

Table 14-18 LTE700-FDD12 #1 Body

LTE700-FDD12 #1 Body						
Ambient Temperature: 22.5			Liquid Temperature: 22.3			
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]
			23130	23095	23060	23130
10MHz QPSK1RB	Front	M	M	M	M	M
		Tune-up		24.00	24.00	24.00
		Measured Power [dBm]	23.23	23.26	23.23	Scaling factor*
	Rear	1g SAR		0.119		0.14
		10g SAR		0.093		0.11
		Deviation		0.05		0.05
	Left edge	1g SAR		0.196		0.23
		10g SAR		0.154		0.18
		Deviation		0.02		0.02
	Right edge	1g SAR		0.141		0.17
		10g SAR		0.1		0.12
		Deviation		0.14		0.14
	Bottom edge	1g SAR		0.164		0.19
		10g SAR		0.118		0.14
		Deviation		0.16		0.16
10MHz QPSK50% RB	Front	1g SAR		0.053		0.06
		10g SAR		0.036		0.04
		Deviation		0.08		0.08
	Rear	1g SAR		0.149		0.18
		10g SAR		0.116		0.14
		Deviation		0.18		0.18
	Left edge	1g SAR		0.105		0.13
		10g SAR		0.075		0.09
		Deviation		0.18		0.18
	Right edge	1g SAR		0.123		0.15
		10g SAR		0.089		0.11
		Deviation		0.03		0.03
	Bottom edge	1g SAR		0.047		0.06
		10g SAR		0.027		0.03
		Deviation		0.03		0.03
10MHz QPSK100% RB	Front	M	H	H	M	H
		Tune-up		23.00	23.00	23.00
		Measured Power [dBm]	22.16	22.20	22.17	Scaling factor*
	Rear	1g SAR		0.09		0.11
		10g SAR		0.07		0.08
		Deviation		0.18		0.18
	Left edge	1g SAR		0.149		0.18
		10g SAR		0.116		0.14
		Deviation		0.18		0.18
	Right edge	1g SAR		0.105		0.13
		10g SAR		0.075		0.09
		Deviation		0.18		0.18
	Bottom edge	1g SAR		0.123		0.15
		10g SAR		0.089		0.11
		Deviation		0.03		0.03
10MHz QPSK1RB B2	Front	M	H	H	M	H
		Tune-up		23.00	23.00	23.00
		Measured Power [dBm]	22.16	22.26	22.15	Scaling factor*
	Rear	1g SAR				
		10g SAR				
		Deviation				
	Left edge	1g SAR		0.176		0.21
		10g SAR		0.143		0.17
		Deviation		0.05		0.05

Table 14-19 LTE750-FDD13 #1 Head

LTE750-FDD13 #1 Head						
Ambient Temperature: 22.5			Liquid Temperature: 22.3			
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]
			H	M	23230	H
10MHz QPSK1RB	Left Cheek	H	H	M	23230	H
		1g SAR			0.086	
		10g SAR			0.068	
	Left Tilt	Deviation			0.18	
		1g SAR			0.07	
		10g SAR			0.057	
	Right Cheek	Deviation			0.19	
		1g SAR			0.104	
		10g SAR			0.08	
		Deviation			-0.02	
	Right Tilt	1g SAR			0.064	
		10g SAR			0.05	
		Deviation			0.17	
TRUE	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]
			H	M	23230	H
			H	H	H	H
10MHz QPSK50% RB	Left Cheek	Tune-up	23.00	23.00	24.00	Scaling factor*
		Measured Power [dBm]	0.00	0.00	22.23	199.53
		1g SAR			0.055	
	Left Tilt	10g SAR			0.044	
		Deviation			0.14	
		1g SAR			0.05	
	Right Cheek	10g SAR			0.04	
		Deviation			0.13	
		1g SAR			0.081	
	Right Tilt	10g SAR			0.062	
		Deviation			0.17	
		1g SAR			0.058	
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]
			H	M	23230	H
			H	H	H	H
10MHz QPSK100% RB	Left Cheek	Tune-up	23.00	23.00	24.00	Scaling factor*
		Measured Power [dBm]	0.00	0.00	22.24	199.53
		1g SAR				
10MHz QPSK1RB B2	Right Cheek	10g SAR				
		Deviation				
		1g SAR			0.098	
		10g SAR			0.067	
		Deviation			0.03	

Table 14-20 LTE750-FDD13 #1 Body

LTE750-FDD13 #1 Body									
Ambient Temperature: 22.5				Liquid Temperature: 22.3					
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			H	M	23230	H			
			H	H	M	H			
10MHz QPSK1RB	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Measured Power [dBm]		0.00	0.00	23.23	251.19	251.19	1.19	
	Front	1g SAR			0.124			0.15	
		10g SAR			0.092			0.11	
		Deviation			0.04			0.04	
	Rear	1g SAR			0.228			0.27	
		10g SAR			0.126			0.15	
		Deviation			-0.02			-0.02	
	Left edge	1g SAR			0.13			0.16	
		10g SAR			0.085			0.10	
		Deviation			-0.09			-0.09	
	Right edge	1g SAR			0.176			0.21	
		10g SAR			0.121			0.14	
		Deviation			-0.01			-0.01	
	Bottom edge	1g SAR			0.096			0.11	
		10g SAR			0.052			0.06	
		Deviation			0.05			0.05	
10MHz QPSK50% RB	Mode	Device orientation	Measured SAR [W/kg]			Reported SAR [W/kg]			
			H	M	23230	H	M	23230	
			H	H	H				
	Tune-up		23.00	23.00	24.00	Scaling factor*			
	Measured Power [dBm]		0.00	0.00	22.23	199.53	199.53	1.50	
	Front	1g SAR			0.098			0.15	
		10g SAR			0.073			0.11	
		Deviation			0.02			0.02	
	Rear	1g SAR			0.171			0.26	
		10g SAR			0.097			0.15	
		Deviation			-0.06			-0.06	
	Left edge	1g SAR			0.096			0.14	
		10g SAR			0.063			0.09	
		Deviation			-0.05			-0.05	
	Right edge	1g SAR			0.134			0.20	
		10g SAR			0.091			0.14	
		Deviation			0.01			0.01	
	Bottom edge	1g SAR			0.077			0.12	
		10g SAR			0.042			0.06	
		Deviation			0.08			0.08	
10MHz QPSK100% RB	Mode	Device orientation	Measured SAR [W/kg]			Reported SAR [W/kg]			
			H	M	23230	H	M	23230	
			H	H	H				
	Tune-up		23.00	23.00	24.00	Scaling factor*			
	Measured Power [dBm]		0.00	0.00	22.24	199.53	199.53	1.50	
	Front	1g SAR							
		10g SAR							
		Deviation							
	Rear	1g SAR			0.206			0.25	
		10g SAR			0.112			0.13	
		Deviation			0.09			0.09	

Table 14-21 LTE1700-FDD66 #1 Head

LTE1700-FDD66 #1 Head								
Ambient Temperature: 22.5				Liquid Temperature: 22.3				
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			132572	132322	132072	132572	132322	
20MHz QPSK1RB	Tune-up		24.50	24.50	24.50	Scaling factor*		
	Measured Power [dBm]		23.84	23.88	23.92	1.16	1.15	
	Left Cheek	1g SAR			0.204		0.23	
		10g SAR			0.137		0.16	
		Deviation			0.03		0.03	
	Left Tilt	1g SAR			0.173		0.20	
		10g SAR			0.108		0.12	
		Deviation			0.09		0.09	
	Right Cheek	1g SAR			0.198		0.23	
		10g SAR			0.127		0.15	
		Deviation			0.11		0.11	
20MHz QPSK50% RB	Right Tilt	1g SAR			0.175		0.20	
		10g SAR			0.115		0.13	
		Deviation			0.04		0.04	
FALSE	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			132572	132322	132072	132572	132322	
	L	M	M	L	M	M	M	
20MHz QPSK50% RB	Tune-up		23.50	23.50	23.50	Scaling factor*		
	Measured Power [dBm]		22.88	22.79	22.79	1.15	1.18	
	Left Cheek	1g SAR	0.219			0.25		
		10g SAR	0.142			0.16		
		Deviation	0.19			0.19		
	Left Tilt	1g SAR	0.128			0.15		
		10g SAR	0.077			0.09		
		Deviation	0.01			0.01		
	Right Cheek	1g SAR	0.206			0.24		
		10g SAR	0.13			0.15		
		Deviation	0.03			0.03		
20MHz QPSK100% RB	Right Tilt	1g SAR	0.121			0.14		
		10g SAR	0.08			0.09		
		Deviation	0.04			0.04		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			132572	132322	132072	132572	132322	
	L	M	M	L	M	M	M	
20MHz QPSK100% RB	Tune-up		23.50	23.50	23.50	Scaling factor*		
	Measured Power [dBm]		22.82	22.78	22.75	1.17	1.18	
	Left Cheek	1g SAR						
		10g SAR						
		Deviation						
	Left Cheek	1g SAR	0.211			0.24		
		10g SAR	0.137			0.16		
		Deviation	0.04			0.04		

Table 14-22 LTE1700-FDD66 #1 Body

LTE1700-FDD66 #1 Body									
Ambient Temperature: 22.5				Liquid Temperature: 22.3					
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			132572	132322	132072	132572			
			M	M	M	M			
20MHz QPSK1RB	Tune-up		24.50	24.50	24.50	Scaling factor*			
	Measured Power [dBm]		23.84	23.88	23.92	1.16	1.15	1.14	
	Front	1g SAR			0.462			0.53	
		10g SAR			0.26			0.30	
		Deviation			0.09			0.09	
	Rear	1g SAR			0.648			0.74	
		10g SAR			0.341			0.39	
		Deviation			0.14			0.14	
	Left edge	1g SAR			0.306			0.35	
		10g SAR			0.175			0.20	
		Deviation			0.02			0.02	
	Right edge	1g SAR			0.127			0.15	
		10g SAR			0.075			0.09	
		Deviation			0.15			0.15	
	Bottom edge	1g SAR			0.438			0.50	
		10g SAR			0.243			0.28	
		Deviation			0.18			0.18	
20MHz QPSK50% RB	Mode	Device orientation	Measured SAR [W/kg]			Reported SAR [W/kg]			
			132572	132322	132072	132572	132322	132072	
			L	M	M				
	Tune-up		23.50	23.50	23.50	Scaling factor*			
	Measured Power [dBm]		22.88	22.79	22.79	1.15	1.18	1.18	
	Front	1g SAR	0.368			0.42			
		10g SAR	0.203			0.23			
		Deviation	0.05			0.05			
	Rear	1g SAR	0.476			0.55			
		10g SAR	0.249			0.29			
		Deviation	0.16			0.16			
	Left edge	1g SAR	0.215			0.25			
		10g SAR	0.123			0.14			
		Deviation	0.07			0.07			
	Right edge	1g SAR	0.089			0.10			
		10g SAR	0.052			0.06			
		Deviation	0.14			0.14			
	Bottom edge	1g SAR	0.324			0.37			
		10g SAR	0.178			0.21			
		Deviation	0.1			0.10			
20MHz QPSK100% RB	Mode	Device orientation	Measured SAR [W/kg]			Reported SAR [W/kg]			
			132572	132322	132072	132572	132322	132072	
			L	M	M				
	Tune-up		23.50	23.50	23.50	Scaling factor*			
	Measured Power [dBm]		22.82	22.78	22.75	1.17	1.18	1.19	
	Front	1g SAR							
		10g SAR							
		Deviation							
	Rear	1g SAR			0.621			0.71	
		10g SAR			0.304			0.35	
		Deviation			0.04			0.04	

14.3 Full SAR

Test Band	Channel	Frequency	Tune-Up	Measured Power	Test Position	Measured 10g SAR	Measured 1g SAR	Reported 10g SAR	Reported 1g SAR	Power Drift	Figure
GSM850	251	848.8 MHz	33.8	32.94	Right Cheek	0.142	0.187	0.17	0.23	0.18	Fig A.1
GSM850	190	836.6 MHz	30.5	30.49	Rear	0.115	0.215	0.12	0.22	0.04	Fig A.2
PCS1900	512	1850.2 MHz	30.3	29.79	Left Cheek	0.094	0.149	0.11	0.17	0.11	Fig A.3
PCS1900	661	1880 MHz	25	24.38	Rear	0.232	0.44	0.27	0.51	-0.06	Fig A.4
WCDMA850-BV	4233	846.6 MHz	24	23.98	Right Cheek	0.157	0.207	0.16	0.21	0.17	Fig A.5
WCDMA850-BV	4182	835.4 MHz	24	23.87	Rear	0.118	0.22	0.12	0.23	-0.02	Fig A.6
WCDMA1700-BIV	1412	1732.4 MHz	24	23.57	Left Cheek	0.167	0.259	0.18	0.29	0.02	Fig A.7
WCDMA1700-BIV	1412	1732.4 MHz	24	23.57	Rear	0.282	0.524	0.31	0.58	0.18	Fig A.8
WCDMA1900-BII	9400	1880 MHz	24	23.62	Left Cheek	0.139	0.225	0.15	0.25	0.18	Fig A.9
WCDMA1900-BII	9400	1880 MHz	24	23.62	Rear	0.305	0.573	0.33	0.63	0.16	Fig A.10
LTE1900-FDD2	19100	1900 MHz	24	23.51	Left Cheek	0.119	0.189	0.13	0.21	-0.09	Fig A.11
LTE1900-FDD2	19100	1900 MHz	24	23.51	Rear	0.345	0.658	0.39	0.74	0.19	Fig A.12
LTE850-FDD5	20600	844 MHz	24.5	23.97	Right Cheek	0.144	0.189	0.16	0.21	0.1	Fig A.13
LTE850-FDD5	20600	844 MHz	24.5	23.97	Rear	0.141	0.264	0.16	0.30	-0.02	Fig A.14
LTE2500-FDD7	21350	2560 MHz	23.5	23.18	Left Cheek	0.147	0.275	0.16	0.30	0.05	Fig A.15
LTE2500-FDD7	21350	2560 MHz	23.5	23.18	Bottom edge	0.431	1.03	0.46	1.11	0.07	Fig A.16
LTE700-FDD12	23095	707.5 MHz	24	23.26	Left Cheek	0.064	0.08	0.08	0.09	0.08	Fig A.17
LTE700-FDD12	23095	707.5 MHz	24	23.26	Rear	0.154	0.196	0.18	0.23	0.02	Fig A.18
LTE750-FDD13	23230	782 MHz	24	23.23	Right Cheek	0.08	0.104	0.10	0.12	-0.02	Fig A.19
LTE750-FDD13	23230	782 MHz	24	23.23	Rear	0.126	0.228	0.15	0.27	-0.02	Fig A.20
LTE1700-FDD66	132572	782 MHz	24.5	23.84	Left Cheek	0.142	0.219	0.16	0.25	0.19	Fig A.21
LTE1700-FDD66	132072	782 MHz	24.5	23.92	Rear	0.341	0.648	0.39	0.74	0.14	Fig A.22

14.4 WLAN Evaluation

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

Note1: When the reported SAR of the initial test position is $> 0.4 \text{ W/kg}$, 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 $\leq 0.8 \text{ W/kg}$.

Note2: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is $> 0.8 \text{ W/kg}$, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is $\leq 1.2 \text{ W/kg}$ or all required channels are tested.

Note3: 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.

Table 14-23 WLAN2450 #1 Head Fast SAR

WLAN2450 #1 Head Fast SAR						
Ambient Temperature: 22.5			Liquid Temperature: 22.3			
Rate	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]
			11 2462 MHz	6 2437 MHz	1 2412 MHz	
802.11b 1Mbps	Left Cheek	Tune up	18	18	18	Scaling factor*
		Slot Average Power [dBm]	17.59	17.32	17.67	1.10
		1g Fast SAR			0.11	0.12
	Left Tilt	10g SAR			0.058	0.06
		Deviation			0.06	0.06
		1g Fast SAR			0.117	0.13
	Right Cheek	10g SAR			0.059	0.06
		Deviation			0.01	0.01
		1g Fast SAR			0.198	0.21
	Right Tilt	10g SAR			0.102	0.11
		Deviation			0.02	0.02
		1g Fast SAR			0.207	0.22
	B2	10g SAR			0.099	0.11
		Deviation			0.03	0.03
		1g Fast SAR			0.198	0.21

Table 14-24 WLAN2450 #1 Head Full SAR

WLAN2450 #1 Head Full SAR						
Ambient Temperature: 22.5			Liquid Temperature: 22.3			
Rate	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]
			11 2462 MHz	6 2437 MHz	1 2412 MHz	
802.11b 1Mbps	Right Tilt	Tune up	18	18	18	Scaling factor*
		Slot Average Power [dBm]	17.59	17.32	17.67	1.10
		1g Full SAR			0.201	0.22
	Right Tilt	10g SAR			0.098	0.11
		Deviation			0.03	0.03

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							
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR(1g)(W/kg)	Scaled reported SAR(1g)(W/kg)	Figure
MHz	Ch.						
2412 MHz	1	Right Tilt	100.00%	100%	0.22	0.22	Fig A.23

Table 14-25 WLAN2450 #1 Body Fast SAR

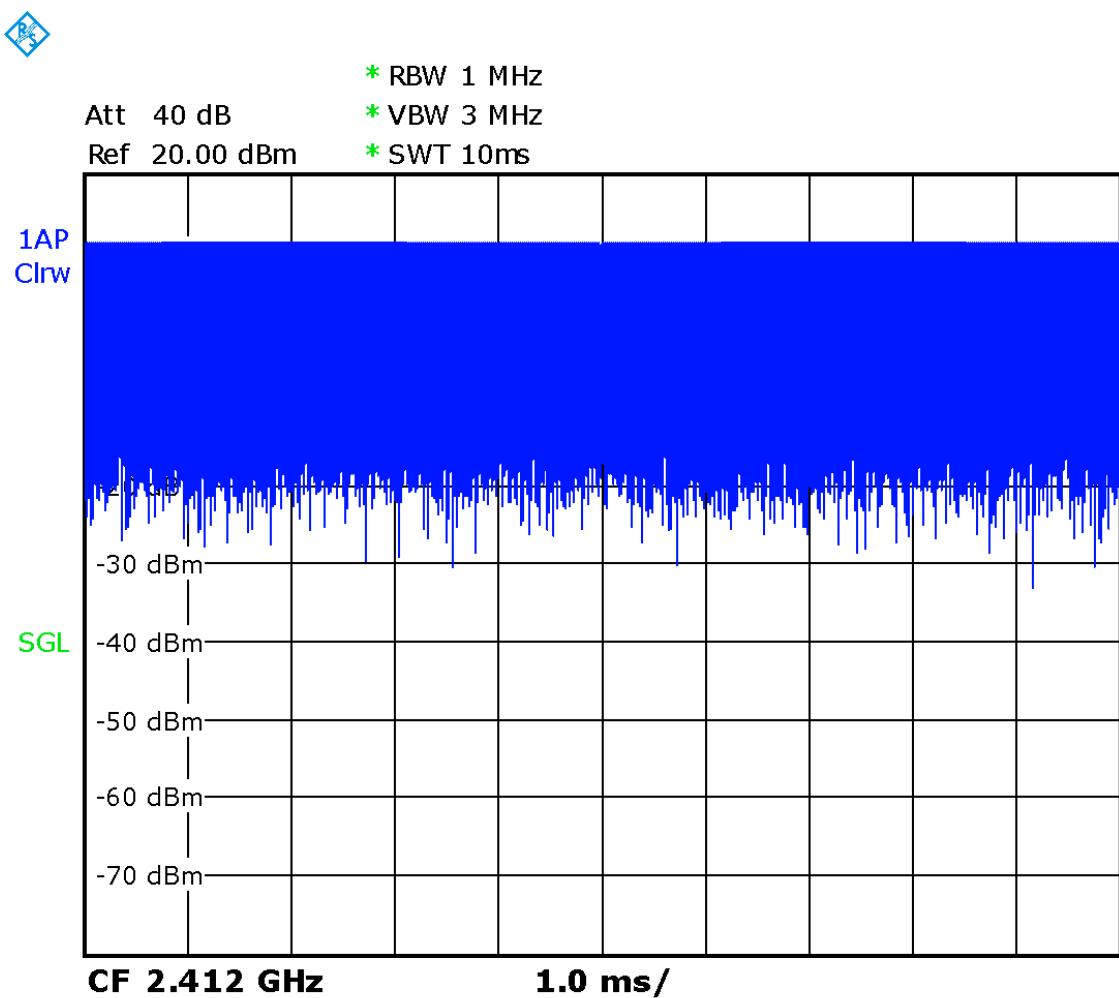
WLAN2450 #1 Body Fast SAR									
Ambient Temperature: 22.5				Liquid Temperature: 22.3					
Rate	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			11	6	1	11	6	1	
		2462 MHz	2437 MHz	2412 MHz					
802.11b 1Mbps		Tune up		18	18	18	Scaling factor*		
		Slot Average Power [dBm]		17.59	17.32	17.67	1.10	1.17	1.08
		Front	1g Fast SAR			0.043			0.05
			10g SAR			0.024			0.03
			Deviation			0.06			0.06
		Rear	1g Fast SAR			0.174			0.19
			10g SAR			0.067			0.07
			Deviation			-0.03			-0.03
		Top edge	1g Fast SAR			0.045			0.05
			10g SAR			0.022			0.02
			Deviation			0.05			0.05
		Left edge	1g Fast SAR			0.063			0.07
			10g SAR			0.03			0.03
			Deviation			0.08			0.08
802.11b 1Mbps B2	Rear	1g Fast SAR				0.156			0.17
		10g SAR				0.062			0.07
		Deviation				0.04			0.04

Table 14-26 WLAN2450 #1 Body Full SAR

WLAN2450 #1 Body Full SAR									
Ambient Temperature: 22.5				Liquid Temperature: 22.3					
Rate	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			11	6	1	11	6	1	
		2462 MHz	2437 MHz	2412 MHz					
802.11b 1Mbps		Tune up		18	18	18	Scaling factor*		
		Slot Average Power [dBm]		17.59	17.32	17.67	1.10	1.17	1.08
		Rear	1g Full SAR			0.161			0.17
			10g SAR			0.066			0.07
			Deviation			-0.03			-0.03

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							
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR(1g)(W/kg)	Scaled reported SAR(1g)(W/kg)	Figure
MHz	Ch.						
2412 MHz	1	Rear	100.00%	100%	0.17	0.17	Fig A.24

SAR is not required for OFDM because the 802.11b adjusted SAR $\leq 1.2 \text{ W/kg}$.



Picture 14.1 Duty factor plot

15 SAR Measurement Variability

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

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

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
- 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

Mode	CH	Freq	Test Position	Original SAR (W/kg)	First Repeated SAR(W/kg)	The Ratio
LTE2500-FDD7	21350	2560 MHz	Bottom edge	1.03	1.02	1.01

16 Measurement Uncertainty

16.1 Measurement Uncertainty for Normal SAR Tests (300MHz~3GHz)

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.0	N	1	1	1	6.0	6.0	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	N	1	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	∞
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Test sample related										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
15	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
16	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
20	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521

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

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

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

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

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

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

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

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

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
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Measurement system

1	Probe calibration	B	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z- Approximation	B	14.0	R	$\sqrt{3}$	1	1	8.1	8.1	∞

Test sample related

15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71
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16	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
17	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
Phantom and set-up										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	A	2.06	N	1	0.64	0.43	1.32	0.89	43
21	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						13.5	13.4	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						27.0	26.8	

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	January 24, 2018	One year
02	Power meter	NRVD	102083	November 01, 2017	One year
03	Power sensor	NRV-Z5	100542		
04	Signal Generator	E4438C	MY49071430	January 2,2018	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	E5515C	MY50263375	January 23, 2018	One year
07	BTS	CMW500	149646	October 31, 2017	One year
08	E-field Probe	SPEAG EX3DV4	7464	September 12,2017	One year
09	DAE	SPEAG DAE4	1525	October 2, 2017	One year
10	Dipole Validation Kit	SPEAG D750V3	1017	July 19, 2017	One year
11	Dipole Validation Kit	SPEAG D835V2	4d069	July 19, 2017	One year
12	Dipole Validation Kit	SPEAG D1750V2	1003	July 21, 2017	One year
13	Dipole Validation Kit	SPEAG D1900V2	5d101	July 26, 2017	One year
14	Dipole Validation Kit	SPEAG D2450V2	853	July 21, 2017	One year
15	Dipole Validation Kit	SPEAG D2600V2	1012	July 21, 2017	One year

END OF REPORT BODY

ANNEX A Graph Results

GSM850_CH251 Right Cheek

Date: 6/2/2018

Electronics: DAE4 Sn1525

Medium: Head 835 MHz

Medium parameters used: $f = 848.8 \text{ MHz}$; $\sigma = 0.914 \text{ mho/m}$; $\epsilon_r = 41.58$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C , Liquid Temperature: 22.3°C

Communication System: GSM850 848.8 MHz Duty Cycle: 1:8.3

Probe: EX3DV4 – SN7464 ConvF(10.28,10.28,10.28)

Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.205 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 5.208 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.241 W/kg

SAR(1 g) = 0.187 W/kg; SAR(10 g) = 0.142 W/kg

Maximum value of SAR (measured) = 0.205 W/kg

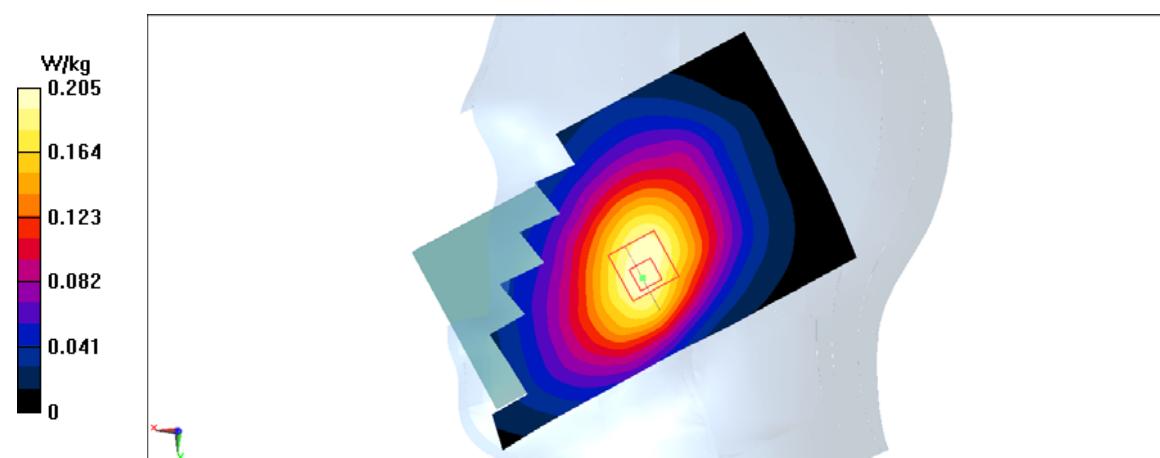


Fig A.1

GSM850_CH190 Rear

Date: 6/2/2018

Electronics: DAE4 Sn1525

Medium: Head 835 MHz

Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 56.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: GSM850 836.6 MHz Duty Cycle: 1:4

Probe: EX3DV4 – SN7464 ConvF(10.21,10.21,10.21)

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

Maximum value of SAR (interpolated) = 0.27 W/kg

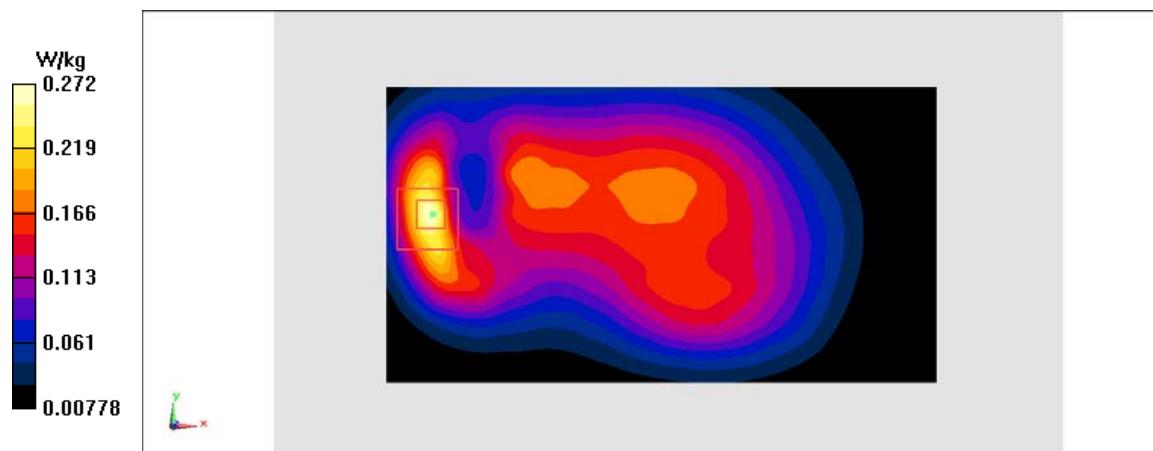
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.9 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.404 W/kg

SAR(1 g) = 0.215 W/kg; SAR(10 g) = 0.115 W/kg

Maximum value of SAR (measured) = 0.272 W/kg

**Fig A.2**

PCS1900_CH512 Left Cheek

Date: 6/9/2018

Electronics: DAE4 Sn1525

Medium: Head 1900 MHz

Medium parameters used: $f = 1850.2$ MHz; $\sigma = 1.342$ mho/m; $\epsilon_r = 39.61$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: PCS1900 1850.2 MHz Duty Cycle: 1:8.3

Probe: EX3DV4 – SN7464 ConvF(8.39,8.39,8.39)

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

Maximum value of SAR (interpolated) = 0.175 W/kg

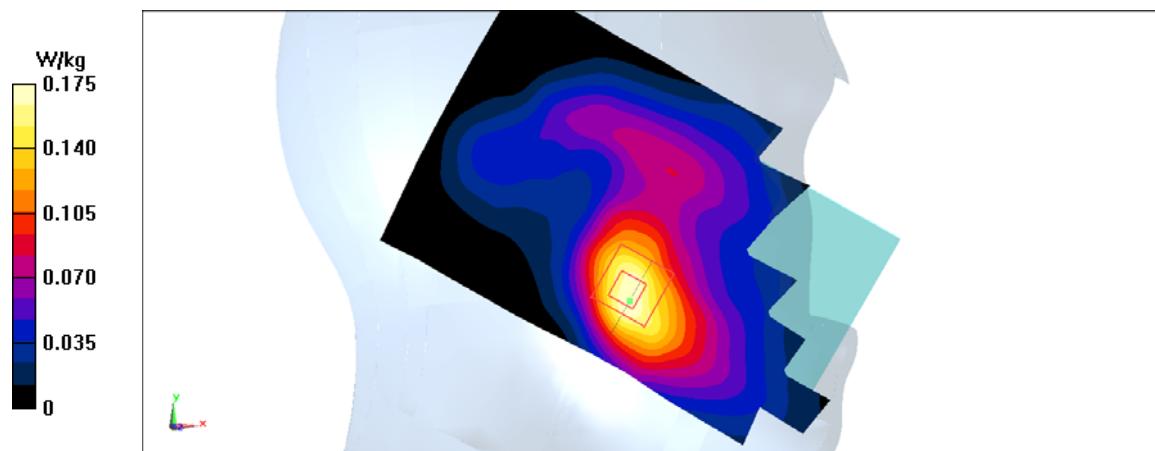
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.615 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.227 W/kg

SAR(1 g) = 0.149 W/kg; SAR(10 g) = 0.094 W/kg

Maximum value of SAR (measured) = 0.176 W/kg

**Fig A.3**

PCS1900_CH661 Rear

Date: 6/9/2018

Electronics: DAE4 Sn1525

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.517$ mho/m; $\epsilon_r = 53.21$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: PCS1900 1880 MHz Duty Cycle: 1:2

Probe: EX3DV4 – SN7464 ConvF(8.32,8.32,8.32)

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

Maximum value of SAR (interpolated) = 0.561 W/kg

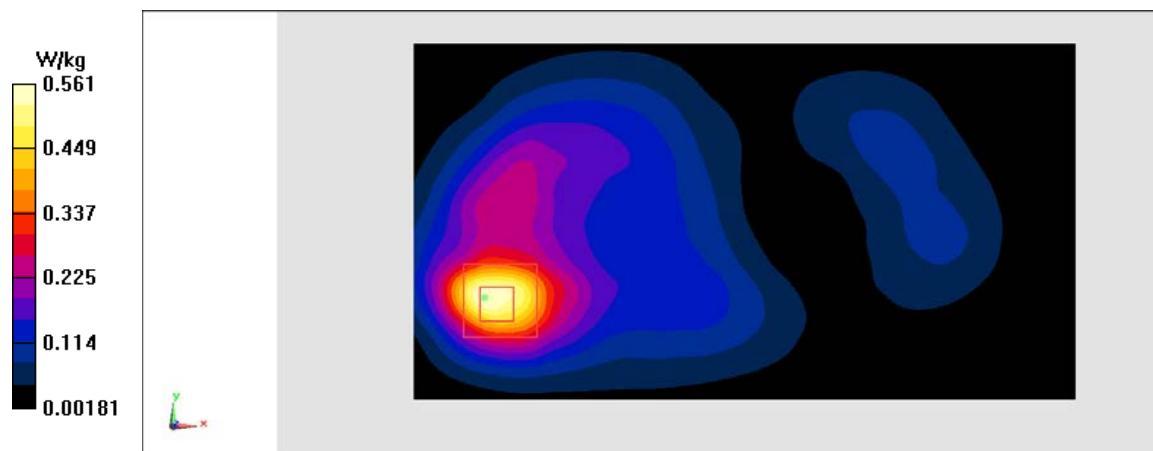
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.288 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.794 W/kg

SAR(1 g) = 0.44 W/kg; SAR(10 g) = 0.232 W/kg

Maximum value of SAR (measured) = 0.546 W/kg

**Fig A.4**

WCDMA850-BV_CH4233 Right Cheek

Date: 6/2/2018

Electronics: DAE4 Sn1525

Medium: Head 835 MHz

Medium parameters used: $f = 846.6$ MHz; $\sigma = 0.912$ mho/m; $\epsilon_r = 41.59$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WCDMA850-BV 846.6 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(10.28,10.28,10.28)

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

Maximum value of SAR (interpolated) = 0.23 W/kg

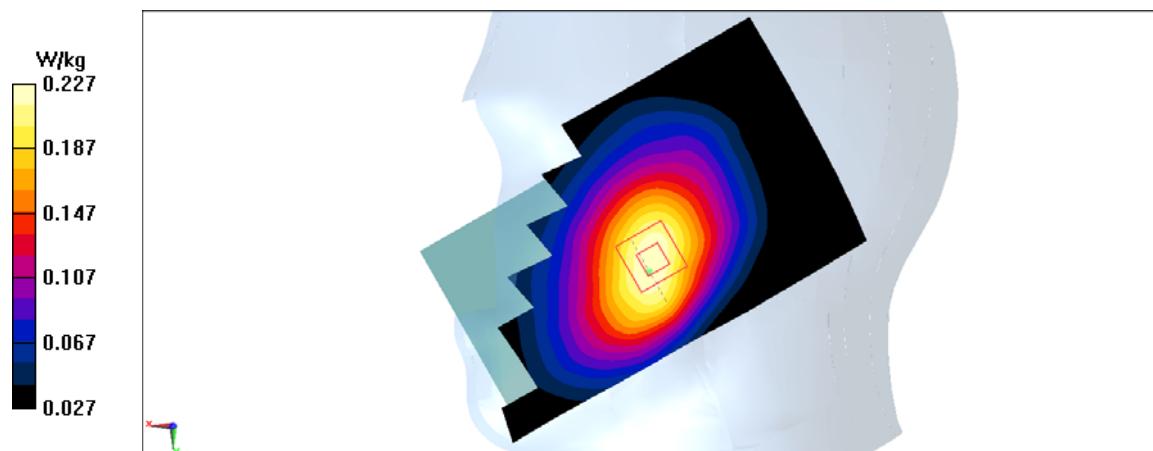
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.62 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.261 W/kg

SAR(1 g) = 0.207 W/kg; SAR(10 g) = 0.157 W/kg

Maximum value of SAR (measured) = 0.227 W/kg

**Fig A.5**

WCDMA850-BV_CH4182 Rear

Date: 6/2/2018

Electronics: DAE4 Sn1525

Medium: Head 835 MHz

Medium parameters used: $f = 835.4$ MHz; $\sigma = 0.988$ mho/m; $\epsilon_r = 56.1$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WCDMA850-BV 835.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(10.21,10.21,10.21)

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

Maximum value of SAR (interpolated) = 0.276 W/kg

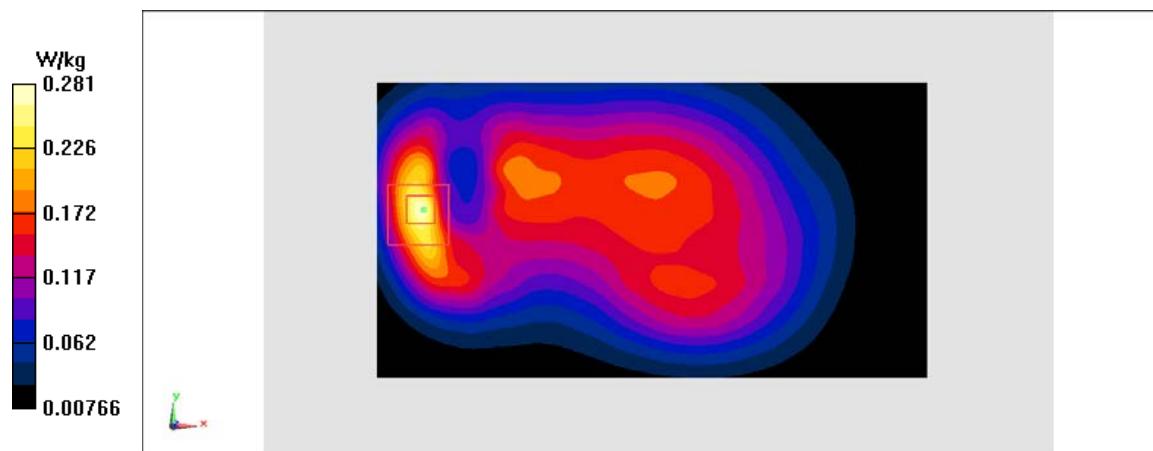
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.85 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.414 W/kg

SAR(1 g) = 0.22 W/kg; SAR(10 g) = 0.118 W/kg

Maximum value of SAR (measured) = 0.281 W/kg

**Fig A.6**

WCDMA1700-BIV_CH1412 Left Cheek

Date: 6/3/2018

Electronics: DAE4 Sn1525

Medium: Head 1750 MHz

Medium parameters used: $f = 1732.4$ MHz; $\sigma = 1.363$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m 3

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WCDMA1700-BIV 1732.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.70,8.70,8.70)

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

Maximum value of SAR (interpolated) = 0.303 W/kg

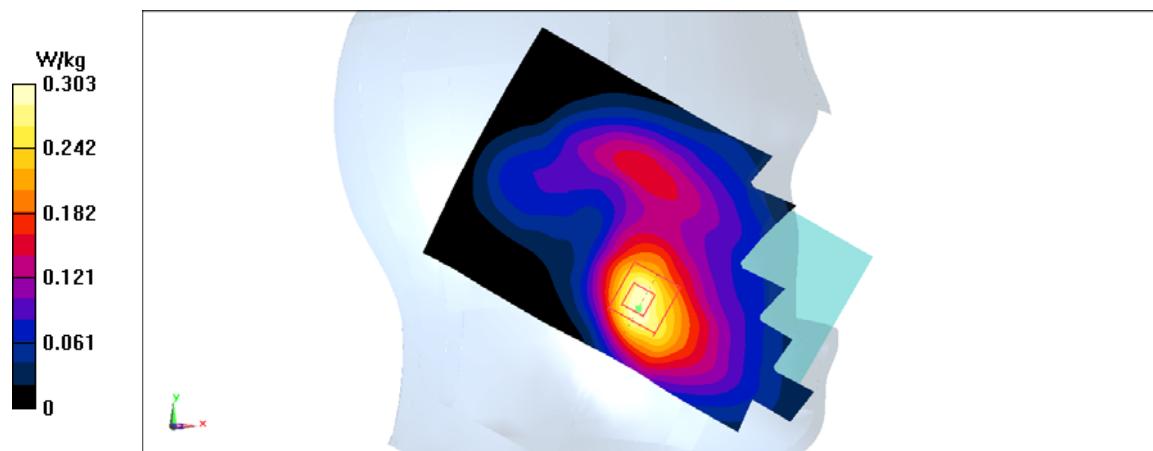
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.832 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.38 W/kg

SAR(1 g) = 0.259 W/kg; SAR(10 g) = 0.167 W/kg

Maximum value of SAR (measured) = 0.3 W/kg

**Fig A.7**

WCDMA1700-BIV_CH1412 Rear

Date: 6/3/2018

Electronics: DAE4 Sn1525

Medium: Head 1750 MHz

Medium parameters used: $f = 1732.4$ MHz; $\sigma = 1.497$ mho/m; $\epsilon_r = 53.24$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WCDMA1700-BIV 1732.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.60,8.60,8.60)

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

Maximum value of SAR (interpolated) = 0.633 W/kg

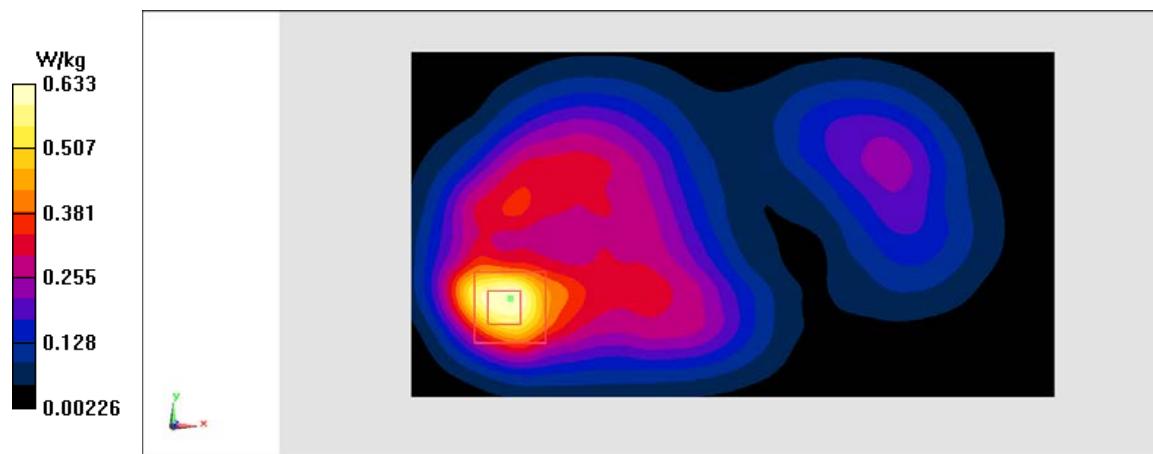
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.847 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.937 W/kg

SAR(1 g) = 0.524 W/kg; SAR(10 g) = 0.282 W/kg

Maximum value of SAR (measured) = 0.635 W/kg

**Fig A.8**

WCDMA1900-BII_CH9400 Left Cheek

Date: 6/9/2018

Electronics: DAE4 Sn1525

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.371$ mho/m; $\epsilon_r = 39.57$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WCDMA1900-BII 1880 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.39,8.39,8.39)

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

Maximum value of SAR (interpolated) = 0.266 W/kg

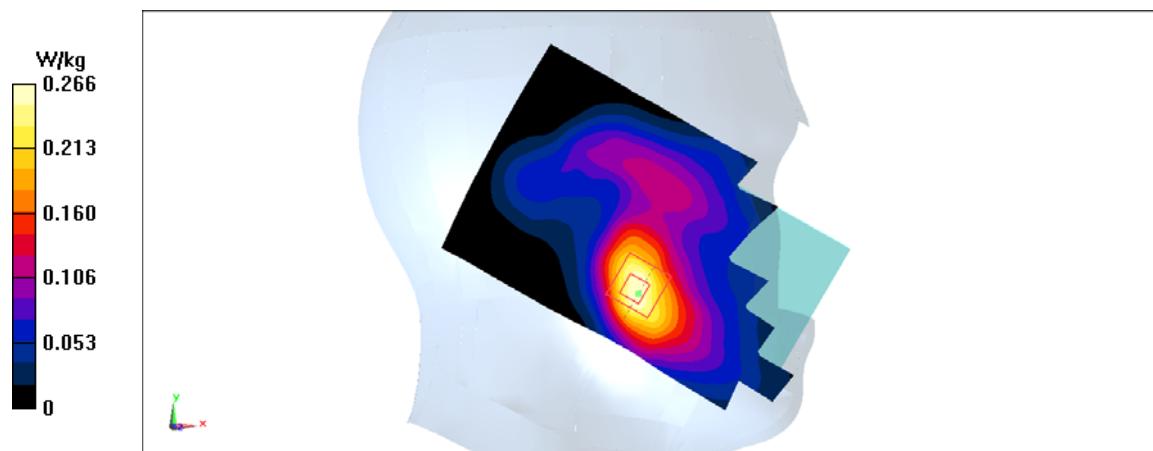
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.83 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.348 W/kg

SAR(1 g) = 0.225 W/kg; SAR(10 g) = 0.139 W/kg

Maximum value of SAR (measured) = 0.264 W/kg

**Fig A.9**

WCDMA1900-BII_CH9400 Rear

Date: 6/9/2018

Electronics: DAE4 Sn1525

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.517$ mho/m; $\epsilon_r = 53.21$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WCDMA1900-BII 1880 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.32,8.32,8.32)

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

Maximum value of SAR (interpolated) = 0.688 W/kg

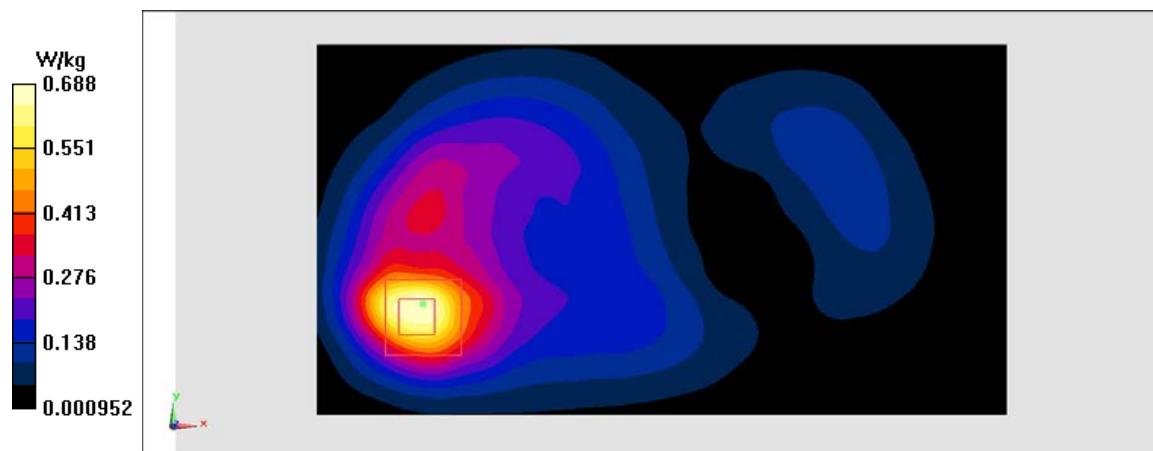
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.282 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.573 W/kg; SAR(10 g) = 0.305 W/kg

Maximum value of SAR (measured) = 0.706 W/kg

**Fig A.10**

LTE1900-FDD2_CH19100 Left Cheek

Date: 6/9/2018

Electronics: DAE4 Sn1525

Medium: Head 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.39 \text{ mho/m}$; $\epsilon_r = 39.55$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE1900-FDD2 1900 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.39,8.39,8.39)

Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.22 W/kg

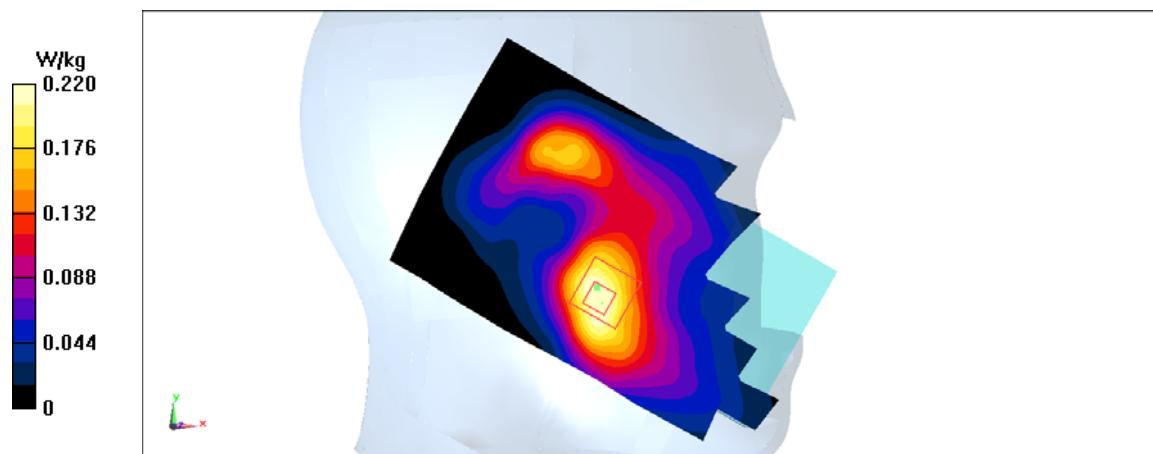
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 7.182 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.281 W/kg

SAR(1 g) = 0.189 W/kg; SAR(10 g) = 0.119 W/kg

Maximum value of SAR (measured) = 0.221 W/kg

**Fig A.11**

LTE1900-FDD2_CH19100 Rear

Date: 6/9/2018

Electronics: DAE4 Sn1525

Medium: Head 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.536 \text{ mho/m}$; $\epsilon_r = 53.19$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE1900-FDD2 1900 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.32,8.32,8.32)

Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.812 W/kg

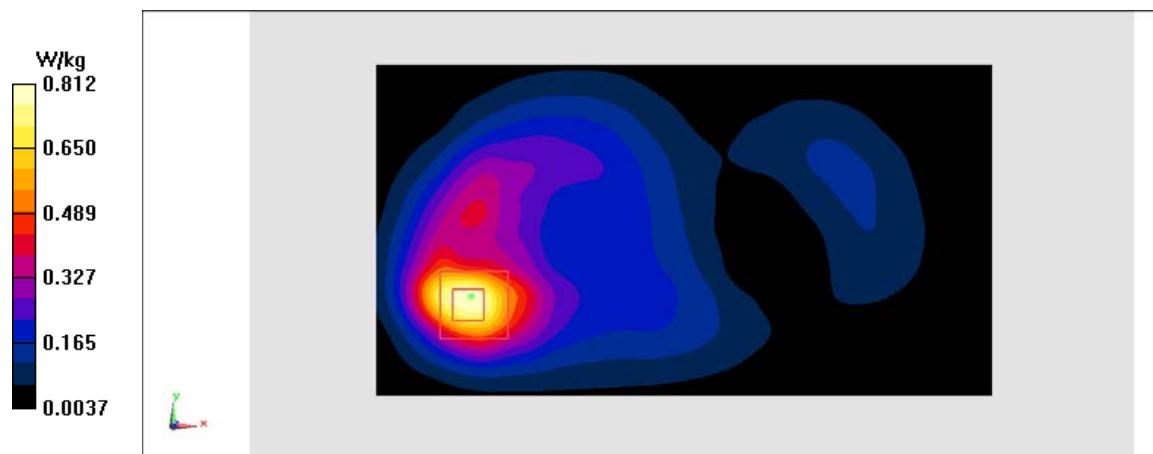
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.053 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 1.2 W/kg

SAR(1 g) = 0.658 W/kg; SAR(10 g) = 0.345 W/kg

Maximum value of SAR (measured) = 0.815 W/kg

**Fig A.12**

LTE850-FDD5_CH20600 Right Cheek

Date: 6/2/2018

Electronics: DAE4 Sn1525

Medium: Head 835 MHz

Medium parameters used: $f = 844$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 41.59$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE850-FDD5 844 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(10.28,10.28,10.28)

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

Maximum value of SAR (interpolated) = 0.208 W/kg

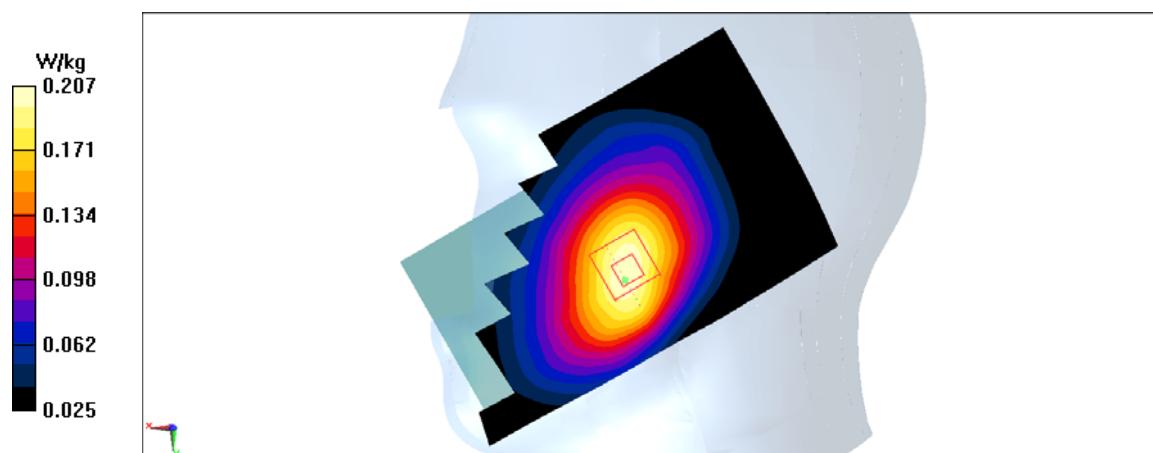
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.846 V/m; Power Drift = 0.1 dB

Peak SAR (extrapolated) = 0.238 W/kg

SAR(1 g) = 0.189 W/kg; SAR(10 g) = 0.144 W/kg

Maximum value of SAR (measured) = 0.207 W/kg

**Fig A.13**

LTE850-FDD5_CH20600 Rear

Date: 6/2/2018

Electronics: DAE4 Sn1525

Medium: Head 835 MHz

Medium parameters used: $f = 844$ MHz; $\sigma = 0.997$ mho/m; $\epsilon_r = 56.09$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE850-FDD5 844 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(10.21,10.21,10.21)

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

Maximum value of SAR (interpolated) = 0.329 W/kg

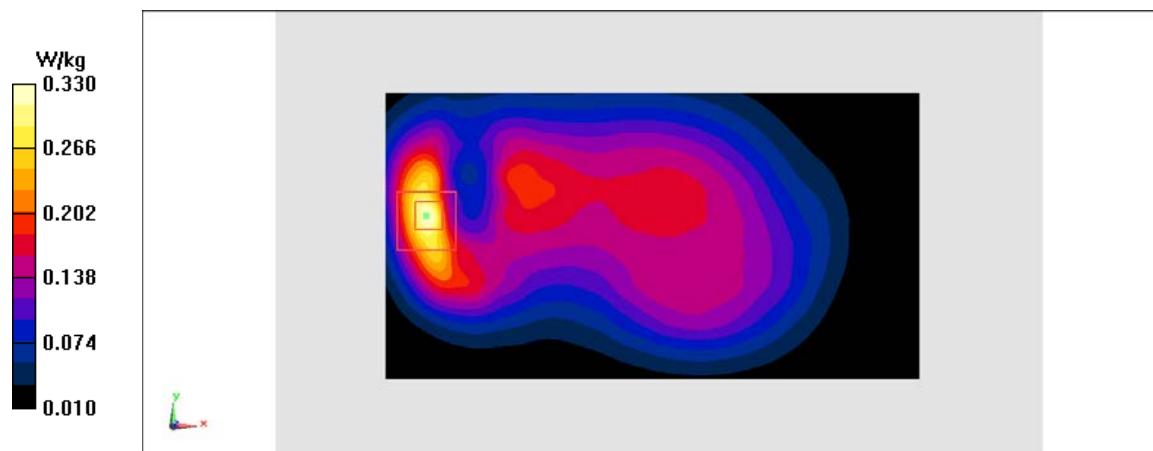
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.81 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.495 W/kg

SAR(1 g) = 0.264 W/kg; SAR(10 g) = 0.141 W/kg

Maximum value of SAR (measured) = 0.33 W/kg

**Fig A.14**

LTE2500-FDD7_CH21350 Left Cheek

Date: 6/11/2018

Electronics: DAE4 Sn1525

Medium: Head 2600 MHz

Medium parameters used: $f = 2560$ MHz; $\sigma = 1.928$ mho/m; $\epsilon_r = 39.62$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE2500-FDD7 2560 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(7.76,7.76,7.76)

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

Maximum value of SAR (interpolated) = 0.357 W/kg

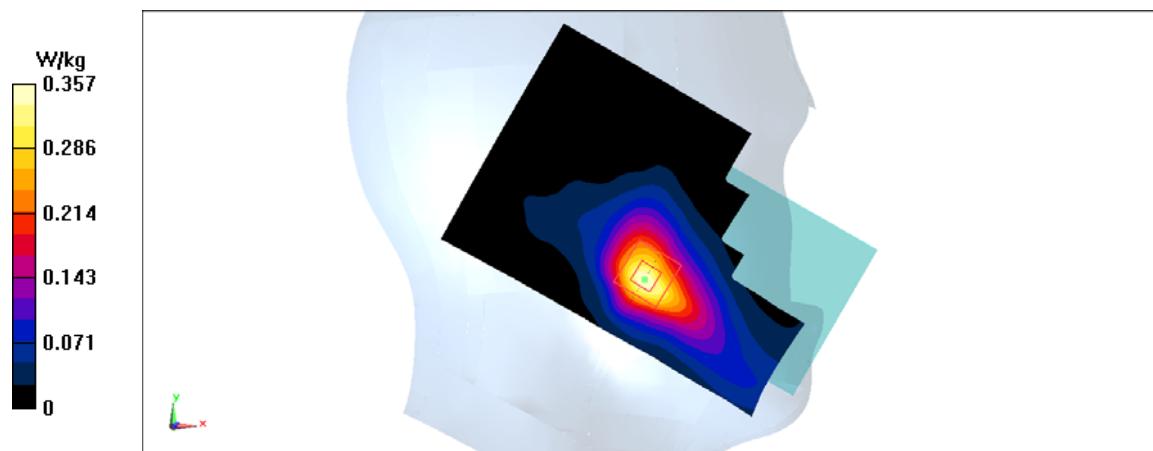
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.826 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.515 W/kg

SAR(1 g) = 0.275 W/kg; SAR(10 g) = 0.147 W/kg

Maximum value of SAR (measured) = 0.345 W/kg

**Fig A.15**

LTE2500-FDD7_CH21350 Bottom edge

Date: 6/11/2018

Electronics: DAE4 Sn1525

Medium: Head 2600 MHz

Medium parameters used: $f = 2560$ MHz; $\sigma = 2.1$ mho/m; $\epsilon_r = 51.66$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE2500-FDD7 2560 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(7.84,7.84,7.84)

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

Maximum value of SAR (interpolated) = 1.38 W/kg

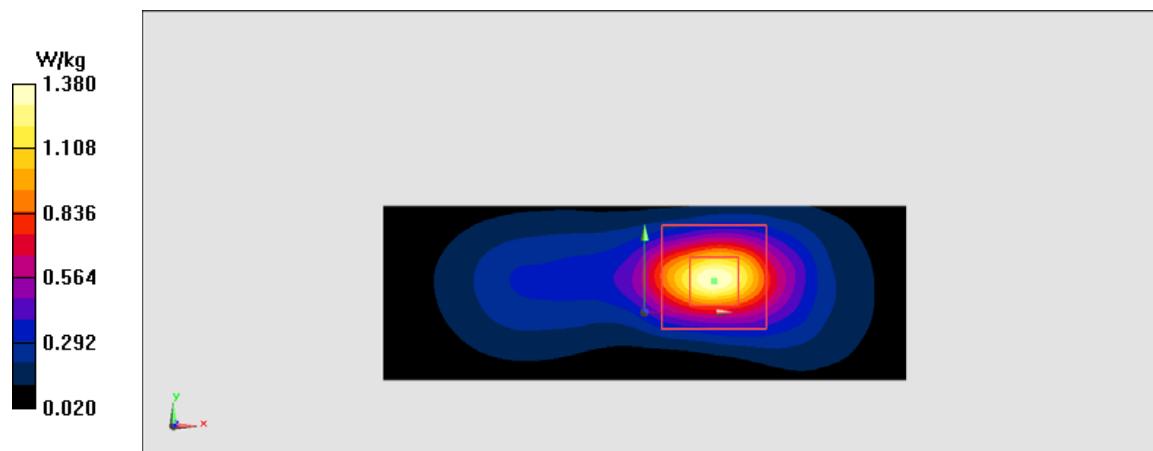
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.93 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 2.12 W/kg

SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.431 W/kg

Maximum value of SAR (measured) = 1.41 W/kg

**Fig A.16**

LTE700-FDD12_CH23095 Left Cheek

Date: 6/1/2018

Electronics: DAE4 Sn1525

Medium: Head 750 MHz

Medium parameters used: $f = 707.5 \text{ MHz}$; $\sigma = 0.858 \text{ mho/m}$; $\epsilon_r = 41.75$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE700-FDD12 707.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(10.57,10.57,10.57)

Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.0855 W/kg

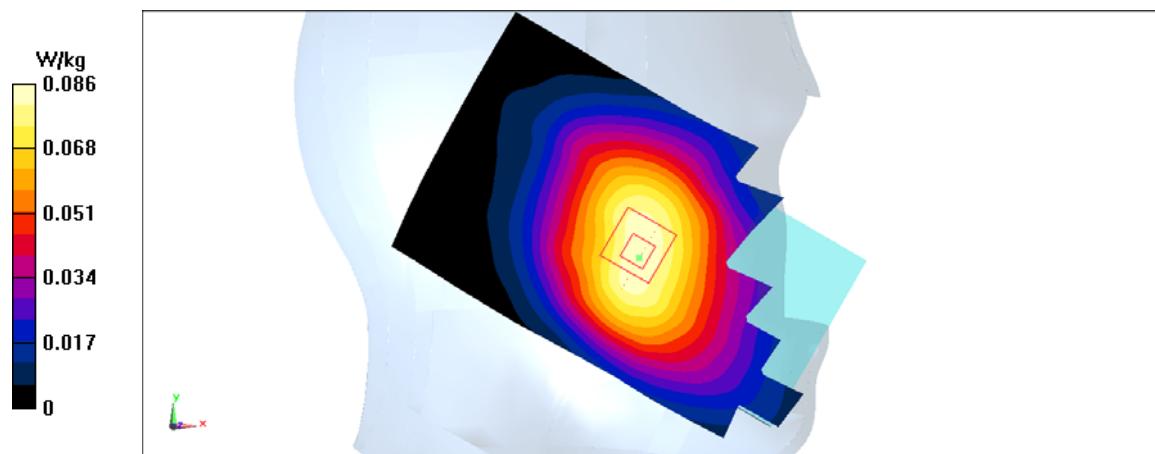
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 3.216 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.097 W/kg

SAR(1 g) = 0.08 W/kg; SAR(10 g) = 0.064 W/kg

Maximum value of SAR (measured) = 0.0864 W/kg

**Fig A.17**

LTE700-FDD12_CH23095 Rear

Date: 6/1/2018

Electronics: DAE4 Sn1525

Medium: Head 750 MHz

Medium parameters used: $f = 707.5$ MHz; $\sigma = 0.911$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE700-FDD12 707.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(10.63,10.63,10.63)

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

Maximum value of SAR (interpolated) = 0.214 W/kg

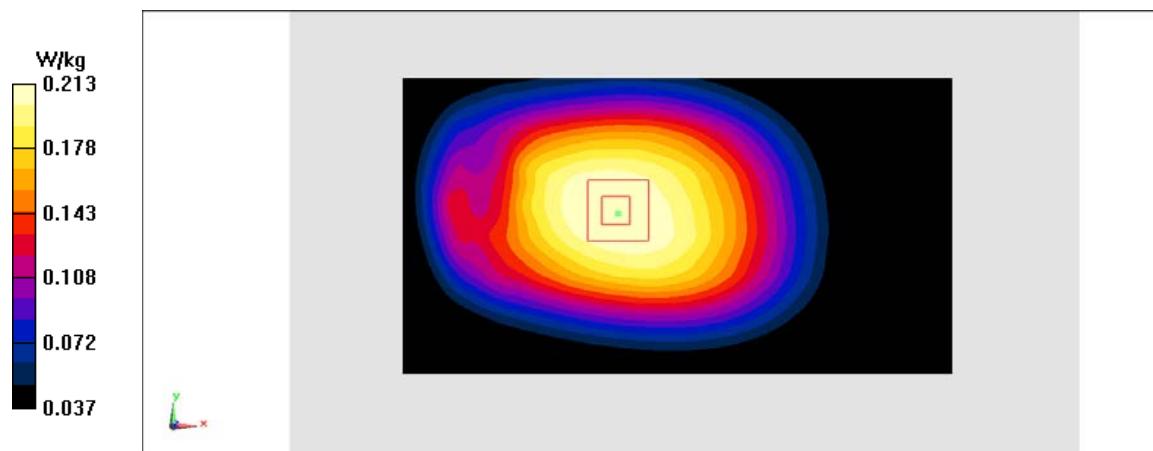
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.63 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.241 W/kg

SAR(1 g) = 0.196 W/kg; SAR(10 g) = 0.154 W/kg

Maximum value of SAR (measured) = 0.213 W/kg

**Fig A.18**

LTE750-FDD13_CH23230 Right Cheek

Date: 6/1/2018

Electronics: DAE4 Sn1525

Medium: Head 750 MHz

Medium parameters used: $f = 782 \text{ MHz}$; $\sigma = 0.928 \text{ mho/m}$; $\epsilon_r = 41.66$; $\rho = 1000 \text{ kg/m}^3$ Ambient Temperature: 22.5°C , Liquid Temperature: 22.3°C

Communication System: LTE750-FDD13 782 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(10.57,10.57,10.57)

Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.105 W/kg

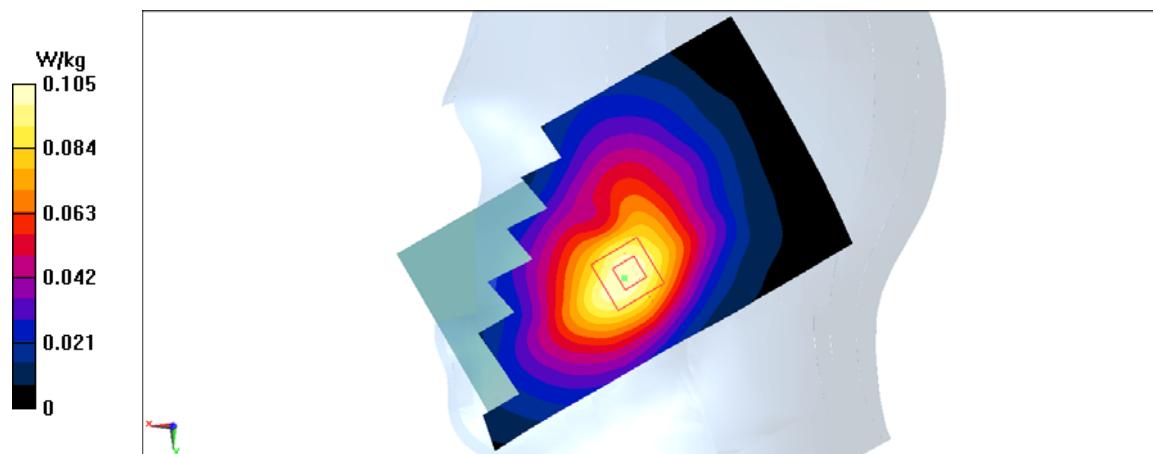
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.295 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.13 W/kg

SAR(1 g) = 0.104 W/kg; SAR(10 g) = 0.08 W/kg

Maximum value of SAR (measured) = 0.114 W/kg

**Fig A.19**

LTE750-FDD13_CH23230 Rear

Date: 6/1/2018

Electronics: DAE4 Sn1525

Medium: Head 750 MHz

Medium parameters used: $f = 782$ MHz; $\sigma = 0.981$ mho/m; $\epsilon_r = 55.31$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE750-FDD13 782 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(10.63,10.63,10.63)

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

Maximum value of SAR (interpolated) = 0.289 W/kg

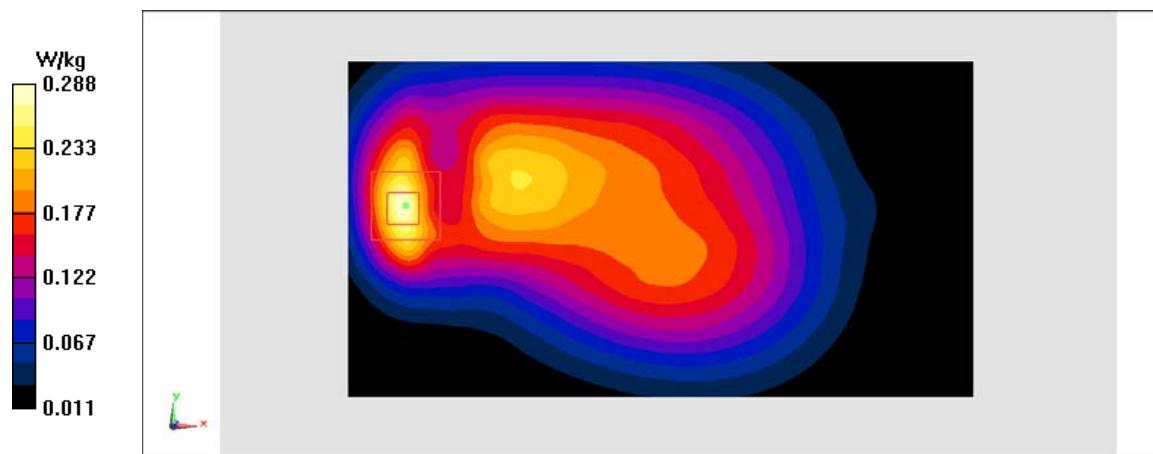
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.89 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.415 W/kg

SAR(1 g) = 0.228 W/kg; SAR(10 g) = 0.126 W/kg

Maximum value of SAR (measured) = 0.288 W/kg

**Fig A.20**

LTE1700-FDD66_CH132572 Left Cheek

Date: 6/3/2018

Electronics: DAE4 Sn1525

Medium: Head 1750 MHz

Medium parameters used: $f = 782$ MHz; $\sigma = 0.46$ mho/m; $\epsilon_r = 41.84$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE1700-FDD66 782 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.70,8.70,8.70)

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

Maximum value of SAR (interpolated) = 0.235 W/kg

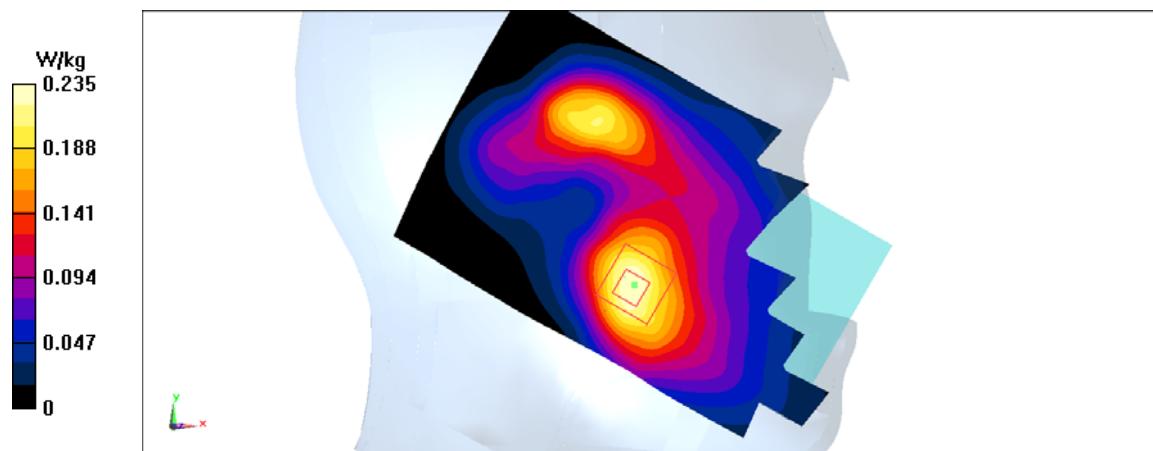
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.465 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.319 W/kg

SAR(1 g) = 0.219 W/kg; SAR(10 g) = 0.142 W/kg

Maximum value of SAR (measured) = 0.252 W/kg

**Fig A.21**

LTE1700-FDD66_CH132072 Rear

Date: 6/3/2018

Electronics: DAE4 Sn1525

Medium: Head 1750 MHz

Medium parameters used: $f = 782$ MHz; $\sigma = 0.594$ mho/m; $\epsilon_r = 54.38$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: LTE1700-FDD66 782 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.60,8.60,8.60)

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

Maximum value of SAR (interpolated) = 0.779 W/kg

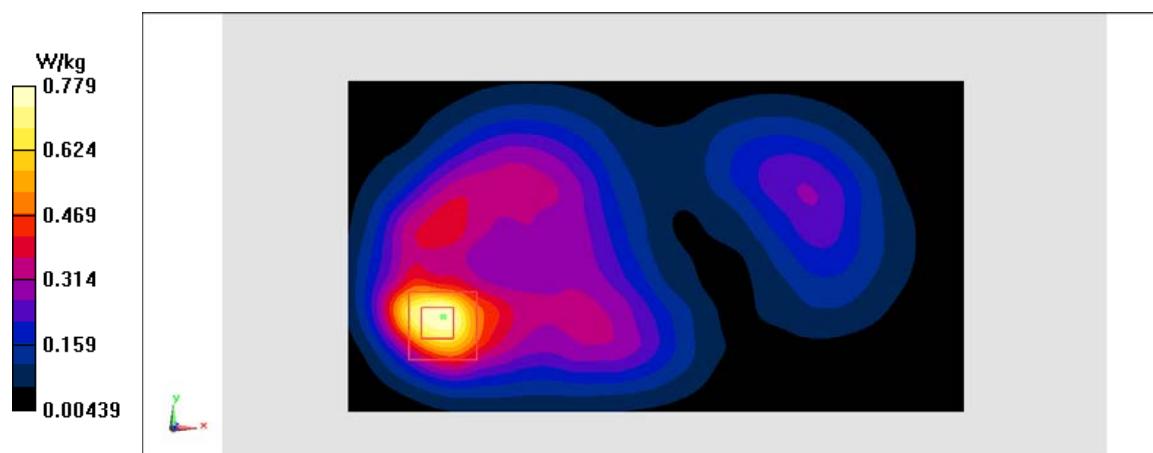
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.764 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.648 W/kg; SAR(10 g) = 0.341 W/kg

Maximum value of SAR (measured) = 0.803 W/kg

**Fig A.22**

WLAN2450_CH1 Right Tilt

Date: 6/10/2018

Electronics: DAE4 Sn1525

Medium: Head 2450 MHz

Medium parameters used: $f = 2412 \text{ MHz}$; $\sigma = 1.748 \text{ mho/m}$; $\epsilon_r = 39.1$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WLAN2450 2412 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(7.89,7.89,7.89)

Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.286 W/kg

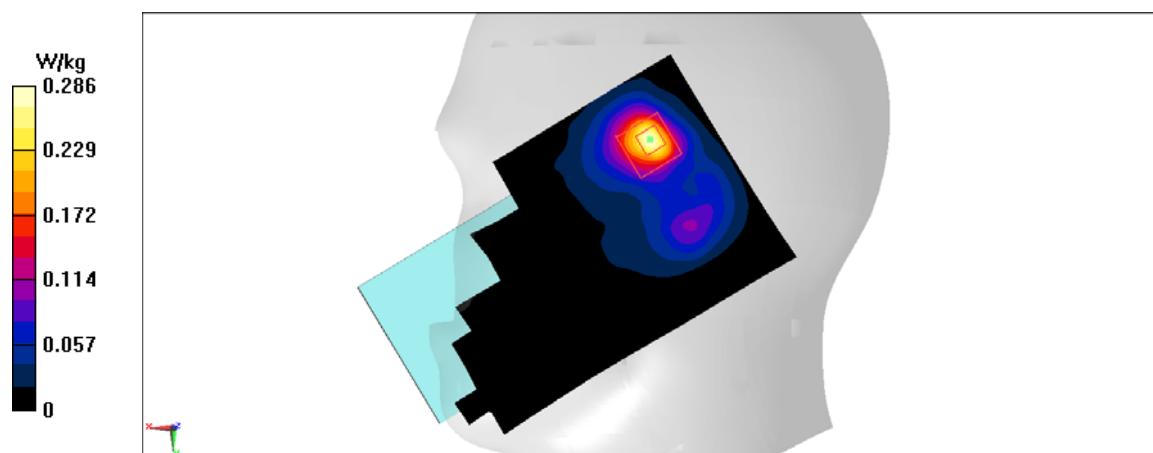
Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.232 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.448 W/kg

SAR(1 g) = 0.201 W/kg; SAR(10 g) = 0.098 W/kg

Maximum value of SAR (measured) = 0.26 W/kg

**Fig A.23**

WLAN2450_CH1 Rear

Date: 6/10/2018

Electronics: DAE4 Sn1525

Medium: Head 2450 MHz

Medium parameters used: $f = 2412 \text{ MHz}$; $\sigma = 1.93 \text{ mho/m}$; $\epsilon_r = 53.41$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C, Liquid Temperature: 22.3°C

Communication System: WLAN2450 2412 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.09,8.09,8.09)

Area Scan (71x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Maximum value of SAR (interpolated) = 0.285 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 2.802 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.37 W/kg

SAR(1 g) = 0.161 W/kg; SAR(10 g) = 0.066 W/kg

Maximum value of SAR (measured) = 0.217 W/kg

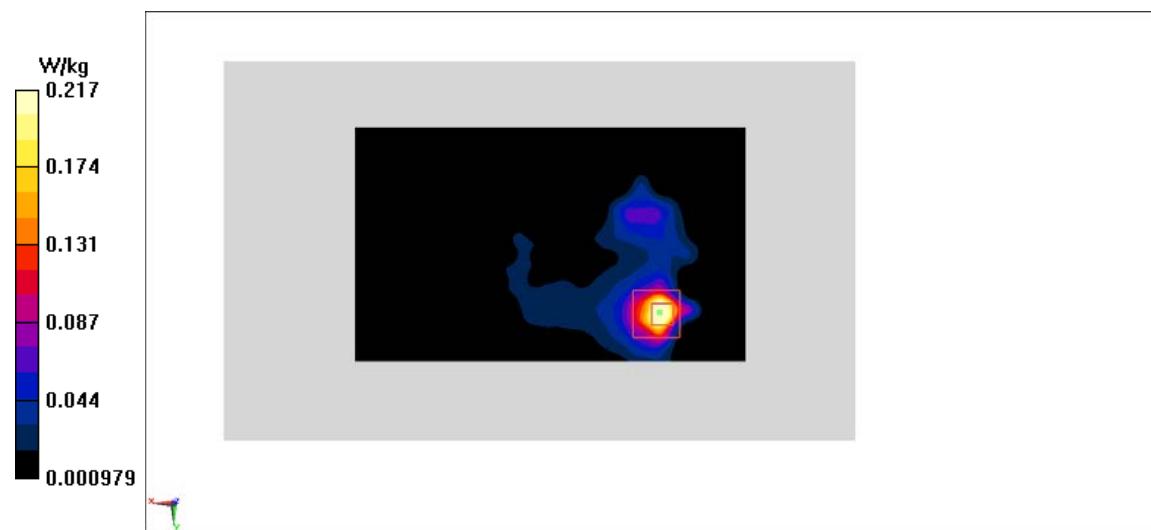
**Fig A.24**



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

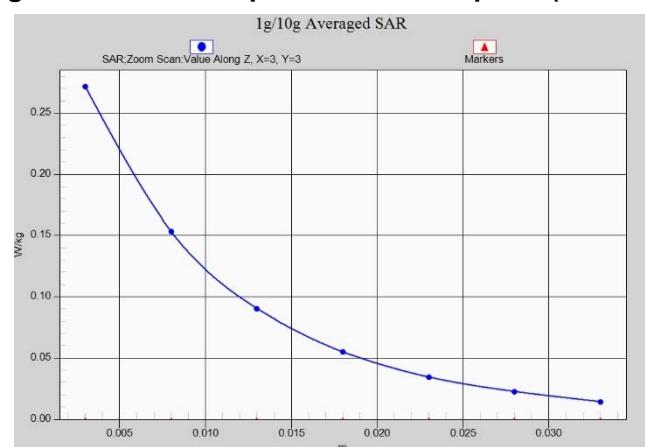


Fig.A.1- 2 Z-Scan at power reference point (GSM850)

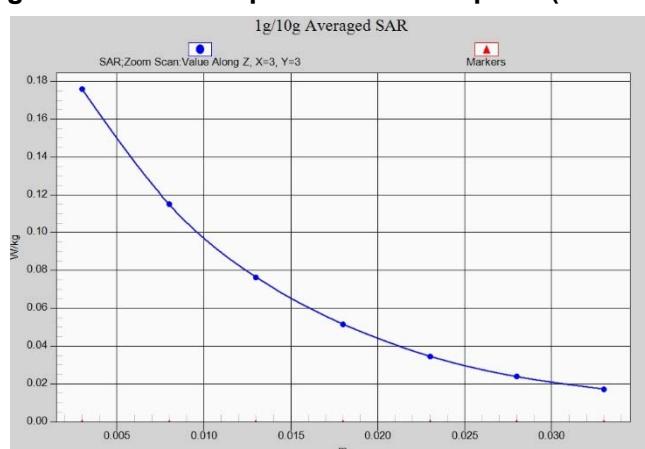


Fig.A.1- 3 Z-Scan at power reference point (PCS1900)

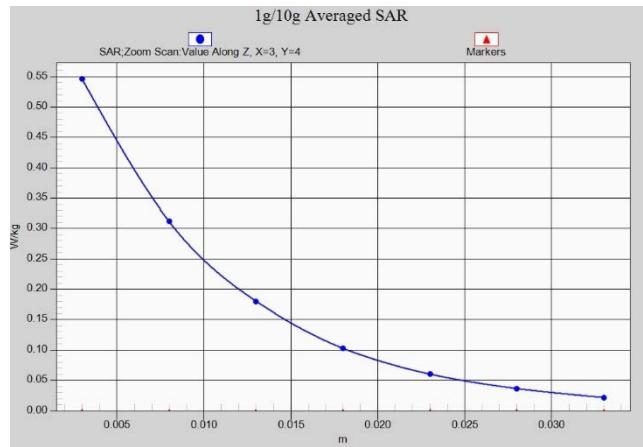


Fig.A.1- 4 Z-Scan at power reference point (PCS1900)

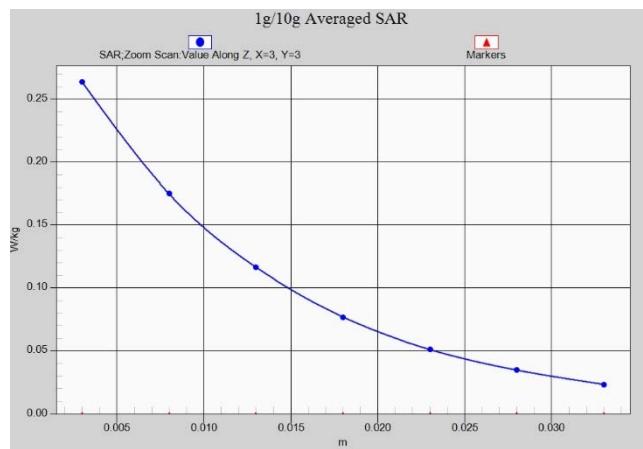


Fig.A.1- 5 Z-Scan at power reference point (W1900)

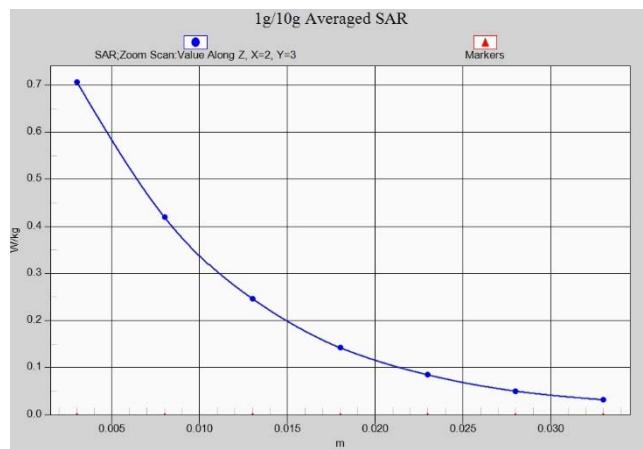


Fig.A.1- 6 Z-Scan at power reference point (W1900)

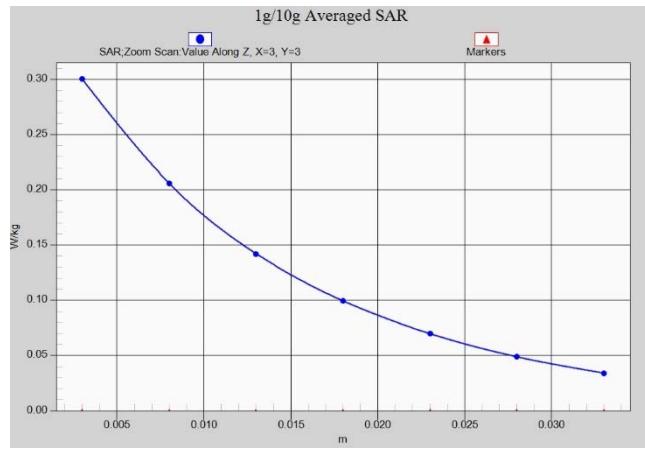


Fig.A.1- 7 Z-Scan at power reference point (W1700)

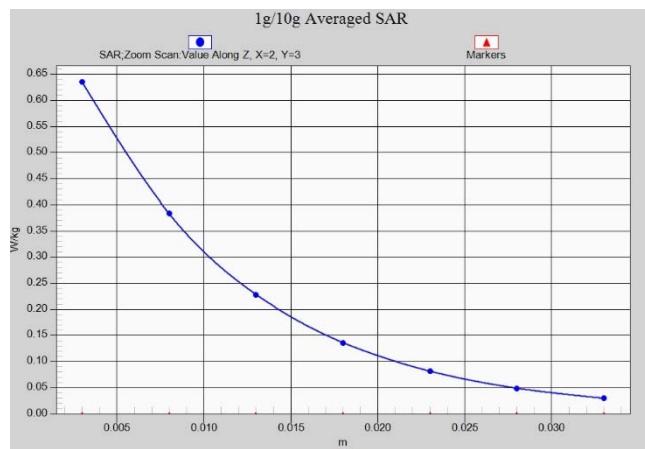


Fig.A.1- 8 Z-Scan at power reference point (W1700)

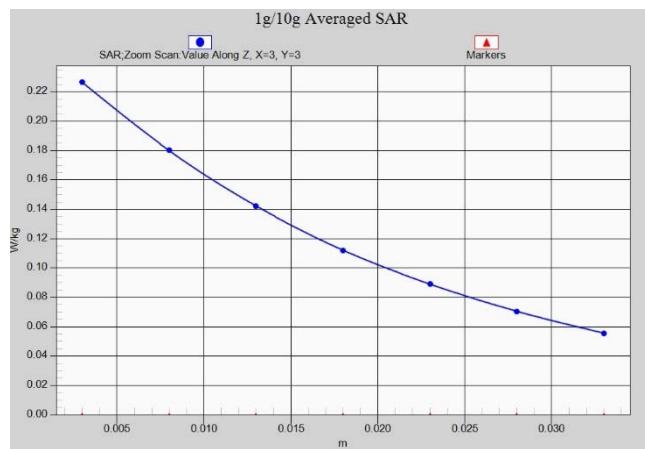


Fig.A.1- 9 Z-Scan at power reference point (W850)

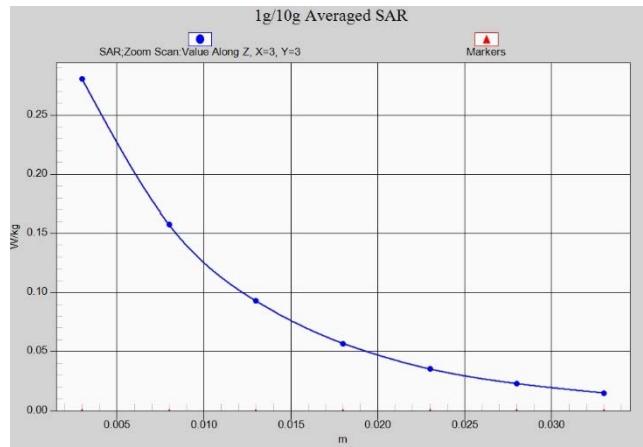


Fig.A.1- 10 Z-Scan at power reference point (W850)

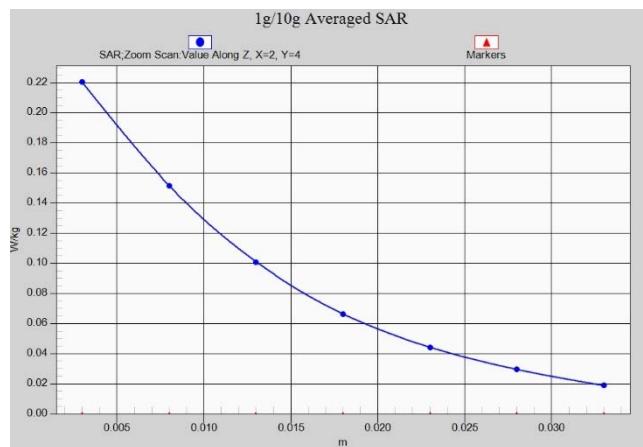


Fig.A.1- 11 Z-Scan at power reference point (LTE band2)

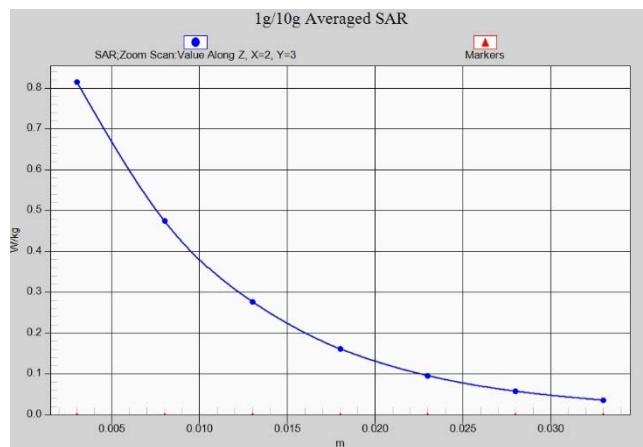


Fig.A.1- 12 Z-Scan at power reference point (LTE band2)



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

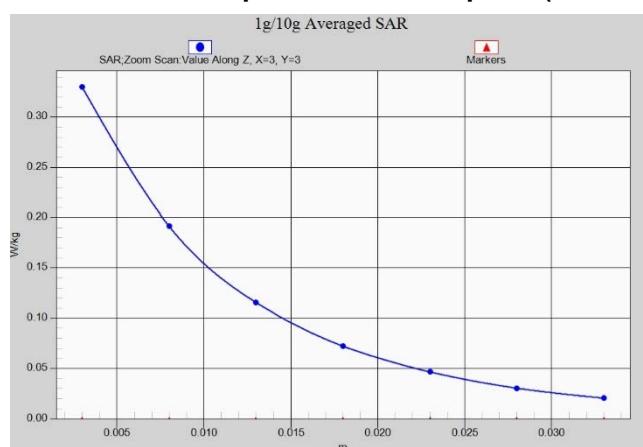


Fig.A.1- 14 Z-Scan at power reference point (LTE band5)

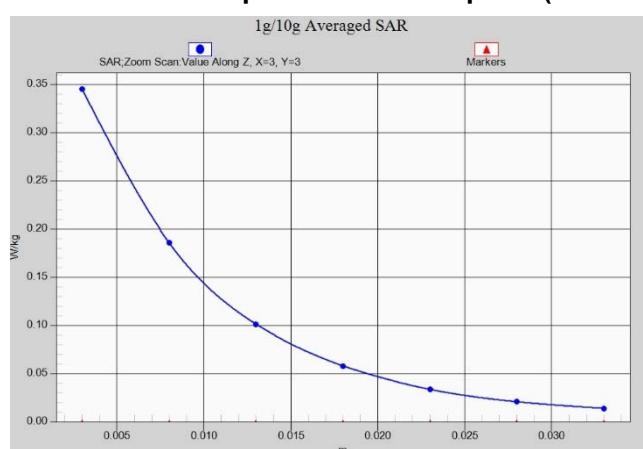


Fig.A.1- 15 Z-Scan at power reference point (LTE band7)

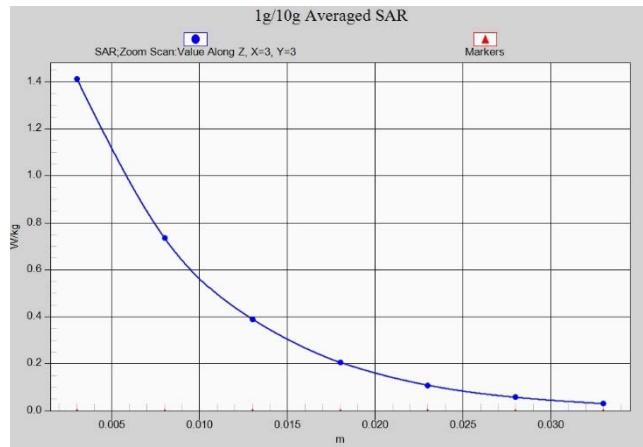


Fig.A.1- 16 Z-Scan at power reference point (LTE band7)

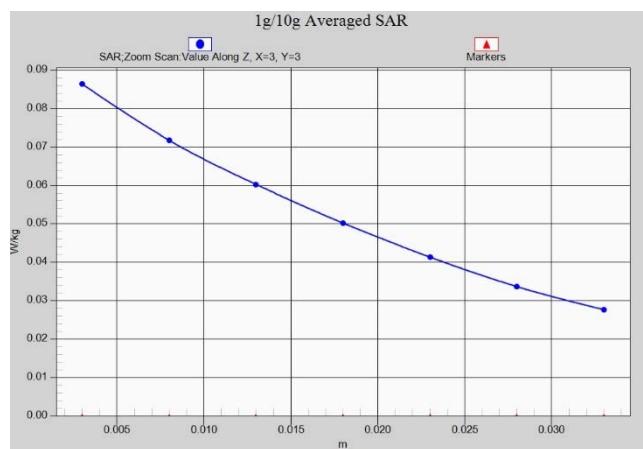


Fig.A.1- 17 Z-Scan at power reference point (LTE band12)



Fig.A.1- 18 Z-Scan at power reference point (LTE band12)

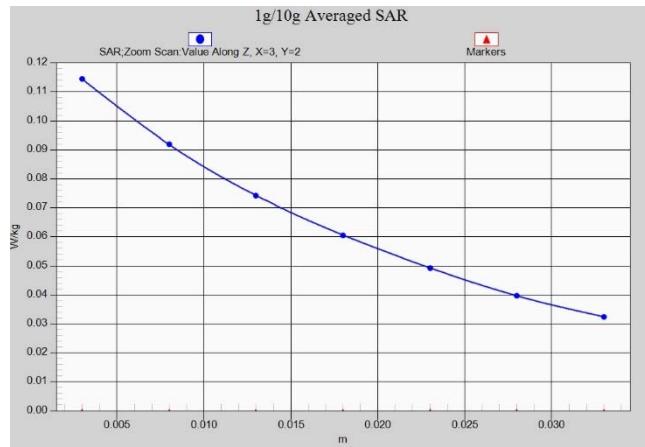


Fig.A.1- 19 Z-Scan at power reference point (LTE band13)

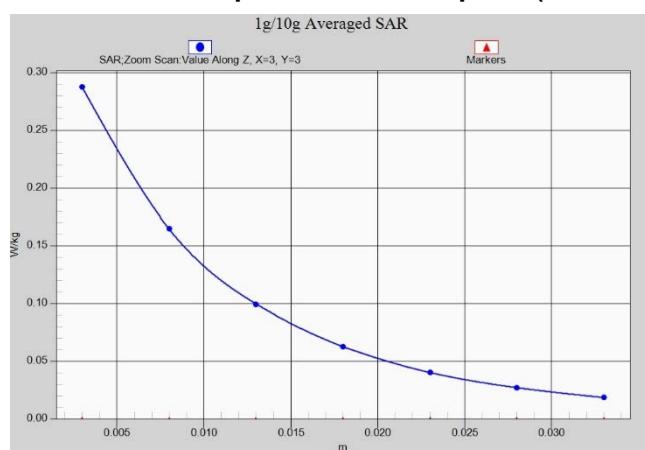


Fig.A.1- 20 Z-Scan at power reference point (LTE band13)

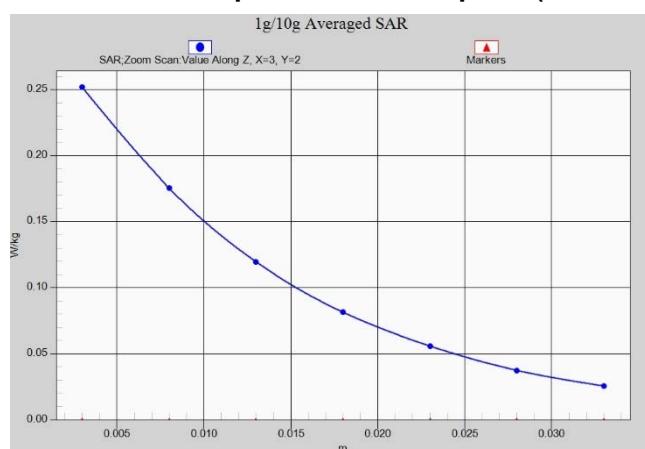


Fig.A.1- 21 Z-Scan at power reference point (LTE band66)

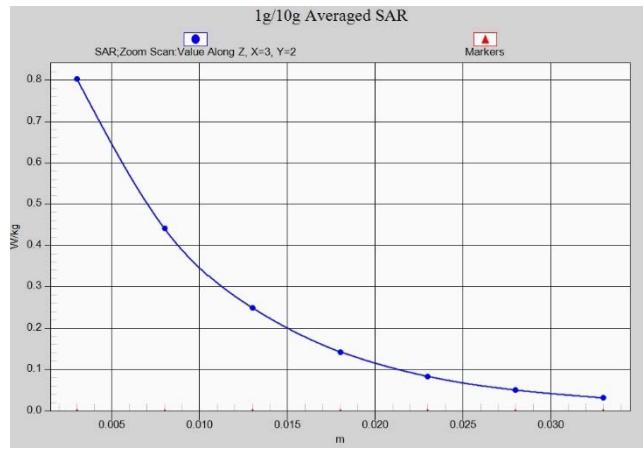


Fig.A.1- 22 Z-Scan at power reference point (LTE band66)

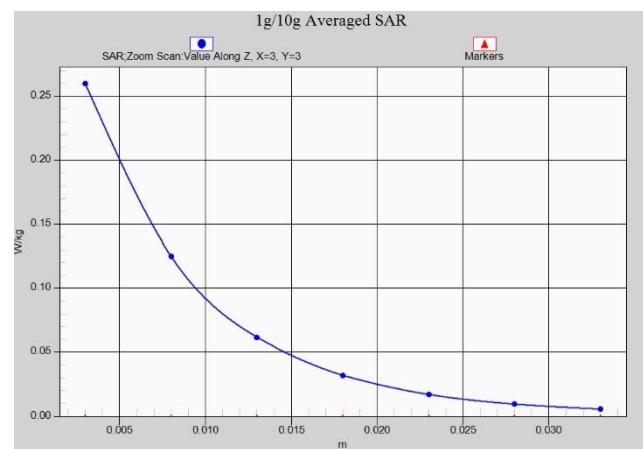


Fig.A.1- 23 Z-Scan at power reference point (Wifi2450)

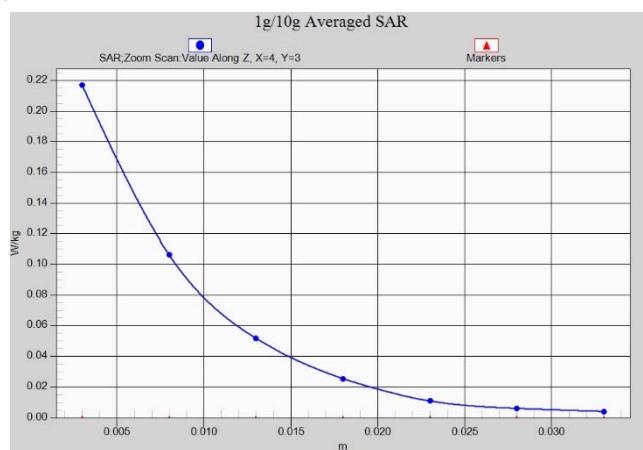


Fig.A.1- 24 Z-Scan at power reference point (Wifi2450)

ANNEX B System Verification Results

750 MHz

Date: 6/1/2018

Electronics: DAE4 Sn1525

Medium: Head 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.898 \text{ mho/m}$; $\epsilon_r = 41.7$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C

Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(10.57,10.57,10.57)

System Validation /Area Scan (81x191x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 59.9 V/m; Power Drift = 0.03

Fast SAR: SAR(1 g) = 2.04 W/kg; SAR(10 g) = 1.38 W/kg

Maximum value of SAR (interpolated) = 2.75 W/kg

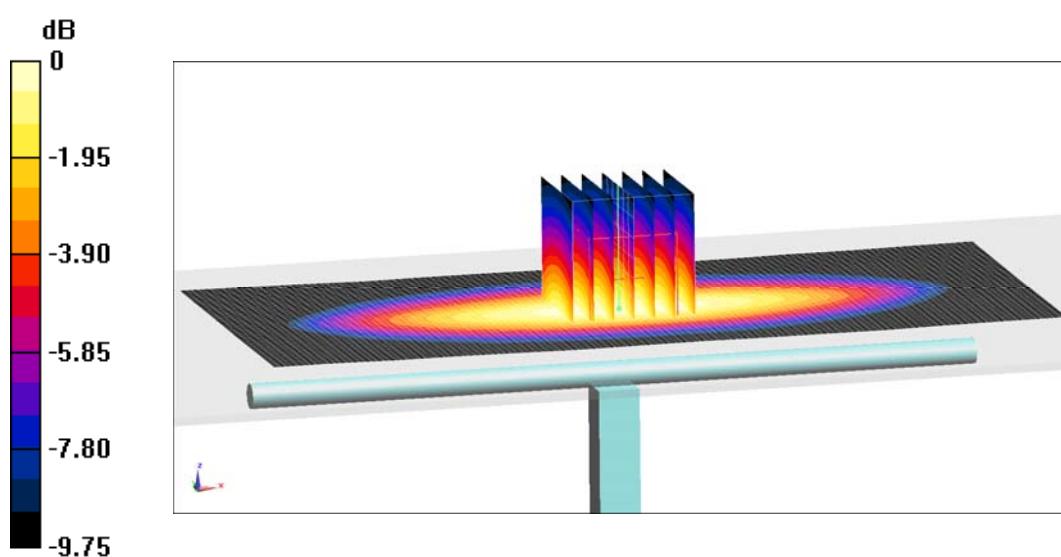
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 59.9 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 3.17 W/kg

SAR(1 g) = 2.08 W/kg; SAR(10 g) = 1.34 W/kg

Maximum value of SAR (measured) = 2.82 W/kg



0 dB = 2.82 W/kg = 4.5 dB W/kg

Fig.B.1 validation 750 MHz 250mW

750 MHz

Date: 6/1/2018

Electronics: DAE4 Sn1525

Medium: Body 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.951 \text{ mho/m}$; $\epsilon_r = 55.35$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C

Communication System: CW Frequency: 750 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(10.63,10.63,10.63)

System Validation /Area Scan (81x191x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 56.8 V/m; Power Drift = -0.03

Fast SAR: SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.42 W/kg

Maximum value of SAR (interpolated) = 3.23 W/kg

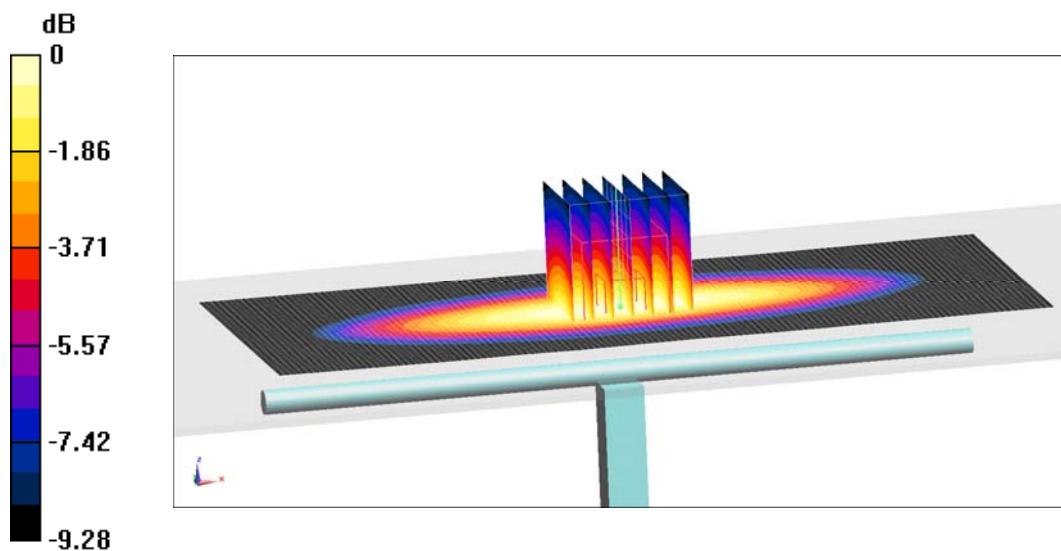
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 56.8 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 3.3 W/kg

SAR(1 g) = 2.21 W/kg; SAR(10 g) = 1.41 W/kg

Maximum value of SAR (measured) = 2.9 W/kg



0 dB = 2.9 W/kg = 4.62 dB W/kg

Fig.B.2 validation 750 MHz 250mW

835 MHz

Date: 6/2/2018

Electronics: DAE4 Sn1525

Medium: Head 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.901 \text{ mho/m}$; $\epsilon_r = 41.6$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C

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

Probe: EX3DV4 – SN7464 ConvF(10.28,10.28,10.28)

System Validation /Area Scan (81x191x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 64.81 V/m; Power Drift = 0.04

Fast SAR: SAR(1 g) = 2.34 W/kg; SAR(10 g) = 1.5 W/kg

Maximum value of SAR (interpolated) = 3.8 W/kg

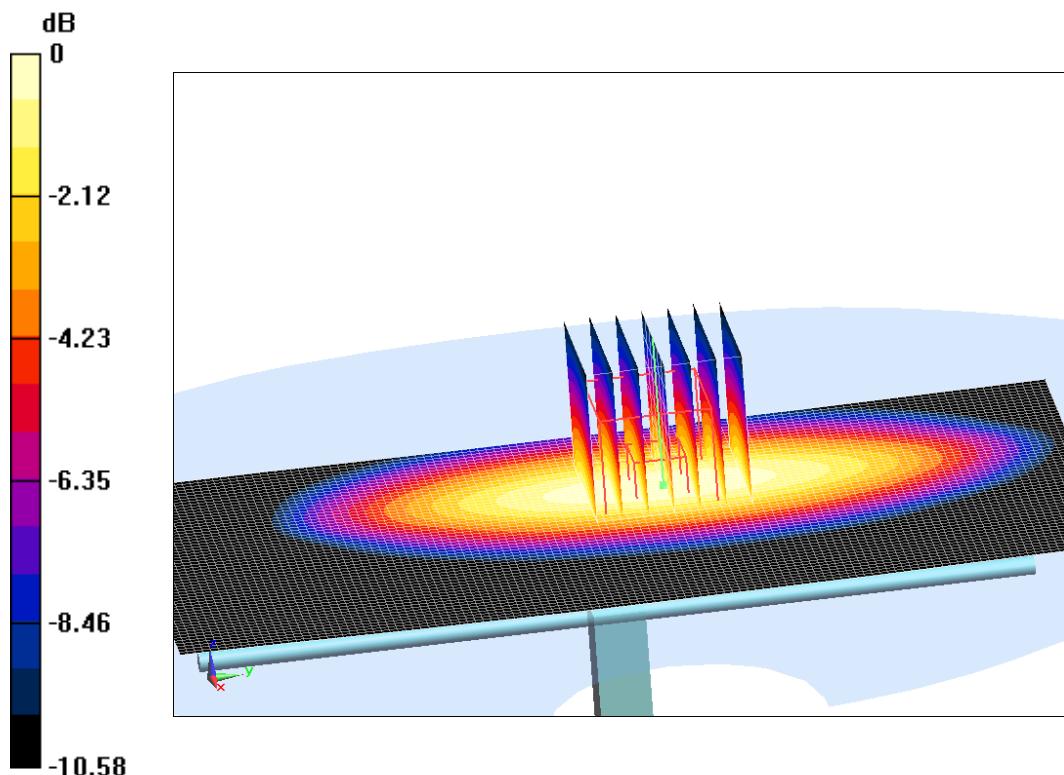
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 64.81 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 4.12 W/kg

SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.52 W/kg

Maximum value of SAR (measured) = 3.63 W/kg



0 dB = 3.63 W/kg = 5.6 dB W/kg

Fig.B.3 validation 835 MHz 250mW

835 MHz

Date: 6/2/2018

Electronics: DAE4 Sn1525

Medium: Body 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.988 \text{ mho/m}$; $\epsilon_r = 56.1$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C

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

Probe: EX3DV4 – SN7464 ConvF(10.21,10.21,10.21)

System Validation /Area Scan (81x191x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 59.21 V/m; Power Drift = -0.09

Fast SAR: SAR(1 g) = 2.32 W/kg; SAR(10 g) = 1.52 W/kg

Maximum value of SAR (interpolated) = 3.58 W/kg

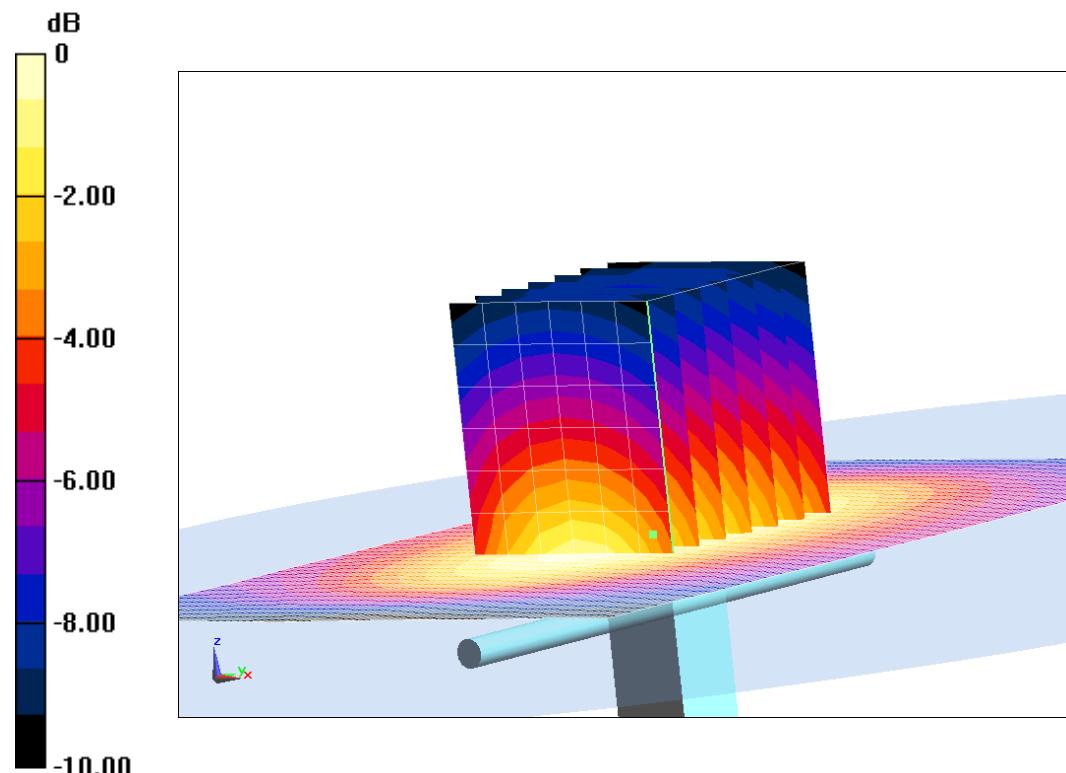
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 59.21 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 3.7 W/kg

SAR(1 g) = 2.31 W/kg; SAR(10 g) = 1.55 W/kg

Maximum value of SAR (measured) = 3.2 W/kg



0 dB = 3.2 W/kg = 5.05 dB W/kg

Fig.B.4 validation 835 MHz 250mW

1750 MHz

Date: 6/3/2018

Electronics: DAE4 Sn1525

Medium: Head 1750 MHz

Medium parameters used: $f = 1750 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 40.68$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C

Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.70,8.70,8.70)

System Validation /Area Scan (81x191x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 104.5 V/m; Power Drift = 0.06

Fast SAR: SAR(1 g) = 9.05 W/kg; SAR(10 g) = 4.85 W/kg

Maximum value of SAR (interpolated) = 14.9 W/kg

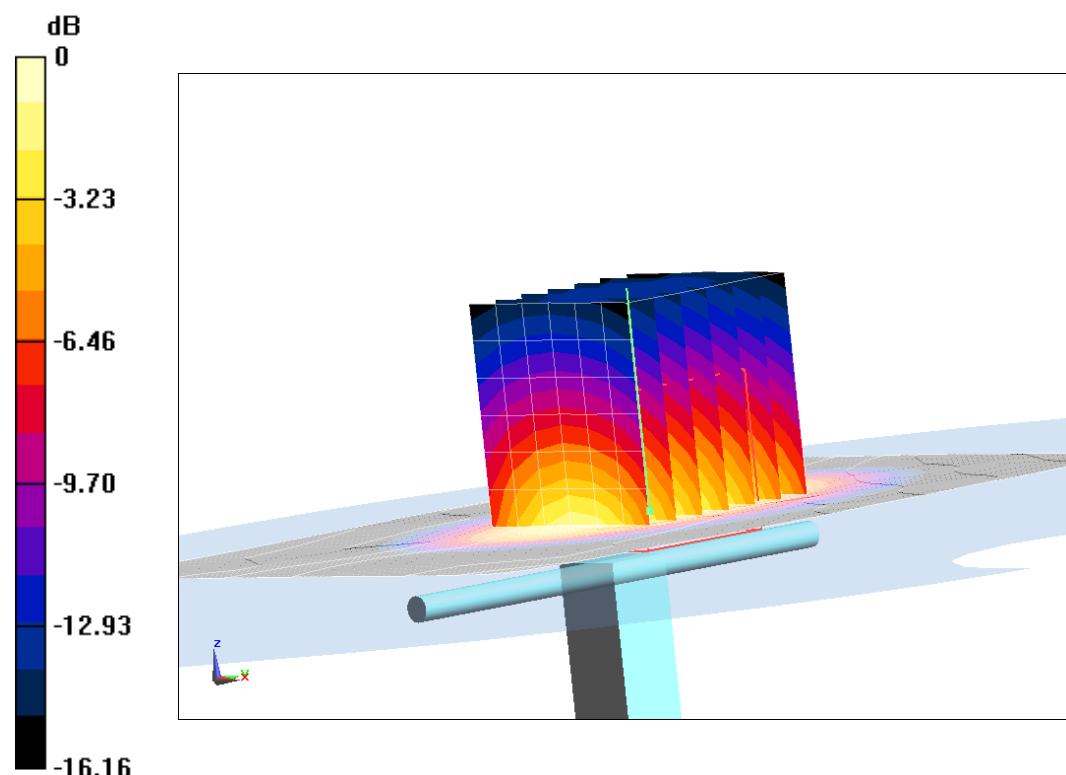
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 104.5 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 17.93 W/kg

SAR(1 g) = 9.03 W/kg; SAR(10 g) = 4.88 W/kg

Maximum value of SAR (measured) = 14.5 W/kg



0 dB = 14.5 W/kg = 11.61 dB W/kg

Fig.B.5 validation 1750 MHz 250mW

1750 MHz

Date: 6/3/2018

Electronics: DAE4 Sn1525

Medium: Body 1750 MHz

Medium parameters used: $f = 1750 \text{ MHz}$; $\sigma = 1.514 \text{ mho/m}$; $\epsilon_r = 53.22$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C

Communication System: CW Frequency: 1750 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.60,8.60,8.60)

System Validation /Area Scan (81x191x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 101.14 V/m; Power Drift = 0.04

Fast SAR: SAR(1 g) = 9.15 W/kg; SAR(10 g) = 4.93 W/kg

Maximum value of SAR (interpolated) = 16.23 W/kg

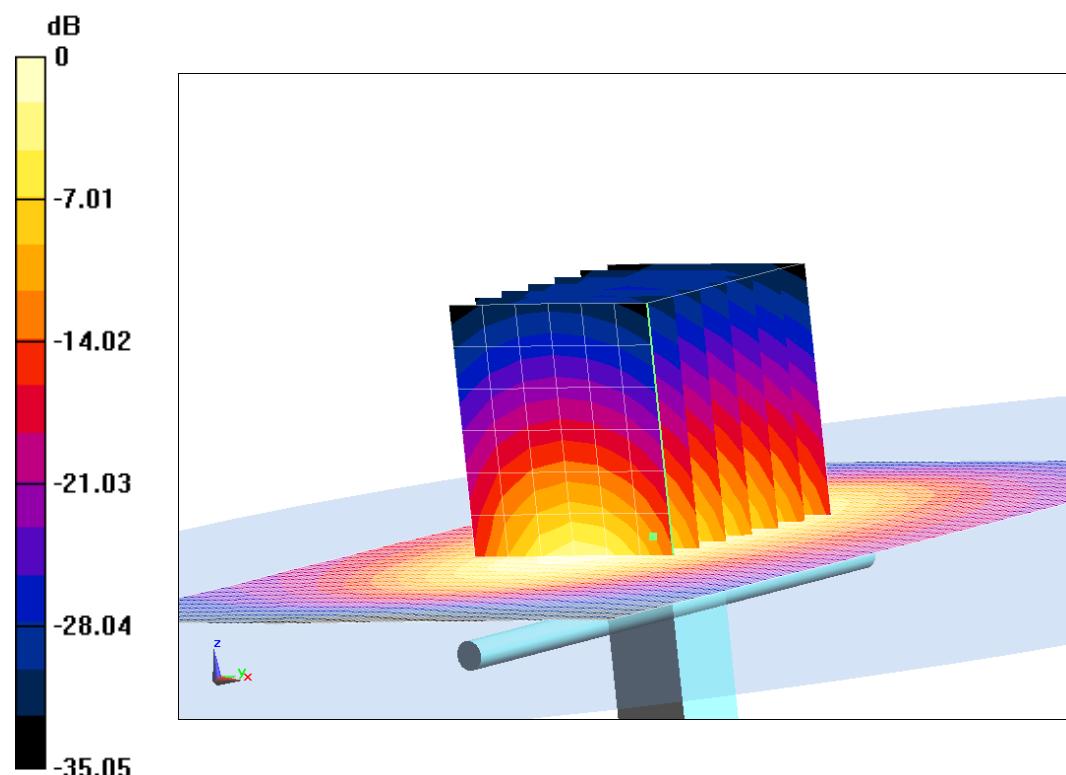
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 101.14 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 16.08 W/kg

SAR(1 g) = 9.19 W/kg; SAR(10 g) = 5.02 W/kg

Maximum value of SAR (measured) = 13.23 W/kg



0 dB = 13.23 W/kg = 11.22 dB W/kg

Fig.B.6 validation 1750 MHz 250mW

1900 MHz

Date: 6/9/2018

Electronics: DAE4 Sn1525

Medium: Head 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.39 \text{ mho/m}$; $\epsilon_r = 39.55$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C

Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.39,8.39,8.39)

System Validation /Area Scan (81x191x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 105.18 V/m; Power Drift = 0.02

Fast SAR: SAR(1 g) = 10.03 W/kg; SAR(10 g) = 5.25 W/kg

Maximum value of SAR (interpolated) = 14.95 W/kg

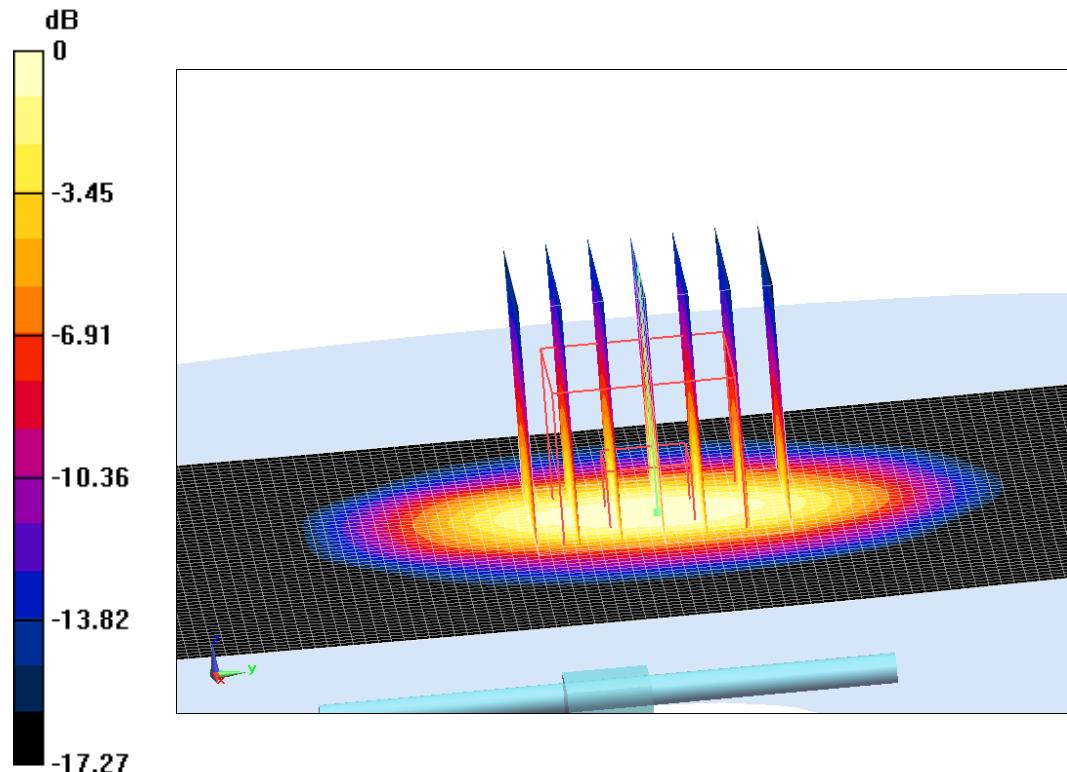
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 105.18 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 18.32 W/kg

SAR(1 g) = 10.15 W/kg; SAR(10 g) = 5.2 W/kg

Maximum value of SAR (measured) = 14.81 W/kg



0 dB = 14.81 W/kg = 11.71 dB W/kg

Fig.B.7 validation 1900 MHz 250mW

1900 MHz

Date: 6/9/2018

Electronics: DAE4 Sn1525

Medium: Body 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.536 \text{ mho/m}$; $\epsilon_r = 53.19$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C

Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.32,8.32,8.32)

System Validation /Area Scan (81x191x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 103.34 V/m; Power Drift = -0.03

Fast SAR: SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.34 W/kg

Maximum value of SAR (interpolated) = 17.78 W/kg

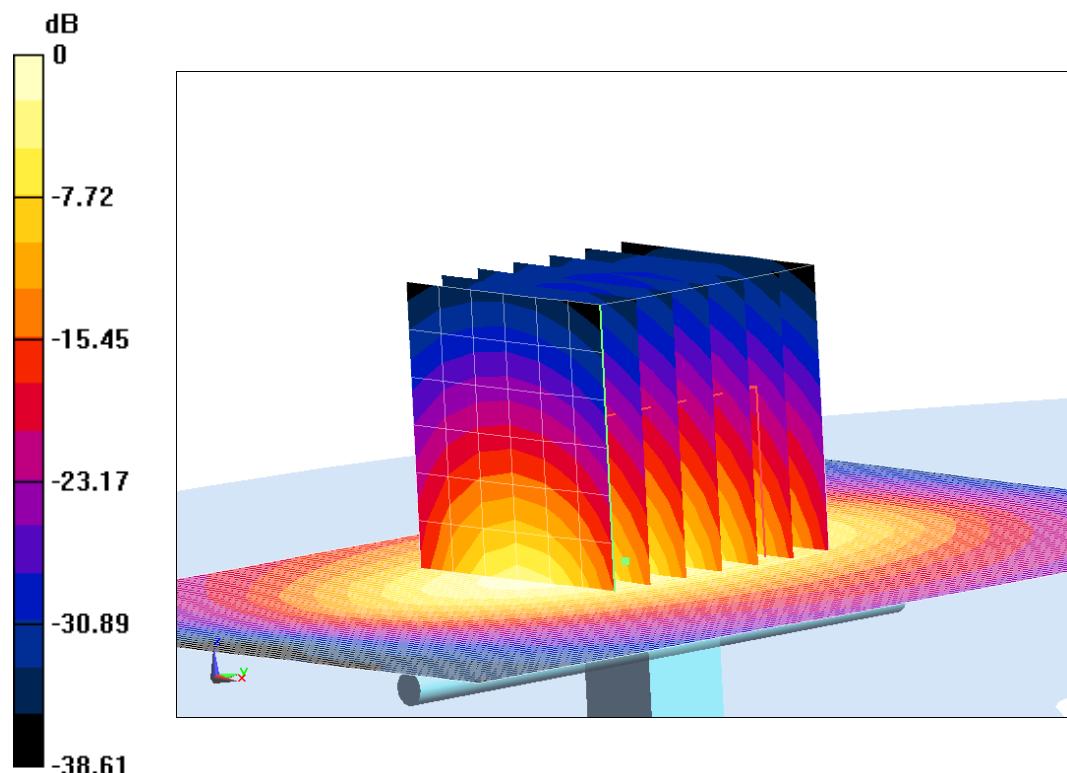
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 103.34 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 17.85 W/kg

SAR(1 g) = 10.03 W/kg; SAR(10 g) = 5.31 W/kg

Maximum value of SAR (measured) = 14.11 W/kg



0 dB = 14.11 W/kg = 11.5 dB W/kg

Fig.B.8 validation 1900 MHz 250mW

2450 MHz

Date: 6/10/2018

Electronics: DAE4 Sn1525

Medium: Head 2450 MHz

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.784 \text{ mho/m}$; $\epsilon_r = 39.05$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C

Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(7.89,7.89,7.89)

System Validation /Area Scan (81x191x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 113.79 V/m; Power Drift = -0.08

Fast SAR: SAR(1 g) = 12.95 W/kg; SAR(10 g) = 6.09 W/kg

Maximum value of SAR (interpolated) = 21.4 W/kg

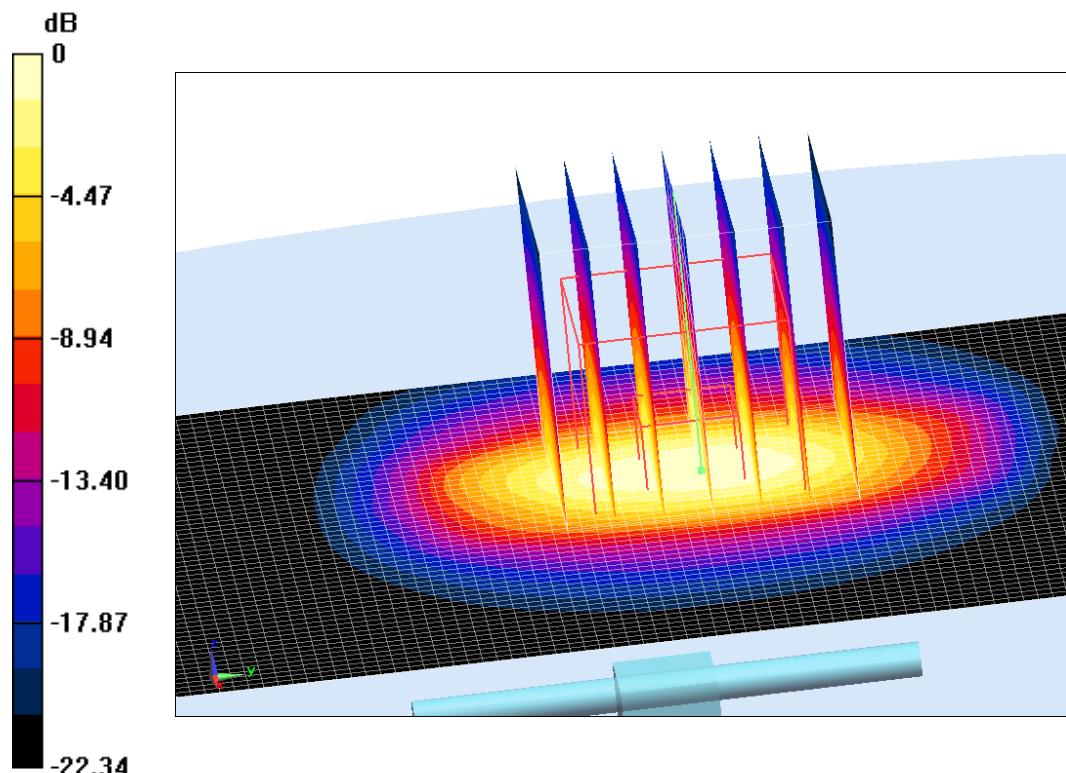
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 113.79 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 26.83 W/kg

SAR(1 g) = 13.29 W/kg; SAR(10 g) = 6.28 W/kg

Maximum value of SAR (measured) = 21.92 W/kg



0 dB = 21.92 W/kg = 13.41 dB W/kg

Fig.B.9 validation 2450 MHz 250mW

2450 MHz

Date: 6/10/2018

Electronics: DAE4 Sn1525

Medium: Body 2450 MHz

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.966 \text{ mho/m}$; $\epsilon_r = 53.36$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.5°C Liquid Temperature: 22.3°C

Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN7464 ConvF(8.09,8.09,8.09)

System Validation /Area Scan (81x191x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 103.84 V/m; Power Drift = -0.02

Fast SAR: $\text{SAR}(1 \text{ g}) = 12.75 \text{ W/kg}$; $\text{SAR}(10 \text{ g}) = 5.97 \text{ W/kg}$

Maximum value of SAR (interpolated) = 25.88 W/kg

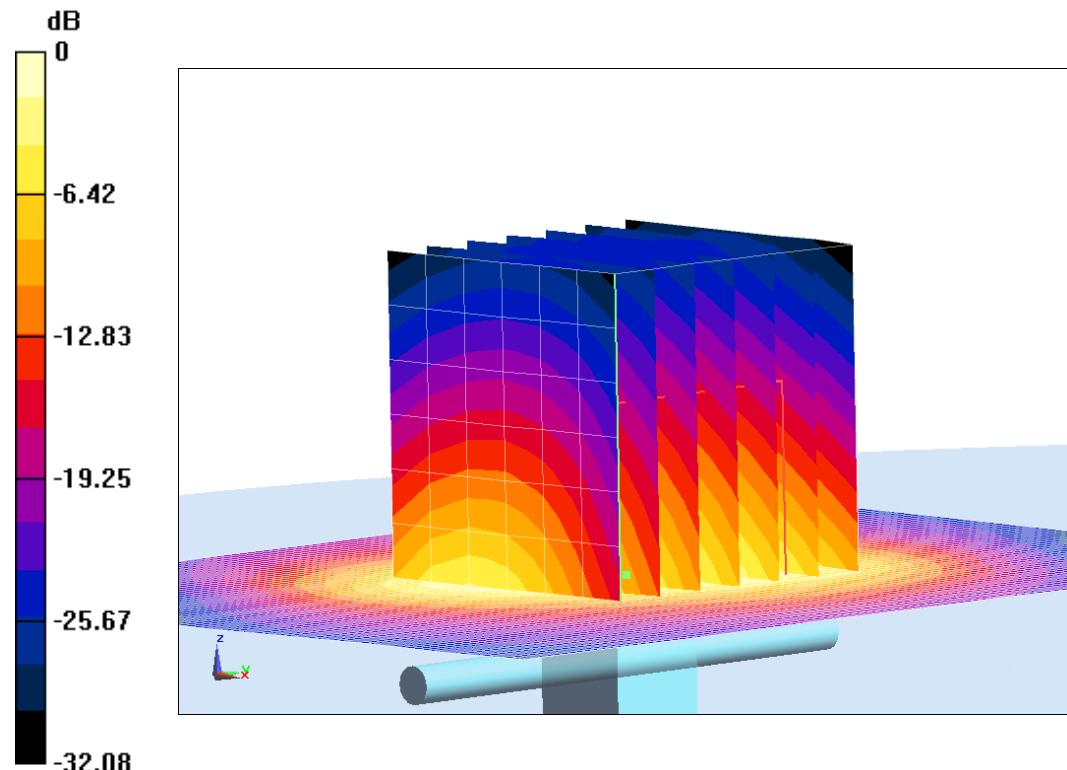
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 103.84 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 25.71 W/kg

SAR(1 g) = 12.47 W/kg; SAR(10 g) = 5.86 W/kg

Maximum value of SAR (measured) = 20.11 W/kg



0 dB = 20.11 W/kg = 13.03 dB W/kg

Fig.B.10 validation 2450 MHz 250mW