14 SAR Test Result

It is determined by user manual for the distance between the EUT and the phantom bottom.
The distance is 15 mm and just applied to the condition of body worn accessory.
It is performed for all SAR measurements with area scan based 1-g SAR estimation (Fast SAR). A zoom scan measurement is added when the estimated 1-gSAR is the highest measured SAR in each exposure configuration, wireless mode and frequency band combination or more than 1.2W/kg.
The calculated SAR is obtained by the following formula:

$$\text{Reported SAR} = \text{Measured SAR} \times 10^{(P_{Target}-P_{Measured})/10}$$

Where P_{Target} is the power of manufacturing upper limit;
$P_{Measured}$ is the measured power in chapter 11.

Table 14.1: Duty Cycle

Mode	Duty Cycle
Speech for GSM850/1900	1:8.3
GPRS&EGPRS for GSM850	1:2
GPRS&EGPRS for GSM1900	1:2.67
WCDMA&LTE	1:1

14.1 SAR results for Fast SAR

Table 14.1-1: SAR Values (GSM 850 MHz Band - Head)

Ambient Temperature: 22.9 °C					Liquid Temperature: 22.5 °C						
Frequency		Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
836.6	190	Left	Touch	/	32.30	33.2	0.274	**0.34**	0.407	**0.50**	0.10
836.6	190	Left	Tilt	/	32.30	33.2	0.145	**0.18**	0.207	**0.25**	-0.03
848.8	251	Right	Touch	Fig.1	32.37	33.2	0.360	**0.44**	0.571	**0.69**	0.02
836.6	190	Right	Touch	/	32.30	33.2	0.320	**0.39**	0.503	**0.62**	-0.01
824.2	128	Right	Touch	/	32.17	33.2	0.296	**0.38**	0.465	**0.59**	-0.01
836.6	190	Right	Tilt	/	32.30	33.2	0.152	**0.19**	0.221	**0.27**	0.04

Table 14.1-2: SAR Values (GSM 850 MHz Band-Body)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C											
Frequency		Mode (number of timeslots)	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
836.6	190	GPRS (4)	Front closed	/	27.31	27.7	0.071	**0.08**	0.093	**0.10**	0.08
848.8	251	GPRS (4)	Rear closed	Fig.2	27.41	27.7	0.322	**0.34**	0.446	**0.48**	0.19
836.6	190	GPRS (4)	Rear closed	/	27.31	27.7	0.273	**0.30**	0.395	**0.43**	-0.04
824.2	128	GPRS (4)	Rear closed	/	27.25	27.7	0.210	**0.23**	0.288	**0.32**	0.07
836.6	190	GPRS (4)	Rear open	/	27.31	27.7	0.137	**0.15**	0.226	**0.25**	0.09
848.8	251	EGPRS (4)	Rear closed	/	27.42	27.7	0.306	**0.33**	0.441	**0.47**	0.10

Note1: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-3: SAR Values (GSM1900 MHz Band - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C											
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
1909.8	810	Left	Touch	/	30.18	30.7	0.090	**0.10**	0.131	**0.15**	0.09
1880	661	Left	Touch	Fig.3	30.07	30.7	0.093	**0.11**	0.138	**0.16**	-0.06
1850.2	512	Left	Touch	/	29.93	30.7	0.085	**0.10**	0.124	**0.15**	-0.02
1880	661	Left	Tilt	/	30.07	30.7	0.041	**0.05**	0.058	**0.07**	0.11
1880	661	Right	Touch	/	30.07	30.7	0.056	**0.06**	0.079	**0.09**	0.12
1880	661	Right	Tilt	/	30.07	30.7	0.028	**0.03**	0.037	**0.04**	-0.08

Table 14.1-4: SAR Values (GSM 1900 MHz Band-Body)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C											
Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
1880	661	GPRS (3)	Front closed	/	26.24	26.7	0.054	**0.06**	0.089	**0.10**	0.05
1880	661	GPRS (3)	Rear closed	/	26.24	26.7	0.207	**0.23**	0.351	**0.39**	0.19
1909.8	810	GPRS (3)	Rear open	/	26.30	26.7	0.249	**0.27**	0.415	**0.46**	-0.03
1880	661	GPRS (3)	Rear open	/	26.24	26.7	0.284	**0.32**	0.471	**0.52**	0.15
1850.2	512	GPRS (3)	Rear open	Fig.4	26.14	26.7	0.297	**0.34**	0.481	**0.55**	-0.03
1850.2	512	EGPRS (3)	Rear open	/	26.13	26.7	0.281	**0.32**	0.474	**0.54**	-0.12

Note1: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-5: SAR Values (WCDMA850 MHz Band - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C											
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
836.4	4182	Left	Touch	/	23.56	24.2	0.268	**0.31**	0.392	**0.45**	0.01
836.4	4182	Left	Tilt	/	23.56	24.2	0.158	**0.18**	0.216	**0.25**	-0.03
846.6	4233	Right	Touch	/	23.60	24.2	0.284	**0.33**	0.434	**0.50**	-0.01
836.4	4182	Right	Touch	/	23.56	24.2	0.302	**0.35**	0.458	**0.53**	0.06
826.4	4132	Right	Touch	Fig.5	23.54	24.2	0.326	**0.38**	0.495	**0.58**	0.15
836.4	4182	Right	Tilt	/	23.56	24.2	0.172	**0.20**	0.239	**0.28**	-0.07

Table 14.1-6: SAR Values (WCDMA 850 MHz Band-Body)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
836.4	4182	Front closed	/	23.56	24.2	0.061	**0.07**	0.085	**0.10**	0.04
846.6	4233	Rear closed	/	23.60	24.2	0.214	**0.25**	0.312	**0.36**	0.02
836.4	4182	Rear closed	/	23.56	24.2	0.227	**0.26**	0.314	**0.36**	0.02
826.4	4132	Rear closed	Fig.6	23.54	24.2	0.248	**0.29**	0.340	**0.40**	-0.18
836.4	4182	Rear open	/	23.56	24.2	0.166	**0.19**	0.295	**0.34**	-0.02

Note1: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-7: SAR Values (WCDMA1700 MHz Band - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C											
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
1752.6	1513	Left	Touch	Fig.7	23.65	24.2	0.235	**0.27**	0.345	**0.39**	0.14
1732.4	1412	Left	Touch	/	23.78	24.2	0.215	**0.24**	0.321	**0.35**	0.08
1712.4	1312	Left	Touch	/	23.70	24.2	0.180	**0.20**	0.247	**0.28**	-0.11
1732.4	1412	Left	Tilt	/	23.78	24.2	0.136	**0.15**	0.163	**0.18**	-0.03
1732.4	1412	Right	Touch	/	23.78	24.2	0.178	**0.20**	0.217	**0.24**	0.09
1732.4	1412	Right	Tilt	/	23.78	24.2	0.117	**0.13**	0.137	**0.15**	-0.10

Table 14.1-8: SAR Values (WCDMA1700 MHz Band-Body)

Ambient Temperature: 22.9 °C		Liquid Temperature: 22.5 °C								
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
1732.4	1412	Front closed	/	23.78	24.2	0.135	**0.15**	0.213	**0.23**	0.11
1752.6	1513	Rear closed	/	23.65	24.2	0.472	**0.54**	0.768	**0.87**	-0.16
1732.4	1412	Rear closed	/	23.78	24.2	0.431	**0.48**	0.741	**0.82**	0.01
1712.4	1312	Rear closed	/	23.70	24.2	0.359	**0.40**	0.623	**0.70**	0.17
1752.6	1513	Rear open	/	23.65	24.2	0.613	**0.70**	0.983	**1.11**	-0.03
1732.4	1412	Rear open	/	23.78	24.2	0.526	**0.58**	0.900	**0.99**	-0.06
1712.4	1312	Rear open	/	23.70	24.2	0.443	**0.50**	0.756	**0.85**	-0.03

Note1: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-9: SAR Values(WCDMA1900 MHz Band - Head)

Ambient Temperature: 22.9 °C		Liquid Temperature: 22.5 °C									
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
1907.6	9538	Left	Touch	/	23.69	24.2	0.115	**0.13**	0.200	**0.22**	0.11
1880	9400	Left	Touch	Fig.9	23.67	24.2	0.161	**0.18**	0.245	**0.28**	-0.12
1852.4	9262	Left	Touch	/	23.80	24.2	0.118	**0.13**	0.223	**0.24**	0.03
1880	9400	Left	Tilt	/	23.67	24.2	0.053	**0.06**	0.085	**0.10**	0.01
1880	9400	Right	Touch	/	23.67	24.2	0.082	**0.09**	0.135	**0.15**	-0.12
1880	9400	Right	Tilt	/	23.67	24.2	0.040	**0.05**	0.064	**0.07**	-0.02

Table 14.1-10: SAR Values (WCDMA1900 MHz Band-Body)

Ambient Temperature: 22.9 °C										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
1880	9400	Front closed	/	23.67	24.2	0.156	**0.18**	0.256	**0.29**	0.04
1907.6	9538	Rear closed	/	23.69	24.2	0.548	**0.62**	0.91	**1.02**	0.10
1880	9400	Rear closed	/	23.67	24.2	0.566	**0.64**	0.952	**1.08**	-0.05
1852.4	9262	Rear closed	/	23.80	24.2	0.609	**0.67**	1.00	**1.10**	-0.09
1907.6	9538	Rear open	/	23.69	24.2	0.572	**0.64**	0.909	**1.02**	-0.12
1880	9400	Rear open	/	23.67	24.2	0.630	**0.71**	1.00	**1.13**	0.08
1852.4	9262	Rear open	Fig.10	23.80	24.2	0.657	**0.72**	1.04	**1.14**	0.02

Note1: The distance between the EUT and the phantom bottom is 15mm.

Table 14.1-11: SAR Values (LTE Band2 - Head)

Ambient Temperature: 22.9 °C												
Frequency		Mode	Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.											
1860	18700	1RB_Low	Left	Touch	Fig.11	24.01	24.2	0.204	**0.21**	0.305	**0.32**	0.05
1860	18700	1RB_Low	Left	Tilt	/	24.01	24.2	0.091	**0.10**	0.151	**0.16**	0.05
1860	18700	1RB_Low	Right	Touch	/	24.01	24.2	0.155	**0.16**	0.285	**0.30**	-0.01
1860	18700	1RB_Low	Right	Tilt	/	24.01	24.2	0.059	**0.06**	0.096	**0.10**	0.02
1860	18700	50RB_Low	Left	Touch	/	22.86	23.2	0.134	**0.14**	0.213	**0.23**	-0.11
1860	18700	50RB_Low	Left	Tilt	/	22.86	23.2	0.065	**0.07**	0.108	**0.12**	0.07
1860	18700	50RB_Low	Right	Touch	/	22.86	23.2	0.131	**0.14**	0.205	**0.22**	-0.12
1860	18700	50RB_Low	Right	Tilt	/	22.86	23.2	0.047	**0.05**	0.076	**0.08**	0.11

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-12: SAR Values (LTE Band2 -Body)

Ambient Temperature: 22.9 °C		Liquid Temperature: 22.5 °C									
Frequency		Mode	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
1860	18700	1RB_Low	Front closed	/	24.01	24.2	0.160	**0.17**	0.237	**0.25**	-0.09
1900	19100	1RB_High	Rear closed	/	23.75	24.2	0.489	**0.54**	0.771	**0.86**	0.11
1880	18900	1RB_Low	Rear closed	/	23.94	24.2	0.499	**0.53**	0.785	**0.83**	0.02
1860	18700	1RB_Low	Rear closed	Fig.12	24.01	24.2	0.518	**0.54**	0.818	**0.85**	-0.1
1860	18700	1RB_Low	Rear open	/	24.01	24.2	0.468	**0.49**	0.762	**0.80**	0.04
1860	18700	50RB_Low	Front closed	/	22.86	23.2	0.125	**0.13**	0.186	**0.20**	0.16
1860	18700	50RB_Low	Rear closed	/	22.86	23.2	0.416	**0.45**	0.653	**0.71**	0.1
1860	18700	50RB_Low	Rear open	/	22.86	23.2	0.424	**0.46**	0.621	**0.67**	0.12
1860	18700	100RB	Rear closed	/	22.82	23.2	0.395	**0.43**	0.620	**0.68**	0.1

Note1: The distance between the EUT and the phantom bottom is 15mm.

Note2: The LTE mode is QPSK_20MHz.

Table 14.1-13: SAR Values(LTE Band4 - Head)

Ambient Temperature: 22.9 °C		Liquid Temperature: 22.5 °C										
Frequency		Mode	Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.											
1745	20300	1RB_Low	Left	Touch	Fig.13	23.87	24.2	0.158	**0.17**	0.231	**0.25**	-0.13
1745	20300	1RB_Low	Left	Tilt	/	23.87	24.2	0.082	**0.09**	0.112	**0.12**	0.11
1745	20300	1RB_Low	Right	Touch	/	23.87	24.2	0.123	**0.13**	0.175	**0.19**	-0.11
1745	20300	1RB_Low	Right	Tilt	/	23.87	24.2	0.062	**0.07**	0.082	**0.09**	0.09
1745	20300	50RB_Low	Left	Touch	/	22.82	23.2	0.127	**0.14**	0.205	**0.22**	0.12
1745	20300	50RB_Low	Left	Tilt	/	22.82	23.2	0.064	**0.07**	0.086	**0.09**	-0.14
1745	20300	50RB_Low	Right	Touch	/	22.82	23.2	0.095	**0.10**	0.140	**0.15**	0.06
1745	20300	50RB_Low	Right	Tilt	/	22.82	23.2	0.050	**0.05**	0.066	**0.07**	-0.03

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-14: SAR Values (LTE Band4 -Body)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C											
Frequency		Mode	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
1745	20300	1RB_Low	Front closed	/	23.87	24.2	0.143	**0.15**	0.228	**0.25**	0.06
1745	20300	1RB_Low	Rear closed	/	23.87	24.2	0.428	**0.46**	0.744	**0.80**	-0.10
1732.5	20175	1RB_High	Rear closed	/	23.81	24.2	0.483	**0.53**	0.785	**0.86**	-0.03
1720	20050	1RB_High	Rear closed	/	23.78	24.2	0.440	**0.49**	0.771	**0.85**	0.11
1745	20300	1RB_Low	Rear open	Fig.14	23.87	24.2	0.648	**0.70**	1.06	**1.14**	-0.03
1732.5	20175	1RB_High	Rear open	/	23.81	24.2	0.549	**0.60**	0.938	**1.02**	-0.14
1720	20050	1RB_High	Rear open	/	23.78	24.2	0.572	**0.63**	0.996	**1.10**	-0.02
1745	20300	50RB_Low	Front closed	/	22.82	23.2	0.121	**0.13**	0.193	**0.21**	-0.1
1745	20300	50RB_Low	Rear closed	/	22.82	23.2	0.409	**0.45**	0.713	**0.78**	0.01
1745	20300	50RB_Low	Rear open	/	22.82	23.2	0.526	**0.57**	0.910	**0.99**	-0.10
1732.5	20175	50RB_Low	Rear open	/	22.76	23.2	0.469	**0.52**	0.802	**0.89**	0.16
1720	20050	50RB_Low	Rear open	/	22.70	23.2	0.424	**0.48**	0.722	**0.81**	0.11
1745	20300	100RB	Rear open	/	22.81	23.2	0.543	**0.59**	0.930	**1.02**	0.01

Note1: The distance between the EUT and the phantom bottom is 15mm.
Note2: The LTE mode is QPSK_20MHz.

Table 14.1-15: SAR Values (LTE Band5 - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C												
Frequency		Mode	Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.											
836.5	20525	1RB_Mid	Left	Touch	/	23.65	24.2	0.299	**0.34**	0.437	**0.50**	0.02
836.5	20525	1RB_Mid	Left	Tilt	/	23.65	24.2	0.175	**0.20**	0.240	**0.27**	-0.03
836.5	20525	1RB_Mid	Right	Touch	Fig.15	23.65	24.2	0.347	**0.39**	0.540	**0.61**	-0.14
836.5	20525	1RB_Mid	Right	Tilt	/	23.65	24.2	0.187	**0.21**	0.261	**0.30**	-0.02
829	20450	25RB_Mid	Left	Touch	/	22.72	23.2	0.250	**0.28**	0.364	**0.41**	-0.1
829	20450	25RB_Mid	Left	Tilt	/	22.72	23.2	0.150	**0.17**	0.206	**0.23**	0.01
829	20450	25RB_Mid	Right	Touch	/	22.72	23.2	0.318	**0.36**	0.487	**0.54**	0.06
829	20450	25RB_Mid	Right	Tilt	/	22.72	23.2	0.162	**0.18**	0.226	**0.25**	0.01

Note1: The LTE mode is QPSK_10MHz.

Table 14.1-16: SAR Values (LTE Band5 -Body)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C												
Frequency		Mode	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)	
MHz	Ch.											
836.5	20525	1RB_Mid	Front closed	/	23.65	24.2	0.064	**0.07**	0.087	**0.10**	0.03	
836.5	20525	1RB_Mid	Rear closed	Fig.16	23.65	24.2	0.288	**0.33**	0.393	**0.45**	0.16	
836.5	20525	1RB_Mid	Rear open	/	23.65	24.2	0.177	**0.20**	0.295	**0.34**	0.05	
829	20450	25RB_Mid	Front closed	/	22.72	23.2	0.051	**0.06**	0.070	**0.08**	-0.03	
829	20450	25RB_Mid	Rear closed	/	22.72	23.2	0.187	**0.21**	0.276	**0.31**	-0.01	
829	20450	25RB_Mid	Rear open	/	22.72	23.2	0.129	**0.14**	0.229	**0.26**	-0.06	

Note1: The distance between the EUT and the phantom bottom is 15mm.
Note2: The LTE mode is QPSK_10MHz.

Table 14.1-17: SAR Values (LTEBand7 - Head)

Ambient Temperature: 22.9 °C							Liquid Temperature: 22.5 °C						
Frequency		Mode	Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.											
2560	21350	1RB_Low	Left	Touch	Fig.17	24.28	24.5	0.156	**0.16**	0.290	**0.30**	0.08
2560	21350	1RB_Low	Left	Tilt	/	24.28	24.5	0.049	**0.05**	0.091	**0.10**	0.01
2560	21350	1RB_Low	Right	Touch	/	24.28	24.5	0.055	**0.06**	0.103	**0.11**	-0.02
2560	21350	1RB_Low	Right	Tilt	/	24.28	24.5	0.044	**0.05**	0.085	**0.09**	0.04
2560	21350	50RB_Low	Left	Touch	/	23.16	23.5	0.123	**0.13**	0.230	**0.25**	-0.11
2560	21350	50RB_Low	Left	Tilt	/	23.16	23.5	0.039	**0.04**	0.072	**0.08**	0.07
2560	21350	50RB_Low	Right	Touch	/	23.16	23.5	0.042	**0.05**	0.079	**0.09**	-0.04
2560	21350	50RB_Low	Right	Tilt	/	23.16	23.5	0.034	**0.04**	0.067	**0.07**	-0.06

Note1: The LTE mode is QPSK_20MHz.

Table 14.1-18: SAR Values (LTE Band7 -Body)

Ambient Temperature: 22.9 °C							Liquid Temperature: 22.5 °C					
Frequency		Mode	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.										
2560	21350	1RB_Low	Front closed	/	24.28	24.5	0.041	**0.04**	0.074	**0.08**	0.04
2560	21350	1RB_Low	Rear closed	Fig.18	24.28	24.5	0.203	**0.21**	0.378	**0.40**	-0.01
2560	21350	1RB_Low	Rear open	/	24.28	24.5	0.196	**0.21**	0.367	**0.39**	-0.15
2560	21350	50RB_Low	Front closed	/	23.16	23.5	0.028	**0.03**	0.050	**0.05**	-0.06
2560	21350	50RB_Low	Rear closed	/	23.16	23.5	0.156	**0.17**	0.293	**0.32**	-0.01
2560	21350	50RB_Low	Rear open	/	23.16	23.5	0.149	**0.16**	0.273	**0.30**	0.02

Note1: The distance between the EUT and the phantom bottom is 15mm.
Note2: The LTE mode is QPSK_20MHz.

Table 14.1-19: SAR Values(LTE Band12 - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C												
Frequency		Mode	Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.											
704	23060	1RB_High	Left	Touch	Fig.19	23.80	24.2	0.208	**0.23**	0.299	**0.33**	-0.02
704	23060	1RB_High	Left	Tilt	/	23.80	24.2	0.078	**0.09**	0.106	**0.12**	0.02
704	23060	1RB_High	Right	Touch	/	23.80	24.2	0.183	**0.20**	0.289	**0.32**	-0.05
704	23060	1RB_High	Right	Tilt	/	23.80	24.2	0.077	**0.08**	0.105	**0.12**	0.01
711	23130	25RB_High	Left	Touch	/	22.88	23.2	0.153	**0.16**	0.242	**0.26**	0.03
711	23130	25RB_High	Left	Tilt	/	22.88	23.2	0.069	**0.07**	0.093	**0.10**	0.06
711	23130	25RB_High	Right	Touch	/	22.88	23.2	0.172	**0.19**	0.271	**0.29**	-0.03
711	23130	25RB_High	Right	Tilt	/	22.88	23.2	0.061	**0.07**	0.083	**0.09**	-0.04

Note1: The LTE mode is QPSK_10MHz.

Table 14.1-20: SAR Values (LTE Band12-Body)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C												
Frequency		Mode	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)	
MHz	Ch.											
704	23060	1RB_High	Front closed	/	23.80	24.2	0.062	**0.07**	0.089	**0.10**	0.04	
704	23060	1RB_High	Rear closed	/	23.80	24.2	0.259	**0.28**	0.348	**0.38**	0.07	
704	23060	1RB_High	Rear open	Fig.20	23.80	24.2	0.353	**0.39**	0.484	**0.53**	0.1	
711	23130	25RB_High	Front closed	/	22.88	23.2	0.051	**0.05**	0.073	**0.08**	-0.01	
711	23130	25RB_High	Rear closed	/	22.88	23.2	0.192	**0.21**	0.291	**0.31**	-0.03	
711	23130	25RB_High	Rear open	/	22.88	23.2	0.225	**0.24**	0.345	**0.37**	-0.01	

Note1: The distance between the EUT and the phantom bottom is 15mm.
Note2: The LTE mode is QPSK_10MHz.

Table 14.1-21: SAR Values (Bluetooth - Head)

Ambient Temperature: 22.9 °C Liquid Temperature: 22.5 °C											
Frequency		Side	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-upPower (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
2402	0	Left	Touch	/	11.03	12	0.001	**<0.01**	0.001	**<0.01**	0.02
2402	0	Left	Tilt	/	11.03	12	0.001	**<0.01**	0.001	**<0.01**	0.02
2480	78	Right	Touch	Fig.21	9.34	10	0.001	**<0.01**	0.002	**<0.01**	0.07
2441	39	Right	Touch	/	10.46	11	0.009	**0.01**	0.004	**<0.01**	0.06
2402	0	Right	Touch	/	11.03	12	0.009	**0.01**	0.004	**0.01**	0.09
2402	0	Right	Tilt	/	11.03	12	0.001	**<0.01**	0.001	**<0.01**	0.03

14.3 SAR results for Standard procedure

There is zoom scan measurement to be added for the highest measured SAR in each exposure configuration/band.

	Full SAR for Head											
Test Band	mode	Channel	Frequncy	Tune-Up	Measured Power	Test Poisition	Measrued 10g SAR	Measued 1g SAR	Report 10g SAR	Report 1g SAR	Power Drift	Plot
GSM850	/	251	848.8	33.2	32.37	Right Cheek	0.360	0.571	0.44	0.69	0.02	Figure A.1
GSM1900	/	661	1880	30.7	30.07	Left Cheek	0.093	0.138	0.11	0.16	-0.06	Figure A.3
WCDMA850	/	4132	826.4	24.2	23.54	Right Cheek	0.326	0.495	0.38	0.58	0.15	Figure A.5
WCDMA1700	/	1738	1752.6	24.2	23.65	Left Cheek	0.235	0.345	0.27	0.39	0.14	Figure A.7
WCDMA1900	/	9800	1880	24.2	23.67	Left Cheek	0.161	0.245	0.18	0.28	-0.12	Figure A.9
LTE Band 2	1RB-Low	18700	1860	24.2	24.01	Left Cheek	0.204	0.305	0.21	0.32	0.05	Figure A.11
LTE Band 4	1RB-Low	20300	1745	24.2	23.87	Left Cheek	0.158	0.231	0.17	0.25	-0.13	Figure A.13
LTE Band 5	1RB-Middle	20525	836.5	24.2	23.65	Right Cheek	0.347	0.540	0.39	0.61	-0.14	Figure A.15
LTE Band 7	1RB-Low	21350	2560	24.5	24.28	Left Cheek	0.156	0.290	0.16	0.30	0.08	Figure A.17
LTE Band 12	1RB-High	23060	704	24.2	23.80	Left Cheek	0.208	0.299	0.23	0.33	-0.02	Figure A.19
Bluetooth	DR2M-4_DQPS	0	2402	12	11.03	Right Cheek	0.009	0.004	0.01	0.01	0.09	Figure A.21

	Full SAR For Body											
Test Band	mode	Channel	Frequncy	Tune-Up	Measured Power	Test Poisition	Measrued 10g SAR	Measued 1g SAR	Report 10g SAR	Report 1g SAR	Power Drift	Plot
GSM850	/	251	848.8	27.7	27.41	Rear closed	0.322	0.446	0.34	0.48	0.19	Figure A.2
GSM1900	/	512	1850.2	26.7	26.14	Rear open	0.297	0.481	0.34	0.55	-0.03	Figure A.4
WCDMA850	/	4132	826.4	24.2	23.54	Rear closed	0.248	0.340	0.29	0.40	-0.18	Figure A.6
WCDMA1700	/	1738	1752.6	24.2	23.65	Rear open	0.613	0.983	0.70	1.11	-0.03	Figure A.8
WCDMA1900	/	9662	1852.4	24.2	23.80	Rear open	0.657	1.040	0.72	1.14	0.02	Figure A.10
LTE Band 2	1RB-Low	18700	1860	24.2	24.01	Rear closed	0.518	0.818	0.54	0.85	-0.1	Figure A.12
LTE Band 4	1RB-Low	20300	1745	24.2	23.87	Rear open	0.648	1.060	0.70	1.14	-0.03	Figure A.14
LTE Band 5	1RB-Middle	20525	836.5	24.2	23.65	Rear closed	0.288	0.393	0.33	0.45	0.16	Figure A.16
LTE Band 7	1RB-Low	21350	2560	24.5	24.28	Rear closed	0.203	0.378	0.21	0.40	-0.01	Figure A.18
LTE Band 12	1RB-High	23060	704	24.2	23.80	Rear open	0.353	0.484	0.39	0.53	0.1	Figure A.20

14.4 WLAN Evaluation

According to the KDB248227 D01, SAR is measured for 802.11b DSSS using the initial test position procedure.

Head Evaluation

Table 14.4-1: SAR Values(WLAN - Head)– 802.11b 5.5Mbps (Fast SAR)

Ambient Temperature: 22.9 °C		Liquid Temperature: 22.5 °C									
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
2437	6	Left	Touch	/	19.31	19.4	0.100	**0.10**	0.204	**0.21**	0.15
2437	6	Left	Tilt	/	19.31	19.4	0.016	**0.02**	0.030	**0.03**	-0.01
2437	6	Right	Touch	/	19.31	19.4	0.144	**0.15**	0.267	**0.27**	0.04
2437	6	Right	Tilt	/	19.31	19.4	0.019	**0.02**	0.034	**0.03**	-0.11

As shown above table, the initial test position for head is “Right Touch”. So the head SAR of WLAN is presented as below:

Table 14.4-2: SAR Values(WLAN - Head)– 802.11b 5.5Mbps (Full SAR)

Ambient Temperature: 22.9 °C		Liquid Temperature: 22.5 °C									
Frequency		Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.										
2437	6	Right	Touch	Fig.22	19.31	19.4	0.142	**0.14**	0.251	**0.26**	0.04

Note1: When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest estimated 1-g SAR conditions determined by area scans, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg.
Note2: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. The scaled reported SAR is presented as below.

Table 14.4-3: SAR Values (WLAN - Head) – 802.11b 1Mbps (Scaled Reported SAR)

Ambient Temperature: 22.9 °C		Liquid Temperature: 22.5 °C					
Frequency		Side	Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.						
2437	6	Right	Touch	96.85%	100%	**0.26**	**0.27**

SAR is not required for OFDM because the 802.11b adjusted SAR ≤ 1.2 W/kg.

Body Evaluation

Table 14.4-4: SAR Values(WLAN - Body)– 802.11b 5.5Mbps (Fast SAR)

Ambient Temperature: 22.9 °C		Liquid Temperature: 22.5 °C								
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
2437	6	Front closed	/	19.31	19.4	0.010	**0.01**	0.018	**0.02**	0.11
2437	6	Rear closed	/	19.31	19.4	0.019	**0.02**	0.035	**0.04**	0.09
2437	6	Rear open	/	19.31	19.4	0.028	**0.03**	0.050	**0.05**	-0.12

As shown above table, the initial test position for body is "Rear open". So the body SAR of WLAN is presented as below:

Table 14.4-5: SAR Values(WLAN - Body)– 802.11b 5.5Mbps (Full SAR)

Ambient Temperature: 22.9 °C		Liquid Temperature: 22.5 °C								
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
2437	6	Rear open	Fig.23	19.31	19.4	0.030	**0.03**	0.053	**0.05**	-0.12

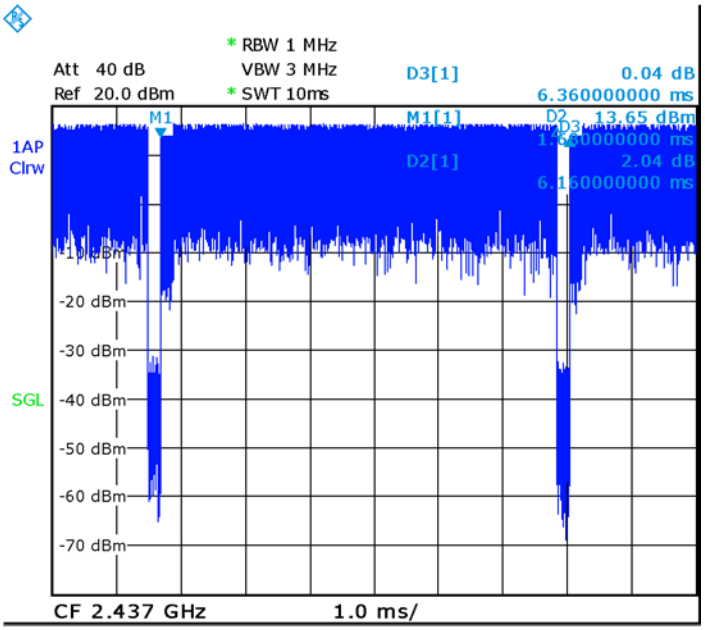
Note1: When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest estimated 1-g SAR conditions determined by area scans, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg.
Note2: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. The scaled reported SAR is presented as below.

Table 14.4-6: SAR Values (WLAN - Body) – 802.11b 1Mbps (Scaled Reported SAR)

Ambient Temperature: 22.9 °C		Liquid Temperature: 22.5 °C				
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
2437	6	Rear open	96.85%	100%	**0.05**	**0.05**

SAR is not required for OFDM because the 802.11b adjusted SAR ≤ 1.2 W/kg.



Picture 14.1Duty factor plot

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; steps2) 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 ≥ 1.45W/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.

Table 15.1: SAR Measurement Variability for Body WCDMA 1700 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
MHz	Ch.						
1752.6	1513	Rear open	15	0.983	0.980	1.01	/

Table 15.2: SAR Measurement Variability for Body WCDMA 1900 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
MHz	Ch.						
1852.4	9262	Rear open	15	1.04	1.03	1.01	/

Table 15.3: SAR Measurement Variability for Body LTE Band 2 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
MHz	Ch.						
1860	18700	Rear closed	15	0.818	0.817	1.00	/

Table 15.4: SAR Measurement Variability for Body LTE Band 4 (1g)

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
MHz	Ch.						
1745	20300	Rear open	15	1.06	1.05	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	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	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	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 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 26, 2016	One year
02	Power meter	NRVD	102196	March 03,2016	One year
03	Power sensor	NRV-Z5	100596		
04	Signal Generator	E4438C	MY49071430	February 01,2016	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	E5515C	MY50263375	January 30, 2016	One year
07	BTS	CMW500	129942	March 03, 2016	One year
08	E-field Probe	SPEAG EX3DV4	7307	February19, 2016	One year
09	DAE	SPEAG DAE4	1331	January 21, 2016	One year
10	Dipole Validation Kit	SPEAG D750V3	1017	July20, 2016	One year
11	Dipole Validation Kit	SPEAG D835V2	4d069	July20, 2016	One year
12	Dipole Validation Kit	SPEAG D1750V2	1003	July21, 2016	One year
13	Dipole Validation Kit	SPEAG D1900V2	5d101	July28, 2016	One year
14	Dipole Validation Kit	SPEAG D2450V2	853	July25, 2016	One year
15	Dipole Validation Kit	SPEAG D2600V2	1012	July25, 2016	One year

END OF REPORT BODY

ANNEX A Graph Results

GSM850_848.8_Right Cheek

Date: 11/16/2016
Electronics: DAE4 Sn1331
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.945 mho/m; εr = 41.12; ρ = 1000 kg/m^3
Ambient Temperature: 22.9^{o}C, Liquid Temperature: 22.5^{o}C
Communication System: GSM850 Frequency: 848.8MHz Duty Cycle: 1:8.3
Probe: EX3DV4 – SN7307ConvF(10.01, 10.01, 10.01)

Area Scan (61x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.669 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.495 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.917 W/kg
SAR(1 g) = 0.571 W/kg; SAR(10 g) = 0.360 W/kg
Maximum value of SAR (measured) = 0.694 W/kg

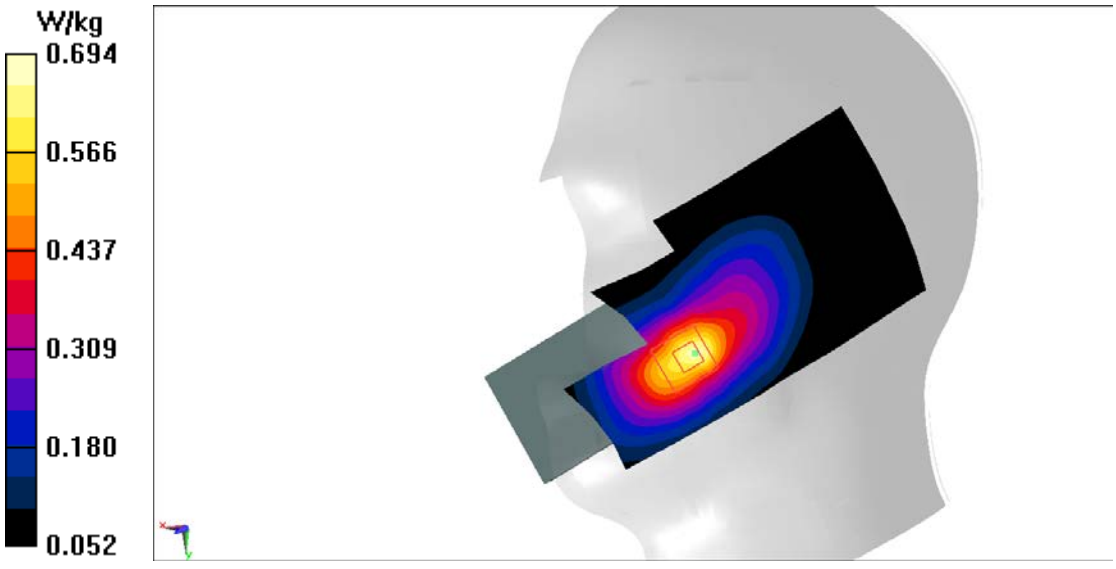


Figure A.1

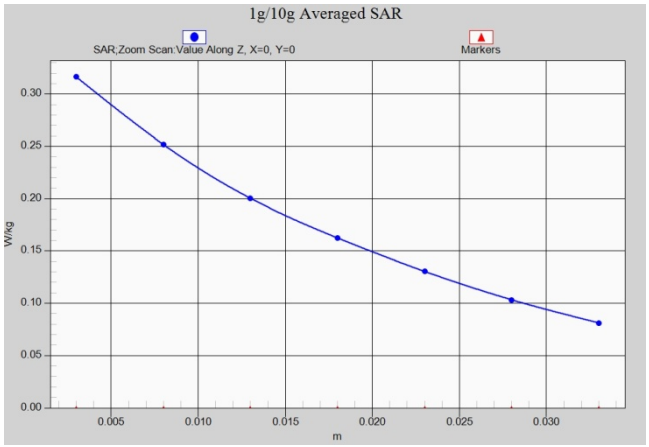


Figure A.1-2

GSM850_848.8_Rear closed

Date: 11/16/2016
Electronics: DAE4 Sn1331
Medium: Body 850 MHz
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.966 mho/m; εr = 56.055; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: GSM850 848.8 Frequency: 848.8MHz Duty Cycle: 1:2
Probe: EX3DV4 – SN7307ConvF(9.83, 9.83, 9.83)

Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.501 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.47 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.606 W/kg
SAR(1 g) = 0.446 W/kg; SAR(10 g) = 0.322 W/kg
Maximum value of SAR (measured) = 0.503 W/kg

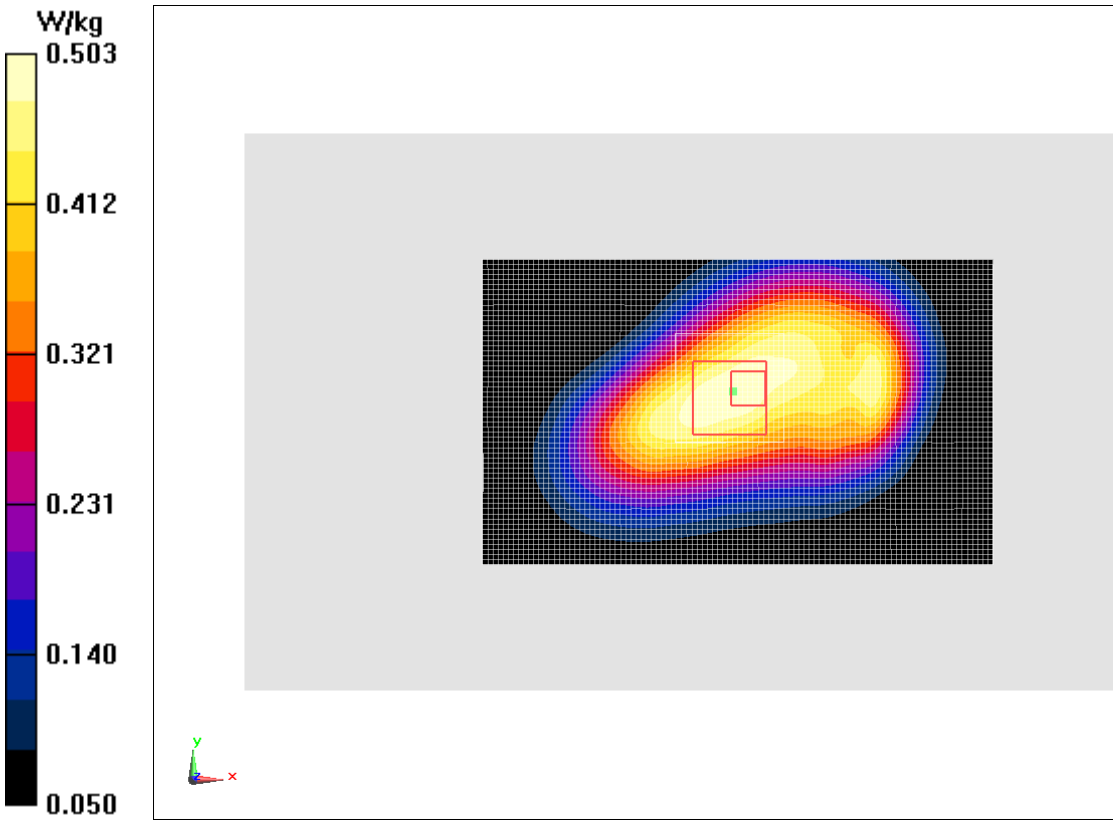


Figure A.2

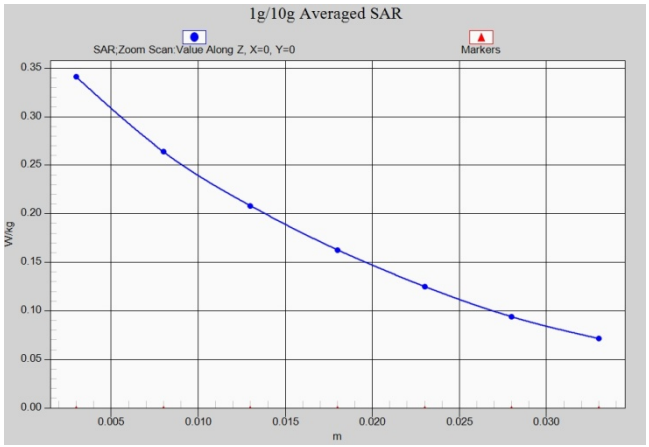


Figure A.2-2

GSM1900_1880_Left Cheek

Date: 11/18/2016
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1880 MHz; σ = 1.351 mho/m; εr = 40.672; ρ = 1000 kg/m^3
Ambient Temperature: 22.9^{o}C, Liquid Temperature: 22.5^{o}C
Communication System: GSM1900 1880 Frequency: 1880MHz Duty Cycle: 1:8.3
Probe: EX3DV4 – SN7307 ConvF(8.10, 8.10, 8.10)

Area Scan (61x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.157 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.227 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.193 W/kg
SAR(1 g) = 0.138 W/kg; SAR(10 g) = 0.093 W/kg
Maximum value of SAR (measured) = 0.157 W/kg

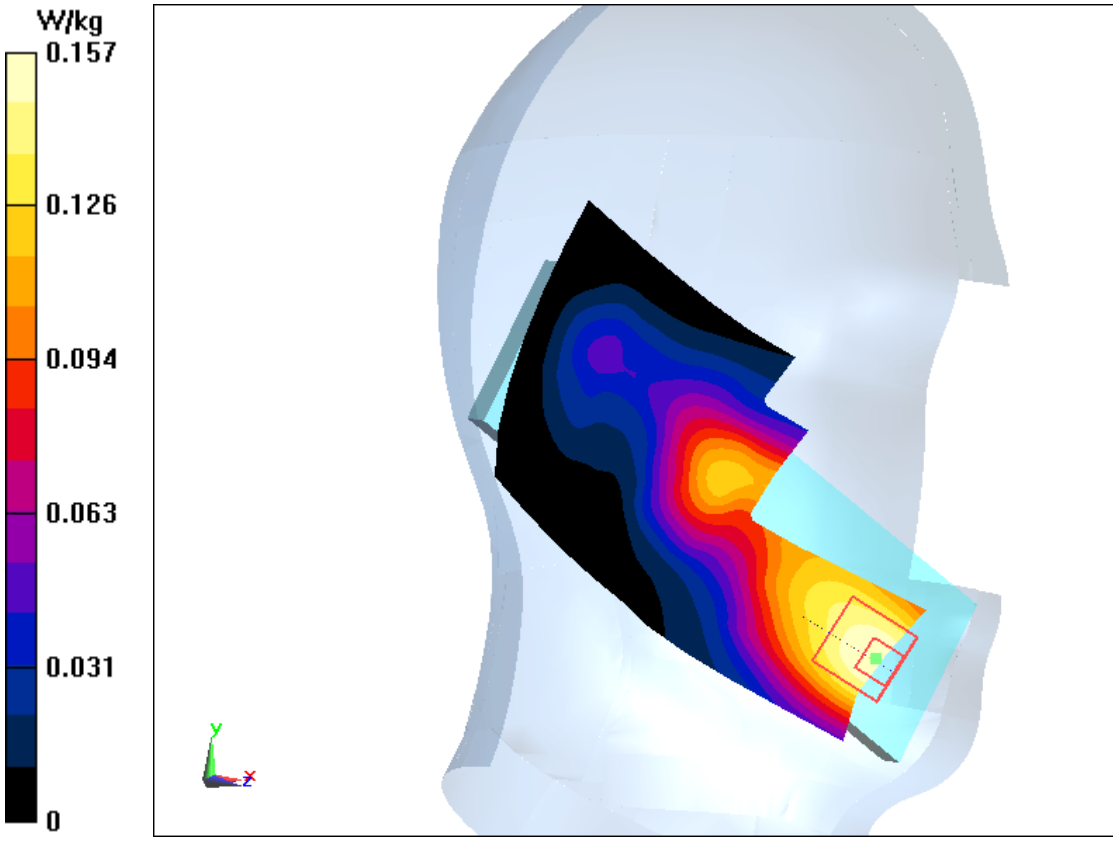


Figure A.3

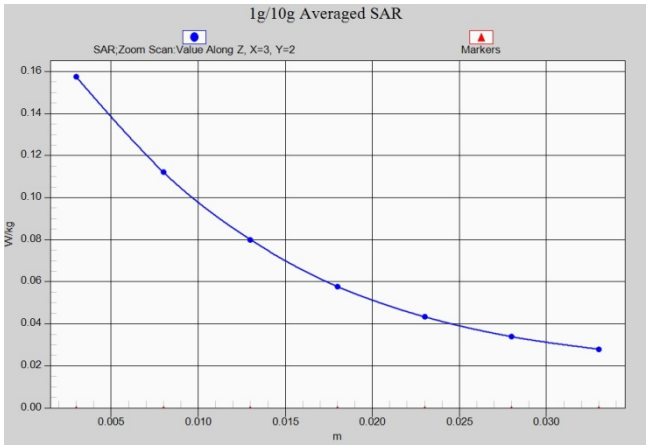


Figure A.3-2

GSM1900_1850.2_Rear open

Date: 11/18/2016
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.513 mho/m; εr = 54.015; εr = ; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: GSM1900 Frequency: 1850.2MHz Duty Cycle: 1:2.67
Probe: EX3DV4 – SN7307 ConvF(7.67, 7.67, 7.67)

Area Scan (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.596 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.714 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.745 W/kg
SAR(1 g) = 0.481 W/kg; SAR(10 g) = 0.297 W/kg
Maximum value of SAR (measured) = 0.560 W/kg

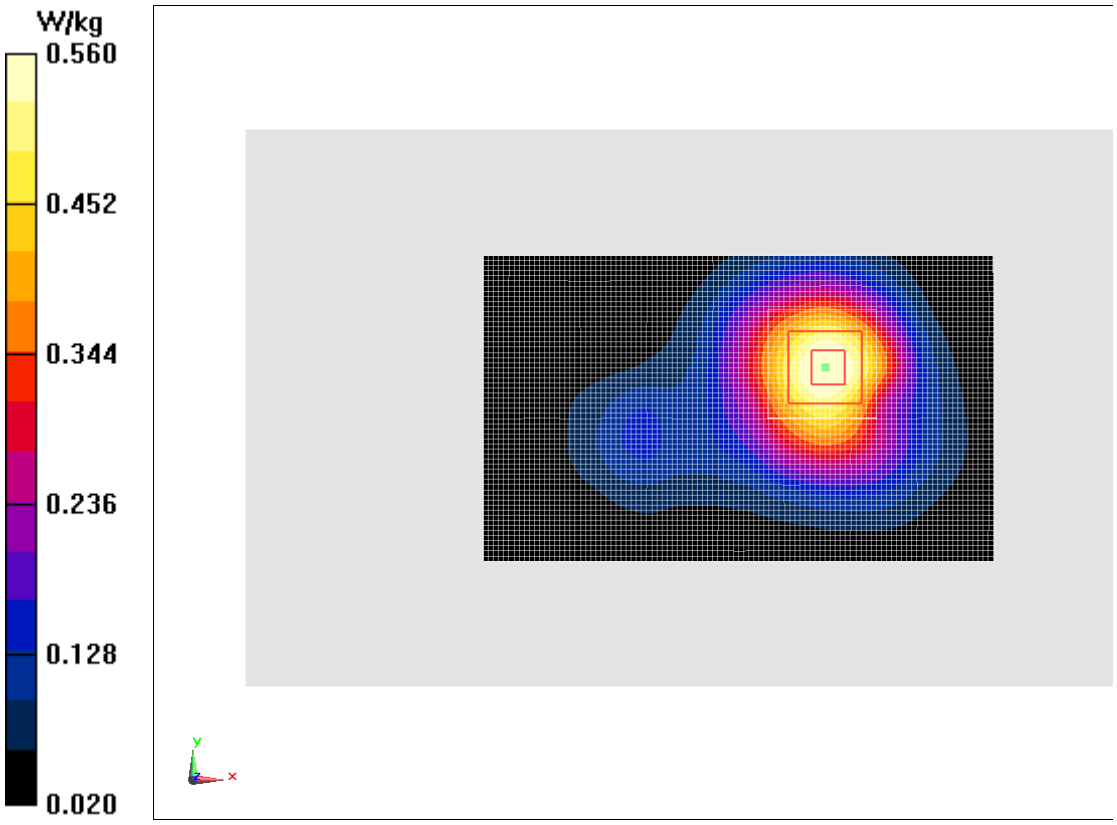


Figure A.4

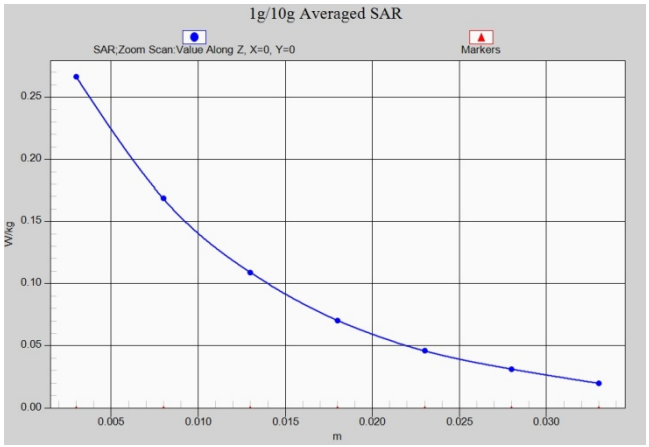


Figure A.4-2

WCDMA850_826.4_Right Cheek

Date: 11/2/2016
Electronics: DAE4 Sn1331
Medium: Head 850 MHz
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.901 mho/m; εr = 41.295; ρ = 1000 kg/m^3
Ambient Temperature: 22.9^{o}C, Liquid Temperature: 22.5^{o}C
Communication System: WCDMA850 Frequency: 826.4MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(10.01, 10.01, 10.01)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.586 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.402 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.752 W/kg
SAR(1 g) = 0.495 W/kg; SAR(10 g) = 0.326 W/kg
Maximum value of SAR (measured) = 0.588 W/kg

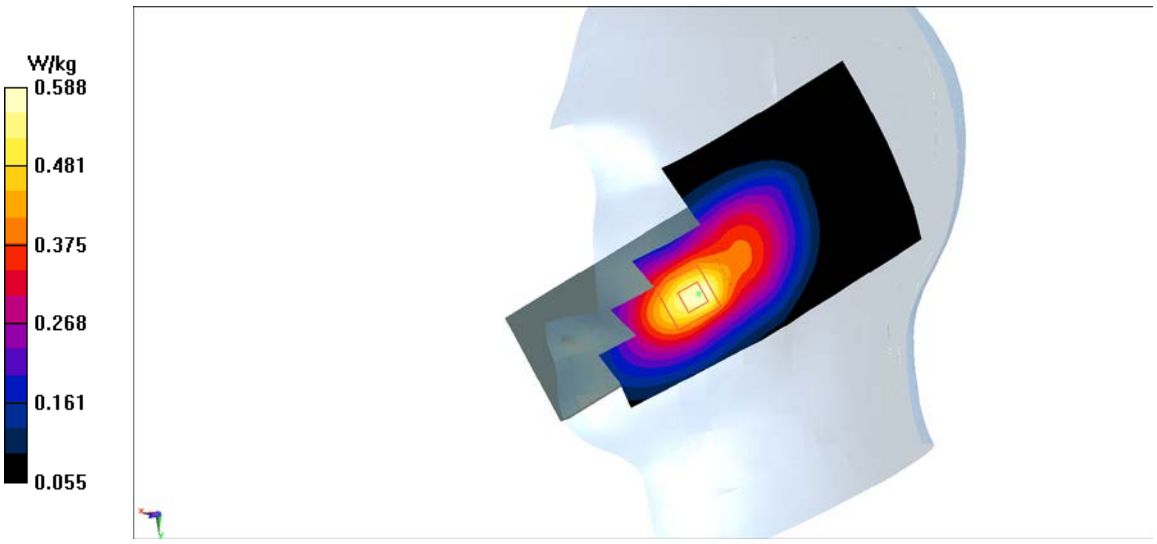


Figure A.5

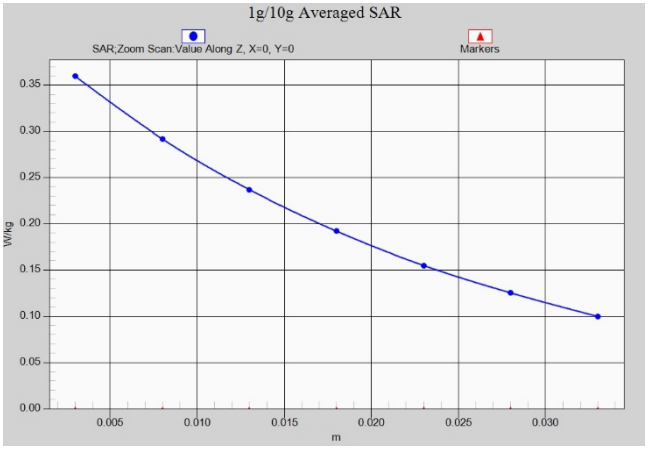


Figure A.5-2

WCDMA850_826.4_Rear closed

Date: 11/2/2016
Electronics: DAE4 Sn1331
Medium: Body 850 MHz
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.961 mho/m; εr = 56.163; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: WCDMA850 Frequency: 826.4MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(9.83, 9.83, 9.83)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.378 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.09 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.462 W/kg
SAR(1 g) = 0.340 W/kg; SAR(10 g) = 0.248 W/kg
Maximum value of SAR (measured) = 0.379 W/kg

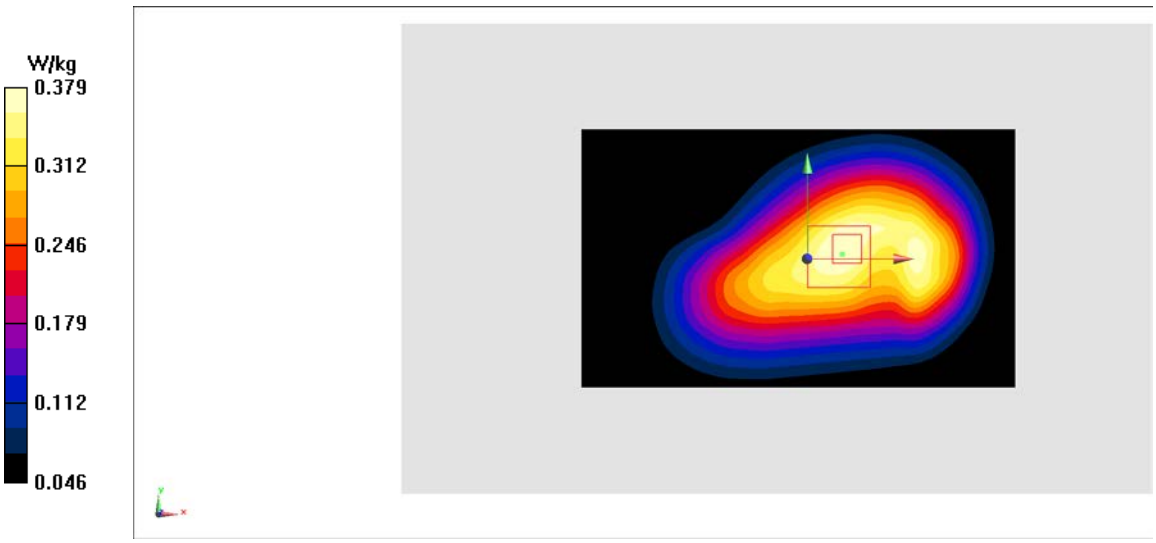


Figure A.6

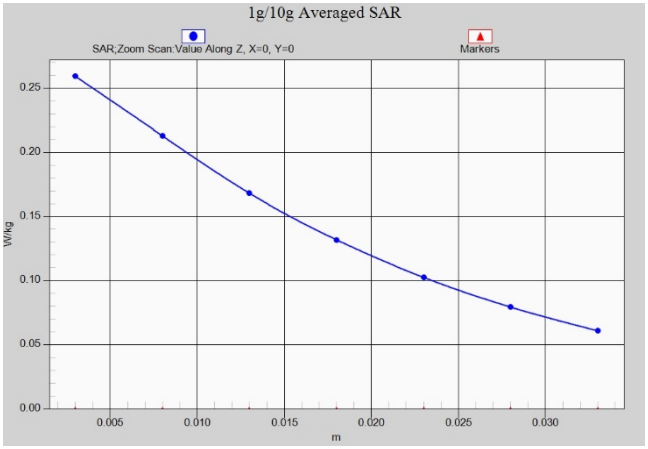


Figure A.6-2

WCDMA1700_1752.6_Left Cheek

Date: 11/3/2016
Electronics: DAE4 Sn1331
Medium: Head 1750 MHz
Medium parameters used (interpolated): f = 1752.6 MHz; σ = 1.361 mho/m; εr = 40.733; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: WCDMA1700 Frequency: 1752.6MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(8.37, 8.37, 8.37)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.402 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.318 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.509 W/kg
SAR(1 g) = 0.345 W/kg; SAR(10 g) = 0.235 W/kg
Maximum value of SAR (measured) = 0.399 W/kg

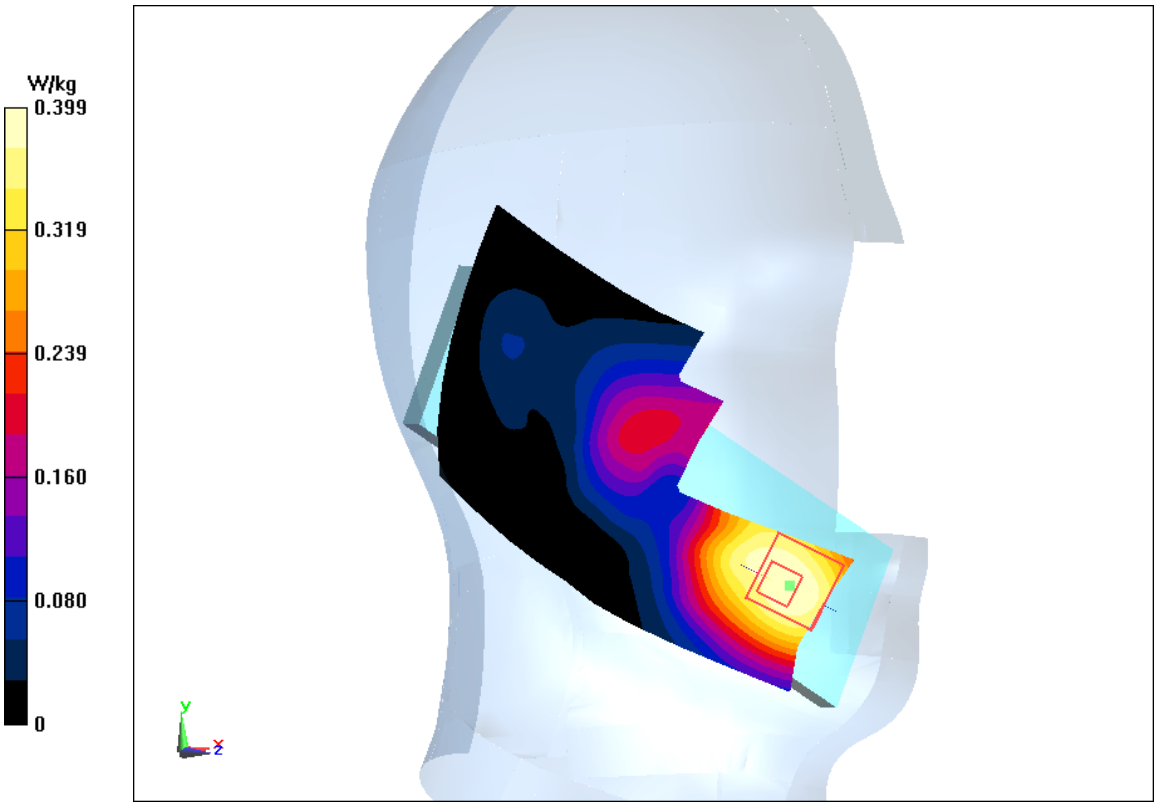


Figure A.7

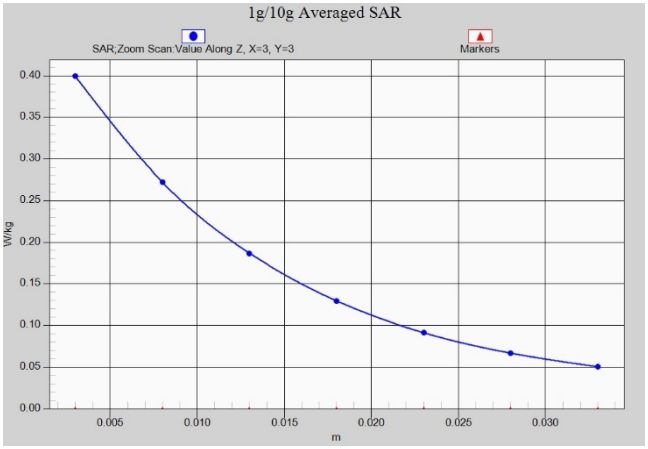


Figure A.7-2

WCDMA1700_1752.6_Rear open

Date: 11/3/2016
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used (interpolated): f = 1752.6 MHz; σ = 1.532 mho/m; εr = 53.562; ρ = 1000 kg/m^3
Ambient Temperature: 22.9^{o}C, Liquid Temperature: 22.5^{o}C
Communication System: WCDMA1700 Frequency: 1752.6MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(8.18, 8.18, 8.18)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.20 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.99 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.52 W/kg
SAR(1 g) = 0.983 W/kg; SAR(10 g) = 0.613 W/kg
Maximum value of SAR (measured) = 1.15 W/kg

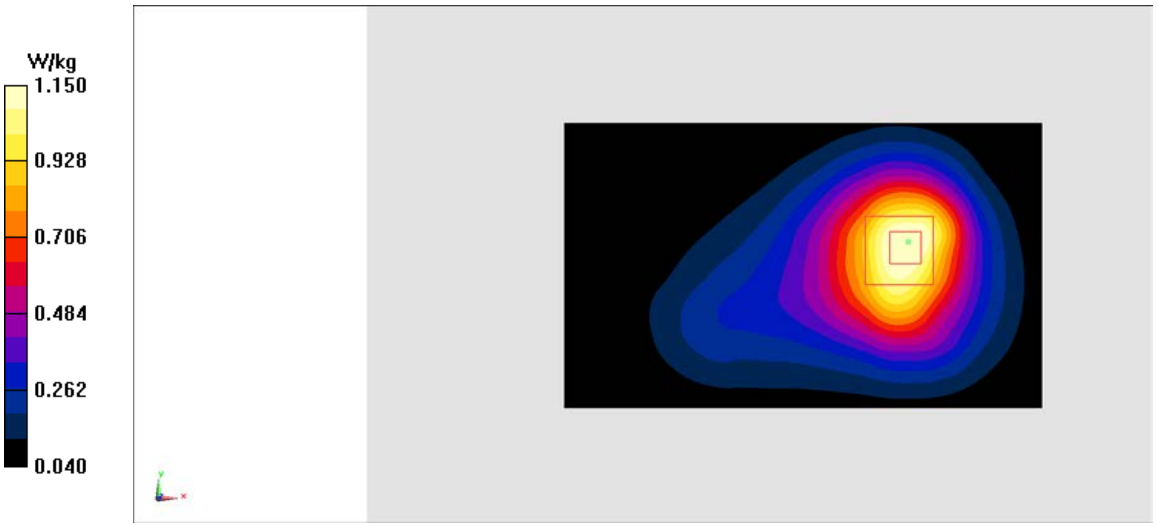


Figure A.8

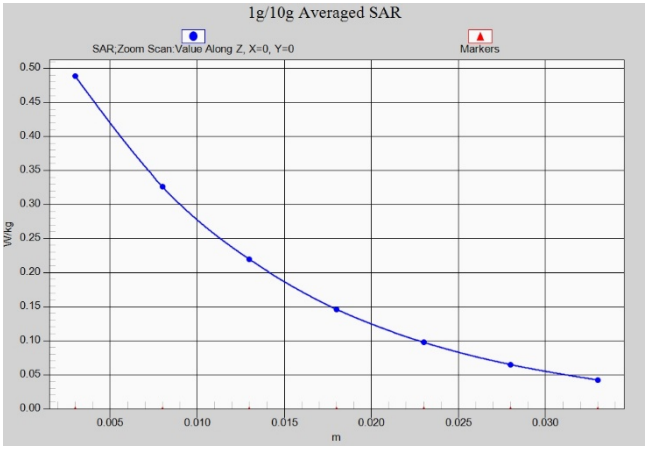


Figure A.8-2

WCDMA1900_1880_Left Cheek

Date: 11/4/2016
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.424 mho/m; εr = 40.145; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: WCDMA1900 Frequency: 1880MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(8.10, 8.10, 8.10)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.283 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.425 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.355 W/kg
SAR(1 g) = 0.245 W/kg; SAR(10 g) = 0.161 W/kg
Maximum value of SAR (measured) = 0.279 W/kg

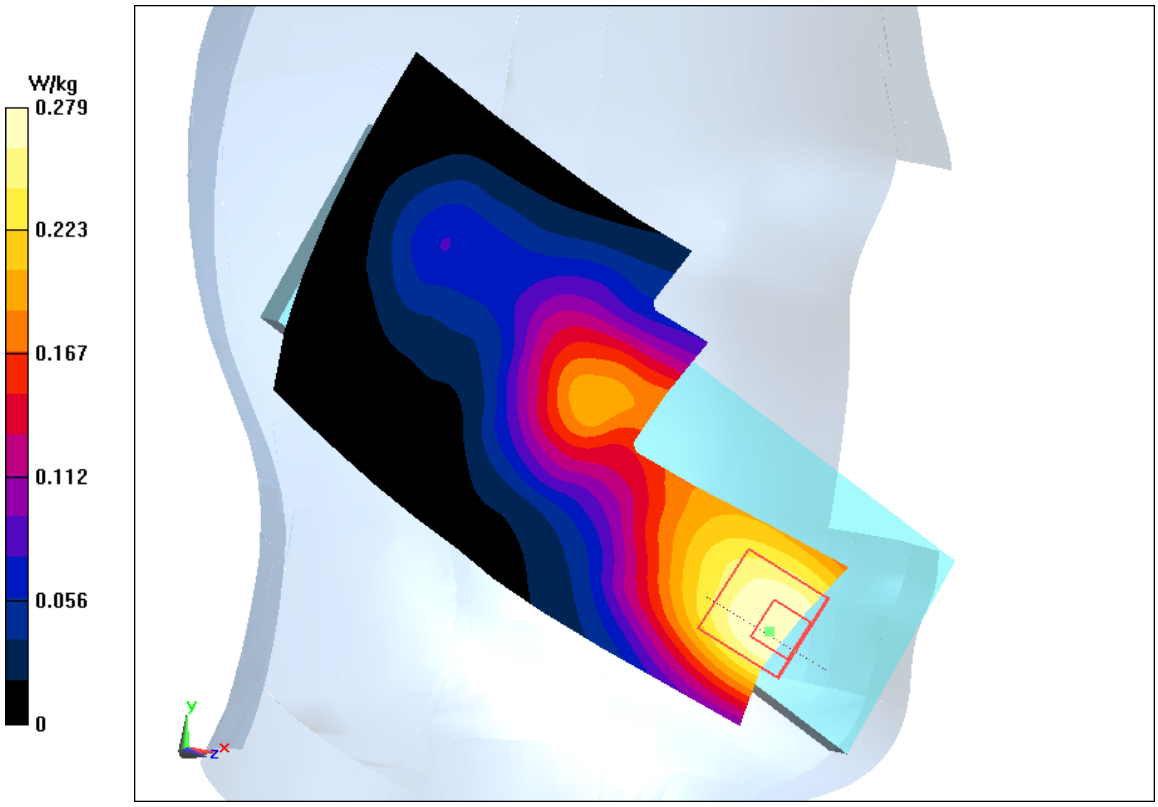


Figure A.9

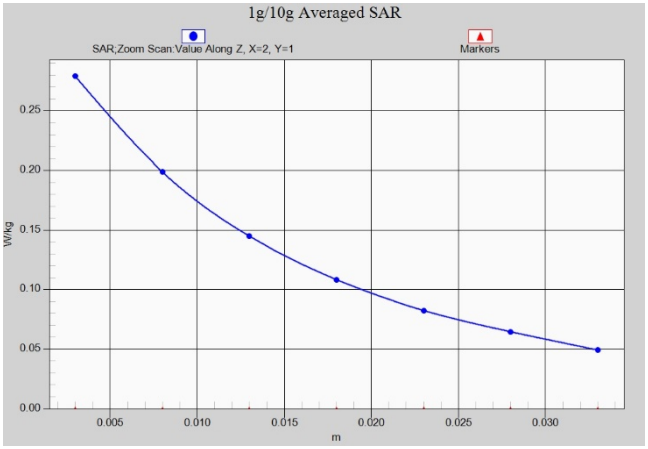


Figure A.9-2

WCDMA1900_1852.4_Rear open

Date: 11/4/2016
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.517 mho/m; εr = 51.73; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: WCDMA1900 Frequency: 1852.4MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.67, 7.67, 7.67)

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

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.71 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.52 W/kg
SAR(1 g) = 1.04 W/kg; SAR(10 g) = 0.657 W/kg
Maximum value of SAR (measured) = 1.20 W/kg

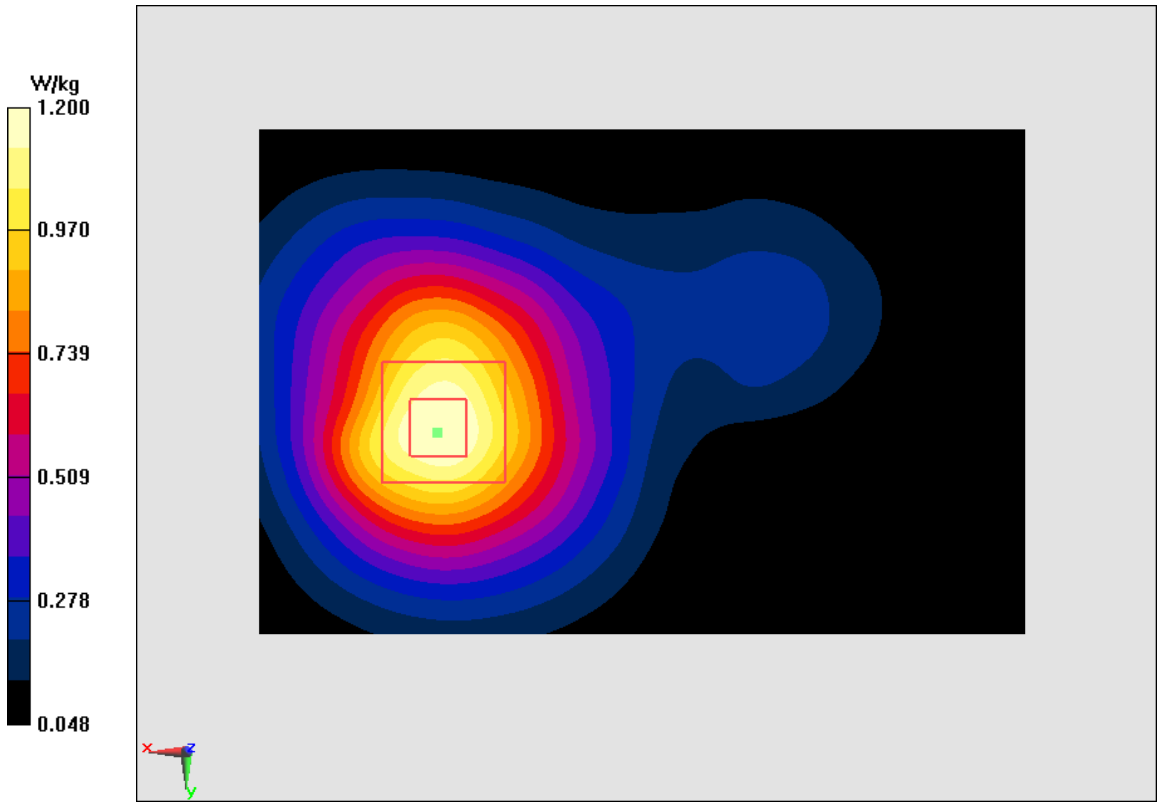


Figure A.10

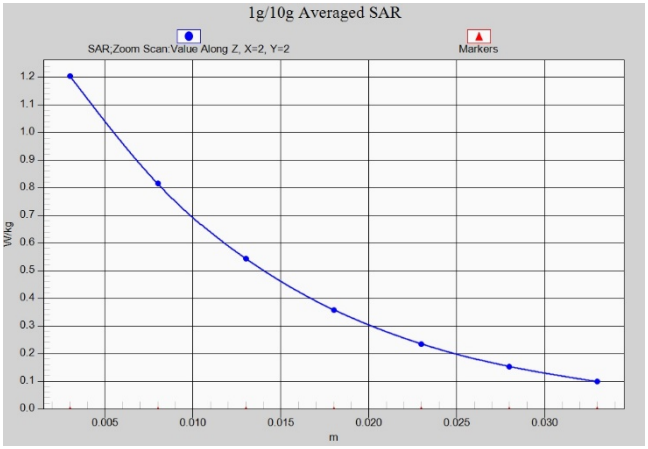


Figure A.10-2

LTEBand2_1860_Left Cheek

Date: 11/4/2016
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used (interpolated): f = 1860 MHz; σ = 1.449 mho/m; εr = 40.70; ρ = 1000 kg/m^3
Ambient Temperature: 22.9^{o}C, Liquid Temperature: 22.5^{o}C
Communication System: LTEBand2 Frequency: 1860MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(8.10, 8.10, 8.10)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.345 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.775 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.442 W/kg
SAR(1 g) = 0.305 W/kg; SAR(10 g) = 0.204 W/kg
Maximum value of SAR (measured) = 0.352 W/kg

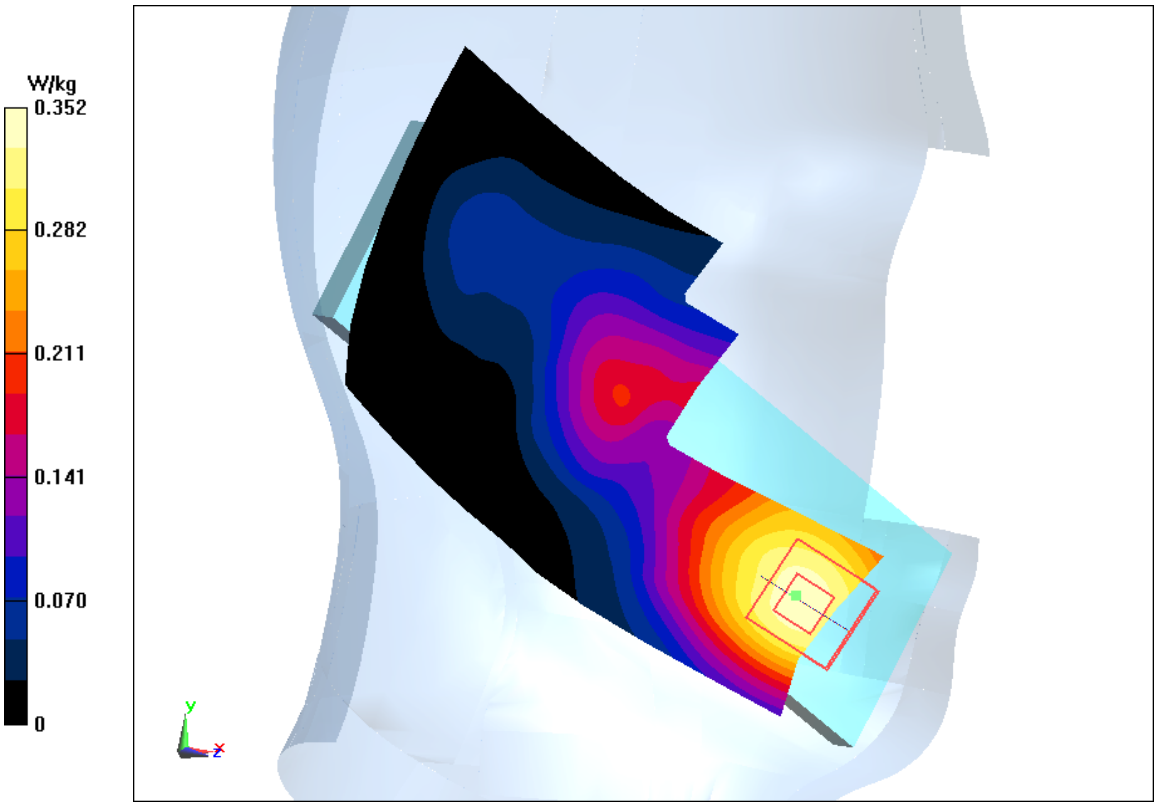


Figure A.11

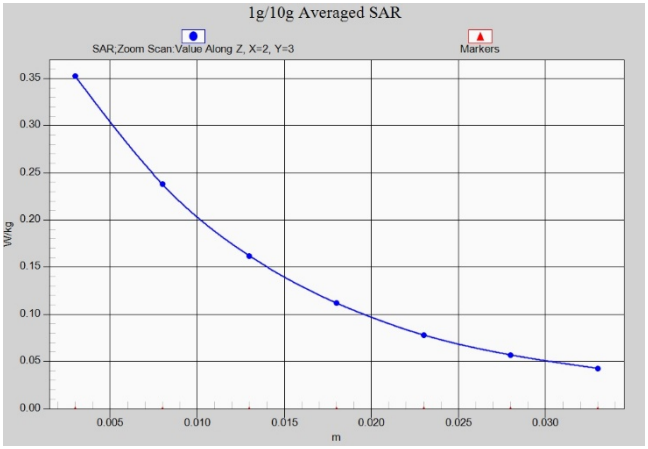


Figure A.11-2

LTEBand2_1860_Rear closed

Date: 11/4/2016
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used (interpolated): f = 1860 MHz; σ = 1.507 mho/m; εr = 51.93; ρ = 1000 kg/m^3
Ambient Temperature: 22.9^{o}C, Liquid Temperature: 22.5^{o}C
Communication System: LTEBand2 Frequency: 1860MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.67, 7.67, 7.67)

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

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.32 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.818 W/kg; SAR(10 g) = 0.518 W/kg
Maximum value of SAR (measured) = 0.948 W/kg

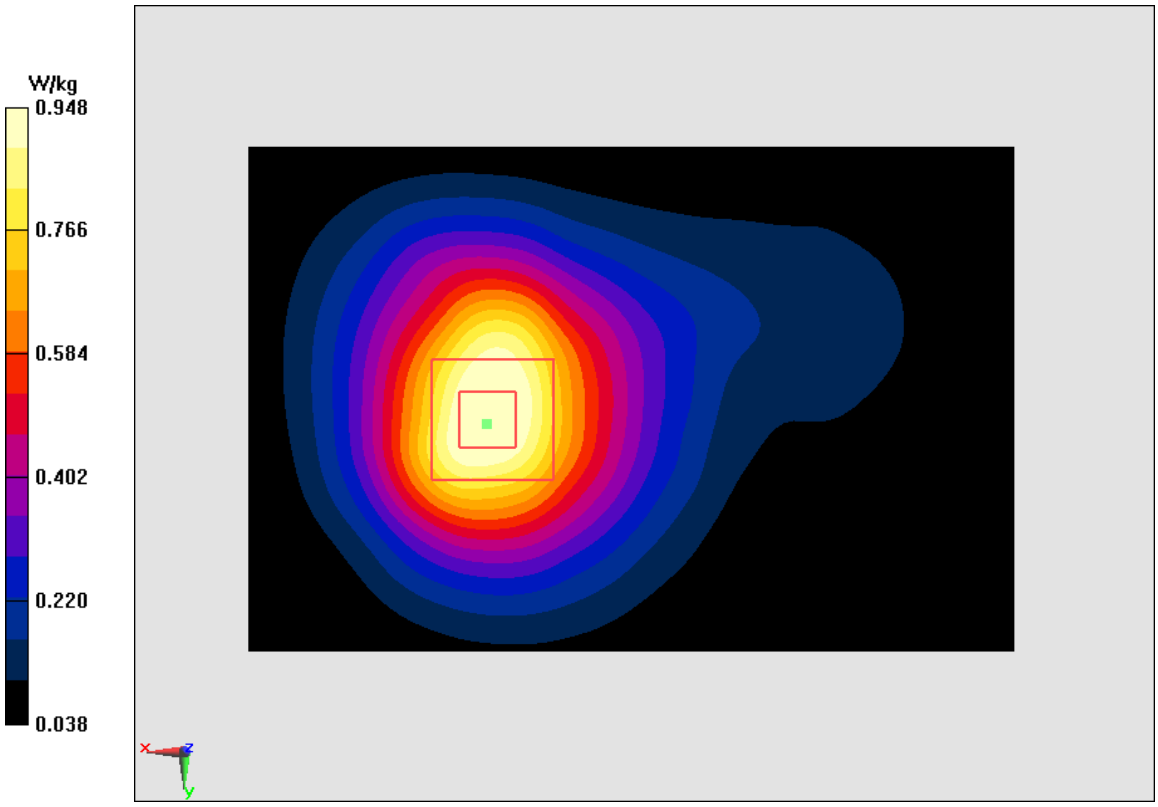


Figure A.12

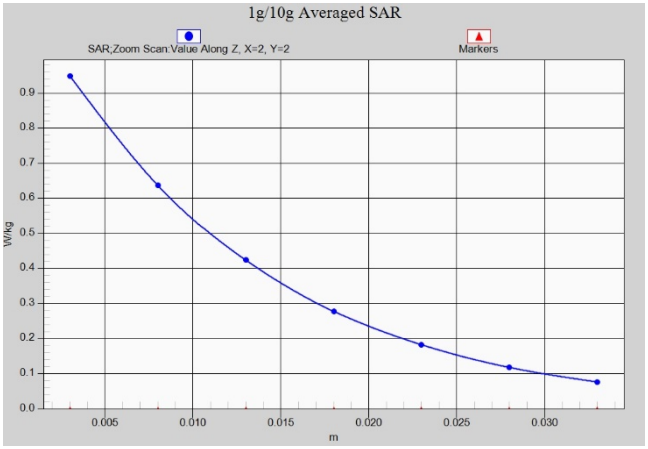


Figure A.12-2

LTEBand4_1745_Left Cheek

Date: 11/3/2016
Electronics: DAE4 Sn1331
Medium: Head 1750 MHz
Medium parameters used (interpolated): f = 1745 MHz; σ = 1.421 mho/m; εr = 40.61; ρ = 1000 kg/m^3
Ambient Temperature: 22.9^{o}C, Liquid Temperature: 22.5^{o}C
Communication System: LTEBand4 Frequency: 1745MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(8.37, 8.37, 8.37)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.273 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.082 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.329 W/kg
SAR(1 g) = 0.231 W/kg; SAR(10 g) = 0.158 W/kg
Maximum value of SAR (measured) = 0.266 W/kg

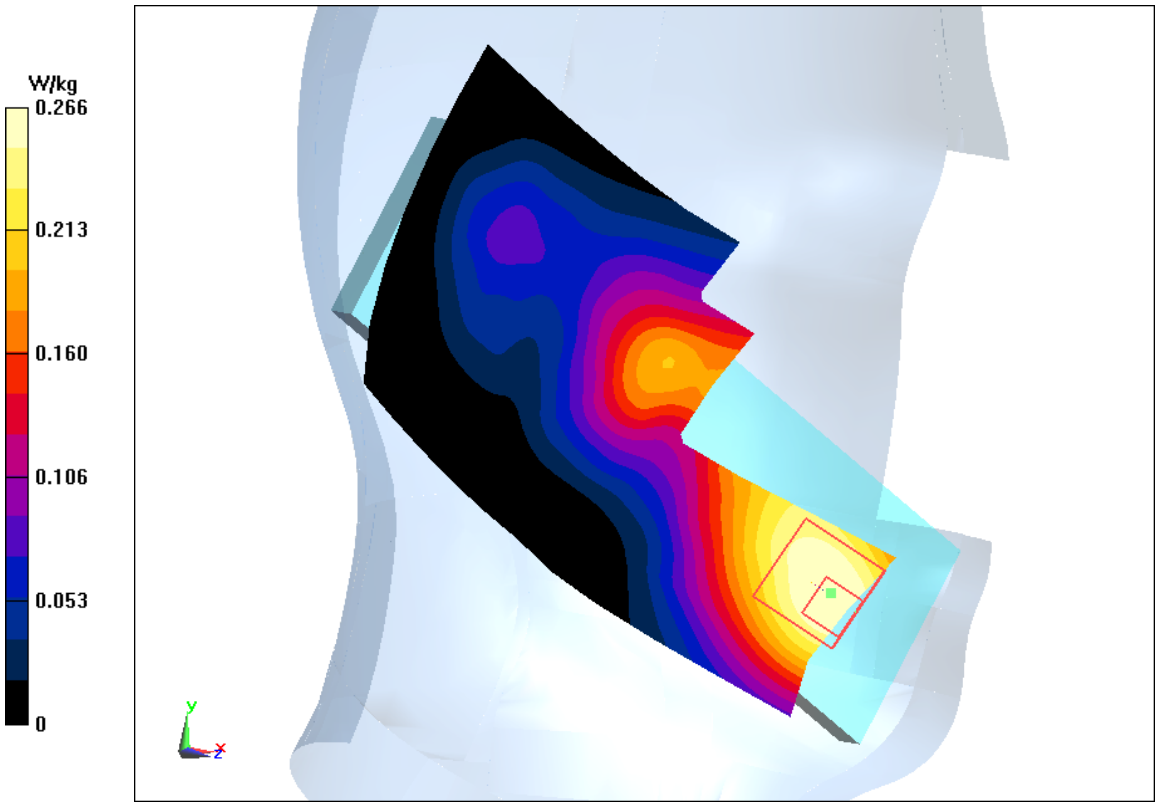


Figure A.13

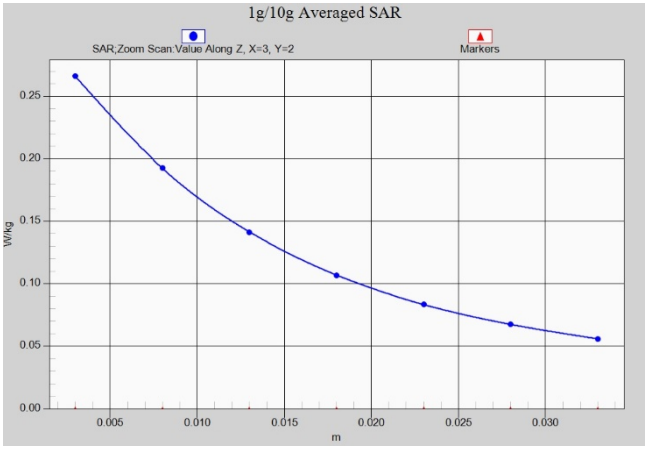


Figure A.13-2

LTEBand4_1745_Rear open

Date: 11/3/2016
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used (interpolated): f = 1745 MHz; σ = 1.51 mho/m; εr = 53.98; ρ = 1000 kg/m^3
Ambient Temperature: 22.9^{o}C, Liquid Temperature: 22.5^{o}C
Communication System: LTEBand4 Frequency: 1745MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(8.18, 8.18, 8.18)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.24 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.56 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 1.06 W/kg; SAR(10 g) = 0.648 W/kg
Maximum value of SAR (measured) = 1.24 W/kg

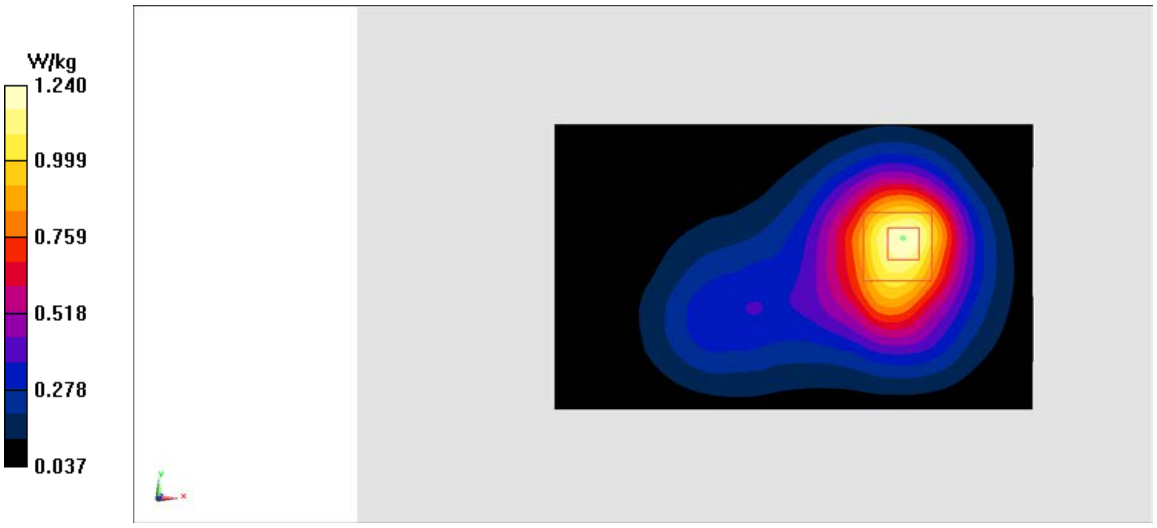


Figure A.14

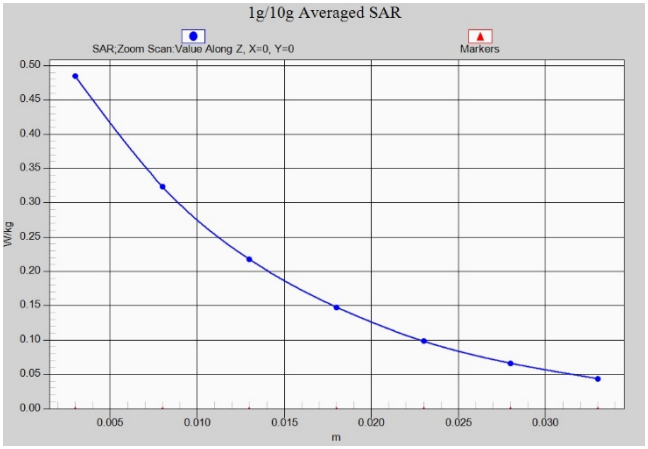


Figure A.14-2

LTEBand5_836.5_Right Cheek

Date: 11/2/2016
Electronics: DAE4 Sn1331
Medium: Head850 MHz
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.917 mho/m; εr = 40.94; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: LTEBand5 Frequency: 836.5MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(10.01, 10.01, 10.01)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.679 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.466 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.838 W/kg
SAR(1 g) = 0.540 W/kg; SAR(10 g) = 0.347 W/kg
Maximum value of SAR (measured) = 0.622 W/kg

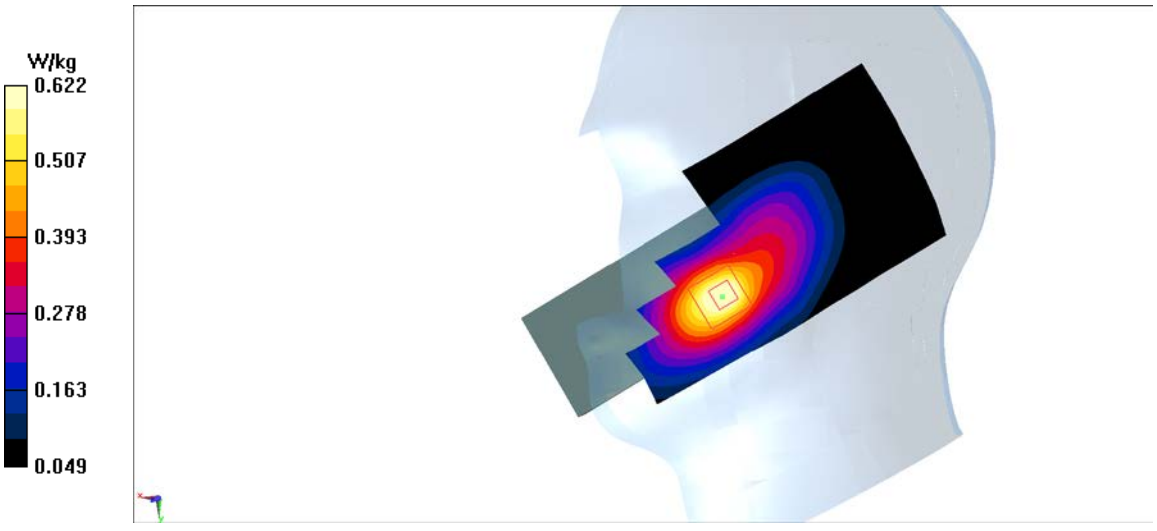


Figure A.15

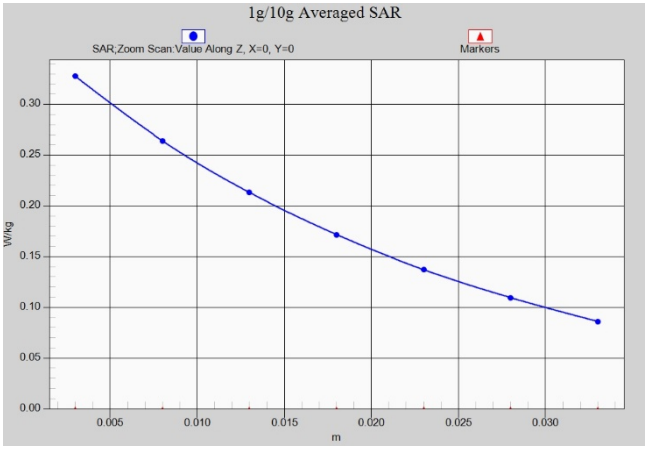


Figure A.15-2

LTEBand5_836.5_Rear closed

Date: 11/2/2016
Electronics: DAE4 Sn1331
Medium: Body850 MHz
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.951 mho/m; εr = 56.17; ρ = 1000 kg/m^3
Ambient Temperature: 22.9^{o}C, Liquid Temperature: 22.5^{o}C
Communication System: LTEBand5 Frequency: 836.5MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(9.83, 9.83, 9.83)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.431 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.97 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.527 W/kg
SAR(1 g) = 0.393 W/kg; SAR(10 g) = 0.288 W/kg
Maximum value of SAR (measured) = 0.440 W/kg

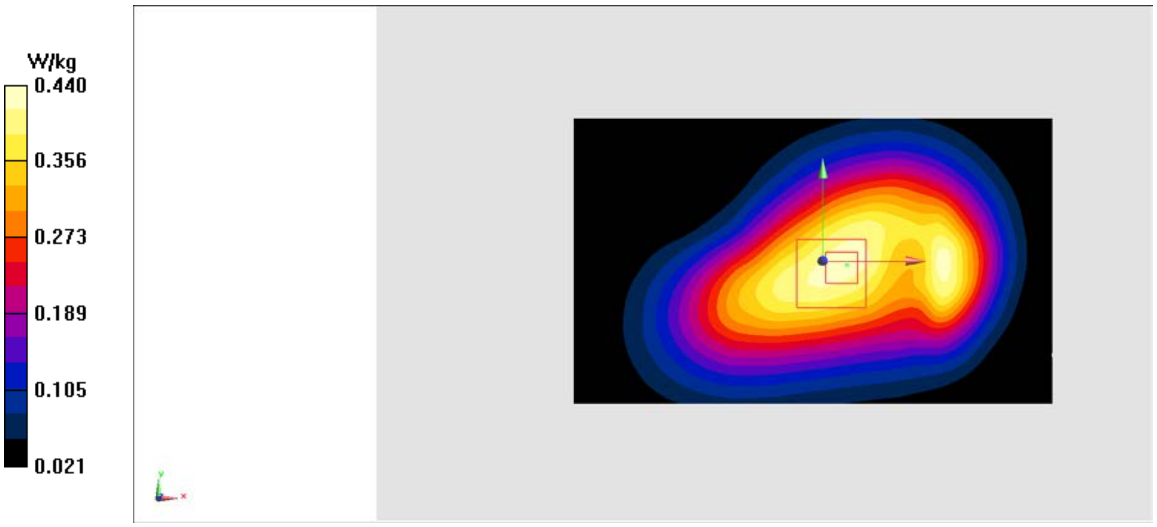


Figure A.16

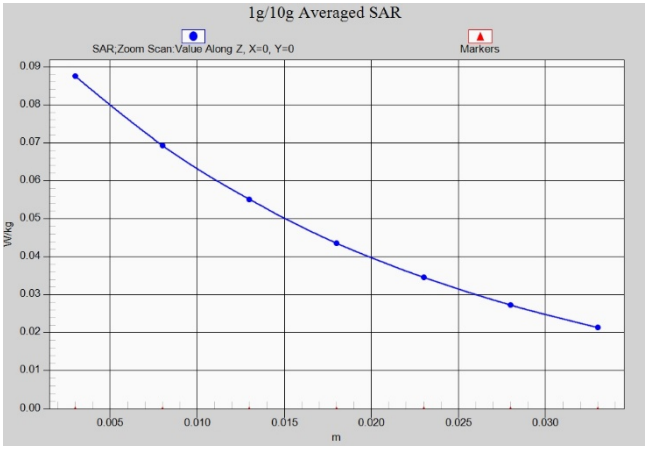


Figure A.16-2

LTEBand7_2560_Left Cheek

Date: 11/6/2016
Electronics: DAE4 Sn1331
Medium: Head2600 MHz
Medium parameters used (interpolated): f = 2560 MHz; σ = 1.857 mho/m; εr = 37.512 ; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: LTEBand7 Frequency: 2560MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.21, 7.21, 7.21)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.360 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.160 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.544 W/kg
SAR(1 g) = 0.290 W/kg; SAR(10 g) = 0.156 W/kg
Maximum value of SAR (measured) = 0.363 W/kg

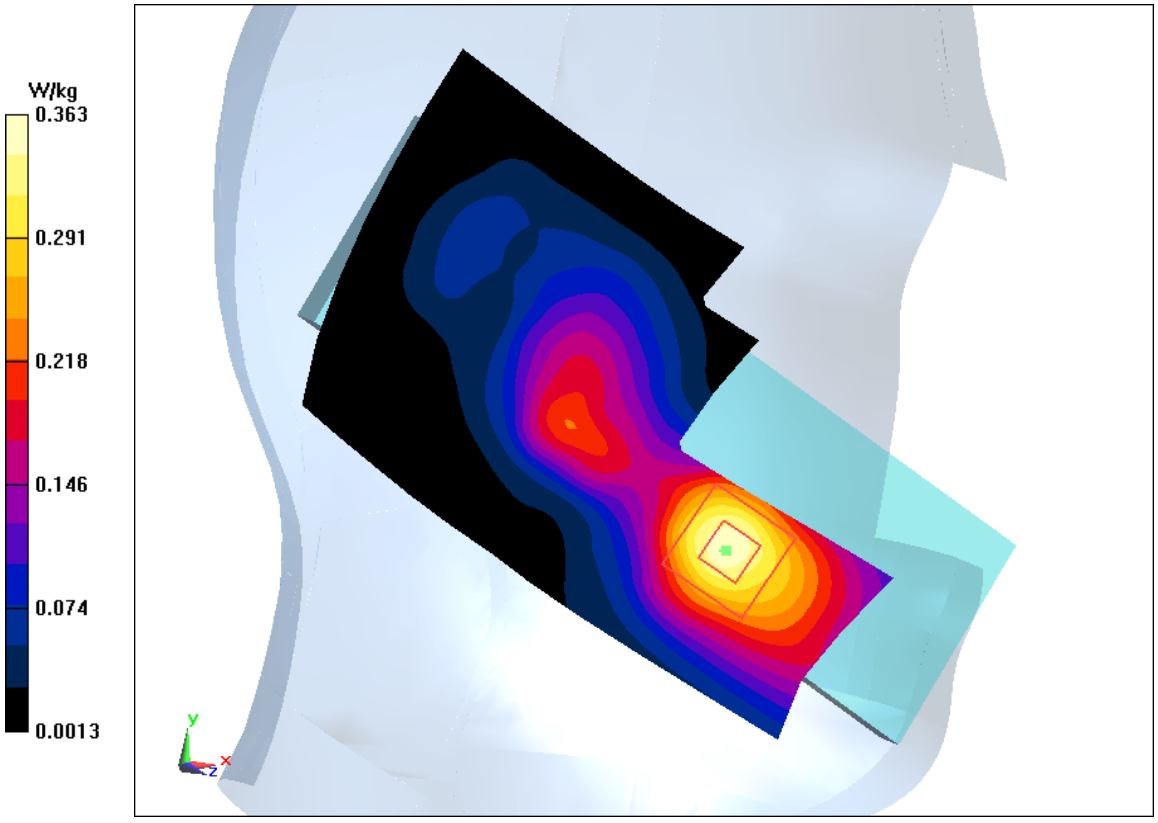


Figure A.17

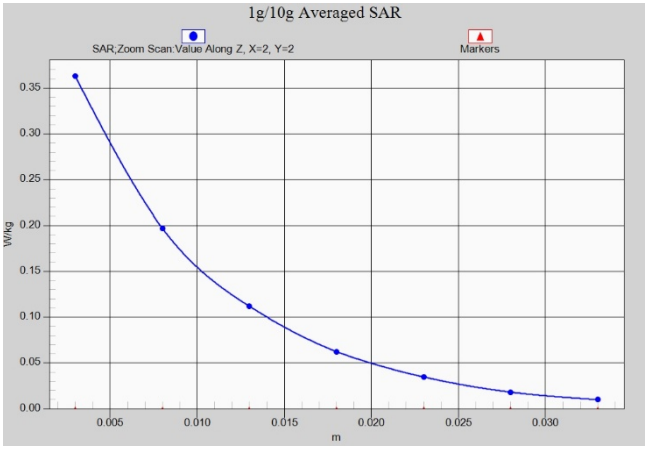


Figure A.17-2

LTEBand7_2560_Rear closed

Date: 11/6/2016
Electronics: DAE4 Sn1331
Medium: Body2600 MHz
Medium parameters used (interpolated): f = 2560 MHz; σ = 2.073 mho/m; εr = 51.22; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: LTEBand7 Frequency: 2560MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.03, 7.03, 7.03)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.508 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.69 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.681 W/kg
SAR(1 g) = 0.378 W/kg; SAR(10 g) = 0.203 W/kg
Maximum value of SAR (measured) = 0.472 W/kg

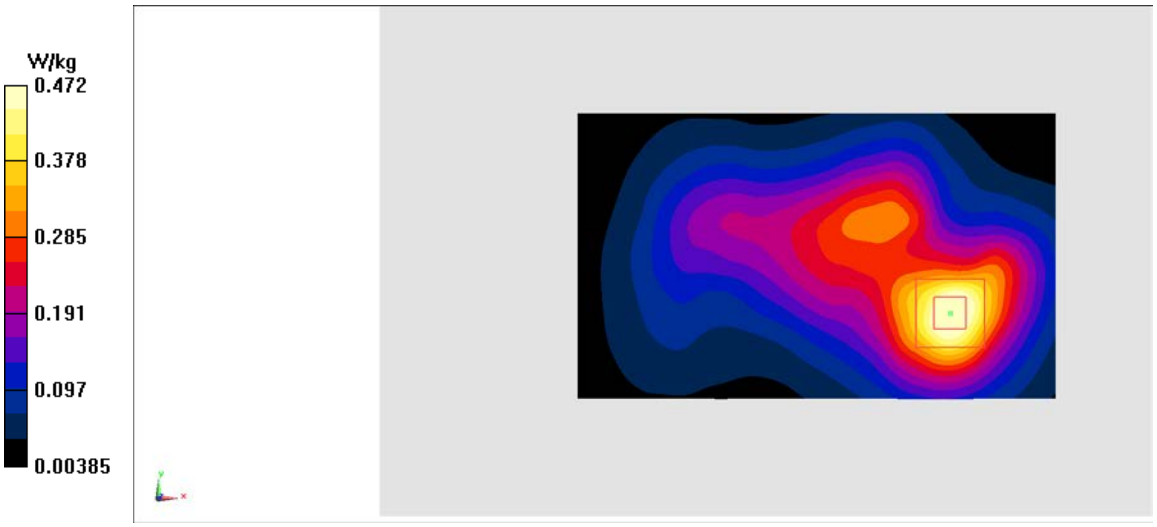


Figure A.18

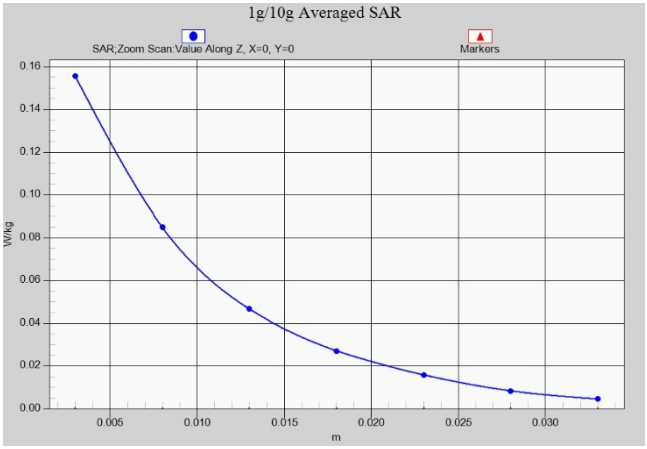


Figure A.18-2

LTEBand12_704_Left Cheek

Date: 11/1/2016
Electronics: DAE4 Sn1331
Medium: Head750 MHz
Medium parameters used (interpolated): f = 704 MHz; σ = 0.837 mho/m; εr = 42.973; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: LTEBand12 Frequency: 704MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(10.47, 10.47, 10.47)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.346 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.605 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.445 W/kg
SAR(1 g) = 0.299 W/kg; SAR(10 g) = 0.208 W/kg
Maximum value of SAR (measured) = 0.346 W/kg

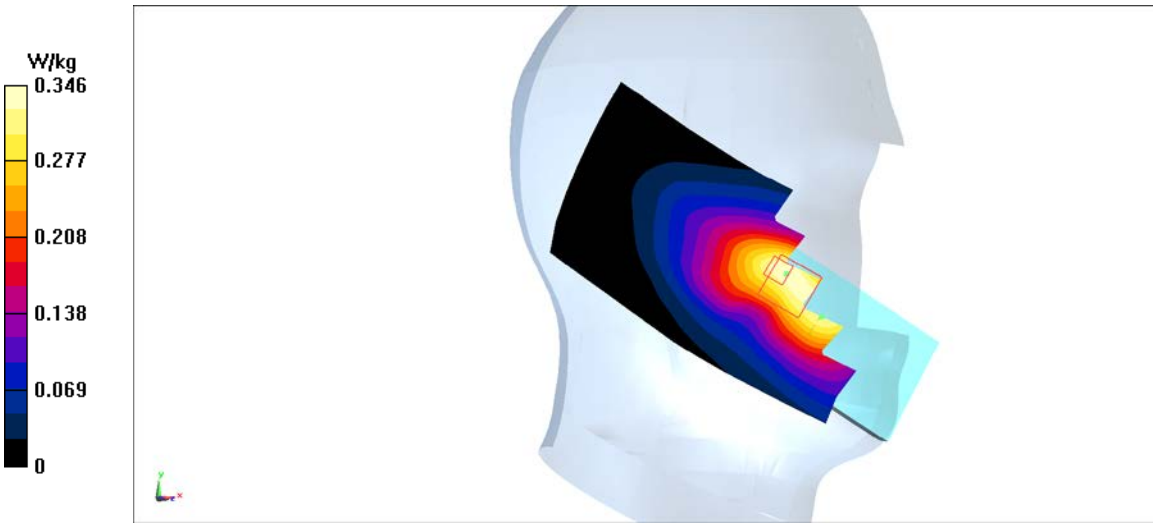


Figure A.19

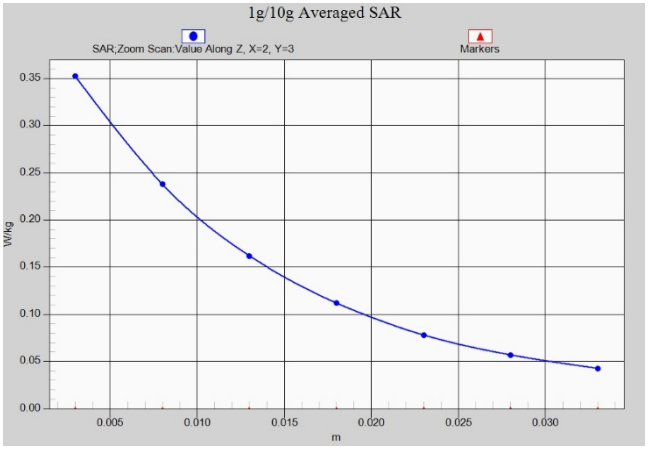


Figure A.19-2

LTEBand12_704_Rear open

Date: 11/1/2016
Electronics: DAE4 Sn1331
Medium: Body750 MHz
Medium parameters used (interpolated): f = 704 MHz; σ = 0.931 mho/m; εr = 56.64; ρ = 1000 kg/m^3
Ambient Temperature: 22.9^{o}C, Liquid Temperature: 22.5^{o}C
Communication System: LTEBand12 Frequency: 704MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(9.93, 9.93, 9.93)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.536 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.23 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.637 W/kg
SAR(1 g) = 0.484 W/kg; SAR(10 g) = 0.353 W/kg
Maximum value of SAR (measured) = 0.540 W/kg

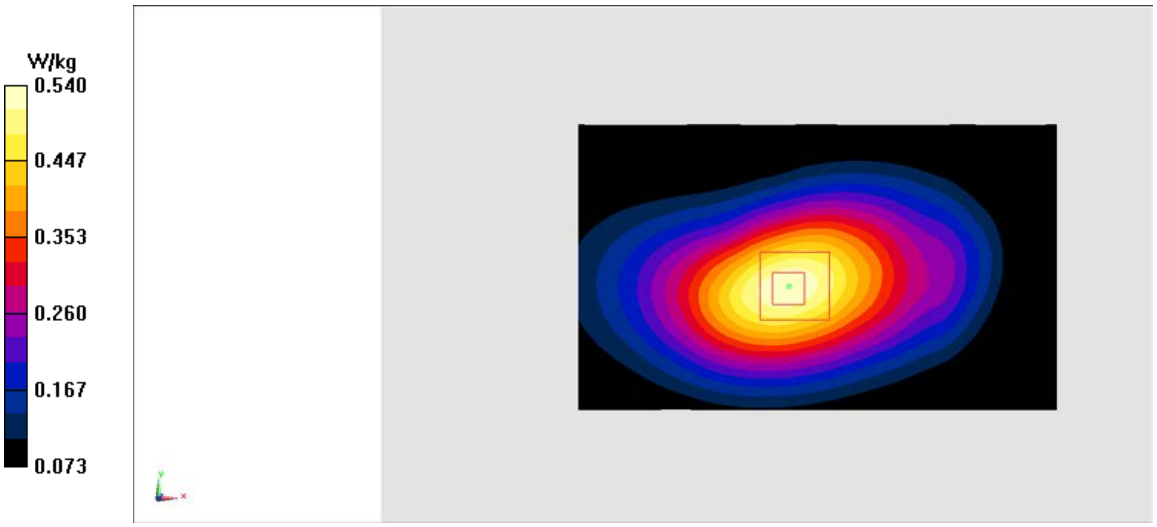


Figure A.20

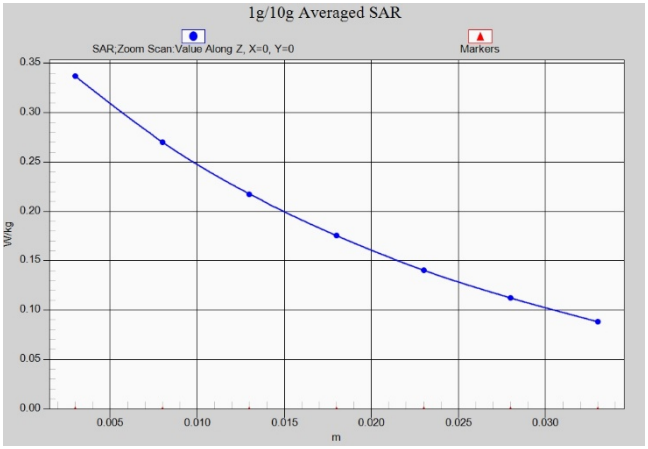


Figure A.20-2

BLUETOOTH HEAD

Date: 11/5/2016
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used (interpolated): f = 2402 MHz; σ = 1.825 mho/m; ε_r = 38.142; ρ = 1000 kg/m^3
Ambient Temperature: 22.9^{o}C, Liquid Temperature: 22.5^{o}C
Communication System: BluetoothFrequency: 2402MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.36, 7.36, 7.36)

Area Scan (61x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0167 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.6730 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.0460 W/kg
SAR(1 g) = 0.00934 W/kg; SAR(10 g) = 0.00321 W/kg
Maximum value of SAR (measured) = 0.0126 W/kg

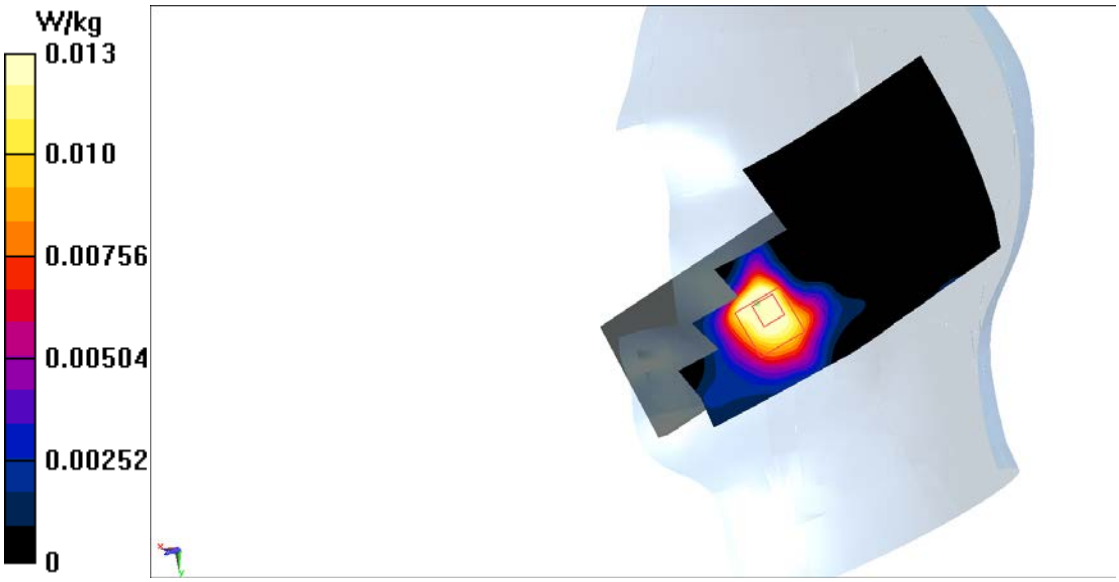


Figure A.21

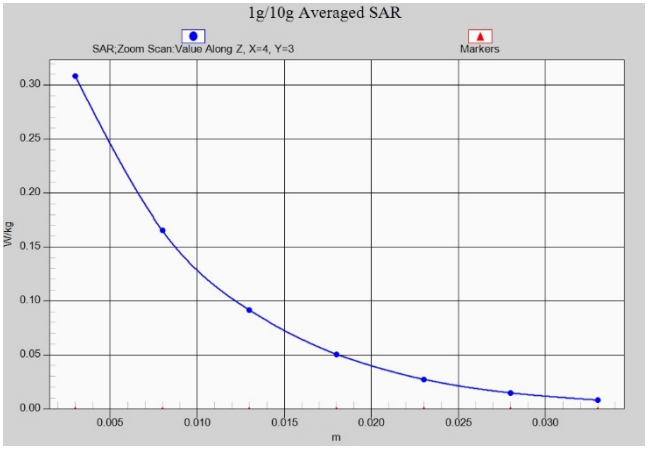


Figure A.21-2

WLAN2.4GHz_2437_Right Cheek

Date: 11/5/2016
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.813 mho/m; ε_r = 38.022; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: WLAN2.4GHz Frequency: 2437MHz 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) = 0.334 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.366 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.461 W/kg
SAR(1 g) = 0.251 W/kg; SAR(10 g) = 0.142 W/kg
Maximum value of SAR (measured) = 0.308 W/kg

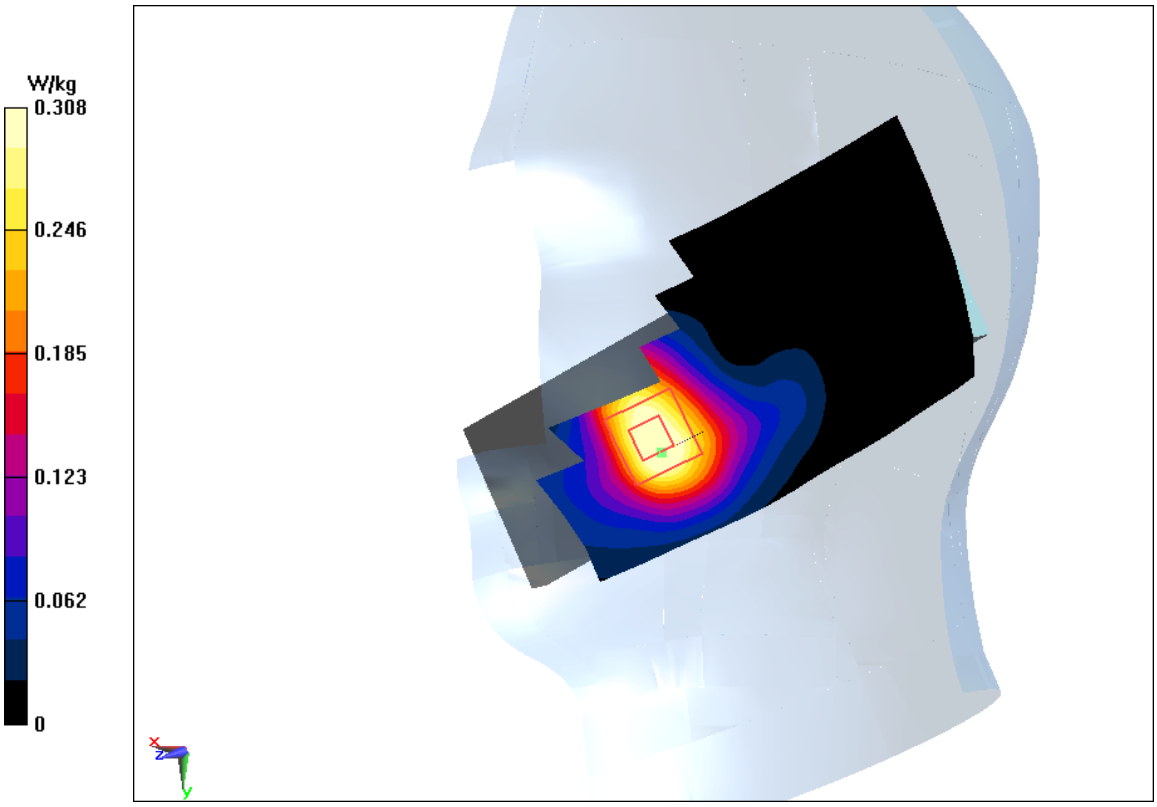


Figure A.22

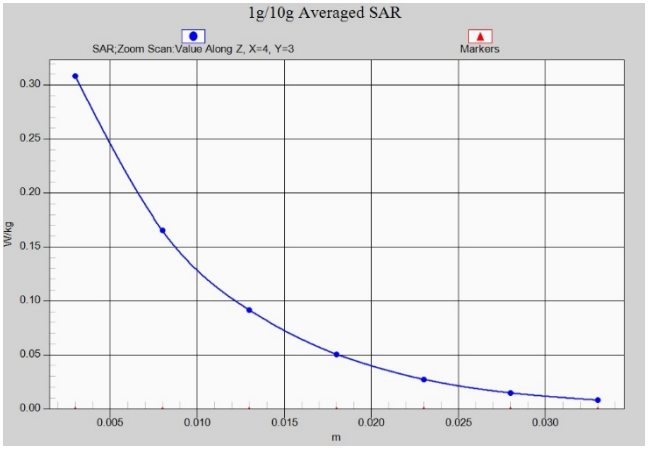


Figure A.22-2

WLAN2.4GHz_2437_Rear open

Date: 11/5/2016
Electronics: DAE4 Sn1331
Medium: Body 2450 MHz
Medium parameters used (interpolated): f = 2437 MHz; σ = 2.033 mho/m; ε_r = 51.893; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: WLAN2.4GHz Frequency: 2437MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.22, 7.22, 7.22)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0627 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.514 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 0.0960 W/kg
SAR(1 g) = 0.053 W/kg; SAR(10 g) = 0.030 W/kg
Maximum value of SAR (measured) = 0.0639 W/kg

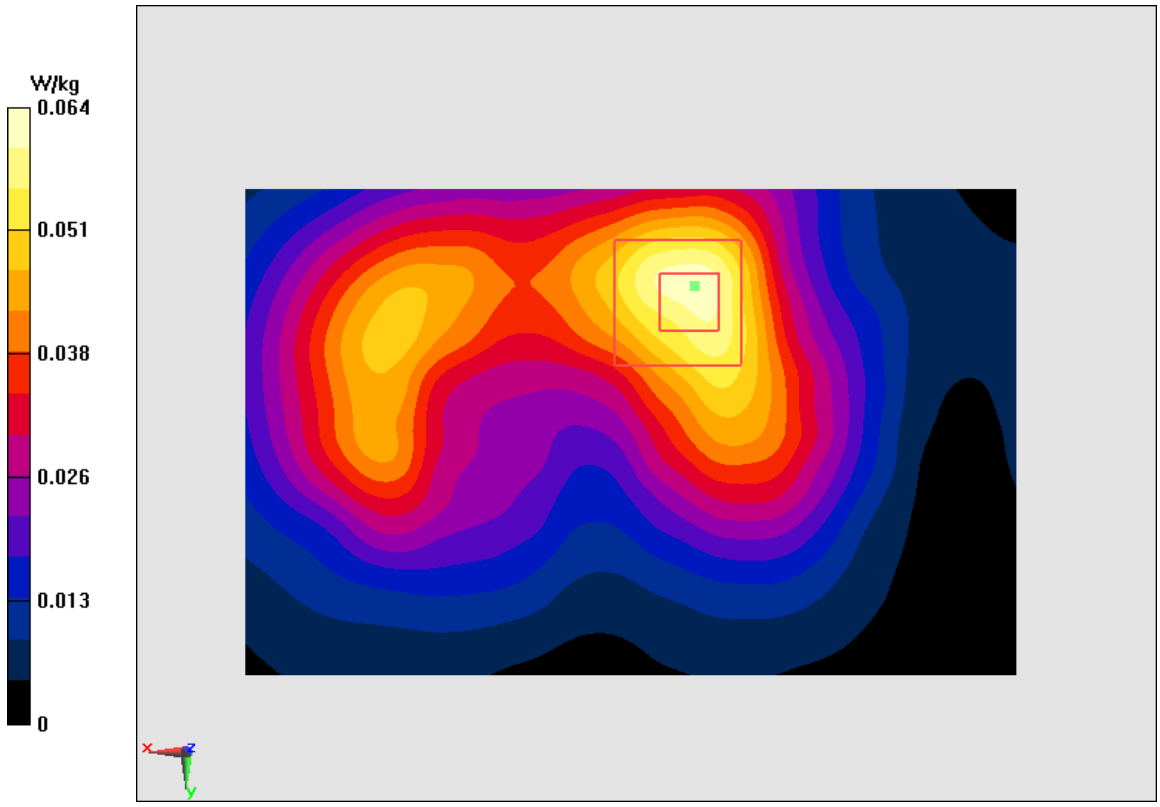


Figure A.23

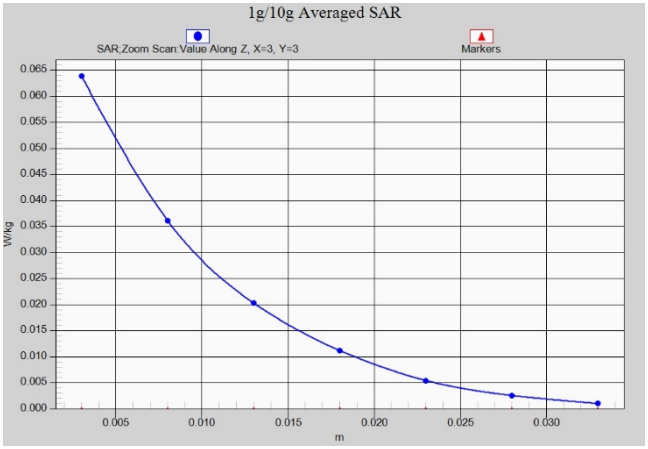


Figure A.23-2

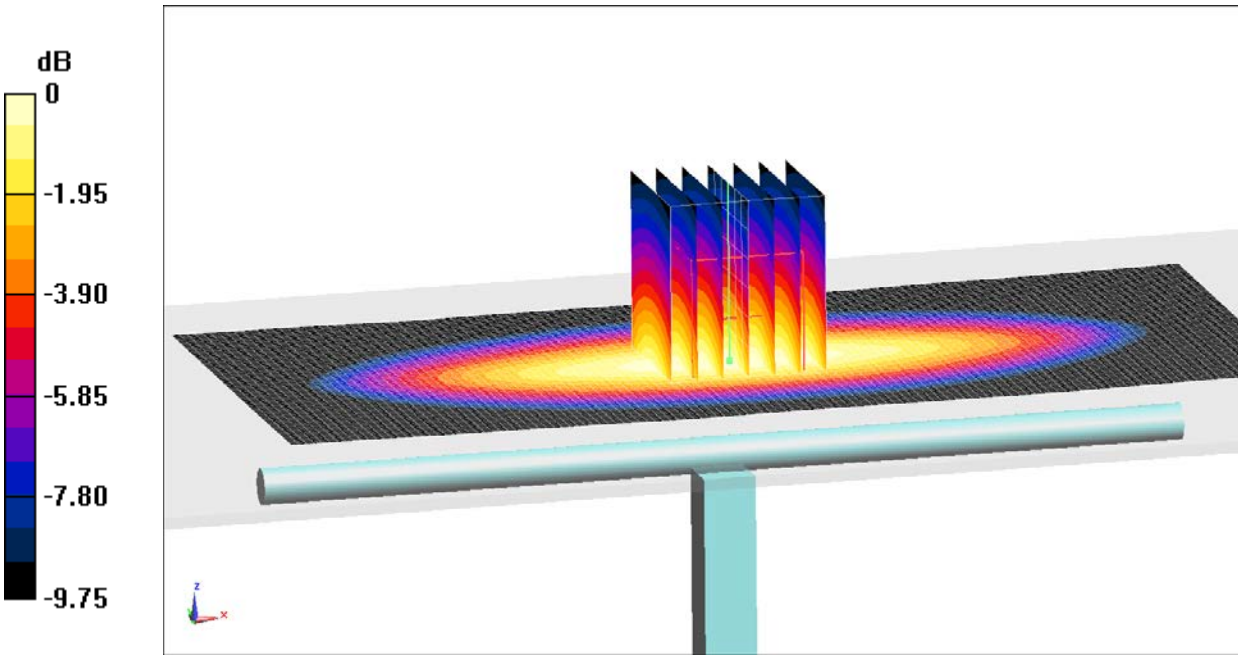
ANNEX B SystemVerification Results

750MHz

Date: 2016-11-1
Electronics: DAE4 Sn1331
Medium: Head 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.892 mho/m; ε_r = 43.28; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(10.47, 10.47, 10.47)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 48.902 V/m; Power Drift = -0.08 dB
Fast SAR: SAR(1 g) = 2.06W/kg; SAR(10 g) = 1.36 W/kg
Maximum value of SAR (interpolated) = 2.17 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 48.902 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 2.81 W/kg
SAR(1 g) = 2.02W/kg; SAR(10 g) = 1.32 W/kg
Maximum value of SAR (measured) = 2.13 W/kg



0 dB = 2.13W/kg = 3.28 dB W/kg

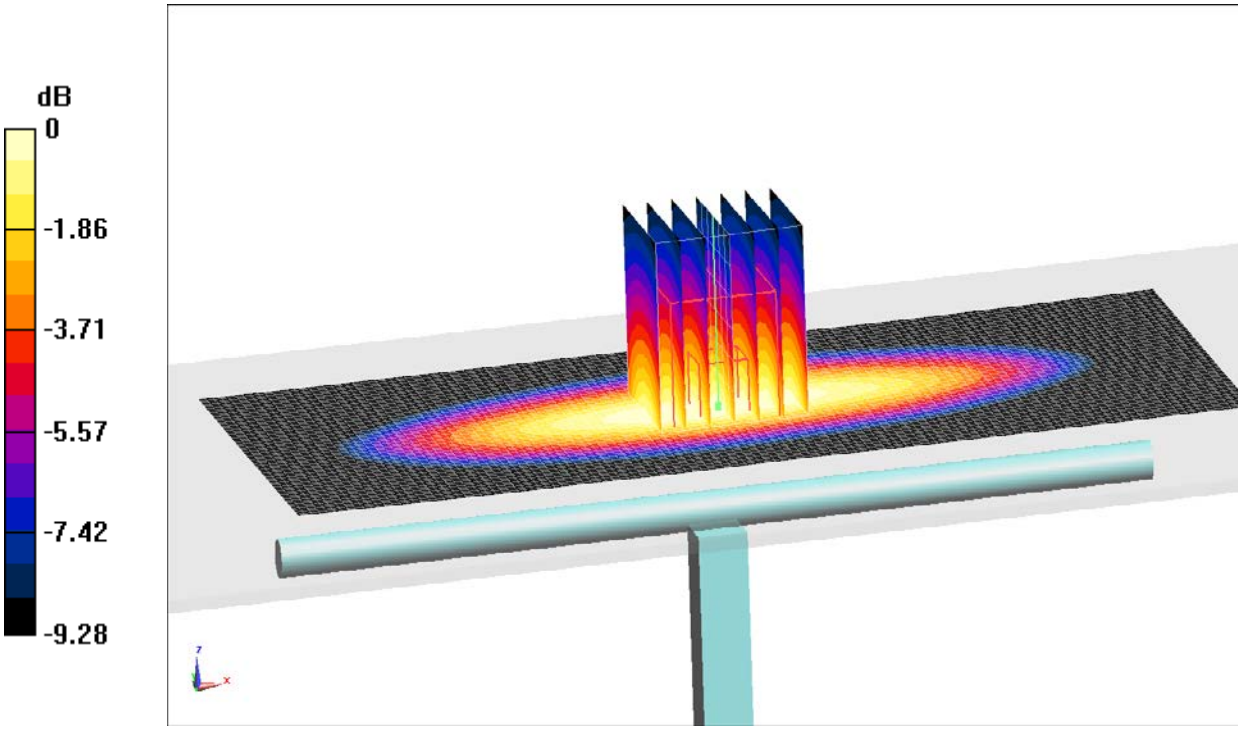
Fig.B.1 validation 750MHz 250mW

750MHz

Date: 2016-11-1
Electronics: DAE4 Sn1331
Medium: Body750 MHz
Medium parameters used: f = 750 MHz; σ = 0.966 mho/m; ε_r = 57.08; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(9.93, 9.93, 9.93)

System Validation/Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 50.985 V/m; Power Drift = 0.06 dB
Fast SAR: SAR(1 g) = 2.14W/kg; SAR(10 g) = 1.41 W/kg
Maximum value of SAR (interpolated) = 2.32 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.985 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 2.99 W/kg
SAR(1 g) = 2.11W/kg; SAR(10 g) = 1.39 W/kg
Maximum value of SAR (measured) = 2.31 W/kg



0 dB = 2.31W/kg = 3.64 dB W/kg

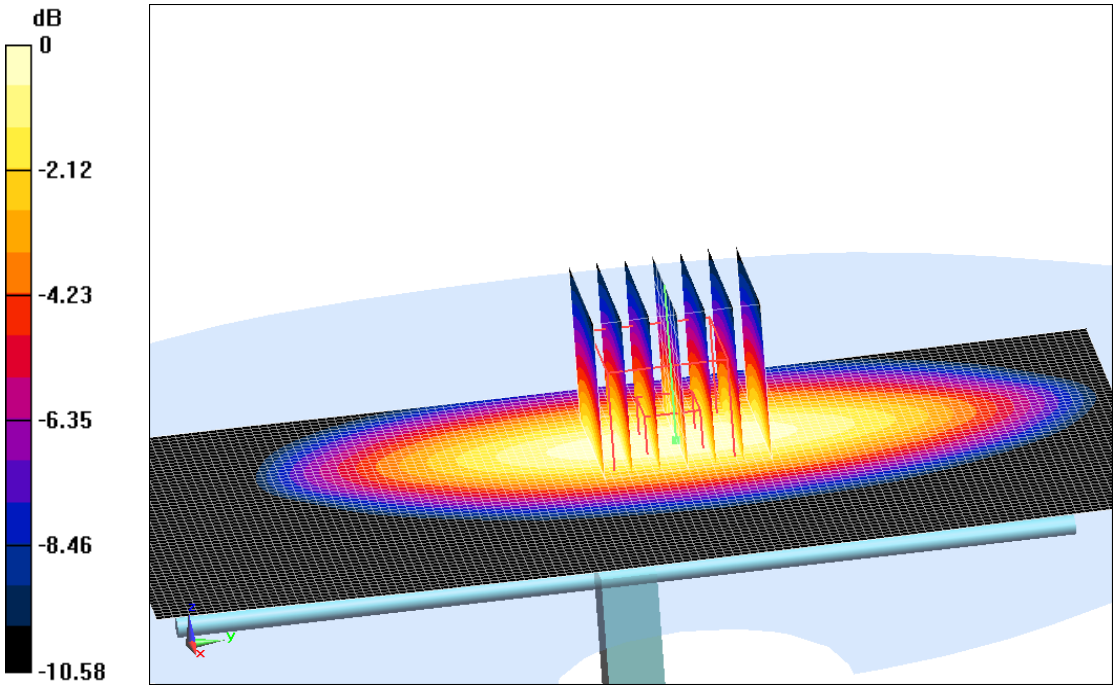
Fig.B.2 validation 750MHz 250mW

835MHz

Date: 2016-11-2
Electronics: DAE4 Sn1331
Medium: Head 850 MHz
Medium parameters used: f = 835 MHz; σ = 0.911 S/m; ε_r = 41.42; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(10.01, 10.01, 10.01)

System Validation/Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 54.191 V/m; Power Drift = -0.07 dB
Fast SAR: SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (interpolated) = 2.56 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.191 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 3.08 W/kg
SAR(1 g) = 2.3 W/kg; SAR(10 g) = 1.51 W/kg
Maximum value of SAR (measured) = 2.45 W/kg



0 dB = 2.45 W/kg = 3.89 dBW/kg

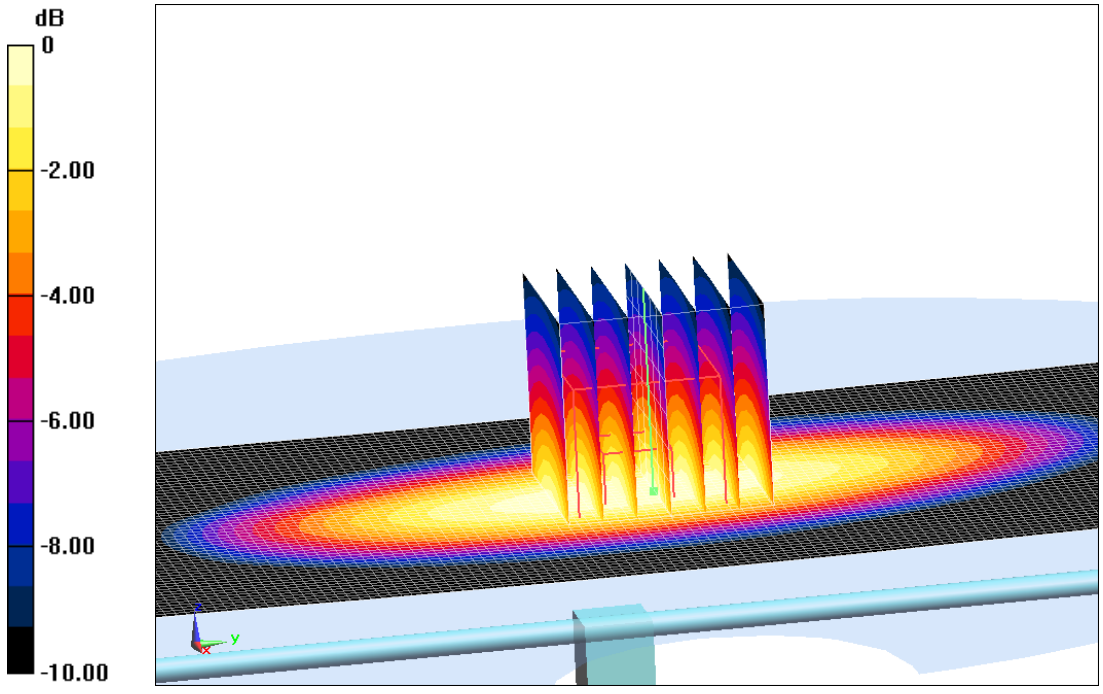
Fig.B.3 validation 835MHz 250mW

835MHz

Date: 2016-11-2
Electronics: DAE4 Sn1331
Medium: Body 850 MHz
Medium parameters used: f = 835 MHz; σ = 0.952S/m; ε_r = 56.53; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(9.83, 9.83, 9.83)

System Validation /Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 52.099 V/m; Power Drift = 0.05 dB
Fast SAR: SAR(1 g) = 2.32 W/kg; SAR(10 g) = 1.50 W/kg
Maximum value of SAR (interpolated) = 2.60 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.099 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.12 W/kg
SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (measured) = 2.63 W/kg



0 dB = 2.63 W/kg = 4.20 dBW/kg

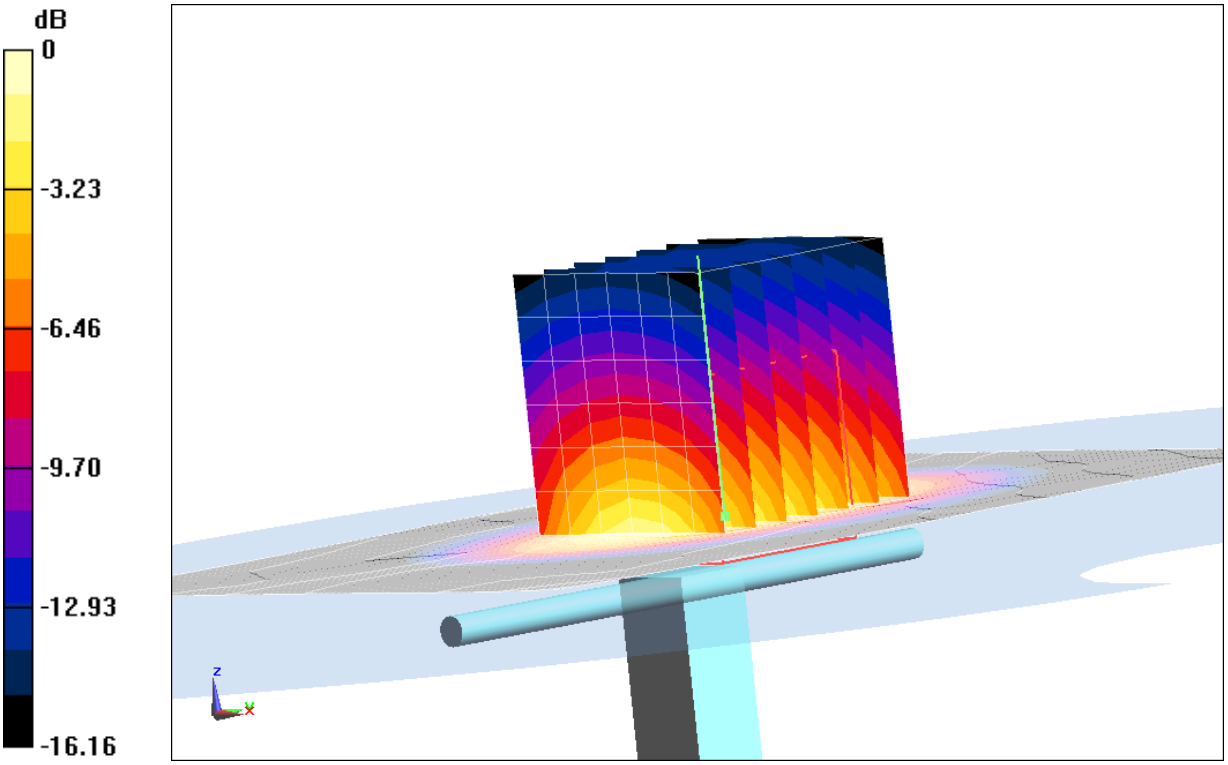
Fig.B.4 validation 835MHz 250mW

1750MHz

Date: 2016-11-3
Electronics: DAE4 Sn1331
Medium: Head 1750 MHz
Medium parameters used: f=1750 MHz; σ = 1.341 mho/m; εr = 40.53; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(8.37, 8.37, 8.37)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 88.27 V/m; Power Drift = -0.08 dB
Fast SAR: SAR(1 g) = 8.99 W/kg; SAR(10 g) = 4.74 W/kg
Maximum value of SAR (interpolated) = 9.86 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.27 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 15.46 W/kg
SAR(1 g) = 9.04 W/kg; SAR(10 g) = 4.77 W/kg
Maximum value of SAR (measured) = 9.91 W/kg



0 dB = 9.91W/kg = 9.96 dB W/kg

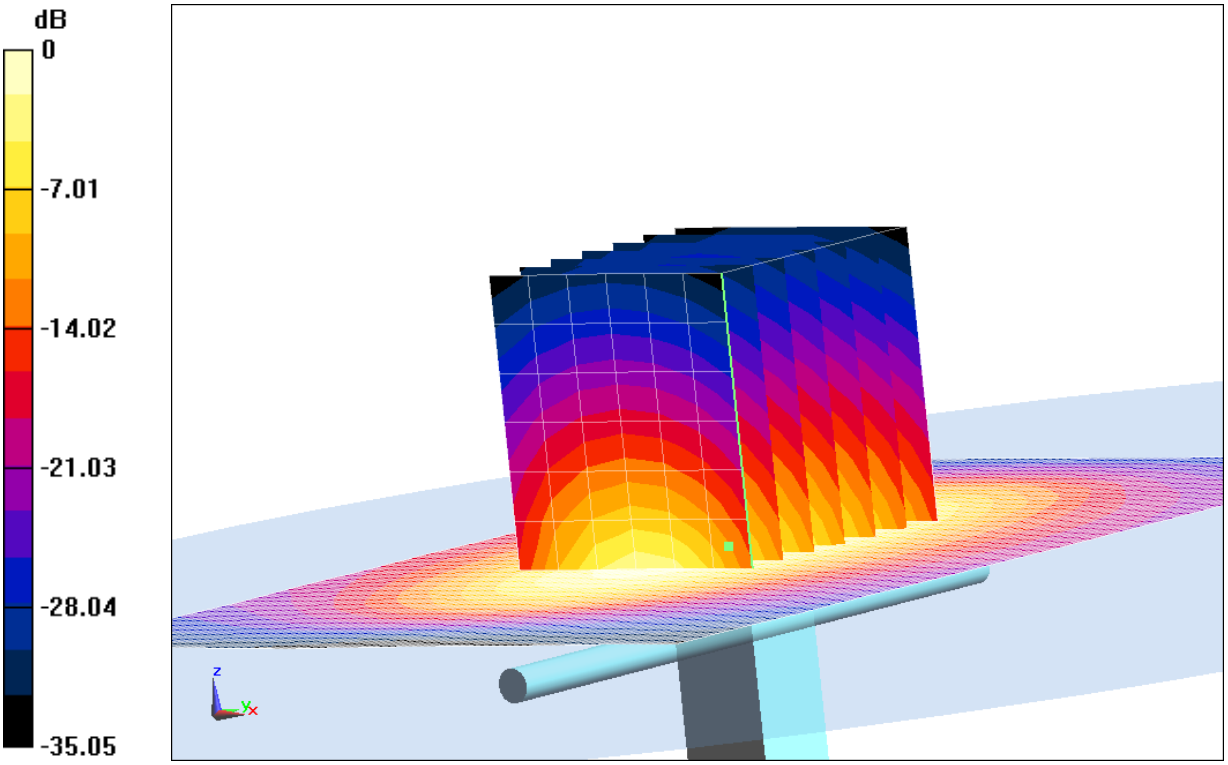
Fig.B.5 validation 1750MHz 250mW

1750MHz

Date: 2016-11-3
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used: f=1750 MHz; σ = 1.512 mho/m; εr = 53.7; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307ConvF(8.18, 8.18, 8.18)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 94.892 V/m; Power Drift = -0.04 dB
Fast SAR: SAR(1 g) = 9.55 W/kg; SAR(10 g) = 5.15 W/kg
Maximum value of SAR (interpolated) = 10.4 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.892 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 15.5 W/kg
SAR(1 g) = 9.37 W/kg; SAR(10 g) = 4.98 W/kg
Maximum value of SAR (measured) = 10.2 W/kg



0 dB = 10.2W/kg = 10.09 dB W/kg

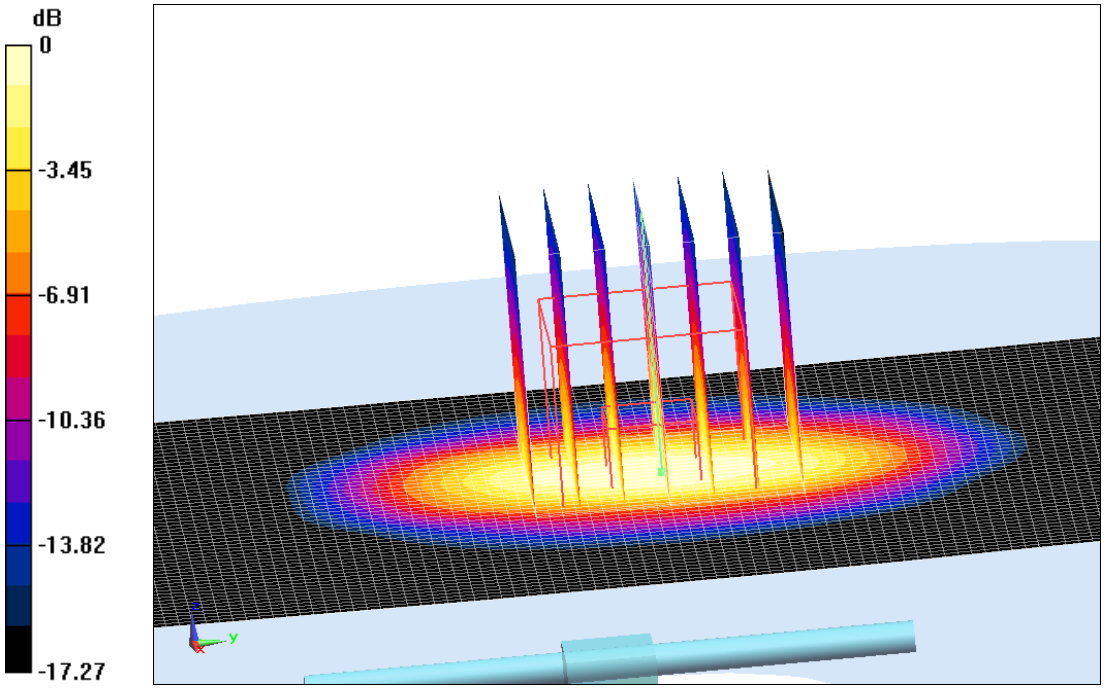
Fig.B.6 validation 1750MHz 250mW

1900MHz

Date: 2016-11-4
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used:f = 1900 MHz;σ = 1.428 mho/m; ε_r = 40.94; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(8.10, 8.10, 8.10)

System Validation /Area Scan(61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 90.476 V/m; Power Drift = 0.04 dB
SAR(1 g) = 10.2W/kg; SAR(10 g) = 5.32 W/kg
Maximum value of SAR (interpolated) = 12.5 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.476 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 10 W/kg; SAR(10 g) = 5.17 W/kg
Maximum value of SAR (measured) = 12.2 W/kg



0 dB = 12.2 W/kg = 10.86 dBW/kg

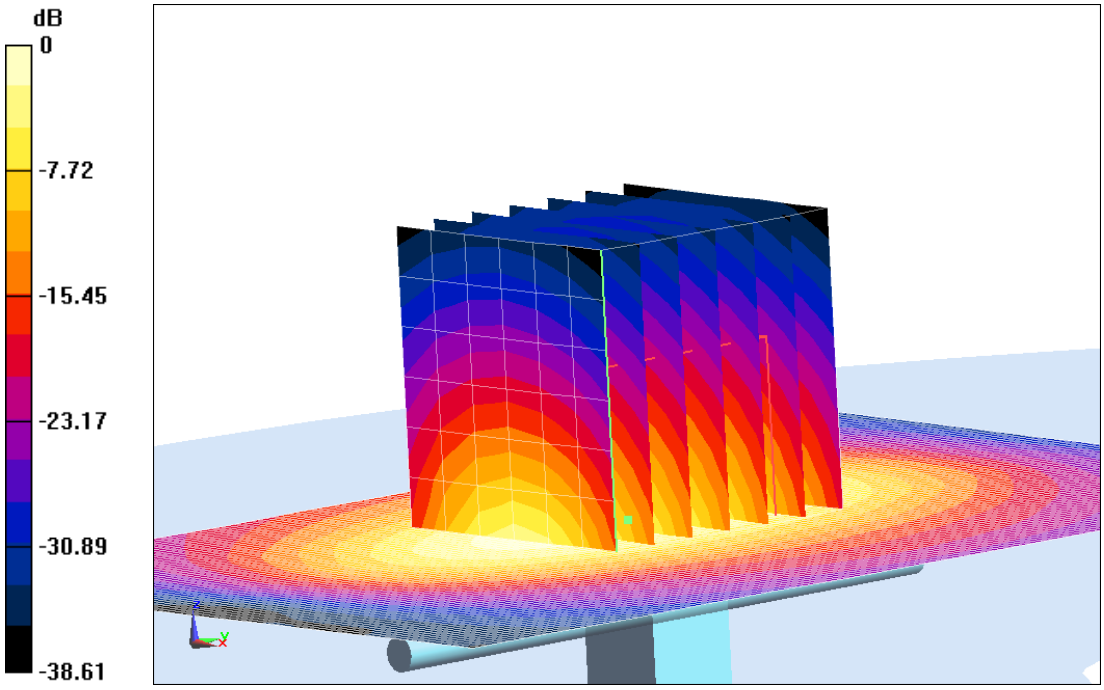
Fig.B.7validation 1900MHz 250mW

1900MHz

Date: 2016-11-4
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.507S/m; ε_r = 51.93; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.67, 7.67, 7.67)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 93.07 V/m; Power Drift = 0.02 dB
Fast SAR: SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.48 W/kg
Maximum value of SAR (interpolated) = 12.3 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.07 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 19.08 W/kg
SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.41 W/kg
Maximum value of SAR (measured) = 12.2 W/kg



0 dB = 12.2W/kg = 10.9 dB W/kg

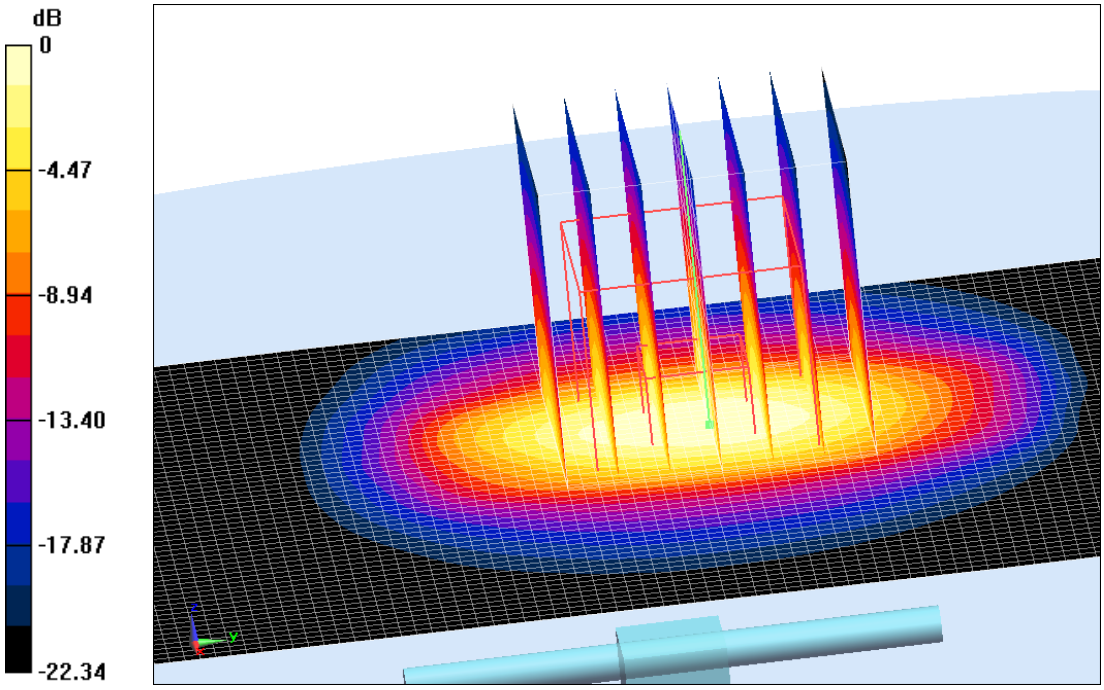
Fig.B.8validation 1900MHz 250mW

2450MHz

Date: 2016-11-5
Electronics: DAE4 Sn1331
Medium: Head 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.836 mho/m; ε_r = 38.22; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°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 = 92.513 V/m; Power Drift = -0.02 dB
SAR(1 g) = 13.7W/kg; SAR(10 g) = 6.52 W/kg
Maximum value of SAR (interpolated) = 17.1 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.513 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 27.64 W/kg
SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.35 W/kg
Maximum value of SAR (measured) = 16.6 W/kg



0 dB = 16.6 W/kg = 12.20 dBW/kg

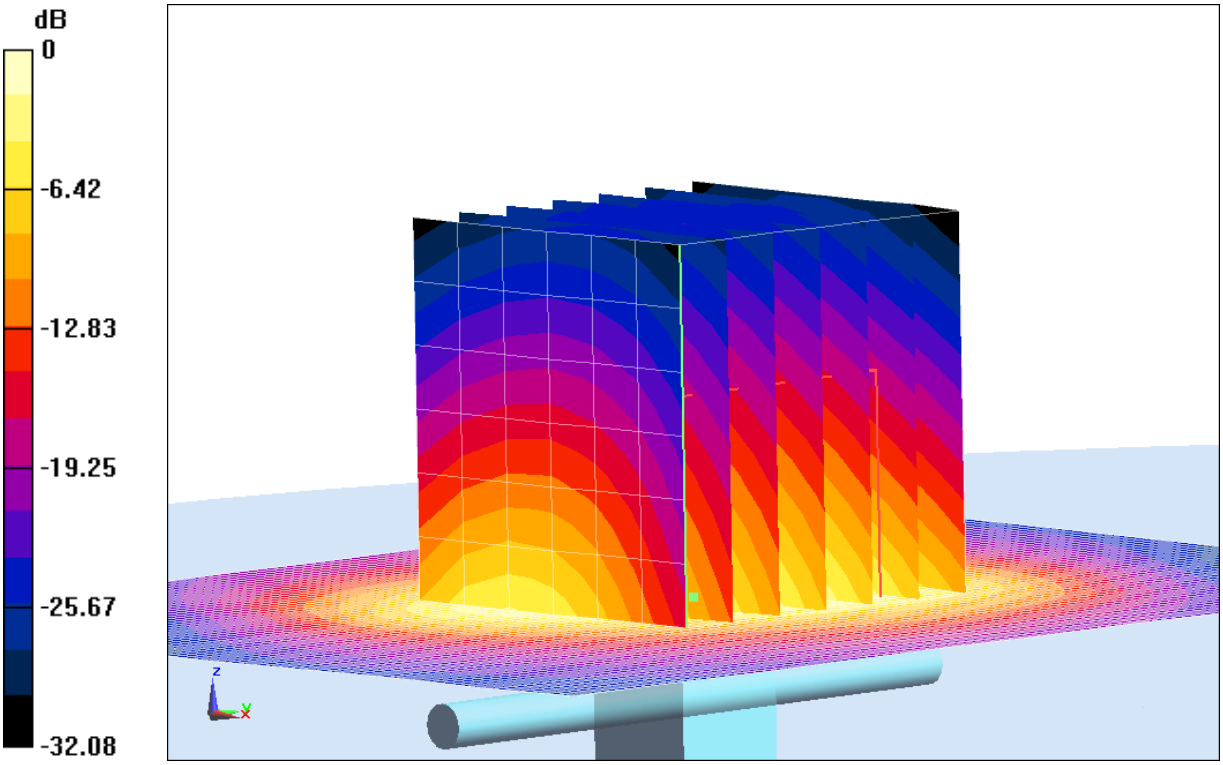
Fig.B.9 validation 2450MHz 250mW

2450MHz

Date: 2016-11-5
Electronics: DAE4 Sn1331
Medium: Body 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.998S/m; ε_r = 51.88; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°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 = 92.188 V/m; Power Drift = 0.05 dB
SAR(1 g) = 13.1W/kg; SAR(10 g) = 6.09 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 = 92.188 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 24.81 W/kg
SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.22 W/kg
Maximum value of SAR (measured) = 14.7 W/kg



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

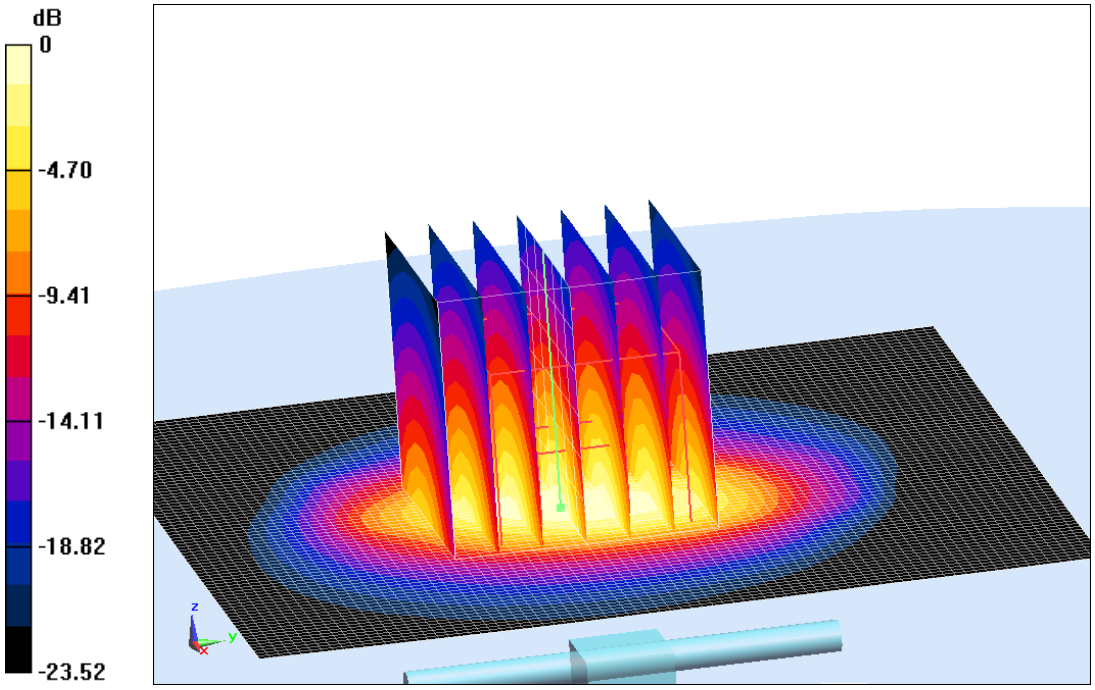
Fig.B.10validation 2450MHz 250mW

2600MHz

Date: 2016-11-6
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 1.906 mho/m; ε_r = 37.86; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 2600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.21, 7.21, 7.21)

System Validation/Area Scan(81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 80.401 V/m; Power Drift = 0.06 dB
SAR(1 g) = 14.7W/kg; SAR(10 g) = 6.59 W/kg
Maximum value of SAR (interpolated) = 22.6 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 80.401 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 31.03 W/kg
SAR(1 g) = 14.5 W/kg; SAR(10 g) = 6.45 W/kg
Maximum value of SAR (measured) = 22.4 W/kg



0 dB = 22.4 W/kg = 13.5 dBW/kg

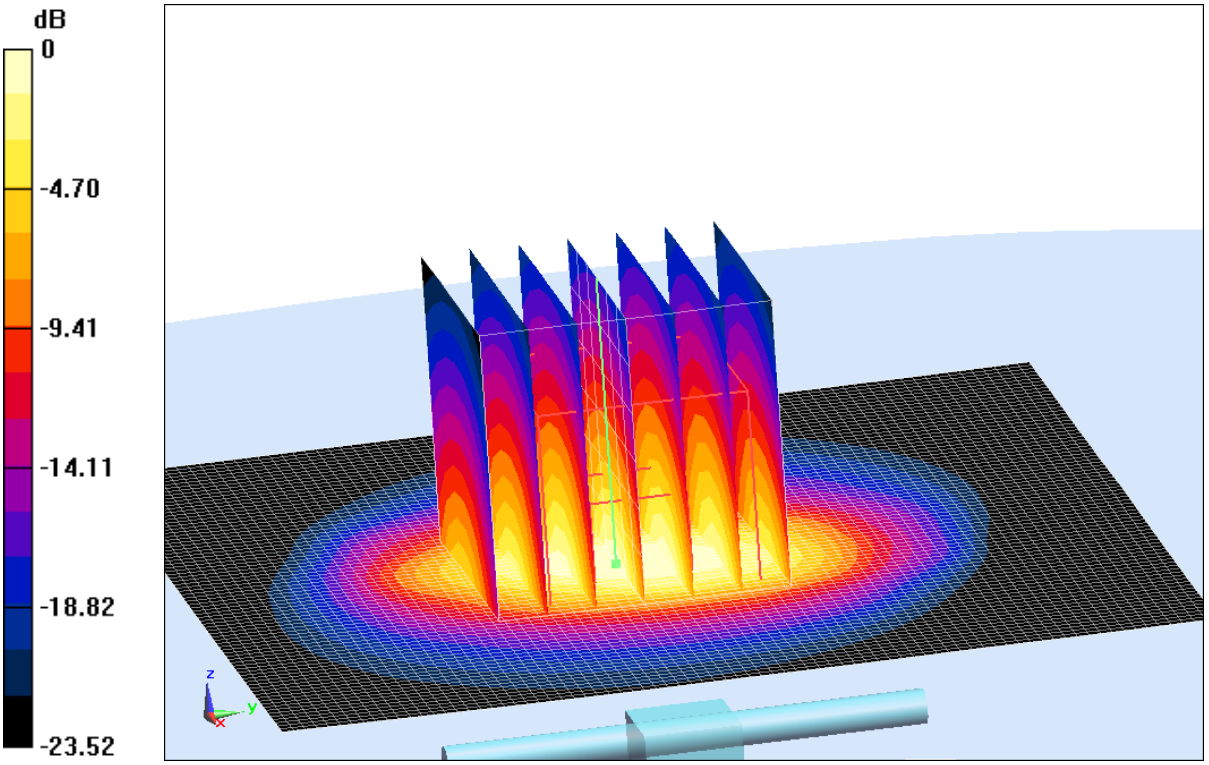
Fig.B.11 validation 2600MHz 250mW

2600MHz

Date: 2016-11-6
Electronics: DAE4 Sn1331
Medium: Body 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.23 mho/m; ε_r = 51.27; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 2600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.03, 7.03, 7.03)

System Validation /Area Scan(81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 83.31 V/m; Power Drift = 0.05 dB
Fast SAR: SAR(1 g) = 14.6W/kg; SAR(10 g) = 6.57 W/kg
Maximum value of SAR (interpolated) = 22.5W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 83.31 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 31.29W/kg
SAR(1 g) = 14.4W/kg; SAR(10 g) = 6.41W/kg
Maximum value of SAR (measured) = 22.3W/kg



0 dB = 22.3W/kg = 13.48 dB W/kg

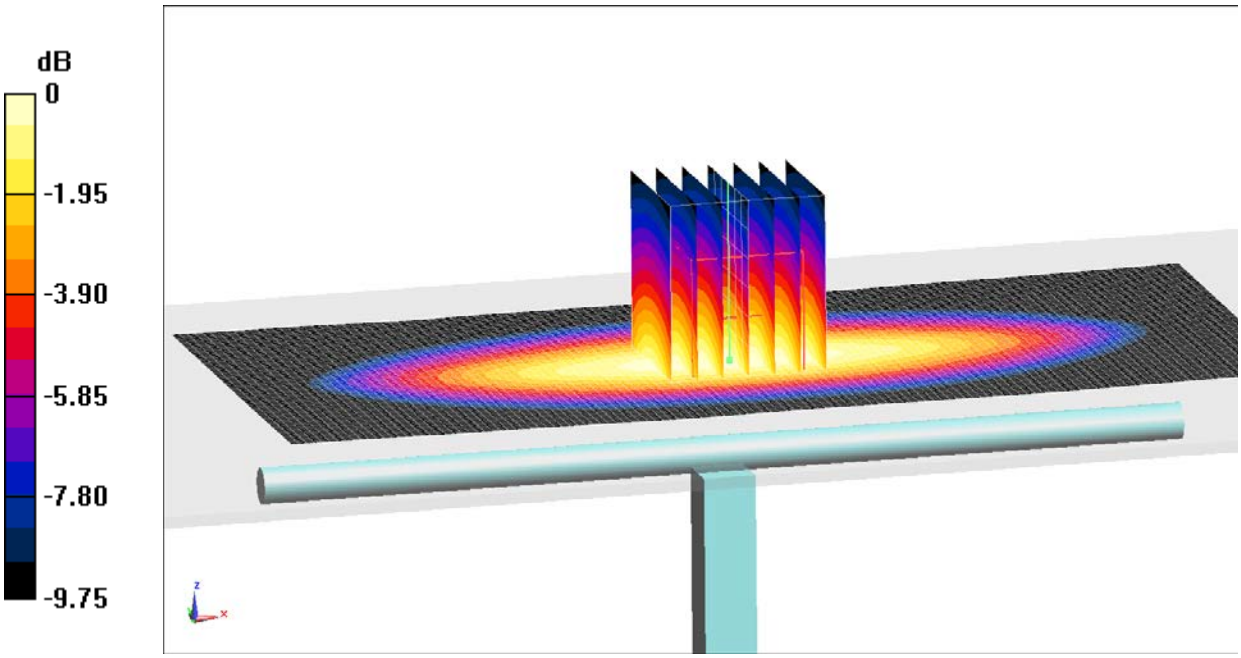
Fig.B.12 validation 2600MHz 250mW

750MHz

Date: 2016-11-21
Electronics: DAE4 Sn1331
Medium: Head 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.912 mho/m; ε_r = 41.25; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(10.47, 10.47, 10.47)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 49.534 V/m; Power Drift = 0.09 dB
Fast SAR: SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (interpolated) = 2.22 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 49.534 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 2.89 W/kg
SAR(1 g) = 2.08 W/kg; SAR(10 g) = 1.35 W/kg
Maximum value of SAR (measured) = 2.19 W/kg



0 dB = 2.19W/kg = 3.40 dB W/kg

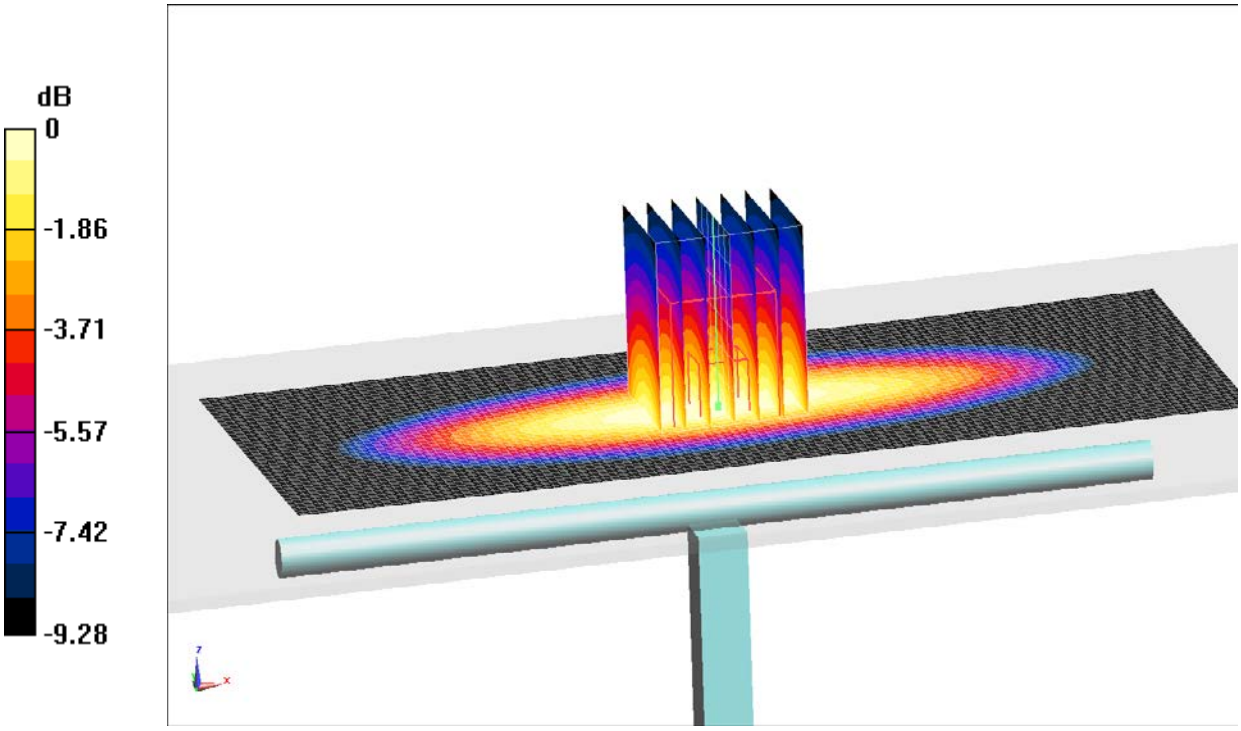
Fig.B.13 validation 750MHz 250mW

750MHz

Date: 2016-11-21
Electronics: DAE4 Sn1331
Medium: Body750 MHz
Medium parameters used: f = 750 MHz; σ = 0.977 mho/m; ε_r = 56.37; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(9.93, 9.93, 9.93)

System Validation/Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 51.318 V/m; Power Drift = 0.04 dB
Fast SAR: SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.43 W/kg
Maximum value of SAR (interpolated) = 2.36 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.318 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 3.02 W/kg
SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.41 W/kg
Maximum value of SAR (measured) = 2.34 W/kg



0 dB = 2.34W/kg = 3.69 dB W/kg

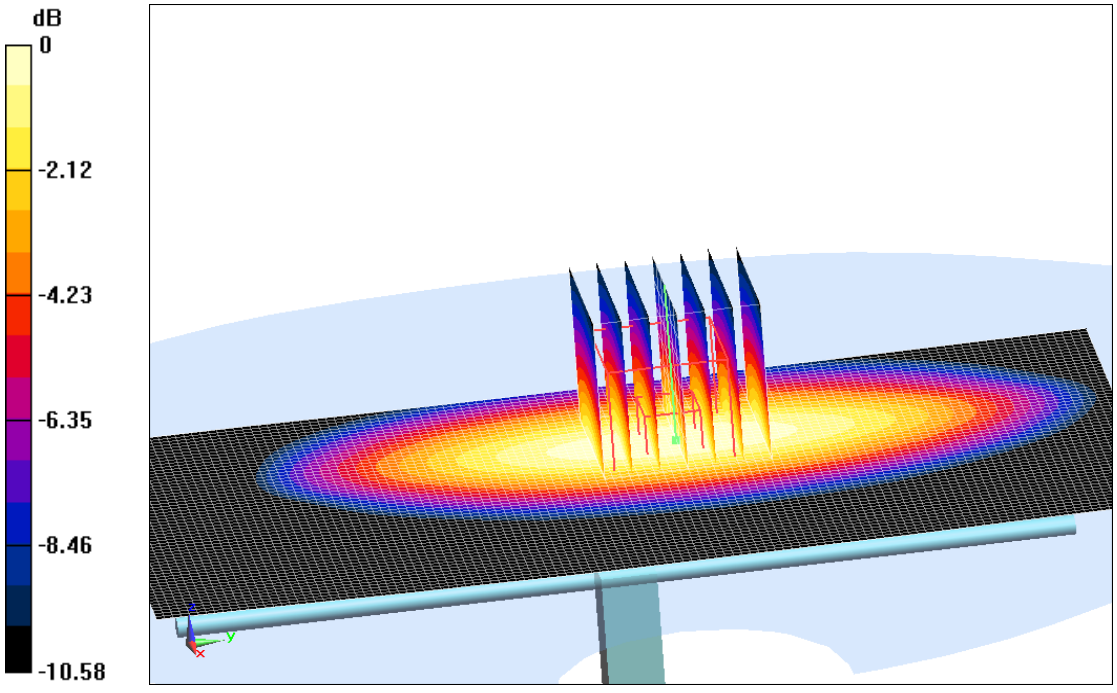
Fig.B.14 validation 750MHz 250mW

835MHz

Date: 2016-11-16
Electronics: DAE4 Sn1331
Medium: Head 850 MHz
Medium parameters used: f = 835 MHz; σ = 0.924 S/m; ε_r = 41.01; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(10.01, 10.01, 10.01)

System Validation/Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 55.16 V/m; Power Drift = -0.08 dB
Fast SAR: SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.61 W/kg
Maximum value of SAR (interpolated) = 2.61 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.16 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 2.54 W/kg



0 dB = 2.54 W/kg = 4.05 dBW/kg

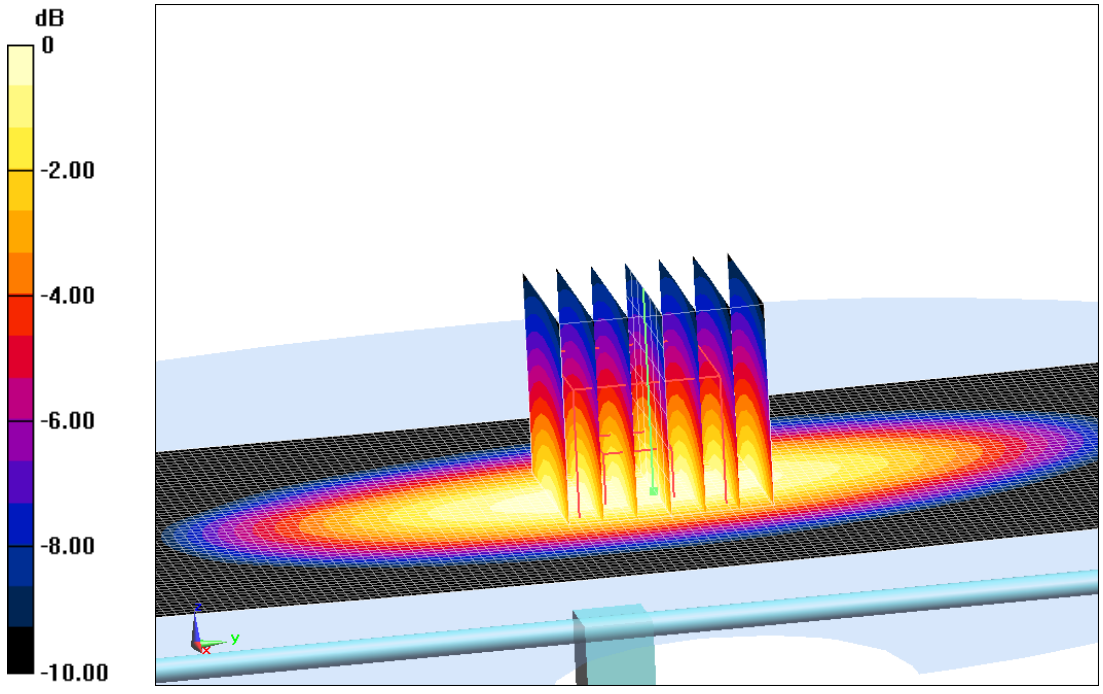
Fig.B.15 validation 835MHz 250mW

835MHz

Date: 2016-11-16
Electronics: DAE4 Sn1331
Medium: Body 850 MHz
Medium parameters used: f = 835 MHz; σ = 0.941 S/m; ε_r = 56.03; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(9.83, 9.83, 9.83)

System Validation /Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 52.72 V/m; Power Drift = -0.05 dB
Fast SAR: SAR(1 g) = 2.38 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (interpolated) = 2.66 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.72 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.18 W/kg
SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.57 W/kg
Maximum value of SAR (measured) = 2.69 W/kg



0 dB = 2.69 W/kg = 4.30 dBW/kg

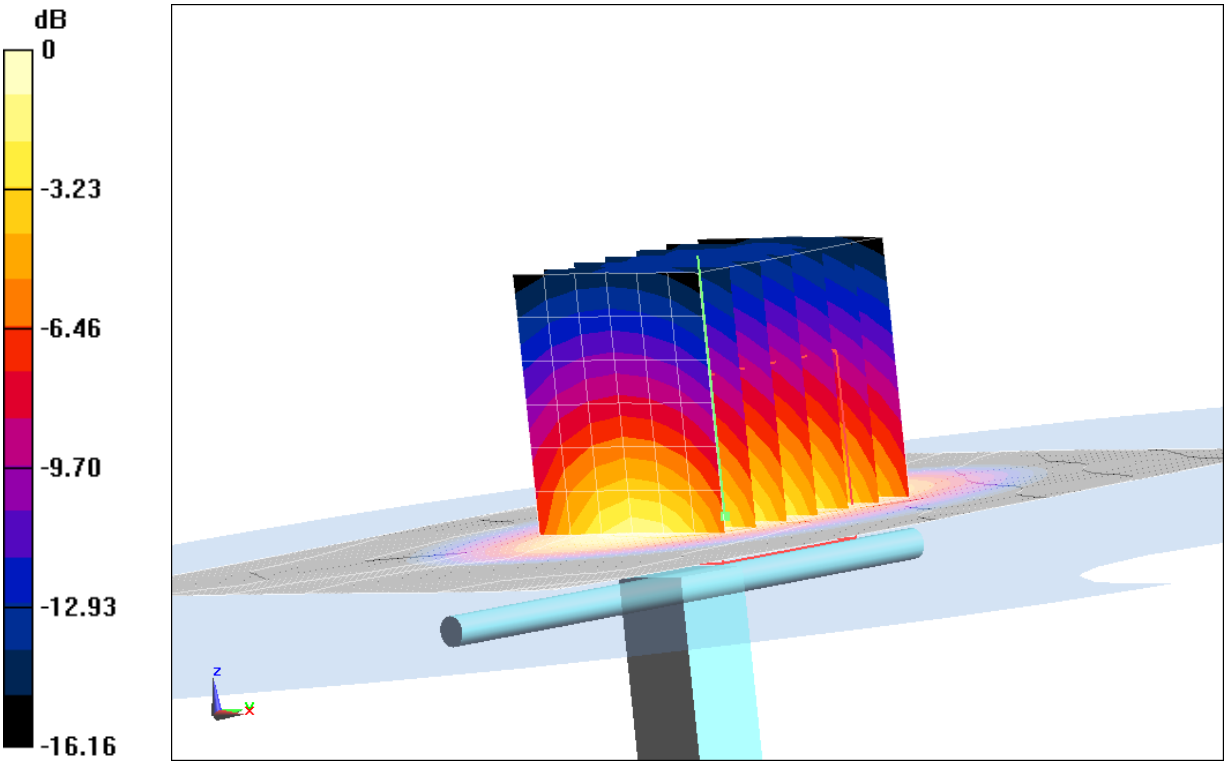
Fig.B.16 validation 835MHz 250mW

1750MHz

Date: 2016-11-20
Electronics: DAE4 Sn1331
Medium: Head 1750 MHz
Medium parameters used: f=1750 MHz; σ = 1.356 mho/m; εr = 39.43; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(8.37, 8.37, 8.37)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 87.633 V/m; Power Drift = -0.05 dB
Fast SAR: SAR(1 g) = 8.93 W/kg; SAR(10 g) = 4.69 W/kg
Maximum value of SAR (interpolated) = 9.80 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.633 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 15.41 W/kg
SAR(1 g) = 8.98 W/kg; SAR(10 g) = 4.73 W/kg
Maximum value of SAR (measured) = 9.85 W/kg



0 dB = 9.85W/kg = 9.93 dB W/kg

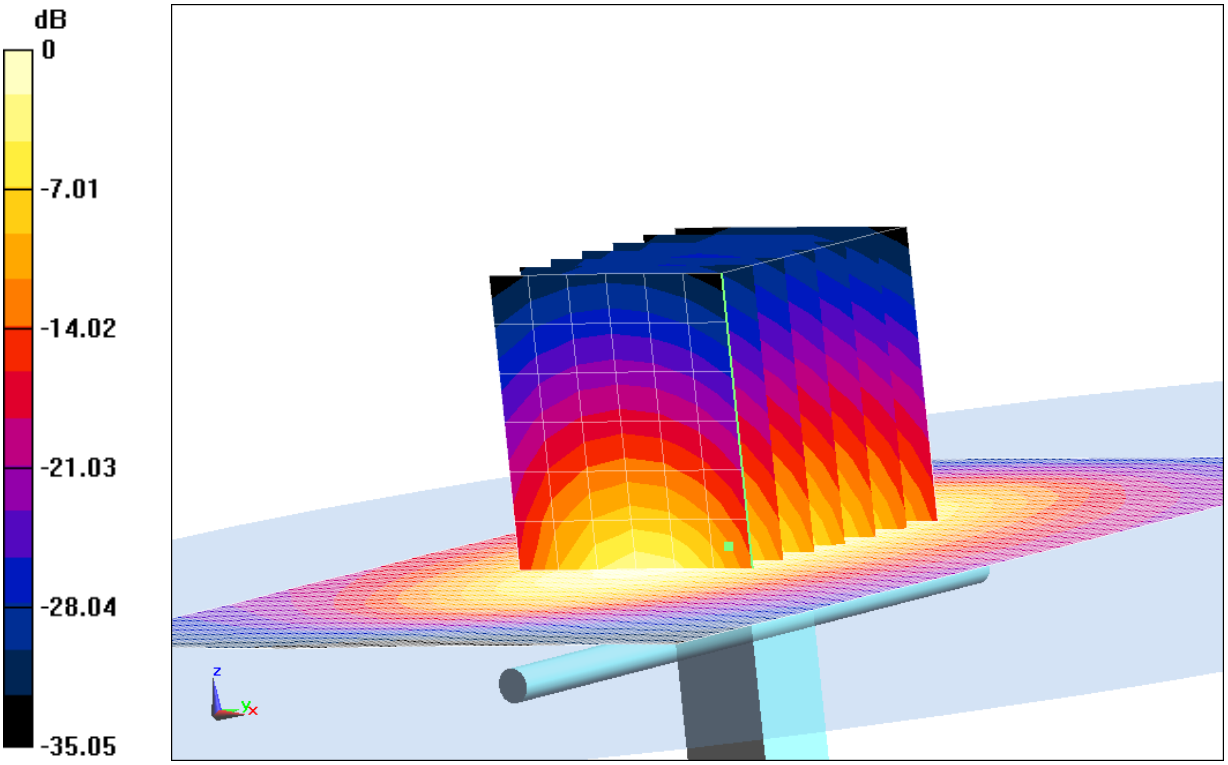
Fig.B.17 validation 1750MHz 250mW

1750MHz

Date: 2016-11-20
Electronics: DAE4 Sn1331
Medium: Body 1750 MHz
Medium parameters used: f=1750 MHz; σ = 1.525 mho/m; εr = 54.01; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(8.18, 8.18, 8.18)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 94.378 V/m; Power Drift = 0.06 dB
Fast SAR: SAR(1 g) = 9.52 W/kg; SAR(10 g) = 5.12 W/kg
Maximum value of SAR (interpolated) = 10.4 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.378 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 15.5 W/kg
SAR(1 g) = 9.33 W/kg; SAR(10 g) = 4.95 W/kg
Maximum value of SAR (measured) = 10.2 W/kg



0 dB = 10.2W/kg = 10.09 dB W/kg

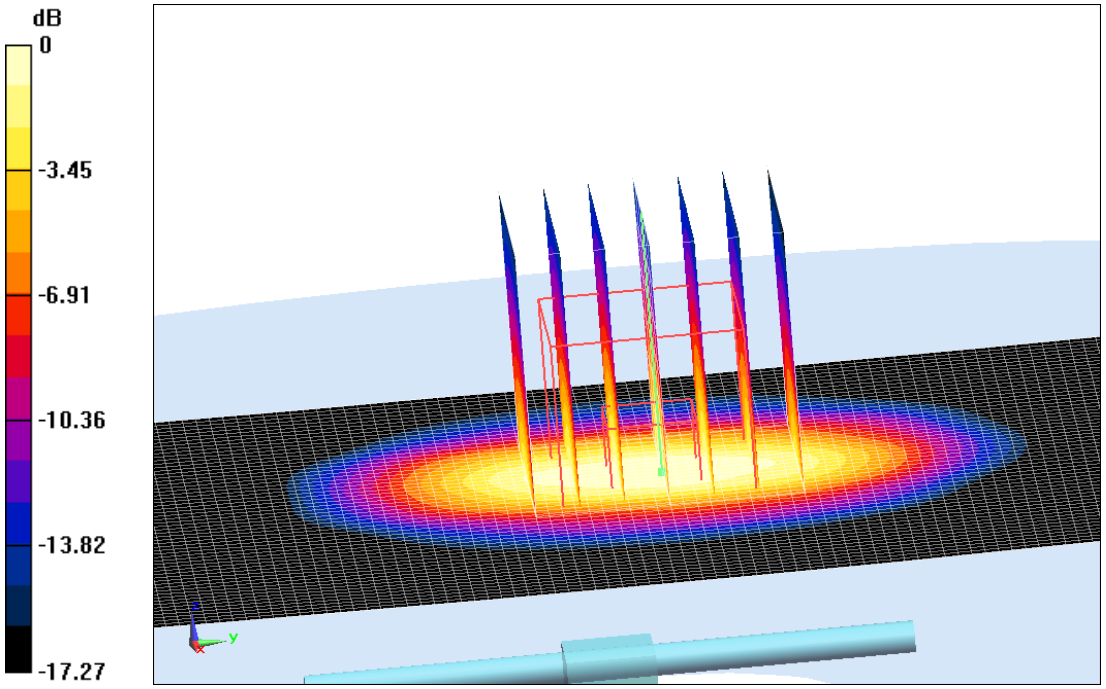
Fig.B.18 validation 1750MHz 250mW

1900MHz

Date: 2016-11-18
Electronics: DAE4 Sn1331
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.417 mho/m; ε_r = 41.15; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(8.10, 8.10, 8.10)

System Validation /Area Scan(61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 91.395 V/m; Power Drift = -0.05 dB
SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.44 W/kg
Maximum value of SAR (interpolated) = 12.5 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.395 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.26 W/kg
Maximum value of SAR (measured) = 12.3 W/kg



0 dB = 12.3 W/kg = 10.90 dBW/kg

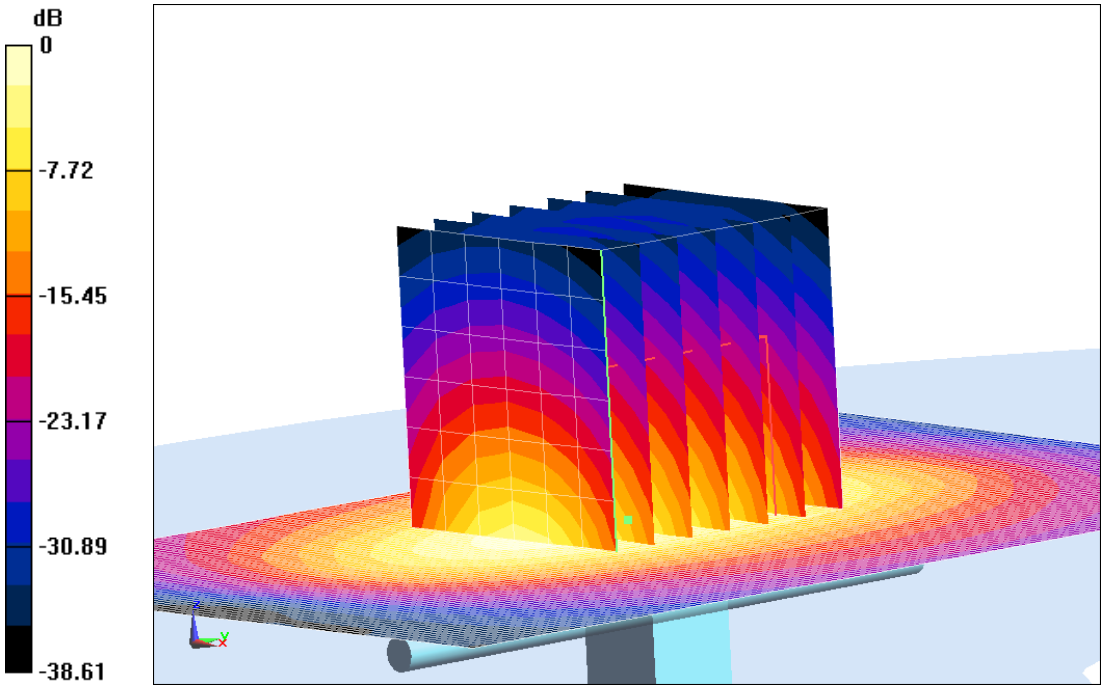
Fig.B.19 validation 1900MHz 250mW

1900MHz

Date: 2016-11-18
Electronics: DAE4 Sn1331
Medium: Body 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.497 mho/m; ε_r = 53.73; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.67, 7.67, 7.67)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 92.046 V/m; Power Drift = -0.04 dB
Fast SAR: SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.46 W/kg
Maximum value of SAR (interpolated) = 12.2 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.046 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 18.99 W/kg
SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.38 W/kg
Maximum value of SAR (measured) = 12.1 W/kg



0 dB = 12.1W/kg = 10.83 dB W/kg

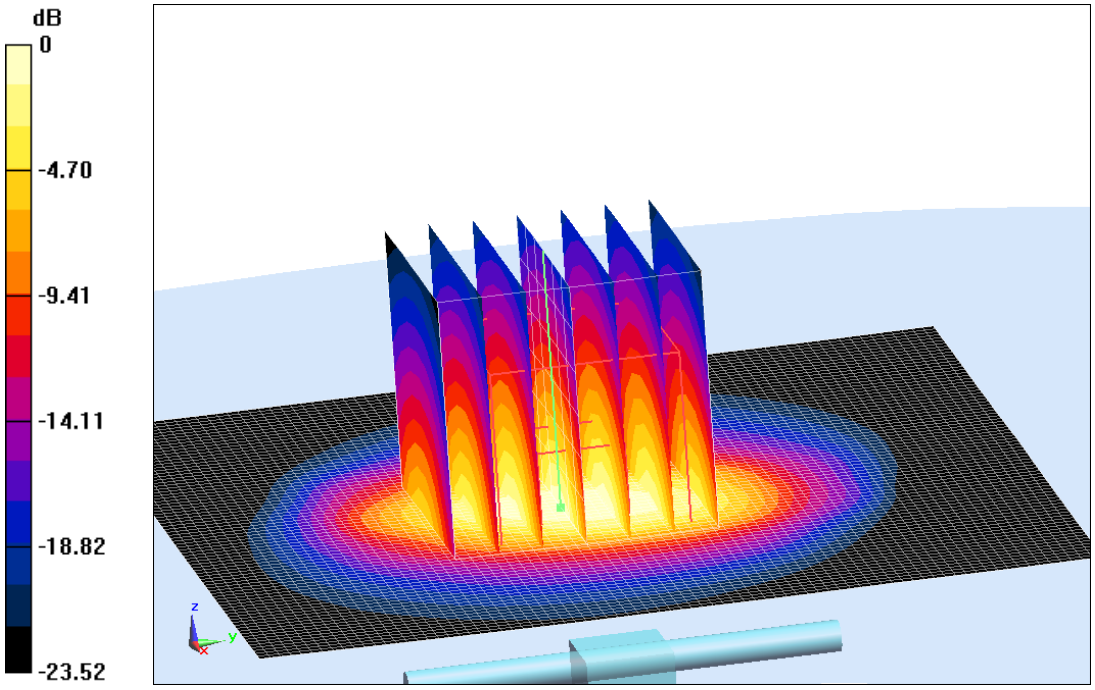
Fig.B.20 validation 1900MHz 250mW

2600MHz

Date: 2016-11-20
Electronics: DAE4 Sn1331
Medium: Head 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 1.947 mho/m; ε_r = 38.26; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 2600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.21, 7.21, 7.21)

System Validation/Area Scan(81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 79.45 V/m; Power Drift = 0.03 dB
SAR(1 g) = 14.6 W/kg; SAR(10 g) = 6.55 W/kg
Maximum value of SAR (interpolated) = 22.5 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 79.45 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 30.94 W/kg
SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.37 W/kg
Maximum value of SAR (measured) = 22.3 W/kg



0 dB = 22.3 W/kg = 13.48 dBW/kg

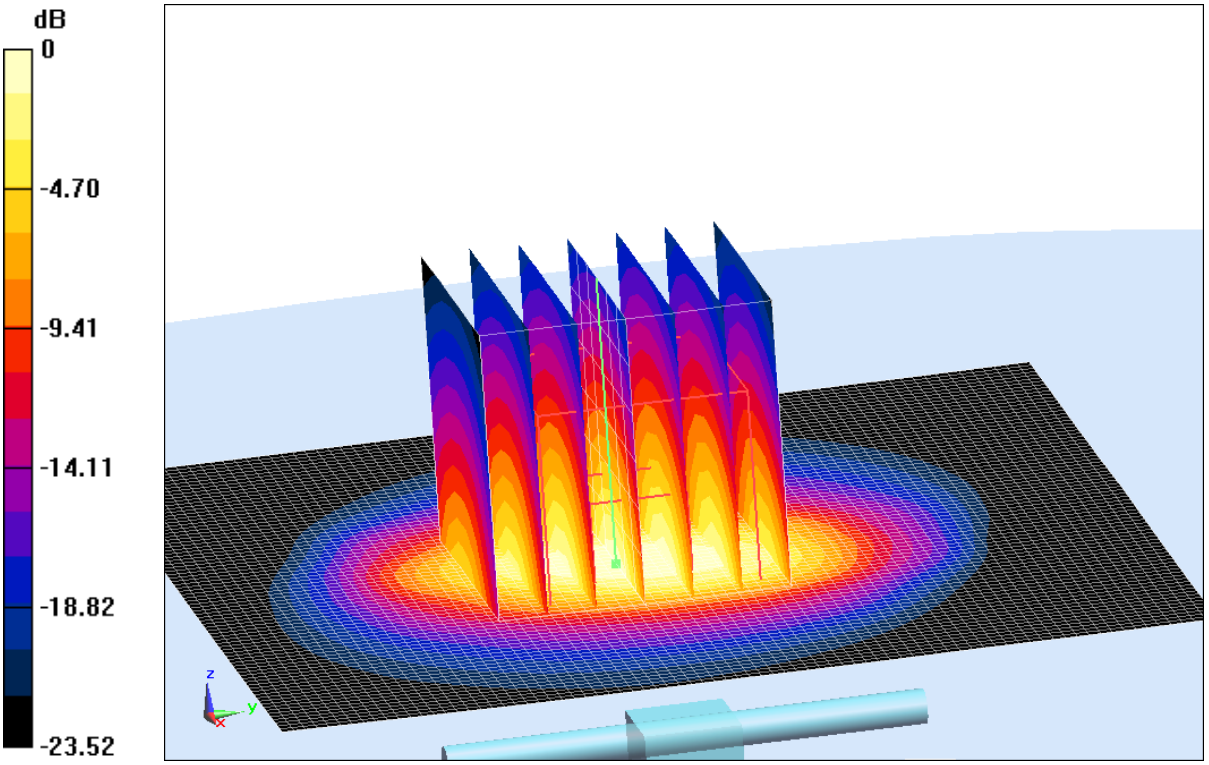
Fig.B.21 validation 2600MHz 250mW

2600MHz

Date: 2016-11-20
Electronics: DAE4 Sn1331
Medium: Body 2600 MHz
Medium parameters used: f = 2600 MHz; σ = 2.12 mho/m; ε_r = 51.49; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 2600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7307 ConvF(7.03, 7.03, 7.03)

System Validation /Area Scan(81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 82.371 V/m; Power Drift = 0.05 dB
Fast SAR: SAR(1 g) = 14.5 W/kg; SAR(10 g) = 6.51 W/kg
Maximum value of SAR (interpolated) = 22.4 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 82.371 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 31.21 W/kg
SAR(1 g) = 14.3 W/kg; SAR(10 g) = 6.33 W/kg
Maximum value of SAR (measured) = 22.2 W/kg



0 dB = 22.2W/kg = 13.46 dB W/kg

Fig.B.22 validation 2600MHz 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.

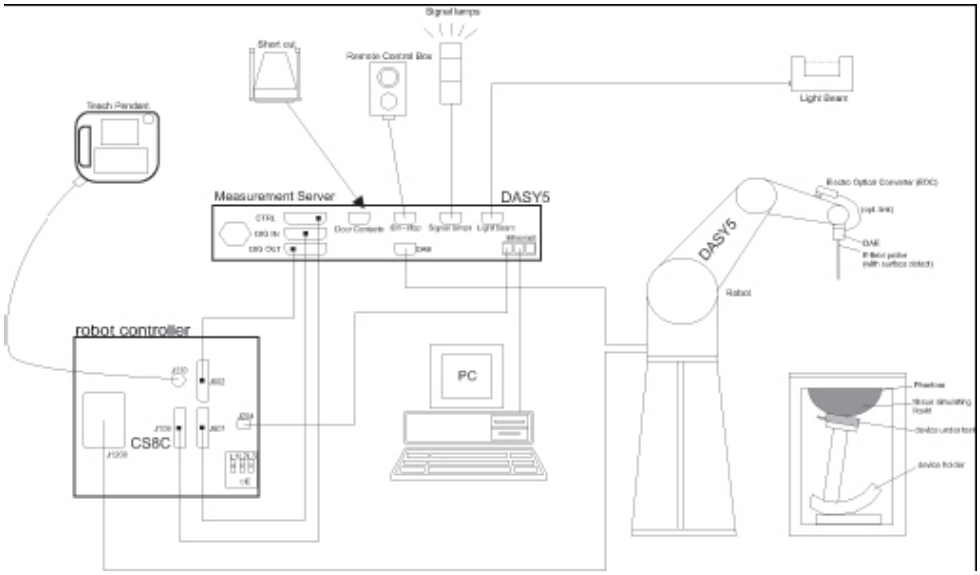
Table B.1 Comparison between area scan and zoom scan for system verification

Date	Band	Position	Area scan (1g)	Zoom scan (1g)	Drift (%)
2016-11-1	750	Head	2.06	2.02	1.98
	750	Body	2.14	2.11	1.42
2016-11-2	835	Head	2.35	2.3	2.17
	835	Body	2.32	2.35	-1.28
2016-11-3	1750	Head	8.99	9.04	-0.55
	1750	Body	9.55	9.37	1.92
2016-11-4	1900	Head	10.2	10	2.00
	1900	Body	10.4	10.3	0.97
2016-11-5	2450	Head	13.7	13.5	1.48
	2450	Body	13.1	13.2	-0.76
2016-11-6	2600	Head	14.7	14.5	1.38
	2600	Body	14.6	14.4	1.39
2016-11-21	750	Head	2.11	2.08	1.44
	750	Body	2.16	2.14	0.93
2016-11-16	835	Head	2.46	2.39	2.93
	835	Body	2.38	2.41	-1.24
2016-11-20	1750	Head	8.93	8.98	-0.56
	1750	Body	9.52	9.33	2.04
2016-11-18	1900	Head	10.3	10.1	1.98
	1900	Body	10.3	10.2	0.98
2016-11-20	2600	Head	14.6	14.4	1.39
	2600	Body	14.5	14.3	1.40

ANNEX C SAR Measurement Setup

C.1 Measurement Set-up

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



Picture C.1 SAR Lab Test Measurement Set-up

- A standard high precision 6-axis robot (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 Probe
± 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.2 Near-field

Picture C.3 E-field Probe

C.3 E-field Probe Calibration

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

TEM cell, and RF Power Meter.

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