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# PART 0 SAR AND POWER DENSITY CHAR REPORT

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| **FCC ID:** | **A3LSMG986U** |
| **APPLICANT:** | **SAMSUNG ELECTRONICS CO., LTD** |

| | |
|---|---|
| **Report Type:** | Part 0 SAR and Power Density Characterization |
| **DUT Type:** | Portable Handset |
| **Model:** | SM-G986U |
| **Additional Model(s):** | SM-G986U1, SM-G986XU |

Note: This revised test report (S/N: 1M1910220166-22-R1.A3L) 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.

Randy Ortanez
President

TESTING CERT#2041.01

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APPENDIX A: SAR TEST RESULTS FOR *PLimit* CALCULATIONS

# 1 DEVICE UNDER TEST

## 1.1 Device Overview

This device uses the Qualcomm® Smart Transmit feature to control and manage transmitting power in real time and to ensure the time-averaged RF exposure is in compliance with the FCC requirement at all times for 2G/3G/4G/5G WWAN operations. Additionally, this device supports WLAN/BT/NFC/ANT+/MST technologies, but the output power of these modems is not controlled by the Smart Transmit algorithm.

## 1.2 Time-Averaging for SAR and Power Density

This device is enabled with Qualcomm® Smart Transmit algorithm to control and manage transmitting power in real time and to ensure that the time-averaged RF exposure from 2G/3G/4G/5G NR WWAN is in compliance with FCC requirements. This Part 0 report shows SAR and Power Density characterization of WWAN radios for 2G/3G/4G/5G Sub-6 NR and 5G mmW NR respectively. Characterization is achieved by determining $P_{Limit}$ for 2G/3G/4G/5G Sub-6 NR and input.power.limit for 5G mmW NR that correspond to the exposure design targets after accounting for all device design related uncertainties, i.e., SAR_design_target (< FCC SAR limit) for sub-6 radio and PD_design_target (< FCC PD limit) for mmW radio. The SAR characterization and PD characterization are denoted as SAR Char and PD Char in this report. Section 1.3 includes a nomenclature of the specific terms used in this report.

The compliance test under the static transmission scenario and simultaneous transmission analysis are reported in Part 1 report. The validation of the time-averaging algorithm and compliance under the dynamic (time- varying) transmission scenario for WWAN technologies are reported in Part 2 report (report SN could be found in Section 1.4 – Bibliography).

## 1.3 Nomenclature for Part 0 Report

| Technology | Term | Description |
|---|---|---|
| 2G/3G/4G/5G Sub 6 NR | $P_{limit}$ | Power level that corresponds to the exposure design target (*SAR_design_target)* after accounting for all device design related uncertainties |
| | $P_{max}$ | Maximum tune up output power |
| | *SAR_design_target* | Target SAR level < FCC SAR limit after accounting for all device design related uncertainties |
| | *SAR Char* | Table containing *Plimit* for all technologies and bands |
| 5G mmW NR | *input.power.limit* | Power level at antenna element for each beam corresponding to the exposure design target (*PD_design_target)* |
| | *PD_design_target* | Target PD level < FCC PD limit after accounting for all device design related uncertainties |
| | $\Delta_{min}$ | Housing material influence |
| | *PD Char* | Table containing *input.power.limit* for all beams and bands |

## 1.4 Bibliography

| Report Type | Report Serial Number |
|---|---|
| FCC SAR Evaluation Report (Part 1) | 1M1910220166-01-R1.A3L |
| FCC PD Evaluation Report (Part 1) | 1M1910220166-23.A3L |
| RF Exposure Part 2 Test Report | 80-W5681-4 Rev.B |
| Power Density Simulation Report | Revision A |

# 2 SAR AND POWER DENSITY MEASUREMENTS

## 2.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 2-1).

**Equation 2-1**
**SAR Mathematical Equation**

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

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

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

where:

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

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

## 2.2 SAR Measurement Procedure

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

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See
2. Table 2-1) and IEEE 1528-2013.
3. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.

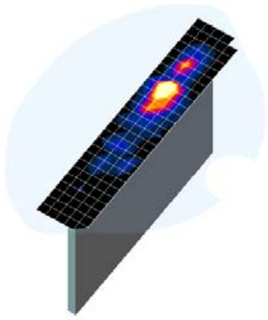

**Figure 2-1**
**Sample SAR Area Scan**

4. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See
5. Table 2-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):
   a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in
   b. Table 2-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
   c. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
   d. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
6. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

**Table 2-1**
**Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04***

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

*Also compliant to IEEE 1528-2013 Table 6

## 2.3 Power Density Measurement Setup

Power Density measurements for mmWave frequencies were performed using the DASY6 with cDASY6 5G module. The DASY6 is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland and consists of a high precision robotics system (Staubli), robot controller, desktop computer, near-field probe, probe alignment sensor, and the 5G phantom. The robot is a six-axis industrial robot, performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF).

## 2.4 SPEAG EUmmWV3 Probe / E-Field 5G Probe

The EUmmWV3 probe consists of two dipoles optimally arranged to obtain pseudo-vector information.

| | |
|---|---|
| **Frequency Range** | 750 MHz – 110 GHz |
| **Dynamic Range** | < 20 V/m – 10,000 V/m with PRE-10 (min < 50 V/m – 3,000 V/m) |
| **Position Precision** | < 0.2 mm (cDASY6) |
| **Dimensions** | Probe Overall Length: 320 mm<br>Probe Body Diameter: 8 mm<br>Probe Tip Length: 23 mm<br>Probe Tip Diameter: Encapsulation 8 mm<br>Distance from Probe Tip to Sensor X Calibration Point: 1.5 mm<br>Distance from Probe Tip to Sensor Y Calibration Point: 1.5 mm |
| **Applications** | E-field measurements of 5G devices and other mm-wave transmitters operating above 10 GHz in < 2 mm distance from device (free-space)<br>Power density, H-field and far-field analysis using total field reconstruction |
| **Compatibility** | cDASY6 + 5G-Module SW2.0.0.23 |

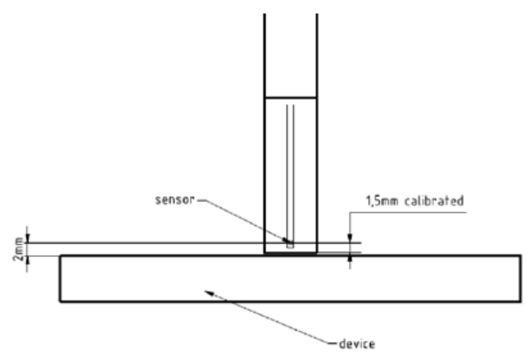


**Figure 2-2**
**EUmmWV3 Probe**

## 2.5 Power Density Assessment Based on E-field Measurements

Within a short distance from the transmitting source, power density was determined based on both electric and magnetic fields. Generally, the magnitude and phase of two components of either the E-field or H-field were needed on a sufficiently large surface to fully characterize the total E-field and H-field distributions. Nevertheless, solutions based on direct measurement of E-field and H-field can be used to compute power density. The general measurement approach used for this device was:

a) The local E field on the measurement surface was measured at a reference location where the field is well above the noise level. This reference level was used at the end of this procedure to assess output power drift of the DUT during the measurement.

b) The electric field on the measurement surface was scanned. Measurements are conducted according to the instructions provided by the measurement system manufacturer. Measurement spatial resolution can depend on the measured field characteristic and measurement methodology used by the system. The planar scan step size was configured at λ/4.

c) For cDASY6, H-field was calculated from the measured E-field using a reconstruction algorithm. As the power density calculation requires knowledge of both amplitude and phase, reconstruction algorithms can also be used to obtain field information from the measured E-field data (e.g. the phase from the amplitude if only the amplitude is measured). H-field and phase data was reconstructed from repeated measurements (three per measurement point) on two measurement planes separated by λ/4.

d) The total peak spatial-averaged power density (psPD) distribution on the evaluation surface is determined per the below equation. The spatial averaging area, *A*, is specified by the applicable exposure limits or regulatory requirements. A circular shape was used.

**Equation 2-2**
**psPD Mathematical Equation**

$$psPD = \frac{1}{2A_{av}} \iint_{A_{av}} ||\, Re\{E \times H^*\} \,||\, dA$$

e) The maximum peak spatial-average on the evaluation surface is the final quantity to determine compliance against applicable limits.

f) The local E field reference value, at the same location as step 2, was re-measured after the scan was complete to calculate the power drift. If the drift deviated by more than 5%, the power density test and drift measurements were repeated.

## 2.6 Reconstruction Algorithm

Computation of the power density in general requires measurement information from the both E-field and H-field amplitudes and phases in the plane of incidence. Reconstruction of these quantities from pseudo-vector E-field measurements is feasible according to the manufacturer, as they are determined via Maxwell's equations. As such, the SPEAG reconstruction approach was based on the Gerchberg-Saxton algorithm, which benefits from the availability of the E-field polarization ellipse information obtained with the EUmmWV3 probe.

# 3 SAR CHARACTERIZATION

## 3.1 DSI and SAR Determination

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

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

The device state index (DSI) conditions used in Table 3-1 represent different exposure scenarios.

**Table 3-1**
**DSI and Corresponding Exposure Scenarios**

| Scenario | Description | SAR Test Cases |
|---|---|---|
| Head (DSI = 2) | ▪ Device positioned next to head<br>▪ Receiver Active | *Head SAR per KDB Publication 648474 D04* |
| Hotspot mode (DSI = 3) | ▪ Device transmits in hotspot mode near body<br>▪ Hotspot Mode Active | *Hotspot SAR per KDB Publication 941225 D06* |
| Phablet Grip (DSI=1 or 4) | ▪ Device is held with hand and grip sensor is triggered<br>▪ Grip sensor triggered or earjack is active | *Phablet SAR per KDB Publication 648474 D04 & KDB Publication 616217 D04* |
| Phablet (DSI = 0) | ▪ Device is held with hand and grip sensor is not triggered<br>▪ Distance grip sensor not triggered | *Phablet SAR per KDB Publication 648474 D04 & KDB Publication 616217 D04* |
| Body-worn (DSI = 0) | ▪ Device being used with a body-worn accessory | *Body-worn SAR per KDB Publication 648474 D04* |

## 3.2 SAR Design Target

*SAR_design_target* is determined by ensuring that it is less than FCC SAR limit after accounting for total device designed related uncertainties specified by the manufacturer (see Table 3-2).

**Table 3-2**
***SAR_design_target* Calculations**

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

## 3.3 SAR Char

SAR test results corresponding to *Pmax* for each antenna/technology/band/DSI can be found in Appendix A.

*Plimit* is calculated by linearly scaling with the measured SAR at the *Pmax* to correspond to the *SAR_design_target*. *Plimit* determination for each exposure scenario corresponding to *SAR_design_target* are shown in Table 3-3.

**Table 3-3**
***PLimit* Determination**

| Device State Index (DSI) | *PLimit* Determination Scenarios |
|---|---|
| 0 | The worst-case SAR exposure is determined as maximum SAR normalized to the limit among:<br>1. Body Worn SAR<br>2. Extremity SAR measured at 8, 6 and 11 mm spacing for back, front, bottom respectively<br>3. Extremity SAR measured at 0 mm for left and right surfaces |
| 1 or 4 | $P_{limit}$ is calculated based on 10g Extremity SAR at 0 mm for back, front, and bottom surfaces |
| 2 | $P_{limit}$ is calculated based on 1g Head SAR |
| 3 | $P_{limit}$ is calculated based on 1g Hotspot SAR at 10 mm |

**Note:**

For DSI = 0, $P_{limit}$ is calculated by:

$$P_{limit} = \min\{ P_{limit} \text{ corresponding to 1g Body Worn SAR evaluation at 15 mm spacing,}$$
$$P_{limit} \text{ corresponding to 10g Extremity SAR evaluation at 7~12 mm spacing,}$$
$$P_{limit} \text{ corresponding to 10g Extremity SAR evaluation at 0 mm for left and right surfaces} \}$$

**Table 3-4**
**SAR Characterizations**

| Device State Index (DSI) | 0 | | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|
| Exposure Scenario | Body-Worn 1g SAR at 15 mm | Phablet 10g SAR at Max Power | Body-Worn 1g SAR at 15 mm Phablet 10g SAR at Max Power | Phablet 10g SAR at Red Power | Head 1g SAR | Hotspot 1g SAR | Phablet 10g SAR at Red Power |
| Mode/Band | (dBm) | (dBm) | PLimit (dBm) | PLimit (dBm) | PLimit (dBm) | PLimit (dBm) | PLimit (dBm) |
| GSM/GPRS/EDGE 850 MHz | 30.9 | 33.0 | 30.9 | 26.1 | 31.1 | 26.1 | 26.1 |
| GSM/GPRS/EDGE 1900 MHz | 25.5 | 28.7 | 25.5 | 18.8 | 34.0 | 18.8 | 18.8 |
| UMTS B5 | 30.6 | 32.3 | 30.6 | 26.0 | 31.6 | 26.0 | 26.0 |
| UMTS B4 | 25.0 | 26.1 | 25.0 | 19.0 | 32.6 | 19.0 | 19.0 |
| UMTS B2 | 24.9 | 26.6 | 24.9 | 18.5 | 32.9 | 18.5 | 18.5 |
| CDMA/EVDO BC10 | 31.6 | 33.1 | 31.6 | 26.2 | 32.0 | 26.2 | 26.2 |
| CDMA/EVDO BC0 | 30.8 | 32.1 | 30.8 | 26.2 | 31.1 | 26.2 | 26.2 |
| CDMA/EVDO BC1 | 24.8 | 27.0 | 24.8 | 19.0 | 32.6 | 18.5 | 19.0 |
| LTE FDD B71 | 32.6 | 36.7 | 32.6 | 29.8 | 34.9 | 29.8 | 29.8 |
| LTE FDD B12 | 32.2 | 36.1 | 32.2 | 29.6 | 34.1 | 29.6 | 29.6 |
| LTE FDD B13 | 30.9 | 33.6 | 30.9 | 27.2 | 32.9 | 27.2 | 27.2 |
| LTE FDD B14 | 30.3 | 32.4 | 30.3 | 26.7 | 31.5 | 26.7 | 26.7 |
| LTE FDD B26 | 30.5 | 31.9 | 30.5 | 25.8 | 31.6 | 25.8 | 25.8 |
| LTE FDD B5 | 30.9 | 32.1 | 30.9 | 26.1 | 31.8 | 26.1 | 26.1 |
| LTE FDD B66/4 | 24.8 | 26.8 | 24.8 | 19.8 | 32.7 | 19.5 | 19.8 |
| LTE FDD B25 | 25.2 | 27.1 | 25.2 | 18.5 | 33.0 | 18.5 | 18.5 |
| LTE FDD B2 | 25.2 | 26.7 | 25.2 | 18.5 | 33.0 | 18.5 | 18.5 |
| LTE FDD B30 | 24.7 | 26.2 | 24.7 | 20.5 | 32.8 | 18.2 | 20.5 |
| LTE FDD B7 | 27.5 | 29.2 | 27.5 | 20.5 | 32.6 | 19.5 | 20.5 |
| LTE TDD B48 | 28.2 | 22.5 | 22.5 | 22.5 | 16.5 | 22.5 | 22.5 |
| LTE TDD B38 | 28.0 | 31.7 | 28.0 | 19.0 | 28.0 | 19.0 | 19.0 |
| LTE TDD B41 | 29.5 | 31.7 | 29.5 | 21.5 | 34.6 | 19.0 | 21.5 |
| NR FDD n71 | 31.9 | 36.3 | 31.9 | 29.4 | 34.3 | 29.4 | 29.4 |
| NR FDD n5 | 31.0 | 32.1 | 31.0 | 25.8 | 31.7 | 25.8 | 25.8 |
| NR FDD n66 | 25.4 | 27.6 | 25.4 | 19.8 | 32.8 | 19.8 | 19.8 |
| NR FDD n2 | 26.1 | 26.9 | 26.1 | 18.5 | 32.5 | 18.5 | 18.5 |
| NR TDD n41 | 29.3 | 22.9 | 22.9 | 22.9 | 18.2 | 22.9 | 22.9 |

**Notes:**

1. For all modes/bands, when Hotspot Mode (DSI=3) and Extremity sensor (DSI=1) are triggered at the same time, DSI=3 takes priority, thus the $P_{limit}$ for DSI=1 is set to be less or equal to $P_{limit}$ for DSI=3.
2. For LTE Band 48, when RCV is active, DSI=2 takes priority over all levels.
3. When $P_{max} < P_{limit}$, the DUT will operate at a power level up to $P_{max}$.
4. $P_{limit}$ for DSI=1 and DSI =4 are the same.

# 4 POWER DENSITY CHARACTERIZATION

## 4.1 Exposure Scenarios in Power Density Evaluation

At frequencies > 6 GHz, the total peak spatial averaged power density (psPD) is required to be assessed for all antenna configurations (beams) from all mmW antenna modules installed inside the device. This device has 3 patch antenna arrays (J Patch, K Patch, L Patch) and 1 dipole antenna array (J Dipole). Per each supported band, there are a total of 153 beams: 102 SISO beams and 51 MIMO beam pairs.

As showed in Figure 4-1, the surfaces near-by each mmW antenna module for PD characterization are identified and listed in Table 4-1.

**Table 4-1**
**Evaluation Surfaces for PD Characterization**

| Band & Mode | Antenna | Back (S2) | Front (S1) | Top (S5) | Bottom (S6) | Right (S4) | Left (S3) |
|---|---|---|---|---|---|---|---|
| 5G NR Band n261 | J Dipole | Yes | Yes | Yes | No | No | Yes |
| | J Patch | Yes | No | Yes | No | No | Yes |
| | K Patch | Yes | Yes | No | No | No | Yes |
| | L Patch | Yes | Yes | No | No | Yes | No |
| 5G NR Band n260 | J Dipole | Yes | Yes | Yes | No | No | Yes |
| | J Patch | Yes | No | Yes | No | No | Yes |
| | K Patch | Yes | Yes | No | No | No | Yes |
| | L Patch | Yes | Yes | No | No | Yes | No |

Note: The J Patch antenna, located on the back surface, is constructed with its dedicated ground plane behind the entire patch array and can only propagate outward. Therefore, the front surface (S1) is excluded in Table 4-1 for the J Patch antenna.

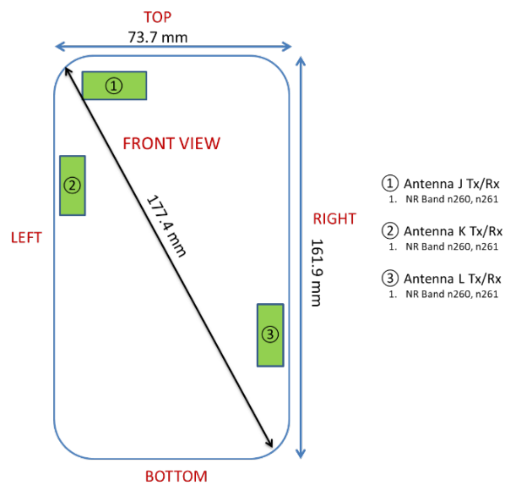


**Figure 4-1: Location of mmW antenna modules looking from front of the DUT**

Particular DUT edges were not required to be evaluated for power density if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 Section III and FCC KDB Publication 648474 D04v01r03. The distances between the transmit antennas and the edges of the device are included in the filing. Per FCC guidance, additional edges with negligible psPD results could be excluded from testing towards $\Delta_{min}$ calculations.

## 4.2 Power Density Characterization Method

An overview of power density characterization method could be found in Figure 4-2 below.

**Simulation modeling and validation**

- Correlate the simulated PD distributions with measured PD distribution for the selected beams to validate simulation model

↓

**Uncertainty Budget**

- Calculate the total device design uncertainty to include worst case RF tune-up accuracy and device-to-device variation

↓

***PD_design_target***

Specify a power density design target, which should be less than power density regulatory limit to account for the total device design uncertainties

↓

**Worst-case housing material Influence Quantification**

- Determine

$\Delta_{min}$ = *min{simulated PD@reference_power – measured PD@reference_power}*

to quantify the worst-case housing influence

↓

**PD Char Generation**

- Use validated simulation approach to determine input power limit for all the beams after accounting for the worst-case housing influence

**Figure 4-3**
**Flow Chart for Power Density Characterization**

## 4.3 Codebook for all supported beams

All the beams that the DUT supports are specified in the pre-defined codebook. The codebook for this device is specified as below.

**Table 4-2**
**5G mmW NR Band n261 Ant J Codebook**

| Band | Beam ID | Antenna | Ant_Type | Paired_With | # of Antenna Feed |
|---|---|---|---|---|---|
| 261 | 0 | J | PATCH | 128 | 1 |
| 261 | 1 | J | DIPOLE | 129 | 2 |
| 261 | 4 | J | PATCH | 134 | 2 |
| 261 | 5 | J | PATCH | 133 | 2 |
| 261 | 6 | J | PATCH | 132 | 2 |
| 261 | 7 | J | DIPOLE | 137 | 4 |
| 261 | 8 | J | DIPOLE | 136 | 4 |
| 261 | 9 | J | DIPOLE | 135 | 4 |
| 261 | 16 | J | PATCH | 144 | 2 |
| 261 | 17 | J | PATCH | 145 | 2 |
| 261 | 18 | J | DIPOLE | 147 | 4 |
| 261 | 19 | J | DIPOLE | 146 | 4 |
| 261 | 24 | J | PATCH | 155 | 4 |
| 261 | 25 | J | PATCH | 154 | 4 |
| 261 | 26 | J | PATCH | 153 | 4 |
| 261 | 27 | J | PATCH | 152 | 4 |
| 261 | 28 | J | PATCH | 156 | 4 |
| 261 | 39 | J | PATCH | 169 | 4 |
| 261 | 40 | J | PATCH | 168 | 4 |
| 261 | 41 | J | PATCH | 167 | 4 |
| 261 | 42 | J | PATCH | 170 | 4 |
| 261 | 128 | J | PATCH | 0 | 1 |
| 261 | 129 | J | DIPOLE | 1 | 2 |
| 261 | 132 | J | PATCH | 6 | 2 |
| 261 | 133 | J | PATCH | 5 | 2 |
| 261 | 134 | J | PATCH | 4 | 2 |
| 261 | 135 | J | DIPOLE | 9 | 4 |
| 261 | 136 | J | DIPOLE | 8 | 4 |
| 261 | 137 | J | DIPOLE | 7 | 4 |
| 261 | 144 | J | PATCH | 16 | 2 |
| 261 | 145 | J | PATCH | 17 | 2 |
| 261 | 146 | J | DIPOLE | 19 | 4 |
| 261 | 147 | J | DIPOLE | 18 | 4 |
| 261 | 152 | J | PATCH | 27 | 4 |
| 261 | 153 | J | PATCH | 26 | 4 |
| 261 | 154 | J | PATCH | 25 | 4 |
| 261 | 155 | J | PATCH | 24 | 4 |
| 261 | 156 | J | PATCH | 28 | 4 |
| 261 | 167 | J | PATCH | 41 | 4 |
| 261 | 168 | J | PATCH | 40 | 4 |
| 261 | 169 | J | PATCH | 39 | 4 |
| 261 | 170 | J | PATCH | 42 | 4 |

**Table 4-3**
**5G mmW NR Band n260 Ant J Codebook**

| Band | Beam ID | Antenna | Ant_Type | Paired_With | # of Antenna Feed |
|---|---|---|---|---|---|
| 260 | 0 | J | PATCH | 128 | 1 |
| 260 | 1 | J | DIPOLE | 129 | 2 |
| 260 | 4 | J | PATCH | 132 | 2 |
| 260 | 5 | J | PATCH | 133 | 2 |
| 260 | 6 | J | PATCH | 134 | 2 |
| 260 | 7 | J | DIPOLE | 135 | 4 |
| 260 | 8 | J | DIPOLE | 136 | 4 |
| 260 | 9 | J | DIPOLE | 137 | 4 |
| 260 | 16 | J | PATCH | 144 | 2 |
| 260 | 17 | J | PATCH | 145 | 2 |
| 260 | 18 | J | DIPOLE | 146 | 4 |
| 260 | 19 | J | DIPOLE | 147 | 4 |
| 260 | 24 | J | PATCH | 152 | 4 |
| 260 | 25 | J | PATCH | 153 | 4 |
| 260 | 26 | J | PATCH | 154 | 4 |
| 260 | 27 | J | PATCH | 155 | 4 |
| 260 | 28 | J | PATCH | 156 | 4 |
| 260 | 39 | J | PATCH | 167 | 4 |
| 260 | 40 | J | PATCH | 168 | 4 |
| 260 | 41 | J | PATCH | 169 | 4 |
| 260 | 42 | J | PATCH | 170 | 4 |
| 260 | 128 | J | PATCH | 0 | 1 |
| 260 | 129 | J | DIPOLE | 1 | 2 |
| 260 | 132 | J | PATCH | 4 | 2 |
| 260 | 133 | J | PATCH | 5 | 2 |
| 260 | 134 | J | PATCH | 6 | 2 |
| 260 | 135 | J | DIPOLE | 7 | 4 |
| 260 | 136 | J | DIPOLE | 8 | 4 |
| 260 | 137 | J | DIPOLE | 9 | 4 |
| 260 | 144 | J | PATCH | 16 | 2 |
| 260 | 145 | J | PATCH | 17 | 2 |
| 260 | 146 | J | DIPOLE | 18 | 4 |
| 260 | 147 | J | DIPOLE | 19 | 4 |
| 260 | 152 | J | PATCH | 24 | 4 |
| 260 | 153 | J | PATCH | 25 | 4 |
| 260 | 154 | J | PATCH | 26 | 4 |
| 260 | 155 | J | PATCH | 27 | 4 |
| 260 | 156 | J | PATCH | 28 | 4 |
| 260 | 167 | J | PATCH | 39 | 4 |
| 260 | 168 | J | PATCH | 40 | 4 |
| 260 | 169 | J | PATCH | 41 | 4 |
| 260 | 170 | J | PATCH | 42 | 4 |

## Table 4-4
## 5G mmW NR Band n261 Ant K Codebook

| Band | Beam ID | Antenna | Ant_Type | Paired_With | # of Antenna Feed |
|---|---|---|---|---|---|
| 261 | 3 | K | PATCH | 131 | 1 |
| 261 | 13 | K | PATCH | 143 | 2 |
| 261 | 14 | K | PATCH | 142 | 2 |
| 261 | 15 | K | PATCH | 141 | 2 |
| 261 | 22 | K | PATCH | 151 | 2 |
| 261 | 23 | K | PATCH | 150 | 2 |
| 261 | 34 | K | PATCH | 166 | 4 |
| 261 | 35 | K | PATCH | 164 | 4 |
| 261 | 36 | K | PATCH | 163 | 4 |
| 261 | 37 | K | PATCH | 162 | 4 |
| 261 | 38 | K | PATCH | 165 | 4 |
| 261 | 47 | K | PATCH | 177 | 4 |
| 261 | 48 | K | PATCH | 178 | 4 |
| 261 | 49 | K | PATCH | 176 | 4 |
| 261 | 50 | K | PATCH | 175 | 4 |
| 261 | 131 | K | PATCH | 3 | 1 |
| 261 | 141 | K | PATCH | 15 | 2 |
| 261 | 142 | K | PATCH | 14 | 2 |
| 261 | 143 | K | PATCH | 13 | 2 |
| 261 | 150 | K | PATCH | 23 | 2 |
| 261 | 151 | K | PATCH | 22 | 2 |
| 261 | 162 | K | PATCH | 37 | 4 |
| 261 | 163 | K | PATCH | 36 | 4 |
| 261 | 164 | K | PATCH | 35 | 4 |
| 261 | 165 | K | PATCH | 38 | 4 |
| 261 | 166 | K | PATCH | 34 | 4 |
| 261 | 175 | K | PATCH | 50 | 4 |
| 261 | 176 | K | PATCH | 49 | 4 |
| 261 | 177 | K | PATCH | 47 | 4 |
| 261 | 178 | K | PATCH | 48 | 4 |

**Table 4-5**
**5G mmW NR Band n260 Ant K Codebook**

| Band | Beam ID | Antenna | Ant_Type | Paired_With | # of Antenna Feed |
|---|---|---|---|---|---|
| 260 | 3 | K | PATCH | 131 | 1 |
| 260 | 13 | K | PATCH | 142 | 2 |
| 260 | 14 | K | PATCH | 141 | 2 |
| 260 | 15 | K | PATCH | 143 | 2 |
| 260 | 22 | K | PATCH | 150 | 2 |
| 260 | 23 | K | PATCH | 151 | 2 |
| 260 | 34 | K | PATCH | 164 | 4 |
| 260 | 35 | K | PATCH | 163 | 4 |
| 260 | 36 | K | PATCH | 162 | 4 |
| 260 | 37 | K | PATCH | 166 | 4 |
| 260 | 38 | K | PATCH | 165 | 4 |
| 260 | 47 | K | PATCH | 177 | 4 |
| 260 | 48 | K | PATCH | 176 | 4 |
| 260 | 49 | K | PATCH | 175 | 4 |
| 260 | 50 | K | PATCH | 178 | 4 |
| 260 | 131 | K | PATCH | 3 | 1 |
| 260 | 141 | K | PATCH | 14 | 2 |
| 260 | 142 | K | PATCH | 13 | 2 |
| 260 | 143 | K | PATCH | 15 | 2 |
| 260 | 150 | K | PATCH | 22 | 2 |
| 260 | 151 | K | PATCH | 23 | 2 |
| 260 | 162 | K | PATCH | 36 | 4 |
| 260 | 163 | K | PATCH | 35 | 4 |
| 260 | 164 | K | PATCH | 34 | 4 |
| 260 | 165 | K | PATCH | 38 | 4 |
| 260 | 166 | K | PATCH | 37 | 4 |
| 260 | 175 | K | PATCH | 49 | 4 |
| 260 | 176 | K | PATCH | 48 | 4 |
| 260 | 177 | K | PATCH | 47 | 4 |
| 260 | 178 | K | PATCH | 50 | 4 |

**Table 4-6**
**5G mmW NR Band n261 Ant L Codebook**

| Band | Beam ID | Antenna | Ant_Type | Paired_With | # of Antenna Feed |
|---|---|---|---|---|---|
| 261 | 2 | L | PATCH | 130 | 1 |
| 261 | 10 | L | PATCH | 140 | 2 |
| 261 | 11 | L | PATCH | 139 | 2 |
| 261 | 12 | L | PATCH | 138 | 2 |
| 261 | 20 | L | PATCH | 149 | 2 |
| 261 | 21 | L | PATCH | 148 | 2 |
| 261 | 29 | L | PATCH | 161 | 4 |
| 261 | 30 | L | PATCH | 159 | 4 |
| 261 | 31 | L | PATCH | 158 | 4 |
| 261 | 32 | L | PATCH | 157 | 4 |
| 261 | 33 | L | PATCH | 160 | 4 |
| 261 | 43 | L | PATCH | 174 | 4 |
| 261 | 44 | L | PATCH | 172 | 4 |
| 261 | 45 | L | PATCH | 171 | 4 |
| 261 | 46 | L | PATCH | 173 | 4 |
| 261 | 130 | L | PATCH | 2 | 1 |
| 261 | 138 | L | PATCH | 12 | 2 |
| 261 | 139 | L | PATCH | 11 | 2 |
| 261 | 140 | L | PATCH | 10 | 2 |
| 261 | 148 | L | PATCH | 21 | 2 |
| 261 | 149 | L | PATCH | 20 | 2 |
| 261 | 157 | L | PATCH | 32 | 4 |
| 261 | 158 | L | PATCH | 31 | 4 |
| 261 | 159 | L | PATCH | 30 | 4 |
| 261 | 160 | L | PATCH | 33 | 4 |
| 261 | 161 | L | PATCH | 29 | 4 |
| 261 | 171 | L | PATCH | 45 | 4 |
| 261 | 172 | L | PATCH | 44 | 4 |
| 261 | 173 | L | PATCH | 46 | 4 |
| 261 | 174 | L | PATCH | 43 | 4 |

**Table 4-7**
**5G mmW NR Band n260 Ant L Codebook**

| Band | Beam ID | Antenna | Ant_Type | Paired_With | # of Antenna Feed |
|---|---|---|---|---|---|
| 260 | 2 | L | PATCH | 130 | 1 |
| 260 | 10 | L | PATCH | 139 | 2 |
| 260 | 11 | L | PATCH | 138 | 2 |
| 260 | 12 | L | PATCH | 140 | 2 |
| 260 | 20 | L | PATCH | 148 | 2 |
| 260 | 21 | L | PATCH | 149 | 2 |
| 260 | 29 | L | PATCH | 159 | 4 |
| 260 | 30 | L | PATCH | 157 | 4 |
| 260 | 31 | L | PATCH | 158 | 4 |
| 260 | 32 | L | PATCH | 161 | 4 |
| 260 | 33 | L | PATCH | 160 | 4 |
| 260 | 43 | L | PATCH | 173 | 4 |
| 260 | 44 | L | PATCH | 172 | 4 |
| 260 | 45 | L | PATCH | 171 | 4 |
| 260 | 46 | L | PATCH | 174 | 4 |
| 260 | 130 | L | PATCH | 2 | 1 |
| 260 | 138 | L | PATCH | 11 | 2 |
| 260 | 139 | L | PATCH | 10 | 2 |
| 260 | 140 | L | PATCH | 12 | 2 |
| 260 | 148 | L | PATCH | 20 | 2 |
| 260 | 149 | L | PATCH | 21 | 2 |
| 260 | 157 | L | PATCH | 30 | 4 |
| 260 | 158 | L | PATCH | 31 | 4 |
| 260 | 159 | L | PATCH | 29 | 4 |
| 260 | 160 | L | PATCH | 33 | 4 |
| 260 | 161 | L | PATCH | 32 | 4 |
| 260 | 171 | L | PATCH | 45 | 4 |
| 260 | 172 | L | PATCH | 44 | 4 |
| 260 | 173 | L | PATCH | 43 | 4 |
| 260 | 174 | L | PATCH | 46 | 4 |

## 4.4 Simulation and modeling validation

Power density simulations of all beams and surfaces were performed by the manufacturer. Details of these simulations and modeling validation can be found in the Power Density Simulation Report (report SN could be found in Section 1-4 – Bibliography). Table 4-8 includes a summary of the validation results to support worst-case housing influence quantification in power density characterization for this model.

With an input power of 6 dBm for n261 band and 6 dBm for n260 band, PD measurements are conducted for at least one single beam per antenna type (dipole vs. patch) and per antenna module (J, K, L) on worst-surface(s) listed in Section 4.6. PD measurements are performed at mid channel of each mmW band and with CW modulation. All measured PD values are listed in Table 4-8 along with corresponding simulated PD values for the same configuration.

PD value will be used to determine worst-case housing influence for conservative assessment.

**Table 4-8**
**Measured and Simulated 4cm$^2$ psPD for Selected Beams**
**with 6 dBm Input Power for n261 and 6 dBm Input Power for n260**

| | | | | 4cm$^2$ psPD (mW/cm$^2$) | | |
|---|---|---|---|---|---|---|
| **Band** | **Antenna** | **Beam ID** | **Surface** | **Meas.** | **Sim** | **Delta = Sim. - Meas. (dB)** |
| n261 | J (Dipole) | 9 | Back | 0.45 | 1.18 | 4.21 |
| | | 136 | Back | 0.52 | 1.15 | **3.45** |
| | J (Patch) | 25 | Back | 1.33 | 1.70 | **1.07** |
| | | 155 | Back | 0.79 | 1.42 | 2.53 |
| | K (Patch) | 49 | Back | 0.49 | 1.23 | 4.00 |
| | | | Left | 0.61 | 1.45 | 3.80 |
| | | 164 | Back | 0.46 | 0.82 | **2.52** |
| | | | Left | 0.58 | 1.55 | 4.25 |
| | L (Patch) | 31 | Back | 0.72 | 1.39 | 2.86 |
| | | | Right | 0.80 | 1.35 | 2.24 |
| | | 172 | Back | 0.61 | 1.47 | 3.81 |
| | | | Right | 1.04 | 1.47 | **1.49** |
| n260 | J (Dipole) | 18 | Back | 0.29 | 0.90 | 4.88 |
| | | 146 | Back | 0.39 | 0.85 | **3.41** |
| | J (Patch) | 26 | Back | 0.55 | 1.53 | 4.47 |
| | | 168 | Back | 0.85 | 1.33 | **1.93** |
| | K (Patch) | 36 | Back | 0.93 | 1.13 | **0.86** |
| | | | Left | 0.99 | 1.48 | 1.78 |
| | | 177 | Back | 0.87 | 1.19 | 1.35 |
| | | | Left | 1.14 | 1.47 | 1.12 |
| | L (Patch) | 31 | Back | 0.77 | 1.34 | 2.39 |
| | | | Right | 1.03 | 1.43 | 1.42 |
| | | 173 | Back | 1.01 | 1.35 | 1.26 |
| | | | Right | 1.36 | 1.41 | **0.15** |

## 4.5 *PD_design_target*

*PD_design_target* is determined by ensuring that it is less than FCC PD limit after accounting for total device design uncertainties including TxAGC and device-to-device variation, specified by the manufacturer (see Table 4-9).

**Table 4-9**
***PD_design_target* Calculations**

| ***PD_design_target*** | |
|---|---|
| $PD\_design\_target < PD\_regulatory\_limit \times 10^{\frac{-Total\ Uncertainty}{10}}$ | |
| **psPD over 4 cm² Averaging Area (mW/cm²)** | |
| *Total Uncertainty* | 2.1 dB |
| *PD_regulatory_limit* | 1.0 mW/cm² |
| *PD_design_target* | 0.6166 mW/cm² |

## 4.6 Worst-case Housing Influence Determination: *Δmin*

For non-metal material, the material property cannot be accurately characterized at mmW frequencies to date. The estimated material property for the device housing is used in the simulation model, which could influence the accuracy in simulation for PD amplitude quantification. Since the housing influence on PD could vary from surface to surface where the EM field propagates through, the most underestimated surface is used to quantify the worst-case housing influence for conservative assessment.

Since the mmW antenna modules are placed at different location as shown in Figure 4-1, only surrounding material/housing has impact on EM field propagation, and in turn power density. Furthermore, depending on the type of antenna array, i.e., dipole antenna array or patch antenna array, the nature of EM field propagation in the near field is different. Therefore, the worst-case housing influence is determined per antenna module and per antenna type.

For this DUT, the below procedure was used to determine worst-case housing influence, *Δmin*:

1. Based on PD simulation, for each module and antenna type, determine one or more worst-surface(s) that has highest 4cm² PD for all the single beams per antenna module and per antenna type in the mid channel of each band.
2. For identified worst surface(s) per antenna module and per antenna type group,
    a. First determine $\Delta_{min}$ based on identified worst surface(s), and derive *input.power.limit*
    b. Then prove all other near-by surface(s), i.e., non-selected surface(s), is not required for housing material loss quantification (in other words, these non-evaluated surfaces have no influence on the determined *input.power.limit*) by:
        i. re-scale all simulated 4cm²PD values to *input.power.limit* to identify the worst-PD beam per each non-evaluated surface
        ii. Measure 4cm²PD at *input.power.limit* on identified worst-PD beam per each non-evaluated surface
        iii. Demonstrate all measured 4cm²PD values are below *PD_design_target*

3. If any of the above surface(s) in Step (2.b.iii) have measured 4cm² PD ≥ *PD_design_target*, then those surfaces must be included in the $\Delta_{min}$ determination in Step (2.a), and re-evaluate *input.power.limit* with these added surfaces.

Following above procedure, based on Table 2 ~ Table 7 in Samsung PD simulation report, the worst-surface(s) having highest 4cm²PD for all the single beams per each antenna type and each antenna module group in the mid channel of n261 and n260 bands are identified as:

a. for J dipole: Back (S2)

b. for J patch: Back (S2)

c. for K patch: Back (S2) & Left (S3)

d. for L patch: Back (S2) & Right (S4)

Thus, when comparing a simulated 4cm²-averaged PD and measured 4 cm²-averaged PD for the identified worst surface(s), the worst error introduced for each antenna type and each antenna module group when using the estimated material property in the simulation is highlighted in bold numbers in Table 4-8. Thus, the worst-case housing influence, denoted as $\Delta_{min} = \mathrm{Sim.PD} - \mathrm{Meas.PD}$ , is determined as

**Table 4-10**
**$\Delta_{min}$ for Ant J, Ant K and Ant L**

| Band | Ant | $\Delta_{min}$ (dB) |
|---|---|---|
| n261 | J (Dipole Beam) | 3.45 |
| | J (Patch Beam) | 1.07 |
| | K (Patch Beam) | 2.52 |
| | L (Patch Beam) | 1.49 |
| n260 | J (Dipole Beam) | 3.41 |
| | J (Patch Beam) | 1.93 |
| | K (Patch Beam) | 0.86 |
| | L (Patch Beam) | 0.15 |

$\Delta_{min}$ represents the worst case where RF exposure is underestimated the most in simulation when using the estimated material property of the housing. For conservative assessment, the $\Delta_{min}$ is used as the worst-case factor and applied to all the beams in the corresponding antenna type and antenna module group to determine input power limits in PD char for compliance.

The detail *input.power.limit* derivation is described in Section 4.7.

Simulated 4cm² PD values in Table 2 ~ Table 7 in Power Density Simulation Report are scaled to *input.power.limit* and are listed in Tables 4-11 – 4-18 for all single beams for all identified surfaces (shown in Table 4-1), when assuming the simulation is performed with correct housing influence.

Determine the worst beam for each of non-selected surface(s), i.e.,

a. for J dipole: Left (S3), Top (S5), Front (S1)

b. for J patch: Left (S3), Top (S5)

c. for K patch: Front (S1)

d. for L patch: Front (S1)

Then perform PD measurement for all determined worst-case beams, highlighted in orange in Tables 4-11 – 4-18, on the corresponding surface. Measurement is performed in the mid channel of each band with CW modulation. The evaluation distance is at 2 mm.

The test results in Table 4-19 shows that the all measured 4cm$^2$ PD values are less than *PD_design_target* of 0.6166 mW/cm$^2$, thus, the non-selected surfaces have no influence on the determined $\Delta_{min}$ and *input.power.limit* in Section 4.7.

**Table 4-11: n261/mid channel, J Dipole simulated 4cm$^2$ PD at *PD_Design_Target* (if simulation performed with correct housing material properties) ($\Delta_{min}$)**

| No. | Module | Type (P or D) | Beam ID_1 | Simulated 4cm2 PD(mW/cm2) Corresponding to PD_design_target if the simulation was performed with correct No. Module Type housing material properties | | | |
|---|---|---|---|---|---|---|---|
| | | | | S3(Left) | S5(Top) | S1(Front) | S2(Back) |
| 1 | J | DIPOLE | 1 | 0.106 | 0.197 | 0.012 | 0.552 |
| 2 | | | 7 | 0.184 | 0.209 | 0.021 | 0.582 |
| 3 | | | 8 | 0.070 | 0.256 | 0.010 | 0.569 |
| 4 | | | 9 | 0.061 | 0.264 | 0.014 | 0.607 |
| 5 | | | 18 | 0.127 | 0.231 | 0.014 | 0.555 |
| 6 | | | 19 | 0.046 | 0.266 | 0.011 | 0.592 |
| 7 | | | 129 | 0.086 | 0.236 | 0.022 | 0.602 |
| 8 | | | 135 | 0.059 | 0.275 | 0.042 | 0.571 |
| 9 | | | 136 | 0.030 | 0.303 | 0.017 | 0.598 |
| 10 | | | 137 | 0.174 | 0.228 | 0.050 | 0.596 |
| 11 | | | 146 | 0.025 | 0.294 | 0.029 | 0.583 |
| 12 | | | 147 | 0.116 | 0.304 | 0.024 | 0.617 |

Please note the above scaled simulation values correspond to PD_design_target if the simulation was performed with correct housing material properties.

### Table 4-12: n261/mid channel J Patch simulated 4cm$^2$ PD at *PD_Design_Target* (if simulation performed with correct housing material properties) ($\Delta_{min}$)

| No. | Module | Type (P or D) | Beam ID_1 | Simulated 4cm2 PD(mW/cm2) Corresponding to PD_design_target if the simulation was performed with correct No. Module Type housing material properties | | |
|---|---|---|---|---|---|---|
| | | | | S3(Left) | S5(Top) | S2(Back) |
| 19 | J | PATCH | 0 | 0.075 | 0.055 | **0.617** |
| 20 | | | 4 | 0.132 | 0.060 | **0.617** |
| 21 | | | 5 | 0.035 | 0.079 | **0.598** |
| 22 | | | 6 | 0.054 | 0.074 | **0.607** |
| 23 | | | 16 | 0.120 | 0.066 | **0.575** |
| 24 | | | 17 | 0.024 | 0.088 | **0.608** |
| 25 | | | 24 | 0.161 | 0.081 | **0.586** |
| 26 | | | 25 | 0.090 | 0.095 | **0.595** |
| 27 | | | 26 | 0.030 | 0.103 | **0.570** |
| 28 | | | 27 | 0.023 | 0.074 | **0.549** |
| 29 | | | 28 | 0.025 | 0.061 | **0.617** |
| 30 | | | 39 | 0.138 | 0.080 | **0.589** |
| 31 | | | 40 | 0.073 | 0.099 | **0.586** |
| 32 | | | 41 | 0.025 | 0.102 | **0.561** |
| 33 | | | 42 | 0.027 | 0.065 | **0.585** |
| 34 | | | 128 | 0.078 | 0.049 | **0.535** |
| 35 | | | 132 | 0.036 | 0.089 | **0.599** |
| 36 | | | 133 | 0.038 | 0.082 | **0.580** |
| 37 | | | 134 | 0.153 | 0.039 | **0.511** |
| 38 | | | 144 | 0.021 | 0.088 | **0.582** |
| 39 | | | 145 | 0.071 | 0.079 | **0.600** |
| 40 | | | 152 | 0.030 | 0.111 | **0.537** |
| 41 | | | 153 | 0.034 | 0.104 | **0.556** |
| 42 | | | 154 | 0.040 | 0.091 | **0.526** |
| 43 | | | 155 | 0.128 | 0.051 | **0.560** |
| 44 | | | 156 | 0.164 | 0.047 | **0.573** |
| 45 | | | 167 | 0.025 | 0.122 | **0.569** |
| 46 | | | 168 | 0.043 | 0.093 | **0.536** |
| 47 | | | 169 | 0.080 | 0.078 | **0.540** |
| 48 | | | 170 | 0.154 | 0.046 | **0.572** |

Please note the above scaled simulation values correspond to PD_design_target if the simulation was performed with correct housing material properties.

**Table 4-13: n261/mid channel, K Patch simulated 4cm$^2$ PD at *PD_Design_Target* (if simulation performed with correct housing material properties) ($\Delta_{min}$)**

| No. | Module | Type (P or D) | Beam ID_1 | Simulated 4cm2 PD(mW/cm2) Corresponding to PD_design_target if the simulation was performed with correct No. Module Type housing material properties | | |
|---|---|---|---|---|---|---|
| | | | | S3(Left) | S1(Front) | S2(Back) |
| 109 | K | PATCH | 3 | **0.617** | 0.065 | 0.515 |
| 110 | | | 13 | **0.617** | 0.104 | 0.485 |
| 111 | | | 14 | **0.594** | 0.106 | 0.481 |
| 112 | | | 15 | **0.604** | 0.082 | 0.469 |
| 113 | | | 22 | **0.617** | 0.085 | 0.485 |
| 114 | | | 23 | **0.617** | 0.058 | 0.585 |
| 115 | | | 34 | **0.614** | 0.141 | 0.448 |
| 116 | | | 35 | **0.617** | 0.100 | 0.506 |
| 117 | | | 36 | **0.617** | 0.099 | 0.511 |
| 118 | | | 37 | **0.565** | 0.049 | 0.537 |
| 119 | | | 38 | **0.598** | 0.112 | 0.590 |
| 120 | | | 47 | **0.617** | 0.120 | 0.471 |
| 121 | | | 48 | **0.612** | 0.100 | 0.505 |
| 122 | | | 49 | **0.616** | 0.090 | 0.524 |
| 123 | | | 50 | **0.584** | 0.080 | 0.571 |
| 124 | | | 131 | **0.617** | 0.107 | 0.436 |
| 125 | | | 141 | **0.612** | 0.117 | 0.243 |
| 126 | | | 142 | **0.617** | 0.100 | 0.502 |
| 127 | | | 143 | **0.545** | 0.071 | 0.520 |
| 128 | | | 150 | **0.617** | 0.105 | 0.499 |
| 129 | | | 151 | **0.565** | 0.076 | 0.482 |
| 130 | | | 162 | **0.606** | 0.123 | 0.341 |
| 131 | | | 163 | **0.617** | 0.108 | 0.363 |
| 132 | | | 164 | **0.617** | 0.087 | 0.328 |
| 133 | | | 165 | **0.550** | 0.054 | 0.286 |
| 134 | | | 166 | **0.580** | 0.069 | 0.414 |
| 135 | | | 175 | **0.617** | 0.112 | 0.327 |
| 136 | | | 176 | **0.617** | 0.110 | 0.349 |
| 137 | | | 177 | **0.557** | 0.068 | 0.290 |
| 138 | | | 178 | **0.587** | 0.062 | 0.359 |

Note: Even though the worst surface having the highest 4cm$^2$ PD values is left surface (S3), as shown in Table 4-8, the back surface (S2) was also selected for $\Delta_{min}$ determination. Therefore, the worst-case beam for remaining non-selected surfaces (identified in Table 4-1) is from front surface (S1) only.

Please note the above scaled simulation values correspond to PD_design_target if the simulation was performed with correct housing material properties.

### Table 4-14: n261/mid channel, L Patch simulated 4cm² PD at *PD_Design_Target* (if simulation performed with correct housing material properties) ($\Delta_{min}$)

| No. | Module | Type (P or D) | Beam ID_1 | Simulated 4cm2 PD(mW/cm2) Corresponding to PD_design_target if the simulation was performed with correct No. Module Type housing material properties | | |
|---|---|---|---|---|---|---|
| | | | | S4(Right) | S1(Front) | S2(Back) |
| 64 | L | PATCH | 2 | **0.617** | 0.127 | 0.580 |
| 65 | | | 10 | **0.617** | 0.130 | 0.609 |
| 66 | | | 11 | 0.581 | 0.095 | **0.589** |
| 67 | | | 12 | 0.571 | 0.077 | **0.614** |
| 68 | | | 20 | **0.617** | 0.089 | 0.614 |
| 69 | | | 21 | 0.507 | 0.054 | **0.608** |
| 70 | | | 29 | **0.617** | 0.143 | 0.582 |
| 71 | | | 30 | **0.617** | 0.114 | 0.611 |
| 72 | | | 31 | 0.598 | 0.080 | **0.617** |
| 73 | | | 32 | 0.551 | 0.049 | **0.617** |
| 74 | | | 33 | 0.511 | 0.083 | **0.617** |
| 75 | | | 43 | **0.614** | 0.125 | 0.584 |
| 76 | | | 44 | 0.603 | 0.083 | **0.613** |
| 77 | | | 45 | 0.588 | 0.078 | **0.617** |
| 78 | | | 46 | 0.527 | 0.064 | **0.617** |
| 79 | | | 130 | **0.603** | 0.083 | 0.601 |
| 80 | | | 138 | **0.617** | 0.112 | 0.577 |
| 81 | | | 139 | 0.605 | 0.096 | **0.617** |
| 82 | | | 140 | 0.442 | 0.056 | **0.547** |
| 83 | | | 148 | **0.609** | 0.101 | 0.596 |
| 84 | | | 149 | 0.507 | 0.072 | **0.570** |
| 85 | | | 157 | **0.611** | 0.119 | 0.589 |
| 86 | | | 158 | **0.617** | 0.110 | 0.615 |
| 87 | | | 159 | 0.615 | 0.083 | **0.617** |
| 88 | | | 160 | 0.499 | 0.061 | **0.532** |
| 89 | | | 161 | 0.435 | 0.056 | **0.556** |
| 90 | | | 171 | **0.610** | 0.111 | 0.600 |
| 91 | | | 172 | 0.615 | 0.090 | **0.617** |
| 92 | | | 173 | 0.552 | 0.075 | **0.559** |
| 93 | | | 174 | 0.478 | 0.052 | **0.564** |

Please note the above scaled simulation values correspond to PD_design_target if the simulation was performed with correct housing material properties.

**Table 4-15: n260/mid channel, J Dipole simulated 4cm$^2$ PD at *PD_Design_Target* (if simulation performed with correct housing material properties) ($\Delta_{min}$)**

| No. | Module | Type (P or D) | Beam ID_1 | Simulated 4cm2 PD(mW/cm2) Corresponding to PD_design_target if the simulation was performed with correct No. Module Type housing material properties | | | |
|---|---|---|---|---|---|---|---|
| | | | | S3(Left) | S5(Top) | S1(Front) | S2(Back) |
| 1 | J | DIPOLE | 1 | 0.109 | 0.191 | 0.025 | **0.601** |
| 2 | | | 7 | 0.179 | 0.157 | 0.027 | **0.617** |
| 3 | | | 8 | 0.046 | 0.258 | 0.013 | **0.604** |
| 4 | | | 9 | 0.140 | 0.163 | 0.026 | **0.590** |
| 5 | | | 18 | 0.173 | 0.168 | 0.026 | **0.617** |
| 6 | | | 19 | 0.111 | 0.191 | 0.021 | **0.569** |
| 7 | | | 129 | 0.078 | 0.175 | 0.028 | **0.617** |
| 8 | | | 135 | 0.102 | 0.173 | 0.013 | **0.583** |
| 9 | | | 136 | 0.067 | 0.187 | 0.046 | **0.595** |
| 10 | | | 137 | 0.123 | 0.149 | 0.023 | **0.587** |
| 11 | | | 146 | 0.064 | 0.204 | 0.011 | **0.579** |
| 12 | | | 147 | 0.128 | 0.140 | 0.031 | **0.588** |

Please note the above scaled simulation values correspond to PD_design_target if the simulation was performed with correct housing material properties.

### Table 4-16: n260/mid channel, J Patch simulated 4cm$^2$ PD at *PD_Design_Target* (if simulation performed with correct housing material properties) ($\Delta_{min}$)

| No. | Module | Type (P or D) | Beam ID_1 | Simulated 4cm2 PD(mW/cm2) Corresponding to PD_design_target if the simulation was performed with correct No. Module Type housing material properties | | |
|---|---|---|---|---|---|---|
| | | | | S3(Left) | S5(Top) | S2(Back) |
| 19 | J | PATCH | 0 | 0.152 | 0.109 | 0.617 |
| 20 | | | 4 | 0.074 | 0.112 | 0.617 |
| 21 | | | 5 | 0.031 | 0.170 | 0.617 |
| 22 | | | 6 | 0.156 | 0.122 | 0.617 |
| 23 | | | 16 | 0.053 | 0.134 | 0.617 |
| 24 | | | 17 | 0.057 | 0.151 | 0.617 |
| 25 | | | 24 | 0.183 | 0.102 | 0.617 |
| 26 | | | 25 | 0.103 | 0.179 | 0.614 |
| 27 | | | 26 | 0.043 | 0.208 | 0.617 |
| 28 | | | 27 | 0.099 | 0.208 | 0.603 |
| 29 | | | 28 | 0.129 | 0.144 | 0.617 |
| 30 | | | 39 | 0.169 | 0.132 | 0.617 |
| 31 | | | 40 | 0.048 | 0.178 | 0.606 |
| 32 | | | 41 | 0.082 | 0.216 | 0.617 |
| 33 | | | 42 | 0.096 | 0.204 | 0.592 |
| 34 | | | 128 | 0.085 | 0.107 | 0.574 |
| 35 | | | 132 | 0.187 | 0.136 | 0.617 |
| 36 | | | 133 | 0.037 | 0.193 | 0.617 |
| 37 | | | 134 | 0.071 | 0.075 | 0.602 |
| 38 | | | 144 | 0.043 | 0.193 | 0.617 |
| 39 | | | 145 | 0.061 | 0.120 | 0.596 |
| 40 | | | 152 | 0.163 | 0.142 | 0.617 |
| 41 | | | 153 | 0.082 | 0.174 | 0.612 |
| 42 | | | 154 | 0.105 | 0.159 | 0.554 |
| 43 | | | 155 | 0.108 | 0.118 | 0.617 |
| 44 | | | 156 | 0.128 | 0.102 | 0.617 |
| 45 | | | 167 | 0.151 | 0.153 | 0.597 |
| 46 | | | 168 | 0.036 | 0.159 | 0.584 |
| 47 | | | 169 | 0.145 | 0.142 | 0.526 |
| 48 | | | 170 | 0.107 | 0.096 | 0.617 |

Please note the above scaled simulation values correspond to PD_design_target if the simulation was performed with correct housing material properties.

**Table 4-17: n260/mid channel, K Patch simulated 4cm$^2$ PD at *PD_Design_Target***
**(if simulation performed with correct housing material properties) ($\Delta_{min}$)**

| No. | Module | Type (P or D) | Beam ID_1 | Simulated 4cm2 PD(mW/cm2) Corresponding to PD_design_target if the simulation was performed with correct No. Module Type housing material properties | | |
|---|---|---|---|---|---|---|
| | | | | S3(Left) | S1(Front) | S2(Back) |
| 109 | K | PATCH | 3 | **0.617** | 0.062 | 0.402 |
| 110 | | | 13 | **0.617** | 0.098 | 0.385 |
| 111 | | | 14 | **0.617** | 0.132 | 0.441 |
| 112 | | | 15 | **0.617** | 0.086 | 0.390 |
| 113 | | | 22 | **0.617** | 0.124 | 0.410 |
| 114 | | | 23 | **0.617** | 0.084 | 0.399 |
| 115 | | | 34 | **0.617** | 0.084 | 0.398 |
| 116 | | | 35 | **0.617** | 0.108 | 0.474 |
| 117 | | | 36 | **0.617** | 0.099 | 0.469 |
| 118 | | | 37 | **0.591** | 0.083 | 0.428 |
| 119 | | | 38 | **0.617** | 0.110 | 0.365 |
| 120 | | | 47 | **0.617** | 0.094 | 0.448 |
| 121 | | | 48 | **0.617** | 0.129 | 0.481 |
| 122 | | | 49 | **0.602** | 0.088 | 0.467 |
| 123 | | | 50 | **0.607** | 0.099 | 0.390 |
| 124 | | | 131 | **0.617** | 0.058 | 0.395 |
| 125 | | | 141 | **0.617** | 0.079 | 0.366 |
| 126 | | | 142 | **0.617** | 0.115 | 0.481 |
| 127 | | | 143 | **0.617** | 0.074 | 0.343 |
| 128 | | | 150 | **0.617** | 0.115 | 0.438 |
| 129 | | | 151 | **0.617** | 0.102 | 0.399 |
| 130 | | | 162 | **0.617** | 0.110 | 0.371 |
| 131 | | | 163 | **0.597** | 0.106 | 0.471 |
| 132 | | | 164 | **0.617** | 0.099 | 0.497 |
| 133 | | | 165 | **0.612** | 0.098 | 0.461 |
| 134 | | | 166 | **0.617** | 0.112 | 0.345 |
| 135 | | | 175 | **0.593** | 0.103 | 0.455 |
| 136 | | | 176 | **0.610** | 0.112 | 0.477 |
| 137 | | | 177 | **0.617** | 0.088 | 0.496 |
| 138 | | | 178 | **0.616** | 0.113 | 0.373 |

Note: Even though the worst surface having the highest 4cm$^2$ PD values is left surface (S3), as shown in Table 4-8, the back surface (S2) was also selected for $\Delta_{min}$ determination. Therefore, the worst-case beam for remaining non-selected surfaces (identified in Table 4-1) is from front surface (S1) only.

Please note the above scaled simulation values correspond to PD_design_target if the simulation was performed with correct housing material properties.

**Table 4-18: n260/mid channel, L Patch simulated 4cm$^2$PD at *PD_Design_Target* (if simulation performed with correct housing material properties) ($\Delta_{min}$)**

| No. | Module | Type (P or D) | Beam ID_1 | Simulated 4cm2 PD(mW/cm2) Corresponding to PD_design_target if the simulation was performed with correct No. Module Type housing material properties | | |
|---|---|---|---|---|---|---|
| | | | | S4(Right) | S1(Front) | S2(Back) |
| 64 | L | PATCH | 2 | **0.617** | 0.063 | 0.547 |
| 65 | | | 10 | **0.614** | 0.072 | 0.529 |
| 66 | | | 11 | **0.617** | 0.095 | 0.591 |
| 67 | | | 12 | **0.617** | 0.083 | 0.515 |
| 68 | | | 20 | **0.617** | 0.087 | 0.565 |
| 69 | | | 21 | **0.617** | 0.065 | 0.572 |
| 70 | | | 29 | **0.616** | 0.085 | 0.559 |
| 71 | | | 30 | **0.617** | 0.087 | 0.599 |
| 72 | | | 31 | **0.617** | 0.095 | 0.578 |
| 73 | | | 32 | **0.593** | 0.078 | 0.534 |
| 74 | | | 33 | **0.617** | 0.120 | 0.518 |
| 75 | | | 43 | **0.615** | 0.090 | 0.582 |
| 76 | | | 44 | **0.617** | 0.091 | 0.583 |
| 77 | | | 45 | **0.617** | 0.075 | 0.580 |
| 78 | | | 46 | **0.611** | 0.103 | 0.510 |
| 79 | | | 130 | **0.617** | 0.069 | 0.550 |
| 80 | | | 138 | **0.617** | 0.074 | 0.518 |
| 81 | | | 139 | **0.617** | 0.073 | 0.559 |
| 82 | | | 140 | **0.617** | 0.070 | 0.558 |
| 83 | | | 148 | **0.617** | 0.083 | 0.602 |
| 84 | | | 149 | **0.617** | 0.076 | 0.549 |
| 85 | | | 157 | **0.617** | 0.098 | 0.579 |
| 86 | | | 158 | **0.617** | 0.088 | 0.596 |
| 87 | | | 159 | **0.617** | 0.090 | 0.580 |
| 88 | | | 160 | **0.603** | 0.081 | 0.562 |
| 89 | | | 161 | **0.594** | 0.106 | 0.539 |
| 90 | | | 171 | **0.617** | 0.080 | 0.583 |
| 91 | | | 172 | **0.602** | 0.091 | 0.562 |
| 92 | | | 173 | **0.617** | 0.081 | 0.594 |
| 93 | | | 174 | **0.604** | 0.098 | 0.545 |

Note: Even though the worst surface having the highest 4cm$^2$ PD values is right surface (S4), as shown in Table 4-8, the back surface (S2) was also selected for $\Delta_{min}$ determination. Therefore, the worst-case beam for remaining non-selected surfaces (identified in Table 4-1) is from front surface (S1) only.

Please note the above scaled simulation values correspond to PD_design_target if the simulation was performed with correct housing material properties.

**Table 4-19: 4cm² PD of the selected beams measured on the corresponding surfaces that are not selected for $\Delta_{min}$ determination**

| Band | Antenna | Beam ID | Surface | input.power.limit (dBm) | Meas. 4cm² PD (mW/cm²) |
|---|---|---|---|---|---|
| n261 | J (Dipole) | 137 | Front | 8 | 0.09 |
| | | 147 | Top | 7.1 | 0.25 |
| | | 7 | Left | 7.1 | 0.26 |
| | J (Patch) | 167 | Top | 2.8 | 0.19 |
| | | 156 | Left | 2.9 | 0.21 |
| | K (Patch) | 34 | Front | 5.1 | 0.27 |
| | L (Patch) | 29 | Front | 3.9 | 0.22 |
| n260 | J (Dipole) | 136 | Front | 7.9 | 0.12 |
| | | 8 | Top | 7 | 0.18 |
| | | 7 | Left | 7.1 | 0.15 |
| | J (Patch) | 41 | Top | 3.7 | 0.11 |
| | | 132 | Left | 7.2 | 0.17 |
| | K (Patch) | 14 | Front | 5.6 | 0.15 |
| | L (Patch) | 33 | Front | 3.2 | 0.18 |

## 4.7 PD Char

### 4.7.1 Scaling Factor for Single Beams

To determine the input power limit at each antenna port, simulation was performed at low, mid, and high channel for each mmW band supported, with 6 dBm input power per active port for n261 band and 6 dBm input power per active port for n260 band:

1. Obtained $PD_{surface}$ value (the worst PD among all identified surfaces of the DUT) at all three channels for all single beams specified in the codebook.
2. Derived a scaling factor at low, mid and high channel, $s(i)_{low\_or\_mid\_or\_high}$, by:

$$s(i)_{low\_or\_mid\_or\_high} = \frac{PD\ design\ target}{sim.PD_{surface}(i)},\ i \in single\ beams \qquad (1)$$

3. Determined the worst-case scaling factor, $\boldsymbol{s(i)}$, among low, mid and high channels:

$$\boldsymbol{s(i)} = min\{s_{low}(i), s_{mid}(i), s_{high}(i)\},\ i \in single\ beams \qquad (2)$$

and this scaling factor applies to the input power at each antenna port.

### 4.7.2 Scaling Factor for Beam Pairs

Per the manufacturer, the relative phase between beam pair is not controlled in the chipset design and could vary from run to run. Therefore, for each beam pair, based on the simulation results, the worst-case scaling factor was determined mathematically to ensure the compliance. The worst-case PD for MIMO operations was found by sweeping the relative phase for all possible angles to ensure a conservative assessment. The power density simulation report contains the worst-case power density for each surface after sweeping through all relative phases between beams.

Once the power density was determined for the worst-case ∅, the scaling factor was obtained by the below equation for low, mid and high channels:

$$s(i)_{low\_or\_mid\_or\_high} = \frac{PD\ design\ target}{total\ PD\ (\emptyset(i)_{worstcase})}, i \in beam\ pairs \quad (3)$$

The $total\ PD\ (\emptyset_{worstcase})$ varies with channel and beam pair, the lowest scaling factor among all three channels, $s(i)$, is determined for the beam pair *i*:

$$\boldsymbol{s(i)} = min\{s_{low}(i), s_{mid}(i), s_{high}(i)\},\ i \in beam\ pairs \quad (4)$$

### 4.7.3 *Input.Power.Limit* Calculations

The PD Char specifies the limit of input power at antenna port that corresponds to *PD_design_target* for all the beams.

Ideally, if there is no uncertainty associated with hardware design, the input power limit, denoted as $input.power.limit(i)$, for beam *i* can be obtained after accounting for the housing influence ($\Delta_{min}$) determined in Table 4-11, given by:

- For n260 and n261

$$input.power.limit(i) = 6\ dBm + 10 * \log(s(i)) + \Delta_{min},\ i \in all\ beams \quad (5)$$

where $6\ dBm$ is the input power used in simulation for n261 and n260, respectively; $s(i)$ is the scaling factor obtained from Eq. (2) or Eq. (4) for beam *i*; $\Delta_{min}$ is the worst-case housing influence factor (determined in Table 4-10) for beam *i*.

If simulation overestimates the housing influence, then $\Delta_{min}$ (= simulated PD – measured PD) is negative, which means that the measured PD would be higher than the simulated PD. The input power to antenna elements determined via simulation must be decreased for compliance.

Similarly, if simulation underestimates the loss, then $\Delta_{min}$ is positive (measured PD would be lower than the simulated value). Input power to antenna elements determined via simulation can be increased and still be PD compliant.

In reality the hardware design has uncertainty which must be properly considered. The device design related uncertainty is embedded in the process of $\Delta_{min}$ determination. Since the device uncertainty is already accounted for in *PD_design_target*, it needs to be removed to avoid double counting this uncertainty.

Thus, Equation 5 is modified to:

**If** -TxAGC uncertainty < $\Delta_{min}$ < TxAGC uncertainty,

$$input.power.limit(i) = 6\ dBm + 10 * \log(s(i)),\ i \in all\ beams, \text{ for n260 and n261} \quad (6)$$

**else if** $\Delta_{min}$ < -TxAGC uncertainty,

$$input.power.limit(i) = 6\ dBm + 10 * \log(s(i)) + (\Delta_{min} + \text{TxAGC uncertainty}),$$
$$i \in all\ beams, \text{ for n260 and n261} \quad (7)$$

**else if** $\Delta_{min}$ > TxAGC uncertainty,

$$input.power.limit(i) = 6\ dBm + 10 * \log(s(i)) + (\Delta_{min} - \text{TxAGC uncertainty}),$$
$$i \in all\ beams, \text{ for n260 and n261} \quad (8)$$

Following above logic, the *input.power.limit* for this DUT can be calculated using Equations (6), (7), and (8), i.e.,

**Table 4-20**
***input.power.limit* Calculation**

| Band | Antenna | $\Delta_{min}$ (dB) | TxAGC Uncertainty (dB) | *input.power.limit* (dBm) = | Notes |
|---|---|---|---|---|---|
| n261 | J (dipole beam) | 3.45 | 0.7 | $6\ dBm + 10 * \log(s(i)) + 2.75$ | Using Eq. 8 |
| | J (patch beam) | 1.07 | 0.5 | $6\ dBm + 10 * \log(s(i)) + 0.57$ | Using Eq. 8 |
| | K (patch beam) | 2.52 | 0.5 | $6\ dBm + 10 * \log(s(i)) + 2.02$ | Using Eq. 8 |
| | L (patch beam) | 1.49 | 0.5 | $6\ dBm + 10 * \log(s(i)) + 0.99$ | Using Eq. 8 |
| n260 | J (dipole beam) | 3.41 | 0.7 | $6\ dBm + 10 * \log(s(i)) + 2.71$ | Using Eq. 8 |
| | J (patch beam) | 1.93 | 0.5 | $6\ dBm + 10 * \log(s(i)) + 1.43$ | Using Eq. 8 |
| | K (patch beam) | 0.86 | 0.5 | $6\ dBm + 10 * \log(s(i)) + 0.36$ | Using Eq. 8 |
| | L (patch beam) | 0.15 | 0.5 | $6\ dBm + 10 * \log(s(i))$ | Using Eq. 6 |

Thus, the DUT PD Char for n261 and n260 bands is as shown in the tables 4-21 – 4-28 below. The full simulation results used to support this calculation can be found in the Power Density Simulation Report.

**Table 4-21**
**5G NR n261 J Dipole *input.power.limit***

| Antenna | Beam ID_1 | Beam ID_2 | input.power.limit (dBm) |
|---|---|---|---|
| J Dipole | 1 | | 8.7 |
| | 7 | | 7.1 |
| | 8 | | 6.1 |
| | 9 | | 5.9 |
| | 18 | | 6.3 |
| | 19 | | 5.9 |
| | 129 | | 11.4 |
| | 135 | | 6.5 |
| | 136 | | 5.9 |
| | 137 | | 8.0 |
| | 146 | | 6.0 |
| | 147 | | 7.1 |
| | 1 | 129 | 7.8 |
| | 7 | 137 | 6.1 |
| | 8 | 136 | 3.4 |
| | 9 | 135 | 3.7 |
| | 18 | 147 | 3.7 |
| | 19 | 146 | 3.0 |

**Table 4-22**
**5G NR n261 J Patch *input.power.limit***

| Antenna | Beam ID_1 | Beam ID_2 | input.power.limit (dBm) |
|---|---|---|---|
| J Patch | 0 | | 8.4 |
| | 4 | | 5.6 |
| | 5 | | 5.2 |
| | 6 | | 6.1 |
| | 16 | | 4.4 |
| | 17 | | 5.5 |
| | 24 | | 2.5 |
| | 25 | | 2.0 |
| | 26 | | 2.1 |
| | 27 | | 2.3 |
| | 28 | | 2.7 |
| | 39 | | 2.2 |
| | 40 | | 2.0 |
| | 41 | | 2.1 |
| | 42 | | 2.6 |
| | 128 | | 9.6 |
| | 132 | | 5.7 |
| | 133 | | 4.4 |
| | 134 | | 7.1 |
| | 144 | | 4.5 |
| | 145 | | 4.7 |
| | 152 | | 3.0 |
| | 153 | | 2.7 |
| | 154 | | 2.6 |
| | 155 | | 2.5 |
| | 156 | | 2.9 |
| | 167 | | 2.8 |
| | 168 | | 2.7 |
| | 169 | | 2.5 |
| | 170 | | 2.8 |
| | 0 | 128 | 5.8 |
| | 4 | 134 | 3.5 |
| | 5 | 133 | 1.6 |
| | 6 | 132 | 2.3 |
| | 16 | 144 | 2.2 |
| | 17 | 145 | 2.0 |
| | 24 | 155 | -0.7 |
| | 25 | 154 | -1.0 |
| | 26 | 153 | -0.8 |
| | 27 | 152 | -0.7 |
| | 28 | 156 | 0.1 |
| | 39 | 169 | -0.9 |
| | 40 | 168 | -0.9 |
| | 41 | 167 | -0.8 |
| | 42 | 170 | -0.3 |

**Table 4-23**
**5G NR n261 K Patch *input.power.limit***

| Antenna | Beam ID_1 | Beam ID_2 | input.power.limit (dBm) |
|---|---|---|---|
| K Patch | 3 | | 9.9 |
| | 13 | | 8.3 |
| | 14 | | 7.6 |
| | 15 | | 9.0 |
| | 22 | | 7.2 |
| | 23 | | 7.8 |
| | 34 | | 5.1 |
| | 35 | | 4.6 |
| | 36 | | 4.3 |
| | 37 | | 4.8 |
| | 38 | | 5.5 |
| | 47 | | 4.6 |
| | 48 | | 4.4 |
| | 49 | | 4.3 |
| | 50 | | 5.1 |
| | 131 | | 10.3 |
| | 141 | | 9.0 |
| | 142 | | 6.5 |
| | 143 | | 7.6 |
| | 150 | | 6.4 |
| | 151 | | 6.9 |
| | 162 | | 5.5 |
| | 163 | | 4.7 |
| | 164 | | 4.0 |
| | 165 | | 4.2 |
| | 166 | | 5.1 |
| | 175 | | 4.7 |
| | 176 | | 4.6 |
| | 177 | | 4.1 |
| | 178 | | 4.6 |
| | 3 | 131 | 7.3 |
| | 13 | 143 | 3.9 |
| | 14 | 142 | 3.0 |
| | 15 | 141 | 6.2 |
| | 22 | 151 | 3.8 |
| | 23 | 150 | 3.9 |
| | 34 | 166 | 1.0 |
| | 35 | 164 | 0.4 |
| | 36 | 163 | 0.4 |
| | 37 | 162 | 1.1 |
| | 38 | 165 | 2.4 |
| | 47 | 177 | 0.8 |
| | 48 | 178 | 1.5 |
| | 49 | 176 | 0.2 |
| | 50 | 175 | 1.0 |

**Table 4-24**
**5G NR n261 L Patch *input.power.limit***

| Antenna | Beam ID_1 | Beam ID_2 | input.power.limit (dBm) |
|---|---|---|---|
| L Patch | 2 | | 10.6 |
| | 10 | | 7.4 |
| | 11 | | 6.9 |
| | 12 | | 8.1 |
| | 20 | | 6.6 |
| | 21 | | 6.5 |
| | 29 | | 3.9 |
| | 30 | | 3.8 |
| | 31 | | 3.5 |
| | 32 | | 3.9 |
| | 33 | | 4.2 |
| | 43 | | 3.6 |
| | 44 | | 3.7 |
| | 45 | | 3.6 |
| | 46 | | 4.0 |
| | 130 | | 9.6 |
| | 138 | | 8.0 |
| | 139 | | 5.8 |
| | 140 | | 6.1 |
| | 148 | | 5.9 |
| | 149 | | 5.8 |
| | 157 | | 4.5 |
| | 158 | | 3.5 |
| | 159 | | 3.2 |
| | 160 | | 3.3 |
| | 161 | | 3.3 |
| | 171 | | 3.7 |
| | 172 | | 3.2 |
| | 173 | | 3.1 |
| | 174 | | 3.4 |
| | 2 | 130 | 8.2 |
| | 10 | 140 | 2.8 |
| | 11 | 139 | 2.2 |
| | 12 | 138 | 5.3 |
| | 20 | 149 | 2.8 |
| | 21 | 148 | 2.9 |
| | 29 | 161 | -0.3 |
| | 30 | 159 | -0.4 |
| | 31 | 158 | -0.6 |
| | 32 | 157 | -0.2 |
| | 33 | 160 | 0.8 |
| | 43 | 174 | -0.5 |
| | 44 | 172 | -0.7 |
| | 45 | 171 | -0.5 |
| | 46 | 173 | 0.9 |

**Table 4-25**
**5G NR n260 J Dipole *input.power.limit***

| Antenna | Beam ID_1 | Beam ID_2 | input.power.limit (dBm) |
|---|---|---|---|
| J Dipole | 1 | | 9.2 |
| | 7 | | 7.1 |
| | 8 | | 7.0 |
| | 9 | | 6.9 |
| | 18 | | 7.0 |
| | 19 | | 6.8 |
| | 129 | | 11.3 |
| | 135 | | 7.1 |
| | 136 | | 7.9 |
| | 137 | | 7.3 |
| | 146 | | 7.1 |
| | 147 | | 7.5 |
| | 1 | 129 | 7.7 |
| | 7 | 135 | 4.4 |
| | 8 | 136 | 4.9 |
| | 9 | 137 | 4.6 |
| | 18 | 146 | 4.3 |
| | 19 | 147 | 4.5 |

**Table 4-26**
**5G NR n260 J Patch *input.power.limit***

| Antenna | Beam ID_1 | Beam ID_2 | input.power.limit (dBm) |
|---|---|---|---|
| J Patch | 0 | | 9.7 |
| | 4 | | 6.4 |
| | 5 | | 6.6 |
| | 6 | | 6.3 |
| | 16 | | 6.4 |
| | 17 | | 6.1 |
| | 24 | | 3.6 |
| | 25 | | 3.9 |
| | 26 | | 3.5 |
| | 27 | | 3.8 |
| | 28 | | 3.7 |
| | 39 | | 3.6 |
| | 40 | | 3.9 |
| | 41 | | 3.7 |
| | 42 | | 3.7 |
| | 128 | | 9.9 |
| | 132 | | 7.2 |
| | 133 | | 6.9 |
| | 134 | | 6.8 |
| | 144 | | 6.6 |
| | 145 | | 6.8 |
| | 152 | | 4.1 |
| | 153 | | 4.2 |
| | 154 | | 4.1 |
| | 155 | | 4.8 |
| | 156 | | 4.5 |
| | 167 | | 4.0 |
| | 168 | | 3.9 |
| | 169 | | 4.6 |
| | 170 | | 4.6 |
| | 0 | 128 | 6.5 |
| | 4 | 132 | 4.4 |
| | 5 | 133 | 3.4 |
| | 6 | 134 | 3.8 |
| | 16 | 144 | 2.9 |
| | 17 | 145 | 3.4 |
| | 24 | 152 | 0.5 |
| | 25 | 153 | 0.4 |
| | 26 | 154 | 0.5 |
| | 27 | 155 | 0.6 |
| | 28 | 156 | 0.7 |
| | 39 | 167 | 0.2 |
| | 40 | 168 | 0.6 |
| | 41 | 169 | 0.6 |
| | 42 | 170 | 0.5 |

**Table 4-27**
**5G NR n260 K Patch *input.power.limit***

| Antenna | Beam ID_1 | Beam ID_2 | input.power.limit (dBm) |
|---|---|---|---|
| K Patch | 3 | | 7.9 |
| | 13 | | 5.6 |
| | 14 | | 5.6 |
| | 15 | | 5.0 |
| | 22 | | 6.1 |
| | 23 | | 4.9 |
| | 34 | | 3.5 |
| | 35 | | 3.7 |
| | 36 | | 2.5 |
| | 37 | | 2.6 |
| | 38 | | 3.0 |
| | 47 | | 3.7 |
| | 48 | | 3.5 |
| | 49 | | 2.6 |
| | 50 | | 2.7 |
| | 131 | | 8.3 |
| | 141 | | 4.7 |
| | 142 | | 5.6 |
| | 143 | | 4.8 |
| | 150 | | 5.5 |
| | 151 | | 4.8 |
| | 162 | | 3.2 |
| | 163 | | 3.4 |
| | 164 | | 2.8 |
| | 165 | | 2.7 |
| | 166 | | 2.9 |
| | 175 | | 3.6 |
| | 176 | | 3.4 |
| | 177 | | 2.6 |
| | 178 | | 2.8 |
| | 3 | 131 | 4.6 |
| | 13 | 142 | 1.4 |
| | 14 | 141 | 1.5 |
| | 15 | 143 | 1.9 |
| | 22 | 150 | 1.6 |
| | 23 | 151 | 1.5 |
| | 34 | 164 | -0.9 |
| | 35 | 163 | -1.1 |
| | 36 | 162 | -1.2 |
| | 37 | 166 | -0.8 |
| | 38 | 165 | -0.8 |
| | 47 | 177 | -0.4 |
| | 48 | 176 | -1.5 |
| | 49 | 175 | -0.6 |
| | 50 | 178 | -0.5 |

**Table 4-28**
**5G NR n260 L Patch *input.power.limit***

| Antenna | Beam ID_1 | Beam ID_2 | input.power.limit (dBm) |
|---|---|---|---|
| L Patch | 2 | | 7.8 |
| | 10 | | 5.6 |
| | 11 | | 5.7 |
| | 12 | | 4.7 |
| | 20 | | 6.0 |
| | 21 | | 5.0 |
| | 29 | | 3.5 |
| | 30 | | 3.4 |
| | 31 | | 2.4 |
| | 32 | | 2.5 |
| | 33 | | 3.2 |
| | 43 | | 3.5 |
| | 44 | | 3.2 |
| | 45 | | 2.5 |
| | 46 | | 2.8 |
| | 130 | | 8.3 |
| | 138 | | 5.2 |
| | 139 | | 5.4 |
| | 140 | | 4.7 |
| | 148 | | 5.7 |
| | 149 | | 4.7 |
| | 157 | | 3.5 |
| | 158 | | 3.3 |
| | 159 | | 2.6 |
| | 160 | | 2.5 |
| | 161 | | 3.0 |
| | 171 | | 3.5 |
| | 172 | | 3.3 |
| | 173 | | 2.4 |
| | 174 | | 2.8 |
| | 2 | 130 | 4.7 |
| | 10 | 139 | 2.9 |
| | 11 | 138 | 1.6 |
| | 12 | 140 | 1.8 |
| | 20 | 148 | 1.5 |
| | 21 | 149 | 1.3 |
| | 29 | 159 | -1.0 |
| | 30 | 157 | 0.1 |
| | 31 | 158 | -0.9 |
| | 32 | 161 | -0.9 |
| | 33 | 160 | -1.0 |
| | 43 | 173 | -0.8 |
| | 44 | 172 | -1.3 |
| | 45 | 171 | -0.8 |
| | 46 | 174 | -0.6 |

# 5 EQUIPMENT LIST

## For SAR measurements

| Manufacturer | Model | Description | Cal Date | Cal Interval | Cal Due | Serial Number |
|---|---|---|---|---|---|---|
| Agilent | 8753ES | S-Parameter Network Analyzer | 3/11/2019 | Annual | 3/11/2020 | US39170122 |
| Agilent | 8753ES | S-Parameter Network Analyzer | 8/26/2019 | Annual | 8/26/2020 | MY40000670 |
| Agilent | 8753ES | S-Parameter Vector Network Analyzer | 9/19/2019 | Annual | 9/19/2020 | MY40003841 |
| Agilent | E4438C | ESG Vector Signal Generator | 5/22/2019 | Annual | 5/22/2020 | MY45091346 |
| Agilent | E4438C | ESG Vector Signal Generator | 5/23/2019 | Annual | 5/23/2020 | MY47270002 |
| Agilent | E4438C | ESG Vector Signal Generator | 3/8/2019 | Biennial | 3/8/2021 | MY42082385 |
| Agilent | E4438C | ESG Vector Signal Generator | 3/11/2019 | Biennial | 3/11/2021 | MY45090700 |
| Agilent | E5515C | Wireless Communications Test Set | 6/26/2019 | Annual | 6/26/2020 | MY50267125 |
| Agilent | E5515C | Wireless Communications Test Set | 9/25/2019 | Annual | 9/25/2020 | GB43304278 |
| Agilent | E5515C | Wireless Communications Test Set | 2/7/2018 | Triennial | 2/7/2021 | GB43304447 |
| Agilent | N4010A | Wireless Connectivity Test Set | N/A | N/A | N/A | GB46170464 |
| Agilent | N5182A | MXG Vector Signal Generator | 7/10/2019 | Annual | 7/10/2020 | MY47420800 |
| Agilent | N9020A | MXA Signal Analyzer | 4/20/2019 | Annual | 4/20/2020 | US46470561 |
| Agilent | N9030A | PXA Signal Analyzer (44GHz) | 6/12/2019 | Annual | 6/12/2020 | MY52350166 |
| Amplifier Research | 15S1G6 | Amplifier | CBT | N/A | CBT | 433972 |
| Amplifier Research | 15S1G6 | Amplifier | CBT | N/A | CBT | 433974 |
| Amplifier Research | 15S1G6 | Amplifier | CBT | N/A | CBT | 433976 |
| Anritsu | MA24106A | USB Power Sensor | 1/31/2019 | Annual | 1/31/2020 | 1244524 |
| Anritsu | MA24106A | USB Power Sensor | 3/5/2019 | Annual | 3/5/2020 | 1344555 |
| Anritsu | MA24106A | USB Power Sensor | 4/17/2019 | Annual | 4/17/2020 | 1344556 |
| Anritsu | MA24106A | USB Power Sensor | 7/15/2019 | Annual | 7/15/2020 | 1349513 |
| Anritsu | MA2411B | Pulse Power Sensor | 3/6/2019 | Annual | 3/6/2020 | 1339018 |
| Anritsu | MA2411B | Pulse Power Sensor | 6/11/2019 | Annual | 6/11/2020 | 1207364 |
| Anritsu | MA2411B | Pulse Power Sensor | 8/8/2019 | Annual | 8/8/2020 | 1339008 |
| Anritsu | MT8820C | Radio Communication Analyzer | 3/29/2019 | Annual | 3/29/2020 | 6201300731 |
| Anritsu | MT8821C | Radio Communication Analyzer | 1/25/2019 | Annual | 1/25/2020 | 6261895213 |
| Anritsu | MT8821C | Radio Communication Analyzer | 3/6/2019 | Annual | 3/6/2020 | 6201381794 |
| Anritsu | MT8821C | Radio Communication Analyzer | 5/13/2019 | Annual | 5/13/2020 | 6201524637 |
| Anritsu | MT8821C | Radio Communication Analyzer | 11/22/2019 | Annual | 11/22/2020 | 6262044715 |
| Anritsu | MT8862A | Wireless Connectivity Test Set | 8/8/2019 | Annual | 8/8/2020 | 6261782395 |
| Anritsu | ML2496A | Power Meter | 11/6/2019 | Annual | 11/6/2020 | 1405003 |
| Control Company | 4040 | Therm./Clock/Humidity Monitor | 6/29/2019 | Biennial | 6/29/2021 | 192291470 |
| Control Company | 4040 | Therm./Clock/Humidity Monitor | 6/29/2019 | Biennial | 6/29/2021 | 192291455 |
| Control Company | 4040 | Therm./Clock/Humidity Monitor | 6/29/2019 | Biennial | 6/29/2021 | 192291460 |
| Control Company | 4040 | Therm./Clock/Humidity Monitor | 6/29/2019 | Biennial | 6/29/2021 | 192291463 |
| Control Company | 4352 | Long Stem Thermometer | 6/26/2019 | Biennial | 6/26/2021 | 192282744 |
| Control Company | 4352 | Long Stem Thermometer | 6/26/2019 | Biennial | 6/26/2021 | 192282753 |
| Control Company | 4352 | Ultra Long Stem Thermometer | 11/29/2018 | Biennial | 11/29/2020 | 181766801 |
| Control Company | 4352 | Ultra Long Stem Thermometer | 11/29/2018 | Biennial | 11/29/2020 | 181766777 |
| Keysight | 772D | Dual Directional Coupler | CBT | N/A | CBT | MY52180215 |
| Keysight Technologies | 85033E | Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm) | 7/2/2019 | Annual | 7/2/2020 | MY53401181 |
| Keysight Technologies | N6705B | DC Power Analyzer | 4/27/2019 | Biennial | 4/27/2021 | MY53004059 |
| MCL | BW-N6W5+ | 6dB Attenuator | CBT | N/A | CBT | 1139 |
| Mini Circuits | PWR-SEN-4GHS | USB Power Sensor | 4/19/2019 | Annual | 4/19/2020 | 11401010036 |
| MiniCircuits | SLP-2400+ | Low Pass Filter | CBT | N/A | CBT | R8979500903 |
| MiniCircuits | VLF-6000+ | Low Pass Filter | CBT | N/A | CBT | N/A |
| Mini-Circuits | BW-N20W5 | Power Attenuator | CBT | N/A | CBT | 1226 |
| 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 |
| Pasternack | NC-100 | Torque Wrench | 5/23/2018 | Biennial | 5/23/2020 | N/A |
| Pasternack | PE2209-10 | Bidirectional Coupler | CBT | N/A | CBT | N/A |
| Pasternack | PE2208-6 | Bidirectional Coupler | CBT | N/A | CBT | N/A |
| Rohde & Schwarz | CMW500 | Radio Communication Tester | 8/26/2019 | Annual | 8/26/2020 | 100976 |
| Rohde & Schwarz | CMW500 | Radio Communication Tester | 8/27/2019 | Annual | 8/27/2020 | 116743 |
| Rohde & Schwarz | CMW500 | Radio Communication Tester | 10/4/2019 | Annual | 10/4/2020 | 166462 |
| Rohde & Schwarz | ZNLE6 | Vector Network Analyzer | 10/11/2019 | Annual | 10/11/2020 | 101307 |
| Rohde& Schwarz | CMW500 | Wideband Radio Communication Tester | 7/12/2019 | Annual | 7/12/2020 | 145645 |
| Rohde& Schwarz | CMW500 | Wideband Radio Communication Tester | 7/24/2019 | Annual | 7/24/2020 | 151849 |
| SPEAG | DAK-3.5 | Dielectric Assessment Kit | 5/7/2019 | Annual | 5/7/2020 | 1070 |
| SPEAG | DAK-3.5 | Dielectric Assessment Kit | 10/22/2019 | Annual | 10/22/2020 | 1091 |
| SPEAG | D2300V2 | 2300 MHz SAR Dipole | 11/12/2019 | Annual | 11/12/2020 | 1064 |
| SPEAG | D2600V2 | 2600 MHz SAR Dipole | 6/14/2019 | Annual | 6/14/2020 | 1064 |
| SPEAG | D2450V2 | 2450 MHz SAR Dipole | 9/11/2017 | Triennial | 9/11/2020 | 797 |
| SPEAG | D2450V2 | 2450 MHz SAR Dipole | 8/16/2018 | Biennial | 8/16/2020 | 981 |
| SPEAG | D2600V2 | 2600 MHz SAR Dipole | 4/11/2018 | Biennial | 4/11/2020 | 1004 |
| SPEAG | D3500V2 | 3500 MHz SAR Dipole | 1/11/2018 | Biennial | 1/11/2020 | 1059 |
| SPEAG | D3700V2 | 3700 MHz SAR Dipole | 1/11/2018 | Biennial | 1/11/2020 | 1018 |
| SPEAG | D5GHzV2 | 5 GHz SAR Dipole | 9/17/2019 | Annual | 9/17/2020 | 1191 |
| SPEAG | D750V3 | 750 MHz SAR Dipole | 1/15/2018 | Biennial | 1/15/2020 | 1003 |
| SPEAG | D750V3 | 750 MHz SAR Dipole | 10/19/2018 | Biennial | 10/19/2020 | 1161 |
| SPEAG | D835V2 | 835 MHz SAR Dipole | 10/19/2018 | Biennial | 10/19/2020 | 4d133 |
| SPEAG | D1750V2 | 1750 MHz SAR Dipole | 5/15/2019 | Annual | 5/15/2020 | 1148 |
| SPEAG | D1900V2 | 1900 MHz SAR Dipole | 10/23/2018 | Biennial | 10/23/2020 | 5d149 |
| SPEAG | D1900V2 | 1900 MHz SAR Dipole | 10/23/2018 | Biennial | 10/23/2020 | 5d080 |
| SPEAG | D1900V2 | 1900 MHz SAR Dipole | 2/21/2019 | Annual | 2/21/2020 | 5d148 |
| SPEAG | D2300V2 | 2300 MHz SAR Dipole | 8/13/2018 | Biennial | 8/13/2020 | 1073 |
| SPEAG | D2450V2 | 2450 MHz SAR Dipole | 8/14/2019 | Annual | 8/14/2020 | 719 |
| SPEAG | D750V3 | 750 MHz Dipole | 3/18/2019 | Annual | 3/18/2020 | 1054 |
| SPEAG | D835V2 | 835 MHz SAR Dipole | 3/13/2019 | Annual | 3/13/2020 | 4d047 |
| SPEAG | D1765V2 | 1765 MHz SAR Dipole | 5/23/2018 | Biennial | 5/23/2020 | 1008 |
| SPEAG | D1750V2 | 1750 MHz SAR Dipole | 10/22/2018 | Biennial | 10/22/2020 | 1150 |
| SPEAG | EX3DV4 | SAR Probe | 9/19/2019 | Annual | 9/19/2020 | 7551 |
| SPEAG | EX3DV4 | SAR Probe | 2/19/2019 | Annual | 2/19/2020 | 3914 |
| SPEAG | EX3DV4 | SAR Probe | 2/19/2019 | Annual | 2/19/2020 | 7417 |
| SPEAG | EX3DV4 | SAR Probe | 1/25/2019 | Annual | 1/25/2020 | 3589 |
| SPEAG | EX3DV4 | SAR Probe | 6/19/2019 | Annual | 6/19/2020 | 7409 |
| SPEAG | EX3DV4 | SAR Probe | 7/16/2019 | Annual | 7/16/2020 | 7410 |
| SPEAG | EX3DV4 | SAR Probe | 4/24/2019 | Annual | 4/24/2020 | 7357 |
| SPEAG | EX3DV4 | SAR Probe | 1/24/2019 | Annual | 1/24/2020 | 7488 |
| SPEAG | EX3DV4 | SAR Probe | 5/16/2019 | Annual | 5/16/2020 | 7406 |
| SPEAG | EX3DV4 | SAR Probe | 7/15/2019 | Annual | 7/15/2020 | 7547 |
| SPEAG | EX3DV4 | SAR Probe | 8/16/2019 | Annual | 8/16/2020 | 7308 |
| SPEAG | EX3DV4 | SAR Probe | 12/11/2019 | Annual | 12/11/2020 | 7571 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 4/18/2019 | Annual | 4/18/2020 | 1407 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 1/15/2019 | Annual | 1/15/2020 | 1530 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 9/17/2019 | Annual | 9/17/2020 | 1333 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 8/14/2019 | Annual | 8/14/2020 | 1450 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 6/20/2019 | Annual | 6/20/2020 | 1334 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 2/14/2019 | Annual | 2/14/2020 | 1272 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 2/13/2019 | Annual | 2/13/2020 | 665 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 5/8/2019 | Annual | 5/8/2020 | 859 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 5/8/2019 | Annual | 5/8/2020 | 728 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 7/11/2019 | Annual | 7/11/2020 | 1322 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 7/11/2019 | Annual | 7/11/2020 | 1323 |
| SPEAG | DAE4 | Data Acquisition Electronics | 12/5/2019 | Annual | 12/5/2020 | 1533 |

Note:

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 was used solely within its respective calibration period.

## For PD measurements

| Manufacturer | Model | Description | Cal Date | Cal Interval | Cal Due | Serial Number |
|---|---|---|---|---|---|---|
| - | WL25-1 | Conducted Cable Set (25GHz) | 10/30/2019 | Annual | 10/30/2020 | WL25-1 |
| - | WL40-1 | Conducted Cable Set (40GHz) | 10/30/2019 | Annual | 10/30/2020 | WL40-1 |
| Agilent | N9038A | MXE EMI Receiver | 7/17/2019 | Annual | 7/17/2020 | MY51210133 |
| Agilent | N9030A | PXA Signal Analyzer (44GHz) | 6/12/2019 | Annual | 6/12/2020 | MY52350166 |
| Com-Power | PAM-103 | Pre-Amplifier (1-1000MHz) | 5/10/2019 | Annual | 5/10/2020 | 441112 |
| EMCO | 3160-09 | Small Horn (18 - 26.5GHz) | 8/9/2018 | Biennial | 8/9/2020 | 135427 |
| Emco | 3116 | Horn Antenna (18 - 40GHz) | 6/7/2018 | Triennial | 6/7/2021 | 9203-2178 |
| OML | M19HWA | 40 - 60GHz Mixer/Antenna | 1/16/2018 | Biennial | 1/16/2020 | U00228-1 |
| OML | M12HWA | 60 - 90GHz Mixer/Antenna | 1/16/2018 | Biennial | 1/16/2020 | E00228-1 |
| OML | M08HWA | 90 - 140GHz Mixer/Antenna | 1/16/2018 | Biennial | 1/16/2020 | F00228-1 |
| Rohde & Schwarz | ESU40 | EMI Test Receiver (40GHz) | 9/23/2019 | Annual | 9/23/2020 | 100348 |
| Rohde & Schwarz | TS-PR8 | Preamplifier | 1/7/2019 | Annual | 1/7/2020 | 102325 |
| Rohde & Schwarz | SFUNIT-Rx | Shielded Filter Unit | 7/8/2019 | Annual | 7/8/2020 | 102133 |
| Rohde & Schwarz | FSW67 | Signal / Spectrum Analyzer | 5/6/2019 | Annual | 5/6/2020 | 103200 |
| Sunol | JB5 | Bi-Log Antenna (30M - 5GHz) | 4/19/2018 | Biennial | 4/19/2020 | A051107 |
| SPEAG | EUmmWV3 | EUmmWV3 Probe | 10/21/2019 | Annual | 10/21/2020 | 9405 |
| SPEAG | EUmmWV3 | EUmmWV3 Probe | 12/7/2018 | Annual | 12/7/2019 | 9407 |
| SPEAG | SM 003 100 AA | 30GHz System Verification Ka- Band Source Antenna | 4/29/2019 | Annual | 4/29/2020 | 1043 |
| SPEAG | SM 003 100 AA | 30GHz System Verification Ka- Band Source Antenna | 4/29/2019 | Annual | 4/29/2020 | 1044 |
| SPEAG | SM 003 100 AA | 30GHz System Verification Ka- Band Source Antenna | 10/15/2019 | Annual | 10/15/2020 | 1015 |
| SPEAG | SM 003 100 AA | 30GHz System Verification Ka- Band Source Antenna | 4/30/2019 | Annual | 4/30/2020 | 1045 |
| SPEAG | DAE4 | Dasy Data Acquisition Electronics | 5/3/2019 | Annual | 5/3/2020 | 1583 |
| Agilent | N9030A | PXA Signal Analyzer (44GHz) | 6/12/2019 | Annual | 6/12/2020 | MY52350166 |
| Com-Power | AL-130 | 9kHz - 30MHz Loop Antenna | 10/10/2019 | Biennial | 10/10/2021 | 121034 |
| Com-Power | PAM-103 | Pre-Amplifier (1-1000MHz) | 5/10/2019 | Annual | 5/10/2020 | 441112 |
| Emco | 3115 | Horn Antenna (1-18GHz) | 3/28/2018 | Biennial | 3/28/2020 | 9704-5182 |
| Keysight Technologies | N9030A | 3Hz-44GHz PXA Signal Analyzer | 5/2/2019 | Annual | 5/2/2020 | MY49430494 |
| Keysight Technologies | N9030A | 3Hz-44GHz PXA Signal Analyzer | 3/13/2019 | Annual | 3/13/2020 | MY49430244 |
| Rohde & Schwarz | 180-442-KF | Horn (Small) | 8/21/2018 | Bienniel | 8/21/2020 | U157403-01 |
| Rohde & Schwarz | ESU26 | EMI Test Receiver (26.5GHz) | 6/5/2019 | Annual | 6/5/2020 | 100342 |
| Rohde & Schwarz | SFUNIT-Rx | Shielded Filter Unit | 7/11/2019 | Annual | 7/11/2020 | 102134 |
| Sunol | JB5 | Bi-Log Antenna (30M - 5GHz) | 4/19/2018 | Biennial | 4/19/2020 | A051107 |
| Virginia Diodes Inc | SAX252 | Spectrum Analyzer Extension Module | 9/30/2019 | Annual | 9/30/2020 | SAX252 |
| Virginia Diodes Inc | SAX253 | Spectrum Analyzer Extension Module | 9/30/2019 | Annual | 9/30/2020 | SAX253 |
| Virginia Diodes Inc | SAX254 | Spectrum Analyzer Extension Module | 9/30/2019 | Annual | 9/30/2020 | SAX254 |

Note:

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

# 6 MEASUREMENT UNCERTAINTIES

## For SAR Measurements

| a | c | d | e= f(d,k) | f | g | h = c x f/e | i = c x g/e | k |
|---|---|---|---|---|---|---|---|---|
| Uncertainty Component | Tol. (± %) | Prob. Dist. | Div. | $c_i$ 1gm | $c_i$ 10 gms | 1gm $u_i$ (± %) | 10gms $u_i$ (± %) | $v_i$ |
| **Measurement System** | | | | | | | | |
| 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 | ∞ |
| **Test Sample Related** | | | | | | | | |
| 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 | ∞ |
| **Phantom & Tissue Parameters** | | | | | | | | |
| 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 Unceritainty | 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 | ∞ |
| **Combined Standard Uncertainty (k=1)** | | RSS | | | | 11.5 | 11.3 | 60 |
| **Expanded Uncertainty** (95% CONFIDENCE LEVEL) | | k=2 | | | | 23.0 | 22.6 | |

## For PD Measurements

| a | b | c | d | e | f = b x e/d | g |
|---|---|---|---|---|---|---|
| Uncertainty Component | Unc. (± dB) | Prob. Dist. | Div. | ci | ui (± dB) | vi |
| Calibration | 0.49 | N | 1 | 1.0 | 0.49 | ∞ |
| Probe correction | 0 | R | 1.73 | 1.0 | 0.00 | ∞ |
| Frequency Response (BW ≤ 1 GHz) | 0.20 | R | 1.73 | 1.0 | 0.12 | ∞ |
| Sensor cross coupling | 0 | R | 1.73 | 1.0 | 0.00 | ∞ |
| Isotropy | 0.50 | R | 1.73 | 1.0 | 0.29 | ∞ |
| Linearity | 0.20 | R | 1.73 | 1.0 | 0.12 | ∞ |
| Probe Scattering | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Probe Positioning Offset | 0 | R | 1.73 | 1.0 | 0.17 | ∞ |
| Probe Positioning Repeatability | 0 | R | 1.73 | 1.0 | 0.02 | ∞ |
| Sensor Mechanical Offset | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Probe Spatial Resolution | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Field Impedance Dependence | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Amplitude and phase drift | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Amplitude and phase noise | 0.04 | R | 1.73 | 1.0 | 0.02 | ∞ |
| Measurement area truncation | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Data acquisition | 0.03 | N | 1 | 1.0 | 0.03 | ∞ |
| Sampling | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Field Reconstruction | 0.60 | R | 1.73 | 1.0 | 0.35 | ∞ |
| Forward Transformation | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Power Density Scaling | - | R | 1.73 | 1.0 | - | ∞ |
| Spatial Averaging | 0.1 | R | 1.73 | 1.0 | 0.06 | ∞ |
| System Detection Limit | 0.04 | R | 1.73 | 1.0 | 0.02 | ∞ |
| **Test Sample and Environmental Factors** | | | | | | |
| Probe Coupling with DUT | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Modulation Response | 0.40 | R | 1.73 | 1.0 | 0.23 | ∞ |
| Integration Time | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Response Time | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Device Holder Influence | 0.10 | R | 1.73 | 1.0 | 0.06 | ∞ |
| DUT Alignment | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| RF Ambient Conditions | 0.04 | R | 1.73 | 1.0 | 0.02 | ∞ |
| Ambient Reflections | 0.04 | R | 1.73 | 1.0 | 0.02 | ∞ |
| Immunity / Secondary Reception | 0 | R | 1.73 | 1.0 | 0 | ∞ |
| Drift of the DUT | 0.22 | R | 1.73 | 1.0 | 0.13 | ∞ |
| Combined Standard Uncertainty (k=1) | | RSS | | | 0.76 | ∞ |
| **Expanded Uncertainty (95% CONFIDENCE LEVEL)** | **k=2** | | | | **1.53** | |

# APPENDIX A: SAR TEST RESULTS FOR $P_{LIMIT}$ CALCULATIONS

**Table A-1**
**DSI = 2 $P_{Limit}$ Calculations – 2G/3G Head SAR**

| MEASUREMENT RESULTS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | Mode/Band | Service | Conducted Power | Side | Test Position | Duty Cycle | SAR (1g) | Plimit | Minimum Plimit |
| MHz | Ch. | | | [dBm] | | | | (W/kg) | [dBm] | [dBm] |
| 836.60 | 190 | GSM 850 | GSM | 31.54 | Right | Cheek | 1:8.3 | 0.132 | 31.13 | 31.13 |
| 836.60 | 190 | GSM 850 | GSM | 31.54 | Right | Tilt | 1:8.3 | 0.057 | 34.78 | |
| 836.60 | 190 | GSM 850 | GSM | 31.54 | Left | Cheek | 1:8.3 | 0.096 | 32.52 | |
| 836.60 | 190 | GSM 850 | GSM | 31.54 | Left | Tilt | 1:8.3 | 0.060 | 34.56 | |
| 1880.00 | 661 | GSM 1900 | GSM | 29.02 | Right | Cheek | 1:8.3 | 0.023 | 36.20 | 34.02 |
| 1880.00 | 661 | GSM 1900 | GSM | 29.02 | Right | Tilt | 1:8.3 | 0.022 | 36.39 | |
| 1880.00 | 661 | GSM 1900 | GSM | 29.02 | Left | Cheek | 1:8.3 | 0.038 | 34.02 | |
| 1880.00 | 661 | GSM 1900 | GSM | 29.02 | Left | Tilt | 1:8.3 | 0.027 | 35.51 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | Right | Cheek | 1:1 | 0.166 | 31.60 | 31.60 |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | Right | Tilt | 1:1 | 0.075 | 35.05 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | Left | Cheek | 1:1 | 0.110 | 33.39 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | Left | Tilt | 1:1 | 0.077 | 34.94 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | Right | Cheek | 1:1 | 0.081 | 34.31 | 32.56 |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | Right | Tilt | 1:1 | 0.115 | 32.78 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | Left | Cheek | 1:1 | 0.121 | 32.56 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | Left | Tilt | 1:1 | 0.118 | 32.67 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | Right | Cheek | 1:1 | 0.085 | 33.95 | 32.91 |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | Right | Tilt | 1:1 | 0.058 | 35.61 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | Left | Cheek | 1:1 | 0.108 | 32.91 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | Left | Tilt | 1:1 | 0.062 | 35.32 | |
| 820.10 | 564 | CDMA BC10 (§90S) | RC3 / SO55 | 24.53 | Right | Cheek | 1:1 | 0.160 | 32.49 | 32.00 |
| 820.10 | 564 | CDMA BC10 (§90S) | RC3 / SO55 | 24.53 | Right | Tilt | 1:1 | 0.075 | 35.78 | |
| 820.10 | 564 | CDMA BC10 (§90S) | RC3 / SO55 | 24.53 | Left | Cheek | 1:1 | 0.144 | 32.95 | |
| 820.10 | 564 | CDMA BC10 (§90S) | RC3 / SO55 | 24.53 | Left | Tilt | 1:1 | 0.093 | 34.85 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. A | 24.58 | Right | Cheek | 1:1 | 0.181 | 32.00 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. A | 24.58 | Right | Tilt | 1:1 | 0.082 | 35.44 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. A | 24.58 | Left | Cheek | 1:1 | 0.158 | 32.59 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. A | 24.58 | Left | Tilt | 1:1 | 0.098 | 34.67 | |
| 836.52 | 384 | CDMA BC0 (§22H) | RC3 / SO55 | 24.47 | Right | Cheek | 1:1 | 0.163 | 32.35 | 31.08 |
| 836.52 | 384 | CDMA BC0 (§22H) | RC3 / SO55 | 24.47 | Right | Tilt | 1:1 | 0.084 | 35.23 | |
| 836.52 | 384 | CDMA BC0 (§22H) | RC3 / SO55 | 24.47 | Left | Cheek | 1:1 | 0.136 | 33.13 | |
| 836.52 | 384 | CDMA BC0 (§22H) | RC3 / SO55 | 24.47 | Left | Tilt | 1:1 | 0.086 | 35.13 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. A | 24.54 | Right | Cheek | 1:1 | 0.222 | 31.08 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. A | 24.54 | Right | Tilt | 1:1 | 0.096 | 34.72 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. A | 24.54 | Left | Cheek | 1:1 | 0.150 | 32.78 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. A | 24.54 | Left | Tilt | 1:1 | 0.103 | 34.41 | |
| 1880.00 | 600 | PCS CDMA | RC3 / SO55 | 23.00 | Right | Cheek | 1:1 | 0.050 | 36.01 | 32.55 |
| 1880.00 | 600 | PCS CDMA | RC3 / SO55 | 23.00 | Right | Tilt | 1:1 | 0.045 | 36.47 | |
| 1880.00 | 600 | PCS CDMA | RC3 / SO55 | 23.00 | Left | Cheek | 1:1 | 0.111 | 32.55 | |
| 1880.00 | 600 | PCS CDMA | RC3 / SO55 | 23.00 | Left | Tilt | 1:1 | 0.059 | 35.29 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. A | 23.10 | Right | Cheek | 1:1 | 0.053 | 35.86 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. A | 23.10 | Right | Tilt | 1:1 | 0.057 | 35.54 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. A | 23.10 | Left | Cheek | 1:1 | 0.110 | 32.69 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. A | 23.10 | Left | Tilt | 1:1 | 0.075 | 34.35 | |

# Table A-2
# DSI = 2 $P_{Limit}$ Calculations – 4G Head SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Side | Test Position | Modulation | RB Size | RB Offset | Duty Cycle | SAR (1g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | Right | Cheek | QPSK | 1 | 0 | 1:1 | 0.086 | 35.52 | 34.90 |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 23.88 | 1 | Right | Cheek | QPSK | 50 | 0 | 1:1 | 0.077 | 35.02 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | Right | Tilt | QPSK | 1 | 0 | 1:1 | 0.039 | 38.95 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 23.88 | 1 | Right | Tilt | QPSK | 50 | 0 | 1:1 | 0.033 | 38.69 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | Left | Cheek | QPSK | 1 | 0 | 1:1 | 0.088 | 35.42 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 23.88 | 1 | Left | Cheek | QPSK | 50 | 0 | 1:1 | 0.079 | 34.90 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | Left | Tilt | QPSK | 1 | 0 | 1:1 | 0.056 | 37.38 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 23.88 | 1 | Left | Tilt | QPSK | 50 | 0 | 1:1 | 0.050 | 36.89 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | Right | Cheek | QPSK | 1 | 0 | 1:1 | 0.103 | 34.79 | 34.09 |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 23.82 | 1 | Right | Cheek | QPSK | 25 | 12 | 1:1 | 0.094 | 34.09 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | Right | Tilt | QPSK | 1 | 0 | 1:1 | 0.043 | 38.59 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 23.82 | 1 | Right | Tilt | QPSK | 25 | 12 | 1:1 | 0.037 | 38.14 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | Left | Cheek | QPSK | 1 | 0 | 1:1 | 0.106 | 34.67 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 23.82 | 1 | Left | Cheek | QPSK | 25 | 12 | 1:1 | 0.087 | 34.42 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | Left | Tilt | QPSK | 1 | 0 | 1:1 | 0.057 | 37.36 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 23.82 | 1 | Left | Tilt | QPSK | 25 | 12 | 1:1 | 0.051 | 36.74 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | Right | Cheek | QPSK | 1 | 0 | 1:1 | 0.145 | 33.38 | 32.90 |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 23.97 | 1 | Right | Cheek | QPSK | 25 | 0 | 1:1 | 0.128 | 32.90 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | Right | Tilt | QPSK | 1 | 0 | 1:1 | 0.070 | 36.54 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 23.97 | 1 | Right | Tilt | QPSK | 25 | 0 | 1:1 | 0.059 | 36.26 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | Left | Cheek | QPSK | 1 | 0 | 1:1 | 0.122 | 34.13 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 23.97 | 1 | Left | Cheek | QPSK | 25 | 0 | 1:1 | 0.119 | 33.21 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | Left | Tilt | QPSK | 1 | 0 | 1:1 | 0.084 | 35.75 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 23.97 | 1 | Left | Tilt | QPSK | 25 | 0 | 1:1 | 0.074 | 35.28 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | Right | Cheek | QPSK | 1 | 0 | 1:1 | 0.203 | 31.71 | 31.49 |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 23.64 | 1 | Right | Cheek | QPSK | 25 | 0 | 1:1 | 0.164 | 31.49 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | Right | Tilt | QPSK | 1 | 0 | 1:1 | 0.096 | 34.96 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 23.64 | 1 | Right | Tilt | QPSK | 25 | 0 | 1:1 | 0.076 | 34.83 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | Left | Cheek | QPSK | 1 | 0 | 1:1 | 0.137 | 33.41 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 23.64 | 1 | Left | Cheek | QPSK | 25 | 0 | 1:1 | 0.112 | 33.15 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | Left | Tilt | QPSK | 1 | 0 | 1:1 | 0.090 | 35.24 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 23.64 | 1 | Left | Tilt | QPSK | 25 | 0 | 1:1 | 0.073 | 35.01 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | Right | Cheek | QPSK | 1 | 36 | 1:1 | 0.183 | 32.10 | 31.59 |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 23.89 | 1 | Right | Cheek | QPSK | 36 | 37 | 1:1 | 0.170 | 31.59 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | Right | Tilt | QPSK | 1 | 36 | 1:1 | 0.101 | 34.68 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 23.89 | 1 | Right | Tilt | QPSK | 36 | 37 | 1:1 | 0.084 | 34.65 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | Left | Cheek | QPSK | 1 | 36 | 1:1 | 0.134 | 33.45 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 23.89 | 1 | Left | Cheek | QPSK | 36 | 37 | 1:1 | 0.111 | 33.44 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | Left | Tilt | QPSK | 1 | 36 | 1:1 | 0.083 | 35.53 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 23.89 | 1 | Left | Tilt | QPSK | 36 | 37 | 1:1 | 0.072 | 35.32 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | Right | Cheek | QPSK | 1 | 0 | 1:1 | 0.203 | 31.83 | 31.83 |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 23.87 | 1 | Right | Cheek | QPSK | 25 | 25 | 1:1 | 0.160 | 31.83 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | Right | Tilt | QPSK | 1 | 0 | 1:1 | 0.102 | 34.81 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 23.87 | 1 | Right | Tilt | QPSK | 25 | 25 | 1:1 | 0.081 | 34.79 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | Left | Cheek | QPSK | 1 | 0 | 1:1 | 0.163 | 32.78 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 23.87 | 1 | Left | Cheek | QPSK | 25 | 25 | 1:1 | 0.128 | 32.80 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | Left | Tilt | QPSK | 1 | 0 | 1:1 | 0.111 | 34.45 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 23.87 | 1 | Left | Tilt | QPSK | 25 | 25 | 1:1 | 0.080 | 34.84 | |

| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Side | Test Position | Modulation | RB Size | RB Offset | Duty Cycle | SAR (1g) | PLimit | Minimum PLimit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.20 | 0 | Right | Cheek | QPSK | 1 | 50 | 1:1 | 0.106 | 33.95 | 32.62 |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 23.20 | 1 | Right | Cheek | QPSK | 50 | 0 | 1:1 | 0.082 | 34.06 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.20 | 0 | Right | Tilt | QPSK | 1 | 50 | 1:1 | 0.054 | 36.88 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 23.20 | 1 | Right | Tilt | QPSK | 50 | 0 | 1:1 | 0.038 | 37.40 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.20 | 0 | Left | Cheek | QPSK | 1 | 50 | 1:1 | 0.144 | 32.62 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 23.20 | 1 | Left | Cheek | QPSK | 50 | 0 | 1:1 | 0.109 | 32.83 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.20 | 0 | Left | Tilt | QPSK | 1 | 50 | 1:1 | 0.036 | 38.64 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 23.20 | 1 | Left | Tilt | QPSK | 50 | 0 | 1:1 | 0.028 | 38.73 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | Right | Cheek | QPSK | 1 | 99 | 1:1 | 0.072 | 35.44 | 33.56 |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 23.04 | 1 | Right | Cheek | QPSK | 50 | 50 | 1:1 | 0.058 | 35.41 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | Right | Tilt | QPSK | 1 | 99 | 1:1 | 0.072 | 35.44 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 23.04 | 1 | Right | Tilt | QPSK | 50 | 50 | 1:1 | 0.049 | 36.14 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | Left | Cheek | QPSK | 1 | 99 | 1:1 | 0.111 | 33.56 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 23.04 | 1 | Left | Cheek | QPSK | 50 | 50 | 1:1 | 0.081 | 33.96 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | Left | Tilt | QPSK | 1 | 99 | 1:1 | 0.083 | 34.82 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 23.04 | 1 | Left | Tilt | QPSK | 50 | 50 | 1:1 | 0.063 | 35.05 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | Right | Cheek | QPSK | 1 | 99 | 1:1 | 0.073 | 35.26 | 33.03 |
| 1880.00 | 18900 | Mid | LTE Band 2 (PCS) | 20 | 22.98 | 1 | Right | Cheek | QPSK | 50 | 25 | 1:1 | 0.061 | 35.13 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | Right | Tilt | QPSK | 1 | 99 | 1:1 | 0.081 | 34.81 | |
| 1880.00 | 18900 | Mid | LTE Band 2 (PCS) | 20 | 22.98 | 1 | Right | Tilt | QPSK | 50 | 25 | 1:1 | 0.049 | 36.08 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | Left | Cheek | QPSK | 1 | 99 | 1:1 | 0.122 | 33.03 | |
| 1880.00 | 18900 | Mid | LTE Band 2 (PCS) | 20 | 22.98 | 1 | Left | Cheek | QPSK | 50 | 25 | 1:1 | 0.091 | 33.39 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | Left | Tilt | QPSK | 1 | 99 | 1:1 | 0.044 | 37.46 | |
| 1880.00 | 18900 | Mid | LTE Band 2 (PCS) | 20 | 22.98 | 1 | Left | Tilt | QPSK | 50 | 25 | 1:1 | 0.070 | 34.53 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | Right | Cheek | QPSK | 1 | 0 | 1:1 | 0.042 | 36.21 | 32.85 |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 21.58 | 1 | Right | Cheek | QPSK | 25 | 12 | 1:1 | 0.034 | 36.27 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | Right | Tilt | QPSK | 1 | 0 | 1:1 | 0.037 | 36.76 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 21.58 | 1 | Right | Tilt | QPSK | 25 | 12 | 1:1 | 0.031 | 36.67 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | Left | Cheek | QPSK | 1 | 0 | 1:1 | 0.091 | 32.85 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 21.58 | 1 | Left | Cheek | QPSK | 25 | 12 | 1:1 | 0.071 | 33.07 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | Left | Tilt | QPSK | 1 | 0 | 1:1 | 0.033 | 37.25 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 21.58 | 1 | Left | Tilt | QPSK | 25 | 12 | 1:1 | 0.024 | 37.78 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.50 | 0 | Right | Cheek | QPSK | 1 | 99 | 1:1 | 0.098 | 33.59 | 32.60 |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 22.60 | 1 | Right | Cheek | QPSK | 50 | 50 | 1:1 | 0.077 | 33.74 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.50 | 0 | Right | Tilt | QPSK | 1 | 99 | 1:1 | 0.110 | 33.09 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 22.60 | 1 | Right | Tilt | QPSK | 50 | 50 | 1:1 | 0.083 | 33.41 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.50 | 0 | Left | Cheek | QPSK | 1 | 99 | 1:1 | 0.123 | 32.60 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 22.60 | 1 | Left | Cheek | QPSK | 50 | 50 | 1:1 | 0.098 | 32.69 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.50 | 0 | Left | Tilt | QPSK | 1 | 99 | 1:1 | 0.070 | 35.05 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 22.60 | 1 | Left | Tilt | QPSK | 50 | 50 | 1:1 | 0.056 | 35.12 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | Right | Cheek | QPSK | 1 | 50 | 1:1.58 | 1.360 | 20.43 | 19.41 |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | Right | Tilt | QPSK | 1 | 50 | 1:1.58 | 1.720 | 19.41 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | Left | Cheek | QPSK | 1 | 50 | 1:1.58 | 0.590 | 24.05 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | Left | Tilt | QPSK | 1 | 50 | 1:1.58 | 0.711 | 23.25 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | Right | Cheek | QPSK | 1 | 0 | 1:1.58 | 0.060 | 35.04 | 34.56 |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.00 | 1 | Right | Cheek | QPSK | 50 | 0 | 1:1.58 | 0.046 | 35.39 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | Right | Tilt | QPSK | 1 | 0 | 1:1.58 | 0.067 | 34.56 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.00 | 1 | Right | Tilt | QPSK | 50 | 0 | 1:1.58 | 0.051 | 34.94 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | Left | Cheek | QPSK | 1 | 0 | 1:1.58 | 0.042 | 36.59 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.00 | 1 | Left | Cheek | QPSK | 50 | 0 | 1:1.58 | 0.036 | 36.45 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | Left | Tilt | QPSK | 1 | 0 | 1:1.58 | 0.029 | 38.20 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.00 | 1 | Left | Tilt | QPSK | 50 | 0 | 1:1.58 | 0.026 | 37.86 | |

Table: MEASUREMENT RESULTS

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

# Table A-3
# DSI = 2 $P_{Limit}$ Calculations – NR Head SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Side | Test Position | Modulation | RB Size | RB Offset | Duty Cycle | SAR (1g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | Right | Cheek | DFT-s-OFDM QPSK | 1 | 53 | 1:1 | 0.115 | 34.35 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.90 | 0 | Right | Cheek | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.116 | 34.26 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 23.45 | 1.5 | Right | Cheek | CP-OFDM QPSK | 1 | 1 | 1:1 | 0.069 | 35.06 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | Right | Tilt | DFT-s-OFDM QPSK | 1 | 53 | 1:1 | 0.050 | 37.97 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.90 | 0 | Right | Tilt | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.052 | 37.74 | 34.26 |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | Left | Cheek | DFT-s-OFDM QPSK | 1 | 53 | 1:1 | 0.096 | 35.14 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.90 | 0 | Left | Cheek | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.106 | 34.65 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | Left | Tilt | DFT-s-OFDM QPSK | 1 | 53 | 1:1 | 0.046 | 38.33 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.90 | 0 | Left | Tilt | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.048 | 38.09 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.82 | 0 | Right | Cheek | DFT-s-OFDM QPSK | 1 | 1 | 1:1 | 0.181 | 32.24 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | Right | Cheek | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.188 | 31.68 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 23.10 | 1.5 | Right | Cheek | CP-OFDM QPSK | 1 | 1 | 1:1 | 0.116 | 32.46 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.82 | 0 | Right | Tilt | DFT-s-OFDM QPSK | 1 | 1 | 1:1 | 0.091 | 35.23 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | Right | Tilt | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.086 | 35.08 | 31.68 |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.82 | 0 | Left | Cheek | DFT-s-OFDM QPSK | 1 | 1 | 1:1 | 0.129 | 33.71 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | Left | Cheek | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.139 | 32.99 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.82 | 0 | Left | Tilt | DFT-s-OFDM QPSK | 1 | 1 | 1:1 | 0.084 | 35.58 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | Left | Tilt | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.087 | 35.02 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | Right | Cheek | DFT-s-OFDM QPSK | 1 | 53 | 1:1 | 0.075 | 35.53 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.23 | 0 | Right | Cheek | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.070 | 35.78 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | Right | Tilt | DFT-s-OFDM QPSK | 1 | 53 | 1:1 | 0.053 | 37.04 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.23 | 0 | Right | Tilt | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.046 | 37.60 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | Left | Cheek | DFT-s-OFDM QPSK | 1 | 53 | 1:1 | 0.133 | 33.04 | 32.76 |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.23 | 0 | Left | Cheek | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.120 | 33.44 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 21.79 | 1.5 | Left | Cheek | CP-OFDM QPSK | 1 | 1 | 1:1 | 0.080 | 32.76 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | Left | Tilt | DFT-s-OFDM QPSK | 1 | 53 | 1:1 | 0.053 | 37.04 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.23 | 0 | Left | Tilt | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.043 | 37.90 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | Right | Cheek | DFT-s-OFDM QPSK | 1 | 1 | 1:1 | 0.077 | 35.04 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | Right | Cheek | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.066 | 35.70 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | Right | Tilt | DFT-s-OFDM QPSK | 1 | 1 | 1:1 | 0.047 | 37.18 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | Right | Tilt | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.049 | 37.00 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | Left | Cheek | DFT-s-OFDM QPSK | 1 | 1 | 1:1 | 0.138 | 32.50 | 32.50 |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | Left | Cheek | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.124 | 32.97 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 1.5 | Left | Cheek | CP-OFDM QPSK | 1 | 1 | 1:1 | 0.089 | 35.04 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | Left | Tilt | DFT-s-OFDM QPSK | 1 | 1 | 1:1 | 0.055 | 36.50 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | Left | Tilt | DFT-s-OFDM QPSK | 50 | 28 | 1:1 | 0.052 | 36.74 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | Right | Cheek | DFT-s-OFDM QPSK | 1 | 137 | 1:4 | 0.621 | 19.46 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.28 | 0 | Right | Cheek | DFT-s-OFDM QPSK | 135 | 69 | 1:4 | 0.583 | 19.60 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | Right | Tilt | DFT-s-OFDM QPSK | 1 | 137 | 1:4 | 0.838 | 18.16 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.28 | 0 | Right | Tilt | DFT-s-OFDM QPSK | 135 | 69 | 1:4 | 0.815 | 18.15 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 21.17 | 1.5 | Right | Tilt | CP-OFDM QPSK | 1 | 1 | 1:4 | 0.388 | 19.26 | 18.15 |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | Left | Cheek | DFT-s-OFDM QPSK | 1 | 137 | 1:4 | 0.315 | 22.41 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.28 | 0 | Left | Cheek | DFT-s-OFDM QPSK | 135 | 69 | 1:4 | 0.301 | 22.47 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | Left | Tilt | DFT-s-OFDM QPSK | 1 | 137 | 1:4 | 0.429 | 21.06 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.28 | 0 | Left | Tilt | DFT-s-OFDM QPSK | 135 | 69 | 1:4 | 0.412 | 21.11 | |

**Table A-4**
**DSI = 0 $P_{Limit}$ Calculations – 2G/3G Body-Worn SAR**

| MEASUREMENT RESULTS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | Mode/Band | Service | Conducted Power [dBm] | Spacing | Side | Duty Cycle | SAR (1g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | (W/kg) | [dBm] | [dBm] |
| 836.60 | 190 | GSM 850 | GSM | 31.54 | 15 mm | Back | 1:8.3 | 0.139 | 30.91 | 30.91 |
| 1880.00 | 661 | GSM 1900 | GSM | 29.02 | 15 mm | Back | 1:8.3 | 0.271 | 25.49 | 25.49 |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 15 mm | Back | 1:1 | 0.211 | 30.56 | 30.56 |
| 1752.60 | 1513 | UMTS 1750 | RMC | 23.20 | 15 mm | Back | 1:1 | 0.759 | 24.40 | 24.40 |
| 1907.60 | 9538 | UMTS 1900 | RMC | 23.19 | 15 mm | Back | 1:1 | 0.681 | 24.86 | 24.86 |
| 820.10 | 564 | CDMA BC10 (§90S) | TDSO / SO32 | 24.54 | 15 mm | Back | 1:1 | 0.195 | 31.64 | 31.64 |
| 836.52 | 384 | CDMA BC0 (§22H) | TDSO / SO32 | 24.46 | 15 mm | Back | 1:1 | 0.231 | 30.82 | 30.82 |
| 1880.00 | 600 | PCS CDMA | TDSO / SO32 | 23.06 | 15 mm | Back | 1:1 | 0.667 | 24.82 | 24.82 |

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

## Table A-5
## DSI = 0 $P_{Limit}$ Calculations – 4G Body-Worn SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 15 mm | Back | 1:1 | 0.148 | 33.16 | 32.61 |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 23.88 | 1 | QPSK | 50 | 0 | 15 mm | Back | 1:1 | 0.134 | 32.61 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 15 mm | Back | 1:1 | 0.166 | 32.72 | 32.24 |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 23.82 | 1 | QPSK | 25 | 12 | 15 mm | Back | 1:1 | 0.144 | 32.24 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 15 mm | Back | 1:1 | 0.235 | 31.28 | 30.94 |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 23.97 | 1 | QPSK | 25 | 0 | 15 mm | Back | 1:1 | 0.201 | 30.94 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 15 mm | Back | 1:1 | 0.269 | 30.48 | 30.32 |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 23.64 | 1 | QPSK | 25 | 0 | 15 mm | Back | 1:1 | 0.215 | 30.32 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 15 mm | Back | 1:1 | 0.259 | 30.59 | 30.53 |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 23.89 | 1 | QPSK | 36 | 37 | 15 mm | Back | 1:1 | 0.217 | 30.53 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 15 mm | Back | 1:1 | 0.227 | 31.34 | 30.88 |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 23.87 | 1 | QPSK | 25 | 25 | 15 mm | Back | 1:1 | 0.199 | 30.88 | |
| 1720.00 | 132072 | Low | LTE Band 66 (AWS) | 20 | 23.88 | 0 | QPSK | 1 | 99 | 15 mm | Back | 1:1 | 0.740 | 25.19 | 24.80 |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 23.19 | 1 | QPSK | 50 | 0 | 15 mm | Back | 1:1 | 0.691 | 24.80 | |
| 1860.00 | 26140 | Low | LTE Band 25 (PCS) | 20 | 23.74 | 0 | QPSK | 1 | 0 | 15 mm | Back | 1:1 | 0.717 | 25.18 | 25.18 |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 23.04 | 1 | QPSK | 50 | 50 | 15 mm | Back | 1:1 | 0.578 | 25.42 | |
| 1880.00 | 18900 | Mid | LTE Band 2 (PCS) | 20 | 23.72 | 0 | QPSK | 1 | 50 | 15 mm | Back | 1:1 | 0.627 | 25.75 | 25.75 |
| 1880.00 | 18900 | Mid | LTE Band 2 (PCS) | 20 | 22.98 | 1 | QPSK | 50 | 25 | 15 mm | Back | 1:1 | 0.516 | 25.85 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 15 mm | Back | 1:1 | 0.588 | 24.75 | 24.75 |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 21.58 | 1 | QPSK | 25 | 12 | 15 mm | Back | 1:1 | 0.472 | 24.84 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 15 mm | Back | 1:1 | 0.389 | 27.55 | 27.53 |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 22.60 | 1 | QPSK | 50 | 50 | 15 mm | Back | 1:1 | 0.321 | 27.53 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.15 | 0 | QPSK | 1 | 0 | 15 mm | Back | 1:1.58 | 0.198 | 28.20 | 28.20 |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.00 | 1 | QPSK | 50 | 25 | 15 mm | Back | 1:1.58 | 0.155 | 29.11 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 15 mm | Back | 1:1.58 | 0.184 | 30.18 | 29.51 |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.00 | 0 | QPSK | 50 | 0 | 15 mm | Back | 1:1.58 | 0.178 | 29.51 | |

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

## Table A-6
## DSI = 0 $P_{Limit}$ Calculations – NR Body-Worn SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 15 mm | Back | 1:1 | 0.197 | 32.02 | 31.93 |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.90 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 15 mm | Back | 1:1 | 0.198 | 31.93 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 23.45 | 1.5 | CP-OFDM QPSK | 1 | 1 | 15 mm | Back | 1:1 | 0.118 | 32.73 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.82 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 15 mm | Back | 1:1 | 0.196 | 31.90 | 31.04 |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 15 mm | Back | 1:1 | 0.218 | 31.04 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 23.10 | 1.5 | CP-OFDM QPSK | 1 | 1 | 15 mm | Back | 1:1 | 0.137 | 31.73 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 15 mm | Back | 1:1 | 0.677 | 25.97 | 25.42 |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.23 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 15 mm | Back | 1:1 | 0.634 | 26.21 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 21.79 | 1.5 | CP-OFDM QPSK | 1 | 1 | 15 mm | Back | 1:1 | 0.434 | 25.42 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 15 mm | Back | 1:1 | 0.609 | 26.05 | 26.05 |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 15 mm | Back | 1:1 | 0.561 | 26.41 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 22.56 | 1.5 | CP-OFDM QPSK | 1 | 1 | 15 mm | Back | 1:1 | 0.412 | 26.41 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 15 mm | Back | 1:4 | 0.054 | 30.07 | 29.27 |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.28 | 0 | DFT-s-OFDM QPSK | 135 | 69 | 15 mm | Back | 1:4 | 0.063 | 29.27 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 21.17 | 1.5 | CP-OFDM QPSK | 1 | 1 | 15 mm | Back | 1:4 | 0.031 | 30.24 | |

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

## Table A-7
## DSI = 3 $P_{Limit}$ Calculations – 2G/3G Hotspot SAR

| MEASUREMENT RESULTS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | Mode/Band | Service | Conducted Power [dBm] | Spacing | Side | # of GPRS Slots | Duty Cycle | SAR (1g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 10 mm | Back | 3 | 1:2.76 | 0.409 | 28.08 | 28.08 |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 10 mm | Front | 3 | 1:2.76 | 0.272 | 29.85 | |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 10 mm | Bottom | 3 | 1:2.76 | 0.246 | 30.29 | |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 10 mm | Right | 3 | 1:2.76 | 0.218 | 30.82 | |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 10 mm | Left | 3 | 1:2.76 | 0.079 | 35.22 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 10 mm | Back | 3 | 1:2.76 | 0.442 | 24.36 | 21.70 |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 10 mm | Front | 3 | 1:2.76 | 0.384 | 24.97 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 10 mm | Bottom | 3 | 1:2.76 | 0.814 | 21.70 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 10 mm | Right | 3 | 1:2.76 | 0.062 | 32.89 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 10 mm | Left | 3 | 1:2.76 | 0.060 | 33.03 | |
| 846.60 | 4233 | UMTS 850 | RMC | 23.69 | 10 mm | Back | N/A | 1:1 | 0.501 | 26.69 | 26.69 |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 10 mm | Front | N/A | 1:1 | 0.325 | 28.68 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 10 mm | Bottom | N/A | 1:1 | 0.277 | 29.38 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 10 mm | Right | N/A | 1:1 | 0.236 | 30.07 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 10 mm | Left | N/A | 1:1 | 0.088 | 34.36 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 10 mm | Back | N/A | 1:1 | 1.510 | 21.60 | 19.52 |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 10 mm | Front | N/A | 1:1 | 1.180 | 22.67 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 10 mm | Bottom | N/A | 1:1 | 2.440 | 19.52 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 10 mm | Right | N/A | 1:1 | 0.192 | 30.56 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 10 mm | Left | N/A | 1:1 | 0.180 | 30.84 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 10 mm | Back | N/A | 1:1 | 1.410 | 21.75 | 19.24 |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 10 mm | Front | N/A | 1:1 | 1.120 | 22.75 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 10 mm | Bottom | N/A | 1:1 | 2.510 | 19.24 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 10 mm | Right | N/A | 1:1 | 0.170 | 30.94 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 10 mm | Left | N/A | 1:1 | 0.157 | 31.28 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 10 mm | Back | N/A | 1:1 | 0.429 | 28.29 | 28.29 |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 10 mm | Front | N/A | 1:1 | 0.288 | 30.02 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 10 mm | Bottom | N/A | 1:1 | 0.235 | 30.90 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 10 mm | Right | N/A | 1:1 | 0.257 | 30.51 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 10 mm | Left | N/A | 1:1 | 0.109 | 34.24 | |
| 848.31 | 777 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.40 | 10 mm | Back | N/A | 1:1 | 0.560 | 26.92 | 26.92 |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 10 mm | Front | N/A | 1:1 | 0.374 | 28.79 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 10 mm | Bottom | N/A | 1:1 | 0.313 | 29.56 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 10 mm | Right | N/A | 1:1 | 0.283 | 30.00 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 10 mm | Left | N/A | 1:1 | 0.107 | 34.23 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 10 mm | Back | N/A | 1:1 | 1.360 | 21.77 | 19.85 |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 10 mm | Front | N/A | 1:1 | 1.200 | 22.32 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 10 mm | Bottom | N/A | 1:1 | 2.120 | 19.85 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 10 mm | Right | N/A | 1:1 | 0.161 | 31.04 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 10 mm | Left | N/A | 1:1 | 0.140 | 31.65 | |

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

# Table A-8
# DSI = 3 $P_{Limit}$ Calculations – 4G Hotspot SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 10 mm | Back | 1:1 | 0.182 | 32.26 | 31.76 |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 23.88 | 1 | QPSK | 50 | 0 | 10 mm | Back | 1:1 | 0.163 | 31.76 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 10 mm | Front | 1:1 | 0.164 | 32.71 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 23.88 | 1 | QPSK | 50 | 0 | 10 mm | Front | 1:1 | 0.132 | 32.67 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 10 mm | Bottom | 1:1 | 0.073 | 36.23 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 23.88 | 1 | QPSK | 50 | 0 | 10 mm | Bottom | 1:1 | 0.062 | 35.96 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 10 mm | Right | 1:1 | 0.142 | 33.34 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 23.88 | 1 | QPSK | 50 | 0 | 10 mm | Right | 1:1 | 0.128 | 32.81 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 10 mm | Left | 1:1 | 0.116 | 34.22 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 23.88 | 1 | QPSK | 50 | 0 | 10 mm | Left | 1:1 | 0.095 | 34.10 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 10 mm | Back | 1:1 | 0.242 | 31.08 | 30.66 |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 23.82 | 1 | QPSK | 25 | 12 | 10 mm | Back | 1:1 | 0.207 | 30.66 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 10 mm | Front | 1:1 | 0.170 | 32.62 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 23.82 | 1 | QPSK | 25 | 12 | 10 mm | Front | 1:1 | 0.128 | 32.75 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 10 mm | Bottom | 1:1 | 0.095 | 35.14 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 23.82 | 1 | QPSK | 25 | 12 | 10 mm | Bottom | 1:1 | 0.084 | 34.58 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 10 mm | Right | 1:1 | 0.169 | 32.64 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 23.82 | 1 | QPSK | 25 | 12 | 10 mm | Right | 1:1 | 0.160 | 31.78 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 10 mm | Left | 1:1 | 0.122 | 34.06 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 23.82 | 1 | QPSK | 25 | 12 | 10 mm | Left | 1:1 | 0.107 | 33.53 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 10 mm | Back | 1:1 | 0.392 | 29.06 | 28.60 |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 23.97 | 1 | QPSK | 25 | 0 | 10 mm | Back | 1:1 | 0.344 | 28.60 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 10 mm | Front | 1:1 | 0.296 | 30.28 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 23.97 | 1 | QPSK | 25 | 0 | 10 mm | Front | 1:1 | 0.251 | 29.97 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 10 mm | Bottom | 1:1 | 0.220 | 31.57 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 23.97 | 1 | QPSK | 25 | 0 | 10 mm | Bottom | 1:1 | 0.188 | 31.23 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 10 mm | Right | 1:1 | 0.330 | 29.80 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 23.97 | 1 | QPSK | 25 | 0 | 10 mm | Right | 1:1 | 0.253 | 29.94 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 10 mm | Left | 1:1 | 0.167 | 32.76 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 23.97 | 1 | QPSK | 25 | 0 | 10 mm | Left | 1:1 | 0.132 | 32.76 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 10 mm | Back | 1:1 | 0.487 | 27.90 | 27.64 |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 23.64 | 1 | QPSK | 25 | 0 | 10 mm | Back | 1:1 | 0.398 | 27.64 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 10 mm | Front | 1:1 | 0.332 | 29.57 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 23.64 | 1 | QPSK | 25 | 0 | 10 mm | Front | 1:1 | 0.286 | 29.08 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 10 mm | Bottom | 1:1 | 0.282 | 30.28 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 23.64 | 1 | QPSK | 25 | 0 | 10 mm | Bottom | 1:1 | 0.222 | 30.18 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 10 mm | Right | 1:1 | 0.365 | 29.16 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 23.64 | 1 | QPSK | 25 | 0 | 10 mm | Right | 1:1 | 0.284 | 29.11 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 10 mm | Left | 1:1 | 0.161 | 32.71 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 23.64 | 1 | QPSK | 25 | 0 | 10 mm | Left | 1:1 | 0.124 | 32.71 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 10 mm | Back | 1:1 | 0.596 | 26.97 | 26.97 |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 23.89 | 1 | QPSK | 36 | 37 | 10 mm | Back | 1:1 | 0.485 | 27.03 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 10 mm | Front | 1:1 | 0.419 | 28.50 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 23.89 | 1 | QPSK | 36 | 37 | 10 mm | Front | 1:1 | 0.343 | 28.54 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 10 mm | Bottom | 1:1 | 0.325 | 29.60 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 23.89 | 1 | QPSK | 36 | 37 | 10 mm | Bottom | 1:1 | 0.266 | 29.64 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 10 mm | Right | 1:1 | 0.271 | 30.39 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 23.89 | 1 | QPSK | 36 | 37 | 10 mm | Right | 1:1 | 0.216 | 30.55 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 10 mm | Left | 1:1 | 0.096 | 34.90 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 23.89 | 1 | QPSK | 36 | 37 | 10 mm | Left | 1:1 | 0.080 | 34.86 | |

| FREQUENCY MHz | Ch. | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) (W/kg) | PLimit [dBm] | Minimum PLimit [dBm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 10 mm | Back | 1:1 | 0.534 | 27.62 | 27.20 |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 23.87 | 1 | QPSK | 25 | 25 | 10 mm | Back | 1:1 | 0.464 | 27.20 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 10 mm | Front | 1:1 | 0.396 | 28.92 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 23.87 | 1 | QPSK | 25 | 25 | 10 mm | Front | 1:1 | 0.333 | 28.65 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 10 mm | Bottom | 1:1 | 0.324 | 29.79 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 23.87 | 1 | QPSK | 25 | 25 | 10 mm | Bottom | 1:1 | 0.274 | 29.49 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 10 mm | Right | 1:1 | 0.267 | 30.63 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 23.87 | 1 | QPSK | 25 | 25 | 10 mm | Right | 1:1 | 0.211 | 30.63 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 10 mm | Left | 1:1 | 0.093 | 35.22 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 23.87 | 1 | QPSK | 25 | 25 | 10 mm | Left | 1:1 | 0.075 | 35.12 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 10 mm | Back | 1:1 | 1.510 | 22.37 | 20.06 |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 10 mm | Front | 1:1 | 1.380 | 22.76 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 10 mm | Bottom | 1:1 | 2.570 | 20.06 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 10 mm | Right | 1:1 | 0.229 | 30.56 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 10 mm | Left | 1:1 | 0.185 | 31.49 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 10 mm | Back | 1:1 | 1.350 | 22.71 | 19.98 |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 10 mm | Front | 1:1 | 1.170 | 23.33 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 10 mm | Bottom | 1:1 | 2.530 | 19.98 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 10 mm | Right | 1:1 | 0.153 | 32.16 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 10 mm | Left | 1:1 | 0.166 | 31.81 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 10 mm | Back | 1:1 | 1.430 | 22.34 | 19.53 |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 10 mm | Front | 1:1 | 1.250 | 22.92 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 10 mm | Bottom | 1:1 | 2.730 | 19.53 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 10 mm | Right | 1:1 | 0.169 | 31.61 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 10 mm | Left | 1:1 | 0.140 | 32.43 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 10 mm | Back | 1:1 | 1.140 | 21.87 | 18.32 |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 10 mm | Front | 1:1 | 1.090 | 22.07 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 10 mm | Bottom | 1:1 | 2.580 | 18.32 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 10 mm | Right | 1:1 | 0.087 | 33.04 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 10 mm | Left | 1:1 | 0.072 | 33.87 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 10 mm | Back | 1:1 | 0.754 | 24.68 | 21.02 |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 10 mm | Front | 1:1 | 0.628 | 25.47 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 10 mm | Bottom | 1:1 | 1.750 | 21.02 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 10 mm | Left | 1:1 | 0.171 | 31.12 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | QPSK | 1 | 50 | 10 mm | Back | 1:1.58 | 0.370 | 26.08 | 22.92 |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.00 | 1 | QPSK | 50 | 25 | 10 mm | Back | 1:1.58 | 0.295 | 26.32 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | QPSK | 1 | 50 | 10 mm | Front | 1:1.58 | 0.197 | 28.82 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.00 | 1 | QPSK | 50 | 25 | 10 mm | Front | 1:1.58 | 0.157 | 29.06 | |
| 3560.00 | 55340 | Low | LTE Band 48 | 20 | 23.37 | 0 | QPSK | 1 | 99 | 10 mm | Top | 1:1.58 | 0.702 | 22.92 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.00 | 1 | QPSK | 50 | 25 | 10 mm | Top | 1:1.58 | 0.525 | 23.81 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | QPSK | 1 | 50 | 10 mm | Left | 1:1.58 | 0.340 | 26.45 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.00 | 1 | QPSK | 50 | 25 | 10 mm | Left | 1:1.58 | 0.274 | 26.64 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 10 mm | Back | 1:1.58 | 0.365 | 27.20 | 22.82 |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 10 mm | Front | 1:1.58 | 0.329 | 27.65 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 10 mm | Bottom | 1:1.58 | 1.000 | 22.82 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 10 mm | Left | 1:1.58 | 0.136 | 31.49 | |

MEASUREMENT RESULTS

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

# Table A-9
# DSI = 3 $P_{Limit}$ Calculations – NR Hotspot SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (1g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 10 mm | Back | 1:1 | 0.247 | 31.03 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.90 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Back | 1:1 | 0.247 | 30.97 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 23.45 | 1.5 | CP-OFDM QPSK | 1 | 1 | 10 mm | Back | 1:1 | 0.153 | 31.60 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 10 mm | Front | 1:1 | 0.191 | 32.15 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.90 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Front | 1:1 | 0.189 | 32.14 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 10 mm | Bottom | 1:1 | 0.111 | 34.51 | 30.97 |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.90 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Bottom | 1:1 | 0.114 | 34.33 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 10 mm | Right | 1:1 | 0.218 | 31.58 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.90 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Right | 1:1 | 0.207 | 31.74 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 10 mm | Left | 1:1 | 0.150 | 33.20 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.90 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Left | 1:1 | 0.145 | 33.29 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.82 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 10 mm | Back | 1:1 | 0.470 | 28.10 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Back | 1:1 | 0.498 | 27.45 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 23.10 | 1.5 | CP-OFDM QPSK | 1 | 1 | 10 mm | Back | 1:1 | 0.311 | 28.17 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.82 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 10 mm | Front | 1:1 | 0.299 | 30.06 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Front | 1:1 | 0.336 | 29.16 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.82 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 10 mm | Bottom | 1:1 | 0.269 | 30.52 | 27.45 |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Bottom | 1:1 | 0.314 | 29.45 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.82 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 10 mm | Right | 1:1 | 0.240 | 31.02 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Right | 1:1 | 0.242 | 30.58 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.82 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 10 mm | Left | 1:1 | 0.089 | 35.33 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Left | 1:1 | 0.090 | 34.88 | |
| 1770.00 | 354000 | High | NR Band n66 | 20 | 23.94 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 10 mm | Back | 1:1 | 1.070 | 23.65 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.23 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Front | 1:1 | 0.987 | 24.29 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.23 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 10 mm | Bottom | 1:1 | 1.880 | 21.49 | 21.49 |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 10 mm | Right | 1:1 | 0.112 | 33.79 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 10 mm | Left | 1:1 | 0.132 | 33.07 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 10 mm | Back | 1:1 | 1.170 | 23.22 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 10 mm | Front | 1:1 | 1.080 | 23.57 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 10 mm | Bottom | 1:1 | 2.330 | 20.23 | 20.23 |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 10 mm | Right | 1:1 | 0.159 | 31.89 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 10 mm | Left | 1:1 | 0.136 | 32.56 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 10 mm | Back | 1:4 | 0.099 | 27.43 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.28 | 0 | DFT-s-OFDM QPSK | 135 | 69 | 10 mm | Back | 1:4 | 0.104 | 27.09 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 10 mm | Front | 1:4 | 0.051 | 30.31 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.28 | 0 | DFT-s-OFDM QPSK | 135 | 69 | 10 mm | Front | 1:4 | 0.063 | 29.27 | 25.68 |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 10 mm | Top | 1:4 | 0.139 | 25.96 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.28 | 0 | DFT-s-OFDM QPSK | 135 | 69 | 10 mm | Top | 1:4 | 0.144 | 25.68 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 10 mm | Left | 1:4 | 0.028 | 32.92 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.28 | 0 | DFT-s-OFDM QPSK | 135 | 69 | 10 mm | Left | 1:4 | 0.028 | 32.79 | |

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

## Table A-10
## DSI = 0 $P_{Limit}$ Calculations – 2G/3G Phablet SAR

| MEASUREMENT RESULTS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | Mode/Band | Service | Conducted Power [dBm] | Spacing | Side | # of GPRS Slots | Duty Cycle | SAR (10g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 8 mm | Back | 3 | 1:2.76 | 0.317 | 33.17 | |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 6 mm | Front | 3 | 1:2.76 | 0.333 | 32.95 | |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 11 mm | Bottom | 3 | 1:2.76 | 0.107 | 37.89 | 32.95 |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 0 mm | Right | 3 | 1:2.76 | 0.208 | 35.00 | |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 0 mm | Left | 3 | 1:2.76 | 0.138 | 36.78 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 8 mm | Back | 3 | 1:2.76 | 0.318 | 29.77 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 6 mm | Front | 3 | 1:2.76 | 0.403 | 28.74 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 11 mm | Bottom | 3 | 1:2.76 | 0.397 | 28.80 | 28.74 |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 0 mm | Right | 3 | 1:2.76 | 0.124 | 33.86 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 0 mm | Left | 3 | 1:2.76 | 0.119 | 34.03 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 8 mm | Back | N/A | 1:1 | 0.351 | 32.33 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 6 mm | Front | N/A | 1:1 | 0.356 | 32.26 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 11 mm | Bottom | N/A | 1:1 | 0.107 | 37.49 | 32.26 |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 0 mm | Right | N/A | 1:1 | 0.203 | 34.70 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 0 mm | Left | N/A | 1:1 | 0.157 | 35.82 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 8 mm | Back | N/A | 1:1 | 1.060 | 27.12 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 6 mm | Front | N/A | 1:1 | 1.330 | 26.13 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 11 mm | Bottom | N/A | 1:1 | 1.140 | 26.80 | 26.13 |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 0 mm | Right | N/A | 1:1 | 0.382 | 31.55 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 0 mm | Left | N/A | 1:1 | 0.353 | 31.89 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 8 mm | Back | N/A | 1:1 | 0.844 | 27.96 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 6 mm | Front | N/A | 1:1 | 1.150 | 26.61 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 11 mm | Bottom | N/A | 1:1 | 0.995 | 27.24 | 26.61 |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 0 mm | Right | N/A | 1:1 | 0.355 | 31.72 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 0 mm | Left | N/A | 1:1 | 0.340 | 31.90 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 8 mm | Back | N/A | 1:1 | 0.356 | 33.07 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 6 mm | Front | N/A | 1:1 | 0.358 | 33.05 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 11 mm | Bottom | N/A | 1:1 | 0.108 | 38.26 | 33.05 |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 0 mm | Right | N/A | 1:1 | 0.228 | 35.01 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 0 mm | Left | N/A | 1:1 | 0.137 | 37.22 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 8 mm | Back | N/A | 1:1 | 0.403 | 32.45 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 6 mm | Front | N/A | 1:1 | 0.434 | 32.12 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 11 mm | Bottom | N/A | 1:1 | 0.122 | 37.64 | 32.12 |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 0 mm | Right | N/A | 1:1 | 0.259 | 34.37 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 0 mm | Left | N/A | 1:1 | 0.154 | 36.62 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 8 mm | Back | N/A | 1:1 | 0.834 | 27.88 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 6 mm | Front | N/A | 1:1 | 0.987 | 27.15 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 11 mm | Bottom | N/A | 1:1 | 1.020 | 27.00 | 27.00 |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 0 mm | Right | N/A | 1:1 | 0.322 | 32.01 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 0 mm | Left | N/A | 1:1 | 0.304 | 32.26 | |

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

## Table A-11
## DSI = 1 $P_{Limit}$ Calculations – 2G/3G Phablet SAR

| MEASUREMENT RESULTS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | Mode/Band | Service | Conducted Power [dBm] | Spacing | Side | # of GPRS Slots | Duty Cycle | SAR (10g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 0 mm | Back | 3 | 1:2.76 | 1.620 | 26.08 | |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 0 mm | Front | 3 | 1:2.76 | 1.490 | 26.45 | |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 0 mm | Bottom | 3 | 1:2.76 | 0.689 | 29.80 | 26.08 |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 0 mm | Right | 3 | 1:2.76 | 0.208 | 35.00 | |
| 836.60 | 190 | GSM 850 | GPRS | 28.63 | 0 mm | Left | 3 | 1:2.76 | 0.138 | 36.78 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 0 mm | Back | 3 | 1:2.76 | 1.620 | 22.69 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 0 mm | Front | 3 | 1:2.76 | 1.510 | 23.00 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 0 mm | Bottom | 3 | 1:2.76 | 3.180 | 19.77 | 19.77 |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 0 mm | Right | 3 | 1:2.76 | 0.124 | 33.86 | |
| 1880.00 | 661 | GSM 1900 | GPRS | 25.24 | 0 mm | Left | 3 | 1:2.76 | 0.119 | 34.03 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 0 mm | Back | N/A | 1:1 | 1.490 | 26.05 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 0 mm | Front | N/A | 1:1 | 1.470 | 26.11 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 0 mm | Bottom | N/A | 1:1 | 0.801 | 28.74 | 26.05 |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 0 mm | Right | N/A | 1:1 | 0.203 | 34.70 | |
| 836.60 | 4183 | UMTS 850 | RMC | 23.80 | 0 mm | Left | N/A | 1:1 | 0.157 | 35.82 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 0 mm | Back | N/A | 1:1 | 4.030 | 21.32 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 0 mm | Front | N/A | 1:1 | 4.050 | 21.29 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 0 mm | Bottom | N/A | 1:1 | 5.780 | 19.75 | 19.75 |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 0 mm | Right | N/A | 1:1 | 0.382 | 31.55 | |
| 1732.40 | 1412 | UMTS 1750 | RMC | 23.39 | 0 mm | Left | N/A | 1:1 | 0.353 | 31.89 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 0 mm | Back | N/A | 1:1 | 4.310 | 20.87 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 0 mm | Front | N/A | 1:1 | 4.180 | 21.01 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 0 mm | Bottom | N/A | 1:1 | 6.360 | 19.18 | 19.18 |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 0 mm | Right | N/A | 1:1 | 0.355 | 31.72 | |
| 1880.00 | 9400 | UMTS 1900 | RMC | 23.24 | 0 mm | Left | N/A | 1:1 | 0.340 | 31.90 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 0 mm | Back | N/A | 1:1 | 1.720 | 26.23 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 0 mm | Front | N/A | 1:1 | 1.580 | 26.60 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 0 mm | Bottom | N/A | 1:1 | 0.815 | 29.48 | 26.23 |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 0 mm | Right | N/A | 1:1 | 0.228 | 35.01 | |
| 820.10 | 564 | CDMA BC10 (§90S) | EVDO Rev. 0 | 24.61 | 0 mm | Left | N/A | 1:1 | 0.137 | 37.22 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 0 mm | Back | N/A | 1:1 | 1.700 | 26.19 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 0 mm | Front | N/A | 1:1 | 1.630 | 26.38 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 0 mm | Bottom | N/A | 1:1 | 0.661 | 30.30 | 26.19 |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 0 mm | Right | N/A | 1:1 | 0.259 | 34.37 | |
| 836.52 | 384 | CDMA BC0 (§22H) | EVDO Rev. 0 | 24.52 | 0 mm | Left | N/A | 1:1 | 0.154 | 36.62 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 0 mm | Back | N/A | 1:1 | 3.990 | 21.08 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 0 mm | Front | N/A | 1:1 | 3.380 | 21.80 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 0 mm | Bottom | N/A | 1:1 | 5.210 | 19.92 | 19.92 |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 0 mm | Right | N/A | 1:1 | 0.322 | 32.01 | |
| 1880.00 | 600 | PCS CDMA | EVDO Rev. 0 | 23.11 | 0 mm | Left | N/A | 1:1 | 0.304 | 32.26 | |

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

# Table A-12
## DSI = 0 $P_{Limit}$ Calculations – 4G Phablet SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (10g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 8 mm | Back | 1:1 | 0.163 | 36.72 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 6 mm | Front | 1:1 | 0.134 | 37.57 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 11 mm | Bottom | 1:1 | 0.038 | 43.04 | 36.72 |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.094 | 39.11 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1 | 0.053 | 41.60 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 8 mm | Back | 1:1 | 0.189 | 36.13 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 6 mm | Front | 1:1 | 0.171 | 36.57 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 11 mm | Bottom | 1:1 | 0.042 | 42.67 | 36.13 |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.115 | 38.29 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1 | 0.062 | 40.98 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 8 mm | Back | 1:1 | 0.339 | 33.67 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 6 mm | Front | 1:1 | 0.341 | 33.64 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 11 mm | Bottom | 1:1 | 0.100 | 38.97 | 33.64 |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.221 | 35.53 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1 | 0.143 | 37.42 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 8 mm | Back | 1:1 | 0.421 | 32.52 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 6 mm | Front | 1:1 | 0.431 | 32.41 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 11 mm | Bottom | 1:1 | 0.129 | 37.65 | 32.41 |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.256 | 34.68 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1 | 0.161 | 36.69 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 8 mm | Back | 1:1 | 0.476 | 31.92 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 6 mm | Front | 1:1 | 0.434 | 32.32 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 11 mm | Bottom | 1:1 | 0.144 | 37.12 | 31.92 |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 0 mm | Right | 1:1 | 0.259 | 34.57 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 0 mm | Left | 1:1 | 0.165 | 36.52 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 8 mm | Back | 1:1 | 0.474 | 32.12 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 6 mm | Front | 1:1 | 0.431 | 32.53 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 11 mm | Bottom | 1:1 | 0.143 | 37.33 | 32.12 |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.269 | 34.58 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1 | 0.175 | 36.45 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 8 mm | back | 1:1 | 1.110 | 27.69 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 23.19 | 1 | QPSK | 50 | 0 | 8 mm | back | 1:1 | 0.946 | 27.41 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 6 mm | front | 1:1 | 1.270 | 27.10 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 23.19 | 1 | QPSK | 50 | 0 | 6 mm | front | 1:1 | 1.060 | 26.92 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 11 mm | bottom | 1:1 | 1.350 | 26.84 | 26.80 |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 23.19 | 1 | QPSK | 50 | 0 | 11 mm | bottom | 1:1 | 1.090 | 26.80 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 0 mm | right | 1:1 | 0.368 | 32.48 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 23.19 | 1 | QPSK | 50 | 0 | 0 mm | right | 1:1 | 0.303 | 32.35 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 0 mm | left | 1:1 | 0.410 | 32.01 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 23.19 | 1 | QPSK | 50 | 0 | 0 mm | left | 1:1 | 0.337 | 31.89 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 8 mm | back | 1:1 | 0.924 | 28.33 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 23.04 | 1 | QPSK | 50 | 50 | 8 mm | back | 1:1 | 0.766 | 28.18 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 6 mm | front | 1:1 | 1.180 | 27.27 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 23.04 | 1 | QPSK | 50 | 50 | 6 mm | front | 1:1 | 0.979 | 27.11 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 11 mm | bottom | 1:1 | 1.150 | 27.38 | 27.11 |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 23.04 | 1 | QPSK | 50 | 50 | 11 mm | bottom | 1:1 | 0.929 | 27.34 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 0 mm | right | 1:1 | 0.337 | 32.71 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 23.04 | 1 | QPSK | 50 | 50 | 0 mm | right | 1:1 | 0.285 | 32.47 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 0 mm | left | 1:1 | 0.338 | 32.70 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 23.04 | 1 | QPSK | 50 | 50 | 0 mm | left | 1:1 | 0.272 | 32.67 | |

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (10g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 8 mm | back | 1:1 | 0.989 | 27.92 | 26.73 |
| 1880.00 | 18900 | Mid | LTE Band 2 (PCS) | 20 | 22.98 | 1 | QPSK | 50 | 25 | 8 mm | back | 1:1 | 0.797 | 27.94 | |
| 1860.00 | 18700 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 6 mm | front | 1:1 | 1.300 | 26.73 | |
| 1840.00 | 18500 | Mid | LTE Band 2 (PCS) | 20 | 22.98 | 1 | QPSK | 50 | 25 | 6 mm | front | 1:1 | 1.010 | 26.92 | |
| 1820.00 | 18300 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 11 mm | bottom | 1:1 | 1.230 | 26.97 | |
| 1800.00 | 18100 | Mid | LTE Band 2 (PCS) | 20 | 22.98 | 1 | QPSK | 50 | 25 | 11 mm | bottom | 1:1 | 0.966 | 27.11 | |
| 1780.00 | 17900 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 0 mm | right | 1:1 | 0.351 | 32.42 | |
| 1760.00 | 17700 | Mid | LTE Band 2 (PCS) | 20 | 22.98 | 1 | QPSK | 50 | 25 | 0 mm | right | 1:1 | 0.284 | 32.43 | |
| 1740.00 | 17500 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 0 mm | left | 1:1 | 0.330 | 32.68 | |
| 1720.00 | 17300 | Mid | LTE Band 2 (PCS) | 20 | 22.98 | 1 | QPSK | 50 | 25 | 0 mm | left | 1:1 | 0.273 | 32.60 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 8 mm | back | 1:1 | 0.741 | 27.72 | 26.23 |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 21.58 | 1 | QPSK | 25 | 12 | 8 mm | back | 1:1 | 0.599 | 27.79 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 6 mm | front | 1:1 | 0.993 | 26.45 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 21.58 | 1 | QPSK | 25 | 12 | 6 mm | front | 1:1 | 0.814 | 26.45 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 11 mm | bottom | 1:1 | 1.040 | 26.25 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 21.58 | 1 | QPSK | 25 | 12 | 11 mm | bottom | 1:1 | 0.857 | 26.23 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.225 | 32.90 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 21.58 | 1 | QPSK | 25 | 12 | 0 mm | Right | 1:1 | 0.185 | 32.89 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 0 mm | left | 1:1 | 0.298 | 31.68 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 21.58 | 1 | QPSK | 25 | 12 | 0 mm | left | 1:1 | 0.247 | 31.63 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 8 mm | back | 1:1 | 0.511 | 30.35 | 29.18 |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 22.60 | 1 | QPSK | 50 | 50 | 8 mm | back | 1:1 | 0.426 | 30.29 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 6 mm | front | 1:1 | 0.617 | 29.53 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 22.60 | 1 | QPSK | 50 | 50 | 6 mm | front | 1:1 | 0.507 | 29.53 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 11 mm | bottom | 1:1 | 0.669 | 29.18 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 22.60 | 1 | QPSK | 50 | 50 | 11 mm | bottom | 1:1 | 0.520 | 29.42 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 0 mm | left | 1:1 | 0.423 | 31.17 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 22.60 | 1 | QPSK | 50 | 50 | 0 mm | left | 1:1 | 0.420 | 30.35 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | QPSK | 1 | 50 | 0 mm | Back | 1:1.58 | 1.750 | 31.38 | 22.48 |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | QPSK | 1 | 50 | 0 mm | Front | 1:1.58 | 1.430 | 31.45 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | QPSK | 1 | 50 | 0 mm | Top | 1:1.58 | 2.110 | 22.50 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | QPSK | 1 | 50 | 0 mm | Left | 1:1.58 | 2.120 | 22.48 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 8 mm | back | 1:1.58 | 0.232 | 33.15 | 31.74 |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.00 | 1 | QPSK | 50 | 0 | 8 mm | back | 1:1.58 | 0.188 | 33.25 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 6 mm | front | 1:1.58 | 0.243 | 32.95 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.00 | 1 | QPSK | 50 | 0 | 6 mm | front | 1:1.58 | 0.199 | 33.00 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 11 mm | bottom | 1:1.58 | 0.290 | 32.18 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.00 | 1 | QPSK | 50 | 0 | 11 mm | bottom | 1:1.58 | 0.240 | 32.19 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 0 mm | left | 1:1.58 | 0.321 | 31.74 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.00 | 1 | QPSK | 50 | 0 | 0 mm | left | 1:1.58 | 0.264 | 31.78 | |

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

## Table A-13
## DSI = 1 $P_{Limit}$ Calculations – 4G Phablet SAR

**MEASUREMENT RESULTS**

| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (10g) | PLimit | Minimum PLimit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 0 mm | Back | 1:1 | 0.775 | 29.95 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 0 mm | Front | 1:1 | 0.797 | 29.82 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 0 mm | Bottom | 1:1 | 0.540 | 31.52 | 29.82 |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.094 | 39.11 | |
| 680.50 | 133297 | Mid | LTE Band 71 | 20 | 24.86 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1 | 0.053 | 41.60 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 0 mm | Back | 1:1 | 0.844 | 29.64 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 0 mm | Front | 1:1 | 0.740 | 30.21 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 0 mm | Bottom | 1:1 | 0.643 | 30.82 | 29.64 |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.115 | 38.29 | |
| 707.50 | 23095 | Mid | LTE Band 12 | 10 | 24.92 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1 | 0.062 | 40.98 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 0 mm | Back | 1:1 | 1.510 | 27.18 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 0 mm | Front | 1:1 | 1.480 | 27.27 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 0 mm | Bottom | 1:1 | 0.653 | 30.82 | 27.18 |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.221 | 35.53 | |
| 782.00 | 23230 | Mid | LTE Band 13 | 10 | 24.99 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1 | 0.143 | 37.42 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 0 mm | Back | 1:1 | 1.590 | 26.75 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 0 mm | Front | 1:1 | 1.540 | 26.88 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 0 mm | Bottom | 1:1 | 0.751 | 30.00 | 26.75 |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.256 | 34.68 | |
| 793.00 | 23330 | Mid | LTE Band 14 | 10 | 24.78 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1 | 0.161 | 36.69 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 0 mm | Back | 1:1 | 1.950 | 25.80 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 0 mm | Front | 1:1 | 1.410 | 27.21 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 0 mm | Bottom | 1:1 | 1.020 | 28.61 | 25.80 |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 0 mm | Right | 1:1 | 0.259 | 34.57 | |
| 831.50 | 26865 | Mid | LTE Band 26 (Cell) | 15 | 24.72 | 0 | QPSK | 1 | 36 | 0 mm | Left | 1:1 | 0.165 | 36.52 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 0 mm | Back | 1:1 | 1.910 | 26.07 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 0 mm | Front | 1:1 | 1.380 | 27.48 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 0 mm | Bottom | 1:1 | 1.010 | 28.84 | 26.07 |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.269 | 34.58 | |
| 836.50 | 20525 | Mid | LTE Band 5 (Cell) | 10 | 24.90 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1 | 0.175 | 36.45 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 0 mm | Back | 1:1 | 4.480 | 21.63 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 0 mm | Front | 1:1 | 4.330 | 21.77 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 0 mm | Bottom | 1:1 | 6.760 | 19.84 | 19.84 |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 0 mm | Right | 1:1 | 0.368 | 32.48 | |
| 1745.00 | 132322 | Mid | LTE Band 66 (AWS) | 20 | 24.16 | 0 | QPSK | 1 | 50 | 0 mm | Left | 1:1 | 0.410 | 32.01 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 0 mm | Back | 1:1 | 4.400 | 21.55 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 0 mm | Front | 1:1 | 4.150 | 21.81 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 0 mm | Bottom | 1:1 | 5.860 | 20.31 | 20.31 |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 0 mm | Right | 1:1 | 0.337 | 32.71 | |
| 1882.50 | 26365 | Mid | LTE Band 25 (PCS) | 20 | 24.01 | 0 | QPSK | 1 | 99 | 0 mm | Left | 1:1 | 0.338 | 32.70 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 0 mm | Back | 1:1 | 4.300 | 21.53 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 0 mm | Front | 1:1 | 4.030 | 21.82 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 0 mm | Bottom | 1:1 | 6.310 | 19.87 | 19.87 |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 0 mm | Right | 1:1 | 0.351 | 32.42 | |
| 1900.00 | 19100 | High | LTE Band 2 (PCS) | 20 | 23.89 | 0 | QPSK | 1 | 99 | 0 mm | Left | 1:1 | 0.330 | 32.68 | |

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (10g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 0 mm | Back | 1:1 | 2.990 | 21.66 | 21.16 |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 0 mm | Front | 1:1 | 3.210 | 21.35 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 0 mm | Bottom | 1:1 | 3.360 | 21.16 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 0 mm | Right | 1:1 | 0.225 | 32.90 | |
| 2310.00 | 27710 | Mid | LTE Band 30 | 10 | 22.44 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1 | 0.298 | 31.68 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 0 mm | Back | 1:1 | 2.230 | 23.95 | 23.95 |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 0 mm | Front | 1:1 | 1.630 | 25.31 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 0 mm | Bottom | 1:1 | 1.780 | 24.93 | |
| 2510.00 | 20850 | Low | LTE Band 7 | 20 | 23.45 | 0 | QPSK | 1 | 99 | 0 mm | Left | 1:1 | 0.423 | 31.17 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | QPSK | 1 | 0 | 0 mm | Back | 1:1.58 | 1.750 | 23.31 | 22.48 |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | QPSK | 1 | 0 | 0 mm | Front | 1:1.58 | 1.430 | 24.19 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | QPSK | 1 | 0 | 0 mm | Top | 1:1.58 | 2.110 | 22.50 | |
| 3690.00 | 56640 | High | LTE Band 48 | 20 | 23.75 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1.58 | 2.120 | 22.48 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 0 mm | Back | 1:1.58 | 2.270 | 23.24 | 23.24 |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 0 mm | Front | 1:1.58 | 1.170 | 26.12 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 0 mm | Bottom | 1:1.58 | 1.120 | 26.31 | |
| 2593.00 | 40620 | Mid | LTE Band 41 | 20 | 24.81 | 0 | QPSK | 1 | 0 | 0 mm | Left | 1:1.58 | 0.321 | 31.74 | |

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

## Table A-14
## DSI = 0 $P_{Limit}$ Calculations – NR Phablet SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (10g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 8 mm | Back | 1:1 | 0.185 | 36.27 | 36.27 |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 6 mm | Front | 1:1 | 0.160 | 36.90 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 11 mm | Bottom | 1:1 | 0.045 | 42.41 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Right | 1:1 | 0.116 | 38.29 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Left | 1:1 | 0.062 | 41.02 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 8 mm | Back | 1:1 | 0.404 | 32.34 | 32.11 |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 6 mm | Front | 1:1 | 0.426 | 32.11 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 11 mm | Bottom | 1:1 | 0.124 | 37.47 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 0 mm | Right | 1:1 | 0.258 | 34.28 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 0 mm | Left | 1:1 | 0.158 | 36.41 | |
| 1745.00 | 349000 | Mid | NR Band n66 (AWS) | 20 | 24.28 | 0 | DFT-S-OFDM QPSK | 1 | 53 | 8 mm | Back | 1:1 | 1.090 | 27.89 | 27.60 |
| 1745.00 | 349000 | Mid | NR Band n66 (AWS) | 20 | 24.23 | 0 | DFT-S-OFDM QPSK | 50 | 28 | 8 mm | Back | 1:1 | 1.020 | 28.12 | |
| 1745.00 | 349000 | Mid | NR Band n66 (AWS) | 20 | 24.28 | 0 | DFT-S-OFDM QPSK | 1 | 53 | 6 mm | Front | 1:1 | 1.120 | 27.77 | |
| 1745.00 | 349000 | Mid | NR Band n66 (AWS) | 20 | 24.23 | 0 | DFT-S-OFDM QPSK | 50 | 28 | 6 mm | Front | 1:1 | 1.150 | 27.60 | |
| 1745.00 | 349000 | Mid | NR Band n66 (AWS) | 20 | 24.28 | 0 | DFT-S-OFDM QPSK | 1 | 53 | 11 mm | Bottom | 1:1 | 1.050 | 28.05 | |
| 1745.00 | 349000 | Mid | NR Band n66 (AWS) | 20 | 24.23 | 0 | DFT-S-OFDM QPSK | 50 | 28 | 11 mm | Bottom | 1:1 | 1.020 | 28.12 | |
| 1745.00 | 349000 | Mid | NR Band n66 (AWS) | 20 | 24.28 | 0 | DFT-S-OFDM QPSK | 1 | 53 | 0 mm | Right | 1:1 | 0.363 | 32.66 | |
| 1745.00 | 349000 | Mid | NR Band n66 (AWS) | 20 | 24.23 | 0 | DFT-S-OFDM QPSK | 50 | 28 | 0 mm | Right | 1:1 | 0.355 | 32.71 | |
| 1745.00 | 349000 | Mid | NR Band n66 (AWS) | 20 | 24.28 | 0 | DFT-S-OFDM QPSK | 1 | 53 | 0 mm | Left | 1:1 | 0.449 | 31.74 | |
| 1745.00 | 349000 | Mid | NR Band n66 (AWS) | 20 | 24.23 | 0 | DFT-S-OFDM QPSK | 50 | 28 | 0 mm | Left | 1:1 | 0.429 | 31.88 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-S-OFDM QPSK | 1 | 1 | 8 mm | Back | 1:1 | 0.903 | 28.32 | 26.88 |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-S-OFDM QPSK | 50 | 28 | 8 mm | Back | 1:1 | 0.832 | 28.68 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-S-OFDM QPSK | 1 | 1 | 6 mm | Front | 1:1 | 1.260 | 26.88 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-S-OFDM QPSK | 50 | 28 | 6 mm | Front | 1:1 | 1.180 | 27.16 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-S-OFDM QPSK | 1 | 1 | 11 mm | Bottom | 1:1 | 1.110 | 27.43 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-S-OFDM QPSK | 50 | 28 | 11 mm | Bottom | 1:1 | 1.060 | 27.63 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-S-OFDM QPSK | 1 | 1 | 0 mm | Right | 1:1 | 0.314 | 32.91 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-S-OFDM QPSK | 50 | 28 | 0 mm | Right | 1:1 | 0.319 | 32.84 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-S-OFDM QPSK | 1 | 1 | 0 mm | Left | 1:1 | 0.313 | 32.92 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-S-OFDM QPSK | 50 | 28 | 0 mm | Left | 1:1 | 0.325 | 32.76 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 0 mm | Back | 1:4 | 0.404 | 25.30 | 22.86 |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 0 mm | Front | 1:4 | 0.303 | 26.55 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 0 mm | Top | 1:4 | 0.710 | 22.86 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 0 mm | Left | 1:4 | 0.158 | 29.38 | |

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

## Table A-15
## DSI = 1 $P_{Limit}$ Calculations – NR Phablet SAR

| MEASUREMENT RESULTS | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FREQUENCY | | | Mode | Bandwidth [MHz] | Conducted Power [dBm] | MPR [dB] | Modulation | RB Size | RB Offset | Spacing | Side | Duty Cycle | SAR (10g) | PLimit | Minimum PLimit |
| MHz | Ch. | | | | | | | | | | | | (W/kg) | [dBm] | [dBm] |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Back | 1:1 | 0.902 | 29.39 | 29.39 |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Front | 1:1 | 0.788 | 29.97 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Bottom | 1:1 | 0.465 | 32.26 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Right | 1:1 | 0.116 | 38.29 | |
| 680.50 | 136100 | Mid | NR Band n71 | 20 | 24.96 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Left | 1:1 | 0.062 | 41.02 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 0 mm | Back | 1:1 | 1.820 | 25.80 | 25.80 |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 0 mm | Front | 1:1 | 1.610 | 26.33 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 0 mm | Bottom | 1:1 | 0.764 | 29.57 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 0 mm | Right | 1:1 | 0.258 | 34.28 | |
| 836.50 | 167300 | Mid | NR Band n5 | 20 | 24.42 | 0 | DFT-s-OFDM QPSK | 50 | 28 | 0 mm | Left | 1:1 | 0.158 | 36.41 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Back | 1:1 | 2.450 | 24.37 | 20.70 |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Front | 1:1 | 4.410 | 21.82 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Bottom | 1:1 | 5.700 | 20.70 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Right | 1:1 | 0.363 | 32.66 | |
| 1745.00 | 349000 | Mid | NR Band n66 | 20 | 24.28 | 0 | DFT-s-OFDM QPSK | 1 | 53 | 0 mm | Left | 1:1 | 0.449 | 31.74 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 0 mm | Back | 1:1 | 3.980 | 21.88 | 19.73 |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 0 mm | Front | 1:1 | 3.880 | 21.99 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 0 mm | Bottom | 1:1 | 6.530 | 19.73 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 0 mm | Right | 1:1 | 0.314 | 32.91 | |
| 1900.00 | 380000 | High | NR Band n2 | 20 | 23.90 | 0 | DFT-s-OFDM QPSK | 1 | 1 | 0 mm | Left | 1:1 | 0.313 | 32.92 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 0 mm | Back | 1:4 | 0.404 | 25.30 | 22.86 |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 0 mm | Front | 1:4 | 0.303 | 26.55 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 0 mm | Top | 1:4 | 0.710 | 22.86 | |
| 2592.99 | 518598 | Mid | NR Band n41 | 100 | 23.41 | 0 | DFT-s-OFDM QPSK | 1 | 137 | 0 mm | Left | 1:4 | 0.158 | 29.38 | |

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