Table 11-10 WLAN2450 #1

WLAN2450 #1						
Band	Mode	Channel	Frequence	Data Rate	Tune-up	Measured
WLAN 2.4G 20M	802.11b	11	2462 MHz	1Mbps	15.50	15.11
		6	2437 MHz		15.50	15.38
		1	2412 MHz		15.50	15.01
		11	2462 MHz	2Mbps	/	/
		6	2437 MHz		15.50	15.27
		1	2412 MHz		/	/
		11	2462 MHz	5.5Mbps	/	/
		6	2437 MHz		15.50	15.28
		1	2412 MHz		/	/
		11	2462 MHz	11Mbps	/	/
		6	2437 MHz		15.50	15.21
		1	2412 MHz		/	/
	802.11g	11	2462 MHz	6Mbps	15.00	14.16
		6	2437 MHz		15.00	14.52
		1	2412 MHz		15.00	14.28
		11	2462 MHz	9Mbps	/	/
		6	2437 MHz		15.00	14.45
		1	2412 MHz		/	/
		11	2462 MHz	12Mbps	/	/
		6	2437 MHz		15.00	14.43
		1	2412 MHz		/	/
		11	2462 MHz	18Mbps	/	/
		6	2437 MHz		15.00	14.36
		1	2412 MHz		/	/
		11	2462 MHz	24Mbps	/	/
		6	2437 MHz		15.00	14.19
		1	2412 MHz		/	/
		11	2462 MHz	36Mbps	/	/
		6	2437 MHz		15.00	13.87
		1	2412 MHz		/	/
		11	2462 MHz	48Mbps	/	/
		6	2437 MHz		15.00	13.94
		1	2412 MHz		/	/
		11	2462 MHz	54Mbps	/	/
		6	2437 MHz		15.00	13.89
		1	2412 MHz		/	/
	802.11n	11	2462 MHz	MCS0	14.00	13.19
		6	2437 MHz		14.00	13.52
		1	2412 MHz		14.00	13.34
		11	2462 MHz	MCS1	/	/
		6	2437 MHz		14.00	13.37
		1	2412 MHz		/	/
		11	2462 MHz	MCS2	/	/
		6	2437 MHz		14.00	13.33
		1	2412 MHz		/	/
		11	2462 MHz	MCS3	/	/
		6	2437 MHz		14.00	13.21
		1	2412 MHz		/	/

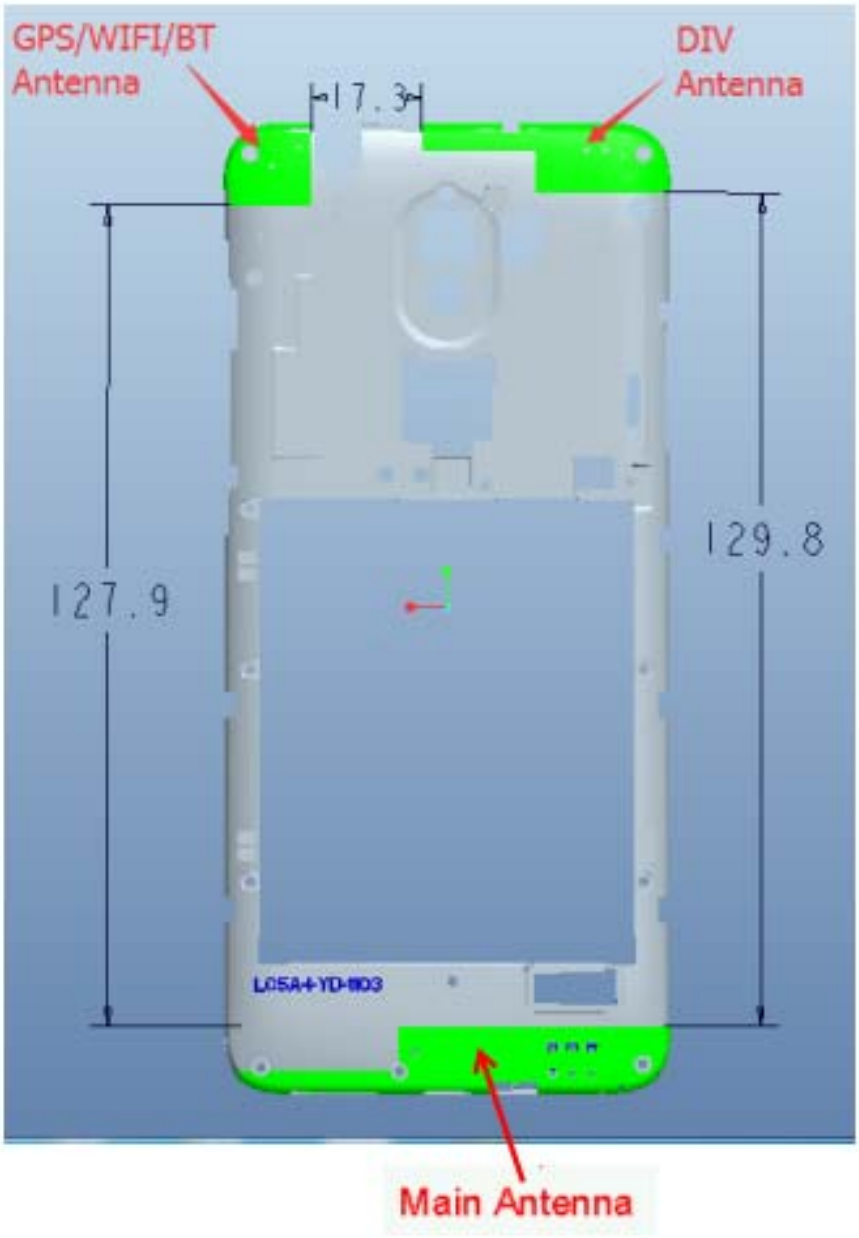
	20M	11	2462 MHz	MCS4	/	/
		6	2437 MHz		14.00	13.06
		1	2412 MHz		/	/
		11	2462 MHz	MCS5	/	/
		6	2437 MHz		14.00	12.89
		1	2412 MHz		/	/
		11	2462 MHz	MCS6	/	/
		6	2437 MHz		14.00	12.82
		1	2412 MHz		/	/
		11	2462 MHz	MCS7	/	/
		6	2437 MHz		14.00	12.74
		1	2412 MHz		/	/
WLAN 2.4G 40M	802.11n 40M	11	2462 MHz	MCS0	14.00	13.13
		6	2437 MHz		14.00	13.56
		1	2412 MHz		14.00	13.27
		11	2462 MHz	MCS1	/	/
		6	2437 MHz		14.00	13.41
		1	2412 MHz		/	/
		11	2462 MHz	MCS2	/	/
		6	2437 MHz		14.00	13.27
		1	2412 MHz		/	/
		11	2462 MHz	MCS3	/	/
		6	2437 MHz		14.00	13.12
		1	2412 MHz		/	/
		11	2462 MHz	MCS4	/	/
		6	2437 MHz		14.00	12.74
		1	2412 MHz		/	/
		11	2462 MHz	MCS5	/	/
		6	2437 MHz		14.00	12.42
		1	2412 MHz		/	/
		11	2462 MHz	MCS6	/	/
		6	2437 MHz		14.00	12.12
		1	2412 MHz		/	/
		11	2462 MHz	MCS7	/	/
		6	2437 MHz		14.00	12.11
		1	2412 MHz		/	/

12 Simultaneous TX SAR Considerations

12.1 Introduction

The following procedures adopted from “FCC SAR Considerations for Cell Phones with Multiple Transmitters” are applicable to handsets with built-in unlicensed transmitters such as 802.11 a/b/g and Bluetooth devices which may simultaneously transmit with the licensed transmitter.
For this device, the BT and Wi-Fi can transmit simultaneous with other transmitters.

12.2 Transmit Antenna Separation Distances



Picture 12.1 Antenna Locations

12.3 SAR Measurement Positions

According to the KDB941225 D06 Hot Spot SAR v01, the edges with less than 2.5 cm distance to the antennas need to be tested for SAR.

SAR measurement positions						
Mode	Front	Rear	Left edge	Right edge	Top edge	Bottom edge
Main antenna	Yes	Yes	Yes	Yes	No	Yes
WLAN	Yes	Yes	No	Yes	Yes	No

12.4 Standalone SAR Test Exclusion Considerations

Standalone 1-g head or body SAR evaluation by measurement or numerical simulation is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.
The 1-g SAR test exclusion threshold for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

Table 12.1: Standalone SAR test exclusion considerations

Band/Mode	F(GHz)	Position	SAR test exclusion threshold (mW)	RF output power		SAR test exclusion
				dBm	mW	
Bluetooth	2.441	Head	9.60	6.5	4.47	Yes
		Body	19.20	6.5	4.47	Yes
2.4GHz WLAN 802.11 b	2.45	Head	9.58	15.5	35.48	No
		Body	19.17	15.5	35.48	No

13 Evaluation of Simultaneous

Table 13.1: The sum of reported SAR values for main antenna and WiFi

	Position	Main antenna	WiFi	Sum
Highest reported SAR value for Head	Left hand, Touch cheek	0.41	0.33	**0.74**
Highest reported SAR value for Body	Rear	0.90	0.09	**0.99**

Table 13.2: The sum of reported SAR values for main antenna and BT

	Position	Main antenna	BT	Sum
Maximum reported SAR value for Head	Left hand, Touch cheek	0.41	0.19	**0.60**
Maximum reported SAR value for Body	Rear	0.90	0.09	**0.99**

[1] - Estimated SAR for Bluetooth (see the table 13.3)

Table 13.3: Estimated SAR for Bluetooth

Mode/Band	F (GHz)	Position	Distance (mm)	Upper limit of power *		Estimated$_{1g}$ (W/kg)
				dBm	mW	
Bluetooth	2.441	Head	5	6.5	4.47	0.19
Bluetooth	2.441	Body	10	6.5	4.47	0.09

* - Maximum possible output power declared by manufacturer

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;
where x = 7.5 for 1-g SAR.
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

Conclusion:
According to the above tables, the sum of reported SAR values is<1.6W/kg. So the simultaneous transmission SAR with volume scans is not required.

14 SAR Test Result

It is determined by user manual for the distance between the EUT and the phantom bottom.
The distance is 10 mm and just applied to the condition of body worn accessory.
It is performed for all SAR measurements with area scan based 1-g SAR estimation (Fast SAR). A zoom scan measurement is added when the estimated 1-g SAR is the highest measured SAR in each exposure configuration, wireless mode and frequency band combination or more than 1.2W/kg.
The calculated SAR is obtained by the following formula:

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

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

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

14.1 Evaluation of multi-batteries and SIM slots

Note: B1: CAC2900009C7 **B2:** CAC2900007C1
We'll perform the head measurement in all bands with the primary battery depending on the evaluation of multi-batteries retest on highest value point with other battery. Then, repeat the measurement in the Body test.

frequency		Mode/Band	Side	Position	BatteryType	1g SAR (W/kg)	PowerDrift
MHz	Channel						
1860	18700	LTE1900	Left	Cheek	CAC2900009C7	0.314	0.01
1860	18700	LTE1900	Left	Cheek	CAC2900007C1	0.28	0.03

Note: According to the values in the above table, the battery, B1, is the primary battery. We'll perform the head measurement with this battery and retest on highest value point with others.

frequency		Mode/Band	Position	BatteryType	1g SAR (W/kg)	PowerDrift
MHz	Channel					
1880	661	PCS1900	Rear	CAC2900009C7	0.5	-0.1
1880	661	PCS1900	Rear	CAC2900007C1	0.503	0.05

Note: According to the values in the above table, the battery, B2, is the primary battery. We'll perform the Body measurement with this battery and retest on highest value point with others.

14.2 SAR results

Note：H1：CCB0046A10C4　H2：CCB0046A10C6

Table 14-1 GSM850 #1 Head

GSM850 #1 Head									
Ambient Temperature:			22.5			Liquid Temperature:			22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH251 848.8 MHz	CH190 836.6 MHz	CH128 824.2 MHz	CH251 848.8 MHz	CH190 836.6 MHz	CH128 824.2 MHz	
GSM	Tune-up		33.50	33.50	33.50	Scaling factor*			
	Slot Average Power [dBm]		32.63	32.61	32.52	1.22	1.23	1.25	
	Left Cheek	1g SAR	0.128	0.146	0.165	0.16	0.18	0.21	
		10g SAR	0.099	0.112	0.126	0.12	0.14	0.16	
		Deviation	0.05	0.09	-0.04	0.05	0.09	-0.04	
	Left Tilt	1g SAR		0.096			0.12		
		10g SAR		0.073			0.09		
		Deviation		-0.01			-0.01		
	Right Cheek	1g SAR		0.13			0.16		
		10g SAR		0.09			0.11		
		Deviation		0.02			0.02		
	Right Tilt	1g SAR		0.106			0.13		
		10g SAR		0.078			0.10		
		Deviation		-0.02			-0.02		
GSM B2	*Worst Case*	1g SAR			0.13			0.16	
		10g SAR			0.09			0.11	
		Deviation			0.02			0.02	

Table 14-2 GSM850 #1 Body

GSM850 #1 Body									
Ambient Temperature:			22.5			Liquid Temperature:			22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH251 848.8 MHz	CH190 836.6 MHz	CH128 824.2 MHz	CH251 848.8 MHz	CH190 836.6 MHz	CH128 824.2 MHz	
GPRS 4 Txslots	Tune-up		29.00	29.00	29.00	Scaling factor*			
	Slot Average Power [dBm]		28.97	28.97	28.86	1.01	1.01	1.03	
	Front	1g SAR		0.277			0.28		
		10g SAR		0.198			0.20		
		Deviation		0.03			0.03		
	Rear	1g SAR	0.36	0.334	0.332	0.36	0.34	0.34	
		10g SAR	0.199	0.183	0.23	0.20	0.18	0.24	
		Deviation	-0.07	0.06	0.01	-0.07	0.06	0.01	
	Left edge	1g SAR		0.141			0.14		
		10g SAR		0.096			0.10		
		Deviation		-0.05			-0.05		
	Right edge	1g SAR		0.296			0.30		
		10g SAR		0.201			0.20		
		Deviation		-0.09			-0.09		
	Bottom edge	1g SAR		0.135			0.14		
		10g SAR		0.067			0.07		
		Deviation		0.02			0.02		
EGPRS GMSK 4 Txslots	Tune-up		29.00	29.00	29.00	Scaling factor*			
	Slot Average Power [dBm]		28.92	28.94	28.96	1.02	1.01	1.01	
	Worst case check	1g SAR	0.343			0.35			
		10g SAR	0.19			0.19			
		Deviation	0.01			0.01			
GPRS 4 Txslots B1	*Worst case check*	1g SAR	0.35			0.36			
		10g SAR	0.20			0.20			
		Deviation	-0.04			-0.04			

Table 14-3 PCS1900 #1 Head

PCS1900 #1 Head									
Ambient Temperature:			22.5			Liquid Temperature:			22.3
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	
GSM	Tune-up		30.50	30.50	30.50	Scaling factor*			
	Slot Average Power [dBm]		29.43	29.41	29.34	1.28	1.28	1.30	
	Left Cheek	1g SAR	0.116	0.122	0.105	0.15	0.16	0.14	
		10g SAR	0.07	0.074	0.064	0.09	0.10	0.08	
		Deviation	0.14	-0.09	-0.02	0.14	-0.09	-0.02	
	Left Tilt	1g SAR		0.1			0.13		
		10g SAR		0.063			0.08		
		Deviation		-0.15			-0.15		
	Right Cheek	1g SAR		0.049			0.06		
		10g SAR		0.03			0.04		
		Deviation		0.08			0.08		
	Right Tilt	1g SAR		0.042			0.05		
		10g SAR		0.022			0.03		
		Deviation		0.11			0.11		
GSM B2	*Worst Case*	1g SAR		0.118			0.15		
		10g SAR		0.071			0.09		
		Deviation		0.04			0.04		

Table 14-4 PCS1900 #1 Body

PCS1900 #1 Body									
Ambient Temperature:		22.5				Liquid Temperature:			22.3
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 4 Txslots	Tune-up		26.50	26.50	26.50	Scaling factor*			
	Slot Average Power [dBm]		25.88	25.85	25.77	1.15	1.16	1.18	
	Front	1g SAR		0.393			0.46		
		10g SAR		0.228			0.26		
		Deviation		-0.04			-0.04		
	Rear	1g SAR	0.501	0.503	0.441	0.58	0.58	0.52	
		10g SAR	0.276	0.297	0.263	0.32	0.34	0.31	
		Deviation	0.12	0.05	0.06	0.12	0.05	0.06	
	Left edge	1g SAR		0.289			0.34		
		10g SAR		0.162			0.19		
		Deviation		0.08			0.08		
	Right edge	1g SAR		0.099			0.11		
		10g SAR		0.057			0.07		
		Deviation		0.11			0.11		
	Bottom edge	1g SAR		0.477			0.55		
		10g SAR		0.25			0.29		
		Deviation		-0.02			-0.02		
EGPRS GMSK 4 Txslots	Tune-up		26.50	26.50	26.50	Scaling factor*			
	Slot Average Power [dBm]		25.79	25.84	25.76	1.18	1.16	1.19	
	Worst case check	1g SAR		0.499			0.58		
		10g SAR		0.29			0.34		
		Deviation		0.15			0.15		
GPRS 4 Txslots B1	*Worst case check*	1g SAR		0.5			0.58		
		10g SAR		0.299			0.35		
		Deviation		-0.1			-0.10		

Table 14-5 WCDMA1900-BII #1Head

WCDMA1900-BII #1Head								
Ambient Temperature:	22.5					Liquid Temperature:		22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			CH9538 1907.6 MHz	CH9400 1880 MHz	CH9262 1852.4 MHz	CH9538 1907.6 MHz	CH9400 1880 MHz	CH9262 1852.4 MHz
RMC	Tune-up		24.00	24.00	24.00	Scaling factor*		
	Slot Average Power [dBm]		23.45	23.60	23.67	1.14	1.10	1.08
	Left Cheek	1g SAR	0.265	0.272	0.283	0.30	0.30	0.31
		10g SAR	0.163	0.168	0.175	0.19	0.18	0.19
		Deviation	0.09	0.11	0.05	0.09	0.11	0.05
	Left Tilt	1g SAR		0.134			0.15	
		10g SAR		0.085			0.09	
		Deviation		-0.08			-0.08	
	Right Cheek	1g SAR		0.195			0.21	
		10g SAR		0.122			0.13	
		Deviation		0.14			0.14	
	Right Tilt	1g SAR		0.088			0.10	
		10g SAR		0.058			0.06	
		Deviation		0.09			0.09	
RMC B2	*Worst Case*	1g SAR			0.271			0.29
		10g SAR			0.171			0.18
		Deviation			0.13			0.13

Table 14-6 WCDMA1900-BII #1Body

WCDMA1900-BII #1Body								
Ambient Temperature:	22.5					Liquid Temperature:		22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]		
			CH9538 1907.6 MHz	CH9400 1880 MHz	CH9262 1852.4 MHz	CH9538 1907.6 MHz	CH9400 1880 MHz	CH9262 1852.4 MHz
RMC	Tune-up		24.00	24.00	24.00	Scaling factor*		
	Slot Average Power [dBm]		23.45	23.60	23.67	1.14	1.10	1.08
	Front	1g SAR		0.463			0.51	
		10g SAR		0.267			0.29	
		Deviation		0.02			0.02	
	Rear	1g SAR	0.53	0.603	0.625	0.60	0.66	0.67
		10g SAR	0.315	0.374	0.391	0.36	0.41	0.42
		Deviation	0.06	0.09	0.11	0.06	0.09	0.11
	Left edge	1g SAR		0.243			0.27	
		10g SAR		0.147			0.16	
		Deviation		-0.12			-0.12	
	Right edge	1g SAR		0.152			0.17	
		10g SAR		0.094			0.10	
		Deviation		0.05			0.05	
	Bottom edge	1g SAR		0.565			0.62	
		10g SAR		0.297			0.33	
		Deviation		0.11			0.11	
RMC B1	*Worst case check*	1g SAR			0.616			0.66
		10g SAR			0.387			0.42
		Deviation			0.04			0.04

Table 14-7 WCDMA1700-BIV #1Head

WCDMA1700-BIV #1Head									
Ambient Temperature:		22.5				Liquid Temperature:			22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH1513 1752.6 MHz	CH1412 1732.4 MHz	CH1312 1712.4 MHz	CH1513 1752.6 MHz	CH1412 1732.4 MHz	CH1312 1712.4 MHz	
RMC	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Slot Average Power [dBm]		23.72	23.69	23.61	1.07	1.07	1.09	
	Left Cheek	1g SAR	0.382	0.363	0.33	0.41	0.39	0.36	
		10g SAR	0.243	0.233	0.213	0.26	0.25	0.23	
		Deviation	-0.09	-0.12	0.06	-0.09	-0.12	0.06	
	Left Tilt	1g SAR		0.139			0.15		
		10g SAR		0.078			0.08		
		Deviation		0.18			0.18		
	Right Cheek	1g SAR		0.358			0.38		
		10g SAR		0.233			0.25		
		Deviation		0.04			0.04		
	Right Tilt	1g SAR		0.118			0.13		
		10g SAR		0.069			0.07		
		Deviation		0.15			0.15		
RMC B2	*Worst Case*	1g SAR	0.374			0.40			
		10g SAR	0.232			0.25			
		Deviation	-0.07			-0.07			

Table 14-8 WCDMA1700-BIV #1Body

WCDMA1700-BIV #1Body									
Ambient Temperature:		22.5				Liquid Temperature:			22.3
Mode	Device orientation	SAR measurement	Measured SAR [W/kg]			Reported SAR [W/kg]			
			CH1513 1752.6 MHz	CH1412 1732.4 MHz	CH1312 1712.4 MHz	CH1513 1752.6 MHz	CH1412 1732.4 MHz	CH1312 1712.4 MHz	
RMC	Tune-up		24.00	24.00	24.00	Scaling factor*			
	Slot Average Power [dBm]		23.72	23.69	23.61	1.07	1.07	1.09	
	Front	1g SAR		0.647			0.69		
		10g SAR		0.398			0.43		
		Deviation		0.04			0.04		
	Rear	1g SAR	0.847	0.81	0.807	0.90	0.87	0.88	
		10g SAR	0.546	0.513	0.51	0.58	0.55	0.56	
		Deviation	-0.09	-0.12	0.07	-0.09	-0.12	0.07	
	Left edge	1g SAR		0.283			0.30		
		10g SAR		0.176			0.19		
		Deviation		0.12			0.12		
	Right edge	1g SAR		0.114			0.12		
		10g SAR		0.072			0.08		
		Deviation		0.09			0.09		
	Bottom edge	1g SAR		0.616			0.66		
		10g SAR		0.345			0.37		
		Deviation		0.04			0.04		
RMC B1	*Worst case check*	1g SAR	0.824			0.88			
		10g SAR	0.531			0.57			
		Deviation	0.11			0.11			