# TEST REPORT

**KCTL Inc.**
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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**1. Client**

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
- Date of Receipt : 2019-02-18

**2. Use of Report** : -

**3. Name of Product and Model** : Mobile Phone / SM-A260G/DS

**4. Manufacturer and Country of Origin**: Samsung Electronics Co., Ltd. / Korea

**5. FCC ID** : A3LSMA260G

**6. Date of Test** : 2019-02-27 to 2019-03-10

**7. Test Standards** : IEEE 1528-2013, ANSI/IEEE C95.1, KDB Publication

**8. Test Results** : Refer to the test result in the test report

| | | |
|---|---|---|
| Affirmation | Tested by<br>Name : Dongkyu Kim (Signature) | Technical Manager<br>Name : Gyuhyun Shim (Signature) |

2019-03-13

## KCTL Inc.

**Report revision history**

| Date | Revision | Page No |
|---|---|---|
| 2019-03-11 | Initial report | - |
| 2019-03-13 | Updated serial number, WLAN Frequency range, Test Equipment Information, WLAN Conducted Power table, TDD-LTE setup for measurements and include information of the Duty cycle, WLAN and Bluetooth Duty cycle, WLAN, Bluetooth Description | 5, 9, 23, 24, 30 ~ 33, 35, 36, 41, 47 |
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Please note: Report KR19-SPF0006-A issued on 2019-03-13 supercedes previously issued report KR19-SPF0006 issued on 2019-03-11.



This test report is a general report that does not use the KOLAS accreditation mark and is not related to KOLAS accreditation.

# CONTENTS

# 1. General information

| | | |
|---|---|---|
| Client | : | Samsung Electronics Co., Ltd. |
| Address | : | 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea |
| Manufacturer | : | Samsung Electronics Co., Ltd. |
| Address | : | 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea |
| Contact Person | | Ayeong Kim / ayeong.kim@samsung.com |
| Laboratory | : | KCTL Inc. |
| Address | : | 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea |
| Accreditations | : | FCC Site Designation No: KR0040, FCC Site Registration No: 687132<br>VCCI Registration No. : R-3327, G-198, C-3706, T-1849<br>Industry Canada Registration No. : 8035A<br>KOLAS No.: KT231 |

# 2. Device information

## 2.1 Basic description

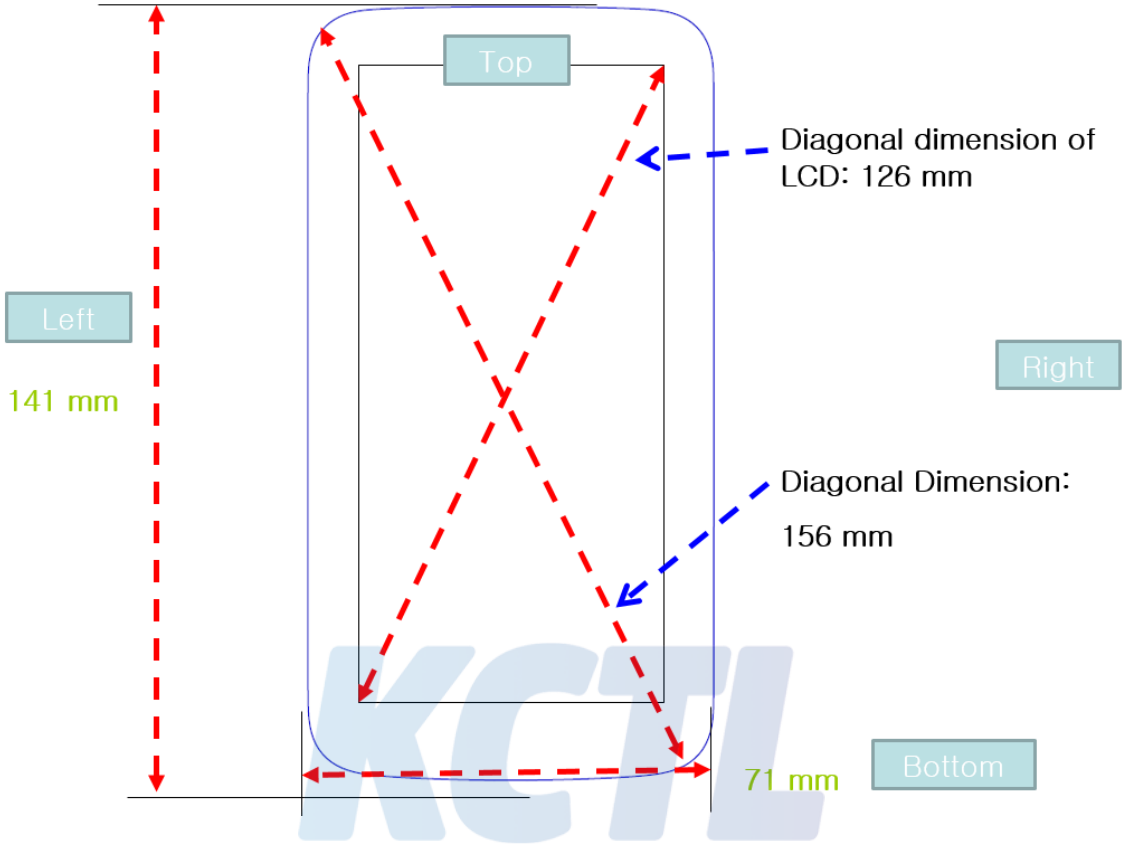
| | | |
|---|---|---|
| EUT Type | | Mobile Phone |
| Brand Name | | Samsung Electronics Co., Ltd. |
| Mode of Operation | | WCDMA Band5, LTE Band5/41,<br>WLAN 2.4 GHz, Bluetooth |
| Model Number | | SM-A260G/DS |
| Serial Number | Radiation | R38M10QHPSP |
| | WLAN Conduction | R38M10QHPXF |
| | WWAN Conduction | R38M10QHPYV |
| Tx Freq. Range | | WCDMA Band5: 824 MHz ~ 849 MHz<br>LTE Band5: 824 MHz ~ 849 MHz<br>LTE Band41: 2 496 MHz ~ 2 690 MHz<br>WLAN 2.4 GHz: 2 412 MHz ~ 2 472 MHz<br>Bluetooth: 2 402 MHz ~ 2 480 MHz |
| H/W Version | | REV1.0 |
| S/W Version | | A260G.001 |

## 2.2 RF power setting in TEST SW

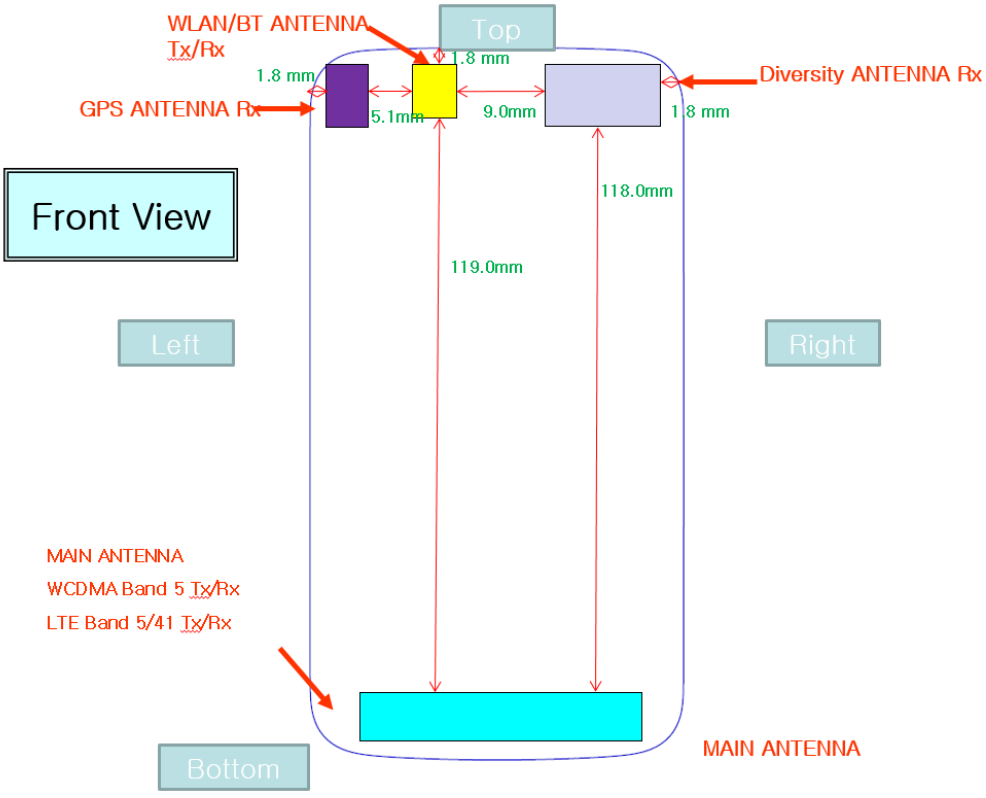
WLAN 2.4 GHz (2 412 MHz ~ 2 462 MHz)

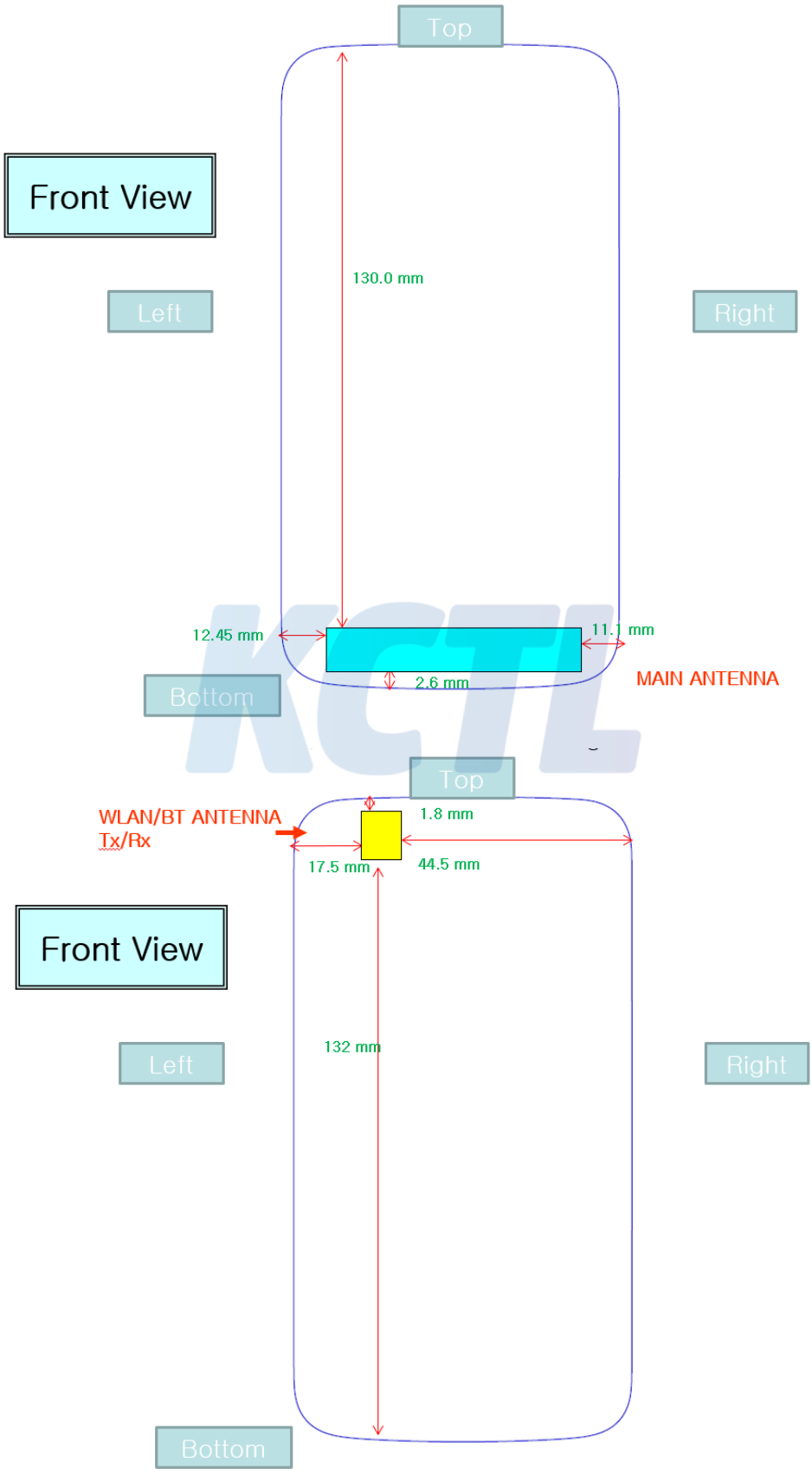
| Mode | Lowest Channel | Middle Channel | Highest Channel |
|---|---|---|---|
| 802.11b | 18.00 | 18.00 | 18.00 |

## 2.3 Antenna Diagram




* Distance between BT/WLAN antenna and Main antenna




Top
Front View
130.0 mm
Left
Right
12.45 mm
11.1 mm
2.6 mm
MAIN ANTENNA
Bottom
Top
WLAN/BT ANTENNA
Tx/Rx
1.8 mm
17.5 mm
44.5 mm
Front View
132 mm
Left
Right
Bottom

# 3. Summary of tests

## 3.1 SAR Test Results

| Band | Head SAR (W/kg) | | Body SAR (W/kg) | | Hotspot SAR (W/kg) | |
|---|---|---|---|---|---|---|
| | 1 g | 10 g | 1 g | 10 g | 1 g | 10 g |
| WCDMA Band 5 | 0.271 | 0.208 | **0.339** | 0.259 | **0.424** | 0.326 |
| LTE Band 5 | 0.250 | 0.189 | 0.283 | 0.217 | 0.380 | 0.292 |
| LTE Band 41 | 0.179 | 0.101 | 0.077 | 0.037 | 0.134 | 0.060 |
| WLAN 2.4 GHz | **1.003** | 0.436 | 0.115 | 0.062 | 0.256 | 0.128 |
| Bluetooth | 0.188 | 0.088 | 0.021 | 0.011 | 0.049 | 0.024 |

<Note>
* SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v06.
* When battery operating of this device is worst case mode.
* 1 g SAR Limit 1.6 W/kg
* Bluetooth SAR were evaluated for BT tethering applications.
* Bluetooth and WLAN share the same antenna path.
* Bluetooth can't transmit with WLAN simultaneously.

## 3.2 Simultaneous Transmission

| RF Exposure conditions | Band | Σ 1 g SAR (W/kg) | 1 g SAR Limit (W/kg) |
|---|---|---|---|
| Head | WCDMA B5 + WLAN 2.4 GHz | **1.274** | 1.6 |
| Body | WCDMA B5 + WLAN 2.4 GHz | 0.454 | |
| Hotspot | WCDMA B5 + WLAN 2.4 GHz | 0.680 | |

## 4. Report Overview

This report details the results of testing carried out on the samples listed in section 2, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this test report is used in any configuration other than that detailed in the test report, the manufacturer must ensure the new configuration complies with all relevant standards and certification requirements. Any mention of KCTL Inc. Wireless lab or testing done by KCTL Inc. Wireless lab made in connection with the distribution or use of the tested product must be approved in writing by KCTL Inc. Wireless lab.

## 5. Test Lab Declaration or Comments

None

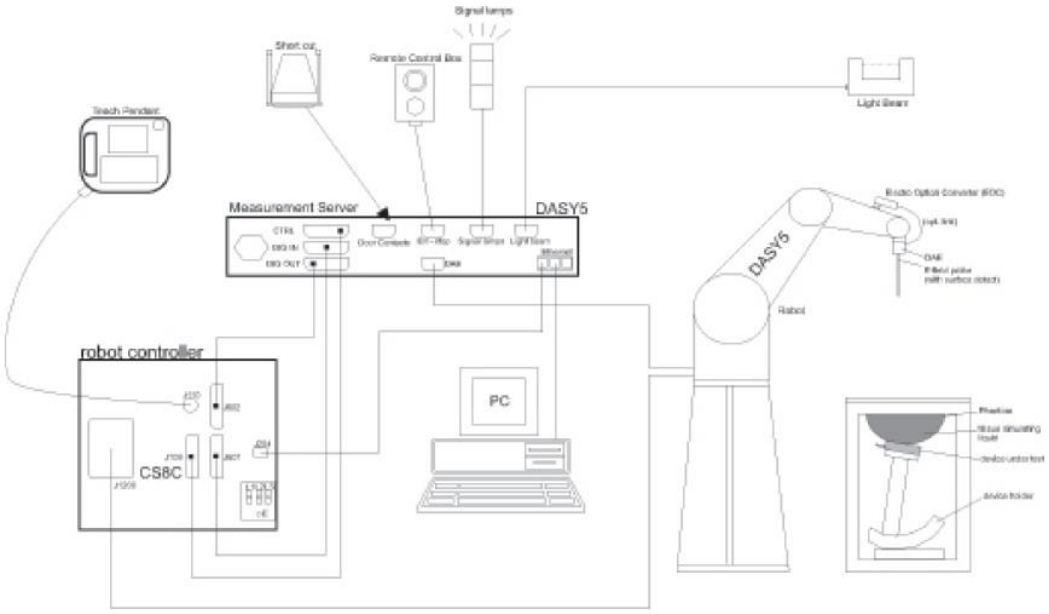
## 6. Applicant Declaration or Comments

None

## 7. Measurement Uncertainty

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR with in a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.

# 8. The SAR Measurement System

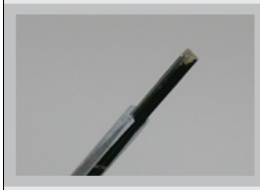



**<SAR System Configuration>**

- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- Data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

## 8.1 Isotropic E-field Probe

| **ES3DV3**<br>**Isotropic E-Field Probe for Dosimetric Measurements** | |
|---|---|
|  | Symmetrical design with triangular core<br>Interleaved sensors<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |
| **Calibration** | ISO/IEC 17025 calibration service available. |
| **Frequency** | 10 MHz to 4 GHz;<br>Linearity: ± 0.2 dB (30 MHz to 4 GHz) |
| **Directivity** | ± 0.2 dB in TSL (rotation around probe axis)<br>± 0.3 dB in TSL (rotation normal to probe axis) |
| **Dynamic Range** | 5 µW/g to > 100 mW/g;<br>Linearity: ± 0.2 dB |
| **Dimensions** | Overall length: 337 mm (Tip: 20 mm)<br>Tip diameter: 3.9 mm (Body: 12 mm)<br>Distance from probe tip to dipole centers: 2.0 mm |
| **Application** | General dosimetry up to 4 GHz<br>Dosimetry in strong gradient fields<br>Compliance tests of mobile phones |
| **Compatibility** | DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI |

| **EX3DV4**<br>**Smallest Isotropic E-Field Probe for Dosimetric Measurements**<br>**(Preliminary Specifications)** | |
|---|---|
|  | Symmetrical design with triangular core<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |
| **Calibration** | ISO/IEC 17025 calibration service available. |
| **Frequency** | 10 MHz to > 6 GHz<br>Linearity: ± 0.2 dB (30 MHz to 6 GHz) |
| **Directivity** | ± 0.3 dB in TSL (rotation around probe axis)<br>± 0.5 dB in TSL (rotation normal to probe axis) |
| **Dynamic Range** | 10 µW/g to > 100 mW/g<br>Linearity: ± 0.2 dB (noise: typically < 1 µW/g) |
| **Dimensions** | Overall length: 337 mm (Tip: 20 mm)<br>Tip diameter: 2.5 mm (Body: 12 mm)<br>Typical distance from probe tip to dipole centers: 1 mm |
| **Application** | High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%. |
| **Compatibility** | DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI |

## 8.2 Phantom

| Twin SAM | |
|---|---|
|  | The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.<br>Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure. |
| **Material** | Vinylester, glass fiber reinforced (VE-GF) |
| **Liquid Compatibility** | Compatible with all SPEAG tissue simulating liquids (incl. DGBE type) |
| **Shell Thickness** | 2 ± 0.2 mm (6 ± 0.2 mm at ear point) |
| **Dimensions**<br>**(incl. Wooden Support)** | Length: 1000 mm<br>Width: 500 mm<br>Height: adjustable feet |
| **Filling Volume** | approx. 25 liters |
| **Wooden Support** | SPEAG standard phantom table |
| **Accessories** | Mounting Device and Adaptors |

| ELI | |
|---|---|
|  | Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.<br>ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure. ELI V6.0, released in August 2014, has the same shell geometry as ELI4 but offers increased longterm stability. |
| **Material** | Vinylester, glass fiber reinforced (VE-GF) |
| **Liquid Compatibility** | Compatible with all SPEAG tissue simulating liquids (incl. DGBE type) |
| **Shell Thickness** | 2.0 ± 0.2 mm (bottom plate) |
| **Dimensions** | Major axis: 600 mm<br>Minor axis: 400 mm |
| **Filling Volume** | approx. 30 liters |
| **Wooden Support** | SPEAG standard phantom table |
| **Accessories** | Mounting Device and Adaptors |

## 8.3 Device Holder for Transmitters

### Mounting Devices and Adaptors

Mounting Device for Hand-Held Transmitters

**MD4HHTV5 - Mounting Device for Hand-Held Transmitters**

In combination with the Twin SAM V5.0/V5.0c or ELI Phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).

**Material:** Polyoxymethylene (POM)

Mounting Device for Laptops

**MD4LAPV5 - Mounting Device for Laptops and other Body-Worn Transmitters**

In combination with the Twin SAM V5.0/V5.0c or ELI Phantoms, the Mounting Device (Body-Worn) enables testing of ransmitter devices according to IEC 62209-2 specifications. The device holder can be locked for positioning at flat phantom section.

**Material:** Polyoxymethylene (POM), PET-G, Foam

# 9. System Verification

## 9.1 Tissue Verification

The dielectric properties for this Tissue Simulant Liquids were measured by using the SPEAG Model DAK3.5 Dielectric Probe in conjunction with Agilent E5071B Network Analyzer (300 kHz – 8 500 MHz). The Conductivity (σ) and Permittivity (ρ) are listed in Table 1.For the SAR measurement given in this report. The temperature variation of the Tissue Simulant Liquids was (22 ± 2) °C.

### 9.1.1 Head Tissue Verification

| Freq. (MHz) | Tissue Type | Limit/Measured | Permittivity (ρ) | Conductivity (σ) | Temp (℃) |
|---|---|---|---|---|---|
| 900 | HSL | Recommended Limit | 41.50 ± 5 % (39.43 ~ 43.58) | 0.97 ± 5 % (0.92 ~ 1.02) | 22 ± 2 |
| | | Measured, 2019-03-10 | 41.70 | 0.96 | 21.37 |
| 2 600 | HSL | Recommended Limit | 39.00 ± 5 % (37.05 ~ 40.95) | 1.96 ± 5 % (1.86 ~ 2.06) | 22 ± 2 |
| | | Measured, 2019-02-27 | 37.54 | 2.01 | 21.02 |
| 2 450 | HSL | Recommended Limit | 39.20 ± 5 % (37.24 ~ 41.16) | 1.80 ± 5 % (1.71 ~ 1.89) | 22 ± 2 |
| | | Measured, 2019-03-05 | 39.43 | 1.78 | 21.49 |

**<Table 1.Measurement result of Head tissue electric parameters>**

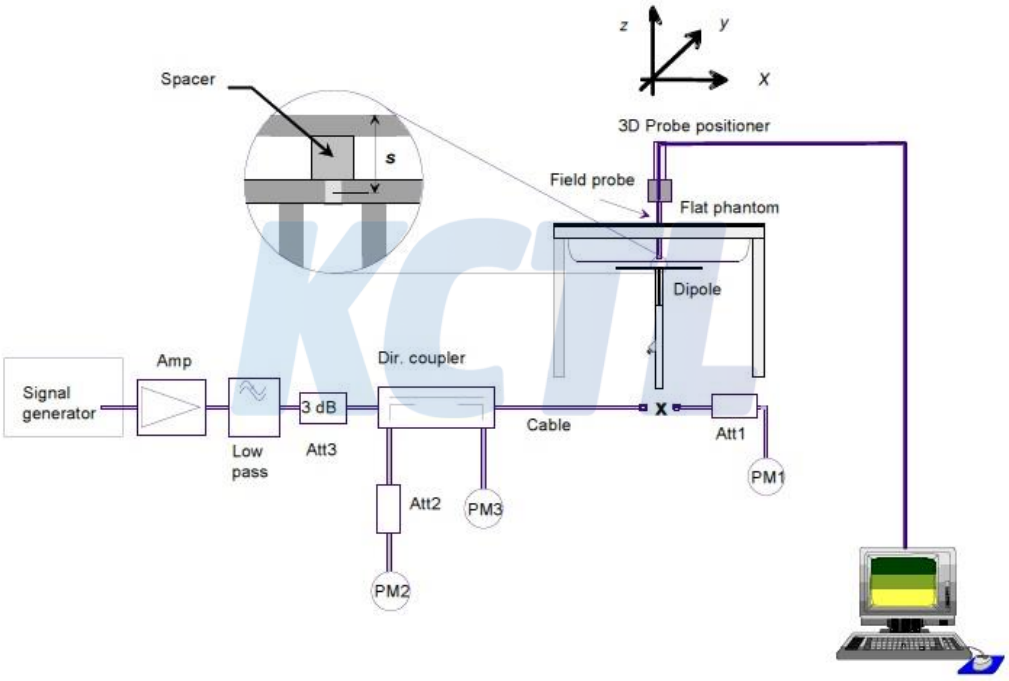
### 9.1.2 Body Tissue Verification

| Freq. (MHz) | Tissue Type | Limit/Measured | Permittivity (ρ) | Conductivity (σ) | Temp (℃) |
|---|---|---|---|---|---|
| 900 | MSL | Recommended Limit | 55.00 ± 5 % (52.25 ~ 57.75) | 1.05 ± 5 % (1.00 ~ 1.10) | 22 ± 2 |
| | | Measured, 2019-03-10 | 54.72 | 1.04 | 21.37 |
| 2 600 | MSL | Recommended Limit | 52.51 ± 5 % (49.88 ~ 55.14) | 2.16 ± 5 % (2.05 ~ 2.27) | 22 ± 2 |
| | | Measured, 2019-02-27 | 52.63 | 2.20 | 20.78 |
| 2 450 | MSL | Recommended Limit | 52.70 ± 5 % (50.07 ~ 55.34) | 1.95 ± 5 % (1.85 ~ 2.05) | 22 ± 2 |
| | | Measured, 2019-03-06 | 52.70 | 1.97 | 21.49 |

**<Table 2.Measurement result of Body tissue electric parameters>**

## 9.2 Test System Verification

The microwave circuit arrangement for system verification is sketched below picture. The daily system accuracy verification occurs within the flat section of the SAM phant om. A SAR measurement was performed to see if the measured SAR was within ± 1 0% from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the Table 2. During the tests, the ambient temperature of the laboratory was in the range (22 ± 2) ℃, the relative humidity was in the range(50 ± 20)% and the liquid depth Above the ear/grid reference points was above 15 cm in a ll the cases. It is seen that the system is operating within its specification, as the res ults are within acceptable tolerance of the reference values.



### 9.2.1 Test System Verification(Head 1 g)

| Validation Kit | Dipole Ant. S/N | Frequency (MHz) | Tissue Type | Limit/Measurement (Normalized to 1 W) | |
|---|---|---|---|---|---|
| | | | | | 1 g |
| D900V2 | 1d138 | 900 | HSL | Recommended Limit (Normalized) | 10.80 ± 10 % (9.72 ~ 11.88) |
| | | | | Measured, 2019-03-10 | 11.12 |
| D2600V2 | 1050 | 2 600 | HSL | Recommended Limit (Normalized) | 56.20 ± 10 % (50.58 ~ 61.82) |
| | | | | Measured, 2019-02-27 | 56.80 |
| D2450V2 | 895 | 2 450 | HSL | Recommended Limit (Normalized) | 51.30 ± 10 % (46.17 ~ 56.43) |
| | | | | Measured, 2019-03-05 | 49.60 |

**<Table 3. Head 1g Test System Verification Result>**

### 9.2.1 Test System Verification(Head 10 g)

| Validation Kit | Dipole Ant. S/N | Frequency (MHz) | Tissue Type | Limit/Measurement (Normalized to 1 W) | |
|---|---|---|---|---|---|
| | | | | | 10 g |
| D900V2 | 1d138 | 900 | HSL | Recommended Limit (Normalized) | 6.86 ± 10 % (6.17 ~ 7.55) |
| | | | | Measured, 2019-03-10 | 7.20 |
| D2600V2 | 1050 | 2 600 | HSL | Recommended Limit (Normalized) | 25.30 ± 10 % (22.77 ~ 27.83) |
| | | | | Measured, 2019-02-27 | 24.64 |
| D2450V2 | 895 | 2 450 | HSL | Recommended Limit (Normalized) | 24.10 ± 10 % (21.69 ~ 26.51) |
| | | | | Measured, 2019-03-05 | 22.48 |

**<Table 4. Head 10g Test System Verification Result>**

### 9.2.3 Test System Verification(Body 1 g)

| Validation Kit | Dipole Ant. S/N | Frequency (MHz) | Tissue Type | Limit/Measurement (Normalized to 1 W) | |
|---|---|---|---|---|---|
| | | | | | 1 g |
| D900V2 | 1d138 | 900 | MSL | Recommended Limit (Normalized) | 11.20 ± 10 % (10.08 ~ 12.32) |
| | | | | Measured, 2019-03-10 | 11.12 |
| D2600V2 | 1050 | 2 600 | MSL | Recommended Limit (Normalized) | 54.90 ± 10 % (49.41 ~ 60.39) |
| | | | | Measured, 2019-02-27 | 52.80 |
| D2450V2 | 895 | 2 450 | MSL | Recommended Limit (Normalized) | 50.60 ± 10 % (45.54 ~ 55.66) |
| | | | | Measured, 2019-03-06 | 50.80 |

**<Table 5. Body 1g Test System Verification Result>**

### 9.2.3 Test System Verification(Body 10 g)

| Validation Kit | Dipole Ant. S/N | Frequency (MHz) | Tissue Type | Limit/Measurement (Normalized to 1 W) | |
|---|---|---|---|---|---|
| | | | | | 10 g |
| D900V2 | 1d138 | 900 | MSL | Recommended Limit (Normalized) | 7.23 ± 10 % (6.51 ~ 7.95) |
| | | | | Measured, 2019-03-10 | 7.20 |
| D2450V2 | 895 | 2 450 | MSL | Recommended Limit (Normalized) | 23.80 ± 10 % (21.42 ~ 26.18) |
| | | | | Measured, 2019-02-27 | 23.36 |
| D2600V2 | 1050 | 2 600 | MSL | Recommended Limit (Normalized) | 24.70 ± 10 % (22.23 ~ 27.17) |
| | | | | Measured, 2019-03-06 | 23.20 |

**<Table 6. Body 10g Test System Verification Result>**

## 10. Operation Configurations

Measurements were performed at the operating band. The EUT was set to maximum power level during all tests and at the beginning of each test the battery was fully charged.

# 11. SAR Measurement Procedures

**Step 1: Power Reference Measurement**

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties.

**Step 2: Area Scan**

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04.

| | ≤ 3 GHz | > 3 GHz |
|---|---|---|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface | 5 ± 1 mm | ½·δ·ln(2) ± 0.5 mm |
| Maximum probe angle from probe axis to phantom surface normal at the measurement location | 30° ± 1° | 20° ± 1° |
| Maximum area scan spatial resolution: $\Delta x_{Area}$, $\Delta y_{Area}$ | ≤ 2 GHz: ≤ 15 mm<br>2 – 3 GHz: ≤ 12 mm | 3 – 4 GHz: ≤ 12 mm<br>4 – 6 GHz: ≤ 10 mm |
| | When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device. | |

**Step 3: Zoom Scan**

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing1 g and 10 g of simulated tissue. The Zoom Scan measures 5x5x7 points within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04.

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

**Step 4: Power drift measurement**

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

**Step 5: Z-Scan**

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one dimensional grid. In order to get a reasonable extrapolation, the extrapolated distance should not be larger than the step size in Z-direction.

* Z Scan Report on Liquid Measure the height Appendix C. Liquid Depth photo to replace

## 12. Test Equipment Information

| Test Platform | SPEAG DASY5 System | | | |
|---|---|---|---|---|
| Version | DASY5 : Version 52.10.1.1476<br>SEMCAD : Version 14.6.11 (7439) | | | |
| Location | KCTL Inc. | | | |
| Manufacture | SPEAG | | | |
| Hardware Reference | | | | |
| Equipment | Model | Serial Number | Date of Calibration | Due date of next Calibration |
| Shield Room | Shield Room | 8F - #1 | N/A | N/A |
| DASY5 Robot | TX90XL Speag | F07/554JA1/A/01 | N/A | N/A |
| DASY5 Controller | TX90XL Speag | F07/554JA1/C/01 | N/A | N/A |
| Phantom | Twin SAM Phantom | 1362 | N/A | N/A |
| Phantom | Twin SAM Phantom | 1363 | N/A | N/A |
| Mounting Device | Mounting Device | None | N/A | N/A |
| DAE | DAE4 | 666 | 2019-01-25 | 2020-01-25 |
| Probe | EX3DV4 | 3865 | 2018-08-29 | 2019-08-29 |
| Signal Generator | E4438C | MY42080486 | 2019-01-04 | 2020-01-04 |
| Dual Power Meter | E4419B | GB43312301 | 2018-05-15 | 2019-05-15 |
| Power Sensor | 8481H | 3318A19377 | 2018-05-15 | 2019-05-15 |
| Power Sensor | 8481H | 3318A19379 | 2018-05-15 | 2019-05-15 |
| Attenuator | 8491B 3dB | 17387 | 2018-05-14 | 2019-05-14 |
| Attenuator | 8491B-6dB | MY39270294 | 2018-05-14 | 2019-05-14 |
| Attenuator | 8491B 10dB | 29425 | 2018-05-14 | 2019-05-14 |
| Power Amplifier | GRF5039 | 1062 | 2018-05-15 | 2019-05-15 |
| Power Amplifier | 5057FE | 1009 | 2018-10-11 | 2019-10-11 |
| Dual Directional Coupler | 778D | 16059 | 2018-05-15 | 2019-05-15 |
| Dual Directional Coupler | 772D | 2839A00719 | 2018-05-15 | 2019-05-15 |
| Low Pass Filter | LA-15N | 36543 | 2018-05-14 | 2019-05-14 |
| Low Pass Filter | LA-30N | 40058 | 2018-05-14 | 2019-05-14 |
| Dipole Validation Kits | D900V2 | 1d138 | 2018-05-30 | 2020-05-30 |
| Dipole Validation Kits | D2450V2 | 895 | 2018-07-24 | 2020-07-24 |
| Dipole Validation Kits | D2600V2 | 1050 | 2018-07-26 | 2020-07-26 |
| Network Analyzer | E5071B | MY42403524 | 2019-01-04 | 2020-01-04 |
| Dielectric Assessment kit | DAK-3.5 | 1078 | 2018-08-22 | 2019-08-22 |
| Humidity/Temp. Data Recorder | MHB-382SD | 23107 | 2018-06-14 | 2019-06-14 |
| WIDEBANDRADIO COMMUNICATION TESTER | CMW500 | 141780 | 2019-01-25 | 2020-01-25 |
| Bluetooth Tester | TC-3000C | 3000C000270 | 2018-08-02 | 2019-08-02 |
| Usb Rf Power Sensor | RPR3006W | 13I00030SNO76 | 2018-08-02 | 2019-08-02 |
| Power Divider | 1580-1 | RM986 | 2019-01-08 | 2020-01-08 |

# 13. RF Average Conducted Output Power

## 13.1 Max. tune up power

WCDMA

| Mode | | Target Power (dBm) | Max. Allowed Power (dBm) |
|---|---|---|---|
| WCDMA B5 | RMC | 23.0 | 24.0 |
| | AMR | 22.5 | 23.5 |
| | HSDPA | 23.0 | 24.0 |
| | HSUPA | 22.0 | 23.0 |
| | DC-HSPDA | 22.0 | 23.0 |

LTE

| Mode | Target Power (dBm) | Max. Allowed Power (dBm) |
|---|---|---|
| LTE B5 | 23.0 | 24.0 |
| LTE B41 | 22.5 | 23.5 |

WLAN 2.4 GHz (2 412 MHz ~ 2 472 MHz)

| Mode | Channel | Target Power (dBm) | Max. Allowed Power (dBm) |
|---|---|---|---|
| 802.11b | 1 ~ 11 | 17.0 | 18.0 |
| | 12 | 7.5 | 8.5 |
| | 13 | 2.0 | 3.0 |
| 802.11g | 1 ~ 11 | 14.0 | 15.0 |
| | 12 | 7.5 | 8.5 |
| | 13 | 2.0 | 3.0 |
| 802.11n(HT-20) | 1 ~ 11 | 14.0 | 15.0 |
| | 12 | 7.5 | 8.5 |
| | 13 | 2.0 | 3.0 |

Bluetooth (2 402 MHz ~ 2 480 MHz)

| Mode | Max. Allowed Power (including tune-up tolerance) |
|---|---|
| BDR(GFSK) | 10.0 dBm |
| EDR (π/4DQPSK) | 6.0 dBm |
| EDR(8DPSK) | 6.0 dBm |
| LE(GFSK) | 9.5 dBm |

## 13.2 Average Conducted Output Power

WCDMA B5

| Mode | Average Conducted Power (dBm) | | |
|---|---|---|---|
| | Frequency (MHz) | | |
| | Low | Middle | High |
| RMC | 23.42 | 23.44 | 23.37 |
| AMR | 22.96 | 22.98 | 22.94 |
| HSDPA-Subtest 1 | 23.25 | 23.25 | 23.18 |
| HSDPA-Subtest 2 | 23.24 | 23.24 | 23.18 |
| HSDPA-Subtest 3 | 23.24 | 23.24 | 23.20 |
| HSDPA-Subtest 4 | 22.39 | 22.42 | 22.37 |
| HSUPA-Subtest 1 | 22.10 | 22.18 | 22.16 |
| HSUPA-Subtest 2 | 22.25 | 22.32 | 22.29 |
| HSUPA-Subtest 3 | 22.28 | 22.31 | 22.27 |
| HSUPA-Subtest 4 | 21.21 | 21.27 | 21.22 |
| HSUPA-Subtest 5 | 22.31 | 22.38 | 22.27 |
| DC-HSDPA-Subtest 1 | 22.91 | 22.85 | 22.88 |
| DC-HSDPA-Subtest 2 | 22.98 | 22.88 | 22.91 |
| DC-HSDPA-Subtest 3 | 22.44 | 22.25 | 22.24 |
| DC-HSDPA-Subtest 4 | 22.18 | 22.08 | 22.10 |

* Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR.
The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA

LTE B5

| Band | Band width | Modulation | RB Size | RB Offset | MPR | Maximum Power | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Channel | | |
| | | | | | | Low | Middle | High |
| LTE B5 | 1.4 MHz | QPSK | 1 | 0 | 0 | 23.19 | 22.80 | 22.75 |
| | | | 1 | 3 | 0 | 23.17 | 22.79 | 22.73 |
| | | | 1 | 5 | 0 | 23.20 | 22.82 | 22.71 |
| | | | 3 | 0 | 0 | 23.12 | 22.87 | 22.74 |
| | | | 3 | 1 | 0 | 23.10 | 22.89 | 22.76 |
| | | | 3 | 3 | 0 | 23.13 | 22.86 | 22.77 |
| | | | 6 | 0 | 1 | 22.01 | 21.76 | 21.70 |
| | | 16QAM | 1 | 0 | 1 | 22.29 | 21.81 | 21.68 |
| | | | 1 | 3 | 1 | 22.27 | 21.80 | 21.67 |
| | | | 1 | 5 | 1 | 22.30 | 21.82 | 21.71 |
| | | | 3 | 0 | 2 | 22.24 | 21.97 | 21.88 |
| | | | 3 | 1 | 2 | 22.23 | 21.94 | 21.87 |
| | | | 3 | 3 | 2 | 22.21 | 21.93 | 21.84 |
| | | | 6 | 0 | 2 | 21.01 | 20.67 | 20.75 |
| | 3 MHz | QPSK | 1 | 0 | 0 | 23.02 | 23.01 | 22.90 |
| | | | 1 | 8 | 0 | 22.98 | 22.96 | 22.85 |
| | | | 1 | 14 | 0 | 23.01 | 22.91 | 22.83 |
| | | | 8 | 0 | 1 | 21.90 | 21.80 | 21.68 |
| | | | 8 | 4 | 1 | 21.88 | 21.74 | 21.67 |
| | | | 8 | 7 | 1 | 21.89 | 21.73 | 21.71 |
| | | | 15 | 0 | 1 | 21.87 | 21.79 | 21.71 |
| | | 16QAM | 1 | 0 | 1 | 22.09 | 21.94 | 21.57 |
| | | | 1 | 8 | 1 | 22.02 | 21.89 | 21.58 |
| | | | 1 | 14 | 1 | 22.03 | 21.84 | 21.48 |
| | | | 8 | 0 | 2 | 20.85 | 20.67 | 20.79 |
| | | | 8 | 4 | 2 | 20.81 | 20.65 | 20.76 |
| | | | 8 | 7 | 2 | 20.82 | 20.66 | 20.75 |
| | | | 15 | 0 | 2 | 20.81 | 20.69 | 20.72 |

| Band | Band width | Modulation | RB Size | RB Offset | MPR | Maximum Power | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Channel | | |
| | | | | | | Low | Middle | High |
| LTE B5 | 5 MHz | QPSK | 1 | 0 | 0 | 23.07 | 22.89 | 22.85 |
| | | | 1 | 12 | 0 | 23.01 | 22.84 | 22.81 |
| | | | 1 | 24 | 0 | 22.99 | 22.85 | 22.79 |
| | | | 12 | 0 | 1 | 21.84 | 21.82 | 21.73 |
| | | | 12 | 7 | 1 | 21.83 | 21.80 | 21.72 |
| | | | 12 | 13 | 1 | 21.81 | 21.81 | 21.71 |
| | | | 25 | 0 | 1 | 21.85 | 21.81 | 21.74 |
| | | 16QAM | 1 | 0 | 1 | 21.79 | 21.59 | 21.54 |
| | | | 1 | 12 | 1 | 21.77 | 21.53 | 21.51 |
| | | | 1 | 24 | 1 | 21.75 | 21.54 | 21.48 |
| | | | 12 | 0 | 2 | 20.94 | 20.85 | 20.69 |
| | | | 12 | 7 | 2 | 20.91 | 20.77 | 20.67 |
| | | | 12 | 13 | 2 | 20.95 | 20.79 | 20.65 |
| | | | 25 | 0 | 2 | 20.81 | 20.76 | 20.74 |
| | 10 MHz | QPSK | 1 | 0 | 0 | 22.81 | 22.87 | 22.74 |
| | | | 1 | 25 | 0 | 22.73 | 22.81 | 22.71 |
| | | | 1 | 49 | 0 | 22.71 | 22.79 | 22.73 |
| | | | 25 | 0 | 1 | 21.83 | 21.81 | 21.73 |
| | | | 25 | 12 | 1 | 21.81 | 21.77 | 21.72 |
| | | | 25 | 25 | 1 | 21.77 | 21.74 | 21.71 |
| | | | 50 | 0 | 1 | 21.78 | 21.76 | 21.73 |
| | | 16QAM | 1 | 0 | 1 | 22.03 | 21.65 | 21.47 |
| | | | 1 | 25 | 1 | 21.98 | 21.61 | 21.39 |
| | | | 1 | 49 | 1 | 21.92 | 21.59 | 21.41 |
| | | | 25 | 0 | 2 | 20.79 | 20.84 | 20.75 |
| | | | 25 | 12 | 2 | 20.78 | 20.82 | 20.74 |
| | | | 25 | 25 | 2 | 20.74 | 20.81 | 20.73 |
| | | | 50 | 0 | 2 | 20.67 | 20.83 | 20.70 |

LTE B41

| Band | Band width | Modulation | RB Size | RB Offset | MPR | Maximum Power | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Channel | | | | |
| | | | | | | Low | Low-Mid | Middle | Mid-High | High |
| LTE B41 | 5 MHz | QPSK | 1 | 0 | 0 | 22.22 | 21.72 | 21.62 | 22.02 | 22.12 |
| | | | 1 | 12 | 0 | 22.22 | 21.72 | 21.52 | 21.92 | 22.02 |
| | | | 1 | 24 | 0 | 22.32 | 21.72 | 21.42 | 21.82 | 21.92 |
| | | | 12 | 0 | 1 | 21.22 | 20.72 | 20.62 | 21.02 | 21.12 |
| | | | 12 | 7 | 1 | 21.22 | 20.72 | 20.62 | 21.02 | 21.12 |
| | | | 12 | 13 | 1 | 21.22 | 20.72 | 20.62 | 20.92 | 21.12 |
| | | | 25 | 0 | 1 | 21.22 | 20.72 | 20.62 | 21.02 | 21.12 |
| | | 16QAM | 1 | 0 | 1 | 20.62 | 20.62 | 20.42 | 20.72 | 21.02 |
| | | | 1 | 12 | 1 | 20.72 | 20.52 | 20.32 | 20.62 | 20.92 |
| | | | 1 | 24 | 1 | 20.82 | 20.52 | 20.32 | 20.52 | 20.92 |
| | | | 12 | 0 | 2 | 20.02 | 19.72 | 19.62 | 20.02 | 20.12 |
| | | | 12 | 7 | 2 | 20.12 | 19.72 | 19.62 | 19.92 | 20.12 |
| | | | 12 | 13 | 2 | 20.12 | 19.72 | 19.62 | 19.82 | 20.02 |
| | | | 25 | 0 | 2 | 20.22 | 19.82 | 19.72 | 20.12 | 20.12 |
| | 10 MHz | QPSK | 1 | 0 | 0 | 22.02 | 21.72 | 21.72 | 22.22 | 22.12 |
| | | | 1 | 25 | 0 | 22.22 | 21.72 | 21.62 | 22.02 | 22.02 |
| | | | 1 | 49 | 0 | 22.42 | 21.72 | 21.52 | 21.82 | 21.92 |
| | | | 25 | 0 | 1 | 21.12 | 20.72 | 20.72 | 21.22 | 21.22 |
| | | | 25 | 12 | 1 | 21.12 | 20.72 | 20.62 | 21.12 | 21.22 |
| | | | 25 | 25 | 1 | 21.22 | 20.72 | 20.62 | 21.02 | 21.12 |
| | | | 50 | 0 | 1 | 21.22 | 20.72 | 20.62 | 21.12 | 21.22 |
| | | 16QAM | 1 | 0 | 1 | 20.92 | 20.52 | 20.42 | 20.82 | 20.92 |
| | | | 1 | 25 | 1 | 21.02 | 20.52 | 20.32 | 20.52 | 20.92 |
| | | | 1 | 49 | 1 | 21.12 | 20.52 | 20.22 | 20.32 | 20.82 |
| | | | 25 | 0 | 2 | 20.22 | 19.82 | 19.72 | 20.22 | 20.22 |
| | | | 25 | 12 | 2 | 20.22 | 19.82 | 19.62 | 20.12 | 20.22 |
| | | | 25 | 25 | 2 | 20.32 | 19.82 | 19.62 | 20.02 | 20.12 |
| | | | 50 | 0 | 2 | 20.22 | 19.72 | 19.62 | 20.12 | 20.22 |

| Band | Band width | Modulation | RB Size | RB Offset | MPR | Maximum Power | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Channel | | | | |
| | | | | | | Low | Low-Mid | Middle | Mid-High | High |
| LTE B41 | 15 MHz | QPSK | 1 | 0 | 0 | 22.22 | 21.62 | 21.82 | 22.42 | 22.12 |
| | | | 1 | 36 | 0 | 22.42 | 21.52 | 21.72 | 22.22 | 22.02 |
| | | | 1 | 74 | 0 | 22.62 | 21.62 | 21.62 | 21.82 | 21.92 |
| | | | 36 | 0 | 1 | 21.32 | 20.62 | 20.82 | 21.32 | 21.22 |
| | | | 36 | 18 | 1 | 21.42 | 20.62 | 20.72 | 21.22 | 21.22 |
| | | | 36 | 37 | 1 | 21.52 | 20.62 | 20.62 | 21.12 | 21.12 |
| | | | 75 | 0 | 1 | 21.32 | 20.62 | 20.62 | 21.12 | 21.12 |
| | | 16QAM | 1 | 0 | 1 | 20.82 | 20.32 | 20.42 | 21.02 | 20.82 |
| | | | 1 | 36 | 1 | 21.02 | 20.22 | 20.22 | 20.82 | 20.82 |
| | | | 1 | 74 | 1 | 21.22 | 20.32 | 20.02 | 20.52 | 20.62 |
| | | | 36 | 0 | 2 | 20.32 | 19.72 | 19.82 | 20.32 | 20.22 |
| | | | 36 | 18 | 2 | 20.42 | 19.72 | 19.72 | 20.22 | 20.22 |
| | | | 36 | 37 | 2 | 20.52 | 19.82 | 19.72 | 20.12 | 20.22 |
| | | | 75 | 0 | 2 | 20.32 | 19.72 | 19.72 | 20.12 | 20.22 |
| | 20 MHz | QPSK | 1 | 0 | 0 | 22.22 | 21.72 | 22.02 | 22.52 | 21.92 |
| | | | 1 | 49 | 0 | 22.52 | 21.62 | 21.72 | 22.32 | 21.92 |
| | | | 1 | 99 | 0 | 22.72 | 21.72 | 21.52 | 21.82 | 21.82 |
| | | | 50 | 0 | 1 | 21.32 | 20.62 | 20.82 | 21.32 | 21.12 |
| | | | 50 | 24 | 1 | 21.42 | 20.62 | 20.72 | 21.22 | 21.12 |
| | | | 50 | 50 | 1 | 21.52 | 20.62 | 20.62 | 21.02 | 21.12 |
| | | | 100 | 0 | 1 | 21.32 | 20.62 | 20.62 | 21.12 | 21.12 |
| | | 16QAM | 1 | 0 | 1 | 20.92 | 20.42 | 20.82 | 21.12 | 20.82 |
| | | | 1 | 49 | 1 | 21.12 | 20.32 | 20.42 | 20.82 | 20.82 |
| | | | 1 | 99 | 1 | 21.32 | 20.42 | 20.32 | 20.42 | 20.72 |
| | | | 50 | 0 | 2 | 20.32 | 19.72 | 19.82 | 20.42 | 20.12 |
| | | | 50 | 24 | 2 | 20.52 | 19.62 | 19.72 | 20.22 | 20.12 |
| | | | 50 | 50 | 2 | 20.52 | 19.72 | 19.62 | 19.92 | 20.02 |
| | | | 100 | 0 | 2 | 20.32 | 19.62 | 19.62 | 20.02 | 20.02 |

## * LTE (TDD) Considerations

According to KDB 941225 D05 SAR for LTE Devices, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for thedevice and supported by the defined 3GPP LTE TDD configurations.
LTE TDD Bands support 3GPP TS 36.211.

Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

| Special subframe configuration | Normal cyclic prefix in downlink | | | Extended cyclic prefix in downlink | | |
|---|---|---|---|---|---|---|
| | DwPTS | UpPTS | | DwPTS | UpPTS | |
| | | Normal cyclic prefix in uplink | Extended cyclic prefix in uplink | | Normal cyclic prefix in uplink | Extended cyclic prefix in uplink |
| 0 | 6592·Ts | 2192·Ts | 2560·Ts | 7680·Ts | 2192·Ts | 2560·Ts |
| 1 | 19760·Ts | | | 20480·Ts | | |
| 2 | 21952·Ts | | | 23040·Ts | | |
| 3 | 24144·Ts | | | 25600·Ts | | |
| 4 | 26336·Ts | | | 7680·Ts | 4384·Ts | 5120·Ts |
| 5 | 6592·Ts | 4384·Ts | 5120·Ts | 20480·Ts | | |
| 6 | 19760·Ts | | | 23040·Ts | | |
| 7 | 21952·Ts | | | 12800·Ts | | |
| 8 | 24144·Ts | | | - | - | - |
| 9 | 13168·Ts | | | - | - | - |

Calculated Duty Cycle

| Uplink-Downlink Configuration | Downlink-to- Uplink Switch-point Periodicity | Subframe Number | | | | | | | | | | Calculated Duty Cycle (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| 0 | 5 ms | D | S | U | U | U | D | S | U | U | U | 63.33 |
| 1 | 5 ms | D | S | U | U | D | D | S | U | U | D | 43.33 |
| 2 | 5 ms | D | S | U | D | D | D | S | U | D | D | 23.33 |
| 3 | 10 ms | D | S | U | U | U | D | D | D | D | D | 31.67 |
| 4 | 10 ms | D | S | U | U | D | D | D | D | D | D | 21.67 |
| 5 | 10 ms | D | S | U | D | D | D | D | D | D | D | 11.67 |
| 6 | 5 ms | D | S | U | U | U | D | S | U | U | D | 53.33 |

Calculated Duty Cycle = Extended cyclic prefix in uplink x (Ts) x # of S + # of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:
Calculated Duty Cycle = 5120 x [1/(15000 x 2048)] x 2 + 6 ms = 63.33%

Ts = 1/(15000 x 2048) seconds

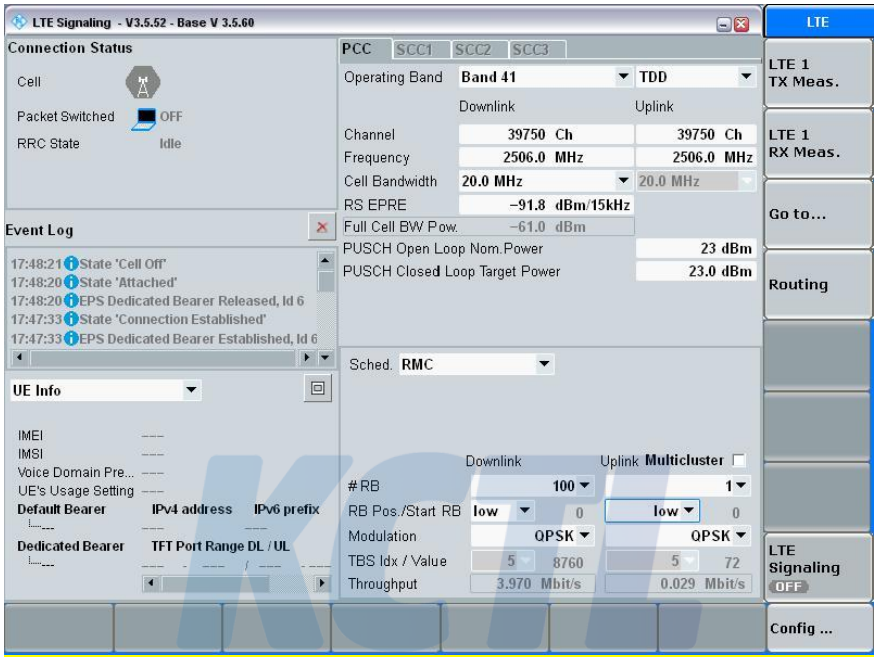
<Note>
* This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used for SAR Testing: configuration 0 at 63.3% duty cycle

## * LTE Band TDD setup for measurements

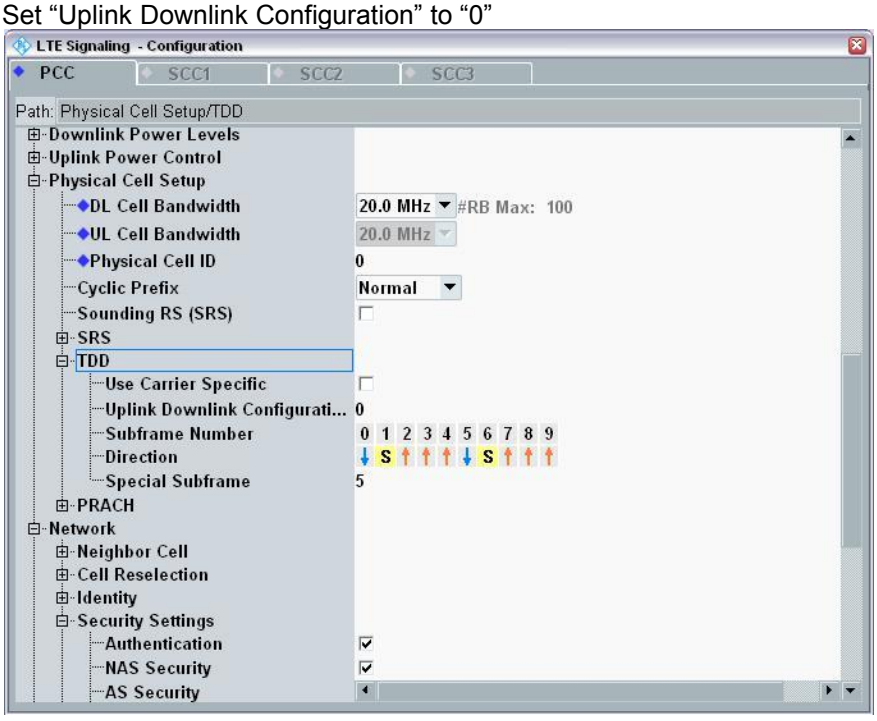
Procedure used to establish SAR test signal for LTE TDD Band

Set to CMW-500 with following parameters:

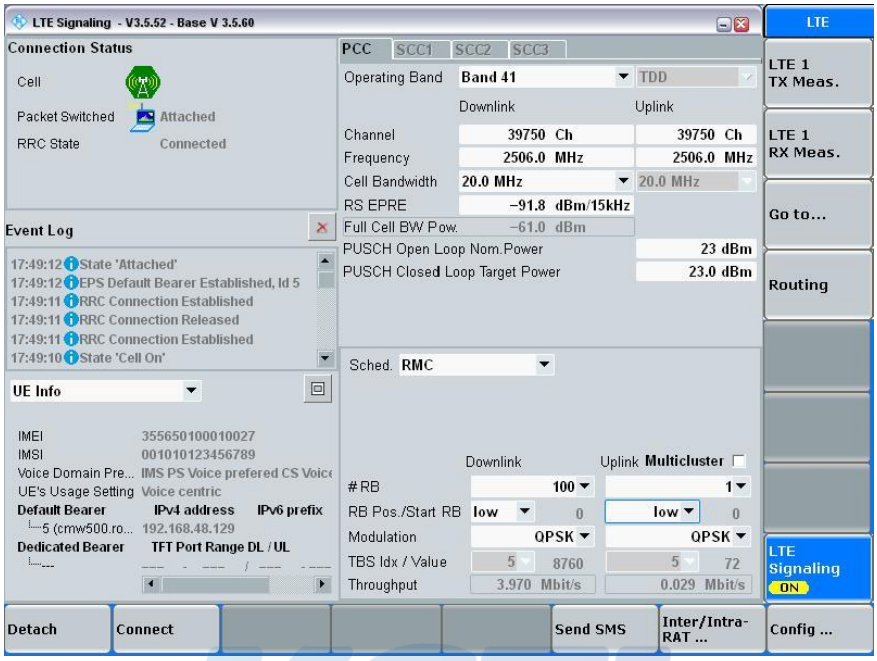
Operating Band: Select Band 41 and TDD
Set Frequency, Cell Bandwidth, RB
Turn the LTE Signaling off using “ON | OFF” key
Go to “Config….”



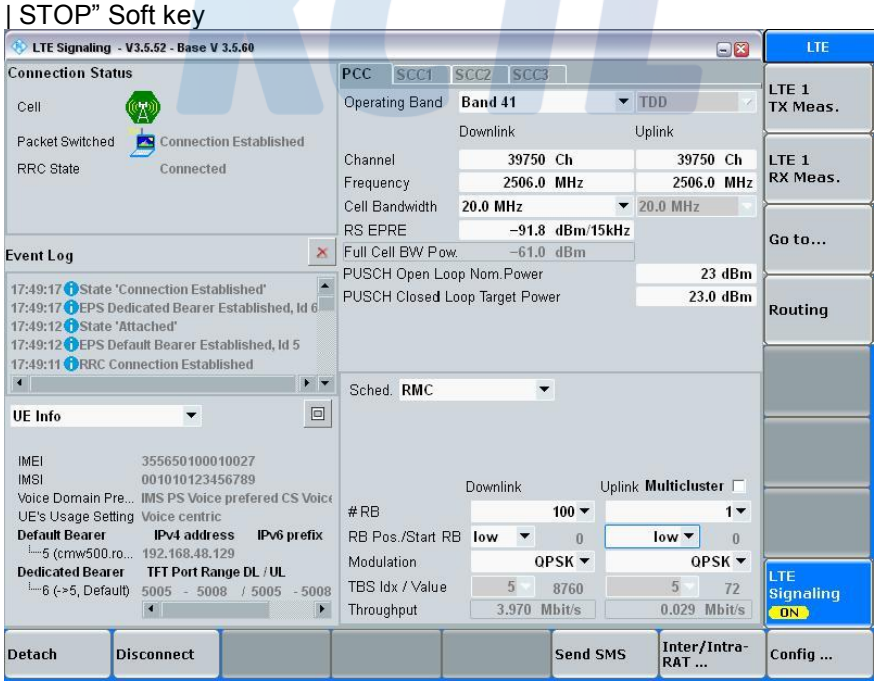

Go to “Physical Cell Setup”
Select “TDD” and Set “Uplink Downlink Configuration” to “0”



Turn the LTE Signaling off using “ON | OFF” key
After EUT is Attached
Select “Connect”

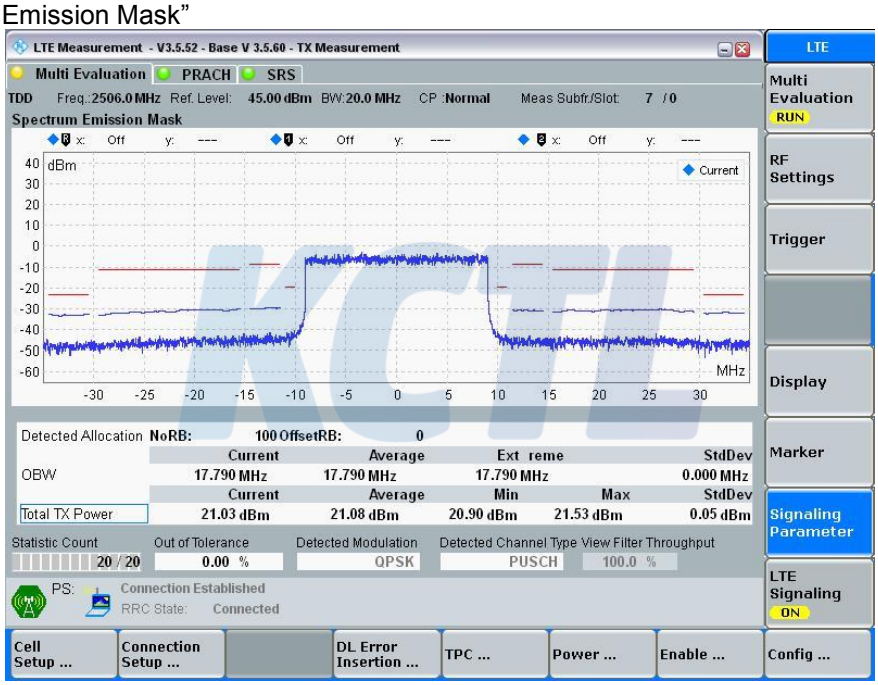



Select “LTE 1 TX Meas.”
Press “RESTART | STOP” Soft key



Select “Signaling Parameter”
Select “TX Power Control (TPC)” > Select “Active TPC Setup” to “Max Power” > Set “Closed Loop Target Power” to “23 dBm”


Go to “Display”
Select “Select View…”
Select “Spectrum Emission Mask”



WLAN 2.4 GHz (2 412 MHz ~ 2 472 MHz)

| Mode | Conducted Powers (dBm) | | | | |
|---|---|---|---|---|---|
| | 2 412 MHz | 2 437 MHz | 2 462 MHz | 2 467 MHz | 2 472 MHz |
| 802.11b_1 Mbps | 17.61 | 17.60 | 17.58 | 8.18 | 2.10 |
| 802.11g_6 Mbps | 14.23 | 14.29 | 14.15 | 8.40 | 2.41 |
| 802.11n(HT-20)_MCS0 | 14.17 | 14.13 | 14.08 | 8.28 | 2.46 |

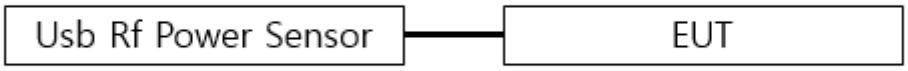
Bluetooth (2 402 MHz ~ 2 480 MHz)

| Mode | Conducted Powers (dBm) | | |
|---|---|---|---|
| | Low | Mid. | High |
| BDR(GFSK) | 8.54 | 9.84 | 8.57 |
| EDR (π/4DQPSK) | 3.84 | 5.66 | 4.57 |
| EDR(8DPSK) | 3.86 | 5.66 | 4.58 |
| LE(GFSK) | 8.83 | 9.38 | 8.53 |

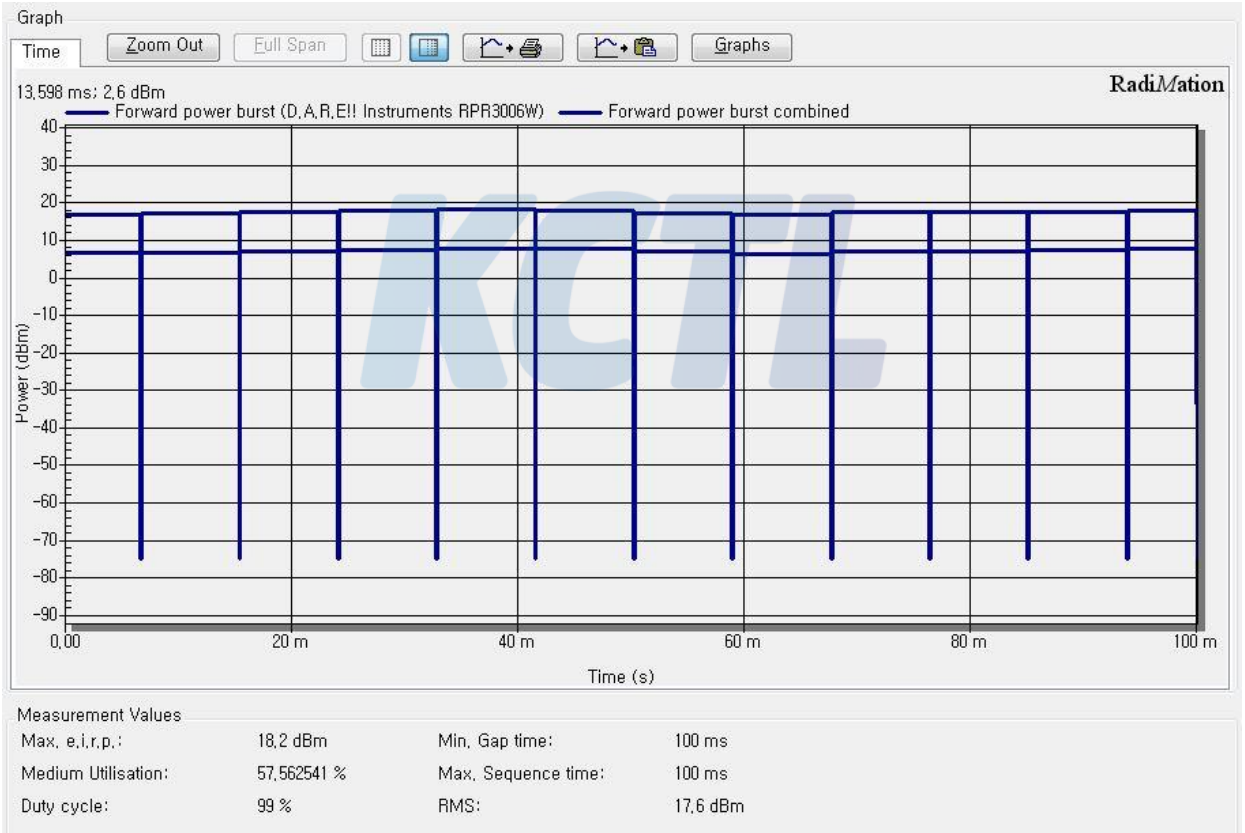
## WLAN Duty Cycle

| Mode | | Duty Cycle [%] | Duty Cycle Compensate Factor |
|---|---|---|---|
| WLAN 2.4 GHz | 802.11b | 99.0 | 1.01 |

## Power Measurement Setup



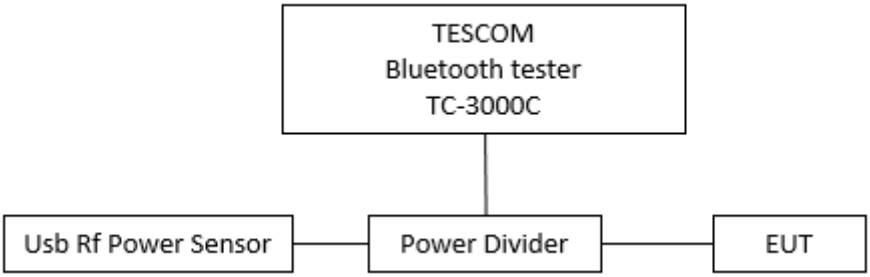

## WLAN Transmission Plot



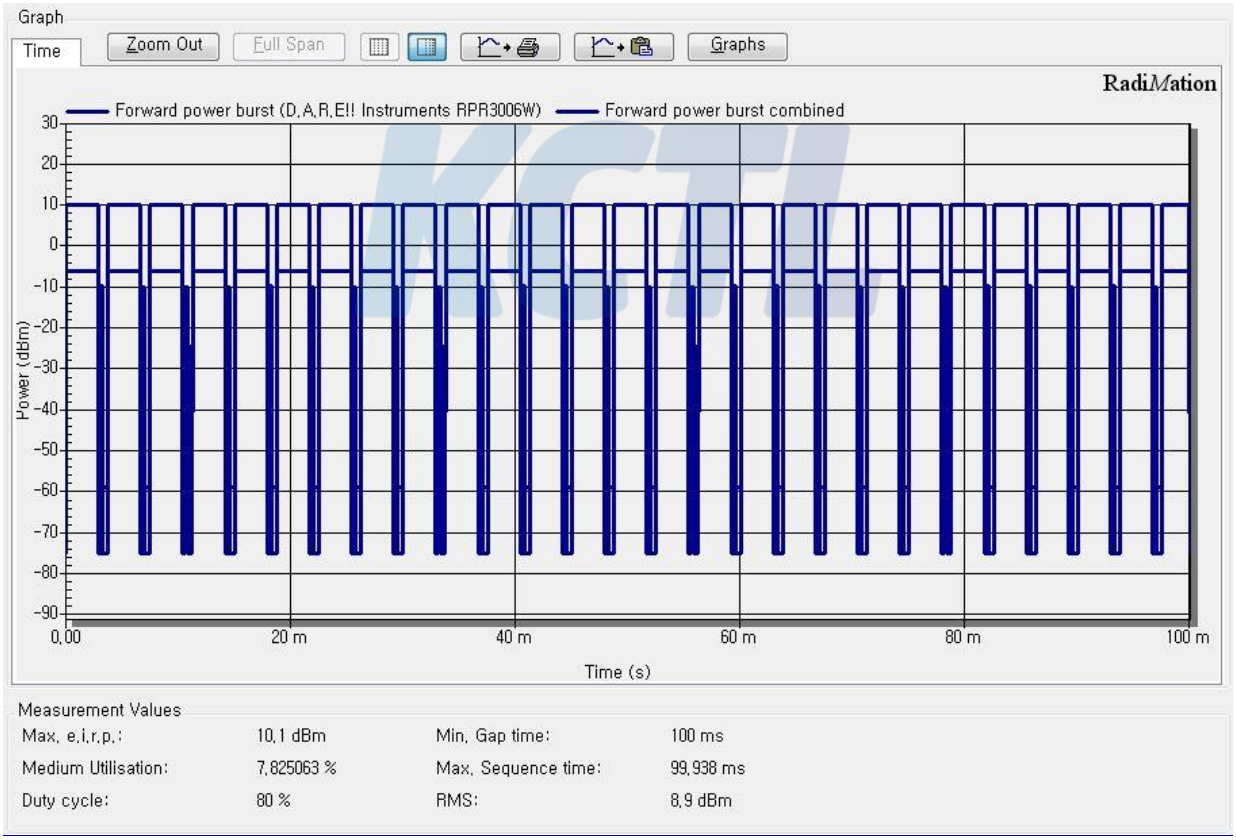
## Bluetooth Duty Cycle

| Mode | | Duty Cycle [%] | Duty Cycle Compensate Factor |
|---|---|---|---|
| BDR | DH5 | 80.0 | 1.25 |

## Power Measurement Setup




## Bluetooth Transmission Plot



# 14. SAR Test Results

**KDB 447498 D01, General RF Exposure Guidance**

Testing of other required channels within the operating mode of a frequency band is not required when the reported SAR for the mid-band or highest output power channel is:

(1) ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz

(2) ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz

(3) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v06.

**KDB 648474 D04 Handset SAR:**

With headset attached, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

**KDB 648474 D04 Handset SAR (Phablet Only):**

When hotspot mode does not apply, 10-g Extremity SAR is required for all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge in direct contact with a flat phantom, to address interactive hand use exposure conditions. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg .

**KDB 941225 D01 SAR test for 3G devices:**

When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode

**KDB 941225 D05, SAR Evaluation Considerations for LTE Devices**

(1) QPSK with 1 RB and 50% RB allocation

Start with the largest channel bandwidth and measure SAR, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

(2) QPSK with 100% RB allocation

SAR is not required when the highest maximum output power for 100% RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

(3) Higher order modulations

SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > 1/2 dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

(4) Other channel bandwidth

SAR is required when the highest maximum output power of the smaller channel bandwidth is > 1/2 dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

**KDB 248227 D01 SAR meas for 802.11:**
SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the *initial test position(s)* by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The *initial test position(s)* is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the *reported* SAR for the *initial test position* is:

- ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.
- > 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the *initial test position* to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the *reported* SAR is ≤ 0.8 W/kg or all required test positions are tested.
  - □ For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
  - □ When it is unclear, all equivalent conditions must be tested.
- For all positions/configurations tested using the *initial test position* and subsequent test positions, when the *reported* SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the *reported* SAR is ≤ 1.2 W/kg or all required test channels are considered.
  - □ The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.
- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.
- When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.

## 14.1 WCDMA B5 (1 g SAR)

| RF Exposure Conditions | Mode | EUT Position | Distance (mm) | Frequency (MHz) | Measured Conducted Power (dBm) | Max. Tune-up Power (dBm) | Power Scaling Factor | Measured 1 g SAR (W/kg) | Scaled 1 g SAR (W/kg) | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|
| Head | RMC | Right Cheek | 0 | 836.6 | 23.44 | 24.0 | 1.14 | 0.238 | **0.271** | #1 |
| | | Right Tilt | 0 | 836.6 | 23.44 | 24.0 | 1.14 | 0.152 | 0.173 | |
| | | Left Cheek | 0 | 836.6 | 23.44 | 24.0 | 1.14 | 0.213 | 0.242 | |
| | | Left Tilt | 0 | 836.6 | 23.44 | 24.0 | 1.14 | 0.143 | 0.163 | |
| Body | RMC | Front | 15 | 836.6 | 23.44 | 24.0 | 1.14 | 0.222 | 0.253 | |
| | | Rear | 15 | 836.6 | 23.44 | 24.0 | 1.14 | 0.298 | **0.339** | #2 |
| Hotspot | RMC | Front | 10 | 836.6 | 23.44 | 24.0 | 1.14 | 0.260 | 0.296 | |
| | | Rear | 10 | 836.6 | 23.44 | 24.0 | 1.14 | 0.373 | **0.424** | #3 |
| | | Left | 10 | 836.6 | 23.44 | 24.0 | 1.14 | 0.154 | 0.175 | |
| | | Right | 10 | 836.6 | 23.44 | 24.0 | 1.14 | 0.178 | 0.202 | |
| | | Bottom | 10 | 836.6 | 23.44 | 24.0 | 1.14 | 0.043 | 0.049 | |

## 14.2 LTE B5 (1 g SAR)

| RF Exposure Conditions | Mode | EUT Position | Distance (mm) | Frequency (MHz) | Measured Conducted Power (dBm) | Max. Tune-up Power (dBm) | Power Scaling Factor | Measured 1 g SAR (W/kg) | Scaled 1 g SAR (W/kg) | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|
| Head | QPSK 10 MHz 1 RB | Right Cheek | 0 | 836.5 | 22.87 | 24.0 | 1.30 | 0.193 | **0.250** | #4 |
| | | Right Tilt | 0 | 836.5 | 22.87 | 24.0 | 1.30 | 0.095 | 0.123 | |
| | | Left Cheek | 0 | 836.5 | 22.87 | 24.0 | 1.30 | 0.169 | 0.219 | |
| | | Left Tilt | 0 | 836.5 | 22.87 | 24.0 | 1.30 | 0.104 | 0.135 | |
| | QPSK 10 MHz 25 RB | Right Cheek | 0 | 829 | 21.83 | 23.0 | 1.31 | 0.126 | 0.165 | |
| | | Right Tilt | 0 | 829 | 21.83 | 23.0 | 1.31 | 0.078 | 0.102 | |
| | | Left Cheek | 0 | 829 | 21.83 | 23.0 | 1.31 | 0.112 | 0.147 | |
| | | Left Tilt | 0 | 829 | 21.83 | 23.0 | 1.31 | 0.073 | 0.095 | |
| Body | QPSK 10 MHz 1 RB | Front | 15 | 836.5 | 22.87 | 24.0 | 1.30 | 0.181 | 0.235 | |
| | | Rear | 15 | 836.5 | 22.87 | 24.0 | 1.30 | 0.218 | **0.283** | #5 |
| | QPSK 10 MHz 25 RB | Front | 15 | 829 | 21.83 | 23.0 | 1.31 | 0.119 | 0.156 | |
| | | Rear | 15 | 829 | 21.83 | 23.0 | 1.31 | 0.156 | 0.204 | |
| Hotspot | QPSK 10 MHz 1 RB | Front | 10 | 836.5 | 22.87 | 24.0 | 1.30 | 0.184 | 0.239 | |
| | | Rear | 10 | 836.5 | 22.87 | 24.0 | 1.30 | 0.293 | **0.380** | #6 |
| | | Left | 10 | 836.5 | 22.87 | 24.0 | 1.30 | 0.150 | 0.195 | |
| | | Right | 10 | 836.5 | 22.87 | 24.0 | 1.30 | 0.153 | 0.198 | |
| | | Bottom | 10 | 836.5 | 22.87 | 24.0 | 1.30 | 0.034 | 0.045 | |
| | QPSK 10 MHz 25 RB | Front | 10 | 829 | 21.83 | 23.0 | 1.31 | 0.134 | 0.175 | |
| | | Rear | 10 | 829 | 21.83 | 23.0 | 1.31 | 0.212 | 0.278 | |
| | | Left | 10 | 829 | 21.83 | 23.0 | 1.31 | 0.105 | 0.137 | |
| | | Right | 10 | 829 | 21.83 | 23.0 | 1.31 | 0.108 | 0.141 | |
| | | Bottom | 10 | 829 | 21.83 | 24.0 | 1.30 | 0.026 | 0.034 | |

## 14.3 LTE B41 (1 g SAR)

| RF Exposure Conditions | Mode | EUT Position | Distance (mm) | Frequency (MHz) | Measured Conducted Power (dBm) | Max. Tune-up Power (dBm) | Power Scaling Factor | Measured 1 g SAR (W/kg) | Scaled 1 g SAR (W/kg) | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|
| Head | QPSK 20 MHz 1 RB | Right Cheek | 0 | 2 506 | 22.71 | 23.5 | 1.20 | 0.061 | 0.073 | |
| | | Right Tilt | 0 | 2 506 | 22.71 | 23.5 | 1.20 | 0.031 | 0.037 | |
| | | Left Cheek | 0 | 2 506 | 22.71 | 23.5 | 1.20 | 0.149 | **0.179** | #7 |
| | | Left Tilt | 0 | 2 506 | 22.71 | 23.5 | 1.20 | 0.026 | 0.032 | |
| | QPSK 20 MHz 50 RB | Right Cheek | 0 | 2 506 | 21.51 | 22.5 | 1.26 | 0.048 | 0.060 | |
| | | Right Tilt | 0 | 2 506 | 21.51 | 22.5 | 1.26 | 0.022 | 0.028 | |
| | | Left Cheek | 0 | 2 506 | 21.51 | 22.5 | 1.26 | 0.111 | 0.139 | |
| | | Left Tilt | 0 | 2 506 | 21.51 | 22.5 | 1.26 | 0.020 | 0.025 | |
| Body | QPSK 20 MHz 1 RB | Front | 15 | 2506 | 22.71 | 23.5 | 1.20 | 0.036 | 0.043 | |
| | | Rear | 15 | 2506 | 22.71 | 23.5 | 1.20 | 0.064 | **0.077** | #8 |
| | QPSK 20 MHz 50 RB | Front | 15 | 2506 | 21.51 | 22.5 | 1.26 | 0.028 | 0.036 | |
| | | Rear | 15 | 2506 | 21.51 | 22.5 | 1.26 | 0.048 | 0.060 | |
| Hotspot | QPSK 20 MHz 1 RB | Front | 10 | 2506 | 22.71 | 23.5 | 1.20 | 0.073 | 0.087 | |
| | | Rear | 10 | 2506 | 22.71 | 23.5 | 1.20 | 0.108 | 0.130 | |
| | | Left | 10 | 2506 | 22.71 | 23.5 | 1.20 | 0.045 | 0.054 | |
| | | Right | 10 | 2506 | 22.71 | 23.5 | 1.20 | 0.009 | 0.011 | |
| | | Bottom | 10 | 2506 | 22.71 | 23.5 | 1.20 | 0.096 | 0.115 | |
| | QPSK 20 MHz 50 RB | Front | 10 | 2506 | 21.51 | 22.5 | 1.26 | 0.071 | 0.089 | |
| | | Rear | 10 | 2506 | 21.51 | 22.5 | 1.26 | 0.107 | **0.134** | #9 |
| | | Left | 10 | 2506 | 21.51 | 22.5 | 1.26 | 0.043 | 0.054 | |
| | | Right | 10 | 2506 | 21.51 | 22.5 | 1.26 | 0.007 | 0.009 | |
| | | Bottom | 10 | 2506 | 21.51 | 22.5 | 1.26 | 0.094 | 0.118 | |

## 14.4 WLAN 2.4 GHz (1 g SAR)

| RF Exposure Conditions | Mode | EUT Position | Distance (mm) | Frequency (MHz) | Measured Conducted Power (dBm) | Max. Tune-up Power (dBm) | Power Scaling Factor | Duty Cycle Compensate Factor | Measured 1 g SAR (W/kg) | Scaled 1 g SAR (W/kg) | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Head | 802.11b | Right Cheek | 0 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.640 | 0.707 | |
| | | Right Tilt | 0 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.900 | 0.995 | |
| | | Right Tilt | 0 | 2 437 | 17.60 | 18.0 | 1.10 | 1.01 | 0.906 | **1.003** | #10 |
| | | Right Tilt | 0 | 2 462 | 17.58 | 18.0 | 1.10 | 1.01 | 0.559 | 0.622 | |
| | | Right Tilt -Retest | 0 | 2 437 | 17.60 | 18.0 | 1.10 | 1.01 | 0.895 | 0.991 | |
| | | Left Cheek | 0 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.485 | 0.536 | |
| | | Left Tilt | 0 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.461 | 0.509 | |
| Body | 802.11b | Front | 15 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.104 | **0.115** | #11 |
| | | Rear | 15 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.103 | 0.114 | |
| Hotspot | 802.11b | Front | 10 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.224 | 0.248 | |
| | | Rear | 10 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.232 | **0.256** | #12 |
| | | Left | 10 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.075 | 0.083 | |
| | | Top | 10 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.081 | 0.090 | |

* KDB Publication 248227 D01v02r02, WLAN 2.4 GHz the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is <= 0.8 W/kg, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is <= 1.2 W/kg per.
* When the original highest measured SAR is >= 0.80 W/kg, repeat that measurement once.
* Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is >= 1.45 W/kg
* KDB Publication 248227 D01v02r02, The maximum output power permitted for devices authorized under §15.247 is 1 W conducted and 36 dBm EIRP.Within the frequency range of 2400 – 2483.5 MHz, currently a total of 13 channels may be used in the U.S. However, non-overlapping frequency channels are necessary to minimize interference degradation; therefore, channels 1, 6 and 11 are used most often. Channels 12 and 13, in general, require reduced output power to satisfy bandedge radiated field strength requirements at 2483.5 MHz. Provided higher maximum output power is not specified for the other channels, channels 1, 6 and 11 are used to configure 22 MHz DSSS and 20 MHz OFDM channels for SAR measurements; otherwise, the closest adjacent channel with the highest maximum output power specified for production units should be tested instead of channels 1, 6 or 11.

## 14.5 Bluetooth (1 g SAR)

| RF Exposure Conditions | Mode | EUT Position | Distance (mm) | Frequency (MHz) | Measured Conducted Power (dBm) | Max. Tune-up Power (dBm) | Power Scaling Factor | Duty Cycle Compensate Factor | Measured 1 g SAR (W/kg) | Scaled 1 g SAR (W/kg) | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Head | Bluetooth | Right Cheek | 0 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.145 | **0.188** | #13 |
| | | Right Tilt | 0 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.121 | 0.157 | |
| | | Left Cheek | 0 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.096 | 0.125 | |
| | | Left Tilt | 0 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.071 | 0.092 | |
| Body | | Front | 15 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.017 | **0.021** | #14 |
| | | Rear | 15 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.016 | 0.020 | |
| Hotspot | | Front | 10 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.033 | 0.042 | |
| | | Rear | 10 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.038 | **0.049** | #15 |
| | | Left | 10 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.011 | 0.014 | |
| | | Top | 10 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.009 | 0.012 | |

## 14.6 WCDMA B5 (10 g SAR)

| RF Exposure Conditions | Mode | EUT Position | Distance (mm) | Frequency (MHz) | Measured Conducted Power (dBm) | Max. Tune-up Power (dBm) | Power Scaling Factor | Measured 10 g SAR (W/kg) | Scaled 10 g SAR (W/kg) | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|
| Head | RMC | Right Cheek | 0 | 836.6 | 23.44 | 24.0 | 1.14 | 0.183 | **0.208** | #16 |
| | | Right Tilt | 0 | 836.6 | 23.44 | 24.0 | 1.14 | 0.119 | 0.135 | |
| | | Left Cheek | 0 | 836.6 | 23.44 | 24.0 | 1.14 | 0.162 | 0.184 | |
| | | Left Tilt | 0 | 836.6 | 23.44 | 24.0 | 1.14 | 0.110 | 0.125 | |
| Body | RMC | Front | 15 | 836.6 | 23.44 | 24.0 | 1.14 | 0.169 | 0.192 | |
| | | Rear | 15 | 836.6 | 23.44 | 24.0 | 1.14 | 0.228 | **0.259** | #17 |
| Hotspot | RMC | Front | 10 | 836.6 | 23.44 | 24.0 | 1.14 | 0.202 | 0.230 | |
| | | Rear | 10 | 836.6 | 23.44 | 24.0 | 1.14 | 0.287 | **0.326** | #18 |
| | | Left | 10 | 836.6 | 23.44 | 24.0 | 1.14 | 0.108 | 0.123 | |
| | | Right | 10 | 836.6 | 23.44 | 24.0 | 1.14 | 0.125 | 0.142 | |
| | | Bottom | 10 | 836.6 | 23.44 | 24.0 | 1.14 | 0.027 | 0.031 | |

## 14.7 LTE B5 (10 g SAR)

| RF Exposure Conditions | Mode | EUT Position | Distance (mm) | Frequency (MHz) | Measured Conducted Power (dBm) | Max. Tune-up Power (dBm) | Power Scaling Factor | Measured 10 g SAR (W/kg) | Scaled 10 g SAR (W/kg) | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|
| Head | QPSK 10 MHz 1 RB | Right Cheek | 0 | 836.5 | 22.87 | 24.0 | 1.30 | 0.146 | **0.189** | #19 |
| | | Right Tilt | 0 | 836.5 | 22.87 | 24.0 | 1.30 | 0.073 | 0.094 | |
| | | Left Cheek | 0 | 836.5 | 22.87 | 24.0 | 1.30 | 0.128 | 0.166 | |
| | | Left Tilt | 0 | 836.5 | 22.87 | 24.0 | 1.30 | 0.080 | 0.104 | |
| | QPSK 10 MHz 25 RB | Right Cheek | 0 | 829 | 21.83 | 23.0 | 1.31 | 0.096 | 0.125 | |
| | | Right Tilt | 0 | 829 | 21.83 | 23.0 | 1.31 | 0.060 | 0.079 | |
| | | Left Cheek | 0 | 829 | 21.83 | 23.0 | 1.31 | 0.085 | 0.112 | |
| | | Left Tilt | 0 | 829 | 21.83 | 23.0 | 1.31 | 0.056 | 0.074 | |
| Body | QPSK 10 MHz 1 RB | Front | 15 | 836.5 | 22.87 | 24.0 | 1.30 | 0.139 | 0.180 | |
| | | Rear | 15 | 836.5 | 22.87 | 24.0 | 1.30 | 0.167 | **0.217** | #20 |
| | QPSK 10 MHz 25 RB | Front | 15 | 829 | 21.83 | 23.0 | 1.31 | 0.092 | 0.120 | |
| | | Rear | 15 | 829 | 21.83 | 23.0 | 1.31 | 0.119 | 0.156 | |
| Hotspot | QPSK 10 MHz 1 RB | Front | 10 | 836.5 | 22.87 | 24.0 | 1.30 | 0.143 | 0.185 | |
| | | Rear | 10 | 836.5 | 22.87 | 24.0 | 1.30 | 0.225 | **0.292** | #21 |
| | | Left | 10 | 836.5 | 22.87 | 24.0 | 1.30 | 0.105 | 0.136 | |
| | | Right | 10 | 836.5 | 22.87 | 24.0 | 1.30 | 0.108 | 0.140 | |
| | | Bottom | 10 | 836.5 | 22.87 | 24.0 | 1.30 | 0.022 | 0.028 | |
| | QPSK 10 MHz 25 RB | Front | 10 | 829 | 21.83 | 23.0 | 1.31 | 0.105 | 0.137 | |
| | | Rear | 10 | 829 | 21.83 | 23.0 | 1.31 | 0.163 | 0.213 | |
| | | Left | 10 | 829 | 21.83 | 23.0 | 1.31 | 0.073 | 0.096 | |
| | | Right | 10 | 829 | 21.83 | 23.0 | 1.31 | 0.076 | 0.099 | |
| | | Bottom | 10 | 829 | 21.83 | 23.0 | 1.31 | 0.017 | 0.022 | |

## 14.8 LTE B41 (10 g SAR)

| RF Exposure Conditions | Mode | EUT Position | Distance (mm) | Frequency (MHz) | Measured Conducted Power (dBm) | Max. Tune-up Power (dBm) | Power Scaling Factor | Measured 10 g SAR (W/kg) | Scaled 10 g SAR (W/kg) | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|
| Head | QPSK 20 MHz 1 RB | Right Cheek | 0 | 2 506 | 22.71 | 23.5 | 1.20 | 0.031 | 0.037 | |
| | | Right Tilt | 0 | 2 506 | 22.71 | 23.5 | 1.20 | 0.015 | 0.018 | |
| | | Left Cheek | 0 | 2 506 | 22.71 | 23.5 | 1.20 | 0.084 | **0.101** | #22 |
| | | Left Tilt | 0 | 2 506 | 22.71 | 23.5 | 1.20 | 0.015 | 0.018 | |
| | QPSK 20 MHz 50 RB | Right Cheek | 0 | 2 506 | 21.51 | 22.5 | 1.26 | 0.024 | 0.030 | |
| | | Right Tilt | 0 | 2 506 | 21.51 | 22.5 | 1.26 | 0.010 | 0.013 | |
| | | Left Cheek | 0 | 2 506 | 21.51 | 22.5 | 1.26 | 0.058 | 0.073 | |
| | | Left Tilt | 0 | 2 506 | 21.51 | 22.5 | 1.26 | 0.013 | 0.017 | |
| Body | QPSK 20 MHz 1 RB | Front | 15 | 2506 | 22.71 | 23.5 | 1.20 | 0.020 | 0.024 | |
| | | Rear | 15 | 2506 | 22.71 | 23.5 | 1.20 | 0.031 | **0.037** | #23 |
| | QPSK 20 MHz 50 RB | Front | 15 | 2506 | 21.51 | 22.5 | 1.26 | 0.016 | 0.020 | |
| | | Rear | 15 | 2506 | 21.51 | 22.5 | 1.26 | 0.024 | 0.031 | |
| Hotspot | QPSK 20 MHz 1 RB | Front | 10 | 2506 | 22.71 | 23.5 | 1.20 | 0.036 | 0.043 | |
| | | Rear | 10 | 2506 | 22.71 | 23.5 | 1.20 | 0.048 | 0.058 | |
| | | Left | 10 | 2506 | 22.71 | 23.5 | 1.20 | 0.024 | 0.029 | |
| | | Right | 10 | 2506 | 22.71 | 23.5 | 1.20 | 0.004 | 0.005 | |
| | | Bottom | 10 | 2506 | 22.71 | 23.5 | 1.20 | 0.048 | 0.058 | |
| | QPSK 20 MHz 50 RB | Front | 10 | 2506 | 21.51 | 22.5 | 1.26 | 0.035 | 0.044 | |
| | | Rear | 10 | 2506 | 21.51 | 22.5 | 1.26 | 0.047 | **0.060** | #24 |
| | | Left | 10 | 2506 | 21.51 | 22.5 | 1.26 | 0.024 | 0.030 | |
| | | Right | 10 | 2506 | 21.51 | 22.5 | 1.26 | 0.003 | 0.004 | |
| | | Bottom | 10 | 2506 | 21.51 | 22.5 | 1.26 | 0.046 | 0.058 | |

## 14.9 WLAN 2.4 GHz (10 g SAR)

| RF Exposure Conditions | Mode | EUT Position | Distance (mm) | Frequency (MHz) | Measured Conducted Power (dBm) | Max. Tune-up Power (dBm) | Power Scaling Factor | Duty Cycle Compensate Factor | Measured 10 g SAR (W/kg) | Scaled 10 g SAR (W/kg) | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Head | 802.11b | Right Cheek | 0 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.297 | 0.328 | |
| | | Right Tilt | 0 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.395 | **0.436** | #25 |
| | | Right Tilt | 0 | 2 437 | 17.60 | 18.0 | 1.10 | 1.01 | 0.393 | 0.435 | |
| | | Right Tilt | 0 | 2 462 | 17.58 | 18.0 | 1.10 | 1.01 | 0.241 | 0.268 | |
| | | Left Cheek | 0 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.242 | 0.267 | |
| | | Left Tilt | 0 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.280 | 0.309 | |
| Body | 802.11b | Front | 15 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.056 | **0.062** | #26 |
| | | Rear | 15 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.056 | 0.061 | |
| Hotspot | 802.11b | Front | 10 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.111 | 0.123 | |
| | | Rear | 10 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.116 | **0.128** | #27 |
| | | Left | 10 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.040 | 0.044 | |
| | | Top | 10 | 2 412 | 17.61 | 18.0 | 1.09 | 1.01 | 0.038 | 0.042 | |

* KDB Publication 248227 D01v02r02, WLAN 2.4 GHz the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is <= 0.8 W/kg, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is <= 1.2 W/kg per.
* When the original highest measured SAR is >= 0.80 W/kg, repeat that measurement once.
* Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is >= 1.45 W/kg
* KDB Publication 248227 D01v02r02, The maximum output power permitted for devices authorized under §15.247 is 1 W conducted and 36 dBm EIRP.Within the frequency range of 2400 – 2483.5 MHz, currently a total of 13 channels may be used in the U.S. However, non-overlapping frequency channels are necessary to minimize interference degradation; therefore, channels 1, 6 and 11 are used most often. Channels 12 and 13, in general, require reduced output power to satisfy bandedge radiated field strength requirements at 2483.5 MHz. Provided higher maximum output power is not specified for the other channels, channels 1, 6 and 11 are used to configure 22 MHz DSSS and 20 MHz OFDM channels for SAR measurements; otherwise, the closest adjacent channel with the highest maximum output power specified for production units should be tested instead of channels 1, 6 or 11.

## 14.10 Bluetooth (10 g SAR)

| RF Exposure Conditions | Mode | EUT Position | Distance (mm) | Frequency (MHz) | Measured Conducted Power (dBm) | Max. Tune-up Power (dBm) | Power Scaling Factor | Duty Cycle Compensate Factor | Measured 10 g SAR (W/kg) | Scaled 10 g SAR (W/kg) | Plot No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Head | Bluetooth | Right Cheek | 0 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.068 | **0.088** | #28 |
| | | Right Tilt | 0 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.051 | 0.066 | |
| | | Left Cheek | 0 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.047 | 0.061 | |
| | | Left Tilt | 0 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.034 | 0.044 | |
| Body | | Front | 15 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.009 | **0.011** | #29 |
| | | Rear | 15 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.008 | 0.010 | |
| Hotspot | | Front | 10 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.017 | 0.022 | |
| | | Rear | 10 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.019 | **0.024** | #30 |
| | | Left | 10 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.005 | 0.007 | |
| | | Top | 10 | 2 441 | 9.84 | 10.0 | 1.04 | 1.25 | 0.004 | 0.005 | |

## 14.11 SAR Measurement Variability

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

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

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps
2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the Original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

| Band | Frequency (MHz) | EUT Position | Separation Distance (mm) | Measured 1 g SAR (W/kg) | Repeated 1g SAR (W/kg) | Ratio |
|---|---|---|---|---|---|---|
| WLAN 2.4 GHz | 2 437 | Right Tilt | 0 | 1.003 | 0.991 | 1.01 |

## 14.12 Simultaneous Transmission

### 14.12.1 Head Simultaneous Transmission with WLAN 2.4 GHz

| Band | Scaled 1 g SAR WWAN (W/kg) | Scaled 1 g SAR WLAN (W/kg) | Σ 1 g SAR (W/kg) | SPLSR |
|---|---|---|---|---|
| WCDMA B5 + WLAN 2.4 GHz | 0.271 | 1.003 | **1.274** | ΣSAR<1.6, Not required |
| LTE B5 + WLAN 2.4 GHz | 0.250 | 1.003 | 1.253 | ΣSAR<1.6, Not required |
| LTE B41 + WLAN 2.4 GHz | 0.178 | 1.003 | 1.181 | ΣSAR<1.6, Not required |

### 14.12.2 Head Simultaneous Transmission with Bluetooth

| Band | Scaled 1 g SAR WWAN (W/kg) | Scaled 1 g SAR Bluetooth (W/kg) | Σ 1 g SAR (W/kg) | SPLSR |
|---|---|---|---|---|
| WCDMA B5 + Bluetooth | 0.271 | 0.188 | 0.459 | ΣSAR<1.6, Not required |
| LTE B5 + Bluetooth | 0.250 | 0.188 | 0.438 | ΣSAR<1.6, Not required |
| LTE B41 + Bluetooth | 0.178 | 0.188 | 0.366 | ΣSAR<1.6, Not required |

### 14.12.3 Body Simultaneous Transmission with WLAN 2.4 GHz

| Band | Scaled 1 g SAR WWAN (W/kg) | Scaled 1 g SAR WLAN (W/kg) | Σ 1 g SAR (W/kg) | SPLSR |
|---|---|---|---|---|
| WCDMA B5 + WLAN 2.4 GHz | 0.339 | 0.115 | **0.454** | ΣSAR<1.6, Not required |
| LTE B5 + WLAN 2.4 GHz | 0.283 | 0.115 | 0.398 | ΣSAR<1.6, Not required |
| LTE B41 + WLAN 2.4 GHz | 0.077 | 0.115 | 0.192 | ΣSAR<1.6, Not required |

### 14.12.4 Body Simultaneous Transmission with Bluetooth

| Band | Scaled 1 g SAR WWAN (W/kg) | Scaled 1 g SAR Bluetooth (W/kg) | Σ 1 g SAR (W/kg) | SPLSR |
|---|---|---|---|---|
| WCDMA B5 + Bluetooth | 0.339 | 0.021 | 0.360 | ΣSAR<1.6, Not required |
| LTE B5 + Bluetooth | 0.283 | 0.021 | 0.304 | ΣSAR<1.6, Not required |
| LTE B41 + Bluetooth | 0.077 | 0.021 | 0.098 | ΣSAR<1.6, Not required |

### 14.12.5 Hotspot Simultaneous Transmission with WLAN 2.4 GHz

| Band | Scaled 1 g SAR WWAN (W/kg) | Scaled 1 g SAR WLAN (W/kg) | Σ 1 g SAR (W/kg) | SPLSR |
|---|---|---|---|---|
| WCDMA B5 + WLAN 2.4 GHz | 0.424 | 0.256 | **0.680** | ΣSAR<1.6, Not required |
| LTE B5 + WLAN 2.4 GHz | 0.380 | 0.256 | 0.636 | ΣSAR<1.6, Not required |
| LTE B41 + WLAN 2.4 GHz | 0.134 | 0.256 | 0.390 | ΣSAR<1.6, Not required |

### 14.12.6 Hotspot Simultaneous Transmission with Bluetooth

| Band | Scaled 1 g SAR WWAN (W/kg) | Scaled 1 g SAR Bluetooth (W/kg) | Σ 1 g SAR (W/kg) | SPLSR |
|---|---|---|---|---|
| WCDMA B5 + Bluetooth | 0.424 | 0.049 | 0.473 | ΣSAR<1.6, Not required |
| LTE B5 + Bluetooth | 0.380 | 0.049 | 0.429 | ΣSAR<1.6, Not required |
| LTE B41 + Bluetooth | 0.134 | 0.049 | 0.183 | ΣSAR<1.6, Not required |

<Note>
* Simultaneous transmission SAR test exclusion considerations
  : Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneously transmitting antenna. When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration. Per KDB Publication 447498 D01v06.
* The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit (1.6 W/kg per 1-g). Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit. And therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06.
* Simultaneous transmission SAR measurement (Volume Scan) is not required because the either sum of the 1-g SAR is < 1.6 W/kg or the SPLSR is < 0.04 for all circumstances that require SPLSR calculation.
* Bluetooth and WLAN share the same antenna path.
* Bluetooth can't transmit with WLAN simultaneously.
* Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests test mode type. See Section 13.2(page 33) for the time domain plot and calculation for the duty factor of the device.
* Bluetooth SAR were evaluated for BT tethering applications.

# 15. Test System Verification Results

900 MHz(2019-03-10)

**Procedure Name: d=15 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)**

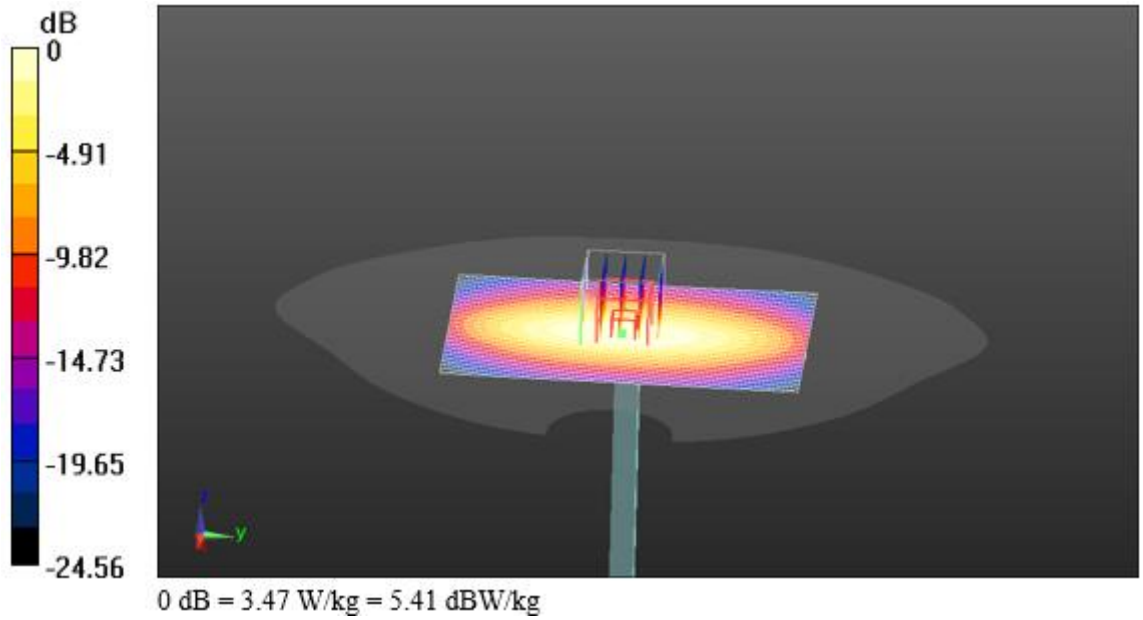
Frequency: 900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; $\sigma$ = 0.962 S/m; $\varepsilon_r$ = 41.703; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(9.94, 9.94, 9.94) @ 900 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_1_20180808; Type: QD 000 P40 CC; Serial: 1363
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/d=15 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)/Area Scan (71x101x1):**
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.47 W/kg

**Configuration/d=15 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)/Zoom Scan (5x5x7)/Cube 0:**
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 62.00 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 4.16 W/kg
**SAR(1 g) = 2.78 W/kg; SAR(10 g) = 1.8 W/kg**
Maximum value of SAR (measured) = 3.55 W/kg



0 dB = 3.47 W/kg = 5.41 dBW/kg

## 2 600 MHz(2019-02-27)

**Procedure Name: d=10 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)**

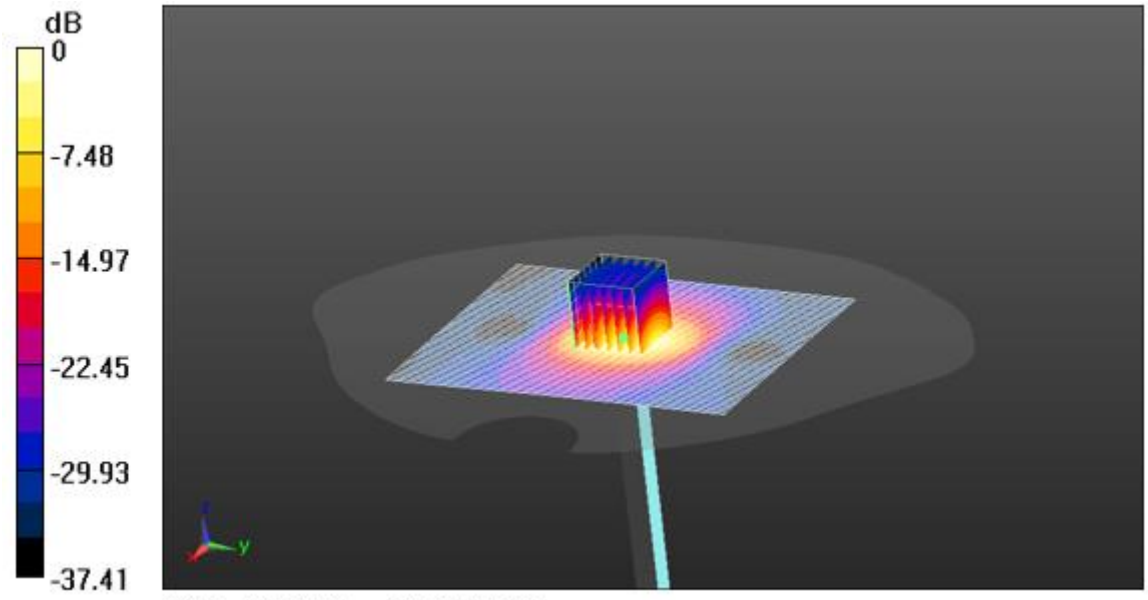
Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; $\sigma$ = 2.009 S/m; $\varepsilon_r$ = 37.536; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.5, 7.5, 7.5) @ 2600 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_4_20180808; Type: QD 000 P40 CC; Serial: 1362
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/d=10 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)/Area Scan (101x131x1):**
Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 23.3 W/kg

**Configuration/d=10 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0:**
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 107.3 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 32.1 W/kg
**SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.16 W/kg**
Maximum value of SAR (measured) = 22.5 W/kg



0 dB = 23.3 W/kg = 13.67 dBW/kg

## 2 450 MHz(2019-03-05)

**Procedure Name: d=10 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)**

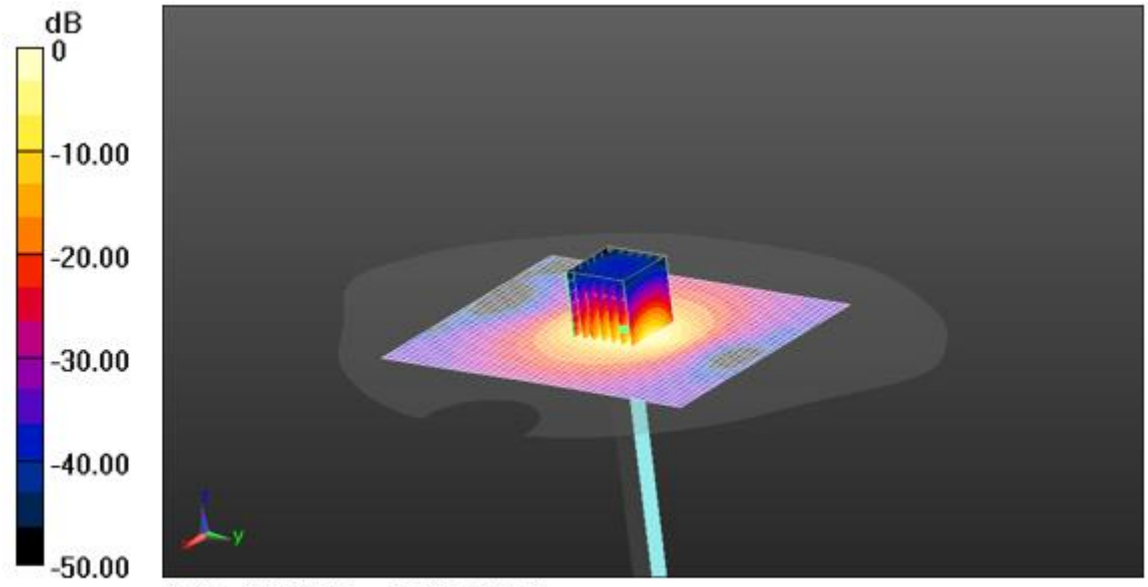
Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; $\sigma$ = 1.783 S/m; $\varepsilon_r$ = 39.427; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.72, 7.72, 7.72) @ 2450 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_4_20180808; Type: QD 000 P40 CC; Serial: 1362
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/d=10 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)/Area Scan (101x131x1):**
Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR(interpolated) = 19.7 W/kg

**Configuration/d=10 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0:**
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.1 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 26.8 W/kg
**SAR(1 g) = 12.4 W/kg; SAR(10 g) = 5.62 W/kg**
Maximum value of SAR (measured) = 19.4 W/kg



0 dB = 19.7 W/kg = 12.94 dBW/kg

900 MHz(2019-03-10)

**Procedure Name: d=15 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)**

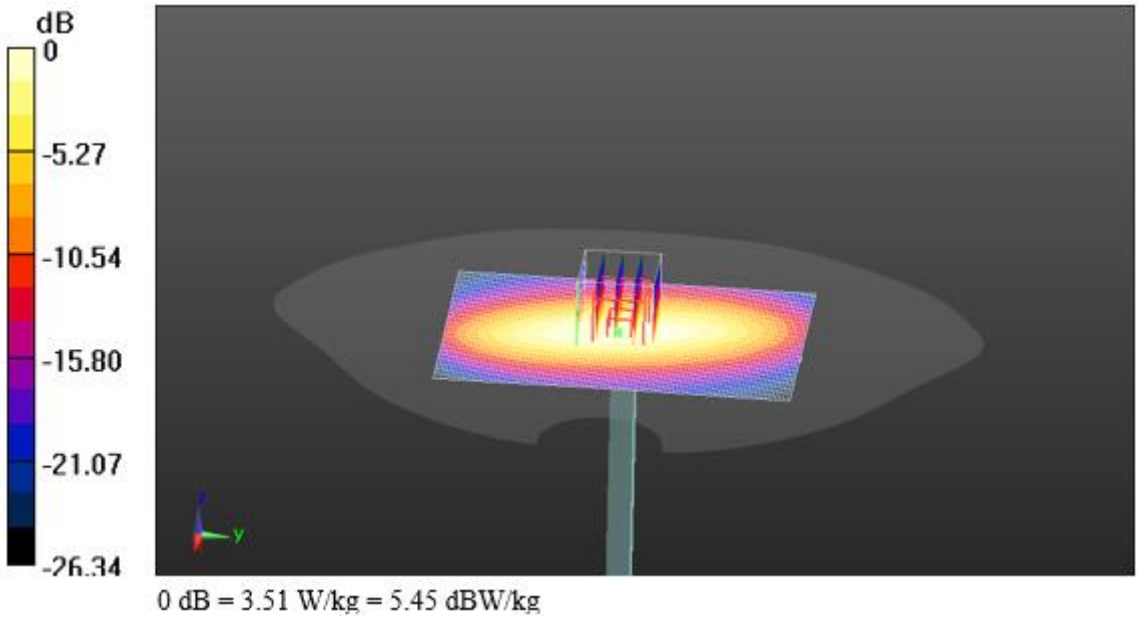
Frequency: 900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; $\sigma$ = 1.044 S/m; $\varepsilon_r$ = 54.724; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(10.37, 10.37, 10.37) @ 900 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_4_20180808; Type: QD 000 P40 CC; Serial: 1362
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/d=15 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)/Area Scan (71x101x1):**
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.51 W/kg

**Configuration/d=15 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)/Zoom Scan (5x5x7)/Cube 0:**
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 57.24 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 4.18 W/kg
**SAR(1 g) = 2.78 W/kg; SAR(10 g) = 1.8 W/kg**
Maximum value of SAR (measured) = 3.55 W/kg



## 2 600 MHz(2019-02-27)

**Procedure Name: d=10 mm, Pin=250 mW, dist=2.0mm (EX-Probe)**

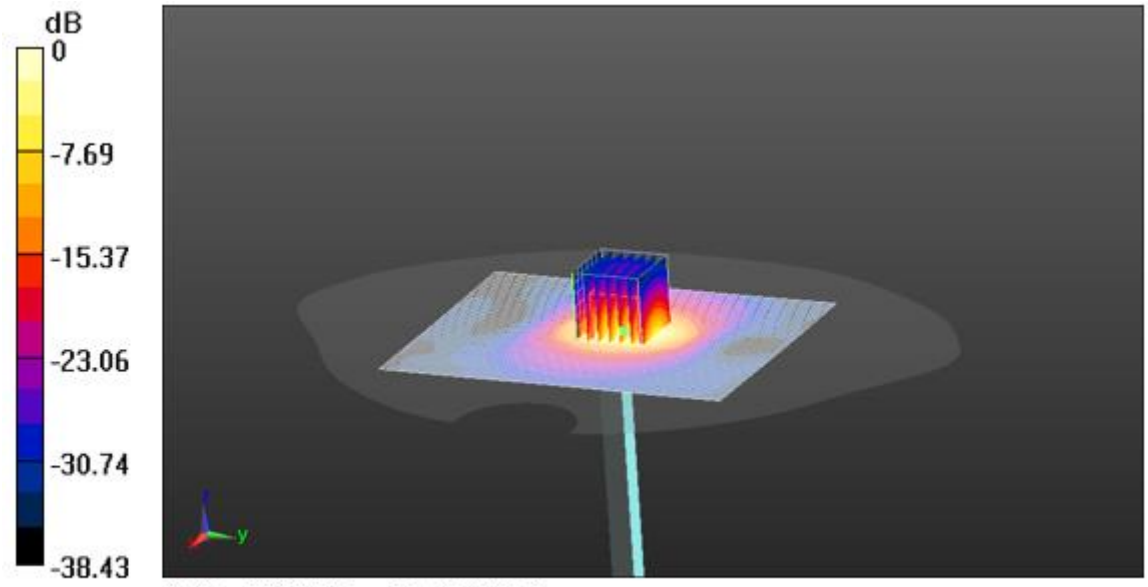
Frequency: 2600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; $\sigma$ = 2.205 S/m; $\varepsilon_r$ = 52.635; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.74, 7.74, 7.74) @ 2600 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_1_20180808; Type: QD 000 P40 CC; Serial: 1363
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**System Performance Check (without Area Scan)/d=10 mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Area Scan (101x131x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 20.3 W/kg

**System Performance Check (without Area Scan)/d=10 mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 67.09 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 28.0 W/kg
**SAR(1 g) = 13.2 W/kg; SAR(10 g) = 5.84 W/kg**
Maximum value of SAR (measured) = 20.5 W/kg



0 dB = 20.3 W/kg = 13.07 dBW/kg

## 2 450 MHz(2019-03-06)

**Procedure Name: d=10 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)**

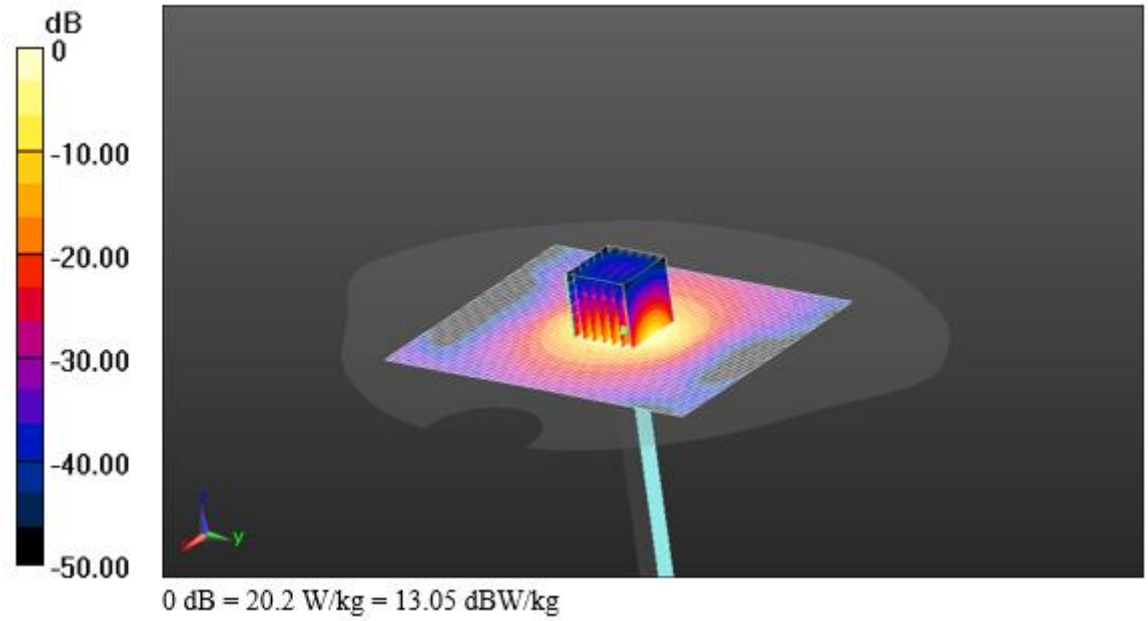
Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; $\sigma$ = 1.975 S/m; $\varepsilon_r$ = 52.698; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.84, 7.84, 7.84) @ 2450 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_1_20180808; Type: QD 000 P40 CC; Serial: 1363
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/d=10 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)/Area Scan (101x131x1):**
Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 20.2 W/kg

**Configuration/d=10 mm, Pin=250 mW, dist=2.0 mm (EX-Probe)/Zoom Scan (7x7x7)/Cube 0:**
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.23 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 26.0 W/kg
**SAR(1 g) = 12.7 W/kg; SAR(10 g) = 5.8 W/kg**
Maximum value of SAR (measured) = 19.4 W/kg



0 dB = 20.2 W/kg = 13.05 dBW/kg

# 16. Test Results

**#1, #16**

**Procedure Name: WCDMA_B5_f.836.6_Right Cheek**

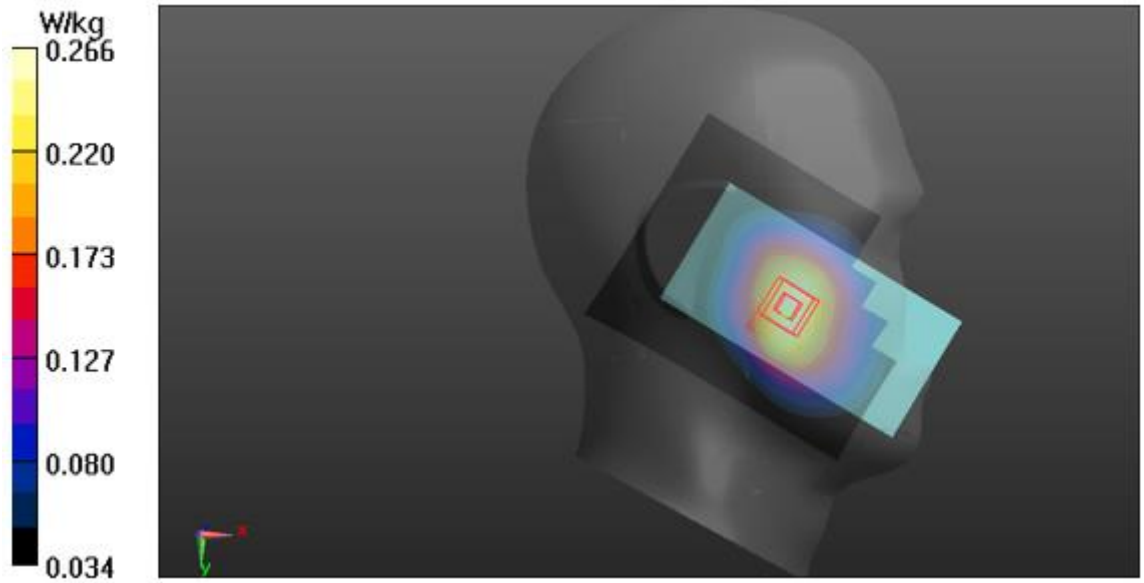
Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 836.6 MHz; $\sigma$ = 0.893 S/m; $\varepsilon_r$ = 42.275; $\rho$ = 1000 kg/m$^3$
Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(10.01, 10.01, 10.01) @ 836.6 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_1_20180808; Type: QD 000 P40 CC; Serial: 1363
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/WCDMA_B5_f.836.6_Right Cheek/Area Scan (81x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.265 W/kg

**Configuration/WCDMA_B5_f.836.6_Right Cheek/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.43 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.286 W/kg
**SAR(1 g) = 0.238 W/kg; SAR(10 g) = 0.183 W/kg**
Maximum value of SAR (measured) = 0.266 W/kg



**#2, #17**

**Procedure Name: WCDMA_B5_f.836.6_Rear_15 mm**

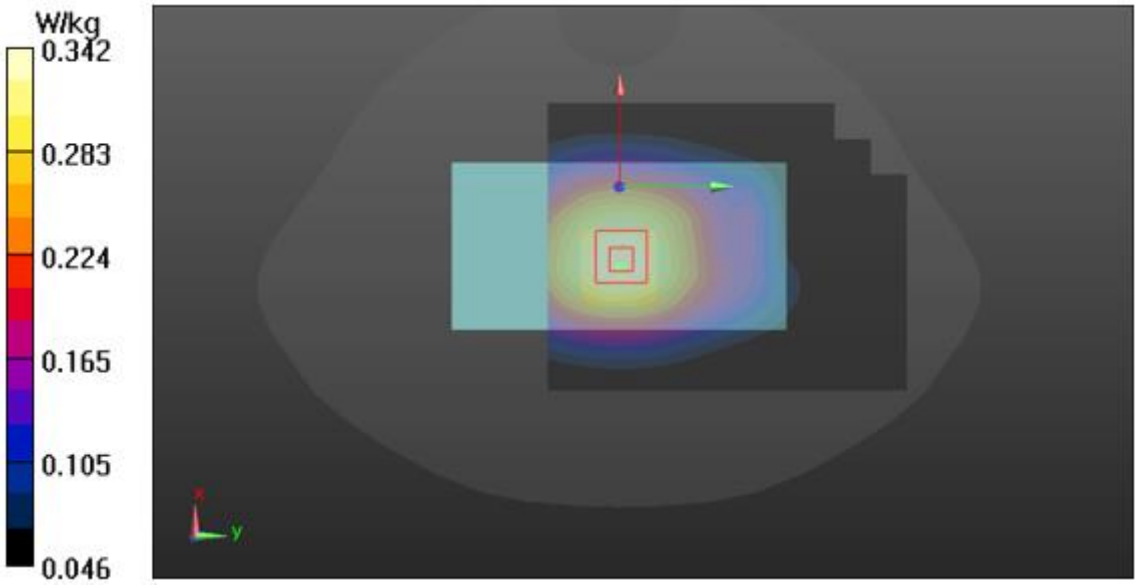
Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 836.6 MHz; $\sigma$ = 0.968 S/m; $\varepsilon_r$ = 55.15; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(10.39, 10.39, 10.39) @ 836.6 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_4_20180808; Type: QD 000 P40 CC; Serial: 1362
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/WCDMA_B5_f.836.6_Rear_15 mm/Area Scan (81x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.344 W/kg

**Configuration/WCDMA_B5_f.836.6_Rear_15 mm/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.07 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.378 W/kg
**SAR(1 g) = 0.298 W/kg; SAR(10 g) = 0.228 W/kg**
Maximum value of SAR (measured) = 0.342 W/kg



**#3, #18**

**Procedure Name: WCDMA_B5_f.836.6_Rear_10 mm**

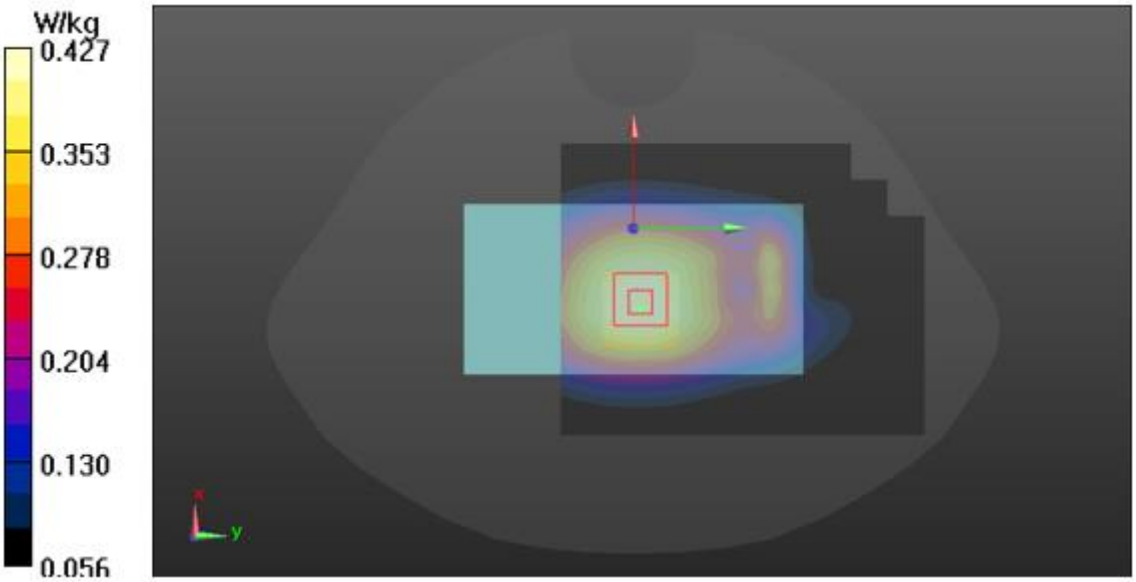
Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used: f = 836.6 MHz; $\sigma$ = 0.968 S/m; $\varepsilon_r$ = 55.15; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(10.39, 10.39, 10.39) @ 836.6 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_4_20180808; Type: QD 000 P40 CC; Serial: 1362
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/WCDMA_B5_f.836.6_Rear_10 mm/Area Scan (81x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.433 W/kg

**Configuration/WCDMA_B5_f.836.6_Rear_10 mm/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.16 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.470 W/kg
**SAR(1 g) = 0.373 W/kg; SAR(10 g) = 0.287 W/kg**
Maximum value of SAR (measured) = 0.427 W/kg



**#4, #19**

**Procedure Name: QPSK_10MHz_1RB_0offset_f.836.5_Right Cheek**

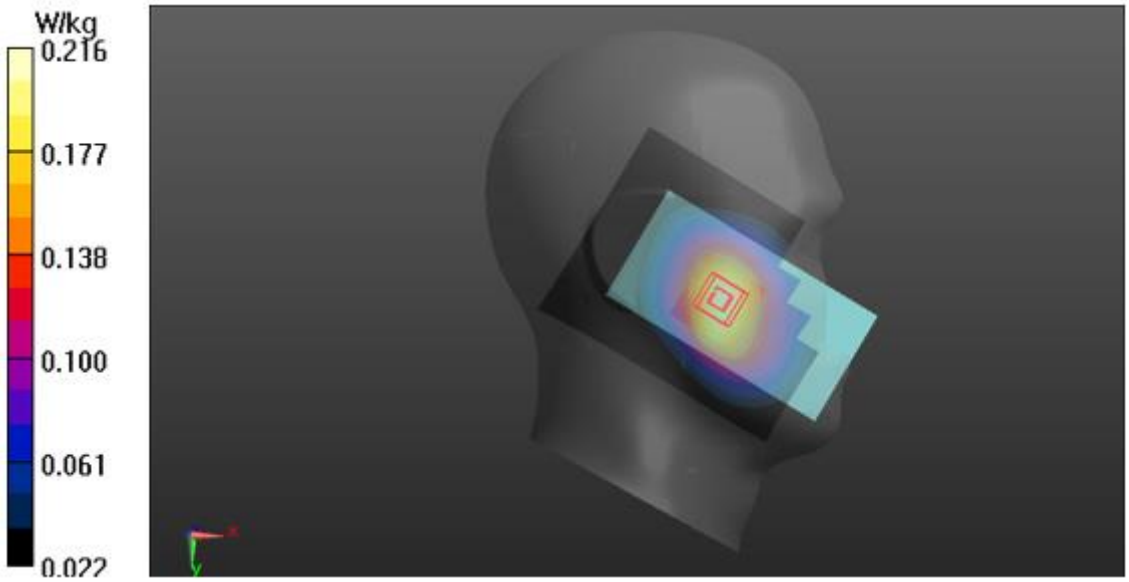
Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium parameters used: f = 836.5 MHz; $\sigma$ = 0.893 S/m; $\varepsilon_r$ = 42.273; $\rho$ = 1000 kg/m$^3$
Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(10.01, 10.01, 10.01) @ 836.5 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_1_20180808; Type: QD 000 P40 CC; Serial: 1363
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/QPSK_10MHz_1RB_0offset_f.836.5_Right Cheek/Area Scan (81x101x1):**
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.210 W/kg

**Configuration/QPSK_10MHz_1RB_0offset_f.836.5_Right Cheek/Zoom Scan (6x6x7)/Cube 0:**
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.74 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.236 W/kg
**SAR(1 g) = 0.193 W/kg; SAR(10 g) = 0.146 W/kg**
Maximum value of SAR (measured) = 0.216 W/kg



**#5, #20**

**Procedure Name: QPSK_10MHz_1RB_0offset_f.836.5_Rear_15 mm**

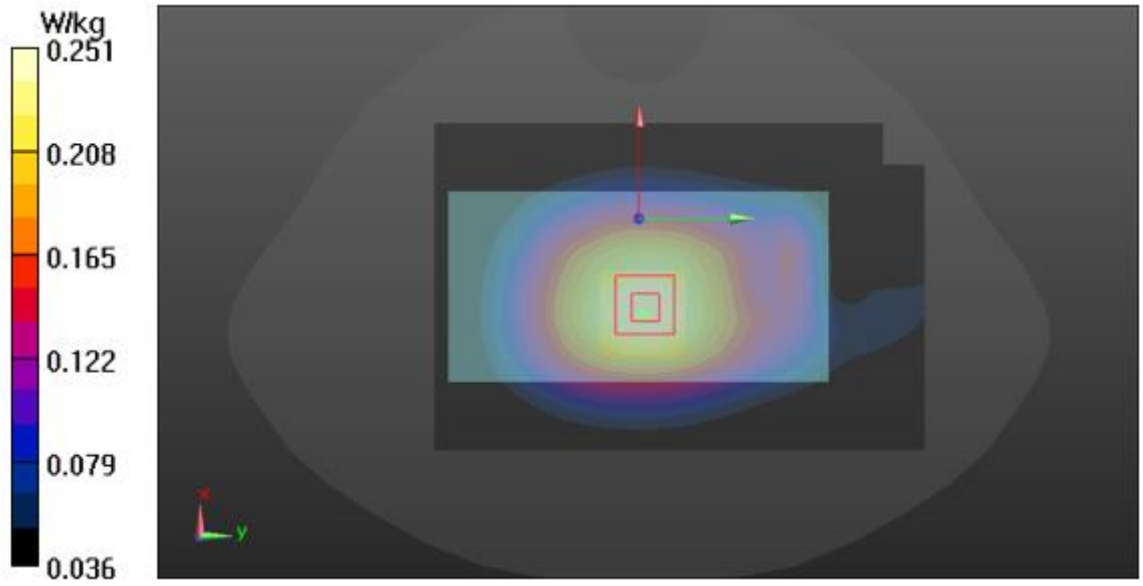
Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium parameters used: f = 836.5 MHz; $\sigma$ = 0.969 S/m; $\varepsilon_r$ = 55.16; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(10.39, 10.39, 10.39) @ 836.5 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_4_20180808; Type: QD 000 P40 CC; Serial: 1362
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/QPSK_10MHz_1RB_0offset_f.836.5_Rear_15 mm/Area Scan (81x121x1):**
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.256 W/kg

**Configuration/QPSK_10MHz_1RB_0offset_f.836.5_Rear_15 mm/Zoom Scan (5x5x7)/Cube 0:**
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.27 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.276 W/kg
**SAR(1 g) = 0.218 W/kg; SAR(10 g) = 0.167 W/kg**
Maximum value of SAR (measured) = 0.251 W/kg



**#6, #21**

**Procedure Name: QPSK_10MHz_1RB_0offset_f.836.5_Rear_10 mm**

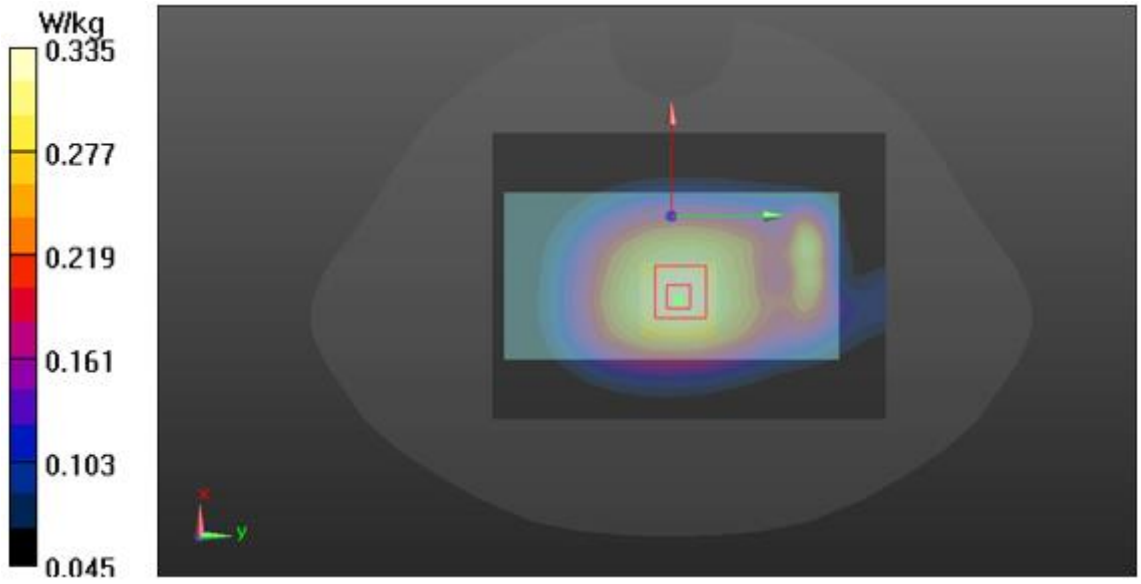
Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium parameters used: f = 836.5 MHz; $\sigma$ = 0.969 S/m; $\varepsilon_r$ = 55.16; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(10.39, 10.39, 10.39) @ 836.5 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_4_20180808; Type: QD 000 P40 CC; Serial: 1362
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/QPSK_10MHz_1RB_0offset_f.836.5_Rear_10 mm/Area Scan (81x111x1):**
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.338 W/kg

**Configuration/QPSK_10MHz_1RB_0offset_f.836.5_Rear_10 mm/Zoom Scan (5x5x7)/Cube 0:**
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.61 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.368 W/kg
**SAR(1 g) = 0.293 W/kg; SAR(10 g) = 0.225 W/kg**
Maximum value of SAR (measured) = 0.335 W/kg



**#7, #22**

**Procedure Name: QPSK_20MHz_1RB_99offset_f.2 506_Left Cheek**

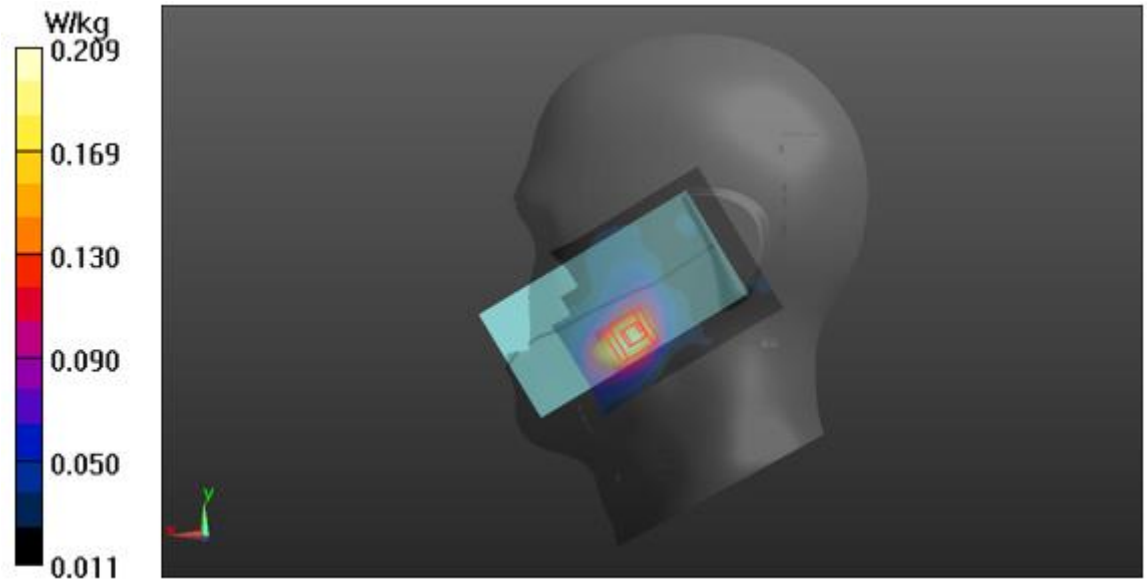
Frequency: 2506 MHz;Duty Cycle: 1:1.58016
Medium parameters used: f = 2506 MHz; $\sigma$ = 1.873 S/m; $\varepsilon_r$ = 37.581; $\rho$ = 1000 kg/m$^3$
Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.5, 7.5, 7.5) @ 2506 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_4_20180808; Type: QD 000 P40 CC; Serial: 1362
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/QPSK_20MHz_1RB_99offset_f.2 506_Left Cheek/Area Scan (81x101x1):**
Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.218 W/kg

**Configuration/QPSK_20MHz_1RB_99offset_f.2 506_Left Cheek/Zoom Scan (7x7x7)/Cube 0:**
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.642 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.281 W/kg
**SAR(1 g) = 0.149 W/kg; SAR(10 g) = 0.084 W/kg**
Maximum value of SAR (measured) = 0.209 W/kg



**#8, #23**

**Procedure Name: QPSK_20MHz_1RB_99offset_f.2 506_Rear_15mm**

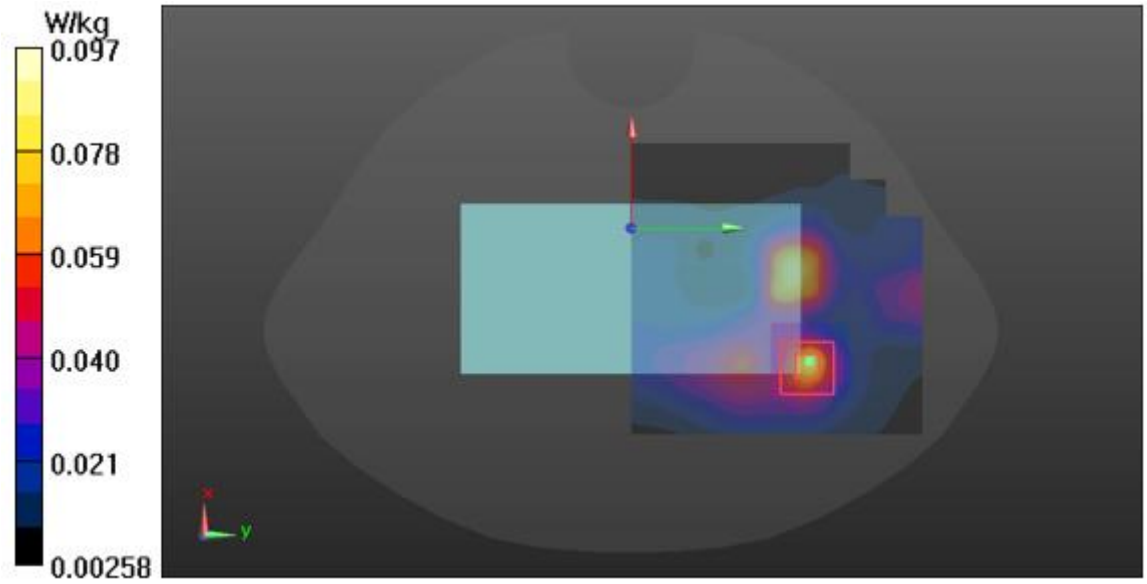
Frequency: 2506 MHz;Duty Cycle: 1:1.58016
Medium parameters used: f = 2506 MHz; $\sigma$ = 2.083 S/m; $\varepsilon_r$ = 52.769; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.74, 7.74, 7.74) @ 2506 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_1_20180808; Type: QD 000 P40 CC; Serial: 1363
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/QPSK_20MHz_1RB_99offset_f.2 506_Rear_15mm/Area Scan (81x81x1):**
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.0935 W/kg

**Configuration/QPSK_20MHz_1RB_99offset_f.2 506_Rear_15mm/Zoom Scan (5x5x7)/Cube 0:**
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.247 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.134 W/kg
**SAR(1 g) = 0.064 W/kg; SAR(10 g) = 0.031 W/kg**
Maximum value of SAR (measured) = 0.0965 W/kg



**#9, #24**

**Procedure Name: QPSK_20MHz_50RB_50offset_f.2 506_Rear_10 mm**

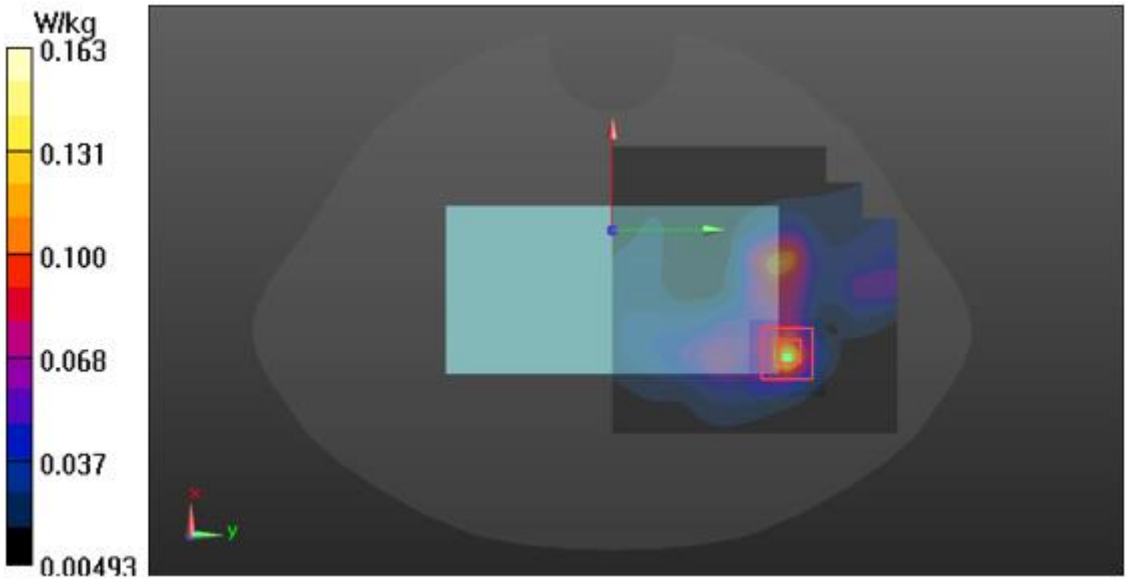
Frequency: 2506 MHz;Duty Cycle: 1:1.58016
Medium parameters used (interpolated): f = 2506 MHz; $\sigma$ = 2.083 S/m; $\varepsilon_r$ = 52.769; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.74, 7.74, 7.74) @ 2506 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_1_20180808; Type: QD 000 P40 CC; Serial: 1363
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/QPSK_20MHz_50RB_50offset_f.2 506_Rear_10 mm/Area Scan (81x81x1):**
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.160 W/kg

**Configuration/QPSK_20MHz_50RB_50offset_f.2 506_Rear_10 mm/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.497 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.235 W/kg
**SAR(1 g) = 0.107 W/kg; SAR(10 g) = 0.047 W/kg**
Maximum value of SAR (measured) = 0.163 W/kg



**#10**

**Procedure Name: 802.11b_f.2 437_Right Tilt**

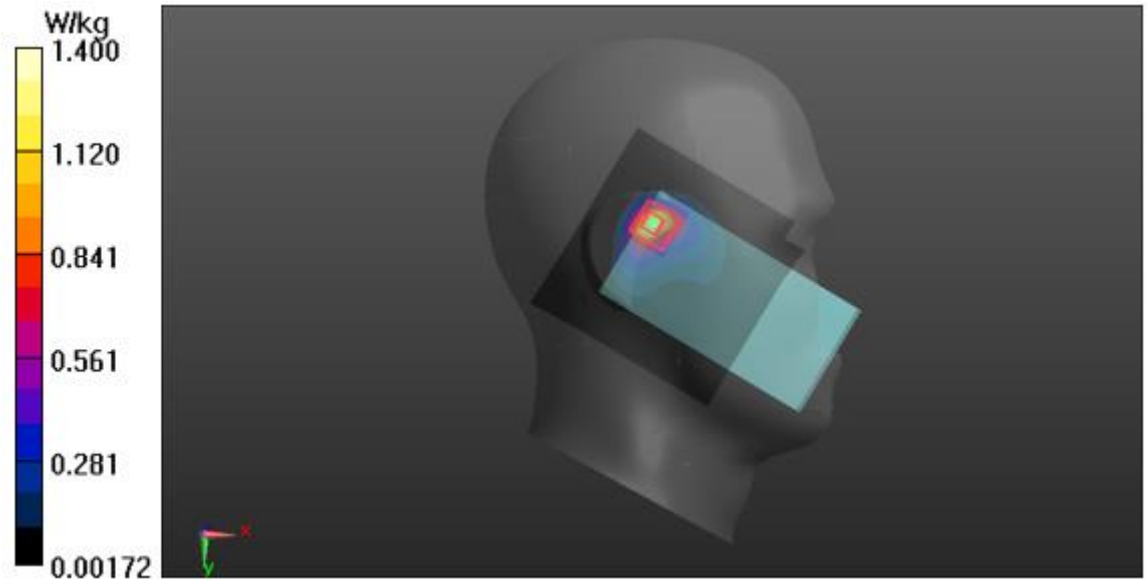
Frequency: 2437 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2437 MHz; $\sigma$ = 1.771 S/m; $\varepsilon_r$ = 39.483; $\rho$ = 1000 kg/m$^3$
Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.72, 7.72, 7.72) @ 2437 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_4_20180808; Type: QD 000 P40 CC; Serial: 1362
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/802.11b_f.2 437_Right Tilt/Area Scan (101x101x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.40 W/kg

**Configuration/802.11b_f.2 437_Right Tilt/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.25 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 2.16 W/kg
**SAR(1 g) = 0.906 W/kg; SAR(10 g) = 0.393 W/kg**
Maximum value of SAR (measured) = 1.40 W/kg



**#11, #26**

**Procedure Name: 802.11b_f.2 412_Front_15 mm**

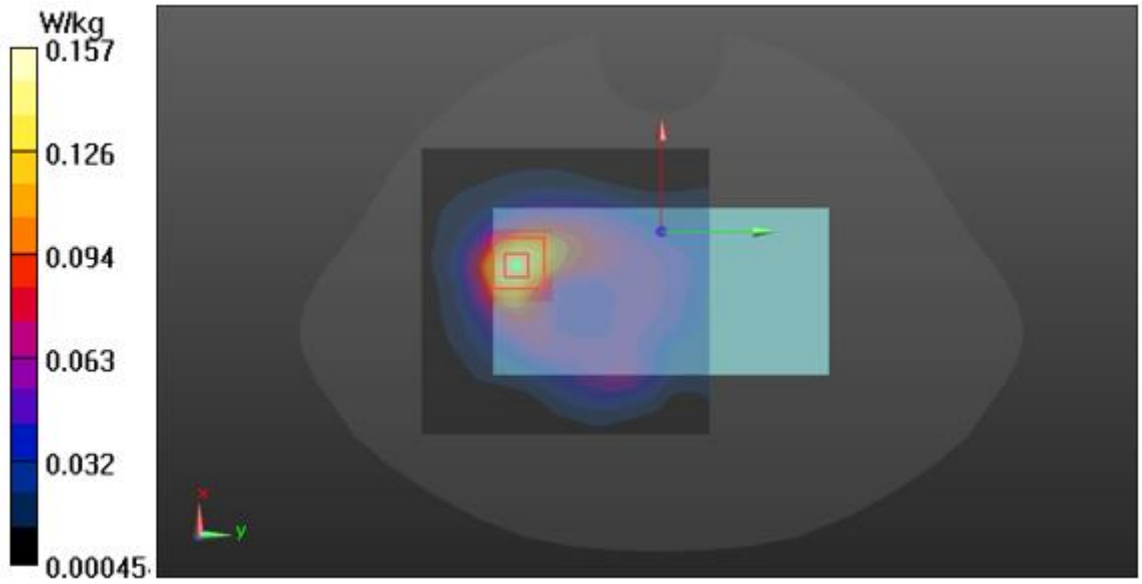
Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; $\sigma$ = 1.927 S/m; $\varepsilon_r$ = 52.754; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.84, 7.84, 7.84) @ 2412 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_1_20180808; Type: QD 000 P40 CC; Serial: 1363
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/802.11b_f.2 412_Front_15 mm/Area Scan (101x101x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.159 W/kg

**Configuration/802.11b_f.2 412_Front_15 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.477 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.215 W/kg
**SAR(1 g) = 0.104 W/kg; SAR(10 g) = 0.056 W/kg**
Maximum value of SAR (measured) = 0.157 W/kg



**#12, #27**

**Procedure Name: 802.11b_f.2 412_Rear_10 mm**

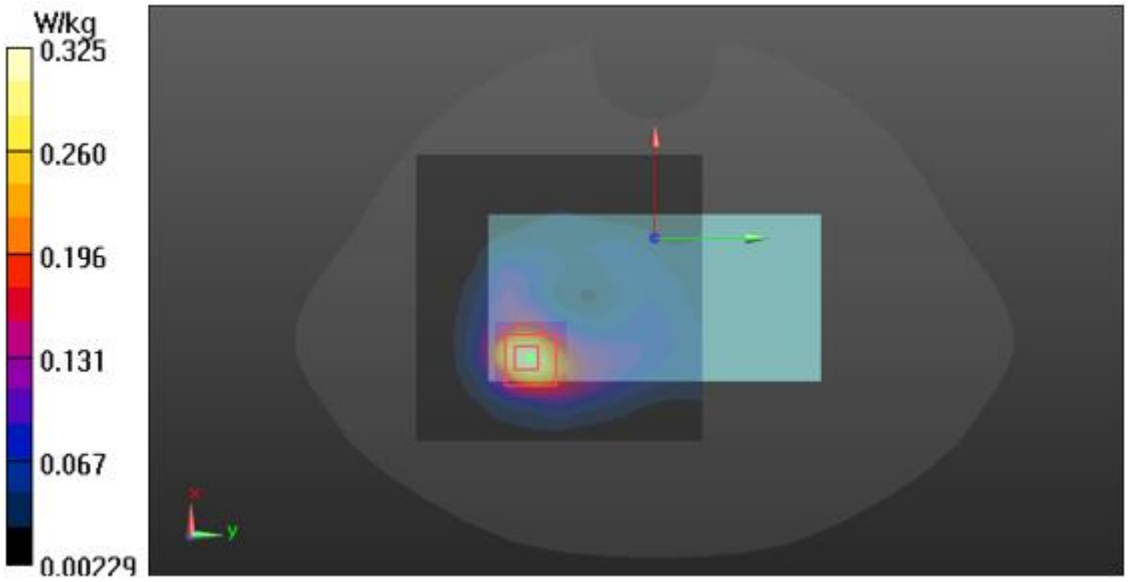
Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; $\sigma$ = 1.927 S/m; $\varepsilon_r$ = 52.754; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.84, 7.84, 7.84) @ 2412 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_1_20180808; Type: QD 000 P40 CC; Serial: 1363
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/802.11b_f.2 412_Rear_10 mm/Area Scan (101x101x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.322 W/kg

**Configuration/802.11b_f.2 412_Rear_10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.985 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.457 W/kg
**SAR(1 g) = 0.232 W/kg; SAR(10 g) = 0.116 W/kg**
Maximum value of SAR (measured) = 0.325 W/kg



**#13, #28**

**Procedure Name: Bluetooth_DH5_f.2 441_Right Cheek**

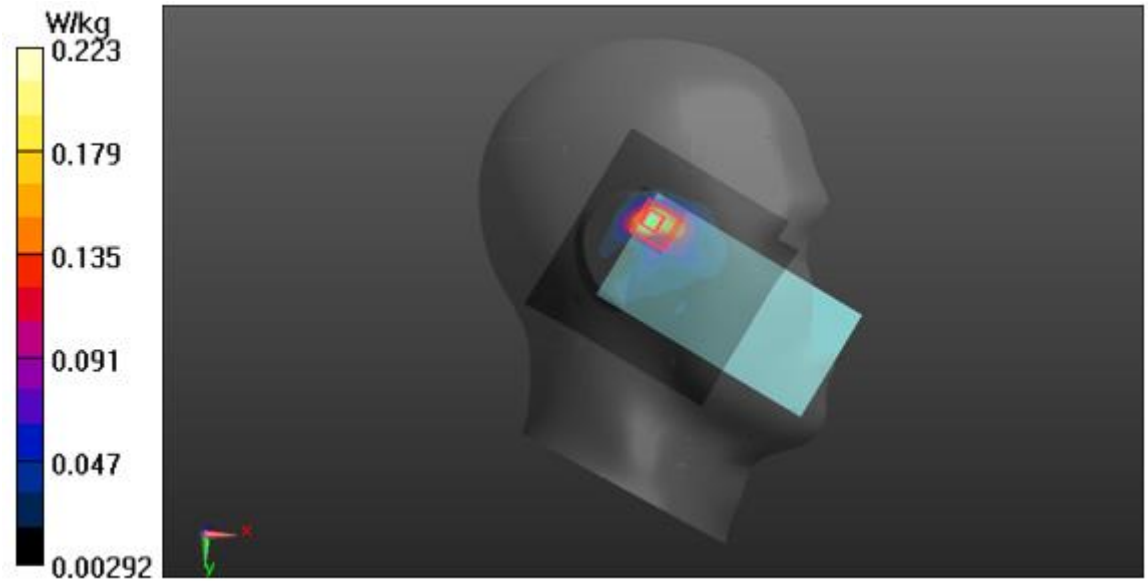
Frequency: 2441 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2441 MHz; $\sigma$ = 1.772 S/m; $\varepsilon_r$ = 39.466; $\rho$ = 1000 kg/m$^3$
Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.72, 7.72, 7.72) @ 2441 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_4_20180808; Type: QD 000 P40 CC; Serial: 1362
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/Bluetooth_DH5_f.2 441_Right Cheek/Area Scan (101x101x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.280 W/kg

**Configuration/Bluetooth_DH5_f.2 441_Right Cheek/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.035 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.336 W/kg
**SAR(1 g) = 0.145 W/kg; SAR(10 g) = 0.068 W/kg**
Maximum value of SAR (measured) = 0.223 W/kg



**#14, #29**

**Procedure Name: Bluetooth_DH5_f.2 441_Front_15 mm**

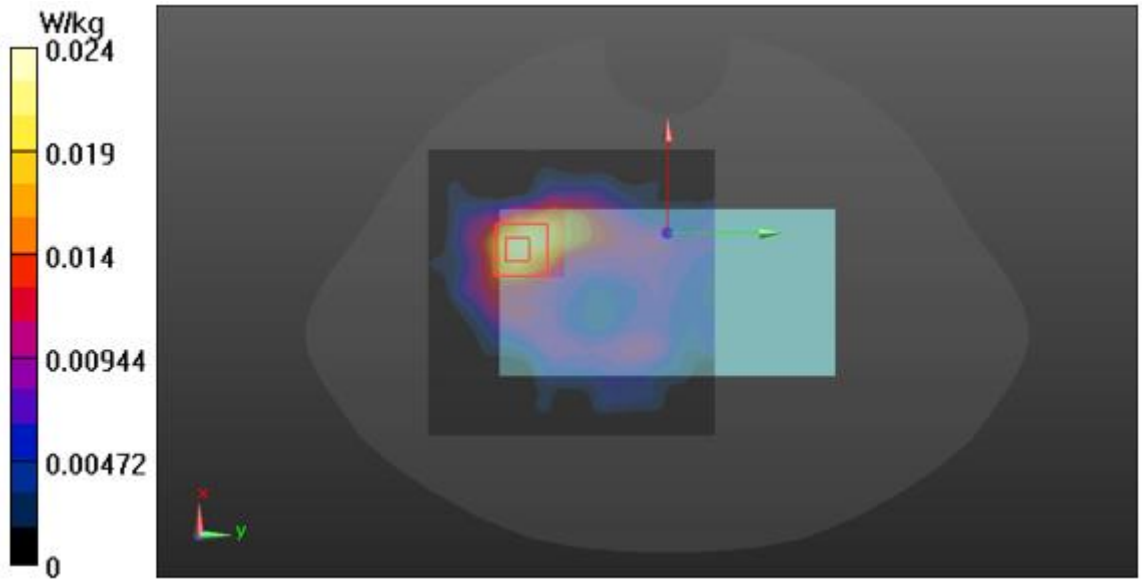
Frequency: 2441 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2441 MHz; $\sigma$ = 1.967 S/m; $\varepsilon_r$ = 52.702; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.84, 7.84, 7.84) @ 2441 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_1_20180808; Type: QD 000 P40 CC; Serial: 1363
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/Bluetooth_DH5_f.2 441_Front_15 mm/Area Scan (101x101x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0243 W/kg

**Configuration/Bluetooth_DH5_f.2 441_Front_15 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.983 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.0320 W/kg
**SAR(1 g) = 0.017 W/kg; SAR(10 g) = 0.00869 W/kg**
Maximum value of SAR (measured) = 0.0236 W/kg



**#15, #30**

**Procedure Name: Bluetooth_DH5_f.2 441_Rear_10 mm**

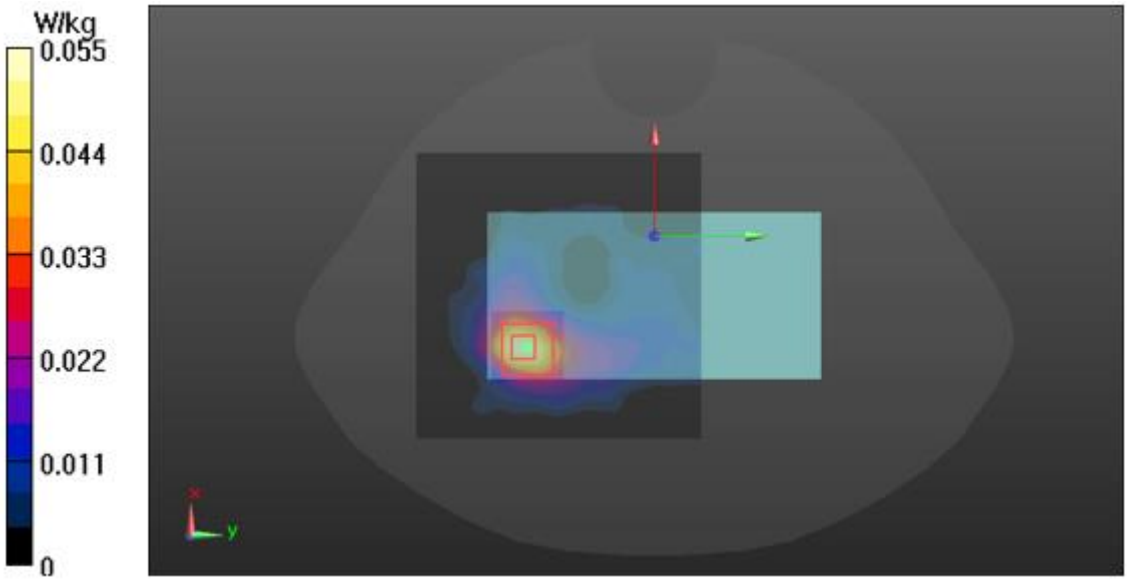
Frequency: 2441 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2441 MHz; $\sigma$ = 1.967 S/m; $\varepsilon_r$ = 52.702; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.84, 7.84, 7.84) @ 2441 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_1_20180808; Type: QD 000 P40 CC; Serial: 1363
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/Bluetooth_DH5_f.2 441_Rear_10 mm/Area Scan (101x101x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0540 W/kg

**Configuration/Bluetooth_DH5_f.2 441_Rear_10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.277 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.0750 W/kg
**SAR(1 g) = 0.038 W/kg; SAR(10 g) = 0.019 W/kg**
Maximum value of SAR (measured) = 0.0553 W/kg



**#25**

**Procedure Name: 802.11b_f.2 412_Right Tilt**

Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2412 MHz; $\sigma$ = 1.743 S/m; $\varepsilon_r$ = 39.56; $\rho$ = 1000 kg/m$^3$
Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.72, 7.72, 7.72) @ 2412 MHz; Calibrated: 2018-08-29
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn666; Calibrated: 2019-01-25
- Phantom: Twin-SAM V4.0 (30deg probe tilt)_4_20180808; Type: QD 000 P40 CC; Serial: 1362
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

**Configuration/802.11b_f.2 412_Right Tilt/Area Scan (101x101x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.35 W/kg

**Configuration/802.11b_f.2 412_Right Tilt/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.02 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 2.10 W/kg
**SAR(1 g) = 0.900 W/kg; SAR(10 g) = 0.395 W/kg**
Maximum value of SAR (measured) = 1.40 W/kg