WCDMA1700-BIV_CH1412 Rear
Date: 12/21/2017
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used: f = 1732.4 MHz; σ = 1.477 mho/m; εr = 53.59; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA1700-BIV 1732.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.9,7.9,7.9)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.868 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.28 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.736 W/kg; SAR(10 g) = 0.495 W/kg
Maximum value of SAR (measured) = 0.846 W/kg

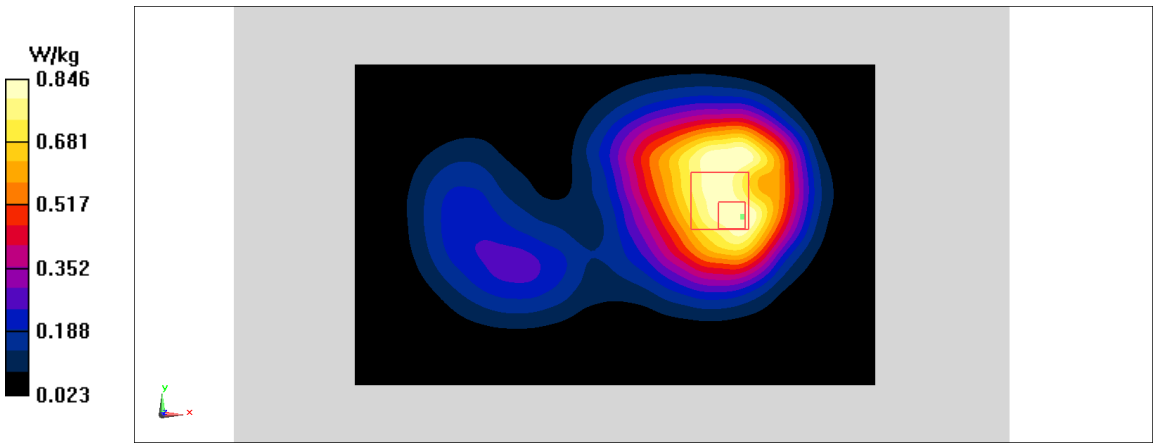


Fig A.8

WCDMA850-BV_CH4132 Right Cheek
Date: 12/20/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 826.4 MHz; σ = 0.906 mho/m; εr = 41.76; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA850-BV 826.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.33,9.33,9.33)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.37 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.688 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.435 W/kg
SAR(1 g) = 0.336 W/kg; SAR(10 g) = 0.25 W/kg
Maximum value of SAR (measured) = 0.372 W/kg

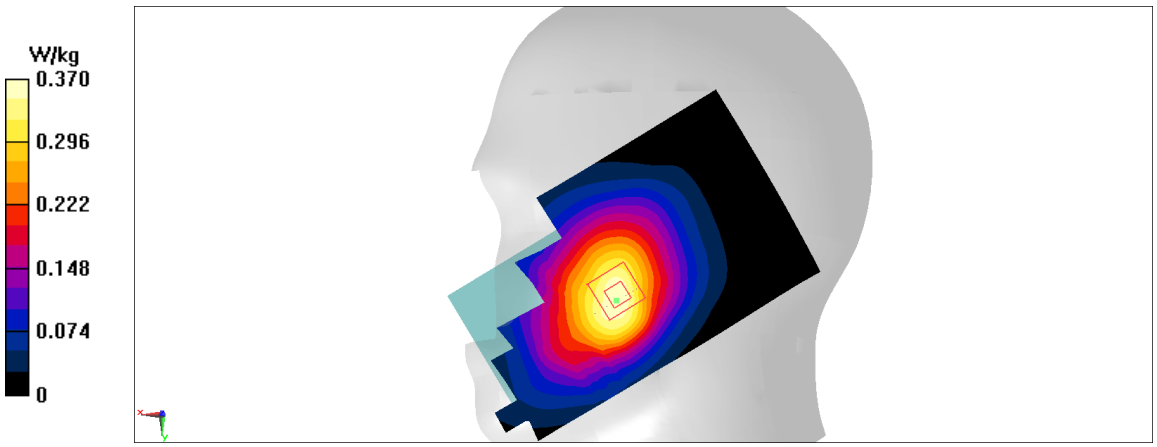


Fig A.9

WCDMA850-BV_CH4182 Rear
Date: 12/20/2017
Electronics: DAE4 Sn1331
Medium: Body 835 MHz
Medium parameters used: f = 835.4 MHz; σ = 0.987 mho/m; εr = 54.13; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: WCDMA850-BV 835.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.52,9.52,9.52)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.549 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.38 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.632 W/kg
SAR(1 g) = 0.503 W/kg; SAR(10 g) = 0.387 W/kg
Maximum value of SAR (measured) = 0.526 W/kg

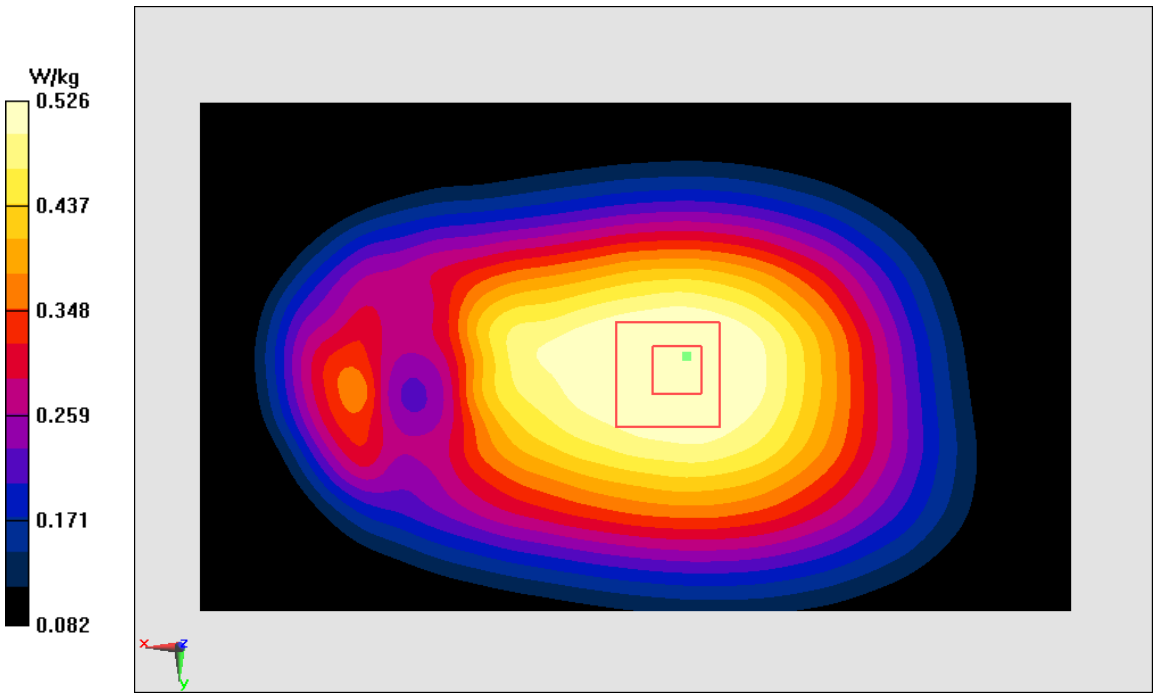


Fig A.10

LTE1900-FDD2_CH19100 Left Cheek
Date: 12/22/2017
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.386 mho/m; εr = 40.26; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1900-FDD2 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.89,7.89,7.89)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.661 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.043 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.837 W/kg
SAR(1 g) = 0.535 W/kg; SAR(10 g) = 0.33 W/kg
Maximum value of SAR (measured) = 0.636 W/kg

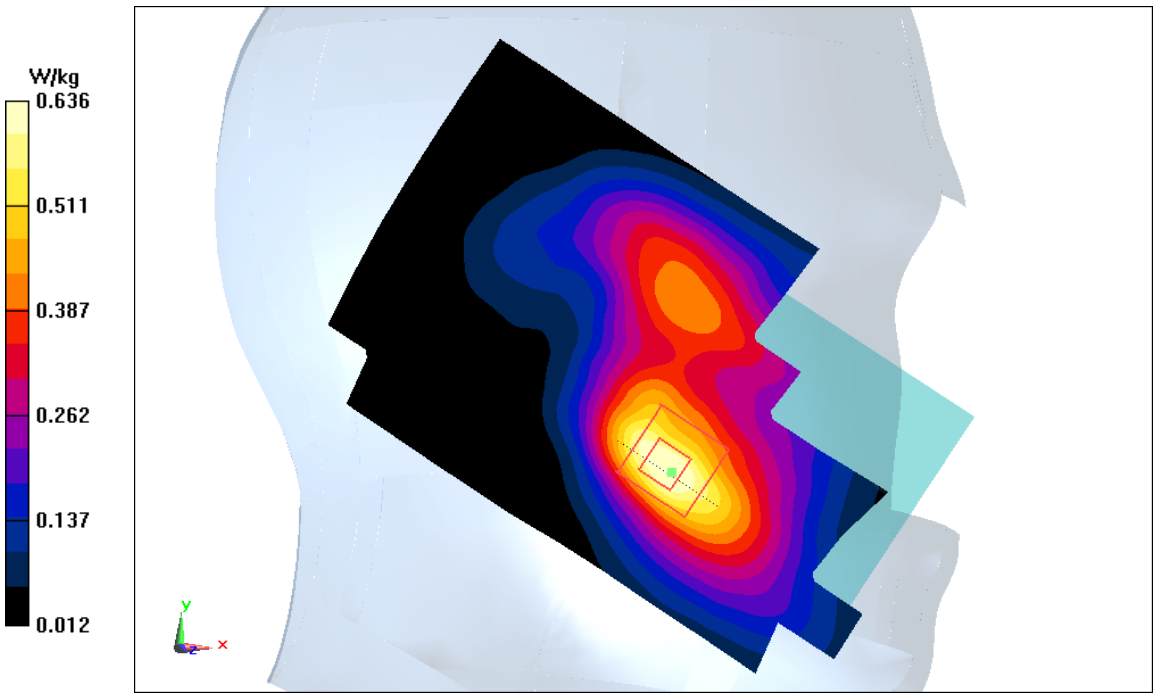


Fig A.11

LTE1900-FDD2_CH19100 Rear
Date: 12/22/2017
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.533 mho/m; εr = 53.88; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1900-FDD2 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.57,7.57,7.57)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.789 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.59 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.709 W/kg; SAR(10 g) = 0.46 W/kg
Maximum value of SAR (measured) = 0.759 W/kg

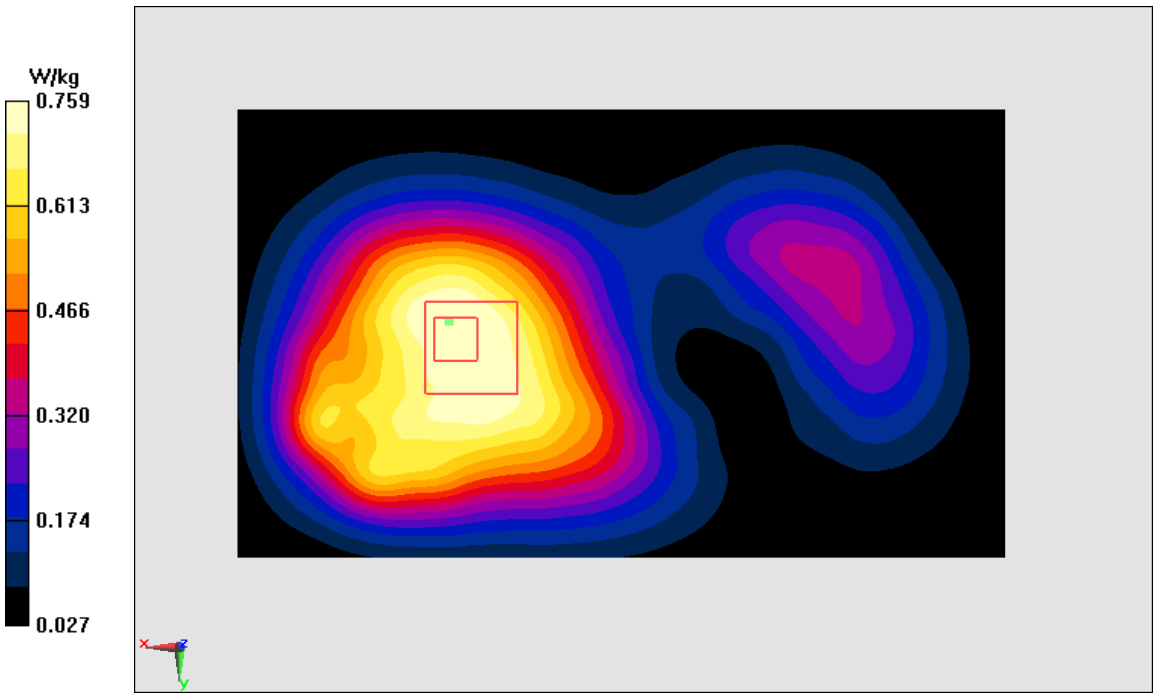


Fig A.12

LTE1700-FDD4_CH20300 Right Cheek
Date: 12/21/2017
Electronics: DAE4 Sn1331
Medium: Head 1750 MHz
Medium parameters used: f = 1745 MHz; σ = 1.36 mho/m; εr = 40.51; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1700-FDD4 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(8.16,8.16,8.16)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.575 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.844 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.701 W/kg
SAR(1 g) = 0.469 W/kg; SAR(10 g) = 0.289 W/kg
Maximum value of SAR (measured) = 0.549 W/kg

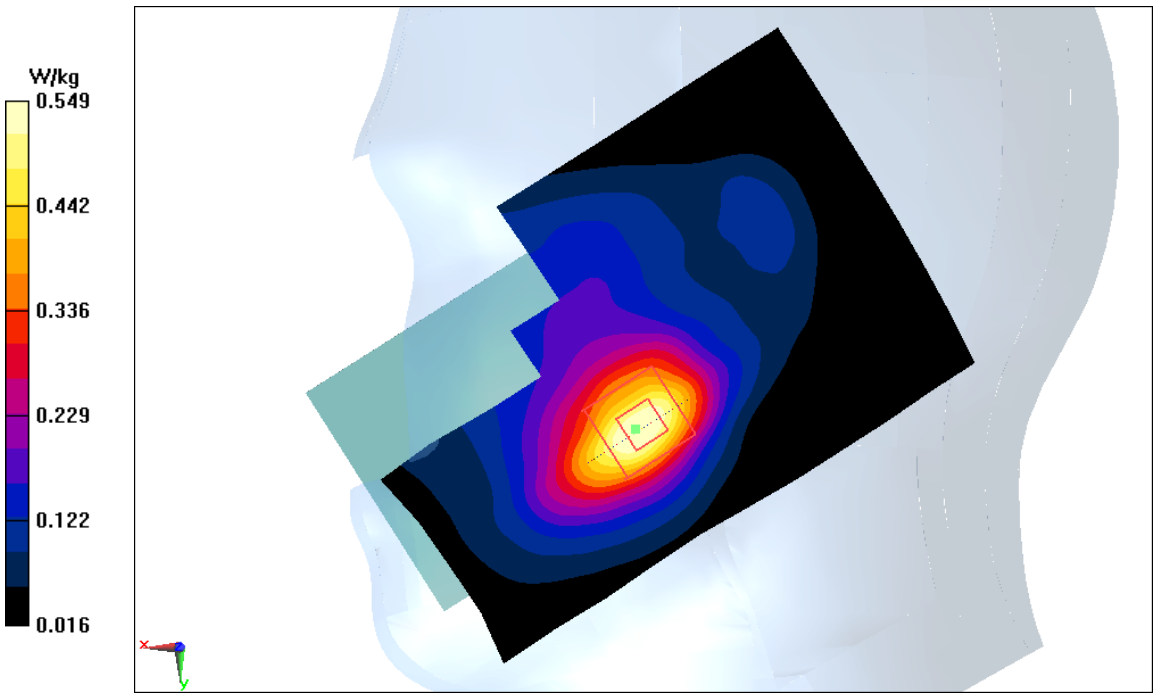


Fig A.13

LTE1700-FDD4_CH20300 Rear
Date: 12/21/2017
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used: f = 1745 MHz; σ = 1.489 mho/m; εr = 53.58; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE1700-FDD4 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.9,7.9,7.9)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.07 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.83 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.879 W/kg; SAR(10 g) = 0.577 W/kg
Maximum value of SAR (measured) = 0.943 W/kg

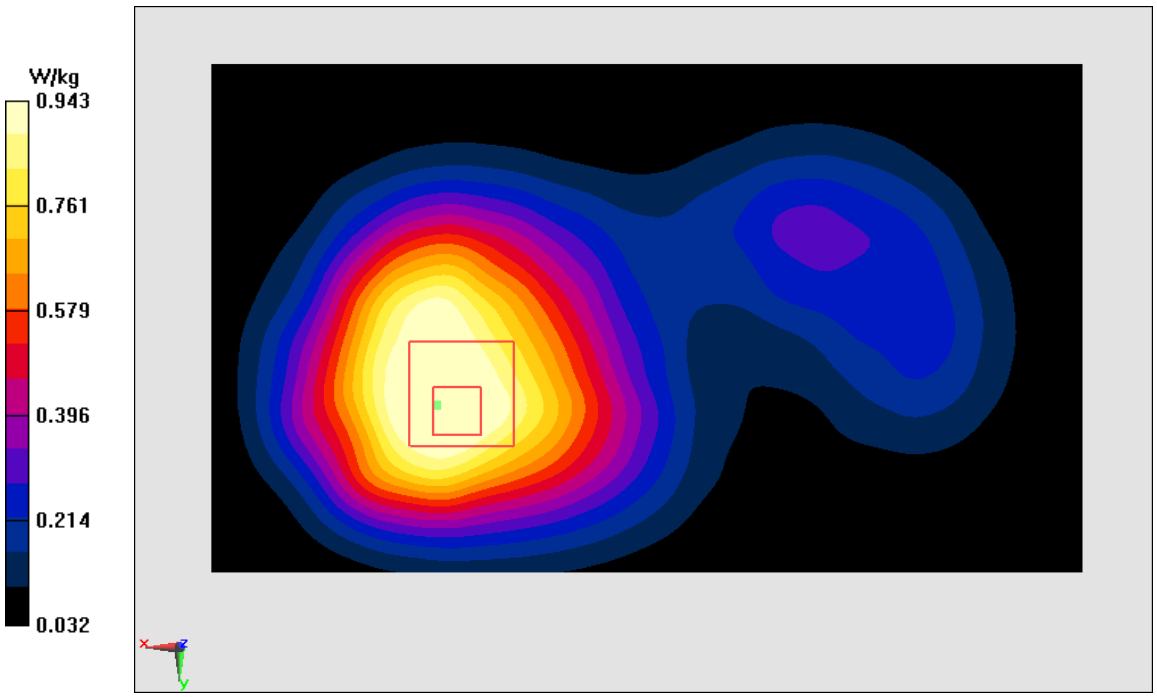


Fig A.14

LTE850-FDD5_CH20525 Right Cheek
Date: 12/20/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 836.5 MHz; σ = 0.916 mho/m; εr = 41.75; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE850-FDD5 836.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.33,9.33,9.33)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.307 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.402 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.358 W/kg
SAR(1 g) = 0.28 W/kg; SAR(10 g) = 0.212 W/kg
Maximum value of SAR (measured) = 0.309 W/kg

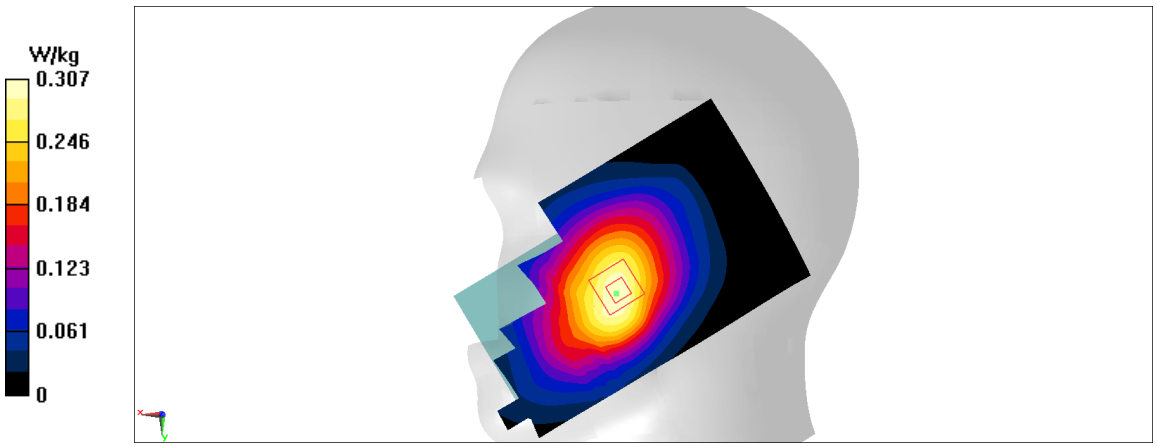


Fig A.15

LTE850-FDD5_CH20525 Rear
Date: 12/20/2017
Electronics: DAE4 Sn1331
Medium: Body 835 MHz
Medium parameters used: f = 836.5 MHz; σ = 0.988 mho/m; εr = 54.13; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE850-FDD5 836.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.52,9.52,9.52)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.45 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.23 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.517 W/kg
SAR(1 g) = 0.412 W/kg; SAR(10 g) = 0.319 W/kg
Maximum value of SAR (measured) = 0.43 W/kg

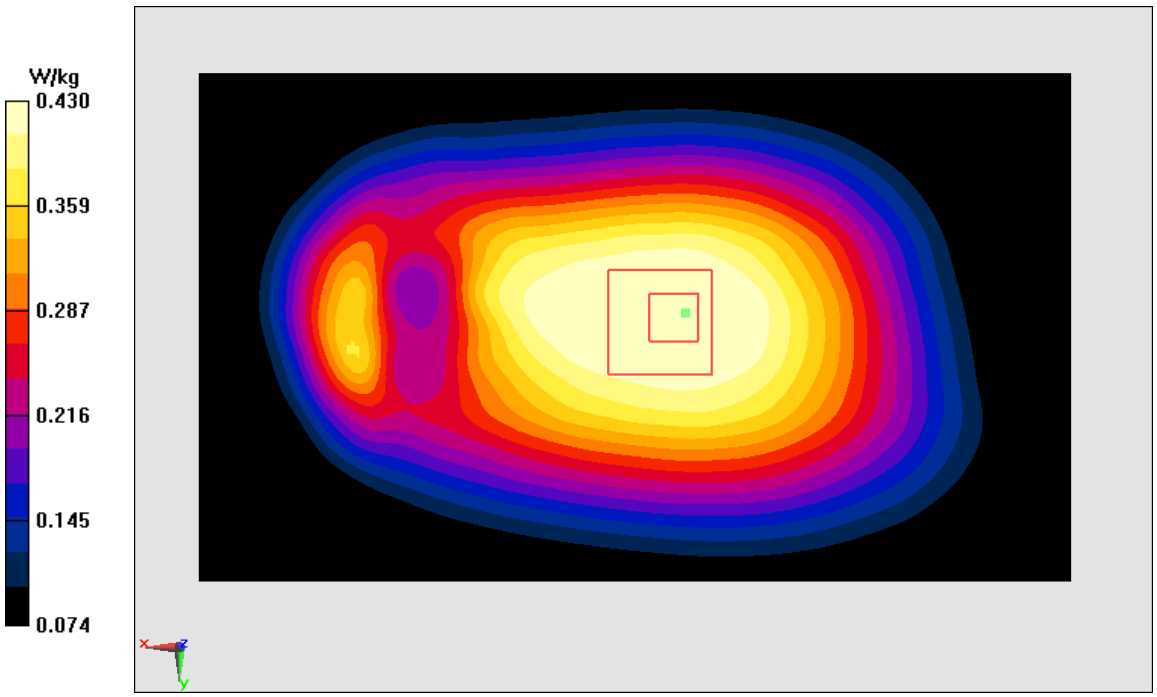


Fig A.16

LTE2500-FDD7_CH20850 Left Cheek
Date: 12/24/2017
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2510 MHz; σ = 1.858 mho/m; εr = 39.87; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE2500-FDD7 2510 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.12,7.12,7.12)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.746 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.322 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.564 W/kg; SAR(10 g) = 0.295 W/kg
Maximum value of SAR (measured) = 0.712 W/kg

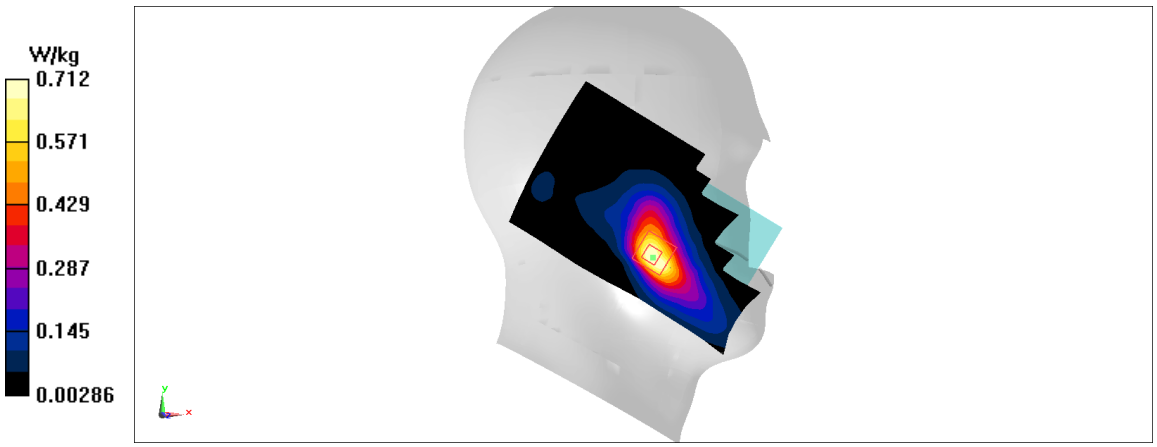


Fig A.17

LTE2500-FDD7_CH20850 Rear
Date: 12/24/2017
Electronics: DAE4 Sn1331
Medium: Body 2600 MHz
Medium parameters used: f = 2510 MHz; σ = 2.038 mho/m; εr = 52.16; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE2500-FDD7 2510 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.25,7.25,7.25)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.23 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.82 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 0.913 W/kg; SAR(10 g) = 0.474 W/kg
Maximum value of SAR (measured) = 1.11 W/kg

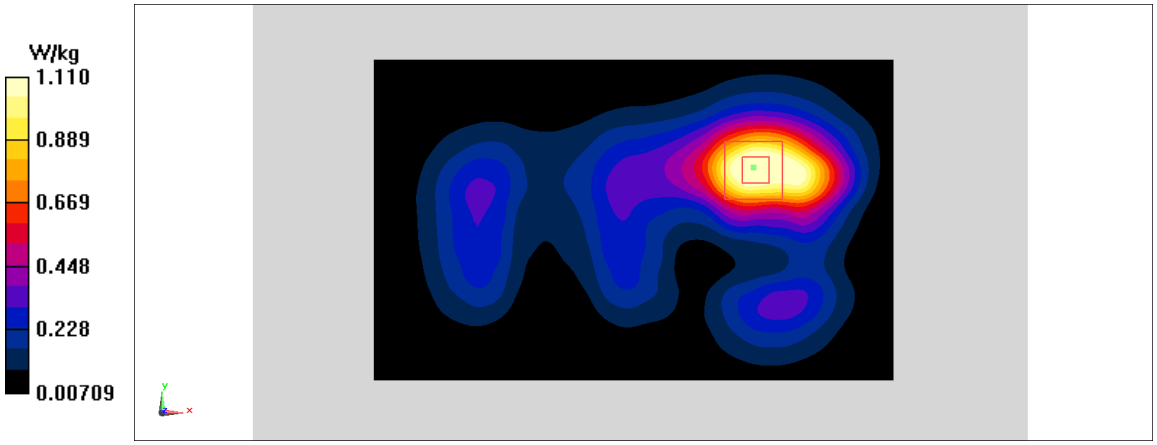


Fig A.18

LTE700-FDD12_CH23095 Right Cheek
Date: 12/19/2017
Electronics: DAE4 Sn1331
Medium: Head 750 MHz
Medium parameters used: f = 707.5 MHz; σ = 0.854 mho/m; εr = 42.15; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE700-FDD12 707.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.65,9.65,9.65)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.154 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.965 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.173 W/kg
SAR(1 g) = 0.142 W/kg; SAR(10 g) = 0.112 W/kg
Maximum value of SAR (measured) = 0.154 W/kg

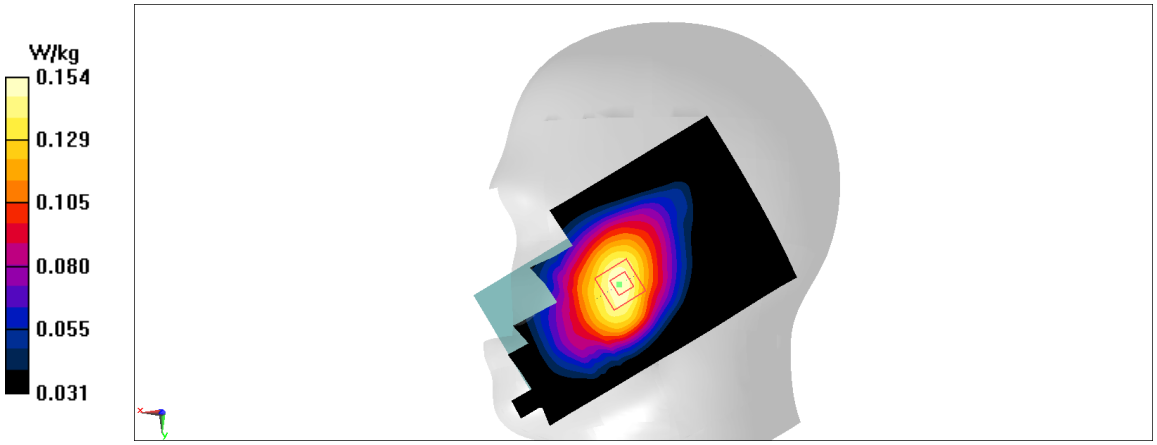


Fig A.19

LTE700-FDD12_CH23095 Rear
Date: 12/19/2017
Electronics: DAE4 Sn1331
Medium: Body 750 MHz
Medium parameters used: f = 707.5 MHz; σ = 0.921 mho/m; εr = 55.17; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE700-FDD12 707.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.96,9.96,9.96)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.385 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.91 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.44 W/kg
SAR(1 g) = 0.357 W/kg; SAR(10 g) = 0.281 W/kg
Maximum value of SAR (measured) = 0.373 W/kg

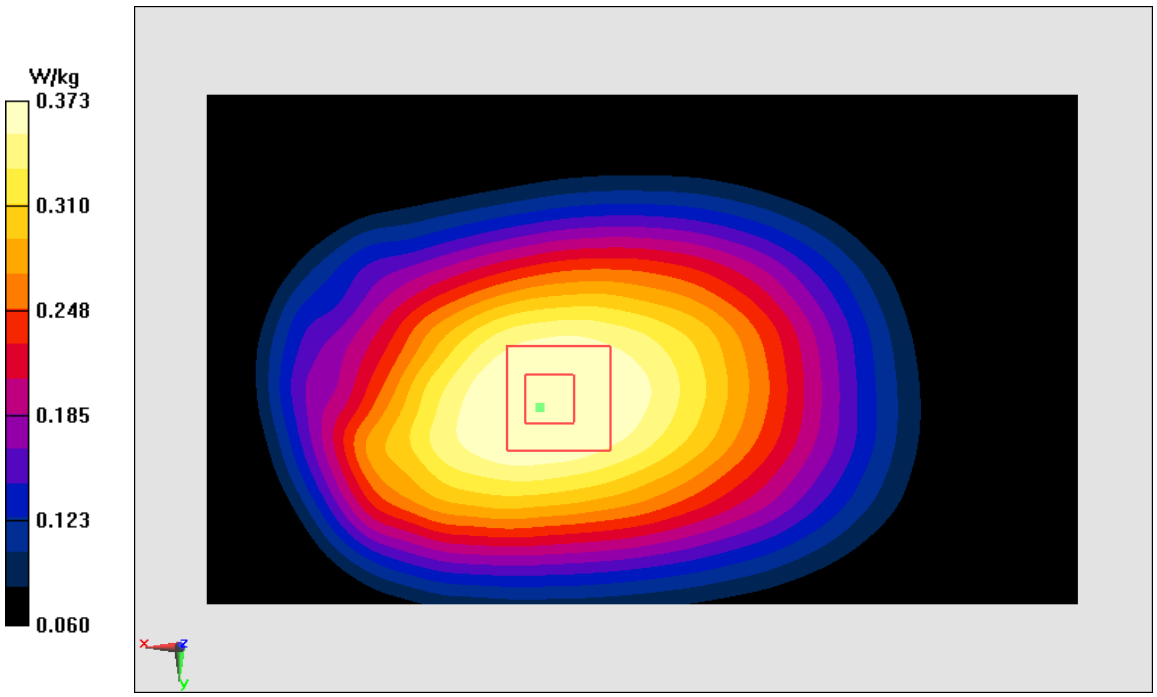


Fig A.20

LTE750-FDD13_CH23230 Right Cheek
Date: 12/19/2017
Electronics: DAE4 Sn1331
Medium: Head 750 MHz
Medium parameters used: f = 782 MHz; σ = 0.924 mho/m; εr = 42.06; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE750-FDD13 782 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.65,9.65,9.65)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.321 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.926 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.365 W/kg
SAR(1 g) = 0.295 W/kg; SAR(10 g) = 0.23 W/kg
Maximum value of SAR (measured) = 0.322 W/kg

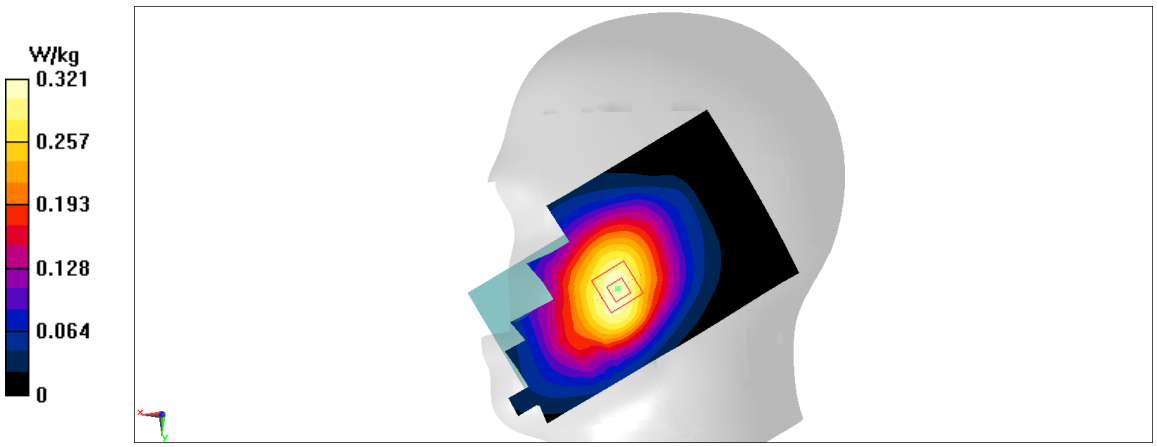


Fig A.21

LTE750-FDD13_CH23230 Rear
Date: 12/19/2017
Electronics: DAE4 Sn1331
Medium: Body 750 MHz
Medium parameters used: f = 782 MHz; σ = 0.991 mho/m; εr = 55.08; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: LTE750-FDD13 782 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.96,9.96,9.96)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.611 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.01 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.686 W/kg
SAR(1 g) = 0.562 W/kg; SAR(10 g) = 0.439 W/kg
Maximum value of SAR (measured) = 0.588 W/kg

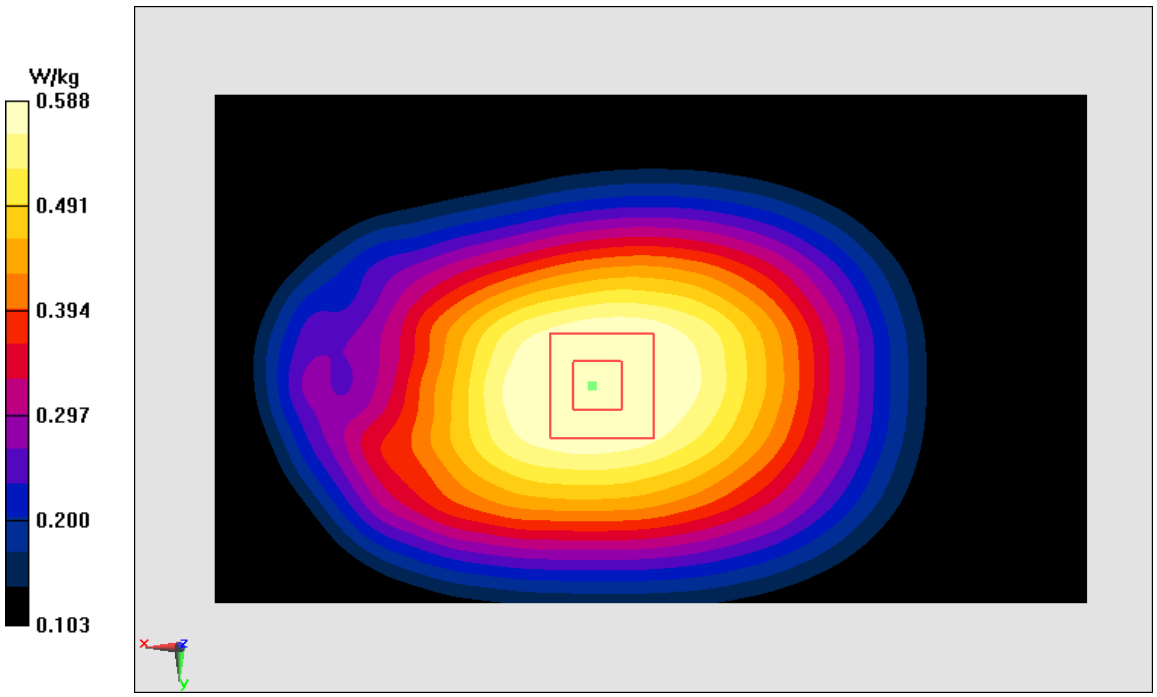


Fig A.22

WLAN2450_CH6 Left Cheek
Date: 12/23/2017
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used: f = 2437 MHz; σ = 1.765 mho/m; εr = 39.96; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: WLAN2450 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.22,7.22,7.22)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.988 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.41 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.74 W/kg
SAR(1 g) = 0.683 W/kg; SAR(10 g) = 0.298 W/kg
Maximum value of SAR (measured) = 0.929 W/kg

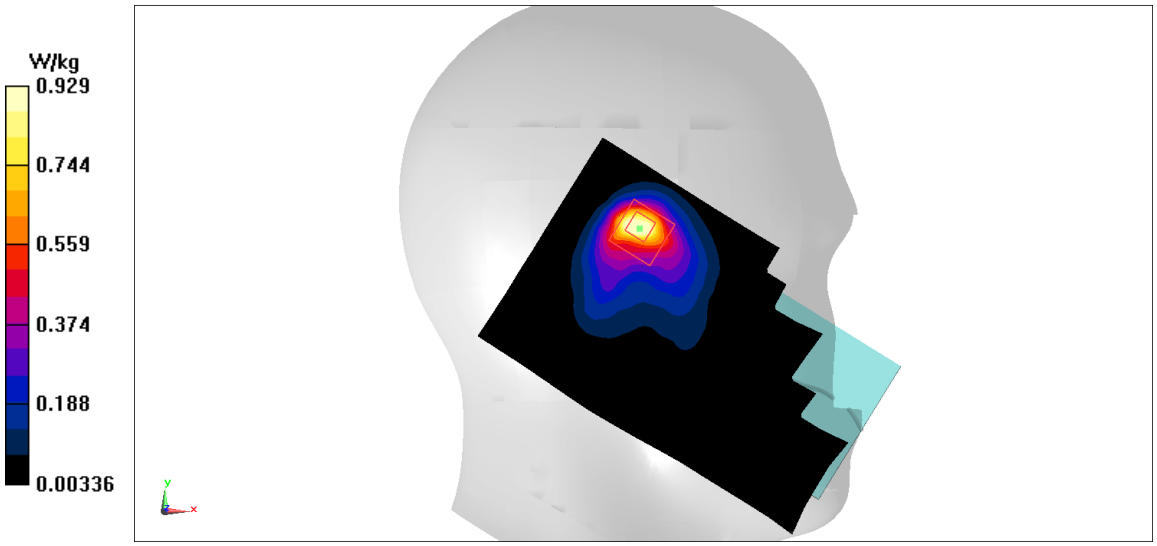


Fig A.23

WLAN2450_CH6 Rear
Date: 12/23/2017
Electronics: DAE4 Sn1331
Medium: Body 2450 MHz
Medium parameters used: f = 2437 MHz; σ = 1.938 mho/m; εr = 53.29; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC, Liquid Temperature: 22.3ºC
Communication System: WLAN2450 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.31,7.31,7.31)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.16 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.934 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.236 W/kg
SAR(1 g) = 0.12 W/kg; SAR(10 g) = 0.06 W/kg
Maximum value of SAR (measured) = 0.136 W/kg

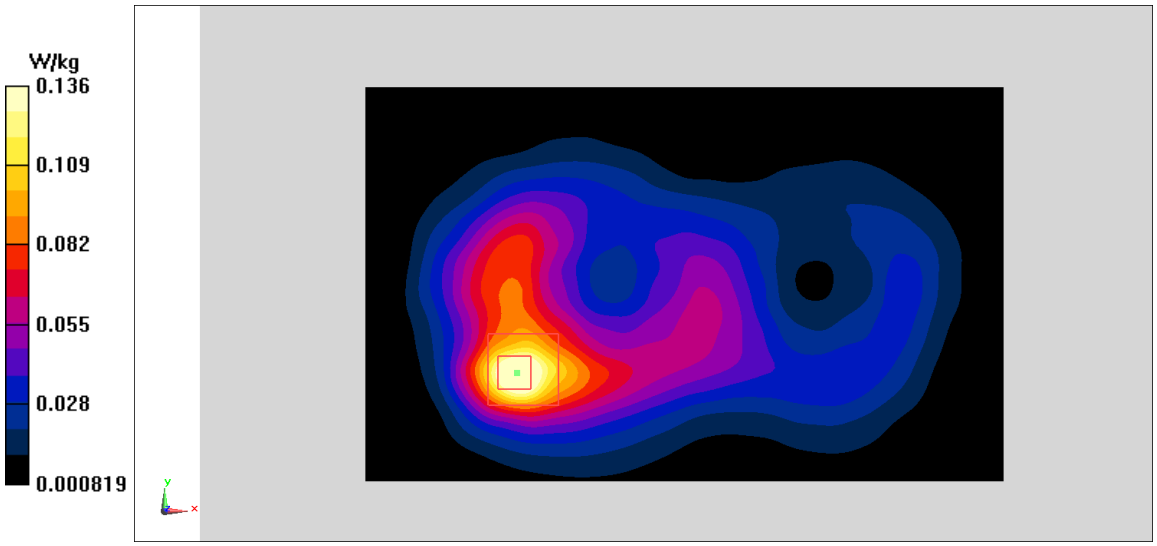


Fig A.24

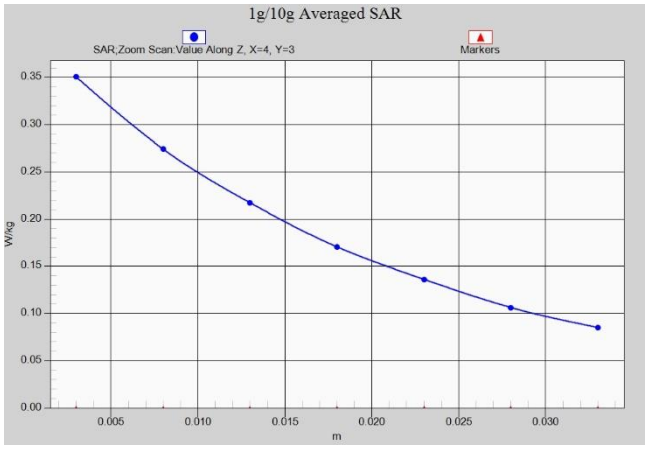


Fig.A.1- 1 Z-Scan at power reference point (GSM850)

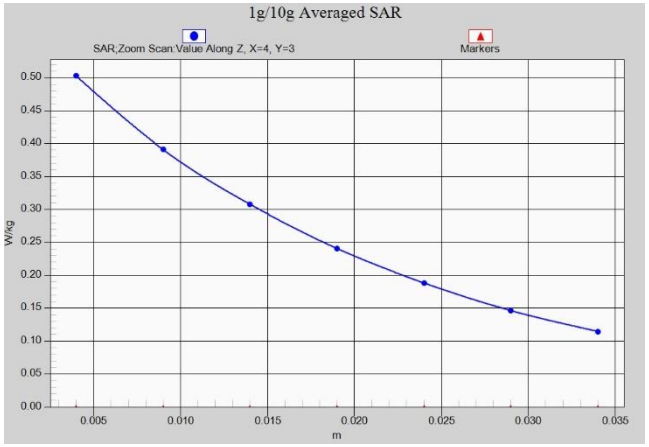


Fig.A.1- 2 Z-Scan at power reference point (GSM850)

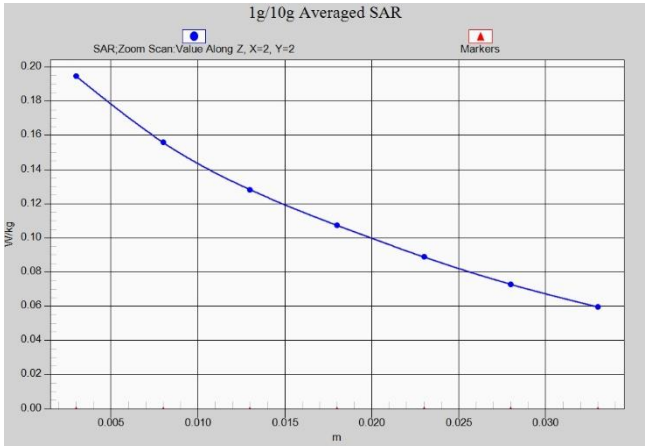


Fig.A.1- 3 Z-Scan at power reference point (PCS1900)

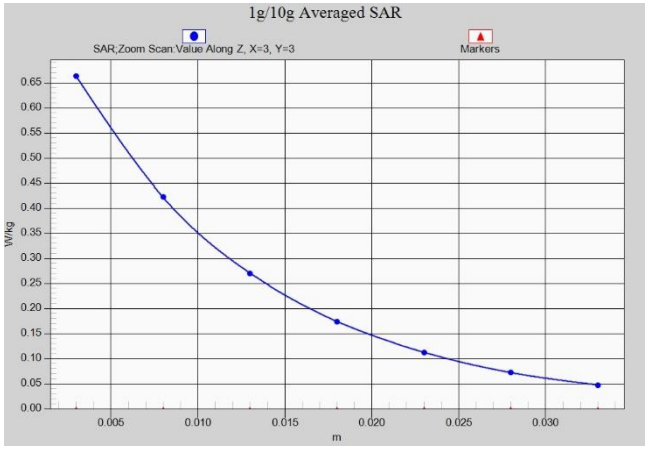


Fig.A.1- 4 Z-Scan at power reference point (PCS1900)

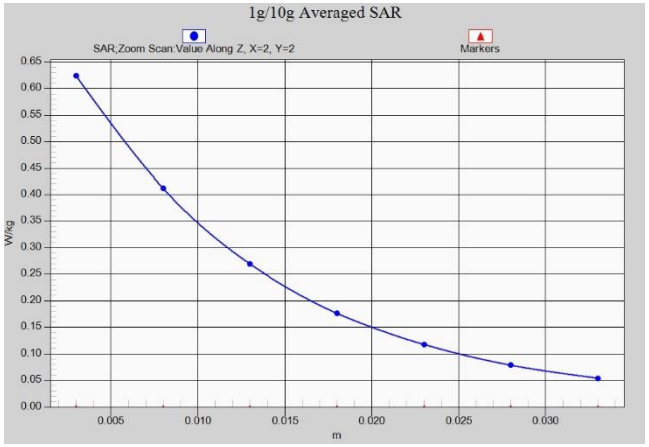


Fig.A.1- 5 Z-Scan at power reference point (W1900)

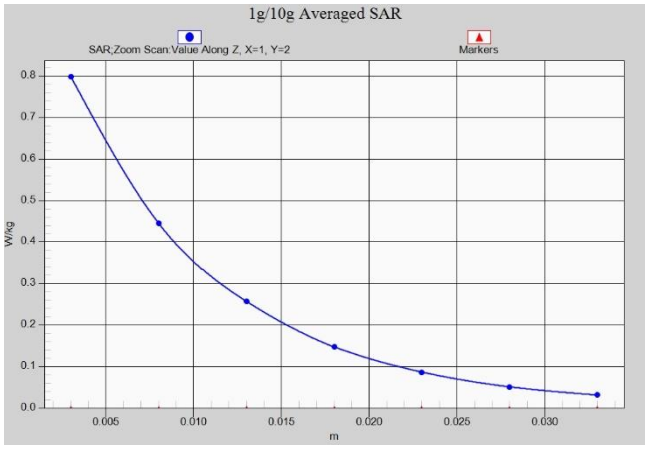


Fig.A.1- 6 Z-Scan at power reference point (W1900)

Fig.A.1- 7 Z-Scan at power reference point (W1700)

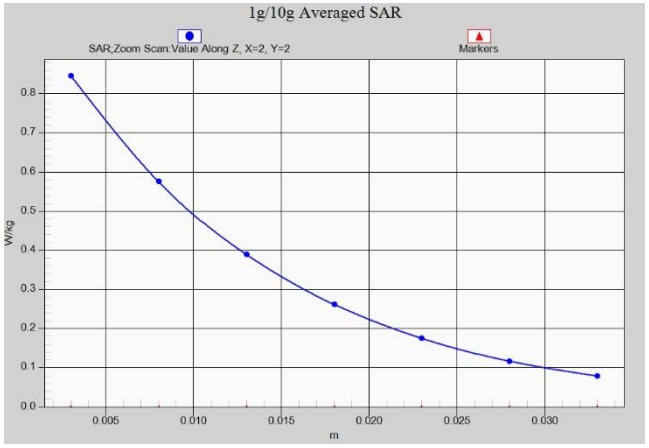


Fig.A.1- 8 Z-Scan at power reference point (W1700)

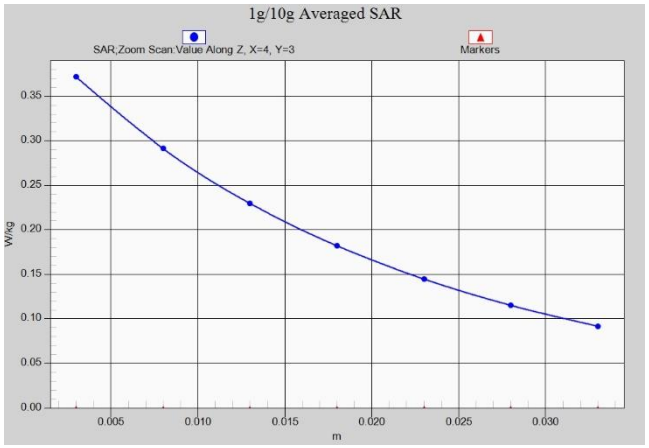


Fig.A.1- 9 Z-Scan at power reference point (W850)

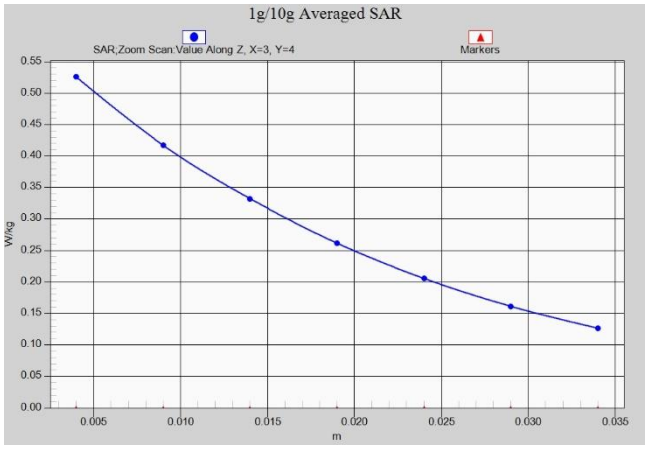


Fig.A.1- 10 Z-Scan at power reference point (W850)

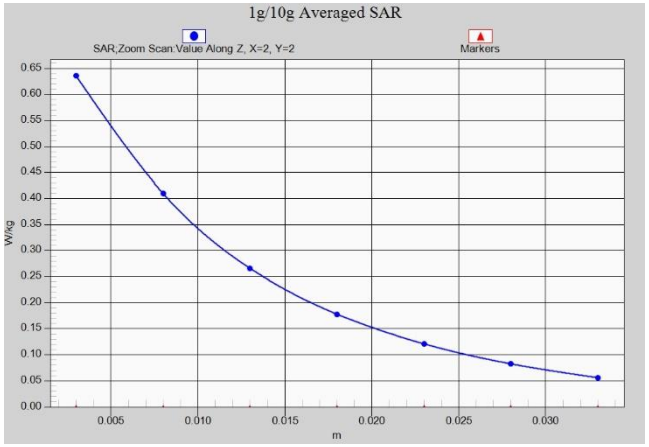


Fig.A.1- 11 Z-Scan at power reference point (LTE Band2)

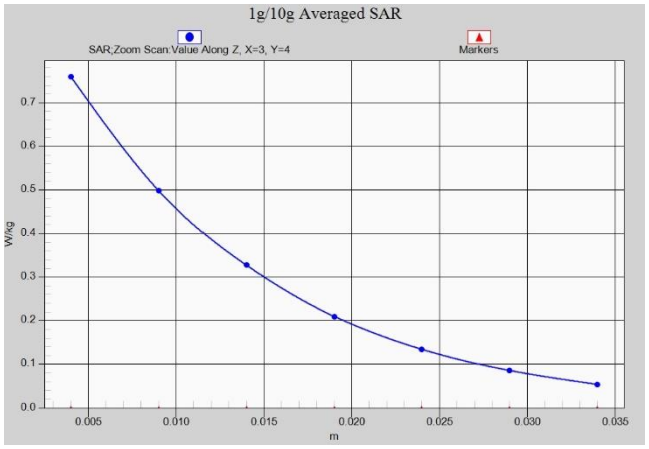


Fig.A.1- 12 Z-Scan at power reference point (LTE Band2)

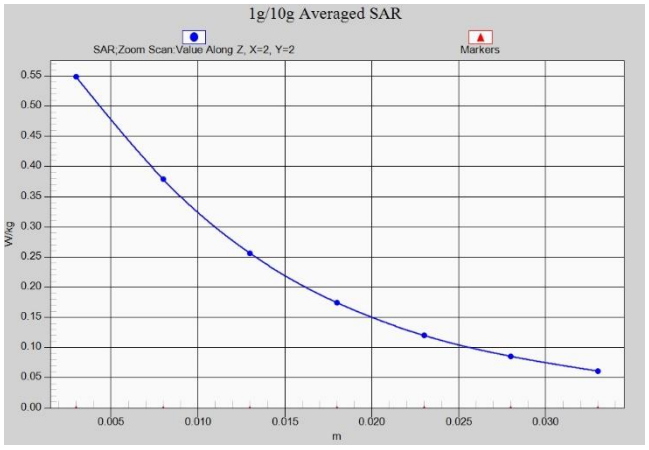


Fig.A.1- 13 Z-Scan at power reference point (LTE Band4)

Fig.A.1- 14 Z-Scan at power reference point (LTE Band4)

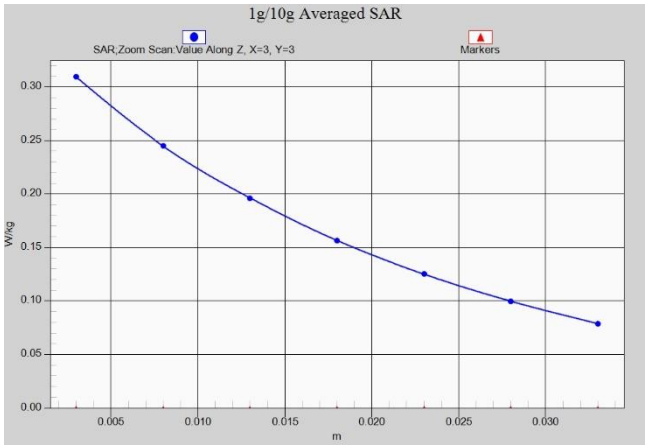


Fig.A.1- 15 Z-Scan at power reference point (LTE Band5)

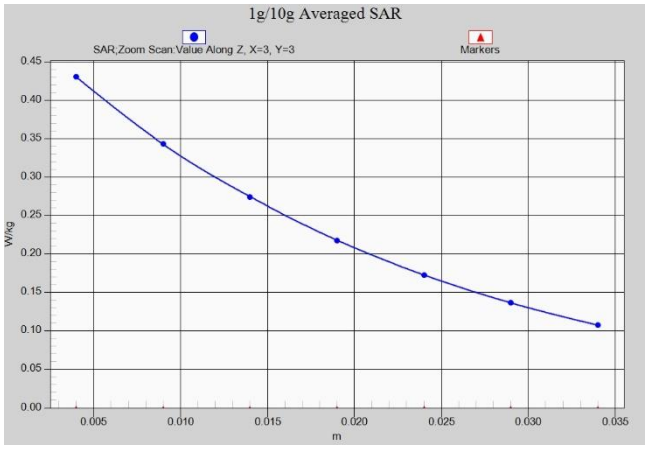


Fig.A.1- 16 Z-Scan at power reference point (LTE Band5)

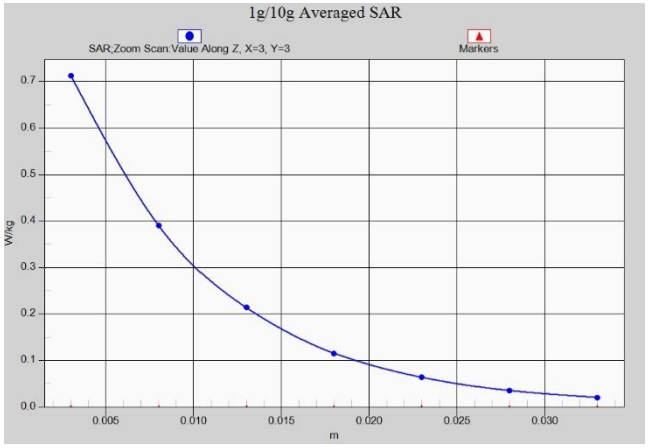


Fig.A.1- 17 Z-Scan at power reference point (LTE Band7)

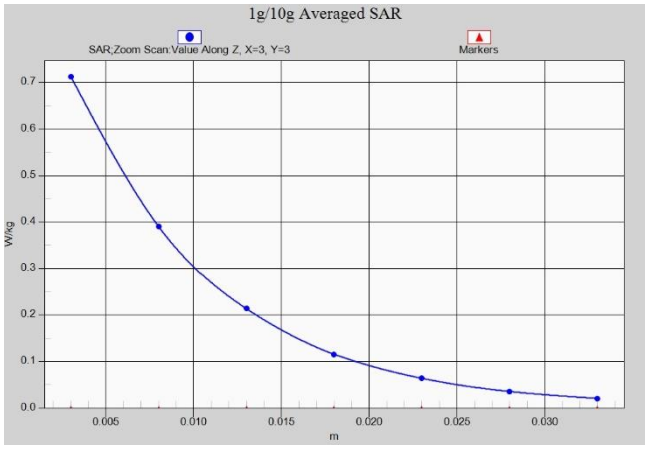


Fig.A.1- 18 Z-Scan at power reference point (LTE Band7)

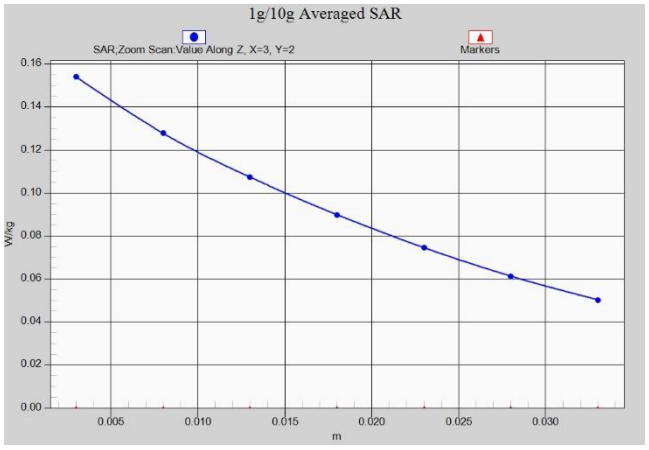


Fig.A.1- 19 Z-Scan at power reference point (LTE Band12)

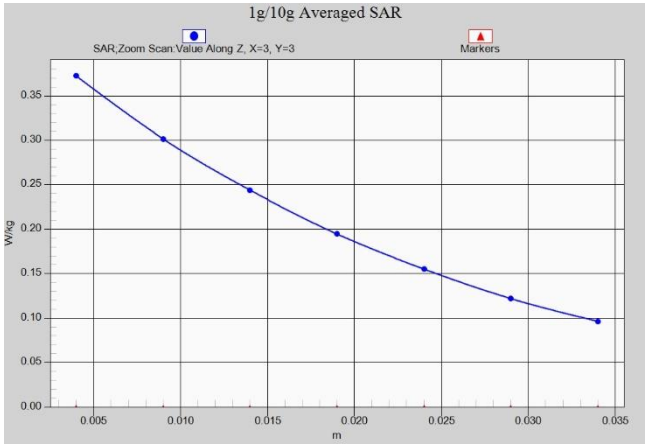


Fig.A.1- 20 Z-Scan at power reference point (LTE Band12)

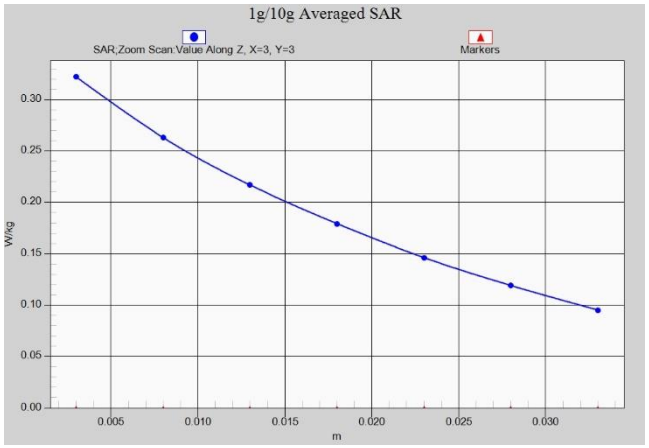


Fig.A.1- 21 Z-Scan at power reference point (LTE Band13)

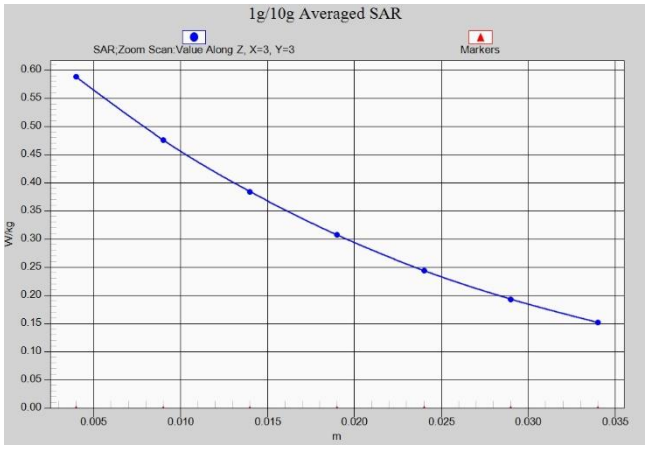


Fig.A.1- 22 Z-Scan at power reference point (LTE Band13)

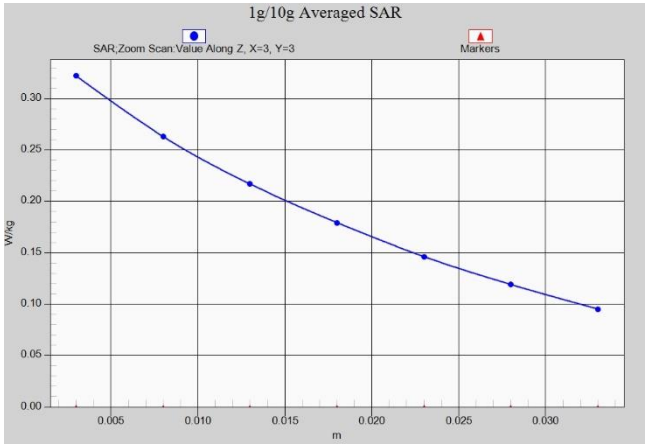


Fig.A.1- 23 Z-Scan at power reference point (Wlan)

Fig.A.1- 24 Z-Scan at power reference point (Wlan)

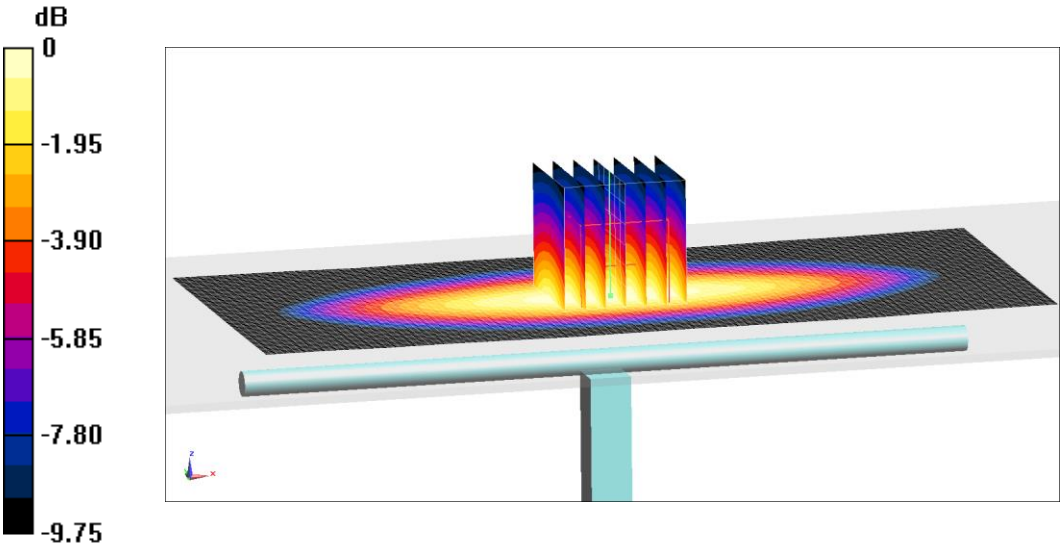
ANNEX B System Verification Results

750 MHz

Date: 12/19/2017
Electronics: DAE4 Sn1331
Medium: Head 750 MHz
Medium parameters used: f = 750 MHz; σ =0.894 mho/m; ε_r = 42.1; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.65,9.65,9.65)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 59.81 V/m; Power Drift = 0.02
Fast SAR: SAR(1 g) = 2.04 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (interpolated) = 2.72 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =59.81 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.25 W/kg
SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (measured) = 2.86 W/kg



0 dB = 2.86 W/kg = 4.56 dB W/kg

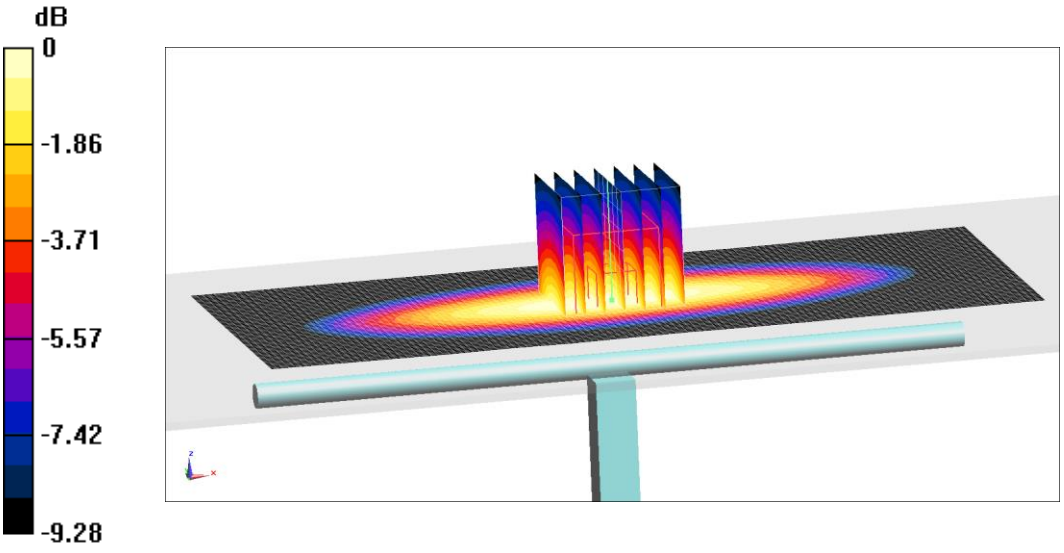
Fig.B.1 validation 750 MHz 250mW

750 MHz

Date: 12/19/2017
Electronics: DAE4 Sn1331
Medium: Body 750 MHz
Medium parameters used: f = 750 MHz; σ =0.961 mho/m; ε_r = 55.12; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.96,9.96,9.96)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 58.29 V/m; Power Drift = -0.01
Fast SAR: SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.45 W/kg
Maximum value of SAR (interpolated) = 3.29 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =58.29 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.29 W/kg
SAR(1 g) = 2.18 W/kg; SAR(10 g) = 1.39 W/kg
Maximum value of SAR (measured) = 2.93 W/kg



0 dB = 2.93 W/kg = 4.67 dB W/kg

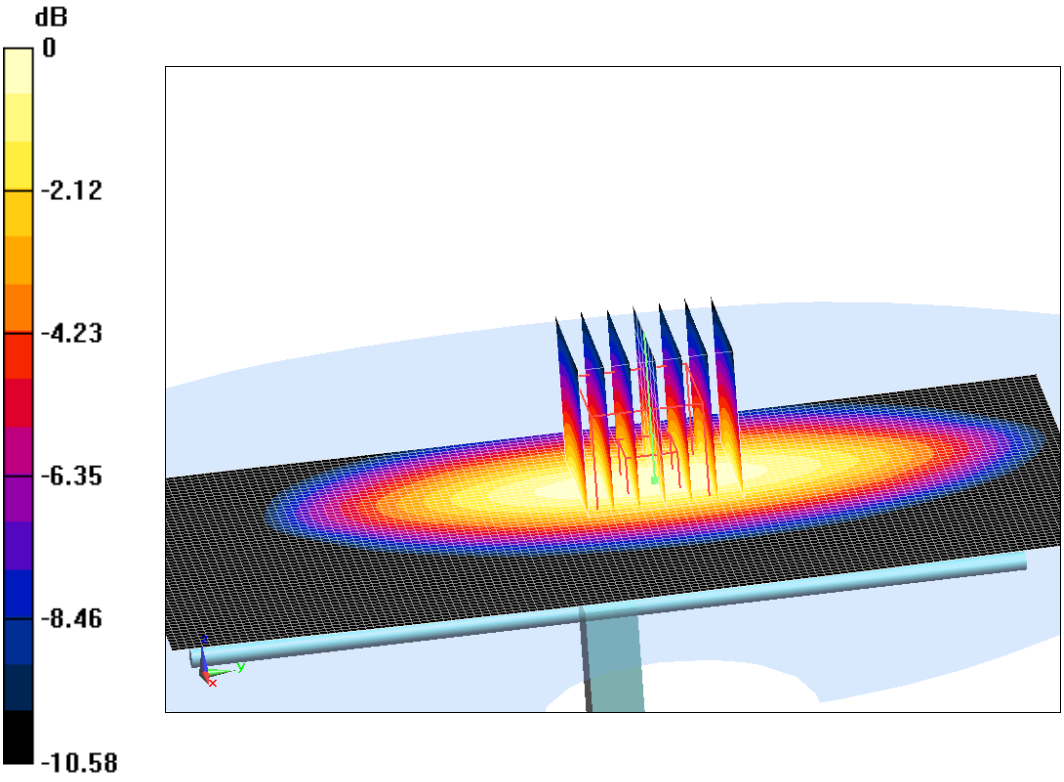
Fig.B.2 validation 750 MHz 250mW

835 MHz

Date: 12/20/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 835 MHz; σ =0.915 mho/m; ε_r = 41.75; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.33,9.33,9.33)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 64.82 V/m; Power Drift = -0.1
Fast SAR: SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.49 W/kg
Maximum value of SAR (interpolated) = 3.7 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =64.82 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 4.01 W/kg
SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.51 W/kg
Maximum value of SAR (measured) = 3.62 W/kg



0 dB = 3.62 W/kg = 5.59 dB W/kg

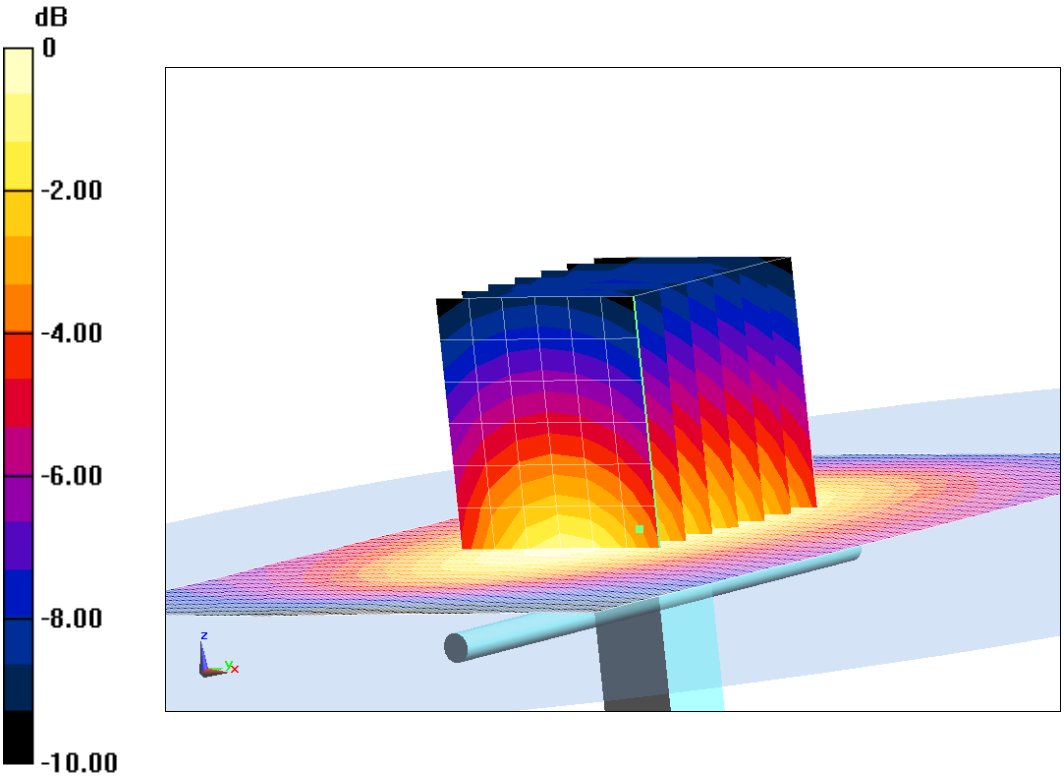
Fig.B.3 validation 835 MHz 250mW

835 MHz

Date: 12/20/2017
Electronics: DAE4 Sn1331
Medium: Body 835 MHz
Medium parameters used: f = 835 MHz; σ =0.987 mho/m; ε_r = 54.13; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.52,9.52,9.52)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 60.45 V/m; Power Drift = 0.09
Fast SAR: SAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.5 W/kg
Maximum value of SAR (interpolated) = 3.48 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =60.45 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 3.64 W/kg
SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (measured) = 3.21 W/kg



0 dB = 3.21 W/kg = 5.07 dB W/kg

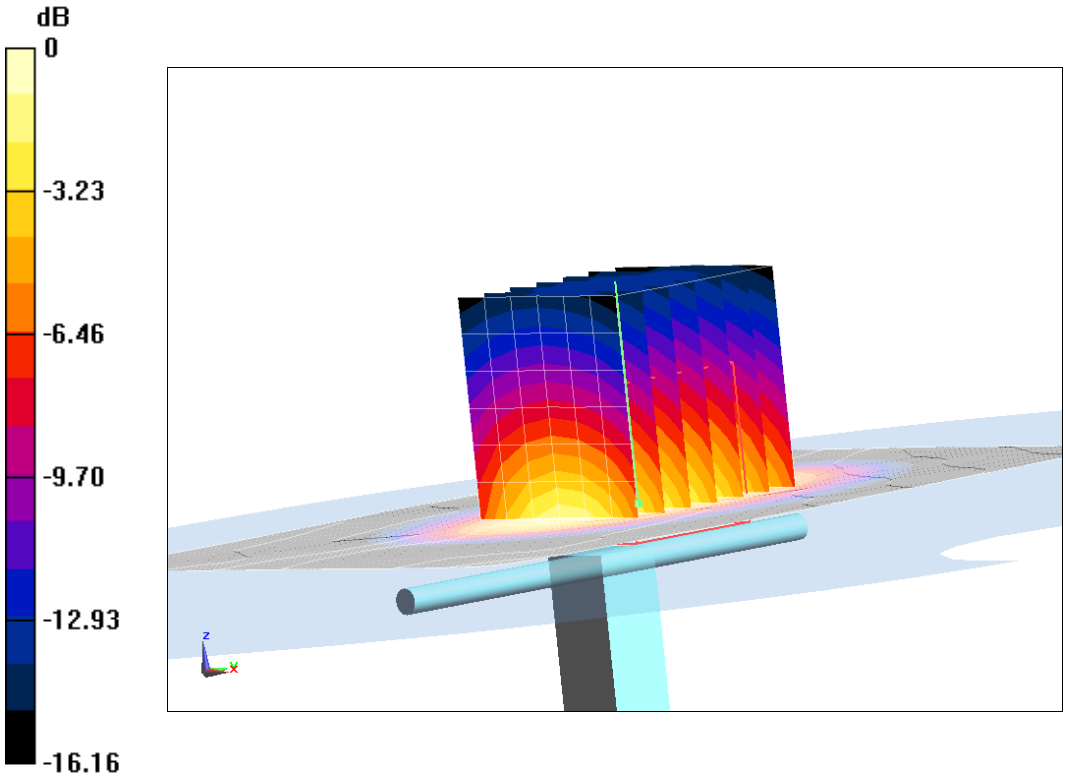
Fig.B.4 validation 835 MHz 250mW

1750 MHz

Date: 12/21/2017
Electronics: DAE4 Sn1331
Medium: Head 1750 MHz
Medium parameters used: f = 1750 MHz; σ =1.365 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(8.16,8.16,8.16)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 106.74 V/m; Power Drift = -0.02
Fast SAR: SAR(1 g) = 9.26 W/kg; SAR(10 g) = 4.9 W/kg
Maximum value of SAR (interpolated) = 14.92 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =106.74 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 18.16 W/kg
SAR(1 g) = 9.08 W/kg; SAR(10 g) = 4.91 W/kg
Maximum value of SAR (measured) = 14.32 W/kg



0 dB = 14.32 W/kg = 11.56 dB W/kg

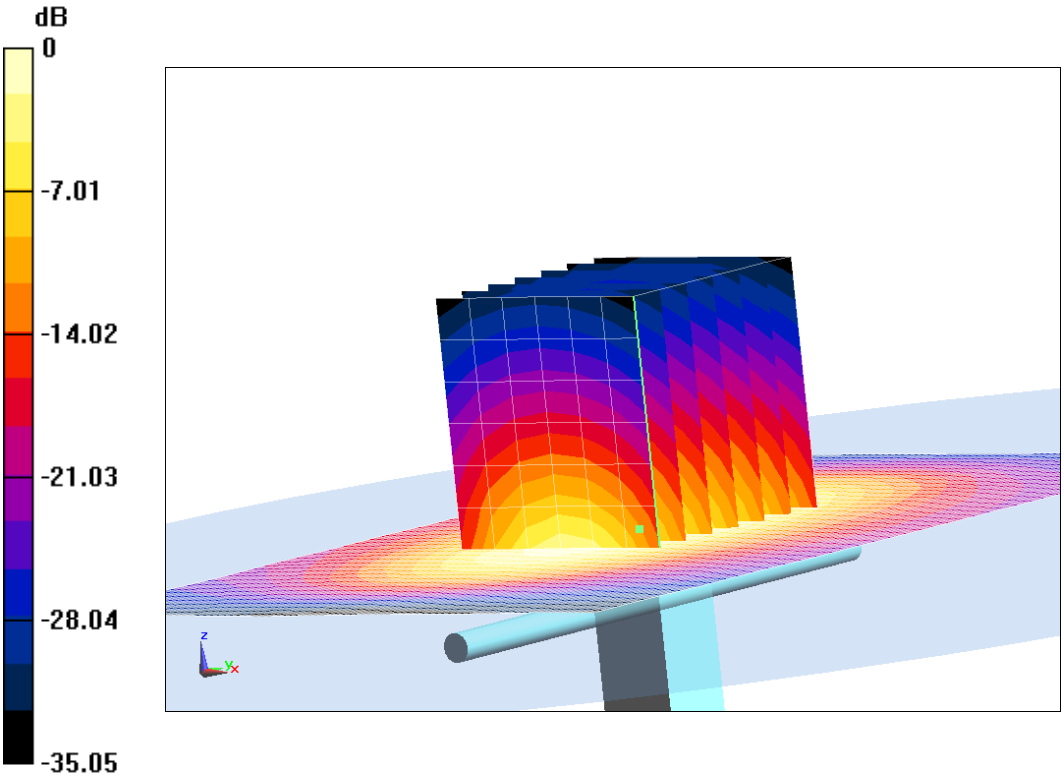
Fig.B.5 validation 1750 MHz 250mW

1750 MHz

Date: 12/21/2017
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used: f = 1750 MHz; σ =1.494 mho/m; ε_r = 53.57; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.9,7.9,7.9)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 100.56 V/m; Power Drift = 0.06
Fast SAR: SAR(1 g) = 9.16 W/kg; SAR(10 g) = 4.86 W/kg
Maximum value of SAR (interpolated) = 16.15 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =100.56 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 16.53 W/kg
SAR(1 g) = 9.44 W/kg; SAR(10 g) = 4.89 W/kg
Maximum value of SAR (measured) = 13.26 W/kg



0 dB = 13.26 W/kg = 11.23 dB W/kg

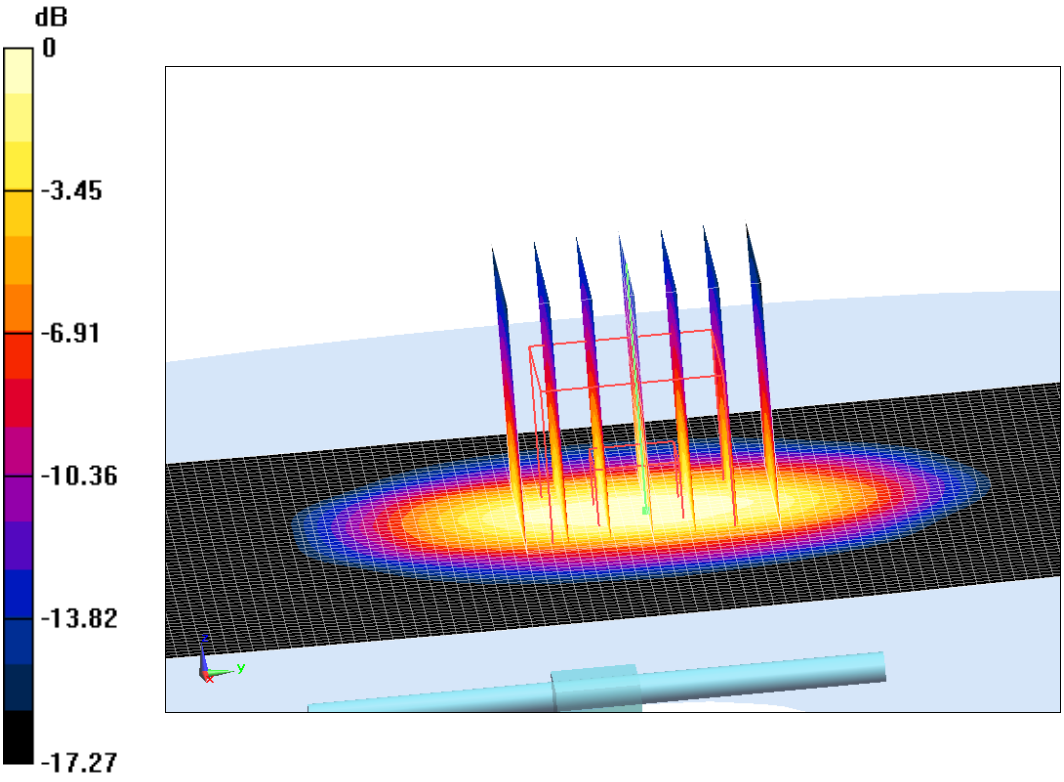
Fig.B.6 validation 1750 MHz 250mW

1900 MHz

Date: 12/22/2017
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.386 mho/m; ε_r = 40.26; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.89,7.89,7.89)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 107.4 V/m; Power Drift = 0.06
Fast SAR: SAR(1 g) = 9.94 W/kg; SAR(10 g) = 5.22 W/kg
Maximum value of SAR (interpolated) = 14.89 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =107.4 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 18.69 W/kg
SAR(1 g) = 10.03 W/kg; SAR(10 g) = 5.17 W/kg
Maximum value of SAR (measured) = 14.98 W/kg



0 dB = 14.98 W/kg = 11.76 dB W/kg

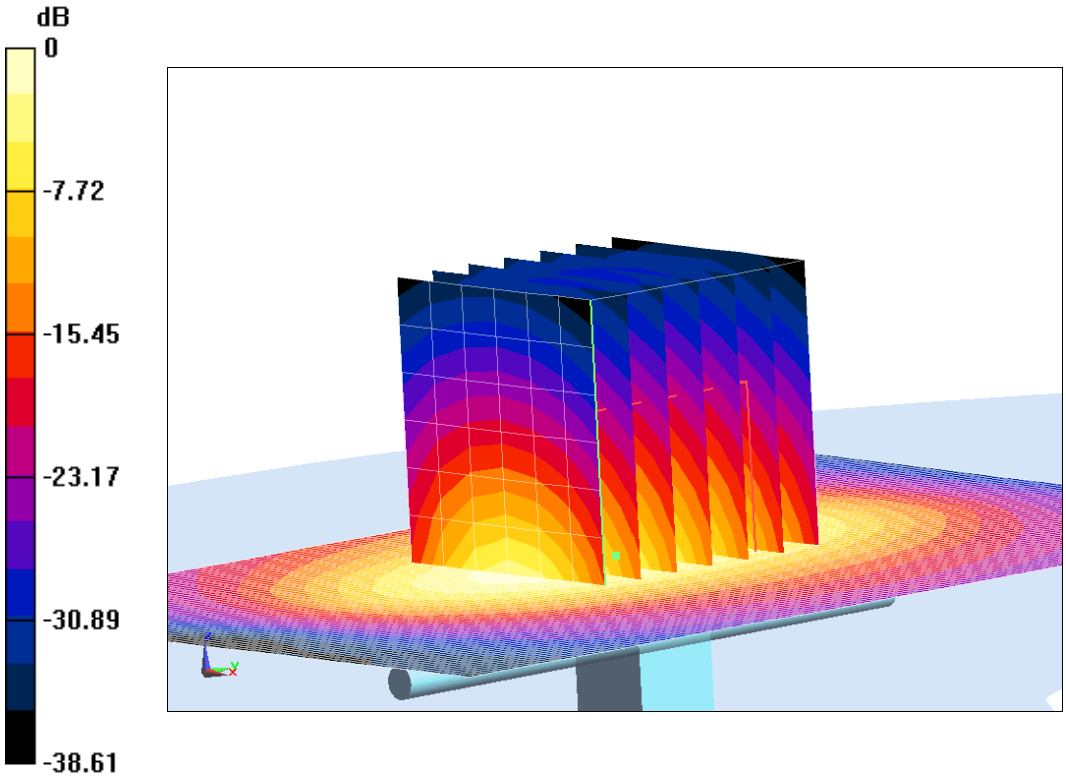
Fig.B.7 validation 1900 MHz 250mW

1900 MHz

Date: 12/22/2017
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.533 mho/m; ε_r = 53.88; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.57,7.57,7.57)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 101.02 V/m; Power Drift = 0.04
Fast SAR: SAR(1 g) = 10.15 W/kg; SAR(10 g) = 5.31 W/kg
Maximum value of SAR (interpolated) = 17.49 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =101.02 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 17.4 W/kg
SAR(1 g) = 10.18 W/kg; SAR(10 g) = 5.28 W/kg
Maximum value of SAR (measured) = 14.6 W/kg



0 dB = 14.6 W/kg = 11.64 dB W/kg

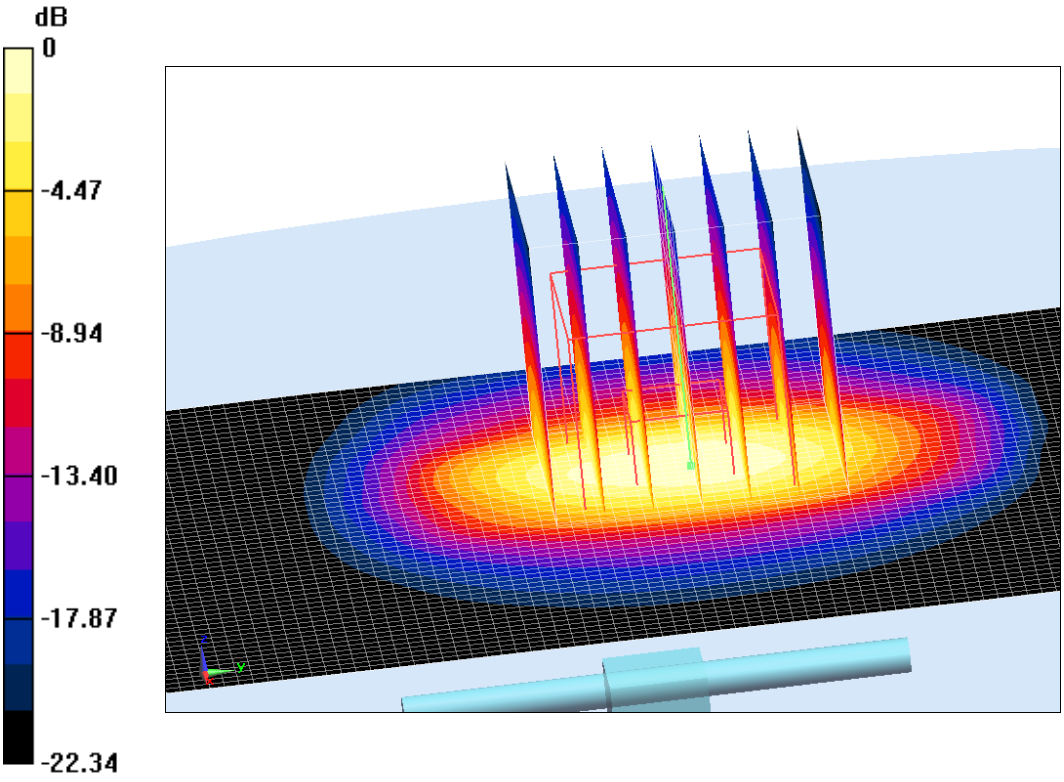
Fig.B.8 validation 1900 MHz 250mW

2450 MHz

Date: 12/23/2017
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.777 mho/m; ε_r = 39.94; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.22,7.22,7.22)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 112.16 V/m; Power Drift = 0.01
Fast SAR: SAR(1 g) = 13.26 W/kg; SAR(10 g) = 6.08 W/kg
Maximum value of SAR (interpolated) = 21.33 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =112.16 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 26.5 W/kg
SAR(1 g) = 13.19 W/kg; SAR(10 g) = 6.15 W/kg
Maximum value of SAR (measured) = 21.45 W/kg



0 dB = 21.45 W/kg = 13.31 dB W/kg

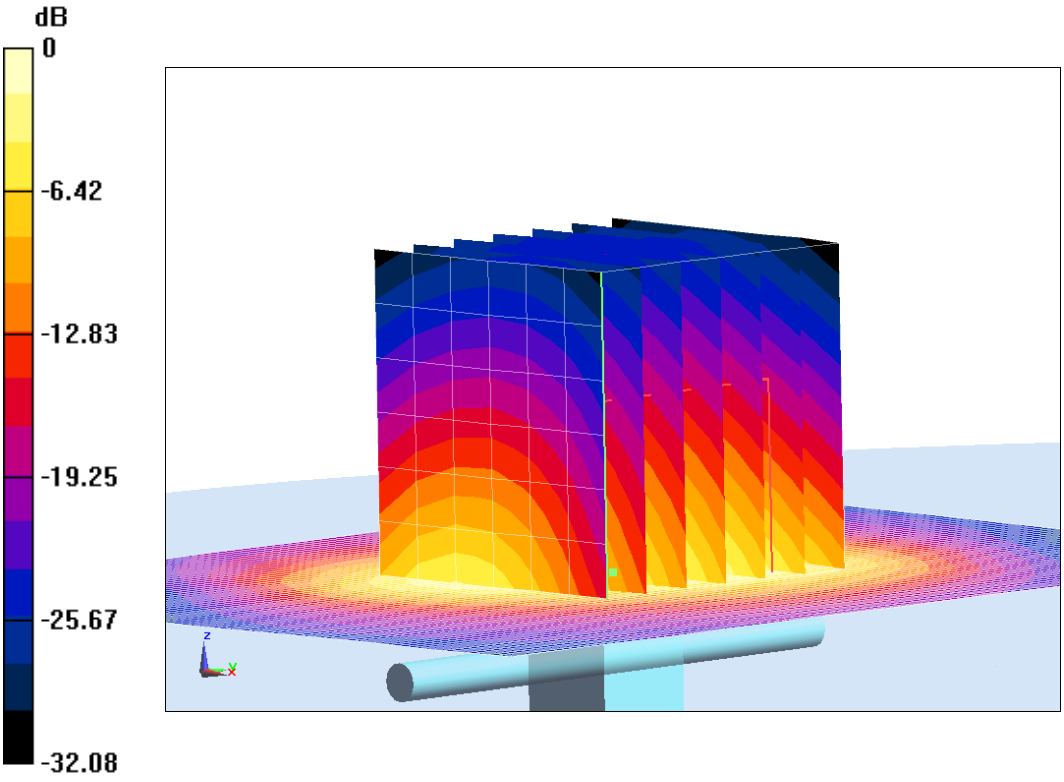
Fig.B.9 validation 2450 MHz 250mW

2450 MHz

Date: 12/23/2017
Electronics: DAE4 Sn1331
Medium: Body 2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.95 mho/m; ε_r = 53.27; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.31,7.31,7.31)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 104.04 V/m; Power Drift = 0.03
Fast SAR: SAR(1 g) = 12.52 W/kg; SAR(10 g) = 5.93 W/kg
Maximum value of SAR (interpolated) = 25.14 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =104.04 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 25.65 W/kg
SAR(1 g) = 12.53 W/kg; SAR(10 g) = 6.01 W/kg
Maximum value of SAR (measured) = 20.18 W/kg



0 dB = 20.18 W/kg = 13.05 dB W/kg

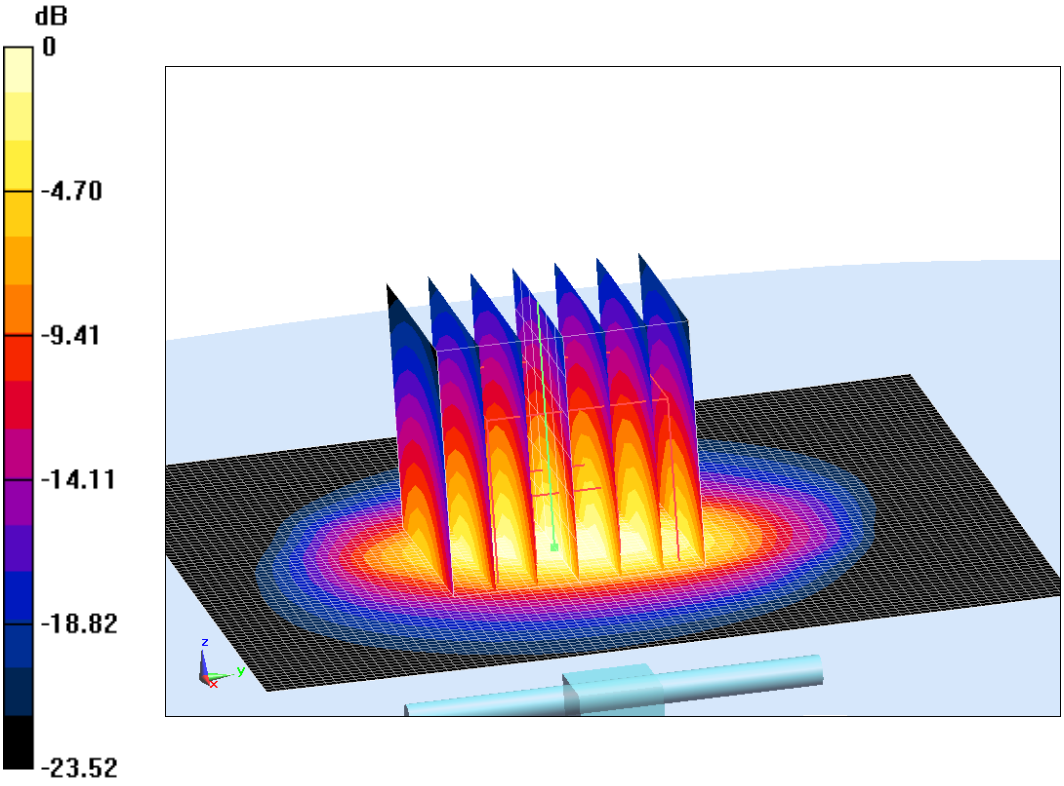
Fig.B.10 validation 2450 MHz 250mW

2600 MHz

Date: 12/24/2017
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2600 MHz; σ =1.943 mho/m; ε_r = 39.76; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 2600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.12,7.12,7.12)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 114.14 V/m; Power Drift = 0.07
Fast SAR: SAR(1 g) = 14.36 W/kg; SAR(10 g) = 6.45 W/kg
Maximum value of SAR (interpolated) = 24.93 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =114.14 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 32.68 W/kg
SAR(1 g) = 14.53 W/kg; SAR(10 g) = 6.4 W/kg
Maximum value of SAR (measured) = 24.83 W/kg



0 dB = 24.83 W/kg = 13.95 dB W/kg

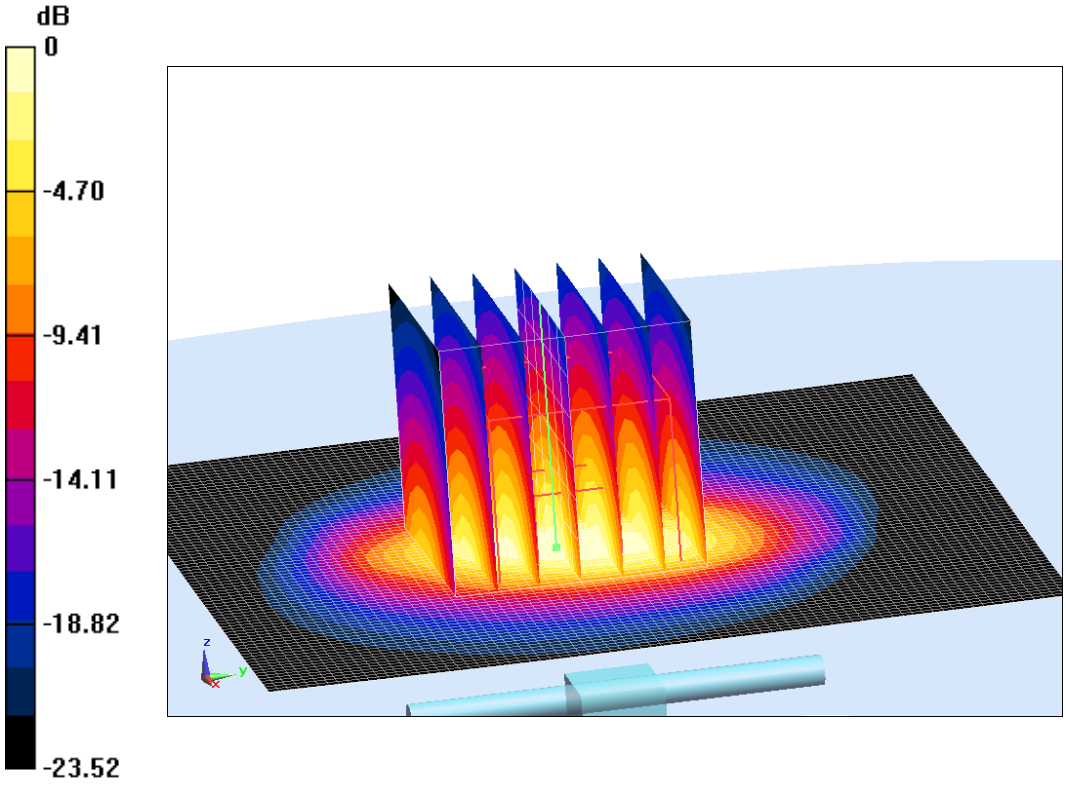
Fig.B.11 validation 2600 MHz 250mW

2600 MHz

Date: 12/24/2017
Electronics: DAE4 Sn1331
Medium: Body 2600 MHz
Medium parameters used: f = 2600 MHz; σ =2.124 mho/m; ε_r = 52.05; ρ = 1000 kg/m^3
Ambient Temperature: 22.2ºC Liquid Temperature: 22.3ºC
Communication System: CW Frequency: 2600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(7.25,7.25,7.25)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 105.78 V/m; Power Drift = -0.04
Fast SAR: SAR(1 g) = 13.64 W/kg; SAR(10 g) = 6.19 W/kg
Maximum value of SAR (interpolated) = 30.47 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =105.78 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 29.71 W/kg
SAR(1 g) = 13.61 W/kg; SAR(10 g) = 6.11 W/kg
Maximum value of SAR (measured) = 23.64 W/kg



0 dB = 23.64 W/kg = 13.74 dB W/kg

Fig.B.12 validation 2600 MHz 250mW

The SAR system verification must be required that the area scan estimated 1-g SAR is within 3% of the zoom scan 1-g SAR.

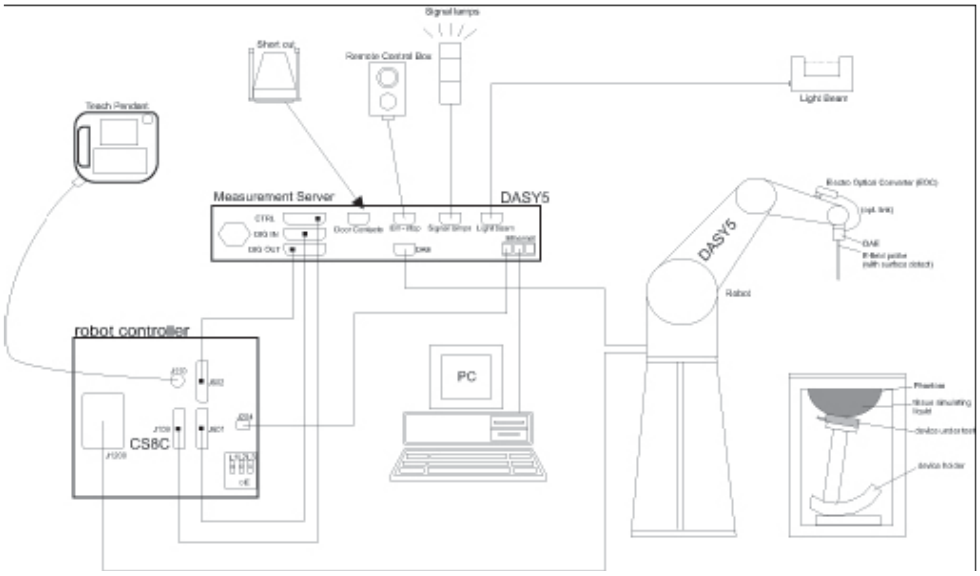
Table B.1 Comparison between area scan and zoom scan for system verification

Date	Band	Position	Area scan (1g)	Zoom scan (1g)	Drift (%)
2017-12-19	750	Head	2.04	2.07	-1.45
	750	Body	2.14	2.18	-1.83
2017-12-20	835	Head	2.35	2.35	0.00
	835	Body	2.38	2.34	1.71
2017-12-21	1750	Head	9.26	9.08	1.98
	1750	Body	9.16	9.44	-2.97
2017-12-22	1900	Head	9.94	10.03	-0.90
	1900	Body	10.15	10.18	-0.29
2017-12-23	2450	Head	13.26	13.19	0.53
	2450	Body	12.52	12.53	-0.08
2017-12-24	2600	Head	14.36	14.53	-1.17
	2600	Body	13.64	13.61	0.22

ANNEX C SAR Measurement Setup

C.1 Measurement Set-up

The Dasy4 or DASY5 system for performing compliance tests is illustrated above graphically. This system consists of the following items:



Picture C.1 SAR Lab Test Measurement Set-up

- A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY4 or DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

C.2 Dasy4 or DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY4 or DASY5 software reads the reflection durning a software approach and looks for the maximum using 2nd ord curve fitting. The approach is stopped at reaching the maximum.

Probe Specifications:

Model: ES3DV3, EX3DV4
Frequency 10MHz — 6.0GHz(EX3DV4)
Range: 10MHz — 4GHz(ES3DV3)
Calibration: In head and body simulating tissue at Frequencies from 835 up to 5800MHz
Linearity: ± 0.2 dB(30 MHz to 6 GHz) for EX3DV4
± 0.2 dB(30 MHz to 4 GHz) for ES3DV3
Dynamic Range: 10 mW/kg — 100W/kg
Probe Length: 330 mm
Probe Tip
Length: 20 mm
Body Diameter: 12 mm
Tip Diameter: 2.5 mm (3.9 mm for ES3DV3)
Tip-Center: 1 mm (2.0mm for ES3DV3)
Application: SAR Dosimetry Testing
Compliance tests of mobile phones
Dosimetry in strong gradient fields

Picture C.2 Near-field Probe

Picture C.3 E-field Probe

C.3 E-field Probe Calibration

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm^2) using an RF Signal generator, TEM cell, and RF Power Meter.

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and inn a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed