

850 Body Towards Ground Middle with battery CAB25L0001C2

Date: 2012-6-30

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 1.006$ mho/m; $\epsilon_r = 53.807$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 850 Frequency: 836.6 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(6.14, 6.14, 6.14)

Toward Ground Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.637 mW/g

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

Reference Value = 23.727 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.800 mW/g

SAR(1 g) = 0.598 mW/g; SAR(10 g) = 0.428 mW/g

Maximum value of SAR (measured) = 0.634 mW/g

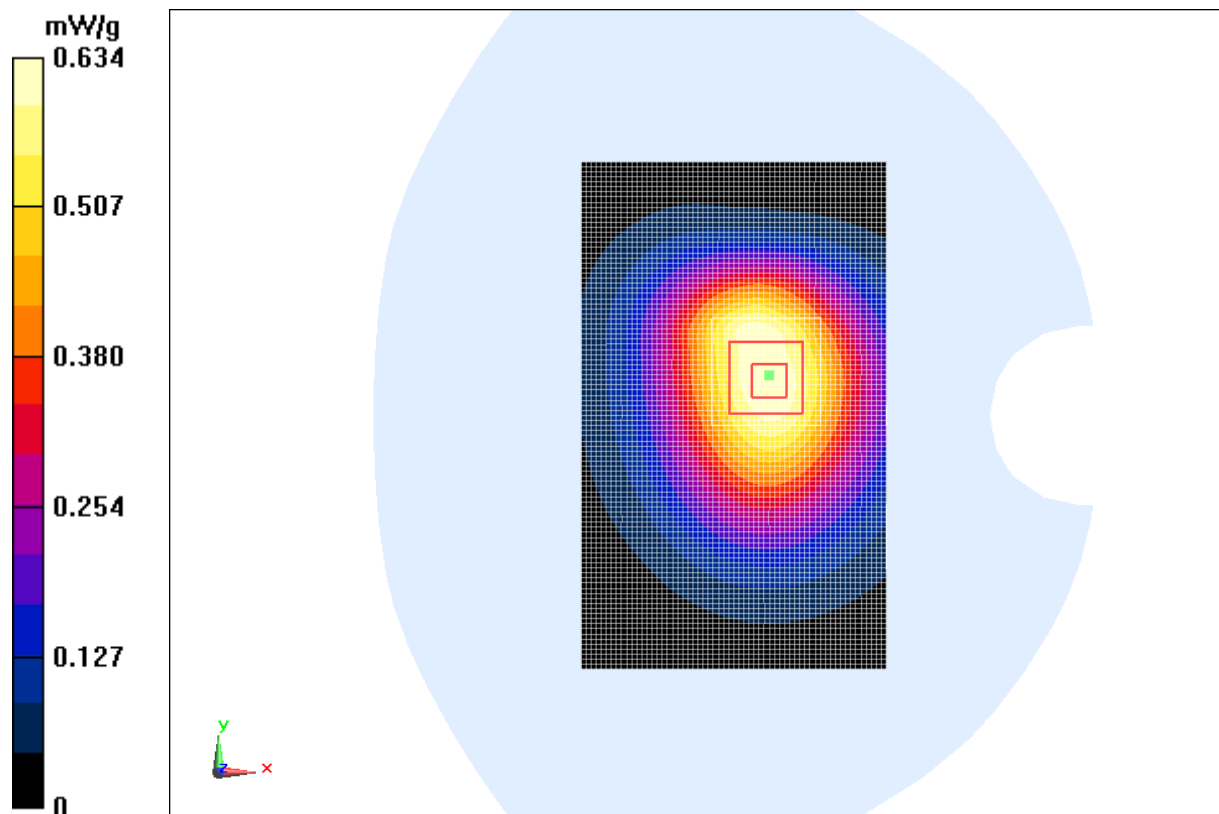


Fig. 25 850 MHz CH190

850 Body Towards Ground Middle with battery CAB25L0000C1

Date: 2012-6-30

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 1.006$ mho/m; $\epsilon_r = 53.807$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 850 Frequency: 836.6 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(6.14, 6.14, 6.14)

Toward Ground Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.669 mW/g

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

Reference Value = 23.869 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.821 mW/g

SAR(1 g) = 0.622 mW/g; SAR(10 g) = 0.444 mW/g

Maximum value of SAR (measured) = 0.659 mW/g

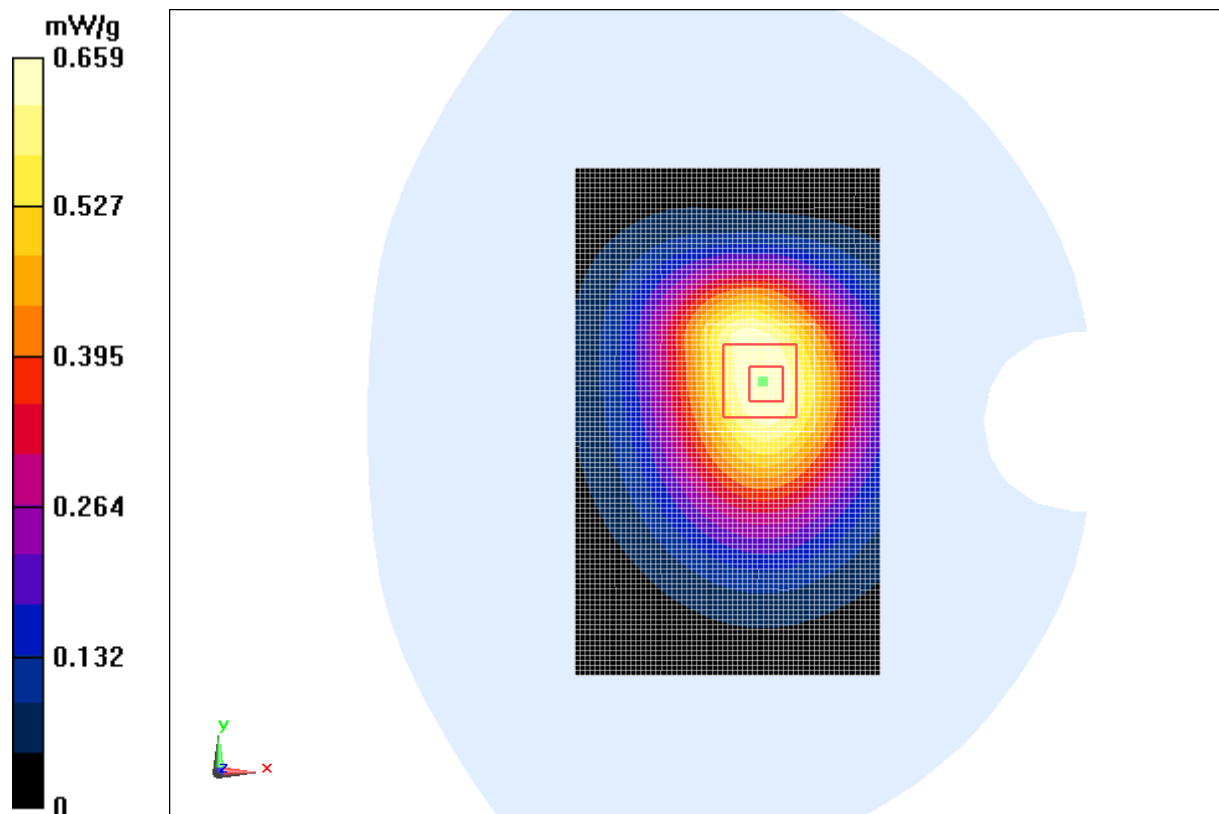


Fig. 26 850 MHz CH190

850 Body Towards Ground Middle with battery CAB25L0002C2

Date: 2012-6-30

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 1.006$ mho/m; $\epsilon_r = 53.807$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 850 Frequency: 836.6 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(6.14, 6.14, 6.14)

Toward Ground Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.642 mW/g

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

Reference Value = 23.266 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.794 mW/g

SAR(1 g) = 0.596 mW/g; SAR(10 g) = 0.426 mW/g

Maximum value of SAR (measured) = 0.633 mW/g

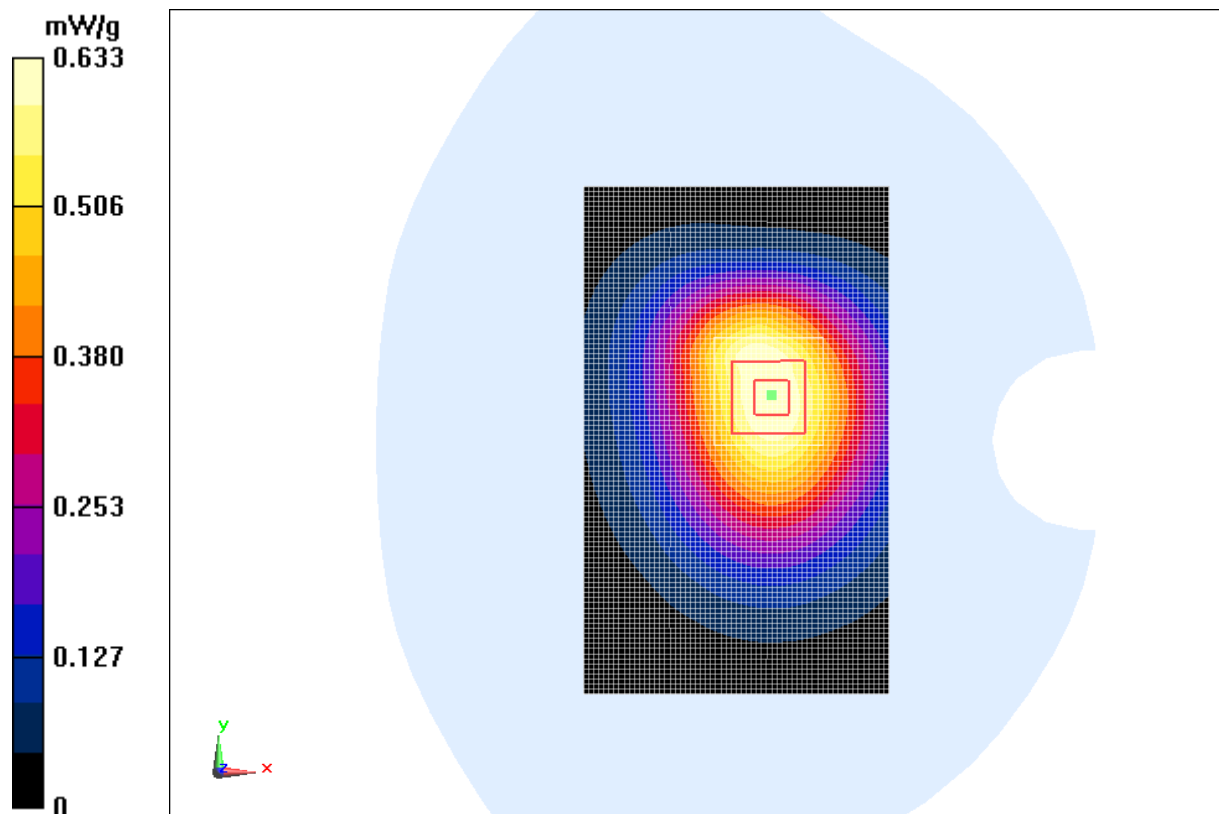


Fig. 27 850 MHz CH190

850 Body Towards Ground Middle with battery CAB2170000C2

Date: 2012-6-30

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 1.006$ mho/m; $\epsilon_r = 53.807$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 850 Frequency: 836.6 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(6.14, 6.14, 6.14)

Toward Ground Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.633 mW/g

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

Reference Value = 22.909 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.786 mW/g

SAR(1 g) = 0.590 mW/g; SAR(10 g) = 0.420 mW/g

Maximum value of SAR (measured) = 0.624 mW/g

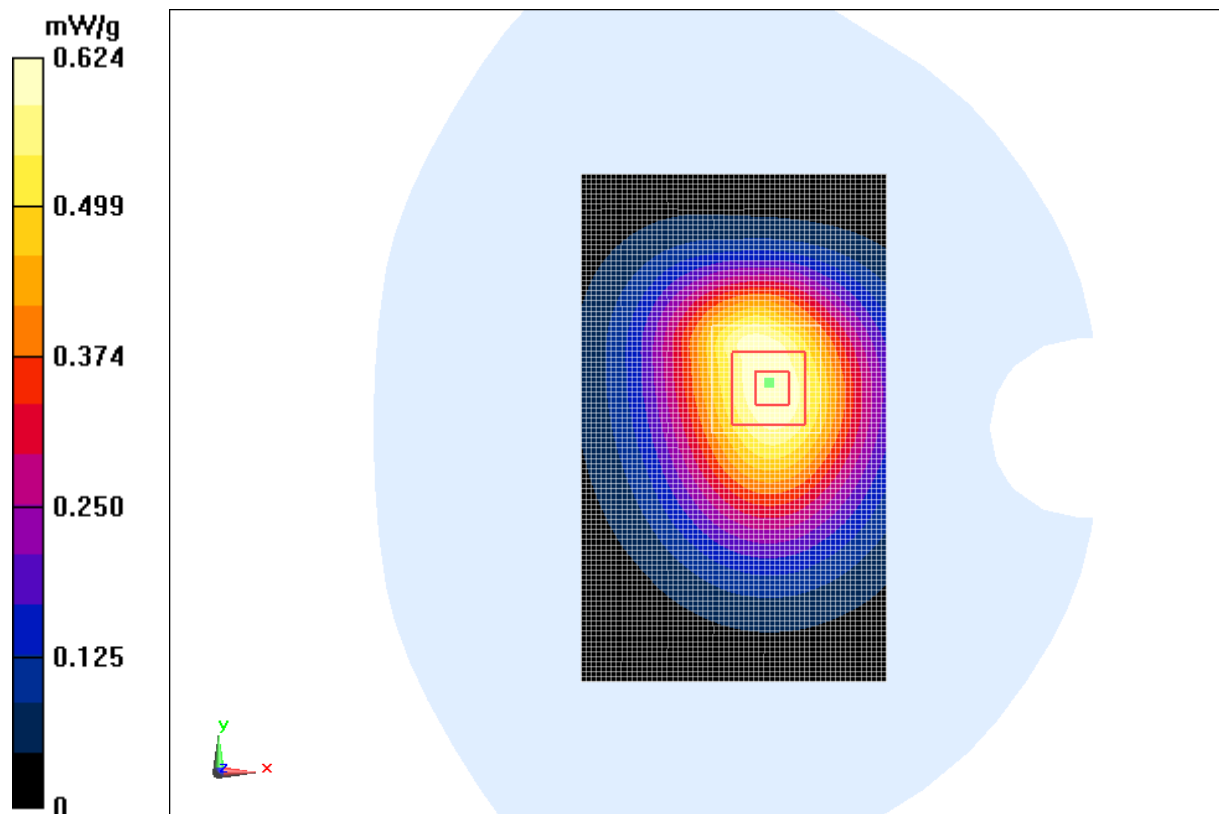


Fig. 28 850 MHz CH190

1900 Left Cheek High

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.405$ mho/m; $\epsilon_r = 41.786$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Cheek High/Area Scan (51x91x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 0.792 mW/g

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

Reference Value = 9.970 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 1.058 mW/g

SAR(1 g) = 0.682 mW/g; SAR(10 g) = 0.403 mW/g

Maximum value of SAR (measured) = 0.748 mW/g

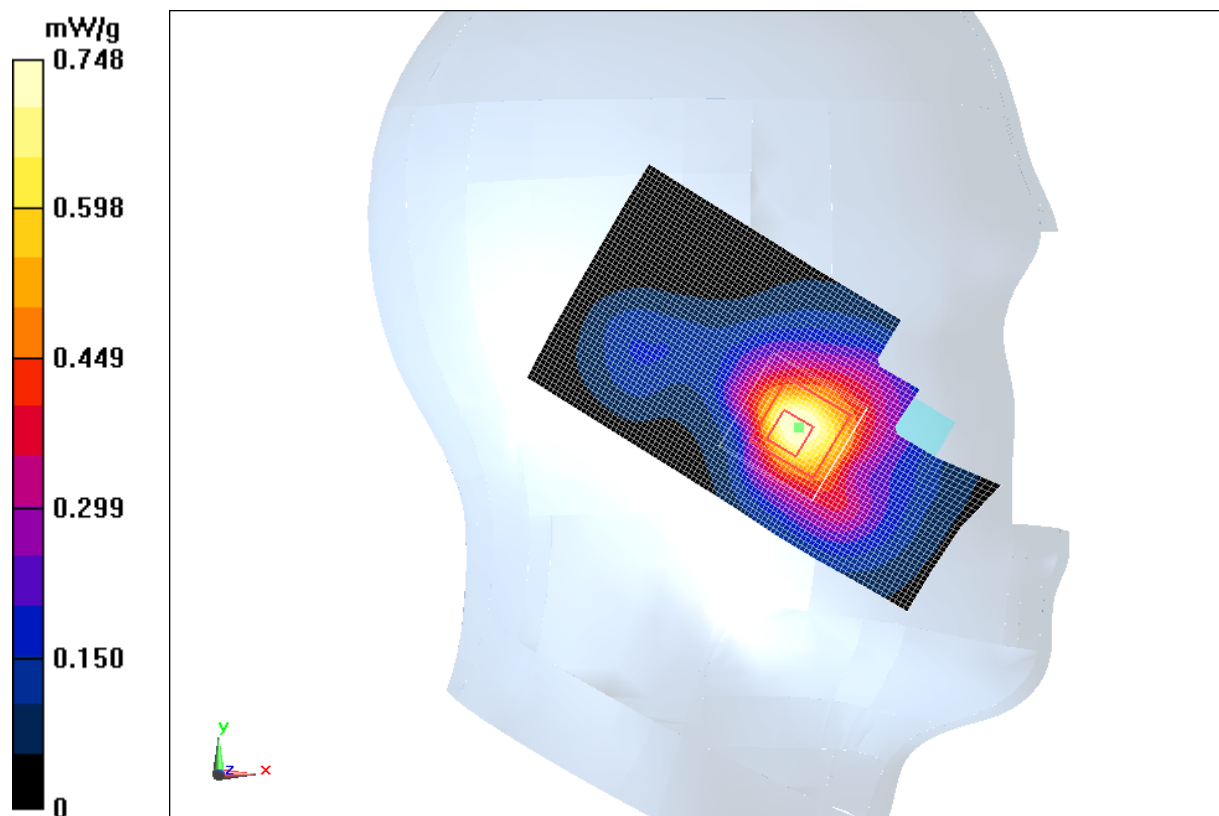


Fig. 29 1900 MHz CH810

1900 Left Cheek Middle

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.377$ mho/m; $\epsilon_r = 41.898$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Cheek Middle/Area Scan (51x91x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 0.865 mW/g

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

Reference Value = 7.889 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.081 mW/g

SAR(1 g) = 0.720 mW/g; SAR(10 g) = 0.435 mW/g

Maximum value of SAR (measured) = 0.780 mW/g

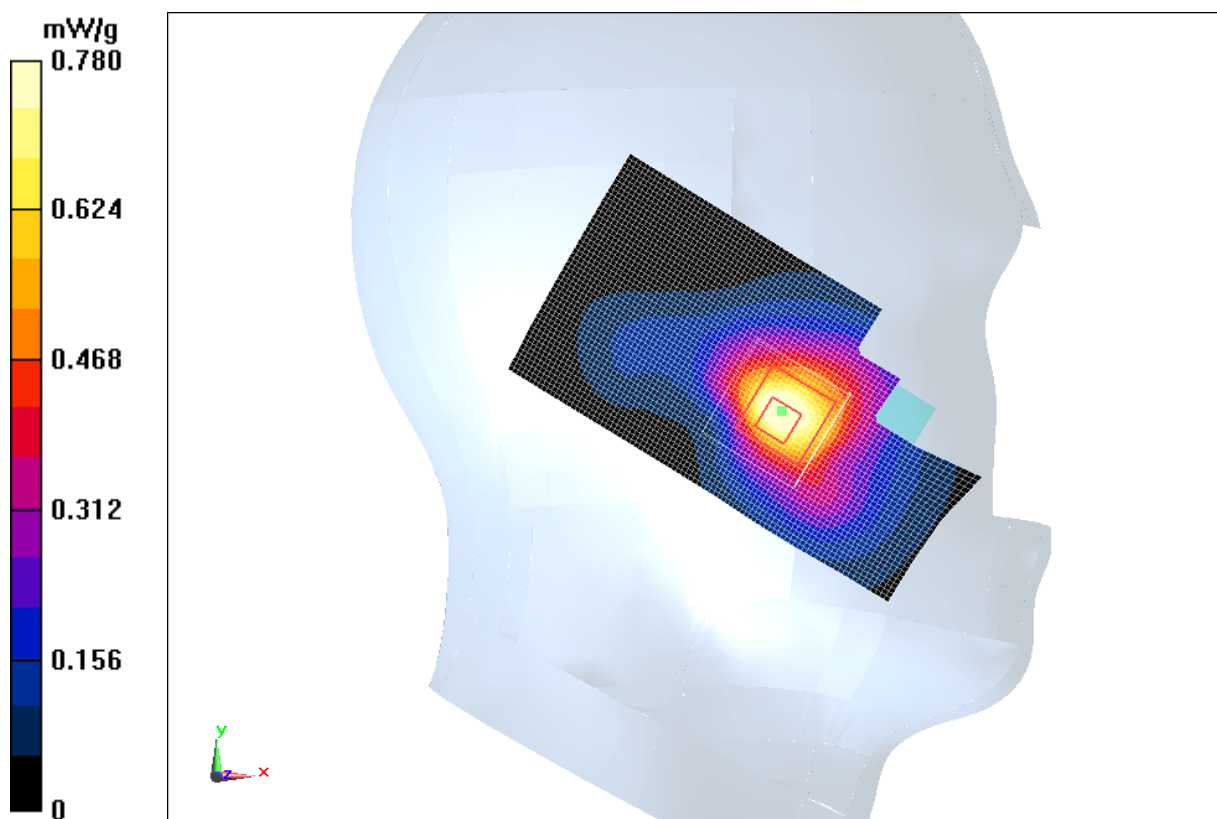


Fig. 30 1900 MHz CH661

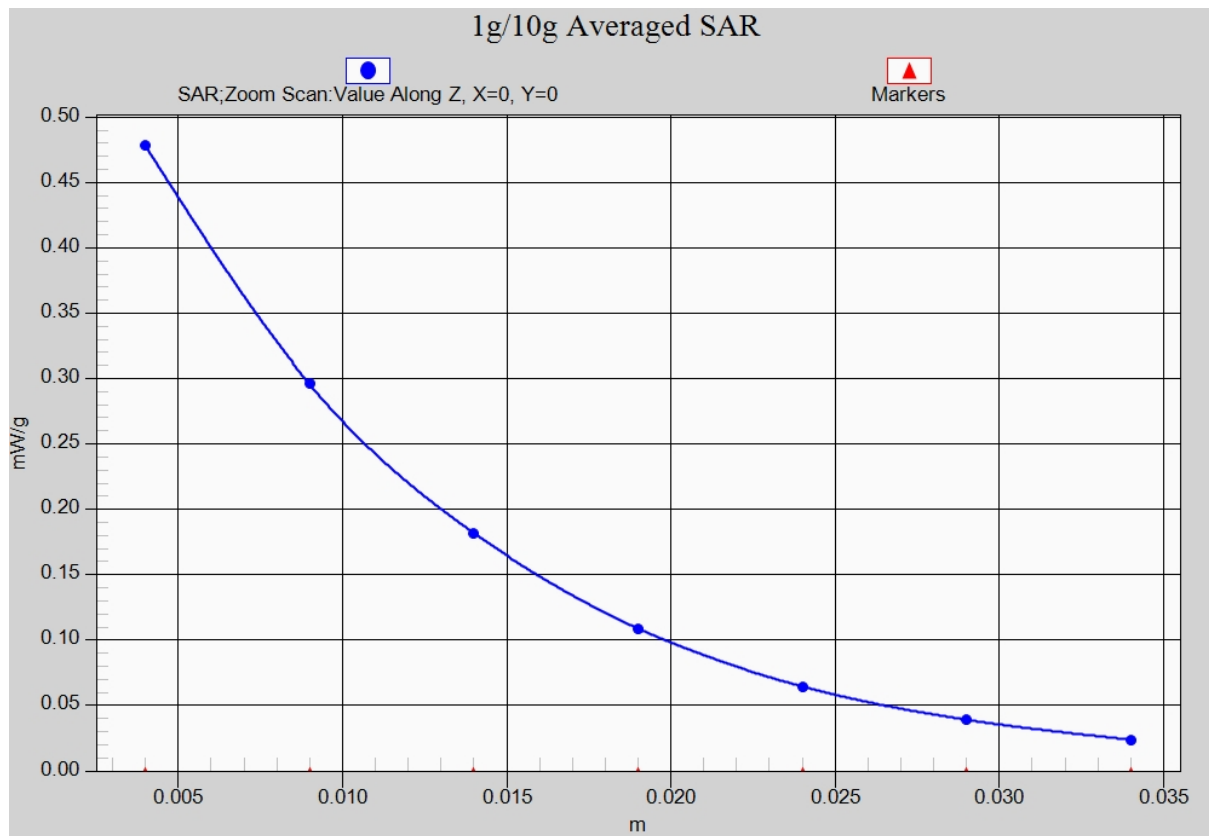


Fig. 30-1 Z-Scan at power reference point (1900 MHz CH661)

1900 Left Cheek Low

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.347$ mho/m; $\epsilon_r = 41.991$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

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

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Cheek Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.783 mW/g

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

Reference Value = 6.285 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.945 mW/g

SAR(1 g) = 0.657 mW/g; SAR(10 g) = 0.403 mW/g

Maximum value of SAR (measured) = 0.708 mW/g

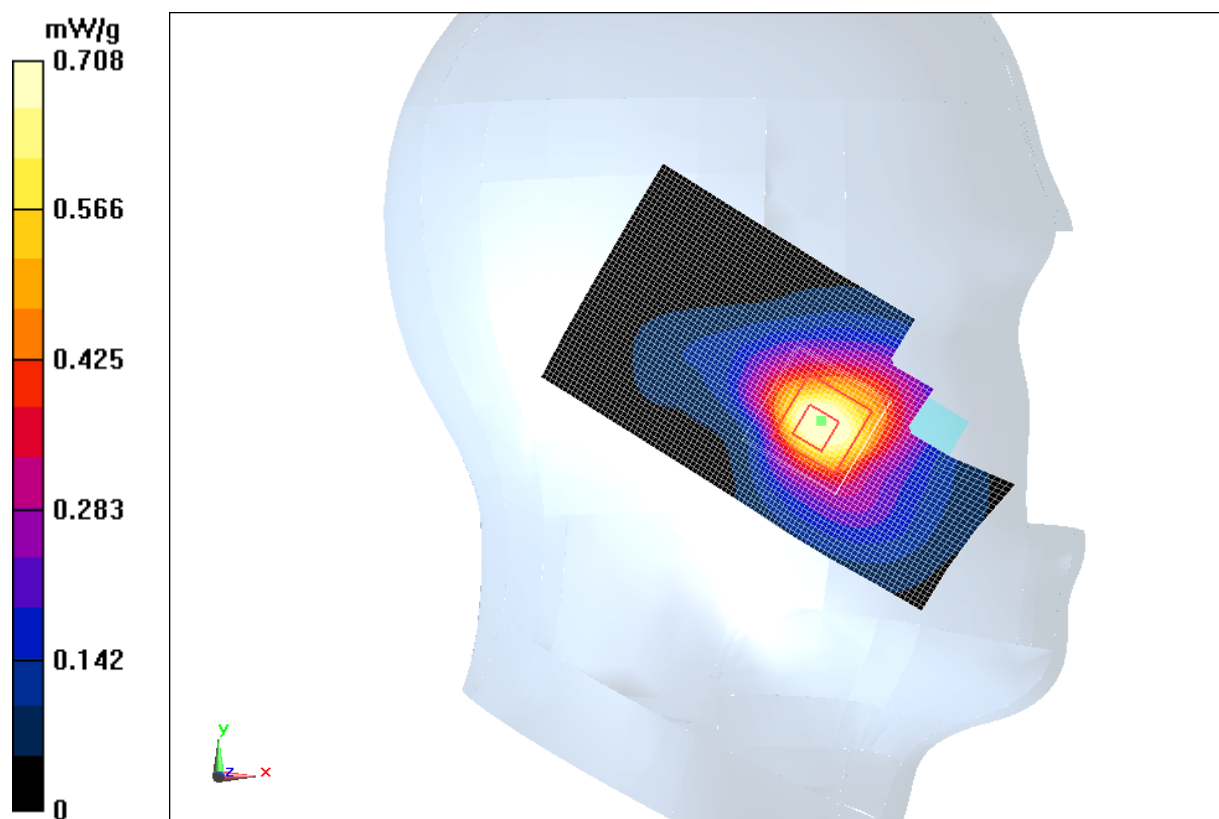


Fig. 31 1900 MHz CH512

1900 Left Tilt High

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.405$ mho/m; $\epsilon_r = 41.786$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Tilt High/Area Scan (51x91x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 0.193 mW/g

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

Reference Value = 9.935 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.282 mW/g

SAR(1 g) = 0.174 mW/g; SAR(10 g) = 0.103 mW/g

Maximum value of SAR (measured) = 0.190 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 1: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 9.935 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.227 mW/g

SAR(1 g) = 0.154 mW/g; SAR(10 g) = 0.099 mW/g

Maximum value of SAR (measured) = 0.167 mW/g

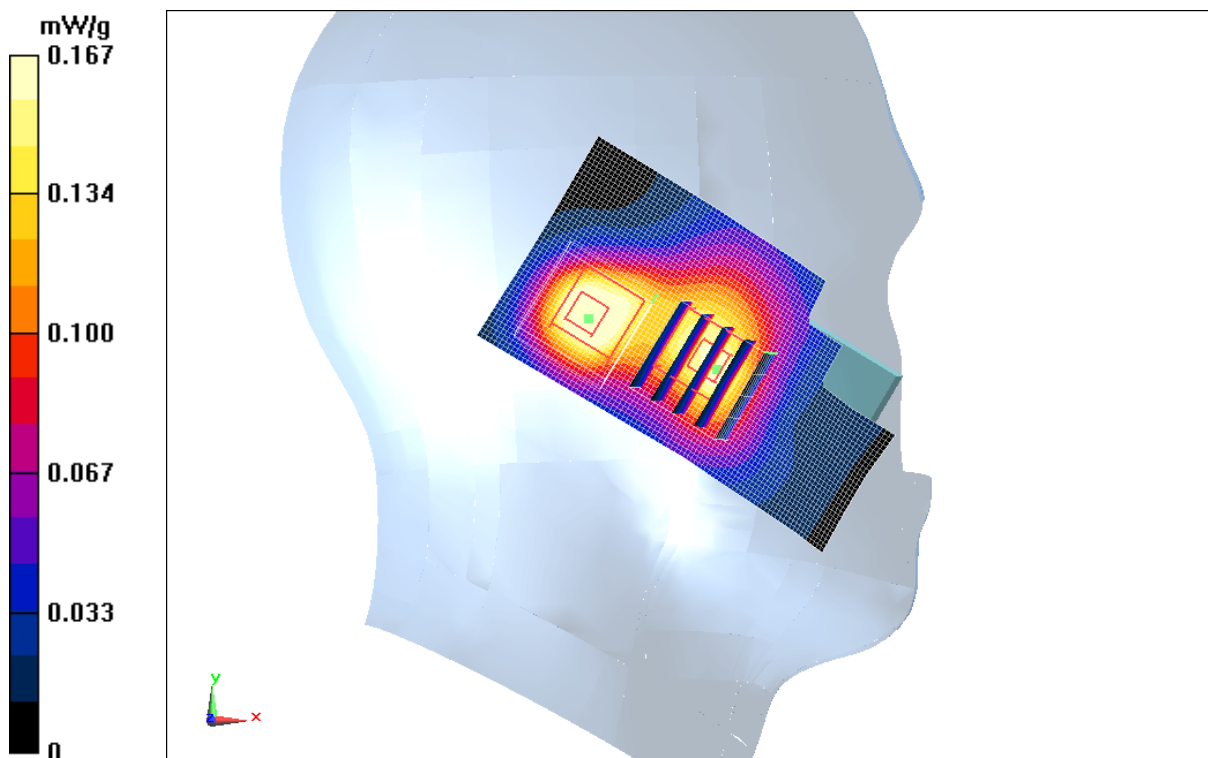


Fig.32 1900 MHz CH810

1900 Left Tilt Middle

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.377$ mho/m; $\epsilon_r = 41.898$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Tilt Middle/Area Scan (51x91x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 0.168 mW/g

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

Reference Value = 7.872 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.221 mW/g

SAR(1 g) = 0.155 mW/g; SAR(10 g) = 0.102 mW/g

Maximum value of SAR (measured) = 0.166 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 7.872 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.195 mW/g

SAR(1 g) = 0.127 mW/g; SAR(10 g) = 0.082 mW/g

Maximum value of SAR (measured) = 0.135 mW/g

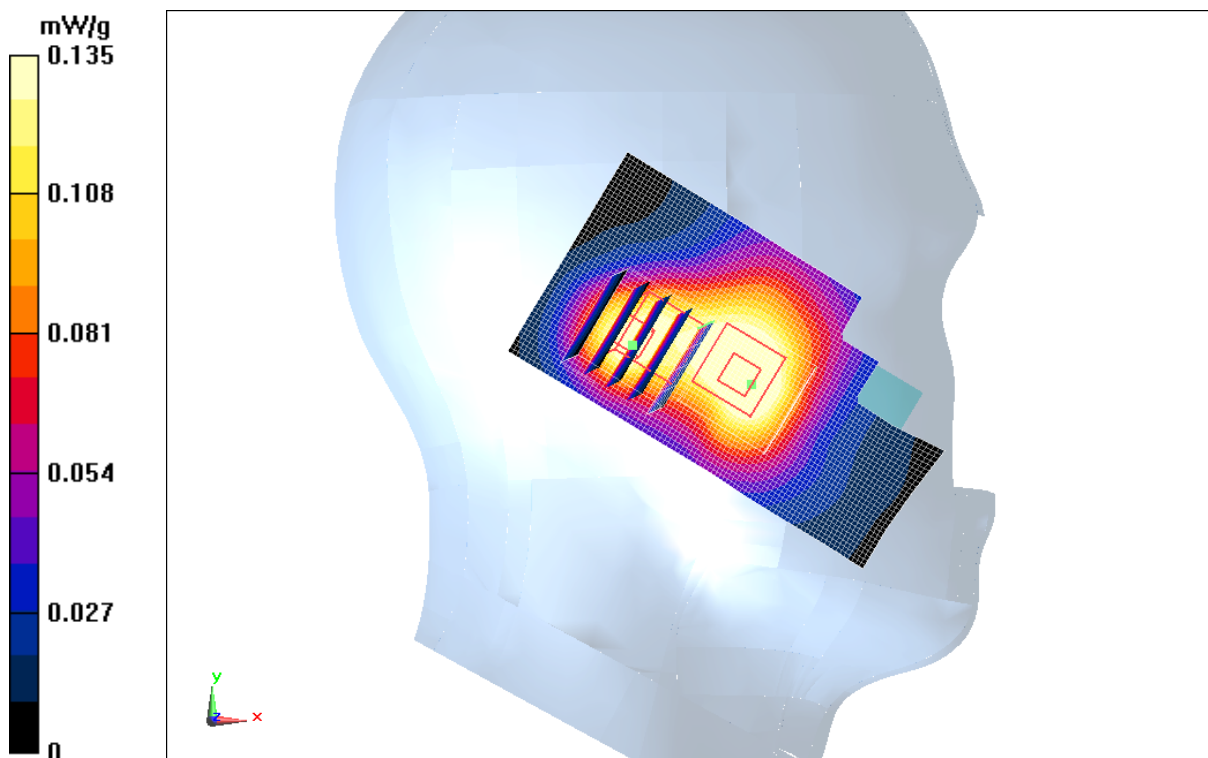


Fig. 33 1900 MHz CH661

1900 Left Tilt Low

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.347$ mho/m; $\epsilon_r = 41.991$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

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

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Tilt Low/Area Scan (51x91x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 0.163 mW/g

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

Reference Value = 7.129 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.217 mW/g

SAR(1 g) = 0.152 mW/g; SAR(10 g) = 0.100 mW/g

Maximum value of SAR (measured) = 0.162 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 7.129 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.165 mW/g

SAR(1 g) = 0.114 mW/g; SAR(10 g) = 0.076 mW/g

Maximum value of SAR (measured) = 0.124 mW/g

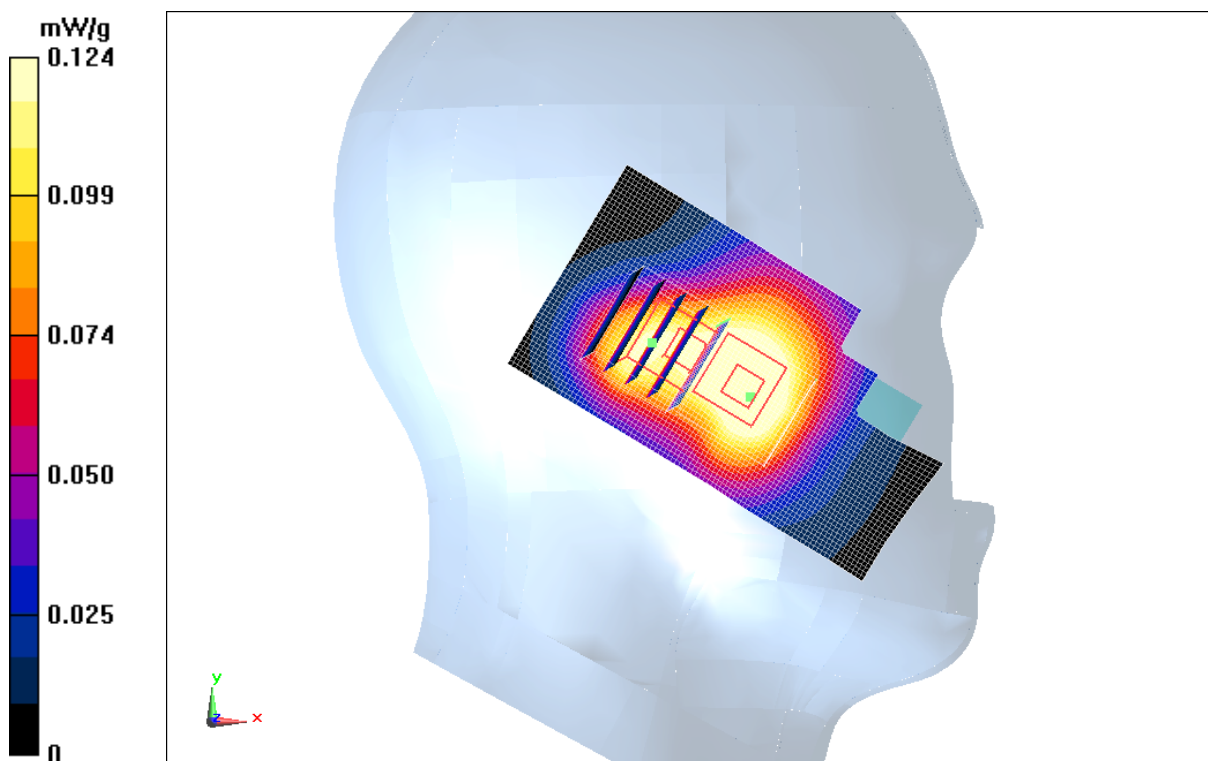


Fig. 34 1900 MHz CH512

1900 Right Cheek High

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.405$ mho/m; $\epsilon_r = 41.786$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Cheek High/Area Scan (51x91x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 0.762 mW/g

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

Reference Value = 7.508 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 1.168 mW/g

SAR(1 g) = 0.678 mW/g; SAR(10 g) = 0.386 mW/g

Maximum value of SAR (measured) = 0.727 mW/g

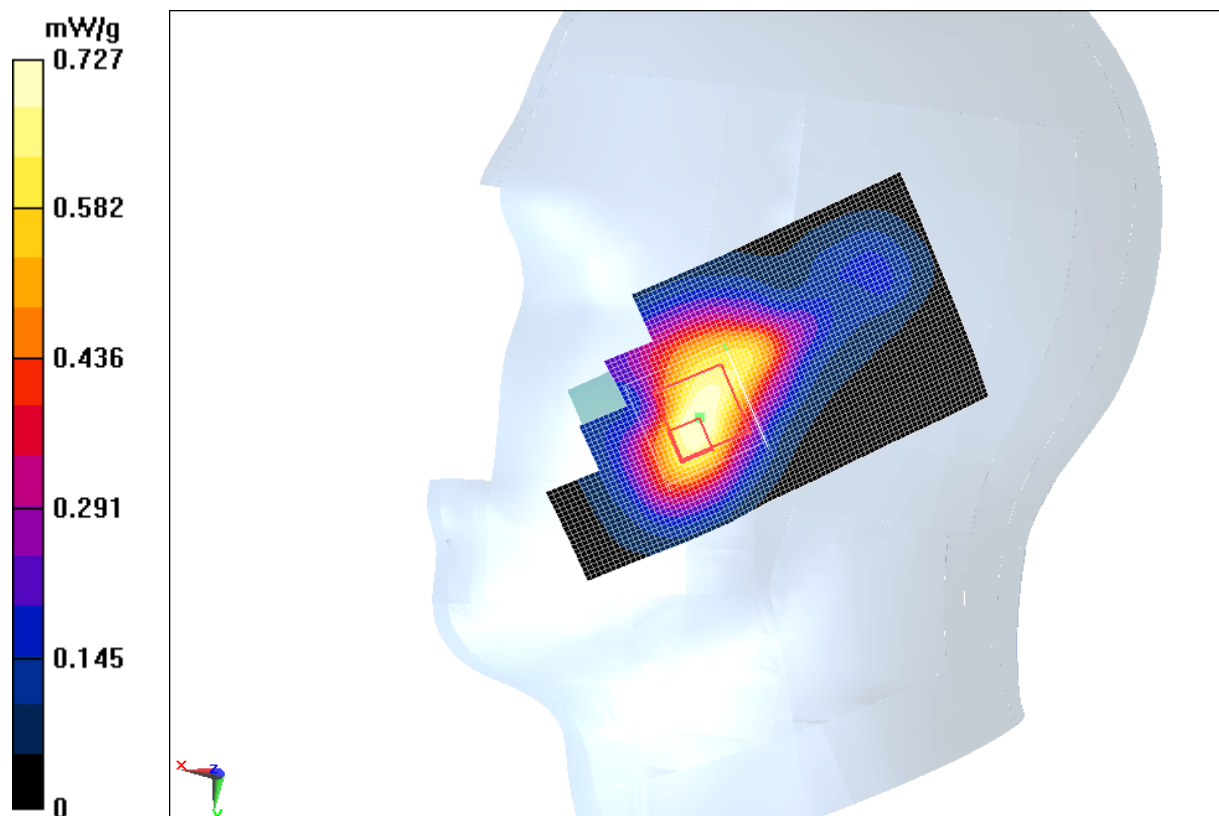


Fig. 35 1900 MHz CH810

1900 Right Cheek Middle

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.377$ mho/m; $\epsilon_r = 41.898$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Cheek Middle/Area Scan (51x91x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 0.817 mW/g

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

Reference Value = 6.750 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.201 mW/g

SAR(1 g) = 0.712 mW/g; SAR(10 g) = 0.430 mW/g

Maximum value of SAR (measured) = 0.747 mW/g

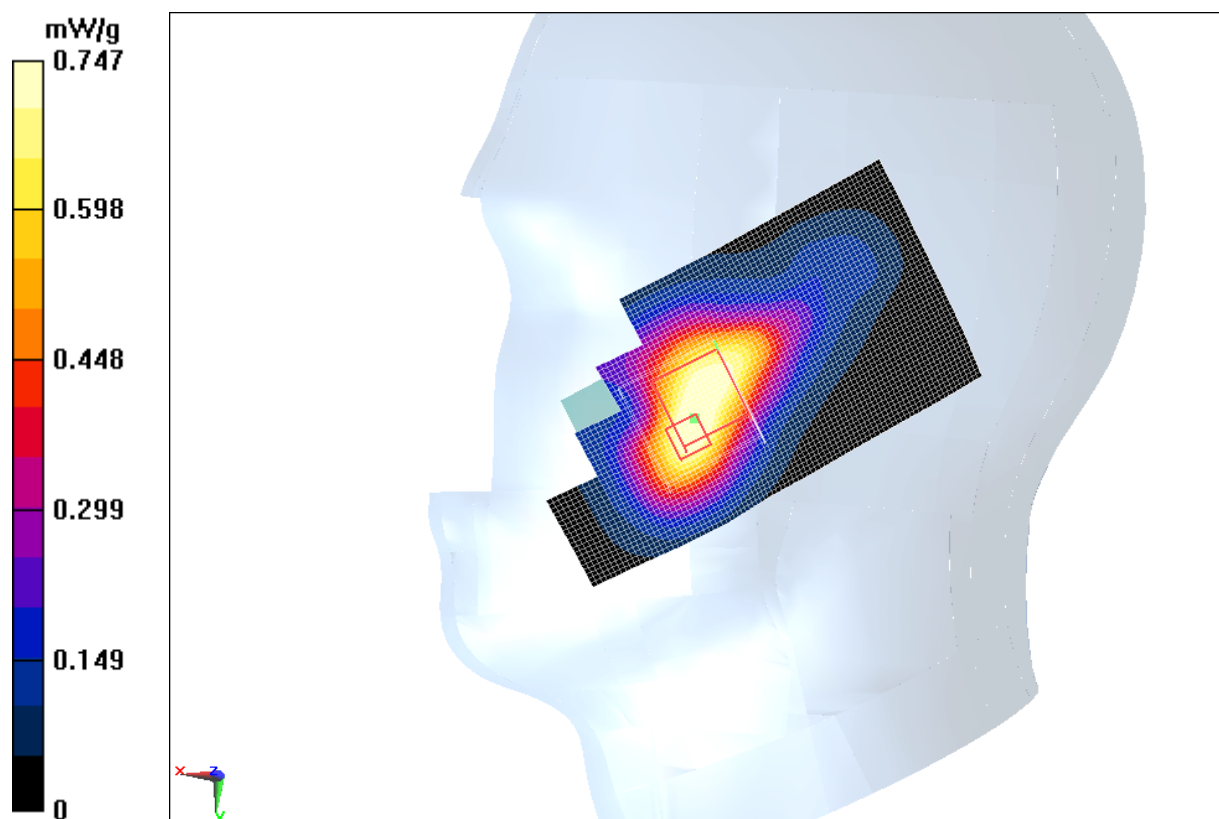


Fig. 36 1900 MHz CH661

1900 Right Cheek Low

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.347$ mho/m; $\epsilon_r = 41.991$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

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

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Cheek Low/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.770 mW/g

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

Reference Value = 5.558 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.086 mW/g

SAR(1 g) = 0.660 mW/g; SAR(10 g) = 0.412 mW/g

Maximum value of SAR (measured) = 0.715 mW/g

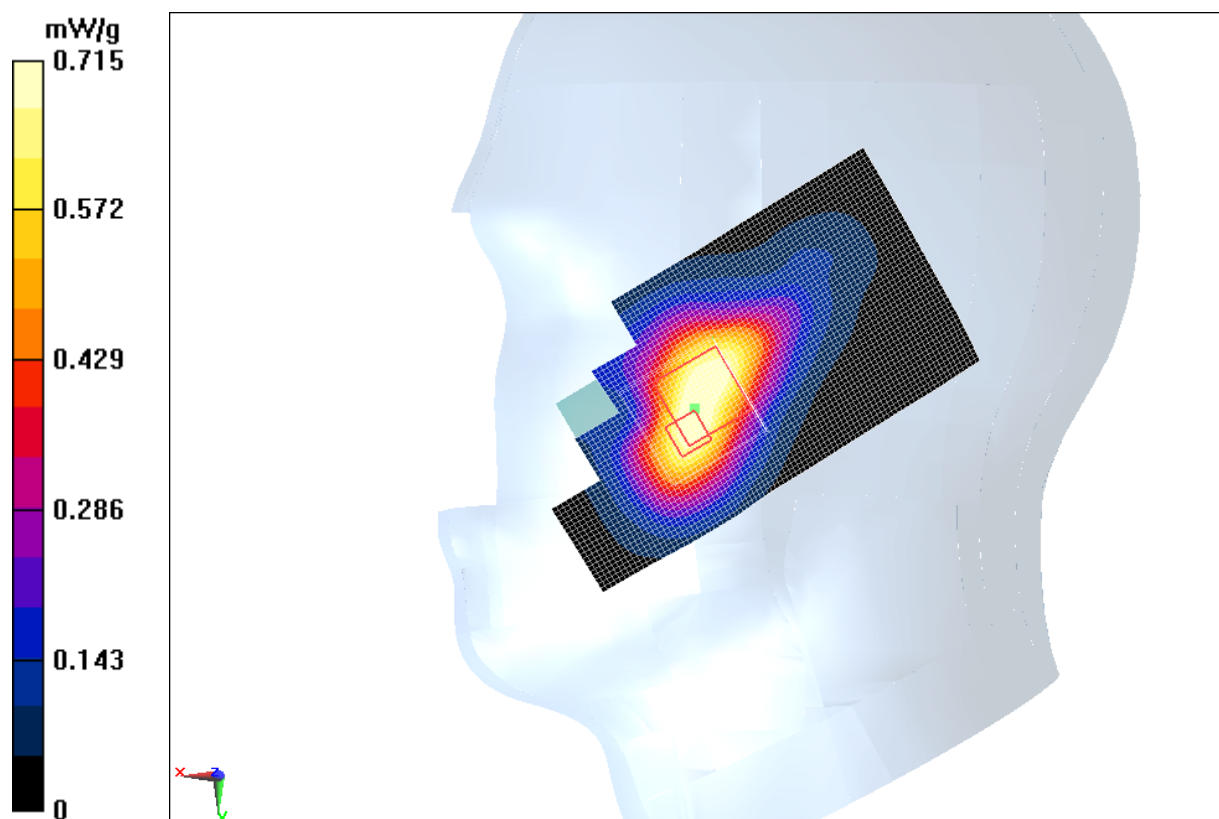


Fig. 37 1900 MHz CH512

1900 Right Tilt High

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.405$ mho/m; $\epsilon_r = 41.786$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Tilt High/Area Scan (51x91x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 0.220 mW/g

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

Reference Value = 8.933 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.332 mW/g

SAR(1 g) = 0.190 mW/g; SAR(10 g) = 0.106 mW/g

Maximum value of SAR (measured) = 0.208 mW/g

Tilt High/Zoom Scan (7x7x7)/Cube 1: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 8.933 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.205 mW/g

SAR(1 g) = 0.139 mW/g; SAR(10 g) = 0.088 mW/g

Maximum value of SAR (measured) = 0.149 mW/g

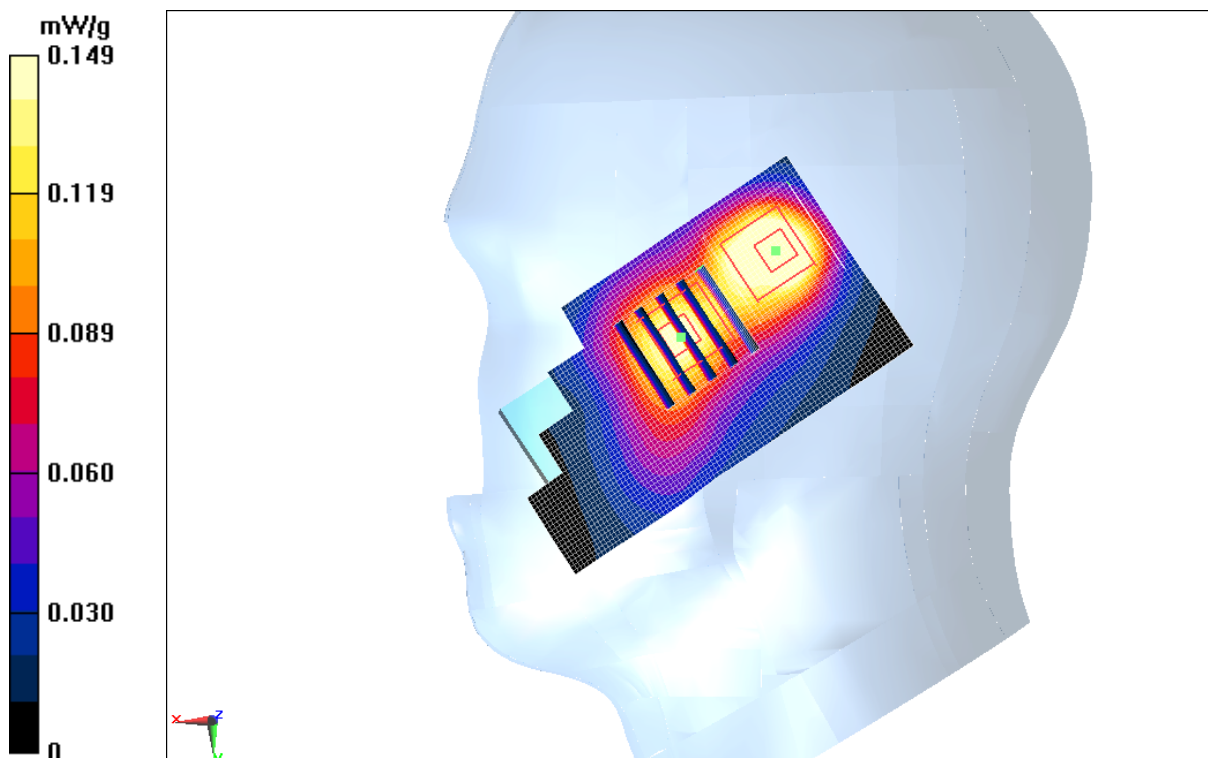


Fig. 38 1900 MHz CH810

1900 Right Tilt Middle

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.377$ mho/m; $\epsilon_r = 41.898$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Tilt Middle/Area Scan (51x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.169 mW/g

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

Reference Value = 7.984 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.225 mW/g

SAR(1 g) = 0.155 mW/g; SAR(10 g) = 0.100 mW/g

Maximum value of SAR (measured) = 0.167 mW/g

Tilt Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.984 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.246 mW/g

SAR(1 g) = 0.150 mW/g; SAR(10 g) = 0.094 mW/g

Maximum value of SAR (measured) = 0.162 mW/g

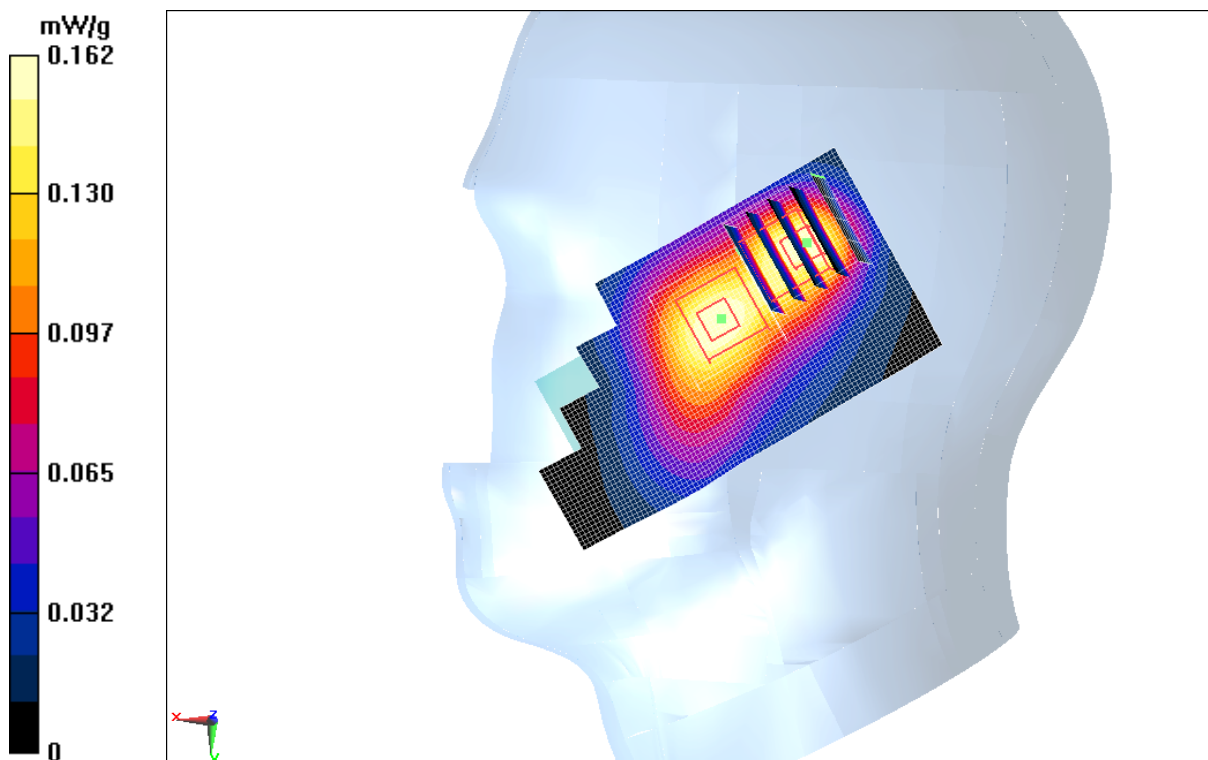


Fig.39 1900 MHz CH661

1900 Right Tilt Low

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.347$ mho/m; $\epsilon_r = 41.991$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

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

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

Tilt Low/Area Scan (51x91x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 0.146 mW/g

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

Reference Value = 6.794 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.193 mW/g

SAR(1 g) = 0.134 mW/g; SAR(10 g) = 0.087 mW/g

Maximum value of SAR (measured) = 0.144 mW/g

Tilt Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.794 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.183 mW/g

SAR(1 g) = 0.120 mW/g; SAR(10 g) = 0.078 mW/g

Maximum value of SAR (measured) = 0.135 mW/g

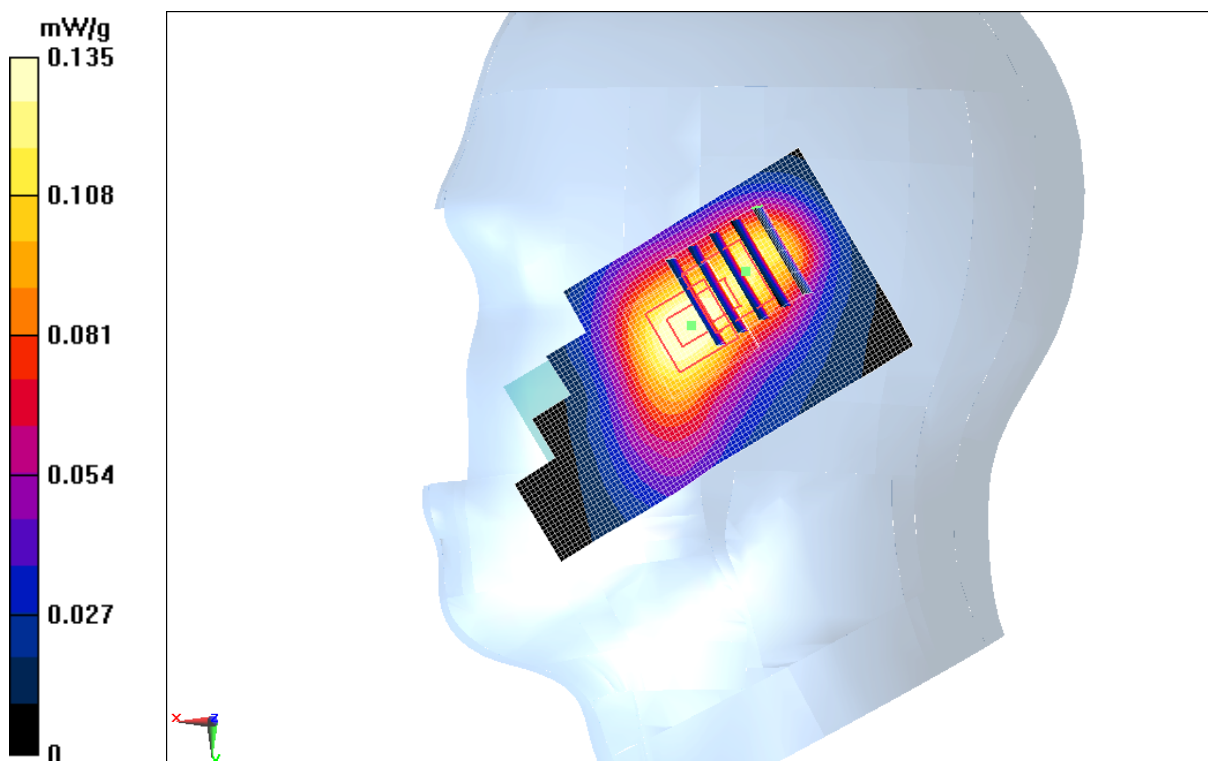


Fig.40 1900 MHz CH512

1900 Body Towards Phantom High

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 52.141$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Toward Phantom High/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.214 mW/g

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

Reference Value = 9.562 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.299 mW/g

SAR(1 g) = 0.195 mW/g; SAR(10 g) = 0.122 mW/g

Maximum value of SAR (measured) = 0.210 mW/g

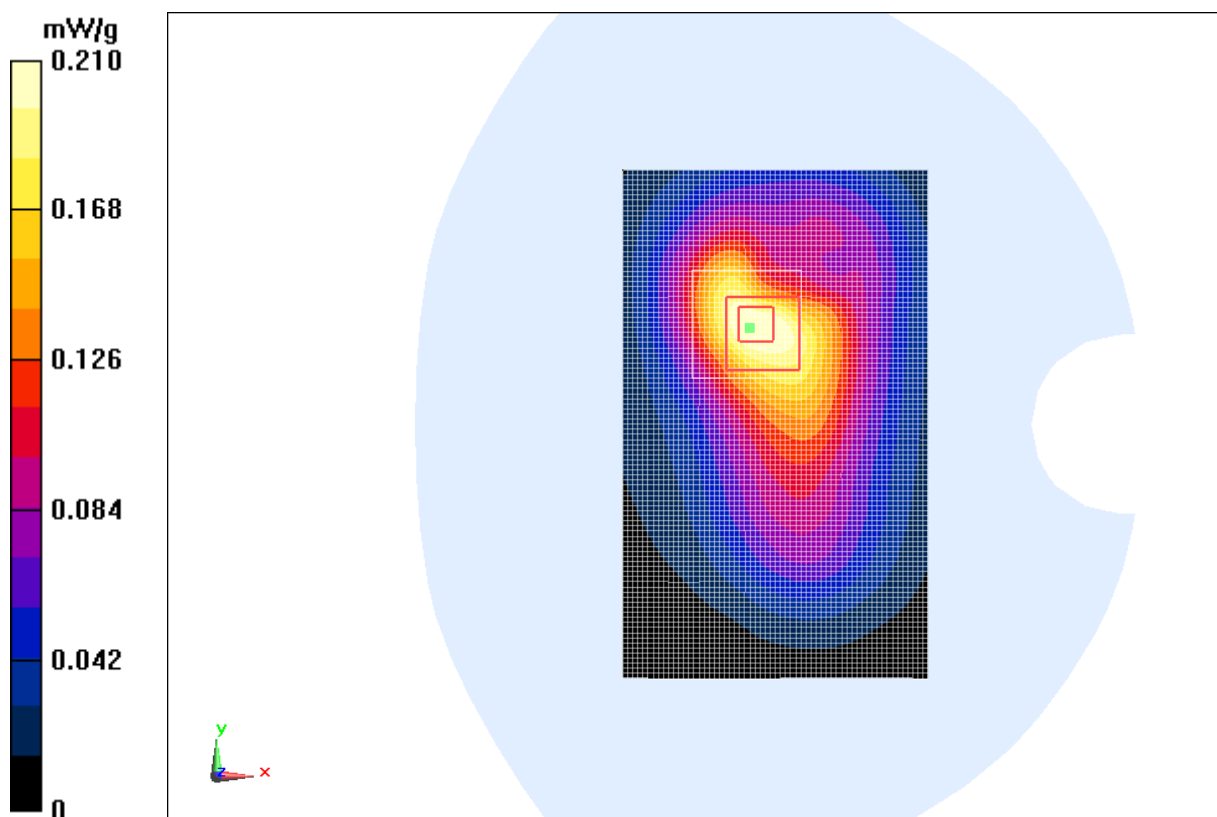


Fig. 41 1900 MHz CH810

1900 Body Towards Phantom Middle

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 52.263$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Toward Phantom Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.245 mW/g

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

Reference Value = 10.377 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.341 mW/g

SAR(1 g) = 0.226 mW/g; SAR(10 g) = 0.142 mW/g

Maximum value of SAR (measured) = 0.245 mW/g

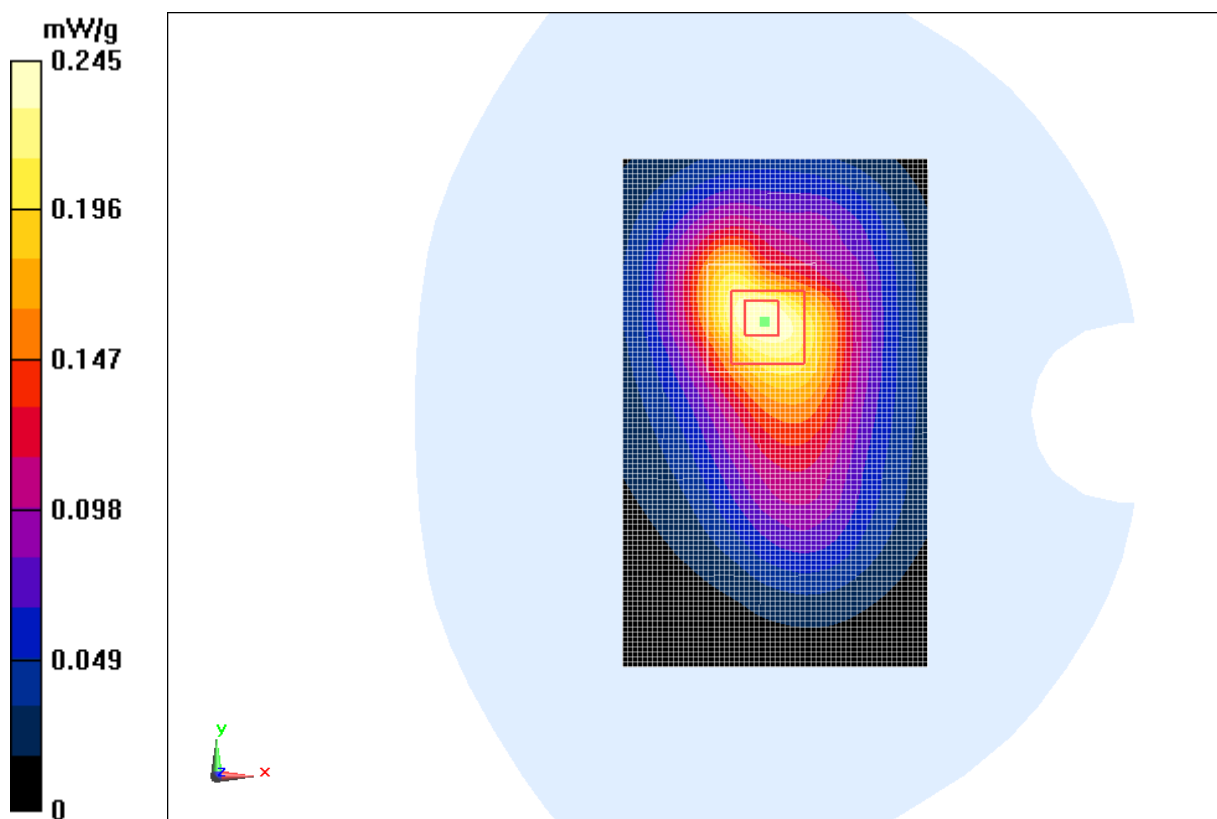


Fig. 42 1900 MHz CH661

1900 Body Towards Phantom Low

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.447$ mho/m; $\epsilon_r = 52.398$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

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

Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Toward Phantom Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.214 mW/g

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

Reference Value = 10.119 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.300 mW/g

SAR(1 g) = 0.197 mW/g; SAR(10 g) = 0.125 mW/g

Maximum value of SAR (measured) = 0.213 mW/g

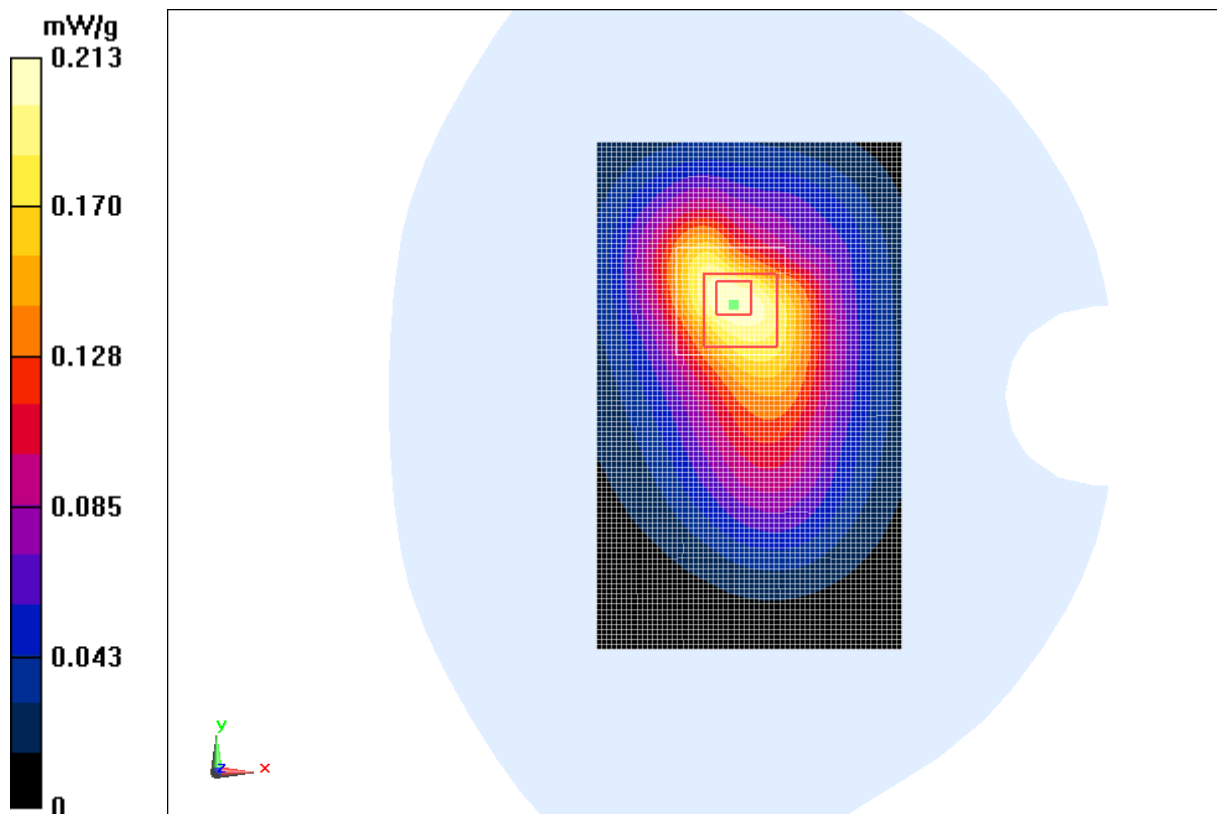


Fig. 43 1900 MHz CH512

1900 Body Towards Ground High

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 52.141$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1909.8 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Toward Ground High/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.250 mW/g

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

Reference Value = 11.018 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.349 mW/g

SAR(1 g) = 0.234 mW/g; SAR(10 g) = 0.143 mW/g

Maximum value of SAR (measured) = 0.253 mW/g

Toward Ground High/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.018 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.324 mW/g

SAR(1 g) = 0.212 mW/g; SAR(10 g) = 0.131 mW/g

Maximum value of SAR (measured) = 0.228 mW/g

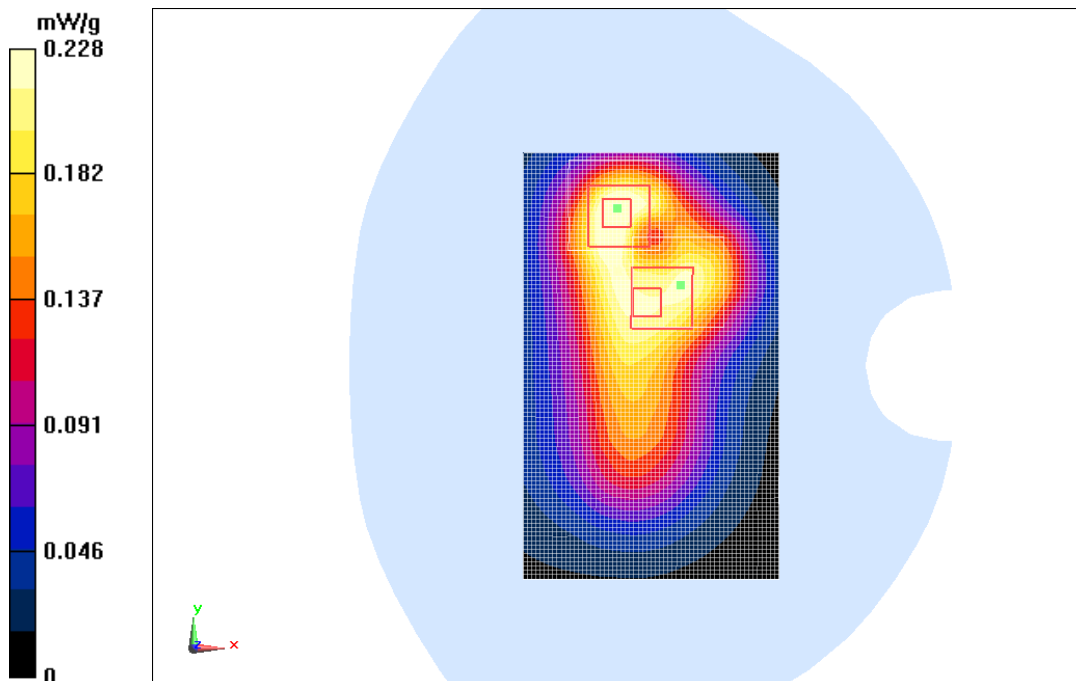


Fig. 44 1900 MHz CH810

1900 Body Towards Ground Middle

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 52.263$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

Communication System: GSM 1900MHz Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Toward Ground Middle/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.241 mW/g

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

Reference Value = 12.026 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.338 mW/g

SAR(1 g) = 0.226 mW/g; SAR(10 g) = 0.139 mW/g

Maximum value of SAR (measured) = 0.244 mW/g

Toward Ground Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.026 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.345 mW/g

SAR(1 g) = 0.235 mW/g; SAR(10 g) = 0.152 mW/g

Maximum value of SAR (measured) = 0.251 mW/g

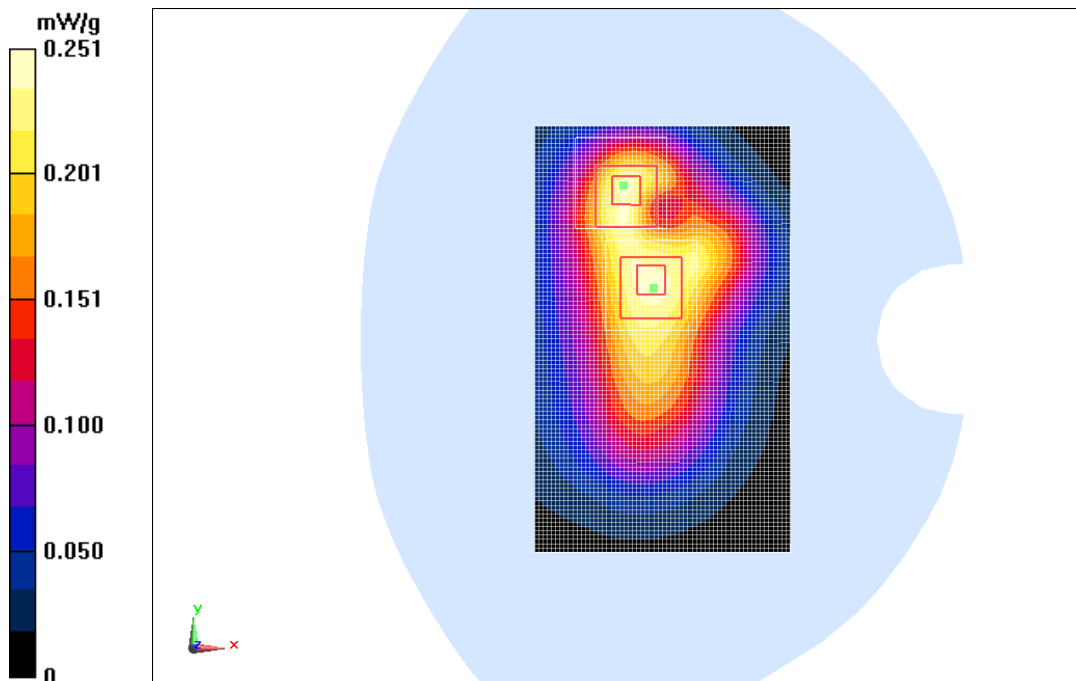


Fig. 45 1900 MHz CH661

1900 Body Towards Ground Low

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.447$ mho/m; $\epsilon_r = 52.398$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

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

Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Toward Ground Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.277 mW/g

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

Reference Value = 12.403 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.393 mW/g

SAR(1 g) = 0.269 mW/g; SAR(10 g) = 0.171 mW/g

Maximum value of SAR (measured) = 0.292 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.403 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.389 mW/g

SAR(1 g) = 0.231 mW/g; SAR(10 g) = 0.137 mW/g

Maximum value of SAR (measured) = 0.280 mW/g

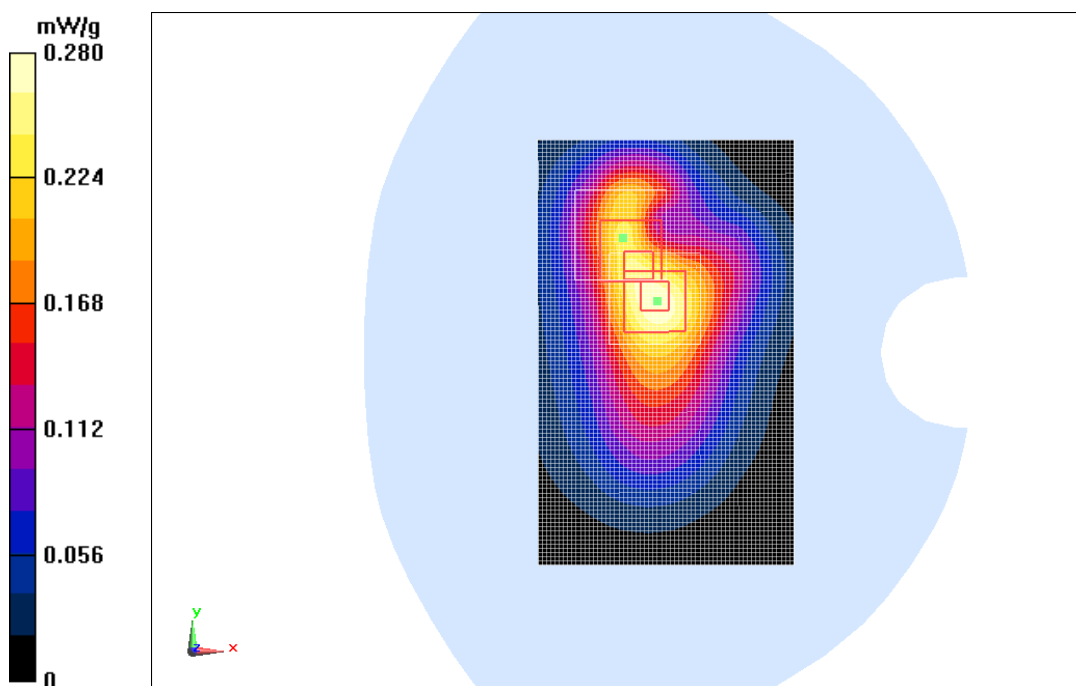


Fig. 46 1900 MHz CH512

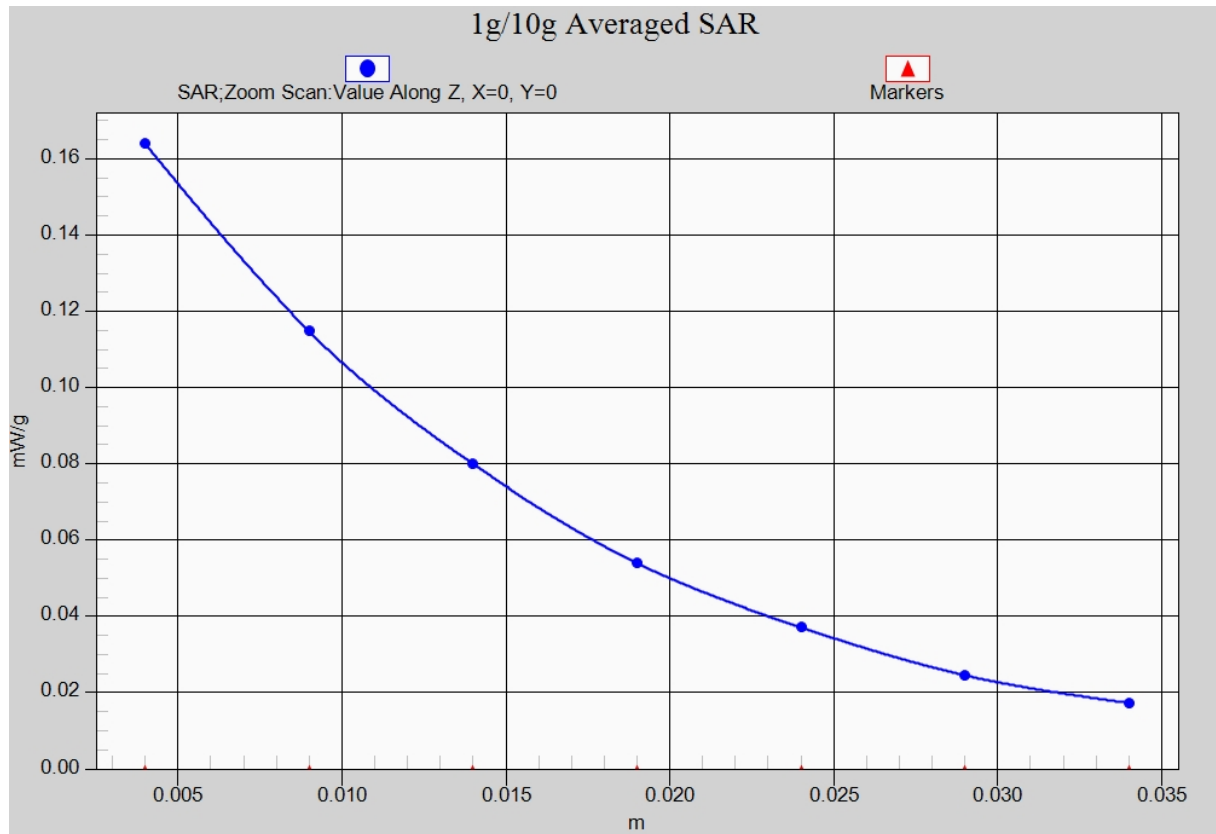


Fig. 46-1 Z-Scan at power reference point (1900 MHz CH512)

1900 Body Towards Ground Low with battery CCA30B4010C2

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.447$ mho/m; $\epsilon_r = 52.398$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

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

Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Toward Ground Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.282 mW/g

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

Reference Value = 13.064 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.385 mW/g

SAR(1 g) = 0.261 mW/g; SAR(10 g) = 0.168 mW/g

Maximum value of SAR (measured) = 0.283 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.064 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.328 mW/g

SAR(1 g) = 0.207 mW/g; SAR(10 g) = 0.130 mW/g

Maximum value of SAR (measured) = 0.228 mW/g

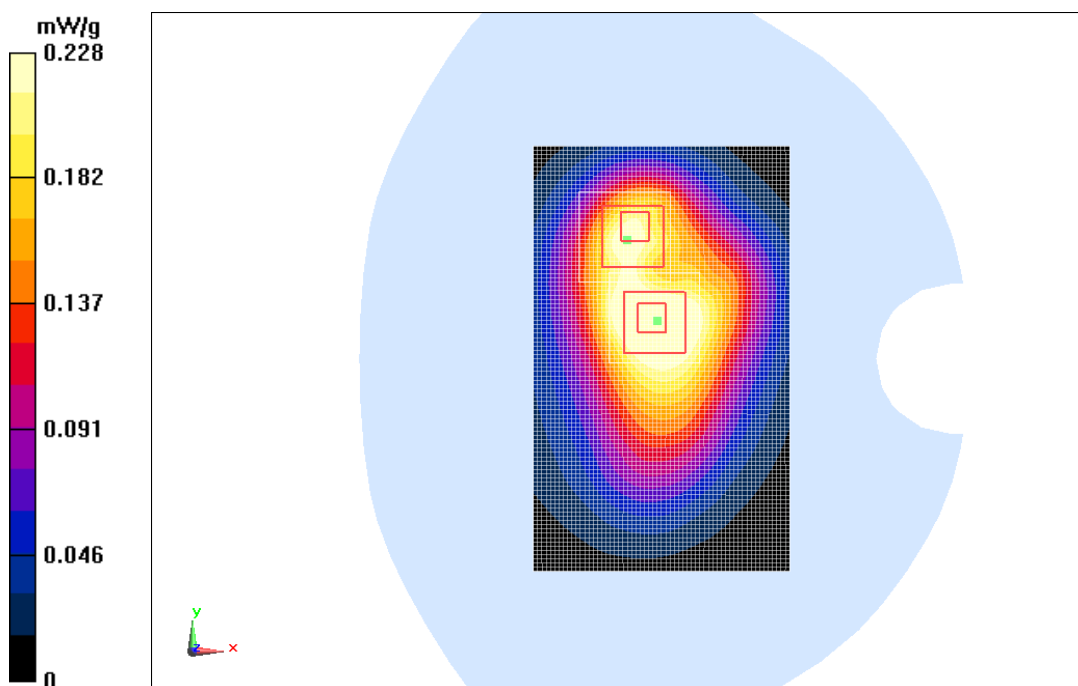


Fig. 47 1900 MHz CH512

1900 Body Towards Ground Low with battery CCA30B4010C5

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.447$ mho/m; $\epsilon_r = 52.398$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Ambient Temperature: 22.0°C

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

Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

Toward Ground Low/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.242 mW/g

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

Reference Value = 12.065 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.343 mW/g

SAR(1 g) = 0.234 mW/g; SAR(10 g) = 0.150 mW/g

Maximum value of SAR (measured) = 0.251 mW/g

Toward Ground Low/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.065 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.282 mW/g

SAR(1 g) = 0.190 mW/g; SAR(10 g) = 0.117 mW/g

Maximum value of SAR (measured) = 0.204 mW/g

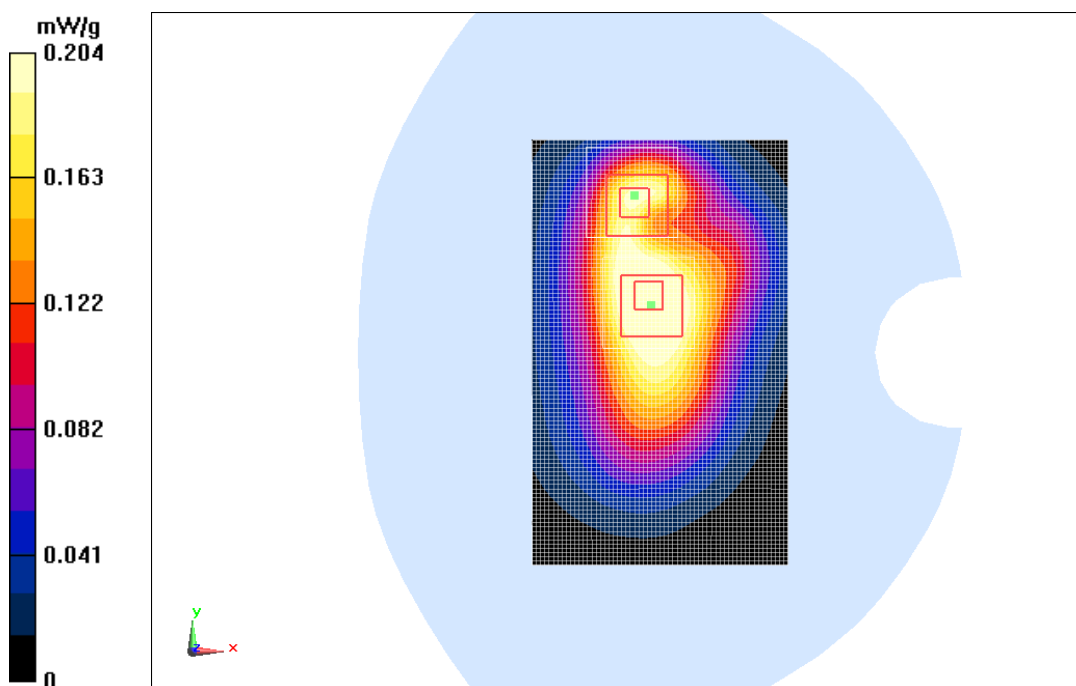


Fig. 48 1900 MHz CH512

ANNEX B SYSTEM VALIDATION RESULTS

835MHz

Date: 2012-6-30

Electronics: DAE4 Sn771

Medium: Head 850 MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 0.89$ mho/m; $\epsilon_r = 41.37$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Liquid Temperature: 22.0°C

Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(6.26, 6.26, 6.26)

System Validation /Area Scan (81x161x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 2.60 mW/g

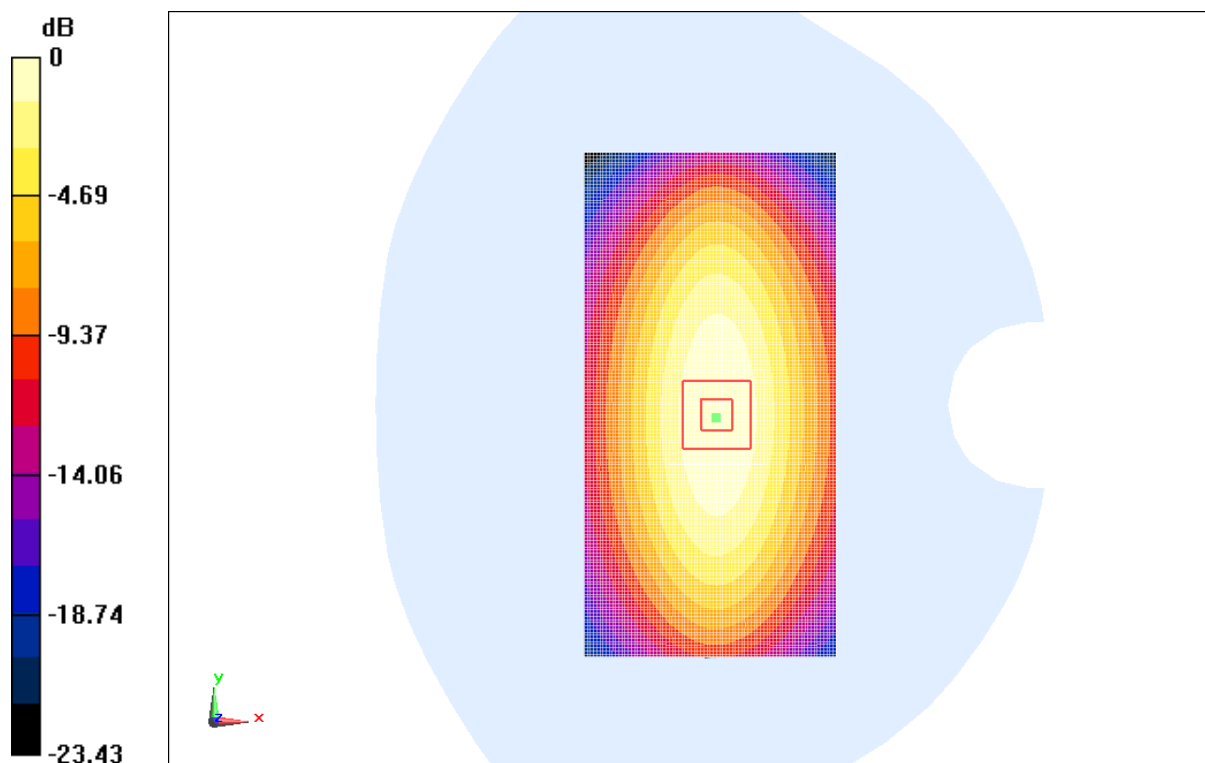
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.205 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 3.573 W/kg

SAR(1 g) = 2.42 mW/g; SAR(10 g) = 1.59 mW/g

Maximum value of SAR (measured) = 2.61 mW/g



0 dB = 2.60 mW/g = 8.30 dB mW/g

Fig.49 validation 835MHz 250mW

835MHz

Date: 2012-6-30

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 1.00 \text{ mho/m}$; $\epsilon_r = 53.82$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.6°C Liquid Temperature: 22.0°C

Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(6.14, 6.14, 6.14)

System Validation /Area Scan (81x171x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 2.65 mW/g

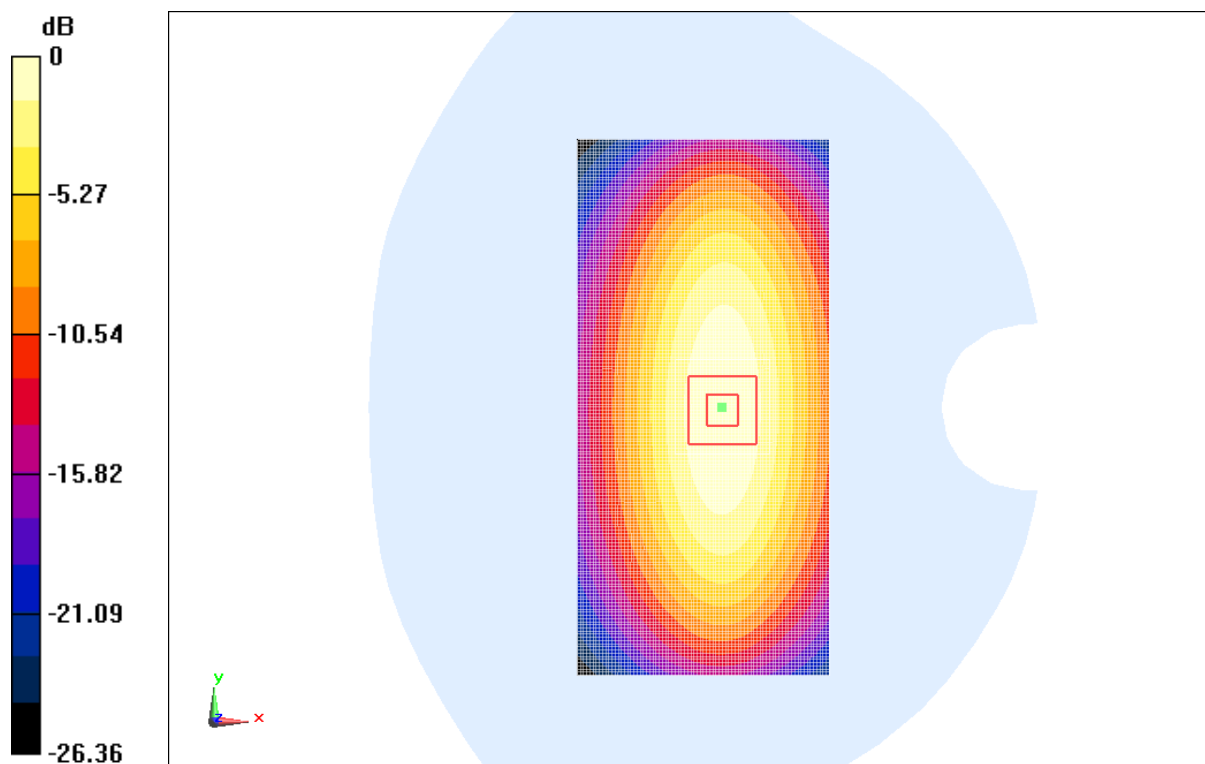
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 48.781 V/m ; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.641 W/kg

SAR(1 g) = 2.44 mW/g ; SAR(10 g) = 1.61 mW/g

Maximum value of SAR (measured) = 2.65 mW/g



0 dB = $2.65 \text{ mW/g} = 8.74 \text{ dB mW/g}$

Fig.50 validation 835MHz 250mW

1900MHz

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Head 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.39 \text{ mho/m}$; $\epsilon_r = 41.82$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.6°C Liquid Temperature: 22.0°C

Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(5.19, 5.19, 5.19)

System Validation/Area Scan (81x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
Maximum value of SAR (interpolated) = 10.8 mW/g

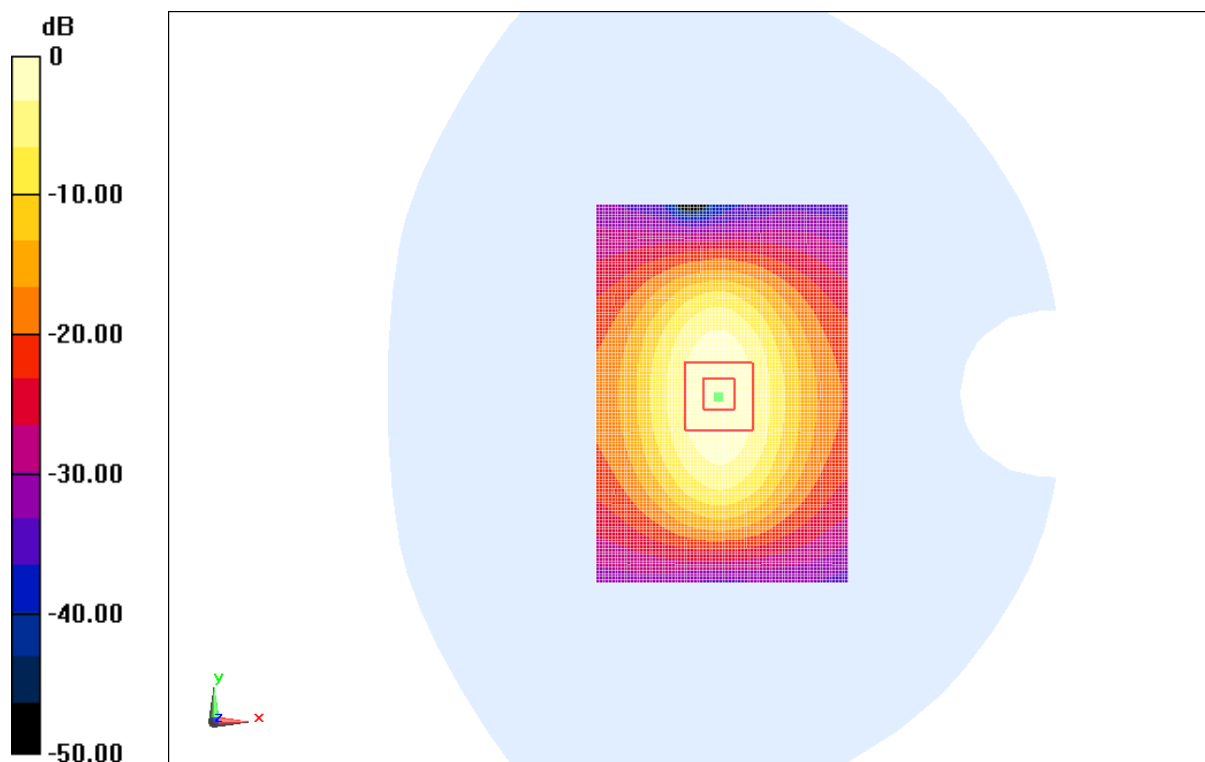
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 89.097 V/m ; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 17.438 W/kg

SAR(1 g) = 9.5 mW/g ; SAR(10 g) = 4.93 mW/g

Maximum value of SAR (measured) = 10.8 mW/g



$0 \text{ dB} = 10.8 \text{ mW/g} = 20.66 \text{ dB mW/g}$

Fig.51 validation 1900MHz 250mW

1900MHz

Date: 2012-7-1

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.50$ mho/m; $\epsilon_r = 52.18$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.6°C Liquid Temperature: 22.0°C

Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1

Probe: ES3DV3 - SN3149 ConvF(4.64, 4.64, 4.64)

System Validation/Area Scan (81x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 11.8 mW/g

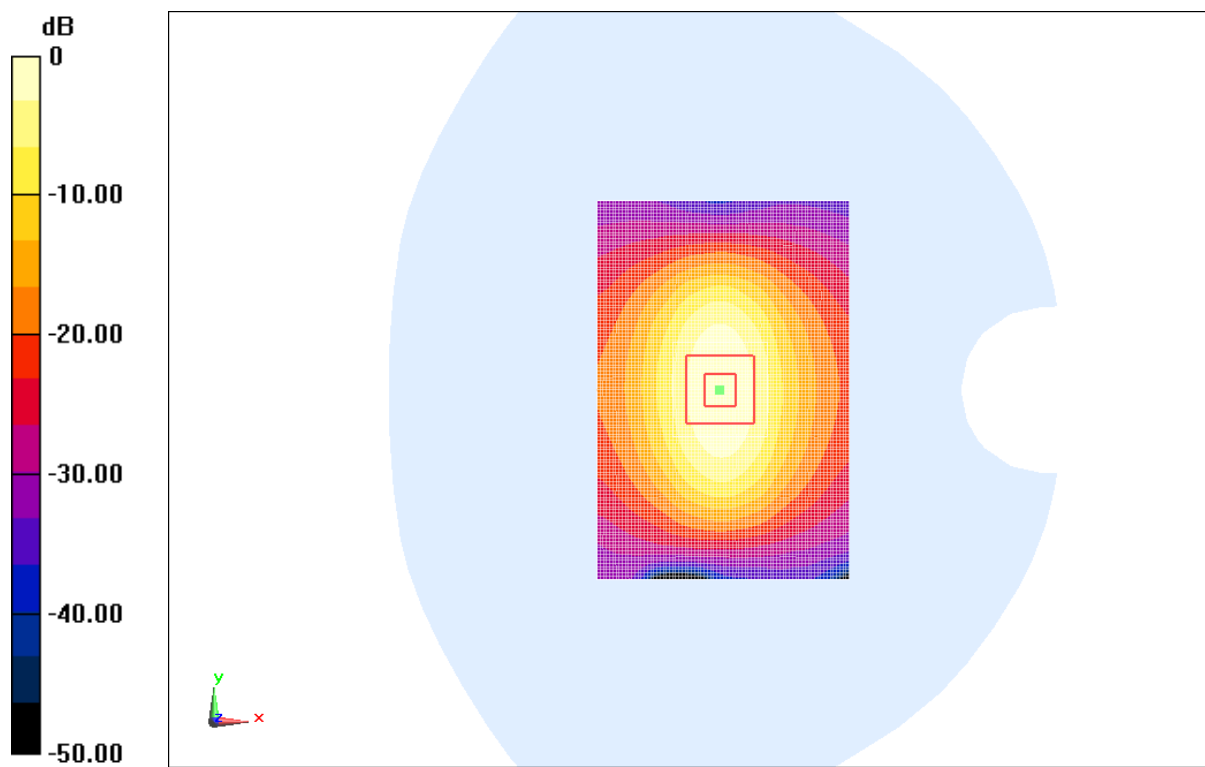
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.298 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 17.860 W/kg

SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.5 mW/g

Maximum value of SAR (measured) = 11.9 mW/g



0 dB = 11.8 mW/g = 21.43 dB mW/g

Fig.52 validation 1900MHz 250mW

ANNEX C PROBE CALIBRATION CERTIFICATE

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **TMC Beijing**

Certificate No: **ES3-3149_Apr12**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3149**

Calibration procedure(s) **QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4**
Calibration procedure for dosimetric E-field probes

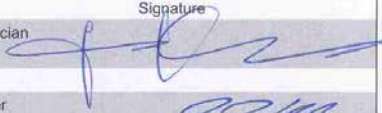
Calibration date: **April 24, 2012**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	10-Jan-12 (No. DAE4-660_Jan12)	Jan-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

Calibrated by:	Name Jeton Kastrati	Function Laboratory Technician	Signature 
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature 

Issued: April 24, 2012

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
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S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E^2 -field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z}** = NORM_{x,y,z} * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,y,z}**: A, B, C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

ES3DV3 – SN:3149

April 24, 2012

Probe ES3DV3

SN:3149

Manufactured: June 12, 2007
Calibrated: April 24, 2012

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

ES3DV3-- SN:3149

April 24, 2012

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3149

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V/m})^2$) ^A	1.21	1.24	1.24	$\pm 10.1 \%$
DCP (mV) ^B	101.1	100.9	100.5	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^E (k=2)
0	CW	0.00	X	0.00	0.00	1.00	112.7	$\pm 2.2 \%$
			Y	0.00	0.00	1.00	114.2	
			Z	0.00	0.00	1.00	118.9	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of NormX,Y,Z do not affect the E^2 -field uncertainty inside TSL (see Pages 5 and 6).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

ES3DV3- SN:3149

April 24, 2012

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3149

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.50	6.50	6.50	0.24	2.36	± 12.0 %
850	41.5	0.92	6.26	6.26	6.26	0.25	2.14	± 12.0 %
900	41.5	0.97	6.17	6.17	6.17	0.21	2.55	± 12.0 %
1800	40.0	1.40	5.23	5.23	5.23	0.43	1.64	± 12.0 %
1900	40.0	1.40	5.19	5.19	5.19	0.45	1.64	± 12.0 %
2000	40.0	1.40	5.11	5.11	5.11	0.52	1.46	± 12.0 %
2100	39.8	1.49	5.12	5.12	5.12	0.49	1.52	± 12.0 %
2450	39.2	1.80	4.49	4.49	4.49	0.71	1.37	± 12.0 %
2550	39.1	1.91	4.34	4.34	4.34	0.69	1.26	± 12.0 %
2600	39.0	1.96	4.26	4.26	4.26	0.55	1.29	± 12.0 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

ES3DV3- SN:3149

April 24, 2012

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3149

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.29	6.29	6.29	0.43	1.56	± 12.0 %
850	55.2	0.99	6.14	6.14	6.14	0.41	1.63	± 12.0 %
900	55.0	1.05	6.16	6.16	6.16	0.63	1.30	± 12.0 %
1800	53.3	1.52	4.84	4.84	4.84	0.28	2.97	± 12.0 %
1900	53.3	1.52	4.64	4.64	4.64	0.34	2.25	± 12.0 %
2000	53.3	1.52	4.63	4.63	4.63	0.35	2.21	± 12.0 %
2100	53.2	1.62	4.91	4.91	4.91	0.36	2.20	± 12.0 %
2450	52.7	1.95	4.15	4.15	4.15	0.80	0.61	± 12.0 %
2550	52.6	2.09	4.07	4.07	4.07	0.80	0.50	± 12.0 %
2600	52.5	2.16	3.99	3.99	3.99	0.80	0.51	± 12.0 %

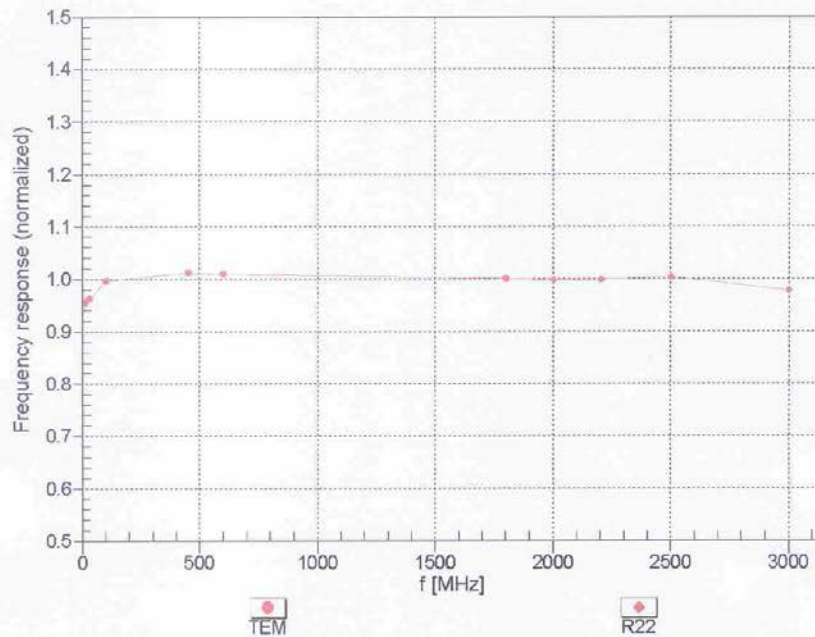
^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

ES3DV3- SN:3149

April 24, 2012

Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



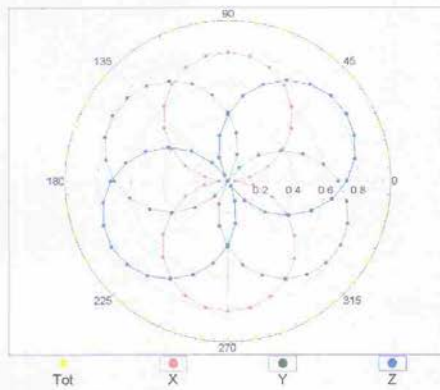
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

ES3DV3- SN:3149

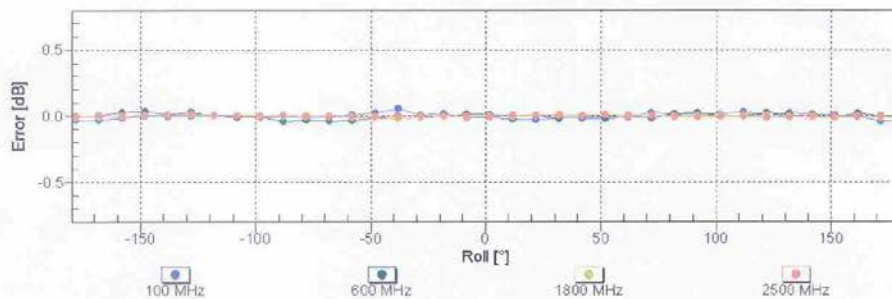
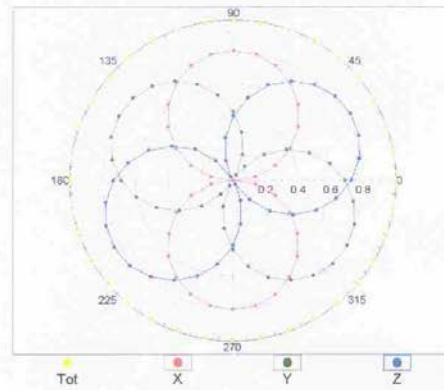
April 24, 2012

Receiving Pattern (ϕ), $\theta = 0^\circ$

f=600 MHz,TEM



f=1800 MHz,R22

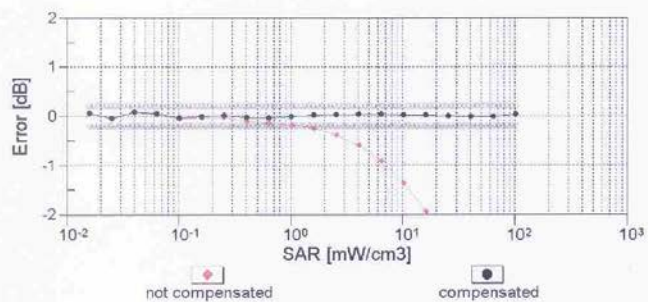
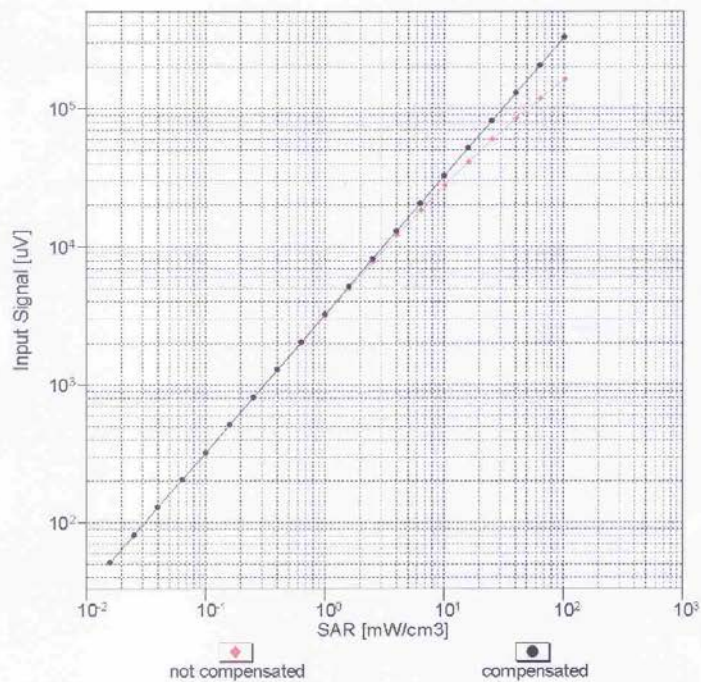


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

ES3DV3- SN:3149

April 24, 2012

Dynamic Range f(SAR_{head}) (TEM cell , f = 900 MHz)

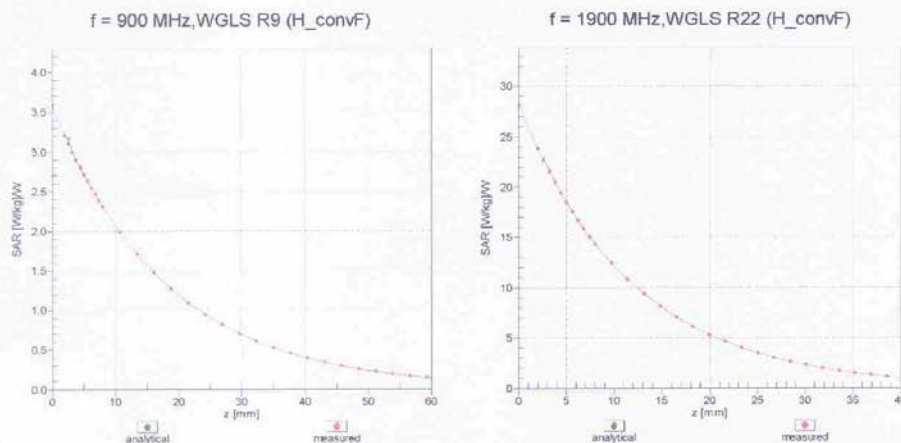


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

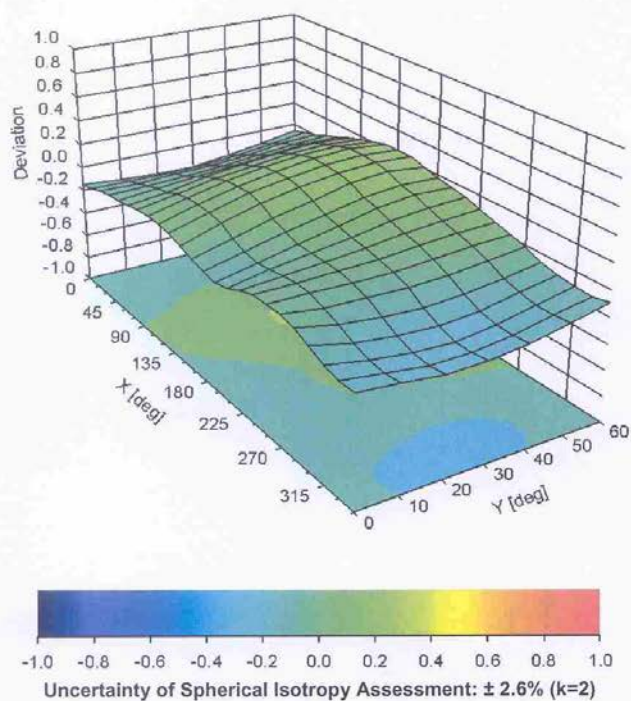
ES3DV3-- SN:3149

April 24, 2012

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (ϕ, ϑ), $f = 900 \text{ MHz}$



ES3DV3- SN:3149

April 24, 2012

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3149

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	51.8
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

ANNEX D DIPOLE CALIBRATION CERTIFICATE

835 MHz Dipole Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **TMC Beijing**

Certificate No.: **D835V2-443_May12**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 443**

Calibration procedure(s) **QA CAL-05.v8**
Calibration procedure for dipole validation kits above 700 MHz

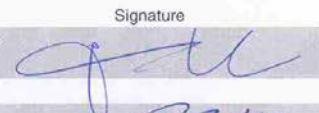
Calibration date: **May 03, 2012**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 3, 2012

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	41.1 $\pm$ 6 %	0.90 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.33 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.30 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.52 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.07 mW / g $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	54.5 $\pm$ 6 %	1.01 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.42 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	9.36 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.59 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	6.20 mW / g $\pm$ 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.8 Ω - 6.7 j Ω
Return Loss	- 23.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.8 Ω - 7.8 j Ω
Return Loss	- 21.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.387 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 26, 2001

DASY5 Validation Report for Head TSL

Date: 03.05.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 443

Communication System: CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.9 \text{ mho/m}$; $\epsilon_r = 41.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

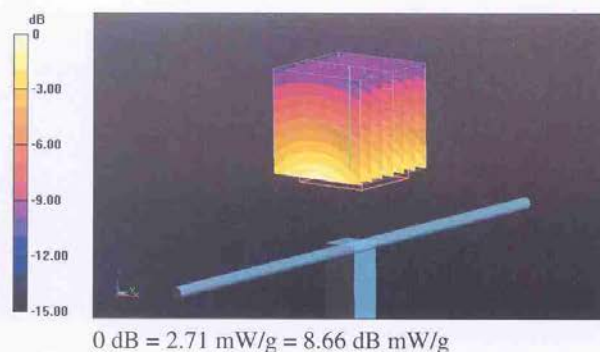
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.826 V/m; Power Drift = -0.01 dB

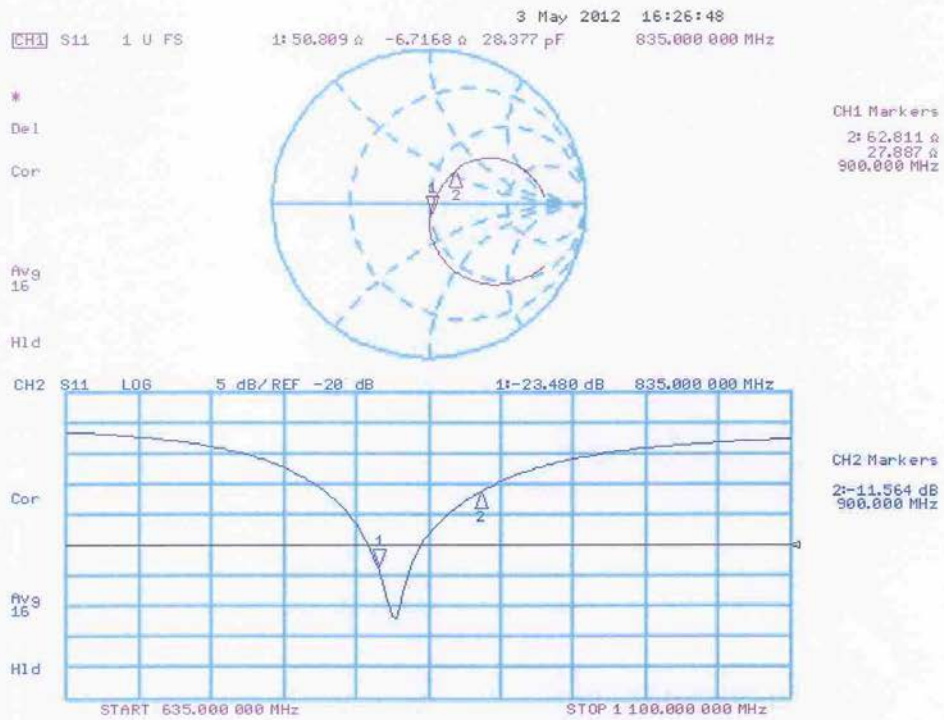
Peak SAR (extrapolated) = 3.423 mW/g

SAR(1 g) = 2.33 mW/g; SAR(10 g) = 1.52 mW/g

Maximum value of SAR (measured) = 2.71 mW/g



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 03.05.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 443

Communication System: CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 1.01 \text{ mho/m}$; $\epsilon_r = 54.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 54.758 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.514 mW/g

SAR(1 g) = 2.42 mW/g; SAR(10 g) = 1.59 mW/g

Maximum value of SAR (measured) = 2.82 mW/g

