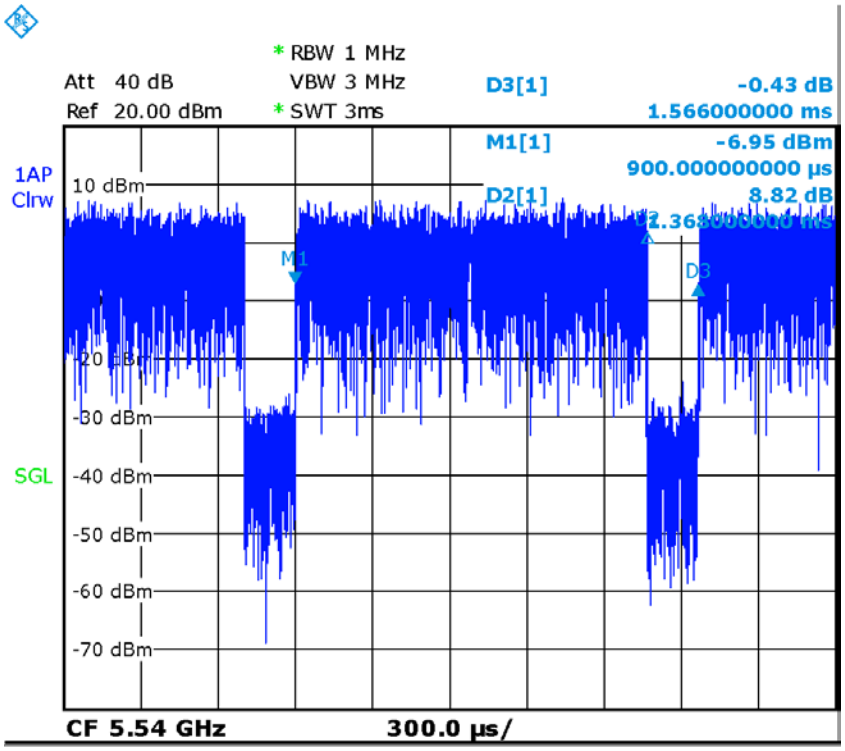
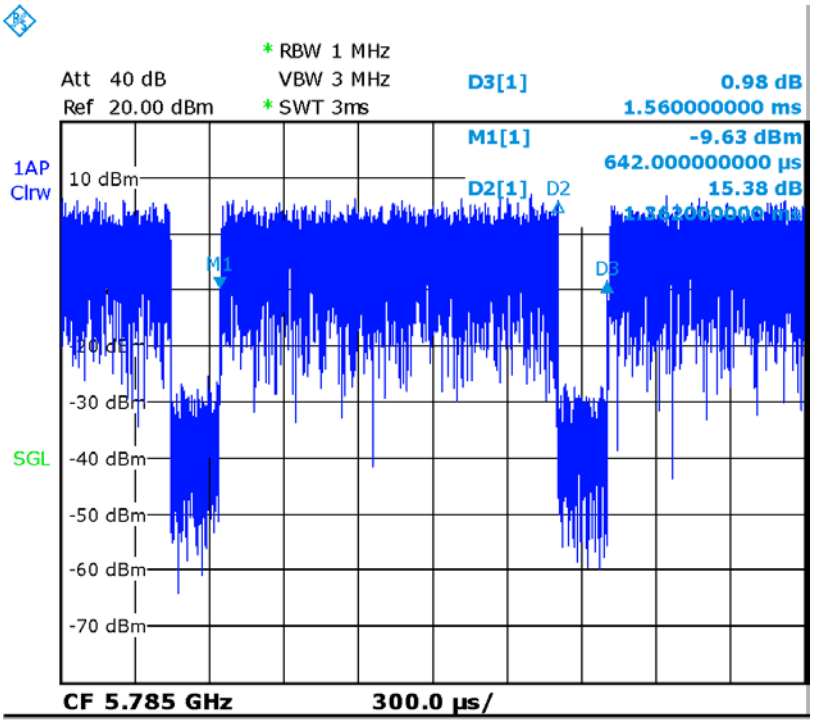


Picture 14.4 The plot of duty factor for CH.112



Picture 14.5 The plot of duty factor for CH.157

15 SAR Measurement Variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium.

The following procedures are applied to determine if repeated measurements are required.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Mode	Channel	Frequency	Test Position	Original SAR (W/kg)	First Repeated SAR(W/kg)	The Ratio
WLAN 2450	6	2437 MHz	Right Cheek	1.13	1.12	1.01
WLAN 5G	157	5785 MHz	Right Cheek	1.07	1.06	1.01

16 Measurement Uncertainty

16.1 Measurement Uncertainty for Normal 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	N	1	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	∞
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	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞

18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	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 (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c' = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						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	$\sqrt{3}$	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	RF ambient 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	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞

	phantom shell									
13	Post-processing	B	4.0	R	$\sqrt{3}$	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	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	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 (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
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	RF ambient 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	RF ambient 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 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		$u_c^{'} = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						13.5	13.4	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						27.0	26.8	

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	January 13, 2017	One year
02	Power meter	NRVD	102083	September 22,2016	One year
03	Power sensor	NRV-Z5	100595		
04	Signal Generator	E4438C	MY49071430	January 13,2017	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	E5515C	MY50263375	January 16, 2017	One year
07	BTS	CMW500	149646	November 03, 2016	One year
08	E-field Probe	SPEAG EX3DV4	3846	January 13,2017	One year
09	DAE	SPEAG DAE4	1331	January19, 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	Dipole Validation Kit	SPEAG D5GHzV2	1060	July 27,2016	One year

END OF REPORT BODY

ANNEX A Graph Results

GSM850_CH128 Right Cheek
Date: 4/6/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 824.2 MHz; σ = 0.891 mho/m; εr = 41.61; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: GSM850 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) = 0.193 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.773 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.223 W/kg
SAR(1 g) = 0.178 W/kg; SAR(10 g) = 0.138 W/kg
Maximum value of SAR (measured) = 0.195 W/kg

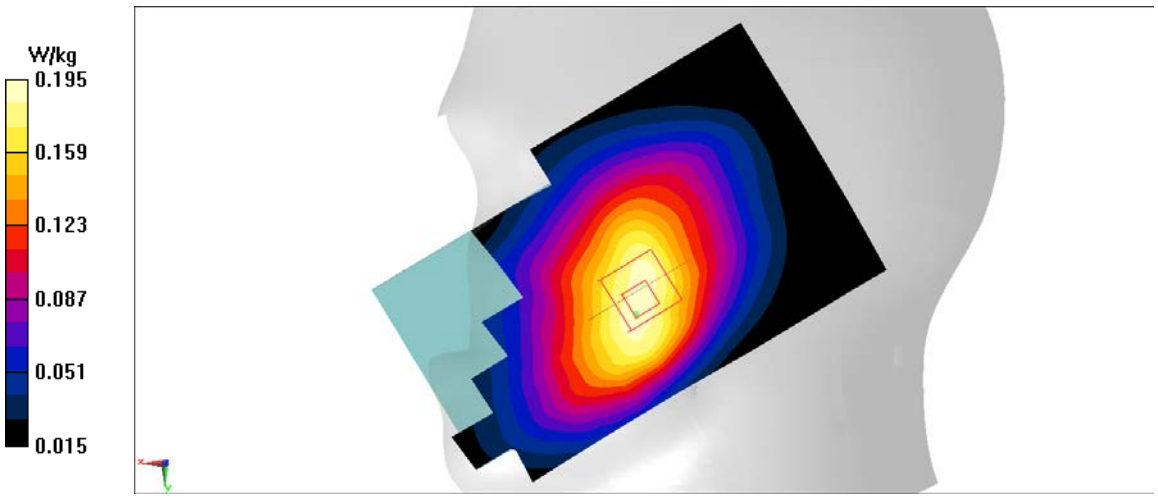


Figure A.1

GSM850_CH128 Right edge
Date: 4/6/2017
Electronics: DAE4 Sn1331
Medium: Body 835 MHz
Medium parameters used: f = 824.2 MHz; σ = 0.978 mho/m; εr = 56.11; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: GSM850 824.2 MHz Duty Cycle: 1:2
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) = 0.35 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.31 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.433 W/kg
SAR(1 g) = 0.305 W/kg; SAR(10 g) = 0.209 W/kg
Maximum value of SAR (measured) = 0.347 W/kg

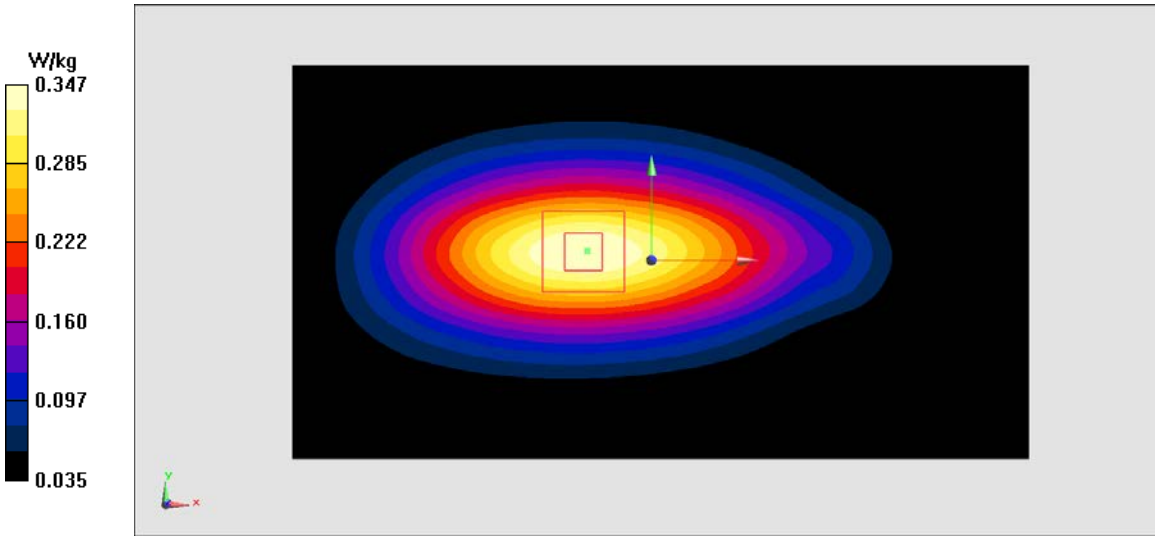


Figure A.2

PCS1900_CH661 Left Cheek
Date: 4/8/2017
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.371 mho/m; εr = 39.57; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: PCS1900 1880 MHz Duty Cycle: 1:8.3
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) = 0.221 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.794 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.275 W/kg
SAR(1 g) = 0.19 W/kg; SAR(10 g) = 0.122 W/kg
Maximum value of SAR (measured) = 0.218 W/kg

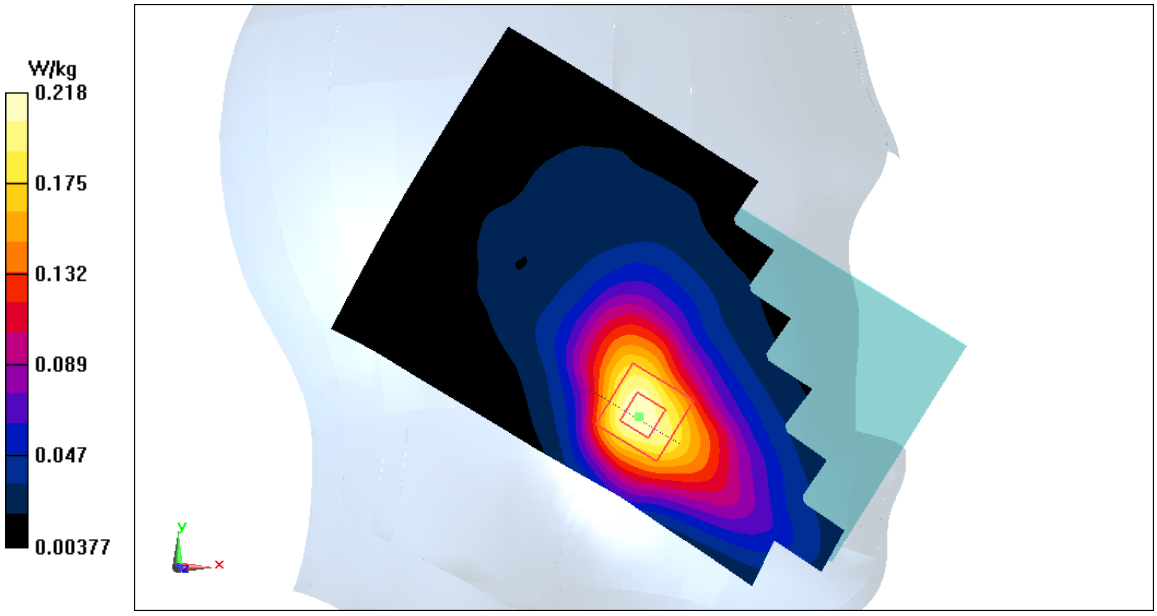


Figure A.3

PCS1900_CH512 Left edge
Date: 4/8/2017
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1850.2 MHz; σ = 1.488 mho/m; εr = 53.25; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: PCS1900 1850.2 MHz Duty Cycle: 1:2
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) = 0.672 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.807 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.881 W/kg
SAR(1 g) = 0.558 W/kg; SAR(10 g) = 0.338 W/kg
Maximum value of SAR (measured) = 0.663 W/kg

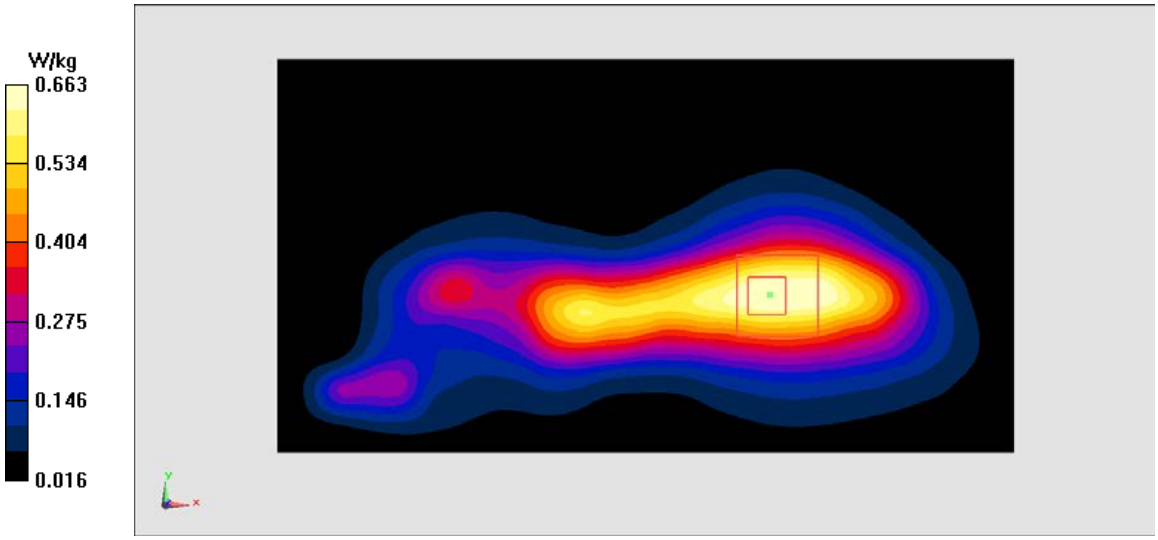


Figure A.4

WCDMA1900-BII_CH9538 Left Cheek
Date: 4/8/2017
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1907.6 MHz; σ = 1.398 mho/m; εr = 39.54; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: WCDMA1900-BII 1907.6 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) = 0.579 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.884 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.734 W/kg
SAR(1 g) = 0.499 W/kg; SAR(10 g) = 0.315 W/kg
Maximum value of SAR (measured) = 0.575 W/kg

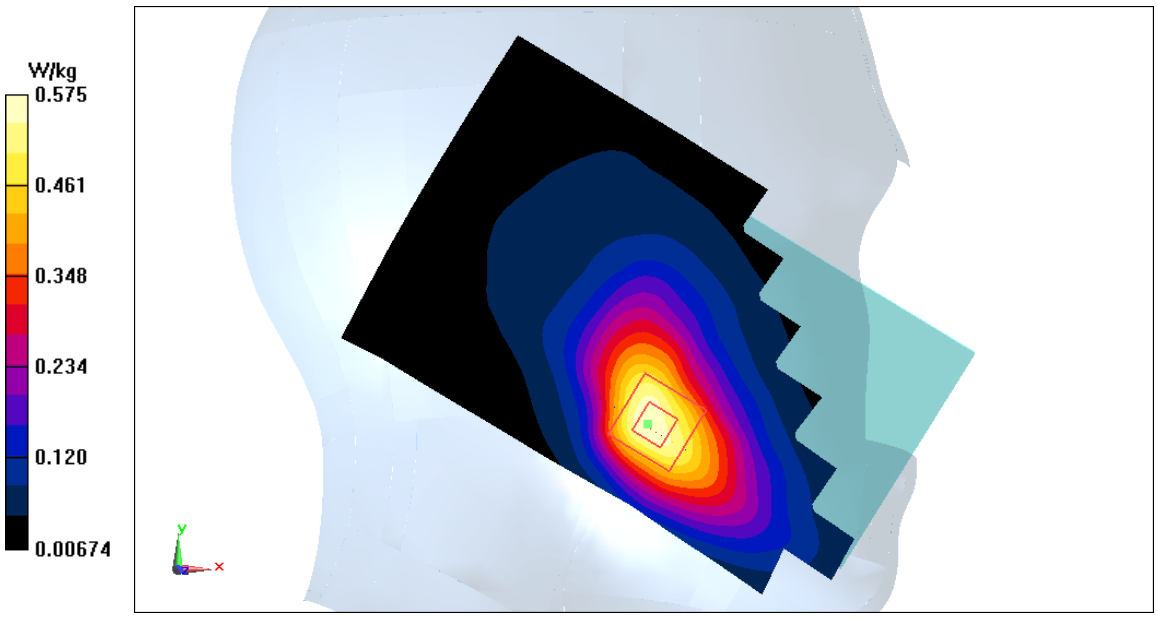


Figure A.5

WCDMA1900-BII_CH9400 Left edge
Date: 4/8/2017
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.517 mho/m; εr = 53.21; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: WCDMA1900-BII 1880 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) = 0.665 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.41 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.875 W/kg
SAR(1 g) = 0.549 W/kg; SAR(10 g) = 0.332 W/kg
Maximum value of SAR (measured) = 0.656 W/kg

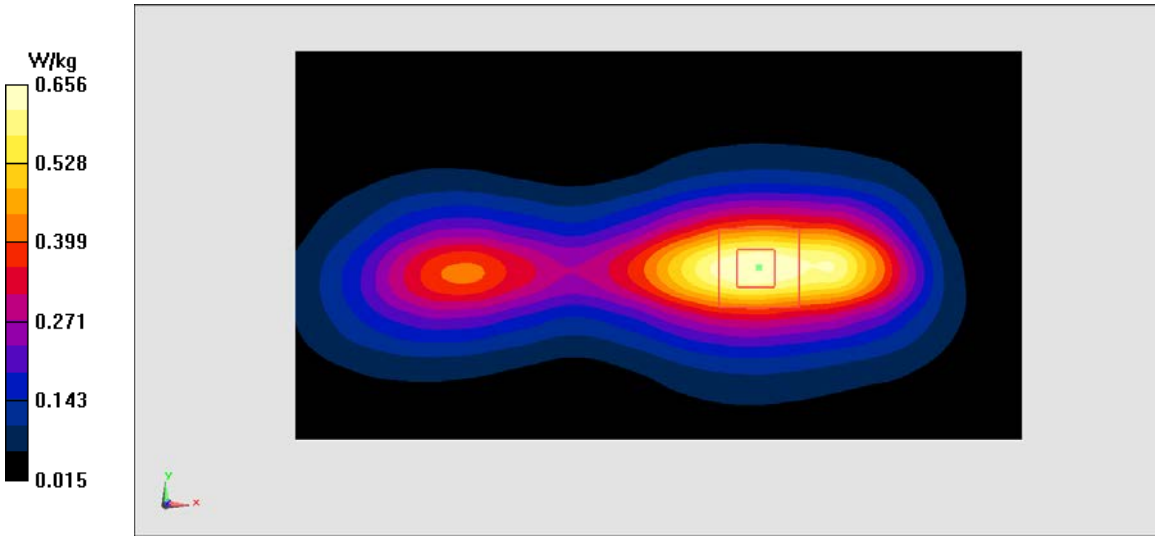


Figure A.6

WCDMA850-BV_CH4715 Right Cheek
Date: 4/6/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 835.4 MHz; σ = 0.902 mho/m; εr = 41.59; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: WCDMA850-BV 835.4 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) = 0.245 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.234 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.277 W/kg
SAR(1 g) = 0.22 W/kg; SAR(10 g) = 0.17 W/kg
Maximum value of SAR (measured) = 0.241 W/kg

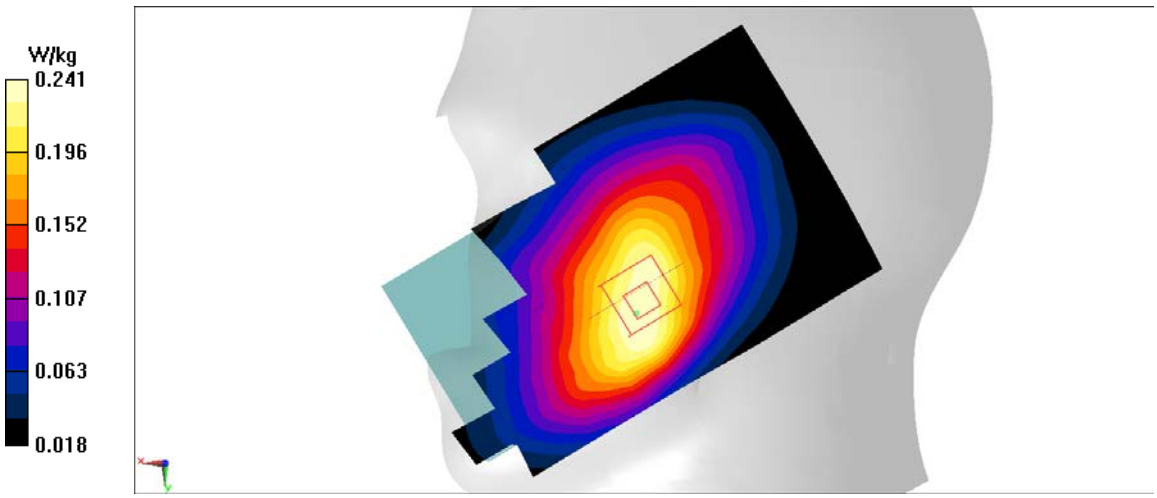


Figure A.7

WCDMA850-BV_CH4715 Right edge
Date: 4/6/2017
Electronics: DAE4 Sn1331
Medium: Body 835 MHz
Medium parameters used: f = 835.4 MHz; σ = 0.989 mho/m; εr = 56.09; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
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) = 0.428 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.02 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.538 W/kg
SAR(1 g) = 0.374 W/kg; SAR(10 g) = 0.256 W/kg
Maximum value of SAR (measured) = 0.429 W/kg

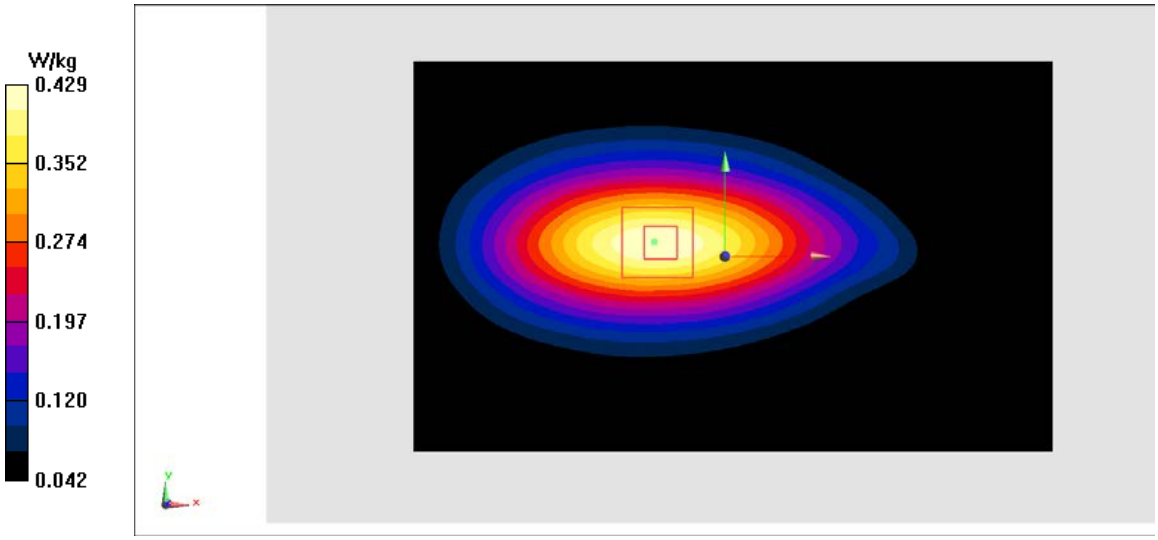


Figure A.8

LTE2500-FDD7_CH21350 Left Cheek
Date: 4/10/2017
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2560 MHz; σ = 1.928 mho/m; εr = 39.62; ρ = 1000 kg/m^3
Ambient Temperature: 22.5^{o}C, Liquid Temperature: 23.3^{o}C
Communication System: LTE2500-FDD7 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) = 0.418 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.591 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.626 W/kg
SAR(1 g) = 0.368 W/kg; SAR(10 g) = 0.206 W/kg
Maximum value of SAR (measured) = 0.437 W/kg

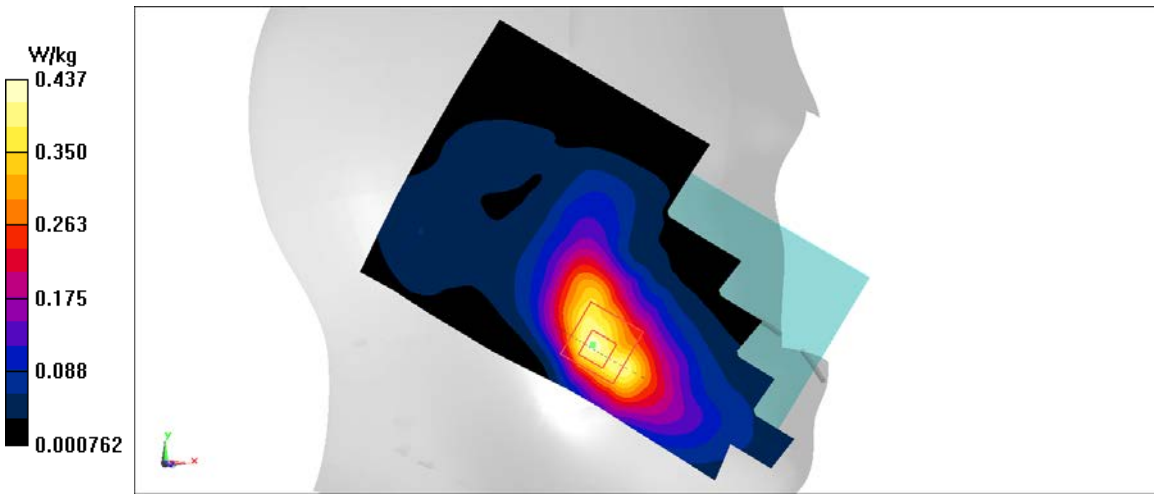


Figure A.9

LTE2500-FDD7_CH21350 Left edge
Date: 4/10/2017
Electronics: DAE4 Sn1331
Medium: Body 2600 MHz
Medium parameters used: f = 2560 MHz; σ = 2.1 mho/m; εr = 51.66; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: LTE2500-FDD7 2560 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) = 0.58 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.63 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.842 W/kg
SAR(1 g) = 0.461 W/kg; SAR(10 g) = 0.247 W/kg
Maximum value of SAR (measured) = 0.578 W/kg

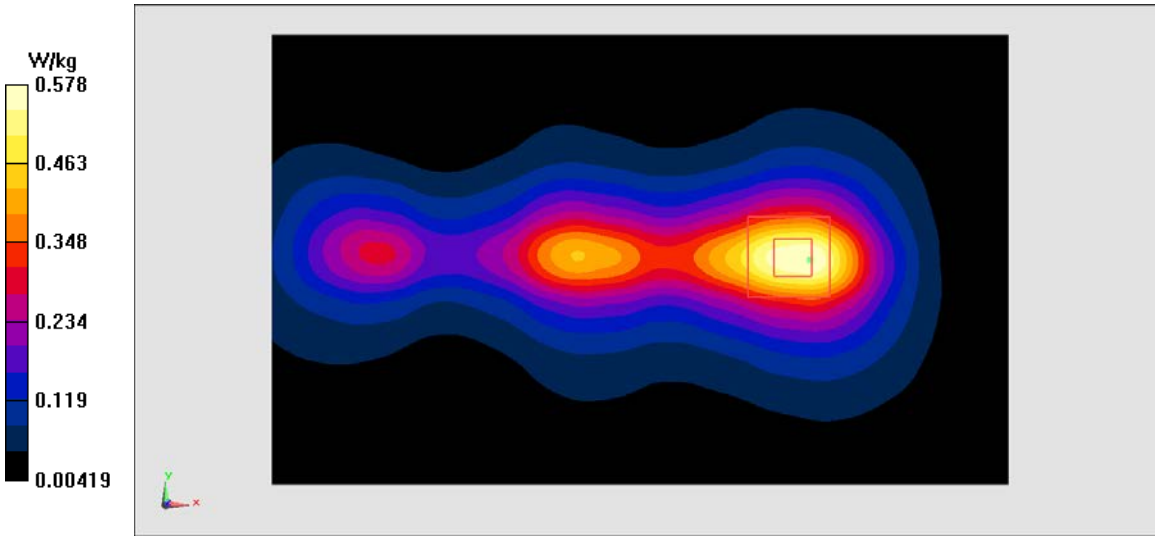


Figure A.10

LTE2600-TDD38_CH38150 Left Cheek
Date: 4/10/2017
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2610 MHz; σ = 1.976 mho/m; εr = 39.56; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: LTE2600-TDD38 2610 MHz Duty Cycle: 1:1.58
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) = 0.175 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.258 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.272 W/kg
SAR(1 g) = 0.2 W/kg; SAR(10 g) = 0.101 W/kg
Maximum value of SAR (measured) = 0.185 W/kg

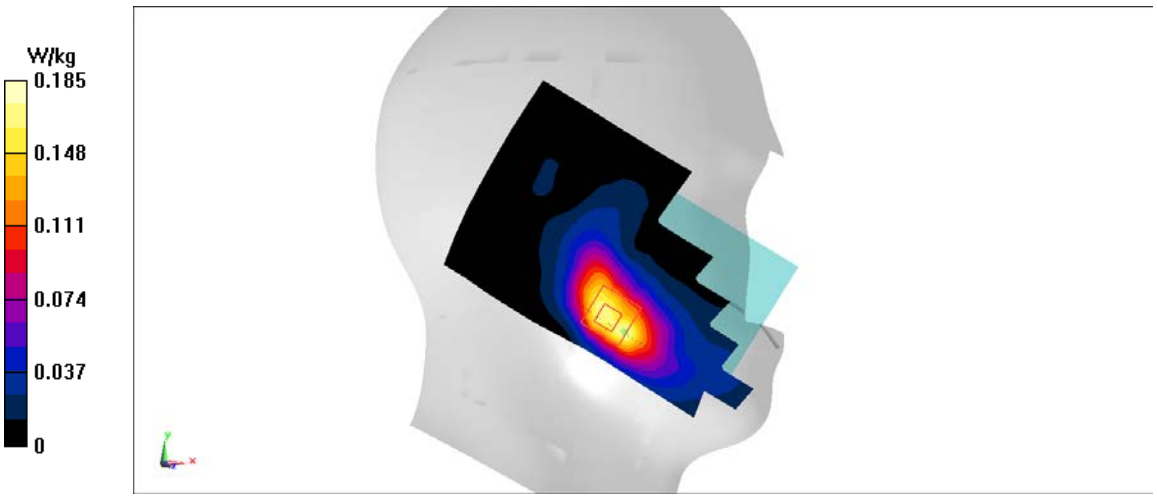


Figure A.11

LTE2600-TDD38_CH38150 Front
Date: 4/10/2017
Electronics: DAE4 Sn1331
Medium: Body 2600 MHz
Medium parameters used: f = 2610 MHz; σ = 2.148 mho/m; εr = 51.6; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: LTE2600-TDD38 2610 MHz Duty Cycle: 1:1.58
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) = 0.176 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.047 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.265 W/kg
SAR(1 g) = 0.146 W/kg; SAR(10 g) = 0.083 W/kg
Maximum value of SAR (measured) = 0.18 W/kg

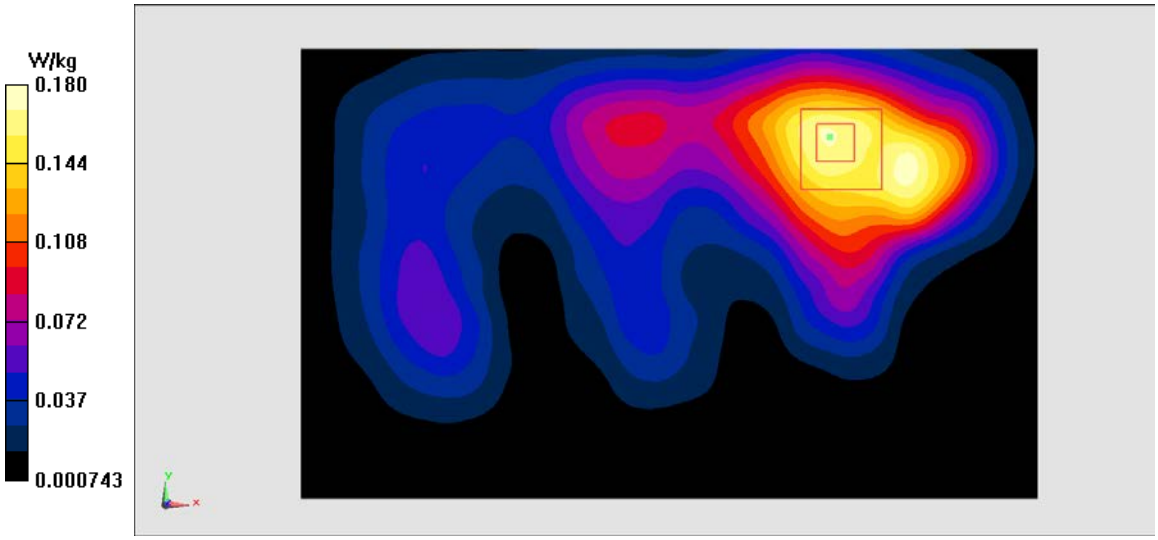


Figure A.12

LTE850-FDD5 Right Cheek
Date: 4/6/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 836.5 MHz; σ = 0.898 mho/m; εr = 41.56; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: GSM850 836.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.33,9.33,9.33)

Area Scan (81x131x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.219 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.961 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.254 W/kg
SAR(1 g) = 0.199 W/kg; SAR(10 g) = 0.152 W/kg
Maximum value of SAR (measured) = 0.217 W/kg

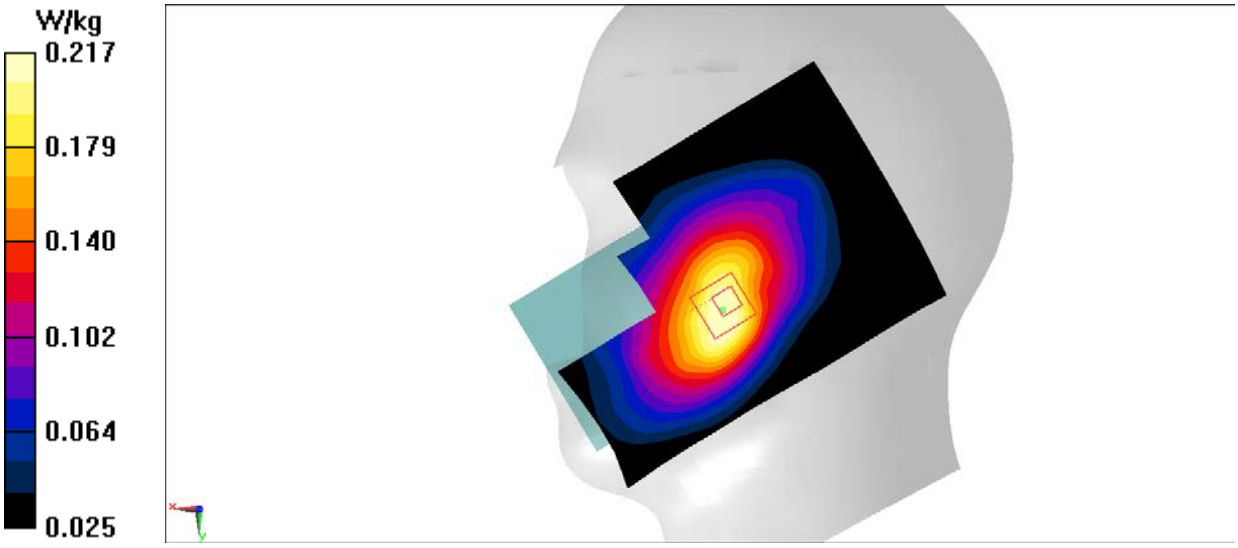


Figure A.13

LTE850-FDD5 Right edge
Date: 4/6/2017
Electronics: DAE4 Sn1331
Medium: Body 835 MHz
Medium parameters used: f = 836.5 MHz; σ = 0.984 mho/m; εr = 56.04; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: GSM850 836.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(9.52,9.52,9.52)

Area Scan (131x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.304 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.15 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.366 W/kg
SAR(1 g) = 0.256 W/kg; SAR(10 g) = 0.175 W/kg
Maximum value of SAR (measured) = 0.294 W/kg

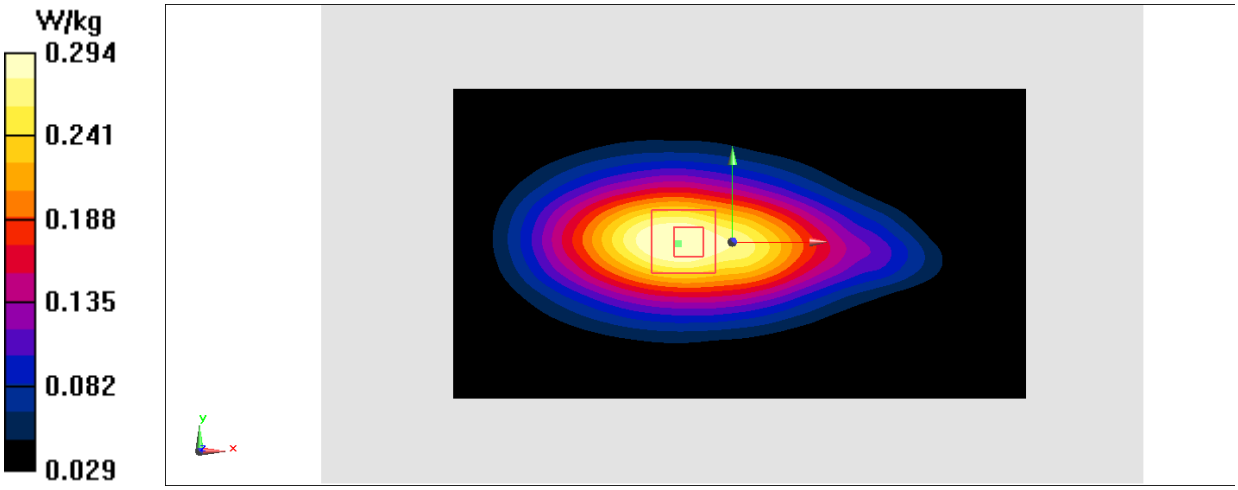


Figure A.14

WLAN2450_CH6 Right Cheek
Date: 4/9/2017
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used: f = 2437 MHz; σ = 1.772 mho/m; εr = 39.07; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
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) = 1.43 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.46 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 3.25 W/kg
SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.466 W/kg
Maximum value of SAR (measured) = 1.47 W/kg

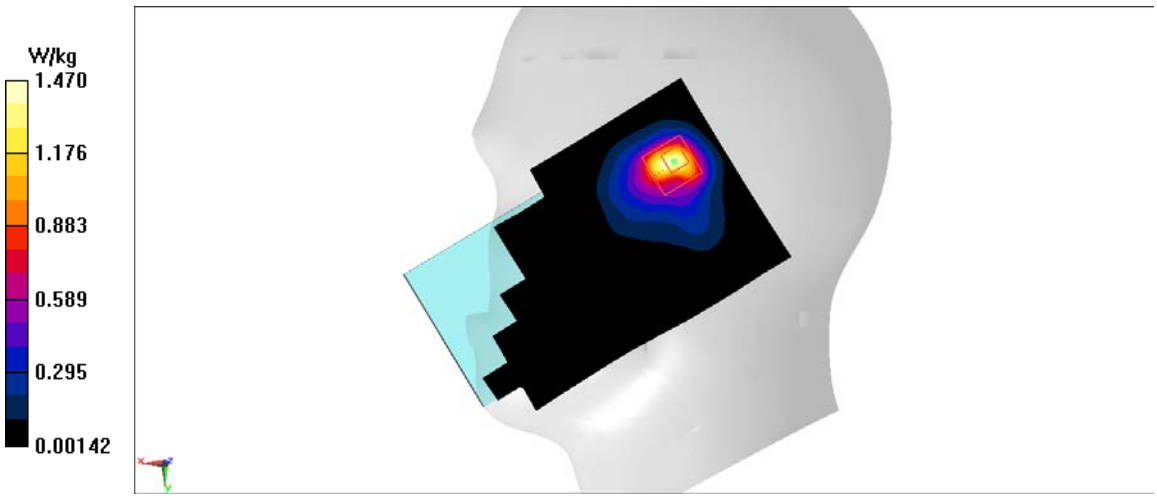


Figure A.15

WLAN2450_CH1 Front
Date: 4/9/2017
Electronics: DAE4 Sn1331
Medium: Body 2450 MHz
Medium parameters used: f = 2412 MHz; σ = 1.93 mho/m; εr = 53.41; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: WLAN2450 2412 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) = 0.107 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.469 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.157 W/kg
SAR(1 g) = 0.086 W/kg; SAR(10 g) = 0.047 W/kg
Maximum value of SAR (measured) = 0.104 W/kg

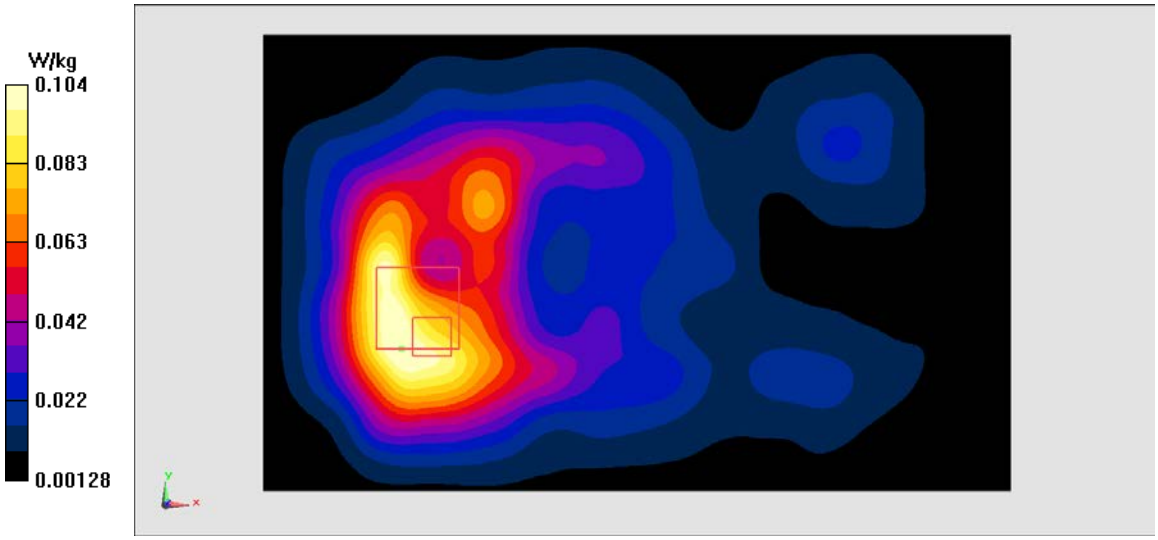


Figure A.16

WLAN5G_CH157 Right Cheek
Date: 4/11/2017
Electronics: DAE4 Sn1331
Medium: Head 5750 MHz
Medium parameters used: f = 5785 MHz; σ = 5.447 mho/m; εr = 35.34; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: WLAN5G 5785 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(4.95,4.95,4.95)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 3.21 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.19 V/m; Power Drift = 0.1 dB
Peak SAR (extrapolated) = 6.25 W/kg
SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.299 W/kg
Maximum value of SAR (measured) = 3.25 W/kg

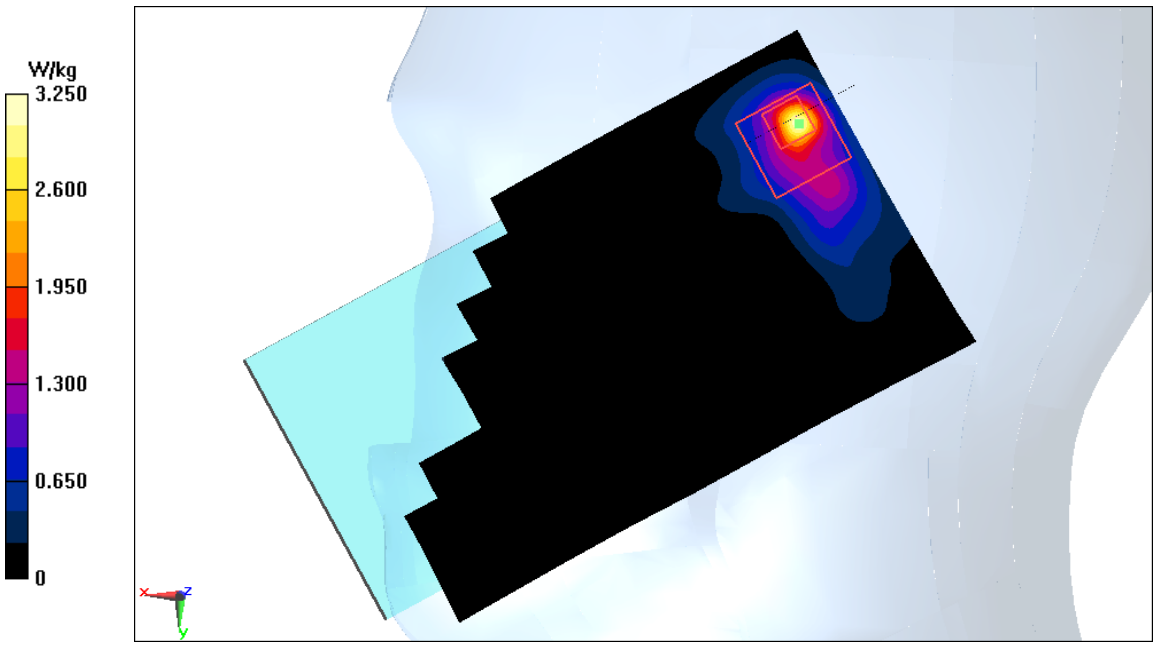


Figure A.17

WLAN5G_CH157 Top
Date: 4/11/2017
Electronics: DAE4 Sn1331
Medium: Body 5750 MHz
Medium parameters used: f = 5785 MHz; σ = 6.025 mho/m; εr = 46.74; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C, Liquid Temperature: 23.3°C
Communication System: WLAN5G 5785 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(4.53,4.53,4.53)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.175 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.408 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.221 W/kg
SAR(1 g) = 0.051 W/kg; SAR(10 g) = 0.018 W/kg
Maximum value of SAR (measured) = 0.137 W/kg

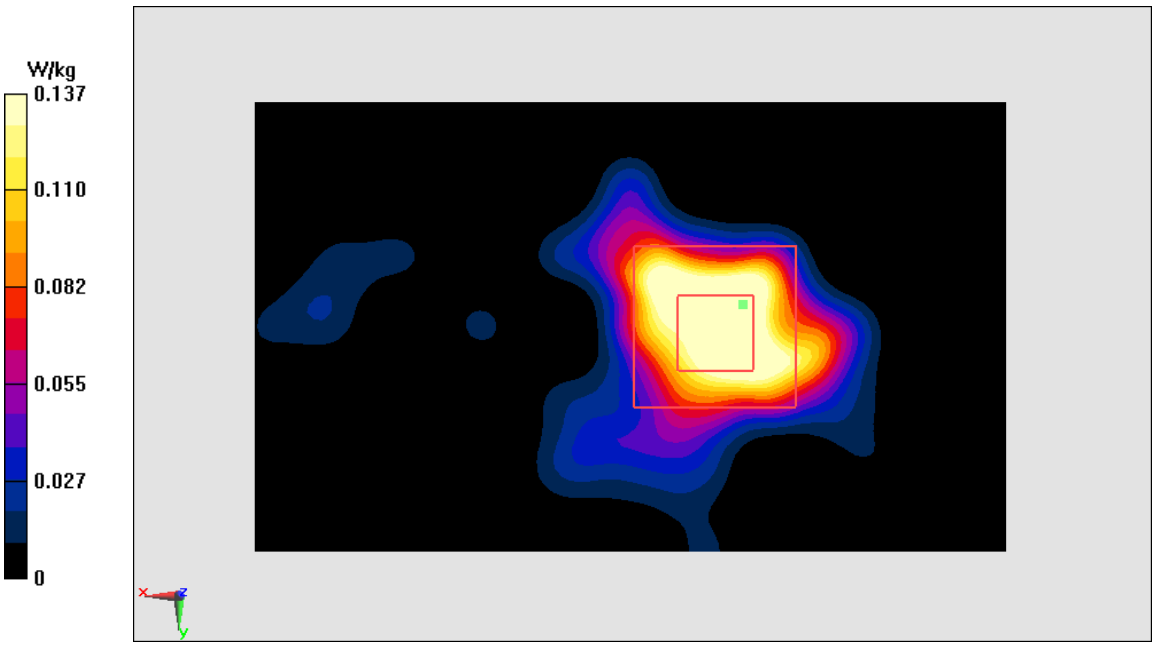


Figure A.18

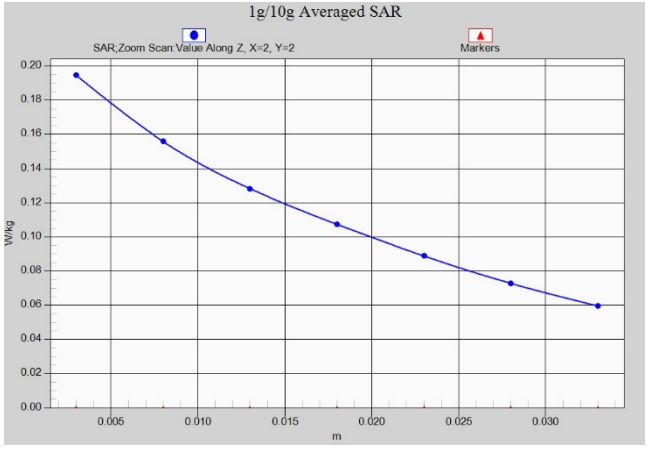


Fig.1- 1 Z-Scan at power reference point (850 MHz)

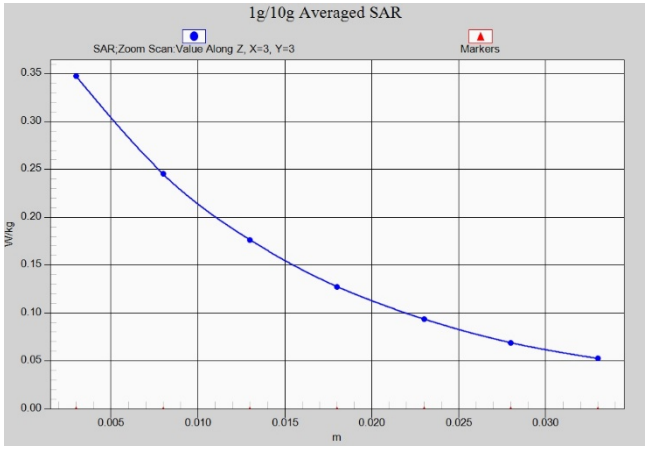


Fig.1- 2 Z-Scan at power reference point (850 MHz)

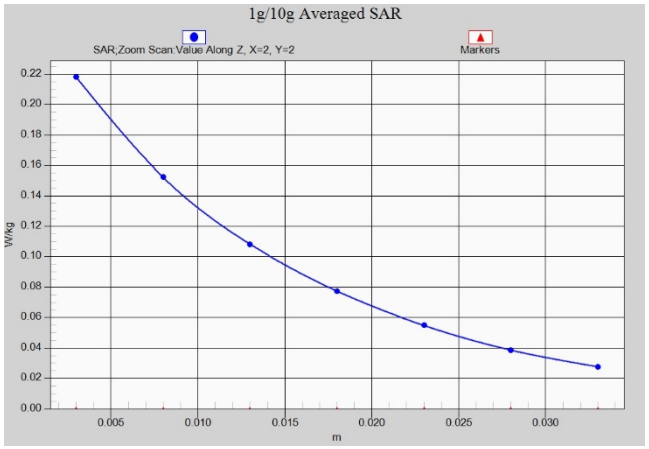


Fig.1- 3 Z-Scan at power reference point (1900 MHz)

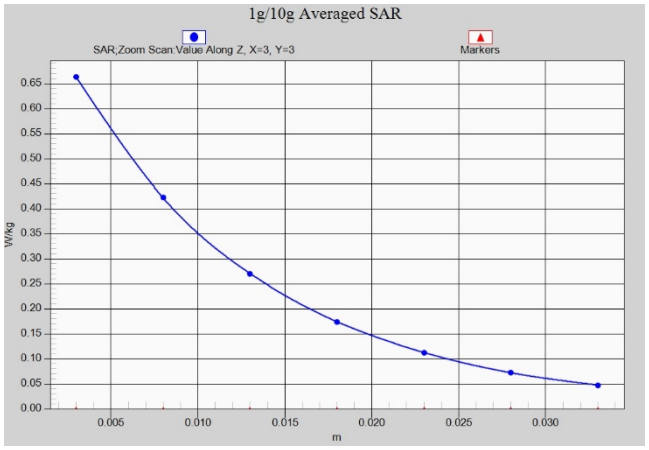


Fig.1- 4 Z-Scan at power reference point (1900 MHz)

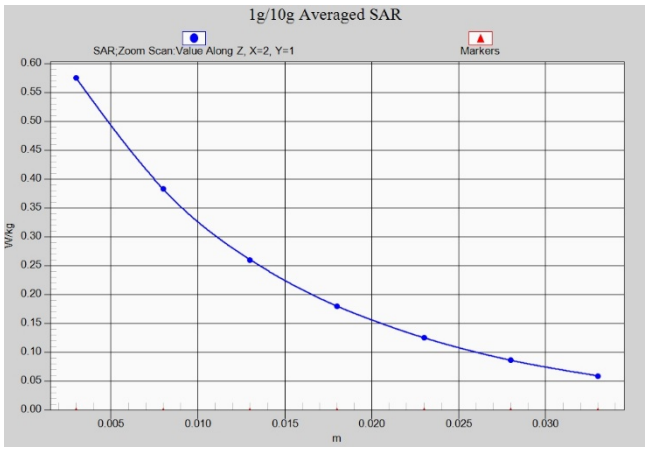


Fig.1- 5 Z-Scan at power reference point (W1900)

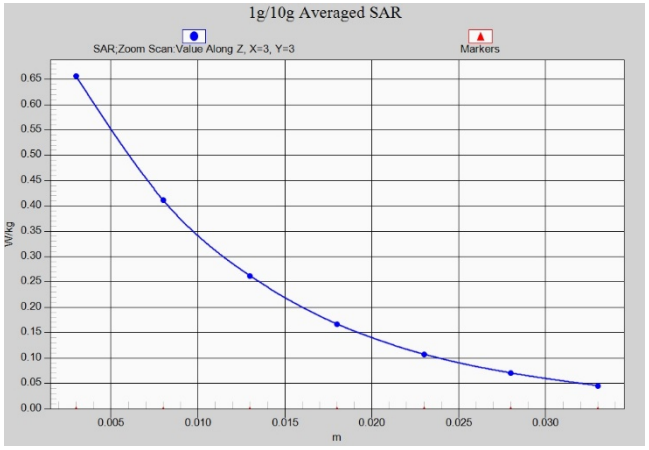


Fig.1- 6 Z-Scan at power reference point (W1900)

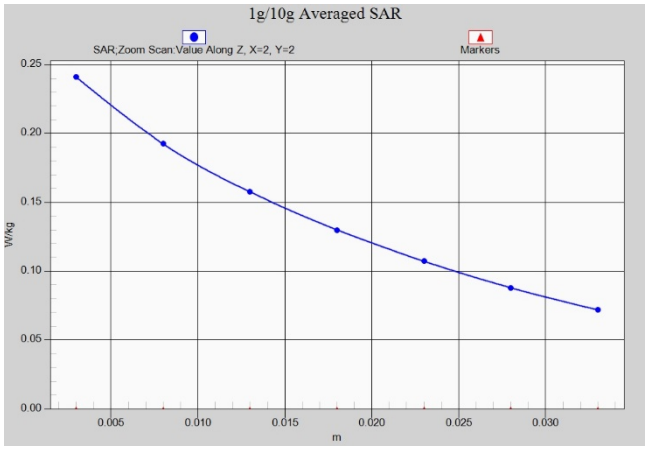


Fig.1- 7 Z-Scan at power reference point (W850)

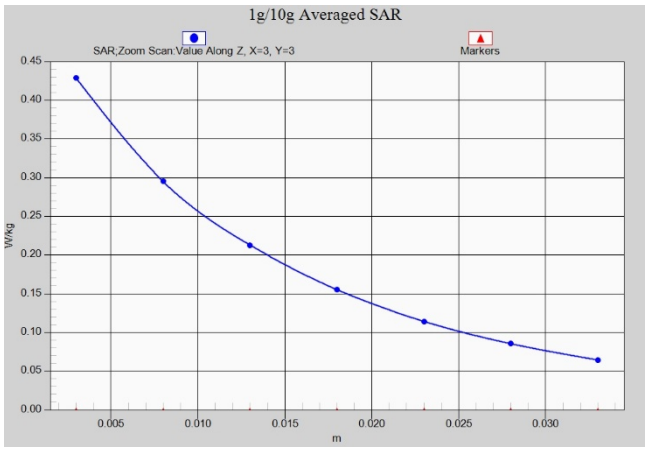


Fig.1- 8 Z-Scan at power reference point (W850)

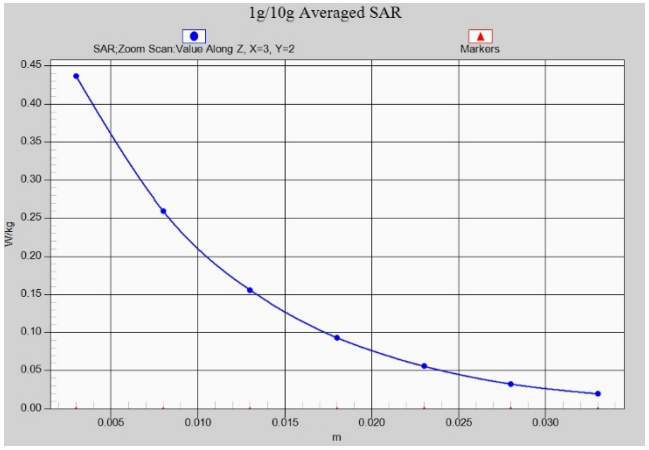


Fig.1- 9 Z-Scan at power reference point (LTE band7)

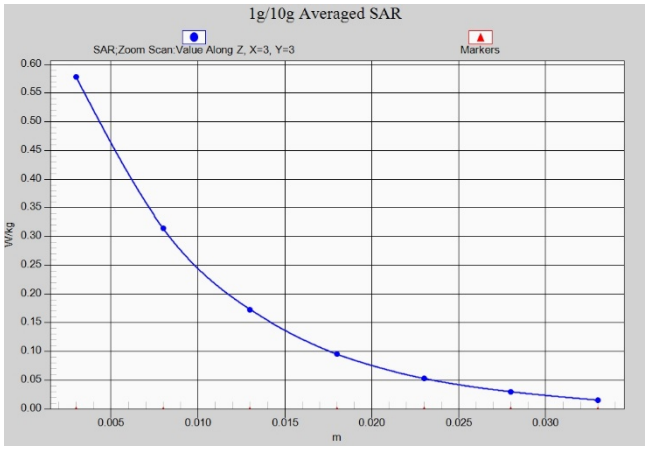


Fig.1- 10 Z-Scan at power reference point (LTE band7)

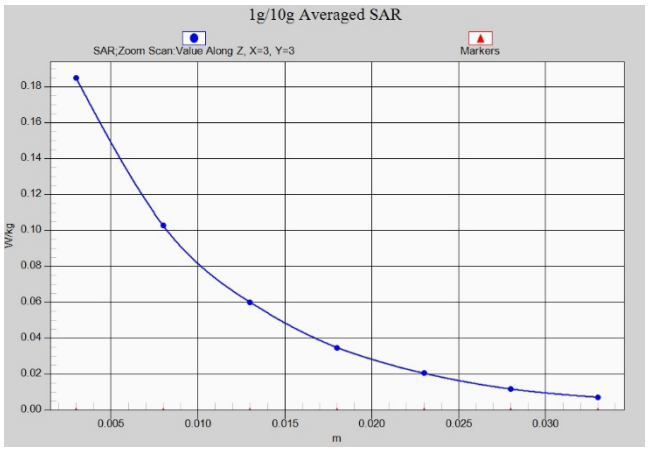


Fig.1- 11 Z-Scan at power reference point (LTE band38)

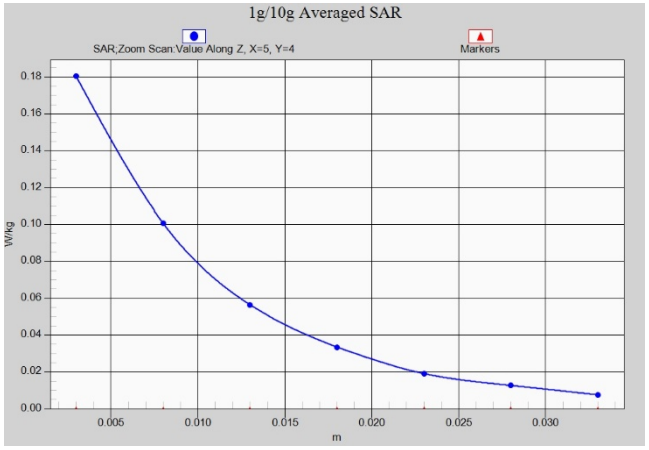


Fig.1- 12 Z-Scan at power reference point (LTE band38)

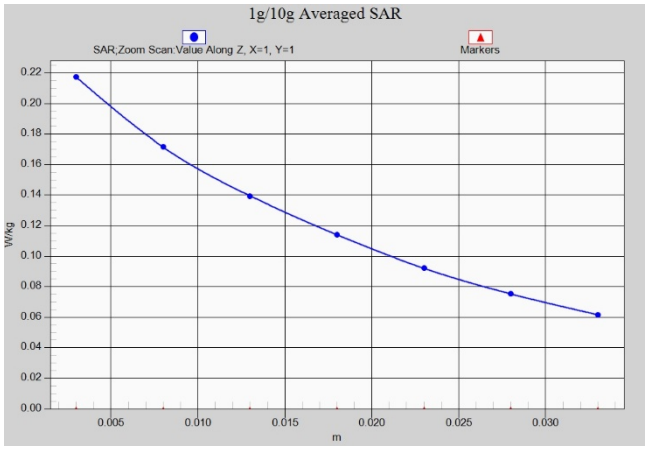


Fig.1- 13 Z-Scan at power reference point (LTE band5)

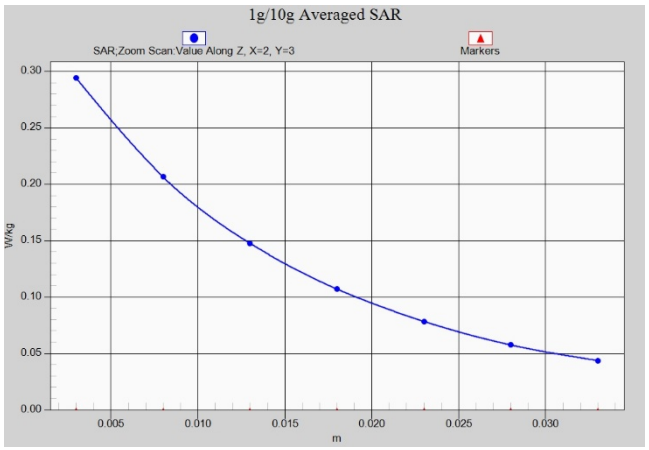


Fig.1- 14 Z-Scan at power reference point (LTE band5)

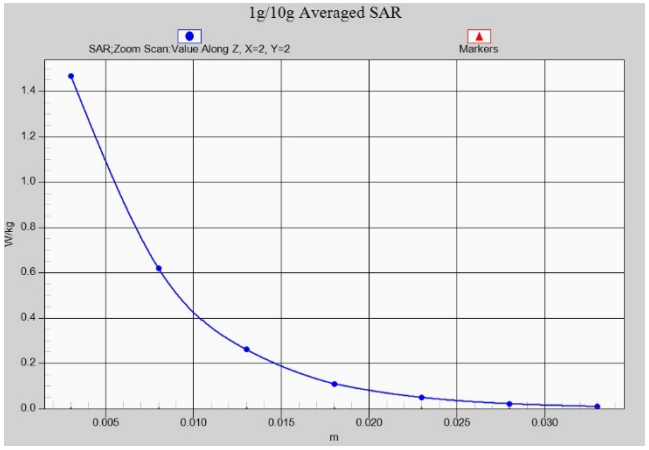


Fig.1- 15 Z-Scan at power reference point (WLAN2450)

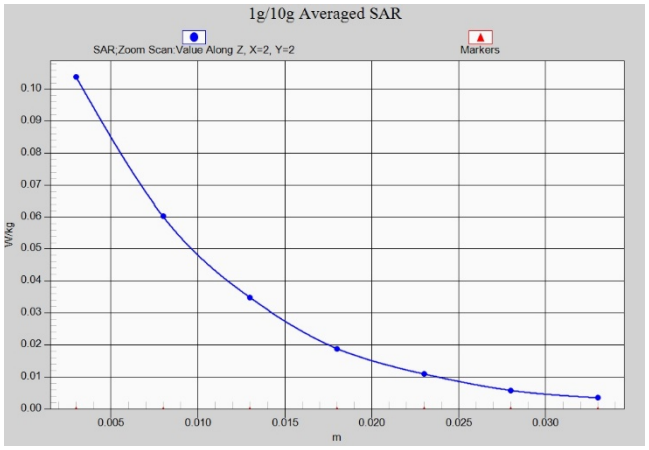


Fig.1- 16 Z-Scan at power reference point (WLAN2450)

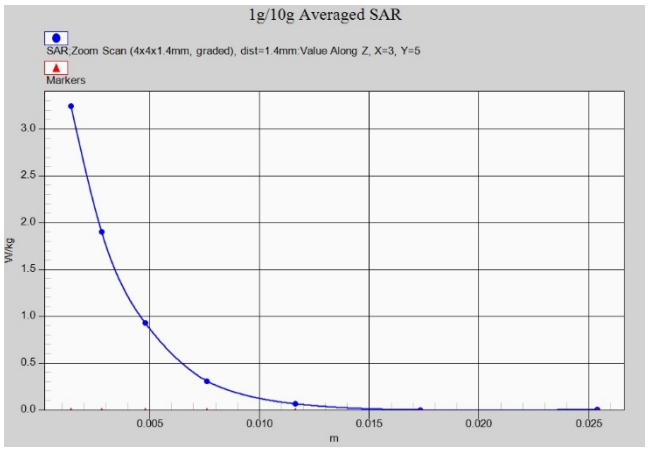


Fig.1- 17 Z-Scan at power reference point (WLAN5G)

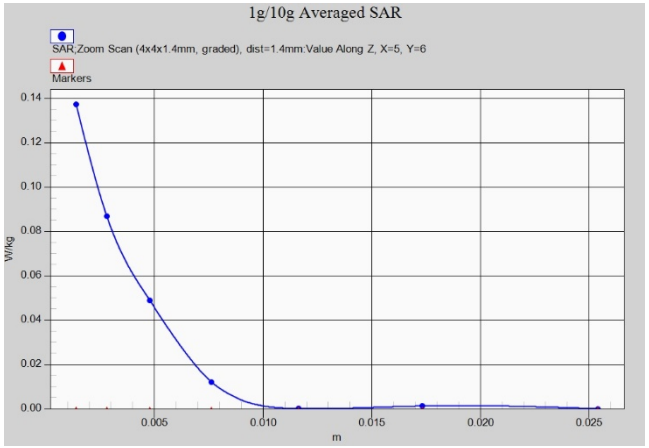


Fig.1- 18 Z-Scan at power reference point (WLAN5G)

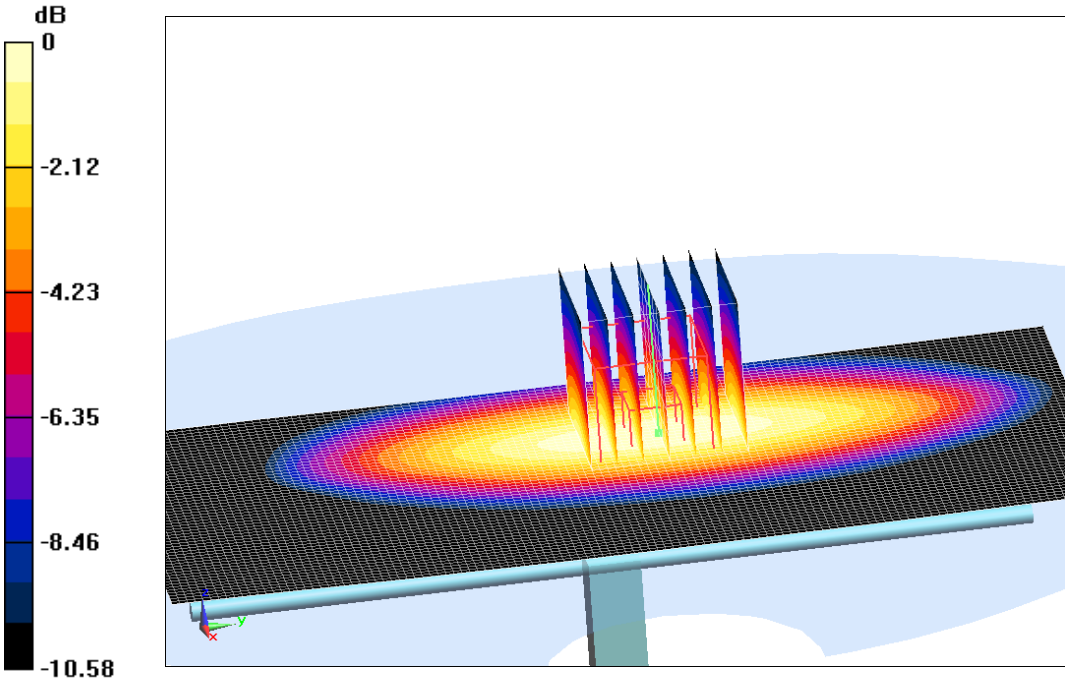
ANNEX B System Verification Results

835 MHz

Date: 4/6/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 835 MHz; σ =0.901 mho/m; ε_r = 41.6; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 = 61.02 V/m; Power Drift = 0.01
Fast SAR: SAR(1 g) = 2.36 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (interpolated) = 3.27 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =61.02 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.72 W/kg
SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 3.35 W/kg



0 dB = 3.35 W/kg = 5.25 dB W/kg

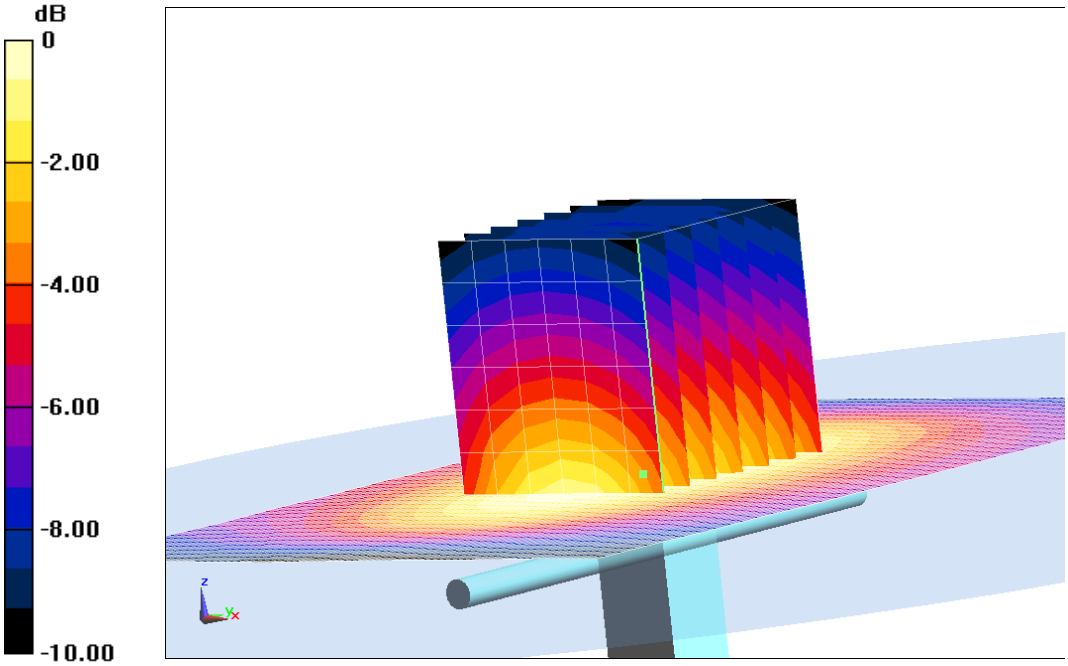
Fig.B.3 validation 835 MHz 250mW

835 MHz

Date: 4/6/2017
Electronics: DAE4 Sn1331
Medium: Body 835 MHz
Medium parameters used: f = 835 MHz; σ =0.988 mho/m; ε_r = 56.1; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 = 60.5 V/m; Power Drift = -0.03
Fast SAR: SAR(1 g) = 2.33 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (interpolated) = 3.43 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =60.5 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.71 W/kg
SAR(1 g) = 2.32 W/kg; SAR(10 g) = 1.56 W/kg
Maximum value of SAR (measured) = 3.29 W/kg



0 dB = 3.29 W/kg = 5.17 dB W/kg

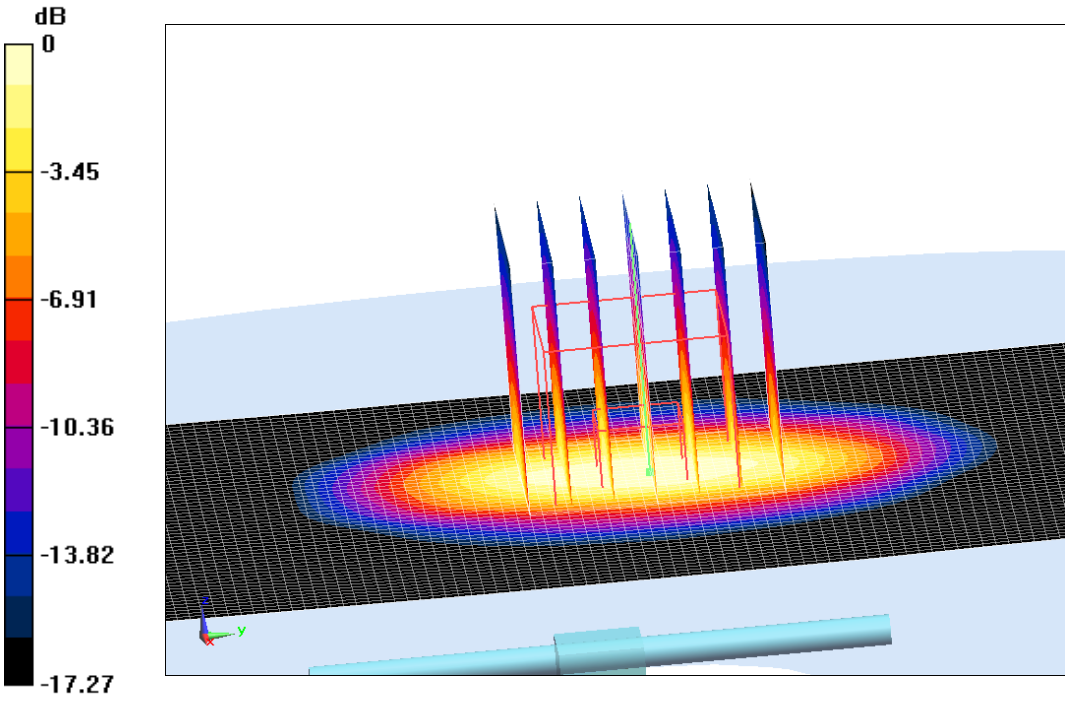
Fig.B.4 validation 835 MHz 250mW

1900 MHz

Date: 4/8/2017
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.39 mho/m; ε_r = 39.55; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 = 106.76 V/m; Power Drift = 0.01
Fast SAR: SAR(1 g) = 10.21 W/kg; SAR(10 g) = 5.3 W/kg
Maximum value of SAR (interpolated) = 15.47 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =106.76 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 18.92 W/kg
SAR(1 g) = 10.32 W/kg; SAR(10 g) = 5.25 W/kg
Maximum value of SAR (measured) = 15.7 W/kg



0 dB = 15.7 W/kg = 11.96 dB W/kg

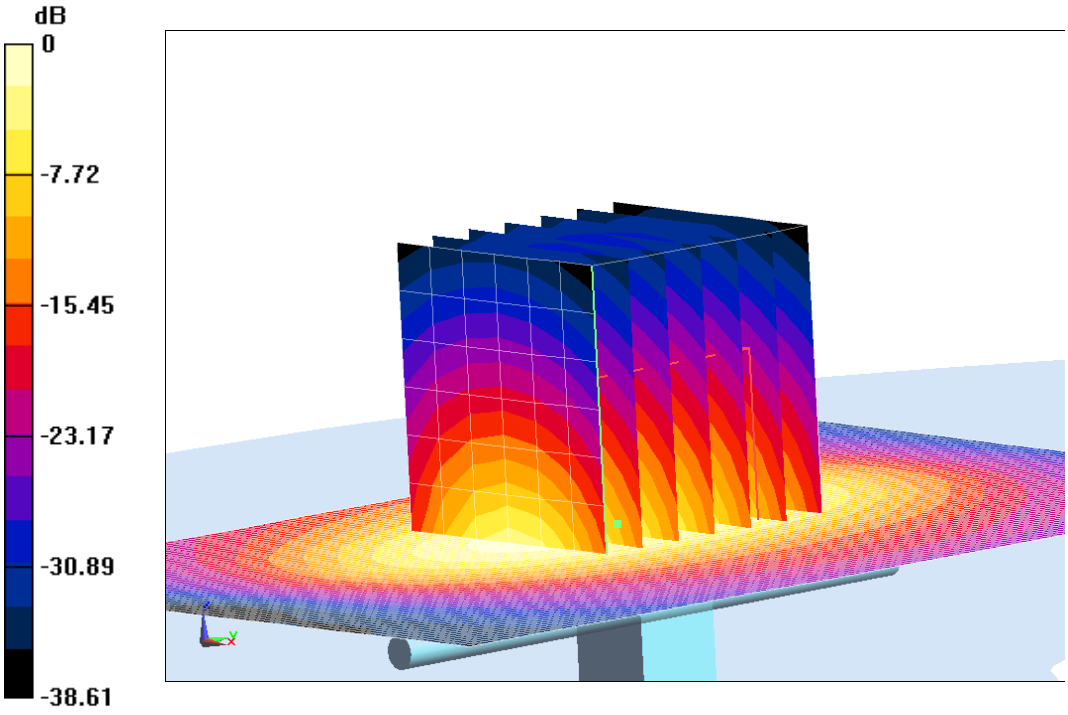
Fig.B.7 validation 1900 MHz 250mW

1900 MHz

Date: 4/8/2017
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.536 mho/m; ε_r = 53.19; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 = 105.78 V/m; Power Drift = -0.01
Fast SAR: SAR(1 g) = 10.35 W/kg; SAR(10 g) = 5.26 W/kg
Maximum value of SAR (interpolated) = 14.84 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 = -0.01 dB
Peak SAR (extrapolated) = 17.85 W/kg
SAR(1 g) = 10.08 W/kg; SAR(10 g) = 5.23 W/kg
Maximum value of SAR (measured) = 14.7 W/kg



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

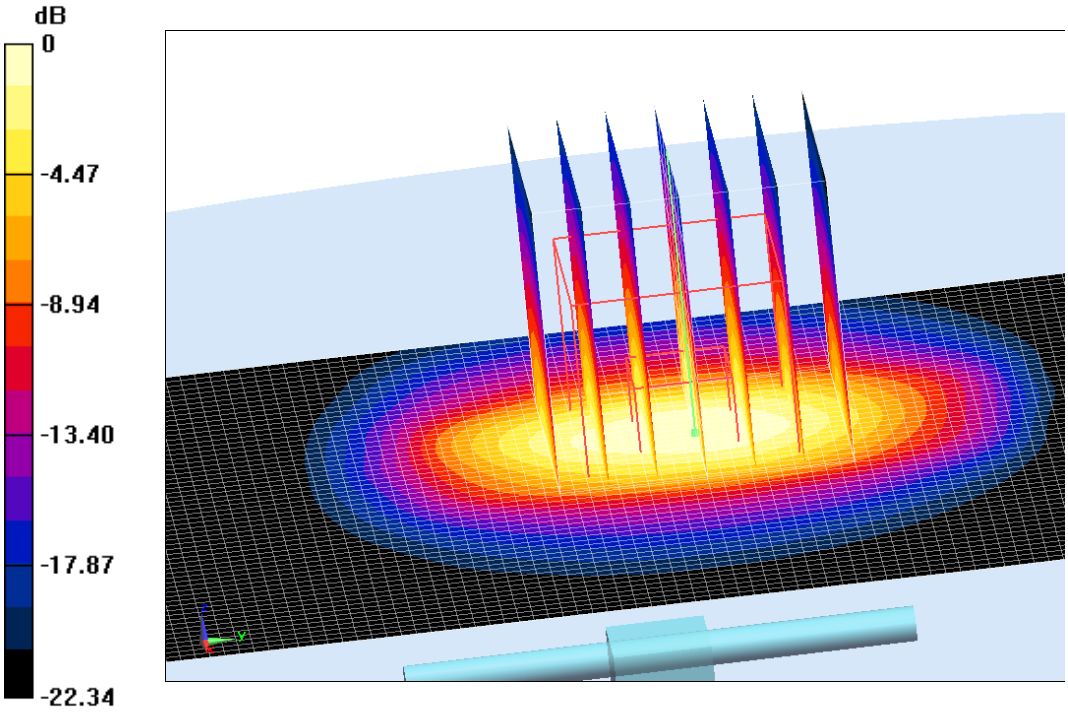
Fig.B.8 validation 1900 MHz 250mW

2450 MHz

Date: 4/9/2017
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.784 mho/m; ε_r = 39.05; ρ = 1000 kg/m^3
Ambient Temperature: 22.5^{o}C Liquid Temperature: 23.3^{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 = 116.11 V/m; Power Drift = -0.03
Fast SAR: SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.06 W/kg
Maximum value of SAR (interpolated) = 22.66 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =116.11 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 27.32 W/kg
SAR(1 g) = 13.44 W/kg; SAR(10 g) = 6.26 W/kg
Maximum value of SAR (measured) = 22.63 W/kg



0 dB = 22.63 W/kg = 13.55 dB W/kg

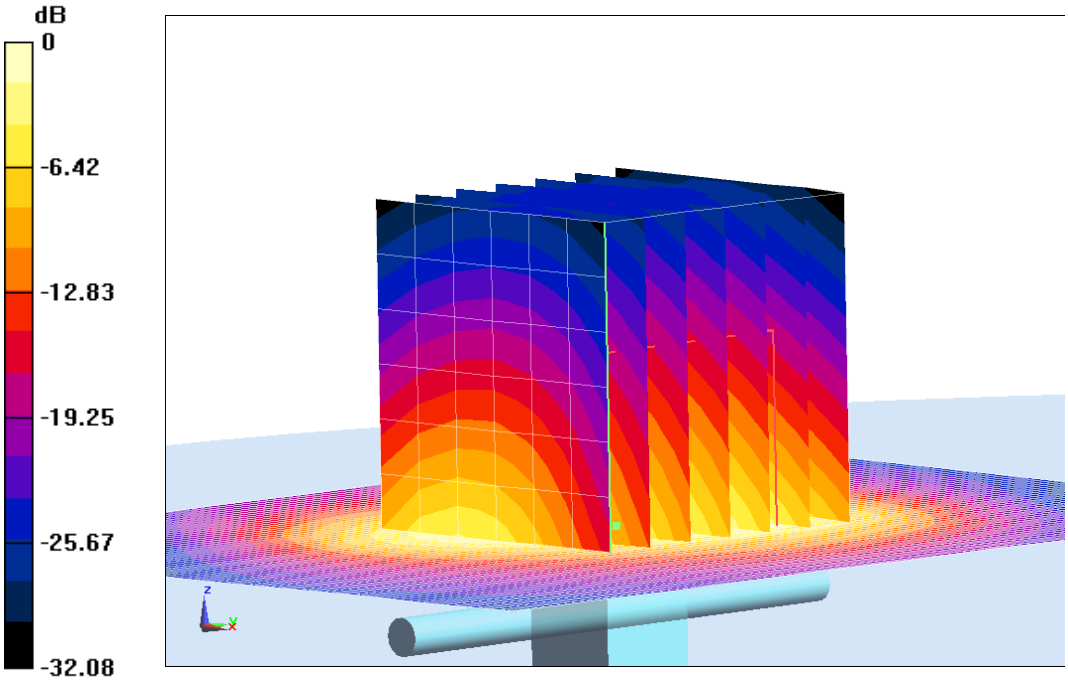
Fig.B.9 validation 2450 MHz 250mW

2450 MHz

Date: 4/9/2017
Electronics: DAE4 Sn1331
Medium: Body 2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.966 mho/m; ε_r = 53.36; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 = 107.13 V/m; Power Drift = -0.01
Fast SAR: SAR(1 g) = 13.36 W/kg; SAR(10 g) = 6.17 W/kg
Maximum value of SAR (interpolated) = 22.05 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =107.13 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 26.52 W/kg
SAR(1 g) = 13.06 W/kg; SAR(10 g) = 6.06 W/kg
Maximum value of SAR (measured) = 21.71 W/kg



0 dB = 21.71 W/kg = 13.37 dB W/kg

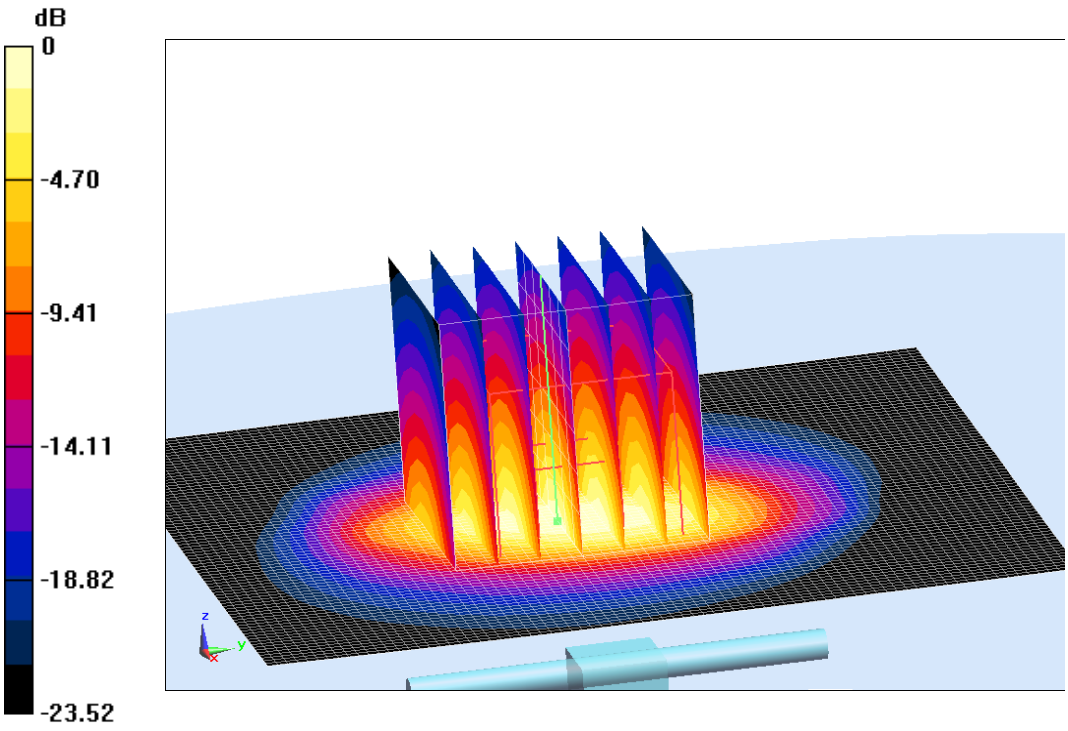
Fig.B.10 validation 2450 MHz 250mW

2600 MHz

Date: 4/10/2017
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2600 MHz; σ =1.966 mho/m; ε_r = 39.57; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 = 115.02 V/m; Power Drift = -0.02
Fast SAR: SAR(1 g) = 14.04 W/kg; SAR(10 g) = 6.23 W/kg
Maximum value of SAR (interpolated) = 24.71 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =115.02 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 30.77 W/kg
SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.34 W/kg
Maximum value of SAR (measured) = 24.43 W/kg



0 dB = 24.43 W/kg = 13.88 dB W/kg

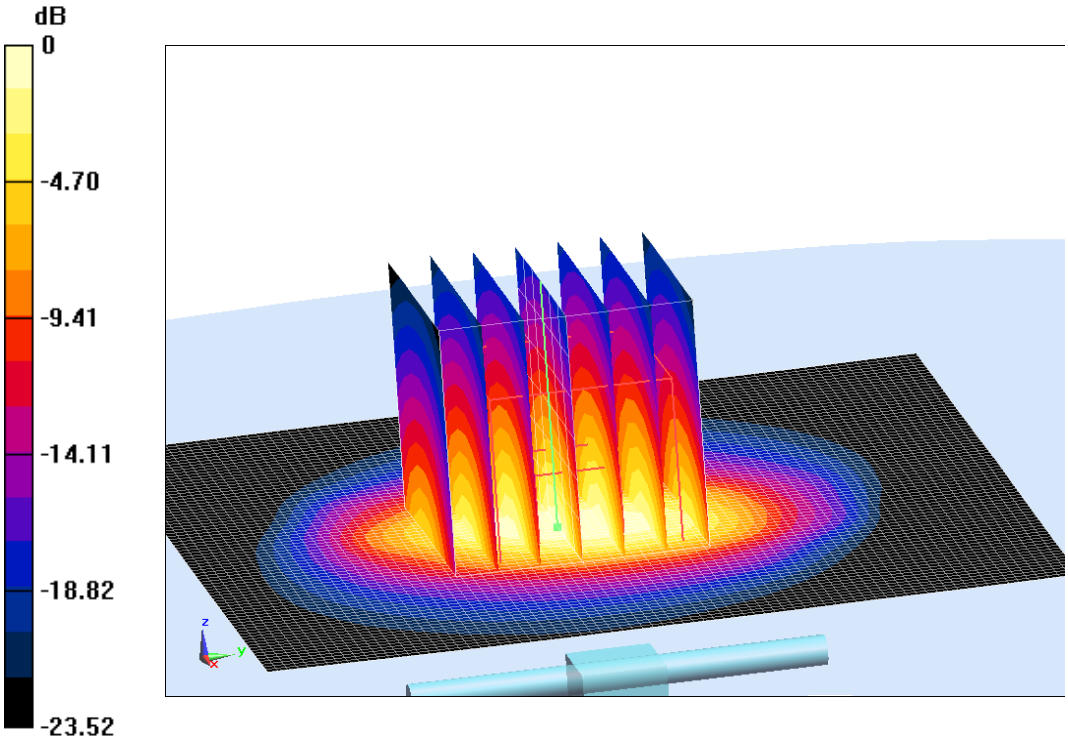
Fig.B.11 validation 2600 MHz 250mW

2600 MHz

Date: 4/10/2017
Electronics: DAE4 Sn1331
Medium: Body 2600 MHz
Medium parameters used: f = 2600 MHz; σ =2.138 mho/m; ε_r = 51.61; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 = 109.93 V/m; Power Drift = -0.01
Fast SAR: SAR(1 g) = 14.22 W/kg; SAR(10 g) = 6.19 W/kg
Maximum value of SAR (interpolated) = 23.31 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =109.93 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 28.93 W/kg
SAR(1 g) = 13.95 W/kg; SAR(10 g) = 6.4 W/kg
Maximum value of SAR (measured) = 23.92 W/kg



0 dB = 23.92 W/kg = 13.79 dB W/kg

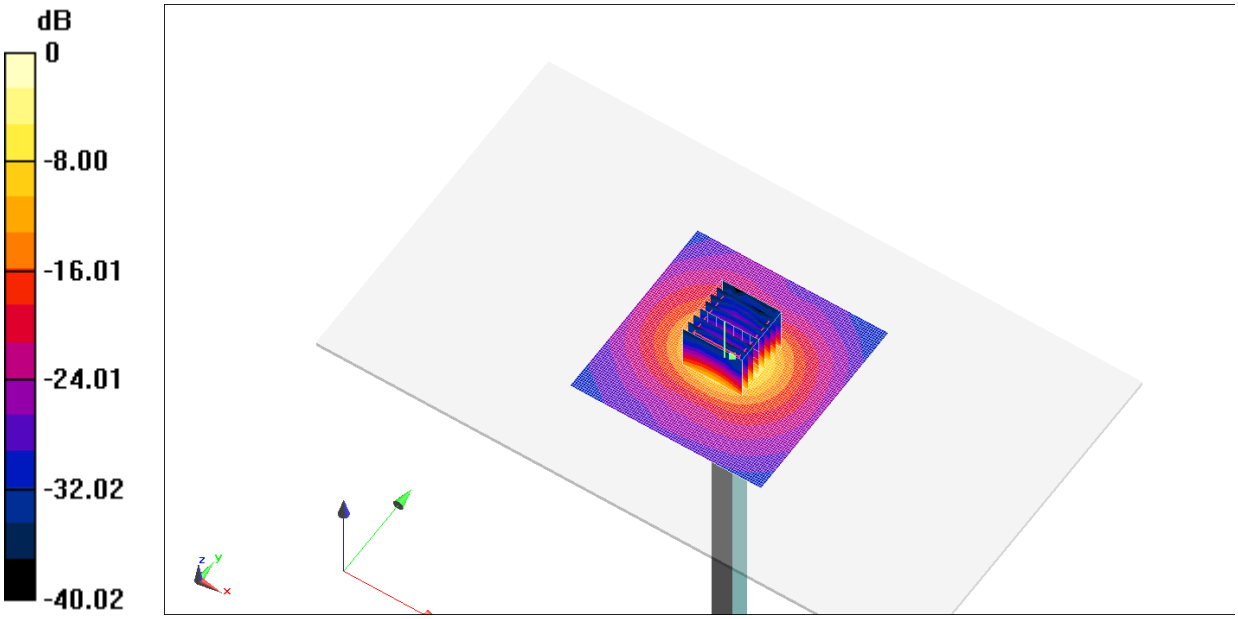
Fig.B.12 validation 2600 MHz 250mW

5250MHz

Date: 2017-4-11
Electronics: DAE4 Sn1331
Medium: Head 5 GHz
Medium parameters used: f = 5250 MHz; σ = 4.726 mho/m; ε_r = 36.28; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 5250 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(5.37, 5.37, 5.37)

System Validation /Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 18.8 W/kg

System Validation /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.88 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 34.9 W/kg
SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.2 W/kg
Maximum value of SAR (measured) = 18.9 W/kg



0 dB = 18.9 W/kg = 12.76 dBW/kg

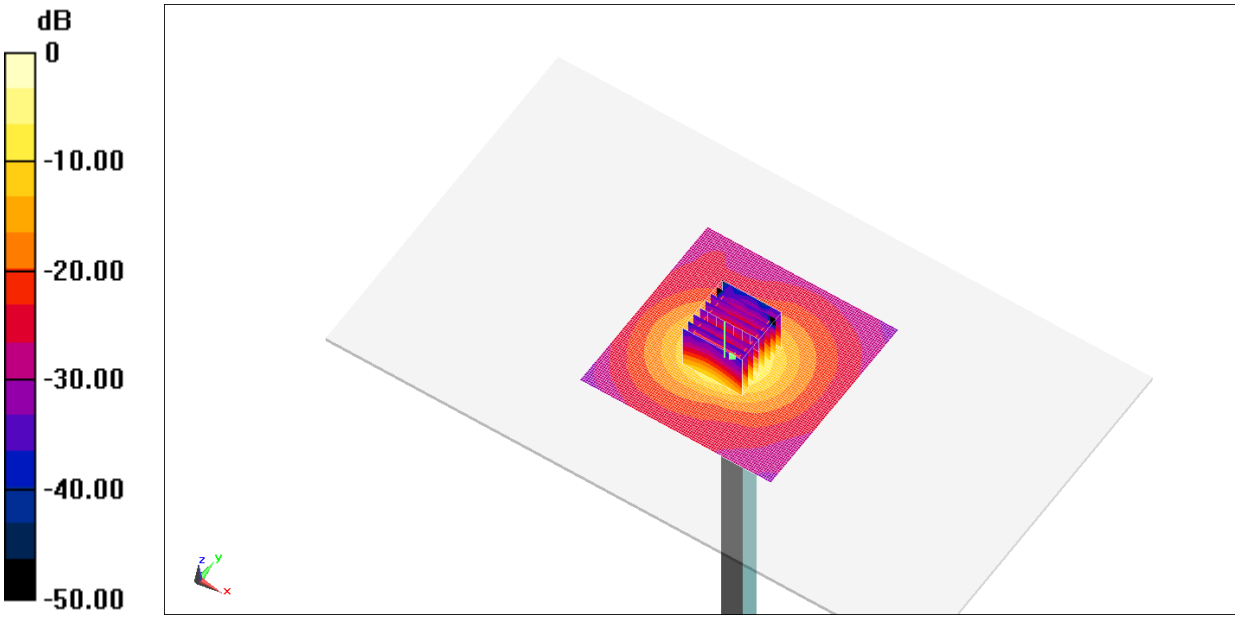
Fig.B.13 validation 5250MHz 100mW

5250MHz

Date: 2017-4-11
Electronics: DAE4 Sn1331
Medium: Body 5 GHz
Medium parameters used: f = 5250 MHz; σ = 5.259 mho/m; ε_r = 47.44; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 5250 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(4.95, 4.95, 4.95)

System Validation /Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 17.5 W/kg

System Validation /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 62.22 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 30.5 W/kg
SAR(1 g) = 7.54 W/kg; SAR(10 g) = 2.13 W/kg
Maximum value of SAR (measured) = 17.3 W/kg



0 dB = 17.3 W/kg = 12.38 dBW/kg

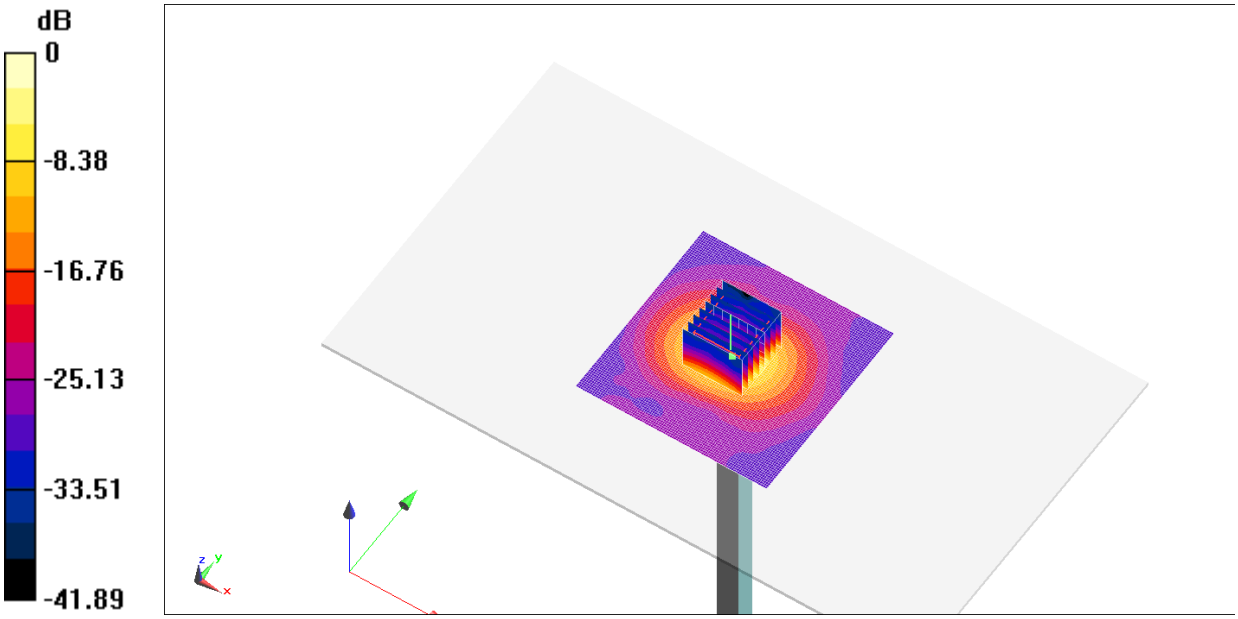
Fig.B.14 validation 5250MHz 100mW

5600MHz

Date: 2017-4-11
Electronics: DAE4 Sn1331
Medium: Head 5 GHz
Medium parameters used: f = 5600 MHz; σ = 5.199 mho/m; ε_r = 35.73; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 5600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(4.72, 4.72, 4.72)

System Validation /Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 19.7 W/kg

System Validation /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 71.29 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 37.6 W/kg
SAR(1 g) = 8.2 W/kg; SAR(10 g) = 2.31 W/kg
Maximum value of SAR (measured) = 20.3 W/kg



0 dB = 20.3 W/kg = 13.07 dBW/kg

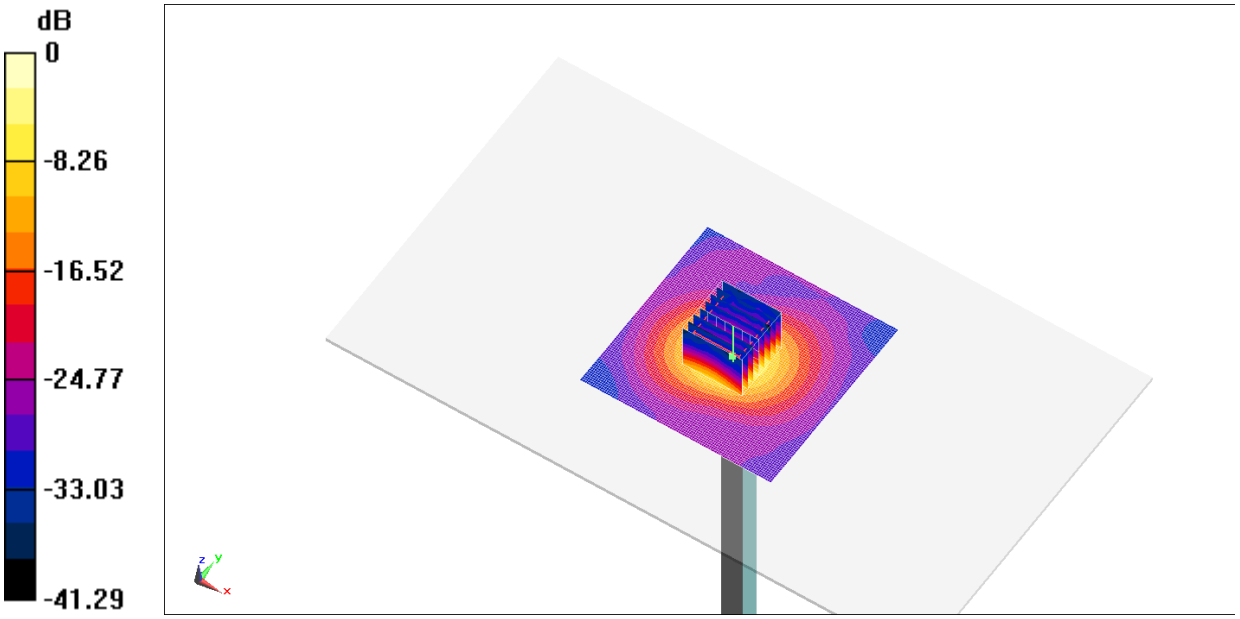
Fig.B.15 validation 5600MHz 100mW

5600MHz

Date: 2017-4-11
Electronics: DAE4 Sn1331
Medium: Body 5 GHz
Medium parameters used: f = 5600 MHz; σ = 5.708 mho/m; ε_r = 46.98; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 5600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(4.18, 4.18, 4.18)

System Validation /Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 18.9 W/kg

System Validation /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 66.52 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 7.93 W/kg; SAR(10 g) = 2.25 W/kg
Maximum value of SAR (measured) = 18.5 W/kg



0 dB = 18.5 W/kg = 12.67 dBW/kg

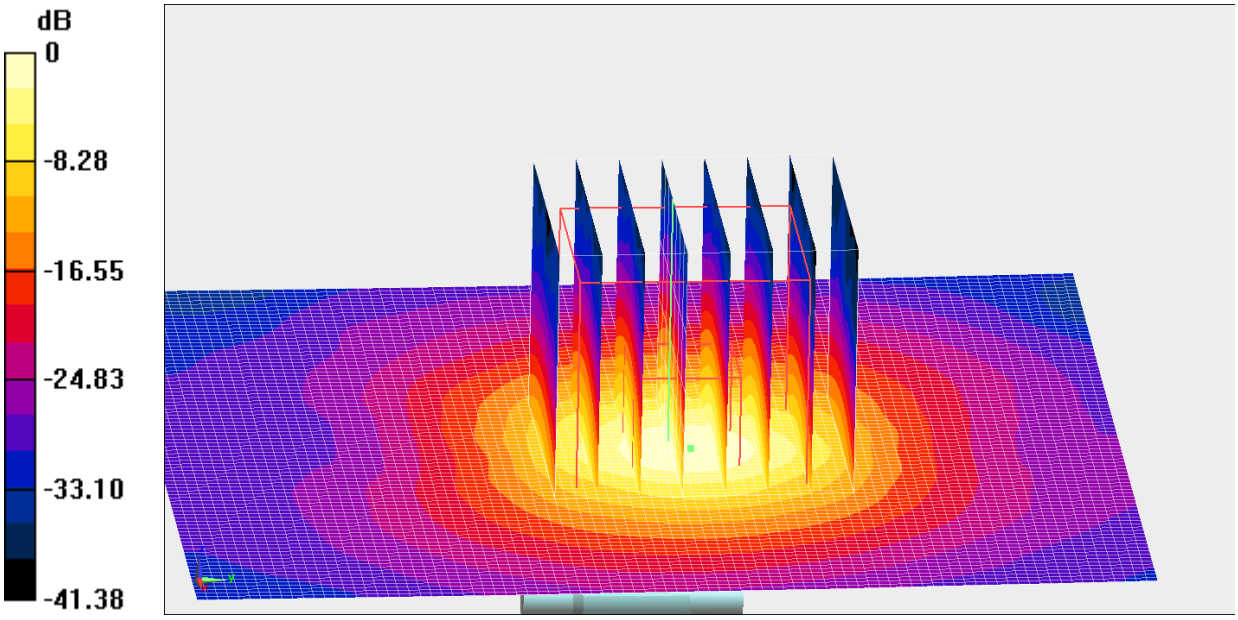
Fig.B.16 validation 5600MHz 100mW

5750MHz

Date: 2017-4-11
Electronics: DAE4 Sn1331
Medium: Head 5 GHz
Medium parameters used: f = 5750 MHz; σ = 5.414 mho/m; ε_r = 35.38; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 5750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(4.95, 4.95, 4.95)

System Validation /Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 19.9 W/kg

System Validation /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 61.40 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 38.7 W/kg
SAR(1 g) = 8.12 W/kg; SAR(10 g) = 2.27 W/kg
Maximum value of SAR (measured) = 20.5 W/kg



0 dB = 20.5 W/kg = 13.12 dBW/kg

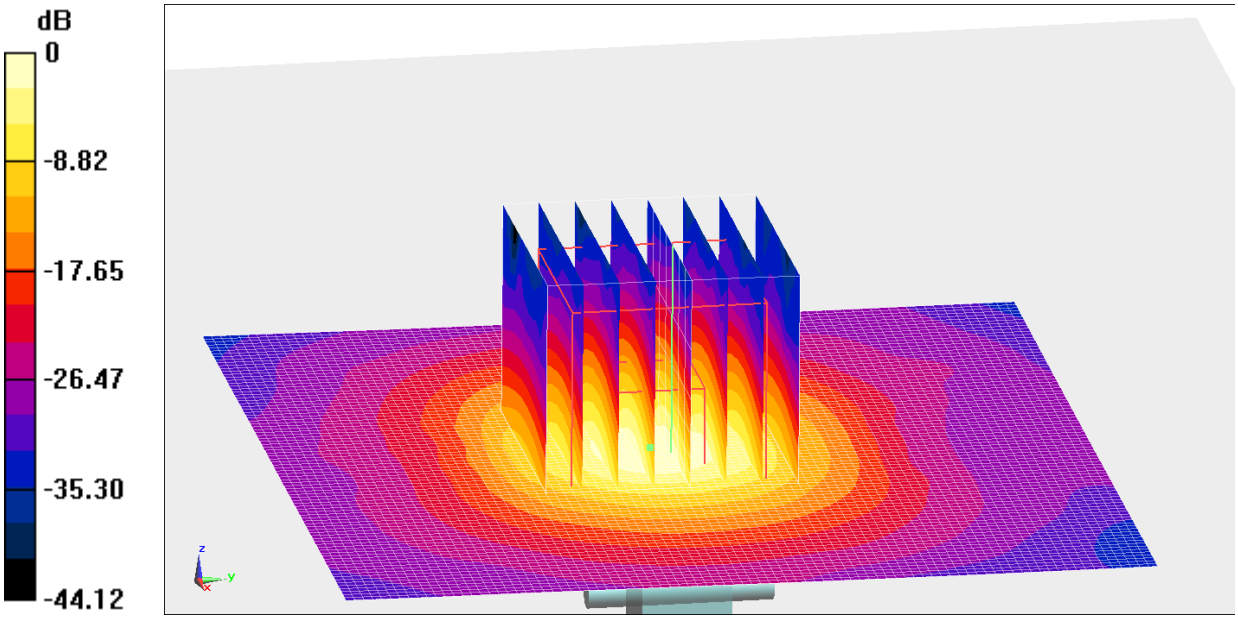
Fig.B.17 validation 5750MHz 100mW

5750MHz

Date: 2017-4-11
Electronics: DAE4 Sn1331
Medium: Body 5 GHz
Medium parameters used: f = 5750 MHz; σ = 5.992 mho/m; ε_r = 46.78; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 5750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(4.53, 4.53, 4.53)

System Validation /Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 17.8 W/kg

System Validation /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.81 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 30.9 W/kg
SAR(1 g) = 7.42 W/kg; SAR(10 g) = 2.09 W/kg
Maximum value of SAR (measured) = 18.3 W/kg



0 dB = 18.3 W/kg = 12.62 dBW/kg

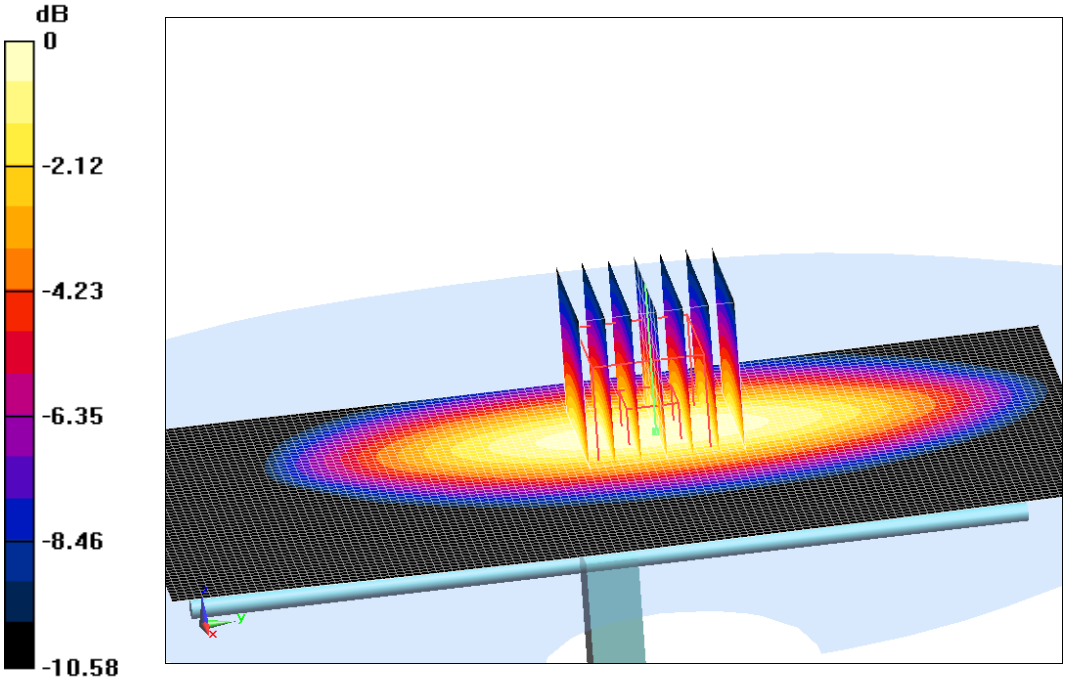
Fig.B.18 validation 5750MHz 100mW

835 MHz

Date: 5/21/2017
Electronics: DAE4 Sn1331
Medium: Head 835 MHz
Medium parameters used: f = 835 MHz; σ =0.931 mho/m; ε_r = 41.95; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 =61.31 V/m; Power Drift = 0.02 dB
Fast SAR: SAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (interpolated) = 3.31 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =61.31 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.75 W/kg
SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.57 W/kg
Maximum value of SAR (measured) = 3.37 W/kg



0 dB = 3.37 W/kg = 5.28 dB W/kg

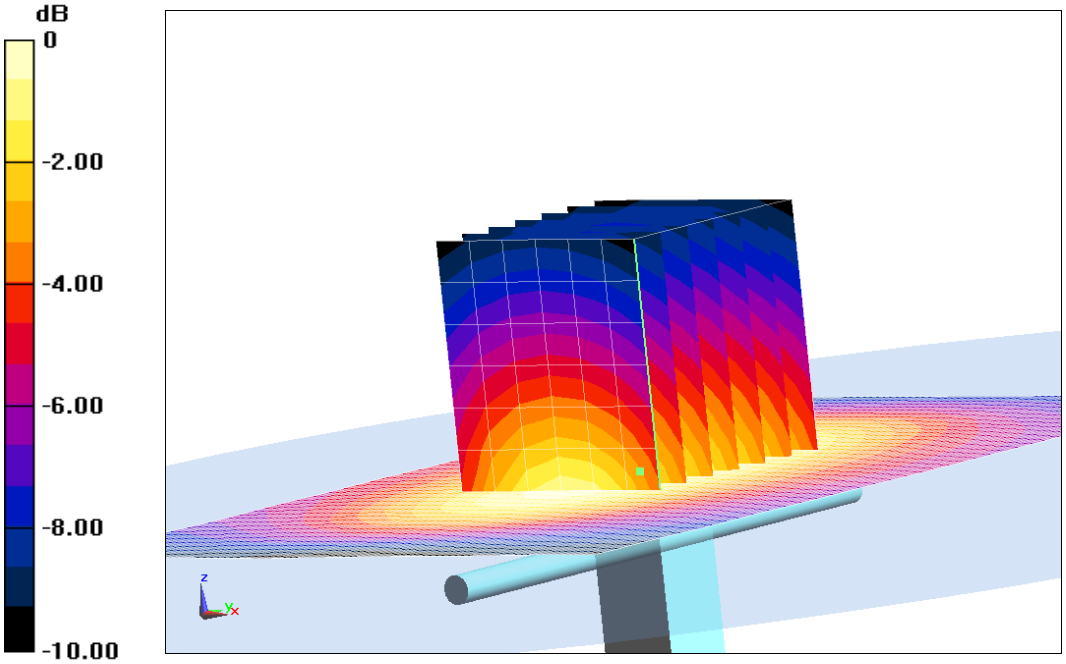
Fig.B.19 validation 835 MHz 250mW

835 MHz

Date: 5/21/2017
Electronics: DAE4 Sn1331
Medium: Body 835 MHz
Medium parameters used: f = 835 MHz; σ =0.968 mho/m; ε_r = 56.35; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 =60.84 V/m; Power Drift = 0.03 dB
Fast SAR: SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (interpolated) = 3.37 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =60.84 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.74 W/kg
SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.58 W/kg
Maximum value of SAR (measured) = 3.32 W/kg



0 dB = 3.32 W/kg = 5.21 dB W/kg

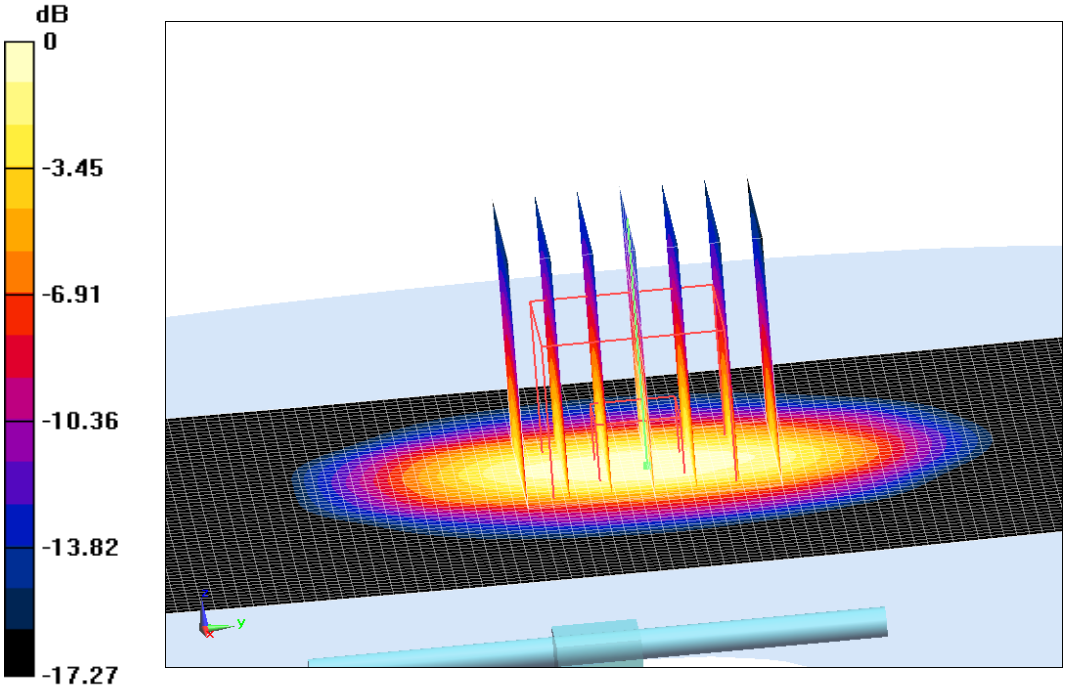
Fig.B.20 validation 835 MHz 250mW

1900 MHz

Date: 5/21/2017
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.409 mho/m; ε_r = 40.65; ρ = 1000 kg/m^3
Ambient Temperature: 22.5^{o}C Liquid Temperature: 23.3^{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 =106.36 V/m; Power Drift = 0.03 dB
Fast SAR: SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.16 W/kg
Maximum value of SAR (interpolated) = 15.5 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =106.36 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 18.91 W/kg
SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.29 W/kg
Maximum value of SAR (measured) = 15.7 W/kg



0 dB = 15.7 W/kg = 11.96 dB W/kg

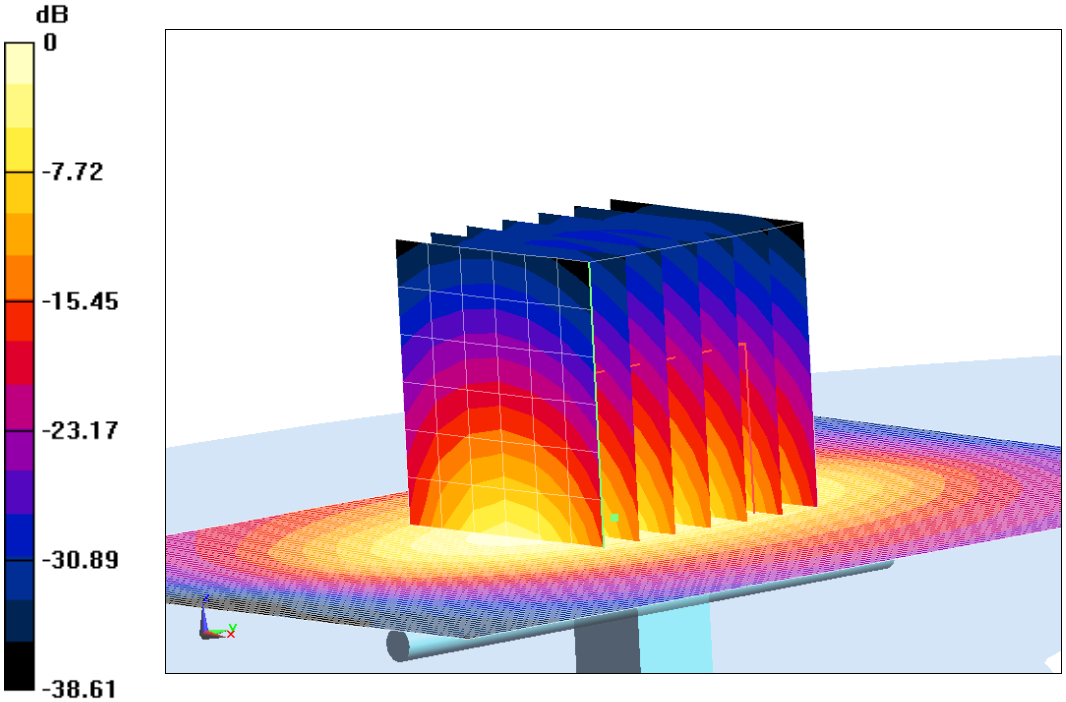
Fig.B.21 validation 1900 MHz 250mW

1900 MHz

Date: 5/21/2017
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.547 mho/m; ε_r = 52.69; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 =105.94 V/m; Power Drift = -0.06 dB
Fast SAR: SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.35 W/kg
Maximum value of SAR (interpolated) = 14.8 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =105.94 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 17.87 W/kg
SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.26 W/kg
Maximum value of SAR (measured) = 14.7 W/kg



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

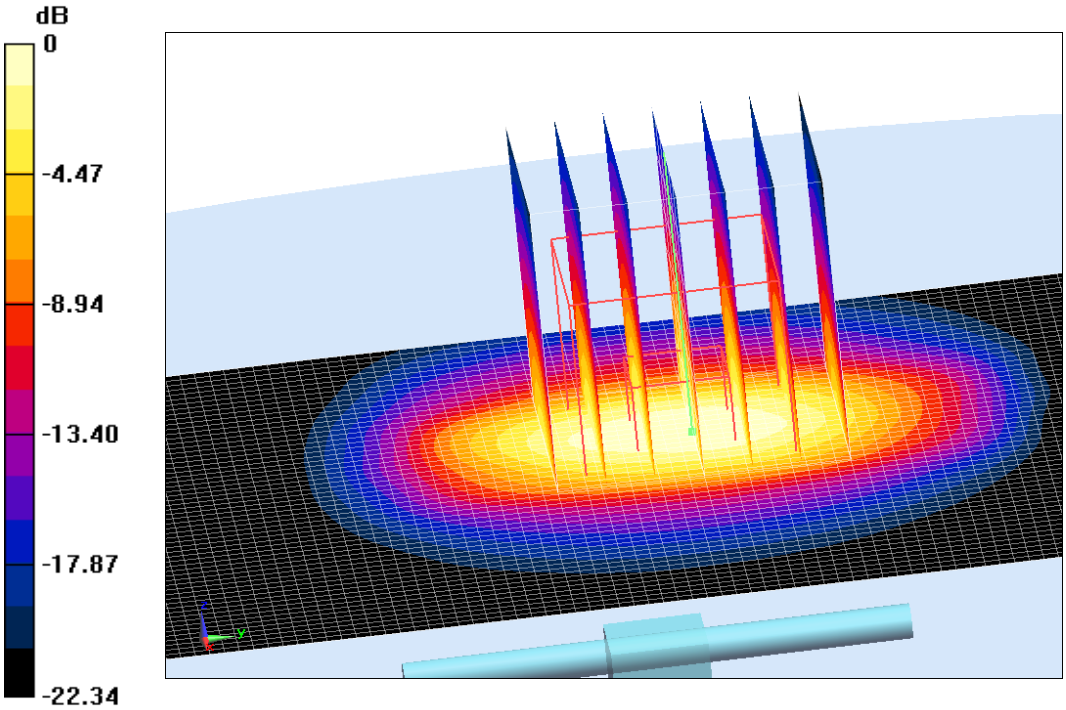
Fig.B.22 validation 1900 MHz 250mW

2450 MHz

Date: 5/22/2017
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.764 mho/m; ε_r = 39.46; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 =115.88 V/m; Power Drift = -0.01 dB
Fast SAR: SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.31 W/kg
Maximum value of SAR (interpolated) = 22.7 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =115.88 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 27.3 W/kg
SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.24 W/kg
Maximum value of SAR (measured) = 22.6 W/kg



0 dB = 22.6 W/kg = 13.54 dB W/kg

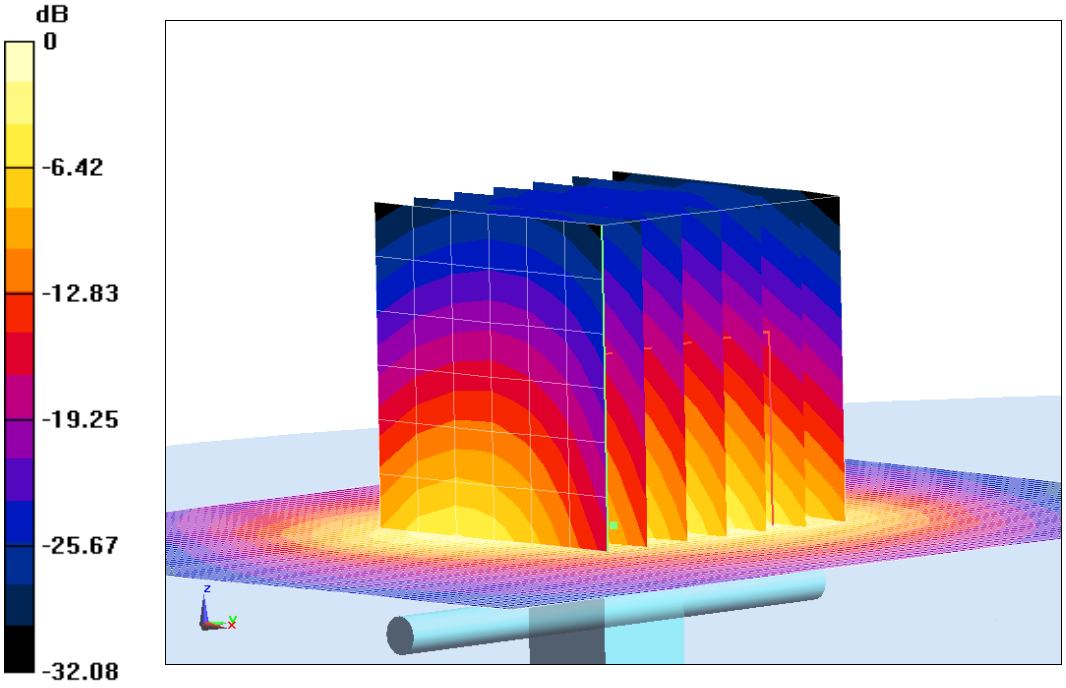
Fig.B.23 validation 2450 MHz 250mW

2450 MHz

Date: 5/22/2017
Electronics: DAE4 Sn1331
Medium: Body 2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.977 mho/m; ε_r = 53.16; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 =106.79 V/m; Power Drift = -0.05 dB
Fast SAR: SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.17 W/kg
Maximum value of SAR (interpolated) = 21.9 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =106.79 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 26.48 W/kg
SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.09 W/kg
Maximum value of SAR (measured) = 21.8 W/kg



0 dB = 21.8 W/kg = 13.38 dB W/kg

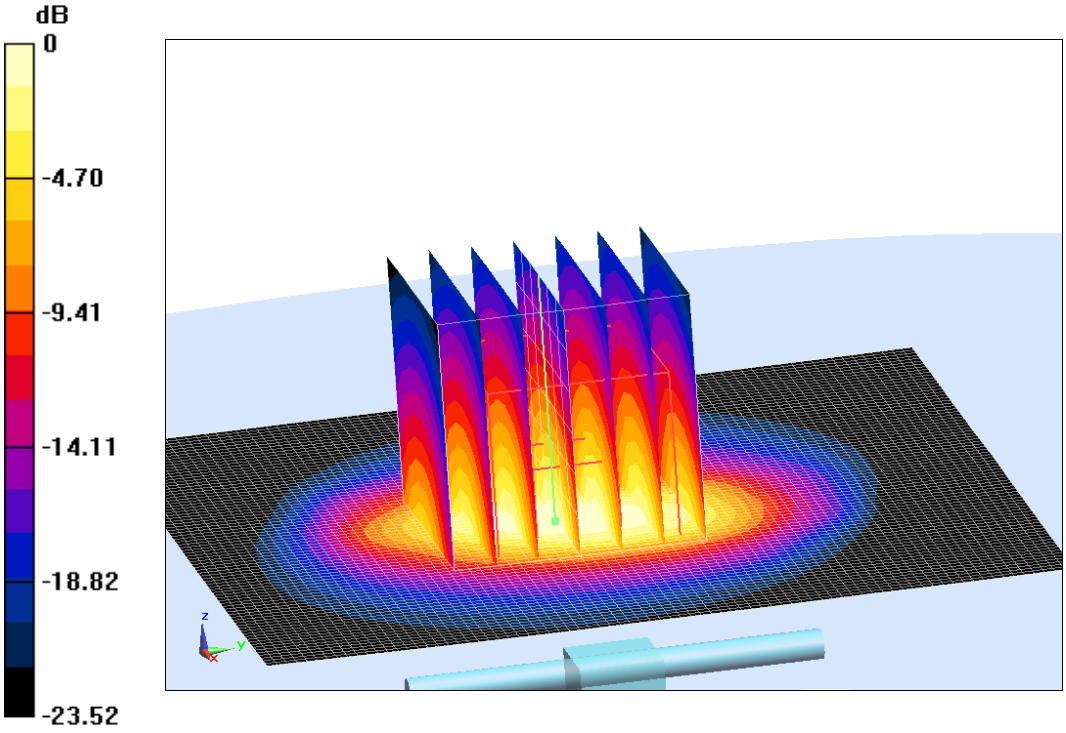
Fig.B.24 validation 2450 MHz 250mW

2600 MHz

Date: 5/20/2017
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2600 MHz; σ =1.986 mho/m; ε_r = 39.46; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 =114.75 V/m; Power Drift = 0.02 dB
Fast SAR: SAR(1 g) = 14.6 W/kg; SAR(10 g) = 6.51 W/kg
Maximum value of SAR (interpolated) = 24.7 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =114.75 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 30.72 W/kg
SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.38 W/kg
Maximum value of SAR (measured) = 24.4 W/kg



0 dB = 24.4 W/kg = 13.87 dB W/kg

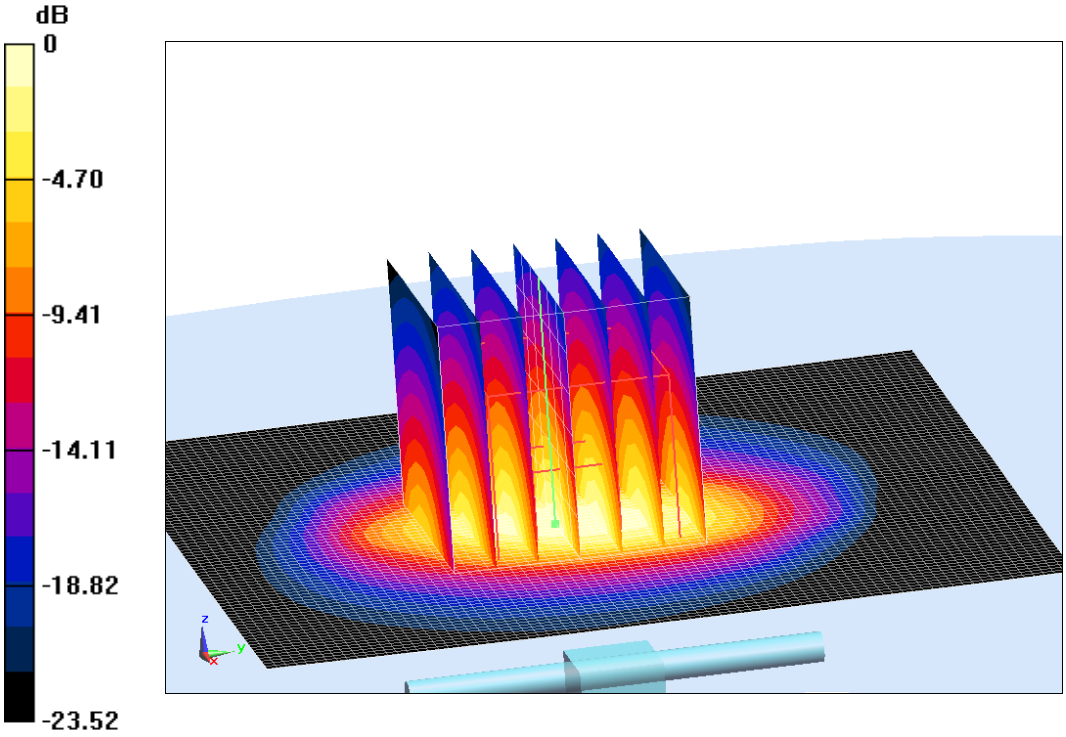
Fig.B.25 validation 2600 MHz 250mW

2600 MHz

Date: 5/20/2017
Electronics: DAE4 Sn1331
Medium: Body 2600 MHz
Medium parameters used: f = 2600 MHz; σ =2.178 mho/m; ε_r = 51.82; ρ = 1000 kg/m^3
Ambient Temperature: 22.5°C Liquid Temperature: 23.3°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 =109.52 V/m; Power Drift = -0.03 dB
Fast SAR: SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.19 W/kg
Maximum value of SAR (interpolated) = 23.4 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =109.52 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 28.88 W/kg
SAR(1 g) = 13.9 W/kg; SAR(10 g) = 6.32 W/kg
Maximum value of SAR (measured) = 23.8 W/kg



0 dB = 23.8 W/kg = 13.77 dB W/kg

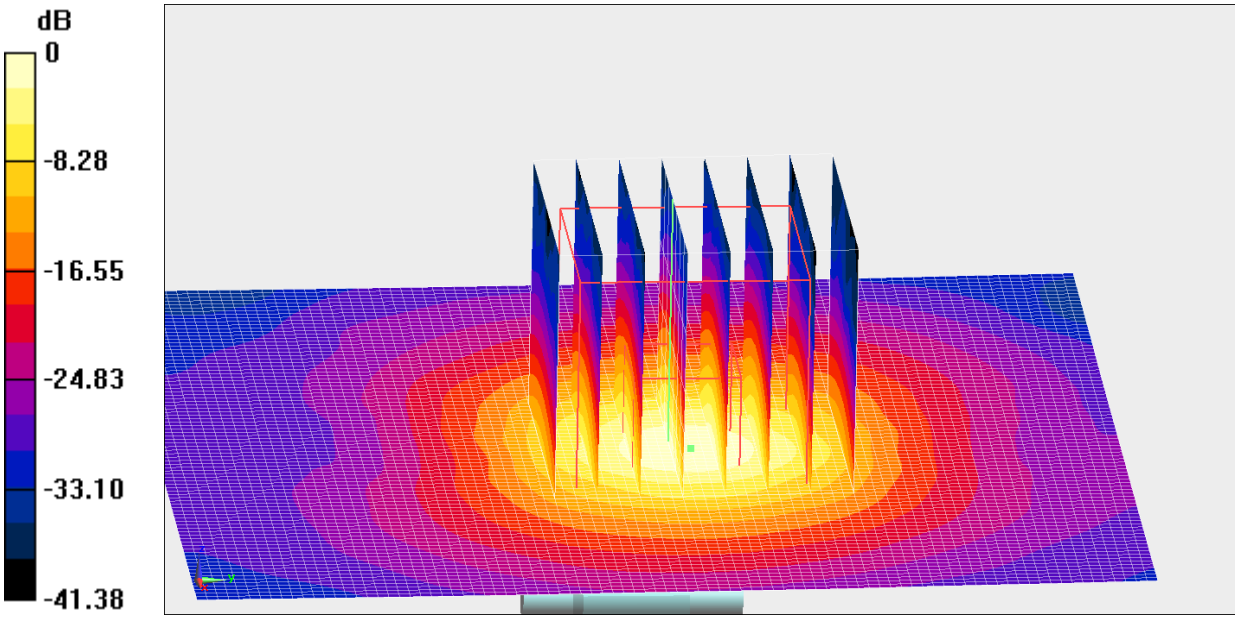
Fig.B.26 validation 2600 MHz 250mW

5750MHz

Date: 2017-5-22
Electronics: DAE4 Sn1331
Medium: Head 5 GHz
Medium parameters used: f = 5750 MHz; σ = 5.313 mho/m; ε_r = 35.79; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 5750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(4.95, 4.95, 4.95)

System Validation /Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 20.2 W/kg

System Validation /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 61.65 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 38.73 W/kg
SAR(1 g) = 8.14 W/kg; SAR(10 g) = 2.31 W/kg
Maximum value of SAR (measured) = 20.5 W/kg



0 dB = 20.5 W/kg = 13.12 dBW/kg

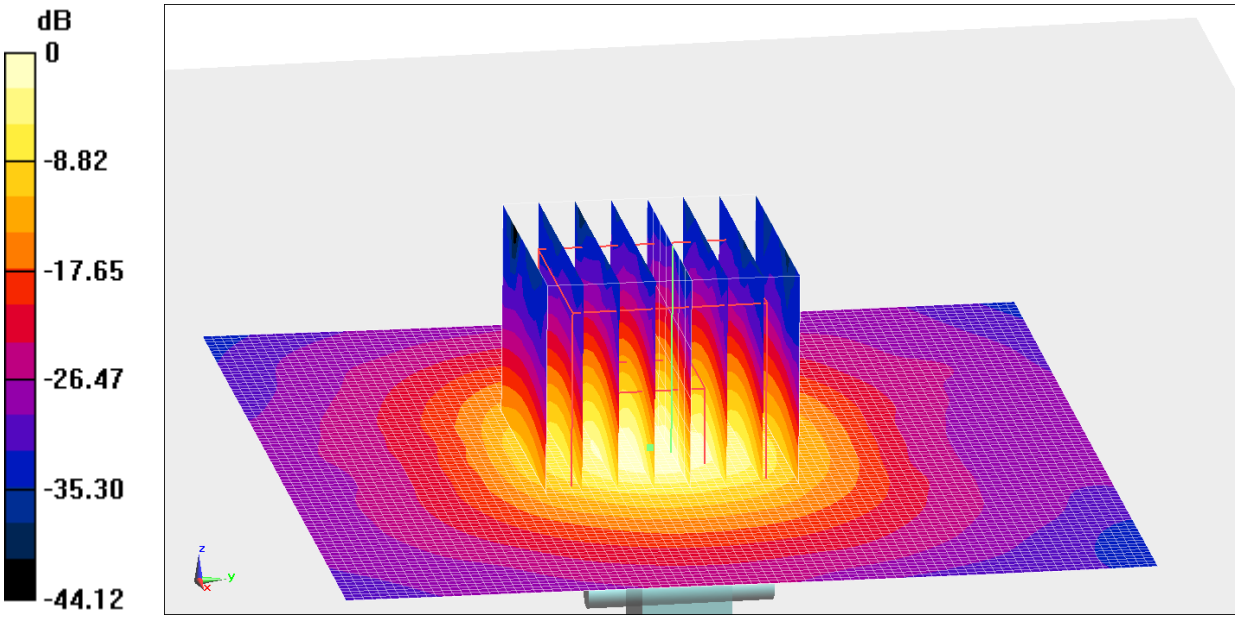
Fig.B.27 validation 5750MHz 100mW

5750MHz

Date: 2017-5-22
Electronics: DAE4 Sn1331
Medium: Body 5 GHz
Medium parameters used: f = 5750 MHz; σ = 5.892 mho/m; ε_r = 47.08; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 5750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3846 ConvF(4.53, 4.53, 4.53)

System Validation /Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 17.9 W/kg

System Validation /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.32 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 30.95 W/kg
SAR(1 g) = 7.49 W/kg; SAR(10 g) = 2.14 W/kg
Maximum value of SAR (measured) = 18.4 W/kg



0 dB = 18.4 W/kg = 12.65 dBW/kg

Fig.B.28 validation 5750MHz 100mW

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.

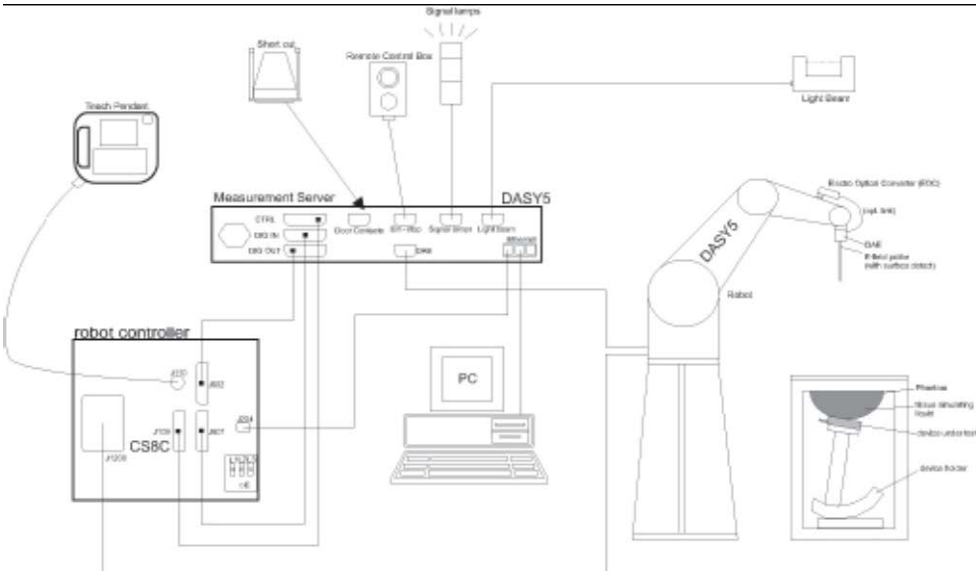
Table B.1 Comparison between area scan and zoom scan for system verification

Date	Band	Position	Area scan (1g)	Zoom scan (1g)	Drift (%)
2017-4-6	835	Head	2.36	2.39	-1.26
	835	Body	2.33	2.32	0.43
2017-4-8	1900	Head	10.21	10.32	-1.07
	1900	Body	10.35	10.08	2.68
2017-4-9	2300	Head	13.1	13.44	-2.53
	2300	Body	13.36	13.06	2.30
2017-4-10	2450	Head	14.04	14.4	-2.50
	2450	Body	14.22	13.95	1.94
2017-4-11	2600	Head	2.05	2.08	-1.44
	2600	Body	2.08	2.12	-1.89
2017-5-21	835	Head	2.38	2.41	-1.24
	835	Body	2.37	2.35	0.85
2017-5-21	1900	Head	10.2	10.3	-0.97
	1900	Body	10.1	10.2	-0.98
2017-5-22	2450	Head	13.5	13.4	0.75
	2450	Body	13.2	13.1	0.76
2017-5-20	2600	Head	14.6	14.4	1.39
	2600	Body	13.7	13.9	-1.44

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 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
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 ofmobile 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