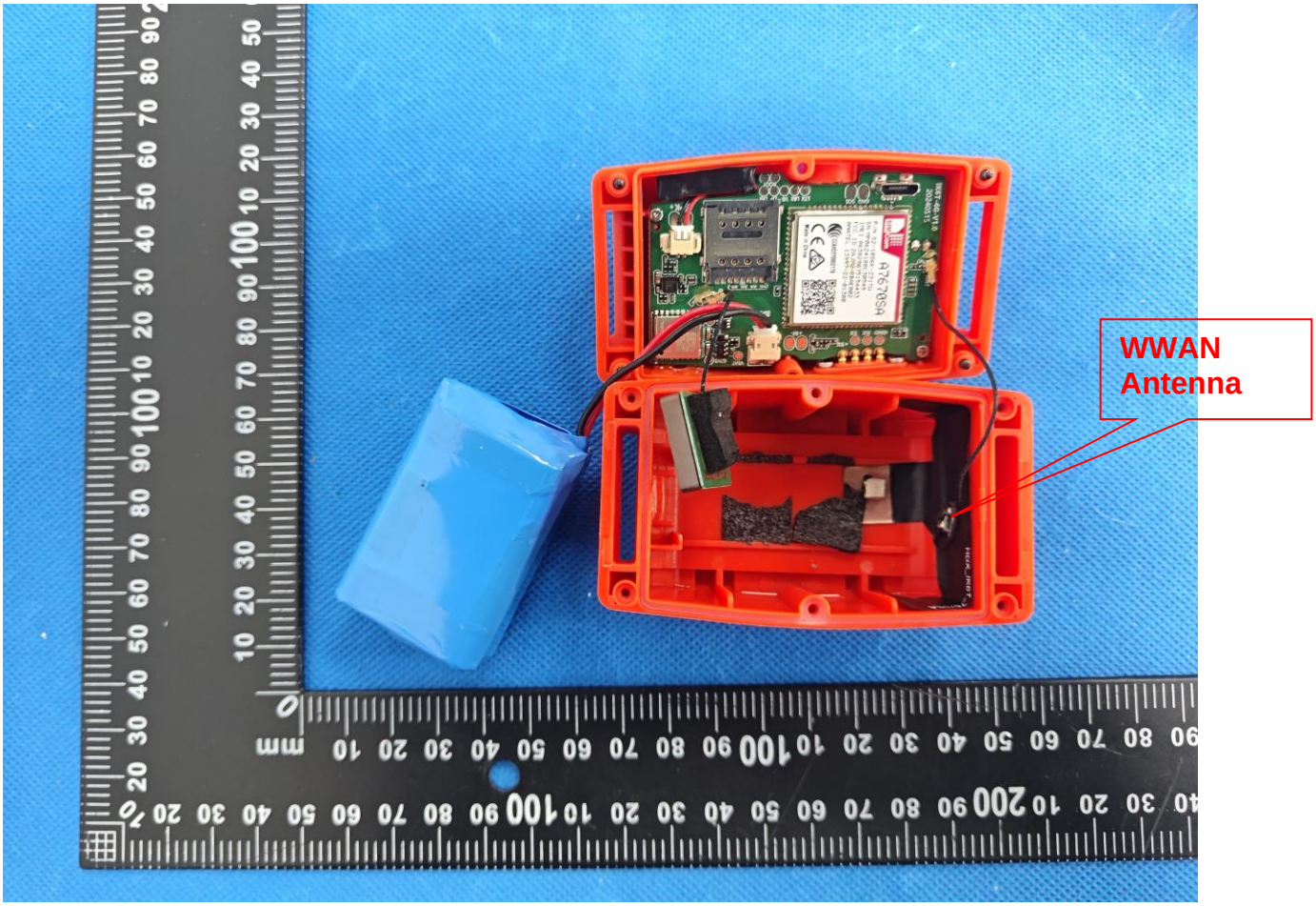
Band66	3	131987	8	#Max	16QAM	19.92	1	20.92	PASS
Band66	3	131987	15	#0	16QAM	19.95	1	20.95	PASS
Band66	3	132322	1	#0	QPSK	23.17	1	24.17	PASS
Band66	3	132322	1	#Mid	QPSK	23.12	1	24.12	PASS
Band66	3	132322	1	#Max	QPSK	22.98	1	23.98	PASS
Band66	3	132322	8	#0	QPSK	22.19	1	23.19	PASS
Band66	3	132322	8	#Mid	QPSK	22.12	1	23.12	PASS
Band66	3	132322	8	#Max	QPSK	22.13	1	23.13	PASS
Band66	3	132322	15	#0	QPSK	22.19	1	23.19	PASS
Band66	3	132322	1	#0	16QAM	22.43	1	23.43	PASS
Band66	3	132322	1	#Mid	16QAM	22.47	1	23.47	PASS
Band66	3	132322	1	#Max	16QAM	22.29	1	23.29	PASS
Band66	3	132322	8	#0	16QAM	21.32	1	22.32	PASS
Band66	3	132322	8	#Mid	16QAM	21.38	1	22.38	PASS
Band66	3	132322	8	#Max	16QAM	21.31	1	22.31	PASS
Band66	3	132322	15	#0	16QAM	21.33	1	22.33	PASS
Band66	3	132657	1	#0	QPSK	19.99	1	20.99	PASS
Band66	3	132657	1	#Mid	QPSK	20.11	1	21.11	PASS
Band66	3	132657	1	#Max	QPSK	20.14	1	21.14	PASS
Band66	3	132657	8	#0	QPSK	19.08	1	20.08	PASS
Band66	3	132657	8	#Mid	QPSK	19.16	1	20.16	PASS
Band66	3	132657	8	#Max	QPSK	19.22	1	20.22	PASS
Band66	3	132657	15	#0	QPSK	19.14	1	20.14	PASS
Band66	3	132657	1	#0	16QAM	18.99	1	19.99	PASS
Band66	3	132657	1	#Mid	16QAM	19.15	1	20.15	PASS
Band66	3	132657	1	#Max	16QAM	19.16	1	20.16	PASS
Band66	3	132657	8	#0	16QAM	18.22	1	19.22	PASS
Band66	3	132657	8	#Mid	16QAM	18.30	1	19.30	PASS
Band66	3	132657	8	#Max	16QAM	18.36	1	19.36	PASS
Band66	3	132657	15	#0	16QAM	18.37	1	19.37	PASS
Band66	5	131997	1	#0	QPSK	22.12	1	23.12	PASS
Band66	5	131997	1	#Mid	QPSK	21.63	1	22.63	PASS
Band66	5	131997	1	#Max	QPSK	21.39	1	22.39	PASS
Band66	5	131997	12	#0	QPSK	20.77	1	21.77	PASS
Band66	5	131997	12	#Mid	QPSK	20.71	1	21.71	PASS
Band66	5	131997	12	#Max	QPSK	20.53	1	21.53	PASS
Band66	5	131997	25	#0	QPSK	20.66	1	21.66	PASS
Band66	5	131997	1	#0	16QAM	21.60	1	22.60	PASS
Band66	5	131997	1	#Mid	16QAM	21.30	1	22.30	PASS
Band66	5	131997	1	#Max	16QAM	21.10	1	22.10	PASS
Band66	5	131997	12	#0	16QAM	19.89	1	20.89	PASS
Band66	5	131997	12	#Mid	16QAM	19.86	1	20.86	PASS
Band66	5	131997	12	#Max	16QAM	19.63	1	20.63	PASS
Band66	5	131997	25	#0	16QAM	19.76	1	20.76	PASS
Band66	5	132322	1	#0	QPSK	23.46	1	24.46	PASS
Band66	5	132322	1	#Mid	QPSK	23.14	1	24.14	PASS
Band66	5	132322	1	#Max	QPSK	23.06	1	24.06	PASS
Band66	5	132322	12	#0	QPSK	22.11	1	23.11	PASS
Band66	5	132322	12	#Mid	QPSK	22.15	1	23.15	PASS
Band66	5	132322	12	#Max	QPSK	22.04	1	23.04	PASS
Band66	5	132322	25	#0	QPSK	22.09	1	23.09	PASS
Band66	5	132322	1	#0	16QAM	22.68	1	23.68	PASS
Band66	5	132322	1	#Mid	16QAM	22.51	1	23.51	PASS
Band66	5	132322	1	#Max	16QAM	22.45	1	23.45	PASS
Band66	5	132322	12	#0	16QAM	21.28	1	22.28	PASS
Band66	5	132322	12	#Mid	16QAM	21.29	1	22.29	PASS
Band66	5	132322	12	#Max	16QAM	21.23	1	22.23	PASS

Band66	5	132322	25	#0	16QAM	21.29	1	22.29	PASS
Band66	5	132647	1	#0	QPSK	20.00	1	21.00	PASS
Band66	5	132647	1	#Mid	QPSK	19.96	1	20.96	PASS
Band66	5	132647	1	#Max	QPSK	20.25	1	21.25	PASS
Band66	5	132647	12	#0	QPSK	18.95	1	19.95	PASS
Band66	5	132647	12	#Mid	QPSK	19.11	1	20.11	PASS
Band66	5	132647	12	#Max	QPSK	19.17	1	20.17	PASS
Band66	5	132647	25	#0	QPSK	19.06	1	20.06	PASS
Band66	5	132647	1	#0	16QAM	19.35	1	20.35	PASS
Band66	5	132647	1	#Mid	16QAM	19.49	1	20.49	PASS
Band66	5	132647	1	#Max	16QAM	19.68	1	20.68	PASS
Band66	5	132647	12	#0	16QAM	18.15	1	19.15	PASS
Band66	5	132647	12	#Mid	16QAM	18.32	1	19.32	PASS
Band66	5	132647	12	#Max	16QAM	18.37	1	19.37	PASS
Band66	5	132647	25	#0	16QAM	18.20	1	19.20	PASS
Band66	10	132022	1	#0	QPSK	22.03	1	23.03	PASS
Band66	10	132022	1	#Mid	QPSK	21.16	1	22.16	PASS
Band66	10	132022	1	#Max	QPSK	20.69	1	21.69	PASS
Band66	10	132022	25	#0	QPSK	20.39	1	21.39	PASS
Band66	10	132022	25	#Mid	QPSK	20.26	1	21.26	PASS
Band66	10	132022	25	#Max	QPSK	19.86	1	20.86	PASS
Band66	10	132022	50	#0	QPSK	20.15	1	21.15	PASS
Band66	10	132322	1	#0	QPSK	23.61	1	24.61	PASS
Band66	10	132322	1	#Mid	QPSK	23.07	1	24.07	PASS
Band66	10	132322	1	#Max	QPSK	22.89	1	23.89	PASS
Band66	10	132322	25	#0	QPSK	21.99	1	22.99	PASS
Band66	10	132322	25	#Mid	QPSK	21.98	1	22.98	PASS
Band66	10	132322	25	#Max	QPSK	21.79	1	22.79	PASS
Band66	10	132322	50	#0	QPSK	21.84	1	22.84	PASS
Band66	10	132622	1	#0	QPSK	19.97	1	20.97	PASS
Band66	10	132622	1	#Mid	QPSK	19.72	1	20.72	PASS
Band66	10	132622	1	#Max	QPSK	20.20	1	21.20	PASS
Band66	10	132622	25	#0	QPSK	18.62	1	19.62	PASS
Band66	10	132622	25	#Mid	QPSK	18.81	1	19.81	PASS
Band66	10	132622	25	#Max	QPSK	18.87	1	19.87	PASS
Band66	10	132622	50	#0	QPSK	18.73	1	19.73	PASS
Band66	15	132047	1	#0	QPSK	22.22	1	23.22	PASS
Band66	15	132047	1	#Mid	QPSK	21.30	1	22.30	PASS
Band66	15	132047	1	#Max	QPSK	21.24	1	22.24	PASS
Band66	15	132047	36	#0	QPSK	20.61	1	21.61	PASS
Band66	15	132047	36	#Mid	QPSK	20.12	1	21.12	PASS
Band66	15	132047	36	#Max	QPSK	19.71	1	20.71	PASS
Band66	15	132047	75	#0	QPSK	21.71	1	22.71	PASS
Band66	15	132322	1	#0	QPSK	23.14	1	24.14	PASS
Band66	15	132322	1	#Mid	QPSK	23.31	1	24.31	PASS
Band66	15	132322	1	#Max	QPSK	23.20	1	24.20	PASS
Band66	15	132322	36	#0	QPSK	22.14	1	23.14	PASS
Band66	15	132322	36	#Mid	QPSK	22.21	1	23.21	PASS
Band66	15	132322	36	#Max	QPSK	22.09	1	23.09	PASS
Band66	15	132322	75	#0	QPSK	22.80	1	23.80	PASS
Band66	15	132597	1	#0	QPSK	21.70	1	22.70	PASS
Band66	15	132597	1	#Mid	QPSK	20.41	1	21.41	PASS
Band66	15	132597	1	#Max	QPSK	20.23	1	21.23	PASS
Band66	15	132597	36	#0	QPSK	19.74	1	20.74	PASS
Band66	15	132597	36	#Mid	QPSK	19.37	1	20.37	PASS
Band66	15	132597	36	#Max	QPSK	19.10	1	20.10	PASS
Band66	15	132597	75	#0	QPSK	20.73	1	21.73	PASS

Band66	20	132072	1	#0	QPSK	22.39	1	23.39	PASS
Band66	20	132072	1	#Mid	QPSK	20.90	1	21.90	PASS
Band66	20	132072	1	#Max	QPSK	21.77	1	22.77	PASS
Band66	20	132072	50	#0	QPSK	20.27	1	21.27	PASS
Band66	20	132072	50	#Mid	QPSK	19.92	1	20.92	PASS
Band66	20	132072	50	#Max	QPSK	19.91	1	20.91	PASS
Band66	20	132072	100	#0	QPSK	21.78	1	22.78	PASS
Band66	20	132322	1	#0	QPSK	22.72	1	23.72	PASS
Band66	20	132322	1	#Mid	QPSK	23.41	1	24.41	PASS
Band66	20	132322	1	#Max	QPSK	23.10	1	24.10	PASS
Band66	20	132322	50	#0	QPSK	22.01	1	23.01	PASS
Band66	20	132322	50	#Mid	QPSK	22.20	1	23.20	PASS
Band66	20	132322	50	#Max	QPSK	21.97	1	22.97	PASS
Band66	20	132322	100	#0	QPSK	22.65	1	23.65	PASS
Band66	20	132572	1	#0	QPSK	22.72	1	23.72	PASS
Band66	20	132572	1	#Mid	QPSK	20.90	1	21.90	PASS
Band66	20	132572	1	#Max	QPSK	20.18	1	21.18	PASS
Band66	20	132572	50	#0	QPSK	20.45	1	21.45	PASS
Band66	20	132572	50	#Mid	QPSK	19.63	1	20.63	PASS
Band66	20	132572	50	#Max	QPSK	19.03	1	20.03	PASS
Band66	20	132572	100	#0	QPSK	20.95	1	21.95	PASS

14.2 Transmit Antennas and SAR Measurement Position

EUT Antenna Location:



Antenna information	
WWAN	GSM 850/1900 + LTE Band2/4/5/7/66

Distance of The Antenna to the EUT surface and edge (mm)						
Antenna	**Front**	**Back**	**Top Side**	**Bottom Side**	**Left Side**	**Right Side**
WWAN	<25	<25	<25	<25	<25	73

Body mode: Positions for SAR tests; Test distance: 0mm						
Antenna	**Front**	**Back**	**Top Side**	**Bottom Side**	**Left Side**	**Right Side**
WWAN	Yes	Yes	Yes	Yes	Yes	No

14.3 Measured and Reported (Scaled) SAR Results

The calculated SAR is obtained by the following formula:
1. Reported SAR for WWAN=Measured SAR * Tune-up Scaling factor
2. Reported SAR for WLAN and Bluetooth=Measured SAR * Tune-up Scaling factor * Duty Cycle Scaling factor
3. Duty Cycle Scaling factor=1/ Duty Cycle (%)

GSM850									
RF Exposure Conditions	Mode	Test Position	Freq. (MHz)	Output Power (dBm)	Turn up (dBm)	Turn-up Scaling Factor	SAR1g (W/kg)		Plot No.
							Meas.	Scaled	
Body (0mm)	GPRS Slot-3	Front	848.8	31.68	32.0	1.076	0.935	1.006	
		Back	848.8	31.68	32.0	1.076	0.062	0.067	
		Left Side	848.8	31.68	32.0	1.076	0.095	0.102	
		Top Side	848.8	31.68	32.0	1.076	0.123	0.132	
		Bottom Side	848.8	31.68	32.0	1.076	0.094	0.101	
		Front	824.2	31.33	32.0	1.167	0.846	0.987	
		Front	836.6	31.57	32.0	1.104	0.921	**1.017**	1

GSM1900									
RF Exposure Conditions	Mode	Test Position	Freq. (MHz)	Output Power (dBm)	Turn up (dBm)	Turn-up Scaling Factor	SAR1g (W/kg)		Plot No.
							Meas.	Scaled	
Body (0mm)	GPRS Slot-3	Front	1880	29.46	30.0	1.132	0.233	0.264	
		Back	1880	29.46	30.0	1.132	0.130	0.147	
		Left Side	1880	29.46	30.0	1.132	0.250	**0.283**	2
		Top Side	1880	29.46	30.0	1.132	0.114	0.129	
		Bottom Side	1880	29.46	30.0	1.132	0.139	0.157	

Remark:
1. The value with the bold is the maximum SAR Value of each test band.
2. Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels SAR tests are not necessary.

LTE Band 2 (20MHz Bandwidth)									
RF Exposure Conditions	Mode	Test Position	Freq. (MHz)	Output Power (dBm)	Turn up (dBm)	Turn-up Scaling Factor	SAR1g (W/kg)		Plot No.
							Meas.	Scaled	
Body (0mm)	QPSK, 1RB	Front	1880	24.18	24.5	1.076	0.488	0.525	
		Back	1880	24.18	24.5	1.076	0.357	0.384	
		Left Side	1880	24.18	24.5	1.076	0.645	**0.694**	3
		Top Side	1880	24.18	24.5	1.076	0.084	0.090	
		Bottom Side	1880	24.18	24.5	1.076	0.290	0.312	
	QPSK, 50%RB	Front	1880	22.82	23.0	1.042	0.335	0.349	
		Back	1880	22.82	23.0	1.042	0.231	0.241	
		Left Side	1880	22.82	23.0	1.042	0.602	0.627	
		Top Side	1880	22.82	23.0	1.042	0.112	0.117	
		Bottom Side	1880	22.82	23.0	1.042	0.134	0.140	

LTE Band 4 (20MHz Bandwidth)									
RF Exposure Conditions	Mode	Test Position	Freq. (MHz)	Output Power (dBm)	Turn up (dBm)	Turn-up Scaling Factor	SAR1g (W/kg)		Plot No.
							Meas.	Scaled	
Body (0mm)	QPSK, 1RB	Front	1745	22.77	23.0	1.054	1.159	1.222	
		Back	1745	22.77	23.0	1.054	0.316	0.333	
		Left Side	1745	22.77	23.0	1.054	0.844	0.890	
		Top Side	1745	22.77	23.0	1.054	0.392	0.413	
		Bottom Side	1745	22.77	23.0	1.054	0.429	0.452	
		Front	1720	21.75	23.0	1.334	0.989	1.319	
		Front	1732.5	22.48	23.0	1.127	1.223	**1.379**	4
	QPSK, 50%RB	Front	1745	21.55	22.0	1.109	1.112	1.233	
		Back	1745	21.55	22.0	1.109	0.213	0.236	
		Left Side	1745	21.55	22.0	1.109	0.663	0.735	
		Top Side	1745	21.55	22.0	1.109	0.224	0.248	
		Bottom Side	1745	21.55	22.0	1.109	0.137	0.152	
		Front	1720	19.85	22.0	1.641	0.783	1.285	
		Front	1732.5	21.00	22.0	1.259	0.702	0.884	
	QPSK, 100%RB	Front	1745	22.14	22.5	1.086	0.936	1.017	

LTE Band 5 (10MHz Bandwidth)									
RF Exposure Conditions	Mode	Test Position	Freq. (MHz)	Output Power (dBm)	Turn up (dBm)	Turn-up Scaling Factor	SAR1g (W/kg)		Plot No.
							Meas.	Scaled	
Body (0mm)	QPSK, 1RB	Front	836.5	23.58	24.0	1.102	0.401	0.442	
		Back	836.5	23.58	24.0	1.102	0.757	**0.834**	5
		Left Side	836.5	23.58	24.0	1.102	0.110	0.121	
		Top Side	836.5	23.58	24.0	1.102	0.223	0.246	
		Bottom Side	836.5	23.58	24.0	1.102	0.128	0.141	
	QPSK, 50%RB	Front	836.5	22.43	22.5	1.016	0.280	0.285	
		Back	836.5	22.43	22.5	1.016	0.364	0.370	
		Left Side	836.5	22.43	22.5	1.016	0.077	0.078	
		Top Side	836.5	22.43	22.5	1.016	0.119	0.121	
		Bottom Side	836.5	22.43	22.5	1.016	0.082	0.083	

LTE Band 7 (20MHz Bandwidth)									
RF Exposure Conditions	Mode	Test Position	Freq. (MHz)	Output Power (dBm)	Turn up (dBm)	Turn-up Scaling Factor	SAR1g (W/kg)		Plot No.
							Meas.	Scaled	
Body (0mm)	QPSK, 1RB	Front	2560	23.86	24.0	1.033	1.208	1.248	
		Back	2560	23.86	24.0	1.033	0.434	0.448	
		Left Side	2560	23.86	24.0	1.033	1.077	1.112	
		Top Side	2560	23.86	24.0	1.033	1.049	1.083	
		Bottom Side	2560	23.86	24.0	1.033	0.620	0.640	
		Front	2510	23.13	24.0	1.222	1.086	**1.327**	6
		Front	2535	23.71	24.0	1.069	1.119	1.196	
	QPSK, 50%RB	Front	2535	22.06	22.5	1.107	0.890	0.985	
		Back	2535	22.06	22.5	1.107	0.225	0.249	
		Left Side	2535	22.06	22.5	1.107	0.824	0.912	
		Top Side	2535	22.06	22.5	1.107	0.751	0.831	
		Bottom Side	2535	22.06	22.5	1.107	0.497	0.550	
		Front	2510	21.41	22.5	1.285	0.796	1.023	
		Front	2560	21.67	22.5	1.211	0.831	1.006	
	QPSK, 100%RB	Front	2510	21.60	22.0	1.096	0.690	0.757	

LTE Band 66 (20MHz Bandwidth)									
RF Exposure Conditions	Mode	Test Position	Freq. (MHz)	Output Power (dBm)	Turn up (dBm)	Turn-up Scaling Factor	SAR1g (W/kg)		Plot No.
							Meas.	Scaled	
Body (0mm)	QPSK, 1RB	Front	1745	23.41	23.5	1.021	0.308	0.314	
		Back	1745	23.41	23.5	1.021	1.338	**1.366**	7
		Left Side	1745	23.41	23.5	1.021	0.129	0.132	
		Top Side	1745	23.41	23.5	1.021	0.457	0.467	
		Bottom Side	1745	23.41	23.5	1.021	0.230	0.235	
		Back	1720	22.39	23.5	1.291	0.922	1.191	
		Back	1770	22.72	23.5	1.197	0.861	1.030	
	QPSK, 50%RB	Front	1745	22.20	22.5	1.072	0.291	0.312	
		Back	1745	22.20	22.5	1.072	1.002	1.074	
		Left Side	1745	22.20	22.5	1.072	0.134	0.144	
		Top Side	1745	22.20	22.5	1.072	0.332	0.356	
		Bottom Side	1745	22.20	22.5	1.072	0.217	0.233	
		Back	1720	20.27	22.5	1.671	0.621	1.038	
		Back	1770	20.45	22.5	1.603	0.608	0.975	
	QPSK, 100%RB	Back	1745	22.65	22.65	1.000	1.004	1.004	

Remark:
1. The value with the bold is the maximum SAR Value of each test band.
2. Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels SAR tests are not necessary.
3. Per FCC KDB Publication 447498 D01, Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.

14.4 SAR Measurement Variability

According to KDB865664, Repeated measurements are required only when the measured SAR is ≥ 0.80 W/kg. If the measured SAR value of the initial repeated measurement is < 1.45 W/kg with ≤ 20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. A second repeated measurement is required only if the measured result for the initial repeated measurement is within 10% of the SAR limit and vary by more than 20%, which are often related to device and measurement setup difficulties. The following procedures are applied to determine if repeated measurements are required. The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.19 The repeated measurement results must be clearly identified in the SAR report. All measured SAR, including the repeated results, must be considered to determine compliance and for reporting according to KDB 690783.Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

1) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
2) 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).
3) 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.
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

Test Mode	Frequency Band (MHz)	RF Exposure Configuration	Test Position	Repeated SAR (yes/no)	Highest Measured SAR1-g (W/Kg)	First Repeated	
						Measured SAR1-g (W/Kg)	Largest to Smallest SAR Ratio
GSM 850	848.8	Body	Front	yes	0.935	0.907	1.031
LTE Band 4	1732.5	Body	Front	yes	1.223	1.193	1.025
LTE Band 7	2560	Body	Front	yes	1.208	1.174	1.029
LTE Band 66	1745	Body	Back	yes	1.338	1.276	1.049

14.5 Simultaneous Transmission Evaluation

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmiting antenna.

Application Simultaneous Transmission information:

No.	Configurations	Body SAR
1	WWAN + WIFI	No
2	WWAN + Bluetooth	No
3	WIFI + Bluetooth	No

Remark:
1. Only WWAN is supported.
2. According to the KDB 447498 D01 v06, when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
● (max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm;
where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
● 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm

Estimated stand alone SAR						
Mode	**Frequency (MHz)**	**Maximum Power (dBm)**	**Maximum Power (mW)**	**Separation Distance (mm)**	**X**	**Estimated SAR1-g (W/kg)**
/	/	/	/	5	3	/
/	/	/	/	10	7.5	/

Note:
1. Maximum average power including tune-up tolerance;
2. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

3. Per FCC KD B447498 D01, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the transmitting antenna in a specific a physical test configuration is ≤1.6 W/Kg. When the sum is greater than the SAR limit, SAR test exclusion is determined by the SAR to peak location separation ratio.

$$\text{Ratio}=\frac{(SAR_1+SAR_2)^{1.5}}{(\text{peak location separation,mm})}<0.04$$

15. Test Plots

15.1 System Performance Check

System check at 835 MHz

Date of measurement: 29/11/2024

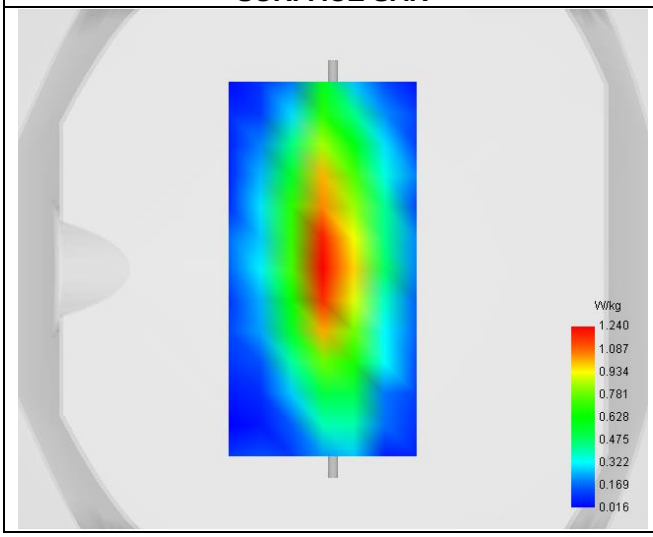
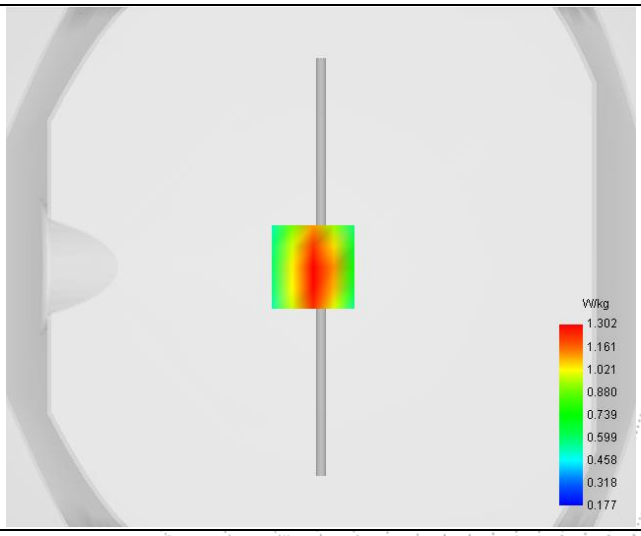
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	0.80
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Dipole
Band	CW835
Signal	CW

B. Permitivity

Frequency (MHz)	835.000
Relative permitivity (real part)	42.489
Relative permitivity (imaginary part)	20.910
Conductivity (S/m)	0.886

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

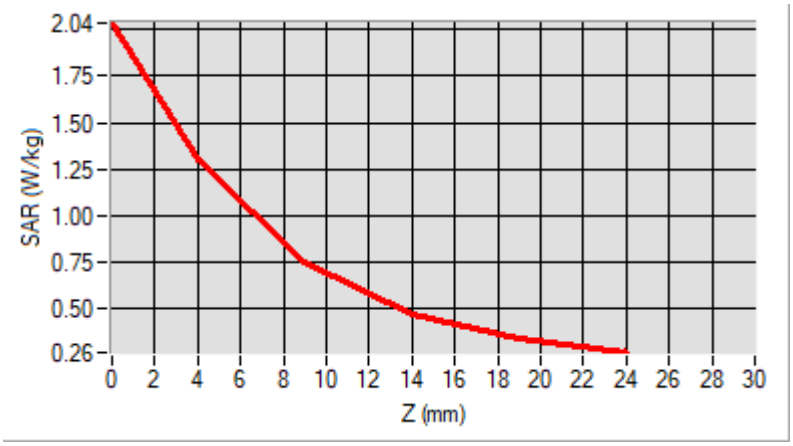
Maximum location: X=-3.00, Y=0.00 ; SAR Peak: 2.06 W/kg

D. SAR 1g & 10g

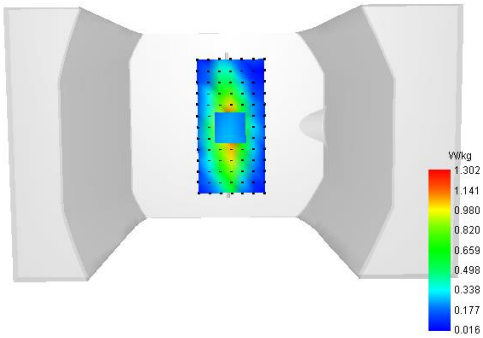
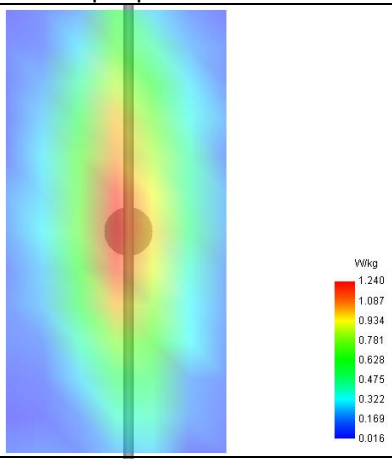
SAR 10g (W/Kg)	1.085
SAR 1g (W/Kg)	2.488
Variation (%)	-2.060
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	2.036	1.302	0.747	0.462	0.331



F. 3D Image

3D screen shot	Hot spot position
	

System check at 1800 MHz

Date of measurement: 6/12/2024

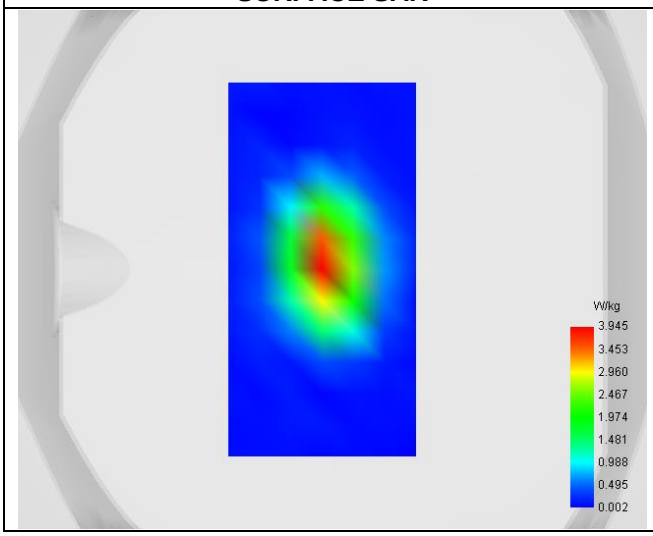
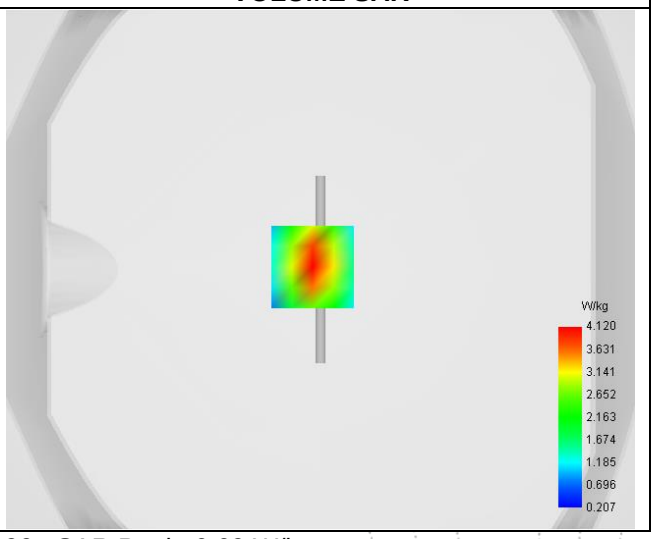
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	1.01
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Dipole
Band	CW1800
Signal	CW

B. Permitivity

Frequency (MHz)	1800.000
Relative permitivity (real part)	39.532
Relative permitivity (imaginary part)	15.200
Conductivity (S/m)	1.427

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

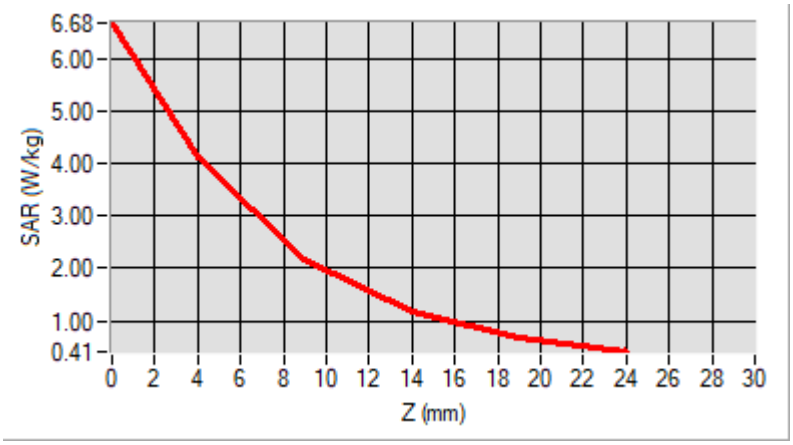
Maximum location: X=-3.00, Y=1.00 ; SAR Peak: 6.69 W/kg

D. SAR 1g & 10g

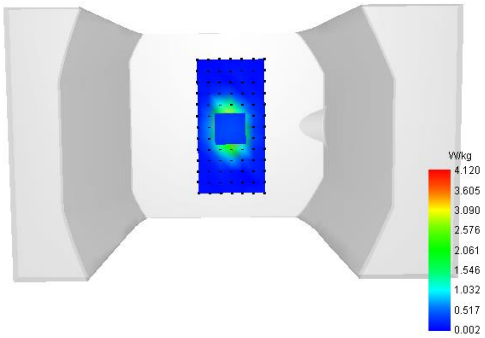
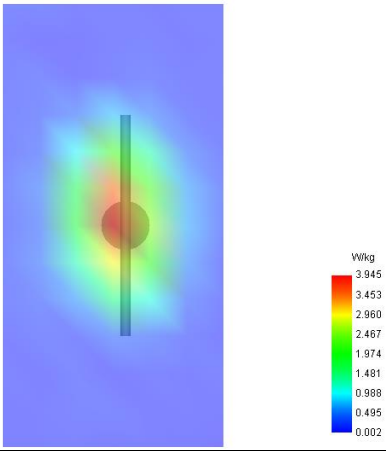
SAR 10g (W/Kg)	4.979
SAR 1g (W/Kg)	9.786
Variation (%)	2.300
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	6.684	4.120	2.184	1.177	0.685



F. 3D Image

3D screen shot	Hot spot position
	

System check at 1900 MHz

Date of measurement: 6/12/2024

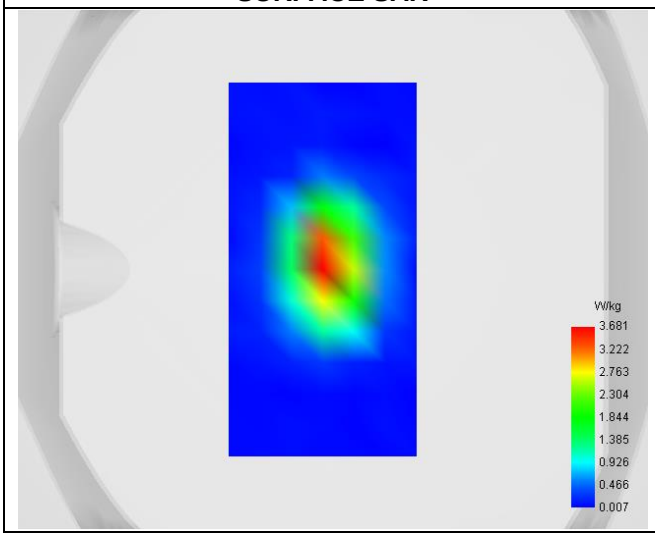
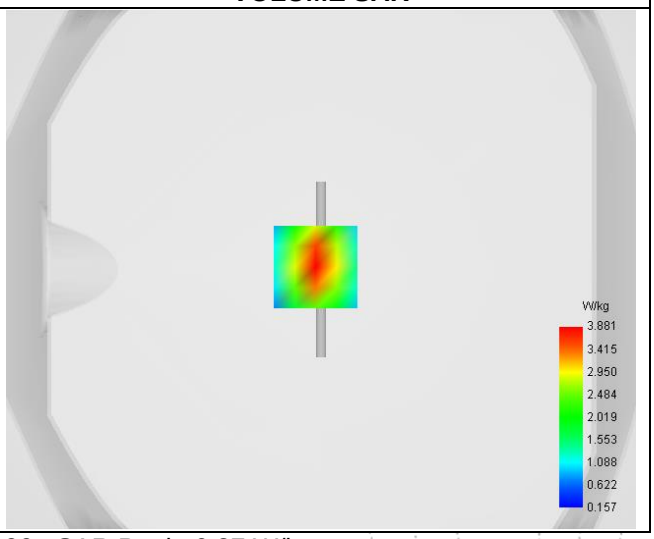
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	1.11
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Dipole
Band	CW1900
Signal	CW

B. Permitivity

Frequency (MHz)	1900.000
Relative permitivity (real part)	41.310
Relative permitivity (imaginary part)	14.400
Conductivity (S/m)	1.434

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

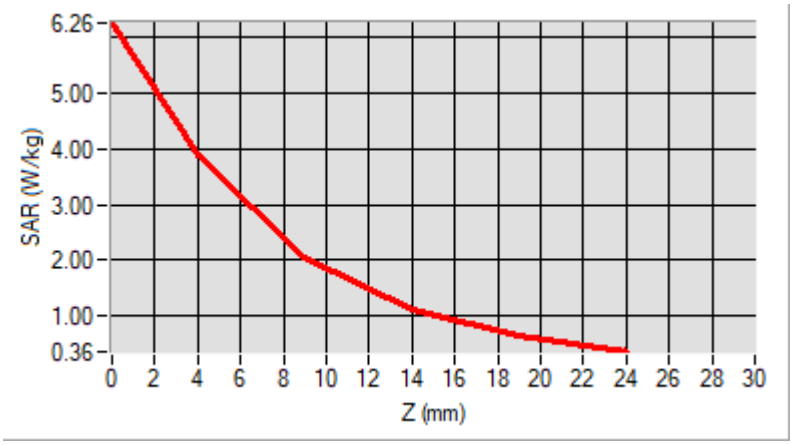
Maximum location: X=-2.00, Y=1.00 ; SAR Peak: 6.27 W/kg

D. SAR 1g & 10g

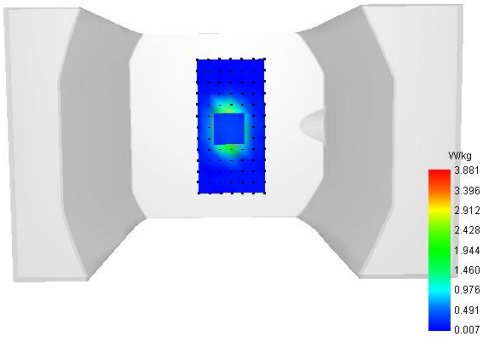
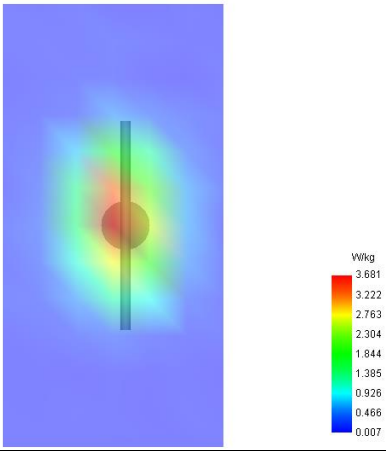
SAR 10g (W/Kg)	4.848
SAR 1g (W/Kg)	9.869
Variation (%)	-0.736
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	6.259	3.881	2.069	1.111	0.634



F. 3D Image

3D screen shot	Hot spot position
	

System check at 2600 MHz

Date of measurement: 29/11/2024

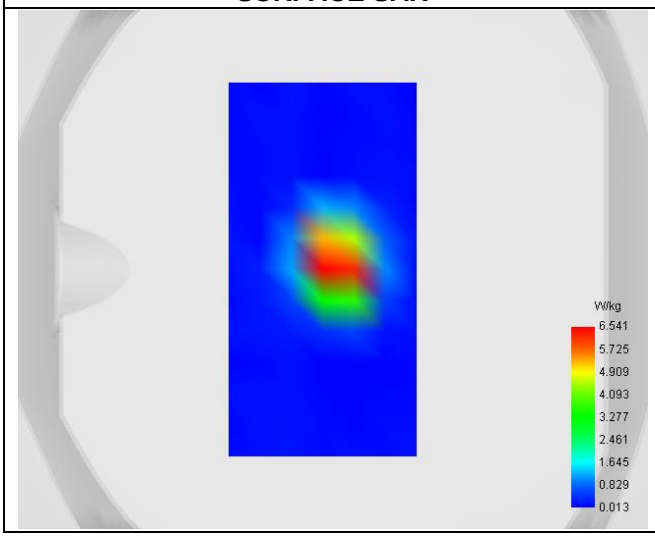
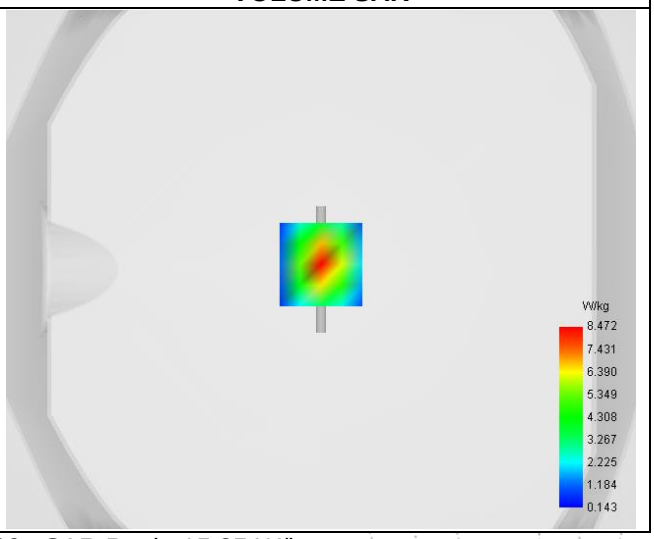
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	1.19
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Dipole
Band	CW2600
Signal	CW

B. Permitivity

Frequency (MHz)	2600.000
Relative permitivity (real part)	39.374
Relative permitivity (imaginary part)	14.889
Conductivity (S/m)	1.887

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

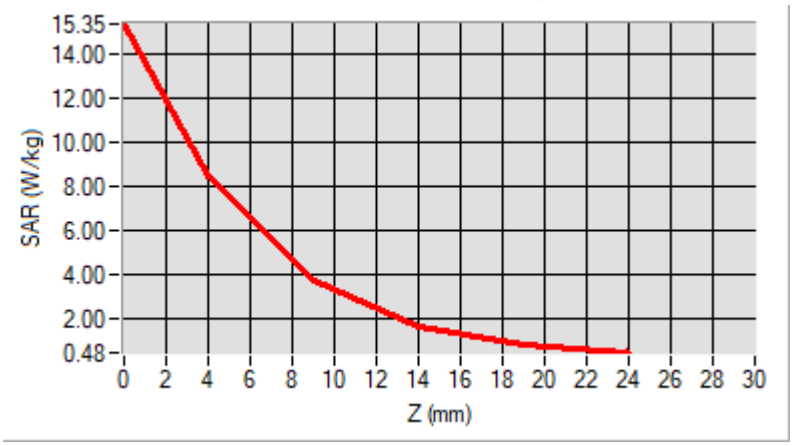
Maximum location: X=0.00, Y=2.00 ; SAR Peak: 15.35 W/kg

D. SAR 1g & 10g

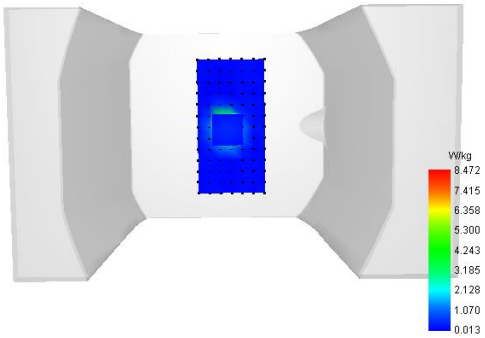
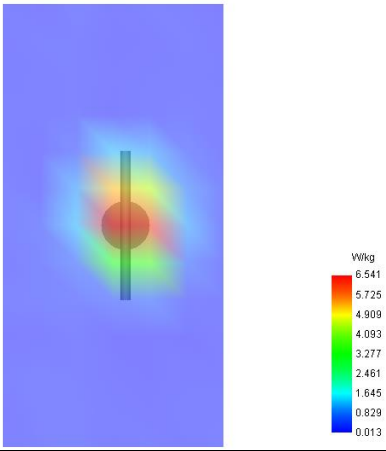
SAR 10g (W/Kg)	6.348
SAR 1g (W/Kg)	14.566
Variation (%)	1.056
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	15.347	8.472	3.768	1.677	0.856



F. 3D Image

3D screen shot	Hot spot position
	

15.2 SAR Test Graph Results

Plot 1

Date of measurement: 29/11/2024

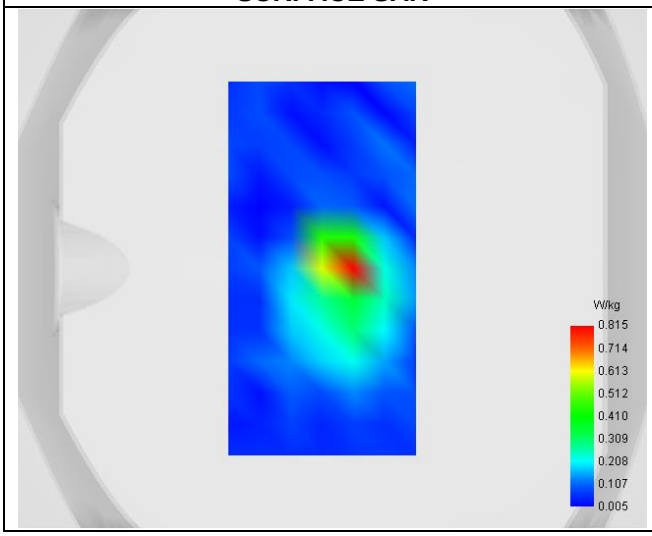
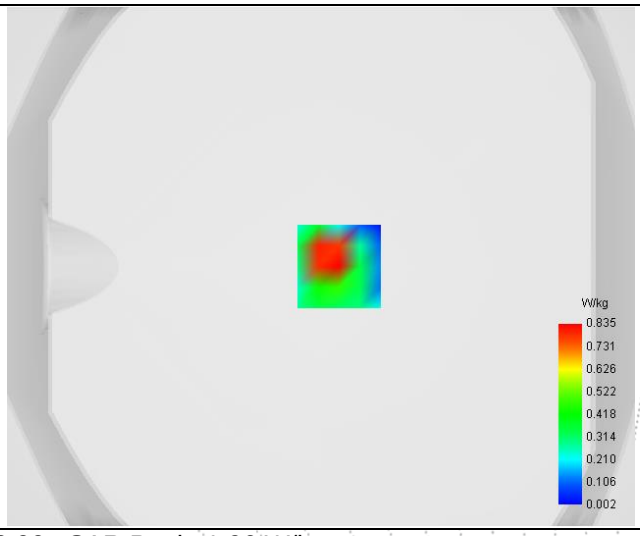
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	0.81
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5.0mm
Phantom	Validation plane
Device Position	Body
Band	GSM850

B. Permitivity

Frequency (MHz)	836.600
Relative permitivity (real part)	42.489
Relative permitivity (imaginary part)	19.400
Conductivity (S/m)	0.886

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

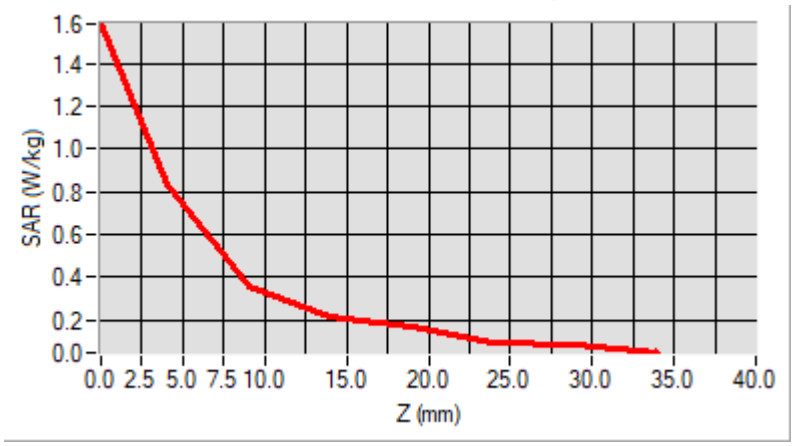
Maximum location: X=7.00, Y=0.00 ; SAR Peak: 1.96 W/kg

D. SAR 1g & 10g

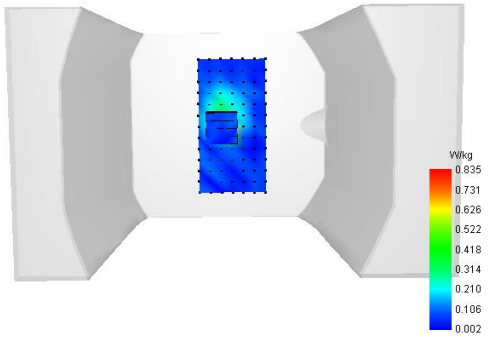
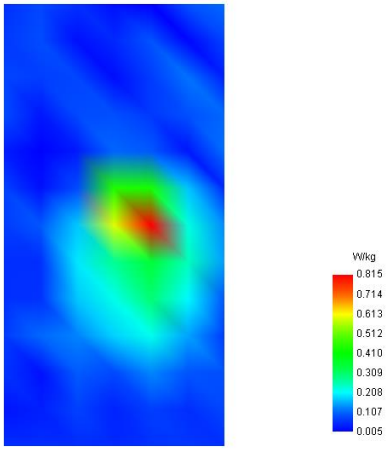
SAR 10g (W/Kg)	0.354
SAR 1g (W/Kg)	0.921
Variation (%)	-4.270
Horizontal validation criteria: minimum distance (mm)	8.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	42.842775

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00	24.00	29.00
SAR (W/Kg)	1.584	0.835	0.358	0.214	0.166	0.091	0.086



F. 3D Image

3D screen shot	Hot spot position
	

Plot 2

Date of measurement: 6/12/2024

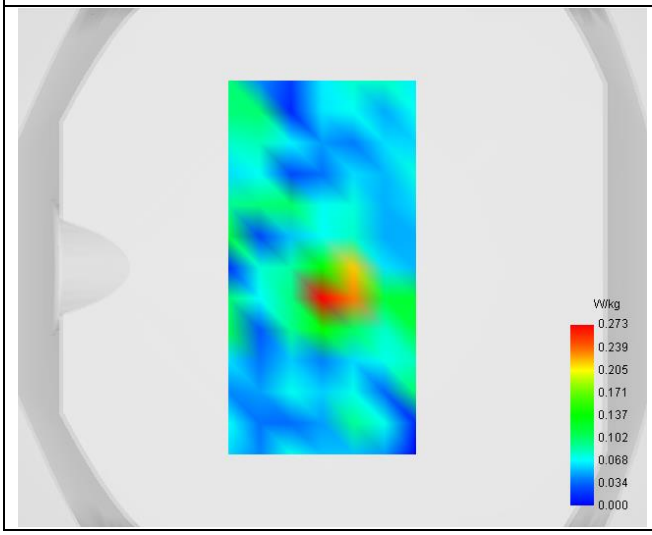
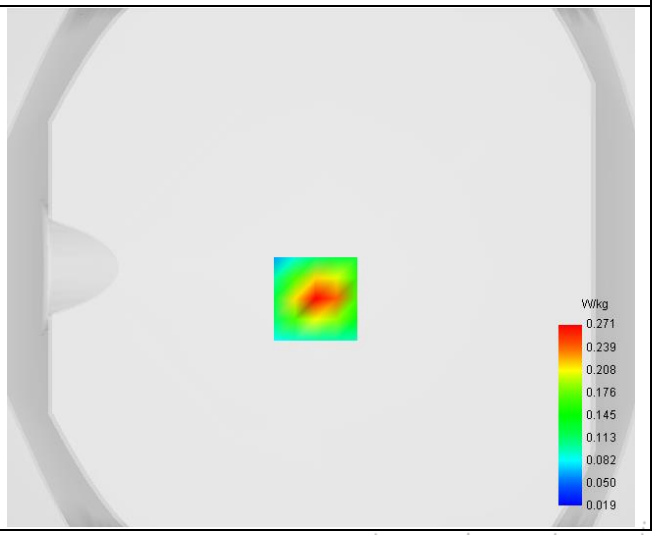
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	1.04
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5.0mm
Phantom	Validation plane
Device Position	Body
Band	GSM1900

B. Permitivity

Frequency (MHz)	1880.000
Relative permitivity (real part)	41.310
Relative permitivity (imaginary part)	13.408
Conductivity (S/m)	1.434

C. SAR Surface and Volume

SURFACE SAR	**VOLUME SAR**
	

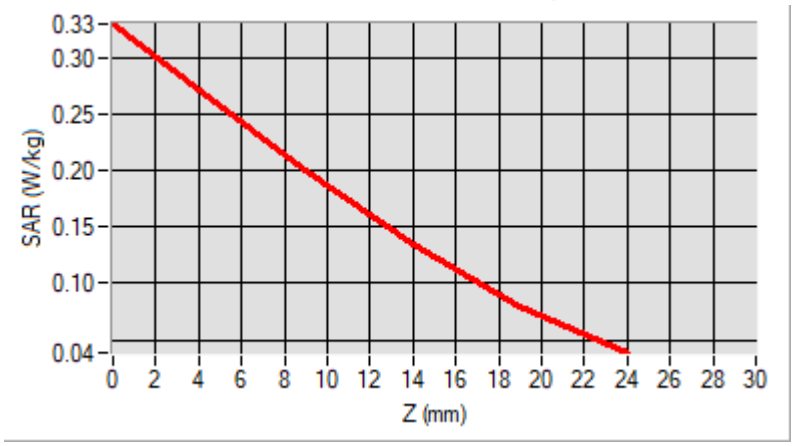
Maximum location: X=-2.00, Y=-12.00 ; SAR Peak: 0.34 W/kg

D. SAR 1g & 10g

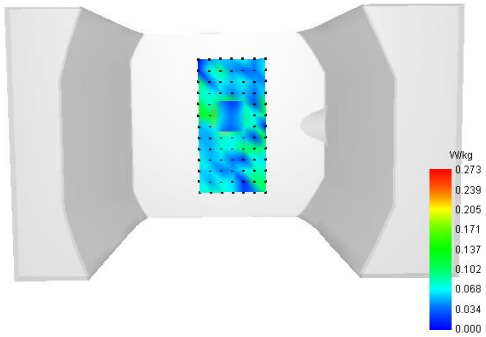
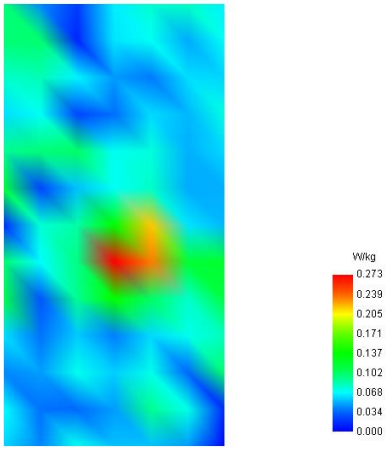
SAR 10g (W/Kg)	0.143
SAR 1g (W/Kg)	0.250
Variation (%)	3.240
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.330	0.271	0.200	0.135	0.080



F. 3D Image

3D screen shot	Hot spot position
	

Plot 3

Date of measurement: 6/12/2024

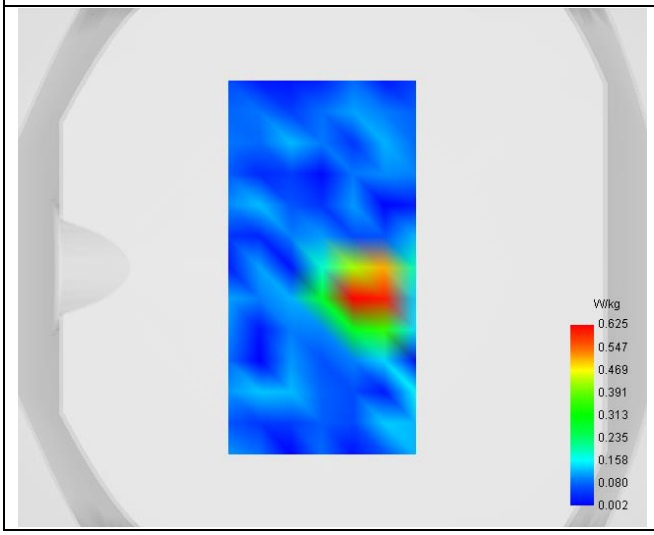
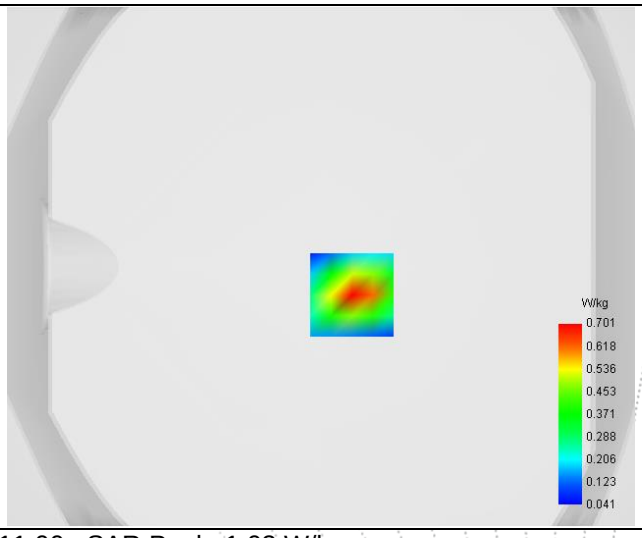
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	1.04
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5.0mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 2
Signal	LTE FDD
Cell Bandwidth	20 Mhz
Modulation	SC-OFDM - QPSK
RB offset	5
RB size	20

B. Permitivity

Frequency (MHz)	1880.000
Relative permitivity (real part)	41.310
Relative permitivity (imaginary part)	13.455
Conductivity (S/m)	1.434

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

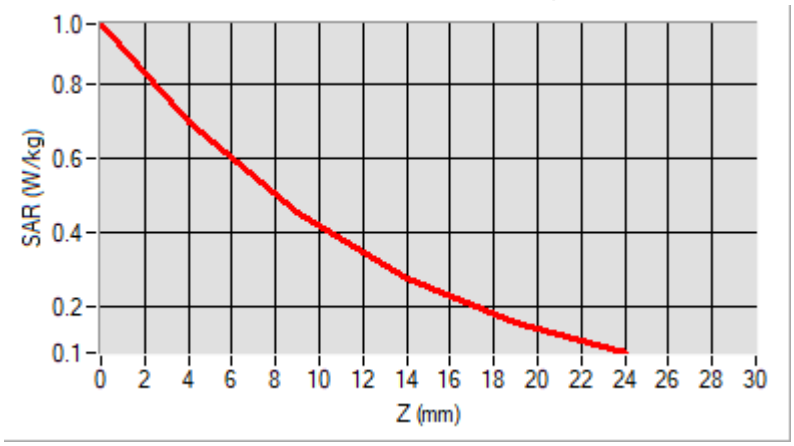
Maximum location: X=12.00, Y=-11.00 ; SAR Peak: 1.03 W/kg

D. SAR 1g & 10g

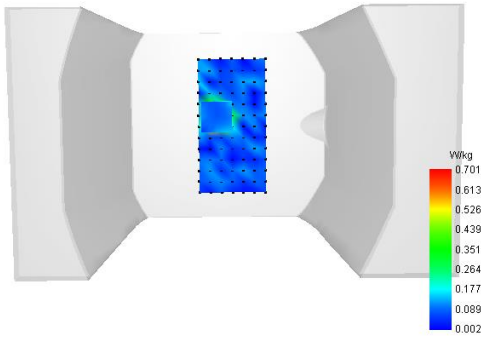
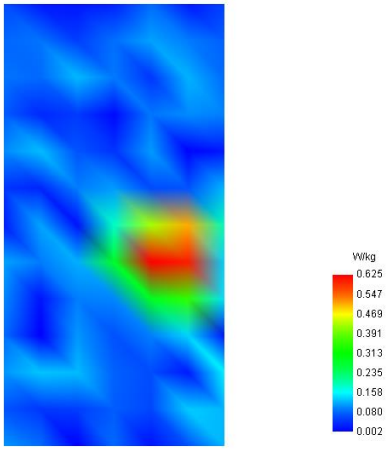
SAR 10g (W/Kg)	0.348
SAR 1g (W/Kg)	0.645
Variation (%)	-3.940
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.963	0.701	0.454	0.280	0.160



F. 3D Image

3D screen shot	Hot spot position
	

Plot 4

Date of measurement: 6/12/2024

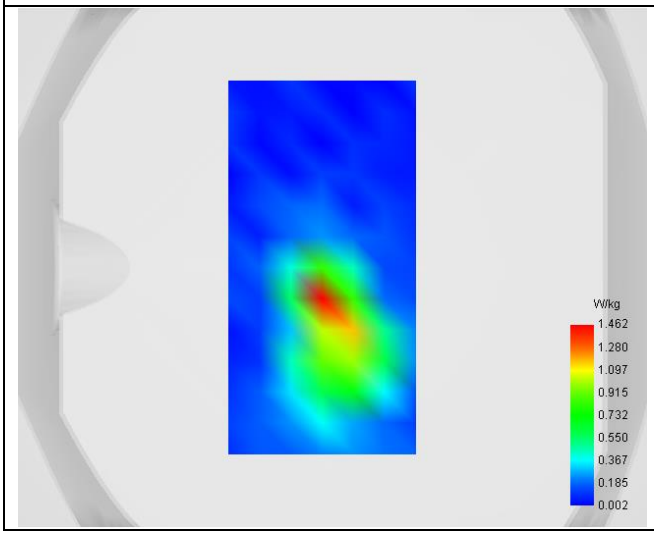
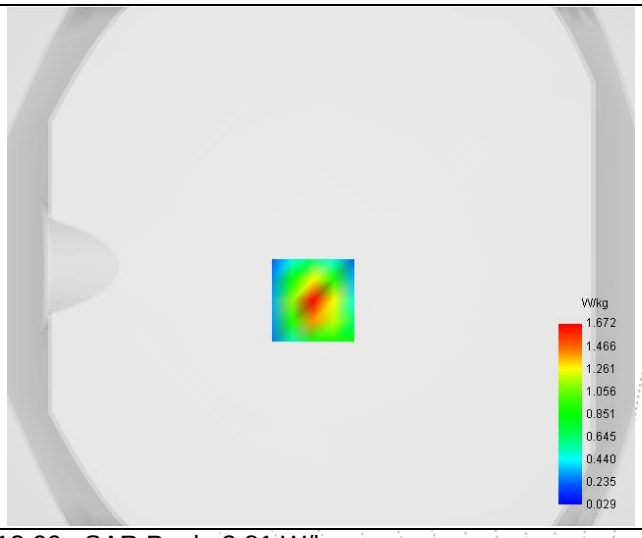
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	0.96
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5.0mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 4
Signal	LTE FDD
Cell Bandwidth	20 Mhz
Modulation	SC-OFDM - QPSK
RB offset	5
RB size	20

B. Permitivity

Frequency (MHz)	1732.500
Relative permitivity (real part)	39.532
Relative permitivity (imaginary part)	14.120
Conductivity (S/m)	1.427

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

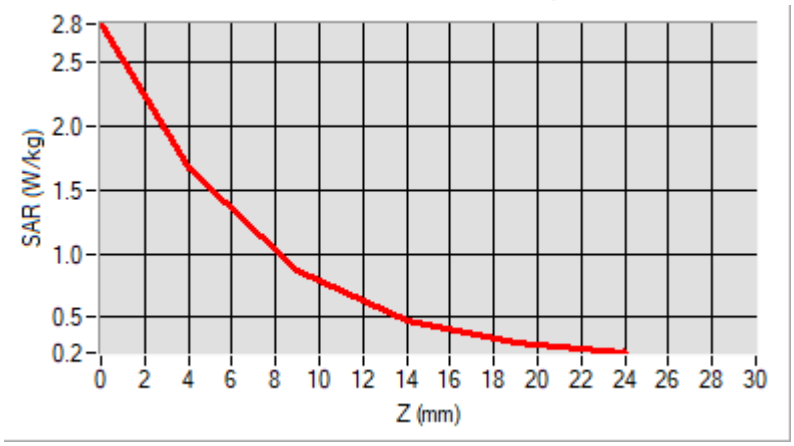
Maximum location: X=-3.00, Y=-13.00 ; SAR Peak: 2.81 W/kg

D. SAR 1g & 10g

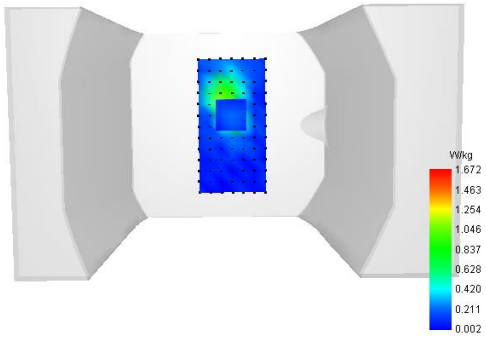
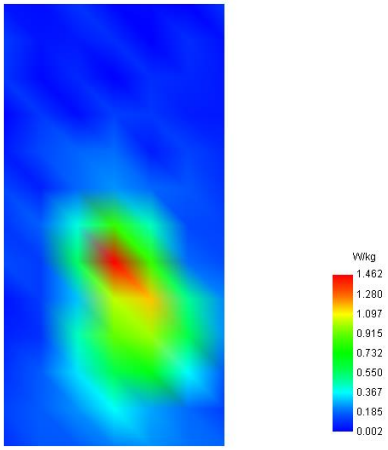
SAR 10g (W/Kg)	0.646
SAR 1g (W/Kg)	1.223
Variation (%)	-2.310
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	2.799	1.672	0.860	0.471	0.305



F. 3D Image

3D screen shot	Hot spot position
	

Plot 5

Date of measurement: 29/11/2024

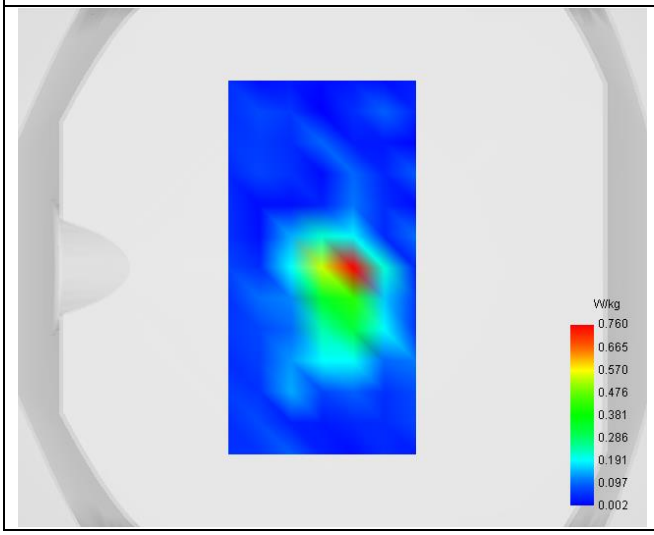
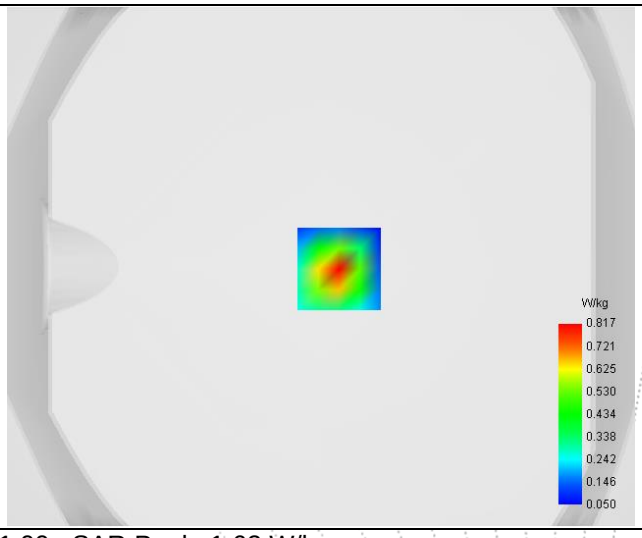
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	0.81
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5.0mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 5
Signal	LTE FDD
Cell Bandwidth	10 Mhz
Modulation	SC-OFDM - QPSK
RB offset	5
RB size	20

B. Permitivity

Frequency (MHz)	836.500
Relative permitivity (real part)	42.489
Relative permitivity (imaginary part)	19.407
Conductivity (S/m)	0.886

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

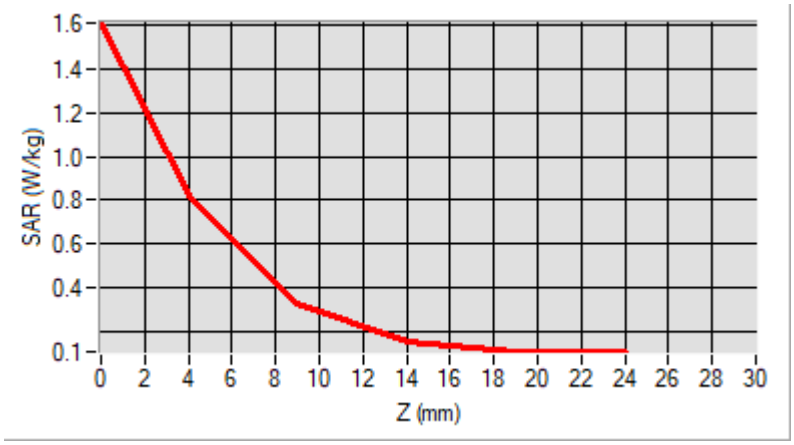
Maximum location: X=7.00, Y=-1.00 ; SAR Peak: 1.62 W/kg

D. SAR 1g & 10g

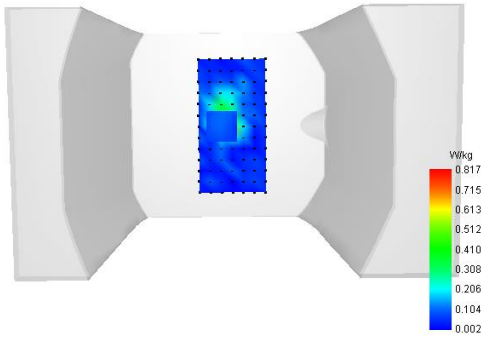
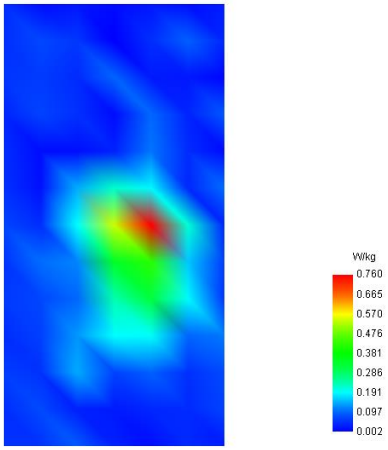
SAR 10g (W/Kg)	0.330
SAR 1g (W/Kg)	0.757
Variation (%)	1.400
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.614	0.817	0.325	0.147	0.103



F. 3D Image

3D screen shot	Hot spot position
	

Plot 6

Date of measurement: 29/11/2024

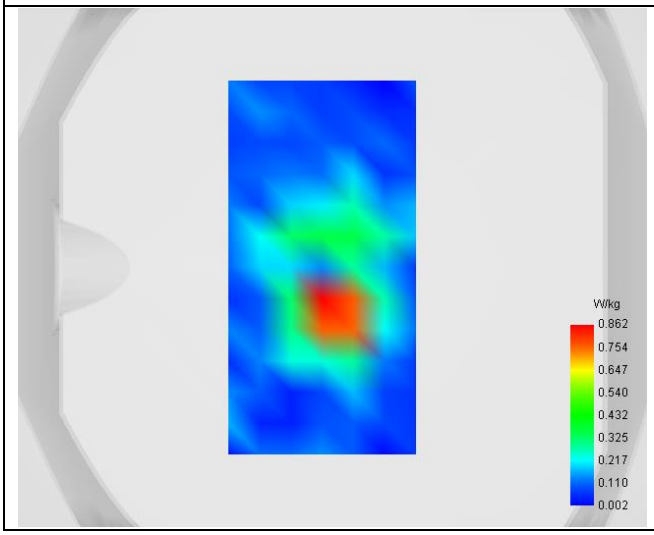
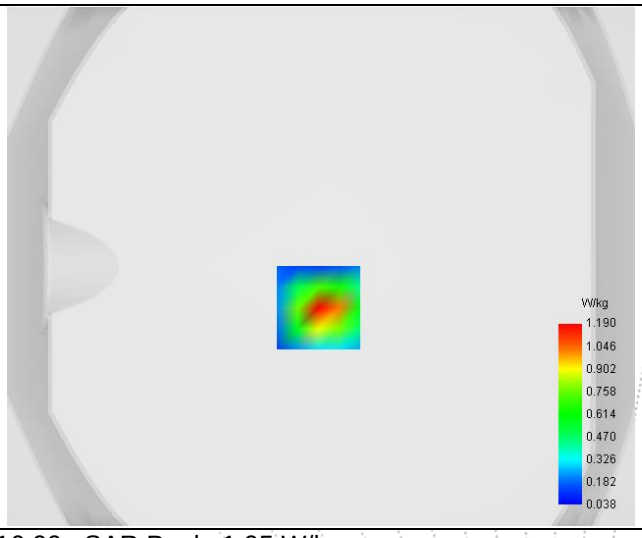
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	1.11
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5.0mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 7
Signal	LTE FDD
Cell Bandwidth	20 Mhz
Modulation	SC-OFDM - QPSK
RB offset	5
RB size	20

B. Permitivity

Frequency (MHz)	2510.000
Relative permitivity (real part)	39.374
Relative permitivity (imaginary part)	13.345
Conductivity (S/m)	1.887

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

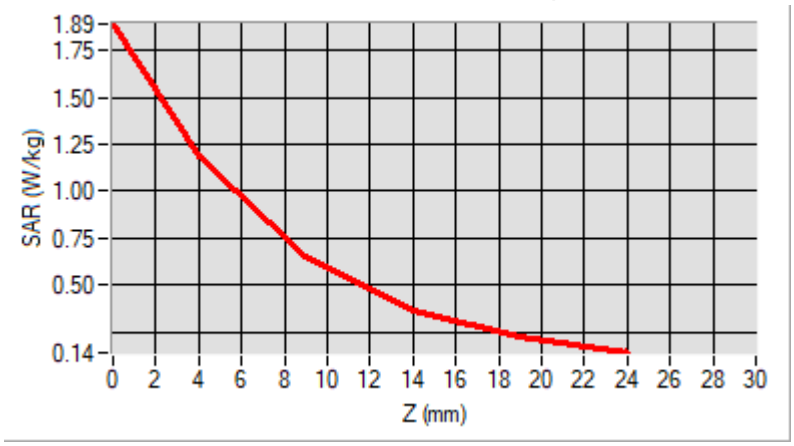
Maximum location: X=-1.00, Y=-16.00 ; SAR Peak: 1.95 W/kg

D. SAR 1g & 10g

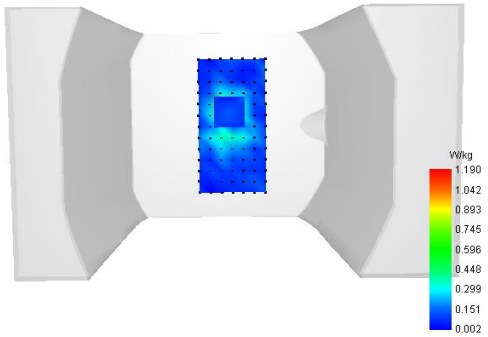
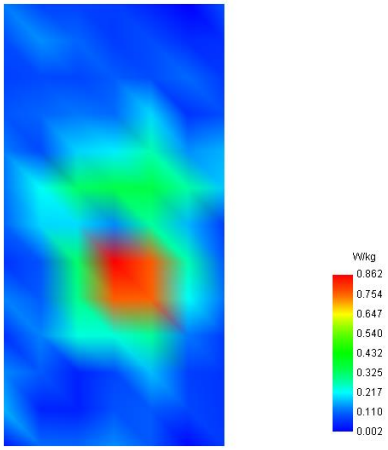
SAR 10g (W/Kg)	0.520
SAR 1g (W/Kg)	1.086
Variation (%)	-1.930
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.890	1.190	0.654	0.367	0.223



F. 3D Image

3D screen shot	Hot spot position
	

Plot 7

Date of measurement: 6/12/2024

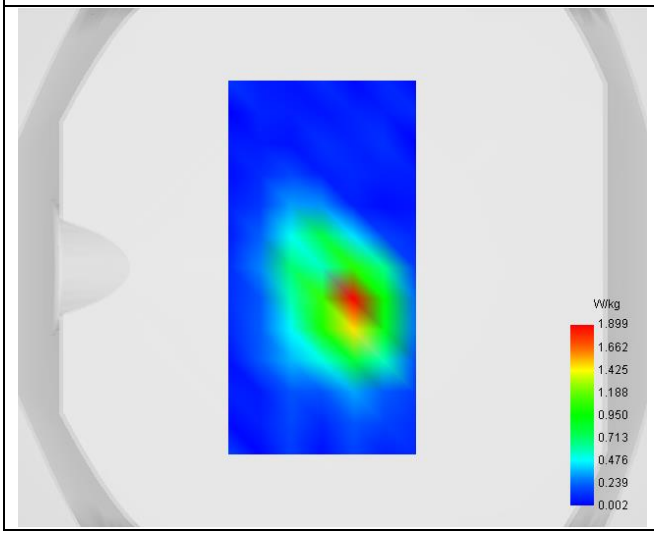
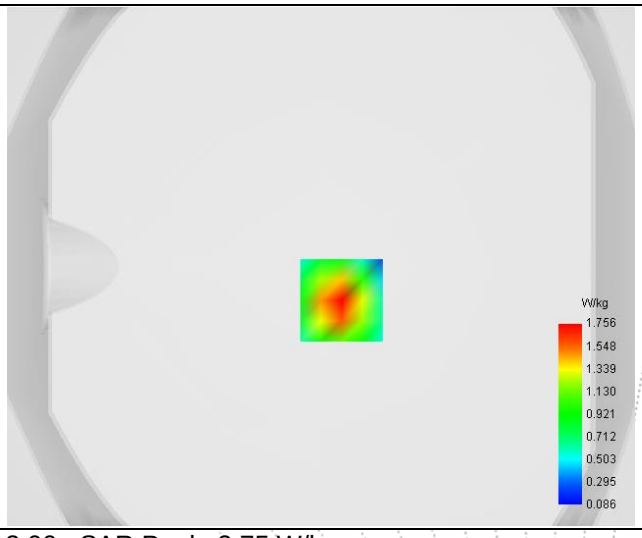
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	0.96
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5.0mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 66
Signal	LTE FDD
Cell Bandwidth	20 Mhz
Modulation	SC-OFDM - QPSK
RB offset	5
RB size	20

B. Permitivity

Frequency (MHz)	1745.000
Relative permitivity (real part)	39.532
Relative permitivity (imaginary part)	14.120
Conductivity (S/m)	1.427

C. SAR Surface and Volume

SURFACE SAR	VOLUME SAR
	

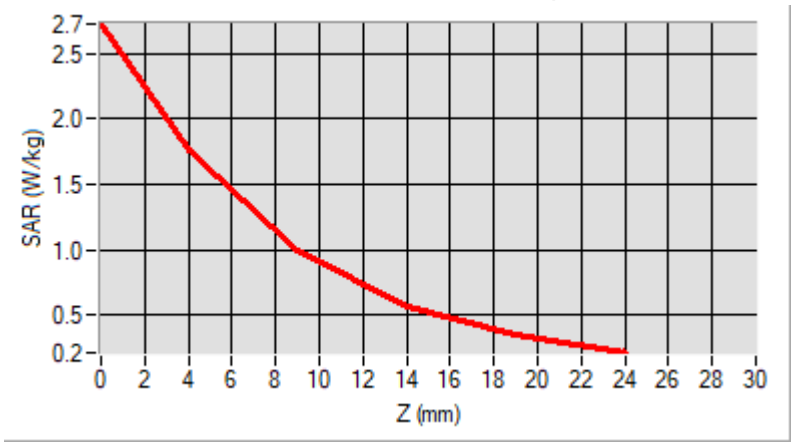
Maximum location: X=8.00, Y=-13.00 ; SAR Peak: 2.75 W/kg

D. SAR 1g & 10g

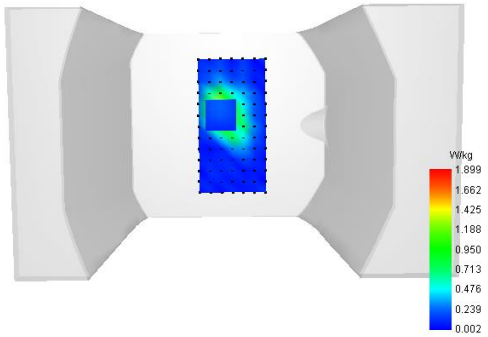
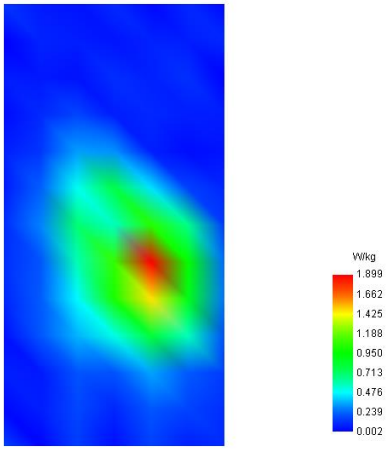
SAR 10g (W/Kg)	0.679
SAR 1g (W/Kg)	1.338
Variation (%)	-1.220
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	2.726	1.756	0.994	0.571	0.348



F. 3D Image

3D screen shot	Hot spot position
	

16 CALIBRATION CERTIFICATES

Probe-EPGO420 Calibration Certificate
SID835Dipole Calibration Ceriticate
SID1800Dipole Calibration Ceriticate
SID1900Dipole Calibration Ceriticate
SID2600Dipole Calibration Ceriticate

COMOSAR E-Field Probe Calibration Report

Ref : ACR.199.1.23.BES.A

SHENZHEN BCTC TECHNOLOGY CO., LTD.
1 ~2/ F, NO. B FACTORY BUILDING, PENGZHOU INDUSTRIAL PARK, FUYUAN 1ST ROAD, TANGWEI COMMUNITY, FUHAI STREET, BAO'AN DISTRICT, SHENZHEN, GUANGDONG,CHINA
MVG COMOSAR DOSIMETRIC E-FIELD PROBE
SERIAL NO.: 2623-EPGO-420

Calibrated at MVG
Z.I. de la pointe du diable
Technopôle Brest Iroise – 295 avenue Alexis de Rochon
29280 PLOUZANE - FRANCE

Calibration date: 7/18/2024

Accreditations #2-6789
Scope available on www.cofrac.fr

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Summary:

This document presents the method and results from an accredited COMOSAR Dosimetric E-Field Probe calibration performed at MVG, using the CALIPROBE test bench, for use with a MVG COMOSAR system only. The test results covered by accreditation are traceable to the International System of Units (SI).

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COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.199.1.23.BES.A

	Name	*Function*	*Date*	*Signature*
Prepared by :	Cyrille ONNEE	Measurement Responsible	7/18/2024	
Checked & approved by:	Jérôme Luc	Technical Manager	7/18/2024	
Authorized by:	Yann Toutain	Laboratory Director	7/18/2024	

Yann Toutain ID Signature numérique de Yann Toutain ID Date : 2024.07.18 10:38:49 +02'00'

	Customer Name
Distribution :	Shenzhen BCTC Technology Co., Ltd.

Issue	*Name*	*Date*	*Modifications*
A	Cyrille ONNEE	7/18/2024	Initial release

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TABLE OF CONTENTS

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1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	2623-EPGO-420
Product Condition (new / used)	New
Frequency Range of Probe	0.15 GHz-7.5GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.228 MΩ Dipole 2: R2=0.238 MΩ Dipole 3: R3=0.230 MΩ

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

MVG's COMOSAR E field Probes are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards.

Figure 1 – *MVG COMOSAR Dosimetric E field Probe*

Probe Length	330 mm
Length of Individual Dipoles	24.5 mm
Maximum external diameter	8 mm
Probe Tip External Diameter	2.55 mm
Distance between dipoles / probe extremity	12.7 mm

3 MEASUREMENT METHOD

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards provide recommended practices for the probe calibrations, including the performance characteristics of interest and methods by which to assess their effect. All calibrations / measurements performed meet the fore-mentioned standards.

3.1 SENSITIVITY

The sensitivity factors of the three dipoles were determined using a two step calibration method (air and tissue simulating liquid) using waveguides as outlined in the standards for frequency range 600-7500MHz and using the calorimeter cell method (transfer method) as outlined in the standards for frequency 150-450 MHz.

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3.2 LINEARITY

The evaluation of the linearity was done in free space using the waveguide, performing a power sweep to cover the SAR range 0.01W/kg to 100W/kg.

3.3 ISOTROPY

The axial isotropy was evaluated by exposing the probe to a reference wave from a standard dipole with the dipole mounted under the flat phantom in the test configuration suggested for system validations and checks. The probe was rotated along its main axis from 0 to 360 degrees in 15-degree steps. The hemispherical isotropy is determined by inserting the probe in a thin plastic box filled with tissue-equivalent liquid, with the plastic box illuminated with the fields from a half wave dipole. The dipole is rotated about its axis (0°–180°) in 15° increments. At each step the probe is rotated about its axis (0°–360°).

3.4 BOUNDARY EFFECT

The boundary effect is defined as the deviation between the SAR measured data and the expected exponential decay in the liquid when the probe is oriented normal to the interface. To evaluate this effect, the liquid filled flat phantom is exposed to fields from either a reference dipole or waveguide. With the probe normal to the phantom surface, the peak spatial average SAR is measured and compared to the analytical value at the surface.

The boundary effect uncertainty can be estimated according to the following uncertainty approximation formula based on linear and exponential extrapolations between the surface and $d_{be} + d_{step}$ along lines that are approximately normal to the surface:

$$\mathrm{SAR}_{\mathrm{uncertainty}}[\%] = \delta\mathrm{SAR}_{be}\,\frac{(d_{be}+d_{step})^2}{2d_{step}}\,\frac{\left(e^{-d_{be}/(\delta\rho)}\right)}{\delta/2} \quad \text{for } (d_{be}+d_{step}) < 10\ \text{mm}$$

where

$\mathrm{SAR}_{\mathrm{uncertainty}}$	is the uncertainty in percent of the probe boundary effect
d_{be}	is the distance between the surface and the closest *zoom-scan* measurement point, in millimetre
Δ_{step}	is the separation distance between the first and second measurement points that are closest to the phantom surface, in millimetre, assuming the boundary effect at the second location is negligible
δ	is the minimum penetration depth in millimetres of the head tissue-equivalent liquids defined in this standard, i.e., $\delta \approx 14$ mm at 3 GHz;
$\Delta\mathrm{SAR}_{be}$	in percent of SAR is the deviation between the measured SAR value, at the distance d_{be} from the boundary, and the analytical SAR value.

The measured worst case boundary effect SARuncertainty[%] for scanning distances larger than 4mm is 1.0% Limit ,2%).

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4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty associated with a SAR probe calibration using the waveguide or calorimetric cell technique depending on the frequency.

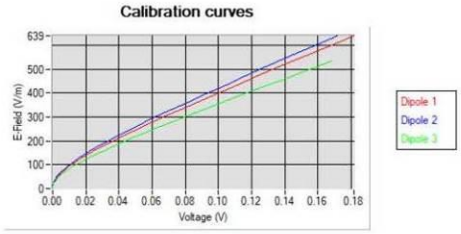
The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is +/-11% for the frequency range 150-450MHz.
The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is +/-14% for the frequency range 600-7500MHz.

5 CALIBRATION RESULTS

Ambient condition	
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

5.1 CALIBRATION IN AIR

The following curve represents the measurement in waveguide of the voltage picked up by the probe toward the E-field generated inside the waveguide.



From this curve, the sensitivity in air is calculated using the below formula.

$$E^2 = \sum_{i=1}^{3} \frac{V_i \left(1 + {}^{V_i}/_{DCP_i}\right)}{Norm_i}$$

where
Vi=voltage readings on the 3 channels of the probe
DCPi=diode compression point given below for the 3 channels of the probe
Normi=dipole sensitivity given below for the 3 channels of the probe

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Normx dipole 1 (μV/(V/m)^2)	Normy dipole 2 (μV/(V/m)^2)	Normz dipole 3 (μV/(V/m)^2)
1.21	1.09	1.56

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
106	109	103

5.2 CALIBRATION IN LIQUID

The calorimeter cell or the waveguide is used to determine the calibration in liquid using the formula below.

$$ConvF = \frac{E^2_{liquid}}{E^2_{air}}$$

The E-field in the liquid is determined from the SAR measurement according to the below formula.

$$E^2_{liquid} = \frac{\rho\, SAR}{\sigma}$$

where
σ=the conductivity of the liquid
ρ=the volumetric density of the liquid
SAR=the SAR measured from the formula that depends on the setup used. The SAR formulas are given below

For the calorimeter cell (150-450 MHz), the formula is:

$$SAR = c\frac{dT}{dt}$$

where
c=the specific heat for the liquid
dT/dt=the temperature rises over the time

For the waveguide setup (600-75000 MHz), the formula is:

$$SAR = \frac{4Pw}{ab\delta} e^{\frac{-2z}{\delta}}$$

where
a=the larger cross-sectional of the waveguide
b=the smaller cross-sectional of the waveguide
δ=the skin depth for the liquid in the waveguide
Pw=the power delivered to the liquid

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The below table summarize the ConvF for the calibrated liquid. The curves give examples for the measured SAR depending on the voltage in some liquid.

Liquid	Frequency (MHz*)	ConvF
HL450	450	0.86
BL450	450	0.78
HL750	750	0.80
BL750	750	0.87
HL850	835	0.81
BL850	835	0.80
HL900	900	0.76
BL900	900	0.87
HL1800	1800	0.96
BL1800	1800	1.01
HL1900	1900	1.04
BL1900	1900	1.11
HL2100	2100	1.00
BL2100	2100	1.16
HL2300	2300	1.11
BL2300	2300	1.23
HL2450	2450	1.11
BL2450	2450	1.32
HL2600	2600	1.03
BL2600	2600	1.19
HL5200	5200	1.18
BL5200	5200	0.97
HL5400	5400	1.17
BL5400	5400	1.00
HL5600	5600	1.20
BL5600	5600	0.95
HL5800	5800	1.15
BL5800	5800	1.05

(*) Frequency validity is +/-50MHz below 600MHz, +/-100MHz from 600MHz to 6GHz and +/-700MHz above 6GHz

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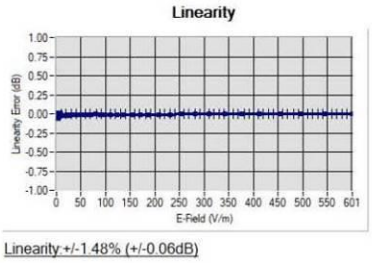
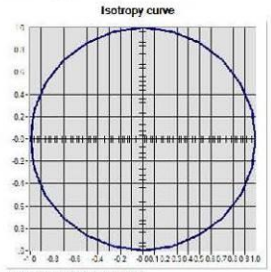
6 VERIFICATION RESULTS

The figures below represent the measured linearity and axial isotropy for this probe. The probe specification is +/-0.2 dB for linearity and +/-0.15 dB for axial isotropy.



Linearity:+/-1.48% (+/-0.06dB)



Isotropy:+/-0.25% (+/-0.01dB)

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7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Descriptio	**Manufacturer / Model**	**Identification No.**	**Current Calibration Date**	**Next Calibration Date**
CALIPROBE Test Bench	Version 2	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2024	08/2027
Network Analyzer	Agilent 8753ES	MY40003210	10/2023	10/2027
Network Analyzer – Calibration kit	HP 85033D	3423A08186	06/2021	06/2027
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Multimeter	Keithley 2000	4013982	02/2023	02/2026
Signal Generator	Rohde & Schwarz SMB	106589	03/2022	03/2025
Amplifier	MVG	MODU-023-C-0002	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	NI-USB 5680	170100013	06/2024	06/2027
Power Meter	Keysight U2000A	SN: MY62340002	10/2022	10/2025
Directional Coupler	Krytar 158020	131467	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Fluoroptic Thermometer	LumaSense Luxtron 812	94264	09/2022	09/2025
Coaxial cell	MVG	SN 32/16 COAXCELL_	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG2_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G600_	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG4_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G900_	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG6_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G500_	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG8_1	Validated. No cal required.	Validated. No cal required.

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Liquid transition	MVG	SN 32/16 WGLIQ_1G800B_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800H_	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG10_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_3G500_	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG12_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_5G000_	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG14_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_7G000_1	Validated. No cal required.	Validated. No cal required.
Temperature / Humidity Sensor	Testo 184 H1	44225320	06/2021	06/2024

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