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# SAR EVALUATION REPORT

**Applicant Name:**
Samsung Electronics Co., Ltd.
129, Samsung-ro, Maetan dong,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

**Date of Testing:**
02/16/22 – 03/07/22
**Test Site/Location:**
PCTEST Lab, Columbia, MD, USA
**Document Serial No.:**
1M2202030012-05.A3L

**FCC ID:** **A3LSMS901E**

**APPLICANT:** **SAMSUNG ELECTRONICS CO., LTD.**

| | |
|---|---|
| **DUT Type:** | Portable Handset |
| **Application Type:** | Class II Permissive Change |
| **FCC Rule Part(s):** | CFR §2.1093 |
| **Model:** | SM-S901E/DS |
| **Additional Model:** | SM-S901E |
| **Permissive Change(s):** | See FCC Change Document |
| **Date of Original Certification:** | 01/04/2022 |

| Equipment Class | Band & Mode | Tx Frequency | SAR | | | |
|---|---|---|---|---|---|---|
| | | | 1g Head (W/kg) | 1g Body-Worn (W/kg) | 1g Hotspot (W/kg) | 10g Phablet (W/kg) |
| PCE | GSM/GPRS/EDGE 1900 | 1850.20 - 1909.80 MHz | N/A | N/A | 1.00 | 0.78 |
| PCE | LTE Band 41 | 2498.5 - 2687.5 MHz | N/A | N/A | 1.08 | 2.93 |
| PCE | NR Band n25 (PCS) | 1852.5 - 1912.5 MHz | 0.21 | 0.95 | 1.02 | 2.00 |
| PCE | NR Band n2 (PCS) | 1852.5 - 1907.5 MHz | N/A | N/A | N/A | N/A |
| PCE | NR Band n41 | 2506.02 - 2679.99 MHz | 1.04 | 0.14 | 0.39 | 0.72 |
| PCE | NR Band n77 DoD | 3455.01 - 3544.98 MHz | 0.55 | 0.17 | 0.56 | 2.70 |
| PCE | NR Band n77 | 3705 - 3975 MHz | 0.58 | 0.18 | 0.60 | 3.14 |
| NII | U-NII-1 | 5180 - 5240 MHz | N/A | N/A | N/A | N/A |
| NII | U-NII-2A | 5260 - 5320 MHz | N/A | N/A | N/A | 0.55 |
| NII | U-NII-2C | 5500 - 5720 MHz | N/A | N/A | N/A | 0.42 |
| NII | U-NII-4 | 5845 - 5885 MHz | N/A | N/A | N/A | 0.36 |
| **Simultaneous SAR per KDB 690783 D01v01r03:** | | | 1.58 | 1.54 | 1.55 | 3.95 |

Only operations relevant to this permissive change were evaluated for compliance. Please see the original compliance evaluation in RF Exposure Technical Report (serial number found in Section 1.11) for complete evaluation of all other operating modes. The operational description includes a description of all changed items.

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.9 of this report; for North American frequency bands only.

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

Randy Ortanez
President

The SAR Tick is an initiative of the Mobile & Wireless Forum (MWF). While a product may be considered eligible, use of the SAR Tick logo requires an agreement with the MWF. Further details can be obtained by emailing: sartick@mwfai.info.

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# 1 DEVICE UNDER TEST

## 1.1 Device Overview

| Band & Mode | Operating Modes | Tx Frequency |
|---|---|---|
| GSM/GPRS/EDGE 850 | Voice/Data | 824.20 - 848.80 MHz |
| GSM/GPRS/EDGE 1900 | Voice/Data | 1850.20 - 1909.80 MHz |
| UMTS 850 | Voice/Data | 826.40 - 846.60 MHz |
| UMTS 1750 | Voice/Data | 1712.4 - 1752.6 MHz |
| UMTS 1900 | Voice/Data | 1852.4 - 1907.6 MHz |
| LTE Band 12 | Voice/Data | 699.7 - 715.3 MHz |
| LTE Band 17 | Voice/Data | 706.5 - 713.5 MHz |
| LTE Band 13 | Voice/Data | 779.5 - 784.5 MHz |
| LTE Band 26 (Cell) | Voice/Data | 814.7 - 848.3 MHz |
| LTE Band 5 (Cell) | Voice/Data | 824.7 - 848.3 MHz |
| LTE Band 66 (AWS) | Voice/Data | 1710.7 - 1779.3 MHz |
| LTE Band 4 (AWS) | Voice/Data | 1710.7 - 1754.3 MHz |
| LTE Band 25 (PCS) | Voice/Data | 1850.7 - 1914.3 MHz |
| LTE Band 2 (PCS) | Voice/Data | 1850.7 - 1909.3 MHz |
| LTE Band 41 | Voice/Data | 2498.5 - 2687.5 MHz |
| NR Band n5 (Cell) | Voice/Data | 826.5 - 846.5 MHz |
| NR Band n66 (AWS) | Voice/Data | 1712.5 - 1777.5 MHz |
| NR Band n25 (PCS) | Voice/Data | 1852.5 - 1912.5 MHz |
| NR Band n2 (PCS) | Voice/Data | 1852.5 - 1907.5 MHz |
| NR Band n41 | Voice/Data | 2506.02 - 2679.99 MHz |
| NR Band n77 DoD | Voice/Data | 3455.01 - 3544.98 MHz |
| NR Band n77 | Voice/Data | 3705 - 3975 MHz |
| 2.4 GHz WLAN | Voice/Data | 2412 - 2472 MHz |
| U-NII-1 | Voice/Data | 5180 - 5240 MHz |
| U-NII-2A | Voice/Data | 5260 - 5320 MHz |
| U-NII-2C | Voice/Data | 5500 - 5720 MHz |
| U-NII-3 | Voice/Data | 5745 - 5825 MHz |
| U-NII-4 | Voice/Data | 5845 - 5885 MHz |
| Bluetooth | Data | 2402 - 2480 MHz |
| NFC | Data | 13.56 MHz |

## 1.2 Time-Averaging Algorithm for RF Exposure Compliance

This device is enabled with the Qualcomm® Smart Transmit feature. This feature performs time averaging algorithm in real time to control and manage transmitting power and ensure the time-averaged RF exposure is in compliance with FCC requirements all the time. **For this device, all US Operations are limited to peak exposure mode only.**

Note that WLAN operations are not enabled with Smart Transmit.

In Peak Exposure mode, the output power of the device is limited to the lower of the Pmax and the Plimit for each characterized technology and band (see RF Exposure Part 0 Test Report, report SN could be found in Section 1.11 - Bibliography).

Below table shows Plimit EFS settings and maximum tune up output power Pmax configured for this EUT for various transmit conditions (Device State Index DSI). Note that the device uncertainty for sub-6GHz WWAN is 1.0dB for this EUT.

**SAR CHAR**

| Exposure Senario | | | Body-Worn | Phablet Max | Phablet Reduced | Head | Hotspot | Earjack | Maximum Tune-Up Output Power* |
|---|---|---|---|---|---|---|---|---|---|
| Averaging Volume | | | 1g | 10g | 10g | 1g | 1g | 10g | |
| Spacing | | | 15 mm | 9, 7, 13, 0 mm | 0 mm | 0 mm | 10 mm | 0 mm | |
| DSI | | | 0 | 0 | 1 | 2 | 3 | 4 | |
| Technology/Band | Antenna | Antenna Group | | | | | | | Pmax |
| GSM 850 | A | AG0 | 29.0 | | 28.9 | 29.6 | 27.1 | 28.9 | 25.3 |
| GSM 1900 | A | AG0 | 25.8 | | 17.8 | 30.4 | 17.8 | 17.8 | 22.1 |
| UMTS 850 | A | AG0 | 28.0 | | 25.5 | 29.1 | 25.5 | 25.5 | 24.5 |
| UMTS 1750 | A | AG0 | 25.2 | | 19.0 | 30.7 | 19.0 | 19.0 | 23.0 |
| UMTS 1900 | A | AG0 | 26.1 | | 19.0 | 31.2 | 19.0 | 19.0 | 23.7 |
| LTE Band 12/17 | A | AG0 | 28.8 | | 27.0 | 33.7 | 27.0 | 27.0 | 23.5 |
| LTE Band 13 | A | AG0 | 29.8 | | 26.5 | 31.0 | 26.5 | 26.5 | 23.5 |
| LTE Band 26/5 (Cell) | A | AG0 | 29.2 | | 25.7 | 29.9 | 25.7 | 25.7 | 23.0 |
| LTE Band 66/4 (AWS) | A | AG0 | 26.1 | | 18.3 | 30.8 | 18.3 | 18.3 | 22.8 |
| LTE Band 4 (AWS) | F | AG1 | 21.2 | | 21.2 | 16.0 | 16.0 | 21.2 | 21.0 |
| LTE Band 25/2 (PCS) | A | AG0 | 26.7 | | 18.0 | 30.6 | 18.0 | 18.0 | 22.5 |
| LTE Band 41 (PC3) | B | AG0 | 26.2 | | 20.0 | 34.7 | 20.0 | 20.0 | 22.0 |
| LTE Band 41 (PC2) | B | AG0 | 26.2 | | 20.0 | 34.7 | 20.0 | 20.0 | 21.9 |
| NR Band n5 (Cell) | A | AG0 | 28.4 | | 26.0 | 30.6 | 26.0 | 26.0 | 23.0 |
| NR Band n66 (AWS) | A | AG0 | 24.6 | | 20.0 | 30.2 | 20.0 | 20.0 | 24.0 |
| NR Band n66 (AWS) | F | AG1 | 22.1 | | 22.1 | 18.0 | 22.1 | 22.1 | 22.0 |
| NR Band n25/2 (PCS) | A | AG0 | 24.7 | | 18.5 | 30.8 | 18.5 | 18.5 | 23.5 |
| NR Band n41 SRS 1 | F | AG1 | 18.0 | | 18.0 | 18.0 | 18.0 | 18.0 | 24.0 |
| NR Band n41 SRS 2 | B | AG0 | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 20.0 |
| NR Band n41 SRS 3 | E | AG1 | 13.0 | | 13.0 | 13.0 | 13.0 | 13.0 | 19.0 |
| NR Band n41 SRS 4 | D | AG0 | 10.5 | | 10.5 | 10.5 | 10.5 | 10.5 | 16.5 |
| NR Band n77 DoD SRS 1 | G | AG1 | 17.5 | | 17.5 | 13.0 | 17.5 | 17.5 | 23.5 |
| NR Band n77 DoD SRS 2 | C | AG0 | 13.0 | | 13.0 | 13.0 | 13.0 | 13.0 | 19.0 |
| NR Band n77 DoD SRS 3 | H | AG1 | 15.5 | | 15.5 | 11.0 | 15.5 | 15.5 | 21.5 |
| NR Band n77 DoD SRS 4 | D | AG0 | 13.0 | | 13.0 | 13.0 | 13.0 | 13.0 | 19.0 |
| NR Band n77 SRS 1 | G | AG1 | 17.5 | | 17.5 | 13.0 | 17.5 | 17.5 | 23.5 |
| NR Band n77 SRS 2 | C | AG0 | 13.0 | | 13.0 | 13.0 | 13.0 | 13.0 | 19.0 |
| NR Band n77 SRS 3 | H | AG1 | 15.5 | | 15.5 | 11.0 | 15.5 | 15.5 | 21.5 |
| NR Band n77 SRS 4 | D | AG0 | 13.0 | | 13.0 | 13.0 | 13.0 | 13.0 | 19.0 |

*Note all $P_{limit}$ EFS and maximum tune up output power $P_{max}$ levels entered in above Table correspond to average power levels after accounting for duty cycle in the case of TDD modulation schemes (e.g. GSM and LTE TDD).

*Maximum tune up output power $P_{max}$ is used to configure EUT during RF tune up procedure. The maximum allowed output power is equal to maximum Tune up output power + 1dB device design uncertainty.

The maximum time-averaged output power (dBm) for any 2G/3G/4G/5G Sub6 WWAN technology, band, and DSI = minimum of "$P_{limit}$ EFS" and "Maximum tune up output power $P_{max}$" + 1dB device uncertainty. SAR values in this report were scaled to this maximum time-averaged output power to determine compliance per KDB Publication 447498 D01v06.

The purpose of this report (Part 1 test) is to demonstrate that the EUT meets FCC SAR limits when transmitting in static transmission scenario at maximum allowable time-averaged power levels.

**Measurement Condition: All conducted power and SAR measurements in this report (Part 1 test) were performed by setting *Reserve_power_margin* (Smart Transmit EFS entry) to 0dB.**

## 1.3 Power Reduction for SAR

This device used an independent fixed level power reduction mechanism for WLAN when 5G NR is active and also for WLAN/BT during all voice or VoIP held to ear scenarios. Per FCC Guidance, the held-to-ear exposure conditions were evaluated at reduced power according to the head SAR positions described in IEEE 1528-2013. Detailed descriptions of the power reduction mechanism are included in the operational description.

## 1.4 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v06.

### 1.4.1 2G/3G/4G/5G Output Power

| GSM/GPRS/EDGE 850 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Power Level | | Voice (in dBm) | Data - Burst Average GMSK (in dBm) | | | | Data - Burst Average 8-PSK (in dBm) | | | |
| | | 1 TX Slot | 1 TX Slots | 2 TX Slots | 3 TX Slots | 4 TX Slots | 1 TX Slots | 2 TX Slots | 3 TX Slots | 4 TX Slots |
| Pmax | Max Allowed Power | 33.0 | 33.0 | 32.5 | 30.5 | 28.5 | 28.0 | 26.0 | 24.0 | 23.0 |
| | Nominal | 32.0 | 32.0 | 31.5 | 29.5 | 27.5 | 27.0 | 25.0 | 23.0 | 22.0 |
| DSI = 0 (Body-Worn or Phablet Max) | Max Allowed Power | 33.0 | 33.0 | 32.5 | 30.5 | 28.5 | 28.0 | 26.0 | 24.0 | 23.0 |
| | Nominal | 32.0 | 32.0 | 31.5 | 29.5 | 27.5 | 27.0 | 25.0 | 23.0 | 22.0 |
| DSI = 1 (Phablet Reduced) | Max Allowed Power | 33.0 | 33.0 | 32.5 | 30.5 | 28.5 | 28.0 | 26.0 | 24.0 | 23.0 |
| | Nominal | 32.0 | 32.0 | 31.5 | 29.5 | 27.5 | 27.0 | 25.0 | 23.0 | 22.0 |
| DSI = 2 (Head) | Max Allowed Power | 33.0 | 33.0 | 32.5 | 30.5 | 28.5 | 28.0 | 26.0 | 24.0 | 23.0 |
| | Nominal | 32.0 | 32.0 | 31.5 | 29.5 | 27.5 | 27.0 | 25.0 | 23.0 | 22.0 |
| DSI = 3 (Hotspot) | Max Allowed Power | N/A | 33.0 | 32.5 | 30.5 | 28.5 | 28.0 | 26.0 | 24.0 | 23.0 |
| | Nominal | N/A | 32.0 | 31.5 | 29.5 | 27.5 | 27.0 | 25.0 | 23.0 | 22.0 |
| DSI = 4 (Earjack) | Max Allowed Power | 33.0 | 33.0 | 32.5 | 30.5 | 28.5 | 28.0 | 26.0 | 24.0 | 23.0 |
| | Nominal | 32.0 | 32.0 | 31.5 | 29.5 | 27.5 | 27.0 | 25.0 | 23.0 | 22.0 |
| **GSM/GPRS/EDGE 1900** | | | | | | | | | | |
| Power Level | | Voice (in dBm) | Data - Burst Average GMSK (in dBm) | | | | Data - Burst Average 8-PSK (in dBm) | | | |
| | | 1 TX Slot | 1 TX Slots | 2 TX Slots | 3 TX Slots | 4 TX Slots | 1 TX Slots | 2 TX Slots | 3 TX Slots | 4 TX Slots |
| Pmax | Max Allowed Power | 30.0 | 30.0 | 29.0 | 27.5 | 25.5 | 27.0 | 25.0 | 23.0 | 22.0 |
| | Nominal | 29.0 | 29.0 | 28.0 | 26.5 | 24.5 | 26.0 | 24.0 | 22.0 | 21.0 |
| DSI = 0 (Body-Worn or Phablet Max) | Max Allowed Power | 30.0 | 30.0 | 29.0 | 27.5 | 25.5 | 27.0 | 25.0 | 23.0 | 22.0 |
| | Nominal | 29.0 | 29.0 | 28.0 | 26.5 | 24.5 | 26.0 | 24.0 | 22.0 | 21.0 |
| DSI = 1 (Phablet Reduced) | Max Allowed Power | 28.0 | 28.0 | 25.0 | 23.2 | 22.0 | 27.0 | 25.0 | 23.0 | 22.0 |
| | Nominal | 27.0 | 27.0 | 24.0 | 22.2 | 21.0 | 26.0 | 24.0 | 22.0 | 21.0 |
| DSI = 2 (Head) | Max Allowed Power | 30.0 | 30.0 | 29.0 | 27.5 | 25.5 | 27.0 | 25.0 | 23.0 | 22.0 |
| | Nominal | 29.0 | 29.0 | 28.0 | 26.5 | 24.5 | 26.0 | 24.0 | 22.0 | 21.0 |
| DSI = 3 (Hotspot) | Max Allowed Power | N/A | 28.0 | 25.0 | 23.2 | 22.0 | 27.0 | 25.0 | 23.0 | 22.0 |
| | Nominal | N/A | 27.0 | 24.0 | 22.2 | 21.0 | 26.0 | 24.0 | 22.0 | 21.0 |
| DSI = 4 (Earjack) | Max Allowed Power | 28.0 | 28.0 | 25.0 | 23.2 | 22.0 | 27.0 | 25.0 | 23.0 | 22.0 |
| | Nominal | 27.0 | 27.0 | 24.0 | 22.2 | 21.0 | 26.0 | 24.0 | 22.0 | 21.0 |

For GSM, the above powers listed are GSM burst average values.

| UMTS Band 5 (850 MHz) | | | | | |
|---|---|---|---|---|---|
| Power Level | | Modulated Average Output Power | | | |
| | | 3GPP WCDMA Rel 99 | 3GPP HSDPA Rel 5 | 3GPP HSUPA Rel 6 | 3GPP DC-HSDPA Rel 8 |
| Pmax | Max Allowed Power | 25.5 | 24.5 | 24.5 | 24.5 |
| | Nominal | 24.5 | 23.5 | 23.5 | 23.5 |
| DSI = 0 (Body-Worn or Phablet Max) | Max Allowed Power | 25.5 | 24.5 | 24.5 | 24.5 |
| | Nominal | 24.5 | 23.5 | 23.5 | 23.5 |
| DSI = 1 (Phablet Reduced) | Max Allowed Power | 25.5 | 24.5 | 24.5 | 24.5 |
| | Nominal | 24.5 | 23.5 | 23.5 | 23.5 |
| DSI = 2 (Head) | Max Allowed Power | 25.5 | 24.5 | 24.5 | 24.5 |
| | Nominal | 24.5 | 23.5 | 23.5 | 23.5 |
| DSI = 3 (Hotspot) | Max Allowed Power | 25.5 | 24.5 | 24.5 | 24.5 |
| | Nominal | 24.5 | 23.5 | 23.5 | 23.5 |
| DSI = 4 (Earjack) | Max Allowed Power | 25.5 | 24.5 | 24.5 | 24.5 |
| | Nominal | 24.5 | 23.5 | 23.5 | 23.5 |
| **UMTS Band 4 (1750 MHz)** | | | | | |
| Power Level | | Modulated Average Output Power | | | |
| | | 3GPP WCDMA Rel 99 | 3GPP HSDPA Rel 5 | 3GPP HSUPA Rel 6 | 3GPP DC-HSDPA Rel 8 |
| Pmax | Max Allowed Power | 24.0 | 23.0 | 23.0 | 23.0 |
| | Nominal | 23.0 | 22.0 | 22.0 | 22.0 |
| DSI = 0 (Body-Worn or Phablet Max) | Max Allowed Power | 24.0 | 23.0 | 23.0 | 23.0 |
| | Nominal | 23.0 | 22.0 | 22.0 | 22.0 |
| DSI = 1 (Phablet Reduced) | Max Allowed Power | 20.0 | 19.0 | 19.0 | 19.0 |
| | Nominal | 19.0 | 18.0 | 18.0 | 18.0 |
| DSI = 2 (Head) | Max Allowed Power | 24.0 | 23.0 | 23.0 | 23.0 |
| | Nominal | 23.0 | 22.0 | 22.0 | 22.0 |
| DSI = 3 (Hotspot) | Max Allowed Power | 20.0 | 19.0 | 19.0 | 19.0 |
| | Nominal | 19.0 | 18.0 | 18.0 | 18.0 |
| DSI = 4 (Earjack) | Max Allowed Power | 20.0 | 19.0 | 19.0 | 19.0 |
| | Nominal | 19.0 | 18.0 | 18.0 | 18.0 |
| **UMTS Band 2 (1900 MHz)** | | | | | |
| Power Level | | Modulated Average Output Power | | | |
| | | 3GPP WCDMA Rel 99 | 3GPP HSDPA Rel 5 | 3GPP HSUPA Rel 6 | 3GPP DC-HSDPA Rel 8 |
| Pmax | Max Allowed Power | 24.7 | 23.7 | 23.7 | 23.7 |
| | Nominal | 23.7 | 22.7 | 22.7 | 22.7 |
| DSI = 0 (Body-Worn or Phablet Max) | Max Allowed Power | 24.7 | 23.7 | 23.7 | 23.7 |
| | Nominal | 23.7 | 22.7 | 22.7 | 22.7 |
| DSI = 1 (Phablet Reduced) | Max Allowed Power | 20.0 | 19.0 | 19.0 | 19.0 |
| | Nominal | 19.0 | 18.0 | 18.0 | 18.0 |
| DSI = 2 (Head) | Max Allowed Power | 24.7 | 23.7 | 23.7 | 23.7 |
| | Nominal | 23.7 | 22.7 | 22.7 | 22.7 |
| DSI = 3 (Hotspot) | Max Allowed Power | 20.0 | 19.0 | 19.0 | 19.0 |
| | Nominal | 19.0 | 18.0 | 18.0 | 18.0 |
| DSI = 4 (Earjack) | Max Allowed Power | 20.0 | 19.0 | 19.0 | 19.0 |
| | Nominal | 19.0 | 18.0 | 18.0 | 18.0 |

| Mode / Band | Antenna | | Modulated Average Output Power (in dBm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Pmax | DSI =0 (Body-Worn or Phablet Max) | DSI =1 (Phablet Reduced) | DSI =2 (Head) | DSI =3 (Hotspot) | DSI =4 (Earjack) |
| LTE Band 12 | A | Max Allowed Power | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 |
| | | Nominal | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 |
| LTE Band 17 | A | Max Allowed Power | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 |
| | | Nominal | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 |
| LTE Band 13 | A | Max Allowed Power | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 |
| | | Nominal | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 |
| LTE Band 26 (Cell) | A | Max Allowed Power | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| | | Nominal | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 |
| LTE Band 5 (Cell) | A | Max Allowed Power | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| | | Nominal | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 |
| LTE Band 66 (AWS) | A | Max Allowed Power | 23.8 | 23.8 | 19.3 | 23.8 | 19.3 | 19.3 |
| | | Nominal | 22.8 | 22.8 | 18.3 | 22.8 | 18.3 | 18.3 |
| LTE Band 4 (AWS) | A | Max Allowed Power | 23.8 | 23.8 | 19.3 | 23.8 | 19.3 | 19.3 |
| | | Nominal | 22.8 | 22.8 | 18.3 | 22.8 | 18.3 | 18.3 |
| LTE Band 4 (AWS) | F | Max Allowed Power | 22.0 | 22.0 | 22.0 | 17.0 | 17.0 | 22.0 |
| | | Nominal | 21.0 | 21.0 | 21.0 | 16.0 | 16.0 | 21.0 |
| LTE Band 25 (PCS) | A | Max Allowed Power | 23.5 | 23.5 | 19.0 | 23.5 | 19.0 | 19.0 |
| | | Nominal | 22.5 | 22.5 | 18.0 | 22.5 | 18.0 | 18.0 |
| LTE Band 2 (PCS) | A | Max Allowed Power | 23.5 | 23.5 | 19.0 | 23.5 | 19.0 | 19.0 |
| | | Nominal | 22.5 | 22.5 | 18.0 | 22.5 | 18.0 | 18.0 |
| LTE Band 41 (PC3) | B | Max Allowed Power | 25.0 | 25.0 | 23.0 | 25.0 | 23.0 | 23.0 |
| | | Nominal | 24.0 | 24.0 | 22.0 | 24.0 | 22.0 | 22.0 |
| LTE Band 41 (PC2) | B | Max Allowed Power | 26.5 | 26.5 | 24.6 | 26.5 | 24.6 | 24.6 |
| | | Nominal | 25.5 | 25.5 | 23.6 | 25.5 | 23.6 | 23.6 |

| Mode / Band | Antenna | | Modulated Average Output Power (in dBm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Pmax | DSI =0 (Body-Worn or Phablet Max) | DSI =1 (Phablet Reduced) | DSI =2 (Head) | DSI =3 (Hotspot) | DSI =4 (Earjack) |
| NR Band n5 (Cell) | A | Max Allowed Power | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| | | Nominal | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 | 23.0 |
| NR Band n66 (AWS) | A | Max Allowed Power | 25.0 | 25.0 | 21.0 | 25.0 | 21.0 | 21.0 |
| | | Nominal | 24.0 | 24.0 | 20.0 | 24.0 | 20.0 | 20.0 |
| NR Band n66 (AWS) | F | Max Allowed Power | 23.0 | 23.0 | 23.0 | 19.0 | 23.0 | 23.0 |
| | | Nominal | 22.0 | 22.0 | 22.0 | 18.0 | 22.0 | 22.0 |
| NR Band n25 (PCS) | A | Max Allowed Power | 24.5 | 24.5 | 19.5 | 24.5 | 19.5 | 19.5 |
| | | Nominal | 23.5 | 23.5 | 18.5 | 23.5 | 18.5 | 18.5 |
| NR Band n2 (PCS) | A | Max Allowed Power | 24.5 | 24.5 | 19.5 | 24.5 | 19.5 | 19.5 |
| | | Nominal | 23.5 | 23.5 | 18.5 | 23.5 | 18.5 | 18.5 |
| NR Band n41 SRS 1 | F | Max Allowed Power | 25.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 |
| | | Nominal | 24.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| NR Band n41 SRS 2 | B | Max Allowed Power | 21.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| | | Nominal | 20.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| NR Band n41 SRS 3 | E | Max Allowed Power | 20.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| | | Nominal | 19.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 |
| NR Band n41 SRS 4 | D | Max Allowed Power | 17.5 | 11.5 | 11.5 | 11.5 | 11.5 | 11.5 |
| | | Nominal | 16.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 |
| NR Band n77 DoD SRS 1 | G | Max Allowed Power | 24.5 | 18.5 | 18.5 | 14.0 | 18.5 | 18.5 |
| | | Nominal | 23.5 | 17.5 | 17.5 | 13.0 | 17.5 | 17.5 |
| NR Band n77 DoD SRS 2 | C | Max Allowed Power | 20.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| | | Nominal | 19.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 |
| NR Band n77 DoD SRS 3 | H | Max Allowed Power | 22.5 | 16.5 | 16.5 | 12.0 | 16.5 | 16.5 |
| | | Nominal | 21.5 | 15.5 | 15.5 | 11.0 | 15.5 | 15.5 |
| NR Band n77 DoD SRS 4 | D | Max Allowed Power | 20.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| | | Nominal | 19.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 |
| NR Band n77 SRS 1 | G | Max Allowed Power | 24.5 | 18.5 | 18.5 | 14.0 | 18.5 | 18.5 |
| | | Nominal | 23.5 | 17.5 | 17.5 | 13.0 | 17.5 | 17.5 |
| NR Band n77 SRS 2 | C | Max Allowed Power | 20.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| | | Nominal | 19.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 |
| NR Band n77 SRS 3 | H | Max Allowed Power | 22.5 | 16.5 | 16.5 | 12.0 | 16.5 | 16.5 |
| | | Nominal | 21.5 | 15.5 | 15.5 | 11.0 | 15.5 | 15.5 |
| NR Band n77 SRS 4 | D | Max Allowed Power | 20.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| | | Nominal | 19.0 | 13.0 | 13.0 | 13.0 | 13.0 | 13.0 |

For LTE and NR TDD, the above powers listed are TDD burst average values.

### 1.4.2 5 GHz Reduced SISO/MIMO WLAN Output Power

The below table is applicable in the following conditions:

• Simultaneous conditions with 2.4 GHz WLAN and/or 5G NR

| Mode | Band | IEEE 802.11 (in dBm) SISO Antenna 1 & Antenna 2 | | | | | | | | IEEE 802.11 (in dBm) MIMO | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | a | | n | | ac | | ax (SU) | | a (CDD + STBC) | | n (CDD + STBC, SDM) | | ac (CDD + STBC, SDM) | | ax (SU) (CDD + STBC, SDM) | |
| | | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum | Nominal | Maximum |
| 5 GHz WIFI (20MHz BW) | UNII-1 | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-2A | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-2C | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-3 | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-4 | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 |
| 5 GHz WIFI (40MHz BW) | UNII-1 | | | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | | | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-2A | | | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | | | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-2C | | | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | | | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-3 | | | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | | | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-4 | | | 12.0 | 13.0 | 12.0 | 13.0 | 12.0 | 13.0 | | | 15.0 | 16.0 | 15.0 | 16.0 | 15.0 | 16.0 |
| 5 GHz WIFI (80MHz BW) | UNII-1 | | | | | 12.0 | 13.0 | 12.0 | 13.0 | | | | | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-2A | | | | | 12.0 | 13.0 | 12.0 | 13.0 | | | | | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-2C | | | | | 12.0 | 13.0 | 12.0 | 13.0 | | | | | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-3 | | | | | 12.0 | 13.0 | 12.0 | 13.0 | | | | | 15.0 | 16.0 | 15.0 | 16.0 |
| | UNII-4 | | | | | 12.0 | 13.0 | 12.0 | 13.0 | | | | | 15.0 | 16.0 | 15.0 | 16.0 |

Only operations relevant to this permissive change were evaluated for compliance. No other target changes have been made. Targets for all other bands/exposure conditions can be found in the original filing.

## 1.5 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. A diagram showing the location of the device antennas can be found in Appendix I. Since the display diagonal dimension of this device is > 150 mm and <200 mm, it is considered a “phablet.”

**Table 1-1**
**Device Edges/Sides for SAR Testing - Legacy**

| Device Sides/Edges for SAR Testing | | | | | | |
|---|---|---|---|---|---|---|
| Mode | Back | Front | Top | Bottom | Right | Left |
| GPRS 1900 | Yes | Yes | No | Yes | Yes | Yes |
| LTE Band 41 | Yes | Yes | No | Yes | No | Yes |
| 5 GHz WLAN Ant 1 | Yes | Yes | Yes | No | No | Yes |
| 5 GHz WLAN MIMO | Yes | Yes | Yes | No | No | Yes |

**Table 1-2**
**Device Edges/Sides for SAR Testing - NR**

| Device Sides/Edges for SAR Testing | | | | | | |
|---|---|---|---|---|---|---|
| | Back | Front | Top | Bottom | Right | Left |
| NR Band n25 (PCS) Antenna A | Yes | Yes | No | Yes | Yes | Yes |
| NR Band n41 Antenna F | Yes | Yes | Yes | No | Yes | No |
| NR Band n41 Antenna B | Yes | Yes | No | Yes | No | Yes |
| NR Band n41 Antenna E | Yes | Yes | Yes | No | No | Yes |
| NR Band n41 Antenna D | Yes | Yes | No | Yes | Yes | No |
| NR Band n77 DoD Antenna G | Yes | Yes | Yes | No | No | Yes |
| NR Band n77 DoD Antenna C | Yes | Yes | No | Yes | No | Yes |
| NR Band n77 DoD Antenna H | Yes | Yes | Yes | No | Yes | Yes |
| NR Band n77 DoD Antenna D | Yes | Yes | No | Yes | Yes | No |
| NR Band n77 Antenna G | Yes | Yes | Yes | No | No | Yes |
| NR Band n77 Antenna C | Yes | Yes | No | Yes | No | Yes |
| NR Band n77 Antenna H | Yes | Yes | Yes | No | Yes | Yes |
| NR Band n77 Antenna D | Yes | Yes | No | Yes | Yes | No |

Note: Particular DUT edges were not required to be evaluated for wireless router SAR or phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 Section III and FCC KDB Publication 648474 D04v01r03. The distances between the transmit antennas and the edges of the device are included in the filing. Additional edges may have been evaluated for simultaneous transmission analysis.

## 1.6 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the device for this model. Therefore, all SAR tests were performed with the device which already incorporates the NFC antenna. A diagram showing the location of the NFC antenna can be found in Appendix I.

## 1.7 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be operating simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06 4.3.2 procedures.

**Table 1-2**
**Simultaneous Transmission Scenarios**

| No. | Capable Transmit Configuration | Head | Body-Worn Accessory | Wireless Router | Phablet | Notes |
|---|---|---|---|---|---|---|
| 1 | GSM voice + 2.4 GHz WLAN MIMO | Yes | Yes | N/A | Yes | |
| 2 | GSM voice + 5 GHz WLAN Ant 1 | Yes | Yes | N/A | Yes | |
| 3 | GSM voice + 5 GHz WLAN MIMO | Yes | Yes | N/A | Yes | |
| 4 | GSM voice + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO | Yes | Yes | N/A | Yes | |
| 5 | GSM voice + 2.4 GHz Bluetooth | Yes^ | Yes | N/A | Yes | ^ Bluetooth Tethering is considered |
| 6 | GSM voice + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 | Yes^ | Yes | N/A | Yes | ^ Bluetooth Tethering is considered |
| 7 | GSM voice + 2.4 GHz Bluetooth + 5 GHz WLAN Ant 1 | Yes^ | Yes | N/A | Yes | ^ Bluetooth Tethering is considered |
| 8 | GSM voice + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO | Yes^ | Yes | N/A | Yes | ^ Bluetooth Tethering is considered |
| 9 | GSM voice + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 | Yes^ | Yes | N/A | Yes | ^ Bluetooth Tethering is considered |
| 10 | GSM voice + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO | Yes^ | Yes | N/A | Yes | ^ Bluetooth Tethering is considered |
| 11 | UMTS + 2.4 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 12 | UMTS + 5 GHz WLAN Ant 1 | Yes | Yes | Yes | Yes | |
| 13 | UMTS + 5 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 14 | UMTS + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 15 | UMTS + 2.4 GHz Bluetooth | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 16 | UMTS + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 17 | UMTS + 2.4 GHz Bluetooth + 5 GHz WLAN Ant 1 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 18 | UMTS + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 19 | UMTS + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 20 | UMTS + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 21 | LTE + 2.4 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 22 | LTE + 5 GHz WLAN Ant 1 | Yes | Yes | Yes | Yes | |
| 23 | LTE + 5 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 24 | LTE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 25 | LTE + 2.4 GHz Bluetooth | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 26 | LTE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 27 | LTE + 2.4 GHz Bluetooth + 5 GHz WLAN Ant 1 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 28 | LTE + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 29 | LTE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 30 | LTE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 31 | LTE + NR | Yes | Yes | N/A | Yes | |
| 32 | LTE + NR + 2.4 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 33 | LTE + NR + 5 GHz WLAN Ant 1 | Yes | Yes | Yes | Yes | |
| 34 | LTE + NR + 5 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 35 | LTE + NR + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 36 | LTE + NR + 2.4 GHz Bluetooth | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 37 | LTE + NR + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 38 | LTE + NR + 2.4 GHz Bluetooth + 5 GHz WLAN Ant 1 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 39 | LTE + NR + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 40 | LTE + NR + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 41 | LTE + NR + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 42 | NR + 2.4 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 43 | NR + 5 GHz WLAN Ant 1 | Yes | Yes | Yes | Yes | |
| 44 | NR + 5 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 45 | NR + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO | Yes | Yes | Yes | Yes | |
| 46 | NR + 2.4 GHz Bluetooth | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 47 | NR + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 48 | NR + 2.4 GHz Bluetooth + 5 GHz WLAN Ant 1 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 49 | NR + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 50 | NR + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 51 | NR + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO | Yes^ | Yes | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 52 | GPRS/EDGE + 2.4 GHz WLAN MIMO | N/A | N/A | Yes | Yes | |
| 53 | GPRS/EDGE + 5 GHz WLAN Ant 1 | N/A | N/A | Yes | Yes | |
| 54 | GPRS/EDGE + 5 GHz WLAN MIMO | N/A | N/A | Yes | Yes | |
| 55 | GPRS/EDGE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO | N/A | N/A | Yes | Yes | |
| 56 | GPRS/EDGE + 2.4 GHz Bluetooth | N/A | N/A | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 57 | GPRS/EDGE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 | N/A | N/A | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 58 | GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WLAN Ant 1 | N/A | N/A | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 59 | GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WLAN MIMO | N/A | N/A | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 60 | GPRS/EDGE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN Ant 1 | N/A | N/A | Yes^ | Yes | ^ Bluetooth Tethering is considered |
| 61 | GPRS/EDGE + 2.4 GHz Bluetooth + 2.4 GHz WLAN Ant 2 + 5 GHz WLAN MIMO | N/A | N/A | Yes^ | Yes | ^ Bluetooth Tethering is considered |

1. 2.4 GHz WLAN Antenna 1 and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.

3. Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
4. 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII2A, U-NII2C, and UNII-4 were not evaluated for wireless router conditions.
5. This device supports 2x2 MIMO Tx for WLAN 802.11a/b/g/n/ac/ax. 802.11a/b/g/n/ac/ax supports CDD and STBC and 802.11n/ac/ax additionally supports SDM.
6. This device supports VoWIFI.
7. This device supports Bluetooth Tethering.
8. This device supports VoLTE.
9. This device supports VoNR
10. LTE + 5G NR FR1 Scenarios are limited to EN-DC combinations with anchor bands as shown in the NR FR1 checklist.

## 1.8 Miscellaneous SAR Test Considerations

### (A) WIFI/BT

There were no changes made to the WIFI and BT operations within this device. Please see original filing for complete evaluation of these operating modes.

### (B) Licensed Transmitter(s)

Only operations relevant to this permissive change were evaluated for compliance. Please see original filing for complete evaluation of all other operating modes. The operational description includes a description of all changed items.

GSM/GPRS/EDGE DTM is not supported for US bands. Therefore, the GSM Voice modes in this report do not transmit simultaneously with GPRS/EDGE Data.

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r04.

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the display diagonal dimension is greater than 150mm and less than 200mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.

This device supports NR 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.

This device supports both Power Class 2 (PC2) and Power Class 3 (PC3) for LTE Band 41. Per May 2017 TCB Workshop Notes, SAR tests were performed with Power Class 3 (given the specific UL/DL limitations for Power Class 2). Additionally, SAR testing for the power class 2 condition was evaluated for the highest configuration in Power Class 3 for each test configuration to confirm the results were scalable linearly (See Section 13)

NR implementation supports SA and NSA mode. In EN-DC mode, NR operates with the LTE Bands shown in the NR FR1 checklist acting as anchor bands. Per FCC guidance, SAR tests for NR Bands and LTE Anchors Bands were performed separately due to limitations in SAR probe calibration factors.

SRS was tested with CW signal per Qualcomm guidance in 80-w2112-4.

## 1.9 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedures)
- FCC KDB Publication 616217 D04v01r02 (Proximity Sensor)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- May 2017 TCB Workshop Notes (LTE 4x4 Downlink MIMO, LTE Band 41 Power Class 2/3)
- April 2019 TCB Workshop Notes (Dynamic Antenna Tuning)

## 1.10 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. 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. The serial numbers used for each test are indicated alongside the results in Section 11.

## 1.11 Bibliography

| Report Type | Report Serial Number |
|---|---|
| RF Exposure Part 0 Test Report | 1M2202030012-06.A3L |
| Original RF Exposure Part 1 Test Report | 1M2109290114-01.A3L (Original Filing) |
| RF Exposure Part 2 Test Report | 1M2202030012-07.A3L |
| Compliance Summary Report | 1M2202030012-08.A3L |

# 2 LTE AND NR INFORMATION

| LTE Information | | | | | |
|---|---|---|---|---|---|
| Form Factor | Portable Handset | | | | |
| Frequency Range of each LTE transmission band | LTE Band 12 (699.7 - 715.3 MHz) | | | | |
| | LTE Band 17 (706.5 - 713.5 MHz) | | | | |
| | LTE Band 13 (779.5 - 784.5 MHz) | | | | |
| | LTE Band 26 (Cell) (814.7 - 848.3 MHz) | | | | |
| | LTE Band 5 (Cell) (824.7 - 848.3 MHz) | | | | |
| | LTE Band 66 (AWS) (1710.7 - 1779.3 MHz) | | | | |
| | LTE Band 4 (AWS) (1710.7 - 1754.3 MHz) | | | | |
| | LTE Band 25 (PCS) (1850.7 - 1914.3 MHz) | | | | |
| | LTE Band 2 (PCS) (1850.7 - 1909.3 MHz) | | | | |
| | LTE Band 41 (2498.5 - 2687.5 MHz) | | | | |
| Channel Bandwidths | LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz | | | | |
| | LTE Band 17: 5 MHz, 10 MHz | | | | |
| | LTE Band 13: 5 MHz, 10 MHz | | | | |
| | LTE Band 26 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz | | | | |
| | LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz | | | | |
| | LTE Band 66 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz | | | | |
| | LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz | | | | |
| | LTE Band 25 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz | | | | |
| | LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz | | | | |
| | LTE Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz | | | | |
| Channel Numbers and Frequencies (MHz) | Low | Low-Mid | Mid | Mid-High | High |
| LTE Band 12: 1.4 MHz | 699.7 (23017) | | 707.5 (23095) | 715.3 (23173) | |
| LTE Band 12: 3 MHz | 700.5 (23025) | | 707.5 (23095) | 714.5 (23165) | |
| LTE Band 12: 5 MHz | 701.5 (23035) | | 707.5 (23095) | 713.5 (23155) | |
| LTE Band 12: 10 MHz | 704 (23060) | | 707.5 (23095) | 711 (23130) | |
| LTE Band 17: 5 MHz | 706.5 (23755) | | 710 (23790) | 713.5 (23825) | |
| LTE Band 17: 10 MHz | 709 (23780) | | 710 (23790) | 711 (23800) | |
| LTE Band 13: 5 MHz | 779.5 (23205) | | 782 (23230) | 784.5 (23255) | |
| LTE Band 13: 10 MHz | N/A | | 782 (23230) | N/A | |
| LTE Band 26 (Cell): 1.4 MHz | 814.7 (26697) | | 831.5 (26865) | 848.3 (27033) | |
| LTE Band 26 (Cell): 3 MHz | 815.5 (26705) | | 831.5 (26865) | 847.5 (27025) | |
| LTE Band 26 (Cell): 5 MHz | 816.5 (26715) | | 831.5 (26865) | 846.5 (27015) | |
| LTE Band 26 (Cell): 10 MHz | 819 (26740) | | 831.5 (26865) | 844 (26990) | |
| LTE Band 26 (Cell): 15 MHz | 821.5 (26765) | | 831.5 (26865) | 841.5 (26965) | |
| LTE Band 5 (Cell): 1.4 MHz | 824.7 (20407) | | 836.5 (20525) | 848.3 (20643) | |
| LTE Band 5 (Cell): 3 MHz | 825.5 (20415) | | 836.5 (20525) | 847.5 (20635) | |
| LTE Band 5 (Cell): 5 MHz | 826.5 (20425) | | 836.5 (20525) | 846.5 (20625) | |
| LTE Band 5 (Cell): 10 MHz | 829 (20450) | | 836.5 (20525) | 844 (20600) | |
| LTE Band 66 (AWS): 1.4 MHz | 1710.7 (131979) | | 1745 (132322) | 1779.3 (132665) | |
| LTE Band 66 (AWS): 3 MHz | 1711.5 (131987) | | 1745 (132322) | 1778.5 (132657) | |
| LTE Band 66 (AWS): 5 MHz | 1712.5 (131997) | | 1745 (132322) | 1777.5 (132647) | |
| LTE Band 66 (AWS): 10 MHz | 1715 (132022) | | 1745 (132322) | 1775 (132622) | |
| LTE Band 66 (AWS): 15 MHz | 1717.5 (132047) | | 1745 (132322) | 1772.5 (132597) | |
| LTE Band 66 (AWS): 20 MHz | 1720 (132072) | | 1745 (132322) | 1770 (132572) | |
| LTE Band 4 (AWS): 1.4 MHz | 1710.7 (19957) | | 1732.5 (20175) | 1754.3 (20393) | |
| LTE Band 4 (AWS): 3 MHz | 1711.5 (19965) | | 1732.5 (20175) | 1753.5 (20385) | |
| LTE Band 4 (AWS): 5 MHz | 1712.5 (19975) | | 1732.5 (20175) | 1752.5 (20375) | |
| LTE Band 4 (AWS): 10 MHz | 1715 (20000) | | 1732.5 (20175) | 1750 (20350) | |
| LTE Band 4 (AWS): 15 MHz | 1717.5 (20025) | | 1732.5 (20175) | 1747.5 (20325) | |
| LTE Band 4 (AWS): 20 MHz | 1720 (20050) | | 1732.5 (20175) | 1745 (20300) | |
| LTE Band 25 (PCS): 1.4 MHz | 1850.7 (26047) | | 1882.5 (26365) | 1914.3 (26683) | |
| LTE Band 25 (PCS): 3 MHz | 1851.5 (26055) | | 1882.5 (26365) | 1913.5 (26675) | |
| LTE Band 25 (PCS): 5 MHz | 1852.5 (26065) | | 1882.5 (26365) | 1912.5 (26665) | |
| LTE Band 25 (PCS): 10 MHz | 1855 (26090) | | 1882.5 (26365) | 1910 (26640) | |
| LTE Band 25 (PCS): 15 MHz | 1857.5 (26115) | | 1882.5 (26365) | 1907.5 (26615) | |
| LTE Band 25 (PCS): 20 MHz | 1860 (26140) | | 1882.5 (26365) | 1905 (26590) | |
| LTE Band 2 (PCS): 1.4 MHz | 1850.7 (18607) | | 1880 (18900) | 1909.3 (19193) | |
| LTE Band 2 (PCS): 3 MHz | 1851.5 (18615) | | 1880 (18900) | 1908.5 (19185) | |
| LTE Band 2 (PCS): 5 MHz | 1852.5 (18625) | | 1880 (18900) | 1907.5 (19175) | |
| LTE Band 2 (PCS): 10 MHz | 1855 (18650) | | 1880 (18900) | 1905 (19150) | |
| LTE Band 2 (PCS): 15 MHz | 1857.5 (18675) | | 1880 (18900) | 1902.5 (19125) | |
| LTE Band 2 (PCS): 20 MHz | 1860 (18700) | | 1880 (18900) | 1900 (19100) | |
| LTE Band 41: 5 MHz | 2506 (39750) | 2549.5 (40185) | 2593 (40620) | 2636.5 (41055) | 2680 (41490) |
| LTE Band 41: 10 MHz | 2506 (39750) | 2549.5 (40185) | 2593 (40620) | 2636.5 (41055) | 2680 (41490) |
| LTE Band 41: 15 MHz | 2506 (39750) | 2549.5 (40185) | 2593 (40620) | 2636.5 (41055) | 2680 (41490) |
| LTE Band 41: 20 MHz | 2506 (39750) | 2549.5 (40185) | 2593 (40620) | 2636.5 (41055) | 2680 (41490) |
| UE Category | DL UE Cat 20, UL UE Cat 18 | | | | |
| Modulations Supported in UL | QPSK, 16QAM, 64QAM, 256QAM | | | | |
| LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3~6.2.5? (manufacturer attestation to be provided) | YES | | | | |
| A-MPR (Additional MPR) disabled for SAR Testing? | YES | | | | |
| LTE Carrier Aggregation Possible Combinations | The technical description includes all the possible carrier aggregation combinations | | | | |
| LTE Additional Information | This device does not support full CA features on 3GPP Release 15. It supports carrier aggregation, downlink MIMO features as shown in Appendix I in the original filing. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 15 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, WIFI Offloading, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA. | | | | |

| NR Information | | | | | | |
|---|---|---|---|---|---|---|
| Form Factor | Portable Handset | | | | | |
| | NR Band n5 (Cell) (826.5 - 846.5 MHz) | | | | | |
| | NR Band n66 (AWS) (1712.5 - 1777.5 MHz) | | | | | |
| | NR Band n25 (PCS) (1852.5 - 1912.5 MHz) | | | | | |
| | NR Band n2 (PCS) (1852.5 - 1907.5 MHz) | | | | | |
| | NR Band n41 (2506.02 - 2679.99 MHz) | | | | | |
| | NR Band n77 DoD (3455.01 - 3544.98 MHz) | | | | | |
| | NR Band n77 (3705 - 3975 MHz) | | | | | |
| Channel Bandwidths | NR Band n5 (Cell): 5 MHz, 10 MHz, 15 MHz, 20 MHz | | | | | |
| | NR Band n66 (AWS): 5 MHz, 10 MHz, 15 MHz, 20 MHz | | | | | |
| | NR Band n25 (PCS): 5 MHz, 10 MHz, 15 MHz, 20 MHz | | | | | |
| | NR Band n2 (PCS): 5 MHz, 10 MHz, 15 MHz, 20 MHz | | | | | |
| | NR Band n41: 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 80 MHz, 90 MHz, 100 MHz | | | | | |
| | NR Band n77 DoD: 10 MHz, 15 MHz, 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 70 MHz, 80 MHz, 90 MHz, 100 MHz | | | | | |
| | NR Band n77: 10 MHz, 15 MHz, 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 70 MHz, 80 MHz, 90 MHz, 100 MHz | | | | | |
| Channel Numbers and Frequencies (MHz) | | | | | | |
| NR Band n5 (Cell): 5 MHz | 826.5 (165300) | | 836.5 (167300) | | 846.5 (169300) | |
| NR Band n5 (Cell): 10 MHz | 829 (165800) | | 836.5 (167300) | | 844 (168800) | |
| NR Band n5 (Cell): 15 MHz | 831.5 (166300) | | 836.5 (167300) | | 841.5 (168300) | |
| NR Band n5 (Cell): 20 MHz | 834 (166800) | | 836.5 (167300) | | 839 (167800) | |
| NR Band n66 (AWS): 5 MHz | 1712.5 (342500) | | 1745 (349000) | | 1777.5 (355500) | |
| NR Band n66 (AWS): 10 MHz | 1715 (343000) | | 1745 (349000) | | 1775 (355000) | |
| NR Band n66 (AWS): 15 MHz | 1717.5 (343500) | | 1745 (349000) | | 1772.5 (354500) | |
| NR Band n66 (AWS): 20 MHz | 1720 (344000) | | 1745 (349000) | | 1770 (354000) | |
| NR Band n25 (PCS): 5 MHz | 1852.5 (370500) | | 1882.5 (376500) | | 1912.5 (382500) | |
| NR Band n25 (PCS): 10 MHz | 1855 (371000) | | 1882.5 (376500) | | 1910 (382000) | |
| NR Band n25 (PCS): 15 MHz | 1857.5 (371500) | | 1882.5 (376500) | | 1907.5 (381500) | |
| NR Band n25 (PCS): 20 MHz | 1860 (372000) | | 1882.5 (376500) | | 1905 (381000) | |
| NR Band n2 (PCS): 5 MHz | 1852.5 (370500) | | 1880 (376000) | | 1907.5 (381500) | |
| NR Band n2 (PCS): 10 MHz | 1855 (371000) | | 1880 (376000) | | 1905 (381000) | |
| NR Band n2 (PCS): 15 MHz | 1857.5 (371500) | | 1880 (376000) | | 1902.5 (380500) | |
| NR Band n2 (PCS): 20 MHz | 1860 (372000) | | 1880 (376000) | | 1900 (380000) | |
| NR Band n41: 20 MHz | 2506.02 (501204) | 2549.49 (509898) | 2592.99 (518598) | | 2636.49 (527298) | 2679.99 (535998) |
| NR Band n41: 30 MHz | 2511 (502200) | 2552.01 (510402) | 2592.99 (518598) | | 2634 (526800) | 2674.98 (534996) |
| NR Band n41: 40 MHz | 2516.01 (503202) | 2567.34 (513468) | N/A | | 2618.67 (523734) | 2670 (534000) |
| NR Band n41: 50 MHz | 2521.02 (504204) | | 2592.99 (518598) | | 2664.99 (532998) | |
| NR Band n41: 60 MHz | 2526 (505200) | | 2592.99 (518598) | | 2659.98 (531996) | |
| NR Band n41: 80 MHz | 2536.02 (507204) | | N/A | | 2649.99 (529998) | |
| NR Band n41: 90 MHz | 2541 (508200) | | N/A | | 2644.98 (528996) | |
| NR Band n41: 100 MHz | 2546.01 (509202) | | 2592.99 (518598) | | 2640 (528000) | |
| NR Band n77 DoD: 10 MHz | 3455.01 (630334) | | 3500.01 (633334) | | 3544.98 (636332) | |
| NR Band n77 DoD: 15 MHz | 3457.5 (630500) | | 3500.01 (633334) | | 3542.49 (636166) | |
| NR Band n77 DoD: 20 MHz | 3460.02 (630668) | | 3500.01 (633334) | | 3540 (636000) | |
| NR Band n77 DoD: 30 MHz | 3465 (631000) | | 3500.01 (633334) | | 3534.99 (635666) | |
| NR Band n77 DoD: 40 MHz | 3470.01 (631334) | | N/A | | 3470.01 (631334) | |
| NR Band n77 DoD: 50 MHz | 3475.02 (631668) | | N/A | | 3475.02 (631668) | |
| NR Band n77 DoD: 60 MHz | N/A | | 3500.01(633334) | | N/A | |
| NR Band n77 DoD: 70 MHz | N/A | | 3500.01(633334) | | N/A | |
| NR Band n77 DoD: 80 MHz | N/A | | 3500.01(633334) | | N/A | |
| NR Band n77 DoD: 90 MHz | N/A | | 3500.01(633334) | | N/A | |
| NR Band n77 DoD: 100 MHz | N/A | | 3500.01(633334) | | N/A | |
| NR Band n77: 10 MHz | 3705 (647000) | 3759 (650600) | 3813 (654200) | 3867 (657800) | 3921 (661400) | 3975 (665000) |
| NR Band n77: 15 MHz | 3707.52 (647168) | 3760.5 (650700) | 3813.51 (654234) | 3866.49 (657766) | 3919.5 (661300) | 3972.48 (664832) |
| NR Band n77: 20 MHz | 3710.01 (647334) | 3762 (650800) | 3813.99 (654266) | 3866.01 (657734) | 3918 (661200) | 3969.99 (664666) |
| NR Band n77: 30 MHz | 3715.02 (647668) | 3765 (651000) | 3815.01 (654334) | 3864.99 (657666) | 3915 (661000) | 3964.98 (664332) |
| NR Band n77: 40 MHz | 3720 (648000) | 3768 (651200) | 3816 (654400) | 3864 (657600) | 3912 (660800) | 3960 (664000) |
| NR Band n77: 50 MHz | 3725.01 (648334) | 3782.49 (652166) | 3840 (656000) | | 3897.51 (659834) | 3954.99 (663666) |
| NR Band n77: 60 MHz | 3730.02 (648668) | 3803.34 (653556) | N/A | N/A | 3876.66 (658444) | 3949.98 (663332) |
| NR Band n77: 70 MHz | 3735 (649000) | 3804.99 (653666) | N/A | | 3875.01 (658334) | 3945 (663000) |
| NR Band n77: 80 MHz | 3740.01 (649334) | N/A | 3840 (656000) | | N/A | 3939.99 (662666) |
| NR Band n77: 90 MHz | 3745.02 (649668) | N/A | 3840 (656000) | | N/A | 3934.98 (662332) |
| NR Band n77: 100 MHz | 3750 (650000) | N/A | N/A | N/A | N/A | 3930 (662000) |
| SCS for NR Band n5/n66/n25/n2 | 15 kHz | | | | | |
| SCS for NR Band n41/n77 | 30 kHz | | | | | |
| Modulations Supported in UL | DFT-s-OFDM: π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM<br>CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM | | | | | |
| A-MPR (Additional MPR) disabled for SAR Testing? | YES | | | | | |
| EN-DC Carrier Aggregation Possible Combinations | The technical description includes all the possible carrier aggregation combinations | | | | | |
| LTE Anchor Bands for NR Band n5 (Cell) | LTE Band 2/66 | | | | | |
| LTE Anchor Bands for NR Band n66 (AWS) | LTE Band 2/5/12/13 | | | | | |
| LTE Anchor Bands for NR Band n25 (PCS) | LTE Band 12/13 | | | | | |
| LTE Anchor Bands for NR Band n2 (PCS) | LTE Band 5/12/13 | | | | | |
| LTE Anchor Bands for NR Band n41 | LTE Band 4/12/66 | | | | | |
| LTE Anchor Bands for NR Band n77 | LTE Band 2/5/12/13/25/66 | | | | | |

# 3 INTRODUCTION

The FCC and Innovation, Science, and Economic Development Canada have adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 and Health Canada Safety Code 6 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. [1]

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [22]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," Report No. Vol 74. 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.

## 3.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density ($\rho$). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 3-1).

**Equation 3-1**
**SAR Mathematical Equation**

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

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

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

where:

$\sigma$ = conductivity of the tissue-simulating material (S/m)
$\rho$ = mass density of the tissue-simulating material (kg/m$^3$)
E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

# 4 DOSIMETRIC ASSESSMENT

## 4.1 Measurement Procedure

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

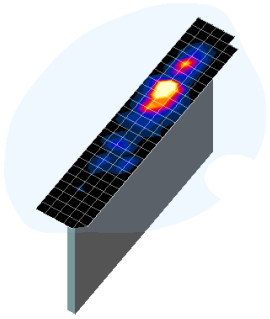


**Figure 4-1**
**Sample SAR Area Scan**

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):

   a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).

   b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.

   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

**Table 4-1**
**Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04***

| Frequency | Maximum Area Scan Resolution (mm) ($\Delta x_{area}$, $\Delta y_{area}$) | Maximum Zoom Scan Resolution (mm) ($\Delta x_{zoom}$, $\Delta y_{zoom}$) | Maximum Zoom Scan Spatial Resolution (mm) | | | Minimum Zoom Scan Volume (mm) (x,y,z) |
|---|---|---|---|---|---|---|
| | | | Uniform Grid | Graded Grid | | |
| | | | $\Delta z_{zoom}(n)$ | $\Delta z_{zoom}(1)$* | $\Delta z_{zoom}(n>1)$* | |
| ≤ 2 GHz | ≤ 15 | ≤ 8 | ≤ 5 | ≤ 4 | ≤ 1.5*$\Delta z_{zoom}$(n-1) | ≥ 30 |
| 2-3 GHz | ≤ 12 | ≤ 5 | ≤ 5 | ≤ 4 | ≤ 1.5*$\Delta z_{zoom}$(n-1) | ≥ 30 |
| 3-4 GHz | ≤ 12 | ≤ 5 | ≤ 4 | ≤ 3 | ≤ 1.5*$\Delta z_{zoom}$(n-1) | ≥ 28 |
| 4-5 GHz | ≤ 10 | ≤ 4 | ≤ 3 | ≤ 2.5 | ≤ 1.5*$\Delta z_{zoom}$(n-1) | ≥ 25 |
| 5-6 GHz | ≤ 10 | ≤ 4 | ≤ 2 | ≤ 2 | ≤ 1.5*$\Delta z_{zoom}$(n-1) | ≥ 22 |

*Also compliant to IEEE 1528-2013 Table 6

# 5 DEFINITION OF REFERENCE POINTS

## 5.1 EAR REFERENCE POINT

Figure 5-2 shows the front, back and side views of the SAM Twin Phantom. The point "M" is the reference point for the center of the mouth, "LE" is the left ear reference point (ERP), and "RE" is the right ERP. The ERP is 15mm posterior to the entrance to the ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 5-1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front), also called the Reference Pivoting Line, is not perpendicular to the reference plane (see Figure 5-1). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning [5].

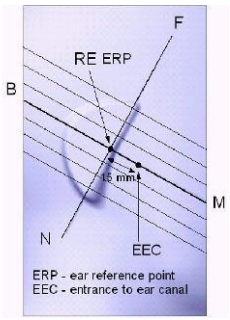



**Figure 5-1**
**Close-Up Side view of ERP**

## 5.2 HANDSET REFERENCE POINTS

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the acoustic output located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (See Figure 5-3). The acoustic output was than located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at its top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.


**Figure 5-2**
**Front, back and side view of SAM Twin Phantom**

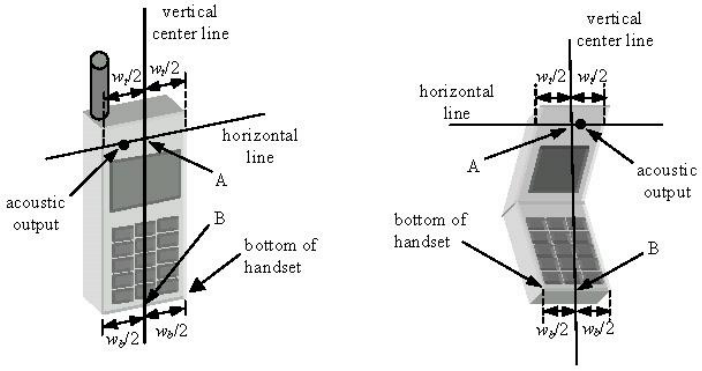



**Figure 5-3**
**Handset Vertical Center & Horizontal Line Reference Points**

# 6 TEST CONFIGURATION POSITIONS

## 6.1 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ = 0.02.

## 6.2 Positioning for Cheek

1. The test device was positioned with the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 6-1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

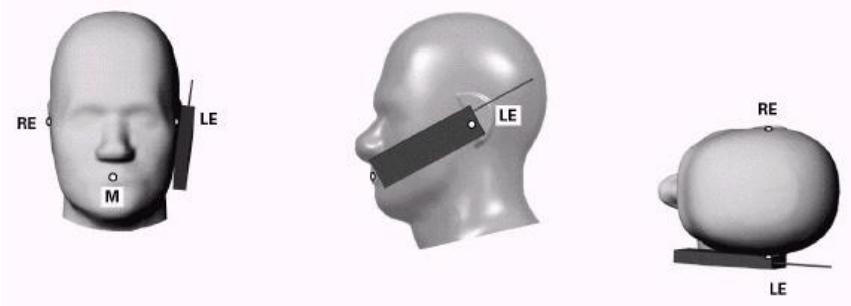



**Figure 6-1 Front, Side and Top View of Cheek Position**

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the reference plane.
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical was respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the device contact with the ear, the device was rotated about the NF line until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 6-2).

## 6.3 Positioning for Ear / 15º Tilt

With the test device aligned in the “Cheek Position”:

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. In this situation, the tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 6-2).

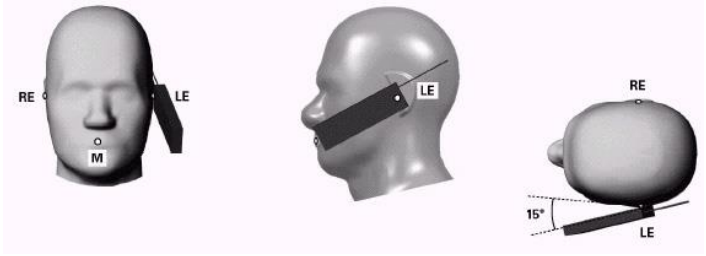



**Figure 6-2 Front, Side and Top View of Ear/15º Tilt Position**

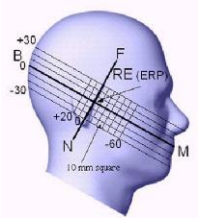



**Figure 6-3**
**Side view w/ relevant markings**

## 6.4 SAR Evaluations near the Mouth/Jaw Regions of the SAM Phantom

Antennas located near the bottom of a phone may require SAR measurements around the mouth and jaw regions of the SAM head phantom. This typically applies to clam-shell style phones that are generally longer in the unfolded normal use positions or to certain older style long rectangular phones. Per IEEE 1528-2013, a rotated SAM phantom is necessary to allow probe access to such regions. Both SAM heads of the TwinSAM-Chin20 are rotated 20 degrees around the NF line. Each head can be removed from the table for emptying and cleaning.

Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document FCC KDB Publication 648474 D04v01r03. The SAR required in these regions of SAM should be measured using a flat phantom. The phone should be positioned with a separation distance of 4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell. While maintaining this distance at the ERP location, the low (bottom) edge of the phone should be lowered from the phantom to establish the same separation distance between the peak SAR location identified by the truncated partial SAR distribution measured with the SAM phantom. The distance from the peak SAR location to the phone is determined by the straight line passing perpendicularly through the phantom surface. When it is not feasible to maintain 4 mm separation at the ERP while also establishing the required separation at the peak SAR location, the top edge of the phone will be allowed to touch the phantom with a separation < 4 mm at the ERP. The phone should not be tilted to the left or right while placed in this inclined position to the flat phantom.

## 6.5 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6-4). Per FCC KDB Publication 648474 D04v01r03, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

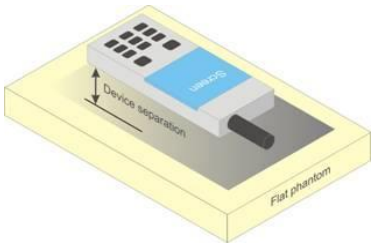



**Figure 6-4**
**Sample Body-Worn Diagram**

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not

contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.
Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

## 6.6 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1g body and 10g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

Per KDB Publication 447498 D01v06, Cell phones (handsets) are not normally designed to be used on extremities or operated in extremity only exposure conditions. The maximum output power levels of handsets generally do not require extremity SAR testing to show compliance. Therefore, extremity SAR was not evaluated for this device.

## 6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

## 6.8 Phablet Configurations

For smart phones with a display diagonal dimension > 150 mm or an overall diagonal dimension > 160 mm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that

support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna <=25 mm from that surface or edge, in direct contact with the phantom, for 10g SAR. The UMPC mini-tablet 1g SAR at 5 mm is not required. When hotspot mode applies, 10g SAR is required only for the surfaces and edges with hotspot mode 1g SAR > 1.2 W/kg.

## 6.9 Proximity Sensor Considerations

This device uses a power reduction mechanism to reduce output powers in certain use conditions when the device is used close the user's body.

When the device's antenna is within a certain distance of the user, the sensor activates and reduces the maximum allowed output power. However, the sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, additional evaluation is needed in the vicinity of the triggering distance to ensure SAR is compliant when the device is allowed to operate at a non-reduced output power level. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional test positions. Sensor triggering distance summary data is included in Appendix G of the original filing

The sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the sensor entirely covers the antennas.

# 7 RF EXPOSURE LIMITS

## 7.1 Uncontrolled Environment

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

## 7.2 Controlled Environment

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

**Table 7-1**
**SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6**

| HUMAN EXPOSURE LIMITS | | |
|---|---|---|
| | UNCONTROLLED ENVIRONMENT *General Population* (W/kg) or (mW/g) | CONTROLLED ENVIRONMENT *Occupational* (W/kg) or (mW/g) |
| **Peak Spatial Average SAR** Head | 1.6 | 8.0 |
| **Whole Body SAR** | 0.08 | 0.4 |
| **Peak Spatial Average SAR** Hands, Feet, Ankle, Wrists, etc. | 4.0 | 20 |

1. The Spatial Peak value of the SAR averaged over any 1 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.

# 8 FCC MEASUREMENT PROCEDURES

Power measurements for licensed transmitters are performed using a base station simulator under digital average power.

## 8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, 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. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

## 8.2 3G SAR Test Reduction Procedure

In FCC KDB Publication 941225 D01v03r01, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

## 8.3 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01v03r01 “3G SAR Measurement Procedures.”

The device is placed into a simulated call using a base station simulator in a RF shielded chamber. Establishing connections in this manner ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. Devices under test are evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power. In order to verify that the device is tested throughout the SAR test at maximum output power, the SAR measurement system measures a “point SAR” at an arbitrary reference point at the start and end of the 1 gram SAR evaluation, to assess for any power drifts during the evaluation. If the power drift deviates by more than 5%, the SAR test and drift measurements are repeated.

## 8.4 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r04 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are 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).

### 8.4.1 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.

### 8.4.2 MPR

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.

### 8.4.3 A-MPR

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

### 8.4.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

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 Sections 5.2.1 through 5.2.3 is less than or equal to ½ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is <1.45 W/kg.

### 8.4.5 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.

## 8.5 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v02r02 for more details.

### 8.5.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters.

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

### 8.5.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is > 1.2 W/kg. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

### 8.5.3 U-NII-2C and U-NII-3

The frequency range covered by U-NII-2C and U-NII-3 is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification. Unless band gap channels are permanently disabled, SAR must be considered for these channels. Each band is tested independently according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

### 8.5.4 Initial Test Position Procedure

For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

### 8.5.5 OFDM Transmission Mode and SAR Test Channel Selection

When the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11ac or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. Per April 2019 TCB Workshop guidance, 802.11ax was considered the highest order 802.11 mode. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

### 8.5.6 Initial Test Configuration Procedure

For OFDM, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order IEEE 802.11 mode. The channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤ 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements (See Section 8.5.5). When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

### 8.5.7 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg, no additional SAR tests for the subsequent test configurations are required. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

### 8.5.8 MIMO SAR considerations

Per KDB Publication 248227 D01v02r02, the simultaneous SAR provisions in KDB Publication 447498 D01v06 should be applied to determine simultaneous transmission SAR test exclusion for WIFI MIMO. If the sum of 1g single transmission chain SAR measurements is <1.6 W/kg, no additional SAR measurements for MIMO are required. Alternatively, SAR for MIMO can be measured with all antennas transmitting simultaneously at the specified maximum output power of MIMO operation. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

# 9 RF CONDUCTED POWERS

## 9.1 GSM Conducted Powers

**Table 9-1**
**Measured $P_{Limit}$ for DSI = 1 (Phablet with grip sensor active), or DSI = 3 (Hotspot mode active) and/or DSI = 4 (Earjack Active)**

| Maximum Burst-Averaged Output Power | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *Voice* | *GPRS/EDGE Data (GMSK)* | | | | *EDGE Data (8-PSK)* | | | |
| **Band** | **Channel** | **GSM [dBm] CS (1 Slot)** | **GPRS [dBm] 1 Tx Slot** | **GPRS [dBm] 2 Tx Slot** | **GPRS [dBm] 3 Tx Slot** | **GPRS [dBm] 4 Tx Slot** | **EDGE [dBm] 1 Tx Slot** | **EDGE [dBm] 2 Tx Slot** | **EDGE [dBm] 3 Tx Slot** | **EDGE [dBm] 4 Tx Slot** |
| **GSM 1900** | 512 | 26.42 | 26.75 | 23.47 | 21.85 | **20.36** | 26.70 | 23.38 | 21.63 | 20.29 |
| | 661 | 26.30 | 26.37 | 23.59 | 21.97 | **20.00** | 26.29 | 23.45 | 21.80 | 19.82 |
| | 810 | 26.66 | 26.83 | 23.31 | 21.38 | **20.46** | 26.77 | 23.25 | 21.23 | 20.33 |

| Calculated Maximum Frame-Averaged Output Power | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *Voice* | *GPRS/EDGE Data (GMSK)* | | | | *EDGE Data (8-PSK)* | | | |
| **Band** | **Channel** | **GSM [dBm] CS (1 Slot)** | **GPRS [dBm] 1 Tx Slot** | **GPRS [dBm] 2 Tx Slot** | **GPRS [dBm] 3 Tx Slot** | **GPRS [dBm] 4 Tx Slot** | **EDGE [dBm] 1 Tx Slot** | **EDGE [dBm] 2 Tx Slot** | **EDGE [dBm] 3 Tx Slot** | **EDGE [dBm] 4 Tx Slot** |
| **GSM 1900** | 512 | 17.22 | 17.55 | 17.28 | 17.42 | **17.18** | 17.50 | 17.19 | 17.20 | 17.11 |
| | 661 | 17.10 | 17.17 | 17.40 | 17.54 | **16.82** | 17.09 | 17.26 | 17.37 | 16.64 |
| | 810 | 17.46 | 17.63 | 17.12 | 16.95 | **17.28** | 17.57 | 17.06 | 16.80 | 17.15 |
| **GSM 1900** | **Frame Avg.Targets:** | 17.80 | 17.80 | 17.81 | 17.77 | **17.82** | 16.80 | 17.81 | 17.57 | 17.82 |

Note:

1. Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
2. GPRS/EDGE (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.
3. EDGE (8-PSK) output powers were measured with MCS7 on the base station simulator. MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing

MCS7 coding scheme will ensure 8-PSK modulation. It has been shown that MCS levels that produce 8-PSK modulation do not have an impact on output power.

**GSM Class:** B
**GPRS Multislot class:** 33 (Max 4 Tx uplink slots)
**EDGE Multislot class:** 33 (Max 4 Tx uplink slots)
**DTM Multislot Class:** N/A


**Figure 9-1**
**Power Measurement Setup**

## 9.2 LTE Conducted Powers

Note: Per FCC KDB Publication 941225 D05v02r05, LTE SAR for the lower bandwidths was not required for testing since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg. Lower bandwidth conducted powers for all LTE bands can be found in Appendix H.

Note: Some LTE bands do not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

### 9.2.1 LTE Band 41

**Table 9-2**
**LTE Band 41 PC3 Measured $P_{Limit}$ for DSI = 1 (Phablet with grip sensor active), or DSI = 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth**

| LTE Band 41 20 MHz Bandwidth | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Modulation | RB Size | RB Offset | Low Channel | Low-Mid Channel | Mid Channel | Mid-High Channel | High Channel | MPR Allowed per 3GPP [dB] | MPR [dB] |
| | | | 39750 (2506.0 MHz) | 40185 (2549.5 MHz) | 40620 (2593.0 MHz) | 41055 (2636.5 MHz) | 41490 (2680.0 MHz) | | |
| | | | Conducted Power [dBm] | | | | | | |
| QPSK | 1 | 0 | 21.30 | 21.16 | 21.13 | 21.14 | 21.01 | 0 | 0 |
| | 1 | 50 | 21.35 | **21.42** | 21.39 | 21.38 | 21.38 | | 0 |
| | 1 | 99 | 21.09 | 21.33 | 21.20 | 21.01 | 21.37 | | 0 |
| | 50 | 0 | 21.24 | 21.26 | 21.43 | 21.40 | 21.33 | 0-1 | 0 |
| | 50 | 25 | 21.21 | **21.53** | 21.52 | 21.51 | 21.50 | | 0 |
| | 50 | 50 | 21.19 | 21.37 | 21.39 | 21.46 | 21.51 | | 0 |
| | 100 | 0 | 21.16 | 21.19 | 21.38 | 21.37 | 21.36 | | 0 |
| 16QAM | 1 | 0 | 21.50 | 21.37 | 21.26 | 21.33 | 21.04 | 0-1 | 0 |
| | 1 | 50 | 21.43 | 21.43 | 21.61 | 21.66 | 21.53 | | 0 |
| | 1 | 99 | 21.22 | 21.47 | 21.37 | 21.16 | 21.54 | | 0 |
| | 50 | 0 | 21.39 | 21.30 | 21.40 | 21.48 | 21.34 | 0-2 | 0 |
| | 50 | 25 | 21.30 | 21.34 | 21.59 | 21.58 | 21.54 | | 0 |
| | 50 | 50 | 21.20 | 21.39 | 21.46 | 21.48 | 21.60 | | 0 |
| | 100 | 0 | 21.23 | 21.22 | 21.45 | 21.54 | 21.50 | | 0 |
| 64QAM | 1 | 0 | 21.29 | 21.42 | 21.36 | 21.40 | 21.25 | 0-2 | 0 |
| | 1 | 50 | 21.34 | 21.46 | 21.58 | 21.58 | 21.63 | | 0 |
| | 1 | 99 | 21.21 | 21.47 | 21.26 | 21.48 | 21.58 | | 0 |
| | 50 | 0 | 20.30 | 20.28 | 20.40 | 20.43 | 20.34 | 0-3 | 1 |
| | 50 | 25 | 20.31 | 20.30 | 20.54 | 20.62 | 20.58 | | 1 |
| | 50 | 50 | 20.19 | 20.43 | 20.50 | 20.46 | 20.59 | | 1 |
| | 100 | 0 | 20.22 | 20.28 | 20.42 | 20.53 | 20.53 | | 1 |
| 256QAM | 1 | 0 | 17.95 | 17.71 | 18.05 | 18.24 | 17.88 | 0-5 | 3 |
| | 1 | 50 | 18.39 | 18.52 | 18.48 | 18.43 | 18.51 | | 3 |
| | 1 | 99 | 17.86 | 17.94 | 18.21 | 18.02 | 18.46 | | 3 |
| | 50 | 0 | 18.25 | 18.18 | 18.43 | 18.41 | 18.30 | | 3 |
| | 50 | 25 | 18.30 | 18.32 | 18.53 | 18.54 | 18.53 | | 3 |
| | 50 | 50 | 18.09 | 18.27 | 18.50 | 18.38 | 18.56 | | 3 |
| | 100 | 0 | 18.23 | 18.17 | 18.41 | 18.42 | 18.43 | | 3 |

**Table 9-3**
**LTE Band 41 PC2 Measured $P_{Limit}$ for DSI = 1 (Phablet with grip sensor active), or DSI = 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth**

| LTE Band 41 20 MHz Bandwidth | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Modulation | RB Size | RB Offset | Low Channel | Low-Mid Channel | Mid Channel | Mid-High Channel | High Channel | MPR Allowed per 3GPP [dB] | MPR [dB] |
| | | | 39750 (2506.0 MHz) | 40185 (2549.5 MHz) | 40620 (2593.0 MHz) | 41055 (2636.5 MHz) | 41490 (2680.0 MHz) | | |
| | | | Conducted Power [dBm] | | | | | | |
| QPSK | 1 | 0 | 23.21 | 23.57 | 23.70 | 23.90 | 23.72 | 0 | 0 |
| | 1 | 50 | 23.30 | 23.70 | 23.85 | 23.77 | 24.15 | | 0 |
| | 1 | 99 | 23.41 | 23.22 | 23.67 | 23.70 | 23.88 | | 0 |
| | 50 | 0 | 23.32 | 23.33 | 23.64 | 23.61 | 23.53 | 0-1 | 0 |
| | 50 | 25 | 23.25 | 23.28 | 23.43 | 23.67 | 23.80 | | 0 |
| | 50 | 50 | 23.33 | 23.22 | 23.35 | 23.66 | 23.75 | | 0 |
| | 100 | 0 | 23.23 | 23.21 | 23.35 | 23.57 | 23.68 | | 0 |


**Figure 9-2**
**Power Measurement Setup**

## 9.3 NR Conducted Powers

Per October 2020 TCB Workshop Guidance, NR FR1 SAR evaluations are being generally based on adapting the existing LTE SAR procedures (FCC KDB Publication 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. Lower bandwidth conducted powers for all NR bands can be found in appendix H.

Note: Some NR bands do not support non-overlapping channels. Per FCC Guidance, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

### 9.3.1 NR Band n25

**Table 9-4**
**NR Band n25 Measured $P_{Max}$ - 20 MHz Bandwidth**

| NR Band n25<br>20 MHz Bandwidth | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Channel | | | MPR Allowed per 3GPP [dB] | MPR [dB] |
| Modulation | RB Size | RB Offset | 372000 (1860 MHz) | 376500 (1882.5 MHz) | 381000 (1905 MHz) | | |
| | | | Conducted Power [dBm] | | | | |
| DFT-s-OFDM π/2 BPSK | 1 | 1 | 23.23 | 23.06 | 23.03 | 0 | 0.0 |
| | 1 | 53 | 23.12 | 23.04 | 23.02 | | 0.0 |
| | 1 | 104 | 23.07 | 22.98 | 22.96 | | 0.0 |
| | 50 | 0 | 22.88 | 22.55 | 22.66 | 0-0.5 | 0.5 |
| | 50 | 28 | 23.32 | 23.06 | 23.01 | 0 | 0.0 |
| | 50 | 56 | 22.80 | 22.58 | 22.65 | 0-0.5 | 0.5 |
| | 100 | 0 | 22.85 | 22.62 | 22.60 | | 0.5 |
| DFT-s-OFDM QPSK | 1 | 1 | 23.02 | 22.78 | 22.80 | 0 | 0.0 |
| | 1 | 53 | **23.03** | 22.80 | 22.83 | | 0.0 |
| | 1 | 104 | 22.97 | 22.80 | 22.82 | | 0.0 |
| | 50 | 0 | 22.32 | 22.07 | 22.15 | 0-1 | 1.0 |
| | 50 | 28 | **23.34** | 23.07 | 23.08 | 0 | 0.0 |
| | 50 | 56 | 22.32 | 22.15 | 22.15 | 0-1 | 1.0 |
| | 100 | 0 | 22.31 | 22.07 | 22.10 | | 1.0 |
| DFT-s-OFDM 16QAM | 1 | 1 | 22.61 | 22.35 | 22.31 | 0-1 | 1.0 |
| CP-OFDM QPSK | 1 | 1 | 21.77 | 21.50 | 21.53 | 0-1.5 | 1.5 |

**Table 9-5**
**NR Band n25 Measured $P_{Limit}$ for DSI = 1 (Phablet with grip sensor active), or DSI = 3 (Hotspot mode active) and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth**

| NR Band n25<br>20 MHz Bandwidth | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Channel | | | MPR Allowed per 3GPP [dB] | MPR [dB] |
| Modulation | RB Size | RB Offset | 372000 (1860 MHz) | 376500 (1882.5 MHz) | 381000 (1905 MHz) | | |
| | | | Conducted Power [dBm] | | | | |
| DFT-s-OFDM π/2 BPSK | 1 | 1 | 18.72 | 18.60 | 18.56 | 0 | 0.0 |
| | 1 | 53 | 18.75 | 18.54 | 18.51 | | 0.0 |
| | 1 | 104 | 18.57 | 18.51 | 18.54 | | 0.0 |
| | 50 | 0 | 18.70 | 18.62 | 18.68 | 0-0.5 | 0.0 |
| | 50 | 28 | 18.72 | 18.63 | 18.71 | 0 | 0.0 |
| | 50 | 56 | 18.69 | 18.63 | 18.58 | 0-0.5 | 0.0 |
| | 100 | 0 | 18.74 | 18.69 | 18.64 | | 0.0 |
| DFT-s-OFDM QPSK | 1 | 1 | 18.51 | 18.52 | 18.52 | 0 | 0.0 |
| | 1 | 53 | 18.51 | 18.53 | 18.53 | | 0.0 |
| | 1 | 104 | **18.70** | 18.51 | 18.51 | | 0.0 |
| | 50 | 0 | 18.72 | 18.64 | 18.67 | 0-1 | 0.0 |
| | 50 | 28 | **18.75** | 18.61 | 18.66 | 0 | 0.0 |
| | 50 | 56 | 18.74 | 18.62 | 18.63 | 0-1 | 0.0 |
| | 100 | 0 | 18.66 | 18.65 | 18.64 | | 0.0 |
| DFT-s-OFDM 16QAM | 1 | 1 | 18.95 | 18.87 | 18.89 | 0-1 | 0.0 |
| CP-OFDM QPSK | 1 | 1 | 18.62 | 18.51 | 18.53 | 0-1.5 | 0.0 |

### 9.3.2 NR Band n41 Antenna F

**Table 9-6**
**NR Band n41 Antenna F Measured $P_{Limit}$ for all DSI levels- 100 MHz Bandwidth**

| NR Band n41 100 MHz Bandwidth | | | | | |
|---|---|---|---|---|---|
| | | | Channel | MPR Allowed per 3GPP [dB] | MPR [dB] |
| Modulation | RB Size | RB Offset | 518598 (2592.99 MHz) Conducted Power [dBm] | | |
| DFT-s-OFDM π/2 BPSK | 1 | 1 | 18.32 | 0 | 0.0 |
| | 1 | 137 | 18.56 | | 0.0 |
| | 1 | 271 | 18.58 | | 0.0 |
| | 135 | 0 | 18.38 | 0-0.5 | 0.0 |
| | 135 | 69 | 18.44 | 0 | 0.0 |
| | 135 | 138 | 18.42 | 0-0.5 | 0.0 |
| | 270 | 0 | 18.45 | | 0.0 |
| DFT-s-OFDM QPSK | 1 | 1 | 18.26 | 0 | 0.0 |
| | 1 | 137 | 18.33 | | 0.0 |
| | 1 | 271 | **18.43** | | 0.0 |
| | 135 | 0 | 18.25 | 0-1 | 0.0 |
| | 135 | 69 | 18.32 | 0 | 0.0 |
| | 135 | 138 | **18.42** | 0-1 | 0.0 |
| | 270 | 0 | 18.41 | | 0.0 |
| DFT-s-OFDM 16QAM | 1 | 1 | 18.26 | 0-1 | 0.0 |
| CP-OFDM QPSK | 1 | 1 | **18.64** | 0-1.5 | 0.0 |

### 9.3.3 NR Band n41 Antenna B

**Table 9-7**
**NR Band n41 Antenna B Measured $P_{Limit}$ for all DSI - 100 MHz Bandwidth**

| NR Band n41 100 MHz Bandwidth | |
|---|---|
| | Channel |
| | 518598 (2592.99 MHz) Conducted Power [dBm] |
| | **14.24** |

### 9.3.4 NR Band n41 Antenna E

**Table 9-8**
**NR Band n41 Antenna E Measured $P_{Limit}$ for all DSI - 100 MHz Bandwidth**

| NR Band n41 100 MHz Bandwidth | |
|---|---|
| | Channel |
| | 518598 (2592.99 MHz) |
| | Conducted Power [dBm] |
| | 13.46 |

### 9.3.5 NR Band n41 Antenna D

**Table 9-9**
**NR Band n41 Antenna D Measured $P_{Limit}$ for all DSI - 100 MHz Bandwidth**

| NR Band n41 100 MHz Bandwidth | |
|---|---|
| | Channel |
| | 518598 (2592.99 MHz) |
| | Conducted Power [dBm] |
| | 10.71 |

### 9.3.6 NR Band n77 DoD Band Antenna G

**Table 9-10**
**NR Band n77 DoD Antenna G Measured $P_{Limit}$ for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active), or DSI= 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active) - 100 MHz Bandwidth**

| NR Band n77<br>100 MHz Bandwidth | | | | | |
|---|---|---|---|---|---|
| | | | Channel | MPR Allowed per 3GPP [dB] | MPR [dB] |
| Modulation | RB Size | RB Offset | 633334 (3500.01 MHz)<br>Conducted Power [dBm] | | |
| DFT-s-OFDM π/2 BPSK | 1 | 1 | 17.42 | 0 | 0.0 |
| | 1 | 137 | 17.53 | | 0.0 |
| | 1 | 271 | 17.76 | | 0.0 |
| | 135 | 0 | 17.46 | 0-0.5 | 0.0 |
| | 135 | 69 | 17.45 | 0 | 0.0 |
| | 135 | 138 | 17.52 | 0-0.5 | 0.0 |
| | 270 | 0 | 17.48 | | 0.0 |
| DFT-s-OFDM QPSK | 1 | 1 | 17.43 | 0 | 0.0 |
| | 1 | 137 | 17.47 | | 0.0 |
| | 1 | 271 | **17.79** | | 0.0 |
| | 135 | 0 | 17.45 | 0-1 | 0.0 |
| | 135 | 69 | 17.45 | 0 | 0.0 |
| | 135 | 138 | **17.46** | 0-1 | 0.0 |
| | 270 | 0 | 17.44 | | 0.0 |
| DFT-s-OFDM 16QAM | 1 | 1 | 17.72 | 0-1 | 0.0 |
| CP-OFDM QPSK | 1 | 1 | **17.31** | 0-1.5 | 0.0 |

**Table 9-11**
**NR Band n77 DoD Antenna G Measured $P_{Limit}$ for DSI = 2 (Head) - 100 MHz Bandwidth**

| NR Band n77 100 MHz Bandwidth | | | | | |
|---|---|---|---|---|---|
| | | | Channel | MPR Allowed per 3GPP [dB] | MPR [dB] |
| Modulation | RB Size | RB Offset | 633334 (3500.01 MHz) Conducted Power [dBm] | | |
| DFT-s-OFDM π/2 BPSK | 1 | 1 | 13.09 | 0 | 0.0 |
| | 1 | 137 | 13.05 | | 0.0 |
| | 1 | 271 | 13.31 | | 0.0 |
| | 135 | 0 | 13.10 | 0-0.5 | 0.0 |
| | 135 | 69 | 13.06 | 0 | 0.0 |
| | 135 | 138 | 13.03 | 0-0.5 | 0.0 |
| | 270 | 0 | 13.08 | | 0.0 |
| DFT-s-OFDM QPSK | 1 | 1 | 13.11 | 0 | 0.0 |
| | 1 | 137 | 13.12 | | 0.0 |
| | 1 | 271 | **13.34** | | 0.0 |
| | 135 | 0 | **13.18** | 0-1 | 0.0 |
| | 135 | 69 | 13.07 | 0 | 0.0 |
| | 135 | 138 | 13.02 | 0-1 | 0.0 |
| | 270 | 0 | 13.06 | | 0.0 |
| DFT-s-OFDM 16QAM | 1 | 1 | 13.17 | 0-1 | 0.0 |
| CP-OFDM QPSK | 1 | 1 | **12.65** | 0-1.5 | 0.0 |

## 9.3.7 NR Band n77 DoD Band Antenna C

**Table 9-12**
**NR Band n77 DoD Antenna C Measured $P_{Limit}$ for all DSI levels - 100 MHz Bandwidth**

| NR Band n77 100 MHz Bandwidth | |
|---|---|
| | Channel |
| | 633334 (3500.01 MHz) Conducted Power [dBm] |
| | **13.32** |

### 9.3.8 NR Band n77 DoD Band Antenna H

**Table 9-13**
**NR Band n77 DoD Antenna H Measured $P_{Limit}$ for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active), or DSI= 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active) - 100 MHz Bandwidth**

| NR Band n77<br>100 MHz Bandwidth | | |
|---|---|---|
| | Channel | |
| | 633334<br>(3500.01 MHz) | |
| | Conducted<br>Power [dBm] | |
| | 15.36 | |

**Table 9-14**
**NR Band n77 DoD Antenna H Measured $P_{Limit}$ for DSI = 2 (Head) - 100MHz Bandwidth**

| NR Band n77<br>100 MHz Bandwidth | | |
|---|---|---|
| | Channel | |
| | 633334<br>(3500.01 MHz) | |
| | Conducted<br>Power [dBm] | |
| | 11.43 | |

### 9.3.9 NR Band n77 DoD Band Antenna D

**Table 9-15**
**NR Band n77 DoD Antenna D Measured $P_{Limit}$ for all DSI levels- 100 MHz Bandwidth**

| NR Band n77 100 MHz Bandwidth | |
|---|---|
| | Channel |
| | 633334 (3500.01 MHz) |
| | Conducted Power [dBm] |
| | 12.82 |

### 9.3.10 NR Band n77 Antenna G

**Table 9-16**
**NR Band n77 Antenna G Measured $P_{Limit}$ for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active), or DSI= 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active) - 100 MHz Bandwidth**

| NR Band n77 100 MHz Bandwidth | | | | | | |
|---|---|---|---|---|---|---|
| | | | Channel | | MPR Allowed per 3GPP [dB] | MPR [dB] |
| Modulation | RB Size | RB Offset | 650000 (3750 MHz) | 662000 (3930 MHz) | | |
| | | | Conducted Power [dBm] | | | |
| DFT-s-OFDM π/2 BPSK | 1 | 1 | 17.01 | 17.19 | 0 | 0.0 |
| | 1 | 137 | 17.34 | 17.54 | | 0.0 |
| | 1 | 271 | 16.79 | 17.27 | | 0.0 |
| | 135 | 0 | 17.48 | 17.33 | 0-0.5 | 0.0 |
| | 135 | 69 | 17.33 | 17.48 | 0 | 0.0 |
| | 135 | 138 | 16.88 | 17.42 | 0-0.5 | 0.0 |
| | 270 | 0 | 17.21 | 17.37 | | 0.0 |
| DFT-s-OFDM QPSK | 1 | 1 | 17.04 | 17.26 | 0 | 0.0 |
| | 1 | 137 | 17.35 | **17.60** | | 0.0 |
| | 1 | 271 | 16.78 | 17.31 | | 0.0 |
| | 135 | 0 | 17.46 | 17.39 | 0-1 | 0.0 |
| | 135 | 69 | 17.33 | **17.53** | 0 | 0.0 |
| | 135 | 138 | 16.88 | 17.48 | 0-1 | 0.0 |
| | 270 | 0 | 17.20 | 17.47 | | 0.0 |
| DFT-s-OFDM 16QAM | 1 | 1 | 17.27 | 17.51 | 0-1 | 0.0 |
| CP-OFDM QPSK | 1 | 1 | 16.92 | **17.25** | 0-1.5 | 0.0 |

**Table 9-17**
**NR Band n77 Antenna G Measured $P_{Limit}$ for DSI = 2 (Head)- 100 MHz Bandwidth**

| NR Band n77<br>100 MHz Bandwidth | | | | | | |
|---|---|---|---|---|---|---|
| | | | Channel | | MPR Allowed per 3GPP [dB] | MPR [dB] |
| Modulation | RB Size | RB Offset | 650000 (3750 MHz) | 662000 (3930 MHz) | | |
| | | | Conducted Power [dBm] | | | |
| DFT-s-OFDM π/2 BPSK | 1 | 1 | 13.21 | 13.34 | 0 | 0.0 |
| | 1 | 137 | 13.20 | 13.30 | | 0.0 |
| | 1 | 271 | 13.25 | 13.28 | | 0.0 |
| | 135 | 0 | 13.15 | 13.29 | 0-0.5 | 0.0 |
| | 135 | 69 | 13.07 | 13.22 | 0 | 0.0 |
| | 135 | 138 | 13.08 | 13.26 | 0-0.5 | 0.0 |
| | 270 | 0 | 13.08 | 13.28 | | 0.0 |
| DFT-s-OFDM QPSK | 1 | 1 | 13.21 | **13.44** | 0 | 0.0 |
| | 1 | 137 | 13.25 | 13.37 | | 0.0 |
| | 1 | 271 | 13.20 | 13.33 | | 0.0 |
| | 135 | 0 | 13.18 | **13.34** | 0-1 | 0.0 |
| | 135 | 69 | 13.10 | 13.26 | 0 | 0.0 |
| | 135 | 138 | 13.12 | 13.27 | 0-1 | 0.0 |
| | 270 | 0 | 13.08 | 13.27 | | 0.0 |
| DFT-s-OFDM 16QAM | 1 | 1 | 12.96 | 13.30 | 0-1 | 0.0 |
| CP-OFDM QPSK | 1 | 1 | 12.95 | **13.33** | 0-1.5 | 0.0 |

### 9.3.11 NR Band n77 Antenna C

**Table 9-18**
**NR Band n77 Antenna C Measured $P_{Limit}$ for all DSI levels - 100 MHz Bandwidth**

| NR Band n77 100 MHz Bandwidth | | |
|---|---|---|
| | Channel | |
| | 650000 (3750 MHz) | 662000 (3930 MHz) |
| | Conducted Power [dBm] | |
| | 13.26 | 12.65 |

### 9.3.12 NR Band n77 Antenna H

**Table 9-19**
**NR Band n77 Antenna H Measured $P_{Limit}$ for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active), or DSI= 3 (Hotspot Mode), and/or DSI = 4 (Earjack Active) - 100 MHz Bandwidth**

| NR Band n77 100 MHz Bandwidth | | |
|---|---|---|
| | Channel | |
| | 650000 (3750 MHz) | 662000 (3930 MHz) |
| | Conducted Power [dBm] | |
| | 15.78 | 16.05 |

**Table 9-20**
**NR Band n77 Antenna H Measured $P_{Limit}$ for DSI = 2 (Head)- 100 MHz Bandwidth**

| NR Band n77 100 MHz Bandwidth | | |
|---|---|---|
| | Channel | |
| | 650000 (3750 MHz) | 662000 (3930 MHz) |
| | Conducted Power [dBm] | |
| | 11.87 | 12.00 |

## 9.3.13 NR Band n77 Antenna D

**Table 9-21**
**NR Band n77 Antenna D Measured $P_{Limit}$ for all DSI levels - 100 MHz Bandwidth**

| NR Band n77 100 MHz Bandwidth | | |
|---|---|---|
| | Channel | |
| | 650000 (3750 MHz) | 662000 (3930 MHz) |
| | Conducted Power [dBm] | |
| | 12.07 | 13.24 |


**Figure 9-3**
**Power Measurement Setup – NR FDD**

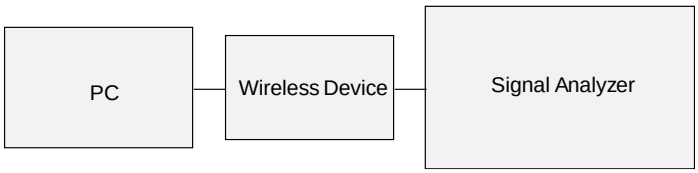



**Figure 9-4**
**Power Measurement Setup – TDD**

## 9.4 WLAN Conducted Powers

**Table 9-22**
**5 GHz WLAN Reduced Average RF Power During Conditions with 2.45 GHz WLAN and/or 5G NR-Antenna 1**

| Freq [MHz] | Channel | IEEE Transmission Mode |
|---|---|---|
| | | 802.11ac |
| | | Average |
| 5210 | 42 | 11.80 |
| 5290 | 58 | 12.01 |
| 5530 | 106 | 11.96 |
| 5610 | 122 | 12.23 |
| 5690 | 138 | 12.19 |
| 5775 | 155 | 12.06 |
| 5855 | 171 | 11.93 |

**Table 9-23**
**5 GHz WLAN Reduced Average RF Power During Conditions with 2.45 GHz WLAN and/or 5G NR-MIMO**

| 5GHz (80MHz) 802.11ac Conducted Power [dBm] | | | | |
|---|---|---|---|---|
| Freq [MHz] | Channel | ANT1 | ANT2 | MIMO |
| 5210 | 42 | 11.80 | 11.76 | 14.79 |
| 5290 | 58 | 12.01 | 12.07 | 15.05 |
| 5530 | 106 | 11.96 | 12.18 | 15.08 |
| 5610 | 122 | 12.23 | 12.34 | 15.30 |
| 5690 | 138 | 12.19 | 12.27 | 15.24 |
| 5775 | 155 | 12.06 | 11.87 | 14.98 |
| 5855 | 171 | 11.93 | 12.02 | 14.99 |

# 10 SYSTEM VERIFICATION

## 10.1 Tissue Verification

**Table 10-1**
**Measured Head Tissue Properties**

| Calibrated for Tests Performed on: | Tissue Type | Tissue Temp During Calibration (°C) | Measured Frequency (MHz) | Measured Conductivity, σ (S/m) | Measured Dielectric Constant, ε | TARGET Conductivity, σ (S/m) | TARGET Dielectric Constant, ε | % dev σ | % dev ε |
|---|---|---|---|---|---|---|---|---|---|
| 02/28/2022 | 1900 Head | 21.1 | 1850 | 1.393 | 40.321 | 1.400 | 40.000 | -0.50% | 0.80% |
| | | | 1860 | 1.403 | 40.290 | 1.400 | 40.000 | 0.21% | 0.72% |
| | | | 1880 | 1.422 | 40.226 | 1.400 | 40.000 | 1.57% | 0.56% |
| | | | 1900 | 1.442 | 40.158 | 1.400 | 40.000 | 3.00% | 0.40% |
| | | | 1905 | 1.446 | 40.139 | 1.400 | 40.000 | 3.29% | 0.35% |
| | | | 1910 | 1.451 | 40.120 | 1.400 | 40.000 | 3.64% | 0.30% |
| 02/16/2022 | 2450 Head | 20.2 | 2300 | 1.731 | 37.828 | 1.670 | 39.500 | 3.65% | -4.23% |
| | | | 2310 | 1.739 | 37.809 | 1.679 | 39.480 | 3.57% | -4.23% |
| | | | 2320 | 1.746 | 37.792 | 1.687 | 39.460 | 3.50% | -4.23% |
| | | | 2400 | 1.810 | 37.661 | 1.756 | 39.289 | 3.08% | -4.14% |
| | | | 2450 | 1.848 | 37.567 | 1.800 | 39.200 | 2.67% | -4.17% |
| | | | 2480 | 1.873 | 37.514 | 1.833 | 39.162 | 2.18% | -4.21% |
| | | | 2500 | 1.889 | 37.481 | 1.855 | 39.136 | 1.83% | -4.23% |
| | | | 2510 | 1.898 | 37.464 | 1.866 | 39.123 | 1.71% | -4.24% |
| | | | 2535 | 1.918 | 37.418 | 1.893 | 39.092 | 1.32% | -4.28% |
| | | | 2550 | 1.931 | 37.387 | 1.909 | 39.073 | 1.15% | -4.32% |
| | | | 2560 | 1.940 | 37.369 | 1.920 | 39.060 | 1.04% | -4.33% |
| | | | 2600 | 1.973 | 37.301 | 1.964 | 39.009 | 0.46% | -4.38% |
| | | | 2650 | 2.014 | 37.185 | 2.018 | 38.945 | -0.20% | -4.52% |
| | | | 2680 | 2.040 | 37.150 | 2.051 | 38.907 | -0.54% | -4.52% |
| | | | 2700 | 2.054 | 37.114 | 2.073 | 38.882 | -0.92% | -4.55% |
| 02/24/2022 | 2450 Head | 21.1 | 2300 | 1.750 | 38.850 | 1.670 | 39.500 | 4.79% | -1.65% |
| | | | 2310 | 1.757 | 38.832 | 1.679 | 39.480 | 4.65% | -1.64% |
| | | | 2320 | 1.764 | 38.816 | 1.687 | 39.460 | 4.56% | -1.63% |
| | | | 2400 | 1.825 | 38.708 | 1.756 | 39.289 | 3.93% | -1.48% |
| | | | 2450 | 1.862 | 38.624 | 1.800 | 39.200 | 3.44% | -1.47% |
| | | | 2480 | 1.886 | 38.572 | 1.833 | 39.162 | 2.89% | -1.51% |
| | | | 2500 | 1.902 | 38.542 | 1.855 | 39.136 | 2.53% | -1.52% |
| | | | 2510 | 1.910 | 38.529 | 1.866 | 39.123 | 2.36% | -1.52% |
| | | | 2535 | 1.929 | 38.487 | 1.893 | 39.092 | 1.90% | -1.55% |
| | | | 2550 | 1.942 | 38.460 | 1.909 | 39.073 | 1.73% | -1.57% |
| | | | 2560 | 1.950 | 38.445 | 1.920 | 39.060 | 1.56% | -1.57% |
| | | | 2600 | 1.983 | 38.384 | 1.964 | 39.009 | 0.97% | -1.60% |
| | | | 2650 | 2.024 | 38.274 | 2.018 | 38.945 | 0.30% | -1.72% |
| | | | 2680 | 2.048 | 38.232 | 2.051 | 38.907 | -0.15% | -1.73% |
| | | | 2700 | 2.063 | 38.192 | 2.073 | 38.882 | -0.48% | -1.77% |
| 02/23/2022 | 3600 Head | 21.6 | 3300 | 2.610 | 38.193 | 2.708 | 38.157 | -3.62% | 0.09% |
| | | | 3350 | 2.643 | 38.078 | 2.759 | 38.100 | -4.20% | -0.06% |
| | | | 3450 | 2.730 | 37.890 | 2.861 | 37.986 | -4.58% | -0.25% |
| | | | 3500 | 2.792 | 37.816 | 2.913 | 37.929 | -4.15% | -0.30% |
| | | | 3550 | 2.826 | 37.700 | 2.964 | 37.871 | -4.66% | -0.45% |
| | | | 3560 | 2.841 | 37.681 | 2.974 | 37.860 | -4.47% | -0.47% |
| | | | 3600 | 2.890 | 37.654 | 3.015 | 37.814 | -4.15% | -0.42% |
| | | | 3650 | 2.921 | 37.545 | 3.066 | 37.757 | -4.73% | -0.56% |
| | | | 3690 | 2.975 | 37.498 | 3.107 | 37.711 | -4.25% | -0.56% |
| | | | 3700 | 2.982 | 37.492 | 3.117 | 37.700 | -4.33% | -0.55% |
| | | | 3750 | 3.018 | 37.376 | 3.169 | 37.643 | -4.76% | -0.71% |
| | | | 3900 | 3.175 | 37.160 | 3.323 | 37.471 | -4.45% | -0.83% |
| | | | 3930 | 3.196 | 37.080 | 3.353 | 37.437 | -4.68% | -0.95% |
| | | | 4100 | 3.375 | 36.822 | 3.528 | 37.243 | -4.34% | -1.13% |
| | | | 4150 | 3.438 | 36.707 | 3.579 | 37.186 | -3.94% | -1.29% |

## Table 10-2
## Measured Body Tissue Properties

| Calibrated for Tests Performed on: | Tissue Type | Tissue Temp During Calibration (°C) | Measured Frequency (MHz) | Measured Conductivity, σ (S/m) | Measured Dielectric Constant, ε | TARGET Conductivity, σ (S/m) | TARGET Dielectric Constant, ε | % dev σ | % dev ε |
|---|---|---|---|---|---|---|---|---|---|
| 02/18/2022 | 1900 Body | 24.1 | 1850 | 1.492 | 51.569 | 1.520 | 53.300 | -1.84% | -3.25% |
| | | | 1860 | 1.500 | 51.510 | 1.520 | 53.300 | -1.32% | -3.36% |
| | | | 1880 | 1.521 | 51.399 | 1.520 | 53.300 | 0.07% | -3.57% |
| | | | 1900 | 1.545 | 51.356 | 1.520 | 53.300 | 1.64% | -3.65% |
| | | | 1905 | 1.551 | 51.357 | 1.520 | 53.300 | 2.04% | -3.65% |
| | | | 1910 | 1.557 | 51.359 | 1.520 | 53.300 | 2.43% | -3.64% |
| 02/21/2022 | 1900 Body | 23.8 | 1850 | 1.526 | 51.003 | 1.520 | 53.300 | 0.39% | -4.31% |
| | | | 1860 | 1.537 | 50.972 | 1.520 | 53.300 | 1.12% | -4.37% |
| | | | 1880 | 1.558 | 50.914 | 1.520 | 53.300 | 2.50% | -4.48% |
| | | | 1900 | 1.579 | 50.857 | 1.520 | 53.300 | 3.88% | -4.58% |
| | | | 1905 | 1.584 | 50.842 | 1.520 | 53.300 | 4.21% | -4.61% |
| | | | 1910 | 1.589 | 50.825 | 1.520 | 53.300 | 4.54% | -4.64% |
| 02/28/2022 | 1900 Body | 24.1 | 1850 | 1.518 | 52.385 | 1.520 | 53.300 | -0.13% | -1.72% |
| | | | 1860 | 1.529 | 52.343 | 1.520 | 53.300 | 0.59% | -1.80% |
| | | | 1880 | 1.551 | 52.258 | 1.520 | 53.300 | 2.04% | -1.95% |
| | | | 1900 | 1.574 | 52.180 | 1.520 | 53.300 | 3.55% | -2.10% |
| | | | 1905 | 1.580 | 52.161 | 1.520 | 53.300 | 3.95% | -2.14% |
| | | | 1910 | 1.585 | 52.142 | 1.520 | 53.300 | 4.28% | -2.17% |
| 03/07/2022 | 1900 Body | 23.2 | 1850 | 1.516 | 51.313 | 1.520 | 53.300 | -0.26% | -3.73% |
| | | | 1860 | 1.526 | 51.280 | 1.520 | 53.300 | 0.39% | -3.79% |
| | | | 1880 | 1.544 | 51.209 | 1.520 | 53.300 | 1.58% | -3.92% |
| | | | 1900 | 1.563 | 51.138 | 1.520 | 53.300 | 2.83% | -4.06% |
| | | | 1905 | 1.568 | 51.123 | 1.520 | 53.300 | 3.16% | -4.08% |
| | | | 1910 | 1.573 | 51.109 | 1.520 | 53.300 | 3.49% | -4.11% |
| 03/07/2022 | 1900 Body | 24.6 | 1850 | 1.479 | 51.999 | 1.520 | 53.300 | -2.70% | -2.44% |
| | | | 1860 | 1.490 | 51.970 | 1.520 | 53.300 | -1.97% | -2.50% |
| | | | 1880 | 1.512 | 51.915 | 1.520 | 53.300 | -0.53% | -2.60% |
| | | | 1900 | 1.535 | 51.849 | 1.520 | 53.300 | 0.99% | -2.72% |
| | | | 1905 | 1.540 | 51.832 | 1.520 | 53.300 | 1.32% | -2.75% |
| | | | 1910 | 1.546 | 51.815 | 1.520 | 53.300 | 1.71% | -2.79% |
| 02/21/2022 | 2450 Body | 25.0 | 2300 | 1.897 | 51.995 | 1.809 | 52.900 | 4.86% | -1.71% |
| | | | 2310 | 1.906 | 51.977 | 1.816 | 52.887 | 4.96% | -1.72% |
| | | | 2320 | 1.914 | 51.961 | 1.826 | 52.873 | 4.82% | -1.72% |
| | | | 2400 | 1.980 | 51.831 | 1.902 | 52.767 | 4.10% | -1.77% |
| | | | 2450 | 2.023 | 51.758 | 1.950 | 52.700 | 3.74% | -1.79% |
| | | | 2480 | 2.047 | 51.720 | 1.993 | 52.662 | 2.71% | -1.79% |
| | | | 2500 | 2.065 | 51.683 | 2.021 | 52.636 | 2.18% | -1.81% |
| | | | 2510 | 2.074 | 51.666 | 2.035 | 52.623 | 1.92% | -1.82% |
| | | | 2535 | 2.097 | 51.634 | 2.071 | 52.592 | 1.26% | -1.82% |
| | | | 2550 | 2.111 | 51.619 | 2.092 | 52.573 | 0.91% | -1.81% |
| | | | 2560 | 2.120 | 51.611 | 2.106 | 52.560 | 0.66% | -1.81% |
| | | | 2600 | 2.155 | 51.558 | 2.163 | 52.509 | -0.37% | -1.81% |
| | | | 2650 | 2.203 | 51.476 | 2.234 | 52.445 | -1.39% | -1.85% |
| | | | 2680 | 2.231 | 51.442 | 2.277 | 52.407 | -2.02% | -1.84% |
| | | | 2700 | 2.247 | 51.406 | 2.305 | 52.382 | -2.52% | -1.86% |
| 02/23/2022 | 2450 Body | 25.0 | 2300 | 1.885 | 52.910 | 1.809 | 52.900 | 4.20% | 0.02% |
| | | | 2310 | 1.893 | 52.897 | 1.816 | 52.887 | 4.24% | 0.02% |
| | | | 2320 | 1.902 | 52.885 | 1.826 | 52.873 | 4.16% | 0.02% |
| | | | 2400 | 1.970 | 52.795 | 1.902 | 52.767 | 3.58% | 0.05% |
| | | | 2450 | 2.014 | 52.728 | 1.950 | 52.700 | 3.28% | 0.05% |
| | | | 2480 | 2.040 | 52.685 | 1.993 | 52.662 | 2.36% | 0.04% |
| | | | 2500 | 2.059 | 52.648 | 2.021 | 52.636 | 1.88% | 0.02% |
| | | | 2510 | 2.068 | 52.631 | 2.035 | 52.623 | 1.62% | 0.02% |
| | | | 2535 | 2.092 | 52.597 | 2.071 | 52.592 | 1.01% | 0.01% |
| | | | 2550 | 2.106 | 52.582 | 2.092 | 52.573 | 0.67% | 0.02% |
| | | | 2560 | 2.116 | 52.571 | 2.106 | 52.560 | 0.47% | 0.02% |
| | | | 2600 | 2.151 | 52.505 | 2.163 | 52.509 | -0.55% | -0.01% |
| | | | 2650 | 2.197 | 52.420 | 2.234 | 52.445 | -1.66% | -0.05% |
| | | | 2680 | 2.225 | 52.385 | 2.277 | 52.407 | -2.28% | -0.04% |
| | | | 2700 | 2.241 | 52.354 | 2.305 | 52.382 | -2.78% | -0.05% |
| 02/16/2022 | 3600 Body | 20.0 | 3300 | 2.999 | 50.521 | 3.080 | 51.593 | -2.63% | -2.08% |
| | | | 3350 | 3.058 | 50.437 | 3.139 | 51.525 | -2.58% | -2.11% |
| | | | 3450 | 3.172 | 50.271 | 3.256 | 51.389 | -2.58% | -2.18% |
| | | | 3500 | 3.232 | 50.182 | 3.314 | 51.321 | -2.47% | -2.22% |
| | | | 3550 | 3.289 | 50.104 | 3.372 | 51.254 | -2.46% | -2.24% |
| | | | 3560 | 3.301 | 50.095 | 3.384 | 51.240 | -2.45% | -2.23% |
| | | | 3600 | 3.349 | 50.027 | 3.431 | 51.186 | -2.39% | -2.26% |
| | | | 3650 | 3.405 | 49.952 | 3.489 | 51.118 | -2.41% | -2.28% |
| | | | 3690 | 3.453 | 49.870 | 3.536 | 51.063 | -2.35% | -2.34% |
| | | | 3700 | 3.465 | 49.857 | 3.548 | 51.050 | -2.34% | -2.34% |
| | | | 3750 | 3.523 | 49.785 | 3.606 | 50.982 | -2.30% | -2.35% |
| | | | 3900 | 3.709 | 49.492 | 3.781 | 50.779 | -1.90% | -2.53% |
| | | | 3930 | 3.751 | 49.417 | 3.816 | 50.738 | -1.70% | -2.60% |
| | | | 4100 | 3.971 | 49.102 | 4.015 | 50.507 | -1.10% | -2.78% |
| | | | 4150 | 4.042 | 48.990 | 4.073 | 50.439 | -0.76% | -2.87% |

## Table 10-3
## Measured Body Tissue Properties (Cont.)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 02/20/2022 | 3600 Body | 21.6 | 3300 | 2.944 | 49.713 | 3.080 | 51.593 | -4.42% | -3.64% |
| | | | 3350 | 3.005 | 49.641 | 3.139 | 51.525 | -4.27% | -3.66% |
| | | | 3450 | 3.113 | 49.466 | 3.256 | 51.389 | -4.39% | -3.74% |
| | | | 3500 | 3.170 | 49.384 | 3.314 | 51.321 | -4.35% | -3.77% |
| | | | 3550 | 3.223 | 49.321 | 3.372 | 51.254 | -4.42% | -3.77% |
| | | | 3560 | 3.233 | 49.302 | 3.384 | 51.240 | -4.46% | -3.78% |
| | | | 3600 | 3.281 | 49.235 | 3.431 | 51.186 | -4.37% | -3.81% |
| | | | 3650 | 3.331 | 49.161 | 3.489 | 51.118 | -4.53% | -3.83% |
| | | | 3690 | 3.377 | 49.074 | 3.536 | 51.063 | -4.50% | -3.90% |
| | | | 3700 | 3.389 | 49.066 | 3.548 | 51.050 | -4.48% | -3.89% |
| | | | 3750 | 3.443 | 49.002 | 3.606 | 50.982 | -4.52% | -3.88% |
| | | | 3900 | 3.618 | 48.709 | 3.781 | 50.779 | -4.31% | -4.08% |
| | | | 3930 | 3.658 | 48.647 | 3.816 | 50.738 | -4.14% | -4.12% |
| | | | 4100 | 3.879 | 48.370 | 4.015 | 50.507 | -3.39% | -4.23% |
| | | | 4150 | 3.949 | 48.249 | 4.073 | 50.439 | -3.04% | -4.34% |
| 02/24/2022 | 5200-5800 Body | 22.5 | 5180 | 5.171 | 49.177 | 5.276 | 49.041 | -1.99% | 0.28% |
| | | | 5190 | 5.179 | 49.158 | 5.288 | 49.028 | -2.06% | 0.27% |
| | | | 5200 | 5.191 | 49.134 | 5.299 | 49.014 | -2.04% | 0.24% |
| | | | 5210 | 5.216 | 49.102 | 5.311 | 49.001 | -1.79% | 0.21% |
| | | | 5220 | 5.231 | 49.066 | 5.323 | 48.987 | -1.73% | 0.16% |
| | | | 5240 | 5.255 | 49.049 | 5.346 | 48.960 | -1.70% | 0.18% |
| | | | 5250 | 5.274 | 49.035 | 5.358 | 48.947 | -1.57% | 0.18% |
| | | | 5260 | 5.298 | 49.020 | 5.369 | 48.933 | -1.32% | 0.18% |
| | | | 5270 | 5.319 | 49.015 | 5.381 | 48.919 | -1.15% | 0.20% |
| | | | 5280 | 5.329 | 49.014 | 5.393 | 48.906 | -1.19% | 0.22% |
| | | | 5290 | 5.338 | 49.013 | 5.404 | 48.892 | -1.22% | 0.25% |
| | | | 5300 | 5.343 | 49.012 | 5.416 | 48.879 | -1.35% | 0.27% |
| | | | 5310 | 5.356 | 49.011 | 5.428 | 48.865 | -1.33% | 0.30% |
| | | | 5320 | 5.373 | 48.994 | 5.439 | 48.851 | -1.21% | 0.29% |
| | | | 5500 | 5.650 | 48.764 | 5.650 | 48.607 | 0.00% | 0.32% |
| | | | 5510 | 5.666 | 48.764 | 5.661 | 48.594 | 0.09% | 0.35% |
| | | | 5520 | 5.680 | 48.763 | 5.673 | 48.580 | 0.12% | 0.38% |
| | | | 5530 | 5.694 | 48.762 | 5.685 | 48.566 | 0.16% | 0.40% |
| | | | 5540 | 5.706 | 48.750 | 5.696 | 48.553 | 0.18% | 0.41% |
| | | | 5550 | 5.715 | 48.722 | 5.708 | 48.539 | 0.12% | 0.38% |
| | | | 5560 | 5.727 | 48.688 | 5.720 | 48.526 | 0.12% | 0.33% |
| | | | 5580 | 5.754 | 48.633 | 5.743 | 48.499 | 0.19% | 0.28% |
| | | | 5600 | 5.790 | 48.618 | 5.766 | 48.471 | 0.42% | 0.30% |
| | | | 5610 | 5.807 | 48.611 | 5.778 | 48.458 | 0.50% | 0.32% |
| | | | 5620 | 5.820 | 48.602 | 5.790 | 48.444 | 0.52% | 0.33% |
| | | | 5640 | 5.846 | 48.590 | 5.813 | 48.417 | 0.57% | 0.36% |
| | | | 5660 | 5.866 | 48.518 | 5.837 | 48.390 | 0.50% | 0.26% |
| | | | 5670 | 5.875 | 48.492 | 5.848 | 48.376 | 0.46% | 0.24% |
| | | | 5680 | 5.889 | 48.462 | 5.860 | 48.363 | 0.49% | 0.20% |
| | | | 5690 | 5.905 | 48.425 | 5.872 | 48.349 | 0.56% | 0.16% |
| | | | 5700 | 5.919 | 48.385 | 5.883 | 48.336 | 0.61% | 0.10% |
| | | | 5710 | 5.929 | 48.374 | 5.895 | 48.322 | 0.58% | 0.11% |
| | | | 5720 | 5.944 | 48.372 | 5.907 | 48.309 | 0.63% | 0.13% |
| | | | 5745 | 5.984 | 48.344 | 5.936 | 48.275 | 0.81% | 0.14% |
| | | | 5750 | 5.989 | 48.331 | 5.942 | 48.268 | 0.79% | 0.13% |
| | | | 5755 | 5.993 | 48.325 | 5.947 | 48.261 | 0.77% | 0.13% |
| | | | 5765 | 6.002 | 48.301 | 5.959 | 48.248 | 0.72% | 0.11% |
| | | | 5775 | 6.017 | 48.270 | 5.971 | 48.234 | 0.77% | 0.07% |
| | | | 5785 | 6.032 | 48.218 | 5.982 | 48.220 | 0.84% | 0.00% |
| | | | 5795 | 6.045 | 48.165 | 5.994 | 48.207 | 0.85% | -0.09% |
| | | | 5800 | 6.050 | 48.149 | 6.000 | 48.200 | 0.83% | -0.11% |
| | | | 5805 | 6.055 | 48.139 | 6.006 | 48.193 | 0.82% | -0.11% |
| | | | 5825 | 6.084 | 48.120 | 6.029 | 48.166 | 0.91% | -0.10% |
| | | | 5835 | 6.105 | 48.120 | 6.042 | 48.130 | 1.04% | -0.02% |
| | | | 5845 | 6.120 | 48.098 | 6.054 | 48.110 | 1.09% | -0.02% |
| | | | 5855 | 6.135 | 48.076 | 6.066 | 48.093 | 1.14% | -0.04% |
| | | | 5865 | 6.145 | 48.051 | 6.077 | 48.080 | 1.12% | -0.06% |
| | | | 5875 | 6.158 | 48.011 | 6.088 | 48.067 | 1.15% | -0.12% |
| | | | 5885 | 6.173 | 47.959 | 6.100 | 48.053 | 1.20% | -0.20% |
| | | | 5905 | 6.196 | 47.866 | 6.122 | 48.027 | 1.21% | -0.34% |

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB Publication 865664 D01v01r04 and IEEE 1528-2013 6.6.1.2. The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

## 10.2 Test System Verification

Prior to SAR assessment, the system is verified to ±10% of the SAR measurement on the reference dipole at the time of calibration by the calibration facility. Full system validation status and result summary can be found in Appendix F.

**Table 10-4**
**System Verification Results – 1g**

| System Verification TARGET & MEASURED | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAR System | Tissue Frequency (MHz) | Tissue Type | Date | Amb. Temp. (C) | Liquid Temp. (C) | Input Power (W) | Source SN | Probe SN | Measured SAR1g (W/kg) | 1W Target SAR1g (W/kg) | 1W Normalized SAR 1g (W/kg) | Deviation1g (%) |
| A | 1900 | HEAD | 02/28/2022 | 21.5 | 21.1 | 0.10 | 5d080 | 7406 | 4.190 | 40.50 | 41.900 | 3.46% |
| S | 2600 | HEAD | 02/16/2022 | 20.2 | 19.1 | 0.10 | 1064 | 7552 | 5.960 | 58.10 | 59.600 | 2.58% |
| S | 2600 | HEAD | 02/24/2022 | 21.0 | 21.1 | 0.10 | 1004 | 7552 | 5.850 | 57.80 | 58.500 | 1.21% |
| L | 3500 | HEAD | 02/23/2022 | 23.8 | 21.1 | 0.10 | 1059 | 7670 | 6.330 | 63.70 | 63.300 | -0.63% |
| L | 3700 | HEAD | 02/23/2022 | 23.8 | 21.1 | 0.10 | 1067 | 7670 | 6.880 | 67.20 | 68.800 | 2.38% |
| L | 3900 | HEAD | 02/23/2022 | 23.8 | 21.1 | 0.10 | 1056 | 7670 | 6.770 | 68.90 | 67.700 | -1.74% |
| P | 1900 | BODY | 02/18/2022 | 22.9 | 22.4 | 0.10 | 5d080 | 7410 | 4.150 | 40.70 | 41.500 | 1.97% |
| P | 1900 | BODY | 02/28/2022 | 24.3 | 22.8 | 0.10 | 5d080 | 7410 | 4.190 | 40.70 | 41.900 | 2.95% |
| P | 1900 | BODY | 03/07/2022 | 24.8 | 23.4 | 0.10 | 5d148 | 7410 | 4.210 | 39.90 | 42.100 | 5.51% |
| H | 2450 | BODY | 02/23/2022 | 21.7 | 23.0 | 0.10 | 981 | 7409 | 4.980 | 50.30 | 49.800 | -0.99% |
| H | 2600 | BODY | 02/21/2022 | 20.9 | 23.0 | 0.10 | 1004 | 7409 | 5.270 | 55.40 | 52.700 | -4.87% |
| H | 2600 | BODY | 02/23/2022 | 21.7 | 23.0 | 0.10 | 1071 | 7409 | 5.620 | 54.30 | 56.200 | 3.50% |
| I | 3500 | BODY | 02/20/2022 | 21.8 | 21.6 | 0.10 | 1097 | 7661 | 6.690 | 64.20 | 66.900 | 4.21% |
| I | 3700 | BODY | 02/16/2022 | 21.0 | 21.0 | 0.10 | 1018 | 7661 | 6.700 | 63.50 | 67.000 | 5.51% |
| I | 3900 | BODY | 02/16/2022 | 21.0 | 21.0 | 0.10 | 1073 | 7661 | 6.840 | 64.30 | 68.400 | 6.38% |

**Table 10-5**
**System Verification Results – 10g**

| SAR System | Tissue Frequency (MHz) | Tissue Type | Date | Amb. Temp. (C) | Liquid Temp. (C) | Input Power (W) | Source SN | Probe SN | Measured SAR10g (W/kg) | 1W Target SAR10g (W/kg) | 1W Normalized SAR10g (W/kg) | Deviation10g (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | 1900 | BODY | 02/21/2022 | 24.1 | 22.1 | 0.10 | 5d149 | 7410 | 2.230 | 21.10 | 22.300 | 5.69% |
| H | 1900 | BODY | 03/07/2022 | 20.8 | 22.9 | 0.10 | 5d149 | 7409 | 2.100 | 21.10 | 21.000 | -0.47% |
| H | 2450 | BODY | 02/23/2022 | 21.7 | 23.0 | 0.10 | 981 | 7409 | 2.310 | 23.70 | 23.100 | -2.53% |
| H | 2600 | BODY | 02/21/2022 | 20.9 | 23.0 | 0.10 | 1004 | 7409 | 2.330 | 24.80 | 23.300 | -6.05% |
| H | 2600 | BODY | 02/23/2022 | 21.7 | 23.0 | 0.10 | 1071 | 7409 | 2.500 | 24.10 | 25.000 | 3.73% |
| I | 3500 | BODY | 02/20/2022 | 21.8 | 21.6 | 0.10 | 1097 | 7661 | 2.520 | 23.80 | 25.200 | 5.88% |
| I | 3700 | BODY | 02/16/2022 | 21.0 | 21.0 | 0.10 | 1018 | 7661 | 2.470 | 22.50 | 24.700 | 9.78% |
| I | 3900 | BODY | 02/16/2022 | 21.0 | 21.0 | 0.10 | 1073 | 7661 | 2.370 | 22.00 | 23.700 | 7.73% |
| G | 5250 | BODY | 02/24/2022 | 22.4 | 22.0 | 0.05 | 1191 | 7357 | 1.010 | 20.80 | 20.200 | -2.88% |
| G | 5600 | BODY | 02/24/2022 | 22.4 | 22.0 | 0.05 | 1191 | 7357 | 1.100 | 21.30 | 22.000 | 3.29% |
| G | 5750 | BODY | 02/24/2022 | 22.4 | 22.0 | 0.05 | 1191 | 7357 | 1.030 | 20.70 | 20.600 | -0.48% |

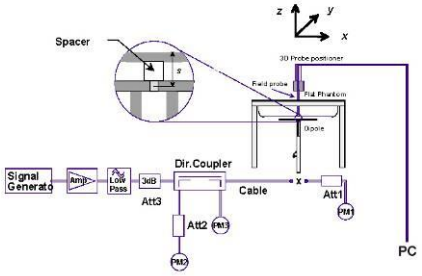



**Figure 10-1**
**System Verification Setup Diagram**

**Figure 10-2**
**System Verification Setup Photo**

# 11 SAR DATA SUMMARY

## 11.1 Standalone Head SAR Data

### Table 11-1
### NR Band n25 Head SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Side | Test Position | Tune State | Waveform | Modulation | RB Size | RB Offset | Serial Number | Duty Cycle | SAR (1g) | Scaling Factor | Reported SAR (1g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.03 | A | 0.00 | 0 | Right | Cheek | 2 | DFT-S-OFDM | QPSK | 1 | 53 | 0851V | 1:1 | 0.124 | 1.403 | 0.174 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.34 | A | 0.13 | 0 | Right | Cheek | 2 | DFT-S-OFDM | QPSK | 50 | 28 | 0851V | 1:1 | 0.108 | 1.306 | 0.141 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.03 | A | 0.07 | 0 | Right | Tilt | 2 | DFT-S-OFDM | QPSK | 1 | 53 | 0851V | 1:1 | 0.055 | 1.403 | 0.077 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.34 | A | -0.03 | 0 | Right | Tilt | 2 | DFT-S-OFDM | QPSK | 50 | 28 | 0851V | 1:1 | 0.058 | 1.306 | 0.076 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.03 | A | 0.13 | 0 | Left | Cheek | 2 | DFT-S-OFDM | QPSK | 1 | 53 | 0851V | 1:1 | 0.152 | 1.403 | 0.213 | A1 |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.34 | A | 0.01 | 0 | Left | Cheek | 2 | DFT-S-OFDM | QPSK | 50 | 28 | 0851V | 1:1 | 0.149 | 1.306 | 0.195 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 23.0 | 21.77 | A | 0.06 | 1.5 | Left | Cheek | 2 | CP-OFDM | QPSK | 1 | 1 | 0851V | 1:1 | 0.123 | 1.327 | 0.163 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.03 | A | -0.13 | 0 | Left | Tilt | 2 | DFT-S-OFDM | QPSK | 1 | 53 | 0851V | 1:1 | 0.051 | 1.403 | 0.072 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.34 | A | -0.07 | 0 | Left | Tilt | 2 | DFT-S-OFDM | QPSK | 50 | 28 | 0851V | 1:1 | 0.051 | 1.306 | 0.067 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | | | | | | | Head<br>1.6 W/kg (mW/g)<br>averaged over 1 gram | | | | | | | | |

### Table 11-2
### NR Band n41 Head SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Side | Test Position | Waveform | Modulation | RB Size | RB Offset | Serial Number | Duty Cycle | SAR (1g) | Scaling Factor | Reported SAR (1g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.43 | F | 0.05 | 0 | Right | Cheek | DFT-S-OFDM | QPSK | 1 | 271 | 0851V | 1:1 | 0.353 | 1.140 | 0.402 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.42 | F | -0.02 | 0 | Right | Cheek | DFT-S-OFDM | QPSK | 135 | 138 | 0851V | 1:1 | 0.369 | 1.143 | 0.422 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.43 | F | 0.06 | 0 | Right | Tilt | DFT-S-OFDM | QPSK | 1 | 271 | 0851V | 1:1 | 0.468 | 1.140 | 0.534 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.42 | F | -0.01 | 0 | Right | Tilt | DFT-S-OFDM | QPSK | 135 | 138 | 0851V | 1:1 | 0.483 | 1.143 | 0.552 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.43 | F | 0.10 | 0 | Left | Cheek | DFT-S-OFDM | QPSK | 1 | 271 | 0851V | 1:1 | 0.709 | 1.140 | 0.808 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.42 | F | -0.03 | 0 | Left | Cheek | DFT-S-OFDM | QPSK | 135 | 138 | 0851V | 1:1 | 0.770 | 1.143 | 0.880 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.41 | F | -0.06 | 0 | Left | Cheek | DFT-S-OFDM | QPSK | 270 | 0 | 0851V | 1:1 | 0.795 | 1.146 | 0.911 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.43 | F | 0.03 | 0 | Left | Tilt | DFT-S-OFDM | QPSK | 1 | 271 | 0851V | 1:1 | 0.847 | 1.140 | 0.966 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.42 | F | -0.02 | 0 | Left | Tilt | DFT-S-OFDM | QPSK | 135 | 138 | 0851V | 1:1 | 0.860 | 1.143 | 0.983 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.41 | F | -0.02 | 0 | Left | Tilt | DFT-S-OFDM | QPSK | 270 | 0 | 0851V | 1:1 | 0.908 | 1.146 | **1.041** | A2 |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.64 | F | 0.12 | 0 | Left | Tilt | CP-OFDM | QPSK | 1 | 1 | 0851V | 1:1 | 0.820 | 1.086 | 0.891 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 15.0 | 14.24 | B | -0.18 | N/A | Right | Cheek | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.021 | 1.191 | 0.025 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 15.0 | 14.24 | B | 0.12 | N/A | Right | Tilt | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.004 | 1.191 | 0.005 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 15.0 | 14.24 | B | -0.10 | N/A | Left | Cheek | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.028 | 1.191 | 0.033 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 15.0 | 14.24 | B | -0.16 | N/A | Left | Tilt | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.021 | 1.191 | 0.025 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 14.0 | 13.46 | E | 0.03 | N/A | Right | Cheek | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.274 | 1.132 | 0.310 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 14.0 | 13.46 | E | -0.06 | N/A | Right | Tilt | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.263 | 1.132 | 0.298 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 14.0 | 13.46 | E | 0.00 | N/A | Left | Cheek | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.231 | 1.132 | 0.261 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 14.0 | 13.46 | E | 0.03 | N/A | Left | Tilt | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.210 | 1.132 | 0.238 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 11.5 | 10.71 | D | 0.13 | N/A | Right | Cheek | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.005 | 1.199 | 0.006 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 11.5 | 10.71 | D | 0.16 | N/A | Right | Tilt | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.004 | 1.199 | 0.005 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 11.5 | 10.71 | D | 0.14 | N/A | Left | Cheek | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.008 | 1.199 | 0.010 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 11.5 | 10.71 | D | -0.13 | N/A | Left | Tilt | CW/SRS | N/A | N/A | N/A | 0851V | 1:1 | 0.008 | 1.199 | 0.010 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.41 | F | 0.03 | 0 | Left | Tilt | DFT-S-OFDM | QPSK | 270 | 0 | 0851V | 1:1 | 0.894 | 1.146 | 1.025 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | | | | | | | Head<br>1.6 W/kg (mW/g)<br>averaged over 1 gram | | | | | | | |

Note: Blue entry represents variability measurement.

# Table 11-3
# NR Band n77 Head SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Side | Test Position | Waveform | Modulation | RB Size | RB Offset | Serial Number | Duty Cycle | SAR (1g) | Scaling Factor | Reported SAR (1g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.34 | G | 0.12 | 0 | Right | Cheek | DFT-S-OFDM | QPSK | 1 | 271 | 0838V | 1:1 | 0.409 | 1.164 | 0.476 | A3 |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.18 | G | 0.06 | 0 | Right | Cheek | DFT-S-OFDM | QPSK | 135 | 0 | 0838V | 1:1 | 0.370 | 1.208 | 0.447 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.06 | G | -0.02 | 0 | Right | Cheek | DFT-S-OFDM | QPSK | 270 | 0 | 0838V | 1:1 | 0.395 | 1.242 | 0.491 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 12.65 | G | 0.04 | 0 | Right | Cheek | CP-OFDM | QPSK | 1 | 1 | 0838V | 1:1 | 0.406 | 1.365 | 0.554 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.34 | G | 0.06 | 0 | Right | Tilt | DFT-S-OFDM | QPSK | 1 | 271 | 0838V | 1:1 | 0.314 | 1.164 | 0.365 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.18 | G | 0.03 | 0 | Right | Tilt | DFT-S-OFDM | QPSK | 135 | 0 | 0838V | 1:1 | 0.294 | 1.208 | 0.355 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.34 | G | 0.02 | 0 | Left | Cheek | DFT-S-OFDM | QPSK | 1 | 271 | 0838V | 1:1 | 0.122 | 1.164 | 0.142 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.18 | G | 0.12 | 0 | Left | Cheek | DFT-S-OFDM | QPSK | 135 | 0 | 0838V | 1:1 | 0.108 | 1.208 | 0.130 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.34 | G | 0.04 | 0 | Left | Tilt | DFT-S-OFDM | QPSK | 1 | 271 | 0838V | 1:1 | 0.121 | 1.164 | 0.141 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.18 | G | -0.05 | 0 | Left | Tilt | DFT-S-OFDM | QPSK | 135 | 0 | 0838V | 1:1 | 0.109 | 1.208 | 0.132 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.32 | C | 0.00 | N/A | Right | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.009 | 1.169 | 0.011 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.32 | C | 0.00 | N/A | Right | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.015 | 1.169 | 0.018 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.32 | C | 0.00 | N/A | Left | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.033 | 1.169 | 0.039 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.32 | C | 0.00 | N/A | Left | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.004 | 1.169 | 0.005 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 12.0 | 11.43 | H | 0.20 | N/A | Right | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.013 | 1.140 | 0.015 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 12.0 | 11.43 | H | 0.21 | N/A | Right | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.016 | 1.140 | 0.018 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 12.0 | 11.43 | H | 0.13 | N/A | Left | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.024 | 1.140 | 0.027 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 12.0 | 11.43 | H | 0.13 | N/A | Left | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.046 | 1.140 | 0.052 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 12.82 | D | 0.00 | N/A | Right | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.000 | 1.312 | 0.000 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 12.82 | D | 0.00 | N/A | Right | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.000 | 1.312 | 0.000 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 12.82 | D | 0.00 | N/A | Left | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.000 | 1.312 | 0.000 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 12.82 | D | 0.00 | N/A | Left | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.000 | 1.312 | 0.000 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 14.0 | 13.25 | G | -0.02 | 0 | Right | Cheek | DFT-S-OFDM | QPSK | 1 | 137 | 0838V | 1:1 | 0.357 | 1.189 | 0.424 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.44 | G | 0.00 | 0 | Right | Cheek | DFT-S-OFDM | QPSK | 1 | 1 | 0838V | 1:1 | 0.500 | 1.138 | 0.569 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 14.0 | 13.18 | G | -0.04 | 0 | Right | Cheek | DFT-S-OFDM | QPSK | 135 | 0 | 0838V | 1:1 | 0.386 | 1.208 | 0.466 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.34 | G | 0.11 | 0 | Right | Cheek | DFT-S-OFDM | QPSK | 135 | 0 | 0838V | 1:1 | 0.481 | 1.164 | 0.560 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.27 | G | 0.04 | 0 | Right | Cheek | DFT-S-OFDM | QPSK | 270 | 0 | 0838V | 1:1 | 0.460 | 1.183 | 0.544 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.33 | G | 0.04 | 0 | Right | Cheek | CP-OFDM | QPSK | 1 | 1 | 0838V | 1:1 | 0.500 | 1.167 | 0.584 | A4 |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.44 | G | -0.04 | 0 | Right | Tilt | DFT-S-OFDM | QPSK | 1 | 1 | 0846V | 1:1 | 0.297 | 1.138 | 0.338 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.34 | G | 0.07 | 0 | Right | Tilt | DFT-S-OFDM | QPSK | 135 | 0 | 0846V | 1:1 | 0.291 | 1.164 | 0.339 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.44 | G | 0.06 | 0 | Left | Cheek | DFT-S-OFDM | QPSK | 1 | 1 | 0846V | 1:1 | 0.120 | 1.138 | 0.137 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.34 | G | -0.07 | 0 | Left | Cheek | DFT-S-OFDM | QPSK | 135 | 0 | 0846V | 1:1 | 0.117 | 1.164 | 0.136 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.44 | G | 0.01 | 0 | Left | Tilt | DFT-S-OFDM | QPSK | 1 | 1 | 0846V | 1:1 | 0.080 | 1.138 | 0.091 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.34 | G | -0.03 | 0 | Left | Tilt | DFT-S-OFDM | QPSK | 135 | 0 | 0846V | 1:1 | 0.087 | 1.164 | 0.101 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 14.0 | 13.26 | C | 0.00 | N/A | Right | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.000 | 1.186 | 0.000 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 14.0 | 13.26 | C | 0.00 | N/A | Right | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.002 | 1.186 | 0.002 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 14.0 | 13.26 | C | 0.00 | N/A | Left | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.006 | 1.186 | 0.007 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 14.0 | 13.26 | C | 0.00 | N/A | Left | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.000 | 1.186 | 0.000 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 12.0 | 12.00 | H | 0.08 | N/A | Right | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.020 | 1.000 | 0.020 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 12.0 | 12.00 | H | 0.11 | N/A | Right | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.023 | 1.000 | 0.023 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 12.0 | 12.00 | H | 0.12 | N/A | Left | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.022 | 1.000 | 0.022 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 12.0 | 12.00 | H | 0.19 | N/A | Left | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.022 | 1.000 | 0.022 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.24 | D | 0.00 | N/A | Right | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.000 | 1.191 | 0.000 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.24 | D | 0.00 | N/A | Right | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.000 | 1.191 | 0.000 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.24 | D | 0.00 | N/A | Left | Cheek | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.000 | 1.191 | 0.000 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.24 | D | 0.00 | N/A | Left | Tilt | CW/SRS | N/A | N/A | N/A | 0838V | 1:1 | 0.000 | 1.191 | 0.000 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | | | | | | | | Head<br>1.6 W/kg (mW/g)<br>averaged over 1 gram | | | | | | |

## 11.2 Standalone Body-Worn SAR Data

### Table 11-4
### NR Band n25 Body-Worn SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Tune State | Serial Number | Waveform | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) | Scaling Factor | Reported SAR (1g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.03 | A | -0.13 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 1 | 53 | 15 mm | back | 1:1 | 0.674 | 1.403 | **0.946** | A5 |
| 1882.50 | 376500 | Mid | NR Band n25 (PCS) | 20 | 24.5 | 22.80 | A | 0.01 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 1 | 53 | 15 mm | back | 1:1 | 0.586 | 1.479 | 0.867 | |
| 1905.00 | 381000 | High | NR Band n25 (PCS) | 20 | 24.5 | 22.83 | A | -0.05 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 1 | 53 | 15 mm | back | 1:1 | 0.518 | 1.469 | 0.761 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.34 | A | -0.04 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 50 | 28 | 15 mm | back | 1:1 | 0.561 | 1.306 | 0.733 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 23.5 | 22.31 | A | 0.02 | 1 | 18 | 0851V | DFT-S-OFDM | QPSK | 100 | 0 | 15 mm | back | 1:1 | 0.520 | 1.315 | 0.684 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 23.0 | 21.77 | A | 0.05 | 1.5 | 18 | 0851V | CP-OFDM | QPSK | 1 | 1 | 15 mm | back | 1:1 | 0.462 | 1.327 | 0.613 | |
| **ANSI / IEEE C95.1 1992 - SAFETY LIMIT**<br>**Spatial Peak**<br>**Uncontrolled Exposure/General Population** | | | | | | | | | | | | | **Body**<br>**1.6 W/kg (mW/g)**<br>averaged over 1 gram | | | | | | | | | |

### Table 11-5
### NR Band n41 Body-Worn SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Tune State | Serial Number | Waveform | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) | Scaling Factor | Reported SAR (1g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.43 | F | 0.16 | 0 | N/A | 2226V | DFT-S-OFDM | QPSK | 1 | 271 | 15 mm | back | 1:1 | 0.091 | 1.140 | 0.104 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.42 | F | -0.16 | 0 | N/A | 2226V | DFT-S-OFDM | QPSK | 135 | 138 | 15 mm | back | 1:1 | 0.088 | 1.143 | 0.101 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.64 | F | 0.02 | 0 | N/A | 2226V | CP-OFDM | QPSK | 1 | 1 | 15 mm | back | 1:1 | 0.124 | 1.086 | 0.135 | A6 |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 15.0 | 14.24 | B | 0.06 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 15 mm | back | 1:1 | 0.083 | 1.191 | 0.099 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 14.0 | 13.46 | E | -0.01 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 15 mm | back | 1:1 | 0.017 | 1.132 | 0.019 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 11.5 | 10.71 | D | 0.01 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 15 mm | back | 1:1 | 0.027 | 1.199 | 0.032 | |
| **ANSI / IEEE C95.1 1992 - SAFETY LIMIT**<br>**Spatial Peak**<br>**Uncontrolled Exposure/General Population** | | | | | | | | | | | | | **Body**<br>**1.6 W/kg (mW/g)**<br>averaged over 1 gram | | | | | | | | | |

### Table 11-6
### NR Band n77 Body-Worn SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Serial Number | Waveform | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) | Scaling Factor | Reported SAR (1g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.79 | G | 0.07 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 271 | 15 mm | back | 1:1 | 0.137 | 1.178 | 0.161 | A7 |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.46 | G | -0.03 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 138 | 15 mm | back | 1:1 | 0.133 | 1.271 | 0.169 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.31 | G | -0.12 | 0 | 0846V | CP-OFDM | QPSK | 1 | 1 | 15 mm | back | 1:1 | 0.132 | 1.315 | 0.174 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.32 | C | -0.17 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 15 mm | back | 1:1 | 0.014 | 1.169 | 0.016 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 16.5 | 15.36 | H | -0.01 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 15 mm | back | 1:1 | 0.091 | 1.300 | 0.118 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 12.82 | D | -0.20 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 15 mm | back | 1:1 | 0.082 | 1.312 | 0.108 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.60 | G | -0.12 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 137 | 15 mm | back | 1:1 | 0.115 | 1.230 | 0.141 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.53 | G | 0.00 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 69 | 15 mm | back | 1:1 | 0.111 | 1.250 | 0.139 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.25 | G | -0.15 | 0 | 0846V | CP-OFDM | QPSK | 1 | 1 | 15 mm | back | 1:1 | 0.136 | 1.334 | 0.181 | A8 |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 14.0 | 13.26 | C | 0.00 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 15 mm | back | 1:1 | 0.000 | 1.186 | 0.000 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 16.5 | 16.05 | H | 0.07 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 15 mm | back | 1:1 | 0.044 | 1.109 | 0.049 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.24 | D | 0.13 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 15 mm | back | 1:1 | 0.005 | 1.191 | 0.006 | |
| **ANSI / IEEE C95.1 1992 - SAFETY LIMIT**<br>**Spatial Peak**<br>**Uncontrolled Exposure/General Population** | | | | | | | | | | | | **Body**<br>**1.6 W/kg (mW/g)**<br>averaged over 1 gram | | | | | | | | | |

## 11.3 Standalone Hotspot SAR Data

**Table 11-7**
**GPRS Hotspot SAR Data**

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | Mode | Service | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Power Drift [dB] | Spacing | Antenna Config. | Device Serial Number | # of Time Slots | Duty Cycle | Side | SAR (1g) | Scaling Factor | Reported SAR (1g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 1909.80 | 810 | GSM 1900 | GPRS | 22.0 | 20.46 | 0.07 | 10 mm | A | 2346V | 4 | 1:2.076 | back | 0.342 | 1.426 | 0.488 | |
| 1909.80 | 810 | GSM 1900 | GPRS | 22.0 | 20.46 | 0.01 | 10 mm | A | 2346V | 4 | 1:2.076 | front | 0.303 | 1.426 | 0.432 | |
| 1850.20 | 512 | GSM 1900 | GPRS | 22.0 | 20.36 | 0.01 | 10 mm | A | 2346V | 4 | 1:2.076 | bottom | 0.510 | 1.459 | 0.744 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 22.0 | 20.00 | -0.02 | 10 mm | A | 2346V | 4 | 1:2.076 | bottom | 0.630 | 1.585 | 0.999 | A9 |
| 1909.80 | 810 | GSM 1900 | GPRS | 22.0 | 20.46 | -0.01 | 10 mm | A | 2346V | 4 | 1:2.076 | bottom | 0.622 | 1.426 | 0.887 | |
| 1909.80 | 810 | GSM 1900 | GPRS | 22.0 | 20.46 | -0.08 | 10 mm | A | 2346V | 4 | 1:2.076 | right | 0.032 | 1.426 | 0.046 | |
| 1909.80 | 810 | GSM 1900 | GPRS | 22.0 | 20.46 | -0.01 | 10 mm | A | 2346V | 4 | 1:2.076 | left | 0.078 | 1.426 | 0.111 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | Body<br>1.6 W/kg (mW/g)<br>averaged over 1 gram | | | | | | | | | |

**Table 11-8**
**LTE Band 41 Hotspot SAR**

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Power Class | FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Power Drift [dB] | MPR [dB] | Antenna Config. | Device Serial Number | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) | Scaling Factor | Reported SAR (1g) | Plot # |
| | MHz | Ch. | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.42 | 0.02 | 0 | B | 2226V | QPSK | 1 | 50 | 10 mm | back | 1:1.58 | 0.228 | 1.439 | 0.328 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.53 | 0.00 | 0 | B | 2226V | QPSK | 50 | 25 | 10 mm | back | 1:1.58 | 0.227 | 1.403 | 0.318 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.42 | 0.01 | 0 | B | 2226V | QPSK | 1 | 50 | 10 mm | front | 1:1.58 | 0.275 | 1.439 | 0.396 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.53 | 0.01 | 0 | B | 2226V | QPSK | 50 | 25 | 10 mm | front | 1:1.58 | 0.280 | 1.403 | 0.393 | |
| Power Class 3 | 2506.00 | 39750 | Low | LTE Band 41 | 20 | 23.0 | 21.35 | 0.03 | 0 | B | 2226V | QPSK | 1 | 50 | 10 mm | bottom | 1:1.58 | 0.741 | 1.462 | **1.083** | A10 |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.42 | -0.05 | 0 | B | 2226V | QPSK | 1 | 50 | 10 mm | bottom | 1:1.58 | 0.621 | 1.439 | 0.894 | |
| Power Class 3 | 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 23.0 | 21.39 | -0.01 | 0 | B | 2226V | QPSK | 1 | 50 | 10 mm | bottom | 1:1.58 | 0.587 | 1.449 | 0.851 | |
| Power Class 3 | 2636.50 | 41055 | Mid-High | LTE Band 41 | 20 | 23.0 | 21.38 | -0.01 | 0 | B | 2226V | QPSK | 1 | 50 | 10 mm | bottom | 1:1.58 | 0.505 | 1.452 | 0.733 | |
| Power Class 3 | 2680.00 | 41490 | High | LTE Band 41 | 20 | 23.0 | 21.38 | 0.04 | 0 | B | 2226V | QPSK | 1 | 50 | 10 mm | bottom | 1:1.58 | 0.496 | 1.452 | 0.720 | |
| Power Class 3 | 2506.00 | 39750 | Low | LTE Band 41 | 20 | 23.0 | 21.24 | -0.02 | 0 | B | 2226V | QPSK | 50 | 0 | 10 mm | bottom | 1:1.58 | 0.520 | 1.500 | 0.780 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.53 | -0.01 | 0 | B | 2226V | QPSK | 50 | 25 | 10 mm | bottom | 1:1.58 | 0.605 | 1.403 | 0.849 | |
| Power Class 3 | 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 23.0 | 21.52 | 0.01 | 0 | B | 2226V | QPSK | 50 | 25 | 10 mm | bottom | 1:1.58 | 0.540 | 1.406 | 0.759 | |
| Power Class 3 | 2636.50 | 41055 | Mid-High | LTE Band 41 | 20 | 23.0 | 21.51 | 0.00 | 0 | B | 2226V | QPSK | 50 | 25 | 10 mm | bottom | 1:1.58 | 0.558 | 1.409 | 0.786 | |
| Power Class 3 | 2680.00 | 41490 | High | LTE Band 41 | 20 | 23.0 | 21.51 | -0.01 | 0 | B | 2226V | QPSK | 50 | 50 | 10 mm | bottom | 1:1.58 | 0.536 | 1.409 | 0.755 | |
| Power Class 3 | 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 23.0 | 21.38 | -0.01 | 0 | B | 2226V | QPSK | 100 | 0 | 10 mm | bottom | 1:1.58 | 0.522 | 1.452 | 0.758 | |
| Power Class 2 | 2506.00 | 39750 | Low | LTE Band 41 | 20 | 24.6 | 23.30 | -0.06 | 0 | B | 2226V | QPSK | 1 | 50 | 10 mm | bottom | 1:2.31 | 0.715 | 1.349 | 0.965 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.42 | -0.01 | 0 | B | 2226V | QPSK | 1 | 50 | 10 mm | left | 1:1.58 | 0.273 | 1.439 | 0.393 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.53 | 0.03 | 0 | B | 2226V | QPSK | 50 | 25 | 10 mm | left | 1:1.58 | 0.272 | 1.403 | 0.382 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | Body<br>1.6 W/kg (mW/g)<br>averaged over 1 gram | | | | | | | | | | | | | |

# Table 11-9
# NR Band n25 Hotspot SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Tune State | Serial Number | Waveform | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) | Scaling Factor | Reported SAR (1g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.70 | A | 0.03 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 1 | 104 | 10 mm | back | 1:1 | 0.578 | 1.202 | 0.695 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.75 | A | -0.03 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 28 | 10 mm | back | 1:1 | 0.610 | 1.189 | 0.725 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.70 | A | 0.03 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 1 | 104 | 10 mm | front | 1:1 | 0.423 | 1.202 | 0.508 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.75 | A | -0.02 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 28 | 10 mm | front | 1:1 | 0.446 | 1.189 | 0.530 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.70 | A | 0.01 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 1 | 104 | 10 mm | bottom | 1:1 | 0.789 | 1.202 | 0.948 | |
| 1882.50 | 376500 | Mid | NR Band n25 (PCS) | 20 | 19.5 | 18.53 | A | -0.01 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 1 | 53 | 10 mm | bottom | 1:1 | 0.818 | 1.250 | 1.023 | A11 |
| 1905.00 | 381000 | High | NR Band n25 (PCS) | 20 | 19.5 | 18.53 | A | 0.02 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 1 | 53 | 10 mm | bottom | 1:1 | 0.810 | 1.250 | 1.013 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.75 | A | 0.00 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 28 | 10 mm | bottom | 1:1 | 0.807 | 1.189 | 0.960 | |
| 1882.50 | 376500 | Mid | NR Band n25 (PCS) | 20 | 19.5 | 18.64 | A | -0.06 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 0 | 10 mm | bottom | 1:1 | 0.811 | 1.219 | 0.989 | |
| 1905.00 | 381000 | High | NR Band n25 (PCS) | 20 | 19.5 | 18.67 | A | 0.00 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 0 | 10 mm | bottom | 1:1 | 0.775 | 1.211 | 0.939 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.66 | A | -0.01 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 100 | 0 | 10 mm | bottom | 1:1 | 0.802 | 1.213 | 0.973 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.62 | A | -0.03 | 0 | 18 | 1789M | CP-OFDM | QPSK | 1 | 1 | 10 mm | bottom | 1:1 | 0.758 | 1.225 | 0.929 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.70 | A | 0.11 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 1 | 104 | 10 mm | right | 1:1 | 0.047 | 1.202 | 0.056 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.75 | A | -0.06 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 28 | 10 mm | right | 1:1 | 0.047 | 1.189 | 0.056 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.70 | A | 0.05 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 1 | 104 | 10 mm | left | 1:1 | 0.155 | 1.202 | 0.186 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.75 | A | -0.02 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 28 | 10 mm | left | 1:1 | 0.157 | 1.189 | 0.187 | |
| 1882.50 | 376500 | Mid | NR Band n25 (PCS) | 20 | 19.5 | 18.53 | A | -0.10 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 1 | 53 | 10 mm | bottom | 1:1 | 0.813 | 1.250 | 1.016 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | | Body<br>1.6 W/kg (mW/g)<br>averaged over 1 gram | | | | | | | | | | | | | |

Note: Blue entry represents variability measurement.

# Table 11-10
# NR Band n41 Hotspot SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Tune State | Serial Number | Waveform | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) | Scaling Factor | Reported SAR (1g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.43 | F | 0.13 | 0 | N/A | 2226V | DFT-S-OFDM | QPSK | 1 | 271 | 10 mm | back | 1:1 | 0.150 | 1.140 | 0.171 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.42 | F | -0.11 | 0 | N/A | 2226V | DFT-S-OFDM | QPSK | 135 | 138 | 10 mm | back | 1:1 | 0.142 | 1.143 | 0.162 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.43 | F | 0.18 | 0 | N/A | 2226V | DFT-S-OFDM | QPSK | 1 | 271 | 10 mm | front | 1:1 | 0.091 | 1.140 | 0.104 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.42 | F | -0.04 | 0 | N/A | 2226V | DFT-S-OFDM | QPSK | 135 | 138 | 10 mm | front | 1:1 | 0.096 | 1.143 | 0.110 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.43 | F | -0.02 | 0 | N/A | 2226V | DFT-S-OFDM | QPSK | 1 | 271 | 10 mm | top | 1:1 | 0.160 | 1.140 | 0.182 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.42 | F | 0.06 | 0 | N/A | 2226V | DFT-S-OFDM | QPSK | 135 | 138 | 10 mm | top | 1:1 | 0.168 | 1.143 | 0.192 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.64 | F | 0.08 | 0 | N/A | 2226V | CP-OFDM | QPSK | 1 | 1 | 10 mm | top | 1:1 | 0.259 | 1.086 | 0.281 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.43 | F | -0.11 | 0 | N/A | 2226V | DFT-S-OFDM | QPSK | 1 | 271 | 10 mm | right | 1:1 | 0.037 | 1.140 | 0.042 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 19.0 | 18.42 | F | 0.04 | 0 | N/A | 2226V | DFT-S-OFDM | QPSK | 135 | 138 | 10 mm | right | 1:1 | 0.036 | 1.143 | 0.041 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 15.0 | 14.24 | B | 0.13 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | back | 1:1 | 0.172 | 1.191 | 0.205 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 15.0 | 14.24 | B | 0.10 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | front | 1:1 | 0.006 | 1.191 | 0.007 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 15.0 | 14.24 | B | -0.01 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | bottom | 1:1 | 0.323 | 1.191 | 0.385 | A12 |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 15.0 | 14.24 | B | -0.04 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | left | 1:1 | 0.100 | 1.191 | 0.119 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 14.0 | 13.46 | E | 0.20 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | back | 1:1 | 0.030 | 1.132 | 0.034 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 14.0 | 13.46 | E | 0.18 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | front | 1:1 | 0.062 | 1.132 | 0.070 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 14.0 | 13.46 | E | -0.05 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | top | 1:1 | 0.041 | 1.132 | 0.046 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 14.0 | 13.46 | E | 0.00 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | right | 1:1 | 0.001 | 1.132 | 0.001 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 14.0 | 13.46 | E | 0.21 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | left | 1:1 | 0.020 | 1.132 | 0.023 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 11.5 | 10.71 | D | 0.02 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | back | 1:1 | 0.051 | 1.199 | 0.061 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 11.5 | 10.71 | D | 0.12 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | front | 1:1 | 0.010 | 1.199 | 0.012 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 11.5 | 10.71 | D | -0.06 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | bottom | 1:1 | 0.013 | 1.199 | 0.016 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 11.5 | 10.71 | D | 0.13 | N/A | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 10 mm | right | 1:1 | 0.006 | 1.199 | 0.007 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | | Body<br>1.6 W/kg (mW/g)<br>averaged over 1 gram | | | | | | | | | | | | | |

# Table 11-11
# NR Band n77 Hotspot SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Serial Number | Waveform | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) | Scaling Factor | Reported SAR (1g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.79 | G | 0.00 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 271 | 10 mm | back | 1:1 | 0.186 | 1.178 | 0.219 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.46 | G | 0.06 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 138 | 10 mm | back | 1:1 | 0.183 | 1.271 | 0.233 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.79 | G | -0.06 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 271 | 10 mm | front | 1:1 | 0.157 | 1.178 | 0.185 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.46 | G | -0.03 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 138 | 10 mm | front | 1:1 | 0.156 | 1.271 | 0.198 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.79 | G | 0.13 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 271 | 10 mm | top | 1:1 | 0.132 | 1.178 | 0.155 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.46 | G | 0.06 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 138 | 10 mm | top | 1:1 | 0.126 | 1.271 | 0.160 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.79 | G | 0.09 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 271 | 10 mm | left | 1:1 | 0.448 | 1.178 | 0.528 | A13 |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.46 | G | 0.03 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 138 | 10 mm | left | 1:1 | 0.443 | 1.271 | 0.563 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 18.5 | 17.31 | G | -0.02 | 0 | 0846V | CP-OFDM | QPSK | 1 | 1 | 10 mm | left | 1:1 | 0.412 | 1.315 | 0.542 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.32 | C | -0.12 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | back | 1:1 | 0.037 | 1.169 | 0.043 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.32 | C | 0.00 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | front | 1:1 | 0.021 | 1.169 | 0.025 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.32 | C | 0.15 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | bottom | 1:1 | 0.009 | 1.169 | 0.011 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 13.32 | C | -0.03 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | left | 1:1 | 0.054 | 1.169 | 0.063 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 16.5 | 15.36 | H | -0.05 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | back | 1:1 | 0.273 | 1.300 | 0.355 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 16.5 | 15.36 | H | -0.10 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | front | 1:1 | 0.002 | 1.300 | 0.003 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 16.5 | 15.36 | H | 0.00 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | top | 1:1 | 0.000 | 1.300 | 0.000 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 16.5 | 15.36 | H | 0.00 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | right | 1:1 | 0.000 | 1.300 | 0.000 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 16.5 | 15.36 | H | 0.12 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | left | 1:1 | 0.008 | 1.300 | 0.010 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 12.82 | D | 0.00 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | back | 1:1 | 0.219 | 1.312 | 0.287 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 12.82 | D | 0.16 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | front | 1:1 | 0.004 | 1.312 | 0.005 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 12.82 | D | 0.14 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | bottom | 1:1 | 0.000 | 1.312 | 0.000 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 14.0 | 12.82 | D | -0.21 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 10 mm | right | 1:1 | 0.000 | 1.312 | 0.000 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.60 | G | -0.16 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 137 | 10 mm | back | 1:1 | 0.258 | 1.230 | 0.317 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.53 | G | -0.02 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 69 | 10 mm | back | 1:1 | 0.249 | 1.250 | 0.311 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.60 | G | -0.06 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 137 | 10 mm | front | 1:1 | 0.140 | 1.230 | 0.172 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.53 | G | -0.13 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 69 | 10 mm | front | 1:1 | 0.136 | 1.250 | 0.170 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.60 | G | -0.19 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 137 | 10 mm | top | 1:1 | 0.083 | 1.230 | 0.102 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.53 | G | -0.03 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 69 | 10 mm | top | 1:1 | 0.084 | 1.250 | 0.105 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 18.5 | 17.35 | G | -0.08 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 137 | 10 mm | left | 1:1 | 0.385 | 1.303 | 0.502 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.60 | G | 0.10 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 137 | 10 mm | left | 1:1 | 0.360 | 1.230 | 0.443 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 18.5 | 17.46 | G | 0.10 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 0 | 10 mm | left | 1:1 | 0.390 | 1.271 | 0.496 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.53 | G | -0.02 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 69 | 10 mm | left | 1:1 | 0.356 | 1.250 | 0.445 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.47 | G | -0.03 | 0 | 0846V | DFT-S-OFDM | QPSK | 270 | 0 | 10 mm | left | 1:1 | 0.360 | 1.268 | 0.456 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 18.5 | 17.25 | G | 0.04 | 0 | 0846V | CP-OFDM | QPSK | 1 | 1 | 10 mm | left | 1:1 | 0.453 | 1.334 | 0.604 | A14 |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 14.0 | 13.26 | C | 0.18 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | back | 1:1 | 0.026 | 1.186 | 0.031 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 14.0 | 13.26 | C | 0.13 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | front | 1:1 | 0.011 | 1.186 | 0.013 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 14.0 | 13.26 | C | 0.02 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | bottom | 1:1 | 0.014 | 1.186 | 0.017 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 14.0 | 13.26 | C | -0.10 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | left | 1:1 | 0.051 | 1.186 | 0.060 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 16.5 | 16.05 | H | -0.20 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | back | 1:1 | 0.092 | 1.109 | 0.102 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 16.5 | 16.05 | H | -0.21 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | front | 1:1 | 0.000 | 1.109 | 0.000 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 16.5 | 16.05 | H | -0.10 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | top | 1:1 | 0.019 | 1.109 | 0.021 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 16.5 | 16.05 | H | -0.13 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | right | 1:1 | 0.000 | 1.109 | 0.000 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 16.5 | 16.05 | H | -0.20 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | left | 1:1 | 0.000 | 1.109 | 0.000 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.24 | D | -0.18 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | back | 1:1 | 0.026 | 1.191 | 0.031 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.24 | D | 0.00 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | front | 1:1 | 0.000 | 1.191 | 0.000 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.24 | D | 0.19 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | bottom | 1:1 | 0.003 | 1.191 | 0.004 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 14.0 | 13.24 | D | -0.18 | N/A | 0838V | CW/SRS | N/A | N/A | N/A | 10 mm | right | 1:1 | 0.000 | 1.191 | 0.000 | |

| ANSI / IEEE C95.1 1992 - SAFETY LIMIT | Body |
|---|---|
| Spatial Peak | 1.6 W/kg (mW/g) |
| Uncontrolled Exposure/General Population | averaged over 1 gram |

## 11.4 Standalone Phablet SAR Data

**Table 11-12**
**GPRS Phablet SAR Data**

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | Mode | Service | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Power Drift [dB] | Spacing | Antenna Config. | Device Serial Number | # of Time Slots | Duty Cycle | Side | SAR (10g) | Scaling Factor | Reported SAR (10g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 1909.80 | 810 | GSM 1900 | GPRS | 22.0 | 20.46 | -0.03 | 0 mm | A | 0851V | 4 | 1:2.076 | back | 0.548 | 1.426 | 0.781 | A15 |
| 1909.80 | 810 | GSM 1900 | GPRS | 22.0 | 20.46 | -0.01 | 0 mm | A | 0851V | 4 | 1:2.076 | front | 0.477 | 1.426 | 0.680 | |
| 1909.80 | 810 | GSM 1900 | GPRS | 22.0 | 20.46 | 0.00 | 0 mm | A | 0851V | 4 | 1:2.076 | bottom | 0.498 | 1.426 | 0.710 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | | | | | | Phablet<br>4.0 W/kg (mW/g)<br>averaged over 10 grams | | | |

**Table 11-13**
**LTE Band 41 Phablet SAR**

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Power Class | FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Power Drift [dB] | MPR [dB] | Antenna Config. | Serial Number | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (10g) | Scaling Factor | Reported SAR (10g) | Plot # |
| | MHz | Ch. | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| Power Class 3 | 2506.00 | 39750 | Low | LTE Band 41 | 20 | 23.0 | 21.35 | 0.01 | 0 | B | 2226V | QPSK | 1 | 50 | 0 mm | back | 1:1.58 | 1.930 | 1.462 | 2.822 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.42 | -0.02 | 0 | B | 2226V | QPSK | 1 | 50 | 0 mm | back | 1:1.58 | 2.000 | 1.439 | 2.878 | |
| Power Class 3 | 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 23.0 | 21.39 | 0.07 | 0 | B | 2226V | QPSK | 1 | 50 | 0 mm | back | 1:1.58 | 1.880 | 1.449 | 2.724 | |
| Power Class 3 | 2636.50 | 41055 | Mid-High | LTE Band 41 | 20 | 23.0 | 21.38 | 0.05 | 0 | B | 2226V | QPSK | 1 | 50 | 0 mm | back | 1:1.58 | 1.800 | 1.452 | 2.614 | |
| Power Class 3 | 2680.00 | 41490 | High | LTE Band 41 | 20 | 23.0 | 21.38 | -0.02 | 0 | B | 2226V | QPSK | 1 | 50 | 0 mm | back | 1:1.58 | 1.710 | 1.452 | 2.483 | |
| Power Class 3 | 2506.00 | 39750 | Low | LTE Band 41 | 20 | 23.0 | 21.24 | -0.01 | 0 | B | 2226V | QPSK | 50 | 0 | 0 mm | back | 1:1.58 | 1.950 | 1.500 | 2.925 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.53 | -0.02 | 0 | B | 2226V | QPSK | 50 | 25 | 0 mm | back | 1:1.58 | 2.020 | 1.403 | 2.834 | A16 |
| Power Class 3 | 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 23.0 | 21.52 | 0.02 | 0 | B | 2226V | QPSK | 50 | 25 | 0 mm | back | 1:1.58 | 1.890 | 1.406 | 2.657 | |
| Power Class 3 | 2636.50 | 41055 | Mid-High | LTE Band 41 | 20 | 23.0 | 21.51 | 0.01 | 0 | B | 2226V | QPSK | 50 | 25 | 0 mm | back | 1:1.58 | 1.820 | 1.409 | 2.564 | |
| Power Class 3 | 2680.00 | 41490 | High | LTE Band 41 | 20 | 23.0 | 21.51 | 0.03 | 0 | B | 2226V | QPSK | 50 | 50 | 0 mm | back | 1:1.58 | 1.820 | 1.409 | 2.564 | |
| Power Class 3 | 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 23.0 | 21.38 | 0.01 | 0 | B | 2226V | QPSK | 100 | 0 | 0 mm | back | 1:1.58 | 1.830 | 1.452 | 2.657 | |
| Power Class 2 | 2506.00 | 39750 | Low | LTE Band 41 | 20 | 24.6 | 23.32 | 0.00 | 0 | B | 2226V | QPSK | 50 | 0 | 0 mm | back | 1:2.31 | 1.940 | 1.343 | 2.605 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.42 | -0.05 | 0 | B | 2226V | QPSK | 1 | 50 | 0 mm | front | 1:1.58 | 1.040 | 1.439 | 1.497 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.53 | 0.05 | 0 | B | 2226V | QPSK | 50 | 25 | 0 mm | front | 1:1.58 | 1.040 | 1.403 | 1.459 | |
| Power Class 3 | 2506.00 | 39750 | Low | LTE Band 41 | 20 | 23.0 | 21.35 | 0.01 | 0 | B | 2226V | QPSK | 1 | 50 | 0 mm | bottom | 1:1.58 | 0.950 | 1.462 | 1.389 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.42 | 0.02 | 0 | B | 2226V | QPSK | 1 | 50 | 0 mm | bottom | 1:1.58 | 1.270 | 1.439 | 1.828 | |
| Power Class 3 | 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 23.0 | 21.39 | 0.00 | 0 | B | 2226V | QPSK | 1 | 50 | 0 mm | bottom | 1:1.58 | 1.150 | 1.449 | 1.666 | |
| Power Class 3 | 2636.50 | 41055 | Mid-High | LTE Band 41 | 20 | 23.0 | 21.38 | 0.10 | 0 | B | 2226V | QPSK | 1 | 50 | 0 mm | bottom | 1:1.58 | 1.090 | 1.452 | 1.583 | |
| Power Class 3 | 2680.00 | 41490 | High | LTE Band 41 | 20 | 23.0 | 21.38 | -0.10 | 0 | B | 2226V | QPSK | 1 | 50 | 0 mm | bottom | 1:1.58 | 1.130 | 1.452 | 1.641 | |
| Power Class 3 | 2506.00 | 39750 | Low | LTE Band 41 | 20 | 23.0 | 21.24 | 0.01 | 0 | B | 2226V | QPSK | 50 | 0 | 0 mm | bottom | 1:1.58 | 0.935 | 1.500 | 1.403 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.53 | -0.01 | 0 | B | 2226V | QPSK | 50 | 25 | 0 mm | bottom | 1:1.58 | 1.260 | 1.403 | 1.768 | |
| Power Class 3 | 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 23.0 | 21.52 | 0.01 | 0 | B | 2226V | QPSK | 50 | 25 | 0 mm | bottom | 1:1.58 | 1.160 | 1.406 | 1.631 | |
| Power Class 3 | 2636.50 | 41055 | Mid-High | LTE Band 41 | 20 | 23.0 | 21.51 | 0.04 | 0 | B | 2226V | QPSK | 50 | 25 | 0 mm | bottom | 1:1.58 | 1.120 | 1.409 | 1.578 | |
| Power Class 3 | 2680.00 | 41490 | High | LTE Band 41 | 20 | 23.0 | 21.51 | 0.03 | 0 | B | 2226V | QPSK | 50 | 50 | 0 mm | bottom | 1:1.58 | 1.150 | 1.409 | 1.620 | |
| Power Class 3 | 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 23.0 | 21.38 | 0.01 | 0 | B | 2226V | QPSK | 100 | 0 | 0 mm | bottom | 1:1.58 | 1.120 | 1.452 | 1.626 | |
| Power Class 3 | 2549.50 | 40185 | Low-Mid | LTE Band 41 | 20 | 23.0 | 21.53 | 0.01 | 0 | B | 2226V | QPSK | 50 | 25 | 0 mm | back | 1:1.58 | 1.920 | 1.403 | 2.694 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | | | | | | | | | | Phablet<br>4.0 W/kg (mW/g)<br>averaged over 10 grams | | | | |

Note: Blue entry represents variability measurement.

# Table 11-14
# NR Band n25 Phablet SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Tune State | Serial Number | Waveform | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (10g) | Scaling Factor | Reported SAR (10g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.03 | A | -0.09 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 1 | 53 | 9 mm | back | 1:1 | 0.523 | 1.403 | 0.734 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.34 | A | -0.07 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 50 | 28 | 9 mm | back | 1:1 | 0.456 | 1.306 | 0.596 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.03 | A | -0.06 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 1 | 53 | 7 mm | front | 1:1 | 0.560 | 1.403 | 0.786 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.34 | A | -0.03 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 50 | 28 | 7 mm | front | 1:1 | 0.613 | 1.306 | 0.801 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.03 | A | -0.04 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 1 | 53 | 13 mm | bottom | 1:1 | 0.655 | 1.403 | 0.919 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.34 | A | -0.03 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 50 | 28 | 13 mm | bottom | 1:1 | 0.660 | 1.306 | 0.862 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.03 | A | -0.03 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 1 | 53 | 0 mm | right | 1:1 | 0.316 | 1.403 | 0.443 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.34 | A | 0.03 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 50 | 28 | 0 mm | right | 1:1 | 0.326 | 1.306 | 0.426 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.03 | A | -0.13 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 1 | 53 | 0 mm | left | 1:1 | 0.837 | 1.403 | 1.174 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 24.5 | 23.34 | A | -0.04 | 0 | 18 | 0851V | DFT-S-OFDM | QPSK | 50 | 28 | 0 mm | left | 1:1 | 0.779 | 1.306 | 1.017 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.70 | A | 0.01 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 1 | 104 | 0 mm | back | 1:1 | 1.510 | 1.202 | 1.815 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.75 | A | 0.03 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 28 | 0 mm | back | 1:1 | 1.620 | 1.189 | 1.926 | |
| 1882.50 | 376500 | Mid | NR Band n25 (PCS) | 20 | 19.5 | 18.64 | A | 0.04 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 0 | 0 mm | back | 1:1 | 1.330 | 1.219 | 1.621 | |
| 1905.00 | 381000 | High | NR Band n25 (PCS) | 20 | 19.5 | 18.67 | A | 0.01 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 0 | 0 mm | back | 1:1 | 1.300 | 1.211 | 1.574 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.62 | A | -0.02 | 0 | 18 | 1789M | CP-OFDM | QPSK | 1 | 1 | 0 mm | back | 1:1 | 1.630 | 1.225 | 1.997 | A17 |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.70 | A | -0.03 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 1 | 104 | 0 mm | front | 1:1 | 0.972 | 1.202 | 1.168 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.75 | A | -0.02 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 28 | 0 mm | front | 1:1 | 0.979 | 1.189 | 1.164 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.70 | A | 0.02 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 1 | 104 | 0 mm | bottom | 1:1 | 1.590 | 1.202 | 1.911 | |
| 1860.00 | 372000 | Low | NR Band n25 (PCS) | 20 | 19.5 | 18.75 | A | 0.03 | 0 | 18 | 1789M | DFT-S-OFDM | QPSK | 50 | 28 | 0 mm | bottom | 1:1 | 1.500 | 1.189 | 1.784 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | | | | | | | | | | | | Phablet<br>4.0 W/kg (mW/g)<br>averaged over 10 grams | | | |

## Table 11-15
## NR Band n41 Phablet SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Serial Number | Waveform | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (10g) | Scaling Factor | Reported SAR (10g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | (W/kg) | | (W/kg) | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 15.0 | 14.24 | B | -0.02 | N/A | 2346V | CW/SRS | N/A | N/A | N/A | 0 mm | bottom | 1:1 | 0.604 | 1.191 | 0.719 | A18 |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | | Phablet<br>4.0 W/kg (mW/g)<br>averaged over 10 grams | | | | | | | | | | | | |

## Table 11-16
## NR Band n77 Phablet SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | Antenna Config | Power Drift [dB] | MPR [dB] | Serial Number | Waveform | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | Scaling Factor | SAR (10g) | Reported SAR (10g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | | | (W/kg) | (W/kg) | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 17.79 | G | -0.03 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 271 | 0 mm | left | 1:1 | 1.178 | 2.150 | 2.533 | A19 |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 17.46 | G | 0.09 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 138 | 0 mm | left | 1:1 | 1.271 | 2.120 | 2.695 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 17.44 | G | 0.16 | 0 | 0846V | DFT-S-OFDM | QPSK | 270 | 0 | 0 mm | left | 1:1 | 1.276 | 2.020 | 2.578 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 17.31 | G | 0.05 | 0 | 0846V | CP-OFDM | QPSK | 1 | 1 | 0 mm | left | 1:1 | 1.315 | 2.040 | 2.683 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 15.36 | H | 0.17 | N/A | 0851V | CW/SRS | N/A | N/A | N/A | 0 mm | back | 1:1 | 1.300 | 0.946 | 1.230 | |
| 3500.01 | 633334 | Mid | NR Band n77 DoD | 100 | 17.79 | G | 0.03 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 271 | 0 mm | left | 1:1 | 1.178 | 2.150 | 2.533 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 17.35 | G | 0.02 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 137 | 0 mm | back | 1:1 | 1.303 | 0.837 | 1.091 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 17.60 | G | -0.10 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 137 | 0 mm | back | 1:1 | 1.230 | 0.845 | 1.039 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 17.46 | G | 0.05 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 0 | 0 mm | back | 1:1 | 1.271 | 0.841 | 1.069 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 17.53 | G | -0.03 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 69 | 0 mm | back | 1:1 | 1.250 | 0.832 | 1.040 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 17.47 | G | -0.05 | 0 | 0846V | DFT-S-OFDM | QPSK | 270 | 0 | 0 mm | back | 1:1 | 1.268 | 0.865 | 1.097 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 17.35 | G | 0.00 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 137 | 0 mm | left | 1:1 | 1.303 | 1.870 | 2.437 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 17.60 | G | 0.01 | 0 | 0846V | DFT-S-OFDM | QPSK | 1 | 137 | 0 mm | left | 1:1 | 1.230 | 2.060 | 2.534 | |
| 3750.00 | 650000 | Low | NR Band n77 | 100 | 17.46 | G | 0.06 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 0 | 0 mm | left | 1:1 | 1.271 | 1.790 | 2.275 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 17.53 | G | 0.09 | 0 | 0846V | DFT-S-OFDM | QPSK | 135 | 69 | 0 mm | left | 1:1 | 1.250 | 2.000 | 2.500 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 17.47 | G | 0.02 | 0 | 0846V | DFT-S-OFDM | QPSK | 270 | 0 | 0 mm | left | 1:1 | 1.268 | 2.060 | 2.612 | |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 17.25 | G | -0.19 | 0 | 0846V | CP-OFDM | QPSK | 1 | 1 | 0 mm | left | 1:1 | 1.334 | 2.350 | **3.135** | A20 |
| 3930.00 | 662000 | High | NR Band n77 | 100 | 17.25 | G | -0.06 | 0 | 0846V | CP-OFDM | QPSK | 1 | 1 | 0 mm | left | 1:1 | 1.334 | 2.340 | 3.122 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | Phablet<br>4 W/kg (mW/g)<br>averaged over 10 grams | | | | | | | | | | | | |

Note: Blue entries represent variability measurement.

## Table 11-17
## WLAN SISO Phablet SAR when 5G NR is active

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | Mode | Service | Bandwidth [MHz] | Maximum Allowed Power [dBm] | Conducted Power [dBm] | Power Drift [dB] | Spacing | Antenna Config. | Device Serial Number | Data Rate (Mbps) | Side | Duty Cycle (%) | Peak SAR of Area Scan | SAR (10g) | Scaling Factor (Power) | Scaling Factor (Duty Cycle) | Reported SAR (10g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | W/kg | (W/kg) | | | (W/kg) | |
| 5290 | 58 | 802.11ac | OFDM | 80 | 13.0 | 12.01 | 0.00 | 0 mm | 1 | 2346V | 29.3 | back | 92.4 | 1.600 | - | 1.256 | 1.082 | - | |
| 5290 | 58 | 802.11ac | OFDM | 80 | 13.0 | 12.01 | 0.01 | 0 mm | 1 | 2346V | 29.3 | front | 92.4 | 1.540 | - | 1.256 | 1.082 | - | |
| 5290 | 58 | 802.11ac | OFDM | 80 | 13.0 | 12.01 | 0.05 | 0 mm | 1 | 2346V | 29.3 | left | 92.4 | 2.820 | 0.405 | 1.256 | 1.082 | **0.550** | A21 |
| 5610 | 122 | 802.11ac | OFDM | 80 | 13.0 | 12.23 | -0.07 | 0 mm | 1 | 2346V | 29.3 | back | 92.4 | 1.130 | - | 1.194 | 1.082 | - | |
| 5610 | 122 | 802.11ac | OFDM | 80 | 13.0 | 12.23 | -0.03 | 0 mm | 1 | 2346V | 29.3 | front | 92.4 | 1.210 | - | 1.194 | 1.082 | - | |
| 5610 | 122 | 802.11ac | OFDM | 80 | 13.0 | 12.23 | -0.03 | 0 mm | 1 | 2346V | 29.3 | left | 92.4 | 2.250 | 0.322 | 1.194 | 1.082 | 0.416 | |
| 5855 | 171 | 802.11ac | OFDM | 80 | 13.0 | 11.93 | 0.10 | 0 mm | 1 | 2346V | 29.3 | back | 92.4 | 0.723 | - | 1.279 | 1.082 | - | |
| 5855 | 171 | 802.11ac | OFDM | 80 | 13.0 | 11.93 | -0.10 | 0 mm | 1 | 2346V | 29.3 | front | 92.4 | 0.720 | - | 1.279 | 1.082 | - | |
| 5855 | 171 | 802.11ac | OFDM | 80 | 13.0 | 11.93 | 0.02 | 0 mm | 1 | 2346V | 29.3 | left | 92.4 | 1.460 | 0.257 | 1.279 | 1.082 | 0.356 | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | | Phablet<br>4.0 W/kg (mW/g)<br>averaged over 10 grams | | | | | | | | | | |

**Table 11-18**
**WLAN MIMO Phablet SAR when NR is active**

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | Mode | Service | Bandwidth [MHz] | Maximum Allowed Power (Ant 1) [dBm] | Conducted Power (Ant 1) [dBm] | Maximum Allowed Power (Ant 2) [dBm] | Conducted Power (Ant 2) [dBm] | Power Drift [dB] | Spacing | Antenna Config. | Device Serial Number | Data Rate (Mbps) | Side | Duty Cycle (%) | Peak SAR of Area Scan | SAR (10g) | Scaling Factor (Power) | Scaling Factor (Duty Cycle) | Reported SAR (10g) | Plot # |
| MHz | Ch. | | | | | | | | | | | | | | | W/kg | (W/kg) | | | (W/kg) | |
| 5290 | 58 | 802.11ac | OFDM | 80 | 13.0 | 12.01 | 13.0 | 12.07 | -0.01 | 0 mm | MIMO | 2346V | 58.5 | back | 91.7 | 2.140 | - | 1.256 | 1.091 | - | |
| 5290 | 58 | 802.11ac | OFDM | 80 | 13.0 | 12.01 | 13.0 | 12.07 | 0.10 | 0 mm | MIMO | 2346V | 58.5 | front | 91.7 | 1.680 | - | 1.256 | 1.091 | - | |
| 5290 | 58 | 802.11ac | OFDM | 80 | 13.0 | 12.01 | 13.0 | 12.07 | 0.11 | 0 mm | MIMO | 2346V | 58.5 | top | 91.7 | 0.323 | - | 1.256 | 1.091 | - | |
| 5290 | 58 | 802.11ac | OFDM | 80 | 13.0 | 12.01 | 13.0 | 12.07 | -0.08 | 0 mm | MIMO | 2346V | 58.5 | left | 91.7 | 2.930 | 0.397 | 1.256 | 1.091 | 0.544 | |
| 5610 | 122 | 802.11ac | OFDM | 80 | 13.0 | 12.23 | 13.0 | 12.34 | 0.00 | 0 mm | MIMO | 2346V | 58.5 | back | 91.7 | 1.940 | - | 1.194 | 1.091 | - | |
| 5610 | 122 | 802.11ac | OFDM | 80 | 13.0 | 12.23 | 13.0 | 12.34 | 0.10 | 0 mm | MIMO | 2346V | 58.5 | front | 91.7 | 1.410 | - | 1.194 | 1.091 | - | |
| 5610 | 122 | 802.11ac | OFDM | 80 | 13.0 | 12.23 | 13.0 | 12.34 | -0.10 | 0 mm | MIMO | 2346V | 58.5 | top | 91.7 | 0.282 | - | 1.194 | 1.091 | - | |
| 5610 | 122 | 802.11ac | OFDM | 80 | 13.0 | 12.23 | 13.0 | 12.34 | 0.04 | 0 mm | MIMO | 2346V | 58.5 | left | 91.7 | 2.190 | 0.301 | 1.194 | 1.091 | 0.392 | |
| 5855 | 171 | 802.11ac | OFDM | 80 | 13.0 | 11.93 | 13.0 | 12.02 | 0.10 | 0 mm | MIMO | 2346V | 58.5 | back | 91.7 | 2.400 | 0.340 | 1.279 | 1.091 | 0.474 | |
| 5855 | 171 | 802.11ac | OFDM | 80 | 13.0 | 11.93 | 13.0 | 12.02 | -0.09 | 0 mm | MIMO | 2346V | 58.5 | front | 91.7 | 0.736 | - | 1.279 | 1.091 | - | |
| 5855 | 171 | 802.11ac | OFDM | 80 | 13.0 | 11.93 | 13.0 | 12.02 | 0.05 | 0 mm | MIMO | 2346V | 58.5 | top | 91.7 | 0.174 | - | 1.279 | 1.091 | - | |
| 5855 | 171 | 802.11ac | OFDM | 80 | 13.0 | 11.93 | 13.0 | 12.02 | -0.03 | 0 mm | MIMO | 2346V | 58.5 | left | 91.7 | 1.510 | - | 1.279 | 1.091 | - | |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | | | | | | | | | Phablet<br>4.0 W/kg (mW/g)<br>averaged over 10 grams | | | | | |

Note: To achieve the 16.0 dBm maximum allowed MIMO power shown in the documentation, each antenna transmits at a maximum allowed power of 13.0 dBm.

## 11.5 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. 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.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 12 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
10. Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the display diagonal dimension is > 150 mm and < 200 mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.
11. This device supports dynamic antenna tuning for some bands. Per FCC Guidance, SAR was measured according to the normally required SAR measurement configurations with tuner active. The auto-tune state determined by the device was verified before and after each SAR measurement and is listed in tables above. Please see Section 13 for supplemental data.
12. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information).
13. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the 1g thresholds for the equivalent test cases.

14. This device uses Qualcomm Smart Transmit for 2G/3G/4G/5G operations to control and manage transmitting power in real time to ensure RF Exposure compliance. Per FCC Guidance, compliance for was assessed at the minimum of the time averaged power and the maximum output power for each band/mode/exposure condition (DSI).

GSM Test Notes:

1. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the highest output power channel for each test configuration is $\leq$ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s).

LTE Notes:

1. LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 8.4.4.
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 and MCC=001 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC KDB Publication 447498 D01v06, when the reported 1g SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for LTE B41 testing at the other channels was required for such test configurations.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per FCC Guidance, all SAR tests were performed using Power Class 3. SAR with power class 2 at the available duty factor was additionally performed for the power class 3 configuration with the highest SAR configuration for each exposure conditions. Please see Section 13 for linearity results.

NR Notes:

1. NR implementation supports SA and NSA mode. In EN-DC mode, NR operates with the LTE Bands shown in the NR FR1 checklist acting as anchor bands. Per FCC guidance, SAR tests for NR Bands and LTE Anchors Bands were performed separately due to limitations in SAR probe calibration factors.
2. Due to test setup limitations, SAR testing for NR TDD was performed using test mode software to establish the connection.
3. Per 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.
4. Per FCC KDB Publication 447498 D01v06, when the reported NR Band n77 C-Band SAR measured at the highest output power channel in a given a test configuration was > 0.4 W/kg for 1g evaluations and >1 W/kg for 10g evaluation, testing at the other channels was required for such est configurations.

5. Per FCC KDB Publication 447498 D01v06, when the reported NR Band n41 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for 1g evaluations and > 1.5 W/kg for 10g evaluation, testing at the other channels was required for such test configurations.
6. SRS was tested with CW signal per Qualcomm guidance in 80-w2112-4.
7. Simultaneous transmission analysis for EN-DC operations is addressed in the Part 2 Test Report (Serial Number can be found in the bibliography).
8. This device additionally supports some EN-DC conditions where additional LTE carriers are added on the downlink only.

# 12 SAR MEASUREMENT VARIABILITY

## 12.1 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 battery fully charged 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 1g 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
5) When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

**Table 12-1**
**Head SAR Measurement Variability Results**

| HEAD VARIABILITY RESULTS | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Band | FREQUENCY | | Mode | Service | Side | Test Position | Antenna Config | Measured SAR (1g) | 1st Repeated SAR (1g) | Ratio | 2nd Repeated SAR (1g) | Ratio | 3rd Repeated SAR (1g) | Ratio |
| | MHz | Ch. | | | | | | (W/kg) | (W/kg) | | (W/kg) | | (W/kg) | |
| 2600 | 2592.99 | 518598 | NR Band n41,100 MHz Bandwidth | DFT-S-OFDM, QPSK, 270 RB, 0 RB Offset | Left | Tilt | F | 0.908 | 0.894 | 1.02 | N/A | N/A | N/A | N/A |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | Head<br>1.6 W/kg (mW/g)<br>averaged over 1 gram | | | | | | | | | |

**Table 12-2**
**Body SAR Measurement Variability Results**

| BODY VARIABILITY RESULTS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Band | FREQUENCY | | Mode | Service | Side | Spacing | Antenna Config | Tune State | Measured SAR (1g) | 1st Repeated SAR (1g) | Ratio | 2nd Repeated SAR (1g) | Ratio | 3rd Repeated SAR (1g) | Ratio |
| | MHz | Ch. | | | | | | | (W/kg) | (W/kg) | | (W/kg) | | (W/kg) | |
| 1900 | 1882.50 | 376500 | NR Band n25 (PCS), 20 MHz Bandwidth | DFT-S-OFDM, QPSK, 1 RB, 53 RB Offset | bottom | 10 mm | A | 18 | 0.818 | 0.813 | 1.01 | N/A | N/A | N/A | N/A |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | Body<br>1.6 W/kg (mW/g)<br>averaged over 1 gram | | | | | | | | | | |

**Table 12-3**
**Phablet SAR Measurement Variability Results**

| PHABLET VARIABILITY RESULTS | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Band | FREQUENCY | | Mode | Service | Side | Spacing | Antenna Config | Measured SAR (10g) | 1st Repeated SAR (10g) | Ratio | 2nd Repeated SAR (10g) | Ratio | 3rd Repeated SAR (10g) | Ratio |
| | MHz | Ch. | | | | | | (W/kg) | (W/kg) | | (W/kg) | | (W/kg) | |
| 2600 | 2549.50 | 40185 | LTE Band 41, 20 MHz Bandwidth | QPSK, 50 RB, 25 RB Offset | back | 0mm | B | 2.020 | 1.920 | 1.05 | N/A | N/A | N/A | N/A |
| 3500 | 3500.01 | 633334 | NR Band n77 DoD, 100 MHz Bandwidth | CW/SRS, N/A, N/A RB, N/A RB Offset | left | 0 mm | D | 2.350 | 2.150 | 1.09 | N/A | N/A | N/A | N/A |
| 3900 | 3930.00 | 662000 | NR Band n77, 100 MHz Bandwidth | CP-OFDM, QPSK, 1 RB, 1 RB Offset | left | 0 mm | G | 2.350 | 2.340 | 1.00 | N/A | N/A | N/A | N/A |
| ANSI / IEEE C95.1 1992 - SAFETY LIMIT<br>Spatial Peak<br>Uncontrolled Exposure/General Population | | | | | | | | Phablet<br>4.0 W/kg (mW/g)<br>averaged over 10 grams | | | | | | |

## 12.2 Measurement Uncertainty

The measured SAR was <1.5 W/kg for 1g and <3.75 W/kg for 10g for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

# 13 ADDITIONAL TESTING PER FCC GUIDANCE

## 13.1 Tuner Testing

Per April 2019 TCB Workshop Notes, the following test procedures were followed to demonstrate that the SAR results in Section 11 represented the appropriate SAR test conditions. For bands with dynamic tuning implemented, SAR was measured according to the required FCC SAR test procedures with the dynamic tuner active to allow the device to automatically tune to the antenna state for the respective RF exposure test configurations. Per FCC Guidance, during NR testing the device was configured with the tuner state selected by the device in LTE mode with auto-tune active at the same frequency. The additional tuner hardware has no influence on the antenna characteristics, other than impedance matching.

To evaluate all the tuner states, the 120 tuner states were divided among the aggregate band, mode and exposure combinations. Single point time-sweep measurements were performed at the peak SAR location determined by the zoom scan of the configuration with the highest reported SAR for each combination. The tuner state was able to be established remotely so that the device was not moved for the entire series of single point SAR for the tuner states in each combination. The SAR probe remained stationary at the same position throughout the entire series of single point measurements for each combination. When the single point SAR or 1g SAR was > 1.2 W/kg for a particular band/mode/exposure condition, point SAR measurements were made for all 120 states.

The operational description contains more information about the design and implementation of the dynamic antenna tuning.

## Table 13-1
## NR Supplemental Head SAR Data

| Supplemental Head SAR Data | |
|---|---|
| NR Band n25 | |
| DFT-s-OFDM QPSK, 20 MHz Bandwidth, 1 RB, 53 RB Offset | |
| Test Position | Left Cheek |
| Frequency (MHz) | 1860.00 |
| Channel | 372000 |
| Measured 1g SAR (W/kg) | 0.152 |
| Average Value of Time Sweep (W/kg) | |
| Auto-tune (State 2) | 0.165 |
| Default (State 0) | 0.149 |
| State 0 | 0.149 |
| State 1 | 0.153 |
| State 4 | 0.156 |
| State 5 | 0.152 |
| State 8 | 0.137 |
| State 9 | 0.143 |
| State 12 | 0.048 |
| State 13 | 0.133 |
| State 16 | 0.160 |
| State 17 | 0.156 |
| State 20 | 0.158 |
| State 21 | 0.169 |
| State 24 | 0.084 |
| State 25 | 0.073 |
| State 28 | 0.178 |
| State 29 | 0.174 |
| State 32 | 0.176 |
| State 33 | 0.170 |
| State 36 | 0.131 |
| State 37 | 0.130 |
| State 40 | 0.060 |
| State 41 | 0.076 |
| State 44 | 0.061 |
| State 45 | 0.073 |
| State 48 | 0.040 |
| State 49 | 0.045 |
| State 52 | 0.142 |
| State 53 | 0.149 |
| State 56 | 0.166 |
| State 57 | 0.160 |
| State 60 | 0.174 |
| State 61 | 0.174 |
| State 64 | 0.083 |
| State 65 | 0.064 |
| State 68 | 0.068 |
| State 69 | 0.086 |
| State 72 | 0.086 |
| State 73 | 0.097 |
| State 76 | 0.029 |
| State 77 | 0.022 |
| State 80 | 0.102 |
| State 81 | 0.121 |
| State 84 | 0.101 |
| State 85 | 0.115 |
| State 88 | 0.057 |
| State 89 | 0.055 |
| State 92 | 0.113 |
| State 93 | 0.134 |
| State 96 | 0.121 |
| State 97 | 0.148 |
| State 100 | 0.096 |
| State 101 | 0.096 |
| State 104 | 0.154 |
| State 105 | 0.159 |
| State 108 | 0.143 |
| State 109 | 0.068 |
| State 112 | 0.153 |
| State 113 | 0.138 |
| State 116 | 0.141 |
| State 117 | 0.060 |

## Table 13-2
## NR Supplemental Body SAR Data

| Supplemental Body SAR Data | |
|---|---|
| NR Band n25 | |
| DFT-s-OFDM QPSK, 20 MHz Bandwidth, 1 RB, 53 RB Offset | |
| Test Position | Bottom |
| Spacing | 10 mm |
| Frequency (MHz) | 1882.50 |
| Channel | 376500 |
| Measured 1g SAR (W/kg) | 0.818 |
| Average Value of Time Sweep (W/kg) | |
| Auto-tune (State 18) | 0.903 |
| Default (State 0) | 0.895 |
| State 0 | 0.895 |
| State 2 | 0.897 |
| State 3 | 0.875 |
| State 6 | 0.834 |
| State 7 | 0.762 |
| State 10 | 0.540 |
| State 11 | 0.397 |
| State 14 | 0.910 |
| State 15 | 0.893 |
| State 18 | 0.918 |
| State 19 | 0.877 |
| State 22 | 0.727 |
| State 23 | 0.577 |
| State 26 | 0.923 |
| State 27 | 0.909 |
| State 30 | 0.936 |
| State 31 | 0.907 |
| State 34 | 0.885 |
| State 35 | 0.782 |
| State 38 | 0.450 |
| State 39 | 0.286 |
| State 42 | 0.320 |
| State 43 | 0.292 |
| State 46 | 0.276 |
| State 47 | 0.219 |
| State 50 | 0.099 |
| State 51 | 0.054 |
| State 54 | 0.845 |
| State 55 | 0.824 |
| State 58 | 0.883 |
| State 59 | 0.852 |
| State 62 | 0.787 |
| State 63 | 0.628 |
| State 66 | 0.364 |
| State 67 | 0.339 |
| State 70 | 0.382 |
| State 71 | 0.354 |
| State 74 | 0.250 |
| State 75 | 0.176 |
| State 78 | 0.526 |
| State 79 | 0.515 |
| State 82 | 0.509 |
| State 83 | 0.488 |
| State 86 | 0.394 |
| State 87 | 0.288 |
| State 90 | 0.118 |
| State 91 | 0.510 |
| State 94 | 0.596 |
| State 95 | 0.559 |
| State 98 | 0.562 |
| State 99 | 0.466 |
| State 102 | 0.228 |
| State 103 | 0.123 |
| State 106 | 0.923 |
| State 107 | 0.277 |
| State 110 | 0.522 |
| State 111 | 0.504 |
| State 114 | 0.923 |
| State 115 | 0.279 |
| State 118 | 0.521 |
| State 119 | 0.495 |

## 13.1 LTE Band 41 Power Class 2 and Power Class 3 Linearity

This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per May 2017 TCB Workshop Notes based on the device behavior, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the highest power and available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR for each exposure condition. The linearity between the Power Class 2 and Power Class 3 SAR results and the respective frame averaged powers was calculated to determine that the results were linear.
Per May 2017 TCB Workshop, no additional SAR measurements were required since the linearity between power classes was < 10% and all reported SAR values were < 1.4 W/kg for 1g and < 3.5 W/kg for 10g.

**Table 13-3**
**LTE Band 41 Hotspot Linearity Data**

| | LTE Band 41 PC3 | LTE Band 41 PC2 |
|---|---|---|
| Maximum Allowed Output Power (dBm) | 23.00 | 24.60 |
| Measured Output Power (dBm) | 21.35 | 23.30 |
| Measured SAR (W/kg) | 0.741 | 0.715 |
| Measured Power (mW) | 136.46 | 213.80 |
| Duty Cycle | 63.3% | 43.3% |
| Frame Averaged Output Power (mW) | 86.38 | 92.57 |
| % deviation from expected linearity | | -9.97% |

**Figure 13-1**
**LTE Band 41 Hotspot Linearity**

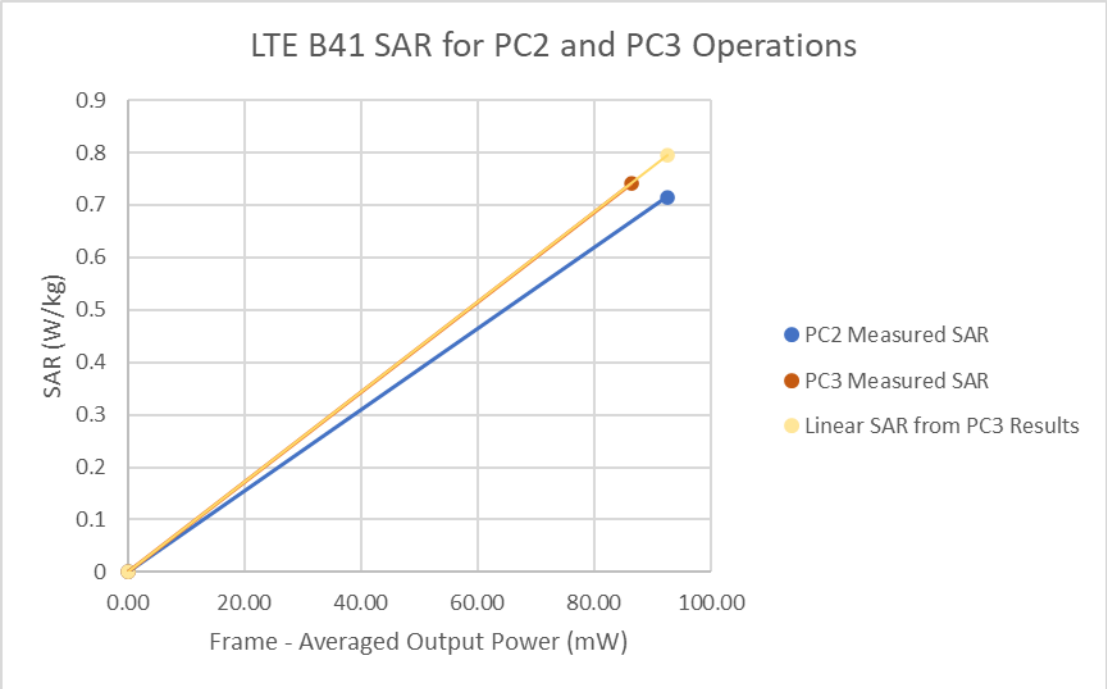
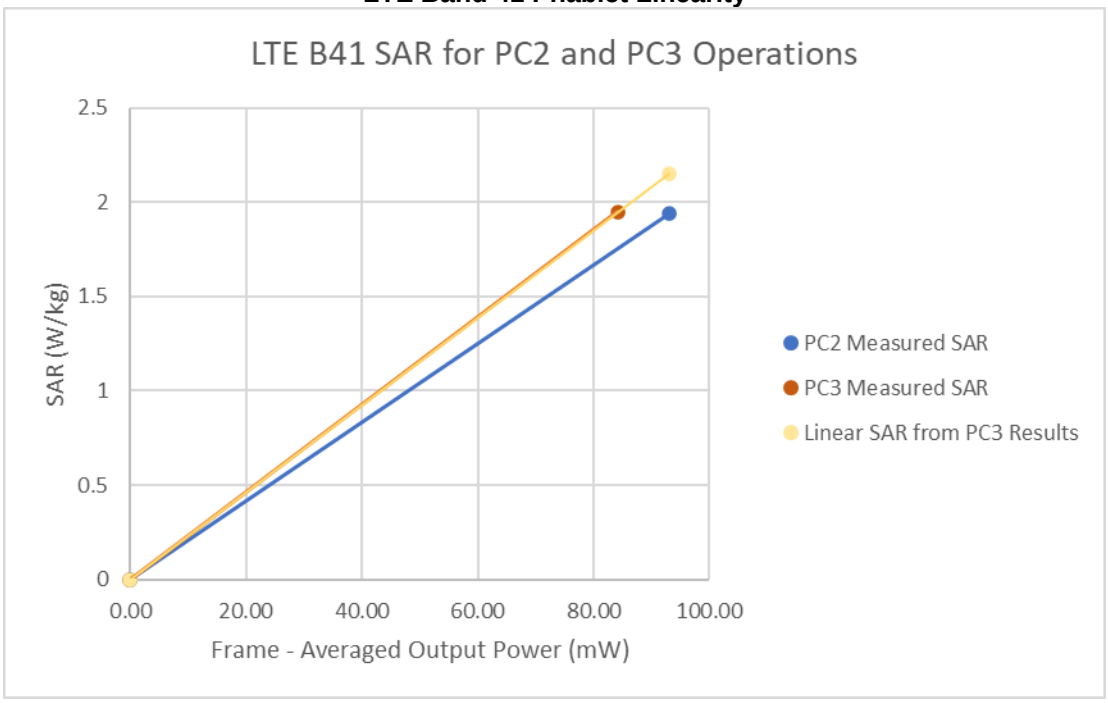



**Table 13-4**
**LTE Band 41 Phablet Linearity Data**

| | LTE Band 41 PC3 | LTE Band 41 PC2 |
|---|---|---|
| Maximum Allowed Output Power (dBm) | 23.00 | 24.60 |
| Measured Output Power (dBm) | 21.24 | 23.32 |
| Measured SAR (W/kg) | 1.950 | 1.940 |
| Measured Power (mW) | 133.05 | 214.78 |
| Duty Cycle | 63.3% | 43.3% |
| Frame Averaged Output Power (mW) | 84.22 | 93.00 |
| % deviation from expected linearity | | -9.91% |

**Figure 13-2**
**LTE Band 41 Phablet Linearity**



# 14 EQUIPMENT LIST

| Manufacturer | Model | Description | Cal Date | Cal Interval | Cal Due | Serial Number |
|---|---|---|---|---|---|---|
| Agilent | E4404B | Spectrum Analyzer | N/A | N/A | N/A | MY45113242 |
| Agilent | E4438C | ESG Vector Signal Generator | 2/14/2022 | Annual | 2/14/2023 | MY42082385 |
| Agilent | E4438C | ESG Vector Signal Generator | 12/20/2021 | Biennial | 12/20/2022 | MY45090700 |
| Agilent | N5182A | MXG Vector Signal Generator | 6/21/2021 | Annual | 6/21/2022 | MY47420603 |
| Agilent | N5182A | MXG Vector Signal Generator | 6/15/2021 | Annual | 6/15/2022 | MY47420800 |
| Agilent | 8753ES | S-Parameter Vector Network Analyzer | 2/11/2022 | Annual | 2/11/2023 | MY40003841 |
| Agilent | 8753ES | S-Parameter Vector Network Analyzer | 12/17/2021 | Annual | 12/17/2022 | MY40000670 |
| Agilent | E5515C | Wireless Communications Test Set | 5/6/2021 | Annual | 5/6/2022 | GB44400860 |
| Agilent | E5515C | Wireless Communications Test Set | 1/14/2020 | Triennial | 1/14/2023 | GB43304447 |
| Agilent | N4010A | Wireless Connectivity Test Set | N/A | N/A | N/A | GB46170464 |
| Amplifier Research | 15S1G6 | Amplifier | CBT | N/A | CBT | 433974 |
| Amplifier Research | 15S1G6 | Amplifier | CBT | N/A | CBT | 433972 |
| Anritsu | ML2496A | Power Meter | 4/21/2021 | Annual | 4/21/2022 | 1351001 |
| Anritsu | ML2496A | Power Meter | 2/11/2022 | Annual | 2/11/2023 | 1405003 |
| Anritsu | MA2411B | Pulse Power Sensor | 9/21/2021 | Annual | 9/21/2022 | 1339008 |
| Anritsu | MA2411B | Pulse Power Sensor | 8/10/2021 | Annual | 8/10/2022 | 1207364 |
| Anritsu | MT8821C | Radio Communication Analyzer MT8821C | 9/26/2021 | Annual | 9/26/2022 | 6201524637 |
| Anritsu | MT8821C | Radio Communication Analyzer MT8821C | 8/10/2021 | Annual | 8/10/2022 | 6262150000 |
| Anritsu | MT8821C | Radio Communication Analyzer MT8821C | 5/21/2021 | Annual | 5/21/2022 | 6201144419 |
| Anritsu | MT8821C | Radio Communication Analyzer MT8821C | 4/14/2021 | Annual | 4/14/2022 | 6261895213 |
| Anritsu | MT8000A | Radio Communication Test Station | 8/2/2021 | Annual | 8/2/2022 | 6272337439 |
| Anritsu | MT8000A | Radio Communication Test Station | 8/2/2021 | Annual | 8/2/2022 | 6272337438 |
| Anritsu | MT8000A | Radio Communication Test Station | 8/2/2021 | Annual | 8/2/2022 | 6272337436 |
| Anritsu | MA24106A | USB Power Sensor | 10/20/2021 | Annual | 10/20/2022 | 1344545 |
| Anritsu | MA24106A | USB Power Sensor | 9/20/2021 | Annual | 9/20/2022 | 1349511 |
| Control Company | 4353 | Long Stem Thermometer | 10/28/2020 | Biennial | 10/28/2022 | 200670623 |
| Control Company | 4353 | Long Stem Thermometer | 10/28/2020 | Biennial | 10/28/2022 | 200670633 |
| Control Company | 4353 | Long Stem Thermometer | 10/28/2020 | Biennial | 10/28/2022 | 200670635 |
| Control Company | 4040 | Therm./ Clock/ Humidity Monitor | 2/28/2018 | Biennial | CBT | 170151872 |
| Control Company | 4040 | Therm./ Clock/ Humidity Monitor | 2/28/2018 | Biennial | CBT | 170151893 |
| Control Company | 4040 | Therm./ Clock/ Humidity Monitor | 2/23/2021 | Annual | 2/23/2022 | 160574418 |
| Keysight Technologies | N6705B | DC Power Analyzer | 5/5/2021 | Triennial | 5/5/2024 | MY53004059 |
| Keysight Technologies | N9020A | MXA Signal Analyzer | 3/4/2022 | Annual | 3/4/2023 | US46470561 |
| MCL | BW-N6W5+ | 6dB Attenuator | CBT | N/A | CBT | 1139 |
| Mini-Circuits | VLF-6000+ | Low Pass Filter DC to 6000 MHz | CBT | N/A | CBT | N/A |
| Mini-Circuits | VLF-6000+ | Low Pass Filter DC to 6000 MHz | 7/6/2021 | Annual | 7/6/2022 | 31634 |
| Mini-Circuits | BW-N20W5+ | DC to 18 GHz Precision Fixed 20 dB Attenuator | CBT | N/A | CBT | N/A |
| Mini-Circuits | NLP-1200+ | Low Pass Filter DC to 1000 MHz | CBT | N/A | CBT | N/A |
| Mini-Circuits | NLP-2950+ | Low Pass Filter DC to 2700 MHz | CBT | N/A | CBT | N/A |
| Mini-Circuits | BW-N20W5 | Power Attenuator | CBT | N/A | CBT | 1226 |
| Mini-Circuits | ZUDC10-83-S+ | Directional Coupler | CBT | N/A | CBT | 2050 |
| Narda | 4772-3 | Attenuator (3dB) | CBT | N/A | CBT | 9406 |
| Narda | BW-S3W2 | Attenuator (3dB) | CBT | N/A | CBT | 120 |
| Rohde & Schwarz | CMW500 | Wideband Radio Communication Tester | 2/21/2022 | Annual | 2/21/2023 | 164948 |
| Rohde & Schwarz | CMW500 | Wideband Radio Communication Tester | 2/17/2022 | Annual | 2/17/2023 | 161662 |
| Rohde & Schwarz | CMW500 | Wideband Radio Communication Tester | 12/2/2021 | Annual | 12/2/2022 | 166462 |
| Rohde & Schwarz | CMW500 | Wideband Radio Communication Tester | 10/5/2021 | Annual | 10/5/2022 | 116743 |
| SPEAG | DAK-3.5 | Dielectric Assessment Kit | 1/6/2022 | Annual | 1/6/2023 | 1278 |
| SPEAG | DAKS-3.5 | Portable Dielectric Assessment Kit | 8/18/2021 | Annual | 8/18/2022 | 1041 |
| SPEAG | MAIA | Modulation and Audio Interference Analyzer | N/A | N/A | N/A | 1379 |
| SPEAG | D1900V2 | 1900 MHz SAR Dipole | 10/22/2021 | Annual | 10/22/2022 | 5d080 |
| SPEAG | D1900V2 | 1900 MHz SAR Dipole | 2/21/2022 | Annual | 2/21/2023 | 5d148 |
| SPEAG | D2450V2 | 2450 MHz SAR Dipole | 11/25/2021 | Annual | 11/25/2022 | 981 |
| SPEAG | D2600V2 | 2600 MHz SAR Dipole | 6/14/2019 | Triennial | 6/14/2022 | 1064 |
| SPEAG | D2600V2 | 2600 MHz SAR Dipole | 4/14/2021 | Annual | 4/14/2022 | 1004 |
| SPEAG | D2600V2 | 2600 MHz SAR Dipole | 11/12/2019 | Triennial | 11/12/2022 | 1071 |
| SPEAG | D3500V2 | 3500 MHz SAR Dipole | 1/19/2021 | Biennial | 1/19/2023 | 1059 |
| SPEAG | D3500V2 | 3500 MHz SAR Dipole | 1/21/2020 | Triennial | 1/21/2023 | 1097 |
| SPEAG | D3700V2 | 3700 MHz SAR Dipole | 1/21/2020 | Triennial | 1/21/2023 | 1067 |
| SPEAG | D3700V2 | 3700 MHz SAR Dipole | 1/19/2021 | Biennial | 1/19/2023 | 1018 |
| SPEAG | D3900V2 | 3900 MHz SAR Dipole | 10/9/2020 | Biennial | 10/9/2022 | 1056 |
| SPEAG | D3900V2 | 3900 MHz SAR Dipole | 6/10/2021 | Biennial | 6/10/2023 | 1073 |
| SPEAG | D5GHzV2 | 5 GHz SAR Dipole | 9/15/2021 | Annual | 9/15/2022 | 1191 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 7/13/2021 | Annual | 7/13/2022 | 1583 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 6/21/2021 | Annual | 6/21/2022 | 1676 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 8/4/2021 | Annual | 8/4/2022 | 1680 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 8/3/2021 | Annual | 8/3/2022 | 1681 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 4/7/2021 | Annual | 4/7/2022 | 1407 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 6/15/2021 | Annual | 6/15/2022 | 1334 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 8/16/2021 | Annual | 8/16/2022 | 1450 |
| SPEAG | EX3DV4 | SAR Probe | 7/20/2021 | Annual | 7/20/2022 | 7410 |
| SPEAG | EX3DV4 | SAR Probe | 7/20/2021 | Annual | 7/20/2022 | 7406 |
| SPEAG | EX3DV4 | SAR Probe | 9/20/2021 | Annual | 9/20/2022 | 7552 |
| SPEAG | EX3DV4 | SAR Probe | 8/5/2021 | Annual | 8/5/2022 | 7670 |
| SPEAG | EX3DV4 | SAR Probe | 4/19/2021 | Annual | 4/19/2022 | 7357 |
| SPEAG | EX3DV4 | SAR Probe | 6/21/2021 | Annual | 6/21/2022 | 7409 |
| SPEAG | EX3DV4 | SAR Probe | 6/28/2021 | Annual | 6/28/2022 | 7661 |

Note: all equipment was used solely within its respective calibration period.

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.

# 15 MEASUREMENT UNCERTAINTIES

| a | b | c | d | e= f(d,k) | f | g | h = c x f/e | i = c x g/e | k |
|---|---|---|---|---|---|---|---|---|---|
| **Uncertainty Component** | IEEE 1528 Sec. | Tol. (± %) | Prob. Dist. | Div. | $c_i$ 1gm | $c_i$ 10 gms | 1gm $u_i$ (± %) | 10gms $u_i$ (± %) | $v_i$ |
| **Measurement System** | | | | | | | | | |
| Probe Calibration | E.2.1 | 7 | N | 1 | 1 | 1 | 7.0 | 7.0 | ∞ |
| Axial Isotropy | E.2.2 | 0.25 | N | 1 | 0.7 | 0.7 | 0.2 | 0.2 | ∞ |
| Hemishperical Isotropy | E.2.2 | 1.3 | N | 1 | 0.7 | 0.7 | 0.9 | 0.9 | ∞ |
| Boundary Effect | E.2.3 | 2 | R | 1.732 | 1 | 1 | 1.2 | 1.2 | ∞ |
| Linearity | E.2.4 | 0.3 | N | 1 | 1 | 1 | 0.3 | 0.3 | ∞ |
| System Detection Limits | E.2.4 | 0.25 | R | 1.732 | 1 | 1 | 0.1 | 0.1 | ∞ |
| Modulation Response | E.2.5 | 4.8 | R | 1.732 | 1 | 1 | 2.8 | 2.8 | ∞ |
| Readout Electronics | E.2.6 | 0.3 | N | 1 | 1 | 1 | 0.3 | 0.3 | ∞ |
| Response Time | E.2.7 | 0.8 | R | 1.732 | 1 | 1 | 0.5 | 0.5 | ∞ |
| Integration Time | E.2.8 | 2.6 | R | 1.732 | 1 | 1 | 1.5 | 1.5 | ∞ |
| RF Ambient Conditions - Noise | E.6.1 | 3 | R | 1.732 | 1 | 1 | 1.7 | 1.7 | ∞ |
| RF Ambient Conditions - Reflections | E.6.1 | 3 | R | 1.732 | 1 | 1 | 1.7 | 1.7 | ∞ |
| Probe Positioner Mechanical Tolerance | E.6.2 | 0.8 | R | 1.732 | 1 | 1 | 0.5 | 0.5 | ∞ |
| Probe Positioning w/ respect to Phantom | E.6.3 | 6.7 | R | 1.732 | 1 | 1 | 3.9 | 3.9 | ∞ |
| Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation | E.5 | 4 | R | 1.732 | 1 | 1 | 2.3 | 2.3 | ∞ |
| **Test Sample Related** | | | | | | | | | |
| Test Sample Positioning | E.4.2 | 3.12 | N | 1 | 1 | 1 | 3.1 | 3.1 | 35 |
| Device Holder Uncertainty | E.4.1 | 1.67 | N | 1 | 1 | 1 | 1.7 | 1.7 | 5 |
| Output Power Variation - SAR drift measurement | E.2.9 | 5 | R | 1.732 | 1 | 1 | 2.9 | 2.9 | ∞ |
| SAR Scaling | E.6.5 | 0 | R | 1.732 | 1 | 1 | 0.0 | 0.0 | ∞ |
| **Phantom & Tissue Parameters** | | | | | | | | | |
| Phantom Uncertainty (Shape & Thickness tolerances) | E.3.1 | 7.6 | R | 1.73 | 1.0 | 1.0 | 4.4 | 4.4 | ∞ |
| Liquid Conductivity - measurement uncertainty | E.3.3 | 4.3 | N | 1 | 0.78 | 0.71 | 3.3 | 3.0 | 76 |
| Liquid Permittivity - measurement uncertainty | E.3.3 | 4.2 | N | 1 | 0.23 | 0.26 | 1.0 | 1.1 | 75 |
| Liquid Conductivity - Temperature Uncertainty | E.3.4 | 3.4 | R | 1.732 | 0.78 | 0.71 | 1.5 | 1.4 | ∞ |
| Liquid Permittivity - Temperature Unceritainty | E.3.4 | 0.6 | R | 1.732 | 0.23 | 0.26 | 0.1 | 0.1 | ∞ |
| Liquid Conductivity - deviation from target values | E.3.2 | 5.0 | R | 1.73 | 0.64 | 0.43 | 1.8 | 1.2 | ∞ |
| Liquid Permittivity - deviation from target values | E.3.2 | 5.0 | R | 1.73 | 0.60 | 0.49 | 1.7 | 1.4 | ∞ |
| **Combined Standard Uncertainty (k=1)** | | | RSS | | | | 12.2 | 12.0 | 191 |
| **Expanded Uncertainty** (95% CONFIDENCE LEVEL) | | | k=2 | | | | 24.4 | 24.0 | |

The above measurement uncertainties are according to IEEE Std. 1528-2013

# 16 CONCLUSION

## 16.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and Innovation, Science, and Economic Development Canada, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables. [3]

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