

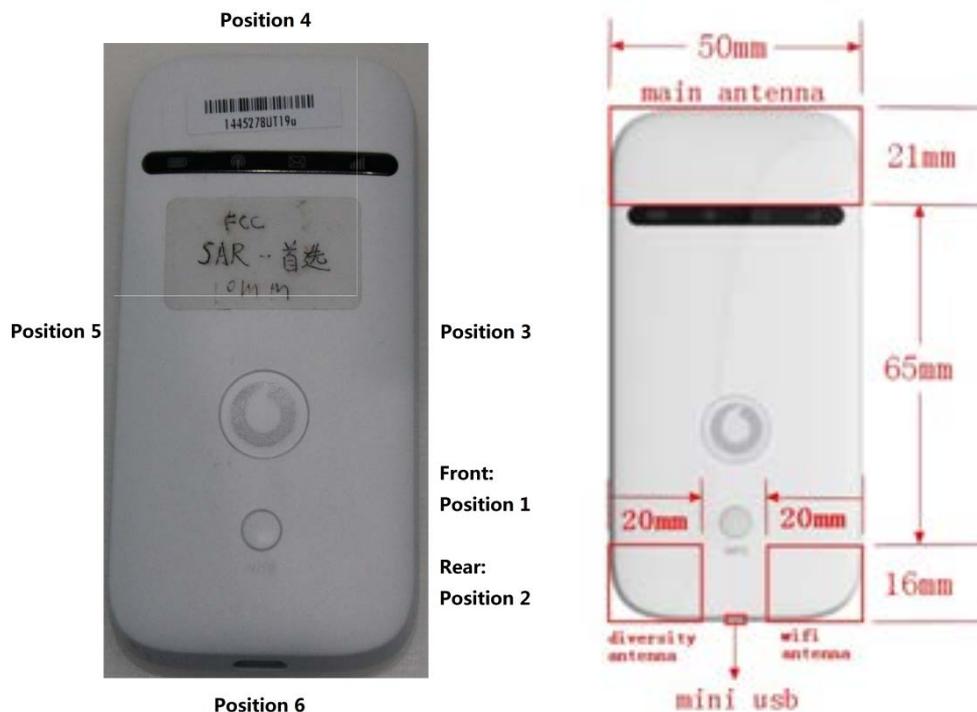
## 12 Simultaneous TX SAR Considerations

### 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 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	Position1	Position2	Position3	Position4	Position5	Position6
Main antenna	Yes	Yes	Yes	Yes	Yes	No
WLAN	Yes	Yes	Yes	No	Yes	Yes

## 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  $\leq 50$  mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR, where

- $f(\text{GHz})$  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	
2.4GHz WLAN 802.11 b	2.45	Head	9.58	15.54	35.81	No
		Body	19.17	15.54	35.81	No

## 13 Evaluation of Simultaneous

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

	Position	Main antenna	WiFi	Sum
<b>Highest reported SAR value for Body</b>	Test Position 1	1.15	0.34	<b>1.49</b>

### Conclusion:

According to the above tables, the sum of reported SAR values is  $< 1.6\text{W/kg}$ . 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 10mm 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 > 1.2W/kg.  
The calculated SAR is obtained by the following formula:

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

Where  $P_{\text{Target}}$  is the power of manufacturing upper limit;

$P_{\text{Measured}}$  is the measured power in chapter 11.

**Table 14.1: Duty Cycle**

Mode	Duty Cycle
GPRS for GSM850/1900	1:4
EGPRS for GSM850/1900	1:2
WCDMA1900 & WiFi	1:1

### 14.1 SAR results for Fast SAR

**Table 14.1: SAR Values (GSM 850 MHz Band - Body)**

Frequency		Mode (number of timeslots)	Test Positio n	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
848.8	251	GPRS (2)	1	/	30.92	31	1.00	<b>1.02</b>	-0.15
836.6	190	GPRS (2)	1	/	30.98	31	1.02	<b>1.02</b>	-0.10
824.2	128	GPRS (2)	1	Fig.1	30.97	31	1.03	<b>1.04</b>	-0.07
836.6	190	GPRS (2)	2	/	30.98	31	0.850	<b>0.85</b>	-0.18
836.6	190	GPRS (2)	3	/	30.98	31	0.599	<b>0.60</b>	-0.08
836.6	190	GPRS (2)	4	/	30.98	31	0.062	<b>0.06</b>	0.07
836.6	190	GPRS (2)	5	/	30.98	31	0.535	<b>0.54</b>	-0.06
824.2	128	EGPRS (4)	1	/	28.69	29	0.966	<b>1.04</b>	0.11

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

**Table 14.2: SAR Values (GSM 1900 MHz Band - Body)**

Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1909.8		GPRS (2)	1	/	28.62	29	0.611	<b>0.67</b>	0.00
1880		GPRS (2)	1	/	28.68	29	0.616	<b>0.66</b>	0.02
1850.2		GPRS (2)	1	Fig.2	28.67	29	0.659	<b>0.71</b>	-0.00
1880		GPRS (2)	2	/	28.68	29	0.575	<b>0.62</b>	0.01
1880		GPRS (2)	3	/	28.68	29	0.202	<b>0.22</b>	-0.06
1880		GPRS (2)	4	/	28.68	29	0.308	<b>0.33</b>	-0.09
1880		GPRS (2)	5	/	28.68	29	0.261	<b>0.28</b>	-0.10
1850.2		EGPRS (4)	1	/	26.11	26.5	0.641	<b>0.70</b>	-0.07

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

**Table 14.3: SAR Values (WCDMA 1900 MHz Band - Body)**

Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.							
1907.6		1	/	22.78	23	0.941	<b>0.99</b>	-0.06
1880		1	/	22.86	23	0.997	<b>1.03</b>	-0.06
1852.4		1	Fig.3	22.80	23	1.10	<b>1.15</b>	-0.02
1880		2	/	22.86	23	0.899	<b>0.93</b>	-0.18
1880		3	/	22.86	23	0.331	<b>0.34</b>	-0.19
1880		4	/	22.86	23	0.610	<b>0.63</b>	-0.04
1880		5	/	22.86	23	0.418	<b>0.43</b>	-0.07

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

**Table 14.4: SAR Values (Wi-Fi 802.11b - Body)**

Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.							
2462		1	/	15.45	16	0.198	<b>0.22</b>	0.13
2437		1	/	15.47	16	0.229	<b>0.26</b>	0.11
2412		1	Fig.4	15.31	16	0.287	<b>0.34</b>	-0.07
2437		2	/	15.47	16	0.129	<b>0.15</b>	0.09
2437		3	/	15.47	16	0.088	<b>0.10</b>	0.12
2437		5	/	15.47	16	0.025	<b>0.03</b>	0.10
2437		6	/	15.47	16	0.052	<b>0.06</b>	0.10

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

## 14.2 SAR results for Standard procedure

There is zoom scan measurement to be added for the highest measured SAR in each exposure configuration/band.

**Table 14.5: SAR Values (GSM 850 MHz Band - Body)**

Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
824.2	128	GPRS (2)	1	Fig.1	30.97	31	1.03	<b>1.04</b>	-0.07

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

**Table 14.6: SAR Values (GSM 1900 MHz Band - Body)**

Frequency		Mode (number of timeslots)	Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.								
1850.2	512	GPRS (2)	1	Fig.2	28.67	29	0.659	<b>0.71</b>	-0.00

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

**Table 14.7: SAR Values (WCDMA 1900 MHz Band - Body)**

Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.							
1852.4	9262	1	Fig.3	22.80	23	1.10	<b>1.15</b>	-0.02

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

**Table 14.8: SAR Values (Wi-Fi 802.11b - Body)**

Frequency		Test Position	Figure No.	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift (dB)
MHz	Ch.							
2412	1	1	Fig.4	15.31	16	0.287	<b>0.34</b>	-0.07

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

## 15 SAR Measurement Variability

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

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

- 1) Repeated measurement is not required when the original highest measured SAR is  $< 0.80$  W/kg; steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is  $\geq 0.80$  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  $\geq 1.45$  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  $\geq 1.5$  W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is  $> 1.20$ .

**Table 15.1: SAR Measurement Variability for Body GSM 850 (1g)**

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
MHz	Ch.						
824.2	128	1	10	1.03	1.01	1.02	/

**Table 15.2: SAR Measurement Variability for Body WCDMA 1900 (1g)**

Frequency		Test Position	Spacing (mm)	Original SAR (W/kg)	First Repeated SAR (W/kg)	The Ratio	Second Repeated SAR (W/kg)
MHz	Ch.						
1852.4	9262	1	10	1.10	1.09	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
<b>Measurement system</b>										
1	Probe calibration	B	5.5	N	1	1	1	5.5	5.5	$\infty$
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	$\infty$
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	$\infty$
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	$\infty$
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	$\infty$
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	$\infty$
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	$\infty$
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	$\infty$
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	$\infty$
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	$\infty$
11	Probe positioned mech. restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	$\infty$
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	$\infty$
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	$\infty$
<b>Test sample related</b>										
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	$\infty$
<b>Phantom and set-up</b>										
17	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	$\infty$
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	$\infty$
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	$\infty$
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521

Combined standard uncertainty	$u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$							9.25	9.12	257
Expanded uncertainty (confidence interval of 95 %)	$u_e = 2u_c$							18.5	18.2	

### 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
<b>Measurement system</b>										
1	Probe calibration	B	6.5	N	1	1	1	6.5	6.5	∞
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	∞
<b>Test sample related</b>										
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	∞
<b>Phantom and set-up</b>										
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	$\infty$
21	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						10.8	10.7	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						21.6	21.4	

### 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
<b>Measurement system</b>										
1	Probe calibration	B	5.5	N	1	1	1	5.5	5.5	$\infty$
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	$\infty$
3	Boundary effect	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	$\infty$
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	$\infty$
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	$\infty$
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	$\infty$
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	$\infty$
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	$\infty$
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	$\infty$
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	$\infty$
11	Probe positioned mech. Restrictions	B	0.4	R	$\sqrt{3}$	1	1	0.2	0.2	$\infty$
12	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	$\infty$
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	$\infty$
14	Fast SAR z-Approximation	B	7.0	R	$\sqrt{3}$	1	1	4.0	4.0	$\infty$
<b>Test sample related</b>										
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	$\infty$
<b>Phantom and set-up</b>										

18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	$\infty$
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	$\infty$
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	$\infty$
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						10.1	9.95	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						20.2	19.9	

#### 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
<b>Measurement system</b>										
1	Probe calibration	B	6.5	N	1	1	1	6.5	6.5	$\infty$
2	Isotropy	B	4.7	R	$\sqrt{3}$	0.7	0.7	1.9	1.9	$\infty$
3	Boundary effect	B	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	$\infty$
4	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	$\infty$
5	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	$\infty$
6	Readout electronics	B	0.3	R	$\sqrt{3}$	1	1	0.3	0.3	$\infty$
7	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	$\infty$
8	Integration time	B	2.6	R	$\sqrt{3}$	1	1	1.5	1.5	$\infty$
9	RF ambient conditions-noise	B	0	R	$\sqrt{3}$	1	1	0	0	$\infty$
10	RF ambient conditions-reflection	B	0	R	$\sqrt{3}$	1	1	0	0	$\infty$
11	Probe positioned mech. Restrictions	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	$\infty$
12	Probe positioning with respect to phantom shell	B	6.7	R	$\sqrt{3}$	1	1	3.9	3.9	$\infty$
13	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	$\infty$
14	Fast SAR z-Approximation	B	14.0	R	$\sqrt{3}$	1	1	8.1	8.1	$\infty$
<b>Test sample related</b>										
15	Test sample	A	3.3	N	1	1	1	3.3	3.3	71

	positioning									
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	$\infty$
<b>Phantom and set-up</b>										
18	Phantom uncertainty	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	$\infty$
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	$\infty$
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	$\infty$
22	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	1.0	0.8	521
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						13.3	13.2	257
Expanded uncertainty (confidence interval of 95 %)		$u_e = 2u_c$						26.6	26.4	

## 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	February 15, 2014	One year
02	Power meter	NRVD	102083	September 11, 2013	One year
03	Power sensor	NRV-Z5	100542		
04	Signal Generator	E4438C	MY49070393	November 08, 2013	One Year
05	Amplifier	60S1G4	0331848	No Calibration Requested	
06	BTS	E5515C	MY50263375	January 30, 2014	One year
07	E-field Probe	SPEAG EX3DV4	3846	September 03, 2013	One year
08	DAE	SPEAG DAE4	771	November 12, 2013	One year
09	Dipole Validation Kit	SPEAG D835V2	443	August 29, 2013	One year
10	Dipole Validation Kit	SPEAG D1900V2	5d101	July 09, 2013	One year
11	Dipole Validation Kit	SPEAG D2450V2	853	July 08, 2013	One year

\*\*\*END OF REPORT BODY\*\*\*

## ANNEX A Graph Results

### 850 Body Test Position 1 Low

Date: 2014-3-21

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used:  $f = 825$  MHz;  $\sigma = 0.955$  S/m;  $\epsilon_r = 56.451$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.4°C      Liquid Temperature: 21.9°C

Communication System: GSM 850 EGPRS Frequency: 824.2 MHz Duty Cycle: 1:4

Probe: EX3DV4 - SN3846 ConvF(8.73, 8.73, 8.73)

**Test Position 1 Low/Area Scan (61x101x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 1.08 W/kg

**Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.322 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.35 W/kg

**SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.753 W/kg**

Maximum value of SAR (measured) = 1.13 W/kg

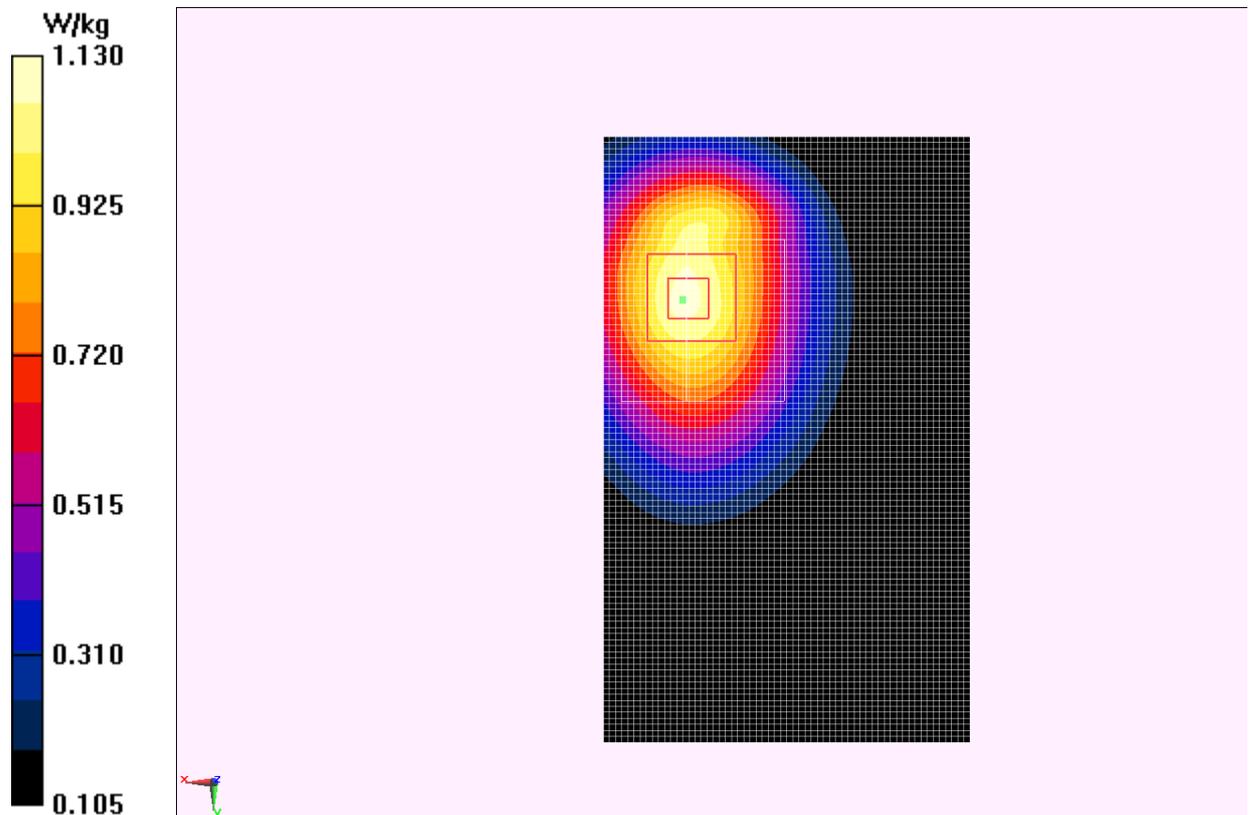
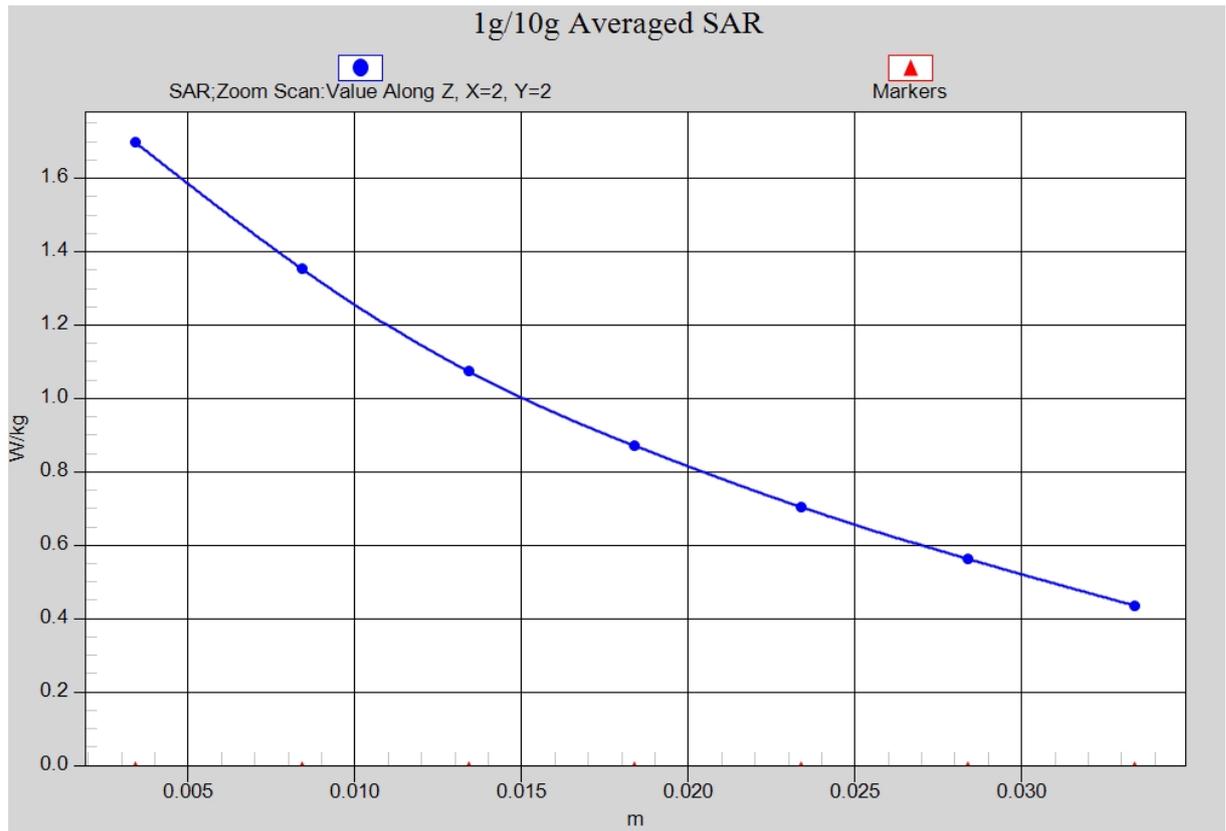


Fig.1 850 MHz CH128



**Fig. 1-1 Z-Scan at power reference point (850 MHz CH128)**

**GSM1900 Body Test Position 1 Low**

Date: 2014-3-23

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.471$  S/m;  $\epsilon_r = 54.282$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.4°C      Liquid Temperature: 21.9°C

Communication System: GSM 1900MHz GPRS Frequency: 1850.2 MHz Duty Cycle: 1:4

Probe: EX3DV4 - SN3846 ConvF(7.03, 7.03, 7.03)

**Test Position 1 Low/Area Scan (61x101x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 0.737 W/kg

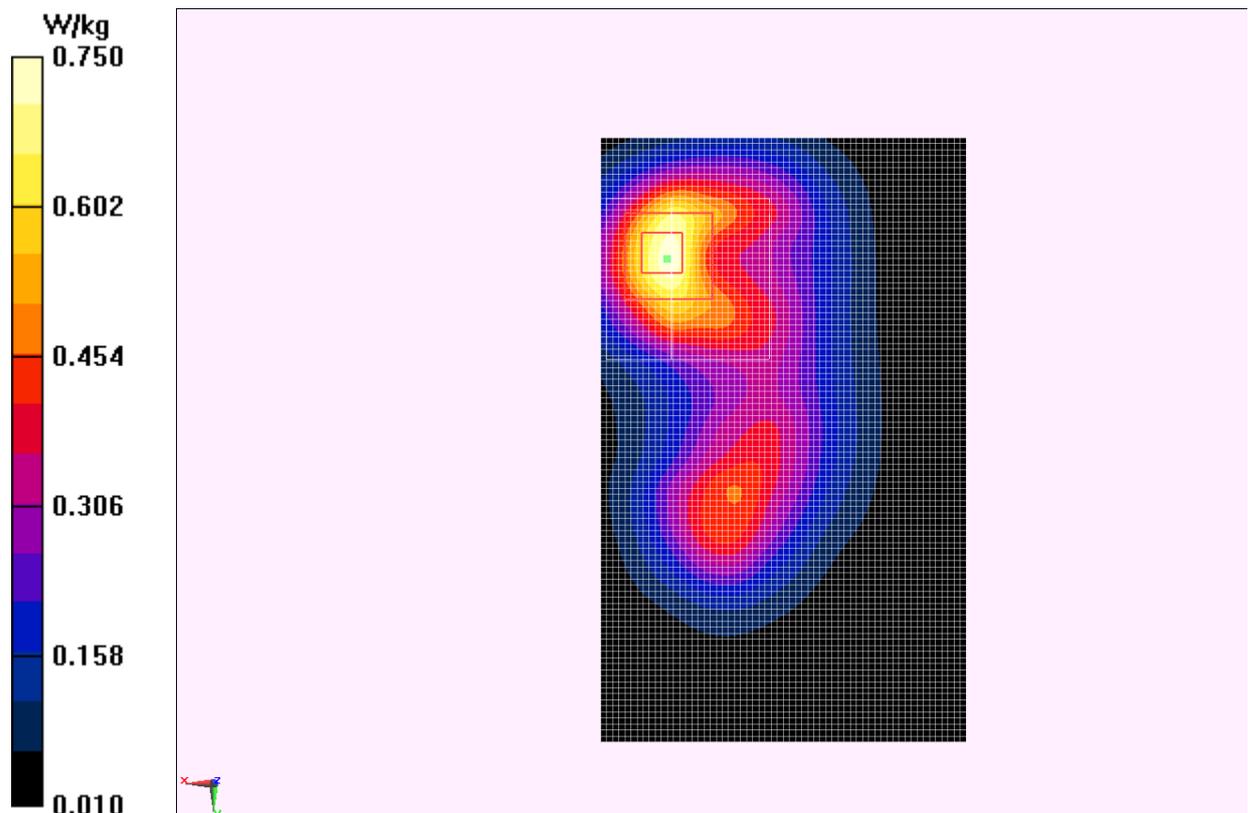
**Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.474 V/m; Power Drift = -0.00 dB

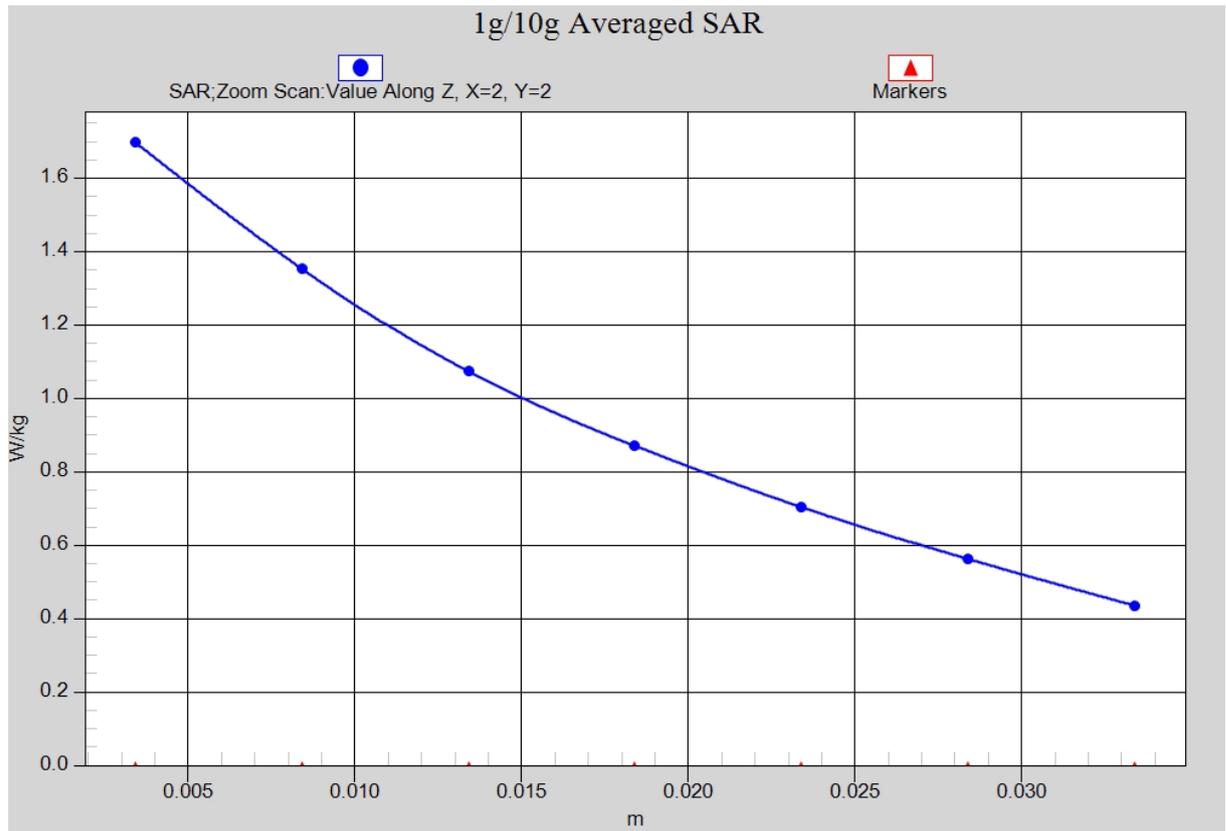
Peak SAR (extrapolated) = 1.11 W/kg

**SAR(1 g) = 0.659 W/kg; SAR(10 g) = 0.374 W/kg**

Maximum value of SAR (measured) = 0.750 W/kg



**Fig.2 1900 MHz CH512**



**Fig.2-1 Z-Scan at power reference point (1900 MHz CH512)**

**WCDMA 1900 Body Test Position 1 Low**

Date: 2014-3-23

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.472$  S/m;  $\epsilon_r = 54.278$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.4°C      Liquid Temperature: 21.9°C

Communication System: WCDMA 1900 Frequency: 1852.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3846 ConvF(7.03, 7.03, 7.03)

**Test Position 1 Low/Area Scan (61x101x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 1.23 W/kg

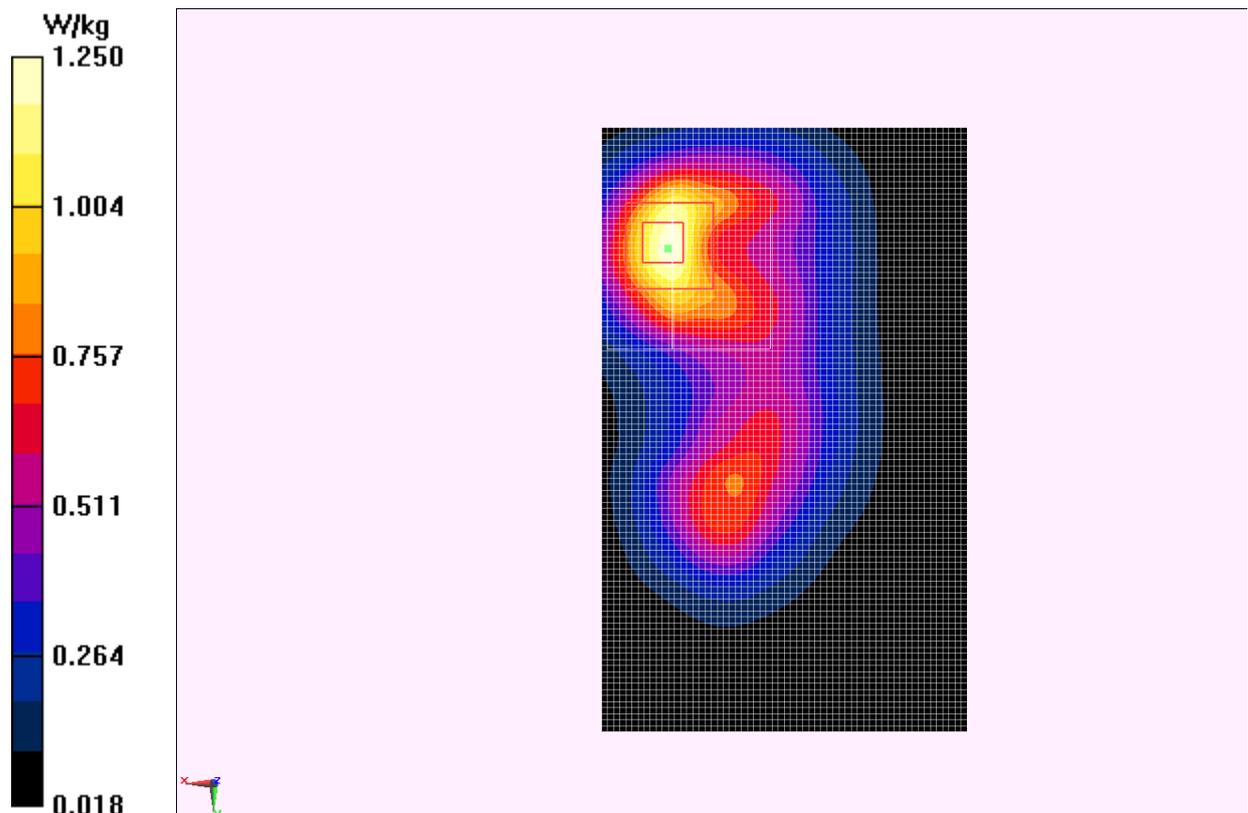
**Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.928 V/m; Power Drift = -0.02 dB

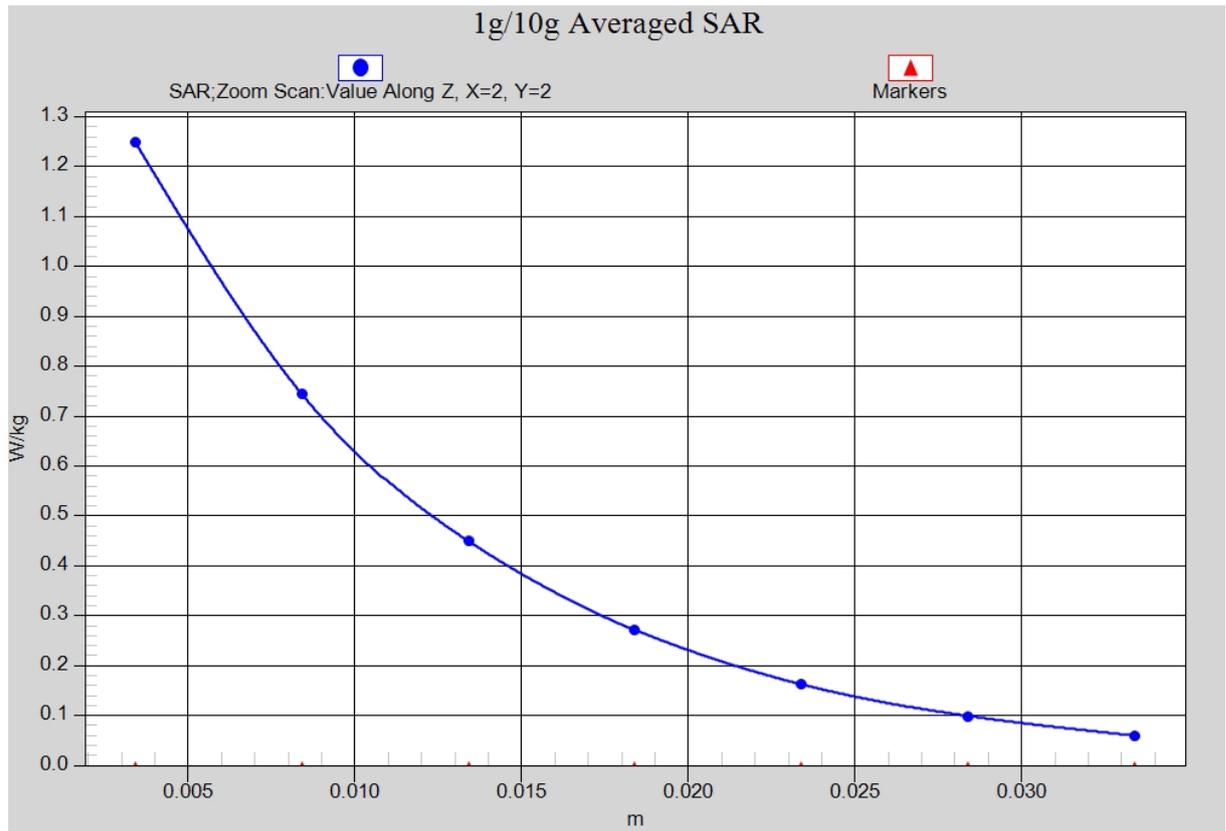
Peak SAR (extrapolated) = 1.85 W/kg

**SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.626 W/kg**

Maximum value of SAR (measured) = 1.25 W/kg



**Fig.3 WCDMA1900 CH9262**



**Fig. 3-1 Z-Scan at power reference point (WCDMA1900 CH9262)**

**Wifi 802.11b Body Test Position 1 Channel 1**

Date: 2014-3-24

Electronics: DAE4 Sn771

Medium: Body 2450 MHz

Medium parameters used (interpolated):  $f = 2412$  MHz;  $\sigma = 1.889$  S/m;  $\epsilon_r = 53.718$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3°C      Liquid Temperature: 21.8°C

Communication System: WLAN 2450 Frequency: 2412 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN3846 ConvF(6.73, 6.73, 6.73)

**Test Position 1 Low/Area Scan (71x111x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 0.336 W/kg

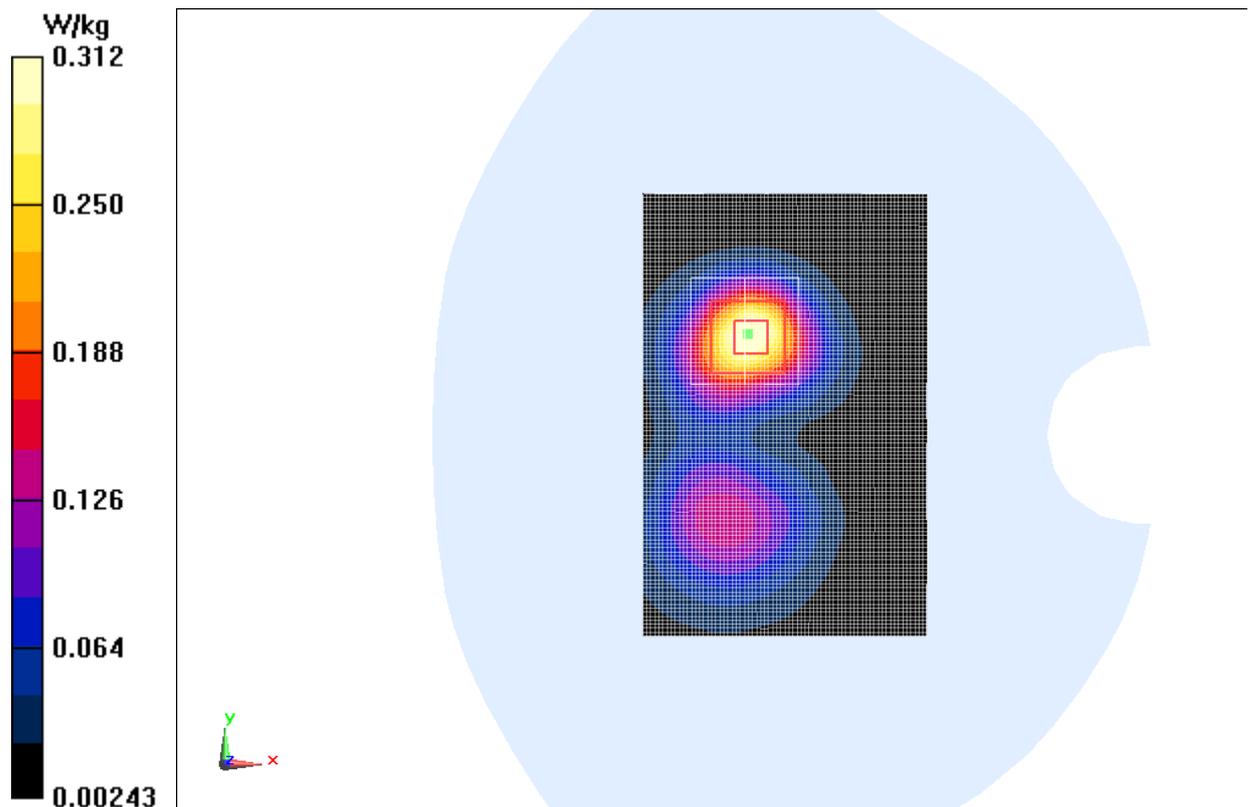
**Test Position 1 Low/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.749 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.573 W/kg

**SAR(1 g) = 0.287 W/kg; SAR(10 g) = 0.146 W/kg**

Maximum value of SAR (measured) = 0.312 W/kg



**Fig.4 2450 MHz CH1**

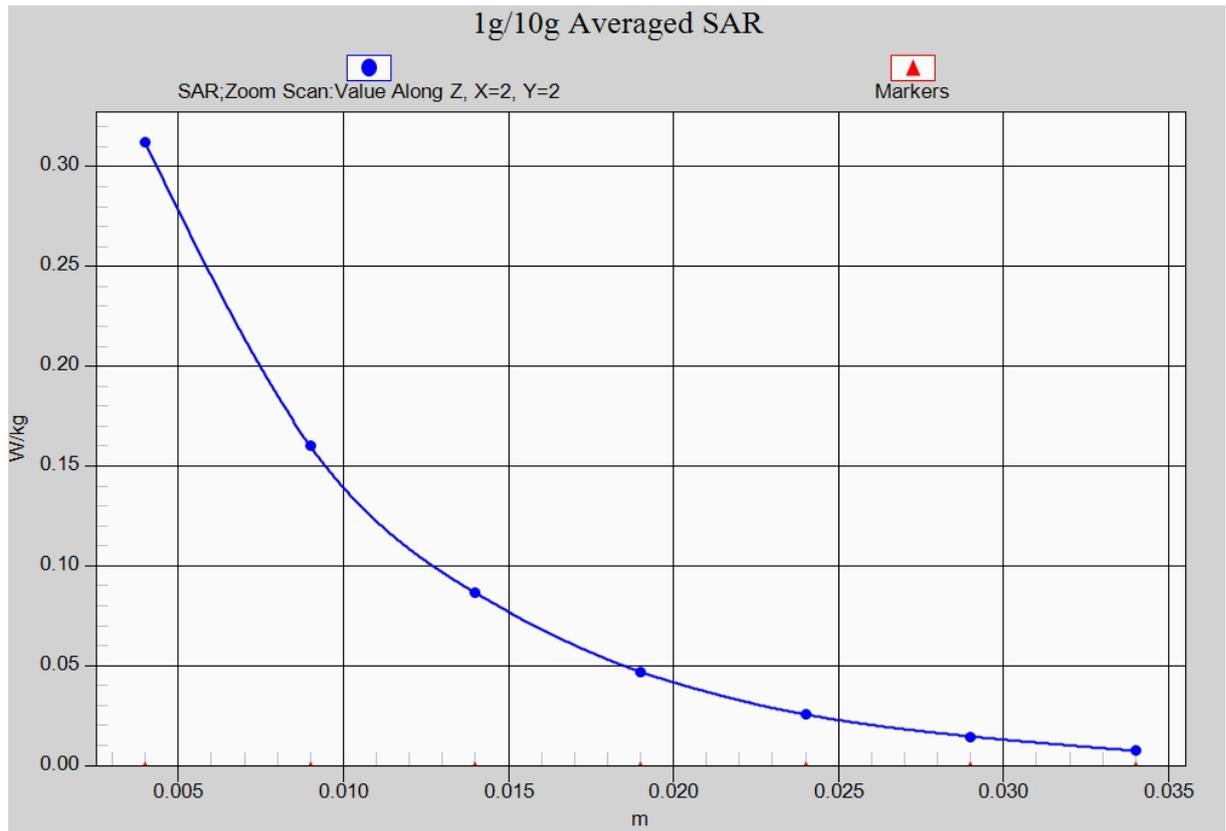


Fig. 4-1 Z-Scan at power reference point (2450 MHz CH1)

## ANNEX B System Verification Results

### 835MHz

Date: 2014-3-21

Electronics: DAE4 Sn771

Medium: Body 850 MHz

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.965 \text{ S/m}$ ;  $\epsilon_r = 56.34$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $22.4^\circ\text{C}$       Liquid Temperature:  $21.9^\circ\text{C}$

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

Probe: EX3DV4 - SN3846 ConvF(8.73, 8.73, 8.73)

**System Validation /Area Scan (81x171x1):** Interpolated grid:  $dx=1.000 \text{ mm}$ ,  $dy=1.000 \text{ mm}$

Reference Value =  $52.128 \text{ V/m}$ ; Power Drift =  $0.09 \text{ dB}$

**Fast SAR: SAR(1 g) =  $2.37 \text{ W/kg}$ ; SAR(10 g) =  $1.58 \text{ W/kg}$**

Maximum value of SAR (interpolated) =  $2.63 \text{ W/kg}$

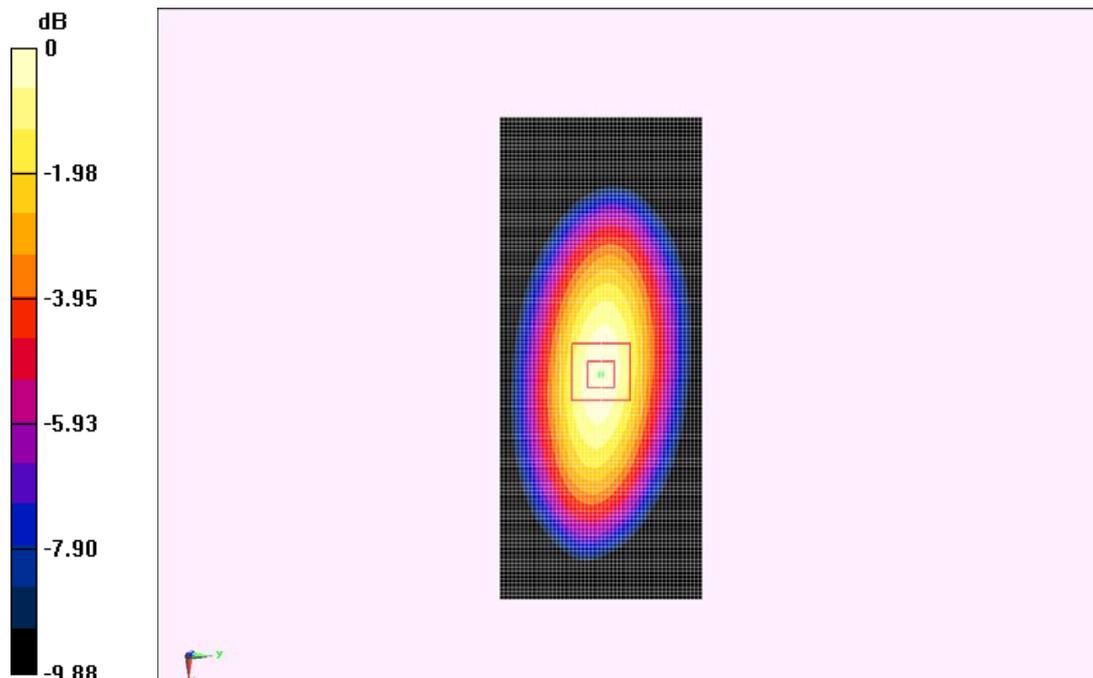
**System Validation /Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $52.128 \text{ V/m}$ ; Power Drift =  $0.09 \text{ dB}$

Peak SAR (extrapolated) =  $3.45 \text{ W/kg}$

**SAR(1 g) =  $2.41 \text{ W/kg}$ ; SAR(10 g) =  $1.60 \text{ W/kg}$**

Maximum value of SAR (measured) =  $2.65 \text{ W/kg}$



0 dB =  $2.63 \text{ W/kg}$  =  $8.40 \text{ dBW/kg}$

Fig.B.1 validation 835MHz 250mW

## 1900MHz

Date: 2014-3-23

Electronics: DAE4 Sn771

Medium: Body 1900 MHz

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.517 \text{ S/m}$ ;  $\epsilon_r = 54.11$ ;  $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature:  $22.4^\circ\text{C}$       Liquid Temperature:  $21.9^\circ\text{C}$

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

Probe: EX3DV4 - SN3846 ConvF(7.03, 7.03, 7.03)

**System Validation/Area Scan (81x121x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Reference Value =  $78.804 \text{ V/m}$ ; Power Drift =  $0.08 \text{ dB}$

**Fast SAR: SAR(1 g) =  $9.94 \text{ W/kg}$ ; SAR(10 g) =  $5.13 \text{ W/kg}$**

Maximum value of SAR (interpolated) =  $11.5 \text{ W/kg}$

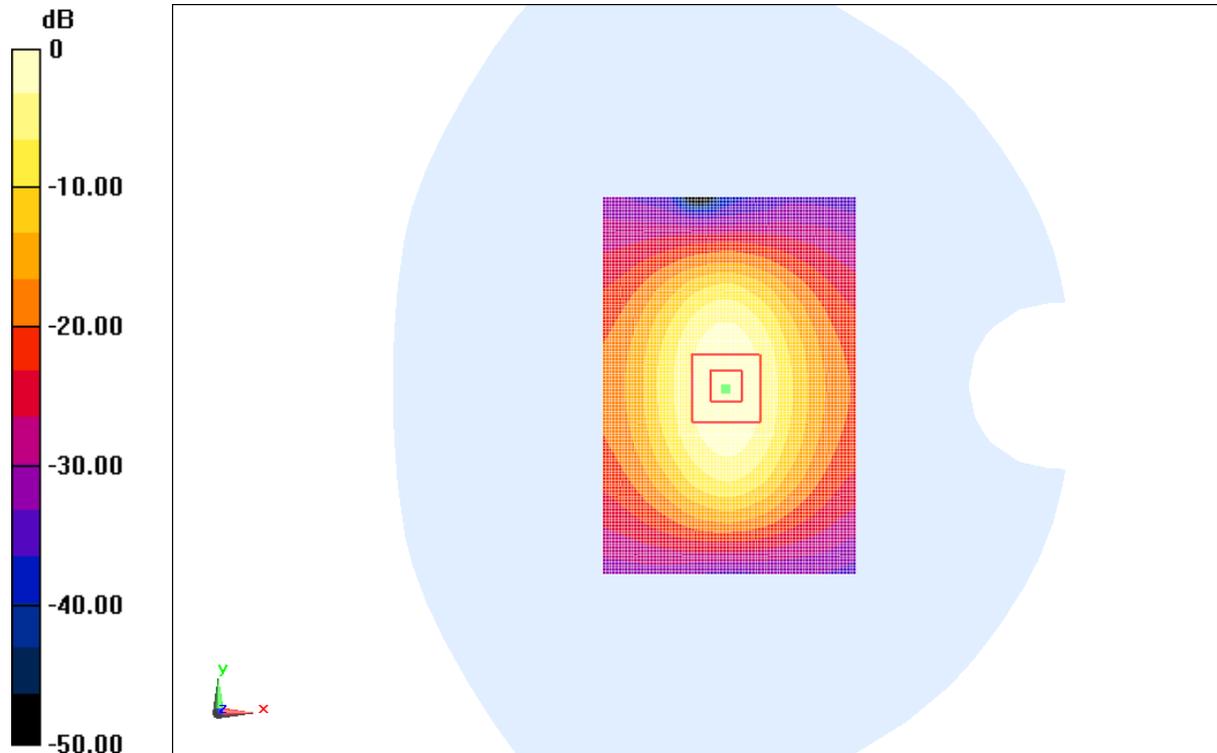
**System Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value =  $78.804 \text{ V/m}$ ; Power Drift =  $0.08 \text{ dB}$

Peak SAR (extrapolated) =  $16.54 \text{ W/kg}$

**SAR(1 g) =  $10.1 \text{ W/kg}$ ; SAR(10 g) =  $5.30 \text{ W/kg}$**

Maximum value of SAR (measured) =  $11.7 \text{ W/kg}$



0 dB =  $11.5 \text{ W/kg}$  =  $21.21 \text{ dB W/kg}$

**Fig.B.2 validation 1900MHz 250mW**

## 2450MHz

Date: 2014-3-24

Electronics: DAE4 Sn771

Medium: Body 2450 MHz

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.932$  S/m;  $\epsilon_r = 53.61$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.3°C      Liquid Temperature: 21.8°C

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

Probe: EX3DV4 - SN3846 ConvF(6.73, 6.73, 6.73)

**System Validation/Area Scan (81x101x1):** Measurement grid: dx=10mm, dy=10mm

Reference Value = 91.378 V/m; Power Drift = 0.10 dB

**Fast SAR: SAR(1 g) = 12.7 W/kg; SAR(10 g) = 5.82 W/kg**

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

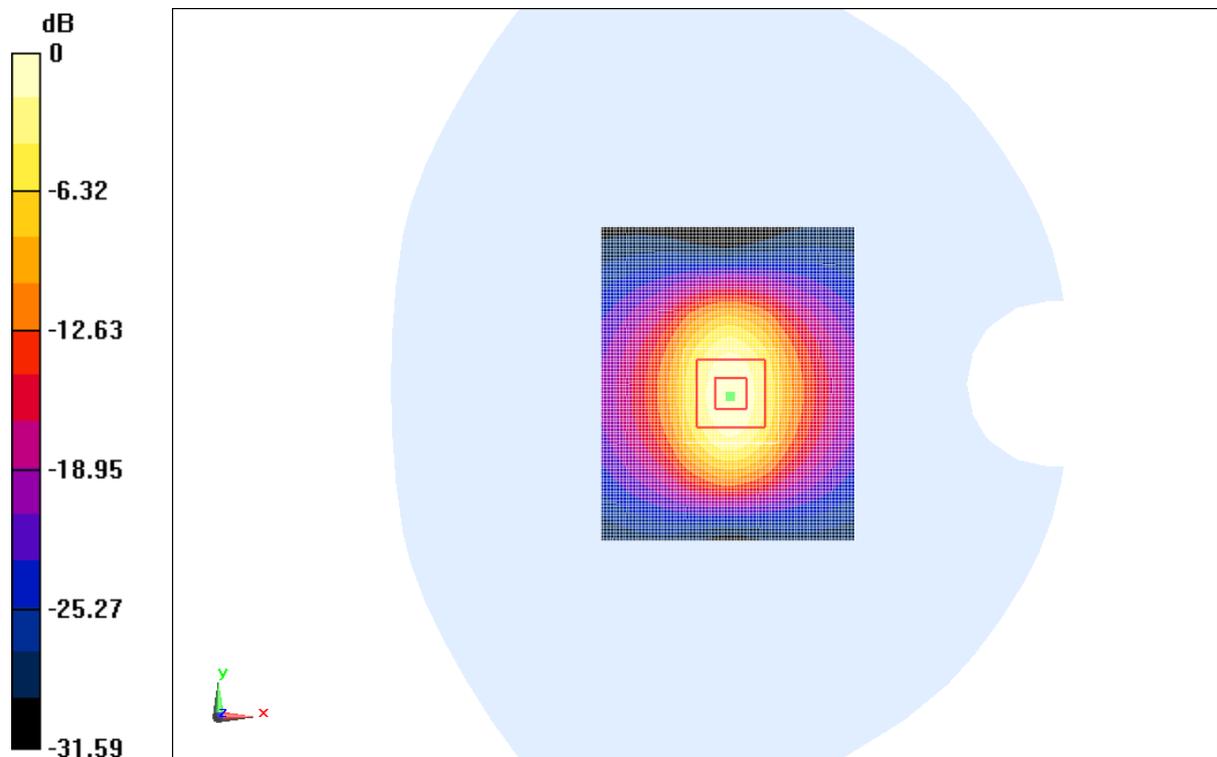
**System Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.378 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 25.78 W/kg

**SAR(1 g) = 12.9 W/kg; SAR(10 g) = 5.98 W/kg**

Maximum value of SAR (measured) = 14.7 W/kg



0 dB = 14.5 W/kg = 23.23 dB W/kg

**Fig.B.3 validation 2450MHz 250mW**

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

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

<b>Band</b>	<b>Position</b>	<b>Area scan (1g)</b>	<b>Zoom scan (1g)</b>	<b>Drift (%)</b>
835	Body	2.37	2.41	-1.66
1900	Body	9.94	10.1	-1.58
2450	Body	12.7	12.9	-1.55