

**Table 13.22: SAR Values (LTE Band 41 PC2 - 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)
Ch.	MHz								
<b>Hotspot Test Data (10mm) - Power Level B1</b>									
41490	2680.0	1RB50	Front	/	22.51	23.5	0.324	<b>0.41</b>	-0.02
41490	2680.0	50RB25	Front	/	22.45	23.5	0.319	<b>0.41</b>	0.08
41490	2680.0	1RB50	Rear	/	22.51	23.5	0.744	<b>0.93</b>	0.09
41490	2680.0	50RB25	Rear	/	22.45	23.5	0.701	<b>0.89</b>	0.17
41490	2680.0	1RB50	Left	/	22.51	23.5	0.045	<b>0.06</b>	0.03
41490	2680.0	50RB25	Left	/	22.45	23.5	0.042	<b>0.05</b>	0.14
41490	2680.0	1RB50	Right	/	22.51	23.5	0.066	<b>0.08</b>	0.11
41490	2680.0	50RB25	Right	/	22.45	23.5	0.057	<b>0.07</b>	0.05
41490	2680.0	1RB50	Bottom	/	22.51	23.5	0.858	<b>1.08</b>	0.01
41490	2680.0	50RB25	Bottom	/	22.45	23.5	0.758	<b>0.97</b>	0.16
41055	2636.5	1RB50	Rear	/	22.44	23.5	0.632	<b>0.81</b>	-0.18
40620	2593.0	1RB50	Rear	/	22.39	23.5	0.647	<b>0.84</b>	-0.08
40185	2549.5	1RB50	Rear	/	22.33	23.5	0.712	<b>0.93</b>	0.00
39750	2506.0	1RB50	Rear	/	22.37	23.5	0.565	<b>0.73</b>	-0.18
41055	2636.5	50RB25	Rear	/	22.40	23.5	0.753	<b>0.97</b>	-0.05
40620	2593.0	50RB25	Rear	/	22.36	23.5	0.793	<b>1.03</b>	0.07
40185	2549.5	50RB25	Rear	/	22.34	23.5	0.904	<b>1.18</b>	0.17
39750	2506.0	50RB25	Rear	/	22.34	23.5	0.712	<b>0.93</b>	0.18
41055	2636.5	1RB50	Bottom	/	22.44	23.5	0.729	<b>0.93</b>	-0.02
40620	2593.0	1RB50	Bottom	/	22.39	23.5	0.746	<b>0.96</b>	-0.19
40185	2549.5	1RB50	Bottom	/	22.33	23.5	0.844	<b>1.10</b>	0.12
39750	2506.0	1RB50	Bottom	/	22.37	23.5	0.652	<b>0.85</b>	-0.14
41055	2636.5	50RB25	Bottom	/	22.40	23.5	0.868	<b>1.12</b>	0.10
40620	2593.0	50RB25	Bottom	/	22.36	23.5	0.914	<b>1.19</b>	0.17
40185	2549.5	50RB25	Bottom	<b>22</b>	22.34	23.5	<b>0.953</b>	<b>1.24</b>	-0.19
39750	2506.0	50RB25	Bottom	/	22.34	23.5	0.821	<b>1.07</b>	0.17
40620	2593.0	100RB0	Bottom	/	22.40	23.5	0.916	<b>1.18</b>	0.03
40185	2549.5	1RB50	Bottom	B2	22.33	23.5	0.833	<b>1.09</b>	0.12
<b>Body-Worn Test Data (15mm) - Power Level C1</b>									
41490	2680.0	1RB50	Front	/	23.45	24.0	0.206	<b>0.23</b>	0.02
41490	2680.0	50RB25	Front	/	23.49	24.0	0.231	<b>0.26</b>	-0.14
41490	2680.0	1RB50	Rear	/	23.45	24.0	0.415	<b>0.47</b>	-0.15
41490	2680.0	50RB25	Rear	/	23.49	24.0	0.429	<b>0.48</b>	0.02
41490	2680.0	50RB25	Rear	B2	23.49	24.0	0.421	<b>0.47</b>	0.06

**Table 13.23: SAR Values (LTE Band 66 - Head)**

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)
Ch.	MHz								
<b>Power Level A1</b>									
132572	1770.0	1RB50	Left Cheek	/	22.97	24.0	0.171	<b>0.22</b>	-0.18
132572	1770.0	50RB25	Left Cheek	/	21.96	23.0	0.142	<b>0.18</b>	0.04
132572	1770.0	1RB50	Left Tilt	/	22.97	24.0	0.147	<b>0.19</b>	0.02
132572	1770.0	50RB25	Left Tilt	/	21.96	23.0	0.116	<b>0.15</b>	-0.18
132572	1770.0	1RB50	Right Cheek	<b>23</b>	22.97	24.0	<b>0.261</b>	<b>0.33</b>	-0.07
132572	1770.0	50RB25	Right Cheek	/	21.96	23.0	0.181	<b>0.23</b>	0.03
132572	1770.0	1RB50	Right Tilt	/	22.97	24.0	0.124	<b>0.16</b>	0.04
132572	1770.0	50RB25	Right Tilt	/	21.96	23.0	0.095	<b>0.12</b>	0.00
132572	1770.0	1RB50	Right Cheek	B2	22.97	24.0	0.256	<b>0.32</b>	0.12
<b>The worst case with CA_66B &amp; CA_66C</b>									
132022	1715.0	CA_66B	Right Cheek	/	22.88	24.0	0.236	<b>0.31</b>	0.05
132572	1770.0	CA_66C	Right Cheek	/	22.91	24.0	0.252	<b>0.32</b>	0.08

**Note:** SAR for LTE Band 4 is covered by LTE Band 66 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

**Table 13.24: 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)
Ch.	MHz								
<b>Hotspot Test Data (10mm) - Power Level B1</b>									
132572	1770.0	1RB50	Front	/	18.06	19.5	0.305	<b>0.42</b>	-0.13
132572	1770.0	50RB25	Front	/	18.10	19.5	0.301	<b>0.42</b>	-0.07
132572	1770.0	1RB50	Rear	/	18.06	19.5	0.535	<b>0.75</b>	-0.06
132572	1770.0	50RB25	Rear	/	18.10	19.5	0.528	<b>0.73</b>	-0.20
132572	1770.0	1RB50	Left	/	18.06	19.5	0.066	<b>0.09</b>	-0.03
132572	1770.0	50RB25	Left	/	18.10	19.5	0.065	<b>0.09</b>	-0.10
132572	1770.0	1RB50	Right	/	18.06	19.5	0.079	<b>0.11</b>	0.07
132572	1770.0	50RB25	Right	/	18.10	19.5	0.078	<b>0.11</b>	-0.11
132572	1770.0	1RB50	Bottom	/	18.06	19.5	0.667	<b>0.93</b>	-0.13
132572	1770.0	50RB25	Bottom	/	18.10	19.5	0.658	<b>0.91</b>	-0.03
132322	1745.0	1RB50	Bottom	/	18.03	19.5	0.726	<b>1.02</b>	0.16
132072	1720.0	1RB50	Bottom	<b>24</b>	17.98	19.5	<b>0.793</b>	<b>1.13</b>	-0.04
132322	1745.0	50RB25	Bottom	/	18.09	19.5	0.688	<b>0.95</b>	0.01
132072	1720.0	50RB25	Bottom	/	18.01	19.5	0.774	<b>1.09</b>	0.18
132572	1770.0	100RB	Bottom	/	18.03	19.5	0.632	<b>0.89</b>	0.02
132072	1720.0	1RB50	Bottom	B2	17.98	19.5	0.792	<b>1.12</b>	0.06
<b>Hotspot Test Data (10mm) - The worst case with CA_66B &amp; CA_66C</b>									
132022	1715.0	CA_66B	Bottom	/	17.94	19.5	0.761	<b>1.09</b>	0.08
132572	1770.0	CA_66C	Bottom	/	17.99	19.5	0.784	<b>1.11</b>	0.01
<b>Body-Worn Test Data (15mm) - Power Level C1</b>									
132572	1770.0	1RB50	Front	/	21.04	22.5	0.243	<b>0.34</b>	0.02
132572	1770.0	50RB25	Front	/	21.12	22.5	0.239	<b>0.33</b>	-0.12
132572	1770.0	1RB50	Rear	/	21.04	22.5	<b>0.471</b>	<b>0.66</b>	-0.08
132572	1770.0	50RB25	Rear	/	21.12	22.5	0.467	<b>0.64</b>	0.15
132572	1770.0	1RB50	Rear	B2	21.04	22.5	0.467	<b>0.65</b>	0.07
<b>Body-Worn Test Data (15mm) - The worst case with CA_66B &amp; CA_66C</b>									
132022	1715.0	CA_66B	Rear	/	20.95	22.5	0.447	<b>0.64</b>	-0.06
132572	1770.0	CA_66C	Rear	/	20.98	22.5	0.438	<b>0.62</b>	0.07

**Note:** SAR for LTE Band 4 is covered by LTE Band 66 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

**Table 13.25: SAR Values (LTE Band 71 - Head)**

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)
Ch.	MHz								
<b>Power Level A1</b>									
133372	688.0	1RB50	Left Cheek	<b>25</b>	24.35	24.5	<b>0.385</b>	<b>0.40</b>	0.18
133372	688.0	50RB50	Left Cheek	/	23.41	23.5	0.242	<b>0.25</b>	0.06
133372	688.0	1RB50	Left Tilt	/	24.35	24.5	0.191	<b>0.20</b>	0.07
133372	688.0	50RB50	Left Tilt	/	23.41	23.5	0.152	<b>0.16</b>	-0.03
133372	688.0	1RB50	Right Cheek	/	24.35	24.5	0.376	<b>0.39</b>	0.03
133372	688.0	50RB50	Right Cheek	/	23.41	23.5	0.233	<b>0.24</b>	-0.14
133372	688.0	1RB50	Right Tilt	/	24.35	24.5	0.171	<b>0.18</b>	0.06
133372	688.0	50RB50	Right Tilt	/	23.41	23.5	0.134	<b>0.14</b>	-0.19
133372	688.0	1RB50	Left Cheek	B2	24.35	24.5	0.269	<b>0.28</b>	0.14

**Table 13.26: SAR Values (LTE Band 71 - 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)
Ch.	MHz								
<b>Hotspot Test Data (10mm) - Power Level B1</b>									
133372	688.0	1RB50	Front	/	24.35	24.5	0.265	<b>0.27</b>	0.08
133372	688.0	50RB50	Front	/	23.41	23.5	0.199	<b>0.20</b>	-0.10
133372	688.0	1RB50	Rear	/	24.35	24.5	0.389	<b>0.40</b>	0.03
133372	688.0	50RB50	Rear	/	23.41	23.5	0.294	<b>0.30</b>	0.11
133372	688.0	1RB50	Left	/	24.35	24.5	0.483	<b>0.50</b>	0.02
133372	688.0	50RB50	Left	/	23.41	23.5	0.374	<b>0.38</b>	0.06
133372	688.0	1RB50	Right	<b>26</b>	24.35	24.5	<b>0.582</b>	<b>0.60</b>	0.17
133372	688.0	50RB50	Right	/	23.41	23.5	0.449	<b>0.46</b>	0.02
133372	688.0	1RB50	Bottom	/	24.35	24.5	0.106	<b>0.11</b>	0.06
133372	688.0	50RB50	Bottom	/	23.41	23.5	0.085	<b>0.09</b>	0.13
133372	688.0	1RB50	Right	B2	24.35	24.5	0.509	<b>0.53</b>	0.07
<b>Body-Worn Test Data (15mm) - Power Level C1</b>									
133372	688.0	1RB50	Front	/	24.35	24.5	0.198	<b>0.20</b>	0.11
133372	688.0	50RB50	Front	/	23.41	23.5	0.152	<b>0.16</b>	-0.03
133372	688.0	1RB50	Rear	/	24.35	24.5	0.263	<b>0.27</b>	0.14
133372	688.0	50RB50	Rear	/	23.41	23.5	0.201	<b>0.21</b>	0.16
133372	688.0	1RB50	Rear	B2	24.35	24.5	0.261	<b>0.27</b>	-0.15

**Table 13.27: SAR Values (Bluetooth - Head)**

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)
Ch.	MHz								
0	2402.0	GFSK	Left Cheek	<b>27</b>	10.35	11.0	<b>0.125</b>	<b>0.15</b>	0.01
0	2402.0	GFSK	Left Tilt	/	10.35	11.0	0.120	<b>0.14</b>	0.01
0	2402.0	GFSK	Right Cheek	/	10.35	11.0	0.051	<b>0.06</b>	0.11
0	2402.0	GFSK	Right Tilt	/	10.35	11.0	0.056	<b>0.07</b>	0.04
0	2402.0	GFSK	Left Cheek	B2	10.35	11.0	0.054	<b>0.06</b>	0.02

**Table 13.28: SAR Values (Bluetooth - 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)
Ch.	MHz								
<b>Test Data (10mm)</b>									
0	2402.0	GFSK	Front	/	10.35	11.0	0.014	<b>0.02</b>	0.03
0	2402.0	GFSK	Rear	/	10.35	11.0	0.039	<b>0.05</b>	0.12
0	2402.0	GFSK	Right	/	10.35	11.0	0.011	<b>0.01</b>	0.04
0	2402.0	GFSK	Top	<b>28</b>	10.35	11.0	<b>0.054</b>	<b>0.06</b>	0.12
0	2402.0	GFSK	Top	B2	10.35	11.0	0.025	<b>0.03</b>	0.03
<b>Test Data (15mm)</b>									
0	2402.0	GFSK	Front	/	10.35	11.0	0.006	<b>0.01</b>	0.04
0	2402.0	GFSK	Rear	/	10.35	11.0	0.018	<b>0.02</b>	0.12
0	2402.0	GFSK	Rear	B2	10.35	11.0	0.008	<b>0.01</b>	0.03

### 13.3. WLAN Evaluation for 2.4GHz

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

**Table 13.29: SAR Values (WLAN 2.4GHz - Head)**

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)
Ch.	MHz								
<b>Power Level D1</b>									
6	2437.0	802.11b	Left Cheek	/	17.61	18.5	0.738	<b>0.91</b>	-0.12
6	2437.0	802.11b	Left Tilt	<b>29</b>	17.61	18.5	<b>0.935</b>	<b>1.15</b>	0.19
6	2437.0	802.11b	Right Cheek	/	17.61	18.5	0.479	<b>0.59</b>	0.15
6	2437.0	802.11b	Right Tilt	/	17.61	18.5	0.413	<b>0.51</b>	-0.08
11	2462.0	802.11b	Left Cheek	/	17.56	18.5	0.681	<b>0.85</b>	0.03
11	2462.0	802.11b	Left Tilt	/	17.56	18.5	0.754	<b>0.94</b>	0.01
6	2437.0	802.11b	Left Tilt	B2	17.61	18.5	0.761	<b>0.93</b>	0.04

**Table 13.30: SAR Values (WLAN 2.4GHz - 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)
Ch.	MHz								
<b>Hotspot Test Data (10mm) - Power Level E1</b>									
6	2437.0	802.11b	Front	/	19.59	20.5	0.268	<b>0.33</b>	0.05
6	2437.0	802.11b	Rear	/	19.59	20.5	0.472	<b>0.58</b>	-0.03
6	2437.0	802.11b	Right	/	19.59	20.5	0.374	<b>0.46</b>	0.12
6	2437.0	802.11b	Top	<b>30</b>	19.59	20.5	<b>0.557</b>	<b>0.69</b>	0.05
6	2437.0	802.11b	Top	B2	19.59	20.5	0.531	<b>0.65</b>	0.06
<b>Body-Worn Test Data (15mm) - Power Level F1</b>									
6	2437.0	802.11b	Front	/	19.59	20.5	0.144	<b>0.18</b>	-0.01
6	2437.0	802.11b	Rear	/	19.59	20.5	0.197	<b>0.24</b>	0.05
6	2437.0	802.11b	Rear	B2	19.59	20.5	0.192	<b>0.24</b>	0.01

Note: 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.

**Table 13.31: SAR Values - WLAN 2.4GHz (Scaled Reported SAR)**

Frequency		Test Position		Actual duty factor	maximum duty factor	Reported SAR (1g) (W/kg)	Scaled reported SAR (1g) (W/kg)
Ch.	MHz						
6	2437.0	Head	Left Tilt	100%	100%	1.15	<b>1.15</b>
6	2437.0	Body	Top	100%	100%	0.69	<b>0.69</b>

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

### 13.4. WLAN Evaluation for 5GHz

**Table 13.32: SAR Values (WLAN 5GHz - Head)**

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)
Ch.	MHz								
<b>&lt;U-NII-2A&gt; - Power Level D1</b>									
62	5310.0	11n.40	Left Cheek	/	16.21	18.0	0.588	<b>0.89</b>	0.12
62	5310.0	11n.40	Left Tilt	/	16.21	18.0	0.497	<b>0.75</b>	0.10
62	5310.0	11n.40	Right Cheek	/	16.21	18.0	0.264	<b>0.40</b>	-0.13
62	5310.0	11n.40	Right Tilt	/	16.21	18.0	0.280	<b>0.42</b>	0.17
54	5270.0	11n.40	Left Cheek	/	16.18	18.0	0.641	<b>0.97</b>	0.12
62	5310.0	11n.40	Left Cheek	B2	16.18	18.0	0.403	<b>0.61</b>	0.02
<b>&lt;U-NII-2C&gt; - Power Level D1</b>									
122	5610.0	11ac.80	Left Cheek	/	15.92	17.0	0.636	<b>0.82</b>	-0.15
122	5610.0	11ac.80	Left Tilt	/	15.92	17.0	0.351	<b>0.45</b>	0.05
122	5610.0	11ac.80	Right Cheek	/	15.92	17.0	0.298	<b>0.38</b>	0.01
122	5610.0	11ac.80	Right Tilt	/	15.92	17.0	0.275	<b>0.35</b>	0.15
138	5690.0	11ac.80	Left Cheek	/	15.86	17.0	0.558	<b>0.73</b>	0.03
122	5610.0	11ac.80	Left Cheek	B2	15.92	17.0	0.414	<b>0.53</b>	0.05
<b>&lt;U-NII-3&gt; - Power Level D1</b>									
155	5775.0	11ac.80	Left Cheek	<b>31</b>	17.02	18.0	<b>0.693</b>	<b>0.87</b>	0.14
155	5775.0	11ac.80	Left Tilt	/	17.02	18.0	0.492	<b>0.62</b>	0.09
155	5775.0	11ac.80	Right Cheek	/	17.02	18.0	0.320	<b>0.40</b>	-0.03
155	5775.0	11ac.80	Right Tilt	/	17.02	18.0	0.280	<b>0.35</b>	-0.01
155	5775.0	11ac.80	Left Cheek	B2	17.02	18.0	0.638	<b>0.80</b>	0.11



**Table 13.33: SAR Values (WLAN 5GHz - 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)
Ch.	MHz								
<b>&lt;U-NII-1&gt; - Hotspot Test Data (10mm) - Power Level E1</b>									
42	5210.0	11ac.80	Front	/	16.43	18.0	0.181	<b>0.26</b>	0.00
42	5210.0	11ac.80	Rear	<b>32</b>	16.43	18.0	<b>0.875</b>	<b>1.26</b>	0.00
42	5210.0	11ac.80	Right	/	16.43	18.0	0.569	<b>0.82</b>	0.16
42	5210.0	11ac.80	Top	/	16.43	18.0	0.224	<b>0.32</b>	0.13
42	5210.0	11ac.80	Rear	B2	16.43	18.0	0.543	<b>0.78</b>	0.12
<b>&lt;U-NII-3&gt; - Hotspot Test Data (10mm) - Power Level E1</b>									
155	5775.0	11ac.80	Front	/	17.02	18.0	0.150	<b>0.19</b>	0.12
155	5775.0	11ac.80	Rear	/	17.02	18.0	0.571	<b>0.72</b>	-0.15
155	5775.0	11ac.80	Right	/	17.02	18.0	0.351	<b>0.44</b>	-0.09
155	5775.0	11ac.80	Top	/	17.02	18.0	0.168	<b>0.21</b>	0.08
155	5775.0	11ac.80	Rear	B2	17.02	18.0	0.448	<b>0.56</b>	0.01
<b>&lt; U-NII-2A&gt; - Body-Worn Test Data (15mm) - Power Level F1</b>									
58	5920.0	11ac.80	Front	/	15.79	17.0	0.085	<b>0.11</b>	-0.13
58	5920.0	11ac.80	Rear	/	15.79	17.0	0.275	<b>0.36</b>	0.10
58	5920.0	11ac.80	Rear	B2	15.79	17.0	0.168	<b>0.22</b>	-0.01
<b>&lt; U-NII-2C&gt; - Body-Worn Test Data (15mm) - Power Level F1</b>									
138	5690.0	11ac.80	Front	/	16.49	18.0	0.079	<b>0.11</b>	0.09
138	5690.0	11ac.80	Rear	/	16.49	18.0	0.351	<b>0.50</b>	0.04
138	5690.0	11ac.80	Rear	B2	16.49	18.0	0.298	<b>0.42</b>	0.04
<b>&lt; U-NII-3&gt; - Body-Worn Test Data (15mm) - Power Level F1</b>									
155	5775.0	11ac.80	Front	/	17.02	18.0	0.082	<b>0.10</b>	-0.18
155	5775.0	11ac.80	Rear	/	17.02	18.0	0.334	<b>0.42</b>	0.18
155	5775.0	11ac.80	Rear	B2	17.02	18.0	0.278	<b>0.35</b>	0.09

**Note:**

1. 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.

2. 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.

**Table 13.34: SAR Values - WLAN 5GHz (Scaled Reported SAR)**

Frequency		Test Position		Actual duty factor	maximum duty factor	Reported SAR (1g) (W/kg)	Scaled reported SAR (1g) (W/kg)
Ch.	MHz						
54	5270.0	Head	Left Cheek	100%	100%	0.97	<b>0.97</b>
42	5210.0	Body	Rear	100%	100%	1.26	<b>1.26</b>

### 13.5. Product specific 10g SAR

**Table 13.35: SAR Values (WCDMA Band 2 - Extremity)**

Frequency		Test Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift(dB)
Ch.	MHz								
<b>Test Data (0mm) - Power Level C1</b>									
9400	1880.0	RMC	Bottom	/	22.50	23.5	2.150	<b>2.71</b>	0.02
9538	1907.6	RMC	Bottom	/	22.50	23.5	1.870	<b>2.35</b>	0.05
9262	1852.4	RMC	Bottom	<b>33</b>	22.70	23.5	<b>2.480</b>	<b>2.98</b>	0.08
9262	1852.4	RMC	Bottom	B2	22.70	23.5	2.430	<b>2.92</b>	0.07

**Table 13.36: SAR Values (WCDMA Band 4 - Extremity)**

Frequency		Test Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift(dB)
Ch.	MHz								
<b>Test Data (0mm) - Power Level C1</b>									
1413	1732.6	RMC	Rear	/	21.50	22.5	1.900	<b>2.39</b>	-0.07
1513	1752.6	RMC	Rear	/	21.50	22.5	1.810	<b>2.28</b>	0.16
1312	1712.4	RMC	Rear	/	21.50	22.5	2.150	<b>2.71</b>	0.03
1413	1732.6	RMC	Bottom	/	21.50	22.5	2.170	<b>2.73</b>	0.03
1513	1752.6	RMC	Bottom	/	21.50	22.5	2.060	<b>2.59</b>	-0.07
1312	1712.4	RMC	Bottom	<b>34</b>	21.50	22.5	<b>2.450</b>	<b>3.08</b>	0.01
1312	1712.4	RMC	Bottom	B2	21.50	22.5	2.370	<b>2.98</b>	0.07

**Table 13.37: SAR Values (LTE Band 25 - Extremity)**

Frequency		Test Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift(dB)
Ch.	MHz								
<b>Test Data (0mm) - Power Level C1</b>									
26140	1860.0	1RB50	Rear	/	21.88	23.5	1.680	<b>2.44</b>	0.10
26590	1905.0	1RB50	Rear	/	21.88	23.5	1.280	<b>1.86</b>	0.13
26365	1882.5	1RB50	Rear	/	21.92	23.0	1.440	<b>1.85</b>	-0.05
26140	1860.0	50RB25	Rear	/	21.92	23.0	1.640	<b>2.10</b>	0.11
26590	1905.0	50RB25	Rear	/	21.88	23.5	1.040	<b>1.51</b>	0.00
26365	1882.5	50RB25	Rear	/	21.92	23.0	1.450	<b>1.86</b>	-0.13
26140	1860.0	1RB50	Bottom	<b>35</b>	21.88	23.5	<b>2.140</b>	<b>3.11</b>	0.12
26590	1905.0	1RB50	Bottom	/	21.86	23.5	1.630	<b>2.38</b>	0.06
26365	1882.5	1RB50	Bottom	/	21.86	23.5	1.840	<b>2.68</b>	0.19
26140	1860.0	50RB25	Bottom	/	21.92	23.0	2.090	<b>2.68</b>	0.11
26590	1905.0	50RB25	Bottom	/	21.86	23.0	1.330	<b>1.73</b>	0.10
26365	1882.5	50RB25	Bottom	/	21.85	23.0	1.850	<b>2.41</b>	0.14
26140	1860.0	100RB	Bottom	/	21.77	23.0	2.080	<b>2.76</b>	0.18
26140	1860.0	1RB50	Bottom	B2	21.88	23.5	2.040	<b>2.96</b>	0.08

**Note:** SAR for LTE Band 2 is covered by LTE Band 25 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

**Table 13.38: SAR Values (LTE Band 41 PC3 - Extremity)**

Frequency		Test Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift(dB)
Ch.	MHz								
<b>Test Data (0mm) - Power Level C1</b>									
41490	2680.0	1RB50	Bottom	<b>36</b>	21.46	22.5	<b>2.620</b>	<b>3.33</b>	0.10
41055	2636.5	1RB50	Bottom	/	21.42	22.5	2.160	<b>2.77</b>	-0.05
40620	2593.0	1RB50	Bottom	/	21.37	22.5	2.240	<b>2.91</b>	-0.17
40185	2549.5	1RB50	Bottom	/	21.42	22.5	2.530	<b>3.24</b>	-0.16
39750	2506.0	1RB50	Bottom	/	21.35	22.5	1.870	<b>2.44</b>	-0.17
41490	2680.0	50RB25	Bottom	/	21.46	22.5	2.570	<b>3.27</b>	-0.18
41055	2636.5	50RB25	Bottom	/	21.43	22.5	2.120	<b>2.71</b>	-0.18
40620	2593.0	50RB25	Bottom	/	21.37	22.5	2.190	<b>2.84</b>	0.17
40185	2549.5	50RB25	Bottom	/	21.35	22.5	2.480	<b>3.23</b>	-0.08
39750	2506.0	50RB25	Bottom	/	21.37	22.5	1.830	<b>2.37</b>	-0.02
41490	2680.0	100RB	Bottom	/	21.42	22.5	2.130	<b>2.73</b>	-0.15
41490	2680.0	1RB50	Bottom	B2	21.46	22.5	2.380	<b>3.02</b>	0.07

**Table 13.39: SAR Values (LTE Band 41 PC2 - Extremity)**

Frequency		Test Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift(dB)
Ch.	MHz								
<b>Test Data (0mm) - Power Level C1</b>									
41490	2680.0	1RB50	Bottom	/	23.45	24.0	2.220	<b>2.52</b>	-0.19
41055	2636.5	1RB50	Bottom	/	23.43	24.0	2.230	<b>2.54</b>	0.13
40620	2593.0	1RB50	Bottom	/	23.37	24.0	2.290	<b>2.65</b>	0.17
40185	2549.5	1RB50	Bottom	/	23.37	24.0	2.580	<b>2.98</b>	0.15
39750	2506.0	1RB50	Bottom	/	23.29	24.0	2.430	<b>2.86</b>	0.10
41490	2680.0	50RB25	Bottom	/	23.49	24.0	2.310	<b>2.60</b>	0.03
41055	2636.5	50RB25	Bottom	/	23.45	24.0	2.460	<b>2.79</b>	0.17
40620	2593.0	50RB25	Bottom	/	23.39	24.0	2.580	<b>2.97</b>	0.19
40185	2549.5	50RB25	Bottom	<b>37</b>	23.36	24.0	<b>2.700</b>	<b>3.13</b>	-0.14
39750	2506.0	50RB25	Bottom	/	23.37	24.0	2.330	<b>2.69</b>	-0.14
40620	2593.0	100RB	Bottom	/	23.47	24.0	2.590	<b>2.93</b>	0.02
40185	2549.5	50RB25	Bottom	B2	23.36	24.0	2.600	<b>3.01</b>	0.11

**Table 13.40: SAR Values (LTE Band 66 - Extremity)**

Frequency		Test Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift(dB)
Ch.	MHz								
<b>Test Data (0mm) - Power Level C1</b>									
132572	1770.0	1RB50	Rear	/	21.04	22.5	1.870	<b>2.62</b>	0.14
132322	1745.0	1RB50	Rear	/	21.00	22.5	1.970	<b>2.78</b>	-0.07
132072	1720.0	1RB50	Rear	<b>38</b>	20.95	22.5	<b>2.220</b>	<b>3.17</b>	0.08
132572	1770.0	50RB25	Rear	/	21.12	22.5	1.840	<b>2.53</b>	-0.15
132322	1745.0	50RB25	Rear	/	21.11	22.5	1.480	<b>2.04</b>	0.08
132072	1720.0	50RB25	Rear	/	21.02	22.5	1.720	<b>2.42</b>	0.04
132572	1770.0	100RB	Rear	/	21.06	22.5	1.310	<b>1.83</b>	0.15
132572	1770.0	1RB50	Bottom	/	21.04	22.5	1.820	<b>2.55</b>	-0.14
132322	1745.0	1RB50	Bottom	/	21.00	22.5	1.920	<b>2.71</b>	0.10
132072	1720.0	1RB50	Bottom	/	20.95	22.5	2.160	<b>3.09</b>	0.01
132572	1770.0	50RB25	Bottom	/	21.12	22.5	1.790	<b>2.46</b>	-0.12
132322	1745.0	50RB25	Bottom	/	21.11	22.5	1.440	<b>1.98</b>	0.00
132072	1720.0	50RB25	Bottom	/	21.02	22.5	1.670	<b>2.35</b>	-0.12
132072	1720.0	1RB50	Rear	B2	20.95	22.5	2.170	<b>3.10</b>	0.16
<b>Test Data (0mm) - The worst case with CA_66B &amp; CA_66C</b>									
132022	1715.0	CA_66B	Rear	/	20.95	22.5	2.180	<b>3.11</b>	-0.05
132572	1770.0	CA_66C	Rear	/	20.98	22.5	2.050	<b>2.91</b>	0.02

**Note:** SAR for LTE Band 4 is covered by LTE Band 66 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.



**Table 13.41: SAR Values (WLAN 5GHz - Extremity)**

Frequency		Test Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(10g) (W/kg)	Reported SAR(10g) (W/kg)	Power Drift(dB)
Ch.	MHz								
<b>&lt;U-NII-2A&gt; - Test Data (0mm) - Power Level F1</b>									
58	5920.0	11ac.80	Front	/	15.79	17.0	0.432	<b>0.57</b>	0.03
58	5920.0	11ac.80	Rear	<b>39</b>	15.79	17.0	<b>1.500</b>	<b>1.98</b>	0.15
58	5920.0	11ac.80	Right	/	15.79	17.0	0.765	<b>1.01</b>	0.12
58	5920.0	11ac.80	Top	/	15.79	17.0	0.160	<b>0.21</b>	-0.01
58	5920.0	11ac.80	Rear	B2	15.79	17.0	1.130	<b>1.49</b>	0.12
<b>&lt;U-NII-2C&gt; - Test Data (0mm) - Power Level F1</b>									
138	5690.0	11ac.80	Front	/	16.49	18.0	0.495	<b>0.70</b>	-0.19
138	5690.0	11ac.80	Rear	/	16.49	18.0	1.230	<b>1.74</b>	0.18
138	5690.0	11ac.80	Right	/	16.49	18.0	0.880	<b>1.25</b>	-0.07
138	5690.0	11ac.80	Top	/	16.49	18.0	0.262	<b>0.37</b>	-0.06
138	5690.0	11ac.80	Rear	B2	16.49	18.0	1.090	<b>1.54</b>	-0.14

## 14. 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 14.1: SAR Measurement Variability for Body - GSM1900**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
512	1850.2	Bottom	0.916	0.903	1.01	/

**Table 14.2: SAR Measurement Variability for Body - WCDMA Band 2**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
9262	1852.4	Bottom	0.931	0.914	1.02	/

**Table 14.3: SAR Measurement Variability for Body - WCDMA Band 4**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
1312	1712.4	Bottom	0.903	0.885	1.02	/

**Table 14.4: SAR Measurement Variability for Body - LTE Band 41 PC3**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
41490	2680.0	Bottom	0.967	0.948	1.02	/

**Table 14.5: SAR Measurement Variability for Body - LTE Band 41 PC2**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
40185	2549.5	Bottom	0.953	0.932	1.02	/

**Table 14.6: SAR Measurement Variability for Head - WLAN 2.4GHz**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
6	2437.0	Left Tilt	0.935	0.914	1.02	/

**Table 14.7: SAR Measurement Variability for Body - WLAN 2.4GHz**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
42	5210.0	Rear	0.875	0.859	1.02	/

**Table 14.8: SAR Measurement Variability for Extremity - WCDMA Band 2**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
9262	1852.4	Bottom	2.480	2.350	1.06	/

**Table 14.9: SAR Measurement Variability for Extremity - WCDMA Band 4**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
1312	1712.4	Bottom	2.450	2.330	1.05	/

**Table 14.10: SAR Measurement Variability for Extremity - LTE Band 25**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
26140	1860.0	Bottom	2.140	2.070	1.03	/

**Table 14.11: SAR Measurement Variability for Extremity - LTE Band 41 PC3**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
41490	2680.0	Bottom	2.620	2.510	1.04	/

**Table 14.12: SAR Measurement Variability for Extremity - LTE Band 41 PC2**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
40185	2549.5	Bottom	2.700	2.590	1.04	/

**Table 14.13: SAR Measurement Variability for Extremity - LTE Band 66**

Frequency		Test Position	Original	1 <sup>st</sup> Repeated	Ratio	2 <sup>nd</sup> Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
132072	1720.0	Rear	2.220	2.100	1.06	/



## 15. Measurement Uncertainty

### 15.1. 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	Axial isotropy	B	4.7	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	4.3	4.3	∞
3	Hemispherical isotropy	B	9.6	R	$\sqrt{3}$	1	1	4.8	4.8	∞
4	Boundary effect	B	1.1	R	$\sqrt{3}$	1	1	0.6	0.6	∞
5	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
6	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
7	Modulation response	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
8	Readout electronics	B	1.0	N	1	1	1	1.0	1.0	∞
9	Response time	B	0.8	R	$\sqrt{3}$	1	1	0.5	0.5	∞
10	Integration time	B	1.7	R	$\sqrt{3}$	1	1	1.0	1.0	∞
11	RF ambient conditions-noise	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
12	RF ambient conditions-reflection	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Probe positioned mech. restrictions	B	0.35	R	$\sqrt{3}$	1	1	0.2	0.2	∞
14	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
15	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
<b>Test sample related</b>										
16	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	5
17	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
18	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
<b>Phantom and set-up</b>										
19	Phantom uncertainty	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
20	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
21	Liquid conductivity (meas.)	A	1.3	N	1	0.64	0.43	0.83	0.56	9
22	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
23	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	0.96	0.78	9
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{23} c_i^2 u_i^2}$						11.3	11.2	95.5
Expanded uncertainty (Confidence interval of 95 %)		$u_e = 2u_c$						22.6	22.4	

**15.2. 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	13.1	N	2	1	1	6.65	6.65	∞
2	Axial isotropy	B	4.7	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	4.3	4.3	∞
3	Hemispherical isotropy	B	9.6	R	$\sqrt{3}$	1	1	4.8	4.8	∞
4	Boundary effect	B	1.1	R	$\sqrt{3}$	1	1	0.6	0.6	∞
5	Linearity	B	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
6	Detection limit	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
7	modulation response	B	4.0	R	$\sqrt{3}$	1	1	2.3	2.3	∞
8	Readout electronics	B	1.0	N	1	1	1	1.0	1.0	∞
9	Response time	B	0.0	R	$\sqrt{3}$	1	1	0.0	0.0	∞
10	Integration time	B	1.7	R	$\sqrt{3}$	1	1	1.0	1.0	∞
11	RF ambient conditions-noise	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
12	RF ambient conditions-reflection	B	3.0	R	$\sqrt{3}$	1	1	1.7	1.7	∞
13	Probe positioned mech. Restrictions	B	0.35	R	$\sqrt{3}$	1	1	0.2	0.2	∞
14	Probe positioning with respect to phantom shell	B	2.9	R	$\sqrt{3}$	1	1	1.7	1.7	∞
15	Post-processing	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
<b>Test sample related</b>										
16	Test sample positioning	A	3.3	N	1	1	1	3.3	3.3	5
17	Device holder uncertainty	A	3.4	N	1	1	1	3.4	3.4	5
18	Drift of output power	B	5.0	R	$\sqrt{3}$	1	1	2.9	2.9	∞
<b>Phantom and set-up</b>										
19	Phantom uncertainty	B	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
20	Liquid conductivity (target)	B	5.0	R	$\sqrt{3}$	0.64	0.43	1.8	1.2	∞
21	Liquid conductivity (meas.)	A	1.3	N	1	0.64	0.43	0.83	0.56	43
22	Liquid permittivity (target)	B	5.0	R	$\sqrt{3}$	0.6	0.49	1.7	1.4	∞
23	Liquid permittivity (meas.)	A	1.6	N	1	0.6	0.49	0.96	0.78	521
Combined standard uncertainty		$u_c = \sqrt{\sum_{i=1}^{22} c_i^2 u_i^2}$						11.6	11.5	257
Expanded uncertainty (Confidence interval of 95 %)		$u_e = 2u_c$						23.2	23.0	

## 16. Main Test Instruments

**Table 16.1: List of Main Instruments**

No.	Name	Type	Serial Number	Calibration Date	Valid Period
01	Network analyzer	E5071C	MY46103759	2022-11-14	One year
02	Dielectric probe	85070E	MY44300317	/	/
03	Power meter	E4418B	MY50000366	2022-12-11	One year
04	Power sensor	E9304A	MY50000188	2022-12-11	One year
05	Power meter	NRP	101260	2021-12-30&2022-12-29	One year
06	Power sensor	NRP-Z91	102211	2021-12-30&2022-12-29	One year
07	Signal Generator	E8257D	MY47461211	2022-01-14&2023-01-13	One year
08	Amplifier	VTL5400	0404	/	/
09	E-field Probe	EX3DV4	7621	2022-05-06	One year
10	DAE	DAE4	1527	2022-06-21	One year
11	Dipole Validation Kit	D750V3	1163	2022-08-22	Three years
12	Dipole Validation Kit	D835V2	4d057	2021-10-18	Three years
13	Dipole Validation Kit	D1750V2	1152	2022-08-22	Three years
14	Dipole Validation Kit	D1900V2	5d088	2021-10-18	Three years
15	Dipole Validation Kit	D2450V2	873	2021-10-21	Three years
16	Dipole Validation Kit	D2550V2	1010	2021-05-21	Three years
17	Dipole Validation Kit	D5GHzV2	1238	2022-08-17	Three years
18	BTS	MT8820C	6201341853	2022-01-14&2023-01-13	One year
19	BTS	E5515C	GB46110722	2022-01-14&2023-01-13	One year
20	BTS	CMW500	152499	2022-07-15	One year
21	Software	DASY5	/	/	/

## ANNEX A: Graph Results

### GSM850 Head

Date: 2022-12-13

Electronics: DAE4 Sn1527

Medium: Head 835MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.929$  S/m;  $\epsilon_r = 40.717$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**Right Cheek Middle/Area Scan (61x71x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm

Maximum value of SAR (interpolated) = 0.414 W/kg

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

Reference Value = 5.107 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.464 W/kg

**SAR(1 g) = 0.334 W/kg; SAR(10 g) = 0.252 W/kg**

Maximum value of SAR (measured) = 0.416 W/kg

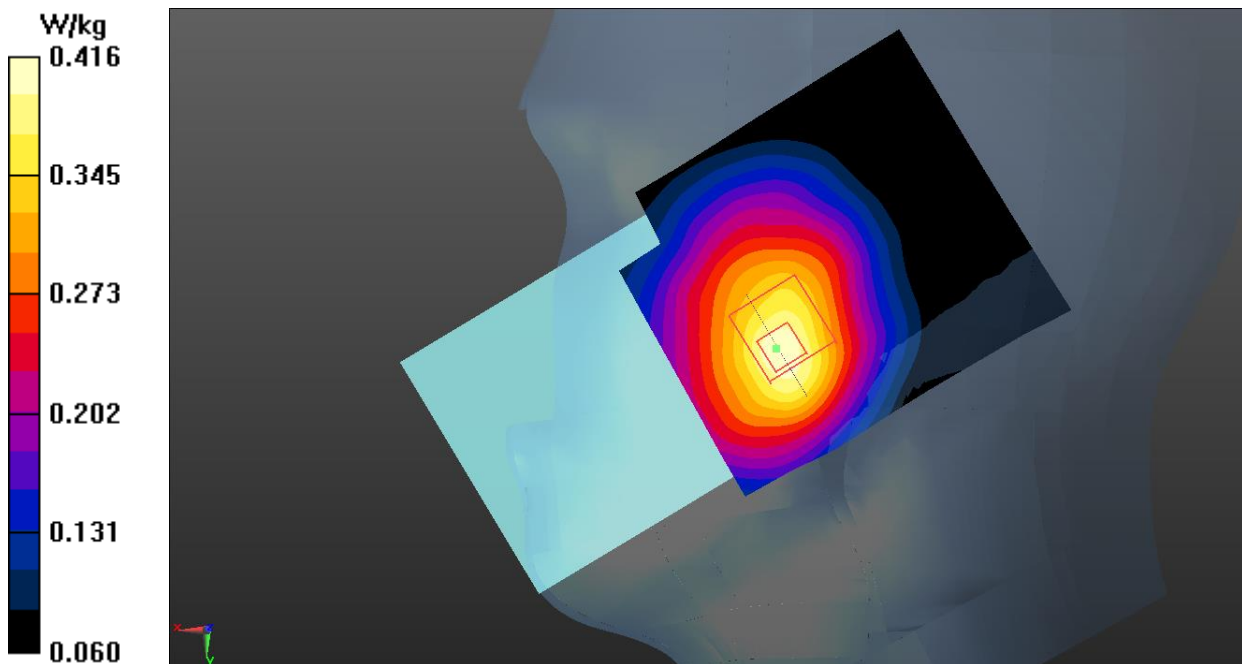


Fig.1 GSM850 Head

**GSM850 Body**

Date: 2022-12-13

Electronics: DAE4 Sn1527

Medium: Head 835MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.929$  S/m;  $\epsilon_r = 40.717$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**Rear Side Middle/Area Scan (61x101x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm

Maximum value of SAR (interpolated) = 0.739 W/kg

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

Reference Value = 20.20 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.909 W/kg

**SAR(1 g) = 0.536 W/kg; SAR(10 g) = 0.333 W/kg**

Maximum value of SAR (measured) = 0.704 W/kg

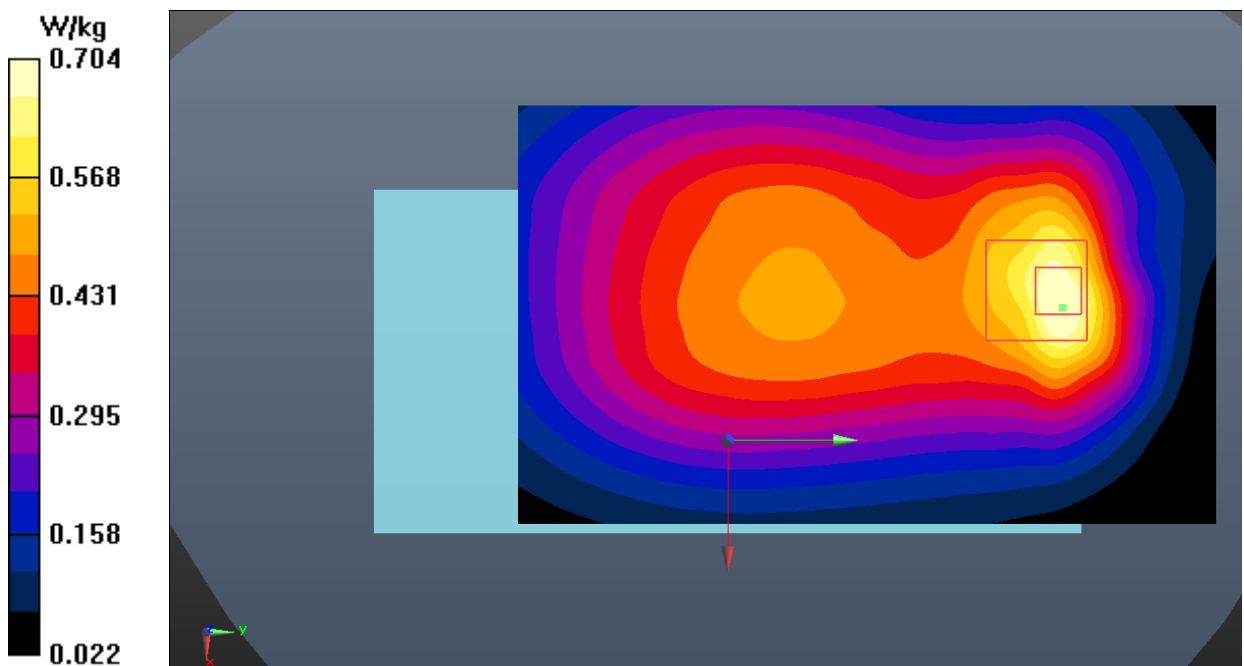


Fig.2 GSM850 Body

**GSM1900 Head**

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.404$  S/m;  $\epsilon_r = 39.57$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

**Left Cheek Middle/Area Scan (61x71x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm

Maximum value of SAR (interpolated) = 0.160 W/kg

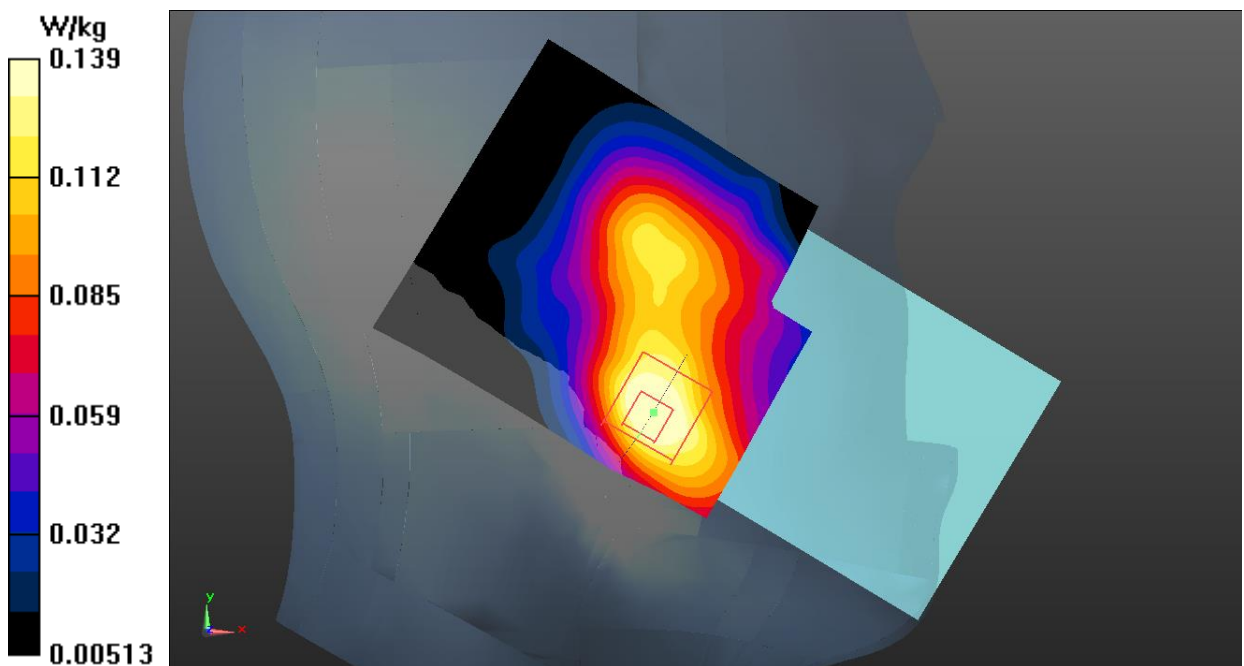
**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 1.318 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.181 W/kg

**SAR(1 g) = 0.111 W/kg; SAR(10 g) = 0.071 W/kg**

Maximum value of SAR (measured) = 0.139 W/kg

**Fig.3 GSM1900 Head**

**GSM1900 Body**

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used (interpolated):  $f = 1850.2$  MHz;  $\sigma = 1.378$  S/m;  $\epsilon_r = 39.686$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

**Bottom Side Low/Area Scan (41x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.31 W/kg

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

Reference Value = 19.79 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 1.59 W/kg

**SAR(1 g) = 0.916 W/kg; SAR(10 g) = 0.483 W/kg**

Maximum value of SAR (measured) = 1.28 W/kg

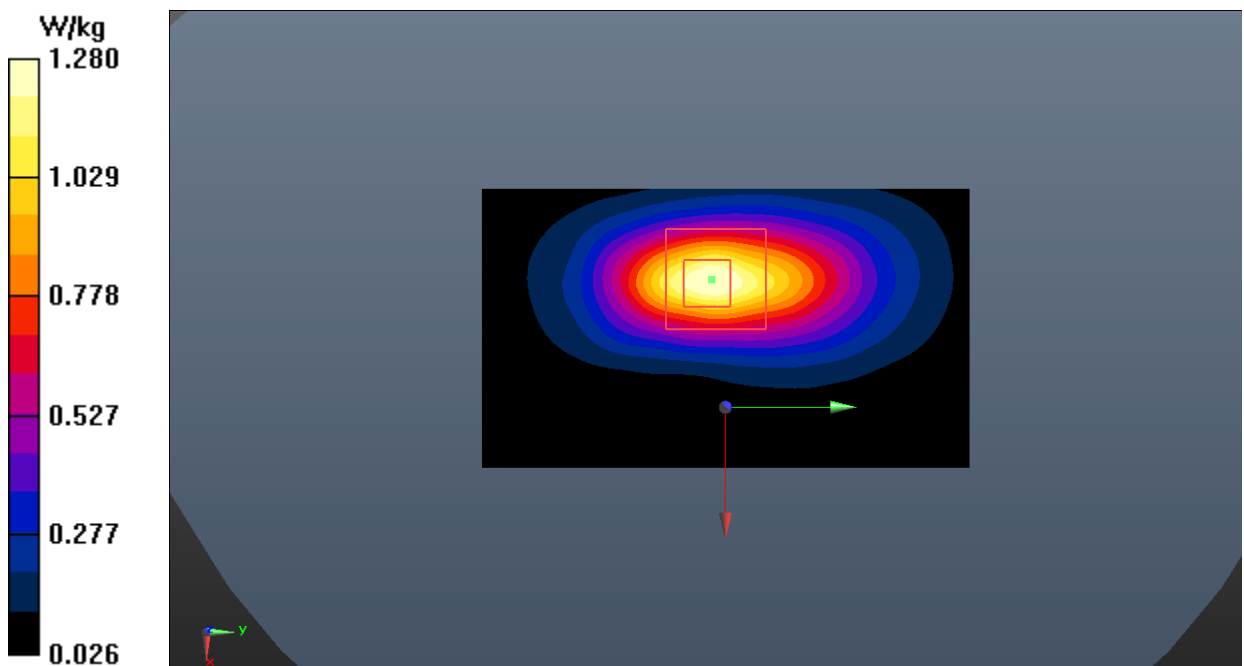


Fig.4 GSM1900 Body

**WCDMA Band 2 Head**

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.404$  S/m;  $\epsilon_r = 39.57$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

**Right Cheek Middle/Area Scan (61x71x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm  
Maximum value of SAR (interpolated) = 0.341 W/kg

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

Reference Value = 4.974 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.359 W/kg

**SAR(1 g) = 0.245 W/kg; SAR(10 g) = 0.159 W/kg**

Maximum value of SAR (measured) = 0.301 W/kg

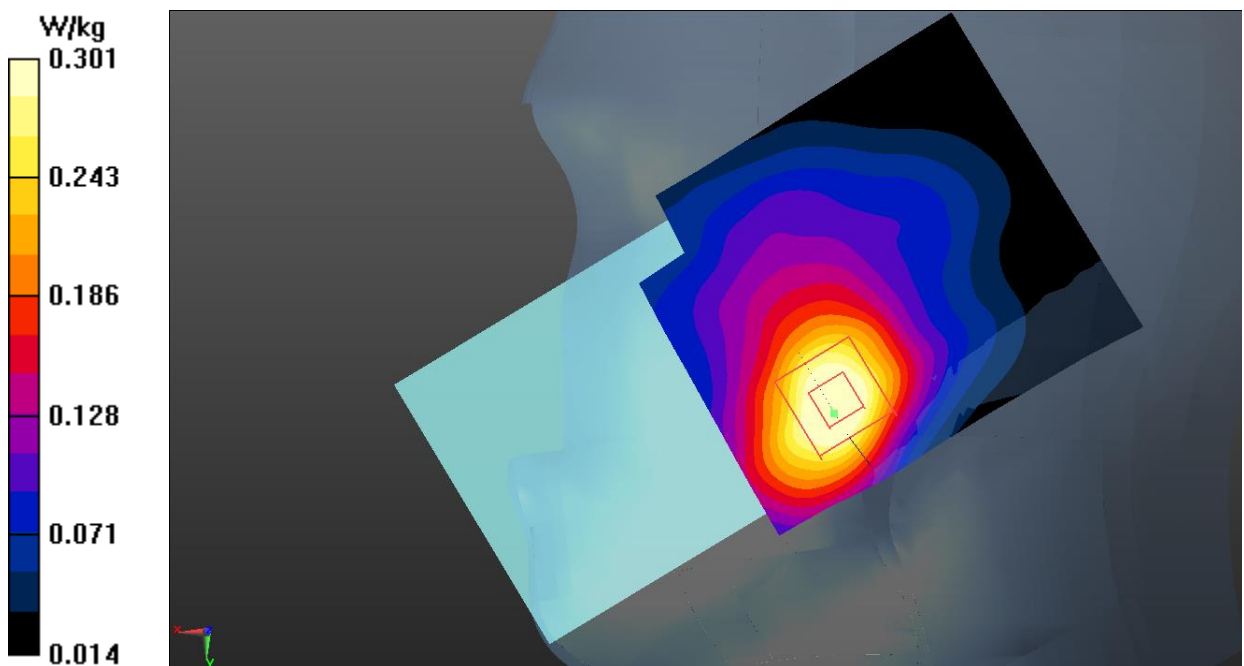


Fig.5 WCDMA Band 2 Head



**WCDMA Band 2 Body**

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.38$  S/m;  $\epsilon_r = 39.678$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, WCDMA (0) Frequency: 1852.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

**Bottom Side Low/Area Scan (41x71x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm

Maximum value of SAR (interpolated) = 1.37 W/kg

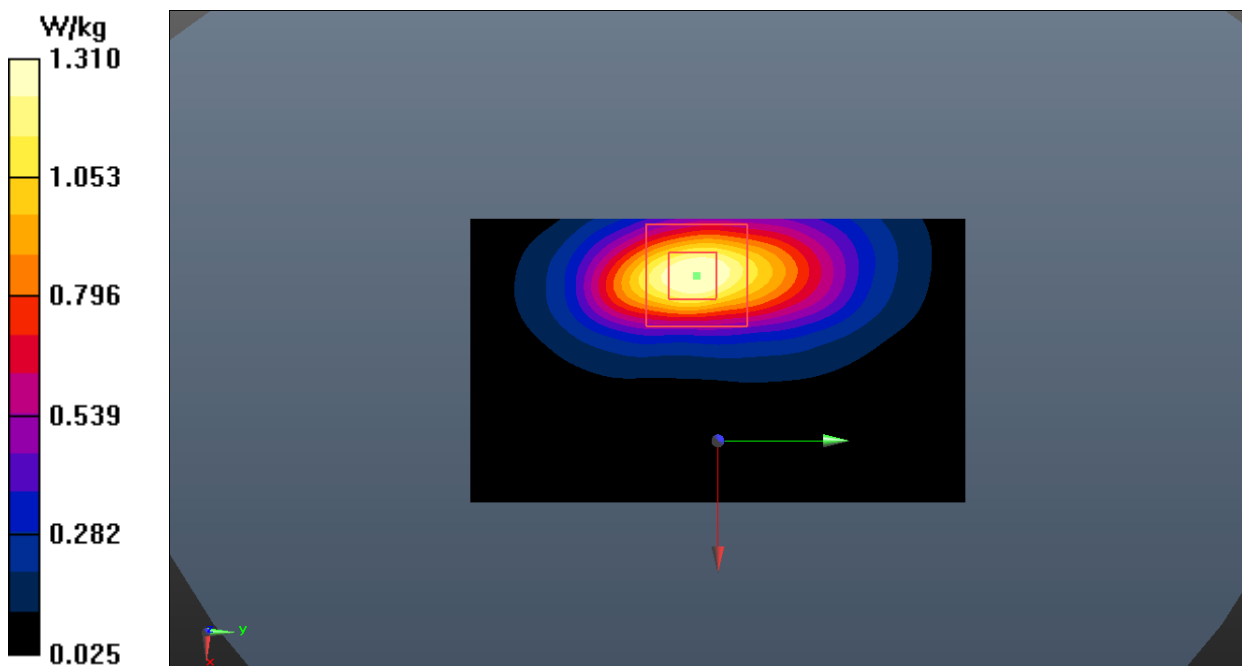
**Bottom Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 10.98 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 1.65 W/kg

**SAR(1 g) = 0.931 W/kg; SAR(10 g) = 0.489 W/kg**

Maximum value of SAR (measured) = 1.31 W/kg



**Fig.6 WCDMA Band 2 Body**

**WCDMA Band 4 Head**

Date: 2022-12-17

Electronics: DAE4 Sn1527

Medium: Head 1750MHz

Medium parameters used:  $f = 1733$  MHz;  $\sigma = 1.345$  S/m;  $\epsilon_r = 40.625$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

**Right Cheek Middle/Area Scan (61x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 0.356 W/kg

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

Reference Value = 3.650 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.391 W/kg

**SAR(1 g) = 0.265 W/kg; SAR(10 g) = 0.174 W/kg**

Maximum value of SAR (measured) = 0.332 W/kg

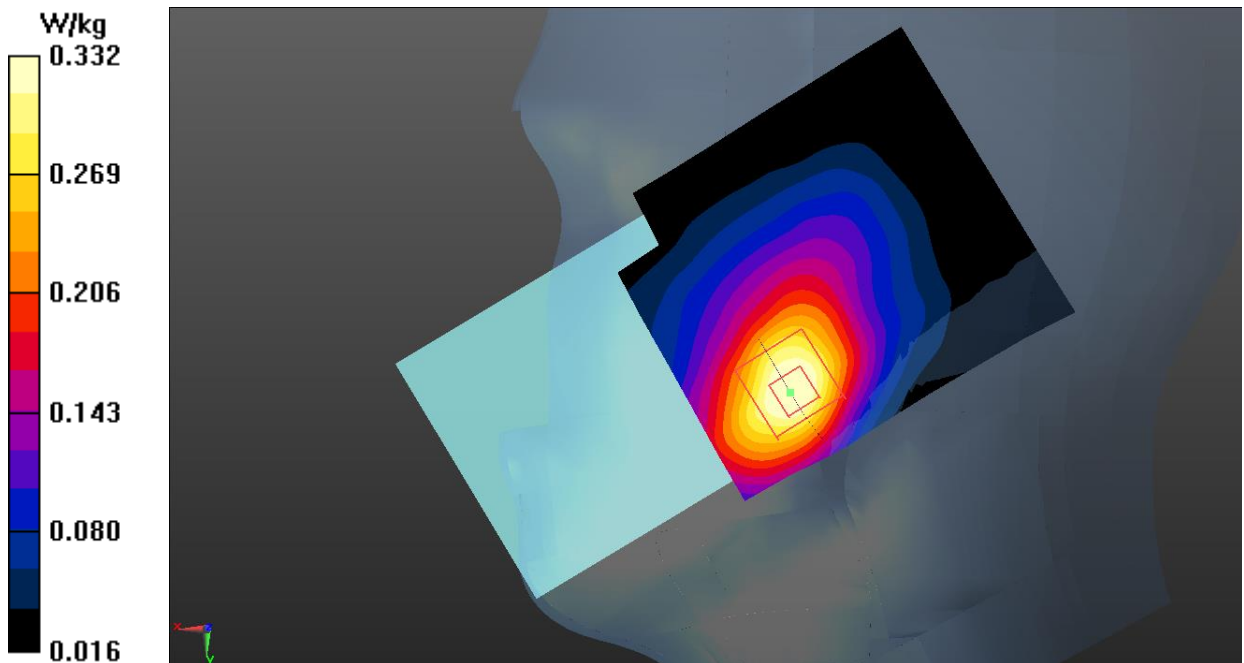


Fig.7 WCDMA Band 4 Head

**WCDMA Band 4 Body**

Date: 2022-12-17

Electronics: DAE4 Sn1527

Medium: Head 1750MHz

Medium parameters used (interpolated):  $f = 1712.4$  MHz;  $\sigma = 1.327$  S/m;  $\epsilon_r = 40.706$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, WCDMA (0) Frequency: 1712.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

**Bottom Side Low/Area Scan (41x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.36 W/kg

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

Reference Value = 8.798 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 1.59 W/kg

**SAR(1 g) = 0.903 W/kg; SAR(10 g) = 0.474 W/kg**

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

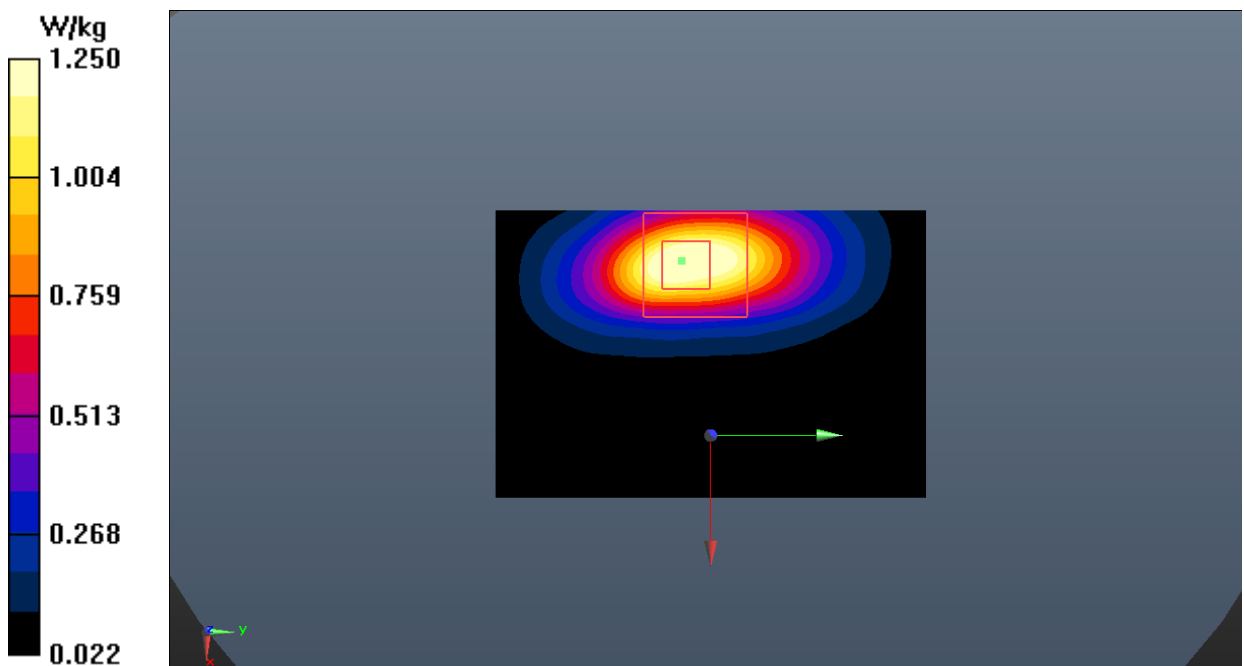


Fig.8 WCDMA Band 4 Body

**WCDMA Band 5 Head**

Date: 2022-12-13

Electronics: DAE4 Sn1527

Medium: Head 835MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.929$  S/m;  $\epsilon_r = 40.717$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**Left Cheek Middle/Area Scan (61x71x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm

Maximum value of SAR (interpolated) = 0.354 W/kg

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

Reference Value = 3.758 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.400 W/kg

**SAR(1 g) = 0.296 W/kg; SAR(10 g) = 0.223 W/kg**

Maximum value of SAR (measured) = 0.358 W/kg

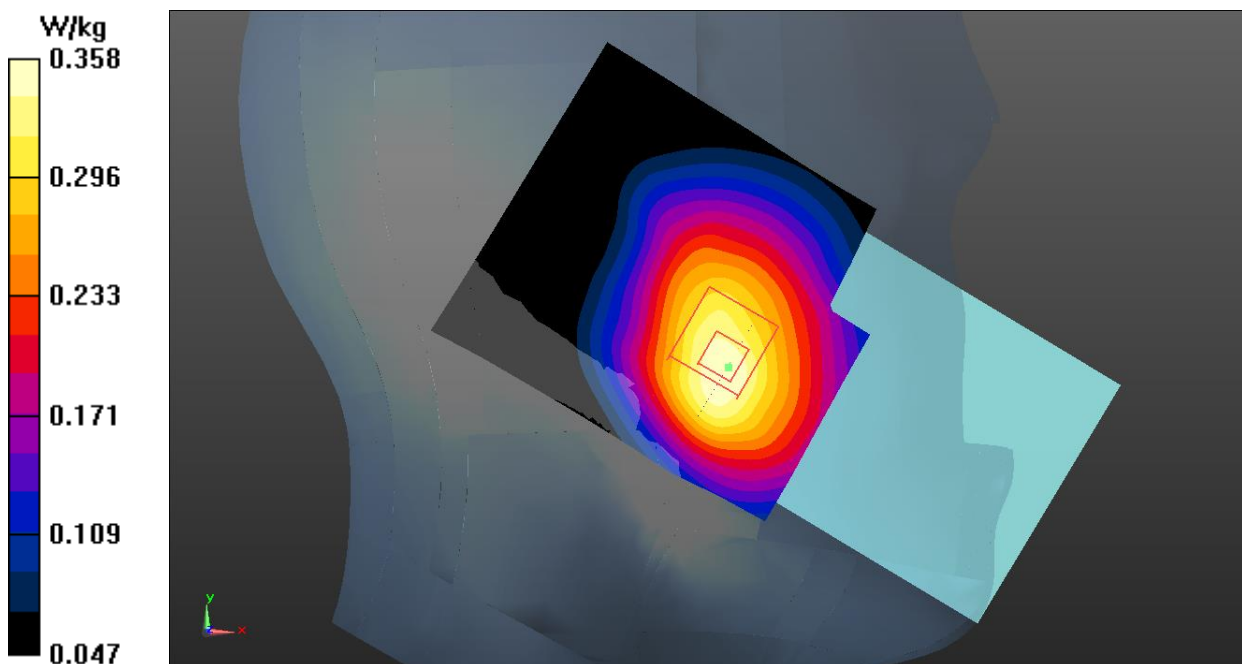


Fig.9 WCDMA Band 5 Head

**WCDMA Band 5 Body**

Date: 2022-12-13

Electronics: DAE4 Sn1527

Medium: Head 835MHz

Medium parameters used (interpolated):  $f = 836.6$  MHz;  $\sigma = 0.929$  S/m;  $\epsilon_r = 40.717$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**Rear Side Middle/Area Scan (61x101x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm

Maximum value of SAR (interpolated) = 0.458 W/kg

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

Reference Value = 20.31 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.507 W/kg

**SAR(1 g) = 0.394 W/kg; SAR(10 g) = 0.300 W/kg**

Maximum value of SAR (measured) = 0.456 W/kg

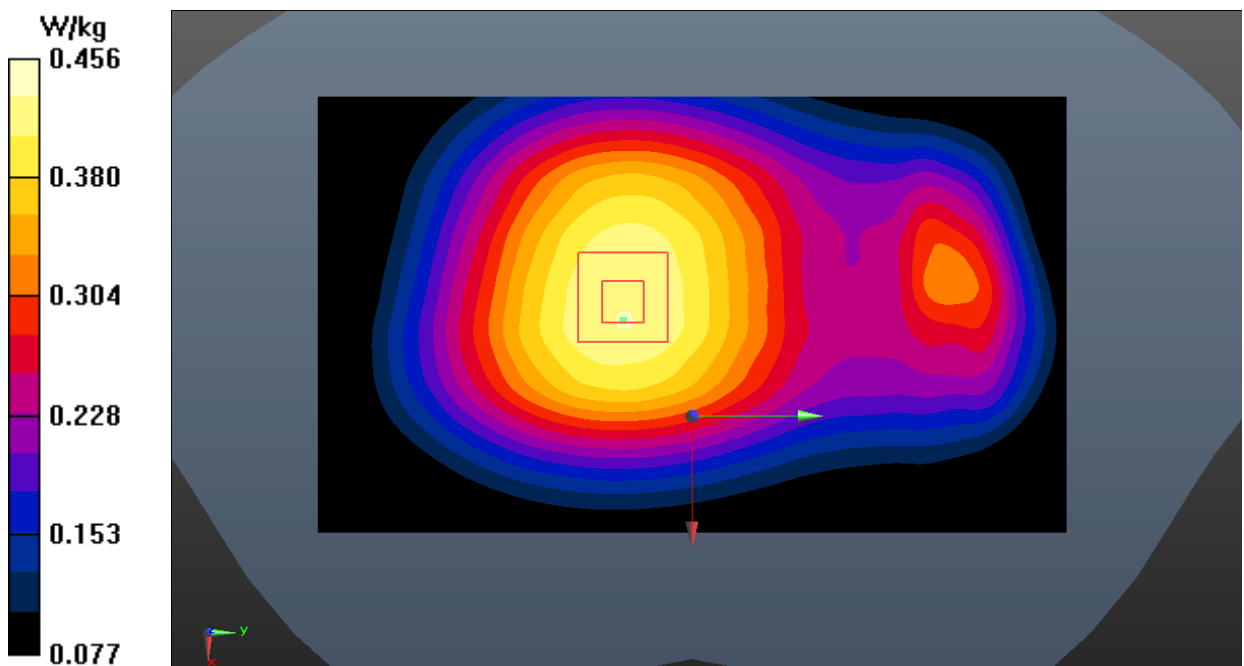


Fig.10 WCDMA Band 5 Body

**LTE Band 12 Head**

Date: 2022-12-22

Electronics: DAE4 Sn1527

Medium: Head 750MHz

Medium parameters used:  $f = 704$  MHz;  $\sigma = 0.864$  S/m;  $\epsilon_r = 42.003$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_FDD (0) Frequency: 704 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**Right Cheek Low 1RB24/Area Scan (61x71x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm  
Maximum value of SAR (interpolated) = 0.367 W/kg**Right Cheek Low 1RB24/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 5.917 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.437 W/kg

**SAR(1 g) = 0.303 W/kg; SAR(10 g) = 0.228 W/kg**

Maximum value of SAR (measured) = 0.389 W/kg

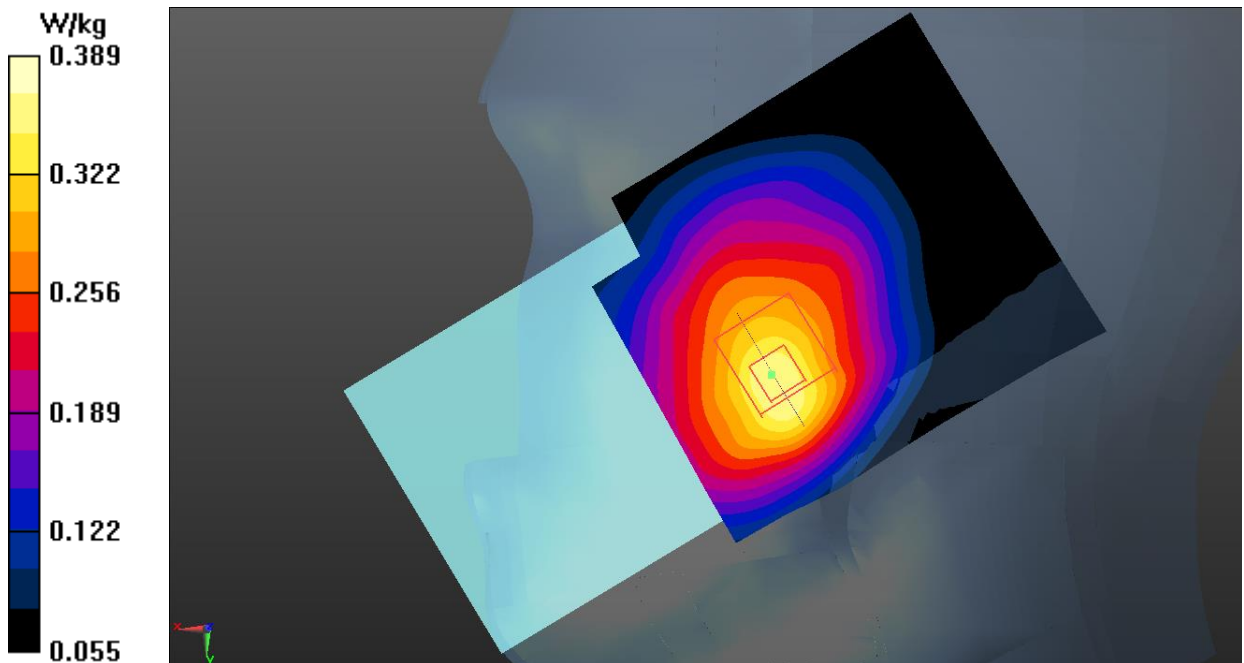


Fig.11 LTE Band 12 Head

**LTE Band 12 Body**

Date: 2022-12-22

Electronics: DAE4 Sn1527

Medium: Head 750MHz

Medium parameters used:  $f = 704$  MHz;  $\sigma = 0.864$  S/m;  $\epsilon_r = 42.003$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_FDD (0) Frequency: 704 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**Rear Side Low 1RB24/Area Scan (61x101x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm

Maximum value of SAR (interpolated) = 0.624 W/kg

**Rear Side Low 1RB24/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 21.85 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.691 W/kg

**SAR(1 g) = 0.541 W/kg; SAR(10 g) = 0.392 W/kg**

Maximum value of SAR (measured) = 0.623 W/kg

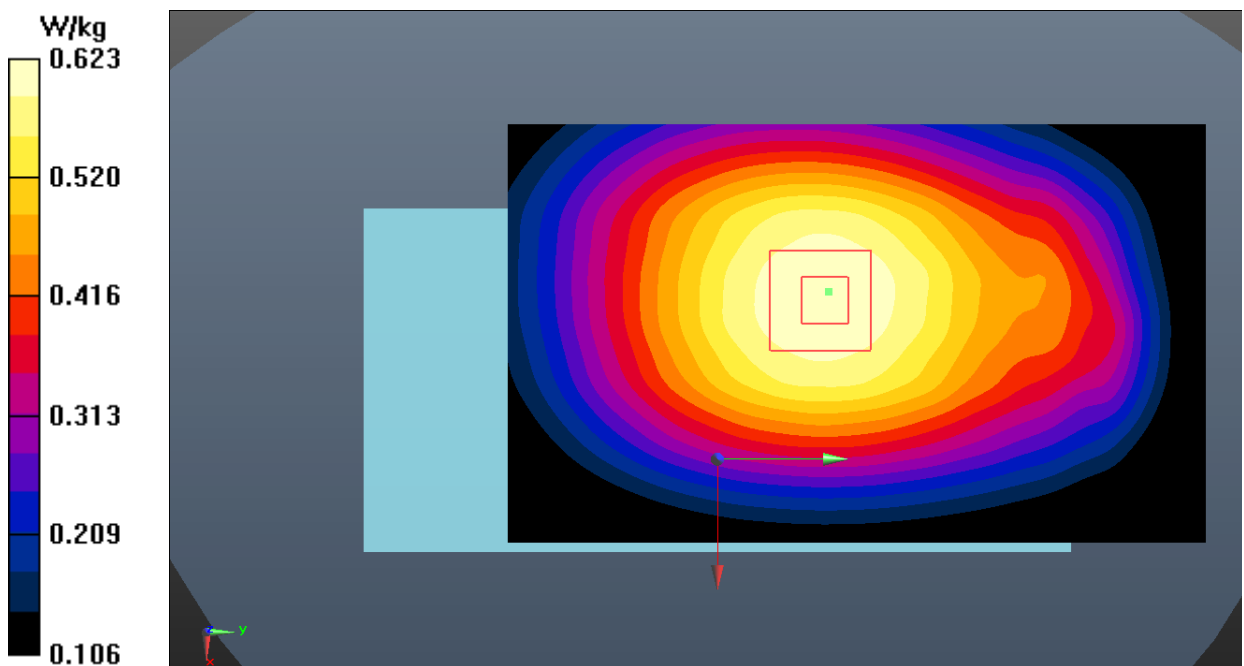


Fig.12 LTE Band 12 Body

**LTE Band 13 Head**

Date: 2022-12-22

Electronics: DAE4 Sn1527

Medium: Head 750MHz

Medium parameters used:  $f = 782 \text{ MHz}$ ;  $\sigma = 0.913 \text{ S/m}$ ;  $\epsilon_r = 41.067$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Communication System: UID 0, LTE\_FDD (0) Frequency: 782 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

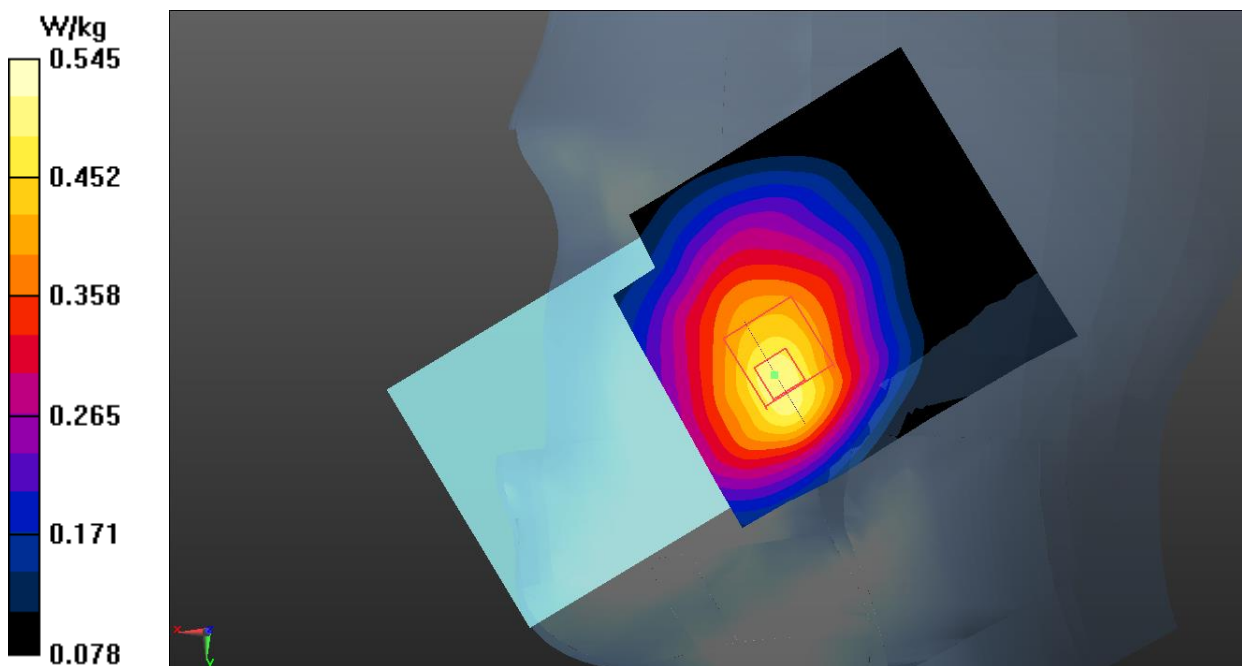
**Right Cheek Middle 1RB24/Area Scan (61x71x1):** Interpolated grid:  $dx=1.500 \text{ mm}$ ,  $dy=1.500 \text{ mm}$   
Maximum value of SAR (interpolated) = 0.508 W/kg**Right Cheek Middle 1RB24/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  
 $dz=5\text{mm}$ 

Reference Value = 5.957 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.613 W/kg

**SAR(1 g) = 0.428 W/kg; SAR(10 g) = 0.323 W/kg**

Maximum value of SAR (measured) = 0.545 W/kg

**Fig.13 LTE Band 13 Head**



**LTE Band 13 Body**

Date: 2022-12-22

Electronics: DAE4 Sn1527

Medium: Head 750MHz

Medium parameters used:  $f = 782$  MHz;  $\sigma = 0.913$  S/m;  $\epsilon_r = 41.067$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_FDD (0) Frequency: 782 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**Right Side Middle 1RB24/Area Scan (41x101x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm  
Maximum value of SAR (interpolated) = 0.818 W/kg**Right Side Middle 1RB24/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 23.08 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.959 W/kg

**SAR(1 g) = 0.663 W/kg; SAR(10 g) = 0.455 W/kg**

Maximum value of SAR (measured) = 0.824 W/kg

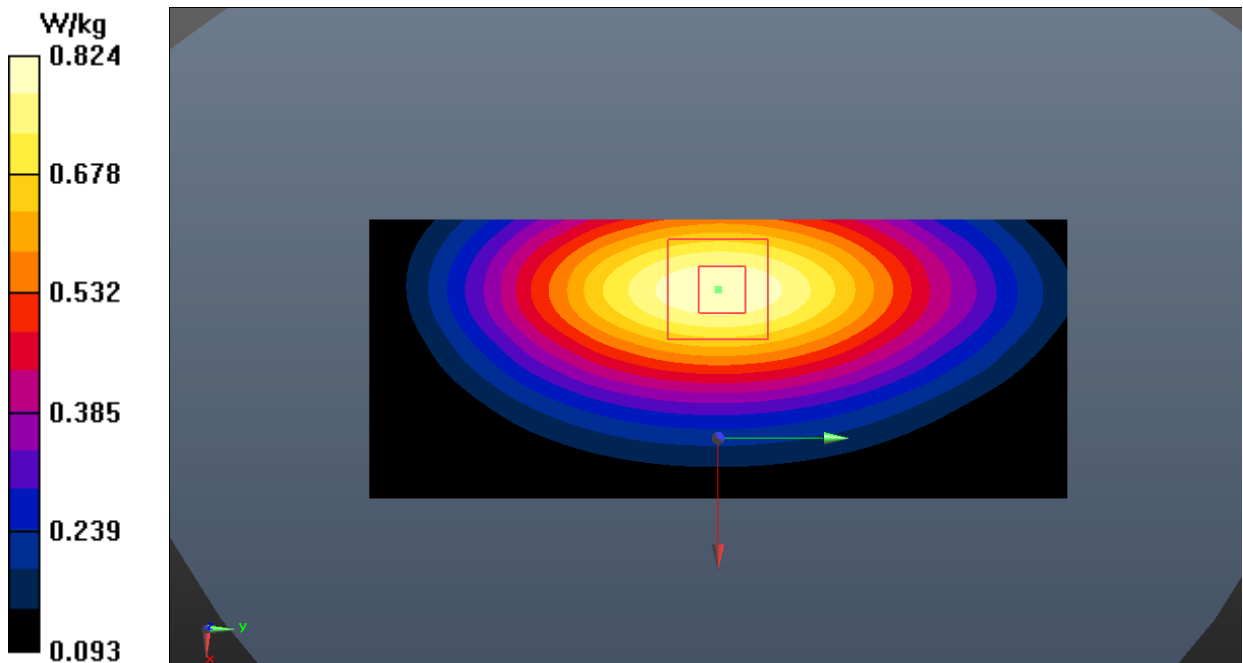


Fig.14 LTE Band 13 Body

**LTE Band 25 Head**

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used:  $f = 1860$  MHz;  $\sigma = 1.387$  S/m;  $\epsilon_r = 39.648$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

**Right Cheek Low 1RB50/Area Scan (61x71x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm  
Maximum value of SAR (interpolated) = 0.425 W/kg**Right Cheek Low 1RB50/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 5.539 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.461 W/kg

**SAR(1 g) = 0.309 W/kg; SAR(10 g) = 0.197 W/kg**

Maximum value of SAR (measured) = 0.387 W/kg

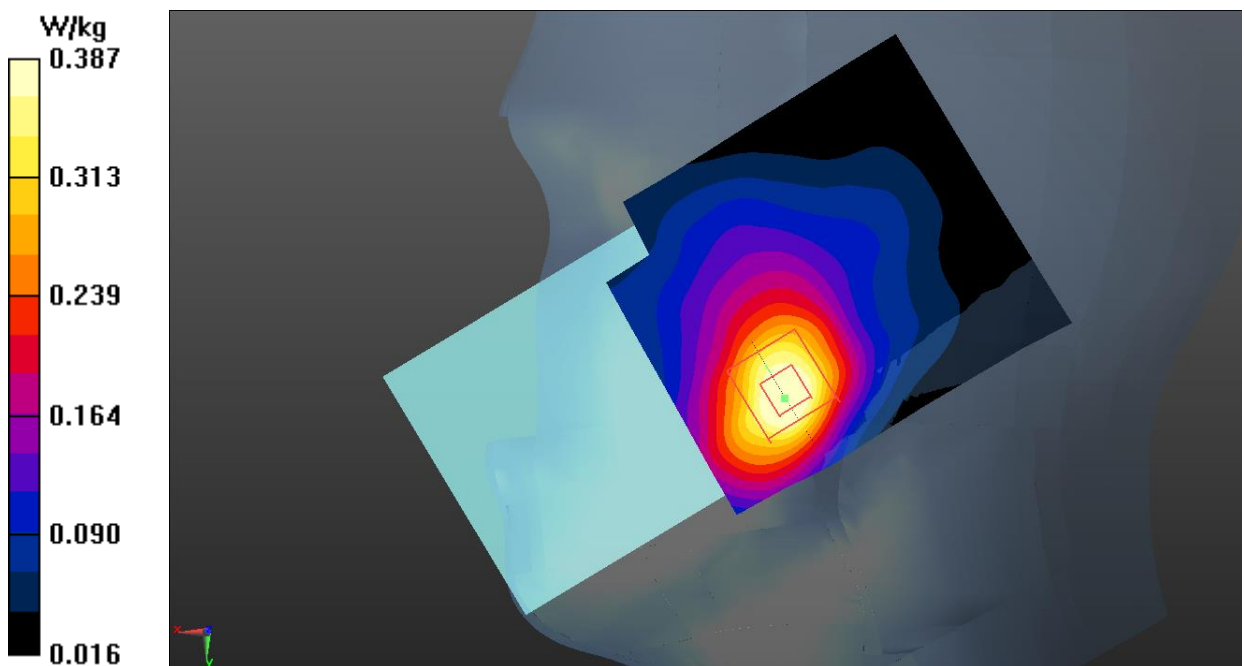


Fig.15 LTE Band 25 Head

**LTE Band 25 Body**

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used:  $f = 1860 \text{ MHz}$ ;  $\sigma = 1.387 \text{ S/m}$ ;  $\epsilon_r = 39.648$ ;  $\rho = 1000 \text{ kg/m}^3$

Communication System: UID 0, LTE\_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

**Bottom Side Low 1RB50/Area Scan (41x71x1):** Interpolated grid:  $dx=1.500 \text{ mm}$ ,  $dy=1.500 \text{ mm}$   
 Maximum value of SAR (interpolated) = 1.13 W/kg

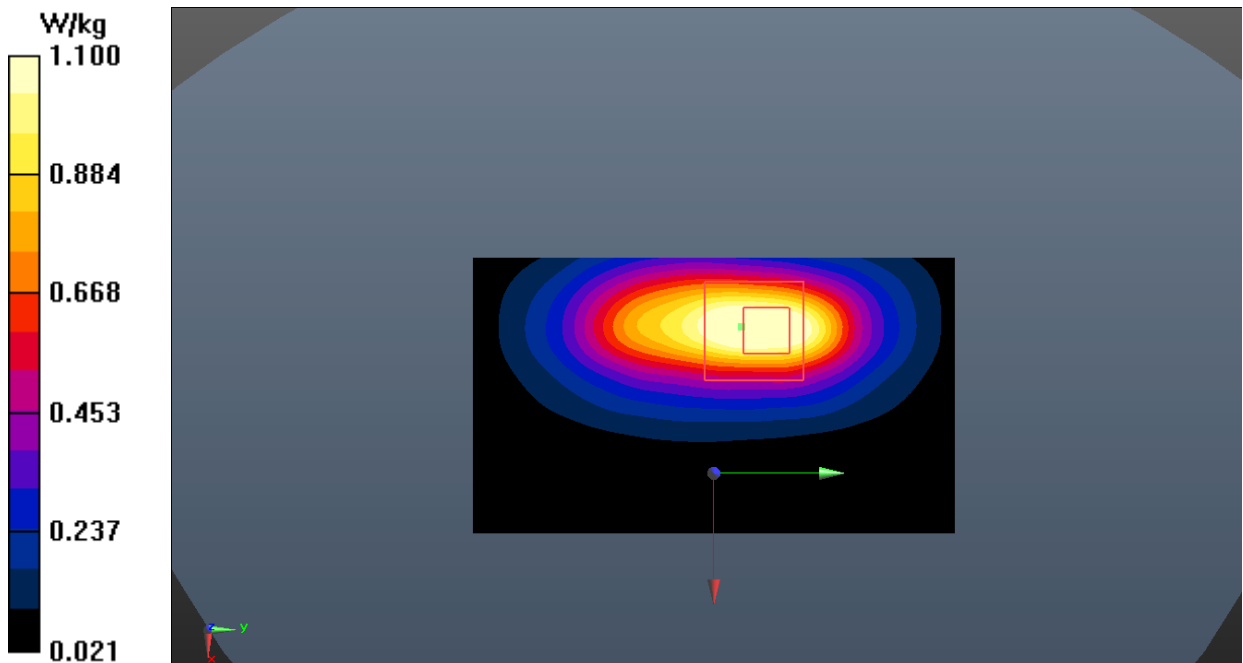
**Bottom Side Low 1RB50/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 9.404 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 1.39 W/kg

**SAR(1 g) = 0.787 W/kg; SAR(10 g) = 0.414 W/kg**

Maximum value of SAR (measured) = 1.10 W/kg



**Fig.16 LTE Band 25 Body**

**LTE Band 26 Head**

Date: 2022-12-13

Electronics: DAE4 Sn1527

Medium: Head 835MHz

Medium parameters used (interpolated):  $f = 822.5$  MHz;  $\sigma = 0.917$  S/m;  $\epsilon_r = 40.886$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_FDD (0) Frequency: 822.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**Right Cheek Low 1RB74/Area Scan (61x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 0.437 W/kg**Right Cheek Low 1RB74/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.050 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.520 W/kg

**SAR(1 g) = 0.365 W/kg; SAR(10 g) = 0.274 W/kg**

Maximum value of SAR (measured) = 0.462 W/kg

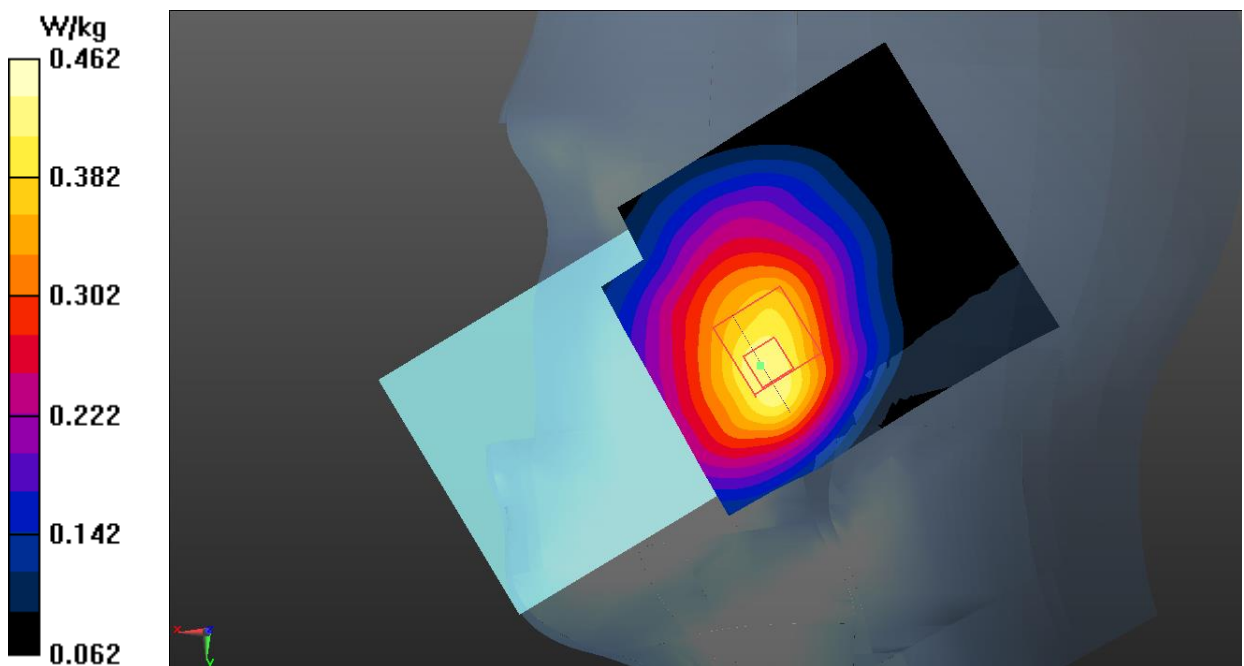


Fig.17 LTE Band 26 Head

**LTE Band 26 Body**

Date: 2022-12-13

Electronics: DAE4 Sn1527

Medium: Head 835MHz

Medium parameters used (interpolated):  $f = 822.5$  MHz;  $\sigma = 0.917$  S/m;  $\epsilon_r = 40.886$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_FDD (0) Frequency: 822.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**Rear Side Low 1RB74/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.427 W/kg

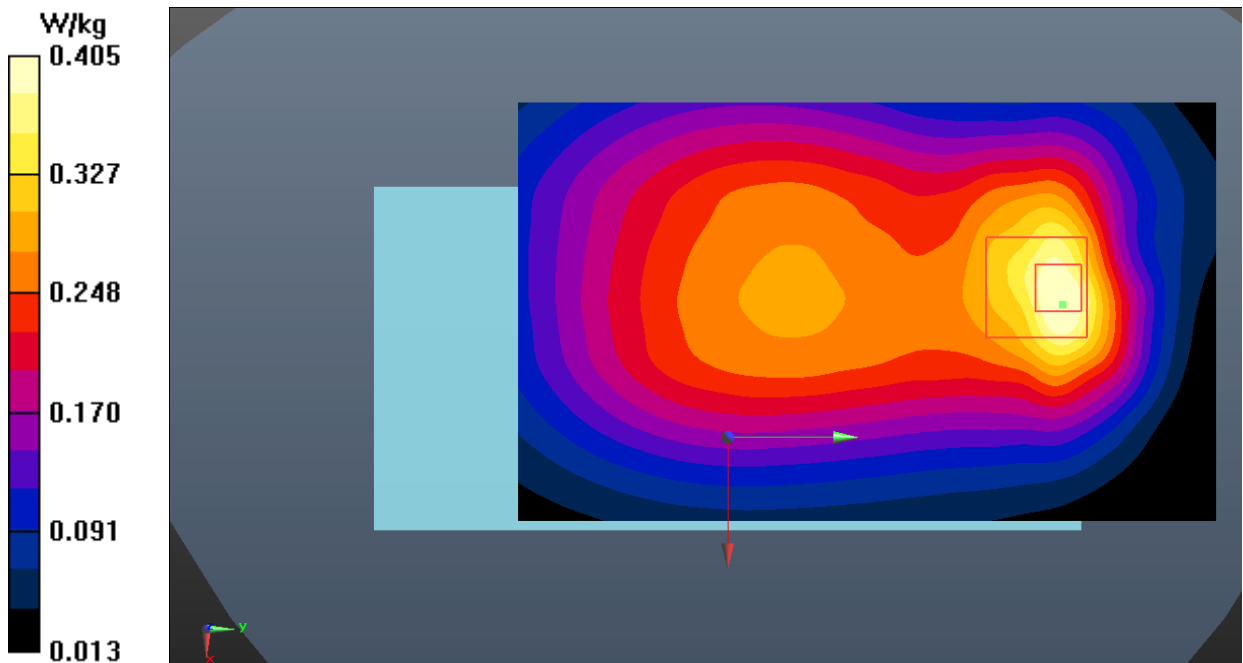
**Rear Side Low 1RB74/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.81 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.515 W/kg

**SAR(1 g) = 0.326 W/kg; SAR(10 g) = 0.210 W/kg**

Maximum value of SAR (measured) = 0.405 W/kg



**Fig.18 LTE Band 26 Body**

**LTE Band 41 PC3 Head**

Date: 2023-1-20

Electronics: DAE4 Sn1527

Medium: Head 2550MHz

Medium parameters used:  $f = 2680$  MHz;  $\sigma = 2.09$  S/m;  $\epsilon_r = 37.682$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_TDD (0) Frequency: 2680 MHz Duty Cycle: 1:1.58

Probe: EX3DV4 - SN7621 ConvF (7.93, 7.93, 7.93)

**Right Cheek High 1RB50/Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
 Maximum value of SAR (interpolated) = 0.163 W/kg

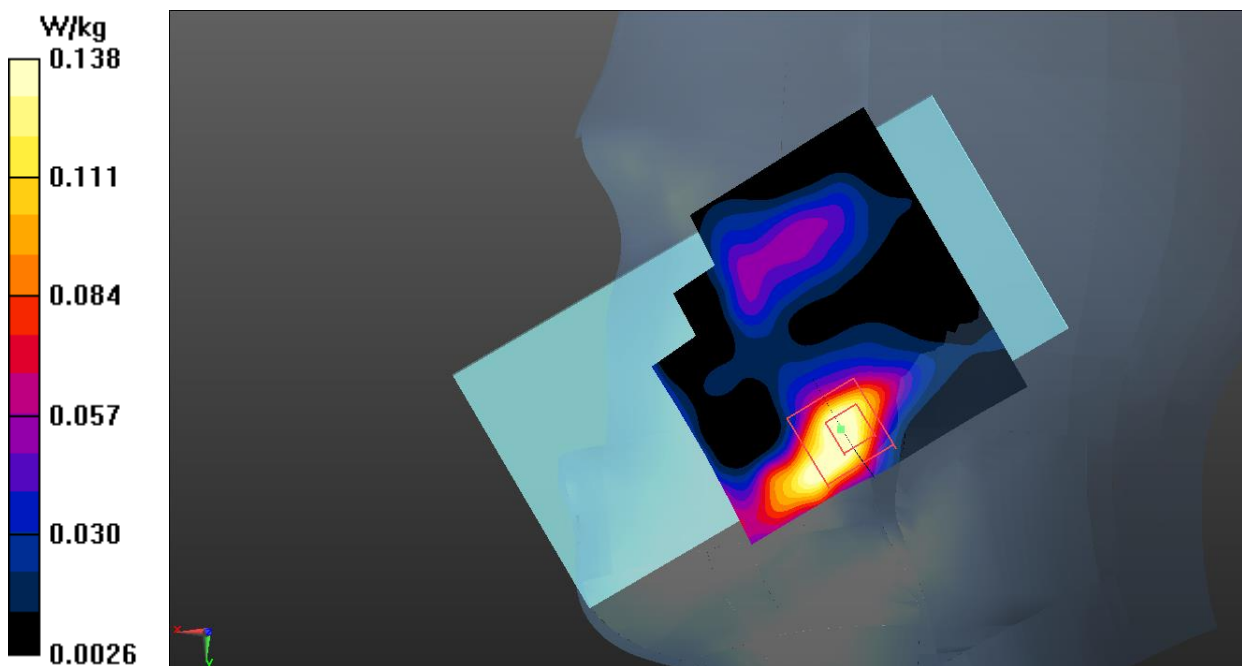
**Right Cheek High 1RB50/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.344 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.193 W/kg

**SAR(1 g) = 0.097 W/kg; SAR(10 g) = 0.049 W/kg**

Maximum value of SAR (measured) = 0.138 W/kg



**Fig.19 LTE Band 26 Head**

**LTE Band 41 PC3 Body**

Date: 2023-1-20

Electronics: DAE4 Sn1527

Medium: Head 2550MHz

Medium parameters used:  $f = 2680$  MHz;  $\sigma = 2.09$  S/m;  $\epsilon_r = 37.682$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_TDD (0) Frequency: 2680 MHz Duty Cycle: 1:1.58

Probe: EX3DV4 - SN7621 ConvF (7.93, 7.93, 7.93)

**Bottom Side High 1RB50/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 1.31 W/kg**Bottom Side High 1RB50/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.97 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 2.07 W/kg

**SAR(1 g) = 0.967 W/kg; SAR(10 g) = 0.425 W/kg**

Maximum value of SAR (measured) = 1.50 W/kg

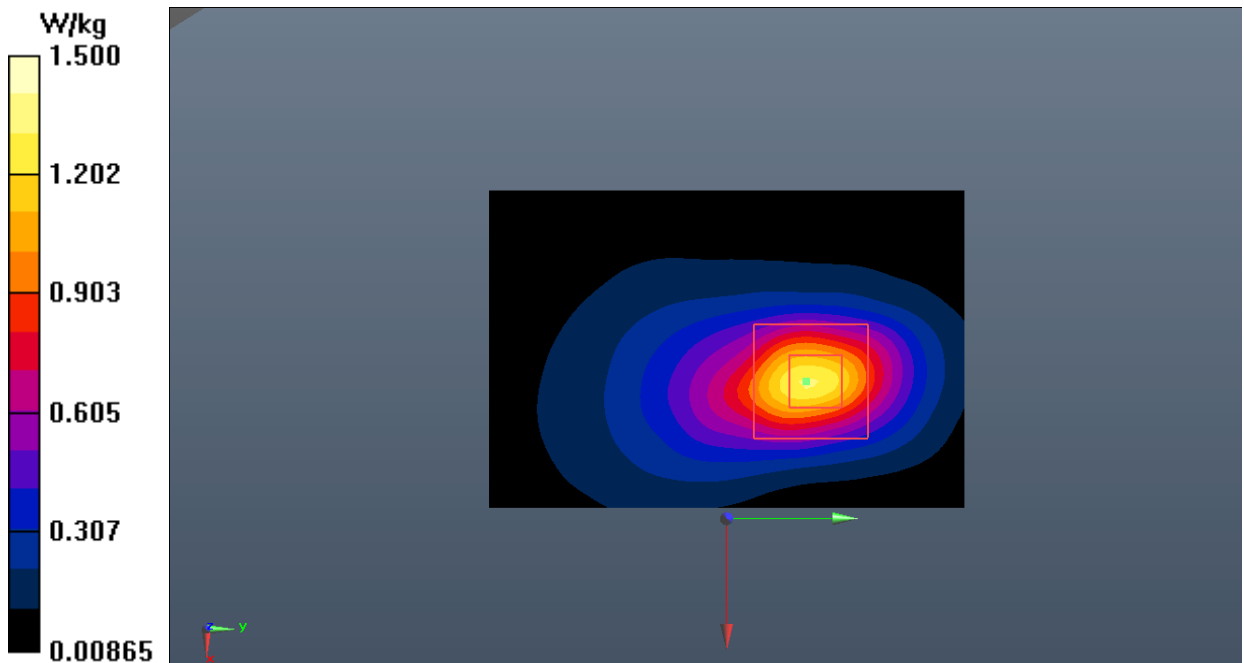


Fig.20 LTE Band 41 Body

**LTE Band 41 PC2 Head**

Date: 2023-1-20

Electronics: DAE4 Sn1527

Medium: Head 2550MHz

Medium parameters used:  $f = 2680$  MHz;  $\sigma = 2.09$  S/m;  $\epsilon_r = 37.682$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE TDD (0) Frequency: 2680 MHz Duty Cycle: 1:2.31

Probe: EX3DV4 - SN7621 ConvF (7.93, 7.93, 7.93)

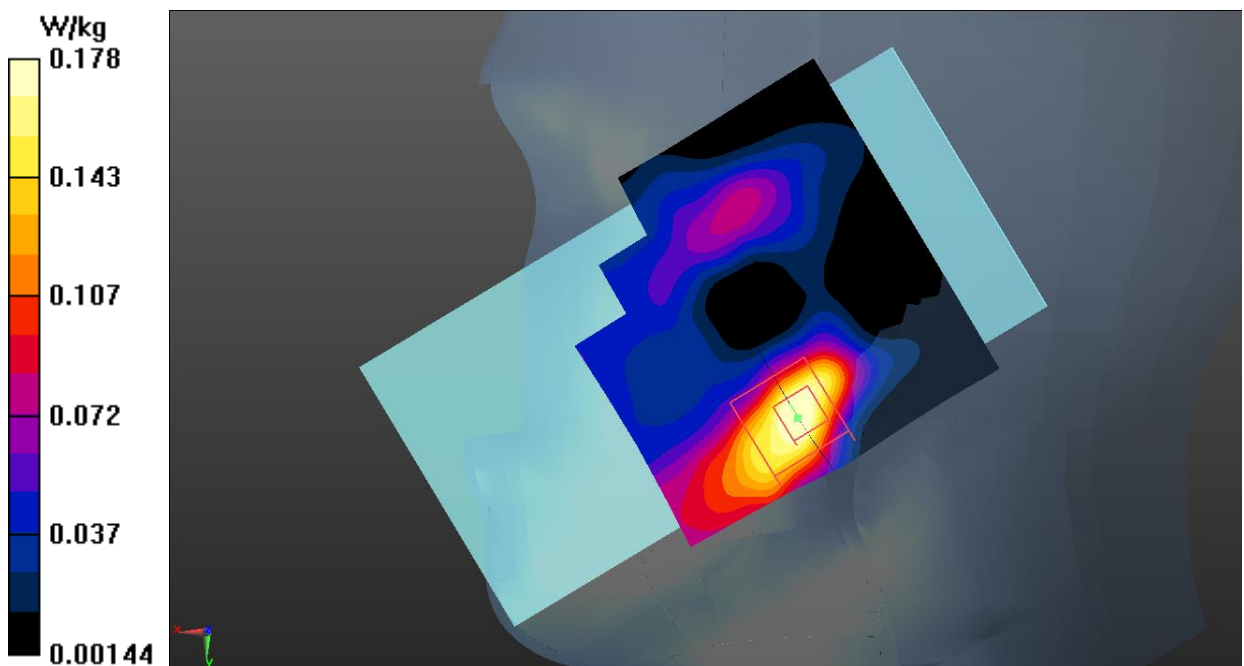
**Right Cheek High 1RB50/Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 0.199 W/kg**Right Cheek High1RB50/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.651 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.243 W/kg

**SAR(1 g) = 0.125 W/kg; SAR(10 g) = 0.064 W/kg**

Maximum value of SAR (measured) = 0.178 W/kg

**Fig.21 LTE Band 41 Head**



**LTE Band 41 PC2 Body**

Date: 2023-1-20

Electronics: DAE4 Sn1527

Medium: Head 2550MHz

Medium parameters used:  $f = 2550$  MHz;  $\sigma = 1.937$  S/m;  $\epsilon_r = 38.111$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE TDD (0) Frequency: 2549.5 MHz Duty Cycle: 1:2.31

Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

**Bottom Side M-Low 50RB25/Area Scan (61x91x1):** Interpolated grid:  $dx=1.000$  mm,  $dy=1.000$  mm

Maximum value of SAR (interpolated) = 1.37 W/kg

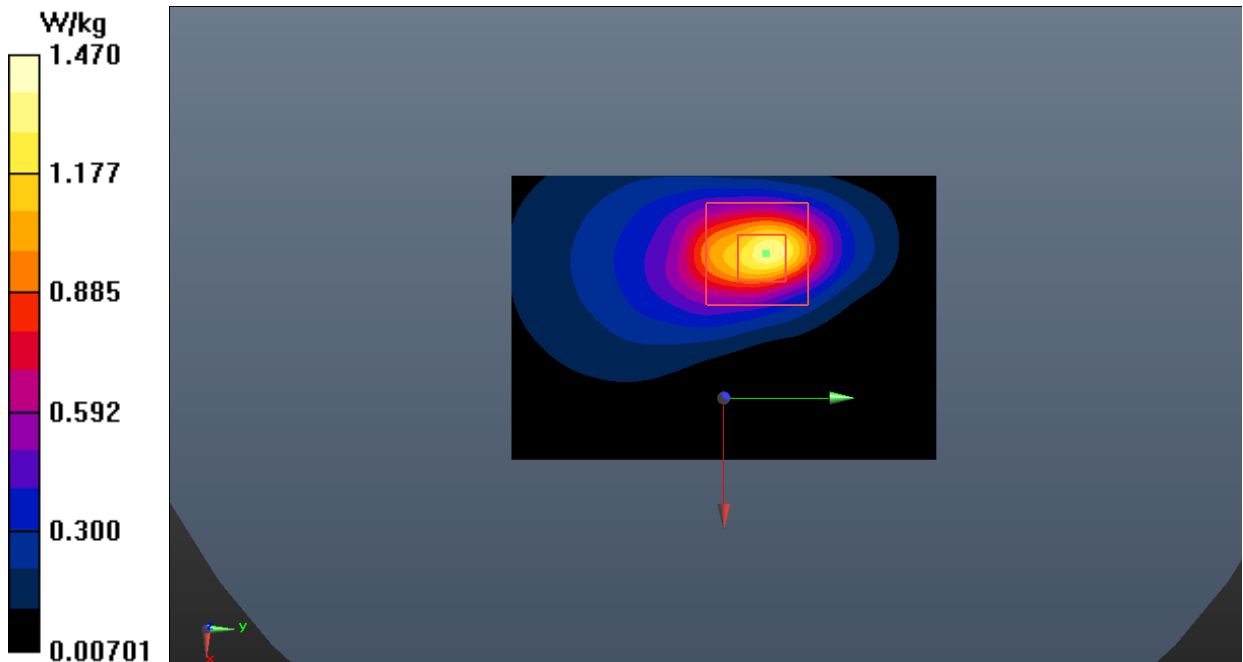
**Bottom Side M-Low 50RB25/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5$ mm,  $dy=5$ mm,  $dz=5$ mm

Reference Value = 12.33 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 2.02 W/kg

**SAR(1 g) = 0.953 W/kg; SAR(10 g) = 0.416 W/kg**

Maximum value of SAR (measured) = 1.47 W/kg

**Fig.22 LTE Band 41 Body**

**LTE Band 66 Head**

Date: 2022-12-17

Electronics: DAE4 Sn1527

Medium: Head 1750MHz

Medium parameters used:  $f = 1770$  MHz;  $\sigma = 1.378$  S/m;  $\epsilon_r = 40.481$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_FDD (0) Frequency: 1770 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

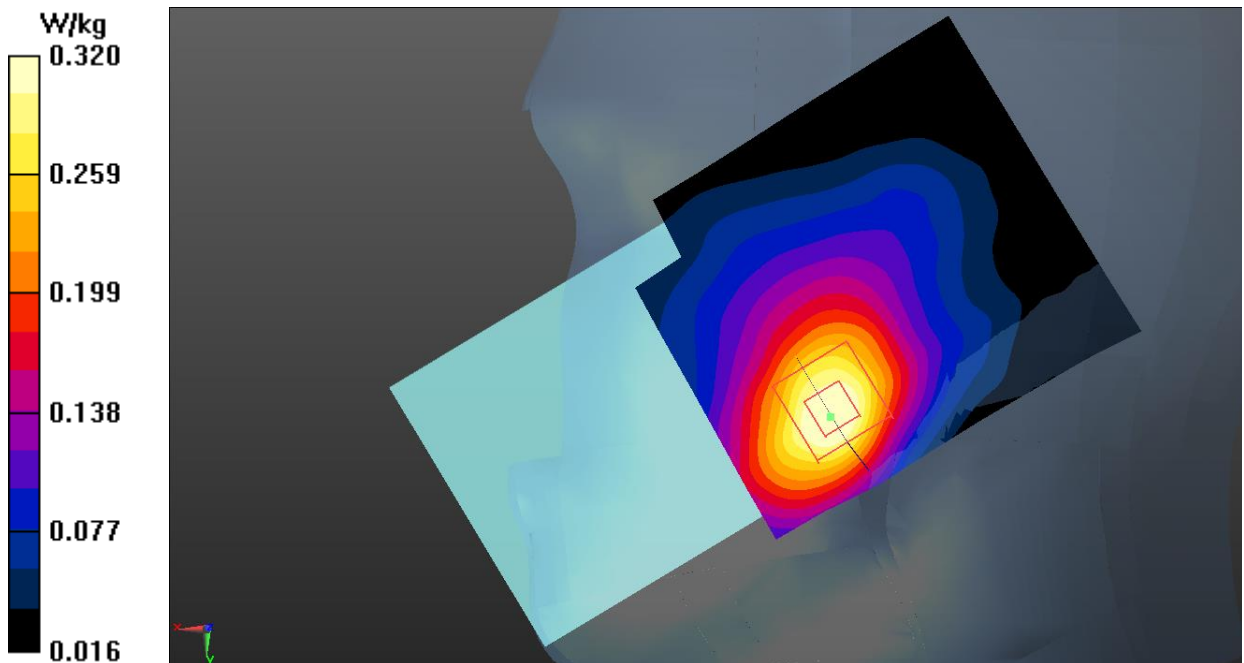
**Right Cheek High 1RB50/Area Scan (61x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 0.347 W/kg**Right Cheek High 1RB50/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.992 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.378 W/kg

**SAR(1 g) = 0.261 W/kg; SAR(10 g) = 0.171 W/kg**

Maximum value of SAR (measured) = 0.320 W/kg

**Fig.23 LTE Band 66 Head**

**LTE Band 66 Body**

Date: 2022-12-17

Electronics: DAE4 Sn1527

Medium: Head 1750MHz

Medium parameters used:  $f = 1720$  MHz;  $\sigma = 1.334$  S/m;  $\epsilon_r = 40.676$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_FDD (0) Frequency: 1720 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

**Bottom Side Low 1RB50/Area Scan (41x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
 Maximum value of SAR (interpolated) = 1.14 W/kg

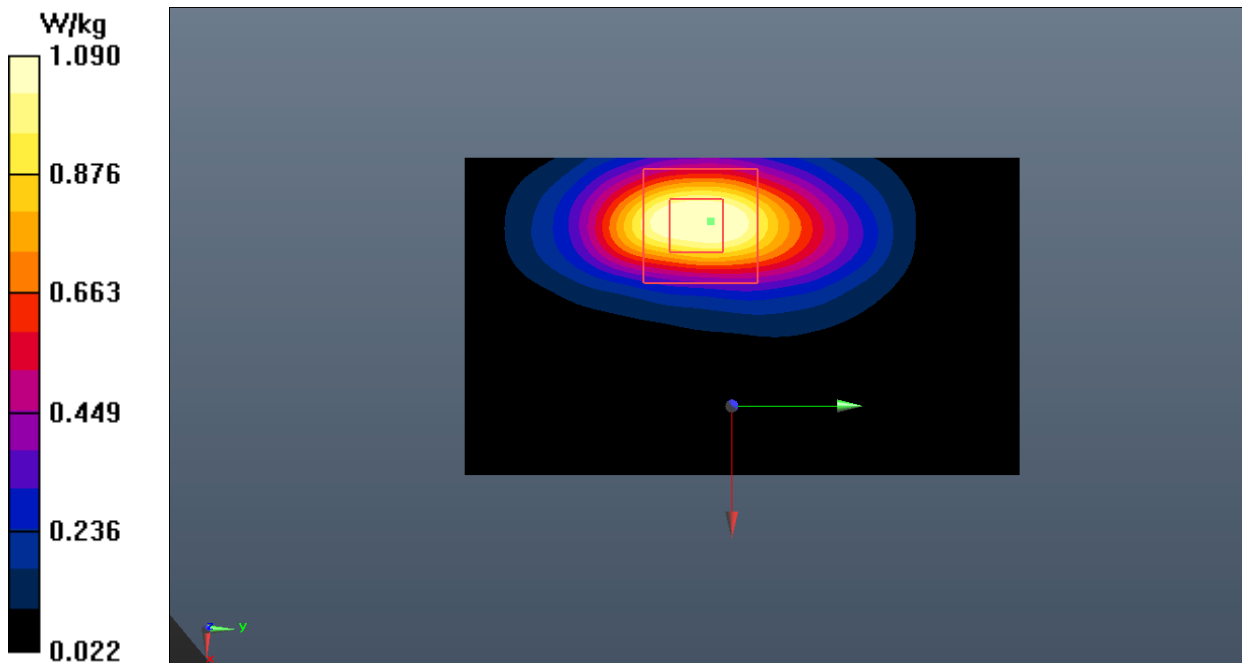
**Bottom Side Low 1RB50/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.30 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 1.40 W/kg

**SAR(1 g) = 0.793 W/kg; SAR(10 g) = 0.416 W/kg**

Maximum value of SAR (measured) = 1.09 W/kg



**Fig.24 LTE Band 66 Body**

**LTE Band 71 Head**

Date: 2022-12-22

Electronics: DAE4 Sn1527

Medium: Head 750MHz

Medium parameters used (extrapolated):  $f = 688$  MHz;  $\sigma = 0.853$  S/m;  $\epsilon_r = 42.195$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_FDD (0) Frequency: 688 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**Left Cheek High 1RB50/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 0.457 W/kg**Left Cheek High 1RB50/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.950 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.510 W/kg

**SAR(1 g) = 0.385 W/kg; SAR(10 g) = 0.298 W/kg**

Maximum value of SAR (measured) = 0.464 W/kg

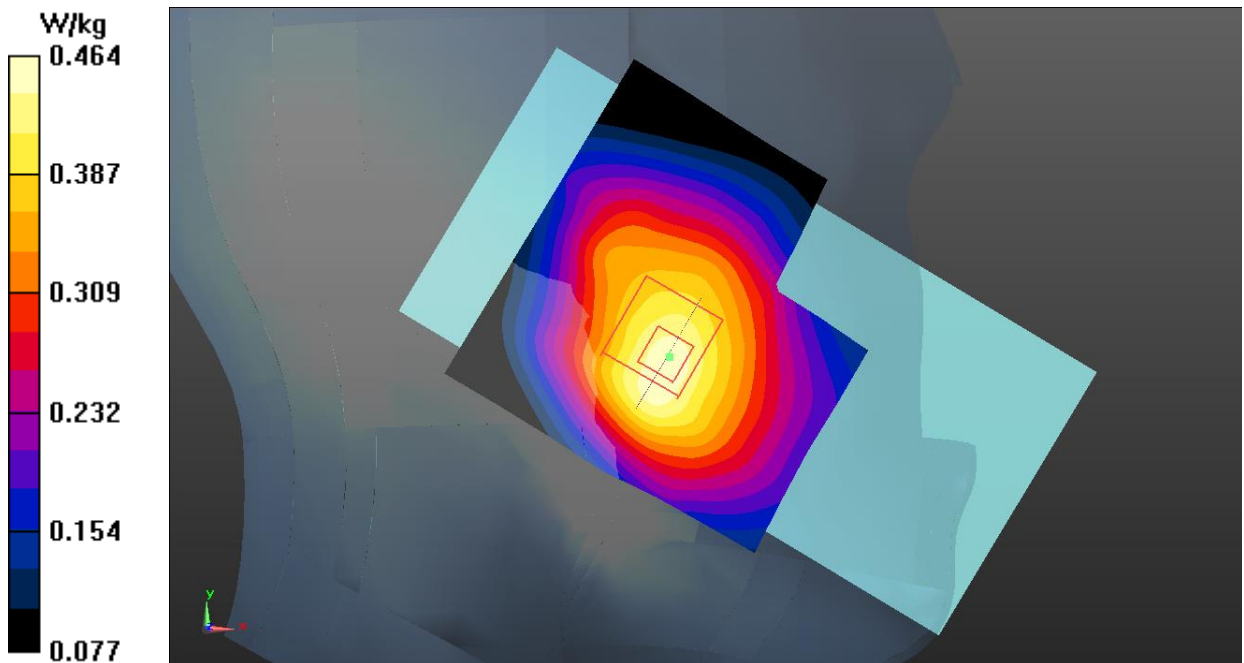


Fig.25 LTE Band 71 Head

**LTE Band 71 Body**

Date: 2022-12-22

Electronics: DAE4 Sn1527

Medium: Head 750MHz

Medium parameters used (extrapolated):  $f = 688$  MHz;  $\sigma = 0.853$  S/m;  $\epsilon_r = 42.195$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_FDD (0) Frequency: 688 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**Right Side High 1RB50/Area Scan (41x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 0.714 W/kg**Right Side High 1RB50/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.75 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.830 W/kg

**SAR(1 g) = 0.582 W/kg; SAR(10 g) = 0.405 W/kg**

Maximum value of SAR (measured) = 0.715 W/kg

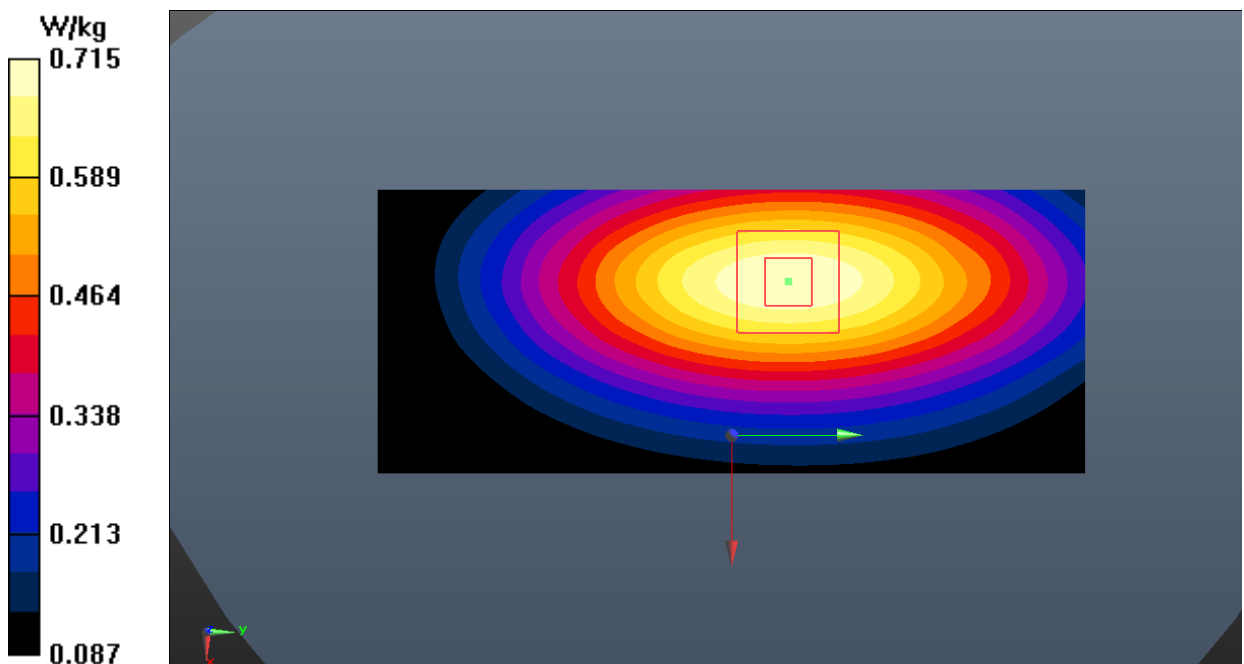


Fig.26 LTE Band 71 Body

**Bluetooth Head**

Date: 2022-12-24

Electronics: DAE4 Sn1527

Medium: Head 2450MHz

Medium parameters used:  $f = 2402$  MHz;  $\sigma = 1.788$  S/m;  $\epsilon_r = 38.569$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, BT (0) Frequency: 2402 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

**Left Cheek Ch.0/Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.220 W/kg

**Left Cheek Ch.0/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.813 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.274 W/kg

**SAR(1 g) = 0.125 W/kg; SAR(10 g) = 0.059 W/kg**

Maximum value of SAR (measured) = 0.191 W/kg

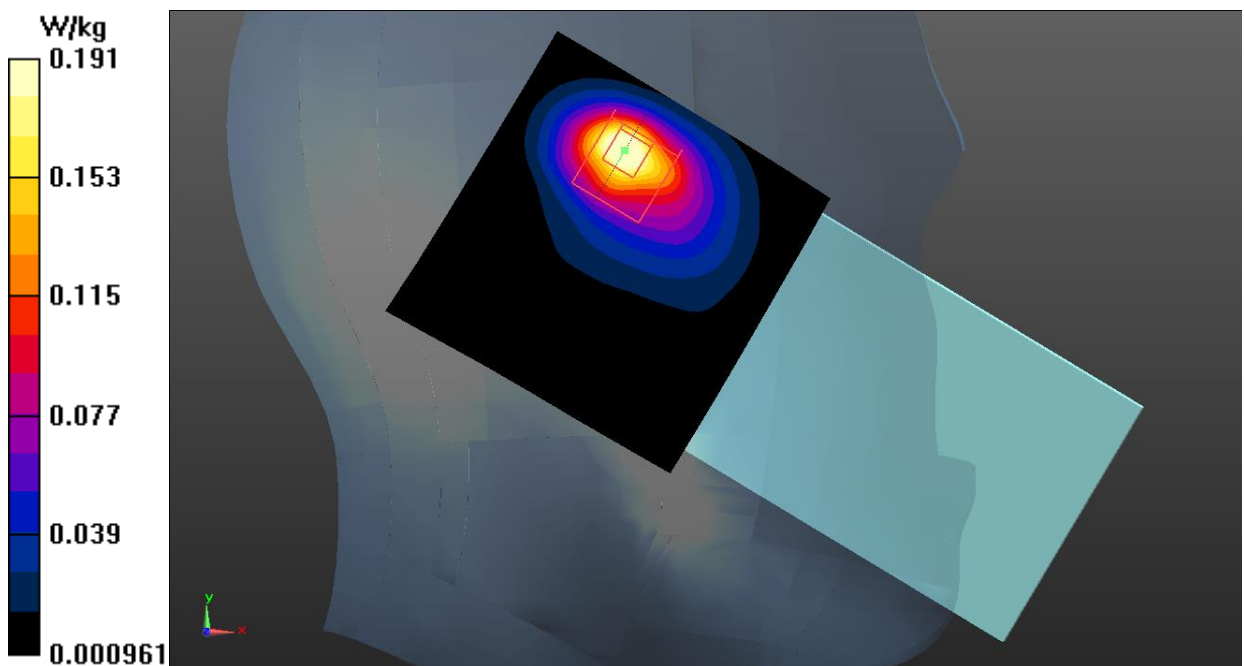


Fig.27 Bluetooth Head

**Bluetooth Body**

Date: 2022-12-24

Electronics: DAE4 Sn1527

Medium: Head 2450MHz

Medium parameters used:  $f = 2402$  MHz;  $\sigma = 1.788$  S/m;  $\epsilon_r = 38.569$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, BT (0) Frequency: 2402 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

**Top Side Ch.0/Area Scan (61x111x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.0847 W/kg

**Top Side Ch.0/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.150 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.115 W/kg

**SAR(1 g) = 0.054 W/kg; SAR(10 g) = 0.023 W/kg**

Maximum value of SAR (measured) = 0.0630 W/kg

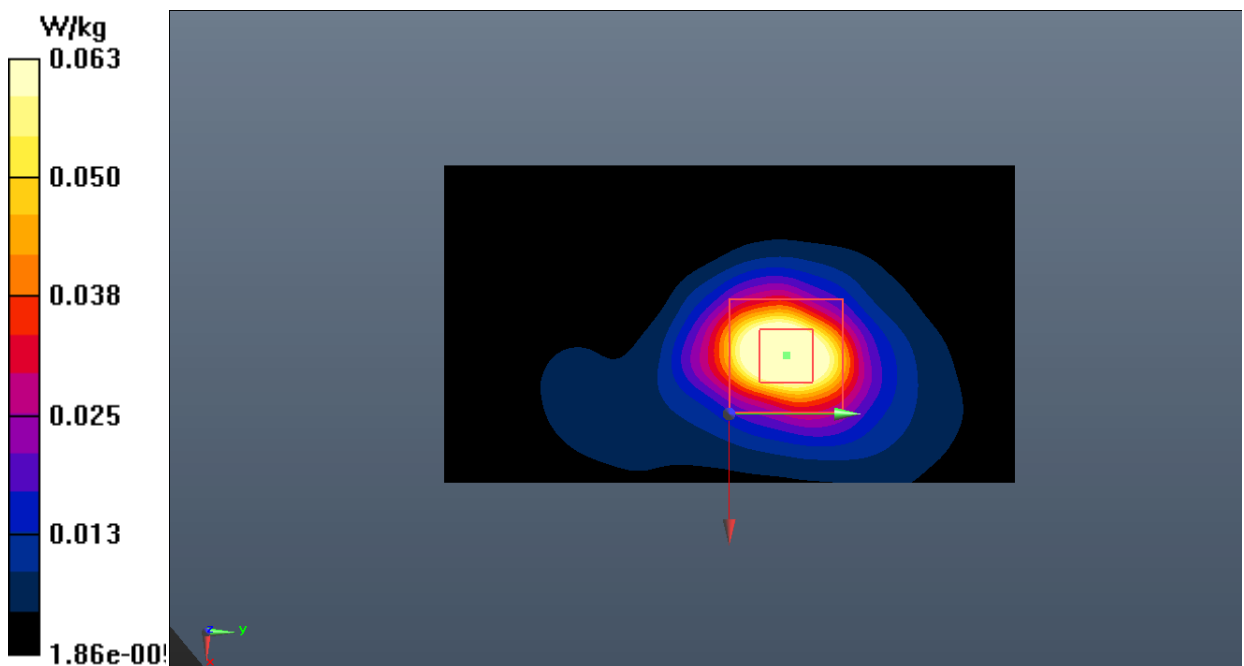


Fig.28 Bluetooth Body

**WLAN 2.4GHz Head**

Date: 2022-12-24

Electronics: DAE4 Sn1527

Medium: Head 2450MHz

Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 1.83$  S/m;  $\epsilon_r = 38.454$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, WLAN (0) Frequency: 2437 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

**Left Tilt Ch.6/Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.58 W/kg

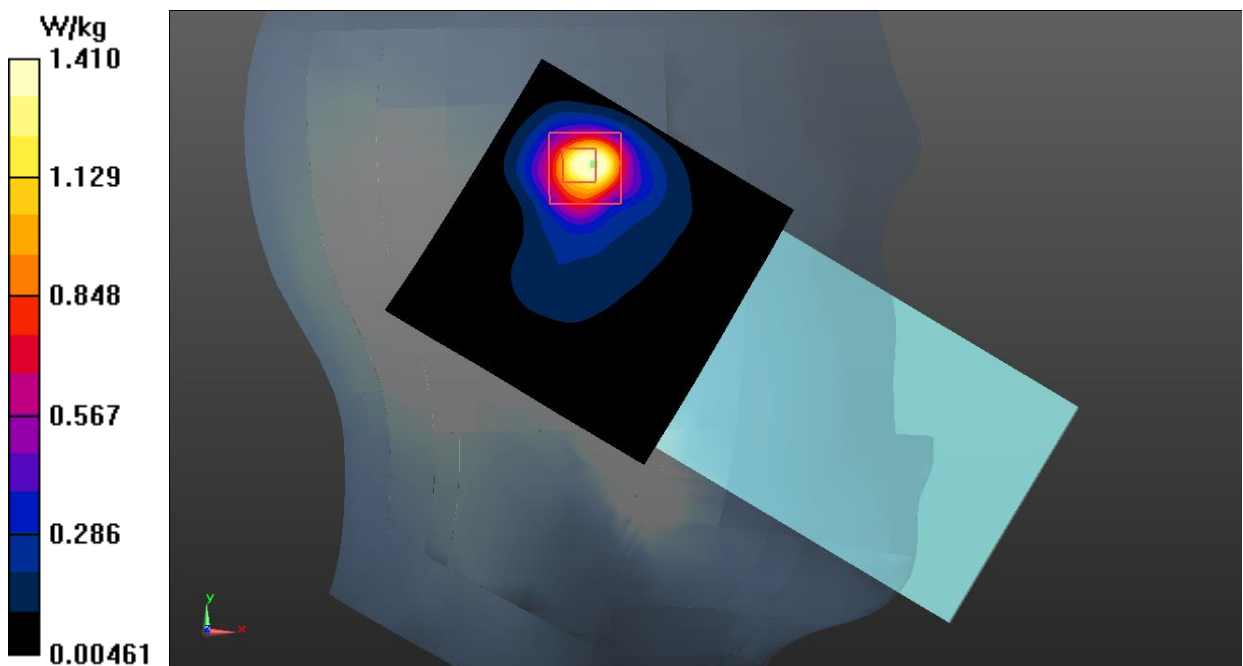
**Left Tilt Ch.6/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.511 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 2.16 W/kg

**SAR(1 g) = 0.935 W/kg; SAR(10 g) = 0.403 W/kg**

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



**Fig.29 WLAN 2.4GHz Head**



**WLAN 2.4GHz Body**

Date: 2022-12-24

Electronics: DAE4 Sn1527

Medium: Head 2450MHz

Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 1.83$  S/m;  $\epsilon_r = 38.454$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, WLAN (0) Frequency: 2437 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

**Top Side Ch.6/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 0.841 W/kg

**Top Side Ch.6/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.496 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.22 W/kg

**SAR(1 g) = 0.557 W/kg; SAR(10 g) = 0.241 W/kg**

Maximum value of SAR (measured) = 0.878 W/kg

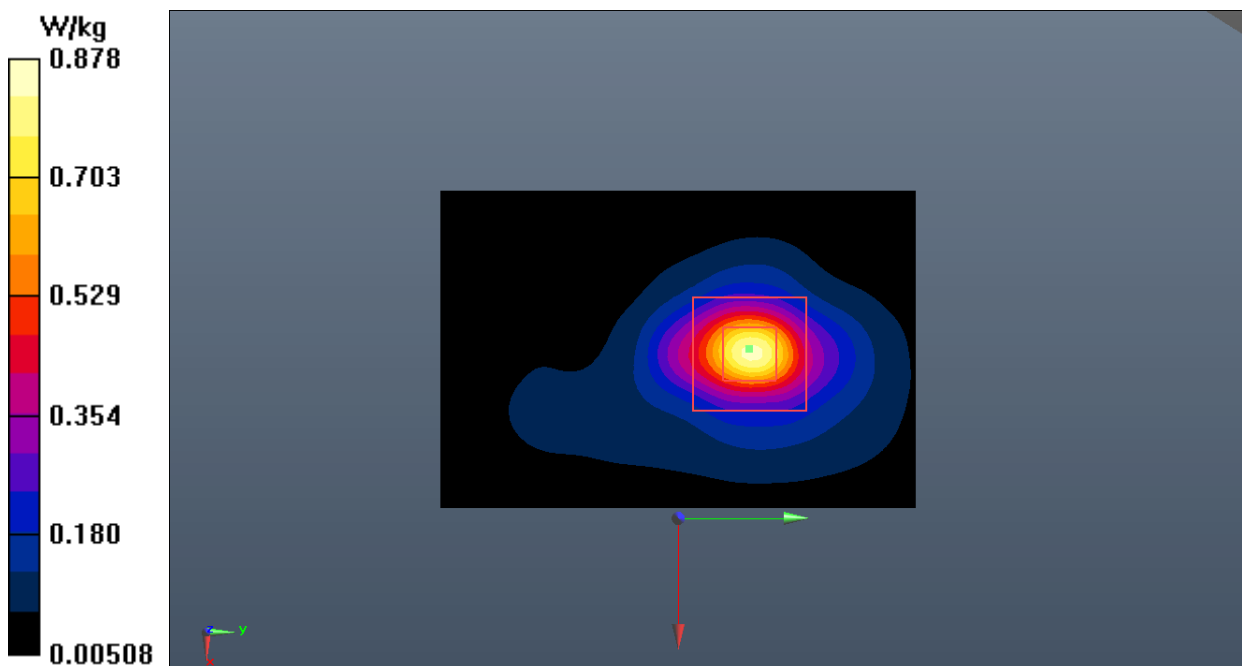


Fig.30 WLAN 2.4GHz Body

**WLAN 5GHz Head**

Date: 2023-1-19

Electronics: DAE4 Sn1527

Medium: Head 5750MHz

Medium parameters used (interpolated):  $f = 5775$  MHz;  $\sigma = 5.17$  S/m;  $\epsilon_r = 34.496$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, WLAN 5G (0) Frequency: 5775 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (5.40, 5.40, 5.40)

**Left Cheek Ch.155/Area Scan (91x91x1):** Interpolated grid:  $dx=1.000$  mm,  $dy=1.000$  mm  
Maximum value of SAR (interpolated) = 1.25 W/kg**Left Cheek Ch.155/Zoom Scan (8x8x21)/Cube 0:** Measurement grid:  $dx=4$ mm,  $dy=4$ mm,  
 $dz=1.4$ mm

Reference Value = 2.359 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 3.28 W/kg

**SAR(1 g) = 0.693 W/kg; SAR(10 g) = 0.257 W/kg**

Maximum value of SAR (measured) = 1.32 W/kg

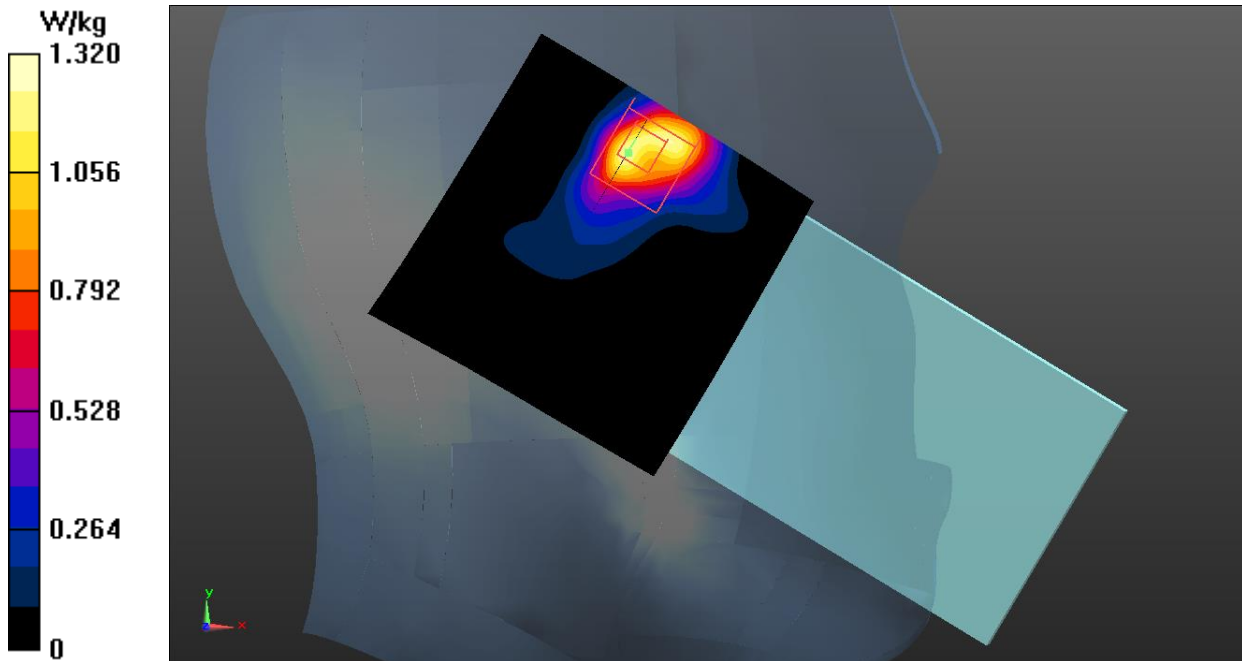


Fig.31 WLAN 5GHz Head

**WLAN 5GHz Body**

Date: 2023-1-19

Electronics: DAE4 Sn1527

Medium: Head 5250MHz

Medium parameters used (interpolated):  $f = 5210$  MHz;  $\sigma = 4.701$  S/m;  $\epsilon_r = 35.277$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, WLAN 5G (0) Frequency: 5210 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (5.98, 5.98, 5.98)

**Rear Side Ch.42/Area Scan (91x91x1):** Interpolated grid:  $dx=1.000$  mm,  $dy=1.000$  mm

Maximum value of SAR (interpolated) = 0.785 W/kg

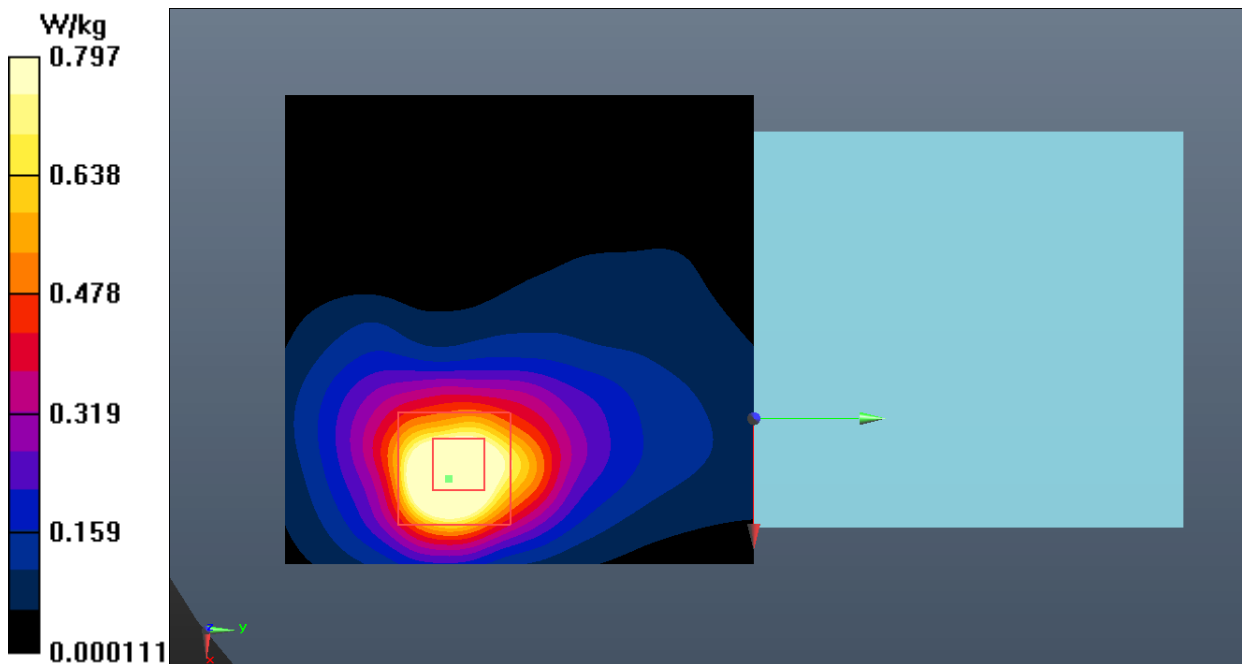
**Rear Side Ch.42/Zoom Scan (8x8x21)/Cube 0:** Measurement grid:  $dx=4$ mm,  $dy=4$ mm,  $dz=1.4$ mm

Reference Value = 1.829 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 4.27 W/kg

**SAR(1 g) = 0.875 W/kg; SAR(10 g) = 0.267 W/kg**

Maximum value of SAR (measured) = 0.797 W/kg



**Fig.32 WLAN 5GHz Body**

**WCDMA Band 2 Extremity**

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used (interpolated):  $f = 1852.4$  MHz;  $\sigma = 1.38$  S/m;  $\epsilon_r = 39.678$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, WCDMA (0) Frequency: 1852.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

**Bottom Side Low/Area Scan (41x71x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm

Maximum value of SAR (interpolated) = 8.86 W/kg

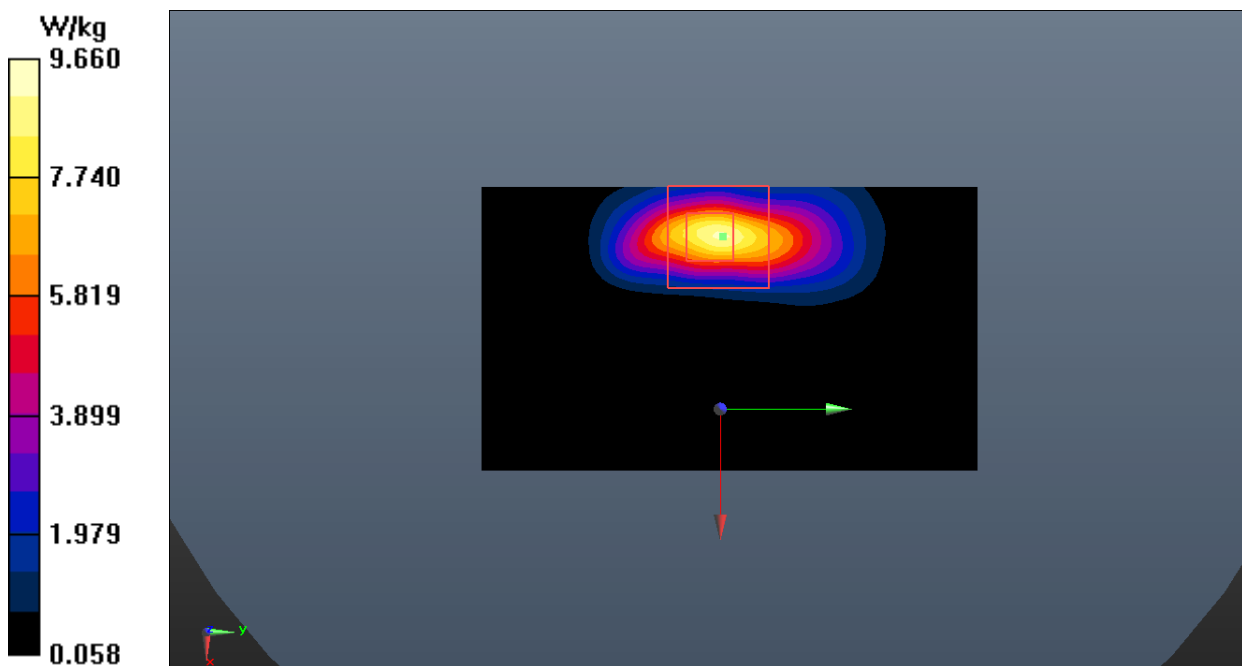
**Bottom Side Low/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 6.535 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 13.1 W/kg

**SAR(1 g) = 5.79 W/kg; SAR(10 g) = 2.48 W/kg**

Maximum value of SAR (measured) = 9.66 W/kg

**Fig.33 WCDMA Band 2 Extremity**

**WCDMA Band 4 Extremity**

Date: 2022-12-17

Electronics: DAE4 Sn1527

Medium: Head 1750MHz

Medium parameters used (interpolated):  $f = 1712.4$  MHz;  $\sigma = 1.327$  S/m;  $\epsilon_r = 40.706$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, WCDMA (0) Frequency: 1712.4 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

**Bottom Side Low/Area Scan (41x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 7.63 W/kg

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

Reference Value = 8.034 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 12.8 W/kg

**SAR(1 g) = 5.60 W/kg; SAR(10 g) = 2.45 W/kg**

Maximum value of SAR (measured) = 9.61 W/kg

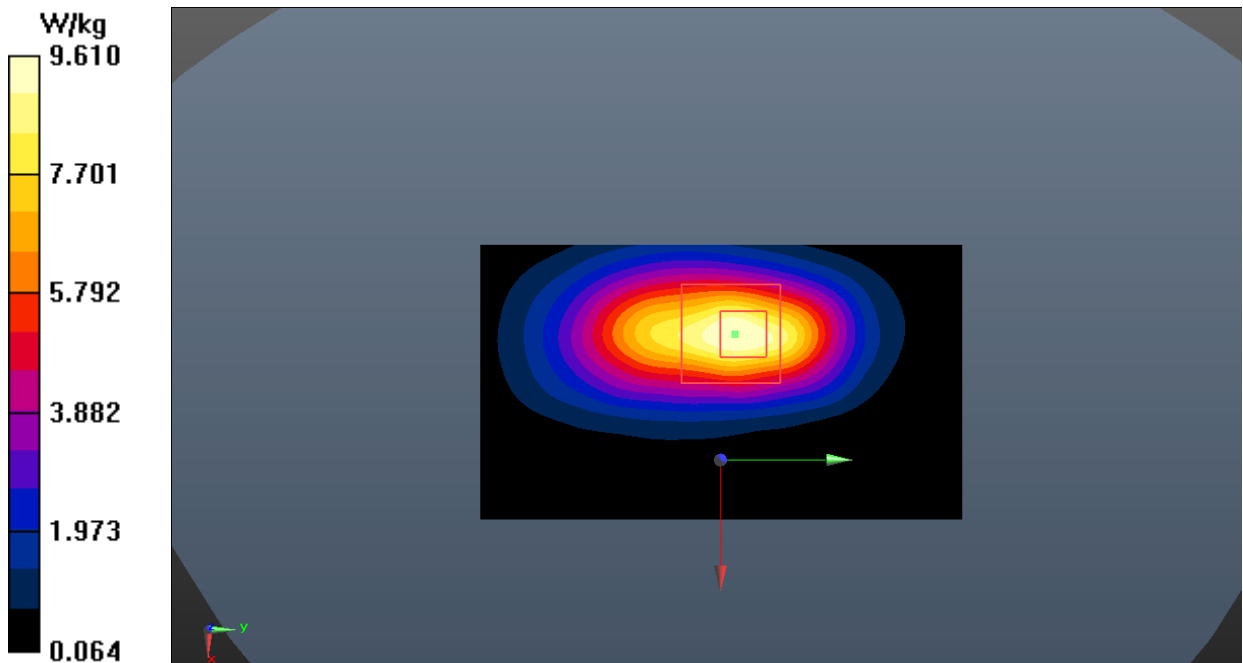


Fig.34 WCDMA Band 4 Extremity

**LTE Band 25 Extremity**

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used:  $f = 1860$  MHz;  $\sigma = 1.387$  S/m;  $\epsilon_r = 39.648$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_FDD (0) Frequency: 1860 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

**Bottom Side Low 1RB50/Area Scan (41x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 8.07 W/kg

**Bottom Side Low 1RB50/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.472 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 11.3 W/kg

**SAR(1 g) = 5.00 W/kg; SAR(10 g) = 2.14 W/kg**

Maximum value of SAR (measured) = 8.49 W/kg

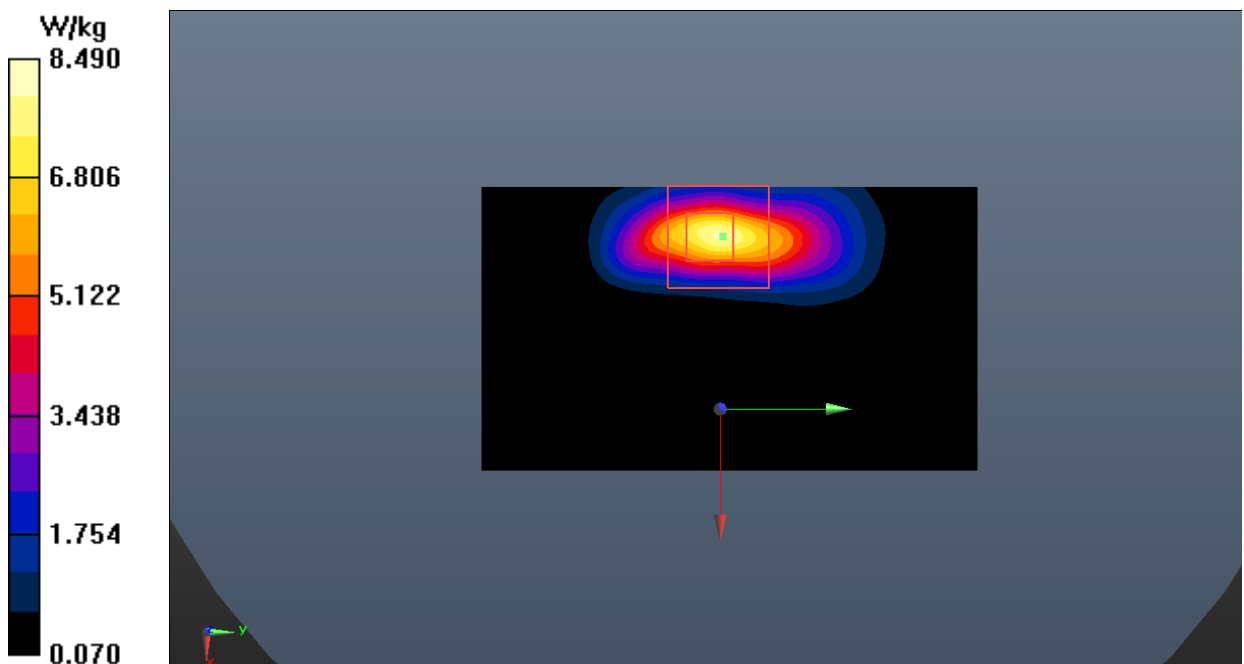


Fig.35 LTE Band 25 Extremity

**LTE Band 41 PC3 Extremity**

Date: 2023-1-20

Electronics: DAE4 Sn1527

Medium: Head 2550MHz

Medium parameters used:  $f = 2680$  MHz;  $\sigma = 2.09$  S/m;  $\epsilon_r = 37.682$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE\_TDD (0) Frequency: 2680 MHz Duty Cycle: 1:1.58

Probe: EX3DV4 - SN7621 ConvF (7.93, 7.93, 7.93)

**Bottom Side High 1RB50/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
 Maximum value of SAR (interpolated) = 7.67 W/kg

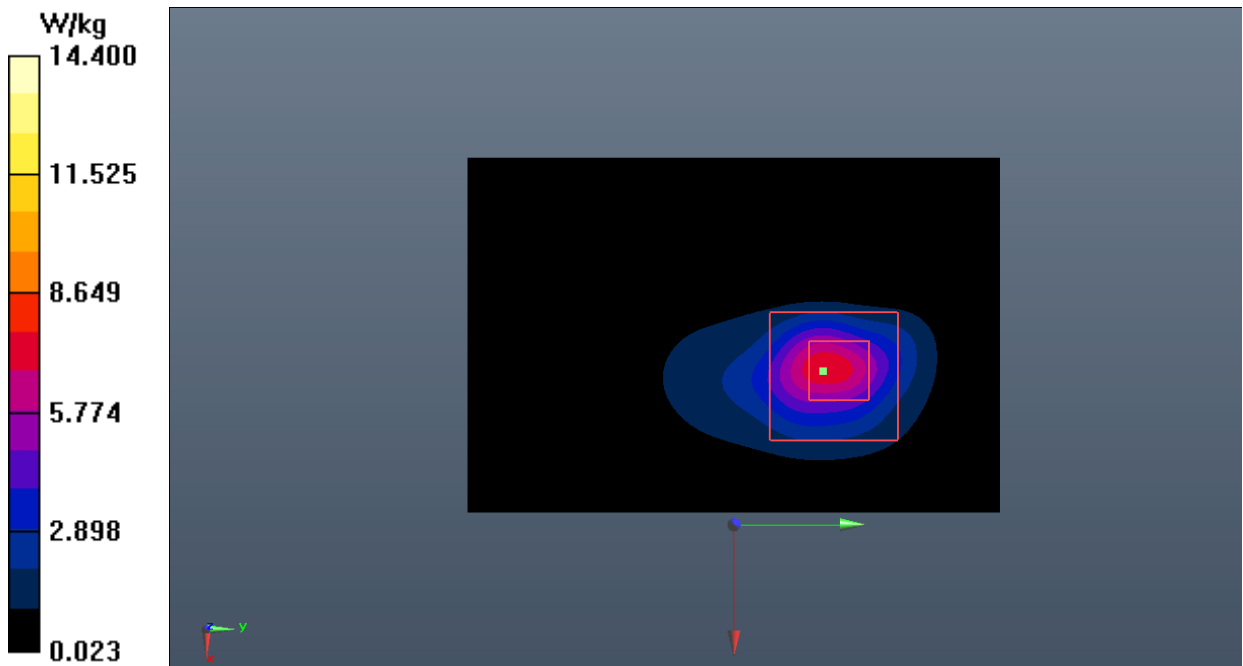
**Bottom Side High 1RB50/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 24.74 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 19.9 W/kg

**SAR(1 g) = 7.69 W/kg; SAR(10 g) = 2.62 W/kg**

Maximum value of SAR (measured) = 14.4 W/kg



**Fig.36 LTE Band 41 Extremity**

**LTE Band 41 PC2 Extremity**

Date: 2023-1-20

Electronics: DAE4 Sn1527

Medium: Head 2550MHz

Medium parameters used:  $f = 2550$  MHz;  $\sigma = 1.937$  S/m;  $\epsilon_r = 38.111$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, LTE TDD (0) Frequency: 2549.5 MHz Duty Cycle: 1:2.31

Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

**Bottom Side M-Low 50RB25/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 15.1 W/kg

**Bottom Side M-Low 50RB25/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 59.77 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 23.2 W/kg

**SAR(1 g) = 8.13 W/kg; SAR(10 g) = 2.70 W/kg**

Maximum value of SAR (measured) = 15.9 W/kg

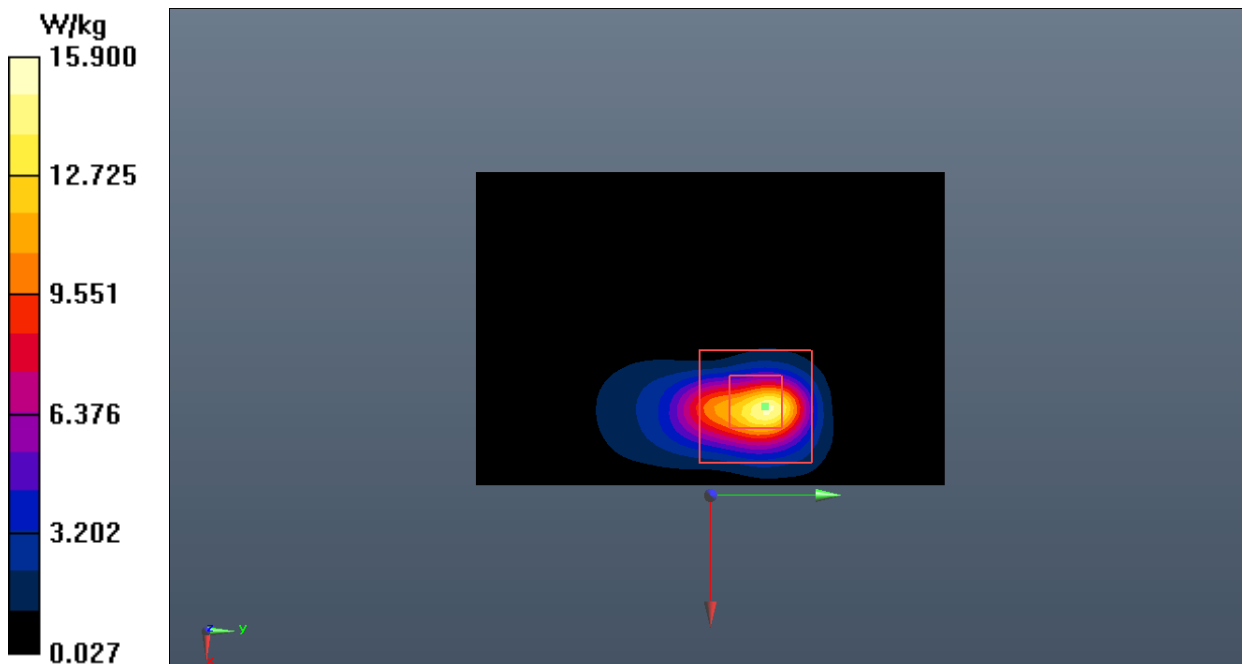


Fig.37 LTE Band 41 Extremity



**LTE Band 66 Extremity**

Date: 2022-12-17

Electronics: DAE4 Sn1527

Medium: Head 1750MHz

Medium parameters used:  $f = 1720 \text{ MHz}$ ;  $\sigma = 1.334 \text{ S/m}$ ;  $\epsilon_r = 40.676$ ;  $\rho = 1000 \text{ kg/m}^3$

Communication System: UID 0, LTE\_FDD (0) Frequency: 1720 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

**Bottom Side Low 1RB50/Area Scan (41x71x1):** Interpolated grid:  $dx=1.500 \text{ mm}$ ,  $dy=1.500 \text{ mm}$   
 Maximum value of SAR (interpolated) = 8.90 W/kg

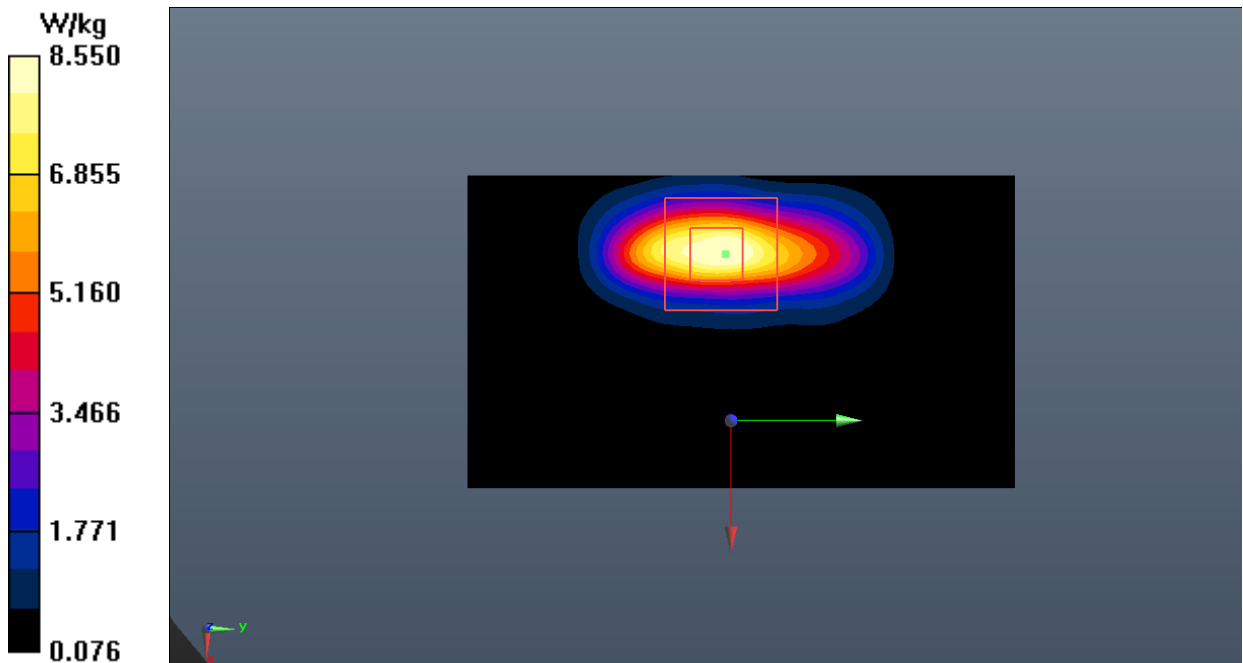
**Bottom Side Low 1RB50/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 21.80 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 11.4 W/kg

**SAR(1 g) = 5.08 W/kg; SAR(10 g) = 2.22 W/kg**

Maximum value of SAR (measured) = 8.55 W/kg



**Fig.38 LTE Band 66 Extremity**

**WLAN 5GHz Extremity**

Date: 2023-1-19

Electronics: DAE4 Sn1527

Medium: Head 5250MHz

Medium parameters used (interpolated):  $f = 5290$  MHz;  $\sigma = 4.809$  S/m;  $\epsilon_r = 35.061$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: UID 0, WLAN 5G (0) Frequency: 5290 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (5.98, 5.98, 5.98)

**Rear Side Ch.58/Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 19.7 W/kg

**Rear Side Ch.58/Zoom Scan (8x8x21)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 0.7380 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 25.8 W/kg

**SAR(1 g) = 7.08 W/kg; SAR(10 g) = 1.50 W/kg**

Maximum value of SAR (measured) = 9.86 W/kg

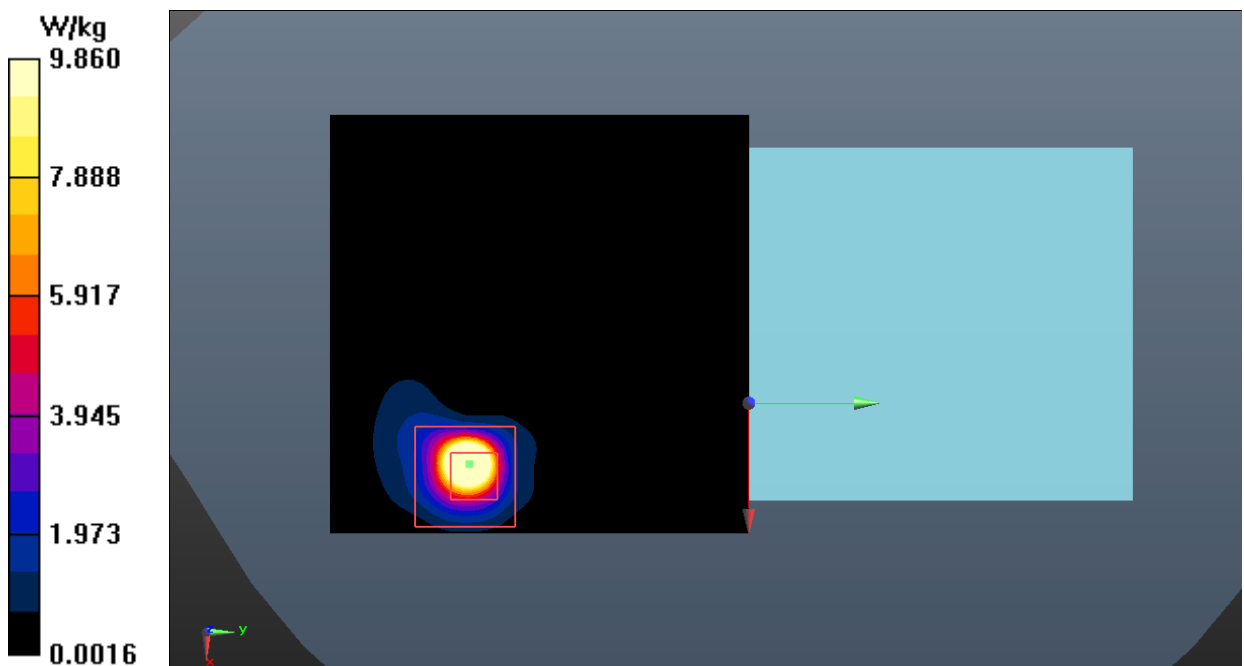


Fig.39 WLAN 5GHz Extremity

## ANNEX B: SystemVerification Results

### 750MHz

Date: 2022-12-22

Electronics: DAE4 Sn1527

Medium: Head 750MHz

Medium parameters used:  $f = 750 \text{ MHz}$ ;  $\sigma = 0.893 \text{ S/m}$ ;  $\epsilon_r = 41.451$ ;  $\rho = 1000 \text{ kg/m}^3$

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

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**System Validation/Area Scan (81x161x1):** Interpolated grid:  $dx=1.000 \text{ mm}$ ,  $dy=1.000 \text{ mm}$

Reference Value = 60.149 V/m; Power Drift = -0.06 dB

**SAR(1 g) = 2.09 W/kg; SAR(10 g) = 1.40 W/kg**

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

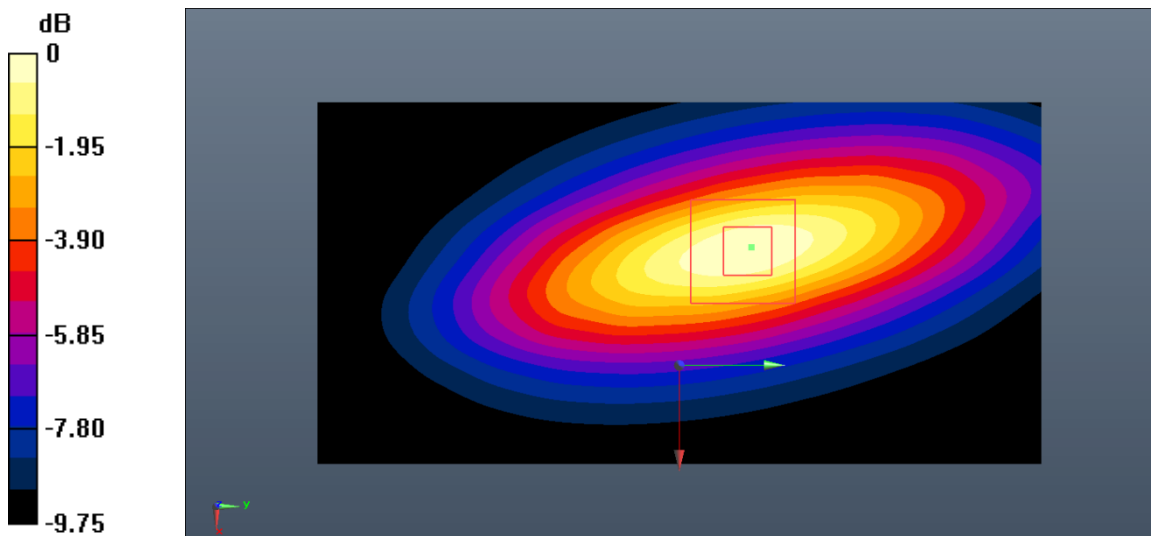
**System Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 60.149 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 3.08 W/kg

**SAR(1 g) = 2.05 W/kg; SAR(10 g) = 1.37 W/kg**

Maximum value of SAR (measured) = 2.71 W/kg



0 dB = 2.71 W/kg = 4.33 dB W/kg

**Fig.B.1. Validation 750MHz 250mW**

**835MHz**

Date: 2022-12-13

Electronics: DAE4 Sn1527

Medium: Head 835MHz

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.928 \text{ S/m}$ ;  $\epsilon_r = 40.736$ ;  $\rho = 1000 \text{ kg/m}^3$

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

Probe: EX3DV4 - SN7621 ConvF (11.12, 11.12, 11.12)

**System Validation/Area Scan (91x161x1):** Interpolated grid:  $dx=1.000 \text{ mm}$ ,  $dy=1.000 \text{ mm}$

Reference Value = 63.745 V/m; Power Drift = 0.06 dB

**SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.60 W/kg**

Maximum value of SAR (interpolated) = 3.66 W/kg

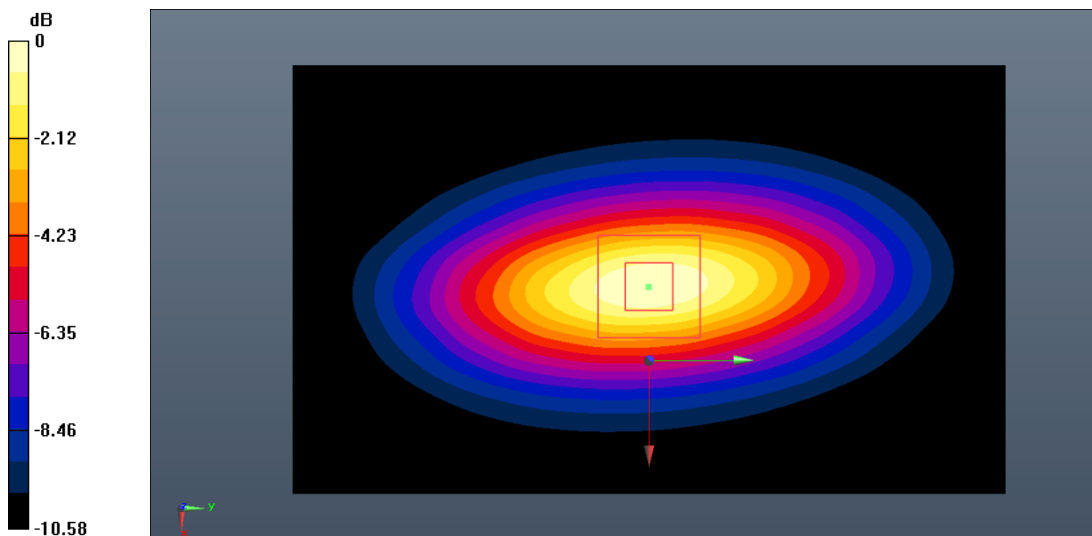
**System Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 63.745 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 4.39 W/kg

**SAR(1 g) = 2.52 W/kg; SAR(10 g) = 1.63 W/kg**

Maximum value of SAR (measured) = 3.69 W/kg



0 dB = 3.69 W/kg = 5.67 dB W/kg

**Fig.B.2. Validation 835MHz 250mW**

**1750MHz**

Date: 2022-12-17

Electronics: DAE4 Sn1527

Medium: Head 1750MHz

Medium parameters used:  $f = 1750 \text{ MHz}$ ;  $\sigma = 1.36 \text{ S/m}$ ;  $\epsilon_r = 40.559$ ;  $\rho = 1000 \text{ kg/m}^3$

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

Probe: EX3DV4 - SN7621 ConvF (9.22, 9.22, 9.22)

**System Validation/Area Scan (81x121x1):** Interpolated grid:  $dx=1.000 \text{ mm}$ ,  $dy=1.000 \text{ mm}$

Reference Value = 79.364 V/m; Power Drift = -0.08 dB

**SAR(1 g) = 8.94 W/kg; SAR(10 g) = 4.86 W/kg**

Maximum value of SAR (interpolated) = 11.0 W/kg

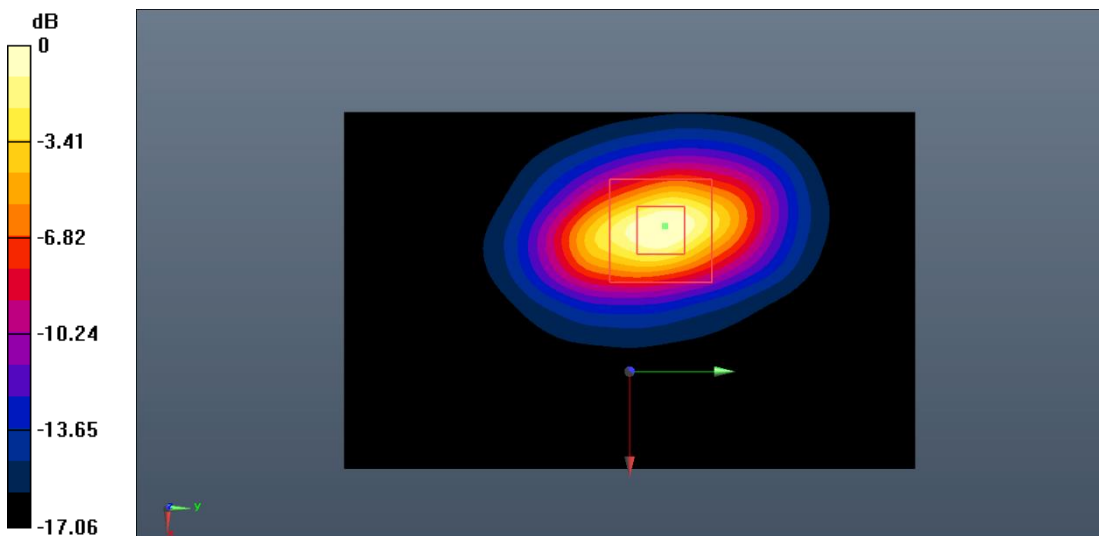
**System Validation/Zoom Scan (7x7x7)/Cube0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 79.364 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 21.3 W/kg

**SAR(1 g) = 8.77 W/kg; SAR(10 g) = 4.79 W/kg**

Maximum value of SAR (measured) = 10.8 W/kg



0 dB = 10.8 W/kg = 10.33 dB W/kg

**Fig.B.3. Validation 1750MHz 250mW**

**1900MHz**

Date: 2022-12-18

Electronics: DAE4 Sn1527

Medium: Head 1900MHz

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.422$  S/m;  $\epsilon_r = 39.492$ ;  $\rho = 1000$  kg/m<sup>3</sup>

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

Probe: EX3DV4 - SN7621 ConvF (8.90, 8.90, 8.90)

**System Validation/Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 81.795 V/m; Power Drift = 0.13 dB

**SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.15 W/kg**

Maximum value of SAR (interpolated) = 12.1 W/kg

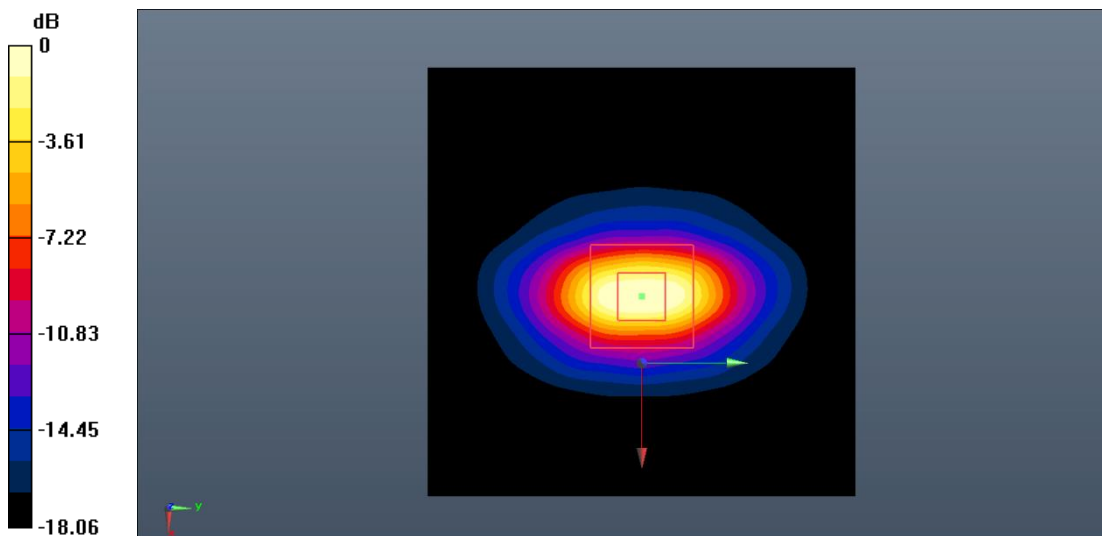
**System Validation/Zoom Scan (7x7x7)/Cube0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 81.795 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 25.8 W/kg

**SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.24 W/kg**

Maximum value of SAR (measured) = 12.3 W/kg



0 dB = 12.3 W/kg = 10.90 dB W/kg

**Fig.B.4. Validation 1900MHz 250mW**

**2450MHz**

Date: 2022-12-24

Electronics: DAE4 Sn1527

Medium: Head 2450MHz

Medium parameters used:  $f = 2450 \text{ MHz}$ ;  $\sigma = 1.845 \text{ S/m}$ ;  $\epsilon_r = 38.411$ ;  $\rho = 1000 \text{ kg/m}^3$

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

Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

**System Validation/Area Scan (81x121x1):** Interpolated grid:  $dx=1.000 \text{ mm}$ ,  $dy=1.000 \text{ mm}$

Reference Value = 92.146 V/m; Power Drift = 0.05 dB

**SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.10 W/kg**

Maximum value of SAR (interpolated) = 15.5 W/kg

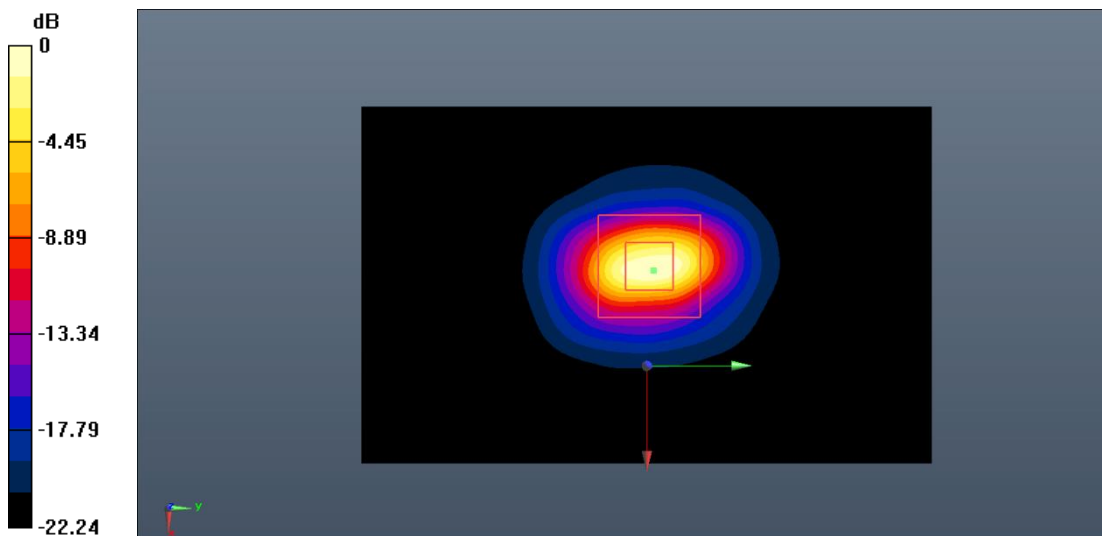
**System Validation/Zoom Scan (7x7x7)/Cube0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 92.146 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 36.5 W/kg

**SAR(1 g) = 13.9 W/kg; SAR(10 g) = 6.23 W/kg**

Maximum value of SAR (measured) = 15.8 W/kg



0 dB = 15.8 W/kg = 11.99 dB W/kg

**Fig.B.5. Validation 2450MHz 250mW**

**2550MHz**

Date: 2023-1-20

Electronics: DAE4 Sn1527

Medium: Head 2550MHz

Medium parameters used:  $f = 2550 \text{ MHz}$ ;  $\sigma = 1.937 \text{ S/m}$ ;  $\epsilon_r = 38.111$ ;  $\rho = 1000 \text{ kg/m}^3$

Communication System: CW\_TMC Frequency: 2550 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (8.17, 8.17, 8.17)

**System Validation/Area Scan (91x91x1):** Interpolated grid:  $dx=1.000 \text{ mm}$ ,  $dy=1.000 \text{ mm}$

Reference Value = 94.456 V/m; Power Drift = 0.13 dB

**SAR(1 g) = 14.1 W/kg; SAR(10 g) = 6.31 W/kg**

Maximum value of SAR (interpolated) = 16.0 W/kg

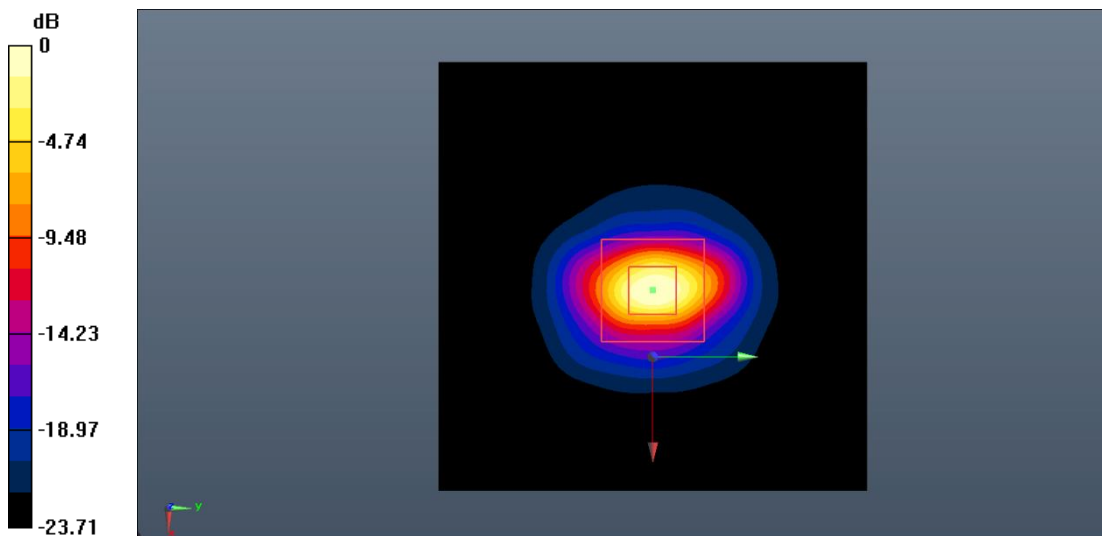
**System Validation/Zoom Scan (7x7x7)/Cube0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 94.456 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 30.9 W/kg

**SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.38 W/kg**

Maximum value of SAR (measured) = 16.3 W/kg



0 dB = 16.3 W/kg = 12.12 dB W/kg

**Fig.B.6. Validation 2550MHz 250mW**



**5250MHz**

Date: 2023-1-19

Electronics: DAE4 Sn1527

Medium: Head 5250MHz

Medium parameters used:  $f = 5250 \text{ MHz}$ ;  $\sigma = 4.755 \text{ S/m}$ ;  $\epsilon_r = 35.169$ ;  $\rho = 1000 \text{ kg/m}^3$

Communication System: CW\_TMC Frequency: 5250 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (5.98, 5.98, 5.98)

**System Validation/Area Scan (61x91x1):** Interpolated grid:  $dx=1.000 \text{ mm}$ ,  $dy=1.000 \text{ mm}$

Reference Value = 68.347 V/m; Power Drift = 0.07 dB

**SAR(1 g) = 8.14 W/kg; SAR(10 g) = 2.28 W/kg**

Maximum value of SAR (interpolated) = 10.2 W/kg

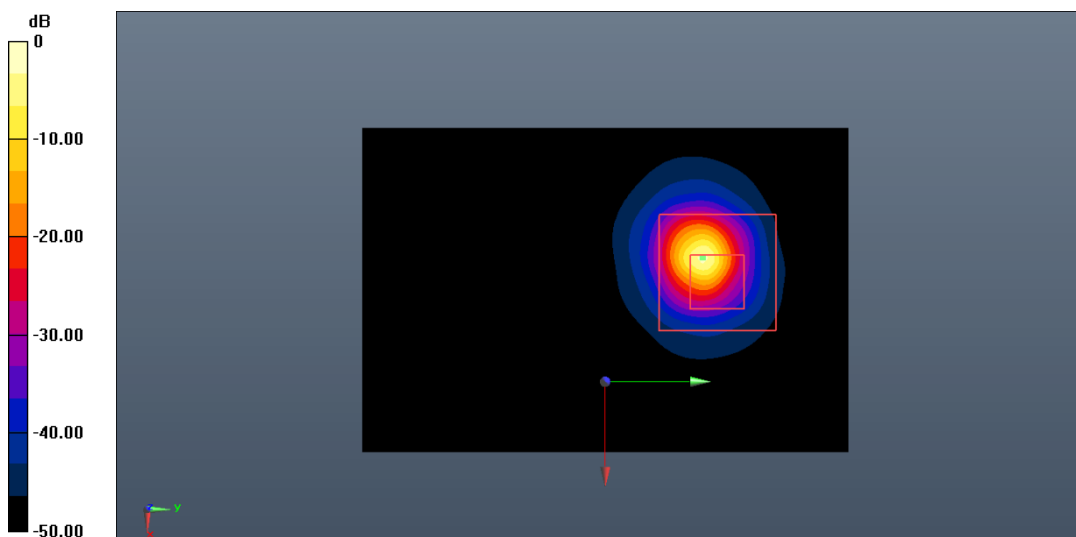
**System Validation/Zoom Scan (8x8x21)/Cube0:** Measurement grid:  $dx=4\text{mm}$ ,  $dy=4\text{mm}$ ,  $dz=1.4\text{mm}$

Reference Value = 68.347 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 27.7 W/kg

**SAR(1 g) = 8.25 W/kg; SAR(10 g) = 2.33 W/kg**

Maximum value of SAR (measured) = 10.4 W/kg



0 dB = 10.4 W/kg = 10.17 dB W/kg

**Fig.B.7. Validation 5250MHz 100mW**

**5600MHz**

Date: 2023-1-19

Electronics: DAE4 Sn1527

Medium: Head 5600MHz

Medium parameters used:  $f = 5600$  MHz;  $\sigma = 5.168$  S/m;  $\epsilon_r = 34.844$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: CW\_TMC Frequency: 5600 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (5.47, 5.47, 5.47)

**System Validation/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 69.254 V/m; Power Drift = 0.12 dB

**SAR(1 g) = 8.47 W/kg; SAR(10 g) = 2.39 W/kg**

Maximum value of SAR (interpolated) = 10.3 W/kg

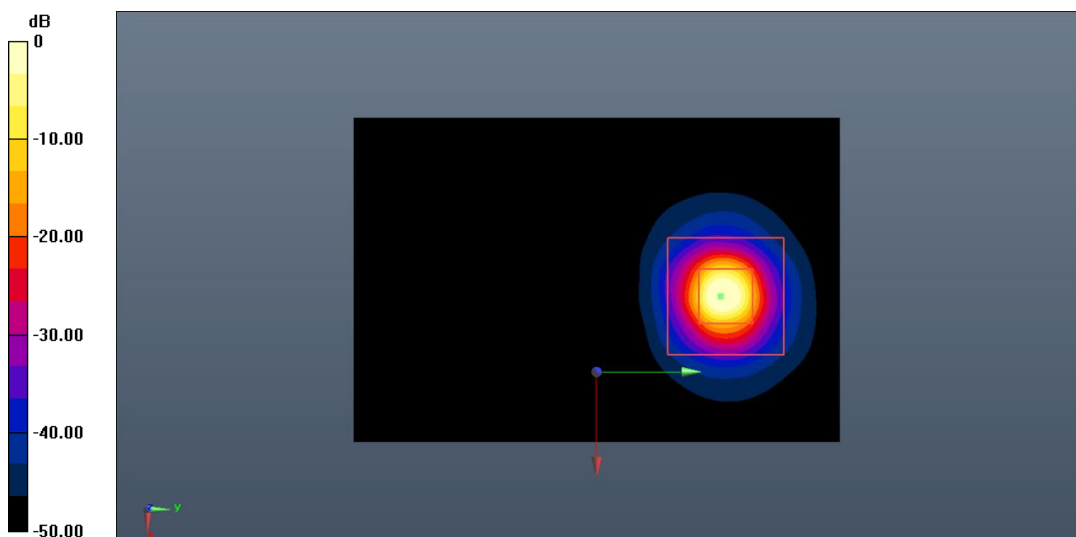
**System Validation/Zoom Scan (8x8x21)/Cube0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 69.254 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 29.3 W/kg

**SAR(1 g) = 8.65 W/kg; SAR(10 g) = 2.45 W/kg**

Maximum value of SAR (measured) = 10.5 W/kg



0 dB = 10.5 W/kg = 10.21 dB W/kg

**Fig.B.8. Validation 5600MHz 100mW**

**5750MHz**

Date: 2023-1-19

Electronics: DAE4 Sn1527

Medium: Head 5750MHz

Medium parameters used:  $f = 5750$  MHz;  $\sigma = 5.136$  S/m;  $\epsilon_r = 34.563$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Communication System: CW\_TMC Frequency: 5750 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7621 ConvF (5.40, 5.40, 5.40)

**System Validation/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 64.454 V/m; Power Drift = -0.03 dB

**SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.21 W/kg**

Maximum value of SAR (interpolated) = 9.81 W/kg

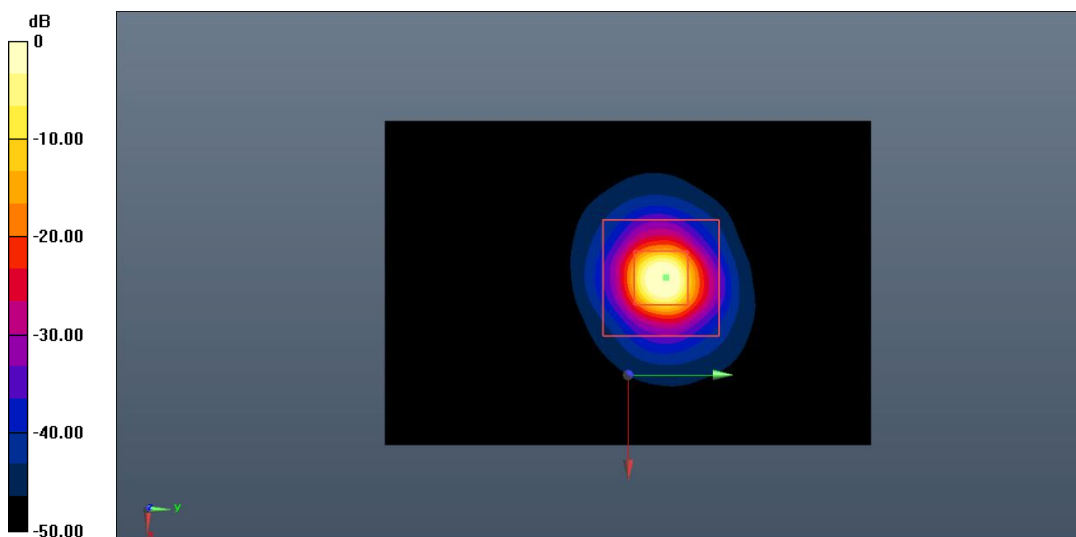
**System Validation/Zoom Scan (8x8x21)/Cube0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 64.454 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 24.4 W/kg

**SAR(1 g) = 7.63 W/kg; SAR(10 g) = 2.17 W/kg**

Maximum value of SAR (measured) = 9.77 W/kg



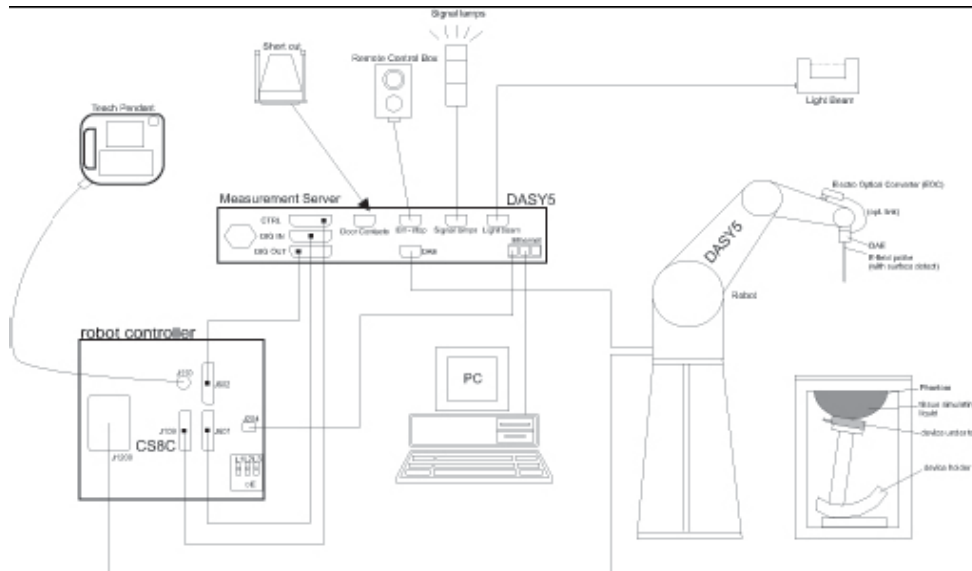
0 dB = 9.77 W/kg = 9.90 dB W/kg

**Fig.B.9. Validation 5750MHz 100mW**

## ANNEX C: SAR Measurement Setup

### C.1. Measurement Set-up

DASY5 system for performing compliance tests is illustrated above graphically. This system consists of the following items:



Picture C.1 SAR Lab Test Measurement Set-up

- A standard high precision 6-axis robot (Stäubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as
- warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

## C.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY5 software reads the reflection during a software approach and looks for the maximum using 2<sup>nd</sup> order curve fitting. The approach is stopped at reaching the maximum.

### Probe Specifications:

<b>Model:</b>	ES3DV3, EX3DV4
<b>Frequency</b>	10MHz — 6.0GHz(EX3DV4)
<b>Range:</b>	10MHz — 4GHz(ES3DV3)
<b>Calibration:</b>	In head and body simulating tissue at Frequencies from 835 up to 5800MHz
<b>Linearity:</b>	± 0.2 dB(30 MHz to 6 GHz) for EX3DV4 ± 0.2 dB(30 MHz to 4 GHz) for ES3DV3
<b>Dynamic Range:</b>	10 mW/kg — 100W/kg
<b>Probe Length:</b>	330 mm
<b>Probe Tip</b>	
<b>Length:</b>	20 mm
<b>Body Diameter:</b>	12 mm
<b>Tip Diameter:</b>	2.5 mm (3.9 mm for ES3DV3)
<b>Tip-Center:</b>	1 mm (2.0mm for ES3DV3)
<b>Application:</b>	SAR Dosimetry Testing Compliance tests of mobile phones Dosimetry in strong gradient fields



Picture C.2 Near-field Probe



Picture C.3 E-field Probe

### C.3. E-field Probe Calibration

Each E-Probe/Probe Amplifier combination has unique calibration parameters. A TEM cell calibration procedure is conducted to determine the proper amplifier settings to enter in the probe parameters. The amplifier settings are determined for a given frequency by subjecting the probe to a known E-field density (1 mW/cm<sup>2</sup>) using an RF Signal generator, TEM cell, and RF Power Meter.

The free space E-field from amplified probe outputs is determined in a test chamber. This calibration can be performed in a TEM cell if the frequency is below 1 GHz and in a waveguide or other methodologies above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees until the three channels show the maximum reading. The power density readings equate to 1 mW/cm<sup>2</sup>.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The E-field in the medium correlates with the temperature rise in the dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C \frac{\Delta T}{\Delta t}$$

Where:

$\Delta t$  = Exposure time (30 seconds),

C = Heat capacity of tissue (brain or muscle),

$\Delta T$  = Temperature increase due to RF exposure.

$$SAR = \frac{|E|^2 \cdot \sigma}{\rho}$$

Where:

$\sigma$  = Simulated tissue conductivity,

$\rho$  = Tissue density (kg/m<sup>3</sup>).

## C.4. Other Test Equipment

### C.4.1. Data Acquisition Electronics (DAE)

The data acquisition electronics consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.



PictureC.4: DAE

### C.4.2. Robot

The SPEAG DASY system uses the high precision robots (DASY5: RX160L) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchron motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)



Picture C.5 DASY 5

### C.4.3. Measurement Server

The Measurement server is based on a PC/104 CPU board with CPU (DASY5: 400 MHz, Intel Celeron), chipdisk (DASY5:128MB), RAM (DASY5:128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY I/O board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.



Picture C.6 Server for DASY 5

### C.4.4. Device Holder for Phantom

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source at 5mm distance, a positioning uncertainty of  $\pm 0.5\text{mm}$  would produce a SAR uncertainty of  $\pm 20\%$ . Accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards.

The DASY device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-loss POM material having the following dielectric

parameters: relative permittivity  $\epsilon = 3$  and loss tangent  $\delta = 0.02$ . The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

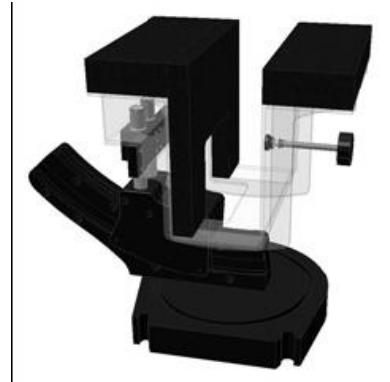
<Laptop Extension Kit>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin-SAM and ELI phantoms.





**Picture C.7-1: Device Holder**



**Picture C.7-2: Laptop Extension Kit**

#### **C.4.5. Phantom**

The SAM Twin Phantom V4.0 is constructed of a fiberglass shell integrated in a table. The shape of the shell is based on data from an anatomical study designed to represent the 90<sup>th</sup> percentile of the population. The phantom enables the dissymmetric evaluation of SAR for both left and right handed handset usage, as well as body-worn usage using the flat phantom region. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot. The shell phantom has a 2mm shell thickness (except the ear region where shell thickness increases to 6 mm).

Shell Thickness:  $2 \pm 0.2$  mm  
Filling Volume: Approx. 25 liters  
Dimensions: 810 x 1000 x 500 mm (H x L x W)  
Available: Special

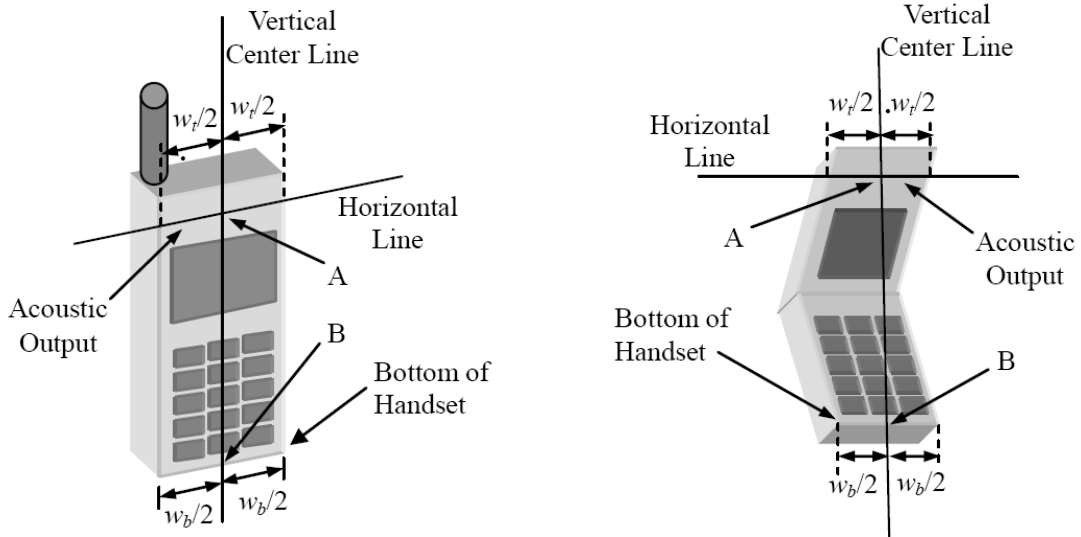


**Picture C.8: SAM Twin Phantom**

## ANNEX D: Position of the wireless device in relation to the phantom

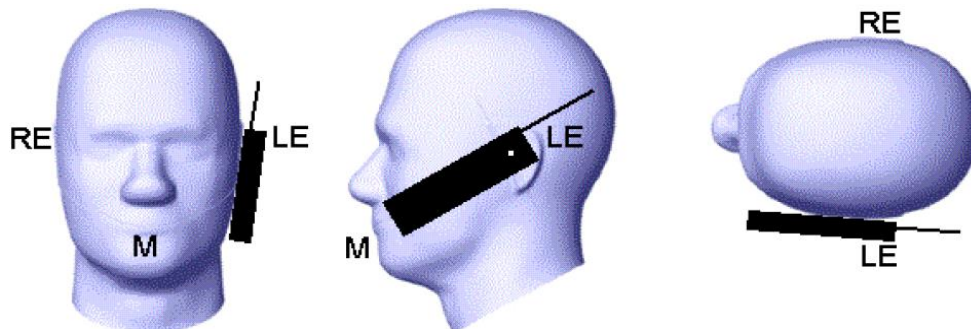
### D.1. General considerations

This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.

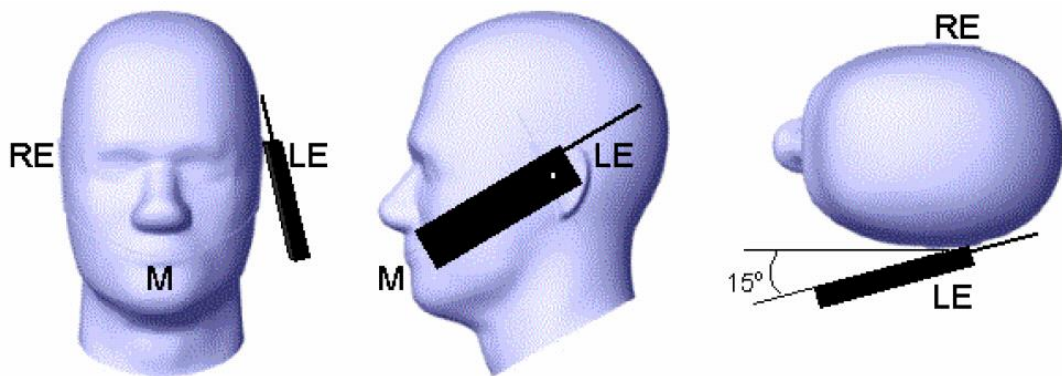


- $w_t$  Width of the handset at the level of the acoustic
- $w_b$  Width of the bottom of the handset
- A Midpoint of the width  $w_t$  of the handset at the level of the acoustic output
- B Midpoint of the width  $w_b$  of the bottom of the handset

Picture D.1-a Typical “fixed” case handset      Picture D.1-b Typical “clam-shell” case handset



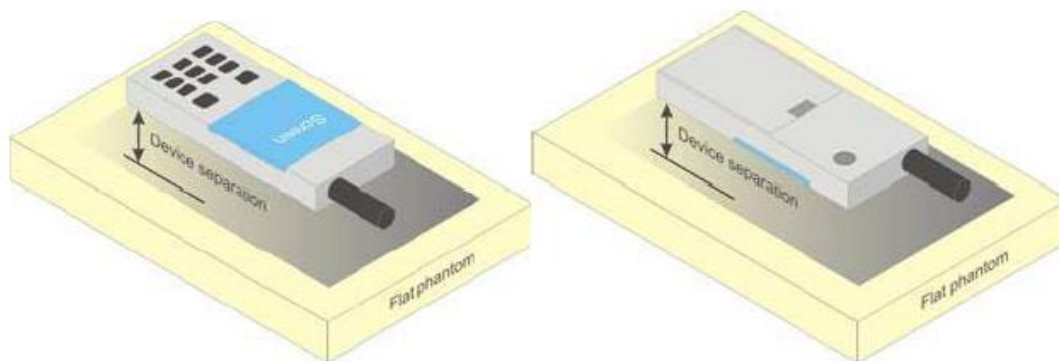
Picture D.2 Cheek position of the wireless device on the left side of SAM



Picture D.3 Tilt position of the wireless device on the left side of SAM

## D.2. Body-worn device

A typical example of a body-worn device is a mobile phone, wireless enabled PDA or other battery operated wireless device with the ability to transmit while mounted on a person's body using a carry accessory approved by the wireless device manufacturer.

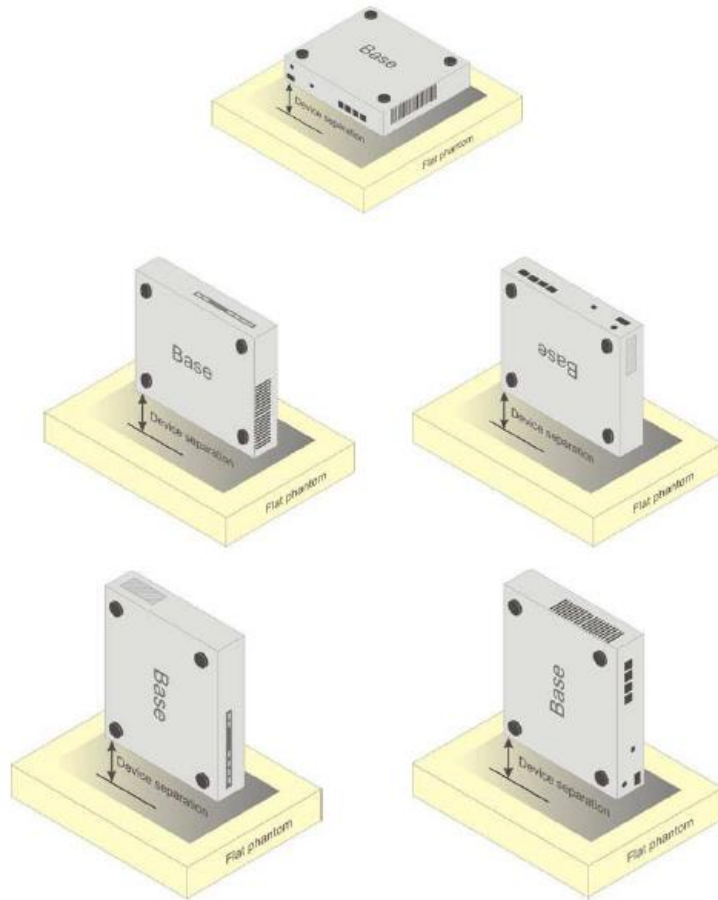


Picture D.4 Test positions for body-worn devices

## D.3. Desktop device

A typical example of a desktop device is a wireless enabled desktop computer placed on a table or desk when used.

The DUT shall be positioned at the distance and in the orientation to the phantom that corresponds to the intended use as specified by the manufacturer in the user instructions. For devices that employ an external antenna with variable positions, tests shall be performed for all antenna positions specified. Picture 8.5 show positions for desktop device SAR tests. If the intended use is not specified, the device shall be tested directly against the flat phantom.



Picture D.5 Test positions for desktop devices

#### D.4. DUT Setup Photos



Picture D.6

## ANNEX E: Equivalent Media Recipes

The liquid used for the frequency range of 700-6000 MHz consisted of water, sugar, salt, preventol, glycol monobutyl and Cellulose. The liquid has been previously proven to be suited for worst-case. The Table E.1 shows the detail solution. It's satisfying the latest tissue dielectric parameters requirements proposed by the IEEE 1528 and IEC 62209.

**Table E.1: Composition of the Tissue Equivalent Matter**

Frequency (MHz)	835	1750	1900	2450	2600	5200	5800
Water	41.45	55.242	55.242	58.79	58.79	65.53	66.10
Sugar	56.0	/	/	/	/	/	/
Salt	1.45	0.306	0.306	0.06	0.06		
Preventol	0.1	/	/	/	/	17.24	16.95
Cellulose	1.0	/	/	/	/	17.24	16.95
Glycol Monobutyl	/	44.452	44.452	41.15	41.15	/	/
Diethylenglycol monohexylether	/	/	/	/	/	/	/
Triton X-100	/	/	/	/	/	/	/
Dielectric Parameters Target Value	$\epsilon=41.5$ $\sigma=0.90$	$\epsilon=40.08$ $\sigma=1.37$	$\epsilon=40.0$ $\sigma=1.40$	$\epsilon=39.20$ $\sigma=1.80$	$\epsilon=39.01$ $\sigma=1.96$	$\epsilon=35.99$ $\sigma=4.66$	$\epsilon=35.30$ $\sigma=5.27$

**Note: There is a little adjustment respectively for 750, 5300 and 5600, based on the recipe of closest frequency in table E.1**

## ANNEX F: System Validation

The SAR system must be validated against its performance specifications before it is deployed. When SAR probes, system components or software are changed, upgraded or recalibrated, these must be validated with the SAR system(s) that operates with such components.

**Table F.1: System Validation**

Probe SN.	Liquid name (MHz)	Validation date	Frequency point	CW Validation	Modulation Signal Validation		
					Modulation Type	Duty Factor	PAR
7621	Head 750	2022-05-09	750MHz	Pass	N/A	N/A	N/A
7621	Head 835	2022-05-09	835MHz	Pass	GMSK	Pass	N/A
7621	Head 1750	2022-05-09	1750MHz	Pass	N/A	N/A	N/A
7621	Head 1900	2022-05-09	1900MHz	Pass	GMSK	Pass	N/A
7621	Head 2450	2022-05-08	2450MHz	Pass	OFDM/TDD	Pass	Pass
7621	Head 2550	2022-05-08	2550MHz	Pass	TDD	Pass	N/A
7621	Head 3500	2022-05-10	3500MHz	Pass	TDD	Pass	N/A
7621	Head 3700	2022-05-10	3700MHz	Pass	TDD	Pass	N/A
7621	Head 3900	2022-05-10	3900MHz	Pass	TDD	Pass	N/A
7621	Head 5250	2022-05-08	5250MHz	Pass	OFDM	N/A	Pass
7621	Head 5600	2022-05-08	5600MHz	Pass	OFDM	N/A	Pass
7621	Head 5750	2022-05-08	5750MHz	Pass	OFDM	N/A	Pass

## ANNEX G: DAE Calibration Certificate

Calibration Laboratory of  
Schmid & Partner  
Engineering AG  
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst  
C Service suisse d'étalonnage  
S Servizio svizzero di taratura  
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **Saict-SZ (Auden)**

Certificate No: DAE4-1527\_Jun22

### CALIBRATION CERTIFICATE

Object: DAE4 - SD 000 D04 BM - SN: 1527

Calibration procedure(s): QA CAL-06.V30  
Calibration procedure for the data acquisition electronics (DAE)



Calibration date: June 21, 2022

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	31-Aug-21 (No:31368)	Aug-22
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Auto DAE Calibration Unit	SE UWS 053 AA 1001	24-Jan-22 (in house check)	In house check: Jan-23
Calibrator Box V2.1	SE UMS 006 AA 1002	24-Jan-22 (in house check)	In house check: Jan-23

Calibrated by:	Name Adrian Gehring	Function Laboratory Technician	Signature 
Approved by:	Sven Kühn	Technical Manager	

Issued: June 21, 2022

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

**Calibration Laboratory of**  
Schmid & Partner  
Engineering AG  
Zeughausstrasse 43, 8004 Zurich, Switzerland



**S** Schweizerischer Kalibrierdienst  
**C** Service suisse d'étalonnage  
**S** Servizio svizzero di taratura  
**S** Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

### Glossary

**DAE** data acquisition electronics  
**Connector angle** information used in DASY system to align probe sensor X to the robot coordinate system.

### Methods Applied and Interpretation of Parameters

- **DC Voltage Measurement:** Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- **Connector angle:** The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - **DC Voltage Measurement Linearity:** Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - **Common mode sensitivity:** Influence of a positive or negative common mode voltage on the differential measurement.
  - **Channel separation:** Influence of a voltage on the neighbor channels not subject to an input voltage.
  - **AD Converter Values with inputs shorted:** Values on the internal AD converter corresponding to zero input voltage
  - **Input Offset Measurement:** Output voltage and statistical results over a large number of zero voltage measurements.
  - **Input Offset Current:** Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - **Input resistance:** Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - **Low Battery Alarm Voltage:** Typical value for information. Below this voltage, a battery alarm signal is generated.
  - **Power consumption:** Typical value for information. Supply currents in various operating modes.



**DC Voltage Measurement**

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1μV, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	403.865 ± 0.02% (k=2)	403.595 ± 0.02% (k=2)	403.805 ± 0.02% (k=2)
Low Range	3.95898 ± 1.50% (k=2)	3.98939 ± 1.50% (k=2)	3.96763 ± 1.50% (k=2)

**Connector Angle**

Connector Angle to be used in DASY system	61.0 ° ± 1 °
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**Appendix (Additional assessments outside the scope of SCS0108)**
**1. DC Voltage Linearity**

High Range	Reading ( $\mu\text{V}$ )	Difference ( $\mu\text{V}$ )	Error (%)
Channel X + Input	200037.59	1.98	0.00
Channel X + Input	20007.61	1.34	0.01
Channel X - Input	-20004.09	1.79	-0.01
Channel Y + Input	200037.45	1.53	0.00
Channel Y + Input	20002.68	-3.42	-0.02
Channel Y - Input	-20007.17	-1.14	0.01
Channel Z + Input	200037.73	2.17	0.00
Channel Z + Input	20005.72	-0.34	-0.00
Channel Z - Input	-20006.63	-0.49	0.00

Low Range	Reading ( $\mu\text{V}$ )	Difference ( $\mu\text{V}$ )	Error (%)
Channel X + Input	2001.36	-0.15	-0.01
Channel X + Input	201.70	0.16	0.08
Channel X - Input	-198.10	0.49	-0.24
Channel Y + Input	2001.44	0.07	0.00
Channel Y + Input	201.07	-0.21	-0.11
Channel Y - Input	-199.66	-0.98	0.50
Channel Z + Input	2001.52	0.21	0.01
Channel Z + Input	200.61	-0.41	-0.20
Channel Z - Input	-199.00	-0.15	0.07

**2. Common mode sensitivity**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading ( $\mu\text{V}$ )	Low Range Average Reading ( $\mu\text{V}$ )
Channel X	200	-3.95	-5.31
	-200	5.96	4.97
Channel Y	200	-16.18	-16.25
	-200	14.41	14.34
Channel Z	200	3.01	2.86
	-200	-3.93	-4.13

**3. Channel separation**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X ( $\mu\text{V}$ )	Channel Y ( $\mu\text{V}$ )	Channel Z ( $\mu\text{V}$ )
Channel X	200	-	-0.68	-2.76
Channel Y	200	5.43	-	-0.31
Channel Z	200	10.73	3.29	-

**4. AD-Converter Values with inputs shorted**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	16059	17078
Channel Y	15965	16219
Channel Z	15888	13556

**5. Input Offset Measurement**

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec  
Input 10M $\Omega$

	Average ( $\mu$ V)	min. Offset ( $\mu$ V)	max. Offset ( $\mu$ V)	Std. Deviation ( $\mu$ V)
Channel X	1.40	0.30	2.25	0.35
Channel Y	-0.62	-1.30	0.47	0.33
Channel Z	-0.18	-0.90	0.60	0.31

**6. Input Offset Current**

Nominal input circuitry offset current on all channels: <25fA

**7. Input Resistance** (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

**8. Low Battery Alarm Voltage** (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

**9. Power Consumption** (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9