| | | | | |
|---|---|---|---|---|
| 1800 | 40.0 ±5 % | | 1.40 ±5 % | |
| 1900 | 40.0 ±5 % | | 1.40 ±5 % | |
| 1950 | 40.0 ±5 % | | 1.40 ±5 % | |
| 2000 | 40.0 ±5 % | | 1.40 ±5 % | |
| 2100 | 39.8 ±5 % | | 1.49 ±5 % | |
| 2300 | 39.5 ±5 % | | 1.67 ±5 % | |
| 2450 | 39.2 ±5 % | | 1.80 ±5 % | |
| 2600 | 39.0 ±5 % | PASS | 1.96 ±5 % | PASS |
| 3000 | 38.5 ±5 % | | 2.40 ±5 % | |
| 3500 | 37.9 ±5 % | | 2.91 ±5 % | |

## 7.2 SAR MEASUREMENT RESULT WITH HEAD LIQUID

The IEEE Std. 1528 and CEI/IEC 62209 standards state that the system validation measurements should produce the SAR values shown below (for phantom thickness of 2 mm), within the uncertainty for the system validation. All SAR values are normalized to 1 W forward power. In bracket, the measured SAR is given with the used input power.

| | |
|---|---|
| Software | OPENSAR V4 |
| Phantom | SN 20/09 SAM71 |
| Probe | SN 18/11 EPG122 |
| Liquid | Head Liquid Values: eps' : 38.2 sigma : 1.93 |
| Distance between dipole center and liquid | 10.0 mm |
| Area scan resolution | dx=8mm/dy=8mm |
| Zoon Scan Resolution | dx=5mm/dy=5mm/dz=5mm |
| Frequency | 2600 MHz |
| Input power | 20 dBm |
| Liquid Temperature | 21 °C |
| Lab Temperature | 21 °C |
| Lab Humidity | 45 % |

| Frequency MHz | 1 g SAR (W/kg/W) | | 10 g SAR (W/kg/W) | |
|---|---|---|---|---|
| | required | measured | required | measured |
| 300 | 2.85 | | 1.94 | |
| 450 | 4.58 | | 3.06 | |
| 750 | 8.49 | | 5.55 | |
| 835 | 9.56 | | 6.22 | |
| 900 | 10.9 | | 6.99 | |
| 1450 | 29 | | 16 | |
| 1500 | 30.5 | | 16.8 | |
| 1640 | 34.2 | | 18.4 | |
| 1750 | 36.4 | | 19.3 | |
| 1800 | 38.4 | | 20.1 | |



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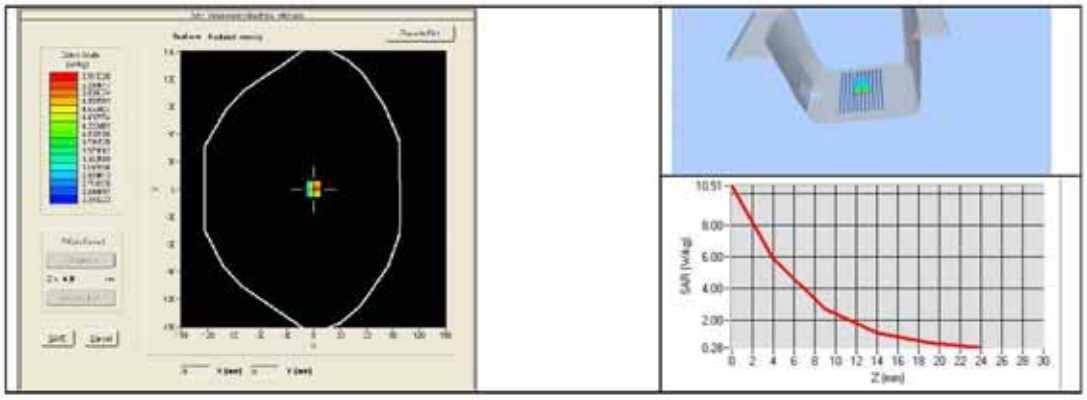
| | | | | |
|---|---|---|---|---|
| 1900 | 39.7 | | 20.5 | |
| 1950 | 40.5 | | 20.9 | |
| 2000 | 41.1 | | 21.1 | |
| 2100 | 43.6 | | 21.9 | |
| 2300 | 48.7 | | 23.3 | |
| 2450 | 52.4 | | 24 | |
| 2600 | 55.3 | 55.02 (5.50) | 24.6 | 24.30 (2.43) |
| 3000 | 63.8 | | 25.7 | |
| 3500 | 67.1 | | 25 | |




## 7.3 BODY LIQUID MEASUREMENT

| Frequency MHz | Relative permittivity (ε,') | | Conductivity (σ) S/m | |
|---|---|---|---|---|
| | required | measured | required | measured |
| 150 | 61.9 ±5 % | | 0.80 ±5 % | |
| 300 | 58.2 ±5 % | | 0.92 ±5 % | |
| 450 | 56.7 ±5 % | | 0.94 ±5 % | |
| 750 | 55.5 ±5 % | | 0.96 ±5 % | |
| 835 | 55.2 ±5 % | | 0.97 ±5 % | |
| 900 | 55.0 ±5 % | | 1.05 ±5 % | |
| 915 | 55.0 ±5 % | | 1.06 ±5 % | |
| 1450 | 54.0 ±5 % | | 1.30 ±5 % | |
| 1610 | 53.8 ±5 % | | 1.40 ±5 % | |
| 1800 | 53.3 ±5 % | | 1.52 ±5 % | |
| 1900 | 53.3 ±5 % | | 1.52 ±5 % | |
| 2000 | 53.3 ±5 % | | 1.52 ±5 % | |
| 2100 | 53.2 ±5 % | | 1.62 ±5 % | |
| 2450 | 52.7 ±5 % | | 1.95 ±5 % | |



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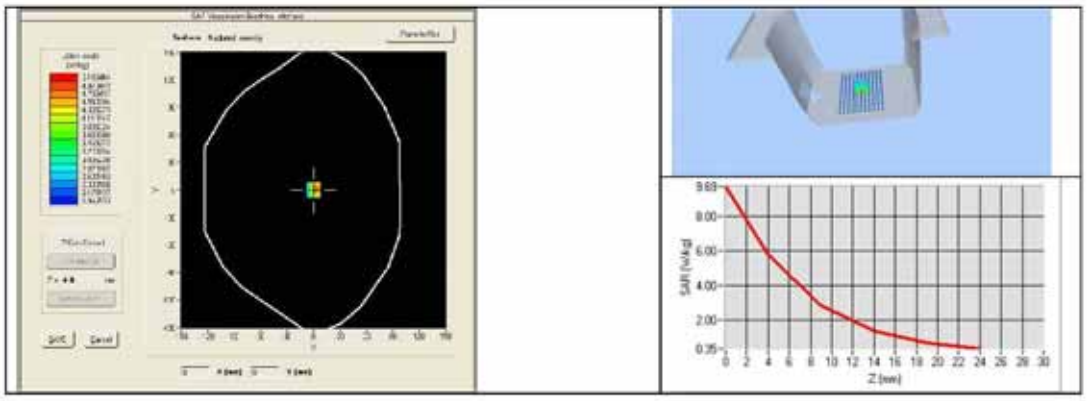
| | | | | |
|---|---|---|---|---|
| 2600 | 52.5 ±5 % | PASS | 2.16 ±5 % | PASS |
| 3000 | 52.0 ±5 % | | 2.73 ±5 % | |
| 3500 | 51.3 ±5 % | | 3.31 ±5 % | |
| 5200 | 49.0 ±10 % | | 5.30 ±10 % | |
| 5300 | 48.9 ±10 % | | 5.42 ±10 % | |
| 5400 | 48.7 ±10 % | | 5.53 ±10 % | |
| 5500 | 48.6 ±10 % | | 5.65 ±10 % | |
| 5600 | 48.5 ±10 % | | 5.77 ±10 % | |
| 5800 | 48.2 ±10 % | | 6.00 ±10 % | |

## 7.4 SAR MEASUREMENT RESULT WITH BODY LIQUID

| | |
|---|---|
| Software | OPENSAR V4 |
| Phantom | SN 20/09 SAM71 |
| Probe | SN 18/11 EPG122 |
| Liquid | Body Liquid Values: eps' : 51.6 sigma : 2.21 |
| Distance between dipole center and liquid | 10.0 mm |
| Area scan resolution | dx=8mm/dy=8mm |
| Zoon Scan Resolution | dx=5mm/dy=5mm/dz=5mm |
| Frequency | 2600 MHz |
| Input power | 20 dBm |
| Liquid Temperature | 21 °C |
| Lab Temperature | 21 °C |
| Lab Humidity | 45 % |

| Frequency MHz | 1 g SAR (W/kg/W) | 10 g SAR (W/kg/W) |
|---|---|---|
| | measured | measured |
| 2600 | 53.02 (5.30) | 23.66 (2.37) |





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## 8 LIST OF EQUIPMENT

| Equipment Summary Sheet | | | | |
|---|---|---|---|---|
| **Equipment Description** | **Manufacturer / Model** | **Identification No.** | **Current Calibration Date** | **Next Calibration Date** |
| SAM Phantom | MVG | SN-20/09-SAM71 | Validated. No cal required. | Validated. No cal required. |
| COMOSAR Test Bench | Version 3 | NA | Validated. No cal required. | Validated. No cal required. |
| Network Analyzer | Rhode & Schwarz ZVA | SN100132 | 02/2013 | 02/2016 |
| Calipers | Carrera | CALIPER-01 | 12/2013 | 12/2016 |
| Reference Probe | MVG | EPG122 SN 18/11 | 10/2014 | 10/2015 |
| Multimeter | Keithley 2000 | 1188656 | 12/2013 | 12/2016 |
| Signal Generator | Agilent E4438C | MY49070581 | 12/2013 | 12/2016 |
| Amplifier | Aethercomm | SN 046 | Characterized prior to test. No cal required. | Characterized prior to test. No cal required. |
| Power Meter | HP E4418A | US38261498 | 12/2013 | 12/2016 |
| Power Sensor | HP ECP-E26A | US37181460 | 12/2013 | 12/2016 |
| Directional Coupler | Narda 4216-20 | 01386 | Characterized prior to test. No cal required. | Characterized prior to test. No cal required. |
| Temperature and Humidity Sensor | Control Company | 11-661-9 | 8/2012 | 8/2015 |



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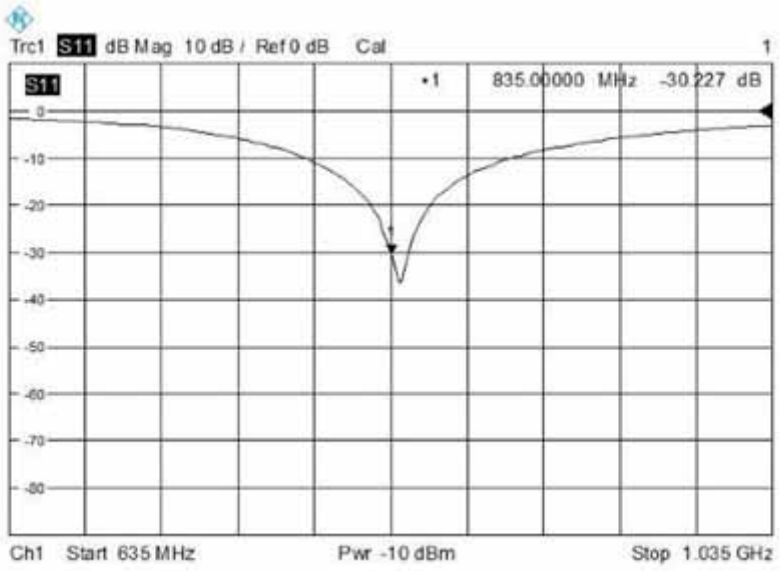
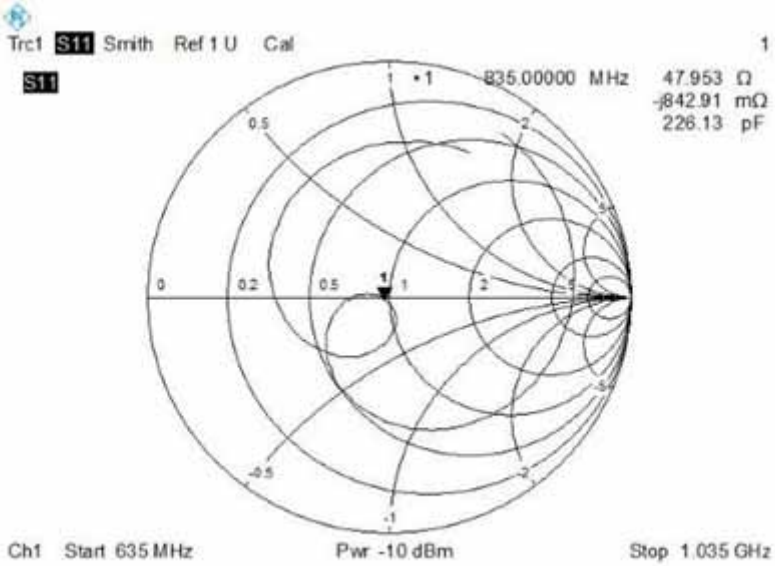
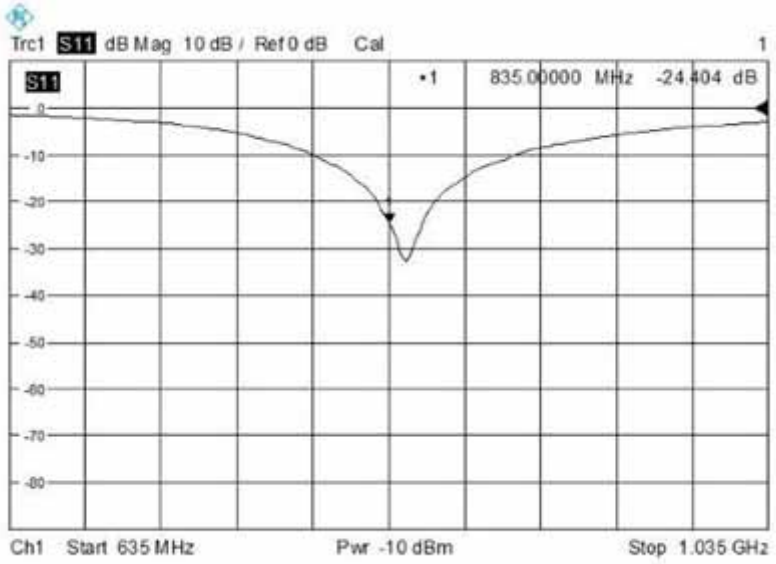
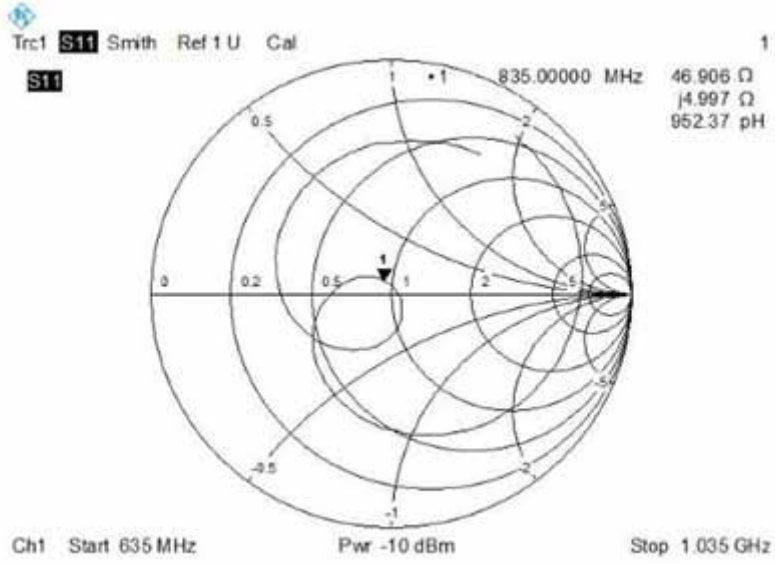
# 17 Re-calibration for Dipole

## 17.1 DIPOLE 835 (SN 09/15 DIP 0G835-358)

Return Loss and Impedance in Head liquid(Mar 15,2017)

| Frequency(MHz) | Return loss(dB) | Requirement(dB) | Impedance |
|---|---|---|---|
| 835 | -30.227 | -20 | 48.0Ω-0.842jΩ |
| Return loss | | | |
|  | | | |
| Impedance | | | |
|  | | | |

Return Loss and Impedance in Body liquid(Mar 15,2017)

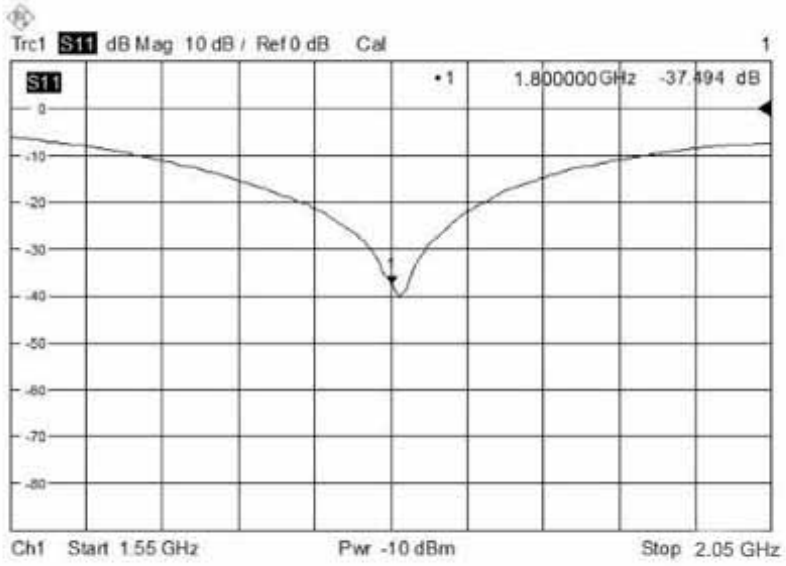
| Frequency(MHz) | Return loss(dB) | Requirement(dB) | Impedance |
|---|---|---|---|
| 835 | -24.404 | -20 | 46.9Ω+4.997jΩ |
| Return loss | | | |
|  | | | |
| Impedance | | | |
|  | | | |

## 17.2 DIPOLE 1800 (SN 09/15 DIP 1G800-360)

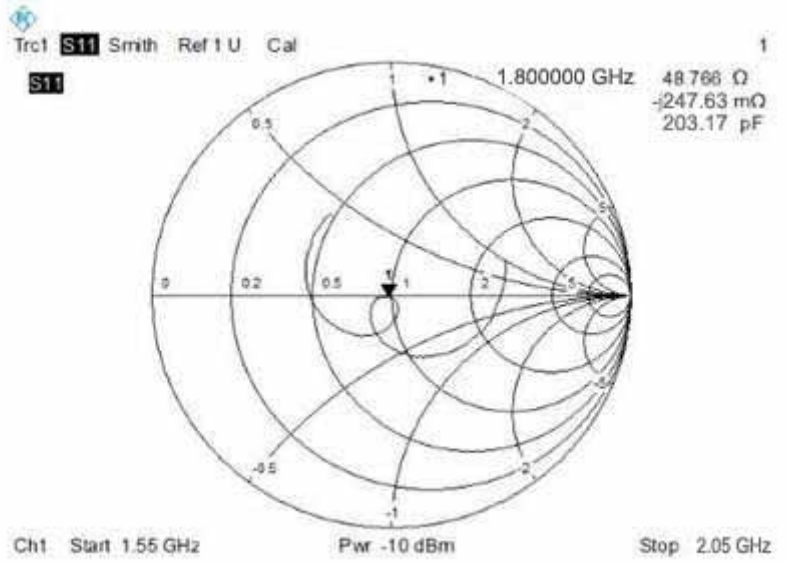
Return Loss and Impedance in Head liquid(Mar 16,2017)

| Frequency(MHz) | Return loss(dB) | Requirement(dB) | Impedance |
|---|---|---|---|
| 1800 | -37.494 | -20 | 48.766Ω-0.248jΩ |

Return loss



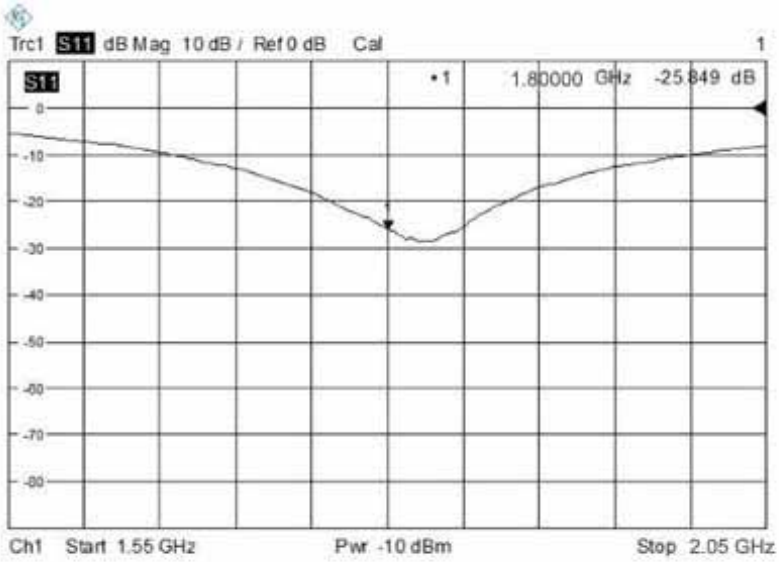

Impedance



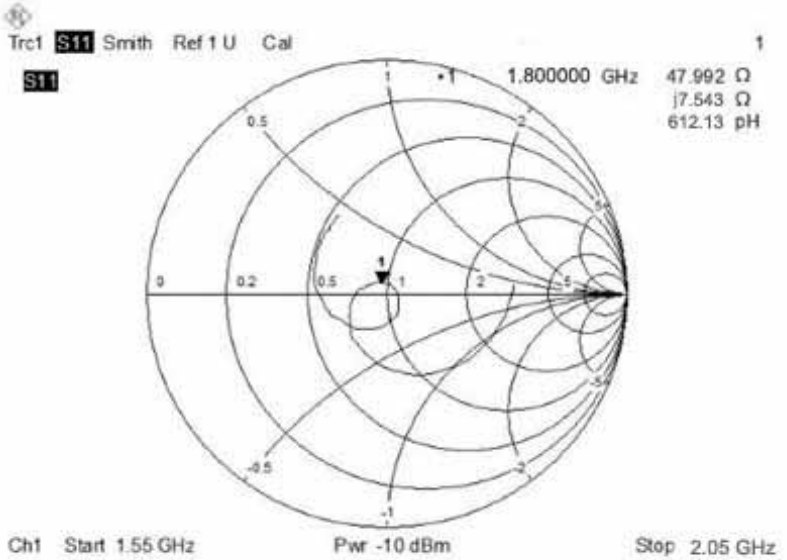
Return Loss and Impedance in Body liquid(Mar 16,2017)

| Frequency(MHz) | Return loss(dB) | Requirement(dB) | Impedance |
|---|---|---|---|
| 1800 | -25.849 | -20 | 47.992Ω+7.543jΩ |

Return loss




Impedance

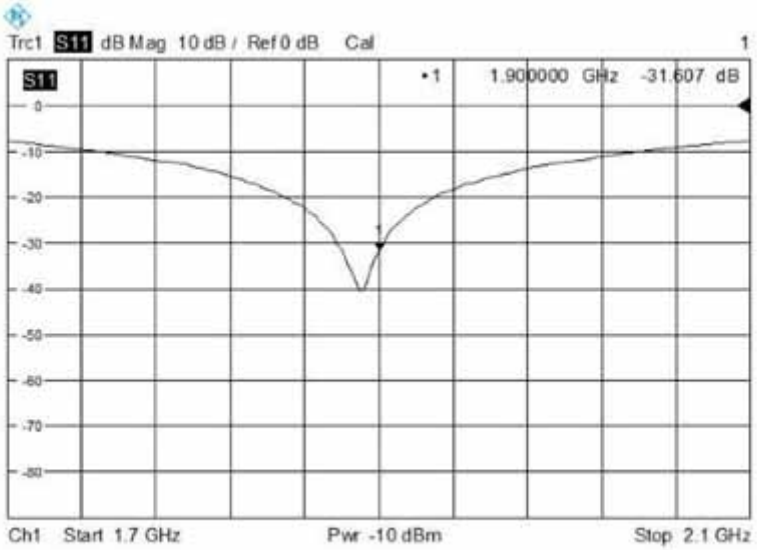


### 17.3 DIPOLE 1900 (SN 09/15 DIP 1G900-361)

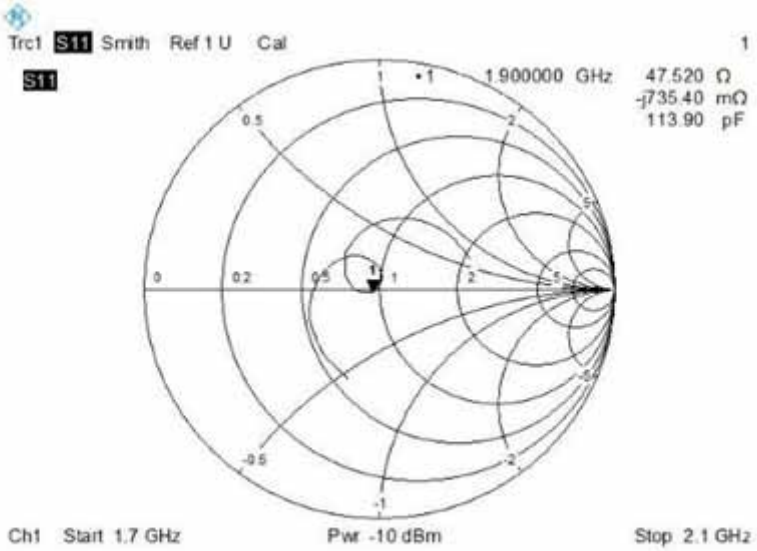
Return Loss and Impedance in Head liquid(Mar 16,2017)

| Frequency(MHz) | Return loss(dB) | Requirement(dB) | Impedance |
|---|---|---|---|
| 1900 | -31.607 | -20 | 47.52Ω-0.735jΩ |

Return loss

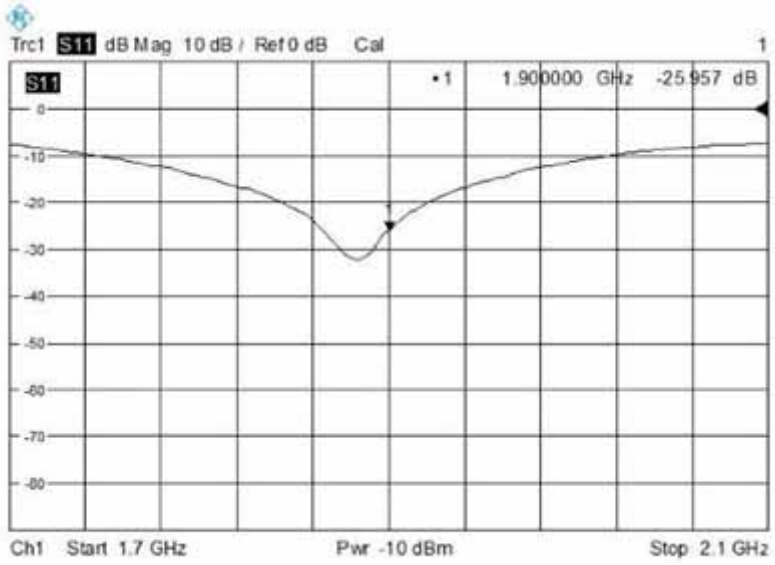



Impedance

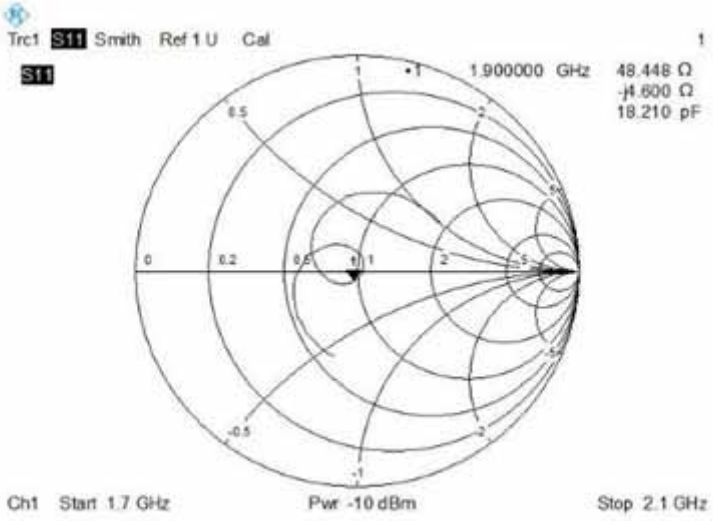


Return Loss and Impedance in Body liquid(Mar 16,2017)

| Frequency(MHz) | Return loss(dB) | Requirement(dB) | Impedance |
|---|---|---|---|
| 1900 | -25.967 | -20 | 48.4Ω-4.6jΩ |
| Return loss | | | |




| Impedance |
|---|

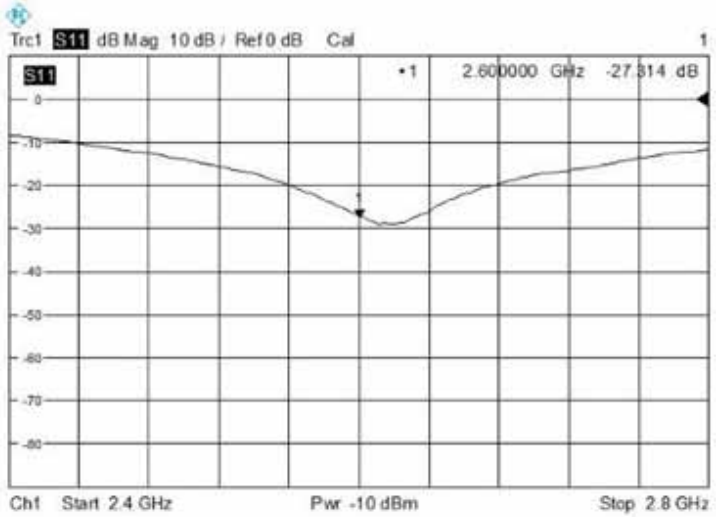


## 17.4 DIPOLE 2600 (SN 16/15 DIP 2G600-376)

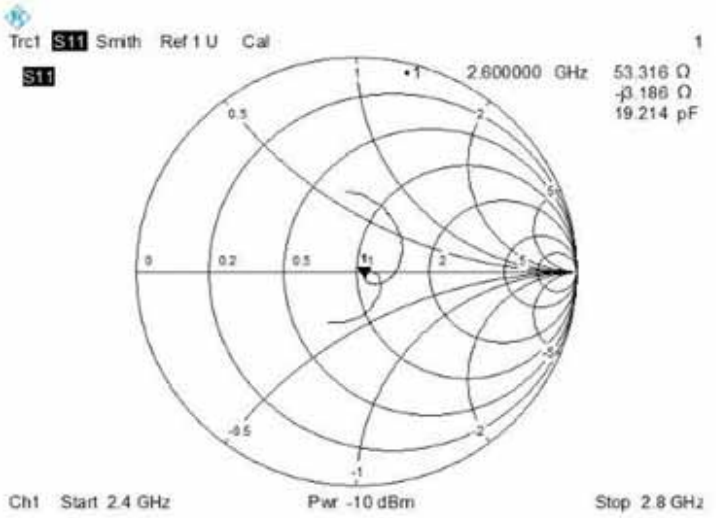
Return Loss and Impedance in Head liquid(Mar 18,2017)

| Frequency(MHz) | Return loss(dB) | Requirement(dB) | Impedance |
|---|---|---|---|
| 2600 | -27.314 | -20 | 53.316Ω-3.186jΩ |

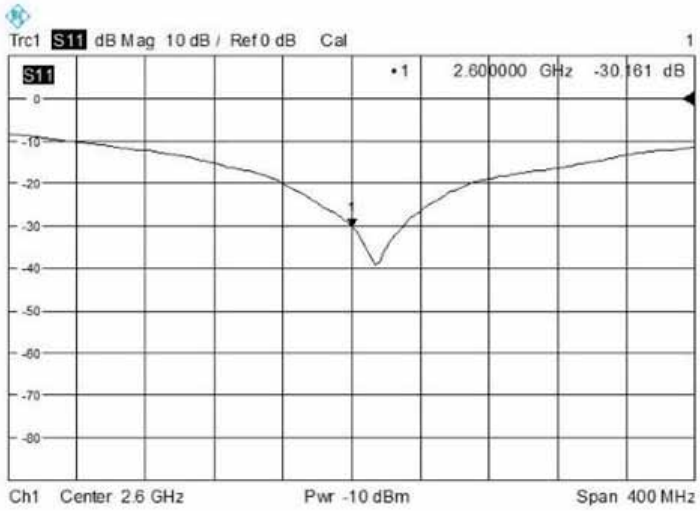
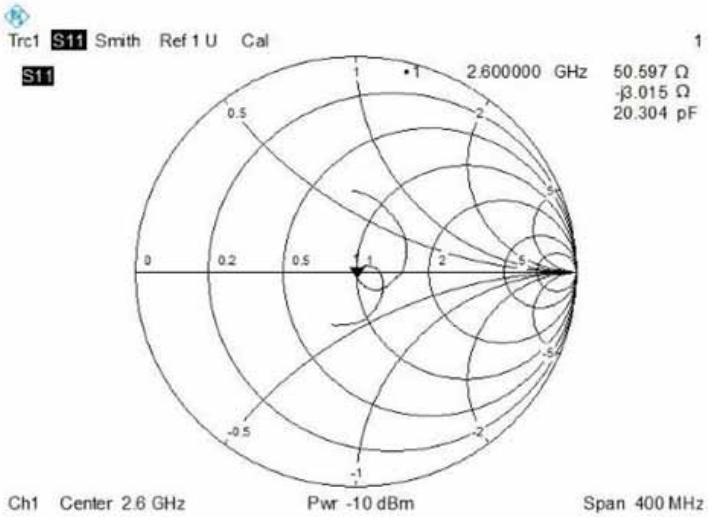
Return loss




Impedance



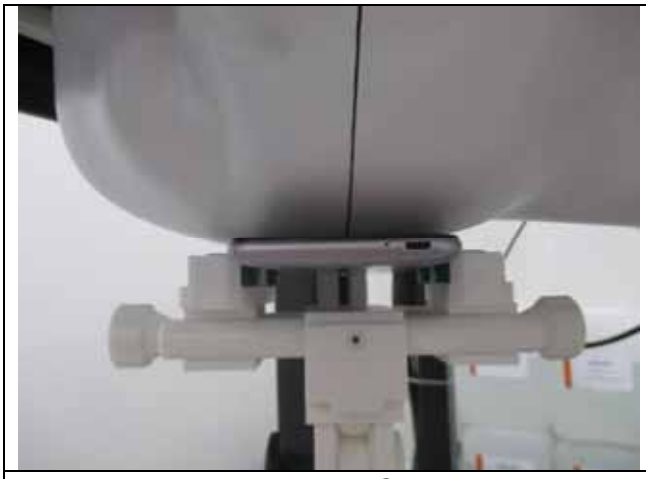
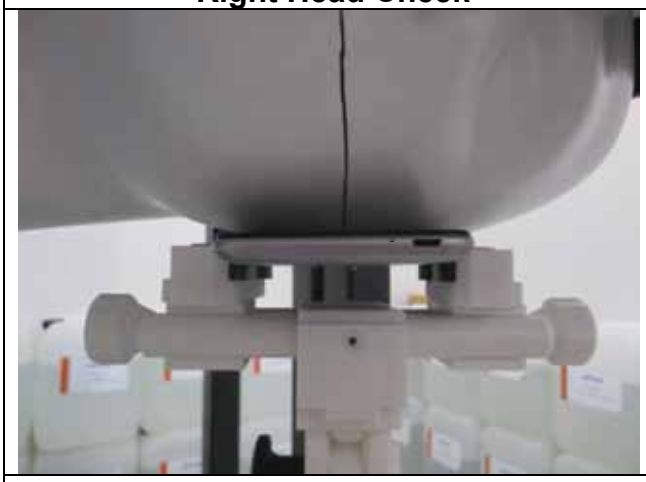
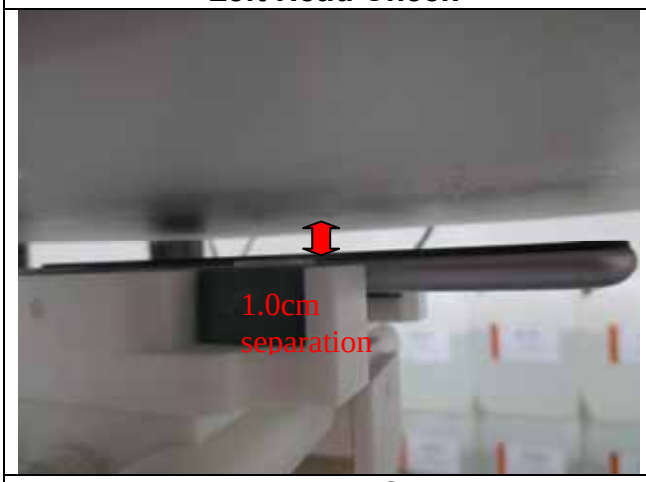
Return Loss and Impedance in Body liquid(Mar 18,2017)

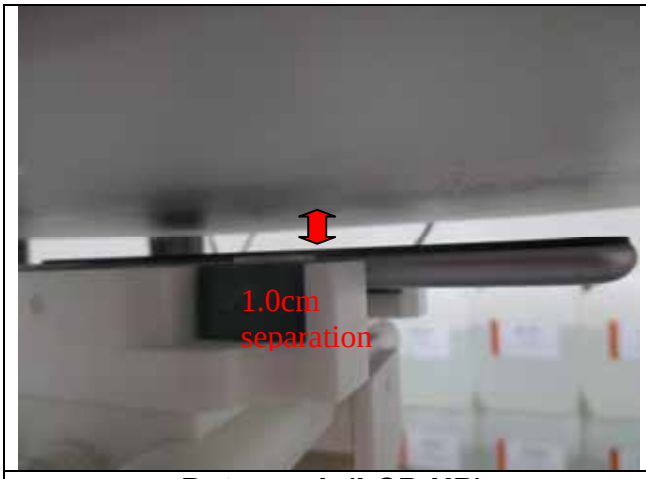
| Frequency(MHz) | Return loss(dB) | Requirement(dB) | Impedance |
|---|---|---|---|
| 2600 | -30.161 | -20 | 50.597Ω-3.015jΩ |
| Return loss | | | |
|  | | | |
| Impedance | | | |
|  | | | |

# 18 SAR System Photos

Liquid depth ≥ 15cm

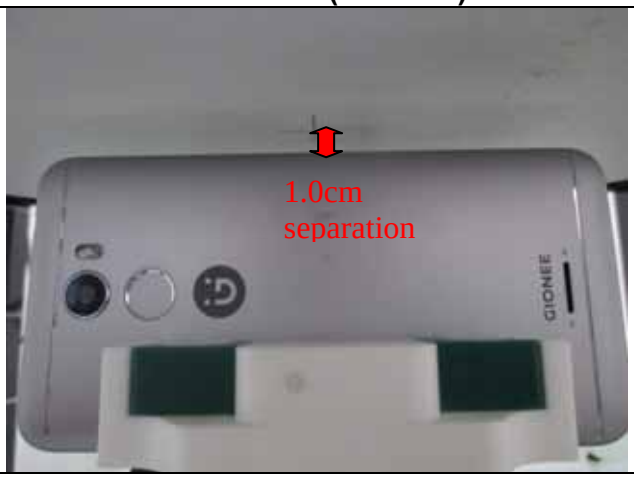
# 19 Setup Photos

| | |
|---|---|
|  | |
| **Right Head Cheek** | **Right Head Tilt** |
|  | |
| **Left Head Cheek** | **Left Head Tilt** |
|   | |
| **Body-Worn(LCD UP)** | **Body-Worn(LCD Down)** |

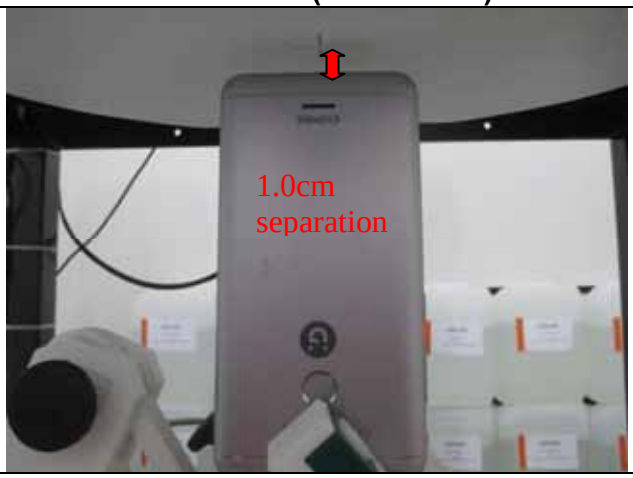



**Data mode(LCD UP)**

**Data mode (LCD Down)**




**Data mode(RIGHT EDGE)**




**Data mode(BOTTOM EDGE)**

# 20 EUT Photos

**Front side**

**Back side**

======End of report======