



## Element Materials Technology

(formerly PCTEST)  
18855 Adams Court, Morgan Hill, CA 95037 USA  
Tel. +1.408.538.5600  
<http://www.element.com>



### TIME-AVERAGED SAR VALIDATION REPORT

**Applicant Name:**  
Apple, Inc.  
One Apple Park Way  
Cupertino, CA, 95014, USA

**Date of Testing:**  
07/09/2025 – 09/05/2025  
**Test Site/Location:**  
Element, Morgan Hill, CA, USA  
**Document Serial No.:**  
1C2504170039-04.BCG (Rev1)

**FCC ID:** BCGA3358

**APPLICANT:** APPLE INC.

**DUT Type:** Tablet Device  
**Application Type:** Certification  
**FCC Rule Part(s):** CFR §2.1093  
**Model:** A3358  
**Additional Model:** A3359  
**Device Serial Numbers:** Pre-Production Samples [GPQ99, 4910M, JHQDQ, 5471P, 35DW5]

Note: This revised test report supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly

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.

RJ Ortanez  
Executive Vice President



|                                                    |                                            |                                          |
|----------------------------------------------------|--------------------------------------------|------------------------------------------|
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# 1. RF EXPOSURE LIMITS

## 1.1 Device Overview

| Band & Mode        | Operating Modes | Tx Frequency                                                                                                   |
|--------------------|-----------------|----------------------------------------------------------------------------------------------------------------|
| UMTS 850           | Data            | 826.40 - 846.60 MHz                                                                                            |
| UMTS 1750          | Data            | 1712.4 - 1752.6 MHz                                                                                            |
| UMTS 1900          | Data            | 1852.4 - 1907.6 MHz                                                                                            |
| LTE Band 71        | Data            | 665.5 - 695.5 MHz                                                                                              |
| LTE Band 12        | Data            | 699.7 - 715.3 MHz                                                                                              |
| LTE Band 13        | Data            | 779.5 - 784.5 MHz                                                                                              |
| LTE Band 14        | Data            | 790.5 - 795.5 MHz                                                                                              |
| LTE Band 26 (Cell) | Data            | 814.7 - 848.3 MHz                                                                                              |
| LTE Band 5 (Cell)  | Data            | 824.7 - 848.3 MHz                                                                                              |
| LTE Band 66 (AWS)  | Data            | 1710.7 - 1779.3 MHz                                                                                            |
| LTE Band 25 (PCS)  | Data            | 1850.7 - 1914.3 MHz                                                                                            |
| LTE Band 30        | Data            | 2307.5 - 2312.5 MHz                                                                                            |
| LTE Band 7         | Data            | 2502.5 - 2567.5 MHz                                                                                            |
| LTE Band 41        | Data            | 2498.5 - 2687.5 MHz                                                                                            |
| LTE Band 48        | Data            | 3552.5 - 3697.5 MHz                                                                                            |
| NR Band n71        | Data            | 665.5 - 695.5 MHz                                                                                              |
| NR Band n12        | Data            | 701.5 - 713.5 MHz                                                                                              |
| NR Band n14        | Data            | 790.5 - 795.5 MHz                                                                                              |
| NR Band n26 (Cell) | Data            | 816.5 - 846.5 MHz                                                                                              |
| NR Band n5 (Cell)  | Data            | 826.5 - 846.5 MHz                                                                                              |
| NR Band n70        | Data            | 1697.5 - 1707.5 MHz                                                                                            |
| NR Band n66 (AWS)  | Data            | 1712.5 - 1777.5 MHz                                                                                            |
| NR Band n25 (PCS)  | Data            | 1852.5 - 1912.5 MHz                                                                                            |
| NR Band n30        | Data            | 2307.5 - 2312.5 MHz                                                                                            |
| NR Band n7         | Data            | 2502.5 - 2567.5 MHz                                                                                            |
| NR Band n41        | Data            | 2505.0 - 2685.0 MHz                                                                                            |
| NR Band n48        | Data            | 3550 - 3700 MHz                                                                                                |
| NR Band n77 DoD    | Data            | 3460.02 - 3540 MHz                                                                                             |
| NR Band n77        | Data            | 3710.01 - 3969.99 MHz                                                                                          |
| 2.4 GHz WIFI       | Voice/Data      | 2412 - 2472 MHz                                                                                                |
| 5 GHz WIFI         | Voice/Data      | U-NII-1: 5180 - 5240 MHz<br>U-NII-2A: 5260 - 5320 MHz<br>U-NII-2C: 5500 - 5720 MHz<br>U-NII-3: 5745 - 5825 MHz |
| 6 GHz WIFI         | Voice/Data      | U-NII-5: 5935 - 6415 MHz<br>U-NII-6: 6435 - 6515 MHz<br>U-NII-7: 6535 - 6875 MHz<br>U-NII-8: 6895 - 7115 MHz   |
| 2.4 GHz Bluetooth  | Data            | 2402 - 2480 MHz                                                                                                |
| 802.15.4           | Data            | 2405 - 2475 MHz                                                                                                |
| NB U-NII 1         | Data            | 5162 - 5245 MHz                                                                                                |
| NB U-NII 3         | Data            | 5733 - 5844 MHz                                                                                                |
| NB U-NII 5         | Data            | 6105 - 6420 MHz                                                                                                |
| WPT                | N/A             | 13.56 MHz                                                                                                      |

|                                                    |                                            |                                          |
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## 1.2 Key Parameter Description

| Operating parameters   | Description                                                                                      |
|------------------------|--------------------------------------------------------------------------------------------------|
| $P_{limit}$            | The maximum possible time-averaged power for all device operating states where TAS is supported. |
| $P_{limit,nom}$        | The target time-averaged power, excluding total device uncertainty.                              |
| $P_{max}$              | The maximum possible instantaneous power for all device operating states where TAS is supported. |
| $SAR_{Design\ Target}$ | The maximum Spatial Peak averaged-SAR value, corresponding to $P_{limit,nom}$ .                  |
| $SAR_{Design\ Limit}$  | The maximum Spatial Peak averaged-SAR value, corresponding to $P_{limit}$ .                      |

$P_{limit,nom}$ ,  $P_{limit}$ , and  $P_{max}$  values are defined for all antennas, technologies, bands, and operating state combinations supporting TAS on the DUT. The  $P_{limit,nom}$  value is defined to ensure the RF exposure is never greater than  $SAR_{Design\ Limit}$ .

## 1.3 Time-Averaging Algorithm for RF Exposure Compliance

This DUT supports time-averaging with dynamic budgeting for Cellular technologies to control and manage transmitting power, in real time. Consumed SAR from active radios is tracked and stored for the duration of the applicable regulatory averaging window. Rolling time-averaged SAR values are calculated from the consumed SAR reported from active radios. The time-averaged SAR is always maintained less than the applicable  $SAR_{Design\ Limit}$ . Only Cellular technologies implement this dynamic budgeting method. Connectivity technologies (WLAN, BT, NB UNII, 802.15.4) implement an independent TAS algorithm for power and budget control.

The purpose of this document is to demonstrate the validity of the Cellular TAS and Budget Sharing feature.

|                                             |                                     |                                   |
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## 1.4 Bibliography

| Report Type        | Report Serial Number |
|--------------------|----------------------|
| RF Exposure Report | 1C2504170039-02.BCG  |

## 1.5 Time-Averaging Algorithm for RF Exposure Compliance

The maximum time-averaged output power (dBm) for any WWAN Sub6 technology, band, and device state is the minimum of (“P<sub>limit</sub>” and “Maximum tune-up output power P<sub>max</sub>”) + corresponding device uncertainty on the table above. SAR values in this report were scaled to this maximum time-averaged output power to determine compliance per KDB Publication 447498 D01v06.

The tables below define the following parameters (SAR<sub>target</sub>, SAR Design<sub>limit</sub>, P<sub>limit,nom</sub> and P<sub>max,nom</sub> values) for TAS operations.

|                                             |                                     |                                   |
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## 1.5.1 SAR Design Target Calculations

**Table 1-1**  
**Antenna 1**

| SAR_design_target Calculations               |                   |                  |                      |
|----------------------------------------------|-------------------|------------------|----------------------|
| Mode/Band                                    | 1g SAR<br>[W/kg]  |                  |                      |
|                                              | SAR_design_target | SAR_Design_limit | SAR_regulatory_limit |
| UMTS 850                                     | 1.04              | 1.2 W/kg         | 1.6 W/kg             |
| UMTS 1750                                    | 0.97              |                  |                      |
| UMTS 1900                                    | 1.02              |                  |                      |
| LTE Band 71                                  | 0.93              |                  |                      |
| LTE Band 12                                  | 0.97              |                  |                      |
| LTE Band 17                                  | 0.97              |                  |                      |
| LTE Band 13                                  | 1.02              |                  |                      |
| LTE Band 14                                  | 1.02              |                  |                      |
| LTE Band 26                                  | 1.04              |                  |                      |
| LTE Band 5                                   | 1.04              |                  |                      |
| LTE Band 5 ULCA                              | 1.04              |                  |                      |
| LTE Band 4                                   | 0.97              |                  |                      |
| LTE Band 66                                  | 0.97              |                  |                      |
| LTE Band 2                                   | 1.02              |                  |                      |
| LTE Band 25                                  | 1.02              |                  |                      |
| LTE Band 30                                  | 1.02              |                  |                      |
| LTE Band 7                                   | 0.88              |                  |                      |
| LTE Band 7 ULCA                              | 0.88              |                  |                      |
| LTE Band 48                                  | 0.95              |                  |                      |
| LTE Band 48 ULCA                             | 0.95              |                  |                      |
| LTE Band 41 (PC3) - [Ch. 39750 - 40620]      | 0.88              |                  |                      |
| LTE Band 41 (PC3) ULCA - [Ch. 39750 - 40620] | 0.88              |                  |                      |
| LTE Band 41 (PC2) - [Ch. 39750 - 40620]      | 0.88              |                  |                      |
| LTE Band 41 (PC2) ULCA - [Ch. 39750 - 40620] | 0.88              |                  |                      |
| LTE Band 41 (PC3) - [Ch. 41055 - 41490]      | 0.84              |                  |                      |
| LTE Band 41 (PC3) ULCA - [Ch. 41055 - 41490] | 0.84              |                  |                      |
| LTE Band 41 (PC2) - [Ch. 41055 - 41490]      | 0.84              |                  |                      |
| LTE Band 41 (PC2) ULCA - [Ch. 41055 - 41490] | 0.84              |                  |                      |
| NR Band n71                                  | 0.93              |                  |                      |
| NR Band n12                                  | 0.97              |                  |                      |
| NR Band n14                                  | 1.02              |                  |                      |
| NR Band n26                                  | 1.04              |                  |                      |
| NR Band n5                                   | 1.02              |                  |                      |
| NR Band n70                                  | 0.95              |                  |                      |
| NR Band n66                                  | 0.95              |                  |                      |
| NR Band n2                                   | 0.99              |                  |                      |
| NR Band n25                                  | 0.99              |                  |                      |
| NR Band n30                                  | 1.02              |                  |                      |
| NR Band n7                                   | 0.86              |                  |                      |
| NR Band n48                                  | 0.86              |                  |                      |
| NR Band n41 (PC3) - [Ch. 518598]             | 0.81              |                  |                      |
| NR Band n41 (PC2) - [Ch. 518598]             | 0.81              |                  |                      |
| NR Band n41 (PC3) - [Ch. 528000]             | 0.81              |                  |                      |
| NR Band n41 (PC2) - [Ch. 528000]             | 0.81              |                  |                      |
| NR Band n77 DoD (PC3) - [Ch. 633334]         | 0.93              |                  |                      |
| NR Band n77 DoD (PC2) - [Ch. 633334]         | 0.93              |                  |                      |
| NR Band n77 (PC3) - [Ch. 650000]             | 0.81              |                  |                      |
| NR Band n77 (PC2) - [Ch. 650000]             | 0.81              |                  |                      |
| NR Band n77 (PC3) - [Ch. 662000]             | 0.88              |                  |                      |
| NR Band n77 (PC2) - [Ch. 662000]             | 0.88              |                  |                      |

|                                                    |                                            |                                          |
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**Table 1-2**  
**Antenna 2b**

| SAR_design_target Calculations               |                   |                  |                      |
|----------------------------------------------|-------------------|------------------|----------------------|
| Mode/Band                                    | 1g SAR<br>[W/kg]  |                  |                      |
|                                              | SAR_design_target | SAR_Design_limit | SAR_regulatory_limit |
| UMTS 1750                                    | 0.99              | 1.2 W/kg         | 1.6 W/kg             |
| UMTS 1900                                    | 0.99              |                  |                      |
| LTE Band 4                                   | 0.99              |                  |                      |
| LTE Band 66                                  | 0.99              |                  |                      |
| LTE Band 2                                   | 0.99              |                  |                      |
| LTE Band 25                                  | 0.99              |                  |                      |
| LTE Band 30                                  | 1.02              |                  |                      |
| LTE Band 7                                   | 0.99              |                  |                      |
| LTE Band 7 ULCA                              | 0.99              |                  |                      |
| LTE Band 48                                  | 1.04              |                  |                      |
| LTE Band 48 ULCA                             | 1.04              |                  |                      |
| LTE Band 41 (PC3) - [Ch. 39750 - 40620]      | 0.99              |                  |                      |
| LTE Band 41 (PC3) ULCA - [Ch. 39750 - 40620] | 0.99              |                  |                      |
| LTE Band 41 (PC2) - [Ch. 39750 - 40620]      | 0.99              |                  |                      |
| LTE Band 41 (PC2) ULCA - [Ch. 39750 - 40620] | 0.99              |                  |                      |
| LTE Band 41 (PC3) - [Ch. 41055 - 41490]      | 1.02              |                  |                      |
| LTE Band 41 (PC3) ULCA- [Ch. 41055 - 41490]  | 1.02              |                  |                      |
| LTE Band 41 (PC2) - [Ch. 41055 - 41490]      | 1.02              |                  |                      |
| LTE Band 41 (PC2) ULCA- [Ch. 41055 - 41490]  | 1.02              |                  |                      |
| NR Band n70                                  | 0.97              |                  |                      |
| NR Band n66                                  | 0.97              |                  |                      |
| NR Band n2                                   | 0.97              |                  |                      |
| NR Band n25                                  | 0.97              |                  |                      |
| NR Band n30                                  | 1.04              |                  |                      |
| NR Band n7                                   | 0.99              |                  |                      |
| NR Band n48                                  | 0.86              |                  |                      |
| NR Band n41 (PC3) - [Ch. 518598]             | 0.86              |                  |                      |
| NR Band n41 (PC2) - [Ch. 518598]             | 0.86              |                  |                      |
| NR Band n41 (PC3) - [Ch. 528000]             | 0.83              |                  |                      |
| NR Band n41 (PC2) - [Ch. 528000]             | 0.83              |                  |                      |
| NR Band n77 DoD (PC3) - [Ch. 633334]         | 0.99              |                  |                      |
| NR Band n77 DoD (PC2) - [Ch. 633334]         | 0.99              |                  |                      |
| NR Band n77 (PC3) - [Ch. 650000]             | 0.91              |                  |                      |
| NR Band n77 (PC2) - [Ch. 650000]             | 0.91              |                  |                      |
| NR Band n77 (PC3) - [Ch. 662000]             | 0.84              |                  |                      |
| NR Band n77 (PC2) - [Ch. 662000]             | 0.84              |                  |                      |

|                                             |                                     |                                   |
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**Table 1-3**  
**Antenna 3**

| SAR_design_target Calculations               |                   |                  |                      |
|----------------------------------------------|-------------------|------------------|----------------------|
| Mode/Band                                    | 1g SAR<br>[W/kg]  |                  |                      |
|                                              | SAR_design_target | SAR_Design_limit | SAR_regulatory_limit |
| UMTS 850                                     | 1.02              | 1.2 W/kg         | 1.6 W/kg             |
| UMTS 1750                                    | 1.02              |                  |                      |
| UMTS 1900                                    | 0.99              |                  |                      |
| LTE Band 71                                  | 0.99              |                  |                      |
| LTE Band 12                                  | 0.99              |                  |                      |
| LTE Band 17                                  | 0.99              |                  |                      |
| LTE Band 13                                  | 1.02              |                  |                      |
| LTE Band 14                                  | 0.99              |                  |                      |
| LTE Band 26                                  | 0.99              |                  |                      |
| LTE Band 5                                   | 1.02              |                  |                      |
| LTE Band 5 ULCA                              | 1.02              |                  |                      |
| LTE Band 4                                   | 1.02              |                  |                      |
| LTE Band 66                                  | 1.02              |                  |                      |
| LTE Band 2                                   | 0.99              |                  |                      |
| LTE Band 25                                  | 0.99              |                  |                      |
| LTE Band 30                                  | 0.97              |                  |                      |
| LTE Band 7                                   | 0.91              |                  |                      |
| LTE Band 7 ULCA                              | 0.91              |                  |                      |
| LTE Band 48                                  | 0.93              |                  |                      |
| LTE Band 48 ULCA                             | 0.93              |                  |                      |
| LTE Band 41 (PC3) - [Ch. 39750 - 40620]      | 0.93              |                  |                      |
| LTE Band 41 (PC3) ULCA - [Ch. 39750 - 40620] | 0.93              |                  |                      |
| LTE Band 41 (PC2) - [Ch. 39750 - 40620]      | 0.93              |                  |                      |
| LTE Band 41 (PC2) ULCA - [Ch. 39750 - 40620] | 0.93              |                  |                      |
| LTE Band 41 (PC3) - [Ch. 41055 - 41490]      | 0.88              |                  |                      |
| LTE Band 41 (PC3) ULCA - [Ch. 41055 - 41490] | 0.88              |                  |                      |
| LTE Band 41 (PC2) - [Ch. 41055 - 41490]      | 0.88              |                  |                      |
| LTE Band 41 (PC2) ULCA - [Ch. 41055 - 41490] | 0.88              |                  |                      |
| NR Band n71                                  | 0.99              |                  |                      |
| NR Band n12                                  | 0.99              |                  |                      |
| NR Band n14                                  | 0.99              |                  |                      |
| NR Band n26                                  | 0.99              |                  |                      |
| NR Band n5                                   | 0.99              |                  |                      |
| NR Band n70                                  | 0.97              |                  |                      |
| NR Band n66                                  | 0.99              |                  |                      |
| NR Band n2                                   | 1.02              |                  |                      |
| NR Band n25                                  | 1.02              |                  |                      |
| NR Band n30                                  | 0.97              |                  |                      |
| NR Band n7                                   | 0.86              |                  |                      |
| NR Band n48                                  | 0.84              |                  |                      |
| NR Band n41 (PC3) - [Ch. 518598]             | 0.88              |                  |                      |
| NR Band n41 (PC2) - [Ch. 518598]             | 0.88              |                  |                      |
| NR Band n41 (PC3) - [Ch. 528000]             | 0.83              |                  |                      |
| NR Band n41 (PC2) - [Ch. 528000]             | 0.83              |                  |                      |
| NR Band n77 DoD (PC3) - [Ch. 633334]         | 0.93              |                  |                      |
| NR Band n77 DoD (PC2) - [Ch. 633334]         | 0.93              |                  |                      |
| NR Band n77 (PC3) - [Ch. 650000]             | 0.91              |                  |                      |
| NR Band n77 (PC2) - [Ch. 650000]             | 0.91              |                  |                      |
| NR Band n77 (PC3) - [Ch. 662000]             | 0.91              |                  |                      |
| NR Band n77 (PC2) - [Ch. 662000]             | 0.91              |                  |                      |

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**Table 1-4**  
**Antenna 4b**

| SAR_design_target Calculations               |                   |                  |                      |
|----------------------------------------------|-------------------|------------------|----------------------|
| Mode/Band                                    | 1g SAR<br>[W/kg]  |                  |                      |
|                                              | SAR_design_target | SAR_Design_limit | SAR_regulatory_limit |
| UMTS 1750                                    | 0.97              | 1.2 W/kg         | 1.6 W/kg             |
| UMTS 1900                                    | 0.99              |                  |                      |
| LTE Band 4                                   | 0.97              |                  |                      |
| LTE Band 66                                  | 0.97              |                  |                      |
| LTE Band 2                                   | 1.02              |                  |                      |
| LTE Band 25                                  | 1.02              |                  |                      |
| LTE Band 30                                  | 1.04              |                  |                      |
| LTE Band 7                                   | 1.02              |                  |                      |
| LTE Band 7 ULCA                              | 1.02              |                  |                      |
| LTE Band 48                                  | 0.93              |                  |                      |
| LTE Band 48 ULCA                             | 0.93              |                  |                      |
| LTE Band 41 (PC3) - [Ch. 39750 - 40620]      | 1.04              |                  |                      |
| LTE Band 41 (PC3) ULCA - [Ch. 39750 - 40620] | 1.04              |                  |                      |
| LTE Band 41 (PC2) - [Ch. 39750 - 40620]      | 1.04              |                  |                      |
| LTE Band 41 (PC2) ULCA - [Ch. 39750 - 40620] | 1.04              |                  |                      |
| LTE Band 41 (PC3) - [Ch. 41055 - 41490]      | 1.02              |                  |                      |
| LTE Band 41 (PC3) ULCA- [Ch. 41055 - 41490]  | 1.02              |                  |                      |
| LTE Band 41 (PC2) - [Ch. 41055 - 41490]      | 1.02              |                  |                      |
| LTE Band 41 (PC2) ULCA- [Ch. 41055 - 41490]  | 1.02              |                  |                      |
| NR Band n70                                  | 0.97              |                  |                      |
| NR Band n66                                  | 0.97              |                  |                      |
| NR Band n2                                   | 0.99              |                  |                      |
| NR Band n25                                  | 0.99              |                  |                      |
| NR Band n30                                  | 1.04              |                  |                      |
| NR Band n7                                   | 0.99              |                  |                      |
| NR Band n48                                  | 0.81              |                  |                      |
| NR Band n41 (PC3) - [Ch. 518598]             | 0.84              |                  |                      |
| NR Band n41 (PC2) - [Ch. 518598]             | 0.84              |                  |                      |
| NR Band n41 (PC3) - [Ch. 528000]             | 0.86              |                  |                      |
| NR Band n41 (PC2) - [Ch. 528000]             | 0.86              |                  |                      |
| NR Band n77 DoD (PC3) - [Ch. 633334]         | 0.86              |                  |                      |
| NR Band n77 DoD (PC2) - [Ch. 633334]         | 0.86              |                  |                      |
| NR Band n77 (PC3) - [Ch. 650000]             | 0.91              |                  |                      |
| NR Band n77 (PC2) - [Ch. 650000]             | 0.91              |                  |                      |
| NR Band n77 (PC3) - [Ch. 662000]             | 0.84              |                  |                      |
| NR Band n77 (PC2) - [Ch. 662000]             | 0.84              |                  |                      |

|                                             |                                     |                                   |
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## 2. RF EXPOSURE LIMITS

### 2.1 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.

### 2.2 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.

## RF Exposure Limits for Frequencies Below 6 GHz

**Table 2-1**  
**SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6**

| HUMAN EXPOSURE LIMITS                                               |                                                                           |                                                                   |
|---------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------------|
|                                                                     | UNCONTROLLED ENVIRONMENT<br><i>General Population</i><br>(W/kg) or (mW/g) | CONTROLLED ENVIRONMENT<br><i>Occupational</i><br>(W/kg) or (mW/g) |
| <b>Peak Spatial Average SAR</b><br>Head                             | 1.6                                                                       | 8.0                                                               |
| <b>Whole Body SAR</b>                                               | 0.08                                                                      | 0.4                                                               |
| <b>Peak Spatial Average SAR</b><br>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.

|                                                    |                                            |                                          |
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## 2.3 Time Averaging Windows for FCC Compliance

Per October 2018 TCB Workshop Notes, the below time-averaging windows can be used for assessing time-averaged exposures for devices that are capable of actively monitoring and adjusting power output over time to comply with exposure limits.

| Interim Guidance | Frequency (GHz) | Maximum Averaging Time (sec) |
|------------------|-----------------|------------------------------|
| SAR              | < 3             | 100                          |
|                  | 3 – 6           | 60                           |
| MPE              | 6 - 10          | 30                           |
|                  | 10 - 16         | 14                           |
|                  | 16 – 24         | 8                            |
|                  | 24 – 42         | 4                            |
|                  | 42 – 95         | 2                            |

|                                             |                                     |                                   |
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### 3. VALIDATION TEST CASES

To validate the time averaging feature and demonstrate the compliance in Tx varying transmission conditions, the following transmission scenarios are covered in the TAS test:

- 1) Time-varying Tx power transmission: To prove that the algorithm accounts for Tx power variations in time accurately.
- 2) Antenna switching scenarios: To prove that the algorithm functions correctly during transitions in antenna.
- 3) Change in band: To prove that the algorithm functions correctly during transitions in bands.
- 4) Change in technology: To prove that the algorithm functions correctly during transitions in technology.
- 5) TDD/FDD Switch: To prove that the algorithm functions correctly during transitions between frequency division duplexing (FDD) and time division duplexing (TDD) configurations.
- 6) Call drop: To prove that the algorithm accounts for history of past Tx power transmissions accurately.
- 7) Linearity Validation: To validate linearity with TAS operation turned off.

The RF exposure is proportional to the Tx power for a SAR-characterized wireless device. Thus, feature validation in TAS can be effectively performed through conducted (for  $f < 6\text{GHz}$ ) power measurement. Therefore, the compliance demonstration under dynamic transmission conditions and feature validation are done in conducted/radiated power measurement setup for transmission scenario 1 through 7.

Conducted power measurements will be used to validate all TAS test cases. In addition, single point SAR measurements will be performed to validate linearity.

|                                                    |                                            |                                          |
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## 4. FCC MEASUREMENT PROCEDURES

This chapter provides the test plan and test procedure for validating Cellular TAS algorithm for sub-6 transmission. The 100 seconds time window for operating  $f < 3\text{GHz}$  is used as an example to detail the test procedures in this chapter. The same test plan and test procedures described in this chapter apply to 100 seconds time window for operating  $f \leq 3\text{GHz}$ . The same test plan and test procedures described in this chapter apply to 60 seconds time window for operating  $f \geq 3\text{GHz}$ .

### 4.1 Test Configuration and Procedure for Test Case 1: Time-varying Tx power transmission via Conducted Power Measurements

**Test Case 1a – Test Sequence A:** Tx power is requested to be at  $P_{max}$  for a period of time (duration dependent on configuration being tested), followed by  $0.5 \times P_{limit}$  for a period of time (duration dependent on configuration being tested).

**Test Case 1b – Test Sequence B:** Tx power is requested to be at 1mW (0dBm) for a period of time (duration dependent on configuration being tested), then at  $P_{max}$  for a period of time (duration dependent on configuration being tested).

**Test Case 1c – Pseudo-Random Validation Sequence:** Tx power is requested to vary with time. A unique pseudo-random sequence with 150 independent power requests according to RSS-102.SAR.MEAS is obtained based on the following formula:

$$P_{req} = P_{max,nom} \left( \frac{P_{limit,nom}}{P_{max,nom}} \right)^x$$

- $P_{req}$  is the requested power in watts.
- $x$  is a random value drawn from the Weibull distribution with shape and scale parameters of 2.0 and 0.8 respectively.
- The corresponding request durations are given by:  

$$T_{req} = 2(1 + 2y)$$
- $P_{req}$  is the duration of the power request in seconds.
- $y$  is a uniform distributed random value between 0 and 1.

The details for generating test sequences A, B, and pseudo-random are described and listed in Appendix D.

#### 4.1.1 Configuration

Conducted power measurements shall be performed for at least one band per technology. The  $P_{limit}$  value associated with the chosen band should be several dB lower than the corresponding value of  $P_{max}$ . Whenever possible, the same band should not be repeated for different technologies. FDD, TDD, ENDC, and ULCA configurations shall be treated as separate technologies.

|                                             |                                     |                                   |
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#### 4.1.2 Procedure

Step 1: Measure  $P_{max}$ , measure  $P_{limit}$  for all the RATs and selected bands.

Step 2: Apply TAS on EUT to initialize time-averaging behavior.

Step 3: Establish radio link with callbox in the selected RAT/band.

Step 4: Callbox requests the EUT's Tx power according to time-varying test cases.

Step 5: Convert the measured conducted TX power from Step 4 into rolling time-averaged power ( $P_{avg}$ ) for the  $n$ th step using equation 1a.

$$P_{avg}(n) = \frac{1}{M} \sum_{m=0}^{M-1} P_{meas}[n-m] \quad (1a)$$

Where 'M' is the total number of reporting periods per time-averaging window and 'm' is the index of the time-averaging window. The TAS algorithm is validated when  $P_{avg}$  is maintained less than or equal to  $P_{limit}$ .

In test cases where  $P_{limit}$  is not constant, the equation 1b below is used to calculate the normalized, rolling time-averaged power ( $P_{avg}$ ).

$$P_{avg}(n) = \frac{1}{M} \sum_{m=0}^{M-1} \frac{P_{meas}[n-m]}{P_{limit}[n-m]} \quad (1b)$$

Step 6: Plot results.

- A. Make one power perspective plot containing
  1. Requested power
  2. Measured instantaneous conducted TX power
  3. Power limit  $P_{limit}$  in mW
  4. Capable maximum TX power  $P_{max}$  in mW
- B. Make one time-averaged validation perspective plot containing
  1. Rolling power average  $P_{avg}$  in mW
  2. Power limit  $P_{limit}$  in mW

Step 7: repeat steps 2~6 for time varying test case B and pseudo-random test case.

The validation criteria are, at all times, the calculated rolling power average  $P_{avg}$  does not exceed  $P_{limit}$ .

|                                             |                                     |                                   |
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## 4.2 Test Configuration and Procedure for Test Case 2: Antenna Switching via Conducted Power Measurements

### 4.2.1 Configuration

When different  $P_{max}$  and  $P_{limit}$  values are associated with each transmitting antenna, consideration shall be given to the combinations of antennas and operating state(s) for which the  $P_{limit}$  values are several dB below the corresponding  $P_{max}$  values. Of these combinations, the performance of the TAS algorithm shall be validated when the EUT switches from the antenna with the highest  $P_{limit}$  value to that with the lowest.

Among RATs/bands supporting TX antenna switches, select the RAT/band with the highest  $P_{limit}$  difference between a pair of supported TX antennas.

A single test case covering antenna switch may be performed to display compliance.

### 4.2.2 Procedures

Step 1: Measure  $P_{max}$  measure  $P_{limit}$  for both selected antennas.

Step 2: Apply TAS on EUT to initialize time-averaging behavior.

Step 3: Establish radio link with callbox in the selected RAT/band.

Step 4: Request EUT's Tx power at 0 dBm for at least one time window specified for the selected technology/band, then request EUT's Tx power to be at maximum for at least one time window. Switch the radio link to second antenna selected. For the remaining time, continue callbox requesting EUT's TX power to be at maximum power at least one time window.

Step 5: Convert the measured conducted TX power from Step 4 into normalized rolling time-averaged power ( $P_{avg}$ ) using equation 1b.

Step 6: Plot results.

- A. Make one power perspective plot containing
  1. Requested power
  2. Measured instantaneous conducted TX power
  3. Power limit  $P_{limit}$  in mW
  4. Capable maximum TX power  $P_{max}$  in mW
- B. Make one time-averaged validation perspective plot containing
  1. Normalized total rolling power average  $P_{avg}$  in mW
  2. Normalized rolling power average  $P_{avg}$  in mW for each antenna/technology
  3. Normalized power limit  $P_{limit}$  in mW

The validation criteria are, at all times, the normalized total rolling power average  $P_{avg}$  does not exceed  $P_{limit}$ .

|                                             |                                     |                                   |
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## 4.3 Test Configuration and Procedure for Test Case 3: Change in Band via Conducted Power Measurements

### 4.3.1 Configuration

Conducted power measurements shall be performed to validate the TAS algorithm when the EUT switches between frequency bands with different  $P_{limit}$  values.

The TAS algorithm shall be validated for the following changes in frequency band:

- Among the frequency band configuration for which the  $P_{limit}$  values are several dB below the corresponding  $P_{max}$  values, changing from one frequency band to another with a lower  $P_{limit}$  value.
- If applicable, changing from an frequency for which the TAS algorithm is transparent  $P_{limit} \geq P_{max}$ , to one for which  $P_{limit}$  is several dB below  $P_{max}$ .

A single test case covering frequency band switch may be performed to display compliance.

### 4.3.2 Procedure

Step 1: Measure  $P_{max}$ , measure  $P_{limit}$  for both selected bands.

Step 2: Apply TAS on EUT to initialize time-averaging behavior.

Step 3: Establish radio link with callbox in the selected RAT/band.

Step 4: Request EUT's Tx power at 0 dBm for at least one time window specified for the selected technology/band, then request EUT's Tx power to be at maximum for at least one time window. Switch the radio link to second selected band. For the remaining time, continue callbox requesting EUT's TX power to be at maximum power at least one time window.

Step 5: Convert the measured conducted TX power from Step 4 into normalized rolling time-averaged power ( $P_{avg}$ ) using equation 1b.

Step 6: Plot results.

- A. Make one power perspective plot containing
  1. Requested power
  2. Measured instantaneous conducted TX power
  3. Power limit  $P_{limit}$  in mW
  4. Capable maximum TX power  $P_{max}$  in mW
- B. Make one time-averaged validation perspective plot containing
  1. Normalized total rolling power average  $P_{avg}$  in mW
  2. Normalized rolling power average  $P_{avg}$  in mW for each antenna/technology
  3. Normalized power limit  $P_{limit}$  in mW

|                                             |                                     |                                   |
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The validation criteria are, at all times, the normalized total rolling power average  $P_{avg}$  does not exceed  $P_{limit}$ .

## 4.4 Test Configuration and Procedure for Test Case 4: Change in Technology via Conducted Power Measurements

### 4.4.1 Configuration

Conducted power measurements shall be performed to validate the TAS algorithm when the EUT switches between technologies with different  $P_{limit}$  values.

Among the technology configuration for which the  $P_{limit}$  values are several dB below the corresponding  $P_{max}$  values, changing from one technology to another with a lower  $P_{limit}$  value.

### 4.4.2 Procedures

Step 1: Measure  $P_{max}$ , measure  $P_{limit}$  for both selected technologies.

Step 2: Apply TAS on EUT to initialize time-averaging behavior.

Step 3: Establish radio link with callbox in the selected RAT/band.

Step 4: Request EUT's Tx power at 0 dBm for at least one time window specified for the selected technology/band, then request EUT's Tx power to be at maximum for at least one time window. Switch the radio link to second technology/band selected. For the remaining time, continue callbox requesting EUT's TX power to be at maximum power at least one time window.

Step 5: Convert the measured conducted TX power from Step 4 into normalized rolling time-averaged power ( $P_{avg}$ ) using equation 1b.

Step 6: Plot results.

- A. Make one power perspective plot containing
  1. Requested power
  2. Measured instantaneous conducted TX power
  3. Power limit  $P_{limit}$  in mW
  4. Capable maximum TX power  $P_{max}$  in mW
- B. Make one time-averaged validation perspective plot containing
  1. Normalized total rolling power average  $P_{avg}$  in mW
  2. Normalized rolling power average  $P_{avg}$  in mW for each antenna/technology
  3. Normalized power limit  $P_{limit}$  in mW

|                                             |                                     |                                   |
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The validation criteria are, at all times, the normalized total rolling power average  $P_{avg}$  does not exceed  $P_{limit}$ .

## 4.5 Test Configuration and Procedure for Test Case 5: TDD/FDD Switch Configurations via Conducted Power Measurements

### 4.5.1 Configuration

Conducted power measurements shall be performed to validate the TAS algorithm when the EUT switches between TDD and FDD configurations with different  $P_{limit}$  values, both of which should be several dB lower than the corresponding  $P_{max}$  values.

### 4.5.2 Procedure

Step 1: Measure  $P_{max}$ , measure  $P_{limit}$  for both selected technologies with TDD and FDD.

Step 2: Apply TAS on EUT to initialize time-averaging behavior.

Step 3: Establish radio link with callbox in the selected RAT/band.

Step 4: Request EUT's Tx power at 0 dBm for at least one time window specified for the selected technology/band, then request EUT's Tx power to be at maximum for at least one time window. Switch the radio link to second technology/band selected. For the remaining time, continue callbox requesting EUT's TX power to be at maximum power at least one time window.

Step 5: Convert the measured conducted TX power from Step 4 into normalized rolling time-averaged power ( $P_{avg}$ ) using equation 1b.

Step 6: Plot results.

- A. Make one power perspective plot containing
  1. Requested power
  2. Measured instantaneous conducted TX power
  3. Power limit  $P_{limit}$  in mW
  4. Capable maximum TX power  $P_{max}$  in mW
- B. Make one time-averaged validation perspective plot containing
  1. Normalized total rolling power average  $P_{avg}$  in mW
  2. Normalized rolling power average  $P_{avg}$  in mW for each antenna/technology
  3. Normalized power limit  $P_{limit}$  in mW

The validation criteria are, at all times, the normalized total rolling power average  $P_{avg}$  does not exceed  $P_{limit}$ .

|                                             |                                     |                                   |
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## 4.6 Test Configuration and Procedure for Test Case 6: Call Drop via Conducted Power Measurements

### 4.6.1 Configuration

Conducted power measurements shall be performed to validate the TAS algorithm during dropped connections to ensure the algorithm is able to account for previous connection states.

Only one test is required with one of the configurations for which  $P_{limit}$  is below  $P_{max}$ .

### 4.6.2 Procedure

Step 1: Measure  $P_{max}$ , measure  $P_{limit}$  for the selected technology.

Step 2: Apply TAS on EUT to initialize time-averaging behavior.

Step 3: Establish radio link with callbox in the selected RAT/band.

Step 4: Request EUT's Tx power at 0 dBm for at least one time window specified for the selected technology/band, then drop the call for ~10 seconds. Re-establish another call in the same radio configuration at first link. For the remaining time, continue callbox requesting EUT's Tx power to be at maximum power at least one time window.

Step 5: Convert the measured conducted TX power from Step 4 into rolling time-averaged power ( $P_{avg}$ ) for the nth step using equation 1a.

Step 6: Plot results.

- A. Make one power perspective plot containing
  1. Requested power
  2. Measured instantaneous conducted TX power
  3. Power limit  $P_{limit}$  in mW
  4. Capable maximum TX power  $P_{max}$  in mW
- B. Make one time-averaged validation perspective plot containing
  1. Rolling power average  $P_{avg}$  in mW
  2. Power limit  $P_{limit}$  in mW

The validation criteria are, at all times, the calculated rolling power average  $P_{avg}$  does not exceed  $P_{limit}$ .

## 4.7 Technology Specific Validations

### 4.7.1 ENDC

ENDC operation is validated by performing a single test sequence. A transition is initiated from cellular operation at all down bits/lower power configuration + NR requesting  $P_{max}$  to cellular requesting  $P_{max}$  + NR requesting  $P_{max}$  to cellular

|                                             |                                     |                                   |
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requesting  $P_{max} + NR$  at all down bits / lower power configuration. The configurations and operating states selected for single point SAR measurements shall match those selected for conducted power measurements and for SAR compliance assessment. This requirement facilitates the correlation of the single point SAR results with both the conducted power measurements and the  $SAR_{target}$  results in the RF exposure technical brief.

#### 4.7.2 ULCA

ULCA operation is validated by performing a single test sequence. A transition is initiated from PCC at 0dBm + SCC at  $P_{max}$  to PCC at  $P_{max} + SCC$  at 0dBm to PCC at  $P_{max} + SCC$  at  $P_{max}$ .

### 4.8 Test Configuration and Procedure for Test Case 1: Time-varying TX power transmission via Single Point SAR Measurements

#### 4.8.1 Configuration

Single point SAR measurements shall be performed to validate the TAS algorithm; however, compared with the requirements for conducted power measurements, fewer test cases are required:

- Single point SAR measurements need be performed only for changes in requested power.
- To account for linearity, single point SAR measurements shall be performed on each antenna for at least one frequency. If possible, each antenna should be validated using a different frequency.
- Single point SAR measurements shall be performed only for configurations involving a single transmitter.

The configurations and operating states selected for single point SAR measurements shall match those selected for conducted power measurements and for SAR compliance assessment. This requirement facilitates the correlation of the single point SAR results with both the conducted power measurements and the  $SAR_{target}$  results in the RF exposure technical brief.

#### 4.8.2 Procedure

Step 1: Perform area scan with DUT set to transmit at a fixed output of  $P_{limit}$ , and callbox set to request maximum power for all RATs and selected bands. Measure *pointSAR* at peak location of the area scan. This *pointSAR* value corresponds to *pointSAR* at the measured  $P_{limit}$

Step 2: Apply TAS on EUT to initialize time-averaging behavior.

Step 3: Establish radio link in selected radio configuration.

Step 4: Measure and record *pointSAR* versus time at peak location of the area scan. Configure callbox to request the DUT's Tx power accordingly to pre-defined test sequences.

Step 5: Convert the measured SAR into time-averaged SAR.

Convert the instantaneous measured SAR from Step 4 into 1gSAR value. Perform the running time average to 1gSAR to determine time-averaged value versus time as follows,

|                                             |                                     |                                   |
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$$1gSAR \text{ or } 10gSAR(t) = \frac{pointSAR(t)}{PointSAR\_P_{limit}} * SAR_{target,nom} \quad (2a)$$

Step 6: Plot results.

- A. Make one SAR perspective plot containing
  1. Calculated time-averaged 1gSAR or 10gSAR
  2.  $SAR_{target,nom}$  and  $SAR_{target}$   
( $SAR_{target} = SAR_{target,nom} \times 10^{1dB \text{ uncertainty}/10}$ )
  3. FCC limit of 1.6 W/kg (1gSAR) or 4.0 W/kg (10gSAR)
  4. Maximum time-averaged 1gSAR or 10gSAR value
  5. Measured instantaneous single point SAR

Step 7: Repeat steps 2~6 with the pre-defined test sequence 2

Step 8: Repeat steps 2~6 with the pre-defined pseudo-random test sequence

Step 9: Repeat steps 2~6 for all the selected technologies and bands

The validation criteria are, at all times, the calculated time-averaged 1gSAR or 10gSAR versus time shall not exceed  $SAR_{target}$

|                                             |                                     |                                   |
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## 5 DYNAMIC BUDGET VALIDATION

This DUT supports dynamic budget sharing for Cellular technologies. The SAR budget for cellular technologies is allocated dynamically over time considering usage statistics and consumed SAR from all active radios. The device total exposure ratio (TER) is always maintained less than 1.

To validate the dynamic budgeting algorithm, the following configurations are applicable:

- 1) Cellular standalone -> Cellular + WLAN -> WLAN standalone
  - a) Pmax will be requested for this test scenario in all operating conditions. The test time for each connection will be sufficient to allow steady state to be reached.
- 2) Sub-6GHz Cellular standalone -> Sub-6GHz Cellular + FR2
  - a) Pseudo-random time-varying TX power will be used for this test scenario to display budget adjustment activity for varying Tx power values. The determination of power values will be outlined in the validation report.
- 3) Dynamic budget mode -> Static budget mode
  - a) This test case will display the transition between a mode that uses the dynamic budget algorithm to a mode that uses a fixed budget implementation.
  - b) Pmax will be requested for this test scenario in all operating conditions. The test time for each connection will be sufficient to allow steady state to be reached.

These cases are validated using log information collected from the application processor (AP). Only validation cases applicable for the device under test will be performed.

### 5.1.1 Test Exclusion

FR2 is not supported in this DUT, which excludes test case 2 for dynamic budget validation.

### 5.1.2 Dynamic Budget Validation Test Case

Test cases 1 and 3 reference the continuity assessment listed below in Table 5-1

**Table 5-1 TAS Parameters setting for Dynamic Budget Validation Test Case**

| Test Case Scenario             | Technology/Band | Core/Antenna    | Plimit [dBm] | Time Window |
|--------------------------------|-----------------|-----------------|--------------|-------------|
| Dynamic Budget Validation Test | LTE B30         | Ant 4b          | 18.20        | 100s        |
|                                | LTE B30         | Ant 4b          | 18.20        | 100s        |
|                                | 2.4 GHz Wi-Fi   | Core 0 (Ant 4a) | 19.75        |             |
|                                | 2.4 GHz Wi-Fi   | Core 0 (Ant 4a) | 19.75        | 30s         |

|                                             |                                     |                                   |
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Test result for Dynamic Budget Validation Test Case

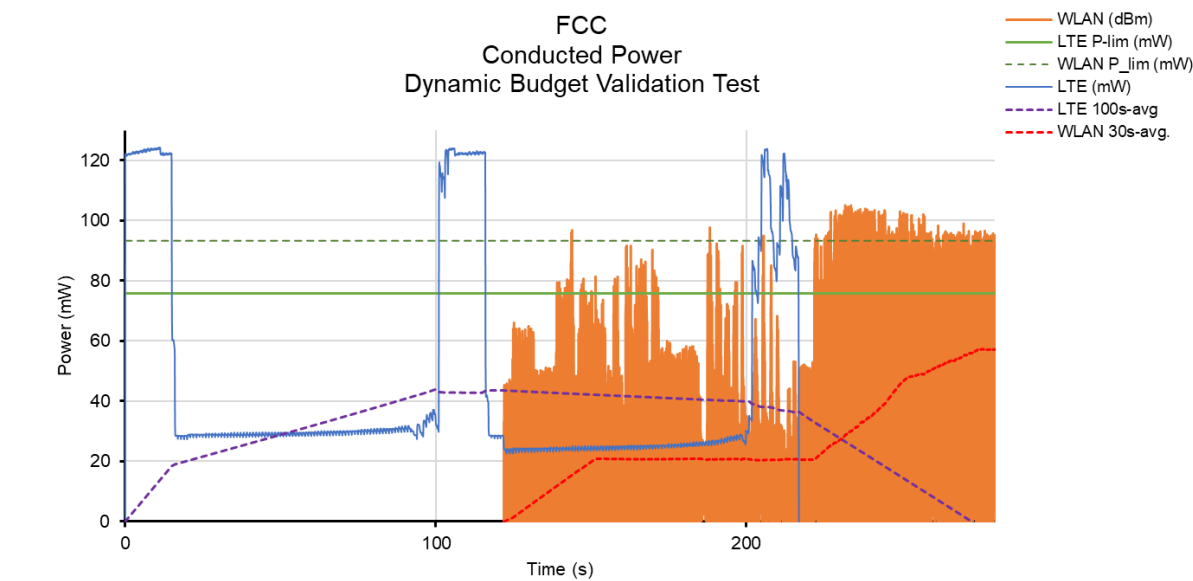


Figure 5-1(a) Dynamic Budget Validation Time-averaged conducted TX power

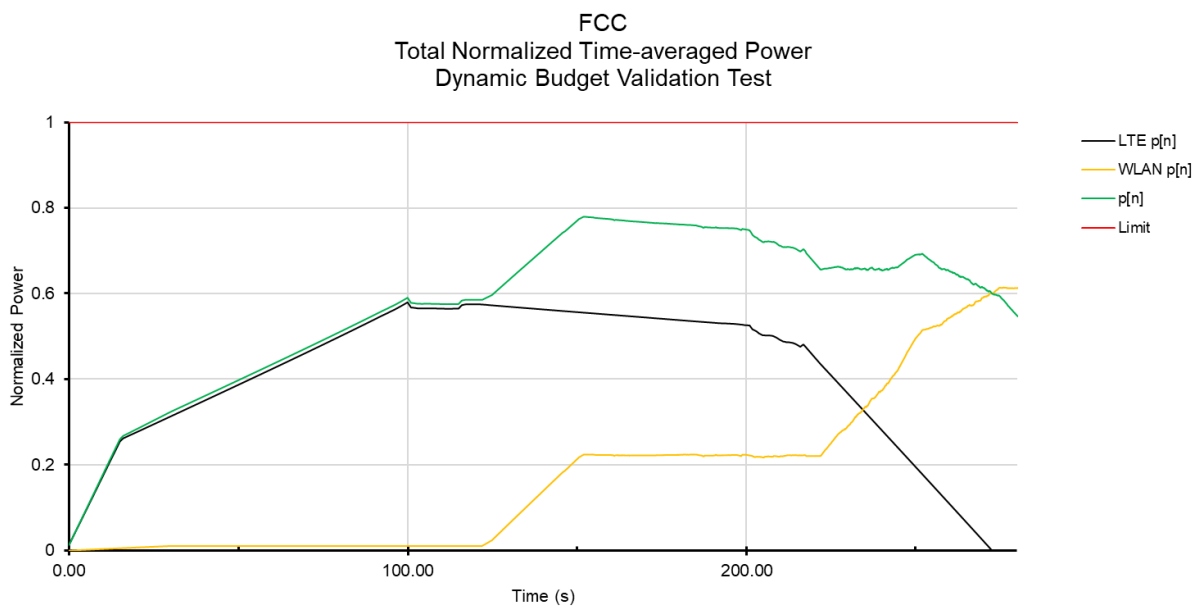


Figure 5-1(b) Dynamic Budget Validation Normalized Time-averaged conducted power

|                                             |                                     |                                   |
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## 6 MEASUREMENT TEST SETUP

### 6.1 Conducted Measurement

#### LTE test setup

The Rohde & Schwarz CMW500 callbox was used in this test. The test setup schematic is shown in Figure 6-1(a) (Appendix D – Test Setup Photo 1) for measurements with a single antenna of DUT and in Figure 6-1(b) (Appendix D – Test Setup Photo 3) for measurements involving antenna switch. For single antenna measurement, one port (RF1 COM) of the callbox is connected to the RF port of the DUT using a directional coupler. For technology/band switch measurement, one port (RF1 COM) of the callbox used for signaling two different technologies is connected to a combiner, which is in turn connected to a directional coupler. The other end of the directional coupler is connected to a splitter to connect to two RF ports of the DUT corresponding to the two antennas of interest. In the setups, power meter is used to tap the directional coupler for measuring the conducted output power of the DUT. For all conducted tests, only RF1 COM port of the callbox is used to communicate with the DUT.

All the path losses from RF port of DUT to the callbox RF COM port and to the power meter are calibrated and automatically entered as offsets in the callbox and the power meter via test scripts on the PC used to control callbox and power meter

#### Sub6 NR test setup:

The Keysight UXM 5G callbox was used in this test. The test setup schematic is the same as the LTE Test Setup shown in Figure 6-1(a) (Appendix D – Test Setup Photo 2). One port of the callbox is connected to the RF port of the DUT using a directional coupler. In the setup, the power meter is used to tap the directional coupler for measuring the conducted output power of the DUT.

All the path losses from RF port of DUT to the callbox RF COM port and to the power meter are calibrated and automatically entered as offsets in the callbox and the power meter via test scripts on the PC used to control callbox and power meter.

#### LTE+Sub6 NR test setup:

LTE conducted port and Sub6 NR conducted port are different on this EUT, therefore, the LTE and Sub6 NR signals for power meter measurement are performed on separate paths as shown below in Figure 6-1(c) (Appendix D – Test Setup Photo 4).

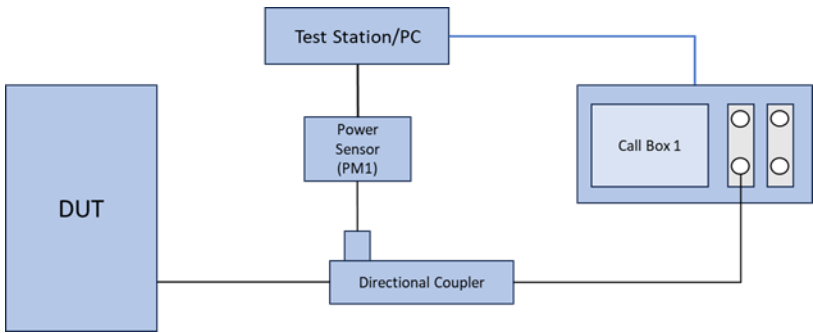
All the path losses from RF port of DUT to the callbox RF COM port and to the power meter are calibrated and automatically entered as offsets in the callbox and the power meter via test scripts on the PC used to control callbox and power meter.

#### LTE+LTE Inter-band ULCA test setup:

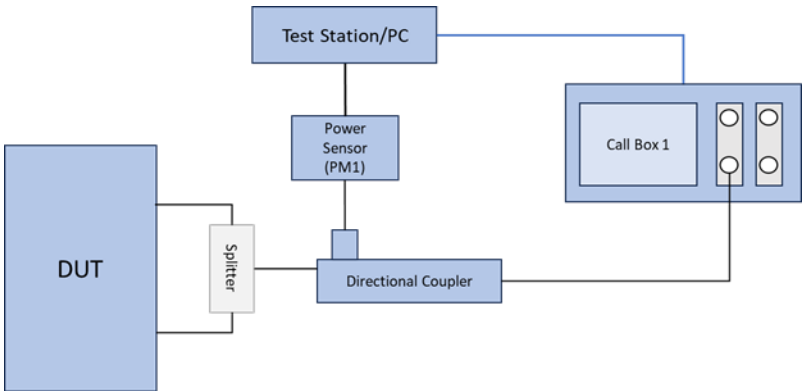
LTE conducted PCC port and LTE conducted SCC conducted port are different on this EUT, therefore, the LTE PCC and LTE SCC signals for power meter measurement are performed on separate paths as shown below in Figure 6-1(d) (Appendix D – Test Setup Photo 5).

All the path losses from RF port of DUT to the callbox RF COM port and to the power meter are calibrated and automatically entered as offsets in the callbox and the power meter via test scripts on the PC used to control callbox and power meter.

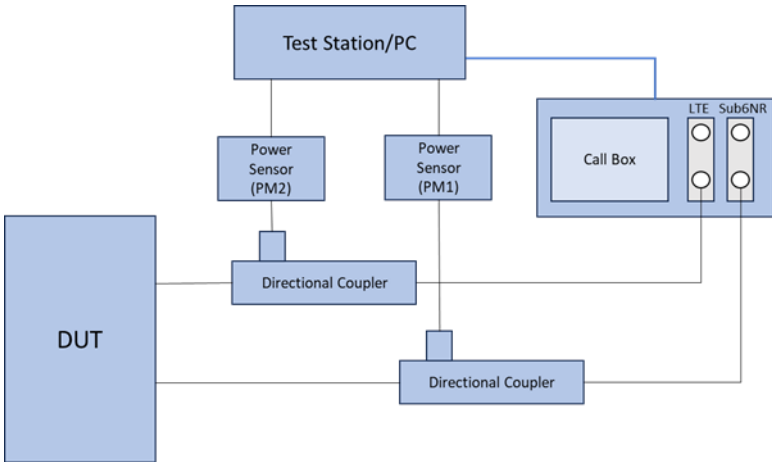
|                                                    |                                            |                                          |
|----------------------------------------------------|--------------------------------------------|------------------------------------------|
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(a) Appendix D – Test Setup Photo 1 and 2

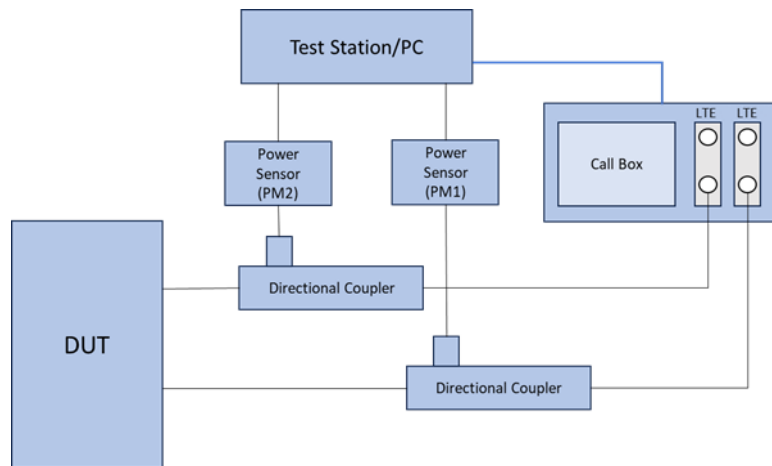


(b) Appendix D – Test Setup Photo 3



(c) Appendix D – Test Setup Photo 4

|                                             |                                     |                                   |
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(d) Appendix D – Test Setup Photo 5

**Figure 6-1**  
**Conducted power measurement setup**

Both the callbox and power meter are connected to the PC using ethernet cables. Test scripts are custom made for automation, and the test duration set in the test scripts is 500 seconds.

For time-varying Tx power measurement, the PC runs the 1<sup>st</sup> test script to send GPIB commands to control the callbox's requested power versus time, while at the same time to record the conducted power measured at DUT RF port using the power meter. The commands sent to the callbox to request power are:

- 0dBm for 100 seconds
- test sequence A, test sequence B, or pseudo-random test sequence (defined in Section 4.1 and generated in Section 4.2.1), for 100 seconds.
- stay at the last power level of test sequence A, test sequence B, or pseudo-random sequence for the remaining time.

Power meter readings are periodically recorded every 100ms. A running average of this measured Tx power over 100 seconds is performed in the post-data processing to determine the 100s-time averaged power.

For call drop, technology/band/antenna switch, and device state switch tests, after the call is established, the callbox is set to request the DUT's Tx power at 0dBm for 100 seconds while simultaneously starting the 2<sup>nd</sup> test script runs at the same time to start recording the Tx power measured at DUT RF port using the power meter. After the initial 100 seconds since starting the Tx power recording, the callbox is set to request maximum power from the DUT for the rest of the test. Note that the call drop/re-establish, or technology/band/antenna switch or device state switch is manually performed when the Tx power of DUT is at the time-averaged reduced level. See Section 4.2-4.8 for detailed test procedure of call drop test, technology/band/antenna switch test and device state switch test.

|                                             |                                     |                                   |
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## SAR Measurement

The measurement setup is similar to normal SAR measurements as described in the RF Exposure Report. The difference in SAR measurement setup for time averaging feature validation is that the callbox is signaling in close loop power control mode (instead of requesting maximum power in open loop control mode) and callbox is connected to the PC using ethernet so that the test script executed on PC can send commands to control the callbox's requested power over time (test sequence). The same test script used in conducted setup for time-varying Tx power measurements is also used in this section for running the test sequences during SAR measurements, and the recorded values from the disconnected power meter by the test script were discarded.

As mentioned in Section 4.10, for DUT to follow TPC command sent from the callbox wirelessly, the "path loss" between callbox antenna and the DUT needs to be very well calibrated. Since the SAR chamber is in uncontrolled environment, precautions must be taken to minimize the environmental influences on "path loss".

The DUT is placed in worst-case position according to Table 7-2.

|                                                    |                                            |                                          |
|----------------------------------------------------|--------------------------------------------|------------------------------------------|
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## 7 TEST CONFIGURATIONS (FREQ < 6GHZ)

### 7.1 WWAN Sub6 Transmission

The  $P_{limit}$  values for technologies and bands supported by EUT are derived in RF Exposure Validation report Power Level Summary Table and summarized in Table 7-1. Note: all  $P_{limit}$  power levels entered in Table 7-1 correspond to average power levels after accounting for duty cycle in the case of TDD modulation schemes.

**Table 7-1**  
 **$P_{limit,nom}$  and  $P_{max,nom}$  for supported technologies and bands**

| Exposure Scenario:                           | Ant 1                                                  | Ant 1 Maximum Tune-up Output Power* | Ant 2b                                                 | Ant 2b Maximum Tune-up Output Power* | Ant 3                                                  | Ant 3 Maximum Tune-up Output Power* | Ant 4b                                                 | Ant 4b Maximum Tune-up Output Power* |
|----------------------------------------------|--------------------------------------------------------|-------------------------------------|--------------------------------------------------------|--------------------------------------|--------------------------------------------------------|-------------------------------------|--------------------------------------------------------|--------------------------------------|
| Averaging Volume:                            | 1g                                                     |                                     | 1g                                                     |                                      | 1g                                                     |                                     | 1g                                                     |                                      |
| Test Distance:                               | 5 mm                                                   |                                     | 5 mm                                                   |                                      | 5 mm                                                   |                                     | 5 mm                                                   |                                      |
| OBD:                                         | 1, Body                                                |                                     | 1, Body                                                |                                      | 1, Body                                                |                                     | 1, Body                                                |                                      |
| Technology/Band                              | $P_{limit}$<br>(Inclusive of Total Device Uncertainty) | $P_{max}$<br>(Max Allowed Power)    | $P_{limit}$<br>(Inclusive of Total Device Uncertainty) | $P_{max}$<br>(Max Allowed Power)     | $P_{limit}$<br>(Inclusive of Total Device Uncertainty) | $P_{max}$<br>(Max Allowed Power)    | $P_{limit}$<br>(Inclusive of Total Device Uncertainty) | $P_{max}$<br>(Max Allowed Power)     |
| UMTS 850                                     | 23.90                                                  | 24.70                               | N/A                                                    | N/A                                  | 24.20                                                  | 25.70                               | N/A                                                    | N/A                                  |
| UMTS 1750                                    | 19.60                                                  | 25.70                               | 20.50                                                  | 25.70                                | 18.00                                                  | 25.70                               | 18.60                                                  | 25.70                                |
| UMTS 1900                                    | 18.80                                                  | 24.20                               | 19.30                                                  | 24.20                                | 17.50                                                  | 25.20                               | 19.30                                                  | 25.30                                |
| LTE Band 71                                  | 24.70                                                  | 24.70                               | N/A                                                    | N/A                                  | 24.50                                                  | 25.70                               | N/A                                                    | N/A                                  |
| LTE Band 12                                  | 24.70                                                  | 24.70                               | N/A                                                    | N/A                                  | 25.00                                                  | 25.70                               | N/A                                                    | N/A                                  |
| LTE Band 17                                  | 24.70                                                  | 24.70                               | N/A                                                    | N/A                                  | 25.00                                                  | 25.70                               | N/A                                                    | N/A                                  |
| LTE Band 13                                  | 24.30                                                  | 24.70                               | N/A                                                    | N/A                                  | 23.50                                                  | 25.70                               | N/A                                                    | N/A                                  |
| LTE Band 14                                  | 24.30                                                  | 24.70                               | N/A                                                    | N/A                                  | 23.50                                                  | 25.70                               | N/A                                                    | N/A                                  |
| LTE Band 26                                  | 23.90                                                  | 24.70                               | N/A                                                    | N/A                                  | 24.20                                                  | 25.70                               | N/A                                                    | N/A                                  |
| LTE Band 5                                   | 23.90                                                  | 24.70                               | N/A                                                    | N/A                                  | 24.20                                                  | 25.70                               | N/A                                                    | N/A                                  |
| LTE Band 5 ULCA                              | 23.90                                                  | 24.70                               | N/A                                                    | N/A                                  | 24.20                                                  | 25.70                               | N/A                                                    | N/A                                  |
| LTE Band 4                                   | 19.60                                                  | 25.70                               | 20.50                                                  | 25.70                                | 18.00                                                  | 25.70                               | 18.60                                                  | 25.70                                |
| LTE Band 66                                  | 19.60                                                  | 25.70                               | 20.50                                                  | 25.70                                | 18.00                                                  | 25.70                               | 18.60                                                  | 25.70                                |
| LTE Band 2                                   | 18.80                                                  | 24.20                               | 19.80                                                  | 24.20                                | 17.50                                                  | 25.20                               | 19.30                                                  | 25.30                                |
| LTE Band 25                                  | 18.80                                                  | 24.20                               | 19.80                                                  | 24.20                                | 17.50                                                  | 25.20                               | 19.30                                                  | 25.30                                |
| LTE Band 30                                  | 19.50                                                  | 24.20                               | 20.50                                                  | 24.20                                | 17.20                                                  | 22.10                               | 18.80                                                  | 23.40                                |
| LTE Band 7                                   | 18.20                                                  | 24.20                               | 20.10                                                  | 24.20                                | 17.90                                                  | 25.20                               | 18.90                                                  | 25.30                                |
| LTE Band 7 ULCA                              | 18.20                                                  | 24.20                               | 20.10                                                  | 24.20                                | 17.90                                                  | 25.20                               | 18.90                                                  | 25.30                                |
| LTE Band 41 (PC3) - [Ch. 39750 - 40620]      | 17.70                                                  | 23.70                               | 20.10                                                  | 23.70                                | 17.20                                                  | 23.70                               | 19.30                                                  | 23.70                                |
| LTE Band 41 (PC3) ULCA - [Ch. 39750 - 40620] | 17.70                                                  | 23.70                               | 20.10                                                  | 23.70                                | 17.20                                                  | 23.70                               | 19.30                                                  | 23.70                                |
| LTE Band 41 (PC2) - [Ch. 39750 - 40620]      | 17.70                                                  | 25.10                               | 20.10                                                  | 25.10                                | 17.20                                                  | 24.60                               | 19.30                                                  | 24.10                                |
| LTE Band 41 (PC2) ULCA - [Ch. 39750 - 40620] | 17.70                                                  | 24.60                               | 20.10                                                  | 24.60                                | 17.20                                                  | 24.60                               | 19.30                                                  | 24.10                                |
| LTE Band 41 (PC3) - [Ch. 41055 - 41490]      | 19.90                                                  | 23.70                               | 20.10                                                  | 23.70                                | 19.90                                                  | 23.70                               | 19.30                                                  | 23.70                                |
| LTE Band 41 (PC3) ULCA - [Ch. 41055 - 41490] | 19.90                                                  | 23.70                               | 20.10                                                  | 23.70                                | 19.90                                                  | 23.70                               | 19.30                                                  | 23.70                                |
| LTE Band 41 (PC2) - [Ch. 41055 - 41490]      | 19.90                                                  | 25.10                               | 20.10                                                  | 25.10                                | 19.90                                                  | 24.60                               | 19.30                                                  | 24.10                                |
| LTE Band 41 (PC2) ULCA - [Ch. 41055 - 41490] | 19.90                                                  | 24.60                               | 20.10                                                  | 24.60                                | 19.90                                                  | 24.60                               | 19.30                                                  | 24.10                                |
| LTE Band 48                                  | 16.60                                                  | 19.80                               | 21.00                                                  | 21.30                                | 16.40                                                  | 18.30                               | 16.10                                                  | 19.10                                |
| LTE Band 48 ULCA                             | 16.60                                                  | 19.80                               | 21.00                                                  | 21.30                                | 16.40                                                  | 18.30                               | 16.10                                                  | 19.10                                |
| NR Band n71                                  | 24.70                                                  | 24.70                               | N/A                                                    | N/A                                  | 24.50                                                  | 25.70                               | N/A                                                    | N/A                                  |
| NR Band n12                                  | 24.70                                                  | 24.70                               | N/A                                                    | N/A                                  | 25.00                                                  | 25.70                               | N/A                                                    | N/A                                  |
| NR Band n14                                  | 24.30                                                  | 24.70                               | N/A                                                    | N/A                                  | 23.50                                                  | 25.70                               | N/A                                                    | N/A                                  |
| NR Band n26                                  | 23.90                                                  | 24.70                               | N/A                                                    | N/A                                  | 24.20                                                  | 25.70                               | N/A                                                    | N/A                                  |
| NR Band n5                                   | 23.90                                                  | 24.70                               | N/A                                                    | N/A                                  | 24.20                                                  | 25.70                               | N/A                                                    | N/A                                  |
| NR Band n70                                  | 19.60                                                  | 25.70                               | 20.50                                                  | 25.70                                | 18.00                                                  | 25.20                               | 18.60                                                  | 25.30                                |
| NR Band n66                                  | 19.60                                                  | 25.70                               | 20.50                                                  | 25.70                                | 18.00                                                  | 25.70                               | 18.60                                                  | 25.70                                |
| NR Band n2                                   | 18.80                                                  | 24.20                               | 19.30                                                  | 24.20                                | 17.50                                                  | 25.20                               | 19.30                                                  | 25.30                                |
| NR Band n25                                  | 18.80                                                  | 24.20                               | 19.30                                                  | 24.20                                | 17.50                                                  | 25.20                               | 19.30                                                  | 25.30                                |
| NR Band n30                                  | 19.50                                                  | 24.20                               | 20.50                                                  | 24.20                                | 17.20                                                  | 22.10                               | 18.80                                                  | 23.40                                |
| NR Band n7                                   | 18.20                                                  | 24.20                               | 20.10                                                  | 24.20                                | 17.90                                                  | 25.20                               | 18.90                                                  | 25.30                                |
| NR Band n41 (PC3) - [Ch. 518598]             | 17.70                                                  | 28.70                               | 20.10                                                  | 28.70                                | 17.20                                                  | 28.20                               | 19.30                                                  | 27.70                                |
| NR Band n41 (PC2) - [Ch. 518598]             | 17.70                                                  | 28.70                               | 20.10                                                  | 28.70                                | 17.20                                                  | 28.20                               | 19.30                                                  | 27.70                                |
| NR Band n41 (PC3) - [Ch. 528000]             | 19.90                                                  | 28.70                               | 20.10                                                  | 28.70                                | 19.90                                                  | 28.20                               | 19.30                                                  | 27.70                                |
| NR Band n41 (PC2) - [Ch. 528000]             | 19.90                                                  | 28.70                               | 20.10                                                  | 28.70                                | 19.90                                                  | 28.20                               | 19.30                                                  | 27.70                                |
| NR Band n48                                  | 16.60                                                  | 21.80                               | 21.00                                                  | 23.30                                | 16.40                                                  | 20.30                               | 16.10                                                  | 21.10                                |
| NR Band n77 DoD (PC3) - [Ch. 633334]         | 17.40                                                  | 25.00                               | 20.30                                                  | 25.00                                | 18.30                                                  | 25.70                               | 16.60                                                  | 25.70                                |
| NR Band n77 DoD (PC2) - [Ch. 633334]         | 17.40                                                  | 25.50                               | 20.30                                                  | 25.50                                | 18.30                                                  | 27.50                               | 16.60                                                  | 27.00                                |
| NR Band n77 (PC3) - [Ch. 650000]             | 20.70                                                  | 25.00                               | 22.90                                                  | 25.00                                | 19.40                                                  | 25.70                               | 18.20                                                  | 25.70                                |
| NR Band n77 (PC2) - [Ch. 650000]             | 20.70                                                  | 25.50                               | 22.90                                                  | 25.50                                | 19.40                                                  | 27.50                               | 18.20                                                  | 27.00                                |
| NR Band n77 (PC3) - [Ch. 662000]             | 21.00                                                  | 25.00                               | 22.00                                                  | 25.00                                | 19.80                                                  | 25.70                               | 19.20                                                  | 25.70                                |
| NR Band n77 (PC2) - [Ch. 662000]             | 21.00                                                  | 25.50                               | 22.00                                                  | 25.50                                | 19.80                                                  | 27.50                               | 19.20                                                  | 27.00                                |

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

|                                             |                                     |                                   |
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Note: The target powers listed in Table 7-1 for Plim account for the total device uncertainty, while the Pmax values include the specified tolerance.

The selected technologies/bands for testing time-varying test sequences are highlighted in yellow in Table 7-1.

The radio configurations used in time-averaged SAR validation test for selected technologies, bands, and antennas are listed in Table 7-2. The corresponding worst-case radio configuration 1gSAR values for selected technology/band/device state are extracted from RF exposure validation report and are listed in Table 7-1.

The  $P_{limit,nom}$  for all the selected radio configurations are listed in below Table 7-2.  $P_{max,nom}$  was also used for radio configurations selected for testing time-varying Tx power transmission scenarios in order to generate test sequences following the test procedures in Section 4.1.

**Table 7-2**  
**Radio configurations selected for TAS Validation test**

| Test Case # | Test Scenario                                 | Tech       | Band    | Antenna | OPS | Channel | Frequency [MHz] | Test Configurations                  | SAR Exposure Scenario | Part 1 Worst Case Measured SAR at Plimit [W/kg] | Plimit, nom [dBm] | Pmax, nom [dBm] |
|-------------|-----------------------------------------------|------------|---------|---------|-----|---------|-----------------|--------------------------------------|-----------------------|-------------------------------------------------|-------------------|-----------------|
| 1a          | Time-varying Tx Power: Sequence A             | LTE FDD    | 66      | 3       | 1   | 132322  | 1745            | QPSK<br>1/49/20 MHz BW               | Top Edge, 5mm         | 0.986                                           | 17.3              | 25.0            |
| 1b          | Time-varying Tx Power: Sequence B             | WCDMA      | 5       | 3       | 1   | 4183    | 836.6           | RMC<br>-                             | Top Edge, 5mm         | 0.795                                           | 23.5              | 25.0            |
|             |                                               | LTE FDD    | 66      | 3       | 1   | 132322  | 1745            | QPSK<br>1/49/20 MHz BW               | Top Edge, 5mm         | 0.986                                           | 17.3              | 25.0            |
|             |                                               | LTE TDD    | 48      | 4b      | 1   | 56207   | 3646.7          | QPSK<br>1/49/20 MHz BW               | Top Edge, 5mm         | 0.685                                           | 15.0              | 18.1            |
|             |                                               | NR FR1 FDD | n25 SA  | 1       | 1   | 376500  | 1882.5          | DFT-S-OFDM,<br>QPSK<br>1/1/40 MHz BW | Bottom Edge, 5mm      | 0.893                                           | 18.0              | 23.5            |
|             |                                               | NR FR1 TDD | n48 SA  | 3       | 1   | 641666  | 3624.99         | DFT-S-OFDM,<br>QPSK<br>1/1/40 MHz BW | Top Edge, 5mm         | 0.862                                           | 14.9              | 19.3            |
| 1c          | Time-varying Tx Power Pseudo-Random Sequence: | LTE FDD    | 66      | 3       | 1   | 132322  | 1745            | QPSK<br>1/49/20 MHz BW               | Top Edge, 5mm         | 0.986                                           | 17.3              | 25.0            |
| 2           | Antenna Switching                             | LTE        | 12      | 3       | 1   | 23095   | 707.5           | QPSK<br>1/24/10 MHz BW               | Top Edge, 5mm         | 0.904                                           | 24.2              | 25.0            |
|             |                                               |            | 48      | 4b      | 1   | 56207   | 3646.7          | QPSK<br>1/49/20 MHz BW               | Top Edge, 5mm         | 0.685                                           | 15.0              | 18.1            |
| 3           | Change in Band/Frequency                      | LTE        | 66      | 1       | 1   | 132322  | 1745            | QPSK<br>1/49/20 MHz BW               | Bottom Edge, 5mm      | 0.994                                           | 18.7              | 25.0            |
|             |                                               |            | 25      |         | 1   | 26365   | 1882.5          | QPSK<br>1/49/20 MHz BW               | Bottom Edge, 5mm      | 0.892                                           | 18.1              | 23.5            |
| 4           | Change in Technology                          | LTE        | 71      | 3       | 1   | 133297  | 680.5           | QPSK<br>1/49/20 MHz BW               | Back Side, 5mm        | 1.080                                           | 23.7              | 25.0            |
|             |                                               | WCDMA      | 4       | 4b      | 1   | 1412    | 1732.4          | RMC<br>-                             | Top Edge, 5mm         | 1.000                                           | 17.7              | 25.0            |
| 5           | TDD/FDD Switch                                | LTE FDD    | 66      | 1       | 1   | 132322  | 1745            | QPSK<br>1/49/20 MHz BW               | Bottom Edge, 5mm      | 0.994                                           | 18.7              | 25.0            |
|             |                                               | LTE TDD    | 41 PC3  |         | 1   | 40620   | 2593            | QPSK<br>1/49/20 MHz BW               | Bottom Edge, 5mm      | 1.130                                           | 16.4              | 23.0            |
| 6           | Call Drop                                     | LTE FDD    | 14      | 3       | 1   | 23330   | 793             | QPSK<br>1/24/10 MHz BW               | Back Side, 5mm        | 1.010                                           | 22.7              | 25.0            |
| 7           | Time-varying Tx Power: EN-DC Same Time Window | LTE        | 5       | 3       | 1   | 20525   | 836.5           | QPSK<br>1/24/10 MHz BW               | Back Side, 5mm        | 1.030                                           | 23.5              | 25.0            |
|             |                                               | NR FR1     | n66 NSA | 4b      | 1   | 349000  | 1745            | DFT-S-OFDM,<br>QPSK<br>1/1/40 MHz BW | Top Edge, 5mm         | 1.020                                           | 17.7              | 25.0            |
| 9           | Time-varying Tx Power: Inter-Band ULCA        | LTE PCC    | 5       | 3       | 1   | 20525   | 836.5           | QPSK<br>1/24/10 MHz BW               | Back Side, 5mm        | 1.030                                           | 23.5              | 25.0            |
|             |                                               | LTE SCC    | 66      | 4b      | 1   | 132322  | 1745            | QPSK<br>1/49/20 MHz BW               | Top Edge, 5mm         | 0.917                                           | 17.7              | 25.0            |

|                                             |                                     |                                   |
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## 8 CONDUCTED TX CASES

### 8.1 Scenario 1: Change in Requested Power

In this scenario, the TAS algorithm is tested under dynamic power test sequences. The test sequences A, B, and Pseudo-Random are shown and tabulated in Appendix E. All of the test cases for this scenario are relegated in Table 7-2, and the test procedure follows section 4.1.2. The measurement setup is shown in Figure 6-1. The following details will demonstrate case-by-case to show how the TAS algorithm behaves for each RAT.

The test case for 3G WCDMA are conducted under WCDMA Band 5, the test cases for 4G LTE are conducted under LTE bands B66 and B48, and the test cases for 5G NR are conducted under NR bands n25 and n48. The corresponding detailed test procedure is described in section 4.1.2. For the figure set of each case, the first figure demonstrates the DUT's instantaneous conducted TX power, the requested power over time,  $P_{limit}$ , and  $P_{max}$ . The second figure illustrates the corresponding rolling average power over time. For all test cases, the time-averaged SAR does not exceed the FCC limit.

|                                             |                                     |                                   |
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WCDMA Band 5, Antenna 3

Test result for Test Sequence B

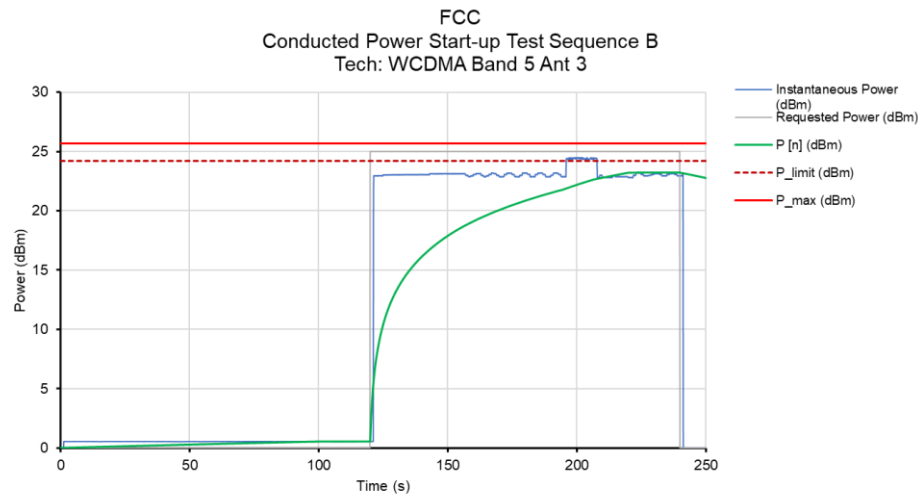


Figure 8-1: Time-averaged conducted TX power over time for Changes in Power case (WCDMA Band 5 – Test Sequence B)

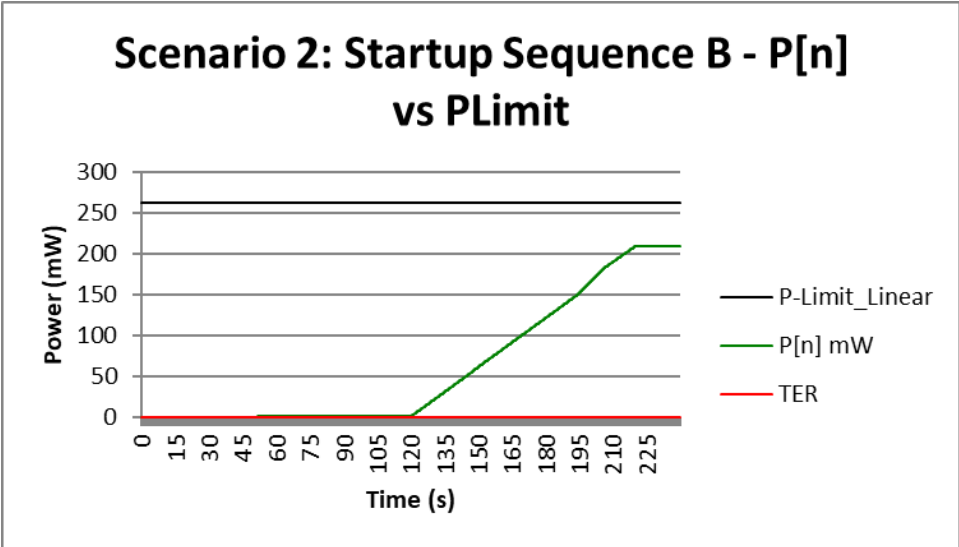


Figure 8-2: Time-averaged Power for Changes in Power case (WCDMA Band 5 – Test Sequence B)

|                                                                                                   |          |
|---------------------------------------------------------------------------------------------------|----------|
|                                                                                                   | mW       |
| Plimit (Plimit,nom with uncertainty)                                                              | 263.0 mW |
| Max P[n]                                                                                          | 210.0 mW |
| Validation: $P[n] \leq P_{limit}$ for all n, that is for every time step associated with the test |          |

|                                             |                                     |                                   |
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LTE Band 66, Antenna 3

Test result for Test Sequence A

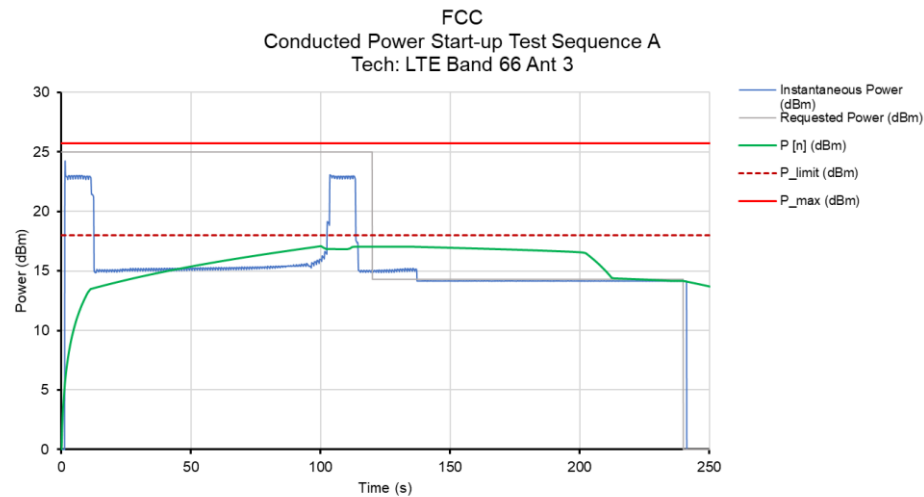


Figure 8-3: Time-averaged conducted TX power over time for Changes in Power case (LTE Band 66 – Test Sequence A)

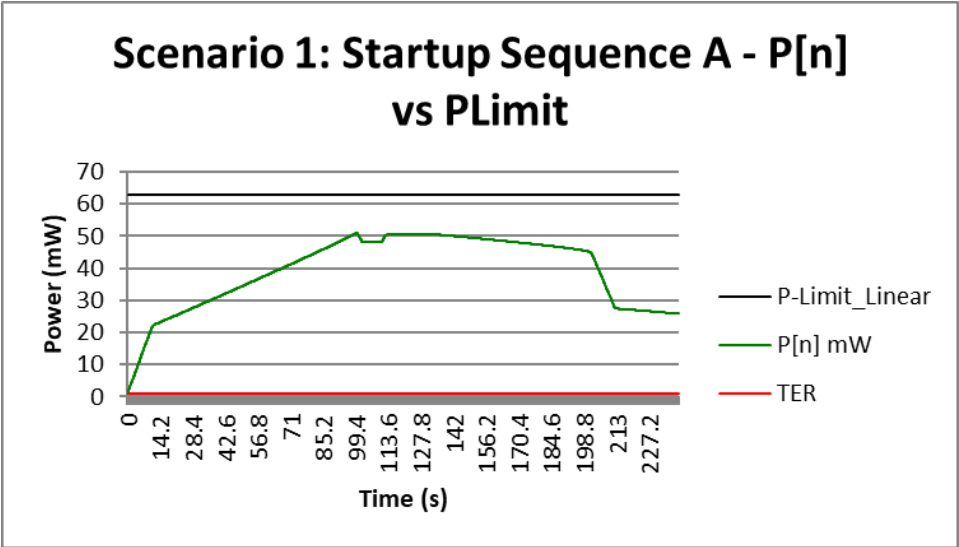


Figure 8-4: Time-averaged Power for Changes in Power case (LTE Band 66 – Test Sequence A)

|                                                                                                   |         |
|---------------------------------------------------------------------------------------------------|---------|
|                                                                                                   | mW      |
| Plimit (Plimit,nom with uncertainty)                                                              | 63.1 mW |
| Max P[n]                                                                                          | 51.2 mW |
| Validation: $P[n] \leq P_{limit}$ for all n, that is for every time step associated with the test |         |

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Test result for Test Sequence B

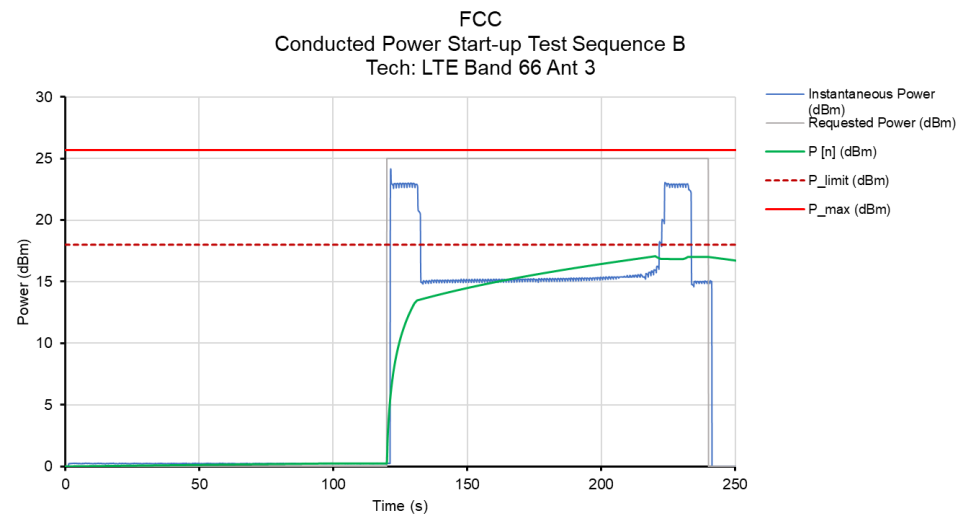


Figure 8-5: Time-averaged conducted TX power over time for Changes in Power case (LTE Band 66 – Test Sequence B)

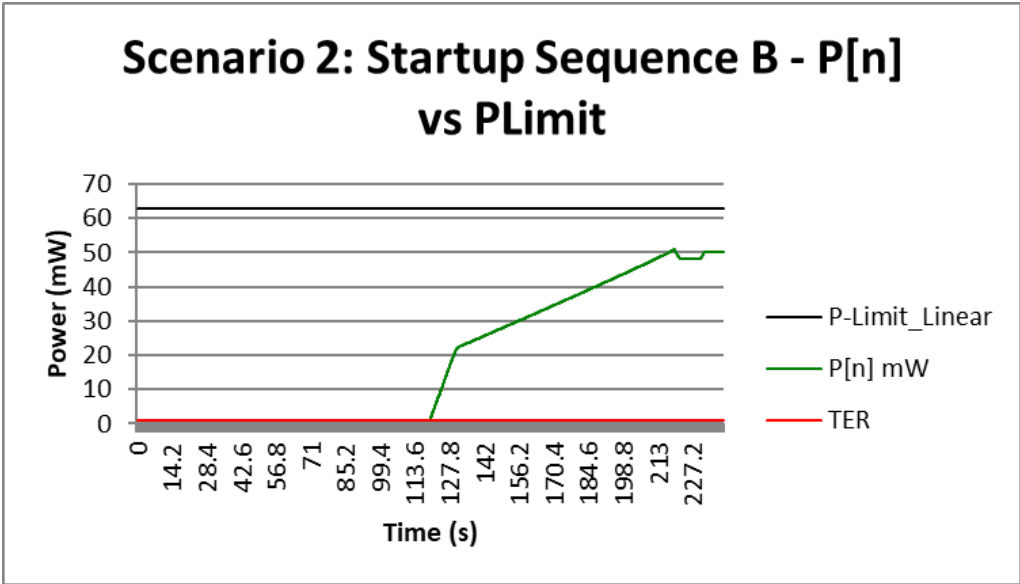


Figure 8-6: Time-averaged Power for Changes in Power case (LTE Band 66 – Test Sequence B)

|                                                                                           |         |
|-------------------------------------------------------------------------------------------|---------|
|                                                                                           | mW      |
| Plimit (Plimit,nom with uncertainty)                                                      | 63.1 mW |
| Max P[n]                                                                                  | 51.0 mW |
| Validation: P[n] ≤ Plimit for all n, that is for every time step associated with the test |         |

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Test result for Pseudo-Random Test Sequence

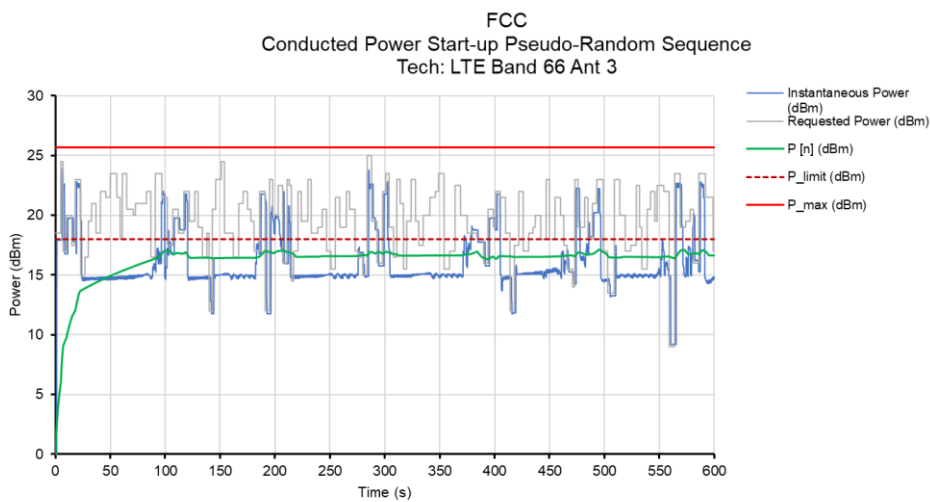


Figure 8-7: Time-averaged conducted TX power over time for Changes in Power case (LTE Band 66 – Pseudo-Random Test Sequence)

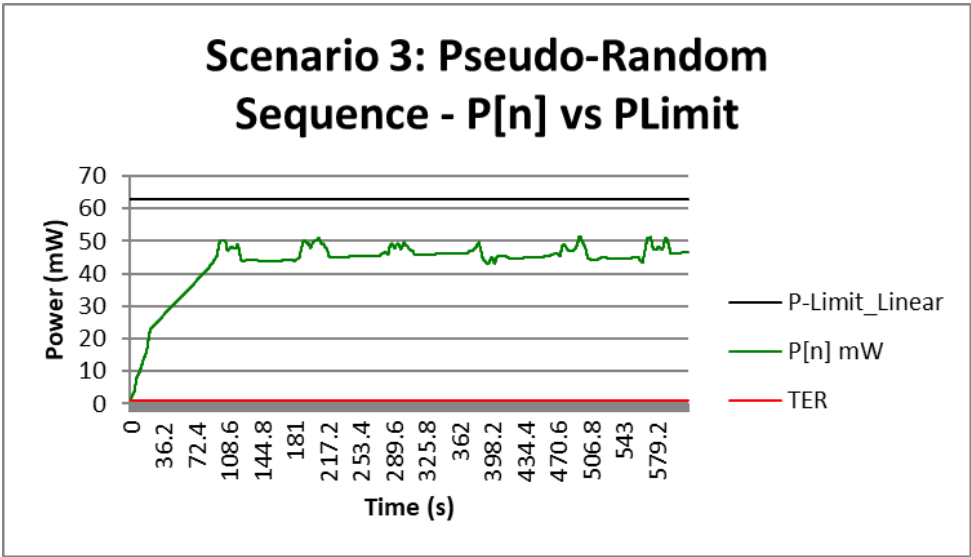


Figure 8-8: Time-averaged Power for Changes in Power case (LTE Band 66 – Pseudo-Random Test Sequence)

|                                                                                                |         |
|------------------------------------------------------------------------------------------------|---------|
|                                                                                                | mW      |
| Plimit (Plimit,nom with uncertainty)                                                           | 63.1 mW |
| Max P[n]                                                                                       | 51.5 mW |
| Validation: $P[n] \leq Plimit$ for all n, that is for every time step associated with the test |         |

|                                             |                                     |                                   |
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## LTE Band 48, Antenna 4b

### Test result for Test Sequence B

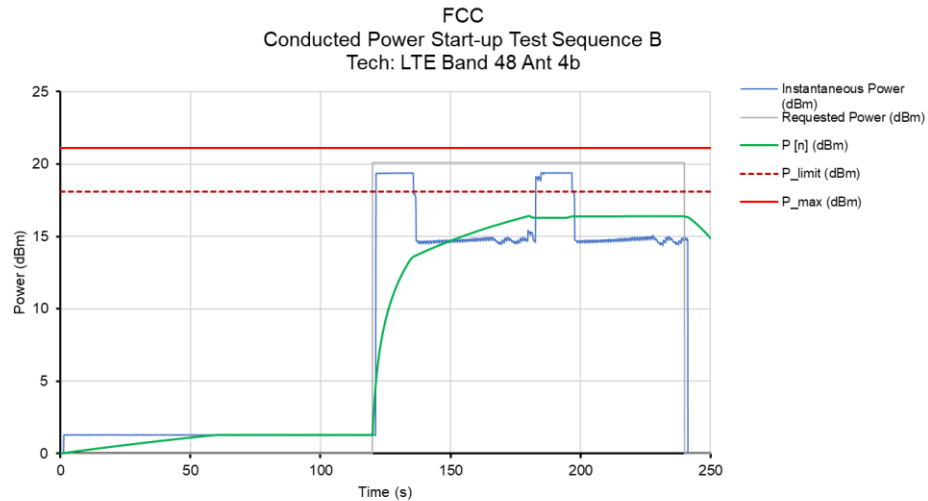


Figure 8-9: Time-averaged conducted TX power over time for Changes in Power case (LTE Band 48 – Test Sequence B)

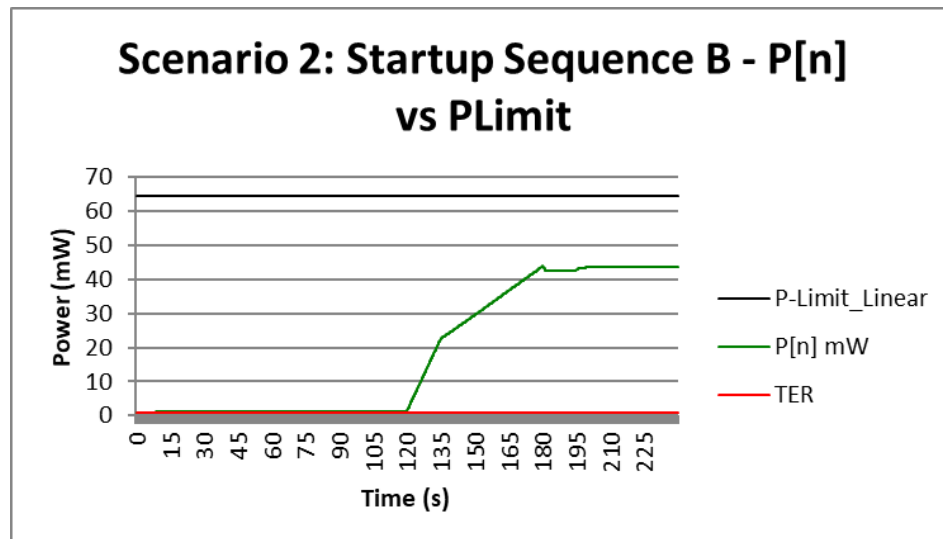


Figure 8-10: Time-averaged Power for Changes in Power case (LTE Band 48 – Test Sequence B)

|                                                                                                   |         |
|---------------------------------------------------------------------------------------------------|---------|
|                                                                                                   | mW      |
| Plimit (Plimit,nom with uncertainty)                                                              | 64.6 mW |
| Max P[n]                                                                                          | 46.5 mW |
| Validation: $P[n] \leq P_{limit}$ for all n, that is for every time step associated with the test |         |

|                                             |                                     |                                   |
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NR n25 SA, Antenna 1

Test result for Test Sequence B

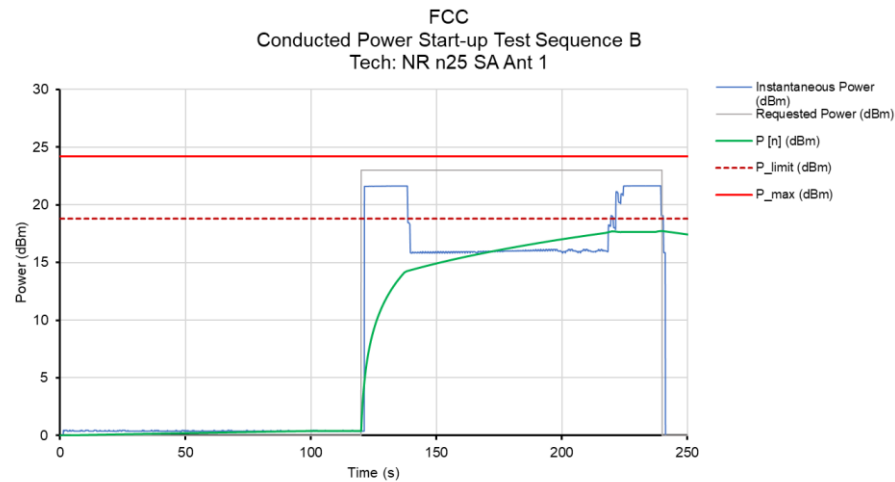


Figure 8-11: Time-averaged conducted TX power over time for Changes in Power case (NR n25 SA – Test Sequence B)

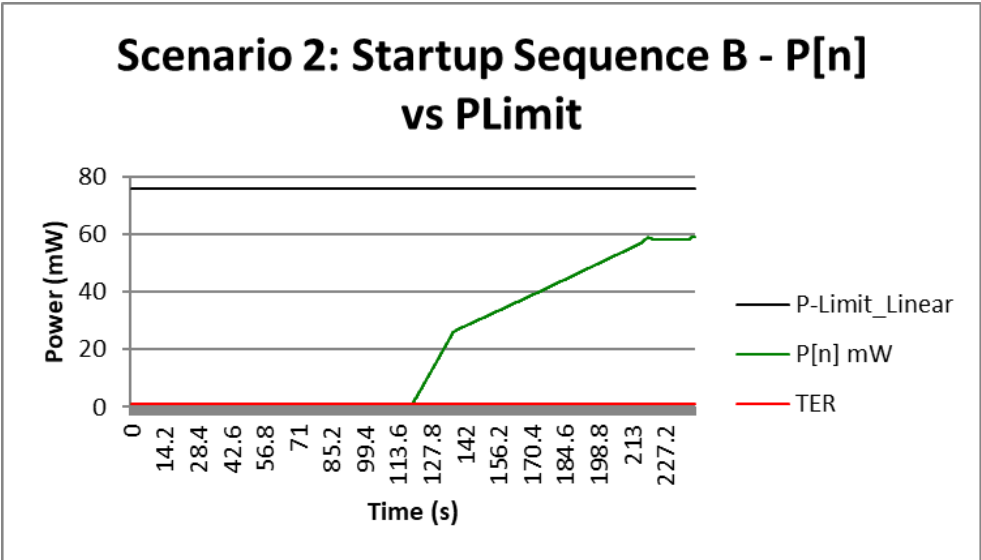


Figure 8-12: Time-averaged Power for Changes in Power case (NR n25 SA – Test Sequence B)

|                                                                                                   |         |
|---------------------------------------------------------------------------------------------------|---------|
|                                                                                                   | mW      |
| Plimit (Plimit,nom with uncertainty)                                                              | 75.9 mW |
| Max P[n]                                                                                          | 59.3 mW |
| Validation: $P[n] \leq P_{limit}$ for all n, that is for every time step associated with the test |         |

|                                             |                                     |                                   |
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NR n48 SA, Antenna 3

Test result for Test Sequence B

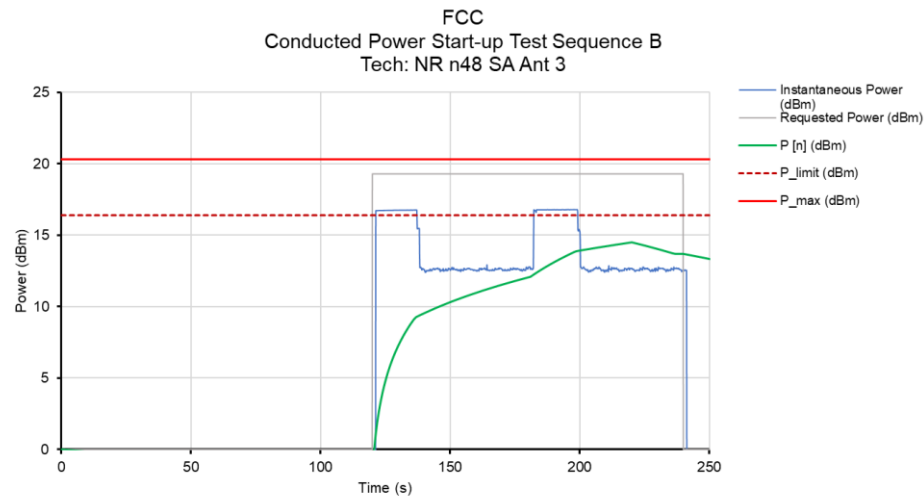


Figure 8-13: Time-averaged conducted TX power over time for Changes in Power case (NR n48 SA – Test Sequence B)

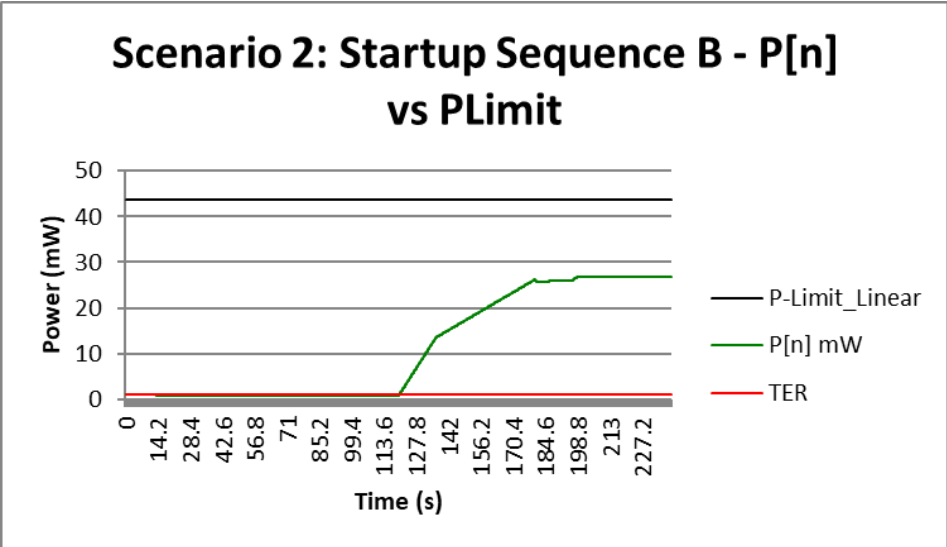


Figure 8-14: Time-averaged Power for Changes in Power case (NR n48 SA – Test Sequence B)

|                                                                                                   |         |
|---------------------------------------------------------------------------------------------------|---------|
|                                                                                                   | mW      |
| Plimit (Plimit,nom with uncertainty)                                                              | 43.7 mW |
| Max P[n]                                                                                          | 28.2 mW |
| Validation: $P[n] \leq P_{limit}$ for all n, that is for every time step associated with the test |         |

|                                             |                                     |                                   |
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8.2 Scenario 2: Antenna Switching

In this scenario, maximum TX power is requested by a call box for each RAT , and the antenna change at the EUT side is manually configured at a specific time instance. The test case for this scenario is relegated in Table 7-2, and the test procedure follows section 4.2.2. The measurement setup is shown in Figure 6-1.

This test aims to validate the TAS algorithm with antenna change during the test period for 4G LTE Band 12 to LTE Band 48. The corresponding detailed test procedure is described in section 4.2.2. Figure 8-15 demonstrates the DUT’s instantaneous conducted TX power, the requested power over time,  $P_{limit}$ , and  $P_{max}$ . During the test period, the antenna change event is configured to switch at the time instance 120 seconds. The change is from Ant 3 to Ant 4b and maximum power is requested for the remainder of the test. It is observed in the figure that the rolling power average of the individual RAT is below its own  $P_{limit}$ . Figure 8-16 illustrates the corresponding normalized total rolling power average over time by using the equation listed in section 4.1. As seen in this figure, the total normalized rolling power average does not exceed the normalized  $P_{limit}$ .

|                                             |                                     |                                   |
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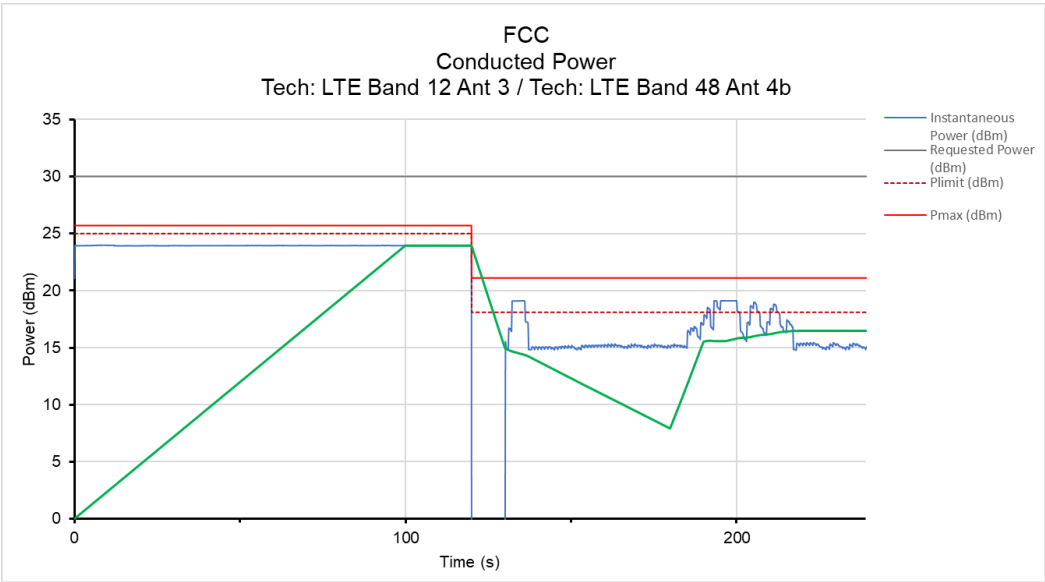


Figure 8-15: Time-averaged conducted TX power over time for Antenna Switch case (LTE Band 12 to LTE Band 48)

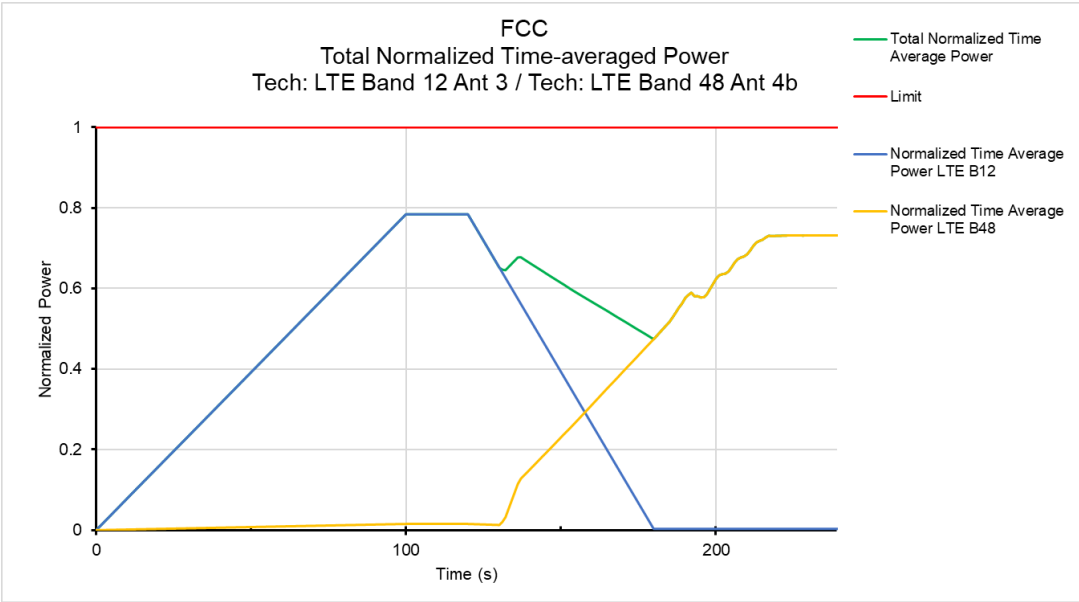


Figure 8-16: Normalized Time-averaged Power for Antenna Switch case (LTE Band 12 to LTE Band 48)

|                                      |       |
|--------------------------------------|-------|
| Normalized $P_{limit}$               | 1.00  |
| Highest normalized $P_{avg}$         | 0.784 |
| Validation result: <span>Pass</span> |       |

|                                             |                                     |                                   |
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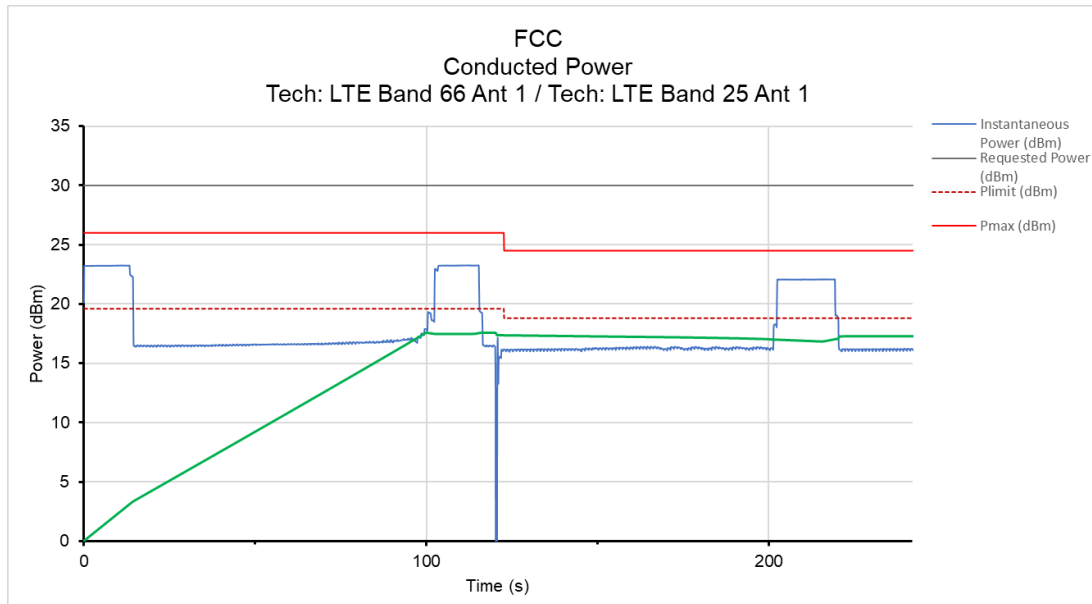


8.3 Scenario 3: Change in Band/Frequency

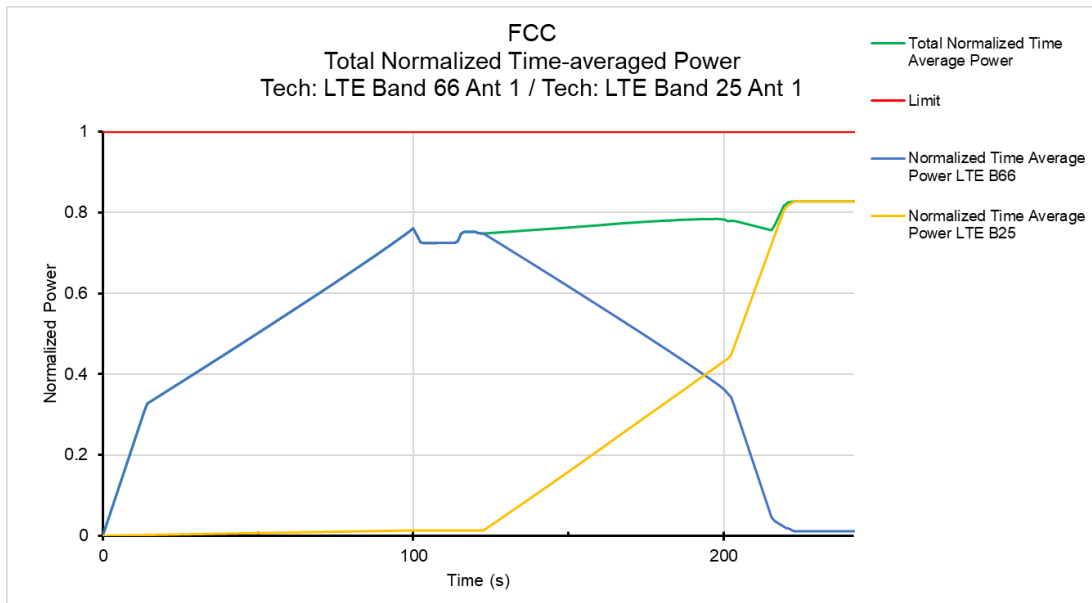
In this scenario, maximum TX power is requested by a call box for each RAT, and the change in band is manually configured at a specific time instance. The test case covers change in band scenario between two frequencies. The test case for this scenario is relegated in Table 7-2, and the test procedure follows section 4.3.2. The measurement setup is shown in Figure 6-1.

This test aims to validate the TAS algorithm with band change from 4G LTE Band 66 to LTE Band 25. The corresponding detailed test procedure is described in section 4.3.2. Figure 8-17 demonstrates the DUT’s instantaneous conducted TX power, the requested power over time, *P<sub>limit</sub>*, and *P<sub>max</sub>*. The hand-off is configured at the time instance of 120 seconds. It is observed in the figure that the rolling power average of the individual RAT is below its own *P<sub>limit</sub>*. Figure 8-18 illustrates the corresponding normalized total rolling power average over time by using the equation listed in section 4.1. As seen in this figure, the total normalized rolling power average does not exceed the normalized *P<sub>limit</sub>*.

|                                             |                                     |                                   |
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**Figure 8-17: Time-averaged conducted TX power over time for Change in Band case (LTE Band 66 to LTE Band 25)**



**Figure 8-18: Normalized Time-averaged Power for Change in Band case (LTE Band 66 to LTE Band 25)**

|                                                            |       |
|------------------------------------------------------------|-------|
| Normalized $P_{limit}$                                     | 1.00  |
| Highest normalized $P_{avg}$                               | 0.828 |
| Validation result: <span style="color: green;">Pass</span> |       |

|                                             |                                     |                                   |
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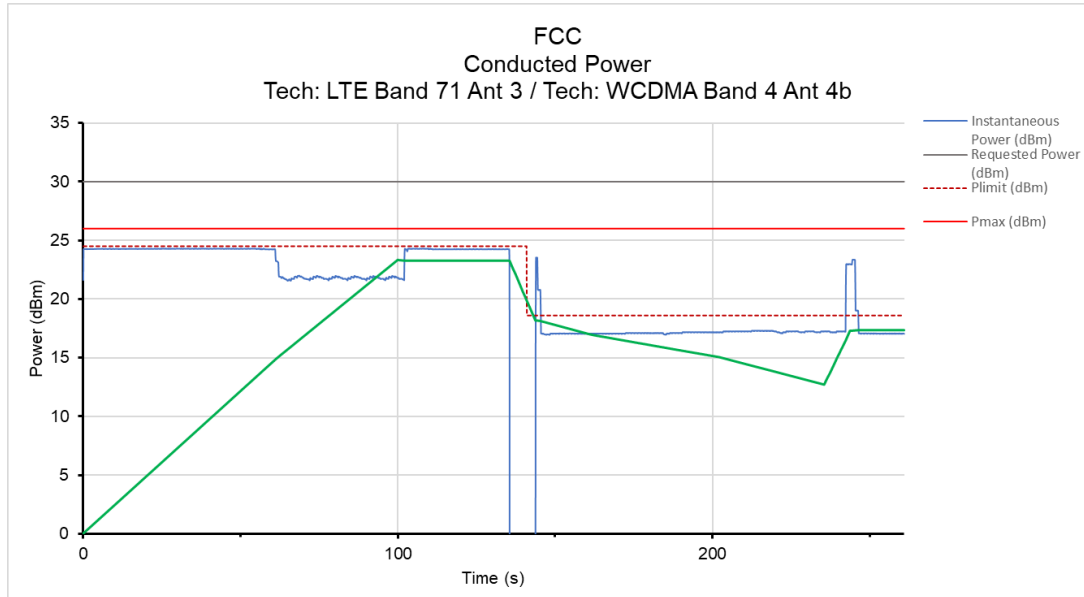


8.4 Scenario 4: Change in Technology

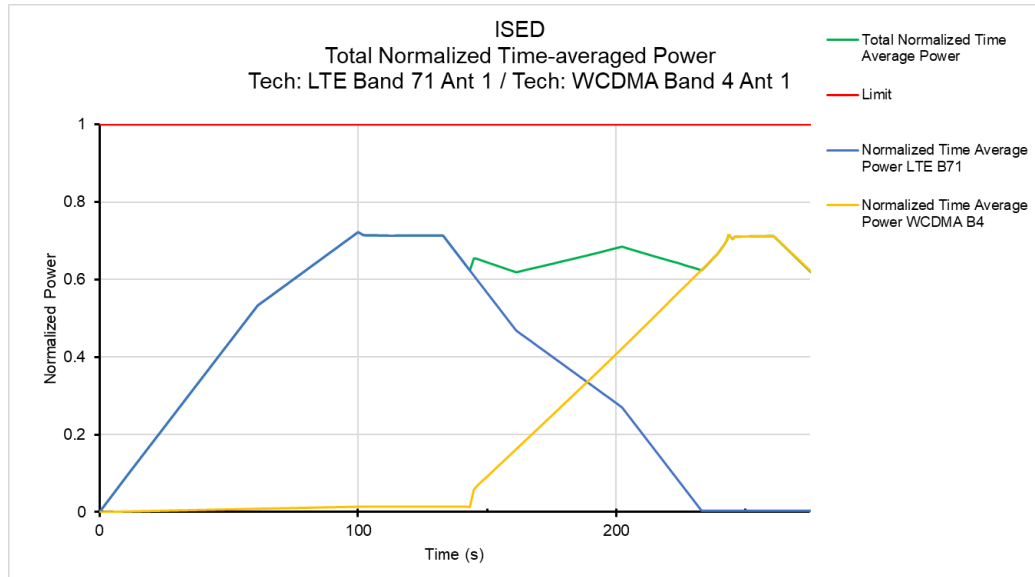
In this scenario, maximum TX power is requested by a call box for each RAT , and the change in technology is manually configured at a specific time instance. The test case for this scenario is relegated in Table 7-2, and the test procedure follows section 4.4.2. The measurement setup is shown in Figure 6-1.

This test aims to validate the TAS algorithm with change in technology during the test period from 4G LTE Band 71 to WCMDA Band 4. The corresponding detailed test procedure is described in section 4.4.2. Figure 8-19 demonstrates the DUT’s instantaneous conducted TX power, the requested power over time,  $P_{limit}$ , and  $P_{max}$ . The hand-off is configured at the time instance of 140 seconds. It is observed in the figure that the rolling power average of the individual RAT is below its own  $P_{limit}$ . Figure 8-20 illustrates the corresponding normalized total rolling power average over time by using the equation listed in section 4.1. As seen in this figure, the total normalized rolling power average does not exceed the normalized  $P_{limit}$ .

|                                             |                                     |                                   |
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**Figure 8-19: Time-averaged conducted TX power over time for Technology Hand-Off case (LTE Band 71 to WCDMA Band 4)**



**Figure 8-20: Normalized Time-averaged Power for Technology Hand-Off case (LTE Band 71 to WCDMA Band 4)**

|                                                            |       |
|------------------------------------------------------------|-------|
| Normalized $P_{limit}$                                     | 1.00  |
| Highest normalized $P_{avg}$                               | 0.790 |
| Validation result: <span style="color: green;">Pass</span> |       |

|                                             |                                     |                                   |
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8.5 Scenario 5: TDD/FDD Switch

In this scenario, maximum TX power is requested by a call box for each RAT , and FDD to TDD switching at the EUT side is manually configured at a specific time instance. The test case for this scenario is relegated in Table 7-2, and the test procedure follows section 4.5.2. The measurement setup is shown in Figure 6-1.

This test aims to validate the TAS algorithm with FDD to TDD switching during the test period from 4G LTE Band 66 to LTE Band 41 PC3. The corresponding detailed test procedure is described in section 4.5.2. Figure 8-21 demonstrates the DUT’s instantaneous conducted TX power, the requested power over time,  $P_{limit}$ , and  $P_{max}$ . The hand-off is configured at the time instance of 120 seconds. It is observed in the figure that the rolling power average of the individual RAT is below its own  $P_{limit}$ . Figure 8-22 illustrates the corresponding normalized total rolling power average over time by using the equation listed in section 4.1. As seen in this figure, the total normalized rolling power average does not exceed the normalized  $P_{limit}$ .

|                                             |                                     |                                   |
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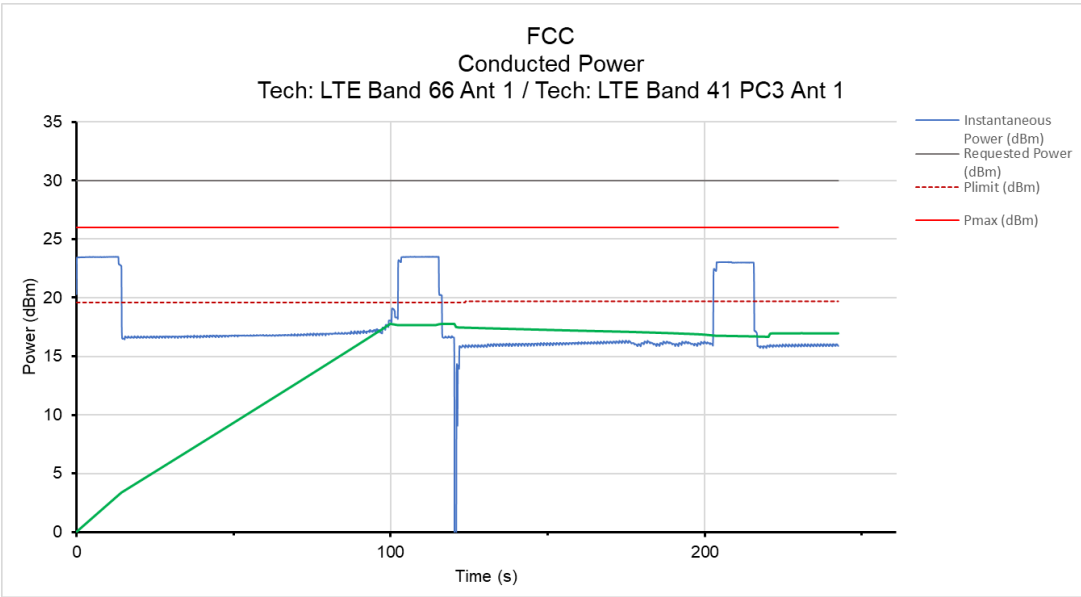


Figure 8-21: Time-averaged conducted TX power over time for TDD/FDD Switch case (LTE Band 66 to LTE Band 41 PC3)

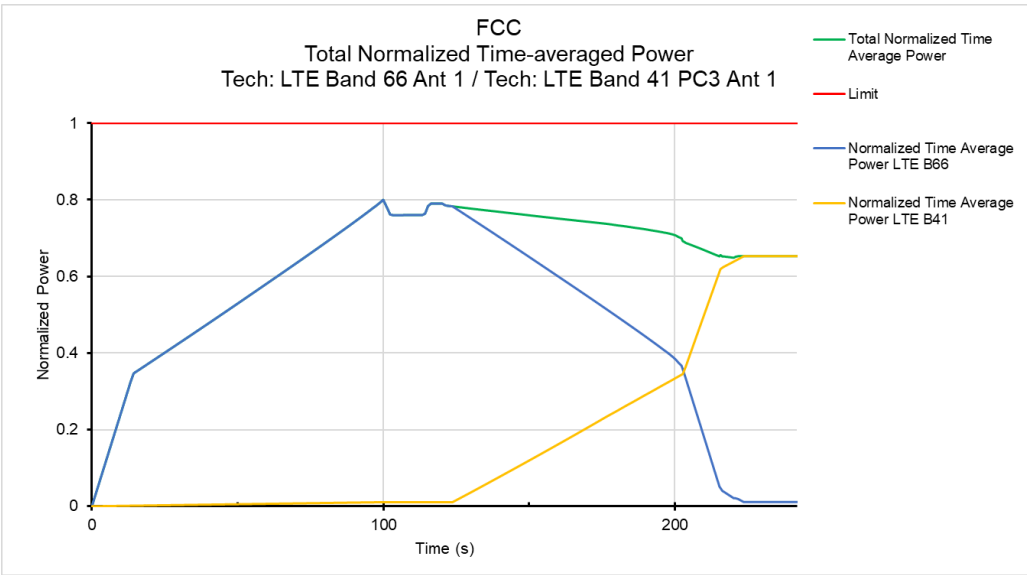


Figure 8-22: Normalized Time-averaged Power for TDD/FDD Switch case (LTE Band 66 to LTE Band 41 PC3)

|                                                            |       |
|------------------------------------------------------------|-------|
| Normalized $P_{limit}$                                     | 1.00  |
| Highest normalized $P_{avg}$                               | 0.800 |
| Validation result: <span style="color: green;">Pass</span> |       |

|                                             |                                     |                                   |
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8.6 Scenario 6: Call Drop

In this scenario, maximum TX power is requested by a call box for each RAT , and call drop at the EUT side is manually configured at a specific time instance. The test case for this scenario is relegated in Table 7-2, and the test procedure follows section 4.6.2. The measurement setup is shown in Figure 6-1.

This test aims to validate the TA-SAR algorithm with call disconnection during the test period from 4G LTE Band 14. The corresponding detailed test procedure is described in section 4.6.2. Figure 8-23 demonstrates the DUT’s instantaneous conducted TX power, the requested power over time,  $P_{limit}$ , and  $P_{max}$ . The call disconnection is configured at the time instance of 125 seconds and is configured to re-establish connection after 10 seconds. It is observed in the figure that the rolling power average of the individual RAT is below its own  $P_{limit}$ . Figure 8-24 illustrates the corresponding calculated rolling power average over time by using the equation listed in section 4.1. As seen in this figure, the calculated rolling power average does not exceed the normalized  $P_{limit}$ .

|                                             |                                     |                                   |
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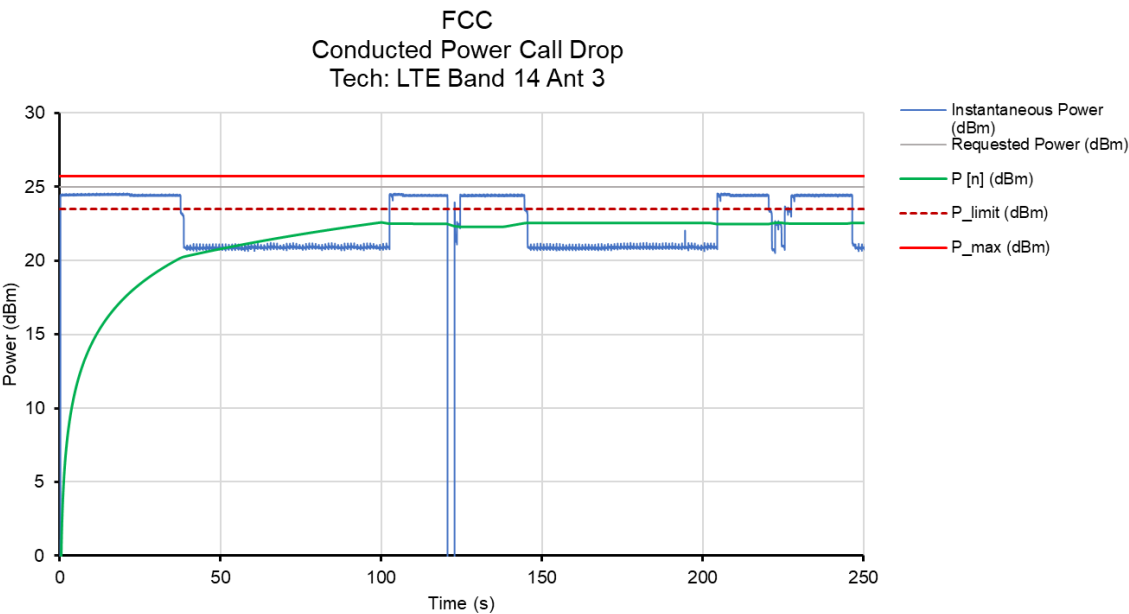


Figure 8-23: Time-averaged conducted TX power over time for Call Disconnection case (LTE Band 14)

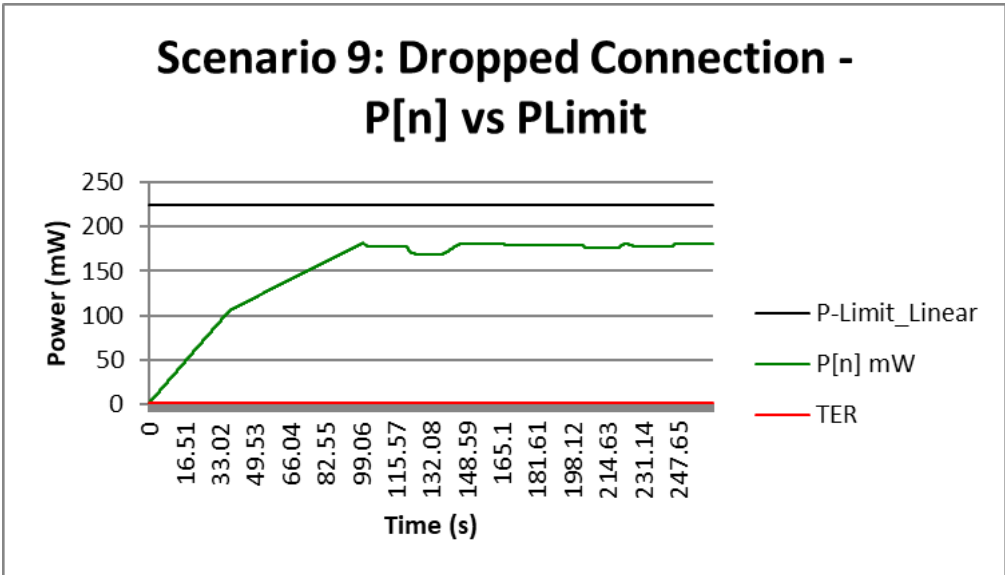


Figure 8-24: Normalized Time-averaged Power for Call Disconnection case (LTE Band 14)

|                                                                                                |          |
|------------------------------------------------------------------------------------------------|----------|
|                                                                                                | mW       |
| Plimit (Plimit,nom with uncertainty)                                                           | 223.9 mW |
| Max P[n]                                                                                       | 181.7 mW |
| Validation: $P[n] \leq Plimit$ for all n, that is for every time step associated with the test |          |

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 47 of 72                     |

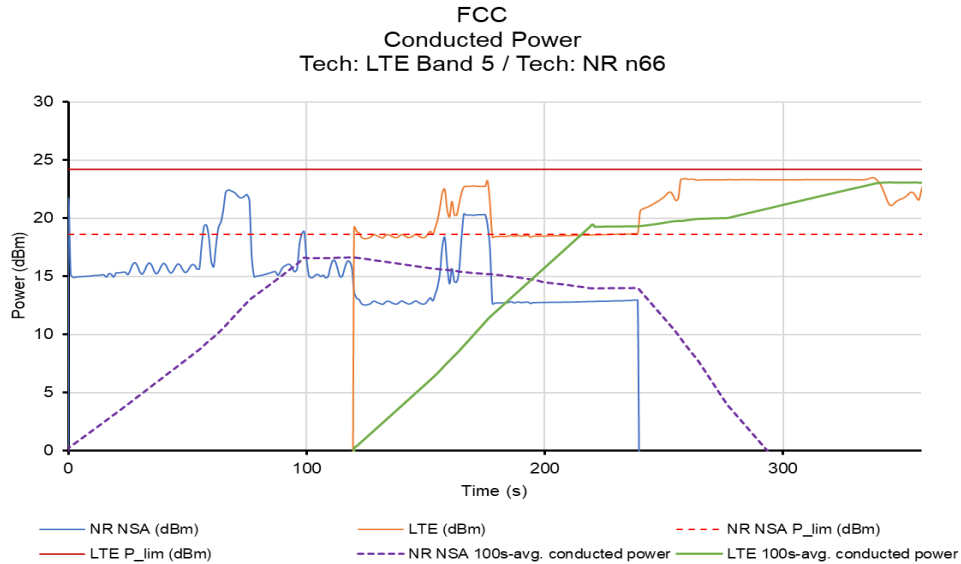


8.7 Scenario 7: Time-Varying Tx Power (ENDC)

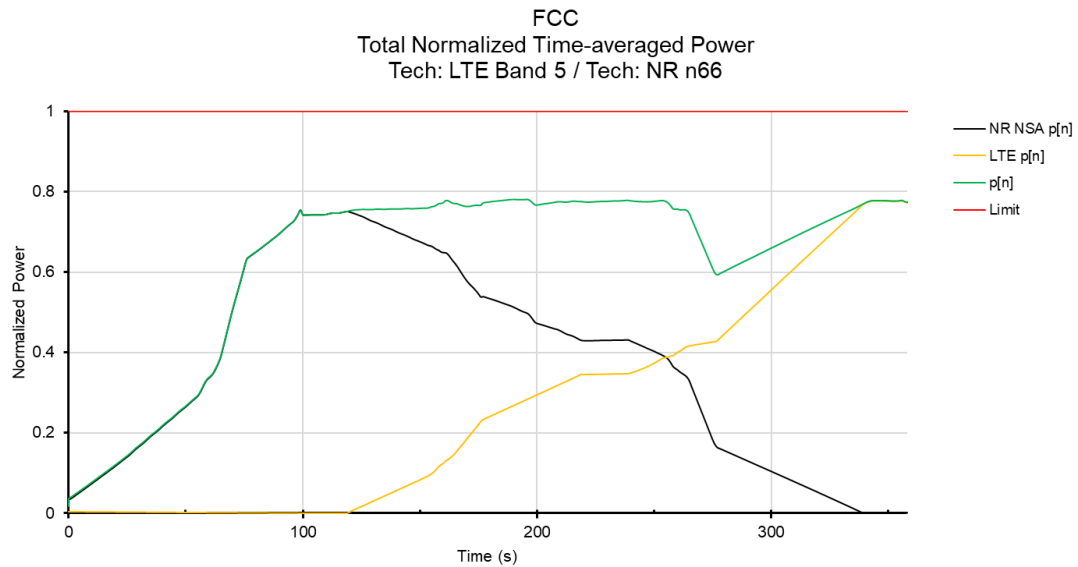
In this scenario, maximum TX power is requested by a call box for each RAT , and technology hand-off at the EUT side is manually configured at a specific time instance. The test case for this scenario is relegated in Table 7-2, and the test procedure follows section 4.7.1. The measurement setup is shown in Figure 6-1.

This test aims to validate the TA-SAR algorithm with technology hand-off during the test period from LTE Band 5 to NR n66 NSA. The corresponding detailed test procedure is described in section 4.7.1. Figure 8-25 demonstrates the DUT's instantaneous conducted TX power, the time-averaged conducted TX power behavior over time, the  $P_{limit,nom}$ , the  $P_{limit}$ , and  $P_{max}$ . The hand-off is configured at the time instance of 120 seconds and 240 seconds. It is observed in the figure that the time-averaged TX power of the individual RAT is below its own  $P_{limit,nom}$ . Figure 8-26 illustrates the corresponding time-averaged SAR over time converted from the TX time-averaged power by using the equation listed in section 4.1. As seen in this figure, the time-averaged normalized SAR does not exceed the normalized limit of 1.

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 48 of 72                     |



**Figure 8-25: Time-averaged conducted TX power over time for Technology Hand-Off (ENDC) case (LTE Band 5 to NR n66 NSA)**



**Figure 8-26: Normalized Time-averaged Power for Technology Hand-Off (ENDC) case (LTE Band 5 to NR n66 NSA)**

|                                                                                                   |       |
|---------------------------------------------------------------------------------------------------|-------|
| Normalized $P_{limit}$                                                                            | 1.00  |
| Highest normalized $P_{avg}$                                                                      | 0.781 |
| Validation: $P[n] \leq P_{limit}$ for all n, that is for every time step associated with the test |       |

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 49 of 72                     |

8.8 Scenario 8: Time-Varying Tx Power (Inter-Band ULCA)

In this scenario, maximum TX power is requested by a call box for each RAT, and technology hand-off at the EUT side is manually configured at a specific time instance. The test case for this scenario is relegated in Table 7-2, and the test procedure follows section 4.7.2. The measurement setup is shown in Figure 6-1.

This test aims to validate the TA-SAR algorithm with technology hand-off during the test period from LTE Band 5 to LTE Band 66. The corresponding detailed test procedure is described in section 4.7.2. Figure 8-27 demonstrates the DUT’s instantaneous conducted TX power, the time-averaged conducted TX power behavior over time, the  $P_{limit,nom}$ , the  $P_{limit}$ , and  $P_{max}$ . The hand-off is configured at the time instance of 160 seconds and 320 seconds. It is observed in the figure that the time-averaged TX power of the individual RAT is below its own  $P_{limit,nom}$ . Figure 8-28 illustrates the corresponding time-averaged SAR over time converted from the TX time-averaged power by using the equation listed in section 4.1. As seen in this figure, the time-averaged normalized SAR does not exceed the normalized limit of 1.

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 50 of 72                     |

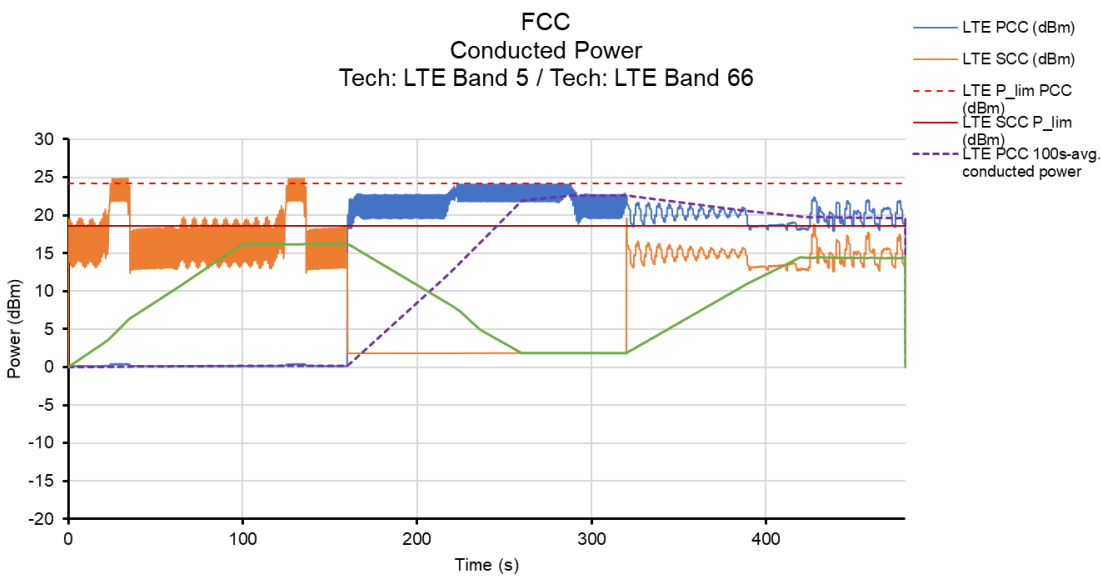


Figure 8-27: Time-averaged conducted TX power over time for Technology Hand-Off case (LTE Band 5 to LTE Band 66)

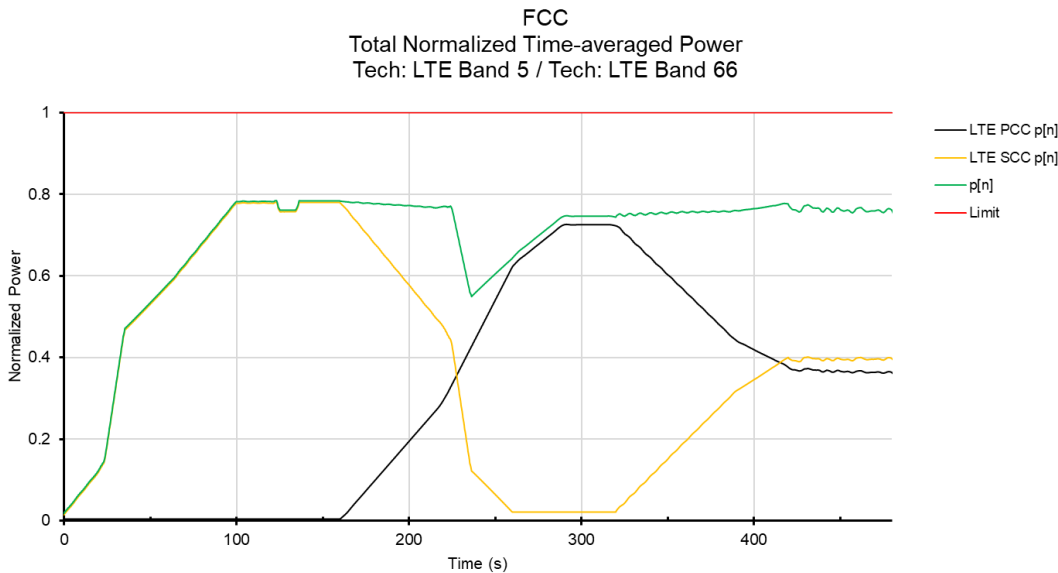


Figure 8-28: Normalized Time-averaged Power for Technology Hand-Off case (LTE Band 5 to LTE Band 66)

|                                                                                                   |       |
|---------------------------------------------------------------------------------------------------|-------|
| Normalized $P_{limit}$                                                                            | 1.00  |
| Highest normalized $P_{avg}$                                                                      | 0.784 |
| Validation: $P[n] \leq P_{limit}$ for all n, that is for every time step associated with the test |       |

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 51 of 72                     |

## 9 SYSTEM VERIFICATION

### 9.1 Tissue Verification

**Table 9-1**  
**Measured Tissue Properties**

| Calibrated for Tests Performed on: | Tissue Type | Tissue Temp During Calibration (°C) | Measured Frequency (MHz) | Measured Conductivity, $\sigma$ (S/m) | Measured Dielectric Constant, $\epsilon$ | TARGET Conductivity, $\sigma$ (S/m) | TARGET Dielectric Constant, $\epsilon$ | % dev $\sigma$ | % dev $\epsilon$ |
|------------------------------------|-------------|-------------------------------------|--------------------------|---------------------------------------|------------------------------------------|-------------------------------------|----------------------------------------|----------------|------------------|
| 8/12/2025                          | 835 Head    | 22.2                                | 815                      | 0.914                                 | 40.855                                   | 0.898                               | 41.594                                 | 1.78%          | -1.78%           |
|                                    |             |                                     | 820                      | 0.915                                 | 40.847                                   | 0.899                               | 41.578                                 | 1.78%          | -1.77%           |
|                                    |             |                                     | 835                      | 0.920                                 | 40.810                                   | 0.900                               | 41.500                                 | 2.22%          | -2.68%           |
|                                    |             |                                     | 850                      | 0.924                                 | 40.776                                   | 0.918                               | 41.500                                 | 0.87%          | -2.74%           |
|                                    |             |                                     | 855                      | 0.925                                 | 42.035                                   | 0.899                               | 41.584                                 | 2.78%          | 1.06%            |
| 8/21/2025                          | 835 Head    | 21.7                                | 820                      | 0.925                                 | 42.015                                   | 0.899                               | 41.578                                 | 2.89%          | 1.05%            |
|                                    |             |                                     | 835                      | 0.930                                 | 41.981                                   | 0.900                               | 41.500                                 | 3.33%          | 1.11%            |
|                                    |             |                                     | 850                      | 0.935                                 | 41.913                                   | 0.918                               | 41.500                                 | 2.07%          | 1.00%            |
|                                    |             |                                     | 1700                     | 1.329                                 | 39.229                                   | 1.343                               | 40.145                                 | 1.04%          | -2.28%           |
|                                    |             |                                     | 1705                     | 1.332                                 | 39.223                                   | 1.345                               | 40.141                                 | -0.97%         | -2.29%           |
| 8/12/2025                          | 1750 Head   | 22.2                                | 1710                     | 1.334                                 | 39.218                                   | 1.348                               | 40.138                                 | -1.04%         | -2.29%           |
|                                    |             |                                     | 1720                     | 1.339                                 | 39.208                                   | 1.354                               | 40.128                                 | -1.11%         | -2.29%           |
|                                    |             |                                     | 1745                     | 1.355                                 | 39.199                                   | 1.368                               | 40.087                                 | -0.95%         | -2.30%           |
|                                    |             |                                     | 1750                     | 1.358                                 | 39.188                                   | 1.371                               | 40.079                                 | -0.95%         | -2.29%           |
|                                    |             |                                     | 1770                     | 1.371                                 | 39.138                                   | 1.383                               | 40.047                                 | -0.87%         | -2.27%           |
| 8/21/2025                          | 1750 Head   | 21.7                                | 1790                     | 1.383                                 | 39.119                                   | 1.394                               | 40.018                                 | -0.79%         | -2.24%           |
|                                    |             |                                     | 1790                     | 1.326                                 | 40.269                                   | 1.343                               | 40.145                                 | -2.27%         | 0.21%            |
|                                    |             |                                     | 1795                     | 1.329                                 | 40.265                                   | 1.345                               | 40.141                                 | -2.19%         | 0.21%            |
|                                    |             |                                     | 1710                     | 1.332                                 | 40.261                                   | 1.348                               | 40.138                                 | -2.39%         | 0.21%            |
|                                    |             |                                     | 1720                     | 1.337                                 | 40.247                                   | 1.354                               | 40.128                                 | -2.26%         | 0.20%            |
| 8/18/2025                          | 1900 Head   | 23.0                                | 1745                     | 1.381                                 | 40.183                                   | 1.398                               | 40.087                                 | -2.24%         | 0.26%            |
|                                    |             |                                     | 1750                     | 1.384                                 | 40.182                                   | 1.371                               | 40.079                                 | -2.24%         | 0.26%            |
|                                    |             |                                     | 1770                     | 1.367                                 | 40.151                                   | 1.383                               | 40.047                                 | -1.16%         | 0.26%            |
|                                    |             |                                     | 1790                     | 1.379                                 | 40.138                                   | 1.394                               | 40.018                                 | -1.08%         | 0.30%            |
|                                    |             |                                     | 1850                     | 1.414                                 | 39.849                                   | 1.430                               | 40.000                                 | 1.60%          | -1.23%           |
| 8/21/2025                          | 1900 Head   | 21.7                                | 1880                     | 1.420                                 | 39.532                                   | 1.400                               | 40.000                                 | 1.43%          | -1.17%           |
|                                    |             |                                     | 1880                     | 1.432                                 | 39.512                                   | 1.400                               | 40.000                                 | 2.29%          | -1.22%           |
|                                    |             |                                     | 1900                     | 1.446                                 | 39.504                                   | 1.400                               | 40.000                                 | 3.29%          | -1.24%           |
|                                    |             |                                     | 1905                     | 1.450                                 | 39.502                                   | 1.400                               | 40.000                                 | 3.50%          | -1.24%           |
|                                    |             |                                     | 1910                     | 1.452                                 | 39.500                                   | 1.400                               | 40.000                                 | 3.71%          | -1.25%           |
| 8/27/2025                          | 2450 Head   | 21.0                                | 1920                     | 1.457                                 | 39.492                                   | 1.400                               | 40.000                                 | 4.07%          | -1.27%           |
|                                    |             |                                     | 1950                     | 1.452                                 | 40.055                                   | 1.400                               | 40.000                                 | 3.93%          | 0.14%            |
|                                    |             |                                     | 1980                     | 1.420                                 | 40.052                                   | 1.400                               | 40.000                                 | 1.43%          | 0.08%            |
|                                    |             |                                     | 1880                     | 1.433                                 | 39.597                                   | 1.400                               | 40.000                                 | 2.36%          | -0.01%           |
|                                    |             |                                     | 1900                     | 1.446                                 | 39.589                                   | 1.400                               | 40.000                                 | 3.29%          | -0.05%           |
| 8/27/2025                          | 2450 Head   | 24.7                                | 1905                     | 1.450                                 | 39.577                                   | 1.400                               | 40.000                                 | 3.57%          | -0.06%           |
|                                    |             |                                     | 1910                     | 1.452                                 | 39.574                                   | 1.400                               | 40.000                                 | 3.71%          | -0.07%           |
|                                    |             |                                     | 1920                     | 1.458                                 | 39.567                                   | 1.400                               | 40.000                                 | 4.14%          | -0.08%           |
|                                    |             |                                     | 2000                     | 1.703                                 | 40.264                                   | 1.679                               | 39.500                                 | 1.88%          | 0.30%            |
|                                    |             |                                     | 2110                     | 1.710                                 | 40.236                                   | 1.679                               | 39.480                                 | 1.85%          | 1.85%            |
| 8/28/2025                          | 2450 Head   | 21.4                                | 2450                     | 1.815                                 | 40.039                                   | 1.800                               | 39.200                                 | 0.83%          | 2.14%            |
|                                    |             |                                     | 2480                     | 1.836                                 | 39.984                                   | 1.833                               | 39.162                                 | 0.16%          | 2.10%            |
|                                    |             |                                     | 2500                     | 1.852                                 | 39.959                                   | 1.855                               | 39.136                                 | -0.18%         | 2.05%            |
|                                    |             |                                     | 2510                     | 1.860                                 | 39.925                                   | 1.888                               | 39.123                                 | 2.91%          | -2.04%           |
|                                    |             |                                     | 2535                     | 1.882                                 | 39.880                                   | 1.893                               | 39.092                                 | -0.58%         | 2.03%            |
| 8/29/2025                          | 2450 Head   | 21.4                                | 2550                     | 1.902                                 | 39.861                                   | 1.920                               | 39.060                                 | -0.89%         | 2.05%            |
|                                    |             |                                     | 2600                     | 1.936                                 | 39.774                                   | 1.964                               | 39.009                                 | -1.43%         | 1.98%            |
|                                    |             |                                     | 2650                     | 1.980                                 | 39.690                                   | 2.018                               | 39.845                                 | -1.88%         | 1.91%            |
|                                    |             |                                     | 2680                     | 2.002                                 | 39.648                                   | 2.051                               | 39.907                                 | -2.39%         | 1.90%            |
|                                    |             |                                     | 2700                     | 2.015                                 | 39.599                                   | 2.073                               | 39.882                                 | -2.60%         | 1.84%            |
| 8/29/2025                          | 2450 Head   | 24.7                                | 2300                     | 1.681                                 | 39.001                                   | 1.670                               | 39.500                                 | 0.66%          | -1.26%           |
|                                    |             |                                     | 2310                     | 1.692                                 | 39.987                                   | 1.679                               | 39.480                                 | 0.77%          | -1.25%           |
|                                    |             |                                     | 2320                     | 1.704                                 | 39.919                                   | 1.687                               | 39.460                                 | 1.01%          | -1.27%           |
|                                    |             |                                     | 2400                     | 1.766                                 | 39.614                                   | 1.756                               | 39.289                                 | 2.28%          | -1.72%           |
|                                    |             |                                     | 2450                     | 1.807                                 | 39.418                                   | 1.800                               | 39.200                                 | 1.17%          | -1.99%           |
| 8/29/2025                          | 2450 Head   | 21.4                                | 2480                     | 1.891                                 | 39.319                                   | 1.833                               | 39.162                                 | 3.16%          | -2.18%           |
|                                    |             |                                     | 2500                     | 1.911                                 | 39.220                                   | 1.855                               | 39.136                                 | 3.62%          | -2.34%           |
|                                    |             |                                     | 2510                     | 1.921                                 | 39.171                                   | 1.888                               | 39.123                                 | 2.95%          | -2.43%           |
|                                    |             |                                     | 2535                     | 1.950                                 | 39.052                                   | 1.893                               | 39.092                                 | 2.68%          | -2.65%           |
|                                    |             |                                     | 2550                     | 1.971                                 | 37.994                                   | 1.909                               | 39.073                                 | 3.25%          | -2.76%           |
| 8/29/2025                          | 2450 Head   | 24.7                                | 2560                     | 1.984                                 | 37.984                                   | 1.920                               | 39.060                                 | 3.33%          | -2.81%           |
|                                    |             |                                     | 2600                     | 2.029                                 | 37.897                                   | 1.964                               | 39.009                                 | 3.24%          | -3.08%           |
|                                    |             |                                     | 2650                     | 2.084                                 | 37.574                                   | 2.018                               | 39.845                                 | -2.27%         | 2.03%            |
|                                    |             |                                     | 2680                     | 2.124                                 | 37.473                                   | 2.051                               | 39.907                                 | -3.56%         | -3.69%           |
|                                    |             |                                     | 2700                     | 2.146                                 | 37.399                                   | 2.073                               | 39.882                                 | -3.82%         | -3.81%           |
| 8/29/2025                          | 2450 Head   | 21.4                                | 2300                     | 1.711                                 | 37.773                                   | 1.670                               | 39.500                                 | 2.46%          | -4.37%           |
|                                    |             |                                     | 2310                     | 1.719                                 | 37.763                                   | 1.679                               | 39.480                                 | 2.38%          | -4.35%           |
|                                    |             |                                     | 2320                     | 1.726                                 | 37.754                                   | 1.687                               | 39.460                                 | 2.31%          | -4.32%           |
|                                    |             |                                     | 2400                     | 1.784                                 | 37.621                                   | 1.756                               | 39.289                                 | 1.59%          | -4.25%           |
|                                    |             |                                     | 2450                     | 1.822                                 | 37.573                                   | 1.800                               | 39.200                                 | 1.22%          | -4.15%           |
| 8/29/2025                          | 2450 Head   | 21.4                                | 2480                     | 1.843                                 | 37.509                                   | 1.833                               | 39.162                                 | 0.55%          | -4.22%           |
|                                    |             |                                     | 2500                     | 1.860                                 | 37.471                                   | 1.855                               | 39.136                                 | 0.27%          | -4.25%           |
|                                    |             |                                     | 2510                     | 1.869                                 | 37.458                                   | 1.888                               | 39.123                                 | 0.16%          | -4.26%           |
|                                    |             |                                     | 2535                     | 1.889                                 | 37.438                                   | 1.893                               | 39.092                                 | -0.16%         | -4.23%           |
|                                    |             |                                     | 2550                     | 1.901                                 | 37.425                                   | 1.909                               | 39.073                                 | -0.42%         | -4.22%           |
| 8/29/2025                          | 2450 Head   | 24.7                                | 2560                     | 1.936                                 | 37.417                                   | 1.920                               | 39.060                                 | -0.63%         | -4.22%           |
|                                    |             |                                     | 2600                     | 1.941                                 | 37.315                                   | 1.964                               | 39.009                                 | -1.37%         | -4.35%           |
|                                    |             |                                     | 2650                     | 1.986                                 | 37.242                                   | 2.018                               | 39.845                                 | -1.89%         | -4.37%           |
|                                    |             |                                     | 2680                     | 2.008                                 | 37.188                                   | 2.051                               | 39.907                                 | -2.10%         | -4.40%           |
|                                    |             |                                     | 2700                     | 2.024                                 | 37.140                                   | 2.073                               | 39.882                                 | -2.36%         | -4.48%           |
| 8/29/2025                          | 2450 Head   | 21.4                                | 2300                     | 1.678                                 | 39.529                                   | 1.670                               | 39.500                                 | 0.48%          | 0.07%            |
|                                    |             |                                     | 2310                     | 1.690                                 | 39.488                                   | 1.679                               | 39.480                                 | 0.66%          | 0.04%            |
|                                    |             |                                     | 2320                     | 1.701                                 | 39.462                                   | 1.687                               | 39.460                                 | 0.83%          | 0.01%            |
|                                    |             |                                     | 2400                     | 1.763                                 | 39.156                                   | 1.756                               | 39.289                                 | 2.11%          | -0.34%           |
|                                    |             |                                     | 2450                     | 1.802                                 | 39.069                                   | 1.800                               | 39.200                                 | 2.94%          | -0.59%           |
| 8/29/2025                          | 2450 Head   | 21.4                                | 2480                     | 1.897                                 | 38.818                                   | 1.833                               | 39.162                                 | 2.95%          | -0.83%           |
|                                    |             |                                     | 2500                     | 1.909                                 | 38.749                                   | 1.855                               | 39.136                                 | 2.91%          | -0.99%           |
|                                    |             |                                     | 2510                     | 1.921                                 | 38.710                                   | 1.888                               | 39.123                                 | 2.95%          | -1.06%           |
|                                    |             |                                     | 2535                     | 1.951                                 | 38.615                                   | 1.893                               | 39.092                                 | 2.64%          | -1.22%           |
|                                    |             |                                     | 2550                     | 1.970                                 | 38.563                                   | 1.909                               | 39.073                                 | 3.20%          | -1.31%           |
| 8/29/2025                          | 2450 Head   | 24.7                                | 2560                     | 1.982                                 | 38.526                                   | 1.920                               | 39.060                                 | 2.23%          | -1.37%           |
|                                    |             |                                     | 2600                     | 2.027                                 | 38.446                                   | 1.964                               | 39.009                                 | 3.00%          | -2.17%           |
|                                    |             |                                     | 2650                     | 2.080                                 | 38.147                                   | 2.018                               | 39.845                                 | -3.37%         | -2.05%           |
|                                    |             |                                     | 2680                     | 2.121                                 | 38.037                                   | 2.051                               | 39.907                                 | -3.87%         | -2.41%           |
|                                    |             |                                     | 2700                     | 2.143                                 | 37.948                                   | 2.073                               | 39.882                                 | -3.98%         | -2.40%           |
| 8/29/2025                          | 2450 Head   | 21.4                                | 2300                     | 1.657                                 | 40.305                                   | 1.670                               | 39.500                                 | -2.76%         | 2.04%            |
|                                    |             |                                     | 2310                     | 1.666                                 | 40.297                                   | 1.679                               | 39.480                                 | -0.77%         | 2.07%            |
|                                    |             |                                     | 2320                     | 1.674                                 | 40.289                                   | 1.687                               | 39.460                                 | -0.77%         | 2.10%            |
|                                    |             |                                     | 2400                     | 1.735                                 | 40.148                                   | 1.756                               | 39.289                                 | 2.20%          | 2.19%            |
|                                    |             |                                     | 2450                     | 1.774                                 | 40.087                                   | 1.800                               | 39.200                                 | -1.44%         | 2.26%            |
| 8/29/2025                          | 2450 Head   | 24.7                                | 2480                     | 1.796                                 | 40.018                                   | 1.833                               | 39.162                                 | -2.02%         | 2.19%            |
|                                    |             |                                     | 2500                     | 1.814                                 | 39.977                                   | 1.855                               | 39.136                                 | -2.21%         | 2.15%            |
|                                    |             |                                     | 2510                     | 1.823                                 | 39.961                                   | 1.888                               | 39.123                                 | -2.39%         | 2.14%            |
|                                    |             |                                     | 2535                     | 1.843                                 | 39.928                                   | 1.893                               | 39.092                                 | -2.64%         | 2.14%            |
|                                    |             |                                     | 2550                     | 1.855                                 | 39.911                                   | 1.909                               | 39.073                                 | -2.83%         | 2.14%            |
| 8/29/2025                          | 2450 Head   | 21.4                                | 2560                     | 1.882                                 | 39.867                                   | 1.920                               | 39.060                                 | -2.02%         | 2.14%            |
|                                    |             |                                     | 2600                     | 1.884                                 | 39.811                                   | 1.964                               | 39.009                                 | -3.56%         | 2.08%            |
|                                    |             |                                     | 2650                     | 1.937                                 | 39.737                                   | 2.018                               | 39.845                                 | -4.01%         | 2.03%            |
|                                    |             |                                     | 2680                     | 1.968                                 | 39.685                                   | 2.051                               | 39.907                                 | -4.53%         | 2.02%            |
|                                    |             |                                     | 2700                     | 1.975                                 | 39.649                                   | 2.073                               | 39.882                                 | -4.68%         | 2.01%            |

|            |           |      |      |       |        |       |        |        |        |
|------------|-----------|------|------|-------|--------|-------|--------|--------|--------|
| 09/02/2025 | 2450 Head | 23.0 | 2300 | 1.675 | 41.199 | 1.670 | 39.500 | 0.30%  | 4.30%  |
|            |           |      | 2310 | 1.682 | 41.183 | 1.679 | 39.480 | 0.18%  | 4.31%  |
|            |           |      | 2320 | 1.689 | 41.166 | 1.687 | 39.460 | 0.12%  | 4.32%  |
|            |           |      | 2400 | 1.748 | 41.052 | 1.755 | 39.289 | -0.57% | 4.49%  |
|            |           |      | 2450 | 1.784 | 40.981 | 1.800 | 39.200 | -0.89% | 4.54%  |
|            |           |      | 2480 | 1.805 | 40.951 | 1.833 | 39.152 | -1.47% | 4.57%  |
|            |           |      | 2500 | 1.819 | 40.920 | 1.855 | 39.136 | -1.94% | 4.56%  |
|            |           |      | 2510 | 1.826 | 40.901 | 1.866 | 39.123 | -2.14% | 4.54%  |
|            |           |      | 2535 | 1.845 | 40.853 | 1.893 | 39.092 | -2.54% | 4.50%  |
|            |           |      | 2550 | 1.859 | 40.834 | 1.909 | 39.073 | -2.62% | 4.51%  |
|            |           |      | 2560 | 1.868 | 40.827 | 1.920 | 39.060 | -2.71% | 4.52%  |
|            |           |      | 2600 | 1.898 | 40.781 | 1.964 | 39.009 | -3.36% | 4.54%  |
|            |           |      | 2650 | 1.936 | 40.682 | 2.018 | 38.945 | -4.06% | 4.46%  |
|            |           |      | 2680 | 1.963 | 40.662 | 2.051 | 38.907 | -4.29% | 4.51%  |
|            |           |      | 2700 | 1.979 | 40.635 | 2.073 | 38.882 | -4.53% | 4.51%  |
|            |           |      | 3300 | 2.631 | 38.167 | 2.708 | 38.157 | -2.84% | 0.03%  |
|            |           |      | 3350 | 2.675 | 38.059 | 2.759 | 38.100 | -3.04% | -0.11% |
|            |           |      | 3450 | 2.761 | 37.861 | 2.861 | 37.986 | -3.50% | -0.33% |
|            |           |      | 3500 | 2.802 | 37.747 | 2.913 | 37.929 | -3.81% | -0.48% |
|            |           |      | 3550 | 2.847 | 37.650 | 2.964 | 37.871 | -3.95% | -0.58% |
| 8/15/2025  | 3600 Head | 19.8 | 3560 | 2.856 | 37.633 | 2.974 | 37.860 | -3.97% | -0.60% |
|            |           |      | 3600 | 2.895 | 37.537 | 3.015 | 37.814 | -3.98% | -0.73% |
|            |           |      | 3650 | 2.942 | 37.444 | 3.066 | 37.757 | -4.04% | -0.83% |
|            |           |      | 3690 | 2.983 | 37.358 | 3.107 | 37.711 | -3.99% | -0.94% |
|            |           |      | 3700 | 2.992 | 37.339 | 3.117 | 37.700 | -4.01% | -0.97% |
|            |           |      | 3750 | 3.043 | 37.252 | 3.169 | 37.643 | -3.98% | -1.04% |
|            |           |      | 3900 | 3.208 | 36.984 | 3.323 | 37.471 | -3.46% | -1.30% |
|            |           |      | 3930 | 3.241 | 36.948 | 3.353 | 37.437 | -3.34% | -1.31% |
|            |           |      | 4100 | 3.421 | 36.710 | 3.528 | 37.243 | -3.03% | -1.43% |
|            |           |      | 4150 | 3.477 | 36.632 | 3.579 | 37.186 | -2.85% | -1.49% |
|            |           |      | 3300 | 2.614 | 38.003 | 2.708 | 38.157 | -3.47% | -0.40% |
|            |           |      | 3350 | 2.654 | 37.901 | 2.759 | 38.100 | -3.61% | -0.52% |
|            |           |      | 3450 | 2.744 | 37.706 | 2.861 | 37.986 | -4.09% | -0.73% |
|            |           |      | 3500 | 2.792 | 37.596 | 2.913 | 37.929 | -4.15% | -0.88% |
|            |           |      | 3550 | 2.837 | 37.533 | 2.964 | 37.871 | -4.28% | -0.89% |
|            |           |      | 3560 | 2.845 | 37.510 | 2.974 | 37.860 | -4.34% | -0.92% |
|            |           |      | 3600 | 2.885 | 37.422 | 3.015 | 37.814 | -4.31% | -1.04% |
|            |           |      | 3650 | 2.931 | 37.336 | 3.066 | 37.757 | -4.49% | -1.06% |
|            |           |      | 3690 | 2.969 | 37.273 | 3.107 | 37.711 | -4.44% | -1.16% |
| 8/19/2025  | 3600 Head | 20.6 | 3700 | 2.980 | 37.257 | 3.117 | 37.700 | -4.40% | -1.18% |
|            |           |      | 3750 | 3.027 | 37.189 | 3.169 | 37.643 | -4.48% | -1.21% |
|            |           |      | 3900 | 3.173 | 36.920 | 3.323 | 37.471 | -4.51% | -1.47% |
|            |           |      | 3930 | 3.204 | 36.889 | 3.353 | 37.437 | -4.44% | -1.52% |
|            |           |      | 4100 | 3.375 | 36.690 | 3.528 | 37.243 | -4.31% | -1.70% |
|            |           |      | 4150 | 3.430 | 36.607 | 3.579 | 37.186 | -4.16% | -1.85% |
|            |           |      | 3300 | 2.600 | 38.480 | 2.708 | 38.157 | -3.99% | 0.85%  |
|            |           |      | 3350 | 2.647 | 38.355 | 2.759 | 38.100 | -4.06% | 0.67%  |
|            |           |      | 3450 | 2.739 | 38.171 | 2.861 | 37.986 | -4.26% | 0.49%  |
|            |           |      | 3500 | 2.786 | 38.080 | 2.913 | 37.929 | -4.36% | 0.40%  |
|            |           |      | 3550 | 2.832 | 37.986 | 2.964 | 37.871 | -4.45% | 0.30%  |
|            |           |      | 3560 | 2.842 | 37.962 | 2.974 | 37.860 | -4.44% | 0.27%  |
|            |           |      | 3600 | 2.885 | 37.886 | 3.015 | 37.814 | -4.31% | 0.19%  |
|            |           |      | 3650 | 2.930 | 37.823 | 3.066 | 37.757 | -4.44% | 0.17%  |
|            |           |      | 3690 | 2.971 | 37.728 | 3.107 | 37.711 | -4.38% | 0.05%  |
|            |           |      | 3700 | 2.980 | 37.715 | 3.117 | 37.700 | -4.49% | 0.04%  |
|            |           |      | 3750 | 3.025 | 37.638 | 3.169 | 37.643 | -4.45% | -0.01% |
|            |           |      | 3900 | 3.188 | 37.364 | 3.323 | 37.471 | -4.06% | -0.29% |
|            |           |      | 3930 | 3.216 | 37.313 | 3.353 | 37.437 | -4.09% | -0.33% |
| 8/25/2025  | 3600 Head | 19.3 | 4100 | 3.400 | 36.996 | 3.528 | 37.243 | -3.63% | -0.66% |
|            |           |      | 4150 | 3.455 | 36.926 | 3.579 | 37.186 | -3.46% | -0.70% |
|            |           |      | 4350 | 3.677 | 36.546 | 3.781 | 36.943 | -2.75% | -1.07% |
|            |           |      | 4400 | 3.727 | 36.451 | 3.833 | 36.886 | -2.77% | -1.18% |
|            |           |      | 4450 | 3.787 | 36.339 | 3.884 | 36.829 | -2.50% | -1.33% |
|            |           |      | 4500 | 3.845 | 36.259 | 3.936 | 36.771 | -2.31% | -1.39% |
|            |           |      | 4550 | 3.902 | 36.143 | 3.987 | 36.714 | -2.13% | -1.56% |
|            |           |      | 4600 | 3.959 | 36.050 | 4.039 | 36.657 | -1.98% | -1.66% |
|            |           |      | 4650 | 4.013 | 35.925 | 4.090 | 36.600 | -1.86% | -1.84% |
|            |           |      | 4700 | 4.072 | 35.828 | 4.141 | 36.543 | -1.67% | -1.96% |
|            |           |      | 4750 | 4.128 | 35.726 | 4.193 | 36.486 | -1.55% | -2.08% |
|            |           |      | 4800 | 4.186 | 35.618 | 4.244 | 36.429 | -1.37% | -2.23% |
|            |           |      | 4850 | 4.242 | 35.522 | 4.296 | 36.371 | -1.26% | -2.33% |
|            |           |      | 4900 | 4.301 | 35.398 | 4.347 | 36.314 | -1.08% | -2.52% |
|            |           |      | 4950 | 4.357 | 35.294 | 4.399 | 36.257 | -0.95% | -2.66% |
|            |           |      | 5000 | 4.416 | 35.206 | 4.450 | 36.200 | -0.76% | -2.75% |
|            |           |      | 3300 | 2.630 | 39.538 | 2.708 | 38.157 | -2.88% | 3.62%  |
|            |           |      | 3350 | 2.679 | 39.516 | 2.759 | 38.100 | -2.90% | 3.72%  |
|            |           |      | 3450 | 2.768 | 39.328 | 2.861 | 37.986 | -3.25% | 3.53%  |
| 8/28/2025  | 3600 Head | 19.0 | 3500 | 2.802 | 39.159 | 2.913 | 37.929 | -3.81% | 3.24%  |
|            |           |      | 3550 | 2.861 | 39.081 | 2.964 | 37.871 | -3.48% | 3.20%  |
|            |           |      | 3560 | 2.868 | 39.071 | 2.974 | 37.860 | -3.56% | 3.20%  |
|            |           |      | 3600 | 2.902 | 38.964 | 3.015 | 37.814 | -3.75% | 3.04%  |
|            |           |      | 3650 | 2.959 | 38.889 | 3.066 | 37.757 | -3.49% | 3.00%  |
|            |           |      | 3690 | 2.988 | 38.818 | 3.107 | 37.711 | -3.63% | 2.84%  |
|            |           |      | 3700 | 2.999 | 38.785 | 3.117 | 37.700 | -3.79% | 2.88%  |
|            |           |      | 3750 | 3.067 | 38.685 | 3.169 | 37.643 | -3.22% | 2.77%  |
|            |           |      | 3900 | 3.220 | 38.499 | 3.323 | 37.471 | -2.86% | 2.74%  |
|            |           |      | 3930 | 3.274 | 38.434 | 3.353 | 37.437 | -2.36% | 2.66%  |
|            |           |      | 4100 | 3.469 | 38.291 | 3.528 | 37.243 | -1.67% | 2.81%  |
|            |           |      | 4150 | 3.533 | 38.126 | 3.579 | 37.186 | -1.29% | 2.53%  |
|            |           |      | 4350 | 3.749 | 37.834 | 3.781 | 36.943 | -0.65% | 2.41%  |
|            |           |      | 4400 | 3.824 | 37.751 | 3.833 | 36.886 | -0.23% | 2.35%  |
|            |           |      | 4450 | 3.840 | 37.655 | 3.884 | 36.829 | -1.13% | 2.24%  |
|            |           |      | 4500 | 3.900 | 37.465 | 3.936 | 36.771 | -0.69% | 1.89%  |
|            |           |      | 4550 | 3.954 | 37.404 | 3.987 | 36.714 | -0.83% | 1.88%  |
|            |           |      | 4600 | 4.010 | 37.223 | 4.039 | 36.657 | -0.72% | 1.95%  |
|            |           |      | 4650 | 4.054 | 37.154 | 4.090 | 36.600 | -0.68% | 1.51%  |
|            |           |      | 4700 | 4.120 | 36.967 | 4.141 | 36.543 | -0.51% | 1.16%  |
| 8/28/2025  | 3600 Head | 19.0 | 4750 | 4.188 | 36.900 | 4.193 | 36.486 | -0.12% | 1.13%  |
|            |           |      | 4800 | 4.252 | 36.757 | 4.244 | 36.429 | 0.19%  | 0.90%  |
|            |           |      | 4850 | 4.308 | 36.706 | 4.296 | 36.371 | 0.28%  | 0.82%  |
|            |           |      | 4900 | 4.375 | 36.550 | 4.347 | 36.314 | 0.64%  | 0.65%  |
|            |           |      | 4950 | 4.465 | 36.498 | 4.399 | 36.257 | 1.50%  | 0.66%  |
|            |           |      | 5000 | 4.511 | 36.403 | 4.450 | 36.200 | 1.37%  | 0.56%  |

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.

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
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9.2 Test System Verification

Prior to SAR assessment, the system is verified to  $\pm 10\%$  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 C.

Table 9-2  
System Verification Results – 1g

| System Verification<br>TARGET & MEASURED |                        |             |            |                |                  |                 |           |          |      |                        |                         |                             |                  |
|------------------------------------------|------------------------|-------------|------------|----------------|------------------|-----------------|-----------|----------|------|------------------------|-------------------------|-----------------------------|------------------|
| SAR System                               | Tissue Frequency (MHz) | Tissue Type | Date       | Amb. Temp. (C) | Liquid Temp. (C) | Input Power (W) | Source SN | Probe SN | DAE  | Measured SAR 1g (W/kg) | 1W Target SAR 1g (W/kg) | 1W Normalized SAR 1g (W/kg) | Deviation 1g (%) |
| AM4                                      | 835                    | HEAD        | 08/12/2025 | 23.5           | 22.1             | 0.20            | 4d040     | 7360     | 534  | 1.950                  | 9.590                   | 9.750                       | 1.67%            |
| AM4                                      | 835                    | HEAD        | 08/21/2025 | 23.0           | 21.7             | 0.20            | 4d040     | 7360     | 534  | 2.020                  | 9.590                   | 10.100                      | 5.32%            |
| AM4                                      | 1750                   | HEAD        | 08/12/2025 | 23.5           | 22.1             | 0.10            | 1104      | 7360     | 534  | 3.730                  | 35.600                  | 37.300                      | 4.78%            |
| AM3                                      | 1750                   | HEAD        | 08/21/2025 | 24.0           | 23.3             | 0.10            | 1104      | 7552     | 1676 | 3.680                  | 35.600                  | 36.800                      | 3.37%            |
| AM3                                      | 1900                   | HEAD        | 08/18/2025 | 23.5           | 23.2             | 0.10            | 5d030     | 7552     | 1676 | 4.170                  | 39.600                  | 41.700                      | 5.30%            |
| AM4                                      | 1900                   | HEAD        | 08/21/2025 | 23.0           | 21.7             | 0.10            | 5d131     | 7360     | 534  | 4.170                  | 39.800                  | 41.700                      | 4.77%            |
| AM1                                      | 2600                   | HEAD        | 08/27/2025 | 21.5           | 21.0             | 0.10            | 1042      | 7357     | 1582 | 5.300                  | 54.900                  | 53.000                      | -3.46%           |
| AM14                                     | 2600                   | HEAD        | 08/27/2025 | 21.6           | 22.7             | 0.10            | 1068      | 3746     | 1237 | 6.020                  | 56.500                  | 60.200                      | 6.55%            |
| AM12                                     | 2600                   | HEAD        | 08/28/2025 | 20.8           | 21.1             | 0.10            | 1068      | 7427     | 1408 | 5.480                  | 56.500                  | 54.800                      | -3.01%           |
| AM16                                     | 2600                   | HEAD        | 08/29/2025 | 22.5           | 23.6             | 0.10            | 1068      | 7532     | 501  | 5.660                  | 56.500                  | 56.600                      | 0.18%            |
| AM4                                      | 2600                   | HEAD        | 08/29/2025 | 20.0           | 19.1             | 0.10            | 1042      | 7360     | 534  | 5.650                  | 54.900                  | 56.500                      | 2.91%            |
| AM3                                      | 2600                   | HEAD        | 09/02/2025 | 22.5           | 21.6             | 0.10            | 1068      | 7552     | 1676 | 5.550                  | 56.500                  | 55.500                      | -1.77%           |
| AM4                                      | 3500                   | HEAD        | 08/15/2025 | 23.0           | 21.6             | 0.10            | 1126      | 7360     | 534  | 6.760                  | 66.200                  | 67.600                      | 2.11%            |
| AM4                                      | 3500                   | HEAD        | 08/19/2025 | 22.1           | 20.5             | 0.10            | 1126      | 7360     | 534  | 6.890                  | 66.200                  | 68.900                      | 4.08%            |
| AM6                                      | 3500                   | HEAD        | 08/25/2025 | 19.5           | 19.0             | 0.10            | 1126      | 7682     | 1683 | 6.950                  | 66.200                  | 69.500                      | 4.98%            |
| AM6                                      | 3500                   | HEAD        | 08/28/2025 | 20.8           | 20.0             | 0.10            | 1126      | 7682     | 1683 | 6.790                  | 66.200                  | 67.900                      | 2.57%            |
| AM4                                      | 3700                   | HEAD        | 08/15/2025 | 23.0           | 21.6             | 0.10            | 1002      | 7360     | 534  | 6.870                  | 67.900                  | 68.700                      | 1.18%            |
| AM4                                      | 3700                   | HEAD        | 08/19/2025 | 22.1           | 20.5             | 0.10            | 1002      | 7360     | 534  | 6.810                  | 67.900                  | 68.100                      | 0.29%            |

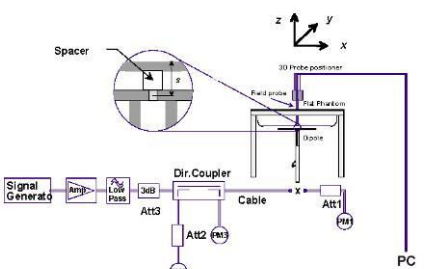


Figure 9-1  
System Verification Setup Diagram



Figure 9-2  
System Verification Setup Photo

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
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## 10 SAR TEST RESULTS

### 10.1 SAR Measurement Results for Test Case 1: Time-varying TX power transmission

In this scenario, the TAS algorithm is tested under more dynamic power test sequences. Test sequences A, B, and pseudo-random are tabulated in Appendix E. All the test cases for this scenario are relegated in Table 7-2, and the test procedure follows section 4.8.2. The following sections will demonstrate case-by-case to show how the TAS algorithm behaves for each RAT.

The test case for 3G WCDMA are conducted under WCDMA Band 5, the test cases for 4G LTE are conducted under LTE bands B66 and B48, and the test cases for 5G NR are conducted under NR bands n25 and n48. The corresponding detailed test procedure is described in section 4.1.2. For the figure set of each case, the first figure demonstrates the DUT's instantaneous conducted TX power, the time-averaged conducted TX power behavior over time, the  $P_{limit}$ , and  $P_{max}$ . The second figure illustrates the corresponding time-averaged SAR over time converted from the TX time-averaged power by using equation 2a in section 4.1. For all test cases, the time-averaged SAR does not exceed the FCC limit.

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
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• WCDMA Band 5 results for Test Sequence B

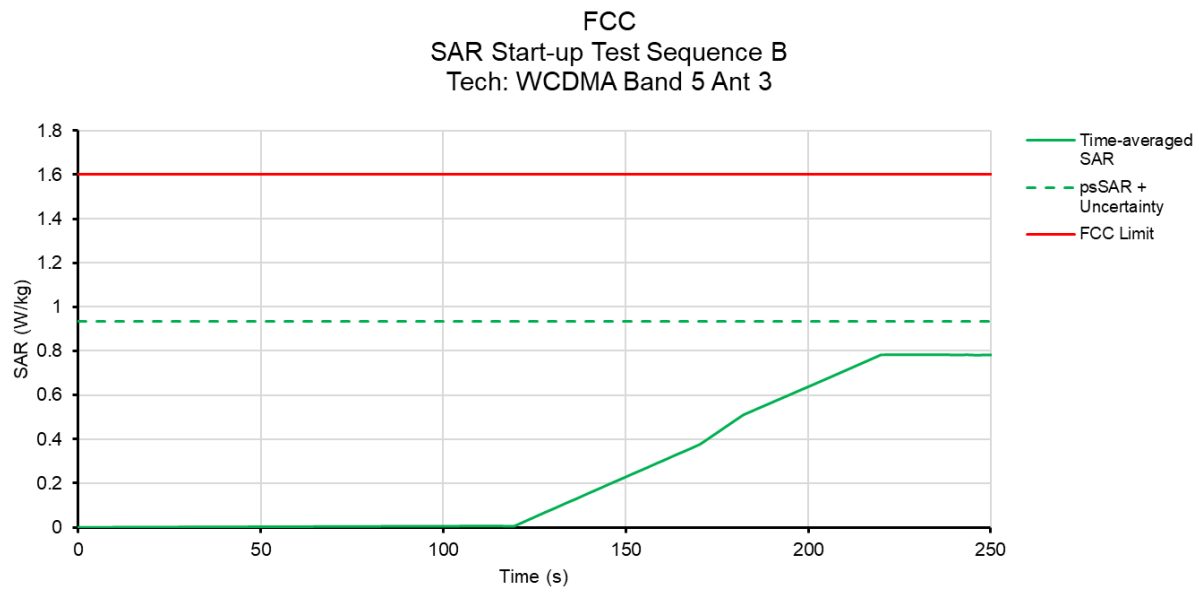


Figure 10-1: Time-averaged SAR for Change in Requested Power case (WCDMA Band 5 – Test Sequence B)

|                                                                                                     |            |
|-----------------------------------------------------------------------------------------------------|------------|
| FCC 1gSAR limit                                                                                     | 1.60 W/kg  |
| psSAR (including all applicable tolerances and uncertainties)                                       | 0.934 W/kg |
| Max TAS[n] 100s Time-Averaged 1gSAR                                                                 | 0.783 W/kg |
| Validation: TAS[n] ≤ reported psSAR for all n, that is for every time step associated with the test |            |

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
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• LTE Band 66 results for Test Sequence A

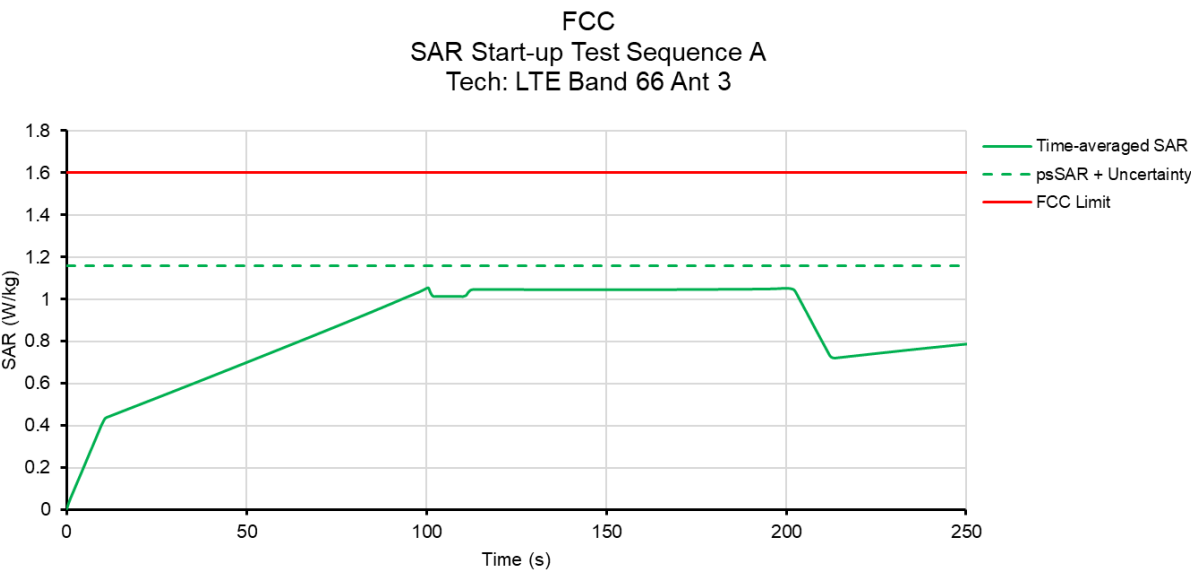


Figure 10-2: Time-averaged SAR for Change in Requested Power case (LTE Band 66 – Test Sequence A)

|                                                                                                     |           |
|-----------------------------------------------------------------------------------------------------|-----------|
| FCC 1gSAR limit                                                                                     | 1.60 W/kg |
| psSAR (including all applicable tolerances and uncertainties)                                       | 1.16 W/kg |
| Max TAS[n] 100s Time-Averaged 1gSAR                                                                 | 1.06 W/kg |
| Validation: TAS[n] ≤ reported psSAR for all n, that is for every time step associated with the test |           |

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
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• LTE Band 66 results for Test Sequence B

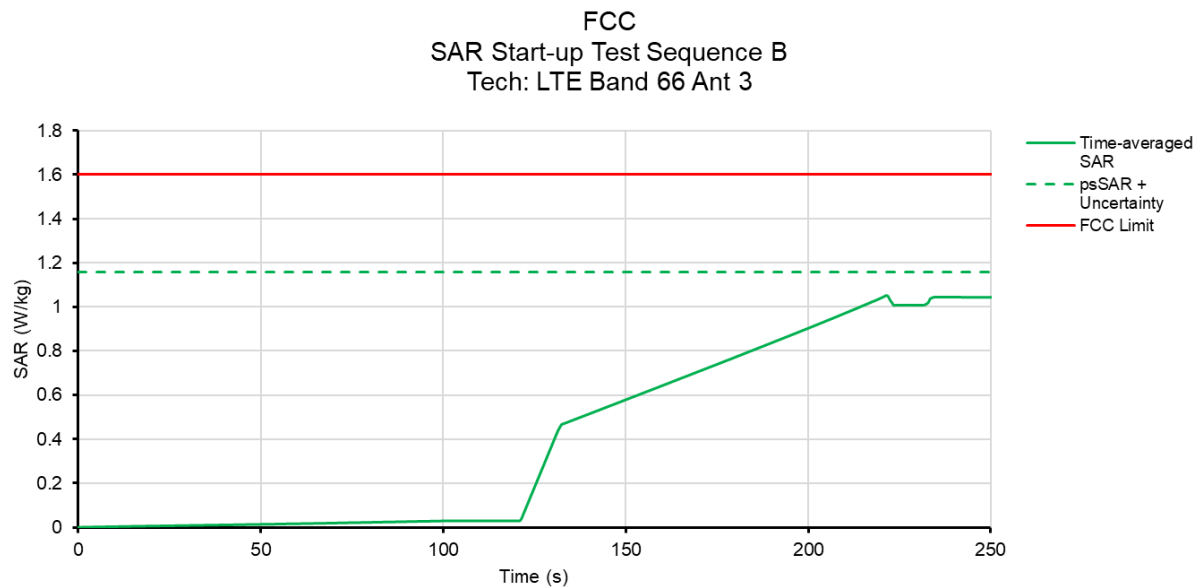


Figure 10-3: Time-averaged SAR for Change in Requested Power case (LTE Band 66 – Test Sequence B)

|                                                                                                     |           |
|-----------------------------------------------------------------------------------------------------|-----------|
| FCC 1gSAR limit                                                                                     | 1.60 W/kg |
| psSAR (including all applicable tolerances and uncertainties)                                       | 1.16 W/kg |
| Max TAS[n] 100s Time-Averaged 1gSAR                                                                 | 1.05 W/kg |
| Validation: TAS[n] ≤ reported psSAR for all n, that is for every time step associated with the test |           |

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
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• LTE Band 66 results for Pseudo-Random Test Sequence

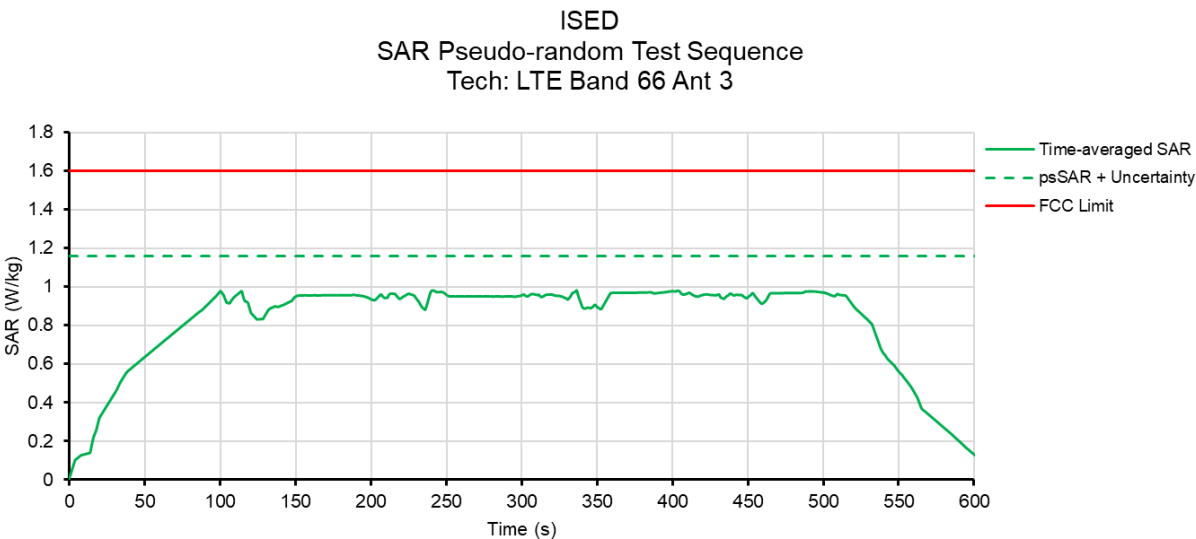


Figure 10-4: Time-averaged SAR for Change in Requested Power case (LTE Band 66 – Pseudo-Random Test Sequence)

|                                                                                                     |            |
|-----------------------------------------------------------------------------------------------------|------------|
| FCC 1gSAR limit                                                                                     | 1.60 W/kg  |
| psSAR (including all applicable tolerances and uncertainties)                                       | 1.16 W/kg  |
| Max TAS[n] 100s Time-Averaged 1gSAR                                                                 | 0.980 W/kg |
| Validation: TAS[n] ≤ reported psSAR for all n, that is for every time step associated with the test |            |

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 59 of 72                     |

• LTE Band 48 results for Test Sequence B

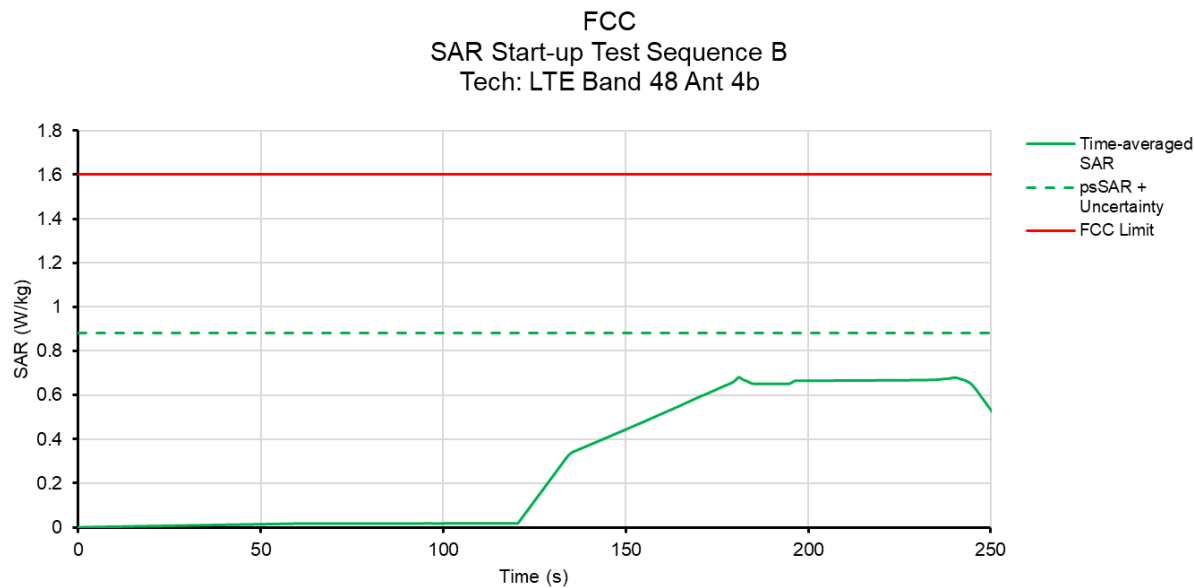


Figure 10-5: Time-averaged SAR for Change in Requested Power case (LTE Band 48 – Test Sequence B)

|                                                                                                     |            |
|-----------------------------------------------------------------------------------------------------|------------|
| FCC 1gSAR limit                                                                                     | 1.60 W/kg  |
| psSAR (including all applicable tolerances and uncertainties)                                       | 0.882 W/kg |
| Max TAS[n] 100s Time-Averaged 1gSAR                                                                 | 0.679 W/kg |
| Validation: TAS[n] ≤ reported psSAR for all n, that is for every time step associated with the test |            |

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 60 of 72                     |

• NR n25 SA results for Test Sequence B

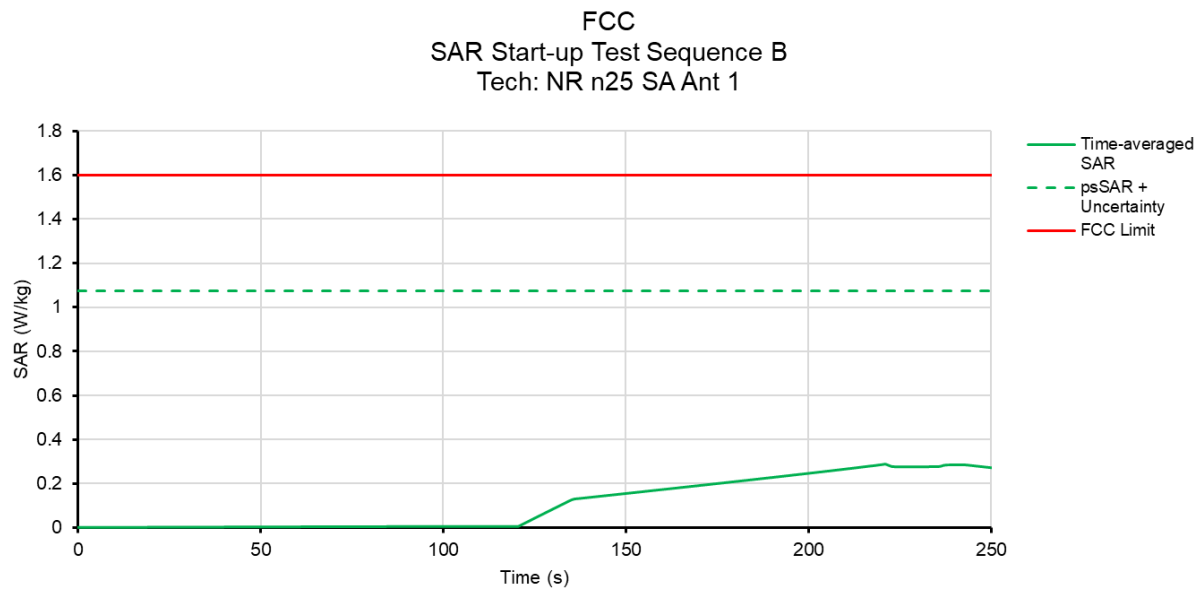


Figure 10-6: Time-averaged SAR for Change in Requested Power case (NR n25 SA – Test Sequence B)

|                                                                                                     |            |
|-----------------------------------------------------------------------------------------------------|------------|
| FCC 1gSAR limit                                                                                     | 1.60 W/kg  |
| psSAR (including all applicable tolerances and uncertainties)                                       | 1.07 W/kg  |
| Max TAS[n] 100s Time-Averaged 1gSAR                                                                 | 0.290 W/kg |
| Validation: TAS[n] ≤ reported psSAR for all n, that is for every time step associated with the test |            |

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 61 of 72                     |

• NR n48 SA results for Test Sequence B

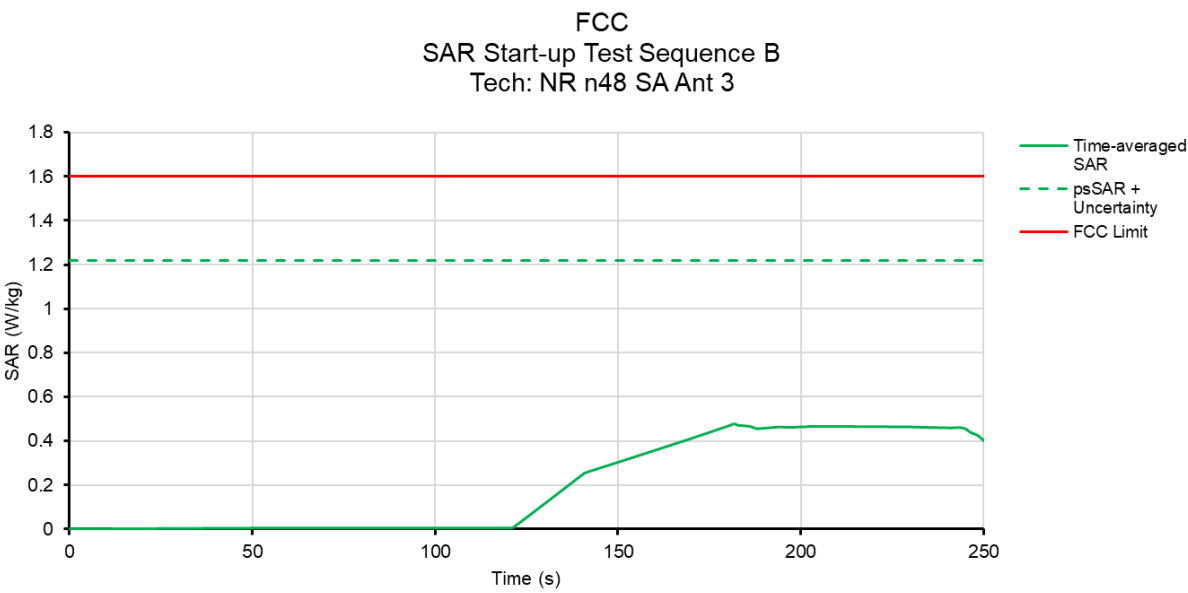


Figure 10-7: Time-averaged SAR for Change in Requested Power case (NR n48 SA – Test Sequence B)

|                                                                                                     |            |
|-----------------------------------------------------------------------------------------------------|------------|
| FCC 1gSAR limit                                                                                     | 1.60 W/kg  |
| psSAR (including all applicable tolerances and uncertainties)                                       | 1.22 W/kg  |
| Max TAS[n] 100s Time-Averaged 1gSAR                                                                 | 0.476 W/kg |
| Validation: TAS[n] ≤ reported psSAR for all n, that is for every time step associated with the test |            |

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 62 of 72                     |

## 11 LINEARITY VALIDATION

### 11.1 Measurement Results for Linearity Validation: Time-varying TX power transmission via Single Point SAR Measurements

To validate linearity, point SAR measurements are performed with TAS operation turned off. Per antenna, the mode with the largest difference between  $P_{\text{limit}}$  and  $P_{\text{max}}$  will be selected for measurement. When possible, different frequency bands will be assessed per antenna.

Point SAR measurements are performed in 2dB step intervals from  $P_{\text{max}}$  to  $P_{\text{limit}}$  minus 4dB.

Linearity is sufficiently validated when the SAR versus requested power is within the defined device parameters.

Note: The upper and lower bounds (dash lines) correspond to the conducted power tolerance +0.7dB to -1.0dB.

**Table 11-1**  
**Linearity Validation Configurations**

| <b>Linearity Validation</b> |                                       |                                  |                                    |                                                            |
|-----------------------------|---------------------------------------|----------------------------------|------------------------------------|------------------------------------------------------------|
| <b>Antenna</b>              | <b>Band</b>                           | <b>P<sub>max</sub><br/>[dBm]</b> | <b>P<sub>limit</sub><br/>[dBm]</b> | <b>P<sub>max</sub> - P<sub>limit</sub> delta<br/>[dBm]</b> |
| 1                           | NR Band n41 - [Ch. 518598]            | 28.00                            | 16.00                              | 12.00                                                      |
| 2b                          | NR Band n41 - [Ch. 518598]            | 28.00                            | 18.70                              | 9.30                                                       |
| 3                           | NR Band n41 - [Ch. 518598]            | 27.50                            | 15.90                              | 11.60                                                      |
| 4b                          | NR Band n77 Subrange 1 - [Ch. 633334] | 26.00                            | 15.20                              | 10.80                                                      |

|                                                    |                                            |                                          |
|----------------------------------------------------|--------------------------------------------|------------------------------------------|
| <b>FCC ID:</b> BCGA3358                            | <b>TIME-AVERAGED SAR VALIDATION REPORT</b> | <b>Approved by:</b><br>Technical Manager |
| <b>Document S/N:</b><br>1C2504170039-04.BCG (Rev1) | <b>DUT Type:</b><br>Tablet Device          | Page 63 of 72                            |

Table 11-2  
NR Band n41 Ant 1 Linearity Validation Results

| Ant 1: NR Band n41 - [Ch. 518598] |            |                          |                     |                       |
|-----------------------------------|------------|--------------------------|---------------------|-----------------------|
| Nominal Power (dBm)               | Power (mW) | Time-Averaged SAR (W/kg) | Lower Bound (-1 dB) | Upper Bound (+0.7 dB) |
| 28.00                             | 630.96     | 14.30                    | 10.79               | 15.96                 |
| 26.00                             | 398.11     | 9.25                     | 6.81                | 10.07                 |
| 24.00                             | 251.19     | 6.17                     | 4.29                | 6.34                  |
| 22.00                             | 158.49     | 3.85                     | 2.71                | 4.01                  |
| 20.00                             | 100.00     | 2.32                     | 1.71                | 2.53                  |
| 18.00                             | 63.10      | 1.51                     | 1.08                | 1.60                  |
| 16.00                             | 39.81      | 0.87                     | 0.68                | 1.01                  |
| 14.00                             | 25.12      | 0.58                     | 0.43                | 0.63                  |
| 12.00                             | 15.85      | 0.38                     | 0.27                | 0.40                  |

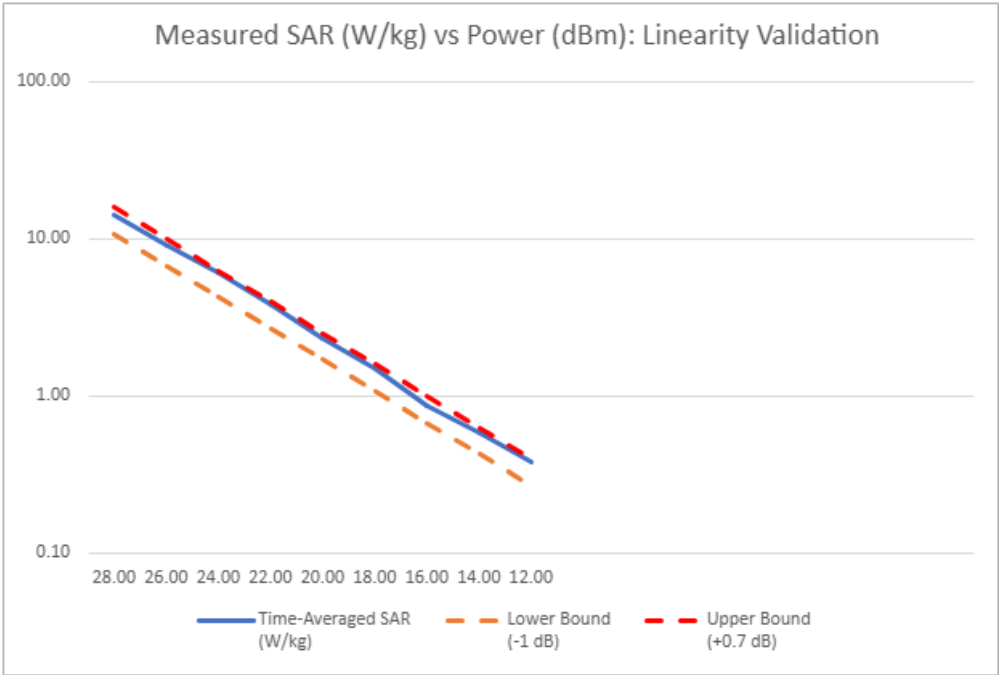
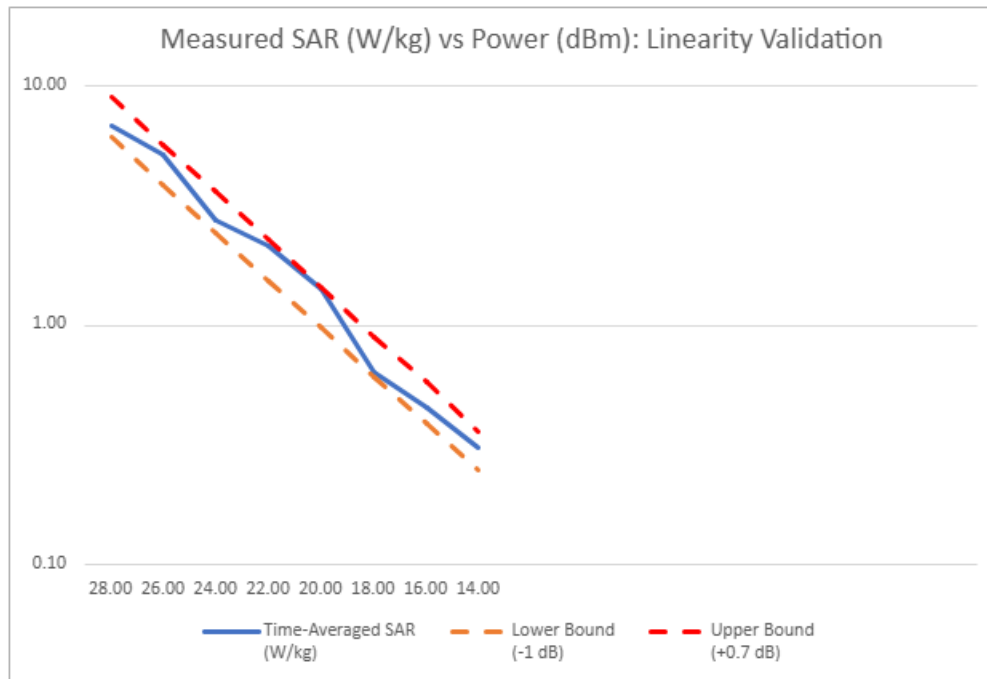


Figure 11-1  
NR Band n41 Ant 1 Linearity Validation Results

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 64 of 72                     |

**Table 11-3**  
**NR Band n41 Ant 2b Linearity Validation Results**

| Ant 2b: NR Band n41 - [Ch. 518598] |            |                          |                     |                       |
|------------------------------------|------------|--------------------------|---------------------|-----------------------|
| Nominal Power (dBm)                | Power (mW) | Time-Averaged SAR (W/kg) | Lower Bound (-1 dB) | Upper Bound (+0.7 dB) |
| 28.00                              | 630.96     | 6.89                     | 6.14                | 9.08                  |
| 26.00                              | 398.11     | 5.18                     | 3.88                | 5.73                  |
| 24.00                              | 251.19     | 2.76                     | 2.45                | 3.62                  |
| 22.00                              | 158.49     | 2.17                     | 1.54                | 2.28                  |
| 20.00                              | 100.00     | 1.42                     | 0.98                | 1.45                  |
| 18.00                              | 63.10      | 0.64                     | 0.61                | 0.90                  |
| 16.00                              | 39.81      | 0.45                     | 0.39                | 0.58                  |
| 14.00                              | 25.12      | 0.31                     | 0.25                | 0.36                  |

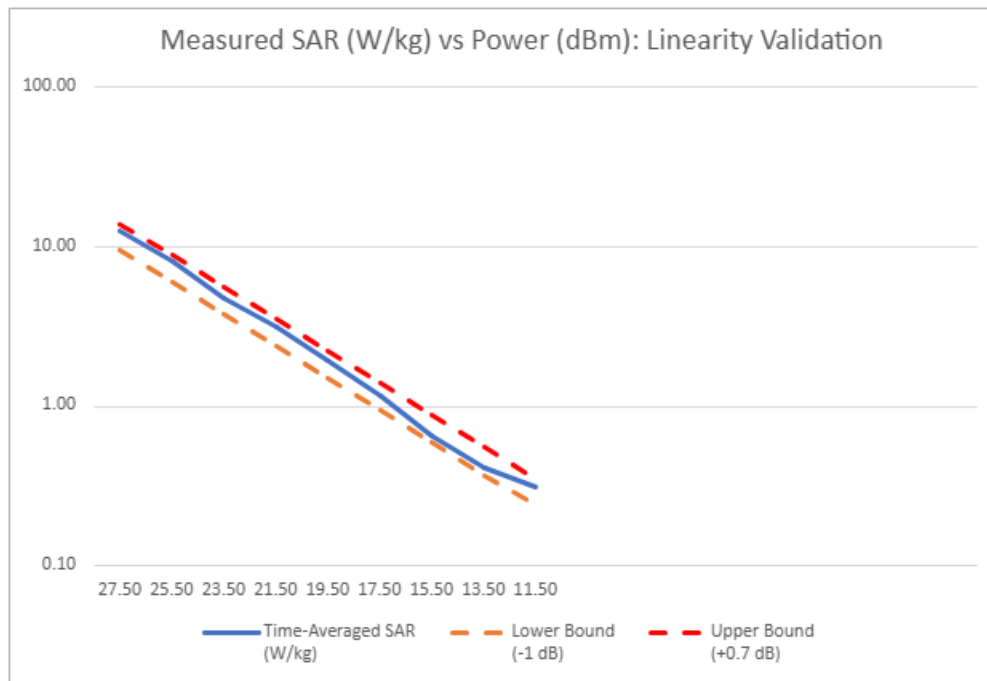


**Figure 11-2**  
**NR Band n41 Ant 2b Linearity Validation Results**

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 65 of 72                     |

**Table 11-4**  
**NR Band n41 Ant 3 Linearity Validation Results**

| Ant 3: NR Band n41 - [Ch. 518598] |            |                          |                     |                       |
|-----------------------------------|------------|--------------------------|---------------------|-----------------------|
| Nominal Power (dBm)               | Power (mW) | Time-Averaged SAR (W/kg) | Lower Bound (-1 dB) | Upper Bound (+0.7 dB) |
| 27.50                             | 562.34     | 12.50                    | 9.44                | 13.97                 |
| 25.50                             | 354.81     | 8.18                     | 5.96                | 8.81                  |
| 23.50                             | 223.87     | 4.80                     | 3.76                | 5.56                  |
| 21.50                             | 141.25     | 3.14                     | 2.38                | 3.51                  |
| 19.50                             | 89.13      | 1.92                     | 1.49                | 2.21                  |
| 17.50                             | 56.23      | 1.15                     | 0.95                | 1.40                  |
| 15.50                             | 35.48      | 0.65                     | 0.60                | 0.88                  |
| 13.50                             | 22.39      | 0.41                     | 0.37                | 0.55                  |
| 11.50                             | 14.13      | 0.31                     | 0.24                | 0.35                  |

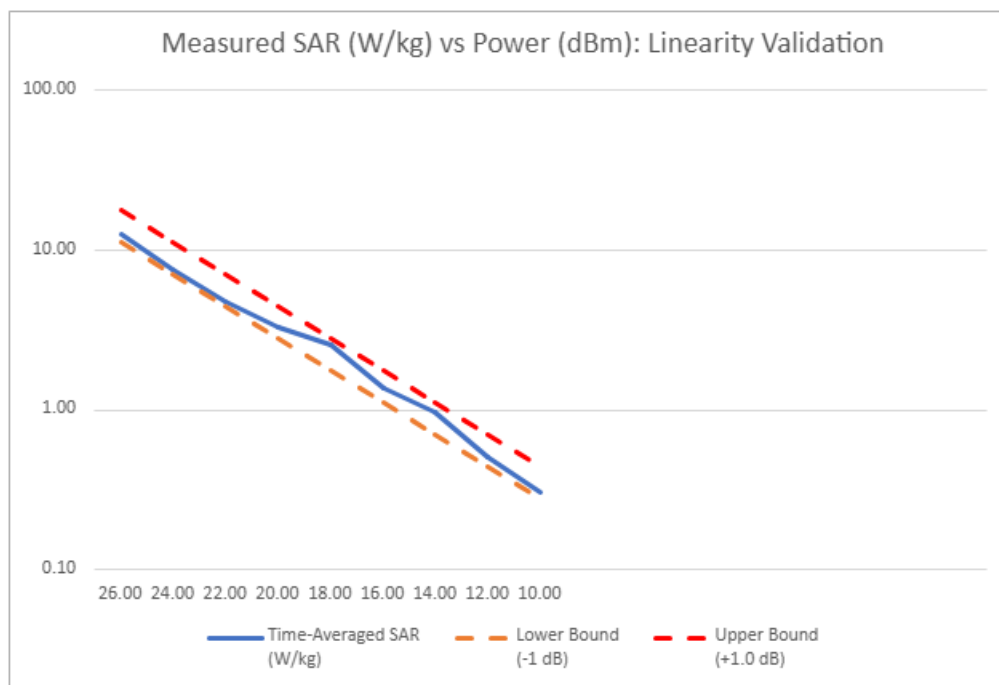


**Figure 11-3**  
**NR Band n41 Ant 3 Linearity Validation Results**

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 66 of 72                     |

**Table 11-5**  
**NR Band n77 Subrange 1 Ant 4b Linearity Validation Results**

| Ant 4b: NR Band n77 Subrange 1 - [Ch. 633334] |            |                          |                     |                       |
|-----------------------------------------------|------------|--------------------------|---------------------|-----------------------|
| Nominal Power (dBm)                           | Power (mW) | Time-Averaged SAR (W/kg) | Lower Bound (-1 dB) | Upper Bound (+1.0 dB) |
| 26.00                                         | 398.11     | 12.60                    | 11.15               | 17.68                 |
| 24.00                                         | 251.19     | 7.55                     | 7.04                | 11.15                 |
| 22.00                                         | 158.49     | 4.83                     | 4.44                | 7.04                  |
| 20.00                                         | 100.00     | 3.34                     | 2.80                | 4.44                  |
| 18.00                                         | 63.10      | 2.54                     | 1.76                | 2.79                  |
| 16.00                                         | 39.81      | 1.39                     | 1.11                | 1.76                  |
| 14.00                                         | 25.12      | 0.96                     | 0.71                | 1.12                  |
| 12.00                                         | 15.85      | 0.51                     | 0.44                | 0.70                  |
| 10.00                                         | 10.00      | 0.31                     | 0.28                | 0.44                  |



**Figure 11-4**  
**NR Band n77 Subrange 1 Ant 4b Linearity Validation Results**

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
| Document S/N:<br>1C2504170039-04.BCG (Rev1) | DUT Type:<br>Tablet Device          | Page 67 of 72                     |

## 12 EQUIPMENT LIST

| Manufacturer          | Model        | Description                                   | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|-----------------------|--------------|-----------------------------------------------|------------|--------------|------------|---------------|
| Agilent               | E4404B       | Spectrum Analyzer                             | N/A        | N/A          | N/A        | MY4511242     |
| Agilent               | E4438C       | ESG Vector Signal Generator                   | 10/23/2024 | Annual       | 10/23/2025 | MY45093852    |
| Agilent               | E4438C       | ESG Vector Signal Generator                   | 11/15/2024 | Annual       | 11/15/2025 | MY45092078    |
| Agilent               | N5182A       | MKG Vector Signal Generator                   | 5/30/2025  | Annual       | 5/30/2026  | MY48180366    |
| Agilent               | 8753ES       | 5-Parameter Vector Network Analyzer           | 1/6/2025   | Annual       | 1/6/2026   | MY40001472    |
| Agilent               | 8753ES       | 5-Parameter Vector Network Analyzer           | 9/25/2024  | Annual       | 9/25/2025  | MY40003841    |
| Agilent               | ES515C       | Wireless Communications Test Set              | CBT        | N/A          | CBT        | GB48310798    |
| Agilent               | ES515C       | Wireless Communications Test Set              | CBT        | N/A          | CBT        | GB41450275    |
| Agilent               | N4010A       | Wireless Connectivity Test Set                | N/A        | N/A          | N/A        | GB46170464    |
| Agilent               | N9020A       | MXA Signal Analyzer                           | 7/7/2025   | Biennial     | 7/7/2027   | MY56470202    |
| Amplifier Research    | 1551G6       | Amplifier                                     | CBT        | N/A          | CBT        | 433973        |
| Amplifier Research    | 1551G6       | Amplifier                                     | CBT        | N/A          | CBT        | 433974        |
| Amplifier Research    | 150A100C     | Amplifier                                     | CBT        | N/A          | CBT        | 350132        |
| Anritsu               | MN8110B      | V/Q Adaptor                                   | CBT        | N/A          | CBT        | 6261247881    |
| Anritsu               | ML2496A      | Power Meter                                   | 6/27/2025  | Annual       | 6/27/2026  | 1840005       |
| Anritsu               | ML2495A      | Power Meter                                   | 7/3/2025   | Annual       | 7/3/2026   | 1039008       |
| Anritsu               | MA2411B      | Pulse Power Sensor                            | 9/5/2024   | Annual       | 9/5/2025   | 1726262       |
| Anritsu               | MA2411B      | Pulse Power Sensor                            | 10/21/2024 | Annual       | 10/21/2025 | 1027293       |
| Anritsu               | MA24106A     | USB Power Sensor                              | 5/29/2025  | Annual       | 5/29/2026  | 1344554       |
| Anritsu               | MA24106A     | USB Power Sensor                              | 10/29/2024 | Annual       | 10/29/2025 | 1248508       |
| Control Company       | 4052         | Long Stem Thermometer                         | 2/27/2024  | Biennial     | 2/27/2026  | 240174346     |
| Control Company       | 4052         | Long Stem Thermometer                         | 2/27/2024  | Biennial     | 2/27/2026  | 240171096     |
| Control Company       | 4052         | Long Stem Thermometer                         | 2/27/2024  | Biennial     | 2/27/2026  | 240171059     |
| Control Company       | 4040         | Therm./ Clock/ Humidity Monitor               | 4/15/2024  | Biennial     | 4/15/2026  | 240310280     |
| Control Company       | 4040         | Therm./ Clock/ Humidity Monitor               | 10/15/2024 | Biennial     | 10/15/2026 | 240763503     |
| Control Company       | 4040         | Therm./ Clock/ Humidity Monitor               | 4/15/2024  | Biennial     | 4/15/2026  | 240310282     |
| GHl Intek             | GPS-3030DD   | DC Power Supply                               | N/A        | N/A          | N/A        | E1883874      |
| Insize                | 1108-150     | Insize - Digital Caliper                      | 2/25/2025  | Annual       | 2/25/2026  | 711245294     |
| Keylight Technologies | N9020A       | MXA Signal Analyzer                           | 7/7/2025   | Annual       | 7/7/2026   | MY48010233    |
| Keylight Technologies | E7515B       | UXM 5G Wireless Test Platform                 | 6/13/2025  | Annual       | 6/13/2026  | MY60192562    |
| MCL                   | BW-N6W5+     | 6dB Attenuator                                | CBT        | N/A          | CBT        | 1139          |
| Mini-Circuits         | PWR-4GHS     | 9-KHz-4000MHz USB Power Sensor                | 6/20/2025  | Annual       | 6/20/2026  | 12503270057   |
| Mini-Circuits         | VLF-600N     | Low Pass Filter DC to 6000 MHz                | 7/22/2025  | Annual       | 7/22/2026  | 32026         |
| Mini-Circuits         | VLF-600N+    | Low Pass Filter DC to 6000 MHz                | 7/3/2025   | Annual       | 7/3/2026   | 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         | ZUDC10-83-5+ | Directional Coupler                           | CBT        | N/A          | CBT        | 2050          |
| Mini-Circuits         | ZUDC10-83-5+ | Directional Coupler                           | CBT        | N/A          | CBT        | 2437          |
| Mini-Circuits         | ZUDC10-83-5+ | Directional Coupler                           | CBT        | N/A          | CBT        | 2408          |
| Narda                 | 4772-3       | Attenuator (3dB)                              | CBT        | N/A          | CBT        | 9406          |
| Narda                 | BW-53W2      | Attenuator (3dB)                              | CBT        | N/A          | CBT        | 120           |
| Narda                 | 4216-10      | Directional Coupler, 0.5 to 8.0 GHz, 10 dB    | CBT        | N/A          | CBT        | 01492         |
| Narda                 | 4216-10      | Directional Coupler, 0.5 to 8.0 GHz, 10 dB    | CBT        | N/A          | CBT        | 01493         |
| Pasternack            | NC-100       | Torque Wrench                                 | 5/29/2025  | Biennial     | 5/29/2027  | N/A           |
| Pasternack            | PE2088       | Power Divider                                 | CBT        | N/A          | CBT        | N/A           |
| Rohde & Schwarz       | CMW500       | Wideband Radio Communication Tester           | CBT        | N/A          | CBT        | 120504        |
| Rohde & Schwarz       | CMW500       | Wideband Radio Communication Tester           | CBT        | N/A          | CBT        | 109366        |
| Rohde & Schwarz       | CMW500       | Wideband Radio Communication Tester           | CBT        | N/A          | CBT        | 155128        |
| Rohde & Schwarz       | CMW500       | Wideband Radio Communication Tester           | CBT        | N/A          | CBT        | 102060        |
| Rohde & Schwarz       | CMW500       | Wideband Radio Communication Tester           | CBT        | N/A          | CBT        | 107112        |
| Rohde & Schwarz       | NRPS         | 3-Path Dipole Power Sensor                    | 10/28/2024 | Annual       | 10/28/2025 | 109957        |
| Rohde & Schwarz       | NRPS         | 3-Path Dipole Power Sensor                    | 2/24/2025  | Annual       | 2/24/2026  | 109961        |
| Rohde & Schwarz       | NRPS         | 3-Path Dipole Power Sensor                    | 10/28/2024 | Annual       | 10/28/2025 | 109956        |
| Rohde & Schwarz       | NRPS05       | 3-Path Dipole Power Sensor                    | 2/19/2025  | Annual       | 2/19/2026  | 101139        |
| Rosenberger           | 32W006-016   | Torque Wrench                                 | 4/2/2024   | Biennial     | 4/2/2026   | N/A           |
| SPEAG                 | DAK-3.5      | Dielectric Assessment Kit                     | 11/5/2024  | Annual       | 11/5/2025  | 1277          |
| SPEAG                 | DAK-3.5      | Portable Dielectric Assessment Kit            | 5/12/2025  | Annual       | 5/12/2026  | 1323          |
| SPEAG                 | MAIA         | Modulation and Audio Interference Analyzer    | N/A        | N/A          | N/A        | 1237          |
| SPEAG                 | MAIA         | Modulation and Audio Interference Analyzer    | N/A        | N/A          | N/A        | 1331          |
| SPEAG                 | MAIA         | Modulation and Audio Interference Analyzer    | N/A        | N/A          | N/A        | 1390          |
| SPEAG                 | DAK-12       | Dielectric Assessment Kit (4MHz - 3GHz)       | 3/10/2025  | Annual       | 3/10/2026  | 1102          |
| SPEAG                 | D835V2       | 835 MHz SAR Dipole                            | 10/25/2024 | Annual       | 10/25/2025 | 44040         |
| SPEAG                 | D1750V2      | 1750 MHz SAR Dipole                           | 9/9/2023   | Biennial     | 9/9/2025   | 1104          |
| SPEAG                 | D1900V2      | 1900 MHz SAR Dipole                           | 10/23/2024 | Annual       | 10/23/2025 | 54131         |
| SPEAG                 | D1900V2      | 1900 MHz SAR Dipole                           | 5/8/2025   | Annual       | 5/8/2026   | 54030         |
| SPEAG                 | D2600V2      | 2600 MHz SAR Dipole                           | 5/7/2025   | Annual       | 5/7/2026   | 1042          |
| SPEAG                 | D2600V2      | 2600 MHz SAR Dipole                           | 11/15/2022 | Triennial    | 11/15/2025 | 1068          |
| SPEAG                 | D3500V2      | 3500 MHz SAR Dipole                           | 6/10/2024  | Biennial     | 6/10/2026  | 1126          |
| SPEAG                 | D3700V2      | 3700 MHz SAR Dipole                           | 10/21/2022 | Triennial    | 10/21/2025 | 1002          |
| SPEAG                 | DAE4         | Dasy Data Acquisition Electronics             | 4/9/2025   | Annual       | 4/9/2026   | 501           |
| SPEAG                 | DAE4         | Dasy Data Acquisition Electronics             | 5/13/2025  | Annual       | 5/13/2026  | 1683          |
| SPEAG                 | DAE4         | Dasy Data Acquisition Electronics             | 4/10/2025  | Annual       | 4/10/2026  | 1582          |
| SPEAG                 | DAE4         | Dasy Data Acquisition Electronics             | 3/11/2025  | Annual       | 3/11/2026  | 534           |
| SPEAG                 | DAE4         | Dasy Data Acquisition Electronics             | 5/13/2025  | Annual       | 5/13/2026  | 1676          |
| SPEAG                 | DAE4         | Dasy Data Acquisition Electronics             | 10/10/2024 | Annual       | 10/10/2025 | 1237          |
| SPEAG                 | DAE4         | Dasy Data Acquisition Electronics             | 10/10/2024 | Annual       | 10/10/2025 | 1408          |
| SPEAG                 | EX3DV4       | SAR Probe                                     | 3/7/2025   | Annual       | 3/7/2026   | 7360          |
| SPEAG                 | EX3DV4       | SAR Probe                                     | 5/14/2025  | Annual       | 5/14/2026  | 7552          |
| SPEAG                 | EX3DV4       | SAR Probe                                     | 4/16/2025  | Annual       | 4/16/2026  | 7532          |
| SPEAG                 | EX3DV4       | SAR Probe                                     | 4/11/2025  | Annual       | 4/11/2026  | 7357          |
| SPEAG                 | EX3DV4       | SAR Probe                                     | 2/10/2025  | Annual       | 2/10/2026  | 7427          |
| SPEAG                 | EX3DV4       | SAR Probe                                     | 10/15/2024 | Annual       | 10/15/2025 | 7146          |
| SPEAG                 | EX3DV4       | SAR Probe                                     | 5/14/2025  | Annual       | 5/14/2026  | 7682          |

### Notes:

1. 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.
2. Each equipment item is used solely within its respective calibration period.

|                                             |                                     |                                   |
|---------------------------------------------|-------------------------------------|-----------------------------------|
| FCC ID: BCGA3358                            | TIME-AVERAGED SAR VALIDATION REPORT | Approved by:<br>Technical Manager |
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## 13 MEASUREMENT UNCERTAINTIES

### For SAR Measurements

| a                                                                             | c             | d              | e=<br>f(d,k) | f                     | g                        | h =<br>c x f/e                 | i =<br>c x g/e                   | k              |
|-------------------------------------------------------------------------------|---------------|----------------|--------------|-----------------------|--------------------------|--------------------------------|----------------------------------|----------------|
| Uncertainty Component                                                         | Tol.<br>(± %) | Prob.<br>Dist. | Div.         | c <sub>i</sub><br>1gm | c <sub>i</sub><br>10 gms | 1gm<br>u <sub>i</sub><br>(± %) | 10gms<br>u <sub>i</sub><br>(± %) | v <sub>i</sub> |
| <b>Measurement System</b>                                                     |               |                |              |                       |                          |                                |                                  |                |
| Probe Calibration                                                             | 6.55          | N              | 1            | 1.0                   | 1.0                      | 6.6                            | 6.6                              | ∞              |
| Axial Isotropy                                                                | 0.25          | N              | 1            | 0.7                   | 0.7                      | 0.2                            | 0.2                              | ∞              |
| Hemishperical Isotropy                                                        | 1.3           | N              | 1            | 0.7                   | 0.7                      | 0.9                            | 0.9                              | ∞              |
| Boundary Effect                                                               | 2.0           | R              | 1.73         | 1.0                   | 1.0                      | 1.2                            | 1.2                              | ∞              |
| Linearity                                                                     | 0.3           | N              | 1            | 1.0                   | 1.0                      | 0.3                            | 0.3                              | ∞              |
| System Detection Limits                                                       | 0.25          | R              | 1.73         | 1.0                   | 1.0                      | 0.1                            | 0.1                              | ∞              |
| Readout Electronics                                                           | 0.3           | N              | 1            | 1.0                   | 1.0                      | 0.3                            | 0.3                              | ∞              |
| Response Time                                                                 | 0.8           | R              | 1.73         | 1.0                   | 1.0                      | 0.5                            | 0.5                              | ∞              |
| Integration Time                                                              | 2.6           | R              | 1.73         | 1.0                   | 1.0                      | 1.5                            | 1.5                              | ∞              |
| RF Ambient Conditions - Noise                                                 | 3.0           | R              | 1.73         | 1.0                   | 1.0                      | 1.7                            | 1.7                              | ∞              |
| RF Ambient Conditions - Reflections                                           | 3.0           | R              | 1.73         | 1.0                   | 1.0                      | 1.7                            | 1.7                              | ∞              |
| Probe Positioner Mechanical Tolerance                                         | 0.4           | R              | 1.73         | 1.0                   | 1.0                      | 0.2                            | 0.2                              | ∞              |
| Probe Positioning w/ respect to Phantom                                       | 6.7           | R              | 1.73         | 1.0                   | 1.0                      | 3.9                            | 3.9                              | ∞              |
| Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation | 4.0           | R              | 1.73         | 1.0                   | 1.0                      | 2.3                            | 2.3                              | ∞              |
| <b>Test Sample Related</b>                                                    |               |                |              |                       |                          |                                |                                  |                |
| Test Sample Positioning                                                       | 2.7           | N              | 1            | 1.0                   | 1.0                      | 2.7                            | 2.7                              | 35             |
| Device Holder Uncertainty                                                     | 1.67          | N              | 1            | 1.0                   | 1.0                      | 1.7                            | 1.7                              | 5              |
| Output Power Variation - SAR drift measurement                                | 5.0           | R              | 1.73         | 1.0                   | 1.0                      | 2.9                            | 2.9                              | ∞              |
| SAR Scaling                                                                   | 0.0           | R              | 1.73         | 1.0                   | 1.0                      | 0.0                            | 0.0                              | ∞              |
| <b>Phantom &amp; Tissue Parameters</b>                                        |               |                |              |                       |                          |                                |                                  |                |
| Phantom Uncertainty (Shape & Thickness tolerances)                            | 7.6           | R              | 1.73         | 1.0                   | 1.0                      | 4.4                            | 4.4                              | ∞              |
| Liquid Conductivity - measurement uncertainty                                 | 4.2           | N              | 1            | 0.78                  | 0.71                     | 3.3                            | 3.0                              | 10             |
| Liquid Permittivity - measurement uncertainty                                 | 4.1           | N              | 1            | 0.23                  | 0.26                     | 1.0                            | 1.1                              | 10             |
| Liquid Conductivity - Temperature Uncertainty                                 | 3.4           | R              | 1.73         | 0.78                  | 0.71                     | 1.5                            | 1.4                              | ∞              |
| Liquid Permittivity - Temperature Uncertainty                                 | 0.6           | R              | 1.73         | 0.23                  | 0.26                     | 0.1                            | 0.1                              | ∞              |
| Liquid Conductivity - deviation from target values                            | 5.0           | R              | 1.73         | 0.64                  | 0.43                     | 1.8                            | 1.2                              | ∞              |
| Liquid Permittivity - deviation from target values                            | 5.0           | R              | 1.73         | 0.60                  | 0.49                     | 1.7                            | 1.4                              | ∞              |
| <b>Combined Standard Uncertainty (k=1)</b>                                    |               |                |              |                       |                          | RSS                            | 11.5                             | 11.3           |
| <b>Expanded Uncertainty</b><br>(95% CONFIDENCE LEVEL)                         |               |                |              |                       |                          | k=2                            | 23.0                             | 22.6           |

|                                             |                                     |                                   |
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## 14 CONCLUSION

### 14.1 Measurement Conclusion

The SAR evaluation indicates that the DUT complies with the RF radiation exposure limits of the FCC 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. The above analysis is sufficient in displaying the validation of this Cellular TAS algorithm.

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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