



SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZSAR-TRF-01 Rev. A/0 May15,2023

Report No.: SZCR250100004910

Page: 1 of 82

FCC TEST REPORT PART 2

(Test Under Dynamic Transmission Condition)

Application No.: SZCR2501000049WM
Applicant: Guangdong OPPO Mobile Telecommunications Corp.,Ltd.
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Manufacturer: Guangdong OPPO Mobile Telecommunications Corp.,Ltd.
Address of Manufacturer: NO.18 Haibin Road, Wusha, Chang'an Town, Dongguan City, Guangdong, China
Product Name: Mobile Phone
Model No.(EUT): CPH2699, A501OP, OPG05
Trade Mark: OPPO
FCC ID: R9C-OP24264
Date of Receipt: 2025-01-17
Date of Test: 2025-02-07 to 2025-02-09
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Test conclusion: PASS

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EMC Laboratory Manager



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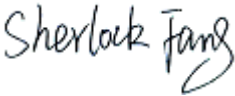
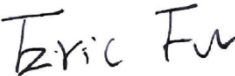
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1 Introduction

The equipment under test (EUT) is a portable handset, it contains the Qualcomm modem supporting 2G/3G/4G/BT/WLAN/NFC bands, but only 2G/3G/4G are enabled with Qualcomm Smart Transmit feature to control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is in compliance with the FCC requirement. we verification the applicable cases in part2.

This purpose of the Part 2 report is to demonstrate the EUT complies with FCC RF exposure requirement under Tx varying transmission scenarios, thereby validity of Qualcomm Smart Transmit feature for FCC equipment authorization.

1.1 Test Lab Information

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1.2 Bibliography

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2 Tx Varying Transmission Test Cases and Test Proposal

To validate time averaging feature and demonstrate the compliance in Tx varying transmission conditions, the following transmission scenarios are covered in Part 2 test:

1. During a time-varying Tx power transmission: To prove that the Smart Transmit feature accounts for Tx power variations in time accurately.
2. During a call disconnect and re-establish scenario: To prove that the Smart Transmit feature accounts for history of past Tx power transmissions accurately.
3. During technology/band handover: To prove that the Smart Transmit feature functions correctly during transitions in technology/band.
4. During DSI (Device State Index) change: To prove that the Smart Transmit feature functions correctly during transition from one device state (DSI) to another.
5. During antenna switch: To prove that the Smart Transmit feature functions correctly during transitions in antenna (such as AsDiv scenario).
6. SAR exposure switching between two active radios (radio1 and radio2): To prove that the Smart Transmit feature functions correctly and ensures total RF exposure compliance when exposure varies among SAR_radio1 only, SAR_radio1 + SAR_radio2, and SAR_radio2 only scenarios.

As described in Part 0 report, the RF exposure is proportional to the Tx power for a SAR-characterized wireless device. Thus, feature validation in Part 2 can be effectively performed through conducted (for $f < 6\text{GHz}$) measurement. Therefore, the compliance demonstration under dynamic transmission conditions and feature validation are done in conducted/radiated power measurement setup for transmission scenario 1 through 5.



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Mathematical expression:

- For sub-6 transmission only:

$$1g_or_10gSAR(t) = \frac{conducted_Tx_power(t)}{conducted_Tx_power_Plimit} * 1g_or_10gSAR_Plimit \quad (1a)$$

$$\frac{\frac{1}{T_{SAR}} \int_{t-T_{SAR}}^t 1g_or_10gSAR(t) dt}{FCC \ SAR \ limit} \leq 1 \quad (1b)$$

where, *conducted_Tx_power(t)*, *conducted_Tx_power_Plimit*, and *1g_or_10gSAR_Plimit* correspond to the measured instantaneous conducted Tx power, measured conducted Tx power at Plimit, and measured 1gSAR or 10gSAR values at Plimit corresponding to sub-6 transmission. Plimit is the parameters pre-defined in Part 0 and loaded via Embedded File System (EFS) onto the EUT.

- Demonstrate the total RF exposure averaged over FCC defined time windows does not exceed FCC's SAR limit, through time-averaged SAR measurement. Note as mentioned earlier, this measurement is performed for transmission scenario 1 only.
 - Convert it into RF exposure and divide by respective FCC limits to obtain normalized exposure versus time.
 - Perform time averaging over FCC defined time window.
 - Demonstrate that the total normalized time-averaged RF exposure is less than 1 for transmission scenario 1 at all times.

Mathematical expression:

- For sub-6 transmission only:

$$1g_or_10gSAR(t) = \frac{pointSAR(t)}{pointSAR_Plimit} * 1g_or_10gSAR(t)_Plimit \quad (3a)$$

$$\frac{\frac{1}{T_{SAR}} \int_{t-T_{SAR}}^t 1g_or_10gSAR(t) dt}{FCC \ SAR \ limit} \leq 1 \quad (3b)$$

where, *pointSAR(t)*, *pointSAR_Plimit*, and *1g_or_10gSAR_Plimit* correspond to the measured instantaneous point SAR, measured point SAR at Plimit, and measured 1gSAR or 10gSAR values at Plimit corresponding to sub-6 transmission.

Note: cDASY6 or Cdasy8 measurement system by Schmid & Partner Engineering AG (SPEAG) of Zurich, Switzerland measures relative E-field and provides ratio of $\frac{[pointE(t)]^2}{2[pointE_input.power.limit]^2}$ versus time.



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3 SAR Time Averaging Validation Test Procedures

This chapter provides the test plan and test procedure for validating Qualcomm Smart Transmit feature for sub-6 transmission. The 100 seconds time window for operating $f < 3\text{GHz}$ is used as an example to detail the test procedures in this chapter.

3.1 Test sequence determination for validation

Following the FCC recommendation, two test sequences having time-variation in Tx power are predefined for sub-6 ($f < 6\text{GHz}$) validation:

- Test sequence 1: request EUT's Tx power to be at maximum power, measured P_{max} , for 80s, then requesting for half of the maximum power, i.e., measured $P_{max}/2$, for the rest of the time.
- Test sequence 2: request EUT's Tx power to vary with time. This sequence is generated relative to measured P_{max} , measured P_{limit} and calculated $P_{reserve}$ (= measured P_{limit} in dBm - Reserve_power_margin in dB) of EUT based on measured P_{limit} .

The details for generating these two test sequences is described and listed in Appendix A.

NOTE: For test sequence generation, “measured P_{limit} ” and “measured P_{max} ” are used instead of the “ P_{limit} ” specified in EFS entry and “ P_{max} ” specified for the device, because Smart Transmit feature operates against the actual power level of the “ P_{limit} ” that was calibrated for the EUT. The “measured P_{limit} ” accurately reflects what the feature is referencing to, therefore, it should be used during feature validation testing. The RF tune up and device-to-device variation are already considered in Part 0 report prior to determining P_{limit} .

3.2 Test configuration selection criteria for validating Smart Transmit feature

For validating Smart Transmit feature, this section provides a general guidance to select test cases. In practice, an adjustment can be made in test case selection. The justification/clarification may be provided.

3.2.1 Test configuration selection for time-varying Tx power transmission

The Smart Transmit time averaging feature operation is independent of bands, modes,



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and channels for a given technology. Hence, validation of Smart Transmit in one band/mode/channel per technology is sufficient.

The criteria for the selection are based on the P_{limit} values determined in Part 0 report. Select the band in each supported technology that corresponds to the P_{limit} value that is less than P_{max} for validating Smart Transmit.

3.2.2 Test configuration selection for change in call

The criteria to select a test configuration for call-drop measurement is:

- Select technology/band with least P_{limit} among all supported technologies/bands, and select the radio configuration (e.g., # of RBs, channel#) in this technology/band that corresponds to the highest *measured* 1gSAR at P_{limit} listed in Part 1 report.
- In case of multiple bands having same least P_{limit} , then select the band having the highest *measured* 1gSAR at P_{limit} in Part 1 report.

This test is performed with the EUT's Tx power requested to be at maximum power, the above band selection will result in Tx power enforcement (i.e., EUT forced to have Tx power at $P_{reserve}$) for longest duration in one FCC defined time window. The call change (call drop/reestablish) is performed during the Tx power enforcement duration (i.e., during the time when EUT is forced to have Tx power at $P_{reserve}$). One test is sufficient as the feature operation is independent of technology and band.

3.2.3 Test configuration selection for change in technology/band

The selection criteria for this measurement are to have EUT switch from a technology/band with lowest (or highest) P_{limit} within the technology group to a technology/band with highest (or lowest) P_{limit} within the technology group, or vice versa.

The selection order is:

First select both technology/band configurations having $P_{limit} < P_{max}$. In case of multiple bands having the same P_{limit} , select one band/radio configuration for this test. If this cannot be found, then, select at least one technology/band configuration having $P_{limit} < P_{max}$. If all $P_{limit} > P_{max}$, then, test for change in technology/band is not required.

Use the highest measured 10g_SAR at P_{limit} ($P_{limit} < P_{max}$) shown in Part 1 SAR Test Report for the selected tech/band/antenna/DSI out of all radio configurations and device positions in Equation (3a), (4a), (5a) and (6a) to calculate time-varying SAR. However, in the case of $P_{limit} > P_{max}$, the SAR measured in Part 1 report for the corresponding radio configuration selected and tested in Part 2 should be applied in Equation (3a), (4a), (5a) and



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(6a).

This test is performed with the EUT being requested to transmit at maximum power, the technology/band switch is performed during Tx power enforcement (i.e., EUT forced to transmit at Preserve). One test is sufficient as the feature operation is independent of technology and band.

3.2.4 Test configuration selection for change in antenna

The criteria to select a test configuration for antenna switch measurement is:

- Whenever possible and supported by the DUT, first select antenna switch configuration within the same technology/band (i.e., same technology and band combination).
- Then, select any technology/band that supports multiple Tx antennas, and has the highest difference in Plimit among all supported antennas.
- In case of multiple bands having same difference in Plimit among supported antennas, then select the band having the highest measured 1gSAR at Plimit in Part 1 report.

This test is performed with the DUT's Tx power requested to be at maximum power in selected technology/band, and antenna change is conducted during Tx power enforcement duration (i.e., during the time when DUT is forced to have Tx power at Preserve).

3.2.5 Test configuration selection for change in DSI

The criteria to select a test configuration for DSI change test is

- Select a technology/band having the $P_{limit} < P_{max}$ within any technology and DSI group, and for the same technology/band having a different P_{limit} in any other DSI group. Note that the selected DSI transition need to be supported by the device.

This test is performed with the EUT's Tx power requested to be at maximum power in selected technology/band, and DSI change is conducted during Tx power enforcement duration (i.e., during the time when EUT is forced to have Tx power at $P_{reserve}$).

3.2.6 Test configuration selection for SAR exposure switching

If supported, the test configuration for SAR exposure switching should cover:

1. SAR exposure switch when two active radios are at the same time window.
2. SAR exposure switch when two active radios are in different time windows.
One test with two active radios in any two different time windows is sufficient



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as Smart Transmit operation is the same for RF exposure switch in any combination of two different time windows.

The Smart Transmit time averaging operation is independent of the source of SAR exposure (for example, LTE vs. LTE) and ensures total time-averaged RF exposure compliance. Hence, validation of Smart Transmit in any one simultaneous SAR transmission scenario (i.e., one combination for LTE + LTE transmission) is sufficient, where the SAR exposure varies among SAR_{radio1} only, $SAR_{radio1} + SAR_{radio2}$, and SAR_{radio2} only scenarios.

The criteria to select a test configuration for validating Smart Transmit feature during SAR exposure switching scenarios is

- Select any two < 6GHz technologies/bands that the EUT supports simultaneous transmission (for example, LTE+LTE).
- Among all supported simultaneous transmission configurations, the selection order is
 1. select one configuration where both P_{limit} of radio1 and radio2 is less than their corresponding P_{max} , preferably, with different P_{limits} . If this configuration is not available, then,
 2. select one configuration that has P_{limit} less than its P_{max} for at least one radio. If this cannot be found, then,
 3. select one configuration that has P_{limit} of radio1 and radio2 greater than P_{max} but with least $(P_{limit} - P_{max})$ delta.

Test for one simultaneous transmission scenario is sufficient as the feature operation is the same.

3.3 Test procedures for conducted power measurements

This section provides general conducted power measurement procedures to perform compliance test under dynamic transmission scenarios described in Section 2. In practice, an adjustment can be made in these procedures. The justification/clarification may be provided.

3.3.1 Time-varying Tx power transmission scenario

This test is performed with the two pre-defined test sequences described in Section 3.1 for all the technologies and bands selected in Section 3.2.1. The purpose of the test is to demonstrate the effectiveness of power limiting enforcement and that the time-averaged SAR (corresponding time-averaged Tx power) does not exceed the FCC limit at all times (see Eq. (1a) and (1b)).



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Test procedure

1. Measure P_{max} , measure P_{limit} and calculate $P_{reserve}$ (= measured P_{limit} in dBm – Reserve_power_margin in dB) and follow Section 3.1 to generate the test sequences for all the technologies and bands selected in Section 3.2.1. Both test sequence 1 and test sequence 2 are created based on measured P_{max} and measured P_{limit} of the EUT. Test condition to measure P_{max} and P_{limit} is:
 - Measure P_{max} with Smart Transmit disabled and callbox set to request maximum power.
 - Measure P_{limit} with Smart Transmit enabled and Reserve_power_margin set to 0 dB, callbox set to request maximum power.
2. Set Reserve_power_margin to actual (intended) value (3dB for this EUT based on Part 1 report) and reset power on EUT to enable Smart Transmit, establish radio link in desired radio configuration, with callbox requesting the EUT's Tx power to be at pre-defined test sequence 1, measure and record Tx power versus time, and then convert the conducted Tx power into 1gSAR or 10gSAR value (see Eq. (1a)) using measured P_{limit} from above Step 1. Perform running time average to determine time-averaged power and 1gSAR or 10gSAR versus time as illustrated in Figure 3-1 where using 100-seconds time window as an example.

NOTE: In Eq.(1a), instantaneous Tx power is converted into instantaneous 1gSAR or 10gSAR value by applying the measured worst-case 1gSAR or 10gSAR value at P_{limit} for the corresponding technology/band/antenna/DSI reported in Part 1 report.

NOTE: For an easier computation of the running time average, 0 dBm can be added at the beginning of the test sequences the length of the responding time window, for example, add 0dBm for 100-seconds so the running time average can be directly performed starting with the first 100-seconds data using excel spreadsheet. This technique applies to all tests performed in this Part 2 report for easier time-averaged computation using excel spreadsheet.



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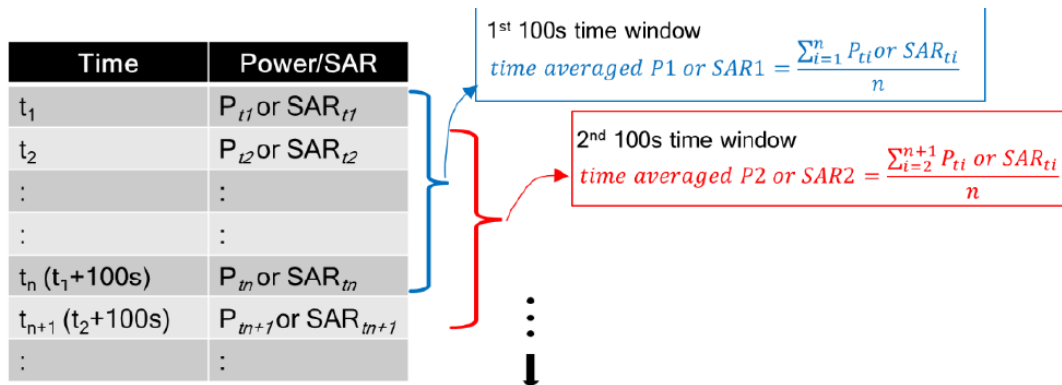


Figure 3-1 100s running average illustration

3. Make one plot containing:
 - a. Instantaneous Tx power versus time measured in Step 2,
 - b. Requested Tx power used in Step 2 (test sequence 1),
 - c. Computed time-averaged power versus time determined in Step 2,
 - d. Time-averaged power limit (corresponding to FCC SAR limit of 1.6 W/kg for 1gSAR or 4.0W/kg for 10gSAR) given by

$$\text{Time avearged power limit} = \text{meas. } P_{\text{limit}} + 10 \times \log \left(\frac{\text{FCC SAR limit}}{\text{meas.SAR_Plimit}} \right) \quad (5a)$$

where $\text{meas. } P_{\text{limit}}$ and meas. SAR_Plimit correspond to measured power at P_{limit} and measured SAR at P_{limit} .

4. Make another plot containing:
 - a. Computed time-averaged 1gSAR or 10gSAR versus time determined in Step 2
 - b. FCC 1gSAR_{limit} of 1.6W/kg or FCC 10gSAR_{limit} of 4.0W/kg.
5. Repeat Steps 2 ~ 4 for pre-defined test sequence 2 and replace the requested Tx power (test sequence 1) in Step 2 with test sequence 2.
6. Repeat Steps 2 ~ 5 for all the selected technologies and bands.

The validation criteria are, at all times, the time-averaged power versus time shown in Step 3 plot shall not exceed the time-averaged power limit (defined in Eq. (5a)), in turn, the time-averaged 1gSAR or 10gSAR versus time shown in Step 4 plot shall not exceed the FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR (i.e., Eq. (1b)).



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3.3.2 Change in call scenario

This test is to demonstrate that Smart Transmit feature accurately accounts for the past Tx powers during time-averaging when a new call is established.

The call disconnect and re-establishment needs to be performed during power limit enforcement, i.e., when the EUT's Tx power is at $P_{reserve}$ level, to demonstrate the continuity of RF exposure management and limiting in call change scenario. In other words, the RF exposure averaged over any FCC defined time window (including the time windows containing the call change) doesn't exceed FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR.

Test procedure

1. Measure P_{limit} for the technology/band selected in Section 3.2.2. Measure P_{limit} with Smart Transmit enabled and Reserve_power_margin set to 0 dB, callbox set to request maximum power.
2. Set Reserve_power_margin to actual (intended) value and reset power on EUT to enable Smart Transmit.
3. Establish radio link with callbox in the selected technology/band.
4. Request EUT's Tx power at 0 dBm for at least one time window specified for the selected technology/band, followed by requesting EUT's Tx power to be at maximum power for about ~60 seconds, and then drop the call for ~10 seconds. Afterwards, re-establish another call in the same radio configuration (i.e., same technology/band/channel) and continue callbox requesting EUT's Tx power to be at maximum power for the remaining time of at least another full duration of the specified time window. Measure and record Tx power versus time. Once the measurement is done, extract instantaneous Tx power versus time, convert the measured conducted Tx power into 1gSAR or 10gSAR value using Eq. (1a), and then perform the running time average to determine time-averaged power and 1gSAR or 10gSAR versus time.

NOTE: In Eq.(1a), instantaneous Tx power is converted into instantaneous 1gSAR or 10gSAR value by applying the measured worst-case 1gSAR or 10gSAR value at P_{limit} for the corresponding technology/band/antenna/DSI reported in Part 1 report.

5. Make one plot containing: (a) instantaneous Tx power versus time, (b) requested power, (c) computed time-averaged power, (d) time-averaged power limit calculated using Eq.(5a).
6. Make another plot containing: (a) computed time-averaged 1gSAR or 10gSAR versus time, and (b) FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR.



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The validation criteria are, at all times, the time-averaged power versus time shall not exceed the time-averaged power limit (defined in Eq.(5a)), in turn, the time-averaged 1gSAR or 10gSAR versus time shall not exceed the FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR (i.e., Eq. (1b)).

3.3.3 Change in technology and band

This test is to demonstrate the correct power control by Smart Transmit during technology switches and/or band handovers.

Similar to the change in call test in Section 3.3.2, to validate the continuity of RF exposure limiting during the transition, the antenna handover needs to be performed when EUT's Tx power is at $P_{reserve}$ level (i.e., during Tx power enforcement) to make sure that the EUT's Tx power from previous $P_{reserve}$ level to the new $P_{reserve}$ level (corresponding to new antenna). Since the P_{limit} could vary with technology and band, Eq. (1a) can be written as follows to convert the instantaneous Tx power in 1gSAR or 10gSAR exposure for the two given radios, respectively:

$$1g_or_10gSAR_1(t) = \frac{conducted_Tx_power_1(t)}{conducted_Tx_power_P_{limit_1}} * 1g_or_10gSAR_P_{limit_1} \quad (6a)$$

$$1g_or_10gSAR_2(t) = \frac{conducted_Tx_power_2(t)}{conducted_Tx_power_P_{limit_2}} * 1g_or_10gSAR_P_{limit_2} \quad (6b)$$

$$\frac{1}{T_{SAR}} \left[\int_{t-T_{SAR}}^{t_1} \frac{1g_or_10gSAR_1(t)}{FCC\ SAR\ limit} dt + \int_{t-T_{SAR}}^t \frac{1g_or_10gSAR_2(t)}{FCC\ SAR\ limit} dt \right] \leq 1 \quad (6c)$$

where, $conducted_Tx_power_1(t)$, $conducted_Tx_power_P_{limit_1}$, and $1g_or_10gSAR_P_{limit_1}$ correspond to the measured instantaneous conducted Tx power, measured conducted Tx power at P_{limit} , and measured 1gSAR or 10gSAR value at P_{limit} of antenna1; $conducted_Tx_power_2(t)$, $conducted_Tx_power_P_{limit_2}(t)$, and $1g_or_10gSAR_P_{limit_2}$ correspond to the measured instantaneous conducted Tx power, measured conducted Tx power at P_{limit} , and measured 1gSAR or 10gSAR value at P_{limit} of antenna2. Transition from technology1/band1 to the technology2/band2 happens at time-instant ' t_1 '.

Test procedure

1. Measure P_{limit} for both the technologies and bands selected in Section 3.2.3. Measure P_{limit} with Smart Transmit enabled and Reserve_power_margin set to 0 dB, callbox set to request maximum power.
2. Set Reserve_power_margin to actual (intended) value and reset power on EUT to enable Smart Transmit
3. Establish radio link with callbox in first antenna selected.
4. Request EUT's Tx power at 0 dBm for at least one time window specified for the selected technology/band, followed by requesting EUT's Tx power to be at maximum



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power for about ~60 seconds, and then switch to second technology/band selected. Continue with callbox requesting EUT's Tx power to be at maximum power for the remaining time of at least another full duration of the specified time window. Measure and record Tx power versus time for the full duration of the test.

5. Once the measurement is done, extract instantaneous Tx power versus time, and convert the conducted Tx power into 1gSAR or 10gSAR value using Eq. (6a) and (6b) and corresponding measured P_{limit} values from Step 1 of this section. Perform the running time average to determine time-averaged power and 1gSAR or 10gSAR versus time.

NOTE: In Eq.(6a) & (6b), instantaneous Tx power is converted into instantaneous 1gSAR or 10gSAR value by applying the measured worst-case 1gSAR or 10gSAR value at P_{limit} for the corresponding technology/band/antenna/DSI reported in Part 1 report.

6. Make one plot containing: (a) instantaneous Tx power versus time, (b) requested power, (c) computed time-averaged power, (d) time-averaged power limit calculated using Eq.(5a).
7. Make another plot containing: (a) computed time-averaged 1gSAR or 10gSAR versus time, and (b) FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR.

The validation criteria are, at all times, the time-averaged 1gSAR or 10gSAR versus time shall not exceed the FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR (i.e., Eq. (6c)).



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3.3.4 Change in antenna

This test is to demonstrate the correct power control by Smart Transmit during antenna switches from one antenna to another. The validation criteria are, at all times, the time-averaged 1gSAR or 10gSAR versus time shall not exceed FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR.

Similar to the change in call test in Section 3.3.2, to validate the continuity of RF exposure limiting during the transition, the antenna handover needs to be performed when EUT's Tx power is at $P_{reserve}$ level (i.e., during Tx power enforcement) to make sure that the EUT's Tx power from previous $P_{reserve}$ level to the new $P_{reserve}$ level (corresponding to new antenna). Since the P_{limit} could vary with antenna, Eq. (1a) can be written as follows to convert the instantaneous Tx power in 1gSAR or 10gSAR exposure for the two given radios, respectively:

$$1g_or_10gSAR_1(t) = \frac{conducted_Tx_power_1(t)}{conducted_Tx_power_P_{limit_1}} * 1g_or_10gSAR_P_{limit_1} \quad (6a)$$

$$1g_or_10gSAR_2(t) = \frac{conducted_Tx_power_2(t)}{conducted_Tx_power_P_{limit_2}} * 1g_or_10gSAR_P_{limit_2} \quad (6b)$$

$$\frac{1}{T_{SAR}} \left[\int_{t-T_{SAR}}^{t_1} \frac{1g_or_10gSAR_1(t)}{FCC\ SAR\ limit} dt + \int_{t-T_{SAR}}^t \frac{1g_or_10gSAR_2(t)}{FCC\ SAR\ limit} dt \right] \leq 1 \quad (6c)$$

where, $conducted_Tx_power_1(t)$, $conducted_Tx_power_P_{limit_1}$, and $1g_or_10gSAR_P_{limit_1}$ correspond to the measured instantaneous conducted Tx power, measured conducted Tx power at P_{limit} , and measured 1gSAR or 10gSAR value at P_{limit} of antenna1; $conducted_Tx_power_2(t)$, $conducted_Tx_power_P_{limit_2}(t)$, and $1g_or_10gSAR_P_{limit_2}$ correspond to the measured instantaneous conducted Tx power, measured conducted Tx power at P_{limit} , and measured 1gSAR or 10gSAR value at P_{limit} of antenna2. Transition from technology1/band1 to the technology2/band2 happens at time-instant ' t_1 '.

Test procedure

8. Measure P_{limit} for both the antennas selected in Section 3.2.3. Measure P_{limit} with Smart Transmit enabled and Reserve_power_margin set to 0 dB, callbox set to request maximum power.
9. Set Reserve_power_margin to actual (intended) value and reset power on EUT to enable Smart Transmit
10. Establish radio link with callbox in first antenna selected.
11. Request EUT's Tx power at 0 dBm for at least one time window specified for the selected technology/band, followed by requesting EUT's Tx power to be at maximum power for about ~60 seconds, and then switch to second technology/band selected.



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Continue with callbox requesting EUT's Tx power to be at maximum power for the remaining time of at least another full duration of the specified time window. Measure and record Tx power versus time for the full duration of the test.

12. Once the measurement is done, extract instantaneous Tx power versus time, and convert the conducted Tx power into 1gSAR or 10gSAR value using Eq. (6a) and (6b) and corresponding measured P_{limit} values from Step 1 of this section. Perform the running time average to determine time-averaged power and 1gSAR or 10gSAR versus time.

NOTE: In Eq.(6a) & (6b), instantaneous Tx power is converted into instantaneous 1gSAR or 10gSAR value by applying the measured worst-case 1gSAR or 10gSAR value at P_{limit} for the corresponding technology/band/antenna/DSI reported in Part 1 report.

13. Make one plot containing: (a) instantaneous Tx power versus time, (b) requested power, (c) computed time-averaged power, (d) time-averaged power limit calculated using Eq.(5a).
14. Make another plot containing: (a) computed time-averaged 1gSAR or 10gSAR versus time, and (b) FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR.

The validation criteria are, at all times, the time-averaged 1gSAR or 10gSAR versus time shall not exceed the FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR (i.e., Eq. (6c)).



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3.3.5 Change in DSI

This test is to demonstrate the correct power control by Smart Transmit during DSI switches from one DSI to another. The test procedure is identical to Section 3.3.3, by replacing antenna switch operation with DSI switch. The validation criteria are, at all times, the time-averaged 1gSAR or 10gSAR versus time shall not exceed FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR.

3.3.6 SAR exposure switching

This test is to demonstrate that Smart Transmit feature is accurately accounts for switching in exposures among SAR from radio1 only, SAR from both radio1 and radio2, and SAR from radio2 only scenarios, and ensures total time-averaged RF exposure complies with the FCC limit. Here, radio1 represents primary radio (for example, LTE anchor in a LTE non-standalone mode call) and radio2 represents secondary radio (for example, another LTE Band). The detailed test procedure for SAR exposure switching in the case of LTE+LTE non-standalone mode transmission scenario is provided in Appendix B.

Test procedure:

1. Measure conducted Tx power corresponding to P_{limit} for radio1 and radio2 in selected band. Test condition to measure conducted P_{limit} is:

□ Establish device in call with the callbox for radio1 technology/band. Measure conducted Tx power corresponding to radio1 P_{limit} with Smart Transmit enabled and Reserve_power_margin set to 0 dB, callbox set to request maximum power.

□ Repeat above step to measure conducted Tx power corresponding to radio2 P_{limit} . If radio2 is dependent on radio1 (for example, non-standalone mode of LTE requiring radio1 LTE as anchor), then establish radio1 + radio2 call with callbox, and request all down bits for radio1 LTE. In this scenario, with callbox requesting maximum power from radio2 LTE, measured conducted Tx power corresponds to radio2 P_{limit} (as radio1 LTE is at all-down bits)

2. Set Reserve_power_margin to actual (intended) value, with EUT setup for radio1 + radio2 call. In this description, it is assumed that radio2 has lower priority than radio1. Establish device in radio1+radio2 call, and request all-down bits or low power on radio1, with callbox requesting EUT's Tx power to be at maximum power in radio2 for at least one time window. After one time window, set callbox to request EUT's Tx power to be at maximum power on radio1, i.e., all-up bits. Continue radio1+radio2 call with both radios at maximum power for at least one time window, and drop (or request all-down bits on) radio2. Continue radio1 at maximum power for at least one time window. Record the conducted Tx power for both radio1 and radio2 for the entire duration of this test.



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3. Once the measurement is done, extract instantaneous Tx power versus time for both radio1 and radio2 links. Convert the conducted Tx power for both these radios into 1gSAR or 10gSAR value (see Eq. (6a) and (6b)) using corresponding technology/band P_{limit} measured in Step 1, and then perform the running time average to determine time-averaged 1gSAR or 10gSAR versus time.

4. Make one plot containing: (a) instantaneous Tx power versus time measured in Step 2.

5. Make another plot containing: (a) instantaneous 1gSAR versus time determined in Step 3, (b) computed time-averaged 1gSAR versus time determined in Step 3, and (c) corresponding regulatory $1gSAR_{limit}$ of 1.6W/kg or $10gSAR_{limit}$ of 4.0W/kg.

The validation criteria is, at all times, the time-averaged 1gSAR or 10gSAR versus time shall not exceed the regulatory $1gSAR_{limit}$ of 1.6W/kg or $10gSAR_{limit}$ of 4.0W/kg.

3.4 Test procedure for time-varying SAR measurements

This section provides general time-varying SAR measurement procedures to perform compliance test under dynamic transmission scenarios described in Section 2. In practice, an adjustment can be made in these procedures. The justification/clarification may be provided.

To perform the validation through SAR measurement for transmission scenario 1 described in Section 2, the “path loss” between callbox antenna and EUT needs to be calibrated to ensure that the EUT Tx power reacts to the requested power from callbox in a radiated call. It should be noted that when signaling in closed loop mode, protocol-level power control is in play, resulting in EUT not solely following callbox TPC (Tx power control) commands. In other words, EUT response has many dependencies (RSSI, quality of signal, path loss variation, fading, etc.) other than just TPC commands. These dependencies have less impact in conducted setup (as it is a controlled environment and the path loss can be very well calibrated) but have significant impact on radiated testing in an uncontrolled environment, such as SAR test setup. Therefore, the deviation in EUT Tx power from callbox requested power is expected, however the time-averaged SAR should not exceed FCC SAR requirement at all times as Smart Transmit controls Tx power at EUT.

The following steps are for time averaging feature validation through SAR measurement:

1. “Path Loss” calibration: Place the EUT against the phantom in the worst-case position determined based on Section 3.2.1. For each band selected, prior to SAR measurement, perform “path loss” calibration between callbox antenna and EUT. Since the SAR test environment is not controlled and well calibrated for OTA (Over the Air) test, extreme care needs to be taken to avoid the influence from reflections. The test setup is described in Section 6.1.
2. Time averaging feature validation:
 - i For a given radio configuration (technology/band) selected in Section 3.2.1, enable Smart Transmit and set *Reserve_power_margin* to 0 dB, with callbox to



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request maximum power, perform area scan, conduct pointSAR measurement at peak location of the area scan. This point SAR value, $pointSAR_{P_{limit}}$, corresponds to point SAR at the measured P_{limit} (i.e., measured P_{limit} from the EUT in Step 1 of Section 3.3.1).

- ii Set *Reserve_power_margin* to actual (intended) value and reset power on EUT to enable Smart Transmit. Note, if *Reserve_power_margin* cannot be set wirelessly, care must be taken to re-position the EUT in the exact same position relative to the SAM phantom as in above Step 2.i. Establish radio link in desired radio configuration, with callbox requesting the EUT's Tx power at power levels described by test sequence 1 generated in Step 1 of Section 3.3.1, conduct point SAR measurement versus time at peak location of the area scan determined in Step 2.i of this section. Once the measurement is done, extract instantaneous point SAR vs time data, $pointSAR(t)$, and convert it into instantaneous 1gSAR or 10gSAR vs. time using Eq. (3a), re-written below:

$$1g_or_10gSAR(t) = \frac{pointSAR(t)}{pointSAR_{P_{limit}}} * 1g_or_10gSAR_{P_{limit}}$$

where, $pointSAR_{P_{limit}}$ is the value determined in Step 2.i, and $pointSAR(t)$ is the instantaneous point SAR measured in Step 2.ii, $1g_or_10gSAR_{P_{limit}}$ is the measured 1gSAR or 10gSAR value listed in Part 1 report.

- iii Perform 100s running average to determine time-averaged 1gSAR or 10gSAR versus time.
- iv Make one plot containing: (a) time-averaged 1gSAR or 10gSAR versus time determined in Step 2.iii of this section, (b) FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR.
- v Repeat 2.ii ~ 2.iv for test sequence 2 generated in Step 1 of Section 3.3.1.
- vi Repeat 2.i ~ 2.v for all the technologies and bands selected in Section 3.2.1.

The time-averaging validation criteria for SAR measurement is that, at all times, the time-averaged 1gSAR or 10gSAR versus time shall not exceed FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR (i.e., Eq. (3b)).



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4 Test Configurations

4.1 WWAN (sub-6) transmission

The Plimit values, corresponding to SAR_design_target, for technologies and bands supported by EUT are derived in Part 0 report and summarized in Table 4-1.

Band	Mode	Antenna	P _{max} *	P _{limit} (average)		
				Head DSI5(State5)	Body Worn DSI3(State3)	Hotspot DSI8(State8)
GSM 850	GPRS 4TS	0#	23.5	23.5	23.5	23.0
		1#	24.5	24.0	24.0	22.5
GSM 1900	GPRS 4TS	3#	21.5	18.5	21.5	20.0
		4#	21.5	21.5	21.5	20.5
WCDMA_B2	RMC	3#	24.0	18.0	20.0	18.0
	RMC	4#	24.0	24.0	20.5	19.0
WCDMA_B4	RMC	3#	24.0	18.0	21.5	19.5
	RMC	4#	24.0	24.0	21.0	19.5
WCDMA_B5	RMC	0#	22.8	22.8	22.3	20.8
	RMC	1#	24.0	22.5	22.0	20.5
LTE_B2	QPSK	3#	23.2	18.2	20.2	18.7
	QPSK	4#	23.2	23.2	20.7	19.2
	QPSK	5#	20.4	17.9	19.9	17.9
LTE_B4	QPSK	3#	24.2	18.2	21.7	19.7
	QPSK	4#	24.2	24.2	21.7	19.7
	QPSK	5#	23.0	22.0	22.5	20.5
LTE_B5	QPSK	0#	23.2	23.2	22.7	21.2
	QPSK	1#	24.2	22.2	22.2	20.7
LTE_B7	QPSK	3#	24.2	16.7	19.7	17.7
	QPSK	4#	24.2	24.2	22.2	20.2
	QPSK	5#	22.5	20.5	22.5	22.0
LTE_B12	QPSK	0#	23.7	23.7	23.7	23.7
	QPSK	1#	24.2	24.2	24.2	23.2
LTE_B17	QPSK	0#	23.7	23.7	23.7	23.7
	QPSK	1#	24.2	24.2	24.2	23.2
LTE_B26	QPSK	0#	23.2	23.2	23.2	21.7
	QPSK	1#	24.2	22.7	22.7	21.2
LTE_B38	QPSK	3#	22.2	16.7	20.2	18.7
	QPSK	4#	22.2	22.2	22.2	20.7
	QPSK	5#	20.0	20.0	20.0	20.0
LTE_B41 PC2	QPSK	3#	21.9	16.4	21.4	19.4
	QPSK	4#	21.9	21.9	21.9	21.9
	QPSK	5#	19.4	19.4	19.4	19.4
LTE_B41 PC3	QPSK	3#	22.2	16.7	21.7	19.7



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	QPSK	4#	22.2	22.2	22.2	22.2
	QPSK	5#	20.0	20.0	20.0	20.0

Table 4-1: Plimit for supported technologies and bands (Plimit in EFS file)

*Pmax is used for RF tune up procedure. The maximum allowed output power is equal to Pmax + device uncertainty.

Note:

To account for total uncertainty, SAR_design_target should be determined as:

$$SAR_design_target < SAR_regulatory_limit \times 10^{\frac{-total\ uncertainty}{10}}$$

Uncertainty dB (k=2)	All Band
Total uncertainty	1.2

Exposure position	Frequency band	SAR_Regulatory_Limit W/kg(1g)	SAR_design_target W/kg(1g)
Head	WWAN	1.6	1.2
Body worn	WWAN	1.6	1.2
Hotspot	WWAN	1.6	1.2
Exposure position	Frequency band	SAR_Regulatory_Limit W/kg(10g)	SAR_design_target W/kg(10g)
Product specific 10gSAR	WWAN	4.0	3.0

Table4-2: Radio configurations selected for Part 2 test

Part 2 test configurations										Part 1 worst-case ratio config 1g SAR measured at P _{limit}
Test case No.	Test scenario	Tech	Band	Ant	DSI	RB/offset	Channel/Freq (MHz)	position	Distance (mm)	
1	time-varying Tx power transmission	GSM GPRS 4TS	GSM 850	Ant1	DSI8	/	190/836.6	Left side	10mm	0.769
2		GSM GPRS 4TS	GSM 1900	Ant3	DSI5	/	512/1850.2	Right cheek	0mm	0.561
3		WCDMA	WCDMA B2	Ant3	DSI5	/	9538/1907.6	Right tilted	0mm	0.798
4		WCDMA	WCDMA B5	Ant1	DSI5	/	4182/836.4	Left cheek	0mm	0.639
5		LTE	LTE Band 41	Ant3	DSI5	QPSK 50 50	41055/2636.5	Right cheek	0mm	0.688
6		LTE	LTE Band 12	Ant1	DSI8	QPSK 25 0	23095/707.5	Left side	10mm	0.478
7	change in call	LTE	LTE Band 41	Ant3	DSI5	QPSK 50 50	41055/2636.5	Right cheek	0mm	0.688
8	Tech/band switch	LTE	LTE Band 7	Ant4	DSI8	QPSK 50 0	21100/2535	Bottom side	10mm	0.359
		WCDMA	WCDMA B2	Ant4	DSI8	/	9400/1880	Bottom side	10mm	0.428
9	Antenna Switch	LTE	LTE Band 7	Ant3	DSI8	QPSK 50 0	21100/2535	Top side	10mm	0.394
		LTE	LTE Band 7	Ant4	DSI8	QPSK 50 0	21100/2535	Bottom side	10mm	0.359
10	Change In DSI	WCDMA	WCDMA B2	Ant3	DSI5	/	9538/1907.6	Right tilted	0mm	0.798
		WCDMA	WCDMA B2	Ant3	DSI3	/	9400/1880	Back side	15mm	0.164
11	ULCA SAR1 vs SAR2	LTE	LTE Band 4	Ant4	DSI8	QPSK 50 25	20175/1732.5	Bottom side	10mm	0.353
		LTE	LTE Band 5	Ant1	DSI8	QPSK 36 0	26865/831.5	Left side	10mm	0.503



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The radio configurations used in Part 2 test for selected technologies, bands, DSIs and antennas are listed in Table 4-2. The corresponding worst-case radio configuration 1gSAR or 10gSAR values for selected technology/band/DSI are extracted from Part 1 report and are listed in the last column of Table 4-2.

Based on equations (1a) and (3a), it is clear that Part 2 testing outcome is normalized quantity, which implies that it can be applied to any radio configuration within a selected technology/band/DSI. Thus, as long as applying the worst-case SAR obtained from the worst radio configuration in Part 1 testing to calculate time-varying SAR exposure in equations (1a) and (3a), the accuracy in compliance demonstration remains the same.

Based on the selection criteria described in Section 3.2, the radio configurations for the Tx varying transmission test cases listed in Section 2 are:

1. Technologies and bands for time-varying Tx power transmission: The test case 1-6 listed in Table 4-2 are selected to test with the test sequences defined in Section 3.1 in both time-varying conducted power measurement and time-varying SAR measurement.
2. Technology and band for change in call test: The test case 7 listed in Table 4-2 are selected for performing the call drop test in conducted power setup. The case having the lowest P_{limit} among all technologies and bands.
3. Tech/band switch: The test case 8 listed in Table 4-2 is selected for handover test from a technology/band to another technology/band, in conducted power setup.
4. Technologies and bands for change in DSI: The test case 9 listed in Table 4-2 is selected for DSI switch test by establishing a call in WCDMA B2 in DSI=5, and then handing over to DSI = 3 exposure scenario in conducted power setup.
5. Antenna switch: The test case 10 listed in Table 4-2 is selected for antenna switch from LTE B7 Antenna 3 to Antenna 4, in conducted power setup.
6. Technologies and bands for switch in SAR exposure: The test case 11 listed in Table 4-2 are selected for SAR exposure switching test in one of the supported simultaneous WWAN transmission scenario, i.e., LTE Inter-Band Uplink CA active, in conducted power setup.

Note: Based on the manufacturer's differential statement, LTE Band13/66, 5G NR, and DSDA have been disabled. The "change in call" and "ULCA_SAR1 vs SAR2" have been retested. For other cases, the data from the report 'SZCR241000395912' is reused.



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5 Conducted Power Test Results for Sub-6 Smart Transmit Feature Validation

5.1 Measurement setup

The Rohde & Schwarz callbox is used in this test. The test setup schematic are shown in Figures 6-1. For single antenna measurement, one port (RF1 COM) of the callbox is connected to the RF port of the EUT using a directional coupler. For antenna & technology switch measurement, two ports (RF1 COM and RF3 COM) of the callbox used for signaling two different technologies are connected to a combiner, which is in turn connected to a directional coupler. The other end of the directional coupler is connected to a splitter to connect to two RF ports of the EUT corresponding to the two antennas of interest. In both the setups, power meter is used to tap the directional coupler for measuring the conducted output power of the EUT. For time averaging validation test (Section 3.3.1), call drop test (Section 3.3.2), and DSI switch test (Section 3.3.4), only RF1 COM port of the callbox is used to communicate with the EUT. For technology/band switch measurement (Section. 3.3.3), both RF1 COM and RF3 COM port of callbox are used to switch from one technology communicating on RF1 COM port to another technology communicating on RF3 COM port. All the path losses from RF port of EUT to the callbox RF COM port and to the power meter are calibrated and automatically entered as offsets in the callbox and the power meter via test scripts on the PC used to control callbox and power meter.

LTE+LTE test setup:

The CMW500 is used in this test. If LTE conducted port and another LTE conducted port are same on this EUT (i.e., they share the same antenna), therefore, low-/high-pass filter are used to separate LTE and LTE signals for power meter measurement via directional couplers, as shown in below Figure 6-1 C (Appendix F – Test Setup Photo).

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



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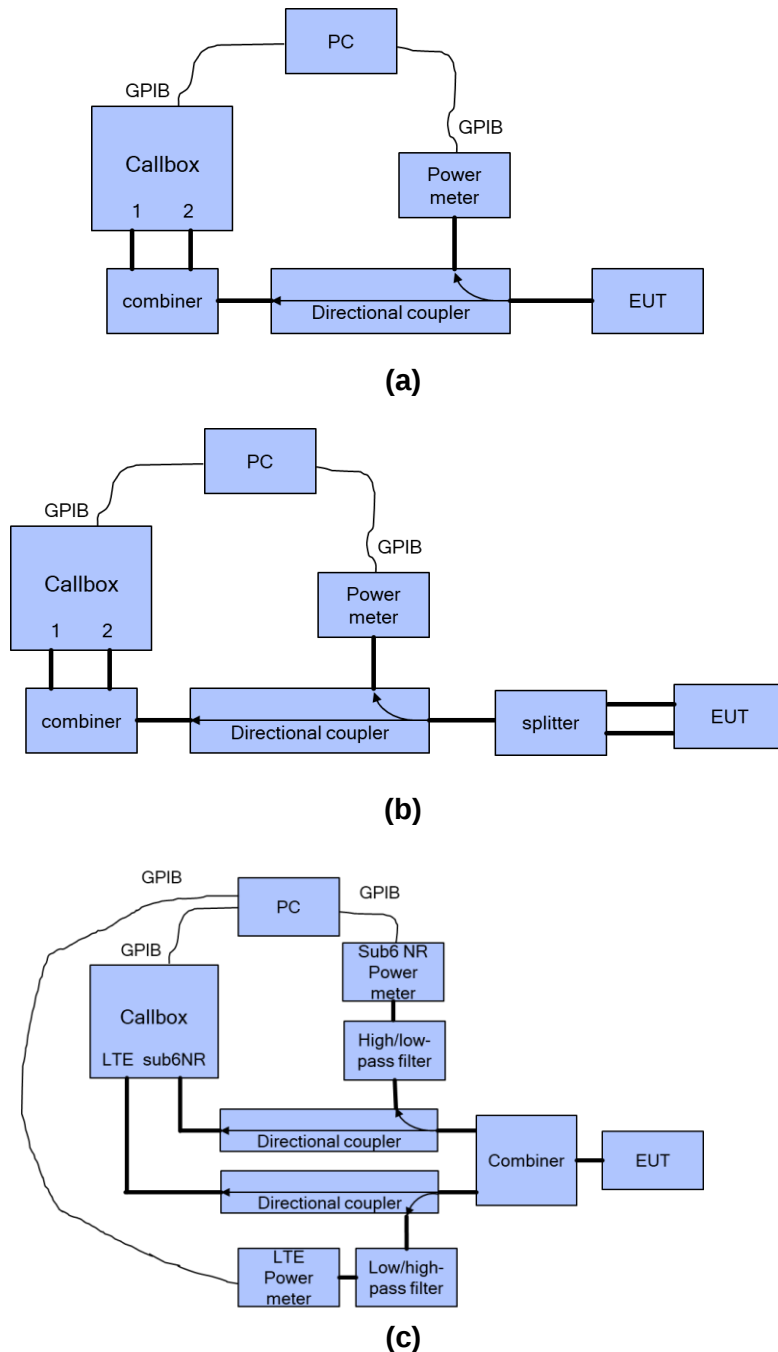


Figure 5-1 Conducted power measurement setup

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

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

- 0dBm for 100 seconds
- test sequence 1 or test sequence 2 (defined in Section 3.1 and generated in Section 3.2.1), for 360 seconds
- stay at the last power level of test sequence 1 or test sequence 2 for the remaining time.

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

For call drop, technology/band/antenna switch, and DSI switch tests, after the call is established, the callbox is set to request the EUT's Tx power at 0dBm for 100 seconds while simultaneously starting the 2nd test script runs at the same time to start recording the Tx power measured at EUT RF port using the power meter. After the initial 100 seconds since starting the Tx power recording, the callbox is set to request maximum power from the EUT for the rest of the test. Note that the call drop/re-establish, or technology/band/antenna switch or DSI switch is manually performed when the Tx power of EUT is at $P_{reserve}$ level. See Section 3.3 for detailed test procedure of call drop test, technology/band/antenna switch test and DSI switch test.



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5.2 Plimit and Pmax measurement results

The measured P_{limit} for all the selected radio configurations given in Table 4-2 are listed in below Table. P_{max} was also measured for radio configurations selected for testing time-varying Tx power transmission scenarios in order to generate test sequences following the test procedures in Section 3.

Test case No.	Test scenario	Tech	Band	Ant	DSI	RB/offset	Channel/Freq (MHz)	position	Distance (mm)	Pmax EFS setting(dBm)	Plimit EFS setting(dBm)	Measured Pmax (dBm)	Measured Plimit (dBm)
1	time-varying Tx power transmission	GSM GPRS 4TS	GSM 850	Ant1	DSI8	/	190/836.6	Left side	10mm	24.5	22.5	23.89	21.17
2		GSM GPRS 4TS	GSM 1900	Ant3	DSI5	/	512/1850.2	Right cheek	0mm	21.5	18.5	20.49	17.09
3		WCDMA	WCDMA B2	Ant3	DSI5	/	9538/1907.6	Right tilted	0mm	24.0	18.0	23.80	17.90
4		WCDMA	WCDMA B5	Ant1	DSI5	/	4182/836.4	Left cheek	0mm	24.0	22.5	24.49	23.12
5		LTE	LTE Band 41	Ant3	DSI5	QPSK 50 50	41055/2636.5	Right cheek	0mm	21.9	16.4	21.58	16.52
6		LTE	LTE Band 12	Ant1	DSI8	QPSK 25 0	23095/707.5	Left side	10mm	24.2	23.2	24.47	23.45
7	change in call	LTE	LTE Band 41	Ant3	DSI5	QPSK 50 50	41055/2636.5	Right cheek	0mm	21.9	16.4	21.58	16.52
8	Tech/band switch	LTE	LTE Band 7	Ant4	DSI8	QPSK 50 0	21100/2535	Bottom side	10mm	24.2	20.2	24.21	20.01
		WCDMA	WCDMA B2	Ant4	DSI8	/	9400/1880	Bottom side	10mm	24.0	19.0	23.75	18.88
9	Antenna Switch	LTE	LTE Band 7	Ant3	DSI8	QPSK 50 0	21100/2535	Top side	10mm	24.2	17.7	23.93	17.15
		LTE	LTE Band 7	Ant4	DSI8	QPSK 50 0	21100/2535	Bottom side	10mm	24.2	20.2	24.21	20.01
10	Change In DSI	WCDMA	WCDMA B2	Ant3	DSI5	/	9538/1907.6	Right tilted	0mm	24.0	18.0	23.80	17.90
		WCDMA	WCDMA B2	Ant3	DSI3	/	9400/1880	Back side	15mm	24.0	20.0	23.80	19.99
11	ULCA_SAR1 vs SAR2	LTE	LTE Band 4	Ant4	DSI8	QPSK 50 25	20175/1732.5	Bottom side	10mm	24.2	19.7	24.68	20.10
		LTE	LTE Band 5	Ant1	DSI8	QPSK 36 0	26865/831.5	Left side	10mm	24.2	20.7	24.36	20.53

Table5-1: Measured Plimit and Pmax of selected radio configurations



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5.3 Time-varying Tx power measurement results

The measurement setup is shown in Figures 5-1(a) and 5-1(c). The purpose of the time-varying Tx power measurement is to demonstrate the effectiveness of power limiting enforcement and that the time-averaged Tx power when represented in time-averaged 1gSAR or 10gSAR values does not exceed FCC limit as shown in Eq. (1a) and (1b), rewritten below:

$$1g_or_10gSAR(t) = \frac{conducted_Tx_power(t)}{conducted_Tx_power_P_{limit}} * 1g_or_10gSAR_P_{limit} \quad (1a)$$

$$\frac{\frac{1}{T_{SAR}} \int_{t-T_{SAR}}^t 1g_or_10gSAR(t) dt}{FCC\ SAR\ limit} \leq 1 \quad (1b)$$

where, $conducted_Tx_power(t)$, $conducted_Tx_power_P_{limit}$, and $1g_or_10gSAR_P_{limit}$ correspond to the measured instantaneous conducted Tx power, measured conducted Tx power at P_{limit} , and measured 1gSAR and 10gSAR values at P_{limit} reported in Part 1 test (listed in Table 4-2 of this report as well).

Following the test procedure in Section 3.3, the conducted Tx power measurement for all selected configurations are reported in this section. In all the conducted Tx power plots, the dotted line represents the requested power by callbox (test sequence 1 or test sequence 2), the blue curve represents the instantaneous conducted Tx power measured using power meter, the green curve represents time-averaged power and red line represents the conducted power limit that corresponds to FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR.

Similarly, in all the 1g or 10gSAR plots (when converted using Eq. (1a)), the green curve represents the 100s/60s-time averaged 1gSAR or 10gSAR value calculated based on instantaneous 1gSAR or 10gSAR; and the red line limit represents the FCC limit of 1.6 W/kg for 1gSAR or 4.0 W/kg for 10gSAR.

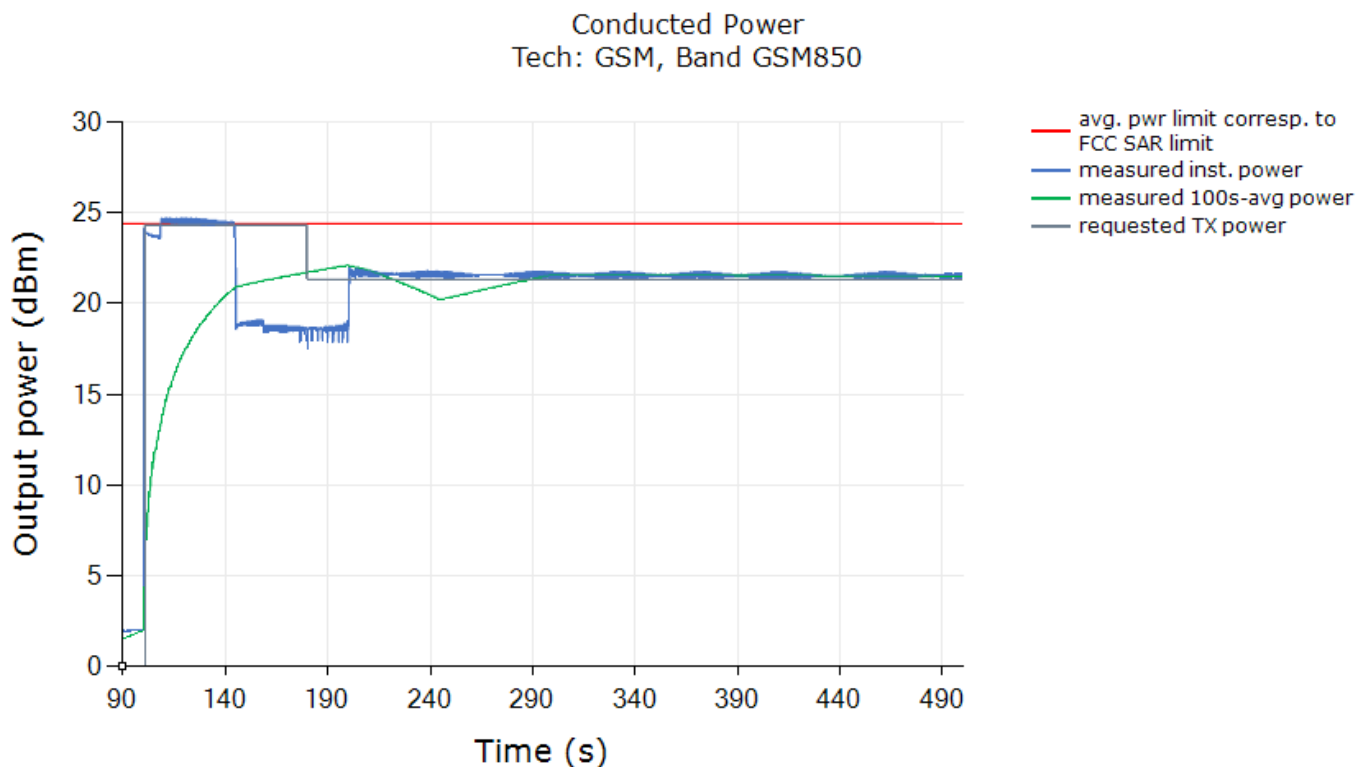


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5.3.1 GSM 850 Ant1 DSI8

Test result for test sequence 1:



Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:

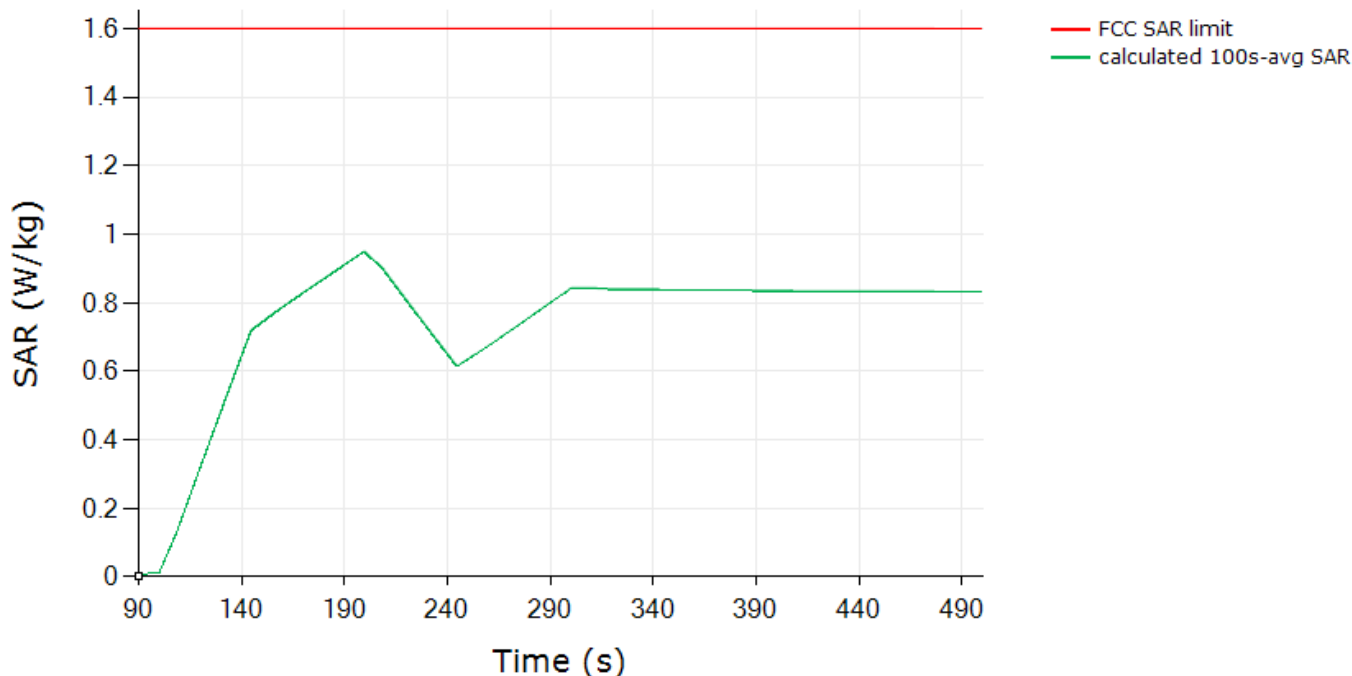


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SAR Tech: GSM, Band GSM850



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.949
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



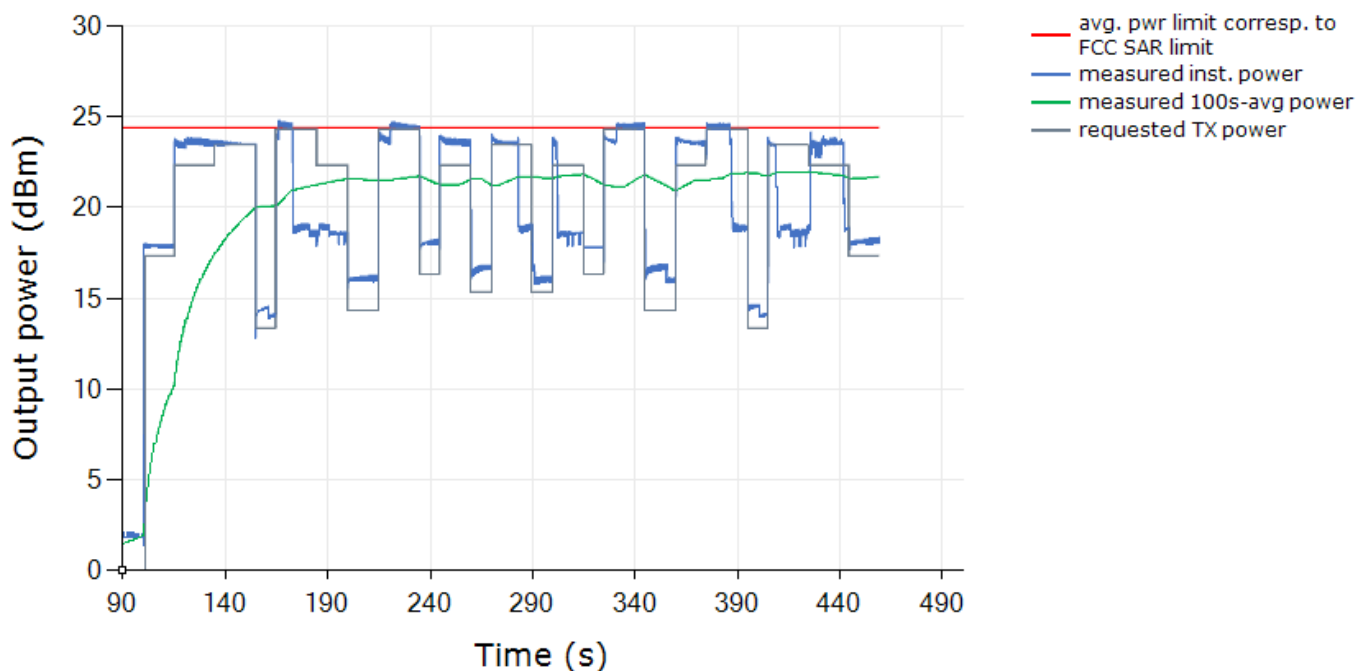
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Test result for test sequence 2:

Conducted Power Tech: GSM, Band GSM850



Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:

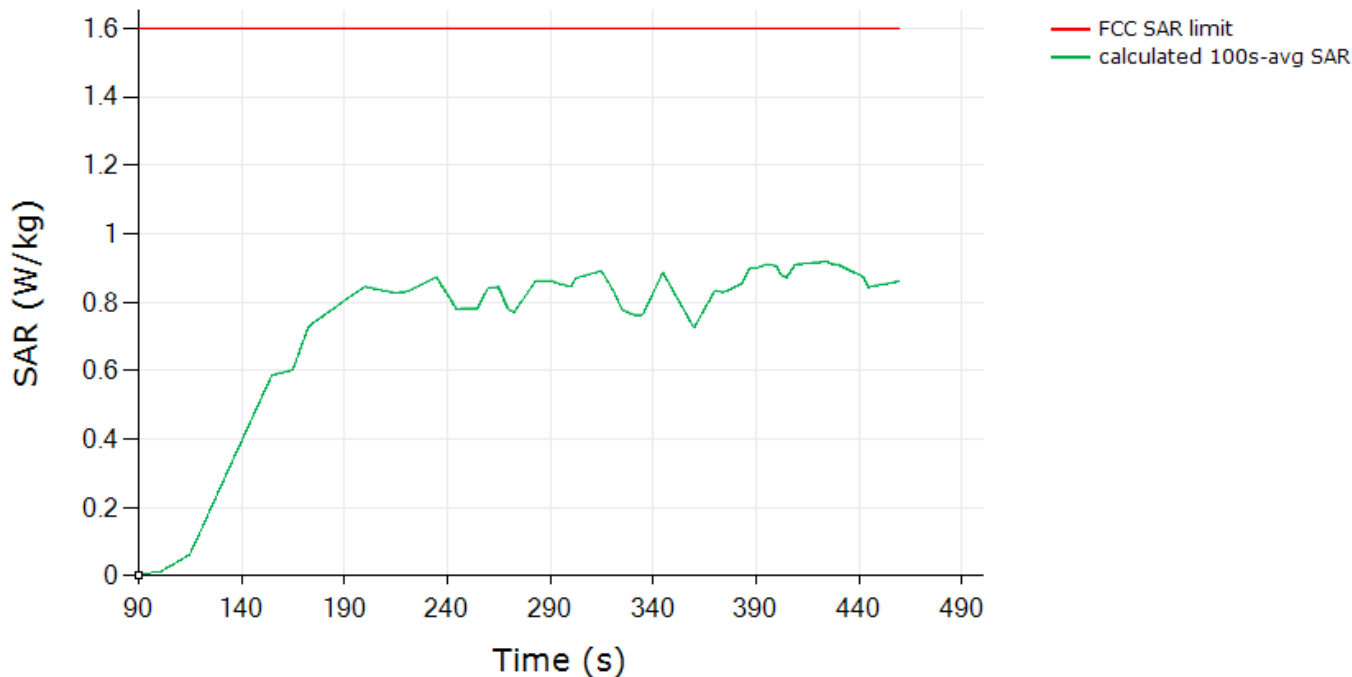


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SAR Tech: GSM, Band GSM850



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.918
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



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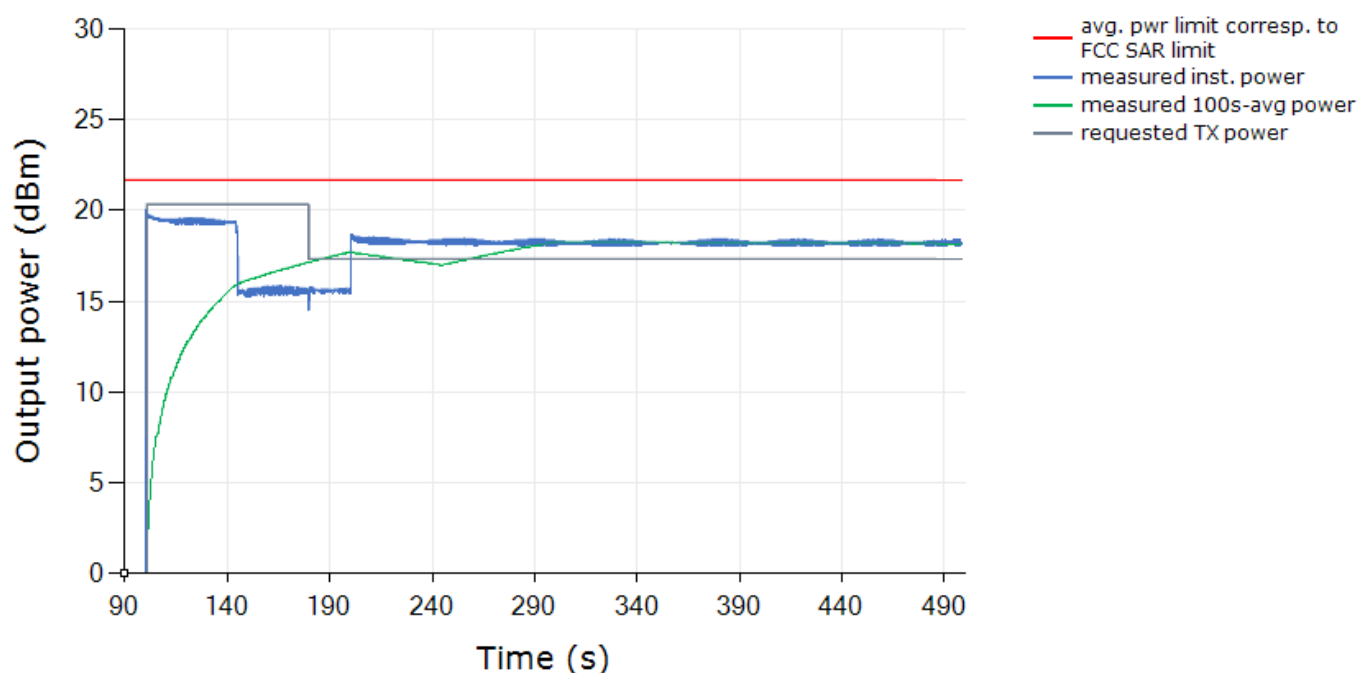
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5.3.2 GSM 1900 Ant3 DSI5

Test result for test sequence 1:

Conducted Power
Tech: GSM, Band PCS



Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:

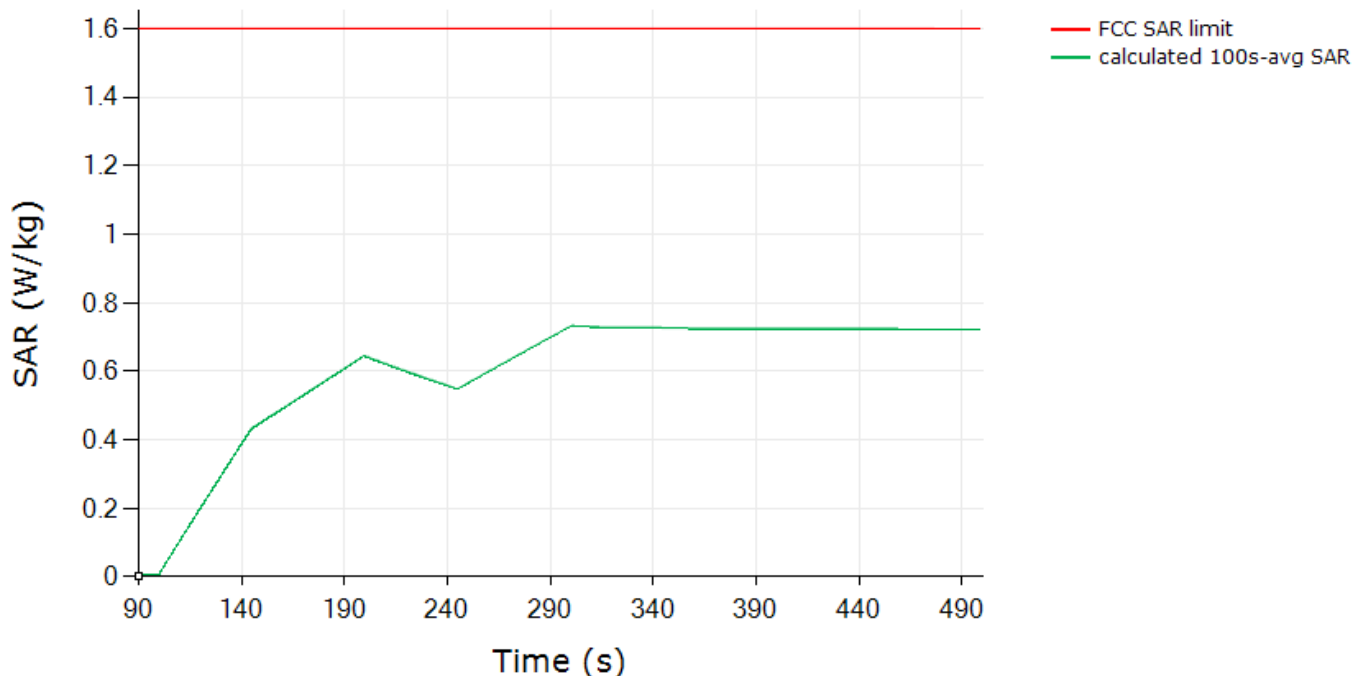


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SAR Tech: GSM, Band PCS



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.731
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



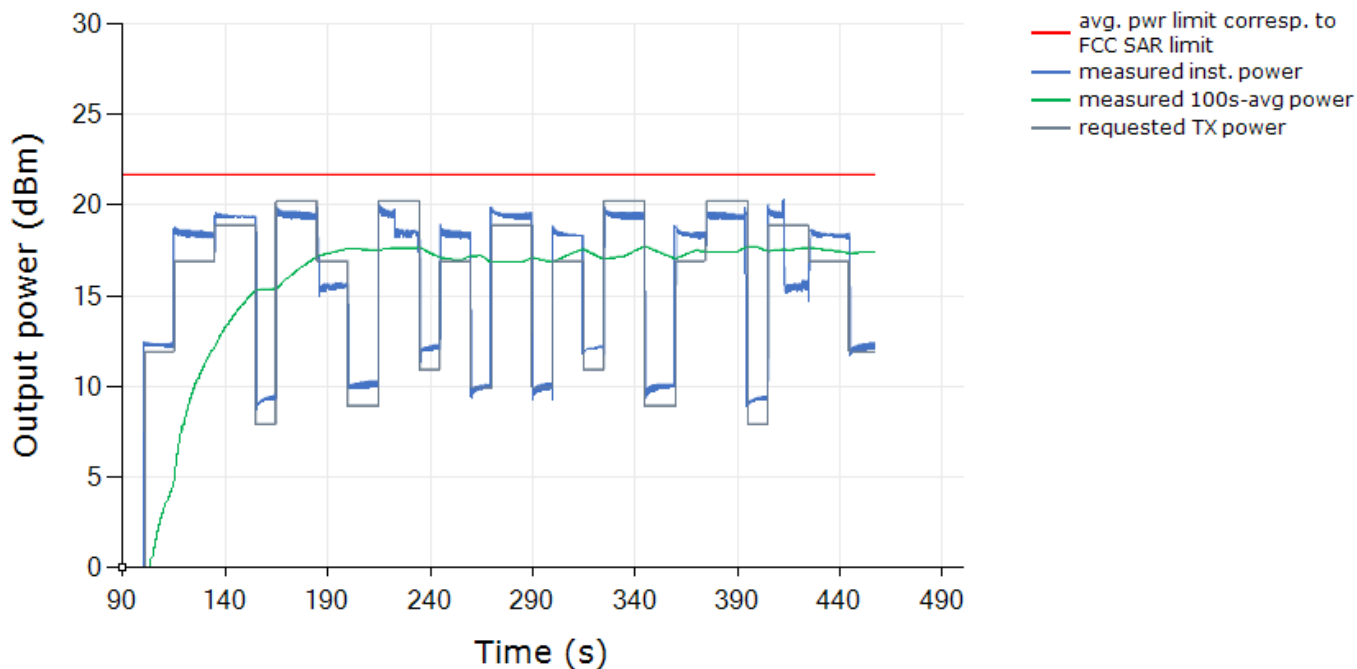
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Test result for test sequence 2:

Conducted Power Tech: GSM, Band PCS



Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:

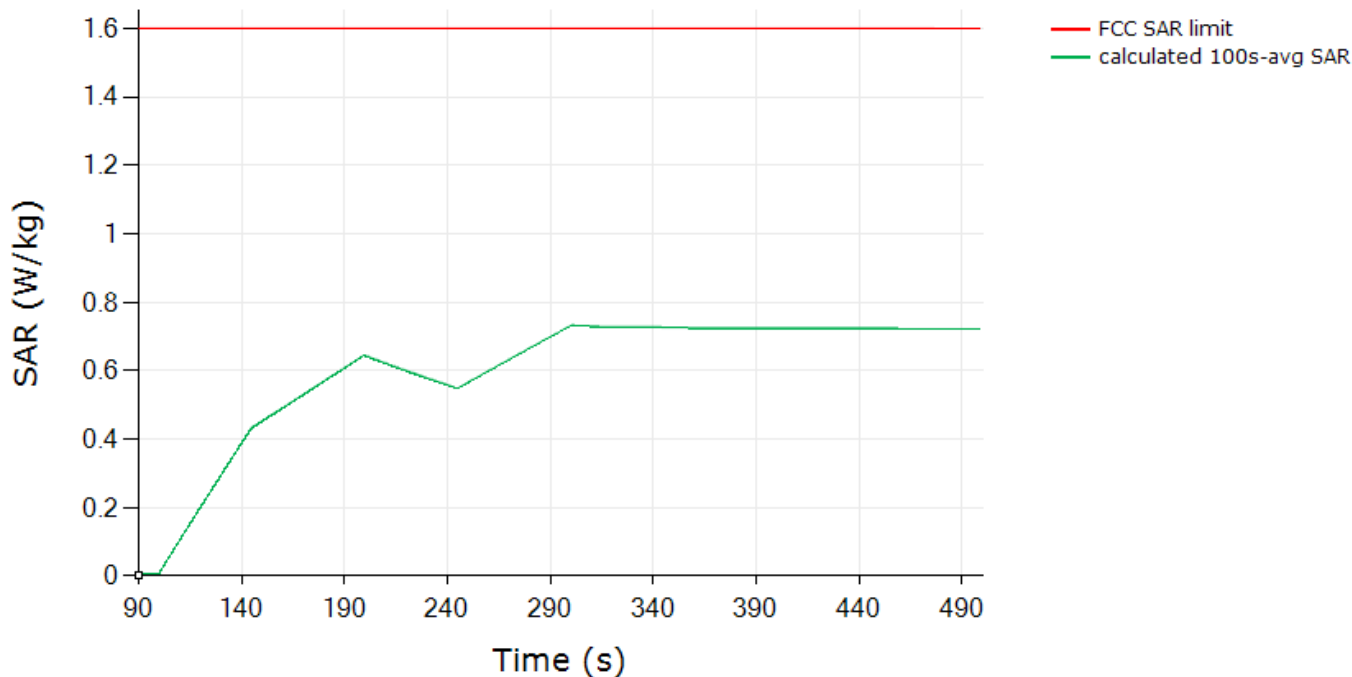


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SAR Tech: GSM, Band PCS



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.647
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



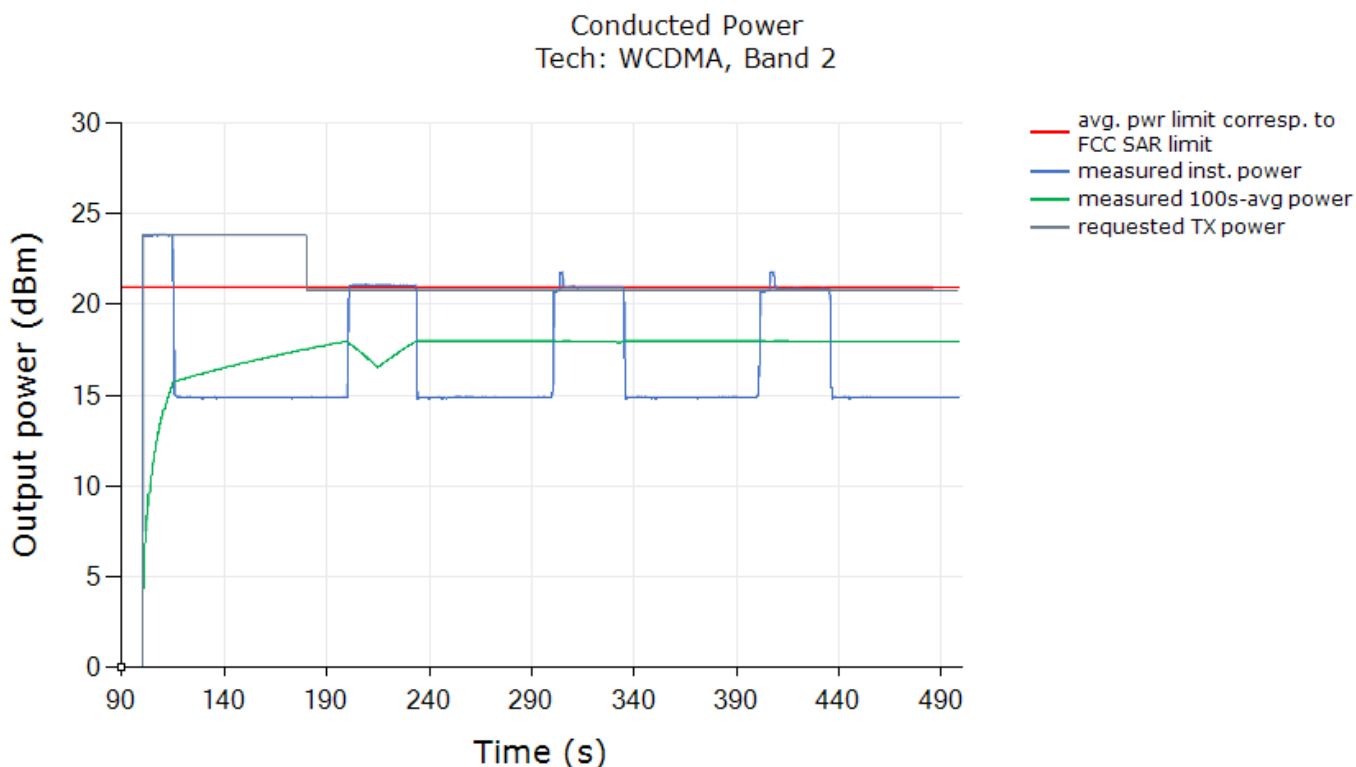
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5.3.3 WCDMA B2 Ant3 DSI5

Test result for test sequence 1:



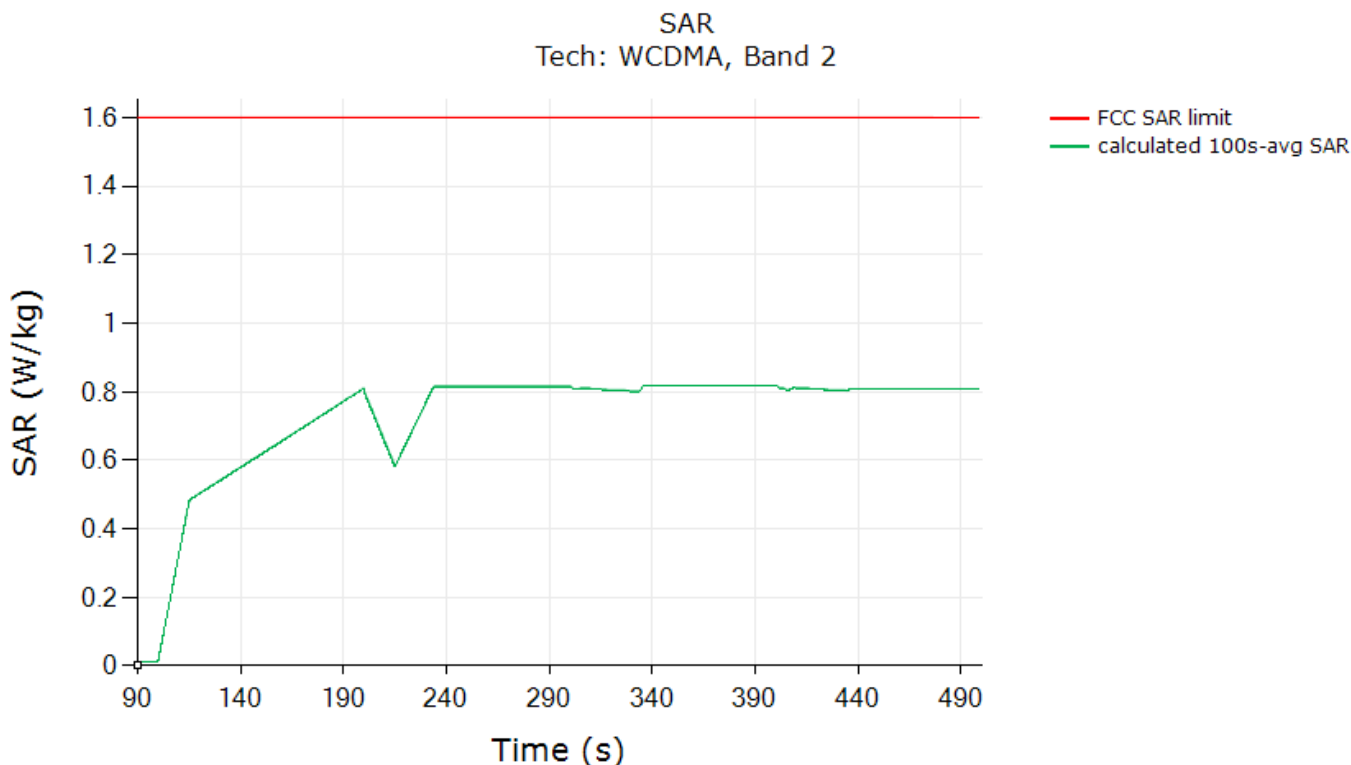
Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:



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	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.816
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



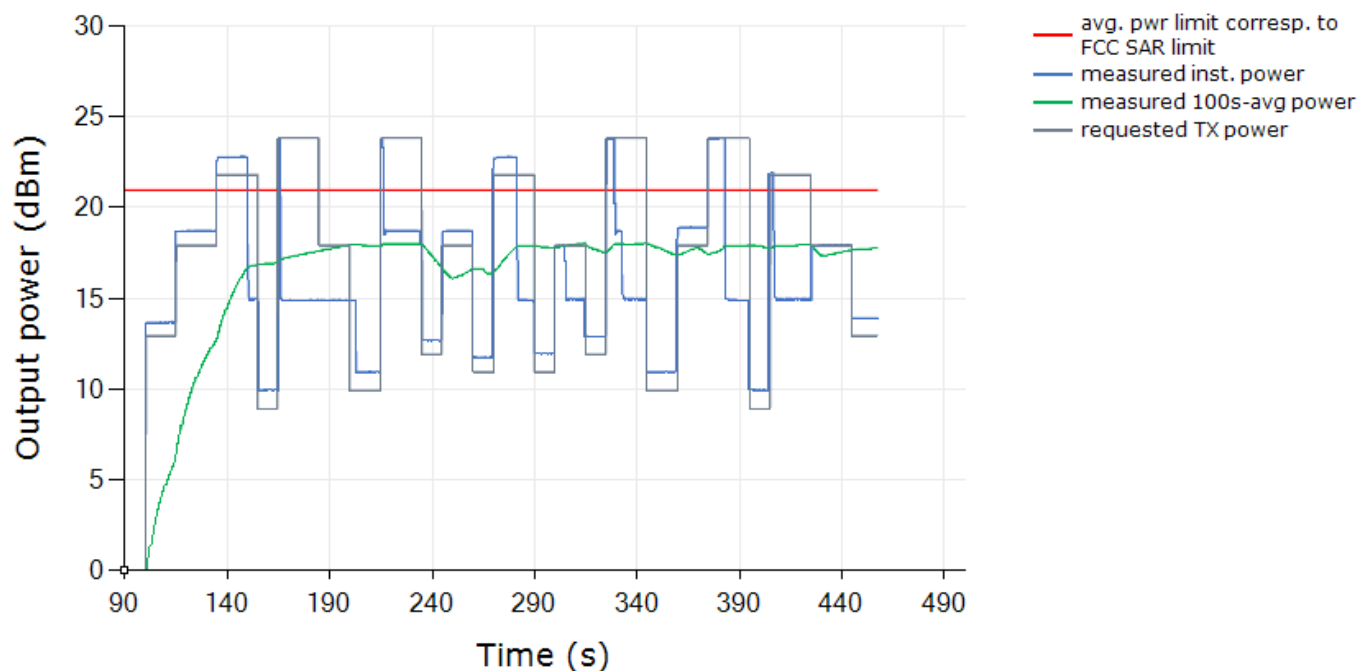
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Test result for test sequence 2:

Conducted Power Tech: WCDMA, Band 2



Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:

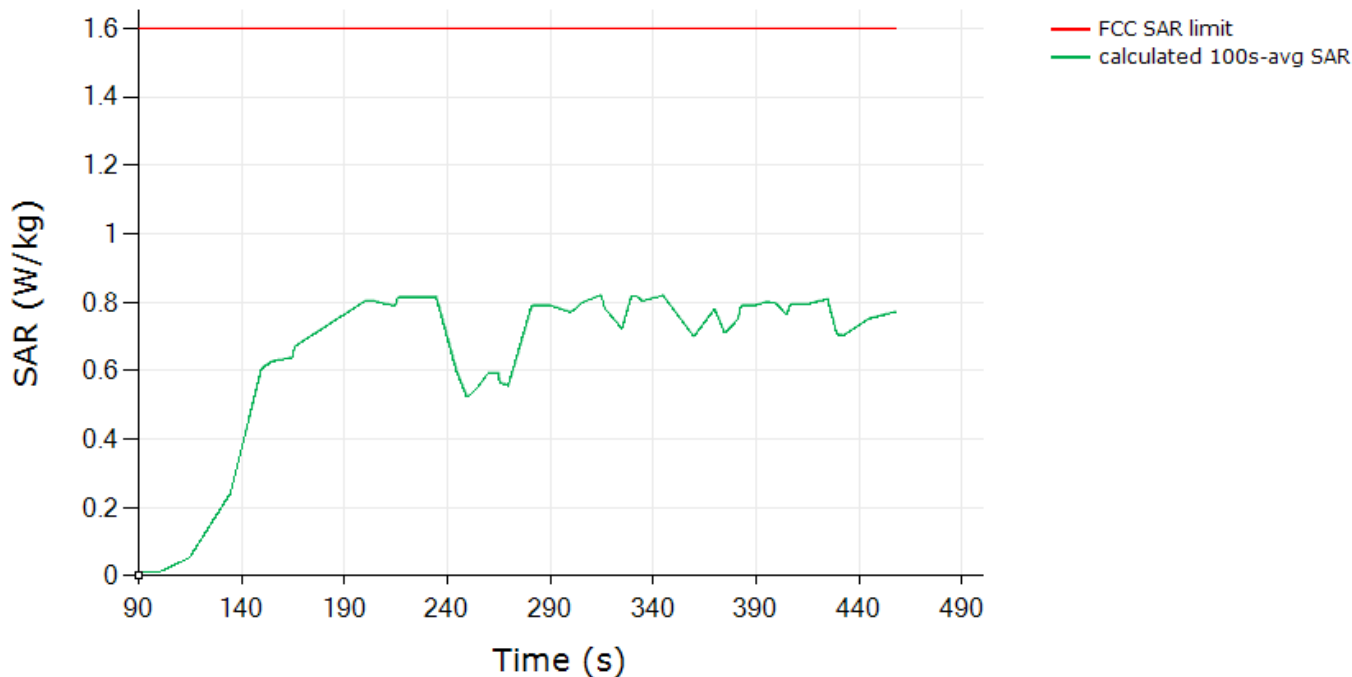


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SAR Tech: WCDMA, Band 2



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.82
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



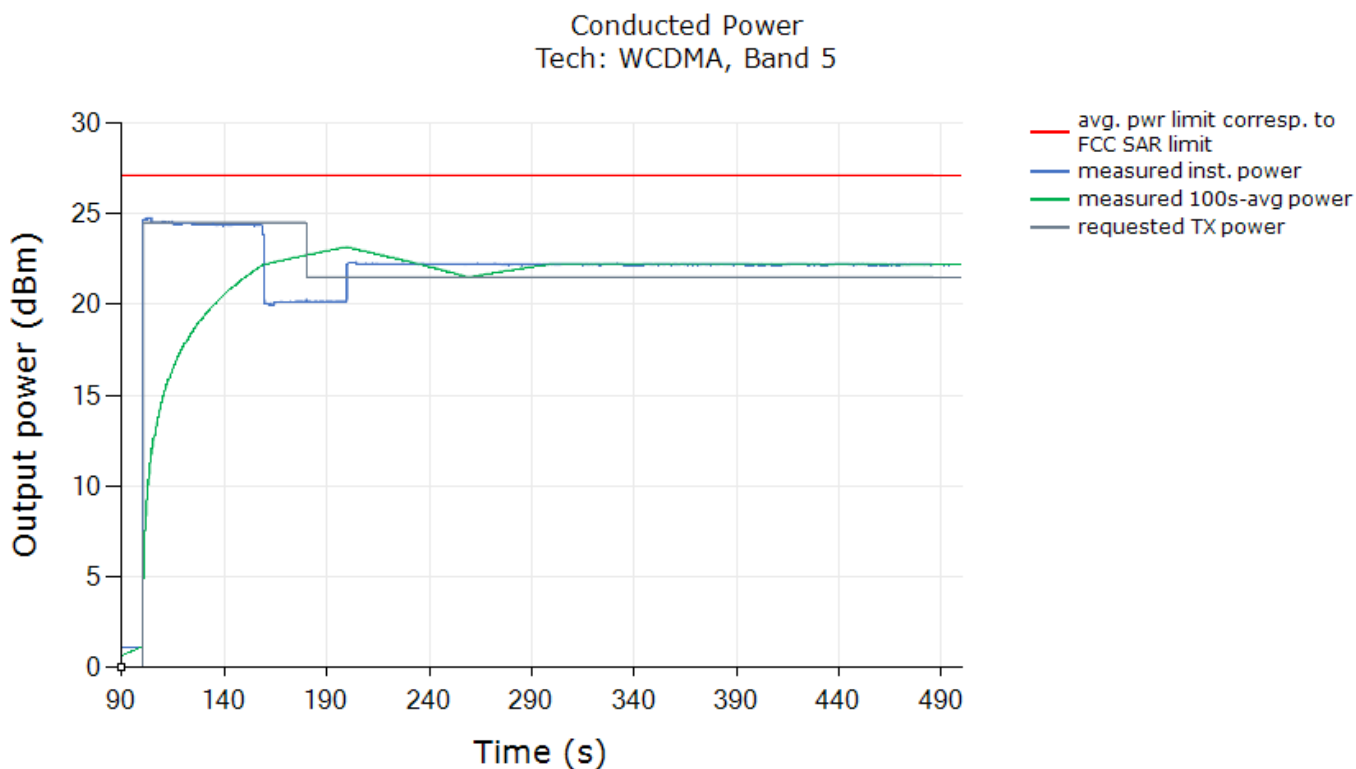
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5.3.4 WCDMA B5 Ant1 DSI5

Test result for test sequence 1:



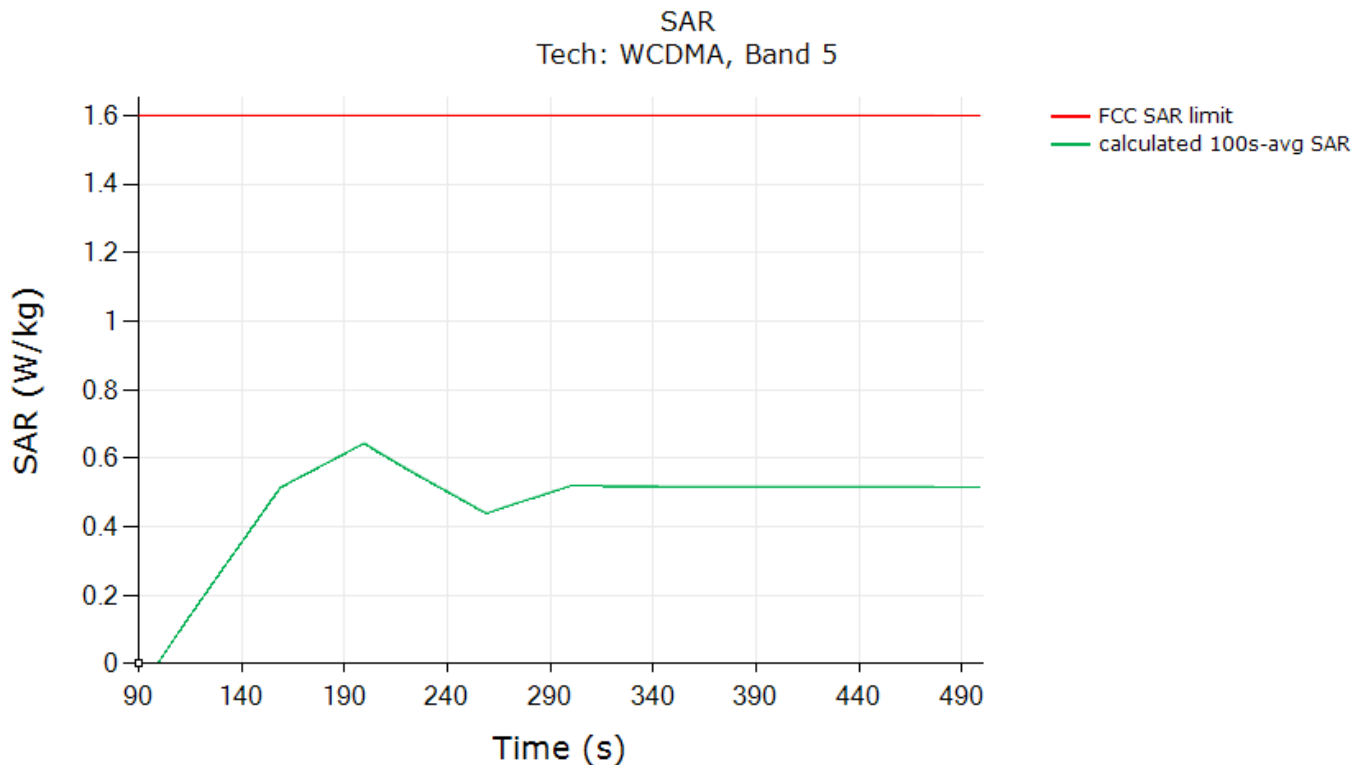
Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:



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	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.643
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



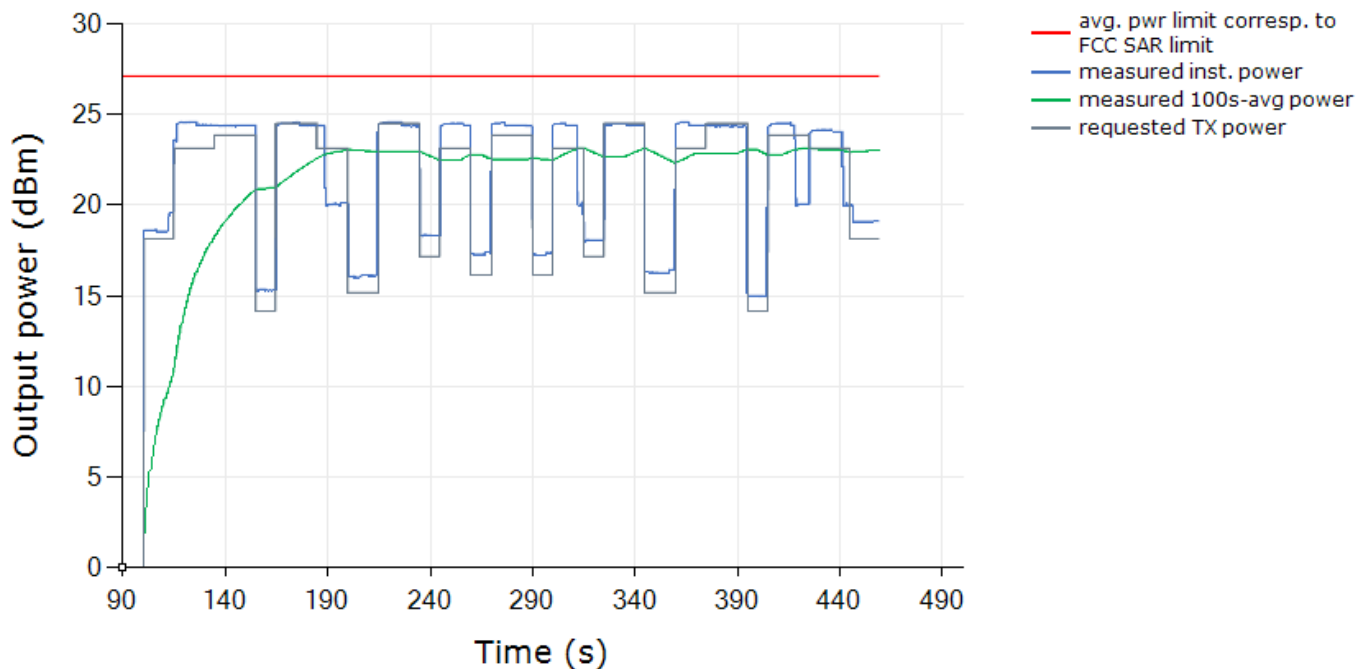
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Test result for test sequence 2:

Conducted Power Tech: WCDMA, Band 5



Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:

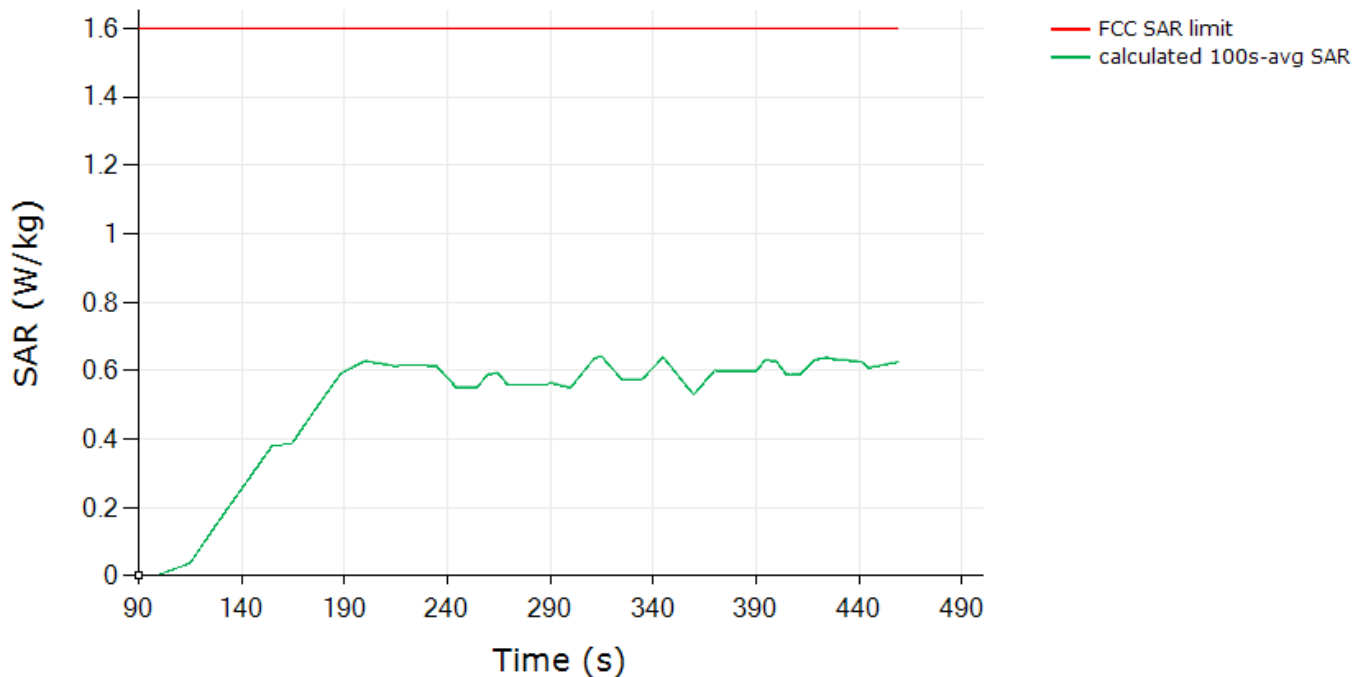


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SAR Tech: WCDMA, Band 5



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.641
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



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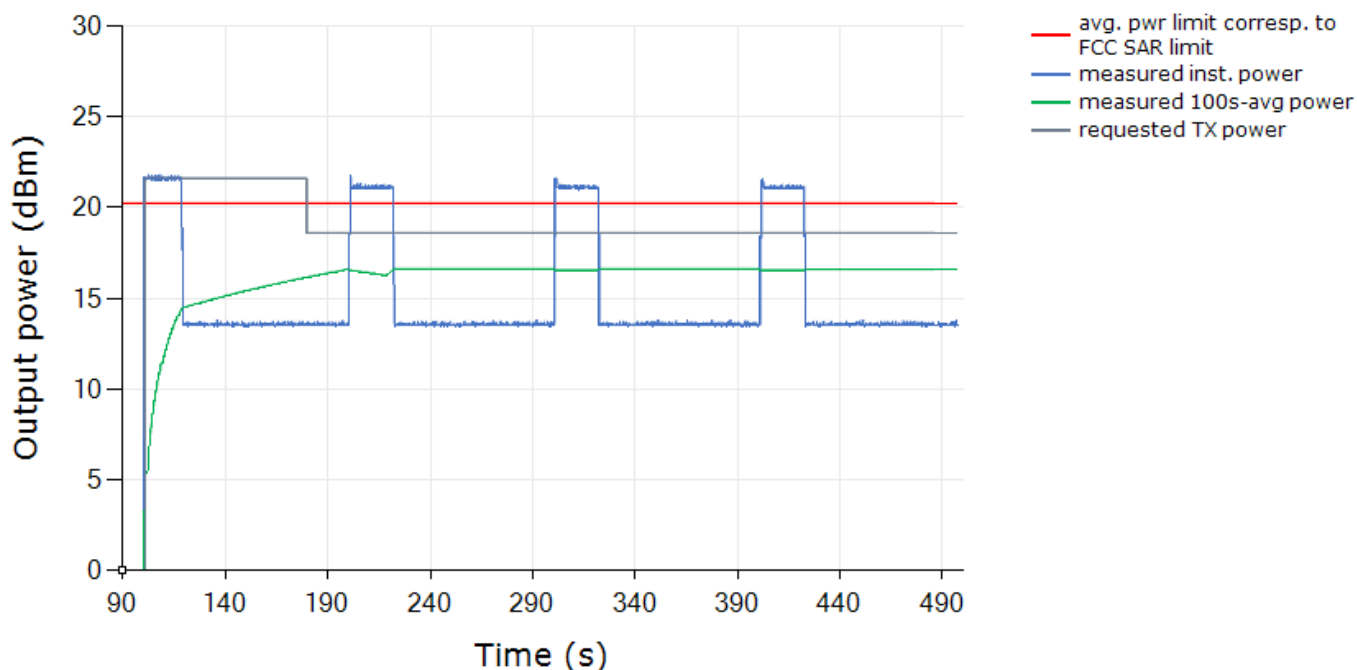
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5.3.5 LTE Band 41 Ant3 DSI5

Test result for test sequence 1:

Conducted Power
Tech: LTE, Band 41



Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:

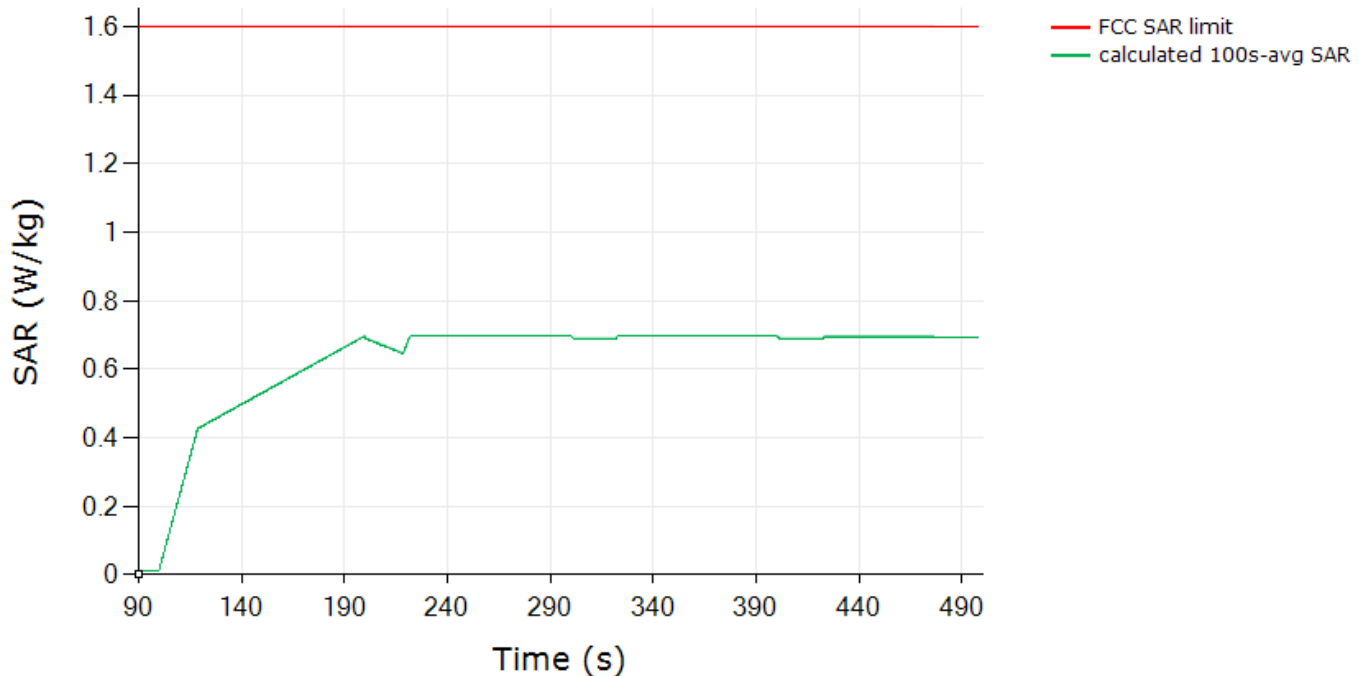


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SAR Tech: LTE, Band 41



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.696
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



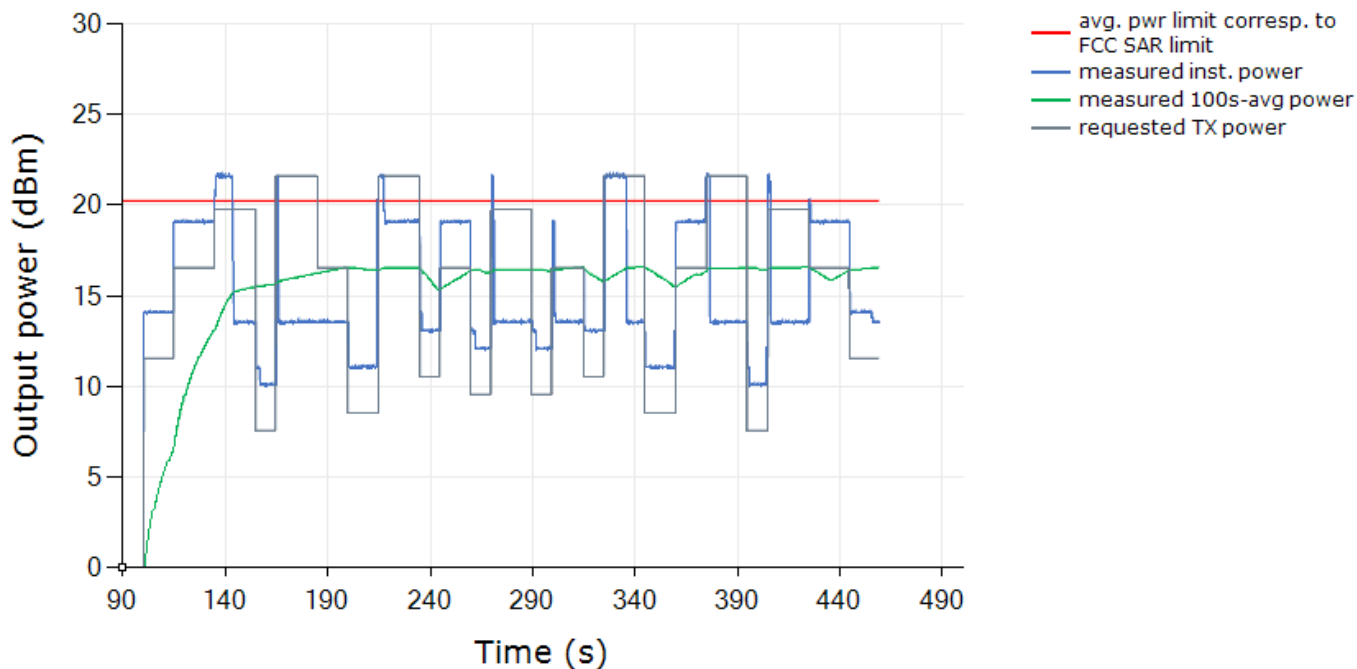
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Test result for test sequence 2:

Conducted Power Tech: LTE, Band 41



Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:

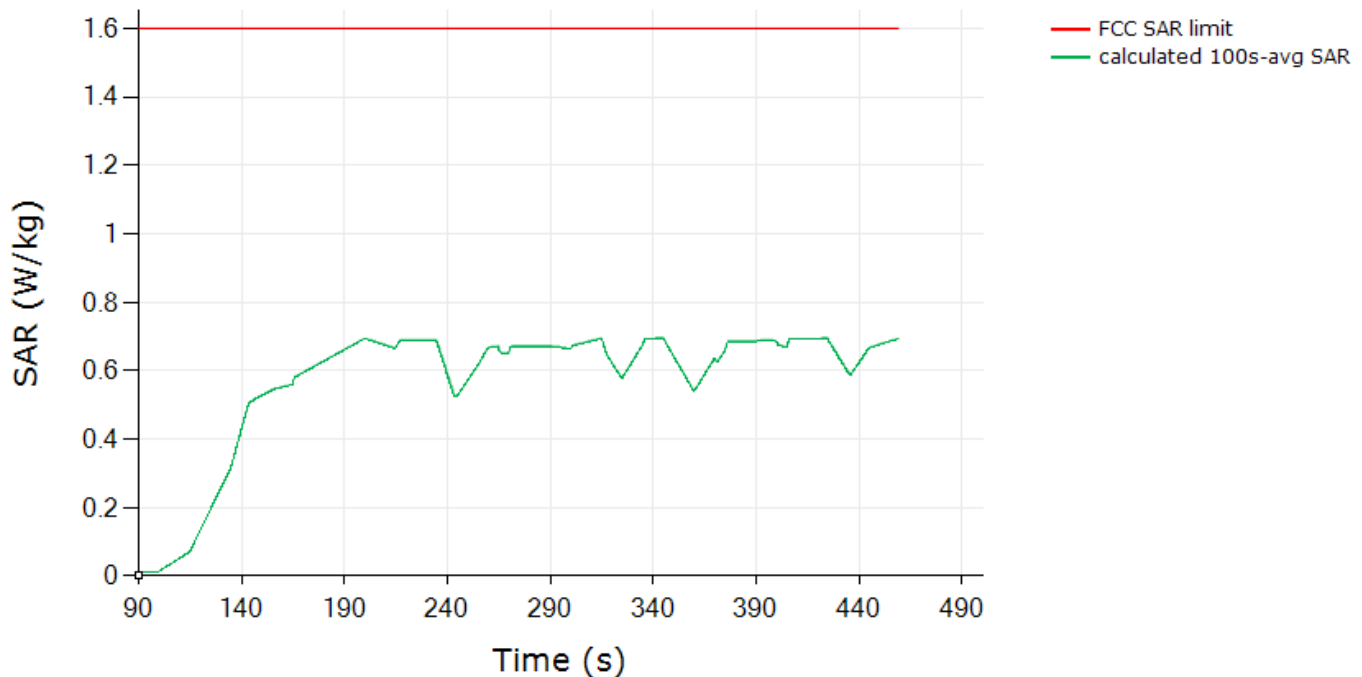


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SAR Tech: LTE, Band 41



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.694
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



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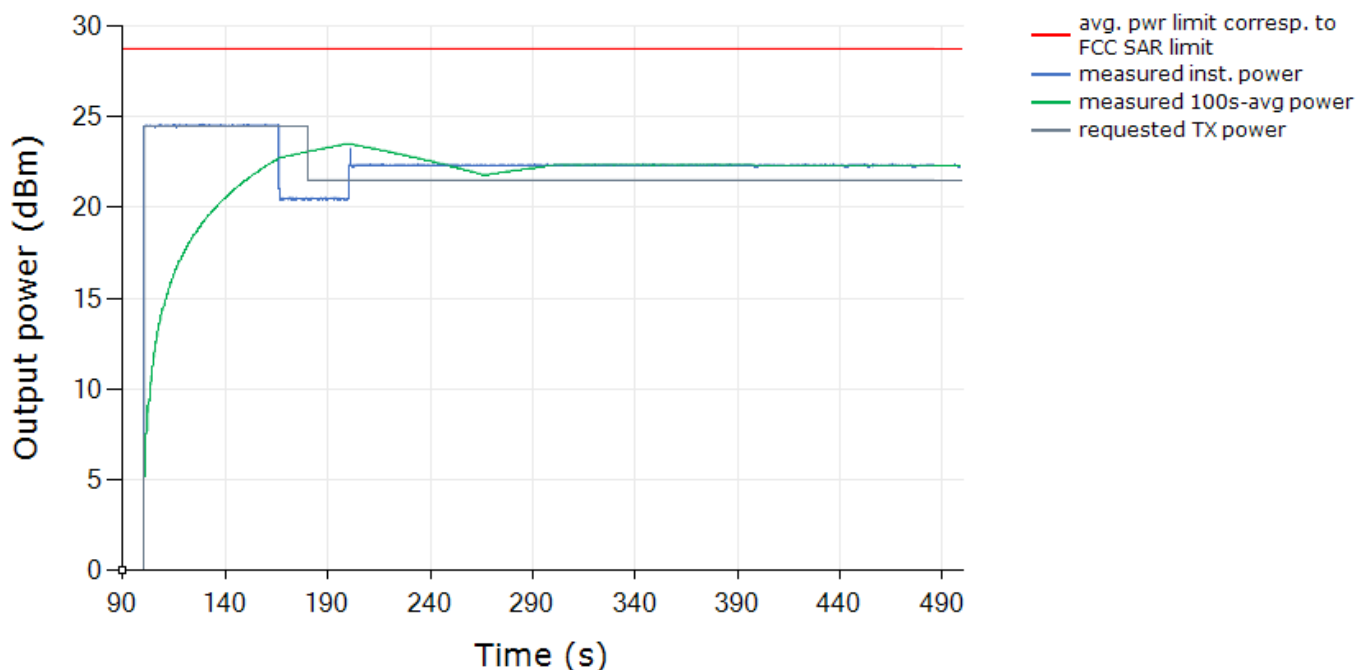
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5.3.6 LTE Band 12 Ant1 DSI8

Test result for test sequence 1:

Conducted Power
Tech: LTE, Band 12



Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:

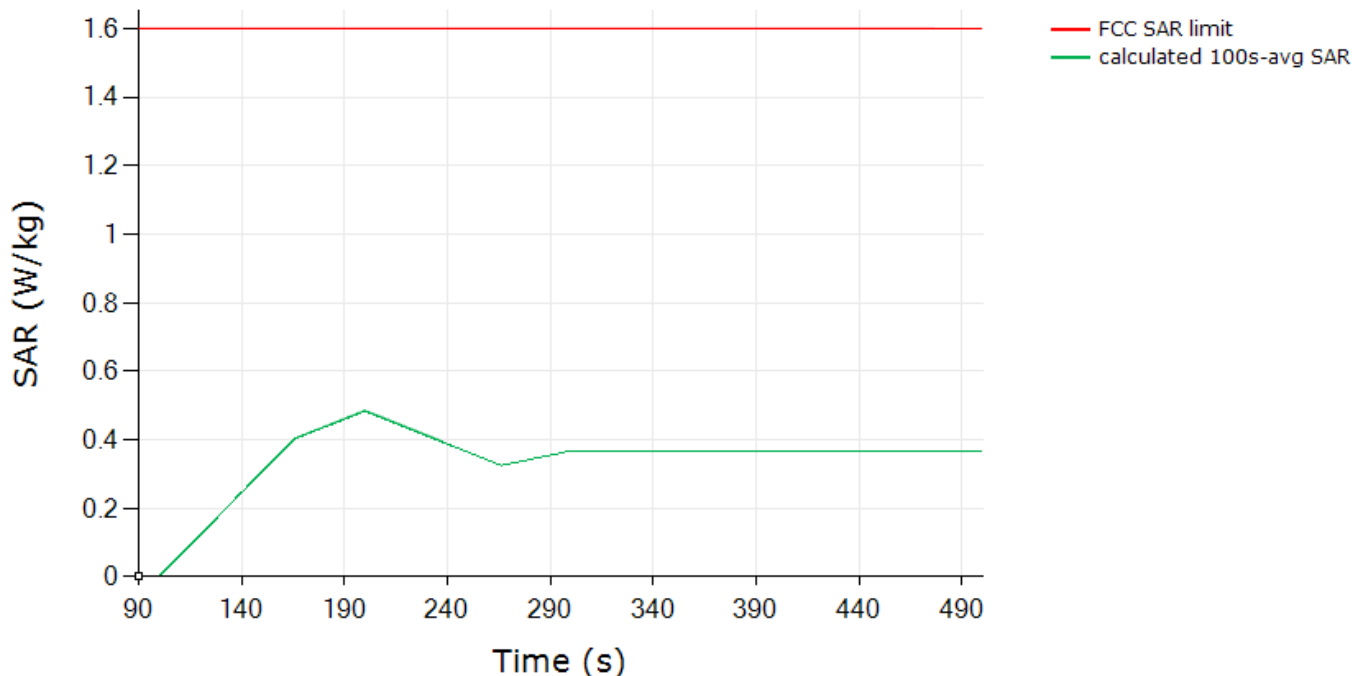


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SAR Tech: LTE, Band 12



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.483
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



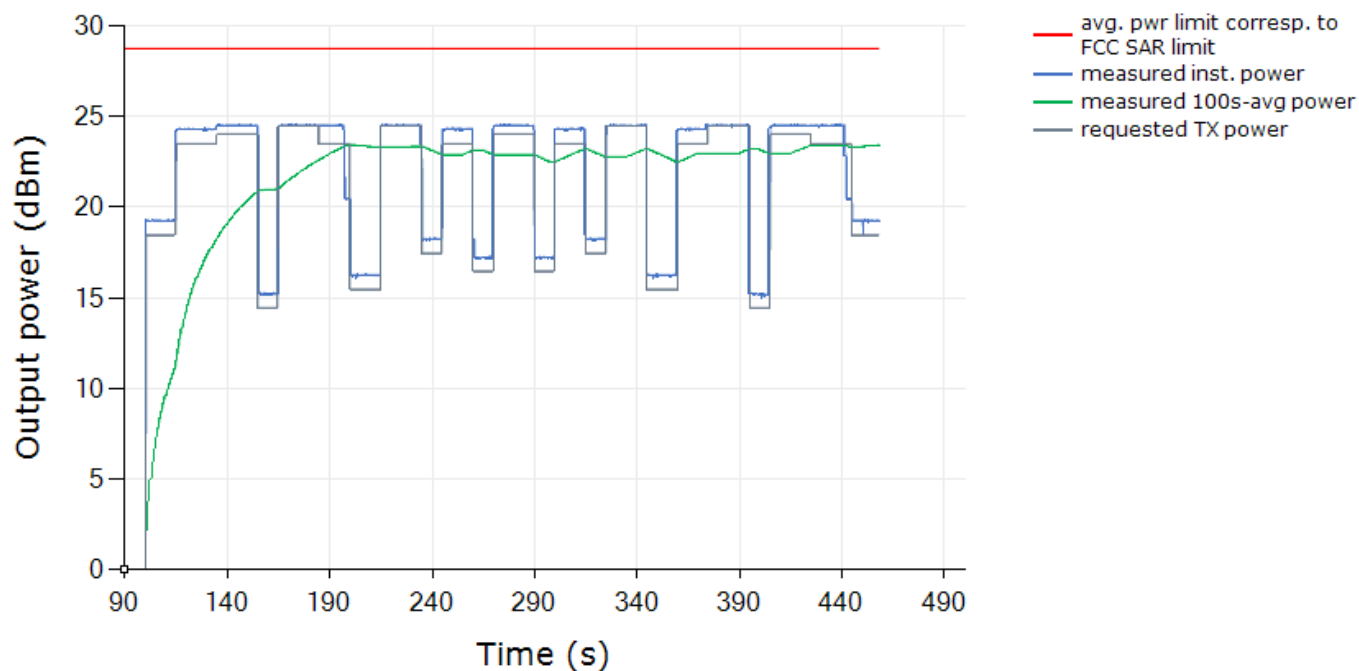
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Test result for test sequence 2:

Conducted Power Tech: LTE, Band 12



Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:

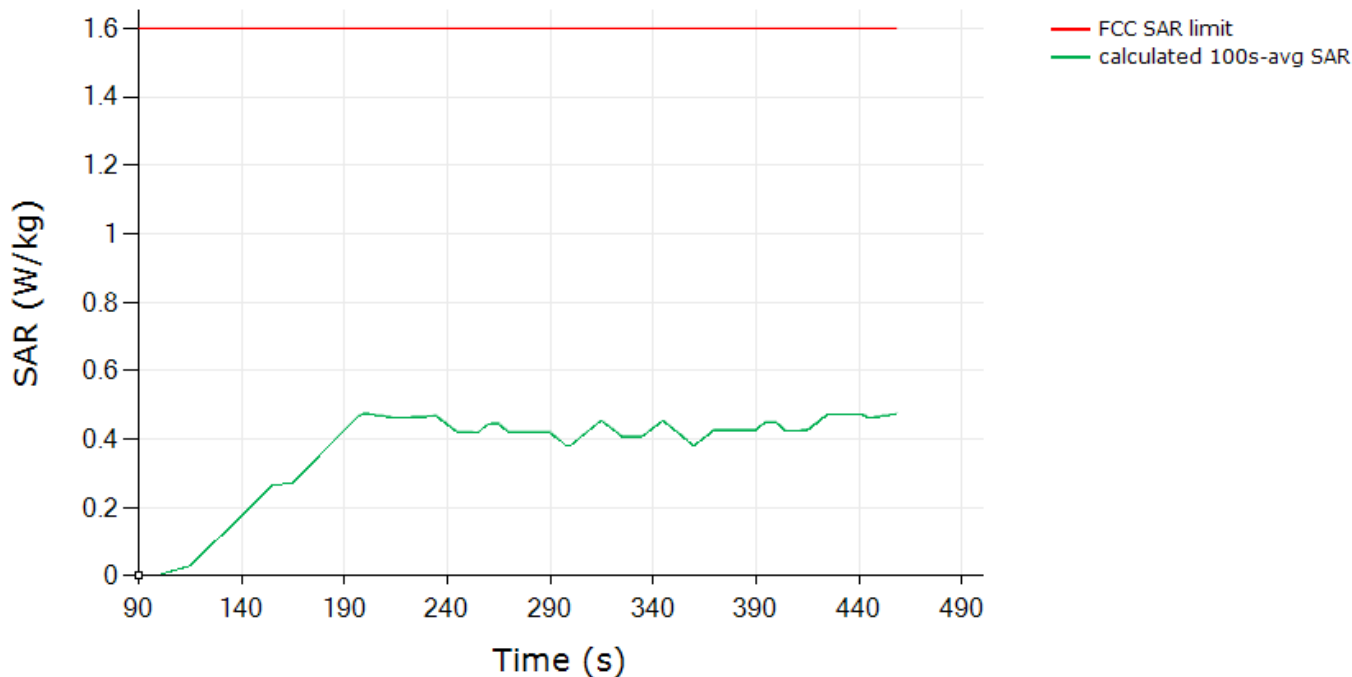


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SAR Tech: LTE, Band 12



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.473
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



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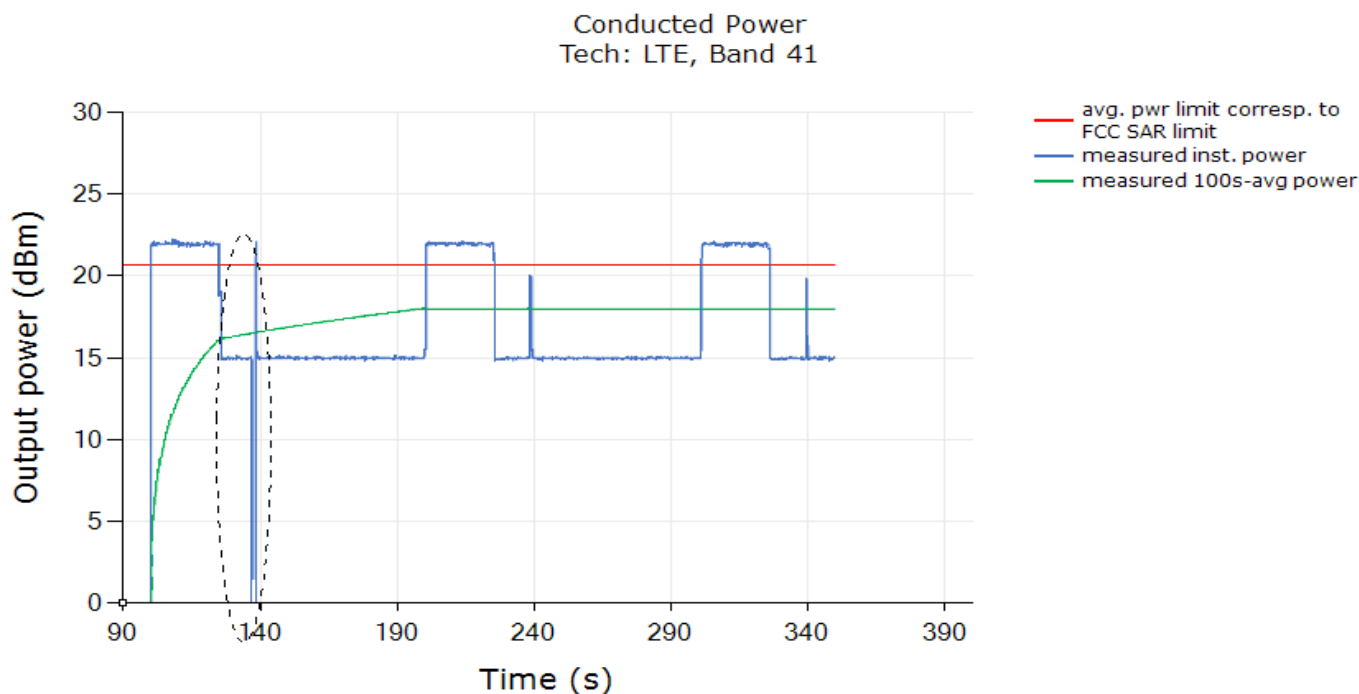
5.4 Change in Call Test Results

This test was measured with LTE Band 41 Ant3 DSI5 and with callbox requesting maximum power. The call drop was manually performed when the EUT is transmitting at $P_{reserve}$ level as shown in the plot below (dotted black region). The measurement setup is shown in Figure 6

1. The detailed test procedure is described in Section 3.3.2.

Call drop test result:

Plot 1: Measured Tx power (dBm) versus time shows that the transmitting power kept the same $P_{reserve}$ level of LTE Band 41 Ant3 DSI5 after the call was re-established:



Plot Notes: The conducted power plot shows expected Tx transition.

Plot 2: Above time-averaged conducted Tx power is converted/calculated into time-averaged 1gSAR using Equation (1a) and plotted below to demonstrate that the time-averaged 1gSAR versus time does not exceed the FCC limit of 1.6 W/kg for 1gSAR:

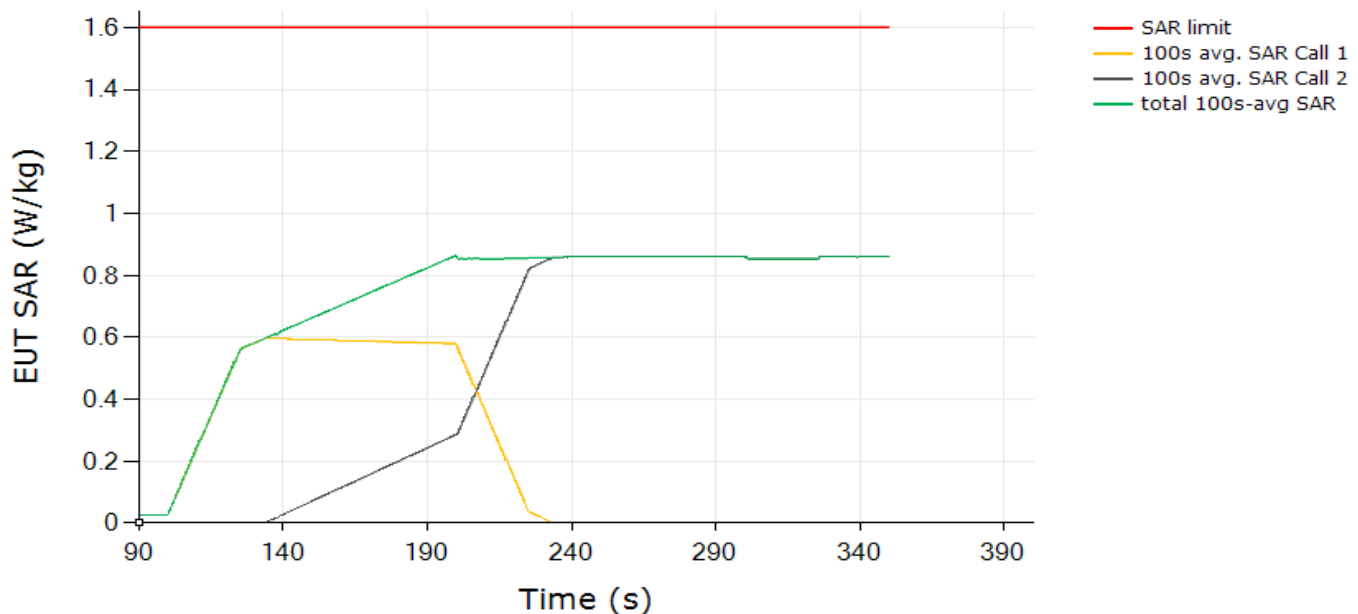


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SAR Call Drop
Tech: LTE, Band 41



	(W/kg)
FCC 1gSAR limit	1.6
Max 60s-time averaged 1gSAR (green curve)	0.863
Validated: The test result validated the continuity of power limiting in change in call scenario.	



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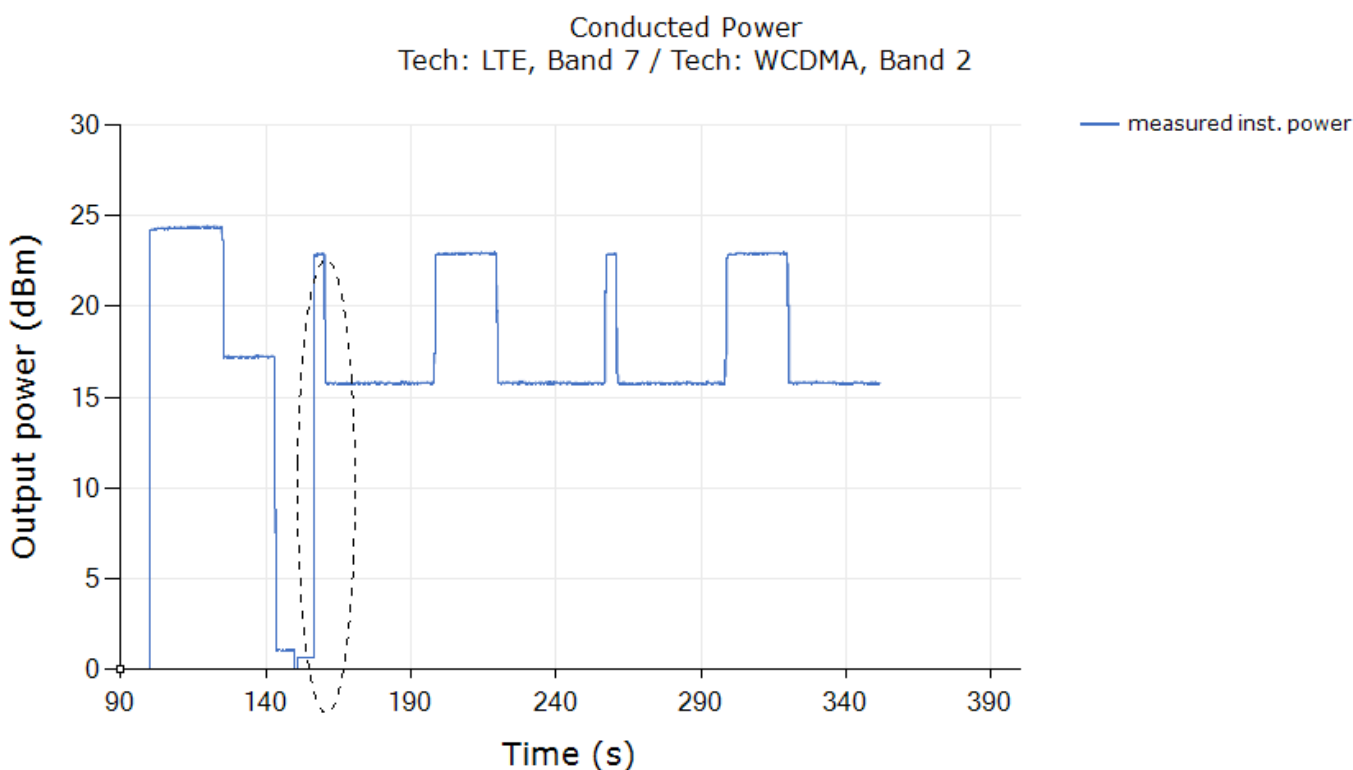
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5.5 Change in technology/band test results

This test was conducted with callbox requesting maximum power, and with technology switch from LTE Band 7 Ant4 DS18 Switch to WCDMA B2 Ant4 DS18. Following procedure and using the measurement setup shown in Figure 7-1(a) and (c), the technology/band switch was performed when the EUT is transmitting at Preserve level as shown in the plot below (dotted black region).

Plot 1: Measured Tx power (dBm) versus time shows that the transmitting power changed from LTE Band 7, Preserve level to WCDMA B2



Plot 2: All the time-averaged conducted Tx power measurement results were converted into time-averaged normalized SAR values, and plotted below to demonstrate that the time-averaged normalized exposure versus time does not exceed the normalized limit of 1.0:

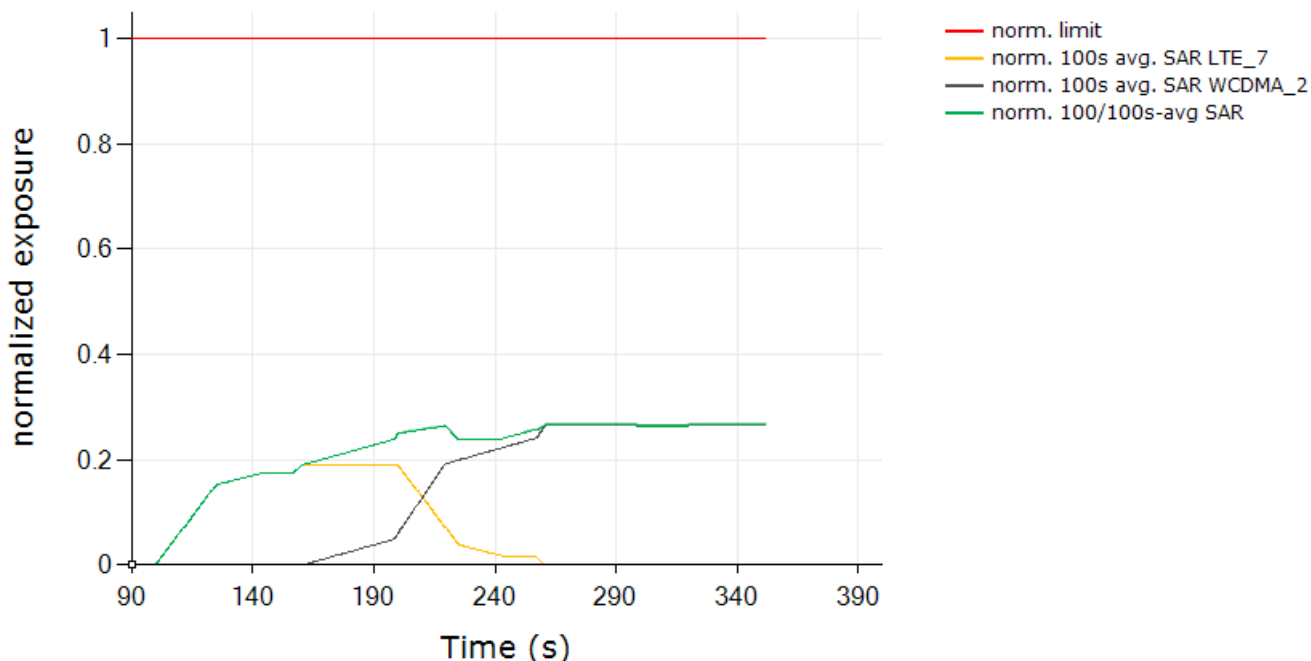


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Total Normalized Time-averaged RF Exposure Tech: LTE, Band 7 / Tech: WCDMA, Band 2



	Exposure Ratio
Normalized Exposure Ratio limit	1.0
Max total time averaged normalized Exposure Ratio (green curve)	0.266
Validated: The test result validated the continuity of power limiting in technology/band switch scenario.	



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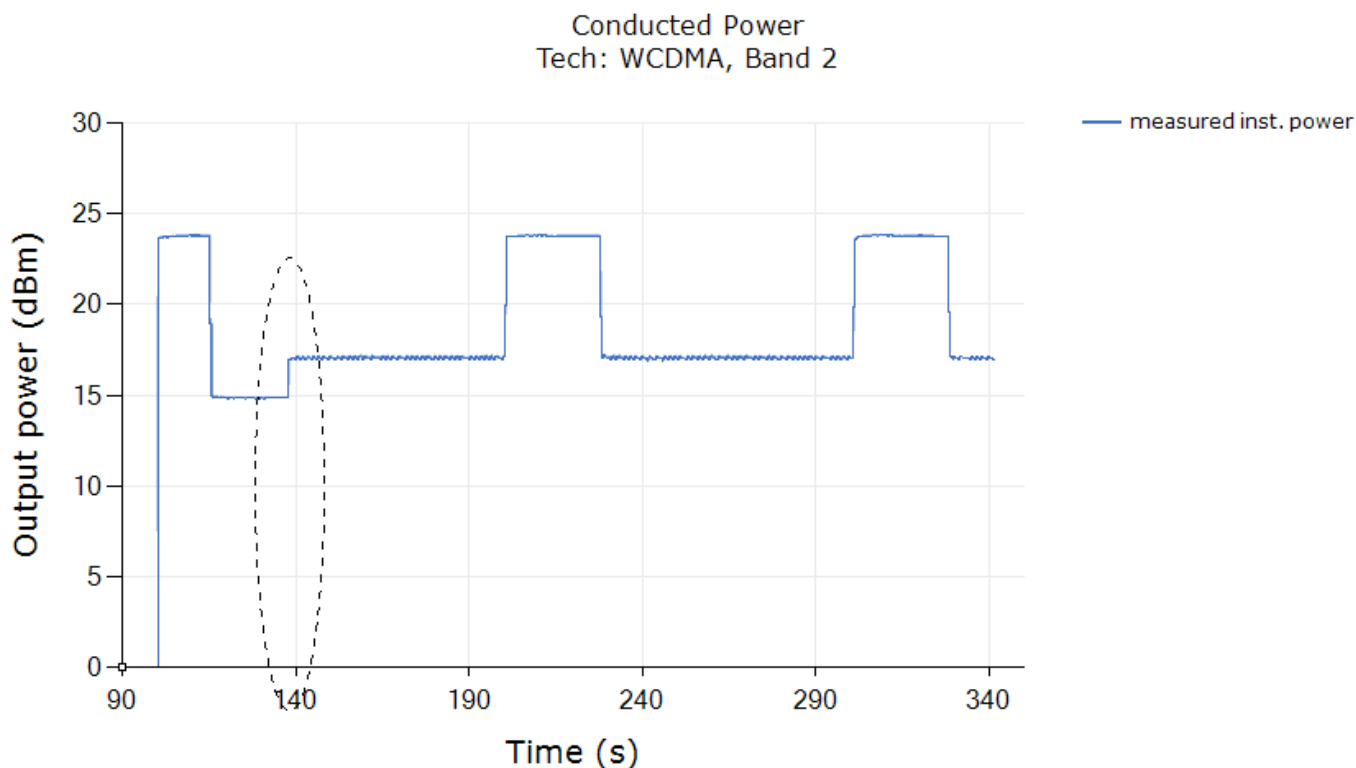
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5.6 Change in DSI test results

This test was conducted with callbox requesting maximum power, and with DSI switch from WCDMA B2 Ant3 DSI5 to WCDMA B2 Ant3 DSI3. Following procedure detailed in Section 3.3.4 using the measurement setup shown in Figure 5-1(a) and (c), the DSI switch was performed when the EUT is transmitting at $P_{reserve}$ level as shown in the plot below (dotted black circle).

Test result for change in DSI:

Plot 1: Measured Tx power (dBm) versus time shows that the transmitting power changed when DSI=5 to DSI =3.



Plot 2: All the time-averaged conducted Tx power measurement results were converted into time-averaged normalized SAR values using Equation (6a), (6b) and (6c), and plotted below to demonstrate that the time-averaged normalized Exposure versus time does not exceed the FCC limit of 1 unit.

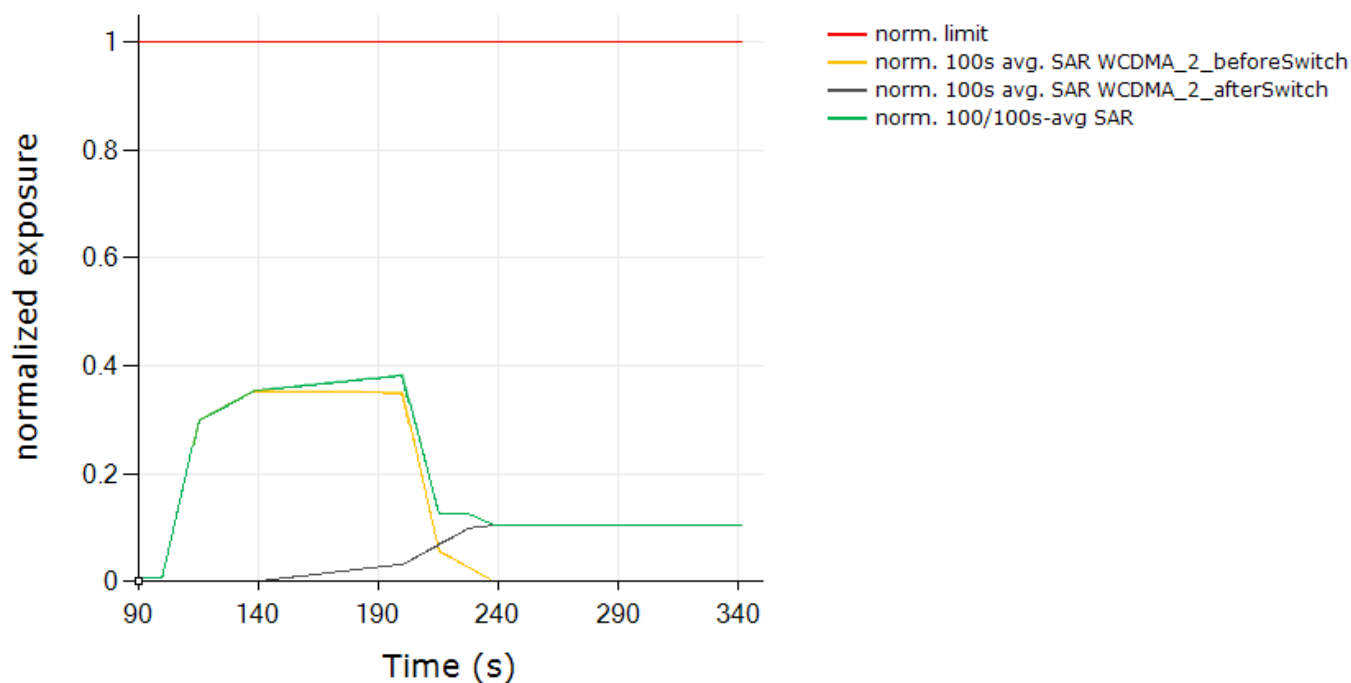


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Total Normalized Time-averaged RF Exposure Tech: WCDMA, Band 2



	Exposure Ratio
FCC normalized Exposure Ratio limit	1.0
Max 100s-time averaged normalized Exposure Ratio (green curve)	0.382
Validated: The test result validated the continuity of power limiting in DSI switch scenario.	



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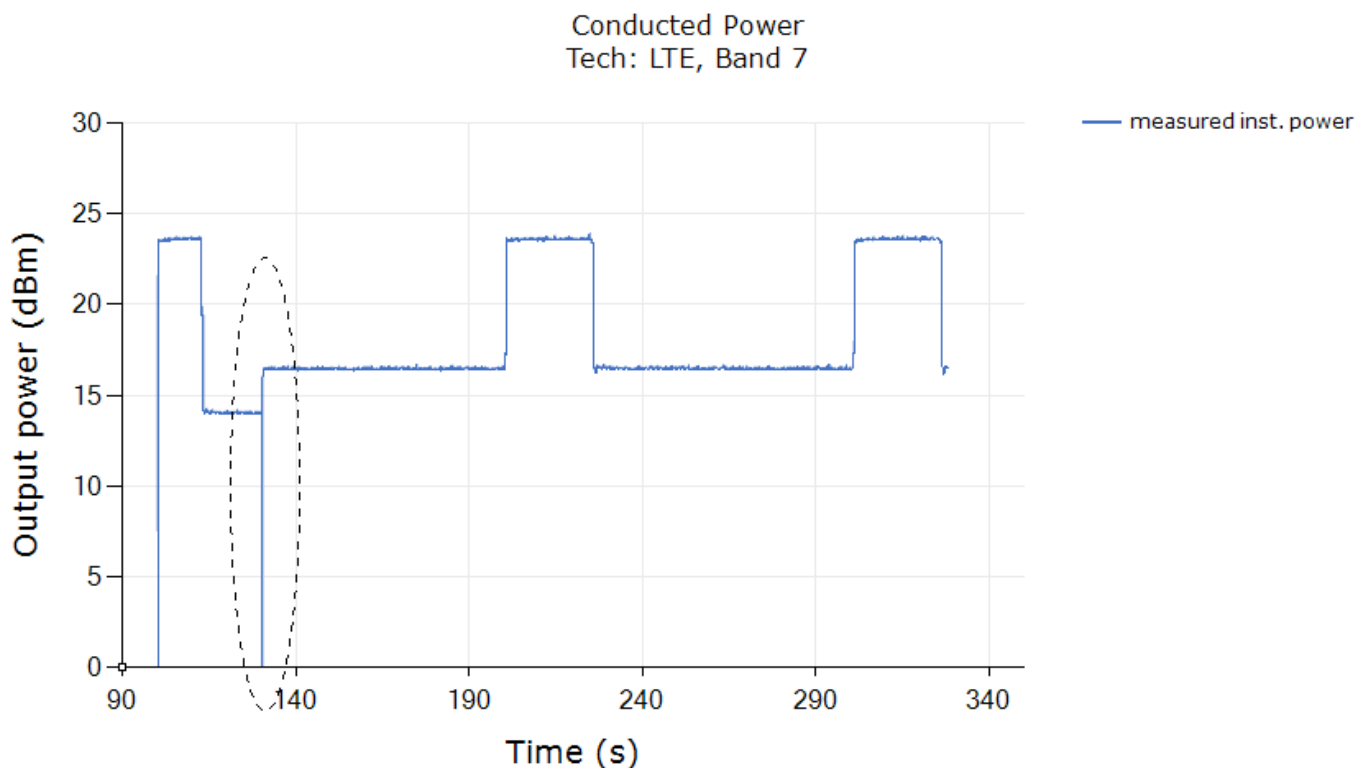
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5.7 Change in antenna switch test results

This test was conducted with callbox requesting maximum power, and with Antenna switch from LTE Band 7 Ant3 DSI8 to LTE Band 7 Ant4 DSI8. Following procedure detailed before using the measurement setup shown in Figure 5-1(a), the Antenna switch was performed when the EUT is transmitting at Preserve level as shown in the plot below (dotted black circle).

Plot 1: Measured Tx power (dBm) versus time shows that the transmitting power changed when Ant 3 switches to Ant 4.

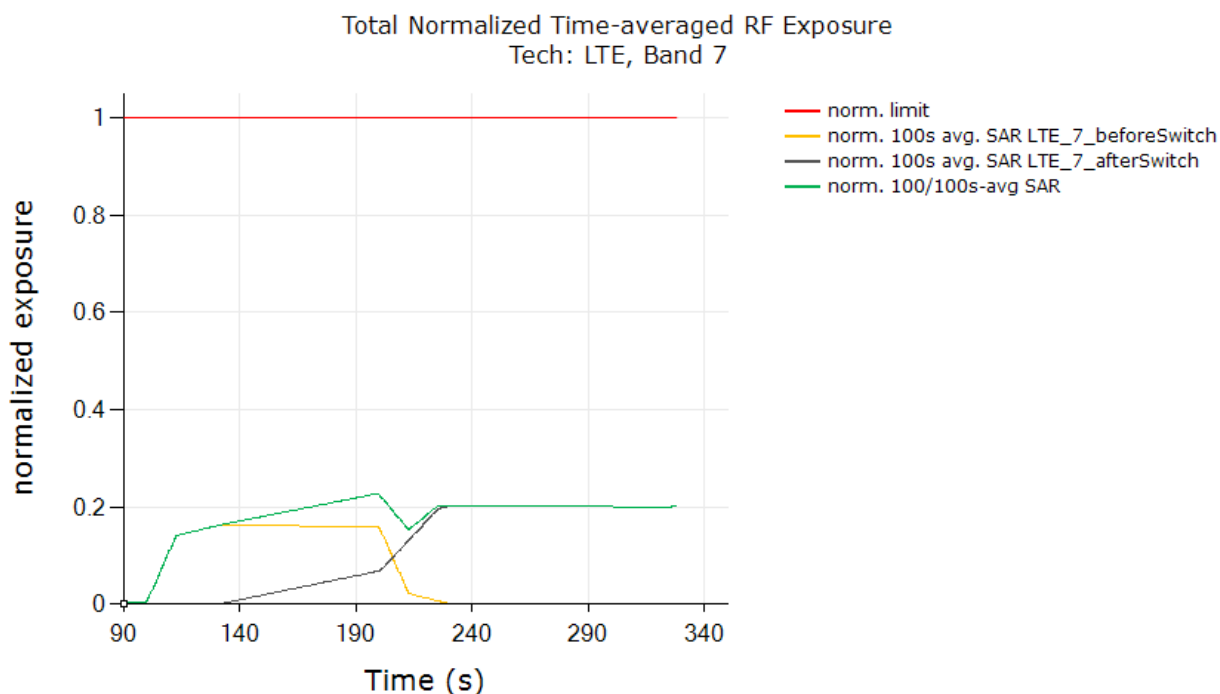


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Plot 2: All the time-averaged conducted Tx power measurement results were converted into time-averaged normalized SAR values and plotted below to demonstrate that the time-averaged normalized Exposure versus time does not exceed the limit of 1 unit.



	Exposure Ratio
FCC normalized Exposure Ratio	1.0
Max time averaged normalized Exposure Ratio (green curve)	0.228
Validated	



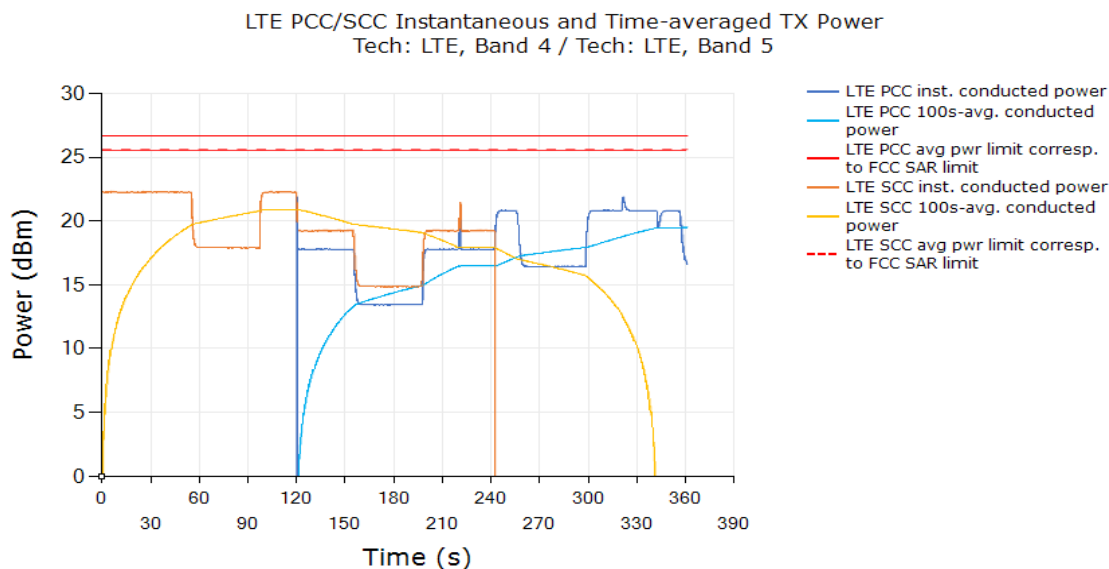
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5.8 Switch in SAR exposure test results (ULCA Combination)

This test was conducted with callbox requesting maximum power, and with the EUT in LTE UL CA B4 + LTE UL CA B5 call. Following procedure detailed in Section 3.3.6, and using the measurement setup shown in Figure 5-1, the SAR exposure switch measurement is performed with the EUT in various SAR exposure scenarios.



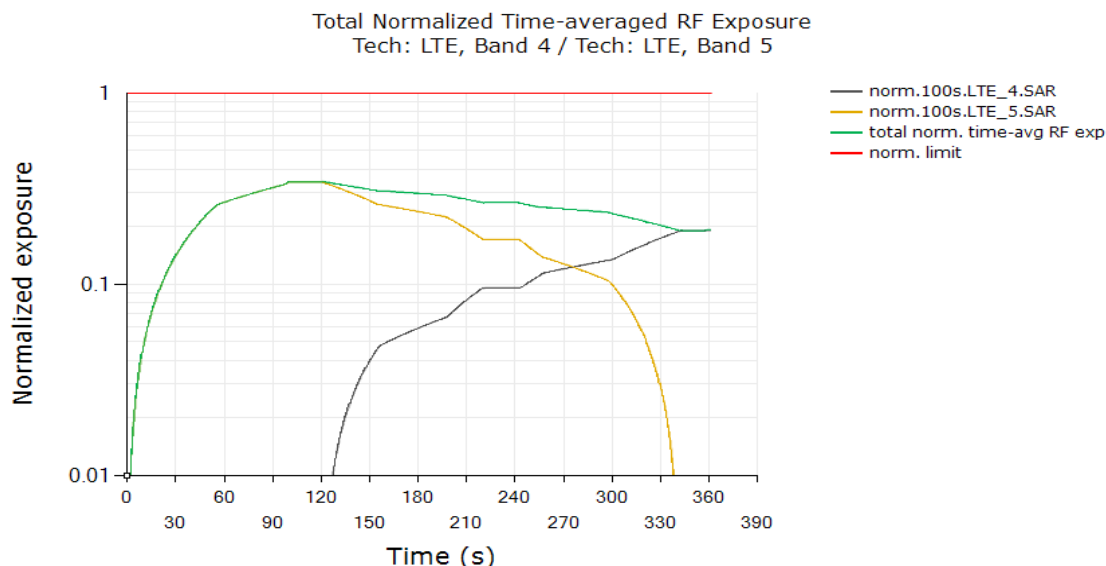
Plot 2: All the conducted Tx power measurement results were converted into time-averaged normalized SAR values using Equation (6a), (6b) and (6c), and plotted below to demonstrate that the time-averaged normalized SAR versus time does not exceed the FCC limit of 1 unit. Equation (6a) is used to convert the LTE Tx power of device to obtain 100s- averaged normalized SAR in LTE UL CA B4 PCC as shown in black curve. Similarly, equation (6b) is used to obtain 100s-averaged normalized SAR in LTE UL CA B5 SCC as shown in orange curve. Equation (6c) is used to obtain total time-averaged normalized SAR as shown in green curve (i.e., sum of black and orange curves).



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	Exposure Ratio
FCC normalized Exposure Ratio limit	1.0
Max time averaged normalized Exposure Ratio (green curve)	0.344
Validated	

Plot Notes:

Device starts predominantly in SCC SAR exposure scenario between 0s and 120s, and in PCC SAR + SCC SAR exposure scenario between 120s and 240s, and in predominantly in PCC SAR exposure scenario after t=240s. Between 0s and 120s, PCC is at low power, however, SCC Tx power leakage (~30dB lower) due to filter/directional coupler characteristics in the measurement setup is shown as PCC power in the plot. Similarly, PCC leakage is shown as SCC power after t=240s. For predominantly PCC SAR exposure scenario, maximum normalized 1gSAR exposure should correspond to 100% exposure margin = 0.191 W/kg measured SAR at LTE Plimit / 1.6W/kg limit = 0.221 +1.2dB device related uncertainty (see black curve after t = 240s).

Additionally, in SAR exposure switch test, at all times the total time-averaged normalized RF exposure (green curve) should not exceed normalized SAR_design_target + device uncertainty. In this test, with a maximum normalized SAR of 0.344 being $\leq 0.902 (=1.2/1.6+1.2\text{dB device uncertainty})$, the above test result validated the continuity of power limiting in SAR exposure switch scenario.



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6 SAR Test Results for Sub-6 Smart Transmit Feature Validation

6.1 Measurement setup

The measurement setup in Figure 5-1 is similar to normal SAR measurements. The difference in SAR measurement setup for time averaging feature validation is that the callbox is signaling in close loop power control mode (instead of requesting maximum power in open loop control mode) and callbox is connected to the PC using GPIB so that the test script executed on PC can send GPIB commands to control the callbox's requested power over time (test sequence). The same test script used in conducted setup for time-varying Tx power measurements is also used in this section for running the test sequences during SAR measurements, and the recorded values from the disconnected power meter by the test script were discarded.

As mentioned in Section 3.4, for EUT to follow TPC command sent from the callbox wirelessly, the "path loss" between callbox antenna and the EUT needs to be very well calibrated. Since the SAR chamber is in uncontrolled environment, precautions must be taken to minimize the environmental influences on "path loss". Similarly, in the case of time-varying SAR measurements in LTE (with LTE as anchor), "path loss" between callbox antenna and the EUT needs to be carefully calibrated for both LTE link as well as for LTE link.

The EUT is placed in worst-case position according to Table 4-2.



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6.2 SAR measurement results for time-varying Tx power transmission scenario

Following Section 3.4 procedure, time-averaged SAR measurements are conducted using EX3DV4 probe at peak location of area scan over 500 seconds. cDASY6 or cDASY8 system verification for SAR measurement is provided in Appendix D, and the associated SPEAG certificates are attached in Appendix E.

SAR probe integration times depend on the communication signal being tested. Integration times used by SPEAG for their probe calibrations can be downloaded from here (integration time is listed on the bottom of the first page for each tech):

<https://www.speag.com/assets/downloads/services/cs/UIDSummary171205.pdf>

Since the sampling rate used by cDASY6/8 for pointSAR measurements is not in user control, the number of points in 100s or 60s interval is determined from the scan duration setting in cDASY6/8 time-average pointSAR measurement by (100s or 60s / cDASY6/8_scan_duration * total number of pointSAR values recorded). Running average is performed over these number of points in excel spreadsheet to obtain 100s-/60s-averaged pointSAR.

Following Section 3.4, for each of selected technology/band (listed in Table 5-2):

7. With *Reserve_power_margin* set to 0 dB, area scan is performed at P_{limit} , and time-averaged pointSAR measurements are conducted to determine the pointSAR at P_{limit} at peak location, denoted as $pointSAR_{P_{limit}}$.
8. With *Reserve_power_margin* set to actual (intended) value, two more time-averaged pointSAR measurements are performed at the same peak location for test sequences 1 and 2.

To demonstrate compliance, all the pointSAR measurement results were converted into 1gSAR or 10gSAR values by using Equation (3a), rewritten below:

$$1g_or_10gSAR(t) = \frac{pointSAR(t)}{pointSAR_{P_{limit}}} * 1g_or_10gSAR_{P_{limit}} \quad (3a)$$

where, $pointSAR(t)$, $pointSAR_{P_{limit}}$, and $1g_or_10gSAR_{P_{limit}}$ correspond to the measured instantaneous point SAR, measured point SAR at P_{limit} from above step 1 and 2, and measured 1gSAR or 10gSAR values at P_{limit} obtained from Part 1 report and listed in Table measured 1gSAR or 10gSAR values at P_{limit} obtained from Part 1 report and listed in Table 4-2 in Section 4.1 of this report.



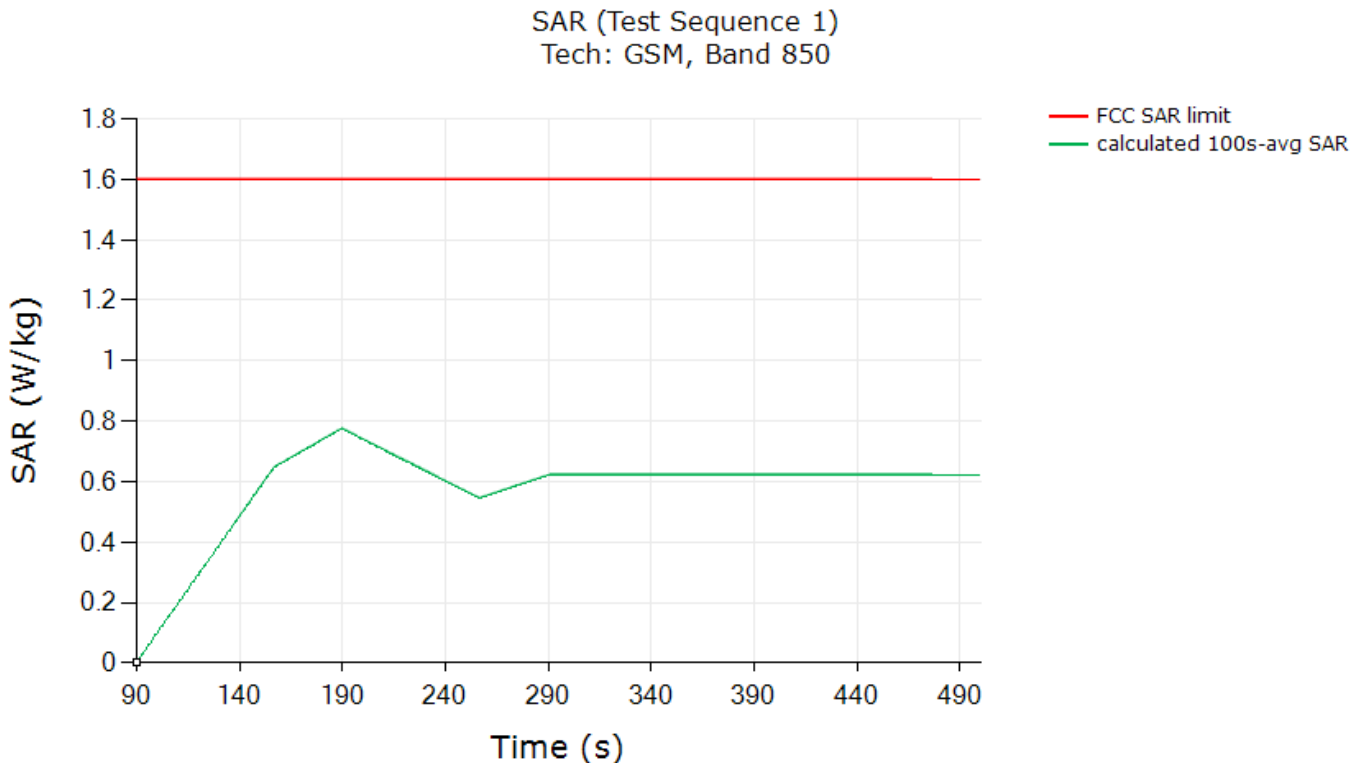
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6.2.1 GSM 850 Ant1 DS18

SAR test results for test sequence 1:



FCC 1gSAR limit	(W/kg)
	1.6
Max 100s-time averaged 1gSAR (green curve)	0.776
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



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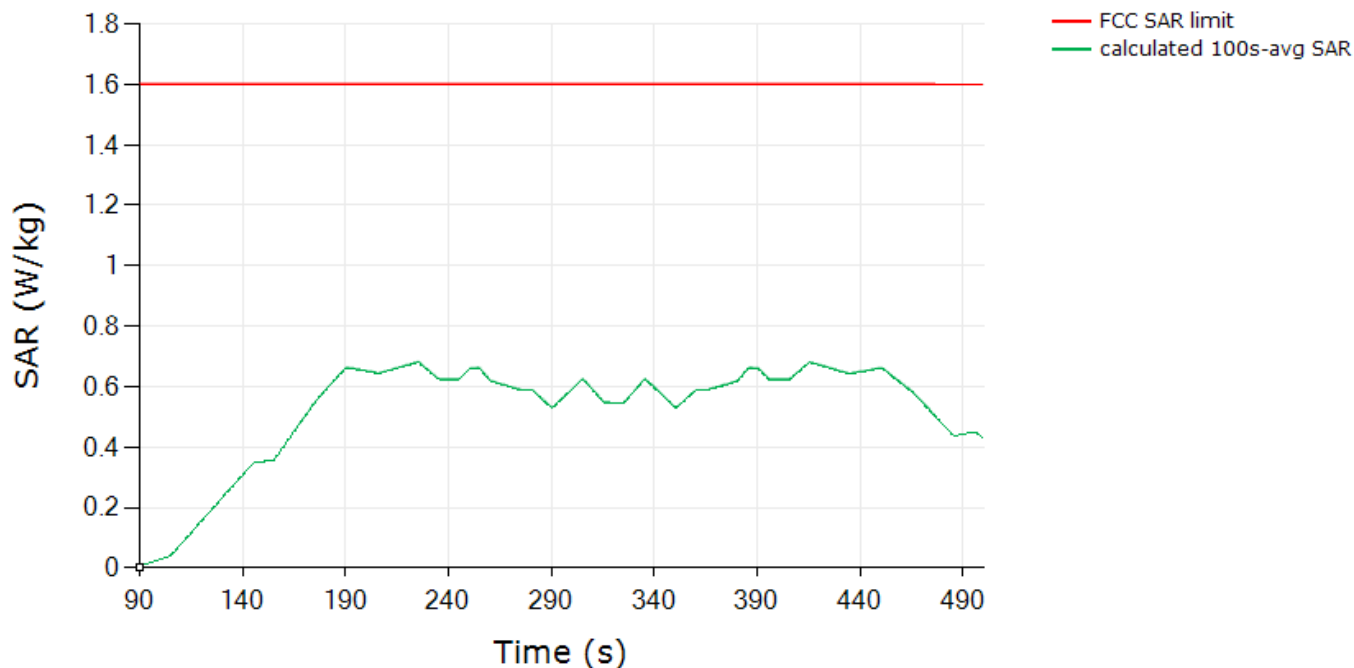
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SAR test results for test sequence 2:

SAR (Test Sequence 2)

Tech: GSM, Band 850



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.679
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



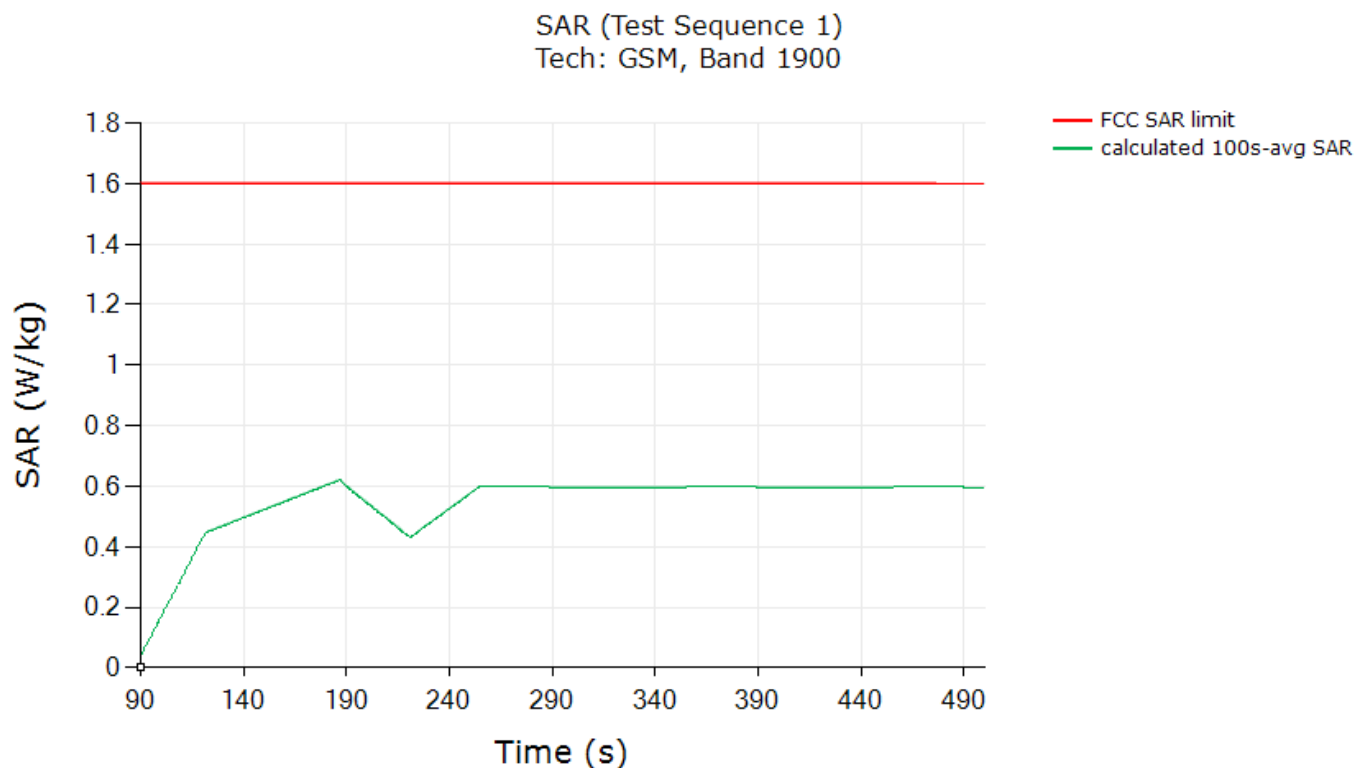
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6.2.2 GSM 1900 Ant3 DSI5

SAR test results for test sequence 1:



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.619
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



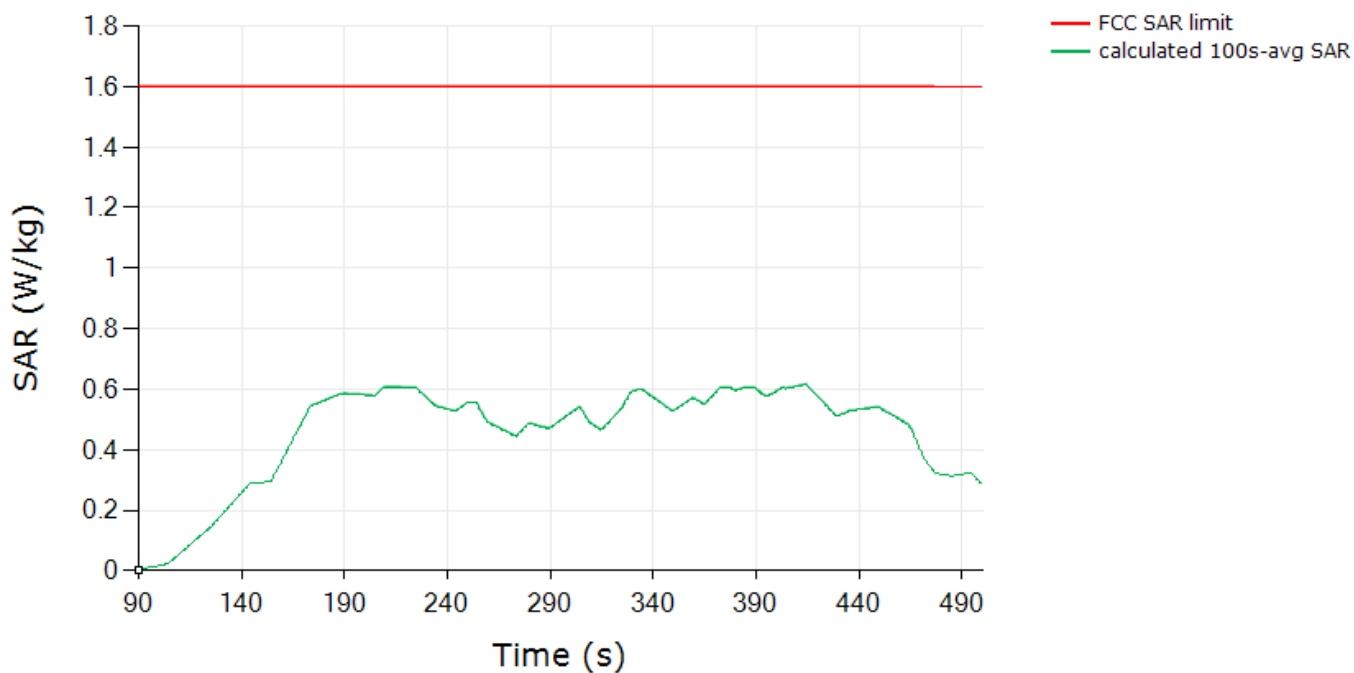
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SAR test results for test sequence 2:

SAR (Test Sequence 2) Tech: GSM, Band 1900



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.615
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



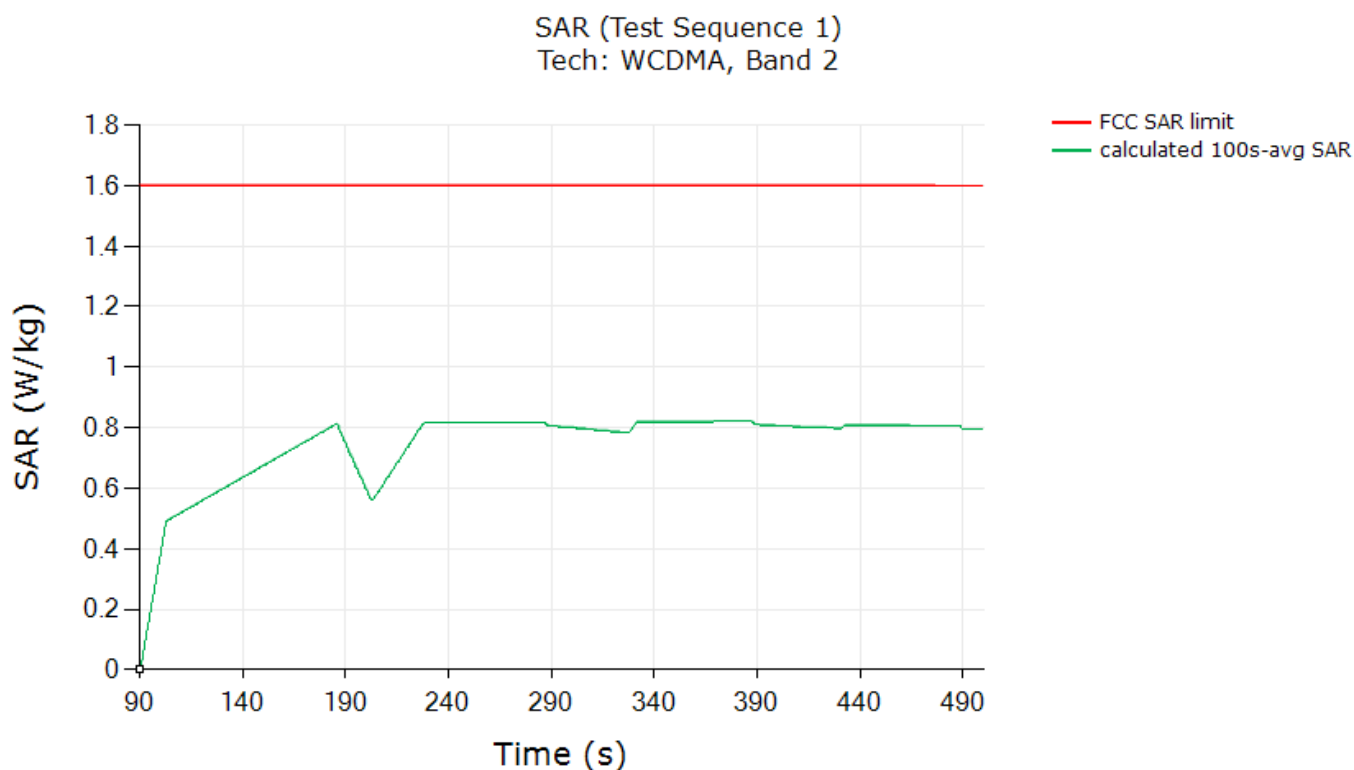
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6.2.3 WCDMA B2 Ant3 DSI5

SAR test results for test sequence 1:



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.819
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



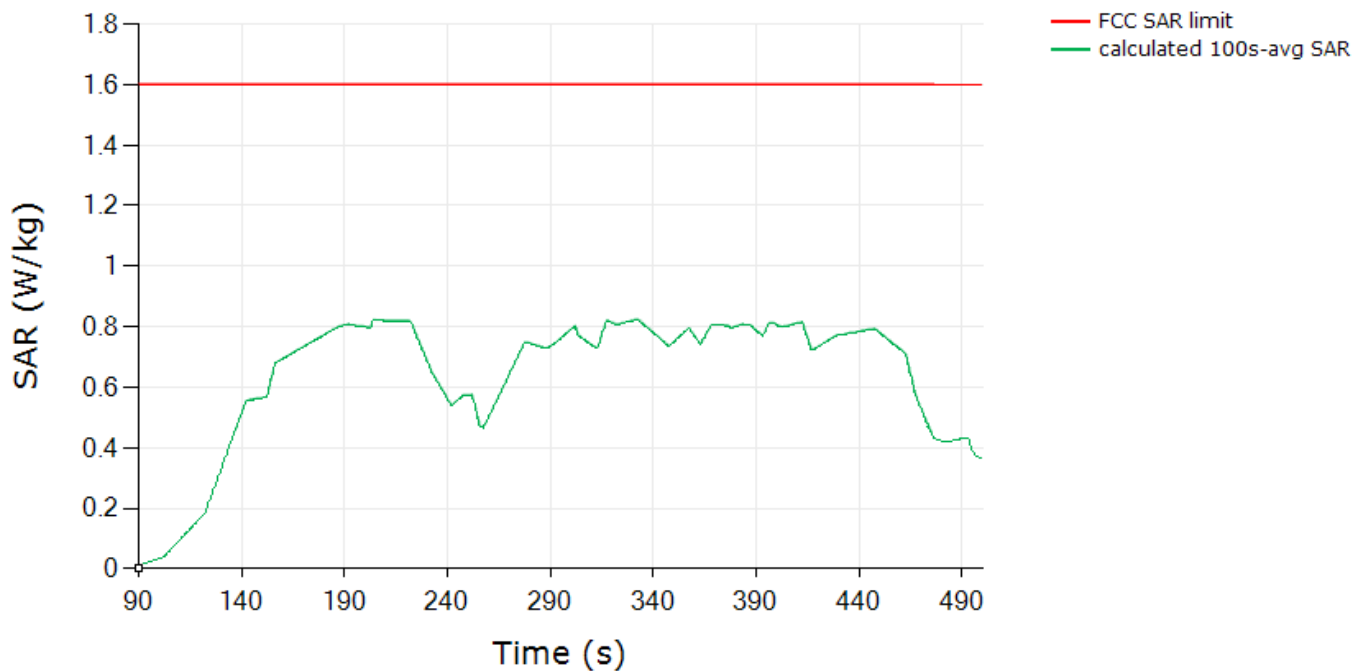
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SAR test results for test sequence 2:

SAR (Test Sequence 2) Tech: WCDMA, Band 2



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.823
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



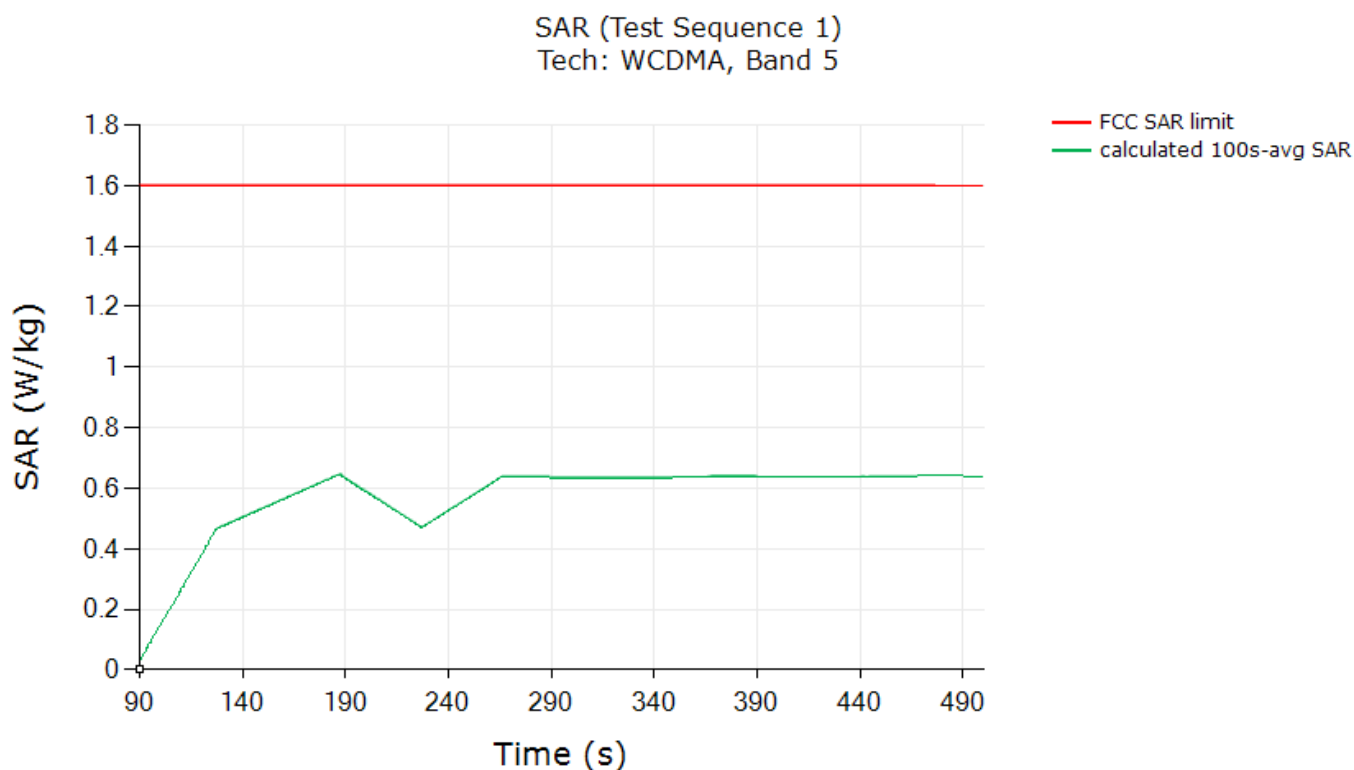
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6.2.4 WCDMA B5 Ant1 DSI5

SAR test results for test sequence 1:



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.645
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



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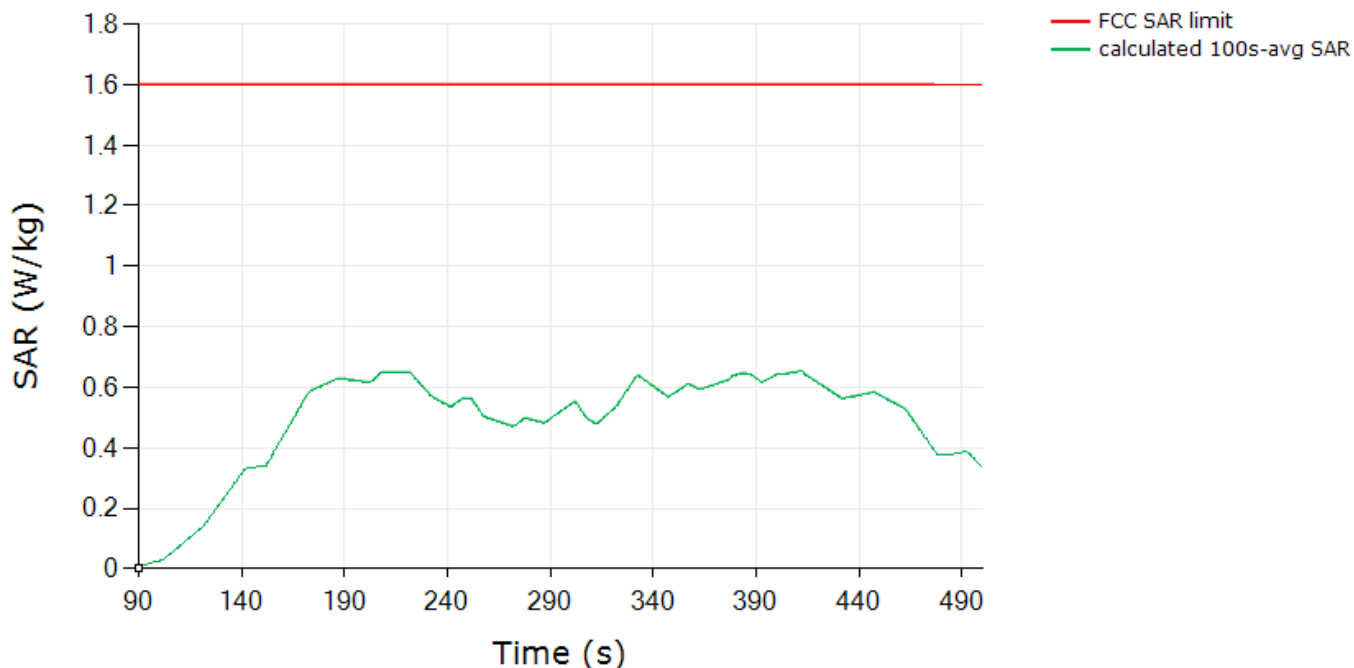
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SAR test results for test sequence 2:

SAR (Test Sequence 2)

Tech: WCDMA, Band 5



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.653
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



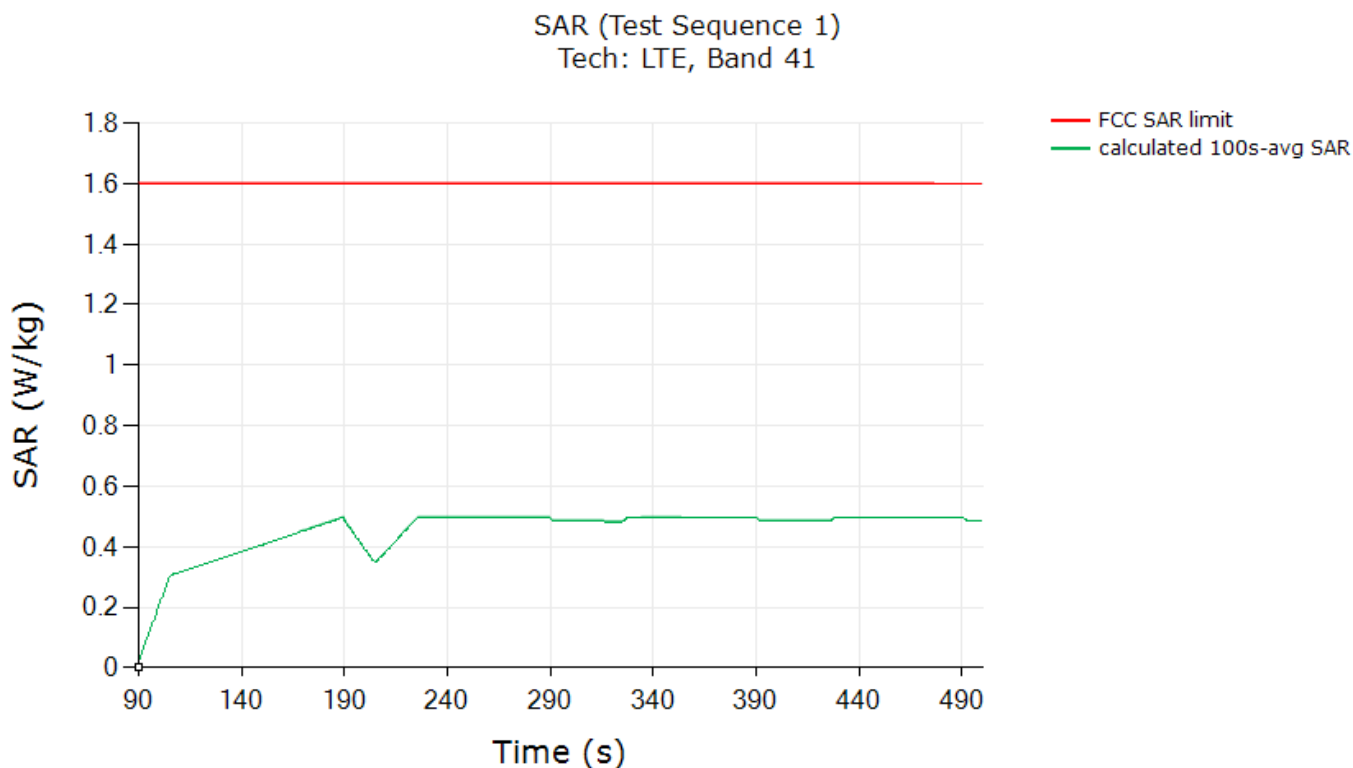
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6.2.5 LTE Band 41 Ant3 DSI5

SAR test results for test sequence 1:



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.496
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



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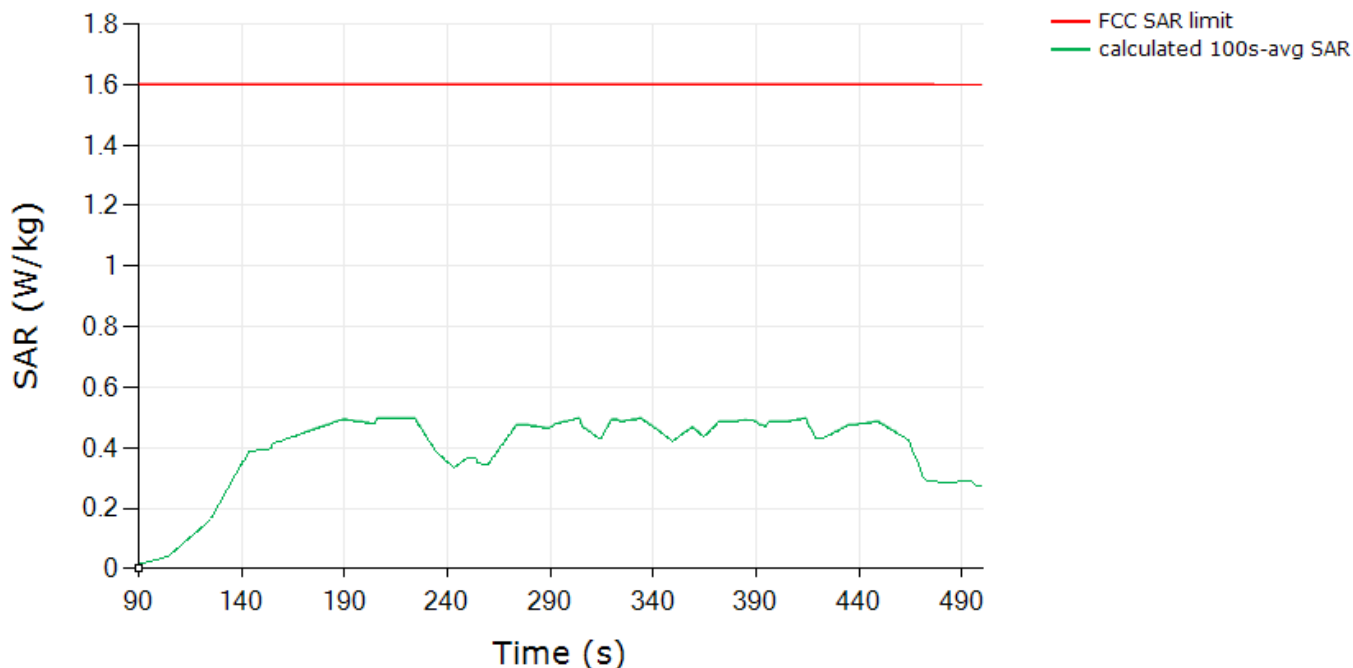
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SAR test results for test sequence 2:

SAR (Test Sequence 2)

Tech: LTE, Band 41



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.497
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



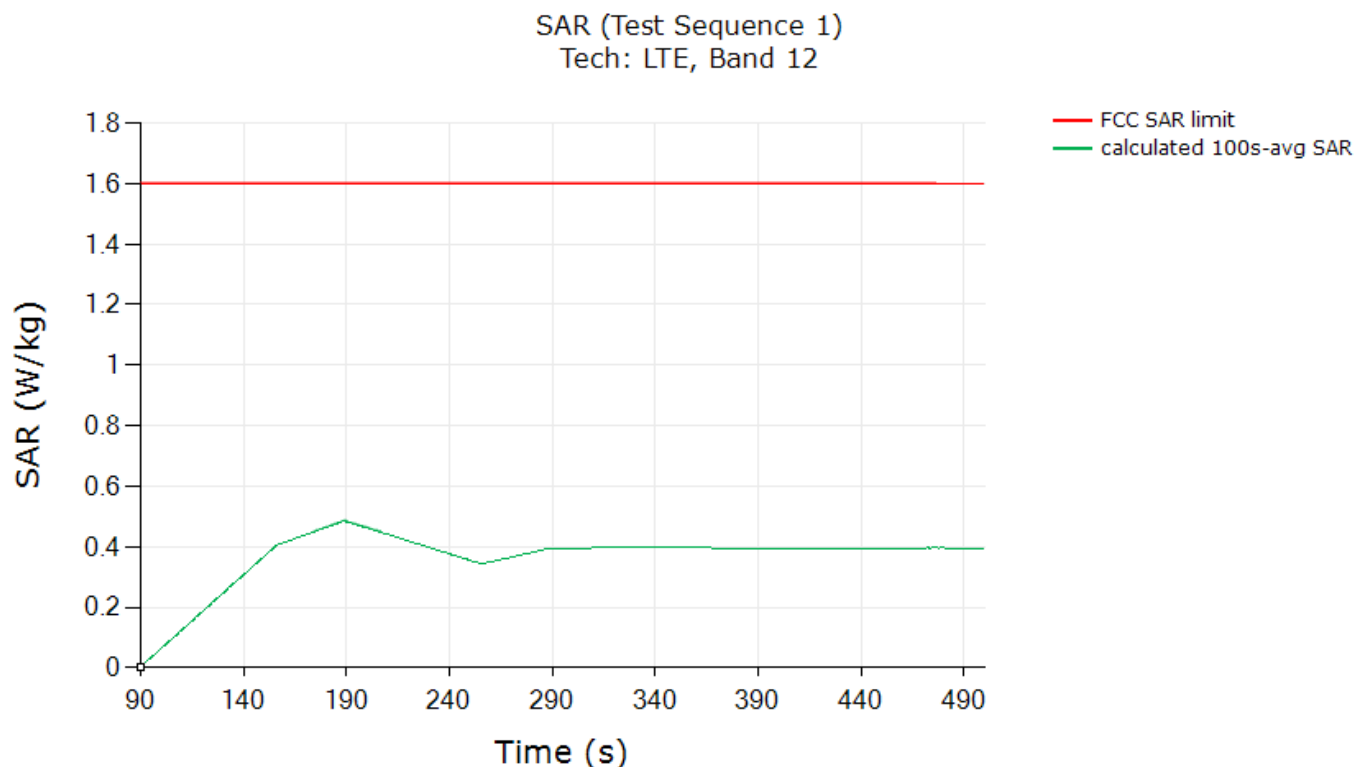
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6.2.6 LTE Band 12 Ant1 DSI8

SAR test results for test sequence 1:



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.484
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



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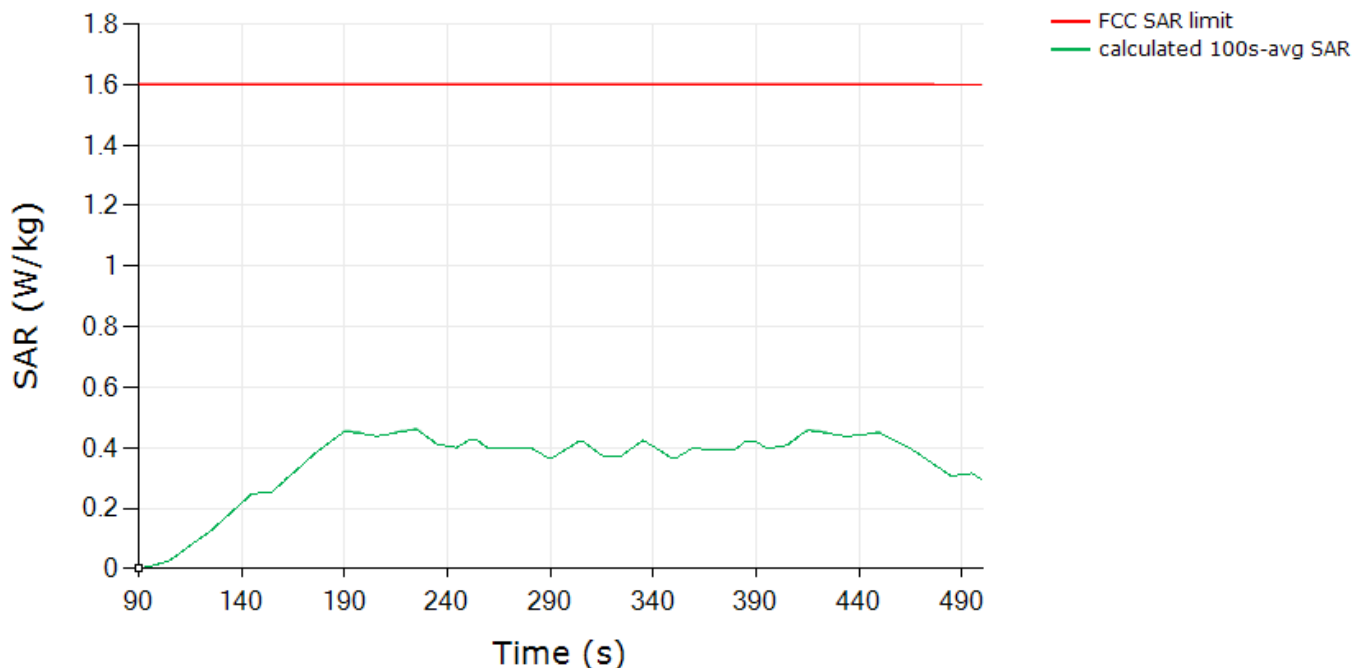
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SAR test results for test sequence 2:

SAR (Test Sequence 2)

Tech: LTE, Band 12



	(W/kg)
FCC 1gSAR limit	1.6
Max 100s-time averaged 1gSAR (green curve)	0.46
Validated: Max time averaged SAR (green curve) does not exceed measured SAR at Plimit + device uncertainty	



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7 Conclusions

Qualcomm Smart Transmit feature employed has been validated through the conducted/radiated power measurement, as well as SAR measurement.

As demonstrated in this report, the power limiting enforcement is effective and the total normalized time-averaged RF exposure does not exceed 1.0 for all the transmission scenarios described in Section 2. Therefore, the EUT complies with FCC RF exposure requirement.



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8 Test Equipment List

Test Platform		SPEAG DASY Professional				
Description		SAR Test System				
Software Reference		cDASY8 V16.4.0.5005				
Hardware Reference						
Equipment		Manufacturer	Model	Inventory No.	Calibration Date	Due date of calibration
☒	Universal Radio Communication Tester	R&S	CMW500	SZ-WRG-M-033	2025/1/7	2026/1/6
☒	Power Sensor	R&S	NRP8S	SZ-WSR-M-024	2024/12/18	2025/12/17
☒	Power Sensor	R&S	NRP8S	SZ-WSR-M-025	2024/12/18	2025/12/17
☒	RF Coupler	Narda	4216-10	SZ-WSR-A-008	NCR	NCR
☒	RF Coupler	Narda	4216-10	SZ-WSR-A-009	NCR	NCR
☒	Temperature and humidity meter	MingGao	T809	SZ-WSR-M-015	2024/05/30	2025/05/29

Note: All the equipment are within the valid period when the tests are performed. NCR=Not Calibration Require.



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Appendix A. Test Sequences

1. Test sequence is generated based on below parameters of the EUT:
 - a. Measured maximum power (P_{max})
 - b. Measured Tx_power_at_SAR_design_target (P_{limit})
 - c. Reserve_power_margin (dB)
 - $P_{reserve} \text{ (dBm)} = \text{measured } P_{limit} \text{ (dBm)} - \text{Reserve_power_margin (dB)}$
 - d. SAR_time_window (100s for FCC)
2. Test Sequence 1 Waveform:

Based on the parameters above, the Test Sequence 1 is generated with one transition between high and low Tx powers. Here, high power = P_{max} ; low power = $P_{max}/2$, and the transition occurs after 80 seconds at high power P_{max} . As long as the power enforcement is taking into effective during one 100s/60s time window, the validation test with this defined test sequence 1 is valid, otherwise, select other radio configuration (band/DSI within the same technology group) having lower P_{limit} for this test. The Test sequence 1 waveform is shown below:

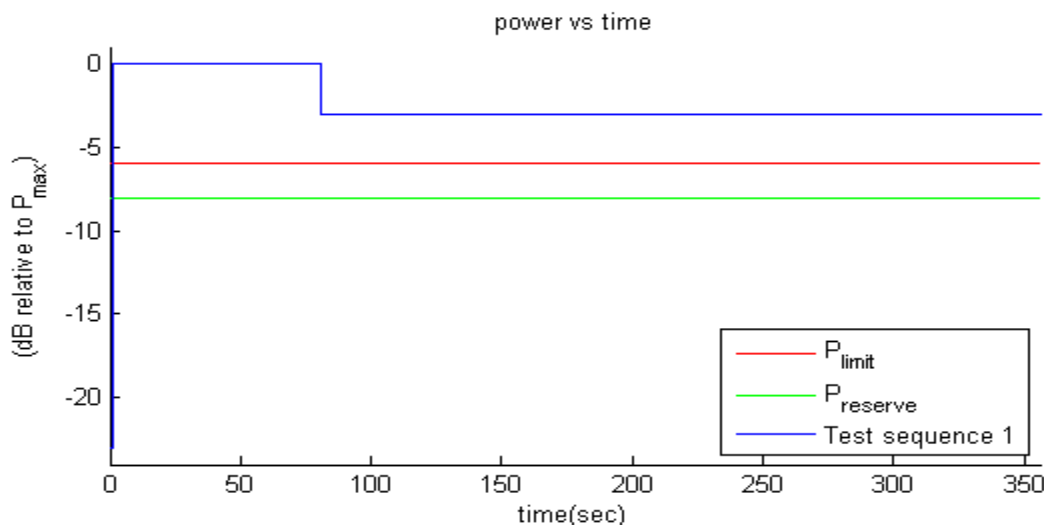


Figure 0-1 Test sequence 1 waveform



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3. Test Sequence 2 Waveform:

Based on the parameters in A-1, the Test Sequence 2 is generated as described in Table 10-1, which contains two 170 second-long sequences (yellow and green highlighted rows) that are mirrored around the center row of 20s, resulting in a total duration of 360 seconds:

Table 0-1 Test Sequence 2

Time duration (seconds)	dB relative to P_{limit} or $P_{reserve}$
15	$P_{reserve} - 2$
20	P_{limit}
20	$(P_{limit} + P_{max})/2$ averaged in mW and rounded to nearest 0.1 dB step
10	$P_{reserve} - 6$
20	P_{max}
15	P_{limit}
15	$P_{reserve} - 5$
20	P_{max}
10	$P_{reserve} - 3$
15	P_{limit}
10	$P_{reserve} - 4$
20	$(P_{limit} + P_{max})/2$ averaged in mW and rounded to nearest 0.1 dB step
10	$P_{reserve} - 4$
15	P_{limit}
10	$P_{reserve} - 3$
20	P_{max}
15	$P_{reserve} - 5$
15	P_{limit}
20	P_{max}
10	$P_{reserve} - 6$
20	$(P_{limit} + P_{max})/2$ averaged in mW and rounded to nearest 0.1 dB step
20	P_{limit}
15	$P_{reserve} - 2$

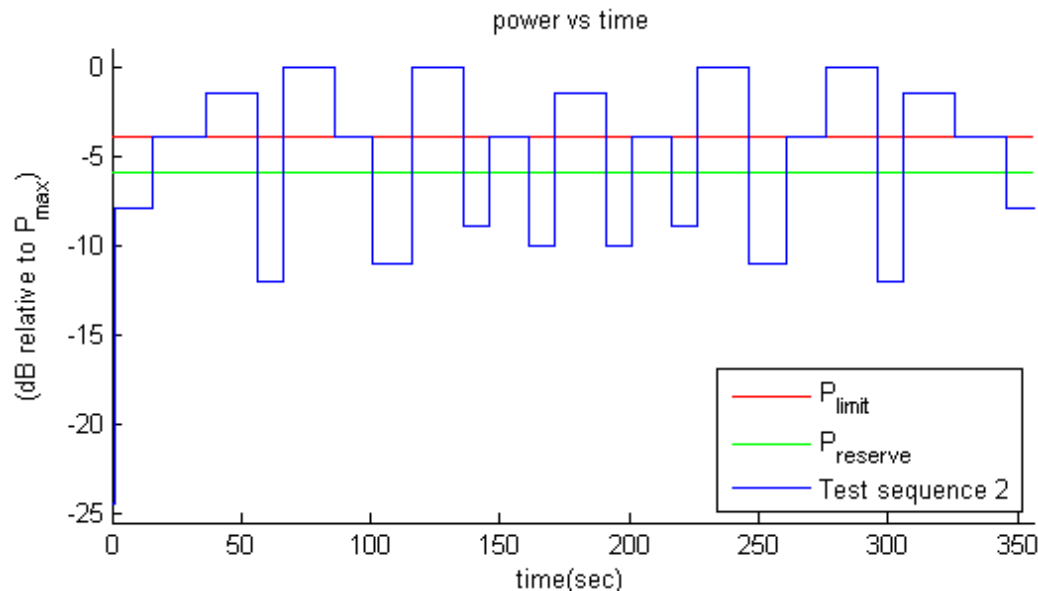


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The Test Sequence 2 waveform is shown as below.



--- End of report ---



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