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SAR CHAR REPORT

Applicant Name: **SAMSUNG Electronics Co., Ltd.** 129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do, 16677 Rep. of Korea	**Date of Issue: Jan. 16, 2023** **Test Report No.: HCT-SR-2301-FC003-R1** **Test Site: HCT CO., LTD.**

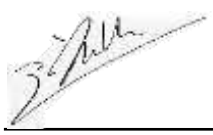
FCC ID: **A3LSMM546B**

Report Type:	**Part 0 SAR Characterization**
Equipment Type:	**Mobile Phone**
Model Name:	**SM-M546B/DS**

This device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in FCC KDB procedures and had been tested in accordance with the measurement procedures specified in FCC KDB procedures.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested By



Chan Min, Ko
Test Engineer
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Reviewed By

Yun-jeang, Heo
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REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	Jan. 10, 2023	Initial Release
1	Jan. 16, 2023	Typo Revised

This test results were applied only to the test methods required by the standard.

Table of Contents

1. Test Location

1.1 Test Laboratory

Company Name	HCT Co., Ltd.
Address	74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
Telephone	031-645-6300
Fax.	031-645-6401

1.2 Test Facilities

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

Korea	National Radio Research Agency (Designation No. KR0032)
	KOLAS (Testing No. KT197)

2. DEVICE UNDER TEST

2.1 General Information of the DUT

Device Wireless specification overview		
Band & Mode	**Operating Mode**	**Tx Frequency**
GSM/GPRS/EDGE 850	Voice / Data	824.2 ㎒ ~ 848.8 ㎒
GSM/GPRS/EDGE 1900	Voice / Data	1 850.2 ㎒ ~ 1 909.8 ㎒
UMTS Band 5	Voice / Data	826.4 ㎒ ~ 846.6 ㎒
UMTS Band 4	Voice / Data	1 712.4 ㎒ ~ 1 752.6 ㎒
UMTS Band 2	Voice / Data	1 852.4 ㎒ ~ 1 907.6 ㎒
LTE Band 2 (PCS)	Voice / Data	1 850.7 ㎒ ~ 1 909.3 ㎒
LTE Band 4 (AWS)	Voice / Data	1 710.7 ㎒ ~ 1 754.3 ㎒
LTE Band 5 (Cell)	Voice / Data	824.7 ㎒ ~ 848.3 ㎒
LTE Band 12	Voice / Data	699.7 ㎒ ~ 715.3 ㎒
LTE Band 17	Voice / Data	706.5 ㎒ ~ 713.5 ㎒
LTE Band 26	Voice / Data	814.7 ㎒ ~ 848.3 ㎒
LTE Band 41	Voice / Data	2 498.5 ㎒ ~ 2 687.5 ㎒
LTE Band 66 (AWS)	Voice / Data	1 710.7 ㎒ ~ 1 779.3 ㎒
NR Band n5	Voice / Data	826.5 ㎒ ~ 846.5 ㎒
NR Band n66	Voice / Data	1 712.5 ㎒ ~ 1 777.5 ㎒
U-NII-1	Voice / Data	5 180 ㎒ ~ 5 240 ㎒
U-NII-2A	Voice / Data	5 260 ㎒ ~ 5 320 ㎒
U-NII-2C	Voice / Data	5 500 ㎒ ~ 5 720 ㎒
U-NII-3	Voice / Data	5 745 ㎒ ~ 5 825 ㎒
2.4 ㎓ WLAN	Voice / Data	2 412 ㎒ ~ 2 472 ㎒
Bluetooth /LE 5.3	Data	2 402 ㎒ ~ 2 480 ㎒
NFC	Data	13.56 ㎒

2.2 Introduction of SAR compliance test with TAS algorithm

FCC RF exposure limit is based on time –averaged RF exposure. Both SAR regulatory specifications are defined over certain measurement duration allowing for time-averaging. The Samsung S.LSI proprietary TAS (Time Average SAR) algorithm has been designed to meet the compliance limits over the required duration, while still allowing dynamic control of transmit power to satisfy the performance of the system.

This test report shows SAR characterization of sub 6 GHz. The characterization is achieved by determination of Plimit.

This feature performs time averaging SAR algorithm in real time to control and manage transmitting power and ensure the time-averaged RF exposure is in compliance with FCC requirements all the time.
The 2G/3G communication mode and WLAN/BT mode are not controlled by The Samsung S.LSI proprietary TAS (Time Average SAR) algorithm.
In the wireless mode of 2G/3G, the output power is not dynamically controlled by the TAS algorithm, but the static Plimit output is applied to comply with the SAR_Target specified by the manufacturer.

SAR Characterization confirms that Plimit in the 4G/5G communication mode declared by the manufacturer satisfies SAR_target.

The compliance test under the static transmission scenario and simultaneous transmission analysis are reporte d in SAR report for Sub 6GHz. The validation of The Samsung S.LSI proprietary TAS (Time Average SAR) algorithm and compliance under the time- varying transmission scenario for WWAN technologies are reported in TAS Validation report

Term	Description
Plimit	The Time-averaged RF power that corresponds to SAR_target.
Pmax	Maximum Tx power tha can be transmitted physically from RFIC for a given RAT.
SAR_target	Target SAR level used in TAS algorithm. This SAR value should be less than FCC limit and should be determined after accounting for all uncertainties and other design considerations.
SAR_FCC_Limit	SAR Limit specified by FCC 1.6 W/kg averaged over 1g , for head and body exposure, and 4W/kg averaged over 10g, for Phablet SAR.
SAR Characterization	Characterization of SAR value for Sub 6 technology..

3. SAR MEASUREMENTS

3.1 SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy (d*W*) absorbed by (dissipated in) an incremental mass (d*m*) contained in a volume element (d*V*) of a given density (*r*). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right)$$

SAR Mathematical Equation

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \sigma E^2 / \rho$$

Where:

σ = conductivity of the tissue-simulant material (S/m)

ρ = mass density of the tissue-simulant material (kg/㎥)

E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

3.2 SAR Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013:

1. The SAR distribution at the exposed side of the head or body was measured at a distance no more than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the DUT's head and body area and the horizontal grid resolution was depending on the FCC KDB 865664 D01v01r04 (see table 3-1) & IEEE 1528-2013.

2. Based on step, the area of the maximum absorption was determined by sophisticated interpolations routines implemented in DASY software. When an Area Scan has measured all reachable point. DASY system computes the field maximal found in the scanned are, within a range of the maximum. SAR at this fixed point was measured and used as a reference value.

3. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB 865664 D01v01r04 table 4-1 and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (reference from the DASY manual.)

   a. The data at the surface were extrapolated, since the center of the dipoles is no more than 2.7 mm away from the tip of the probe (it is different from the probe type) and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

   b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan. If the value changed by more than 5 %, the SAR evaluation and drift measurements were repeated.

Table 3-1

Frequency	Maximum Area Scan Resolution(mm) (Δxarea, Δyarea)	Maximum Zoom Scan Resolution (mm) (Δxzoom, Δyzoom)	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid	Graded Grid		
			Δzzoom(n)	Δzzoom(1)*	Δzzoom(n>1)*	
≤2 GHz	≤15	≤8	≤5	≤4	≤1.5*Δzzoom(n-1)	≥30
2-3 GHz	≤12	≤5	≤5	≤4	≤1.5*Δzzoom(n-1)	≥30
3-4 GHz	≤12	≤5	≤4	≤3	≤1.5*Δzzoom(n-1)	≥28
4-5 GHz	≤10	≤4	≤3	≤2.5	≤1.5*Δzzoom(n-1)	≥25
5-6 GHz	≤10	≤4	≤2	≤2	≤1.5*Δzzoom(n-1)	≥22

Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

4. SAR CHACTERIZATION.

It should be confirmed that Plimit and SAR_target applied by OEM to device in SAR characterization satisfy within the uncertainty of device through SAR measurement.

4.1 Design target for TAS

SAR_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.

SAR_target			
$SAR\_target < FCC\_SAR\_limit \times 10^{-Total\ Uncertainty/10}$			
1g SAR (W/kg)		**10g SAR (W/kg)**	
Total Uncertainty	1.0 dB	Total Uncertainty	1.0 dB
FCC_SAR_limit	1.6 W/kg	FCC_SAR_limit	4.0 W/kg
SAR_target	1.0 W/kg	SAR_target	2.5 W/kg

This device use differennt Radio SAR Index[RSI] to configure different Plimit based on certan exposure configurations for each 2G/3G/4G/5G wireless mode

Radio SAR Indicator (RSI)	Configuration
0	1.Body Worn SAR 2. Phablet SAR measured at Maximum Power 3. Phablet SAR measured at 12 and 6 mm spacing for back, bottom respectively 4. Phablet SAR measured at 0 mm for Front,Top,Left and Right surfaces
1&2	Phablet SAR condition in which the grip sensor in the wireless mode is activated at 0 mm for back and bottom surfaces. Ear jack inseted mode.
3	Hotspot SAR conditions in wireless mode. at 10 mm
4	Head SAR conditions in wireless mode.

SAR test results corresponding to Pmax for each antenna/technology/band/RSI can be found in Appendix A. Plimit is calculated by linearly scaling with the measured SAR at the Pmax to correspond to the SAR_target.

4G/5G Plimit For S.LSI TAS Algorithm								Pmax Maximum Tune-up Output Power
SAR Exposure Configuration			Body Worn SAR Max Power FREE	Phablet SAR Max Power FREE	Phablet SAR Reduced Grip ON Ear-jack	Head SAR RCV-ON	Hotspot SAR	
			15 mm	12, 6, and 0 mm	0 mm	0 mm	10 mm	
Averaging volume			1g	10g	10g	1g	1g	[dBm]
Mode	Band	Antenna	RSI=0		RSI=1,2	RSI=4	RSI=3	
LTE FDD	2	Main 1	27.7	28.8	20.0	28.6	20.0	24.0
LTE FDD	2	Sub 1	33.6	30.0	30.0	18.0	19.0	22.0
LTE FDD	12(17)	Main 1	29.3	27.1	27.1	32.5	29.7	24.5
LTE FDD	26(5)	Main 1	28.8	27.6	27.6	32.1	25.8	24.5
LTE TDD	41	Main 2	18.5	18.5	18.5	18.5	18.5	21.5
LTE FDD	66(4)	Main 1	26.9	27.0	21.0	28.7	21.0	24.0
NR FDD	n5	Main 1	29.5	29.5	26.9	31.4	27.4	24.0
NR FDD	n66	Main 1	27.4	25.0	21.0	29.4	21.0	24.0

Note :
1. Radio SAR indicator (RSI) in the table above means the SAR test configuration of each mobile communication technology.
2. The GSM/UMTS mode and WLAN/BT mode are not controlled by The Samsung S.LSI proprietary TAS (Time Average SAR) algorithm.
2. Plimit and Tune up output power Pmax in above table correspond to average power level after accounting for duty cycle in the case of TDD Modulation schemes (LTE TDD)
3. Maximum tune up output Power Pmax is used to configure DUT during RF tune up procedure. The maximum allowed output power is equal to Tune up power +1 dB device design uncertainty.
4. Compared with the Plimit (Tune up Powers) declared in each RSI by the manufacturer and the Plimit (calculation) calculated by the SAR measurement of each RSI, the lower power is applied to the DUT as the Plimit at each RSI configurations.
5. when Hotspot Mode (RSI=3), Grip sensor (RSI=2) and Ear-jack mode(RSI=1) are triggered at the same time, RSI =3(Hotspot) takes higher priority. The Priority for power reduction was given in the order of hotspot(RSI=3), ear-jack.(RSI=1), and grip (RSI=2).

5. SAR Test Equipment

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F13/ 5R4XF1/ C/ 01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F08/5AJ0A1/C/01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F13/ 5SD0A1/ C/ 01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX60L	F10/5FN3A1/C/01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F13/ 5R4XF1/ A/ 01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F08/5AJ0A1/A/01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F13/ 5SD0A1/ A/ 01	N/A	N/A	N/A
Staubli	TX-60 L spe	F10/5FN3A1/A/01	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick) D21142605	S-1338 1332	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick) D21143300	S-0008	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick) D21142605	001729	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D21142602	N/A	N/A	N/A
TESTO	175-H1/Thermometer	40332651310	12/29/2022	Annual	12/29/2023
TESTO	175-H1/Thermometer	40331949309	12/29/2022	Annual	12/29/2023
TESTO	608-H1/Thermometer	83348029	04/29/2022	Annual	04/29/2023
TESTO	608-H1/Thermometer	2183499992	11/29/2022	Annual	11/29/2023
SPEAG	DAE4	1417	02/24/2022	Annual	02/24/2023
SPEAG	DAE4	446	11/16/2022	Annual	11/16/2023
SPEAG	DAE4	1464	06/15/2022	Annual	06/15/2023
SPEAG	DAE4	1720	05/09/2022	Annual	05/09/2023
SPEAG	E-Field Probe EX3DV4	7655	06/20/2022	Annual	06/20/2023
SPEAG	E-Field Probe EX3DV4	7751	10/07/2022	Annual	10/07/2023
SPEAG	E-Field Probe EX3DV4	7680	09/29/2022	Annual	09/29/2023
SPEAG	E-Field Probe EX3DV4	7370	08/19/2022	Annual	08/19/2023
SPEAG	Dipole D750V3	1014	05/25/2022	Annual	05/25/2023
SPEAG	Dipole D835V2	441	07/15/2022	Annual	07/15/2023
SPEAG	Dipole D1800V2	2d007	07/18/2022	Annual	07/18/2023
SPEAG	Dipole D1900V2	5d032	01/28/2022	Annual	01/28/2023
SPEAG	Dipole D2600V2	1015	07/15/2022	Annual	07/15/2023
Agilent	Power Meter E4419B	MY41291386	09/27/2022	Annual	09/27/2023
Agilent	Power Meter N1911A	MY45101406	06/27/2022	Annual	06/27/2023
Agilent	Power Sensor 8481A	SG1091286	09/272022	Annual	09/27/2023
H.P	Power Sensor 8481A	MY41090873	02/07/2022	Annual	02/07/2023
Agilent	Power Sensor 8481A	MY41090675	09/27/2022	Annual	09/27/2023
Agilent	Wideband Power Sensor N1921A	MY55220026	08/02/2022	Annual	08/02/2023
Agilent	11636B/Power Divider	58698	02/24/2022	Annual	02/24/2023
SPEAG	DAKS 3.5	1038	03/28/2022	Annual	03/28/2023
Agilent	WIRELESS COMMUNICATION E5515C	MY48361100	09/27/2022	Annual	09/27/2023
Agilent	WIRELESS COMMUNICATION E5515C	MY48360252	08/08/2022	Annual	08/08/2023
R&S	Wireless Communication Test Set CMW500	115733	04/14/2022	Annual	04/14/2023
Agilent	SIGNAL GENERATOR N5182A	MY47070230	04/28/2022	Annual	04/28/2023
EMPOWER	RF Power Amplifier	1084	06/20/2022	Annual	06/20/2023
EMPOWER	RF Power Amplifier	1041D/C0508	06/20/2022	Annual	06/20/2023
MICRO LAB	LP Filter / LA-15N	10453	09/27/2022	Annual	09/27/2023
MICRO LAB	LP Filter / LA-30N	-	09/27/2022	Annual	09/27/2023
MICRO LAB	LP Filter / LA-60N	32011	09/27/2022	Annual	09/27/2023

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
Agilent	Attenuator (3dB) 8693B	MY39260298	08/25/2022	Annual	08/25/2023
HP	Attenuator (3dB) 33340A	02427	08/25/2022	Annual	08/25/2023
HP	Attenuator (20dB) 8493C	09271	08/25/2022	Annual	08/25/2023
Agilent	Directional Bridge 86205A	3140A04581	05/262022	Annual	05/26/2023
OSI	Power Divider	#3	06/17/2022	Annual	06/17/2023
HP	Dual Directional Coupler	16072	09/27/2022	Annual	09/27/2023
Anritsu	Radio Communication Test Station MT8000A	6262036812	12/08/2022	Annual	12/08/2023
Anritsu	Radio Communication Tester MT8820C	6201074225	02/24/2022	Annual	02/24/2023
Anritsu	Radio Communication Tester MT8820C	6200695605	04/15/2022	Annual	04/15/2023
Anritsu	Radio Communication Tester MT8821C	6201502997	06/27/2022	Annual	06/27/2023
Anritsu	Radio Communication Tester MT8821C	6262044720	12/07/2022	Annual	12/07/2023

6. Measurement Uncertainty

The measured SAR was <1.5 W/Kg for 1g SAR and <3.75 W/Kg For 10g SAR for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE1528-2013 was not required.

Appendix A: SAR Test Results For P limit CALCULATIONS.

Table A-1 RSI = 4 4G Head SAR

MEASUREMENT RESULTS														
Frequency		Mode		Ant.	Band width	Frame Averaged Conducted Power	Test Position	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				(dBm)	(dBm)		(dB)				(W/kg)	(dBm)	(dBm)
1 880.0	18900	LTE Band 2	Mid	M1	20	23.62	Left Cheek	0	1	49	1:1	0.182	31.0	28.6
1 880.0	18900	LTE Band 2	Mid	M1	20	23.62	Left Tilt	0	1	49	1:1	0.198	30.7	
1 880.0	18900	LTE Band 2	Mid	M1	20	23.62	Right Cheek	0	1	49	1:1	0.319	28.6	
1 880.0	18900	LTE Band 2	Mid	M1	20	23.62	Right Tilt	0	1	49	1:1	0.189	30.9	
1 880.0	18900	LTE Band 2	Mid	S1	20	18.63	Left Cheek	0	1	49	1:1	0.082	29.5	26.6
1 880.0	18900	LTE Band 2	Mid	S1	20	18.63	Left Tilt	0	1	49	1:1	0.100	28.6	
1 880.0	18900	LTE Band 2	Mid	S1	20	18.63	Right Cheek	0	1	49	1:1	0.136	27.3	
1 880.0	18900	LTE Band 2	Mid	S1	20	18.63	Right Tilt	0	1	49	1:1	0.159	26.6	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Left Cheek	0	1	0	1:1	0.144	32.5	32.5
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Left Tilt	0	1	0	1:1	0.078	35.2	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Right Cheek	0	1	0	1:1	0.141	32.6	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Right Tilt	0	1	0	1:1	0.076	35.3	
831.5	26865	LTE Band 26	Mid	M1	10	24.22	Left Cheek	0	1	0	1:1	0.162	32.1	32.1
831.5	26865	LTE Band 26	Mid	M1	10	24.22	Left Tilt	0	1	0	1:1	0.069	35.8	
831.5	26865	LTE Band 26	Mid	M1	10	24.22	Right Cheek	0	1	0	1:1	0.097	34.4	
831.5	26865	LTE Band 26	Mid	M1	10	24.22	Right Tilt	0	1	0	1:1	0.076	35.4	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Left Cheek	0	1	0	1:1.58	0.674	21.2	21.2
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Left Tilt	0	1	0	1:1.58	0.336	24.2	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Right Cheek	0	1	0	1:1.58	0.172	27.1	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Right Tilt	0	1	0	1:1.58	0.150	27.7	
1 770.0	132572	LTE Band 66	High	M1	20	23.64	Left Cheek	0	1	49	1:1	0.292	29.0	28.7
1 770.0	132572	LTE Band 66	High	M1	20	23.64	Left Tilt	0	1	49	1:1	0.278	29.2	
1 770.0	132572	LTE Band 66	High	M1	20	23.64	Right Cheek	0	1	49	1:1	0.309	28.7	
1 770.0	132572	LTE Band 66	High	M1	20	23.64	Right Tilt	0	1	49	1:1	0.234	29.9	

The Plimit of LTE TDD was written as Frame averaged power

Table A-2 RSI=4 – NR Head SAR
For some bands/modes, a lower *PLimit* was selected as a more conservative evaluation.

MEASUREMENT RESULTS																
Frequency		Mode		Ant.	Band width	Frame Averaged Conducted Power	Test Configurations		MPR	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				(dBm)	(dBm)			(dB)				(W/kg)	(dBm)	(dBm)
836.5	167300	NR Band n5	Mid	M1	20	24.08	Left Cheek	DFT-s-OFDM QPSK	0	1	104	1:1	0.187	31.4	31.4
836.5	167300	NR Band n5	Mid	M1	20	24.08	Left Tilt	DFT-s-OFDM QPSK	0	1	104	1:1	0.104	33.9	
836.5	167300	NR Band n5	Mid	M1	20	24.08	Right Cheek	DFT-s-OFDM QPSK	0	1	104	1:1	0.146	31.5	
836.5	167300	NR Band n5	Mid	M1	20	24.08	Right Tilt	DFT-s-OFDM QPSK	0	1	104	1:1	0.107	32.9	
1 770.0	354000	NR Band n66	High	M1	20	23.73	Left Cheek	DFT-s-OFDM QPSK	0	1	104	1:1	0.234	30.0	29.4
1 770.0	354000	NR Band n66	High	M1	20	23.73	Left Tilt	DFT-s-OFDM QPSK	0	1	104	1:1	0.197	30.8	
1 770.0	354000	NR Band n66	High	M1	20	23.73	Right Cheek	DFT-s-OFDM QPSK	0	1	104	1:1	0.273	29.4	
1 770.0	354000	NR Band n66	High	M1	20	23.73	Right Tilt	DFT-s-OFDM QPSK	0	1	104	1:1	0.179	31.2	

Table A-3 RSI = 0 - 4G Body-Worn SAR

For some bands/modes, a lower P_{Limit} was selected as a more conservative evaluation.

MEASUREMENT RESULTS															
Frequency		Mode		Ant.	Band width	Frame Averaged Conducted Power	Test Position	Spacing (mm)	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				MHz	(dBm)			(dB)				(W/kg)	(dBm)	(dBm)
1 880.0	18900	LTE Band 2	Mid	M1	20	23.62	Back	15	0	1	49	1:1	0.374	27.9	27.7
1 880.0	18900	LTE Band 2	Mid	M1	20	23.62	Front	15	0	1	49	1:1	0.392	27.7	
1 880.0	18900	LTE Band 2	Mid	S1	20	21.88	Back	15	0	1	49	1:1	0.068	33.6	33.6
1 880.0	18900	LTE Band 2	Mid	S1	20	21.88	Front	15	0	1	49	1:1	0.036	36.3	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Back	15	0	1	0	1:1	0.298	29.3	29.3
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Front	15	0	1	0	1:1	0.215	30.8	
831.5	26865	LTE Band 26	Mid	M1	10	24.22	Back	15	0	1	0	1:1	0.351	28.8	28.8
831.5	26865	LTE Band 26	Mid	M1	10	24.22	Front	15	0	1	0	1:1	0.094	34.5	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Back	15	0	1	0	1:1.58	0.319	24.5	24.5
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Front	15	0	1	0	1:1.58	0.097	29.6	
1 770.0	132572	LTE Band 66	High	M1	20	23.64	Back	15	0	1	49	1:1	0.473	26.9	26.9
1 770.0	132572	LTE Band 66	High	M1	20	23.64	Front	15	0	1	49	1:1	0.406	27.6	

The Plimit of LTE TDD was written as Frame averaged power

Table A-4 RSI = 0 - NR Body-Worn SAR

For some bands/modes, a lower P_{Limit} was selected as a more conservative evaluation.

MEASUREMENT RESULTS																	
Frequency		Mode		Ant.	Band width	Frame Averaged Conducted Power	Test Configurations		MPR	Spacing (mm)	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				MHz	(dBm)			(dB)					(W/kg)	(dBm)	(dBm)
836.5	167300	NR Band n5	Mid	M1	20	24.08	Back	DFT-s-OFDM QPSK	0	15	1	104	1:1	0.230	29.5	29.5
836.5	167300	NR Band n5	Mid	M1	20	24.08	Front	DFT-s-OFDM QPSK	0	15	1	104	1:1	0.185	30.5	
1 770.0	354000	NR Band n66	High	M1	20	23.73	Back	DFT-s-OFDM QPSK	0	15	1	104	1:1	0.437	27.4	27.4
1 770.0	354000	NR Band n66	High	M1	20	23.73	Front	DFT-s-OFDM QPSK	0	15	1	104	1:1	0.359	28.2	

Table A-5 RSI = 3 – 4G Hotspot SAR

For some bands/modes, a lower P_{Limit} was selected as a more conservative evaluation.

MEASUREMENT RESULTS															
Frequency		Mode		Ant.	Band width	Frame Averaged Conducted Power	Test Position	Spacing (mm)	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				MHz	(dBm)			(dB)				(W/kg)	(dBm)	(dBm)
1 880.0	18900	LTE Band 2	Mid	M1	20	20.75	Back	10	0	1	49	1:1	0.495	23.8	
1 880.0	18900	LTE Band 2	Mid	M1	20	20.75	Front	10	0	1	49	1:1	0.339	25.4	
1 880.0	18900	LTE Band 2	Mid	M1	20	20.75	Left	10	0	1	49	1:1	0.239	27.0	23.8
1 880.0	18900	LTE Band 2	Mid	M1	20	20.75	Right	10	0	1	49	1:1	0.051	33.7	
1 880.0	18900	LTE Band 2	Mid	M1	20	20.75	Bottom	10	0	1	49	1:1	0.410	24.6	
1 900.0	19100	LTE Band 2	High	S1	10	19.63	Back	10	0	1	49	1:1	0.092	30.0	
1 900.0	19100	LTE Band 2	High	S1	10	19.63	Front	10	0	1	49	1:1	0.049	32.7	
1 900.0	19100	LTE Band 2	High	S1	10	19.63	Left	10	0	1	49	1:1	0.010	39.6	30.0
1 900.0	19100	LTE Band 2	High	S1	10	19.63	Right	10	0	1	49	1:1	0.021	36.4	
1 900.0	19100	LTE Band 2	High	S1	10	19.63	Bottom	10	0	1	49	1:1	0.061	31.8	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Back	10	0	1	0	1:1	0.252	30.1	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Front	10	0	1	0	1:1	0.189	31.3	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Left	10	0	1	0	1:1	0.129	33.0	29.7
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Right	10	0	1	0	1:1	0.272	29.7	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Bottom	10	0	1	0	1:1	0.095	34.3	
831.5	26865	LTE Band 26	Mid	M1	20	24.22	Back	10	0	1	0	1:1	0.701	25.8	
831.5	26865	LTE Band 26	Mid	M1	20	24.22	Front	10	0	1	0	1:1	0.122	33.4	
831.5	26865	LTE Band 26	Mid	M1	20	24.22	Left	10	0	1	0	1:1	0.076	35.4	25.8
831.5	26865	LTE Band 26	Mid	M1	20	24.22	Right	10	0	1	0	1:1	0.132	33.0	
831.5	26865	LTE Band 26	Mid	M1	20	24.22	Bottom	10	0	1	0	1:1	0.118	33.5	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Back	10	0	1	0	1:1.58	0.554	22.1	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Front	10	0	1	0	1:1.58	0.165	27.3	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Left	10	0	1	0	1:1.58	0.371	23.8	22.1
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Right	10	0	1	0	1:1.58	0.013	38.4	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Bottom	10	0	1	0	1:1.58	0.053	32.2	
1 745.0	132322	LTE Band 66	Mid	M1	20	21.90	Back	10	0	1	0	1:1	0.558	24.4	
1 745.0	132322	LTE Band 66	Mid	M1	20	21.90	Front	10	0	1	0	1:1	0.376	26.2	
1 745.0	132322	LTE Band 66	Mid	M1	20	21.90	Left	10	0	1	0	1:1	0.224	28.4	24.4
1 745.0	132322	LTE Band 66	Mid	M1	20	21.90	Right	10	0	1	0	1:1	0.092	32.3	
1 745.0	132322	LTE Band 66	Mid	M1	20	21.90	Bottom	10	0	1	0	1:1	0.536	24.6	

The Plimit of LTE TDD was written as Frame averaged power

Table A-6 RSI = 3 – NR Hotspot SAR

For some bands/modes, a lower P_{Limit} was selected as a more conservative evaluation.

MEASUREMENT RESULTS																
Frequency		Mode		Ant.	Band width	Frame Averaged Conducted Power	Test Position		MPR	Spacing (mm)	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				MHz	(dBm)			(dB)					(W/kg)	(dBm)	(dBm)
836.5	167300	NR Band n5	Mid	M1	20	24.08	Back	DFT-s-OFDM QPSK	0	10	1	104	1:1	0.470	27.4	
836.5	167300	NR Band n5	Mid	M1	20	24.08	Front	DFT-s-OFDM QPSK	0	10	1	104	1:1	0.160	32.0	
836.5	167300	NR Band n5	Mid	M1	20	24.08	Left	DFT-s-OFDM QPSK	0	10	1	104	1:1	0.132	32.9	27.4
836.5	167300	NR Band n5	Mid	M1	20	24.08	Right	DFT-s-OFDM QPSK	0	10	1	104	1:1	0.227	30.5	
836.5	167300	NR Band n5	Mid	M1	20	24.08	Bottom	DFT-s-OFDM QPSK	0	10	1	104	1:1	0.207	30.9	
1 720	344000	NR Band n66	Mid	M1	20	21.59	Back	DFT-s-OFDM QPSK	0	10	1	1	1:1	0.695	23.2	
1 720	344000	NR Band n66	Mid	M1	20	21.59	Front	DFT-s-OFDM QPSK	0	10	1	1	1:1	0.492	24.7	
1 720	344000	NR Band n66	Mid	M1	20	21.59	Left	DFT-s-OFDM QPSK	0	10	1	1	1:1	0.356	26.1	23.2
1 720	344000	NR Band n66	Mid	M1	20	21.59	Right	DFT-s-OFDM QPSK	0	10	1	1	1:1	0.195	28.7	
1 720	344000	NR Band n66	Mid	M1	20	21.59	Bottom	DFT-s-OFDM QPSK	0	10	1	1	1:1	0.432	25.2	

Table A-7 RSI = 0 – 4G Phablet SAR

For some bands/modes, a lower P_{Limit} was selected as a more conservative evaluation.

MEASUREMENT RESULTS															
Frequency		Mode		Ant.	Band width	Frame Averaged Conducted Power	Test Position	Spacing (mm)	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				MHz	(dBm)			(dB)				(W/kg)	(dBm)	(dBm)
1 880.0	18900	LTE Band 2	Mid	M1	20	23.62	Back	12	0	1	49	1:1	0.259	33.47	
1 880.0	18900	LTE Band 2	Mid	M1	20	23.62	Front	0	0	1	49	1:1	0.767	28.75	
1 880.0	18900	LTE Band 2	Mid	M1	20	23.62	Left	0	0	1	49	1:1	0.526	30.39	28.75
1 880.0	18900	LTE Band 2	Mid	M1	20	23.62	Right	0	0	1	49	1:1	0.067	39.34	
1 880.0	18900	LTE Band 2	Mid	M1	20	23.62	Bottom	6	0	1	49	1:1	0.306	32.74	
1 880.0	18900	LTE Band 2	Mid	S1	20	18.63	Back	0	0	1	49	1:1	0.390	29.95	
1 880.0	18900	LTE Band 2	Mid	S1	20	18.63	Front	0	0	1	49	1:1	0.274	31.48	
1 880.0	18900	LTE Band 2	Mid	S1	20	18.63	Left	0	0	1	49	1:1	0.023	42.24	29.95
1 880.0	18900	LTE Band 2	Mid	S1	20	18.63	Right	0	0	1	49	1:1	0.057	38.30	
1 880.0	18900	LTE Band 2	Mid	S1	20	18.63	Top	0	0	1	49	1:1	0.334	30.62	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Back	0	0	1	0	1:1	1.260	27.1	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Front	0	0	1	0	1:1	0.204	35.0	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Left	0	0	1	0	1:1	0.129	37.0	27.1
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Right	0	0	1	0	1:1	0.236	34.3	
707.5	23095	LTE Band 12	Mid	M1	10	24.08	Bottom	0	0	1	0	1:1	0.376	32.3	
831.5	26865	LTE Band 26	Mid	M1	10	24.22	Back	0	0	1	0	1:1	1.150	27.6	
831.5	26865	LTE Band 26	Mid	M1	10	24.22	Front	0	0	1	0	1:1	0.484	31.4	
831.5	26865	LTE Band 26	Mid	M1	10	24.22	Left	0	0	1	0	1:1	0.161	36.1	27.6
831.5	26865	LTE Band 26	Mid	M1	10	24.22	Right	0	0	1	0	1:1	0.440	31.8	
831.5	26865	LTE Band 26	Mid	M1	10	24.22	Bottom	0	0	1	0	1:1	0.991	28.2	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Back	0	0	1	0	1:1.58	2.130	22.9	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Front	0	0	1	0	1:1.58	0.859	26.8	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Left	0	0	1	0	1:1.58	1.460	24.5	22.9
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Right	0	0	1	0	1:1.58	0.021	42.9	
2 593.0	40620	LTE Band 41	Mid	M2	20	19.49	Bottom	0	0	1	0	1:1.58	0.343	30.8	
1 770.0	132572	LTE Band 66	High	M1	20	23.64	Back	12	0	1	49	1:1	0.251	33.62	
1 770.0	132572	LTE Band 66	High	M1	20	23.64	Front	0	0	1	49	1:1	1.160	26.97	
1 770.0	132572	LTE Band 66	High	M1	20	23.64	Left	0	0	1	49	1:1	0.709	29.11	26.97
1 770.0	132572	LTE Band 66	High	M1	20	23.64	Right	0	0	1	49	1:1	0.207	34.46	
1 770.0	132572	LTE Band 66	High	M1	20	23.64	Bottom	6	0	1	49	1:1	0.341	32.29	

The Plimit of LTE TDD was written as Frame averaged power

Table A-8 RSI = 0 – NR Phablet SAR (Grip Sensor not activated)
For some bands/modes, a lower P_{Limit} was selected as a more conservative evaluation.

MEASUREMENT RESULTS																	
Frequency		Mode		Ant.	Band width	Frame Averaged Conducted Power	Test Position		MPR	Spacing (mm)	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				MHz	(dBm)			(dB)					(W/kg)	(dBm)	(dBm)
836.5	167300	NR Band n5	Mid	M1	20	24.08	Back	DFT-s-OFDM QPSK	0	0	1	104	1:1	1.320	26.9	26.9
836.5	167300	NR Band n5	Mid	M1	20	24.08	Front	DFT-s-OFDM QPSK	0	0	1	104	1:1	0.262	33.9	
836.5	167300	NR Band n5	Mid	M1	20	24.08	Left	DFT-s-OFDM QPSK	0	0	1	104	1:1	0.089	32.0	
836.5	167300	NR Band n5	Mid	M1	20	24.08	Right	DFT-s-OFDM QPSK	0	0	1	104	1:1	0.271	33.7	
836.5	167300	NR Band n5	Mid	M1	20	24.08	Bottom	DFT-s-OFDM QPSK	0	0	1	104	1:1	0.399	38.6	
1 770.0	354000	NR Band n66	High	M1	20	23.73	Back	DFT-s-OFDM QPSK	0	6	1	104	1:1	0.419	31.5	25.0
1 770.0	354000	NR Band n66	High	M1	20	23.73	Front	DFT-s-OFDM QPSK	0	0	1	104	1:1	1.890	25.0	
1 770.0	354000	NR Band n66	High	M1	20	23.73	Left	DFT-s-OFDM QPSK	0	0	1	104	1:1	1.050	29.7	
1 770.0	354000	NR Band n66	High	M1	20	23.73	Right	DFT-s-OFDM QPSK	0	0	1	104	1:1	0.286	33.2	
1 770.0	354000	NR Band n66	High	M1	20	23.73	Bottom	DFT-s-OFDM QPSK	0	12	1	104	1:1	0.645	27.5	

Table A-9 RSI = 1(Ear-jack is inserted) &2 (Grip Sensor is on) - – 4G Phablet SAR
For some bands/modes, a lower P_{Limit} was selected as a more conservative evaluation.

MEASUREMENT RESULTS															
Frequency		Mode		Ant.	Band width	Frame Averaged Conducted Power	Test Position	Spacing (mm)	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				MHz	(dBm)			(dB)				(W/kg)	(dBm)	(dBm)
1 880.0	18900	LTE Band 2	Mid	M1	20	20.75	Back	0	0	1	49	1:1	1.840	23.2	23.2
1 880.0	18900	LTE Band 2	Mid	M1	20	20.75	Bottom	0	0	1	49	1:1	0.913	26.3	
1 745.0	132322	LTE Band 66	Mid	M1	20	21.90	Back	0	0	1	0	1:1	2.130	22.3	22.3
1 745.0	132322	LTE Band 66	Mid	M1	20	21.90	Bottom	0	0	1	0	1:1	1.090	25.2	

Table A-10 RSI = 1(Ear-jack is inserted**) &2 (**Grip Sensor is on**) – NR Phablet SAR**
For some bands/modes, a lower P_{Limit} was selected as a more conservative evaluation.

MEASUREMENT RESULTS																
Frequency		Mode		Ant.	Band width	Frame Averaged Conducted Power	Test Position		MPR	Spacing (mm)	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				MHz	(dBm)			(dB)					(W/kg)	(dBm)	(dBm)
1 720.0	344000	NR Band n66	Mid	M1	20	21.59	Back	DFT-s-OFDM QPSK	0	0	1	1	1:1	2.130	22.3	22.3
1 720.0	344000	NR Band n66	Mid	M1	20	21.59	Bottom	DFT-s-OFDM QPSK	0	0	1	1	1:1	1.090	25.2	