41055	2636.5	50RB-Low	Left	Touch	/	25.33	25.50	0.066	**0.07**	0.140	**0.15**	-0.08
41055	2636.5	50RB-Low	Left	Tilt	/	25.33	25.50	0.059	**0.06**	0.127	**0.13**	-0.12
41055	2636.5	50RB-Low	Right	Touch	/	25.33	25.50	0.087	**0.09**	0.171	**0.18**	-0.01
41055	2636.5	50RB-Low	Right	Tilt	/	25.33	25.50	0.021	**0.02**	0.044	**0.05**	0.05

Note1: The LTE mode is QPSK_20MHz

Table 13.1-25: SAR Values (LTE Band41(PC2) - 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(10) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
41055	2636.5	1RB-Middle	Front	/	21.25	22.00	0.117	**0.14**	0.228	**0.27**	-0.01
41055	2636.5	1RB-Middle	Rear	Fig.25	21.25	22.00	0.262	**0.46**	0.599	**0.71**	-0.03
41055	2636.5	1RB-Middle	Left	/	21.25	22.00	0.024	**0.03**	0.042	**0.05**	-0.14
41055	2636.5	1RB-Middle	Right	/	21.25	22.00	0.032	**0.04**	0.057	**0.07**	-0.14
41055	2636.5	1RB-Middle	Bottom	/	21.25	22.00	0.189	**0.22**	0.419	**0.50**	0.17
41055	2636.5	50RB-Middle	Front	/	21.32	22.00	0.115	**0.13**	0.223	**0.26**	0.05
41055	2636.5	50RB-Middle	Rear	/	21.32	22.00	0.243	**0.28**	0.561	**0.66**	-0.12
41055	2636.5	50RB-Middle	Left	/	21.32	22.00	0.047	**0.06**	0.083	**0.10**	0.07
41055	2636.5	50RB-Middle	Right	/	21.32	22.00	0.032	**0.04**	0.057	**0.07**	0.13
41055	2636.5	50RB-Middle	Bottom	/	21.32	22.00	0.207	**0.24**	0.438	**0.51**	0.02

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

Note2: The LTE mode is QPSK_20MHz

Table 13.1-26: SAR Values (LTE Band41(PC2) - 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(10) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
41055	2636.5	1RB-Middle	Front	/	22.20	23.00	0.052	**0.06**	0.095	**0.11**	-0.14
41055	2636.5	1RB-Middle	Rear	/	22.20	23.00	0.144	**0.17**	0.290	**0.35**	-0.04
41055	2636.5	50RB-Middle	Front	/	22.24	23.00	0.052	**0.06**	0.096	**0.11**	-0.01
41055	2636.5	50RB-Middle	Rear	Fig.26	22.24	23.00	0.152	**0.18**	0.318	**0.38**	0.04

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

Note2: The LTE mode is QPSK_20MHz

Table 13.1-27: SAR Values (LTE Band66 - Head)

Ambient Temperature: 22.9 ℃							Liquid Temperature: 22.5℃				
Frequency		Mode	Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
132322	1745	1RB-Middle	Left	Touch	Fig.27	24.47	25.00	0.234	**0.26**	0.367	**0.41**	0.13
132322	1745	1RB-Middle	Left	Tilt	/	24.47	25.00	0.069	**0.08**	0.114	**0.13**	-0.18
132322	1745	1RB-Middle	Right	Touch	/	24.47	25.00	0.092	**0.10**	0.149	**0.17**	-0.11
132322	1745	1RB-Middle	Right	Tilt	/	24.47	25.00	0.075	**0.09**	0.124	**0.14**	0.13
132322	1745	50RB-Middle	Left	Touch	/	23.54	24.00	0.131	**0.15**	0.222	**0.25**	-0.15
132322	1745	50RB-Middle	Left	Tilt	/	23.54	24.00	0.070	**0.08**	0.117	**0.13**	0.10
132322	1745	50RB-Middle	Right	Touch	/	23.54	24.00	0.090	**0.10**	0.144	**0.16**	-0.20
132322	1745	50RB-Middle	Right	Tilt	/	23.54	24.00	0.076	**0.08**	0.126	**0.14**	-0.05

Note1: The LTE mode is QPSK_20MHz

Table 13.1-28: 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(10) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
132322	1745	1RB-Middle	Front	/	20.33	21.00	0.163	**0.19**	0.277	**0.32**	0.01
132322	1745	1RB-Middle	Rear	/	20.33	21.00	0.292	**0.34**	0.520	**0.61**	0.11
132322	1745	1RB-Middle	Left	/	20.33	21.00	0.058	**0.07**	0.098	**0.11**	0.06
132322	1745	1RB-Middle	Right	/	20.33	21.00	0.056	**0.07**	0.094	**0.11**	-0.13
132072	1720	1RB-Middle	Bottom	/	20.27	21.00	0.331	**0.39**	0.633	**0.75**	-0.08
132322	1745	1RB-Middle	Bottom	Fig.28	20.33	21.00	0.388	**0.45**	0.727	**0.85**	-0.18
132572	1770	1RB-Middle	Bottom	/	20.26	21.00	0.347	**0.40**	0.660	**0.78**	-0.06
132322	1745	50RB-Middle	Front	/	20.26	21.00	0.221	**0.26**	0.37	**0.44**	-0.01
132322	1745	50RB-Middle	Rear	/	20.26	21.00	0.317	**0.38**	0.632	**0.75**	-0.20
132322	1745	50RB-Middle	Left	/	20.26	21.00	0.039	**0.05**	0.066	**0.08**	-0.05
132322	1745	50RB-Middle	Right	/	20.26	21.00	0.044	**0.05**	0.076	**0.09**	-0.04
132322	1745	50RB-Middle	Bottom	/	20.26	21.00	0.243	**0.29**	0.561	**0.67**	0.17
132322	1745	100RB	Bottom	/	20.20	21.00	0.292	**0.35**	0.589	**0.71**	0.01

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

Note2: The LTE mode is QPSK_20MHz

Table 13.1-29: 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(10) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
132322	1745	1RB-Middle	Front	/	21.45	22.00	0.114	**0.13**	0.170	**0.19**	0.10
132322	1745	1RB-Middle	Rear	Fig.29	21.45	22.00	0.216	**0.25**	0.371	**0.42**	0.01
132322	1745	50RB-Middle	Front	/	21.44	22.00	0.101	**0.11**	0.166	**0.19**	0.12
132322	1745	50RB-Middle	Rear	/	21.44	22.00	0.178	**0.20**	0.311	**0.35**	0.12

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

Note2: The LTE mode is QPSK_20MHz

Table 13.1-30: SAR Values (LTE Band71 - Head)

Ambient Temperature: 22.9 ℃ Liquid Temperature: 22.5℃												
Frequency		Mode	Side	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz											
133372	688	1RB-Middle	Left	Touch	/	22.14	23.00	0.230	**0.28**	0.331	**0.40**	0.03
133372	688	1RB-Middle	Left	Tilt	/	22.14	23.00	0.178	**0.22**	0.274	**0.33**	0.00
133372	688	1RB-Middle	Right	Touch	/	22.14	23.00	0.209	**0.29**	0.342	**0.42**	0.13
133372	688	1RB-Middle	Right	Tilt	/	22.14	23.00	0.218	**0.27**	0.335	**0.41**	-0.01
133322	683	50RB-Middle	Left	Touch	/	22.12	23.00	0.219	**0.27**	0.315	**0.39**	0.01
133322	683	50RB-Middle	Left	Tilt	/	22.12	23.00	0.228	**0.28**	0.349	**0.43**	0.01
133322	683	50RB-Middle	Right	Touch	Fig.30	22.12	23.00	0.284	**0.35**	0.464	**0.57**	-0.05
133322	683	50RB-Middle	Right	Tilt	/	22.12	23.00	0.217	**0.27**	0.388	**0.48**	0.11

Note1: The LTE mode is QPSK_20MHz

Table 13.1-31: SAR Values (LTE Band71 - 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(10) (W/kg)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
Ch.	MHz										
133372	688	1RB-Middle	Front	/	24.06	24.50	0.129	**0.14**	0.181	**0.20**	0.05
133372	688	1RB-Middle	Rear	/	24.06	24.50	0.188	**0.21**	0.264	**0.29**	0.00
133372	688	1RB-Middle	Left	/	24.06	24.50	0.118	**0.13**	0.173	**0.19**	0.01
133372	688	1RB-Middle	Right	/	24.06	24.50	0.166	**0.18**	0.242	**0.27**	-0.03
133322	683	50RB-Middle	Front	/	23.05	23.50	0.129	**0.14**	0.184	**0.20**	0.02
133322	683	50RB-Middle	Rear	Fig.31	23.05	23.50	0.158	**0.18**	0.282	**0.31**	-0.01
133322	683	50RB-Middle	Left	/	23.05	23.50	0.106	**0.12**	0.162	**0.18**	-0.07
133322	683	50RB-Middle	Right	/	23.05	23.50	0.184	**0.20**	0.270	**0.30**	-0.01

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

Note2: The LTE mode is QPSK_20MHz

13.2 SAR results for WLAN

The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.

When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac/ax modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n ac then ax) is selected.

SAR Test reduction was applied from KDB 248227 guidance, when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band. Additional output power measurements were not deemed necessary.

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 13.2-1: SAR Values (WLAN - Head)– 802.11b (Fast SAR)

Ambient Temperature: 22.9℃ Liquid Temperature: 22.5℃											
Frequency		Side	Test Position	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)
Ch.	MHz										
6	2437	Left	Touch	Note1	19.29	20.00	0.232	**0.27**	0.436	**0.51**	-0.07
6	2437	Left	Tilt	Note1	19.29	20.00	0.228	**0.27**	0.456	**0.54**	-0.10
6	2437	Right	Touch	Note1	19.29	20.00	0.558	**0.66**	1.160	**1.37**	-0.08
6	2437	Right	Tilt	Note1	19.29	20.00	0.419	**0.49**	0.891	**1.05**	-0.05
6	2437	Left	Touch	Note2	14.32	15.00	0.061	**0.07**	0.116	**0.14**	0.01
6	2437	Left	Tilt	Note2	14.32	15.00	0.061	**0.07**	0.124	**0.15**	-0.13
6	2437	Right	Touch	Note2	14.32	15.00	0.188	**0.22**	0.404	**0.47**	-0.18
6	2437	Right	Tilt	Note2	14.32	15.00	0.115	**0.13**	0.239	**0.28**	0.03

Note1: The results are for Wifi antenna transmit standalone

Note2: The results are for Wifi antenna transmit with WWAN

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

Table 13.2-2: 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)
Ch.	MHz										
6	2437	Right	Touch	Note1/ Fig.32	19.29	20.00	0.555	**0.65**	1.170	**1.38**	-0.08
1	2412	Right	Touch	Note1	19.08	20.00	0.374	**0.46**	0.781	**0.97**	-0.11
6	2437	Right	Tilt	Note1	19.29	20.00	0.438	**0.52**	0.908	**1.07**	-0.03
1	2412	Right	Tilt	Note1	19.08	20.00	0.302	**0.37**	0.626	**0.77**	-0.18
6	2437	Left	Tilt	Note1	19.29	20.00	0.201	**0.24**	0.388	**0.46**	-0.07
6	2437	Right	Touch	Note2/ Fig.33	14.32	15.00	0.191	**0.22**	0.405	**0.47**	-0.18

Note1: The results are for Wifi antenna transmit standalone

Note2: The results are for Wifi antenna transmit with WWAN

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 13.2-3: 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)
Ch.	MHz						
6	2437	Right	Touch	100%	100%	**1.38**	**1.38**

The highest reported SAR in 802.11 b mode is 1.38 W/kg and the specified maximum output power for 802.11 g mode and n mode are 19dBm,the adjusted SAR is 1.09 W/kg. The adjusted SAR is ≤ 1.2 W/kg; therefore,SAR is not required for OFDM.

Table 13.2-4: SAR Values (WLAN - Head) – 802.11b (Scaled Reported SAR)

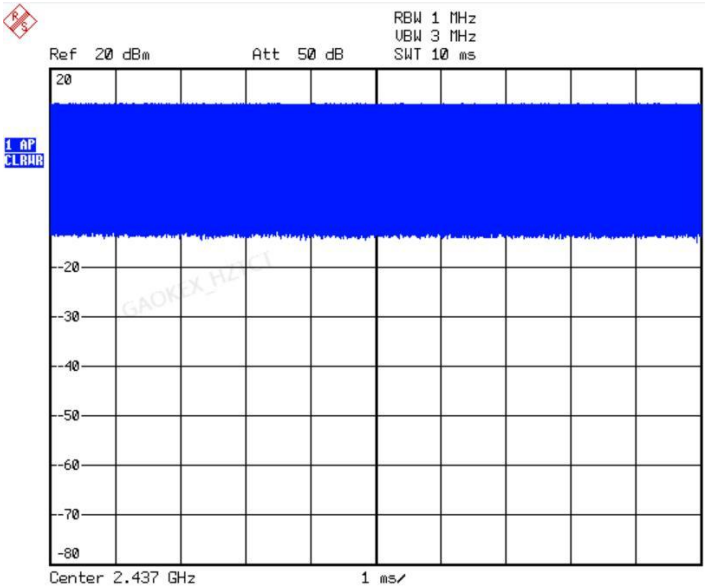
Ambient Temperature: 22.9℃ Liquid Temperature: 22.5℃

Frequency		Side	Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
Ch.	MHz						
6	2437	Right	Touch	100%	100%	**0.47**	**0.47**

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

Duty factor plot

CH6



Body Evaluation

Table 13.2-5: SAR Values (WLAN - Body)– 802.11b (Fast SAR)

Ambient Temperature: 22.9℃ Liquid Temperature: 22.5℃

Frequency		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)
Ch.	MHz									
6	2437	Front	Note1	19.29	20.00	0.098	**0.12**	0.183	**0.22**	-0.08
6	2437	Rear	Note1	19.29	20.00	0.164	**0.19**	0.355	**0.42**	-0.07
6	2437	Left	Note1	19.29	20.00	0.152	**0.18**	0.320	**0.38**	0.02
6	2437	Top	Note1	19.29	20.00	0.070	**0.08**	0.132	**0.16**	0.02
6	2437	Front	Note2	14.32	15.00	0.033	**0.04**	0.061	**0.07**	-0.01
6	2437	Rear	Note2	14.32	15.00	0.062	**0.07**	0.135	**0.16**	-0.12
6	2437	Left	Note2	14.32	15.00	0.056	**0.07**	0.119	**0.14**	-0.13
6	2437	Top	Note2	14.32	15.00	0.024	**0.03**	0.046	**0.05**	0.01

Note1: The results are for Wifi antenna transmit standalone
Note2: The results are for Wifi antenna transmit with WWAN
Note3: the distance between the EUT and the phantom bottom is 10mm

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

Table 13.2-6: SAR Values (WLAN - Body)– 802.11b (Full SAR)

Ambient Temperature: 22.9℃ Liquid Temperature: 22.5℃

Frequency		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)
Ch.	MHz									
6	2437	Rear	Note1/ Fig.34	19.29	20	0.173	**0.20**	0.374	**0.44**	-0.07
6	2437	Rear	Note2/ Fig.35	14.32	15	0.066	**0.08**	0.144	**0.17**	-0.12

Note1: The results are for Wifi antenna transmit standalone
Note2: The results are for Wifi antenna transmit with WWAN
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 13.2-7: 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)
Ch.	MHz					
6	2437	Rear	100%	100%	**0.44**	**0.44**

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

Table 13.2-8: SAR Values (WLAN - Body) – 802.11b (Scaled Reported SAR)

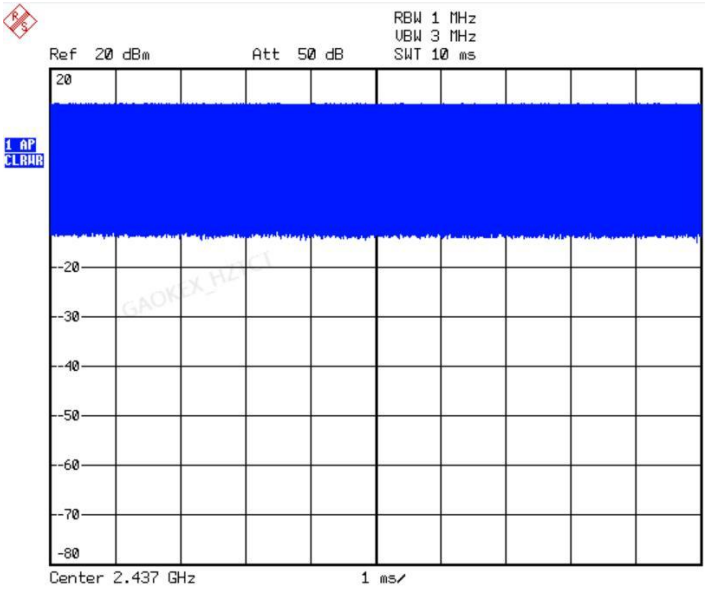
Ambient Temperature: 22.9℃ Liquid Temperature: 22.5℃

Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
Ch.	MHz					
6	2437	Rear	100%	100%	**0.17**	**0.17**

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

Duty factor plot

CH6



WLAN Evaluation for 5G

Table 13.2-9: OFDM mode specified maximum output power of WLAN antenna

802.11 mode	a	g	n		ac			
Ch. BW(MHz)	20	20	20	40	20	40	80	160
U-NII-1	X		X	X	X	X	X	
U-NII-2A	X		X	X	X	X	X	
U-NII-2C	X		X	X	X	X	X	
U-NII-3	X		X	X	X	X	X	
§ 15.247 (5.8 GHz)								
X: maximum(conducted) output power(mW), including tolerance, specified for production units								

Table 13.2-10: Maximum output power specified of WLAN antenna – Head and Body worn– Transmit alone

802.11 mode	a	g	n		ac			
Ch. BW(MHz)	20	20	20	40	20	40	80	160
U-NII-1	76		63	50	50	40	32	
U-NII-2A	76		63	50	50	40	32	
U-NII-2C	76		63	50	50	40	32	
U-NII-3	76		63	50	50	40	32	
§ 15.247 (5.8 GHz)								
● The maximum output power specified for production units is the same for all channels, modulations and data rates in each channel bandwidth configuration of the 802.11a/g/n/ac modes. ● The blue highlighted cells represent highest output configurations in each standalone or aggregated frequency band, with tune-up tolerance included								

Table 13.2-11: Maximum output power specified of WLAN antenna –Head and Body worn – Transmit with WWAN

802.11 mode	a	g	n		ac			
Ch. BW(MHz)	20	20	20	40	20	40	80	160
U-NII-1	43		32	25	25	20	16	
U-NII-2A	43		32	25	25	20	16	
U-NII-2C	43		32	25	25	20	16	
U-NII-3	43		32	25	25	20	16	
§ 15.247 (5.8 GHz)								
● The maximum output power specified for production units is the same for all channels, modulations and data rates in each channel bandwidth configuration of the 802.11a/g/n/ac modes. ● The blue highlighted cells represent highest output configurations in each standalone or								

aggregated frequency band, with tune-up tolerance included.

Table 13.2-12: Maximum output power measured of WLAN antenna, for the applicable OFDM configurations according to the default power measurement procedures for selection initial test configurations – Head and Body worn– Transmit alone

802.11 Mode	a	n		ac		
BW(MHz)	20	20	40	20	40	80
U-NII-1	36/40/44/48 **52/53/59/51**	36/40/44/48 Lower power	38/46 Lower power	36/40/44/48 Lower power	38/46 Lower power	42 Lower power
U-NII-2A	52/56/60/64 **53/56/58/60**	52/56/60/64 Lower power	54/62 Lower power	52/56/60/64 Lower power	54/62 Lower power	58 Lower power
U-NII-2C	100/104/108/112 116/120/124/128/ 132/136/140/144 **63/65/68/70/69/71/ 73/67/68/58/61/62**	100/104/108/112 116/120/124/128/ 132/136/140/144 Lower power	102/110/118/ 126/134/142 Lower power	100/104/108/ 112/116/120/ 124/128/132/ 136/140/144 Lower power	102/110/11 8/126/134/ 142 Lower power	106/122 /138 Lower power
U-NII-3	149/153/157/161/ 165 **57/58/58/58/67**	149/153/157/161/ 165 Lower power	151/159 Lower power	149/153/157/ 161/165 Lower power	151/159 Lower power	155 Lower power

- The bold numbers is the maximum output measured power (mW).
- Channels with measured maximum power within 0.25dB are considered to have the same measured output.Channels selected for initial test configuration are highlighted in yellow

Table 13.2-13: Maximum output power measured of WLAN antenna, for the applicable OFDM configurations according to the default power measurement procedures for selection

initial test configurations– Head and Body worn– Transmit with WWAN

802.11 Mode	a	n		ac		
BW(MHz)	20	20	40	20	40	80
U-NII-1	36/40/44/48 **28/28/29/28**	36/40/44/48 Lower power	38/46 Lower power	36/40/44/48 Lower power	38/46 Lower power	42 Lower power
U-NII-2A	52/56/60/64 **27/27/28/29**	52/56/60/64 Lower power	54/62 Lower power	52/56/60/64 Lower power	54/62 Lower power	58 Lower power
U-NII-2C	100/104/108/112 116/120/124/128/ 132/136/140/144 **33/36/37/37/38/36/ 37/35/29/31/33/33**	100/104/108/112 116/120/124/128/ 132/136/140/144 Lower power	102/110/118/ 126/134/142 Lower power	100/104/108/112 116/120/124/128/ 132/136/140/144 Lower power	102/110/118/ 126/134/142 Lower power	106/122/ 138 Lower power
U-NII-3	149/153/157/161/ 165 **29/29/29/32/37**	149/153/157/161/ 165 Lower power	151/159 Lower power	149/153/157/161 /165 Lower power	151/159 Lower power	155 Lower power

- The **bold numbers** is the maximum output measured power (mW).
- Channels with measured maximum power within 0.25dB are considered to have the same measured output.Channels selected for initial test configuration are highlighted in yellow

Table 13.2-14: Reported SAR of initial test configuration for Head transmit alone

802.11 mode	a	n		ac		
BW(MHz)	20	20	40	20	40	80
U-NII-1	36/40/44/48	36/40/44/48	38/46	36/40/44/48	38/46	42
U-NII-2A	52/56/60/64	52/56/60/64	54/62	52/56/60/64	54/62	58

U-NII-2C	100/104/108/112/116/120/124/128/132/136/140/144	100/104/108/112/116/120/124/128/132/136/140/144	102/110/118/126/134/142	100/104/108/112/116/120/124/128/132/136/140/144	102/110/118/126/134/142	106/122/138
U-NII-3	149/153/157/161/165 **0.85**	149/153/157/161/165	151/159	149/153/157 /165 /161	151/159	155
Highest measured output power channel tested initially are in yellow highlight.						

Table 13.2-15: Reported SAR of initial test configuration for Body worn transmit alone

802.11 mode	**a**	**n**		**ac**		
BW(MHz)	**20**	**20**	**40**	**20**	**40**	**80**
U-NII-1	36/40/44/48	36/40/44/48	38/46	36/40/44/48	38/46	42
U-NII-2A	52/56/60/64	52/56/60/64	54/62	52/56/60/64	54/62	58
U-NII-2C	100/104/108/112/116/120/124/128/132/136/140/144	100/104/108/112/116/120/124/128/132/136/140/144	102/110/118/126/134/142	100/104/108/112/116/120/124/128/132/136/140/144	102/110/118/126/134/142	106/122/138
U-NII-3	149/153/157/161/165 **0.96**	149/153/157/161/165	151/159	149/153/157 /165 /161	151/159	155
Highest measured output power channel tested initially are in yellow highlight.						

Table 13.2-16: Reported SAR of initial test configuration for Head transmit with WWAN

802.11 mode	**a**	**n**		**ac**		
BW(MHz)	**20**	**20**	**40**	**20**	**40**	**80**
U-NII-1	36/40/44/48	36/40/44/48	38/46	36/40/44/48	38/46	42
U-NII-2A	52/56/60/64	52/56/60/64	54/62	52/56/60/64	54/62	58

U-NII-2C	100/104/108/112/116/120/124/128/132/136/140/144	100/104/108/112/116/120/124/128/132/136/140/144	102/110/118/126/134/142	100/104/108/112/116/120/124/128/132/136/140/144	102/110/118/126/134/142	106/122/138
U-NII-3	149/153/157/161/165 **0.45**	149/153/157/161/165	151/159	149/153/157 /165/161	151/159	155
Highest measured output power channel tested initially are in yellow highlight.						

Table 13.2-17: Reported SAR of initial test configuration for Body transmit with WWAN

802.11 mode	**a**	**n**		**ac**		
BW(MHz)	**20**	**20**	**40**	**20**	**40**	**80**
U-NII-1	36/40/44/48	36/40/44/48	38/46	36/40/44/48	38/46	42
U-NII-2A	52/56/60/64 **0.62**	52/56/60/64	54/62	52/56/60/64	54/62	58
U-NII-2C	100/104/108/112/116/120/124/128/132/136/140/144	100/104/108/112/116/120/124/128/132/136/140/144	102/110/118/126/134/142	100/104/108/112/116/120/124/128/132/136/140/144	102/110/118/126/134/142	106/122/138
U-NII-3	149/153/157/161/165	149/153/157/161/165	151/159	149/153/157 /165/161	151/159	155
Highest measured output power channel tested initially are in yellow highlight.						

Table 13.2-18: SAR Values (WLAN 5G - 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										
64	5320	Left	Touch	Note1	17.78	18.80	0.036	**0.05**	0.114	**0.14**	0.01
64	5320	Left	Tilt	Note1	17.78	18.80	0.038	**0.05**	0.109	**0.14**	0.01
64	5320	Right	Touch	Note1	17.78	18.80	0.141	**0.18**	0.395	**0.50**	-0.04
64	5320	Right	Tilt	Note1	17.78	18.80	0.089	**0.11**	0.252	**0.32**	0.16
124	5620	Left	Touch	Note1	18.62	18.80	0.043	**0.05**	0.137	**0.14**	-0.14
124	5620	Left	Tilt	Note1	18.62	18.80	0.041	**0.04**	0.125	**0.13**	-0.04

124	5620	Right	Touch	Note1	18.62	18.80	0.172	**0.18**	0.492	**0.51**	0.02
124	5620	Right	Tilt	Note1	18.62	18.80	0.105	**0.11**	0.327	**0.34**	-0.11
165	5825	Left	Touch	Note1	18.27	18.80	0.133	**0.15**	0.372	**0.42**	-0.07
165	5825	Left	Tilt	Note1	18.27	18.80	0.108	**0.12**	0.290	**0.33**	0.06
165	5825	Right	Touch	Note1/ Fig.36	18.27	18.80	0.220	**0.25**	0.752	**0.85**	-0.19
161	5805	Right	Touch	Note1	17.66	18.80	0.133	**0.17**	0.451	**0.59**	-0.14
165	5825	Right	Tilt	Note1	18.27	18.80	0.211	**0.24**	0.672	**0.76**	-0.10
64	5320	Left	Touch	Note2	14.68	16.30	0.015	**0.02**	0.048	**0.07**	-0.12
64	5320	Left	Tilt	Note2	14.68	16.30	0.009	**0.01**	0.027	**0.04**	0.18
64	5320	Right	Touch	Note2	14.68	16.30	0.069	**0.10**	0.218	**0.32**	0.17
64	5320	Right	Tilt	Note2	14.68	16.30	0.042	**0.06**	0.130	**0.19**	-0.12
116	5580	Left	Touch	Note2	15.75	16.30	0.016	**0.02**	0.055	**0.06**	-0.12
116	5580	Left	Tilt	Note2	15.75	16.30	0.018	**0.02**	0.055	**0.06**	-0.04
116	5580	Right	Touch	Note2	15.75	16.30	0.087	**0.10**	0.269	**0.31**	-0.06
116	5580	Right	Tilt	Note2	15.75	16.30	0.056	**0.06**	0.192	**0.22**	0.20
165	5825	Left	Touch	Note2	15.65	16.30	0.038	**0.04**	0.118	**0.14**	-0.19
165	5825	Left	Tilt	Note2	15.65	16.30	0.028	**0.03**	0.099	**0.11**	0.14
165	5825	Right	Touch	Note2/ Fig.37	15.65	16.30	0.112	**0.13**	0.386	**0.45**	0.06
165	5825	Right	Tilt	Note2	15.65	16.30	0.083	**0.10**	0.302	**0.35**	-0.19

Note1: The results are for Wifi antenna transmit standalone

Note2: The results are for Wifi antenna transmit with WWAN

Table 13.2-19: SAR Values (WLAN 5G – Body worn)

Ambient Temperature: 22.9℃ Liquid Temperature: 22.5℃

Frequency		Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Power Drift (dB)
Ch.	MHz									
64	5320	Front	Note1	17.78	18.80	0.048	**0.06**	0.128	**0.16**	0.07
64	5320	Rear	Note1	17.78	18.80	0.251	**0.32**	0.698	**0.88**	-0.10
60	5300	Rear	Note1	17.66	18.80	0.940	**1.22**	0.529	**0.69**	-0.20
64	5320	Left	Note1	17.78	18.80	0.175	**0.22**	0.496	**0.63**	-0.15
64	5320	Top	Note1	17.78	18.80	0.050	**0.06**	0.124	**0.16**	-0.07
124	5620	Front	Note1	18.62	18.80	0.063	**0.07**	0.164	**0.17**	-0.13
124	5620	Rear	Note1	18.62	18.80	0.274	**0.29**	0.795	**0.83**	0.00
120	5600	Rear	Note1	18.54	18.80	0.206	**0.22**	0.589	**0.63**	0.15
124	5620	Left	Note1	18.62	18.80	0.154	**0.16**	0.478	**0.50**	-0.17
124	5620	Top	Note1	18.62	18.80	0.086	**0.09**	0.223	**0.23**	0.05
165	5825	Front	Note1	18.27	18.80	0.073	**0.08**	0.208	**0.23**	-0.20
165	5825	Rear	Note1/	18.27	18.80	0.291	**0.33**	0.853	**0.96**	-0.20

			Fig.38							
161	5805	Rear	Note1	17.66	18.80	0.221	**0.29**	0.665	**0.86**	0.05
165	5825	Left	Note1	18.27	18.80	0.280	**0.32**	0.730	**0.82**	-0.19
161	5805	Left	Note1	17.66	18.80	0.113	**0.15**	0.373	**0.48**	0.07
165	5825	Top	Note1	18.27	18.80	0.115	**0.13**	0.290	**0.33**	-0.12
64	5320	Front	Note2	14.68	16.30	0.022	**0.03**	0.062	**0.09**	0.16
64	5320	Rear	Note2/ Fig.39	14.68	16.30	0.147	**0.21**	0.425	**0.62**	0.00
64	5320	Left	Note2	14.68	16.30	0.090	**0.13**	0.267	**0.39**	0.07
64	5320	Top	Note2	14.68	16.30	0.029	**0.04**	0.070	**0.10**	0.04
116	5580	Front	Note2	15.75	16.30	0.021	**0.02**	0.055	**0.06**	-0.05
116	5580	Rear	Note2	15.75	16.30	0.140	**0.16**	0.412	**0.47**	0.08
116	5580	Left	Note2	15.75	16.30	0.064	**0.07**	0.203	**0.23**	-0.08
116	5580	Top	Note2	15.75	16.30	0.044	**0.05**	0.113	**0.13**	0.07
165	5825	Front	Note2	15.65	16.30	0.033	**0.04**	0.096	**0.11**	0.16
165	5825	Rear	Note2	15.65	16.30	0.153	**0.18**	0.446	**0.52**	0.01
165	5825	Left	Note2	15.65	16.30	0.098	**0.11**	0.337	**0.39**	0.12
165	5825	Top	Note2	15.65	16.30	0.058	**0.07**	0.147	**0.17**	-0.16

Note1: The results are for Wifi antenna transmit standalone
Note2: The results are for Wifi antenna transmit with WWAN
Note3: the distance between the EUT and the phantom bottom is 10mm

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 13.2-20: SAR Values (WLAN 5G- Head) –(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)
Ch.	MHz						
165	5825	Right	Touch	100%	100%	**0.85**	**0.85**

Table 13.2-21: SAR Values (WLAN 5G- Head) –(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)
Ch.	MHz						
165	5825	Right	Touch	100%	100%	**0.45**	**0.45**

Table 13.2-22: SAR Values (WLAN 5G- Body) – (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)
Ch.	MHz					
165	5825	Rear	100%	100%	**0.96**	**0.96**

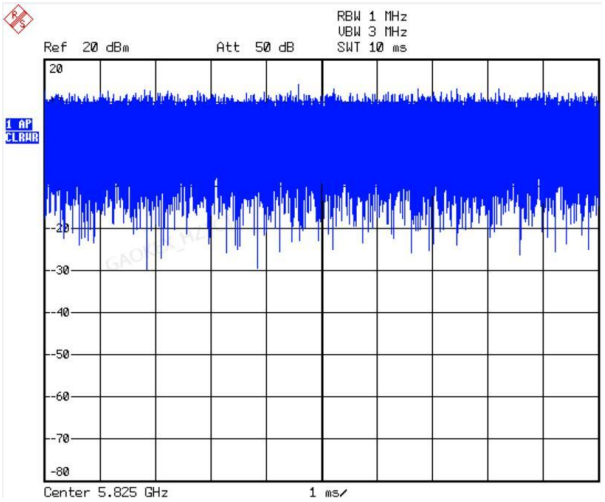
Table 13.2-23: SAR Values (WLAN 5G- Body) –(Scaled Reported SAR)

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)
Ch.	MHz					
64	5320	Rear	100%	100%	**0.62**	**0.62**

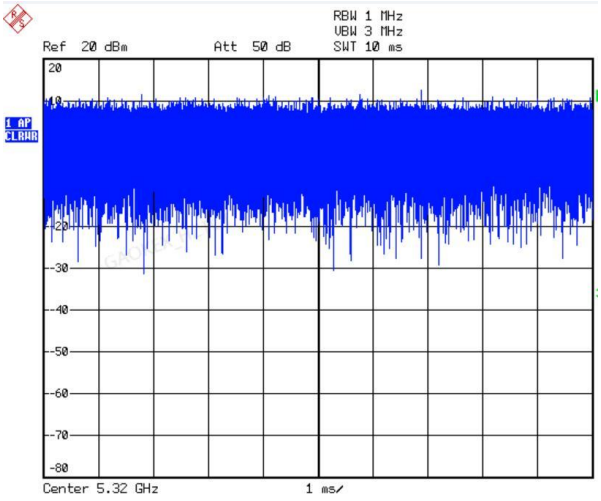
Duty factor plot

CH165



Duty factor plot

CH64



13.3 SAR results for BT

Table 13.3-1: SAR Values (BT - Head)

Ambient Temperature: 22.9℃ Liquid Temperature: 22.5℃											
Frequency		Side	Test Position	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)
Ch.	MHz										
39	2441	Left	Cheek	Note1	8.07	8.50	<0.01	/	<0.01	/	<0.01
39	2441	Left	Tilt	Note1	8.07	8.50	<0.01	/	<0.01	/	<0.01
39	2441	Right	Cheek	Note1	8.07	8.50	<0.01	/	<0.01	/	<0.01
39	2441	Right	Tilt	Note1	8.07	8.50	<0.01	/	<0.01	/	<0.01

Table 13.3-2: SAR Values (BT – Body worn)

Ambient Temperature: 22.9℃ Liquid Temperature: 22.5℃										
Frequency		Test Position	Figure No./Note	Conducted Power (dBm)	Max. tune up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g)(W/kg)	Measured SAR(10g) (W/kg)	Reported SAR(10g)(W/kg)	Power Drift (dB)
Ch.	MHz									
39	2441	Front	Note1	8.07	8.50	<0.01	/	<0.01	/	<0.01
39	2441	Rear	Note1	8.07	8.50	<0.01	/	<0.01	/	<0.01
39	2441	Left	Note1	8.07	8.50	<0.01	/	<0.01	/	<0.01
39	2441	Top	Note1	8.07	8.50	<0.01	/	<0.01	/	<0.01

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

14 Evaluation of Simultaneous

14.1 Introduction

The following procedures adopted from “FCC SAR Considerations for Cell Phones with Multiple Transmitters” are applicable to handsets with built-in unlicensed transmitters such as WLAN and Bluetooth devices which may simultaneously transmit with the licensed transmitter. KDB 447498 D01 provides two procedures for determining simultaneous transmission SAR test exclusion: Sum of SAR and SAR to Peak Location Ratio (SPLSR)

14.1.1 Sum of SAR

To qualify for simultaneous transmission SAR test exclusion based upon Sum of SAR the sum of the reported standalone SARs for all simultaneously transmitting antennas shall be below the applicable standalone SAR limit. If the sum of the SARs is above the applicable limit then simultaneous transmission SAR test exclusion may still apply if the requirements of the SAR to Peak Location Ratio (SPLSR) evaluation are met.

14.1.2 SAR to Peak Location Ratio (SPLSR)

KDB 447498 D01 General RF Exposure Guidance explains how to calculate the SAR to Peak Location Ratio (SPLSR) between pairs of simultaneously transmitting antennas:

$SPLSR = (SAR1 + SAR2)^{1.5} / Ri$

Where:

SAR1 is the highest reported or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition.

SAR2 is the highest reported or estimated SAR for the second of a pair of simultaneous transmitting antennas, in the same test operating mode and exposure condition as the first .

Ri is the separation distance between the pair of simultaneous transmitting antennas. When the SAR is measured, for both antennas in the pair, it is determined by the actual x, y and z coordinates in the 1-g SAR for each SAR peak location, based on the extrapolated and interpolated result in the zoom scan measurement, using the formula of

$[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$

In order for a pair of simultaneous transmitting antennas with the sum of 1-g SAR > 1.6 W/kg to qualify for exemption from Simultaneous Transmission SAR measurements, it has to satisfy the condition of:

$(SAR1 + SAR2)^{1.5} / Ri \leqslant 0.04$

When an individual antenna transmits at on two bands simultaneously, the sum of the highest reported SAR for the frequency bands should be used to determine SAR1 or SAR2. When SPLSR is necessary, the smallest distance between the peak SAR locations for the antenna pair with respect to the peaks from each antenna should be used.

14.2 Simultaneous Transmission Capabilities

The simultaneous transmission possibilities for this device are listed as below:

Capable Transmit Configurations	Head	Body	Product Specific 10-g (0mm)
Cellular + BT	Yes	Yes	Yes
Cellular + Wi-Fi 2.4G	Yes	Yes	Yes
Cellular + Wi-Fi 5G	Yes	Yes	Yes
Cellular + Wi-Fi 5G+ BT	Yes	Yes	Yes

Note:

1. Wi-Fi 2.4G&Bluetooth cannot transmit simultaneously.
2. Wi-Fi 5G&Bluetooth can transmit simultaneously.
3. WWAN cannot transmit simultaneously.
4. The reported SAR summation is calculated based on the same configuration and test position.
5. For the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR, we determined the SAR of this edges were less than 0.01. For the convenience of simultaneous transmission calculation, all SAR values less than 0.01 are uniformly written as 0.00

14.3 SAR Simultaneous Transmission Analysis

Table 14.3-1: The sum of SAR values for Main antenna + WiFi-2.4G

	Position	Main antenna	WiFi-2.4G	Sum
Highest SAR value for Head	Right head, Touch (LTE Band 12)	0.79	0.47	**1.26**
Highest SAR value for Body	Rear10mm (LTE Band 66)	0.75	0.17	**0.92**

Table 14.3-2: The sum of SAR values for Main antenna + WiFi-5G

	Position	Main antenna	WiFi-5G	Sum
Highest SAR value for Head	Right head, Touch (LTE Band 12)	0.79	0.45	**1.24**
Highest SAR value for Body	Rear10mm (LTE Band 66)	0.75	0.62	**1.37**

Table 14.3-3: The sum of SAR values for Main antenna + BT

	Position	Main antenna	BT	Sum
Highest SAR value for Head	Right head, Touch (LTE Band 12)	0.79	＜0.01	**0.79**
Highest SAR value for Body	Rear10mm (LTE Band 66)	0.75	＜0.01	**0.75**

Table 14.3-4: The sum of SAR values for Main antenna + WiFi-5G+ BT

	Position	Main antenna	WiFi-5G	BT	Sum
Highest SAR value for Head	Right head, Touch (LTE Band 12)	0.79	0.45	＜0.01	**1.24**
Highest SAR value for Body	Rear10mm (LTE Band 66)	0.75	0.62	＜0.01	**1.37**

14.4 Conclusion

According to the above tables, he highest simultaneous transmission reported SAR values is **1.37W/kg (1g).** The sum of reported SAR values is<1.6W/kg. So the simultaneous transmission SAR with volume scans is not required.

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.

Band	Frequency		Mode	Side	Test Position	Distance	Hightest Measured SAR(W/kg)	First Repeated SAR(W/kg)	The Ratio	Second Repeated SAR(W/kg)
	Ch.	MHz								
WiFi-2.4G	6	2437	802.11b	Right	Touch	0mm	1.170	1.121	1.04	/
WiFi-2.4G	6	2437	802.11b	Right	Tilt	0mm	0.908	0.881	1.03	/
WiFi-5G	165	5825	802.11a	/	Rear	10mm	0.853	0.814	1.05	/

16 Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR

within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

Therefore, the measurement uncertainty is not required.

17 MAIN TEST INSTRUMENTS

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46418996	May 11, 2022	One year
02	Power sensor	NRP110T	101139	January 13, 2022	One year
03	Power sensor	NRP110T	101159	January 13, 2022	One year
04	Signal Generator	E4438C	MY49071430	January 13, 2022	One year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	CMW500	155735	November 3, 2021	One year
07	BTS	MT8821C	6262314712	July 15, 2022	One year
08	E-field Probe	SPEAG EX3DV4	7609	March 24,2022	One year
09	DAE	SPEAG DAE4	1250	August 3, 2022	One year
10	Dipole Validation Kit	SPEAG D750V3	1017	July 20,,2022	One year
11	Dipole Validation Kit	SPEAG D835V2	4d069	July 20,,2022	One year
12	Dipole Validation Kit	SPEAG D1750V2	1003	July 18,,2022	One year
13	Dipole Validation Kit	SPEAG D1900V2	5d101	July 26,2022	One year
14	Dipole Validation Kit	SPEAG D2450V2	853	July 20,2022	One year
15	Dipole Validation Kit	SPEAG D2600V2	1012	July 20,2022	One year
16	Dipole Validation Kit	SPEAG D5GHzV2	1060	July 5,2022	One year

END OF REPORT BODY

Appendixes

ANNEX A Graph Results

GSM850_CH251 Left Touch
Date: 2022/9/9
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 848.8 MHz; σ = 0.944 mho/m; ε_r = 42.61; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System Band: GSM850 (824-849MHz); Frequency: 848.8 MHz;
Duty Cycle: 1:8.3
Probe: EX3DV4 - SN7609; ConvF(10.53, 10.53, 10.53) @ 848.8 MHz;

Area Scan (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.374 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.684 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.441 W/kg
SAR(1 g) = 0.361 W/kg; SAR(10 g) = 0.280 W/kg
Maximum value of SAR (measured) = 0.374 W/kg

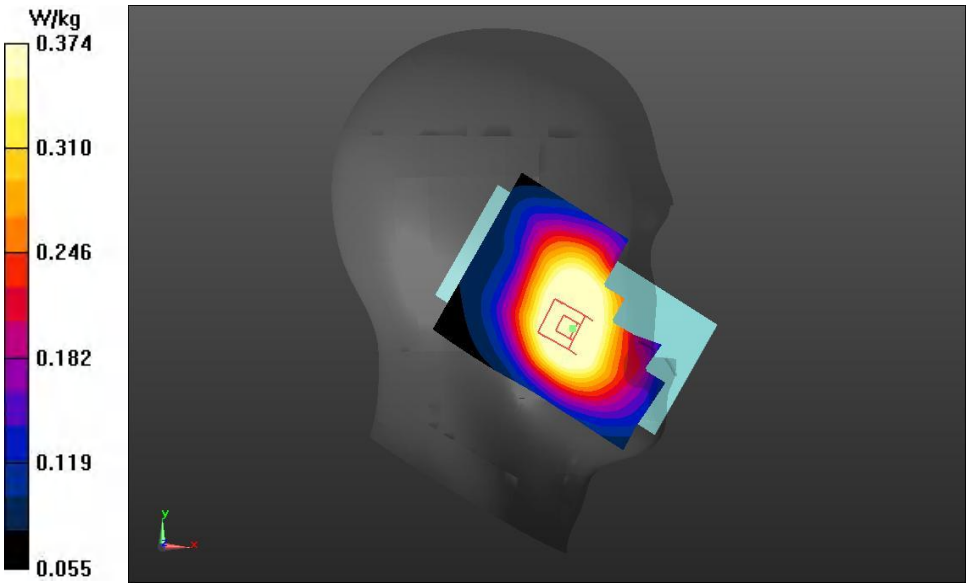


Fig A.1

GSM850_CH251 Rear 4TX 10mm
Date: 2022/9/9
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 848.8 MHz; σ = 0.944 mho/m; ε_r = 42.61; ρ = 1000 kg/m^3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System Band: GSM850 (824-849MHz); Frequency: 848.8 MHz;
Duty Cycle: 1:2
Probe: EX3DV4 - SN7609; ConvF(10.53, 10.53, 10.53) @ 848.8 MHz;

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.713 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.49 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.848 W/kg
SAR(1 g) = 0.630 W/kg; SAR(10 g) = 0.465 W/kg
Maximum value of SAR (measured) = 0.693 W/kg

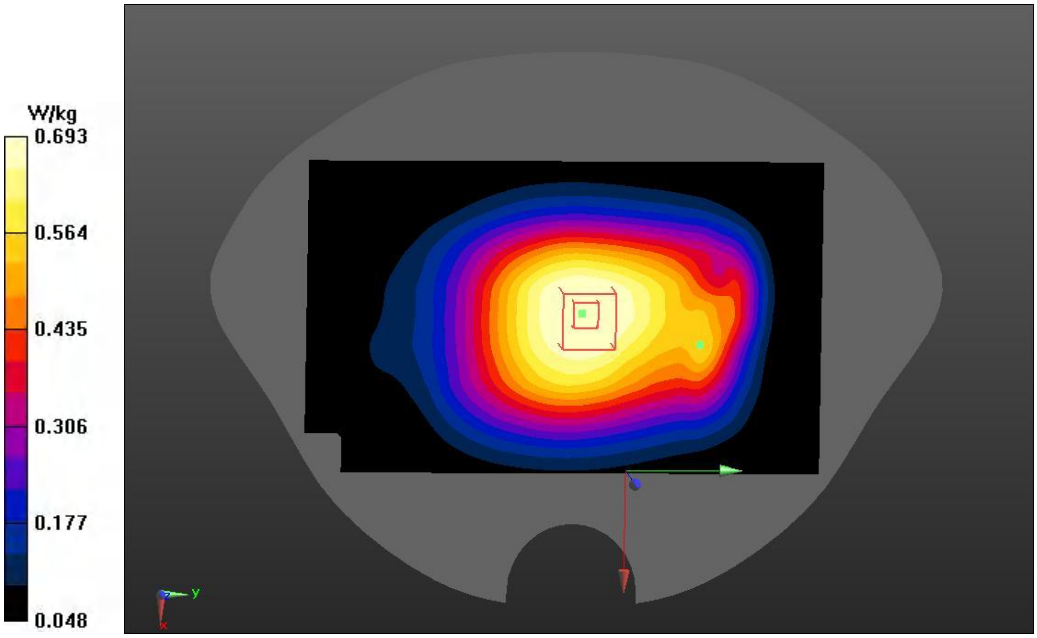


Fig A.2

GSM1900_CH810 Right Touch
Date: 2022/9/11
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1909.8 MHz; σ = 1.468 mho/m; ε_r = 40.76; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System Band: PCS1900(1850-1910MHz); Frequency: 1909.8 MHz;
Duty Cycle: 1:8.3
Probe: EX3DV4 - SN7609; ConvF(8.62, 8.62, 8.62) @ 1909.8 MHz;

Area Scan (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.220 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.847 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.252 W/kg
SAR(1 g) = 0.167 W/kg; SAR(10 g) = 0.107 W/kg
Maximum value of SAR (measured) = 0.181 W/kg

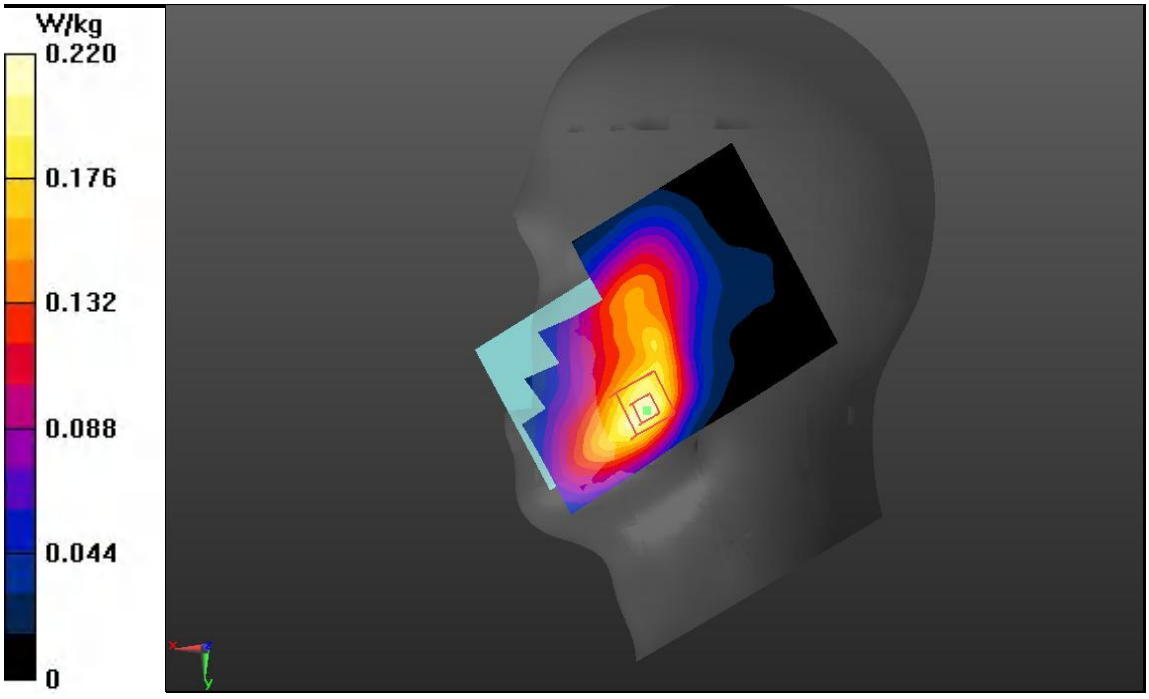


Fig A.3

GSM1900_CH512 Bottom 3TX 10mm
Date: 2022/9/11
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1850.2 MHz; σ = 1.398 mho/m; ε_r = 41.09; ρ = 1000 kg/m^3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System Band: PCS1900(1850-1910MHz); Frequency: 1850.2 MHz;
Duty Cycle: 1: 2.67
Probe: EX3DV4 - SN7609; ConvF(8.62, 8.62, 8.62) @ 1850.2 MHz;

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.820 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.17 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.988 W/kg
SAR(1 g) = 0.547 W/kg; SAR(10 g) = 0.280 W/kg
Maximum value of SAR (measured) = 0.621 W/kg

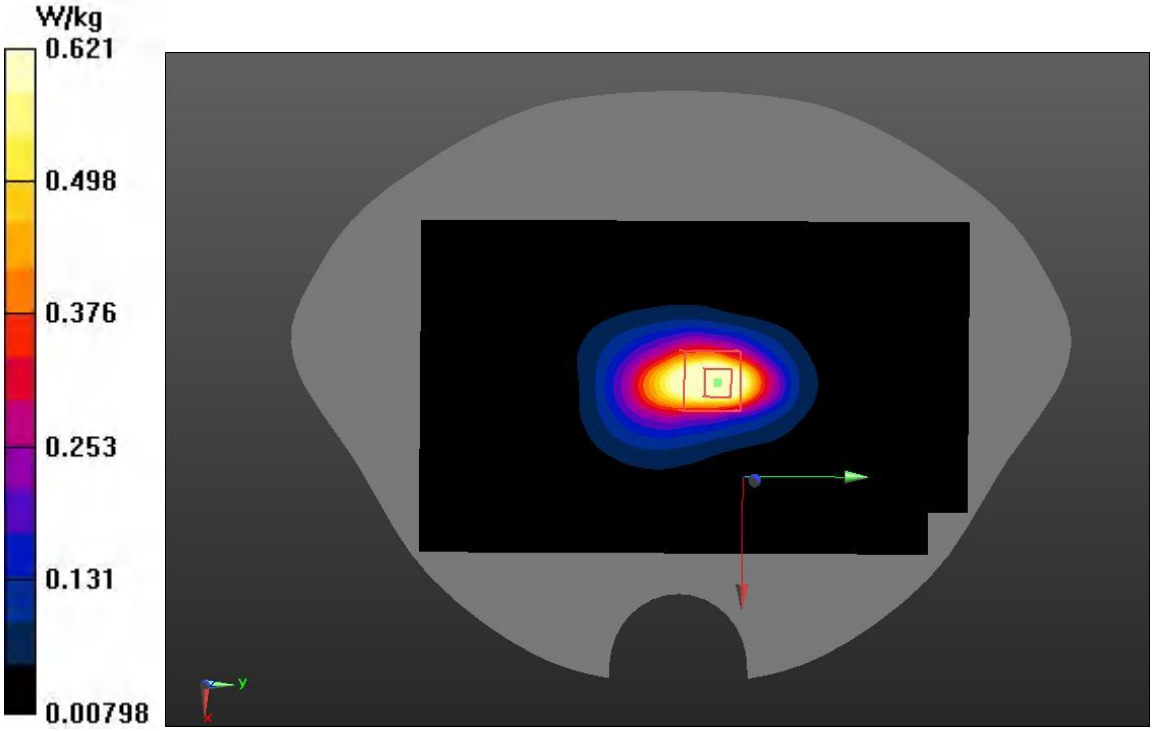


Fig A.4

GSM1900_ CH512 Rear 3TX 15mm
Date: 2022/9/11
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1850.2 MHz; σ = 1.398 mho/m; ε_r = 41.09; ρ = 1000 kg/m^3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System Band: PCS1900(1850-1910MHz); Frequency: 1850.2 MHz;
Duty Cycle: 1: 2.67
Probe: EX3DV4 - SN7609; ConvF(8.62, 8.62, 8.62) @ 1850.2 MHz;

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.354 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.514 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.548 W/kg
SAR(1 g) = 0.323 W/kg; SAR(10 g) = 0.176 W/kg
Maximum value of SAR (measured) = 0.356 W/kg

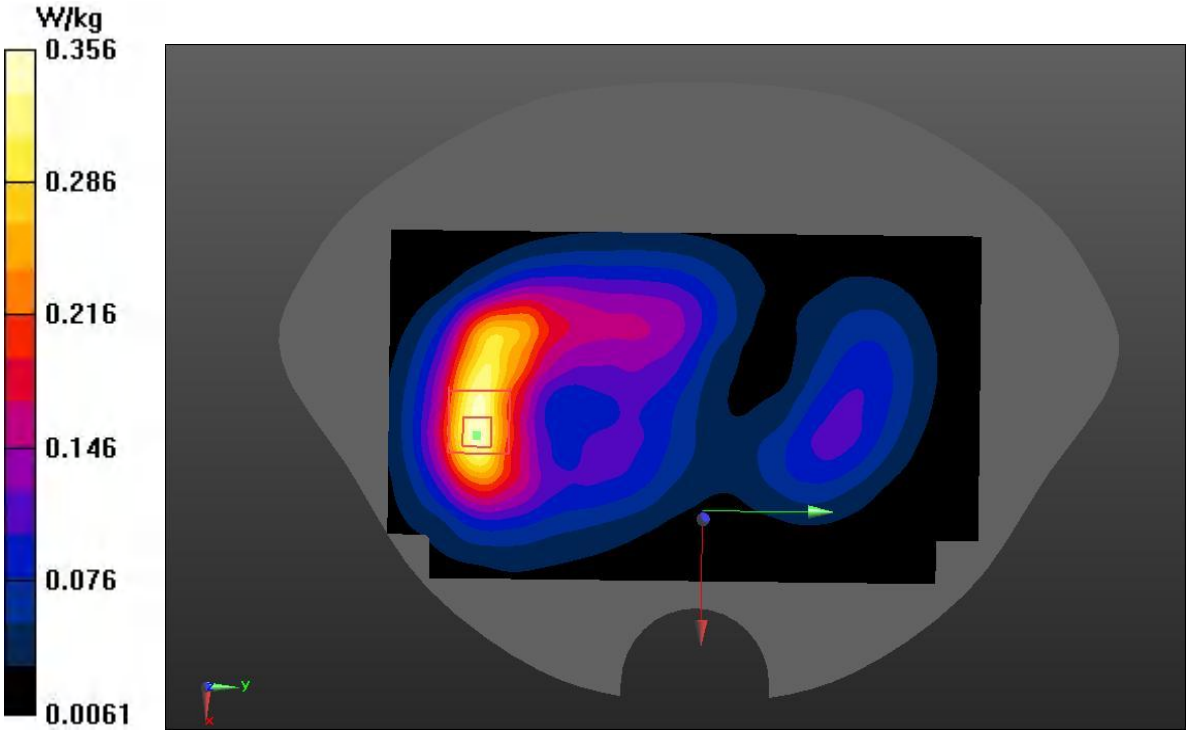


Fig A.5

WCDMA Band 2_CH9538 Right Touch
Date: 2022/9/11
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1907.6 MHz; σ = 1.470 mho/m; ε_r = 40.74; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC,Liquid Temperature: 22.5 ºC
Communication System Band: WCDMA Band 2; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(8.62, 8.62, 8.62) @ 1907.6 MHz;

Area Scan (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.578 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.804 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.654 W/kg
SAR(1 g) = 0.428 W/kg; SAR(10 g) = 0.278 W/kg
Maximum value of SAR (measured) = 0.462 W/kg

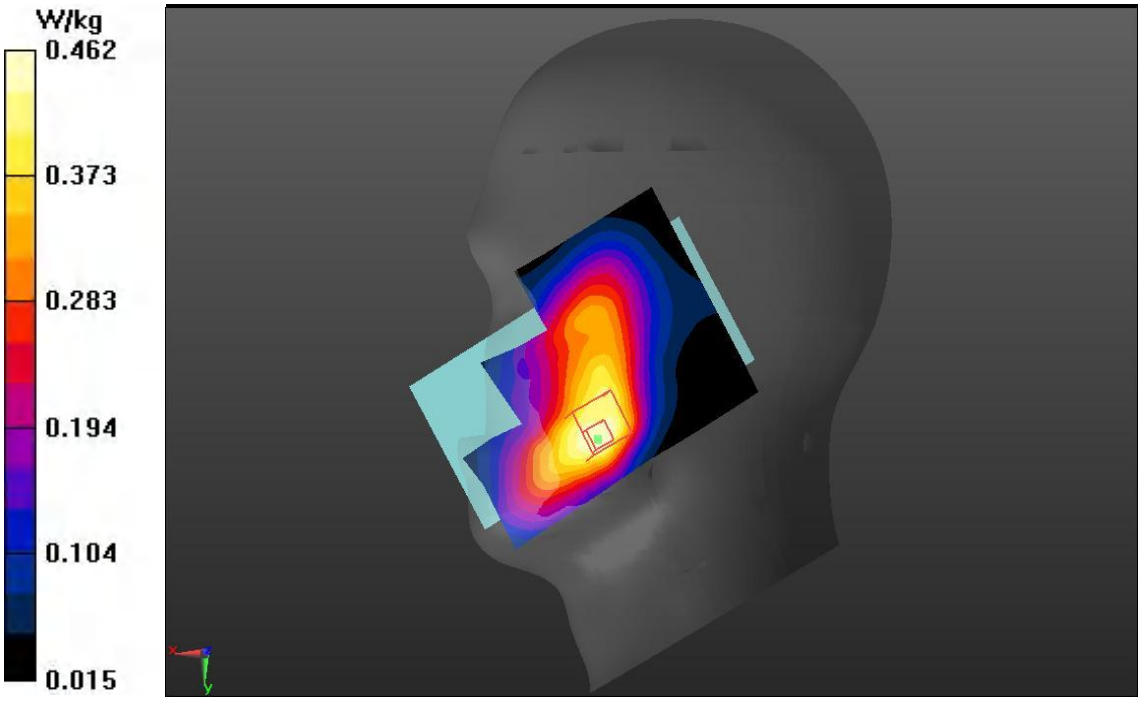


Fig A.6

WCDMA Band 2_CH9400 Bottom 10mm

Date: 2022/9/11

Electronics: DAE4 Sn1250;

Medium: HBBL-600-10000

Medium parameters used (interpolated):

f = 1880 MHz; σ = 1.410 mho/m; ε_r =40.50; ρ = 1000 kg/m^3

Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC

Communication System Band: WCDMA Band 2; Frequency: 1880 MHz;Duty Cycle: 1:1

Probe: EX3DV4 - SN7609; ConvF(8.62, 8.62, 8.62) @ 1880 MHz;

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.898 W/kg

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

Reference Value = 17.22 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.588 W/kg; SAR(10 g) = 0.311 W/kg

Maximum value of SAR (measured) = 0.631 W/kg

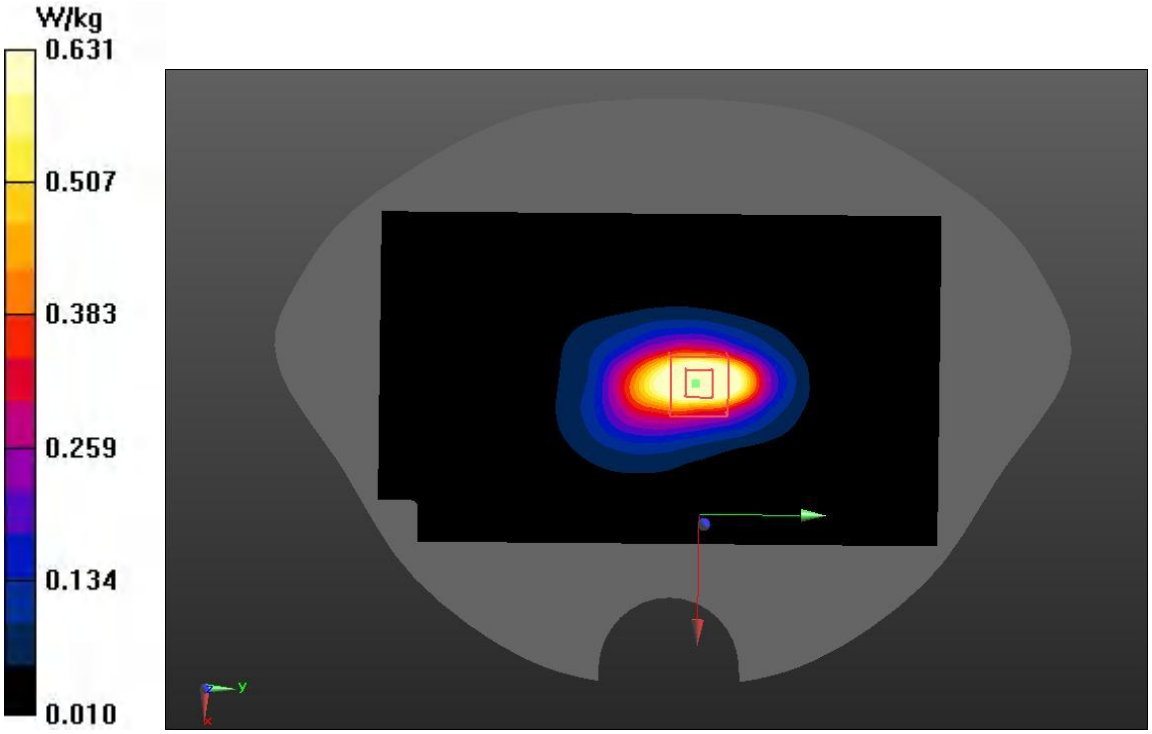


Fig A.7

WCDMA Band 2_CH9400 rear 15mm
Date: 2022/9/11
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1880 MHz; σ = 1.410 mho/m; ε_r =40.50; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System Band: WCDMA Band 2; Frequency: 1880 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(8.62, 8.62, 8.62) @ 1880 MHz;

Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.558 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.01 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.526 W/kg; SAR(10 g) = 0.304 W/kg
Maximum value of SAR (measured) = 0.732 W/kg

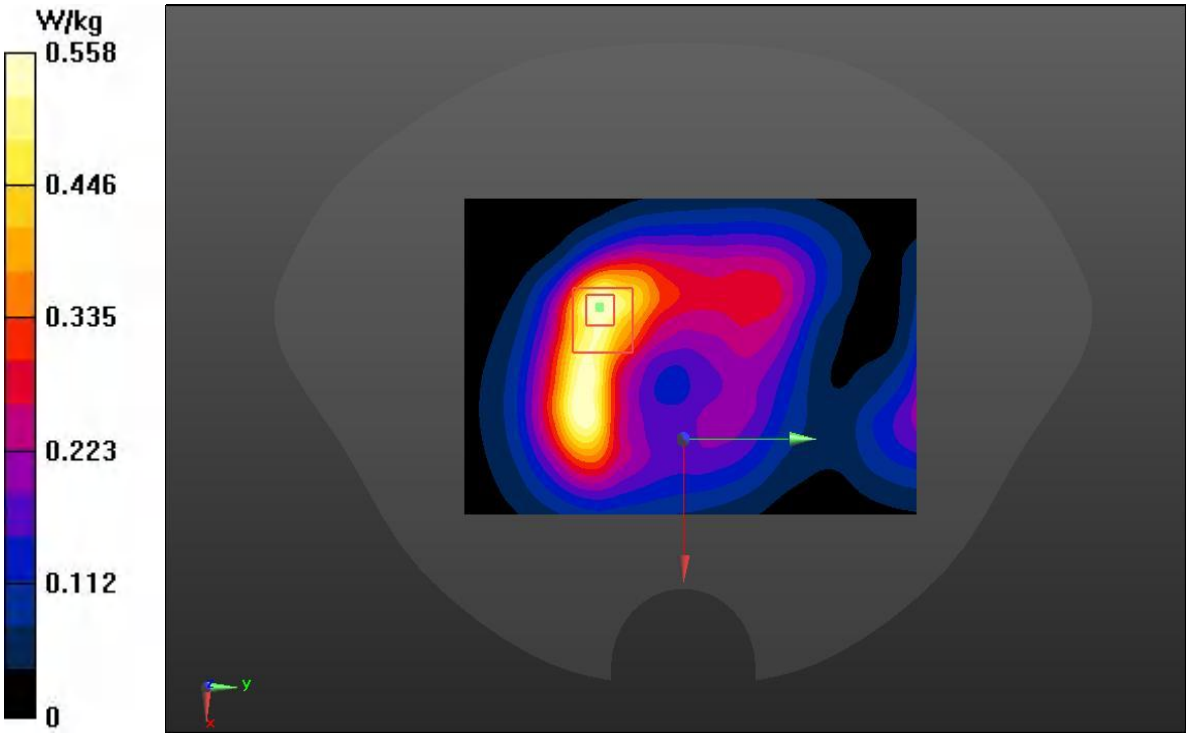


Fig A.8

WCDMA Band 4_CH1513 Left Touch
Date: 2022/9/10
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1752.6 MHz; σ = 1.376 mho/m; ε_r = 40.75; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC,Liquid Temperature: 22.5 ºC
Communication System Band: WCDMA Band 4(1712.2MHz-1752.8MHz); Frequency: 1752.6 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(8.85, 8.85, 8.85) @ 1752.6 MHz;

Area Scan (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.315 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.455 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.329 W/kg
SAR(1 g) = 0.229 W/kg; SAR(10 g) = 0.146 W/kg
Maximum value of SAR (measured) = 0.243 W/kg

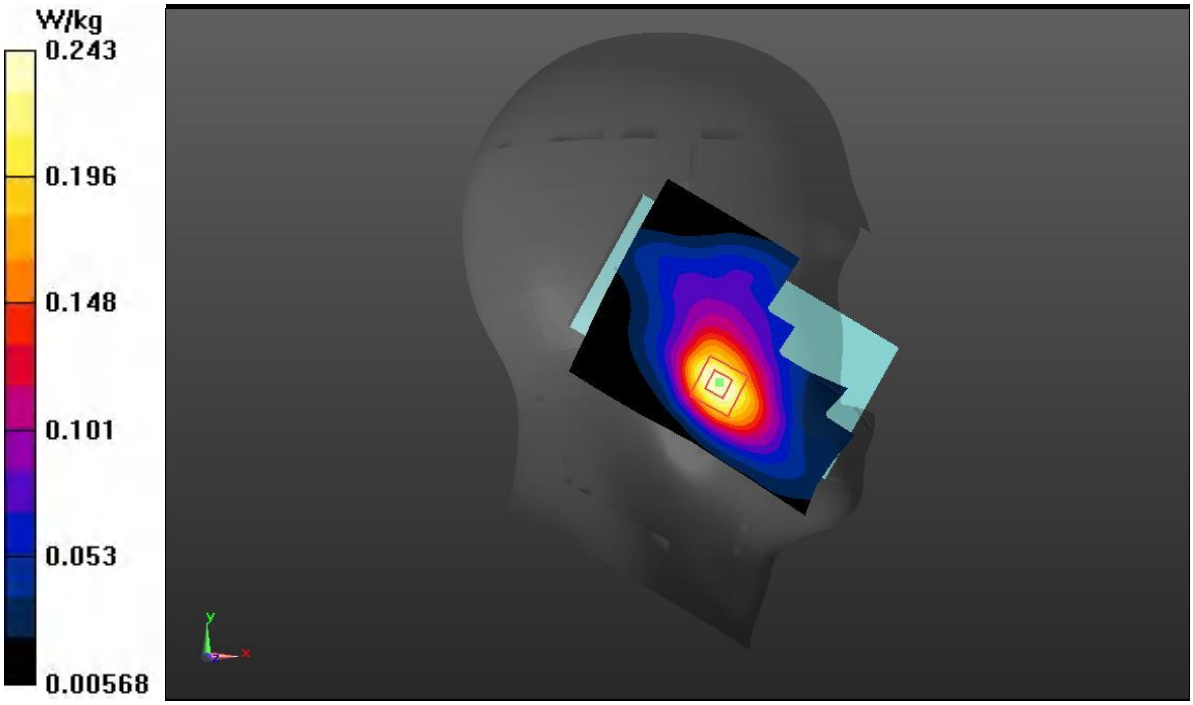


Fig A.9

WCDMA Band 4_1412 Bottom 10mm
Date: 2022/9/10
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.323 mho/m; ε_r = 41.24; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System Band: WCDMA Band 4(1712.2MHz-1752.8MHz); Frequency: 1732.4 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(8.85, 8.85, 8.85) @ 1732.4 MHz;

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.888 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.90 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 0.991 W/kg
SAR(1 g) = 0.593 W/kg; SAR(10 g) = 0.317 W/kg
Maximum value of SAR (measured) = 0.623 W/kg

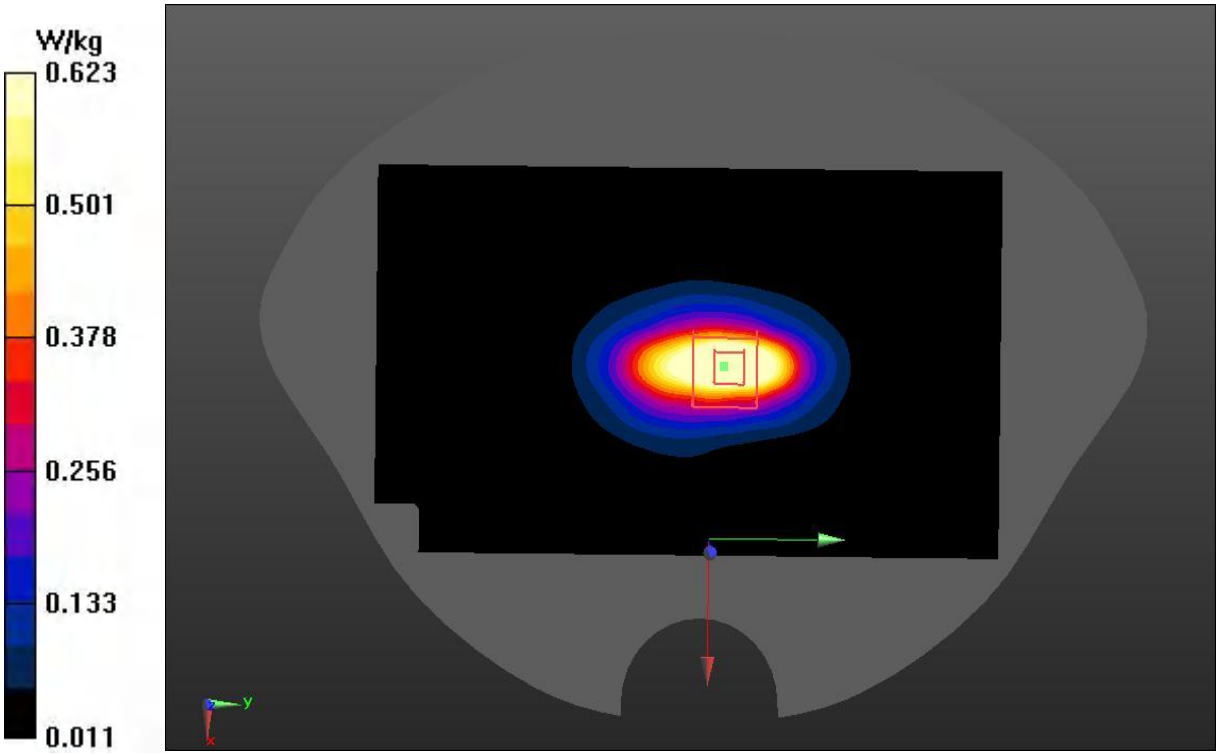


Fig A.10

WCDMA Band 4_CH1412 Rear 15mm
Date: 2022/9/10
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.323 mho/m; ε_r = 41.24; ρ = 1000 kg/m^3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System Band: WCDMA Band 4(1712.2MHz-1752.8MHz); Frequency: 1732.4 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(8.85, 8.85, 8.85) @ 1732.4 MHz;

Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.547 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.21 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.826 W/kg
SAR(1 g) = 0.427 W/kg; SAR(10 g) = 0.241 W/kg
Maximum value of SAR (measured) = 0.602 W/kg

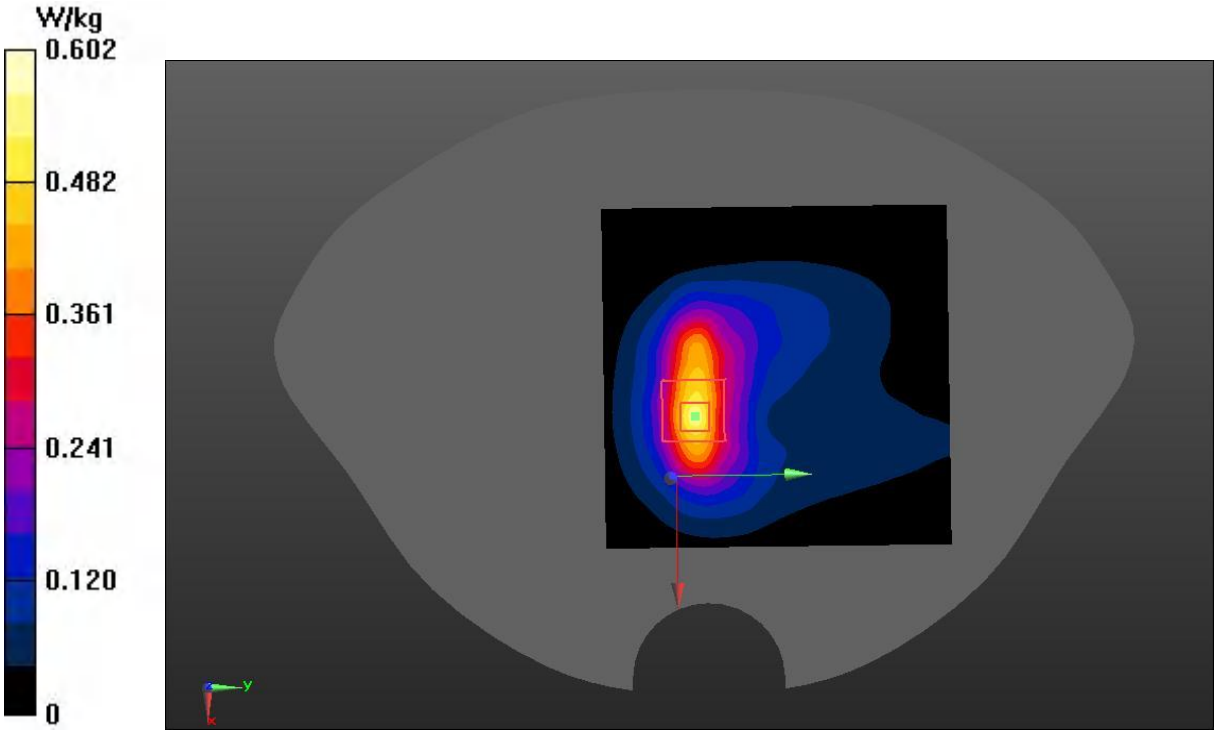


Fig A.11

WCDMA Band 5_CH4183 Right Touch
Date: 2022/9/9
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.940 mho/m; ε_r = 42.65; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC,Liquid Temperature: 22.5 ºC
Communication System Band: WCDMA Band 5; Frequency: 836.6 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(10.53, 10.53, 10.53) @ 836.6 MHz;

Area Scan (81x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.426 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.87 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.669 W/kg
SAR(1 g) = 0.415 W/kg; SAR(10 g) = 0.254 W/kg
Maximum value of SAR (measured) = 0.447 W/kg

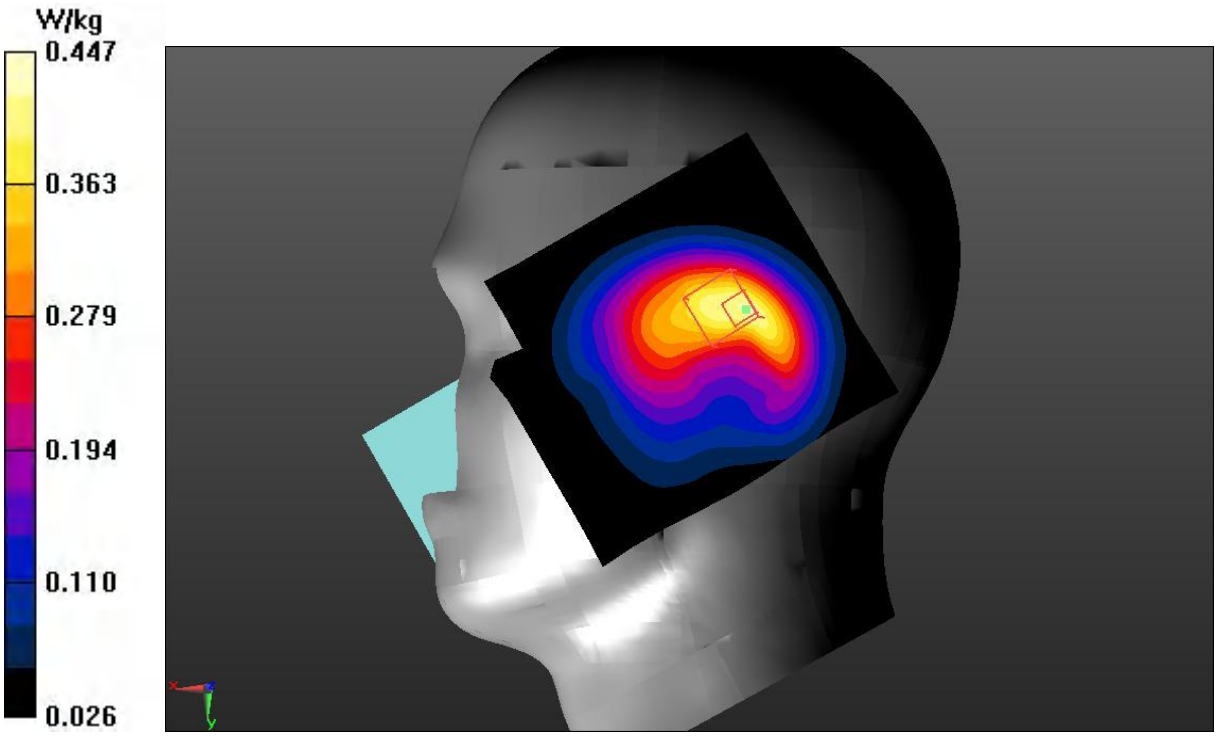


Fig A.12

WCDMA Band 5_CH4183 Rear 10mm
Date: 2022/9/9
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 836.6 MHz; σ = 0.940 mho/m; ε_r = 42.65; ρ = 1000 kg/m^3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System Band: WCDMA Band 5; Frequency: 836.6 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(10.53, 10.53, 10.53) @ 836.6 MHz;

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.343 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.04 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.743 W/kg
SAR(1 g) = 0.423 W/kg; SAR(10 g) = 0.248 W/kg
Maximum value of SAR (measured) = 0.459 W/kg

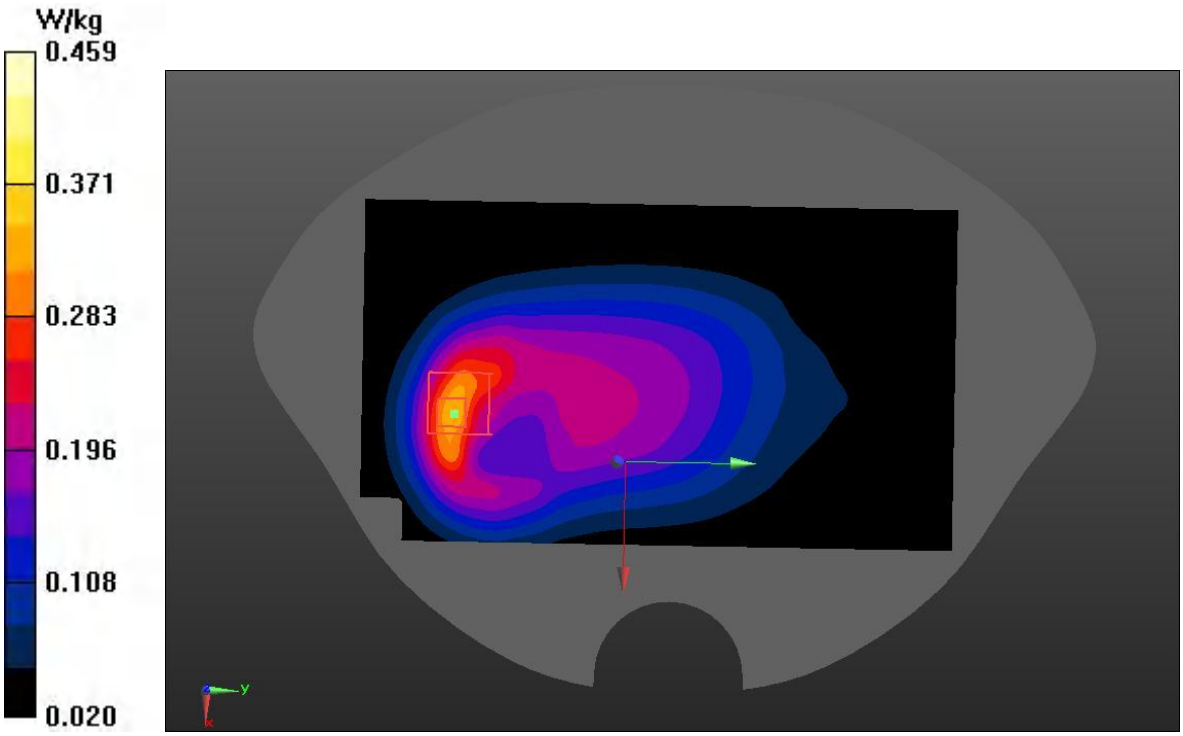


Fig A.13

LTE B12_CH 23095 1RB- Middle Right Touch
Date: 2022/9/8
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.892 mho/m; ε_r = 43.50; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System Band: LTE Band 12 10M; Frequency: 707.5 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(10.87, 10.87, 10.87) @ 707.5 MHz;

Area Scan (81x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.688 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.48 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.661 W/kg; SAR(10 g) = 0.418 W/kg
Maximum value of SAR (measured) = 0.925 W/kg

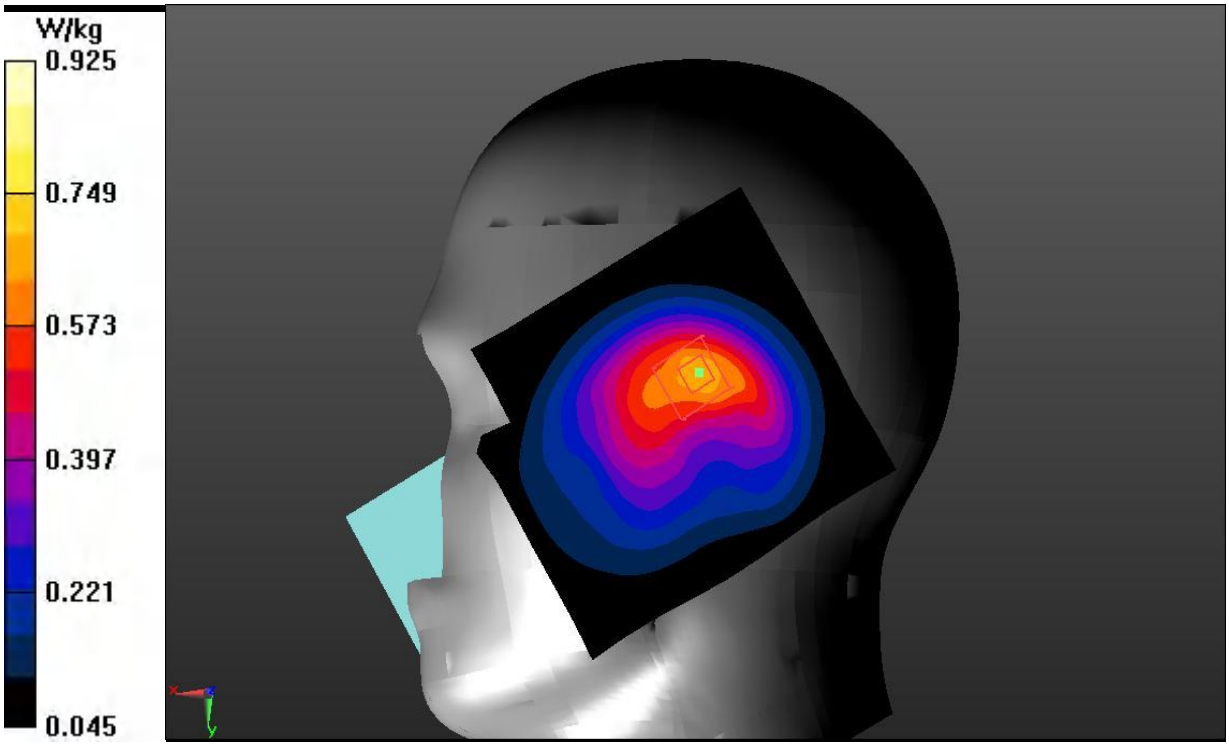


Fig A.14

LTE Band 12_CH23095 1RB-Middle Rear 10mm
Date: 2022/9/8
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 707.5 MHz; σ = 0.892 mho/m; ε_r = 43.50; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System Band: LTE Band 12 10M; Frequency: 707.5 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(10.87, 10.87, 10.87) @ 707.5 MHz;

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.490 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.68 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.595 W/kg
SAR(1 g) = 0.499 W/kg; SAR(10 g) = 0.385 W/kg
Maximum value of SAR (measured) = 0.508 W/kg

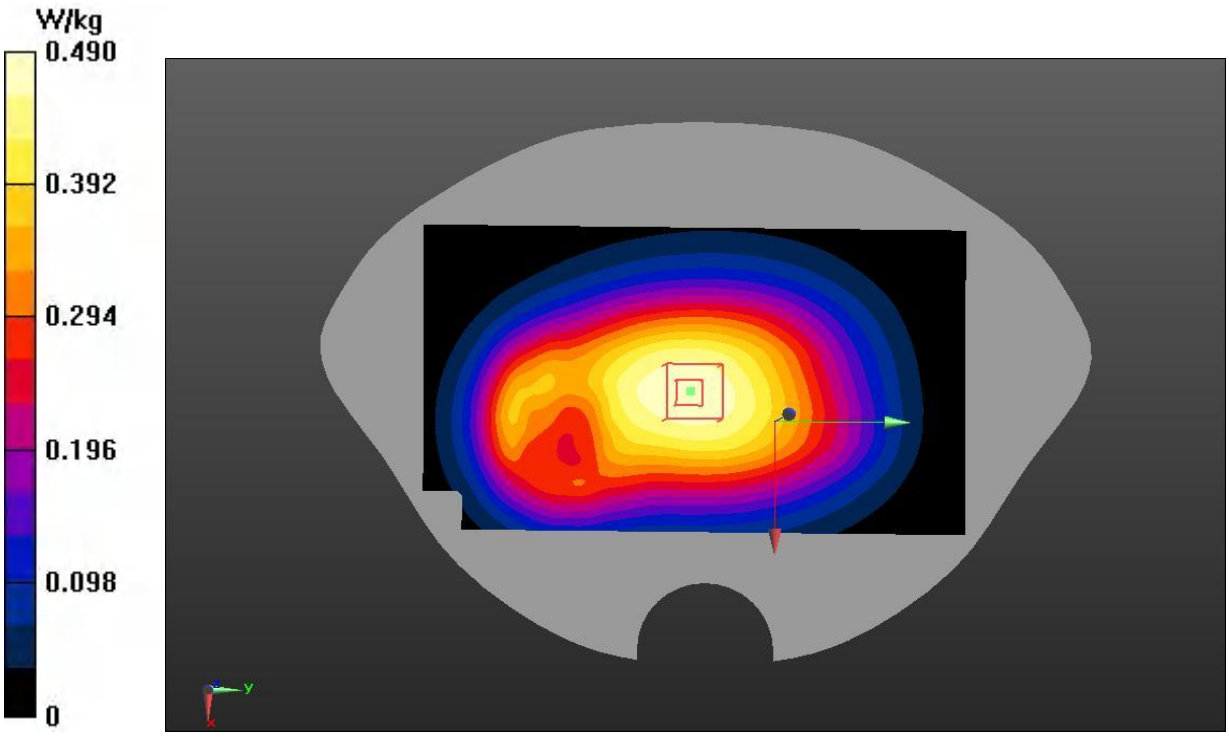


Fig A.15

LTE B25_CH26590 1RB- Middle Right Touch
Date: 2022/9/11
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.432 mho/m; ε_r = 40.72; ρ = 1000 kg/m^3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System Band: Band 25, E-UTRA/FDD (1850.0 - 1915.0 MHz); Frequency: 1905 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(8.62, 8.62, 8.62) @ 1905 MHz;

Area Scan (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.418 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.645 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.757 W/kg
SAR(1 g) = 0.477 W/kg; SAR(10 g) = 0.303 W/kg
Maximum value of SAR (measured) = 0.642 W/kg

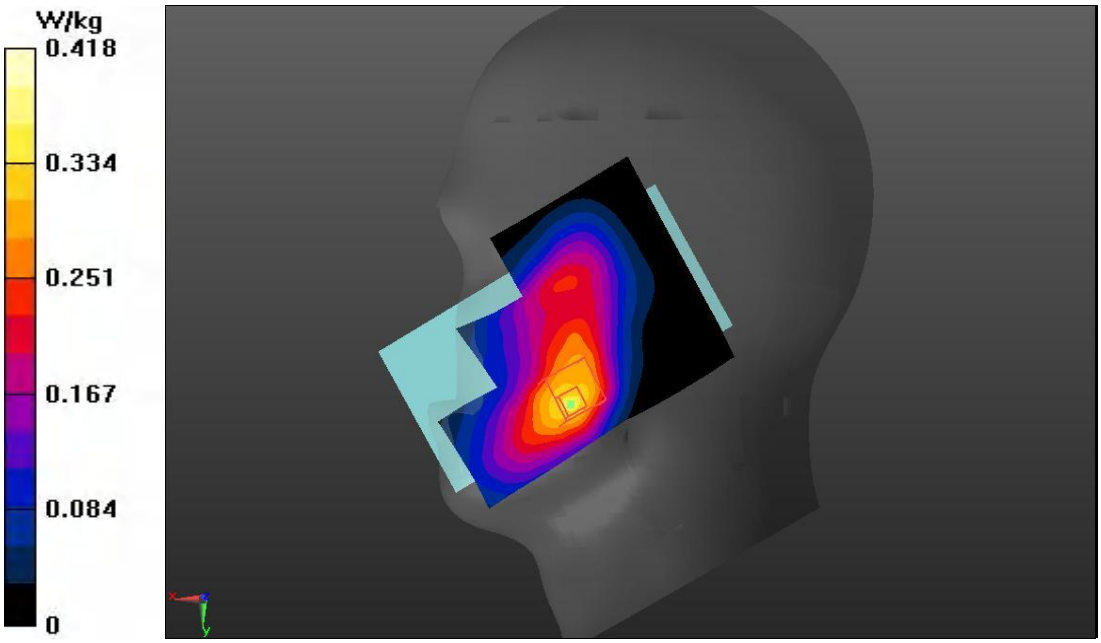


Fig A.16

LTE Band 25_CH26590 50RB-Low Bottom 10mm
Date: 2022/9/11
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.432 mho/m; ε r = 40.72; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System Band: Band 25, E-UTRA/FDD (1850.0 - 1915.0 MHz); Frequency: 1905 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(8.62, 8.62, 8.62) @ 1905 MHz;

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.910 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.66 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.598 W/kg; SAR(10 g) = 0.314 W/kg
Maximum value of SAR (measured) = 0.677 W/kg

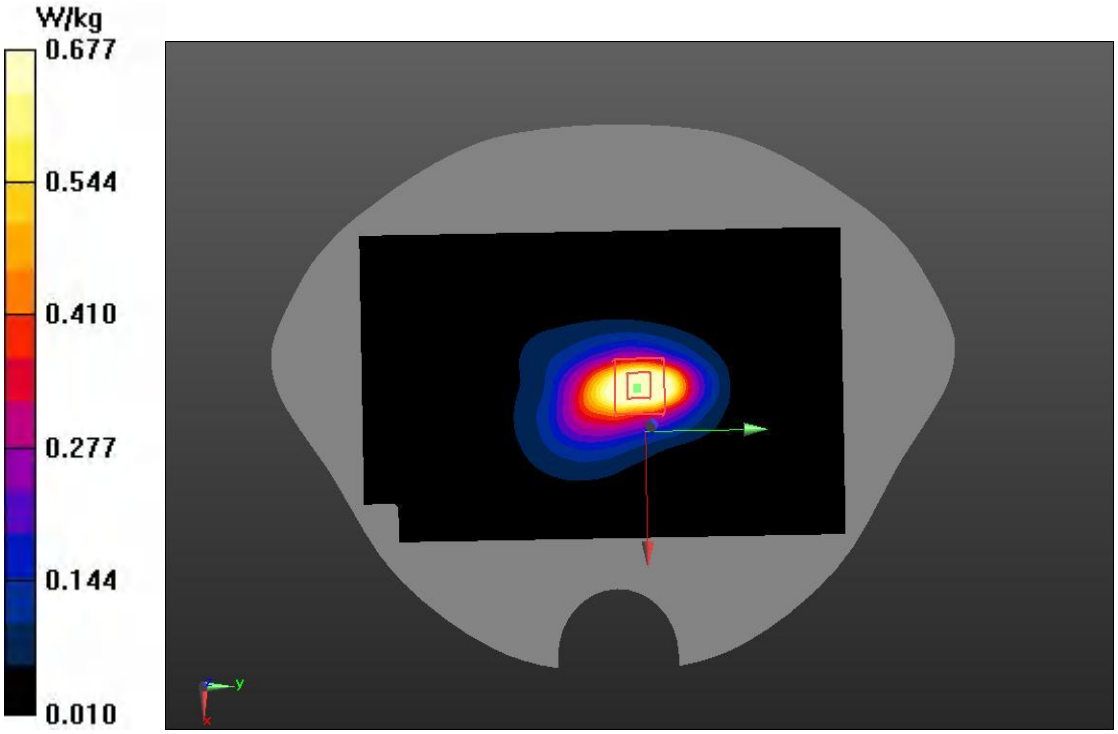


Fig A.17

LTE Band 25 _CH26590 1RB-Middle Rear 15mm
Date: 2022/9/11
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1905 MHz; σ = 1.432 mho/m; εr = 40.72; ρ = 1000 kg/m³
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System: Generic LTE Frequency: 1905 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7609 ConvF(8.62, 8.62, 8.62)

Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.374 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.698 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.6870
SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.194 mW/g
Maximum value of SAR (measured) = 0.552 mW/g

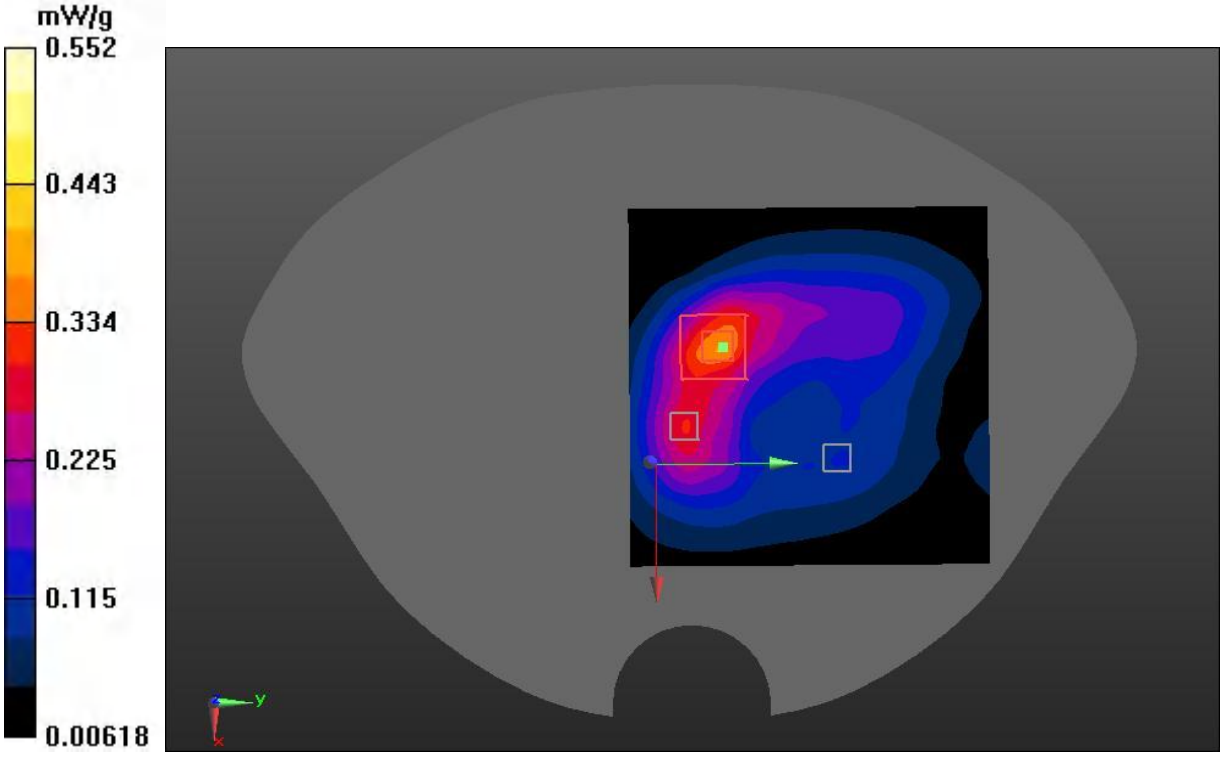


Fig A.18

LTE B26_CH26865 1RB- Middle Right Touch
Date: 2022/9/8
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 718 MHz; σ = 0.919 mho/m; ε r = 43.16; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System Band: Band 26; Frequency: 718 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(10.87, 10.87, 10.87) @ 718 MHz;

Area Scan (81x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.646 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.98 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.945 W/kg
SAR(1 g) = 0.611 W/kg; SAR(10 g) = 0.382 W/kg
Maximum value of SAR (measured) = 0.651 W/kg

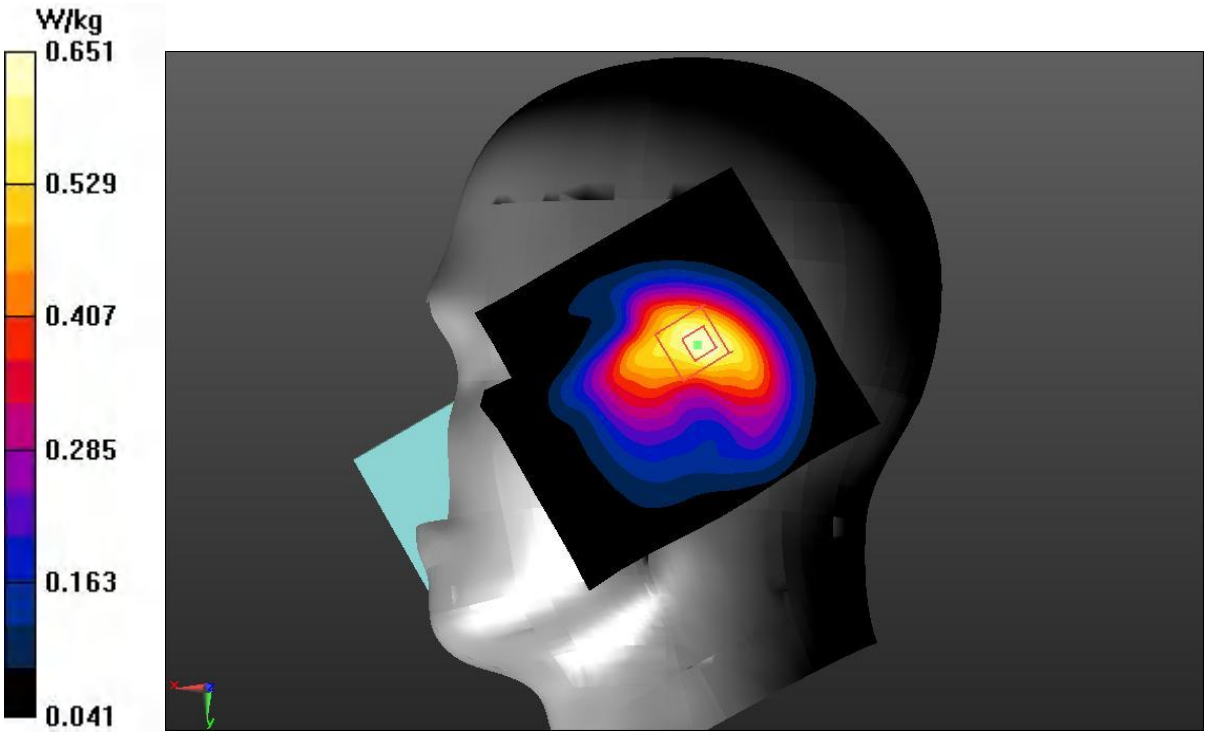


Fig A.19

LTE Band 26_CH26865 1RB-Middle Rear 10mm
Date: 2022/9/9
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 831.5 MHz; σ = 0.935 mho/m; ε r = 42.69; ρ = 1000 kg/m^3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System Band: Mid; Frequency: 831.5 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(10.53, 10.53, 10.53) @ 831.5 MHz;

Area Scan (81x141x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.270 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.38 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.517 W/kg
SAR(1 g) = 0.288 W/kg; SAR(10 g) = 0.166 W/kg
Maximum value of SAR (measured) = 0.316 W/kg

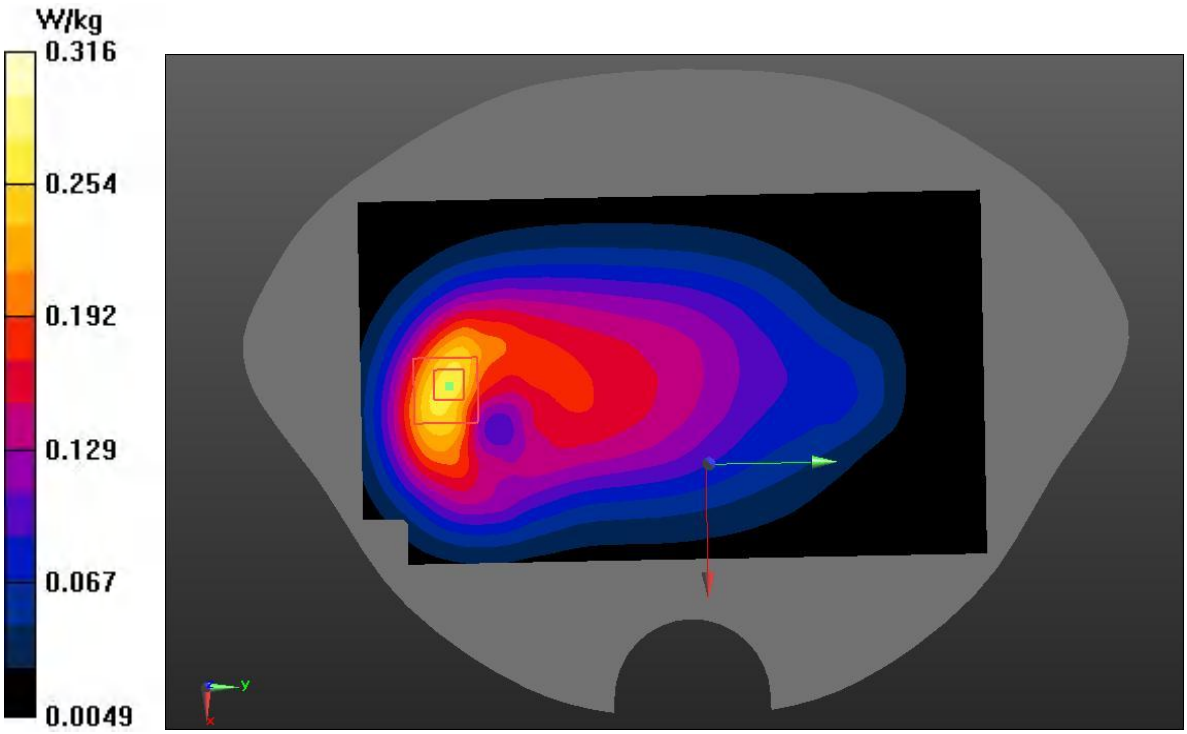


Fig A.20

LTE B41_CH41055 1RB- Middle Right Touch
Date: 2022/9/12
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 2636.5 MHz; σ = 1.958 mho/m; ε r = 38.65; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System Band: TDD band 41; Frequency: 2636.5 MHz;Duty Cycle: 1:1.58
Probe: EX3DV4 - SN7609; ConvF(7.77, 7.77, 7.77) @ 2636.5 MHz;

Area Scan (91x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.216 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.644 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.307 W/kg
SAR(1 g) = 0.188 W/kg; SAR(10 g) = 0.109 W/kg
Maximum value of SAR (measured) = 0.200 W/kg

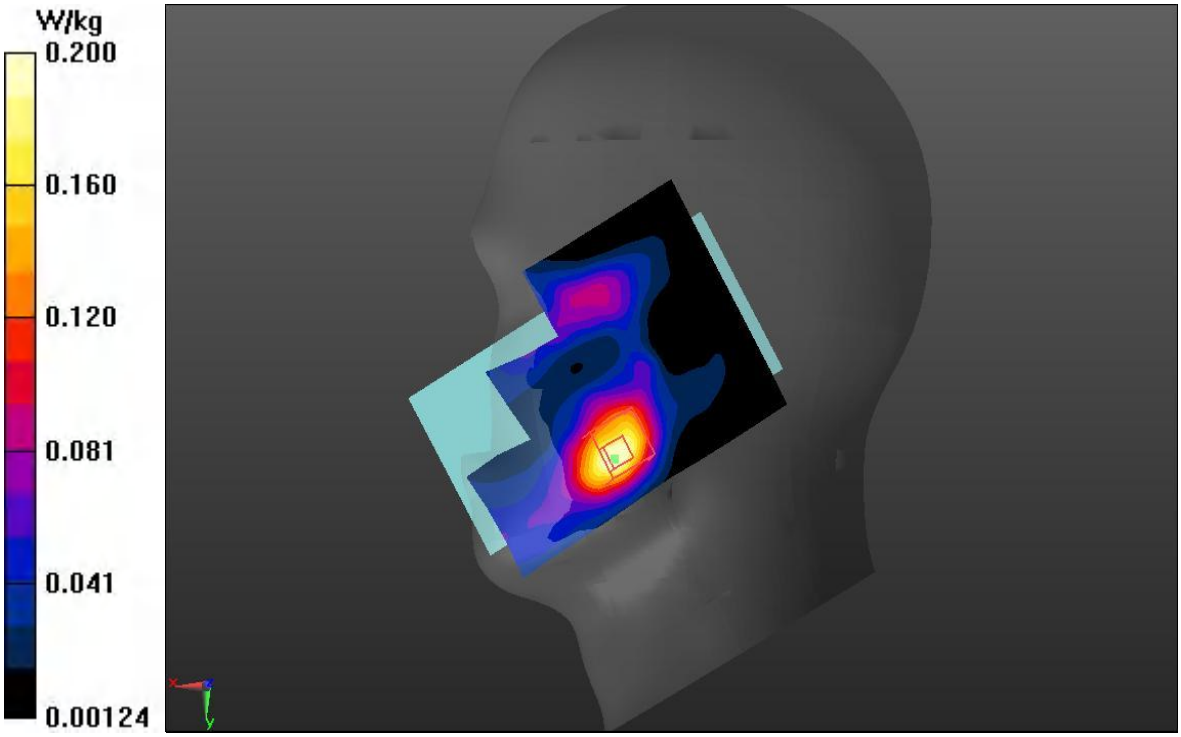


Fig A.21

LTE Band 41_CH41055 1RB-Middle Rear 10mm
Date: 2022/9/12
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 2636.5 MHz; σ = 1.958 mho/m; ε r = 38.65; ρ = 1000 kg/m^3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System Band: Band 41, E-UTRA/TDD (2496.0 - 2690.0 MHz); Frequency: 2636.5 MHz;Duty Cycle: 1:1.58
Probe: EX3DV4 - SN7609; ConvF(7.77, 7.77, 7.77) @ 2636.5 MHz;

Area Scan (121x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.711 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.58 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.924 W/kg
SAR(1 g) = 0.443 W/kg; SAR(10 g) = 0.193 W/kg
Maximum value of SAR (measured) = 0.510 W/kg

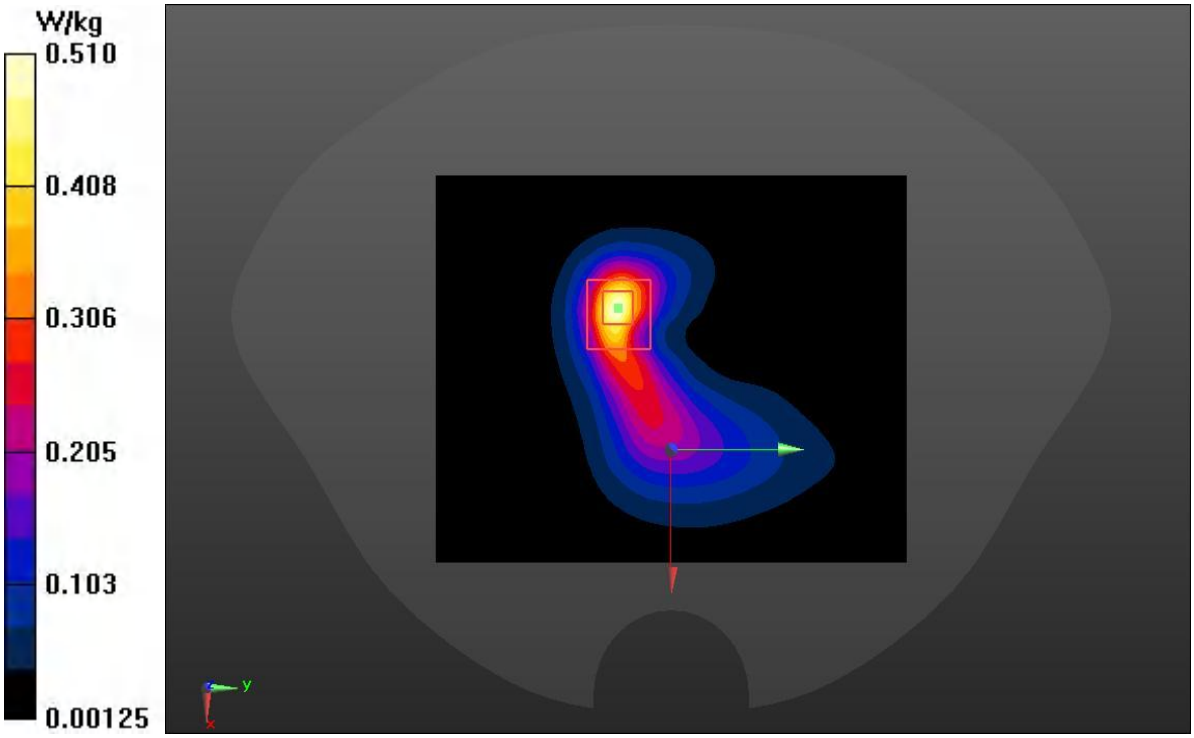


Fig A.22

LTE Band 41 _CH41055 1RB-Middle Rear 15mm
Date: 2022/9/13
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 2636.5 MHz; σ = 1.958 mho/m; ε_r = 38.65; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System: LTE B41 PC3 (0) Frequency: 2636.5 MHz Duty Cycle: 1:1.58
Probe: EX3DV4 - SN7609 ConvF(7.77, 7.77, 7.77)

Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.400 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.893 V/m; Power Drift = 0.0083 dB
Peak SAR (extrapolated) = 0.4670
SAR(1 g) = 0.239 mW/g; SAR(10 g) = 0.114 mW/g
Maximum value of SAR (measured) = 0.261 mW/g

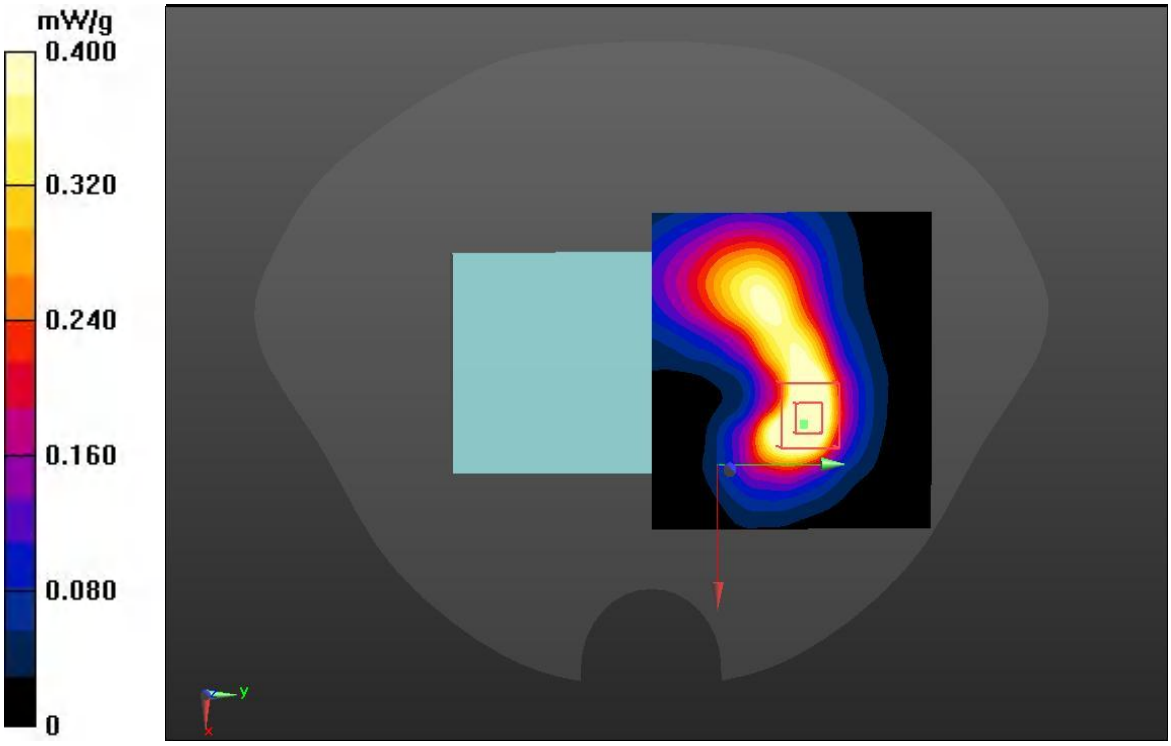


Fig A.23

LTE B41 PC2_CH41055 1RB- Middle Right Touch
Date: 2022/9/14
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 2636.5 MHz; σ = 1.958 mho/m; ε r = 38.65; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System: LTE TDD Frequency: 2636.5 MHz Duty Cycle: 1:2.37
Probe: EX3DV4 - SN7609 ConvF(7.77, 7.77, 7.77)

Area Scan (91x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.261 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.981 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.4390
SAR(1 g) = 0.272 mW/g; SAR(10 g) = 0.156 mW/g
Maximum value of SAR (measured) = 0.291 mW/g

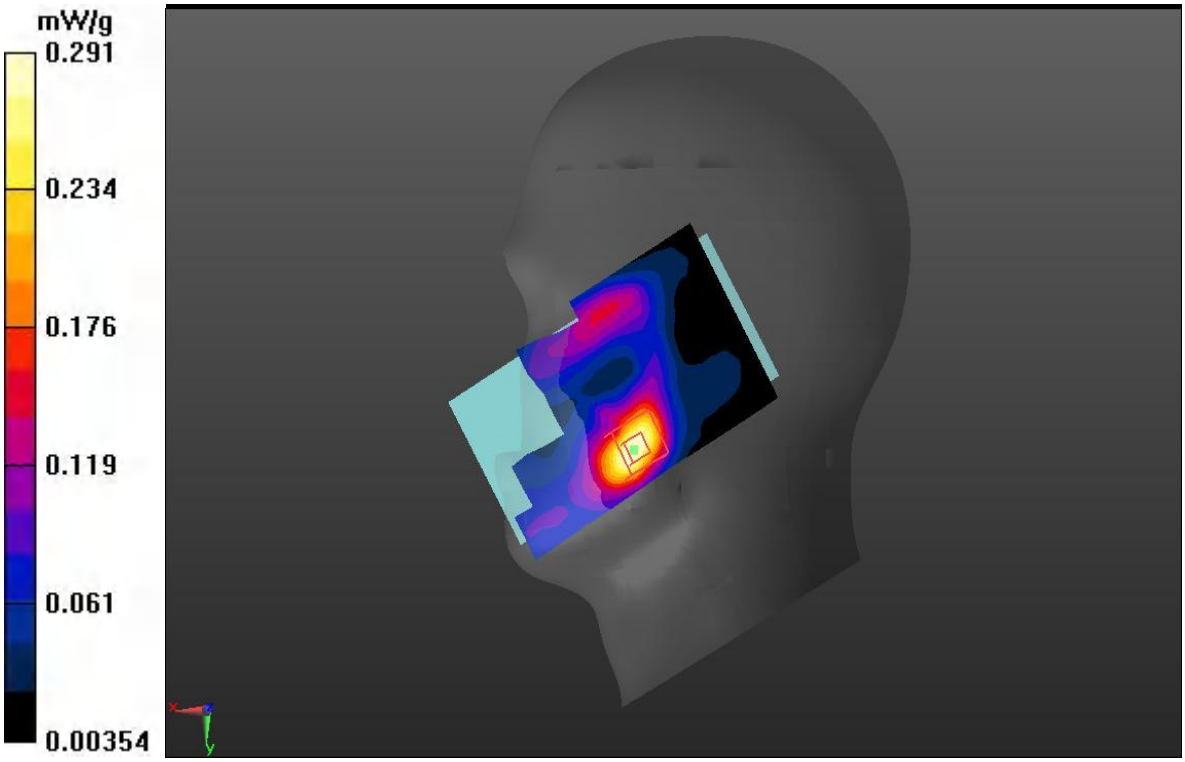


Fig A.24

LTE Band 41 PC2_CH41055 1RB-Middle Rear 10mm
Date: 2022/9/14
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 2636.5 MHz; σ = 1.958 mho/m; ε_r = 38.65; ρ = 1000 kg/m^3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System Band: Band 41, E-UTRA/TDD (2496.0 - 2690.0 MHz); Frequency: 2636.5 MHz;Duty Cycle: 1:2.37
Probe: EX3DV4 - SN7609; ConvF(7.77, 7.77, 7.77) @ 2636.5 MHz;

Area Scan (111x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.10 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.19 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.599 W/kg; SAR(10 g) = 0.262 W/kg
Maximum value of SAR (measured) = 0.677 W/kg

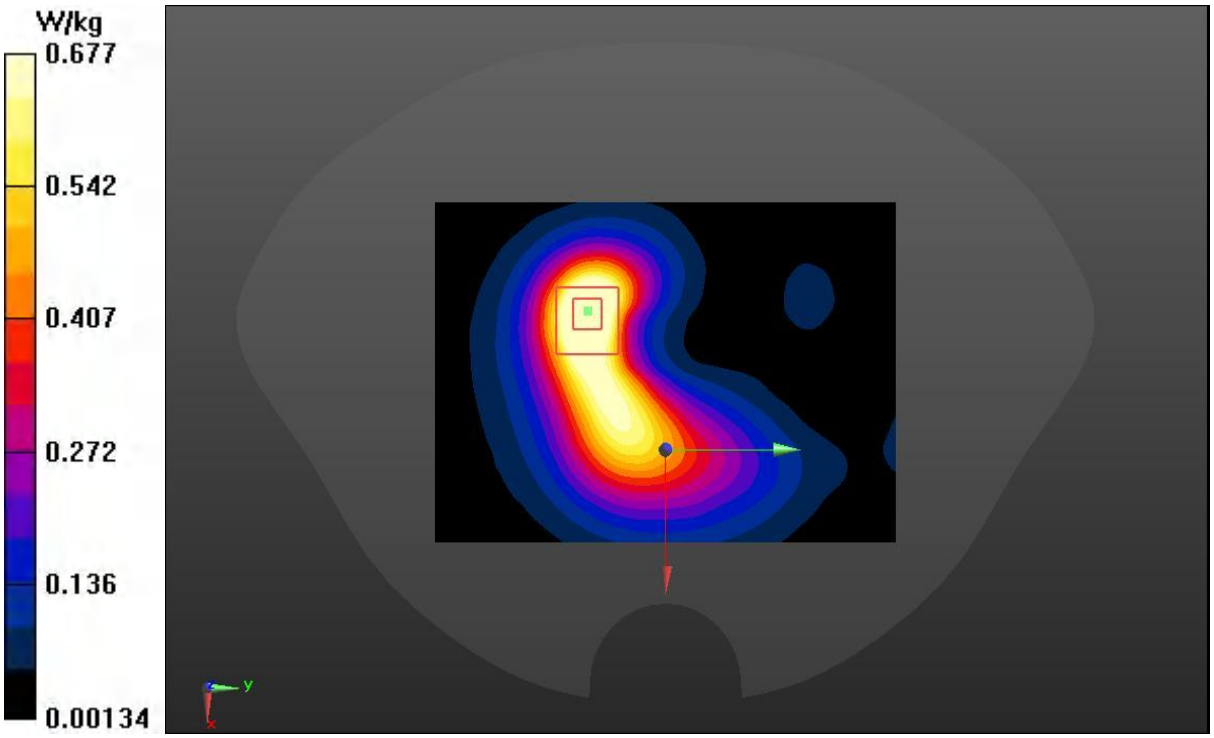


Fig A.25

LTE Band 41 PC2_CH41055 50RB-Middle Rear 15mm
Date: 2022/9/14
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 2636.5 MHz; σ = 1.958 mho/m; ε_r = 38.65; ρ = 1000 kg/m^3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: LTE B41 HPUE (0) Frequency: 2636.5 MHz Duty Cycle: 1:2.37
Probe: EX3DV4 - SN7609 ConvF(7.77, 7.77, 7.77)

Area Scan (111x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.489 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.703 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.6110
SAR(1 g) = 0.318 mW/g; SAR(10 g) = 0.152 mW/g
Maximum value of SAR (measured) = 0.497 mW/g

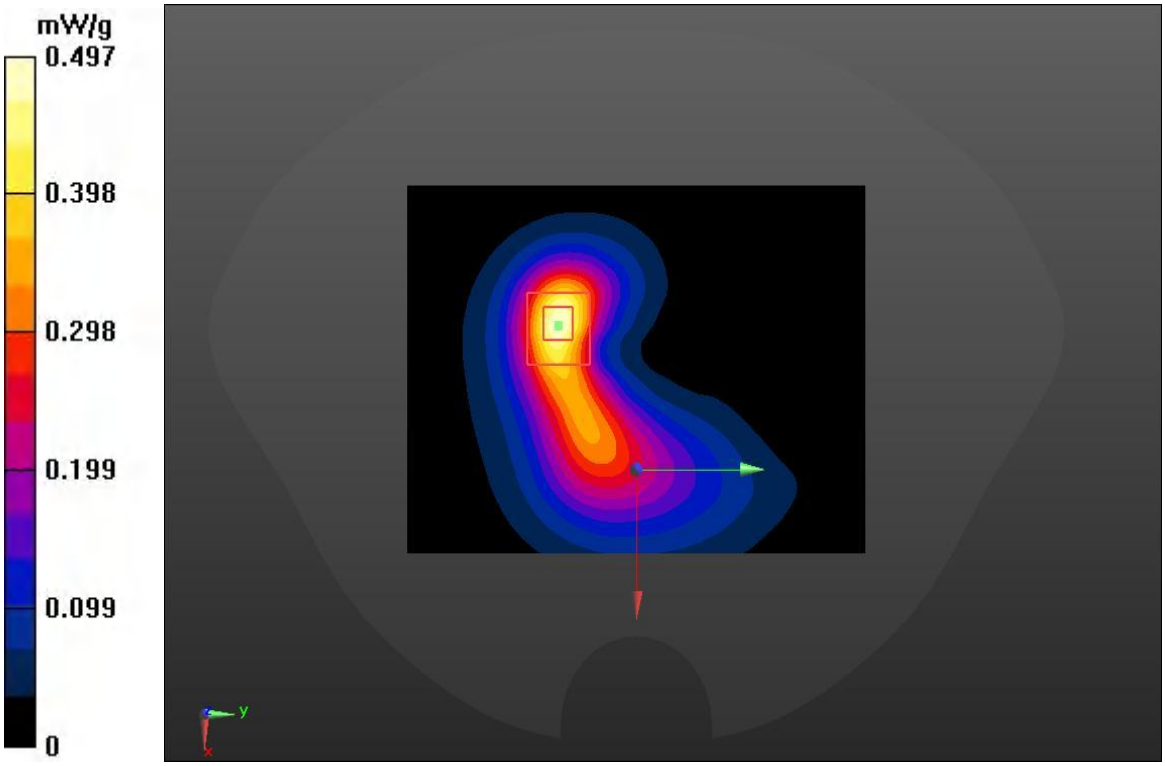


Fig A.26

LTE B66_CH132322 1RB- Middle Left Touch
Date: 2022/9/10
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1745 MHz; σ = 1.343 mho/m; εr = 41.19; ρ = 1000 kg/m³
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System: LTE FDD Frequency: 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7609 ConvF(8.85, 8.85, 8.85)

Area Scan (71x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.286 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.250 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.5240
SAR(1 g) = 0.367 mW/g; SAR(10 g) = 0.234 mW/g
Maximum value of SAR (measured) = 0.389 mW/g

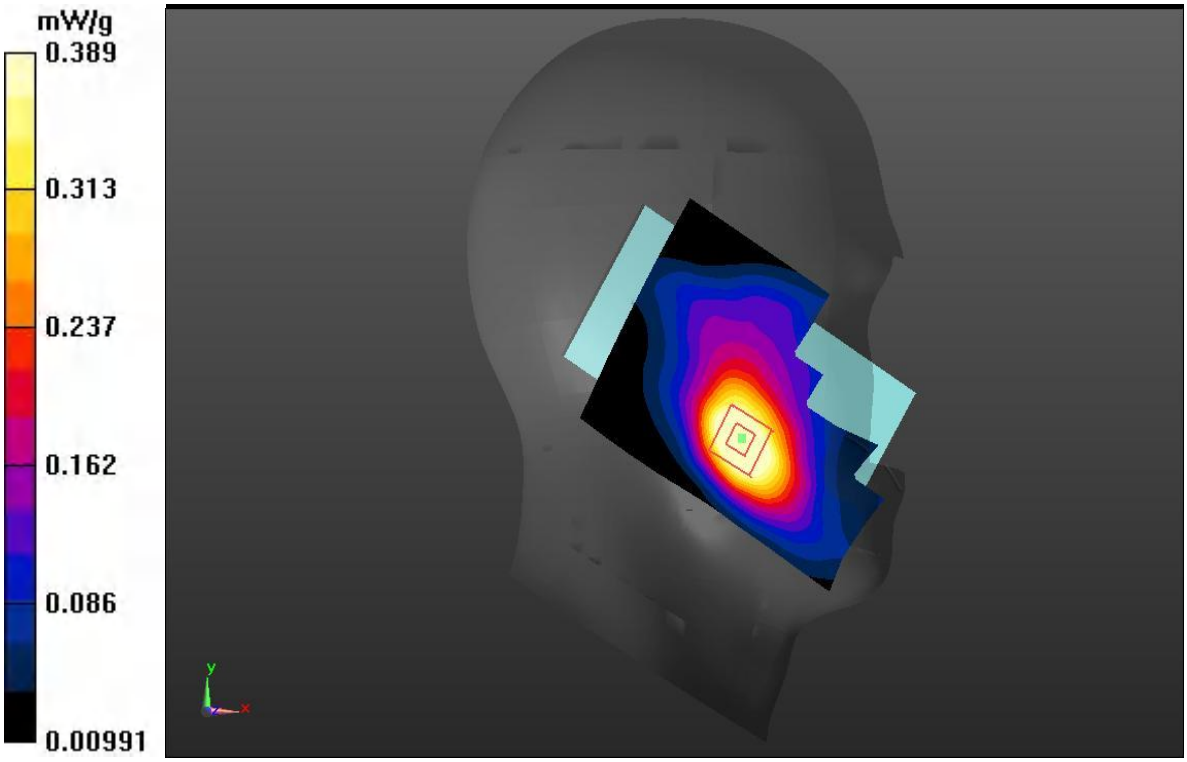


Fig A.27

LTE Band 66_CH132322 1RB-Middle Bottom 10mm
Date: 2022/9/10
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1745 MHz; σ = 1.343 mho/m; εr = 41.19; ρ = 1000 kg/m³
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System: B66 (0) Frequency: 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7609 ConvF(8.85, 8.85, 8.85)

Area Scan (81x141x1): Measurement grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.008 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.018 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 1.2270
SAR(1 g) = 0.727 mW/g; SAR(10 g) = 0.388 mW/g
Maximum value of SAR (measured) = 0.799 mW/g

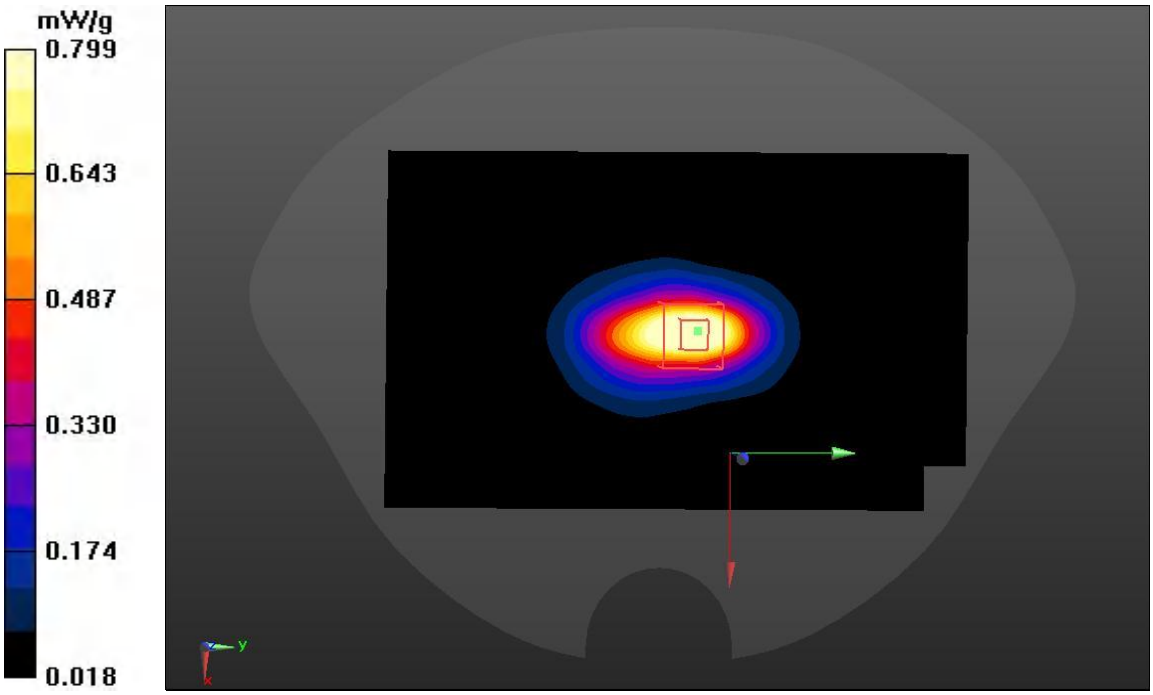


Fig A.28

LTE Band 66_CH132322 1RB-Middle Rear 15mm
Date: 2022/9/10
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 1745 MHz; σ = 1.343 mho/m; εr = 41.19; ρ = 1000 kg/m³
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: LTE FDD Frequency: 1745 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7609 ConvF(8.85, 8.85, 8.85)

Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.512 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.692 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.6030
SAR(1 g) = 0.371 mW/g; SAR(10 g) = 0.216 mW/g
Maximum value of SAR (measured) = 0.503 mW/g

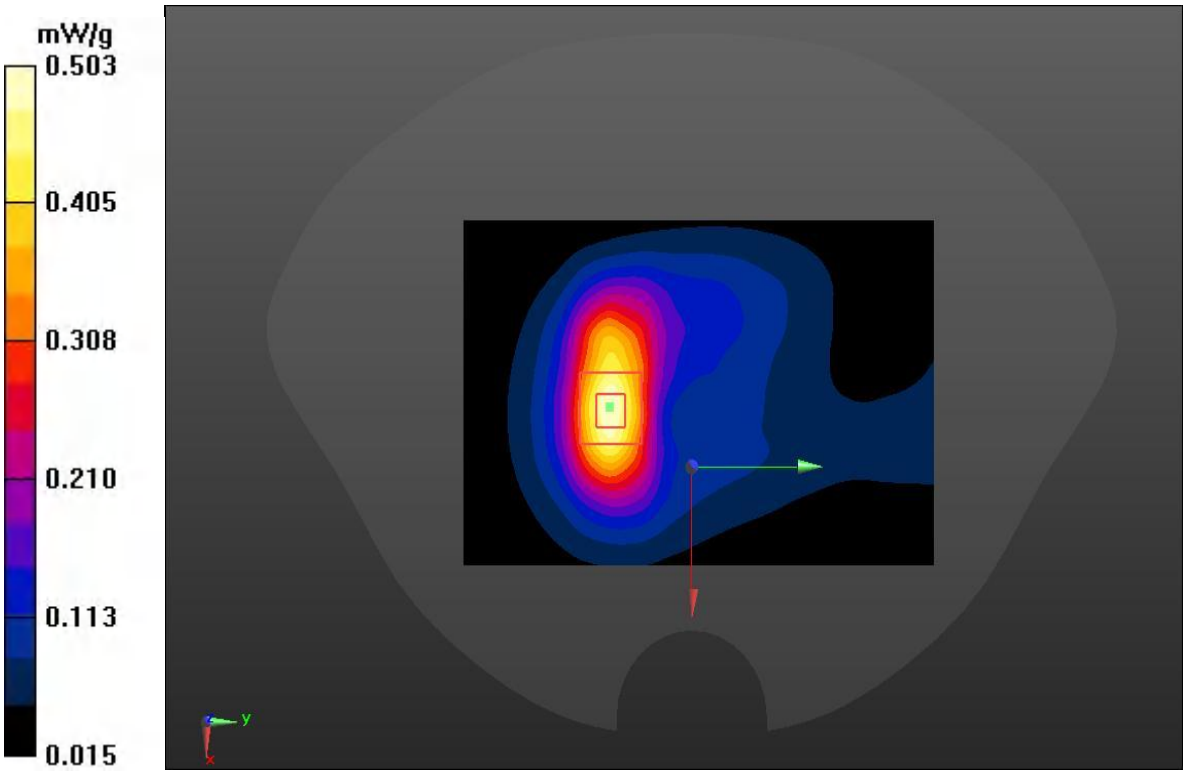


Fig A.29

LTE B71_CH133322 50RB0 Right Touch
Date: 2022/9/8
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 683 MHz; σ = 0.886 mho/m; ε r = 43.7; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System Band: Band 71; Frequency: 683 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(10.87, 10.87, 10.87) @ 683 MHz;

Area Scan (111x101x1): Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (measured) = 0.416 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.70 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.871 W/kg
SAR(1 g) = 0.464 W/kg; SAR(10 g) = 0.284 W/kg
Maximum value of SAR (measured) = 0.672 W/kg

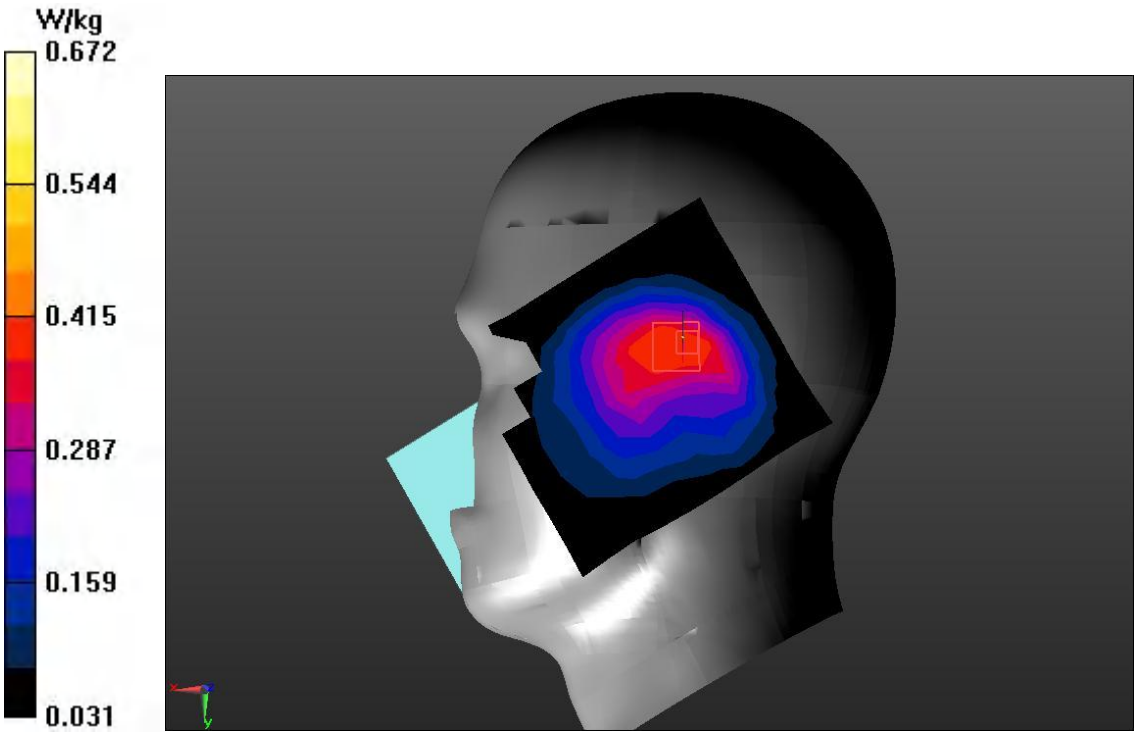


Fig A.30

LTE Band 71_CH132322 50RB-Middle Rear 10mm
Date: 2022/9/8
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 683 MHz; σ = 0.886 mho/m; εr = 43.7; ρ = 1000 kg/m³
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: Generic LTE (0) Frequency: 683 MHz Duty Cycle: 1:2.37
Probe: EX3DV4 - SN7609 ConvF(10.87, 10.87, 10.87)

Area Scan (81x141x1): Measurement grid: dx=1.500mm, dy=1.500mm
Maximum value of SAR (interpolated) = 0.362 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.345 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.5100
SAR(1 g) = 0.282 mW/g; SAR(10 g) = 0.158 mW/g
Maximum value of SAR (measured) = 0.300 mW/g

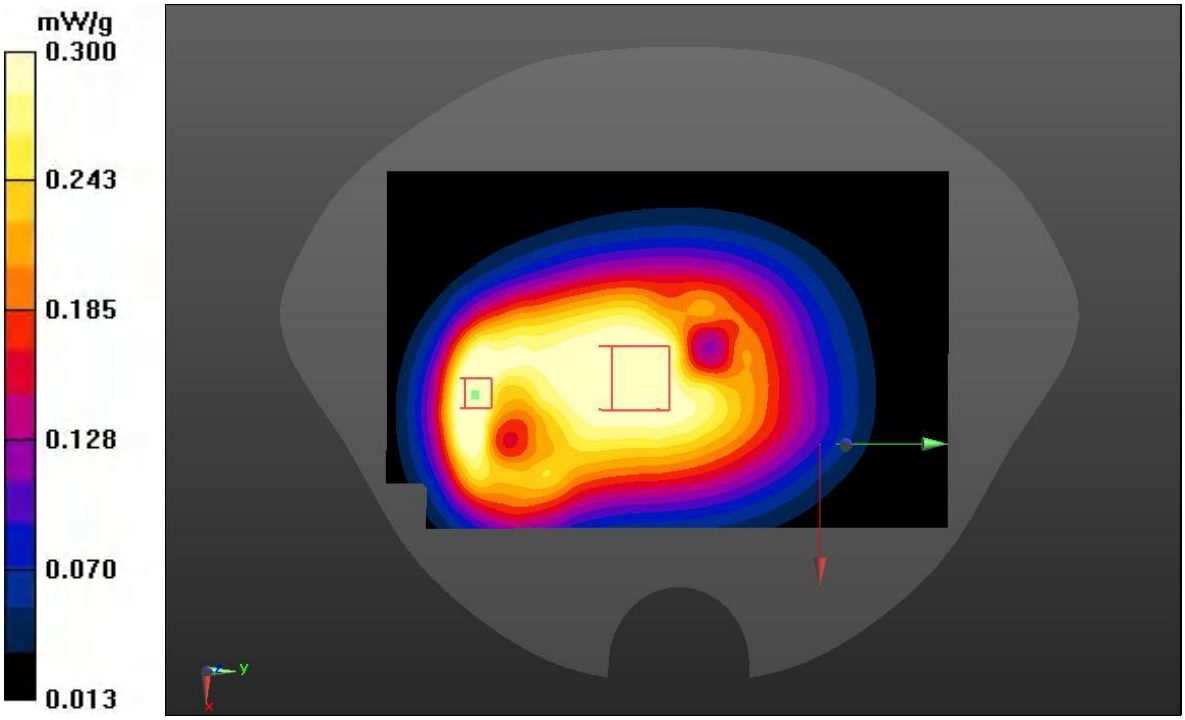


Fig A.31

WLAN2450_CH6 Right Touch
Date: 2022/9/12
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.799 mho/m; εr = 40.36; ρ = 1000 kg/m³
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: WIFI 2.4G (0) Frequency: 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7609 ConvF(8.02, 8.02, 8.02)

Area Scan (111x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.883 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 31.817 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 2.3800
SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.555 mW/g
Maximum value of SAR (measured) = 1.938 mW/g

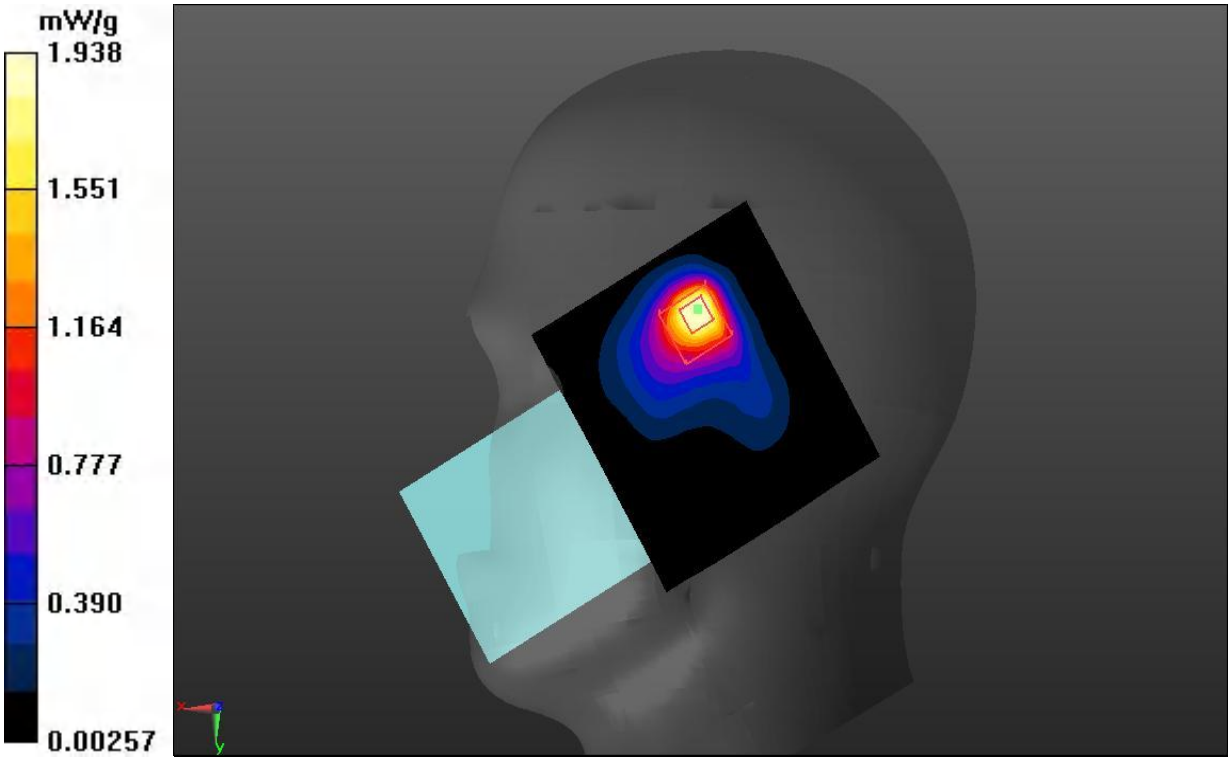


Fig A.32

WLAN2450_CH6 Rear 10mm
Date: 2022/9/12
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.799 mho/m; εr = 40.36; ρ = 1000 kg/m³
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: WIFI 2.4G (0) Frequency: 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7609 ConvF(8.02, 8.02, 8.02)

Area Scan (131x111x1): Measurement grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.577 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.155 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.7530
SAR(1 g) = 0.374 mW/g; SAR(10 g) = 0.173 mW/g
Maximum value of SAR (measured) = 0.603 mW/g

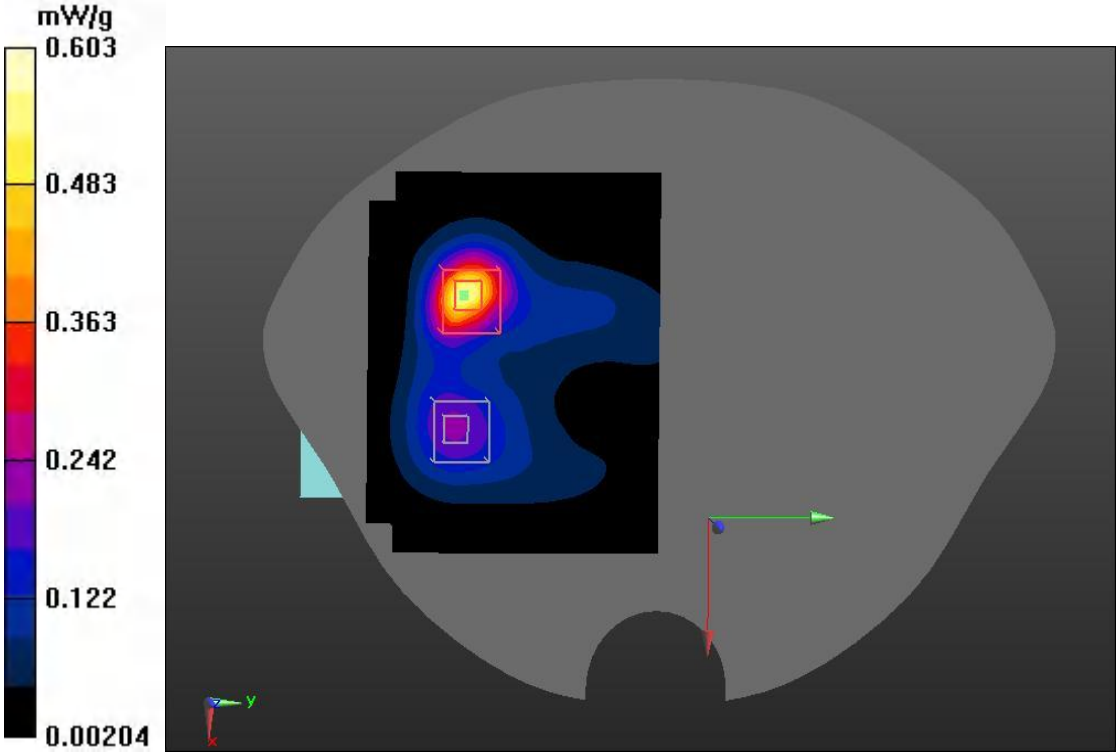


Fig A.33

WLAN2450_CH6 Right Touch
Date: 2022/9/13
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.799 mho/m; εr = 40.36; ρ = 1000 kg/m³
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: WIFI 2.4G (0) Frequency: 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7609 ConvF(8.02, 8.02, 8.02)

Area Scan (101x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.682 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.342 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 0.8250
SAR(1 g) = 0.405 mW/g; SAR(10 g) = 0.191 mW/g
Maximum value of SAR (measured) = 0.670 mW/g

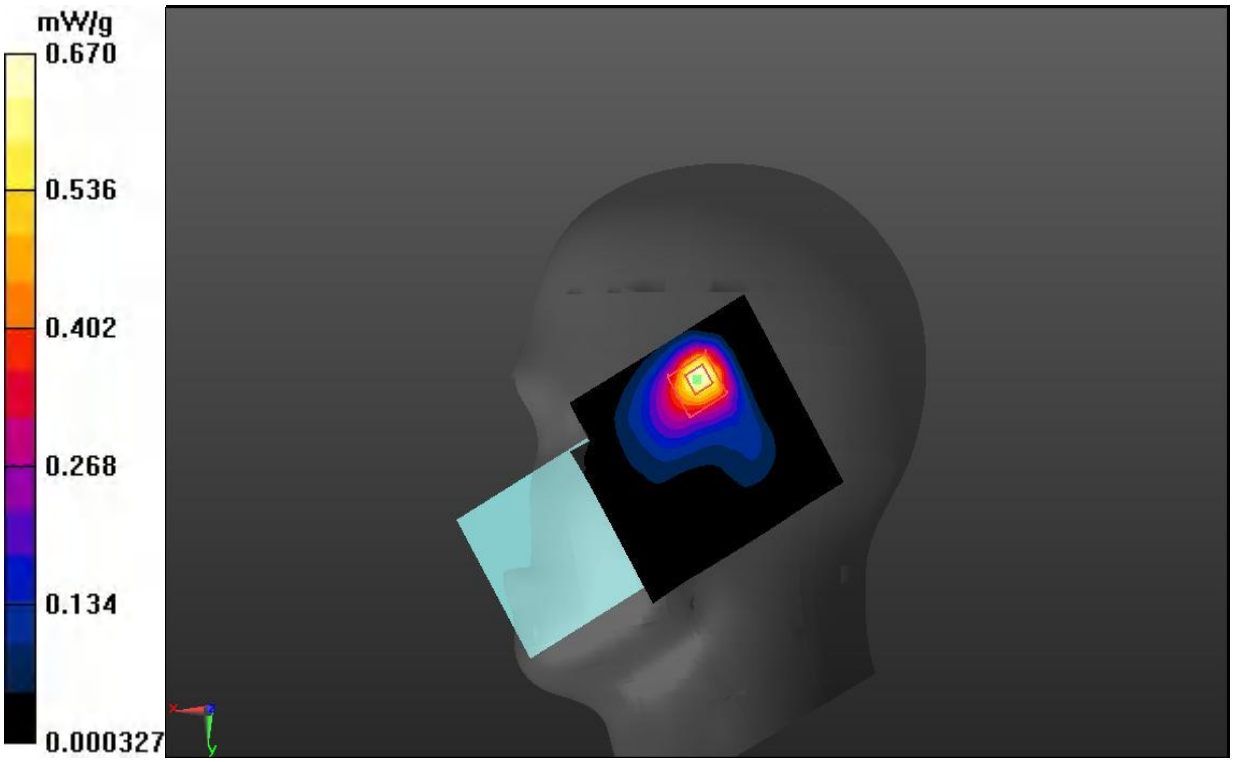


Fig A.34

WLAN2450_CH6 Rear 10mm
Date: 2022/9/13
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 2437 MHz; σ = 1.799 mho/m; εr = 40.36; ρ = 1000 kg/m³
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: WIFI 2.4G (0) Frequency: 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7609 ConvF(8.02, 8.02, 8.02)

Area Scan (131x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.577 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.155 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.7530
SAR(1 g) = 0.374 mW/g; SAR(10 g) = 0.173 mW/g
Maximum value of SAR (measured) = 0.603 mW/g

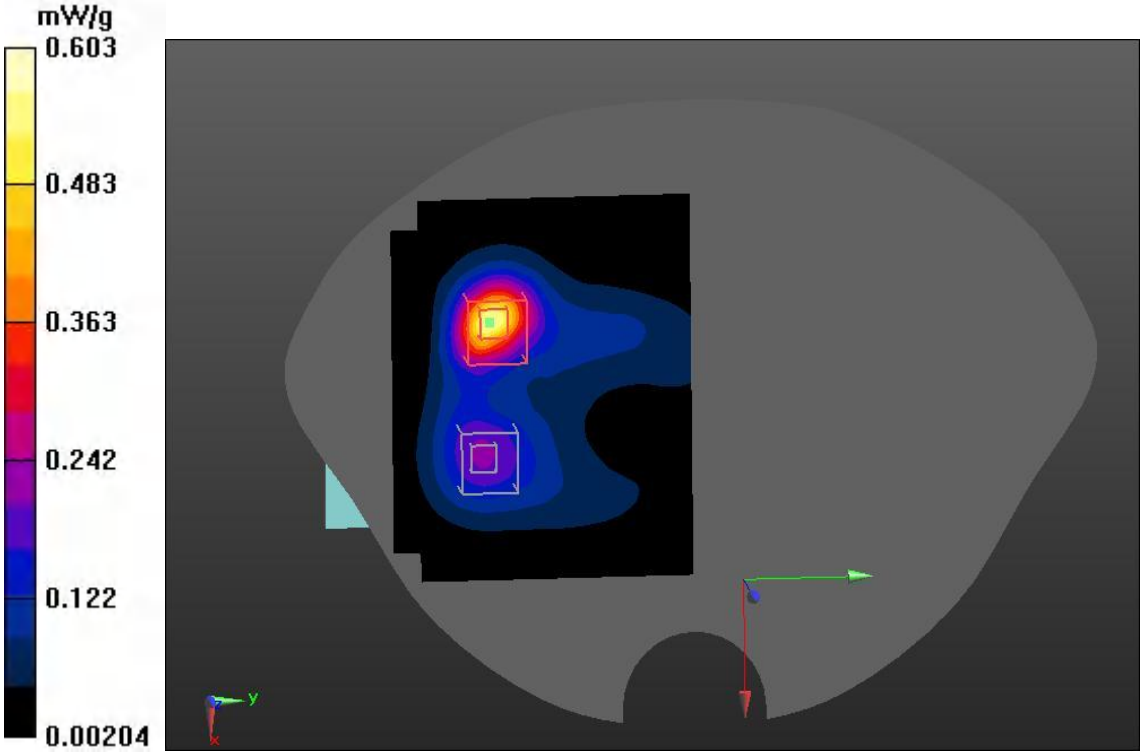


Fig A.35

UNII-3_CH165 Right Touch
Date: 2022/9/18
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 5825 MHz; σ = 5.06 mho/m; ε_r = 34.13; ρ = 1000 kg/m^3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System Band: WIFI 5G; Frequency: 5825 MHz;Duty Cycle: 1:1
Probe: EX3DV4 - SN7609; ConvF(5.1, 5.1, 5.1) @ 5825 MHz;

Area Scan (10x10x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (measured) = 1.83 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 20.00 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 3.42 W/kg
SAR(1 g) = 0.752 W/kg; SAR(10 g) = 0.220 W/kg
Maximum value of SAR (measured) = 1.91 W/kg

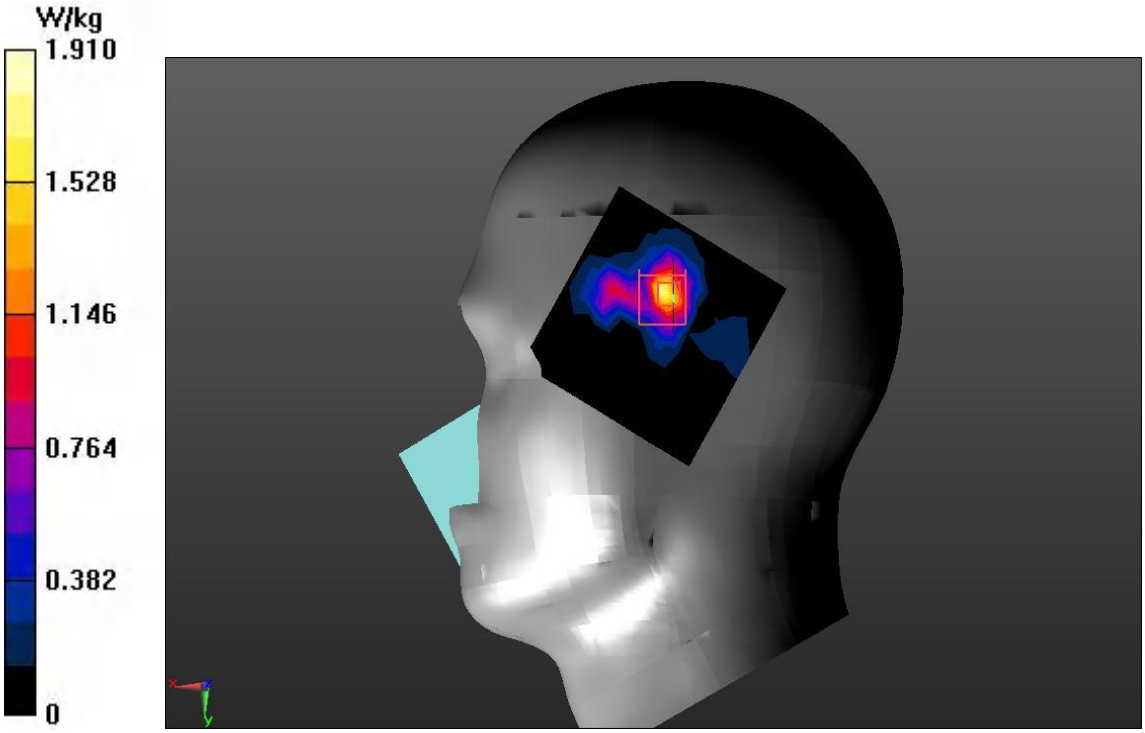


Fig A.36

UNII-3_CH165 Rear 10mm
Date: 2022/9/18
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 5825 MHz; σ = 5.06 mho/m; εr = 34.13; ρ = 1000 kg/m³
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: WIFI 5G (0) Frequency: 5825 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7609 ConvF(5.1, 5.1, 5.1)

Area Scan (101x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (measured) = 1.954 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 1.230 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 3.2510
SAR(1 g) = 0.853 mW/g; SAR(10 g) = 0.291 mW/g
Maximum value of SAR (measured) = 2.055 mW/g

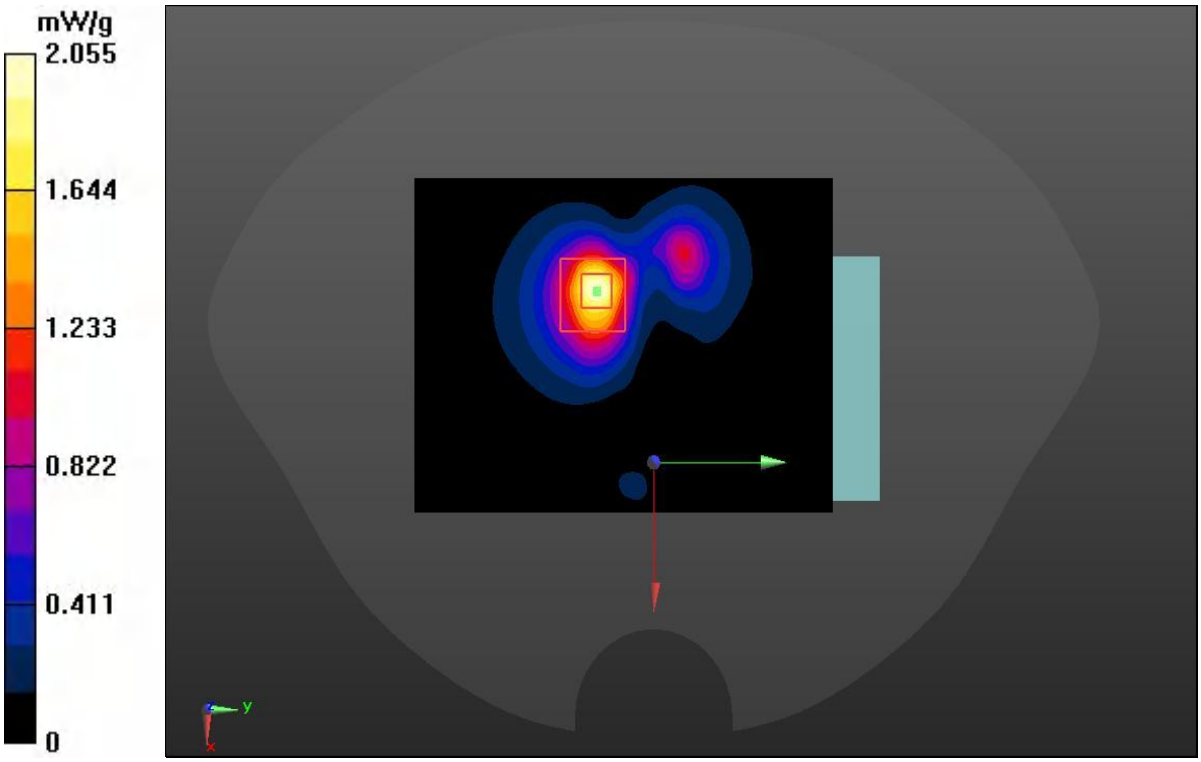


Fig A.37

UNII-3_CH165 Right Touch
Date: 2022/9/18
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 5825 MHz; σ = 5.06 mho/m; εr = 34.13; ρ = 1000 kg/m³
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: WIFI 5G (0) Frequency: 5825 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7609 ConvF(5.1, 5.1, 5.1)

Area Scan (10x10x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (measured) = 1.023 mW/g

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 3.102 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.7000
SAR(1 g) = 0.386 mW/g; SAR(10 g) = 0.112 mW/g
Maximum value of SAR (measured) = 1.002 mW/g

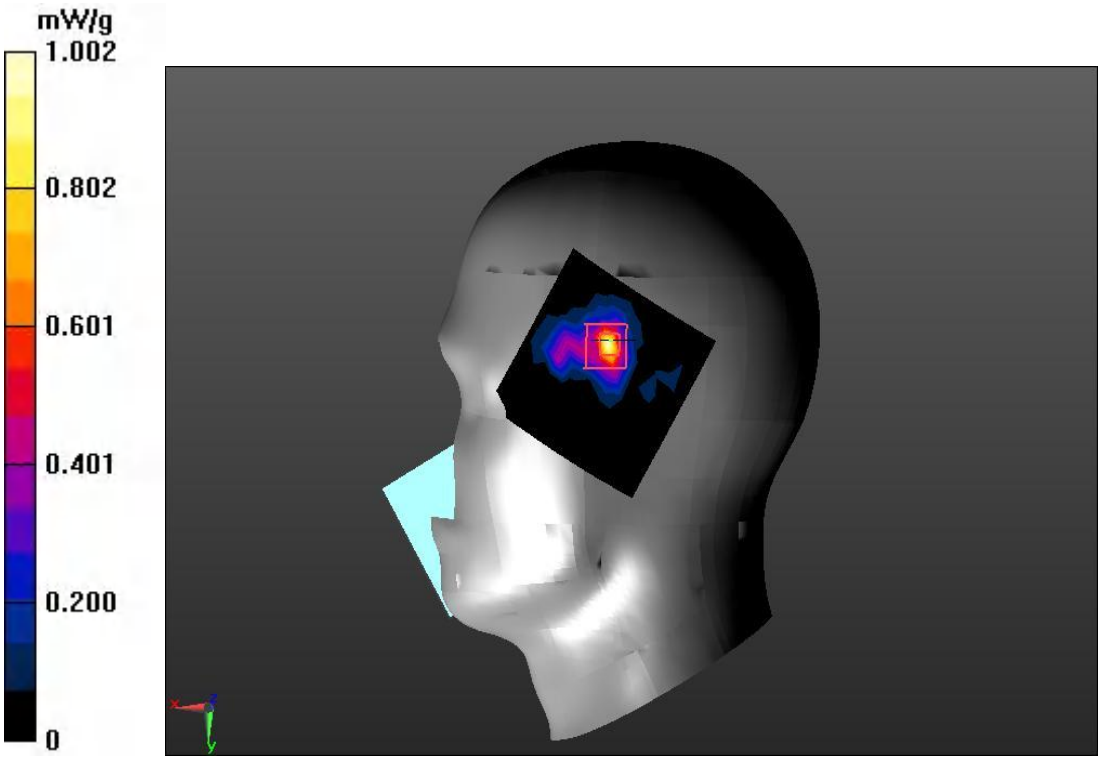


Fig A.38

UNII-2_CH64 Rear 10mm
Date: 2022/9/16
Electronics: DAE4 Sn1250;
Medium: HBBL-600-10000
Medium parameters used (interpolated):
f = 5320 MHz; σ = 4.507 mho/m; εr = 35.18; ρ = 1000 kg/m³
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: WIFI 5G (0) Frequency: 5320 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7609 ConvF(5.5, 5.5, 5.5)

Area Scan (111x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (measured) = 0.823 mW/g

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0 V/m; Power Drift = 0 dB
Peak SAR (extrapolated) = 1.4320
SAR(1 g) = 0.425 mW/g; SAR(10 g) = 0.147 mW/g
Maximum value of SAR (measured) = 0.946 mW/g

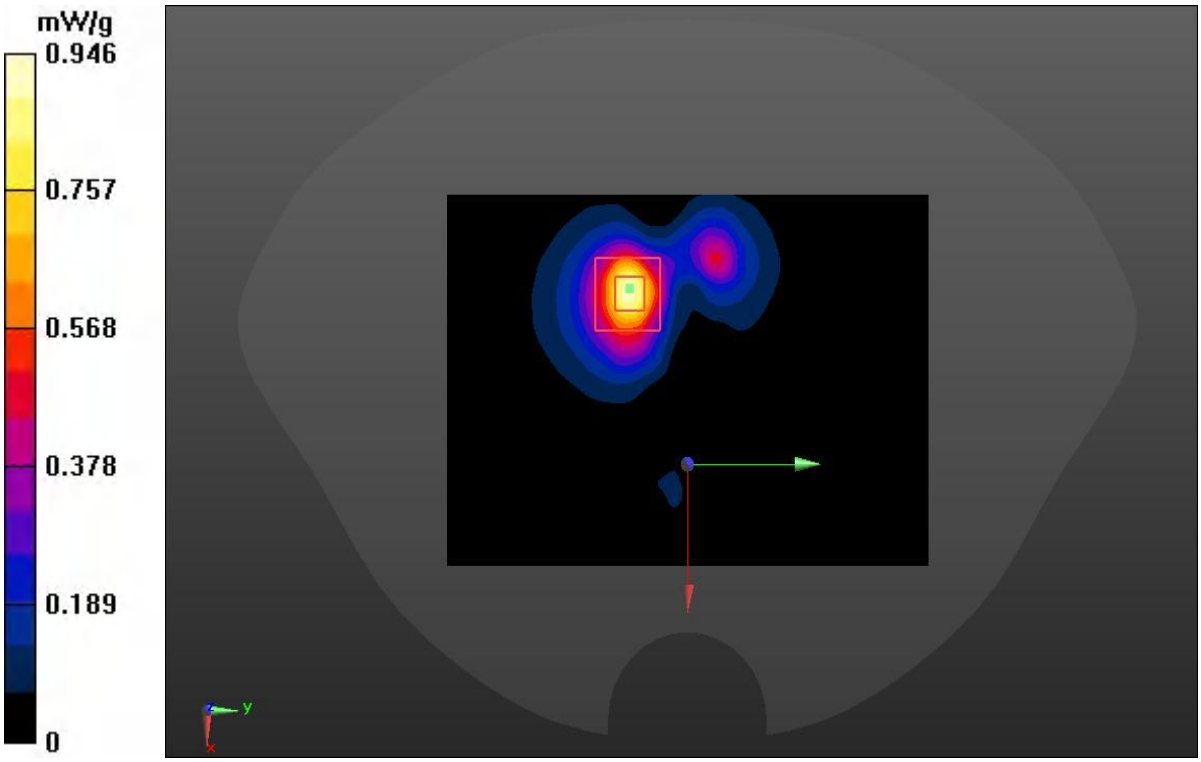
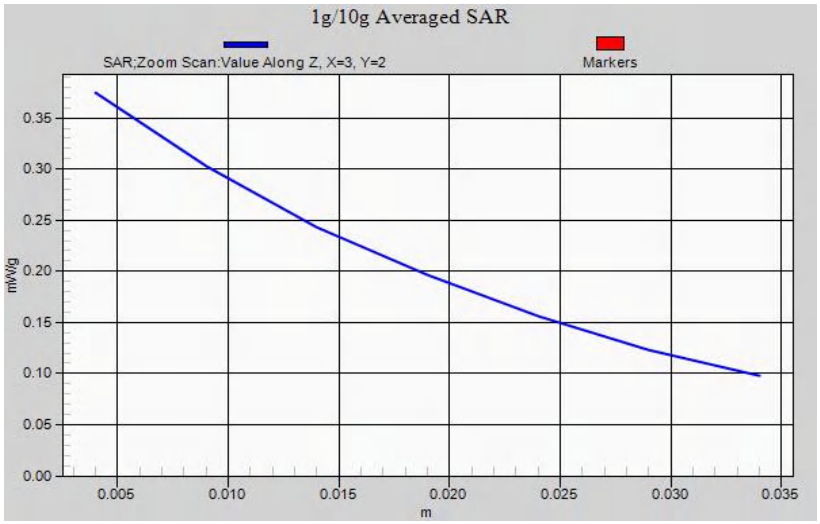
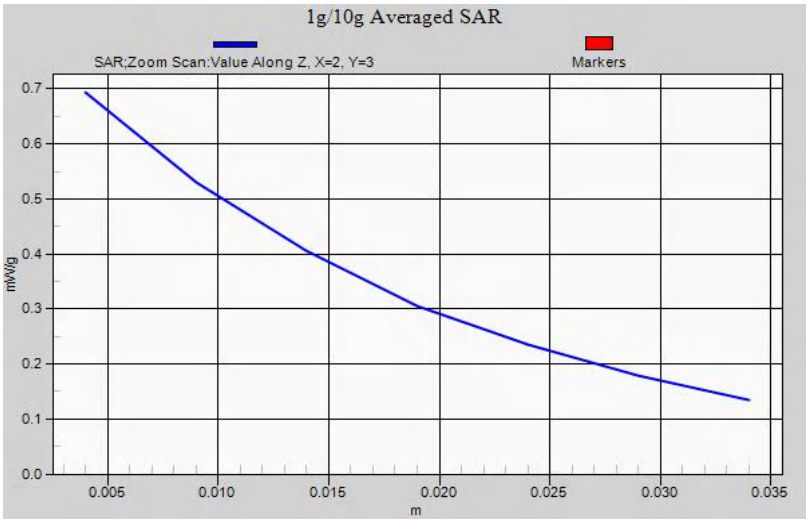


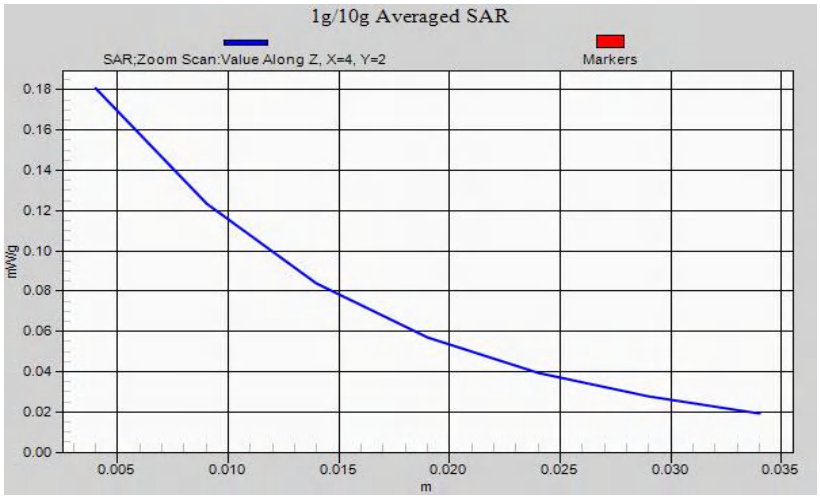
Fig A.39



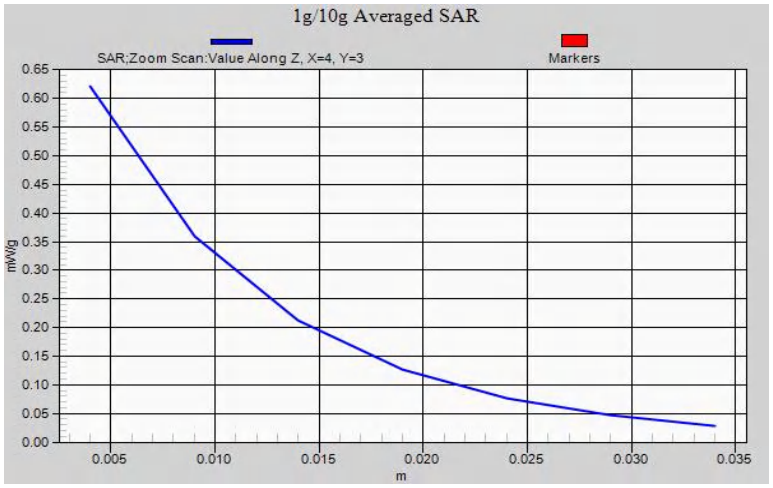
Z-Scan at power reference point-head (850 MHz)



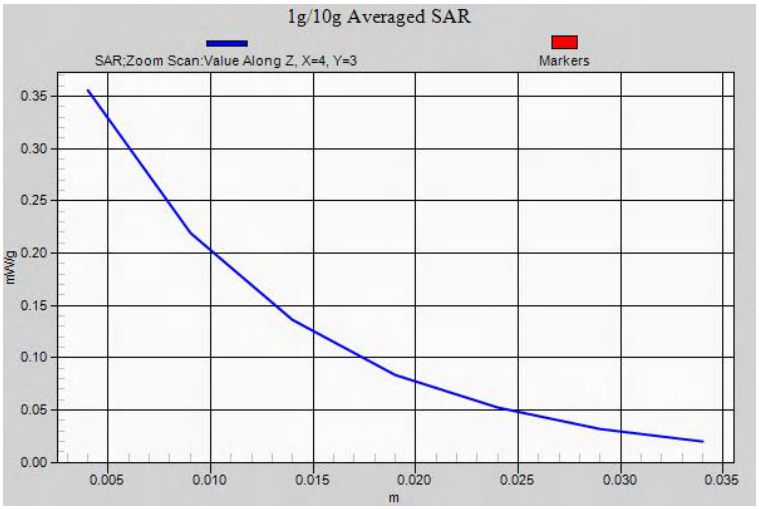
Z-Scan at power reference point-body (850 MHz)



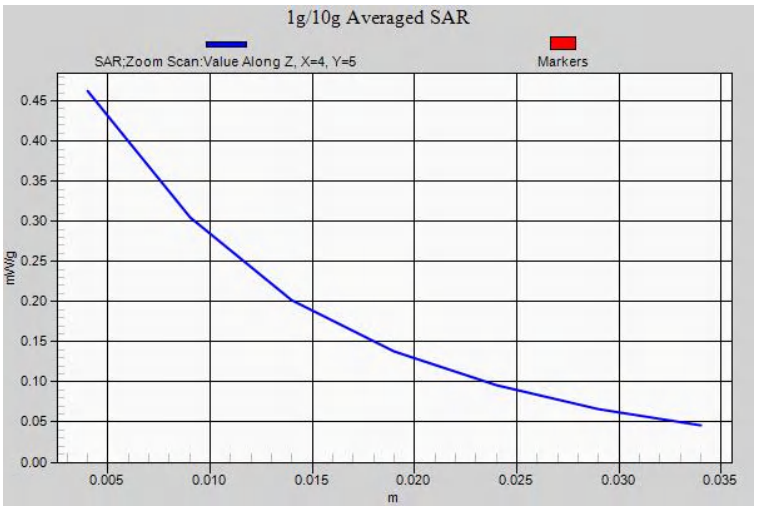
Z-Scan at power reference point-head (1900 MHz)



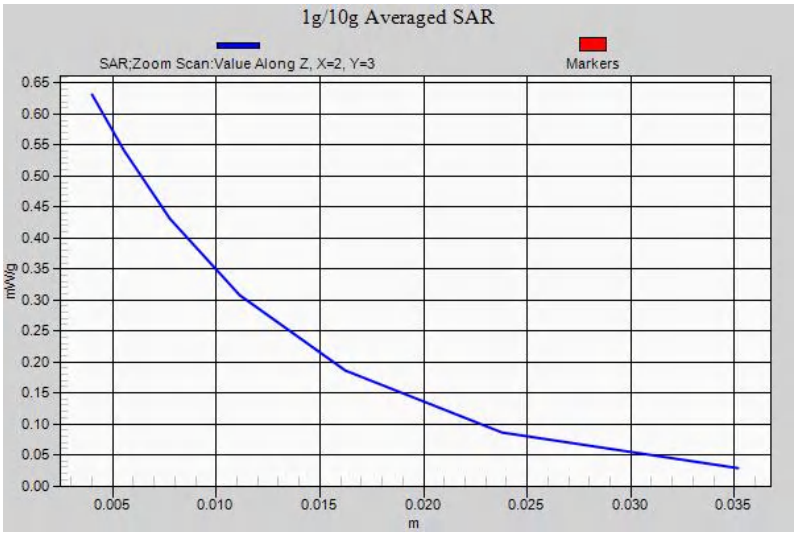
Z-Scan at power reference point-body(1900 MHz)



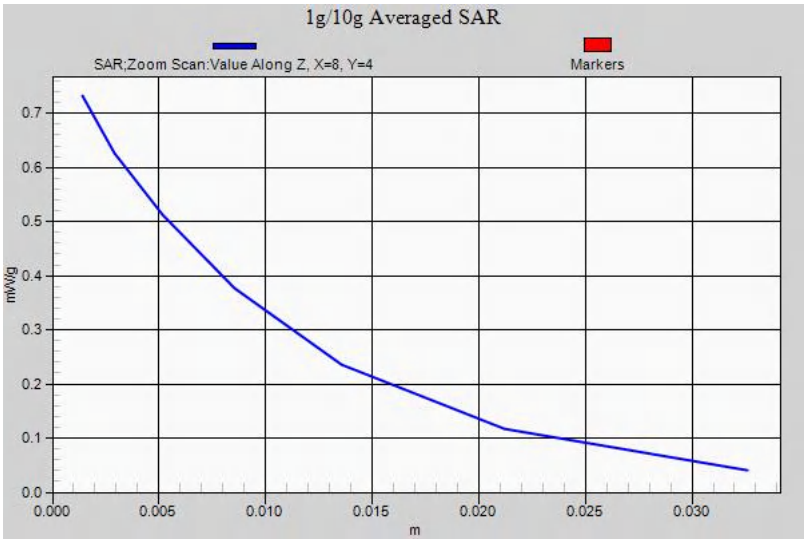
Z-Scan at power reference point-body(1900 MHz)



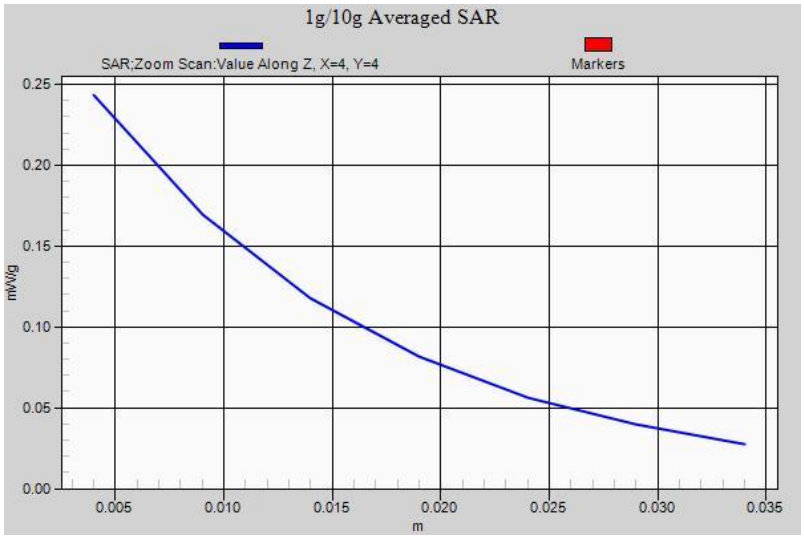
Z-Scan at power reference point-head (WCDMA1900)



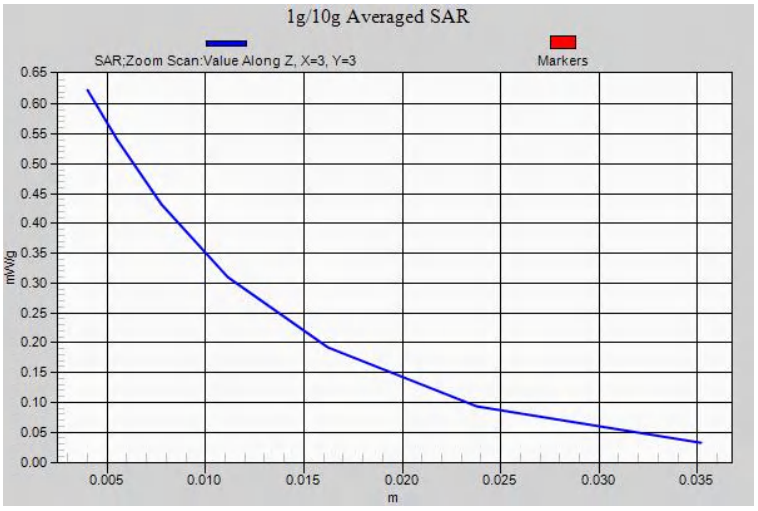
Z-Scan at power reference point -body (WCDMA1900)



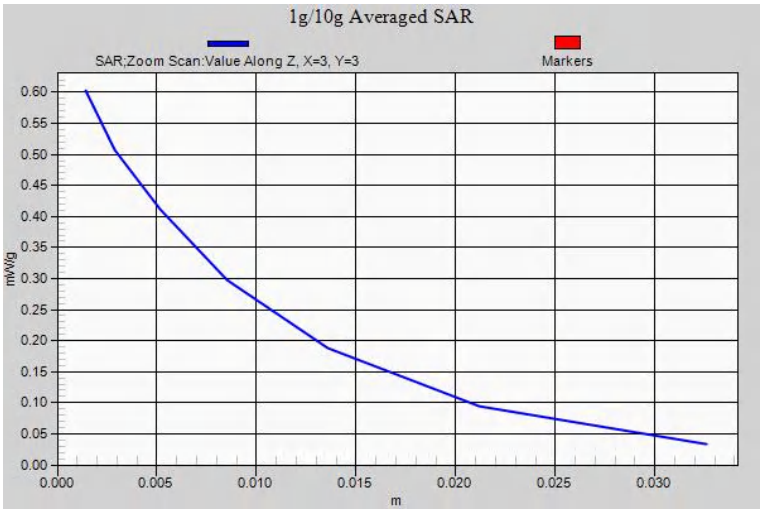
Z-Scan at power reference point -body (WCDMA1900)



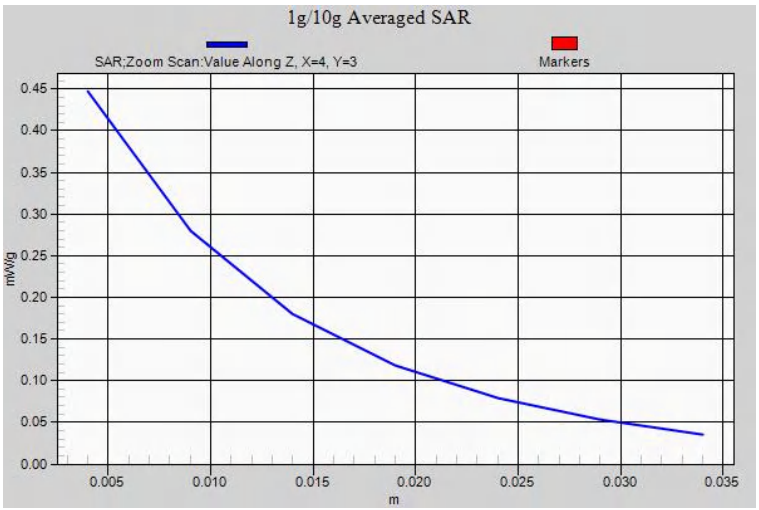
Z-Scan at power reference point -head (WCDMA1700)



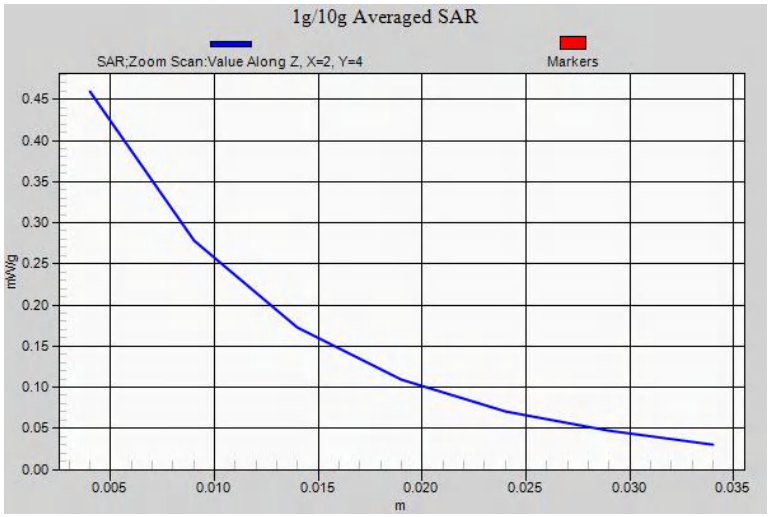
Z-Scan at power reference point-body (WCDMA1700)



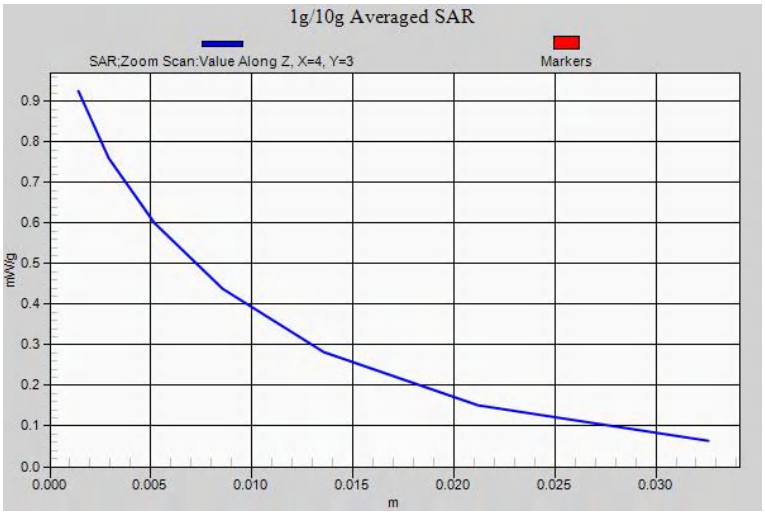
Z-Scan at power reference point -body (WCDMA1700)



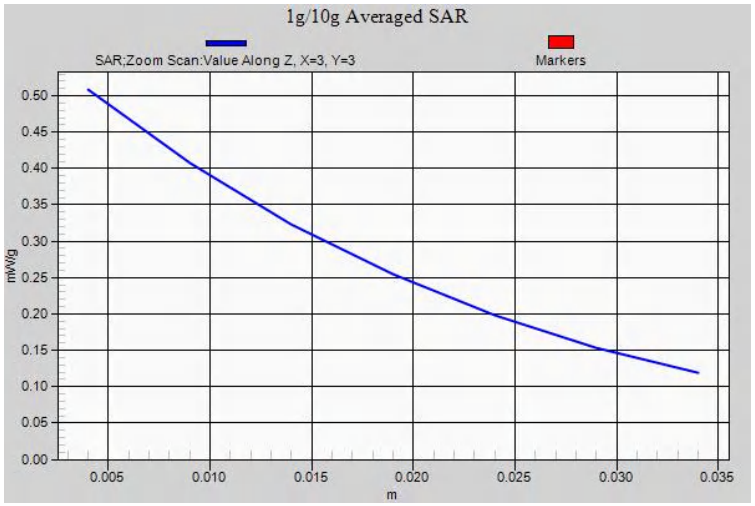
Z-Scan at power reference point -head (WCDMA850)



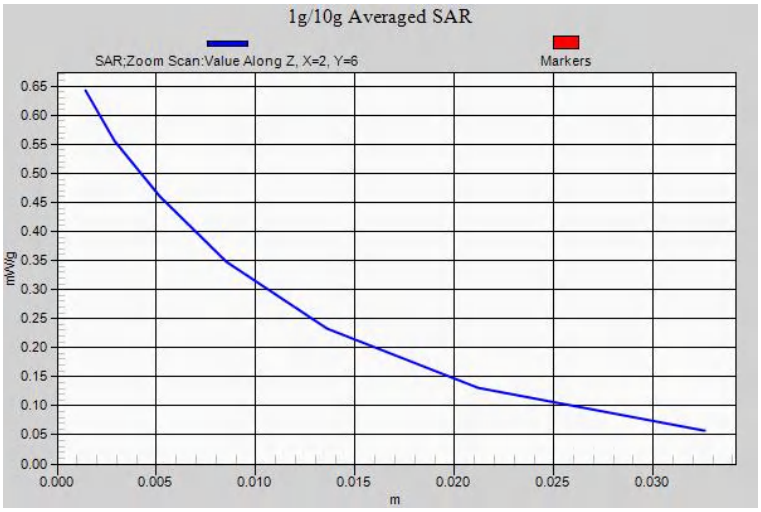
Z-Scan at power reference point-body (WCDMA850)



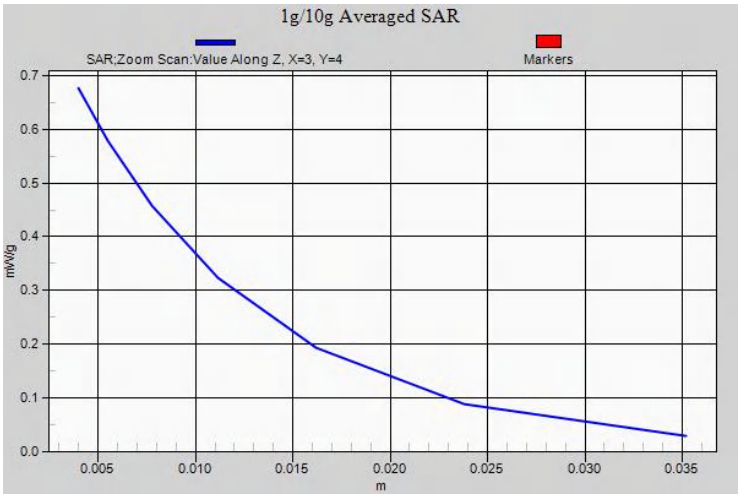
Z-Scan at power reference point-head (LTEB12)



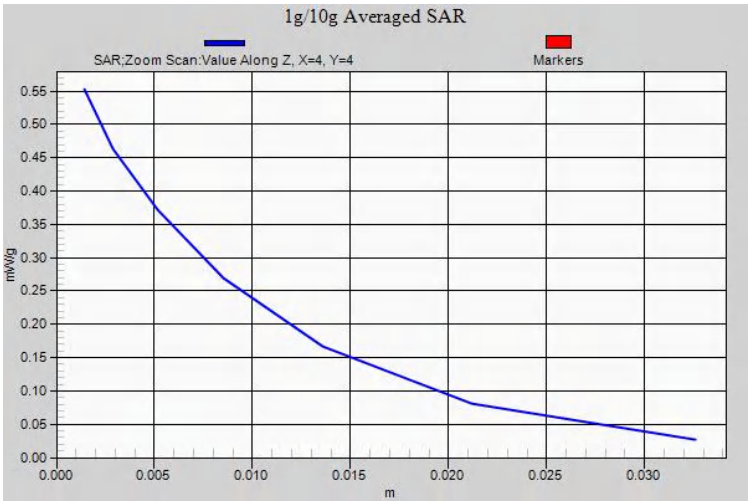
Z-Scan at power reference point-body (LTEB12)



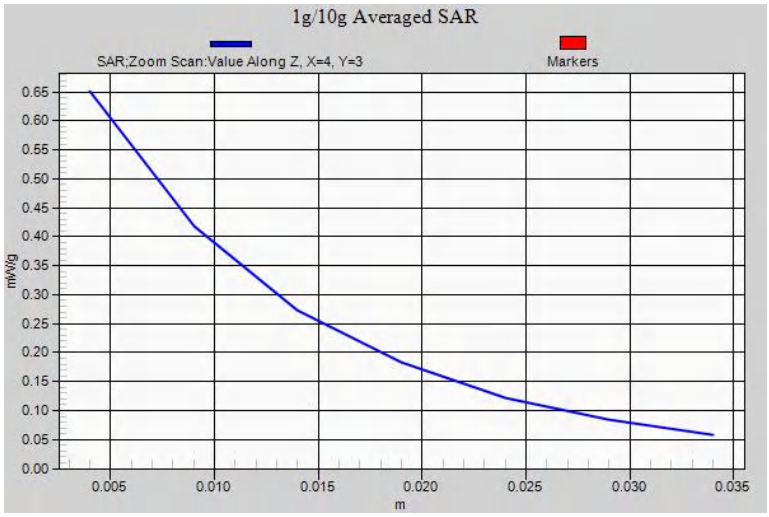
Z-Scan at power reference point-head (LTEB25)



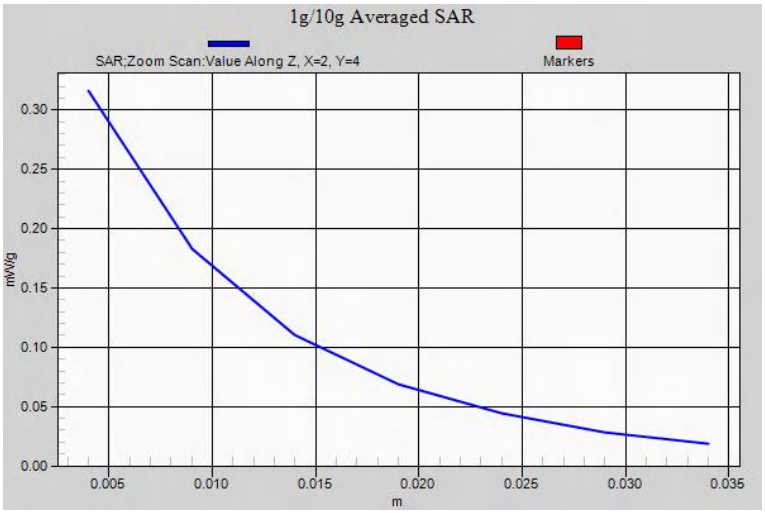
Z-Scan at power reference point-body (LTEB25)



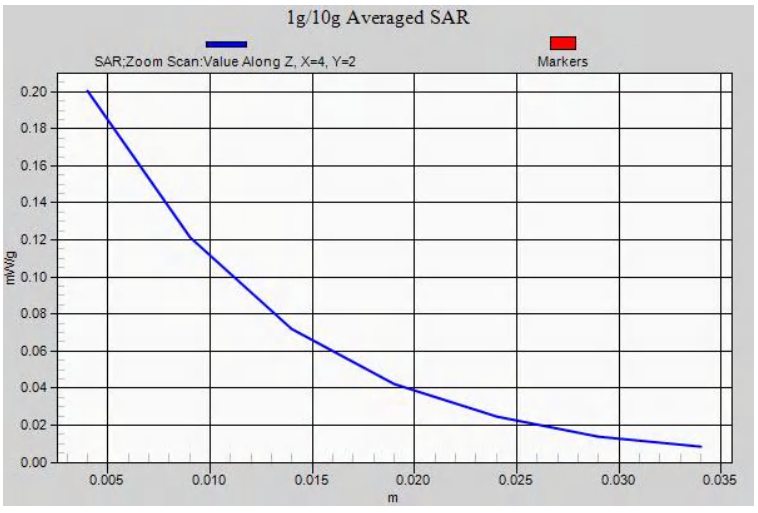
Z-Scan at power reference point-body (LTEB25)



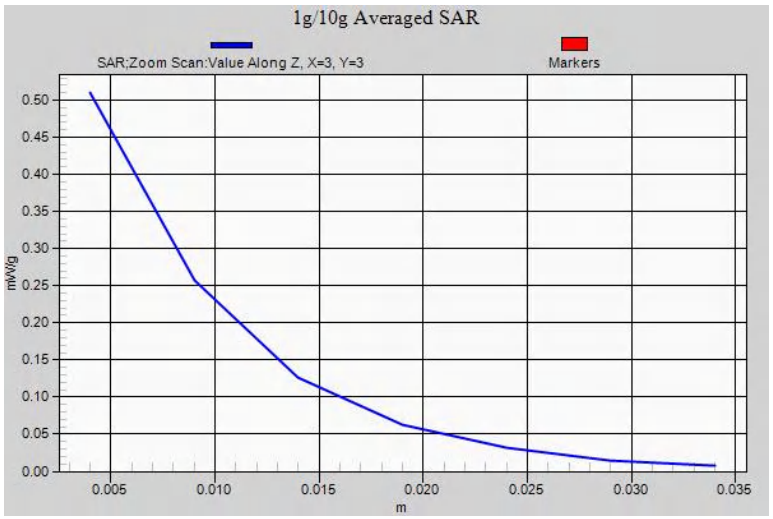
Z-Scan at power reference point -head (LTEB26)



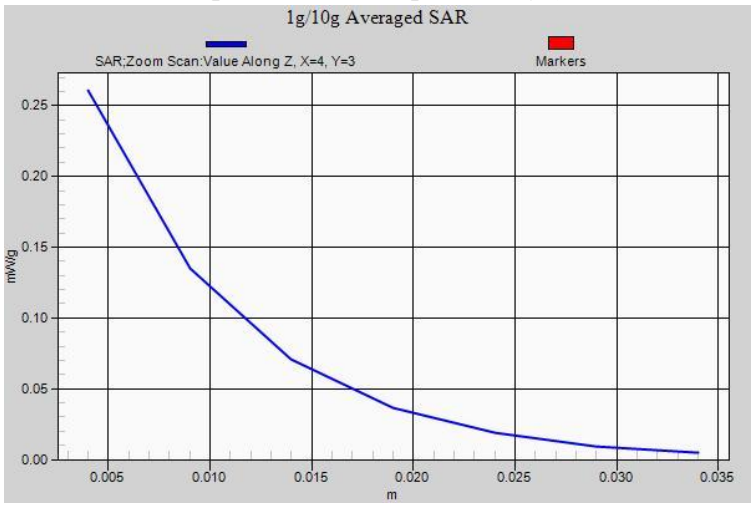
Z-Scan at power reference point -body (LTEB26)



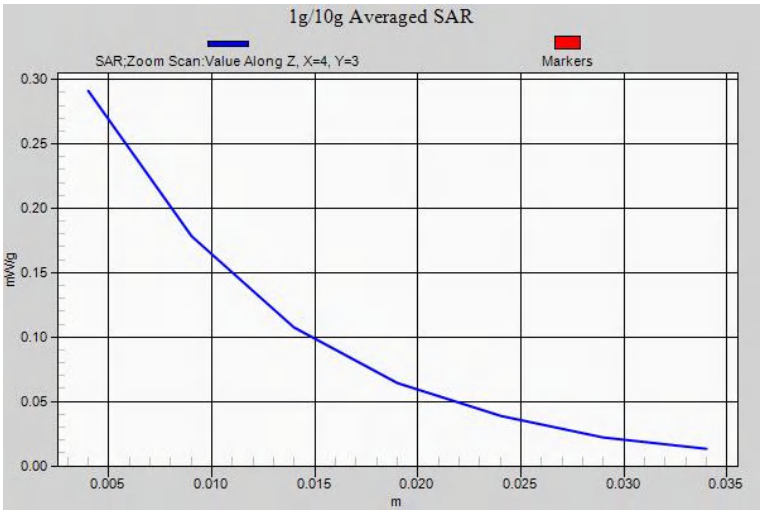
Z-Scan at power reference point -head (LTEB41)



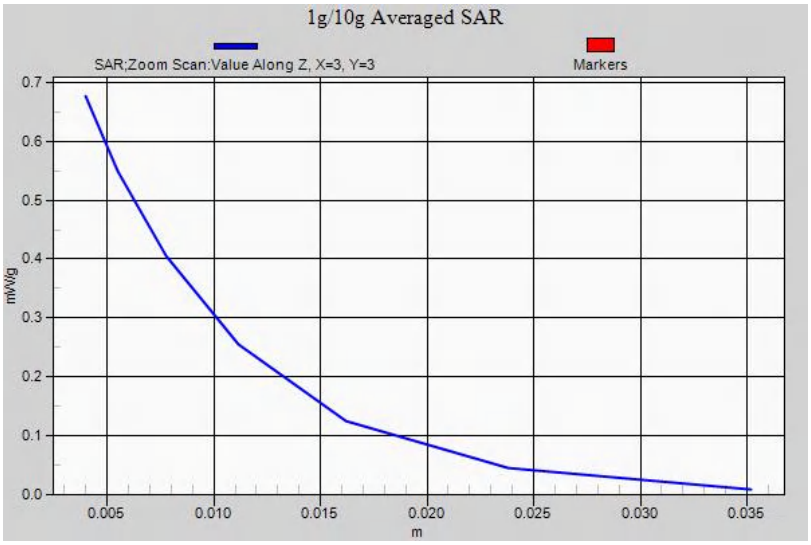
Z-Scan at power reference point-body (LTEB41)



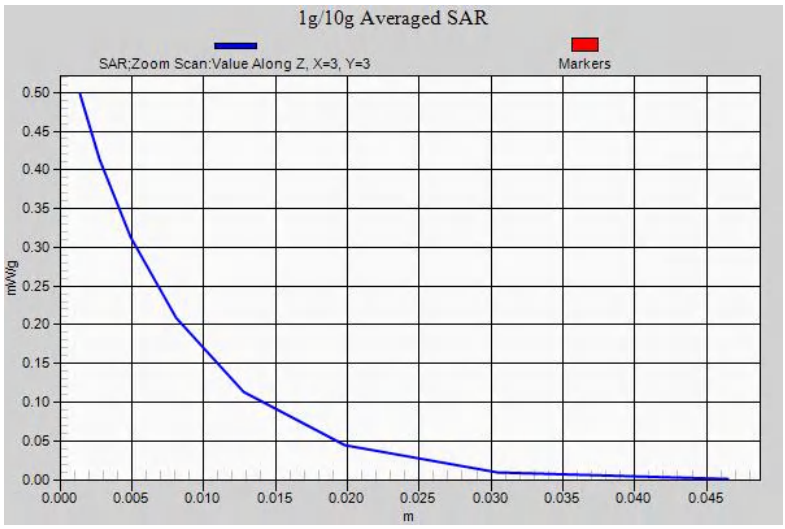
Z-Scan at power reference point -body (LTEB41)



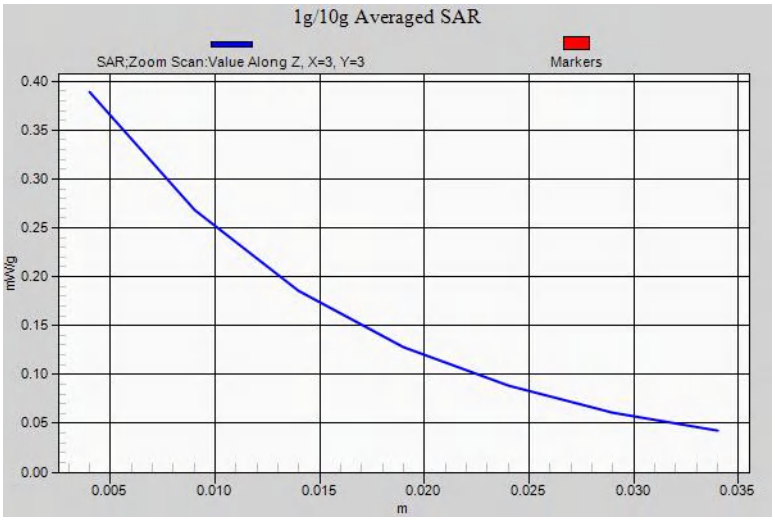
Z-Scan at power reference point-head (LTEB41 PC2)



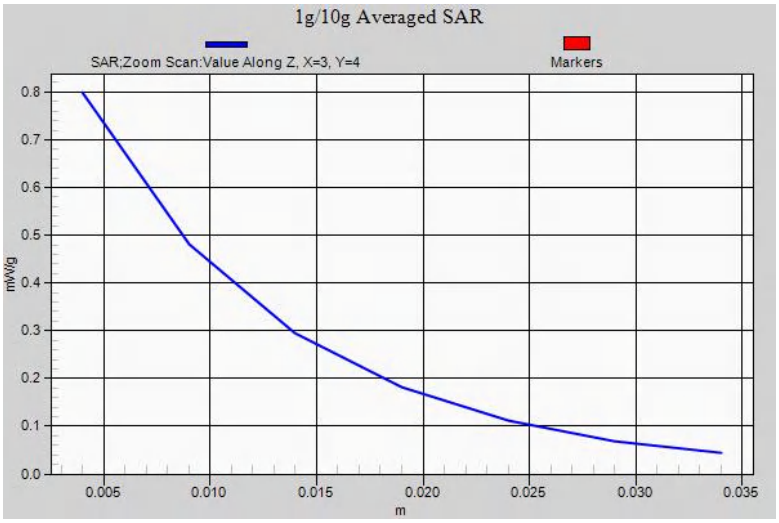
Z-Scan at power reference point -body (LTEB41 PC2)



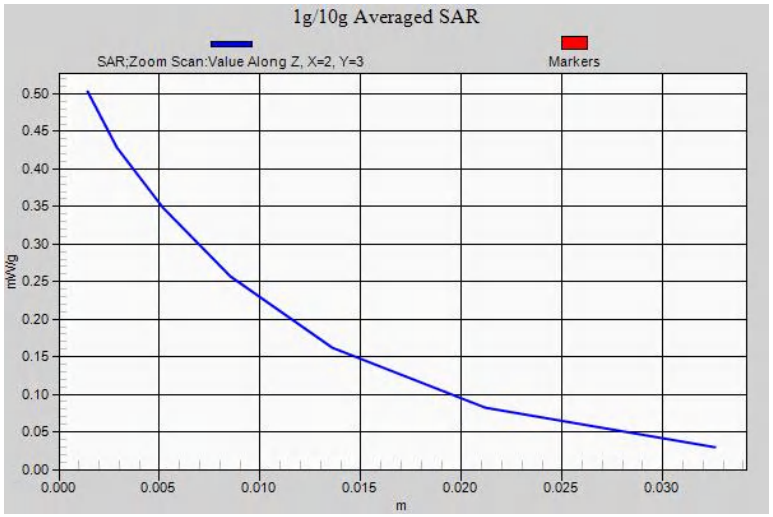
Z-Scan at power reference point-body (LTEB41 PC2)



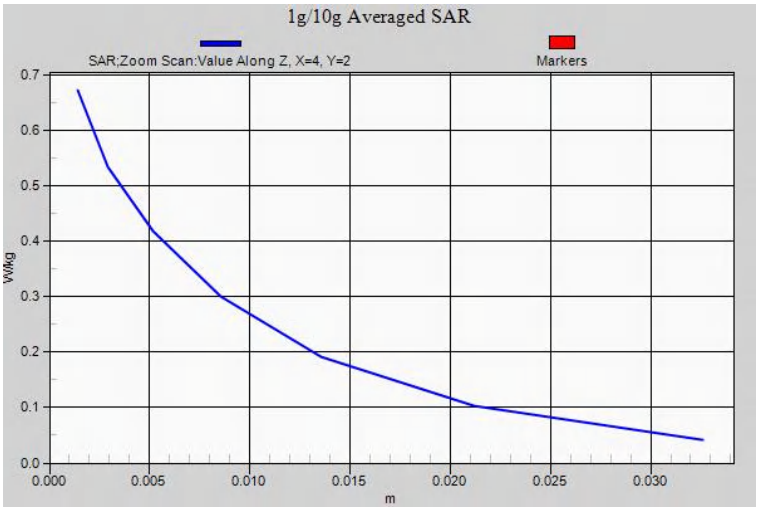
Z-Scan at power reference point-head (LTEB66)



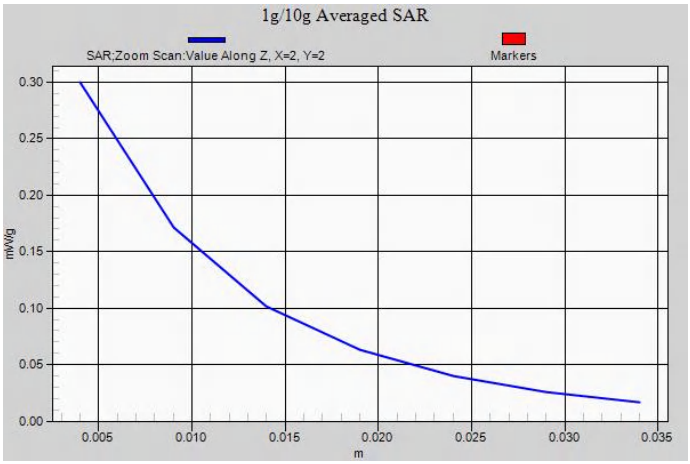
Z-Scan at power reference point-body (LTEB66)



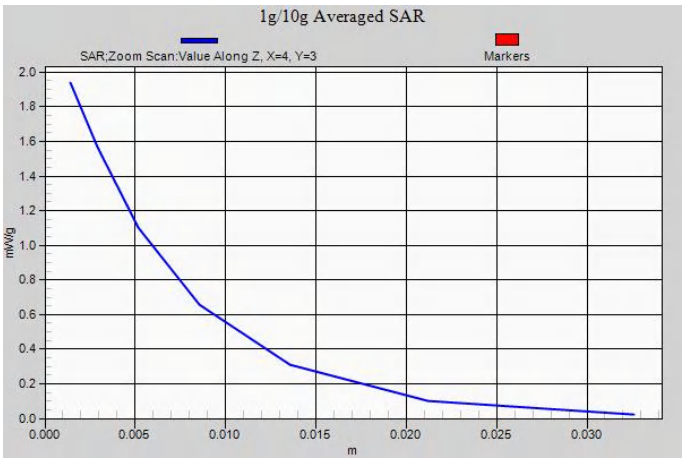
Z-Scan at power reference point-body (LTEB66)



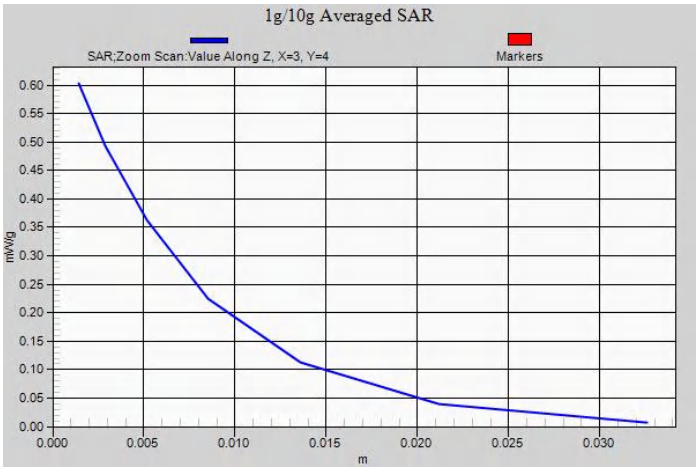
Z-Scan at power reference point -head (LTEB71)



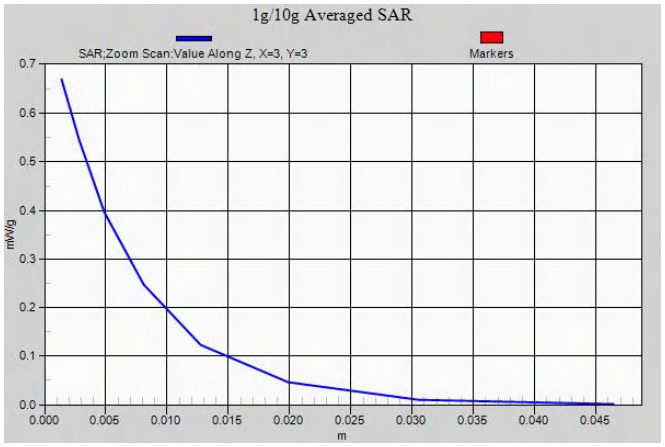
Z-Scan at power reference point-body (LTEB71)



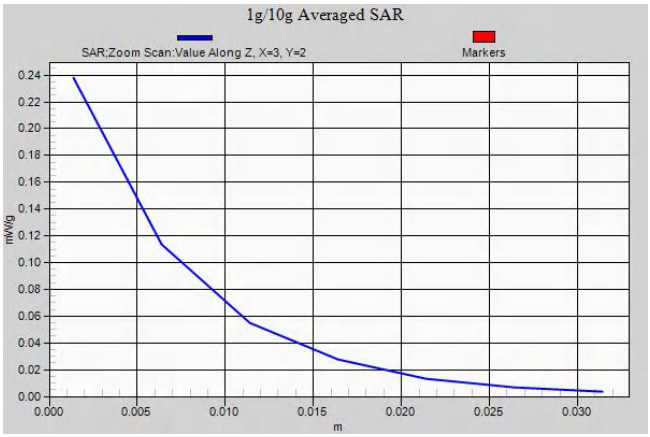
Z-Scan at power reference point -head (WIFI2.4G)



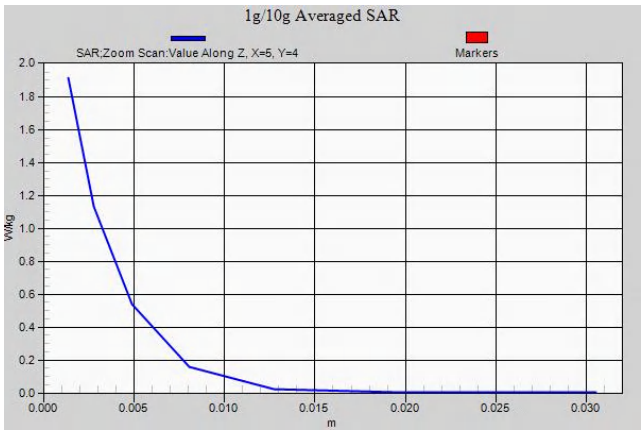
Z-Scan at power reference point -body (WIFI2.4G)



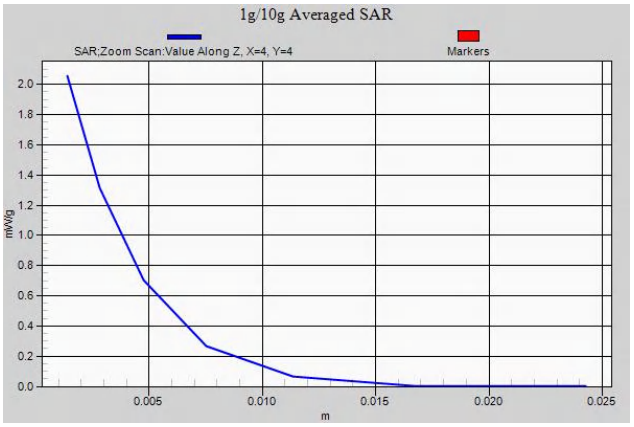
Z-Scan at power reference point -head (WIFI2.4G)



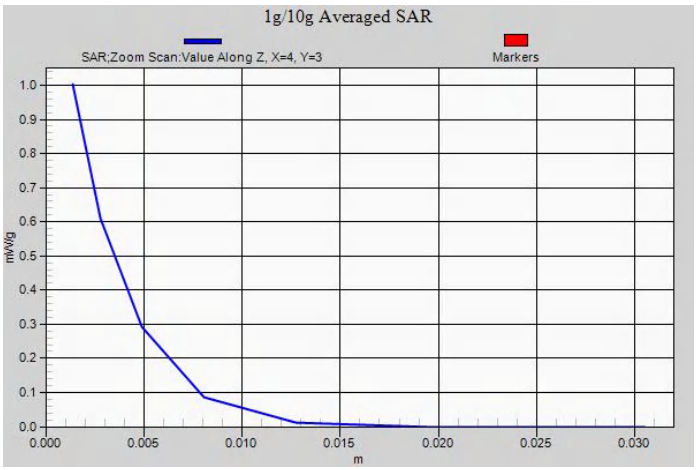
Z-Scan at power reference point-body (WIFI2.4G)



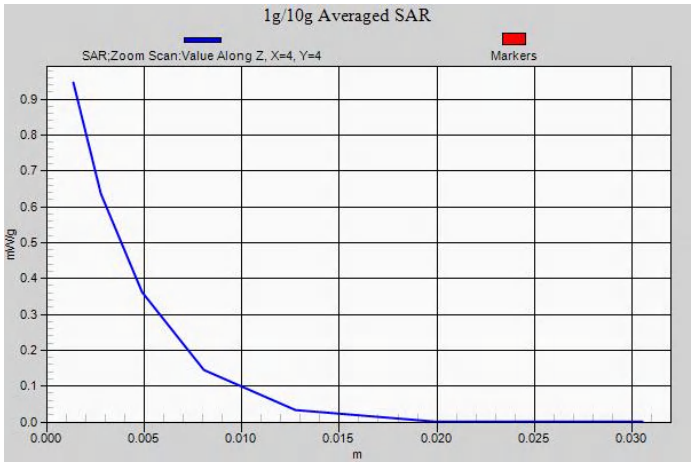
Z-Scan at power reference point-head (WIFI5G)



Z-Scan at power reference point -body (WIFI5G)



Z-Scan at power reference point-head (WIFI5G)



Z-Scan at power reference point -body (WIFI5G)

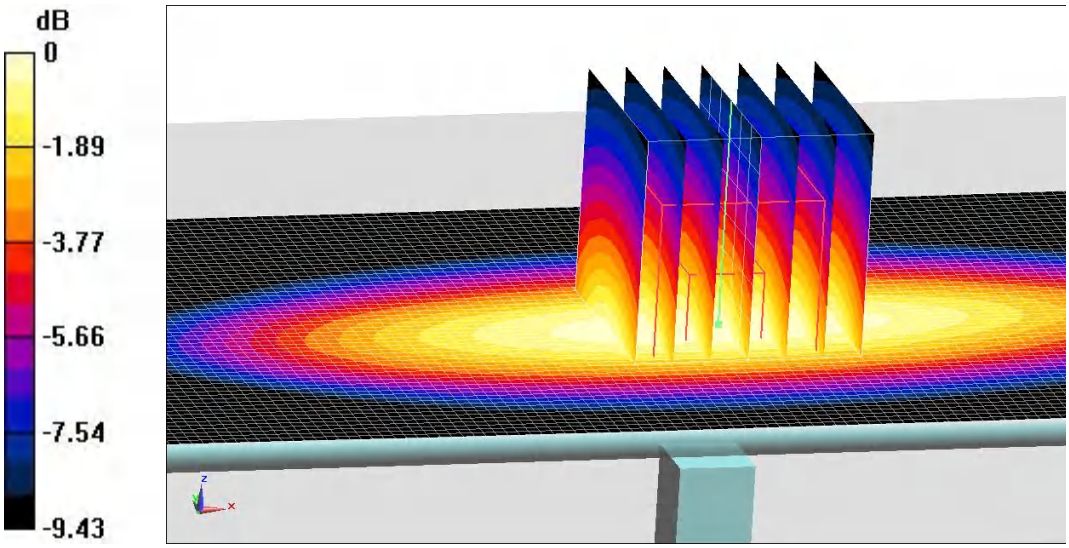
ANNEX B System Verification Results

750MHz

Date: 9/8/2022
Electronics: DAE4 Sn1250
Medium: HBBL-600-10000
Medium parameters used: f = 750MHz; σ= 0.918 mho/m; εr = 43.1; ρ = 1000 kg/m3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: CW Frequency: 750MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7609 ConvF(10.87,10.87,10.87)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =53.73 V/m; Power Drift = 0.01
Fast SAR: SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.42 W/kg
Maximum value of SAR (interpolated) = 2.69 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =53.73 V/m; Power Drift = 0.01
Peak SAR (extrapolated) = 3.04 W/kg
SAR(1 g) = 2.12 W/kg; SAR(10 g) = 1.44 W/kg
Maximum value of SAR (measured) = 2.74 W/kg



0 dB = 2.74 W/kg = 4.38 dB W/kg

Fig.B.1 validation 750MHz 250mW

835MHz

Date: 9/9/2022

Electronics: DAE4 Sn1250

Medium: HBBL-600-10000

Medium parameters used: f = 835MHz; σ = 0.932 mho/m; εr = 42.69; ρ = 1000 kg/m3

Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC

Communication System: CW Frequency: 835MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7609 ConvF(10.53, 10.53, 10.53)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value =57.63 V/m; Power Drift = -0.02 dB

Fast SAR: SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.54 W/kg

Maximum value of SAR (interpolated) = 3.09 W/kg

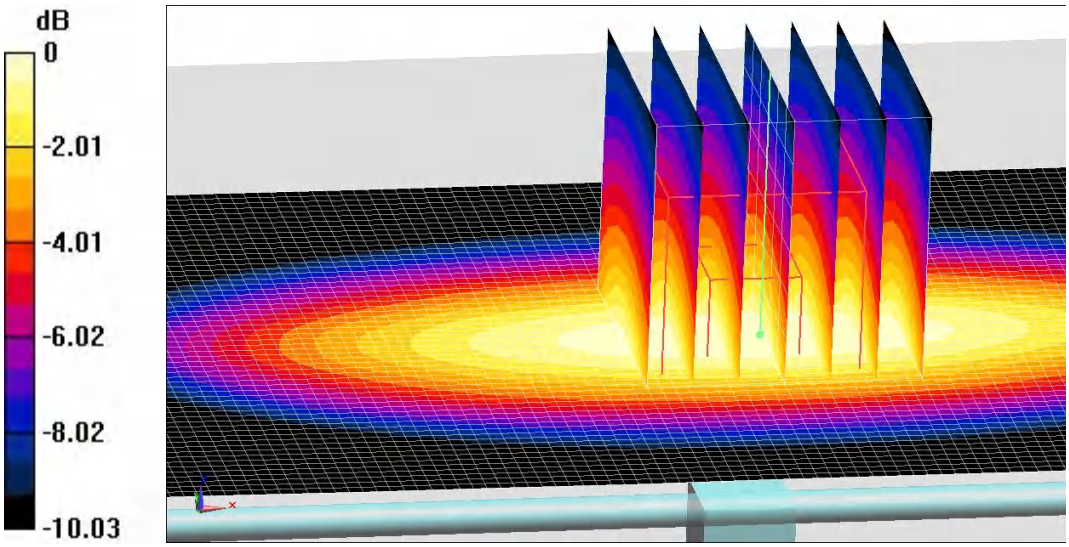
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value =57.63 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.53 W/kg

SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.57 W/kg

Maximum value of SAR (measured) = 3.13 W/kg



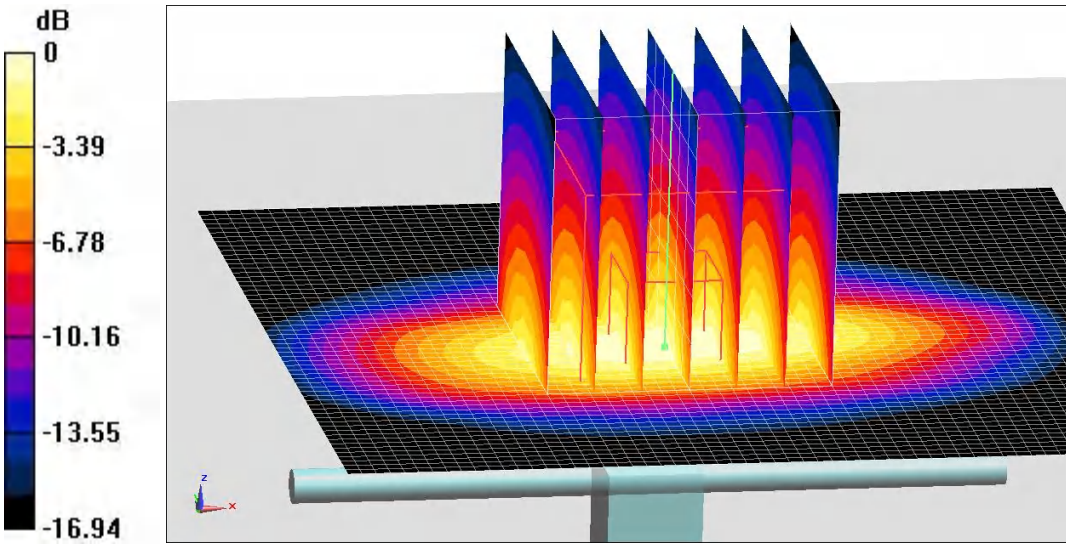
0 dB = 3.13 W/kg = 4.96 dB W/kg

Fig.B.2 validation 835MHz 250mW

1750MHz
Date: 9/10/2022
Electronics: DAE4 Sn1250
Medium: HBBL-600-10000
Medium parameters used: f = 1750MHz; σ = 1.367 mho/m; εr = 40.79; ρ = 1000 kg/m3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System: CW Frequency: 1750MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7609 ConvF(8.85, 8.85, 8.85)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =90.69 V/m; Power Drift = -0.06 dB
Fast SAR: SAR(1 g) = 9.24 W/kg; SAR(10 g) = 5.11 W/kg
Maximum value of SAR (interpolated) = 14.3 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =90.69 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 17.0 W/kg
SAR(1 g) = 9.06 W/kg; SAR(10 g) = 4.97 W/kg
Maximum value of SAR (measured) = 14.1 W/kg



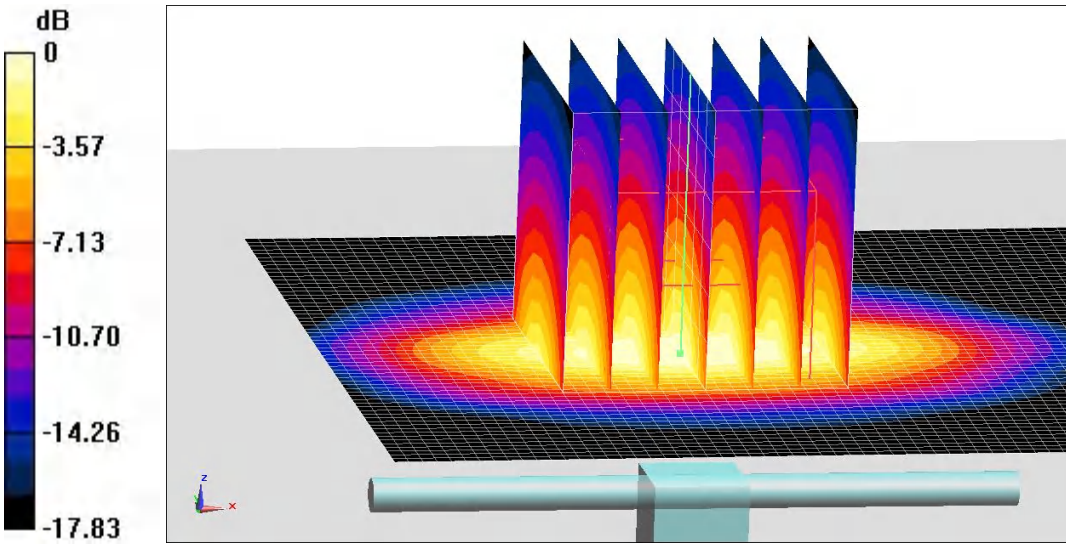
0 dB = 14.1 W/kg = 11.49 dB W/kg

Fig.B.3 validation 1750MHz 250mW

1900MHz
Date: 9/11/2022
Electronics: DAE4 Sn1250
Medium: HBBL-600-10000
Medium parameters used: f = 1900MHz; σ= 1.458 mho/m; εr = 40.81; ρ = 1000 kg/m3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: CW Frequency: 1900MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7609 ConvF(8.62, 8.62, 8.62)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =97.51 V/m; Power Drift = 0.08 dB
Fast SAR: SAR(1 g) = 9.75 W/kg; SAR(10 g) = 4.98 W/kg
Maximum value of SAR (interpolated) = 15.4 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =97.51 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 18.9 W/kg
SAR(1 g) = 9.91 W/kg; SAR(10 g) = 5.12 W/kg
Maximum value of SAR (measured) = 15.6 W/kg



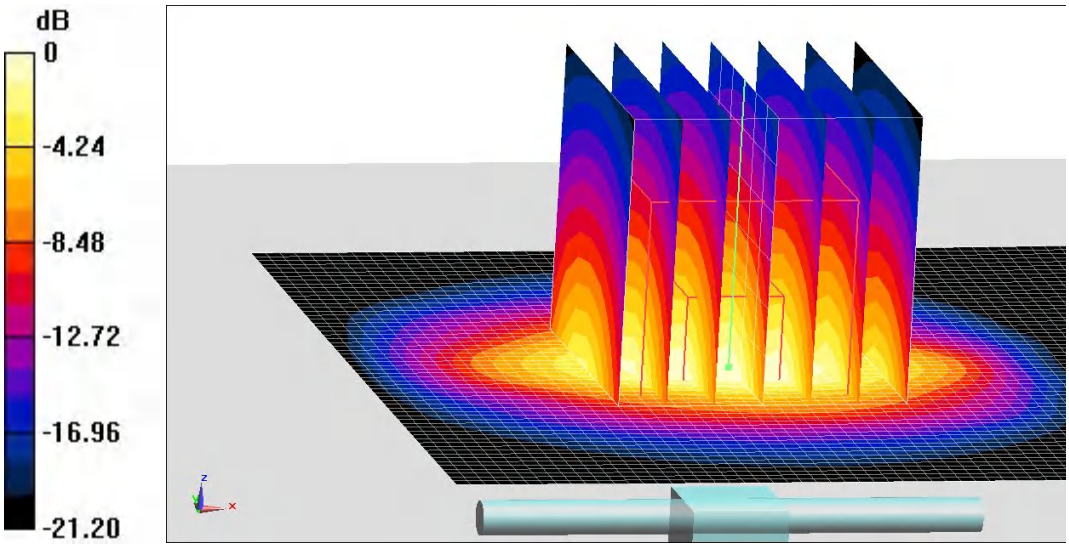
0 dB = 15.6 W/kg = 11.93 dB W/kg

Fig.B.4 validation 1900MHz 250mW

2450MHz
Date: 9/12/2022
Electronics: DAE4 Sn1250
Medium: HBBL-600-10000
Medium parameters used: f = 2450MHz; σ= 1.824 mho/m; εr = 40.2; ρ = 1000 kg/m3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: CW Frequency: 2450MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7609 ConvF(8.02, 8.02, 8.02)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =105.3 V/m; Power Drift = 0.02 dB
Fast SAR: SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.29 W/kg
Maximum value of SAR (interpolated) = 21.8 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =105.3 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 26.5 W/kg
SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.22 W/kg
Maximum value of SAR (measured) = 21.7 W/kg



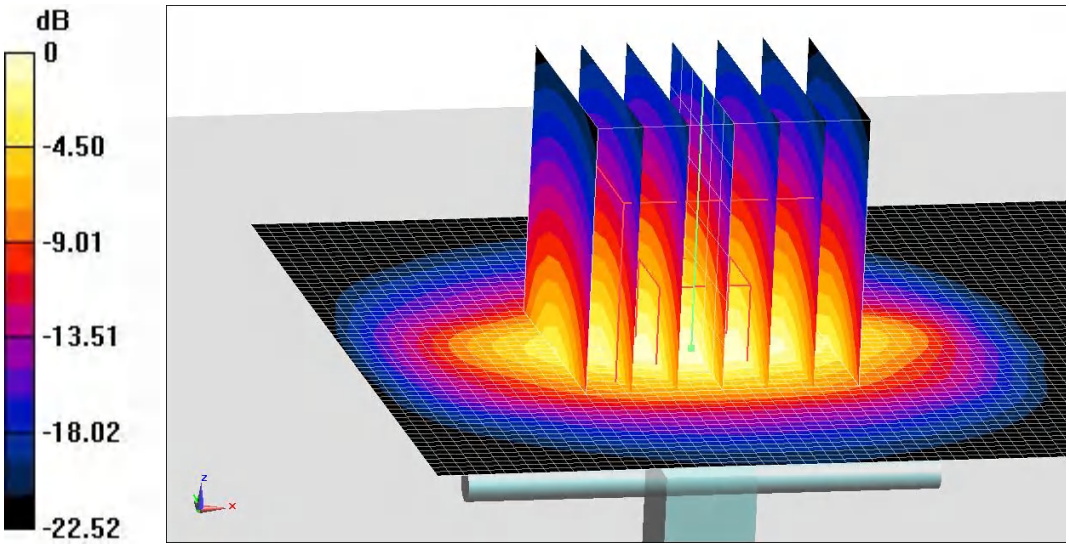
0 dB = 21.7 W/kg = 13.36 dB W/kg

Fig.B.5 validation 2450MHz 250mW

2450MHz
Date: 9/13/2022
Electronics: DAE4 Sn1250
Medium: HBBL-600-10000
Medium parameters used: f = 2450MHz; σ= 1.812 mho/m; εr = 40.1; ρ = 1000 kg/m3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: CW Frequency: 2450MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7609 ConvF(8.02, 8.02, 8.02)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =100.8 V/m; Power Drift = 0.03 dB
Fast SAR: SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.16 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 =100.8 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 28.1 W/kg
SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.08 W/kg
Maximum value of SAR (measured) = 22.4 W/kg



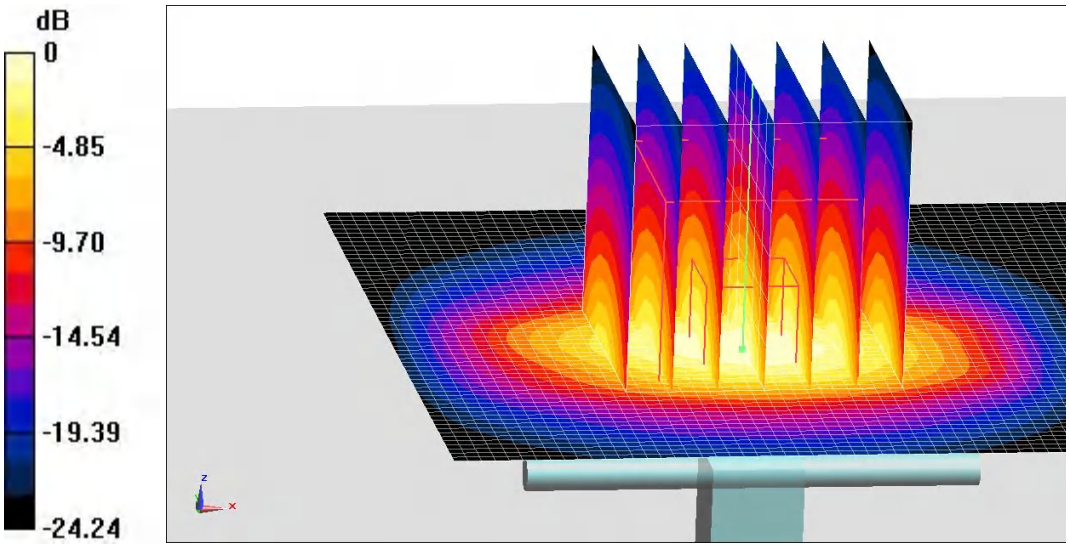
0 dB = 22.4 W/kg = 13.50 dB W/kg

Fig.B.6 validation 2450MHz 250mW

2600MHz
Date: 9/14/2022
Electronics: DAE4 Sn1250
Medium: HBBL-600-10000
Medium parameters used: f = 2600MHz; σ= 1.938 mho/m; εr = 38.74; ρ = 1000 kg/m3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: CW Frequency: 2600MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7609 ConvF(7.77, 7.77, 7.77)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =91.63 V/m; Power Drift = -0.07 dB
Fast SAR: SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.24 W/kg
Maximum value of SAR (interpolated) = 24.8 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =91.63 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 31.6 W/kg
SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.39 W/kg
Maximum value of SAR (measured) = 25.0 W/kg



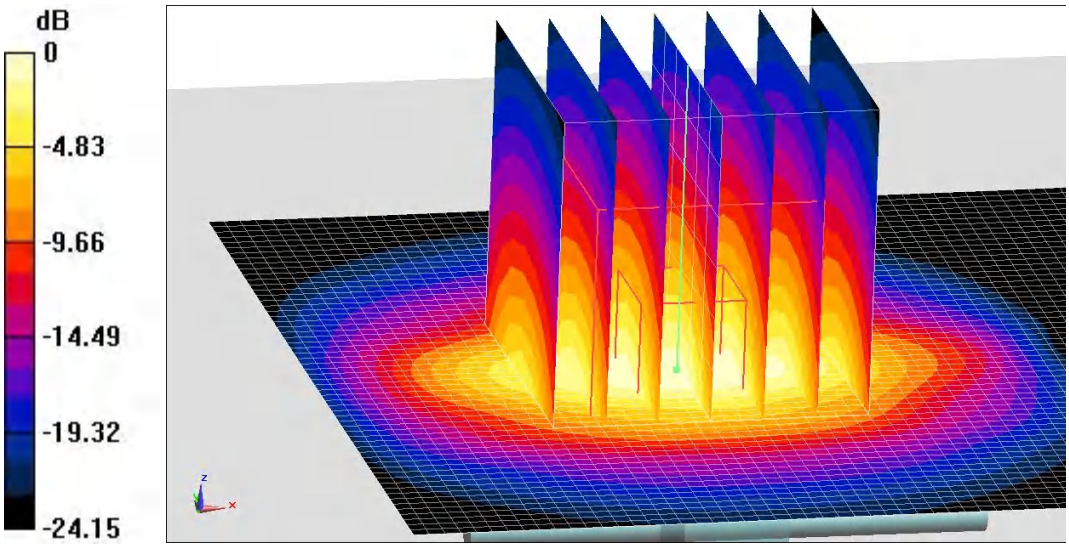
0 dB = 25.0 W/kg = 13.98 dB W/kg

Fig.B.7 validation 2600MHz 250mW

2600MHz
Date: 9/15/2022
Electronics: DAE4 Sn1250
Medium: HBBL-600-10000
Medium parameters used: f = 2600MHz; σ= 1.932 mho/m; εr = 39.82; ρ = 1000 kg/m3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: CW Frequency: 2600MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7609 ConvF(7.77, 7.77, 7.77)

System Validation /Area Scan (81x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value =100.2 V/m; Power Drift = -0.02 dB
Fast SAR: SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.26 W/kg
Maximum value of SAR (interpolated) = 25.0 W/kg

System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value =100.2 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 31.8 W/kg
SAR(1 g) = 14.3 W/kg; SAR(10 g) = 6.35 W/kg
Maximum value of SAR (measured) = 25.1 W/kg



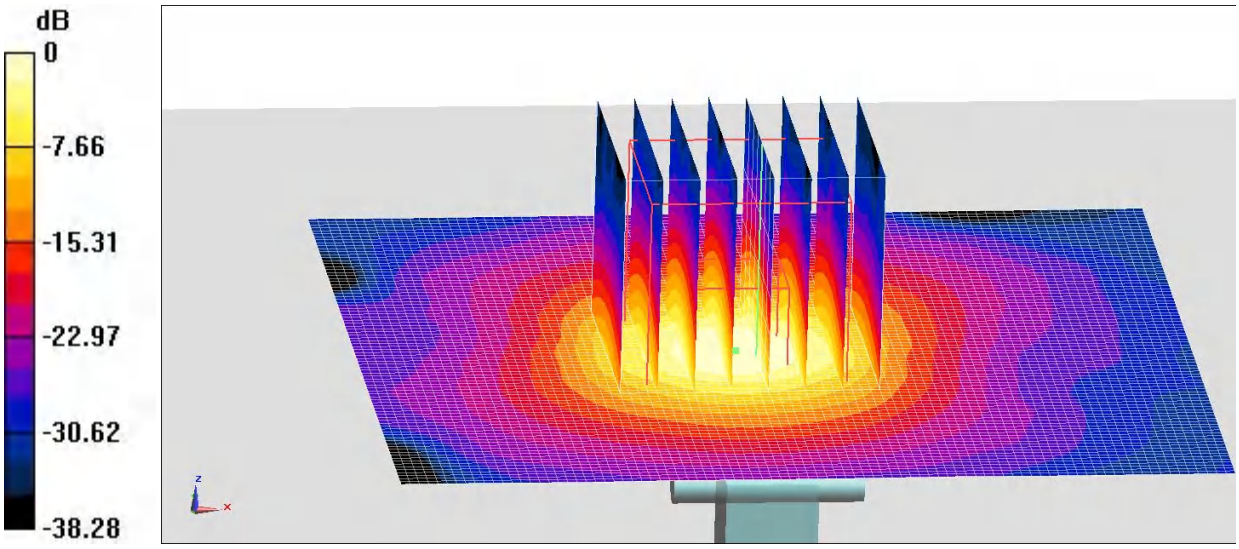
0 dB = 25.1 W/kg = 14.00 dB W/kg

Fig.B.8 validation 2600MHz 250mW

5250MHz
Date: 9/16/2022
Electronics: DAE4 Sn1250
Medium: HBBL-600-10000
Medium parameters used: f = 5250 MHz; σ= 4.558 mho/m; εr = 35.36; ρ = 1000 kg/m3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System: UID 0, CW (0) Frequency: 5250 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7609 ConvF(5.50, 5.50, 5.50)

System Validation /Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 19.1 W/kg

System Validation /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value =63.10 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 36.7 W/kg
SAR(1 g) = 7.9 W/kg; SAR(10 g) = 2.26 W/kg
Maximum value of SAR (measured) = 19.0 W/kg



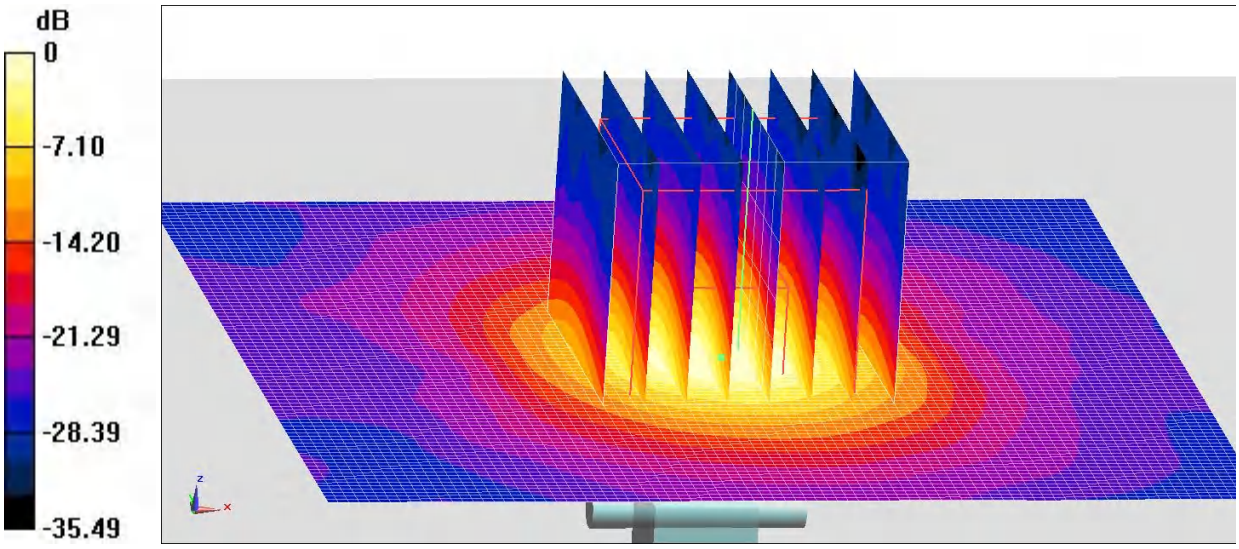
0 dB = 19.0 W/kg = 12.79 dBW/kg

Fig.B.9 validation 5250 MHz 100mW

5600MHz
Date: 9/17/2022
Electronics: DAE4 Sn1250
Medium: HBBL-600-10000
Medium parameters used: f = 5600 MHz; σ= 4.865 mho/m; εr = 34.68; ρ = 1000 kg/m3
Ambient Temperature :22.9 ºC ,Liquid Temperature: 22.5 ºC
Communication System: UID 0, CW (0) Frequency: 5600 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7609 ConvF(5.00, 5.00, 5.00)

System Validation /Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 19.3 W/kg

System Validation /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value =70.02 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 35.7 W/kg
SAR(1 g) = 8.01 W/kg; SAR(10 g) = 2.29 W/kg
Maximum value of SAR (measured) = 19.2 W/kg



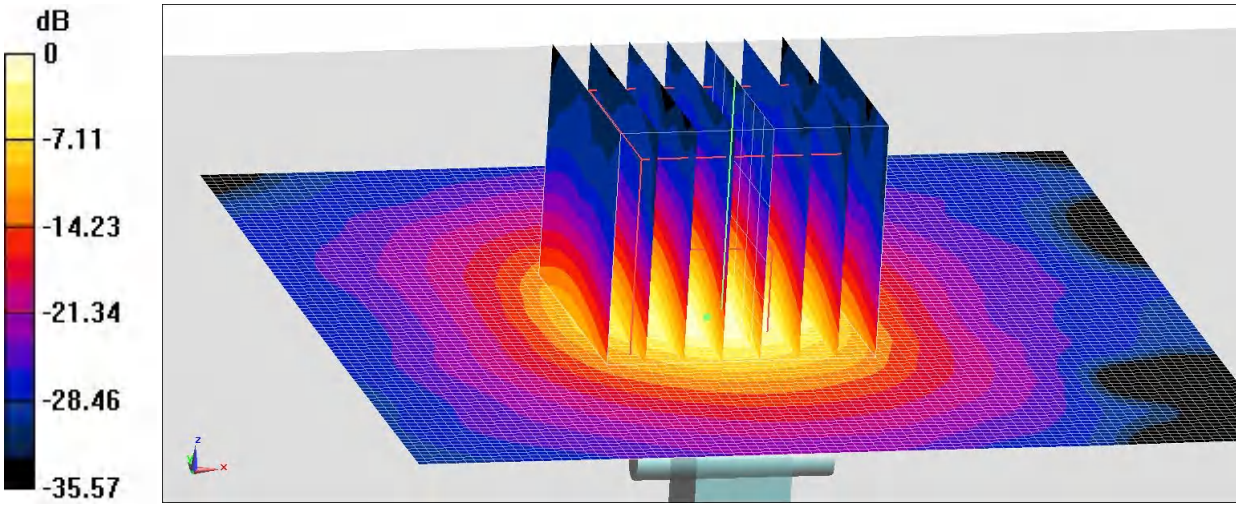
0 dB = 19.2 W/kg = 12.83 dBW/kg

Fig.B.10 validation 5600 MHz 100mW

5750MHz
Date: 9/18/2022
Electronics: DAE4 Sn1250
Medium: HBBL-600-10000
Medium parameters used: f = 5750 MHz; σ= 5.012 mho/m; εr = 34.21; ρ = 1000 kg/m3
Ambient Temperature :22.9 °C ,Liquid Temperature: 22.5 °C
Communication System: UID 0, CW (0) Frequency: 5750 MHz Duty Cycle: 1:1
Probe: EX3DV4 – SN7609 ConvF(5.10, 5.10, 5.10)

System Validation /Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 19.1 W/kg

System Validation /Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value =63.12 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 36.9 W/kg
SAR(1 g) = 7.8 W/kg; SAR(10 g) = 2.21 W/kg
Maximum value of SAR (measured) = 19.3 W/kg



0 dB = 19.3 W/kg = 12.86 dBW/kg

Fig.B.11 validation 5750 MHz 100mW

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

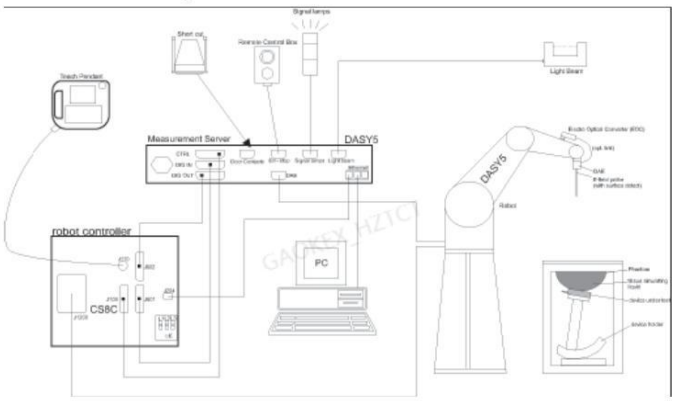
Table B.1 Comparison between area scan and zoom scan for system verification

Date	Band	Position	Area scan (1g)	Zoom scan (1g)	Drift (%)
2022-9-8	750MHz	Head	2.10	2.12	-0.94
2022-9-9	835MHz	Head	2.34	2.37	-1.27
2022-9-10	1750MHz	Head	9.24	9.06	1.99
2022-9-11	1900MHz	Head	9.75	9.91	-1.61
2022-9-12	2450MHz	Head	13.3	13.2	0.76
2022-9-13	2450MHz	Head	13.2	13.1	0.76
2022-9-14	2600MHz	Head	14.2	14.4	-1.39
2022-9-15	2600MHz	Head	14.2	14.3	-0.70

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/cm2) 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/cm2..
E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

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

Where:

Δt = Exposure time (30 seconds),

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

ΔT = Temperature increase due to RF exposure.

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

Where:

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

C.4 Other Test Equipment

C.4.1 Data Acquisition Electronics(DAE)

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

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

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

PictureC.4: DAE

C.4.2 Robot

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

➢ High precision (repeatability 0.02mm)

➢ High reliability (industrial design)

➢ Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)

➢ Jerk-free straight movements (brushless synchron motors; no stepper motors)

➢ Low ELF interference (motor control fields shielded via the closed metallic construction shields)

Picture C.5DASY 4

Picture C.6DASY 5

C.4.3 Measurement Server

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

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

Picture C.7 Server for DASY 4

Picture C.8 Server for DASY 5

C.4.4 Device Holder for Phantom

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

The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with

respect to the line between the ear reference points). The rotation centers for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ =0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that

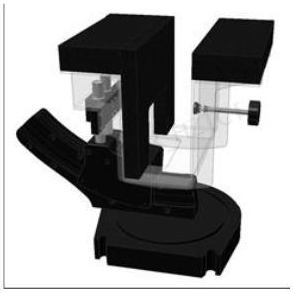
the influence of the clamp on the test results could thus be lowered.

<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper

part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.

Picture C.9-1: Device Holder



Picture C.9-2: Laptop Extension Kit

C.4.5 Phantom

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

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

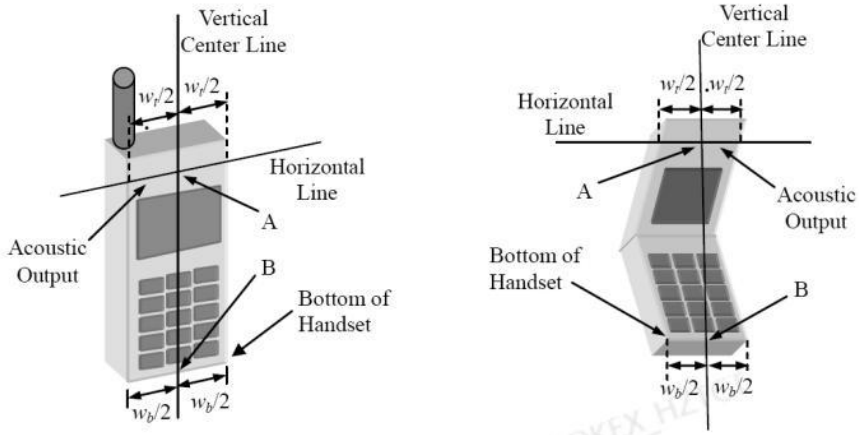
Shell Thickness:	2±0. 2 mm
Filling Volume:	Approx. 25 liters
Dimensions:	810 x l000 x 500 mm (H x L x W)
Available:	Special

Picture C.10: SAM Twin Phantom

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

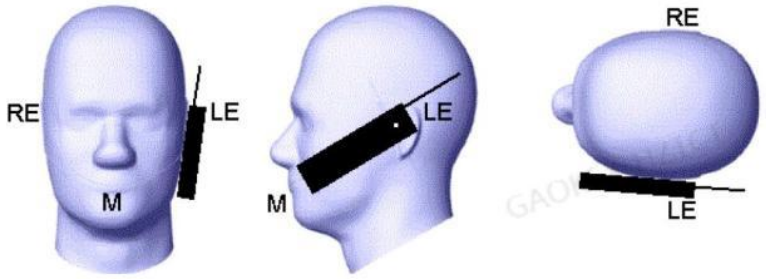
D.1 General considerations

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

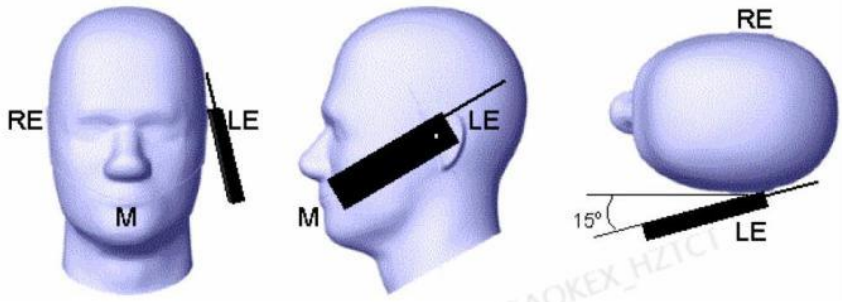


w_t	Width of the handset at the level of the acoustic
w_b	Width of the bottom of the handset
A	Midpoint of the width w_t of the handset at the level of the acoustic output
B	Midpoint of the width w_b of the bottom of the handset

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



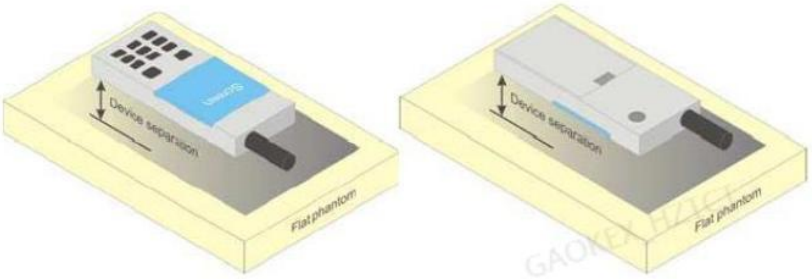
Picture D.2 Cheek position of the wireless device on the left side of SAM



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

D.2 Body-worn device

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

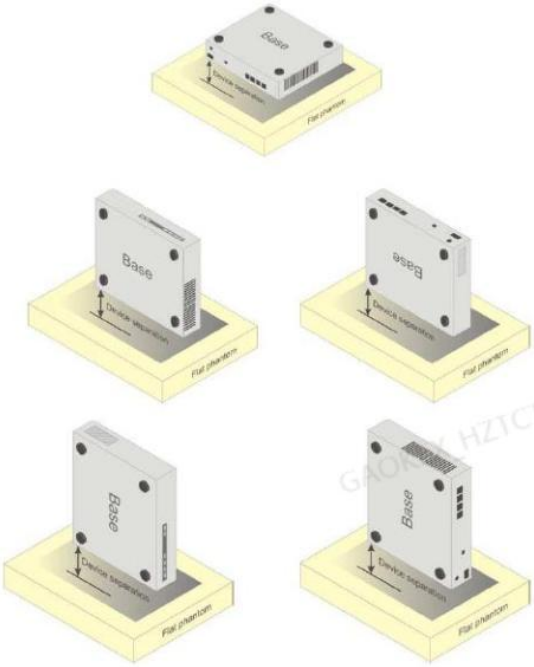


Picture D.4Test positions for body-worn devices

D.3 Desktop device

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

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



Picture D.5 Test positions for desktop devices

D.4 DUT Setup Photos

Picture D.6

ANNEX E Equivalent Media Recipes

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

TableE.1: Composition of the Tissue Equivalent Matter

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

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

ANNEX F System Validation

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

Table F.1: System Validation for 7609

Probe SN.	Liquid name	Validation date	Frequency point	Status (OK or Not)
7609	Head 750MHz	April 1,2022	750 MHz	OK
7609	Head 835MHz	April 1,2022	835 MHz	OK
7609	Head 1750MHz	April 1,2022	1750 MHz	OK
7609	Head 1900MHz	April 1,2022	1900 MHz	OK
7609	Head 2450MHz	April 1,2022	2450 MHz	OK
7609	Head 2600MHz	April 1,2022	2600 MHz	OK
7609	Head 5250MHz	April 2,2022	5250 MHz	OK
7609	Head 5600MHz	April 2,2022	5600 MHz	OK
7609	Head 5750MHz	April 2,2022	5750 MHz	OK

ANNEX G Probe Calibration Certificate

Probe 7609 Calibration Certificate

In Collaboration with speag CALIBRATION LABORATORY
Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

CNAS CALIBRATION CNAS L0570

Client TCL Certificate No: Z22-60100

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN : 7609
Calibration Procedure(s)	FF-Z11-004-02 Calibration Procedures for Dosimetric E-field Probes
Calibration date:	March 24, 2022

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Power sensor NRP-Z91	101547	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Power sensor NRP-Z91	101548	15-Jun-21(CTTL, No.J21X04466)	Jun-22
Reference 10dBAttenuator	18N50W-10dB	20-Jan-21(CTTL, No.J21X00486)	Jan-23
Reference 20dBAttenuator	18N50W-20dB	20-Jan-21(CTTL, No.J21X00485)	Jan-23
Reference Probe EX3DV4	SN 7307	26-May-21(SPEAG, No.EX3-7307_May21)	May-22
DAE4	SN 1555	20-Aug-21(SPEAG, No.DAE4-1555_Aug21/2)	Aug-22

Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
SignalGenerator MG3700A	6201052605	16-Jun-21(CTTL, No.J21X04467)	Jun-22
Network Analyzer E5071C	MY46110673	14-Jan-22(CTTL, No.J22X00406)	Jan-23

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: March 28, 2022

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Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A,B,C,D	modulation dependent linearization parameters
Polarization Φ	Φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), θ=0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016

c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010

d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below ConvF).
- *NORM(f)x,y,z = NORMx,y,z* frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics.
- *Ax,y,z; Bx,y,z; Cx,y,z;VRx,y,z:*A,B,C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from±50MHz to±100MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).