

**7.1.6. Conducted Power Measurement Results(Bluetooth)**

Test Mode	Antenna	Frequency [MHz]	Result[dBm]	Tune up
DH5	Ant1	2402	2.51	3.00
		2441	2.77	3.00
		2480	2.39	3.00
2DH5	Ant1	2402	2.17	3.00
		2441	2.63	3.00
		2480	1.94	2.00
3DH5	Ant1	2402	2.22	3.00
		2441	2.66	3.00
		2480	2.15	3.00

Test Mode	Antenna	Frequency [MHz]	Result[dBm]	Tune up
BLE	Ant1	2402	2.24	3.00
		2440	2.66	3.00
		2480	2.23	3.00





7.2. Stand-alone SAR test evaluation

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and Product specific 10g SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

Freq. Band	Frequency (GHz)	Position	Average Power		Test Separation (mm)	Calculate Value	Exclusion Threshold	Exclusion (Y/N)
			dBm	mW				
Bluetooth	2.48	Head	3.00	2.00	5	0.628	3	Y
	2.48	Body-worn	3.00	2.00	10	0.314	3	Y
	2.48	hotspot	3.00	2.00	10	0.314	3	Y

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:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ 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

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.





7.3. SAR Measurement Results

The calculated SAR is obtained by the following formula:

$$\text{Reported SAR} = \text{Measured SAR} * 10^{(P_{\text{target}} - P_{\text{measured}})/10}$$

$$\text{Scaling factor} = 10^{(P_{\text{target}} - P_{\text{measured}})/10}$$

$$\text{Reported SAR} = \text{Measured SAR} * \text{Scaling factor}$$

Where

P_{target} is the power of manufacturing upper limit;

P_{measured} is the measured power;

Measured SAR is measured SAR at measured power which including power drift)

Reported SAR which including Power Drift and Scaling factor

7.3.1. SAR Results[GSM 850]

SAR Values [GSM850]								
Ch/ Freq. (MHz)	Channel Type	Test Position	Conducted Power (dBm)	Maximum Allowed Power (dBm)	PowerDrift (dB)	Scaling Factor	SAR _{1-g} results(W/kg)	
							Measured	Reported
measured / reported SAR numbers – Head Test data								
190/836.6	GSM	Left Cheek	32.71	33.00	0.00	1.069	0.245	0.262
190/836.6	GSM	Left Tilt	32.71	33.00	-0.13	1.069	0.125	0.134
190/836.6	GSM	Right Cheek	32.71	33.00	-0.04	1.069	0.276	0.295
190/836.6	GSM	Right Tilt	32.71	33.00	0.02	1.069	0.119	0.127
measured / reported SAR numbers - Body (distance 5mm)								
190/836.6	GPRS 4TS	Front side	28.01	29.00	0.11	1.256	0.216	0.271
190/836.6	GPRS 4TS	Rear side	28.01	29.00	-0.02	1.256	0.320	0.402
190/836.6	GPRS 4TS	Left side	28.01	29.00	0.02	1.256	0.254	0.319
190/836.6	GPRS 4TS	Right side	28.01	29.00	-0.02	1.256	0.089	0.112
190/836.6	GPRS 4TS	Top side	28.01	29.00	-0.05	1.256	0.091	0.114
190/836.6	GPRS 4TS	Bottom side	28.01	29.00	-0.14	1.256	0.274	0.344

Note:

- 1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per KDB447498 D01, 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:
 - $\leq 0.8\text{W/kg}$ for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200\text{ MHz}$.
- 3) Body worn mode and hotspot mode use the same test distance for 10mm. The above data only reflects hotspot mode





7.3.2. SAR Results[PCS 1900]

SAR Values [GSM1900]								
Ch/ Freq. (MHz)	Channel Type	Test Position	Conducted Power (dBm)	Maximum Allowed Power (dBm)	PowerDrift (dB)	Scaling Factor	SAR _{1-g} results(W/kg)	
							Measured	Reported
measured / reported SAR numbers – Head Test data								
661/1880	GSM	Left Cheek	29.67	30.00	-0.07	1.079	0.094	0.101
661/1880	GSM	Left Tilt	29.67	30.00	0.19	1.079	0.074	0.080
661/1880	GSM	Right Cheek	29.67	30.00	-0.07	1.079	0.107	0.115
661/1880	GSM	Right Tilt	29.67	30.00	0.10	1.079	0.069	0.074
measured / reported SAR numbers - Body (distance 5mm)								
661/1880	GPRS 4TS	Front side	24.96	25.50	-0.14	1.132	0.424	0.480
661/1880	GPRS 4TS	Rear side	24.96	25.50	0.11	1.132	0.513	0.581
661/1880	GPRS 4TS	Left side	24.96	25.50	0.01	1.132	0.398	0.451
661/1880	GPRS 4TS	Right side	24.96	25.50	-0.10	1.132	0.314	0.356
661/1880	GPRS 4TS	Top side	24.96	25.50	0.16	1.132	0.116	0.131
661/1880	GPRS 4TS	Bottom side	24.96	25.50	0.00	1.132	0.429	0.486

Note:

- 1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per KDB447498 D01, 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:
 - $\leq 0.8\text{W/kg}$ for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200\text{ MHz}$.
- 3) Body worn mode and hotspot mode use the same test distance for 10mm. The above data only reflects hotspot mode





7.3.3. SAR Results [WCDMA Band II]

SAR Values [WCDMA Band II]								
Ch/ Freq. (MHz)	Channel Type	Test Position	Conducted Power (dBm)	Maximum Allowed Power (dBm)	PowerDrift (dB)	Scaling Factor	SAR _{1-g} results(W/kg)	
							Measured	Reported
measured / reported SAR numbers – Head Test data								
9400/1880	RMC	Left Cheek	23.63	24.00	0.01	1.089	0.184	0.200
9400/1880	RMC	Left Tilt	23.63	24.00	-0.09	1.089	0.134	0.146
9400/1880	RMC	Right Cheek	23.63	24.00	-0.08	1.089	0.192	0.209
9400/1880	RMC	Right Tilt	23.63	24.00	-0.07	1.089	0.155	0.169
measured / reported SAR numbers - Body (distance 5mm)								
9400/1880	RMC	Front side	23.63	24.00	0.02	1.089	0.376	0.409
9400/1880	RMC	Rear side	23.63	24.00	0.19	1.089	0.507	0.552
9400/1880	RMC	Left side	23.63	24.00	-0.07	1.089	0.324	0.353
9400/1880	RMC	Right side	23.63	24.00	0.04	1.089	0.218	0.237
9400/1880	RMC	Top side	23.63	24.00	0.18	1.089	0.087	0.095
9400/1880	RMC	Bottom side	23.63	24.00	-0.12	1.089	0.424	0.462

Note:

- 1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per KDB447498 D01, 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:
 - $\leq 0.8\text{W/kg}$ for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200\text{ MHz}$.
- 3) RMC* - RMC 12.2kbps mode;
- 4) Body worn mode and hotspot mode use the same test distance for 10mm. The above data only reflects hotspot mode





7.3.4. SAR Results [WCDMA Band V]

SAR Values [WCDMA Band V]								
Ch/ Freq. (MHz)	Channel Type	Test Position	Conducted Power (dBm)	Maximum Allowed Power (dBm)	PowerDrift (dB)	Scaling Factor	SAR _{1-g} results(W/kg)	
							Measured	Reported
measured / reported SAR numbers – Head Test data								
4182/836.4	RMC	Left Cheek	23.28	24.00	0.13	1.180	0.245	0.289
4182/836.4	RMC	Left Tilt	23.28	24.00	-0.17	1.180	0.213	0.251
4182/836.4	RMC	Right Cheek	23.28	24.00	0.19	1.180	0.297	0.351
4182/836.4	RMC	Right Tilt	23.28	24.00	-0.14	1.180	0.232	0.274
measured / reported SAR numbers - Body (distance 5mm)								
4182/836.4	RMC	Front side	23.28	24.00	-0.18	1.180	0.151	0.178
4182/836.4	RMC	Rear side	23.28	24.00	0.04	1.180	0.227	0.268
4182/836.4	RMC	Left side	23.28	24.00	0.09	1.180	0.174	0.205
4182/836.4	RMC	Right side	23.28	24.00	0.19	1.180	0.123	0.145
4182/836.4	RMC	Top side	23.28	24.00	0.04	1.180	0.101	0.119
4182/836.4	RMC	Bottom side	23.28	24.00	0.10	1.180	0.207	0.244

Note:

- 1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per KDB447498 D01, 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:
 - $\leq 0.8\text{W/kg}$ for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1-g or 10-g respectively, when the transmission band is $\geq 200\text{ MHz}$.
- 3) RMC* - RMC 12.2kbps mode;
- 4) Body worn mode and hotspot mode use the same test distance for 10mm. The above data only reflects hotspot mode





7.3.5. SAR Results [WIFI 2.4G]

SAR Values [WIFI 2.4G]									
Ch/ Freq. (MHz)	Channel Type	Test Position	Duty Cycle	Conducted Power (dBm)	Maximum Allowed Power (dBm)	PowerDrift (dB)	Scaling Factor	SAR _{1-g} results(W/kg)	
								Measured	Reported
measured / reported SAR numbers – Head Test data									
11/2462	802.11b	Left Cheek	1.002	12.97	13.00	0.07	1.007	0.539	0.544
11/2462	802.11b	Left Tilt	1.002	12.97	13.00	0.18	1.007	0.422	0.426
11/2462	802.11b	Right Cheek	1.002	12.97	13.00	0.09	1.007	0.415	0.419
11/2462	802.11b	Right Tilt	1.002	12.97	13.00	0.05	1.007	0.396	0.400
measured / reported SAR numbers - Body (distance 5mm)									
11/2462	802.11b	Front side	1.002	12.97	13.00	-0.15	1.007	0.267	0.269
11/2462	802.11b	Rear side	1.002	12.97	13.00	-0.01	1.007	0.538	0.543
11/2462	802.11b	Left side	1.002	12.97	13.00	-0.11	1.007	0.241	0.243
11/2462	802.11b	Right side	1.002	12.97	13.00	0.02	1.007	0.302	0.305
11/2462	802.11b	Top side	1.002	12.97	13.00	0.12	1.007	0.443	0.447
11/2462	802.11b	Bottom side	1.002	12.97	13.00	-0.12	1.007	0.105	0.106

Note:

- 1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.
- 2) Per KDB 648474 D04, Product Specific 10-g SAR test is not required for this frequency band since hotspot mode 1-g reported SAR < 1.2 W/kg.
- 3) When the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test for the other 802.11 modes are not required.
- 4) Body worn mode and hotspot mode use the same test distance for 10mm. The above data only reflects hotspot mode





7.4. Multiple Transmitter Evaluation

7.4.1. Simultaneous SAR test evaluation

Simultaneous Transmission Possibilities

NO.	Simultaneous Tx Combination	Head	Body-worn	Hotspot
1	GSM Voice + BT	Yes	Yes	Yes
2	GSM DATA + BT	Yes	Yes	Yes
3	GSM Voice + WiFi 2.4G	Yes	Yes	Yes
4	GSM DATA + WiFi 2.4G	Yes	Yes	Yes
5	UMTS + BT	Yes	Yes	Yes
6	UMTS + WiFi 2.4G	Yes	Yes	Yes

Note:

- 1) Wi-Fi 2.4G and Bluetooth share the same Tx antenna and can't transmit simultaneously.
- 2) The device does not support DTM function.





7.4.2. Estimated SAR

When the standalone SAR test exclusion is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the 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.

When the minimum test separation distance is $< 5 \text{ mm}$, a distance of 5 mm is applied to determine SAR test exclusion.

Estimated SAR Result

Freq. Band	Frequency (GHz)	Position	max. power (dBm)	max. power (mw)	Test Separation (mm)	Estimated
						1g SAR (W/kg)
Bluetooth	2.48	Head	3.00	2.00	5	0.084
	2.48	Body-worn	3.00	2.00	10	0.042
	2.48	hotspot	3.00	2.00	10	0.042



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7.4.3. Simultaneous Transmission SAR Summation Scenario

Test position		Main Antenna SAR _{max} (W/kg)				WiFi/BT Antenna SAR _{max} (W/kg)		Summed 1g SAR _{max} (W/kg)
		GSM850	GSM1900	WCDMA Band II	WCDMA Band V	WLAN 2.4G	BT	
Head	Left cheek	0.262	0.101	0.200	0.289	0.544	0.084	0.833
	Left tilted	0.134	0.080	0.146	0.251	0.426	0.084	0.677
	Right cheek	0.295	0.115	0.209	0.351	0.419	0.084	0.770
	Right tilted	0.127	0.074	0.169	0.274	0.400	0.084	0.674
Hotspot 10mm	Front side	0.271	0.480	0.409	0.178	0.269	0.042	0.749
	Back side	0.402	0.581	0.552	0.268	0.543	0.042	1.124
	Left side	0.319	0.451	0.353	0.205	0.243	0.042	0.694
	Right side	0.112	0.356	0.237	0.145	0.305	0.042	0.661
	Top side	0.114	0.131	0.095	0.119	0.447	0.042	0.578
	Bottom side	0.344	0.486	0.462	0.244	0.106	0.042	0.592





Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

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