

Band	Bandwidth (MHz)	UL Channel	RB Size	RB Position	Modulation	Power (dBm)
Band66	1.4	131979	1	#0	QPSK	23.17
Band66	1.4	131979	1	#Mid	QPSK	23.13
Band66	1.4	131979	1	#Max	QPSK	23.10
Band66	1.4	131979	3	#0	QPSK	22.92
Band66	1.4	131979	3	#Mid	QPSK	22.96
Band66	1.4	131979	3	#Max	QPSK	23.02
Band66	1.4	131979	6	#0	QPSK	21.97
Band66	1.4	131979	1	#0	16QAM	23.07
Band66	1.4	131979	1	#Mid	16QAM	23.12
Band66	1.4	131979	1	#Max	16QAM	23.08
Band66	1.4	131979	3	#0	16QAM	22.31
Band66	1.4	131979	3	#Mid	16QAM	22.34
Band66	1.4	131979	3	#Max	16QAM	22.29
Band66	1.4	131979	6	#0	16QAM	21.29
Band66	1.4	132322	1	#0	QPSK	22.95
Band66	1.4	132322	1	#Mid	QPSK	23.10
Band66	1.4	132322	1	#Max	QPSK	22.99
Band66	1.4	132322	3	#0	QPSK	23.00
Band66	1.4	132322	3	#Mid	QPSK	22.95
Band66	1.4	132322	3	#Max	QPSK	23.03
Band66	1.4	132322	6	#0	QPSK	22.08
Band66	1.4	132322	1	#0	16QAM	22.20
Band66	1.4	132322	1	#Mid	16QAM	22.10
Band66	1.4	132322	1	#Max	16QAM	22.24
Band66	1.4	132322	3	#0	16QAM	21.88
Band66	1.4	132322	3	#Mid	16QAM	21.93
Band66	1.4	132322	3	#Max	16QAM	21.91
Band66	1.4	132322	6	#0	16QAM	21.32
Band66	1.4	132665	1	#0	QPSK	23.04
Band66	1.4	132665	1	#Mid	QPSK	23.08
Band66	1.4	132665	1	#Max	QPSK	23.04
Band66	1.4	132665	3	#0	QPSK	22.92
Band66	1.4	132665	3	#Mid	QPSK	22.98
Band66	1.4	132665	3	#Max	QPSK	22.99
Band66	1.4	132665	6	#0	QPSK	22.06
Band66	1.4	132665	1	#0	16QAM	21.98
Band66	1.4	132665	1	#Mid	16QAM	21.98
Band66	1.4	132665	1	#Max	16QAM	22.08
Band66	1.4	132665	3	#0	16QAM	22.03
Band66	1.4	132665	3	#Mid	16QAM	22.02
Band66	1.4	132665	3	#Max	16QAM	21.98
Band66	1.4	132665	6	#0	16QAM	21.14
Band66	3	131987	1	#0	QPSK	22.97
Band66	3	131987	1	#Mid	QPSK	23.05
Band66	3	131987	1	#Max	QPSK	23.00
Band66	3	131987	8	#0	QPSK	21.94
Band66	3	131987	8	#Mid	QPSK	21.95
Band66	3	131987	8	#Max	QPSK	22.01
Band66	3	131987	15	#0	QPSK	22.10
Band66	3	131987	1	#0	16QAM	23.23
Band66	3	131987	1	#Mid	16QAM	23.19
Band66	3	131987	1	#Max	16QAM	23.28
Band66	3	131987	8	#0	16QAM	21.09
Band66	3	131987	8	#Mid	16QAM	21.05
Band66	3	131987	8	#Max	16QAM	21.07

Band66	3	131987	15	#0	16QAM	21.21
Band66	3	132322	1	#0	QPSK	23.02
Band66	3	132322	1	#Mid	QPSK	23.03
Band66	3	132322	1	#Max	QPSK	23.00
Band66	3	132322	8	#0	QPSK	22.02
Band66	3	132322	8	#Mid	QPSK	22.13
Band66	3	132322	8	#Max	QPSK	22.06
Band66	3	132322	15	#0	QPSK	22.11
Band66	3	132322	1	#0	16QAM	22.17
Band66	3	132322	1	#Mid	16QAM	22.14
Band66	3	132322	1	#Max	16QAM	22.16
Band66	3	132322	8	#0	16QAM	21.28
Band66	3	132322	8	#Mid	16QAM	21.32
Band66	3	132322	8	#Max	16QAM	21.36
Band66	3	132322	15	#0	16QAM	21.26
Band66	3	132657	1	#0	QPSK	23.04
Band66	3	132657	1	#Mid	QPSK	23.06
Band66	3	132657	1	#Max	QPSK	23.03
Band66	3	132657	8	#0	QPSK	21.95
Band66	3	132657	8	#Mid	QPSK	21.94
Band66	3	132657	8	#Max	QPSK	21.97
Band66	3	132657	15	#0	QPSK	22.04
Band66	3	132657	1	#0	16QAM	22.03
Band66	3	132657	1	#Mid	16QAM	22.00
Band66	3	132657	1	#Max	16QAM	21.99
Band66	3	132657	8	#0	16QAM	21.04
Band66	3	132657	8	#Mid	16QAM	21.05
Band66	3	132657	8	#Max	16QAM	21.06
Band66	3	132657	15	#0	16QAM	21.19
Band66	5	131997	1	#0	QPSK	22.96
Band66	5	131997	1	#Mid	QPSK	23.01
Band66	5	131997	1	#Max	QPSK	23.12
Band66	5	131997	12	#0	QPSK	22.06
Band66	5	131997	12	#Mid	QPSK	22.15
Band66	5	131997	12	#Max	QPSK	22.00
Band66	5	131997	25	#0	QPSK	22.05
Band66	5	131997	1	#0	16QAM	22.08
Band66	5	131997	1	#Mid	16QAM	22.16
Band66	5	131997	1	#Max	16QAM	22.21
Band66	5	131997	12	#0	16QAM	21.10
Band66	5	131997	12	#Mid	16QAM	21.06
Band66	5	131997	12	#Max	16QAM	21.15
Band66	5	131997	25	#0	16QAM	21.29
Band66	5	132322	1	#0	QPSK	23.09
Band66	5	132322	1	#Mid	QPSK	23.14
Band66	5	132322	1	#Max	QPSK	23.21
Band66	5	132322	12	#0	QPSK	22.02
Band66	5	132322	12	#Mid	QPSK	22.13
Band66	5	132322	12	#Max	QPSK	22.13
Band66	5	132322	25	#0	QPSK	22.03
Band66	5	132322	1	#0	16QAM	22.18
Band66	5	132322	1	#Mid	16QAM	22.19
Band66	5	132322	1	#Max	16QAM	22.23
Band66	5	132322	12	#0	16QAM	21.02
Band66	5	132322	12	#Mid	16QAM	21.04
Band66	5	132322	12	#Max	16QAM	20.96
Band66	5	132322	25	#0	16QAM	21.22

Band66	5	132647	1	#0	QPSK	22.82
Band66	5	132647	1	#Mid	QPSK	22.76
Band66	5	132647	1	#Max	QPSK	22.84
Band66	5	132647	12	#0	QPSK	21.98
Band66	5	132647	12	#Mid	QPSK	22.04
Band66	5	132647	12	#Max	QPSK	21.99
Band66	5	132647	25	#0	QPSK	22.04
Band66	5	132647	1	#0	16QAM	22.58
Band66	5	132647	1	#Mid	16QAM	22.52
Band66	5	132647	1	#Max	16QAM	22.61
Band66	5	132647	12	#0	16QAM	21.08
Band66	5	132647	12	#Mid	16QAM	21.04
Band66	5	132647	12	#Max	16QAM	21.06
Band66	5	132647	25	#0	16QAM	21.22
Band66	10	132022	1	#0	QPSK	22.93
Band66	10	132022	1	#Mid	QPSK	23.07
Band66	10	132022	1	#Max	QPSK	23.10
Band66	10	132022	25	#0	QPSK	21.97
Band66	10	132022	25	#Mid	QPSK	22.00
Band66	10	132022	25	#Max	QPSK	22.27
Band66	10	132022	50	#0	QPSK	22.05
Band66	10	132022	1	#0	16QAM	23.17
Band66	10	132022	1	#Mid	16QAM	23.24
Band66	10	132022	1	#Max	16QAM	23.33
Band66	10	132022	25	#0	16QAM	21.23
Band66	10	132022	25	#Mid	16QAM	21.18
Band66	10	132022	25	#Max	16QAM	21.33
Band66	10	132022	50	#0	16QAM	21.23
Band66	10	132322	1	#0	QPSK	23.07
Band66	10	132322	1	#Mid	QPSK	23.06
Band66	10	132322	1	#Max	QPSK	23.06
Band66	10	132322	25	#0	QPSK	22.05
Band66	10	132322	25	#Mid	QPSK	22.17
Band66	10	132322	25	#Max	QPSK	22.16
Band66	10	132322	50	#0	QPSK	22.15
Band66	10	132322	1	#0	16QAM	22.76
Band66	10	132322	1	#Mid	16QAM	22.69
Band66	10	132322	1	#Max	16QAM	22.75
Band66	10	132322	25	#0	16QAM	21.19
Band66	10	132322	25	#Mid	16QAM	21.22
Band66	10	132322	25	#Max	16QAM	21.22
Band66	10	132322	50	#0	16QAM	21.28
Band66	10	132622	1	#0	QPSK	23.07
Band66	10	132622	1	#Mid	QPSK	23.02
Band66	10	132622	1	#Max	QPSK	23.10
Band66	10	132622	25	#0	QPSK	22.01
Band66	10	132622	25	#Mid	QPSK	21.97
Band66	10	132622	25	#Max	QPSK	21.96
Band66	10	132622	50	#0	QPSK	22.05
Band66	10	132622	1	#0	16QAM	22.24
Band66	10	132622	1	#Mid	16QAM	22.39
Band66	10	132622	1	#Max	16QAM	22.39
Band66	10	132622	25	#0	16QAM	21.14
Band66	10	132622	25	#Mid	16QAM	21.08
Band66	10	132622	25	#Max	16QAM	21.17
Band66	10	132622	50	#0	16QAM	21.08
Band66	15	132047	1	#0	QPSK	23.00

Band66	15	132047	1	#Mid	QPSK	23.14
Band66	15	132047	1	#Max	QPSK	23.12
Band66	15	132047	36	#0	QPSK	22.11
Band66	15	132047	36	#Mid	QPSK	22.28
Band66	15	132047	36	#Max	QPSK	22.13
Band66	15	132047	75	#0	QPSK	22.22
Band66	15	132047	1	#0	16QAM	23.21
Band66	15	132047	1	#Mid	16QAM	23.32
Band66	15	132047	1	#Max	16QAM	23.34
Band66	15	132047	36	#0	16QAM	21.26
Band66	15	132047	36	#Mid	16QAM	21.36
Band66	15	132047	36	#Max	16QAM	21.26
Band66	15	132047	75	#0	16QAM	21.26
Band66	15	132322	1	#0	QPSK	23.10
Band66	15	132322	1	#Mid	QPSK	23.12
Band66	15	132322	1	#Max	QPSK	23.11
Band66	15	132322	36	#0	QPSK	22.13
Band66	15	132322	36	#Mid	QPSK	22.11
Band66	15	132322	36	#Max	QPSK	22.05
Band66	15	132322	75	#0	QPSK	22.19
Band66	15	132322	1	#0	16QAM	22.86
Band66	15	132322	1	#Mid	16QAM	22.75
Band66	15	132322	1	#Max	16QAM	22.79
Band66	15	132322	36	#0	16QAM	21.32
Band66	15	132322	36	#Mid	16QAM	21.34
Band66	15	132322	36	#Max	16QAM	21.31
Band66	15	132322	75	#0	16QAM	21.22
Band66	15	132597	1	#0	QPSK	22.92
Band66	15	132597	1	#Mid	QPSK	22.90
Band66	15	132597	1	#Max	QPSK	22.92
Band66	15	132597	36	#0	QPSK	22.03
Band66	15	132597	36	#Mid	QPSK	22.05
Band66	15	132597	36	#Max	QPSK	22.06
Band66	15	132597	75	#0	QPSK	21.96
Band66	15	132597	1	#0	16QAM	22.88
Band66	15	132597	1	#Mid	16QAM	22.91
Band66	15	132597	1	#Max	16QAM	22.93
Band66	15	132597	36	#0	16QAM	21.05
Band66	15	132597	36	#Mid	16QAM	21.03
Band66	15	132597	36	#Max	16QAM	21.04
Band66	15	132597	75	#0	16QAM	21.13
Band66	20	132072	1	#0	QPSK	23.20
Band66	20	132072	1	#Mid	QPSK	23.23
Band66	20	132072	1	#Max	QPSK	23.20
Band66	20	132072	50	#0	QPSK	22.13
Band66	20	132072	50	#Mid	QPSK	22.14
Band66	20	132072	50	#Max	QPSK	22.16
Band66	20	132072	100	#0	QPSK	22.10
Band66	20	132072	1	#0	16QAM	22.23
Band66	20	132072	1	#Mid	16QAM	22.32
Band66	20	132072	1	#Max	16QAM	22.35
Band66	20	132072	50	#0	16QAM	21.23
Band66	20	132072	50	#Mid	16QAM	21.27
Band66	20	132072	50	#Max	16QAM	21.40
Band66	20	132072	100	#0	16QAM	21.23
Band66	20	132322	1	#0	QPSK	23.37
Band66	20	132322	1	#Mid	QPSK	23.41

Band66	20	132322	1	#Max	QPSK	23.38
Band66	20	132322	50	#0	QPSK	22.17
Band66	20	132322	50	#Mid	QPSK	22.22
Band66	20	132322	50	#Max	QPSK	22.06
Band66	20	132322	100	#0	QPSK	22.15
Band66	20	132322	1	#0	16QAM	21.63
Band66	20	132322	1	#Mid	16QAM	21.59
Band66	20	132322	1	#Max	16QAM	21.73
Band66	20	132322	50	#0	16QAM	21.19
Band66	20	132322	50	#Mid	16QAM	21.21
Band66	20	132322	50	#Max	16QAM	21.22
Band66	20	132322	100	#0	16QAM	21.29
Band66	20	132572	1	#0	QPSK	23.10
Band66	20	132572	1	#Mid	QPSK	23.02
Band66	20	132572	1	#Max	QPSK	23.07
Band66	20	132572	50	#0	QPSK	21.97
Band66	20	132572	50	#Mid	QPSK	22.11
Band66	20	132572	50	#Max	QPSK	21.98
Band66	20	132572	100	#0	QPSK	21.95
Band66	20	132572	1	#0	16QAM	22.40
Band66	20	132572	1	#Mid	16QAM	22.34
Band66	20	132572	1	#Max	16QAM	22.38
Band66	20	132572	50	#0	16QAM	21.12
Band66	20	132572	50	#Mid	16QAM	21.23
Band66	20	132572	50	#Max	16QAM	21.04
Band66	20	132572	100	#0	16QAM	21.13

Note:

1. When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 b/g/n modes, the channel in the lower order/sequence 802.11 mode (i.e. g, n) is selected. Therefore the SAR measurements performed for the 802.11b modes, as the lowest order modulation, cover 802.11g/n modes.
2. SAR is not required for the following 2.4 GHz OFDM conditions as the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
3. Per KDB 248227 D01 v02r02, For 802.11b DSSS SAR measurements ,when the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

Bluetooth			
Modulation	Frequency (MHz)	Output Power (dBm)	Tune-up power (dBm)
1-DH5	2402	3.45	5.5
	2441	4.12	
	2480	4.89	
2-DH5	2402	3.60	4.5
	2441	3.99	
	2480	2.13	
3-DH5	2402	3.92	5.0
	2441	4.30	
	2480	2.31	

BLE			
Mode	Frequency	Maximum Conducted Output Power	Tune-up power
	(MHz)	(dBm)	(dBm)
GFSK BLE 1M	2402	-2.69	-2.0
	2440	-2.36	
	2480	-3.22	
GFSK BLE 2M	2402	-1.16	0.0
	2440	-0.58	
	2480	-3.43	

Note:

Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

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

≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation

The result is rounded to one decimal place for comparison

Bluetooth Turn up Power (dBm)	Bluetooth Turn up Power (mW)	Separation Distance (mm)	Frequency (GHz)	Result	Exclusion Thresholds
5.5	3.55	5	2.48	1.12	7.5

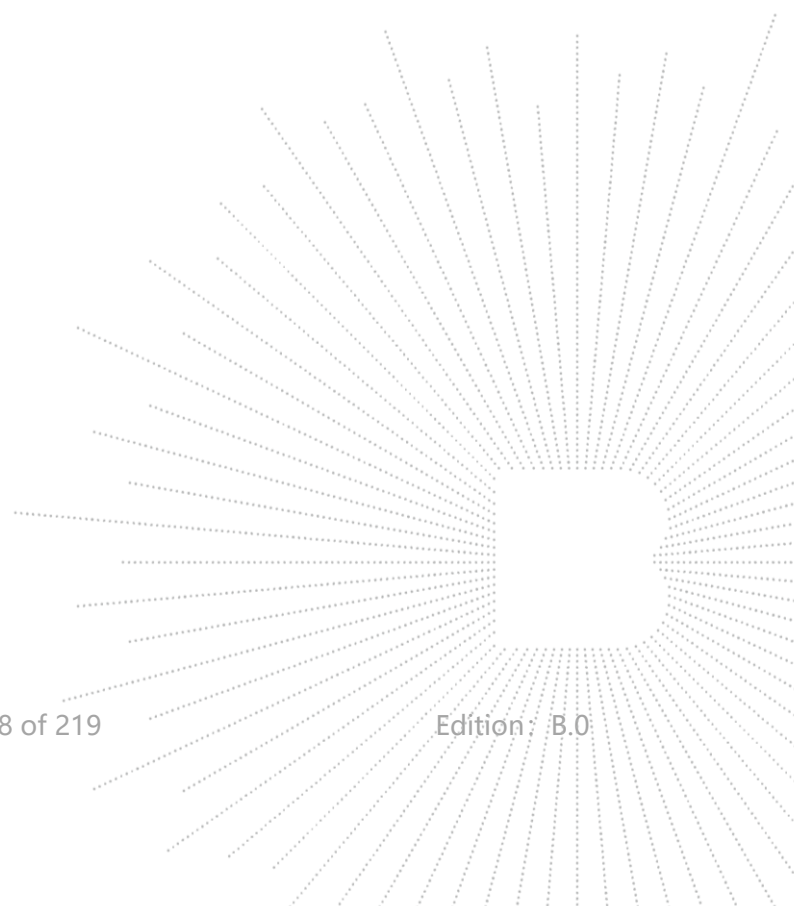
Per KDB 447498 D01v06, when the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

According to the calculation results in the table above, BT SAR does not need to be tested.

WLAN 2.4G			
Mode	Frequency	Maximum Conducted Output Power	Tune-up power
	(MHz)	(dBm)	(dBm)
b	2412	16.10	17.5
	2437	16.39	
	2462	16.81	
g	2412	16.66	17.5
	2437	16.82	
	2462	16.09	
n20	2412	16.56	17.5
	2437	16.83	
	2462	16.09	

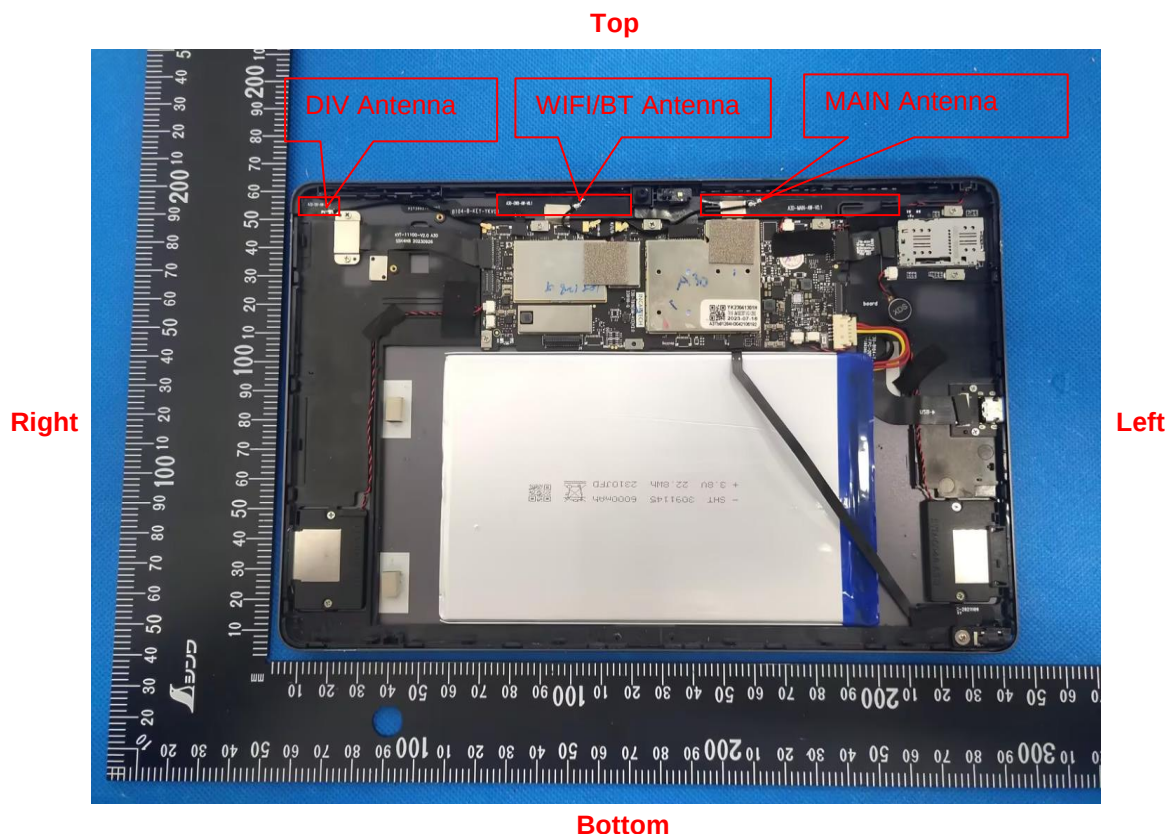
WLAN 5.1G			
Mode	Frequency	Maximum Conducted Output Power	Tune-up power
	(MHz)	(dBm)	(dBm)
a	5180	10.15	11.0
	5200	9.78	
	5240	10.29	
n20	5180	9.70	10.5
	5200	9.80	
	5240	9.40	
n40	5190	8.58	9.5
	5230	8.98	
ac20	5180	8.87	10.0
	5200	8.65	
	5240	9.45	
ac40	5190	8.76	9.5
	5230	8.81	
ac80	5210	7.59	8.0

WLAN 5.8G			
Mode	Frequency	Maximum Conducted Output Power	Tune-up power
	(MHz)	(dBm)	(dBm)
a	5745	10.01	10.5
	5785	9.64	
	5825	9.05	
n20	5745	10.02	10.5
	5785	9.76	
	5825	9.18	
n40	5755	8.43	9.5
	5795	8.76	
ac20	5745	9.58	10.0
	5785	8.98	
	5825	8.59	
ac40	5755	8.32	9.5
	5795	8.88	
ac80	5775	8.11	8.5



14.2 Transmit Antennas and SAR Measurement Position

EUT Antenna Location:



Antennas	Support Band
WWAN	GSM 850/1900+WCDMA Band 2/5+LTE Band 2/4/7 T/RX
BT/WIFI	BT+2.4G WIFI +5G WIFI

Distance of The Antenna to the EUT surface and edge (mm)						
Antennas	Front	Back	Top Side	Bottom Side	Left Side	Right Side
WWAN	<25	<25	<25	146	33	140
BT/WIFI	<25	<25	<25	146	123	115

EUT Testing Location Evaluation:

Positions for SAR tests; Hotspot mode						
Antennas	Front	Back	Top Side	Bottom Side	Left Side	Right Side
WWAN	Yes	Yes	Yes	No	No	No
BT/WIFI	Yes	Yes	Yes	No	No	No

Note:

- According to the KDB 941225 D06 Hot Spot SAR v02, the edges with less than 25 mm distance to the antennas need to be tested for SAR.

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 (%)

KDB 447498 D01 General RF Exposure Guidance:

Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

KDB 648474 D04 Handset SAR v01r03:

1. When the *reported* SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest *reported* SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.
2. when the separation distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, using the same wireless mode test configuration for voice and data, such as UMTS, LTE and Wi-Fi, and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration (surface)
3. For Smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

KDB 941225 D01 3G SAR Procedures:

When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq 1/4$ dB higher than the primary mode (RMC12.2kbps) or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

KDB 941225 D05 SAR for LTE Devices:

1. Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel.
2. When the reported SAR is > 0.8 W/kg, testing for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
3. 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.
4. SAR measurement is not required for the 16QAM and 64QAM. When the highest maximum output power for 16QAM and 64QAM is $\leq \frac{1}{2}$ dB higher than the QPSK or when the reported SAR for the QPSK configuration is ≤ 1.45 W/kg.
5. Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

KDB 248227 D01 802.11 Wi-Fi SAR

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements.

For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions.

DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.¹⁶ The initial test position procedure is described in the following:

- a) When the *reported* SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).
- b) When the *reported* SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the *reported* SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
- c) 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(s) until the *reported* SAR is ≤ 1.2 W/kg or all required channels are tested.

Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.

When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR

TCB workshop April 2015:

SAR test exclusion can be applied for testing overlapping LTE bands as follows:

- a) The maximum output power, including tolerance, for the smaller band must be less than the larger band to qualify for the SAR test exclusion.
- b) The channel bandwidth and other operating parameters for the smaller band must be fully supported by the larger band.

LTE Band 17 (704-716 MHz) is covered by LTE Band 12 (699-716 MHz)

GSM 850											
RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Output Power (dBm)			SAR1g (W/kg)		Plot No.
						Meas.	Turn-up	Scaling Factor	Meas.	Scaled	
Body	0	GSM	Front	128	824.2	32.79	33.5	1.178	0.351	0.413	
		GSM	Back	128	824.2	32.79	33.5	1.178	0.221	0.260	
		GSM	Top Side	128	824.2	32.79	33.5	1.178	0.230	0.271	
		GSM	Front	190	836.6	32.23	33.5	1.340	0.341	0.457	
		GSM	Front	251	848.8	32.26	33.5	1.330	0.392	0.522	1

GSM 1900											
RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Output Power (dBm)			SAR1g (W/kg)		Plot No.
						Meas.	Turn-up	Scaling Factor	Meas.	Scaled	
Body	0	GSM	Front	512	1850.2	28.89	29.5	1.151	0.529	0.609	
		GSM	Back	512	1850.2	28.89	29.5	1.151	0.413	0.475	
		GSM	Top Side	512	1850.2	28.89	29.5	1.151	0.424	0.488	
		GSM	Front	661	1880	28.10	29.5	1.380	0.519	0.716	2
		GSM	Front	810	1909.8	28.86	29.5	1.159	0.459	0.532	

WCDMA Band II											
RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Output Power (dBm)			SAR1g (W/kg)		Plot No.
						Meas.	Turn-up	Scaling Factor	Meas.	Scaled	
Head	0	RMC*	Front	9262	1852.4	22.47	23.0	1.130	0.558	0.630	
		RMC*	Back	9262	1852.4	22.47	23.0	1.130	0.496	0.560	
		RMC*	Top Side	9262	1852.4	22.47	23.0	1.130	0.414	0.468	
		RMC*	Front	9400	1880.0	22.05	23.0	1.245	0.571	0.711	3
		RMC*	Front	9538	1907.6	22.11	23.0	1.227	0.522	0.641	

WCDMA Band V											
RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Output Power (dBm)			SAR1g (W/kg)		Plot No.
						Meas.	Turn-up	Scaling Factor	Meas.	Scaled	
Body	0	RMC*	Front	4132	826.4	22.95	23.5	1.135	0.472	0.536	
		RMC*	Back	4132	826.4	22.95	23.5	1.135	0.317	0.360	
		RMC*	Top Side	4132	826.4	22.95	23.5	1.135	0.366	0.415	
		RMC*	Front	4233	836.4	22.51	23.5	1.256	0.410	0.515	
		RMC*	Front	4182	846.6	22.17	23.5	1.358	0.454	0.617	4

FDD-LTE Band 7 (20MHz Bandwidth)											
RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Output Power (dBm)			SAR1g (W/kg)		Plot No.
						Meas.	Turn-up	Scaling Factor	Meas.	Scaled	
Body	0	QPSK,1RB	Front	21100	2535	22.12	22.5	1.091	0.482	0.526	5
		QPSK,1RB	Back	21100	2535	22.12	22.5	1.091	0.454	0.496	
		QPSK,1RB	Top Side	21100	2535	22.12	22.5	1.091	0.324	0.354	
		QPSK,1RB	Front	20850	2510	21.83	22.5	1.167	0.598	0.698	
		QPSK,1RB	Front	21350	2560	21.72	22.5	1.197	0.398	0.476	
		QPSK,50%RB	Front	21100	2535	22.12	22.5	1.091	0.439	0.479	
		QPSK,50%RB	Back	21100	2535	22.12	22.5	1.091	0.394	0.430	
		QPSK,50%RB	Top Side	21100	2535	22.12	22.5	1.091	0.248	0.271	
		QPSK,50%RB	Front	20850	2510	21.83	22.5	1.167	0.356	0.415	
		QPSK,50%RB	Front	21350	2560	21.72	22.5	1.197	0.357	0.427	

FDD-LTE Band 12 (10MHz Bandwidth)											
RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Output Power (dBm)			SAR1g (W/kg)		Plot No.
						Meas.	Turn-up	Scaling Factor	Meas.	Scaled	
Body	0	QPSK,1RB	Front	23095	711	23.32	24.0	1.169	0.844	0.987	6
		QPSK,1RB	Back	23095	711	23.32	24.0	1.169	0.757	0.885	
		QPSK,1RB	Top Side	23095	711	23.32	24.0	1.169	0.976	1.141	
		QPSK,1RB	Top Side	23060	704	23.29	24.0	1.178	1.012	1.192	
		QPSK,1RB	Top Side	23130	707.5	23.56	24.0	1.107	1.081	1.196	
		QPSK,50%RB	Front	23095	711	23.32	24.0	1.169	0.803	0.939	
		QPSK,50%RB	Back	23095	711	23.32	24.0	1.169	0.679	0.794	
		QPSK,50%RB	Top Side	23095	711	23.32	24.0	1.169	0.918	1.074	
		QPSK,50%RB	Top Side	23060	704	23.29	24.0	1.178	0.959	1.129	
		QPSK,50%RB	Top Side	23130	707.5	23.26	24.0	1.186	0.889	1.054	
		QPSK,100%RB	Top Side	23130	707.5	23.26	24.0	1.186	0.659	0.781	

FDD-LTE Band 17 (10MHz Bandwidth)											
RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Output Power (dBm)			SAR1g (W/kg)		Plot No.
						Meas.	Turn-up	Scaling Factor	Meas.	Scaled	
Body	0	QPSK,1RB	Front	23780	709	23.23	23.5	1.064	1.023	1.089	7
		QPSK,1RB	Back	23780	709	23.23	23.5	1.064	1.110	1.181	
		QPSK,1RB	Top Side	23780	709	23.23	23.5	1.064	1.051	1.118	
		QPSK,1RB	Top Side	23790	710	22.99	23.5	1.125	1.083	1.218	
		QPSK,1RB	Top Side	23800	711	22.96	23.5	1.132	1.023	1.158	
		QPSK,50%RB	Front	23780	709	23.23	23.5	1.064	0.960	1.022	
		QPSK,50%RB	Back	23780	709	23.23	23.5	1.064	0.996	1.060	
		QPSK,50%RB	Top Side	23780	709	23.23	23.5	1.064	1.007	1.072	
		QPSK,50%RB	Top Side	23790	710	22.99	23.5	1.125	0.968	1.089	
		QPSK,50%RB	Top Side	23800	711	22.96	23.5	1.132	0.951	1.077	
		QPSK,100%RB	Top Side	23800	711	22.96	23.5	1.132	0.796	0.901	

FDD-LTE Band 38 (20MHz Bandwidth)

RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Output Power (dBm)			SAR1g (W/kg)		Plot No.
						Meas.	Turn-up	Scaling Factor	Meas.	Scaled	
Body	0	QPSK,1RB	Front	37850	2580	21.87	22.5	1.156	0.638	0.738	8
		QPSK,1RB	Back	37850	2580	21.87	22.5	1.156	0.790	0.913	
		QPSK,1RB	Top Side	37850	2580	21.87	22.5	1.156	0.594	0.687	
		QPSK,1RB	Back	38000	2595	21.60	22.5	1.230	0.643	0.791	
		QPSK,1RB	Back	38150	2610	21.64	22.5	1.219	0.587	0.716	
		QPSK,50%RB	Front	37850	2580	21.87	22.5	1.156	0.530	0.613	
		QPSK,50%RB	Back	37850	2580	21.87	22.5	1.156	0.753	0.871	
		QPSK,50%RB	Top Side	37850	2580	21.87	22.5	1.156	0.487	0.563	
		QPSK,50%RB	Back	38000	2595	21.60	22.5	1.230	0.530	0.652	
		QPSK,50%RB	Back	38150	2610	21.64	22.5	1.219	0.540	0.658	

FDD-LTE Band 41 (20MHz Bandwidth)

RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Output Power (dBm)			SAR1g (W/kg)		Plot No.
						Meas.	Turn-up	Scaling Factor	Meas.	Scaled	
Body	0	QPSK,1RB	Front	40140	2545	21.74	22.0	1.062	0.560	0.595	9
		QPSK,1RB	Back	40140	2545	21.74	22.0	1.062	0.810	0.860	
		QPSK,1RB	Top Side	40140	2545	21.74	22.0	1.062	0.730	0.775	
		QPSK,1RB	Top Side	40640	2595	21.68	22.0	1.076	0.849	0.914	
		QPSK,1RB	Top Side	41140	2645	21.72	22.0	1.067	1.088	1.160	
		QPSK,50%RB	Front	40140	2545	21.74	22.0	1.062	0.489	0.519	
		QPSK,50%RB	Back	40140	2545	21.74	22.0	1.062	0.688	0.730	
		QPSK,50%RB	Top Side	40140	2545	21.74	22.0	1.062	0.610	0.648	
		QPSK,50%RB	Top Side	40640	2595	21.68	22.0	1.076	0.681	0.733	
		QPSK,50%RB	Top Side	41140	2645	21.72	22.0	1.067	0.897	0.957	
		QPSK,100%RB	Top Side	41140	2645	21.72	22.0	1.067	0.913	0.974	

FDD-LTE Band 66 (20MHz Bandwidth)

RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Output Power (dBm)			SAR1g (W/kg)		Plot No.
						Meas.	Turn-up	Scaling Factor	Meas.	Scaled	
Body	0	QPSK,1RB	Front	132322	1745	23.41	24.0	1.146	0.630	0.722	10
		QPSK,1RB	Back	132322	1745	23.41	24.0	1.146	0.403	0.462	
		QPSK,1RB	Top Side	132322	1745	23.41	24.0	1.146	0.747	0.856	
		QPSK,1RB	Top Side	132572	1770	23.07	24.0	1.239	0.757	0.938	
		QPSK,1RB	Top Side	132072	1720	23.23	24.0	1.194	0.824	0.984	
		QPSK,50%RB	Front	132322	1745	23.41	24.0	1.146	0.623	0.714	
		QPSK,50%RB	Back	132322	1745	23.41	24.0	1.146	0.233	0.267	
		QPSK,50%RB	Top Side	132322	1745	23.41	24.0	1.146	0.601	0.688	
		QPSK,50%RB	Top Side	132572	1770	23.07	24.0	1.239	0.654	0.810	
		QPSK,50%RB	Top Side	132072	1720	23.23	24.0	1.194	0.661	0.789	

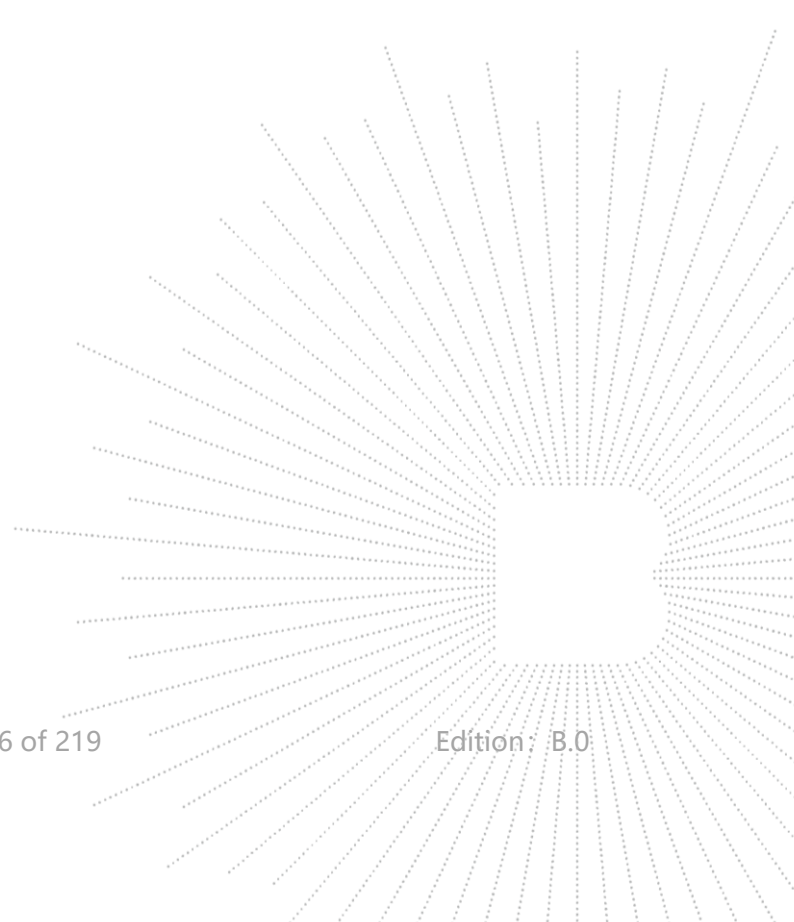
WIFI 2.4G												
RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Duty Cycle (%)	Output Power (dBm)	Turn up (dBm)	Turn-up Scaling Factor	SAR1g (W/kg)		Plot No.
										Meas.	Scaled	
Body	0	n20	Front	6	2437	100	16.83	17.5	1.167	0.187	0.218	
		n20	Back	6	2437	100	16.83	17.5	1.167	0.198	0.231	
		n20	Top Side	6	2437	100	16.83	17.5	1.167	0.226	0.264	
		n20	Top Side	1	2412	100	16.56	17.5	1.242	0.210	0.261	
		n20	Top Side	12	2462	100	16.09	17.5	1.384	0.208	0.288	11

WIFI 5.1G												
RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Duty Cycle (%)	Output Power (dBm)	Turn up (dBm)	Turn-up Scaling Factor	SAR1g (W/kg)		Plot No.
										Meas.	Scaled	
Body	0	a	Front	48	5240	100	10.29	11.0	1.178	0.211	0.248	
		a	Back	48	5240	100	10.29	11.0	1.178	0.201	0.237	
		a	Top Side	48	5240	100	10.29	11.0	1.178	0.208	0.245	
		a	Front	36	5180	100	10.15	11.0	1.216	0.210	0.255	
		a	Front	40	5200	100	9.78	11.0	1.324	0.199	0.264	12

WIFI 5.8G												
RF Exposure Conditions	Dist. (mm)	Mode	Test Position	CH.	Freq. (MHz)	Duty Cycle (%)	Output Power (dBm)	Turn up (dBm)	Turn-up Scaling Factor	SAR1g (W/kg)		Plot No.
										Meas.	Scaled	
Body	0	n20	Front	149	5745	100	10.02	10.5	1.117	0.218	0.243	13
		n20	Back	149	5745	100	10.02	10.5	1.117	0.201	0.224	
		n20	Top Side	149	5745	100	10.02	10.5	1.117	0.206	0.230	
		n20	Front	157	5785	100	9.76	10.5	1.186	0.195	0.231	
		n20	Front	165	5825	100	9.18	10.5	1.355	0.177	0.240	

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.



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 $\leq 20\%$ 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 ($\sim 10\%$ 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
FDD-LTE Band 12	707.5	Body	Top Side	yes	1.196	1.137	1.052
FDD-LTE Band 17	709	Body	Top Side	yes	1.218	1.143	1.066
FDD-LTE Band 38	2580	Body	Back	yes	0.913	0.898	1.017
FDD-LTE Band 41	2645	Body	Top Side	yes	1.160	1.120	1.036
FDD-LTE Band 66	1720	Body	Top Side	yes	0.984	0.967	1.018

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 transmitting antenna.

Application Simultaneous Transmission information:

No.	Configurations	Body SAR	Hotspot SAR
1	WWAN+WLAN 2.4G (Data)	Yes	Yes
2	WWAN+ Bluetooth (Data)	Yes	Yes

Remark:

1. WWAN cannot transmit simultaneously.
2. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. 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:
 - $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})} / x] \text{ W/kg}$ for test separation distances $\leq 50 \text{ mm}$; 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 $> 50 \text{ mm}$

Estimated stand alone SAR						
Communication system	Frequency (MHz)	Maximum Power (dBm)	Maximum Power (mW)	Separation Distance (mm)	X	Estimated SAR1-g (W/kg)
Bluetooth*	2480	5.5	3.55	5	7.5	0.149
Bluetooth*	2480	5.5	3.55	10	7.5	0.075

Note:

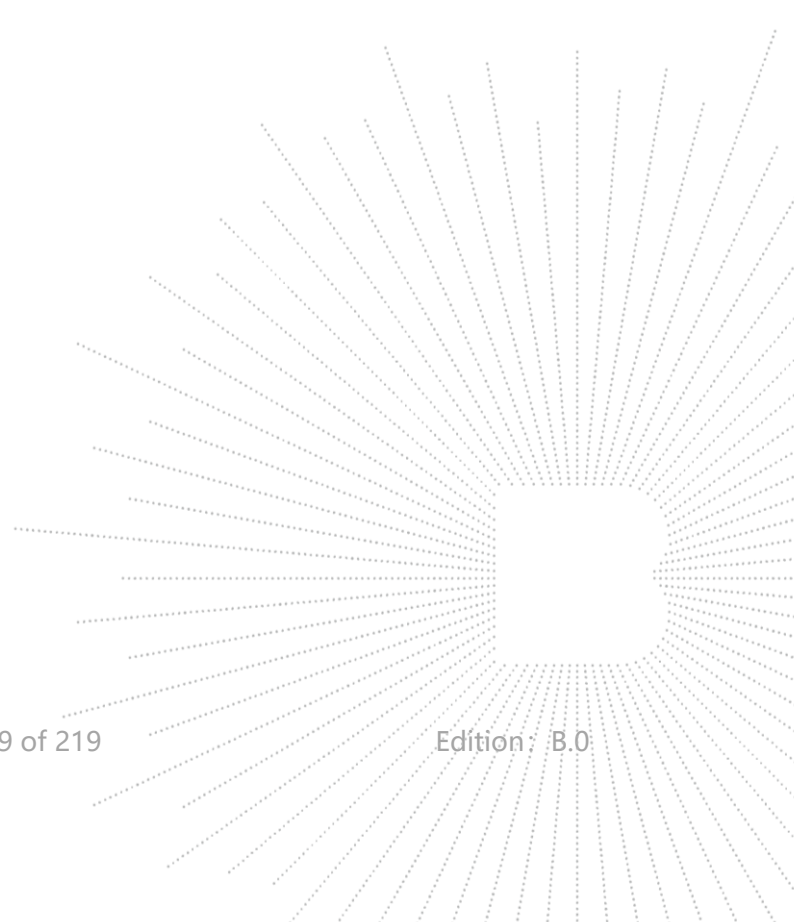
1. Bluetooth*- Including Lower power Bluetooth
2. Maximum average power including tune-up tolerance;
3. When the minimum test separation distance is $< 5 \text{ mm}$, a distance of 5 mm is applied to determine SAR test exclusion

4. 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 $\leq 1.6 \text{ W/Kg}$. When the sum is greater than the SAR limit, SAR test exclusion is determined by the SAR to peak location separation ratio.

$$\text{Ratio} = \frac{(\text{SAR}_1 + \text{SAR}_2)^{1.5}}{(\text{peak location separation, mm})} < 0.04$$

5. Simultaneous transmission of maximum SAR sum calculation.

RF Exposure Conditions	Test Position	Standalone SAR (W/kg)			Summed SAR W/kg)	
		1	2	3	1+2	1+3
		WWAN	Wi-Fi	BT		
Body	Front	1.089	0.264	0.149	1.353	1.238
	Back	1.181	0.237	0.149	1.418	1.330
	Top Side	1.218	0.288	0.149	1.506	1.367



15. Test Plots

15.1 System Performance Check

System check at 750 MHz

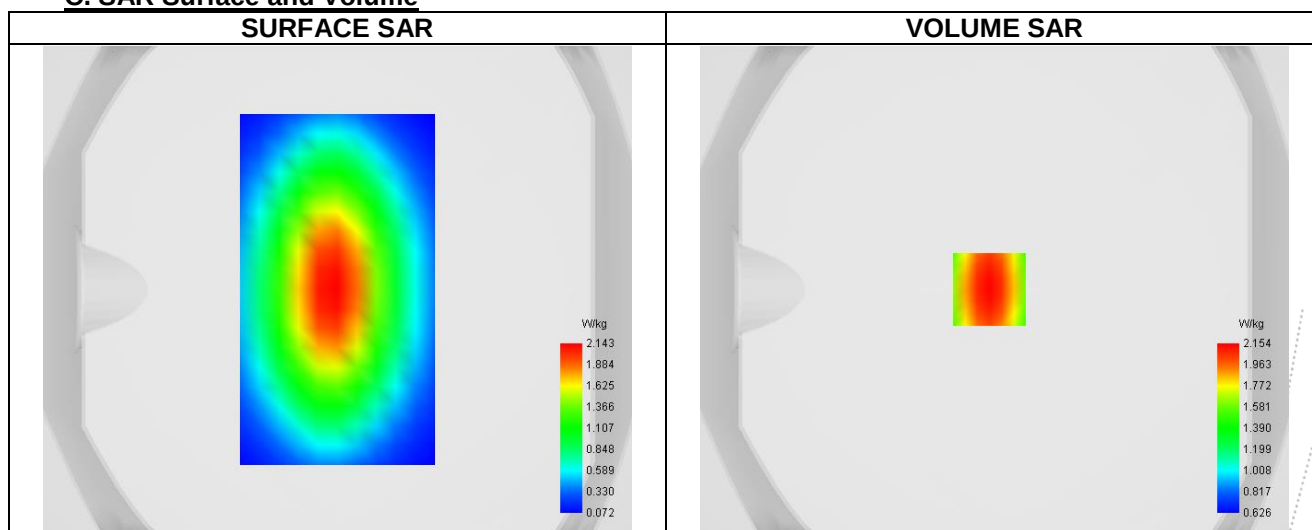
A. Experimental conditions.

Probe	SN 26/23 EPG0420
ConvF	0.80
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x8,dx=5mm dy=5mm dz=4mm
Phantom	Validation plane
Device Position	Dipole
Band	CW750
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	750.000
Relative permittivity (real part)	43.423
Relative permittivity (imaginary part)	20.984
Conductivity (S/m)	0.883

C. SAR Surface and Volume



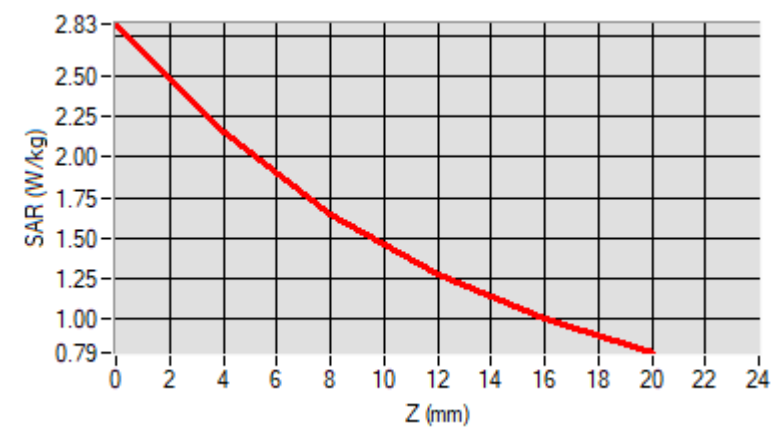
Maximum location: X=-2.00, Y=0.00 ; SAR Peak: 4.96 W/kg

D. SAR 1g & 10g

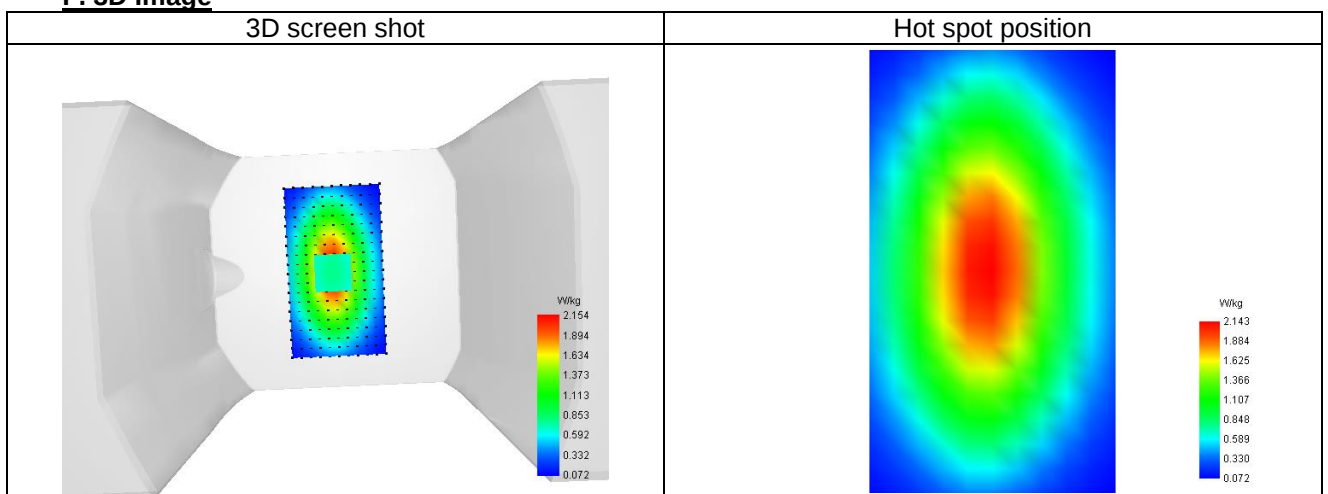
SAR 10g (W/Kg)	0.695
SAR 1g (W/Kg)	2.051
Variation (%)	0.281
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	8.00	12.00	16.00
SAR (W/Kg)	2.832	2.176	1.674	1.285	1.064



F. 3D Image



System check at 835 MHz

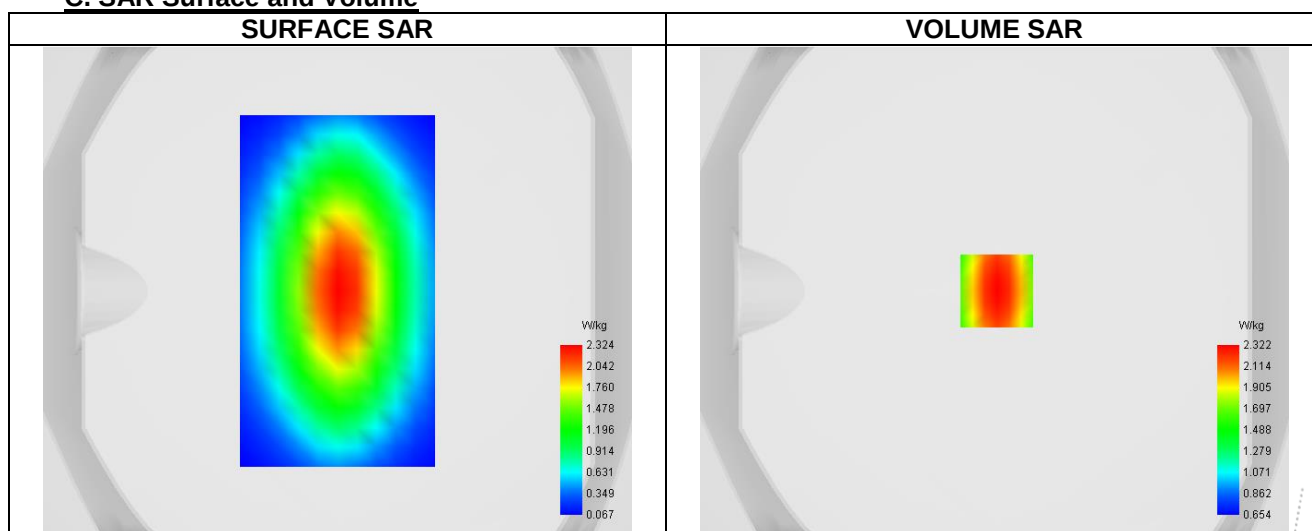
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	0.81
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x8,dx=5mm dy=5mm dz=4mm
Phantom	Validation plane
Device Position	Dipole
Band	CW835
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	835.000
Relative permittivity (real part)	43.371
Relative permittivity (imaginary part)	20.154
Conductivity (S/m)	0.856

C. SAR Surface and Volume



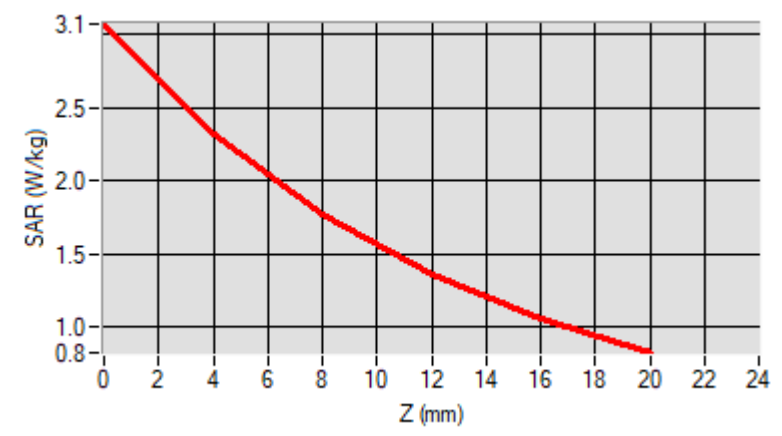
Maximum location: X=1.00, Y=0.00 ; SAR Peak: 5.68 W/kg

D. SAR 1g & 10g

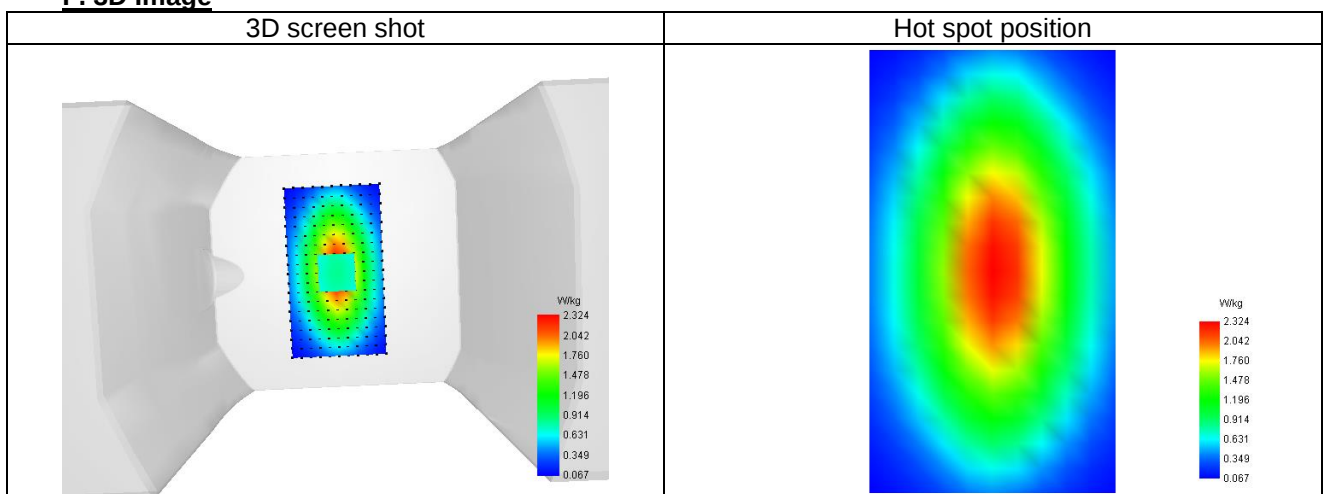
SAR 10g (W/Kg)	1.750
SAR 1g (W/Kg)	2.616
Variation (%)	0.519
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	8.00	12.00	16.00
SAR (W/Kg)	3.108	2.344	1.786	1.395	1.109



F. 3D Image



System check at 1800 MHz

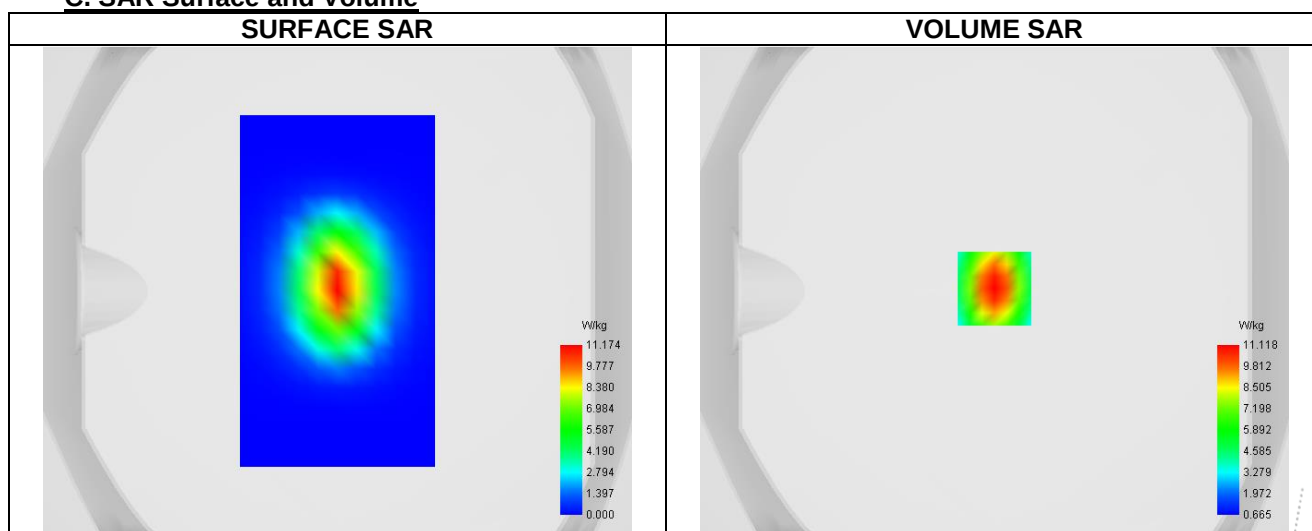
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	0.96
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x8,dx=5mm dy=5mm dz=4mm
Phantom	Validation plane
Device Position	Dipole
Band	CW1800
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	1800.000
Relative permittivity (real part)	40.743
Relative permittivity (imaginary part)	18.082
Conductivity (S/m)	1.401

C. SAR Surface and Volume



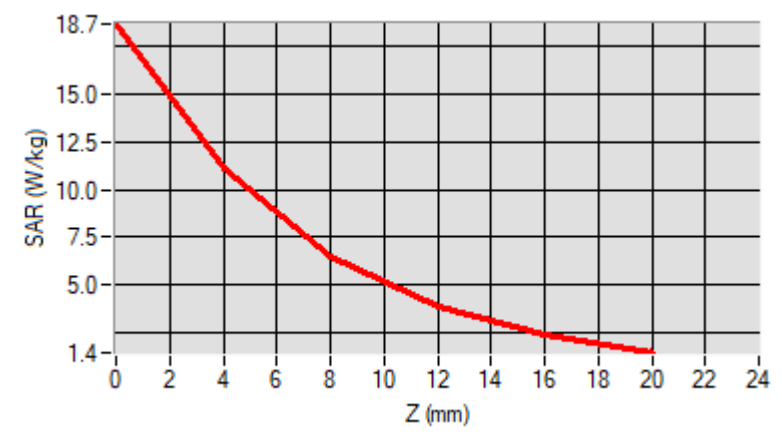
Maximum location: X=0.00, Y=1.00 ; SAR Peak: 22.78 W/kg

D. SAR 1g & 10g

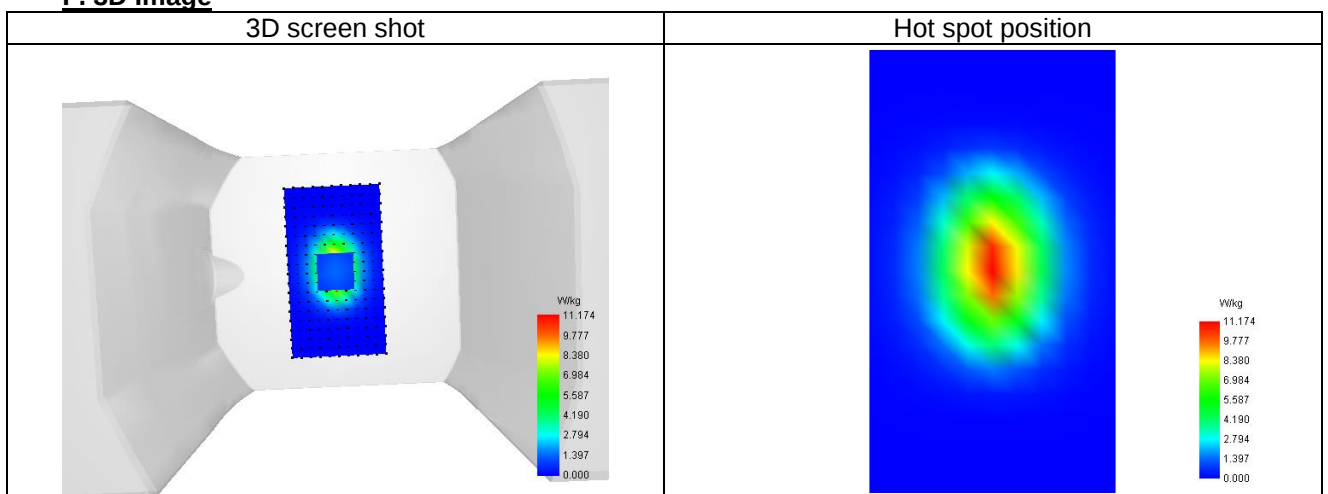
SAR 10g (W/Kg)	3.375
SAR 1g (W/Kg)	9.958
Variation (%)	1.401
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	8.00	12.00	16.00
SAR (W/Kg)	18.71+	11.234	6.561	3.924	2.453



F. 3D Image



System check at 1900 MHz

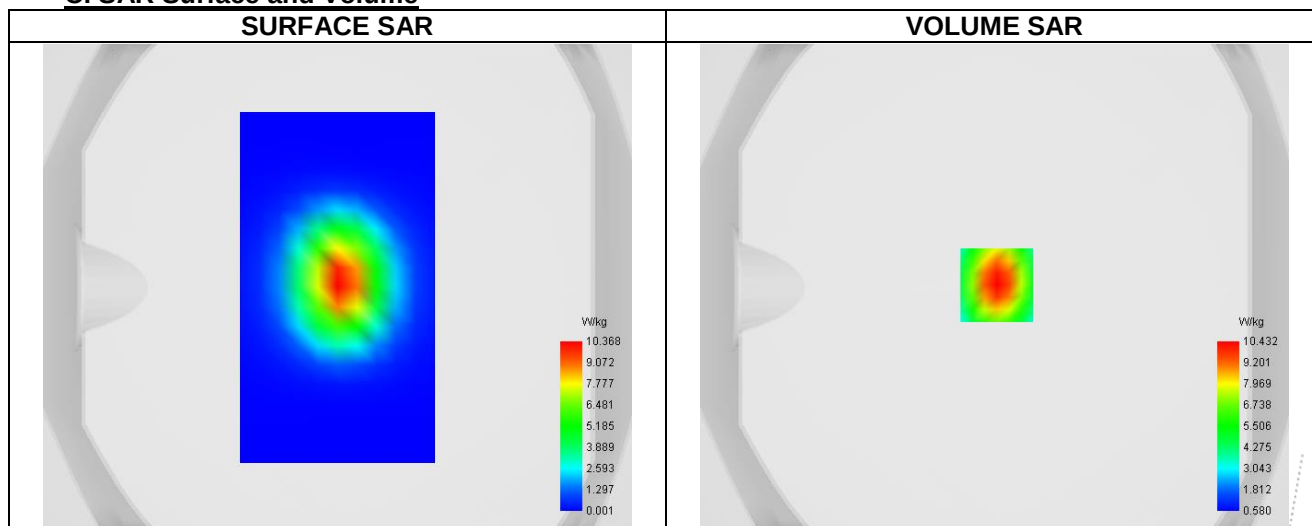
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	1.04
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x8,dx=5mm dy=5mm dz=4mm
Phantom	Validation plane
Device Position	Dipole
Band	CW1900
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	1900.000
Relative permittivity (real part)	41.334
Relative permittivity (imaginary part)	16.911
Conductivity (S/m)	1.454

C. SAR Surface and Volume



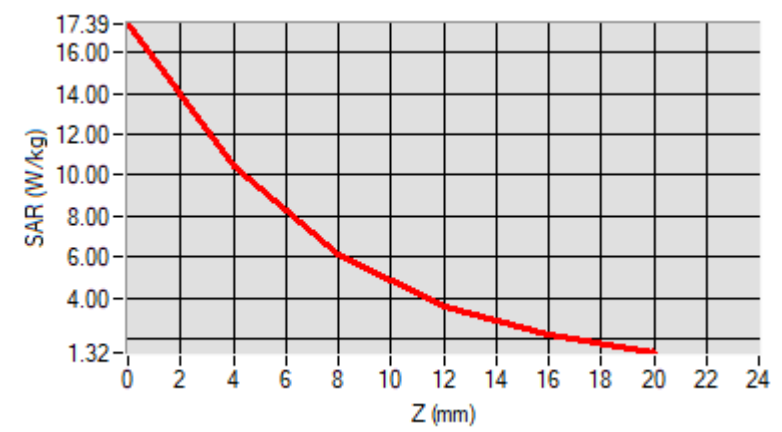
Maximum location: X=1.00, Y=1.00 ; SAR Peak: 22.54 W/kg

D. SAR 1g & 10g

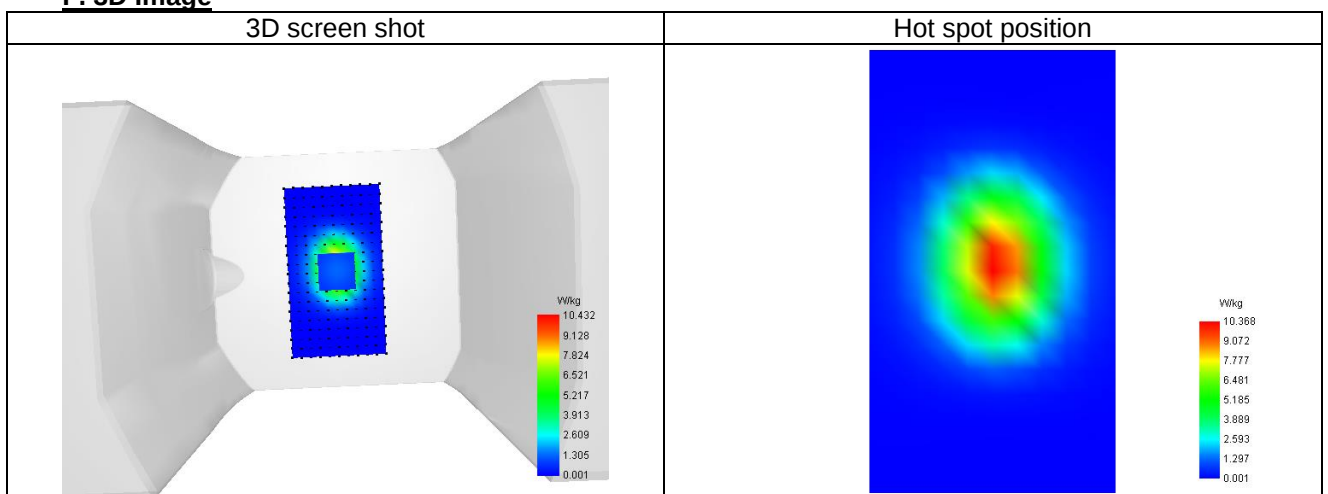
SAR 10g (W/Kg)	3.399
SAR 1g (W/Kg)	10.123
Variation (%)	2.012
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	8.00	12.00	16.00
SAR (W/Kg)	17.387	10.484	6.206	3.672	2.184



F. 3D Image



System check at 2450 MHz

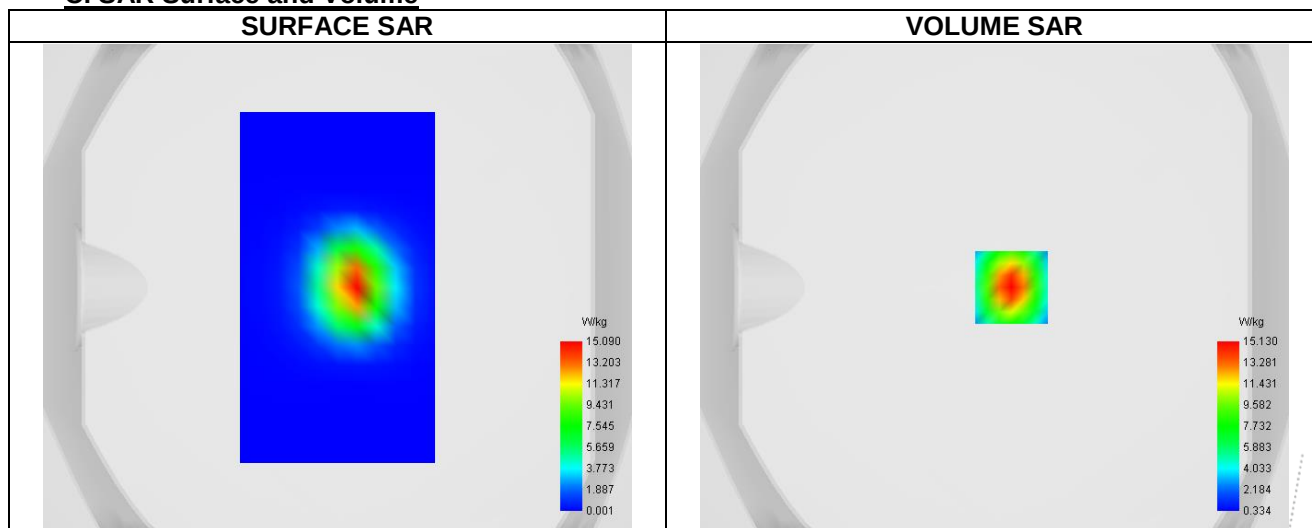
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	1.11
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x8,dx=5mm dy=5mm dz=4mm
Phantom	Validation plane
Device Position	Dipole
Band	CW2450
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	2450.000
Relative permittivity (real part)	40.440
Relative permittivity (imaginary part)	13.685
Conductivity (S/m)	1.867

C. SAR Surface and Volume



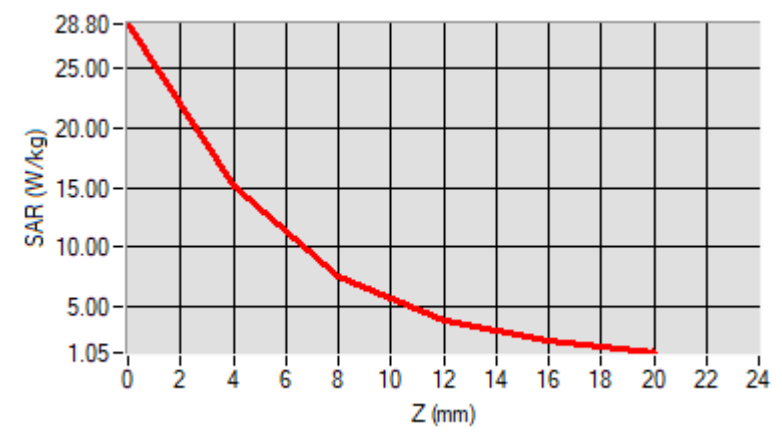
Maximum location: X=7.00, Y=0.00 ; SAR Peak: 29.42 W/kg

D. SAR 1g & 10g

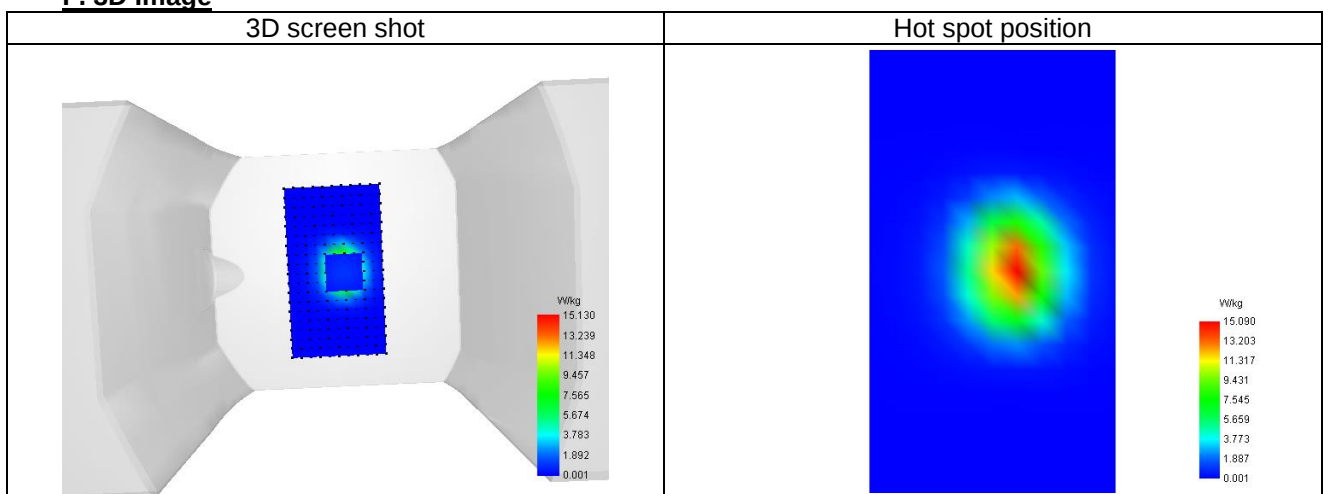
SAR 10g (W/Kg)	4.698
SAR 1g (W/Kg)	14.318
Variation (%)	-1.574
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	8.00	12.00	16.00
SAR (W/Kg)	28.802	15.018	7.416	3.658	1.912



F. 3D Image



System check at 2600 MHz

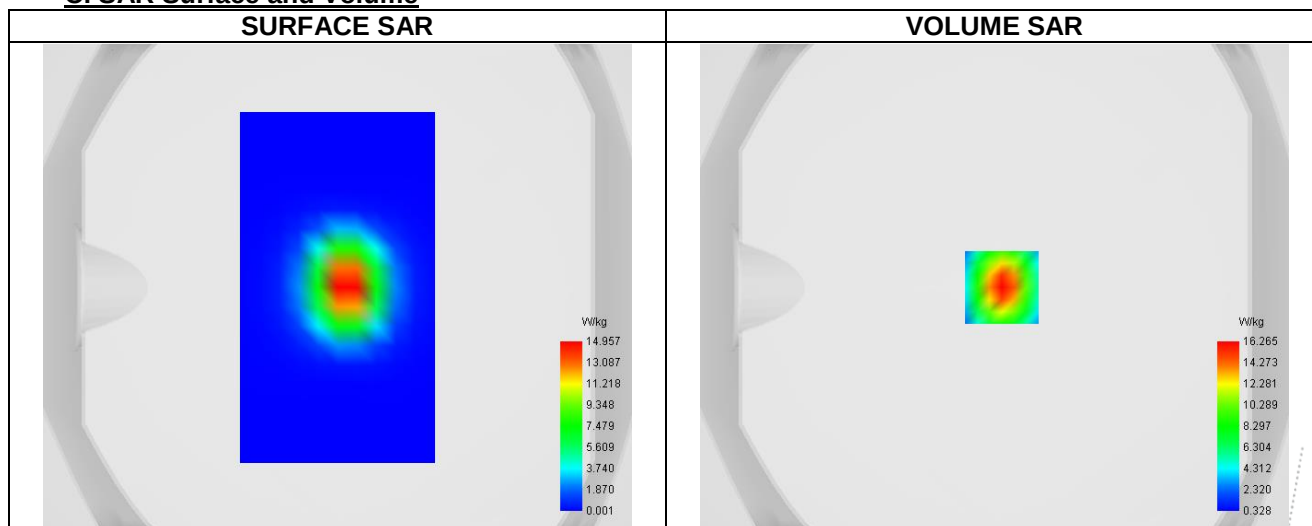
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	1.03
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x8,dx=5mm dy=5mm dz=4mm
Phantom	Validation plane
Device Position	Dipole
Band	CW2600
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	2600.000
Relative permittivity (real part)	37.649
Relative permittivity (imaginary part)	12.811
Conductivity (S/m)	1.911

C. SAR Surface and Volume



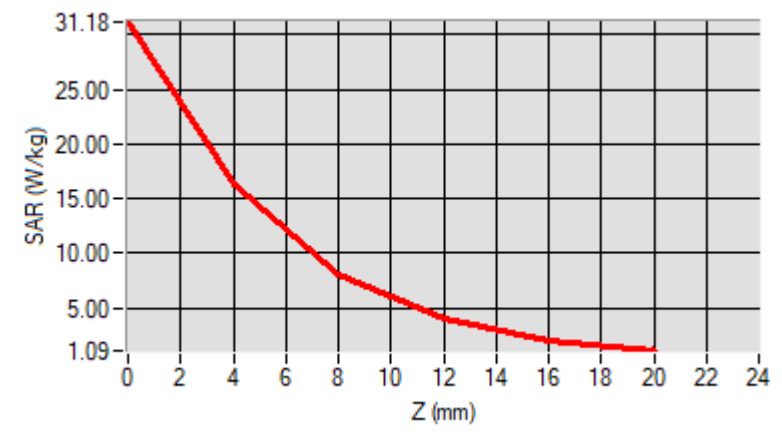
Maximum location: X=3.00, Y=0.00 ; SAR Peak: 31.98 W/kg

D. SAR 1g & 10g

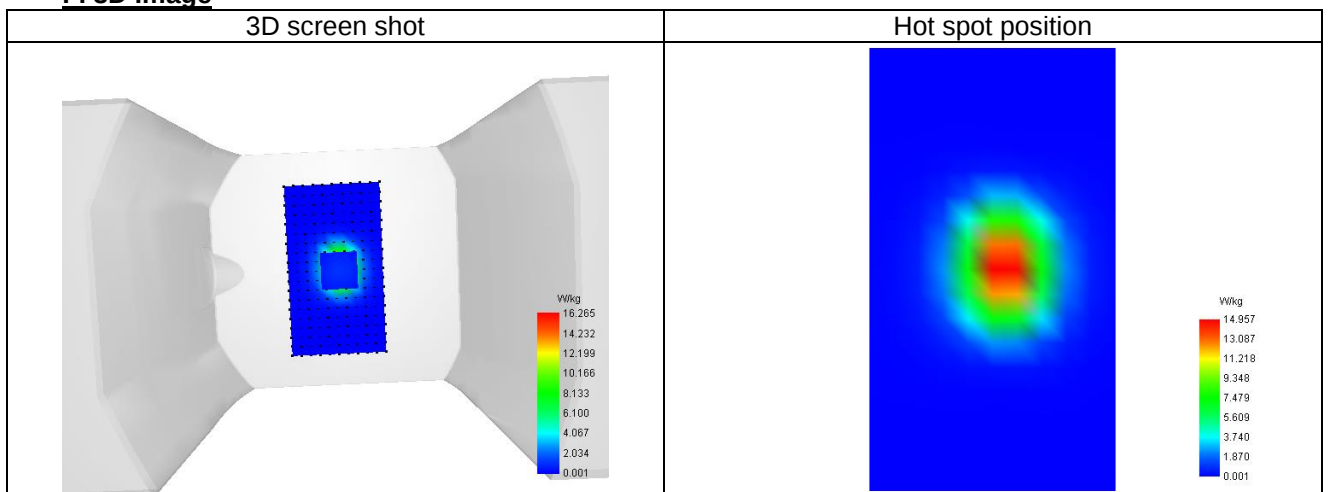
SAR 10g (W/Kg)	4.825
SAR 1g (W/Kg)	14.052
Variation (%)	1.714
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	8.00	12.00	16.00
SAR (W/Kg)	31.172	16.108	7.982	3.835	1.964



F. 3D Image



System check at 5200 MHz

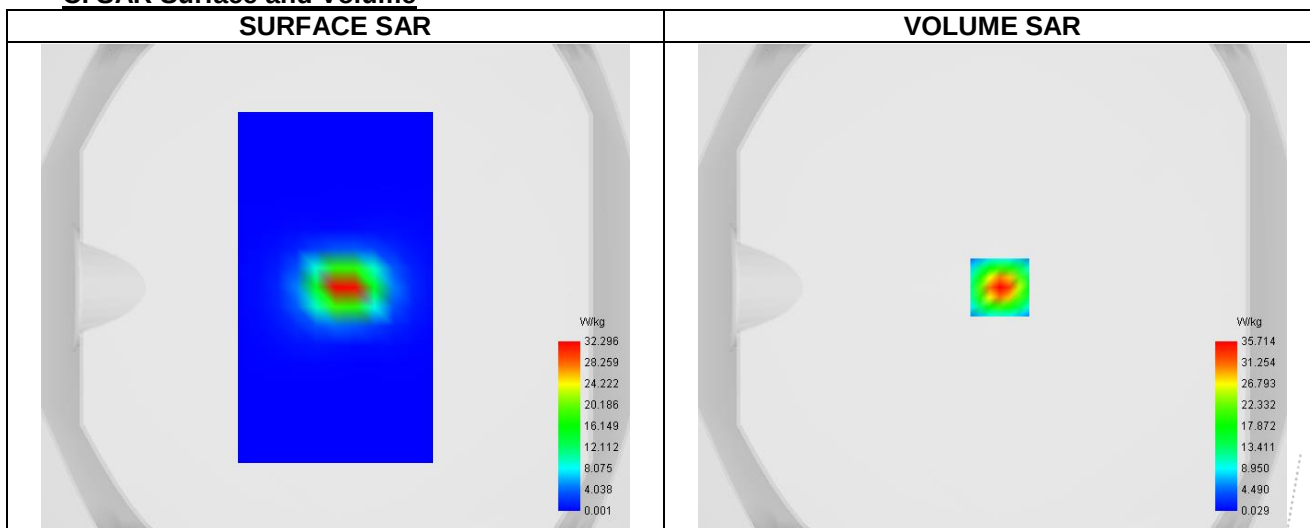
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	1.18
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Dipole
Band	CW5200
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	5200.000
Relative permittivity (real part)	35.871
Relative permittivity (imaginary part)	14.412
Conductivity (S/m)	4.890

C. SAR Surface and Volume



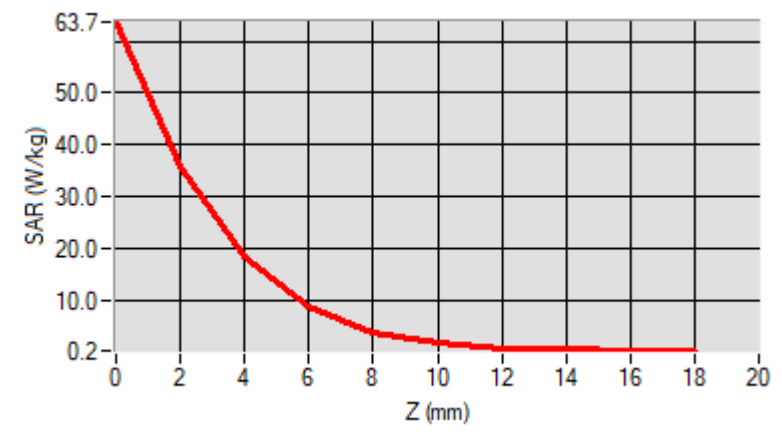
Maximum location: X=3.00, Y=0.00 ; SAR Peak: 64.02 W/kg

D. SAR 1g & 10g

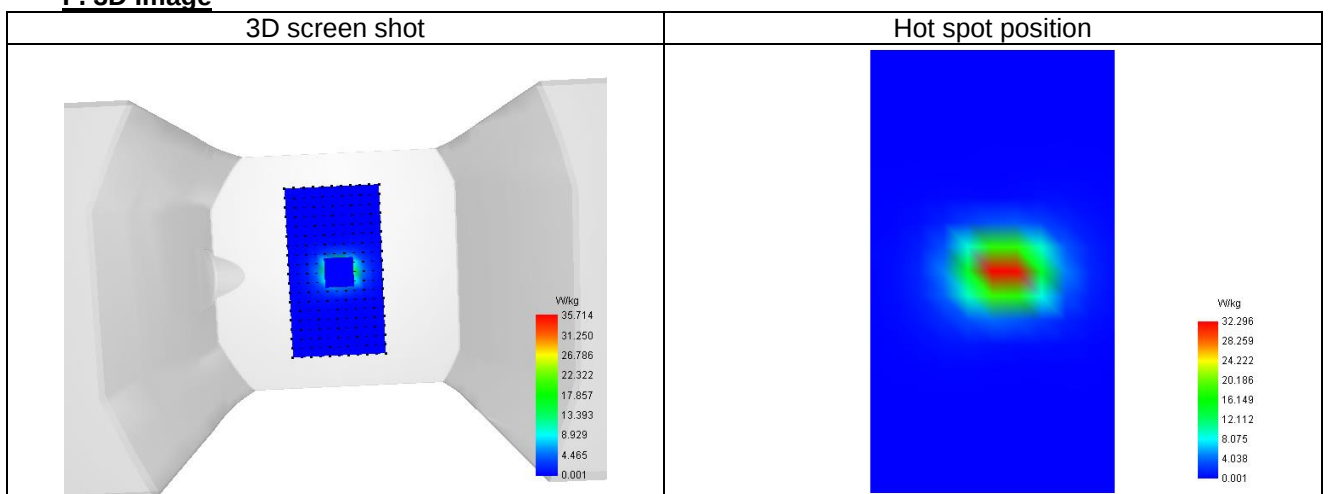
SAR 10g (W/Kg)	6.963
SAR 1g (W/Kg)	19.942
Variation (%)	2.824
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00
SAR (W/Kg)	63.614	35.528	18.106	8.235	3.407	1.502	0.710	0.358	0.255



F. 3D Image



System check at 5800 MHz

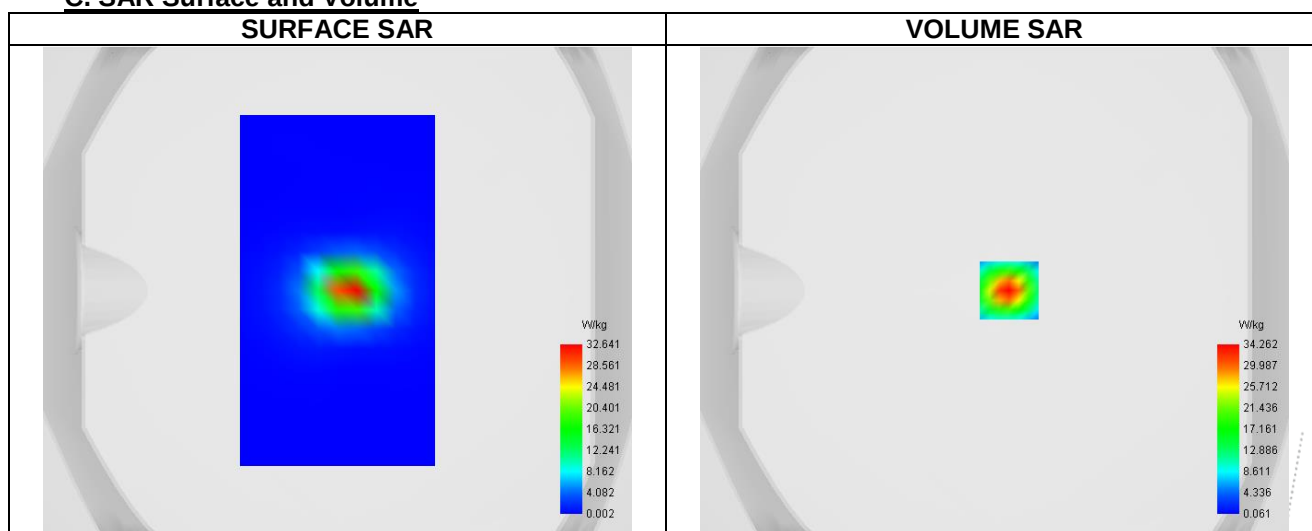
A. Experimental conditions.

Probe	SN 26/23 EPG0420
ConvF	1.15
Area Scan	surf_sam_plan.txt
Zoom Scan	7x7x12,dx=4mm dy=4mm dz=2mm
Phantom	Validation plane
Device Position	Dipole
Band	CW5800
Channels	Middle
Signal	CW (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	5800.000
Relative permittivity (real part)	35.130
Relative permittivity (imaginary part)	17.425
Conductivity (S/m)	5.193

C. SAR Surface and Volume



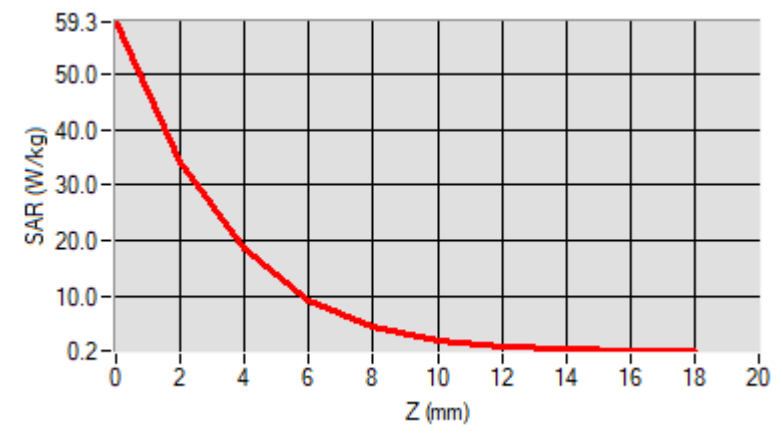
Maximum location: X=0.00, Y=0.00 ; SAR Peak: 61.04 W/kg

D. SAR 1g & 10g

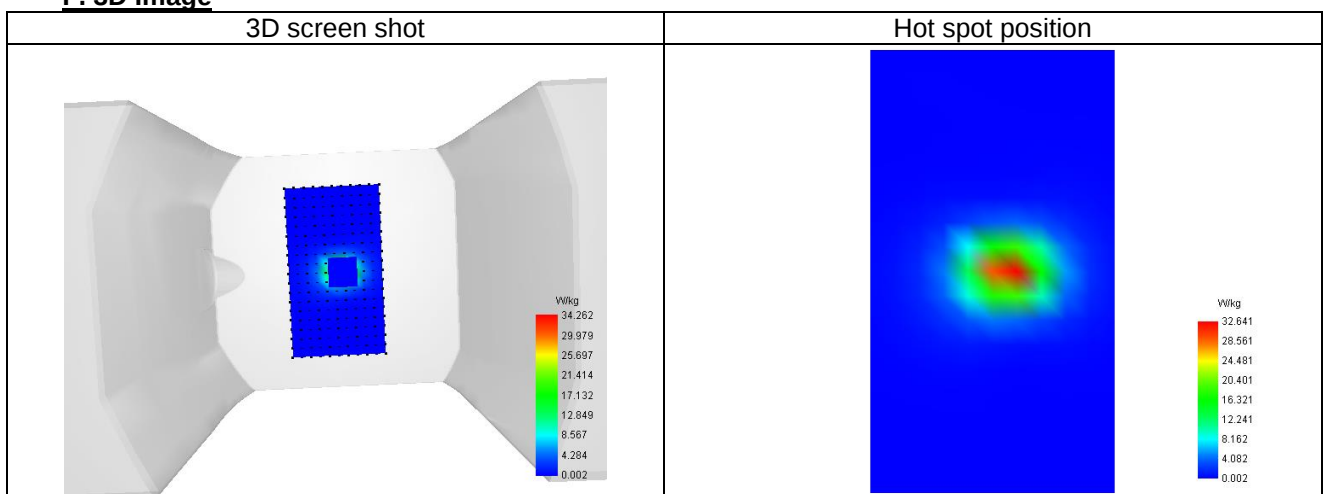
SAR 10g (W/Kg)	8.815
SAR 1g (W/Kg)	19.416
Variation (%)	-0.223
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00
SAR (W/Kg)	59.275	34.082	18.374	9.012	4.026	2.008	1.014	0.521	0.304



F. 3D Image



15.2 SAR Test Graph Results

SAR plots for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination according to FCC KDB 865664 D02

Plot 1

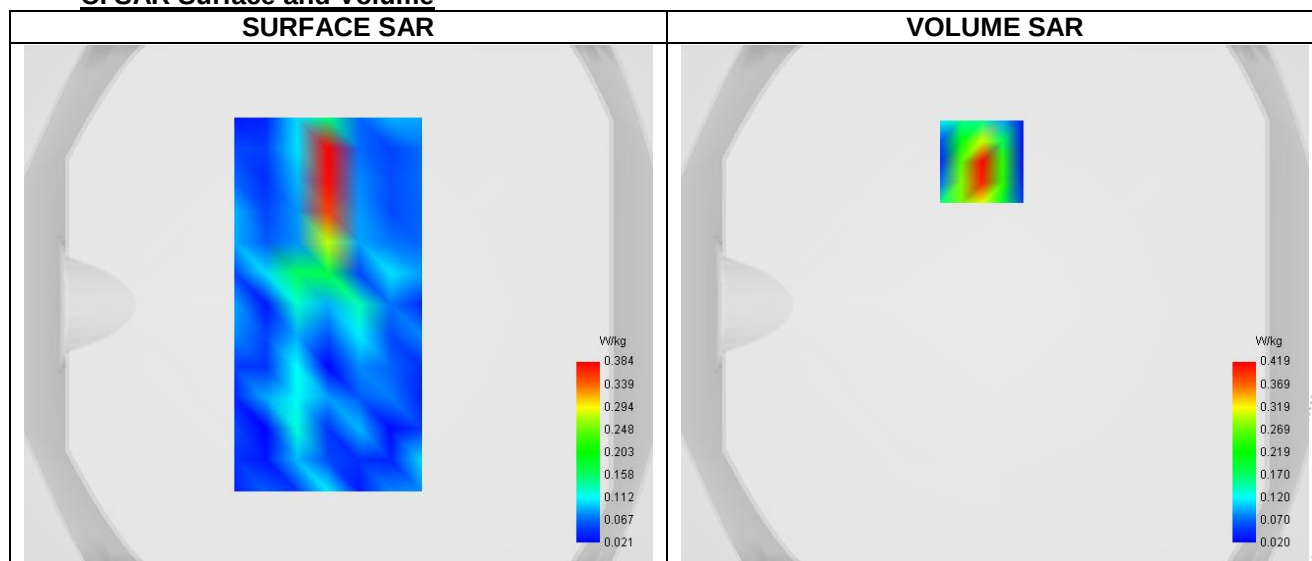
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	0.81
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Higher (251)
Signal	TDMA (Crest factor: 8.0)

B. Permittivity

Frequency (MHz)	848.800	
Relative permittivity (real part)	42.295	
Relative permittivity (imaginary part)	19.400	
Conductivity (S/m)	0.914	

C. SAR Surface and Volume



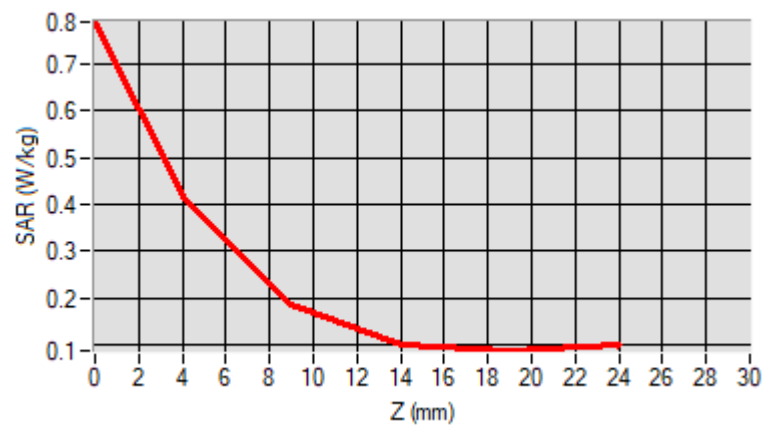
Maximum location: X=-5.00, Y=55.00 ; SAR Peak: 0.80 W/kg

D. SAR 1g & 10g

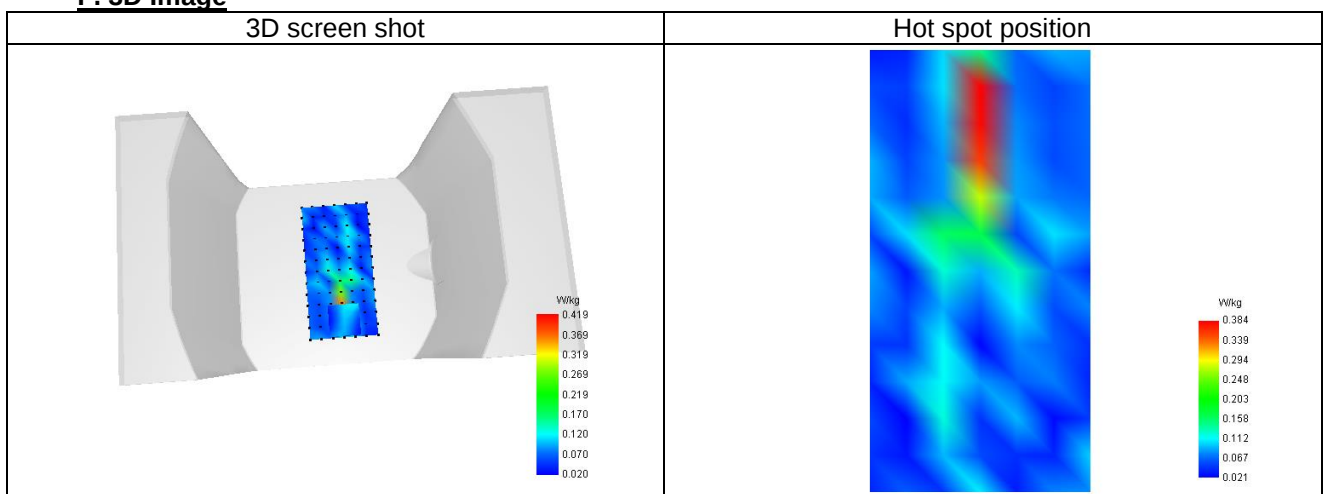
SAR 10g (W/Kg)	0.205
SAR 1g (W/Kg)	0.392
Variation (%)	1.290
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.790	0.419	0.186	0.102	0.088



F. 3D Image



Plot 2

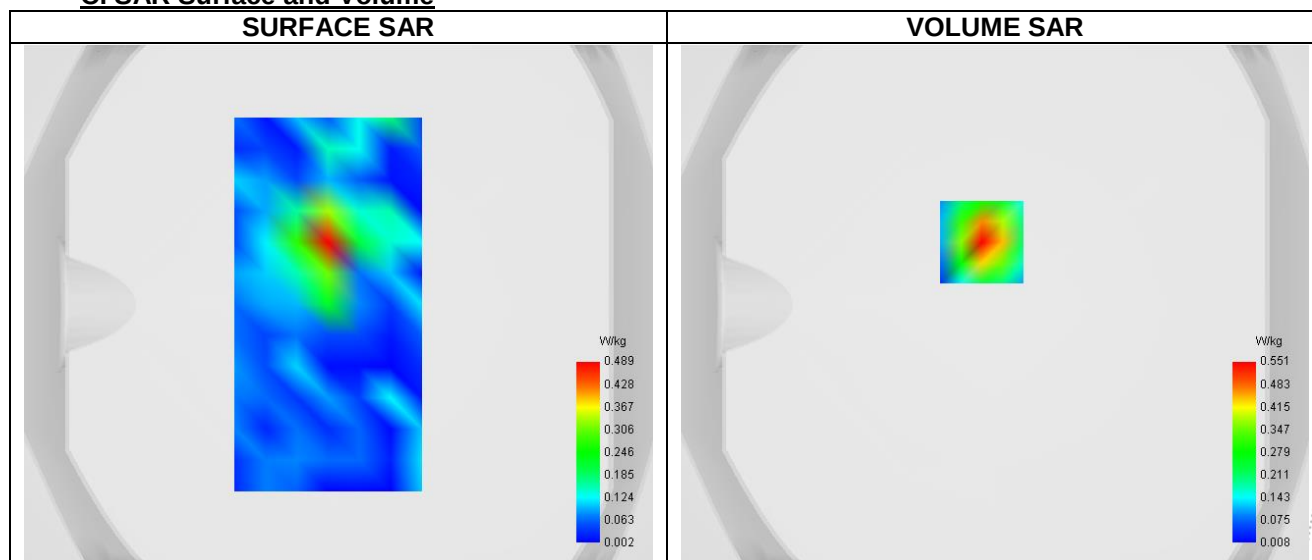
A. Experimental conditions.

Probe	SN 26/23 EPG0420
ConvF	1.04
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle (661)
Signal	TDMA (Crest factor: 8.0)

B. Permittivity

Frequency (MHz)	1880.000	
Relative permittivity (real part)	38.451	
Relative permittivity (imaginary part)	13.408	
Conductivity (S/m)	1.445	

C. SAR Surface and Volume



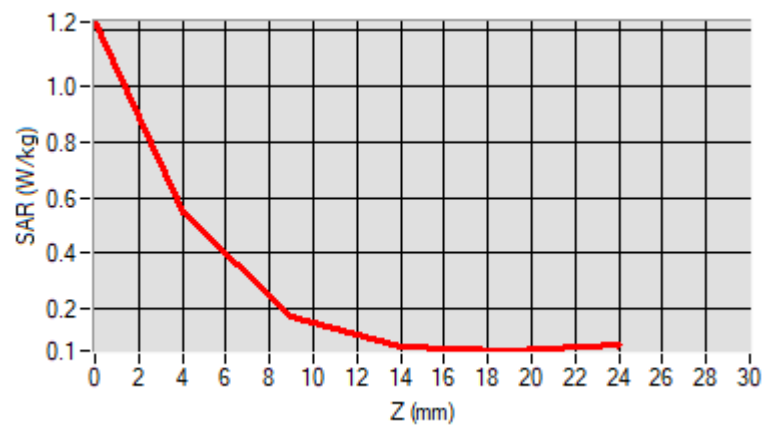
Maximum location: X=-5.00, Y=24.00 ; SAR Peak: 1.24 W/kg

D. SAR 1g & 10g

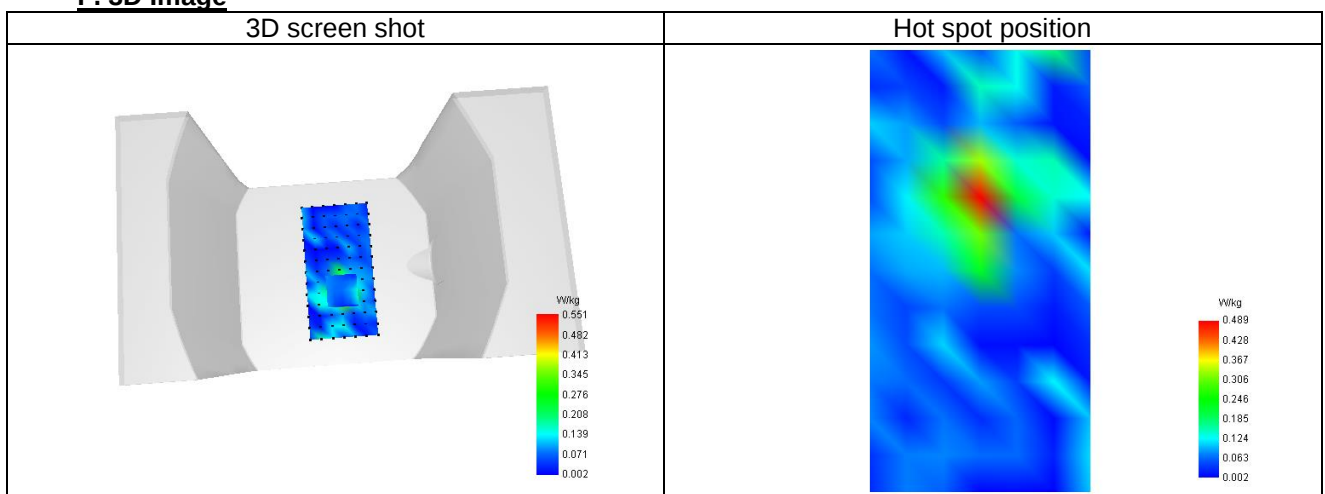
SAR 10g (W/Kg)	0.235
SAR 1g (W/Kg)	0.519
Variation (%)	-1.240
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.230	0.551	0.172	0.063	0.051



F. 3D Image



Plot 3

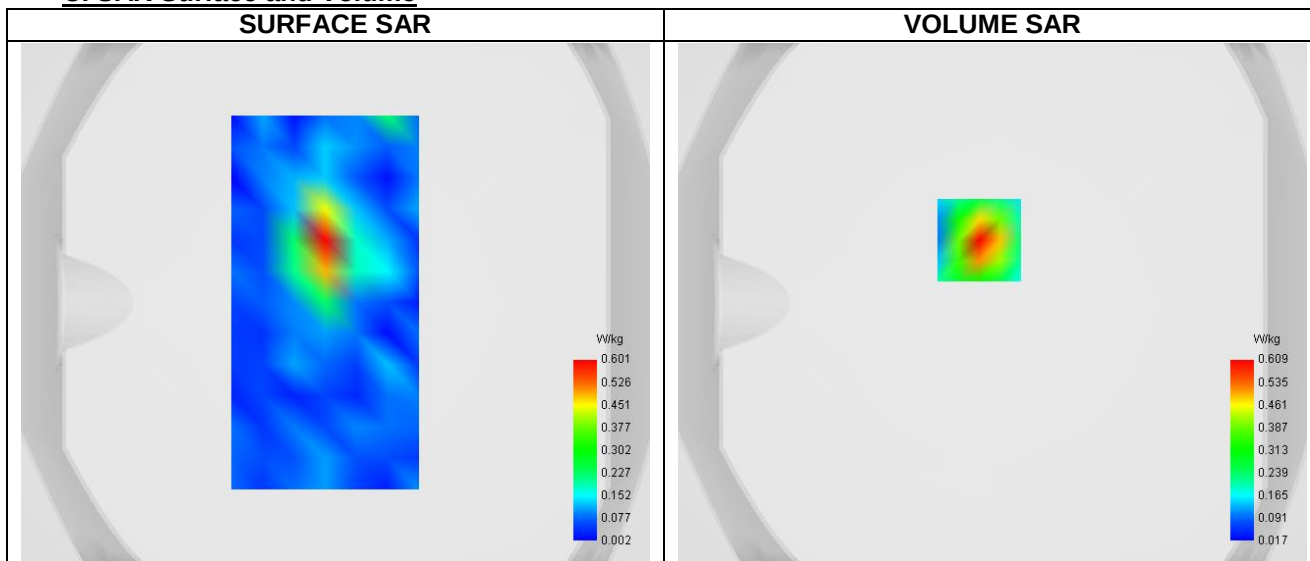
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	1.04
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	Band2_WCDMA1900
Channels	9400
Signal	WCDMA (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	1880.000
Relative permittivity (real part)	38.451
Relative permittivity (imaginary part)	13.612
Conductivity (S/m)	1.445

C. SAR Surface and Volume



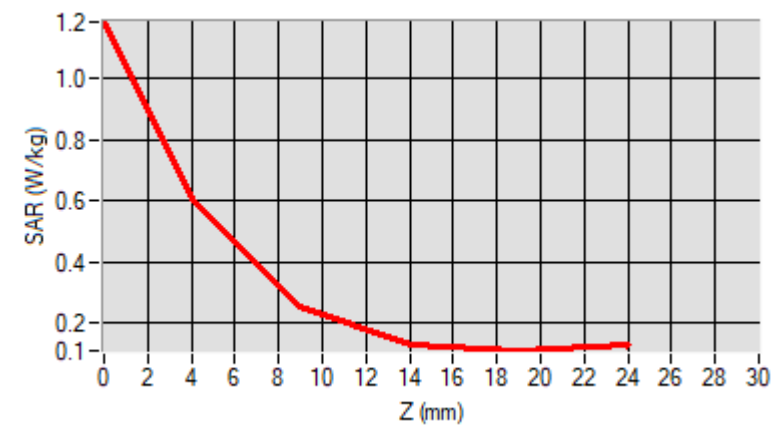
Maximum location: X=-5.00, Y=24.00 ; SAR Peak: 1.20 W/kg

D. SAR 1g & 10g

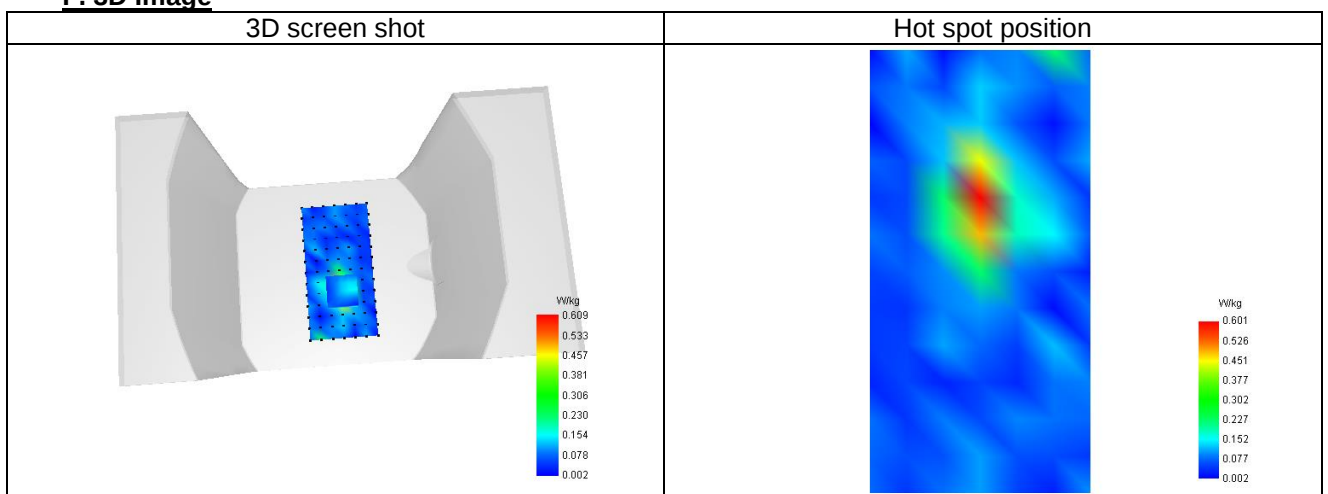
SAR 10g (W/Kg)	0.285
SAR 1g (W/Kg)	0.571
Variation (%)	1.970
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.186	0.609	0.254	0.130	0.110



F. 3D Image



Plot 4

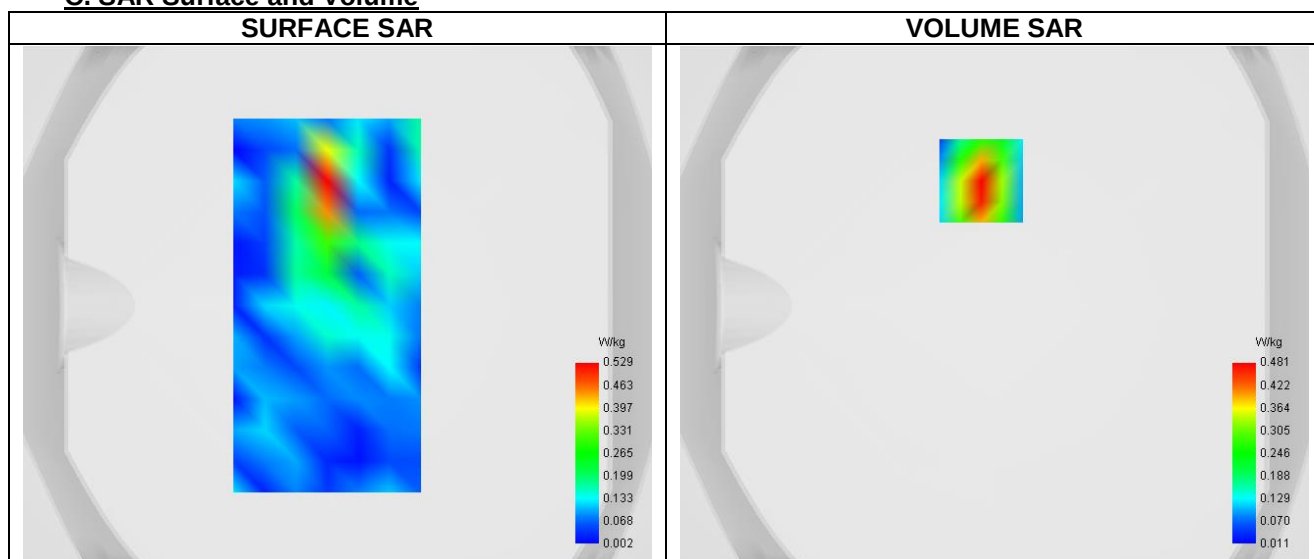
A. Experimental conditions.

Probe	SN 26/23 EPGO420
ConvF	0.81
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	Band5_WCDMA850
Channels	Higher (4233)
Signal	WCDMA (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	846.600
Relative permittivity (real part)	41.920
Relative permittivity (imaginary part)	20.112
Conductivity (S/m)	0.927

C. SAR Surface and Volume



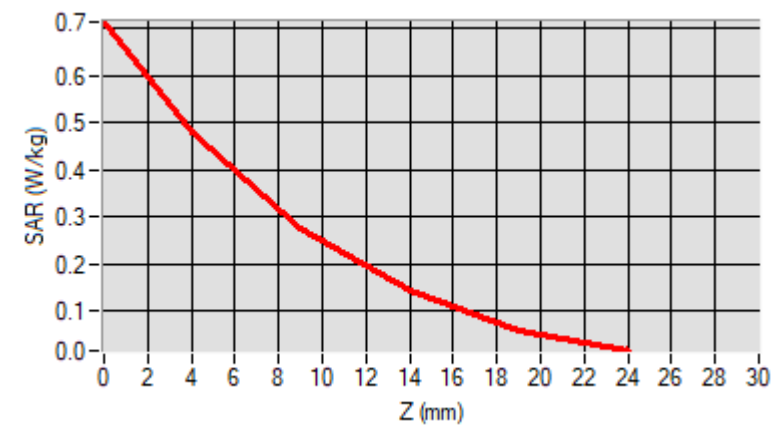
Maximum location: X=-5.00, Y=48.00 ; SAR Peak: 0.72 W/kg

D. SAR 1g & 10g

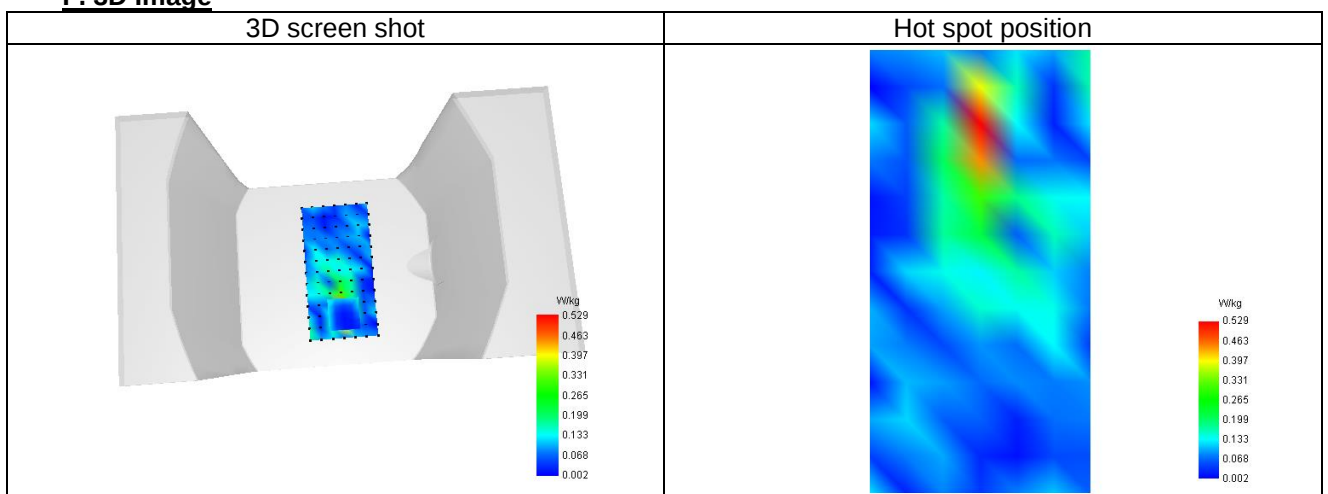
SAR 10g (W/Kg)	0.245
SAR 1g (W/Kg)	0.454
Variation (%)	1.820
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.715	0.481	0.275	0.141	0.059



F. 3D Image



Plot 5

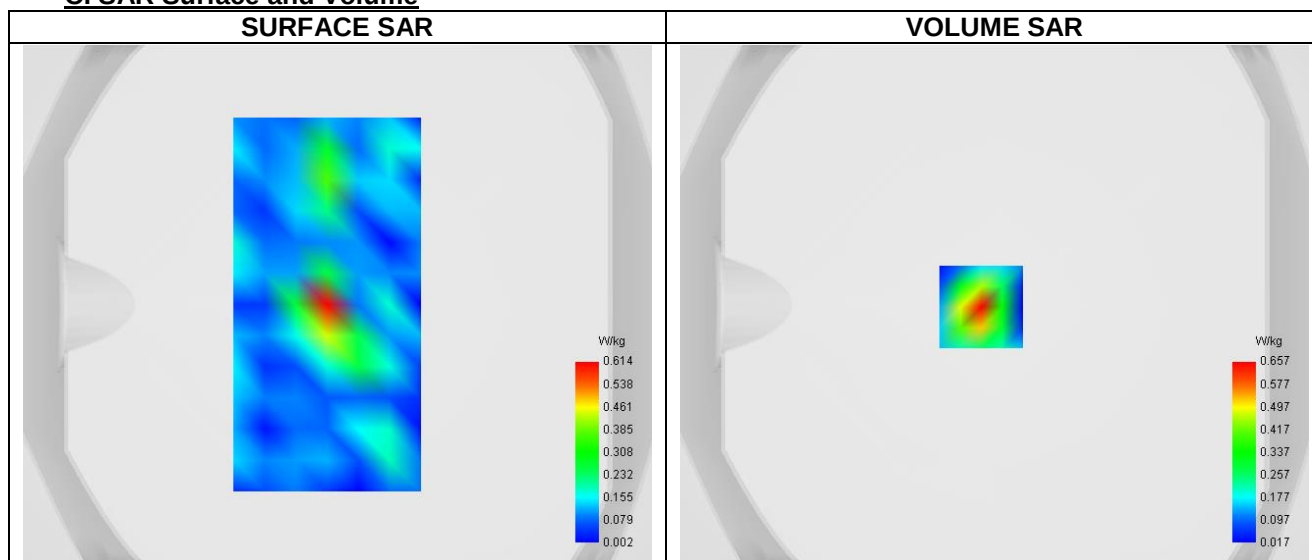
A. Experimental conditions.

Probe	SN 26/23 EPG0420
ConvF	1.11
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 7
Channels	Lower (20850)
Signal	LTE (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	2510.000	
Relative permittivity (real part)	38.600	
Relative permittivity (imaginary part)	13.360	
Conductivity (S/m)	1.864	

C. SAR Surface and Volume



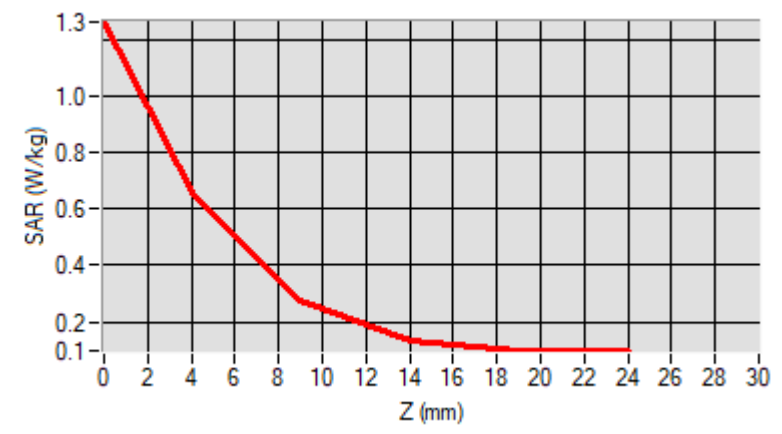
Maximum location: X=-5.00, Y=-1.00 ; SAR Peak: 1.29 W/kg

D. SAR 1g & 10g

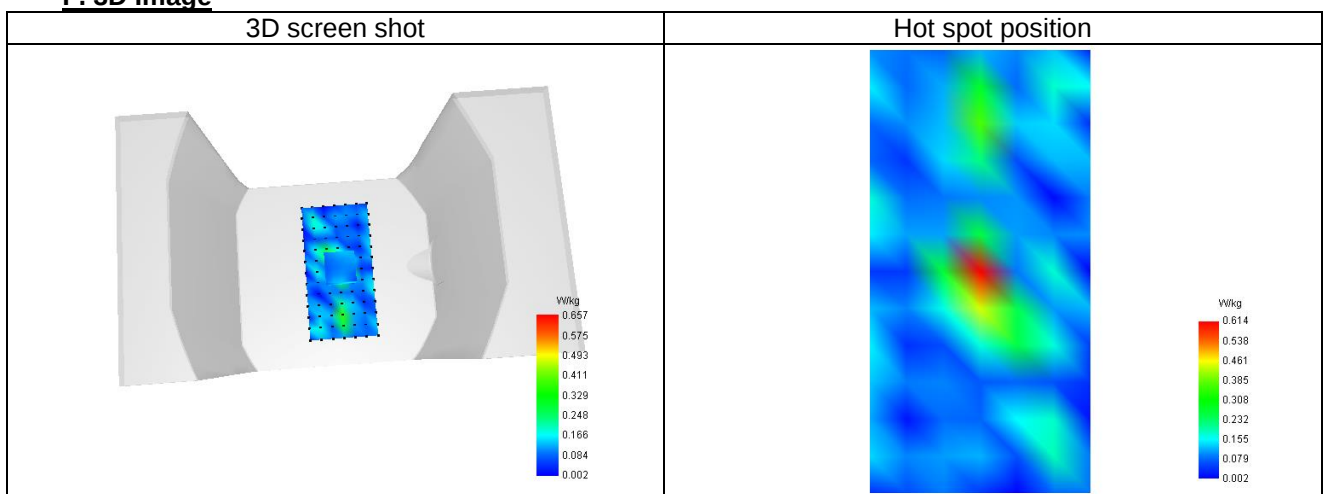
SAR 10g (W/Kg)	0.272
SAR 1g (W/Kg)	0.598
Variation (%)	1.680
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.262	0.657	0.275	0.133	0.098



F. 3D Image



Plot 6

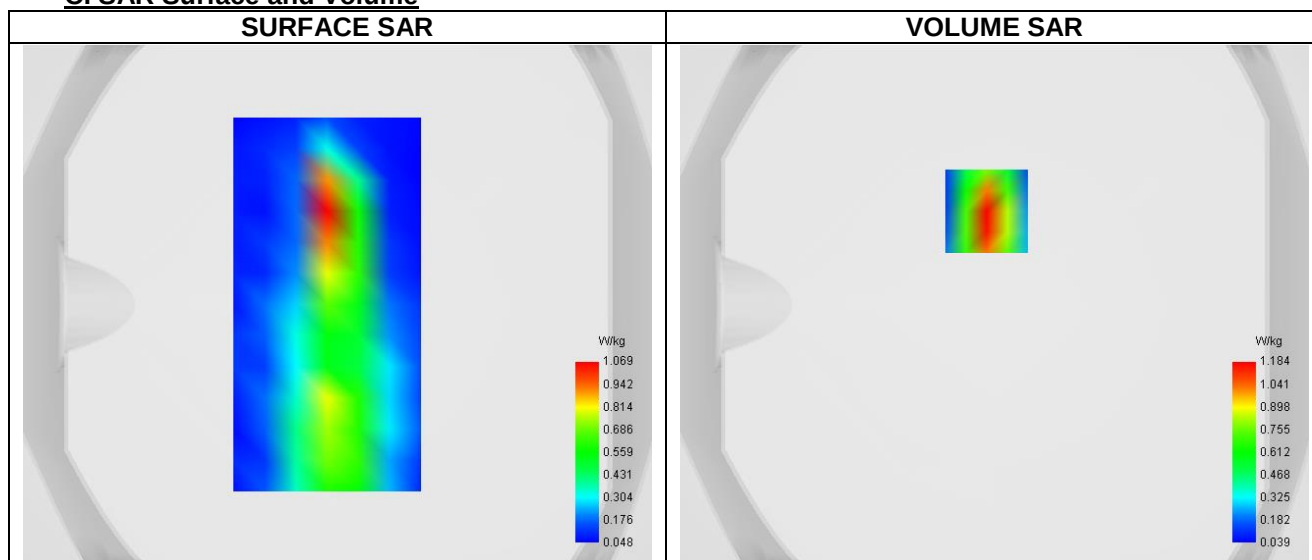
A. Experimental conditions.

Probe	SN 26/23 EPG0420
ConvF	0.80
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 12
Channels	23130
Signal	LTE (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	707.500	
Relative permittivity (real part)	40.914	
Relative permittivity (imaginary part)	23.421	
Conductivity (S/m)	0.857	

C. SAR Surface and Volume

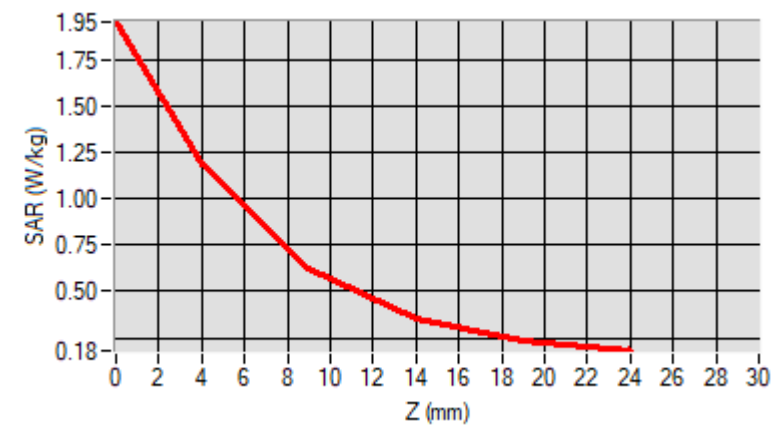


D. SAR 1g & 10g

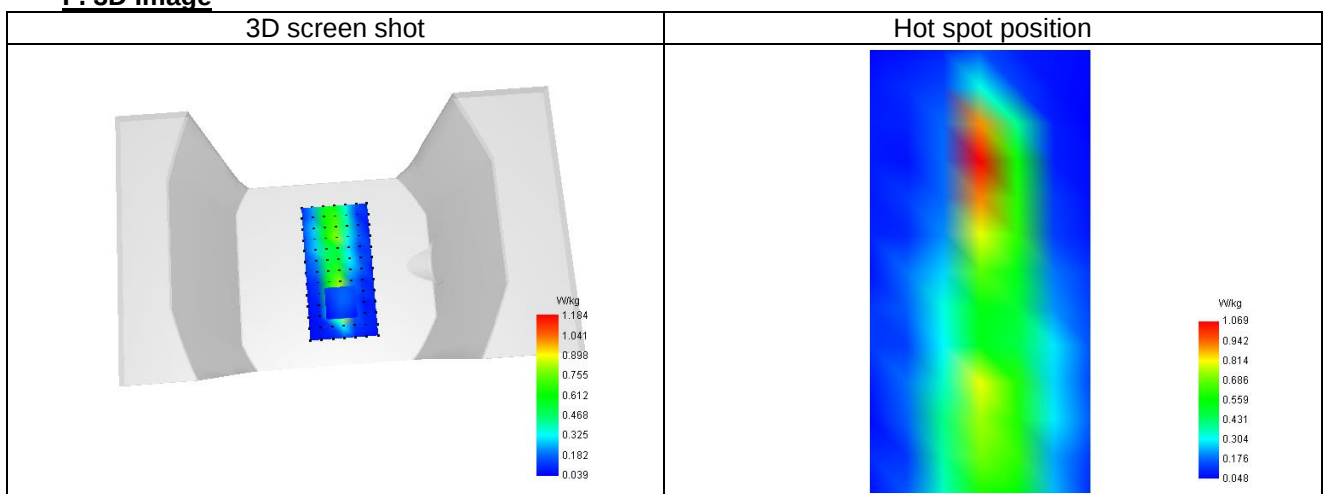
SAR 10g (W/Kg)	0.568
SAR 1g (W/Kg)	1.081
Variation (%)	-4.680
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	1.953	1.184	0.625	0.355	0.239



F. 3D Image



Plot 7

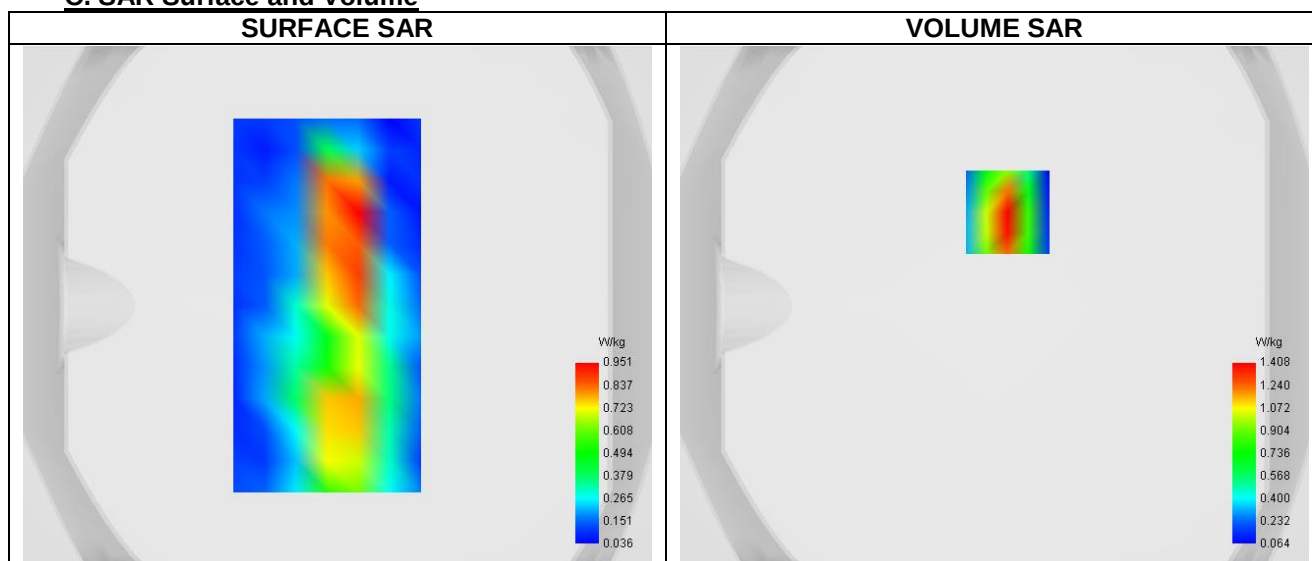
A. Experimental conditions.

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	Body
Band	LTE band 17
Channels	23790
Signal	LTE (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	710.000	
Relative permittivity (real part)	41.194	
Relative permittivity (imaginary part)	23.152	
Conductivity (S/m)	0.890	

C. SAR Surface and Volume



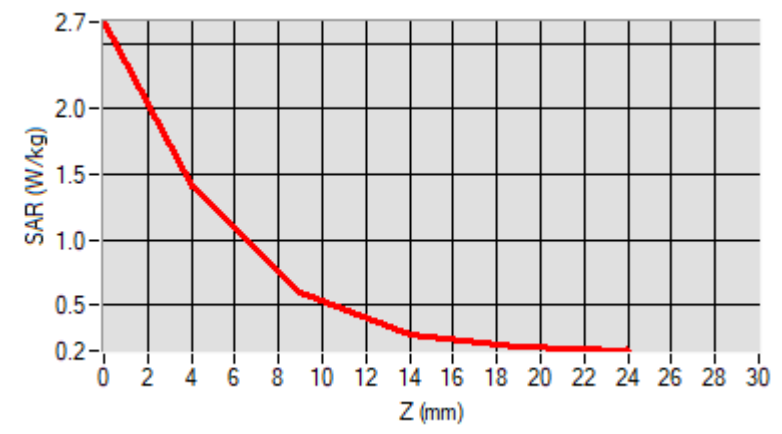
Maximum location: X=5.00, Y=36.00 ; SAR Peak: 2.67 W/kg

D. SAR 1g & 10g

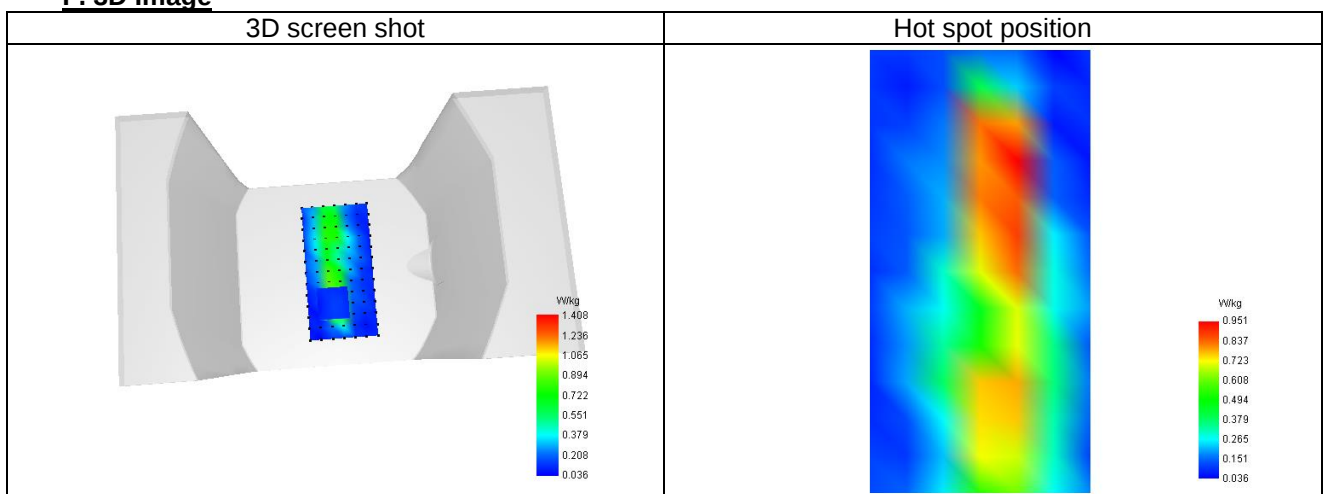
SAR 10g (W/Kg)	0.536
SAR 1g (W/Kg)	1.083
Variation (%)	-2.020
Horizontal validation criteria: minimum distance (mm)	0.000000
Vertical validation criteria: SAR ratio M2/M1 (%)	0.000000

E. Z Axis Scan

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	2.662	1.408	0.598	0.278	0.179



F. 3D Image



Plot 8

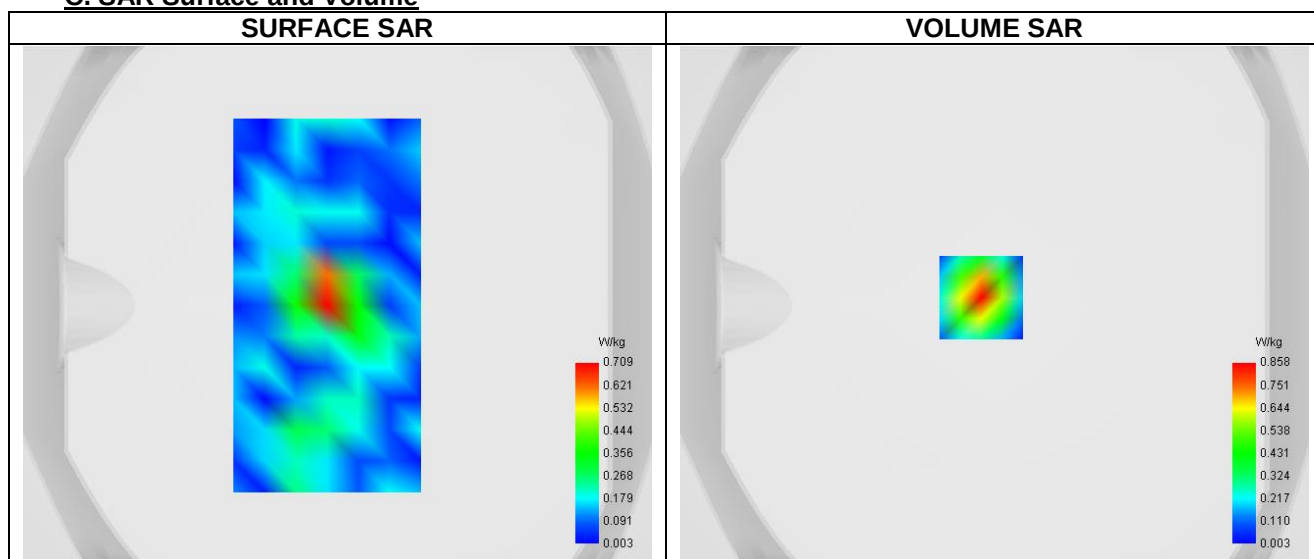
A. Experimental conditions.

Probe	SN 26/23 EPG0420
ConvF	1.03
Area Scan	surf_sam_plan.txt
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Phantom	Validation plane
Device Position	Body
Band	LTE band 38
Channels	37850
Signal	LTE (Crest factor: 1.0)

B. Permittivity

Frequency (MHz)	2580.000
Relative permittivity (real part)	40.134
Relative permittivity (imaginary part)	13.558
Conductivity (S/m)	2.023

C. SAR Surface and Volume



Maximum location: X=-5.00, Y=3.00 ; SAR Peak: 1.67 W/kg

D. SAR 1g & 10g

SAR 10g (W/Kg)	0.365
SAR 1g (W/Kg)	0.790
Variation (%)	-3.910
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)	1.664	0.858	0.348	0.153	0.097