measurement duration: 29 minutes 32 seconds

## Experimental conditions.

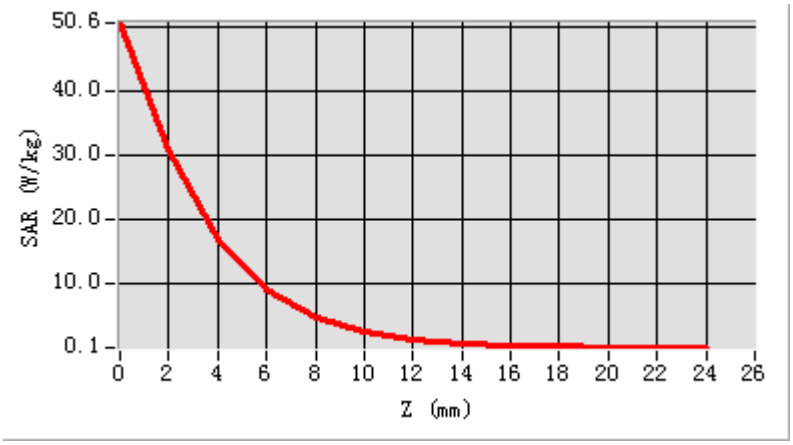
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 5600 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 5600.000000 |
| **Relative permittivity (real part)** | 34.916125 |
| **Conductivity (S/m)** | 5.182485 |
| **Power drift (%)** | -0.780000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.3℃ |
| **ConvF:** | 1.94 |
| **Crest factor:** | 1:1 |

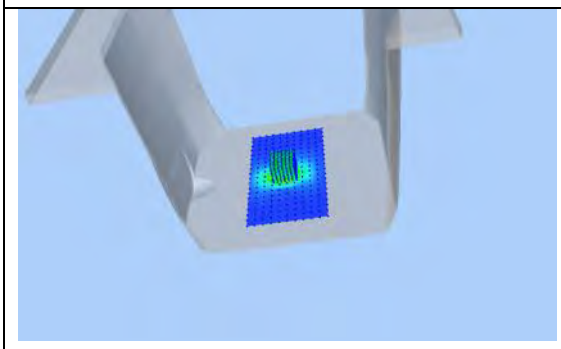
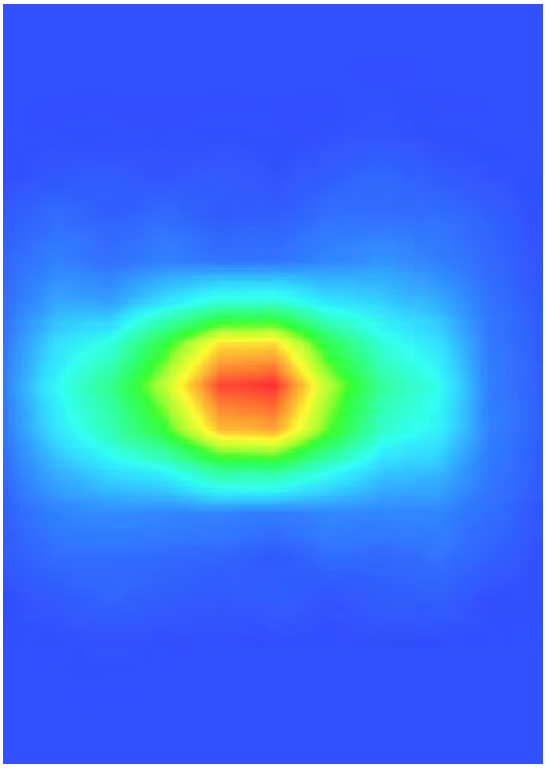
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=1.00, Y=1.00**
**SAR Peak: 50.57 W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 5.851483 |
| **SAR 1g (W/Kg)** | 17.434273 |

## Z Axis Scan



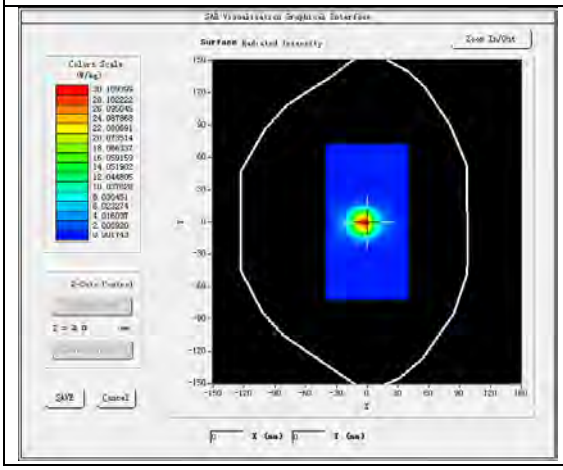
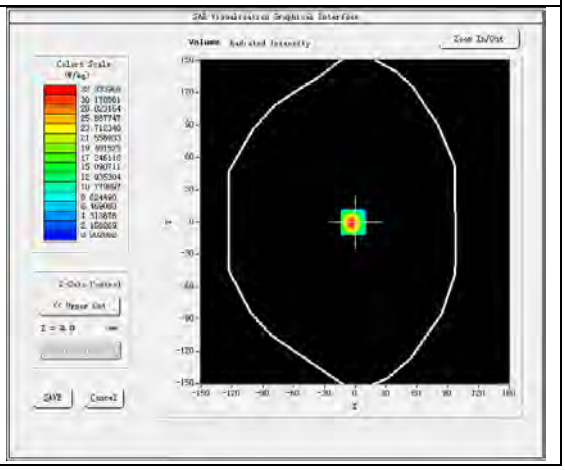

| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# System Performance Check Data(5800 MHz Head)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2018.03.19
Measurement duration: 29 minutes 36 seconds

## Experimental conditions.

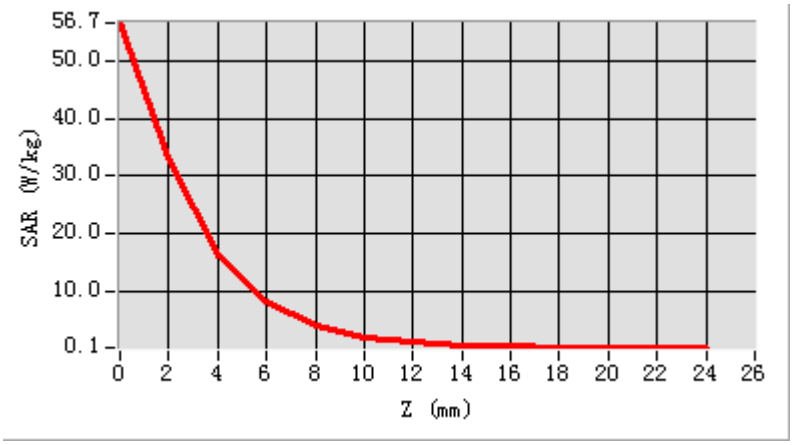
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 5800 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 5800.000000 |
| **Relative permittivity (real part)** | 34.134295 |
| **Conductivity (S/m)** | 5.295178 |
| **Power drift (%)** | -0.180000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.3℃ |
| **ConvF:** | 1.76 |
| **Crest factor:** | 1:1 |

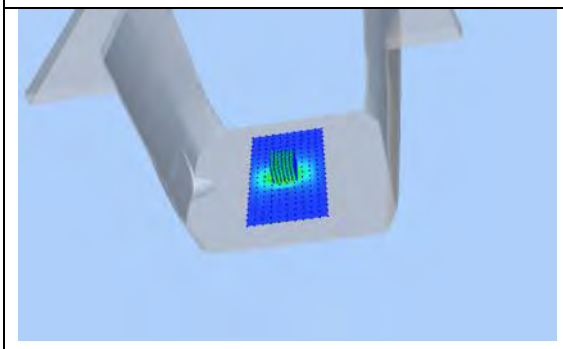
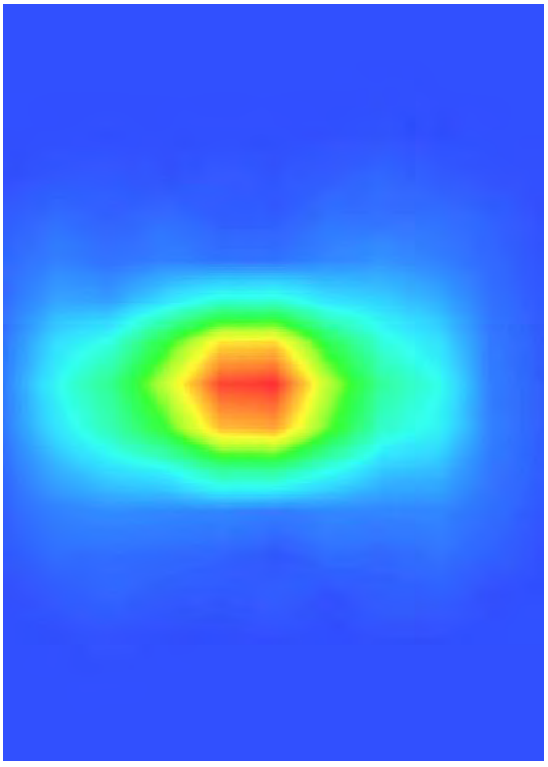
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 56.73 W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 6.037190 |
| **SAR 1g (W/Kg)** | 18.470412 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

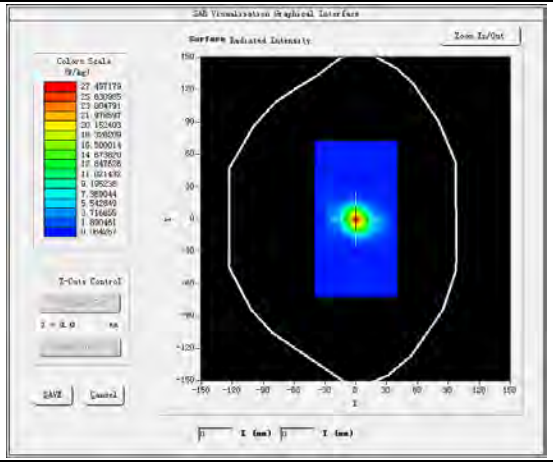
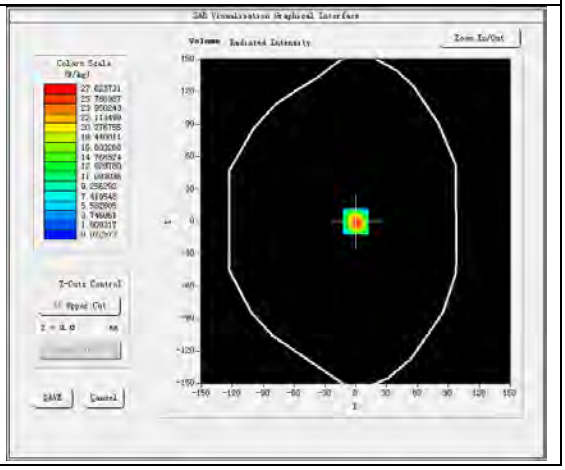
4.11.2 Waveguide 5 GHz Validation Measurement for Body Tissue

# System Performance Check Data(5200MHz Body)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2018.03.19
Measurement duration: 29 minutes 32 seconds

## Experimental conditions.

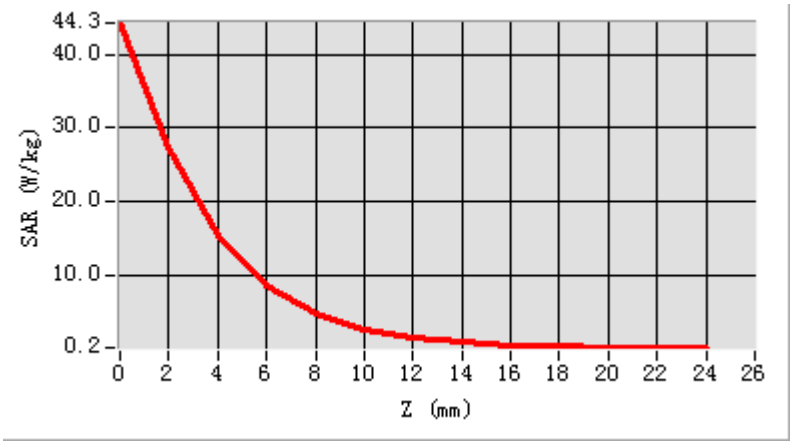
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 5200 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 5200.000000 |
| **Relative permittivity (real part)** | 48.084385 |
| **Conductivity (S/m)** | 5.485217 |
| **Power drift (%)** | -1.140000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.1℃ |
| **ConvF:** | 1.36 |
| **Crest factor:** | 1:1 |

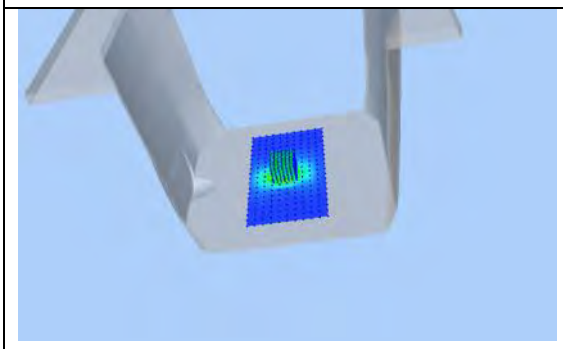
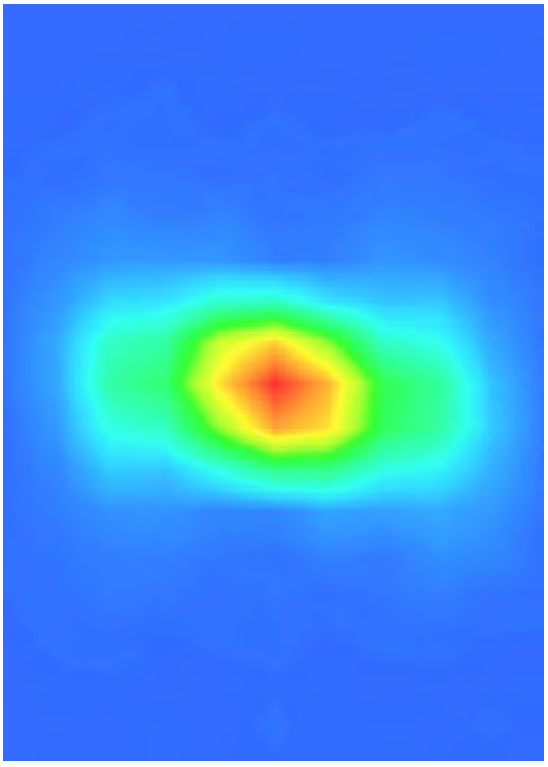
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 44.16 W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 5.453471 |
| **SAR 1g (W/Kg)** | 15.882424 |

## Z Axis Scan



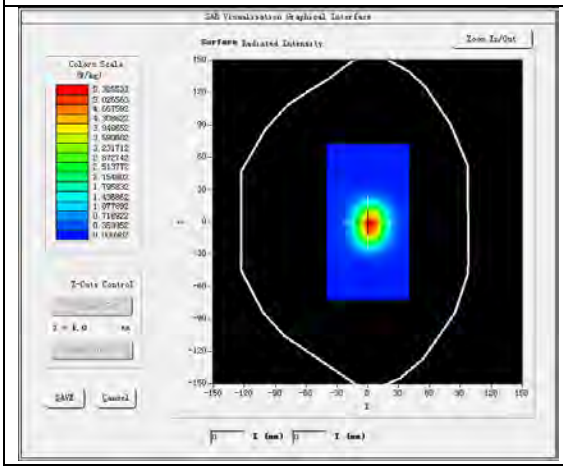
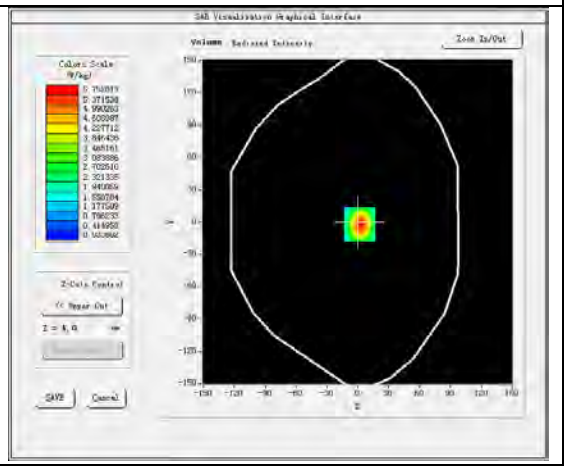

| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# System Performance Check Data (5400MHz Body)

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2018.03.19
Measurement duration: 29 minutes 51 seconds

## Experimental conditions.

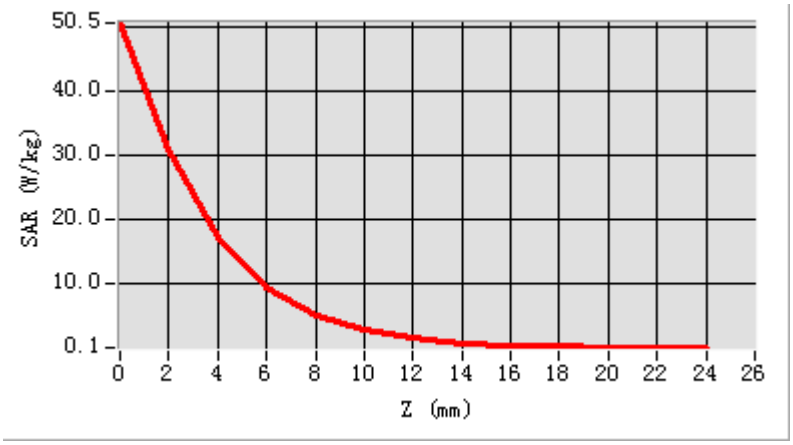
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 5400 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 5400.000000 |
| **Relative permittivity (real part)** | 47.457628 |
| **Conductivity (S/m)** | 5.609439 |
| **Power drift (%)** | -0.160000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.1℃ |
| **ConvF:** | 1.92 |
| **Crest factor:** | 1:1 |

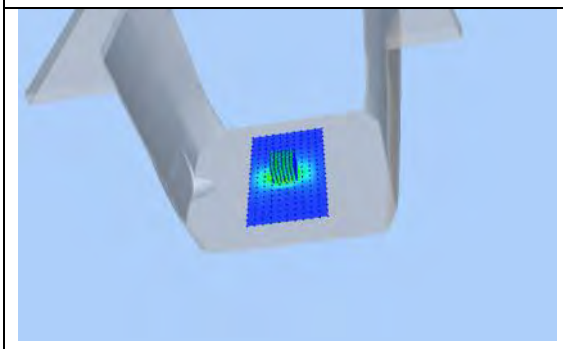
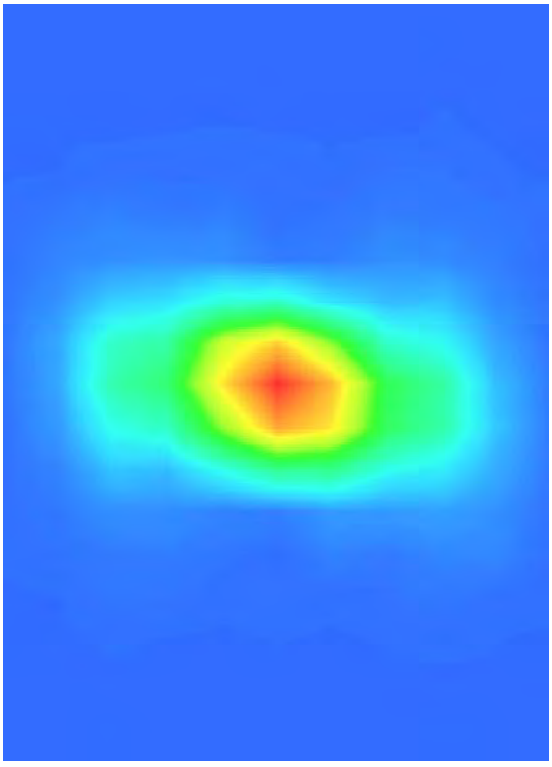
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 50.54 W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 5.963962 |
| **SAR 1g (W/Kg)** | 17.552991 |

## Z Axis Scan



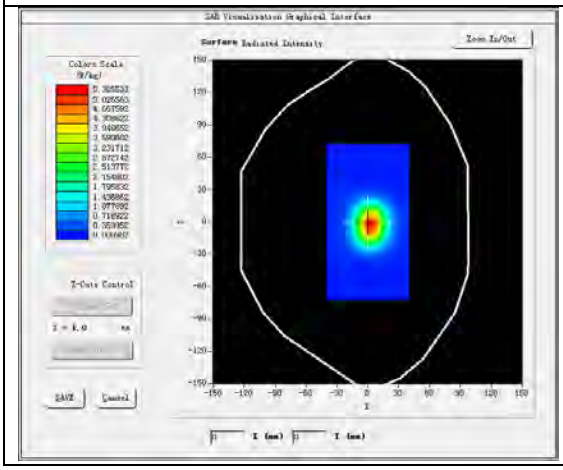
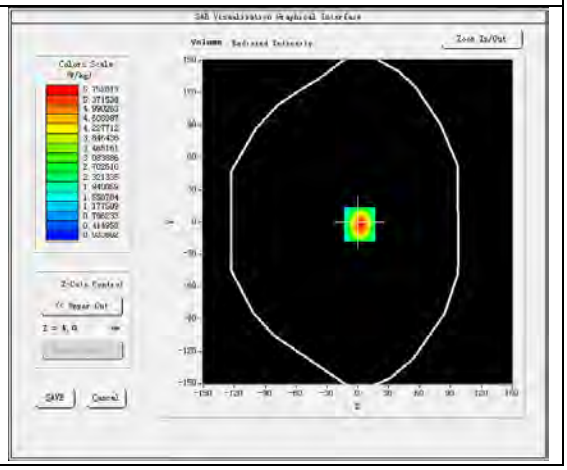

| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# System Performance Check Data (5600MHz Body )

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2018.03.19
Measurement duration: 29 minutes 41 seconds

## Experimental conditions.

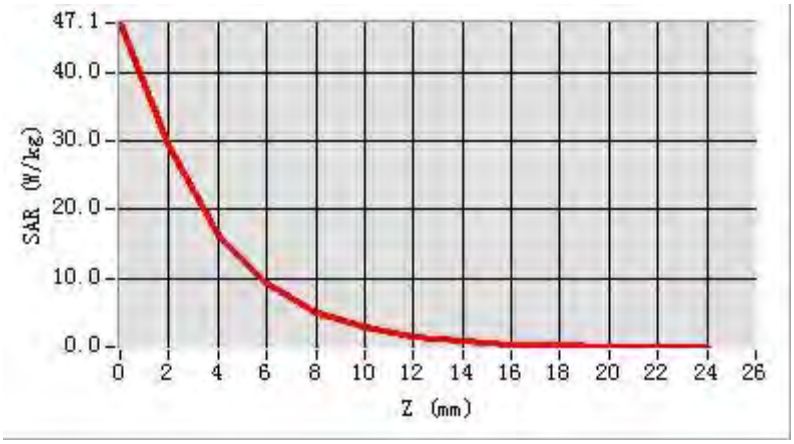
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 5600 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 5600.000000 |
| **Relative permittivity (real part)** | 47.356184 |
| **Conductivity (S/m)** | 5.923357 |
| **Power drift (%)** | 0.440000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.1℃ |
| **ConvF:** | 2.00 |
| **Crest factor:** | 1:1 |

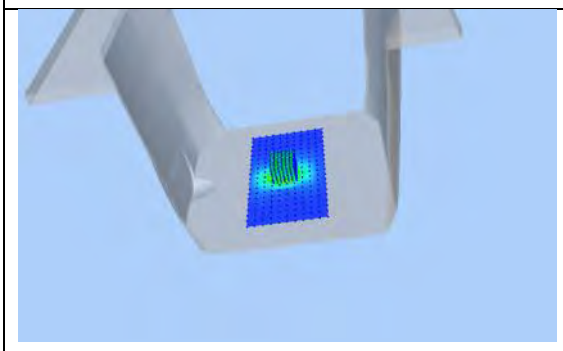
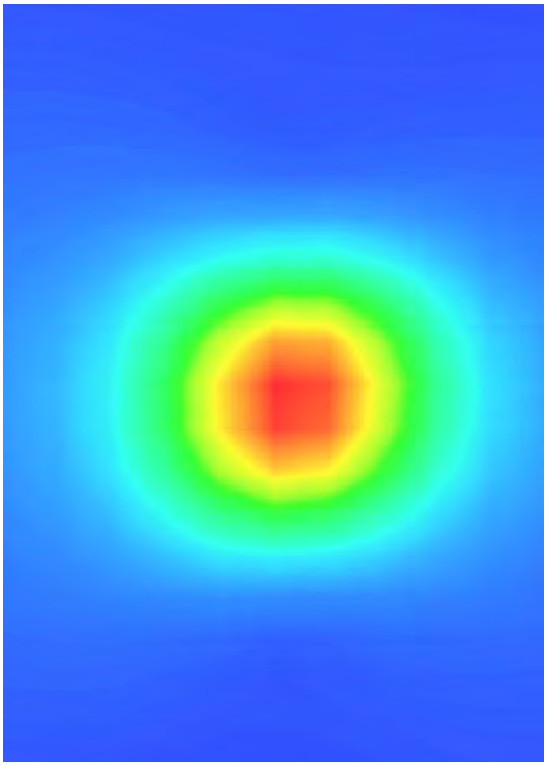
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 47.04W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 5.561507 |
| **SAR 1g (W/Kg)** | 18.257726 |

## Z Axis Scan



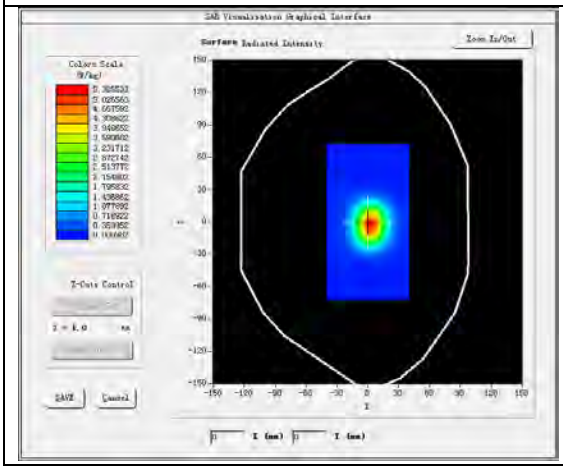
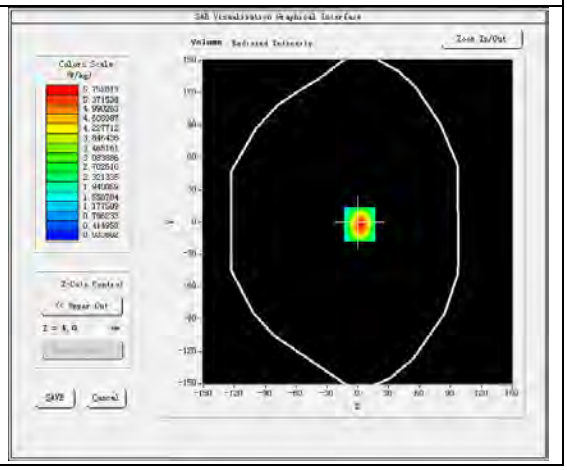

| 3D screen shot | Hot spot position |
|---|---|
|  |  |

# System Performance Check Data (5800MHz Body )

Type: Phone measurement (Complete)
E-Field Probe: SN 08/16 SSE2 EPGO295
Area scan resolution: dx=8mm,dy=8mm
Zoom scan resolution: dx=4mm, dy=4mm, dz=2mm
Date of measurement: 2018.03.19
Measurement duration: 29 minutes 27 seconds

## Experimental conditions.

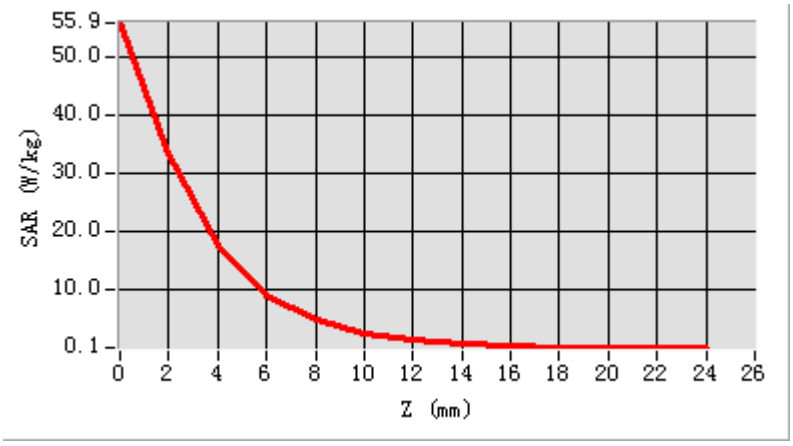
| | |
|---|---|
| **Phantom File** | surf_sam_plan.txt |
| **Phantom** | Validation plane |
| **Band** | 5800 MHz |
| **Signal** | CW |
| **Frequency (MHz)** | 5800.000000 |
| **Relative permittivity (real part)** | 47.312495 |
| **Conductivity (S/m)** | 6.131967 |
| **Power drift (%)** | -0.300000 |
| **Ambient Temperature:** | 22.5℃ |
| **Liquid Temperature:** | 21.1℃ |
| **ConvF:** | 1.82 |
| **Crest factor:** | 1:1 |

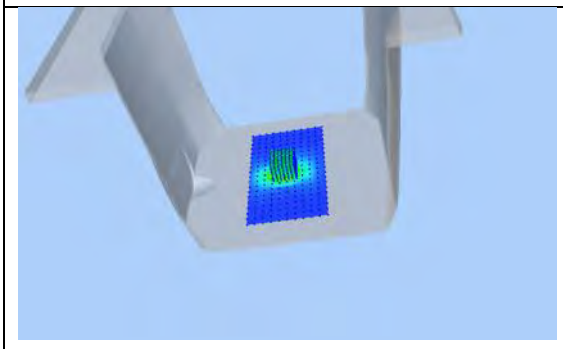
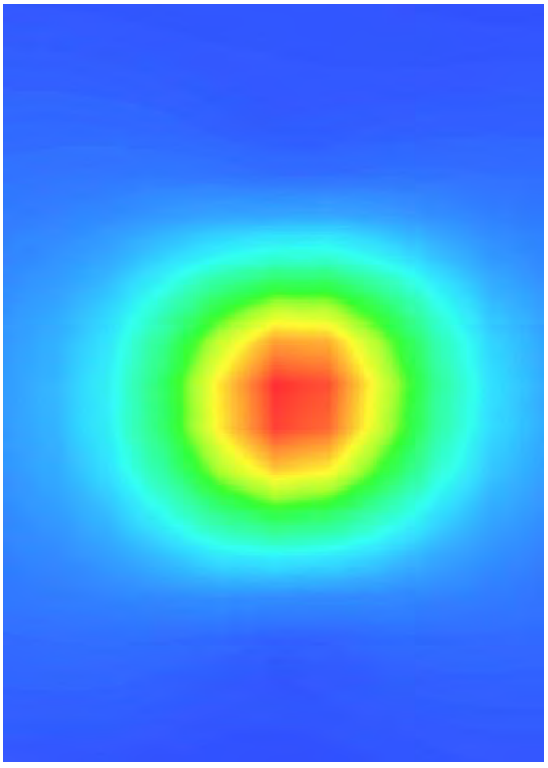
| SURFACE SAR | VOLUME SAR |
|---|---|
|  |  |

**Maximum location: X=0.00, Y=0.00**
**SAR Peak: 55.86W/kg**

| | |
|---|---|
| **SAR 10g (W/Kg)** | 6.172244 |
| **SAR 1g (W/Kg)** | 18.653954 |

## Z Axis Scan




| 3D screen shot | Hot spot position |
|---|---|
|  |  |

--END OF REPORT--