

LG Electronics Model : LM-V600AM

PART 0 SAR CHAR REPORT

Rev. E

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Report Type: Part 0 SAR Characterization

DUT Type: Portable Handset

Test Lab : LG MC R&D Lab

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1. INTRODUCTION

Qualcomm Smart Transmit cannot operate without SAR at the device level, beforehand. The parameters obtained from SAR (referred to as SAR char) will be used as input for Smart Transmit. SAR char will be entered via the Embedded File System (EFS) to enable the Smart Transmit feature.

2. DEVICE UNDER TEST

2.1. Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.2 - 848.8 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.2 - 1909.8 MHz
UMTS 850	Voice/Data	827 - 846.6 MHz
UMTS 1900	Voice/Data	1854.2 - 1906.6 MHz
UMTS 1700	Voice/Data	1712 - 1753 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 14	Voice/Data	790.5 – 795.5 MHz
LTE Band 30	Voice/Data	2305 - 2315 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
LTE Band 66 (AWS)	Voice/Data	1710.7 - 1779.3 MHz
NR n2	Data	1852.5 – 1907.5 MHz
NR n5	Data	826.5 – 846.5 MHz
NR n66	Data	1712.5 – 1777.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2462 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

This device uses the Qualcomm® Smart Transmit feature to control and manage transmitting power in real time and to ensure the time-averaged RF exposure is in compliance with the FCC requirement at all times for 2G/3G/4G/5G WWAN operations. Additionally, this device supports WLAN/BT/NFC technologies but the output power of these modems is not controlled by the Smart Transmit algorithm.

2.2 Time-Averaging for SAR

This device is enabled with Qualcomm® Smart Transmit algorithm to control and manage transmitting power in real time and to ensure that the time-averaged RF exposure from 2G/3G/4G/5G NR Sub6 WWAN is in compliance with FCC requirements. This Part 0 report shows SAR characterization of WWAN radios for 2G/3G/4G/5G NR Sub6. Characterization is achieved by determining PLimit for 2G/3G/4G/5G NR Sub6 that correspond to the exposure design targets after accounting for all device design related uncertainties, i.e., SAR_design_target (< FCC SAR limit) for sub-6 radio. The SAR characterization is denoted as SAR Char in this report. Section 3.3 includes a nomenclature of the specific terms used in this report. The compliance test under the static transmission scenario and simultaneous transmission analysis are reported in Part 1 report. The validation of the time-averaging algorithm and compliance under the dynamic (time- varying) transmission scenario for WWAN technologies are reported in Part 2 report

2.3 Nomenclature for Part 0 Report

Technology	Term	Description
2G/3G/4G/ 5G NR Sub6	PLimit	Power level that corresponds to the exposure design target (SAR_design_target) after accounting for all device design related uncertainties
	Pmax	Maximum tune up output power
	SAR_design_target	Target SAR level < FCC SAR limit after accounting for all device design related uncertainties
	SAR Char	Table containing PLimit for all technologies and bands
	Reserve_power_margin	The margin, in dB, below the PLimit to reserve for future transmission with a minimum transmit power

3 SAR CHARACTERIZATION

3.1 DSI and SAR Determination

This device uses different Device State Index (DSI) to configure different time averaged power levels based on certain exposure scenarios. Depending on the detection scheme implemented in the smartphone, the worst-case SAR was determined by measurements for the relevant exposure conditions for that DSI. Detailed descriptions of the detection mechanisms are included in the operational description.

When 1g SAR and 10g SAR exposure comparison is needed, the worst-case was determined from SAR normalized to 1g or 10g SAR limit. The device state index (DSI) conditions used in Table 3-1 represent different exposure scenarios.

Table 3-1 DSI and Corresponding Exposure Scenarios

Scenario	Description	SAR Test Cases
Hotspot mode (DSI = 5)	<ul style="list-style-type: none"> ■ Device transmits in hotspot mode near body ■ Hotspot Mode Active 	Hotspot SAR per KDB Publication 941225 D06
Proximity sensor active (DSI=8)	<ul style="list-style-type: none"> ■ Device transmits near body and proximity sensor is triggered ■ Proximity sensor triggered 	Phablet SAR per KDB Publication 648474 D04 & KDB Publication 616217 D04

3.2 SAR Design Target

SAR_design_target is determined by ensuring that it is less than FCC SAR limit after accounting for total device designed related uncertainties specified by the manufacturer (see Table 3-2). The *reserve_power_margin* is 3dB.

Table 3-2 SAR_design_target Calculations

SAR_design_target			
$SAR_design_target < SAR_regulatory_limit \times 10^{-Total\ Uncertainty/10}$			
1g SAR (W/kg)		10g SAR (W/kg)	
Total Uncertainty	0.5 dB	Total Uncertainty	0.5 dB
SAR_regulatory_limit	1.6 W/kg	SAR_regulatory_limit	4.0 W/kg
SAR_design_target	1.13 W/kg	SAR_design_target	2.83 W/kg

3.3 SAR Char

SAR test results corresponding to P_{max} for each antenna/technology/band/DSI can be found in Appendix A. P_{limit} is calculated by linearly scaling with the measured SAR at the P_{max} to correspond to the SAR_{design_target} . P_{limit} determination for each exposure scenario corresponding to SAR_{design_target} are shown in Table 3-3.

Table 3-3 P_{Limit} Determination

Device State Index (DSI)	P_{Limit} Determination Scenarios
1	The worst-case SAR exposure is determined as maximum SAR normalized to the limit among: 1. 1g Head SAR and 2. Body Worn SAR and 3. Extremity SAR measured at 2, 1 and 3 mm spacing for back, front, bottom respectively 4. Extremity SAR measured at 0mm for left and right surfaces
5	P_{limit} is calculated based on 1g Hotspot SAR at 10 mm
6	Dual screen attaches at 0 or 360 degrees
7	Dual screen attaches at 180 degree
8	P_{limit} is calculated based on 10g Extremity SAR at 0 mm for back, bottom, and front surfaces

Note:

For DSI = 1, P_{limit} is calculated by:

$$P_{limit} = \min\left\{ \begin{array}{l} P_{limit} \text{ corresponding to 1g Head SAR at 0 mm spacing,} \\ P_{limit} \text{ corresponding to 1g Body Worn SAR evaluation at 10 mm spacing,} \\ P_{limit} \text{ corresponding to 10g Extremity SAR evaluation at 1~3 mm spacing,} \\ P_{limit} \text{ corresponding to 10g Extremity SAR evaluation at 0 mm for left and right surfaces} \end{array} \right\}$$

Table 3-4 SAR Characterizations

Mode/Band	DSI=1	DSI=6	DSI=7	DSI=5	DSI=8	Pmax*
	proximity sensor de-active	Dual Screen 0 or 360 degree	Dual Screen 180 degree	Hotspot mode	proximity sensor active	
	PLimit	PLimit	PLimit	PLimit	PLimit	
	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	
GSM850**	26.2	26.2	26.2	26.2	26.2	24.5
GSM1900**	23.0	23.0	23.0	23.0	23.0	22.5
WCDMA B5	27.6	27.6	27.6	27.6	27.6	25.0
WCDMA B2	25.9	25.9	25.9	22.2	22.2	24.7
WCDMA B4	26.5	26.5	26.5	22.2	22.2	24.7
LTE B12	30.1	30.1	30.1	30.1	30.1	25.0
LTE B14	29.8	29.8	29.8	29.8	29.8	25.0
LTE B5	28.6	28.6	28.6	28.6	28.6	25.0
LTE B2(25)	25.8	25.8	25.8	22.2	22.2	24.7
LTE B66(4)	25.6	25.6	25.6	22.2	22.2	24.7
LTE B30	25.0	25.0	25.0	25.0	25.0	22.2
LTE B41 (PC3)**	23.8	23.8	23.8	23.8	23.8	22.7
NR n5	29.4	29.4	29.4	29.4	29.4	24.2
NR n2	23.2	23.2	23.2	23.2	23.2	25.0
NR n66	23.4	23.4	23.4	23.4	23.4	25.0

Notes:

1. DSI=1 is corresponding to head SAR, body-worn SAR and extremity SAR at larger separation distances that do not trigger the proximity sensor.
 2. When Hotspot Mode (DSI=5) and Extremity sensor (DSI=8) are triggered at the same time, DSI=5 takes priority, thus the P_{limit} for DSI=5 is set to be less or equal to P_{limit} for DSI=8.
 3. When Dual screen attached (DSI=6 or 7) and Extremity sensor (DSI=8) are triggered at the same time, DSI=8 takes priority.
 4. Plimits for DSI=6 and 7 is equal to Plimits for DSI=1.
 5. When $P_{max} < P_{Limit}$, the DUT will operate at a power level up to P_{max} .
- *Pmax is used for RF tune up procedure. The maximum allowed output power is equal to Pmax + device uncertainty.
- **All PLimit power levels entered in Table 3-4 correspond to average power levels after accounting for duty cycle in the case TDD modulation schemes (for e.g., GSM & LTE TDD & NR TDD).

APPENDIX A: SAR TEST RESULTS FOR P_{Limit} CALCULATIONS

Table A-1 DSI = 1 P_{Limit} Calculations – 2G/3G Head SAR

Frequency		Mode	Service	Conducted Power	Test Position	Spacing	Duty Cycle	SAR (1g)	SAR design target	Plimit	Min Plimit
MHz	Ch.			[dBm]				[W/kg]	[W/kg]		[dBm]
836.6	190	GSM850	GSM	32.9	Right	Cheek	1:8.3	0.085	1.13	35.0	33.7
836.6	190	GSM850	GSM	32.9	Right	Tilt	1:8.3	0.068	1.13	35.9	
836.6	190	GSM850	GSM	32.9	Left	Cheek	1:8.3	0.113	1.13	33.7	
836.6	190	GSM850	GSM	32.9	Left	Tilt	1:8.3	0.055	1.13	36.9	
836.6	190	GSM850	GPRS	30.7	Right	Cheek	1:4.15	0.079	1.13	36.1	
836.6	190	GSM850	GPRS	30.7	Right	Tilt	1:4.15	0.059	1.13	37.4	
836.6	190	GSM850	GPRS	30.7	Left	Cheek	1:4.15	0.114	1.13	34.5	
836.6	190	GSM850	GPRS	30.7	Left	Tilt	1:4.15	0.055	1.13	37.7	
1880	661	GSM1900	GSM	29.7	Right	Cheek	1:8.3	0.029	1.13	36.5	35.9
1880	661	GSM1900	GSM	29.7	Right	Tilt	1:8.3	0.029	1.13	36.5	
1880	661	GSM1900	GSM	29.7	Left	Cheek	1:8.3	0.027	1.13	36.7	
1880	661	GSM1900	GSM	29.7	Left	Tilt	1:8.3	0.021	1.13	37.9	
1880	661	GSM1900	GPRS	28.7	Right	Cheek	1:4.15	0.052	1.13	35.9	
1880	661	GSM1900	GPRS	28.7	Right	Tilt	1:4.15	0.042	1.13	36.8	
1880	661	GSM1900	GPRS	28.7	Left	Cheek	1:4.15	0.047	1.13	36.4	
1880	661	GSM1900	GPRS	28.7	Left	Tilt	1:4.15	0.036	1.13	37.5	
836.6	4183	UMTS850	RMC	25	Right	Cheek	1:1	0.168	1.13	33.3	33.0
836.6	4183	UMTS850	RMC	25	Right	Tilt	1:1	0.102	1.13	35.5	
836.6	4183	UMTS850	RMC	25	Left	Cheek	1:1	0.180	1.13	33.0	
836.6	4183	UMTS850	RMC	25	Left	Tilt	1:1	0.089	1.13	36.0	
1880	9400	UMTS1900	RMC	24.7	Right	Cheek	1:1	0.109	1.13	34.9	34.9
1880	9400	UMTS1900	RMC	24.7	Right	Tilt	1:1	0.082	1.13	36.1	
1880	9400	UMTS1900	RMC	24.7	Left	Cheek	1:1	0.077	1.13	36.4	
1880	9400	UMTS1900	RMC	24.7	Left	Tilt	1:1	0.073	1.13	36.6	
1732.4	1412	UMTS1750	RMC	24.7	Right	Cheek	1:1	0.064	1.13	37.2	34.8
1732.4	1412	UMTS1750	RMC	24.7	Right	Tilt	1:1	0.050	1.13	38.3	
1732.4	1412	UMTS1750	RMC	24.7	Left	Cheek	1:1	0.110	1.13	34.8	
1732.4	1412	UMTS1750	RMC	24.7	Left	Tilt	1:1	0.063	1.13	37.2	

Table A-2 DSI = 1 P_{Limit} Calculations – LTE B12/14/5 Head SAR

Frequency		Mode	Bandwidth	Conducted Power	Modulation	RB Size	RB offset	Test Position	Spacing	Duty Cycle	SAR (1g)	SAR design target	Plimit	Min Plimit
MHz	Ch.			[MHz]							[dBm]	[W/kg]		[W/kg]
707.5	23095	LTE Band12	10	25	QPSK	1	25	Right	Cheek	1:1	0.126	1.13	34.5	33.8
707.5	23095	LTE Band12	10	24	QPSK	25	25	Right	Cheek	1:1	0.101	1.13	34.5	
707.5	23095	LTE Band12	10	25	QPSK	1	25	Right	Tilt	1:1	0.077	1.13	36.7	
707.5	23095	LTE Band12	10	24	QPSK	25	25	Right	Tilt	1:1	0.051	1.13	37.5	
707.5	23095	LTE Band12	10	25	QPSK	1	25	Left	Cheek	1:1	0.149	1.13	33.8	
707.5	23095	LTE Band12	10	24	QPSK	25	25	Left	Cheek	1:1	0.103	1.13	34.4	
707.5	23095	LTE Band12	10	25	QPSK	1	25	Left	Tilt	1:1	0.089	1.13	36.1	
707.5	23095	LTE Band12	10	24	QPSK	25	25	Left	Tilt	1:1	0.057	1.13	37.0	
793	23330	LTE Band14	10	25	QPSK	1	0	Right	Cheek	1:1	0.140	1.13	34.1	34.1
793	23330	LTE Band14	10	24	QPSK	25	0	Right	Cheek	1:1	0.089	1.13	35.1	
793	23330	LTE Band14	10	25	QPSK	1	0	Right	Tilt	1:1	0.076	1.13	36.7	
793	23330	LTE Band14	10	24	QPSK	25	0	Right	Tilt	1:1	0.048	1.13	37.7	
793	23330	LTE Band14	10	25	QPSK	1	0	Left	Cheek	1:1	0.136	1.13	34.2	
793	23330	LTE Band14	10	24	QPSK	25	0	Left	Cheek	1:1	0.089	1.13	35.0	
793	23330	LTE Band14	10	25	QPSK	1	0	Left	Tilt	1:1	0.067	1.13	37.3	
793	23330	LTE Band14	10	24	QPSK	25	0	Left	Tilt	1:1	0.043	1.13	38.2	
836.5	20525	LTE Band5	10	25	QPSK	1	0	Right	Cheek	1:1	0.126	1.13	34.5	33.9
836.5	20525	LTE Band5	10	24	QPSK	25	12	Right	Cheek	1:1	0.097	1.13	34.7	
836.5	20525	LTE Band5	10	25	QPSK	1	0	Right	Tilt	1:1	0.081	1.13	36.5	
843.7	20525	LTE Band5	10	24	QPSK	25	12	Right	Tilt	1:1	0.058	1.13	36.9	
836.5	20525	LTE Band5	10	25	QPSK	1	0	Left	Cheek	1:1	0.143	1.13	34.0	
836.5	20525	LTE Band5	10	24	QPSK	25	12	Left	Cheek	1:1	0.110	1.13	34.1	
836.5	20525	LTE Band5	10	25	QPSK	1	0	Left	Cheek	1:1	0.145	1.13	33.9	
829.3	20453	LTE Band5	5			1	24			1:1				
836.5	20525	LTE Band5	10	25	QPSK	1	0	Left	Tilt	1:1	0.076	1.13	36.7	
836.5	20525	LTE Band5	10	24	QPSK	25	12	Left	Tilt	1:1	0.054	1.13	37.2	

Table A-3 DSI = 1 P_{Limit} Calculations – LTE B66(4)/2/30/41 Head SAR

Frequency		Mode	Bandwidth [MHz]	Conducted Power [dBm]	Modulation	RB Size	RB offset	Test Position	Spacing	Duty Cycle	SAR (1g)	SAR design target	Plimit [dBm]	Min Plimit [dBm]								
MHz	Ch.										[W/kg]	[W/kg]										
1880	18900	LTE Band2	20	24.7	QPSK	1	0	Right	Cheek	1:1	0.095	1.13	35.5	35.5								
1900	19100	LTE Band2	20	23.7	QPSK	50	25	Right	Cheek	1:1	0.071	1.13	35.7		35.5							
1880	18900	LTE Band2	20	24.7	QPSK	1	0	Right	Tilt	1:1	0.076	1.13	36.5			35.5						
1900	19100	LTE Band2	20	23.7	QPSK	50	25	Right	Tilt	1:1	0.057	1.13	36.7				35.5					
1880	18900	LTE Band2	20	24.7	QPSK	1	0	Left	Cheek	1:1	0.082	1.13	36.1					35.5				
1900	19100	LTE Band2	20	23.7	QPSK	50	25	Left	Cheek	1:1	0.059	1.13	36.5						35.5			
1880	18900	LTE Band2	20	24.7	QPSK	1	0	Left	Tilt	1:1	0.074	1.13	36.5							35.5		
1900	19100	LTE Band2	20	23.7	QPSK	50	25	Left	Tilt	1:1	0.047	1.13	37.5								35.5	
1770	132572	LTE Band66	20	24.7	QPSK	1	0	Right	Cheek	1:1	0.084	1.13	36.0									34.6
1770	132572	LTE Band66	20	23.7	QPSK	50	50	Right	Cheek	1:1	0.070	1.13	35.8									
1770	132572	LTE Band66	20	24.7	QPSK	1	0	Right	Tilt	1:1	0.070	1.13	36.8	34.6								
1770	132572	LTE Band66	20	23.7	QPSK	50	50	Right	Tilt	1:1	0.050	1.13	37.2		34.6							
1770	132572	LTE Band66	20	24.7	QPSK	1	0	Left	Cheek	1:1	0.104	1.13	35.1			34.6						
1770	132572	LTE Band66	20	23.7	QPSK	50	50	Left	Cheek	1:1	0.092	1.13	34.6				34.6					
1770	132572	LTE Band66	20	24.7	QPSK	1	0	Left	Tilt	1:1	0.069	1.13	36.8					34.6				
1770	132572	LTE Band66	20	23.7	QPSK	50	50	Left	Tilt	1:1	0.046	1.13	37.6						34.6			
2310	27710	LTE Band30	10	22.2	QPSK	1	0	Right	Cheek	1:1	0.040	1.13	36.7							36.2		
2310	27710	LTE Band30	10	21.2	QPSK	25	12	Right	Cheek	1:1	0.034	1.13	36.5								36.2	
2310	27710	LTE Band30	10	22.2	QPSK	1	0	Right	Tilt	1:1	0.019	1.13	40.0									36.2
2310	27710	LTE Band30	10	21.2	QPSK	25	12	Right	Tilt	1:1	0.013	1.13	40.8									
2310	27710	LTE Band30	10	22.2	QPSK	1	0	Left	Cheek	1:1	0.045	1.13	36.2	36.2								
2310	27710	LTE Band30	10	21.2	QPSK	25	12	Left	Cheek	1:1	0.031	1.13	36.8		36.2							
2310	27710	LTE Band30	10	22.2	QPSK	1	0	Left	Tilt	1:1	0.023	1.13	39.2			36.2						
2310	27710	LTE Band30	10	21.2	QPSK	25	12	Left	Tilt	1:1	0.015	1.13	40.1				36.2					
2593	40620	LTE Band41(PC3)	20	24.7	QPSK	1	50	Right	Cheek	1:1.58	0.034	1.13	38.0					36.4				
2593	40620	LTE Band41(PC3)	20	23.7	QPSK	50	25	Right	Cheek	1:1.58	0.026	1.13	38.1						36.4			
2593	40620	LTE Band41(PC3)	20	24.7	QPSK	1	50	Right	Tilt	1:1.58	0.019	1.13	40.4							36.4		
2593	40620	LTE Band41(PC3)	20	23.7	QPSK	50	25	Right	Tilt	1:1.58	0.011	1.13	41.8								36.4	
2593	40620	LTE Band41(PC3)	20	24.7	QPSK	1	50	Left	Cheek	1:1.58	0.048	1.13	36.4									36.4
2593	40620	LTE Band41(PC3)	20	23.7	QPSK	50	25	Left	Cheek	1:1.58	0.038	1.13	36.4									
2593	40620	LTE Band41(PC3)	20	24.7	QPSK	1	50	Left	Tilt	1:1.58	0.027	1.13	38.9	36.4								
2593	40620	LTE Band41(PC3)	20	23.7	QPSK	50	25	Left	Tilt	1:1.58	0.023	1.13	38.7		36.4							

Table A-4 DSI = 1 P_{Limit} Calculations – 5G NR n2/n5/n66 Head SAR

Frequency		Mode	Bandwidth [MHz]	Conducted Power [dBm]	Modulation	RB Size	RB offset	Test Position	Spacing	Duty Cycle	SAR (1g)	SAR design target	Plimit [dBm]	Min Plimit [dBm]								
MHz	Ch.										[W/kg]	[W/kg]										
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	1	53	Right	Cheek	1:1	0.042	1.13	38.5	37.2								
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	50	28	Right	Cheek	1:1	0.044	1.13	38.3		37.2							
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	1	53	Right	Tilt	1:1	0.027	1.13	40.5			37.2						
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	50	28	Right	Tilt	1:1	0.029	1.13	40.1				37.2					
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	1	53	Left	Cheek	1:1	0.052	1.13	37.6					37.2				
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	50	28	Left	Cheek	1:1	0.056	1.13	37.3						37.2			
836.5	167300	NR Band n5	20	23.2	CP-OFDM-QPSK	1	1	Left	Cheek	1:1	0.045	1.13	37.2							37.2		
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	1	53	Left	Tilt	1:1	0.022	1.13	41.3								37.2	
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	50	28	Left	Tilt	1:1	0.022	1.13	41.4									37.2
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	104	Right	Cheek	1:1	0.276	1.13	31.1									
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	50	56	Right	Cheek	1:1	0.283	1.13	31.0	31.0								
1880	376000	NR Band n2	20	25	CP-OFDM-QPSK	1	1	Right	Cheek	1:1	0.244	1.13	31.7		31.0							
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	104	Right	Tilt	1:1	0.089	1.13	36.0			31.0						
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	50	56	Right	Tilt	1:1	0.085	1.13	36.2				31.0					
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	104	Left	Cheek	1:1	0.122	1.13	34.7					31.0				
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	50	56	Left	Cheek	1:1	0.125	1.13	34.6						31.0			
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	104	Left	Tilt	1:1	0.097	1.13	35.7							31.0		
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	50	56	Left	Tilt	1:1	0.104	1.13	35.4								31.0	
1720	344000	NR Band n66	20	25	DFT-s-OFDM-QPSK	1	104	Right	Cheek	1:1	0.201	1.13	32.5									30.9
1720	344000	NR Band n66	20	25	CP-OFDM-QPSK	50	0	Right	Cheek	1:1	0.281	1.13	31.1									
1720	344000	NR Band n66	20	25	CP-OFDM-QPSK	1	1	Right	Cheek	1:1	0.290	1.13	30.9	30.9								
1720	344000	NR Band n66	20	25	DFT-s-OFDM-QPSK	1	104	Right	Tilt	1:1	0.047	1.13	38.9		30.9							
1720	344000	NR Band n66	20	25	CP-OFDM-QPSK	50	0	Right	Tilt	1:1	0.077	1.13	36.7			30.9						
1720	344000	NR Band n66	20	25	DFT-s-OFDM-QPSK	1	104	Left	Cheek	1:1	0.062	1.13	37.6				30.9					
1720	344000	NR Band n66	20	25	CP-OFDM-QPSK	50	0	Left	Cheek	1:1	0.109	1.13	35.2					30.9				
1720	344000	NR Band n66	20	25	DFT-s-OFDM-QPSK	1	104	Left	Tilt	1:1	0.048	1.13	38.7						30.9			
1720	344000	NR Band n66	20	25	CP-OFDM-QPSK	50	0	Left	Tilt	1:1	0.084	1.13	36.3							30.9		

Table A-5 DSI = 1 P_{Limit} Calculations – 2G/3G Body-Worn SAR

Frequency		Mode	Service	Conducted Power	Test Position	Spacing	Duty Cycle	SAR (1g)	SAR design target	Plimit	Min Plimit
MHz	Ch.			[dBm]				[W/kg]	[W/kg]		
836.6	190	GSM850	GSM	32.9	back	10mm	1:8.3	0.333	1.13	29.0	29.0
836.6	190	GSM850	GPRS	30.7	back	10mm	1:4.15	0.349	1.13	29.6	
1880	661	GSM1900	GSM	29.7	back	10mm	1:8.3	0.274	1.13	26.7	
1880	661	GSM1900	GPRS	28.7	back	10mm	1:4.15	0.466	1.13	26.4	26.4
826.4	4132	UMTS850	RMC	25	back	10mm	1:1	0.496	1.13	28.6	
836	4183	UMTS850	RMC	25	back	10mm	1:1	0.570	1.13	28.0	27.6
846.6	4233	UMTS850	RMC	25	back	10mm	1:1	0.629	1.13	27.6	
1880	9400	UMTS1900	RMC	24.7	back	10mm	1:1	0.699	1.13	26.8	
1732.4	1412	UMTS1750	RMC	24.7	back	10mm	1:1	0.689	1.13	26.9	26.8
											26.9

Table A-6 DSI = 1 P_{Limit} Calculations – 4G Body-Worn SAR

Frequency		Mode	Bandwidth	Conducted Power	Modulation	RB Size	RB offset	Test Position	Spacing	Duty Cycle	SAR (1g)	SAR design target	Plimit	Min Plimit
MHz	Ch.										[MHz]	[dBm]		
707.5	23095	LTE Band12	10	25	QPSK	1	25	back	10mm	1:1	0.299	1.13	30.8	30.8
707.5	23095	LTE Band12	10	24	QPSK	25	25	back	10mm	1:1	0.222	1.13	31.1	
793	23330	LTE Band14	10	25	QPSK	1	0	back	10mm	1:1	0.373	1.13	29.8	29.8
793	23330	LTE Band14	10	24	QPSK	25	0	back	10mm	1:1	0.265	1.13	30.3	
836.5	20525	LTE Band5	10	25	QPSK	1	0	back	10mm	1:1	0.471	1.13	28.8	28.6
836.5	20525	LTE Band5	10	24	QPSK	25	12	back	10mm	1:1	0.363	1.13	28.9	
836.5	20525	LTE Band5	10	25	QPSK	1	0	back	10mm	1:1	0.489	1.13	28.6	
829.3	20453	LTE Band5	5	24	QPSK	1	24							
1860	18700	LTE Band2	20	24.7	QPSK	1	99	back	10mm	1:1	0.707	1.13	26.7	26.7
1880	18900	LTE Band2	20	24.7	QPSK	1	0	back	10mm	1:1	0.671	1.13	27.0	
1900	19100	LTE Band2	20	24.7	QPSK	1	0	back	10mm	1:1	0.676	1.13	26.9	
1900	19100	LTE Band2	20	23.7	QPSK	50	25	back	10mm	1:1	0.519	1.13	27.1	
1720	132072	LTE Band66	20	24.7	QPSK	1	50	back	10mm	1:1	0.643	1.13	27.2	26.4
1745	132322	LTE Band66	20	24.7	QPSK	1	50	back	10mm	1:1	0.716	1.13	26.7	
1770	132572	LTE Band66	20	24.7	QPSK	1	0	back	10mm	1:1	0.763	1.13	26.4	
1770	132572	LTE Band66	20	23.7	QPSK	50	50	back	10mm	1:1	0.595	1.13	26.5	
1770	132572	LTE Band66	20	23.7	QPSK	100	0	back	10mm	1:1	0.596	1.13	26.5	
2310	27710	LTE Band30	10	22.2	QPSK	1	0	back	10mm	1:1	0.357	1.13	27.2	
2310	27710	LTE Band30	10	21.2	QPSK	25	12	back	10mm	1:1	0.275	1.13	27.3	27.2
2593	40620	LTE Band41(PC3)	20	24.7	QPSK	1	50	back	10mm	1:1.58	0.500	1.13	26.3	26.3
2593	40620	LTE Band41(PC3)	20	23.7	QPSK	50	25	back	10mm	1:1.58	0.379	1.13	26.5	

Table A-7 DSI = 1 P_{Limit} Calculations – 5G NR Sub6 Body-Worn SAR

Frequency		Mode	Bandwidth	Conducted Power	Modulation	RB Size	RB offset	Test Position	Spacing	Duty Cycle	SAR (1g)	SAR design target	Plimit	Min Plimit
MHz	Ch.										[MHz]	[dBm]		
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	1	53	back	10mm	1:1	0.229	1.13	31.1	30.8
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	1	53	back	10mm	1:1	0.205	1.13	31.6	
836.5	167300	NR Band n5	20	23.2	CP-OFDM-QPSK	1	53	back	10mm	1:1	0.199	1.13	30.8	
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	104	back	10mm	1:1	0.360	1.13	30.0	29.7
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	50	56	back	10mm	1:1	0.382	1.13	29.7	
1880	376000	NR Band n2	20	25	CP-OFDM-QPSK	1	1	back	10mm	1:1	0.387	1.13	29.7	28.9
1720	344000	NR Band n66(4)	20	25	DFT-s-OFDM-QPSK	1	104	back	10mm	1:1	0.439	1.13	29.1	
1720	344000	NR Band n66(4)	20	25	DFT-s-OFDM-QPSK	50	0	back	10mm	1:1	0.421	1.13	29.3	
1720	344000	NR Band n66(4)	20	25	CP-OFDM-QPSK	1	1	back	10mm	1:1	0.459	1.13	28.9	

Table A-8 DSI = 5 P_{Limit} Calculations – 2G/3G Hotspot SAR

Frequency		Mode	Service	Conducted Power	Test Position	Spacing	Duty Cycle	SAR (1g)	SAR design target	Plimit	Min Plimit
MHz	Ch.			[dBm]				[W/kg]	[W/kg]		[dBm]
836.6	190	GSM850	GPRS	30.7	back	10mm	1:4.15	0.345	1.13	29.7	29.7
836.6	190	GSM850	GPRS	30.7	front	10mm	1:4.15	0.344	1.13	29.7	
836.6	190	GSM850	GPRS	30.7	bottom	10mm	1:4.15	0.160	1.13	33.0	
836.6	190	GSM850	GPRS	30.7	right	10mm	1:4.15	0.117	1.13	34.4	
1880	661	GSM1900	GPRS	28.7	back	10mm	1:4.15	0.465	1.13	26.4	23.9
1880	661	GSM1900	GPRS	28.7	front	10mm	1:4.15	0.431	1.13	26.7	
1850.2	512	GSM1900	GPRS	28.7	bottom	10mm	1:4.15	0.829	1.13	23.9	
1880	661	GSM1900	GPRS	28.7	bottom	10mm	1:4.15	0.675	1.13	24.8	
1909.8	810	GSM1900	GPRS	28.7	bottom	10mm	1:4.15	0.694	1.13	24.6	
1880	661	GSM1900	GPRS	28.7	left	10mm	1:4.15	0.104	1.13	32.9	
826.4	4132	UMTS850	RMC	25	back	10mm	1:1	0.495	1.13	28.6	27.6
836.6	4183	UMTS850	RMC	25	back	10mm	1:1	0.569	1.13	28.0	
846.6	4233	UMTS850	RMC	25	back	10mm	1:1	0.626	1.13	27.6	
836.6	4183	UMTS850	RMC	25	front	10mm	1:1	0.451	1.13	29.0	
836.6	4183	UMTS850	RMC	25	bottom	10mm	1:1	0.224	1.13	32.0	
836.6	4183	UMTS850	RMC	25	right	10mm	1:1	0.212	1.13	32.3	
1880	9400	UMTS1900	RMC	24.7	back	10mm	1:1	0.678	1.13	26.9	24.4
1880	9400	UMTS1900	RMC	24.7	front	10mm	1:1	0.618	1.13	27.3	
1852.4	9262	UMTS1900	RMC	24.7	bottom	10mm	1:1	1.225	1.13	24.4	
1880	9400	UMTS1900	RMC	24.7	bottom	10mm	1:1	1.178	1.13	24.5	
1907.6	9538	UMTS1900	RMC	24.7	bottom	10mm	1:1	1.228	1.13	24.4	
1880	9400	UMTS1900	RMC	24.7	left	10mm	1:1	0.197	1.13	32.3	
1732.4	1412	UMTS1750	RMC	24.7	back	10mm	1:1	0.724	1.13	26.6	24.4
1732.4	1412	UMTS1750	RMC	24.7	front	10mm	1:1	0.626	1.13	27.3	
1712.4	1312	UMTS1750	RMC	24.7	bottom	10mm	1:1	0.976	1.13	25.3	
1732.4	1412	UMTS1750	RMC	24.7	bottom	10mm	1:1	1.112	1.13	24.8	
1752.6	1513	UMTS1750	RMC	24.7	bottom	10mm	1:1	1.207	1.13	24.4	
1732.4	1412	UMTS1750	RMC	24.7	left	10mm	1:1	0.206	1.13	32.1	

For some bands/modes, a lower Plimit was selected as a more conservative evaluation.

Table A-9 DSI = 5 P_{Limit} Calculations – LTE B12/14/5 Hotspot SAR

Frequency		Mode	Bandwidth	Conducted Power	Modulation	RB Size	RB offset	Test Position	Spacing	Duty Cycle	SAR (1g)	SAR design target	Plimit	Min Plimit
MHz	Ch.		[MHz]	[dBm]							[W/kg]	[W/kg]		
707.5	23095	LTE Band12	10	25	QPSK	1	25	back	10mm	1:1	0.298	1.13	30.8	30.60
707.5	23095	LTE Band12	10	24	QPSK	25	25	back	10mm	1:1	0.218	1.13	31.2	
707.5	23095	LTE Band12	10	25	QPSK	1	25	front	10mm	1:1	0.274	1.13	31.2	
707.5	23095	LTE Band12	10	24	QPSK	25	25	front	10mm	1:1	0.204	1.13	31.4	
707.5	23095	LTE Band12	10	25	QPSK	1	25	bottom	10mm	1:1	0.105	1.13	35.3	
707.5	23095	LTE Band12	10	24	QPSK	25	25	bottom	10mm	1:1	0.072	1.13	36.0	
707.5	23095	LTE Band12	10	25	QPSK	1	25	right	10mm	1:1	0.312	1.13	30.6	
707.5	23095	LTE Band12	10	24	QPSK	25	25	right	10mm	1:1	0.222	1.13	31.1	
793	23330	LTE Band14	10	25	QPSK	1	0	back	10mm	1:1	0.371	1.13	29.9	
793	23330	LTE Band14	10	24	QPSK	25	0	back	10mm	1:1	0.263	1.13	30.3	
793	23330	LTE Band14	10	25	QPSK	1	0	front	10mm	1:1	0.361	1.13	30.0	
793	23330	LTE Band14	10	24	QPSK	25	0	front	10mm	1:1	0.257	1.13	30.4	
793	23330	LTE Band14	10	25	QPSK	1	0	bottom	10mm	1:1	0.157	1.13	33.6	
793	23330	LTE Band14	10	24	QPSK	25	0	bottom	10mm	1:1	0.104	1.13	34.4	
793	23330	LTE Band14	10	25	QPSK	1	0	right	10mm	1:1	0.275	1.13	31.1	
793	23330	LTE Band14	10	24	QPSK	25	0	right	10mm	1:1	0.182	1.13	31.9	
836.5	20525	LTE Band5	10	25	QPSK	1	0	back	10mm	1:1	0.468	1.13	28.8	28.7
836.5	20525	LTE Band5	10	24	QPSK	25	12	back	10mm	1:1	0.360	1.13	29.0	
836.5	20525	LTE Band5	10	25	QPSK	1	0	back	10mm	1:1	0.487	1.13	28.7	
829.3	20453	LTE Band5	5		QPSK	1	24	back	10mm	1:1				
836.5	20525	LTE Band5	10	25	QPSK	1	0	front	10mm	1:1	0.431	1.13	29.2	
836.5	20525	LTE Band5	10	24	QPSK	25	12	front	10mm	1:1	0.330	1.13	29.4	
836.5	20525	LTE Band5	10	25	QPSK	1	0	bottom	10mm	1:1	0.175	1.13	33.1	
836.5	20525	LTE Band5	10	24	QPSK	25	12	bottom	10mm	1:1	0.138	1.13	33.2	
836.5	20525	LTE Band5	10	25	QPSK	1	0	right	10mm	1:1	0.172	1.13	33.2	
836.5	20525	LTE Band5	10	24	QPSK	25	12	right	10mm	1:1	0.124	1.13	33.6	

Table A-10 DSI = 5 P_{Limit} Calculations – LTE B2/66(4)/30/41 Hotspot SAR

Frequency		Mode	Bandwidth	Conducted Power	Modulation	RB Size	RB offset	Test Position	Spacing	Duty Cycle	SAR (1g)	SAR design target	PLimit	Min PLimit														
MHz	Ch.										[MHz]	[dBm]			[W/kg]	[W/kg]	[dBm]	[dBm]										
1860	18700	LTE Band2	20	24.7	QPSK	1	0	back	10mm	1:1	0.607	1.13	27.4	23.8														
1860	18700	LTE Band2	20	23.7	QPSK	50	25	back	10mm	1:1	0.477	1.13	27.5		23.8													
1860	18700	LTE Band2	20	24.7	QPSK	1	0	front	10mm	1:1	0.591	1.13	27.5			23.8												
1860	18700	LTE Band2	20	23.7	QPSK	50	25	front	10mm	1:1	0.478	1.13	27.4				23.8											
1860	18700	LTE Band2	20	24.7	QPSK	1	0	bottom	10mm	1:1	1.192	1.13	24.5					23.8										
1880	18900	LTE Band2	20	24.7	QPSK	1	0	bottom	10mm	1:1	1.218	1.13	24.4						23.8									
1900	19100	LTE Band2	20	24.7	QPSK	1	50	bottom	10mm	1:1	1.326	1.13	24.0							23.8								
1860	18700	LTE Band2	20	23.7	QPSK	50	25	bottom	10mm	1:1	0.938	1.13	24.5								23.8							
1880	18900	LTE Band2	20	23.7	QPSK	50	50	bottom	10mm	1:1	1.028	1.13	24.1									23.8						
1900	19100	LTE Band2	20	23.7	QPSK	50	50	bottom	10mm	1:1	1.107	1.13	23.8										23.8					
1860	18700	LTE Band2	20	23.7	QPSK	100	0	bottom	10mm	1:1	0.947	1.13	24.5											23.8				
1860	18700	LTE Band2	20	24.7	QPSK	1	0	left	10mm	1:1	0.199	1.13	32.3												23.8			
1860	18700	LTE Band2	20	23.7	QPSK	50	25	left	10mm	1:1	0.157	1.13	32.3													23.8		
1720	132072	LTE Band66(4)	20	24.7	QPSK	1	50	back	10mm	1:1	0.656	1.13	27.1														23.8	
1720	132072	LTE Band66(4)	20	23.7	QPSK	50	25	back	10mm	1:1	0.525	1.13	27.0															23.8
1720	132072	LTE Band66(4)	20	24.7	QPSK	1	50	front	10mm	1:1	0.609	1.13	27.4															
1720	132072	LTE Band66(4)	20	23.7	QPSK	50	25	front	10mm	1:1	0.486	1.13	27.4	23.8														
1720	132072	LTE Band66(4)	20	24.7	QPSK	1	50	bottom	10mm	1:1	1.051	1.13	25.0		23.8													
1720	132072	LTE Band66(4)	20	23.7	QPSK	50	25	bottom	10mm	1:1	0.853	1.13	24.9			23.8												
1745	132322	LTE Band66(4)	20	23.7	QPSK	50	25	bottom	10mm	1:1	1.014	1.13	24.2				23.8											
1770	132572	LTE Band66(4)	20	23.7	QPSK	50	25	bottom	10mm	1:1	1.096	1.13	23.8					23.8										
1720	132072	LTE Band66(4)	20	23.7	QPSK	100	0	bottom	10mm	1:1	0.875	1.13	24.8						23.8									
1720	132072	LTE Band66(4)	20	24.7	QPSK	1	50	left	10mm	1:1	0.225	1.13	31.7							23.8								
1720	132072	LTE Band66(4)	20	23.7	QPSK	50	25	left	10mm	1:1	0.182	1.13	31.6								23.8							
2310	27710	LTE Band30	10	22.2	QPSK	1	0	back	10mm	1:1	0.354	1.13	27.2									25.14						
2310	27710	LTE Band30	10	21.2	QPSK	25	12	back	10mm	1:1	0.272	1.13	27.4										25.14					
2310	27710	LTE Band30	10	22.2	QPSK	1	0	front	10mm	1:1	0.295	1.13	28.0											25.14				
2310	27710	LTE Band30	10	21.2	QPSK	25	12	front	10mm	1:1	0.231	1.13	28.1												25.14			
2310	27710	LTE Band30	10	22.2	QPSK	1	0	bottom	10mm	1:1	0.566	1.13	25.2													25.14		
2310	27710	LTE Band30	10	21.2	QPSK	25	12	bottom	10mm	1:1	0.457	1.13	25.1														25.14	
2310	27710	LTE Band30	10	22.2	QPSK	1	0	left	10mm	1:1	0.062	1.13	34.8															25.14
2310	27710	LTE Band30	10	21.2	QPSK	25	12	left	10mm	1:1	0.049	1.13	34.8															
2593	40620	LTE Band41(PC3)	20	24.7	QPSK	1	50	back	10mm	1:1.58	0.497	1.13	26.3	24.32														
2593	40620	LTE Band41(PC3)	20	23.7	QPSK	50	25	back	10mm	1:1.58	0.376	1.13	26.5		24.32													
2593	40620	LTE Band41(PC3)	20	24.7	QPSK	1	50	front	10mm	1:1.58	0.277	1.13	28.8			24.32												
2593	40620	LTE Band41(PC3)	20	23.7	QPSK	50	25	front	10mm	1:1.58	0.216	1.13	28.9				24.32											
2506	39750	LTE Band41(PC3)	20	24.7	QPSK	1	0	bottom	10mm	1:1.58	0.687	1.13	24.9					24.32										
2549.5	40185	LTE Band41(PC3)	20	24.7	QPSK	1	50	bottom	10mm	1:1.58	0.663	1.13	25.0						24.32									
2593	40620	LTE Band41(PC3)	20	24.7	QPSK	1	50	bottom	10mm	1:1.58	0.683	1.13	24.9							24.32								
2636.5	41055	LTE Band41(PC3)	20	24.7	QPSK	1	50	bottom	10mm	1:1.58	0.701	1.13	24.8								24.32							
2680	41490	LTE Band41(PC3)	20	24.7	QPSK	1	50	bottom	10mm	1:1.58	0.783	1.13	24.3									24.32						
2593	40620	LTE Band41(PC3)	20	23.7	QPSK	50	25	bottom	10mm	1:1.58	0.534	1.13	25.0										24.32					
2593	40620	LTE Band41(PC3)	20	23.7	QPSK	100	0	bottom	10mm	1:1.58	0.521	1.13	25.1											24.32				
2593	40620	LTE Band41(PC3)	20	24.7	QPSK	1	50	left	10mm	1:1.58	0.077	1.13	34.4												24.32			
2593	40620	LTE Band41(PC3)	20	23.7	QPSK	50	25	left	10mm	1:1.58	0.055	1.13	34.8													24.32		

For some bands/modes, a lower PLimit was selected as a more conservative evaluation.

Table A-11 DSI = 5 P_{Limit} Calculations – 5G NR n5/n2/n66(4) Hotspot SAR

Frequency		Mode	Bandwidth	Conducted Power	Modulation	RB Size	RB offset	Test Position	Spacing	Duty Cycle	SAR (1g)	SAR design target	Plimit	Min Plimit
MHz	Ch.		[MHz]	[dBm]							[W/kg]	[W/kg]	[dBm]	[dBm]
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	1	53	back	10mm	1:1	0.225	1.13	31.2	29.84
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	50	28	back	10mm	1:1	0.203	1.13	31.7	
836.5	167300	NR Band n5	20	23.2	CP-OFDM-QPSK	1	1	back	10mm	1:1	0.246	1.13	29.8	
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	1	53	front	10mm	1:1	0.163	1.13	32.6	
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	50	28	front	10mm	1:1	0.182	1.13	32.1	
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	1	53	bottom	10mm	1:1	0.068	1.13	36.4	
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	50	28	bottom	10mm	1:1	0.074	1.13	36.0	
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	1	53	right	10mm	1:1	0.062	1.13	36.8	
836.5	167300	NR Band n5	20	24.2	DFT-s-OFDM-QPSK	50	28	right	10mm	1:1	0.069	1.13	36.3	
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	104	back	10mm	1:1	0.360	1.13	30.0	
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	50	56	back	10mm	1:1	0.382	1.13	29.7	
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	104	front	10mm	1:1	0.484	1.13	28.7	
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	50	56	front	10mm	1:1	0.473	1.13	28.8	
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	104	bottom	10mm	1:1	0.137	1.13	34.2	
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	50	56	bottom	10mm	1:1	0.143	1.13	34.0	
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	104	right	10mm	1:1	0.772	1.13	26.7	
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	50	56	right	10mm	1:1	0.743	1.13	26.8	
1880	376000	NR Band n2	20	25	CP-OFDM-QPSK	1	1	right	10mm	1:1	0.767	1.13	26.7	
1720	344000	NR Band n66(4)	20	25	DFT-s-OFDM-QPSK	1	104	back	10mm	1:1	0.434	1.13	29.2	25.6
1720	344000	NR Band n66(4)	20	25	DFT-s-OFDM-QPSK	50	0	back	10mm	1:1	0.420	1.13	29.3	
1720	344000	NR Band n66(4)	20	25	DFT-s-OFDM-QPSK	1	104	front	10mm	1:1	0.497	1.13	28.6	
1720	344000	NR Band n66(4)	20	25	DFT-s-OFDM-QPSK	50	0	front	10mm	1:1	0.479	1.13	28.7	
1720	344000	NR Band n66(4)	20	25	DFT-s-OFDM-QPSK	1	104	bottom	10mm	1:1	0.073	1.13	36.9	
1720	344000	NR Band n66(4)	20	25	DFT-s-OFDM-QPSK	50	0	bottom	10mm	1:1	0.074	1.13	36.8	
1720	344000	NR Band n66(4)	20	25	DFT-s-OFDM-QPSK	1	104	right	10mm	1:1	0.908	1.13	26.0	
1720	344000	NR Band n66(4)	20	25	DFT-s-OFDM-QPSK	50	0	right	10mm	1:1	0.872	1.13	26.1	
1720	344000	NR Band n66(4)	20	25	CP-OFDM-QPSK	1	1	right	10mm	1:1	0.981	1.13	25.6	

Table A-12 DSI = 1 P_{Limit} Calculations – 2G/3G Phablet SAR

Frequency		Mode	Service	Conducted Power	Test Position	Spacing	Duty Cycle	SAR (10g)	SAR design target	Plimit	Min Plimit
MHz	Ch.			[dBm]				[W/kg]	[W/kg]		[dBm]
836.6	190	GSM850	GPRS	28.7	back	0mm	1:4.15	1.227	2.83	26.2	26.2
836.6	190	GSM850	GPRS	28.7	front	0mm	1:4.15	1.090	2.83	26.7	
836.6	190	GSM850	GPRS	28.7	bottom	0mm	1:4.15	0.415	2.83	30.9	
836.6	190	GSM850	GPRS	28.7	right	0mm	1:4.15	0.312	2.83	32.1	
1880	661	GSM1900	GPRS	26.7	back	0mm	1:4.15	0.962	2.83	25.2	23.0
1880	661	GSM1900	GPRS	26.7	front	0mm	1:4.15	0.962	2.83	25.2	
1880	661	GSM1900	GPRS	26.7	bottom	0mm	1:4.15	1.603	2.83	23.0	
1880	661	GSM1900	GPRS	26.7	left	0mm	1:4.15	0.258	2.83	30.9	
836.6	4183	UMTS850	RMC	25	back	0mm	1:1	1.467	2.83	27.9	27.9
836.6	4183	UMTS850	RMC	25	front	0mm	1:1	1.453	2.83	27.9	
836.6	4183	UMTS850	RMC	25	bottom	0mm	1:1	0.451	2.83	33.0	
836.6	4183	UMTS850	RMC	25	right	0mm	1:1	0.588	2.83	31.8	
1880	9400	UMTS 1900	RMC	24.7	back	2mm	1:1	1.591	2.83	27.2	25.9
1880	9400	UMTS 1900	RMC	24.7	front	1mm	1:1	1.826	2.83	26.6	
1880	9400	UMTS 1900	RMC	24.7	bottom	3mm	1:1	2.145	2.83	25.9	
1880	9400	UMTS1900	RMC	24.7	left	0mm	1:1	0.439	2.83	32.8	
1732.4	1412	UMTS1750	RMC	24.7	back	2mm	1:1	1.448	2.83	27.6	26.5
1732.4	1412	UMTS1750	RMC	24.7	front	1mm	1:1	1.844	2.83	26.6	
1732.4	1412	UMTS1750	RMC	24.7	bottom	3mm	1:1	1.853	2.83	26.5	
1732.4	1412	UMTS1750	RMC	24.7	left	0mm	1:1	0.628	2.83	31.2	

Table A-13 DSI = 8 P_{Limit} Calculations – 2G/3G Phablet SAR

Frequency		Mode	Service	Conducted Power	Test Position	Spacing	Duty Cycle	SAR (10g)	SAR design target	Plimit	Min Plimit
MHz	Ch.			[dBm]				[W/kg]	[W/kg]		[dBm]
1880	9400	UMTS1900	RMC	24.7	back	0mm	1:1	2.948	2.83	24.5	22.5
1880	9400	UMTS1900	RMC	24.7	front	0mm	1:1	3.145	2.83	24.2	
1852.4	9262	UMTS1900	RMC	24.7	bottom	0mm	1:1	4.172	2.83	23.0	
1880	9400	UMTS1900	RMC	24.7	bottom	0mm	1:1	4.389	2.83	22.8	
1907.6	9538	UMTS1900	RMC	24.7	bottom	0mm	1:1	4.681	2.83	22.5	
1732.4	1412	UMTS1700	RMC	24.7	back	0mm	1:1	2.465	2.83	25.3	24.3
1732.4	1412	UMTS1700	RMC	24.7	front	0mm	1:1	2.757	2.83	24.8	
1732.4	1412	UMTS1700	RMC	24.7	bottom	0mm	1:1	3.128	2.83	24.3	

For some bands/modes, a lower PLimit was selected as a more conservative evaluation.

Table A-14 DSI = 1 P_{Limit} Calculations – 4G Phablet SAR

Frequency		Mode	Bandwidth [MHz]	Conducted Power [dBm]	Modulation	RB Size	RB offset	Test Position	Spacing	Duty Cycle	SAR (10g)	SAR design target	Plimit	Min Plimit													
MHz	Ch.										[W/kg]	[W/kg]	[dBm]	[dBm]													
707.5	23095	LTE Band12	10	25	QPSK	1	49	back	0mm	1:1	0.644	2.83	31.4	30.1													
707.5	23095	LTE Band12	10	24	QPSK	25	12	back	0mm	1:1	0.527	2.83	31.3		30.1												
707.5	23095	LTE Band12	10	25	QPSK	1	49	front	0mm	1:1	0.645	2.83	31.4			30.1											
707.5	23095	LTE Band12	10	24	QPSK	25	12	front	0mm	1:1	0.515	2.83	31.4				30.1										
707.5	23095	LTE Band12	10	25	QPSK	1	49	bottom	0mm	1:1	0.206	2.83	36.4					30.1									
707.5	23095	LTE Band12	10	24	QPSK	25	12	bottom	0mm	1:1	0.152	2.83	36.7						30.1								
707.5	23095	LTE Band12	10	25	QPSK	1	49	right	0mm	1:1	0.833	2.83	30.3							30.1							
707.5	23095	LTE Band12	10	24	QPSK	25	12	right	0mm	1:1	0.701	2.83	30.1	30.1													
793	23330	LTE Band14	10	25	QPSK	1	0	back	0mm	1:1	0.907	2.83	29.9		29.9												
793	23330	LTE Band14	10	24	QPSK	25	0	back	0mm	1:1	0.711	2.83	30.0			29.9											
793	23330	LTE Band14	10	25	QPSK	1	0	front	0mm	1:1	0.790	2.83	30.5				29.9										
793	23330	LTE Band14	10	24	QPSK	25	0	front	0mm	1:1	0.680	2.83	30.2					29.9									
793	23330	LTE Band14	10	25	QPSK	1	0	bottom	0mm	1:1	0.298	2.83	34.8						29.9								
793	23330	LTE Band14	10	24	QPSK	25	0	bottom	0mm	1:1	0.216	2.83	35.2							29.9							
793	23330	LTE Band14	10	25	QPSK	1	0	right	0mm	1:1	0.611	2.83	31.7	29.9													
793	23330	LTE Band14	10	24	QPSK	25	0	right	0mm	1:1	0.476	2.83	31.7		29.9												
836.5	20525	LTE Band5	10	25	QPSK	1	0	back	0mm	1:1	1.030	2.83	29.4			29.4											
836.5	20525	LTE Band5	10	24	QPSK	25	12	back	0mm	1:1	0.798	2.83	29.5				29.4										
836.5	20525	LTE Band5	10	25	QPSK	1	0	front	0mm	1:1	0.900	2.83	30.0					29.4									
836.5	20525	LTE Band5	10	24	QPSK	25	12	front	0mm	1:1	0.728	2.83	29.9						29.4								
836.5	20525	LTE Band5	10	25	QPSK	1	0	bottom	0mm	1:1	0.296	2.83	34.8							29.4							
836.5	20525	LTE Band5	10	24	QPSK	25	12	bottom	0mm	1:1	0.237	2.83	34.8	29.4													
836.5	20525	LTE Band5	10	25	QPSK	1	0	right	0mm	1:1	0.323	2.83	34.4		29.4												
836.5	20525	LTE Band5	10	24	QPSK	25	12	right	0mm	1:1	0.276	2.83	34.1			29.4											
1880	18900	LTE Band2	20	24.7	QPSK	1	0	back	2mm	1:1	1.644	2.83	27.1				25.8										
1900	19100	LTE Band2	20	23.7	QPSK	50	25	back	2mm	1:1	1.274	2.83	27.2					25.8									
1860	18700	LTE Band2	20	24.7	QPSK	1	99	front	1mm	1:1	2.188	2.83	25.8						25.8								
1880	18900	LTE Band2	20	24.7	QPSK	1	0	front	1mm	1:1	2.147	2.83	25.9							25.8							
1900	19100	LTE Band2	20	24.7	QPSK	1	0	front	1mm	1:1	2.124	2.83	25.9	25.8													
1900	19100	LTE Band2	20	23.7	QPSK	50	25	front	1mm	1:1	1.726	2.83	25.9		25.8												
1900	19100	LTE Band2	20	23.7	QPSK	100	0	front	1mm	1:1	1.658	2.83	26.0			25.8											
1860	18700	LTE Band2	20	24.7	QPSK	1	99	bottom	3mm	1:1	1.973	2.83	26.3								25.8						
1880	18900	LTE Band2	20	24.7	QPSK	1	0	bottom	3mm	1:1	2.002	2.83	26.2									25.8					
1900	19100	LTE Band2	20	24.7	QPSK	1	0	bottom	3mm	1:1	2.086	2.83	26.0										25.8				
1900	19100	LTE Band2	20	23.7	QPSK	50	25	bottom	3mm	1:1	1.735	2.83	25.8											25.8			
1900	19100	LTE Band2	20	23.7	QPSK	100	0	bottom	3mm	1:1	1.713	2.83	25.9												25.8		
1880	18900	LTE Band2	20	24.7	QPSK	1	0	left	0mm	1:1	0.555	2.83	31.8													25.8	
1900	19100	LTE Band2	20	23.7	QPSK	50	25	left	0mm	1:1	0.430	2.83	31.9														25.8
1770	132572	LTE Band66(4)	20	24.7	QPSK	1	0	back	2mm	1:1	1.504	2.83	27.4														
1770	132572	LTE Band66(4)	20	23.7	QPSK	50	50	back	2mm	1:1	1.203	2.83	27.4				25.6										
1720	132072	LTE Band66(4)	20	24.7	QPSK	1	50	front	1mm	1:1	1.809	2.83	26.6					25.6									
1745	132322	LTE Band66(4)	20	24.7	QPSK	1	50	front	1mm	1:1	1.963	2.83	26.3						25.6								
1770	132572	LTE Band66(4)	20	24.7	QPSK	1	0	front	1mm	1:1	2.307	2.83	25.6							25.6							
1770	132572	LTE Band66(4)	20	23.7	QPSK	50	50	front	1mm	1:1	1.711	2.83	25.9	25.6													
1770	132572	LTE Band66(4)	20	23.7	QPSK	100	0	front	1mm	1:1	1.715	2.83	25.9		25.6												
1770	132572	LTE Band66(4)	20	24.7	QPSK	1	0	bottom	3mm	1:1	1.737	2.83	26.8			25.6											
1770	132572	LTE Band66(4)	20	23.7	QPSK	50	50	bottom	3mm	1:1	1.417	2.83	26.7								25.6						
1770	132572	LTE Band66(4)	20	24.7	QPSK	1	0	left	0mm	1:1	0.708	2.83	30.7									25.6					
1770	132572	LTE Band66(4)	20	23.7	QPSK	50	50	left	0mm	1:1	0.559	2.83	30.7										25.6				
2310	27710	LTE Band30	10	22.2	QPSK	1	25	back	0mm	1:1	0.695	2.83	28.3				25.0										
2310	27710	LTE Band30	10	21.2	QPSK	25	12	back	0mm	1:1	0.551	2.83	28.3					25.0									
2310	27710	LTE Band30	10	22.2	QPSK	1	25	front	0mm	1:1	0.666	2.83	28.5						25.0								
2310	27710	LTE Band30	10	21.2	QPSK	25	12	front	0mm	1:1	0.531	2.83	28.5							25.0							
2310	27710	LTE Band30	10	22.2	QPSK	1	25	bottom	0mm	1:1	1.379	2.83	25.3	25.0													
2310	27710	LTE Band30	10	21.2	QPSK	25	12	bottom	0mm	1:1	1.172	2.83	25.0		25.0												
2506	39750	LTE Band41(PC3)	20	24.7	QPSK	1	0	back	0mm	1:1.58	1.148	2.83	26.6			23.8											
2506	39750	LTE Band41(PC3)	20	23.7	QPSK	50	25	back	0mm	1:1.58	0.899	2.83	26.7				23.8										
2506	39750	LTE Band41(PC3)	20	24.7	QPSK	1	0	front	0mm	1:1.58	1.185	2.83	26.5					23.8									
2506	39750	LTE Band41(PC3)	20	23.7	QPSK	50	25	front	0mm	1:1.58	0.916	2.83	26.6						23.8								
2506	39750	LTE Band41(PC3)	20	24.7	QPSK	1	0	bottom	0mm	1:1.58	2.223	2.83	23.8	23.8													
2506	39750	LTE Band41(PC3)	20	23.7	QPSK	50	0	bottom	0mm	1:1.58	1.766	2.83	23.8		23.8												

Table A-15 DSI = 8 P_{Limit} Calculations – 4G Phablet SAR

Frequency		Mode	Bandwidth	Conducted Power	Modulation	RB Size	RB offset	Test Position	Spacing	Duty Cycle	SAR (10g)	SAR design target	PLimit	Min PLimit								
MHz	Ch.		[MHz]	[dBm]							[W/kg]	[W/kg]			[dBm]	[dBm]						
1860	18700	LTE Band2	20	24.7	QPSK	1	0	back	0mm	1:1	2.681	2.83	24.9	22.4								
1860	18700	LTE Band2	20	23.7	QPSK	50	25	back	0mm	1:1	2.210	2.83	24.8		22.4							
1860	18700	LTE Band2	20	24.7	QPSK	1	0	front	0mm	1:1	3.059	2.83	24.4			22.4						
1860	18700	LTE Band2	20	23.7	QPSK	50	25	front	0mm	1:1	2.517	2.83	24.2				22.4					
1860	18700	LTE Band2	20	24.7	QPSK	1	0	bottom	0mm	1:1	4.154	2.83	23.0					22.4				
1880	18900	LTE Band2	20	24.7	QPSK	1	0	bottom	0mm	1:1	4.356	2.83	22.8						22.4			
1900	19100	LTE Band2	20	24.7	QPSK	1	50	bottom	0mm	1:1	4.615	2.83	22.6							22.4		
1860	18700	LTE Band2	20	23.7	QPSK	50	25	bottom	0mm	1:1	3.483	2.83	22.8								22.4	
1880	18900	LTE Band2	20	23.7	QPSK	50	50	bottom	0mm	1:1	3.511	2.83	22.8									22.4
1900	19100	LTE Band2	20	23.7	QPSK	50	50	bottom	0mm	1:1	3.838	2.83	22.4									
1860	18700	LTE Band2	20	23.7	QPSK	100	0	bottom	0mm	1:1	3.460	2.83	22.8	22.4								
1720	132072	LTE Band66	20	24.7	QPSK	1	50	back	0mm	1:1	2.580	2.83	25.1		24.2							
1720	132072	LTE Band66	20	23.7	QPSK	50	25	back	0mm	1:1	2.100	2.83	25.0			24.2						
1720	132072	LTE Band66	20	24.7	QPSK	1	50	front	0mm	1:1	2.893	2.83	24.6				24.2					
1720	132072	LTE Band66	20	23.7	QPSK	50	25	front	0mm	1:1	2.380	2.83	24.5					24.2				
1720	132072	LTE Band66	20	24.7	QPSK	1	50	bottom	0mm	1:1	3.080	2.83	24.3						24.2			
1720	132072	LTE Band66	20	23.7	QPSK	50	25	bottom	0mm	1:1	2.506	2.83	24.2							24.2		
1720	132072	LTE Band66	20	23.7	QPSK	100	0	bottom	0mm	1:1	2.540	2.83	24.2		24.2							

For some bands/modes, a lower PLimit was selected as a more conservative evaluation.

Table A-14 DSI = 1 P_{Limit} Calculations – 5G Phablet SAR

Frequency		Mode	Bandwidth	Conducted	Modulation	RB Size	RB offset	Test Position	Spacing	Duty Cycle	SAR (10g)	SAR design target	PLimit	Min								
MHz	Ch.		[MHz]	[dBm]							[W/kg]	[W/kg]			[dBm]	[dBm]						
836.5	167300	NR Band n5	20	25	DFT-s-OFDM-QPSK	1	53	back	0mm	1:1	1.030	2.83	29.4	29.4								
836.5	167300	NR Band n5	20	25	CP-OFDM-QPSK	50	28	back	0mm	1:1	0.792	2.83	30.5		29.4							
836.5	167300	NR Band n5	20	25	DFT-s-OFDM-QPSK	1	53	front	0mm	1:1	0.948	2.83	29.8			29.4						
836.5	167300	NR Band n5	20	25	CP-OFDM-QPSK	50	28	front	0mm	1:1	0.726	2.83	30.9				29.4					
836.5	167300	NR Band n5	20	25	DFT-s-OFDM-QPSK	1	53	bottom	0mm	1:1	0.384	2.83	33.7					29.4				
836.5	167300	NR Band n5	20	25	CP-OFDM-QPSK	50	28	bottom	0mm	1:1	0.303	2.83	34.7						29.4			
836.5	167300	NR Band n5	20	25	DFT-s-OFDM-QPSK	1	53	right	0mm	1:1	0.378	2.83	33.7							29.4		
836.5	167300	NR Band n5	20	25	CP-OFDM-QPSK	50	28	right	0mm	1:1	0.273	2.83	35.2								29.4	
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	53	right	0mm	1:1	3.853	2.83	23.7									23.7
1880	376000	NR Band n2	20	25	CP-OFDM-QPSK	1	0	right	0mm	1:1	3.860	2.83	23.7									
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	53	back	0mm	1:1	2.111	2.83	26.3	23.7								
1880	376000	NR Band n2	20	25	CP-OFDM-QPSK	1	0	back	0mm	1:1	2.177	2.83	26.1		23.7							
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	53	front	0mm	1:1	2.488	2.83	25.6			23.7						
1880	376000	NR Band n2	20	25	CP-OFDM-QPSK	1	0	front	0mm	1:1	2.498	2.83	25.5				23.7					
1880	376000	NR Band n2	20	25	DFT-s-OFDM-QPSK	1	53	bottom	0mm	1:1	2.158	2.83	26.2					23.7				
1880	376000	NR Band n2	20	25	CP-OFDM-QPSK	1	0	bottom	0mm	1:1	2.174	2.83	26.1						23.7			
1745	349000	NR Band n66	20	25	DFT-s-OFDM-QPSK	1	53	right	0mm	1:1	3.535	2.83	24.0							23.9		
1745	349000	NR Band n66	20	25	CP-OFDM-QPSK	1	0	right	0mm	1:1	3.628	2.83	23.9								23.9	
1745	349000	NR Band n66	20	25	DFT-s-OFDM-QPSK	1	53	back	0mm	1:1	3.086	2.83	24.6									23.9
1745	349000	NR Band n66	20	25	CP-OFDM-QPSK	1	0	back	0mm	1:1	3.095	2.83	24.6									
1745	349000	NR Band n66	20	25	DFT-s-OFDM-QPSK	1	53	front	0mm	1:1	2.960	2.83	24.8	23.9								
1745	349000	NR Band n66	20	25	CP-OFDM-QPSK	1	0	front	0mm	1:1	2.966	2.83	24.8		23.9							
1745	349000	NR Band n66	20	25	DFT-s-OFDM-QPSK	1	53	bottom	0mm	1:1	1.802	2.83	27.0			23.9						
1745	349000	NR Band n66	20	25	CP-OFDM-QPSK	1	0	bottom	0mm	1:1	1.812	2.83	26.9				23.9					

For some bands/modes, a lower PLimit was selected as a more conservative evaluation.