FCC SAR TEST REPORT

Test File No : F690501-RF-SAR000491-A1

Equipment Under Test	Telematics
Model Name	TFBMEIBN3EU
Variant Model	TFBMNINN0EN, TFBMEIBN3FR
Module Name	TM16FNNABM0
Applicant	LG Electronics USA, Inc.
Address of Applicant	111 Sylvan Avenue, North Building, Englewood Cliffs, New Jersey, United States, 07632
FCC ID	BEJTFBMEIBN3EU
Module FCC ID	BJETM16FNNABM0
Exposure Category	General Population/Uncontrolled Exposure
Standards	FCC 47 CFR Part 2 (2.1093) IEEE 1528, 2013
Receipt No.	GPRI2312000883SR
Date of Receipt	2023-12-13
Date of SAR Test(s)	2024-02-27 ~2024-04-30
Date of Issue	2025-04-03
Test Result	Refer to the Page 07

In the configuration tested, the EUT complied with the standards specified above.

This test report does not assure KOLAS accreditation.

Remarks:

1) The results of this test report are effective only to the items tested.
2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

Report prepared by /
Jayden Jung
Test Engineer

Approved by /
Minhyuk Han
Technical Manager

Revision history

Revision	Date of issue	Revisions	Revised By
-	Sep 04, 2024	Initial issue	
A1	Apr 03, 2025	Revision Update - Added module information	Jayden Jung

Table of Contents

1 Testing Laboratory

Company Name	SGS Korea Co., Ltd. (Gunpo Laboratory)
Address	4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, 15807 Republic of Korea
Telephone	+82 +31 428 5700
FAX	+82 +31 427 2371

2 Details of Applicant

Applicant	LG Electronics USA, Inc.
Address	111 Sylvan Avenue, North Building, Englewood Cliffs, New Jersey, United States, 07632
Email	heejae.cho@lge.com
Phone No.	+1 201 952 0674

3 Details of Manufacturer

Applicant	LG Electronics Inc.
Address	128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea, 07336

4 Description of EUT(s)

EUT Type	Telematics
Model Name	TFBMEIBN3EU
Variant Model	TFBMNINN0EN, TFBMEIBN3FR
Module Name	TM16FNNABM0
TFBMEIBN3EU & Variant Model Difference	Those models are technically identical, but the only difference is digital portions.

Model Name	*Installation capability on PCB	GNSS	WiFi / BT	Backup Battery	Model Remark
TFBMEIBN3EU	O	O	O	O	Basic Model
TFBMNINN0EN	X	O	O	X	
TFBMEIBN3FR	O	O	O	O	

* Cellular Antennas is mounted on TFBMEIBN3EU, TFBMNINN0EN, TFBMEIBN3FR

O: Popped
X: De-Popped

WLAN/BT Antenna Gain

Band		Ant1	Ant2	Ant3	Ant4	Ant1+2	Ant1+3	Ant1+4
2.4GHz		5.06	4.96	4.10	2.90	8.02	7.60	7.06
5GHz	UNII 1	6.46	6.43	2.20	5.00	9.46	7.60	8.77
	UNII 2A	5.73	5.84	2.20	5.00	8.80	7.15	8.38
	UNII 2C	6.86	5.21	1.90	5.00	9.08	7.74	8.99
	UNII 3	5.67	4.29	2.40	5.00	8.02	7.20	8.35
6GHz	UNII 5	2.86	0.77	2.40	-	4.89	5.64	-
	UNII 7	1.11	0.02	2.50	-	3.59	4.84	-
BT		5.06	-					

Software Version	v010.038.045
Hardware Version	Rev. C3
Serial Number	355353850006970, 355353850006940, 355353850006950

Mode of Operation	WCDMA II / WCDMA V / LTE Band 2 / LTE Band 4 / LTE Band 5 / LTE Band 7 / LTE Band 12 / LTE Band 13 / LTE Band 17 / LTE Band 25 / LTE Band 26 / LTE Band 38 / LTE Band 48 / LTE Band 66 / LTE Band 71 / 5G NR n2 / 5G NR n5 / 5G NR n7 / 5G NR n12 / 5G NR n25 / 5G NR n41 / 5G NR n48 / 5G NR n66 / 5G NR n71 / 5G NR n77 / 5G NR n78 / WLAN / Bluetooth LE
Tx Frequency Range	WCDMA II : 1 850.0 ~ 1 910.0 MHz WCDMA V : 824.0 ~ 849.0 MHz LTE Band 2 : 1 850.0 ~ 1 910.0 MHz LTE Band 4 : 1 710.0 ~ 1 755.0 MHz LTE Band 5 : 824.0 ~ 849.0 MHz LTE Band 7 : 2 500.0 ~ 2 570.0 MHz LTE Band 12 : 699.0 ~ 716.0 MHz LTE Band 13 : 777.0 ~ 787.0 MHz LTE Band 17 : 704.0 ~ 716.0 MHz LTE Band 25 : 1 850 ~ 1 915.0 MHz LTE Band 26 : 814.0 ~ 849.0 MHz LTE Band 38 : 2 570.0 ~ 2 620.0 MHz LTE Band 48 : 3 550.0 ~ 3 700.0 MHz LTE Band 66 : 1 710.0 ~ 1 780.0 MHz LTE Band 71 : 663.0 ~ 698.0 MHz 5G NR n2 : 1 850.0 ~ 1 910.0 MHz 5G NR n5 : 824.0 ~ 849.0 MHz 5G NR n7 : 2 500.0 ~ 2 570.0 MHz 5G NR n12 : 699.0 ~ 716.0 MHz 5G NR n25 : 1 850.0 ~ 1 915.0 MHz 5G NR n41 : 2 496.0 ~ 2 690.0 MHz 5G NR n48 : 3 550.0 ~ 3 700.0 MHz 5G NR n66 : 1 710.0 ~ 1 780.0 MHz 5G NR n71 : 663.0 ~ 698.0 MHz 5G NR n77 DoD : 3 450.0 ~ 3 550.0 MHz 5G NR n77 : 3 700.0 ~ 3 980.0 MHz 5G NR n78 DoD : 3 450.0 ~ 3 550.0 MHz 5G NR n78 : 3 700.0 ~ 3 800.0 MHz WLAN 2.4 GHz : 2 412.0 MHz ~ 2 462.0 MHz U-NII 1 : 5 180.0 MHz ~ 5 240.0 MHz U-NII 2A : 5 260.0 MHz ~ 5 320.0 MHz U-NII 2C : 5 500.0 MHz ~ 5 720.0 MHz U-NII 3 : 5 745.0 MHz ~ 5 825.0 MHz U-NII 5 : 5 955.0 ~ 6 415.0 MHz U-NII 7 : 6 535.0 ~ 6 855.0 MHz Bluetooth LE : 2 402.0 MHz ~ 2 480.0 MHz

Module **Tx Frequency Range**	WCDMA II : 1 850.0 ~ 1 910.0 MHz WCDMA V : 824.0 ~ 849.0 MHz LTE Band 2 : 1 850.0 ~ 1 910.0 MHz LTE Band 4 : 1 710.0 ~ 1 755.0 MHz LTE Band 5 : 824.0 ~ 849.0 MHz LTE Band 7 : 2 500.0 ~ 2 570.0 MHz LTE Band 12 : 699.0 ~ 716.0 MHz LTE Band 13 : 777.0 ~ 787.0 MHz LTE Band 17 : 704.0 ~ 716.0 MHz LTE Band 25 : 1 850 ~ 1 915.0 MHz LTE Band 26 : 814.0 ~ 849.0 MHz LTE Band 38 : 2 570.0 ~ 2 620.0 MHz LTE Band 48 : 3 550.0 ~ 3 700.0 MHz LTE Band 66 : 1 710.0 ~ 1 780.0 MHz LTE Band 71 : 663.0 ~ 698.0 MHz 5G NR n2 : 1 850.0 ~ 1 910.0 MHz 5G NR n5 : 824.0 ~ 849.0 MHz 5G NR n7 : 2 500.0 ~ 2 570.0 MHz 5G NR n12 : 699.0 ~ 716.0 MHz 5G NR n25 : 1 850.0 ~ 1 915.0 MHz 5G NR n41 : 2 496.0 ~ 2 690.0 MHz 5G NR n48 : 3 550.0 ~ 3 700.0 MHz 5G NR n66 : 1 710.0 ~ 1 780.0 MHz 5G NR n71 : 663.0 ~ 698.0 MHz 5G NR n77 DoD : 3 450.0 ~ 3 550.0 MHz 5G NR n77 : 3 700.0 ~ 3 980.0 MHz 5G NR n78 DoD : 3 450.0 ~ 3 550.0 MHz 5G NR n78 : 3 700.0 ~ 3 800.0 MHz

5 The Highest Reported SAR Values

Band	Highest Reported SAR 1g (W/kg)
WCDMA II Ant1	**0.232**
WCDMA II Ant3	0.058
WCDMA V Ant1	0.066
WCDMA V Ant3	0.021
LTE Band 7 Ant1	0.072
LTE Band 7 Ant3	0.063
LTE Band 12 Ant1	0.032
LTE Band 12 Ant3	0.007
LTE Band 13 Ant1	0.040
LTE Band 13 Ant3	0.033
LTE Band 25 Ant1	0.163
LTE Band 25 Ant3	0.034
LTE Band 26 Ant1	0.047
LTE Band 26 Ant3	0.016
LTE Band 38 Ant1	0.025
LTE Band 38 Ant3	0.039
LTE Band 48 Ant2	0.012
LTE Band 66 Ant1	0.144
LTE Band 66 Ant3	0.069
LTE Band 71 Ant1	0.026
LTE Band 71 Ant3	0.014
5G NR n5 Ant1	0.041
5G NR n5 Ant3	0.018
5G NR n7 Ant1	0.070
5G NR n7 Ant3	0.065
5G NR n12 Ant1	0.026
5G NR n12 Ant3	0.011
5G NR n25 Ant1	0.149
5G NR n25 Ant3	0.039
5G NR n41 Ant1	0.049
5G NR n41 Ant3	0.055
5G NR n48 Ant2	0.035
5G NR n66 Ant1	0.152
5G NR n66 Ant3	0.066
5G NR n71 Ant1	0.037
5G NR n71 Ant3	0.020
5G NR n77 Ant2	0.035
5G NR n77 DoD Ant2	0.014
Simultaneous SAR(TER) per KDB 690783 D01v01r03 :	0.303

6 Test Methodology

ANSI/IEEE C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. It specifies the maximum exposure limit of 1.6 W/kg as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

Test tests documented in this report were performed in accordance with IEEE Standard 1528-2013 and the following published KDB procedures.

☒	**KDB 865664 D01v01r04**	**SAR Measurement Requirements for 100 MHz to 6 GHz**
☒	**KDB 865664 D02v01r02**	**RF Exposure Compliance Reporting and Documentation Considerations**
☐	KDB 447498 D01v06	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies
☒	**KDB 447498 D04v01**	**Interim General RF Exposure Guidance**
☐	KDB 447498 D02v02r01	SAR Measurement Procedures for USB Dongle Transmitters
☐	KDB 248227 D01v02r02	SAR Guidance For IEEE 802.11 (Wi-Fi) Transmitters
☐	KDB 615223 D01v01r01	802.16e/WiMax SAR Measurement Guidance
☐	KDB 616217 D04v01r02	SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers
☐	KDB 643646 D01v01r03	SAR Test Considerations for Occupational PTT Radios
☐	KDB 648474 D03v01r04	Evaluation and Approval Considerations for Handsets with Specific Wireless Charging Battery Covers
☐	KDB 648474 D04v01r03	SAR Evaluation Considerations for Wireless Handsets
☐	KDB 680106 D01v03r01	RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications
☒	**KDB 941225 D01v03r01**	**3G SAR Measurement Procedures**
☒	**KDB 941225 D05v02r05**	**SAR Evaluation Considerations for LTE Devices**
☐	KDB 941225 D06v02r01	SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities
☐	KDB 941225 D07v01r02	SAR Evaluation Procedures for UMPC Mini-Tablet Devices

7 Testing Environment

Ambient temperature	: 18°C ~ 25°C
Relative humidity	: 30% ~ 70%
Liquid temperature of during the test	: <± 2°C
Ambient noise & Reflection	: < 0.012 W/kg

8 Specific Absorption Rate (SAR)

8.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled

8.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho dv}\right)$$

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

SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = C\left(\frac{\delta T}{\delta t}\right)$$

Where: C is the specific head capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

$$SAR = \frac{\sigma |E|^2}{\rho}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength. However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

8.3 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 ㎑ to 300 ㎓," ANSI/IEEE C95.3–2003, Copyright 2003 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 ㎑ to 6 ㎓. Portable devices that transmit at frequencies above 6 ㎓ are to be evaluated in terms of the

MPE limits specified in § 1.1310 of this chapter. Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 ㎓ should be made at a minimum distance of 5 cm from the radiating source.

(1) Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over an 10 grams of tissue (defined as a tissue volume in the shape of a cube). Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Partial Peak SAR (Partial)	1.60 mW/g	8.00 mW/g
Partial Average SAR (Whole Body)	0.08 mW/g	0.40 mW/g
Partial Peak SAR (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

1. The spatial Peak value of the SAR averaged over any 1g gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The spatial Average value of the SAR averaged over the whole body.
3. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

9 The SAR Measurement System

A block diagram of the SAR measurement System is given in Fig. 1. This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY system). The model EX3DV4 field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ ($|Ei|^2$)/ ρ where σ and ρ are the conductivity and mass density of the tissue-simulant.

The DASY system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Staubli TX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
- A dosimeter probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- Data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.

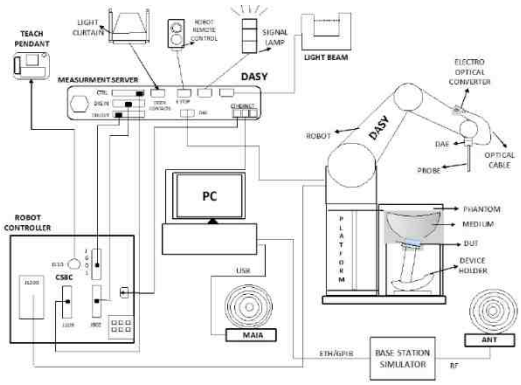


Fig a. The microwave circuit arrangement used for SAR system verification

- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows.
- DASY software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Verification dipole kits allowing to validate the proper functioning of the system.

10 System Components

10.1 Probe

Construction	:	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	:	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 835 and HSL1900. Additional CF-Calibration for other liquids and frequencies upon request.
Frequency	:	10 ㎒ to 6 ㎓; Linearity: ± 0.2 ㏈ (30 ㎒ to 6 ㎓)
Directivity	:	± 0.3 ㏈ in HSL (rotation around probe axis) ± 0.5 ㏈ in tissue material (rotation normal to probe axis)
Dynamic Range	:	10μW/g to > 100 m W/g; Linearity: ± 0.2 ㏈(noise: typically < 1 μW/g)
Dimensions	:	Overall length: 337 ㎜ (Tip length: 20 ㎜) Tip diameter: 2.5 ㎜ (Body diameter: 12 ㎜) Distance from probe tip to dipole centers: 1 ㎜
Application	:	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 ㎓ with precision of better 30%


EX3DV4 E-Field Probe

NOTE:

1. The Probe parameters have been calibrated by the SPEAG. Please reference “APPENDIX C” for the Calibration Certification Report.

10.2 ELI Phantom

Construction	:	Phantom for compliance testing of handheld and bodymounted wireless devices in the frequency range of 30 ㎒ to 6 ㎓. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles. ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure
Shell Thickness	:	2.0 ㎜ ± 0.1 ㎜
Dimensions	:	Major axis : 600 ㎜ Minor axis : 400 ㎜


ELI Phantom

10.3 Device Holder

Construction: : In combination with the Twin SAM PhantomV4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Device Holder

11 SAR Measurement Procedures

11.1 Normal SAR Measurement Procedure

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 1.4 ㎜. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2 and 3: Area Scan & Zoom Scan Procedures

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the Zoom Scan.
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. The generation of a high-resolution mesh within the measured volume
4. The interpolation of all measured values from the measurement grid to the high-resolution grid
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. The calculation of the averaged SAR within masses of 1 g and 10 g.

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1. SAR drift shall be kept within ± 5 % and if it without ± 5 %, SAR retest according to measurement procedure step 1~4.

< Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04 >

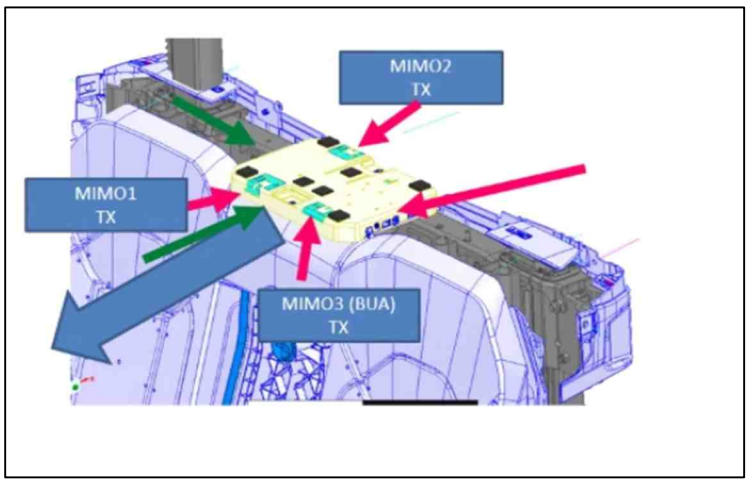
<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 mm ± 1 mm</td><td>½·δ·ln(2) mm ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta z_{Zoom}(n-1)$ mm</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.
* When zoom scan is required and the <u>*reported*</u> SAR from the *area scan based 1-g SAR estimation* procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

12 Definition of Reference※

12.1 Other consumer electronic devices

The exposure conditions of transmitters and modules incorporated in certain consumer electronic devices, such as printers, cameras, and camcorders may vary according to the installation and operating configurations required by the host products. Details of the transmitter and antenna configurations, antenna to user test separation distance, device operating configurations, etc., are required to determine SAR test exclusion or SAR measurement requirements for each host product. When SAR tests are required, a KDB inquiry is recommended to confirm the test setup. Unless the transmitter is used in a specific/dedicated host device, the standalone and simultaneous transmission SAR procedures for transmitters and modules should be applied. These must be fully explained in the permissive change documentation or equipment approval filing, whichever is applicable.

"Intended use distance" specified by the manufacturer: When there is no regulatory requirement, the intended use condition or distance specified by the manufacturer shall be used. This information shall be acquired from the user documentation accompanying the DUT. This device is mounted on the vehicle, and the physical distance from the device is 45mm. By manufacturer declaration, the test distance is 45mm. Testing of all six faces of the DUT might not be required; justification shall be provided when omitting testing of some faces. The SAR was tested only in two positions, the Front and Right Edge.



- The data marked ※ in this report was provided by the customer and may affect the validity of the test results.

We are responsible for all the information of this test report except for the data(※) provided by the customer.

13 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig 1. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. These tests were done at 750 / 835 / 1750 / 1900 / 2600 / 3500 / 3700 / 3900 ㎒. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. (SAR values are normalized to 1W forward power delivered to the dipole). During the tests, the ambient temperature of the laboratory was in the range (22 ± 2) ° C, the relative humidity was in the range (55 ± 5) % R.H and the liquid depth above the ear reference points was ≥ 15 cm ± 5 mm (frequency ≤ 3 GHz) or ≥ 10 cm ± 5 mm (frequency > 3 G Hz)in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

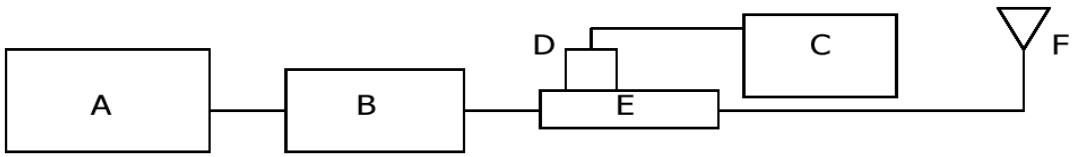


Fig 1. The microwave circuit arrangement used for SAR system verification

A. Signal Generator
B. RF Amplifier
C. Power Meter
D. Power Sensor
E. Dual Directional Coupler
F. Reference dipole Antenna

Photo of the dipole Antenna

SAR System Verification

Dipole Validation Kits		Probe S/N	Freq. (MHz)	Input Power (W)	Target SAR values (W/Kg)	1 W normalized Measured SAR (W/Kg)	SAR Deviation (%)	Date	Temperature (°C)	
Model	S/N				1g	1g	1g		Ambient	Liquid
D750V3	1085	3791	750	0.10	8.49	8.17	-3.77	2024-02-28	22.0	21.4
D750V3	1085	3791	750	0.10	8.49	8.52	0.35	2024-03-04	21.6	21.4
D750V3	1085	3791	750	0.10	8.49	8.46	-0.35	2024-03-05	22.3	22.2
D750V3	1085	3791	750	0.10	8.49	8.49	0.00	2024-03-05	22.3	22.2
D750V3	1085	3791	750	0.10	8.49	8.66	2.00	2024-03-11	21.6	21.4
D750V3	1085	3791	750	0.10	8.49	8.65	1.88	2024-03-12	21.4	20.9
D750V3	1085	3791	750	0.10	8.49	8.65	1.88	2024-03-22	22.4	22.3
D750V3	1085	3791	750	0.10	8.49	8.26	-2.71	2024-03-23	23.2	21.8
D750V3	1085	3791	750	0.10	8.49	8.34	-1.77	2024-03-25	21.6	21.4
D835V2	4d138	3791	835	0.10	9.81	9.31	-5.10	2024-02-27	21.5	21.3
D835V2	4d138	3791	835	0.10	9.81	9.50	-3.16	2024-02-28	22.0	21.6
D835V2	4d138	3791	835	0.10	9.81	9.72	-0.92	2024-03-13	22.1	22.1
D835V2	4d138	3791	835	0.10	9.81	9.55	-2.65	2024-03-25	22.2	22.1
D835V2	4d138	3791	835	0.10	9.81	10.00	1.94	2024-03-26	22.3	22.1
D835V2	4d138	3791	835	0.10	9.81	9.87	0.61	2024-03-27	23.3	23.3
D1750V2	1116	3791	1750	0.10	35.50	36.90	3.94	2024-02-29	21.5	20.9
D1750V2	1116	3791	1750	0.10	35.50	37.00	4.23	2024-03-14	21.6	21.6
D1750V2	1116	3791	1750	0.10	35.50	36.50	2.82	2024-03-22	23.2	23.1
D1900V2	5d158	7574	1900	0.10	39.80	37.60	-5.53	2024-02-28	22.2	21.9
D1900V2	5d158	7574	1900	0.10	39.80	39.20	-1.51	2024-02-29	22.0	21.7
D1900V2	5d158	7574	1900	0.10	39.80	40.40	1.51	2024-03-18	22.1	21.2
D1900V2	5d158	7574	1900	0.10	39.80	40.70	2.26	2024-03-19	22.2	21.5
D2600V2	1038	7574	2600	0.10	55.70	56.10	0.72	2024-03-04	22.2	21.8
D2600V2	1038	7574	2600	0.10	55.70	56.80	1.97	2024-03-05	22.0	21.7
D2600V2	1038	7574	2600	0.10	55.70	55.60	-0.18	2024-03-12	21.9	21.8
D2600V2	1038	7574	2600	0.10	55.70	53.60	-3.77	2024-03-13	22.7	22.6
D2600V2	1038	7574	2600	0.10	55.70	55.10	-1.08	2024-03-19	22.2	22.0
D2600V2	1038	7574	2600	0.10	55.70	57.40	3.05	2024-03-20	22.6	22.4
D2600V2	1038	7574	2600	0.10	55.70	58.20	4.49	2024-03-21	22.4	22.2

Dipole Validation Kits		Probe S/N	Freq. (MHz)	Input Power (W)	Target SAR values (W/Kg)	1 W normalized Measured SAR (W/Kg)	SAR Deviation (%)	Date	Temperature (°C)	
Model	S/N				1g	1g	1g		Ambient	Liquid
D3500V2	1058	7574	3500	0.10	65.30	62.70	-3.98	2024-03-08	22.3	21.9
D3500V2	1058	7574	3500	0.10	65.30	62.80	-3.83	2024-03-11	22.7	22.6
D3500V2	1058	7574	3500	0.10	65.30	63.70	-2.45	2024-04-30	22.7	22.6
D3700V2	1005	7574	3700	0.10	65.70	63.70	-3.04	2024-03-08	22.3	21.9
D3700V2	1005	7574	3700	0.10	65.70	63.00	-4.11	2024-03-28	22.8	22.1
D3700V2	1005	7574	3700	0.10	65.70	63.30	-3.65	2024-04-29	22.9	22.8
D3900V2	1036	7574	3900	0.10	68.00	65.70	-3.38	2024-03-11	22.7	22.6
D3900V2	1036	7574	3900	0.10	68.00	65.70	-3.38	2024-04-30	22.7	22.6

Table 1 Results system verification

14 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this simulant fluid were measured by using the Speag Model DAK-3.5 in conjunction with Keysight E5063A Network Analyzer by using a procedure.

Freq. (MHz)	Target Value		Measure Value		Deviation (%)		Date	Liquid Temperature (°C)
	Permitivity	Conductivity (S/m)	Permittivity	Conductivity (S/m)	Permittivity	Conductivity (S/m)		
750*	41.90	0.89	43.912	0.865	4.80	-2.81	2024-02-28	21.4
782.00	41.90	0.89	43.502	0.903	3.82	1.46		
750*	41.90	0.89	43.413	0.890	3.61	0.00	2024-03-04	21.4
707.50	41.90	0.89	43.703	0.872	4.30	-2.02		
750*	41.90	0.89	42.858	0.899	2.29	1.01	2024-03-05	22.2
707.50	41.90	0.89	43.198	0.880	3.10	-1.12		
750*	41.90	0.89	43.277	0.896	4.27	-1.57	2024-03-05	22.2
680.50	41.90	0.89	43.688	0.876	3.33	-2.47		
750*	41.90	0.89	43.296	0.868	3.33	-2.47	2024-03-11	21.4
707.50	41.90	0.89	43.567	0.851	3.98	-4.38		
750*	41.90	0.89	43.600	0.900	4.06	1.12	2024-03-12	20.9
680.50	41.90	0.89	43.817	0.876	4.58	-1.57		
750*	41.90	0.89	40.631	0.901	-3.03	1.24	2024-03-22	22.3
782.00	41.90	0.89	40.599	0.915	-3.11	2.81		
750*	41.90	0.89	41.075	0.884	-1.97	-0.67	2024-03-23	21.8
680.50	41.90	0.89	41.435	0.863	-1.11	-3.03		
707.50	41.90	0.89	41.402	0.867	-1.19	-2.58		
750*	41.90	0.89	41.089	0.908	-1.94	2.02	2024-03-25	21.4
680.50	41.90	0.89	41.457	0.888	-1.06	-0.22		
707.50	41.90	0.89	41.420	0.892	-1.15	0.22		
835*	41.50	0.90	41.555	0.905	0.13	0.56	2024-02-27	21.3
831.50	41.50	0.90	41.576	0.905	0.18	0.56		
835*	41.50	0.90	41.243	0.921	-0.62	2.33	2024-02-28	21.6
836.60	41.50	0.90	41.232	0.921	-0.65	2.33		
835*	41.50	0.90	43.092	0.901	3.84	0.11	2024-03-13	22.1
836.50	41.50	0.90	43.084	0.902	3.82	0.22		
835*	41.50	0.90	40.124	0.876	-3.32	-2.67	2024-03-25	22.1
836.50	41.50	0.90	40.113	0.876	-3.34	-2.67		

Freq. (MHz)	Target Value		Measure Value		Deviation (%)		Date	Liquid Temperature (°C)
	Permitivity	Conductivity (S/m)	Permittivity	Conductivity (S/m)	Permittivity	Conductivity (S/m)		
835*	41.50	0.90	40.617	0.863	-2.13	-4.11	2024-03-26	22.1
831.50	41.50	0.90	40.637	0.862	-2.08	-4.22		
835*	41.50	0.90	41.943	0.903	1.07	0.33	2024-03-27	23.3
836.60	41.50	0.90	41.910	0.905	0.99	0.56		
1750*	40.07	1.37	38.577	1.386	-3.73	1.17	2024-02-29	20.9
1745.00	40.07	1.37	38.594	1.381	-3.68	0.80		
1750*	40.07	1.37	39.115	1.396	-2.38	1.90	2024-03-14	21.6
1745.00	40.07	1.37	39.131	1.391	-2.34	1.53		
1750*	40.07	1.37	40.415	1.375	0.86	0.36	2024-03-22	23.1
1745.00	40.07	1.37	40.428	1.371	0.89	0.07		
1900*	40.00	1.40	38.959	1.420	-2.60	1.43	2024-02-28	21.9
1880.00	40.00	1.40	38.928	1.413	-2.68	0.93		
1900*	40.00	1.40	39.295	1.428	-1.76	2.00	2024-02-29	21.7
1882.50	40.00	1.40	39.265	1.422	-1.84	1.57		
1900*	40.00	1.40	40.640	1.461	1.60	4.36	2024-03-18	21.2
1882.50	40.00	1.40	40.619	1.455	1.55	3.93		
1900*	40.00	1.40	39.431	1.454	-1.42	3.86	2024-03-19	21.5
1880.00	40.00	1.40	39.410	1.446	-1.48	3.29		
1882.50	40.00	1.40	39.412	1.447	-1.47	3.36		
2600*	39.00	1.96	38.603	1.981	-1.02	1.07	2024-03-04	21.8
2535.00	39.00	1.96	38.751	1.917	-0.64	-2.19		
2600*	39.00	1.96	38.398	1.973	-1.54	0.66	2024-03-05	21.7
2595.00	39.00	1.96	38.410	1.967	-1.51	0.36		
2600*	39.00	1.96	37.710	2.004	-3.31	2.24	2024-03-12	21.8
2592.99	39.00	1.96	37.720	1.995	-3.28	1.79		
2600*	39.00	1.96	37.169	1.936	-4.69	-1.22	2024-03-13	22.6
2535.00	39.00	1.96	37.215	1.883	-4.58	-3.93		
2600*	39.00	1.96	39.158	1.957	0.41	-0.15	2024-03-19	22.0
2535.00	39.00	1.96	39.270	1.898	0.69	-3.16		

Freq. (MHz)	Target Value		Measure Value		Deviation (%)		Date	Liquid Temperature (°C)
	Permitivity	Conductivity (S/m)	Permittivity	Conductivity (S/m)	Permittivity	Conductivity (S/m)		
2600*	39.00	1.96	39.786	1.957	2.02	-0.15	2024-03-20	22.4
2535.00	39.00	1.96	40.000	1.901	2.56	-3.01		
2595.00	39.00	1.96	39.793	1.952	2.03	-0.41		
2600*	39.00	1.96	38.933	1.946	-0.17	-0.71	2024-03-21	22.2
2535.00	39.00	1.96	39.048	1.888	0.12	-3.67		
2592.99	39.00	1.96	38.944	1.938	-0.14	-1.12		
3500*	37.90	2.91	38.718	2.916	2.16	0.21	2024-03-08	21.9
3500.01	37.90	2.91	38.718	2.916	2.16	0.21		
3500*	37.90	2.91	38.308	2.895	1.08	-0.52	2024-03-11	22.6
3500.01	37.90	2.91	38.308	2.895	1.08	-0.52		
3500*	37.90	2.91	38.164	2.890	0.70	-0.69	2024-04-30	22.6
3500.01	37.90	2.91	38.164	2.890	0.70	-0.69		
3700*	37.70	3.12	38.332	3.128	1.68	0.26	2024-03-08	21.9
3646.70	37.70	3.12	38.465	3.074	2.03	-1.47		
3700*	37.70	3.12	37.442	3.164	-0.68	1.41	2024-03-28	22.1
3624.99	37.70	3.12	37.630	3.085	-0.19	-1.12		
3700*	37.70	3.12	37.030	3.072	-1.78	-1.54	2024-04-29	22.8
3624.99	37.70	3.12	37.157	2.998	-1.44	-3.91		
3646.70	37.70	3.12	37.142	3.020	-1.48	-3.21		
3900*	37.50	3.33	36.844	3.256	-1.75	-2.22	2024-03-11	22.6
3840.00	37.50	3.33	37.095	3.215	-1.08	-3.45		
3900*	37.50	3.33	37.449	3.274	-0.14	-1.68	2024-04-30	22.6
3840.00	37.50	3.33	37.545	3.220	0.12	-3.30		

Note: The data marked (*) in this table was Permittivity/Conductivity results of Verification

The brain mixtures consist of a viscous gel using hydroxethlcellullose(HEC) gelling agent and saline solution. Preservation with a bacteriacide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation. The dielectric properties of the liquid material required to fill the phantom shell shall be target. For 3.4 to 10.0 GHz, the tests were done with using stimulating liquid made by SPEAG.

Frequency (㎒)	**450**	**835**	**900**	**1800-2000**	**2450**	**2600**
Tissue Type	**Body**					
Ingredient (% by weight)						
Water	38.91	40.29	40.29	55.24	45.0	45.0
Salt (NaCl)	3.79	1.38	1.38	0.31	0	0
Sugar	56.93	57.90	57.90	0	0	0
HEC	0.25	0.24	0.24	0	0	0
Bactericide	0.12	0.18	0.18	0	0	0
Triton X-100	0	0	0	0	0	0
DGBE	0	0	0	44.45	55.0	55.0
Tissue parameter target by IEEE 1528-2013						
Dielectric Constant	43.5	41.5	41.5	**40.0**	**39.2**	**39.0**
Conductivity (S/m)	0.87	0.90	0.97	**1.40**	**1.80**	**1.96**
Salt: 99^{+}% Pure Sodium Chloride Water: De-ionized, 16 M $^{+}$ resistivity				Sucrose: 98^{+}% Pure Sucrose **HEC: Hydroxyethyl Cellulose**		
DGBE: 99^{+}% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]						

15 Justification for Extended SAR Dipole Calibrations

Usage of SAR dipoles calibrated less than 3 years ago but more than 1 year ago were confirmed in maintaining return loss (< -20 dB, within 20 % of prior calibration) and impedance (within 5 ohm from prior calibration) requirements per extended calibrations in KDB publication 865664 D01V01r04:

750V3 Head (SN : 1085)				
750 GHz				
Measurement Date	Return Loss (dB)	Δ%	Impedance (Ω)	ΔΩ
2024-02-28	-28.120	1.08	51.77	1.63

16 Instruments List

Test Platform	SPEAG DASY System				
Manufacture	SPEAG				
Description	SAR Test System				
Software Reference	DASY52: 52.10.4(1527) SEMCAD X: 14.6.14(7483)				
Equipment	**Type**	**Serial Number**	**Cal Date**	**Cal Interval**	**Cal Due**
Phantom	ELI Phantom	TP-1169	N/A	N/A	N/A
Phantom	ELI Phantom	TP-1244	N/A	N/A	N/A
Verification Dipole	D750V3	1085	2023-03-21	Biennial	2025-03-21
Verification Dipole	D835V2	4d138	2023-04-24	Biennial	2025-04-24
Verification Dipole	D1750V2	1116	2023-07-12	Biennial	2025-07-12
Verification Dipole	D1900V2	5d158	2023-04-26	Biennial	2025-04-26
Verification Dipole	D2600V2	1038	2023-06-16	Biennial	2025-06-16
Verification Dipole	D3500V2	1058	2023-09-28	Biennial	2025-09-28
Verification Dipole	D3700V2	1005	2023-09-27	Biennial	2025-09-27
Verification Dipole	D3900V2	1036	2023-09-27	Biennial	2025-09-27
Dielectric Assessment Kit	DAK-3.5	1107	2024-05-21	Annual	2025-05-21
Dielectric Assessment Kit	DAK-3.5	1228	2023-11-20	Annual	2024-11-20
DAE	DAE4	1430	2023-03-22	Annual	2024-03-22
DAE	DAE4	1507	2023-09-20	Annual	2024-09-20
DAE	DAE4	1503	2023-08-28	Annual	2024-08-28
E-Field Probe	EX3DV4	3791	2023-05-23	Annual	2024-05-23
E-Field Probe	EX3DV4	7574	2023-07-18	Annual	2024-07-18
Network Analyzer	E5063A	MY54706220	2024-01-10	Annual	2025-01-10
Power Meter	N1914A	MY56120017	2023-06-09	Annual	2024-06-09
Power Meter	E4416A	GB41292123	2023-06-29	Annual	2024-06-29
Power Meter	E4416A	GB41291455	2023-06-29	Annual	2024-06-29
Power Sensor	E9300H	MY41495307	2024-04-17	Annual	2025-04-17
Power Sensor	E9300H	MY41495314	2024-04-17	Annual	2025-04-17
Power Sensor	N8481A	MY56120026	2023-12-01	Annual	2024-12-01
Power Sensor	N8481A	MY56120030	2024-02-19	Annual	2025-02-19
Power Sensor	N8481A	MY63190004	2023-07-07	Annual	2024-07-07
Signal Generator	SMBV100A	262093	2023-05-10	Annual	2024-05-10
CW Signal Generator	E8247C	MY43321024	2023-06-07	Annual	2024-06-07
RF Amplifier	AMP2027	10008	2024-03-07	Annual	2025-03-07
RF Amplifier	AMP2027ADB	10001	2023-09-01	Annual	2024-09-01
RF Amplifier	AMP2027ADB	10006	2024-01-15	Annual	2025-01-15
Dual Directional Coupler	778D	MY52180578	2023-06-07	Annual	2024-06-07
Dual Directional Coupler	772D	MY52180226	2024-03-05	Annual	2025-03-05
Dual Directional Coupler	772D	MY52180259	2023-06-07	Annual	2024-06-07
Dual Directional Coupler	777D	50128	2023-06-07	Annual	2024-06-07
LP Filter	LA-30N	LF03	2024-03-05	Annual	2025-03-05
LP Filter	LA-60N	LF04	2024-03-05	Annual	2025-03-05
LP Filter	WLJ5-1500-2355-6000-60EF	1	2023-06-09	Annual	2024-06-09
LP Filter	WLJ4-3000-5850-8000-60EF	1	2023-06-09	Annual	2024-06-09
LP Filter	WLJ8-6000-7440-8000-60EF	1	2023-06-05	Annual	2024-06-05
Digital Thermometer	SDT25	19041500179	2023-09-01	Annual	2024-09-01

Equipment	Type	Serial Number	Cal Date	Cal Interval	Cal Due
Hygro-Thermometer	303C	210609816	2024-01-30	Annual	2025-01-30
Hygro-Thermometer	303	210700311	2024-01-30	Annual	2025-01-30
Communication Tester	MT8820C	6201074216	2023-11-27	Annual	2024-11-27
Communication Tester	MT8821C	6201502996	2023-08-24	Annual	2024-08-24
Communication Tester	MT8821C	6262044721	2023-12-07	Annual	2024-12-07
Radio Communication Test Station	MT8000A	6261906013	2023-09-20	Annual	2024-09-20
Radio Communication Test Station	MT8000A	6262036831	2024-02-08	Annual	2025-02-08
Spectrum Analyzer	FSP	100007	2023-12-01	Annual	2024-12-01
Attenuator	05AS102-K03	A1	2023-12-01	Annual	2024-12-01
Attenuator	05AS102-K20	A4	2023-12-01	Annual	2024-12-01
Attenuator	RFHB1203NC2	A9	2023-11-30	Annual	2024-11-30

17 FCC Power Measurement Procedures

The SAR measurement Software calculates a reference point at the start and end of the test to check for power drifts. If conducted power deviations of more than 5 % occurred, the tests were repeated.

18 Measured and Reported SAR

Per FCC KDB Publication 447498 D04v01, When SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported SAR. Test highest reported SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

19 5G NR FR1※

19.1 5G NR FR1 Test Application

This device supports 5G NR FR1 Band n2, n5, n7, n12, n25, n41, n48, n66, n71, n77 and n78 is declared by the manufacturer used to configuration for frequency, SCS, Bandwidth, Target power, and etc. The RB Configuration was evaluated all using reference to SCS / Bandwidth / Modulation supported by Section 6.1-1 of TS38.521-1.

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to MPR is 3GPP TS38.101-1 Section 6.2.2.

NR test was evaluated under Maximum power in NR single mode. In NR standalone mode, NR power states in the highest power, and the SAR measurement is determined by measuring LTE and 5G NR respectively.

5G NR Band	Mode	SCS (kHz)	Bandwidth (MHz)	Waveform	UL Modulation	RB Configuration	EN-DC (LTE Band)
n2	NSA/SA	15	5, 10, 15, 20, 25, 30, 40	DFT-s-OFDM / CP OFDM	PI/2 BPSK QPSK 16QAM 64QAM 256QAM	Inner 1RB left Inner 1RB Right Inner Full Outer Full Edge 1RB Left Edge Full Left Edge 1RB Right Edge Full Right	5,12,13,48
n5	NSA/SA	15	5, 10, 15, 20				2.66
n7	SA	15	5, 10, 15, 20				-
n12	SA	15	5, 10, 15				-
n25	SA	15	5, 10, 15, 20, 25, 30, 40				-
n41	SA	30	20, 30, 40, 50, 60, 70, 80, 90, 100				-
n48	SA	30	20, 30, 40				-
n66	NSA/SA	15	5, 10, 15, 20, 25, 30, 40				2,5,13
n71	NSA/SA	15	5, 10, 15, 20				2,7,66
n77	NSA/SA	30	20, 30, 40, 50, 60, 70, 80, 90, 100				2,5,7,12,13,25,66
n78	NSA/SA	30	20, 30, 40, 50, 60, 70, 80, 90, 100				2,7,12,25,66

- The data marked ※ in this report was provided by the customer and may affect the validity of the test results.

We are responsible for all the information of this test report except for the data(※) provided by the customer.

20 Maximum Output Power Specifications

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D04v01

WCDMA Maximum Power

Mode	Maximum/Normal	Maximum / Normal Output Power (dBm)			
		3GPP WCDMA AMR / RMC	3GPP HSDPA	3GPP HSUPA	3GPP DC-HSDPA
WCDMA II	**Maximum**	**25.50**	**25.50**	**25.50**	**25.50**
	Normal	24.00	24.00	24.00	24.00
WCDMA V	**Maximum**	**25.50**	**25.50**	**25.50**	**25.50**
	Normal	24.00	24.00	24.00	24.00

LTE Maximum Power

Mode	Maximum / Normal	Maximum / Normal Output Power (dBm)
LTE Band 2	**Maximum**	**24.50**
	Nominal	23.00
LTE Band 4	**Maximum**	**24.50**
	Nominal	23.00
LTE Band 5	**Maximum**	**24.50**
	Nominal	23.00
LTE Band 7	**Maximum**	**24.50**
	Nominal	23.00
LTE Band 12	**Maximum**	**24.50**
	Nominal	23.00
LTE Band 13	**Maximum**	**24.50**
	Nominal	23.00
LTE Band 17	**Maximum**	**24.50**
	Nominal	23.00
LTE Band 25	**Maximum**	**24.50**
	Nominal	23.00
LTE Band 26	**Maximum**	**24.50**
	Nominal	23.00
LTE Band 38	**Maximum**	**24.50**
	Nominal	23.00
LTE Band 48	**Maximum**	**23.00**
	Nominal	22.00
LTE Band 66	**Maximum**	**24.50**
	Nominal	23.00
LTE Band 71	**Maximum**	**24.50**
	Nominal	23.00

5G NR Maximum Power

Mode	Maximum / Normal	Maximum / Normal Output Power (dBm)
5G NR n2	**Maximum**	**24.50**
	Normal	23.00
5G NR n5	**Maximum**	**24.50**
	Normal	23.00
5G NR n7	**Maximum**	**24.50**
	Normal	23.00
5G NR n12	**Maximum**	**24.50**
	Normal	23.00
5G NR n25	**Maximum**	**24.50**
	Normal	23.00
5G NR n41	**Maximum**	**24.50**
	Normal	23.00
5G NR n48	**Maximum**	**23.00**
	Normal	22.00
5G NR n66	**Maximum**	**24.50**
	Normal	23.00
5G NR n71	**Maximum**	**24.50**
	Normal	23.00
5G NR n77	**Maximum**	**24.50**
	Normal	23.00
5G NR n77 DoD	**Maximum**	**24.50**
	Normal	23.00
5G NR n78	**Maximum**	**24.50**
	Normal	23.00
5G NR n78 DoD	**Maximum**	**24.50**
	Normal	23.00

Bluetooth LE Maximum Power

Mode	Maximum / Normal	Maximum / Normal Output Power (dBm)
Bluetooth LE 1M	**Maximum**	**3.00**
	Normal	0.00
Bluetooth LE 2M	**Maximum**	**3.00**
	Normal	0.00

WLAN SISO Maximum Power (WIFI3,WIFI4)

Band	Bandwidth	SISO						tolerance
		a	b	g	n	ac	ax(SU)	
2.4GHz	20MHz	NA	5.5	5.5	5.5	5.5	5.5	- 2 / + 2 dB
	40MHz	NA	-	-	5.5	5.5	5.5	- 2 / + 2 dB
5GHz	20MHz	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	NA	NA	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	- 2 / + 2 dB - 8 / + 2 dB (UNII3)
	40MHz	NA	NA	NA	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	- 2 / + 2 dB
	80MHz	NA	NA	NA	NA	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	- 2 / + 2 dB
	160MHz	NA	NA	NA	NA	NA	NA	-
6GHz	20MHz	-3dB	NA	NA	NA	NA	-3dB	- 2 / + 2 dB
	40MHz	NA	NA	NA	NA	NA	-1dB	- 2 / + 2 dB
	80MHz	NA	NA	NA	NA	NA	1dB	- 2 / + 2 dB
	160MHz	NA	NA	NA	NA	NA	1dB	- 2 / + 2 dB

Band	Bandwidth	SISO						tolerance
		26T	52T	106T	242T	484T	996T	
2.4GHz	20MHz	5.5	5.5	5.5	5.5	NA	NA	- 2 / + 2 dB
	40MHz	5.5	5.5	5.5	5.5	5.5	NA	- 2 / + 2 dB
5GHz	20MHz	UNII1&2A -1dB UNII2C 2dB UNII3 4dB	UNII1&2A 1dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	NA	NA	- 2 / + 2 dB - 4 / +2dB (UNII1&2A) - 17 / + 2 dB (UNII3)
	40MHz	UNII1&2A -1dB UNII2C 2dB UNII3 4dB	UNII1&2A 1dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	NA	- 2 / + 2 dB - 4 / + 2dB (UNII1&2A)
	80MHz	UNII1&2A -1dB UNII2C 2dB UNII3 4dB	UNII1&2A 1dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	- 2 / + 2 dB - 3 / + 2dB (UNII1&2A)
	160MHz	NA	NA	NA	NA	NA	NA	-
6GHz	20MHz	-9dB	-7dB	-5dB	-3dB	NA	NA	- 2 / + 2 dB - 5 / + 2 dB (UNII5)
	40MHz	-9dB	-7dB	-5dB	-3dB	-1dB	NA	- 2 / + 2 dB - 10 / + 2 dB (UNII5)
	80MHz	-9dB	-7dB	-5dB	-3dB	-1dB	1dB	- 2 / + 2 dB - 9 / + 2 dB (UNII5)
	160MHz	-9dB	-7dB	-5dB	-3dB	-1dB	1dB	- 2 / + 2 dB - 8 / + 2 dB (UNII5)

WLAN MIMO Maximum Power (WIFI 1+2,WIFI 1+3, WIFI 1+4)

Band	Bandwidth	MIMO						tolerance
		a	b	g	n	ac	ax(SU)	
2.4GHz	20MHz	NA	5.5	5.5	5.5	5.5	5.5	- 2 / + 2 dB
	40MHz	NA	-	-	5.5	5.5	5.5	- 2 / + 2 dB
5GHz	20MHz	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	NA	NA	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	- 2 / + 2 dB - 8 / + 2 dB (UNII 3)
	40MHz	NA	NA	NA	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	- 2 / + 2 dB - 4 / + 2 dB (UNII 2C)
	80MHz	NA	NA	NA	NA	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	- 2 / + 2 dB - 4 / + 2 dB (UNII 2C)
	160MHz	NA	NA	NA	NA	NA	NA	-
6GHz	20MHz	-3dB	NA	NA	NA	NA	-3dB	- 2 / + 2 dB
	40MHz	NA	NA	NA	NA	NA	-1dB	- 2 / + 2 dB
	80MHz	NA	NA	NA	NA	NA	1dB	- 2 / + 2 dB
	160MHz	NA	NA	NA	NA	NA	1dB	- 2 / + 2 dB

Band	Bandwidth	MIMO						tolerance
		26T	52T	106T	242T	484T	996T	
2.4GHz	20MHz	5.5	5.5	5.5	5.5	NA	NA	- 2 / + 2 dB
	40MHz	5.5	5.5	5.5	5.5	5.5	NA	- 2 / + 2 dB
5GHz	20MHz	UNII1&2A -1dB UNII2C 2dB UNII3 4dB	UNII1&2A 1dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	NA	NA	- 2 / + 2 dB -4 / +2dB (UNII1&2A) -16/+2dB (UNII 3)
	40MHz	UNII1&2A -1dB UNII2C 2dB UNII3 4dB	UNII1&2A 1dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	NA	- 2 / + 2 dB -4 / +2dB (UNII1&2A)
	80MHz	UNII1&2A -1dB UNII2C 2dB UNII3 4dB	UNII1&2A 1dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	UNII1&2A 2dB UNII2C 3.5dB UNII3 4dB	- 2 / + 2 dB -3 / +2dB (UNII1&2A)
	160MHz	NA	NA	NA	NA	NA	NA	-
6GHz	20MHz	-9dB	-7dB	-5dB	-3dB	NA	NA	-13/+2dB
	40MHz	-9dB	-7dB	-5dB	-3dB	-1dB	NA	-17/+2dB
	80MHz	-9dB	-7dB	-5dB	-3dB	-1dB	1dB	-16/+2dB
	160MHz	-9dB	-7dB	-5dB	-3dB	-1dB	1dB	-18/+2dB

21 RF Conducted Power Measurement

21.1 WCDMA

21.1.1 Output Power Verification

Maximum output power is measured on the High, Middle and Low channels for each applicable transmission band according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1s".

21.1.2 Output Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all "1s".

21.1.3 Procedures Used to Establish RF Signal for SAR HSDPA Data Devices

Body SAR is not required for handsets with HSDPA capabilities when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75 % of the SAR limit. Otherwise, SAR is Measured for HSDPA, using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA, on the maximum output channel with the body exposure configuration that results in the highest SAR in 12.2 kbps RMC for that RF channel.

Sub-Test 1 Setup for Release 5 HSDPA

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	CM (dB) (2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 (3)	15/15 (3)	64	12/15 (3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.
Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

21.1.4 SAR Measurements for Conditions for HSUPA Data Devices

Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75 % of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.1 kbps RMC without HSPA. When VOIP is applicable for head exposure, SAR is not required when the maximum output of each RF channel with HSPA is less than ¼ dB higher than that measured using 12.2 kbps RMC; otherwise, the same HSPA configuration used for body measurement should be used to test for head exposure.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}[1]	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM[2] (dB)	MPR (dB)	AG[4] Index	E-TFCI
1	11/15[3]	15/15[3]	64	11/15[3]	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}: 47/15 β_{ed2}: 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15[4]	15/15[4]	64	15/15[4]	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

21.2 LTE

21.2.1 SAR measurement Conditions for LTE

LTE modes were tested according to FCC KDB 941225 D05v02r05 publication. Please see notes after the tabulated SAR data for required test configurations. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluation SAR. Anritsu MT8821C was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

21.2.2 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

21.2.3 MPR

MPR is permanently implemented for this device by the manufacture. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3.-1

21.2.4 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

21.2.5 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05V02r05

a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
   i. The required channel and offset combination with the highest maximum output power is required for SAR.
   ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel
   iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.

b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.

c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.

d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Section 5.2.1, through 5.2.3 is less than or equal to 1/2 dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/kg.

21.2.6 TDD

LTE TDD testing is performed using the SAR test guidance provided in FCC KDB 941225 D05V02r04.

TDD is tested at the highest duty factor using UL-DL configuration 0 with special subframe configuration 6 and applying the FDD LTE procedures in KDB 941225 D05v02r04. SAR testing is performed using the extended cyclic prefix listed in 3GPP TS 36.211 Section 4.

21.2.7 Downlink Only Carrier Aggregation

Conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB 941225 D05Av01r02. The RRC connection is only handle by one cell, the primary component carrier(PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink carrier aggregation is inactive on the PCC. Additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation and RB combinations in each frequency band. Per FCC KDB 941125 D05Av01r02, no SAR measurements are required for downlink only carrier aggregation configurations when the average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

21.2.8 5G NR

According to October 2020 TCB Workshop Guidance, NR FR1 SAR evaluations are being generally based on adapting the existing LTE SAR procedures (FCC KDB 941225 D05V02r05). Therefore, NR SAR for the lower bandwidths was not required for testing based on the measured output power and the reported NR SAR for the highest bandwidth.

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS38.521-1 specification.

The allowed Maximum Power Reduction(MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS38.521-1.

The allowed A-MPR values specified Table 6.2.3.3.1-1 of 3GPP TS38.521-1 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01"

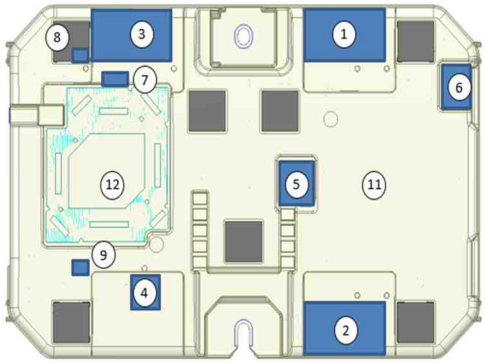
Uplink RB allocations were used to Table 6.1-1 of the 3GPP TS38.521-1.

22 RF Conducted Power

- Refer to Appendix E.

23 DUT Antenna Locations※

Rear View



No.	Antenna	TX	Band
1	MIMO1	O	2G, 3G, LTE NR below 3GHz
2	MIMO2	O	LTE, NR above 3GHz
3	MIMO3	O	2G, 3G, LTE NR below 3GHz
4	Wi-Fi1	O	BT LE / WiFi 1
5	Wi-Fi2	O	WiFi 2
6	Wi-Fi3	O	WiFi 3
7	Wi-Fi4	O	WiFi 4

<The Distance information of Antenna to Edges of Car Telematics Modem>

- The data marked ※ in this report was provided by the customer and may affect the validity of the test results.

We are responsible for all the information of this test report except for the data(※) provided by the customer.

24 SAR Test Exclusion Applied

Based on the maximum tune-up tolerance limit of WLAN, BT and the antenna to use separation distance, Table "Exempt" SAR was not required and Table "Measure" SAR was required.

The threshold power for frequency bands below 6 GHz was calculated with the SAR-based Exemption formula shown in 447498 D04.

$$P_{\text{th}}\,(\text{mW}) = ERP_{20\text{ cm}}\,(\text{mW}) = \begin{cases} 2040f & 0.3\text{ GHz} \le f < 1.5\text{ GHz} \\ 3060 & 1.5\text{ GHz} \le f \le 6\text{ GHz} \end{cases}$$

$$P_{\text{th}}\,(\text{mW}) = \begin{cases} ERP_{20\text{ cm}}(d/20\text{ cm})^{x} & d \le 20\text{ cm} \\ ERP_{20\text{ cm}} & 20\text{ cm} < d \le 40\text{ cm} \end{cases}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\text{ cm}}\sqrt{f}}\right)$$

The threshold power for frequency bands above 6 GHz has been calculated by the formula in Table b.1 of 447498 D04.

RF Source Frequency			**Minimum Distance**			**Threshold ERP**
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	1,920 R^2
1.34	–	30	35.6 m	–	1.6 m	3,450 R^2/f^2
30	–	300	1.6 m	–	159 mm	3.83 R^2
300	–	1,500	159 mm	–	31.8 mm	0.0128 $R^2 f$
1,500	–	100,000	31.8 mm	–	0.5 mm	19.2R^2
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

WLAN Ant	Frequency (GHz)	ERP		Distance (mm)		Power Threshold (mW)		SAR Exemption	
		dBm	mw	Front	Right Edge	Front	Right Edge	Front	Right Edge
WLAN 2.4GHz Ant3	2.462	6.75	4.73	45	45	178.97	178.97	Exempt	Exempt
WLAN 2.4GHz Ant4	2.462	8.25	6.68	45	45	178.97	178.97	Exempt	Exempt
WLAN 2.4GHz MIMO	2.462	13.37	21.73	45	45	178.97	178.97	Exempt	Exempt
WLAN 5GHz Ant3	5.825	6.25	4.22	45	45	135.41	135.41	Exempt	Exempt
WLAN 5GHz Ant4	5.825	8.85	7.67	45	45	135.41	135.41	Exempt	Exempt
WLAN 5GHz MIMO	5.825	13.51	22.44	45	45	135.41	135.41	Exempt	Exempt
WLAN 6GHz Ant3	6.855	3.35	2.16	45	45	38.88	38.88	Exempt	Exempt
WLAN 6GHz MIMO	6.855	6.54	4.51	45	45	38.88	38.88	Exempt	Exempt
BT LE	2.480	5.91	3.90	45	45	178.55	178.55	Exempt	Exempt

25 SAR Data Summary

25.1 SAR data

WCDMA 2 Ant1 Body SAR				Ambient Temperature (°C)			22.2			
				Liquid Temperature (°C)			21.9			
				Date			2024-02-28			
Position	**Mode**	**Freq (MHz)**	**Ch.**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	RMC	1880.00	9400	N/A	45	23.57	0.060	25.50	1.560	0.094
Right Edge	RMC	1880.00	9400	N/A	45	23.57	0.149	25.50	1.560	**0.232**

WCDMA 2 Ant3 Body SAR				Ambient Temperature (°C)			22.2			
				Liquid Temperature (°C)			21.5			
				Date			2024-03-19			
Position	**Mode**	**Freq (MHz)**	**Ch.**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	RMC	1880.00	9400	N/A	45	23.57	0.033	25.50	1.560	0.051
Right Edge	RMC	1880.00	9400	N/A	45	23.57	0.037	25.50	1.560	**0.058**

WCDMA 5 Ant1 Body SAR				Ambient Temperature (°C)			22.0			
				Liquid Temperature (°C)			21.6			
				Date			2024-02-28			
Position	**Mode**	**Freq (MHz)**	**Ch.**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	RMC	836.60	4183	N/A	45	23.95	0.046	25.50	1.429	**0.066**
Right Edge	RMC	836.60	4183	N/A	45	23.95	0.035	25.50	1.429	0.050

WCDMA 5 Ant3 Body SAR				Ambient Temperature (°C)			23.3			
				Liquid Temperature (°C)			23.3			
				Date			2024-03-27			
Position	**Mode**	**Freq (MHz)**	**Ch.**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	RMC	836.60	4183	N/A	45	23.95	0.015	25.50	1.429	**0.021**
Right Edge	RMC	836.60	4183	N/A	45	23.95	0.015	25.50	1.429	0.021

LTE Band 7 Ant1 Body SAR							Ambient Temperature (°C)		22.2				
							Liquid Temperature (°C)		21.8				
							Date		2024-03-04				
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	20	2535.00	21100	1	50	N/A	45	23.41	0.010	24.50	1.285	0.013
Front	QPSK	20	2535.00	21100	50	25	N/A	45	22.69	0.013	23.50	1.205	0.016
Right Edge	QPSK	20	2535.00	21100	1	50	N/A	45	23.41	0.056	24.50	1.285	**0.072**
Right Edge	QPSK	20	2535.00	21100	50	25	N/A	45	22.69	0.043	23.50	1.205	0.052

LTE Band 7 Ant3 Body SAR							Ambient Temperature (°C)		22.2				22.6
							Liquid Temperature (°C)		22.0				22.4
							Date		2024-03-19				2024-03-20
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	20	2535.00	21100	1	50	N/A	45	23.41	0.004	24.50	1.285	0.005
Front	QPSK	20	2535.00	21100	50	25	N/A	45	22.69	0.009	23.50	1.205	0.011
Right Edge	QPSK	20	2535.00	21100	1	50	N/A	45	23.41	0.049	24.50	1.285	**0.063**
Right Edge	QPSK	20	2535.00	21100	50	25	N/A	45	22.69	0.039	23.50	1.205	0.047

LTE Band 12 Ant1 Body SAR							Ambient Temperature (°C)		21.6				22.3
							Liquid Temperature (°C)		21.4				22.2
							Date		2024-03-04				2024-03-05
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	10	707.50	23095	1	0	N/A	45	23.54	0.026	24.50	1.247	**0.032**
Front	QPSK	10	707.50	23095	25	12	N/A	45	23.47	0.021	23.50	1.007	0.021
Right Edge	QPSK	10	707.50	23095	1	0	N/A	45	23.54	0.025	24.50	1.247	0.031
Right Edge	QPSK	10	707.50	23095	25	12	N/A	45	23.47	0.022	23.50	1.007	0.022

LTE Band 12 Ant3 Body SAR							Ambient Temperature (°C)		23.2				
							Liquid Temperature (°C)		21.8				
							Date		2024-03-23				
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	10	707.50	23095	1	0	N/A	45	23.54	0.006	24.50	1.247	**0.007**
Front	QPSK	10	707.50	23095	25	12	N/A	45	23.47	0.005	23.50	1.007	0.005
Right Edge	QPSK	10	707.50	23095	1	0	N/A	45	23.54	0.002	24.50	1.247	0.002
Right Edge	QPSK	10	707.50	23095	25	12	N/A	45	23.47	0.002	23.50	1.007	0.002

LTE Band 13 Ant1 Body SAR							Ambient Temperature (°C)		22.0				
							Liquid Temperature (°C)		21.4				
							Date		2024-02-28				
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	10	782.00	23230	1	49	N/A	45	23.52	0.032	24.50	1.253	**0.040**
Front	QPSK	10	782.00	23230	25	25	N/A	45	22.44	0.028	23.50	1.276	0.036
Right Edge	QPSK	10	782.00	23230	1	49	N/A	45	23.52	0.017	24.50	1.253	0.021
Right Edge	QPSK	10	782.00	23230	25	25	N/A	45	22.44	0.014	23.50	1.276	0.018

LTE Band 13 Ant3 Body SAR							Ambient Temperature (°C)		22.4				
							Liquid Temperature (°C)		22.3				
							Date		2024-03-22				
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	10	782.00	23230	1	49	N/A	45	23.52	0.026	24.50	1.253	**0.033**
Front	QPSK	10	782.00	23230	25	25	N/A	45	22.44	0.021	23.50	1.276	0.027
Right Edge	QPSK	10	782.00	23230	1	49	N/A	45	23.52	0.021	24.50	1.253	0.026
Right Edge	QPSK	10	782.00	23230	25	25	N/A	45	22.44	0.016	23.50	1.276	0.020

LTE Band 25 Ant1 Body SAR							Ambient Temperature (°C)		22.0				
							Liquid Temperature (°C)		21.7				
							Date		2024-02-29				
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	20	1882.50	26365	1	0	N/A	45	23.49	0.047	24.50	1.262	0.059
Front	QPSK	20	1882.50	26365	50	25	N/A	45	23.36	0.043	23.50	1.033	0.044
Right Edge	QPSK	20	1882.50	26365	1	0	N/A	45	23.49	0.129	24.50	1.262	**0.163**
Right Edge	QPSK	20	1882.50	26365	50	25	N/A	45	23.36	0.105	23.50	1.033	0.108

LTE Band 25 Ant3 Body SAR							Ambient Temperature (°C)		22.2				
							Liquid Temperature (°C)		21.5				
							Date		2024-03-19				
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	20	1882.50	26365	1	0	N/A	45	23.49	0.027	24.50	1.262	**0.034**
Front	QPSK	20	1882.50	26365	50	25	N/A	45	23.36	0.019	23.50	1.033	0.020
Right Edge	QPSK	20	1882.50	26365	1	0	N/A	45	23.49	0.024	24.50	1.262	0.030
Right Edge	QPSK	20	1882.50	26365	50	25	N/A	45	23.36	0.017	23.50	1.033	0.018

LTE Band 26 Ant1 Body SAR							Ambient Temperature (°C)		21.5				
							Liquid Temperature (°C)		21.3				
							Date		2024-02-27				
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	15	831.50	26865	1	74	N/A	45	23.34	0.036	24.50	1.306	**0.047**
Front	QPSK	15	831.50	26865	36	37	N/A	45	23.31	0.027	23.50	1.045	0.028
Right Edge	QPSK	15	831.50	26865	1	74	N/A	45	23.34	0.023	24.50	1.306	0.030
Right Edge	QPSK	15	831.50	26865	36	37	N/A	45	23.31	0.018	23.50	1.045	0.019

LTE Band 26 Ant3 Body SAR							Ambient Temperature (°C)		22.3				
							Liquid Temperature (°C)		22.1				
							Date		2024-03-26				
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	15	831.50	26865	1	74	N/A	45	23.34	0.012	24.50	1.306	**0.016**
Front	QPSK	15	831.50	26865	36	37	N/A	45	23.31	0.011	23.50	1.045	0.011
Right Edge	QPSK	15	831.50	26865	1	74	N/A	45	23.34	0.012	24.50	1.306	0.016
Right Edge	QPSK	15	831.50	26865	36	37	N/A	45	23.31	0.009	23.50	1.045	0.009

LTE Band 38 Ant1 Body SAR							Ambient Temperature (°C)		22.0				
							Liquid Temperature (°C)		21.7				
							Date		2024-03-05				
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	20	2595.00	38000	1	0	N/A	45	22.79	0.002	24.50	1.483	0.003
Front	QPSK	20	2595.00	38000	50	0	N/A	45	21.85	N/A	23.50	1.462	N/A
Right Edge	QPSK	20	2595.00	38000	1	0	N/A	45	22.79	0.017	24.50	1.483	**0.025**
Right Edge	QPSK	20	2595.00	38000	50	0	N/A	45	21.85	0.015	23.50	1.462	0.022

LTE Band 38 Ant3 Body SAR							Ambient Temperature (°C)		22.6				
							Liquid Temperature (°C)		22.4				
							Date		2024-03-20				
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	20	2595.00	38000	1	0	N/A	45	22.79	0.015	24.50	1.483	0.022
Front	QPSK	20	2595.00	38000	50	0	N/A	45	21.85	0.012	23.50	1.462	0.018
Right Edge	QPSK	20	2595.00	38000	1	0	N/A	45	22.79	0.026	24.50	1.483	**0.039**
Right Edge	QPSK	20	2595.00	38000	50	0	N/A	45	21.85	0.025	23.50	1.462	0.037

LTE Band 48 Ant2 Body SAR							Ambient Temperature (°C)		22.3			22.9		
							Liquid Temperature (°C)		21.9			22.8		
							Date		2024-03-08			2024-04-29		
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	20	3646.70	56207	1	50	N/A	45	22.87	0.012	23.00	1.030	**0.012**
Front	QPSK	20	3646.70	56207	50	25	N/A	45	21.89	0.010	22.00	1.026	0.010
Right Edge	QPSK	20	3646.70	56207	1	50	N/A	45	22.87	N/A	23.00	1.030	N/A
Right Edge	QPSK	20	3646.70	56207	50	25	N/A	45	21.89	0.0007	22.00	1.026	0.0007

LTE Band 66 Ant1 Body SAR							Ambient Temperature(°C)			21.5			
							Liquid Temperature (°C)			20.9			
							Date			2024-02-29			
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	20	1745.00	132322	1	99	N/A	45	23.12	0.053	24.50	1.374	0.073
Front	QPSK	20	1745.00	132322	50	13	N/A	45	23.05	0.035	23.50	1.109	0.039
Right Edge	QPSK	20	1745.00	132322	1	99	N/A	45	23.12	0.105	24.50	1.374	**0.144**
Right Edge	QPSK	20	1745.00	132322	50	13	N/A	45	23.05	0.090	23.50	1.109	0.100

LTE Band 66 Ant3 Body SAR							Ambient Temperature(°C)			23.2			
							Liquid Temperature (°C)			23.1			
							Date			2024-03-22			
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	20	1745.00	132322	1	99	N/A	45	23.12	0.038	24.50	1.374	0.052
Front	QPSK	20	1745.00	132322	50	13	N/A	45	23.05	0.032	23.50	1.109	0.035
Right Edge	QPSK	20	1745.00	132322	1	99	N/A	45	23.12	0.050	24.50	1.374	**0.069**
Right Edge	QPSK	20	1745.00	132322	50	13	N/A	45	23.05	0.041	23.50	1.109	0.045

LTE Band 71 Ant1 Body SAR							Ambient Temperature(°C)			22.3			
							Liquid Temperature (°C)			22.2			
							Date			2024-03-05			
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	20	680.50	133297	1	99	N/A	45	23.39	0.020	24.50	1.291	**0.026**
Front	QPSK	20	680.50	133297	50	0	N/A	45	23.22	0.012	23.50	1.067	0.013
Right Edge	QPSK	20	680.50	133297	1	99	N/A	45	23.39	0.019	24.50	1.291	0.025
Right Edge	QPSK	20	680.50	133297	50	0	N/A	45	23.22	0.013	23.50	1.067	0.014

LTE Band 71 Ant3 Body SAR							Ambient Temperature(°C)			23.2			
							Liquid Temperature (°C)			21.8			
							Date			2024-03-23			
Position	**Mod.**	**BW (MHz)**	**Freq (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1g SAR (W/kg)**
Front	QPSK	20	680.50	133297	1	99	N/A	45	23.39	0.011	24.50	1.291	**0.014**
Front	QPSK	20	680.50	133297	50	0	N/A	45	23.22	0.010	23.50	1.067	0.011
Right Edge	QPSK	20	680.50	133297	1	99	N/A	45	23.39	0.008	24.50	1.291	0.010
Right Edge	QPSK	20	680.50	133297	50	0	N/A	45	23.22	0.008	23.50	1.067	0.009

5G NR n5 Ant1 Body SAR									Ambient Temperature (°C)		22.1				
									Liquid Temperature (°C)		22.1				
									Date		2024-03-13				
Position	Wave form	Mod.	SCS (kHz)	BW (MHz)	Freq. (MHz)	Ch.	RB Size	RB Offset	Sensor State (Grip)	Space (㎜)	Measure Power (dBm)	Measure 1 g SAR (W/kg)	Tune-Up Limit (dBm)	Power Scaling Factor	Scaling 1 g SAR (W/kg)
Front	DFT-s-OFDM	QPSK	15	20	836.50	167300	1	1	N/A	45	23.01	0.027	24.50	1.409	0.038
Front	DFT-s-OFDM	QPSK	15	20	836.50	167300	50	25	N/A	45	22.84	0.028	24.50	1.466	**0.041**
Right Edge	DFT-s-OFDM	QPSK	15	20	836.50	167300	1	1	N/A	45	23.01	0.023	24.50	1.409	0.032
Right Edge	DFT-s-OFDM	QPSK	15	20	836.50	167300	50	25	N/A	45	22.84	0.025	24.50	1.466	0.037

5G NR n5 Ant3 Body SAR									Ambient Temperature (°C)		22.2				
									Liquid Temperature (°C)		22.1				
									Date		2024-03-25				
Position	Wave form	Mod.	SCS (kHz)	BW (MHz)	Freq. (MHz)	Ch.	RB Size	RB Offset	Sensor State (Grip)	Space (㎜)	Measure Power (dBm)	Measure 1 g SAR (W/kg)	Tune-Up Limit (dBm)	Power Scaling Factor	Scaling 1 g SAR (W/kg)
Front	DFT-s-OFDM	QPSK	15	20	836.50	167300	1	1	N/A	45	23.01	0.012	24.50	1.409	0.017
Front	DFT-s-OFDM	QPSK	15	20	836.50	167300	50	25	N/A	45	22.84	0.012	24.50	1.466	0.018
Right Edge	DFT-s-OFDM	QPSK	15	20	836.50	167300	1	1	N/A	45	23.01	0.012	24.50	1.409	0.017
Right Edge	DFT-s-OFDM	QPSK	15	20	836.50	167300	50	25	N/A	45	22.84	0.012	24.50	1.466	**0.018**

5G NR n7 Ant1 Body SAR									Ambient Temperature (°C)		22.7				
									Liquid Temperature (°C)		22.6				
									Date		2024-03-13				
Position	Wave form	Mod.	SCS (kHz)	BW (MHz)	Freq. (MHz)	Ch.	RB Size	RB Offset	Sensor State (Grip)	Space (㎜)	Measure Power (dBm)	Measure 1 g SAR (W/kg)	Tune-Up Limit (dBm)	Power Scaling Factor	Scaling 1 g SAR (W/kg)
Front	DFT-s-OFDM	Pi/2 BPSK	15	20	2535.00	507000	1	1	N/A	45	23.85	0.014	24.50	1.161	0.016
Front	DFT-s-OFDM	Pi/2 BPSK	15	20	2535.00	507000	50	25	N/A	45	23.79	0.015	24.50	1.178	0.018
Right Edge	DFT-s-OFDM	Pi/2 BPSK	15	20	2535.00	507000	1	1	N/A	45	23.85	0.060	24.50	1.161	**0.070**
Right Edge	DFT-s-OFDM	Pi/2 BPSK	15	20	2535.00	507000	50	25	N/A	45	23.79	0.058	24.50	1.178	0.068

5G NR n7 Ant3 Body SAR									Ambient Temperature (°C)		22.6		22.4	
									Liquid Temperature (°C)		22.4		22.2	
									Date		2024-03-20		2024-03-21	
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	Pi/2 BPSK	15	20	2535.00	507000	1	1	N/A	45	23.85	0.005	24.50	1.161	0.006
Front	DFT-s-OFDM	Pi/2 BPSK	15	20	2535.00	507000	50	25	N/A	45	23.79	0.019	24.50	1.178	0.022
Right Edge	DFT-s-OFDM	Pi/2 BPSK	15	20	2535.00	507000	1	1	N/A	45	23.85	0.041	24.50	1.161	0.048
Right Edge	DFT-s-OFDM	Pi/2 BPSK	15	20	2535.00	507000	50	25	N/A	45	23.79	0.055	24.50	1.178	**0.065**

5G NR n12 Ant1 Body SAR									Ambient Temperature (°C)		21.6			
									Liquid Temperature (°C)		21.4			
									Date		2024-03-11			
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	QPSK	15	15	707.50	141500	1	1	N/A	45	22.96	0.018	24.50	1.426	0.026
Front	DFT-s-OFDM	QPSK	15	15	707.50	141500	36	18	N/A	45	22.94	0.015	24.50	1.432	0.021
Right Edge	DFT-s-OFDM	QPSK	15	15	707.50	141500	1	1	N/A	45	22.96	0.018	24.50	1.426	**0.026**
Right Edge	DFT-s-OFDM	QPSK	15	15	707.50	141500	36	18	N/A	45	22.94	0.018	24.50	1.432	0.026

5G NR n12 Ant3 Body SAR									Ambient Temperature (°C)		21.6			
									Liquid Temperature (°C)		21.4			
									Date		2024-03-25			
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	QPSK	15	15	707.50	141500	1	1	N/A	45	22.96	0.006	24.50	1.426	0.009
Front	DFT-s-OFDM	QPSK	15	15	707.50	141500	36	18	N/A	45	22.94	0.008	24.50	1.432	**0.011**
Right Edge	DFT-s-OFDM	QPSK	15	15	707.50	141500	1	1	N/A	45	22.96	0.002	24.50	1.426	0.003
Right Edge	DFT-s-OFDM	QPSK	15	15	707.50	141500	36	18	N/A	45	22.94	0.002	24.50	1.432	0.003

5G NR n25 Ant1 Body SAR									Ambient Temperature (°C)		22.2			
									Liquid Temperature (°C)		21.5			
									Date		2024-03-19			
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	QPSK	15	40	1882.50	376500	1	1	N/A	45	23.75	0.053	24.50	1.189	0.063
Front	DFT-s-OFDM	QPSK	15	40	1882.50	376500	108	54	N/A	45	23.68	0.052	24.50	1.208	0.063
Right Edge	DFT-s-OFDM	QPSK	15	40	1882.50	376500	1	1	N/A	45	23.75	0.121	24.50	1.189	0.144
Right Edge	DFT-s-OFDM	QPSK	15	40	1882.50	376500	108	54	N/A	45	23.68	0.123	24.50	1.208	**0.149**

5G NR n25 Ant3 Body SAR									Ambient Temperature (°C)		22.1			
									Liquid Temperature (°C)		21.2			
									Date		2024-03-18			
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	QPSK	15	40	1882.50	376500	1	1	N/A	45	23.75	0.028	24.50	1.189	0.033
Front	DFT-s-OFDM	QPSK	15	40	1882.50	376500	108	54	N/A	45	23.68	0.027	24.50	1.208	0.033
Right Edge	DFT-s-OFDM	QPSK	15	40	1882.50	376500	1	1	N/A	45	23.75	0.030	24.50	1.189	0.036
Right Edge	DFT-s-OFDM	QPSK	15	40	1882.50	376500	108	54	N/A	45	23.68	0.032	24.50	1.208	**0.039**

5G NR n41 Ant1 Body SAR									Ambient Temperature (°C)		21.9			
									Liquid Temperature (°C)		21.8			
									Date		2024-03-12			
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	Pi/2 BPSK	30	100	2592.99	518598	1	1	N/A	45	24.50	0.003	24.50	1.000	0.003
Front	DFT-s-OFDM	Pi/2 BPSK	30	100	2592.99	518598	135	67	N/A	45	24.10	0.008	24.50	1.096	0.009
Right Edge	DFT-s-OFDM	Pi/2 BPSK	30	100	2592.99	518598	1	1	N/A	45	24.50	0.049	24.50	1.000	**0.049**
Right Edge	DFT-s-OFDM	Pi/2 BPSK	30	100	2592.99	518598	135	67	N/A	45	24.10	0.038	24.50	1.096	0.042

5G NR n41 Ant3 Body SAR									Ambient Temperature (°C)			22.4			
									Liquid Temperature (°C)			22.2			
									Date			2024-03-21			
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	Pi/2 BPSK	30	100	2592.99	518598	1	1	N/A	45	24.50	0.040	24.50	1.000	0.040
Front	DFT-s-OFDM	Pi/2 BPSK	30	100	2592.99	518598	135	67	N/A	45	24.10	0.036	24.50	1.096	0.039
Right Edge	DFT-s-OFDM	Pi/2 BPSK	30	100	2592.99	518598	1	1	N/A	45	24.50	0.047	24.50	1.000	0.047
Right Edge	DFT-s-OFDM	Pi/2 BPSK	30	100	2592.99	518598	135	67	N/A	45	24.10	0.050	24.50	1.096	**0.055**

5G NR n48 Ant2 Body SAR									Ambient Temperature (°C)			22.8			22.9
									Liquid Temperature (°C)			22.1			22.8
									Date			2024-03-28			2024-04-29
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	Pi/2 BPSK	30	40	3624.99	641666	1	1	N/A	45	21.69	0.024	23.00	1.352	0.032
Front	DFT-s-OFDM	Pi/2 BPSK	30	40	3624.99	641666	50	25	N/A	45	21.57	0.025	23.00	1.390	**0.035**
Right Edge	DFT-s-OFDM	Pi/2 BPSK	30	40	3624.99	641666	1	1	N/A	45	21.69	0.003	23.00	1.352	0.004
Right Edge	DFT-s-OFDM	Pi/2 BPSK	30	40	3624.99	641666	50	25	N/A	45	21.57	0.005	23.00	1.390	0.007

5G NR n66 Ant1 Body SAR									Ambient Temperature (°C)			21.6			
									Liquid Temperature (°C)			21.6			
									Date			2024-03-14			
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	QPSK	15	40	1745.00	349000	1	1	N/A	45	23.55	0.048	24.50	1.245	0.060
Front	DFT-s-OFDM	QPSK	15	40	1745.00	349000	108	54	N/A	45	23.52	0.046	24.50	1.253	0.058
Right Edge	DFT-s-OFDM	QPSK	15	40	1745.00	349000	1	1	N/A	45	23.55	0.107	24.50	1.245	0.133
Right Edge	DFT-s-OFDM	QPSK	15	40	1745.00	349000	108	54	N/A	45	23.52	0.121	24.50	1.253	**0.152**

5G NR n66 Ant3 Body SAR									Ambient Temperature (°C)			23.2			
									Liquid Temperature (°C)			23.1			
									Date			2024-03-22			
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	QPSK	15	40	1745.00	349000	1	1	N/A	45	23.55	0.031	24.50	1.245	0.039
Front	DFT-s-OFDM	QPSK	15	40	1745.00	349000	108	54	N/A	45	23.52	0.036	24.50	1.253	0.045
Right Edge	DFT-s-OFDM	QPSK	15	40	1745.00	349000	1	1	N/A	45	23.55	0.051	24.50	1.245	0.063
Right Edge	DFT-s-OFDM	QPSK	15	40	1745.00	349000	108	54	N/A	45	23.52	0.053	24.50	1.253	**0.066**

5G NR n71 Ant1 Body SAR									Ambient Temperature (°C)			21.4			
									Liquid Temperature (°C)			20.9			
									Date			2024-03-12			
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	QPSK	15	20	680.50	136100	1	104	N/A	45	22.98	0.026	24.50	1.419	**0.037**
Front	DFT-s-OFDM	QPSK	15	20	680.50	136100	50	25	N/A	45	22.86	0.024	24.50	1.459	0.035
Right Edge	DFT-s-OFDM	QPSK	15	20	680.50	136100	1	104	N/A	45	22.98	0.020	24.50	1.419	0.028
Right Edge	DFT-s-OFDM	QPSK	15	20	680.50	136100	50	25	N/A	45	22.86	0.019	24.50	1.459	0.028

5G NR n71 Ant3 Body SAR									Ambient Temperature (°C)			21.6			
									Liquid Temperature (°C)			21.4			
									Date			2024-03-25			
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	QPSK	15	20	680.50	136100	1	104	N/A	45	22.98	0.011	24.50	1.419	0.016
Front	DFT-s-OFDM	QPSK	15	20	680.50	136100	50	25	N/A	45	22.86	0.014	24.50	1.459	**0.020**
Right Edge	DFT-s-OFDM	QPSK	15	20	680.50	136100	1	104	N/A	45	22.98	0.006	24.50	1.419	0.009
Right Edge	DFT-s-OFDM	QPSK	15	20	680.50	136100	50	25	N/A	45	22.86	0.011	24.50	1.459	0.016

5G NR n77 Ant2 Body SAR									Ambient Temperature (°C)			22.7		22.7	
									Liquid Temperature (°C)			22.6		22.6	
									Date			2024-03-11		2024-04-30	
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	Pi/2 BPSK	30	100	3840.00	656000	1	1	N/A	45	23.75	0.025	24.50	1.189	0.030
Front	DFT-s-OFDM	Pi/2 BPSK	30	100	3840.00	656000	135	67	N/A	45	23.50	0.028	24.50	1.259	**0.035**
Right Edge	DFT-s-OFDM	Pi/2 BPSK	30	100	3840.00	656000	1	1	N/A	45	23.75	0.007	24.50	1.189	0.008
Right Edge	DFT-s-OFDM	Pi/2 BPSK	30	100	3840.00	656000	135	67	N/A	45	23.50	0.008	24.50	1.259	0.010

5G NR n77 DoD Ant2 Body SAR									Ambient Temperature (°C)			22.3	22.7	22.7	
									Liquid Temperature (°C)			21.9	22.6	22.6	
									Date			2024-03-08	2024-03-11	2024-04-30	
Position	**Wave form**	**Mod.**	**SCS (kHz)**	**BW (MHz)**	**Freq. (MHz)**	**Ch.**	**RB Size**	**RB Offset**	**Sensor State (Grip)**	**Space (㎜)**	**Measure Power (dBm)**	**Measure 1 g SAR (W/kg)**	**Tune-Up Limit (dBm)**	**Power Scaling Factor**	**Scaling 1 g SAR (W/kg)**
Front	DFT-s-OFDM	Pi/2 BPSK	30	100	3500.01	633334	1	1	N/A	45	23.62	0.005	24.50	1.225	0.006
Front	DFT-s-OFDM	Pi/2 BPSK	30	100	3500.01	633334	135	67	N/A	45	23.46	0.004	24.50	1.271	0.005
Right Edge	DFT-s-OFDM	Pi/2 BPSK	30	100	3500.01	633334	1	1	N/A	45	23.62	0.011	24.50	1.225	0.013
Right Edge	DFT-s-OFDM	Pi/2 BPSK	30	100	3500.01	633334	135	67	N/A	45	23.46	0.011	24.50	1.271	**0.014**

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in FCC KDB Publication 447498 D04v01.
2. Liquid tissue depth was at least 15 cm for all frequencies.
3. All modes of operation were investigated, and worst-case results are reported.
4. The EUT is tested 2nd hot-spot peak, if it is less than 2 dB below the highest peak.
5. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
6. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D04v01.
7. The "N/A" means there is no SAR value or the SAR is too low to be measured.

WCDMA Notes:

1. WCDMA mode in Body SAR was tested under RMC 12.2 kbps with HSPA inactive per KDB Publication 941225 D01v03r01. HSPA SAR was not required since the average output power of the HSPA subtests was not more than 0.25 dB higher than the RMC level and SAR was less than 1.2 W/kg.
2. Per FCC KDB Publication 447498 D04v01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is > 1/2 dB, instead of the middle channel, the highest output power channel must be used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r05. The general test procedures used for testing can be found in Section 5.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3-6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator.
4. This device supports LTE capabilities with overlapping transmission frequency rages. When the supported frequency range of an LTE Band falls completely within an LTE band with a larger transmission frequency range, both LTE bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE bands share the same transmission path and signal characteristics, SAR was only assessed for the band with larger transmission frequency range.

5G NR Notes:

1. According to FCC guidance, SAR test for NR bands and LTE anchor Bands were performed separately due to limitations in SAR probe calibration factors. And, Due to test setup limitations, SAR testing for NR was performed using test mode software to establish the connection.
2. NR configurations of SAR test were determined according to Section 5.2 of KDB 941225 D05.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator.
4. According to FCC guidance, NR modulations and RB sizes/offsets were selected for testing such that configurations with the highest output power were evaluated for SAR tests.
5. This device supports 5G FR1 capabilities with overlapping transmission frequency ranges. When the supported frequency range of an NR band falls completely within an NR band with a larger transmission frequency range, both NR bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both NR bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range.
6. 5G NR n41, n48 and n77 is synchronized using maximum duty cycle of 100 %. SAR testing was performed using FTM mode with a 100 % duty cycle applied to match final duty cycle.

26 LTE Downlink Carrier Aggregation

- Refer to Appendix F

27 Simultaneous SAR Results

27.1 Simultaneous Scenario

Simultaneous scenario	WWAN	Bluetooth LE Ant1	WLAN 2.4/5/6GHz Ant3	WLAN 2.4/5GHz Ant4	WLAN 2.4/5/6GHz Ant1+2	WLAN 2.4/5/6GHz Ant1+3	WLAN 2.4/5GHz Ant1+4
1	O	X	X	X	X	X	X
2	O	O	X	X	X	X	X
3	O	X	O	X	X	X	X
4	O	X	X	O	X	X	X
5	O	X	X	X	O	X	X
6	O	X	X	X	X	O	X
7	O	X	X	X	X	X	O

27.2 Simultaneous SAR Results

Simultaneous Transmission SAR were calculated by TER through the formula of 447498 D04.

$$\sum_{i=1}^{a}\frac{P_i}{P_{\text{th},i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{\text{th},j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}\leq 1$$

ANT	Ant Gain (dB)							ERP						
	2.4GHz	5GHz				6GHz		2.4GHz	5GHz				6GHz	
		UNII 1	UNII 2A	UNII 2C	UNII 3	UNII 5	UNII 7		UNII 1	UNII 2A	UNII 2C	UNII 3	UNII 5	UNII 7
WLAN Ant3	1.40	2.20	2.20	1.90	2.40	2.40	2.50	6.75	6.05	6.05	5.75	6.25	3.25	3.35
WLAN Ant4	2.90	5.00	5.00	5.00	5.00	-	-	8.25	8.85	8.85	8.85	8.85	-	-
WLAN Ant1+2	8.02	9.46	8.80	9.08	8.02	4.89	3.59	13.37	13.31	12.65	12.93	11.87	5.74	4.44
WLAN Ant1+3	6.43	7.60	7.15	7.74	7.20	5.64	4.84	11.78	11.45	11.00	11.59	11.05	6.49	5.69
WLAN Ant1+4	7.06	8.77	8.38	8.99	8.35	-	-	12.41	12.62	12.23	12.84	12.20	-	-
BT LE Ant1	5.06	-	-	-	-	-	-	5.91	-	-	-	-	-	-

ANT	TER						
	2.4GHz	5GHz				6GHz	
		UNII 1	UNII 2A	UNII 2C	UNII 3	UNII 5	UNII 7
WLAN Ant3	**0.026**	0.030	0.030	0.028	**0.031**	0.054	**0.056**
WLAN Ant4	**0.037**	**0.057**	0.057	0.057	0.057	-	-
WLAN Ant1+2	**0.121**	**0.158**	0.136	0.145	0.114	**0.096**	0.071
WLAN Ant1+3	**0.084**	0.103	0.093	**0.106**	0.094	**0.115**	0.095
WLAN Ant1+4	**0.097**	0.135	0.123	**0.142**	0.123	-	-
BT LE Ant1	**0.022**	-	-	-	-	-	-

- WWAN+WLAN 2.4GHz / Position: Front

WWAN Configuration		SAR	SAR	WLAN 2.4GHz TER					Simultaneous TER				
			TER	Ant3	Ant4	Ant 1+2	Ant 1+3	Ant 1+4	WWAN+WLAN Ant3	WWAN+WLAN Ant4	WWAN+WLAN Ant1+2	WWAN+ WLAN Ant1+3	WWAN+ WLAN Ant1+4
WCDMA II Ant1	-	0.094	0.059	0.026	0.037	0.121	0.084	0.097	0.085	0.096	0.180	0.143	0.156
WCDMA II Ant3	-	0.051	0.032	0.026	0.037	0.121	0.084	0.097	0.058	0.069	0.153	0.116	0.129
WCDMA V Ant1	-	0.066	0.041	0.026	0.037	0.121	0.084	0.097	0.067	0.078	0.162	0.125	0.138
WCDMA V Ant3	-	0.021	0.013	0.026	0.037	0.121	0.084	0.097	0.039	0.050	0.134	0.097	0.110
LTE Band 7 Ant1	5G NR n71 Ant1	0.053	0.033	0.026	0.037	0.121	0.084	0.097	0.059	0.070	0.154	0.117	0.130
LTE Band 7 Ant1	5G NR n77 Ant2	0.051	0.032	0.026	0.037	0.121	0.084	0.097	0.058	0.069	0.153	0.116	0.129
LTE Band 7 Ant3	5G NR n71 Ant3	0.031	0.019	0.026	0.037	0.121	0.084	0.097	0.045	0.056	0.140	0.103	0.116
LTE Band 7 Ant3	5G NR n77 Ant2	0.046	0.029	0.026	0.037	0.121	0.084	0.097	0.055	0.066	0.150	0.113	0.126
LTE Band 12 Ant1	LTE Band 66 Ant1	0.105	0.066	0.026	0.037	0.121	0.084	0.097	0.092	0.103	0.187	0.150	0.163
LTE Band 12 Ant1	LTE Band 66 Ant3	0.084	0.053	0.026	0.037	0.121	0.084	0.097	0.079	0.090	0.174	0.137	0.150
LTE Band 12 Ant1	5G NR n77 Ant2	0.067	0.042	0.026	0.037	0.121	0.084	0.097	0.068	0.079	0.163	0.126	0.139
LTE Band 12 Ant3	5G NR n77 Ant2	0.042	0.026	0.026	0.037	0.121	0.084	0.097	0.052	0.063	0.147	0.110	0.123
LTE Band 13 Ant1	5G NR n66 Ant1	0.100	0.063	0.026	0.037	0.121	0.084	0.097	0.089	0.100	0.184	0.147	0.160
LTE Band 13 Ant1	5G NR n77 Ant2	0.075	0.047	0.026	0.037	0.121	0.084	0.097	0.073	0.084	0.168	0.131	0.144
LTE Band 13 Ant3	5G NR n66 Ant3	0.078	0.049	0.026	0.037	0.121	0.084	0.097	0.075	0.086	0.170	0.133	0.146
LTE Band 13 Ant3	5G NR n77 Ant2	0.068	0.043	0.026	0.037	0.121	0.084	0.097	0.069	0.080	0.164	0.127	0.140
LTE Band 25 Ant1	5G NR n77 Ant2	0.094	0.059	0.026	0.037	0.121	0.084	0.097	0.085	0.096	0.180	0.143	0.156
LTE Band 25 Ant3	5G NR n77 Ant2	0.069	0.043	0.026	0.037	0.121	0.084	0.097	0.069	0.080	0.164	0.127	0.140
LTE Band 26 Ant1	-	0.047	0.029	0.026	0.037	0.121	0.084	0.097	0.055	0.066	0.150	0.113	0.126
LTE Band 26 Ant3	-	0.016	0.010	0.026	0.037	0.121	0.084	0.097	0.036	0.047	0.131	0.094	0.107
LTE Band 38 Ant1	-	0.003	0.002	0.026	0.037	0.121	0.084	0.097	0.028	0.039	0.123	0.086	0.099
LTE Band 38 Ant3	-	0.022	0.014	0.026	0.037	0.121	0.084	0.097	0.040	0.051	0.135	0.098	0.111
LTE Band 48 Ant2	-	0.012	0.008	0.026	0.037	0.121	0.084	0.097	0.034	0.045	0.129	0.092	0.105
LTE Band 66 Ant1	5G NR n5 Ant1	0.114	0.071	0.026	0.037	0.121	0.084	0.097	0.097	0.108	0.192	0.155	0.168
LTE Band 66 Ant1	5G NR n71 Ant1	0.110	0.069	0.026	0.037	0.121	0.084	0.097	0.095	0.106	0.190	0.153	0.166
LTE Band 66 Ant1	5G NR n77 Ant2	0.108	0.068	0.026	0.037	0.121	0.084	0.097	0.094	0.105	0.189	0.152	0.165
LTE Band 66 Ant3	5G NR n5 Ant3	0.070	0.044	0.026	0.037	0.121	0.084	0.097	0.070	0.081	0.165	0.128	0.141
LTE Band 66 Ant3	5G NR n71 Ant3	0.072	0.045	0.026	0.037	0.121	0.084	0.097	0.071	0.082	0.166	0.129	0.142
LTE Band 66 Ant3	5G NR n77 Ant2	0.087	0.054	0.026	0.037	0.121	0.084	0.097	0.080	0.091	0.175	0.138	0.151
LTE Band 71 Ant1	-	0.026	0.016	0.026	0.037	0.121	0.084	0.097	0.042	0.053	0.137	0.100	0.113
LTE Band 71 Ant3	-	0.014	0.009	0.026	0.037	0.121	0.084	0.097	0.035	0.046	0.130	0.093	0.106
5G NR n7 Ant1	-	0.018	0.011	0.026	0.037	0.121	0.084	0.097	0.037	0.048	0.132	0.095	0.108
5G NR n7 Ant3	-	0.022	0.014	0.026	0.037	0.121	0.084	0.097	0.040	0.051	0.135	0.098	0.111
5G NR n12 Ant1	-	0.026	0.016	0.026	0.037	0.121	0.084	0.097	0.042	0.053	0.137	0.100	0.113
5G NR n12 Ant3	-	0.011	0.007	0.026	0.037	0.121	0.084	0.097	0.033	0.044	0.128	0.091	0.104
5G NR n25 Ant1	-	0.063	0.039	0.026	0.037	0.121	0.084	0.097	0.065	0.076	0.160	0.123	0.136
5G NR n25 Ant3	-	0.033	0.021	0.026	0.037	0.121	0.084	0.097	0.047	0.058	0.142	0.105	0.118
5G NR n41 Ant1	-	0.009	0.006	0.026	0.037	0.121	0.084	0.097	0.032	0.043	0.127	0.090	0.103
5G NR n41 Ant3	-	0.040	0.025	0.026	0.037	0.121	0.084	0.097	0.051	0.062	0.146	0.109	0.122
5G NR n48 Ant2	-	0.035	0.022	0.026	0.037	0.121	0.084	0.097	0.048	0.059	0.143	0.106	0.119

- WWAN+WLAN 2.4GHz / Position: Right Edge

WWAN Configuration		SAR	SAR	WLAN 2.4GHz TER					Simultaneous TER				
			TER	Ant3	Ant4	Ant 1+2	Ant 1+3	Ant 1+4	WWAN+WLAN Ant3	WWAN+WLAN Ant4	WWAN+WLAN Ant1+2	WWAN+ WLAN Ant1+3	WWAN+ WLAN Ant1+4
WCDMA II Ant1	-	0.232	0.145	0.026	0.037	0.121	0.084	0.097	0.171	0.182	0.266	0.229	0.242
WCDMA II Ant3	-	0.058	0.036	0.026	0.037	0.121	0.084	0.097	0.062	0.073	0.157	0.120	0.133
WCDMA V Ant1	-	0.050	0.031	0.026	0.037	0.121	0.084	0.097	0.057	0.068	0.152	0.115	0.128
WCDMA V Ant3	-	0.021	0.013	0.026	0.037	0.121	0.084	0.097	0.039	0.050	0.134	0.097	0.110
LTE Band 7 Ant1	5G NR n71 Ant1	0.100	0.063	0.026	0.037	0.121	0.084	0.097	0.089	0.100	0.184	0.147	0.160
LTE Band 7 Ant1	5G NR n77 Ant2	0.082	0.051	0.026	0.037	0.121	0.084	0.097	0.077	0.088	0.172	0.135	0.148
LTE Band 7 Ant3	5G NR n71 Ant3	0.079	0.049	0.026	0.037	0.121	0.084	0.097	0.075	0.086	0.170	0.133	0.146
LTE Band 7 Ant3	5G NR n77 Ant2	0.073	0.046	0.026	0.037	0.121	0.084	0.097	0.072	0.083	0.167	0.130	0.143
LTE Band 12 Ant1	LTE Band 66 Ant1	0.175	0.109	0.026	0.037	0.121	0.084	0.097	0.135	0.146	0.230	0.193	0.206
LTE Band 12 Ant1	LTE Band 66 Ant3	0.100	0.063	0.026	0.037	0.121	0.084	0.097	0.089	0.100	0.184	0.147	0.160
LTE Band 12 Ant1	5G NR n77 Ant2	0.041	0.026	0.026	0.037	0.121	0.084	0.097	0.052	0.063	0.147	0.110	0.123
LTE Band 12 Ant3	5G NR n77 Ant2	0.012	0.008	0.026	0.037	0.121	0.084	0.097	0.034	0.045	0.129	0.092	0.105
LTE Band 13 Ant1	5G NR n66 Ant1	0.173	0.108	0.026	0.037	0.121	0.084	0.097	0.134	0.145	0.229	0.192	0.205
LTE Band 13 Ant1	5G NR n77 Ant2	0.031	0.019	0.026	0.037	0.121	0.084	0.097	0.045	0.056	0.140	0.103	0.116
LTE Band 13 Ant3	5G NR n66 Ant3	0.092	0.058	0.026	0.037	0.121	0.084	0.097	0.084	0.095	0.179	0.142	0.155
LTE Band 13 Ant3	5G NR n77 Ant2	0.036	0.023	0.026	0.037	0.121	0.084	0.097	0.049	0.060	0.144	0.107	0.120
LTE Band 25 Ant1	5G NR n77 Ant2	0.173	0.108	0.026	0.037	0.121	0.084	0.097	0.134	0.145	0.229	0.192	0.205
LTE Band 25 Ant3	5G NR n77 Ant2	0.040	0.025	0.026	0.037	0.121	0.084	0.097	0.051	0.062	0.146	0.109	0.122
LTE Band 26 Ant1	-	0.030	0.019	0.026	0.037	0.121	0.084	0.097	0.045	0.056	0.140	0.103	0.116
LTE Band 26 Ant3	-	0.016	0.010	0.026	0.037	0.121	0.084	0.097	0.036	0.047	0.131	0.094	0.107
LTE Band 38 Ant1	-	0.025	0.016	0.026	0.037	0.121	0.084	0.097	0.042	0.053	0.137	0.100	0.113
LTE Band 38 Ant3	-	0.039	0.024	0.026	0.037	0.121	0.084	0.097	0.050	0.061	0.145	0.108	0.121
LTE Band 48 Ant2	-	0.001	0.001	0.026	0.037	0.121	0.084	0.097	0.027	0.038	0.122	0.085	0.098
LTE Band 66 Ant1	5G NR n5 Ant1	0.181	0.113	0.026	0.037	0.121	0.084	0.097	0.139	0.150	0.234	0.197	0.210
LTE Band 66 Ant1	5G NR n71 Ant1	0.172	0.108	0.026	0.037	0.121	0.084	0.097	0.134	0.145	0.229	0.192	0.205
LTE Band 66 Ant1	5G NR n77 Ant2	0.154	0.096	0.026	0.037	0.121	0.084	0.097	0.122	0.133	0.217	0.180	0.193
LTE Band 66 Ant3	5G NR n5 Ant3	0.087	0.054	0.026	0.037	0.121	0.084	0.097	0.080	0.091	0.175	0.138	0.151
LTE Band 66 Ant3	5G NR n71 Ant3	0.085	0.053	0.026	0.037	0.121	0.084	0.097	0.079	0.090	0.174	0.137	0.150
LTE Band 66 Ant3	5G NR n77 Ant2	0.079	0.049	0.026	0.037	0.121	0.084	0.097	0.075	0.086	0.170	0.133	0.146
LTE Band 71 Ant1	-	0.025	0.016	0.026	0.037	0.121	0.084	0.097	0.042	0.053	0.137	0.100	0.113
LTE Band 71 Ant3	-	0.010	0.006	0.026	0.037	0.121	0.084	0.097	0.032	0.043	0.127	0.090	0.103
5G NR n7 Ant1	-	0.070	0.044	0.026	0.037	0.121	0.084	0.097	0.070	0.081	0.165	0.128	0.141
5G NR n7 Ant3	-	0.065	0.041	0.026	0.037	0.121	0.084	0.097	0.067	0.078	0.162	0.125	0.138
5G NR n12 Ant1	-	0.026	0.016	0.026	0.037	0.121	0.084	0.097	0.042	0.053	0.137	0.100	0.113
5G NR n12 Ant3	-	0.003	0.002	0.026	0.037	0.121	0.084	0.097	0.028	0.039	0.123	0.086	0.099
5G NR n25 Ant1	-	0.149	0.093	0.026	0.037	0.121	0.084	0.097	0.119	0.130	0.214	0.177	0.190
5G NR n25 Ant3	-	0.039	0.024	0.026	0.037	0.121	0.084	0.097	0.050	0.061	0.145	0.108	0.121
5G NR n41 Ant1	-	0.049	0.031	0.026	0.037	0.121	0.084	0.097	0.057	0.068	0.152	0.115	0.128
5G NR n41 Ant3	-	0.055	0.034	0.026	0.037	0.121	0.084	0.097	0.060	0.071	0.155	0.118	0.131
5G NR n48 Ant2	-	0.007	0.004	0.026	0.037	0.121	0.084	0.097	0.030	0.041	0.125	0.088	0.101

- WWAN+WLAN 5GHz / Position: Front

WWAN Configuration		SAR	SAR	WLAN 5GHz TER					Simultaneous TER				
			TER	Ant3	Ant4	Ant 1+2	Ant 1+3	Ant 1+4	WWAN+WLAN Ant3	WWAN+WLAN Ant4	WWAN+WLAN Ant1+2	WWAN+ WLAN Ant1+3	WWAN+ WLAN Ant1+4
WCDMA II Ant1	-	0.094	0.059	0.031	0.057	0.158	0.106	0.142	0.090	0.116	0.217	0.165	0.201
WCDMA II Ant3	-	0.051	0.032	0.031	0.057	0.158	0.106	0.142	0.063	0.089	0.190	0.138	0.174
WCDMA V Ant1	-	0.066	0.041	0.031	0.057	0.158	0.106	0.142	0.072	0.098	0.199	0.147	0.183
WCDMA V Ant3	-	0.021	0.013	0.031	0.057	0.158	0.106	0.142	0.044	0.070	0.171	0.119	0.155
LTE Band 7 Ant1	5G NR n71 Ant1	0.053	0.033	0.031	0.057	0.158	0.106	0.142	0.064	0.090	0.191	0.139	0.175
LTE Band 7 Ant1	5G NR n77 Ant2	0.051	0.032	0.031	0.057	0.158	0.106	0.142	0.063	0.089	0.190	0.138	0.174
LTE Band 7 Ant3	5G NR n71 Ant3	0.031	0.019	0.031	0.057	0.158	0.106	0.142	0.050	0.076	0.177	0.125	0.161
LTE Band 7 Ant3	5G NR n77 Ant2	0.046	0.029	0.031	0.057	0.158	0.106	0.142	0.060	0.086	0.187	0.135	0.171
LTE Band 12 Ant1	LTE Band 66 Ant1	0.105	0.066	0.031	0.057	0.158	0.106	0.142	0.097	0.123	0.224	0.172	0.208
LTE Band 12 Ant1	LTE Band 66 Ant3	0.084	0.053	0.031	0.057	0.158	0.106	0.142	0.084	0.110	0.211	0.159	0.195
LTE Band 12 Ant1	5G NR n77 Ant2	0.067	0.042	0.031	0.057	0.158	0.106	0.142	0.073	0.099	0.200	0.148	0.184
LTE Band 12 Ant3	5G NR n77 Ant2	0.042	0.026	0.031	0.057	0.158	0.106	0.142	0.057	0.083	0.184	0.132	0.168
LTE Band 13 Ant1	5G NR n66 Ant1	0.100	0.063	0.031	0.057	0.158	0.106	0.142	0.094	0.120	0.221	0.169	0.205
LTE Band 13 Ant1	5G NR n77 Ant2	0.075	0.047	0.031	0.057	0.158	0.106	0.142	0.078	0.104	0.205	0.153	0.189
LTE Band 13 Ant3	5G NR n66 Ant3	0.078	0.049	0.031	0.057	0.158	0.106	0.142	0.080	0.106	0.207	0.155	0.191
LTE Band 13 Ant3	5G NR n77 Ant2	0.068	0.043	0.031	0.057	0.158	0.106	0.142	0.074	0.100	0.201	0.149	0.185
LTE Band 25 Ant1	5G NR n77 Ant2	0.094	0.059	0.031	0.057	0.158	0.106	0.142	0.090	0.116	0.217	0.165	0.201
LTE Band 25 Ant3	5G NR n77 Ant2	0.069	0.043	0.031	0.057	0.158	0.106	0.142	0.074	0.100	0.201	0.149	0.185
LTE Band 26 Ant1	-	0.047	0.029	0.031	0.057	0.158	0.106	0.142	0.060	0.086	0.187	0.135	0.171
LTE Band 26 Ant3	-	0.016	0.010	0.031	0.057	0.158	0.106	0.142	0.041	0.067	0.168	0.116	0.152
LTE Band 38 Ant1	-	0.003	0.002	0.031	0.057	0.158	0.106	0.142	0.033	0.059	0.160	0.108	0.144
LTE Band 38 Ant3	-	0.022	0.014	0.031	0.057	0.158	0.106	0.142	0.045	0.071	0.172	0.120	0.156
LTE Band 48 Ant2	-	0.012	0.008	0.031	0.057	0.158	0.106	0.142	0.039	0.065	0.166	0.114	0.150
LTE Band 66 Ant1	5G NR n5 Ant1	0.114	0.071	0.031	0.057	0.158	0.106	0.142	0.102	0.128	0.229	0.177	0.213
LTE Band 66 Ant1	5G NR n71 Ant1	0.110	0.069	0.031	0.057	0.158	0.106	0.142	0.100	0.126	0.227	0.175	0.211
LTE Band 66 Ant1	5G NR n77 Ant2	0.108	0.068	0.031	0.057	0.158	0.106	0.142	0.099	0.125	0.226	0.174	0.210
LTE Band 66 Ant3	5G NR n5 Ant3	0.070	0.044	0.031	0.057	0.158	0.106	0.142	0.075	0.101	0.202	0.150	0.186
LTE Band 66 Ant3	5G NR n71 Ant3	0.072	0.045	0.031	0.057	0.158	0.106	0.142	0.076	0.102	0.203	0.151	0.187
LTE Band 66 Ant3	5G NR n77 Ant2	0.087	0.054	0.031	0.057	0.158	0.106	0.142	0.085	0.111	0.212	0.160	0.196
LTE Band 71 Ant1	-	0.026	0.016	0.031	0.057	0.158	0.106	0.142	0.047	0.073	0.174	0.122	0.158
LTE Band 71 Ant3	-	0.014	0.009	0.031	0.057	0.158	0.106	0.142	0.040	0.066	0.167	0.115	0.151
5G NR n7 Ant1	-	0.018	0.011	0.031	0.057	0.158	0.106	0.142	0.042	0.068	0.169	0.117	0.153
5G NR n7 Ant3	-	0.022	0.014	0.031	0.057	0.158	0.106	0.142	0.045	0.071	0.172	0.120	0.156
5G NR n12 Ant1	-	0.026	0.016	0.031	0.057	0.158	0.106	0.142	0.047	0.073	0.174	0.122	0.158
5G NR n12 Ant3	-	0.011	0.007	0.031	0.057	0.158	0.106	0.142	0.038	0.064	0.165	0.113	0.149
5G NR n25 Ant1	-	0.063	0.039	0.031	0.057	0.158	0.106	0.142	0.070	0.096	0.197	0.145	0.181
5G NR n25 Ant3	-	0.033	0.021	0.031	0.057	0.158	0.106	0.142	0.052	0.078	0.179	0.127	0.163
5G NR n41 Ant1	-	0.009	0.006	0.031	0.057	0.158	0.106	0.142	0.037	0.063	0.164	0.112	0.148
5G NR n41 Ant3	-	0.040	0.025	0.031	0.057	0.158	0.106	0.142	0.056	0.082	0.183	0.131	0.167
5G NR n48 Ant2	-	0.035	0.022	0.031	0.057	0.158	0.106	0.142	0.053	0.079	0.180	0.128	0.164

- WWAN+WLAN 5GHz / Position: Right Edge

WWAN Configuration		SAR	SAR	WLAN 5GHz TER					Simultaneous TER				
			TER	Ant3	Ant4	Ant 1+2	Ant 1+3	Ant 1+4	WWAN+WLAN Ant3	WWAN+WLAN Ant4	WWAN+WLAN Ant1+2	WWAN+ WLAN Ant1+3	WWAN+ WLAN Ant1+4
WCDMA II Ant1	-	0.232	0.145	0.031	0.057	0.158	0.106	0.142	0.176	0.202	0.303	0.251	0.287
WCDMA II Ant3	-	0.058	0.036	0.031	0.057	0.158	0.106	0.142	0.067	0.093	0.194	0.142	0.178
WCDMA V Ant1	-	0.050	0.031	0.031	0.057	0.158	0.106	0.142	0.062	0.088	0.189	0.137	0.173
WCDMA V Ant3	-	0.021	0.013	0.031	0.057	0.158	0.106	0.142	0.044	0.070	0.171	0.119	0.155
LTE Band 7 Ant1	5G NR n71 Ant1	0.100	0.063	0.031	0.057	0.158	0.106	0.142	0.094	0.120	0.221	0.169	0.205
LTE Band 7 Ant1	5G NR n77 Ant2	0.082	0.051	0.031	0.057	0.158	0.106	0.142	0.082	0.108	0.209	0.157	0.193
LTE Band 7 Ant3	5G NR n71 Ant3	0.079	0.049	0.031	0.057	0.158	0.106	0.142	0.080	0.106	0.207	0.155	0.191
LTE Band 7 Ant3	5G NR n77 Ant2	0.073	0.046	0.031	0.057	0.158	0.106	0.142	0.077	0.103	0.204	0.152	0.188
LTE Band 12 Ant1	LTE Band 66 Ant1	0.175	0.109	0.031	0.057	0.158	0.106	0.142	0.140	0.166	0.267	0.215	0.251
LTE Band 12 Ant1	LTE Band 66 Ant3	0.100	0.063	0.031	0.057	0.158	0.106	0.142	0.094	0.120	0.221	0.169	0.205
LTE Band 12 Ant1	5G NR n77 Ant2	0.041	0.026	0.031	0.057	0.158	0.106	0.142	0.057	0.083	0.184	0.132	0.168
LTE Band 12 Ant3	5G NR n77 Ant2	0.012	0.008	0.031	0.057	0.158	0.106	0.142	0.039	0.065	0.166	0.114	0.150
LTE Band 13 Ant1	5G NR n66 Ant1	0.173	0.108	0.031	0.057	0.158	0.106	0.142	0.139	0.165	0.266	0.214	0.250
LTE Band 13 Ant1	5G NR n77 Ant2	0.031	0.019	0.031	0.057	0.158	0.106	0.142	0.050	0.076	0.177	0.125	0.161
LTE Band 13 Ant3	5G NR n66 Ant3	0.092	0.058	0.031	0.057	0.158	0.106	0.142	0.089	0.115	0.216	0.164	0.200
LTE Band 13 Ant3	5G NR n77 Ant2	0.036	0.023	0.031	0.057	0.158	0.106	0.142	0.054	0.080	0.181	0.129	0.165
LTE Band 25 Ant1	5G NR n77 Ant2	0.173	0.108	0.031	0.057	0.158	0.106	0.142	0.139	0.165	0.266	0.214	0.250
LTE Band 25 Ant3	5G NR n77 Ant2	0.040	0.025	0.031	0.057	0.158	0.106	0.142	0.056	0.082	0.183	0.131	0.167
LTE Band 26 Ant1	-	0.030	0.019	0.031	0.057	0.158	0.106	0.142	0.050	0.076	0.177	0.125	0.161
LTE Band 26 Ant3	-	0.016	0.010	0.031	0.057	0.158	0.106	0.142	0.041	0.067	0.168	0.116	0.152
LTE Band 38 Ant1	-	0.025	0.016	0.031	0.057	0.158	0.106	0.142	0.047	0.073	0.174	0.122	0.158
LTE Band 38 Ant3	-	0.039	0.024	0.031	0.057	0.158	0.106	0.142	0.055	0.081	0.182	0.130	0.166
LTE Band 48 Ant2	-	0.001	0.001	0.031	0.057	0.158	0.106	0.142	0.032	0.058	0.159	0.107	0.143
LTE Band 66 Ant1	5G NR n5 Ant1	0.181	0.113	0.031	0.057	0.158	0.106	0.142	0.144	0.170	0.271	0.219	0.255
LTE Band 66 Ant1	5G NR n71 Ant1	0.172	0.108	0.031	0.057	0.158	0.106	0.142	0.139	0.165	0.266	0.214	0.250
LTE Band 66 Ant1	5G NR n77 Ant2	0.154	0.096	0.031	0.057	0.158	0.106	0.142	0.127	0.153	0.254	0.202	0.238
LTE Band 66 Ant3	5G NR n5 Ant3	0.087	0.054	0.031	0.057	0.158	0.106	0.142	0.085	0.111	0.212	0.160	0.196
LTE Band 66 Ant3	5G NR n71 Ant3	0.085	0.053	0.031	0.057	0.158	0.106	0.142	0.084	0.110	0.211	0.159	0.195
LTE Band 66 Ant3	5G NR n77 Ant2	0.079	0.049	0.031	0.057	0.158	0.106	0.142	0.080	0.106	0.207	0.155	0.191
LTE Band 71 Ant1	-	0.025	0.016	0.031	0.057	0.158	0.106	0.142	0.047	0.073	0.174	0.122	0.158
LTE Band 71 Ant3	-	0.010	0.006	0.031	0.057	0.158	0.106	0.142	0.037	0.063	0.164	0.112	0.148
5G NR n7 Ant1	-	0.070	0.044	0.031	0.057	0.158	0.106	0.142	0.075	0.101	0.202	0.150	0.186
5G NR n7 Ant3	-	0.065	0.041	0.031	0.057	0.158	0.106	0.142	0.072	0.098	0.199	0.147	0.183
5G NR n12 Ant1	-	0.026	0.016	0.031	0.057	0.158	0.106	0.142	0.047	0.073	0.174	0.122	0.158
5G NR n12 Ant3	-	0.003	0.002	0.031	0.057	0.158	0.106	0.142	0.033	0.059	0.160	0.108	0.144
5G NR n25 Ant1	-	0.149	0.093	0.031	0.057	0.158	0.106	0.142	0.124	0.150	0.251	0.199	0.235
5G NR n25 Ant3	-	0.039	0.024	0.031	0.057	0.158	0.106	0.142	0.055	0.081	0.182	0.130	0.166
5G NR n41 Ant1	-	0.049	0.031	0.031	0.057	0.158	0.106	0.142	0.062	0.088	0.189	0.137	0.173
5G NR n41 Ant3	-	0.055	0.034	0.031	0.057	0.158	0.106	0.142	0.065	0.091	0.192	0.140	0.176
5G NR n48 Ant2	-	0.007	0.004	0.031	0.057	0.158	0.106	0.142	0.035	0.061	0.162	0.110	0.146

- WWAN+WLAN 6GHz / Position: Front

WWAN Configuration		SAR	SAR	WLAN 6GHz TER			Simultaneous TER		
			TER	Ant3	Ant1+2	Ant1+3	WWAN+WLAN Ant3	WWAN+WLAN Ant1+2	WWAN+ WLAN Ant1+3
WCDMA II Ant1	-	0.094	0.059	0.056	0.096	0.115	0.115	0.155	0.174
WCDMA II Ant3	-	0.051	0.032	0.056	0.096	0.115	0.088	0.128	0.147
WCDMA V Ant1	-	0.066	0.041	0.056	0.096	0.115	0.097	0.137	0.156
WCDMA V Ant3	-	0.021	0.013	0.056	0.096	0.115	0.069	0.109	0.128
LTE Band 7 Ant1	5G NR n71 Ant1	0.053	0.033	0.056	0.096	0.115	0.089	0.129	0.148
LTE Band 7 Ant1	5G NR n77 Ant2	0.051	0.032	0.056	0.096	0.115	0.088	0.128	0.147
LTE Band 7 Ant3	5G NR n71 Ant3	0.031	0.019	0.056	0.096	0.115	0.075	0.115	0.134
LTE Band 7 Ant3	5G NR n77 Ant2	0.046	0.029	0.056	0.096	0.115	0.085	0.125	0.144
LTE Band 12 Ant1	LTE Band 66 Ant1	0.105	0.066	0.056	0.096	0.115	0.122	0.162	0.181
LTE Band 12 Ant1	LTE Band 66 Ant3	0.084	0.053	0.056	0.096	0.115	0.109	0.149	0.168
LTE Band 12 Ant1	5G NR n77 Ant2	0.067	0.042	0.056	0.096	0.115	0.098	0.138	0.157
LTE Band 12 Ant3	5G NR n77 Ant2	0.042	0.026	0.056	0.096	0.115	0.082	0.122	0.141
LTE Band 13 Ant1	5G NR n66 Ant1	0.100	0.063	0.056	0.096	0.115	0.119	0.159	0.178
LTE Band 13 Ant1	5G NR n77 Ant2	0.075	0.047	0.056	0.096	0.115	0.103	0.143	0.162
LTE Band 13 Ant3	5G NR n66 Ant3	0.078	0.049	0.056	0.096	0.115	0.105	0.145	0.164
LTE Band 13 Ant3	5G NR n77 Ant2	0.068	0.043	0.056	0.096	0.115	0.099	0.139	0.158
LTE Band 25 Ant1	5G NR n77 Ant2	0.094	0.059	0.056	0.096	0.115	0.115	0.155	0.174
LTE Band 25 Ant3	5G NR n77 Ant2	0.069	0.043	0.056	0.096	0.115	0.099	0.139	0.158
LTE Band 26 Ant1	-	0.047	0.029	0.056	0.096	0.115	0.085	0.125	0.144
LTE Band 26 Ant3	-	0.016	0.010	0.056	0.096	0.115	0.066	0.106	0.125
LTE Band 38 Ant1	-	0.003	0.002	0.056	0.096	0.115	0.058	0.098	0.117
LTE Band 38 Ant3	-	0.022	0.014	0.056	0.096	0.115	0.070	0.110	0.129
LTE Band 48 Ant2	-	0.012	0.008	0.056	0.096	0.115	0.064	0.104	0.123
LTE Band 66 Ant1	5G NR n5 Ant1	0.114	0.071	0.056	0.096	0.115	0.127	0.167	0.186
LTE Band 66 Ant1	5G NR n71 Ant1	0.110	0.069	0.056	0.096	0.115	0.125	0.165	0.184
LTE Band 66 Ant1	5G NR n77 Ant2	0.108	0.068	0.056	0.096	0.115	0.124	0.164	0.183
LTE Band 66 Ant3	5G NR n5 Ant3	0.070	0.044	0.056	0.096	0.115	0.100	0.140	0.159
LTE Band 66 Ant3	5G NR n71 Ant3	0.072	0.045	0.056	0.096	0.115	0.101	0.141	0.160
LTE Band 66 Ant3	5G NR n77 Ant2	0.087	0.054	0.056	0.096	0.115	0.110	0.150	0.169
LTE Band 71 Ant1	-	0.026	0.016	0.056	0.096	0.115	0.072	0.112	0.131
LTE Band 71 Ant3	-	0.014	0.009	0.056	0.096	0.115	0.065	0.105	0.124
5G NR n7 Ant1	-	0.018	0.011	0.056	0.096	0.115	0.067	0.107	0.126
5G NR n7 Ant3	-	0.022	0.014	0.056	0.096	0.115	0.070	0.110	0.129
5G NR n12 Ant1	-	0.026	0.016	0.056	0.096	0.115	0.072	0.112	0.131
5G NR n12 Ant3	-	0.011	0.007	0.056	0.096	0.115	0.063	0.103	0.122
5G NR n25 Ant1	-	0.063	0.039	0.056	0.096	0.115	0.095	0.135	0.154
5G NR n25 Ant3	-	0.033	0.021	0.056	0.096	0.115	0.077	0.117	0.136
5G NR n41 Ant1	-	0.009	0.006	0.056	0.096	0.115	0.062	0.102	0.121
5G NR n41 Ant3	-	0.040	0.025	0.056	0.096	0.115	0.081	0.121	0.140
5G NR n48 Ant2	-	0.035	0.022	0.056	0.096	0.115	0.078	0.118	0.137

- WWAN+WLAN 6GHz / Position: Right Edge

WWAN Configuration		SAR	SAR	WLAN 6GHz TER			Simultaneous TER		
			TER	Ant3	Ant1+2	Ant1+3	WWAN+WLAN Ant3	WWAN+WLAN Ant1+2	WWAN+ WLAN Ant1+3
WCDMA II Ant1	-	0.232	0.145	0.056	0.096	0.115	0.201	0.241	0.260
WCDMA II Ant3	-	0.058	0.036	0.056	0.096	0.115	0.092	0.132	0.151
WCDMA V Ant1	-	0.050	0.031	0.056	0.096	0.115	0.087	0.127	0.146
WCDMA V Ant3	-	0.021	0.013	0.056	0.096	0.115	0.069	0.109	0.128
LTE Band 7 Ant1	5G NR n71 Ant1	0.100	0.063	0.056	0.096	0.115	0.119	0.159	0.178
LTE Band 7 Ant1	5G NR n77 Ant2	0.082	0.051	0.056	0.096	0.115	0.107	0.147	0.166
LTE Band 7 Ant3	5G NR n71 Ant3	0.079	0.049	0.056	0.096	0.115	0.105	0.145	0.164
LTE Band 7 Ant3	5G NR n77 Ant2	0.073	0.046	0.056	0.096	0.115	0.102	0.142	0.161
LTE Band 12 Ant1	LTE Band 66 Ant1	0.175	0.109	0.056	0.096	0.115	0.165	0.205	0.224
LTE Band 12 Ant1	LTE Band 66 Ant3	0.100	0.063	0.056	0.096	0.115	0.119	0.159	0.178
LTE Band 12 Ant1	5G NR n77 Ant2	0.041	0.026	0.056	0.096	0.115	0.082	0.122	0.141
LTE Band 12 Ant3	5G NR n77 Ant2	0.012	0.008	0.056	0.096	0.115	0.064	0.104	0.123
LTE Band 13 Ant1	5G NR n66 Ant1	0.173	0.108	0.056	0.096	0.115	0.164	0.204	0.223
LTE Band 13 Ant1	5G NR n77 Ant2	0.031	0.019	0.056	0.096	0.115	0.075	0.115	0.134
LTE Band 13 Ant3	5G NR n66 Ant3	0.092	0.058	0.056	0.096	0.115	0.114	0.154	0.173
LTE Band 13 Ant3	5G NR n77 Ant2	0.036	0.023	0.056	0.096	0.115	0.079	0.119	0.138
LTE Band 25 Ant1	5G NR n77 Ant2	0.173	0.108	0.056	0.096	0.115	0.164	0.204	0.223
LTE Band 25 Ant3	5G NR n77 Ant2	0.040	0.025	0.056	0.096	0.115	0.081	0.121	0.140
LTE Band 26 Ant1	-	0.030	0.019	0.056	0.096	0.115	0.075	0.115	0.134
LTE Band 26 Ant3	-	0.016	0.010	0.056	0.096	0.115	0.066	0.106	0.125
LTE Band 38 Ant1	-	0.025	0.016	0.056	0.096	0.115	0.072	0.112	0.131
LTE Band 38 Ant3	-	0.039	0.024	0.056	0.096	0.115	0.080	0.120	0.139
LTE Band 48 Ant2	-	0.001	0.001	0.056	0.096	0.115	0.057	0.097	0.116
LTE Band 66 Ant1	5G NR n5 Ant1	0.181	0.113	0.056	0.096	0.115	0.169	0.209	0.228
LTE Band 66 Ant1	5G NR n71 Ant1	0.172	0.108	0.056	0.096	0.115	0.164	0.204	0.223
LTE Band 66 Ant1	5G NR n77 Ant2	0.154	0.096	0.056	0.096	0.115	0.152	0.192	0.211
LTE Band 66 Ant3	5G NR n5 Ant3	0.087	0.054	0.056	0.096	0.115	0.110	0.150	0.169
LTE Band 66 Ant3	5G NR n71 Ant3	0.085	0.053	0.056	0.096	0.115	0.109	0.149	0.168
LTE Band 66 Ant3	5G NR n77 Ant2	0.079	0.049	0.056	0.096	0.115	0.105	0.145	0.164
LTE Band 71 Ant1	-	0.025	0.016	0.056	0.096	0.115	0.072	0.112	0.131
LTE Band 71 Ant3	-	0.010	0.006	0.056	0.096	0.115	0.062	0.102	0.121
5G NR n7 Ant1	-	0.070	0.044	0.056	0.096	0.115	0.100	0.140	0.159
5G NR n7 Ant3	-	0.065	0.041	0.056	0.096	0.115	0.097	0.137	0.156
5G NR n12 Ant1	-	0.026	0.016	0.056	0.096	0.115	0.072	0.112	0.131
5G NR n12 Ant3	-	0.003	0.002	0.056	0.096	0.115	0.058	0.098	0.117
5G NR n25 Ant1	-	0.149	0.093	0.056	0.096	0.115	0.149	0.189	0.208
5G NR n25 Ant3	-	0.039	0.024	0.056	0.096	0.115	0.080	0.120	0.139
5G NR n41 Ant1	-	0.049	0.031	0.056	0.096	0.115	0.087	0.127	0.146
5G NR n41 Ant3	-	0.055	0.034	0.056	0.096	0.115	0.090	0.130	0.149
5G NR n48 Ant2	-	0.007	0.004	0.056	0.096	0.115	0.060	0.100	0.119

- WWAN+BT / Position: Front

WWAN Configuration		SAR	SAR	BT LE TER	Simultaneous TER
			TER	Ant1	WWAN + BT Ant1
WCDMA II Ant1	-	0.094	0.059	0.022	0.081
WCDMA II Ant3	-	0.051	0.032	0.022	0.054
WCDMA V Ant1	-	0.066	0.041	0.022	0.063
WCDMA V Ant3	-	0.021	0.013	0.022	0.035
LTE Band 7 Ant1	5G NR n71 Ant1	0.053	0.033	0.022	0.055
LTE Band 7 Ant1	5G NR n77 Ant2	0.051	0.032	0.022	0.054
LTE Band 7 Ant3	5G NR n71 Ant3	0.031	0.019	0.022	0.041
LTE Band 7 Ant3	5G NR n77 Ant2	0.046	0.029	0.022	0.051
LTE Band 12 Ant1	LTE Band 66 Ant1	0.105	0.066	0.022	0.088
LTE Band 12 Ant1	LTE Band 66 Ant3	0.084	0.053	0.022	0.075
LTE Band 12 Ant1	5G NR n77 Ant2	0.067	0.042	0.022	0.064
LTE Band 12 Ant3	5G NR n77 Ant2	0.042	0.026	0.022	0.048
LTE Band 13 Ant1	5G NR n66 Ant1	0.100	0.063	0.022	0.085
LTE Band 13 Ant1	5G NR n77 Ant2	0.075	0.047	0.022	0.069
LTE Band 13 Ant3	5G NR n66 Ant3	0.078	0.049	0.022	0.071
LTE Band 13 Ant3	5G NR n77 Ant2	0.068	0.043	0.022	0.065
LTE Band 25 Ant1	5G NR n77 Ant2	0.094	0.059	0.022	0.081
LTE Band 25 Ant3	5G NR n77 Ant2	0.069	0.043	0.022	0.065
LTE Band 26 Ant1	-	0.047	0.029	0.022	0.051
LTE Band 26 Ant3	-	0.016	0.010	0.022	0.032
LTE Band 38 Ant1	-	0.003	0.002	0.022	0.024
LTE Band 38 Ant3	-	0.022	0.014	0.022	0.036
LTE Band 48 Ant2	-	0.012	0.008	0.022	0.030
LTE Band 66 Ant1	5G NR n5 Ant1	0.114	0.071	0.022	0.093
LTE Band 66 Ant1	5G NR n71 Ant1	0.110	0.069	0.022	0.091
LTE Band 66 Ant1	5G NR n77 Ant2	0.108	0.068	0.022	0.090
LTE Band 66 Ant3	5G NR n5 Ant3	0.070	0.044	0.022	0.066
LTE Band 66 Ant3	5G NR n71 Ant3	0.072	0.045	0.022	0.067
LTE Band 66 Ant3	5G NR n77 Ant2	0.087	0.054	0.022	0.076
LTE Band 71 Ant1	-	0.026	0.016	0.022	0.038
LTE Band 71 Ant3	-	0.014	0.009	0.022	0.031
5G NR n7 Ant1	-	0.018	0.011	0.022	0.033
5G NR n7 Ant3	-	0.022	0.014	0.022	0.036
5G NR n12 Ant1	-	0.026	0.016	0.022	0.038
5G NR n12 Ant3	-	0.011	0.007	0.022	0.029
5G NR n25 Ant1	-	0.063	0.039	0.022	0.061
5G NR n25 Ant3	-	0.033	0.021	0.022	0.043
5G NR n41 Ant1	-	0.009	0.006	0.022	0.028
5G NR n41 Ant3	-	0.040	0.025	0.022	0.047
5G NR n48 Ant2	-	0.035	0.022	0.022	0.044

- WWAN+BT / Position: Right Edge

WWAN Configuration		SAR	SAR	BT LE TER	Simultaneous TER
			TER	Ant1	WWAN + BT Ant1
WCDMA II Ant1	-	0.232	0.145	0.022	0.167
WCDMA II Ant3	-	0.058	0.036	0.022	0.058
WCDMA V Ant1	-	0.050	0.031	0.022	0.053
WCDMA V Ant3	-	0.021	0.013	0.022	0.035
LTE Band 7 Ant1	5G NR n71 Ant1	0.100	0.063	0.022	0.085
LTE Band 7 Ant1	5G NR n77 Ant2	0.082	0.051	0.022	0.073
LTE Band 7 Ant3	5G NR n71 Ant3	0.079	0.049	0.022	0.071
LTE Band 7 Ant3	5G NR n77 Ant2	0.073	0.046	0.022	0.068
LTE Band 12 Ant1	LTE Band 66 Ant1	0.175	0.109	0.022	0.131
LTE Band 12 Ant1	LTE Band 66 Ant3	0.100	0.063	0.022	0.085
LTE Band 12 Ant1	5G NR n77 Ant2	0.041	0.026	0.022	0.048
LTE Band 12 Ant3	5G NR n77 Ant2	0.012	0.008	0.022	0.030
LTE Band 13 Ant1	5G NR n66 Ant1	0.173	0.108	0.022	0.130
LTE Band 13 Ant1	5G NR n77 Ant2	0.031	0.019	0.022	0.041
LTE Band 13 Ant3	5G NR n66 Ant3	0.092	0.058	0.022	0.080
LTE Band 13 Ant3	5G NR n77 Ant2	0.036	0.023	0.022	0.045
LTE Band 25 Ant1	5G NR n77 Ant2	0.173	0.108	0.022	0.130
LTE Band 25 Ant3	5G NR n77 Ant2	0.040	0.025	0.022	0.047
LTE Band 26 Ant1	-	0.030	0.019	0.022	0.041
LTE Band 26 Ant3	-	0.016	0.010	0.022	0.032
LTE Band 38 Ant1	-	0.025	0.016	0.022	0.038
LTE Band 38 Ant3	-	0.039	0.024	0.022	0.046
LTE Band 48 Ant2	-	0.001	0.001	0.022	0.023
LTE Band 66 Ant1	5G NR n5 Ant1	0.181	0.113	0.022	0.135
LTE Band 66 Ant1	5G NR n71 Ant1	0.172	0.108	0.022	0.130
LTE Band 66 Ant1	5G NR n77 Ant2	0.154	0.096	0.022	0.118
LTE Band 66 Ant3	5G NR n5 Ant3	0.087	0.054	0.022	0.076
LTE Band 66 Ant3	5G NR n71 Ant3	0.085	0.053	0.022	0.075
LTE Band 66 Ant3	5G NR n77 Ant2	0.079	0.049	0.022	0.071
LTE Band 71 Ant1	-	0.025	0.016	0.022	0.038
LTE Band 71 Ant3	-	0.010	0.006	0.022	0.028
5G NR n7 Ant1	-	0.070	0.044	0.022	0.066
5G NR n7 Ant3	-	0.065	0.041	0.022	0.063
5G NR n12 Ant1	-	0.026	0.016	0.022	0.038
5G NR n12 Ant3	-	0.003	0.002	0.022	0.024
5G NR n25 Ant1	-	0.149	0.093	0.022	0.115
5G NR n25 Ant3	-	0.039	0.024	0.022	0.046
5G NR n41 Ant1	-	0.049	0.031	0.022	0.053
5G NR n41 Ant3	-	0.055	0.034	0.022	0.056
5G NR n48 Ant2	-	0.007	0.004	0.022	0.026

SAR Measurement Variability

27.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the power supply before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

1. When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2. A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
3. A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4. Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg

28 Appendixes List

Appendix A	Appendix A Verification Plots
Appendix B	Appendix B Test Plots
Appendix C	Appendix C Photograph
Appendix D	Appendix D Probe, DAE and Dipole Calibration Certificates
Appendix E	Appendix E RF Conducted Power
Appendix F	Appendix F LTE Downlink Carrier Aggregation

-THE END-