

**Table 11.7: The conducted Power for 5G WIFI**

**<Main antenna>**

Averaged Power (dBm)								
Mode	802.11a	802.11n -20MHz	802.11ac -20MHz	Mode	802.11n -40MHz	802.11ac -40MHz	Mode	802.11ac -80MHz
Channel	6Mbps	MCS0	MCS0	Channel	MCS0	MCS0	Channel	MCS0
<b>&lt;U-NII-1&gt;</b>								
<b>Tune up</b>	<b>16</b>	<b>15.5</b>	<b>15</b>	/	<b>15.5</b>	<b>15</b>	/	<b>15</b>
36(5180MHz)	14.37	14.23	14.15	38(5190MHz)	14.21	13.53	42(5210MHz)	13.75
40(5200MHz)	<b>14.57</b>	14.46	14.37	46(5230MHz)	14.32	13.63	/	/
48(5240MHz)	14.43	14.35	14.23	/	/	/	/	/
<b>&lt;U-NII-2A&gt;</b>								
<b>Tune up</b>	<b>16</b>	<b>15.5</b>	<b>15</b>	/	<b>15.5</b>	<b>15</b>	/	<b>15</b>
52(5260MHz)	<b>14.75</b>	14.41	14.42	54(5270MHz)	13.81	13.83	58(5290MHz)	13.75
56(5280MHz)	14.42	14.36	14.37	62(5310MHz)	13.74	13.74	/	/
64(5320MHz)	14.53	14.23	14.20	/	/	/	/	/
<b>&lt;U-NII-2C&gt;</b>								
<b>Tune up</b>	<b>16</b>	<b>15.5</b>	<b>15</b>	/	<b>15.5</b>	<b>15</b>	/	<b>15</b>
100(5500MHz)	14.31	14.25	14.11	102(5510MHz)	13.67	13.44	106(5530MHz)	13.35
120(5600MHz)	14.12	14.31	14.31	118(5590MHz)	13.78	13.48	122(5610MHz)	13.47
140(5700MHz)	<b>14.53</b>	14.46	14.14	134(5670MHz)	13.84	13.41	/	/
<b>&lt;U-NII-3&gt;</b>								
<b>Tune up</b>	<b>16</b>	<b>15.5</b>	<b>15</b>	/	<b>15.5</b>	<b>15</b>	/	<b>15</b>
149(5745MHz)	14.11	/	/	151(5755 MHz)	13.65	13.49	155(5775MHz)	13.31
157(5785MHz)	14.15	13.74	14.23	159(5795 MHz)	13.73	13.40	/	/
165(5825MHz)	<b>14.34</b>	13.76	14.18	/	/	/	/	/

Channel	Mode	
	802.11n-20MHz	802.11ac-20MHz
<b>Tune up</b>	<b>13.5</b>	<b>13.5</b>
149(5745MHz)	12.13	12.25

< Second antenna >

Averaged Power (dBm)								
Mode	802.11a	802.11n -20MHz	802.11ac -20MHz	Mode	802.11n -40MHz	802.11ac -40MHz	Mode	802.11ac -80MHz
Channel	6Mbps	MCS0	MCS0	Channel	MCS0	MCS0	Channel	MCS0
<b>&lt;U-NII-1&gt;</b>								
<b>Tune up</b>	<b>16.5</b>	<b>16</b>	<b>15.5</b>	/	<b>16</b>	<b>15.5</b>	/	<b>15.5</b>
36(5180MHz)	15.32	14.93	15.37	38(5190MHz)	14.35	14.83	42(5210MHz)	14.66
40(5200MHz)	15.15	14.78	15.30	46(5230MHz)	14.27	14.67	/	/
48(5240MHz)	14.83	14.65	15.42	/	/	/	/	/
<b>&lt;U-NII-2A&gt;</b>								
<b>Tune up</b>	<b>16.5</b>	<b>16</b>	<b>15.5</b>	/	<b>16</b>	<b>15.5</b>	/	<b>15.5</b>
52(5260MHz)	<b>15.15</b>	14.56	14.65	54(5270MHz)	14.13	14.19	58(5290MHz)	13.73
56(5280MHz)	15.13	14.35	14.74	62(5310MHz)	14.21	13.71	/	/
64(5320MHz)	14.78	14.78	14.05	/	/	/	/	/
<b>&lt;U-NII-2C&gt;</b>								
<b>Tune up</b>	<b>16</b>	<b>15.5</b>	<b>15</b>	/	<b>15.5</b>	<b>15</b>	/	<b>15</b>
100(5500MHz)	<b>14.75</b>	14.21	14.36	102(5510MHz)	13.88	13.92	106(5530MHz)	13.98
120(5600MHz)	14.23	14.15	14.39	118(5590MHz)	14.23	13.96	122(5610MHz)	13.41
140(5700MHz)	14.34	13.86	13.75	134(5670MHz)	13.78	13.01	/	/
<b>&lt;U-NII-3&gt;</b>								
<b>Tune up</b>	<b>16</b>	<b>15.5</b>	<b>15</b>	/	<b>15.5</b>	<b>15</b>	/	<b>15</b>
149(5745MHz)	14.23	/	/	151(5755 MHz)	13.65	13.51	155(5775MHz)	13.38
157(5785MHz)	<b>14.45</b>	13.68	13.95	159(5795 MHz)	13.57	13.63	/	/
165(5825MHz)	14.12	13.58	14.13	/	/	/	/	/

Channel	Mode	
	802.11n-20MHz	802.11ac-20MHz
<b>Tune up</b>	<b>13.5</b>	<b>13.5</b>
149(5745MHz)	11.97	12.21

<MIMO>

Averaged Power (dBm)							
Mode	802.11n -20MHz	802.11ac -20MHz	Mode	802.11n -40MHz	802.11ac -40MHz	Mode	802.11ac -80MHz
Channel	MCS0	MCS0	Channel	MCS0	MCS0	Channel	MCS0
<b>&lt;U-NII-1&gt;</b>							
<b>Tune up</b>	<b>19.5</b>	<b>19</b>	/	<b>19.5</b>	<b>19</b>	/	<b>19</b>
36(5180MHz)	18.12	18.10	38(5190MHz)	17.89	17.34	42(5210MHz)	17.37
40(5200MHz)	18.12	18.22	46(5230MHz)	17.64	17.41	/	/
48(5240MHz)	17.74	17.55	/	/	/	/	/
<b>&lt;U-NII-2A&gt;</b>							
<b>Tune up</b>	<b>19.5</b>	<b>19</b>	/	<b>19.5</b>	<b>19</b>	/	<b>19</b>
52(5260MHz)	<b>18.19</b>	18.09	54(5270MHz)	17.89	17.34	58(5290MHz)	17.34
56(5280MHz)	17.82	17.69	62(5310MHz)	17.66	17.36	/	/
64(5320MHz)	17.79	17.55	/	/	/	/	/
<b>&lt;U-NII-2C&gt;</b>							
<b>Tune up</b>	<b>19</b>	<b>18</b>	/	<b>19</b>	<b>18</b>	/	<b>18</b>
100(5500MHz)	<b>18.05</b>	17.79	102(5510MHz)	17.58	16.99	106(5530MHz)	16.99
120(5600MHz)	17.88	17.50	118(5590MHz)	17.48	16.81	122(5610MHz)	16.81
140(5700MHz)	17.37	17.23	134(5670MHz)	17.05	16.30	/	/
<b>&lt;U-NII-3&gt;</b>							
<b>Tune up</b>	<b>18.3</b>	<b>18.5</b>	/	<b>18.5</b>	<b>18.5</b>	/	<b>18.5</b>
149(5745MHz)	/	/	151(5755 MHz)	17.06	17.30	155(5775MHz)	16.82
157(5785MHz)	<b>17.78</b>	17.69	159(5795 MHz)	17.19	17.19	/	/
165(5825MHz)	17.46	17.59	/	/	/	/	/

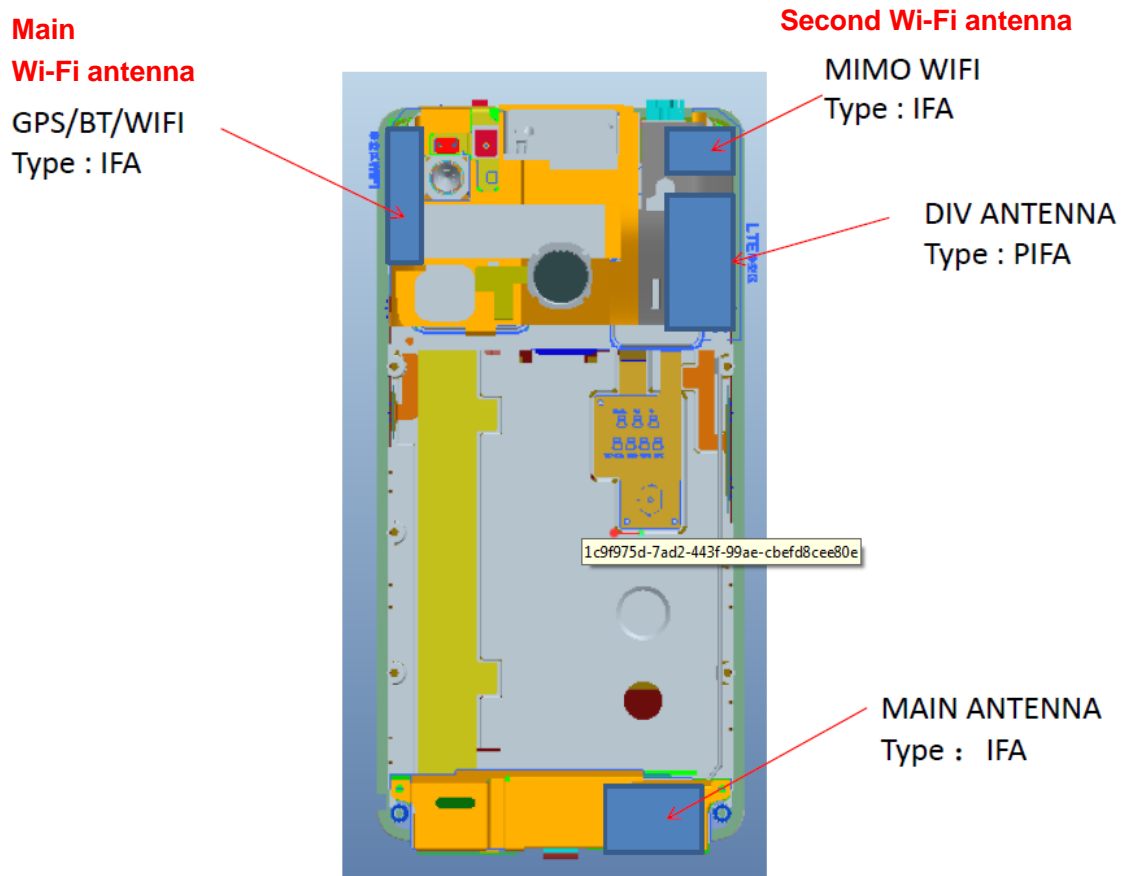
Channel	Mode	
	802.11n-20MHz	802.11ac-20MHz
<b>Tune up</b>	<b>16.5</b>	<b>16.5</b>
149(5745MHz)	15.96	15.90

## 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 (Back View)

### 12.3 SAR Measurement Positions

According to the KDB941225 D06 Hot Spot SAR, 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
Main WIFI antenna	Yes	Yes	No	Yes	Yes	No
Second WIFI antenna	Yes	Yes	Yes	No	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  $\leq 50$  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	
Bluetooth	2.441	Head	9.60	9.5	8.91	Yes
		Body	19.20	9.5	8.91	Yes
2.4GHz WLAN	2.45	Head	9.58	19	79.43	No
		Body	19.17	19	79.43	No
5GHz WLAN	5.2	Head	6.58	19.5	89.13	No
	5.2	Body	13.16	19.5	89.13	No
	5.3	Head	6.52	19.5	89.13	No
	5.3	Body	13.03	19.5	89.13	No
	5.6	Head	6.34	19	79.43	No
	5.6	Body	12.68	19	79.43	No
	5.8	Head	6.23	18.3	67.61	No
	5.8	Body	12.46	18.3	67.61	No

### 13 Evaluation of Simultaneous

**Table 13.1: The sum of reported SAR values for main antenna and Wi-Fi**

/	Position	Main antenna	Wi-Fi	Sum
Highest reported SAR value for Head	Right Tilt	0.18	1.08	1.26
Highest reported SAR value for Body	Front	0.87	0.15	1.02

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

/	Position	Main antenna	BT*	Sum
Highest reported SAR value for Head	Left Touch	0.55	0.37	0.92
Highest reported SAR value for Body	Front	0.87	0.21	1.08

BT\* - Estimated SAR for Bluetooth (see the table 13.3)

**Table 13.3: Estimated SAR for Bluetooth**

Position	f (GHz)	Distance (mm)	Upper limit of power *		Estimated <sub>1g</sub> (W/kg)
			dBm	mW	
Head	2.441	5	9.5	8.91	0.37
Body	2.441	10	9.5	8.91	0.21

\* - 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 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**

<b>Mode</b>	<b>Duty Cycle</b>
Speech for GSM850/1900	1:8.3
GPRS for GSM850/1900	1:4
WCDMA850/1700/1900	1:1
FDD_LTE Band 2/4/5/7/12/13/25/26/66	1:1
TDD_LTE Band 38	1:1.58

### 14.1 SAR results

**Table 14.2: SAR Values (GSM 850 - Head)**

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.5°C		Liquid Temperature: 22.0°C		Power Drift(dB)
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	
836.6	190	Speech	Left Touch	<b>Fig.1</b>	33.06	34	<b>0.163</b>	<b>0.20</b>	0.08
836.6	190	Speech	Left Tilt	/	33.06	34	0.093	0.12	0.06
836.6	190	Speech	Right Touch	/	33.06	34	0.122	0.15	-0.09
836.6	190	Speech	Right Tilt	/	33.06	34	0.088	0.11	0.06

**Table 14.3: SAR Values (GSM 850 -Body)**

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.5°C		Liquid Temperature: 22.0°C		Power Drift(dB)
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	
<b>Hotspot / Body Worn Test Data (10mm)</b>									
836.6	190	GPRS	Front	/	30.71	31.5	0.210	0.25	0.10
836.6	190	GPRS	Rear	/	30.71	31.5	0.206	0.25	-0.05
836.6	190	GPRS	Left	/	30.71	31.5	0.153	0.18	0.08
836.6	190	GPRS	Right	/	30.71	31.5	0.119	0.14	-0.10
836.6	190	GPRS	Bottom	<b>Fig.2</b>	30.71	31.5	<b>0.235</b>	<b>0.28</b>	0.01



**Table 14.4: SAR Values (GSM 1900 - Head)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.7°C      Liquid Temperature: 22.2°C									
1880	661	Speech	Left Touch	/	30.04	30.5	0.082	0.09	0.07
1880	661	Speech	Left Tilt	/	30.04	30.5	0.026	0.03	0.10
1880	661	Speech	Right Touch	<b>Fig.3</b>	30.04	30.5	<b>0.092</b>	<b>0.10</b>	0.01
1880	661	Speech	Right Tilt	/	30.04	30.5	0.040	0.04	0.12

**Table 14.5: SAR Values (GSM 1900 - Body)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.4°C      Liquid Temperature: 22.0°C									
<b>Hotspot / Body Worn Test Data (10mm)</b>									
1880	661	GPRS	Front	<b>Fig.4</b>	27.99	28.5	<b>0.304</b>	<b>0.34</b>	0.13
1880	661	GPRS	Rear	/	27.99	28.5	0.235	0.26	0.02
1880	661	GPRS	Left	/	27.99	28.5	0.105	0.12	0.05
1880	661	GPRS	Right	/	27.99	28.5	0.123	0.14	0.03
1880	661	GPRS	Bottom	/	27.99	28.5	0.216	0.24	0.06

**Table 14.6: SAR Values (WCDMA 850 - Head)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.5°C      Liquid Temperature: 22.0°C									
836.4	4182	RMC	Left Touch	<b>Fig.5</b>	23.70	24	<b>0.118</b>	<b>0.13</b>	0.13
836.4	4182	RMC	Left Tilt	/	23.70	24	0.091	0.10	-0.03
836.4	4182	RMC	Right Touch	/	23.70	24	0.115	0.12	0.05
836.4	4182	RMC	Right Tilt	/	23.70	24	0.075	0.08	0.05

**Table 14.7: SAR Values (WCDMA 850 -Body)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.8°C      Liquid Temperature: 22.2°C									
<b>Hotspot / Body Worn Test Data (10mm)</b>									
836.4	4182	RMC	Front	/	23.70	24	0.159	0.17	-0.02
836.4	4182	RMC	Rear	/	23.70	24	0.144	0.15	0.01
836.4	4182	RMC	Left	/	23.70	24	0.050	0.05	0.09
836.4	4182	RMC	Right	/	23.70	24	0.061	0.07	0.07
836.4	4182	RMC	Bottom	<b>Fig.6</b>	23.70	24	<b>0.201</b>	<b>0.22</b>	0.03

**Table 14.8: SAR Values (WCDMA1900 - Head)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.7°C      Liquid Temperature: 22.2°C									
1880	9400	RMC	Left Touch	<b>Fig.7</b>	23.80	24	<b>0.521</b>	<b>0.55</b>	0.19
1880	9400	RMC	Left Tilt	/	23.80	24	0.137	0.14	0.07
1880	9400	RMC	Right Touch	/	23.80	24	0.290	0.30	0.04
1880	9400	RMC	Right Tilt	/	23.80	24	0.098	0.10	0.05

**Table 14.9: SAR Values (WCDMA1900 - Body)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.4°C      Liquid Temperature: 22.0°C									
<b>Hotspot / Body Worn Test Data (10mm)</b>									
1880	9400	RMC	Front	<b>Fig.8</b>	23.80	24	<b>0.449</b>	<b>0.47</b>	-0.05
1880	9400	RMC	Rear	/	23.80	24	0.404	0.42	0.15
1880	9400	RMC	Left	/	23.80	24	0.098	0.10	0.05
1880	9400	RMC	Right	/	23.80	24	0.144	0.15	0.05
1880	9400	RMC	Bottom	/	23.80	24	0.388	0.41	0.17

**Table 14.10: SAR Values (WCDMA 1700 - Head)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.9°C      Liquid Temperature: 22.4°C									
1732.6	1413	RMC	Left Touch	<b>Fig.9</b>	23.70	24	<b>0.363</b>	<b>0.39</b>	0.02
1732.6	1413	RMC	Left Tilt	/	23.70	24	0.074	0.08	0.05
1732.6	1413	RMC	Right Touch	/	23.70	24	0.205	0.22	0.05
1732.6	1413	RMC	Right Tilt	/	23.70	24	0.055	0.06	0.07

**Table 14.11: SAR Values (WCDMA 1700 - Body)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.6°C      Liquid Temperature: 22.1°C									
<b>Hotspot / Body Worn Test Data (10mm)</b>									
1732.6	1413	RMC	Front	<b>Fig.10</b>	23.70	24	<b>0.379</b>	<b>0.41</b>	0.11
1732.6	1413	RMC	Rear	/	23.70	24	0.261	0.28	0.08
1732.6	1413	RMC	Left	/	23.70	24	0.102	0.11	0.05
1732.6	1413	RMC	Right	/	23.70	24	0.051	0.06	0.11
1732.6	1413	RMC	Bottom	/	23.70	24	0.352	0.38	0.09

**Table 14.12: SAR Values (LTE Band 2 - Head)**

Frequency		Test Mode	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.								
		Ambient Temperature: 22.7°C			Liquid Temperature: 22.2°C				
1880	18900	1RB_Low	Left Touch	<b>Fig.11</b>	23.43	24	<b>0.474</b>	<b>0.54</b>	0.09
1880	18900	50RB_Low	Left Touch	/	22.43	23	0.379	0.43	0.19
1880	18900	1RB_Low	Left Tilt	/	23.43	24	0.103	0.12	0.11
1880	18900	50RB_Low	Left Tilt	/	22.43	23	0.087	0.10	0.18
1880	18900	1RB_Low	Right Touch	/	23.43	24	0.285	0.32	0.18
1880	18900	50RB_Low	Right Touch	/	22.43	23	0.237	0.27	0.05
1880	18900	1RB_Low	Right Tilt	/	23.43	24	0.103	0.12	0.02
1880	18900	50RB_Low	Right Tilt	/	22.43	23	0.083	0.09	0.12

**Table 14.13: SAR Values (LTE Band 2 - Body)**

Frequency		Test Mode	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.								
		Ambient Temperature: 22.4°C			Liquid Temperature: 22.0°C				
<b>Hotspot / Body Worn Test Data (10mm)</b>									
1880	18900	1RB_Low	Front	/	23.43	24	0.392	0.45	-0.04
1880	18900	50RB_Low	Front	/	22.43	23	0.307	0.35	0.03
1880	18900	1RB_Low	Rear	/	23.43	24	0.390	0.44	0.02
1880	18900	50RB_Low	Rear	/	22.43	23	0.316	0.36	0.02
1880	18900	1RB_Low	Left	/	23.43	24	0.034	0.04	0.05
1880	18900	50RB_Low	Left	/	22.43	23	0.026	0.03	0.18
1880	18900	1RB_Low	Right	/	23.43	24	0.099	0.11	0.10
1880	18900	50RB_Low	Right	/	22.43	23	0.077	0.09	0.13
1880	18900	1RB_Low	Bottom	<b>Fig.12</b>	23.43	24	<b>0.477</b>	<b>0.54</b>	0.17
1880	18900	50RB_Low	Bottom	/	22.43	23	0.423	0.48	0.16

**Table 14.14: SAR Values (LTE Band 4 - Head)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.9°C					Liquid Temperature: 22.4°C				
1732.5	20175	1RB_Low	Left Touch	<b>Fig.13</b>	23.17	24	<b>0.341</b>	<b>0.41</b>	0.09
1732.5	20175	50RB_Low	Left Touch	/	22.23	23	0.264	0.32	0.07
1732.5	20175	1RB_Low	Left Tilt	/	23.17	24	0.080	0.10	0.06
1732.5	20175	50RB_Low	Left Tilt	/	22.23	23	0.066	0.08	0.05
1732.5	20175	1RB_Low	Right Touch	/	23.17	24	0.168	0.20	0.08
1732.5	20175	50RB_Low	Right Touch	/	22.23	23	0.134	0.16	0.04
1732.5	20175	1RB_Low	Right Tilt	/	23.17	24	0.053	0.06	0.07
1732.5	20175	50RB_Low	Right Tilt	/	22.23	23	0.044	0.05	0.09

**Table 14.15: SAR Values (LTE Band 4 - Body)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.6°C					Liquid Temperature: 22.1°C				
<b>Hotspot / Body Worn Test Data (10mm)</b>									
1732.5	20175	1RB_Low	Front	/	23.17	24	0.400	0.48	0.05
1732.5	20175	50RB_Low	Front	/	22.23	23	0.325	0.39	0.07
1732.5	20175	1RB_Low	Rear	/	23.17	24	0.368	0.45	0.06
1732.5	20175	50RB_Low	Rear	/	22.23	23	0.296	0.35	0.02
1732.5	20175	1RB_Low	Left	/	23.17	24	0.101	0.12	0.01
1732.5	20175	50RB_Low	Left	/	22.23	23	0.098	0.12	0.08
1732.5	20175	1RB_Low	Right	/	23.17	24	0.076	0.09	0.15
1732.5	20175	50RB_Low	Right	/	22.23	23	0.063	0.07	0.13
1732.5	20175	1RB_Low	Bottom	<b>Fig.14</b>	23.17	24	<b>0.441</b>	<b>0.53</b>	0.12
1732.5	20175	50RB_Low	Bottom	/	22.23	23	0.410	0.49	0.08

**Table 14.16: SAR Values (LTE Band 5 - Head)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.5°C      Liquid Temperature: 22.0°C									
836.5	20525	1RB_Mid	Left Touch	/	24.24	24.5	0.098	0.10	0.04
836.5	20525	25RB_Mid	Left Touch	/	23.33	23.5	0.077	0.08	0.06
836.5	20525	1RB_Mid	Left Tilt	/	24.24	24.5	0.075	0.08	0.02
836.5	20525	25RB_Mid	Left Tilt	/	23.33	23.5	0.061	0.06	0.02
836.5	20525	1RB_Mid	Right Touch	<b>Fig.15</b>	24.24	24.5	<b>0.124</b>	<b>0.13</b>	0.13
836.5	20525	25RB_Mid	Right Touch	/	23.33	23.5	0.107	0.11	0.06
836.5	20525	1RB_Mid	Right Tilt	/	24.24	24.5	0.102	0.11	0.03
836.5	20525	25RB_Mid	Right Tilt	/	23.33	23.5	0.082	0.09	0.03

**Table 14.17: SAR Values (LTE Band 5 - Body)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.8°C      Liquid Temperature: 22.2°C									
<b>Hotspot / Body Worn Test Data (10mm)</b>									
836.5	20525	1RB_Mid	Front	/	24.24	24.5	0.036	<b>0.04</b>	0.09
836.5	20525	25RB_Mid	Front	/	23.33	23.5	0.031	0.03	0.04
836.5	20525	1RB_Mid	Rear	<b>Fig.16</b>	24.24	24.5	<b>0.037</b>	<b>0.04</b>	0.01
836.5	20525	25RB_Mid	Rear	/	23.33	23.5	0.029	0.03	-0.01
836.5	20525	1RB_Mid	Left	/	24.24	24.5	0.020	0.02	0.11
836.5	20525	25RB_Mid	Left	/	23.33	23.5	0.015	0.02	0.03
836.5	20525	1RB_Mid	Right	/	24.24	24.5	0.021	0.02	-0.05
836.5	20525	25RB_Mid	Right	/	23.33	23.5	0.016	0.02	0.01
836.5	20525	1RB_Mid	Bottom	/	24.24	24.5	0.029	0.03	0.16
836.5	20525	25RB_Mid	Bottom	/	23.33	23.5	0.022	0.02	0.09

**Table 14.18: SAR Values (LTE Band 7 - Head)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.2°C      Liquid Temperature: 21.7°C									
2535	21100	1RB_High	Left Touch	<b>Fig.17</b>	22.06	23	<b>0.227</b>	<b>0.28</b>	0.00
2535	21100	50RB_High	Left Touch	/	21.03	22	0.186	0.23	0.13
2535	21100	1RB_High	Left Tilt	/	22.06	23	0.120	0.15	0.06
2535	21100	50RB_High	Left Tilt	/	21.03	22	0.093	0.12	0.09
2535	21100	1RB_High	Right Touch	/	22.06	23	0.178	0.22	0.07
2535	21100	50RB_High	Right Touch	/	21.03	22	0.140	0.18	0.09
2535	21100	1RB_High	Right Tilt	/	22.06	23	0.101	0.13	0.05
2535	21100	50RB_High	Right Tilt	/	21.03	22	0.083	0.10	0.07

**Table 14.19: SAR Values (LTE Band 7 - Body)**

Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Ambient Temperature: 22.2°C      Liquid Temperature: 21.7°C									
<b>Hotspot / Body Worn Test Data (10mm)</b>									
2535	21100	1RB_High	Front	<b>Fig.18</b>	22.06	23	<b>0.701</b>	<b>0.87</b>	0.12
2535	21100	50RB_High	Front	/	21.03	22	0.536	0.67	0.15
2535	21100	1RB_High	Rear	/	22.06	23	0.446	0.55	0.05
2535	21100	50RB_High	Rear	/	21.03	22	0.358	0.45	0.18
2535	21100	1RB_High	Left	/	22.06	23	0.235	0.29	0.01
2535	21100	50RB_High	Left	/	21.03	22	0.221	0.28	0.02
2535	21100	1RB_High	Right	/	22.06	23	0.219	0.27	-0.01
2535	21100	50RB_High	Right	/	21.03	22	0.186	0.23	0.11
2535	21100	1RB_High	Bottom	/	22.06	23	0.683	0.85	0.08
2535	21100	50RB_High	Bottom	/	21.03	22	0.509	0.64	0.12
2560	21350	1RB_High	Front	/	22.15	23	0.656	0.80	0.13
2510	20850	1RB_High	Front	/	22.12	23	0.661	0.81	0.12
2535	21100	100RB	Front	/	21.03	22	0.540	0.68	0.10
2560	21350	1RB_High	Bottom	/	22.15	23	0.635	0.77	-0.08
2510	20850	1RB_High	Bottom	/	22.12	23	0.624	0.76	0.12
2535	21100	100RB	Bottom	/	21.03	22	0.524	0.66	-0.07



**Table 14.20: SAR Values (LTE Band 12 - Head)**

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.5°C		Liquid Temperature: 22.0°C		
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
707.5	23095	1RB_Mid	Left Touch	<b>Fig.19</b>	24.33	24.5	<b>0.107</b>	<b>0.11</b>	0.04
707.5	23095	25RB_Mid	Left Touch	/	23.45	23.5	0.086	0.09	0.04
707.5	23095	1RB_Mid	Left Tilt	/	24.33	24.5	0.067	0.07	0.01
707.5	23095	25RB_Mid	Left Tilt	/	23.45	23.5	0.055	0.06	0.01
707.5	23095	1RB_Mid	Right Touch	/	24.33	24.5	0.081	0.08	0.01
707.5	23095	25RB_Mid	Right Touch	/	23.45	23.5	0.066	0.07	0.05
707.5	23095	1RB_Mid	Right Tilt	/	24.33	24.5	0.054	0.06	-0.12
707.5	23095	25RB_Mid	Right Tilt	/	23.45	23.5	0.036	0.04	0.05

**Table 14.21: SAR Values (LTE Band 12 - Body)**

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.8°C		Liquid Temperature: 22.2°C		
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
<b>Hotspot / Body Worn Test Data (10mm)</b>									
707.5	23095	1RB_Mid	Front	/	24.33	24.5	0.094	0.10	0.03
707.5	23095	25RB_Mid	Front	/	23.45	23.5	0.074	0.07	0.02
707.5	23095	1RB_Mid	Rear	<b>Fig.20</b>	24.33	24.5	<b>0.148</b>	<b>0.15</b>	0.02
707.5	23095	25RB_Mid	Rear	/	23.45	23.5	0.120	0.12	0.01
707.5	23095	1RB_Mid	Left	/	24.33	24.5	0.141	<b>0.15</b>	0.06
707.5	23095	25RB_Mid	Left	/	23.45	23.5	0.120	0.12	0.05
707.5	23095	1RB_Mid	Right	/	24.33	24.5	0.116	0.12	0.02
707.5	23095	25RB_Mid	Right	/	23.45	23.5	0.091	0.09	0.03
707.5	23095	1RB_Mid	Bottom	/	24.33	24.5	0.059	0.06	0.06
707.5	23095	25RB_Mid	Bottom	/	23.45	23.5	0.047	0.05	0.06

**Table 14.22: SAR Values (LTE Band 13 - Head)**

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.5°C		Liquid Temperature: 22.0°C		
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
782	23230	1RB_Mid	Left Touch	<b>Fig.21</b>	24.09	24.5	<b>0.090</b>	<b>0.10</b>	0.09
782	23230	25RB_Low	Left Touch	/	23.23	23.5	0.071	0.08	0.05
782	23230	1RB_Mid	Left Tilt	/	24.09	24.5	0.062	0.07	0.16
782	23230	25RB_Low	Left Tilt	/	23.23	23.5	0.052	0.06	0.02
782	23230	1RB_Mid	Right Touch	/	24.09	24.5	0.069	0.08	0.11
782	23230	25RB_Low	Right Touch	/	23.23	23.5	0.056	0.06	0.11
782	23230	1RB_Mid	Right Tilt	/	24.09	24.5	0.055	0.06	0.01
782	23230	25RB_Low	Right Tilt	/	23.23	23.5	0.043	0.05	0.05

**Table 14.23: SAR Values (LTE Band 13 - Body)**

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.8°C		Liquid Temperature: 22.2°C		
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
<b>Hotspot / Body Worn Test Data (10mm)</b>									
782	23230	1RB_Mid	Front	/	24.09	24.5	0.086	0.09	0.04
782	23230	25RB_Low	Front	/	23.23	23.5	0.070	0.07	0.04
782	23230	1RB_Mid	Rear	<b>Fig.22</b>	24.09	24.5	<b>0.095</b>	<b>0.10</b>	-0.01
782	23230	25RB_Low	Rear	/	23.23	23.5	0.068	0.07	-0.06
782	23230	1RB_Mid	Left	/	24.09	24.5	0.070	0.08	0.04
782	23230	25RB_Low	Left	/	23.23	23.5	0.066	0.07	0.05
782	23230	1RB_Mid	Right	/	24.09	24.5	0.068	0.07	0.03
782	23230	25RB_Low	Right	/	23.23	23.5	0.057	0.06	-0.01
782	23230	1RB_Mid	Bottom	/	24.09	24.5	0.068	0.07	0.05
782	23230	25RB_Low	Bottom	/	23.23	23.5	0.056	0.06	0.06

**Table 14.24: SAR Values (LTE Band 25 - Head)**

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.5°C		Liquid Temperature: 22.0°C		
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
1882.5	26365	1RB_Low	Left Touch	<b>Fig.23</b>	23.18	23.5	<b>0.459</b>	<b>0.49</b>	0.08
1882.5	26365	25RB_Mid	Left Touch	/	22.20	23	0.366	0.44	0.02
1882.5	26365	1RB_Low	Left Tilt	/	23.18	23.5	0.116	0.12	0.05
1882.5	26365	25RB_Mid	Left Tilt	/	22.20	23	0.097	0.12	0.01
1882.5	26365	1RB_Low	Right Touch	/	23.18	23.5	0.236	0.25	-0.13
1882.5	26365	25RB_Mid	Right Touch	/	22.20	23	0.194	0.23	0.04
1882.5	26365	1RB_Low	Right Tilt	/	23.18	23.5	0.165	0.18	0.05
1882.5	26365	25RB_Mid	Right Tilt	/	22.20	23	0.102	0.12	0.04

**Table 14.25: SAR Values (LTE Band 25 - Body)**

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.8°C		Liquid Temperature: 22.2°C		
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
<b>Hotspot / Body Worn Test Data (10mm)</b>									
1882.5	26365	1RB_Low	Front	/	23.18	23.5	0.387	0.42	-0.02
1882.5	26365	25RB_Mid	Front	/	22.20	23	0.304	0.37	-0.02
1882.5	26365	1RB_Low	Rear	/	23.18	23.5	0.411	0.44	0.09
1882.5	26365	25RB_Mid	Rear	/	22.20	23	0.314	0.38	0.08
1882.5	26365	1RB_Low	Left	/	23.18	23.5	0.137	0.15	0.02
1882.5	26365	25RB_Mid	Left	/	22.20	23	0.112	0.13	-0.01
1882.5	26365	1RB_Low	Right	/	23.18	23.5	0.096	0.10	0.13
1882.5	26365	25RB_Mid	Right	/	22.20	23	0.075	0.09	0.03
1882.5	26365	1RB_Low	Bottom	<b>Fig.24</b>	23.18	23.5	<b>0.455</b>	<b>0.49</b>	0.01
1882.5	26365	25RB_Mid	Bottom	/	22.20	23	0.359	0.43	-0.04

**Table 14.26: SAR Values (LTE Band 26 - Head)**

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.5°C		Liquid Temperature: 22.0°C		
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
831.5	26865	1RB_High	Left Touch	/	23.92	24.5	0.095	0.11	0.07
831.5	26865	36RB_Mid	Left Touch	/	23.01	23.5	0.073	0.08	0.05
831.5	26865	1RB_High	Left Tilt	/	23.92	24.5	0.073	0.08	0.06
831.5	26865	36RB_Mid	Left Tilt	/	23.01	23.5	0.058	0.06	0.09
831.5	26865	1RB_High	Right Touch	<b>Fig.25</b>	23.92	24.5	<b>0.121</b>	<b>0.14</b>	0.08
831.5	26865	36RB_Mid	Right Touch	/	23.01	23.5	0.069	0.08	0.08
831.5	26865	1RB_High	Right Tilt	/	23.92	24.5	0.062	0.07	0.13
831.5	26865	36RB_Mid	Right Tilt	/	23.01	23.5	0.049	0.05	0.05

**Table 14.27: SAR Values (LTE Band 26 - Body)**

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.8°C		Liquid Temperature: 22.2°C		
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
<b>Hotspot / Body Worn Test Data (10mm)</b>									
831.5	26865	1RB_High	Front	/	23.92	24.5	0.038	0.04	0.05
831.5	26865	36RB_Mid	Front	/	23.01	23.5	0.031	0.03	0.02
831.5	26865	1RB_High	Rear	<b>Fig.26</b>	23.92	24.5	<b>0.040</b>	<b>0.05</b>	-0.02
831.5	26865	36RB_Mid	Rear	/	23.01	23.5	0.030	0.03	0.03
831.5	26865	1RB_High	Left	/	23.92	24.5	0.019	0.02	0.06
831.5	26865	36RB_Mid	Left	/	23.01	23.5	0.015	0.02	0.01
831.5	26865	1RB_High	Right	/	23.92	24.5	0.023	0.03	0.06
831.5	26865	36RB_Mid	Right	/	23.01	23.5	0.017	0.02	0.03
831.5	26865	1RB_High	Bottom	/	23.92	24.5	0.032	0.04	0.05
831.5	26865	36RB_Mid	Bottom	/	23.01	23.5	0.025	0.03	0.04

**Table 14.28: SAR Values (LTE Band 38 - Head)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.2°C      Liquid Temperature: 21.7°C									
2595	38000	1RB_Low	Left Touch	<b>Fig.27</b>	22.97	23.5	<b>0.227</b>	<b>0.26</b>	0.03
2595	38000	50RB_Low	Left Touch	/	21.96	22.5	0.186	0.21	0.06
2595	38000	1RB_Low	Left Tilt	/	22.97	23.5	0.120	0.14	0.04
2595	38000	50RB_Low	Left Tilt	/	21.96	22.5	0.093	0.11	0.03
2595	38000	1RB_Low	Right Touch	/	22.97	23.5	0.167	0.19	0.01
2595	38000	50RB_Low	Right Touch	/	21.96	22.5	0.130	0.15	0.12
2595	38000	1RB_Low	Right Tilt	/	22.97	23.5	0.109	0.12	0.15
2595	38000	50RB_Low	Right Tilt	/	21.96	22.5	0.082	0.09	-0.13

**Table 14.29: SAR Values (LTE Band 38 - Body)**

Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Ambient Temperature: 22.2°C      Liquid Temperature: 21.7°C									
<b>Hotspot / Body Worn Test Data (10mm)</b>									
2595	38000	1RB_Low	Front	<b>Fig.28</b>	22.97	23.5	<b>0.399</b>	<b>0.45</b>	0.10
2595	38000	50RB_Low	Front	/	21.96	22.5	0.311	0.35	0.02
2595	38000	1RB_Low	Rear	/	22.97	23.5	0.365	0.41	0.10
2595	38000	50RB_Low	Rear	/	21.96	22.5	0.286	0.32	0.15
2595	38000	1RB_Low	Left	/	22.97	23.5	0.166	0.19	-0.08
2595	38000	50RB_Low	Left	/	21.96	22.5	0.154	0.17	0.05
2595	38000	1RB_Low	Right	/	22.97	23.5	0.046	0.05	0.09
2595	38000	50RB_Low	Right	/	21.96	22.5	0.040	0.05	0.03
2595	38000	1RB_Low	Bottom	/	22.97	23.5	0.392	0.44	0.02
2595	38000	50RB_Low	Bottom	/	21.96	22.5	0.304	0.34	0.12

**Table 14.30: SAR Values (LTE Band 66 - Head)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.2°C					Liquid Temperature: 21.7°C				
1755	132322	1RB_Low	Left Touch	<b>Fig.29</b>	23.37	24	<b>0.351</b>	<b>0.41</b>	0.04
1755	132322	50RB_Low	Left Touch	/	22.17	23	0.279	0.34	0.08
1755	132322	1RB_Low	Left Tilt	/	23.37	24	0.096	0.11	0.16
1755	132322	50RB_Low	Left Tilt	/	22.17	23	0.077	0.09	0.04
1755	132322	1RB_Low	Right Touch	/	23.37	24	0.217	0.25	0.03
1755	132322	50RB_Low	Right Touch	/	22.17	23	0.170	0.21	0.06
1755	132322	1RB_Low	Right Tilt	/	23.37	24	0.053	0.06	0.08
1755	132322	50RB_Low	Right Tilt	/	22.17	23	0.042	0.05	0.08

**Table 14.31: SAR Values (LTE Band 66 - Body)**

Frequency		Test Mode	Test Position	Figure No. / Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
MHz	Ch.								
Ambient Temperature: 22.2°C					Liquid Temperature: 21.7°C				
<b>Hotspot / Body Worn Test Data (10mm)</b>									
1755	132322	1RB_Low	Front	<b>Fig.30</b>	23.37	24	<b>0.444</b>	<b>0.51</b>	0.15
1755	132322	50RB_Low	Front	/	22.17	23	0.380	0.46	0.03
1755	132322	1RB_Low	Rear	/	23.37	24	0.386	0.45	0.00
1755	132322	50RB_Low	Rear	/	22.17	23	0.300	0.36	0.06
1755	132322	1RB_Low	Left	/	23.37	24	0.119	0.14	0.11
1755	132322	50RB_Low	Left	/	22.17	23	0.092	0.11	0.10
1755	132322	1RB_Low	Right	/	23.37	24	0.068	0.08	0.09
1755	132322	50RB_Low	Right	/	22.17	23	0.054	0.07	0.07
1755	132322	1RB_Low	Bottom	/	23.37	24	0.435	0.50	0.01
1755	132322	50RB_Low	Bottom	/	22.17	23	0.359	0.43	-0.04

### 14.2 WLAN Evaluation for 2.4G

According to the KDB248227 D01, SAR is measured for 2.4GHz 802.11b DSSS using the initial test position procedure.

**Table 14.32: SAR Values (WLAN 2.4G - Head)**

Frequency		Test Mode	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.								
Ambient Temperature: 22.6°C      Liquid Temperature: 22.0°C									
<b>&lt;Main antenna&gt;</b>									
2437	6	802.11 b	Left Touch	<b>Fig.31</b>	18.39	19	<b>0.576</b>	<b>0.66</b>	0.09
2437	6	802.11 b	Left Tilt	/	18.39	19	0.441	0.51	0.08
2437	6	802.11 b	Right Touch	/	18.39	19	0.255	0.29	-0.02
2437	6	802.11 b	Right Tilt	/	18.39	19	0.238	0.27	0.07
<b>&lt;Second antenna&gt;</b>									
2462	11	802.11 b	Left Touch	/	18.56	19	0.281	0.31	0.08
2462	11	802.11 b	Left Tilt	/	18.56	19	0.314	0.35	0.08
2462	11	802.11 b	Right Touch	/	18.56	19	<b>0.538</b>	0.60	-0.08
2462	11	802.11 b	Right Tilt	/	18.56	19	0.329	0.36	0.08
<b>&lt;MIMO&gt;</b>									
2412	1	802.11 n	Left Touch	/	17.21	18	0.190	0.23	0.03
2412	1	802.11 n	Left Tilt	/	17.21	18	<b>0.215</b>	0.26	0.08
2412	1	802.11 n	Right Touch	/	17.21	18	0.185	0.22	0.08
2412	1	802.11 n	Right Tilt	/	17.21	18	0.154	0.18	0.07

Note1:For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. A maximum transmission duty factor of 100% is achievable for WLAN in this project and the scaled reported SAR is presented as below.

**Table 14.33: SAR Values (WLAN - Head) – 802.11b 1Mbps (Scaled Reported SAR)**

Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
2437	6	Left Touch	100%	100%	0.66	<b>0.66</b>

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

**Table 14.34: SAR Values (WLAN 2.4G - Body)**

Ambient Temperature: 22.6°C					Liquid Temperature: 22.0°C				
Frequency		Test Mode	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.								
<b>&lt;Main antenna&gt;</b>									
2437	6	802.11 b	Front	/	18.39	19	0.130	0.15	0.04
2437	6	802.11 b	Rear	<b>Fig.32</b>	18.39	19	<b>0.161</b>	<b>0.19</b>	-0.03
2437	6	802.11 b	Right	/	18.39	19	0.073	0.08	0.07
2437	6	802.11 b	Top	/	18.39	19	0.105	0.12	0.05
<b>&lt;Second antenna&gt;</b>									
2462	11	802.11 b	Front	/	18.56	19	0.103	0.11	0.04
2462	11	802.11 b	Rear	/	18.56	19	<b>0.154</b>	0.17	0.01
2462	11	802.11 b	Left	/	18.56	19	0.065	0.07	-0.06
2462	11	802.11 b	Top	/	18.56	19	0.105	0.12	0.05
<b>&lt;MIMO&gt;</b>									
2412	1	802.11 n	Front	/	17.21	18	0.035	0.04	0.09
2412	1	802.11 n	Rear	/	17.21	18	<b>0.092</b>	0.11	0.01
2412	1	802.11 n	Left	/	17.21	18	0.012	0.01	-0.05
2412	1	802.11 n	Right	/	17.21	18	0.029	0.03	-0.10
2412	1	802.11 n	Top	/	17.21	18	0.088	0.11	0.02

Note1: For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. A maximum transmission duty factor of 100% is achievable for WLAN in this project and the scaled reported SAR is presented as below.

**Table 14.35: SAR Values (WLAN - Body) – 802.11b 1Mbps (Scaled Reported SAR)**

Ambient Temperature: 22.6°C					Liquid Temperature: 22.0°C	
Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
2437	6	Rear	100%	100%	0.19	<b>0.19</b>

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



### 14.3 WLAN Evaluation for 5G

**Table 14.36: SAR Values (WLAN 5G - Head)**

<Main antenna>

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.5°C		Liquid Temperature: 22.0°C		
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
<b>U-NII-2A</b>									
5260	52	802.11 a	Left Touch	/	14.75	16	<b>0.200</b>	0.27	0.03
5260	52	802.11 a	Left Tilt	/	14.75	16	0.140	0.19	0.09
5260	52	802.11 a	Right Touch	/	14.75	16	0.162	0.22	0.04
5260	52	802.11 a	Right Tilt	/	14.75	16	0.158	0.21	0.06
<b>U-NII-2C</b>									
5700	140	802.11 a	Left Touch	/	14.53	16	0.124	0.17	0.03
5700	140	802.11 a	Left Tilt	/	14.53	16	<b>0.194</b>	0.27	0.07
5700	140	802.11 a	Right Touch	/	14.53	16	0.110	0.15	0.09
5700	140	802.11 a	Right Tilt	/	14.53	16	0.115	0.16	0.05
<b>U-NII-3</b>									
5825	165	802.11 a	Left Touch	/	14.34	16	<b>0.236</b>	0.35	0.00
5825	165	802.11 a	Left Tilt	/	14.34	16	0.215	0.32	0.09
5825	165	802.11 a	Right Touch	/	14.34	16	0.113	0.17	0.07
5825	165	802.11 a	Right Tilt	/	14.34	16	0.188	0.28	0.03

Note1: U-NII-1 and U-NII-2A bands have the same specified maximum output and tolerance; SAR is measured for U-NII-2A band first. Adjusted SAR of U-NII-2A band is  $\leq 1.2$ W/kg, SAR is not required for U-NII-1 band.

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

<Second antenna>

Frequency		Test Mode	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.								
Ambient Temperature: 22.5°C      Liquid Temperature: 22.0°C									
<b>U-NII-2A</b>									
5260	52	802.11 a	Left Touch	/	15.15	16.5	0.109	0.15	0.08
5260	52	802.11 a	Left Tilt	/	15.15	16.5	0.140	0.19	0.04
5260	52	802.11 a	Right Touch	/	15.15	16.5	<b>0.202</b>	0.28	0.09
5260	52	802.11 a	Right Tilt	/	15.15	16.5	0.101	0.14	0.01
<b>U-NII-2C</b>									
5500	100	802.11 a	Left Touch	/	14.75	16	0.340	0.45	0.02
5500	100	802.11 a	Left Tilt	/	14.75	16	0.385	0.51	0.06
5500	100	802.11 a	Right Touch	/	14.75	16	0.355	0.47	0.03
5500	100	802.11 a	Right Tilt	/	14.75	16	<b>0.456</b>	0.61	0.06
<b>U-NII-3</b>									
5785	157	802.11 a	Left Touch	/	14.45	16	0.343	0.49	0.07
5785	157	802.11 a	Left Tilt	/	14.45	16	0.508	0.73	0.09
5785	157	802.11 a	Right Touch	/	14.45	16	0.619	0.88	0.09
5785	157	802.11 a	Right Tilt	/	14.45	16	<b>0.690</b>	0.99	0.02
5745	149	802.11 a	Right Touch	/	14.23	16	0.552	0.83	0.02
5745	149	802.11 a	Right Tilt	/	14.23	16	0.641	0.96	0.09

Note1: U-NII-1 and U-NII-2A bands have the same specified maximum output and tolerance; SAR is measured for U-NII-2A band first. Adjusted SAR of U-NII-2A band is  $\leq 1.2$ W/kg, SAR is not required for U-NII-1 band.

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

<MIMO>

Frequency		Test Mode	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.								
Ambient Temperature: 22.5°C      Liquid Temperature: 22.0°C									
<b>U-NII-2A</b>									
5260	52	802.11 n	Left Touch	/	18.19	19.5	0.218	0.29	0.01
5260	52	802.11 n	Left Tilt	/	18.19	19.5	<b>0.281</b>	0.38	0.01
5260	52	802.11 n	Right Touch	/	18.19	19.5	0.266	0.36	0.04
5260	52	802.11 n	Right Tilt	/	18.19	19.5	0.178	0.24	0.09
<b>U-NII-2C</b>									
5500	100	802.11 n	Left Touch	/	18.05	19	0.372	0.46	0.08
5500	100	802.11 n	Left Tilt	/	18.05	19	0.474	0.59	0.05
5500	100	802.11 n	Right Touch	/	18.05	19	<b>0.534</b>	0.66	0.01
5500	100	802.11 n	Right Tilt	/	18.05	19	0.244	0.30	0.05
<b>U-NII-3</b>									
5785	157	802.11 n	Left Touch	/	17.78	18.3	0.506	0.57	0.08
5785	157	802.11 n	Left Tilt	/	17.78	18.3	0.553	0.62	0.04
5785	157	802.11 n	Right Touch	/	17.78	18.3	0.672	0.76	0.02
5785	157	802.11 n	Right Tilt	/	17.78	18.3	0.694	0.78	0.06
5825	165	802.11 n	Right Tilt	<b>Fig.33</b>	17.46	18.3	<b>0.886</b>	<b>1.08</b>	0.04

Note1: U-NII-1 and U-NII-2A bands have the same specified maximum output and tolerance; SAR is measured for U-NII-2A band first. Adjusted SAR of U-NII-2A band is  $\leq 1.2$ W/kg, SAR is not required for U-NII-1 band.

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

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. A maximum transmission duty factor of 100% is achievable for WLAN in this project and the scaled reported SAR is presented as below.

**Table 14.37: SAR Values (WLAN 5G - Head) – (Scaled Reported SAR)**

Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
5825	165	Right Tilt	100%	100%	1.08	<b>1.08</b>

**Table 14.38: SAR Values (WLAN 5G - Body)**

**<Main antenna>**

Frequency		Test Mode	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.								
Ambient Temperature: 22.5°C					Liquid Temperature: 22.0°C				
<b>U-NII-2A</b>									
5260	52	802.11 a	Front	/	14.75	16	0.066	0.09	0.09
5260	52	802.11 a	Rear	/	14.75	16	<b>0.143</b>	0.19	0.09
5260	52	802.11 a	Right	/	14.75	16	0.053	0.07	0.06
5260	52	802.11 a	Top	/	14.75	16	0.011	0.01	0.06
<b>U-NII-2C</b>									
5700	140	802.11 a	Front	/	14.53	16	0.027	0.04	-0.11
5700	140	802.11 a	Rear	/	14.53	16	<b>0.168</b>	0.24	-0.13
5700	140	802.11 a	Right	/	14.53	16	0.046	0.07	0.01
5700	140	802.11 a	Top	/	14.53	16	0.040	0.06	0.05
<b>U-NII-3</b>									
5825	165	802.11 a	Front	/	14.34	16	0.052	0.08	-0.12
5825	165	802.11 a	Rear	/	14.34	16	<b>0.213</b>	<b>0.31</b>	0.07
5825	165	802.11 a	Right	/	14.34	16	0.080	0.12	0.04
5825	165	802.11 a	Top	/	14.34	16	0.130	0.19	0.07

Note1: U-NII-1 and U-NII-2A bands have the same specified maximum output and tolerance; SAR is measured for U-NII-2A band first. Adjusted SAR of U-NII-2A band is  $\leq 1.2$ W/kg, SAR is not required for U-NII-1 band.

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

<Second antenna>

Ambient Temperature: 22.5°C					Liquid Temperature: 22.0°C				
Frequency		Test Mode	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.								
<b>U-NII-2A</b>									
5260	52	802.11 a	Front	/	15.15	16.5	0.058	0.08	0.09
5260	52	802.11 a	Rear	/	15.15	16.5	0.024	0.03	0.05
5260	52	802.11 a	Left	/	15.15	16.5	<b>0.119</b>	0.16	0.09
5260	52	802.11 a	Top	/	15.15	16.5	0.026	0.04	-0.08
<b>U-NII-2C</b>									
5500	100	802.11 a	Front	/	14.75	16	0.105	0.14	0.04
5500	100	802.11 a	Rear	/	14.75	16	0.081	0.11	0.08
5500	100	802.11 a	Left	/	14.75	16	0.152	0.20	-0.04
5500	100	802.11 a	Top	/	14.75	16	<b>0.181</b>	0.24	-0.04
<b>U-NII-3</b>									
5785	157	802.11 a	Front	/	14.45	16	0.010	0.01	0.02
5785	157	802.11 a	Rear	/	14.45	16	0.014	0.02	0.06
5785	157	802.11 a	Left	/	14.45	16	0.144	0.21	0.07
5785	157	802.11 a	Top	<b>Fig.34</b>	14.45	16	<b>0.219</b>	<b>0.31</b>	0.07

Note1: U-NII-1 and U-NII-2A bands have the same specified maximum output and tolerance; SAR is measured for U-NII-2A band first. Adjusted SAR of U-NII-2A band is  $\leq 1.2$ W/kg, SAR is not required for U-NII-1 band.

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

<MIMO>

Frequency		Test Mode	Test Position	Figure No.	Ambient Temperature: 22.5°C		Liquid Temperature: 22.0°C		
MHz	Ch.				Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
<b>U-NII-2A</b>									
5260	52	802.11 n	Front	/	18.19	19.5	0.026	0.04	0.09
5260	52	802.11 n	Rear	/	18.19	19.5	0.088	0.12	0.09
5260	52	802.11 n	Left	/	18.19	19.5	0.124	0.17	0.01
5260	52	802.11 n	Right	/	18.19	19.5	0.011	0.02	0.09
5260	52	802.11 n	Top	/	18.19	19.5	<b>0.130</b>	0.18	0.05
<b>U-NII-2C</b>									
5500	100	802.11 n	Front	/	18.05	19	0.042	0.05	0.09
5500	100	802.11 n	Rear	/	18.05	19	0.090	0.11	0.04
5500	100	802.11 n	Left	/	18.05	19	0.011	0.01	-0.06
5500	100	802.11 n	Right	/	18.05	19	0.040	0.05	0.01
5500	100	802.11 n	Top	/	18.05	19	<b>0.133</b>	0.17	0.08
<b>U-NII-3</b>									
5785	157	802.11 n	Front	/	17.78	18.3	0.053	0.06	-0.04
5785	157	802.11 n	Rear	/	17.78	18.3	<b>0.214</b>	0.24	0.04
5785	157	802.11 n	Left	/	17.78	18.3	0.011	0.01	0.07
5785	157	802.11 n	Right	/	17.78	18.3	0.040	0.04	0.01
5785	157	802.11 n	Top	/	17.78	18.3	0.132	0.15	-0.13

Note1: U-NII-1 and U-NII-2A bands have the same specified maximum output and tolerance; SAR is measured for U-NII-2A band first. Adjusted SAR of U-NII-2A band is  $\leq 1.2$ W/kg, SAR is not required for U-NII-1 band.

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

According to the KDB248227 D01, The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit. A maximum transmission duty factor of 100% is achievable for WLAN in this project and the scaled reported SAR is presented as below.

**Table 14.39: SAR Values (WLAN 5G - Body) – (Scaled Reported SAR)**

Frequency		Test Position	Actual duty factor	maximum duty factor	Reported SAR (1g)(W/kg)	Scaled reported SAR (1g)(W/kg)
MHz	Ch.					
Ambient Temperature: 22.5°C      Liquid Temperature: 22.0°C						
5825	165	Rear	100%	100%	0.31	<b>0.31</b>
5785	157	Top	100%	100%	0.31	<b>0.31</b>

## 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 Head – 5G WIFI (MIMO)**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
MHz	Ch.		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
5825	165	Right Tilt	0.886	0.875	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	12	N	2	1	1	6.0	6.0	∞
2	Isotropy	B	7.4	R	$\sqrt{3}$	1	1	4.3	4.3	∞
3	Boundary effect	B	1.1	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	1.0	N	1	1	1	1.0	1.0	∞
7	Response time	B	0.0	R	$\sqrt{3}$	1	1	0.0	0.0	∞
8	Integration time	B	1.7	R	$\sqrt{3}$	1	1	1.0	1.0	∞
9	RF ambient conditions-noise	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
10	RF ambient conditions-reflection	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
11	Probe positioned mech. restrictions	B	0.35	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	∞
<b>Test sample related</b>										
14	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	5
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	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	1.3	N	1	0.64	0.43	0.83	0.56	9
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	0.96	0.78	9
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						10.4	10.3	95.5
Expanded uncertainty (Confidence interval of 95 %)		$u_e = 2u_c$						20.8	20.6	

### 16.2 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	12	N	2	1	1	6.0	6.0	∞
2	Isotropy	B	7.4	R	$\sqrt{3}$	1	1	4.3	4.3	∞
3	Boundary effect	B	1.1	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	1.0	N	1	1	1	1.0	1.0	∞
7	Response time	B	0.0	R	$\sqrt{3}$	1	1	0.0	0.0	∞
8	Integration time	B	1.7	R	$\sqrt{3}$	1	1	1.0	1.0	∞
9	RF ambient conditions-noise	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
10	RF ambient conditions-reflection	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
11	Probe positioned mech. Restrictions	B	0.35	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	∞
<b>Test sample related</b>										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	5
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	∞
<b>Phantom and set-up</b>										
18	Phantom uncertainty	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity (meas.)	A	1.3	N	1	0.64	0.43	0.83	0.56	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	0.96	0.78	521
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						11.1	11.0	257
Expanded uncertainty (Confidence interval of 95 %)		$u_e = 2u_c$						22.2	22.0	

### 16.3 Measurement Uncertainty for Normal SAR Tests (3GHz~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	13	N	2	1	1	6.5	6.5	∞
2	Isotropy	B	7.4	R	$\sqrt{3}$	1	1	4.3	4.3	∞
3	Boundary effect	B	2.3	R	$\sqrt{3}$	1	1	1.3	1.3	∞
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	1.0	N	1	1	1	1.0	1.0	∞
7	Response time	B	0.0	R	$\sqrt{3}$	1	1	0.0	0.0	∞
8	Integration time	B	1.7	R	$\sqrt{3}$	1	1	1.0	1.0	∞
9	RF ambient conditions-noise	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
10	RF ambient conditions-reflection	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
11	Probe positioned mech. restrictions	B	0.71	R	$\sqrt{3}$	1	1	0.4	0.4	∞
12	Probe positioning with respect to phantom shell	B	5.7	R	$\sqrt{3}$	1	1	3.3	3.3	∞
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	5
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	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
18	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
19	Liquid conductivity (meas.)	A	1.3	N	1	0.64	0.43	0.83	0.56	9
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	0.96	0.78	9
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{21} c_i^2 u_i^2}$						11.3	11.2	95.5
Expanded uncertainty (Confidence interval of 95 %)		$u_e = 2u_c$						22.6	22.4	

### 16.4 Measurement Uncertainty for Fast SAR Tests (3GHz~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	13	N	2	1	1	6.5	6.5	∞
2	Isotropy	B	7.4	R	$\sqrt{3}$	1	1	4.3	4.3	∞
3	Boundary effect	B	2.3	R	$\sqrt{3}$	1	1	1.3	1.3	∞
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	1.0	N	1	1	1	1.0	1.0	∞
7	Response time	B	0.0	R	$\sqrt{3}$	1	1	0.0	0.0	∞
8	Integration time	B	1.7	R	$\sqrt{3}$	1	1	1.0	1.0	∞
9	RF ambient conditions-noise	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
10	RF ambient conditions-reflection	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
11	Probe positioned mech. Restrictions	B	0.71	R	$\sqrt{3}$	1	1	0.4	0.4	∞
12	Probe positioning with respect to phantom shell	B	5.7	R	$\sqrt{3}$	1	1	3.3	3.3	∞
13	Post-processing	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
14	Fast SAR z-Approximation	B	14.0	R	$\sqrt{3}$	1	1	8.1	8.1	∞
<b>Test sample related</b>										
15	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	5
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	∞
<b>Phantom and set-up</b>										
18	Phantom uncertainty	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
19	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
20	Liquid conductivity	A	1.3	N	1	0.64	0.43	0.83	0.56	43

	(meas.)									
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	0.96	0.78	521
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						13.9	13.9	257
Expanded uncertainty (Confidence interval of 95 %)		$u_e = 2u_c$						27.8	27.7	

## 17 Main Test Instruments

**Table 17.1: List of Main Instruments**

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	Agilent E5071C	MY46103759	2017-11-17	One year
02	Dielectric probe	85070E	MY44300317	/	/
03	Power meter	NRP	102603	2018-01-04	One year
04	Power sensor	NRP-Z51	102211		
05	Power meter	NRP	101460	2018-02-05	One year
06	Power sensor	NRP-Z91	100553		
07	Signal Generator	E8257D	MY47461211	2018-06-05	One year
08	Amplifier	VTL5400	0404	/	/
09	E-field Probe	SPEAG EX3DV4	3633	2018-02-01	One year
10	DAE	SPEAG DAE4	786	2017-11-22	One year
11	Dipole Validation Kit	SPEAG D750V3	1163	2016-09-19	Three year
12	Dipole Validation Kit	SPEAG D835V2	4d057	2015-10-22	Three year
13	Dipole Validation Kit	SPEAG D1800V2	2d147	2015-11-03	Three year
14	Dipole Validation Kit	SPEAG D1900V2	5d088	2015-11-04	Three year
15	Dipole Validation Kit	SPEAG D2450V2	873	2015-10-30	Three year
16	Dipole Validation Kit	SPEAG D2550V2	1010	2015-07-24	Three year
17	Dipole Validation Kit	SPEAG D5GHzV2	1238	2016-09-21	Three year
18	BTS	E5515C	GB46110722	2018-02-19	One year
19	Radio Communication Analyzer	Anristu MT8820C	6201341853	2018-03-08	One year

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

## ANNEX A Graph Results

### GSM850 Head

Date: 2018-6-8

Electronics: DAE4 Sn786

Medium: Head 835 MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.888$  S/m;  $\epsilon_r = 41.938$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C      Liquid Temperature: 21.5°C

Communication System: UID 0, GSM (0) Frequency: 836.6 MHz Duty Cycle: 1:8.3

Probe: EX3DV4 – SN3633 ConvF (9.33, 9.33, 9.33);

**Left Cheek Middle/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.177 W/kg

**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.140 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.218 W/kg

**SAR(1 g) = 0.163 W/kg; SAR(10 g) = 0.119 W/kg**

Maximum value of SAR (measured) = 0.172 W/kg

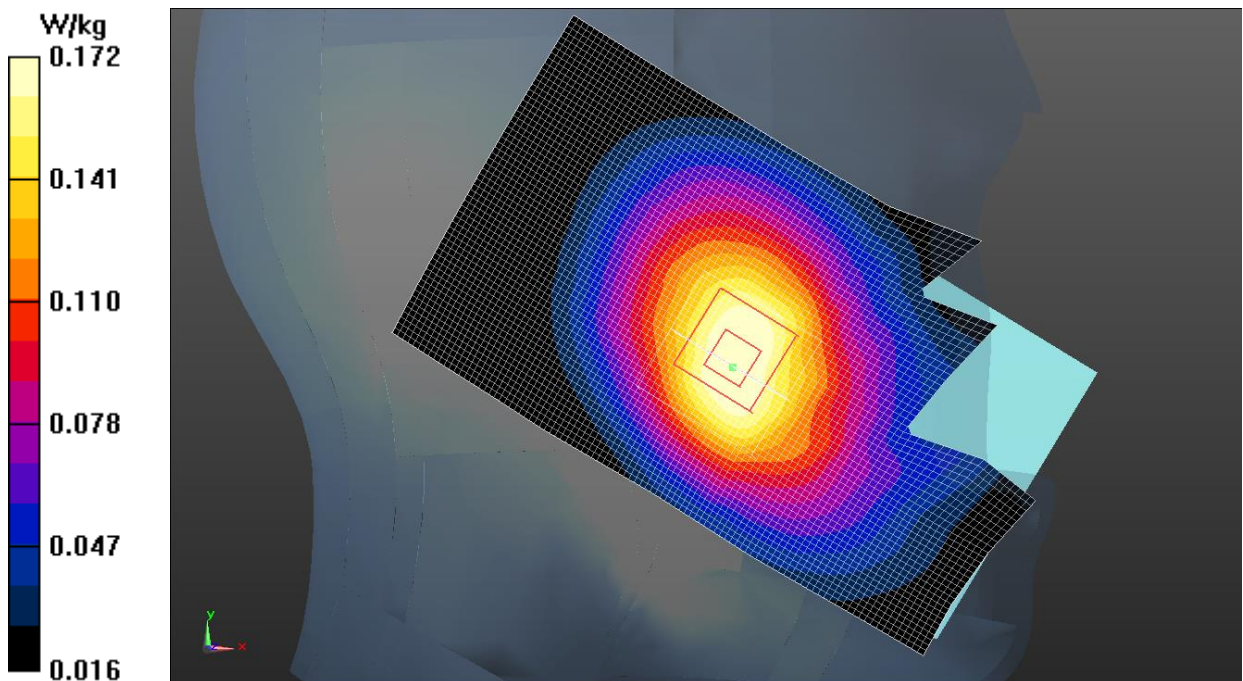


Fig.1 GSM 850MHz

**GSM850 Body**

Date: 2018-6-8

Electronics: DAE4 Sn786

Medium: Body 835 MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.994$  S/m;  $\epsilon_r = 53.825$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C      Liquid Temperature: 21.5°C

Communication System: UID 0, GPRS 2Txslot (0) Frequency: 836.6 MHz Duty Cycle: 1:4

Probe: EX3DV4 – SN3633 ConvF (9.69, 9.69, 9.69);

**Bottom side Middle /Area Scan (51x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.262 W/kg

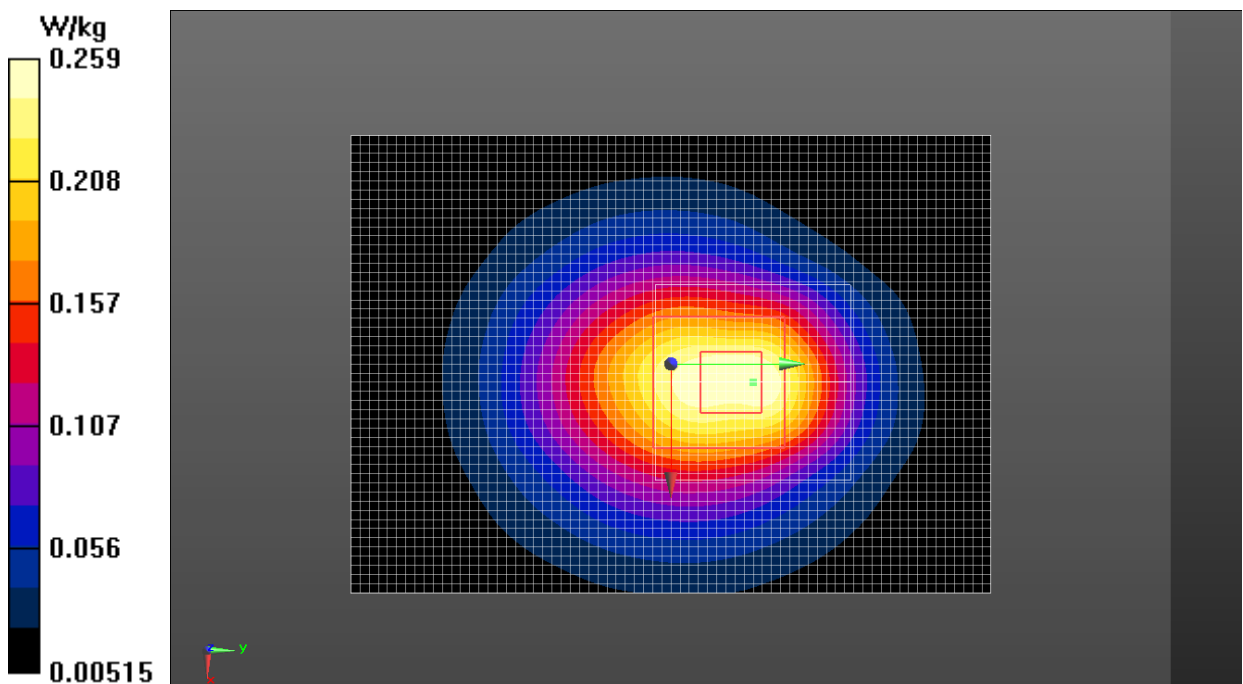
**Bottom side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.33 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.419 W/kg

**SAR(1 g) = 0.235 W/kg; SAR(10 g) = 0.140 W/kg**

Maximum value of SAR (measured) = 0.259 W/kg



**Fig.2 GSM 850 MHz**



**GSM1900 Head**

Date: 2018-5-25

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.393$  S/m;  $\epsilon_r = 39.644$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C      Liquid Temperature: 21.5°C

Communication System: UID 0, GSM (0) Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: EX3DV4 – SN3633 ConvF (7.81, 7.81, 7.81);

**Right Cheek Middle/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.102 W/kg

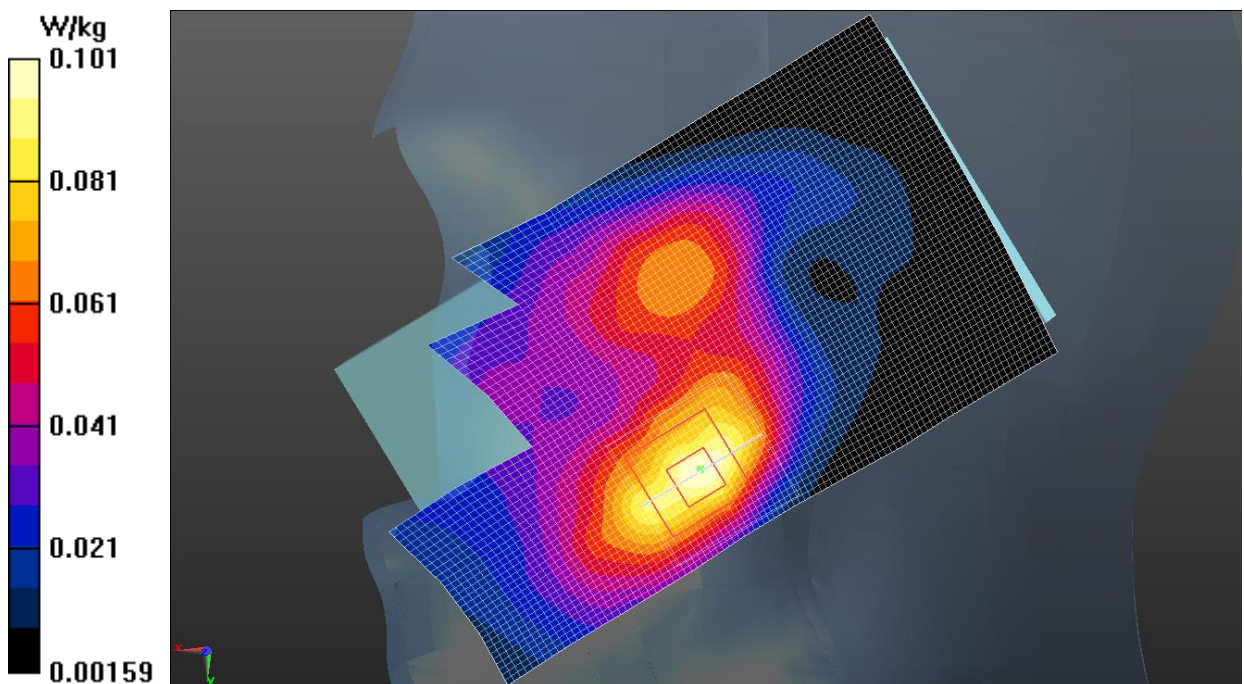
**Right Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.606 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.143 W/kg

**SAR(1 g) = 0.092 W/kg; SAR(10 g) = 0.057 W/kg**

Maximum value of SAR (measured) = 0.101 W/kg



**Fig.3 GSM 1900 MHz**

**GSM1900 Body**

Date: 2018-5-25

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.544$  S/m;  $\epsilon_r = 52.833$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C      Liquid Temperature: 21.5°C

Communication System: UID 0, GPRS 2Txslot (0) Frequency: 1850.2 MHz Duty Cycle: 1:4

Probe: EX3DV4 – SN3633 ConvF (7.75, 7.75, 7.75);

**Front side Middle/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.497 W/kg

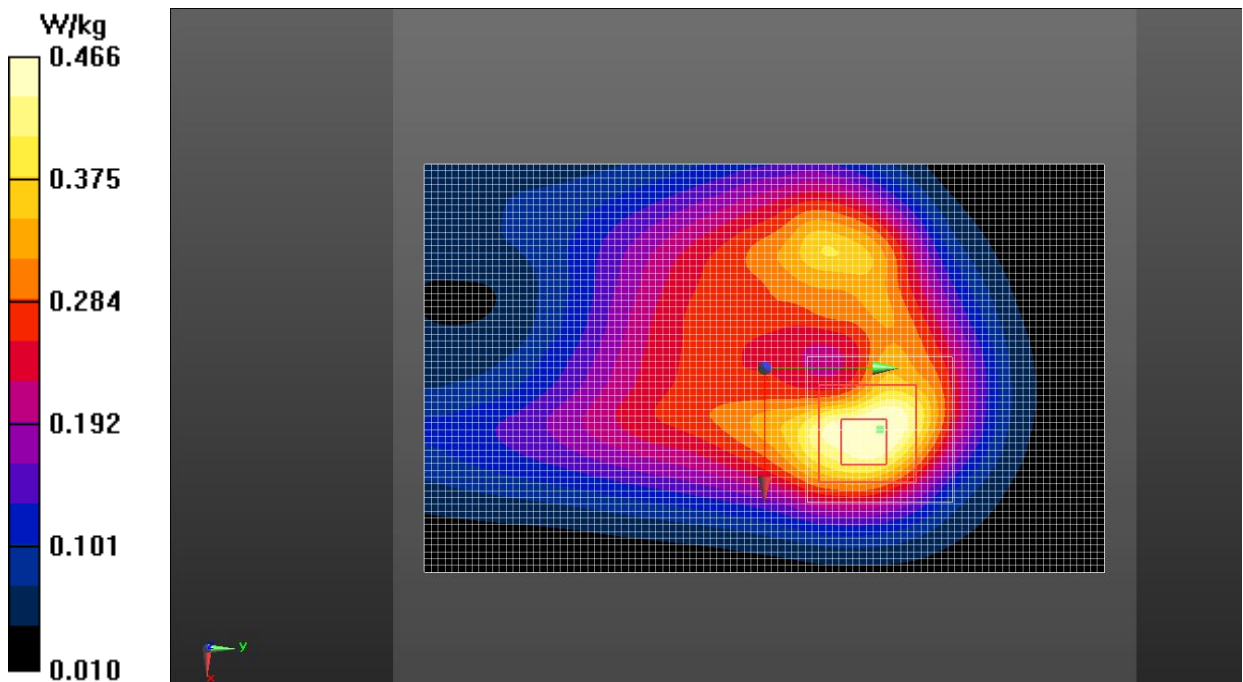
**Front side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.83 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.791 W/kg

**SAR(1 g) = 0.304 W/kg; SAR(10 g) = 0.169 W/kg**

Maximum value of SAR (measured) = 0.466 W/kg



**Fig.4 GSM 1900 MHz**

**WCDMA 850 Head**

Date: 2018-6-8

Electronics: DAE4 Sn786

Medium: Head 835 MHz

Medium parameters used (interpolated):  $f = 836.4$  MHz;  $\sigma = 0.888$  S/m;  $\epsilon_r = 41.94$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C      Liquid Temperature: 21.5°C

Communication System: UID 0, WCDMA (0) Frequency: 836.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (9.33, 9.33, 9.33);

**Left Cheek Middle/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.122 W/kg

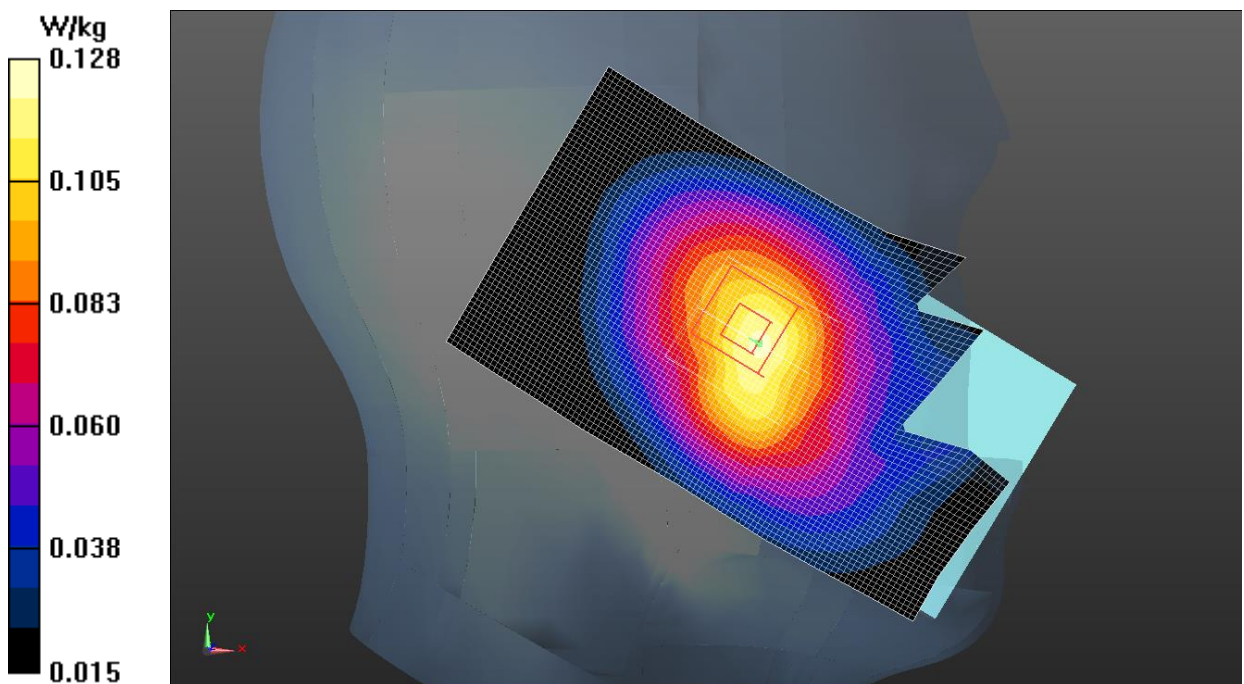
**Left/Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.200 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.154 W/kg

**SAR(1 g) = 0.118 W/kg; SAR(10 g) = 0.086 W/kg**

Maximum value of SAR (measured) = 0.128 W/kg



**Fig.5 WCDMA 850**

**WCDMA 850 Body**

Date: 2018-6-8

Electronics: DAE4 Sn786

Medium: Body 835 MHz

Medium parameters used (interpolated):  $f = 836.4$  MHz;  $\sigma = 0.994$  S/m;  $\epsilon_r = 53.827$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C      Liquid Temperature: 21.5°C

Communication System: UID 0, WCDMA (0) Frequency: 836.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (9.69, 9.69, 9.69);

**Bottom side Middle/Area Scan (51x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

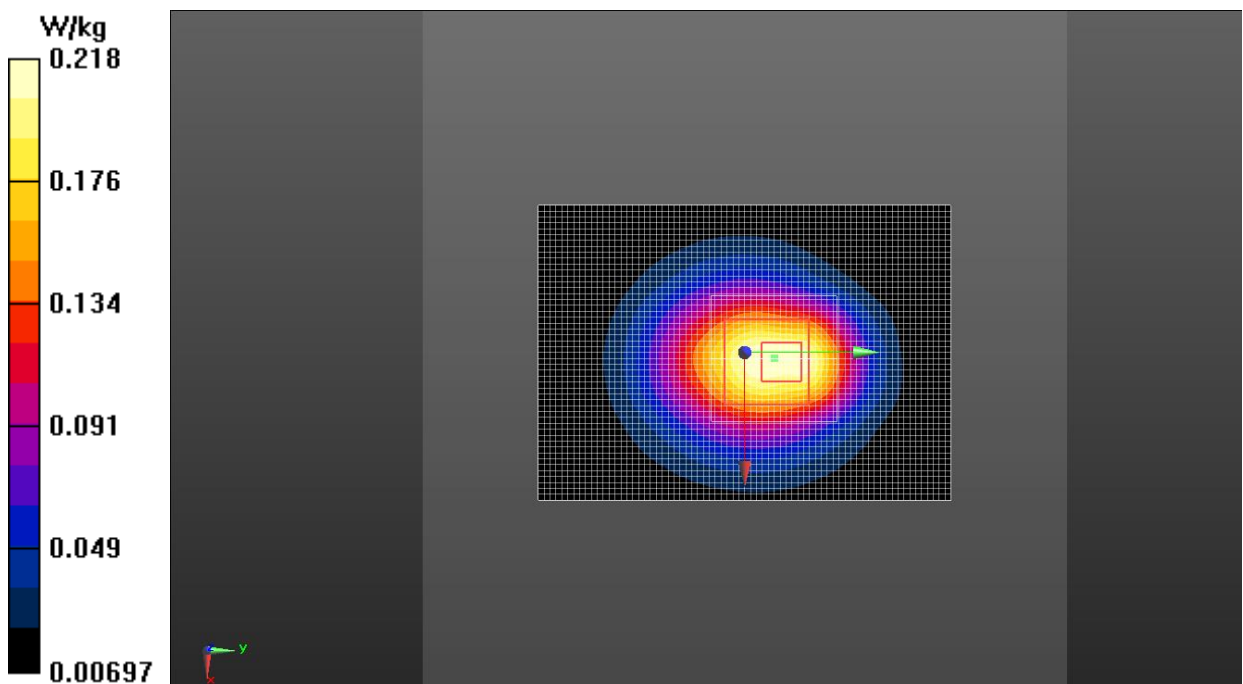
**Bottom side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.31 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.348 W/kg

**SAR(1 g) = 0.201 W/kg; SAR(10 g) = 0.120 W/kg**

Maximum value of SAR (measured) = 0.218 W/kg



**Fig.6 WCDMA 850**

**WCDMA 1900 Head**

Date: 2018-5-25

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.393$  S/m;  $\epsilon_r = 39.644$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C      Liquid Temperature: 21.5°C

Communication System: UID 0, WCDMA (0) Frequency: 1880 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.81, 7.81, 7.81);

**Left Cheek Middle/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.241 W/kg

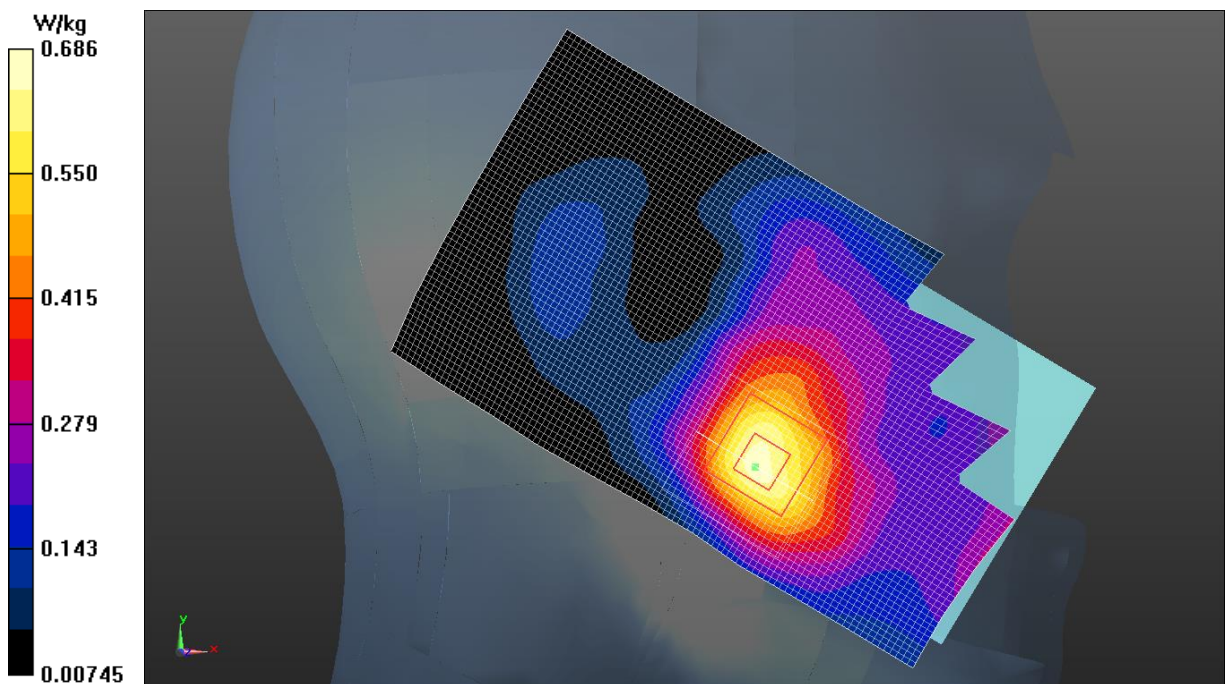
**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.649 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.838 W/kg

**SAR(1 g) = 0.521 W/kg; SAR(10 g) = 0.303 W/kg**

Maximum value of SAR (measured) = 0.686 W/kg



**Fig.7 WCDMA 1900**



**WCDMA 1900 Body**

Date: 2018-5-25

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.544$  S/m;  $\epsilon_r = 52.833$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C      Liquid Temperature: 21.5°C

Communication System: UID 0, WCDMA (0) Frequency: 1880 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.75, 7.75, 7.75);

**Front side Middle/Area Scan (61x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.690 W/kg

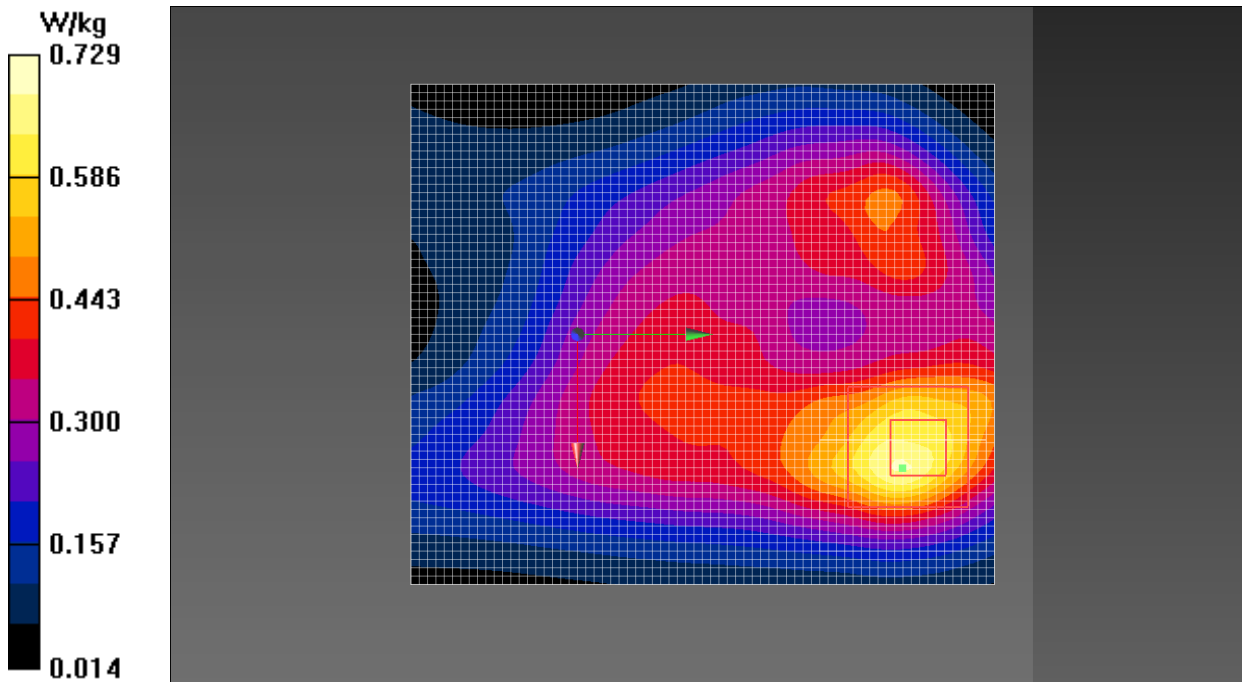
**Front side Middle/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.40 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 1.15 W/kg

**SAR(1 g) = 0.449 W/kg; SAR(10 g) = 0.260 W/kg**

Maximum value of SAR (measured) = 0.729 W/kg



**Fig.8 WCDMA 1900**

**WCDMA 1700 Head**

Date: 2018-6-5

Electronics: DAE4 Sn786

Medium: Head 1800 MHz

Medium parameters used (interpolated):  $f = 1732.6$  MHz;  $\sigma = 1.360$  S/m;  $\epsilon_r = 39.052$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C      Liquid Temperature: 21.5°C

Communication System: UID 0, WCDMA (0) Frequency: 1732.6 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (8.12, 8.12, 8.12);

**Left Cheek Middle/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.393 W/kg

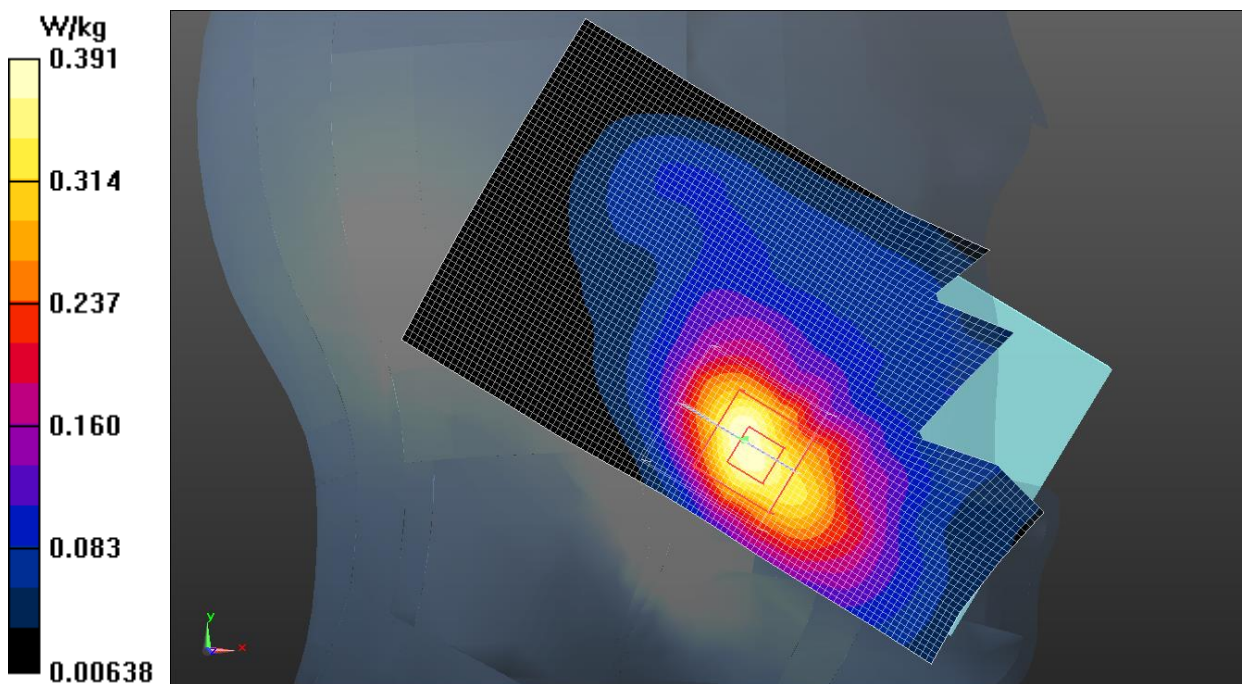
**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.173 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.573 W/kg

**SAR(1 g) = 0.363 W/kg; SAR(10 g) = 0.221 W/kg**

Maximum value of SAR (measured) = 0.391 W/kg



**Fig.9 WCDMA 1700**

**WCDMA 1700 Body**

Date: 2018-6-5

Electronics: DAE4 Sn786

Medium: Body 1800 MHz

Medium parameters used (interpolated):  $f = 1732.6$  MHz;  $\sigma = 1.436$  S/m;  $\epsilon_r = 54.276$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature: 22.0°C      Liquid Temperature: 21.5°C

Communication System: UID 0, WCDMA (0) Frequency: 1732.6 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (8.05, 8.05, 8.05);

**Front side Middle/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.442 W/kg

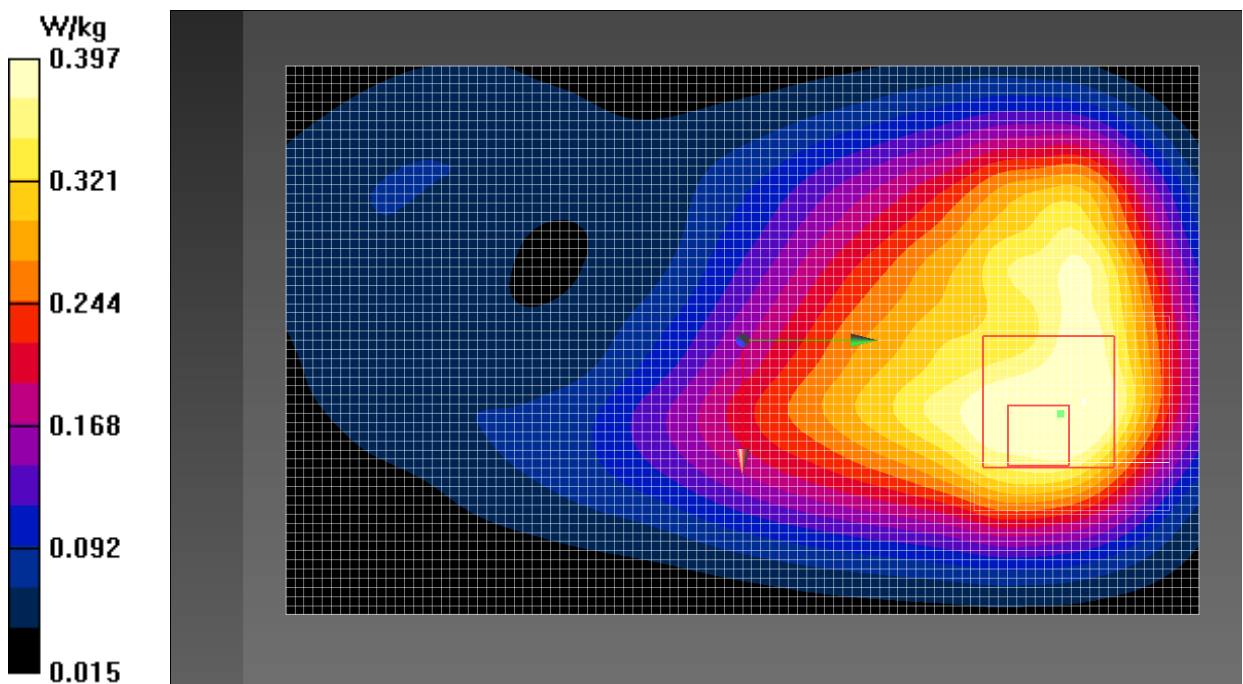
**Front side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.96 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.639 W/kg

**SAR(1 g) = 0.379 W/kg; SAR(10 g) = 0.238 W/kg**

Maximum value of SAR (measured) = 0.397 W/kg



**Fig.10 WCDMA 1700**