Combined standard uncertainty	$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						9.55	9.43	257
Expanded uncertainty (confidence interval of 95 %)	$u_e = 2u_c$						19.1	18.9	

16.2 Measurement Uncertainty for Normal SAR Tests (3~6GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	√3	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	√3	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	√3	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	√3	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	√3	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	√3	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	√3	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	√3	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	√3	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.8	R	√3	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	√3	1	1	3.9	3.9	∞
13	Post-processing	B	4.0	R	√3	1	1	2.3	2.3	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	√3	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	√3	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	√3	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity	B	5.0	R	√3	0.6	0.49	1.7	1.4	∞

	(target)									
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						10.7	10.6	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						21.4	21.1	

16.3 Measurement Uncertainty for Fast SAR Tests (300MHz~3GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.0	N	1	1	1	6.0	6.0	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	7.0	R	$\sqrt{3}$	1	1	4.0	4.0	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞

19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c^{'} = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						10.4	10.3	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						20.8	20.6	

16.4 Measurement Uncertainty for Fast SAR Tests (3~6GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	14.0	R	$\sqrt{3}$	1	1	8.1	8.1	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
16	Device holder	A	3.4	N	1	1	1	3.4	3.4	5

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

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	January 13, 2017	One year
02	Power meter	NRVD	102083	September22,2016	One year
03	Power sensor	NRV-Z5	100595		
04	Signal Generator	E4438C	MY49071430	January 13,2017	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	E5515C	MY50263375	January 16, 2017	One year
07	BTS	CMW500	159890	November25, 2016	One year
08	E-field Probe	SPEAG EX3DV4	3846	January 13,2017	One year
09	DAE	SPEAG DAE4	1331	January 19, 2017	One year
10	Dipole Validation Kit	SPEAG D750V3	1017	July 20,2016	One year
11	Dipole Validation Kit	SPEAG D835V2	4d069	July 20,2016	One year
12	Dipole Validation Kit	SPEAG D1750V2	1003	July 21,2016	One year
13	Dipole Validation Kit	SPEAG D1900V2	5d101	July 28,2016	One year
14	Dipole Validation Kit	SPEAG D2450V2	853	July 25,2016	One year
15	Dipole Validation Kit	SPEAG D2600V2	1012	July 25,2016	One year
16	Network analyzer	E5071C	MY46110673	January 26, 2016	One year
17	Power meter	NRVD	102196	March 03,2016	One year
18	Power sensor	NRV-Z5	100596		
19	Signal Generator	E4438C	MY49071430	February 01,2016	One Year
20	Amplifier	60S1G4	0331848	No Calibration Requested	
21	E-field Probe	SPEAG EX3DV4	7307	February 19, 2016	One year
22	DAE	SPEAG DAE4	1331	January 21, 2016	One year
23	Dipole Validation Kit	SPEAG D2450V2	853	July25, 2016	One year

END OF REPORT BODY

ANNEX A Graph Results

850 Left Cheek Low

Date: 2017-5-24
Electronics: DAE4 Sn1331
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.878 mho/m; εr = 42.09; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
Communication System: GSM 850 Frequency: 824.2 MHz Duty Cycle: 1:8.3
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) = 0.361 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.344 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.414 W/kg
SAR(1 g) = 0.334 W/kg; SAR(10 g) = 0.260 W/kg
Maximum value of SAR (measured) = 0.361 W/kg

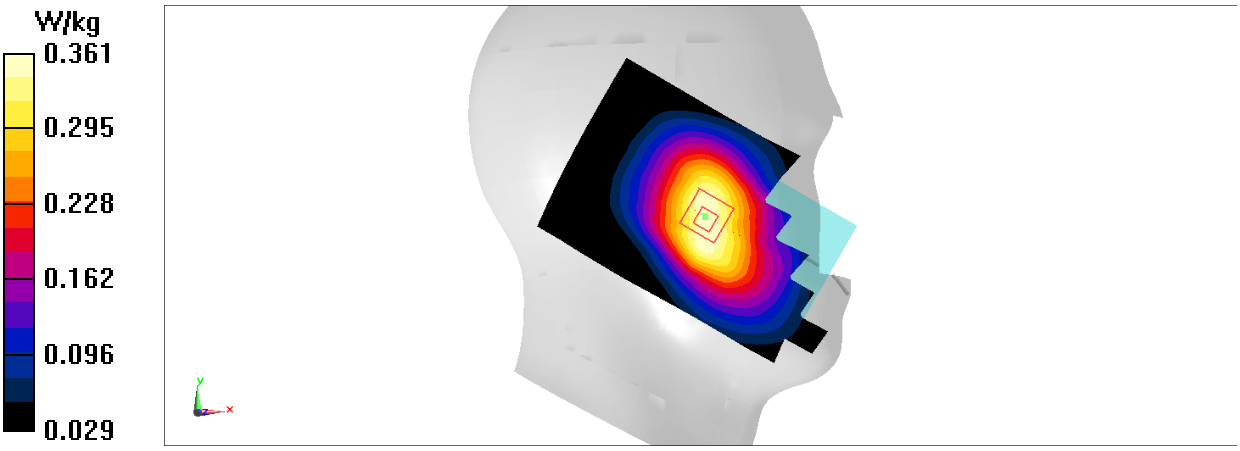


Fig.1 850MHz

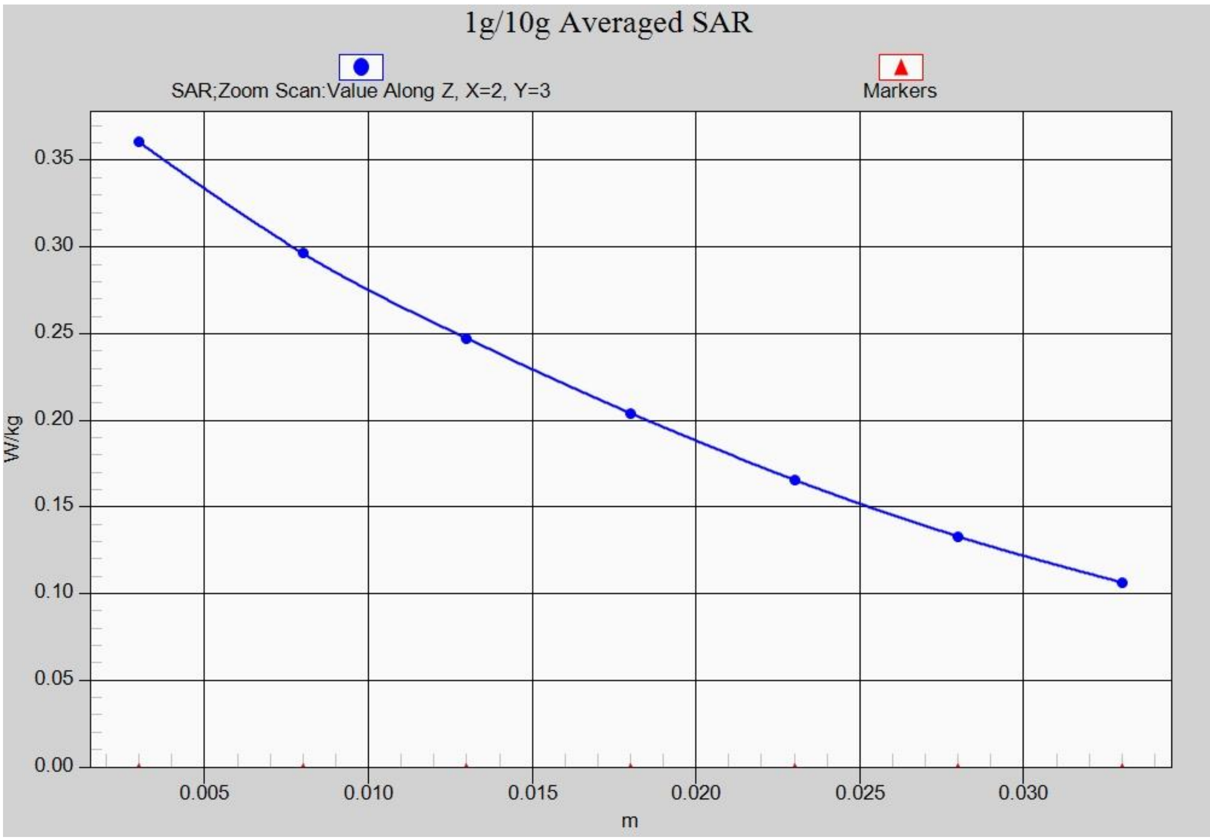


Fig. 1-1 Z-Scan at power reference point (850 MHz)

850Body RearLow
Date: 2017-5-24
Electronics: DAE4 Sn1331
Medium: Body 850 MHz
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.952 mho/m; εr = 54.99; ρ = 1000 kg/m^3
Ambient Temperature: 22.4°C Liquid Temperature: 22.2°C
Communication System: GSM 850 GPRS Frequency: 824.2 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 – SN3846ConvF(9.52, 9.52, 9.52)

Area Scan (111x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.548 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.62 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.627 W/kg
SAR(1 g) = 0.505 W/kg; SAR(10 g) = 0.394 W/kg
Maximum value of SAR (measured) = 0.550 W/kg

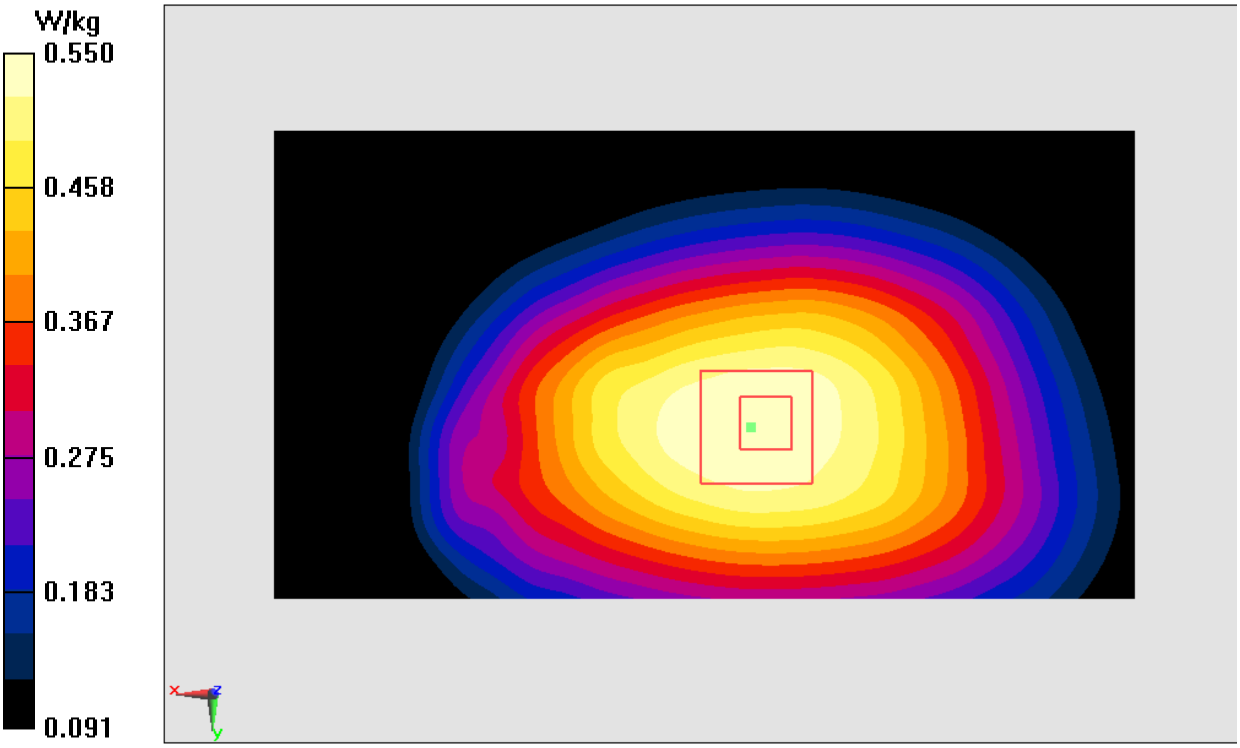


Fig.2 850 MHz

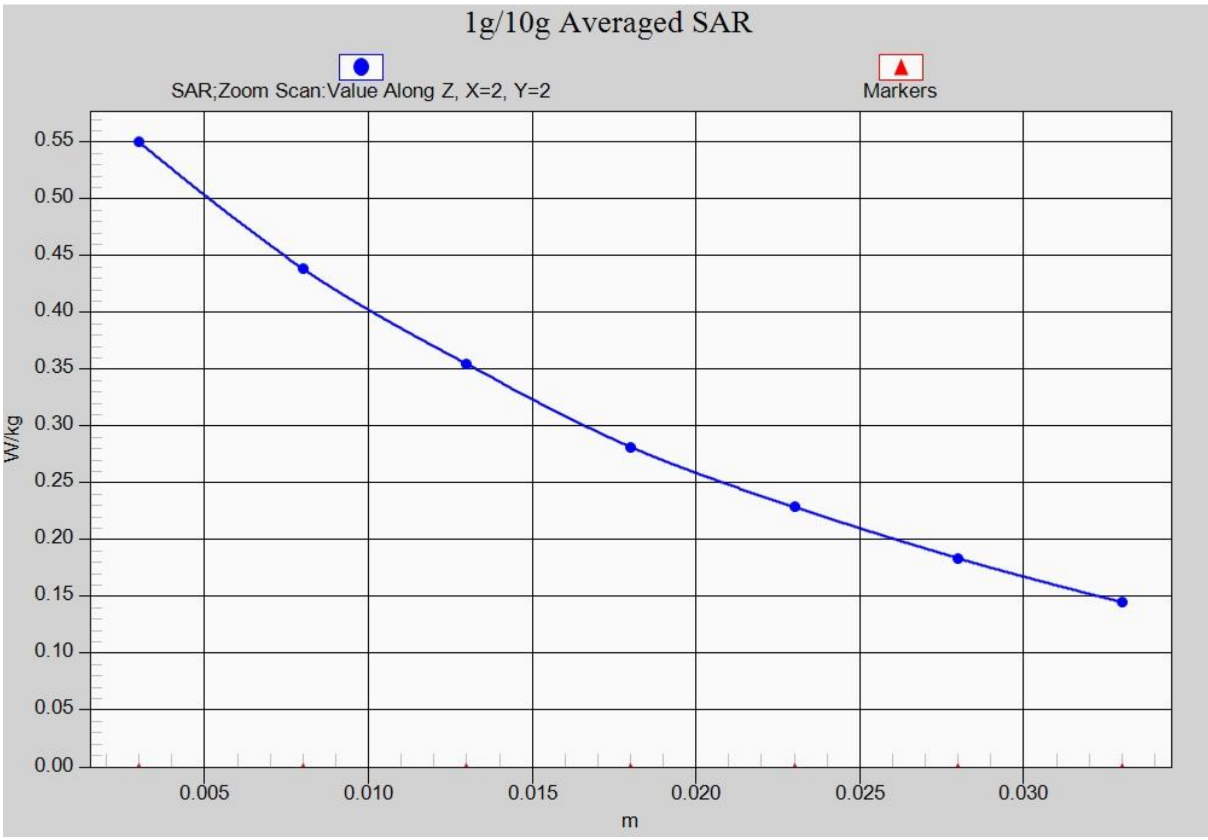


Fig. 2-1Z-Scan at power reference point (850 MHz)

1900 Left Cheek Middle

Date: 2017-5-26

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used: f = 1880 MHz; σ = 1.380 mho/m; εr = 36.69; ρ = 1000 kg/m^3

Ambient Temperature: 22.4^{o}C   Liquid Temperature: 22.2^{o}C

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

Probe: EX3DV4– SN3846ConvF(7.89, 7.89, 7.89)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.142 W/kg

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

Reference Value = 2.780 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.185 W/kg

SAR(1 g) = 0.126 W/kg; SAR(10 g) = 0.081 W/kg

Maximum value of SAR (measured) = 0.147 W/kg

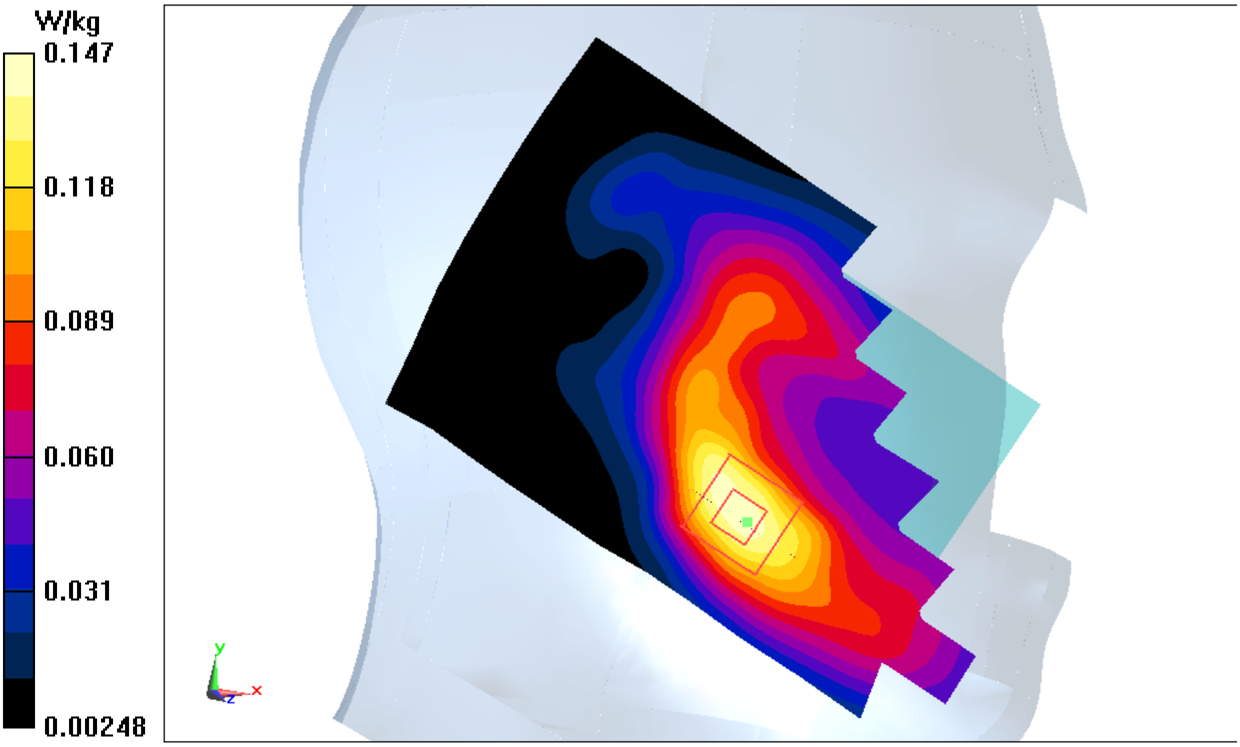


Fig.3 1900 MHz

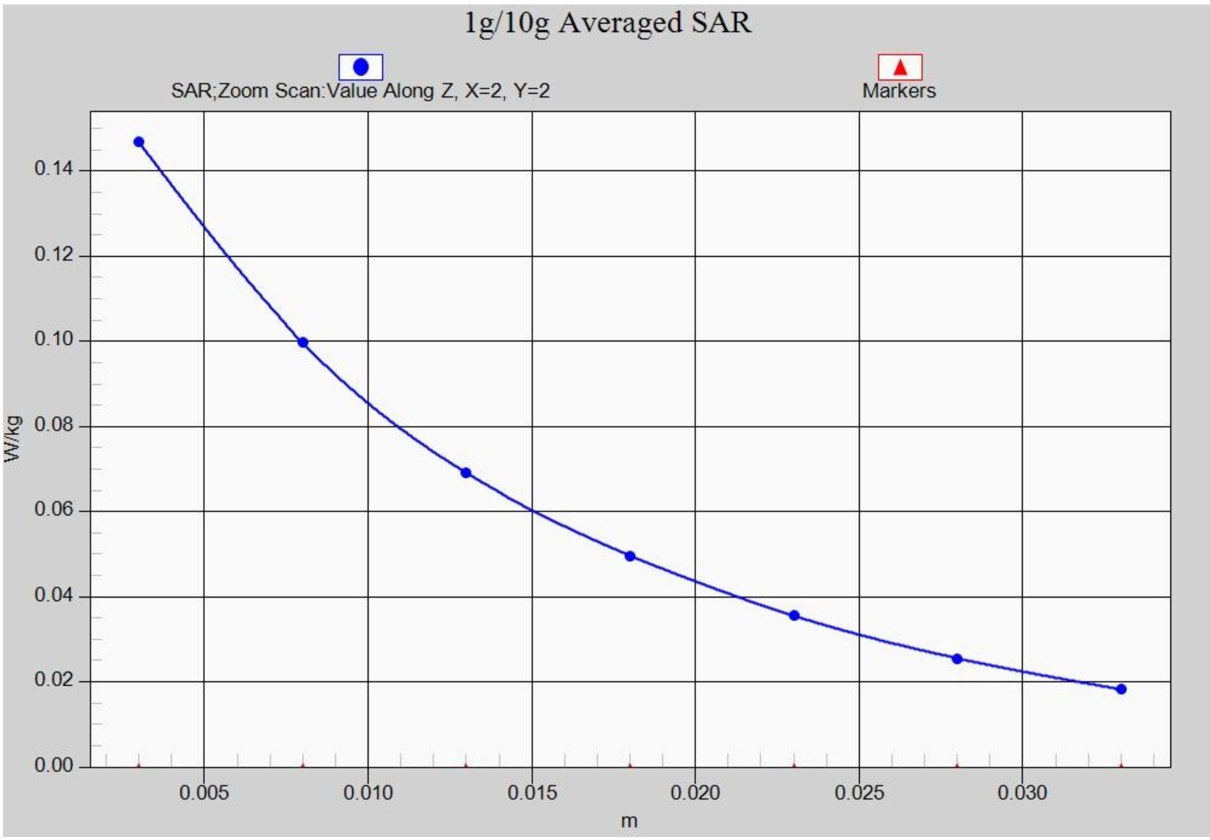


Fig. 3-1Z-Scan at power reference point (1900 MHz)

1900 Body BottomHigh
Date: 2017-5-26
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1909.8 MHz; σ =1.514 mho/m; εr = 53.04; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
Communication System: GSM 1900MHz GPRS Frequency: 1909.8 MHz Duty Cycle: 1:8.3
Probe: EX3DV4– SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (111x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.61 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.11 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 2.00 W/kg
SAR(1 g) = 1.16 W/kg; SAR(10 g) = 0.599 W/kg
Maximum value of SAR (measured) = 1.61 W/kg

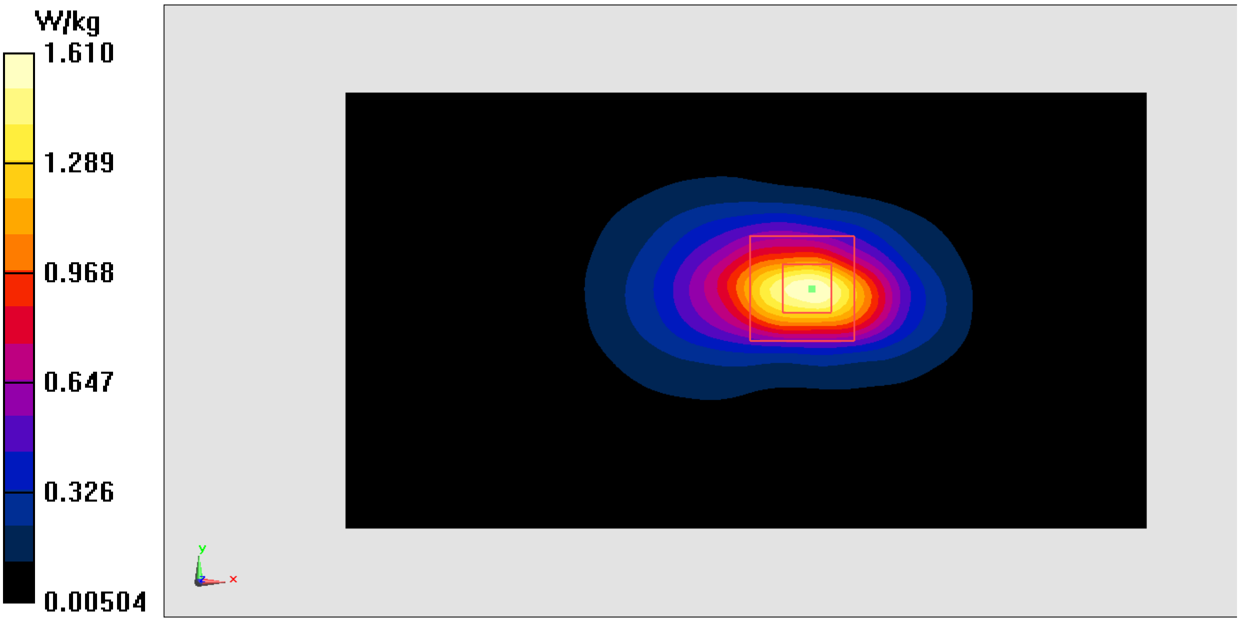


Fig.4 1900 MHz

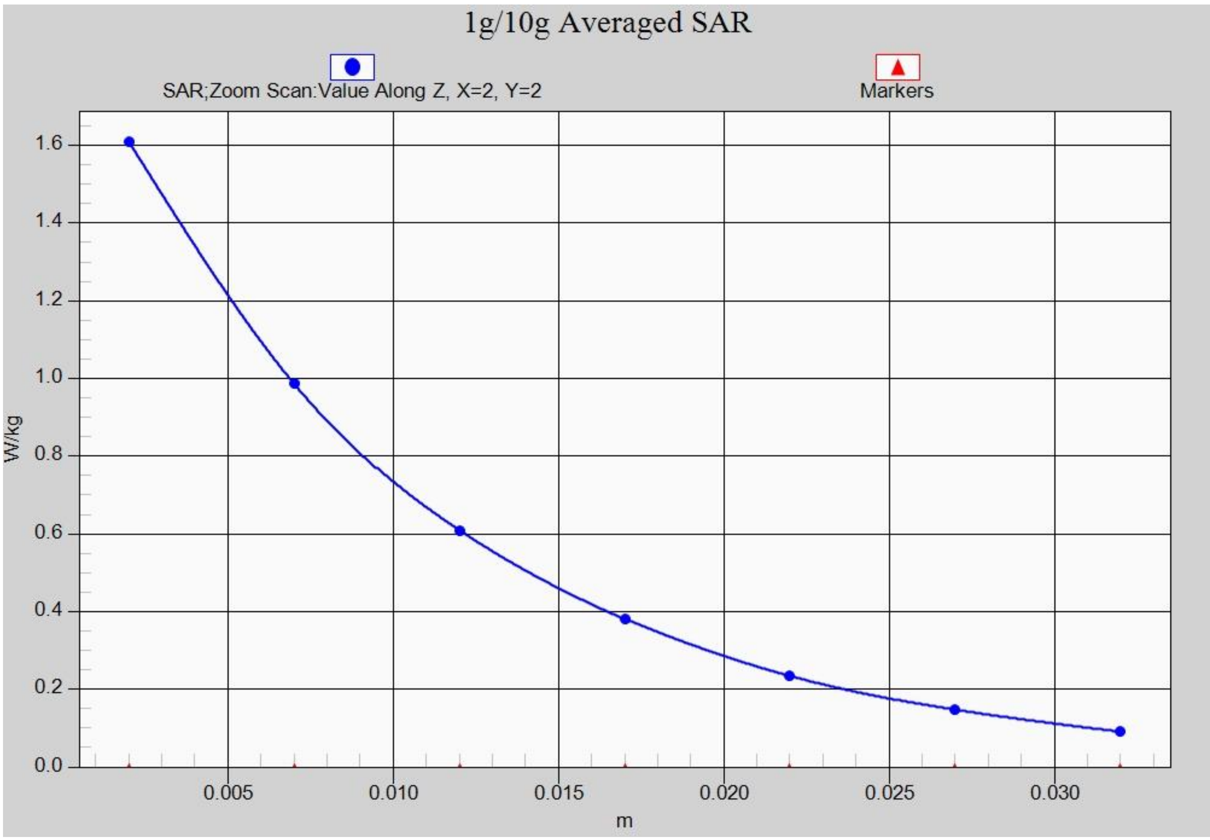


Fig. 4-1Z-Scan at power reference point (1900 MHz)

WCDMA 850 Right Cheek Low

Date: 2017-5-24
Electronics: DAE4 Sn1331
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.880 mho/m; εr = 41.98; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
Communication System: WCDMA; Frequency: 826.4 MHz;Duty Cycle: 1:1
Probe: EX3DV4 – SN3846ConvF(9.33, 9.33, 9.33)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.200 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.240 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.237 W/kg
SAR(1 g) = 0.189 W/kg; SAR(10 g) = 0.146 W/kg
Maximum value of SAR (measured) = 0.206 W/kg

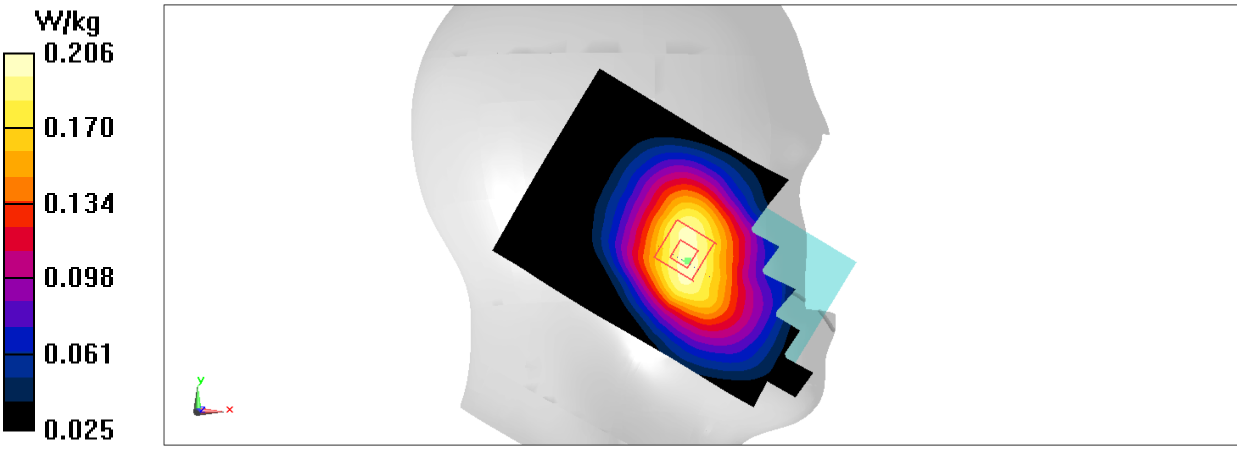


Fig.5 WCDMA 850

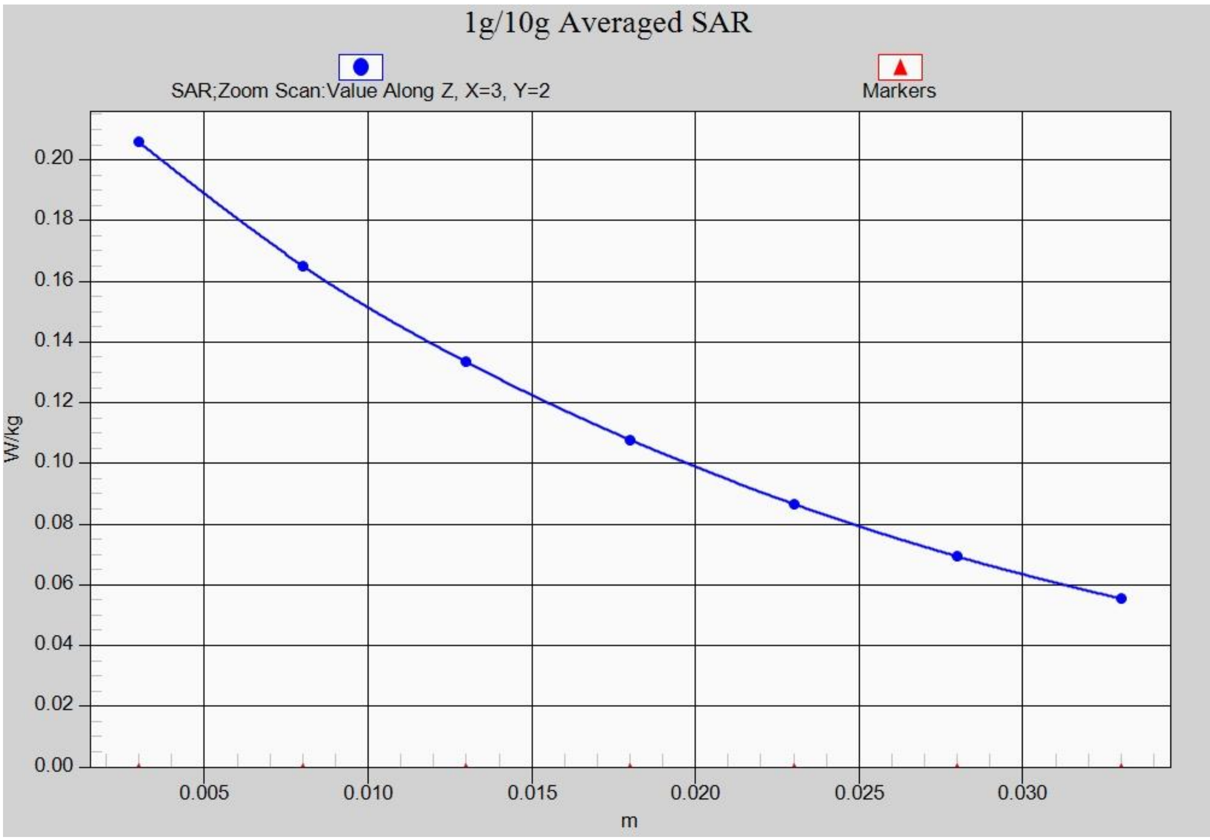


Fig. 5-1Z-Scan at power reference point (850 MHz)

WCDMA 850Body RearMiddle

Date: 2017-5-24
Electronics: DAE4 Sn1331
Medium: Body 850 MHz
Medium parameters used (interpolated): f = 836.4 MHz; σ = 0.966 mho/m; εr = 54.20; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C   Liquid Temperature: 22.2^{o}C
Communication System: WCDMA; Frequency: 836.4 MHz;Duty Cycle: 1:1
Probe: EX3DV4 – SN3846ConvF(9.52, 9.52, 9.52)

Area Scan (111x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.462 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.56 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.519 W/kg
SAR(1 g) = 0.421 W/kg; SAR(10 g) = 0.328 W/kg
Maximum value of SAR (measured) = 0.458 W/kg

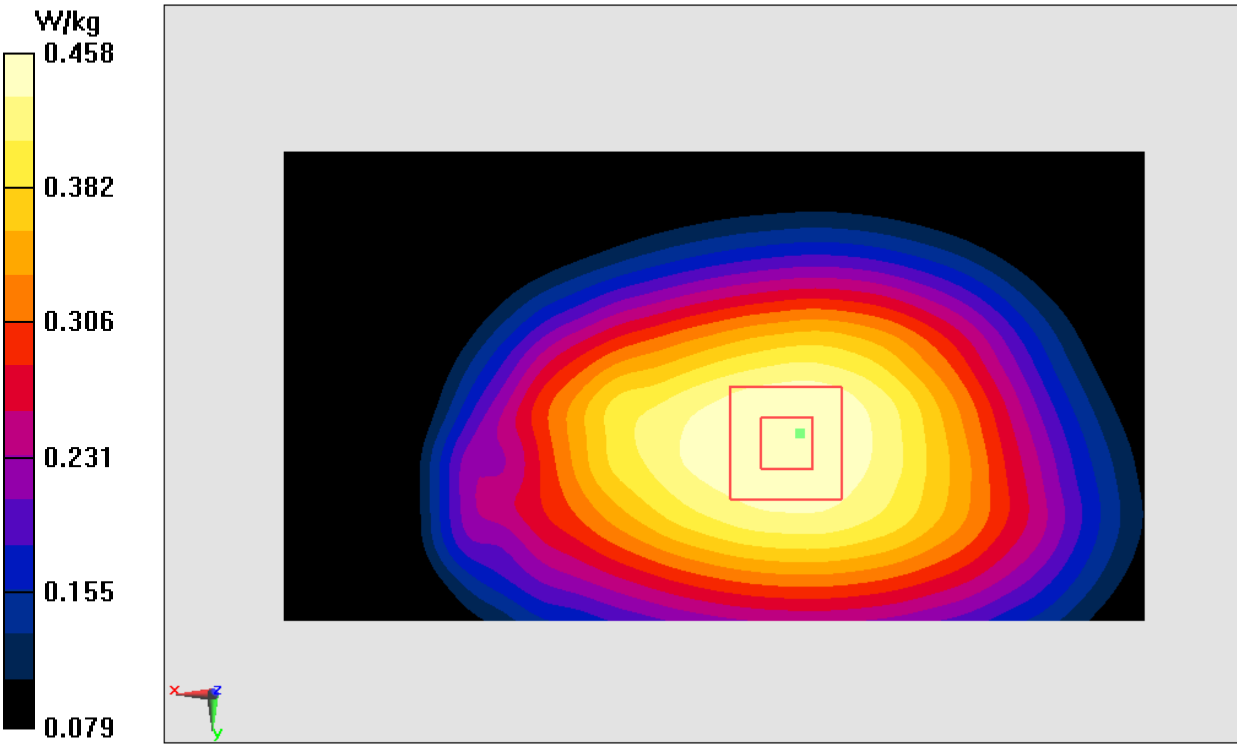


Fig.6 WCDMA 850

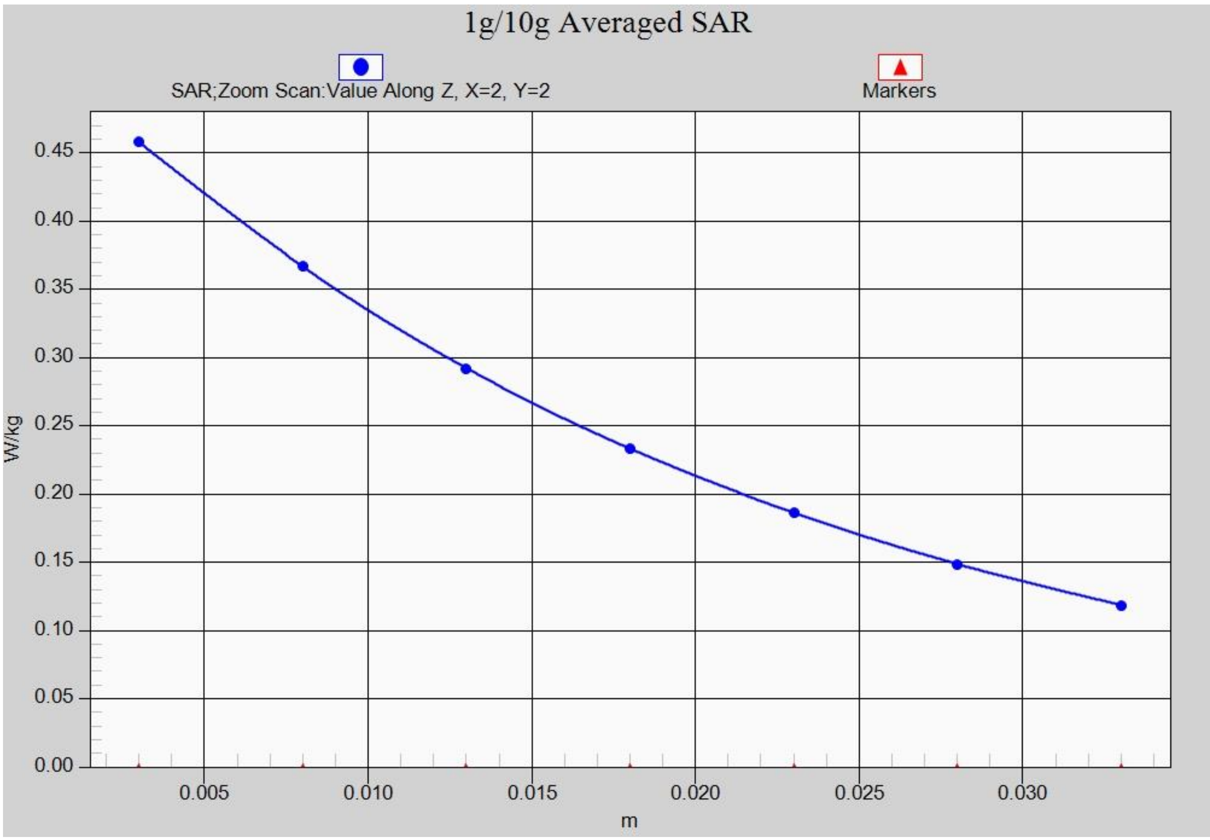


Fig. 6-1 Z-Scan at power reference point (WCDMA850)

WCDMA 1900 Left Cheek Low

Date: 2017-5-26
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1852.4 MHz; σ = 1.360 mho/m; εr = 40.26; ρ = 1000 kg/m^3
Ambient Temperature: 22.4°C Liquid Temperature: 22.2°C
Communication System: WCDMA 1900 Frequency: 1852.4 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846ConvF(7.89, 7.89, 7.89)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.318 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.613 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.411 W/kg
SAR(1 g) = 0.279 W/kg; SAR(10 g) = 0.177 W/kg
Maximum value of SAR (measured) = 0.324 W/kg

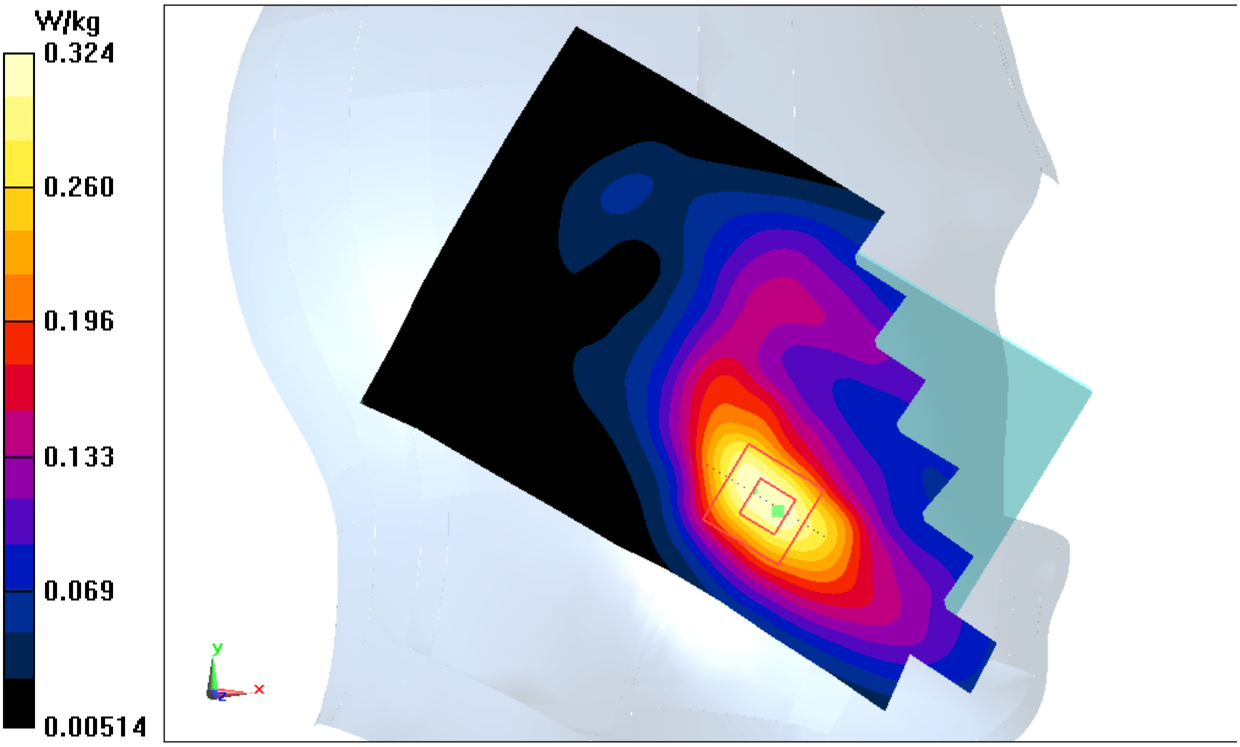


Fig.7WCDMA1900

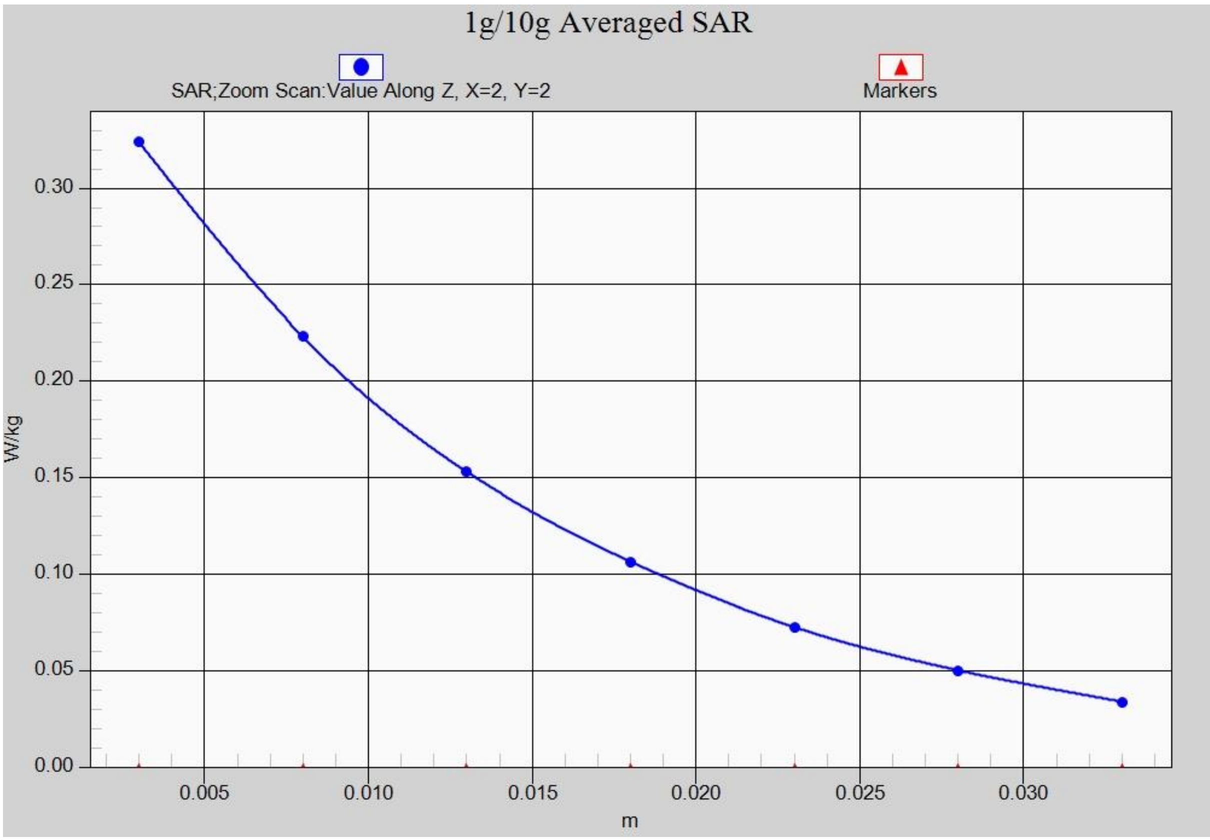


Fig. 7-1 Z-Scan at power reference point (WCDMA1900)

WCDMA 1900 Body BottomHigh AP ON

Date: 2017-5-26
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1907.6 MHz; σ = 1.512 mho/m; εr = 53.10; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
Communication System: WCDMA 1900 Frequency: 1907.6 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (111x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.43 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.89 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.83 W/kg
SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.536 W/kg
Maximum value of SAR (measured) = 1.32 W/kg

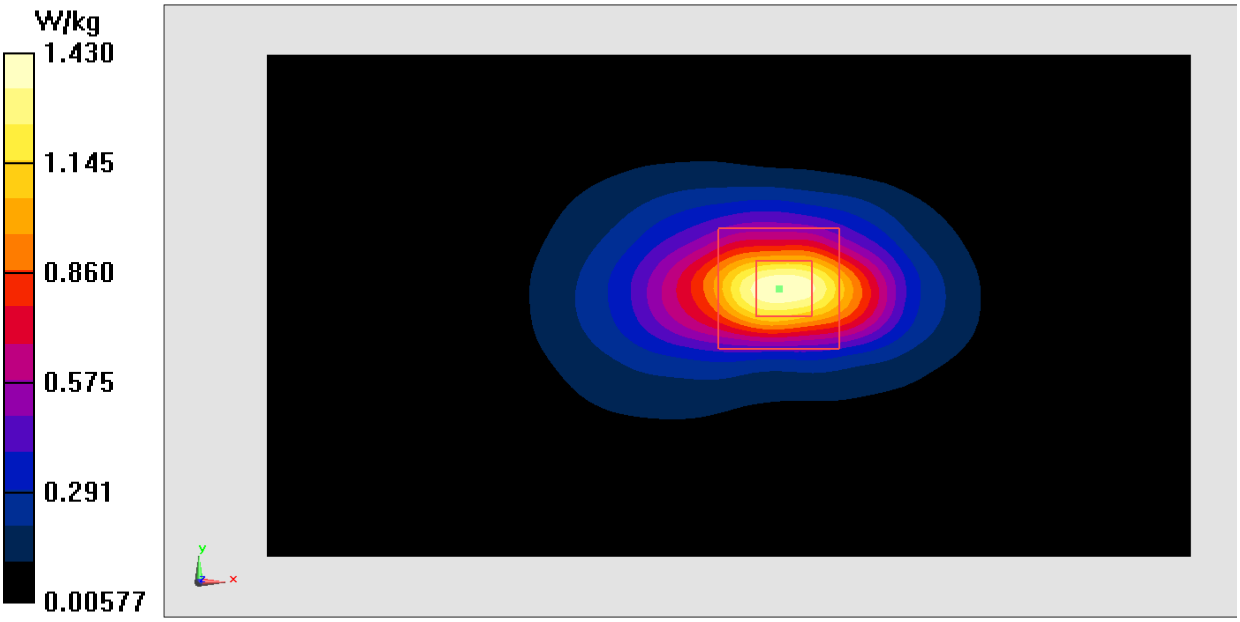


Fig.8WCDMA1900

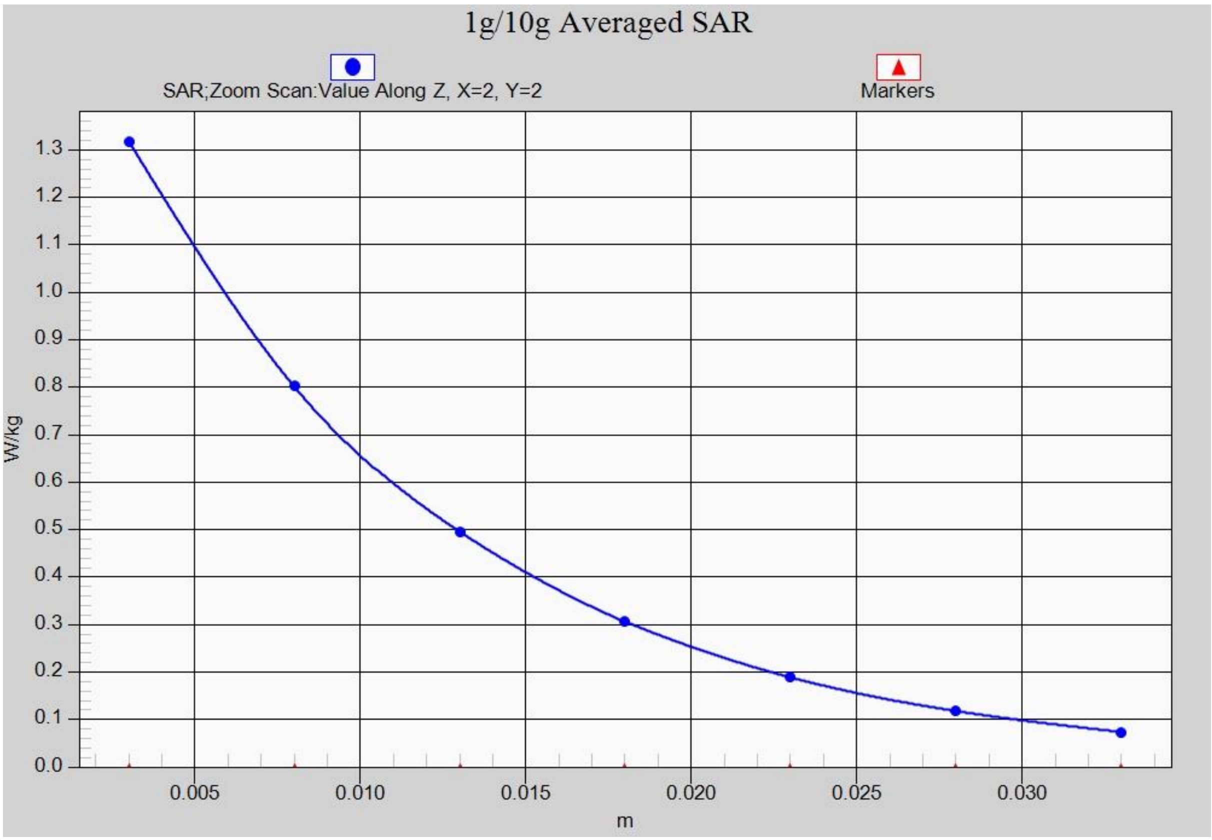


Fig. 8-1 Z-Scan at power reference point (WCDMA1900)

WCDMA 1900 Body RearMiddle AP OFF

Date: 2017-5-26
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; εr = 53.87; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C   Liquid Temperature: 22.2^{o}C
Communication System: WCDMA 1900 Frequency: 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (121x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.836 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.291 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.655 W/kg; SAR(10 g) = 0.382 W/kg
Maximum value of SAR (measured) = 0.866 W/kg

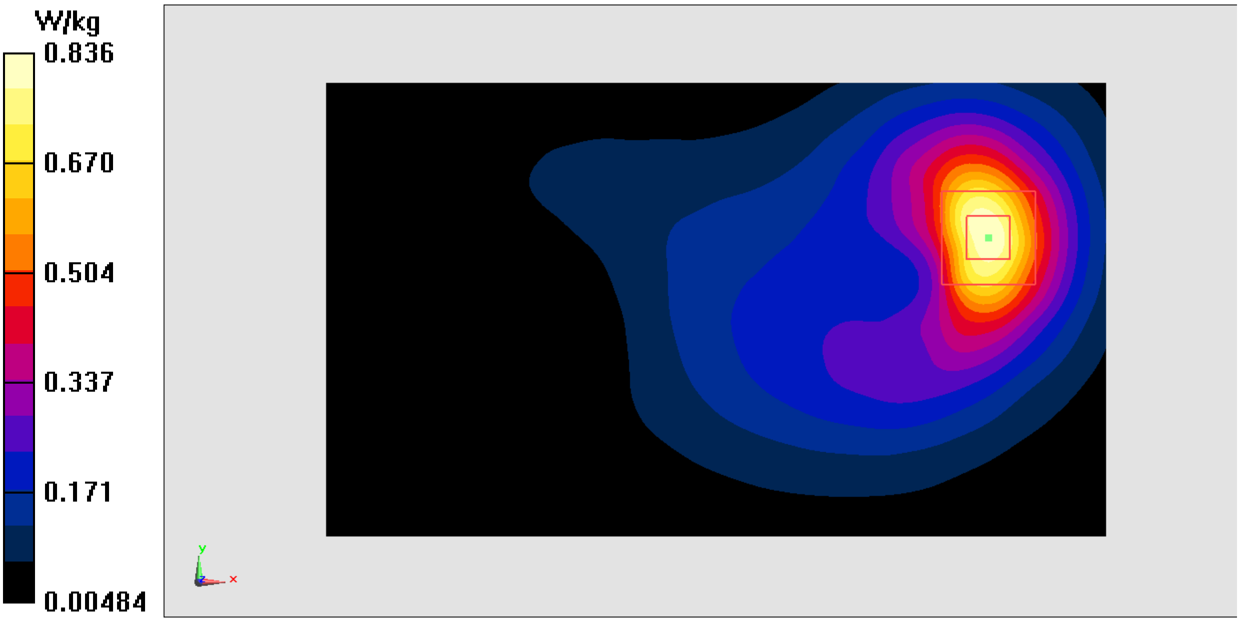


Fig.9WCDMA1900

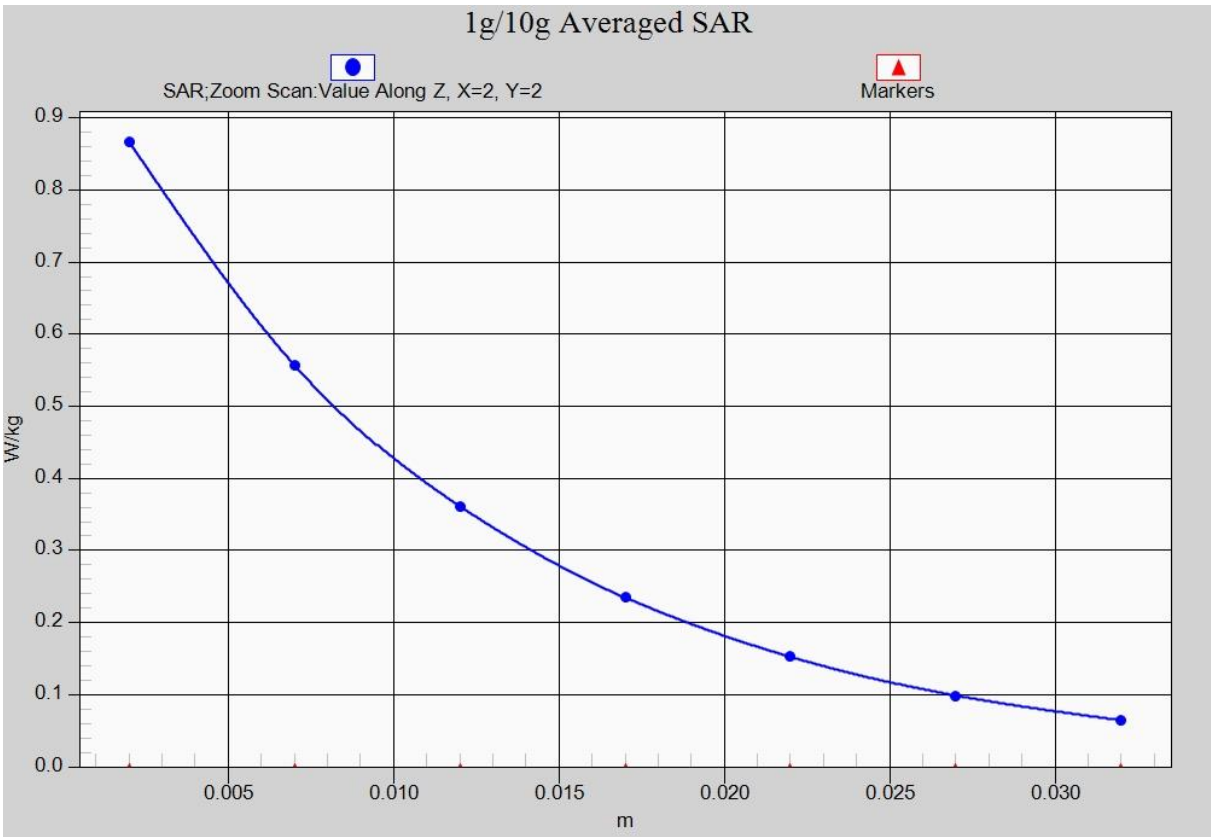


Fig. 9-1 Z-Scan at power reference point (WCDMA1900)

LTE Band2Right Cheek Middle with QPSK_20M_1RB_Low

Date: 2017-5-26

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used: f = 1880 MHz; σ =1.380 mho/m; εr = 39.69; ρ = 1000 kg/m^3

Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C

Communication System: LTE Band2Frequency: 1880 MHz Duty Cycle: 1:1

Probe: EX3DV4– SN3846ConvF(7.89, 7.89, 7.89)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.363 W/kg

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

Reference Value = 5.385 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.444 W/kg

SAR(1 g) = 0.306 W/kg; SAR(10 g) = 0.195 W/kg

Maximum value of SAR (measured) = 0.354 W/kg

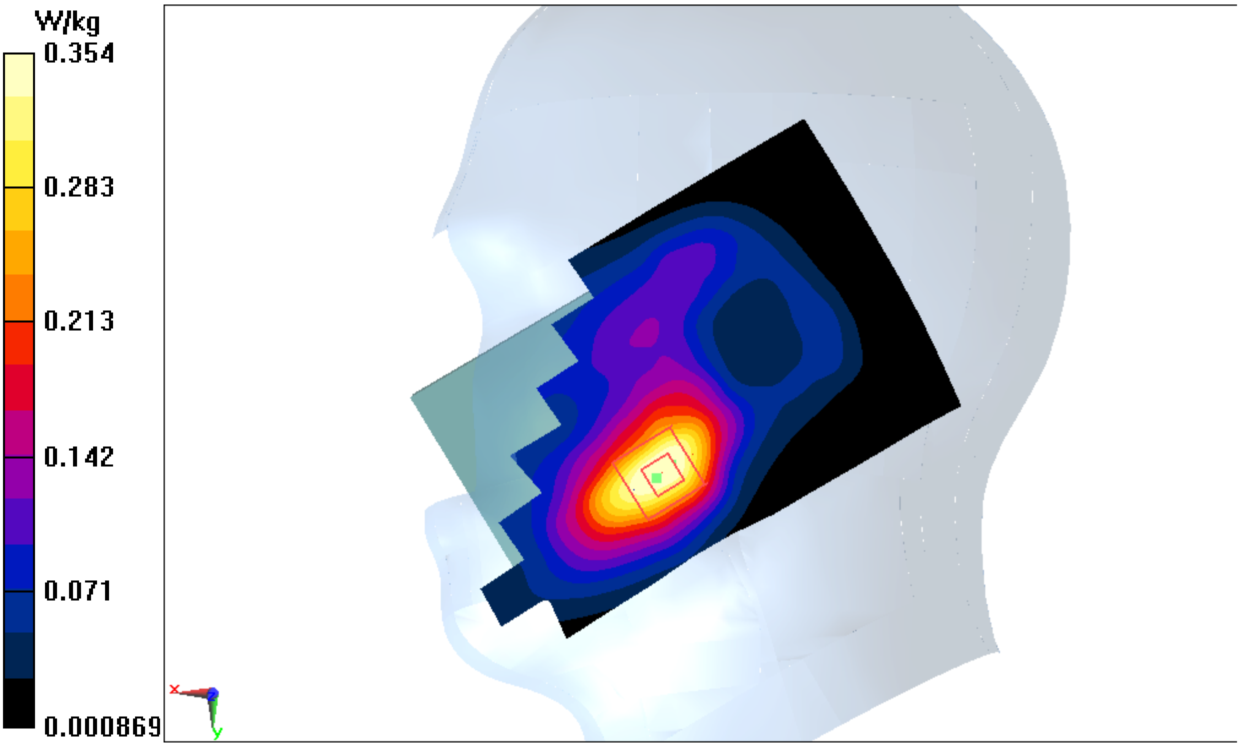


Fig.10 LTE Band2

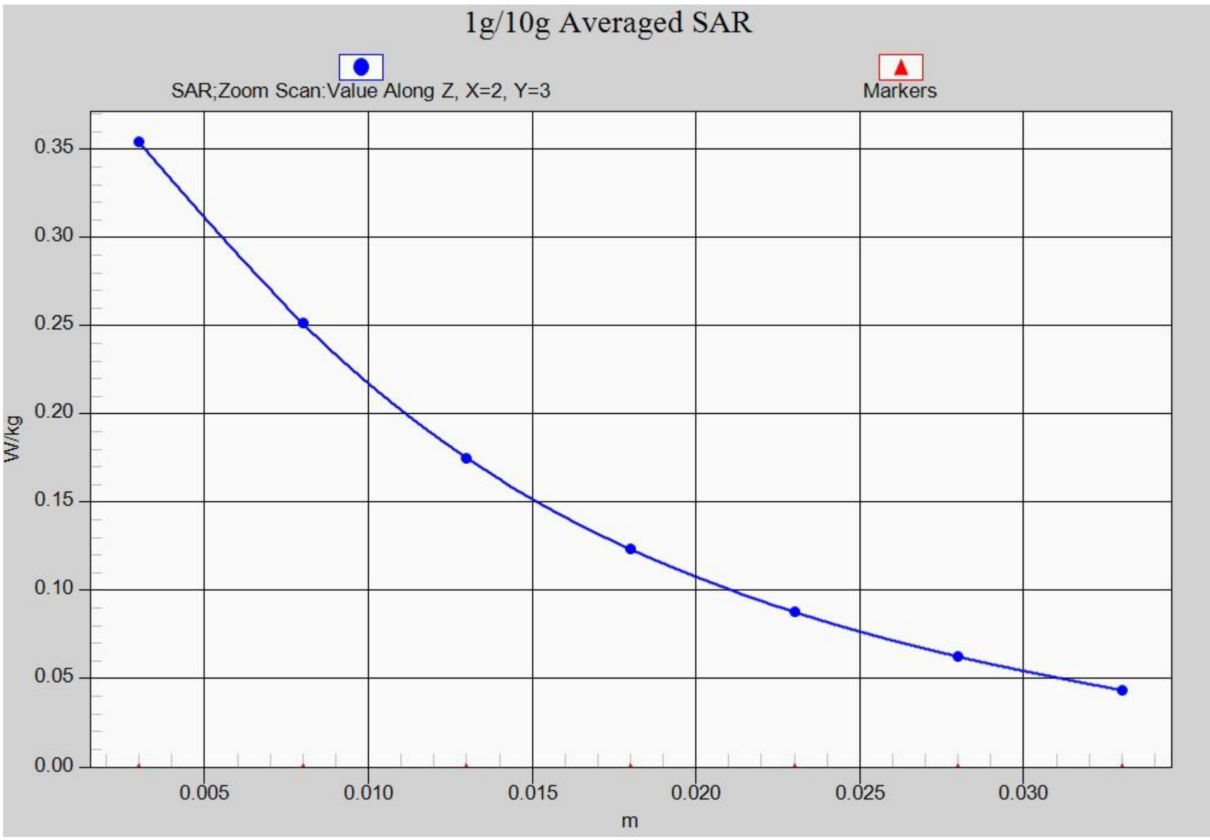


Fig. 10-1 Z-Scan at power reference point (LTE Band2)

LTE Band2Body BottomHigh with QPSK_20M_50RB_Low AP ON

Date: 2017-5-26

Electronics: DAE4 Sn1331

Medium: Body 1900 MHz

Medium parameters used: f = 1900 MHz; σ = 1.506 mho/m; εr = 53.31; ρ = 1000 kg/m^3

Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C

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

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

Area Scan (121x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.47 W/kg

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

Reference Value = 27.84 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.77 W/kg

SAR(1 g) = 1.02 W/kg; SAR(10 g) = 0.522 W/kg

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

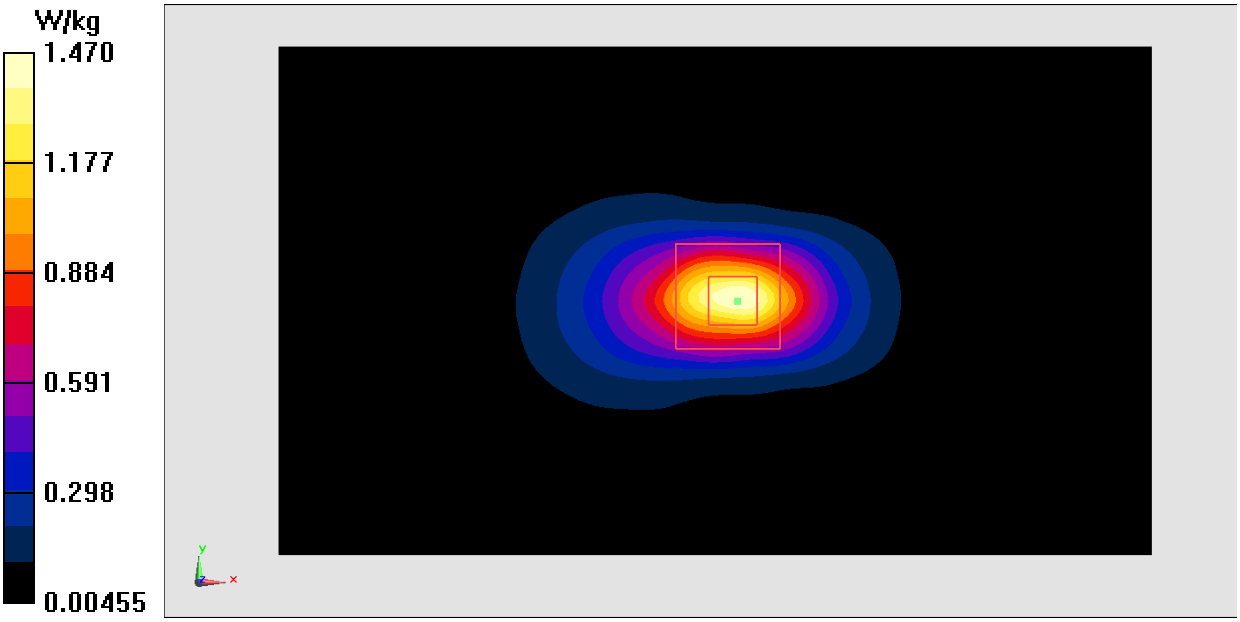


Fig.11 LTE Band2

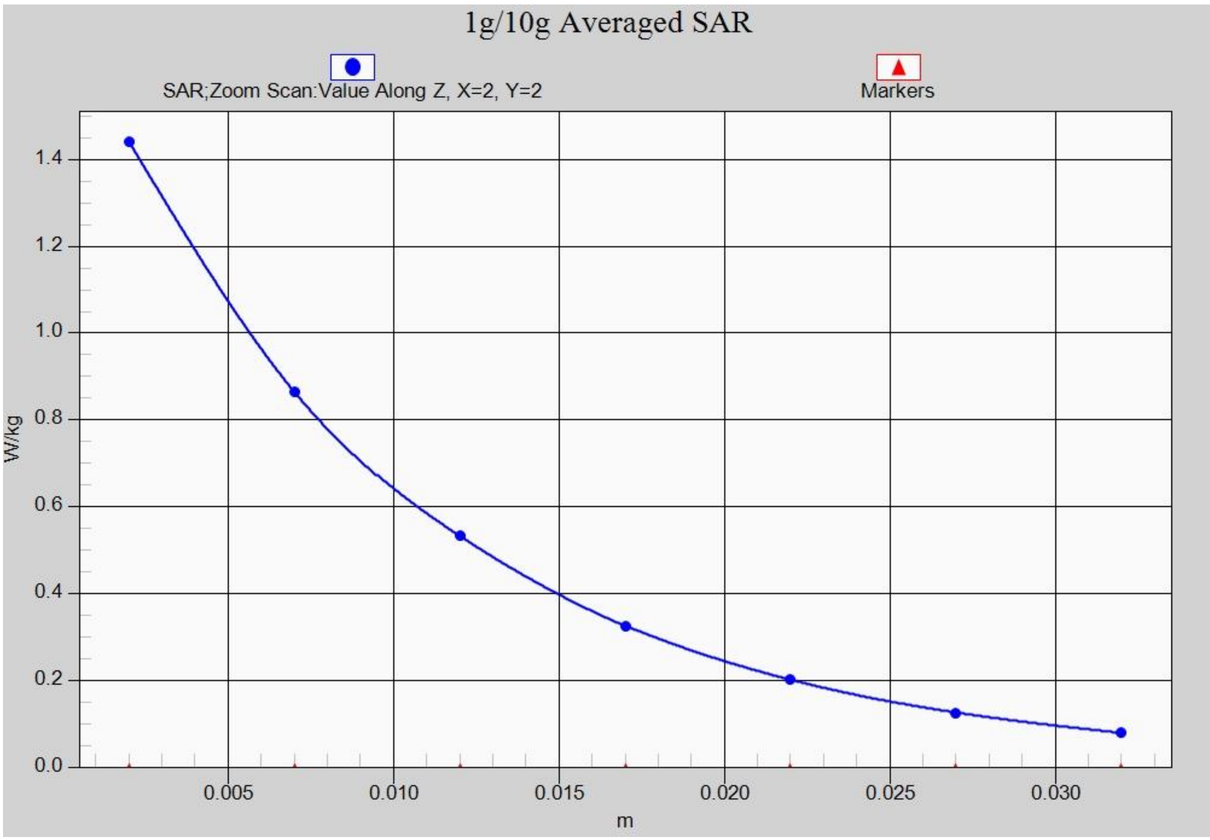


Fig. 11-1 Z-Scan at power reference point (LTE Band2)

LTE Band2 Body RearMiddle with QPSK_20M_1RB_Low AP OFF
Date: 2017-5-26
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.490 mho/m; εr = 53.87; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
Communication System: LTE Band2 Frequency: 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.57, 7.57, 7.57)

Area Scan (121x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.957 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.619 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.771 W/kg; SAR(10 g) = 0.454 W/kg
Maximum value of SAR (measured) = 0.999 W/kg

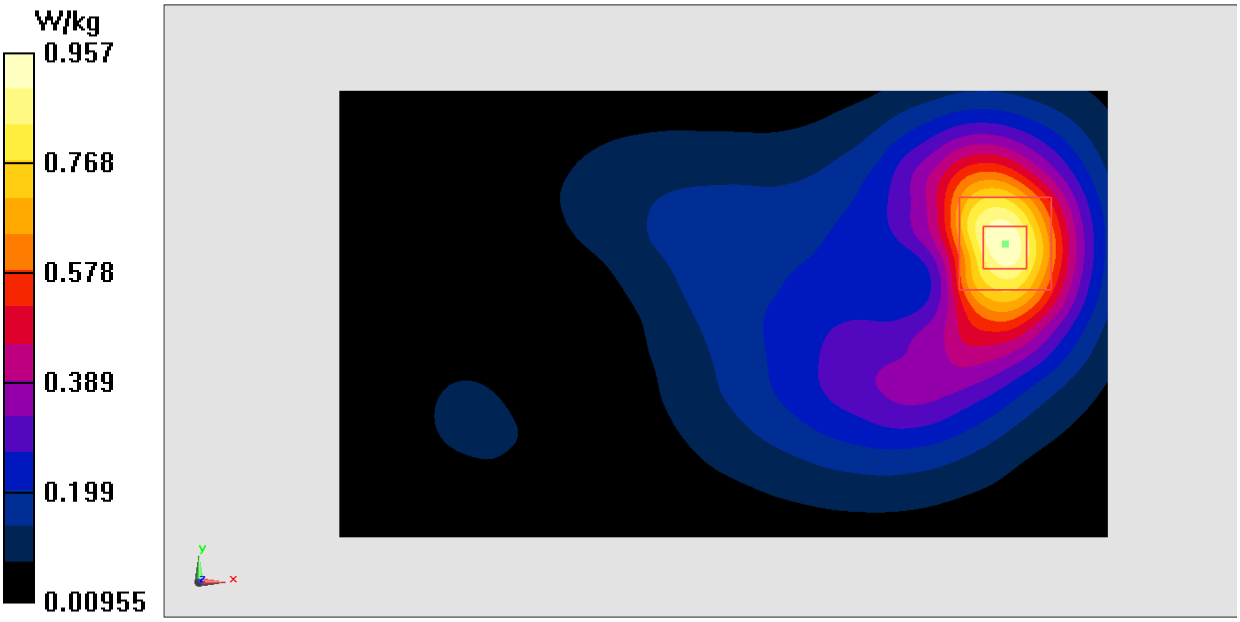


Fig.12 LTE Band2

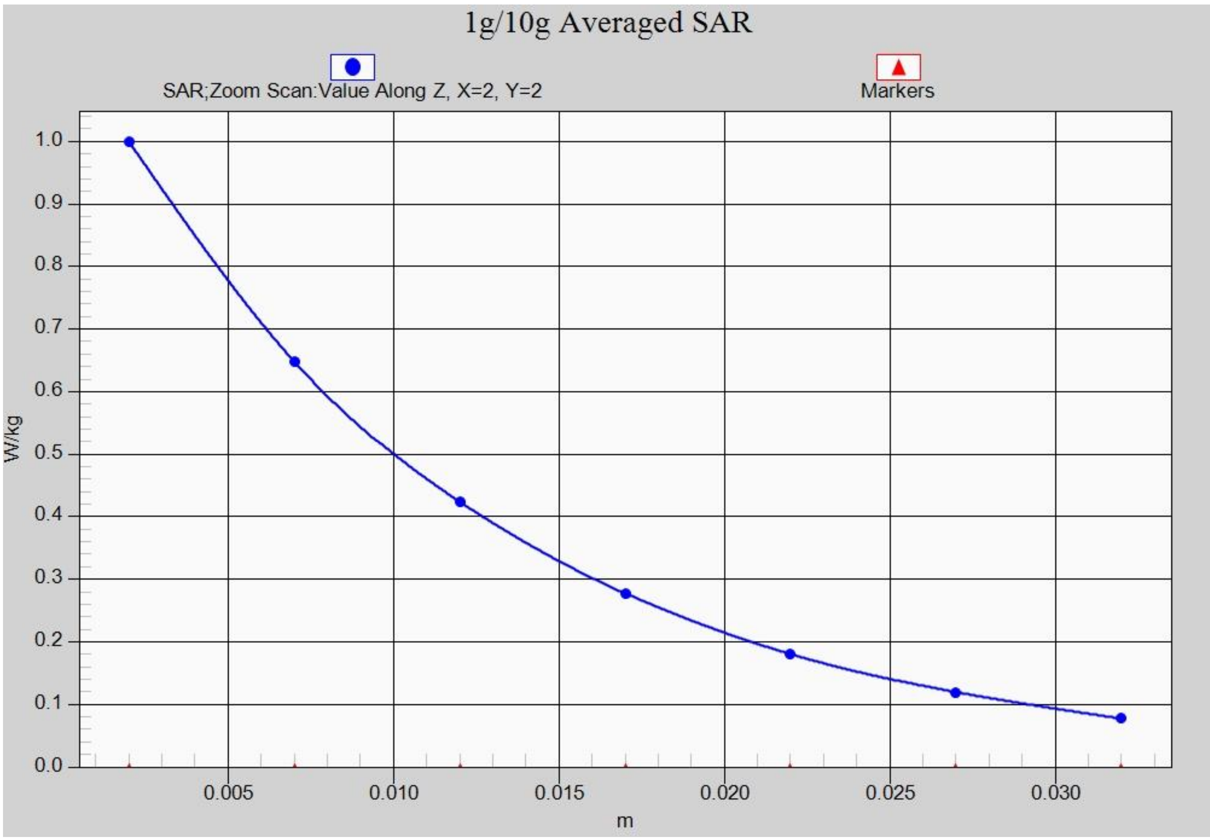


Fig. 12-1 Z-Scan at power reference point (LTE Band2)

LTE Band4Right Cheek High with QPSK_20M_1RB_Middle
Date: 2017-5-25
Electronics: DAE4 Sn1331
Medium: Head 1750 MHz
Medium parameters used f = 1745 MHz; σ = 1.347 mho/m; εr = 40.01; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
Communication System: LTE Band4 Frequency: 1745MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846ConvF(8.16, 8.16, 8.16)

Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.343 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.543 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.356 W/kg
SAR(1 g) = 0.248 W/kg; SAR(10 g) = 0.164 W/kg
Maximum value of SAR (measured) = 0.308 W/kg

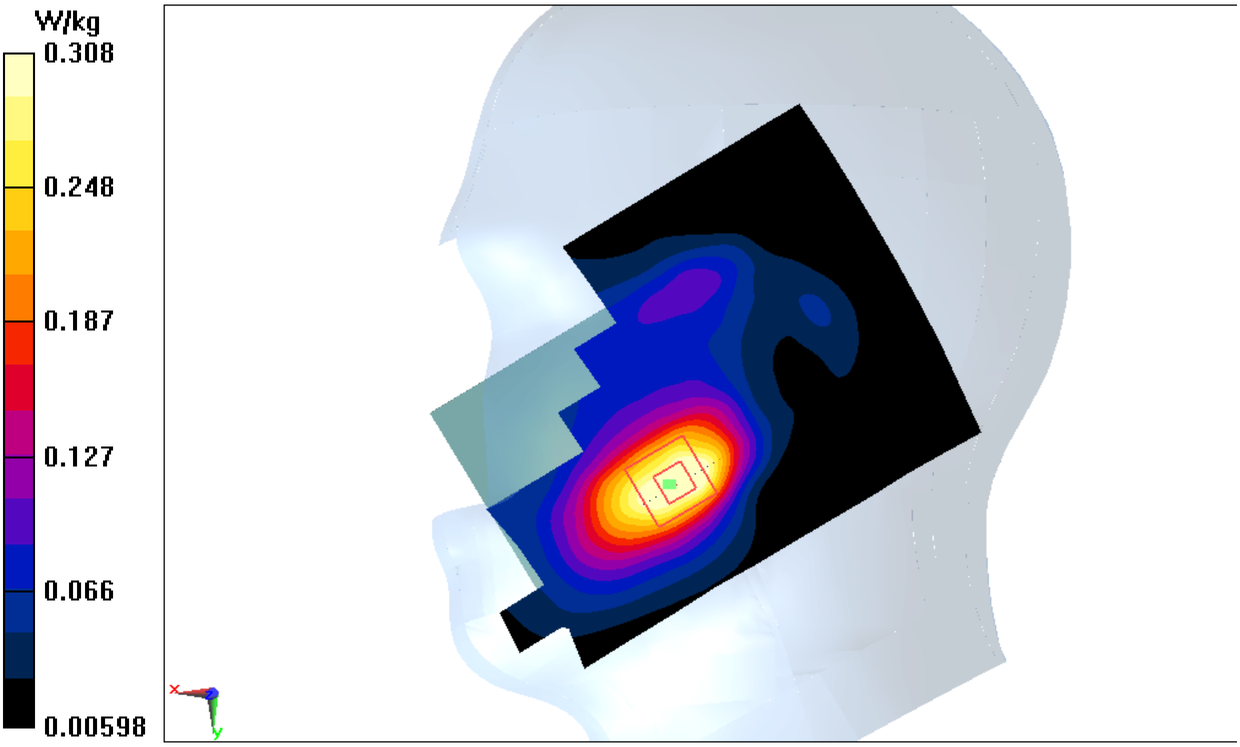


Fig.13 LTE Band4

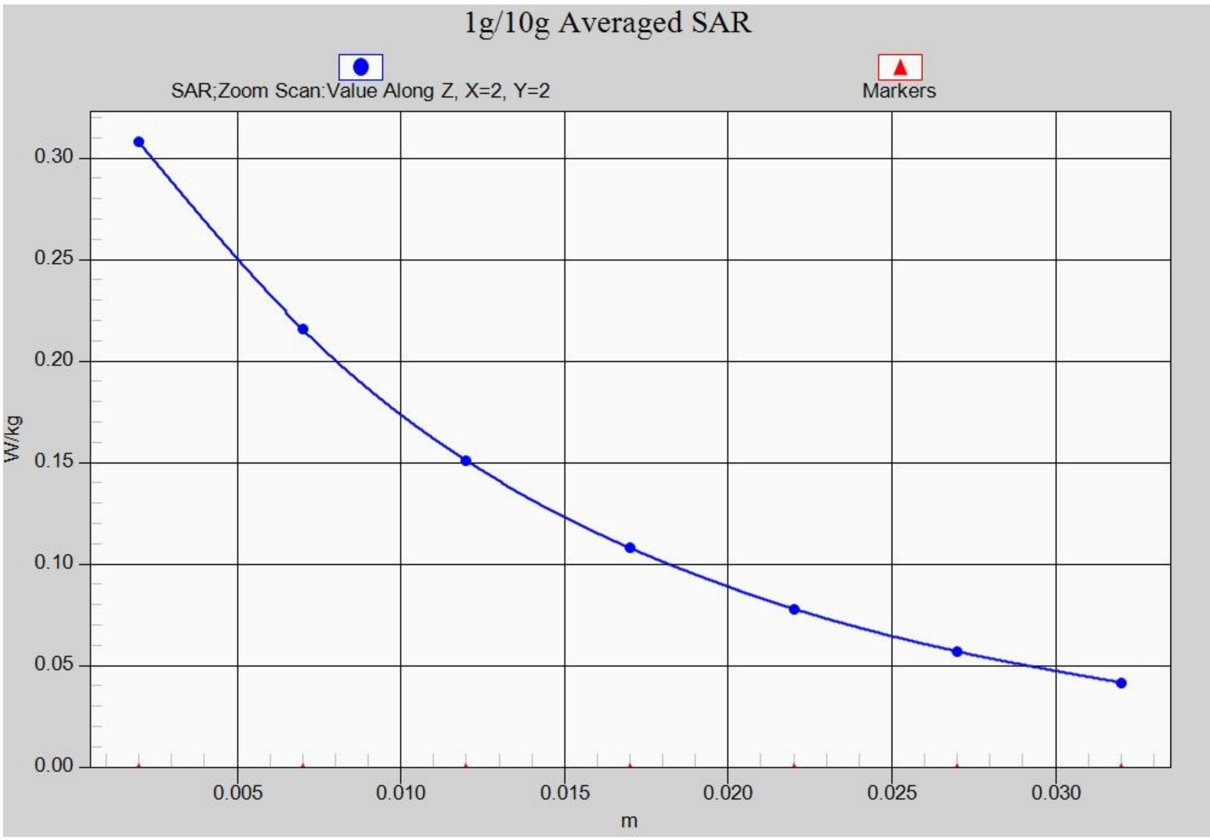


Fig. 13-1 Z-Scan at power reference point (LTE Band4)

LTE Band4Body BottomHigh with QPSK_20M_100RB AP ON

Date: 2017-5-25
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used: f = 1745 MHz; σ =1.507 mho/m; εr = 53.30; ρ = 1000 kg/m^3
Ambient Temperature: 22.4°C Liquid Temperature: 22.2°C
Communication System: LTE Band4 Frequency: 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846ConvF(7.90, 7.90, 7.90)

Area Scan (121x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.36 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.73 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 0.971 W/kg; SAR(10 g) = 0.497 W/kg
Maximum value of SAR (measured) = 1.34 W/kg

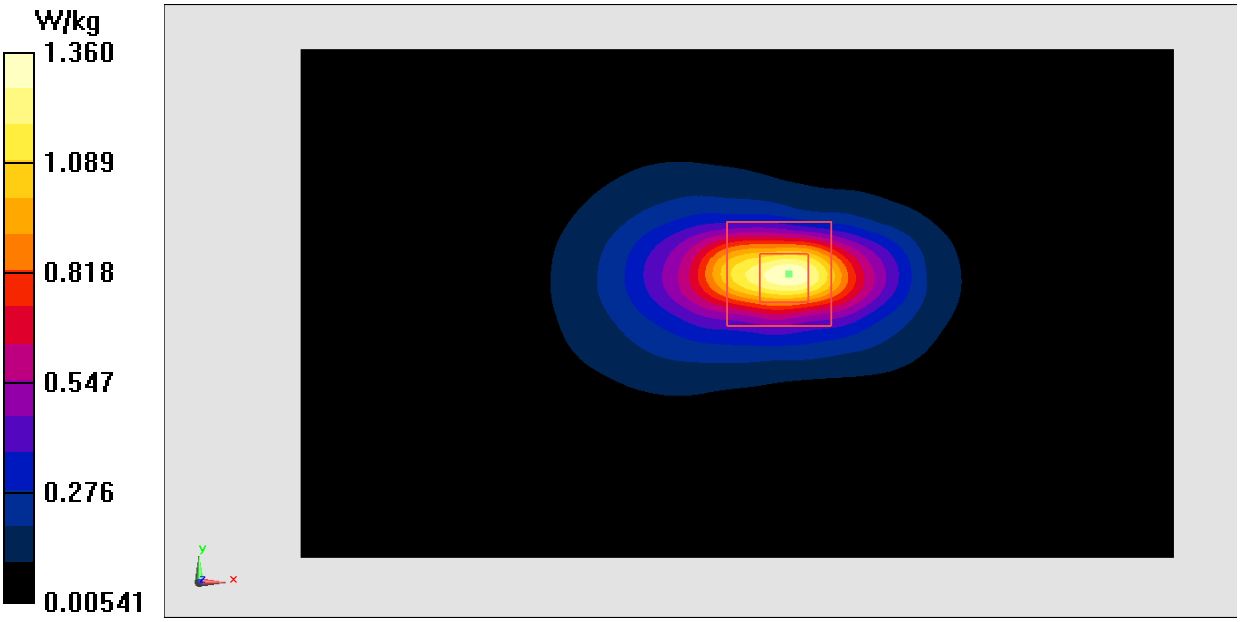


Fig.14 LTE Band4

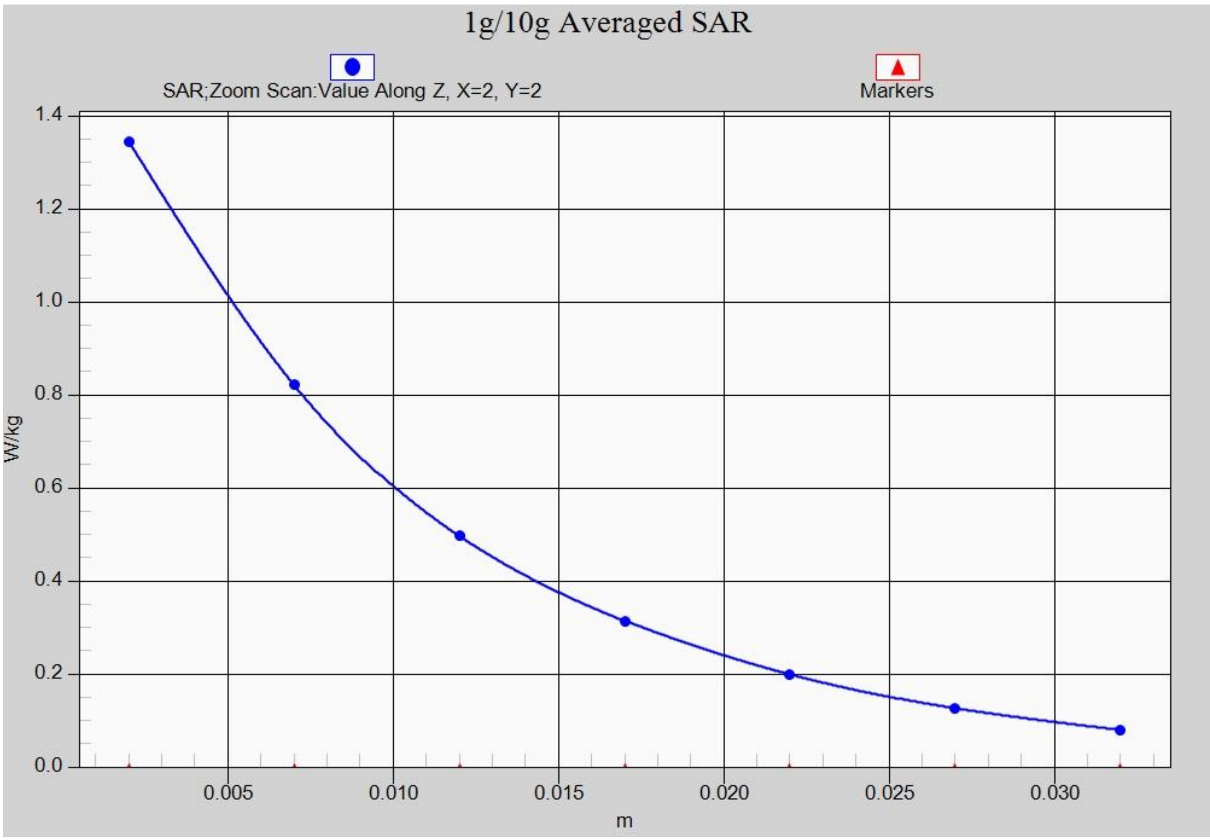


Fig. 14-1 Z-Scan at power reference point (LTE Band4)

LTE Band4 Body RearHigh with QPSK_20M_1RB_Middle AP OFF

Date: 2017-5-25
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used: f = 1745 MHz; σ =1.507 mho/m; εr = 53.30; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
Communication System: LTE Band4 Frequency: 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846ConvF(7.90, 7.90, 7.90)

Area Scan (111x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.751 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.14 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 0.927 W/kg
SAR(1 g) = 0.595 W/kg; SAR(10 g) = 0.358 W/kg
Maximum value of SAR (measured) = 0.720 W/kg

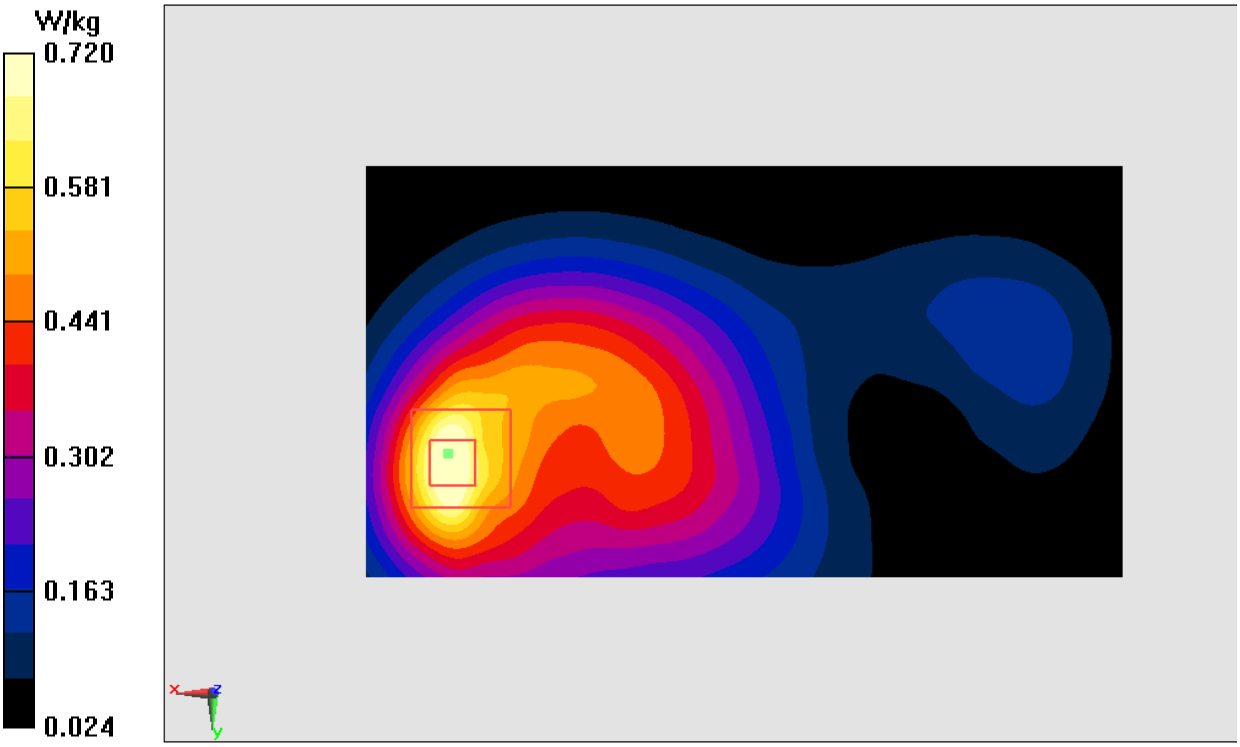


Fig.15 LTE Band4

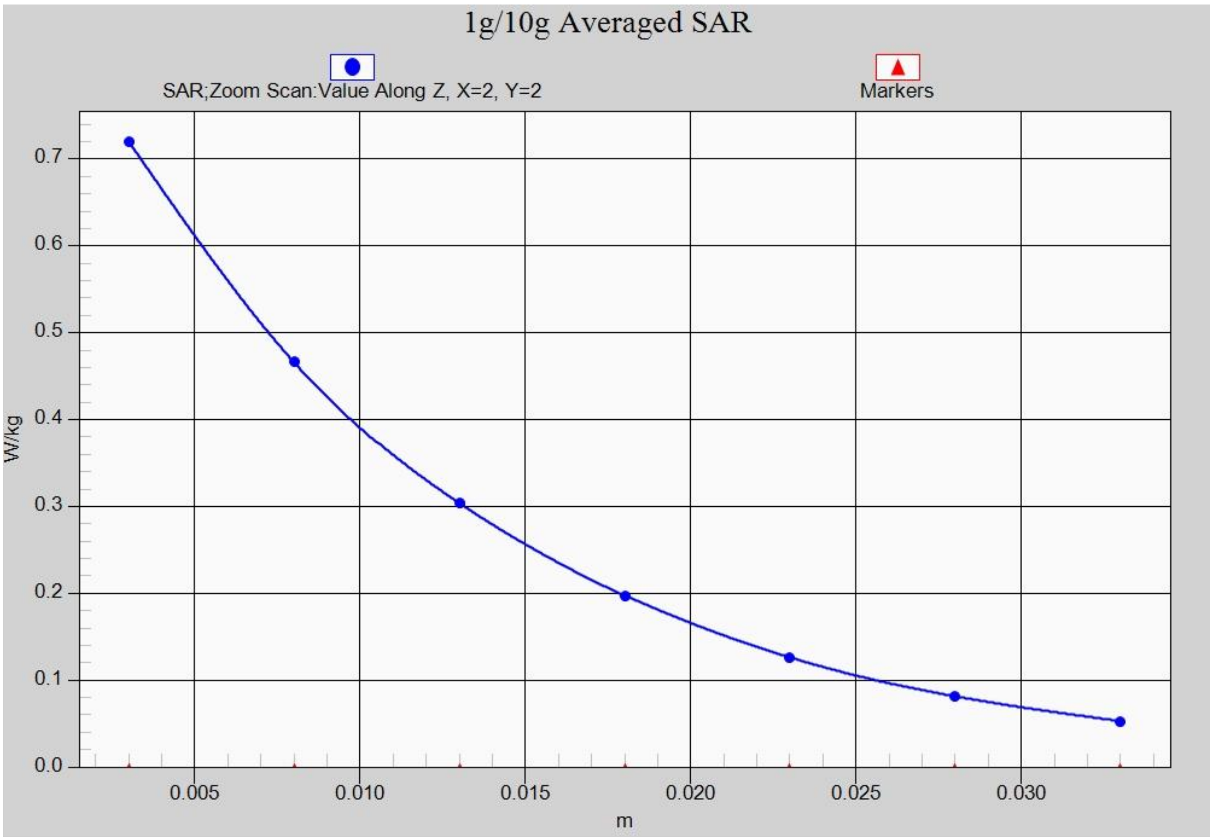


Fig. 15-1 Z-Scan at power reference point (LTE Band4)

LTE Band5 Right Cheek Middle with QPSK_10M_1RB_Middle

Date: 2017-5-24
Electronics: DAE4 Sn1331
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.891 mho/m; εr = 41.48; ρ = 1000 kg/m^3
Ambient Temperature: 22.4°C   Liquid Temperature: 22.2°C
Communication System: LTE Band5 Frequency: 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) = 0.235 W/kg

Right/Cheek 1RB-M/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.767 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.262 W/kg
SAR(1 g) = 0.213 W/kg; SAR(10 g) = 0.165 W/kg
Maximum value of SAR (measured) = 0.230 W/kg

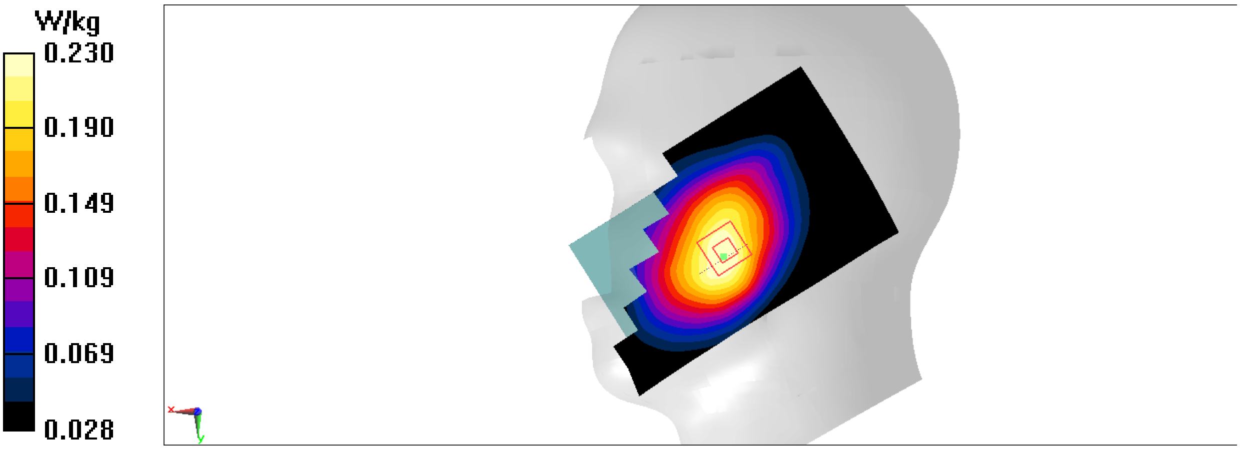


Fig.16 LTE Band5

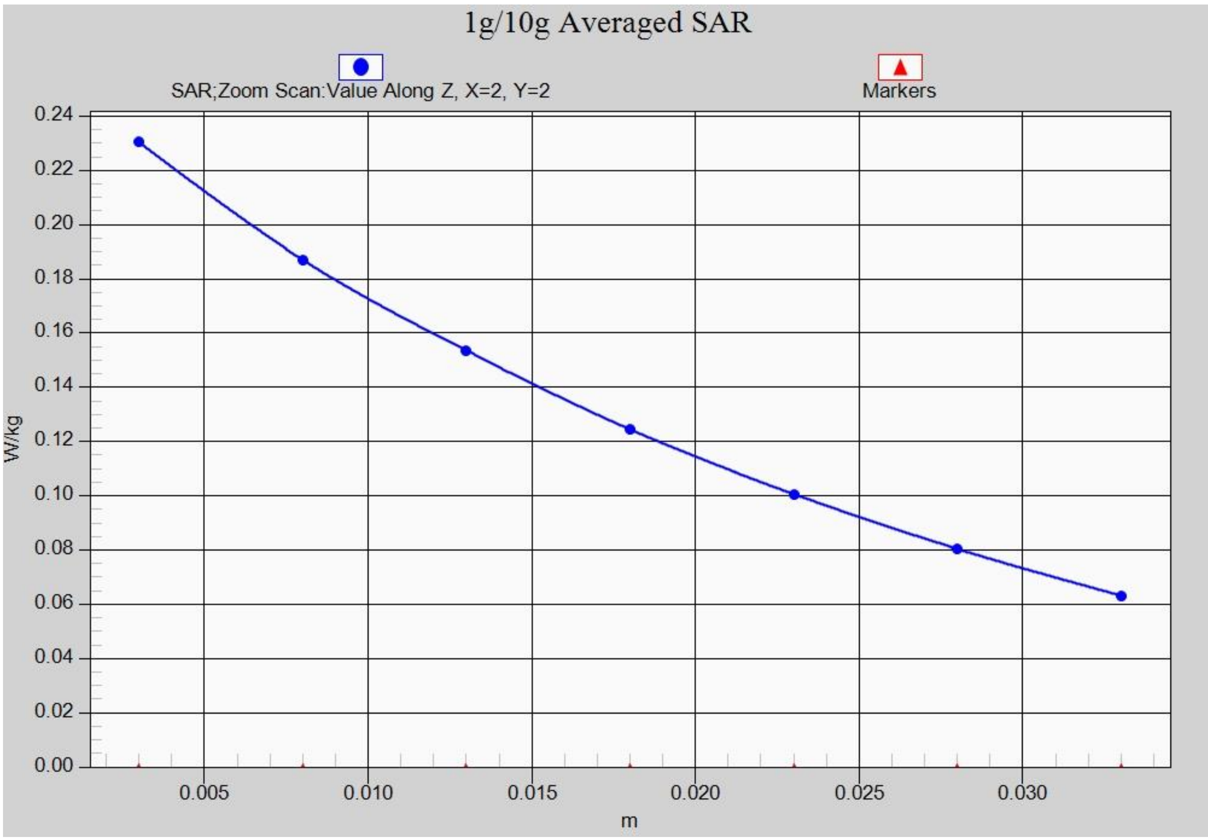


Fig. 16-1 Z-Scan at power reference point (LTE Band5)

LTE Band5 Body Rear Middle with QPSK_10M_1RB_Middle

Date: 2017-5-24

Electronics: DAE4 Sn1331

Medium: Body 850 MHz

Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.966 mho/m; εr = 54.19; ρ = 1000 kg/m^3

Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C

Communication System: LTE Band5 Frequency: 836.5 MHz Duty Cycle: 1:1

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

Area Scan (111x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.375 W/kg

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

Reference Value = 18.32 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.421 W/kg

SAR(1 g) = 0.336 W/kg; SAR(10 g) = 0.259 W/kg

Maximum value of SAR (measured) = 0.371 W/kg

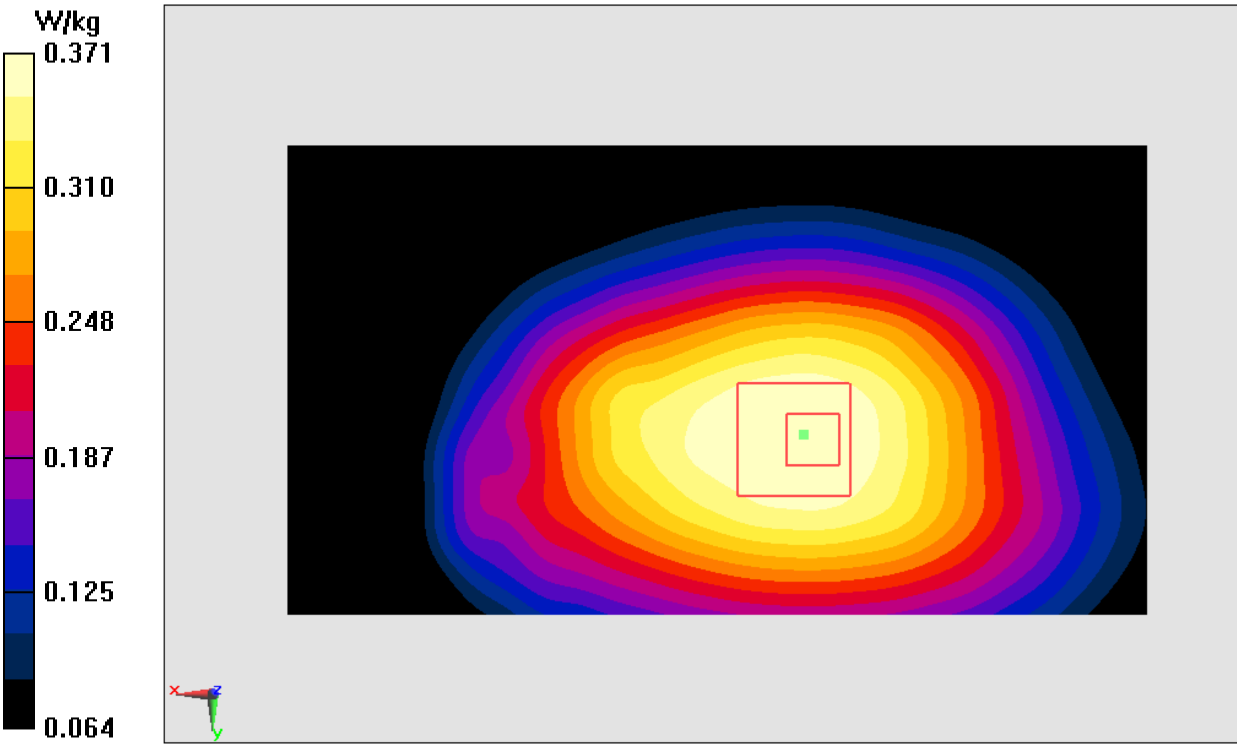


Fig.17LTE Band5

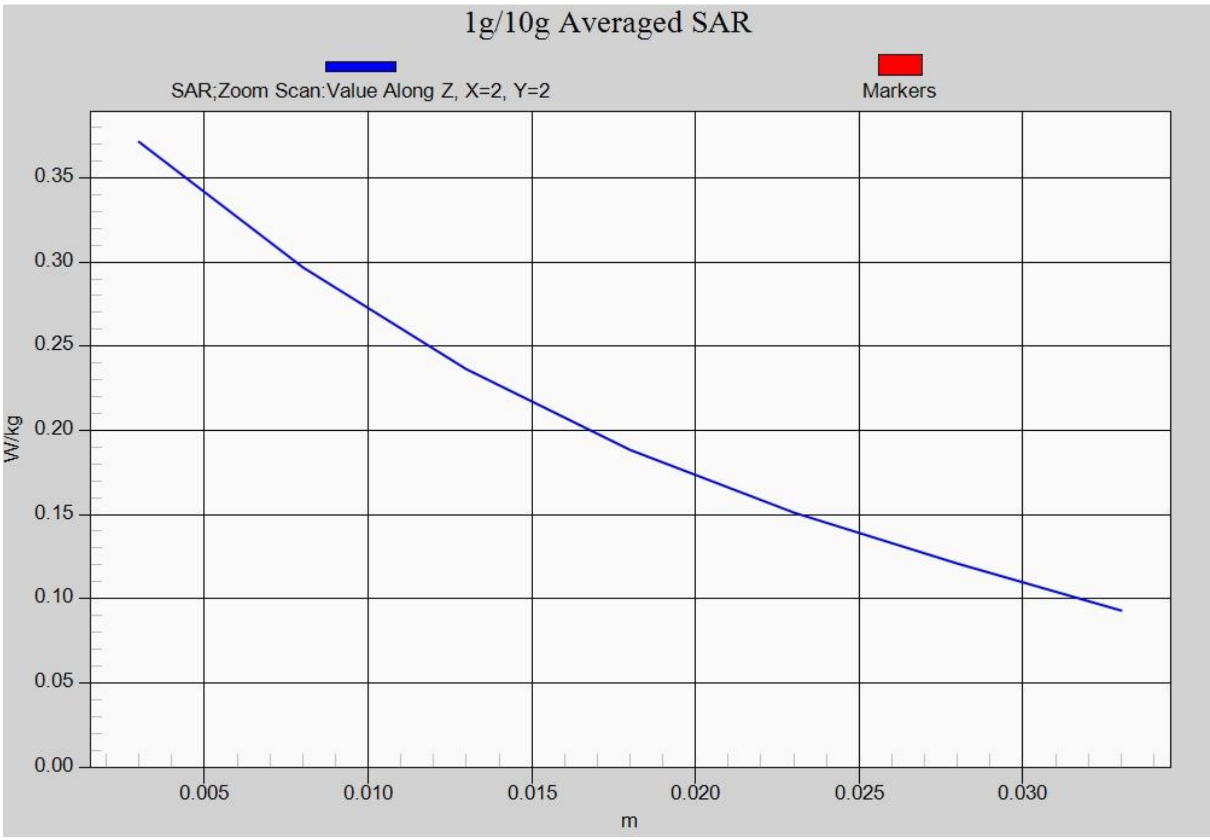


Fig. 17-1 Z-Scan at power reference point (LTE Band5)

LTE Band7Left Cheek High with QPSK_20M_1RB_Middle

Date: 2017-5-28
Electronics: DAE4 Sn1331
Medium: Head2600 MHz
Medium parameters used: f = 2560 MHz; σ = 1.901mho/m; εr = 39.74; ρ = 1000 kg/m^3
Ambient Temperature: 22.4°C Liquid Temperature: 22.2°C
Communication System: LTE Band7Frequency: 2560 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) = 0.388 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.951 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.564 W/kg
SAR(1 g) = 0.312 W/kg; SAR(10 g) = 0.170 W/kg
Maximum value of SAR (measured) = 0.387 W/kg

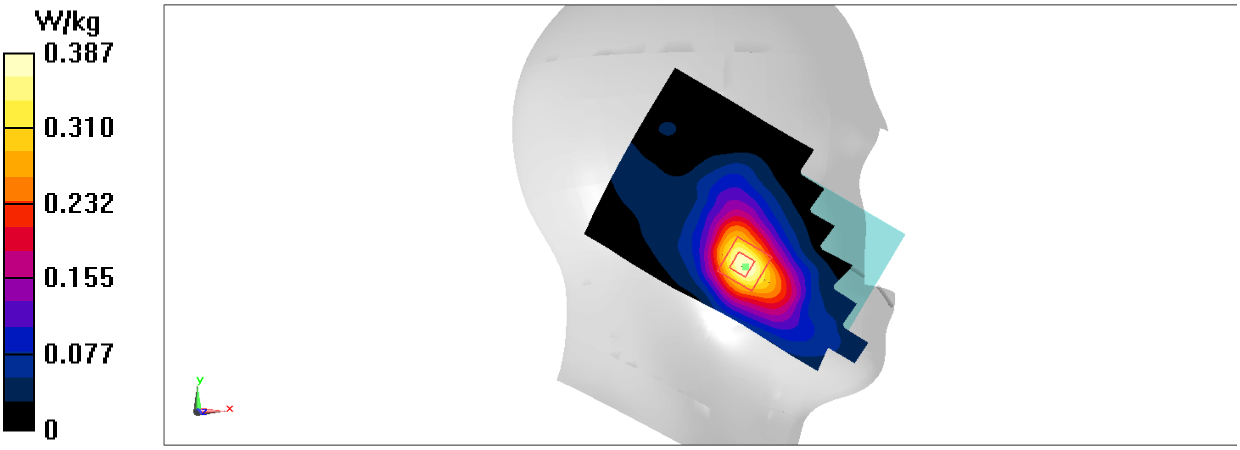


Fig.18 LTE Band7

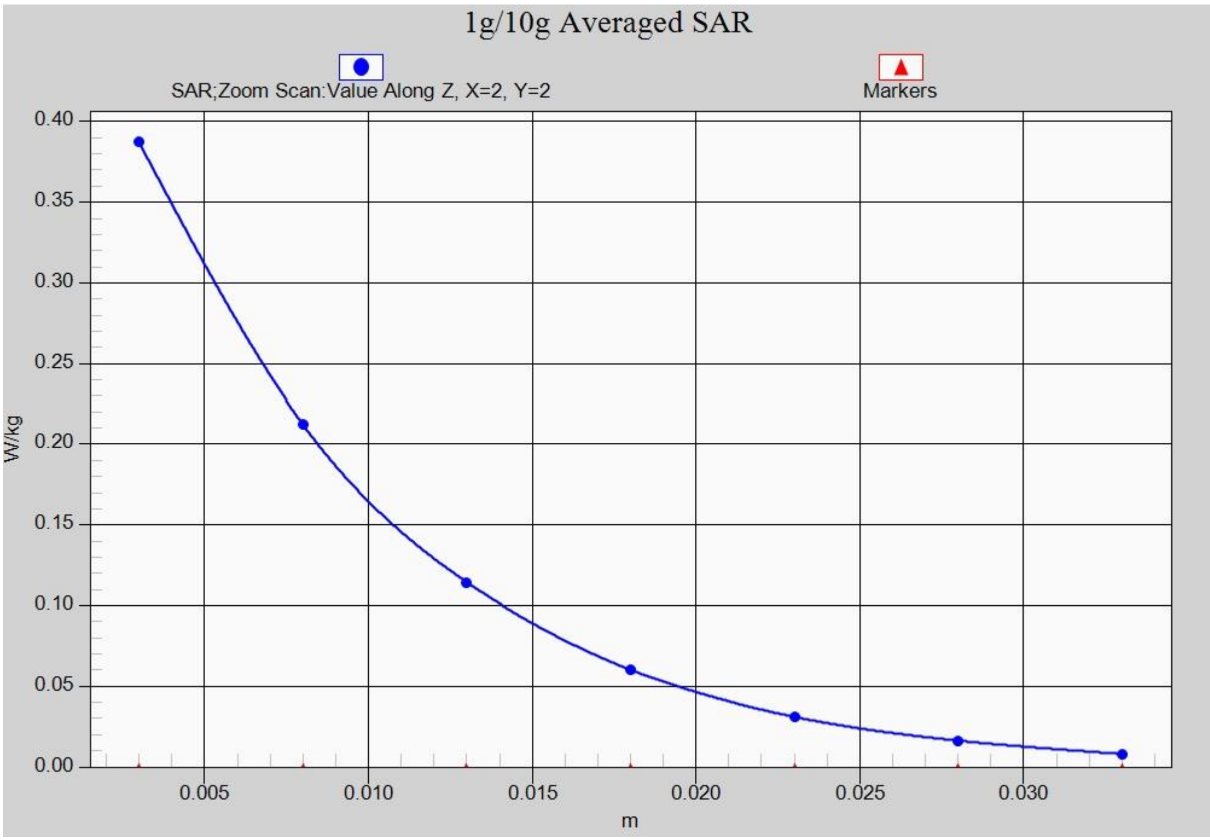


Fig. 18-1 Z-Scan at power reference point (LTE Band7)

LTE Band7Body BottomHigh with QPSK_20M_1RB_Low AP ON
Date: 2017-5-28
Electronics: DAE4 Sn1331
Medium: Body2600 MHz
Medium parameters used: f = 2560 MHz; σ = 2.102 mho/m; εr = 53.41; ρ = 1000 kg/m^3
Ambient Temperature: 22.4°C Liquid Temperature: 22.2°C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.25, 7.25, 7.25)

Area Scan (121x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.63 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.44 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 2.22 W/kg
SAR(1 g) = 1.09 W/kg; SAR(10 g) = 0.483 W/kg
Maximum value of SAR (measured) = 1.66 W/kg

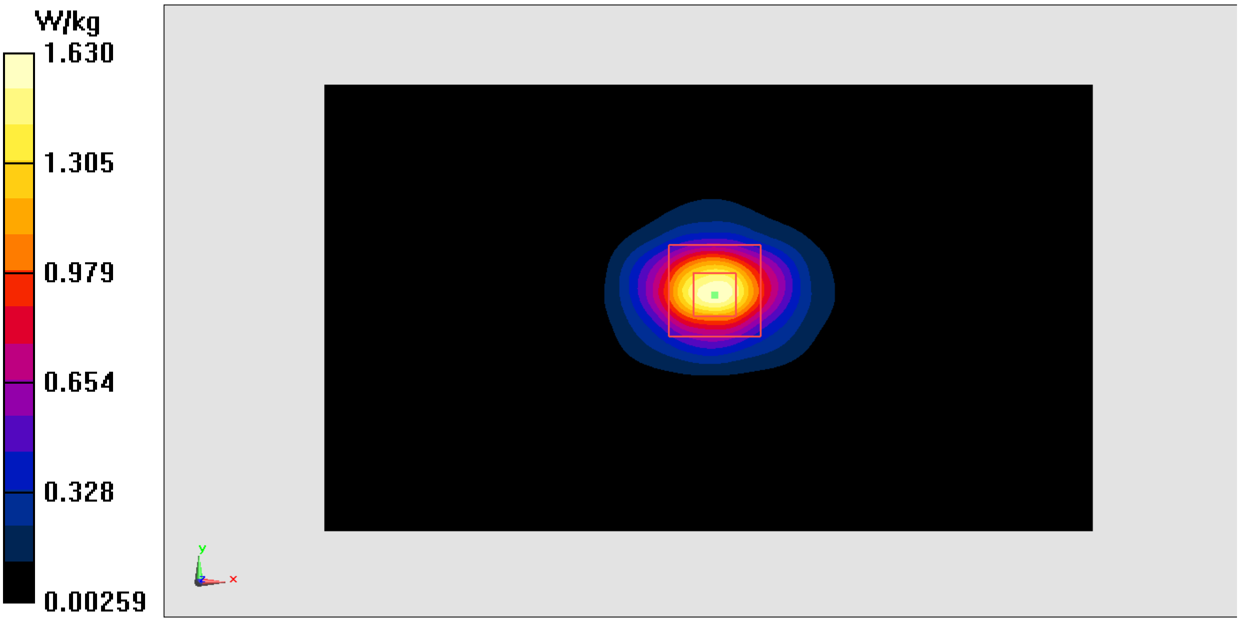


Fig.19 LTE Band7

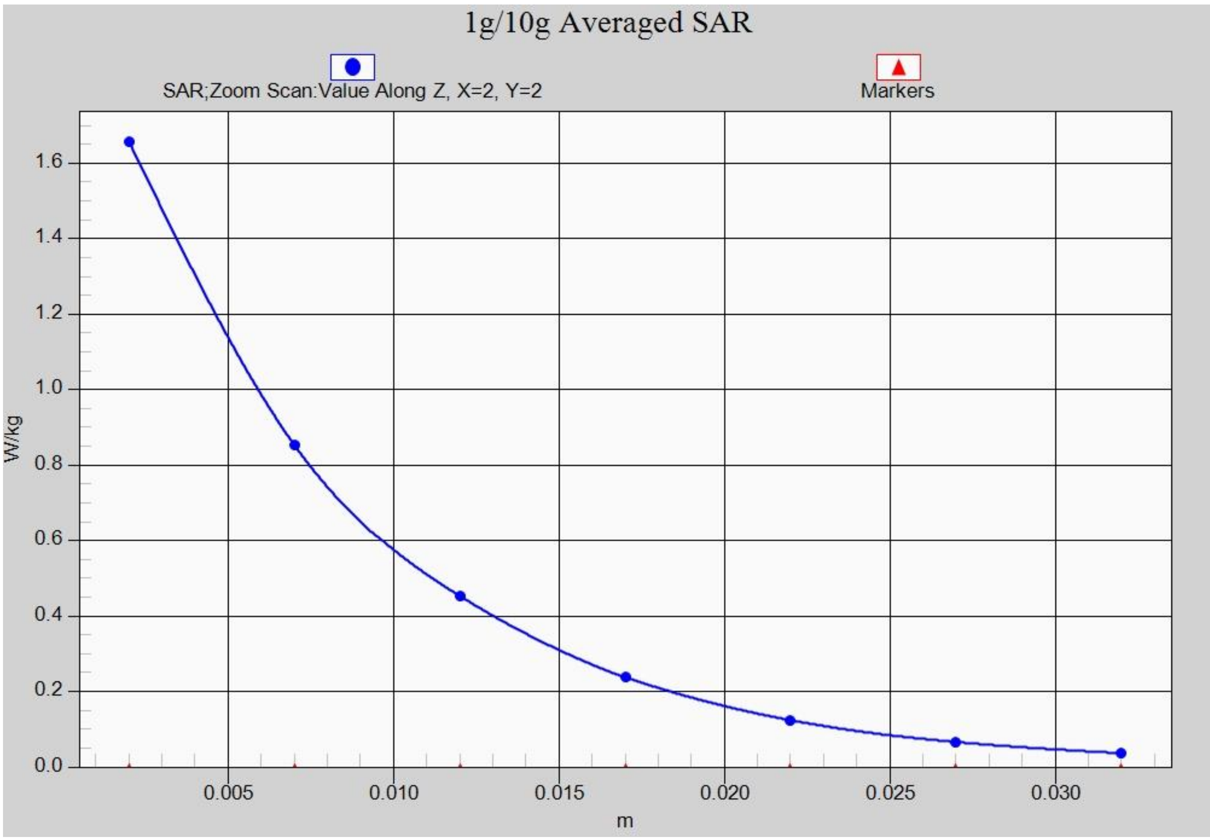


Fig. 19-1 Z-Scan at power reference point (LTE Band7)

LTE Band7Body RearHigh with QPSK_20M_1RB_Low AP OFF

Date: 2017-5-28
Electronics: DAE4 Sn1331
Medium: Body2600 MHz
Medium parameters used: f = 2560 MHz; σ = 2.102 mho/m; εr = 53.41; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C   Liquid Temperature: 22.2^{o}C
Communication System: LTE Band7 Frequency: 2560 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(7.25, 7.25, 7.25)

Area Scan (111x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.558 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.744 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.930 W/kg
SAR(1 g) = 0.478 W/kg; SAR(10 g) = 0.239 W/kg
Maximum value of SAR (measured) = 0.607 W/kg

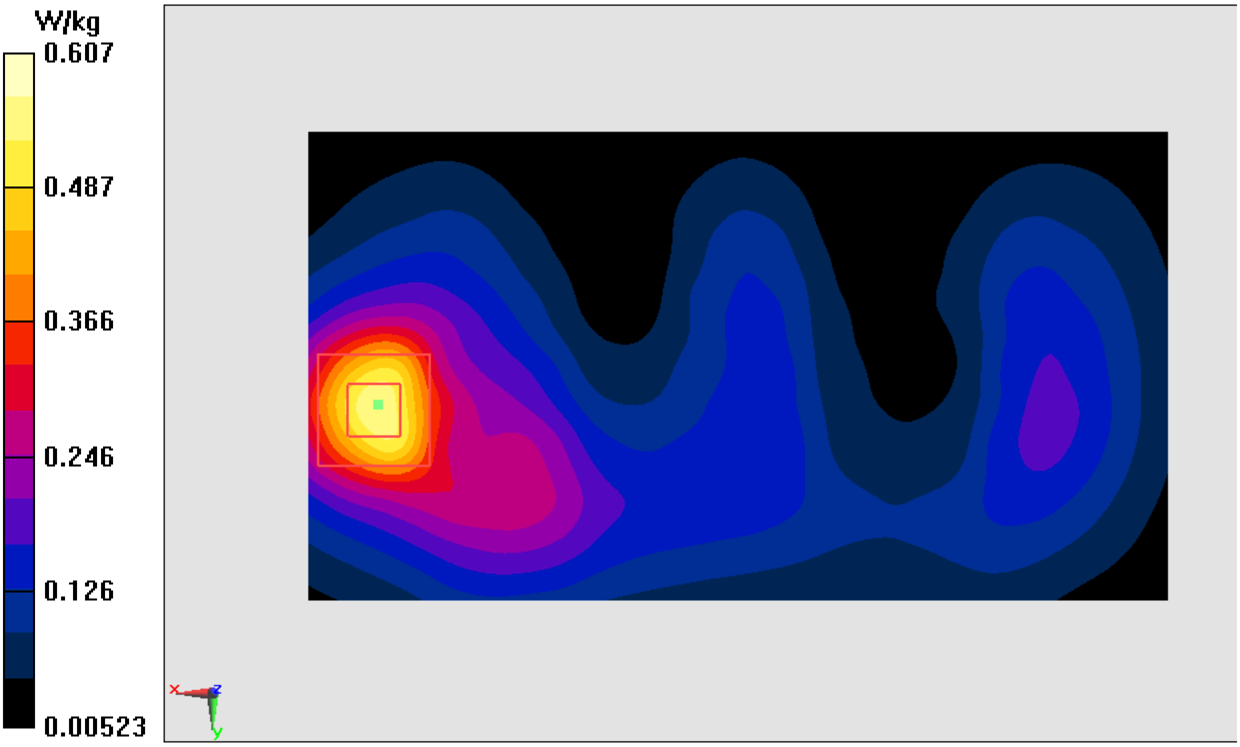


Fig.20 LTE Band7

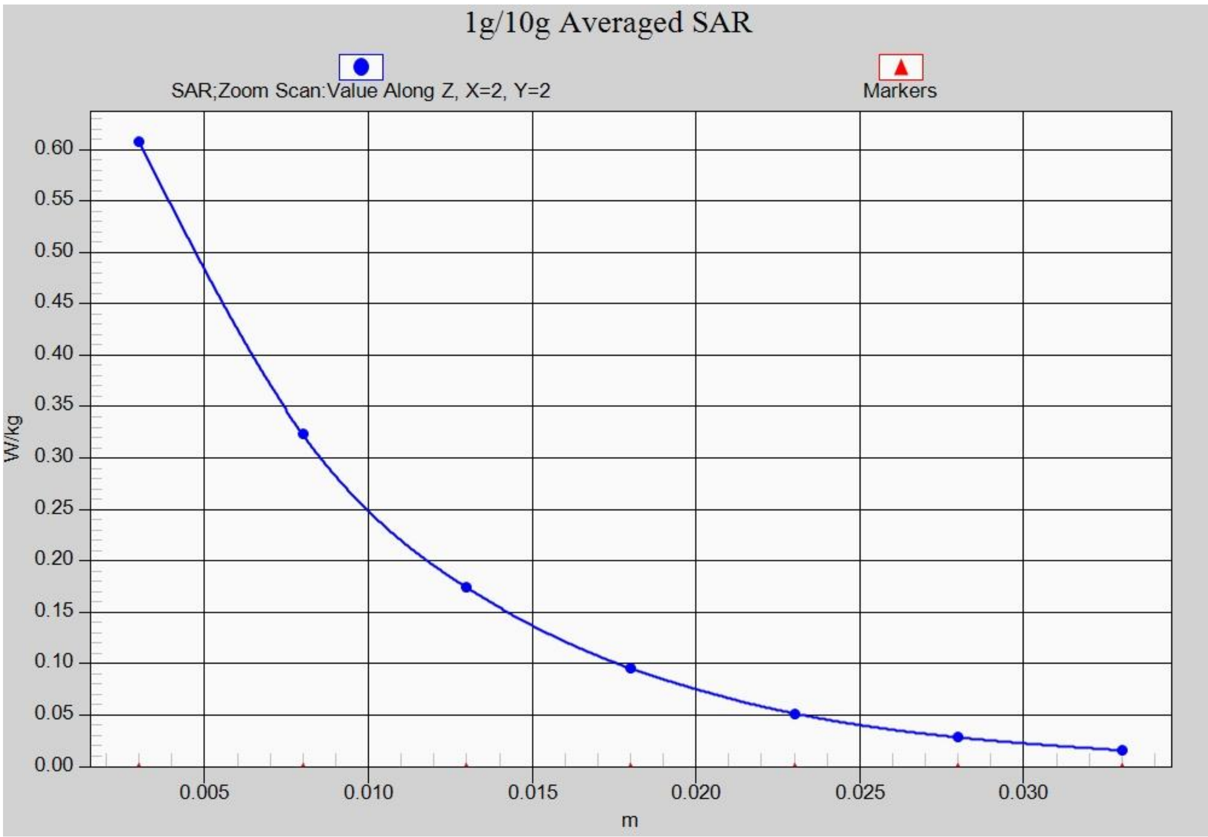


Fig. 20-1 Z-Scan at power reference point (LTE Band7)

LTE Band12Left Cheek Middle with QPSK_10M_1RB_Middle
Date: 2017-5-23
Electronics: DAE4 Sn1331
Medium: Head750 MHz
Medium parameters used (interpolated): f = 707.5 MHz; σ =0.823 mho/m; εr = 43.87; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
Communication System: LTE Band12Frequency: 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) = 0.202 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.828 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.240 W/kg
SAR(1 g) = 0.194 W/kg; SAR(10 g) = 0.154 W/kg
Maximum value of SAR (measured) = 0.212 W/kg

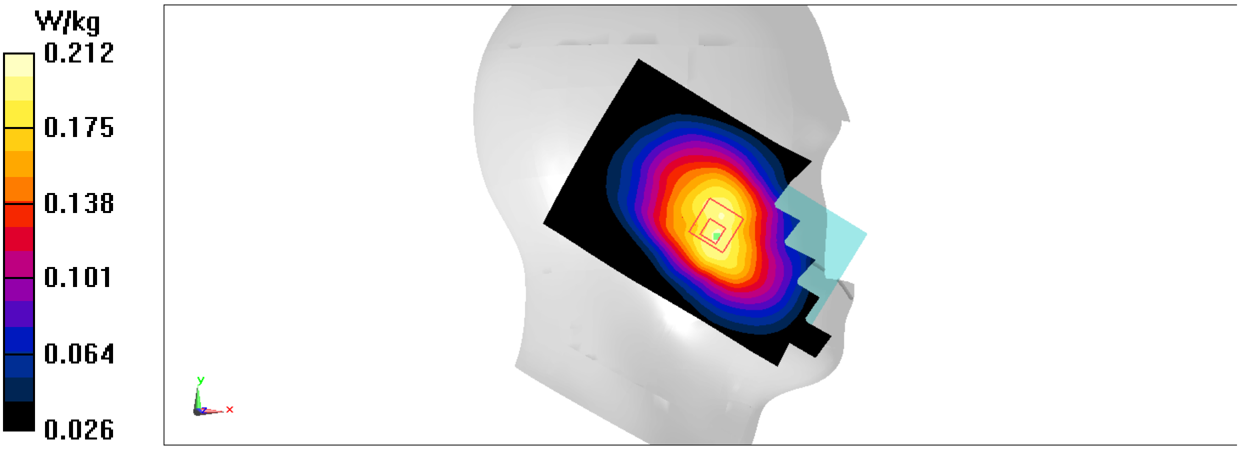


Fig.21 LTE Band12

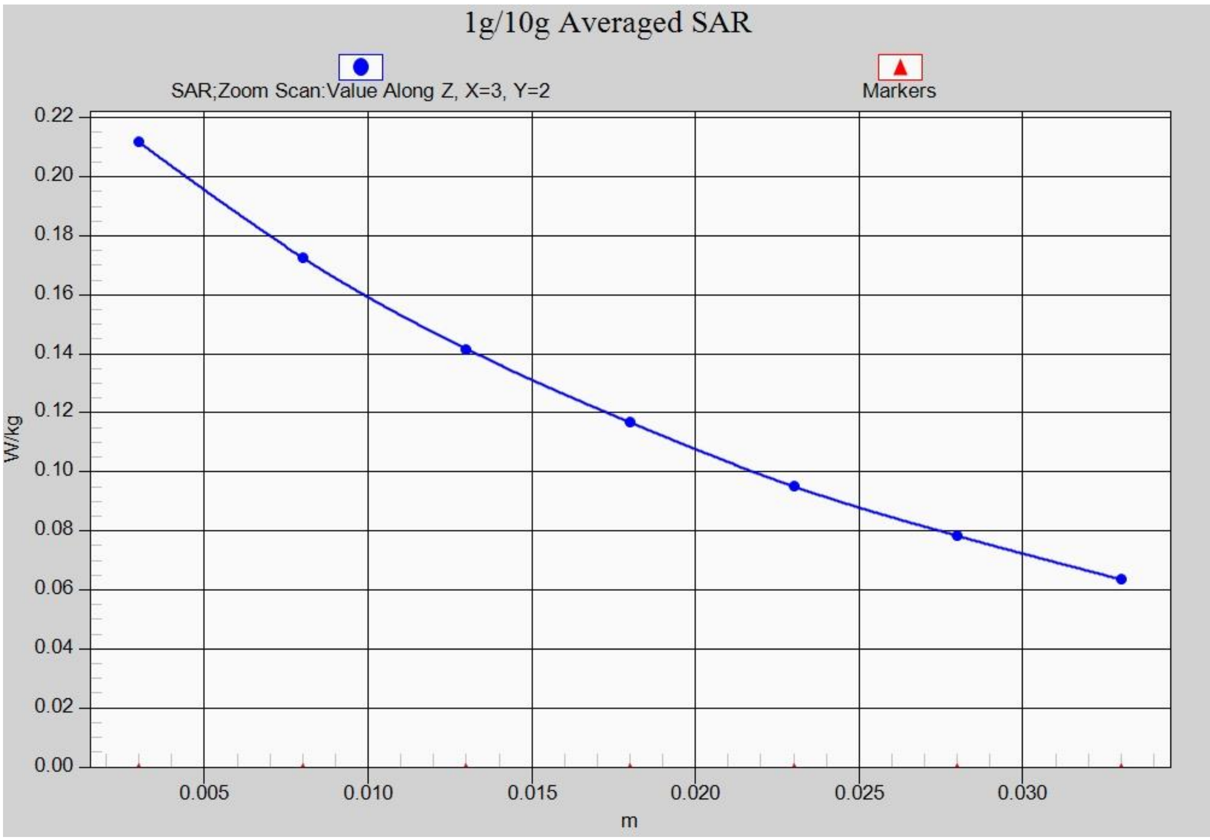


Fig. 21-1 Z-Scan at power reference point (LTE Band12)

LTE Band12Body Rear Middle with QPSK_10M_1RB_Middle
Date: 2017-5-23
Electronics: DAE4 Sn1331
Medium: Body750 MHz
Medium parameters used (interpolated): f = 707.5 MHz; σ = 0.910 mho/m; εr = 58.32; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
Communication System: LTE Band12Frequency: 707.5 MHz Duty Cycle: 1:1
Probe: EX3DV4– SN3846 ConvF(9.96, 9.96, 9.96)

Area Scan (111x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.290 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.51 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.343 W/kg
SAR(1 g) = 0.270 W/kg; SAR(10 g) = 0.212 W/kg
Maximum value of SAR (measured) = 0.295 W/kg

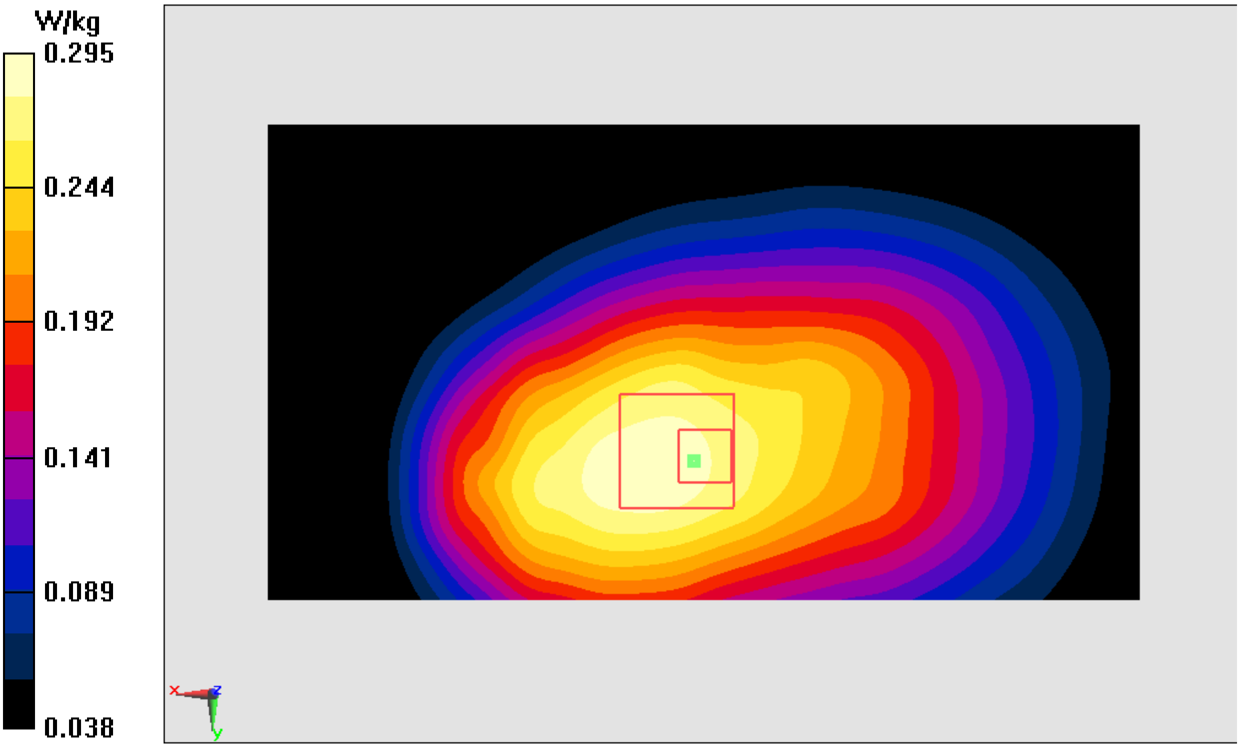


Fig.22LTE Band12

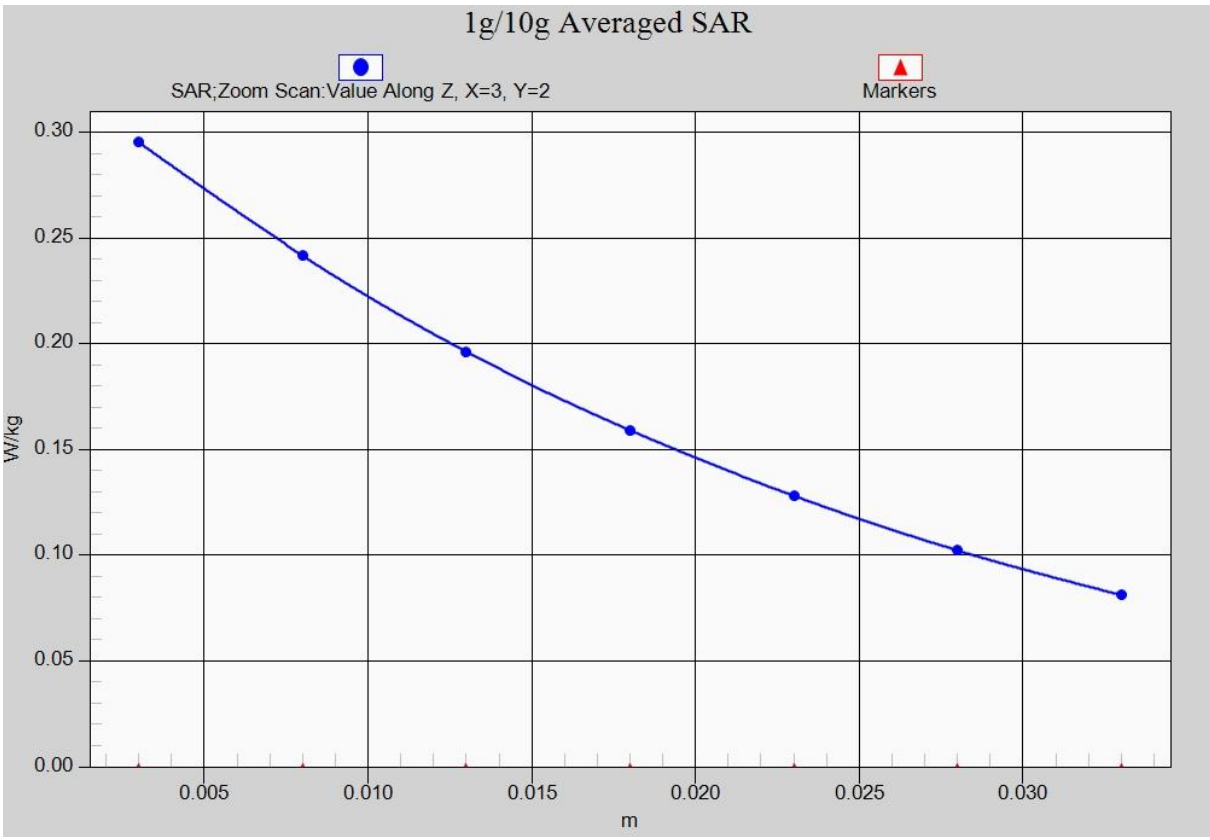


Fig. 22-1 Z-Scan at power reference point (LTE Band12)

Wifi 802.11b Right Cheek Channel 6
Date: 2016-12-5
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.835 mho/m; ε_r = 40.583; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 22.0°C
Communication System: WLan 2450 Frequency: 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7307 ConvF(7.36, 7.36, 7.36)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.922 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.727 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.740 W/kg; SAR(10 g) = 0.349 W/kg
Maximum value of SAR (measured) = 0.951 W/kg

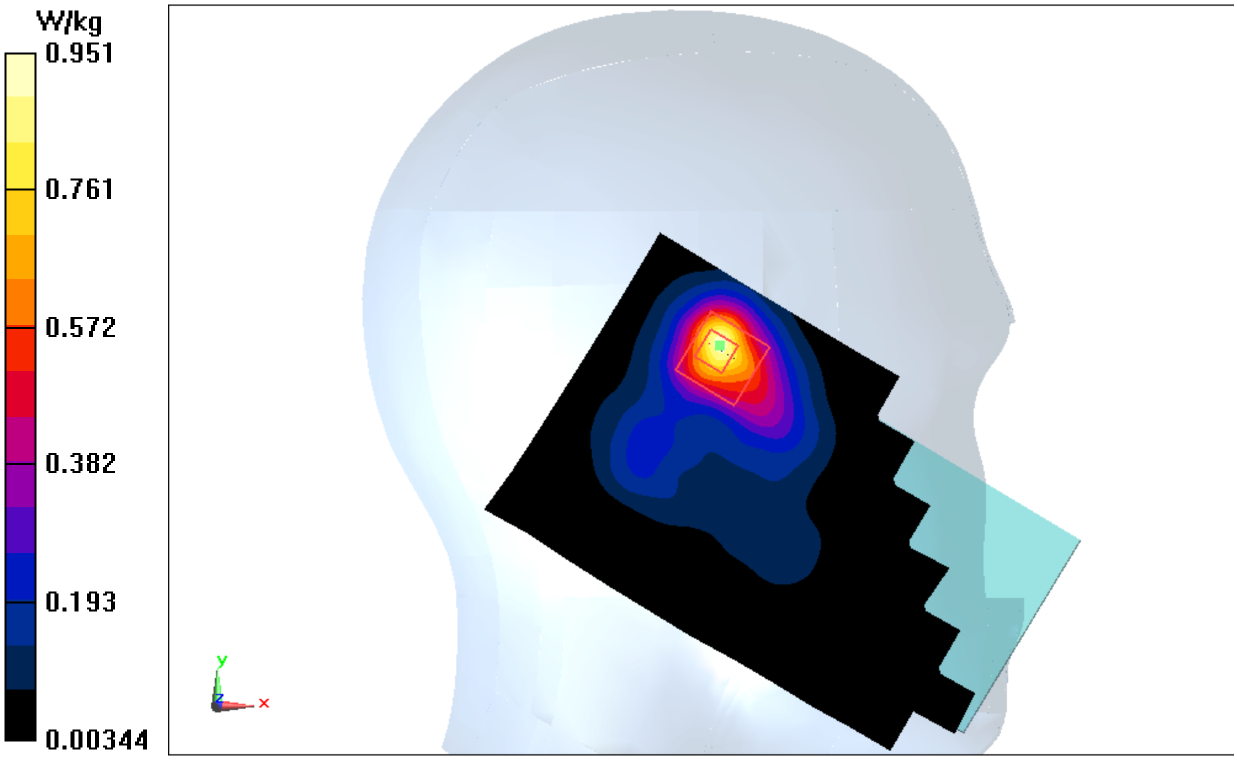


Fig.21 2450 MHz

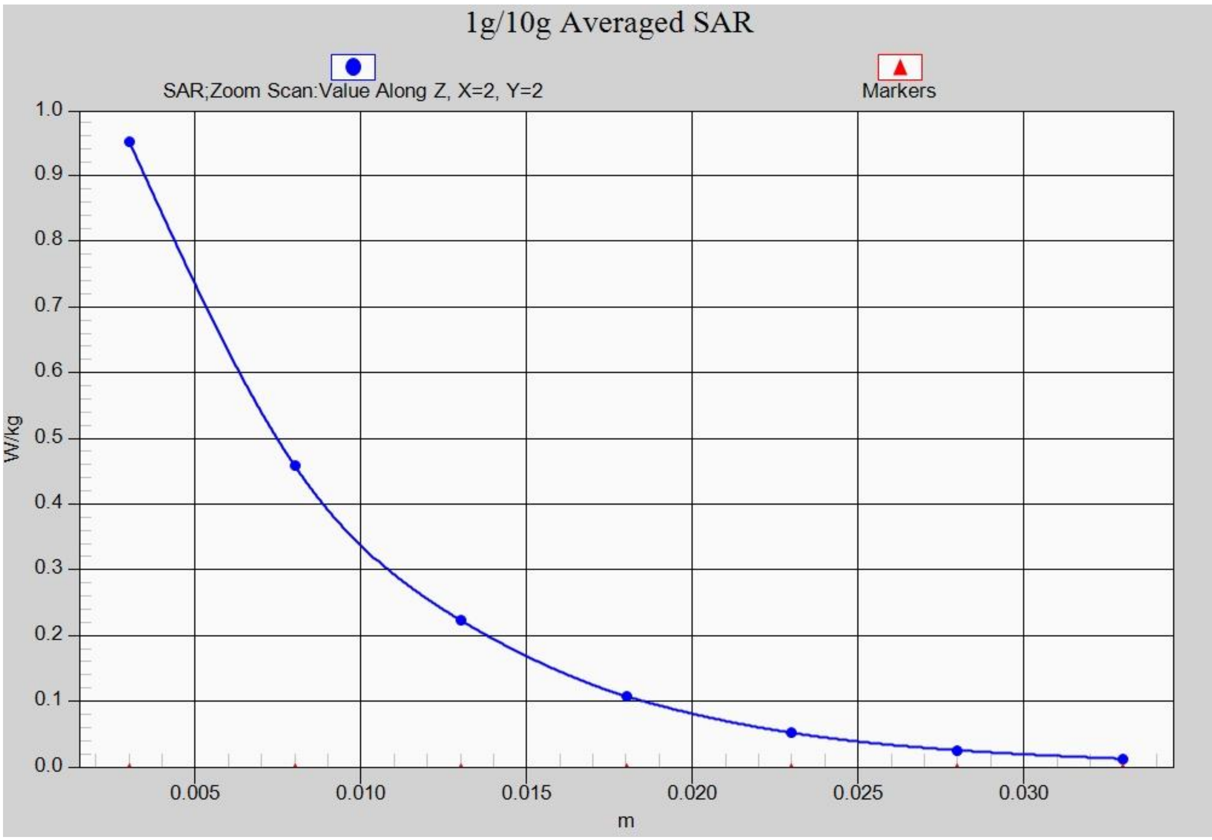


Fig. 21-1 Z-Scan at power reference point (2450 MHz)

Wifi 802.11b Body Rear Channel 6

Date: 2016-12-5

Electronics: DAE4 Sn1331

Medium: Body 2450 MHz

Medium parameters used (interpolated): f = 2437 MHz; σ = 1.925 mho/m; ε_r = 53.984; ρ = 1000 kg/m^3

Ambient Temperature: 22.5^{o}C Liquid Temperature: 22.0^{o}C

Communication System: WLan 2450 Frequency: 2437 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7307 ConvF(7.22, 7.22, 7.22)

Area Scan (121x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.240 W/kg

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

Reference Value = 5.249 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.381 W/kg

SAR(1 g) = 0.183 W/kg; SAR(10 g) = 0.085 W/kg

Maximum value of SAR (measured) = 0.237 W/kg

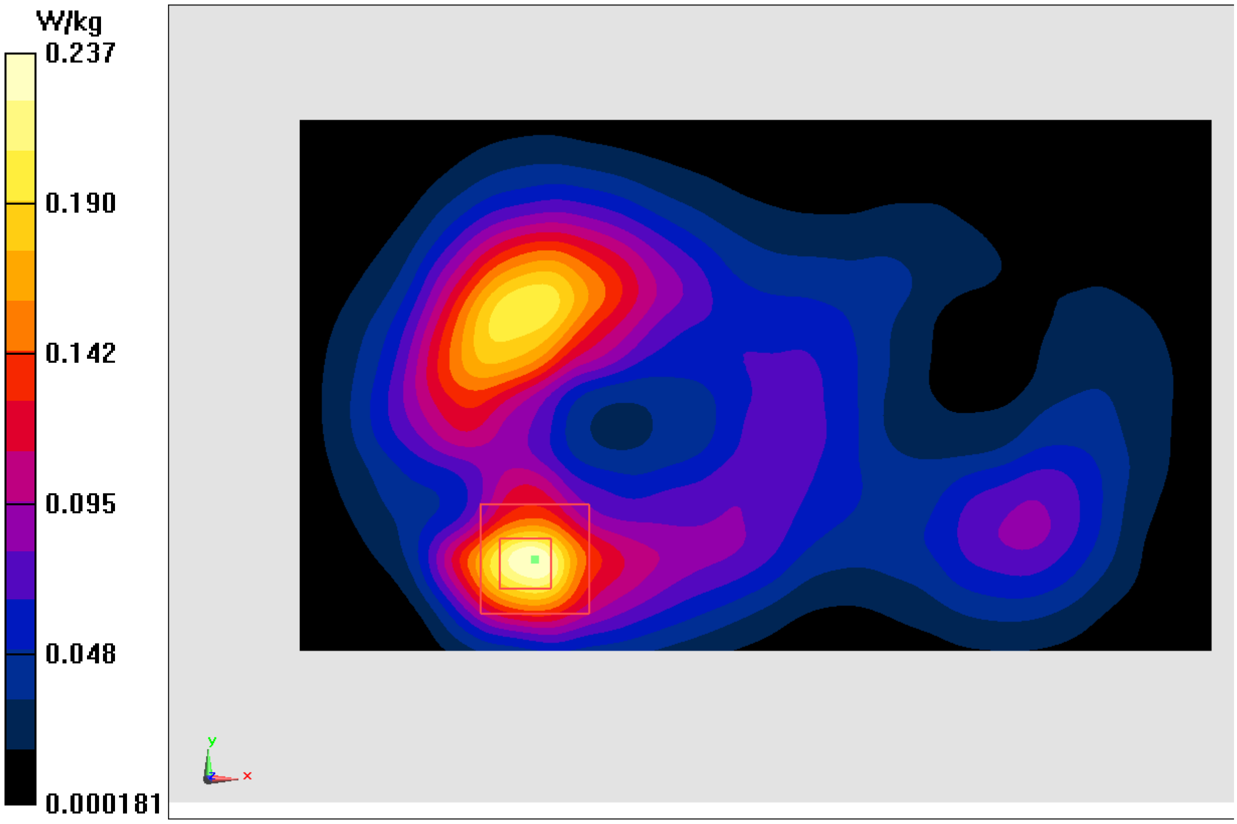


Fig.22 2450 MHz

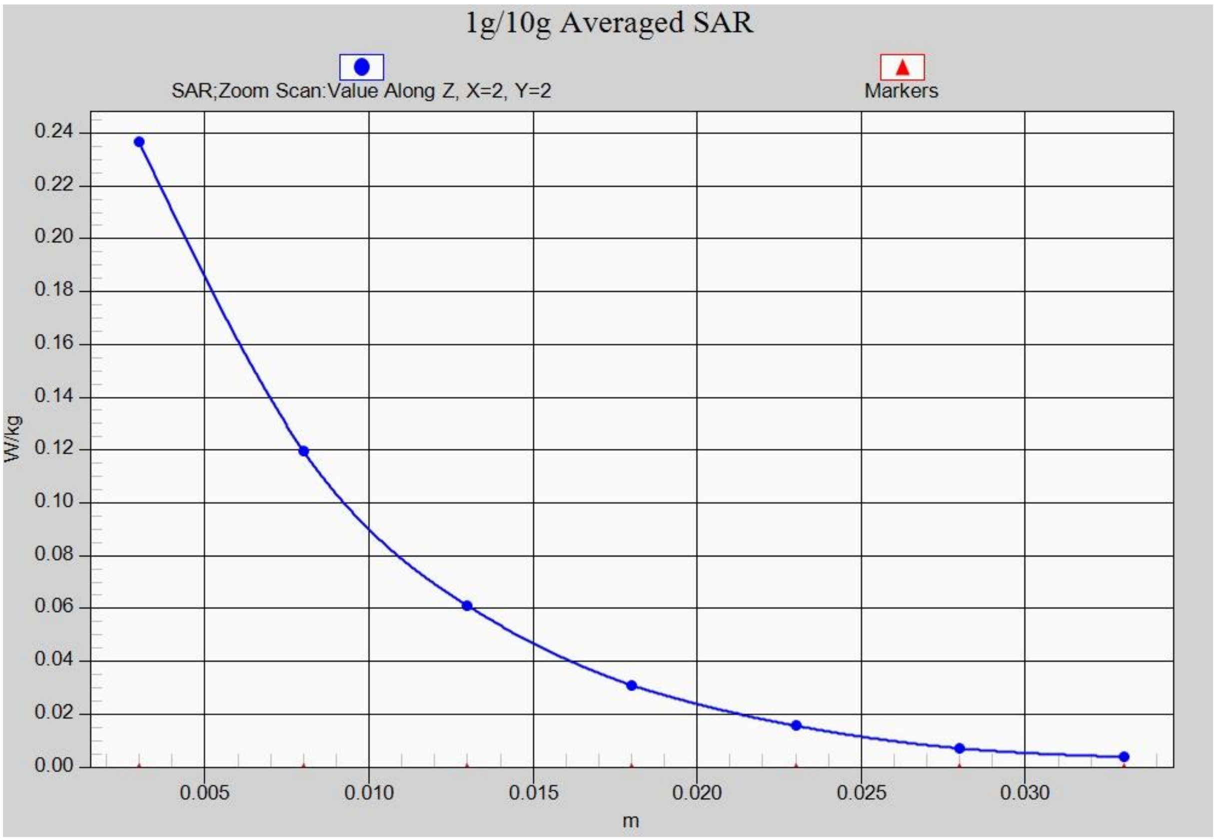


Fig. 22-1 Z-Scan at power reference point (2450 MHz)

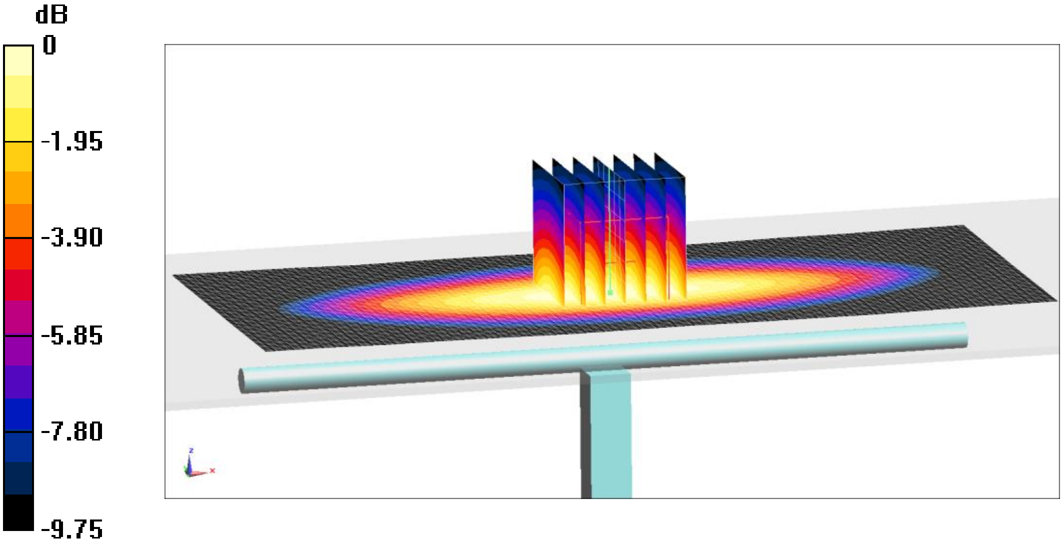
ANNEX B SystemVerification Results

750 MHz

Date: 5/23/2017
Electronics: DAE4 Sn1331
Medium: Head750 MHz
Medium parameters used: f = 750 MHz; σ =0.872 mho/m; ε_r = 41.52; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
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 = 59.38 V/m; Power Drift = .02
Fast SAR: SAR(1 g) = 2.05W/kg; SAR(10 g) = 1.39 W/kg
Maximum value of SAR (interpolated) = 2.73 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =59.38 V/m; Power Drift = .02 dB
Peak SAR (extrapolated) = 3.15 W/kg
SAR(1 g) = 2.07W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (measured) = 2.79 W/kg



0 dB = 2.79 W/kg = 4.46 dB W/kg

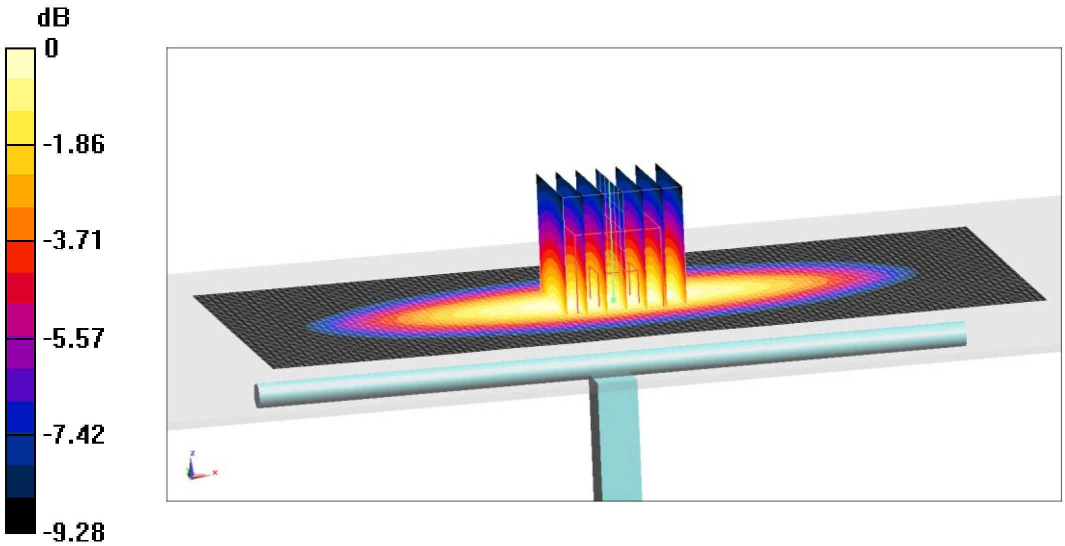
Fig.B.1 validation 750 MHz 250mW

750 MHz

Date: 5/23/2017
Electronics: DAE4 Sn1331
Medium: Body750 MHz
Medium parameters used: f = 750 MHz; σ =0.965 mho/m; ε_r = 55.19; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C   Liquid Temperature: 22.2^{o}C
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 = 58.55 V/m; Power Drift = .03
Fast SAR: SAR(1 g) = 2.18W/kg; SAR(10 g) = 1.43 W/kg
Maximum value of SAR (interpolated) = 2.86 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =58.55 V/m; Power Drift = .03 dB
Peak SAR (extrapolated) = 3.4 W/kg
SAR(1 g) = 2.23W/kg; SAR(10 g) = 1.43 W/kg
Maximum value of SAR (measured) = 3.04 W/kg



0 dB = 3.04 W/kg = 4.83 dB W/kg

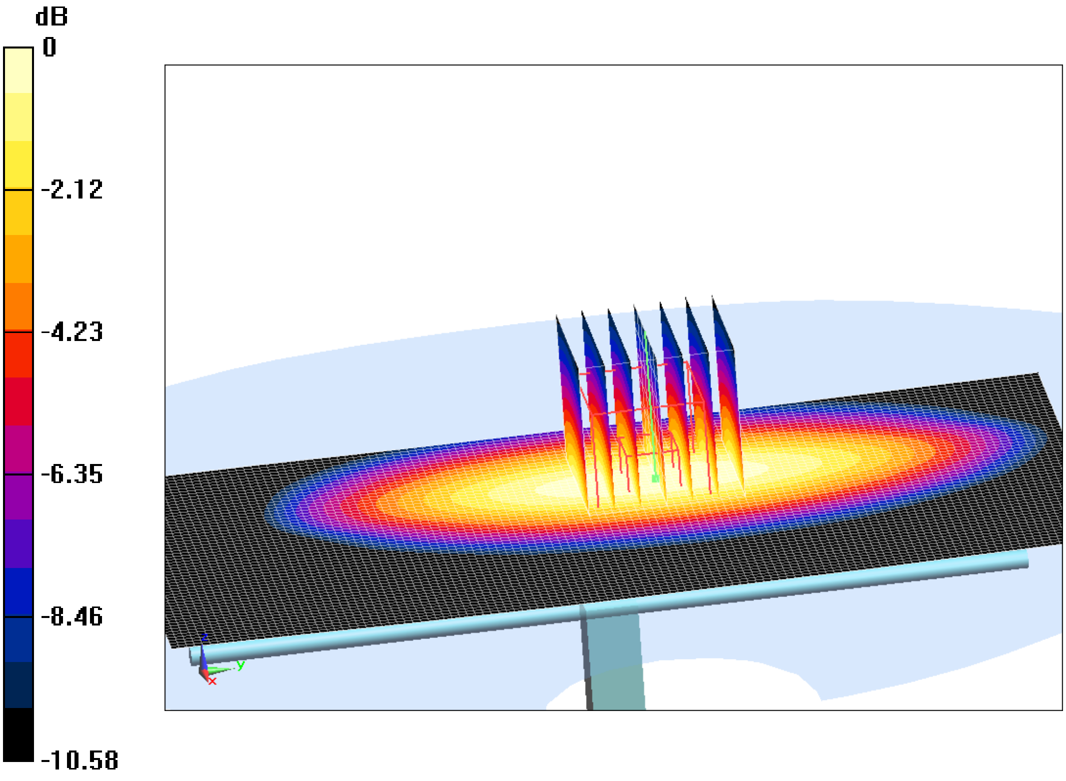
Fig.B.2 validation 750 MHz 250mW

835 MHz

Date: 5/24/2017
Electronics: DAE4 Sn1331
Medium: Head835 MHz
Medium parameters used: f = 835 MHz; σ =0.889 mho/m; ε_r = 41.55; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
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 = 61.65 V/m; Power Drift = .02
Fast SAR: SAR(1 g) = 2.35W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (interpolated) = 3.21 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =61.65 V/m; Power Drift = .02 dB
Peak SAR (extrapolated) = 3.66 W/kg
SAR(1 g) = 2.39W/kg; SAR(10 g) = 1.54 W/kg
Maximum value of SAR (measured) = 3.25 W/kg



0 dB = 3.25 W/kg = 5.12 dB W/kg

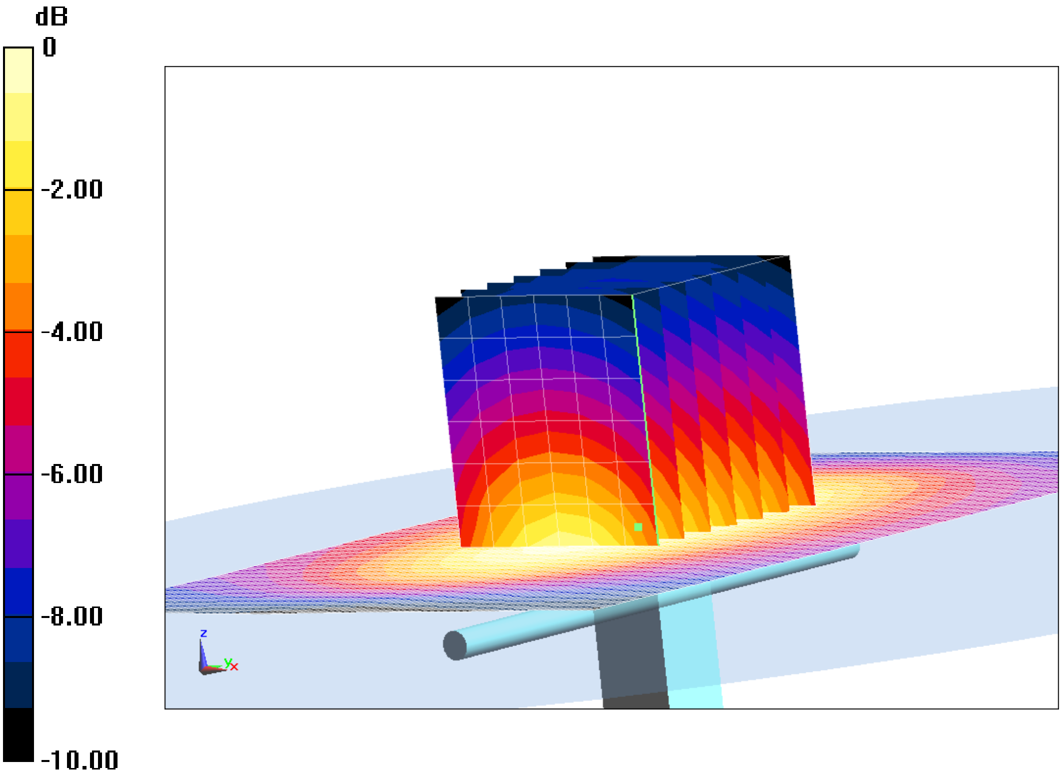
Fig.B.3 validation 835 MHz 250mW

835 MHz

Date: 5/24/2017
Electronics: DAE4 Sn1331
Medium: Body835 MHz
Medium parameters used: f = 835 MHz; σ =0.964 mho/m; ε_r = 54.29; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C   Liquid Temperature: 22.2^{o}C
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 = 60.27 V/m; Power Drift = .03
Fast SAR: SAR(1 g) = 2.4W/kg; SAR(10 g) = 1.61 W/kg
Maximum value of SAR (interpolated) = 3.35 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =60.27 V/m; Power Drift = .03 dB
Peak SAR (extrapolated) = 3.74 W/kg
SAR(1 g) = 2.46W/kg; SAR(10 g) = 1.56 W/kg
Maximum value of SAR (measured) = 3.3 W/kg



0 dB = 3.3 W/kg = 5.19 dB W/kg

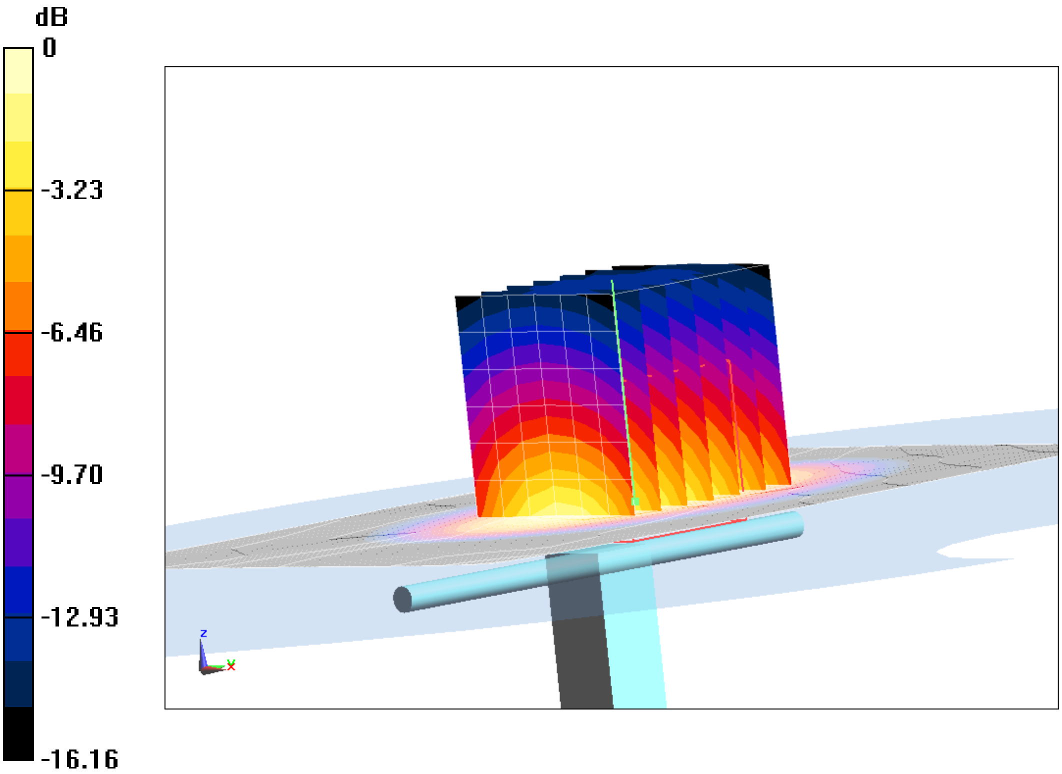
Fig.B.4 validation 835 MHz 250mW

1750 MHz

Date: 5/25/2017
Electronics: DAE4 Sn1331
Medium: Head1750 MHz
Medium parameters used: f = 1750 MHz; σ =1.351 mho/m; ε_r = 39.9; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
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 = 104.38 V/m; Power Drift = .03
Fast SAR: SAR(1 g) = 9.02W/kg; SAR(10 g) = 4.86 W/kg
Maximum value of SAR (interpolated) = 14.62 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =104.38 V/m; Power Drift = .03 dB
Peak SAR (extrapolated) = 16.71 W/kg
SAR(1 g) = 9.29W/kg; SAR(10 g) = 4.78 W/kg
Maximum value of SAR (measured) = 14.06 W/kg



0 dB = 14.06 W/kg = 11.48 dB W/kg

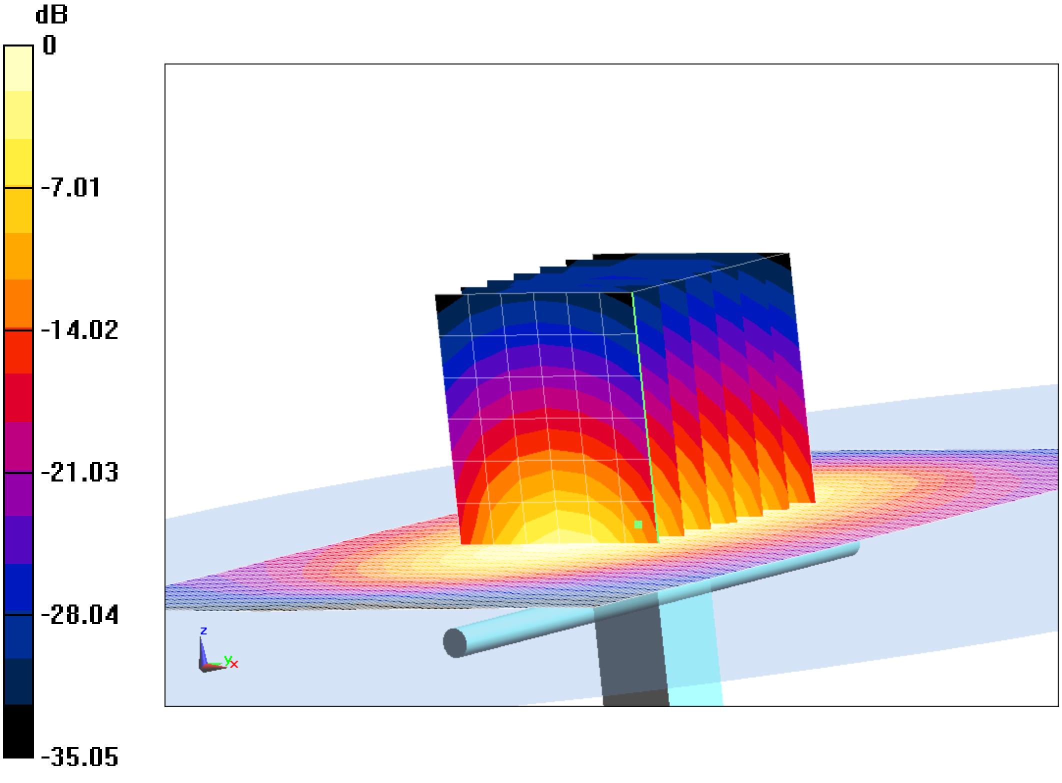
Fig.B.5 validation 1750 MHz 250mW

1750 MHz

Date: 5/25/2017
Electronics: DAE4 Sn1331
Medium: Body1750 MHz
Medium parameters used: f = 1750 MHz; σ =1.511 mho/m; ε_r = 53.15; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
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 = 100.15 V/m; Power Drift = .03
Fast SAR: SAR(1 g) = 9.13W/kg; SAR(10 g) = 4.87 W/kg
Maximum value of SAR (interpolated) = 13.72 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =100.15 V/m; Power Drift = .03 dB
Peak SAR (extrapolated) = 16.16 W/kg
SAR(1 g) = 9.2W/kg; SAR(10 g) = 4.89 W/kg
Maximum value of SAR (measured) = 14.16 W/kg



0 dB = 14.16 W/kg = 11.51 dB W/kg

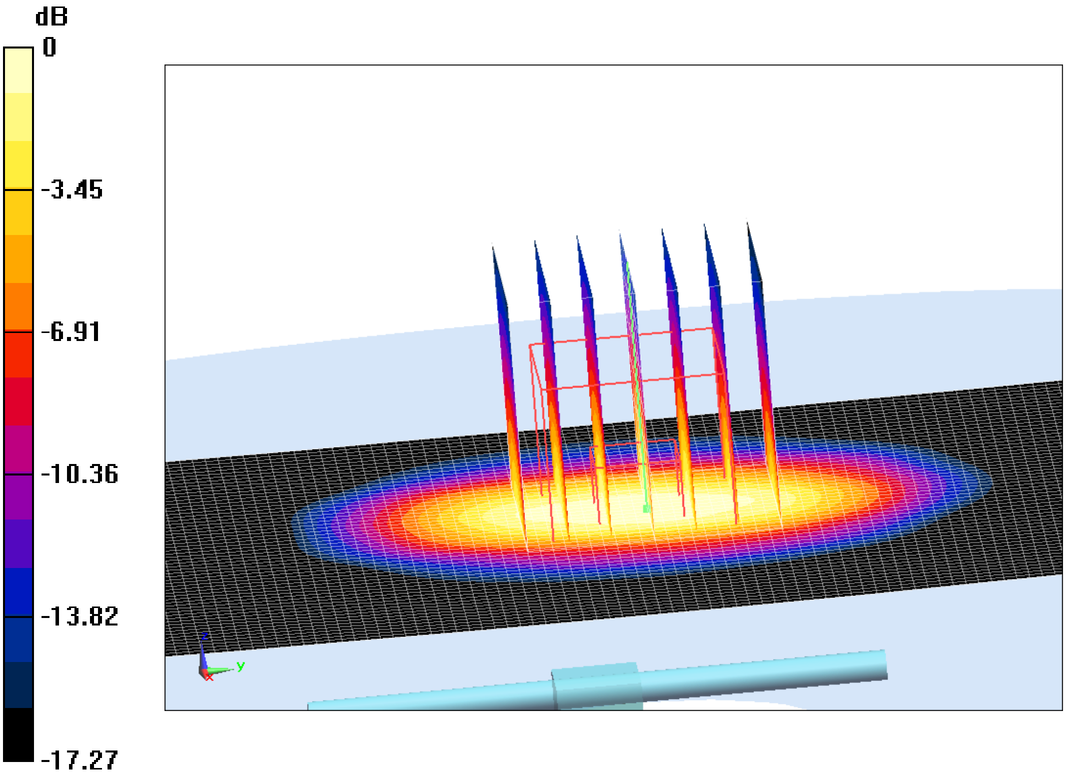
Fig.B.6 validation 1750 MHz 250mW

1900 MHz

Date: 5/26/2017
Electronics: DAE4 Sn1331
Medium: Head1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.395 mho/m; ε_r = 39.28; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
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 = 109.56 V/m; Power Drift = .01
Fast SAR: SAR(1 g) = 10.15W/kg; SAR(10 g) = 5.39 W/kg
Maximum value of SAR (interpolated) = 15.13 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =109.56 V/m; Power Drift = .01 dB
Peak SAR (extrapolated) = 19.03 W/kg
SAR(1 g) = 10.28W/kg; SAR(10 g) = 5.24 W/kg
Maximum value of SAR (measured) = 15.49 W/kg



0 dB = 15.49 W/kg = 11.9 dB W/kg

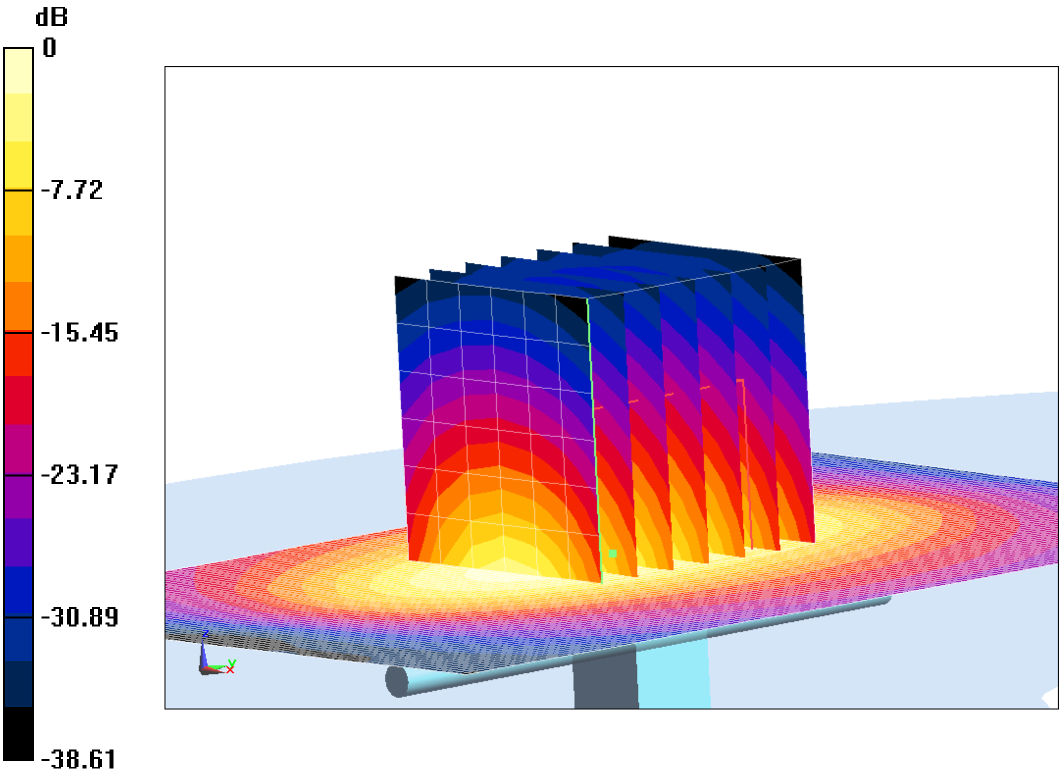
Fig.B.7 validation 1900 MHz 250mW

1900 MHz

Date: 5/26/2017
Electronics: DAE4 Sn1331
Medium: Body1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.506 mho/m; ε_r = 53.31; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C   Liquid Temperature: 22.2^{o}C
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 = 106.22 V/m; Power Drift = .01
Fast SAR: SAR(1 g) = 9.96W/kg; SAR(10 g) = 5.35 W/kg
Maximum value of SAR (interpolated) = 14.38 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =106.22 V/m; Power Drift = .01 dB
Peak SAR (extrapolated) = 17.54 W/kg
SAR(1 g) = 10.1W/kg; SAR(10 g) = 5.22 W/kg
Maximum value of SAR (measured) = 15.21 W/kg



0 dB = 15.21 W/kg = 11.82 dB W/kg

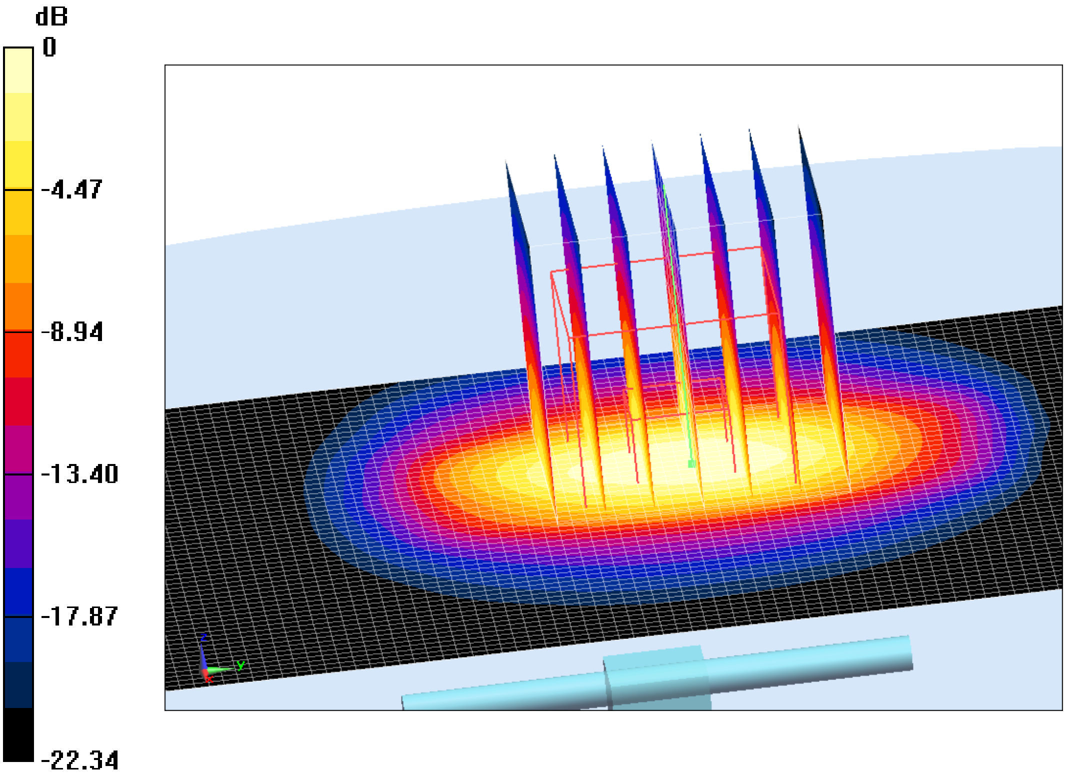
Fig.B.8 validation 1900 MHz 250mW

2450 MHz

Date: 5/27/2017
Electronics: DAE4 Sn1331
Medium: Head2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.792 mho/m; ε_r = 39.35; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
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 = 116.39 V/m; Power Drift = .01
Fast SAR: SAR(1 g) = 13.07W/kg; SAR(10 g) = 6.14 W/kg
Maximum value of SAR (interpolated) = 22.77 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =116.39 V/m; Power Drift = .01 dB
Peak SAR (extrapolated) = 27.04 W/kg
SAR(1 g) = 13.11W/kg; SAR(10 g) = 6.08 W/kg
Maximum value of SAR (measured) = 22.53 W/kg



0 dB = 22.53 W/kg = 13.53 dB W/kg

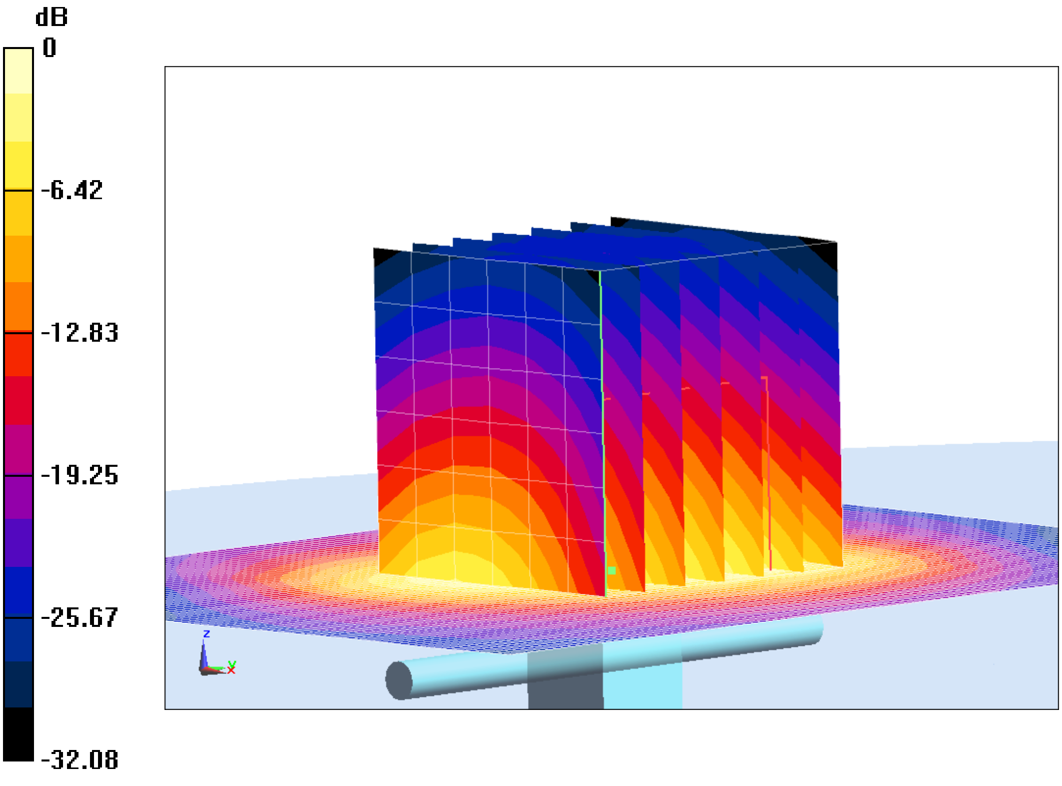
Fig.B.9 validation 2450 MHz 250mW

2450 MHz

Date: 5/27/2017
Electronics: DAE4 Sn1331
Medium: Body2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.956 mho/m; ε_r = 52.21; ρ = 1000 kg/m^3
Ambient Temperature: 22.4°C Liquid Temperature: 22.2°C
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 = 107.35 V/m; Power Drift = 0
Fast SAR: SAR(1 g) = 12.92W/kg; SAR(10 g) = 6.11 W/kg
Maximum value of SAR (interpolated) = 21.3 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =107.35 V/m; Power Drift = 0 dB
Peak SAR (extrapolated) = 26.15 W/kg
SAR(1 g) = 12.65W/kg; SAR(10 g) = 5.98 W/kg
Maximum value of SAR (measured) = 21.2 W/kg



0 dB = 21.2 W/kg = 13.26 dB W/kg

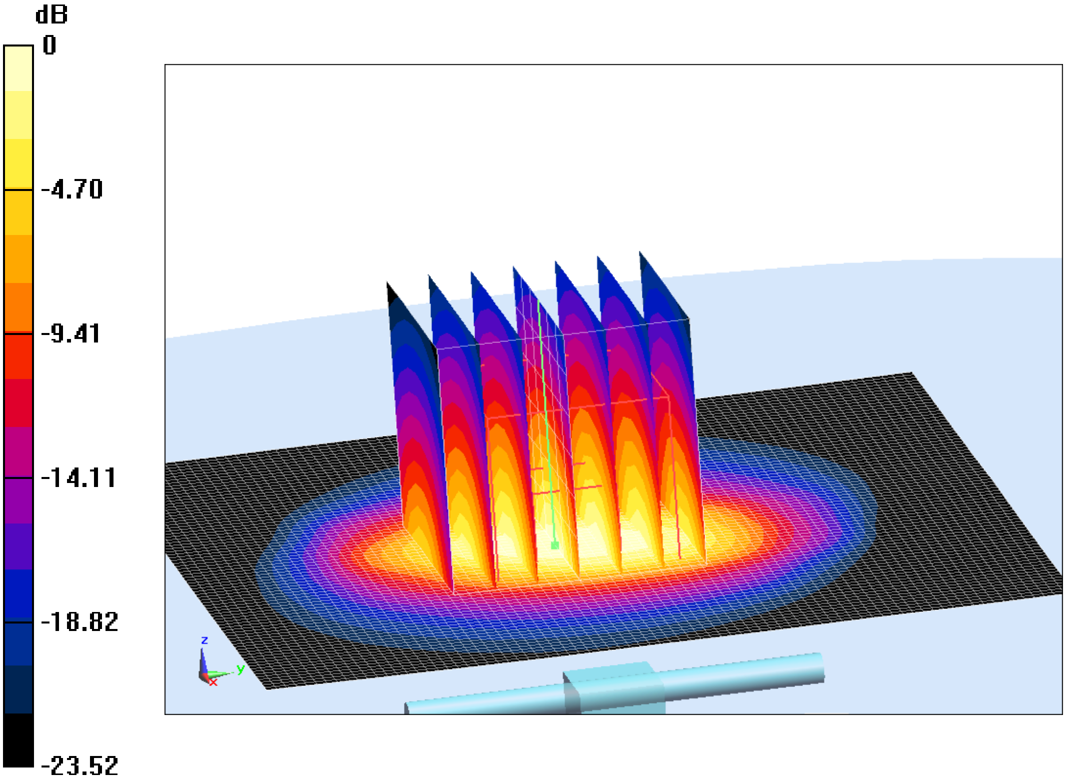
Fig.B.10 validation 2450 MHz 250mW

2600 MHz

Date: 5/28/2017
Electronics: DAE4 Sn1331
Medium: Head2600 MHz
Medium parameters used: f = 2600 MHz; σ =1.931 mho/m; ε_r = 39.14; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
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 = 115.67 V/m; Power Drift = -.03
Fast SAR: SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.32 W/kg
Maximum value of SAR (interpolated) = 24.39 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =115.67 V/m; Power Drift = -.03 dB
Peak SAR (extrapolated) = 31.46 W/kg
SAR(1 g) = 13.93W/kg; SAR(10 g) = 6.41 W/kg
Maximum value of SAR (measured) = 24.41 W/kg



0 dB = 24.41 W/kg = 13.88 dB W/kg

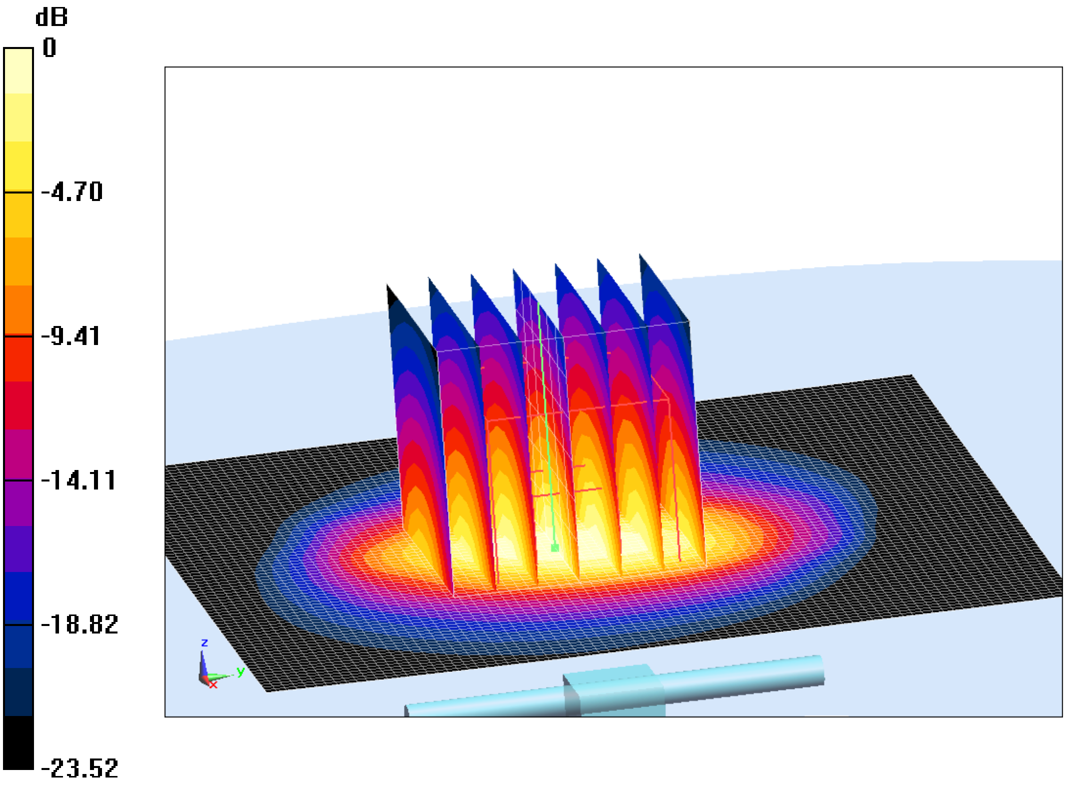
Fig.B.11 validation 2600 MHz 250mW

2600 MHz

Date: 5/28/2017
Electronics: DAE4 Sn1331
Medium: Body2600 MHz
Medium parameters used: f = 2600 MHz; σ =2.135 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Ambient Temperature: 22.4^{o}C Liquid Temperature: 22.2^{o}C
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 = 107.32 V/m; Power Drift = -.01
Fast SAR: SAR(1 g) = 13.83W/kg; SAR(10 g) = 6.1 W/kg
Maximum value of SAR (interpolated) = 23.16 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =107.32 V/m; Power Drift = -.01 dB
Peak SAR (extrapolated) = 28.91 W/kg
SAR(1 g) = 13.77W/kg; SAR(10 g) = 6.14 W/kg
Maximum value of SAR (measured) = 23.47 W/kg



0 dB = 23.47 W/kg = 13.71 dB W/kg

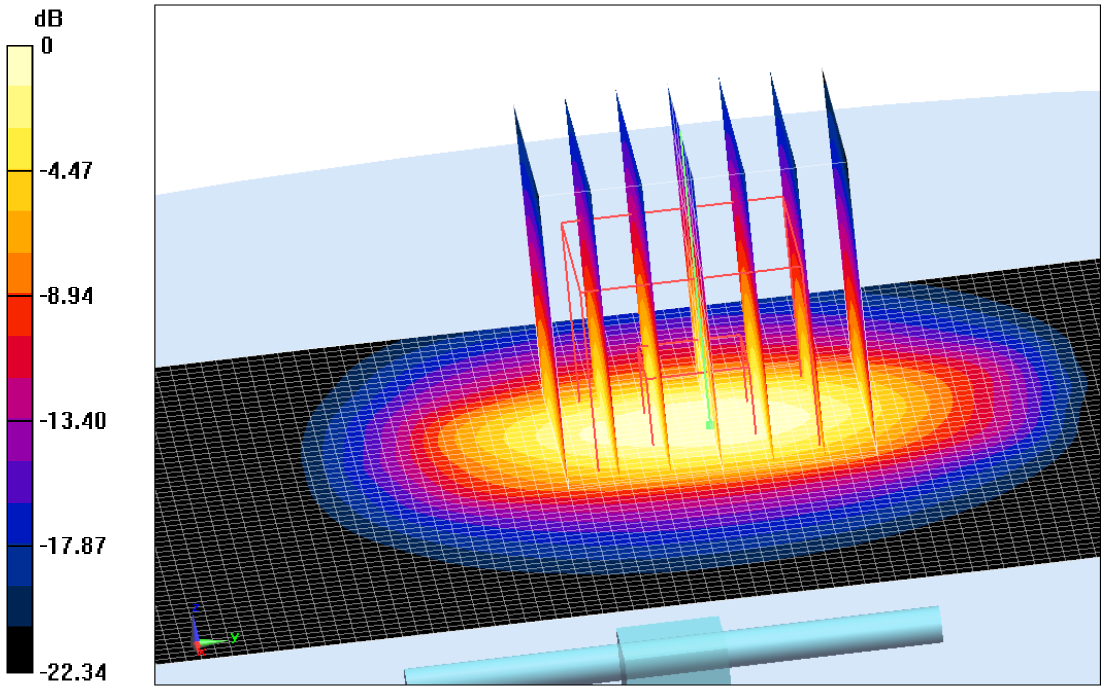
Fig.B.12 validation 2600 MHz 250mW

2450MHz

Date: 2016-12-5
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.838 mho/m; ε_r = 40.26; ρ = 1000 kg/m^3
Ambient Temperature: 22.5^{o}C Liquid Temperature: 22.0^{o}C
Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7307 ConvF(7.36, 7.36, 7.36)

System Validation /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 88.57V/m; Power Drift = 0.04 dB
SAR(1 g) = 13.2W/kg; SAR(10 g) = 6.11 W/kg
Maximum value of SAR (interpolated) = 16.4 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.57V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 27.05 W/kg
SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.01 W/kg
Maximum value of SAR (measured) = 16.3 W/kg



0 dB = 16.3 W/kg = 12.12 dBW/kg

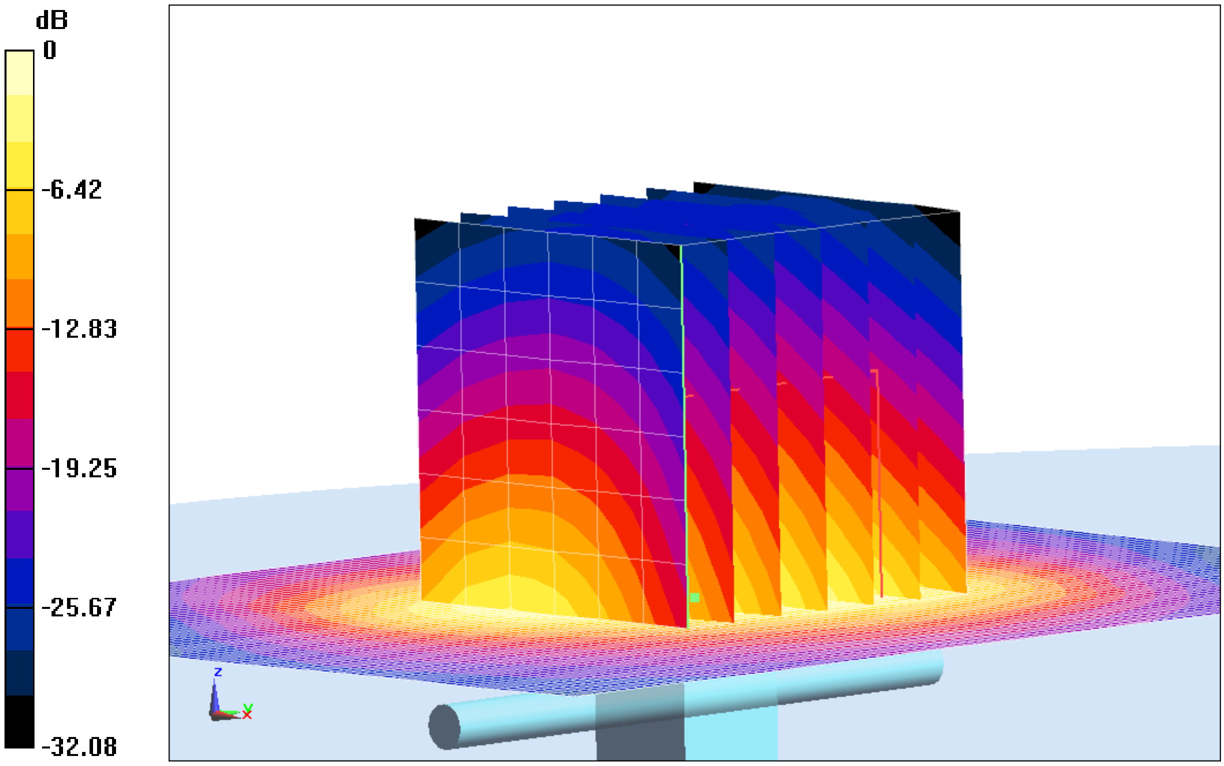
Fig.B.13 validation 2450MHz 250mW

2450MHz

Date: 2016-12-5
Electronics: DAE4 Sn1331
Medium: Body 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.921S/m; ε_r =53.88; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C   Liquid Temperature: 22.0°C
Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7307 ConvF(7.22, 7.22, 7.22)

System Validation/Area Scan (81x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 86.93 V/m; Power Drift = 0.03 dB
SAR(1 g) = 12.4W/kg; SAR(10 g) = 5.7 W/kg
Maximum value of SAR (interpolated) = 14.5 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 86.93 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 23.94 W/kg
SAR(1 g) = 12.6 W/kg; SAR(10 g) = 5.88 W/kg
Maximum value of SAR (measured) = 14.7 W/kg



0 dB = 14.7 W/kg = 11.67 dB W/kgz

Fig.B.14validation 2450MHz 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.

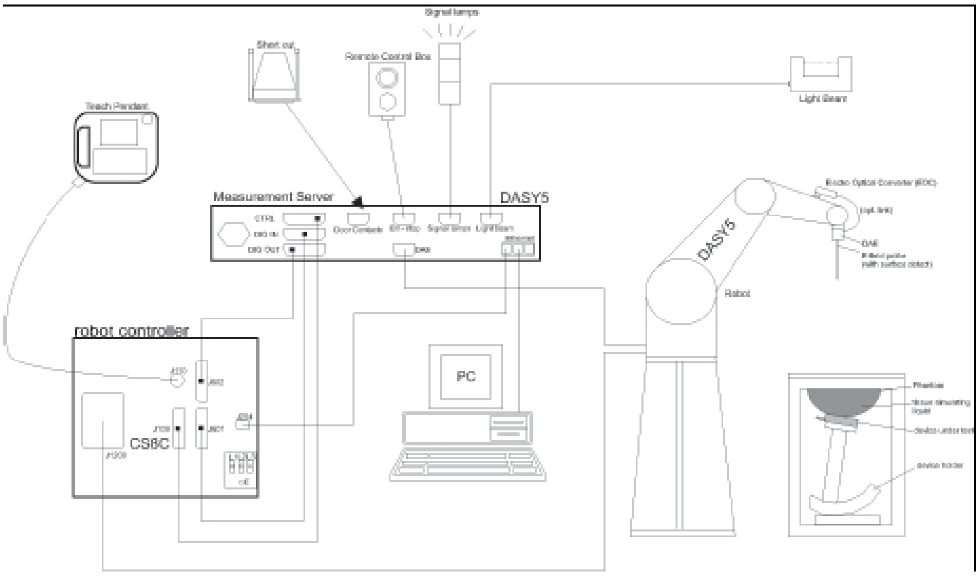
Table B.1 Comparison between area scan and zoom scan for system verification

Date	Band	Position	Area scan (1g)	Zoom scan (1g)	Drift (%)
2017/5/23	750	Head	2.05	2.07	-0.97
	750	Body	2.18	2.23	-2.24
2017/5/24	835	Head	2.35	2.39	-1.67
	835	Body	2.4	2.46	-2.44
2017/5/25	1750	Head	9.02	9.29	-2.91
	1750	Body	9.13	9.2	-0.76
2017/5/26	1900	Head	10.15	10.28	-1.26
	1900	Body	9.96	10.1	-1.39
2017/5/27	2450	Head	13.07	13.11	-0.31
	2450	Body	12.92	12.65	2.13
2017/5/28	2600	Head	14.2	13.93	1.94
	2600	Body	13.83	13.77	0.44
2016-12-5	2450	Head	13.2	13.1	0.76
	2450	Body	12.4	12.6	-1.59

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.1SAR Lab Test Measurement Set-up

- A standard high precision 6-axis robot (StäubliTX=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 Range: 10MHz — 6.0GHz(EX3DV4) 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
DynamicRange: 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.2Near-field Probe

Picture C.3E-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 in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm^2.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

Where:

Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

ΔT = Temperature increase due to RF exposure.

$$SAR = \frac{|E|^2 \cdot \sigma}{\rho}$$

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

C.4 Other Test Equipment

C.4.1 Data Acquisition Electronics(DAE)

The data acquisition electronics consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

PictureC.4: DAE

C.4.2 Robot

The SPEAG DASY system uses the high precision robots (DASY4: RX90XL; DASY5: RX160L) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchron motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

Picture C.5DASY 4

Picture C.6DASY 5

C.4.3 Measurement Server

The Measurement server is based on a PC/104 CPU broad with CPU (dasy4: 166 MHz, Intel Pentium; DASY5: 400 MHz, Intel Celeron), chipdisk (DASY4: 32 MB; DASY5: 128MB), RAM (DASY4: 64 MB, DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O broad, which is directly connected to the PC/104 bus of the CPU broad.

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.

Picture C.7 Server for DASY 4 **Picture C.8 Server for DASY 5**

C.4.4 Device Holder for Phantom

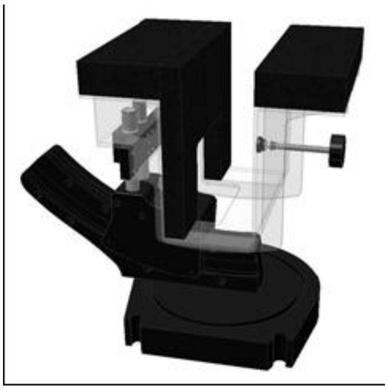
The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales are theear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-lossPOM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.



Picture C.9-1: Device Holder **Picture C.9-2: Laptop Extension Kit**

C.4.5 Phantom

The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to

Represent the 90^{th} percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

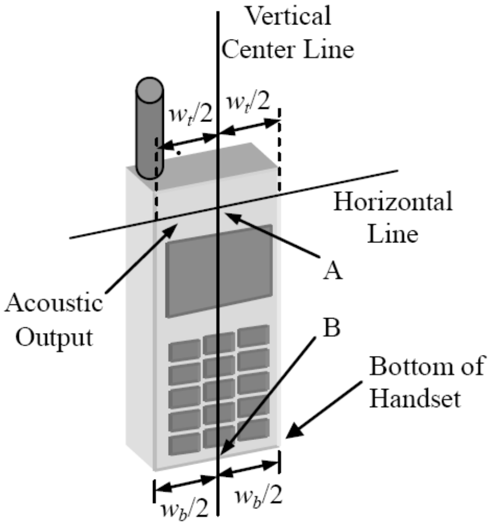
Shell Thickness: 2±0. 2 mm
Filling Volume: Approx. 25 liters
Dimensions: 810 x l000 x 500 mm (H x L x W)
Available: Special

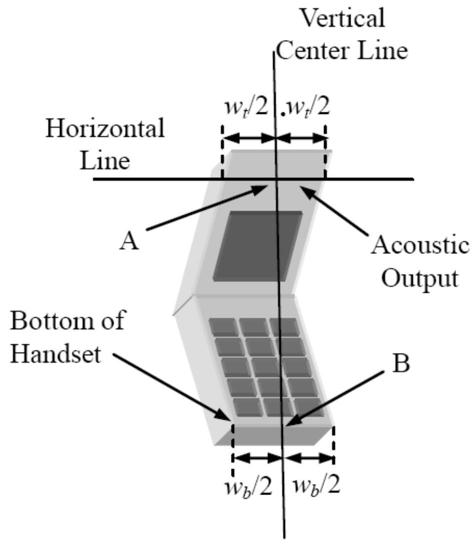
Picture C.10: SAM Twin Phantom

ANNEX D Position of the wireless device in relation to the phantom

D.1 General considerations

This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.





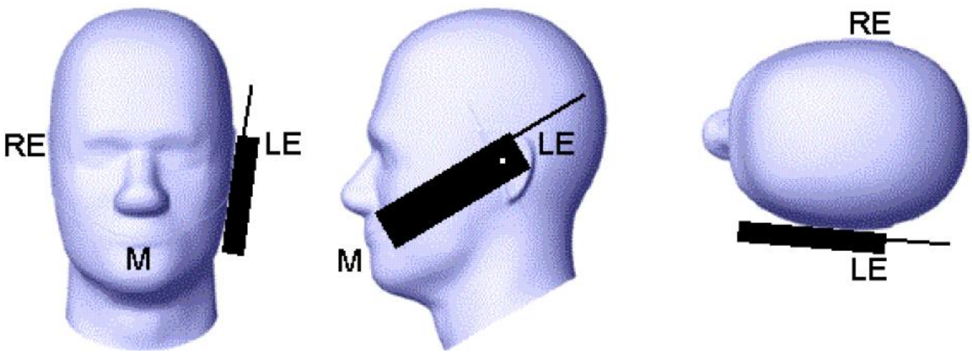
W_t Width of the handset at the level of the acoustic

W_b Width of the bottom of the handset

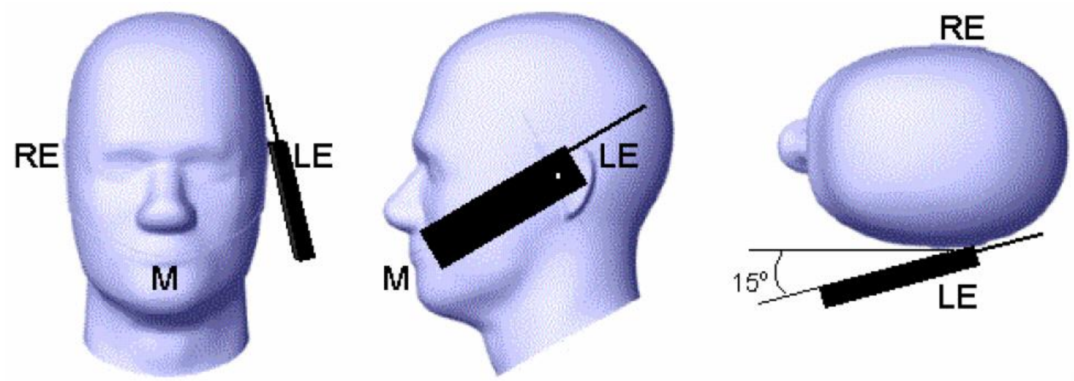
A Midpoint of the width W_t of the handset at the level of the acoustic output

B Midpoint of the width W_b of the bottom of the handset

Picture D.1-a Typical “fixed” case handset **Picture D.1-b Typical “clam-shell” case handset**



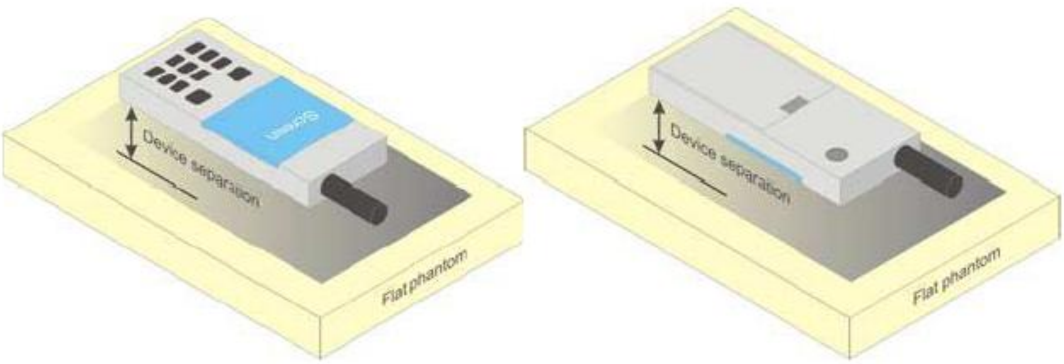
Picture D.2 Cheek position of the wireless device on the left side of SAM



Picture D.3 Tilt position of the wireless device on the left side of SAM

D.2 Body-worn device

A typical example of a body-worn device is a mobile phone, wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer.

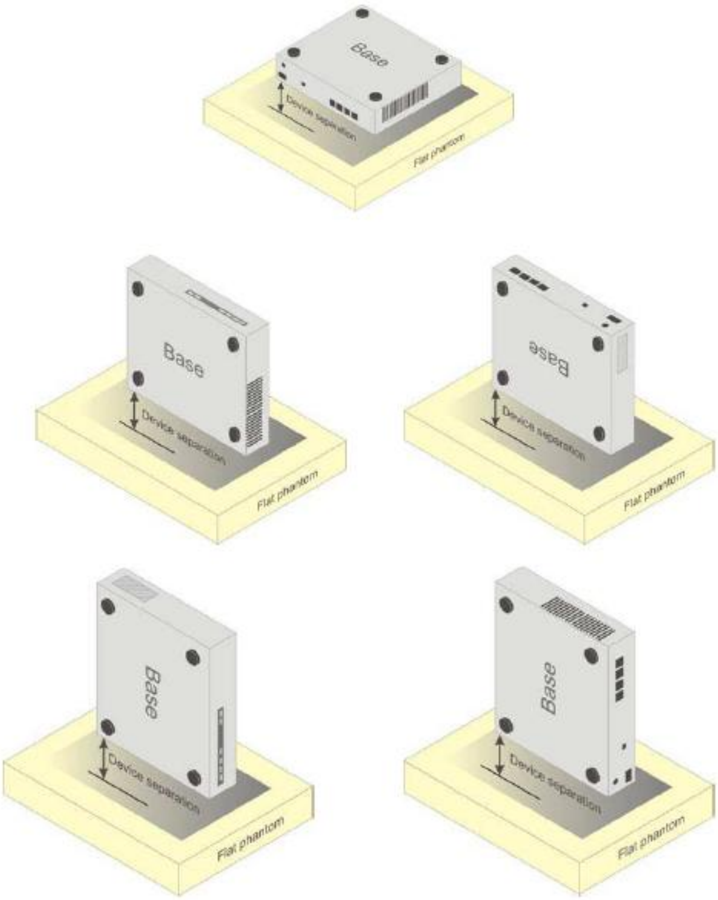


Picture D.4Test positions for body-worn devices

D.3 Desktop device

A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.

The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions, tests shall be performed for all antenna positions specified. Picture8.5 show positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat phantom.



Picture D.5 Test positions for desktop devices

D.4 DUT Setup Photos

Picture D.6

ANNEX E Equivalent Media Recipes

The liquid used for the frequency range of 800-3000 MHz consisted of water, sugar, salt,preventol, glycol monobutyl and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table E.1 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.

TableE.1: Composition of the Tissue Equivalent Matter

Frequency (MHz)	835Head	835Body	1900 Head	1900 Body	2450 Head	2450 Body	5800 Head	5800 Body
Ingredients (% by weight)								
Water	41.45	52.5	55.242	69.91	58.79	72.60	65.53	65.53
Sugar	56.0	45.0	\	\	\	\	\	\
Salt	1.45	1.4	0.306	0.13	0.06	0.18	\	\
Preventol	0.1	0.1	\	\	\	\	\	\
Cellulose	1.0	1.0	\	\	\	\	\	\
Glycol Monobutyl	\	\	44.452	29.96	41.15	27.22	\	\
Diethylenglycol monohexylether	\	\	\	\	\	\	17.24	17.24
Triton X-100	\	\	\	\	\	\	17.24	17.24
Dielectric Parameters Target Value	ε=41.5 σ=0.90	ε=55.2 σ=0.97	ε=40.0 σ=1.40	ε=53.3 σ=1.52	ε=39.2 σ=1.80	ε=52.7 σ=1.95	ε=35.3 σ=5.27	ε=48.2 σ=6.00

Note: There are a little adjustment respectively for 750, 1750, 2600, 5200, 5300 and 5600 based on the recipe of closest frequency in table E.1.

ANNEX F System Validation

The SAR system must be validated against its performance specifications before it is deployed. WhenSAR probes, system components or software are changed, upgraded or recalibrated, these must bevalidated with the SAR system(s) that operates with such components.

Table F.1: System Validationfor 3846

Probe SN.	Liquid name	Validation date	Frequency point	Status (OK or Not)
3846	Head 750MHz	Jan.19,2017	750 MHz	OK
3846	Head 850MHz	Jan.19,2017	850 MHz	OK
3846	Head 900MHz	Jan.18,2017	900 MHz	OK
3846	Head 1750MHz	Jan.17,2017	1750 MHz	OK
3846	Head 1810MHz	Jan.17,2017	1810 MHz	OK
3846	Head 1900MHz	Jan.16,2017	1900 MHz	OK
3846	Head 1950MHz	Jan.16,2017	1950 MHz	OK
3846	Head 2000MHz	Jan.16,2017	2000 MHz	OK
3846	Head 2100MHz	Jan.16,2017	2100 MHz	OK
3846	Head 2300MHz	Jan.15,2017	2300 MHz	OK
3846	Head 2450MHz	Jan.15,2017	2450 MHz	OK
3846	Head 2550MHz	Jan.15,2017	2550 MHz	OK
3846	Head 2600MHz	Jan.15,2017	2600 MHz	OK
3846	Head 3500MHz	Jan.14,2017	3500 MHz	OK
3846	Head 3700MHz	Jan.14,2017	3700 MHz	OK
3846	Head 5200MHz	Jan.13,2017	5200 MHz	OK
3846	Head 5500MHz	Jan.13,2017	5500 MHz	OK
3846	Head 5800MHz	Jan.13,2017	5800 MHz	OK
3846	Body 750MHz	Jan.19,2017	750 MHz	OK
3846	Body 850MHz	Jan.19,2017	850 MHz	OK
3846	Body 900MHz	Jan.18,2017	900 MHz	OK
3846	Body 1750MHz	Jan.17,2017	1750 MHz	OK
3846	Body 1810MHz	Jan.17,2017	1810 MHz	OK
3846	Body 1900MHz	Jan.16,2017	1900 MHz	OK
3846	Body 1950MHz	Jan.16,2017	1950 MHz	OK
3846	Body 2000MHz	Jan.16,2017	2000 MHz	OK
3846	Body 2100MHz	Jan.16,2017	2100 MHz	OK
3846	Body 2300MHz	Jan.15,2017	2300 MHz	OK
3846	Body 2450MHz	Jan.15,2017	2450 MHz	OK
3846	Body 2550MHz	Jan.15,2017	2550 MHz	OK
3846	Body 2600MHz	Jan.15,2017	2600 MHz	OK
3846	Body 3500MHz	Jan.14,2017	3500 MHz	OK
3846	Body 3700MHz	Jan.14,2017	3700 MHz	OK
3846	Body 5200MHz	Jan.13,2017	5200 MHz	OK
3846	Body 5500MHz	Jan.13,2017	5500 MHz	OK
3846	Body 5800MHz	Jan.13,2017	5800 MHz	OK

Table F.2: System Validation for 7307

Probe SN.	Liquid name	Validation date	Frequency point	Status (OK or Not)
7307	Head 750MHz	Mar.15,2016	750 MHz	OK
7307	Head 850MHz	Mar.15,2016	850 MHz	OK
7307	Head 900MHz	Mar.16,2016	900 MHz	OK
7307	Head 1450MHz	Mar.16,2016	1450 MHz	OK
7307	Head 1640MHz	Mar.17,2016	1640 MHz	OK
7307	Head 1750MHz	Mar.17,2016	1750 MHz	OK
7307	Head 1810MHz	Mar.18,2016	1810 MHz	OK
7307	Head 1900MHz	Mar.18,2016	1900 MHz	OK
7307	Head 2000MHz	Mar.19,2016	2000 MHz	OK
7307	Head 2100MHz	Mar.19,2016	2100 MHz	OK
7307	Head 2300MHz	Mar. 20,2016	2300 MHz	OK
7307	Head 2450MHz	Mar.20,2016	2450 MHz	OK
7307	Head 2600MHz	Mar.21,2016	2600 MHz	OK
7307	Head 3500MHz	Mar.21,2016	3500 MHz	OK
7307	Head 3700MHz	Mar.22,2016	3700 MHz	OK
7307	Head 5200MHz	Mar.22,2016	5200 MHz	OK
7307	Head 5300MHz	Mar.23,2016	5300 MHz	OK
7307	Head 5500MHz	Mar.23,2016	5500 MHz	OK
7307	Head 5600MHz	Mar.24,2016	5600 MHz	OK
7307	Head 5800MHz	Mar.24,2016	5800 MHz	OK
7307	Body 750MHz	Mar.15,2016	750 MHz	OK
7307	Body 850MHz	Mar.15,2016	850 MHz	OK
7307	Body 900MHz	Mar.16,2016	900 MHz	OK
7307	Body 1450MHz	Mar.16,2016	1450 MHz	OK
7307	Body 1640MHz	Mar.17,2016	1640 MHz	OK
7307	Body 1750MHz	Mar.17,2016	1750 MHz	OK
7307	Body 1810MHz	Mar.18,2016	1810 MHz	OK
7307	Body 1900MHz	Mar.18,2016	1900 MHz	OK
7307	Body 2000MHz	Mar.19,2016	2000 MHz	OK
7307	Body 2100MHz	Mar.19,2016	2100 MHz	OK
7307	Body 2300MHz	Mar. 20,2016	2300 MHz	OK
7307	Body 2450MHz	Mar.20,2016	2450 MHz	OK
7307	Body 2600MHz	Mar.21,2016	2600 MHz	OK
7307	Body 3500MHz	Mar.21,2016	3500 MHz	OK
7307	Body 3700MHz	Mar.22,2016	3700 MHz	OK
7307	Body 5200MHz	Mar.22,2016	5200 MHz	OK

ANNEX G Probe Calibration Certificate

Probe 7307 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
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 0108

Client CTTL (Auden)

Certificate No: EX3-7307_Feb16

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:7307
Calibration procedure(s)	QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6 Calibration procedure for dosimetric E-field probes
Calibration date:	February 19, 2016

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	01-Apr-15 (No. 217-02128)	Mar-16
Power sensor E4412A	MY41498087	01-Apr-15 (No. 217-02128)	Mar-16
Reference 3 dB Attenuator	SN: S5054 (3c)	01-Apr-15 (No. 217-02129)	Mar-16
Reference 20 dB Attenuator	SN: S5277 (20x)	01-Apr-15 (No. 217-02132)	Mar-16
Reference 30 dB Attenuator	SN: S5129 (30b)	01-Apr-15 (No. 217-02133)	Mar-16
Reference Probe ES3DV2	SN: 3013	31-Dec-15 (No. ES3-3013_Dec15)	Dec-16
DAE4	SN: 660	23-Dec-15 (No. DAE4-660_Dec15)	Dec-16
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

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

Issued: February 20, 2016

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