TEST REPORT

FCC SAR Part 0 Test for SM-X528U
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-SR-2502-FC007

DATE OF ISSUE
February 12, 2025

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TEST REPORT

PART 0 for certification

REPORT NO.
HCT-SR-2502-FC007

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FCC ID
A3LSMX528U

Applicant	SAMSUNG Electronics Co., Ltd 129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do, 16677, Korea
Product Name Model Name	Tablet SM-X528U
Date of Test	Jan 02, 2025 ~ Feb. 07, 2025
Location of Test	■ Permanent Testing Lab ☐ On Site Testing Lab (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA)
FCC Rule Part(s)	CFR § 2.1093
Test Results	Pass (SAR limit : 1.6 W/kg)

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test results were applied only to the test methods required by the standard.

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	Feb. 12, 2025	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)
	KOLAS (Testing No. KT197)

1.3 General Information of the EUT

Model Name	SM-X528U
Equipment Type	Tablet
FCC ID	A3LSMX528U
Application Type	Certification
Applicant	SAMSUNG Electronics Co., Ltd.

2. DEVICE UNDER TEST DESCRIPTION

2.1 General Information of the EUT

Device Wireless specification overview		
Band & Mode	Operating Mode	Tx Frequency
UMTS Band 2	Data	1 852.4 ㎒ ~ 1 907.6 ㎒
UMTS Band 4	Data	1 712.4 ㎒ ~ 1 752.6 ㎒
UMTS Band 5	Data	826.4 ㎒ ~ 846.6 ㎒
LTE FDD Band 2 (PCS)	Data	1 850.7 ㎒ ~ 1 909.3 ㎒
LTE FDD Band 4 (AWS)	Data	1 710.7 ㎒ ~ 1 754.3 ㎒
LTE FDD Band 5 (Cell)	Data	824.7 ㎒ ~ 848.3 ㎒
LTE FDD Band 7	Data	2 502.5 ㎒ ~ 2 567.5 ㎒
LTE FDD Band 12	Data	699.7 ㎒ ~ 715.3 ㎒
LTE FDD Band 13	Data	779.5 ㎒ ~ 784.5 ㎒
LTE FDD Band 14	Data	790.5 ㎒ ~ 795.5 ㎒
LTE FDD Band 25	Data	1 850.7 ㎒ ~ 1 914.3 ㎒
LTE FDD Band 26	Data	814.7 ㎒ ~ 848.3 ㎒
LTE FDD Band 30	Data	2 307.5 ㎒ ~ 2 312.5 ㎒
LTE TDD Band 38	Data	2 572.5 ㎒ ~ 2 617.5 ㎒
LTE TDD Band 41	Data	2 498.5 ㎒ ~ 2 687.5 ㎒
LTE TDD Band 48	Data	3 552.5 ㎒ ~ 3 697.5 ㎒
LTE FDD Band 66 (AWS)	Data	1 710.7 ㎒ ~ 1 779.3 ㎒
LTE FDD Band 71	Data	665.5 ㎒ ~ 695.5 ㎒
NR FDD Band n2 (PCS)	Data	1 852.5 ㎒ ~ 1 907.5 ㎒
NR FDD Band n5	Data	826.5 ㎒ ~ 846.5 ㎒
NR FDD Band n25 (PCS)	Data	1 852.5 ㎒ ~ 1 912.5 ㎒
NR FDD Band n30	Data	2 307.5 ㎒ ~ 2 312.5 ㎒
NR TDD Band n41	Data	2 501.01 ㎒ ~ 2 685 ㎒
NR TDD Band n48	Data	3 555 ㎒ ~ 3 695.01 ㎒
NR FDD Band n66	Data	1 712.5 ㎒ ~ 1 777.5 ㎒
NR FDD Band n70	Data	1 697.5 ㎒ ~ 1 707.5 ㎒
NR FDD Band n71	Data	665.5 ㎒ ~ 695.5 ㎒
NR TDD Band n77	Data	3 705 ㎒ ~ 3 975 ㎒
NR TDD Band n77 DoD	Data	3 445.01 ㎒ ~ 3 544.98 ㎒
NR TDD Band n78	Data	3 705 ㎒ ~ 3 795 ㎒
NR TDD Band n78 DoD	Data	3 455.01 ㎒ ~ 3 544.98 ㎒
U-NII-1	Data	5 180 ㎒ ~ 5 240 ㎒
U-NII-2A	Data	5 260 ㎒ ~ 5 320 ㎒
U-NII-2C	Data	5 500 ㎒ ~ 5 720 ㎒
U-NII-3	Data	5 745 ㎒ ~ 5 825 ㎒
U-NII-4	Data	5 845 ㎒ ~ 5 885 ㎒
2.4 ㎓ WLAN	Data	2 412 ㎒ ~ 2 462 ㎒
Bluetooth / LE 5.3	Data	2 402 ㎒ ~ 2 480 ㎒
S-Pen	Data	531.25 ㎑, 562.5 ㎑, 593.75 ㎑

2.2 Time-Averaging for SAR

This WWAN Mode of DUT is equipped with an S.LSI chipset to which the Samsung S.LSI proprietary TAS (Time Average SAR) algorithm is applied except WLAN/BT mode.
This DUT is enabled with the Samsung S.LSI proprietary TAS (Time Average SAR) algorithm for WWAN Mode and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is in compliance with the FCC requirement

FCC RF exposure limit is based on time averaged RF exposure. The SAR regulatory specification is 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 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 Samsung S.LSI TAS algorithm allow the device to transmit at higher power instantaneously, as high as Pmax, when needed, but enforces power limiting to maintain time-averaged transmit power to Plimit. Below table shows Plimit NV settings and maximum tune up output power Pmax configured for this DUT for various transmit conditions (Radio SAR indicator RSI for body SAR of WWAN Mode).
The purpose of this report is to demonstrate that the DUT meets FCC SAR limits when transmitting in static transmission configurations at Plimit specified by manufacturer.

SAR Characterization confirms that Plimit in the 3G/4G/5G communication mode declared by the manufacturer satisfies SAR_Design_target.

The compliance test under the static transmission scenario and simultaneous transmission analysis are reported in SAR report for WWAN/WLAN/BT. 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 A3LSMX528U_SAR Part 2 RF Exposure Report.

2.3 Nomenclature for Part 0 Report

Technology	Term	Description
3G/4G/5G Sub 6 NR	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

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/m^3)
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)	Δz zoom(1)*	Δz zoom(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 CHARACTERIZATION

4.1 Exposure Index and SAR Determination

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

When 1g Body SAR exposure comparison is needed, the worst-case was determined from SAR normalized to 1g or 10g SAR limit.

The Radio SAR Index (RSI) conditions used in Table 4-1 represent different exposure scenarios.

Table 4-1 RSI and Corresponding Exposure Scenarios

Scenario	Description	SAR Test Cases
Free Power(RSI =0)	Distance grip sensor not triggered.	KDB Publication 616217 D04
Grip On(RSI=1)	Device is held with hand and Grip Sensor #1 is triggered.	KDB Publication 616217 D04
Grip On(RSI=2)	Device is held with hand and Grip Sensor #2 is triggered.	KDB Publication 616217 D04
Grip On(RSI=3)	Device is held with hand and Grip Sensor #3 is triggered.	KDB Publication 616217 D04
Grip On(RSI=4)	Device is held with hand and Grip Sensor #4 is triggered.	KDB Publication 616217 D04
Grip On(RSI=5)	Device is held with hand and Grip Sensor #5 is triggered.	KDB Publication 616217 D04

4.2 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 4-2).

SAR_design_target			
$SAR\_design\_target < SAR\_regulatory\_limit \times 10^{Total\ Uncertainty/10}$			
1g SAR (W/kg)		**10g SAR (W/kg)**	
Total Uncertainty	1.0 dB	*Total Uncertainty*	1.0 dB
SAR_regulatory_limit	1.6 W/kg	*SAR_regulatory_limit*	4.0 W/kg
SAR_design_target	1.0 W/kg	*SAR_design_target*	2.5 W/kg

Table 4-2 *SAR_design_target* Calculations for WWAN Bands

Plim values in green indicate Plimit < Pmax			Plim values in green indicate Plimit > Pmax						
Plimit corresponding to 1 W/kg (1g) SAR_Design_target									Pmax
SAR Exposure Position			Free RSI = 0	Grip (#1) RSI = 1	Grip (#2) RSI = 2	Grip (#3) RSI = 3	Grip (#4) RSI = 4	Grip (#5) RSI = 5	Maximum Tune-up Output Power (Frame Averaged Power) [dBm]
Averaging volume			1g	1g	1g	1g	1g	1g	
seperation Distance			0,10,18,19 mm	0 mm	0 mm	0 mm	0 mm	0 mm	
Mode	Band	Antenna	Free	Grip	Grip	Grip	Grip	Grip	
UMTS	2	Main1	27.1	16.5	12.5	16.5	N/A	N/A	24.0
UMTS	4	Main1	27.1	20.0	13.0	20.0	N/A	N/A	24.0
UMTS	5	Main1	27.3	21.5	15.0	21.5	N/A	N/A	24.0
LTE FDD	7	Main1	26.8	21.5	9.0	21.5	N/A	N/A	24.0
LTE FDD	7	Sub1	26.2	N/A	N/A	N/A	N/A	11.0	23.0
LTE FDD	25 (2)	Main1	27.1	17.5	11.5	17.5	N/A	N/A	24.0
LTE FDD	25 (2)	Sub1	29.1	N/A	N/A	N/A	N/A	10.5	23.0
LTE FDD	66 (4)	Main1	27.5	21.0	11.5	21.0	N/A	N/A	24.0
LTE FDD	66 (4)	Sub1	31.5	N/A	N/A	N/A	N/A	10.5	24.0
LTE FDD	30	Main1	28.4	20.5	11.5	20.5	N/A	N/A	23.0
LTE FDD	30	Sub1	27.5	N/A	N/A	N/A	N/A	13.5	23.0
LTE FDD	12	Main1	27.7	N/A	14.0	N/A	N/A	N/A	24.0
LTE FDD	13	Main1	25.7	N/A	12.5	N/A	N/A	N/A	24.0
LTE FDD	14	Main1	26.0	N/A	13.0	N/A	N/A	N/A	24.0
LTE FDD	26 (5)	Main1	26.3	23.0	14.0	23.0	N/A	N/A	24.0
LTE TDD	41 PC3 (38)	Main1	25.3	N/A	10.0	N/A	N/A	N/A	22.0
LTE TDD	41 PC2	Main1	25.6	N/A	10.0	N/A	N/A	N/A	22.4
LTE TDD	48	Sub2	7.5	7.5	7.5	7.5	7.5	7.5	21.0
LTE FDD	71	Main1	30.5	N/A	15.5	N/A	N/A	N/A	24.0
NR FDD	n5	Main1	27.2	23.0	14.0	23.0	N/A	N/A	24.0
NR FDD	n25 (2)	Main1	27.5	17.5	11.5	17.5	N/A	N/A	24.0
NR FDD	n30	Main1	28.2	20.5	11.5	20.5	N/A	N/A	23.0
NR FDD	n66	Main1	27.1	21.0	11.5	21.0	N/A	N/A	24.0
NR TDD	n41 PC3	Main1	18.0	N/A	11.0	N/A	N/A	N/A	24.0
NR TDD	n41 PC2	Main1	18.0	N/A	11.0	N/A	N/A	N/A	26.5
NR TDD	n48 SRS0	Sub2	9.0	9.0	9.0	9.0	9.0	9.0	23.0
NR TDD	n48 SRS1	Sub4	9.0	N/A	N/A	2.5	N/A	N/A	14.0
NR TDD	n48 SRS2	Main2	18.0	N/A	N/A	N/A	10.5	N/A	23.0
NR TDD	n48 SRS3	Sub3	4.0	4.0	4.0	4.0	4.0	4.0	16.0
NR FDD	n70	Main1	26.5	18.5	12.5	18.5	N/A	N/A	24.0
NR FDD	n71	Main1	30.6	N/A	15.5	N/A	N/A	N/A	24.0
NR TDD	n77 (78) PC3 SRS0	Main2	18.0	N/A	N/A	N/A	8.5	N/A	24.0
NR TDD	n77 (78) PC3 SRS1	Sub3	5.0	5.0	5.0	5.0	5.0	5.0	18.0
NR TDD	n77 (78) PC3 SRS2	Sub2	12.0	12.0	12.0	12.0	12.0	12.0	24.0
NR TDD	n77 (78) PC3 SRS3	Sub4	10.5	N/A	N/A	1.5	N/A	N/A	16.0
NR TDD	n77 (78) PC2 SRS0	Main2	18.0	N/A	N/A	N/A	8.5	N/A	27.0
NR TDD	n77 (78) PC2 SRS1	Sub3	5.0	5.0	5.0	5.0	5.0	5.0	19.0
NR TDD	n77 (78)PC2 SRS2	Sub2	12.0	12.0	12.0	12.0	12.0	12.0	27.0
NR TDD	n77 (78) PC2 SRS3	Sub4	10.5	N/A	N/A	1.5	N/A	N/A	17.0
NR TDD	n77(78) PC3 DoD SRS0	Main2	18.0	N/A	N/A	N/A	8.5	N/A	24.0
NR TDD	n77(78) PC3 DoD SRS1	Sub3	5.0	5.0	5.0	5.0	5.0	5.0	18.0
NR TDD	n77(78) PC3 DoD SRS2	Sub2	12.0	12.0	12.0	12.0	12.0	12.0	24.0
NR TDD	n77(78) PC3 DoD SRS3	Sub4	10.5	N/A	N/A	1.5	N/A	N/A	16.0
NR TDD	n77(78) PC2 DoD SRS0	Main2	18.0	N/A	N/A	N/A	8.5	N/A	27.0
NR TDD	n77(78) PC2 DoD SRS1	Sub3	5.0	5.0	5.0	5.0	5.0	5.0	19.0
NR TDD	n77(78) PC2 DoD SRS2	Sub2	12.0	12.0	12.0	12.0	12.0	12.0	27.0
NR TDD	n77(78)PC2 DoD SRS3	Sub4	10.5	N/A	N/A	1.5	N/A	N/A	17.0

Table 4-4 SAR Characterization

Note:

1. Compared with the Plimit(Tune up Powers) declared in each RSI by manufacturer and the plimit(calculation) calculated by the SAR measurement of each RSI, the lower power were applied to the plimit at each RSI configurations.
2. When *Pmax*<*Plimit*, the DUT will operate at a power level up to *Pmax.*
3. Maximum Tune up Power, Pmax is configured in Nv settings in EUT to limit maximum transmitting power. This power is converted into peak power in NV setting for TDD schemes. (LTE TDD)

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	F08/5AJ0A1/C/01	N/A	N/A	N/A
Staubli	TX90 XLspeag	F08/5AJ0A1/A/01	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D21143300	N/A	N/A	N/A
TESTO	175-H1/Thermometer	40331949309	12/26/2024	Annual	12/26/2025
Staubli	CS8Cspeag-TX60L	F10/5D1CA1/C/01	N/A	N/A	N/A
Staubli	TX60 Xlspeag	F10/5D1CA1/A/01	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D21142106	N/A	N/A	N/A
TESTO	175-H1/Thermometer	44606559906	12/26/2024	Annual	12/26/2025
SPEAG	E-Field Probe EX3DV4	3768	10/07/2024	Annual	10/07/2025
SPEAG	E-Field Probe EX3DV4	7679	08/22/2024	Annual	08/22/2025
SPEAG	E-Field Probe EX3DV4	7309	06/19/2024	Annual	06/19/2025
SPEAG	DAE4	1750	09/13/2024	Annual	09/13/2025
SPEAG	DAE4	1720	04/19/2024	Annual	04/19/2025
SPEAG	Dipole D750V3	1014	05/20/2024	Annual	05/20/2025
SPEAG	Dipole D835V2	441	04/18/2024	Annual	04/18/2025
SPEAG	Dipole D1640V2	345	07/12/2023	Biennial	07/12/2025
SPEAG	Dipole D1800V2	2d007	04/15/2024	Annual	04/15/2026
SPEAG	Dipole D1900V2	5d032	01/18/2024	Annual	01/18/2025
SPEAG	Dipole D2300V2	1010	07/19/2023	Biennial	07/19/2025
SPEAG	Dipole D2450V2	743	03/14/2024	Annual	03/14/2025
SPEAG	Dipole D2600V2	1015	04/22/2024	Annual	04/22/2025
SPEAG	Dipole D3500V2	1040	01/16/2025	Annual	01/16/2026
SPEAG	Dipole D3700V2	1105	09/18/2024	Annual	09/18/2025
SPEAG	Dipole D3900V2	1086	05/21/2024	Annual	05/21/2025
SPEAG	Dipole D5 GHz V2	1107	04/19/2024	Annual	04/19/2025
Agilent	Power Meter E4419B	MY41291386	09/11/2024	Annual	09/11/2025
Agilent	Power Meter N1911A	MY45101406	05/21/2024	Annual	05/21/2025
Agilent	Power Sensor 8481A	SG1091286	09/12/2024	Annual	09/12/2025
H.P	Power Sensor 8481A	MY41090675	09/12/2024	Annual	09/12/2025
Agilent	Wideband Power Sensor N1921A	MY55220026	07/30/2024	Annual	07/30/2025
Agilent	11636B/Power Divider	58698	01/15/2024	Annual	01/15/2025
Agilent	11636B/Power Divider	58698	01/13/2025	Annual	01/13/2026
SPEAG	DAKS 3.5	1031	04/22/2024	Annual	04/22/2025
SPEAG	Vector Reflectometer	0050813	04/15/2024	Annual	04/15/2025
KEYSIGHT	MXA Signal Analyzer	MY49100108	01/09/2024	Annual	01/09/2025
KEYSIGHT	MXA Signal Analyzer	MY49100108	01/07/2025	Annual	01/07/2026
H.P	Network Analyzer /8753ES	JP39240221	12/23/2024	Annual	12/23/2025
Agilent	WIRELESS COMMUNICATION E5515C	MY48360252	07/29/2024	Annual	07/29/2025
Agilent	WIRELESS COMMUNICATION E5515C	MY50260992	05/22/2024	Annual	05/22/2025
R&S	Wireless Communication Test Set CMW500	115733	03/19/2024	Annual	03/19/2025
Agilent	SIGNAL GENERATOR N5182A	MY47070230	03/19/2024	Annual	03/19/2025

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
EMPOWER	RF Power Amplifier	1084	05/21/2024	Annual	05/21/2025
EMPOWER	RF Power Amplifier	1041D/C0508	05/21/2024	Annual	05/21/2025
EMPOWER	RF Power Amplifier	1011	09/11/2024	Annual	09/11/2025
MICRO LAB	LP Filter / LA-15N	10453	09/11/2024	Annual	09/11/2025
MICRO LAB	LP Filter / LA-30N	-	09/11/2024	Annual	09/11/2025
MICRO LAB	LP Filter / LA-60N	32011	09/11/2024	Annual	09/11/2025
Agilent	Attenuator (3dB) 8693B	MY39260298	08/20/2024	Annual	08/20/2025
HP	Attenuator (20dB) 8493C	09271	08/20/2024	Annual	08/20/2025
Agilent	Directional Bridge 86205A	3140A04581	04/22/2024	Annual	04/22/2025
Agilent	MXA Signal Analyzer N9020A	MY50510407	06/04/2024	Annual	06/04/2025
KEYSIGHT	EXG Vector Signal Generator	MY50350097	03/05/2024	Annual	03/05/2025
HP	Dual Directional Coupler	16072	09/11/2024	Annual	09/11/2025
Anritsu	Radio Communication Test Station MT8000A	6262036812	11/27/2024	Annual	11/27/2025
Anritsu	Radio Communication Tester MT8820C	6201074225	01/17/2024	Annual	01/17/2025
Anritsu	Radio Communication Tester MT8820C	6200695605	03/19/2024	Annual	03/19/2025
Anritsu	Radio Communication Tester MT8821C	6201502997	05/21/2024	Annual	05/21/2025
Anritsu	Radio Communication Tester MT8821C	6262044720	11/27/2024	Annual	11/27/2025
ROHDE&SCHWARZ	BLUETOOTH TESTER CBT	100272	01/13/2025	Annual	01/13/2026

Note: All measurements were performed within the valid calibration period of the specific equipment.

* 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

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 Plimit CALCULATIONS

Table A-1 *PLimit* Calculations – 3G Free SAR (RSI=0)

MEASUREMENT RESULTS											
Frequency		Mode/ Band		Ant.	Frame Averaged Conducted Power	Test Position	Ditance	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				(dBm)		(mm)		(W/kg)	(dBm)	(dBm)
836.6	4183	UMTS Band 5	RMC	M1	24.42	Rear	19	1:1	0.401	28.4	27.3
836.6	4183	UMTS Band 5		M1	24.42	Left	10	1:1	0.056	36.9	
836.6	4183	UMTS Band 5		M1	24.42	Right	10	1:1	0.057	36.9	
836.6	4183	UMTS Band 5		M1	24.42	Top	19	1:1	0.513	27.3	
1 732.4	1412	UMTS Band 4	RMC	M1	24.04	Rear	19	1:1	0.373	28.3	27.1
1 732.4	1412	UMTS Band 4		M1	24.04	Left	10	1:1	0.087	34.6	
1 732.4	1412	UMTS Band 4		M1	24.04	Right	10	1:1	0.115	33.4	
1 732.4	1412	UMTS Band 4		M1	24.04	Top	19	1:1	0.496	27.1	
1 880	9400	UMTS Band 2	RMC	M1	23.86	Rear	19	1:1	0.289	29.3	27.1
1 880	9400	UMTS Band 2		M1	23.86	Left	10	1:1	0.054	36.5	
1 880	9400	UMTS Band 2		M1	23.86	Right	10	1:1	0.122	33.0	
1 880	9400	UMTS Band 2		M1	23.86	Top	19	1:1	0.476	27.1	

Table A-2 *PLimit* Calculations – 4G Free SAR(RSI=0)

MEASUREMENT RESULTS														
Frequency		Mode	Ant.	Band width	Frame Averaged Conducted Power	Test Position	Ditance	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.			(MHz)	(dBm)		(mm)	(dB)				(W/kg)	(dBm)	(dBm)
2 510	20850	LTE Band 7	M1	20	23.81	Rear	19	0	1	49	1:1	0.231	30.2	26.8
2 510	20850	LTE Band 7	M1	20	23.81	Left	10	0	1	49	1:1	0.106	33.6	
2 510	20850	LTE Band 7	M1	20	23.81	Right	10	0	1	49	1:1	0.177	31.3	
2 510	20850	LTE Band 7	M1	20	23.81	Top	19	0	1	49	1:1	0.502	26.8	
2 535	21100	LTE Band 7	S1	20	22.64	Rear	18	0	1	49	1:1	0.160	30.6	26.2
2 535	21100	LTE Band 7	S1	20	22.64	Left	10	0	1	49	1:1	0.443	26.2	
2 535	21100	LTE Band 7	S1	20	22.64	Bottom	18	0	1	49	1:1	0.024	38.8	
1 882.5	26365	LTE Band 25	M1	20	24.06	Rear	19	0	1	49	1:1	0.310	29.1	27.1
1 882.5	26365	LTE Band 25	M1	20	24.06	Left	10	0	1	49	1:1	0.060	36.3	
1 882.5	26365	LTE Band 25	M1	20	24.06	Right	10	0	1	49	1:1	0.124	33.1	
1 882.5	26365	LTE Band 25	M1	20	24.06	Top	19	0	1	49	1:1	0.494	27.1	
1 882.5	26365	LTE Band 25	S1	20	22.98	Rear	18	0	1	99	1:1	0.071	34.5	29.1
1 882.5	26365	LTE Band 25	S1	20	22.98	Left	10	0	1	99	1:1	0.247	29.1	
1 882.5	26365	LTE Band 25	S1	20	22.98	Bottom	18	0	1	99	1:1	0.059	35.3	
1 745	132322	LTE Band 66	M1	20	24.56	Rear	19	0	1	0	1:1	0.382	28.7	27.5
1 745	132322	LTE Band 66	M1	20	24.56	Left	10	0	1	0	1:1	0.088	35.1	
1 745	132322	LTE Band 66	M1	20	24.56	Right	10	0	1	0	1:1	0.128	33.5	
1 745	132322	LTE Band 66	M1	20	24.56	Top	19	0	1	0	1:1	0.510	27.5	
1 745	132322	LTE Band 66	S1	20	24.02	Rear	18	0	1	49	1:1	0.069	35.6	31.5
1 745	132322	LTE Band 66	S1	20	24.02	Left	10	0	1	49	1:1	0.180	31.5	
1 745	132322	LTE Band 66	S1	20	24.02	Bottom	18	0	1	49	1:1	0.060	36.2	
2 310	27710	LTE Band 30	M1	10	22.71	Rear	19	0	1	0	1:1	0.181	30.1	28.4
2 310	27710	LTE Band 30	M1	10	22.71	Left	10	0	1	0	1:1	0.036	37.1	
2 310	27710	LTE Band 30	M1	10	22.71	Right	10	0	1	0	1:1	0.129	31.6	
2 310	27710	LTE Band 30	M1	10	22.71	Top	19	0	1	0	1:1	0.267	28.4	
2 310	27710	LTE Band 30	S1	10	22.55	Rear	18	0	1	0	1:1	0.166	30.3	27.5
2 310	27710	LTE Band 30	S1	10	22.55	Left	10	0	1	0	1:1	0.164	30.4	
2 310	27710	LTE Band 30	S1	10	22.55	Bottom	18	0	1	0	1:1	0.320	27.5	
707.5	23095	LTE Band 12	M1	10	23.83	Rear	19	0	1	49	1:1	0.339	28.5	27.7
707.5	23095	LTE Band 12	M1	10	23.83	Left	10	0	1	49	1:1	0.229	30.3	
707.5	23095	LTE Band 12	M1	10	23.83	Right	10	0	1	49	1:1	0.265	29.6	
707.5	23095	LTE Band 12	M1	10	23.83	Top	19	0	1	49	1:1	0.411	27.7	
782.0	23230	LTE Band 13	M1	10	24.01	Rear	19	0	1	49	1:1	0.409	27.9	25.7
782.0	23230	LTE Band 13	M1	10	24.01	Left	10	0	1	49	1:1	0.292	29.4	
782.0	23230	LTE Band 13	M1	10	24.01	Right	10	0	1	49	1:1	0.243	30.2	
782.0	23230	LTE Band 13	M1	10	24.01	Top	19	0	1	49	1:1	0.677	25.7	
793	23330	LTE Band 14	M1	10	24.16	Rear	19	0	1	24	1:1	0.390	28.2	26.0
793	23330	LTE Band 14	M1	10	24.16	Left	10	0	1	24	1:1	0.269	29.9	
793	23330	LTE Band 14	M1	10	24.16	Right	10	0	1	24	1:1	0.176	31.7	
793	23330	LTE Band 14	M1	10	24.16	Top	19	0	1	24	1:1	0.658	26.0	

MEASUREMENT RESULTS														
Frequency		Mode	Ant.	Band width	Frame Averaged Conducted Power	Test Position	Ditance	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.			(MHz)	(dBm)		(mm)	(dB)				(W/kg)	(dBm)	(dBm)
831.5	26865	LTE Band 5	M1	15	24.63	Rear	19	0	1	0	1:1	0.426	28.3	26.3
831.5	26865	LTE Band 5	M1	15	24.63	Left	10	0	1	0	1:1	0.066	36.4	
831.5	26865	LTE Band 5	M1	15	24.63	Right	10	0	1	0	1:1	0.065	36.5	
831.5	26865	LTE Band 5	M1	15	24.63	Top	19	0	1	0	1:1	0.673	26.3	
2 506	39750	LTE Band 41 PC3	M1	20	21.70	Rear	19	0	1	99	1:1.58	0.162	29.6	25.3
2 506	39750	LTE Band 41	M1	20	21.70	Left	10	0	1	99	1:1.58	0.293	27.0	
2 506	39750	LTE Band 41	M1	20	21.70	Right	10	0	1	99	1:1.58	0.437	25.3	
2 506	39750	LTE Band 41	M1	20	21.70	Top	19	0	1	99	1:1.58	0.292	27.1	
2 506	39750	LTE Band 41 PC2	M1	20	21.85	Top	19	0	1	99	1:2.31	0.422	25.6	25.6
680.5	133297	LTE Band 71	M1	20	24.30	Rear	19	0	1	49	1:1	0.188	31.6	30.5
680.5	133297	LTE Band 71	M1	20	24.30	Left	10	0	1	49	1:1	0.176	31.8	
680.5	133297	LTE Band 71	M1	20	24.30	Right	10	0	1	49	1:1	0.110	33.9	
680.5	133297	LTE Band 71	M1	20	24.30	Top	19	0	1	49	1:1	0.242	30.5	

Table A-3 *PLimit* Calculations – NR Free SAR (RSI=0)
For some bands/modes, a lower *PLimit* was selected as a more conservative evaluation.
NR TDD Bands : In the case of the NR TDD bands, the Plimit were calculated as the Frame average power to which the duty factor was applied to the burst power.
SAR measurements of TDD NR bands were measured in FTM Mode.

MEASUREMENT RESULTS															
Frequency		Mode	Ant.	Band width	Frame Averaged Conducted Power	Test Configurations		Distance	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR (1g)	Plimit	Minimum Plimit
MHz	Ch.			(MHz)	(dBm)			(mm)	(dB)				(W/kg)	(dBm)	(dBm)
836.5	167300	NR Band n5	M1	20	24.39	Rear	DFT-s OFDM QPSK	19	0	1	1	1:1	0.425	28.1	27.2
836.5	167300	NR Band n5	M1	20	24.39	Left	DFT-s OFDM QPSK	10	0	1	1	1:1	0.050	37.4	
836.5	167300	NR Band n5	M1	20	24.39	Right	DFT-s OFDM QPSK	10	0	1	1	1:1	0.051	37.3	
836.5	167300	NR Band n5	M1	20	24.39	Top	DFT-s OFDM QPSK	19	0	1	1	1:1	0.529	27.2	
1 882.5	376500	NR Band n25	M1	40	24.27	Rear	DFT-s OFDM QPSK	19	0	1	108	1:1	0.308	29.4	27.5
1 882.5	376500	NR Band n25	M1	40	24.27	Left	DFT-s OFDM QPSK	10	0	1	108	1:1	0.123	33.4	
1 882.5	376500	NR Band n25	M1	40	24.27	Right	DFT-s OFDM QPSK	10	0	1	108	1:1	0.121	33.4	
1 882.5	376500	NR Band n25	M1	40	24.27	Top	DFT-s OFDM QPSK	19	0	1	108	1:1	0.471	27.5	
2 310	462000	NR Band n30	M1	10	23.16	Rear	DFT-s OFDM QPSK	19	0	1	26	1:1	0.214	29.9	28.2
2 310	462000	NR Band n30	M1	10	23.16	Left	DFT-s OFDM QPSK	10	0	1	26	1:1	0.039	37.2	
2 310	462000	NR Band n30	M1	10	23.16	Right	DFT-s OFDM QPSK	10	0	1	26	1:1	0.056	35.7	
2 310	462000	NR Band n30	M1	10	23.16	Top	DFT-s OFDM QPSK	19	0	1	26	1:1	0.311	28.2	
1 745	349000	NR Band n66	M1	40	24.34	Rear	DFT-s OFDM QPSK	19	0	1	108	1:1	0.401	28.3	27.1
1 745	349000	NR Band n66	M1	40	24.34	Left	DFT-s OFDM QPSK	10	0	1	108	1:1	0.108	34.0	
1 745	349000	NR Band n66	M1	40	24.34	Right	DFT-s OFDM QPSK	10	0	1	108	1:1	0.115	33.7	
1 745	349000	NR Band n66	M1	40	24.34	Top	DFT-s OFDM QPSK	19	0	1	108	1:1	0.526	27.1	
2 592.99	518598	NR Band n41	M1	40	18.48	Rear	DFT-s OFDM QPSK	19	0	1	1	1:1	0.085	29.2	25.4
2 592.99	518598	NR Band n41	M1	40	18.48	Left	DFT-s OFDM QPSK	10	0	1	1	1:1	0.085	29.2	
2 592.99	518598	NR Band n41	M1	40	18.48	Right	DFT-s OFDM QPSK	10	0	1	1	1:1	0.203	25.4	
2 592.99	518598	NR Band n41	M1	40	18.48	Top	DFT-s OFDM QPSK	19	0	1	1	1:1	0.153	26.6	
3 624.99	641666	NR Band n48 SRS1	S4	40	9.67	Rear	DFT-s OFDM QPSK	18	0	1	1	1:1	0.001	39.7	39.7
3 624.99	641666	NR Band n48 SRS1	S4	40	9.67	Right	DFT-s OFDM QPSK	10	0	1	1	1:1	0.000	-	
3 624.99	641666	NR Band n48 SRS1	S4	40	9.67	Top	DFT-s OFDM QPSK	18	0	1	1	1:1	0.000	-	
3 624.99	641666	NR Band n48 SRS2	M2	40	18.98	Rear	DFT-s OFDM QPSK	18	0	1	1	1:1	0.056	31.5	24.2
3 624.99	641666	NR Band n48 SRS2	M2	40	18.98	Right	DFT-s OFDM QPSK	10	0	1	1	1:1	0.304	24.2	
3 624.99	641666	NR Band n48 SRS2	M2	40	18.98	Bottom	DFT-s OFDM QPSK	18	0	1	1	1:1	0.034	33.7	
1 702.5	340500	NR Band n70	M1	15	23.79	Rear	DFT-s OFDM QPSK	19	0	1	77	1:1	0.345	28.4	26.5
1 702.5	340500	NR Band n70	M1	15	23.79	Left	DFT-s OFDM QPSK	10	0	1	77	1:1	0.068	35.5	
1 702.5	340500	NR Band n70	M1	15	23.79	Right	DFT-s OFDM QPSK	10	0	1	77	1:1	0.167	31.6	
1 702.5	340500	NR Band n70	M1	15	23.79	Top	DFT-s OFDM QPSK	19	0	1	77	1:1	0.541	26.5	
680.5	136100	NR Band n71	M1	20	24.36	Rear	DFT-s OFDM QPSK	19	0	1	53	1:1	0.23	30.7	30.6
680.5	136100	NR Band n71	M1	20	24.36	Left	DFT-s OFDM QPSK	10	0	1	53	1:1	0.083	35.2	
680.5	136100	NR Band n71	M1	20	24.36	Right	DFT-s OFDM QPSK	10	0	1	53	1:1	0.092	34.7	
680.5	136100	NR Band n71	M1	20	24.36	Top	DFT-s OFDM QPSK	19	0	1	53	1:1	0.235	30.6	

MEASUREMENT RESULTS															
Frequency		Mode	Ant.	Band width	Frame Averaged Conducted Power	Test Configurations		Distance	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR (1g)	Plimit	Minimum Plimit
MHz	Ch.			(MHz)	(dBm)			(mm)	(dB)				(W/kg)	(dBm)	(dBm)
3930	662000	NR Band n77 SRS0	M1	100	18.19	Rear	DFT-s OFDM QPSK	18	0	1	137	1:1	0.057	30.6	22.2
3930	662000	NR Band n77 SRS0	M1	100	18.19	Right	DFT-s OFDM QPSK	10	0	1	137	1:1	0.397	22.2	
3930	662000	NR Band n77 SRS0	M1	100	18.19	Bottom	DFT-s OFDM QPSK	18	0	1	137	1:1	0.068	29.9	
3 750	650000	NR Band n77 SRS3	S4	100	9.96	Rear	DFT-s OFDM QPSK	18	0	1	1	1:1	0.001	40.0	40.0
3 750	650000	NR Band n77 SRS3	S4	100	9.96	Right	DFT-s OFDM QPSK	10	0	1	1	1:1	0.000	-	
3 750	650000	NR Band n77 SRS3	S4	100	9.96	Bottom	DFT-s OFDM QPSK	18	0	1	1	1:1	0.000	-	
3 500.01	633334	NR Band n77 DoD SRS3	S4	100	11.48	Right	DFT-s OFDM QPSK	10	0	1	1	1:1	0.001	41.5	41.5

Table A-4 *PLimit* Calculations – 3G Grip2,4,5 SAR (RSI=2,4,5)

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

MEASUREMENT RESULTS											
Frequency		Mode/ Band		Ant.	Frame Averaged Conducted Power	Test Position	Ditance	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				(dBm)		(mm)		(W/kg)	(dBm)	(dBm)
836.6	4183	UMTS Band 5	RMC	M1	15.00	Rear	0	1:1	0.401	19.0	19.0
836.6	4183	UMTS Band 5		M1	15.00	Top	0	1:1	0.357	19.5	
1 732.4	1412	UMTS Band 4	RMC	M1	12.65	Rear	0	1:1	0.429	16.3	16.3
1 732.4	1412	UMTS Band 4		M1	12.65	Top	0	1:1	0.360	17.1	
1 880	9400	UMTS Band 2	RMC	M1	12.13	Rear	0	1:1	0.342	16.8	16.2
1 880	9400	UMTS Band 2		M1	12.13	Top	0	1:1	0.391	16.2	

Table A-5 *PLimit* Calculations – 4G Grip 2,4,5 SAR (RSI=2,4,5)

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	Distance	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.			(MHz)	(dBm)		(mm)	(dB)				(W/kg)	(dBm)	(dBm)
2 510	20850	LTE Band 7	M1	20	9.01	Rear	0	0	1	49	1:1	0.384	13.2	13.2
2 510	20850	LTE Band 7	M1	20	9.01	Top	0	0	1	49	1:1	0.349	13.6	
2 560	21350	LTE Band 7	S1	20	10.90	Rear	0	0	1	49	1:1	0.237	17.2	16.6
2 560	21350	LTE Band 7	S1	20	10.90	Left	0	0	1	49	1:1	0.269	16.6	
2 560	21350	LTE Band 7	S1	20	10.90	Bottom	0	0	1	49	1:1	0.103	20.8	
831.5	26865	LTE Band 26	M1	15	14.16	Rear	0	0	1	0	1:1	0.382	18.3	18.3
831.5	26865	LTE Band 26	M1	15	14.16	Top	0	0	1	0	1:1	0.364	18.5	
1 882.5	26365	LTE Band 25	M1	20	11.52	Rear	0	0	1	49	1:1	0.316	16.5	16.4
1 882.5	26365	LTE Band 25	M1	20	11.52	Top	0	0	1	49	1:1	0.322	16.4	
1 882.5	26365	LTE Band 25	S1	20	10.77	Rear	0	0	1	0	1:1	0.201	17.7	17.7
1 882.5	26365	LTE Band 25	S1	20	10.77	Left	0	0	1	0	1:1	0.194	17.9	
1 882.5	26365	LTE Band 25	S1	20	10.77	Bottom	0	0	1	0	1:1	0.085	21.5	
1 745	132322	LTE Band 66	M1	20	11.84	Rear	0	0	1	49	1:1	0.398	15.8	15.8
1 745	132322	LTE Band 66	M1	20	11.84	Top	0	0	1	49	1:1	0.291	17.2	
1 745	132322	LTE Band 66	S1	20	10.92	Rear	0	0	1	49	1:1	0.217	17.6	17.6
1 745	132322	LTE Band 66	S1	20	10.92	Left	0	0	1	49	1:1	0.156	19.0	
1 745	132322	LTE Band 66	S1	20	10.92	Bottom	0	0	1	49	1:1	0.101	20.9	
2 310	27710	LTE Band 30	M1	10	11.49	Rear	0	0	1	0	1:1	0.378	15.7	15.7
2 310	27710	LTE Band 30	M1	10	11.49	Top	0	0	1	0	1:1	0.350	16.0	
2 310	27710	LTE Band 30	S1	10	13.28	Rear	0	0	1	0	1:1	0.560	15.8	15.8
2 310	27710	LTE Band 30	S1	10	13.28	Left	0	0	1	0	1:1	0.349	17.9	
2 310	27710	LTE Band 30	S1	10	13.28	Bottom	0	0	1	0	1:1	0.227	19.7	
707.5	23095	LTE Band 12	M1	10	14.29	Rear	0	0	1	49	1:1	0.350	18.8	18.8
707.5	23095	LTE Band 12	M1	10	14.29	Top	0	0	1	49	1:1	0.279	19.8	
782.0	23230	LTE Band 13	M1	10	12.99	Rear	0	0	1	0	1:1	0.282	18.5	17.5
782.0	23230	LTE Band 13	M1	10	12.99	Top	0	0	1	0	1:1	0.352	17.5	
793.0	23330	LTE Band 14	M1	10	13.45	Rear	0	0	1	24	1:1	0.331	18.3	17.5
793.0	23330	LTE Band 14	M1	10	13.45	Top	0	0	1	24	1:1	0.392	17.5	
2 680	41490	LTE Band 41 PC3	M1	20	9.94	Rear	0	0	1	49	1:1.58	0.227	16.4	16.4
2 680	41490	LTE Band 41 PC3	M1	20	9.94	Top	0	0	1	49	1:1.58	0.194	17.1	
2 680	4149	LTE Band 41 PC2	M1	20	10.24	Rear	0	0	50	0	1:2.31	0.273	15.9	15.9
3 646.7	56207	LTE Band 48	S2	20	8.13	Rear	0	0	1	99	1:1.58	0.250	14.2	13.5
3 646.7	56207	LTE Band 48	S2	20	8.13	Left	0	0	1	99	1:1.58	0.00050	38.1	
3 646.7	56207	LTE Band 48	S2	20	8.13	Right	0	0	1	99	1:1.58	0.00234	35.1	
3 646.7	56207	LTE Band 48	S2	20	8.13	Bottom	0	0	1	99	1:1.58	0.288	13.5	
680.5	133297	LTE Band 71	M1	20	15.48	Rear	0	0	1	49	1:1	0.356	20.0	18.4
680.5	133297	LTE Band 71	M1	20	15.48	Top	0	0	1	49	1:1	0.505	18.4	

Table A-6 *PLimit* Calculations – NR Grip 2,4,5 SAR (RSI=2,4,5)

For some bands/modes, a lower *PLimit* was selected as a more conservative evaluation.
NR TDD Bands : In the case of the NR TDD bands, the Plimit were calculated as the Frame average power to which the duty factor was applied to the burst power.0
SAR measurements of TDD NR bands were measured in FTM Mode.

MEASUREMENT RESULTS															
Frequency		Mode	Ant.	Band width	Frame Averaged Conducted Power	Test Configurations		Distance	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR (1g)	Plimit	Minimum Plimit
MHz	Ch.			(MHz)	(dBm)			(mm)	(dB)				(W/kg)	(dBm)	(dBm)
836.5	167300	NR Band n5	M1	20	14.15	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.420	17.9	17.9
836.5	167300	NR Band n5	M1	20	14.15	Top	DFT-s OFDM QPSK	0	0	1	1	1:1	0.417	17.9	
1 882.5	376500	NR Band n25	M1	40	11.56	Rear	DFT-s OFDM QPSK	0	0	1	108	1:1	0.321	16.5	16.3
1 882.5	376500	NR Band n25	M1	40	11.56	Top	DFT-s OFDM QPSK	0	0	1	108	1:1	0.332	16.3	
2 310	462000	NR Band n30	M1	10	11.58	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.371	15.9	15.9
2 310	462000	NR Band n30	M1	10	11.58	Top	DFT-s OFDM QPSK	0	0	1	1	1:1	0.343	16.2	
1 745	349000	NR Band n66	M1	40	12.05	Rear	DFT-s OFDM QPSK	0	0	1	108	1:1	0.379	16.3	16.3
1 745	349000	NR Band n66	M1	40	12.05	Top	DFT-s OFDM QPSK	0	0	1	108	1:1	0.291	17.4	
2 592.99	518598	NR Band n41	M1	40	10.92	Rear	DFT-s OFDM QPSK	0	0	1	137	1:1	0.477	14.1	14.1
2 592.99	518598	NR Band n41	M1	40	10.92	Top	DFT-s OFDM QPSK	0	0	1	137	1:1	0.424	14.6	
3 624.99	641666	NR Band n48	S2	40	9.34	Rear	DFT-s OFDM QPSK	0	0	1	53	1:1	0.295	14.6	14.6
3 624.99	641666	NR Band n48	S2	40	9.34	Left	DFT-s OFDM QPSK	0	0	1	53	1:1	0.025	25.4	
3 624.99	641666	NR Band n48	S2	40	9.34	Right	DFT-s OFDM QPSK	0	0	1	53	1:1	0.079	20.4	
3 624.99	641666	NR Band n48	S2	40	9.34	Bottom	DFT-s OFDM QPSK	0	0	1	53	1:1	0.223	15.9	
3 624.99	641666	NR Band n48 SRS1	S4	40	3.43	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.000	-	23.4
3 624.99	641666	NR Band n48 SRS1	S4	40	3.43	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.000	-	
3 624.99	641666	NR Band n48 SRS1	S4	40	3.43	Top	DFT-s OFDM QPSK	0	0	1	1	1:1	0.010	23.4	
3 624.99	641666	NR Band n48 SRS2	M2	40	11.37	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.488	14.5	12.7
3 624.99	641666	NR Band n48 SRS2	M2	40	11.37	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.728	12.7	
3 624.99	641666	NR Band n48 SRS2	M2	40	11.37	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.169	19.1	
3 624.99	641666	NR Band n48 SRS3	S3	40	4.98	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.720	6.4	6.4
3 624.99	641666	NR Band n48 SRS3	S3	40	4.98	Left	DFT-s OFDM QPSK	0	0	1	1	1:1	0.012	24.2	
3 624.99	641666	NR Band n48 SRS3	S3	40	4.98	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.00253	30.2	
3 624.99	641666	NR Band n48 SRS3	S3	40	4.98	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.476	8.2	
1 702.5	340500	NR Band n70	M1	15	12.44	Rear	DFT-s OFDM QPSK	0	0	1	40	1:1	0.504	15.4	15.4
1 702.5	340500	NR Band n70	M1	15	12.44	Top	DFT-s OFDM QPSK	0	0	1	40	1:1	0.280	18.0	

MEASUREMENT RESULTS															
Frequency		Mode	Ant.	Band width	Frame Averaged Conducted Power	Test Configurations		Distance	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR (1g)	Plimit	Minimum Plimit
MHz	Ch.			(MHz)	(dBm)			(mm)	(dB)				(W/kg)	(dBm)	(dBm)
680.5	136100	NR Band n71	M1	20	15.99	Rear	DFT-s OFDM QPSK	0	0	1	53	1:1	0.425	19.7	19.7
680.5	136100	NR Band n71	M1	20	15.99	Top	DFT-s OFDM QPSK	0	0	1	53	1:1	0.386	20.1	
3 750	650000	NR Band n77	M2	100	8.68	Rear	DFT-s OFDM QPSK	0	0	1	137	1:1	0.351	13.2	13.2
3 750	650000	NR Band n77	M2	100	8.68	Right	DFT-s OFDM QPSK	0	0	1	137	1:1	0.287	14.1	
3 750	650000	NR Band n77	M2	100	8.68	Bottom	DFT-s OFDM QPSK	0	0	1	137	1:1	0.140	17.2	
3 500.01	633334	NR Band 77 DoD	M2	100	8.44	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.353	12.8	12.8
3 750	650000	NR Band n77 SRS1	S3	100	5.83	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.596	8.8	8.8
3 750	650000	NR Band n77 SRS1	S3	100	5.83	Left	DFT-s OFDM QPSK	0	0	1	1	1:1	0.039	19.9	
3 750	650000	NR Band n77 SRS1	S3	100	5.83	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.004	29.8	
3 750	650000	NR Band n77 SRS1	S3	100	5.83	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.468	9.1	
3 500.01	633334	NR Band n77 DoD SRS1	S3	100	5.93	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.850	6.6	6.6
3 750	650000	NR Band n77 SRS2	S2	100	12.98	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.373	17.3	15.8
3 750	650000	NR Band n77 SRS2	S2	100	12.98	Left	DFT-s OFDM QPSK	0	0	1	1	1:1	0.003	38.2	
3 750	650000	NR Band n77 SRS2	S2	100	12.98	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.005	36.0	
3 750	650000	NR Band n77 SRS2	S2	100	12.98	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.518	15.8	
3 500.01	633334	NR Band n77 DoD SRS2	S2	100	11.84	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.912	12.2	12.2
3 750	650000	NR Band n77 SRS3	S4	100	1.06	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.000	-	31.6
3 750	650000	NR Band n77 SRS3	S4	100	1.06	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.000	-	
3 750	650000	NR Band n77 SRS3	S4	100	1.06	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.001	31.6	

Table A-4 *PLimit* Calculations – 3G Grip 1,3 SAR (RSI=1,3)

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

MEASUREMENT RESULTS											
Frequency		Mode/ Band		Ant.	Frame Averaged Conducted Power	Test Position	Ditance	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.				(dBm)		(mm)		(W/kg)	(dBm)	(dBm)
826.4	4132	UMTS Band 5	RMC	M1	21.57	Left	0	1:1	0.178	29.1	29.1
826.4	4132	UMTS Band 5		M1	21.57	Right	0	1:1	0.167	29.3	
1 732.4	1412	UMTS Band 4	RMC	M1	19.79	Left	0	1:1	0.097	29.9	27.9
1 732.4	1412	UMTS Band 4		M1	19.79	Right	0	1:1	0.153	27.9	
1 880	9400	UMTS Band 2	RMC	M1	15.96	Left	0	1:1	0.046	29.3	28.1
1 880	9400	UMTS Band 2		M1	15.96	Right	0	1:1	0.061	28.1	

Table A-5 *PLimit* Calculations – 4G Grip 1,3 SAR (RSI=1,3)

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	Distance	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR(1g)	Plimit	Minimum Plimit
MHz	Ch.			(MHz)	(dBm)		(mm)	(dB)				(W/kg)	(dBm)	(dBm)
2 535	21100	LTE Band 7	M1	20	20.99	Left	0	0	1	49	1:1	0.268	26.7	26.3
2535	21100	LTE Band 7	M1	20	20.99	Right	0	0	1	49	1:1	0.294	26.3	
1 882.5	26365	LTE Band 25	M1	20	17.44	Left	0	0	1	49	1:1	0.064	29.4	26.3
1 882.5	26365	LTE Band 25	M1	20	17.44	Right	0	0	1	49	1:1	0.130	26.3	
831.5	26865	LTE Band 26	M1	15	22.79	Left	0	0	1	0	1:1	0.311	27.6	27.6
831.5	26865	LTE Band 26	M1	15	22.79	Right	0	0	1	0	1:1	0.186	30.1	
1 745	132322	LTE Band 66	M1	20	21.17	Left	0	0	1	49	1:1	0.184	28.5	27.0
1 745	132322	LTE Band 66	M1	20	21.17	Right	0	0	1	49	1:1	0.261	27.0	
2 310	27710	LTE Band 30	M1	10	20.28	Left	0	0	1	0	1:1	0.106	30.0	23.1
2 310	27710	LTE Band 30	M1	10	20.28	Right	0	0	1	0	1:1	0.519	23.1	
3 646.7	56207	LTE Band 48	S2	20	8.13	Rear	0	0	1	99	1:1.58	0.250	14.2	13.5
3 646.7	56207	LTE Band 48	S2	20	8.13	Left	0	0	1	99	1:1.58	0.00050	38.1	
3 646.7	56207	LTE Band 48	S2	20	8.13	Right	0	0	1	99	1:1.58	0.00234	35.1	
3 646.7	56207	LTE Band 48	S2	20	8.13	Bottom	0	0	1	99	1:1.58	0.288	13.5	

Table A-6 *PLimit* Calculations – NR Grip 1,3 SAR (RSI=1,3)

For some bands/modes, a lower *PLimit* was selected as a more conservative evaluation.
NR TDD Bands : In the case of the NR TDD bands, the Plimit were calculated as the Frame average power to which the duty factor was applied to the burst power.0
SAR measurements of TDD NR bands were measured in FTM Mode.

MEASUREMENT RESULTS															
Frequency		Mode	Ant.	Band width	Frame Averaged Conducted Power	Test Configurations		Distance	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR (1g)	Plimit	Minimum Plimit
MHz	Ch.			(MHz)	(dBm)			(mm)	(dB)				(W/kg)	(dBm)	(dBm)
836.5	167300	NR Band n5	M1	20	23.91	Left	DFT-s OFDM QPSK	0	0	1	1	1:1	0.146	32.3	30.0
836.5	167300	NR Band n5	M1	20	23.91	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.245	30.0	
1 882.5	376500	NR Band n25	M1	40	17.67	Left	DFT-s OFDM QPSK	0	0	1	108	1:1	0.070	29.2	25.0
1 882.5	376500	NR Band n25	M1	40	17.67	Right	DFT-s OFDM QPSK	0	0	1	108	1:1	0.186	25.0	
2 310	462000	NR Band n30	M1	10	20.88	Left	DFT-s OFDM QPSK	0	0	1	1	1:1	0.130	29.7	24.9
2 310	462000	NR Band n30	M1	10	20.88	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.392	24.9	
1 745	349000	NR Band n66	M1	40	21.24	Left	DFT-s OFDM QPSK	0	0	1	108	1:1	0.149	29.5	26.0
1 745	349000	NR Band n66	M1	40	21.24	Right	DFT-s OFDM QPSK	0	0	1	108	1:1	0.336	26.0	
2 592.99	518598	NR Band n41	M1	40	10.92	Rear	DFT-s OFDM QPSK	0	0	1	137	1:1	0.477	14.1	14.1
2 592.99	518598	NR Band n41	M1	40	10.92	Top	DFT-s OFDM QPSK	0	0	1	137	1:1	0.424	14.6	
3 624.99	641666	NR Band n48	S2	40	9.34	Rear	DFT-s OFDM QPSK	0	0	1	53	1:1	0.295	14.6	14.6
3 624.99	641666	NR Band n48	S2	40	9.34	Left	DFT-s OFDM QPSK	0	0	1	53	1:1	0.025	25.4	
3 624.99	641666	NR Band n48	S2	40	9.34	Right	DFT-s OFDM QPSK	0	0	1	53	1:1	0.079	20.4	
3 624.99	641666	NR Band n48	S2	40	9.34	Bottom	DFT-s OFDM QPSK	0	0	1	53	1:1	0.223	15.9	
3 624.99	641666	NR Band n48 SRS1	S4	40	3.43	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.000	-	23.4
3 624.99	641666	NR Band n48 SRS1	S4	40	3.43	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.000	-	
3 624.99	641666	NR Band n48 SRS1	S4	40	3.43	Top	DFT-s OFDM QPSK	0	0	1	1	1:1	0.010	23.4	
3 624.99	641666	NR Band n48 SRS2	M2	40	11.37	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.488	14.5	12.7
3 624.99	641666	NR Band n48 SRS2	M2	40	11.37	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.728	12.7	
3 624.99	641666	NR Band n48 SRS2	M2	40	11.37	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.169	19.1	
3 624.99	641666	NR Band n48 SRS3	S3	40	4.98	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.720	6.4	6.4
3 624.99	641666	NR Band n48 SRS3	S3	40	4.98	Left	DFT-s OFDM QPSK	0	0	1	1	1:1	0.012	24.2	
3 624.99	641666	NR Band n48 SRS3	S3	40	4.98	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.00253	30.2	
3 624.99	641666	NR Band n48 SRS3	S3	40	4.98	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.476	8.2	
1 702.5	340500	NR Band n70	M1	15	18.88	Left	DFT-s OFDM QPSK	0	0	1	77	1:1	0.051	31.8	26.4
1 702.5	340500	NR Band n70	M1	15	18.88	Right	DFT-s OFDM QPSK	0	0	1	77	1:1	0.175	26.4	

MEASUREMENT RESULTS

Frequency		Mode	Ant.	Band width	Frame Averaged Conducted Power	Test Configurations		Distance	MPR	RB Size	RB offset	Duty Cycle	Meas. SAR (1g)	Plimit	Minimum Plimit
MHz	Ch.			(MHz)	(dBm)			(mm)	(dB)				(W/kg)	(dBm)	(dBm)
680.5	136100	NR Band n71	M1	20	15.99	Rear	DFT-s OFDM QPSK	0	0	1	53	1:1	0.425	19.7	19.7
680.5	136100	NR Band n71	M1	20	15.99	Top	DFT-s OFDM QPSK	0	0	1	53	1:1	0.386	20.1	
3 750	650000	NR Band n77	M2	100	8.68	Rear	DFT-s OFDM QPSK	0	0	1	137	1:1	0.351	13.2	13.2
3 750	650000	NR Band n77	M2	100	8.68	Right	DFT-s OFDM QPSK	0	0	1	137	1:1	0.287	14.1	
3 750	650000	NR Band n77	M2	100	8.68	Bottom	DFT-s OFDM QPSK	0	0	1	137	1:1	0.140	17.2	
3 500.01	633334	NR Band 77 DoD	M2	100	8.44	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.353	12.8	12.8
3 750	650000	NR Band n77 SRS1	S3	100	5.83	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.596	8.8	8.8
3 750	650000	NR Band n77 SRS1	S3	100	5.83	Left	DFT-s OFDM QPSK	0	0	1	1	1:1	0.039	19.9	
3 750	650000	NR Band n77 SRS1	S3	100	5.83	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.004	29.8	
3 750	650000	NR Band n77 SRS1	S3	100	5.83	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.468	9.1	
3 500.01	633334	NR Band n77 DoD SRS1	S3	100	5.93	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.850	6.6	6.6
3 750	650000	NR Band n77 SRS2	S2	100	12.98	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.373	17.3	15.8
3 750	650000	NR Band n77 SRS2	S2	100	12.98	Left	DFT-s OFDM QPSK	0	0	1	1	1:1	0.003	38.2	
3 750	650000	NR Band n77 SRS2	S2	100	12.98	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.005	36.0	
3 750	650000	NR Band n77 SRS2	S2	100	12.98	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.518	15.8	
3 500.01	633334	NR Band n77 DoD SRS2	S2	100	11.84	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.912	12.2	12.2
3 750	650000	NR Band n77 SRS3	S4	100	1.06	Rear	DFT-s OFDM QPSK	0	0	1	1	1:1	0.000	-	31.1
3 750	650000	NR Band n77 SRS3	S4	100	1.06	Right	DFT-s OFDM QPSK	0	0	1	1	1:1	0.000	-	
3 750	650000	NR Band n77 SRS3	S4	100	1.06	Bottom	DFT-s OFDM QPSK	0	0	1	1	1:1	0.001	31.1	