Table 12.5: The sum of SAR values for ENDC

Mode	Position	DC_2A_n41A		
		LTE Band 2 (W/kg)	NR n41 (W/kg)	SUM (W/kg)
Body (0mm)	Rear	0.55	0.53	**1.08**
	Right	0.39	0.50	**0.89**
	Top	/	0.43	**0.43**
	Bottom	0.22	/	**0.22**
Body (Sensor off)	Rear	0.55	0.73	**1.28**
	Right	0.54	0.58	**1.12**
Mode	Position	DC_2A_n66A		
		LTE Band 2 (W/kg)	NR n66 (W/kg)	SUM (W/kg)
Body (0mm)	Rear	0.55	0.61	**1.16**
	Right	0.39	0.20	**0.59**
	Top	/	0.36	**0.36**
	Bottom	0.22	/	**0.22**
Body (Sensor off)	Rear	0.55	0.61	**1.16**
	Right	0.54	0.20	**0.74**
	Top	/	0.58	**0.58**
Mode	Position	DC_2A_n71A		
		LTE Band 2 (W/kg)	NR n71 (W/kg)	SUM (W/kg)
Body (0mm)	Rear	0.55	0.71	**1.26**
	Right	0.39	0.26	**0.65**
	Top	/	0.58	**0.58**
	Bottom	0.22	/	**0.22**
Body (Sensor off)	Rear	0.55	0.71	**1.26**
	Right	0.54	0.26	**0.80**
	Top	/	0.14	**0.14**
Mode	Position	DC_12A_n2A		
		LTE Band 12 (W/kg)	NR n2 (W/kg)	SUM (W/kg)
Body (0mm)	Rear	0.70	0.70	**1.40**
	Right	0.44	0.19	**0.63**
	Top	0.56	0.49	**1.05**
Body (Sensor off)	Rear	0.35	0.61	**0.96**
	Top	0.26	0.66	**0.92**
Mode	Position	DC_12A_n25A		

		LTE Band 12 (W/kg)	NR n25 (W/kg)	SUM (W/kg)
Body (0mm)	Rear	0.70	0.69	**1.39**
	Right	0.44	0.18	**0.62**
	Top	0.56	0.49	**1.05**
Body (Sensor off)	Rear	0.35	0.63	**0.98**
	Top	0.26	0.70	**0.96**
Mode	Position	**DC_12A_n66A**		
		LTE Band 12 (W/kg)	NR n66 (W/kg)	SUM (W/kg)
Body (0mm)	Rear	0.70	0.61	**1.31**
	Right	0.44	0.20	**0.64**
	Top	0.56	0.36	**0.92**
Body (Sensor off)	Rear	0.35	0.58	**0.93**
	Top	0.26	0.58	**0.84**
Mode	Position	**DC_66A_n25A**		
		LTE Band 66 (W/kg)	NR n25 (W/kg)	SUM (W/kg)
Body (0mm)	Rear	0.58	0.69	**1.27**
	Right	0.46	0.18	**0.64**
	Top	/	0.49	**0.49**
	Bottom	0.18	/	**0.18**
Body (Sensor off)	Rear	0.39	0.69	**1.08**
	Right	0.29	0.18	**0.47**
	Top	/	0.70	**0.70**
Mode	Position	**DC_66A_n41A**		
		LTE Band 66 (W/kg)	NR n41 (W/kg)	SUM (W/kg)
Body (0mm)	Rear	0.58	0.53	**1.11**
	Right	0.46	0.50	**0.96**
	Top	/	0.43	**0.43**
	Bottom	0.18	/	**0.18**
Body (Sensor off)	Rear	0.39	0.73	**1.12**
	Right	0.29	0.58	**0.87**
Mode	Position	**DC_66A_n71A**		
		LTE Band 66 (W/kg)	NR n71 (W/kg)	SUM (W/kg)
Body (0mm)	Rear	0.58	0.71	**1.29**
	Right	0.46	0.26	**0.72**

	Top	/	0.58	**0.58**
	Bottom	0.18	/	**0.18**
Body (Sensor off)	Rear	0.39	0.71	**1.10**
	Right	0.29	0.26	**0.55**
	Top	/	0.14	**0.14**

Note: the test positions of above tables are for the worse case that has been evaluated.

Table 12.6: The sum of reported SAR values for WWAN antenna and WLAN antenna

/	Position	WWAN (W/kg)	WLAN (W/kg)	Sum (W/kg)
Highest reported SAR value for Body	Top Side	0.53 (LTE Band 66)	1.04 (WLAN 5GHz)	1.57

Note: the test positions of above tables are for the worse case that has been evaluated.

Table 12.7: The sum of reported SAR values for WWAN antenna and Bluetooth antenna

/	Position	WWAN (W/kg)	Bluetooth (W/kg)	Sum (W/kg)
Highest reported SAR value for Body	Rear Side	1.27 (DC_66A_n25A)	0.32	1.59

Note: the test positions of above tables are for the worse case that has been evaluated.

Conclusion:

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

13. Summary of Test Results

According to the client's decision rule in the test registration form, which is "based on the measurement results as the basis of the conformity statement", the test conclusion of this report meets the limit requirements.

The calculated SAR is obtained by the following formula:

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

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

$P_{Measured}$ is the measured power in chapter 10.

Duty Cycle

Mode	Duty Cycle
GPRS	1:4/1:8.3
WCDMA	1:1
LTE_FDD	1:1
LTE_TDD	1:1.58/1:2.31
NR	1:1
Bluetooth	1:1
WLAN	1:1

13.1. Testing Environment

Temperature:	18°C~25°C
Relative humidity:	30%~70%
Ground system resistance:	<4Ω
Ambient noise & Reflection:	< 0.012 W/kg

13.2. Test result for 2G/3G/4G

Table 13.1: SAR Values (GSM850 - 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								
Test Data (0mm)									
128	824.2	GPRS-2	Rear	**1**	23.67	24.5	**0.541**	**0.65**	0.04
128	824.2	GPRS-2	Top	/	23.67	24.5	0.515	**0.62**	-0.08
190	836.6	GPRS-2	Right	/	30.90	31.5	0.240	**0.28**	0.08
Sensor off Test Data									
190	836.6	GPRS-2	Rear	Note1	30.90	31.5	0.531	**0.61**	-0.03
190	836.6	GPRS-2	Top	Note1	30.90	31.5	0.318	**0.37**	-0.11

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.2: SAR Values (GSM1900 - 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								
Test Data (0mm)									
810	1909.8	GPRS-2	Rear	**2**	19.69	20.0	**0.987**	**1.06**	0.01
661	1880.0	GPRS-2	Rear	/	18.96	20.0	0.800	**1.02**	-0.09
512	1850.2	GPRS-2	Rear	/	18.42	20.0	0.599	**0.86**	0.06
810	1909.8	GPRS-2	Top	/	19.69	20.0	0.594	**0.64**	-0.09
661	1880.0	GPRS-1	Right	/	31.26	31.5	0.163	**0.17**	0.12
Sensor off Test Data									
661	1880.0	GPRS-1	Rear	Note1	31.26	31.5	0.396	**0.42**	0.07
661	1880.0	GPRS-1	Top	Note1	31.26	31.5	0.497	**0.53**	-0.03

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.3: SAR Values (WCDMA Band 2 - 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								
Test Data (0mm)									
9400	1880.0	RMC	Rear	/	14.70	15.5	0.794	**0.95**	0.18
9538	1907.6	RMC	Rear	/	14.70	15.5	0.868	**1.04**	0.03
9262	1852.4	RMC	Rear	/	14.70	15.5	0.739	**0.89**	-0.14
9400	1880.0	RMC	Top	/	14.70	15.5	0.564	**0.68**	0.09
9400	1880.0	RMC	Right	/	23.60	24.5	0.400	**0.49**	-0.07
Sensor off Test Data									
9400	1880.0	RMC	Rear	Note1	23.60	24.5	0.838	**1.03**	-0.02
9538	1907.6	RMC	Rear	Note1	23.60	24.5	0.895	**1.10**	-0.14
9262	1852.4	RMC	Rear	Note1	23.60	24.5	0.745	**0.92**	-0.04
9400	1880.0	RMC	Top	Note1	23.60	24.5	0.789	**0.97**	-0.16
9538	1907.6	RMC	Top	**3**/Note1	23.60	24.5	**0.919**	**1.13**	0.01
9262	1852.4	RMC	Top	Note1	23.60	24.5	0.661	**0.81**	-0.11

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.4: SAR Values (WCDMA Band 4 - 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								
Test Data (0mm)									
1413	1732.6	RMC	Rear	/	14.50	15.5	0.830	**1.04**	0.06
1513	1752.6	RMC	Rear	**4**	14.40	15.5	**0.830**	**1.07**	-0.04
1312	1712.4	RMC	Rear	/	14.50	15.5	0.814	**1.02**	-0.13
1413	1732.6	RMC	Top	/	14.50	15.5	0.468	**0.59**	-0.05
1413	1732.6	RMC	Right	/	23.50	24.5	0.443	**0.56**	-0.19
Sensor off Test Data									
1413	1732.6	RMC	Rear	Note1	23.50	24.5	0.395	**0.50**	0.13
1413	1732.6	RMC	Top	Note1	23.50	24.5	0.269	**0.34**	0.10

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.5: SAR Values (WCDMA Band 5 - 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								
Test Data (0mm)									
4183	836.6	RMC	Rear	/	17.70	19.0	0.743	**1.00**	0.06
4233	846.6	RMC	Rear	**5**	17.70	19.0	**0.806**	**1.09**	0.11
4132	826.4	RMC	Rear	/	17.90	19.0	0.726	**0.94**	-0.04
4183	836.6	RMC	Top	/	17.70	19.0	0.714	**0.96**	0.02
4233	846.6	RMC	Top	/	17.70	19.0	0.789	**1.06**	0.02
4132	826.4	RMC	Top	/	17.90	19.0	0.762	**0.98**	-0.07
4183	836.6	RMC	Right	/	22.80	24.0	0.171	**0.23**	0.02
Sensor off Test Data									
4183	836.6	RMC	Rear	Note1	22.80	24.0	0.277	**0.37**	0.04
4183	836.6	RMC	Top	Note1	22.80	24.0	0.244	**0.32**	0.06

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.6: SAR Values (LTE Band 2 - Body) – Ant.0

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								
Test Data (0mm)									
19100	1900.0	1RB50	Rear	/	15.21	16.0	0.719	**0.86**	0.18
19100	1900.0	50RB50	Rear	/	15.27	16.0	0.750	**0.89**	0.07
18900	1880.0	1RB50	Rear	/	15.17	16.0	0.664	**0.80**	-0.14
18700	1860.0	1RB50	Rear	/	15.12	16.0	0.611	**0.75**	-0.04
18900	1880.0	50RB50	Rear	/	15.18	16.0	0.665	**0.80**	0.07
18700	1860.0	50RB50	Rear	/	15.17	16.0	0.626	**0.76**	-0.06
19100	1900.0	100RB	Rear	/	15.20	16.0	0.732	**0.88**	0.17
19100	1900.0	1RB50	Top	/	15.21	16.0	0.502	**0.60**	0.10
19100	1900.0	50RB50	Top	/	15.27	16.0	0.589	**0.70**	-0.19
19100	1900.0	1RB50	Right	/	23.03	24.0	0.196	**0.25**	0.04
19100	1900.0	50RB50	Right	/	22.02	23.0	0.142	**0.18**	0.02
Sensor off Test Data									
19100	1900.0	1RB50	Rear	Note1	23.03	24.0	0.748	**0.94**	0.04
19100	1900.0	50RB50	Rear	Note1	22.02	23.0	0.602	**0.75**	0.15
18900	1880.0	1RB50	Rear	Note1	22.68	24.0	0.685	**0.93**	-0.15
18700	1860.0	1RB99	Rear	Note1	22.82	24.0	0.657	**0.86**	0.13
19100	1900.0	100RB	Rear	Note1	21.99	23.0	0.591	**0.75**	0.09
19100	1900.0	1RB50	Top	**6**/Note1	23.03	24.0	**0.759**	**0.95**	0.04
19100	1900.0	50RB50	Top	Note1	22.02	23.0	0.601	**0.75**	0.02
18900	1880.0	1RB50	Top	Note1	22.68	24.0	0.680	**0.92**	-0.09
18700	1860.0	1RB99	Top	Note1	22.82	24.0	0.622	**0.82**	-0.16

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.7: SAR Values (LTE Band 2 - Body) – Ant.0

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								
Test Data (0mm)									
19100	1900.0	1RB50	Rear	/	12.33	13.0	0.471	**0.55**	-0.18
19100	1900.0	50RB50	Rear	/	12.40	13.0	**0.491**	**0.56**	0.04
19100	1900.0	1RB50	Top	/	12.33	13.0	0.302	**0.35**	-0.15
19100	1900.0	50RB50	Top	/	12.40	13.0	0.331	**0.38**	-0.09
19100	1900.0	1RB50	Right	/	20.15	21.0	0.088	**0.11**	0.07
19100	1900.0	50RB50	Right	/	20.26	21.0	0.064	**0.08**	0.04
Sensor off Test Data									
19100	1900.0	1RB50	Rear	Note1	20.15	21.0	0.313	**0.38**	0.06
19100	1900.0	50RB50	Rear	Note1	20.26	21.0	0.302	**0.36**	0.11
19100	1900.0	1RB50	Top	Note1	20.15	21.0	0.340	**0.41**	0.06
19100	1900.0	50RB50	Top	Note1	20.26	21.0	0.328	**0.39**	0.02

Note1: The distance between the EUT's side and the phantom is 19mm.

Note2: The SAR test results only for UL CA mode.

Table 13.8: SAR Values (LTE Band 2 - Body) – Ant.1

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								
Test Data (0mm)									
18700	1860.0	1RB50	Rear	/	12.16	13.0	**0.361**	**0.44**	0.20
18700	1860.0	50RB0	Rear	/	12.19	13.0	0.344	**0.41**	-0.16
18700	1860.0	1RB50	Right	/	12.16	13.0	0.258	**0.31**	0.04
18700	1860.0	50RB0	Right	/	12.19	13.0	0.245	**0.30**	0.03
18700	1860.0	1RB50	Bottom	/	20.09	21.0	0.091	**0.11**	0.13
18700	1860.0	50RB0	Bottom	/	20.07	21.0	0.085	**0.11**	0.03
Sensor off Test Data									
18700	1860.0	1RB50	Rear	Note1	20.09	21.0	0.222	**0.27**	0.01
18700	1860.0	50RB0	Rear	Note1	20.07	21.0	0.219	**0.27**	0.04
18700	1860.0	1RB50	Right	Note1	20.09	21.0	0.223	**0.27**	0.14
18700	1860.0	50RB0	Right	Note1	20.07	21.0	0.207	**0.26**	0.03

Note1: The distance between the EUT's side and the phantom is 14mm.

Note2: The SAR test results only for UL CA mode.

Table 13.9: SAR Values (LTE Band 2 - Body) – Ant.1

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								
Test Data (0mm)									
18700	1860.0	1RB50	Rear	/	13.17	14.0	**0.454**	**0.55**	0.09
18700	1860.0	50RB0	Rear	/	13.14	14.0	0.445	**0.54**	0.03
18700	1860.0	1RB50	Right	/	13.17	14.0	0.324	**0.39**	0.06
18700	1860.0	50RB0	Right	/	13.14	14.0	0.318	**0.39**	0.03
18700	1860.0	1RB50	Bottom	/	23.06	24.0	0.179	**0.22**	0.09
18700	1860.0	50RB0	Bottom	/	22.06	23.0	0.143	**0.18**	0.04
Sensor off Test Data									
18700	1860.0	1RB50	Rear	Note1	23.06	24.0	0.446	**0.55**	0.07
18700	1860.0	50RB0	Rear	Note1	22.06	23.0	0.400	**0.50**	0.05
18700	1860.0	1RB50	Right	Note1	23.06	24.0	0.437	**0.54**	0.04
18700	1860.0	50RB0	Right	Note1	22.06	23.0	0.336	**0.42**	0.11

Note1: The distance between the EUT's side and the phantom is 14mm.

Note2: The SAR test results only for ENDC mode.

Table 13.10: SAR Values (LTE Band 4 - 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								
Test Data (0mm)									
20300	1745.0	1RB99	Rear	/	14.01	15.0	0.675	**0.85**	0.12
20300	1745.0	50RB25	Rear	/	13.96	15.0	0.677	**0.86**	0.16
20175	1732.5	1RB99	Rear	/	13.98	15.0	0.676	**0.85**	0.17
20050	1720.0	1RB99	Rear	/	13.94	15.0	0.647	**0.83**	0.09
20175	1732.5	50RB50	Rear	/	14.04	15.0	0.683	**0.85**	0.13
20050	1720.0	50RB50	Rear	**7**	14.05	15.0	**0.689**	**0.86**	0.16
20300	1745.0	100RB	Rear	/	14.07	15.0	0.683	**0.85**	-0.16
20300	1745.0	1RB99	Top	/	14.01	15.0	0.412	**0.52**	0.00
20300	1745.0	50RB25	Top	/	13.96	15.0	0.408	**0.52**	0.01
20300	1745.0	1RB99	Right	/	22.90	24.0	0.196	**0.25**	0.16
20300	1745.0	50RB25	Right	/	21.84	23.0	0.181	**0.24**	0.18
Sensor off Test Data									
20300	1745.0	1RB99	Rear	Note1	22.90	24.0	0.456	**0.59**	0.07
20300	1745.0	50RB25	Rear	Note1	21.84	23.0	0.341	**0.45**	0.02
20300	1745.0	1RB99	Top	Note1	22.90	24.0	0.361	**0.47**	0.11
20300	1745.0	50RB25	Top	Note1	21.84	23.0	0.272	**0.36**	0.01

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.11: SAR Values (LTE Band 4 - 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								
Test Data (0mm)									
20300	1745.0	1RB99	Rear	/	11.28	12.0	0.315	**0.37**	-0.06
20300	1745.0	50RB25	Rear	/	11.30	12.0	**0.316**	**0.37**	-0.18
20300	1745.0	1RB99	Top	/	11.28	12.0	0.192	**0.23**	0.16
20300	1745.0	50RB25	Top	/	11.30	12.0	0.220	**0.26**	-0.10
20300	1745.0	1RB99	Right	/	20.15	21.0	0.109	**0.13**	-0.09
20300	1745.0	50RB25	Right	/	20.24	21.0	0.101	**0.12**	-0.13
Sensor off Test Data									
20300	1745.0	1RB99	Rear	Note1	20.15	21.0	0.254	**0.31**	0.04
20300	1745.0	50RB25	Rear	Note1	20.24	21.0	0.238	**0.28**	0.18
20300	1745.0	1RB99	Top	Note1	20.15	21.0	0.194	**0.24**	-0.07
20300	1745.0	50RB25	Top	Note1	20.24	21.0	0.182	**0.22**	-0.08

Note1: The distance between the EUT's side and the phantom is 19mm.

Note2: The SAR test results only for UL CA mode.

Table 13.12: SAR Values (LTE Band 7 - Body)

Frequency		Test Mode	Test Position	Figure No./ Note	Conducted Power (dBm)	Max. tune-up Power (dBm)	Measured SAR(1g) (W/kg)	Reported SAR(1g) (W/kg)	Power Drift(dB)
Ch.	MHz								
Test Data (0mm)									
21350	2560.0	1RB99	Rear	/	11.27	12.0	0.848	**1.00**	-0.12
21350	2560.0	50RB0	Rear	/	11.26	12.0	0.869	**1.03**	0.05
21100	2535.0	1RB99	Rear	/	11.19	12.0	0.832	**1.00**	-0.02
20850	2510.0	1RB99	Rear	/	11.09	12.0	0.803	**0.99**	-0.12
21100	2535.0	50RB25	Rear	**8**	11.23	12.0	**0.885**	**1.06**	-0.03
20850	2510.0	50RB50	Rear	/	11.24	12.0	0.865	**1.03**	-0.13
21350	2560.0	100RB	Rear	/	11.19	12.0	0.843	**1.02**	-0.05
21350	2560.0	1RB99	Top	/	11.27	12.0	0.469	**0.55**	0.04
21350	2560.0	50RB0	Top	/	11.26	12.0	0.477	**0.57**	0.03
21350	2560.0	1RB99	Right	/	23.74	24.0	0.893	**0.95**	0.06
21350	2560.0	50RB0	Right	/	22.71	23.0	0.686	**0.73**	0.08
Sensor off Test Data									
21350	2560.0	1RB99	Rear	Note1	23.74	24.0	0.438	**0.47**	0.02
21350	2560.0	50RB0	Rear	Note1	22.71	23.0	0.301	**0.32**	0.15
21350	2560.0	1RB99	Top	Note1	23.74	24.0	0.508	**0.54**	-0.07
21350	2560.0	50RB0	Top	Note1	22.71	23.0	0.387	**0.41**	0.03

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.13: SAR Values (LTE Band 12 - 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								
Test Data (0mm)									
23095	707.5	1RB49	Rear	/	18.03	19.0	0.840	**1.05**	0.08
23130	711.0	25RB25	Rear	/	18.10	19.0	0.851	**1.05**	0.05
23130	711.0	1RB49	Rear	/	17.98	19.0	0.758	**0.96**	-0.16
23060	704.0	1RB49	Rear	/	18.01	19.0	0.806	**1.01**	-0.14
23095	707.5	25RB25	Rear	/	18.05	19.0	0.823	**1.02**	0.06
23060	704.0	25RB0	Rear	**9**	17.98	19.0	**0.874**	**1.11**	-0.17
23130	711.0	50RB	Rear	/	18.05	19.0	0.859	**1.07**	-0.11
23095	707.5	1RB49	Top	/	18.03	19.0	0.628	**0.79**	0.02
23130	711.0	25RB25	Top	/	18.10	19.0	0.612	**0.75**	0.03
23095	707.5	1RB49	Right	/	23.28	24.0	0.371	**0.44**	0.12
23130	711.0	25RB25	Right	/	22.39	23.0	0.305	**0.35**	0.09
Sensor off Test Data									
23095	707.5	1RB49	Rear	Note1	23.28	24.0	0.293	**0.35**	0.05
23130	711.0	25RB25	Rear	Note1	22.39	23.0	0.235	**0.27**	-0.01
23095	707.5	1RB49	Top	Note1	23.28	24.0	0.223	**0.26**	0.03
23130	711.0	25RB25	Top	Note1	22.39	23.0	0.177	**0.20**	0.01

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.14: SAR Values (LTE Band 12 - 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								
Test Data (0mm)									
23095	707.5	1RB49	Rear	/	15.34	16.0	0.468	**0.54**	-0.11
23130	711.0	25RB25	Rear	/	15.36	16.0	**0.495**	**0.57**	0.13
23095	707.5	1RB49	Top	/	15.34	16.0	0.312	**0.36**	0.07
23130	711.0	25RB25	Top	/	15.36	16.0	0.343	**0.40**	-0.13
23095	707.5	1RB49	Right	/	19.80	21.0	0.101	**0.13**	0.04
23130	711.0	25RB25	Right	/	19.92	21.0	0.086	**0.11**	0.13
Sensor off Test Data									
23095	707.5	1RB49	Rear	Note1	19.80	21.0	0.199	**0.26**	-0.13
23130	711.0	25RB25	Rear	Note1	19.92	21.0	0.189	**0.24**	-0.07
23095	707.5	1RB49	Top	Note1	19.80	21.0	0.160	**0.21**	-0.14
23130	711.0	25RB25	Top	Note1	19.92	21.0	0.151	**0.19**	0.18

Note1: The distance between the EUT's side and the phantom is 19mm.

Note2: The SAR test results only for UL CA mode.

Table 13.15: SAR Values (LTE Band 12 - 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								
Test Data (0mm)									
23095	707.5	1RB49	Rear	/	16.06	17.0	0.555	**0.69**	0.12
23130	711.0	25RB25	Rear	/	16.09	17.0	**0.571**	**0.70**	0.20
23095	707.5	1RB49	Top	/	16.06	17.0	0.432	**0.54**	0.02
23130	711.0	25RB25	Top	/	16.09	17.0	0.456	**0.56**	0.04
23095	707.5	1RB49	Right	/	23.28	24.0	0.371	**0.44**	0.12
23130	711.0	25RB25	Right	/	22.39	23.0	0.305	**0.35**	0.09
Sensor off Test Data									
23095	707.5	1RB49	Rear	Note1	23.28	24.0	0.293	**0.35**	0.05
23130	711.0	25RB25	Rear	Note1	22.39	23.0	0.235	**0.27**	-0.01
23095	707.5	1RB49	Top	Note1	23.28	24.0	0.223	**0.26**	0.03
23130	711.0	25RB25	Top	Note1	22.39	23.0	0.177	**0.20**	0.01

Note1: The distance between the EUT's side and the phantom is 19mm.

Note2: The SAR test results only for ENDC mode.

Table 13.16: SAR Values (LTE Band 13 - 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								
Test Data (0mm)									
23230	782.0	1RB24	Rear	/	19.04	20.0	0.817	**1.02**	-0.08
23230	782.0	25RB0	Rear	/	19.14	20.0	0.896	**1.09**	0.09
23230	782.0	50RB0	Rear	**10**	19.17	20.0	**0.908**	**1.10**	0.08
23230	782.0	1RB24	Top	/	19.04	20.0	0.770	**0.96**	-0.05
23230	782.0	25RB0	Top	/	19.14	20.0	0.822	**1.00**	0.01
23230	782.0	1RB24	Right	/	23.25	24.0	0.230	**0.27**	0.10
23230	782.0	25RB0	Right	/	22.36	23.0	0.200	**0.23**	0.11
Sensor off Test Data									
23230	782.0	1RB24	Rear	Note1	23.25	24.0	0.230	**0.27**	0.06
23230	782.0	25RB0	Rear	Note1	22.36	23.0	0.201	**0.23**	-0.09
23230	782.0	1RB24	Top	Note1	23.25	24.0	0.255	**0.30**	-0.03
23230	782.0	25RB0	Top	Note1	22.36	23.0	0.213	**0.25**	0.07

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.17: SAR Values (LTE Band 25 - 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								
Test Data (0mm)									
26590	1905.0	1RB99	Rear	/	13.61	14.5	0.781	**0.96**	0.06
26590	1905.0	50RB25	Rear	/	13.65	14.5	0.800	**0.97**	0.03
26365	1882.5	1RB99	Rear	/	13.58	14.5	0.713	**0.88**	0.01
26140	1860.0	1RB99	Rear	/	13.54	14.5	0.617	**0.77**	0.08
26365	1882.5	50RB25	Rear	/	13.62	14.5	0.668	**0.82**	0.09
26140	1860.0	50RB25	Rear	/	13.60	14.5	0.619	**0.76**	0.10
26590	1905.0	100RB	Rear	/	13.58	14.5	0.783	**0.97**	0.05
26590	1905.0	1RB99	Top	/	13.61	14.5	0.542	**0.67**	0.09
26590	1905.0	50RB25	Top	/	13.65	14.5	0.551	**0.67**	0.04
26590	1905.0	1RB99	Right	/	22.68	24.0	0.184	**0.25**	0.05
26590	1905.0	50RB25	Right	/	21.74	23.0	0.157	**0.21**	0.03
Sensor off Test Data									
26590	1905.0	1RB99	Rear	Note1	22.68	24.0	0.791	**1.07**	0.04
26590	1905.0	50RB25	Rear	Note1	21.74	23.0	0.641	**0.86**	0.09
26365	1882.5	1RB99	Rear	Note1	22.59	24.0	0.713	**0.99**	-0.03
26140	1860.0	1RB99	Rear	Note1	22.49	24.0	0.628	**0.89**	0.06
26365	1882.5	50RB25	Rear	Note1	21.61	23.0	0.556	**0.77**	-0.18
26140	1860.0	50RB0	Rear	Note1	21.44	23.0	0.480	**0.69**	0.11
26590	1905.0	1RB99	Top	**11**/Note1	22.68	24.0	**0.848**	**1.15**	0.04
26590	1905.0	50RB25	Top	Note1	21.74	23.0	0.678	**0.91**	0.09
26365	1882.5	1RB99	Top	Note1	22.59	24.0	0.764	**1.06**	0.08
26140	1860.0	1RB99	Top	Note1	22.49	24.0	0.673	**0.95**	0.03
26365	1882.5	50RB25	Top	Note1	21.61	23.0	0.596	**0.82**	0.17
26140	1860.0	50RB0	Top	Note1	21.44	23.0	0.515	**0.74**	0.11
26590	1905.0	100RB	Top	Note1	21.62	23.0	0.695	**0.95**	0.01

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.18: SAR Values (LTE Band 26 - 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								
Test Data (0mm)									
26765	821.5	1RB0	Rear	/	17.74	18.5	0.646	**0.77**	0.03
26765	821.5	36RB19	Rear	/	17.63	18.5	0.651	**0.80**	0.08
26965	841.5	36RB0	Rear	**12**	17.43	18.5	**0.681**	**0.87**	-0.10
26865	831.5	36RB0	Rear	/	17.62	18.5	0.624	**0.76**	-0.04
26865	831.5	75RB0	Rear	/	17.64	18.5	0.634	**0.77**	0.14
26765	821.5	1RB0	Top	/	17.74	18.5	0.589	**0.70**	0.05
26765	821.5	36RB19	Top	/	17.63	18.5	0.609	**0.74**	0.05
26765	821.5	1RB0	Right	/	23.03	24.0	0.289	**0.36**	0.11
26765	821.5	36RB19	Right	/	21.96	23.0	0.203	**0.26**	0.15
Sensor off Test Data									
26765	821.5	1RB0	Rear	Note1	23.03	24.0	0.255	**0.32**	0.12
26765	821.5	36RB19	Rear	Note1	21.96	23.0	0.214	**0.27**	0.08
26765	821.5	1RB0	Top	Note1	23.03	24.0	0.215	**0.27**	0.04
26765	821.5	36RB19	Top	Note1	21.96	23.0	0.184	**0.23**	-0.01

Note1: The distance between the EUT's side and the phantom is 19mm.

Note2: SAR for LTE Band 5 is covered by LTE Band 26 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

Table 13.19: SAR Values (LTE Band 41 - Body) – PC3

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								
Test Data (0mm)									
41490	2680.0	1RB50	Rear	/	13.41	14.0	0.459	**0.53**	0.18
41490	2680.0	50RB25	Rear	/	13.42	14.0	0.476	**0.54**	0.04
41490	2680.0	1RB50	Right	/	13.41	14.0	0.655	**0.75**	0.20
41490	2680.0	50RB25	Right	**13**	13.42	14.0	**0.680**	**0.78**	0.06
41490	2680.0	1RB50	Top	/	23.53	24.0	0.201	**0.22**	-0.03
41490	2680.0	50RB25	Top	/	22.55	23.0	0.197	**0.22**	0.09
Sensor off Test Data									
41490	2680.0	1RB50	Rear	Note1	23.53	24.0	0.316	**0.35**	0.04
41490	2680.0	50RB25	Rear	Note1	22.55	23.0	0.232	**0.26**	-0.05
41490	2680.0	1RB50	Right	Note1	23.53	24.0	0.259	**0.29**	0.05
41490	2680.0	50RB25	Right	Note1	22.55	23.0	0.203	**0.23**	0.03
The worst case with CA_41C									
41490	2680.0	CA	Right	/	13.35	14.0	0.663	**0.77**	0.09

Note1: The distance between the EUT's side and the phantom is 14mm.

Note2: SAR for LTE Band 38 is covered by LTE Band 41 due to similar frequency range, same maximum tune-up limit and same channel bandwidth.

Table 13.20: SAR Values (LTE Band 41 - Body) – PC2

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								
Test Data (0mm)									
41490	2680.0	1RB50	Rear	/	16.38	17.0	0.821	**0.95**	0.10
41055	2636.5	50RB25	Rear	/	16.39	17.0	0.840	**0.97**	0.09
41055	2636.5	1RB99	Rear	/	16.35	17.0	0.736	**0.85**	-0.05
40620	2593.0	1RB50	Rear	/	16.34	17.0	0.743	**0.86**	-0.04
40185	2549.5	1RB50	Rear	/	16.34	17.0	0.669	**0.78**	0.14
39750	2506.0	1RB50	Rear	/	16.28	17.0	0.630	**0.74**	0.10
41490	2680.0	50RB25	Rear	/	16.36	17.0	0.838	**0.97**	0.09
40620	2593.0	50RB25	Rear	/	16.32	17.0	0.713	**0.83**	-0.17
40185	2549.5	50RB25	Rear	/	16.36	17.0	0.684	**0.79**	-0.09
39750	2506.0	50RB50	Rear	/	16.35	17.0	0.657	**0.76**	0.03
41490	2680.0	1RB50	Right	/	16.38	17.0	0.902	**1.04**	0.09
41490	2680.0	50RB25	Right	/	16.39	17.0	0.851	**0.98**	0.10
41055	2636.5	1RB99	Right	/	16.35	17.0	0.809	**0.94**	-0.04
40620	2593.0	1RB50	Right	/	16.34	17.0	0.816	**0.95**	0.09
40185	2549.5	1RB50	Right	/	16.34	17.0	0.735	**0.86**	0.08
39750	2506.0	1RB50	Right	/	16.28	17.0	0.692	**0.82**	-0.10
41490	2680.0	50RB25	Right	**14**	16.34	17.0	**0.921**	**1.07**	0.11
40620	2593.0	50RB25	Right	/	16.32	17.0	0.783	**0.92**	0.15
40185	2549.5	50RB25	Right	/	16.36	17.0	0.752	**0.87**	0.15
39750	2506.0	50RB50	Right	/	16.35	17.0	0.722	**0.84**	-0.05
41490	2680.0	100RB	Right	/	16.36	17.0	0.916	**1.06**	0.06
41490	2680.0	1RB50	Top	/	26.47	27.0	0.247	**0.28**	0.03
41055	2636.5	50RB25	Top	/	25.57	26.0	0.223	**0.25**	0.07
Sensor off Test Data									
41490	2680.0	1RB50	Rear	Note1	26.47	27.0	0.425	**0.48**	-0.06
41055	2636.5	50RB25	Rear	Note1	25.57	26.0	0.375	**0.41**	0.04
41490	2680.0	1RB50	Right	Note1	26.47	27.0	0.350	**0.40**	-0.02
41055	2636.5	50RB25	Right	Note1	25.57	26.0	0.254	**0.28**	0.04

Note1: The distance between the EUT's side and the phantom is 14mm.

Table 13.21: SAR Values (LTE Band 66 - Body) – Ant.0

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								
Test Data (0mm)									
132572	1770.0	1RB0	Rear	/	13.98	15.0	0.670	**0.85**	0.03
132572	1770.0	50RB25	Rear	**15**	14.03	15.0	**0.688**	**0.86**	-0.12
132322	1745.0	1RB0	Rear	/	13.96	15.0	0.669	**0.85**	0.01
132072	1720.0	1RB0	Rear	/	13.94	15.0	0.649	**0.83**	0.03
132322	1745.0	50RB25	Rear	/	14.02	15.0	0.673	**0.84**	0.04
132072	1720.0	50RB0	Rear	/	14.01	15.0	0.684	**0.86**	0.04
132572	1770.0	100RB	Rear	/	14.08	15.0	0.660	**0.82**	0.07
132572	1770.0	1RB0	Top	/	13.98	15.0	0.421	**0.53**	0.05
132572	1770.0	50RB25	Top	/	14.03	15.0	0.427	**0.53**	-0.02
132572	1770.0	1RB0	Right	/	22.79	24.0	0.187	**0.25**	0.08
132572	1770.0	50RB25	Right	/	21.81	23.0	0.138	**0.18**	0.01
Sensor off Test Data									
132572	1770.0	1RB0	Rear	Note1	22.79	24.0	0.498	**0.66**	0.02
132572	1770.0	50RB25	Rear	Note1	21.81	23.0	0.421	**0.55**	0.06
132572	1770.0	1RB0	Top	Note1	22.79	24.0	0.413	**0.55**	0.02
132572	1770.0	50RB25	Top	Note1	21.81	23.0	0.367	**0.48**	0.05

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.22: SAR Values (LTE Band 66 - Body) – Ant.0

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								
Test Data (0mm)									
132572	1770.0	1RB0	Rear	/	11.26	12.0	0.334	**0.40**	-0.02
132572	1770.0	50RB25	Rear	/	11.30	12.0	**0.343**	**0.40**	0.16
132572	1770.0	1RB0	Top	/	11.26	12.0	0.210	**0.25**	-0.07
132572	1770.0	50RB25	Top	/	11.30	12.0	0.221	**0.26**	0.17
132572	1770.0	1RB0	Right	/	20.11	21.0	0.080	**0.10**	0.08
132572	1770.0	50RB25	Right	/	20.23	21.0	0.108	**0.13**	0.14
Sensor off Test Data									
132572	1770.0	1RB0	Rear	Note1	20.11	21.0	0.270	**0.33**	0.03
132572	1770.0	50RB25	Rear	Note1	20.23	21.0	0.289	**0.35**	0.03
132572	1770.0	1RB0	Top	Note1	20.11	21.0	0.227	**0.28**	0.11
132572	1770.0	50RB25	Top	Note1	20.23	21.0	0.243	**0.29**	0.19

Note1: The distance between the EUT's side and the phantom is 19mm.

Note2: The SAR test results only for UL CA mode.

Table 13.23: SAR Values (LTE Band 66 - Body) – Ant.1

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								
Test Data (0mm)									
132322	1745.0	1RB50	Rear	/	13.10	14.0	**0.471**	**0.58**	0.11
132322	1745.0	50RB0	Rear	/	13.13	14.0	0.463	**0.57**	-0.04
132322	1745.0	1RB50	Right	/	13.10	14.0	0.373	**0.46**	-0.08
132322	1745.0	50RB0	Right	/	13.13	14.0	0.351	**0.43**	-0.05
132322	1745.0	1RB50	Bottom	/	23.02	24.0	0.146	**0.18**	0.04
132322	1745.0	50RB0	Bottom	/	22.12	23.0	0.118	**0.14**	0.06
Sensor off Test Data									
132322	1745.0	1RB50	Rear	Note1	23.02	24.0	0.314	**0.39**	0.19
132322	1745.0	50RB0	Rear	Note1	22.12	23.0	0.269	**0.33**	0.02
132322	1745.0	1RB50	Right	Note1	23.02	24.0	0.234	**0.29**	0.10
132322	1745.0	50RB0	Right	Note1	22.12	23.0	0.185	**0.23**	0.09

Note1: The distance between the EUT's side and the phantom is 14mm.

Note2: The SAR test results only for ENDC mode.

Table 13.24: 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								
Test Data (0mm)									
133372	688.0	1RB99	Rear	/	18.09	19.0	0.652	**0.80**	-0.07
133222	673.0	50RB50	Rear	/	18.23	19.0	0.727	**0.87**	-0.13
133322	683.0	1RB99	Rear	/	18.03	19.0	0.616	**0.77**	-0.15
133222	673.0	1RB50	Rear	**16**	18.06	19.0	**0.785**	**0.97**	-0.17
133372	688.0	50RB50	Rear	/	18.00	19.0	0.603	**0.76**	-0.10
133322	683.0	50RB50	Rear	/	18.06	19.0	0.735	**0.91**	0.04
133372	688.0	100RB	Rear	/	18.05	19.0	0.621	**0.77**	0.09
133372	688.0	1RB99	Top	/	18.09	19.0	0.552	**0.68**	-0.16
133222	673.0	50RB50	Top	/	18.23	19.0	0.608	**0.73**	0.08
133372	688.0	1RB99	Right	/	22.90	24.0	0.122	**0.16**	0.05
133222	673.0	50RB50	Right	/	21.97	23.0	0.112	**0.14**	0.18
Sensor off Test Data									
133372	688.0	1RB99	Rear	Note1	22.90	24.0	0.142	**0.18**	0.11
133222	673.0	50RB50	Rear	Note1	21.97	23.0	0.139	**0.18**	0.08
133372	688.0	1RB99	Top	Note1	22.90	24.0	0.126	**0.16**	0.04
133222	673.0	50RB50	Top	Note1	21.97	23.0	0.125	**0.16**	0.12

Note1: The distance between the EUT's side and the phantom is 19mm.

13.3. Test Results for SUB 6G

Note: For this device, Both NR n41/n77 band support PC3 and PC2 with same 100% duty cycle, so we choose PC2 for SAR test

Table 13.25: SAR Values (NR n2 - Body)

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								
Test Data (0mm)									
381500	1907.5	12@6	Rear	**17**	13.86	15.0	**0.761**	**0.99**	0.08
381500	1907.5	12@6	Top	/	13.86	15.0	0.526	**0.68**	0.04
381500	1907.5	12@6	Right	/	23.00	24.0	0.187	**0.24**	0.06
Sensor off Test Data									
381500	1907.5	12@6	Rear	Note1	23.00	24.0	0.601	**0.76**	0.04
381500	1907.5	12@6	Top	Note1	23.00	24.0	0.645	**0.81**	0.08

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.26: SAR Values (NR n2 - Body)

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								
Test Data (0mm)									
381500	1907.5	12@6	Rear	/	11.78	13.0	**0.528**	**0.70**	0.05
381500	1907.5	12@6	Top	/	11.78	13.0	0.368	**0.49**	0.17
381500	1907.5	12@6	Right	/	21.96	23.0	0.151	**0.19**	-0.14
Sensor off Test Data									
381500	1907.5	12@6	Rear	Note1	21.96	23.0	0.483	**0.61**	0.01
381500	1907.5	12@6	Top	Note1	21.96	23.0	0.522	**0.66**	0.07

Note1: The distance between the EUT's side and the phantom is 19mm.

Note2: The SAR test results only for ENDC mode.

Table 13.27: SAR Values (NR n25 - Body)

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								
Test Data (0mm)									
382500	1912.5	12@6	Rear	**18**	13.85	15.0	**0.777**	**1.01**	0.02
382500	1912.5	12@6	Top	/	13.85	15.0	0.535	**0.70**	0.04
382500	1912.5	12@6	Right	/	22.86	24.0	0.180	**0.23**	0.17
Sensor off Test Data									
382500	1912.5	12@6	Rear	Note1	22.86	24.0	0.618	**0.80**	0.03
382500	1912.5	12@6	Top	Note1	22.86	24.0	0.662	**0.86**	0.06

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.28: SAR Values (NR n25 - Body)

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								
Test Data (0mm)									
382500	1912.5	12@6	Rear	/	11.89	13.0	**0.538**	**0.69**	0.04
382500	1912.5	12@6	Top	/	11.89	13.0	0.377	**0.49**	0.18
382500	1912.5	12@6	Right	/	21.85	23.0	0.140	**0.18**	-0.01
Sensor off Test Data									
382500	1912.5	12@6	Rear	Note1	21.85	23.0	0.482	**0.63**	0.01
382500	1912.5	12@6	Top	Note1	21.85	23.0	0.537	**0.70**	0.14

Note1: The distance between the EUT's side and the phantom is 19mm.

Note2: The SAR test results only for ENDC mode.

Table 13.29: SAR Values (NR n41 - Body) – PC2

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								
Test Data (0mm)									
509202	2546.01	135@67	Rear	**19**	14.47	15.0	**0.968**	**1.09**	0.09
509202	2546.01	135@67	Right	/	14.47	15.0	0.918	**1.04**	0.05
509202	2546.01	135@67	Top	/	26.79	27.0	0.409	**0.43**	0.09
Sensor off Test Data									
509202	2546.01	135@67	Rear	Note1	26.79	27.0	0.697	**0.73**	-0.05
509202	2546.01	135@67	Right	Note1	26.79	27.0	0.556	**0.58**	0.09

Note1: The distance between the EUT's side and the phantom is 14mm.

Table 13.30: SAR Values (NR n41 - Body) – PC2

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								
Test Data (0mm)									
509202	2546.01	135@67	Rear	/	12.51	13.0	0.472	**0.53**	0.09
509202	2546.01	135@67	Right	/	12.51	13.0	0.450	**0.50**	0.10
509202	2546.01	135@67	Top	/	26.79	27.0	0.409	**0.43**	0.09
Sensor off Test Data									
509202	2546.01	135@67	Rear	Note1	26.79	27.0	**0.697**	**0.73**	-0.05
509202	2546.01	135@67	Right	Note1	26.79	27.0	0.556	**0.58**	0.09

Note1: The distance between the EUT's side and the phantom is 14mm.

Note2: The SAR test results only for ENDC mode.

Table 13.31: SAR Values (NR n66 - Body)

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								
Test Data (0mm)									
355500	1777.5	12@6	Rear	**20**	13.78	15.0	**0.735**	**0.97**	0.09
355500	1777.5	12@6	Top	/	13.78	15.0	0.461	**0.61**	-0.01
355500	1777.5	12@6	Right	/	22.78	23.5	0.167	**0.20**	0.07
Sensor off Test Data									
355500	1777.5	12@6	Rear	Note1	22.78	23.5	0.492	**0.58**	0.00
355500	1777.5	12@6	Top	Note1	22.78	23.5	0.488	**0.58**	-0.12

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.32: SAR Values (NR n66 - Body)

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								
Test Data (0mm)									
355500	1777.5	12@6	Rear	/	12.27	13.5	0.459	**0.61**	0.09
355500	1777.5	12@6	Top	/	12.27	13.5	0.274	**0.36**	0.13
355500	1777.5	12@6	Right	/	22.78	23.5	0.167	**0.20**	0.07
Sensor off Test Data									
355500	1777.5	12@6	Rear	Note1	22.78	23.5	0.492	**0.58**	0.00
355500	1777.5	12@6	Top	Note1	22.78	23.5	0.488	**0.58**	-0.12

Note1: The distance between the EUT's side and the phantom is 19mm.

Note2: The SAR test results only for ENDC mode.

Table 13.33: SAR Values (NR n71 - Body)

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								
Test Data (0mm)									
139100	695.5	12@6	Rear	**21**	18.84	20.0	**0.777**	**1.01**	-0.02
139100	695.5	12@6	Top	/	18.84	20.0	0.742	**0.97**	-0.02
139100	695.5	12@6	Right	/	23.03	24.0	0.208	**0.26**	0.06
Sensor off Test Data									
139100	695.5	12@6	Rear	Note1	23.03	24.0	0.125	**0.16**	0.07
139100	695.5	12@6	Top	Note1	23.03	24.0	0.109	**0.14**	0.04

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.34: SAR Values (NR n71 - Body)

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								
Test Data (0mm)									
139100	695.5	12@6	Rear	/	16.81	18.0	**0.539**	**0.71**	0.13
139100	695.5	12@6	Top	/	16.81	18.0	0.442	**0.58**	0.18
139100	695.5	12@6	Right	/	23.03	24.0	0.208	**0.26**	0.06
Sensor off Test Data									
139100	695.5	12@6	Rear	Note1	23.03	24.0	0.125	**0.16**	0.07
139100	695.5	12@6	Top	Note1	23.03	24.0	0.109	**0.14**	0.04

Note1: The distance between the EUT's side and the phantom is 19mm.

Note2: The SAR test results only for ENDC mode.

Table 13.35: SAR Values (NR n77 - Body) – Part 27Q – PC2

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								
Test Data (0mm)									
633334	3500.01	25@12	Rear	/	9.07	10.0	0.727	**0.90**	0.05
633334	3500.01	25@12	Top	/	9.07	10.0	0.344	**0.43**	0.02
Sensor off Test Data									
633334	3500.01	25@12	Rear	Note1	25.12	26.0	0.651	**0.80**	-0.08
633334	3500.01	25@12	Top	**22**/Note1	25.12	26.0	**0.821**	**1.01**	0.03

Note1: The distance between the EUT's side and the phantom is 19mm.

Table 13.36: SAR Values (NR n77 - Body) – Part 27O– PC2

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								
Test Data (0mm)									
650800	3762	25@12	Rear	/	9.19	10.0	0.902	**1.09**	0.09
650800	3762	25@12	Top	/	9.19	10.0	0.529	**0.64**	0.02
Sensor off Test Data									
650800	3762	25@12	Rear	Note1	25.46	26.0	0.728	**0.82**	0.03
650800	3762	25@12	Top	**23**/Note1	25.46	26.0	**0.933**	**1.06**	-0.09

Note1: The distance between the EUT's side and the phantom is 19mm.

13.4. WLAN Evaluation for Bluetooth

Table 13.37: 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								
Test Data (0mm)									
78	2480	GFSK	Rear	**24**	11.59	12.5	**0.256**	**0.32**	-0.07
78	2480	GFSK	Left	/	11.59	12.5	0.014	**0.02**	-0.17
78	2480	GFSK	Top	/	11.59	12.5	0.114	**0.14**	-0.13

13.5. WLAN Evaluation for 2.4G

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

Table 13.38: 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								
Test Data (0mm)									
1	2412	802.11b	Rear	**25**	13.04	14.0	**0.790**	**0.99**	0.06
6	2437	802.11b	Rear	/	12.86	14.0	0.738	**0.96**	0.11
1	2412	802.11b	Top	/	13.04	14.0	0.351	**0.44**	0.04
1	2412	802.11b	Left	/	18.84	20.0	0.140	**0.18**	0.12
Test Data (14mm)									
1	2412	802.11b	Rear	Note1	13.04	14.0	0.060	**0.08**	0.09
Sensor off Test Data									
1	2412	802.11b	Rear	Note2	18.84	20.0	0.175	**0.23**	0.15
1	2412	802.11b	Top	Note2	18.84	20.0	0.115	**0.15**	0.02

Note1: The distance between the EUT's side and the phantom is 14mm.

Note2: The distance between the EUT's side and the phantom is 17mm.

Note3: 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 13.39: SAR Values (WLAN - Body) – 802.11b (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					
1	2412	Rear	100%	100%	0.99	**0.99**

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

13.6. WLAN Evaluation for 5G

Table 13.40: 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								
<U-NII-2A> - Test Data (0mm)									
64	5320	802.11a	Rear	/	9.27	10.0	0.681	**0.81**	0.09
60	5300	802.11a	Rear	/	9.24	10.0	0.654	**0.78**	0.03
64	5320	802.11a	Top	/	9.27	10.0	0.848	**1.00**	0.06
60	5300	802.11a	Top	**26**	9.24	10.0	**0.874**	**1.04**	0.04
64	5320	802.11a	Left	/	17.37	18.0	0.200	**0.23**	0.02
<U-NII-2A> - Test Data (14mm)									
64	5320	802.11a	Rear	Note1	9.27	10.0	0.060	**0.07**	0.09
<U-NII-2A> - Sensor off Test Data									
64	5320	802.11a	Rear	Note2	17.37	18.0	0.219	**0.25**	0.09
64	5320	802.11a	Top	Note2	17.37	18.0	0.225	**0.26**	0.00
<U-NII-2C> - Test Data (0mm)									
140	5700	802.11a	Rear	/	9.51	10.0	0.749	**0.84**	0.09
132	5660	802.11a	Rear	/	9.44	10.0	0.741	**0.84**	0.03
140	5700	802.11a	Top	/	9.51	10.0	0.770	**0.86**	0.01
132	5660	802.11a	Top	/	9.44	10.0	0.790	**0.90**	0.09
132	5660	802.11a	Left	/	17.87	18.0	0.126	**0.13**	0.09
<U-NII-2C> - Test Data (14mm)									
140	5700	802.11a	Rear	Note1	9.51	10.0	0.076	**0.08**	0.05
<U-NII-2C> - Sensor off Test Data									
132	5660	802.11a	Rear	Note2	17.87	18.0	0.503	**0.52**	0.09
132	5660	802.11a	Top	Note2	17.87	18.0	0.330	**0.34**	0.00
<U-NII-3> - Test Data (0mm)									
165	5825	802.11a	Rear	/	9.29	10.0	0.840	**0.99**	0.00
157	5785	802.11a	Rear	/	9.25	10.0	0.796	**0.95**	0.06
165	5825	802.11a	Top	/	9.29	10.0	0.705	**0.83**	-0.10
157	5785	802.11a	Top	/	9.25	10.0	0.635	**0.75**	0.04
165	5825	802.11a	Left	/	17.49	18.0	0.034	**0.04**	0.09
<U-NII-3> - Test Data (14mm)									
165	5825	802.11a	Rear	14mm	9.29	10.0	0.077	**0.09**	0.09
<U-NII-3> - Sensor off Test Data									
165	5825	802.11a	Rear	Note2	17.49	18.0	0.514	**0.58**	0.11
165	5825	802.11a	Top	Note2	17.49	18.0	0.273	**0.31**	0.03

Note1: The distance between the EUT's side and the phantom is 14mm.

Note2: The distance between the EUT's side and the phantom is 17mm.

Note3: 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 ≤ 1.2W/kg, SAR is not required for U-NII-1 band.

Note4: 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 13.41: SAR Values (WLAN - Body) – 802.11a (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					
60	5300	Top	100%	100%	1.04	**1.04**

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 ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Table 14.1: SAR Measurement Variability for Body – GSM1900

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
810	1909.8	Rear	0.987	0.966	1.02	/

Table 14.2: SAR Measurement Variability for Body – WCDMA Band 2

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
9538	1908.0	Rear	0.868	0.845	1.03	/

Table 14.3: SAR Measurement Variability for Body – WCDMA Band 4

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
1513	1752.6	Rear	0.830	0.821	1.01	/

Table 14.4: SAR Measurement Variability for Body – WCDMA Band 5

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
4233	846.6	Rear	0.806	0.789	1.02	/

Table 14.5: SAR Measurement Variability for Body – LTE Band 7

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
21100	2535.0	Rear	0.885	0.860	1.03	/

Table 14.6: SAR Measurement Variability for Body – LTE Band 12

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
23060	704.0	Rear	0.874	0.856	1.02	/

Table 14.7: SAR Measurement Variability for Body – LTE Band 13

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
23230	782.0	Rear	0.908	0.874	1.04	/

Table 14.8: SAR Measurement Variability for Body – LTE Band 25

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
26590	1905.0	Rear	0.848	0.837	1.01	/

Table 14.9: SAR Measurement Variability for Body – LTE Band 41(PC2)

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
41490	2680.0	Right	0.921	0.904	1.02	/

Table 14.10: SAR Measurement Variability for Body – NR n41

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
509202	2546.0	Rear	0.968	0.949	1.02	/

Table 14.11: SAR Measurement Variability for Body – NR n77 (Part 27Q)

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
633334	3500	Top	0.821	0.810	1.01	/

Table 14.12: SAR Measurement Variability for Body – NR n77 (Part 27O)

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
650800	3762	Top	0.933	0.908	1.03	/

Table 14.13: SAR Measurement Variability for Body – WLAN 5GHz

Frequency		Test Position	Original	1st Repeated	Ratio	2nd Repeated
Ch.	MHz		SAR (W/kg)	SAR (W/kg)		SAR (W/kg)
60	5300	Top	0.874	0.852	1.03	/

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
Measurement system										
1	Probe calibration	B	12	N	2	1	1	6.0	6.0	∞
2	Axial isotropy	B	4.7	R	$\sqrt{3}$	√0.5	√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	∞
Test sample related										
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	∞
Phantom and set-up										
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
Measurement system										
1	Probe calibration	B	13.3	N	2	1	1	6.65	6.65	∞
2	Axial isotropy	B	4.7	R	$\sqrt{3}$	√0.5	√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	∞
Test sample related										
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	∞
Phantom and set-up										
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	2021-11-15	One year
02	Dielectric probe	85070E	MY44300317	/	/
03	Power meter	E4418B	MY50000366	2021-12-13	One year
04	Power sensor	E9304A	MY50000188		
05	Power meter	NRP	101460	2022-01-15	One year
06	Power sensor	NRP-Z91	100553		
07	Signal Generator	E8257D	MY47461211	2022-01-15	One year
08	Amplifier	VTL5400	0404	/	/
09	E-field Probe	EX3DV4	7683	2021-12-29 & 2021-09-22	One year
10	DAE	DAE4	1527	2022-01-12	One year
11	Dipole Validation Kit	D750V3	1163	2019-09-03	Three year
12	Dipole Validation Kit	D835V2	4d057	2021-10-18	Three year
13	Dipole Validation Kit	D1750V2	1152	2019-08-30	Three year
14	Dipole Validation Kit	D1900V2	5d088	2021-10-18	Three year
15	Dipole Validation Kit	D2450V2	873	2021-10-21	Three year
16	Dipole Validation Kit	D2550V2	1010	2021-05-21	Three year
17	Dipole Validation Kit	D3500V2	1084	2019-09-20	Three year
18	Dipole Validation Kit	D3700V2	1049	2019-09-20	Three year
19	Dipole Validation Kit	D5GHzV2	1238	2019-08-29	Three year
20	BTS	MT8820C	6201341853	2022-01-15	One year
21	BTS	E5515C	GB46110722	2022-01-15	One year
22	BTS	CMW500	152499	2021-07-16	One year
23	Software	DASY5	/	/	/

ANNEX A: Graph Results

GSM850 Body

Date: 2022-5-7

Electronics: DAE4 Sn1527

Medium: Head 835MHz

Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.914S/m; ε_r = 40.648; ρ = 1000 kg/m^3

Communication System: UID 0, 2 slot GPRS (0) Frequency: 824.2 MHz Duty Cycle: 1:4

Probe: EX3DV4 - SN7683 ConvF (10.34, 10.34, 10.34)

Rear Side Low/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.06 W/kg

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

Reference Value = 2.140 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 2.19 W/kg

SAR(1 g) = 0.541 W/kg; SAR(10 g) = 0.227 W/kg

Maximum value of SAR (measured) = 1.14 W/kg

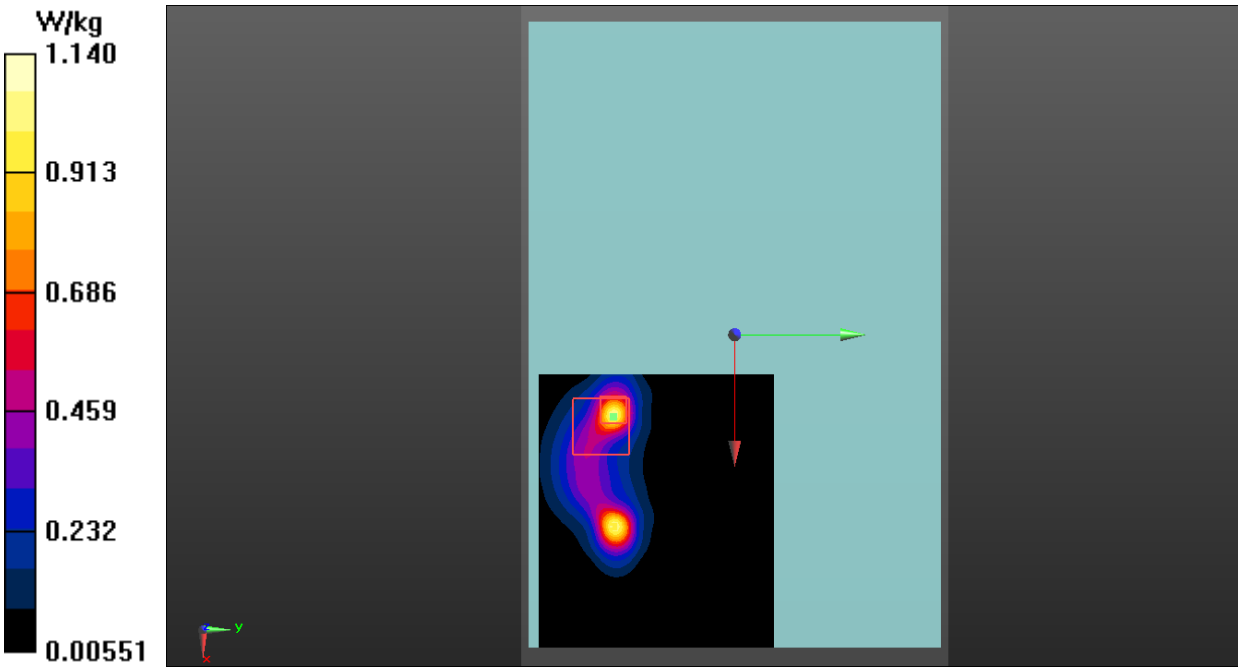


Fig. 1 GSM850 Body

GSM1900 Body
Date: 2022-4-19
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1910 MHz; σ = 1.387 S/m; ε_r = 39.535; ρ = 1000 kg/m^3
Communication System: UID 0, 2 slot GPRS (0) Frequency: 1909.8 MHz Duty Cycle: 1:4
Probe: EX3DV4 - SN7683 ConvF (8.33, 8.33, 8.33)

Rear Side High/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.03 W/kg

Rear Side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.301 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 2.29 W/kg
SAR(1 g) = 0.987 W/kg; SAR(10 g) = 0.479 W/kg
Maximum value of SAR (measured) = 1.57 W/kg

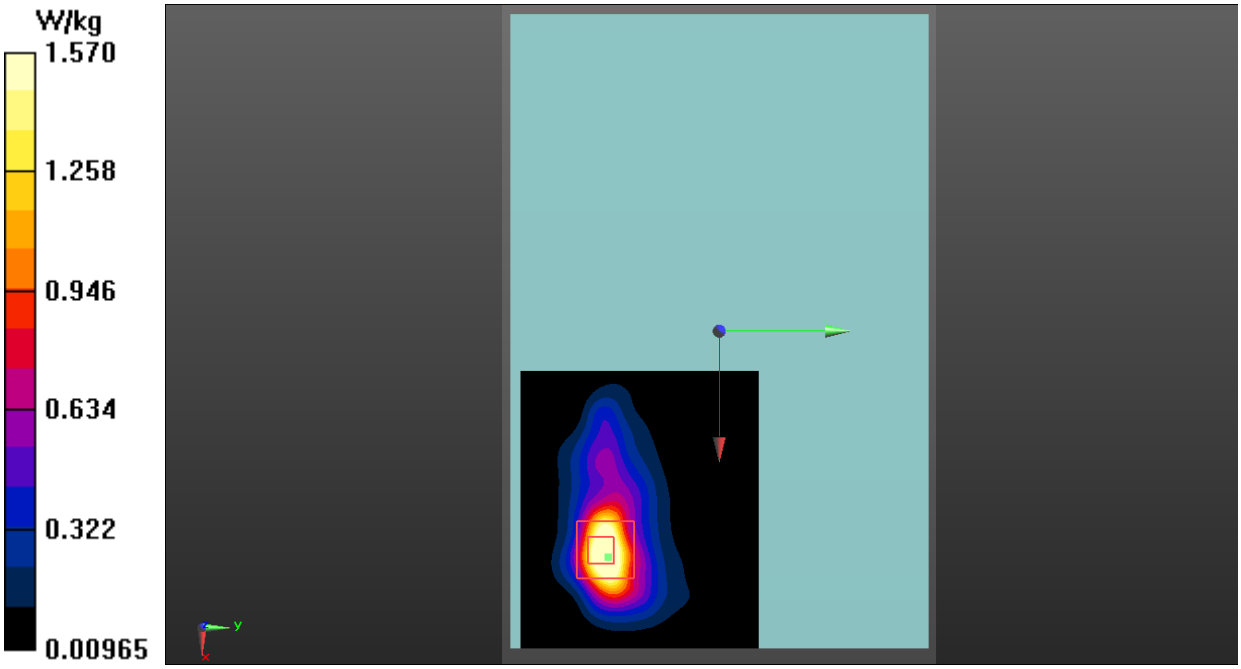


Fig. 2 GSM1900 Body

WCDMA Band 2 Body
Date: 2022-4-19
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1908 MHz; σ = 1.385 S/m; ε_r = 39.543; ρ = 1000 kg/m^3
Communication System: UID 0, WCDMA (0) Frequency: 1907.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (8.33, 8.33, 8.33)

Top Side High/Area Scan (81x41x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.31 W/kg

Top Side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.294 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.52 W/kg
SAR(1 g) = 0.919 W/kg; SAR(10 g) = 0.523 W/kg
Maximum value of SAR (measured) = 1.24 W/kg

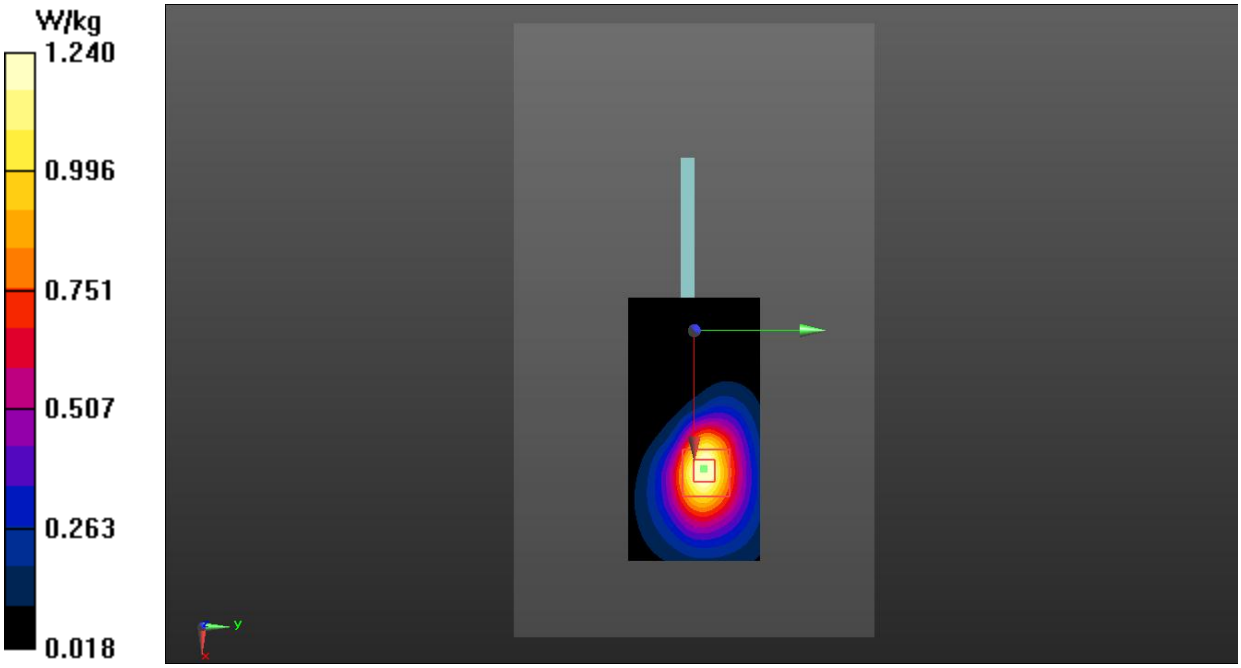


Fig. 3 WCDMA Band 2 Body

WCDMA Band 4 Body
Date: 2022-4-18
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1753 MHz; σ = 1.362 S/m; ε_r = 39.701; ρ = 1000 kg/m^3
Communication System: UID 0, WCDMA (0) Frequency: 1752.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (8.58, 8.58, 8.58)

Rear Side High/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.31 W/kg

Rear Side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.294 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.85 W/kg
SAR(1 g) = 0.830 W/kg; SAR(10 g) = 0.406 W/kg
Maximum value of SAR (measured) = 1.28 W/kg

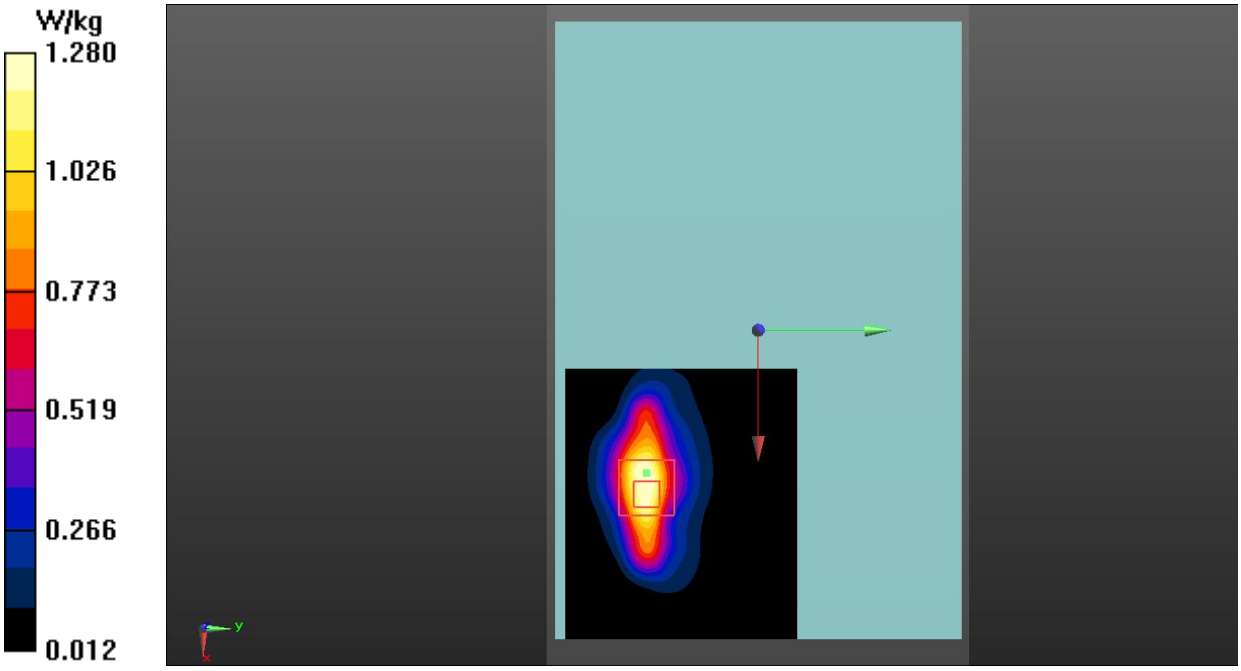


Fig. 4 WCDMA Band 4 Body

WCDMA Band 5 Body
Date: 2022-5-7
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used (interpolated): f = 846.6 MHz; σ = 0.935 S/m; ε_r = 40.379; ρ = 1000 kg/m^3
Communication System: UID 0, WCDMA (0) Frequency: 846.6 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (10.34, 10.34, 10.34)

Rear Side High/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.24 W/kg

Rear Side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.027 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 2.30 W/kg
SAR(1 g) = 0.806 W/kg; SAR(10 g) = 0.369 W/kg
Maximum value of SAR (measured) = 1.45 W/kg

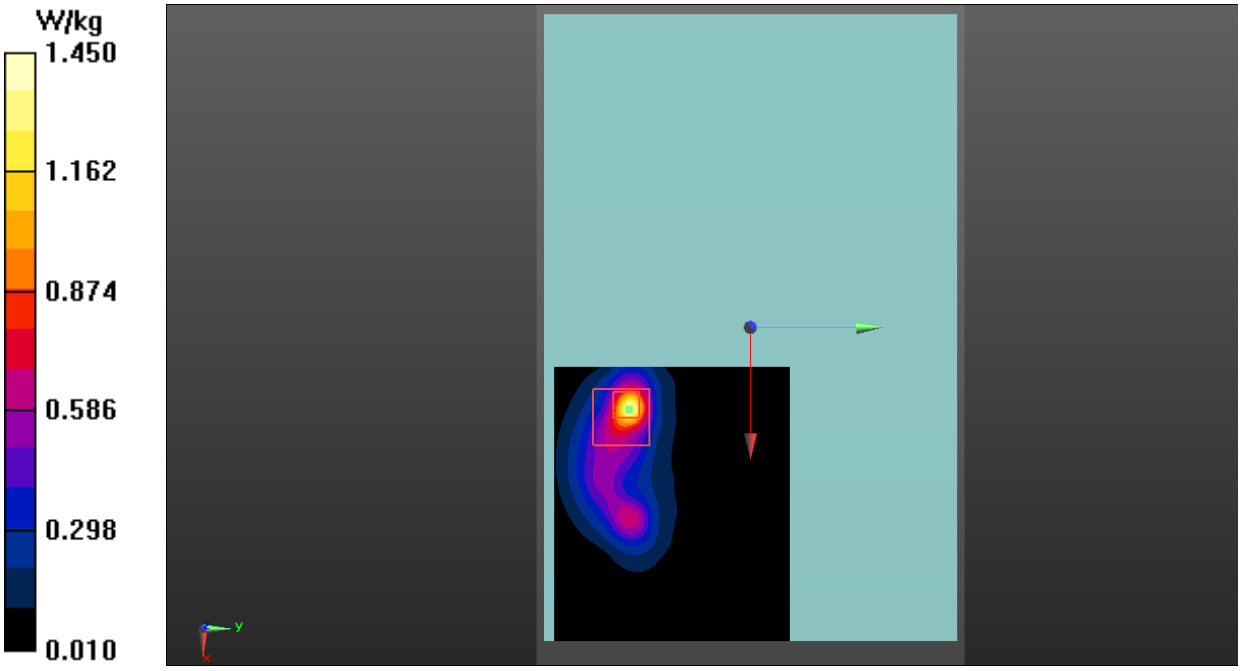


Fig. 5 WCDMA Band 5 Body

LTE Band 2 Body
Date: 2022-4-19
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1900 MHz; σ = 1.378 S/m; ε_r = 39.574; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (8.33, 8.33, 8.33)

Top Side High 1RB50/Area Scan (81x41x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.08 W/kg

Top Side High 1RB50/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.200 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.759 W/kg; SAR(10 g) = 0.433 W/kg
Maximum value of SAR (measured) = 1.02 W/kg

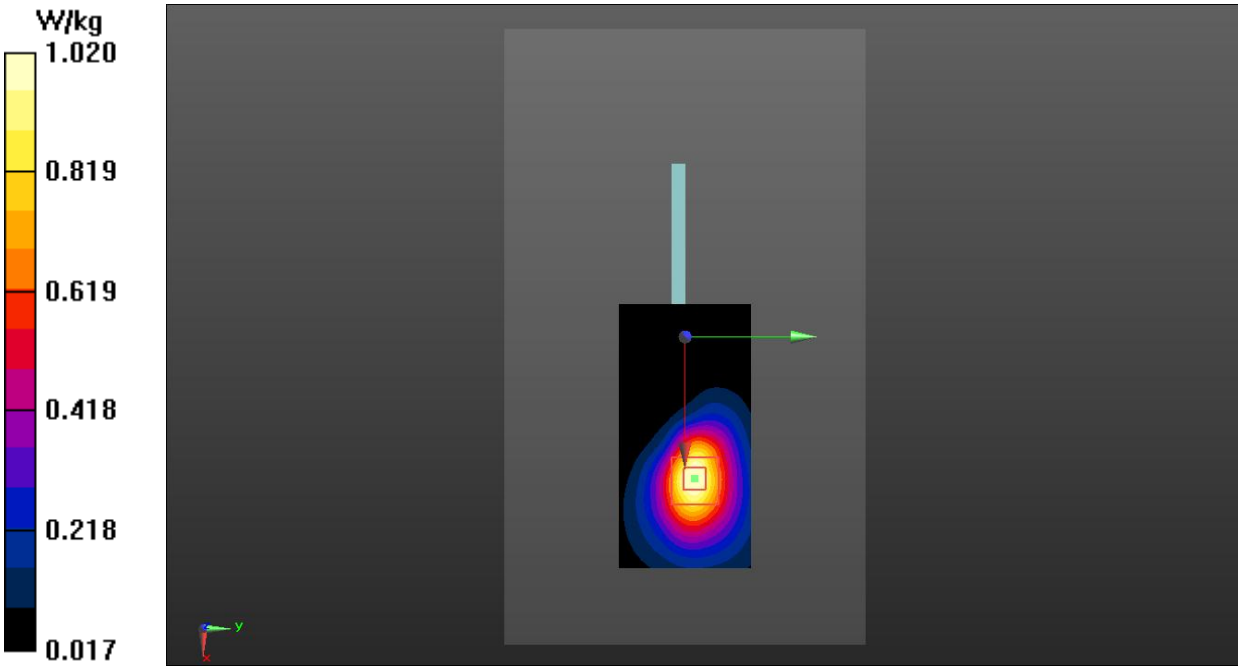


Fig. 6 LTE Band 2 Body

LTE Band 4 Body
Date: 2022-4-18
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1720 MHz; σ = 1.333 S/m; ε_r = 39.83; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 1720 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (8.58, 8.58, 8.58)

Rear Side Low 50RB50/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.952 W/kg

Rear Side Low 50RB50/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.042 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.56 W/kg
SAR(1 g) = 0.689 W/kg; SAR(10 g) = 0.345 W/kg
Maximum value of SAR (measured) = 1.02 W/kg

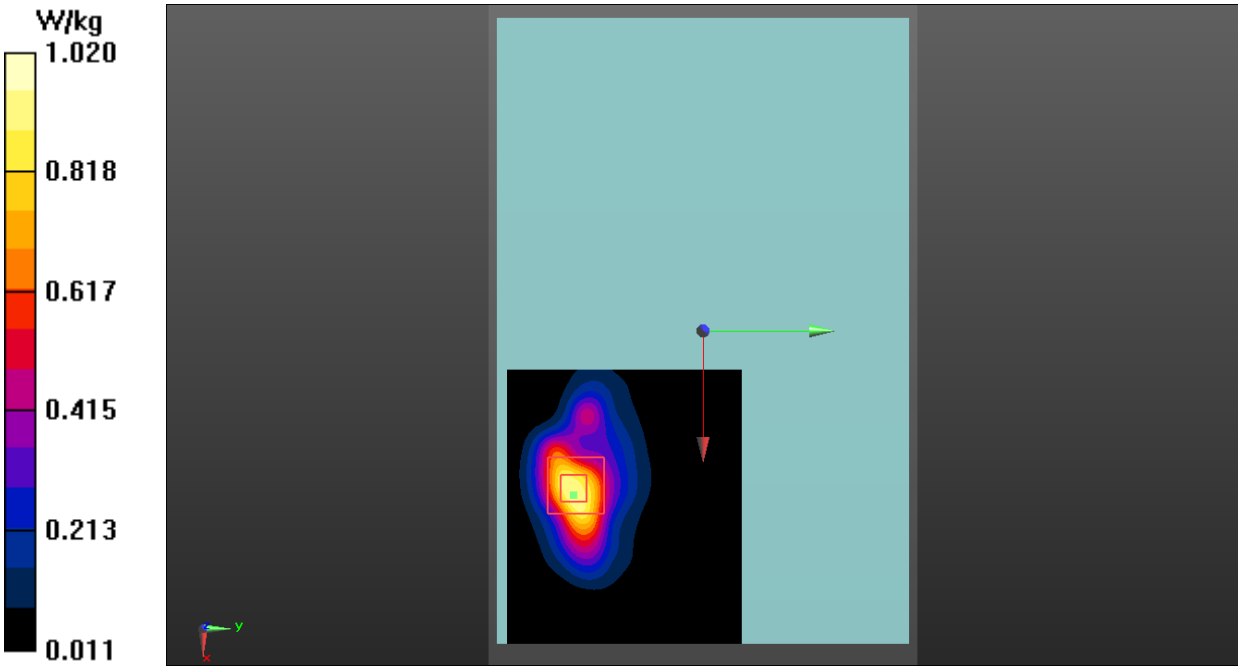


Fig. 7 LTE Band 4 Body

LTE Band 7 Body
Date: 2022-4-26
Electronics: DAE4 Sn1527
Medium: Head 2550MHz
Medium parameters used (interpolated): f = 2535 MHz; σ = 1.931 S/m; ε_r = 38.155; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 2535 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (7.85, 7.85, 7.85)

Rear Side Middle 50RB25/Area Scan (111x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.07 W/kg

Rear Side Middle 50RB25/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.022 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 2.41 W/kg
SAR(1 g) = 0.855 W/kg; SAR(10 g) = 0.290 W/kg
Maximum value of SAR (measured) = 1.38 W/kg

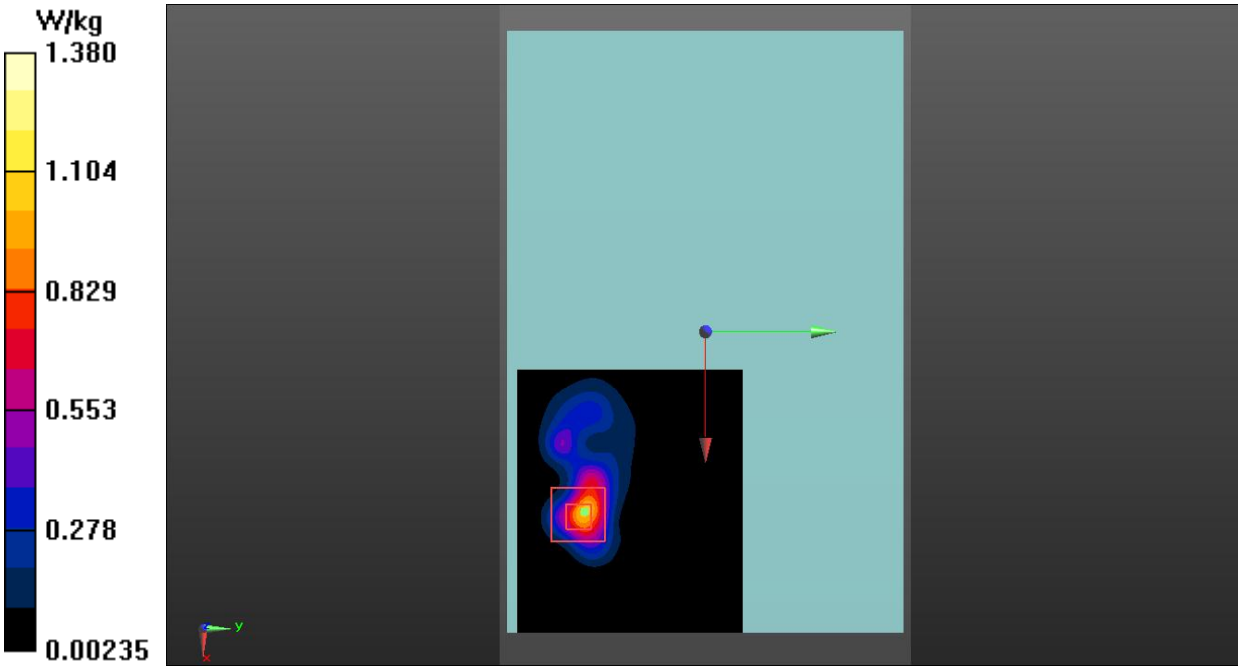


Fig. 8 LTE Band 7 Body

LTE Band 12 Body
Date: 2022-4-29
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used: f = 704 MHz; σ = 0.874 S/m; ε_r = 41.703; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 704 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (10.34, 10.34, 10.34)

Rear Side Low 25RB0/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.07 W/kg

Rear Side Low 25RB0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.298 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 3.26 W/kg
SAR(1 g) = 0.874 W/kg; SAR(10 g) = 0.358 W/kg
Maximum value of SAR (measured) = 1.59 W/kg

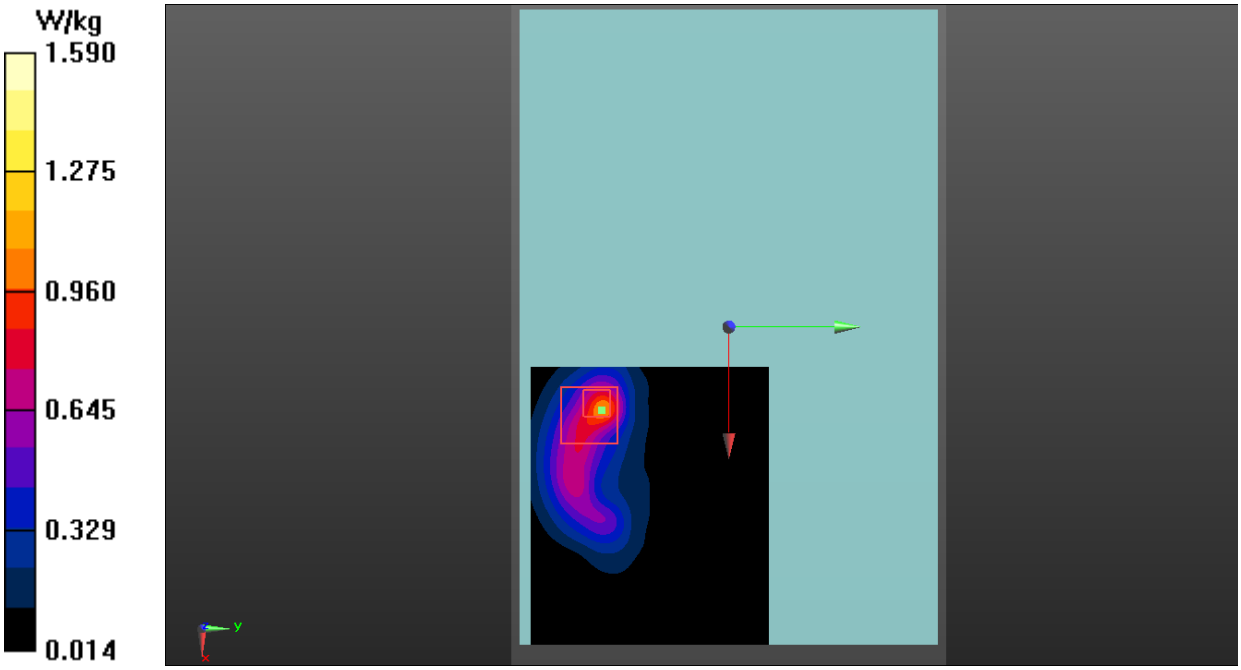


Fig. 9 LTE Band 12 Body

LTE Band 13 Body
Date: 2022-4-29
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used: f = 782 MHz; σ = 0.923 S/m; ε_r = 40.767; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 782 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (10.34, 10.34, 10.34)

Rear Side Middle 50RB0/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.52 W/kg

Rear Side Middle 50RB0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.846 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 3.60 W/kg
SAR(1 g) = 0.908 W/kg; SAR(10 g) = 0.369 W/kg
Maximum value of SAR (measured) = 1.84 W/kg

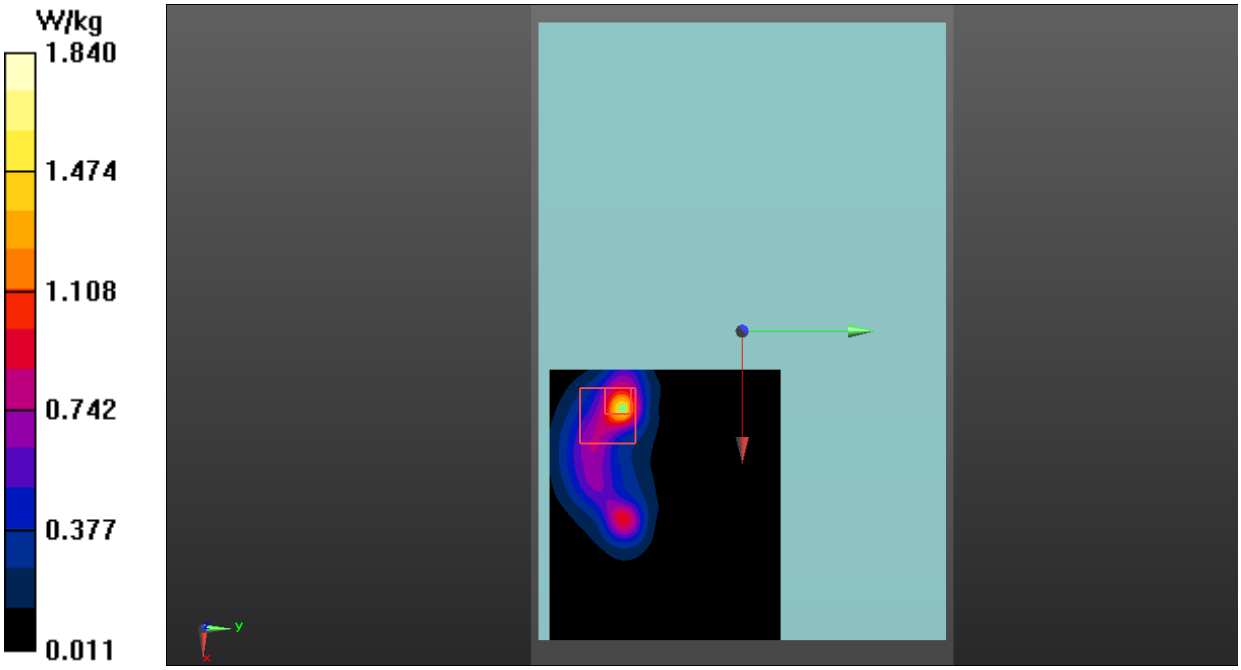


Fig. 10 LTE Band 13 Body

LTE Band 25 Body
Date: 2022-4-19
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1905 MHz; σ = 1.382 S/m; ε_r = 39.555 ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 1905 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (8.33, 8.33, 8.33)

Top Side High 1RB99/Area Scan (81x41x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.21 W/kg

Top Side High 1RB99/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.204 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.848 W/kg; SAR(10 g) = 0.479 W/kg
Maximum value of SAR (measured) = 1.14 W/kg

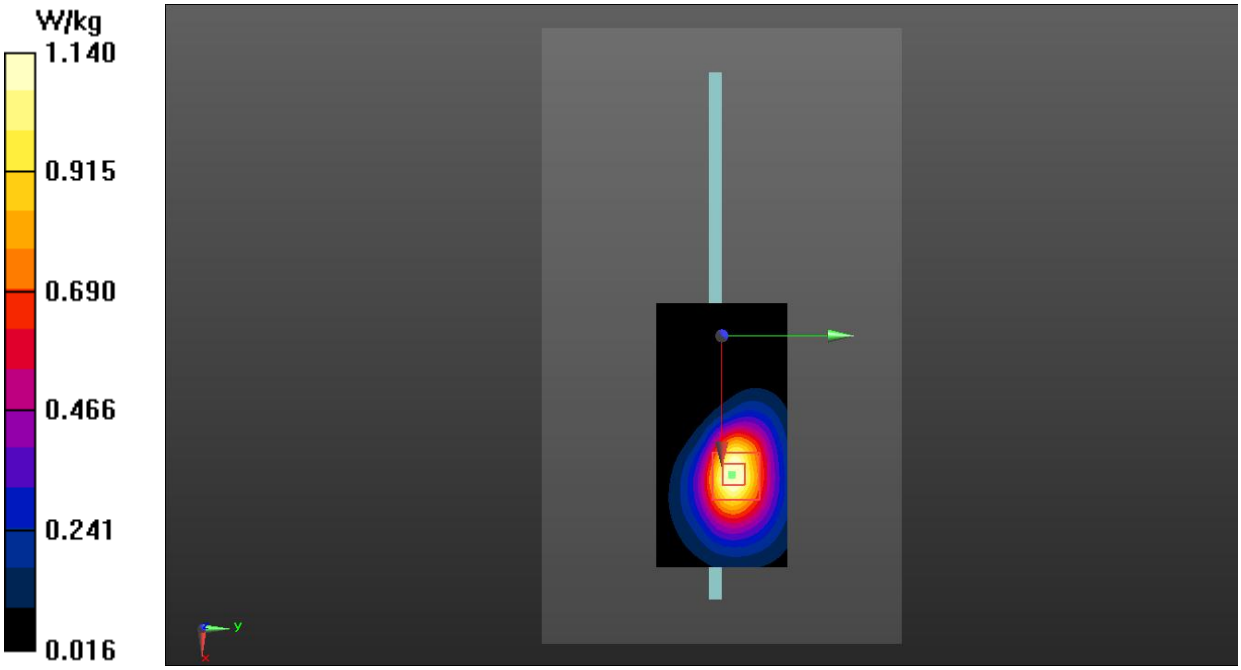


Fig. 11 LTE Band 25 Body

LTE Band 26 Body
Date: 2022-5-7
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used: f = 842 MHz; σ = 0.93 S/m; ε_r = 40.434; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 841.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (10.34, 10.34, 10.34)

Rear Side High 36RB0/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.43 W/kg

Rear Side High 36RB0/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.203 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 2.16 W/kg
SAR(1 g) = 0.681 W/kg; SAR(10 g) = 0.305 W/kg
Maximum value of SAR (measured) = 1.45 W/kg

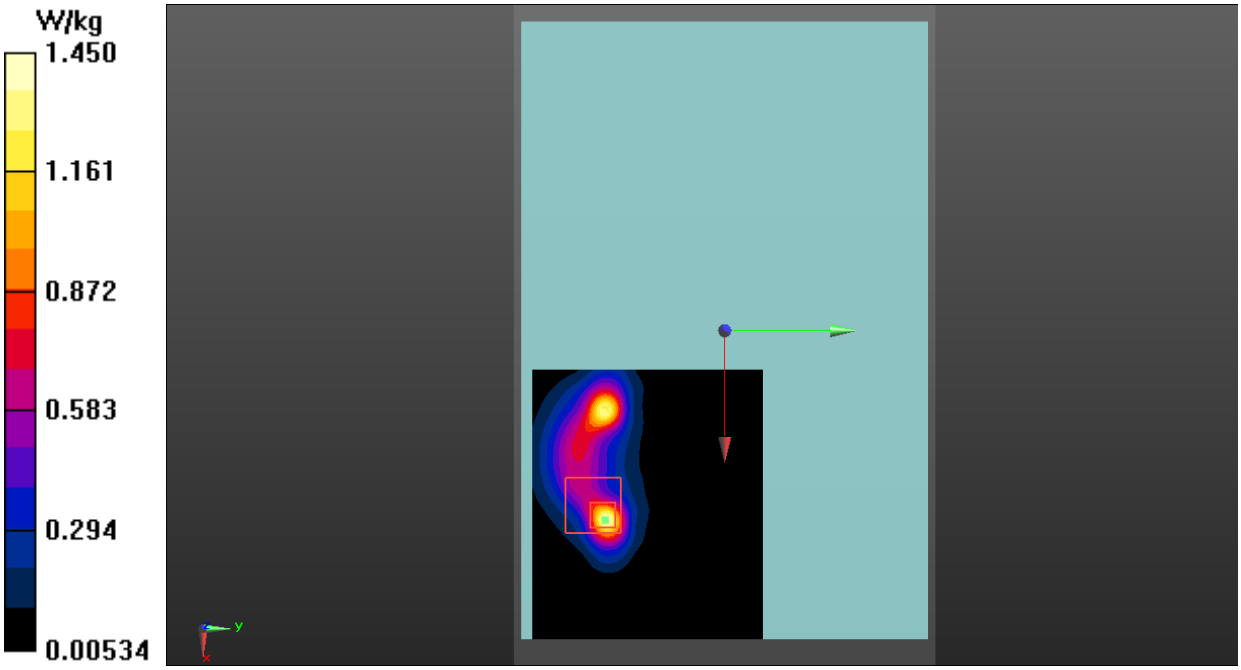


Fig. 12 LTE Band 26 Body

LTE Band 41(PC3) Body
Date: 2022-4-26
Electronics: DAE4 Sn1527
Medium: Head 2550MHz
Medium parameters used: f = 2680 MHz; σ = 2.102 S/m; ε_r = 37.676; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_TDD (0) Frequency: 2680 MHz Duty Cycle: 1:1.58
Probe: EX3DV4 - SN7683 ConvF (7.55, 7.55, 7.55)

Right Side High 50RB25/Area Scan (61x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.663 W/kg

Right Side High 50RB25/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.317 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.90 W/kg
SAR(1 g) = 0.680 W/kg; SAR(10 g) = 0.218 W/kg
Maximum value of SAR (measured) = 1.14 W/kg

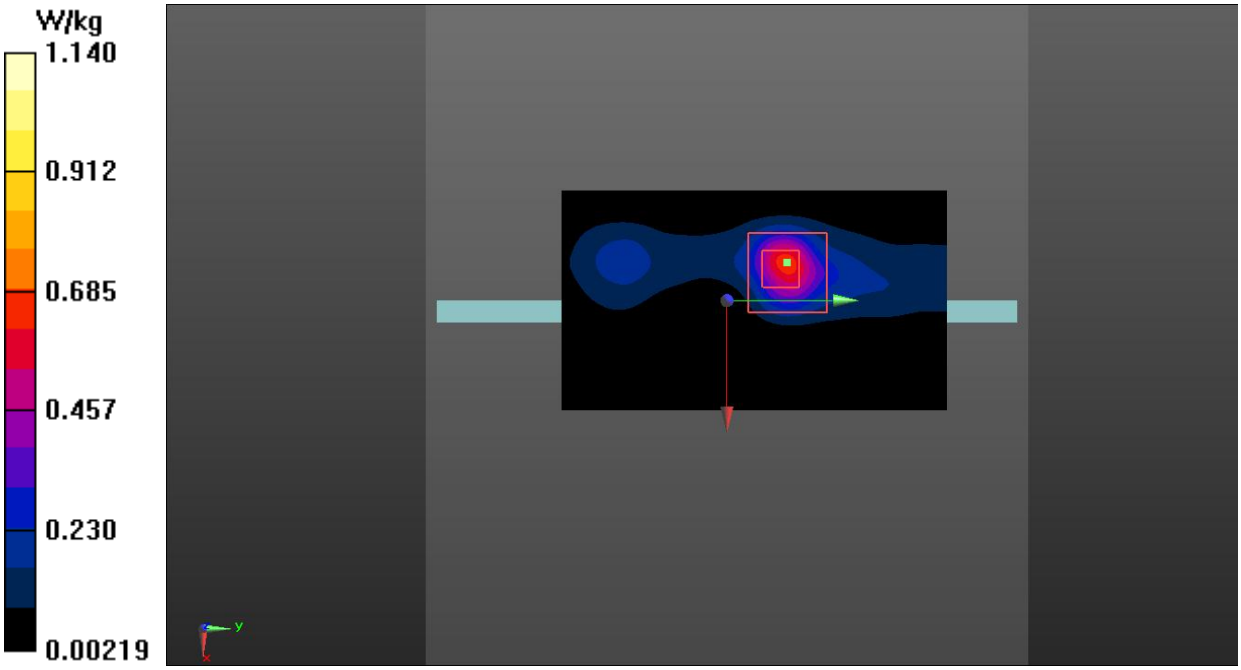


Fig. 13 LTE Band 41(PC3) Body

LTE Band 41(PC2) Body
Date: 2022-4-26
Electronics: DAE4 Sn1527
Medium: Head 2550MHz
Medium parameters used: f = 2680 MHz; σ = 2.102 S/m; ε_r = 37.676; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_TDD (0) Frequency: 2680 MHz Duty Cycle: 1:2.31
Probe: EX3DV4 - SN7683 ConvF (7.55, 7.55, 7.55)

Right Side High 50RB25/Area Scan (61x151x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.91 W/kg

Right Side High 50RB25/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.86 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 3.29 W/kg
SAR(1 g) = 0.921 W/kg; SAR(10 g) = 0.293 W/kg
Maximum value of SAR (measured) = 2.24 W/kg

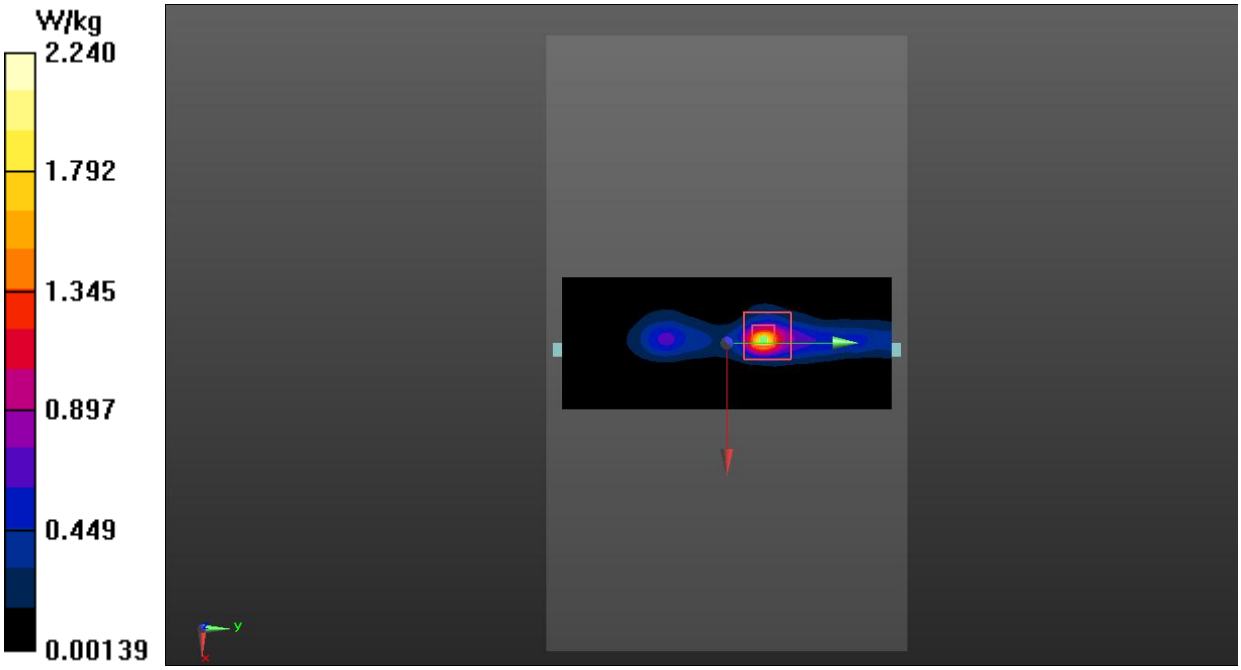


Fig. 14 LTE Band 41(PC2) Body

LTE Band 66 Body
Date: 2022-4-18
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1770 MHz; σ = 1.377 S/m; ε_r = 39.635; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 1770 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (8.58, 8.58, 8.58)

Rear Side High 50RB25/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.05 W/kg

Rear Side High 50RB25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.994 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.53 W/kg
SAR(1 g) = 0.688 W/kg; SAR(10 g) = 0.340 W/kg
Maximum value of SAR (measured) = 1.06 W/kg

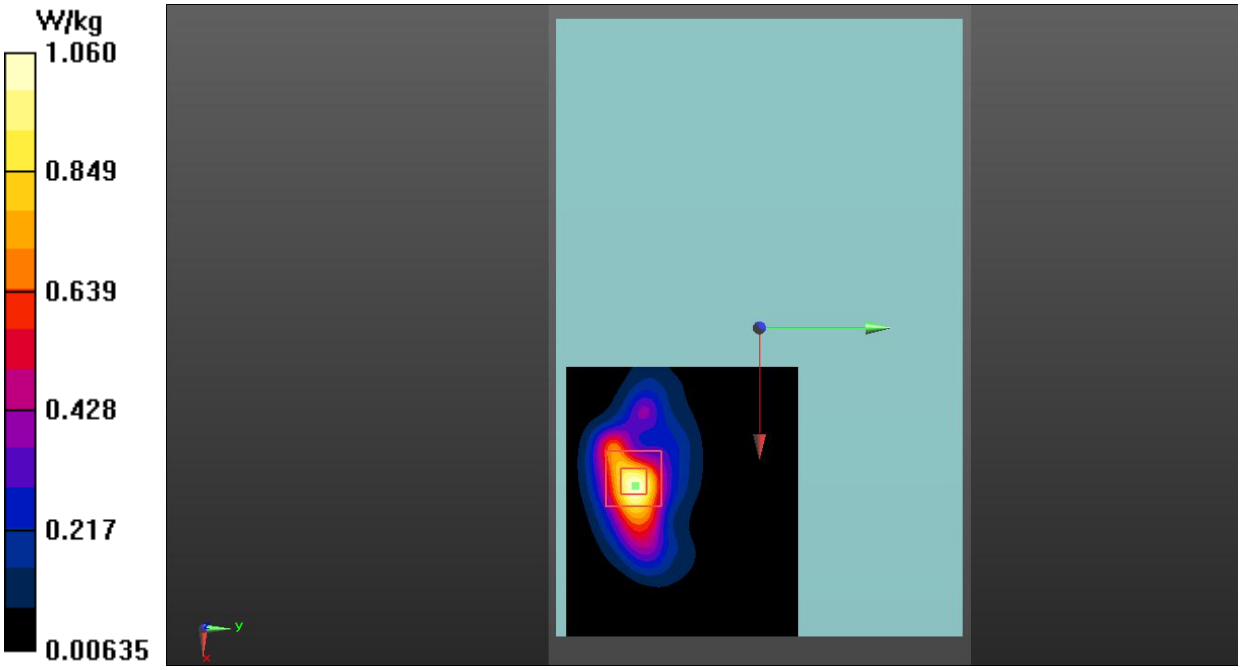


Fig. 15 LTE Band 66 Body

LTE Band 71 Body
Date: 2022-4-29
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used (extrapolated): f = 673 MHz; σ = 0.854 S/m; ε_r = 42.075; ρ = 1000 kg/m^3
Communication System: UID 0, LTE_FDD (0) Frequency: 673 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (10.34, 10.34, 10.34)

Rear Side Low 1RB50/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.57 W/kg

Rear Side Low 1RB50/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.343 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 3.07 W/kg
SAR(1 g) = 0.785 W/kg; SAR(10 g) = 0.304 W/kg
Maximum value of SAR (measured) = 1.62 W/kg

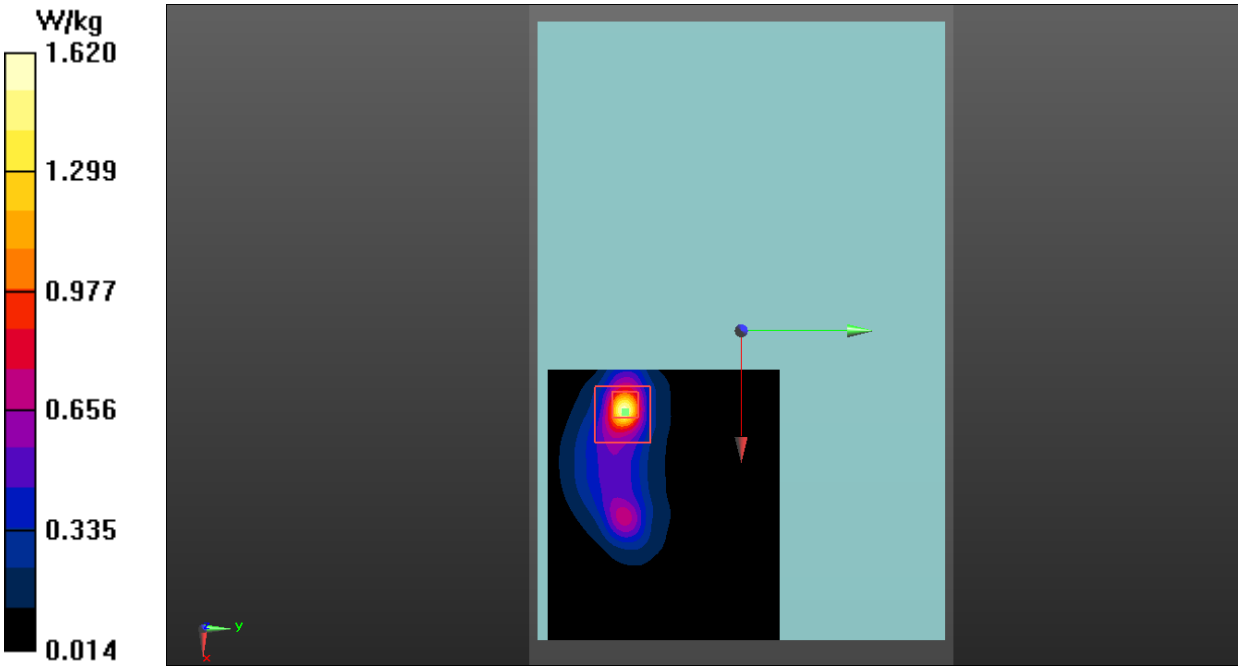


Fig. 16 LTE Band 71 Body

NR n2 Body
Date: 2022-4-19
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used (interpolated): f = 1907.5 MHz; σ = 1.385 S/m; ε_r = 39.545; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 1907.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (8.33, 8.33, 8.33)

Rear Side High 12@6/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.43 W/kg

Rear Side High 12@6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.172 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 0.761 W/kg; SAR(10 g) = 0.368 W/kg
Maximum value of SAR (measured) = 1.15 W/kg

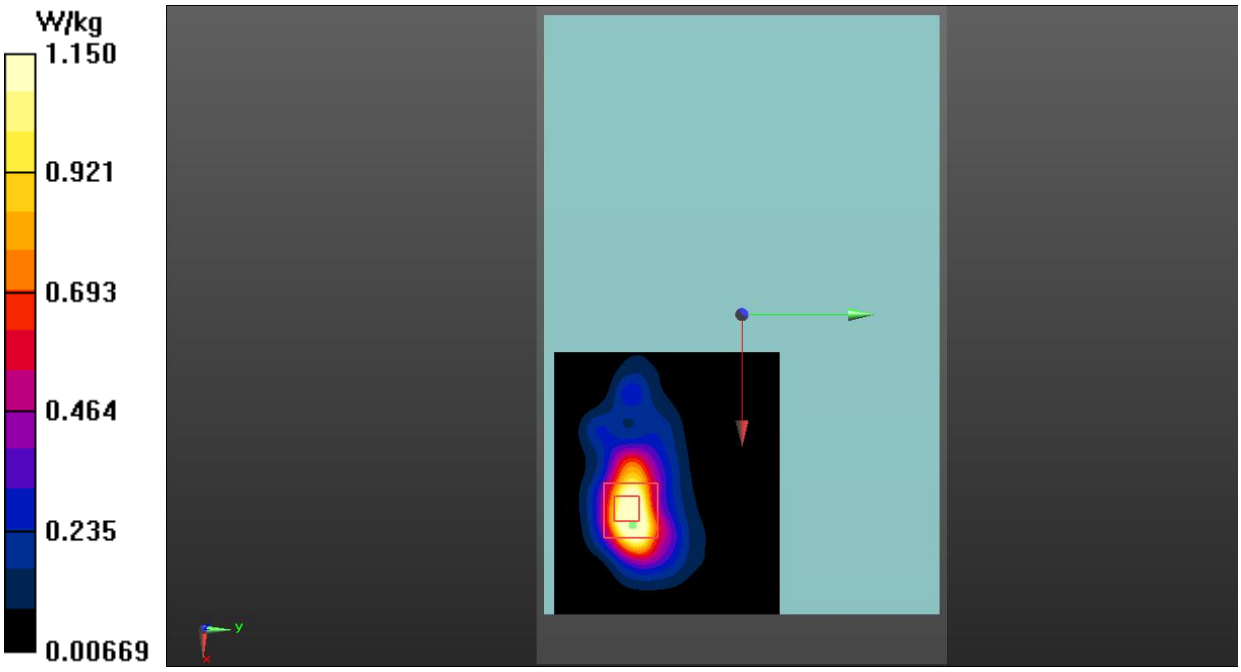


Fig. 17 NR n2 Body

NR n25 Body
Date: 2022-4-19
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used (interpolated): f = 1912.5 MHz; σ = 1.389 S/m; ε_r = 39.525; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 1912.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (8.33, 8.33, 8.33)

Rear Side High 12@6/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.33 W/kg

Rear Side High 12@6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.127 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 0.777 W/kg; SAR(10 g) = 0.373 W/kg
Maximum value of SAR (measured) = 1.23 W/kg

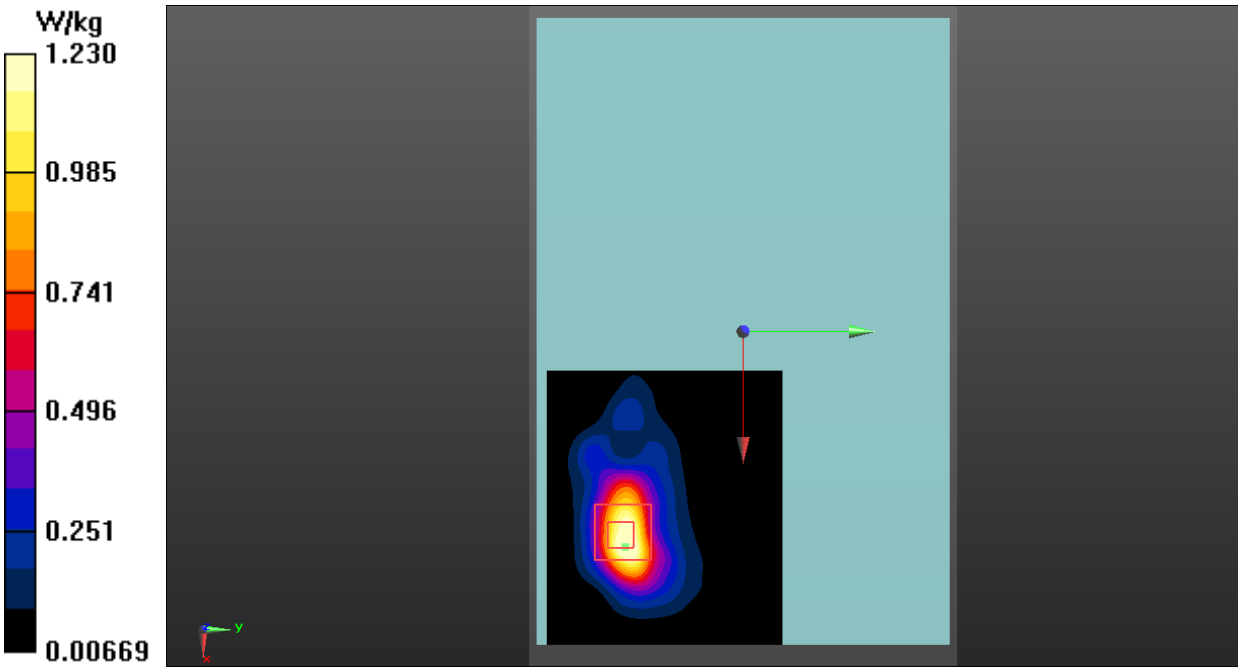


Fig. 18 NR n25 Body

NR n41 Body
Date: 2022-4-26
Electronics: DAE4 Sn1527
Medium: Head 2550MHz
Medium parameters used (interpolated): f = 2546.01 MHz; σ = 1.944 S/m; ε_r = 38.118; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 2546.01 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (7.85, 7.85, 7.85)

Rear Side Low 135@67/Area Scan (91x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.86 W/kg

Rear Side Low 135@67/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.305 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 2.61 W/kg
SAR(1 g) = 0.968 W/kg; SAR(10 g) = 0.371 W/kg
Maximum value of SAR (measured) = 1.60 W/kg

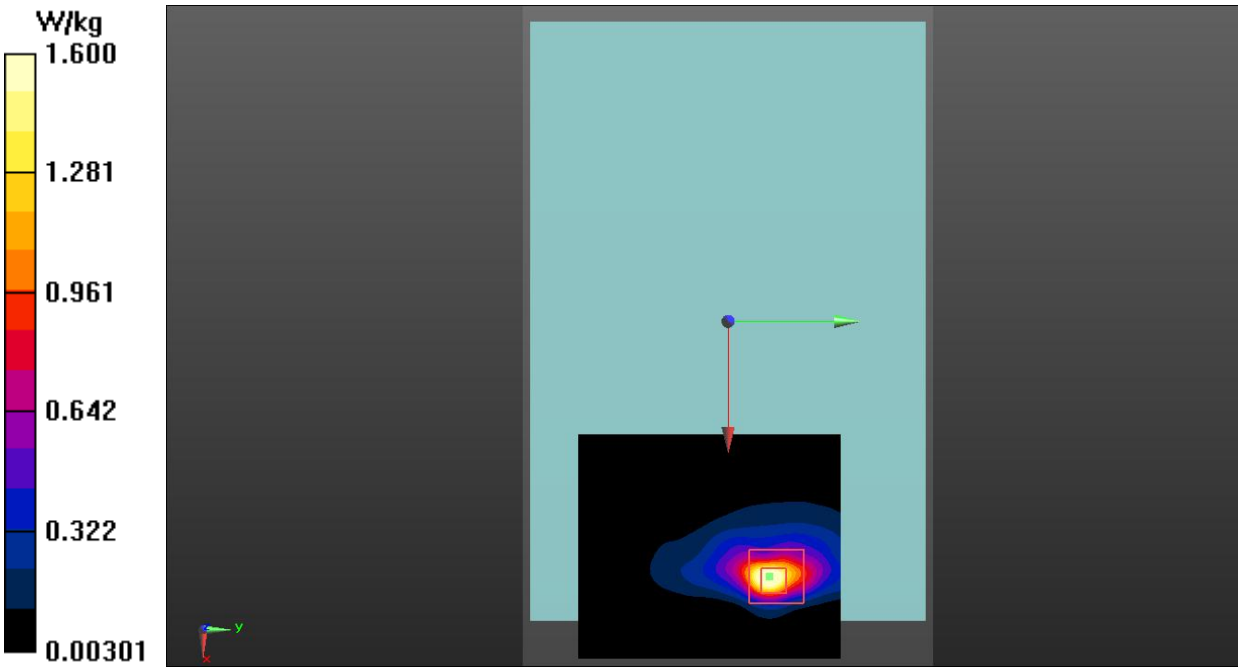


Fig. 19 NR n41 Body

NR n66 Body
Date: 2022-4-18
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used (interpolated): f = 1777.5 MHz; σ = 1.383 S/m; ε_r = 39.606; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 1777.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (8.58, 8.58, 8.58)

Rear Side High 12@6/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.18 W/kg

Rear Side High 12@6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.798 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.735 W/kg; SAR(10 g) = 0.355 W/kg
Maximum value of SAR (measured) = 1.15 W/kg

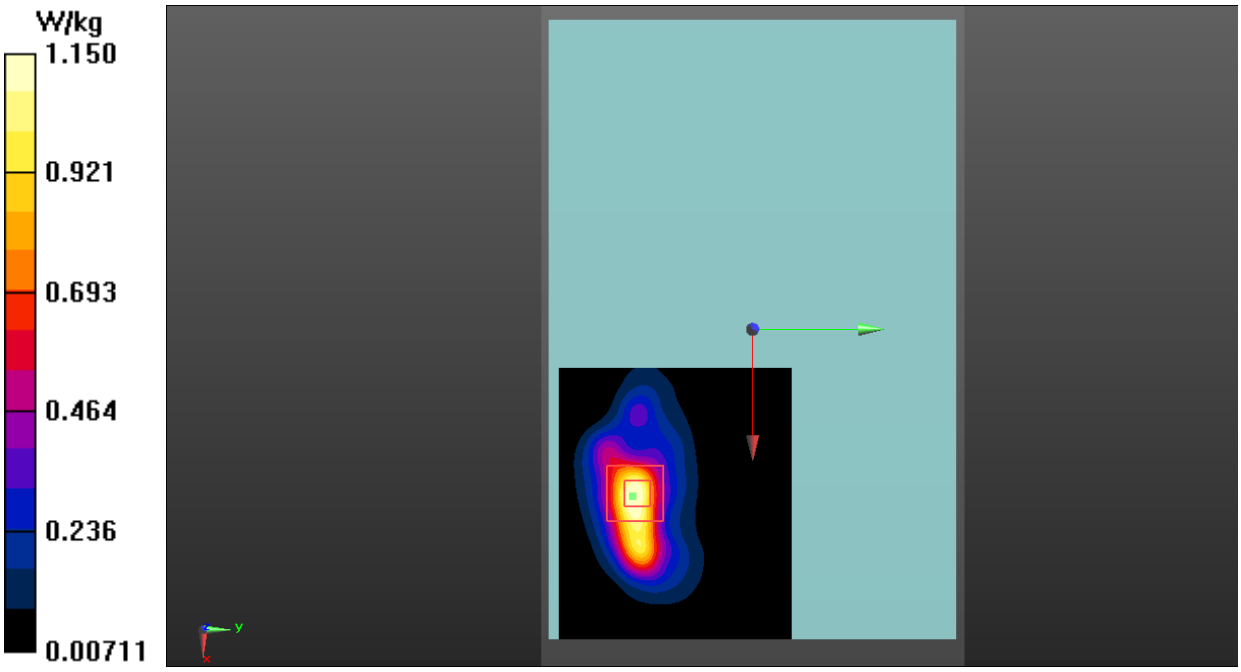


Fig. 20 NR n66 Body

NR n71 Body
Date: 2022-4-29
Electronics: DAE4 Sn1527
Medium: Head 750MHz
Medium parameters used (extrapolated): f = 695.5 MHz; σ = 0.868 S/m; ε_r = 41.805; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 695.5 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (10.34, 10.34, 10.34)

Rear Side High 12@6/Area Scan (71x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.46 W/kg

Rear Side High 12@6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.455 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 2.92 W/kg
SAR(1 g) = 0.777 W/kg; SAR(10 g) = 0.316 W/kg
Maximum value of SAR (measured) = 1.52 W/kg

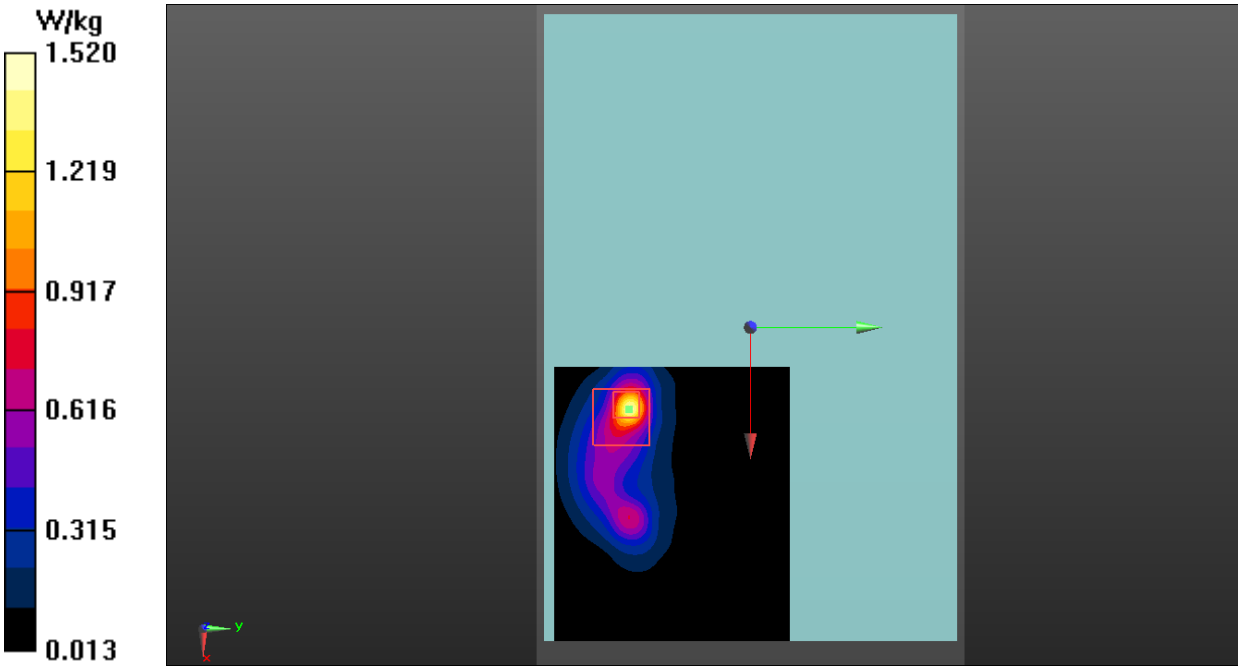


Fig. 21 NR n71 Body

NR n77 (Part 27Q) Body
Date: 2022-5-14
Electronics: DAE4 Sn1527
Medium: Head 3500MHz
Medium parameters used (interpolated): f = 3500.01 MHz; σ = 2.961 S/m; ε_r = 37.127; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 3500.01 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (7.01, 7.01, 7.01)

Top Side Middle 12@6/Area Scan (141x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.28 W/kg

Top Side Middle 12@6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.61 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.85 W/kg
SAR(1 g) = 0.821 W/kg; SAR(10 g) = 0.404 W/kg
Maximum value of SAR (measured) = 1.27 W/kg

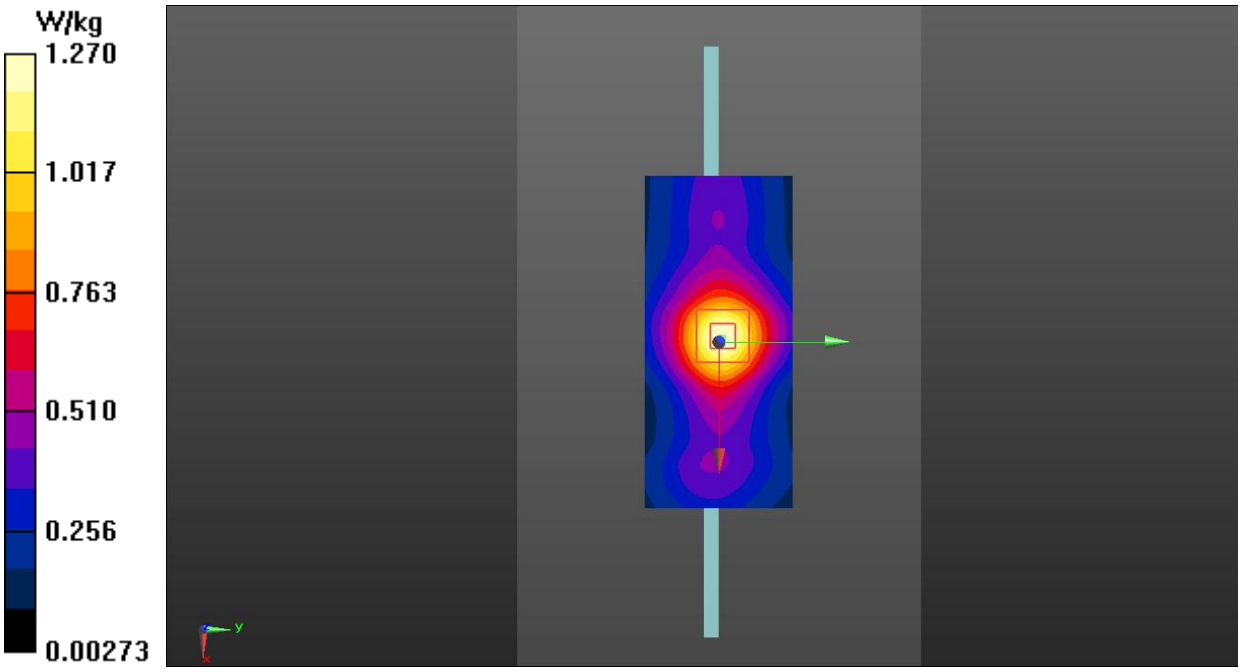


Fig. 22 NR n77 (Part 27Q) Body

NR n77 (Part 27O) Body
Date: 2022-5-14
Electronics: DAE4 Sn1527
Medium: Head 3700MHz
Medium parameters used (interpolated): f = 3762 MHz; σ = 3.168 S/m; ε_r = 38.044; ρ = 1000 kg/m^3
Communication System: UID 0, NR (0) Frequency: 3762 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (6.73, 6.73, 6.73)

Top Side Middle 12@6/Area Scan (141x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.54 W/kg

Top Side Middle 12@6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.88 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 2.24 W/kg
SAR(1 g) = 0.933 W/kg; SAR(10 g) = 0.434 W/kg
Maximum value of SAR (measured) = 1.48 W/kg

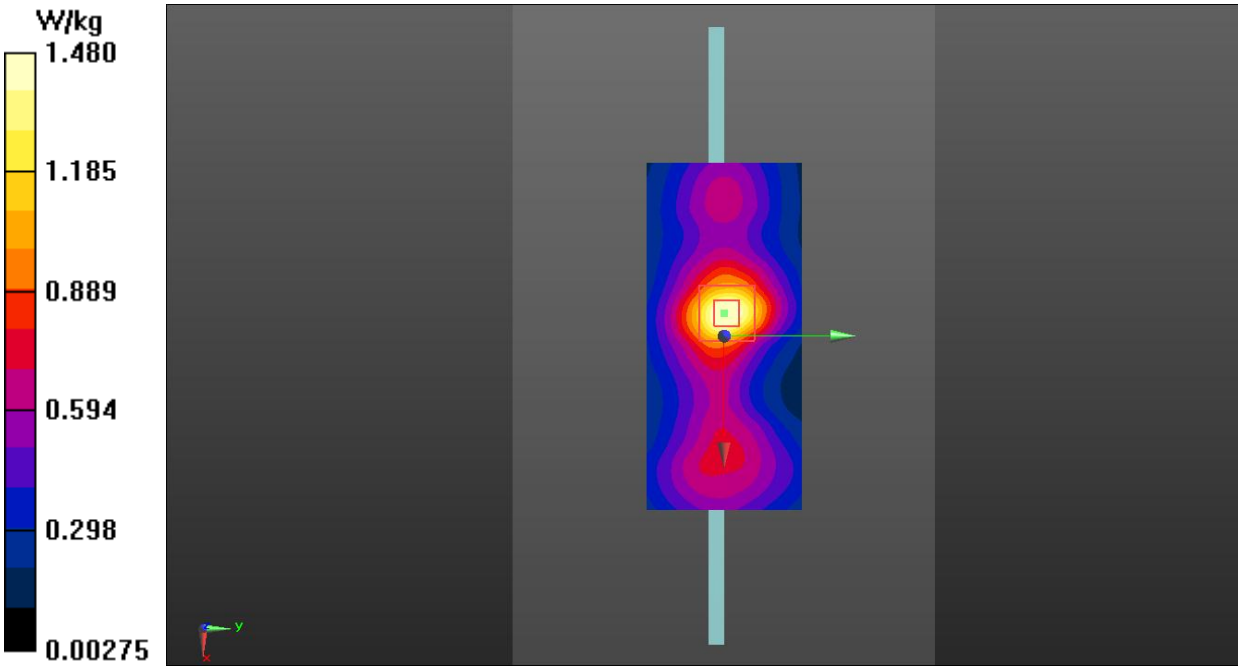


Fig. 23 NR n77 (Part 27O) Body

Bluetooth Body
Date: 2022-4-20
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used: f = 2480 MHz; σ = 1.871 S/m; ε_r = 38.319; ρ = 1000 kg/m^3
Communication System: UID 0, BT (0) Frequency: 2480 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (7.85, 7.85, 7.85)

Rear Side CH.78/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.395 W/kg

Rear Side CH.78/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.741 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.684 W/kg
SAR(1 g) = 0.256 W/kg; SAR(10 g) = 0.105 W/kg
Maximum value of SAR (measured) = 0.412 W/kg

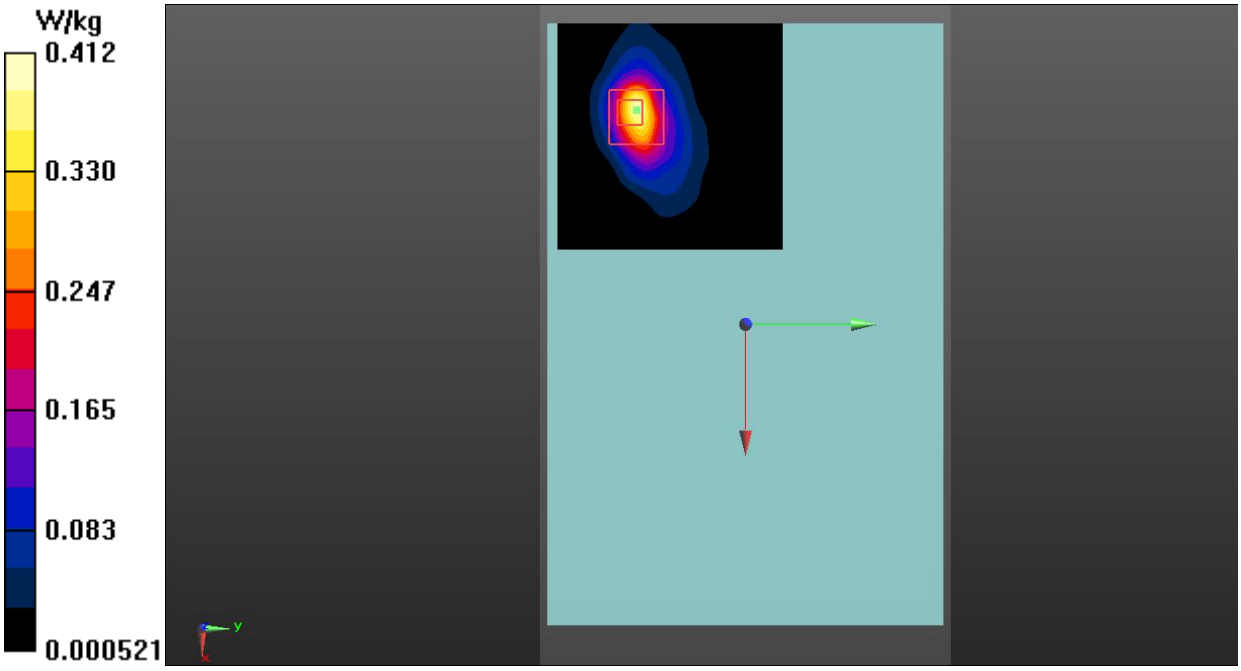


Fig. 24 Bluetooth Body

WLAN 2.4GHz Body
Date: 2022-4-20
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used: f = 2412 MHz; σ = 1.791 S/m; ε_r = 38.543; ρ = 1000 kg/m^3
Communication System: UID 0, WIFI (0) Frequency: 2412 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (7.85, 7.85, 7.85)

Rear Side CH.1/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.43 W/kg

Rear Side CH.1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.552 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 2.08 W/kg
SAR(1 g) = 0.790 W/kg; SAR(10 g) = 0.338 W/kg
Maximum value of SAR (measured) = 1.17 W/kg

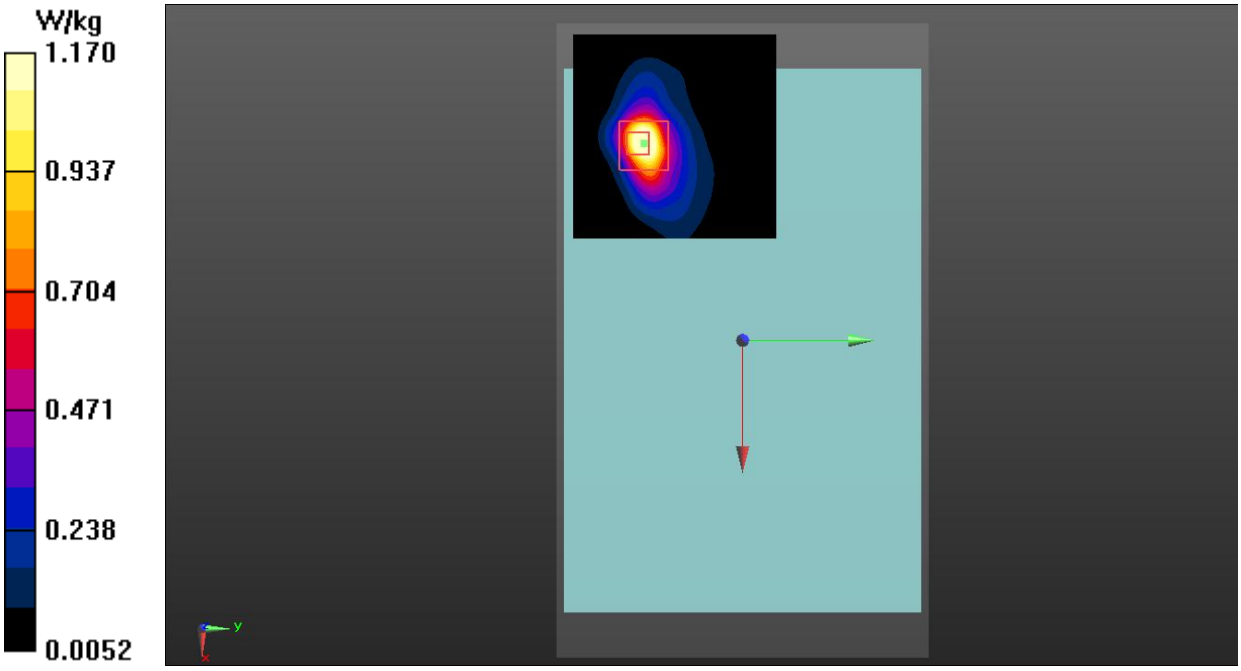


Fig. 25 WLAN 2.4GHz Body

WLAN 5GHz Body
Date: 2022-4-22
Electronics: DAE4 Sn1527
Medium: Head 5250MHz
Medium parameters used: f = 5300 MHz; σ = 4.726 S/m; ε_r = 36.609; ρ = 1000 kg/m^3
Communication System: UID 0, WIFI 5G (0) Frequency: 5300 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (5.56, 5.56, 5.56)

Top Side CH.60/Area Scan (91x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.10 W/kg

Top Side CH.60/Zoom Scan (8x8x21)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 2.040 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 5.54 W/kg
SAR(1 g) = 0.874 W/kg; SAR(10 g) = 0.189 W/kg
Maximum value of SAR (measured) = 1.89 W/kg

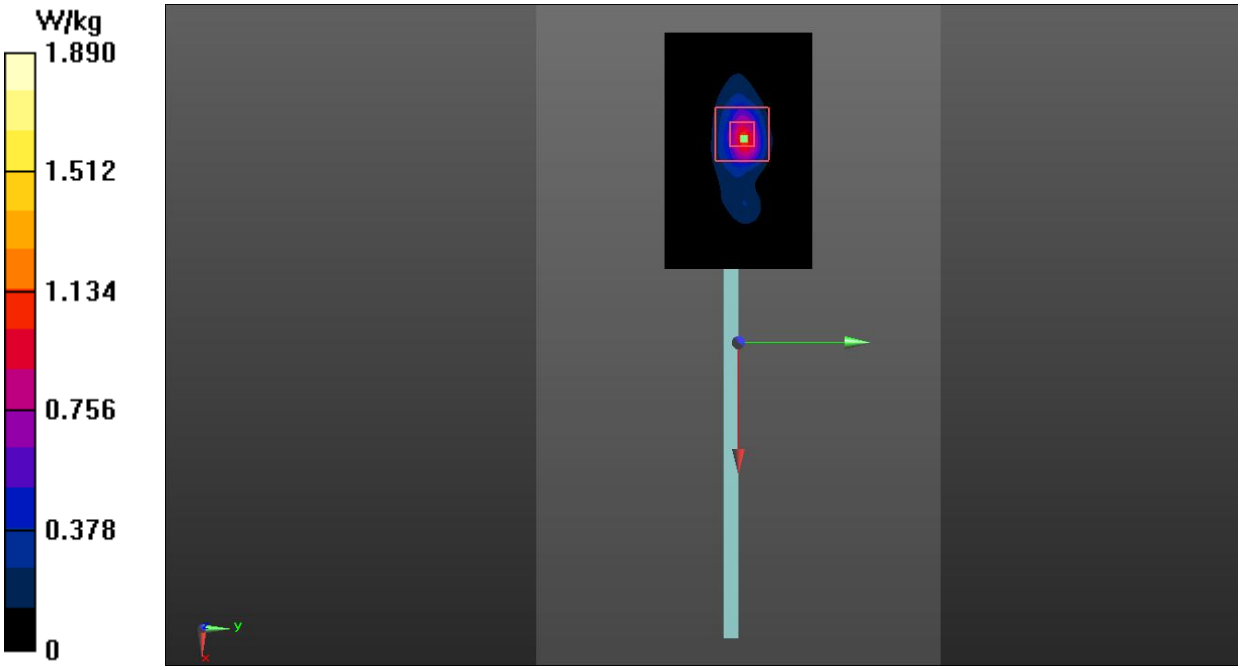


Fig. 26 WLAN 5GHz Body

ANNEX B: SystemVerification Results

750MHz

Date: 2022-4-29

Electronics: DAE4 Sn1527

Medium: Head 750MHz

Medium parameters used: f = 750 MHz; σ = 0.903 S/m; ε_r = 41.151; ρ = 1000 kg/m^3

Communication System: CW_TMC Frequency: 750 MHz Duty Cycle: 1:1

Probe: EX3DV4 - SN7683 ConvF (10.34, 10.34, 10.34)

System Validation/Area Scan (81x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Reference Value = 61.885 V/m; Power Drift = 0.06 dB

SAR(1 g) = 2.13 W/kg; SAR(10 g) = 1.41 W/kg

Maximum value of SAR (interpolated) = 2.83 W/kg

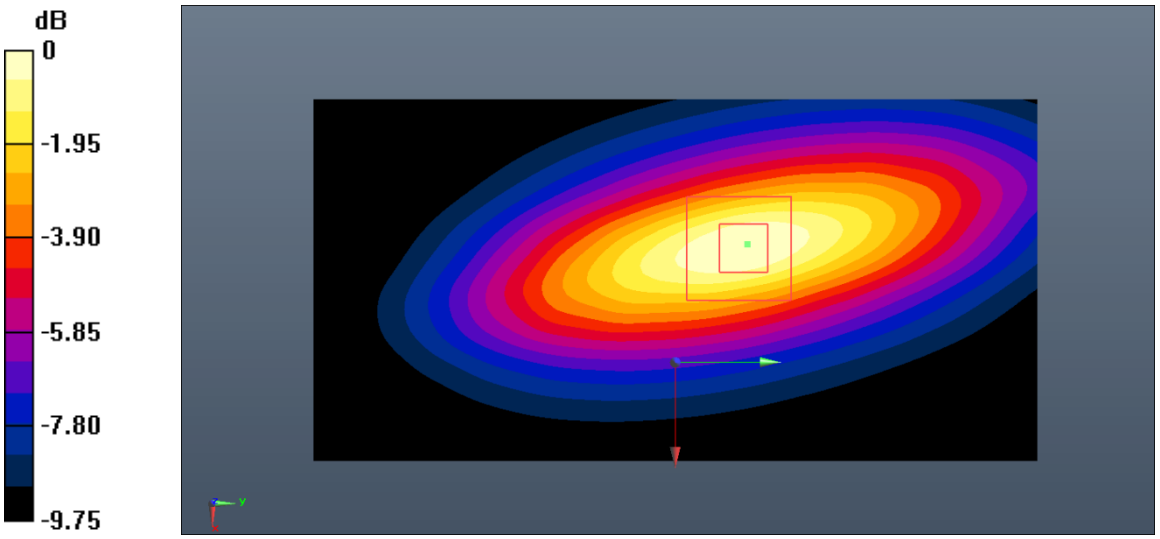
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 61.885 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 3.29 W/kg

SAR(1 g) = 2.18 W/kg; SAR(10 g) = 1.44 W/kg

Maximum value of SAR (measured) = 2.79 W/kg



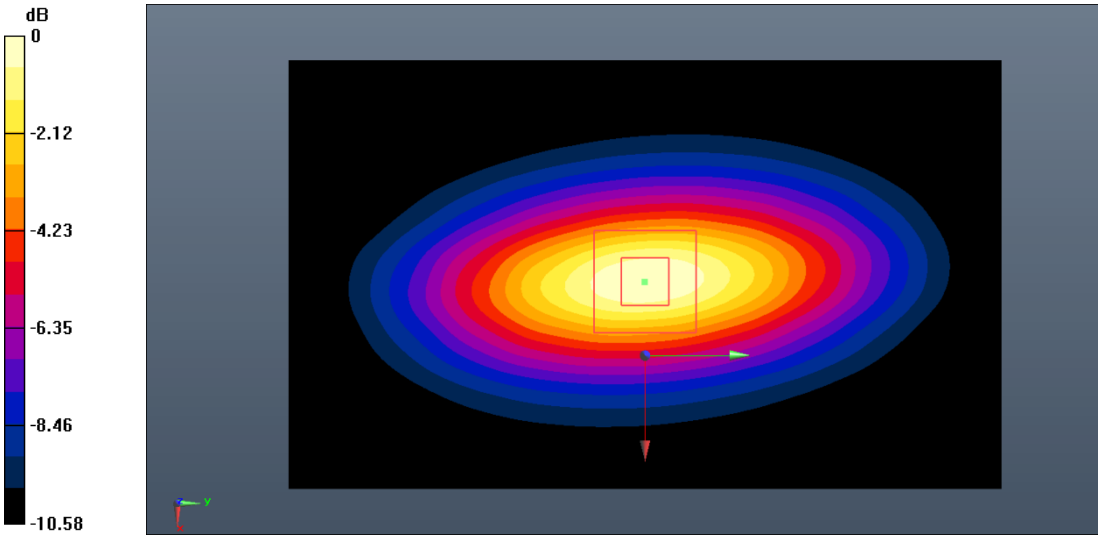
0 dB = 2.79 W/kg = 4.45 dB W/kg

Fig.B.1. Validation 750MHz 250mW

835MHz
Date: 2022-5-7
Electronics: DAE4 Sn1527
Medium: Head 835MHz
Medium parameters used: f = 835 MHz; σ = 0.924 S/m; εr = 40.518; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 835 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (10.34, 10.34, 10.34)

System Validation/Area Scan (91x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 65.784 V/m; Power Drift = 0.01 dB
SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (interpolated) = 3.41 W/kg

System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 65.784 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 4.13 W/kg
SAR(1 g) = 2.49 W/kg; SAR(10 g) = 1.60 W/kg
Maximum value of SAR (measured) = 3.44 W/kg



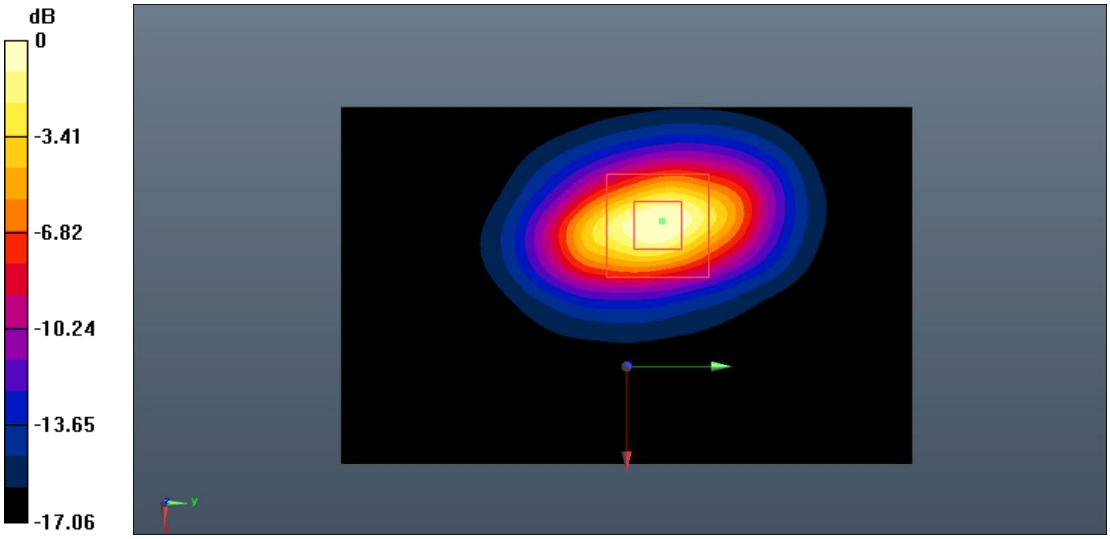
0 dB = 3.44 W/kg = 5.37 dB W/kg

Fig.B.2. Validation 835MHz 250mW

1750MHz
Date: 2022-4-18
Electronics: DAE4 Sn1527
Medium: Head 1750MHz
Medium parameters used: f = 1750 MHz; σ = 1.359 S/m; ε_r = 39.713; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 1750 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (8.58, 8.58, 8.58)

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 78.235 V/m; Power Drift = -0.10 dB
SAR(1 g) = 9.01 W/kg; SAR(10 g) = 4.83 W/kg
Maximum value of SAR (interpolated) = 11.1 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 78.235 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 20.5 W/kg
SAR(1 g) = 8.85 W/kg; SAR(10 g) = 4.77 W/kg
Maximum value of SAR (measured) = 10.9 W/kg



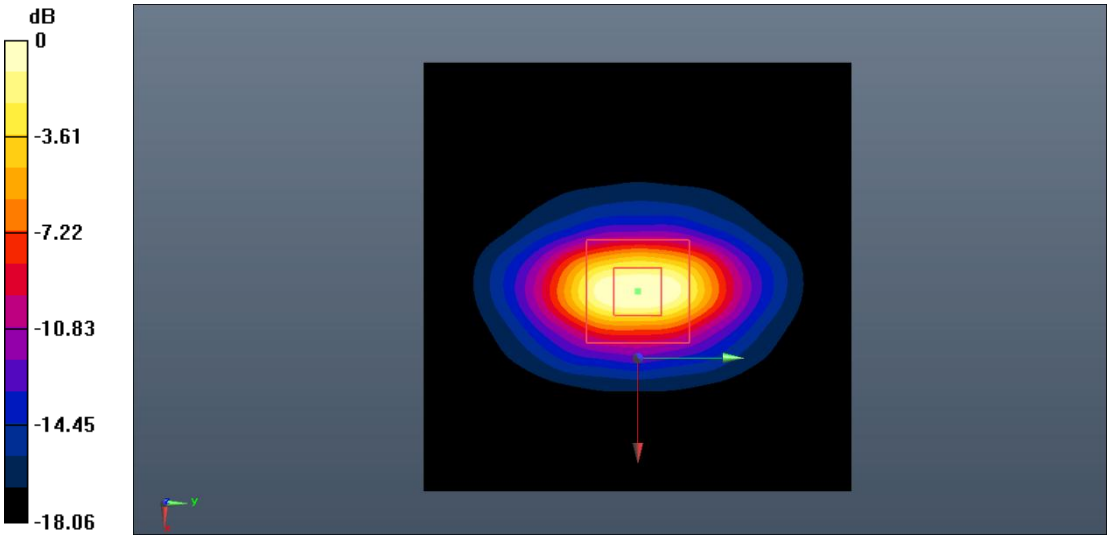
0 dB = 10.9 W/kg = 10.37 dB W/kg

Fig.B.3. Validation 1750MHz 250mW

1900MHz
Date: 2022-4-19
Electronics: DAE4 Sn1527
Medium: Head 1900MHz
Medium parameters used: f = 1900 MHz; σ = 1.378 S/m; ε_r = 39.574; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 1900 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (8.33, 8.33, 8.33)

System Validation/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 82.109 V/m; Power Drift = -0.08 dB
SAR(1 g) = 9.84 W/kg; SAR(10 g) = 5.10 W/kg
Maximum value of SAR (interpolated) = 12.0 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 82.109 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 24.7 W/kg
SAR(1 g) = 9.65 W/kg; SAR(10 g) = 5.03 W/kg
Maximum value of SAR (measured) = 11.8 W/kg



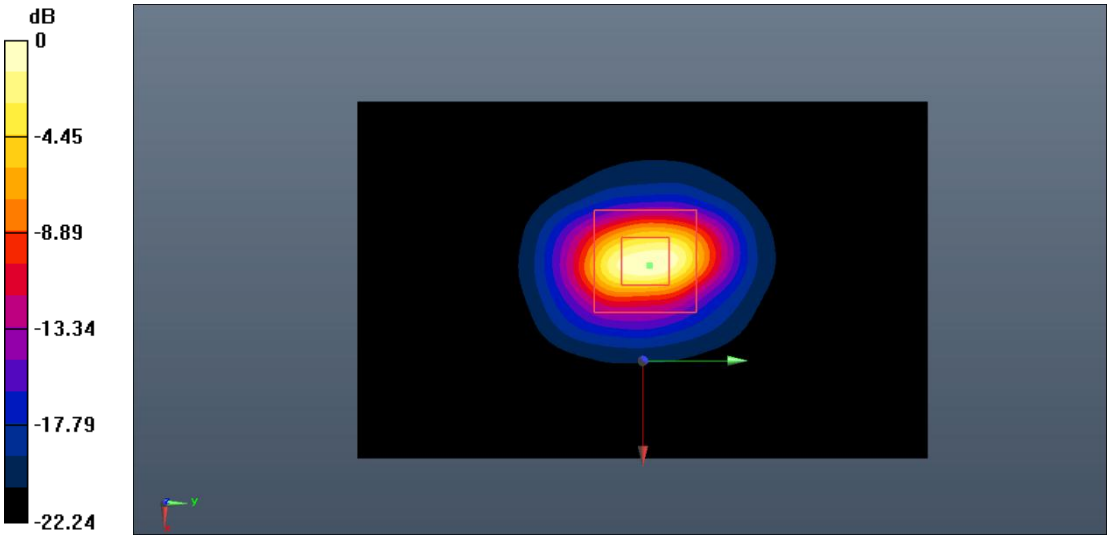
0 dB = 11.8 W/kg = 10.72 dB W/kg

Fig.B.4. Validation 1900MHz 250mW

2450MHz
Date: 2022-4-20
Electronics: DAE4 Sn1527
Medium: Head 2450MHz
Medium parameters used: f = 2450 MHz; σ = 1.836 S/m; ε_r = 38.418; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 2450 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (7.85, 7.85, 7.85);

System Validation/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 92.518 V/m; Power Drift = 0.05 dB
SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.07 W/kg
Maximum value of SAR (interpolated) = 15.6 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.518 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 35.3 W/kg
SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.15 W/kg
Maximum value of SAR (measured) = 15.9 W/kg



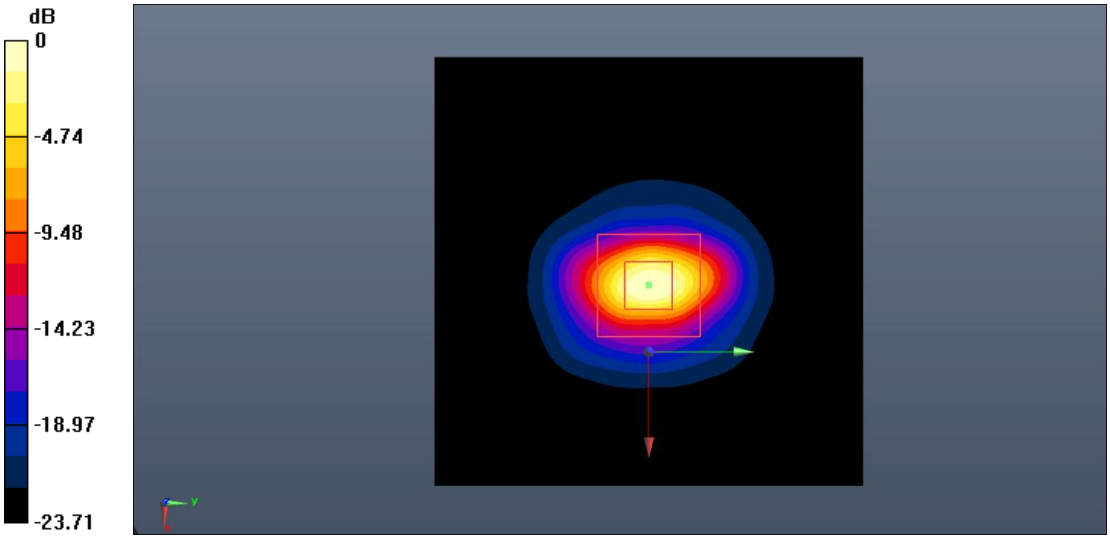
0 dB = 15.9 W/kg = 12.01 dB W/kg

Fig.B.5. Validation 2450MHz 250mW

2550MHz
Date: 2022-4-26
Electronics: DAE4 Sn1527
Medium: Head 2550MHz
Medium parameters used: f = 2550 MHz; σ = 1.949 S/m; ε_r = 38.105; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 2550 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (7.85, 7.85, 7.85)

System Validation/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 94.045 V/m; Power Drift = 0.09 dB
SAR(1 g) = 14.1 W/kg; SAR(10 g) = 6.27 W/kg
Maximum value of SAR (interpolated) = 16.2 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.045 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 37.9 W/kg
SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.42 W/kg
Maximum value of SAR (measured) = 16.5 W/kg



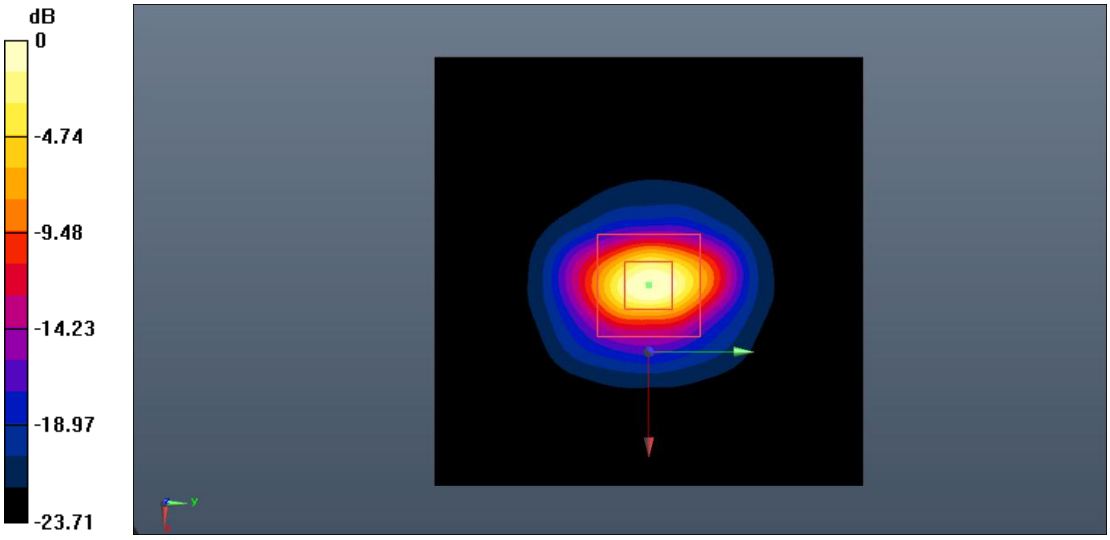
0 dB = 16.5 W/kg = 12.17 dB W/kg

Fig.B.6. Validation 2550MHz 250mW

3500MHz
Date: 2022-5-14
Electronics: DAE4 Sn1527
Medium: Head 3500MHz
Medium parameters used: f = 3500 MHz; σ = 2.961 S/m; ε_r = 37.127; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 3500 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (7.01, 7.01, 7.01)

System Validation/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 71.529 V/m; Power Drift = 0.10 dB
SAR(1 g) = 6.78 W/kg; SAR(10 g) = 2.52 W/kg
Maximum value of SAR (interpolated) = 7.79 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 71.529 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 18.2 W/kg
SAR(1 g) = 6.91 W/kg; SAR(10 g) = 2.57 W/kg
Maximum value of SAR (measured) = 7.82 W/kg



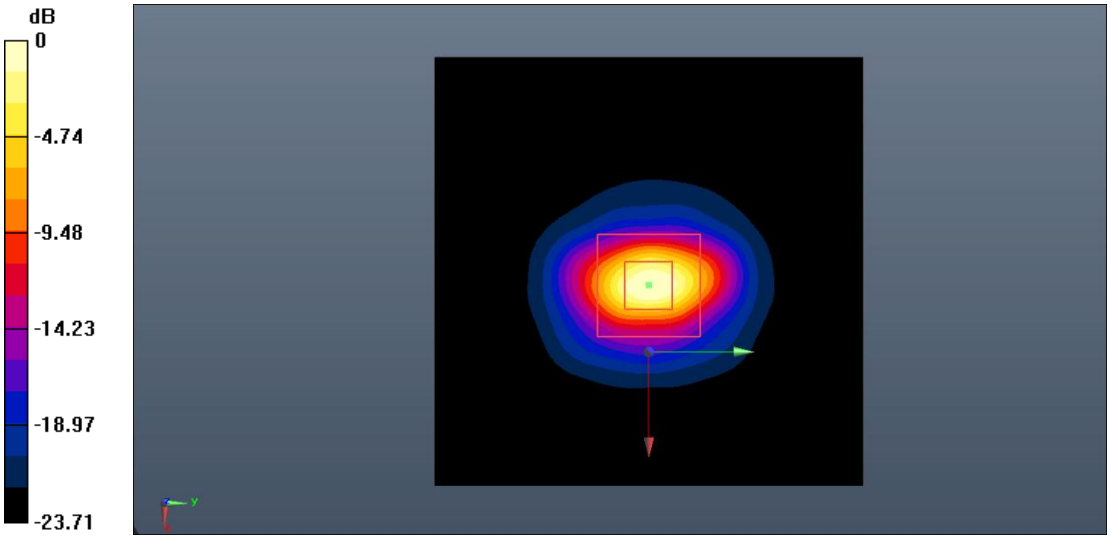
0 dB = 7.82 W/kg = 8.93 dB W/kg

Fig.B.7. Validation 3500MHz 100mW

3700MHz
Date: 2022-5-14
Electronics: DAE4 Sn1527
Medium: Head 3700MHz
Medium parameters used: f = 3700 MHz; σ = 3.095 S/m; ε_r = 38.249; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 3700 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (6.73, 6.73, 6.73)

System Validation/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 71.042 V/m; Power Drift = -0.03 dB
SAR(1 g) = 6.72 W/kg; SAR(10 g) = 2.44 W/kg
Maximum value of SAR (interpolated) = 7.70 W/kg

System Validation/Zoom Scan (7x7x7)/Cube0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 71.042 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 17.5 W/kg
SAR(1 g) = 6.53 W/kg; SAR(10 g) = 2.39 W/kg
Maximum value of SAR (measured) = 7.66 W/kg



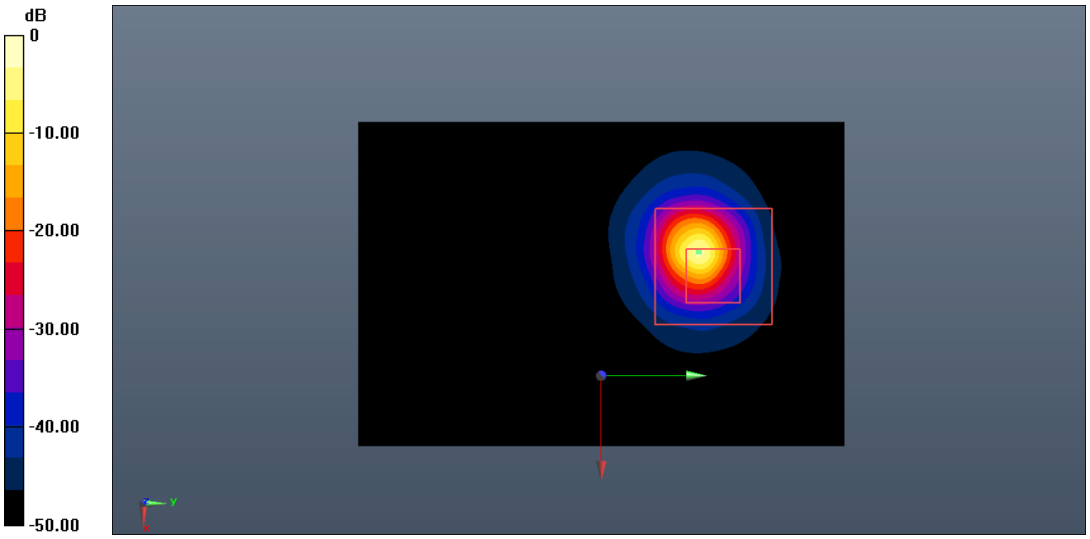
0 dB = 7.66 W/kg = 8.84 dB W/kg

Fig.B.8. Validation 3500MHz 100mW

5250MHz
Date: 2022-4-22
Electronics: DAE4 Sn1527
Medium: Head 5250MHz
Medium parameters used: f = 5250 MHz; σ = 4.658 S/m; ε_r = 36.744; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 5250 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (5.56, 5.56, 5.56)

System Validation/Area Scan (61x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 64.112 V/m; Power Drift = -0.08 dB
SAR(1 g) = 7.76 W/kg; SAR(10 g) = 2.22 W/kg
Maximum value of SAR (interpolated) = 9.86 W/kg

System Validation/Zoom Scan (8x8x21)/Cube0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.112 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 23.4 W/kg
SAR(1 g) = 7.64 W/kg; SAR(10 g) = 2.20 W/kg
Maximum value of SAR (measured) = 9.79 W/kg



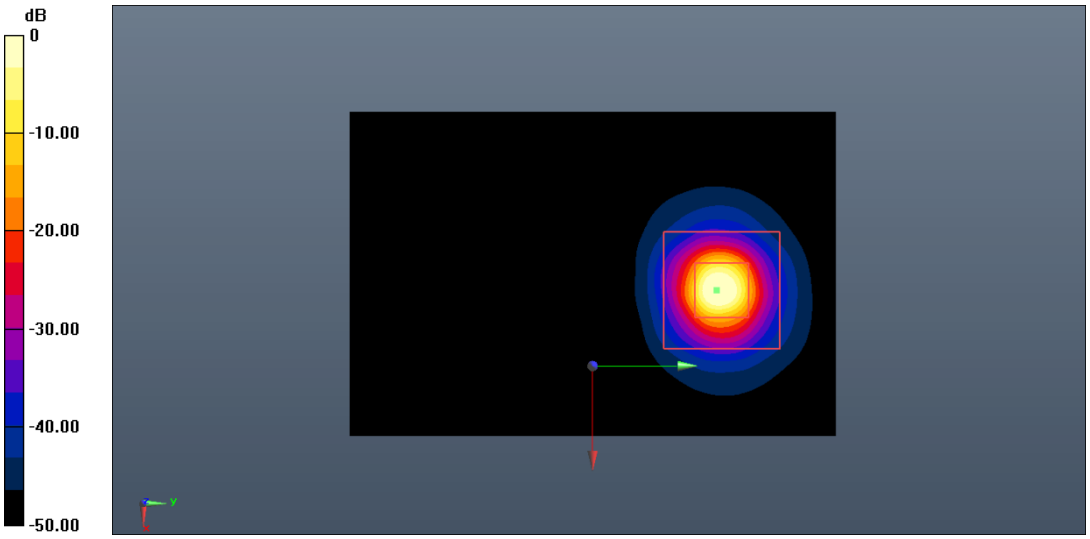
0 dB = 9.79 W/kg = 9.91 dB W/kg

Fig.B.9. Validation 5250MHz 100mW

5600MHz
Date: 2022-4-22
Electronics: DAE4 Sn1527
Medium: Head 5600MHz
Medium parameters used: f = 5600 MHz; σ = 5.175 S/m; ε_r = 34.633; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 5600 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (5.17, 5.17, 5.17)

System Validation/Area Scan (61x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 67.114 V/m; Power Drift = 0.02 dB
SAR(1 g) = 8.13 W/kg; SAR(10 g) = 2.29 W/kg
Maximum value of SAR (interpolated) = 10.2 W/kg

System Validation/Zoom Scan (8x8x21)/Cube0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.114 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 27.1 W/kg
SAR(1 g) = 8.30 W/kg; SAR(10 g) = 2.34 W/kg
Maximum value of SAR (measured) = 10.4 W/kg



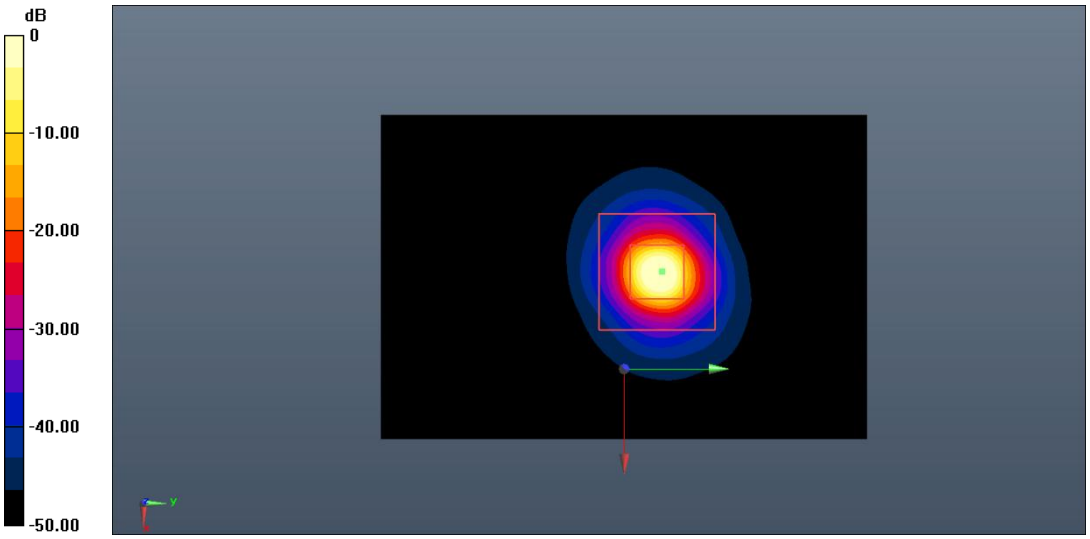
0 dB = 10.4 W/kg = 10.17 dB W/kg

Fig.B.10. Validation 5600MHz 100mW

5750MHz
Date: 2022-4-22
Electronics: DAE4 Sn1527
Medium: Head 5750MHz
Medium parameters used: f = 5750 MHz; σ = 5.114 S/m; ε_r = 36.078; ρ = 1000 kg/m^3
Communication System: CW_TMC Frequency: 5750 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN7683 ConvF (5.21, 5.21, 5.21)

System Validation/Area Scan (61x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 63.711 V/m; Power Drift = -0.04 dB
SAR(1 g) = 7.69 W/kg; SAR(10 g) = 2.21 W/kg
Maximum value of SAR (interpolated) = 9.72 W/kg

System Validation/Zoom Scan (8x8x21)/Cube0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 63.711 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 22.6 W/kg
SAR(1 g) = 7.56 W/kg; SAR(10 g) = 2.18 W/kg
Maximum value of SAR (measured) = 9.66 W/kg



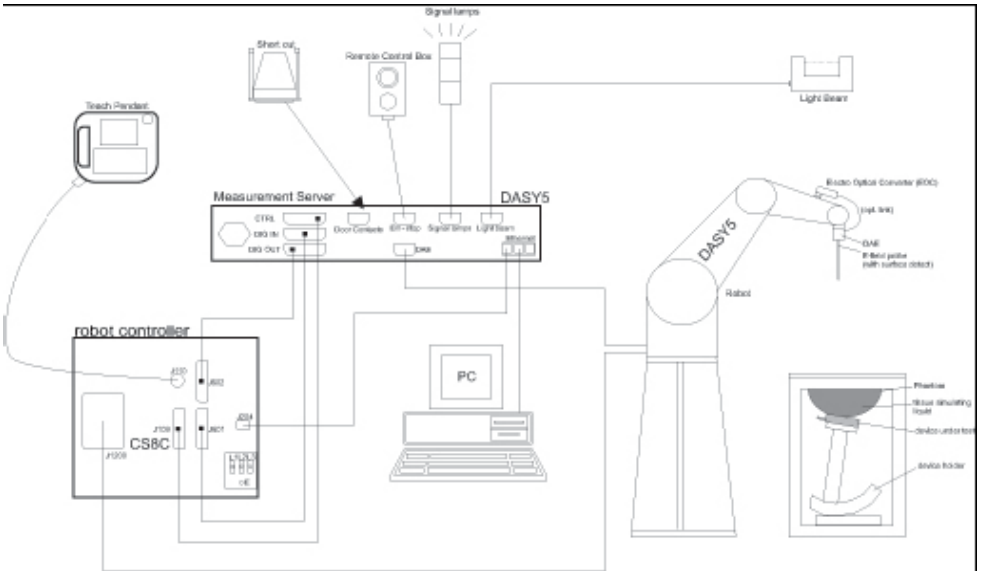
0 dB = 9.66 W/kg = 9.85 dB W/kg

Fig.B.11. 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 durning a software approach and looks for the maximum using 2ndord curve fitting. The approach is stopped at reaching the maximum.

Probe Specifications:

Model: ES3DV3, EX3DV4
Frequency 10MHz — 6.0GHz(EX3DV4)
Range: 10MHz — 4GHz(ES3DV3)
Calibration: In head and body simulating tissue at Frequencies from 835 up to 5800MHz
Linearity: ± 0.2 dB(30 MHz to 6 GHz) for EX3DV4
± 0.2 dB(30 MHz to 4 GHz) for ES3DV3
Dynamic Range: 10 mW/kg — 100W/kg
Probe Length: 330 mm
Probe Tip
Length: 20 mm
Body Diameter: 12 mm
Tip Diameter: 2.5 mm (3.9 mm for ES3DV3)
Tip-Center: 1 mm (2.0mm for ES3DV3)
Application: 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^2) 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 inn 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 equates to 1 mW/ cm^2.

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:
Δt = Exposure time (30 seconds),
C = Heat capacity of tissue (brain or muscle),
ΔT = Temperature increase due to RF exposure.

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

Where:
σ = Simulated tissue conductivity,
ρ = Tissue density (kg/m^3).

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 broad 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 broad, which is directly connected to the PC/104 bus of the CPU broad.

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 ±0.5mm would produce a SAR uncertainty of ±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 ε =3 and loss tangent δ =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.