Table 14.2-6: SAR Values (WCDMA 1900 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)
Ch.	MHz										
9262	1852.4	Right	Touch	Fig.6	22.98	23.5	0.105	**0.12**	0.176	**0.20**	0.04

Table 14.2-7: SAR Values (WCDMA 1900 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)
Ch.	MHz									
9400	1880	Rear	Fig.7	23.03	23.5	0.32	**0.36**	0.54	**0.60**	0.01

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

Table 14.2-8: SAR Values (WCDMA 1900 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)
Ch.	MHz									
9538	1907.6	Bottom	Fig.8	21.01	21.5	0.623	**0.70**	1.2	**1.34**	0.04

Note: The distance between the EUT and the phantom bottom is 10mm

Table 14.2-9: SAR Values (WCDMA 1700 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)
Ch.	MHz										
1412	1732.4	Left	Touch	Fig.9	22.82	24	0.12	**0.16**	0.185	**0.24**	0.18

Table 14.2-10: SAR Values (WCDMA 1700 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)
Ch.	MHz									
1412	1732.5	Rear	Fig.10	22.82	24	0.24	**0.31**	0.4	**0.52**	0.05

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

Table 14.2-11: SAR Values (WCDMA 1700 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)
Ch.	MHz									
1513	1752.6	Bottom	Fig.11	20.55	22	0.334	**0.47**	0.623	**0.87**	-0.04

Note: The distance between the EUT and the phantom bottom is 10mm

Table 14.2-12: SAR Values (WCDMA 850 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)
Ch.	MHz										
4233	846.6	Left	Touch	Fig.12	22.6	24	0.538	**0.74**	0.846	**1.17**	0.02

Table 14.2-13: 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)
Ch.	MHz									
4183	836.6	Top	Fig.13	22.69	24	0.141	**0.19**	0.284	**0.38**	0.03

Note: The distance between the EUT and the phantom bottom is 10mm.

Table 14.2-14: SAR Values (LTE Band2 - 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)
Ch.	MHz											
18700	1860	1RB_Mid	Right	Touch	Fig.14	22.36	23	0.143	**0.17**	0.236	**0.27**	-0.03

Note1: The LTE mode is QPSK_20MHz.

Table 14.2-15: 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)
Ch.	MHz										
18900	1880	1RB_Mid	Rear	Fig.15	22.31	23	0.405	**0.47**	0.7	**0.82**	-0.01

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

Table 14.2-16: SAR Values (LTE Band2 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
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)
Ch.	MHz										
18900	1880	50RB_Mid	Bottom	Fig.16	19.18	20	0.437	**0.53**	0.839	**1.01**	0.15

Note1: The distance between the EUT and the phantom bottom is 10mm.

Note2: The LTE mode is QPSK_20MHz.

Table 14.2-17: SAR Values (LTE Band5 - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
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)
Ch.	MHz											
20450	829	1RB_Mid	Left	Touch	Fig.17	21.63	22.5	0.523	**0.64**	0.852	**1.04**	-0.12

Note: The LTE mode is QPSK_10MHz.

Table 14.2-18: SAR Values (LTE Band5 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
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)
Ch.	MHz										
20450	829	1RB_Middle	Rear	Fig.18	21.63	22.5	0.275	**0.34**	0.356	**0.43**	-0.18

Note1: The distance between the EUT and the phantom bottom is 10mm.

Note2: The LTE mode is QPSK_10MHz.

Table 14.2-19: SAR Values (LTE Band12 - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
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)
Ch.	MHz											
23060	704	1RB_Mid	Left	Touch	Fig.19	23.01	24	0.56	**0.70**	0.821	**1.03**	0.00

Note: The LTE mode is QPSK_10MHz.

Table 14.2-20: SAR Values (LTE Band12 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
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)
Ch.	MHz										
23060	704	1RB_Mid	Rear	Fig.20	23.01	24	0.297	**0.37**	0.387	**0.49**	0.04

Note1: The distance between the EUT and the phantom bottom is 10mm

Note2: The LTE mode is QPSK_10MHz.

Table 14.2-21: SAR Values (LTE Band14 - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
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)
Ch.	MHz											
23330	793	1RB_Mid	Right	Touch	Fig.21	23.03	24	0.172	**0.22**	0.226	**0.28**	0.18

Note: The LTE mode is QPSK_10MHz.

Table 14.2-22: SAR Values (LTE Band14 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
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)
Ch.	MHz										
23330	793	1RB_Mid	Rear	Fig.22	23.03	24	0.237	**0.30**	0.442	**0.55**	0.18

Note1: The distance between the EUT and the phantom bottom is 10mm.

Note2: The LTE mode is QPSK_10MHz.

Table 14.2-23: SAR Values (LTE Band30 - Head)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC												
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)
Ch.	MHz											
27710	2310	1RB_ Mid	Left	Touch	Fig.23	23.33	24	0.124	**0.14**	0.208	**0.24**	0.02

Note: The LTE mode is QPSK_10MHz.

Table 14.2-24: SAR Values (LTE Band30 - Body)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
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)
Ch.	MHz										
27710	2310	1RB_ Mid	Rear	Fig.24	23.33	24	0.324	**0.38**	0.576	**0.67**	0.05

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

Note2: The LTE mode is QPSK_10MHz.

Table 14.2-25: SAR Values (LTE Band30 - Body)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
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)
Ch.	MHz										
27710	2310	1RB_ Mid	Bottom	Fig.25	19.37	20	0.09	**0.10**	0.197	**0.23**	0.13

Note1: The distance between the EUT and the phantom bottom is 10mm.

Note2: The LTE mode is QPSK_10MHz.

Table 14.2-26: SAR Values (LTE Band66 - Head)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
Frequency		Mode	Side	Test Position	Figure No.	Conducted Power (dBm)	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)
Ch.	MHz											
132072	1720	1RB_Mid	Right	Touch	Fig.26	23.2	24	0.239	**0.29**	0.381	**0.46**	-0.02

Note1: The LTE mode is QPSK_20MHz.

Table 14.2-27: SAR Values (LTE Band66 - Body)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
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)
Ch.	MHz										
132072	1720	1RB_Mid	Front	Fig.27	23.2	24	0.393	**0.47**	0.662	**0.80**	-0.02

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

Table 14.2-28: SAR Values (LTE Band66 - Body)

Ambient Temperature: 22.9 ºC Liquid Temperature: 22.5ºC											
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)
Ch.	MHz										
132072	1720	1RB_Mid	Bottom	Fig.28	19.25	20	0.279	**0.33**	0.519	**0.62**	0.09

Note: The distance between the EUT and the phantom bottom is 10mm. The LTE mode is QPSK_20MHz.

14.3 WLAN Evaluation for 2.4G

According to the KDB248227 D01, SAR is measured for 2.4GHz 802.11b DSSS using the initial test position procedure.

Head Evaluation

Table 14.3-1: SAR Values (WLAN - Head)– 802.11b (Fast SAR)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
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	/	16.41	16.6	0.158	**0.17**	0.11	**0.11**	-0.07
2437	6	Left	Tilt	/	16.41	16.6	0.188	**0.20**	0.118	**0.12**	0.02
2437	6	Right	Touch	/	16.41	16.6	0.504	**0.53**	0.3	**0.31**	0.08
2437	6	Right	Tilt	/	16.41	16.6	0.223	**0.23**	0.131	**0.14**	0.16

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

Table 14.3-2: SAR Values (WLAN - Head)– 802.11b (Full SAR)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
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.29	16.41	16.6	0.51	**0.53**	0.308	**0.32**	0.08
2437	6	Right	Tilt	/	16.41	16.6	0.228	**0.24**	0.135	**0.14**	0.16
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 14.3-3: SAR Values (WLAN - Head) – 802.11b (Scaled Reported SAR)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃							
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	100%	100%	**0.53**	**0.53**

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

Body Evaluation

Table 14.3-4: SAR Values (WLAN - Body)– 802.11b (Fast SAR)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃										
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	/	16.41	16.6	0.18	**0.19**	0.094	**0.10**	0.15
2437	6	Rear	/	16.41	16.6	0.221	**0.23**	0.098	**0.10**	-0.02
2437	6	Right	/	16.41	16.6	0.041	**0.04**	0.022	**0.02**	0.19
2437	6	Top	/	16.41	16.6	0.18	**0.19**	0.089	**0.09**	0.09

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

Table 14.3-5: SAR Values (WLAN - Body)– 802.11b (Full SAR)

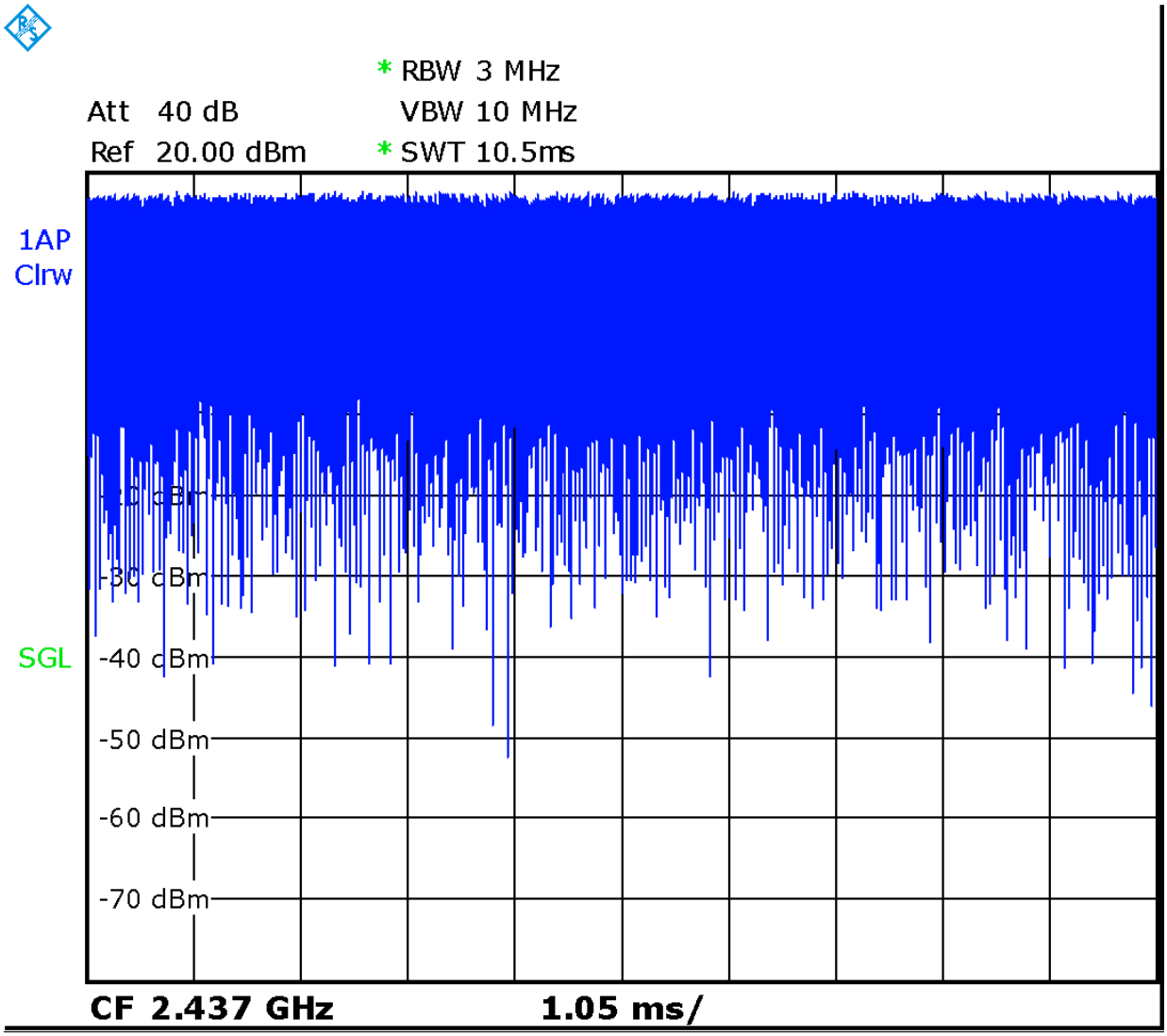
Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃										
Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Power Drift (dB)
MHz	Ch.									
2437	6	Rear	Fig.30	16.41	16.6	0.225	**0.24**	0.11	**0.11**	-0.02
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 14.3-6: SAR Values (WLAN - Body) – 802.11b (Scaled Reported SAR)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃						
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	100%	100%	**0.24**	**0.24**

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



Picture 14.1 Duty factor plot

14.4 SAR results for BT

Table 14.4-1: SAR Values (BT - Head)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
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)
Ch.	MHz										
78	2480	Left	Touch	/	10.19	10.7	0.021	**0.02**	0.037	**0.04**	0.18
78	2480	Left	Tilt	/	10.19	10.7	0.023	**0.03**	0.044	**0.05**	-0.15
78	2480	Right	Touch	/	10.19	10.7	0.06	**0.07**	0.119	**0.13**	-0.11
78	2480	Right	Touch	/	10.19	10.7	0.026	**0.03**	0.053	**0.06**	-0.09

Table 14.4-2: SAR Values (BT - Body)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃											
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)
Ch.	MHz										
78	2480	GFSK	Front	/	10.19	10.7	0.014	**0.02**	0.027	**0.03**	-0.03
78	2480	GFSK	Rear	/	10.19	10.7	0.016	**0.02**	0.033	**0.04**	-0.1
78	2480	GFSK	Right	/	10.19	10.7	0.003	**0.00**	0.006	**0.01**	0.07
78	2480	GFSK	Top	/	10.19	10.7	0.014	**0.02**	0.027	**0.03**	0.09

Note: The distance between the EUT and the phantom bottom is 10mm.

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 GSM1900 (1g)

Frequency		Mode	Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz							
810	1909.8	GPRS(2)	Bottom	10	0.981	0.962	1.02	/

Table 15.2: SAR Measurement Variability for Head WCDMA850 (1g)

Frequency		Mode	Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz							
4132	826.4	RMC	Left touch	10	0.846	0.823	1.03	/

Table 15.3: SAR Measurement Variability for Body WCDMA1900 (1g)

Frequency		Mode	Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz							
9538	1907.6	RMC	Bottom	10	1.2	1.12	1.07	/

Table 15.4: SAR Measurement Variability for Body LTE Band2 (1g)

Frequency		Mode	Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz							
18900	1880	50RB_Mid	Bottom	10	0.839	0.818	1.03	/

Table 15.5: SAR Measurement Variability for Head LTE Band5 (1g)

Frequency		Mode	Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz							
20450	829	1RB_Mid	Left touch	10	0.852	0.831	1.03	/

Table 15.6: SAR Measurement Variability for Head LTE Band12 (1g)

Frequency		Mode	Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
Ch.	MHz							
23060	704	1RB_Mid	Left touch	10	0.821	0.811	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	√3	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	√3	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	√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	√3	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	√3	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	√3	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	√3	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	√3	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.4	R	√3	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	√3	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	√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	√3	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	√3	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	√3	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	√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	√3	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	√3	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	√3	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	√3	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	√3	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	√3	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	√3	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	√3	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	√3	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.8	R	√3	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	√3	1	1	3.9	3.9	∞
13	Post-processing	B	4.0	R	√3	1	1	2.3	2.3	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	√3	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	√3	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	√3	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	√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	√3	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	√3	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	√3	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	√3	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	√3	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	√3	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	√3	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	√3	1	1	0	0	∞
10	RFambient conditions-reflection	B	0	R	√3	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.4	R	√3	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	√3	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	√3	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	7.0	R	√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	√3	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	√3	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	√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	N5239A	MY46110673	January 24, 2020	One year
02	Power meter	NRP2	106277	September 4, 2019	One year
03	Power sensor	NRP8S	104291		
04	Signal Generator	E4438C	MY49070393	January 4, 2020	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	E5515C	MY50263375	January 17, 2020	One year
07	BTS	CMW500	159890	January 3, 2020	One year
08	E-field Probe	SPEAG EX3DV4	3617	January 30, 2020	One year
09	DAE	SPEAG DAE4	777	January 8, 2020	One year
10	Dipole Validation Kit	SPEAG D750V3	1017	July 18,2019	One year
11	Dipole Validation Kit	SPEAG D835V2	4d069	July 18,2019	One year
12	Dipole Validation Kit	SPEAG D1750V2	1003	July 16,2019	One year
13	Dipole Validation Kit	SPEAG D1900V2	5d101	July 17,2019	One year
14	Dipole Validation Kit	SPEAG D2450V2	853	July 17,2019	One year
15	Dipole Validation Kit	SPEAG D2300V2	1018	July 17, 2019	One year

END OF REPORT BODY

ANNEX A Graph Results

GSM850_CH251 Right Cheek
Date: 6/26/2020
Electronics: DAE4 Sn777
Medium: head 835 MHz
Medium parameters used: f = 848.8 MHz; σ = 0.897 mho/m; εr = 41.43; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: GSM850 848.8 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.257 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.727 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.278 W/kg
SAR(1 g) = 0.202 W/kg; SAR(10 g) = 0.152 W/kg
Maximum value of SAR (measured) = 0.246 W/kg

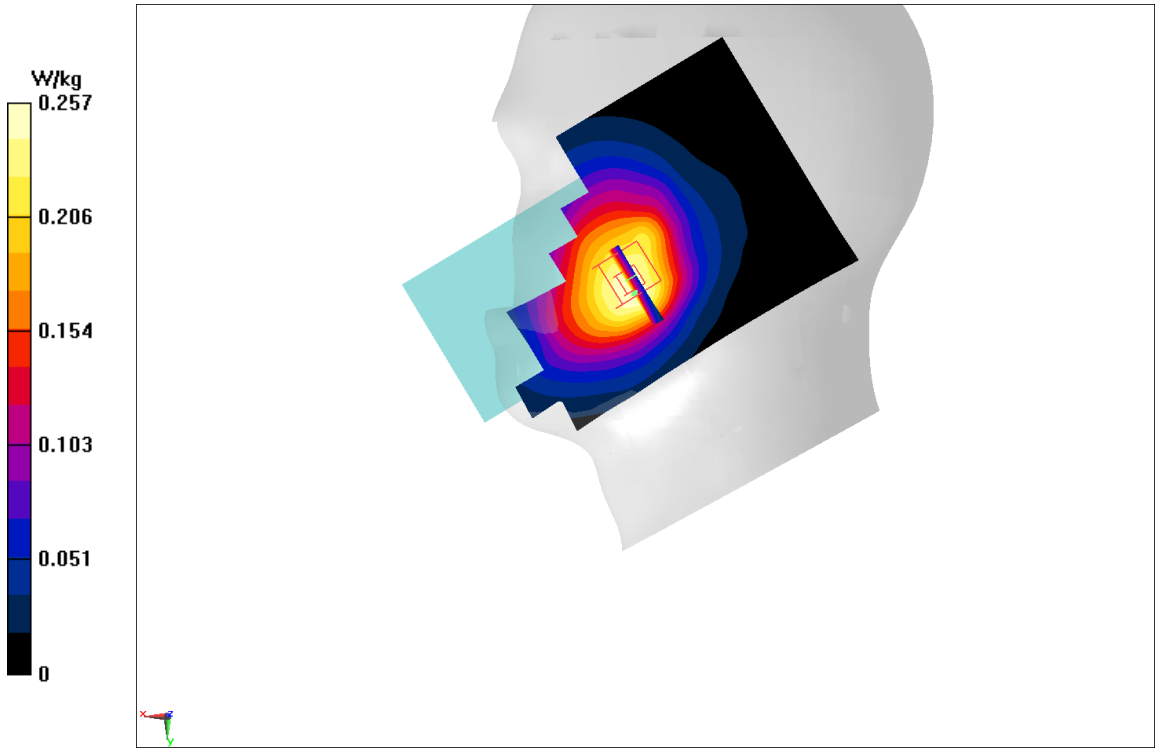


Fig A.1

GSM850_CH190 Rear 10mm
Date: 6/26/2020
Electronics: DAE4 Sn777
Medium: head 835 MHz
Medium parameters used: f = 836.6 MHz; σ = 0.883 mho/m; εr = 41.62; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: GSM850 836.6 MHz Duty Cycle: 1:4
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.947 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.24 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.2 W/kg
SAR(1 g) = 0.604 W/kg; SAR(10 g) = 0.329 W/kg
Maximum value of SAR (measured) = 0.957 W/kg

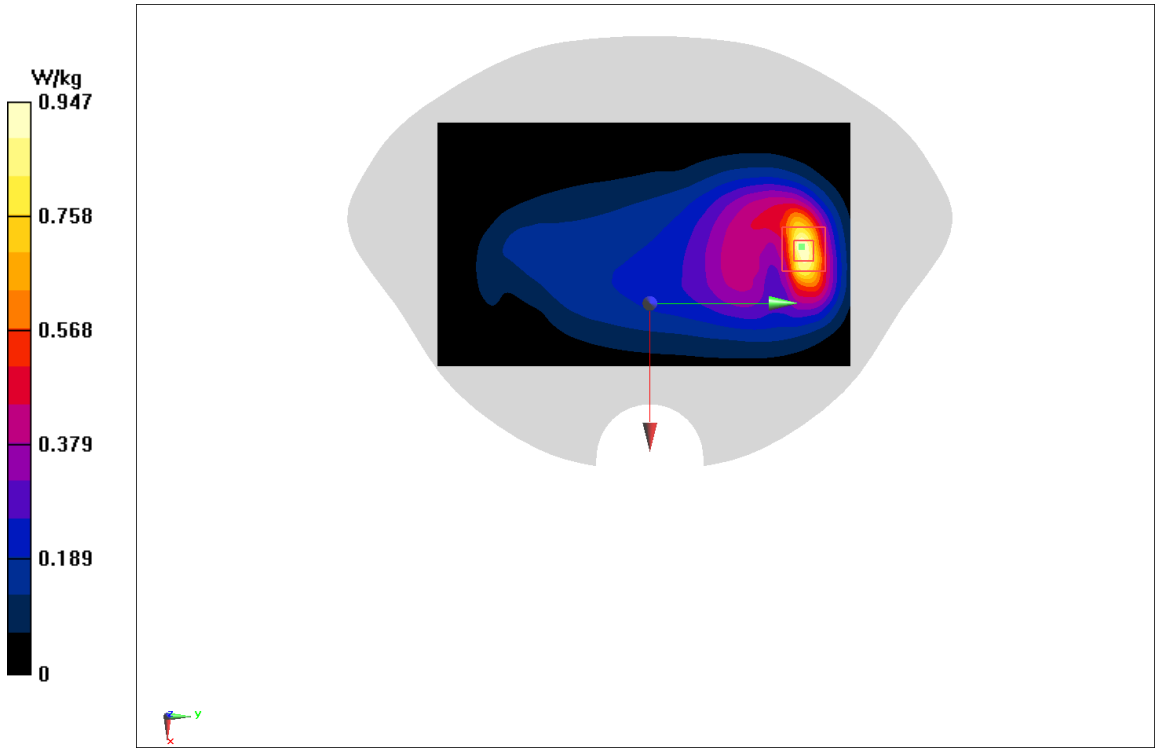


Fig A.2

PCS1900_CH661 Left Cheek
Date: 6/28/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.363 mho/m; εr = 39.35; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: PCS1900 1880 MHz Duty Cycle: 1:8.3
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0987 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.516 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.108 W/kg
SAR(1 g) = 0.066 W/kg; SAR(10 g) = 0.041 W/kg
Maximum value of SAR (measured) = 0.0921 W/kg

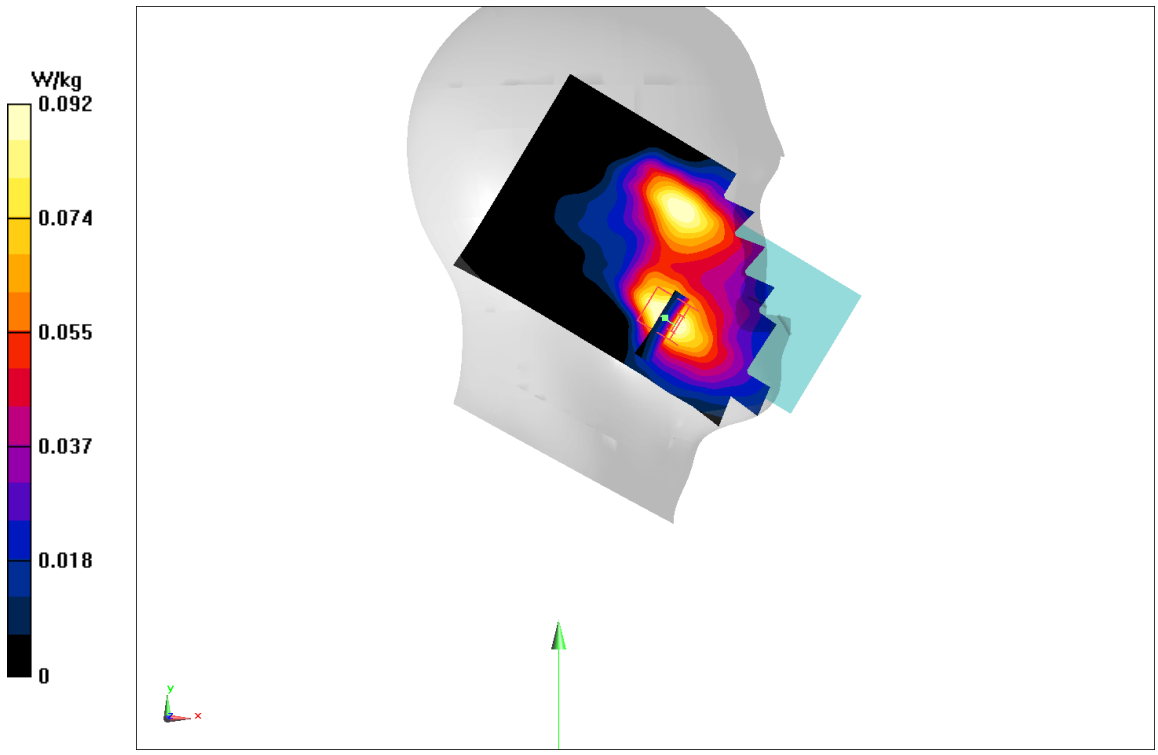


Fig A.3

PCS1900_CH810 Rear 15mm
Date: 6/28/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1909.8 MHz; σ = 1.39 mho/m; εr = 39.23; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: PCS1900 1909.8 MHz Duty Cycle: 1:4
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.77 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.524 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.933 W/kg
SAR(1 g) = 0.557 W/kg; SAR(10 g) = 0.318 W/kg
Maximum value of SAR (measured) = 0.776 W/kg

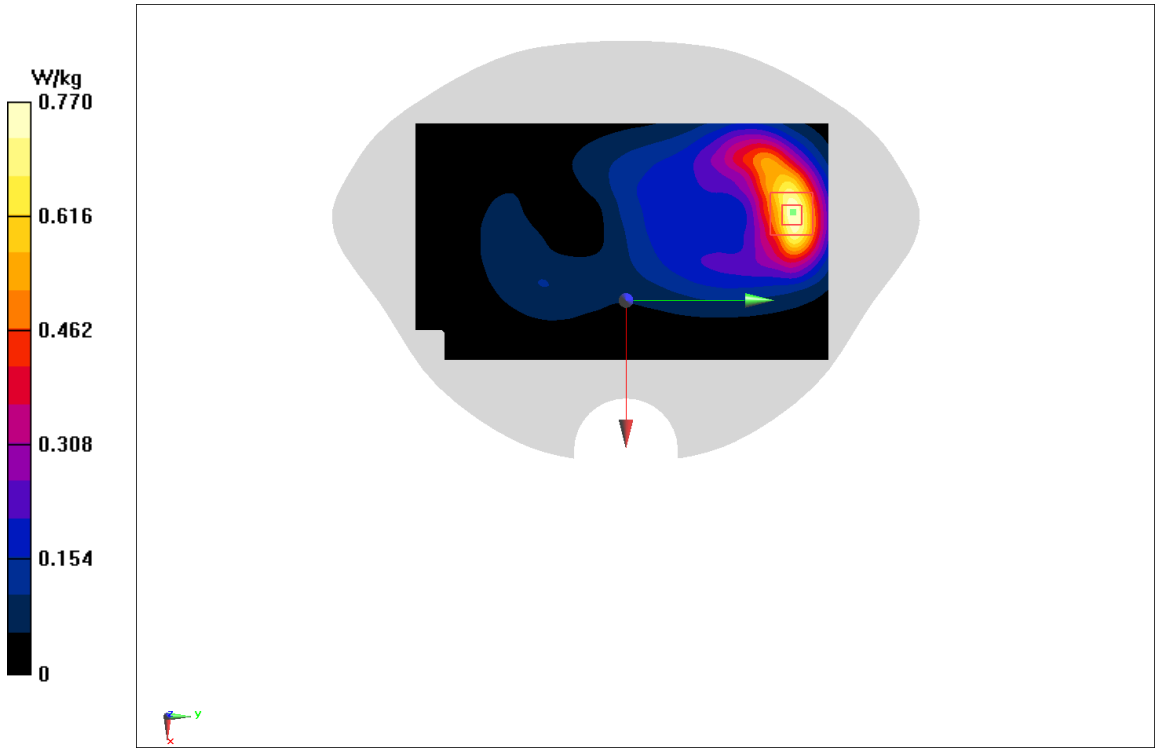


Fig A.4

PCS1900_CH810 Bottom 10mm
Date: 6/28/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1909.8 MHz; σ = 1.39 mho/m; εr = 39.23; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: PCS1900 1909.8 MHz Duty Cycle: 1:4
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.49 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.727 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.278 W/kg
SAR(1 g) = 0.981 W/kg; SAR(10 g) = 0.511 W/kg
Maximum value of SAR (measured) = 0.246 W/kg

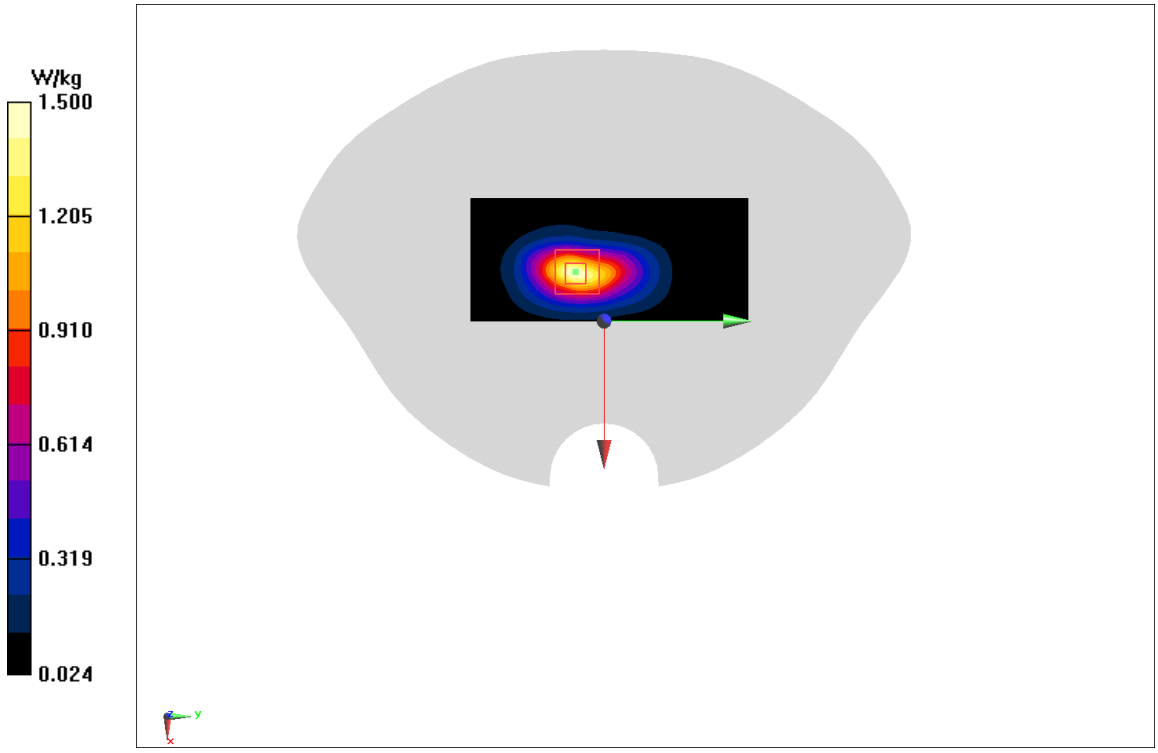


Fig A.5

WCDMA1900-BII_CH9262 Right Cheek
Date: 6/28/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1852.4 MHz; σ = 1.336 mho/m; εr = 39.39; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: WCDMA1900-BII 1852.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.281 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.949 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.288 W/kg
SAR(1 g) = 0.176 W/kg; SAR(10 g) = 0.105 W/kg
Maximum value of SAR (measured) = 0.248 W/kg

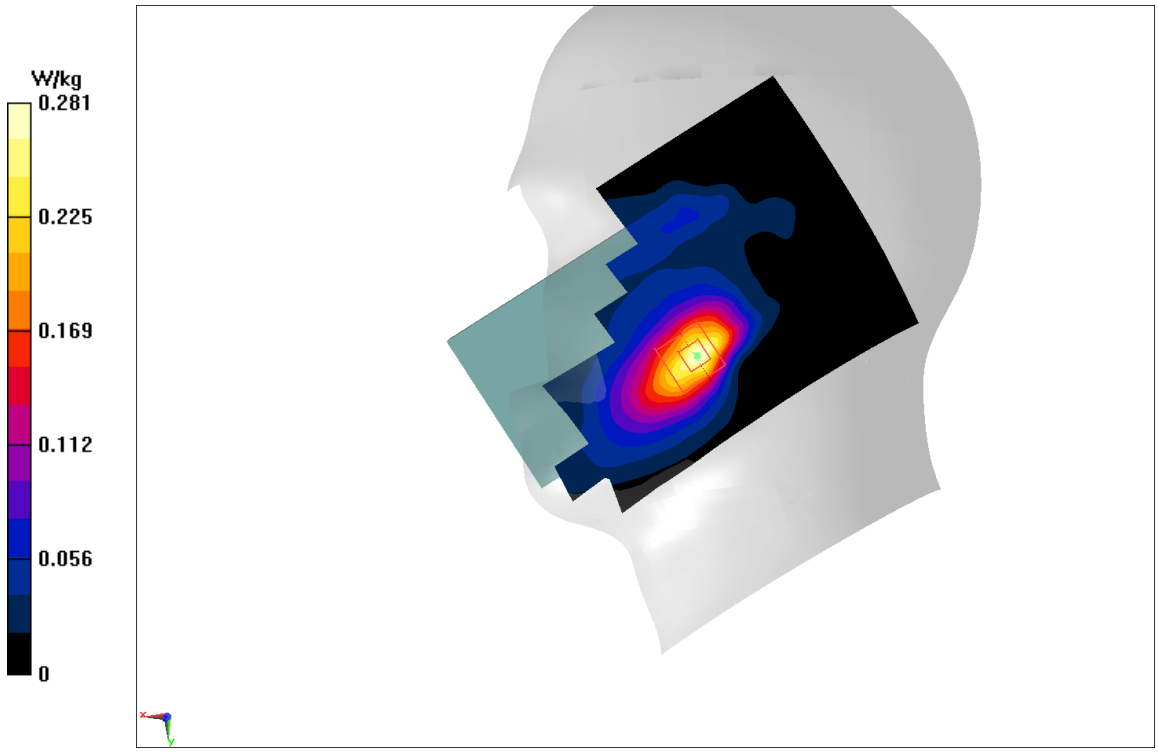


Fig A.6

WCDMA1900-BII_CH9400 Rear 15mm
Date: 6/28/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.363 mho/m; εr = 39.35; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: WCDMA1900-BII 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.765 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.67 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.89 W/kg
SAR(1 g) = 0.541 W/kg; SAR(10 g) = 0.319 W/kg
Maximum value of SAR (measured) = 0.765 W/kg

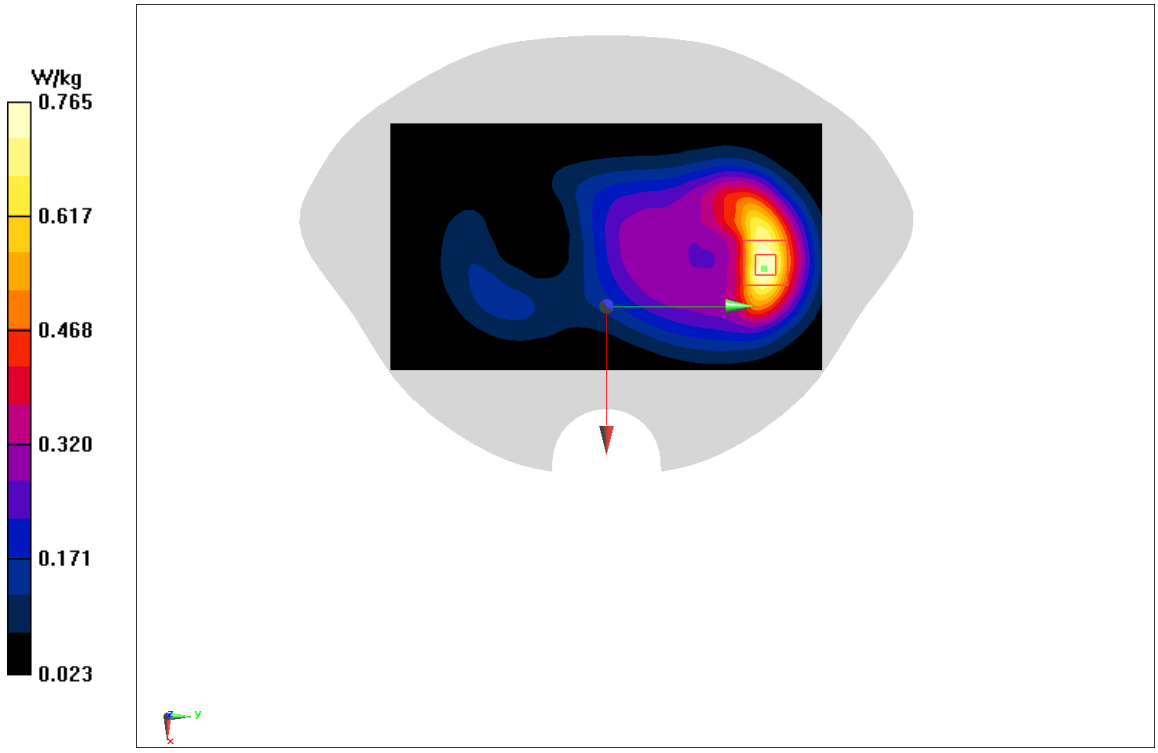


Fig A.7

WCDMA1900-BII_CH9538 Bottom 10mm
Date: 6/28/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1907.6 MHz; σ = 1.389 mho/m; εr = 38.97; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: WCDMA1900-BII 1907.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.80 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 35.89 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 2.20 W/kg
SAR(1 g) = 1.2 W/kg; SAR(10 g) = 0.623 W/kg
Maximum value of SAR (measured) = 1.82 W/kg

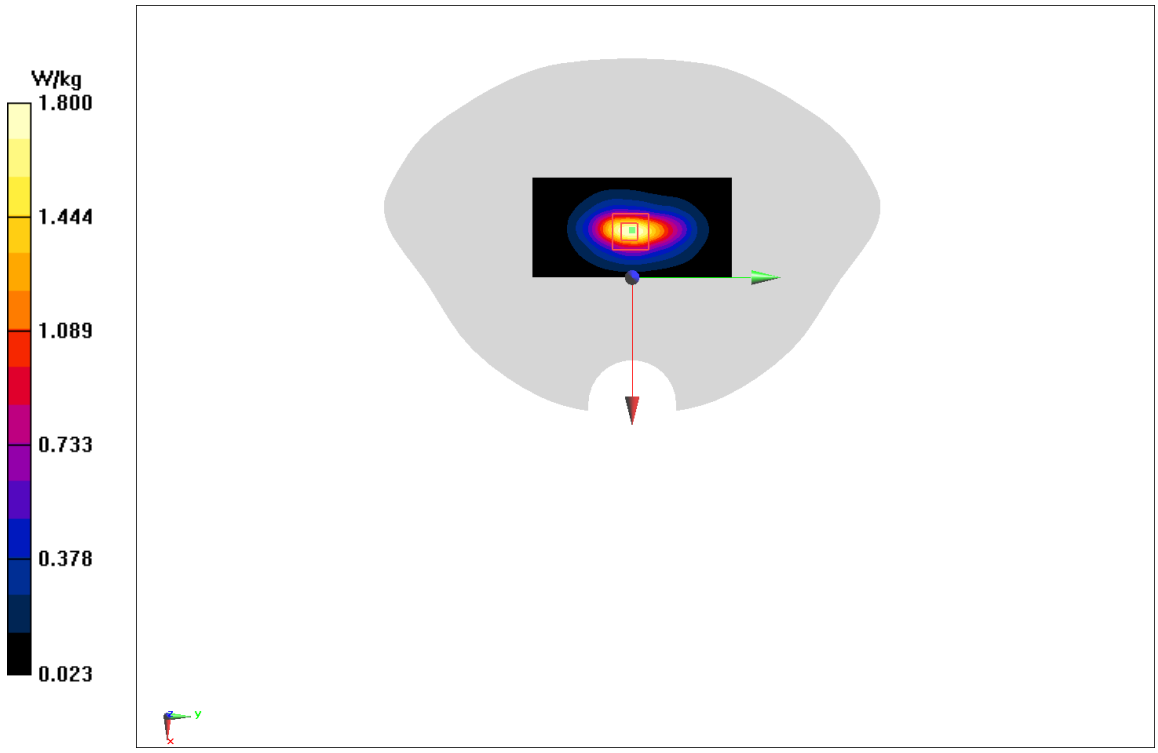


Fig A.8

WCDMA1700-BIV_CH1412 Left Cheek
Date: 6/27/2020
Electronics: DAE4 Sn777
Medium: head 1750 MHz
Medium parameters used: f = 1732.4 MHz; σ = 1.357 mho/m; εr = 39.46; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: WCDMA1700-BIV 1732.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.255 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.935 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.287 W/kg
SAR(1 g) = 0.185 W/kg; SAR(10 g) = 0.12 W/kg
Maximum value of SAR (measured) = 0.248 W/kg

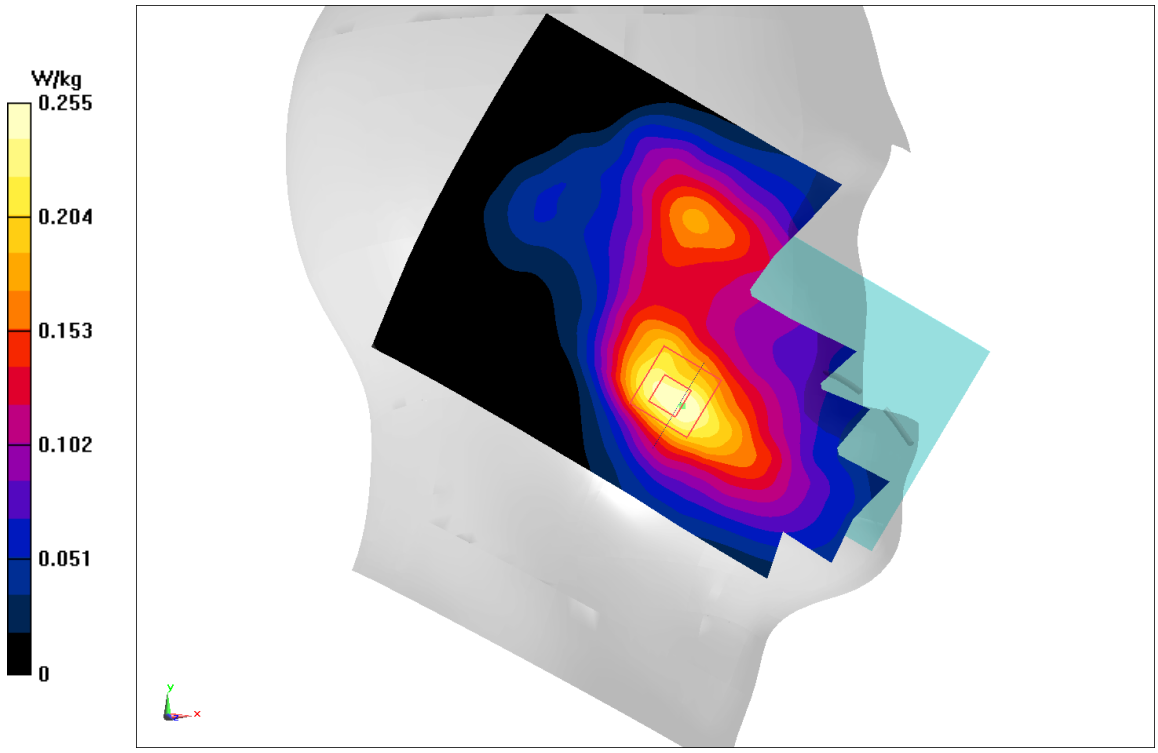


Fig A.9

WCDMA1700-BIV_CH1412 Rear 15mm
Date: 6/27/2020
Electronics: DAE4 Sn777
Medium: head 1750 MHz
Medium parameters used: f = 1732.4 MHz; σ = 1.357 mho/m; εr = 39.46; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: WCDMA1700-BIV 1732.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.515 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.14 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.647 W/kg
SAR(1 g) = 0.397 W/kg; SAR(10 g) = 0.238 W/kg
Maximum value of SAR (measured) = 0.557 W/kg

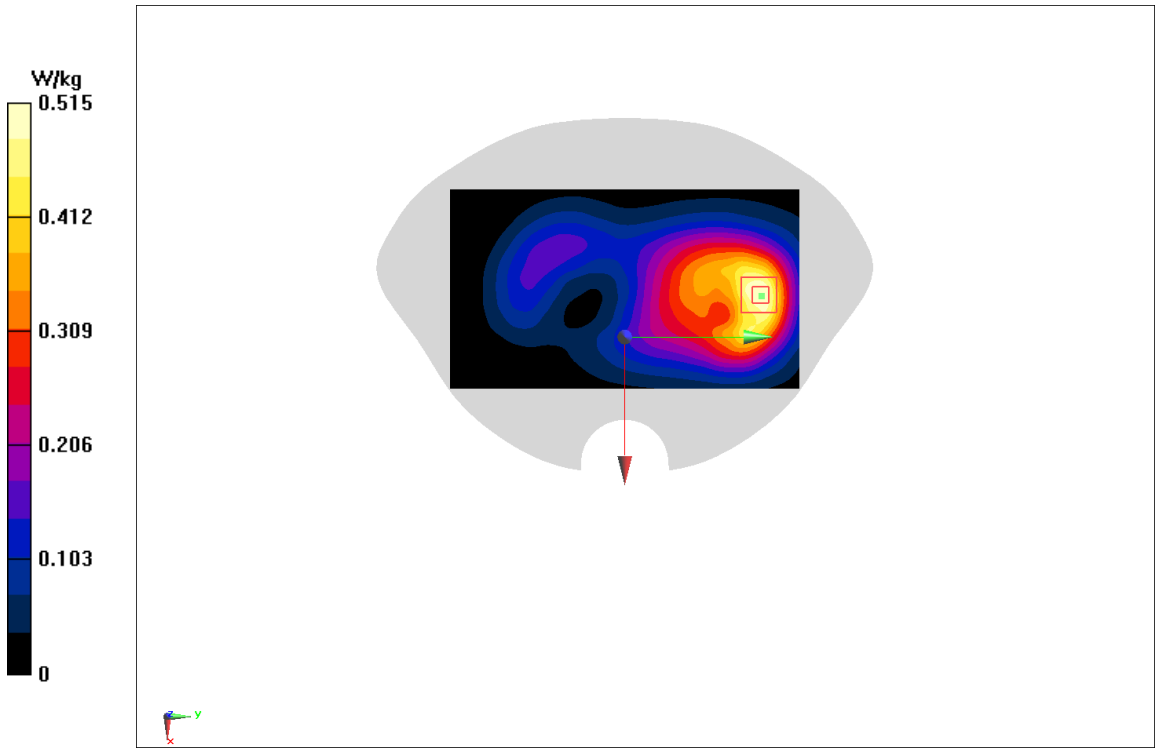


Fig A.10

WCDMA1700-BIV_CH1513 Bottom 10mm
Date: 6/27/2020
Electronics: DAE4 Sn777
Medium: head 1750 MHz
Medium parameters used: f = 1752.6 MHz; σ = 1.359 mho/m; εr = 39.39; ρ = 1000 kg/m^3
Ambient Temperature: 22.9°C, Liquid Temperature: 22.5°C
Communication System: WCDMA1700-BIV 1752.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.893 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.50 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.623 W/kg; SAR(10 g) = 0.334 W/kg
Maximum value of SAR (measured) = 0.938 W/kg

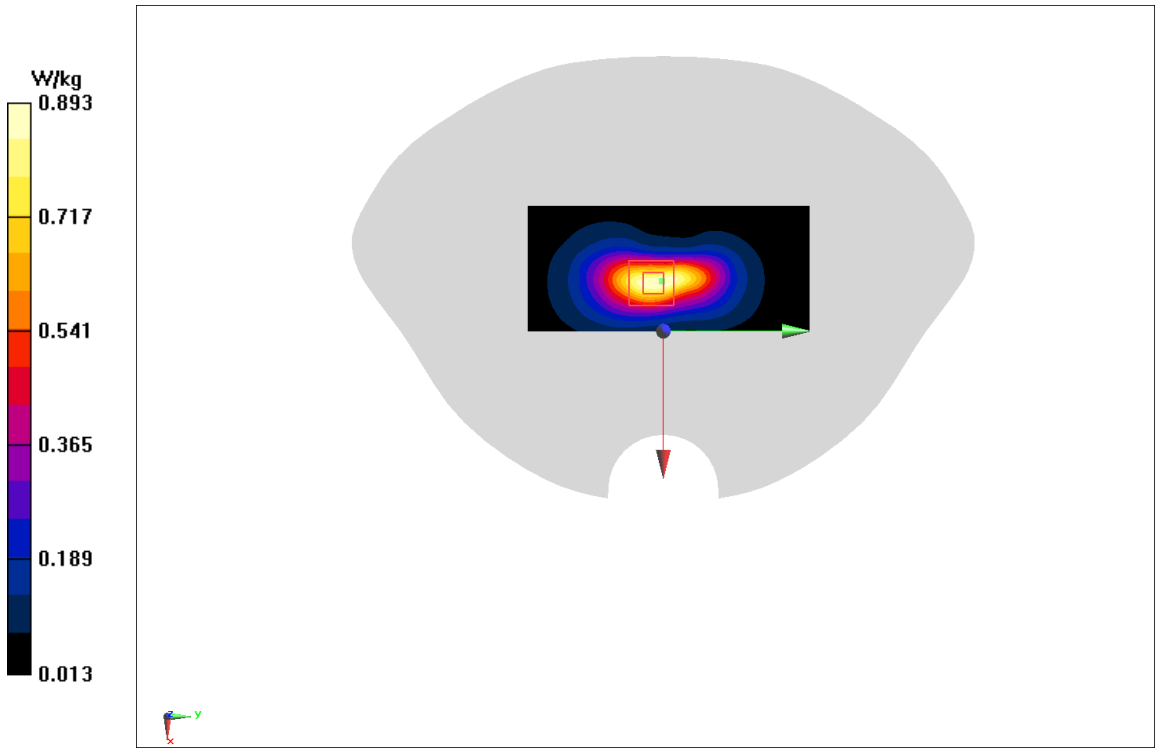


Fig A.11

WCDMA850-BV_CH4132 Left Cheek
Date: 6/26/2020
Electronics: DAE4 Sn777
Medium: head 835 MHz
Medium parameters used: f = 826.4 MHz; σ = 0.875 mho/m; εr = 41.46; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: WCDMA850-BV 826.4 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.54 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.33 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 2.22 W/kg
SAR(1 g) = 0.846 W/kg; SAR(10 g) = 0.538 W/kg
Maximum value of SAR (measured) = 1.51 W/kg

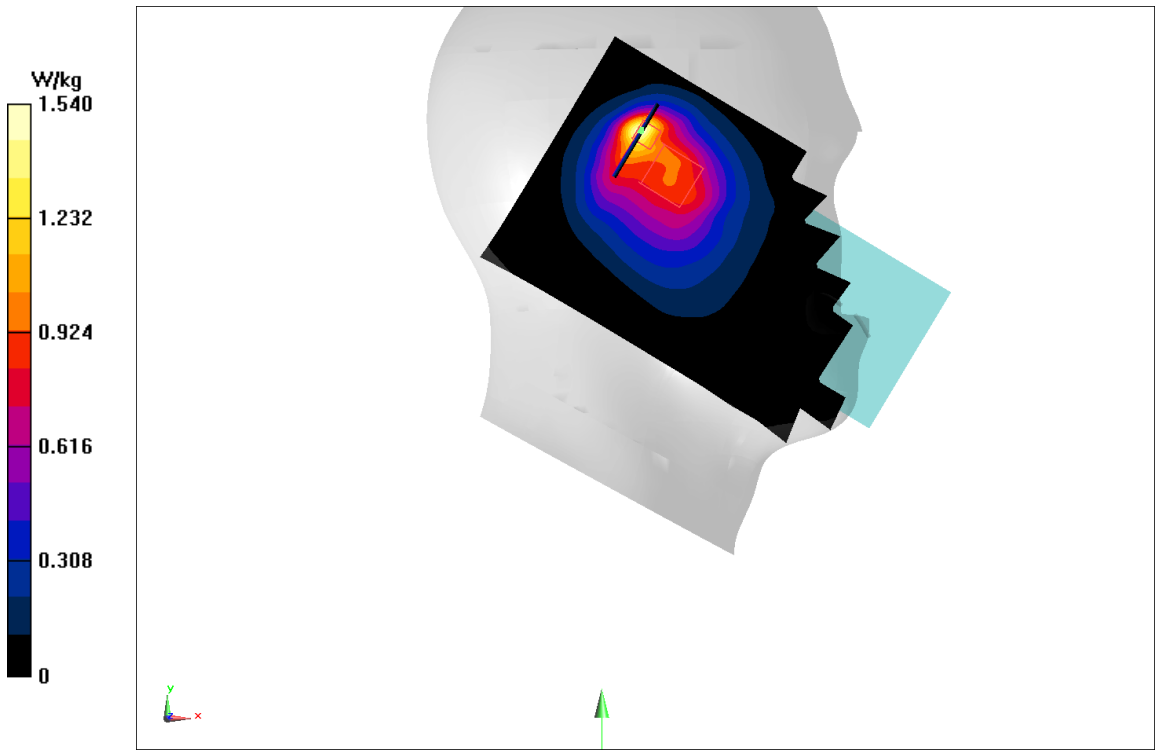


Fig A.12

WCDMA850-BV_CH4183 Top Edge 10mm
Date: 6/26/2020
Electronics: DAE4 Sn777
Medium: head 835 MHz
Medium parameters used: f = 836.6 MHz; σ = 0.884 mho/m; εr = 41.35; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: WCDMA850-BV 836.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.459 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.08 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.558 W/kg
SAR(1 g) = 0.284 W/kg; SAR(10 g) = 0.163 W/kg
Maximum value of SAR (measured) = 0.442 W/kg

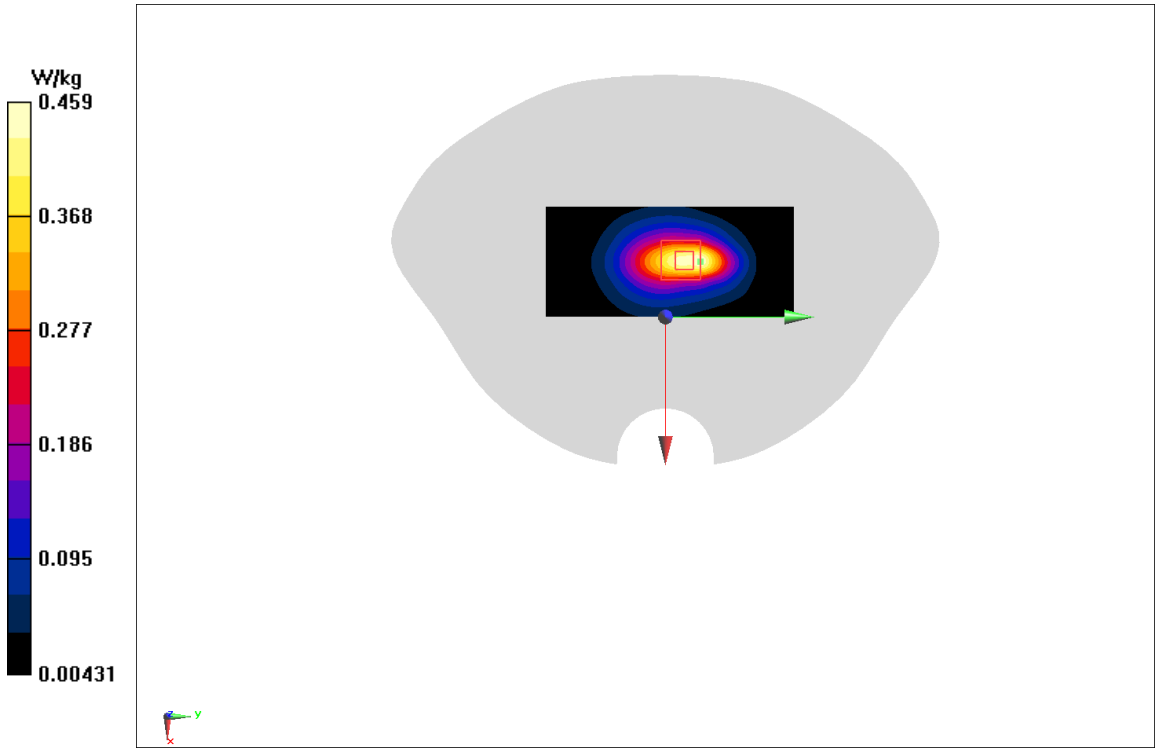


Fig A.13

LTE1900-FDD2_CH18700 Right Cheek
Date: 6/28/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1860 MHz; σ = 1.344 mho/m; εr = 39.38; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE1900-FDD2 1860 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.339 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.888 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.375 W/kg
SAR(1 g) = 0.236 W/kg; SAR(10 g) = 0.143 W/kg
Maximum value of SAR (measured) = 0.323 W/kg

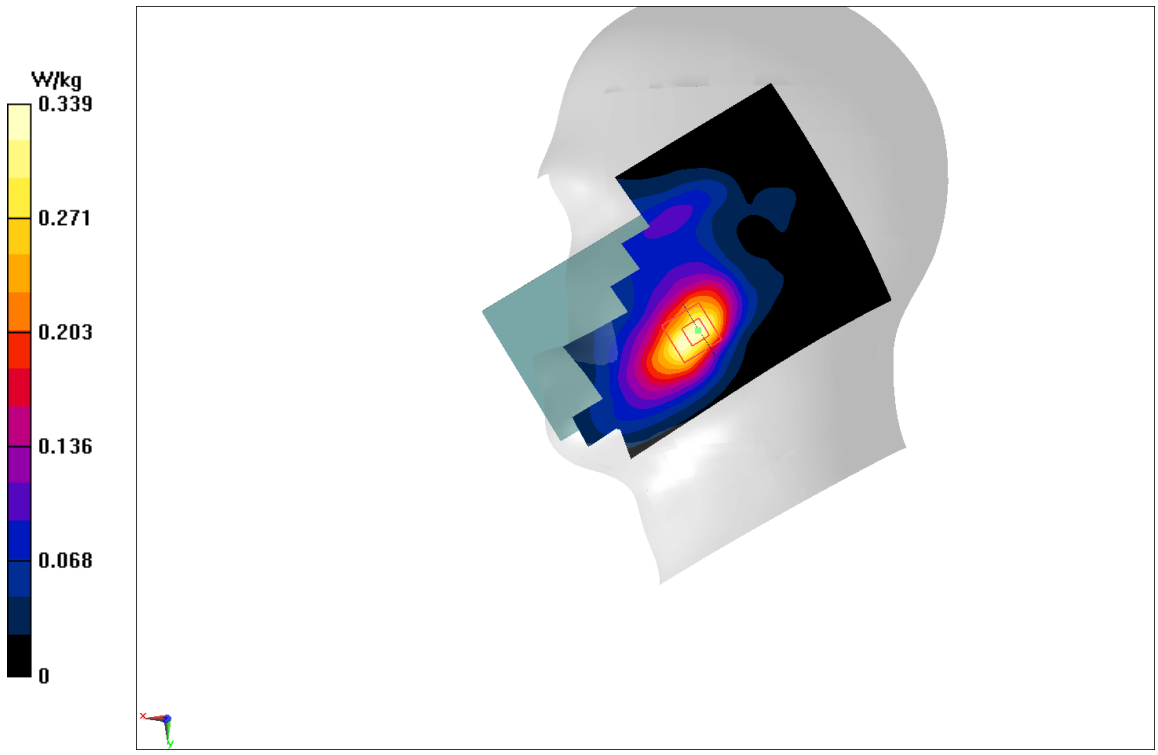


Fig A.14

LTE1900-FDD2_CH18900 Rear 15mm
Date: 6/28/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; εr = 39.28; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE1900-FDD2 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.74 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.703 W/kg; SAR(10 g) = 0.406 W/kg
Maximum value of SAR (measured) = 1.01 W/kg

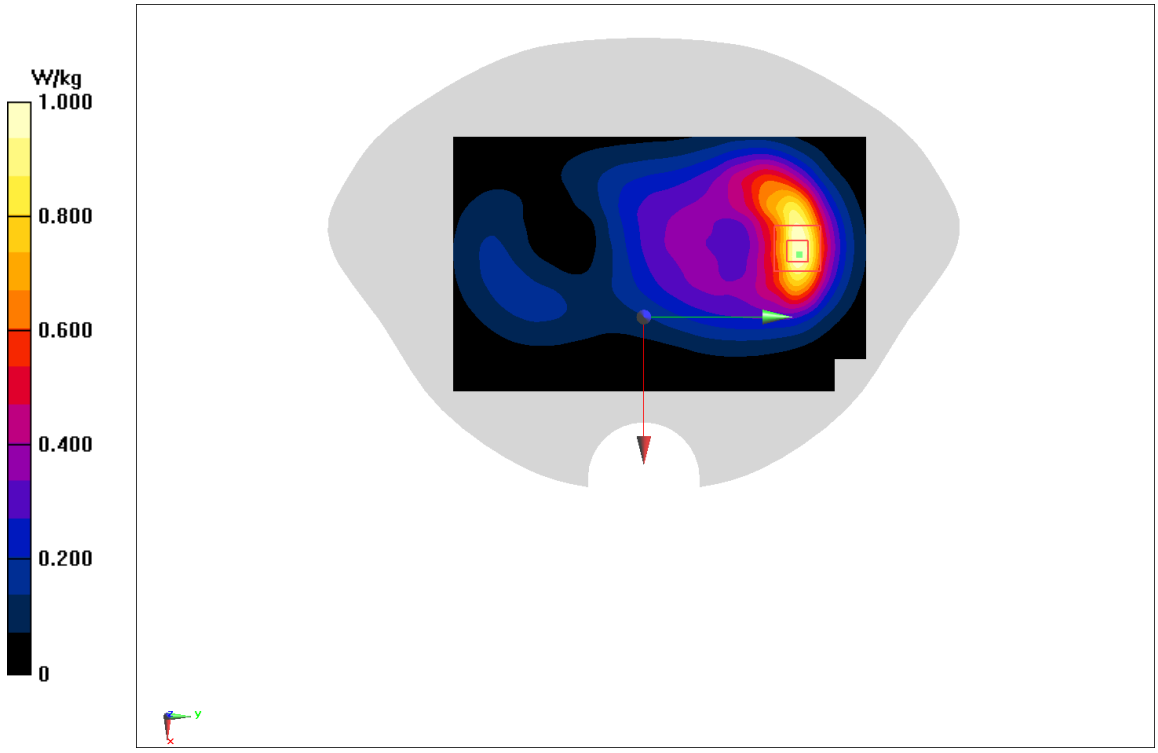


Fig A.15

LTE1900-FDD2_CH18900 Bottom 10mm
Date: 6/28/2020
Electronics: DAE4 Sn777
Medium: head 1900 MHz
Medium parameters used: f = 1880 MHz; σ = 1.363 mho/m; εr = 39.35; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE1900-FDD2 1880 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.29 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.11 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.839 W/kg; SAR(10 g) = 0.437 W/kg
Maximum value of SAR (measured) = 1.29 W/kg

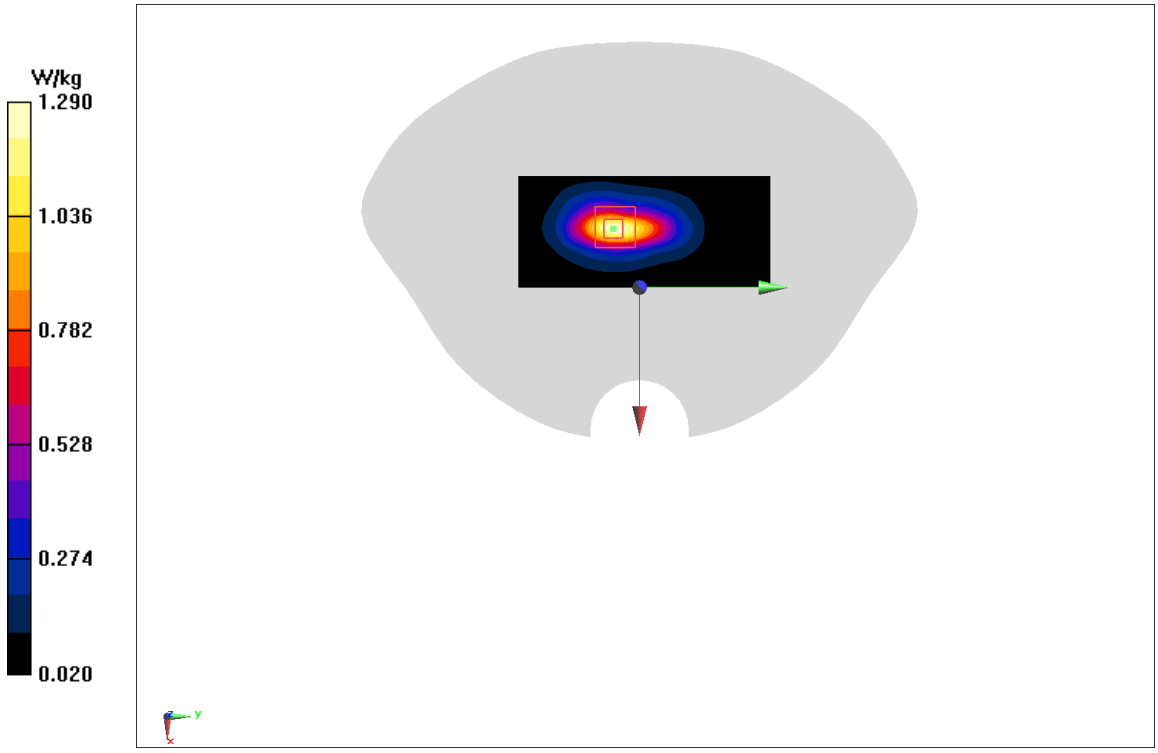


Fig A.16

LTE850-FDD5_CH20450 Left Cheek
Date: 6/26/2020
Electronics: DAE4 Sn777
Medium: head 835 MHz
Medium parameters used: f = 829 MHz; σ = 0.878 mho/m; εr = 41.46; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE850-FDD5 829 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.66 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.74 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.71 W/kg
SAR(1 g) = 0.852 W/kg; SAR(10 g) = 0.523 W/kg
Maximum value of SAR (measured) = 0.877 W/kg

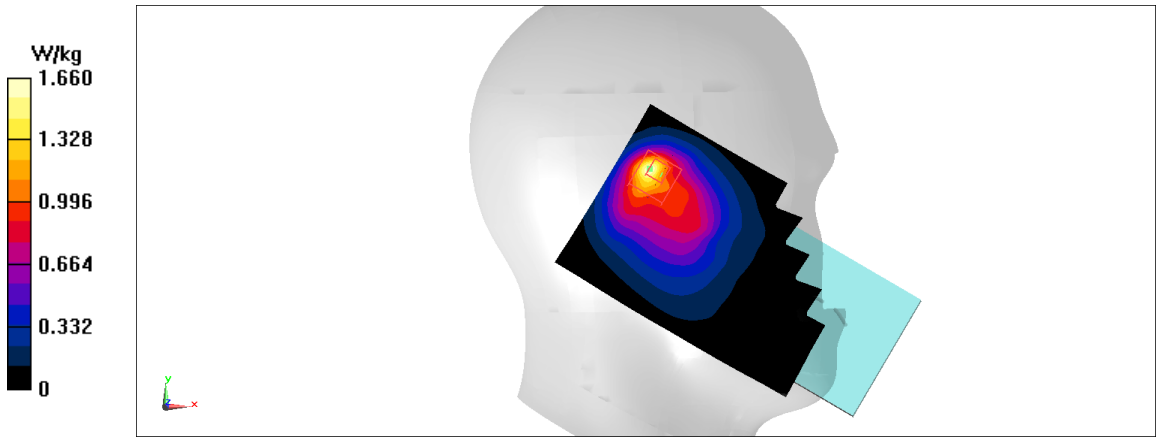


Fig A.17

LTE850-FDD5_CH20450 Rear 10mm
Date: 6/26/2020
Electronics: DAE4 Sn777
Medium: head 835 MHz
Medium parameters used: f = 829 MHz; σ = 0.878 mho/m; εr = 41.46; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE850-FDD5 829 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.455 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.06 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.44 W/kg
SAR(1 g) = 0.356 W/kg; SAR(10 g) = 0.275 W/kg
Maximum value of SAR (measured) = 0.372 W/kg

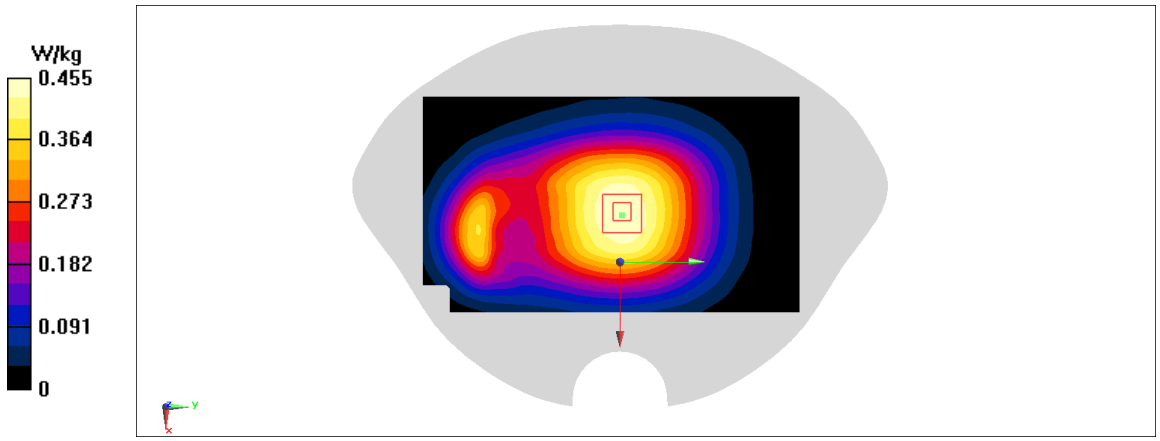


Fig A.18

LTE700-FDD12_CH23060 Left Cheek
Date: 6/25/2020
Electronics: DAE4 Sn777
Medium: head 750 MHz
Medium parameters used: f = 704 MHz; σ = 0.853 mho/m; εr = 42.13; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE700-FDD12 704 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.49 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.02 V/m; Power Drift = 0 dB
Peak SAR (extrapolated) = 2.11 W/kg
SAR(1 g) = 0.821 W/kg; SAR(10 g) = 0.56 W/kg
Maximum value of SAR (measured) = 1.49 W/kg

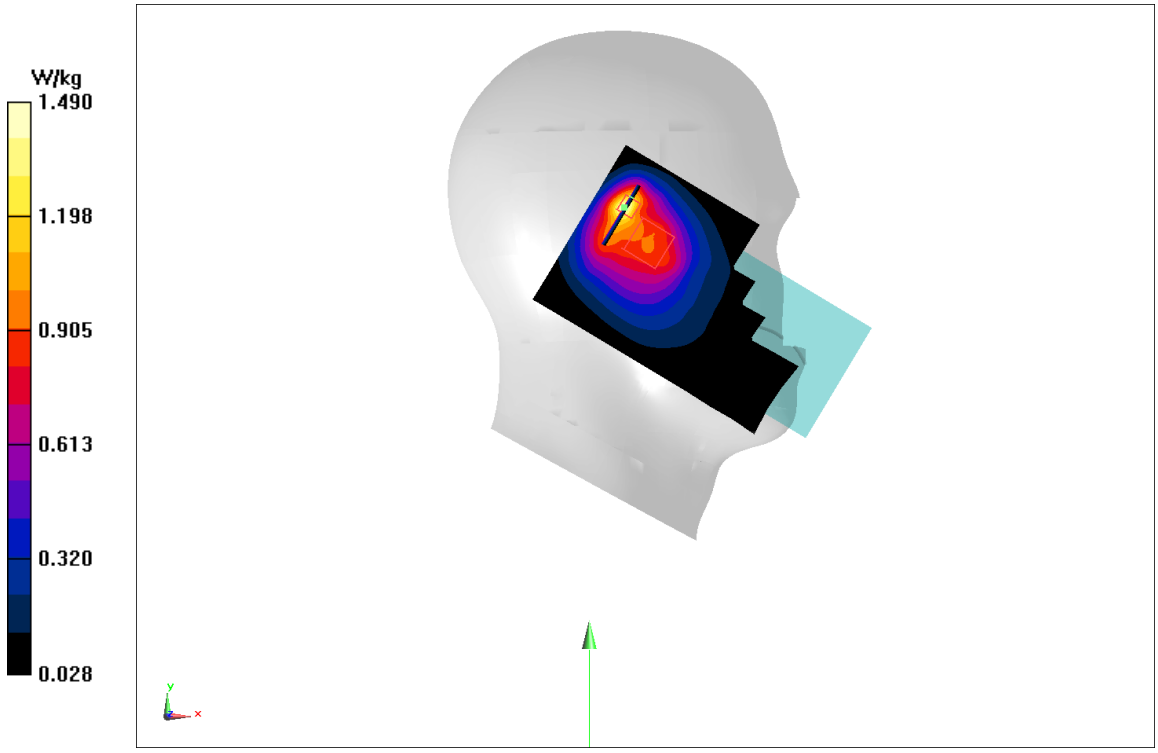


Fig A.19

LTE700-FDD12_CH23060 Rear 10mm
Date: 6/25/2020
Electronics: DAE4 Sn777
Medium: head 750 MHz
Medium parameters used: f = 704 MHz; σ = 0.853 mho/m; εr = 42.13; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE700-FDD12 704 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.471 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.88 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.53 W/kg
SAR(1 g) = 0.387 W/kg; SAR(10 g) = 0.297 W/kg
Maximum value of SAR (measured) = 0.475 W/kg

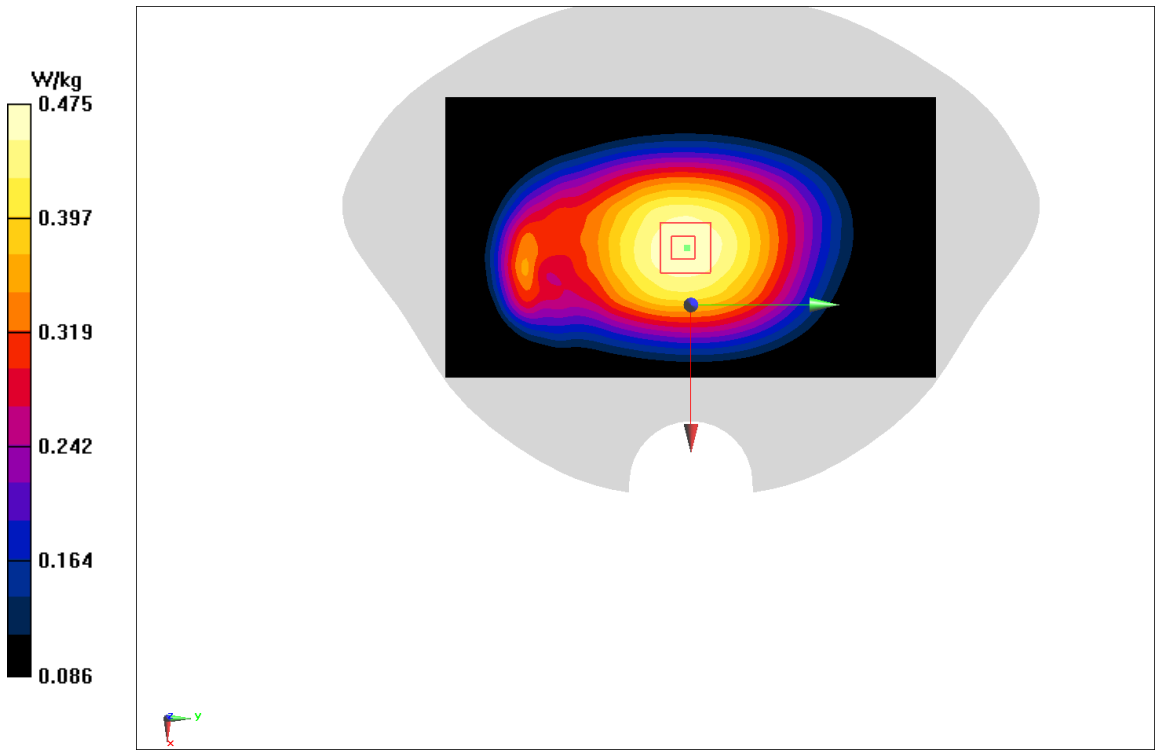


Fig A.20

LTE700-FDD14_CH23330 Right Cheek
Date: 6/25/2020
Electronics: DAE4 Sn777
Medium: head 750 MHz
Medium parameters used: f = 793 MHz; σ = 0.938 mho/m; εr = 42.02; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE700-FDD14 793 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.285 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.418 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.322 W/kg
SAR(1 g) = 0.226 W/kg; SAR(10 g) = 0.172 W/kg
Maximum value of SAR (measured) = 0.282 W/kg

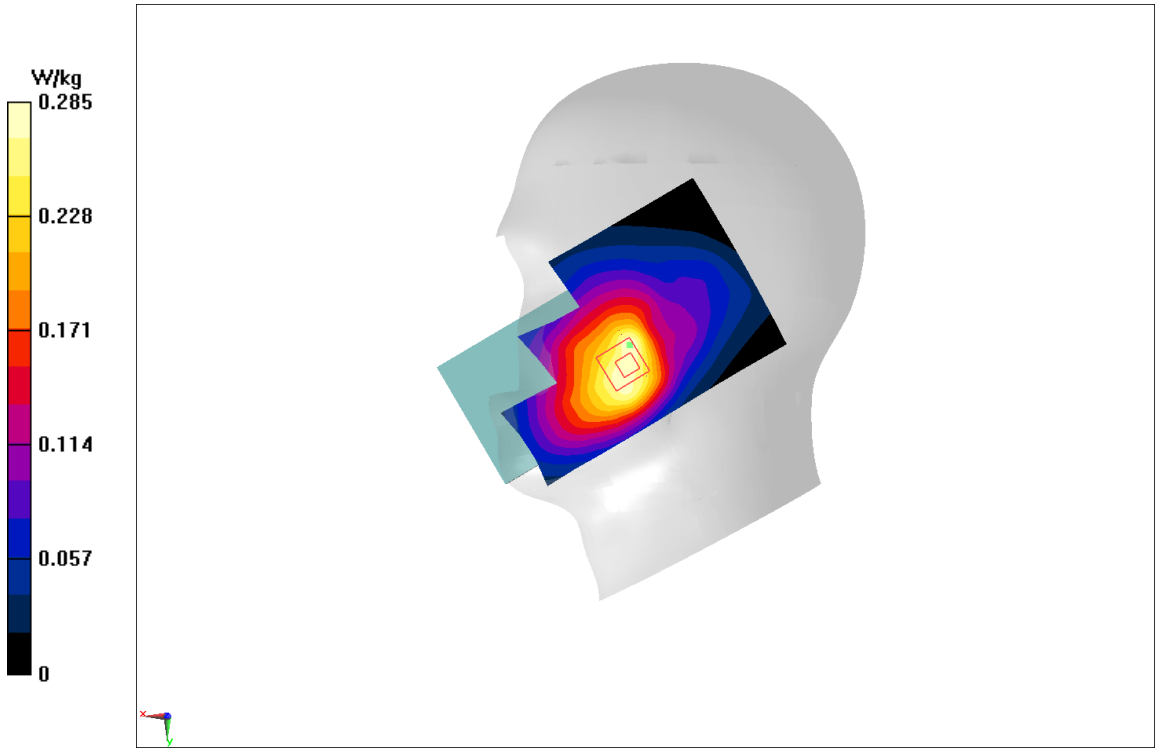


Fig A.21

LTE700-FDD14_CH23330 Rear 10mm
Date: 6/25/2020
Electronics: DAE4 Sn777
Medium: head 750 MHz
Medium parameters used: f = 793 MHz; σ = 0.938 mho/m; εr = 42.02; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE700-FDD14 793 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.621 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.81 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.907 W/kg
SAR(1 g) = 0.442 W/kg; SAR(10 g) = 0.237 W/kg
Maximum value of SAR (measured) = 0.699 W/kg

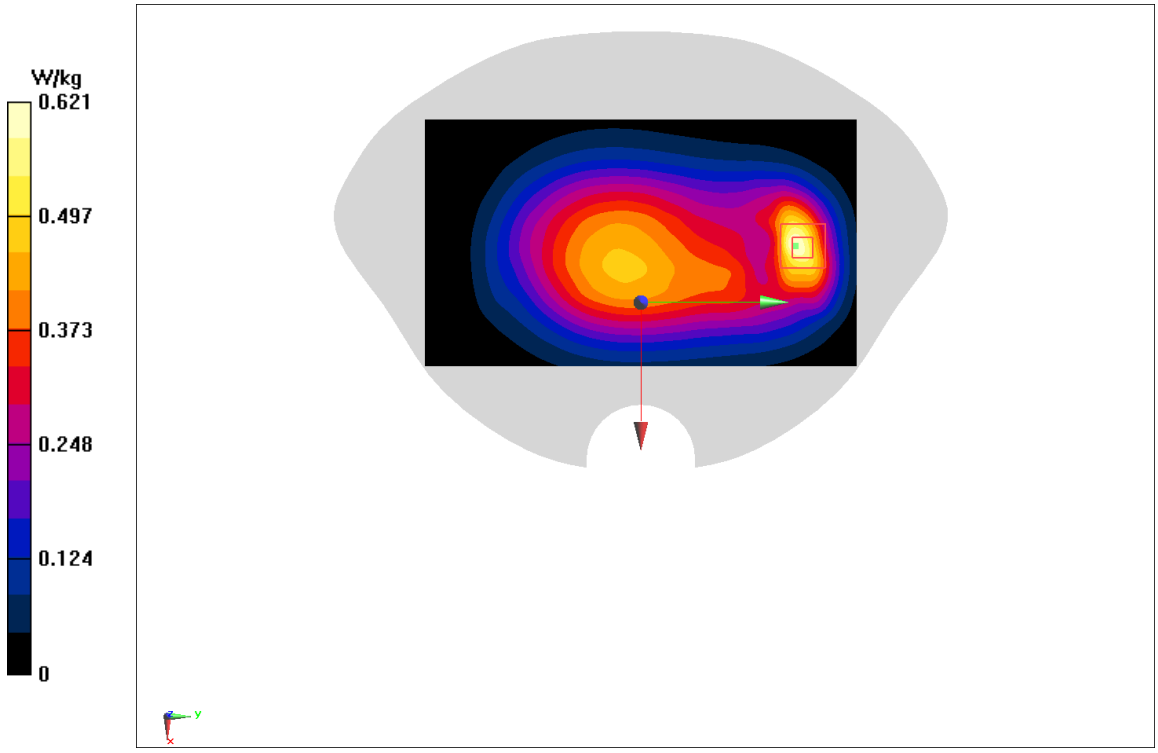


Fig A.22

LTE2300-FDD30_CH27710 Left Cheek
Date: 6/29/2020
Electronics: DAE4 Sn777
Medium: head 2300 MHz
Medium parameters used: f = 2310 MHz; σ = 1.692 mho/m; εr = 39.51; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE2300-FDD30 2310 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(7.95,7.95,7.95)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.323 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.501 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.341 W/kg
SAR(1 g) = 0.208 W/kg; SAR(10 g) = 0.124 W/kg
Maximum value of SAR (measured) = 0.286 W/kg

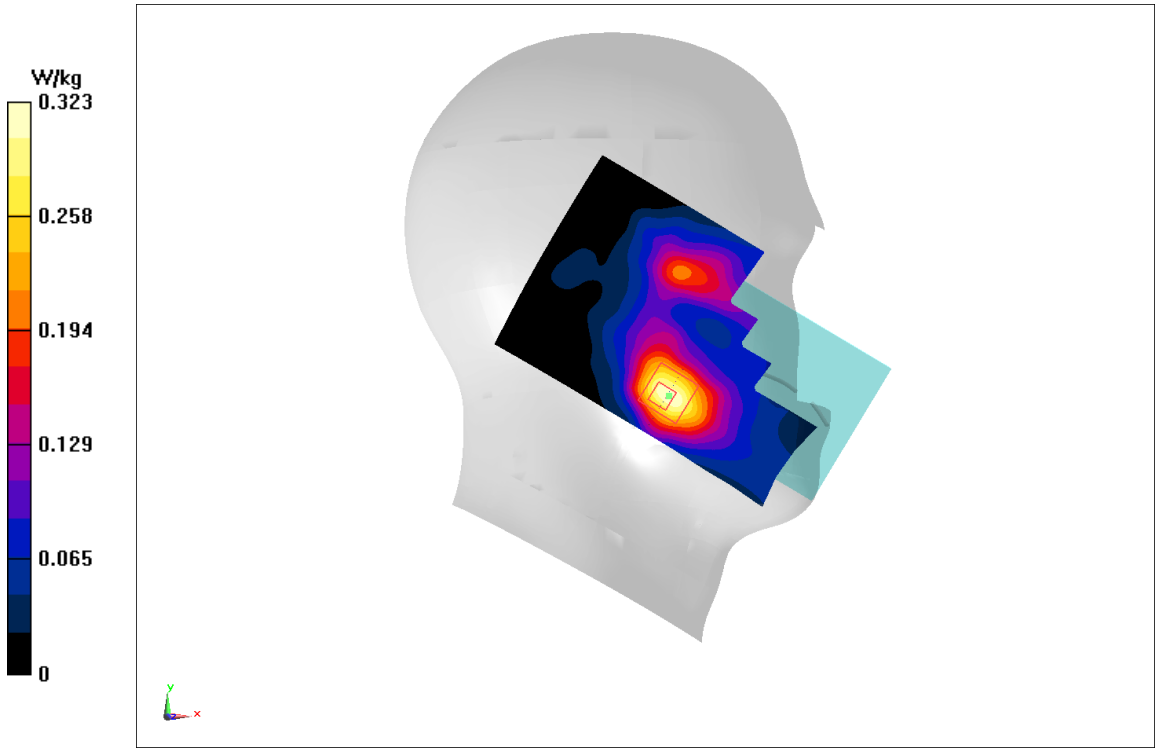


Fig A.23

LTE2300-FDD30_CH27710 Rear 15mm
Date: 6/29/2020
Electronics: DAE4 Sn777
Medium: head 2300 MHz
Medium parameters used: f = 2310 MHz; σ = 1.692 mho/m; εr = 39.51; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE2300-FDD30 2310 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(7.95,7.95,7.95)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.866 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.734 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.576 W/kg; SAR(10 g) = 0.324 W/kg
Maximum value of SAR (measured) = 0.849 W/kg

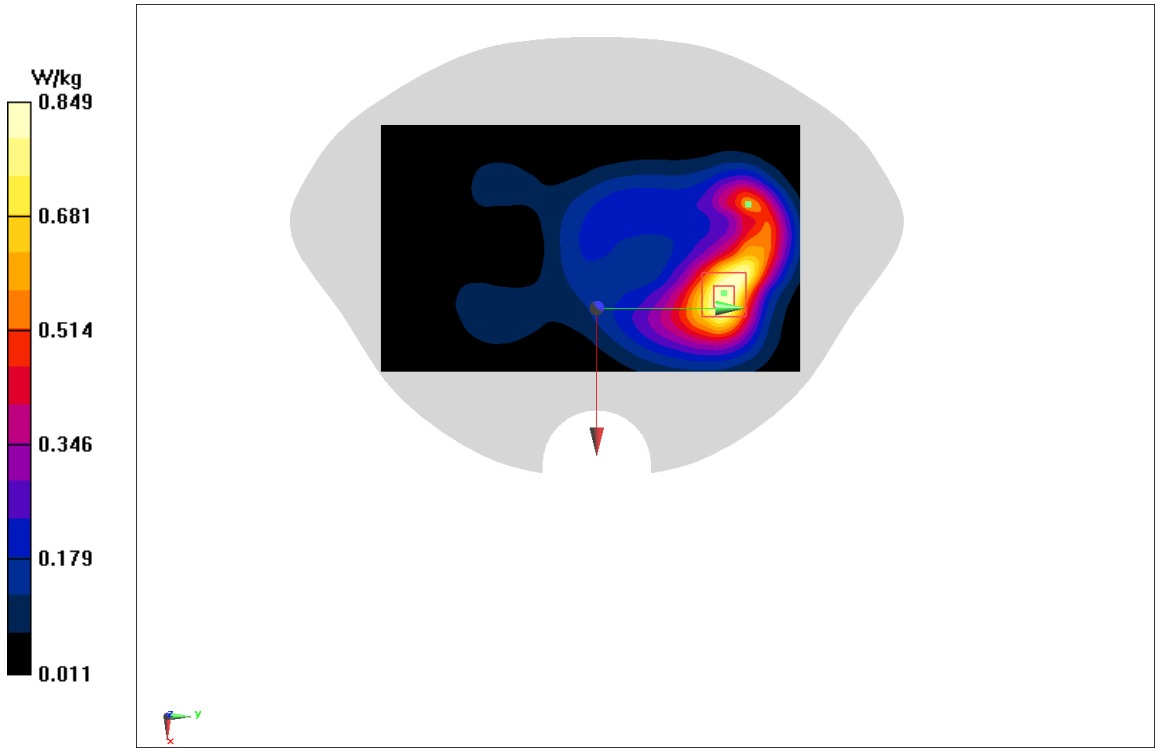


Fig A.24

LTE2300-FDD30_CH27710 Bottom 10mm
Date: 6/29/2020
Electronics: DAE4 Sn777
Medium: head 2300 MHz
Medium parameters used: f = 2310 MHz; σ = 1.692 mho/m; εr = 39.51; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE2300-FDD30 2310 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(7.95,7.95,7.95)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.314 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.857 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.409 W/kg
SAR(1 g) = 0.197 W/kg; SAR(10 g) = 0.09 W/kg
Maximum value of SAR (measured) = 0.321 W/kg

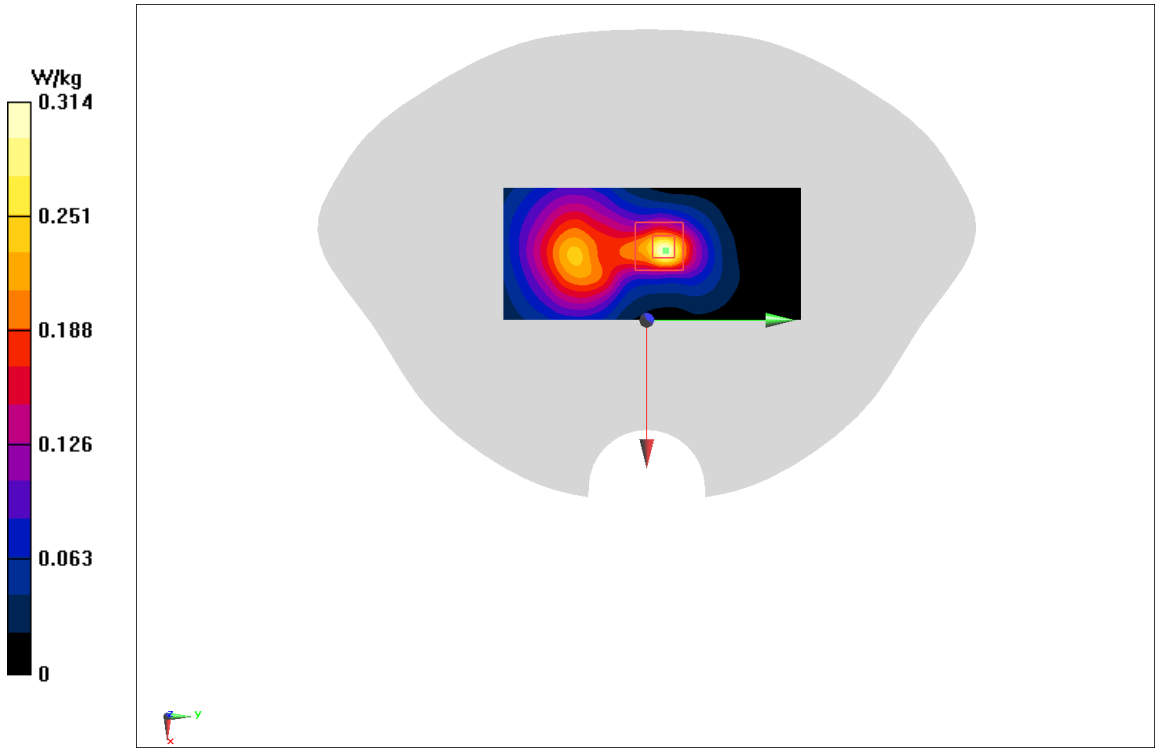


Fig A.25

LTE1700-FDD66_CH132072 Right Cheek
Date: 6/27/2020
Electronics: DAE4 Sn777
Medium: head 1750 MHz
Medium parameters used: f = 1720 MHz; σ = 1.406 mho/m; εr = 40.9; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE1700-FDD66 2310 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.519 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.313 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.585 W/kg
SAR(1 g) = 0.381 W/kg; SAR(10 g) = 0.239 W/kg
Maximum value of SAR (measured) = 0.506 W/kg

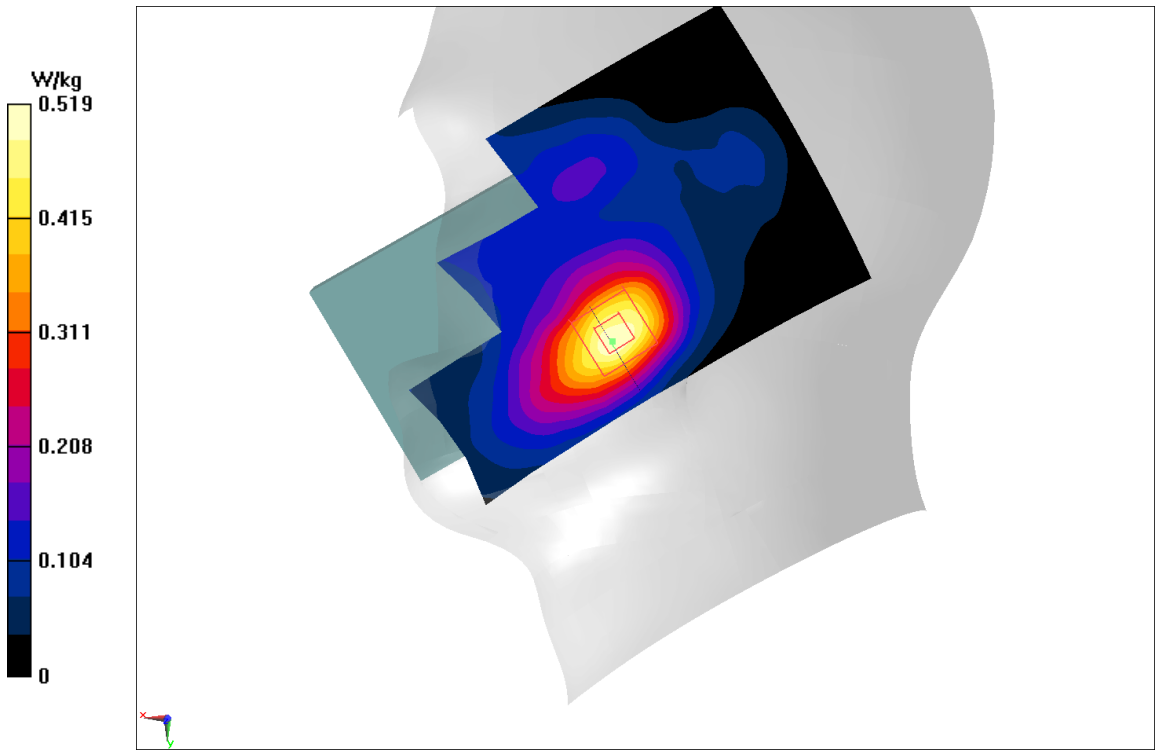


Fig A.26

LTE1700-FDD66_CH132072 Front 15mm
Date: 6/27/2020
Electronics: DAE4 Sn777
Medium: head 1750 MHz
Medium parameters used: f = 1720 MHz; σ = 1.406 mho/m; εr = 40.9; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE1700-FDD66 2310 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.866 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.478 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.662 W/kg; SAR(10 g) = 0.393 W/kg
Maximum value of SAR (measured) = 0.928 W/kg

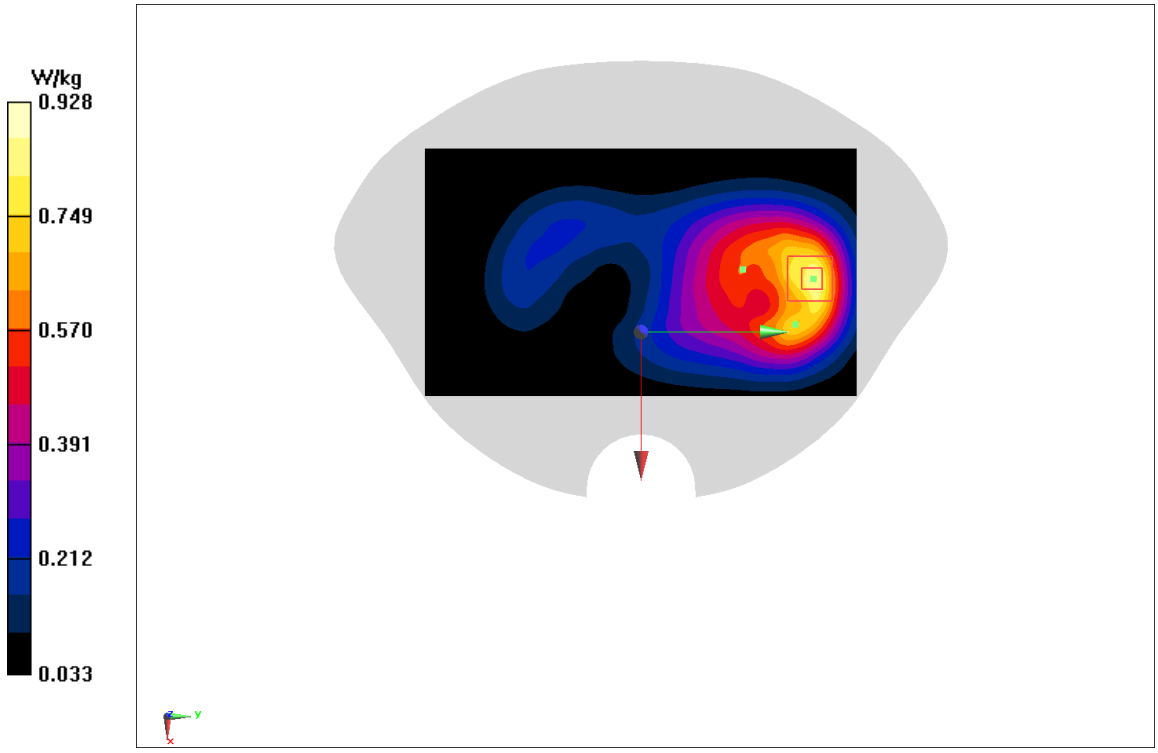


Fig A.27

LTE1700-FDD66_CH132072 Bottom 10mm
Date: 6/27/2020
Electronics: DAE4 Sn777
Medium: head 1750 MHz
Medium parameters used: f = 1720 MHz; σ = 1.406 mho/m; εr = 40.9; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: LTE1700-FDD66 2310 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.782 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.66 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.943 W/kg
SAR(1 g) = 0.519 W/kg; SAR(10 g) = 0.279 W/kg
Maximum value of SAR (measured) = 0.793 W/kg

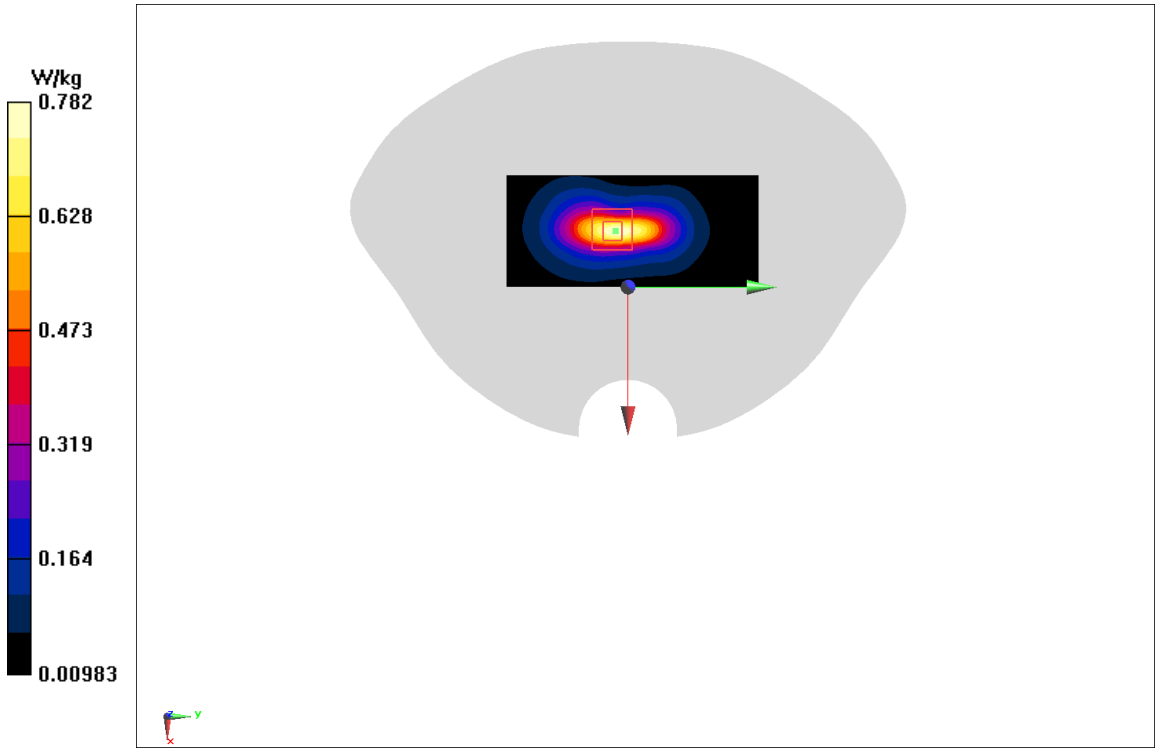


Fig A.28

WLAN2450_CH6 Right Cheek
Date: 6/30/2020
Electronics: DAE4 Sn777
Medium: head 2450 MHz
Medium parameters used: f = 2437 MHz; σ = 1.788 mho/m; εr = 38.6; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: WLAN2450 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(7.65,7.65,7.65)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.822 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.996 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1 W/kg
SAR(1 g) = 0.51 W/kg; SAR(10 g) = 0.308 W/kg
Maximum value of SAR (measured) = 0.799 W/kg

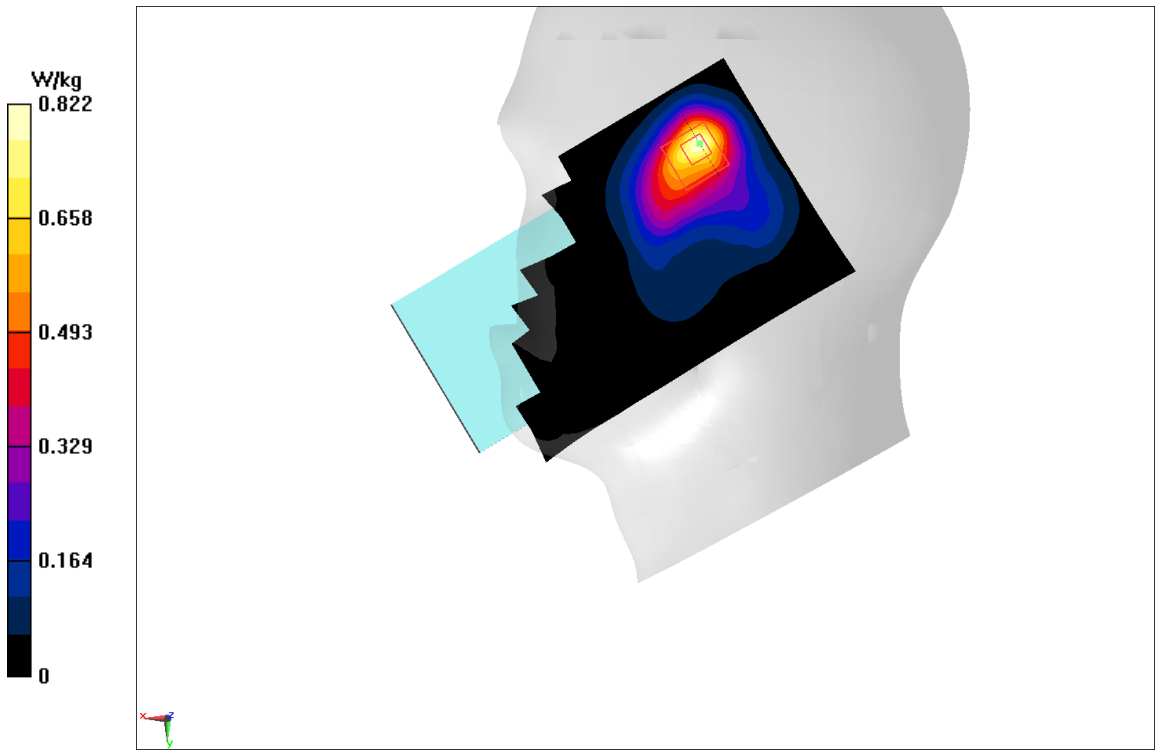


Fig A.29

WLAN2450_CH6 Rear 10mm
Date: 6/30/2020
Electronics: DAE4 Sn777
Medium: head 2450 MHz
Medium parameters used: f = 2437 MHz; σ = 1.788 mho/m; εr = 38.6; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC, Liquid Temperature: 22.5ºC
Communication System: WLAN2450 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(7.65,7.65,7.65)

Area Scan (71x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.365 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.075 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.473 W/kg
SAR(1 g) = 0.225 W/kg; SAR(10 g) = 0.11 W/kg
Maximum value of SAR (measured) = 0.369 W/kg

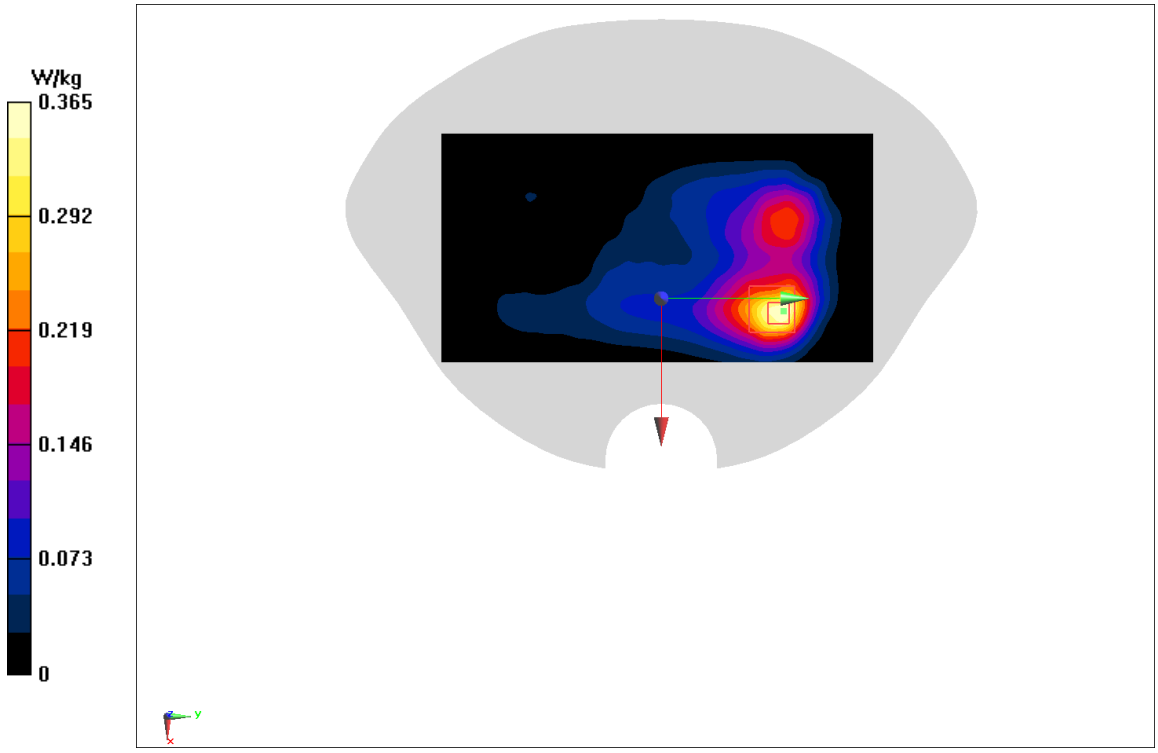


Fig A.30

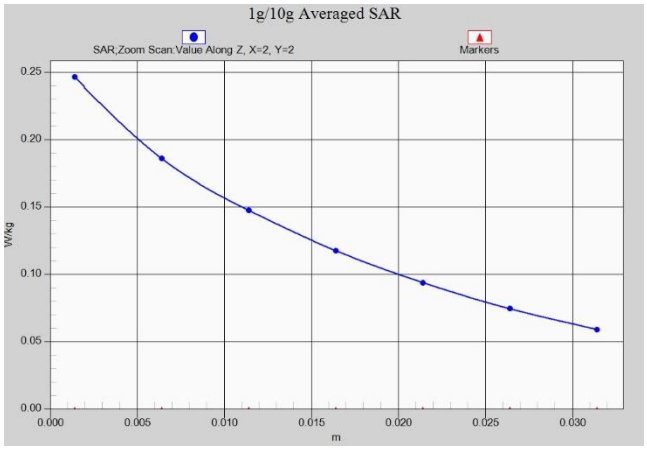


Fig. 1-1 Z-Scan at power reference point (GSM850 Head)

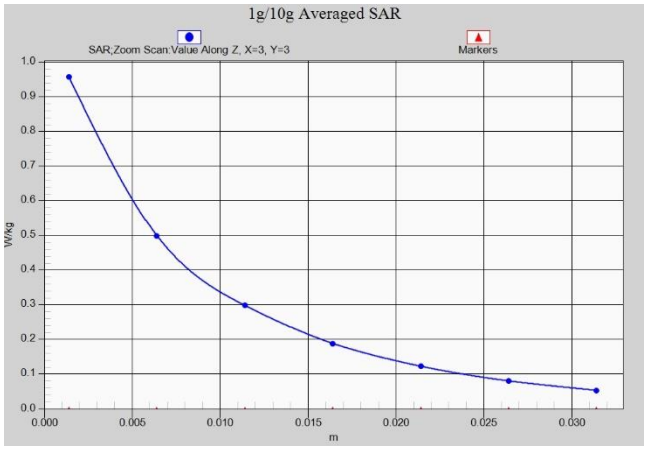


Fig. 1-2 Z-Scan at power reference point (GSM850 Body)

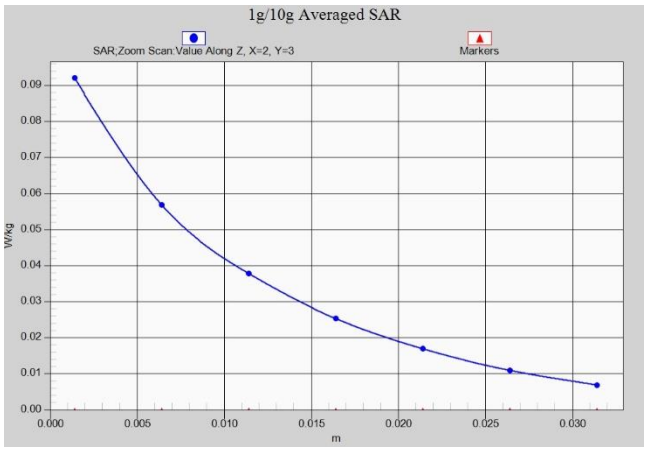


Fig. 1-3 Z-Scan at power reference point (PCS1900 head)

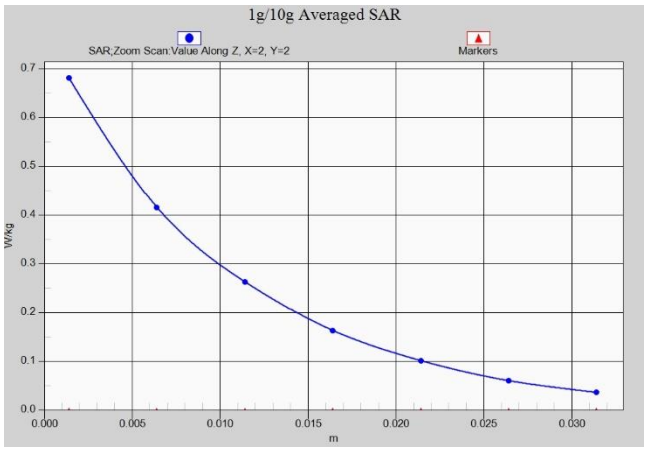


Fig. 1-4 Z-Scan at power reference point (PCS1900 Body)

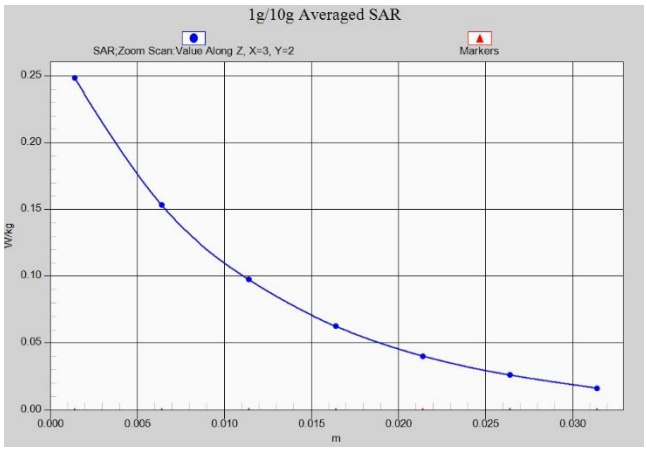


Fig. 1-5 Z-Scan at power reference point (WCDMA1900 Head)

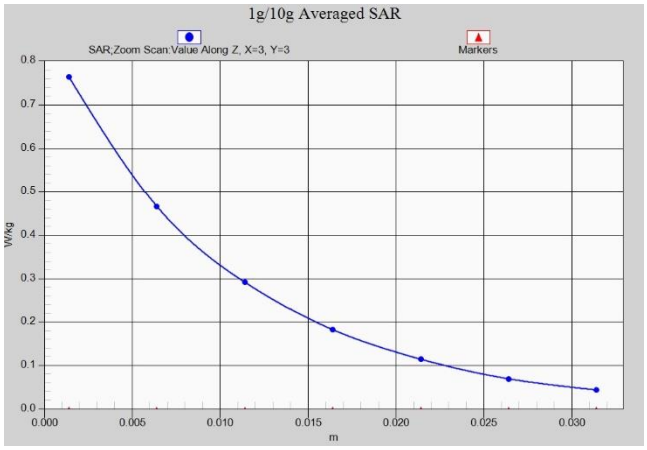


Fig. 1-6 Z-Scan at power reference point (WCDMA1900 Body)

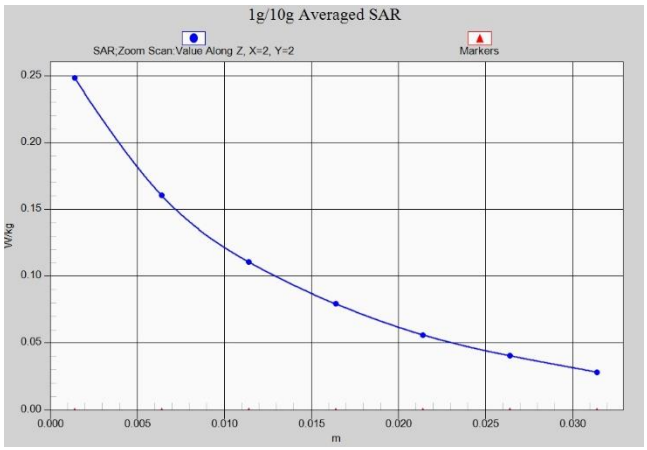


Fig. 1-7 Z-Scan at power reference point (WCDMA1700 Head)

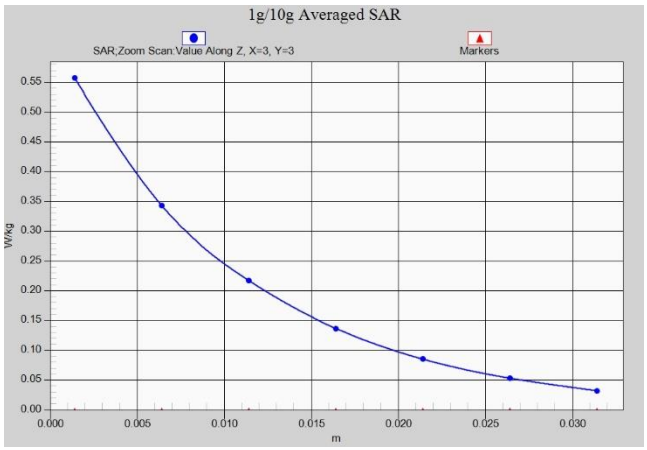


Fig. 1-8 Z-Scan at power reference point (WCDMA1700 Body)

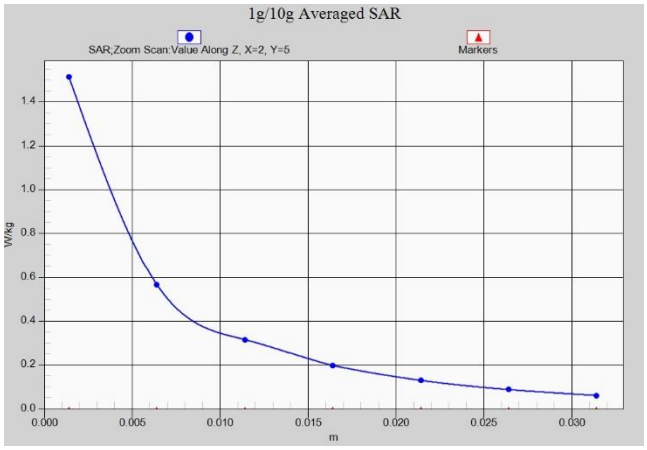


Fig. 1-9 Z-Scan at power reference point (WCDMA850 Head)

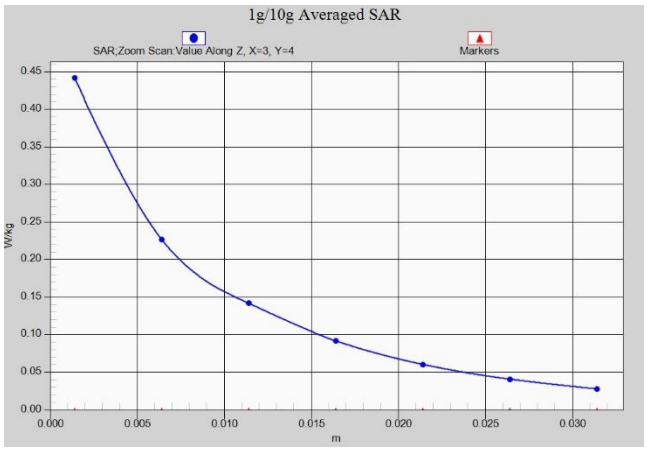


Fig. 1-10 Z-Scan at power reference point (WCDMA850 Body)

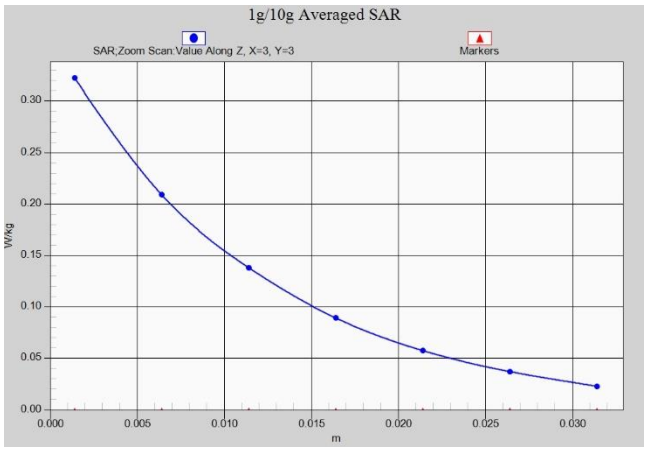


Fig. 1-11 Z-Scan at power reference point (LTE Band 2 Head)

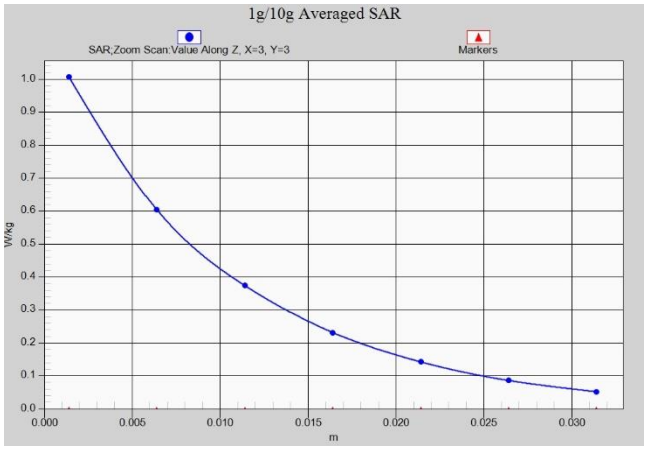


Fig. 1-12 Z-Scan at power reference point (LTE Band2 Body)

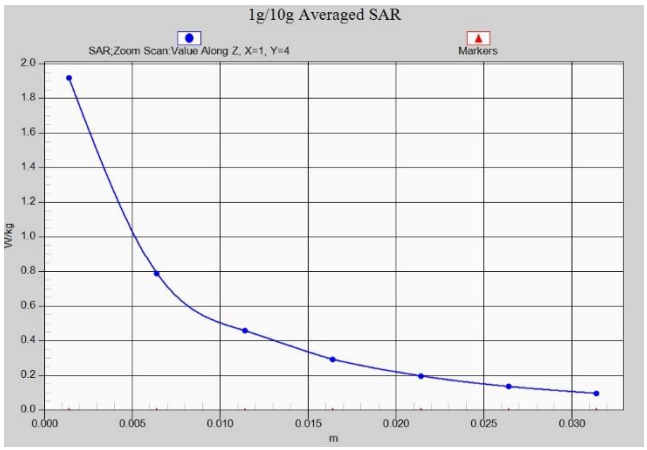


Fig. 1-13 Z-Scan at power reference point (LTE Band 5 Head)

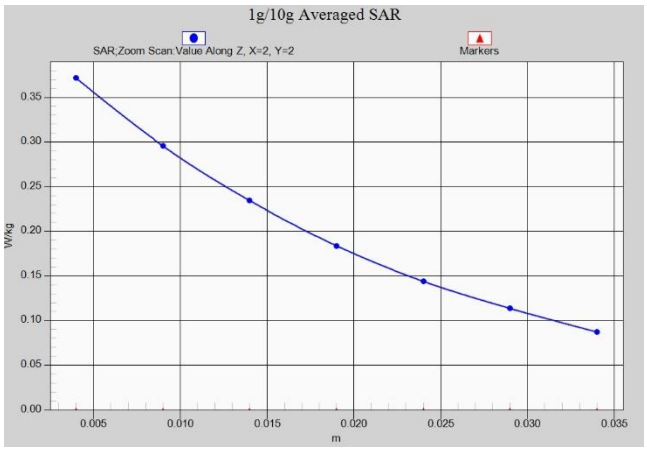


Fig. 1-14 Z-Scan at power reference point (LTE Band 5 Body)

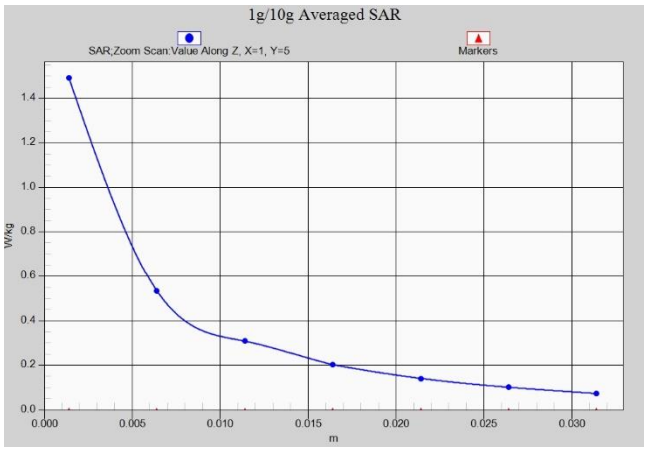


Fig. 1-15 Z-Scan at power reference point (LTE Band 12 Head)

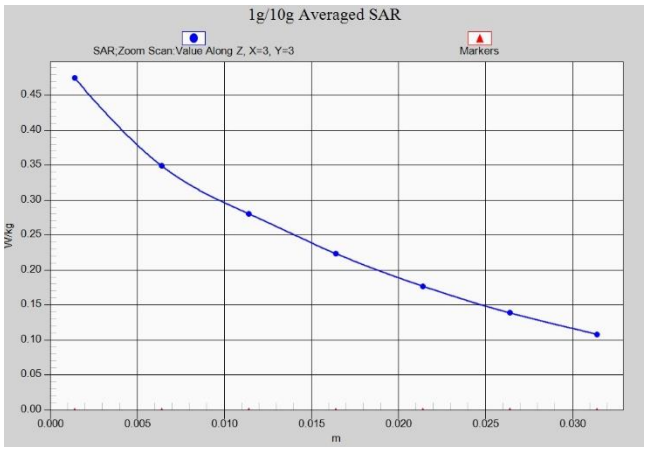


Fig. 1-16 Z-Scan at power reference point (LTE Band 12 Body)

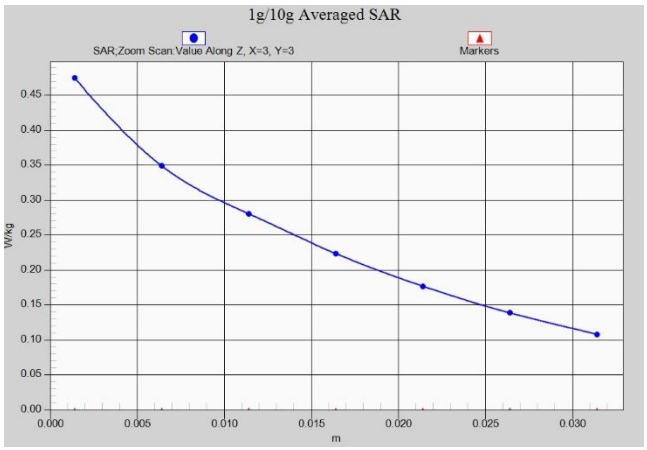


Fig. 1-17 Z-Scan at power reference point (LTE Band14 Head)

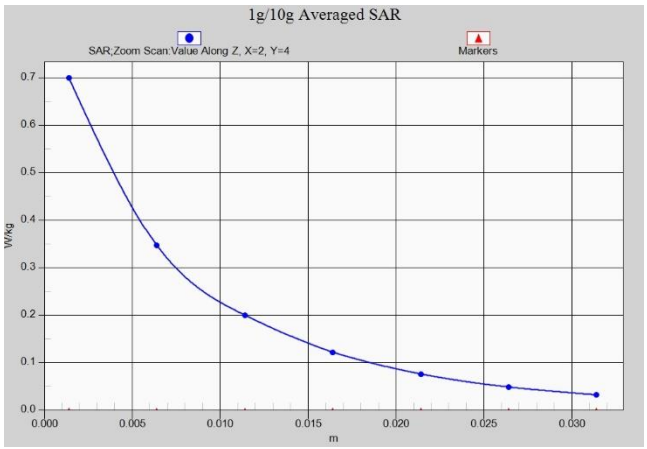


Fig. 1-18 Z-Scan at power reference point (LTE Band14 Body)

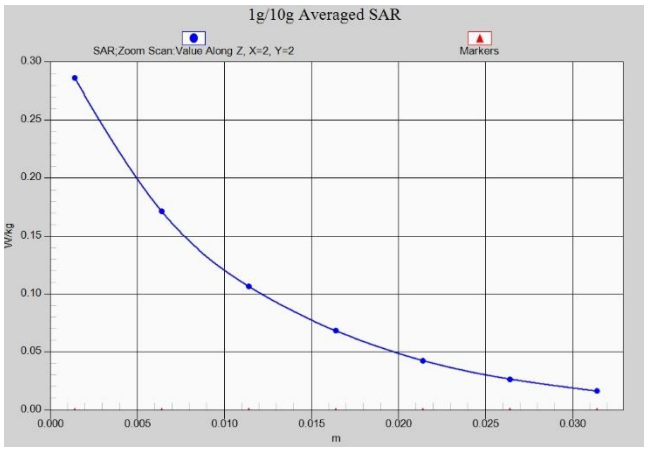


Fig. 1-19 Z-Scan at power reference point (LTE Band30 Head)

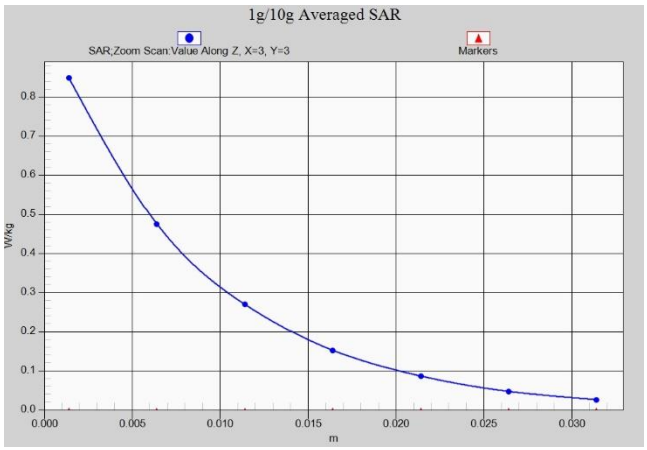


Fig. 1-20 Z-Scan at power reference point (LTE Band30 Body)

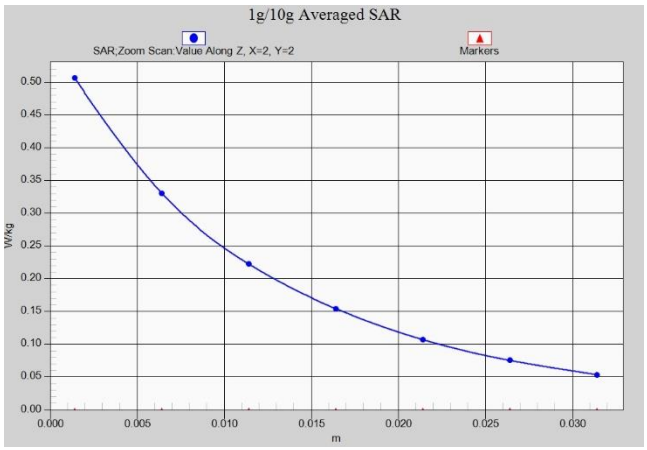


Fig. 1-21 Z-Scan at power reference point (LTE Band66 Head)

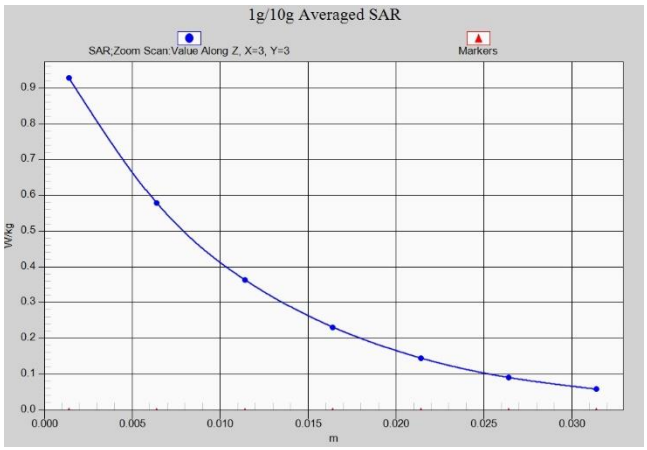


Fig. 1-22 Z-Scan at power reference point (LTE Band66 Body)

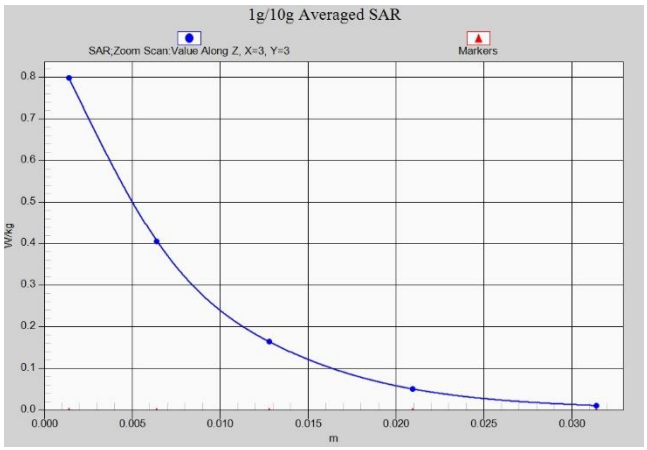


Fig. 1-23 Z-Scan at power reference point (2450 MHz Head)

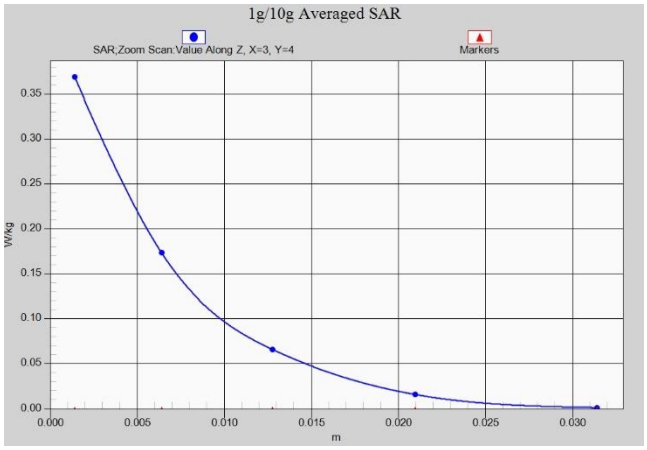


Fig. 1-24 Z-Scan at power reference point (2450 MHz Body)

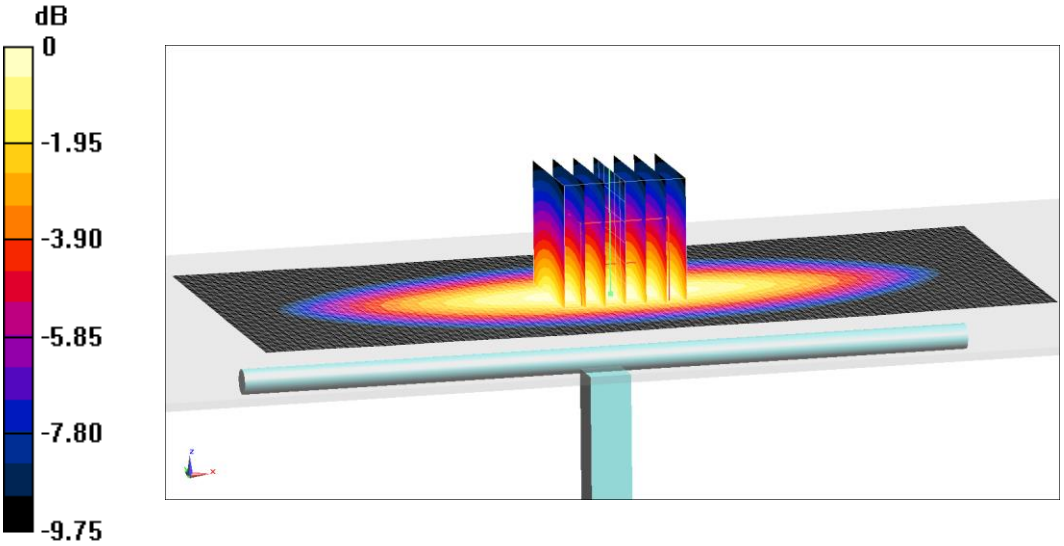
ANNEX B System Verification Results

750 MHz

Date: 6/25/2020
Electronics: DAE4 Sn777
Medium: Head 750 MHz
Medium parameters used: f = 750 MHz; σ =0.897 mho/m; ε_r = 42.07; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(10.07,10.07,10.07)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 59.25 V/m; Power Drift = -0.1
Fast SAR: SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.41 W/kg
Maximum value of SAR (interpolated) = 2.78 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =59.25 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 3.25 W/kg
SAR(1 g) = 2.13 W/kg; SAR(10 g) = 1.41 W/kg
Maximum value of SAR (measured) = 2.89 W/kg



0 dB = 2.89 W/kg = 4.61 dB W/kg

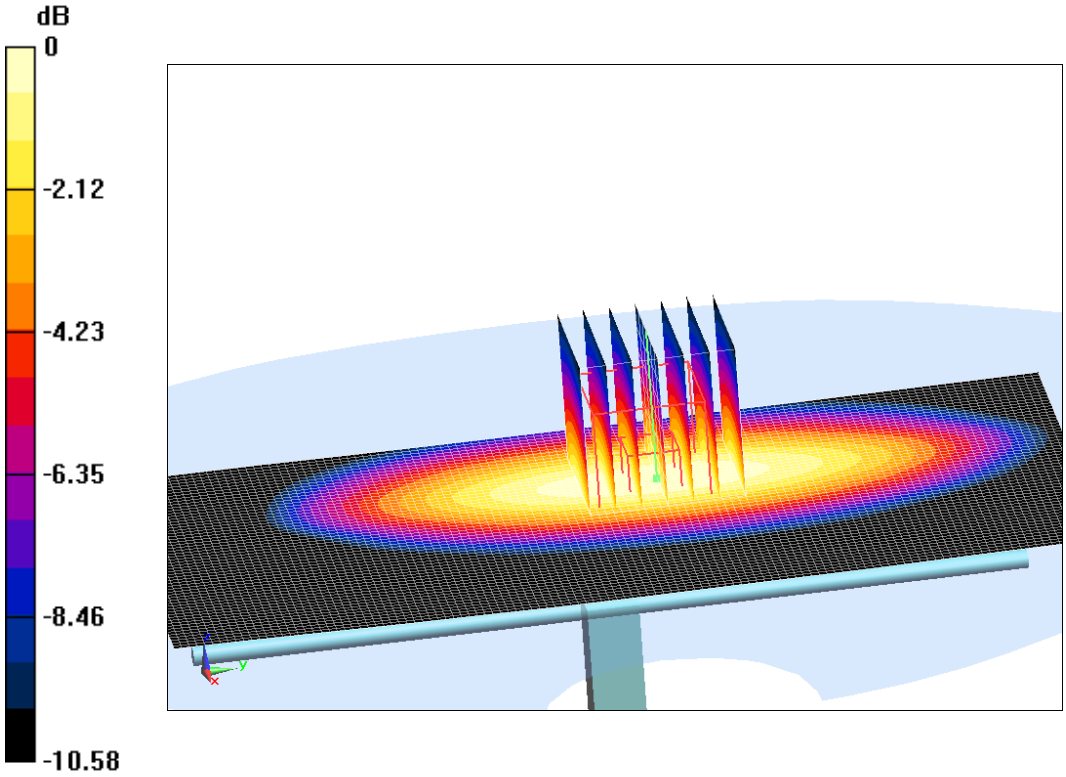
Fig.B.1 validation 750 MHz 250mW

835 MHz

Date: 6/26/2020
Electronics: DAE4 Sn777
Medium: Head 835 MHz
Medium parameters used: f = 835 MHz; σ =0.884 mho/m; ε_r = 41.45; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(9.66,9.66,9.66)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 63.79 V/m; Power Drift = -0.05
Fast SAR: SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.6 W/kg
Maximum value of SAR (interpolated) = 3.12 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =63.79 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 3.63 W/kg
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.56 W/kg
Maximum value of SAR (measured) = 3.17 W/kg



0 dB = 3.17 W/kg = 5.01 dB W/kg

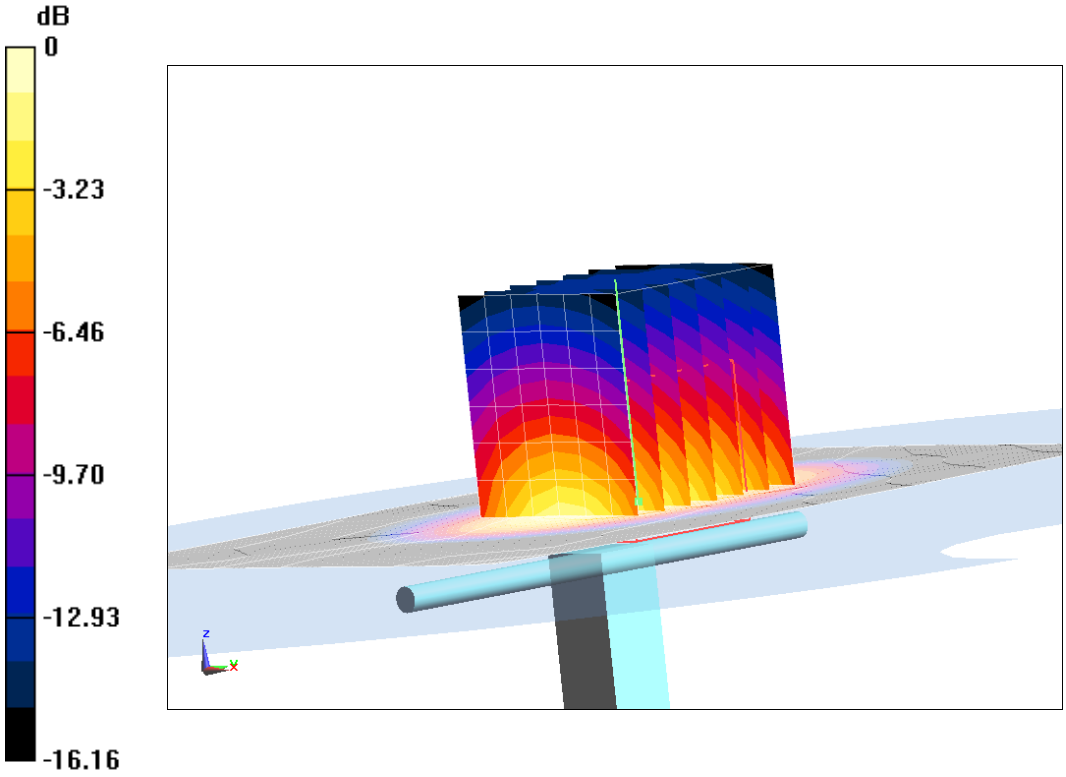
Fig.B.2 validation 835 MHz 250mW

1750 MHz

Date: 6/27/2020
Electronics: DAE4 Sn777
Medium: Head 1750 MHz
Medium parameters used: f = 1750 MHz; σ =1.374 mho/m; ε_r = 39.44; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.41,8.41,8.41)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 105.19 V/m; Power Drift = -0.04
Fast SAR: SAR(1 g) = 9.21 W/kg; SAR(10 g) = 4.78 W/kg
Maximum value of SAR (interpolated) = 14.17 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =105.19 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 16.47 W/kg
SAR(1 g) = 9.03 W/kg; SAR(10 g) = 4.81 W/kg
Maximum value of SAR (measured) = 14.02 W/kg



0 dB = 14.02 W/kg = 11.47 dB W/kg

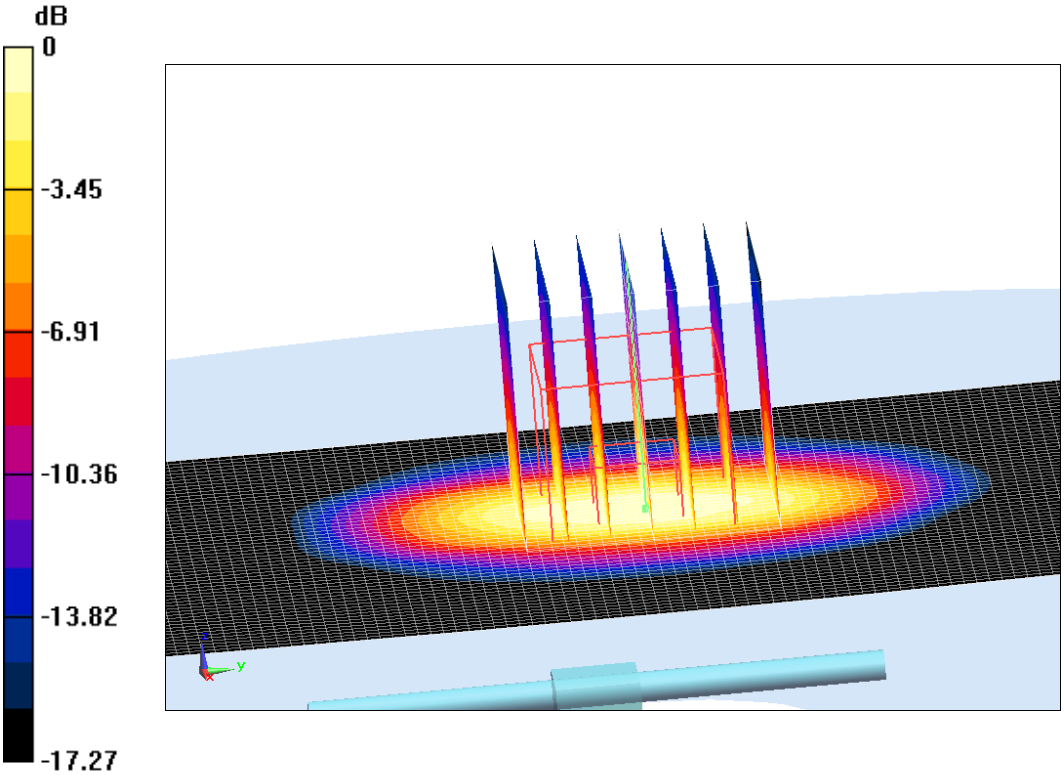
Fig.B.3 validation 1750 MHz 250mW

1900 MHz

Date: 6/28/2020
Electronics: DAE4 Sn777
Medium: Head 1900 MHz
Medium parameters used: f = 1900 MHz; σ =1.382 mho/m; ε_r = 39.33; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(8.14,8.14,8.14)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 110.16 V/m; Power Drift = 0.06
Fast SAR: SAR(1 g) = 9.98 W/kg; SAR(10 g) = 5.19 W/kg
Maximum value of SAR (interpolated) = 15.44 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =110.16 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 17.45 W/kg
SAR(1 g) = 9.95 W/kg; SAR(10 g) = 5.29 W/kg
Maximum value of SAR (measured) = 14.62 W/kg



0 dB = 14.62 W/kg = 11.65 dB W/kg

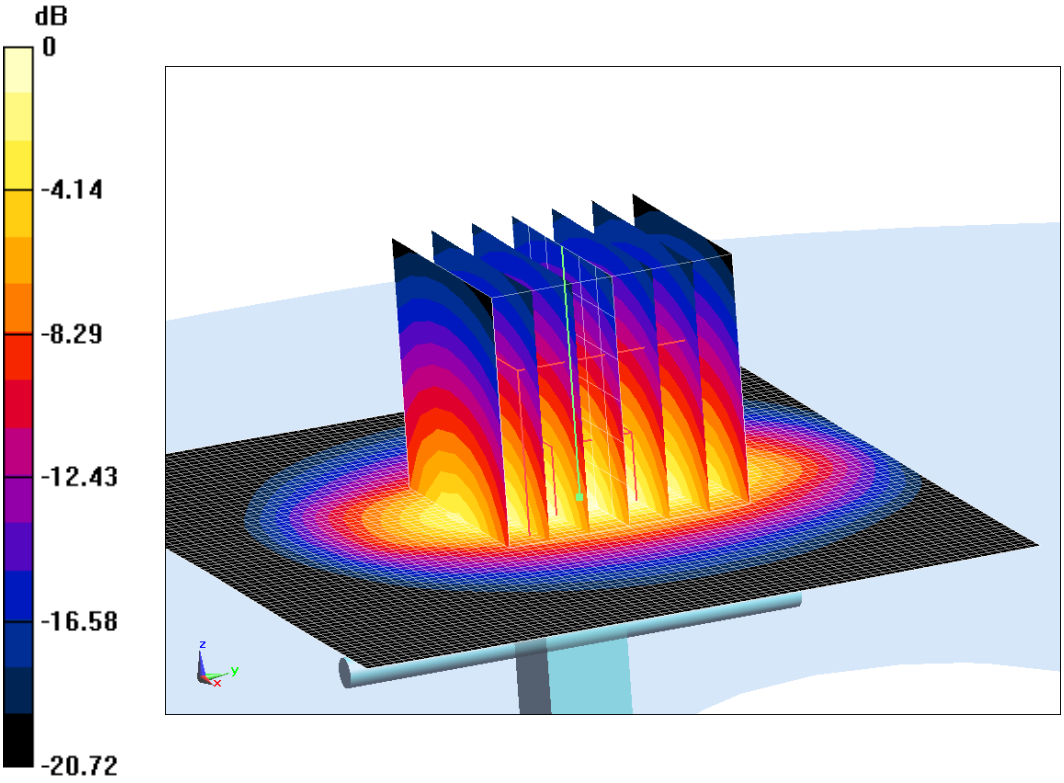
Fig.B.4 validation 1900 MHz 250mW

2300 MHz

Date: 6/29/2020
Electronics: DAE4 Sn777
Medium: Head 2300 MHz
Medium parameters used: f = 2300 MHz; σ =1.682 mho/m; ε_r = 39.52; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 2300 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(7.95,7.95,7.95)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 115.42 V/m; Power Drift = -0.05
Fast SAR: SAR(1 g) = 12.21 W/kg; SAR(10 g) = 5.99 W/kg
Maximum value of SAR (interpolated) = 20.36 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =115.42 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 23.56 W/kg
SAR(1 g) = 12.25 W/kg; SAR(10 g) = 5.97 W/kg
Maximum value of SAR (measured) = 19.93 W/kg



0 dB = 19.93 W/kg = 13 dB W/kg

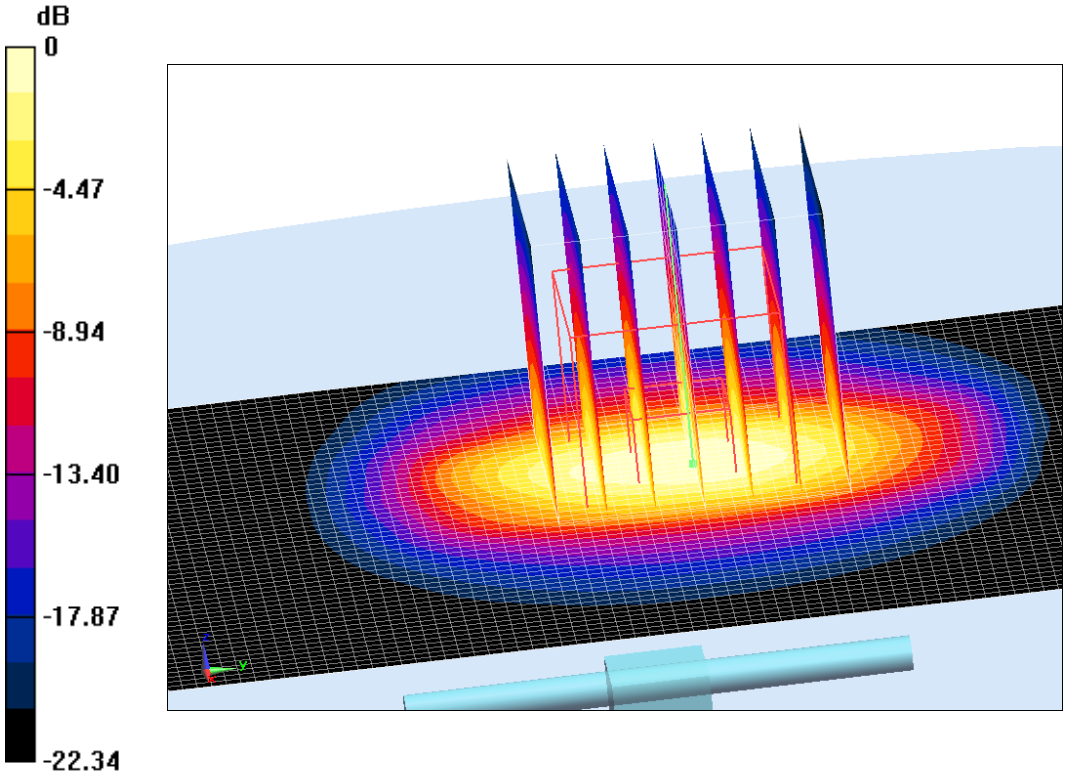
Fig.B.5 validation 2300 MHz 250mW

2450 MHz

Date: 6/30/2020
Electronics: DAE4 Sn777
Medium: Head 2450 MHz
Medium parameters used: f = 2450 MHz; σ =1.8 mho/m; ε_r = 38.58; ρ = 1000 kg/m^3
Ambient Temperature: 22.9ºC Liquid Temperature: 22.5ºC
Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN3617 ConvF(7.65,7.65,7.65)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 115.41 V/m; Power Drift = 0.02
Fast SAR: SAR(1 g) = 12.68 W/kg; SAR(10 g) = 6.01 W/kg
Maximum value of SAR (interpolated) = 21.63 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =115.41 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 25.21 W/kg
SAR(1 g) = 12.64 W/kg; SAR(10 g) = 6.09 W/kg
Maximum value of SAR (measured) = 21.78 W/kg



0 dB = 21.78 W/kg = 13.38 dB W/kg

Fig.B.6 validation 2450 MHz 250mW

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

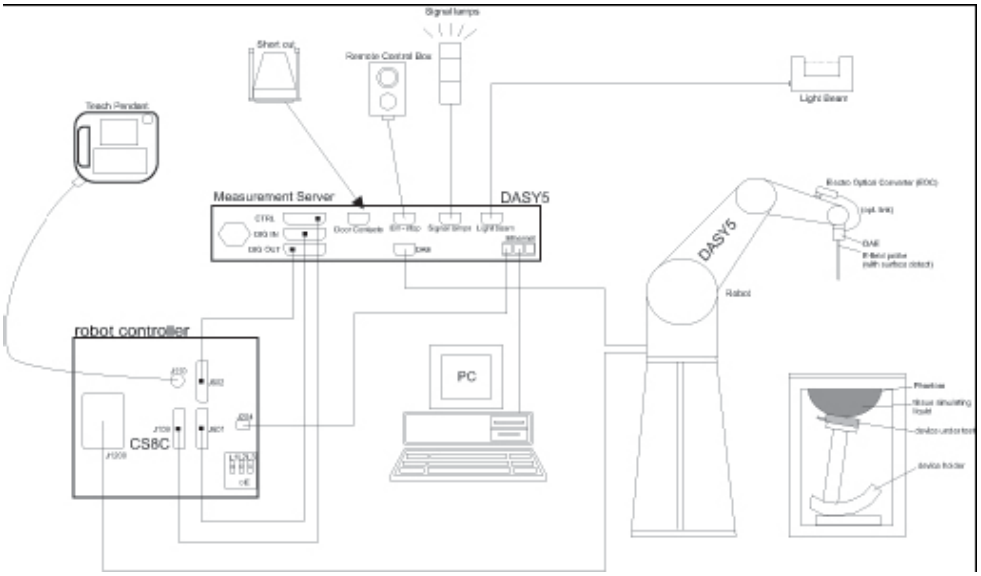
Table B.1 Comparison between area scan and zoom scan for system verification

Date	Band	Position	Area scan (1g)	Zoom scan (1g)	Drift (%)
2020/6/25	750	Head	2.1	2.13	-1.41
2020/6/26	835	Head	2.43	2.44	-0.41
2020/6/27	1750	Head	9.21	9.03	1.99
2020/6/28	1900	Head	9.98	9.95	0.30
2020/6/29	2300	Head	12.21	12.25	-0.33
2020/6/30	2450	Head	12.68	12.64	0.32

ANNEX C SAR Measurement Setup

C.1 Measurement Set-up

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



Picture C.1SAR Lab Test Measurement Set-up

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

C.2 Dasy4 or DASY5 E-field Probe System

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

Probe Specifications:

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

Picture C.2Near-field Probe

Picture C.3E-field Probe

C.3 E-field Probe Calibration

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

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

other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equates to 1 mW/cm^2.

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

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

Where:

Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

C.4 Other Test Equipment

C.4.1 Data Acquisition Electronics(DAE)

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

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

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

PictureC.4: DAE