

Table 14-6 PCS1900 #2 Body

PCS1900 #2 Body								
Ambient Temperature:			22.8			Liquid Temperature: 22.4		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			CH810 1909.8	CH661 1880 MHz	CH512 1850.2	CH810 1909.8	CH661 1880 MHz	CH512 1850.2
GPRS 3 Txslots	Tune-up		20.00	20.00	20.00	Scaling factor*		
	Slot Average Power [dBm]		19.83	19.67	19.65	1.04	1.08	1.08
	Rear 0mm	1g SAR	0.369	0.347	0.317	0.38	0.37	0.34
		10g SAR	0.183	0.169	0.158	0.19	0.18	0.17
		Deviation	0.11	-0.02	0.09	0.11	-0.02	0.09
	Bottom edge 0mm	1g SAR		0.127			0.14	
		10g SAR		0.055			0.06	
		Deviation		0.14			0.14	
	Left edge 0mm	1g SAR		0.052			0.06	
		10g SAR		0.026			0.03	
		Deviation		0.08			0.08	
EGPRS GMSK 3 Txslots	Tune-up		20.00	20.00	20.00	Scaling factor*		
	Slot Average Power [dBm]		19.82	19.67	19.66	1.04	1.08	1.08
	Rear 0mm	1g SAR	0.365			0.38		
		10g SAR	0.179			0.19		
		Deviation	0.05			0.05		
GPRS 3 Txslots SKU8	Rear 0mm	1g SAR	0.363			0.38		
		10g SAR	0.176			0.18		
		Deviation	0.14			0.14		

Table 14-7 WCDMA1900-BII #1Head

WCDMA1900-BII #1Head								
Ambient Temperature: 22.8					Liquid Temperature: 22.4			
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			CH9538 1907.6	CH9400 1880 MHz	CH9262 1852.4	CH9538 1907.6	CH9400 1880 MHz	CH9262 1852.4
RMC	Tune-up		23.00	23.00	23.00	Scaling factor*		
	Slot Average Power [dBm]		22.50	22.66	22.64	1.12	1.08	1.09
	Left Cheek	1g SAR	0.081	0.096	0.055	0.09	0.10	0.06
		10g SAR	0.053	0.063	0.037	0.06	0.07	0.04
		Deviation	0.09	-0.13	-0.07	0.09	-0.13	-0.07
	Left Tilt	1g SAR		0.049			0.05	
		10g SAR		0.032			0.03	
		Deviation		0.16			0.16	
	Right Cheek	1g SAR		0.057			0.06	
		10g SAR		0.038			0.04	
		Deviation		0.11			0.11	
	Right Tilt	1g SAR		0.04			0.04	
		10g SAR		0.026			0.03	
		Deviation		-0.08			-0.08	
RMC SKU8	Left Cheek	1g SAR		0.085			0.09	
		10g SAR		0.058			0.06	
		Deviation		0.15			0.15	

Table 14-8 WCDMA1900-BII #1Body

WCDMA1900-BII #1Body								
Ambient Temperature: 22.8					Liquid Temperature: 22.4			
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			CH9538 1907.6	CH9400 1880 MHz	CH9262 1852.4	CH9538 1907.6	CH9400 1880 MHz	CH9262 1852.4
RMC	Tune-up		23.00	23.00	23.00	Scaling factor*		
	Slot Average Power [dBm]		22.50	22.66	22.64	1.12	1.08	1.09
	Left edge 19mm	1g SAR		0.045			0.05	
		10g SAR		0.027			0.03	
		Deviation		0.09			0.09	
	Rear 19mm	1g SAR		0.103			0.11	
		10g SAR		0.062			0.07	
		Deviation		0.05			0.05	
	Bottom edge 19mm	1g SAR		0.187			0.20	
		10g SAR		0.106			0.11	
		Deviation		0.02			0.02	

Table 14-9 WCDMA1900-BII #2Body

WCDMA1900-BII #2Body									
Ambient Temperature:			22.8			Liquid Temperature:			22.4
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH9538 1907.6	CH9400 1880 MHz	CH9262 1852.4	CH9538 1907.6	CH9400 1880 MHz	CH9262 1852.4	
RMC	Tune-up		17.50	17.50	17.50	Scaling factor*			
	Slot Average Power [dBm]		16.99	17.09	17.07	1.12	1.10	1.10	
	Rear 0mm	1g SAR	0.568	0.556	0.488	0.64	0.61	0.54	
		10g SAR	0.277	0.262	0.24	0.31	0.29	0.26	
		Deviation	0.05	0.09	0.07	0.05	0.09	0.07	
	Bottom edge 0mm	1g SAR		0.195			0.21		
		10g SAR		0.083			0.09		
		Deviation		0.04			0.04		
	Left edge 0mm	1g SAR		0.08			0.09		
		10g SAR		0.04			0.04		
		Deviation		-0.11			-0.11		
RMC SKU8	Rear 0mm	1g SAR	0.557			0.63			
		10g SAR	0.264			0.30			
		Deviation	0.13			0.13			

Table 14-10 WCDMA850-BV #1Head

WCDMA850-BV #1Head								
Ambient Temperature: 22.8					Liquid Temperature: 22.4			
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			CH4233 846.6 MHz	CH4182 835.4 MHz	CH4132 826.4 MHz	CH4233 846.6 MHz	CH4182 835.4 MHz	CH4132 826.4 MHz
RMC	Tune-up		23.00	23.00	23.00	Scaling factor*		
	Slot Average Power [dBm]		22.91	22.97	22.99	1.02	1.01	1.00
	Left Cheek	1g SAR		0.058			0.06	
		10g SAR		0.048			0.05	
		Deviation		-0.06			-0.06	
	Left Tilt	1g SAR		0.052			0.05	
		10g SAR		0.042			0.04	
		Deviation		0.01			0.01	
	Right Cheek	1g SAR	0.083	0.069	0.09	0.08	0.07	0.09
		10g SAR	0.064	0.051	0.068	0.07	0.05	0.07
		Deviation	0.06	0.02	0.06	0.06	0.02	0.06
	Right Tilt	1g SAR		0.033			0.03	
		10g SAR		0.023			0.02	
		Deviation		0.02			0.02	
RMC SKU8	Right Cheek	1g SAR			0.076			0.08
		10g SAR			0.056			0.06
		Deviation			-0.09			-0.09

Table 14-11 WCDMA850-BV #1Body

WCDMA850-BV #1Body								
Ambient Temperature:			22.8			Liquid Temperature: 22.4		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			CH4233	CH4182	CH4132	CH4233	CH4182	CH4132
			846.6 MHz	835.4 MHz	826.4 MHz	846.6 MHz	835.4 MHz	826.4 MHz
RMC	Tune-up		23.00	23.00	23.00	Scaling factor*		
	Slot Average Power [dBm]		22.91	22.97	22.99	1.02	1.01	1.00
	Left edge 19mm	1g SAR		0.022			0.02	
		10g SAR		0.013			0.01	
		Deviation		0.01			0.01	
	Rear 19mm	1g SAR		0.088			0.09	
		10g SAR		0.057			0.06	
		Deviation		0.02			0.02	
	Bottom edge 19mm	1g SAR		0.043			0.04	
		10g SAR		0.021			0.02	
		Deviation		0.02			0.02	

Table 14-12 WCDMA850-BV #2Body

WCDMA850-BV #2Body								
Ambient Temperature:			22.8			Liquid Temperature: 22.4		
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			CH4233	CH4182	CH4132	CH4233	CH4182	CH4132
			846.6 MHz	835.4 MHz	826.4 MHz	846.6 MHz	835.4 MHz	826.4 MHz
RMC	Tune-up		18.00	18.00	18.00	Scaling factor*		
	Slot Average Power [dBm]		17.41	17.52	17.54	1.15	1.12	1.11
	Rear 0mm	1g SAR	0.377	0.37	0.355	0.43	0.41	0.39
		10g SAR	0.206	0.199	0.196	0.24	0.22	0.22
		Deviation	-0.19	0.05	0.07	-0.19	0.05	0.07
	Bottom edge 0mm	1g SAR		0.179			0.20	
		10g SAR		0.146			0.16	
		Deviation		0.09			0.09	
	Left edge 0mm	1g SAR		0.068			0.08	
		10g SAR		0.039			0.04	
		Deviation		-0.01			-0.01	
RMC SKU8	Rear 0mm	1g SAR	0.356			0.41		
		10g SAR	0.189			0.22		
		Deviation	0.04			0.04		

Table 14-13 LTE2500-FDD7 #1 Head

LTE2500-FDD7 #1 Head								
Ambient Temperature: 22.8					Liquid Temperature: 22.4			
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			21350	21100	20850	21350	21100	20850
			L	M	L	L	M	L
20MHz QPSK1RB	Tune-up		24.00	24.00	24.00	Scaling factor*		
	Measured Power [dBm]		22.69	22.57	22.74	1.35	1.39	1.34
	Left Cheek	1g SAR			0.045			0.06
		10g SAR			0.023			0.03
		Deviation			0.09			0.09
	Left Tilt	1g SAR			0.013			0.02
		10g SAR			0.007			0.01
		Deviation			-0.05			-0.05
	Right Cheek	1g SAR			0.02			0.03
		10g SAR			0.009			0.01
		Deviation			-0.06			-0.06
	Right Tilt	1g SAR			0.029			0.04
		10g SAR			0.013			0.02
		Deviation			0.04			0.04
TRUE	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			21350	21100	20850	21350	21100	20850
			L	H	L	L	H	L
20MHz QPSK50% RB	Tune-up		23.00	23.00	23.00	Scaling factor*		
	Measured Power [dBm]		21.55	21.52	21.60	1.40	1.41	1.38
	Left Cheek	1g SAR			0.026			0.04
		10g SAR			0.013			0.02
		Deviation			-0.08			-0.08
	Left Tilt	1g SAR			0.009			0.01
		10g SAR			0.005			0.01
		Deviation			0.06			0.06
	Right Cheek	1g SAR			0.023			0.03
		10g SAR			0.012			0.02
		Deviation			0.08			0.08
	Right Tilt	1g SAR			0.031			0.04
		10g SAR			0.01			0.01
		Deviation			-0.04			-0.04
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			21350	21100	20850	21350	21100	20850
20MHz QPSK100% RB	Tune-up		23.00	23.00	23.00	Scaling factor*		
	Measured Power [dBm]		21.51	21.48	21.53	1.41	1.42	1.40
	Left Cheek	1g SAR						
		10g SAR						
20MHz QPSK1RB SKU8	Left Cheek	1g SAR			0.038			0.05
		10g SAR			0.009			0.01
		Deviation			0.05			0.05

Table 14-14 LTE2500-FDD7 #1 Body

LTE2500-FDD7 #1 Body								
Ambient Temperature: 22.8					Liquid Temperature: 22.4			
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			21350	21100	20850	21350	21100	20850
			L	M	L	L	M	L
20MHz QPSK1RB	Tune-up		24.00	24.00	24.00	Scaling factor*		
	Measured Power [dBm]		22.69	22.57	22.74	1.35	1.39	1.34
	Left edge 19mm	1g SAR			0.011			0.01
		10g SAR			0.005			0.01
		Deviation			0.03			0.03
	Rear 19mm	1g SAR			0.082			0.11
		10g SAR			0.045			0.06
		Deviation			0.02			0.02
	Bottom edge 19mm	1g SAR			0.162			0.22
		10g SAR			0.089			0.12
		Deviation			0.03			0.03
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			21350	21100	20850	21350	21100	20850
			L	H	L			
20MHz QPSK50% RB	Tune-up		23.00	23.00	23.00	Scaling factor*		
	Measured Power [dBm]		21.55	21.52	21.60	1.40	1.41	1.38
	Left edge 19mm	1g SAR			0.009			0.01
		10g SAR			0.002			0.00
		Deviation			0.02			0.02
	Rear 19mm	1g SAR			0.061			0.08
		10g SAR			0.032			0.04
		Deviation			0.01			0.01
	Bottom edge 19mm	1g SAR			0.113			0.16
		10g SAR			0.062			0.09
		Deviation			0.01			0.01

Table 14-15 LTE2500-FDD7 #2 Body

LTE2500-FDD7 #2 Body								
Ambient Temperature: 22.8					Liquid Temperature: 22.4			
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			21350	21100	20850	21350	21100	20850
			L	H	L	L	H	L
20MHz QPSK1RB	Tune-up		18.00	18.00	18.00	Scaling factor*		
	Measured Power [dBm]		17.18	17.00	16.87	1.21	1.26	1.30
	Rear 0mm	1g SAR	0.298			0.36		
		10g SAR	0.158			0.19		
		Deviation	0.04			0.04		
	Bottom edge 0mm	1g SAR	0.488			0.59		
		10g SAR	0.182			0.22		
		Deviation	0.05			0.05		
	Left edge 0mm	1g SAR	0.046			0.06		
		10g SAR	0.031			0.04		
		Deviation	0.03			0.03		
	Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]	
21350				21100	20850	21350	21100	20850
L				H	L			
20MHz QPSK50% RB	Tune-up		17.00	17.00	17.00	Scaling factor*		
	Measured Power [dBm]		17.11	16.92	16.78	1.00	1.02	1.05
	Rear 0mm	1g SAR	0.294			0.29		
		10g SAR	0.126			0.13		
		Deviation	0.04			0.04		
	Bottom edge 0mm	1g SAR	0.412			0.41		
		10g SAR	0.161			0.16		
		Deviation	0.09			0.09		
	Left edge 0mm	1g SAR	0.037			0.04		
		10g SAR	0.023			0.02		
		Deviation	0.03			0.03		
	Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]	
21350				21100	20850	21350	21100	20850
20MHz QPSK100% RB	Tune-up		17.00	17.00	17.00	Scaling factor*		
	Measured Power [dBm]		17.08	16.85	16.74	1.00	1.03	1.06
	Bottom edge 0mm	1g SAR						
		10g SAR						
		Deviation						
20MHz QPSK1RB SKU8	Bottom edge 0mm	1g SAR	0.476			0.58		
		10g SAR	0.173			0.21		
		Deviation	0.04			0.04		

Table 14-16 WLAN2450 #1 Head SAR

WLAN2450 #1								
Ambient Temperature: 22.8						Liquid Temperature: 22.4		
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		16.2	16.2	16.2	Scaling factor*		
	Slot Average Power [dBm]		15.74	16.12	15.94	1.11	1.02	1.06
	Left Cheek	1g SAR		0.286			0.29	
		10g SAR		0.158			0.16	
		Deviation		-0.1			-0.10	
	Left Tilt	1g SAR		0.309			0.31	
		10g SAR		0.164			0.17	
		Deviation		0.01			0.01	
	Right Cheek	1g SAR	0.424	0.737	0.57	0.47	0.75	0.61
		10g SAR	0.181	0.333	0.253	0.20	0.34	0.27
		Deviation	0.07	0.09	0.05	0.07	0.09	0.05
	Right Tilt	1g SAR		0.402			0.41	
		10g SAR		0.188			0.19	
		Deviation		0.08			0.08	
Battery SKU8	Right Cheek	1g SAR		0.687			0.70	
		10g SAR		0.304			0.31	
		Deviation		-0.09			-0.09	

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

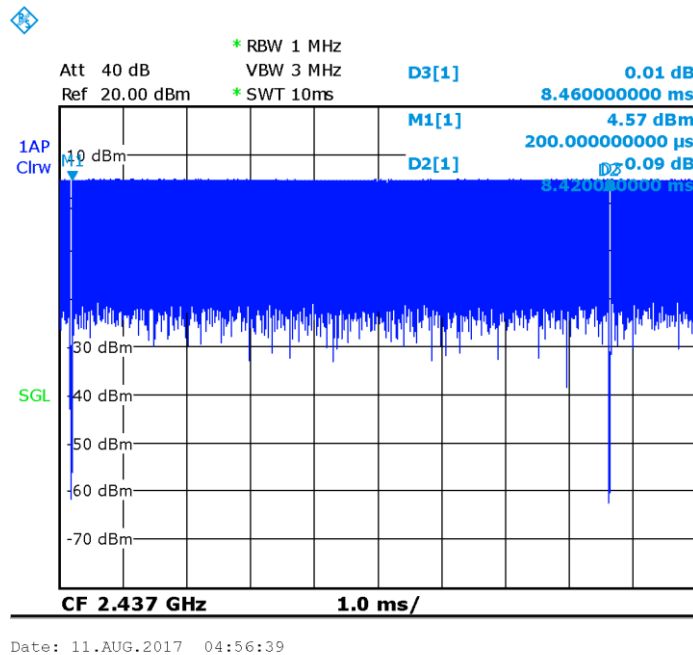
Frequency		Test Position		Actual duty factor	maximum duty factor	Reported SAR(1g)(W/kg)	Scaled reported SAR(1g)(W/kg)	Figure
MHz	Ch.							
2437	6	Right	Touch	99.53%	100%	0.75	0.75	Fig.11

Table 14-17 WLAN2450 #1 Body SAR

WLAN2450 #1 Body SAR									
Ambient Temperature: 22.8					Liquid Temperature: 22.4				
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		16.2	16.2	16.2	Scaling factor*			
	Slot Average Power [dBm]		15.74	16.12	15.94	1.11	1.02	1.06	
	Rear 0mm	1g SAR	0.706	0.903	0.845	0.78	0.92	0.90	
		10g SAR	0.247	0.309	0.259	0.27	0.31	0.27	
		Deviation	0.02	0.01	-0.01	0.02	0.01	-0.01	
	Top edge 0mm	1g SAR		0.295			0.30		
		10g SAR		0.132			0.13		
		Deviation		0.09			0.09		
	Left edge 0mm	1g SAR		0.27			0.28		
		10g SAR		0.102			0.10		
		Deviation		0.08			0.08		
	Battery SKU8	Rear 0mm	1g SAR		0.894			0.91	
			10g SAR		0.291			0.30	
Deviation				0.05			0.02		

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.							
2437	6		Rear 0mm	99.53%	100%	0.92	0.92	Fig.12



Picture 14.1 Duty factor plot

14.2 SAR results for 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	32.01	Right Cheek	0.057	0.076	0.07	0.10	0.18	Fig A.1
GSM850	251	848.8 MHz	22	21.46	Rear 0mm	0.185	0.35	0.21	0.40	0.16	Fig A.2
PCS1900	810	1909.8 MHz	31	29.13	Left Cheek	0.063	0.098	0.10	0.15	0.06	Fig A.3
PCS1900	810	1909.8 MHz	20	19.83	Rear 0mm	0.183	0.369	0.19	0.38	0.11	Fig A.4
WCDMA1900-B1	9400	1880 MHz	23	22.66	Left Cheek	0.063	0.096	0.07	0.10	-0.13	Fig A.5
WCDMA1900-B1	9538	1907.6 MHz	17.5	16.99	Rear 0mm	0.277	0.568	0.31	0.64	0.05	Fig A.6
WCDMA850-BV	4132	826.4 MHz	23	22.99	Right Cheek	0.068	0.09	0.07	0.09	0.06	Fig A.7
WCDMA850-BV	4233	846.6 MHz	18	17.41	Rear 0mm	0.206	0.377	0.24	0.43	-0.19	Fig A.8
LTE2500-FDD7	20850	2510 MHz	24	22.74	Left Cheek	0.023	0.045	0.03	0.06	0.09	Fig A.9
LTE2500-FDD7	21350	2560 MHz	18	17.18	Bottom edge 0mm	0.182	0.488	0.22	0.59	0.05	Fig A.10
WLAN2450	6	2437 MHz	16.2	16.12	Right Cheek	0.333	0.737	0.15	0.75	0.09	Fig A.11
WLAN2450	6	2437 MHz	16.2	16.12	Rear 0mm	0.309	0.903	0.31	0.92	0.01	Fig A.12

15 SAR Measurement Variability

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

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

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

Mode	CH	Freq	Test Poisition	Original SAR (W/kg)	First Repeated SAR(W/kg)	The Ratio
WLAN	6	2437	Rear 0mm	0.903	0.895	1.01

16 Measurement Uncertainty

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

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

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

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

No.	Error Description	Type	Uncertainty value	Probably Distribution	Div.	(Ci) 1g	(Ci) 10g	Std. Unc. (1g)	Std. Unc. (10g)	Degree of freedom
Measurement system										
1	Probe calibration	B	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
12	Probe positioning with respect to 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
Measurement system										
1	Probe calibration	B	6.55	N	1	1	1	6.55	6.55	∞
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	∞
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	∞
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	∞
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	∞
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	∞
11	Probe positioned mech. Restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
12	Probe positioning with respect to phantom shell	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	∞
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
14	Fast SAR z-Approximation	B	14.0	R	$\sqrt{3}$	1	1	8.1	8.1	∞
Test sample related										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	71

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

17 MAIN TEST INSTRUMENTS

Table 17.1: List of Main Instruments

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46110673	January 13, 2017	One year
02	Power meter	NRVD	102083	September 22, 2016	One year
03	Power sensor	NRV-Z5	100595		
04	Signal Generator	E4438C	MY49071430	January 13, 2017	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	E5515C	MY50263375	January 16, 2017	One year
07	BTS	CMW500	149646	November 03, 2016	One year
08	E-field Probe	SPEAG EX3DV4	3846	January 13, 2017	One year
09	DAE	SPEAG DAE4	1331	January 19, 2017	One year
10	Dipole Validation Kit	SPEAG D835V2	4d069	July 20, 2016	One year
11	Dipole Validation Kit	SPEAG D1900V2	5d101	July 28, 2016	One year
12	Dipole Validation Kit	SPEAG D2450V2	853	July 25, 2016	One year
13	Dipole Validation Kit	SPEAG D2600V2	1012	July 25, 2016	One year

END OF REPORT BODY

ANNEX A Graph Results

GSM850_CH251 Right Cheek

Date: 7/19/2017

Electronics: DAE4 Sn1331

Medium: Head 835 MHz

Medium parameters used: $f = 848.8$ MHz; $\sigma = 0.902$ mho/m; $\epsilon_r = 41.6$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.8°C, Liquid Temperature: 22.4°C

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

Probe: EX3DV4 – SN3846 ConvF(9.33,9.33,9.33)

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

Maximum value of SAR (interpolated) = 0.0853 W/kg

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

Reference Value = 2.575 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.098 W/kg

SAR(1 g) = 0.076 W/kg; SAR(10 g) = 0.057 W/kg

Maximum value of SAR (measured) = 0.0834 W/kg

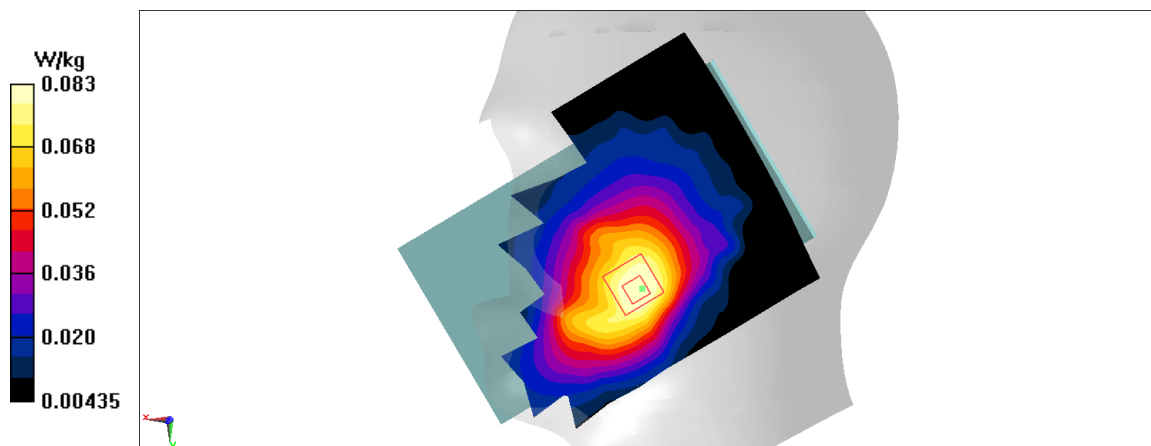


Figure A.1

GSM850_CH251 Rear 0mm

Date: 7/19/2017

Electronics: DAE4 Sn1331

Medium: Head 835 MHz

Medium parameters used: $f = 848.8$ MHz; $\sigma = 0.978$ mho/m; $\epsilon_r = 54.84$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.8°C, Liquid Temperature: 22.4°C

Communication System: GSM850 848.8 MHz Duty Cycle: 1:2

Probe: EX3DV4 – SN3846 ConvF(9.52,9.52,9.52)

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

Maximum value of SAR (interpolated) = 0.424 W/kg

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

Reference Value = 3.459 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.703 W/kg

SAR(1 g) = 0.35 W/kg; SAR(10 g) = 0.185 W/kg

Maximum value of SAR (measured) = 0.41 W/kg

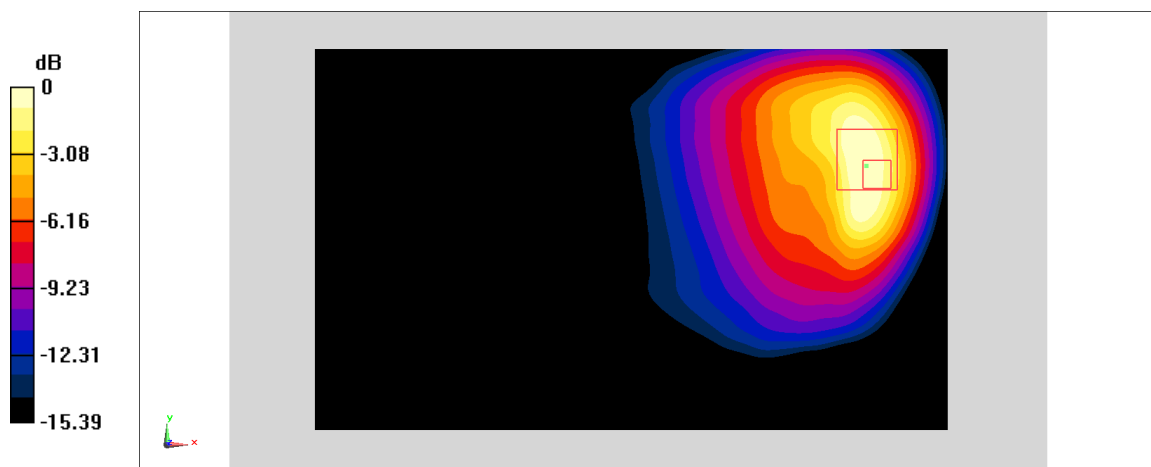


Figure A.2

PCS1900_CH810 Left Cheek

Date: 7/21/2017

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used: $f = 1909.8$ MHz; $\sigma = 1.424$ mho/m; $\epsilon_r = 40.64$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.8°C, Liquid Temperature: 22.4°C

Communication System: PCS1900 1909.8 MHz Duty Cycle: 1:8.3

Probe: EX3DV4 – SN3846 ConvF(7.89,7.89,7.89)

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

Maximum value of SAR (interpolated) = 0.108 W/kg

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

Reference Value = 3.675 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.135 W/kg

SAR(1 g) = 0.098 W/kg; SAR(10 g) = 0.063 W/kg

Maximum value of SAR (measured) = 0.104 W/kg

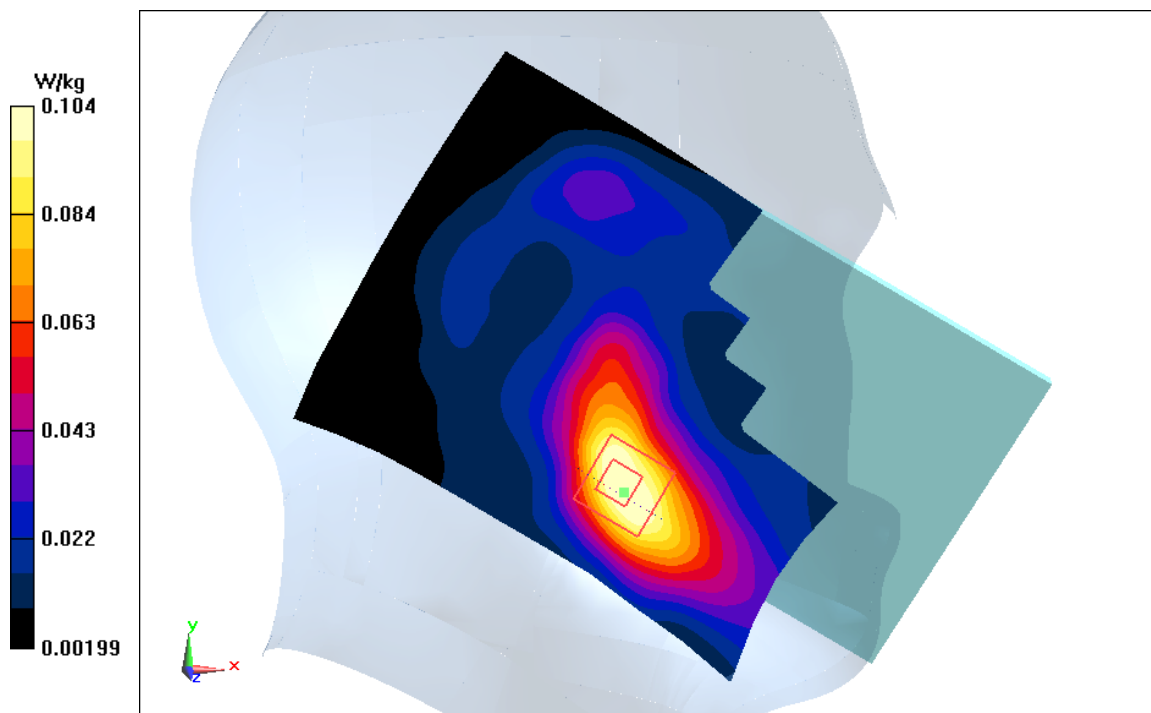


Figure A.3

PCS1900_CH810 Rear 0mm

Date: 7/21/2017

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used: $f = 1909.8$ MHz; $\sigma = 1.526$ mho/m; $\epsilon_r = 52.83$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.8°C, Liquid Temperature: 22.4°C

Communication System: PCS1900 1909.8 MHz Duty Cycle: 1:2.67

Probe: EX3DV4 – SN3846 ConvF(7.57,7.57,7.57)

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

Maximum value of SAR (interpolated) = 0.483 W/kg

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

Reference Value = 2.412 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.776 W/kg

SAR(1 g) = 0.369 W/kg; SAR(10 g) = 0.183 W/kg

Maximum value of SAR (measured) = 0.394 W/kg

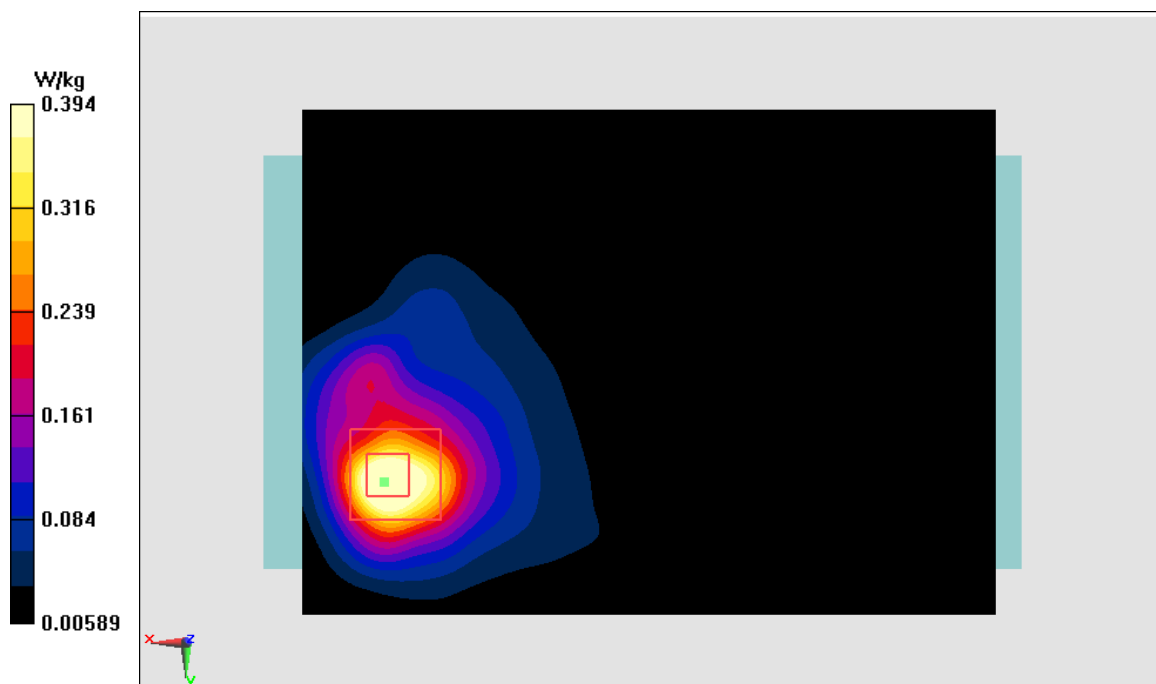


Figure A.4

WCDMA1900-BII_CH9400 Left Cheek

Date: 7/21/2017

Electronics: DAE4 Sn1331

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.395$ mho/m; $\epsilon_r = 40.67$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.8°C, Liquid Temperature: 22.4°C

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

Probe: EX3DV4 – SN3846 ConvF(7.89,7.89,7.89)

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

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

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

Reference Value = 4.552 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.132 W/kg

SAR(1 g) = 0.096 W/kg; SAR(10 g) = 0.063 W/kg

Maximum value of SAR (measured) = 0.103 W/kg

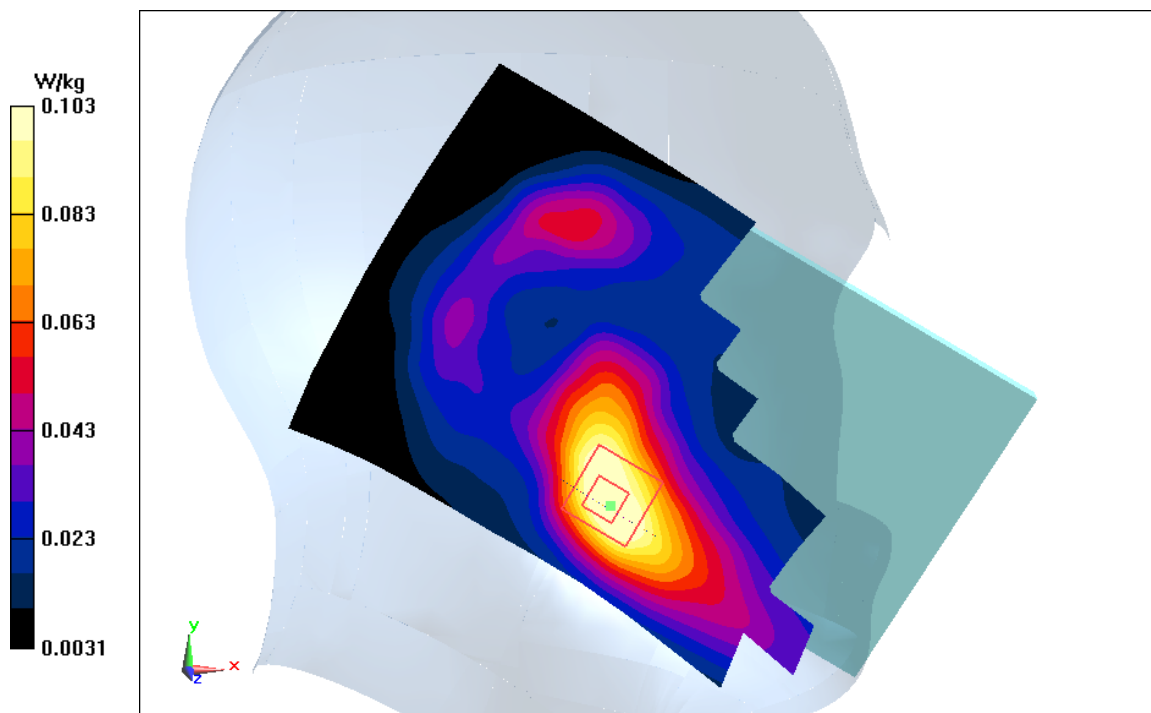


Figure A.5