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SAR Char. REPORT

APPLICANT
Samsung Electronics. Co., Ltd.

REPORT NO.
HCT-SR-2403-FC003

DATE OF ISSUE
Mar. 21, 2024

Tested by (signature)
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TEST REPORT

Part 0 TA-SAR RF Exposure REPORT

REPORT NO.
HCT-SR-2403-FC003

DATE OF ISSUE
Mar. 21, 2024

FCC ID
A3LSMM356B

Applicant	SAMSUNG Electronics Co., Ltd 129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do, 16677, Korea
Product Name	**Mobile Phone**
Model Name	**SM-M356B/DS**
Date of Test	**Feb. 13, 2024 ~ Mar. 19, 2024**
Location of Test	■ Permanent Testing Lab □ On Site Testing Lab (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si,
FCC Rule Part(s)	FCC 47 CFR Part 2.1093

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	Mar. 21, 2024	Initial Release

Notice

Content
The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated. The test results have only been applied with the test methods required by the standard(s). The laboratory is not accredited for the test results marked *. Information provided by the applicant is marked **. Test results provided by external providers are marked ***. When confirmation of authenticity of this test report is required, please contact www.hct.co.kr The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

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)

2. Device Under Test Description

2.1 DUT specification

Device Wireless specification overview		
Band & Mode	**Operating Mode**	**Tx Frequency**
GSM850	Voice / Data	824.2 ㎒ ~ 848.8 ㎒
GSM1900	Voice / Data	1 850.2 ㎒ ~ 1 909.8 ㎒
UMTS Band 2	Voice / Data	1 852.4 ㎒ ~ 1 907.6 ㎒
UMTS Band 4	Voice / Data	1 712.4 ㎒ ~ 1 752.6 ㎒
UMTS Band 5	Voice / Data	826.4 ㎒ ~ 846.6 ㎒
LTE FDD Band 2 (PCS)	Voice / Data	1 850.7 ㎒ ~ 1 909.3 ㎒
LTE FDD Band 4 (AWS)	Voice / Data	1 710.7 ㎒ ~ 1 754.3 ㎒
LTE FDD Band 5 (Cell)	Voice / Data	824.7 ㎒ ~ 848.3 ㎒
LTE FDD Band 12	Voice / Data	699.7 ㎒ ~ 715.3 ㎒
LTE FDD Band 17	Voice / Data	706.5 ㎒ ~ 713.5 ㎒
LTE FDD Band 26	Voice / Data	814.7 ㎒ ~ 848.3 ㎒
LTE TDD Band 41	Voice / Data	2 498.5 ㎒ ~ 2 687.5 ㎒
LTE FDD Band 66 (AWS)	Voice / Data	1 710.7 ㎒ ~ 1 779.3 ㎒
NR FDD Band n5	Voice / Data	826.5 ㎒ ~ 846.5 ㎒
NR TDD Band n41	Voice / Data	2 506.02 ㎒ ~ 2 679.99 ㎒
NR FDD Band n66	Voice / Data	1 712.5 ㎒ ~ 1 777.5 ㎒
NR TDD Band n77	Voice / Data	3 705 ㎒ ~ 3 975 ㎒
NR TDD Band n77 DoD	Voice / Data	3 455.04 ㎒ ~ 3 544.98 ㎒
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 ㎒

This device uses the S.LSI 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 operations. Additionally, this device supports WLAN/NFC technology, but the output power of this technology is not controlled by the S.LSI TAS algorithm.

2.2 Introduction of SAR compliance test with the S.LSI TAS algorithm

FCC RF exposure limit is based on time –
averaged RF exposure. Both SAR regulatory specifications are defined over certain measureme nt duration allowing for time-averaging. The Samsung S.LSI proprietary TAS (Time Average S AR) algorithm has been designed to meet the compliance limits over the required durati on, 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 WLAN/BT mode are not controlled by the Samsung S.LSI proprietary TAS (Time Average SAR) algorithm.
In the wireless mode of WLAN, 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 2G/3G4G/5G communication mode declared by the manufacturer satisfies SAR_target.

The compliance test under the static transmission scenario and simultaneous transmission analys is are reported in SAR report for Sub 6GHz. The validation of The Samsung S.LSI proprietary TA S (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.

Frequency	Maximum Area Scan Resolution(mm) (Δxarea, Δyarea)	Maximum Zoom Scan Resolution (mm) (Δxzoom, Δyzoom)	Maximum Zoom Scan Spatial			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*Δ zzoom(n-1)	≥30
2-3 GHz	≤12	≤5	≤5	≤4	≤1.5*Δ zzoom(n-1)	≥30
3-4 GHz	≤12	≤5	≤4	≤3	≤1.5*Δ zzoom(n-1)	≥28
4-5 GHz	≤10	≤4	≤3	≤2.5	≤1.5*Δ zzoom(n-1)	≥25
5-6 GHz	≤10	≤4	≤2	≤2	≤1.5*Δ zzoom(n-1)	≥22

Table 3-1

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

4. SAR CHARACTERIZATION

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 t otal
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 Free Power
1	Head SAR conditions in wireless mode.
2	Hotspot SAR conditions in wireless mode. at 10 mm

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.

Plim values in green indicate Plimit < Pmax			Plimit values in grey indicate Plimit > Pmax			
Plimit corresponding to 1 W/kg (1g) 2.5W/kg(10g) SAR_Design_target						Pmax
SAR Exposure Position			Head (RCV ON)	Body Phablet		Maximum Tune-up Output Power (Burst Average Power)
Averaging volume			1g	1g	10g	
seperation Distance			0 mm	10 mm	0 mm	
Mode	Band	Antenna	RSI = 1	RSI =0,2		
GSM/GPRS/EDGE	850	MAIN 1	31.4	27.2		28.5
GSM/GPRS/EDGE	1900	MAIN 2	32.0	20.5		26.5
UMTS	2	MAIN 2	30.0	20.0		23.0
UMTS	4	MAIN 2	32.4	20.0		23.0
UMTS	5	MAIN 1	31.2	26.0		24.0
LTE FDD	2	MAIN 2	30.5	20.0		23.0
LTE FDD	2	MAIN 3	26.4	20.0		23.0
LTE FDD	66(4)	MAIN 2	29.7	20.0		23.0
LTE FDD	66(4)	MAIN 3	28.2	20.0		23.0
LTE FDD	12(17)	MAIN 1	33.2	28.7		24.5
LTE FDD	26(5)	MAIN 1	32.2	26.1		24.5
LTE TDD PC3	41	MAIN 2	28.2	20.0		23.0
NR FDD	5	MAIN 1	32.6	27.1		24.5
NR FDD	66	MAIN 2	30.3	20.0		23.5
NR TDD	41 (SRS 0)	MAIN 2	17.0	17.0		23.5
NR TDD	41 (SRS 1)	Sub 1	12.0	12.0		16.0
NR TDD	41 (SRS 2)	MAIN 3	13.5	13.5		18.5
NR TDD	41 (SRS 3)	Sub 4	14.5	14.5		20.0
NR TDD	77	Sub 3	17.0	17.0		25.5

Note:
1. Radio SAR indicator (RSI) in the table above means the SAR test configuration of each mobile communication technology.
2. 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 Free Mode (RSI=0), RCV (RSI=1) and Hotspot Mode (RSI=2) are triggered at the same time, RSI =0(Free) takes higher priority. The priority for power reduction was given in the order of Free (RSI=0), RCV (RSI=1), and Hotspot (RSI=2).

5. Equipment List

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
SPEAG	ELI Phantom	-	N/A	N/A	N/A
HP	SAR System Control PC	-	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F11/5K3RA1/C/01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F12/5K9GA1/C/01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F17/59CHA1/C/01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F17/59RAA1/C/01	N/A	N/A	N/A
Staubli	CS8Cspeag-TX90	F13/5R4XF1/A/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-TX90	F07/55B8A1/C/01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F11/5K3RA1/A/01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F12/5K9GA1/A/01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F17/59CHA1/A/01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F17/59RAA1/A/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	TX90 XLspeag	F07/55B8A1/A/01	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	S-1203 0309	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	S-1206 0513	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	010963	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	011578	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	S-1338 1332	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	S-0008	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	001729	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	S-0306	N/A	N/A	N/A
TESTO	175-H1/Thermometer	40331936309	12/26/2023	Annual	12/26/2024
TESTO	175-H1/Thermometer	40331939309	12/26/2023	Annual	12/26/2024
TESTO	175-H1/Thermometer	40331915309	12/26/2023	Annual	12/26/2024
TESTO	175-H1/Thermometer	40331922309	12/26/2023	Annual	12/26/2024
TESTO	175-H1/Thermometer	40332651310	12/26/2023	Annual	12/26/2024
TESTO	175-H1/Thermometer	40331949309	12/26/2023	Annual	12/26/2024
TESTO	608-H1/Thermometer	83348029	03/27/2023	Annual	03/27/2024
TESTO	608-H1/Thermometer	83348021	03/27/2023	Annual	03/27/2024
SPEAG	DAE4	1687	07/18/2023	Annual	07/18/2024
SPEAG	DAE4	652	01/17/2024	Annual	01/17/2025
SPEAG	DAE4	504	01/30/2024	Annual	01/30/2025
SPEAG	DAE4	466	04/25/2023	Annual	04/25/2024
SPEAG	DAE4	648	04/25/2023	Annual	04/25/2024
SPEAG	DAE4	1629	08/21/2023	Annual	08/21/2024
SPEAG	DAE4	780	07/04/2023	Annual	07/04/2024
SPEAG	DAE4	1417	02/16/2024	Annual	02/16/2025
SPEAG	DAE4	446	11/16/2023	Annual	11/16/2024
SPEAG	E-Field Probe ES3DV3	3076	07/18/2023	Annual	07/18/2024
SPEAG	E-Field Probe EX3DV4	7732	06/20/2023	Annual	06/20/2024
SPEAG	E-Field Probe EX3DV4	7370	08/24/2023	Annual	08/24/2024
SPEAG	E-Field Probe EX3DV4	7654	05/24/2023	Annual	05/24/2024
SPEAG	E-Field Probe EX3DV4	3903	07/19/2023	Annual	07/19/2024
SPEAG	E-Field Probe EX3DV4	7681	11/27/2023	Annual	11/27/2024
SPEAG	E-Field Probe EX3DV4	7679	08/24/2023	Annual	08/24/2024
SPEAG	E-Field Probe EX3DV4	7622	11/24/2023	Annual	11/24/2024
SPEAG	E-Field Probe EX3DV4	7751	10/06/2023	Annual	10/06/2024

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	CLA13	1016	09/21/2023	Annual	09/21/2024
SPEAG	Dipole D750V3	1014	05/23/2023	Annual	05/23/2024
SPEAG	Dipole D835V2	4d165	05/23/2023	Annual	05/23/2024
SPEAG	Dipole D1800V2	2d015	05/17/2023	Annual	05/17/2024
SPEAG	Dipole D1900V2	5d032	01/18/2024	Annual	01/18/2025
SPEAG	Dipole D2450V2	1049	04/25/2023	Annual	04/25/2024
SPEAG	Dipole D2600V2	1106	05/24/2023	Annual	05/24/2024
SPEAG	Dipole D3500V2	1132	01/23/2024	Annual	01/23/2025
SPEAG	Dipole D3700V2	1105	11/20/2023	Annual	11/20/2024
SPEAG	Dipole D3900V2	1019	05/19/2023	Annual	05/19/2024
SPEAG	Dipole D5GHzV2	1317	05/17/2023	Annual	05/17/2024
Agilent	Power Meter E4419B	MY41291386	09/21/2023	Annual	09/21/2024
Agilent	Power Meter N1911A	MY45101406	05/26/2023	Annual	05/26/2024
Agilent	Power Sensor 8481A	SG1091286	09/21/2023	Annual	09/21/2024
H.P	Power Sensor 8481A	MY41090675	09/21/2023	Annual	09/21/2024
Agilent	Wideband Power Sensor N1921A	MY55220026	07/28/2023	Annual	07/28/2024
Agilent	11636B/Power Divider	58698	01/25/2024	Annual	01/25/2025
SPEAG	DAKS 3.5	1038	01/22/2024	Annual	01/22/2025
SPEAG	Vector Reflectometer	00141013	01/11/2024	Annual	01/11/2025
SPEAG	Vector Reflectometer	21393001	03/30/2023	Annual	03/30/2023
SPEAG	MXA Signal Analyzer	MY49100108	01/09/2024	Annual	01/09/2025
H.P	Network Analyzer /8753ES	JP39240221	12/26/2023	Annual	12/26/2024
Agilent	WIRELESS COMMUNICATION E5515C	MY48361100	09/21/2023	Annual	09/21/2024
Agilent	WIRELESS COMMUNICATION E5515C	MY48360252	07/27/2023	Annual	07/27/2024
R&S	Wireless Communication Test Set CMW500	115733	03/23/2023	Annual	03/23/2024
Agilent	SIGNAL GENERATOR N5182A	MY47070230	03/23/2023	Annual	03/23/2024
EMPOWER	RF Power Amplifier	1084	05/26/2023	Annual	05/26/2024
EMPOWER	RF Power Amplifier	1041D/C0508	05/26/2023	Annual	05/26/2024
EMPOWER	RF Power Amplifier	1011	09/21/2023	Annual	09/21/2024
MICRO LAB	LP Filter / LA-15N	10453	09/21/2023	Annual	09/21/2024
MICRO LAB	LP Filter / LA-30N	-	09/21/2023	Annual	09/21/2024
MICRO LAB	LP Filter / LA-60N	32011	09/21/2023	Annual	09/21/2024
Agilent	Attenuator (3dB) 8693B	MY39260298	08/22/2023	Annual	08/22/2024
HP	Attenuator (3dB) 33340A	02427	08/22/2023	Annual	08/22/2024
HP	Attenuator (20dB) 8493C	09271	08/22/2023	Annual	08/22/2024
Agilent	Directional Bridge 86205A	3140A04581	04/25/2023	Annual	04/25/2024
OSI	Power Divider	#3	05/26/2023	Annual	05/26/2024
Agilent	MXA Signal Analyzer N9020A	MY50510407	06/07/2023	Annual	06/07/2024
HP	Dual Directional Coupler	16072	09/21/2023	Annual	09/21/2024
Anritsu	Radio Communication Test Station MT8000A	6261987928	01/18/2024	Annual	01/18/2025
Anritsu	Radio Communication Test Station MT8000A	6262036812	11/28/2023	Annual	11/28/2024
Anritsu	Radio Communication Tester MT8820C	6201074225	01/17/2024	Annual	01/17/2025
Anritsu	Radio Communication Tester MT8820C	6200695605	03/23/2023	Annual	03/23/2024
Anritsu	Radio Communication Tester MT8821C	6201502997	05/26/2023	Annual	05/26/2024
Anritsu	Radio Communication Tester MT8821C	6262044720	11/28/2023	Annual	11/28/2024

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
Anritsu	Radio Communication Tester MT8821C	6201664725	01/17/2024	Annual	01/17/2025
Agilent	WIRELESS COMMUNICATION E5515C	MY50260992	05/26/2023	Annual	05/26/2024
ROHDE&SCHWARZ	BLUETOOTH TESTER CBT	100272	01/16/2024	Annual	01/16/2025

The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Verification measurement is performed by HCT Lab. before each test. The brain/body simulating material is calibrated by HCT using the DAKS 3.5 to determine the conductivity and permittivity (dielectric constant) of the brain/body-equivalent material.

5. 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 = 1 $P_{\_limit}$ Calculations – 2G/3G Head SAR

MEASUREMENT RESULTS										
Frequency		Mode/ Band		Ant.	Frame Averaged Conducted Power	Test Position	Duty Cycle	Meas. SAR(1g)	$P_{\_limit}$	Minimum $P_{\_limit}$
MHz	Ch.				(dBm)			(W/kg)	(dBm)	(dBm)
836.6	190	GSM 850	GPRS 4Tx	Main 1	26.32	Left Cheek	1:2.07	0.290	31.7	31.6
836.6	190	GSM 850		Main 1	26.32	Left Tilt	1:2.07	0.155	34.4	
836.6	190	GSM 850		Main 1	26.32	Right Cheek	1:2.07	0.296	**31.6**	
836.6	190	GSM 850		Main 1	26.32	Right Tilt	1:2.07	0.180	33.8	
1 850.2	512	GSM 1900	GPRS 4Tx	Main 2	23.99	Left Cheek	1:2.07	0.151	**32.2**	32.2
1 850.2	512	GSM 1900		Main 2	23.99	Left Tilt	1:2.07	0.109	33.6	
1 850.2	512	GSM 1900		Main 2	23.99	Right Cheek	1:2.07	0.135	32.7	
1 850.2	512	GSM 1900		Main 2	23.99	Right Tilt	1:2.07	0.093	34.3	
836.4	4183	UMTS Band 5	RMC	Main 1	24.48	Left Cheek	1:1	0.169	32.2	31.2
836.4	4183	UMTS Band 5	RMC	Main 1	24.48	Left Tilt	1:1	0.075	35.7	
836.4	4183	UMTS Band 5	RMC	Main 1	24.48	Right Cheek	1:1	0.211	**31.2**	
836.4	4183	UMTS Band 5	RMC	Main 1	24.48	Right Tilt	1:1	0.102	34.4	
1 732.4	1412	UMTS Band 4	RMC	Main 2	23.05	Left Cheek	1:1	0.116	**32.4**	32.4
1 732.4	1412	UMTS Band 4	RMC	Main 2	23.05	Left Tilt	1:1	0.066	34.9	
1 732.4	1412	UMTS Band 4	RMC	Main 2	23.05	Right Cheek	1:1	0.067	34.8	
1 732.4	1412	UMTS Band 4	RMC	Main 2	23.05	Right Tilt	1:1	0.086	33.7	
1 880	9400	UMTS Band 2	RMC	Main 2	22.84	Left Cheek	1:1	0.191	**30.0**	30.0
1 880	9400	UMTS Band 2	RMC	Main 2	22.84	Left Tilt	1:1	0.092	33.2	
1 880	9400	UMTS Band 2	RMC	Main 2	22.84	Right Cheek	1:1	0.130	31.7	
1 880	9400	UMTS Band 2	RMC	Main 2	22.84	Right Tilt	1:1	0.120	32.0	

Table A-2
RSI = 1 $P_{\_limit}$ Calculations – 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)	$P_{\_limit}$	Minimum $P_{\_limit}$
MHz	Ch.				(dBm)	(dBm)		(dB)				(W/kg)	(dBm)	(dBm)
1 900	19100	LTE Band 2 Lower	High	Main 2	20	23.27	Left Cheek	0	1	49	1:1	0.188	**30.5**	30.5
1 900	19100	LTE Band 2 Lower	High	Main 2	20	23.27	Left Tilt	0	1	49	1:1	0.087	33.9	
1 900	19100	LTE Band 2 Lower	High	Main 2	20	23.27	Right Cheek	0	1	49	1:1	0.163	31.1	
1 900	19100	LTE Band 2 Lower	High	Main 2	20	23.27	Right Tilt	0	1	49	1:1	0.130	32.1	
1 770	19100	LTE Band 2 Upper	High	Main 3	20	23.13	Left Cheek	0	1	0	1:1	0.144	31.5	26.4
1 770	19100	LTE Band 2 Upper	High	Main 3	20	23.13	Left Tilt	0	1	0	1:1	0.063	35.1	
1 770	19100	LTE Band 2 Upper	High	Main 3	20	23.13	Right Cheek	0	1	0	1:1	0.468	**26.4**	
1 770	19100	LTE Band 2 Upper	High	Main 3	20	23.13	Right Tilt	0	1	0	1:1	0.174	30.7	
707.5	23095	LTE Band 12(17)	Mid	Main 1	10	24.17	Left Cheek	0	1	0	1:1	0.096	34.3	33.2
707.5	23095	LTE Band 12(17)	Mid	Main 1	10	24.17	Left Tilt	0	1	0	1:1	0.057	36.6	
707.5	23095	LTE Band 12(17)	Mid	Main 1	10	24.17	Right Cheek	0	1	0	1:1	0.124	**33.2**	
707.5	23095	LTE Band 12(17)	Mid	Main 1	10	24.17	Right Tilt	0	1	0	1:1	0.067	35.9	
831.5	26865	LTE Band 26(5)	Mid	Main 1	15	24.28	Left Cheek	0	1	0	1:1	0.117	33.6	32.2
831.5	26865	LTE Band 26(5)	Mid	Main 1	15	24.28	Left Tilt	0	1	0	1:1	0.077	35.4	
831.5	26865	LTE Band 26(5)	Mid	Main 1	15	24.28	Right Cheek	0	1	0	1:1	0.160	**32.2**	
831.5	26865	LTE Band 26(5)	Mid	Main 1	15	24.28	Right Tilt	0	1	0	1:1	0.090	34.7	
1 745	132322	LTE Band 66(4) Lower	Mid	Main 2	20	23.24	Left Cheek	0	1	49	1:1	0.224	**29.7**	29.7
1 745	132322	LTE Band 66(4) Lower	Mid	Main 2	20	23.24	Left Tilt	0	1	49	1:1	0.139	31.8	
1 745	132322	LTE Band 66(4) Lower	Mid	Main 2	20	23.24	Right Cheek	0	1	49	1:1	0.216	29.9	
1 745	132322	LTE Band 66(4) Lower	Mid	Main 2	20	23.24	Right Tilt	0	1	49	1:1	0.153	31.4	
1770	132572	LTE Band 66(4) Upper	High	Main 3	20	23.10	Left Cheek	0	1	0	1:1	0.159	31.1	28.2
1770	132572	LTE Band 66(4) Upper	High	Main 3	20	23.10	Left Tilt	0	1	0	1:1	0.113	32.6	
1770	132572	LTE Band 66(4) Upper	High	Main 3	20	23.10	Right Cheek	0	1	0	1:1	0.309	**28.2**	
1770	132572	LTE Band 66(4) Upper	High	Main 3	20	23.10	Right Tilt	0	1	0	1:1	0.105	32.9	
2 593	40620	LTE Band41(PC3)	Mid	Main 2	20	21.63	Left Cheek	0	1	49	1:1.58	0.223	**28.2**	28.2
2 593	40620	LTE Band41(PC3)	Mid	Main 2	20	21.63	Left Tilt	0	1	49	1:1.58	0.064	33.6	
2 593	40620	LTE Band41(PC3)	Mid	Main 2	20	21.63	Right Cheek	0	1	49	1:1.58	0.130	30.5	
2 593	40620	LTE Band41(PC3)	Mid	Main 2	20	21.63	Right Tilt	0	1	49	1:1.58	0.123	30.7	

Table A-3

RSI = 1 $P_{\_limit}$ Calculations – NR Head SAR

For some bands/modes, a lower $P_{\_limit}$ was selected as a more conservative evaluation.
SAR measurements of all NR bands were measured in FTM Mode.

MEASUREMENT RESULTS																
Frequency		Mode		Ant.	Band width	Frame Averaged Conducted Power	Test Configurations		MPR	RB Size	RB offset	Duty Cycle	Meas. SAR (1g)	$P_{\_limit}$	Minimum $P_{\_limit}$
MHz	Ch.				(dBm)	(dBm)			(dB)				(W/kg)	(dBm)	(dBm)
836.5	167300	NR Band n5	Mid	Main 1	20	24.64	Left Cheek	DFT-s-OFDM QPSK	0	1	53	1:1	0.130	33.5	32.6
836.5	167300	NR Band n5	Mid	Main 1	20	24.64	Left Tilt	DFT-s-OFDM QPSK	0	50	28	1:1	0.073	36.0	
836.5	167300	NR Band n5	Mid	Main 1	20	24.58	Right Cheek	DFT-s-OFDM QPSK	0	1	53	1:1	0.159	**32.6**	
836.5	167300	NR Band n5	Mid	Main 1	20	24.64	Right Tilt	DFT-s-OFDM QPSK	0	1	53	1:1	0.080	35.6	
1 745	349000	NR Band n66 Lower	Mid	Main 2	40	23.99	Left Cheek	DFT-s-OFDM QPSK	0	1	53	1:1	0.211	30.7	30.3
1 745	349000	NR Band n66 Lower	Mid	Main 2	40	23.99	Left Tilt	DFT-s-OFDM QPSK	0	1	53	1:1	0.142	32.5	
1 745	349000	NR Band n66 Lower	Mid	Main 2	40	23.97	Right Cheek	DFT-s-OFDM QPSK	0	50	28	1:1	0.227	**30.3**	
1 745	349000	NR Band n66 Lower	Mid	Main 2	40	23.99	Right Tilt	DFT-s-OFDM QPSK	0	1	53	1:1	0.146	32.3	
2 592.99	518598	NR Band n41	Mid	Main 2	100	16.37	Left Cheek	CP-OFDM QPSK	0	1	1	1:1	0.118	**25.7**	25.7
2 592.99	518598	NR Band n41	Mid	Main 2	100	16.34	Left Tilt	DFT-s-OFDM QPSK	0	1	1	1:1	0.038	30.5	
2 592.99	518598	NR Band n41	Mid	Main 2	100	16.50	Right Cheek	DFT-s-OFDM QPSK	0	135	0	1:1	0.056	29.0	
2 592.99	518598	NR Band n41	Mid	Main 2	100	16.50	Right Tilt	DFT-s-OFDM QPSK	0	135	0	1:1	0.114	25.9	
2 592.99	518598	NR Band n41 SRS#1	Mid	Sub1	100	11.80	Left Cheek	DFT-s-OFDM QPSK	0	1	137	1:1	0.149	**20.1**	20.1
2 592.99	518598	NR Band n41 SRS#1	Mid	Sub1	100	11.80	Left Tilt	DFT-s-OFDM QPSK	0	1	137	1:1	0.148	20.1	
2 592.99	518598	NR Band n41 SRS#1	Mid	Sub1	100	11.80	Right Cheek	DFT-s-OFDM QPSK	0	1	137	1:1	0.052	24.6	
2 592.99	518598	NR Band n41 SRS#1	Mid	Sub1	100	11.80	Right Tilt	DFT-s-OFDM QPSK	0	1	137	1:1	0.049	24.9	
2 592.99	518598	NR Band n41 SRS#2	Mid	Main 3	100	13.68	Left Cheek	DFT-s-OFDM QPSK	0	1	137	1:1	0.005	36.7	28.2
2 592.99	518598	NR Band n41 SRS#2	Mid	Main 3	100	13.68	Left Tilt	DFT-s-OFDM QPSK	0	1	137	1:1	0.002	40.7	
2 592.99	518598	NR Band n41 SRS#2	Mid	Main 3	100	13.68	Right Cheek	DFT-s-OFDM QPSK	0	1	137	1:1	0.035	**28.2**	
2 592.99	518598	NR Band n41 SRS#2	Mid	Main 3	100	13.68	Right Tilt	DFT-s-OFDM QPSK	0	1	137	1:1	0.014	32.2	
2 592.99	518598	NR Band n41 SRS#3	Mid	Sub4	100	14.44	Left Cheek	DFT-s-OFDM QPSK	0	1	137	1:1	0.087	**25.0**	25.0
2 592.99	518598	NR Band n41 SRS#3	Mid	Sub4	100	14.44	Left Tilt	DFT-s-OFDM QPSK	0	1	137	1:1	0.039	28.5	
2 592.99	518598	NR Band n41 SRS#3	Mid	Sub4	100	14.44	Right Cheek	DFT-s-OFDM QPSK	0	1	137	1:1	0.035	29.0	
2 592.99	518598	NR Band n41 SRS#3	Mid	Sub4	100	14.44	Right Tilt	DFT-s-OFDM QPSK	0	1	137	1:1	0.026	30.3	
3 500.01	633334	NR Band n77	Mid	Sub3	100	16.91	Left Cheek	DFT-s-OFDM QPSK	0	135	0	1:1	0.100	26.9	20.6
3 930	662000	NR Band n77	High	Sub3	100	16.92	Left Tilt	DFT-s-OFDM QPSK	0	1	271	1:1	0.076	28.1	
3 930	662000	NR Band n77 DoD	High	Sub3	100	16.74	Right Cheek	DFT-s-OFDM QPSK	0	1	1	1:1	0.414	**20.6**	
3 930	662000	NR Band n77	High	Sub3	100	16.91	Right Tilt	DFT-s-OFDM QPSK	0	135	0	1:1	0.193	24.1	

Table A-4

RSI = 2 $P_{\_limit}$ Calculations – 2G/3G Hotspot/Body SAR

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

MEASUREMENT RESULTS											
Frequency		Mode/ Band		Ant. No.	Frame Averaged Conducted Power	Test Position	Spacing (mm)	Duty Cycle	Meas. SAR(1g)	$P_{\_limit}$	Minimum $P_{\_limit}$
MHz	Ch.				(dBm)				(W/kg)	(dBm)	(dBm)
836.6	190	GSM 850	GPRS4Tx	Main1	26.32	Rear	10	1:2.07	0.788	**27.4**	27.4
836.6	190	GSM 850	GPRS4Tx	Main1	26.32	Front	10	1:2.07	0.242	32.5	
836.6	190	GSM 850	GPRS4Tx	Main1	26.32	Left	10	1:2.07	0.235	32.6	
836.6	190	GSM 850	GPRS4Tx	Main1	26.32	Right	10	1:2.07	0.482	29.5	
836.6	190	GSM 850	GPRS4Tx	Main1	26.32	Bottom	10	1:2.07	0.574	28.7	
1 850.2	512	GSM 1900	GPRS2Tx	Main2	21.38	Rear	10	1:4.15	0.486	**24.5**	24.5
1 850.2	512	GSM 1900	GPRS2Tx	Main2	21.38	Front	10	1:4.15	0.185	28.7	
1 850.2	512	GSM 1900	GPRS2Tx	Main2	21.38	Left	10	1:4.15	0.088	31.9	
1 850.2	512	GSM 1900	GPRS2Tx	Main2	21.38	Bottom	10	1:4.15	0.317	26.4	
836.6	4183	UMTS 850	RMC	Main1	24.48	Rear	10	1:1	0.709	**26.0**	26.0
836.6	4183	UMTS 850	RMC	Main1	24.48	Front	10	1:1	0.195	31.6	
836.6	4183	UMTS 850	RMC	Main1	24.48	Left	10	1:1	0.153	32.6	
836.6	4183	UMTS 850	RMC	Main1	24.48	Right	10	1:1	0.255	30.4	
836.6	4183	UMTS 850	RMC	Main1	24.48	Bottom	10	1:1	0.399	28.5	
1 732.4	1412	UMTS 1700	RMC	Main2	19.67	Rear	10	1:1	0.309	24.8	24.3
1 732.4	1412	UMTS 1700	RMC	Main2	19.67	Front	10	1:1	0.234	26.0	
1 732.4	1412	UMTS 1700	RMC	Main2	19.67	Left	10	1:1	0.201	26.6	
1 732.4	1412	UMTS 1700	RMC	Main2	19.67	Bottom	10	1:1	0.343	**24.3**	
1 880	9400	UMTS 1900	RMC	Main2	19.39	Rear	10	1:1	0.242	25.6	24.2
1 880	9400	UMTS 1900	RMC	Main2	19.39	Front	10	1:1	0.175	27.0	
1 880	9400	UMTS 1900	RMC	Main2	19.39	Left	10	1:1	0.067	31.1	
1 880	9400	UMTS 1900	RMC	Main2	19.39	Bottom	10	1:1	0.330	**24.2**	

Table A-5

RSI = 2 $P_{\_limit}$ Calculations – 4G Hotspot SAR

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

MEASUREMENT RESULTS															
Frequency		Mode		Ant. No.	Band width	Frame Averaged Conducted Power	Test Position	Spacing (mm)	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR (1g)	$P_{\_limit}$	Minimum $P_{\_limit}$
MHz	Ch.				MHz	(dBm)			(dB)				(W/kg)	(dBm)	(dBm)
1 900	19100	LTE Band 2 Lower	High	Main2	20	19.79	Rear	10	0	1	49	1:1	0.236	26.1	24.8
1 900	19100	LTE Band 2 Lower	High	Main2	20	19.82	Front	10	0	50	49	1:1	0.181	27.2	
1 900	19100	LTE Band 2 Lower	High	Main2	20	19.82	Left	10	0	50	49	1:1	0.096	30.0	
1 900	19100	LTE Band 2 Lower	High	Main2	20	19.79	Bottom	10	0	1	49	1:1	0.315	**24.8**	
1 900	19100	LTE Band 2 Upper	High	Main3	20	19.72	Rear	10	0	1	0	1:1	0.400	**23.7**	23.7
1 900	19100	LTE Band 2 Upper	High	Main3	20	19.72	Front	10	0	1	0	1:1	0.048	32.9	
1 900	19100	LTE Band 2 Upper	High	Main3	20	19.72	Left	10	0	1	0	1:1	0.189	27.0	
1 900	19100	LTE Band 2 Upper	High	Main3	20	19.72	Top	10	0	1	0	1:1	0.023	36.1	
707.5	23095	LTE Band 12 (17)	Mid	Main1	10	24.17	Back	10	0	1	0	1:1	0.345	**28.8**	28.8
707.5	23095	LTE Band 12 (17)	Mid	Main1	10	24.17	Front	10	0	1	0	1:1	0.155	32.3	
707.5	23095	LTE Band 12 (17)	Mid	Main1	10	24.17	Left	10	0	1	0	1:1	0.109	33.8	
707.5	23095	LTE Band 12 (17)	Mid	Main1	10	24.17	Right	10	0	1	0	1:1	0.222	30.7	
707.5	23095	LTE Band 12 (17)	Mid	Main1	10	24.17	Bottom	10	0	1	0	1:1	0.149	32.4	
831.5	26865	LTE Band 26	Mid	Main1	15	24.28	Back	10	0	1	0	1:1	0.655	**26.1**	26.1
831.5	26865	LTE Band 26	Mid	Main1	15	24.28	Front	10	0	1	0	1:1	0.170	32.0	
831.5	26865	LTE Band 26	Mid	Main1	15	24.28	Left	10	0	1	0	1:1	0.135	33.0	
831.5	26865	LTE Band 26	Mid	Main1	15	24.28	Right	10	0	1	0	1:1	0.258	30.2	
831.5	26865	LTE Band 26	Mid	Main1	15	24.28	Bottom	10	0	1	0	1:1	0.272	29.9	
1 720	132072	LTE Band 66(4) Lower	Low	Main2	20	19.64	Back	10	0	1	49	1:1	0.273	25.3	23.7
1 720	132072	LTE Band 66(4) Lower	Low	Main2	20	19.64	Front	10	0	1	49	1:1	0.228	26.1	
1 720	132072	LTE Band 66(4) Lower	Low	Main2	20	19.64	Left	10	0	1	49	1:1	0.166	27.4	
1 720	132072	LTE Band 66(4) Lower	Low	Main2	20	19.64	Bottom	10	0	1	49	1:1	0.392	23.7	
1 720	132072	LTE Band 66(4) Upper	Low	Main3	20	19.73	Back	10	0	1	49	1:1	0.290	25.1	25.1
1 720	132072	LTE Band 66(4) Upper	Low	Main3	20	19.73	Front	10	0	1	49	1:1	0.052	32.6	
1 720	132072	LTE Band 66(4) Upper	Low	Main3	20	19.73	Left	10	0	1	49	1:1	0.174	27.3	
1 720	132072	LTE Band 66(4) Upper	Low	Main3	20	19.73	Top	10	0	1	49	1:1	0.015	38.0	
2 593	40620	LTE Band41 (PC3)	Mid	Main2	20	19.48	Back	10	0	50	0	1:1.58	0.150	28.0	27.3
2 593	40620	LTE Band41 (PC3)	Mid	Main2	20	19.48	Front	10	0	50	0	1:1.58	0.171	27.3	
2 593	40620	LTE Band41 (PC3)	Mid	Main2	20	19.48	Left	10	0	50	0	1:1.58	0.047	33.0	
2 593	40620	LTE Band41 (PC3)	Mid	Main2	20	19.48	Bottom	10	0	50	0	1:1.58	0.149	28.2	

Table A-6

RSI = 2 P_{limit} Calculations – NR Hotspot SAR

For some bands/modes, a lower P_{limit} was selected as a more conservative evaluation.
SAR measurements of all NR bands were measured in FTM Mode.

MEASUREMENT RESULTS																	
Frequency		Mode		Ant. No.	Band width	Frame Averaged Conducted Power	Test Position		MPR	Spacing (mm)	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	P_{limit}	Minimum P_{limit}
MHz	Ch.				MHz	(dBm)			(dB)					(W/kg)	(dBm)	(dBm)
836.5	167300	NR Band n5	Mid	Main1	20	24.64	Rear	DFT-s-OFDM QPSK	0	10	1	53	1:1	0.566	**27.1**	27.1
836.5	167300	NR Band n5	Mid	Main1	20	24.64	Front	DFT-s-OFDM QPSK	0	10	1	53	1:1	0.164	32.5	
836.5	167300	NR Band n5	Mid	Main1	20	24.64	Left	DFT-s-OFDM QPSK	0	10	1	53	1:1	0.140	33.2	
836.5	167300	NR Band n5	Mid	Main1	20	24.58	Right	DFT-s-OFDM QPSK	0	10	50	28	1:1	0.241	30.8	
836.5	167300	NR Band n5	Mid	Main1	20	24.64	Bottom	DFT-s-OFDM QPSK	0	10	1	53	1:1	0.426	28.3	
1 745	349000	NR Band n66	Mid	Main2	20	20.25	Rear	DFT-s-OFDM QPSK	0	10	50	0	1:1	0.262	25.9	25.3
1 745	349000	NR Band n66	Mid	Main2	20	20.25	Front	DFT-s-OFDM QPSK	0	10	50	0	1:1	0.201	27.1	
1 745	349000	NR Band n66	Mid	Main2	20	20.25	Left	DFT-s-OFDM QPSK	0	10	50	0	1:1	0.158	28.2	
1 745	349000	NR Band n66	Mid	Main2	20	20.25	Bottom	DFT-s-OFDM QPSK	0	10	50	0	1:1	0.303	**25.3**	
2 592.99	518598	NR Band n41	Mid	Main2	100	16.34	Rear	DFT-s-OFDM QPSK	0	10	1	1	1:1	0.180	23.8	23.1
2 592.99	518598	NR Band n41	Mid	Main2	100	16.34	Front	DFT-s-OFDM QPSK	0	10	1	1	1:1	0.203	23.3	
2 592.99	518598	NR Band n41	Mid	Main2	100	16.34	Left	DFT-s-OFDM QPSK	0	10	1	1	1:1	0.103	26.2	
2 592.99	518598	NR Band n41	Mid	Main2	100	16.34	Bottom	DFT-s-OFDM QPSK	0	10	1	1	1:1	0.211	**23.1**	
2 592.99	518598	NR Band n41 SRS #1	Mid	Sub1	100	11.80	Rear	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.065	**23.7**	23.7
2 592.99	518598	NR Band n41 SRS #1	Mid	Sub1	100	11.80	Front	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.029	27.2	
2 592.99	518598	NR Band n41 SRS #1	Mid	Sub1	100	11.80	Right	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.014	30.3	
2 592.99	518598	NR Band n41 SRS #1	Mid	Sub1	100	11.80	Top	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.016	29.8	
2 592.99	518598	NR Band n41 SRS #2	Mid	Main3	100	13.68	Rear	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.132	**22.5**	22.5
2 592.99	518598	NR Band n41 SRS #2	Mid	Main3	100	13.68	Front	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.00638	35.9	
2 592.99	518598	NR Band n41 SRS #2	Mid	Main3	100	13.68	Left	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.046	27.1	
2 592.99	518598	NR Band n41 SRS #2	Mid	Main3	100	13.68	Top	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.00298	38.9	
2 592.99	518598	NR Band n41 SRS #3	Mid	Sub4	100	14.44	Rear	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.049	**27.5**	27.5
2 592.99	518598	NR Band n41 SRS #3	Mid	Sub4	100	14.44	Front	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.021	31.2	
2 592.99	518598	NR Band n41 SRS #3	Mid	Sub4	100	14.44	Right	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.044	28.0	
2 592.99	518598	NR Band n41 SRS #3	Mid	Sub4	100	14.44	Top	DFT-s-OFDM QPSK	0	10	1	137	1:1	0.010	34.4	
3 500.01	633334	NR Band n77 DoD	Mid	Sub3	100	16.74	Rear	DFT-s-OFDM QPSK	0	10	1	1	1:1	0.258	**22.8**	22.8
3 930	662000	NR Band n77	High	Sub3	100	16.91	Front	DFT-s-OFDM QPSK	0	10	135	0	1:1	0.060	29.1	
3 930	662000	NR Band n77	High	Sub3	100	16.91	Left	DFT-s-OFDM QPSK	0	10	135	0	1:1	0.180	24.4	
3 930	662000	NR Band n77	High	Sub3	100	16.91	Top	DFT-s-OFDM QPSK	0	10	135	0	1:1	0.077	28.1	

Table A-7

RSI = 0 $P_{\_limit}$ Calculations – 2G/3G Phablet SAR

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

MEASUREMENT RESULTS											
Frequency		Mode/ Band		Ant. No.	Frame Averaged Conducted Power	Test Position	Spacing (mm)	Duty Cycle	Meas. SAR(10g)	$P_{\_limit}$	Minimum $P_{\_limit}$
MHz	Ch.				(dBm)				(W/kg)	(dBm)	(dBm)
836.6	190	GSM 850	GPRS4Tx	Main 1	26.32	Rear	0	1:2.07	0.683	32.0	30.4
836.6	190	GSM 850	GPRS4Tx	Main 1	26.32	Front	0	1:2.07	0.545	32.9	
836.6	190	GSM 850	GPRS4Tx	Main 1	26.32	Left	0	1:2.07	0.133	39.1	
836.6	190	GSM 850	GPRS4Tx	Main 1	26.32	Right	0	1:2.07	0.465	33.6	
836.6	190	GSM 850	GPRS4Tx	Main 1	26.32	Bottom	0	1:2.07	0.969	**30.4**	
1 850.2	512	GSM 1900	GPRS2Tx	Main 2	21.38	Rear	0	1:4.15	1.220	**24.5**	24.5
1 850.2	512	GSM 1900	GPRS2Tx	Main 2	21.38	Front	0	1:4.15	0.918	25.7	
1 850.2	512	GSM 1900	GPRS2Tx	Main 2	21.38	Left	0	1:4.15	0.542	28.0	
1 850.2	512	GSM 1900	GPRS2Tx	Main 2	21.38	Bottom	0	1:4.15	0.805	26.3	
836.6	4183	UMTS 850	RMC	Main 1	24.48	Back	0	1:1	0.817	29.3	28.7
836.6	4183	UMTS 850	RMC	Main 1	24.48	Front	0	1:1	0.378	32.7	
836.6	4183	UMTS 850	RMC	Main 1	24.48	Left	0	1:1	0.064	40.4	
836.6	4183	UMTS 850	RMC	Main 1	24.48	Right	0	1:1	0.396	32.5	
836.6	4183	UMTS 850	RMC	Main 1	24.48	Bottom	0	1:1	0.946	**28.7**	
1 732.4	1412	UMTS 1700	RMC	Main 2	19.67	Rear	0	1:1	0.984	**23.7**	23.7
1 732.4	1412	UMTS 1700	RMC	Main 2	19.67	Front	0	1:1	0.643	25.6	
1 732.4	1412	UMTS 1700	RMC	Main 2	19.67	Left	0	1:1	0.408	27.5	
1 732.4	1412	UMTS 1700	RMC	Main 2	19.67	Bottom	0	1:1	0.552	26.2	
1 880	9400	UMTS 1900	RMC	Main 2	19.39	Rear	0	1:1	1.070	**23.1**	23.1
1 880	9400	UMTS 1900	RMC	Main 2	19.39	Front	0	1:1	0.654	25.2	
1 880	9400	UMTS 1900	RMC	Main 2	19.39	Left	0	1:1	0.469	26.7	
1 880	9400	UMTS 1900	RMC	Main 2	19.39	Bottom	0	1:1	0.584	25.7	

Table A-8

RSI = 0 $P_{\_limit}$ Calculations – 4G Phablet SAR

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

MEASUREMENT RESULTS															
Frequency		Mode		Ant. No.	Band width	Frame Averaged Conducted Power	Test Position	Spacing (mm)	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR (10g)	$P_{\_limit}$	Minimum $P_{\_limit}$
MHz	Ch.				MHz	(dBm)			(dB)				(W/kg)	(dBm)	(dBm)
1 900	19100	LTE Band 2 Lower	High	Main 2	20	19.79	Rear	0	0	1	49	1:1	0.998	**23.8**	23.8
1 900	19100	LTE Band 2 Lower	High	Main 2	20	19.79	Front	0	0	1	49	1:1	0.599	26.0	
1 900	19100	LTE Band 2 Lower	High	Main 2	20	19.79	Left	0	0	1	49	1:1	0.421	27.5	
1 900	19100	LTE Band 2 Lower	High	Main 2	20	19.79	Bottom	0	0	1	49	1:1	0.649	25.6	
1 900	19100	LTE Band 2 Upper	High	Main 3	20	19.72	Rear	0	0	1	0	1:1	0.772	**24.8**	24.8
1 900	19100	LTE Band 2 Upper	High	Main 3	20	19.72	Front	0	0	1	0	1:1	0.164	31.6	
1 900	19100	LTE Band 2 Upper	High	Main 3	20	19.72	Left	0	0	1	0	1:1	0.421	27.5	
1 900	19100	LTE Band 2 Upper	High	Main 3	20	19.72	Top	0	0	1	0	1:1	0.649	37.3	
707.5	23095	LTE Band 12 (17)	Mid	Main 1	10	24.17	Back	0	0	1	0	1:1	0.886	**28.7**	28.7
707.5	23095	LTE Band 12 (17)	Mid	Main 1	10	24.17	Front	0	0	1	0	1:1	0.184	35.5	
707.5	23095	LTE Band 12 (17)	Mid	Main 1	10	24.17	Left	0	0	1	0	1:1	0.057	40.6	
707.5	23095	LTE Band 12 (17)	Mid	Main 1	10	24.17	Right	0	0	1	0	1:1	0.263	33.9	
707.5	23095	LTE Band 12 (17)	Mid	Main 1	10	24.17	Bottom	0	0	1	0	1:1	0.478	31.4	
831.5	26865	LTE Band 26	Mid	Main 1	15	24.28	Back	0	0	1	0	1:1	0.990	**28.3**	28.3
831.5	26865	LTE Band 26	Mid	Main 1	15	24.28	Front	0	0	1	0	1:1	0.383	32.4	
831.5	26865	LTE Band 26	Mid	Main 1	15	24.28	Left	0	0	1	0	1:1	0.077	39.4	
831.5	26865	LTE Band 26	Mid	Main 1	15	24.28	Right	0	0	1	0	1:1	0.420	32.0	
831.5	26865	LTE Band 26	Mid	Main 1	15	24.28	Bottom	0	0	1	0	1:1	0.860	28.9	
1 720	132072	LTE Band66(4) Lower	Low	Main 2	20	19.64	Back	0	0	1	49	1:1	0.705	**25.1**	25.1
1 720	132072	LTE Band66(4) Lower	Low	Main 2	20	19.64	Front	0	0	1	49	1:1	0.635	25.6	
1 720	132072	LTE Band66(4) Lower	Low	Main 2	20	19.64	Left	0	0	1	49	1:1	0.341	28.3	
1 720	132072	LTE Band66(4) Lower	Low	Main 2	20	19.64	Bottom	0	0	1	49	1:1	0.621	25.7	
1 720	132072	LTE Band66(4) Upper	Low	Main 3	20	19.73	Back	0	0	1	49	1:1	0.751	**25.0**	25.0
1 720	132072	LTE Band66(4) Upper	Low	Main 3	20	19.73	Front	0	0	1	49	1:1	0.112	33.2	
1 720	132072	LTE Band66(4) Upper	Low	Main 3	20	19.73	Left	0	0	1	49	1:1	0.466	27.0	
1 720	132072	LTE Band66(4) Upper	Low	Main 3	20	19.73	Top	0	0	1	49	1:1	0.027	39.4	
2 593	40620	LTE Band41(PC3)	Mid	Main 2	20	19.43	Back	0	0	1	49	1:1.58	0.718	24.9	24.5
2 593	40620	LTE Band41(PC3)	Mid	Main 2	20	19.43	Front	0	0	1	49	1:1.58	0.776	**24.5**	
2 593	40620	LTE Band41(PC3)	Mid	Main 2	20	19.43	Left	0	0	1	49	1:1.58	0.314	28.4	
2 593	40620	LTE Band41(PC3)	Mid	Main 2	20	19.43	Bottom	0	0	1	49	1:1.58	0.564	25.9	

Table A-9

RSI = 0 P_{limit} Calculations – NR Phablet SAR

For some bands/modes, a lower P $_{limit}$ was selected as a more conservative evaluation.
SAR measurements of all NR bands were measured in FTM Mode.

MEASUREMENT RESULTS																
Frequency		Mode		Ant. No.	Band width	Frame Averaged Conducted Power	Test Position		MPR	Spacing (mm)	RB Size	RB offset	Duty Cycle	Meas. SAR (10g)	P_{limit}	Minim P_{limit}
MHz	Ch.				MHz	(dBm)			(dB)					(W/kg)	(dBm)	(dBm)
836.5	167300	NR Band n5	Mid	Main 1	20	24.64	Rear	DFT-s-OFDM QPSK	0	0	1	53	1:1	0.875	29.2	29.0
836.5	167300	NR Band n5	Mid	Main 1	20	24.64	Front	DFT-s-OFDM QPSK	0	0	1	53	1:1	0.388	32.7	
836.5	167300	NR Band n5	Mid	Main 1	20	24.64	Left	DFT-s-OFDM QPSK	0	0	1	53	1:1	0.077	39.8	
836.5	167300	NR Band n5	Mid	Main 1	20	24.64	Right	DFT-s-OFDM QPSK	0	0	1	53	1:1	0.389	32.7	
836.5	167300	NR Band n5	Mid	Main 1	20	24.64	Bottom	DFT-s-OFDM QPSK	0	0	1	53	1:1	0.913	**29.0**	
1 745	349000	NR Band n66	Mid	Main 2	20	20.26	Rear	DFT-s-OFDM QPSK	0	0	1	53	1:1	0.781	**25.3**	25.3
1 745	349000	NR Band n66	Mid	Main 2	20	20.26	Front	DFT-s-OFDM QPSK	0	0	1	53	1:1	0.758	25.4	
1 745	349000	NR Band n66	Mid	Main 2	20	20.26	Left	DFT-s-OFDM QPSK	0	0	1	53	1:1	0.406	28.2	
1 745	349000	NR Band n66	Mid	Main 2	20	20.26	Bottom	DFT-s-OFDM QPSK	0	0	1	53	1:1	0.738	25.6	
2 592.99	518598	NR Band n41	Mid	Main2	100	16.34	Rear	DFT-s-OFDM QPSK	0	0	1	1	1:1	0.593	**22.6**	22.6
2 592.99	518598	NR Band n41	Mid	Main2	100	16.34	Front	DFT-s-OFDM QPSK	0	0	1	1	1:1	0.556	22.9	
2 592.99	518598	NR Band n41	Mid	Main2	100	16.34	Left	DFT-s-OFDM QPSK	0	0	1	1	1:1	0.155	28.4	
2 592.99	518598	NR Band n41	Mid	Main2	100	16.34	Bottom	DFT-s-OFDM QPSK	0	0	1	1	1:1	0.489	23.4	
2 592.99	518598	NR Band n41	Mid	Sub1	100	11.80	Rear	DFT-s-OFDM QPSK	0	0	1	137	1:1	0.145	24.2	23.0
2 592.99	518598	NR Band n41	Mid	Sub1	100	11.80	Front	DFT-s-OFDM QPSK	0	0	1	137	1:1	0.121	25.0	
2 592.99	518598	NR Band n41	Mid	Sub1	100	11.80	Right	DFT-s-OFDM QPSK	0	0	1	137	1:1	0.069	27.4	
2 592.99	518598	NR Band n41	Mid	Sub1	100	11.80	Top	DFT-s-OFDM QPSK	0	0	1	137	1:1	0.190	**23.0**	
2 592.99	518598	NR Band n41	Mid	Main3	100	13.68	Rear	DFT-s-OFDM QPSK	0	0	1	137	1:1	0.462	**21.0**	21.0
2 592.99	518598	NR Band n41	Mid	Main3	100	13.68	Front	DFT-s-OFDM QPSK	0	0	1	137	1:1	0.035	32.2	
2 592.99	518598	NR Band n41	Mid	Main3	100	13.68	Left	DFT-s-OFDM QPSK	0	0	1	137	1:1	0.207	24.5	
2 592.99	518598	NR Band n41	Mid	Main3	100	13.68	Top	DFT-s-OFDM QPSK	0	0	1	137	1:1	0	N/A	
2 592.99	518598	NR Band n41	Mid	Sub4	100	14.44	Rear	DFT-s-OFDM QPSK	0	0	1	137	1:1	0.257	**24.3**	24.3
2 592.99	518598	NR Band n41	Mid	Sub4	100	14.44	Front	DFT-s-OFDM QPSK	0	0	1	137	1:1	0.053	31.2	
2 592.99	518598	NR Band n41	Mid	Sub4	100	14.44	Right	DFT-s-OFDM QPSK	0	0	1	137	1:1	0.150	26.7	
2 592.99	518598	NR Band n41	Mid	Sub4	100	14.44	Top	DFT-s-OFDM QPSK	0	0	1	137	1:1	0.017	36.1	
3 930	662000	NR Band n77	High	Sub3	100	16.92	Rear	DFT-s-OFDM QPSK	0	0	1	271	1:1	1.210	**20.1**	20.1
3 930	662000	NR Band n77	High	Sub3	100	16.92	Front	DFT-s-OFDM QPSK	0	0	1	271	1:1	0.154	29.0	
3 930	662000	NR Band n77	High	Sub3	100	16.92	Left	DFT-s-OFDM QPSK	0	0	1	271	1:1	0.580	23.3	
3 930	662000	NR Band n77	High	Sub3	100	16.92	Top	DFT-s-OFDM QPSK	0	0	1	271	1:1	0.094	31.2	