

| | | | | | | | | | | |
|--|------------------------------|--|------|---|------------|------|------|------|------|----------|
| | uncertainty | | | | | | | | | |
| 17 | Drift of output power | B | 5.0 | R | $\sqrt{3}$ | 1 | 1 | 2.9 | 2.9 | ∞ |
| Phantom and set-up | | | | | | | | | | |
| 18 | Phantom uncertainty | B | 4.0 | R | $\sqrt{3}$ | 1 | 1 | 2.3 | 2.3 | ∞ |
| 19 | Liquid conductivity (target) | B | 5.0 | R | $\sqrt{3}$ | 0.64 | 0.43 | 1.8 | 1.2 | ∞ |
| 20 | Liquid conductivity (meas.) | A | 2.06 | N | 1 | 0.64 | 0.43 | 1.32 | 0.89 | 43 |
| 21 | Liquid permittivity (target) | B | 5.0 | R | $\sqrt{3}$ | 0.6 | 0.49 | 1.7 | 1.4 | ∞ |
| 22 | Liquid permittivity (meas.) | A | 1.6 | N | 1 | 0.6 | 0.49 | 1.0 | 0.8 | 521 |
| Combined standard uncertainty | | $u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$ | | | | | | 13.5 | 13.4 | 257 |
| Expanded uncertainty (confidence interval of 95 %) | | $u_e = 2u_c$ | | | | | | 27.0 | 26.8 | |

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

| No. | Name | Type | Serial Number | Calibration Date | Valid Period |
|-----|-----------------------|---------------|---------------|--------------------------|--------------|
| 01 | Network analyzer | E5071C | MY46110673 | January 13, 2017 | One year |
| 02 | Power meter | NRVD | 102083 | September 22, 2016 | One year |
| 03 | Power sensor | NRV-Z5 | 100595 | | |
| 04 | Signal Generator | E4438C | MY49071430 | January 13, 2017 | One Year |
| 05 | Amplifier | 60S1G4 | 0331848 | No Calibration Requested | |
| 06 | BTS | E5515C | MY50263375 | January 16, 2017 | One year |
| 07 | BTS | CMW500 | 159890 | November 25, 2016 | One year |
| 08 | E-field Probe | SPEAG EX3DV4 | 3846 | January 13, 2017 | One year |
| 09 | DAE | SPEAG DAE4 | 1331 | January 19, 2017 | One year |
| 10 | Dipole Validation Kit | SPEAG D835V2 | 4d069 | July 20, 2016 | One year |
| 11 | Dipole Validation Kit | SPEAG D1900V2 | 5d101 | July 28, 2016 | One year |
| 12 | Dipole Validation Kit | SPEAG D2450V2 | 853 | July 25, 2016 | One year |
| 13 | Dipole Validation Kit | SPEAG D2600V2 | 1012 | July 25, 2016 | One year |

END OF REPORT BODY

ANNEX A Graph Results

850 Right Cheek High

Date: 2017-7-14

Electronics: DAE4 Sn1331

Medium: Head 850 MHz

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.92$ mho/m; $\epsilon_r = 42.17$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: GSM 850 Frequency: 848.8 MHz Duty Cycle: 1:8.3

Probe: EX3DV4 – SN3846 ConvF(9.33, 9.33, 9.33)

Area Scan (91x131x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.285 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.800 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.330 W/kg

SAR(1 g) = 0.261 W/kg; SAR(10 g) = 0.199 W/kg

Maximum value of SAR (measured) = 0.286 W/kg

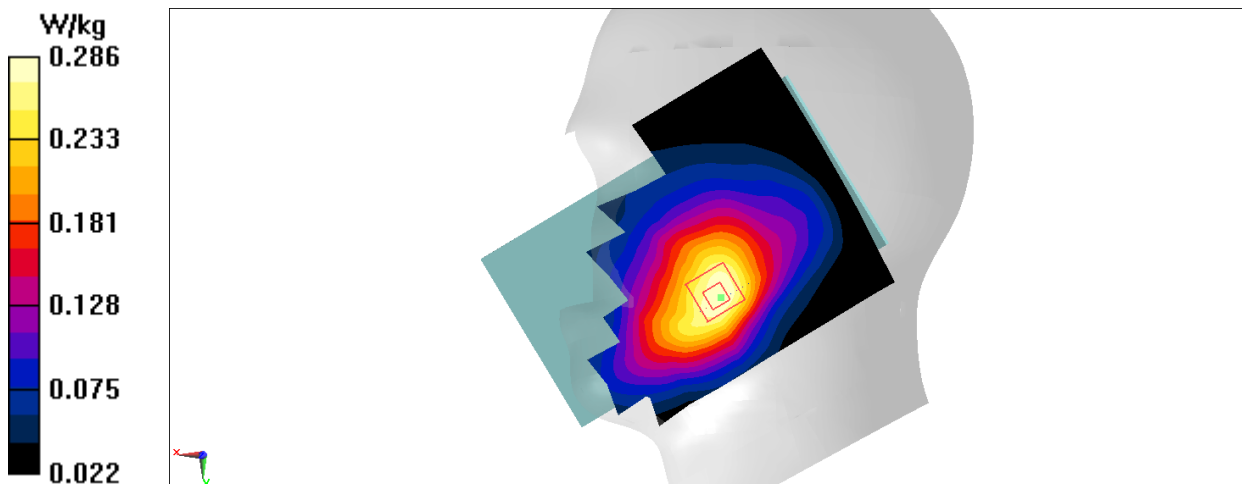


Fig.1 850MHz

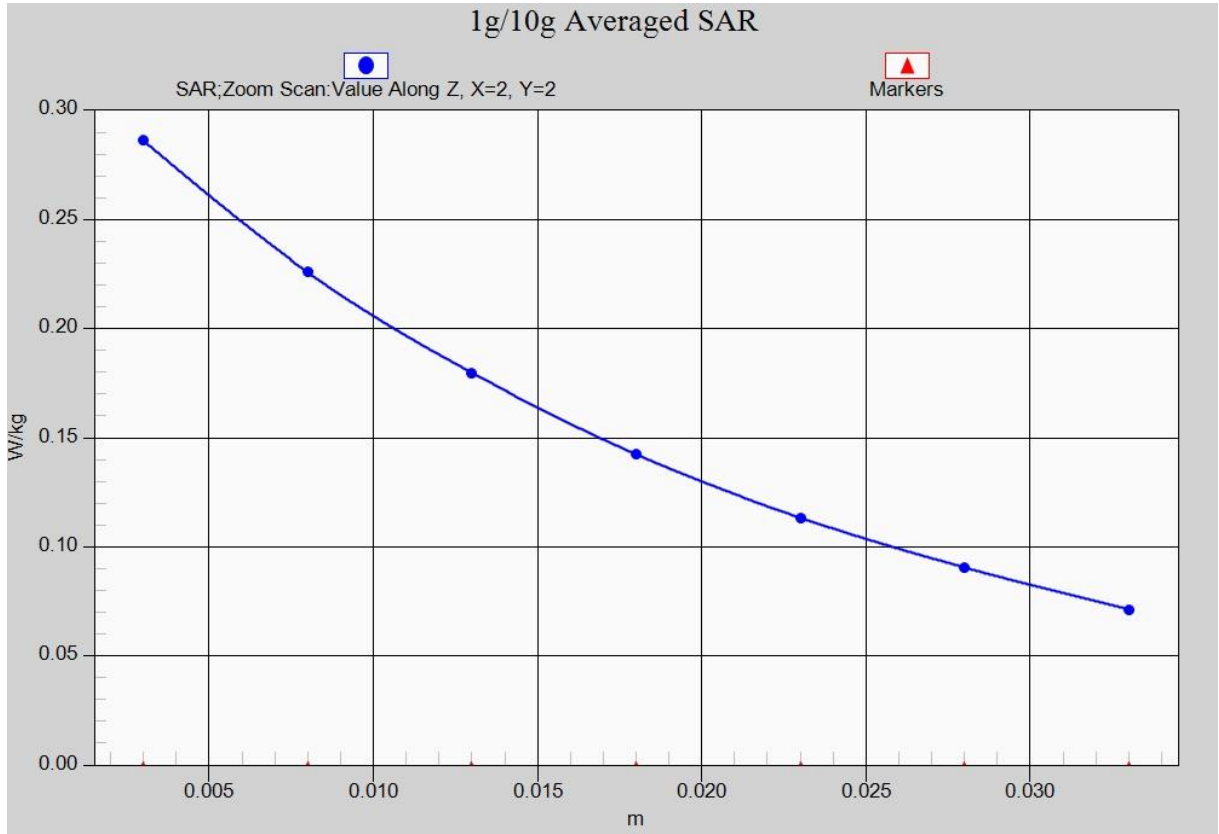


Fig. 1-1 Z-Scan at power reference point (850 MHz)

850 Body Left High

Date: 2017-7-14

Electronics: DAE4 Sn1331

Medium: Body 850 MHz

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.993$ mho/m; $\epsilon_r = 54.01$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: GSM 850 GPRS Frequency: 848.8 MHz Duty Cycle: 1:2

Probe: EX3DV4 – SN3846 ConvF(9.52, 9.52, 9.52)

Area Scan (151x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.44 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.74 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 1.97 W/kg

SAR(1 g) = 1.09 W/kg; SAR(10 g) = 0.615 W/kg

Maximum value of SAR (measured) = 1.56 W/kg

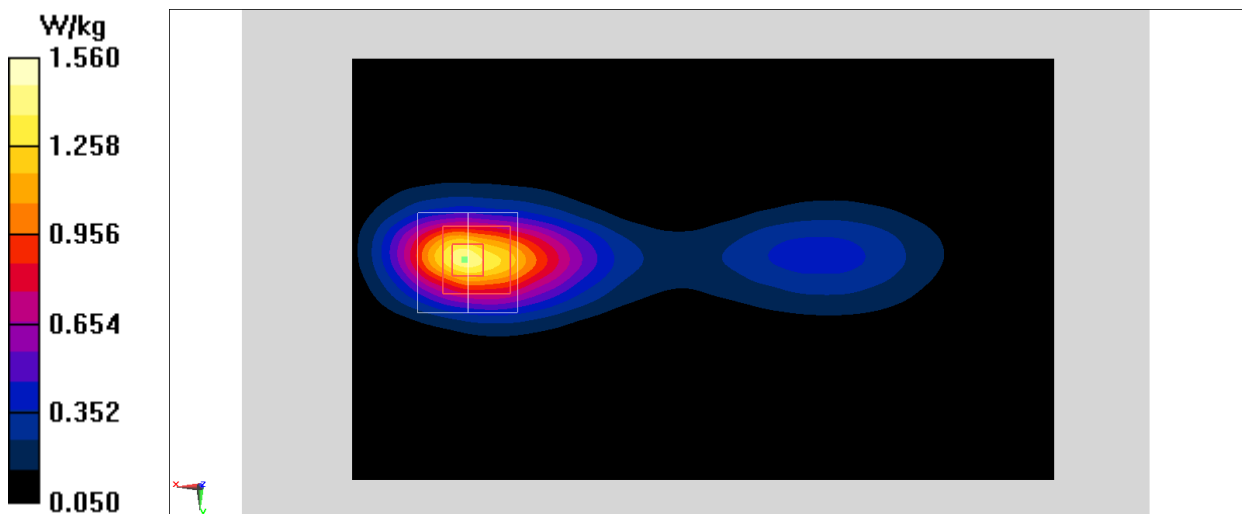


Fig.2 850 MHz

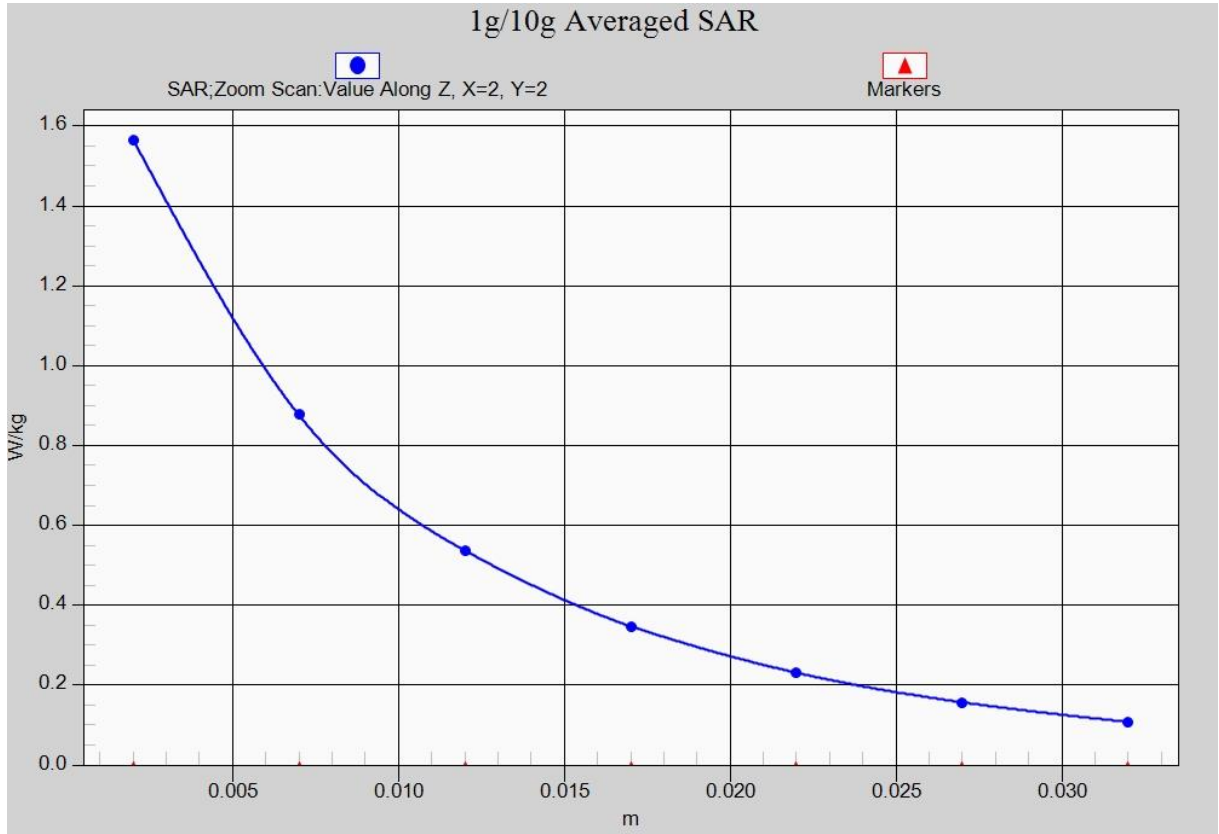


Fig. 2-1 Z-Scan at power reference point (850 MHz)

1900 Left Cheek Low

Date: 2017-7-15

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.405$ mho/m; $\epsilon_r = 40.58$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1850.2 MHz Duty Cycle: 1:8.3

Probe: EX3DV4- SN3846 ConvF(7.89, 7.89, 7.89)

Area Scan (81x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0585 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.567 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.0690 W/kg

SAR(1 g) = 0.049 W/kg; SAR(10 g) = 0.033 W/kg

Maximum value of SAR (measured) = 0.0522 W/kg

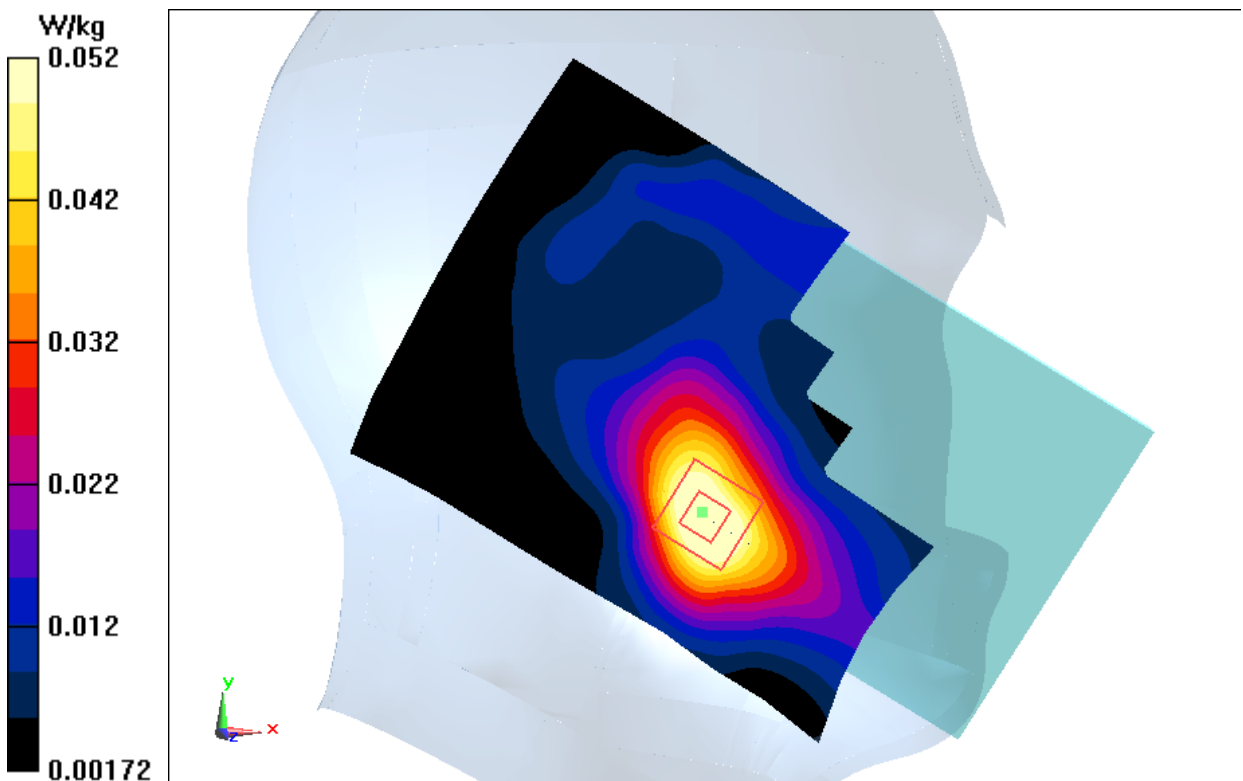


Fig.3 1900 MHz

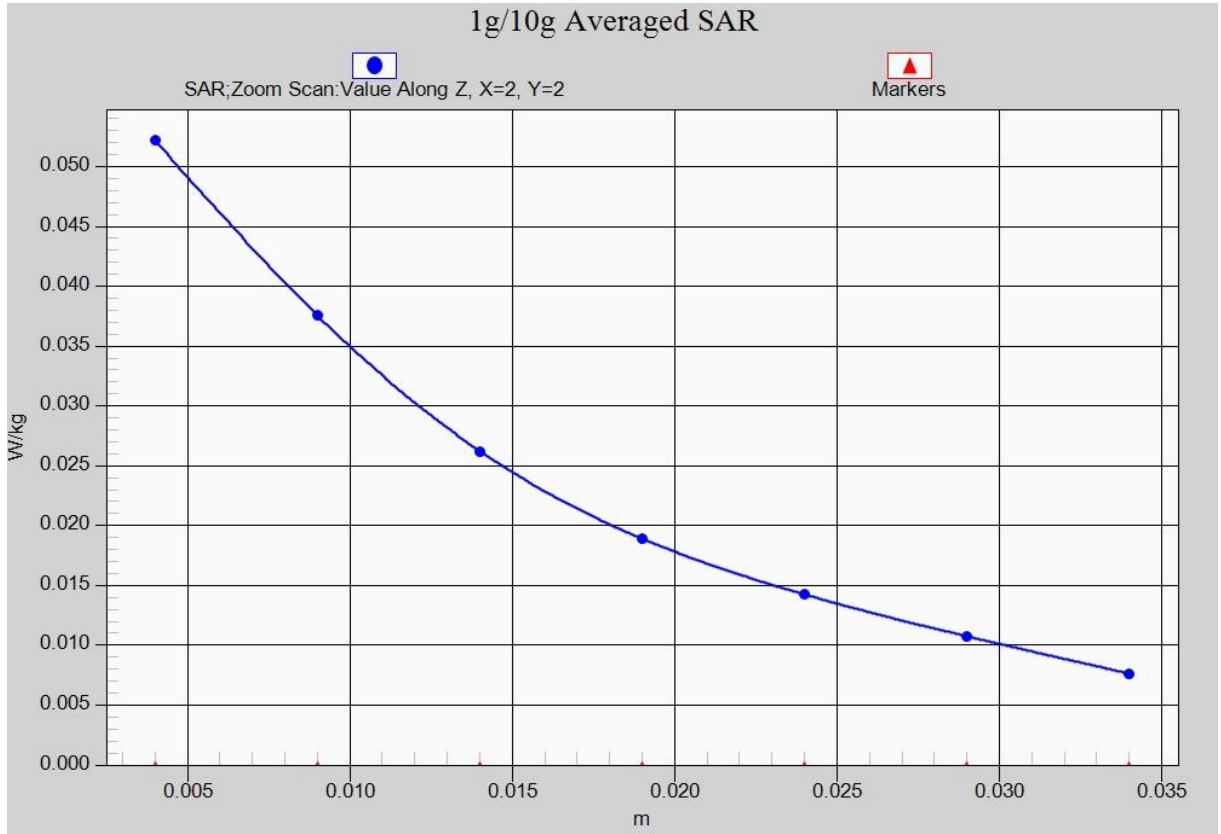


Fig. 3-1 Z-Scan at power reference point (1900 MHz)

1900 Body Bottom Middle

Date: 2017-7-15

Electronics: DAE4 Sn1331

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.546$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: GSM 1900MHz GPRS Frequency: 1880 MHz Duty Cycle: 1:2.67

Probe: EX3DV4– SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (151x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.946 W/kg

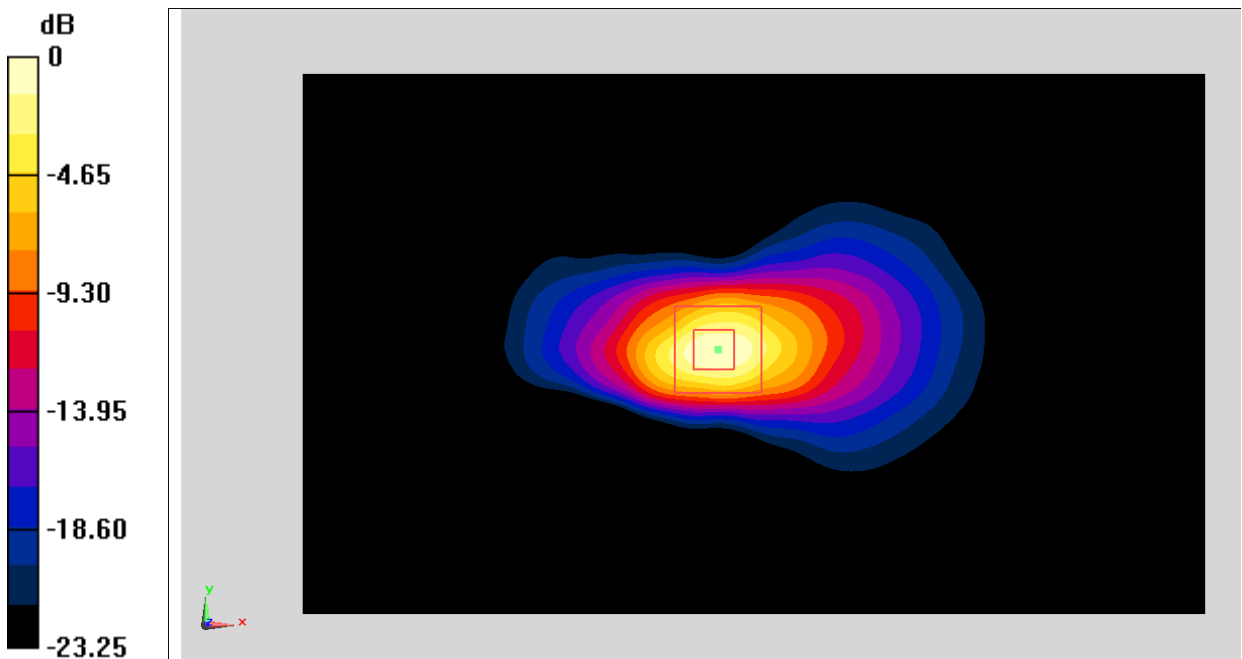
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.15 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.58 W/kg

SAR(1 g) = 0.723 W/kg; SAR(10 g) = 0.300 W/kg

Maximum value of SAR (measured) = 1.21 W/kg



0 dB = 0.946 W/kg = -0.24 dBW/kg

Fig.4 1900 MHz

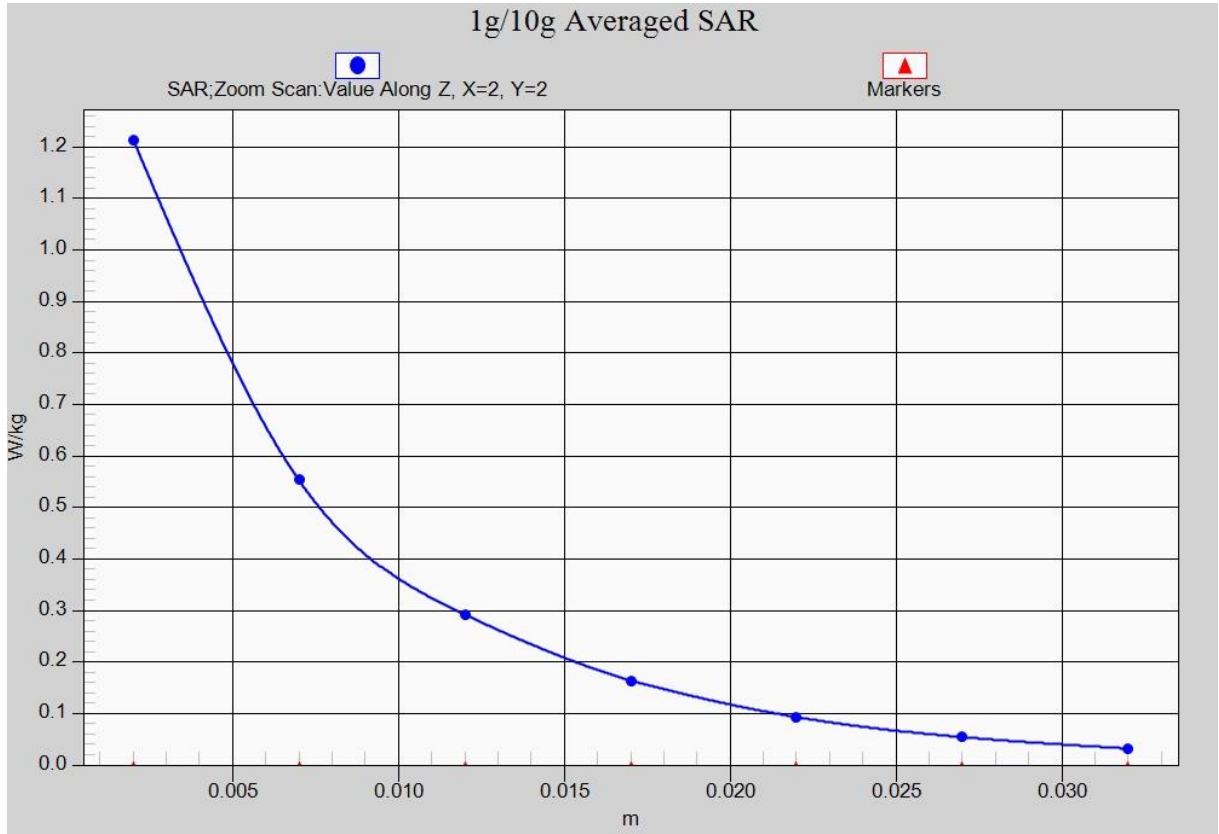


Fig. 4-1 Z-Scan at power reference point (1900 MHz)

WCDMA 850 Right Cheek Middle

Date: 2017-7-14

Electronics: DAE4 Sn1331

Medium: Head 850 MHz

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.908$ mho/m; $\epsilon_r = 42.305$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: WCDMA; Frequency: 836.4 MHz; Duty Cycle: 1:1

Probe: EX3DV4 – SN3846 ConvF(9.33, 9.33, 9.33)

Area Scan (91x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.308 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.069 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.367 W/kg

SAR(1 g) = 0.287 W/kg; SAR(10 g) = 0.218 W/kg

Maximum value of SAR (measured) = 0.318 W/kg

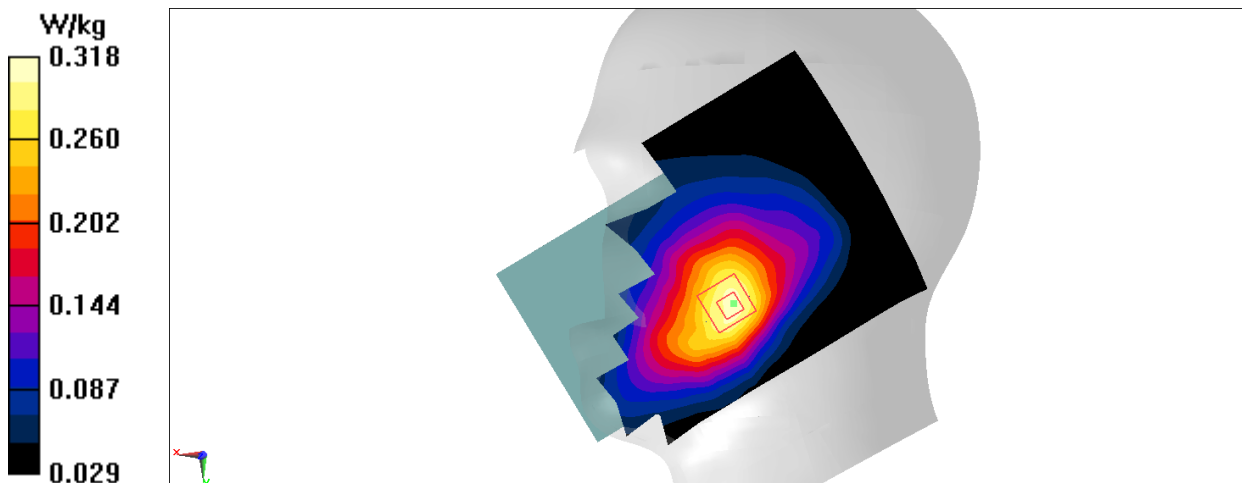


Fig.5 WCDMA 850

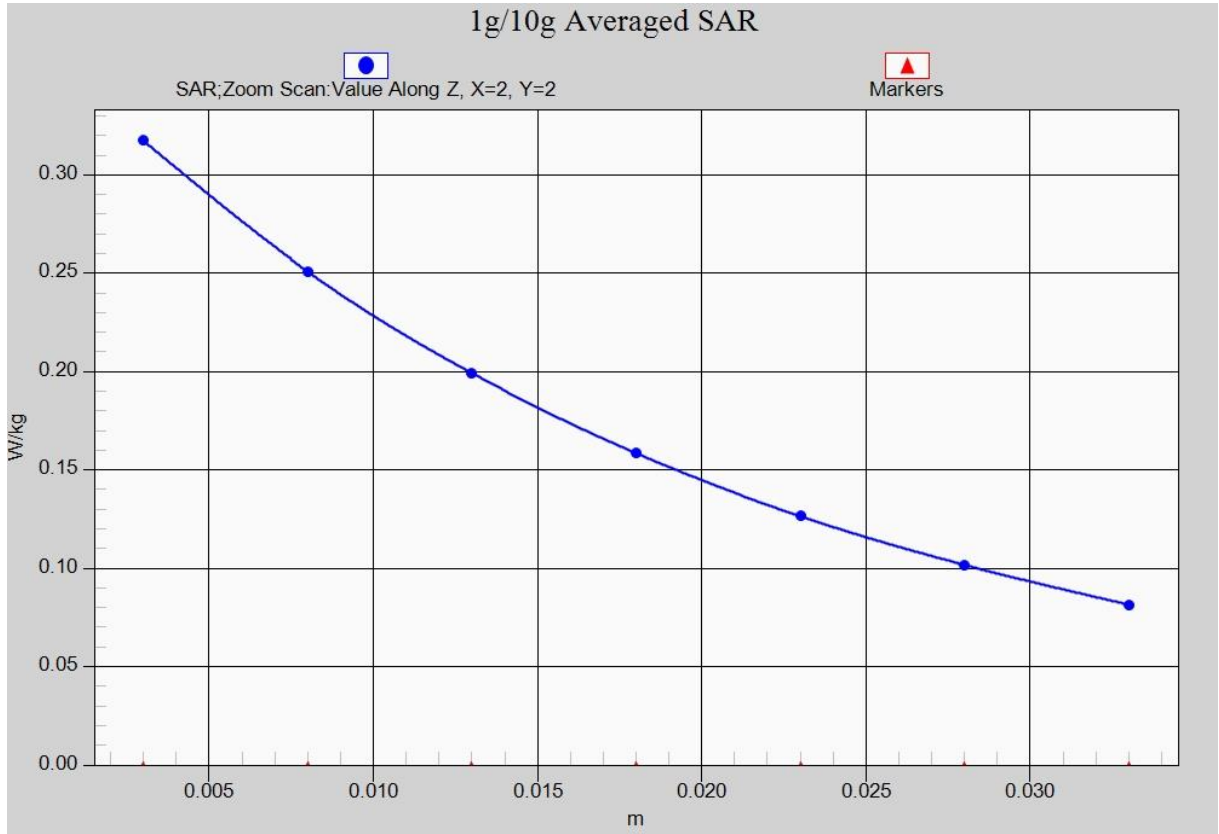


Fig. 5-1 Z-Scan at power reference point (850 MHz)

WCDMA 850 Body Left Middle

Date: 2017-7-14

Electronics: DAE4 Sn1331

Medium: Body 850 MHz

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 54.116$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: WCDMA; Frequency: 836.4 MHz; Duty Cycle: 1:1

Probe: EX3DV4 – SN3846 ConvF(9.52, 9.52, 9.52)

Area Scan (111x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.37 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.30 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 1.87 W/kg

SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.616 W/kg

Maximum value of SAR (measured) = 1.20 W/kg

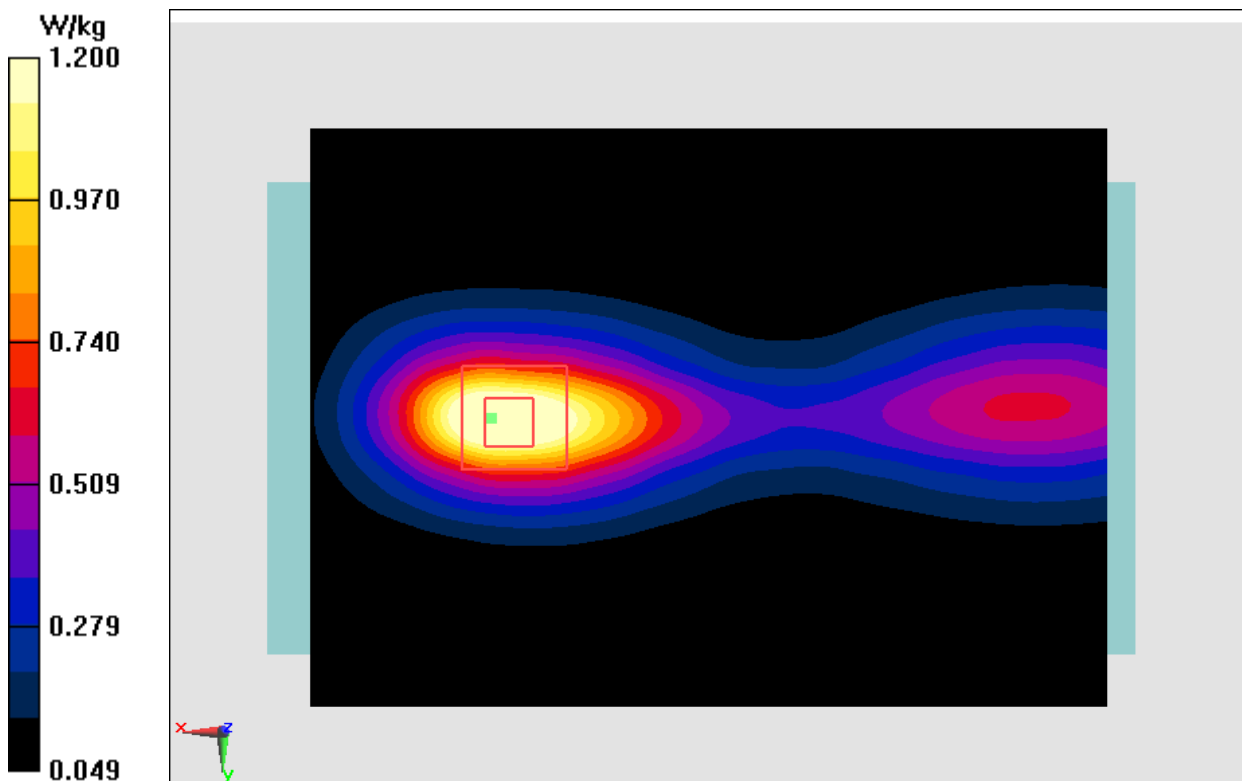


Fig.6 WCDMA 850

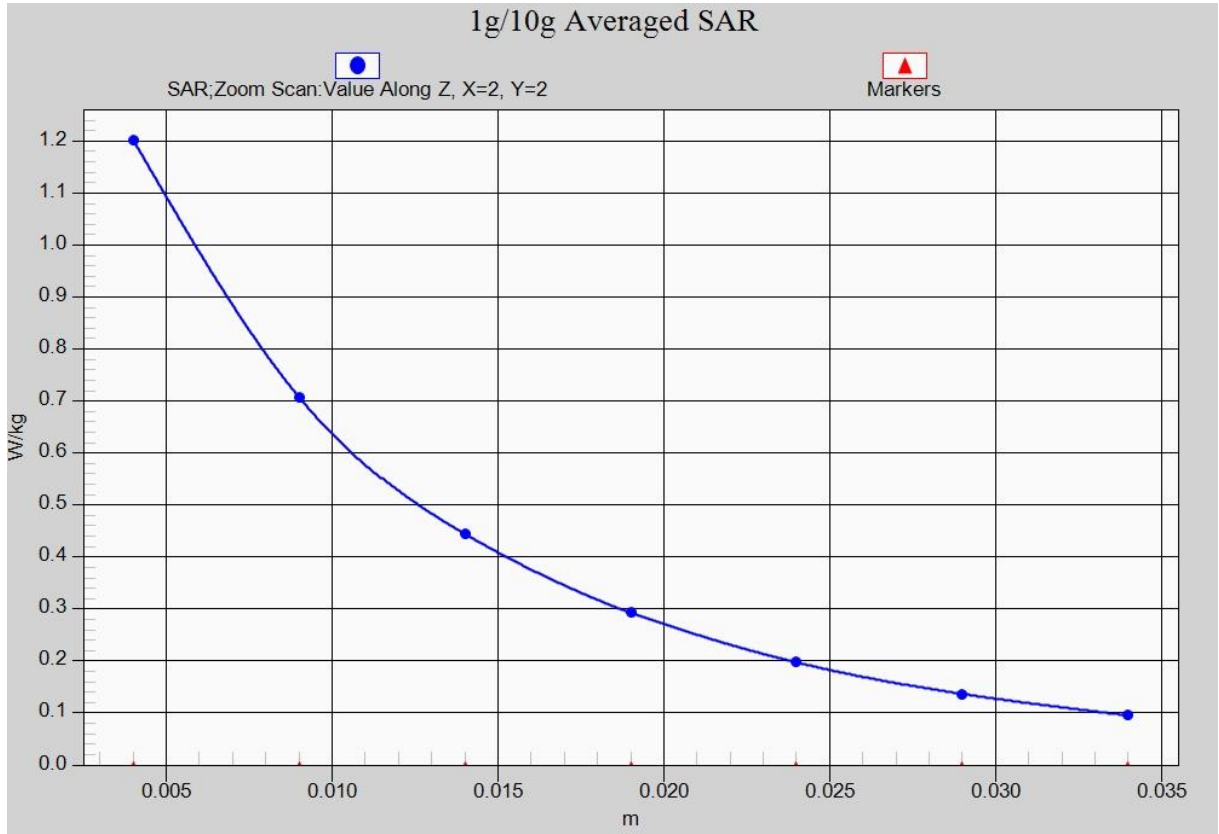


Fig. 6-1 Z-Scan at power reference point (WCDMA850)

WCDMA 1900 Left Cheek High

Date: 2017-7-15

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1907.6$ MHz; $\sigma = 1.481$ mho/m; $\epsilon_r = 40.726$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: WCDMA 1900 Frequency: 1907.6 MHz Duty Cycle: 1:1

Probe: EX3DV4- SN3846 ConvF(7.89, 7.89, 7.89)

Area Scan (81x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.113 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.018 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.131 W/kg

SAR(1 g) = 0.095 W/kg; SAR(10 g) = 0.061 W/kg

Maximum value of SAR (measured) = 0.101 W/kg

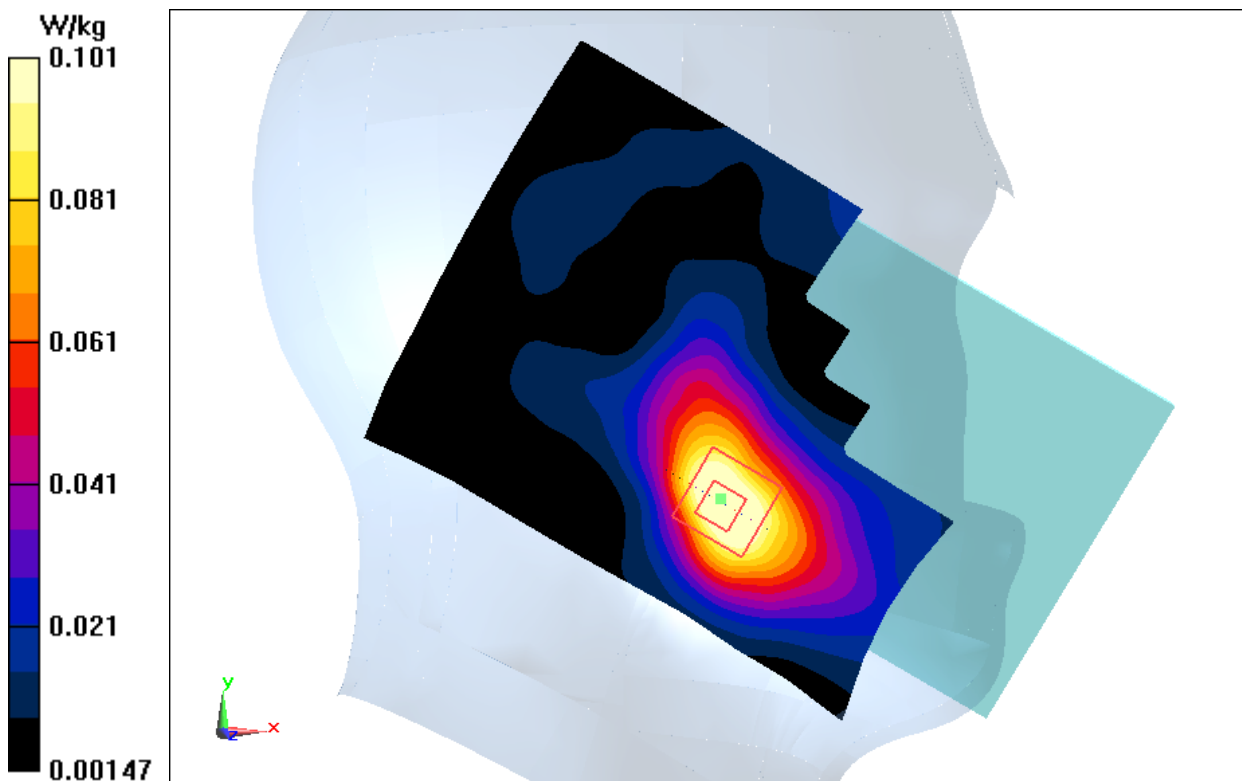


Fig.7 WCDMA1900

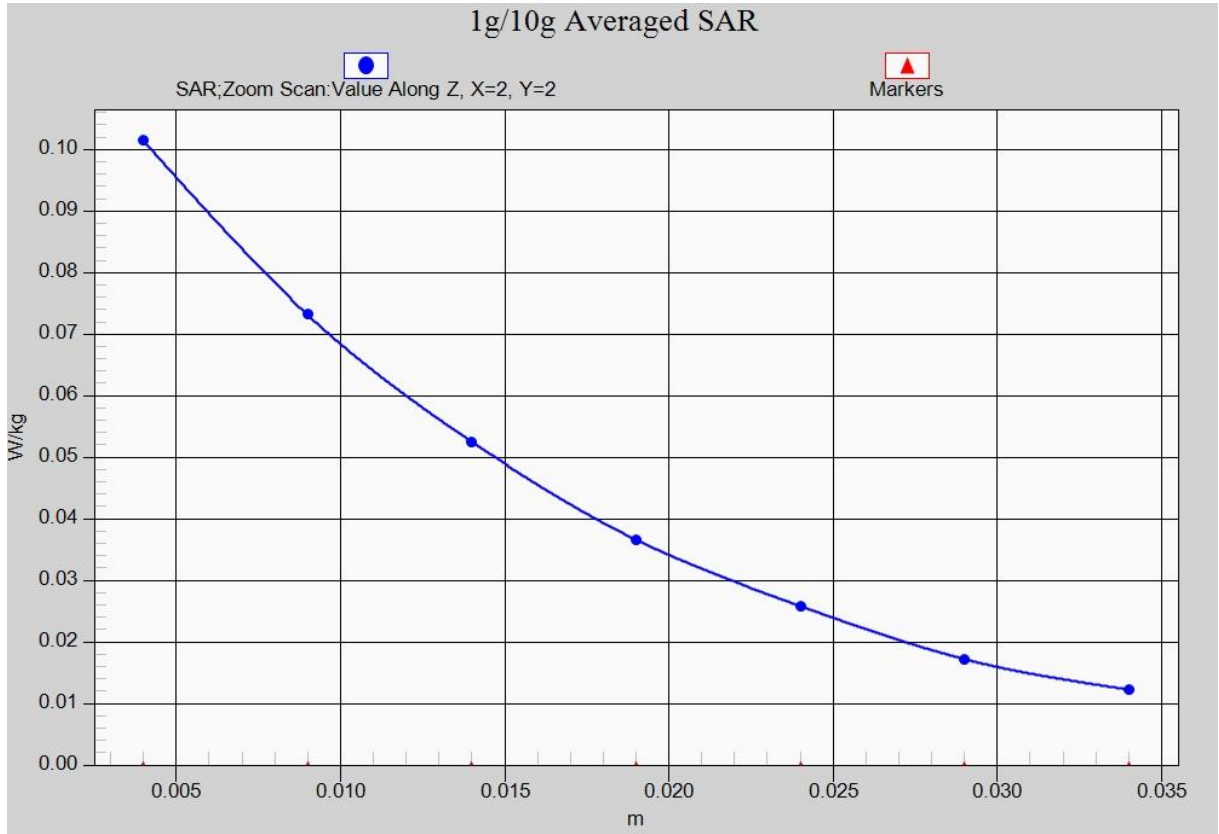


Fig. 7-1 Z-Scan at power reference point (WCDMA1900)

WCDMA 1900 Body Bottom High

Date: 2017-7-15

Electronics: DAE4 Sn1331

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1907.6$ MHz; $\sigma = 1.562$ mho/m; $\epsilon_r = 52.57$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: WCDMA 1900 Frequency: 1907.6 MHz Duty Cycle: 1:1

Probe: EX3DV4- SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (151x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.87 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.65 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 2.50 W/kg

SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.467 W/kg

Maximum value of SAR (measured) = 1.81 W/kg

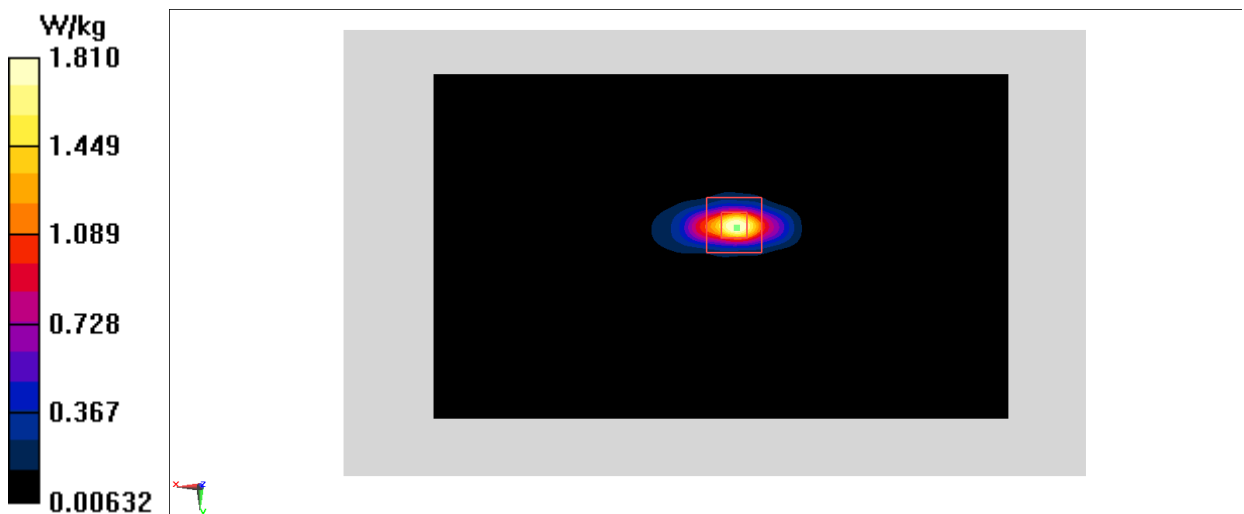


Fig.8 WCDMA1900

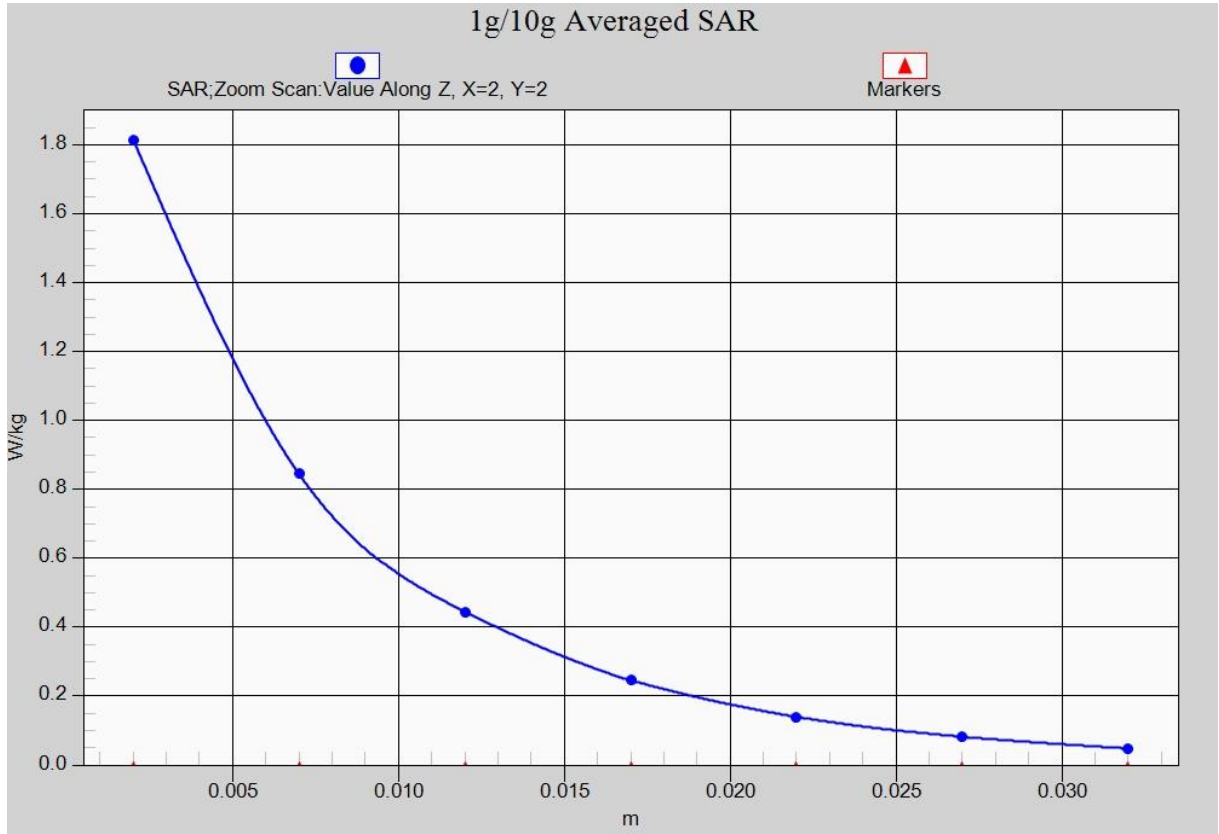


Fig. 8-1 Z-Scan at power reference point (WCDMA1900)

LTE Band2 Left Cheek Low with QPSK_20M_1RB_Low

Date: 2017-7-15

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used: $f = 1860$ MHz; $\sigma = 1.373$ mho/m; $\epsilon_r = 40.71$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: LTE Band2 Frequency: 1860 MHz Duty Cycle: 1:1

Probe: EX3DV4– SN3846 ConvF(7.89, 7.89, 7.89)

Area Scan (81x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0819 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.415 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.100 W/kg

SAR(1 g) = 0.072 W/kg; SAR(10 g) = 0.046 W/kg

Maximum value of SAR (measured) = 0.0749 W/kg

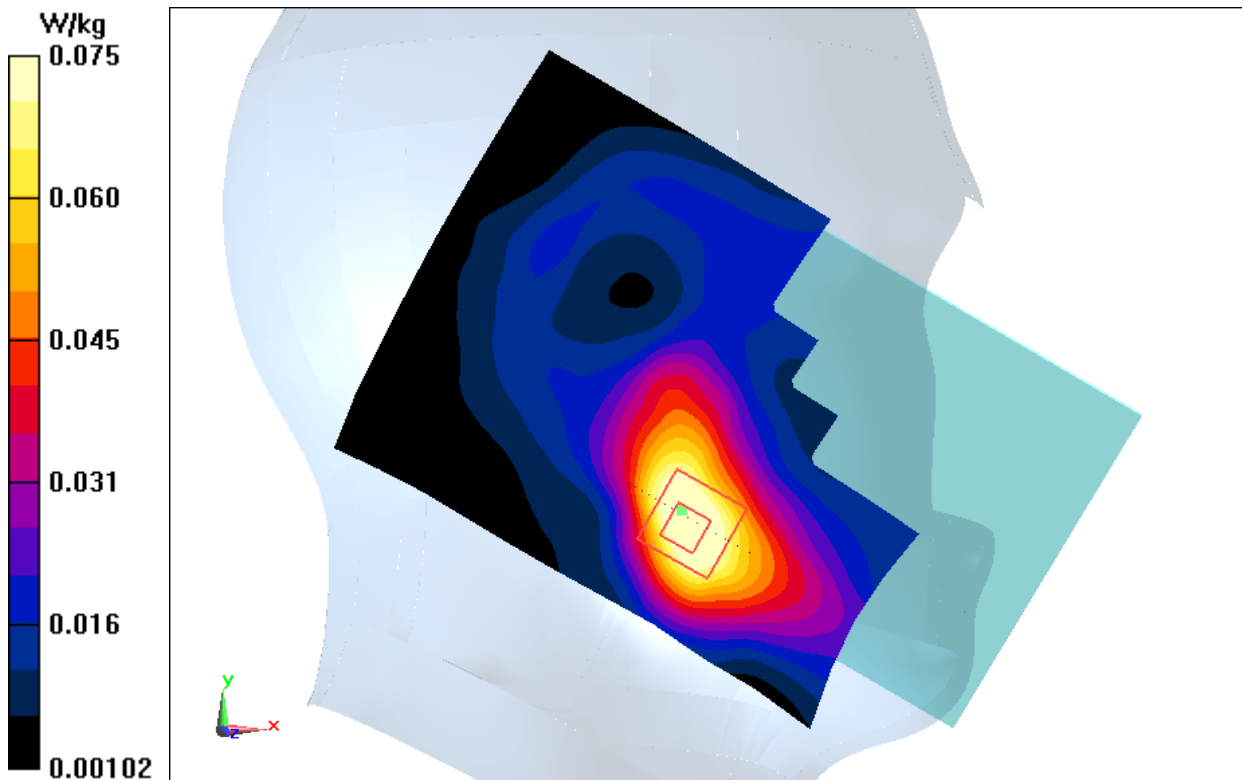


Fig.9 LTE Band2

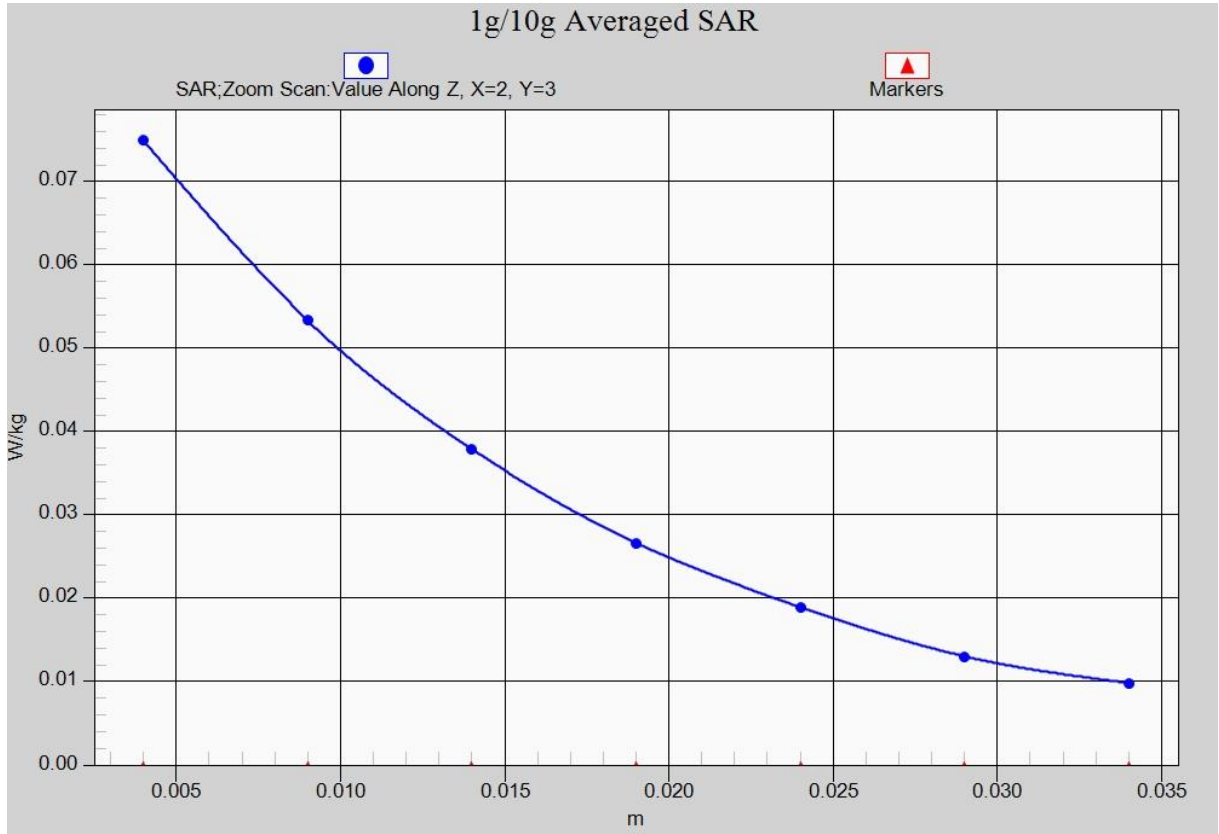


Fig. 9-1 Z-Scan at power reference point (LTE Band2)

LTE Band2 Body Bottom High with QPSK_20M_50RB_Low

Date: 2017-7-15

Electronics: DAE4 Sn1331

Medium: Body 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.528$ mho/m; $\epsilon_r = 52.28$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C

Communication System: LTE Band2 Frequency: 1900 MHz Duty Cycle: 1:1

Probe: EX3DV4– SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (151x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.34 W/kg

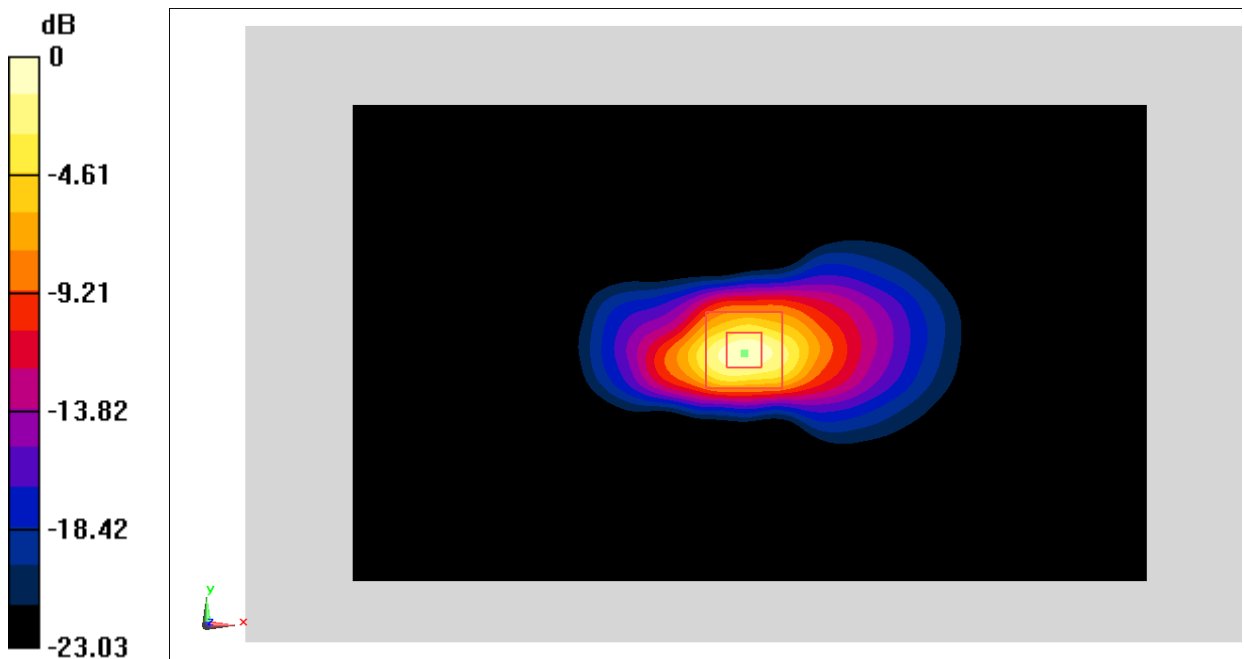
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 21.60 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 2.03 W/kg

SAR(1 g) = 0.917 W/kg; SAR(10 g) = 0.378 W/kg

Maximum value of SAR (measured) = 1.55 W/kg



0 dB = 1.34 W/kg = 1.27 dBW/kg

Fig.10 LTE Band2

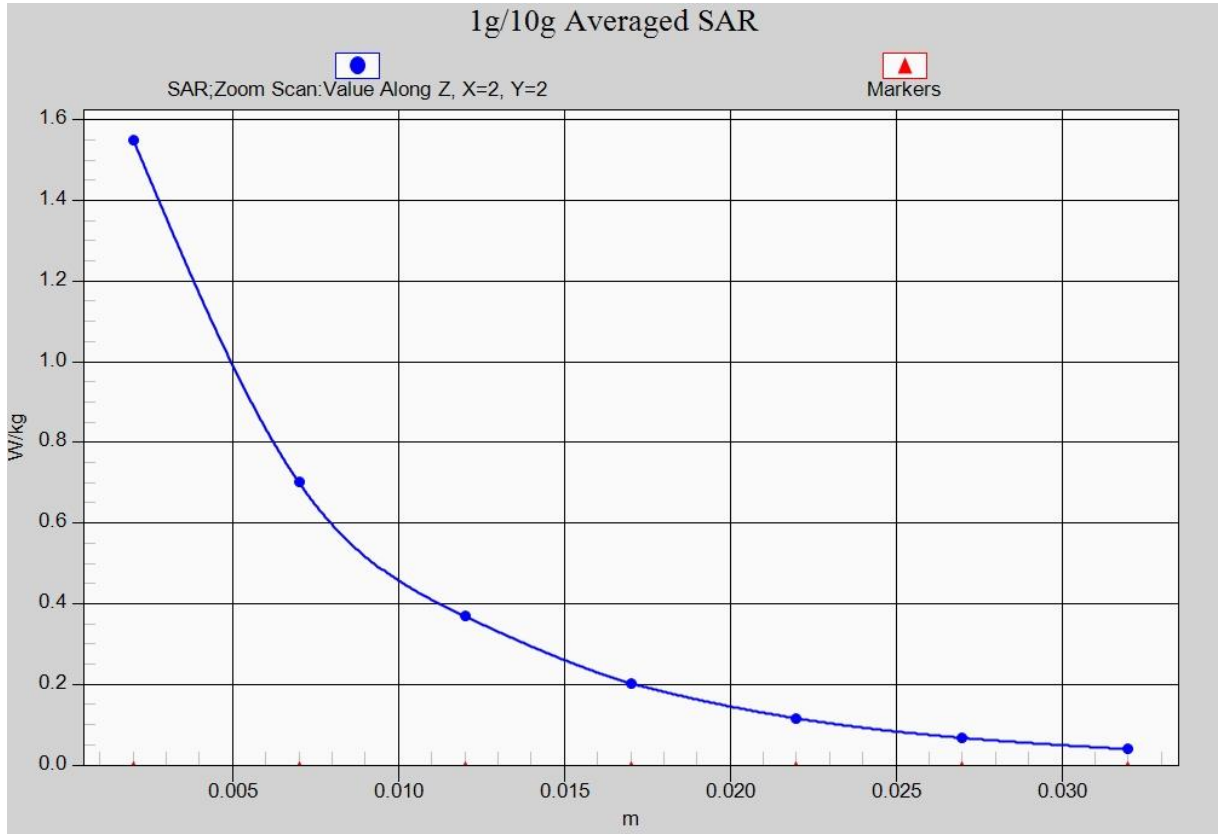


Fig. 10-1 Z-Scan at power reference point (LTE Band2)

LTE Band7 Left Cheek Low with QPSK_20M_1RB_Low

Date: 2017-7-23

Electronics: DAE4 Sn1331

Medium: Head 2600 MHz

Medium parameters used: $f = 2510$ MHz; $\sigma = 1.944$ mho/m; $\epsilon_r = 39.19$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.8°C Liquid Temperature: 22.4°C

Communication System: LTE Band7 Frequency: 2510 MHz Duty Cycle: 1:1

Probe: EX3DV4– SN3846 ConvF(7.12, 7.12, 7.12)

Area Scan (91x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0912 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.1690 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.275 W/kg

SAR(1 g) = 0.064 W/kg; SAR(10 g) = 0.034 W/kg

Maximum value of SAR (measured) = 0.0780 W/kg

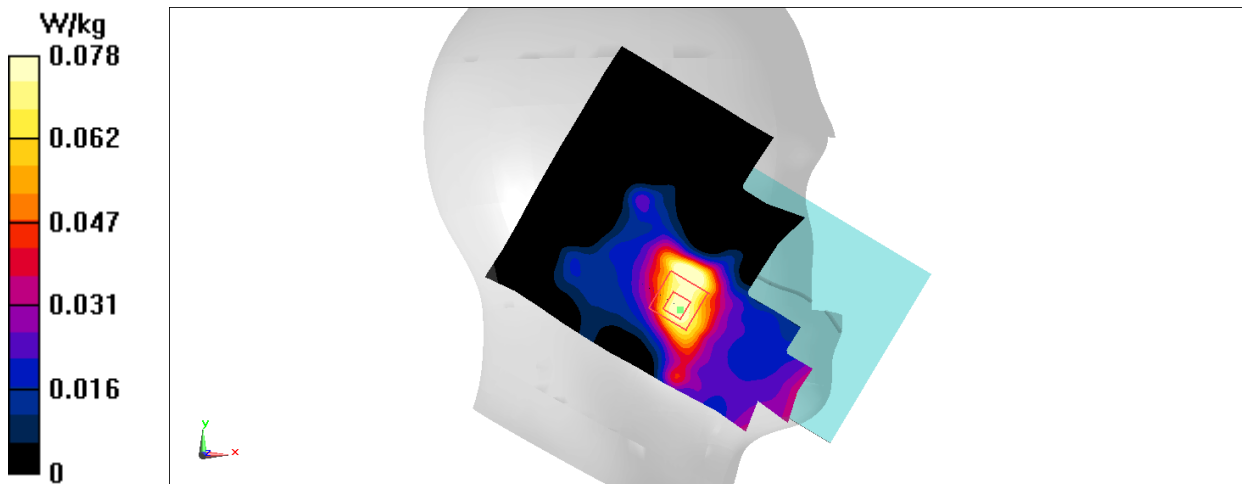


Fig.11 LTE Band7

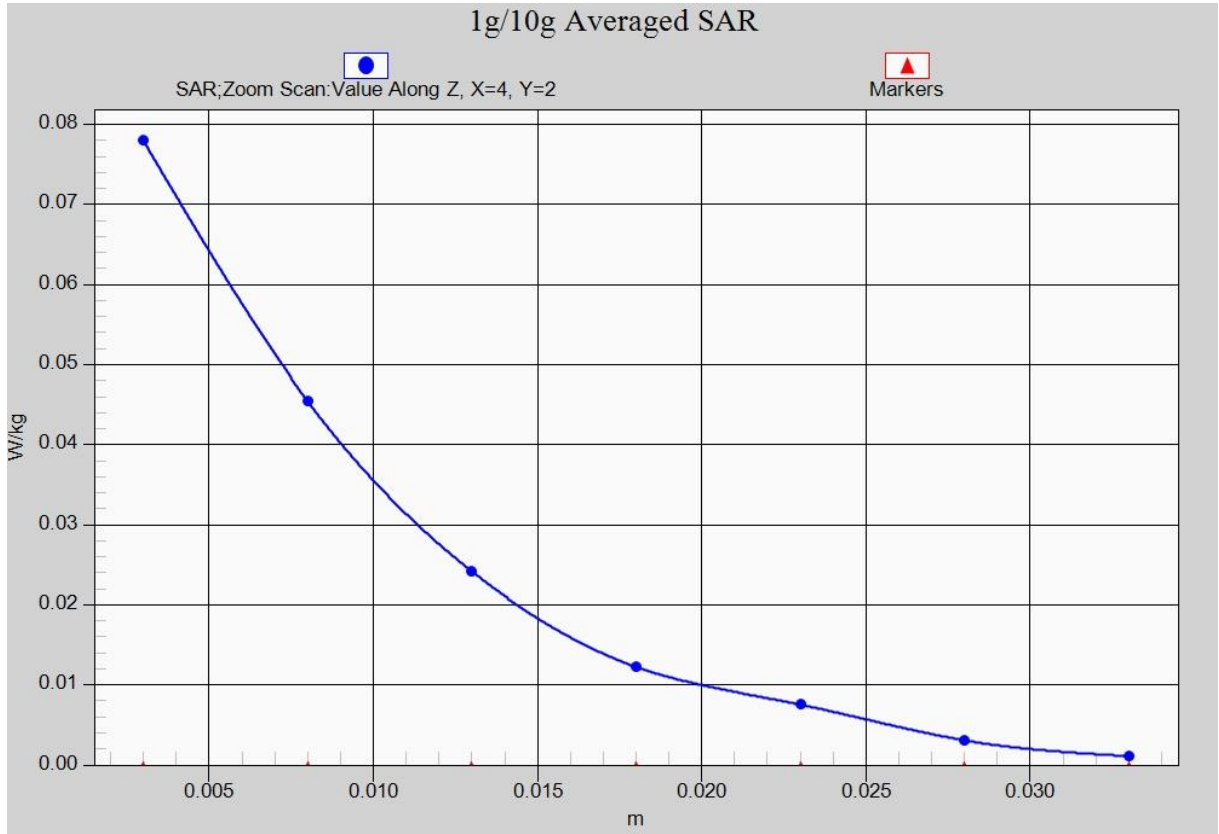


Fig. 11-1 Z-Scan at power reference point (LTE Band7)

LTE Band7 Body Left Low with QPSK_20M_1RB_Low

Date: 2017-7-23

Electronics: DAE4 Sn1331

Medium: Body 2600 MHz

Medium parameters used: $f = 2510$ MHz; $\sigma = 2.117$ mho/m; $\epsilon_r = 52.18$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.8°C Liquid Temperature: 22.4°C

Communication System: LTE Band7 Frequency: 2510 MHz Duty Cycle: 1:1

Probe: EX3DV4– SN3846 ConvF(7.25, 7.25, 7.25)

Area Scan (151x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.80 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.96 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 2.33 W/kg

SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.525 W/kg

Maximum value of SAR (measured) = 1.63 W/kg

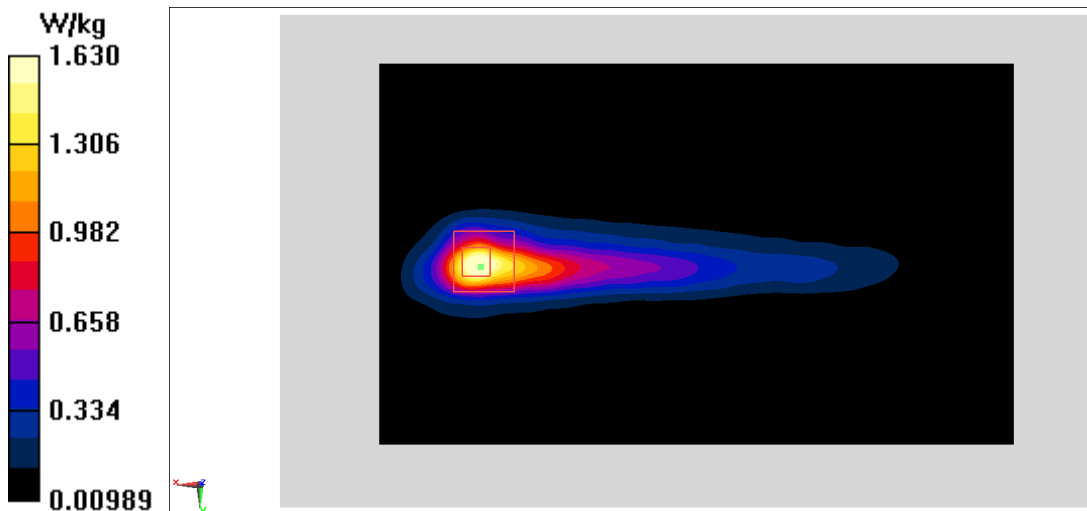


Fig.12 LTE Band7