



<WLAN 2.4GHz Conducted Power>

General Note:

1. Per KDB 248227 D01 v01r02, choose the highest output power channel to test SAR and determine further SAR exclusion
2. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4dB higher than those measured at the lowest data rate. 2.4GHz WLAN SAR was tested on 802.11a 1Mbps.
3. Per KDB 248227 D01 v01r02, 11g, 11n-HT20 and 11n-HT40 output power is less than 1/4dB higher than 11b mode, thus the SAR can be excluded.

802.11b Average Power (dBm)					
Channel	Frequency (MHz)	Data Rate (bps)			
		1M bps	2M bps	5.5M bps	11M bps
CH 01	2412	16.22	16.06	15.54	15.04
CH 06	2437	16.27	16.25	15.53	15.15
CH 11	2462	16.44	16.27	16.62	15.13

802.11g Average Power (dBm)									
Channel	Frequency (MHz)	Data Rate (bps)							
		6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
CH 01	2412	12.12	11.79	11.46	10.68	9.91	8.88	8.15	7.81
CH 06	2437	12.42	11.81	11.61	10.71	10.12	9.02	8.28	7.95
CH 11	2462	12.40	12.03	11.73	10.91	10.12	9.07	8.39	8.07

WLAN 2.4GHz 802.11n-HT20 Average Power (dBm)									
Channel	Frequency (MHz)	MCS Index							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412	10.25	9.36	8.75	8.17	7.01	6.44	6.18	5.78
CH 06	2437	10.51	9.37	8.96	8.35	7.38	6.44	6.31	5.83
CH 11	2462	10.53	9.62	8.98	8.45	7.31	6.42	6.22	5.87

WLAN 2.4GHz 802.11n-HT40 Average Power (dBm)									
Channel	Frequency (MHz)	MCS Index							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422	9.19	7.92	7.07	6.35	5.25	4.59	4.38	3.98
CH 06	2437	9.05	7.85	6.92	6.04	5.04	4.56	4.29	3.62
CH 09	2452	9.33	8.03	7.16	6.47	5.43	4.69	4.51	4.15

<Bluetooth Conducted Power>

Bluetooth Average Power (dBm)					
Channel	Frequency (MHz)	Data Rate			
		DH5	2DH5	3DH5	
CH 00	2402	-1.75	-1.76	-1.81	
CH 39	2441	-0.56	-0.61	-0.63	
CH 78	2480	-1.57	-1.63	-1.58	

Channel	Frequency (MHz)	Average power (dBm)	
		Mode	
		BT v4.0 LE, GFSK	
CH 00	2402	-0.36	
CH 19	2440	0.59	
CH 39	2480	-0.12	



<WLAN 5GHz Conducted Power>

General Note:

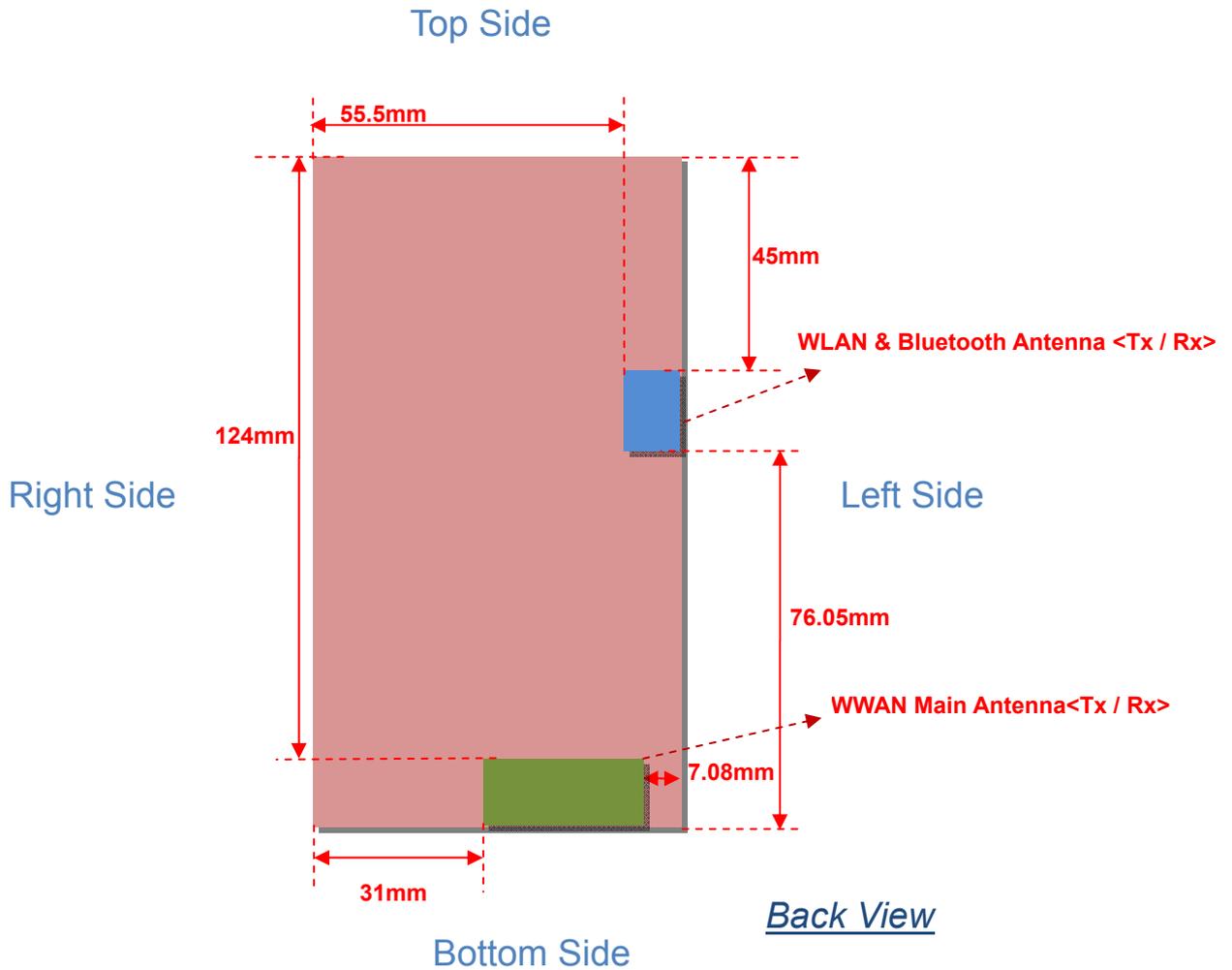
1. Per KDB 248227, choose the highest output power channel to test SAR and determine further SAR exclusion
2. Per KDB 248227 D01 v01r02, 11n-HT20 and 11n-HT40 output power is less than 1/4dB higher than 802.11a mode, thus the SAR can be excluded.
3. For each frequency band, testing at higher data rates and higher order modulations is not required when the maximum average output power for each of these configurations is less than 1/4 dB higher than those measured at the lowest data rate. 5GHz WLAN SAR was tested on 802.11a 6Mbps.

802.11a Average Power (dBm)									
Channel	Frequency (MHz)	Average Power (dBm)							
		Data Rate (bps)							
		6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
CH 36	5180	11.58	11.25	10.73	10.05	9.31	8.34	7.59	7.35
CH 40	5200	11.99	11.34	10.66	10.05	9.08	8.37	8.07	7.85
CH 44	5220	12.21	11.31	10.62	10.08	9.02	8.25	8.04	7.82
CH 48	5240	12.28	11.39	10.68	10.13	9.12	8.41	8.13	7.81
CH 52	5260	12.22	11.34	10.71	10.15	9.14	8.42	8.11	7.85
CH 56	5280	12.33	11.36	10.72	10.19	9.18	8.43	8.14	7.95
CH 60	5300	12.26	11.46	10.88	10.33	9.27	8.55	8.33	8.01
CH 64	5320	11.98	11.49	11.11	10.37	9.69	8.68	7.98	7.59

WLAN 5GHz 802.11n-HT20 Average Power (dBm)									
Channel	Frequency (MHz)	Average Power (dBm)							
		MCS Index							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 36	5180	9.88	8.97	8.25	7.59	6.18	5.39	5.24	4.92
CH 40	5200	9.93	9.21	8.55	7.85	6.79	5.67	5.51	5.21
CH 44	5220	10.05	9.07	8.46	7.83	6.81	5.69	5.39	5.17
CH 48	5240	10.08	9.09	8.39	7.96	6.86	5.71	5.52	5.23
CH 52	5260	10.03	9.08	8.43	7.89	6.83	5.68	5.46	5.17
CH 56	5280	9.98	9.27	8.55	7.92	6.89	5.73	5.55	5.25
CH 60	5300	10.15	9.25	8.53	8.02	7.03	5.87	5.71	5.45
CH 64	5320	10.18	9.33	8.58	7.98	7.12	5.78	5.87	5.27

WLAN 5GHz 802.11n-H40 Average Power (dBm)									
Channel	Frequency (MHz)	Average Power (dBm)							
		MCS Index							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 38	5190	8.48	7.15	6.25	5.58	4.51	3.85	3.53	3.31
CH 46	5230	8.53	7.36	6.43	5.79	4.71	3.87	3.73	3.52
CH 54	5270	8.72	7.39	6.55	5.82	4.81	4.07	3.87	3.62
CH 62	5310	8.73	7.56	6.74	6.07	4.92	4.24	3.85	3.76

11. Exposure Positions Consideration



Antennas	Wireless Interface
WWAN Main Antenna <Tx / Rx>	GSM850 GSM1900 WCDMA Band V
Bluetooth & WLAN Antenna <Tx / Rx>	WLAN 2.4GHz WLAN 5GHz Bluetooth



Distance of the Antenna to the EUT surface/edge Test distance: 10 mm						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	≤ 25mm	≤ 25mm	124mm	≤ 25mm	31mm	≤ 25mm
Bluetooth & WLAN	≤ 25mm	≤ 25mm	45mm	76.05mm	55.5mm	≤ 25mm

Positions for SAR tests; Hotspot mode Test distance: 10 mm						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	Yes	Yes	NO	Yes	NO	Yes
Bluetooth & WLAN	Yes	Yes	NO	NO	NO	Yes

Note:

1. Head/Body-worn/Hotspot mode SAR assessments are required.
2. Referring to KDB 941225 D06 v01, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge
3. Per KDB 447498 D01v05, for handsets the *test separation distance* is determined by the smallest distance between the outer surface of the device and the user; which is 0mm for head SAR, 10mm for hotspot SAR, 10mm for body-worn SAR.
4. If the test separation distance (antenna-user) is < 5mm, 5mm is used for excluded SAR calculation
5. For minimum test separation distance ≤50mm, Bluetooth standalone SAR test exclusion power threshold is determined by: $[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] \cdot [\sqrt{f(GHz)}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR. The formula sets the maximum RF power threshold, and the transmitter with RF power equal or less than the power threshold, SAR testing is not required

Exposure Position	Wireless Interface	Bluetooth
	Tune-up Maximum power (dBm)	3
Tune-up Maximum rated power (mW)	2	
Head	Antenna to user (mm)	5
	SAR exclusion threshold (mW)	10
	SAR testing required?	NO
Body 1 cm(Hotspot)	Antenna to user (mm)	10
	SAR exclusion threshold (mW)	19
	SAR testing required?	NO
Body 1 cm(Body Worn)	Antenna to user (mm)	10
	SAR exclusion threshold (mW)	19
	SAR testing required?	NO



12. SAR Test Results

General Note:

- Per KDB 447498 D01v05, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 $Scaling\ Factor = \frac{tune-up\ limit\ power\ (mW)}{EUT\ RF\ power\ (mW)}$, where tune-up limit is the maximum rated power among all production units.
 $Reported\ SAR(W/kg) = Measured\ SAR(W/kg) * Scaling\ Factor$
- Per KDB 447498 D01v05, for each exposure position, if the highest output channel reported SAR $\leq 0.8W/kg$, other channels SAR testing are not necessary
- For Hotspot SAR testing, per KDB 941225 D06, for EUT dimension $\geq 9cm*5cm$, the test distance is 1cm. SAR must be measured for all surfaces and sides with a transmitting antenna located within 2.5cm from that surface or edge.

12.1 Test Records for Head SAR Test

<GSM SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#01	GSM850	GSM	Right Cheek	189	836.4	32.46	34	1.426	0.06	0.390	0.556
#02	GSM850	GSM	Right Tilted	189	836.4	32.46	34	1.426	0.0058	0.288	0.411
#03	GSM850	GSM	Left Cheek	189	836.4	32.46	34	1.426	0.01	0.393	0.560
#04	GSM850	GSM	Left Tilted	189	836.4	32.46	34	1.426	0.06	0.296	0.422
#05	GSM1900	GSM	Right Cheek	661	1880	29.36	31	1.459	0.037	0.187	0.273
#06	GSM1900	GSM	Right Tilted	661	1880	29.36	31	1.459	0.05	0.080	0.117
#07	GSM1900	GSM	Left Cheek	661	1880	29.36	31	1.459	0.037	0.359	0.524
#08	GSM1900	GSM	Left Tilted	661	1880	29.36	31	1.459	-0.05	0.079	0.115

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#09	WCDMA V	RMC12.2K	Right Cheek	4182	836.4	23.36	25	1.459	0.029	0.462	0.674
#10	WCDMA V	RMC12.2K	Right Tilted	4182	836.4	23.36	25	1.459	-0.04	0.347	0.506
#11	WCDMA V	RMC12.2K	Left Cheek	4182	836.4	23.36	25	1.459	0.10	0.449	0.655
#12	WCDMA V	RMC12.2K	Left Tilted	4182	836.4	23.36	25	1.459	0.09	0.319	0.465

Note:

- Per KDB 941225 D01, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA/HSUPA output power is $< 0.25dB$ higher than RMC, and reported SAR with RMC 12.2kbps setting is $\leq 1.2W/kg$, HSDPA/HSUPA SAR evaluation can be excluded.
- If Reported SAR with RMC 12.2kbps setting is $> 1.2W/kg$, HSDPA subtest-1 and HSUPA subtest-5 SAR is additionally tested at that exposure position.



<WLAN 2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#13	WLAN 2.4GHz	802.11b	Right Cheek	11	2462	16.44	18	1.432	0.028	0.266	0.381
#14	WLAN 2.4GHz	802.11b	Right Tilted	11	2462	16.44	18	1.432	0.039	0.076	0.109
#15	WLAN 2.4GHz	802.11b	Left Cheek	11	2462	16.44	18	1.432	0.027	0.272	0.390
#16	WLAN 2.4GHz	802.11b	Left Tilted	11	2462	16.44	18	1.432	0.026	0.057	0.082

<WLAN 5GHz SAR>

Plot No.	Band	Mode	Test Position	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#17	WLAN 5GHz	802.11a	Right Cheek	48	5240	12.28	13	1.180	0.09	0.052	0.061
#18	WLAN 5GHz	802.11a	Right Tilted	48	5240	12.28	13	1.180	0.06	0.030	0.035
#19	WLAN 5GHz	802.11a	Left Cheek	48	5240	12.28	13	1.180	0.06	0.033	0.039
#20	WLAN 5GHz	802.11a	Left Tilted	48	5240	12.28	13	1.180	0.02	0.025	0.030
#21	WLAN 5GHz	802.11a	Right Cheek	56	5280	12.33	13	1.167	0.01	0.047	0.055
#22	WLAN 5GHz	802.11a	Right Tilted	56	5280	12.33	13	1.167	0.03	0.036	0.042
#23	WLAN 5GHz	802.11a	Left Cheek	56	5280	12.33	13	1.167	-0.01	0.027	0.032
#24	WLAN 5GHz	802.11a	Left Tilted	56	5280	12.33	13	1.167	-0.01	0.018	0.021



12.2 Test Records for Hotspot SAR Test

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#25	GSM850	EDGE (2 Tx slots)	Front	1	189	836.4	30.55	32	1.396	0.04	0.769	1.074
#26	GSM850	EDGE (2 Tx slots)	Back	1	189	836.4	30.55	32	1.396	0.09	0.839	1.172
#27	GSM850	EDGE (2 Tx slots)	Left Side	1	189	836.4	30.55	32	1.396	0.04	0.620	0.866
#29	GSM850	EDGE (2 Tx slots)	Bottom Side	1	189	836.4	30.55	32	1.396	-0.14	0.308	0.430
#30	GSM850	EDGE (2 Tx slots)	Front	1	128	824.2	30.39	32	1.449	0.0062	0.748	1.084
#31	GSM850	EDGE (2 Tx slots)	Front	1	251	848.8	30.48	32	1.419	0.10	0.720	1.022
#32	GSM850	EDGE (2 Tx slots)	Back	1	128	824.2	30.39	32	1.449	0.03	0.846	1.226
#34	GSM850	EDGE (2 Tx slots)	Back	1	251	848.8	30.48	32	1.419	0.0033	0.792	1.124
#35	GSM850	EDGE (2 Tx slots)	Left Side	1	128	824.2	30.39	32	1.449	0.04	0.699	1.013
#36	GSM850	EDGE (2 Tx slots)	Left Side	1	251	848.8	30.48	32	1.419	-0.07	0.468	0.664
#42	GSM1900	EDGE (2 Tx slots)	Front	1	661	1880	27.39	28	1.151	0.10	0.647	0.745
#43	GSM1900	EDGE (2 Tx slots)	Back	1	661	1880	27.39	28	1.151	-0.19	0.620	0.713
#44	GSM1900	EDGE (2 Tx slots)	Left Side	1	661	1880	27.39	28	1.151	0.12	0.191	0.220
#46	GSM1900	EDGE (2 Tx slots)	Bottom Side	1	661	1880	27.39	28	1.151	0.11	0.662	0.762

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#47	WCDMA V	RMC12.2K	Front	1	4182	836.4	23.36	25	1.459	-0.02	0.596	0.869
#48	WCDMA V	RMC12.2K	Back	1	4182	836.4	23.36	25	1.459	-0.03	0.672	0.980
#49	WCDMA V	RMC12.2K	Left Side	1	4182	836.4	23.36	25	1.459	0.00017	0.447	0.652
#51	WCDMA V	RMC12.2K	Bottom Side	1	4182	836.4	23.36	25	1.459	-0.05	0.225	0.328
#52	WCDMA V	RMC12.2K	Front	1	4132	826.4	23.32	25	1.472	-0.021	0.588	0.866
#53	WCDMA V	RMC12.2K	Front	1	4233	846.6	23.38	25	1.452	-0.0022	0.600	0.871
#54	WCDMA V	RMC12.2K	Back	1	4132	826.4	23.32	25	1.472	0.03	0.700	1.031
#55	WCDMA V	RMC12.2K	Back	1	4233	846.6	23.38	25	1.452	0.03	0.648	0.941

Note:

1. Body SAR, per KDB 941225 D01, RMC 12.2kbps setting is used to evaluate SAR. If HSDPA/HSUPA output power is < 0.25dB higher than RMC, and Reported SAR with RMC 12.2kbps setting is ≤ 1.2W/kg, HSDPA/HSUPA SAR evaluation can be excluded.
2. If Reported SAR with RMC 12.2kbps setting is > 1.2W/kg, HSDPA subtest-1 and HSUPA subtest-5 SAR is additionally tested at that exposure position.

<WLAN 2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#56	WLAN 2.4GHz	802.11b	Front	1	11	2462	16.44	18	1.432	-0.059	0.063	0.090
#57	WLAN 2.4GHz	802.11b	Back	1	11	2462	16.44	18	1.432	-0.19	0.117	0.168
#58	WLAN 2.4GHz	802.11b	Left Side	1	11	2462	16.44	18	1.432	0.17	0.126	0.180



12.3 Test Records for Body-worn SAR Test

General Note:

1. For Body-worn SAR testing: "V" in the Headset column means the Headset is plugged during SAR testing.
2. Body-worn SAR testing was performed at 10mm separation, and this distance is determined by the handset manufacturer that there will be body-worn accessories that users may acquire at the time of equipment certification, to enable users to purchase aftermarket body-worn accessories with the required minimum separation.
3. Pre KDB648474 D04v01, 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 that body-worn accessory with a headset attached to the handset.
4. Though per KDB 648474 D04v01, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, the SAR testing with a headset connected to the handset is not required, but considered the simultaneous SAR for body-worn, we still perform the WLAN SAR with headset mode.

<GSM SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Headset	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#25	GSM850	EDGE (2 Tx slots)	Front	1	189	836.4	30.55	32	1.396	-	0.04	0.769	1.074
#26	GSM850	EDGE (2 Tx slots)	Back	1	189	836.4	30.55	32	1.396	-	0.09	0.839	1.172
#30	GSM850	EDGE (2 Tx slots)	Front	1	128	824.2	30.39	32	1.449	-	0.0062	0.748	1.084
#31	GSM850	EDGE (2 Tx slots)	Front	1	251	848.8	30.48	32	1.419	-	0.10	0.720	1.022
#32	GSM850	EDGE (2 Tx slots)	Back	1	128	824.2	30.39	32	1.449	-	0.03	0.846	1.226
#34	GSM850	EDGE (2 Tx slots)	Back	1	251	848.8	30.48	32	1.419	-	0.0033	0.792	1.124
#39	GSM850	GSM	Back	1	128	848.8	32.41	34	1.442	V	-0.0032	0.552	0.796
#40	GSM850	GSM	Back	1	189	824.2	32.46	34	1.426	V	-0.024	0.534	0.761
#41	GSM850	GSM	Back	1	251	848.8	32.49	34	1.416	V	0.074	0.521	0.738
#42	GSM1900	EDGE (2 Tx slots)	Front	1	661	1880	27.39	28	1.151	-	0.10	0.647	0.745
#43	GSM1900	EDGE (2 Tx slots)	Back	1	661	1880	27.39	28	1.151	-	-0.19	0.620	0.713

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Headset	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#47	WCDMA V	RMC12.2K	Front	1	4182	836.4	23.36	25	1.459	-	-0.02	0.596	0.869
#48	WCDMA V	RMC12.2K	Back	1	4182	836.4	23.36	25	1.459	-	-0.03	0.672	0.980
#52	WCDMA V	RMC12.2K	Front	1	4132	826.4	23.32	25	1.472	-	-0.021	0.588	0.866
#53	WCDMA V	RMC12.2K	Front	1	4233	846.6	23.38	25	1.452	-	-0.0022	0.600	0.871
#54	WCDMA V	RMC12.2K	Back	1	4132	826.4	23.32	25	1.472	-	0.03	0.700	1.031
#55	WCDMA V	RMC12.2K	Back	1	4233	846.6	23.38	25	1.452	-	0.03	0.648	0.941



FCC SAR Test Report

<WLAN 2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Headset	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#56	WLAN 2.4GHz	802.11b	Front	1	11	2462	16.44	18	1.432	-	-0.059	0.063	0.090
#57	WLAN 2.4GHz	802.11b	Back	1	11	2462	16.44	18	1.432	-	-0.19	0.117	0.168
#59	WLAN 2.4GHz	802.11b	Back	1	11	2462	16.44	18	1.432	V	-0.11	0.120	0.172

<WLAN 5GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Headset	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#60	WLAN 5GHz	802.11a	Front	1	48	5240	12.28	13	1.180	-	0.002	0.00684	0.008
#61	WLAN 5GHz	802.11a	Back	1	48	5240	12.28	13	1.180	-	0.05	0.088	0.104
#62	WLAN 5GHz	802.11a	Back	1	48	5240	12.28	13	1.180	V	0.056	0.089	0.105
#63	WLAN 5GHz	802.11a	Front	1	56	5280	12.33	13	1.167	-	0.02	0.00844	0.010
#64	WLAN 5GHz	802.11a	Back	1	56	5280	12.33	13	1.167	-	0.09	0.087	0.102
#65	WLAN 5GHz	802.11a	Back	1	56	5280	12.33	13	1.167	V	0.07	0.085	0.099



12.4 Repeated SAR Measurement

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Ratio	Reported SAR _{1g} (W/kg)
#32	GSM850	EDGE (2 Tx slots)	Back	1	128	824.2	30.39	32	1.449	0.03	0.846	1	1.226
#33	GSM850	EDGE (2 Tx slots)	Back	1	128	824.2	30.39	32	1.449	0.0045	0.844	1.002	1.223

Note:

1. Per KDB 865664 D01v01, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8 W/kg
2. Per KDB 865664 D01v01, if the deviation among the repeated measurement is $\leq 20\%$ and the measured SAR < 1.45 W/kg, only one repeated measurement is required.
3. The deviation is the difference in percentage between original and repeated *measured* SAR.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

12.5 Highest SAR Plot

Plot No.	Band	Mode	Test Position	Gap (cm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Scaling Factor	Headset	Power Drift (dB)	Measured SAR _{1g} (W/kg)	Reported SAR _{1g} (W/kg)
#32	GSM850	EDGE (2 Tx slots)	Back	1	128	824.2	30.39	32	1.449	-	0.03	0.846	1.226
#46	GSM1900	EDGE (2 Tx slots)	Bottom Side	1	661	1880	27.39	28	1.151	-	0.11	0.662	0.762
#54	WCDMA V	RMC12.2K	Back	1	4132	826.4	23.32	25	1.472	-	0.03	0.700	1.031
#15	WLAN 2.4GHz	802.11b	Left Cheek	-	11	2462	16.44	18	1.432	-	0.027	0.272	0.390
#62	WLAN 5GHz	802.11a	Back	1	48	5240	12.28	13	1.180	V	0.056	0.089	0.105

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2013-2-1

#32 GSM850_EDGE (2 Tx slots)_Back 1cm_Ch128

DUT: D2_6114

Communication System: GPRS/EDGE (2 Tx slots); Frequency: 824.6MHz;Duty Cycle: 1:4
 Medium: MSL_835_130201 Medium parameters used: $f = 825$ MHz; $\sigma = 0.97$ mho/m; $\epsilon_r = 54.574$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 21.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(8.98, 8.98, 8.98); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Ch128/Area Scan (71x111x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.976 mW/g

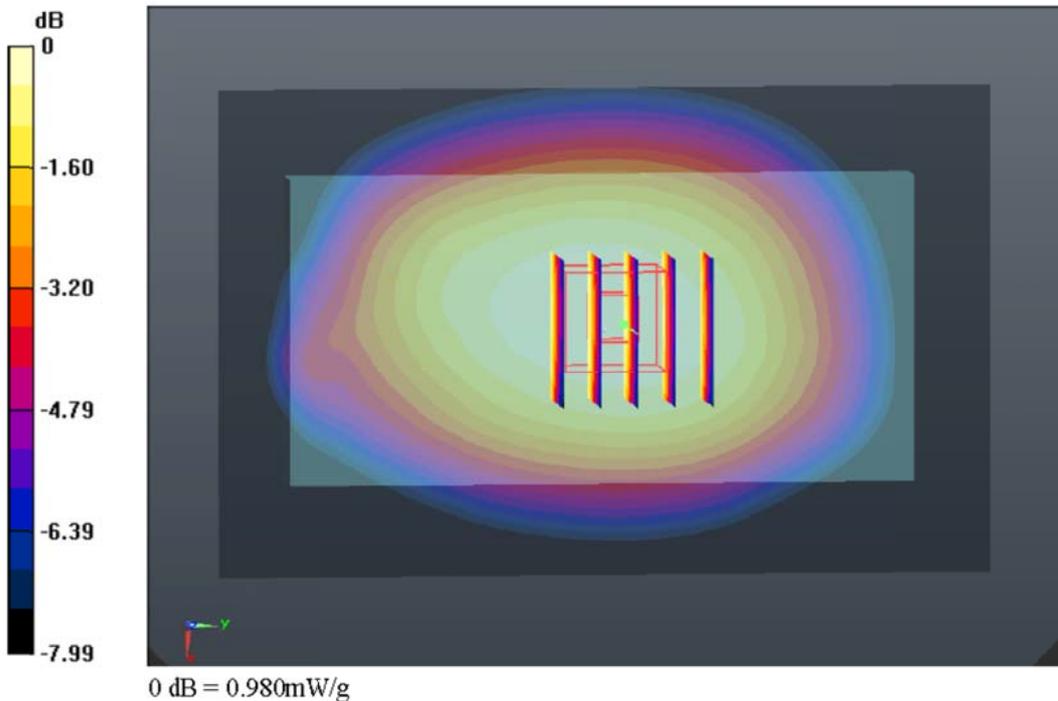
Ch128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 30.396 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.065 W/kg

SAR(1 g) = 0.846 mW/g; SAR(10 g) = 0.657 mW/g

Maximum value of SAR (measured) = 0.978 mW/g



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2013-2-17

#46 GSM1900_EDGE (2 Tx slots)_Bottom Side 1cm_Ch661

DUT: D2_6114

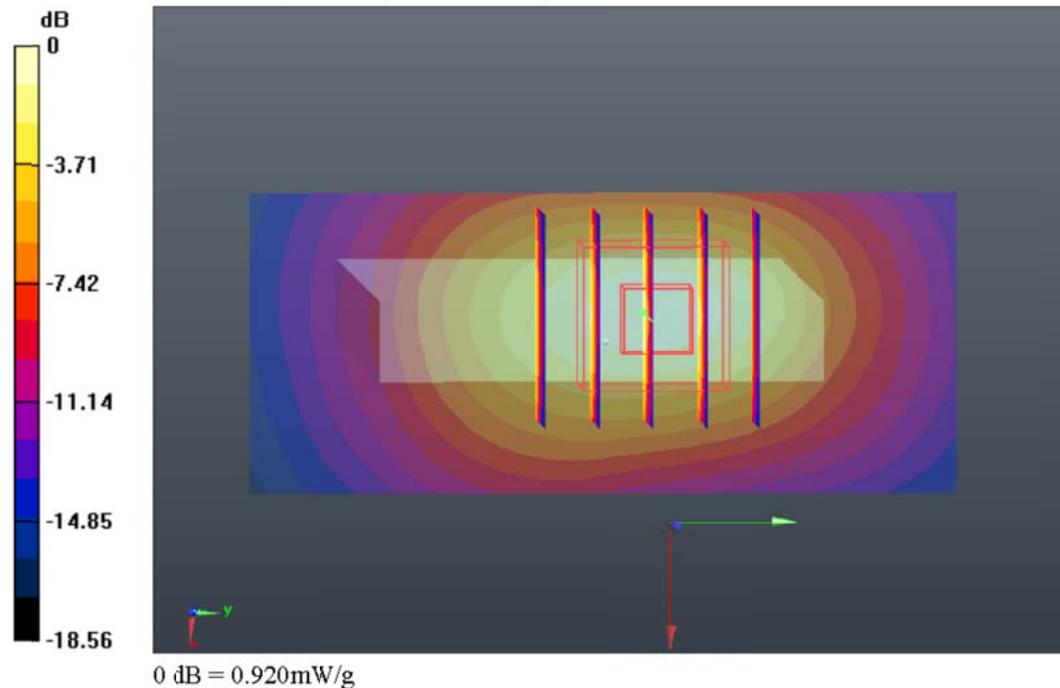
Communication System: GPRS/EDGE (2 Tx slots); Frequency: 1880 MHz; Duty Cycle: 1:4
 Medium: MSL_1900_130217 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.528$ mho/m; $\epsilon_r = 53.358$; $\rho = 1000$ kg/m³
 Ambient Temperature : 23.3 °C; Liquid Temperature : 21.2 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(7.35, 7.35, 7.35); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.3 (2); SEMCAD X Version 14.4.5 (3634)

Ch661/Area Scan (31x71x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.900 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 20.226 V/m; Power Drift = 0.11 dB
 Peak SAR (extrapolated) = 1.121 W/kg
SAR(1 g) = 0.662 mW/g; SAR(10 g) = 0.349 mW/g
 Maximum value of SAR (measured) = 0.916 mW/g



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2013-2-1

#54 WCDMA V_RMC12.2K_Back 1cm_Ch4132

DUT: D2_6114

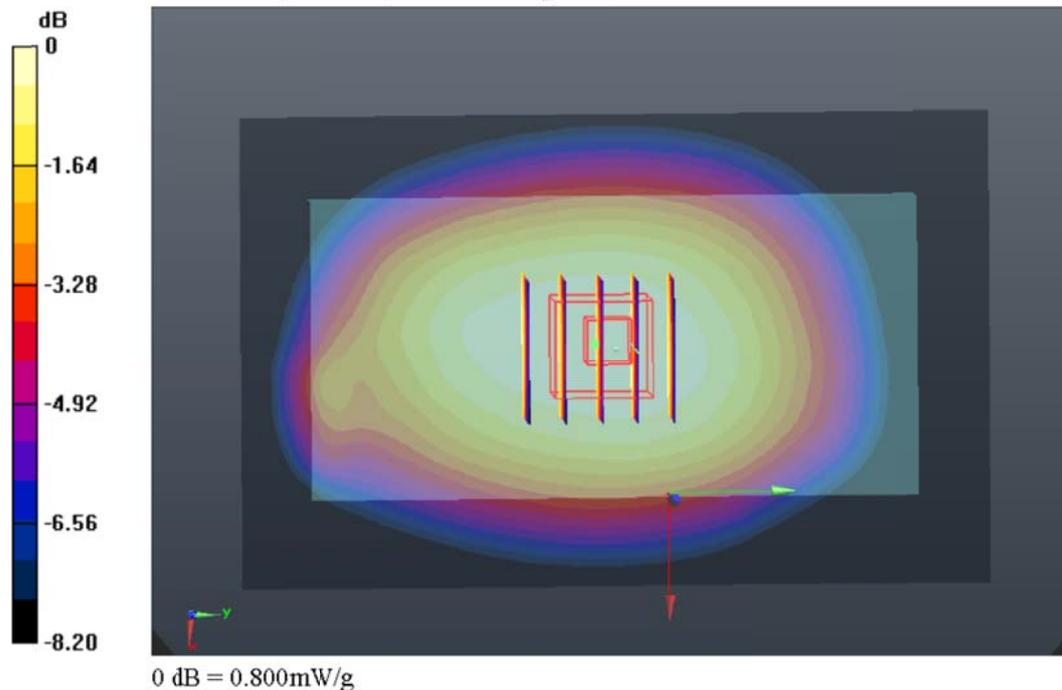
Communication System: UMTS; Frequency: 826.4 MHz; Duty Cycle: 1:1
 Medium: MSL_835_130201 Medium parameters used: $f = 826.4$ MHz; $\sigma = 0.972$ mho/m; $\epsilon_r = 54.561$; $\rho = 1000$ kg/m³
 Ambient Temperature : 23.3 °C; Liquid Temperature : 21.1 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(8.98, 8.98, 8.98); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.3 (2); SEMCAD X Version 14.4.5 (3634)

Ch4132/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.806 mW/g

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 27.579 V/m; Power Drift = 0.03 dB
 Peak SAR (extrapolated) = 0.871 W/kg
SAR(1 g) = 0.700 mW/g; SAR(10 g) = 0.537 mW/g
 Maximum value of SAR (measured) = 0.797 mW/g



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2013-2-17

#15 WLAN 2.4GHz_802.11b_Left Cheek_Ch11

DUT: D2_6114

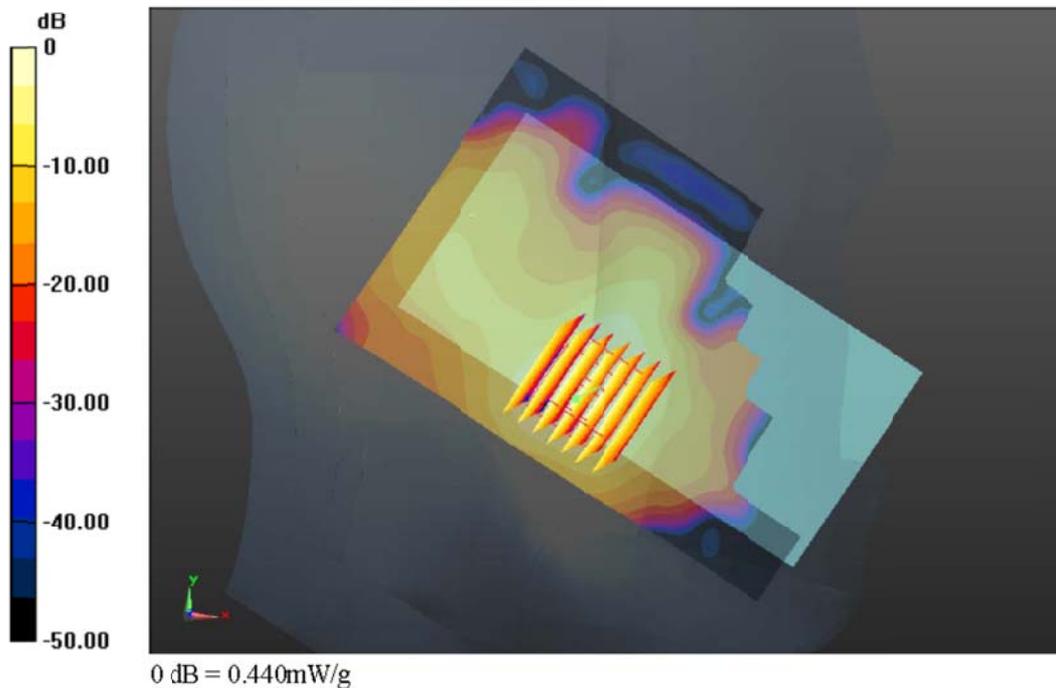
Communication System: WIFI; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium: HSL_2450_130217 Medium parameters used: $f = 2462$ MHz; $\sigma = 1.842$ mho/m; $\epsilon_r = 40.039$; $\rho = 1000$ kg/m³
 Ambient Temperature : 23.4 °C; Liquid Temperature : 21.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(6.87, 6.87, 6.87); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Ch11/Area Scan (81x131x1): Measurement grid: dx=12mm, dy=12mm
 Maximum value of SAR (interpolated) = 0.404 mW/g

Ch11/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 3.990 V/m; Power Drift = 0.027 dB
 Peak SAR (extrapolated) = 0.637 W/kg
SAR(1 g) = 0.272 mW/g; SAR(10 g) = 0.118 mW/g
 Maximum value of SAR (measured) = 0.439 mW/g



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab

Date: 2013-2-17

#62 802.11a_Back_1cm_Ch48_Headset

DUT: D2_6114

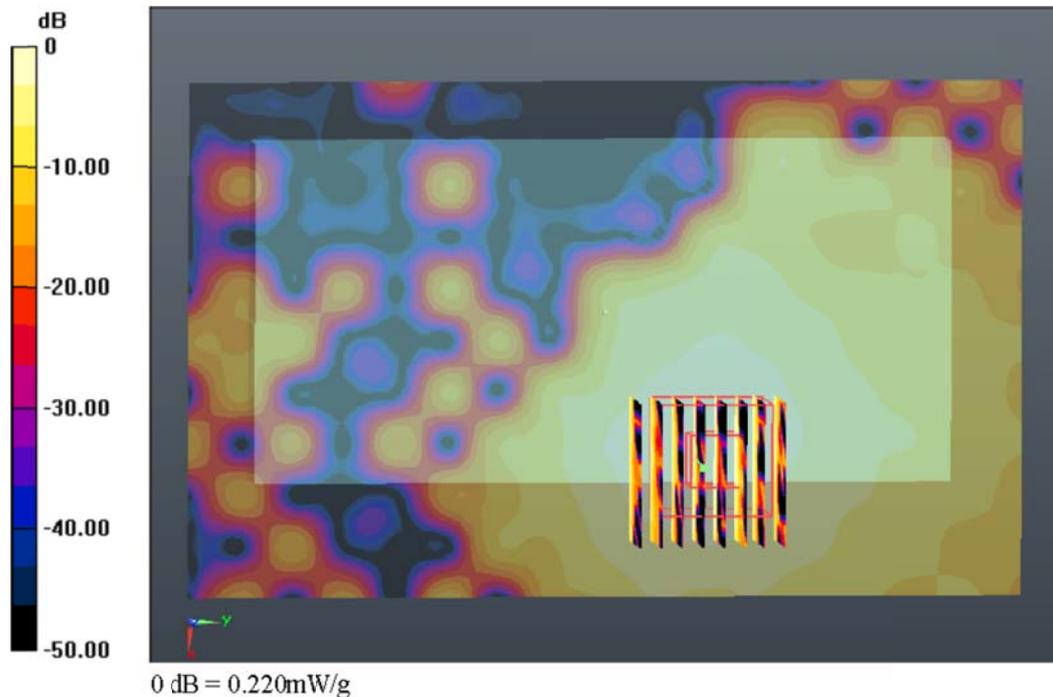
Communication System: WIFI; Frequency: 5240 MHz; Duty Cycle: 1:1
 Medium: MSL_5000_130217 Medium parameters used: $f = 5240 \text{ MHz}$; $\sigma = 5.22 \text{ mho/m}$; $\epsilon_r = 50.277$; $\rho = 1000 \text{ kg/m}^3$
 Ambient Temperature : 23.3 °C; Liquid Temperature : 21.4 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(4.3, 4.3, 4.3); Calibrated: 2012-6-20
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Ch48/Area Scan (101x161x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$
 Maximum value of SAR (interpolated) = 0.218 mW/g

Ch48/Zoom Scan (8x8x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$
 Reference Value = 1.552 V/m; Power Drift = 0.056 dB
 Peak SAR (extrapolated) = 0.293 W/kg
SAR(1 g) = 0.089 mW/g; SAR(10 g) = 0.034 mW/g
 Maximum value of SAR (measured) = 0.219 mW/g



12.6 Simultaneous Multi-band Transmission Analysis

	Position	Applicable Combination
Simultaneous Transmission	Head	WWAN (voice) + WLAN 2.4GHz/WLAN 5GHz
		WWAN (voice) + Bluetooth
	Hotspot	WWAN (data) + WLAN 2.4GHz
		WWAN (data) + Bluetooth
	Body-worn	WWAN (voice) + WLAN 2.4GHz/WLAN 5GHz
		WWAN (voice) + Bluetooth

Note:

1. WLAN 2.4GHz and Bluetooth share the same antenna, and cannot transmit simultaneously.
2. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, they will not transmit simultaneously.
3. GSM/WCDMA share the same antenna, and cannot transmit simultaneously.
4. This device WLAN 5GHz band does not support hotspot mode.
5. The reported SAR summation is calculated based on the same configuration and test position.
6. Simultaneous transmission analysis for hotspot mode 1cm separation to the body represents the compliance for hand-held and near-body use conditions. Simultaneous transmission of Hotspot mode for head and body-worn conditions was covered under simultaneous transmission analysis of head and body-worn positions, due to the possible WWAN voice call and data transmission SAR was considered in standalone SAR measurement for those exposure positions
7. For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v05 based on the formula below.
 - i) $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})} / x]$ W/kg for test separation distances ≤ 50 mm; where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.
 - ii) 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.

Max Power	Exposure Position	Head	Body 1cm
	Test separation	0 mm	10 mm
3 dBm	Estimated SAR (W/kg)	0.083 W/kg	0.042 W/kg

8. Per KDB 447498 D01v05, simultaneous transmission SAR is compliant if,
 - (i) Scalar SAR summation $< 1.6\text{W/kg}$.
 - (ii) $\text{SPLSR} = (\text{SAR1} + \text{SAR2})1.5 / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where $(x1, y1, z1)$ and $(x2, y2, z2)$ are the coordinates of the extrapolated peak SAR locations in the zoom scan.
 If $\text{SPLSR} \leq 0.04$, simultaneously transmission SAR measurement is not necessary.
 - (iii) Simultaneously transmission SAR measurement, and the reported multi-band SAR $< 1.6\text{W/kg}$.



FCC SAR Test Report

<Head>

Position	WWAN (PCE)			WLAN 2.4GHz (DTS)		WWAN + WLAN 2.4GHz (W/kg)	SPLSR ≤ 0.04	Case No
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Plot No	Max. WLAN 2.4GHz SAR (W/kg)			
Right Cheek	GSM850	#01	0.556	#13	0.381	0.94	-	-
	GSM1900	#05	0.273	#13	0.381	0.65	-	-
	WCDMA V	#09	0.674	#13	0.381	1.06	-	-
Right Tilted	GSM850	#02	0.411	#14	0.109	0.52	-	-
	GSM1900	#06	0.117	#14	0.109	0.23	-	-
	WCDMA V	#10	0.506	#14	0.109	0.62	-	-
Left Cheek	GSM850	#03	0.560	#15	0.390	0.95	-	-
	GSM1900	#07	0.524	#15	0.390	0.91	-	-
	WCDMA V	#11	0.655	#15	0.390	1.05	-	-
Left Tilted	GSM850	#04	0.422	#16	0.082	0.50	-	-
	GSM1900	#08	0.115	#16	0.082	0.20	-	-
	WCDMA V	#12	0.465	#16	0.082	0.55	-	-

Position	WWAN (PCE)			WLAN 5GHz (NII)		WWAN + WLAN 5GHz (W/kg)	SPLSR ≤ 0.04	Case No
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Plot No	Max. WLAN 5GHz SAR (W/kg)			
Right Cheek	GSM850	#01	0.556	#17	0.061	0.62	-	-
	GSM1900	#05	0.273	#17	0.061	0.33	-	-
	WCDMA V	#09	0.674	#17	0.061	0.74	-	-
Right Tilted	GSM850	#02	0.411	#22	0.042	0.45	-	-
	GSM1900	#06	0.117	#22	0.042	0.16	-	-
	WCDMA V	#10	0.506	#22	0.042	0.55	-	-
Left Cheek	GSM850	#03	0.560	#19	0.039	0.60	-	-
	GSM1900	#07	0.524	#19	0.039	0.56	-	-
	WCDMA V	#11	0.655	#19	0.039	0.69	-	-
Left Tilted	GSM850	#04	0.422	#20	0.030	0.45	-	-
	GSM1900	#08	0.115	#20	0.030	0.15	-	-
	WCDMA V	#12	0.465	#20	0.030	0.50	-	-

Position	WWAN (PCE)			Bluetooth (DSS)		WWAN + Bluetooth (W/kg)	SPLSR ≤ 0.04	Case No
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Estimated Bluetooth SAR (W/kg)				
Right Cheek	GSM850	#01	0.556	0.083		0.64	-	-
	GSM1900	#05	0.273	0.083		0.36	-	-
	WCDMA V	#09	0.674	0.083		0.76	-	-
Right Tilted	GSM850	#02	0.411	0.083		0.49	-	-
	GSM1900	#06	0.117	0.083		0.20	-	-
	WCDMA V	#10	0.506	0.083		0.59	-	-
Left Cheek	GSM850	#03	0.560	0.083		0.64	-	-
	GSM1900	#07	0.524	0.083		0.61	-	-
	WCDMA V	#11	0.655	0.083		0.74	-	-
Left Tilted	GSM850	#04	0.422	0.083		0.51	-	-
	GSM1900	#08	0.115	0.083		0.20	-	-
	WCDMA V	#12	0.465	0.083		0.55	-	-



FCC SAR Test Report

<Hotspot SAR>

Position	WWAN (PCE)			WLAN 2.4GHz (DTS)		WWAN + WLAN 2.4GHz (W/kg)	SPLSR ≤ 0.04	Case No
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Plot No	Max. WLAN 2.4GHz SAR (W/kg)			
Front	GSM850	#30	1.084	#56	0.090	1.17	-	-
	GSM1900	#42	0.745	#56	0.090	0.84	-	-
	WCDMA V	#53	0.871	#56	0.090	0.96	-	-
Back	GSM850	#32	1.226	#57	0.168	1.39	-	-
	GSM1900	#43	0.713	#57	0.168	0.88	-	-
	WCDMA V	#54	1.031	#57	0.168	1.20	-	-
Left Side	GSM850	#35	1.013	#58	0.180	1.19	-	-
	GSM1900	#44	0.220	#58	0.180	0.40	-	-
	WCDMA V	#49	0.652	#58	0.180	0.83	-	-
Bottom Side	GSM850	#29	0.430	-	-	0.43	-	-
	GSM1900	#46	0.762	-	-	0.76	-	-
	WCDMA V	#51	0.328	-	-	0.33	-	-

Position	WWAN (PCE)			Bluetooth (DSS)	WWAN + Bluetooth (W/kg)	SPLSR ≤ 0.04	Case No
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Estimated Bluetooth SAR (W/kg)			
Front	GSM850	#30	1.084	0.042	1.13	-	-
	GSM1900	#42	0.745	0.042	0.79	-	-
	WCDMA V	#53	0.871	0.042	0.91	-	-
Back	GSM850	#32	1.226	0.042	1.27	-	-
	GSM1900	#43	0.713	0.042	0.76	-	-
	WCDMA V	#54	1.031	0.042	1.07	-	-
Left Side	GSM850	#35	1.013	0.042	1.06	-	-
	GSM1900	#44	0.220	0.042	0.26	-	-
	WCDMA V	#49	0.652	0.042	0.69	-	-
Bottom Side	GSM850	#29	0.430	0.042	0.47	-	-
	GSM1900	#46	0.762	0.042	0.80	-	-
	WCDMA V	#51	0.328	0.042	0.37	-	-



FCC SAR Test Report

<Body-worn SAR>

Position	WWAN (PCE)			WLAN 2.4GHz (DTS)		WWAN + WLAN 2.4GHz (W/kg)	SPLSR ≤ 0.04	Case No
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Plot No	Max. WLAN 2.4GHz SAR (W/kg)			
Front	GSM850	#30	1.084	#56	0.090	1.17	-	-
	GSM1900	#42	0.745	#56	0.090	0.84	-	-
	WCDMA V	#53	0.871	#56	0.090	0.96	-	-
Back	GSM850	#32	1.226	#57	0.168	1.39	-	-
	GSM1900	#43	0.713	#57	0.168	0.88	-	-
	WCDMA V	#54	1.031	#57	0.168	1.20	-	-
Back (with / headset)	GSM850	#39	0.796	#59	0.172	0.97	-	-
	GSM1900	-	-	#59	0.172	0.17	-	-
	WCDMA V	-	-	#59	0.172	0.17	-	-

Position	WWAN (PCE)			WLAN 5GHz (NII)		WWAN + WLAN 5GHz (W/kg)	SPLSR ≤ 0.04	Case No
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Plot No	Max. WLAN 5GHz SAR (W/kg)			
Front	GSM850	#30	1.084	#63	0.010	1.09	-	-
	GSM1900	#42	0.745	#63	0.010	0.76	-	-
	WCDMA V	#53	0.871	#63	0.010	0.88	-	-
Back	GSM850	#32	1.226	#61	0.104	1.33	-	-
	GSM1900	#43	0.713	#61	0.104	0.82	-	-
	WCDMA V	#54	1.031	#61	0.104	1.14	-	-
Back (with / headset)	GSM850	#39	0.796	#62	0.105	0.90	-	-
	GSM1900	-	-	#62	0.105	0.11	-	-
	WCDMA V	-	-	#62	0.105	0.11	-	-

Position	WWAN (PCE)			Bluetooth (DSS)	WWAN + Bluetooth (W/kg)	SPLSR ≤ 0.04	Case No
	WWAN Band	Plot No	Max. WWAN SAR (W/kg)	Estimated Bluetooth SAR (W/kg)			
Front	GSM850	#30	1.084	0.042	1.13	-	-
	GSM1900	#42	0.745	0.042	0.79	-	-
	WCDMA V	#53	0.871	0.042	0.91	-	-
Back	GSM850	#32	1.226	0.042	1.27	-	-
	GSM1900	#43	0.713	0.042	0.76	-	-
	WCDMA V	#54	1.031	0.042	1.07	-	-
Back (with / headset)	GSM850	#39	0.796	0.042	0.84	-	-
	GSM1900	-	-	0.042	0.04	-	-
	WCDMA V	-	-	0.042	0.04	-	-

Test Engineer : Fulu Hu

13. Uncertainty Assessment

The component of uncertainty may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainty by the statistical analysis of a series of observations is termed a Type A evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observations is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture’s specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in Table 12.1

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor ^(a)	1/ κ ^(b)	1/ $\sqrt{3}$	1/ $\sqrt{6}$	1/ $\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 13.1 Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual “root-sum-squares” (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.



FCC SAR Test Report

Error Description	Uncertainty	Probability	Divisor	Ci	Ci	Standard	Standard
	Value (±%)	Distribution		(1g)	(10g)	Uncertainty (1g)	Uncertainty (10g)
Measurement System							
Probe Calibration	6.0	Normal	1	1	1	± 6.0 %	± 6.0 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.4	Rectangular	√3	1	1	± 0.2 %	± 0.2 %
Probe Positioning	2.9	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Max. SAR Eval.	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 11.0 %	± 10.8 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						± 22.0 %	± 21.5 %

Table 13.2 Uncertainty Budget of DASY for frequency range 300 MHz to 3 GHz from IEEE Std 1528™-2003



FCC SAR Test Report

Error Description	Uncertainty	Probability	Divisor	Ci	Ci	Standard	Standard
	Value (±%)	Distribution		(1g)	(10g)	Uncertainty (1g)	Uncertainty (10g)
Measurement System							
Probe Calibration	6.55	Normal	1	1	1	± 6.55 %	± 6.55 %
Axial Isotropy	4.7	Rectangular	√3	0.7	0.7	± 1.9 %	± 1.9 %
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	0.7	± 3.9 %	± 3.9 %
Boundary Effects	2.0	Rectangular	√3	1	1	± 1.2 %	± 1.2 %
Linearity	4.7	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
System Detection Limits	1.0	Rectangular	√3	1	1	± 0.6 %	± 0.6 %
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %
Response Time	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Integration Time	2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
RF Ambient Noise	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
RF Ambient Reflections	3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %
Probe Positioner	0.8	Rectangular	√3	1	1	± 0.5 %	± 0.5 %
Probe Positioning	9.9	Rectangular	√3	1	1	± 5.7 %	± 5.7 %
Max. SAR Eval.	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Test Sample Related							
Device Positioning	2.9	Normal	1	1	1	± 2.9 %	± 2.9 %
Device Holder	3.6	Normal	1	1	1	± 3.6 %	± 3.6 %
Power Drift	5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %
Phantom and Setup							
Phantom Uncertainty	4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %
Liquid Conductivity (Meas.)	2.5	Normal	1	0.64	0.43	± 1.6 %	± 1.1 %
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	0.49	± 1.7 %	± 1.4 %
Liquid Permittivity (Meas.)	2.5	Normal	1	0.6	0.49	± 1.5 %	± 1.2 %
Combined Standard Uncertainty						± 12.8 %	± 12.6 %
Coverage Factor for 95 %						K=2	
Expanded Uncertainty						± 25.6 %	± 25.2 %

Table 13.3 Uncertainty Budget of DASYS for frequency range 3 GHz to 6 GHz from IEEE Std 1528™-2003



14. References

- [1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”
- [2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992
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- [4] FCC OET Bulletin 65 (Edition 97-01) Supplement C (Edition 01-01), “Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields”, June 2001
- [5] SPEAG DASY System Handbook
- [6] FCC KDB 248227 D01 v01r02, “SAR Measurement Procedures for 802.11 a/b/g Transmitters”, May 2007
- [7] FCC KDB 447498 D01 v05, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, October 2012
- [8] FCC KDB 865664 D01 v01, “SAR Measurement Requirements for 100MHz to 6 GHz”, October 2012
- [9] FCC KDB 648474 D04 v01, “SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas”, October 2012
- [10] FCC KDB 941225 D01 v02, “SAR Measurement Procedures for 3G Devices – CDMA 2000 / Ev-Do / WCDMA / HSDPA / HSPA”, October 2007.
- [11] FCC KDB 941225 D03 v01, “Recommended SAR Test Reduction Procedures for GSM / GPRS / EDGE”, December 2008
- [12] FCC KDB 941225 D06 v01, “SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities”, April 2011



Appendix A. Plots of System Performance Check

The plots are shown as follows.

System Check_Head_835MHz_130201

DUT: D835V2 - SN:4d091

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL_835_130201 Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.88 \text{ mho/m}$; $\epsilon_r = 40.875$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : $23.4 \text{ }^\circ\text{C}$; Liquid Temperature : $21.4 \text{ }^\circ\text{C}$

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(8.74, 8.74, 8.74); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.449 mW/g

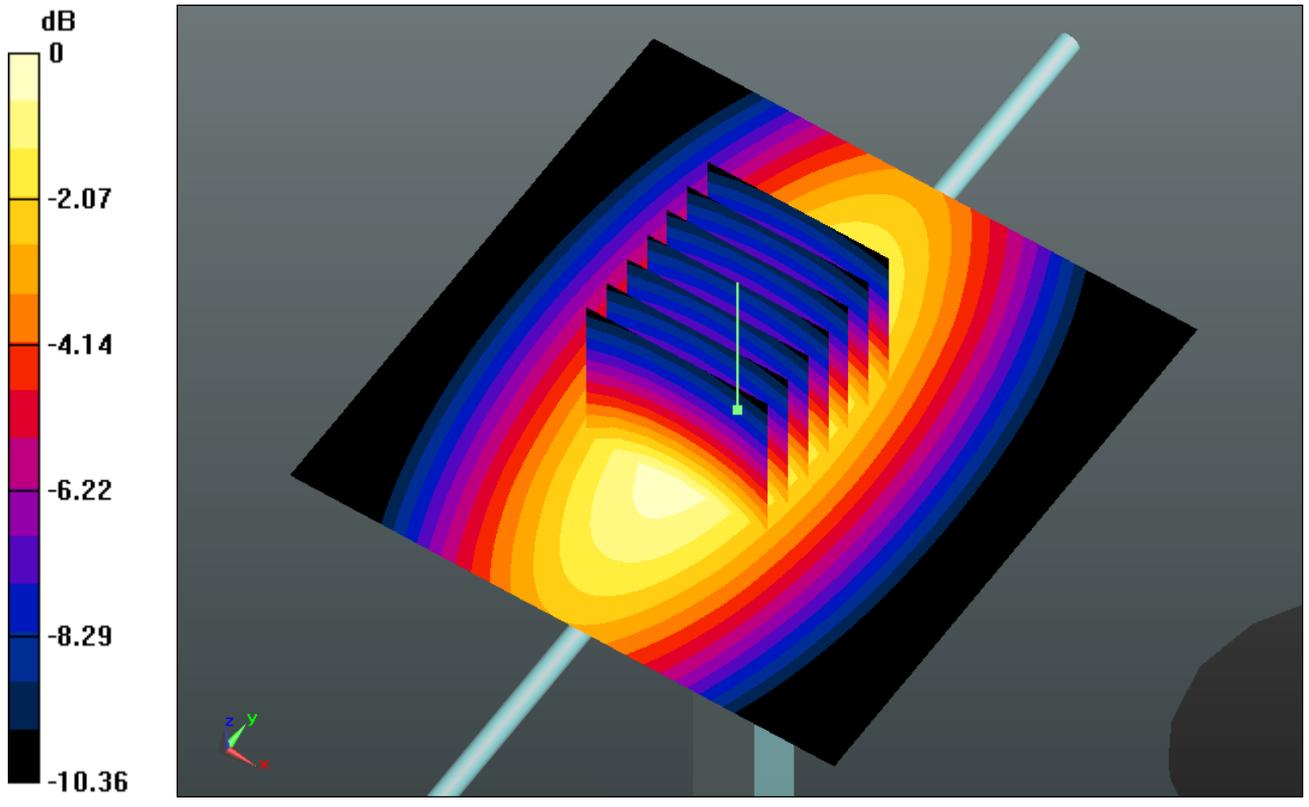
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 53.285 V/m ; Power Drift = 0.0073 dB

Peak SAR (extrapolated) = 3.303 W/kg

SAR(1 g) = 2.27 mW/g ; SAR(10 g) = 1.5 mW/g

Maximum value of SAR (measured) = 2.459 mW/g



System Check_Head_1900MHz_130201

DUT: D1900V2 - SN:5d118

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL_1900_130201 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.425$ mho/m; $\epsilon_r =$

38.952 ; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(7.84, 7.84, 7.84); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 11.398 mW/g

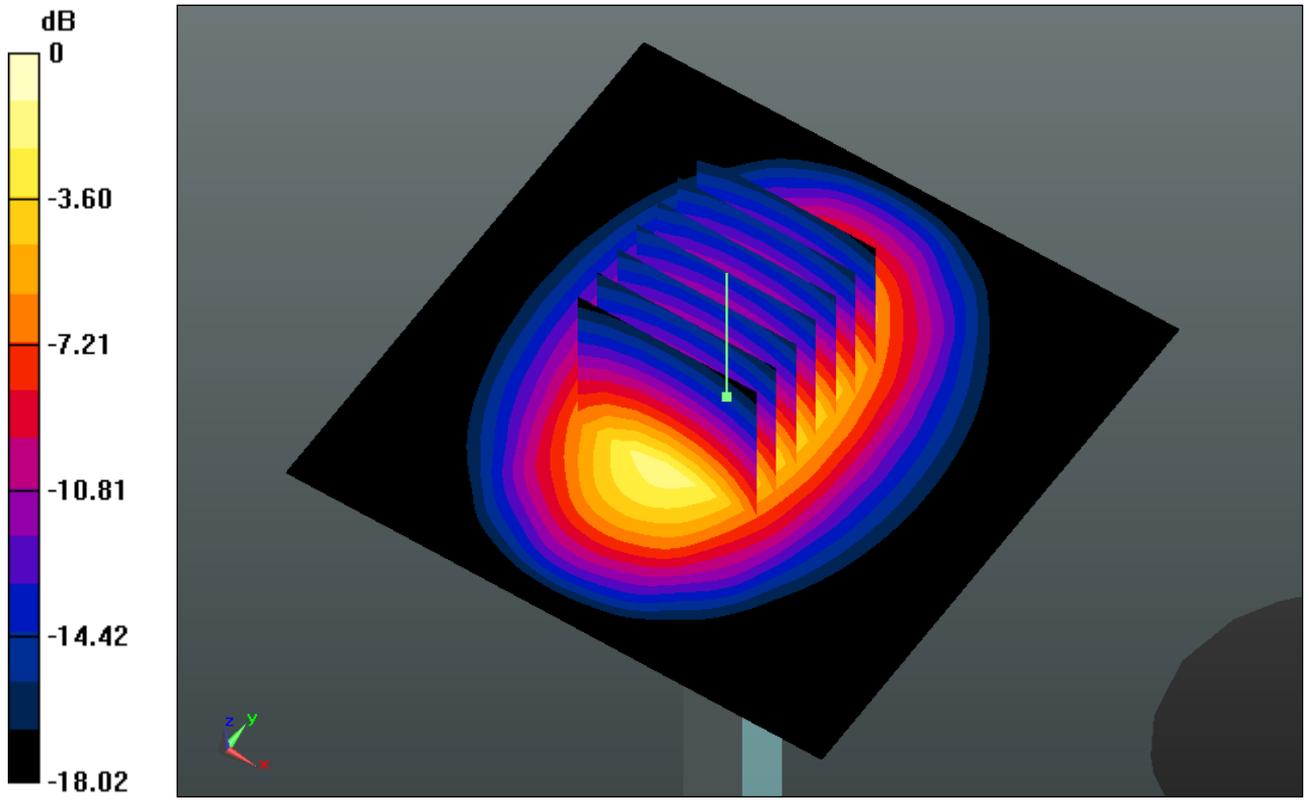
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.662 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 18.977 W/kg

SAR(1 g) = 10 mW/g; SAR(10 g) = 5.15 mW/g

Maximum value of SAR (measured) = 11.293 mW/g



0 dB = 11.290mW/g

System Check_Head_2450MHz_130217

DUT: D2450V2 - SN:736

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL_2450_130217 Medium parameters used: $f = 2450$ MHz; $\sigma = 1.829$ mho/m; $\epsilon_r =$

40.081 ; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C ; Liquid Temperature : 21.3 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(6.87, 6.87, 6.87); Calibrated: 2012-6-20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2012-12-5
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (71x71x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (interpolated) = 21.589 mW/g

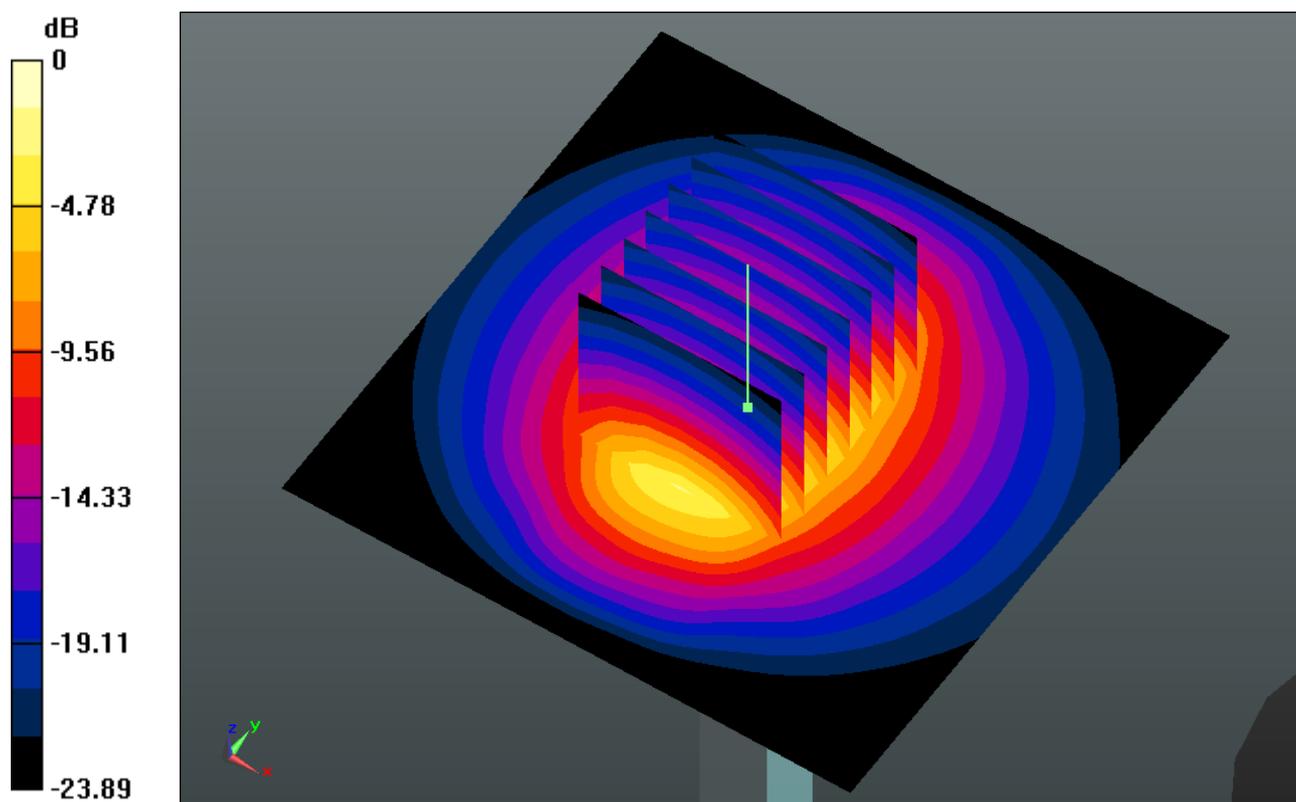
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.314 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 28.544 W/kg

SAR(1 g) = 13.5 mW/g; SAR(10 g) = 6.09 mW/g

Maximum value of SAR (measured) = 20.945 mW/g



0 dB = 20.940mW/g