# SAR TEST REPORT

For

Shenzhen Pet Baby Technology Co., LTD

Pet GPS Tracker & Health Monitor

Test Model: C08

Additional Model No.: WOY-028

| | | |
|---|---|---|
| Prepared for | : | Shenzhen Pet Baby Technology Co., LTD |
| Address | : | 504, Building B, Lin guo suo hengmingzhu Industrial Park, Taoyuan Community, Xixiang Street, Baoan District, Shenzhen, China |
| | | |
| Prepared by | : | Shenzhen LCS Compliance Testing Laboratory Ltd. |
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| | | |
| Date of receipt of test sample | : | June 06, 2024 |
| Number of tested samples | : | 1 |
| Sample number | : | A240603190-1 |
| Serial number | : | Prototype |
| Date of Test | : | June 06, 2024 ~ June 17, 2024 |
| Date of Report | : | June 25, 2024 |

# SAR TEST REPORT

| | |
|---|---|
| Report Reference No.....................: | LCSA06034215EB |
| Date Of Issue...................................: | June 25, 2024 |
| **Testing Laboratory Name.............:** | **Shenzhen LCS Compliance Testing Laboratory Ltd.** |
| Address...............................................: | 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China |
| Testing Location/ Procedure...........: | Full application of Harmonised standards ■<br>Partial application of Harmonised standards □<br>Other standard testing method □ |
| **Applicant's Name........................ :** | **Shenzhen Pet Baby Technology Co., LTD** |
| Address............................................ : | 504, Building B, Lin guo suo hengmingzhu Industrial Park, Taoyuan Community, Xixiang Street, Baoan District, Shenzhen, China |
| **Test Specification:** | |
| Standard..........................................: | FCC 47CFR §2.1093, ANSI/IEEE C95.1-2019, IEEE 1528-2013 |
| Test Report Form No.................... : | LCSEMC-1.0 |
| TRF Originator.................................: | Shenzhen LCS Compliance Testing Laboratory Ltd. |
| Master TRF....................................: | Dated 2014-09 |



| | |
|---|---|
| **Test Item Description.................:** | **Pet GPS Tracker & Health Monitor** |
| Trade Mark......................................: | N/A |
| Model/Type Reference..................: | C08 |
| Ratings.............................................: | Input: 5V⎓1A<br>Battery: DC 3.7V, 500mAh |
| **Result ............................................:** | **Positive** |

| Compiled by: | Supervised by: | Approved by: |
|---|---|---|
| Jay Zhan (signature) | Cary Luo (signature) | Gavin Liang (signature) |
| Jay Zhan/ File administrators | Cary Luo / Technique principal | Gavin Liang/ Manager |

# SAR -- TEST REPORT

| | | |
|---|---|---|
| **Test Report No. :** | **LCSA06034215EB** | June 25, 2024<br>Date of issue |

| | | |
|---|---|---|
| EUT...................................... | : | Pet GPS Tracker & Health Monitor |
| Type/Model .......................... | : | C08 |
| **Applicant..............................** | **:** | **Shenzhen Pet Baby Technology Co., LTD** |
| Address................................. | : | 504, Building B, Lin guo suo hengmingzhu Industrial Park, Taoyuan Community, Xixiang Street, Baoan District, Shenzhen, China |
| Telephone............................. | : | / |
| Fax........................................ | : | / |
| **Manufacturer.......................** | **:** | **Shenzhen Pet Baby Technology Co., LTD** |
| Address................................. | : | 504, Building B, Lin guo suo hengmingzhu Industrial Park, Taoyuan Community, Xixiang Street, Baoan District, Shenzhen, China |
| Telephone............................. | : | / |
| Fax........................................ | : | / |
| **Factory.................................** | **:** | **Shenzhen Pet Baby Technology Co., LTD** |
| Address................................. | : | 504, Building B, Lin guo suo hengmingzhu Industrial Park, Taoyuan Community, Xixiang Street, Baoan District, Shenzhen, China |
| Telephone............................. | : | / |
| Fax........................................ | : | / |

| | |
|---|---|
| **Test Result** | **Positive** |

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

# Revison History

| Revision | Issue Date | Revision Content | Revised By |
|---|---|---|---|
| 000 | June 25, 2024 | Initial Issue | --- |
| | | | |
| | | | |

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# 1. TEST STANDARDS AND TEST DESCRIPTION

## 1.1. Statement of Compliance

The maximum of results of SAR found during testing for C08 are follows:

<Highest Reported standalone SAR Summary>

| Classment Class | Frequency Band | Body (Report SAR1-g (W/kg) |
|---|---|---|
| | | (Separation Distance 0mm) |
| PCE | LTE Band 5 | 0.227 |
| | LTE Band 41 | 0.494 |

Note
1) This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-2005, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013.

## 1.2. Test Location

| | |
|---|---|
| Company: | Shenzhen LCS Compliance Testing Laboratory Ltd. |
| Address: | 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China |
| Telephone: | (+86)755-82591330 |
| Fax: | (+86)755-82591330 |
| Web: | www.LCS-cert.com |
| E-mail: | webmaster@LCS-cert.com |

## 1.3. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

| Site Description | | |
|---|---|---|
| SAR Lab. | : | NVLAP Accreditation Code is 600167-0.<br>FCC Designation Number is CN5024.<br>CAB identifier is CN0071.<br>CNAS Registration Number is L4595.<br>Test Firm Registration Number: 254912. |

## 1.4. Test Laboratory Environment

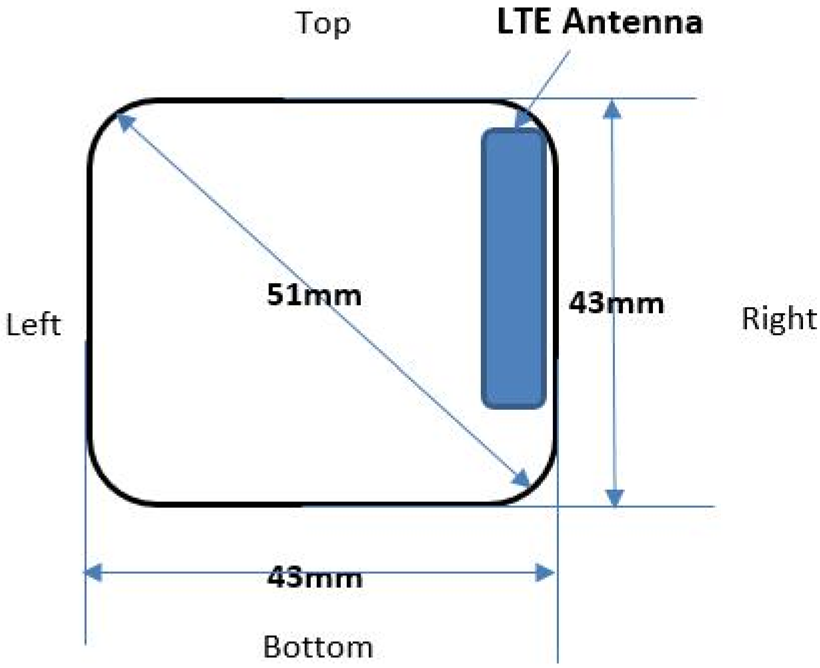
| | |
|---|---|
| Temperature | Min. = 18°C, Max. = 25 °C |
| Relative humidity | Min. = 30%, Max. = 70% |
| Ground system resistance | < 0.5 |
| Atmospheric pressure: | 950-1050mbar |
| Ambient noise is checked and found very low and in compliance with requirement of standards.<br>Reflection of surrounding objects is minimized and in compliance with requirement of standards. | |

## 1.5. Product Description

The **Shenzhen Pet Baby Technology Co., LTD**'s Model: C08 or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

| | | |
|---|---|---|
| EUT | : | Pet GPS Tracker & Health Monitor |
| Test Model | : | C08 |
| Additional Model No. | : | WOY-028 |
| Model Declaration | : | PCB board, structure and internal of these model(s) are the same, So no additional models were tested |
| Power Supply | : | Input: 5V⎓1A<br>Battery: DC 3.7V, 500mAh |
| Hardware Version | : | / |
| Software Version | : | / |
| LTE | : | |
| Support Band | : | ☒ E-UTRA Band 5(U.S.-Band)<br>☒ E-UTRA Band 41(U.S.-Band) |
| LTE Release Version | : | R12 |
| Type Of Modulation | : | QPSK/16QAM |
| Antenna Description | : | FPC Antenna<br>0dBi(max.) For E-UTRA Band 5<br>0dBi(max.) For E-UTRA Band 41 |
| Power Class | : | Class 3 |
| GPS function | : | Support and only RX |
| Exposure category | : | Uncontrolled Environment General Population |

## 1.6. DUT Antenna Locations(Rear View)




Note:

1) Main Antenna: LTE Band 5/41

## 1.7. Test Specification

| Identity | Document Title |
|---|---|
| FCC 47CFR §2.1093 | Radiofrequency Radiation Exposure Evaluation: Portable Devices |
| ANSI/IEEE C95.1-1992 | IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz. |
| IEEE 1528-2013 | Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques |
| KDB 941225 D05 | SAR for LTE Devices v02r05 |
| KDB 941225 D06 | Hotspot Mode SAR v02r01 |
| KDB 648474 D04 | Handset SAR v01r03 |
| KDB 447498 D01 | General RF Exposure Guidance v06 |
| KDB 865664 D01 | SAR Measurement 100 MHz to 6 GHz v01r04 |
| KDB 865664 D02 | RF Exposure Reporting v01r02 |
| KDB 690783 D01 | SAR Listings on Grants v01r03 |

## 1.8. RF exposure limits

| Human Exposure | Uncontrolled Environment General Population | Controlled Environment Occupational |
|---|---|---|
| **Spatial Peak SAR*** (Brain*Trunk) | **1.60 mW/g** | 8.00 mW/g |
| **Spatial Average SAR**** (Whole Body) | 0.08 mW/g | 0.40 mW/g |
| **Spatial Peak SAR***** (Hands/Feet/Ankle/Wrist) | **4.00 mW/g** | 20.00 mW/g |

**Notes:**
* The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time
** The Spatial Average value of the SAR averaged over the whole body.
*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

**Uncontrolled Environments** are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

**Controlled Environments** are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation.)

## 1.9. Equipment list

| | |
|---|---|
| Test Platform | SPEAG DASY5 Professional |
| Description | SAR Test System (Frequency range 300MHz-6GHz) |
| Software Reference | DASY52; SEMCAD X |

**Hardware Reference**

| | Equipment | Manufacturer | Model | Serial Number | Calibration Date | Due date of calibration |
|---|---|---|---|---|---|---|
| ☒ | PC | Lenovo | NA | NA | NA | NA |
| ☒ | Twin Phantom | SPEAG | SAM V5.0 | 1850 | NCR | NCR |
| ☒ | ELI Phantom | SPEAG | ELI V6.0 | 2010 | NCR | NCR |
| ☒ | DAE | SPEAG | DAE3 | 373 | 2024/1/3 | 2025/1/2 |
| ☒ | E-Field Probe | SPEAG | EX3DV4 | 3805 | 2023/11/23 | 2024/11/22 |
| ☒ | Validation Kits | SPEAG | D835V2 | 4d124 | 2023/10/24 | 2026/10/23 |
| ☒ | Validation Kits | SPEAG | D2450V2 | 808 | 2023/10/23 | 2026/10/22 |
| ☒ | Agilent Network Analyzer | Agilent | 8753E | SU38432944 | 2024/6/6 | 2025/6/5 |
| ☒ | Dielectric Probe Kit | SPEAG | DAK3.5 | 1425 | NCR | NCR |
| ☒ | Universal Radio Communication Tester | R&S | CMW500 | 42115 | 2023/10/29 | 2024/10/28 |
| ☒ | Directional Coupler | MCLI/USA | 4426-20 | 03746 | 2024/6/6 | 2025/6/5 |
| ☒ | Power meter | Agilent | E4419B | MY45104493 | 2023/10/29 | 2024/10/28 |
| ☒ | Power meter | Agilent | E4419B | MY45100308 | 2023/10/29 | 2024/10/28 |
| ☒ | Power sensor | Agilent | E9301H | MY41495616 | 2023/10/29 | 2024/10/28 |
| ☒ | Power sensor | Agilent | E9301H | MY41495234 | 2023/10/29 | 2024/10/28 |
| ☒ | Signal Generator | Agilent | E4438C | MY49072627 | 2024/6/6 | 2025/6/5 |
| ☒ | Broadband Preamplifier | / | BP-01M18G | P190501 | 2024/6/6 | 2025/6/5 |
| ☒ | DC POWER SUPPLY | I-SHENG | SP-504 | NA | NCR | NCR |
| ☒ | Speed reading thermometer | HTC-1 | NA | LCS-E-138 | 2024/6/6 | 2025/6/5 |

Note: All the equipments are within the valid period when the tests are performed.

# 2. SAR MEASUREMENTS SYSTEM CONFIGURATION

## 2.1. SAR Measurement System

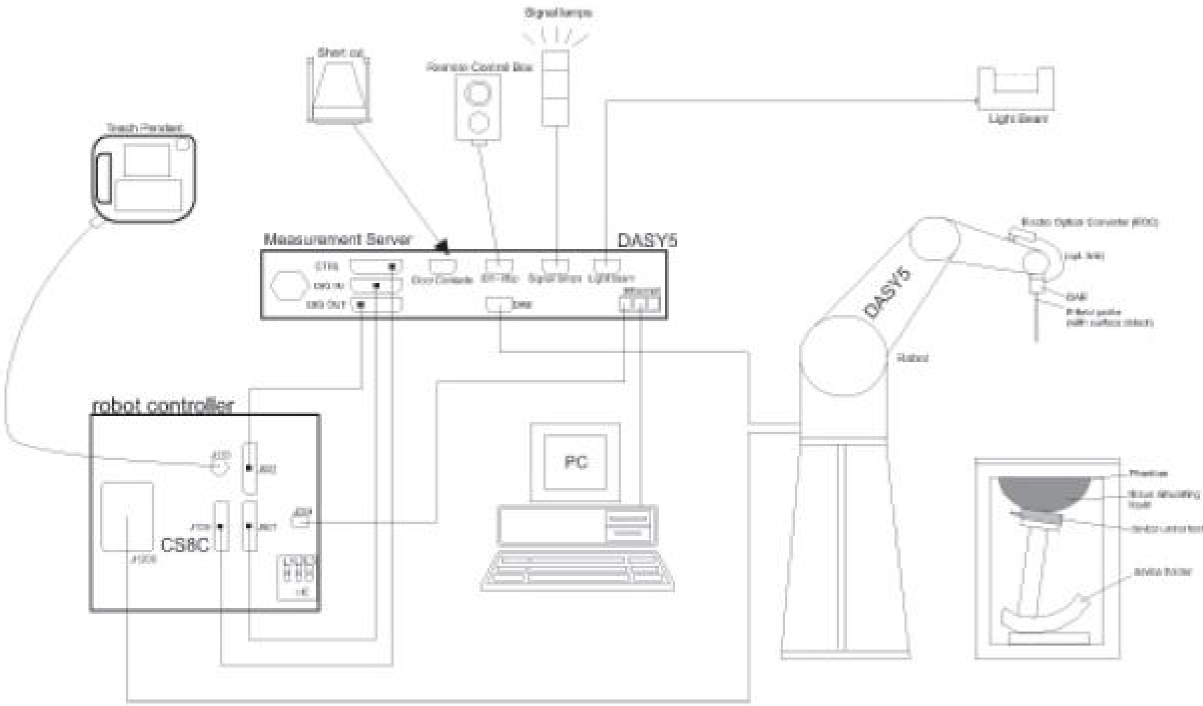
This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

The DASY5 system for performing compliance tests consists of the following items:
A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software .An arm extension for accommodation the data acquisition electronics (DAE).

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A 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 between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



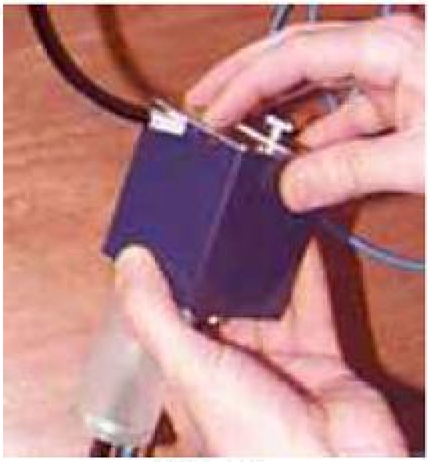

F-1. SAR Measurement System Configuration

- 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.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.

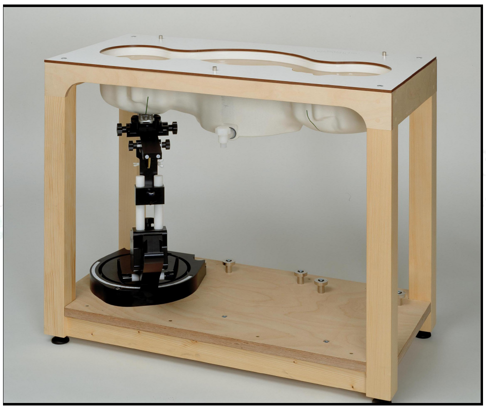
## 2.2. Isotropic E-field Probe EX3DV4

| | |
|---|---|
|  | 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 |

## 2.3. Data Acquisition Electronics (DAE)

| | | |
|---|---|---|
| **Model** | DAE |  |
| **Construction** | Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop. | |
| **Measurement Range** | -100 to +300 mV (16 bit resolution and two range settings: 4mV,400mV) | |
| **Input Offset Voltage** | < 5μV (with auto zero) | |
| **Input Bias Current** | < 50 f A | |
| **Dimensions** | 60 x 60 x 68 mm | |

## 2.4. SAM Twin Phantom

| | | |
|---|---|---|
| **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 (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 | |

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.

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.

## 2.5. ELI Phantom

| | | |
|---|---|---|
| **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 | |

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.

ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4, but has reinforced top structure.

## 2.6. Device Holder for Transmitters

F-2. **Device Holder for Transmitters**

- The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centres for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
- The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

## 2.7. Measurement procedure

### 2.7.1. Scanning procedure

#### *Step 1: Power reference measurement*

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.

#### *Step 2: Area scan*

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm.Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

#### *Step 3: Zoom scan*

Around this point, a volume of 32mm*32mm*30mm (f≤2GHz), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points (f≤2GHz), 7x7x7 points (f for 2-3GHz) and 7x7x12 points (f for 5-6GHz). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification).The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.

| | | | ≤ 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. | |
| Maximum zoom scan spatial resolution: $\Delta x_{Zoom}$, $\Delta y_{Zoom}$ | | | ≤ 2 GHz: ≤ 8 mm<br>2 – 3 GHz: ≤ 5 mm* | 3 – 4 GHz: ≤ 5 mm*<br>4 – 6 GHz: ≤ 4 mm* |
| Maximum zoom scan spatial resolution, normal to phantom surface | uniform grid: $\Delta z_{Zoom}(n)$ | | ≤ 5 mm | 3 – 4 GHz: ≤ 4 mm<br>4 – 5 GHz: ≤ 3 mm<br>5 – 6 GHz: ≤ 2 mm |
| | graded grid | $\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface | ≤ 4 mm | 3 – 4 GHz: ≤ 3 mm<br>4 – 5 GHz: ≤ 2.5 mm<br>5 – 6 GHz: ≤ 2 mm |
| | | $\Delta z_{Zoom}(n>1)$: between subsequent points | ≤ 1.5·$\Delta z_{Zoom}(n-1)$ | |
| Minimum zoom scan volume | x, y, z | | ≥ 30 mm | 3 – 4 GHz: ≥ 28 mm<br>4 – 5 GHz: ≥ 25 mm<br>5 – 6 GHz: ≥ 22 mm |

### *Step 4: Power reference measurement (drift)*

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The indicated drift is mainly the variation of the DUT's output power and should vary max. ± 5 %

## 2.7.2. Data Storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DAE4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

### 2.7.3. Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters: - Sensitivity Normi, ai0, ai1, ai2
- Conversion factor ConvFi
- Diode compression point Dcpi
Device parameters: - Frequency f
- Crest factor cf
Media parameters: - Conductivity ε
- Density ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

With Vi = compensated signal of channel i ( i = x, y, z )
Ui = input signal of channel i ( i = x, y, z )
cf = crest factor of exciting field (DASY parameter)
dcp i = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:

$$E_i = ( V_i / Norm_i \cdot ConvF )^{1/2}$$

H-field probes:

$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel I (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_x^2 + E_Y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (Etot^2 \cdot \sigma) / (\varepsilon \cdot 1000)$$

with SAR = local specific absorption rate in mW/g
Etot = total field strength in V/m
σ= conductivity in [mho/m] or [Siemens/m]
ε= equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}^2 2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}^2 \cdot 37.7$$

with Ppwe = equivalent power density of a plane wave in mW/cm2
Etot = total electric field strength in V/m
Htot = total magnetic field strength in A/m

# 3. SAR measurement variability and uncertainty

## 3.1. SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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.

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

## 3.2. SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

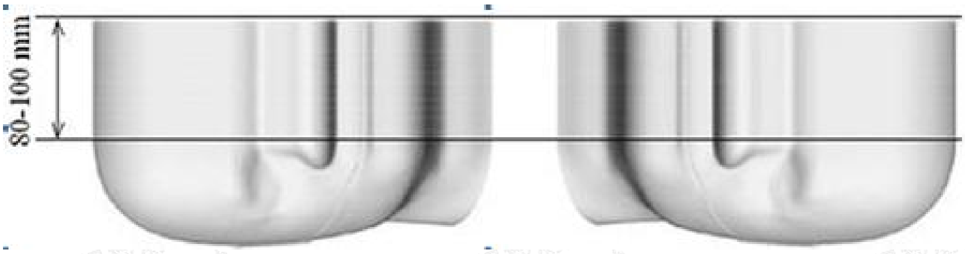
# 4. Description of Test Position

## 4.1. Head Exposure Condition

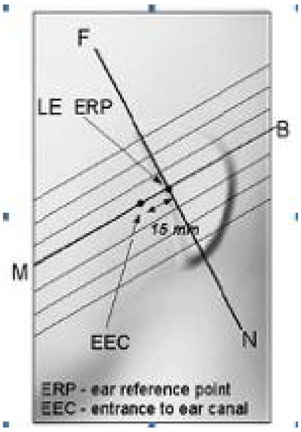
### 4.1.1. SAM Phantom Shape


F-3. Front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only-procedures in this recommended practice are intended primarily for the phantom setup.

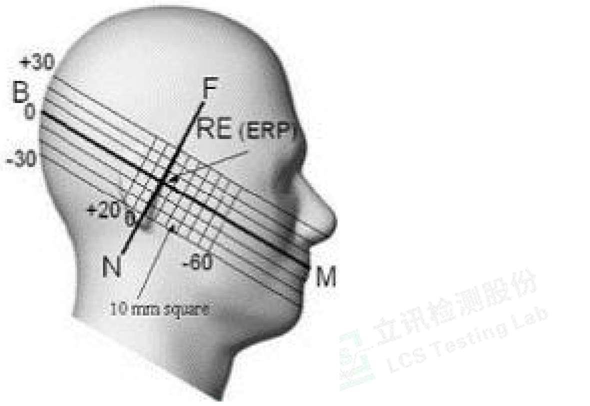
Note: The centre strip including the nose region has a different thickness tolerance.




F-4. Sagittally bisected phantom with extended perimeter (shown placed on its side as used for SAR measurements)

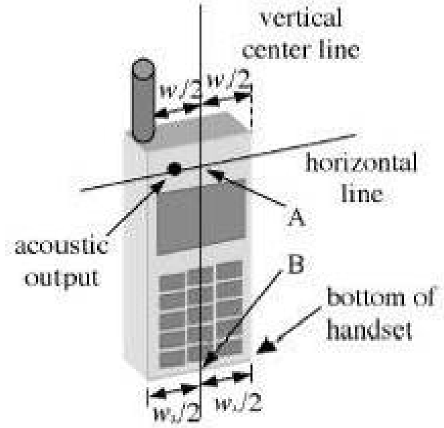



F-5. Close-up side view of phantom, showing the ear region, N-F and B-M lines, and seven cross-sectional plane locations

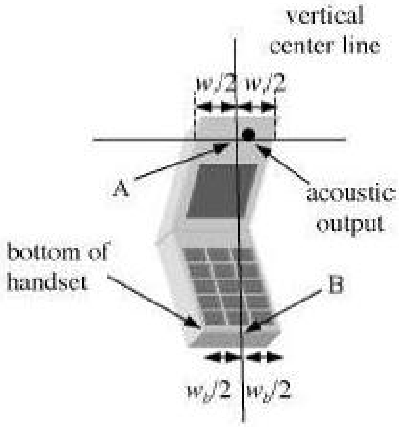



F-6. Side view of the phantom showing relevant markings and seven cross-sectional plane locations

## 4.1.2. EUT constructions




F-1. Handset vertical and horizontal reference lines-“fixed case”



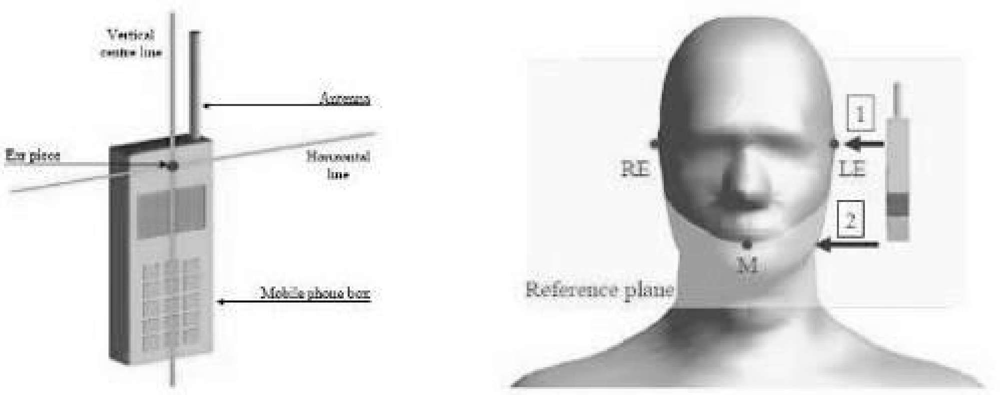

F-2. Handset vertical and horizontal reference lines-“clam-shell case”

## 4.1.3. Definition of the “cheek” position

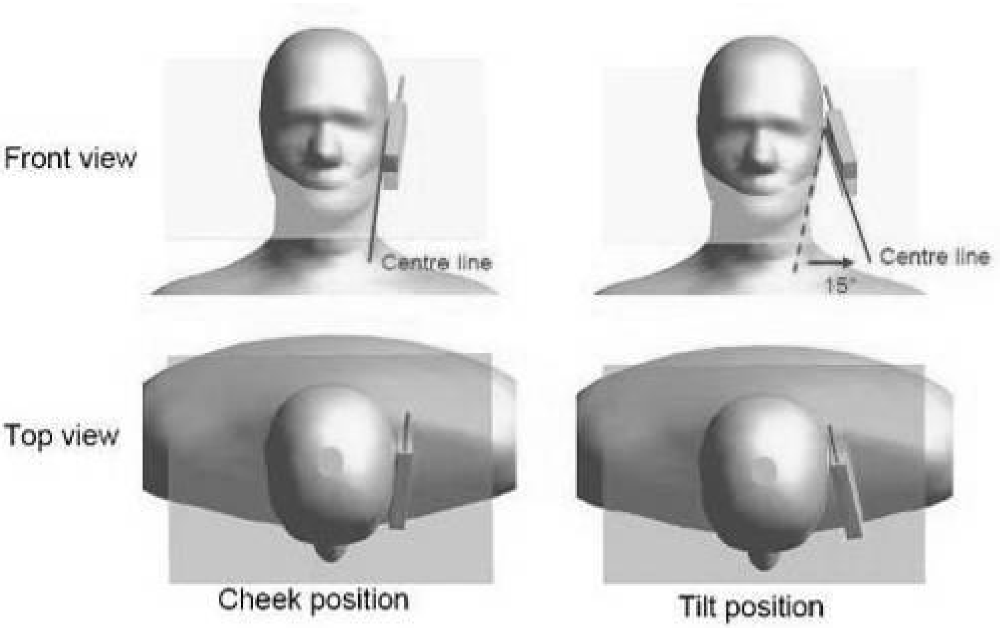
a) Position the device with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagittal plane of the phantom ("initial position"). While maintaining the device in this plane, align the vertical centre line with the reference plane containing the three ear and mouth reference points (M, RE and LE) and align the centre of the ear piece with the line RE-LE.
b) Translate the mobile phone box towards the phantom with the ear piece aligned with the line LE-RE until telephone touches the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the box until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.

### 4.1.4. Definition of the “tilted” position

a) Position the device in the “cheek” position described above;
b) While maintaining the device in the reference plane described above and pivoting against the ear, move it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.




F-1. **Definition of the reference lines and points, on the phone and on the phantom and initial position**




F-2. **“Cheek” and “tilt” positions of the mobile phone on the left side**

## 4.2. Body Exposure Condition

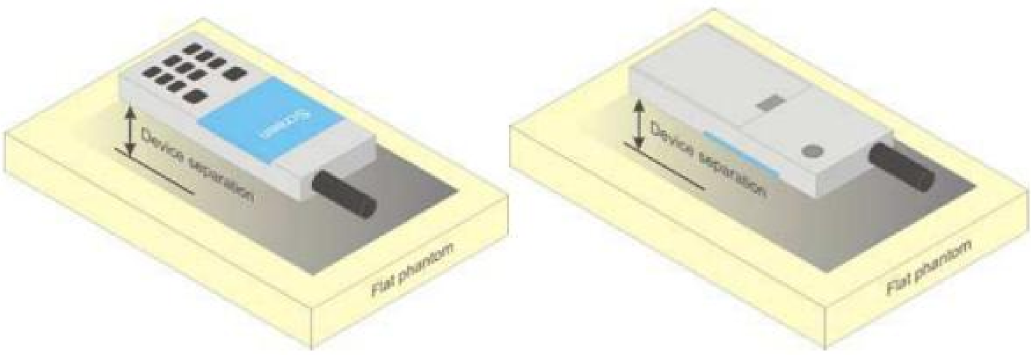
### 4.2.1. Body-worn accessory exposure conditions

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations.

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. Per FCC KDB Publication 648474 D04, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

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




F-1. **Test positions for body-worn devices**

#### 4.2.2. Wireless Router exposure conditions

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. For devices with form factors smaller than 9 cm x 5 cm, a test separation distance of 5 mm is required.

### 4.3. Extremity exposure conditions

Per FCC KDB 648474D04, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the device is marketed as "Phablet".
The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for Product Specific 10-g SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, Product Specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

Due to the SAR result, the Main antenna frequency bands are not required to test with 0mm for the Product Specific 10 g SAR.

# 5. SAR System Verification Procedure

## 5.1. Tissue Simulate Liquid

### 5.1.1. Recipes for Tissue Simulate Liquid

The bellowing tables give the recipes for tissue simulating liquids to be used in different frequency bands：

| Ingredients (% by weight) | Frequency (MHz) | | | | |
|---|---|---|---|---|---|
| | 450 | 700-900 | 1750-2000 | 2300-2500 | 2500-2700 |
| Water | 38.56 | 40.30 | 55.24 | 55.00 | 54.92 |
| Salt (NaCl) | 3.95 | 1.38 | 0.31 | 0.2 | 0.23 |
| Sucrose | 56.32 | 57.90 | 0 | 0 | 0 |
| HEC | 0.98 | 0.24 | 0 | 0 | 0 |
| Bactericide | 0.19 | 0.18 | 0 | 0 | 0 |
| Tween | 0 | 0 | 44.45 | 44.80 | 44.85 |

Salt: 99$^{+}$% Pure Sodium Chloride Sucrose: 98$^{+}$% Pure Sucrose
Water: De-ionized, 16 MΩ$^{+}$ resistivity HEC: Hydroxyethyl Cellulose
Tween: Polyoxyethylene (20) sorbitan monolaurate

HSL5GHz is composed of the following ingredients：

Water：50-65%

Mineral oil：10-30%

Emulsifiers：8-25%

Sodium salt：0-1.5%

Table 1： Recipe of Tissue Simulate Liquid

## 5.1.2. Measurement for Tissue Simulate Liquid

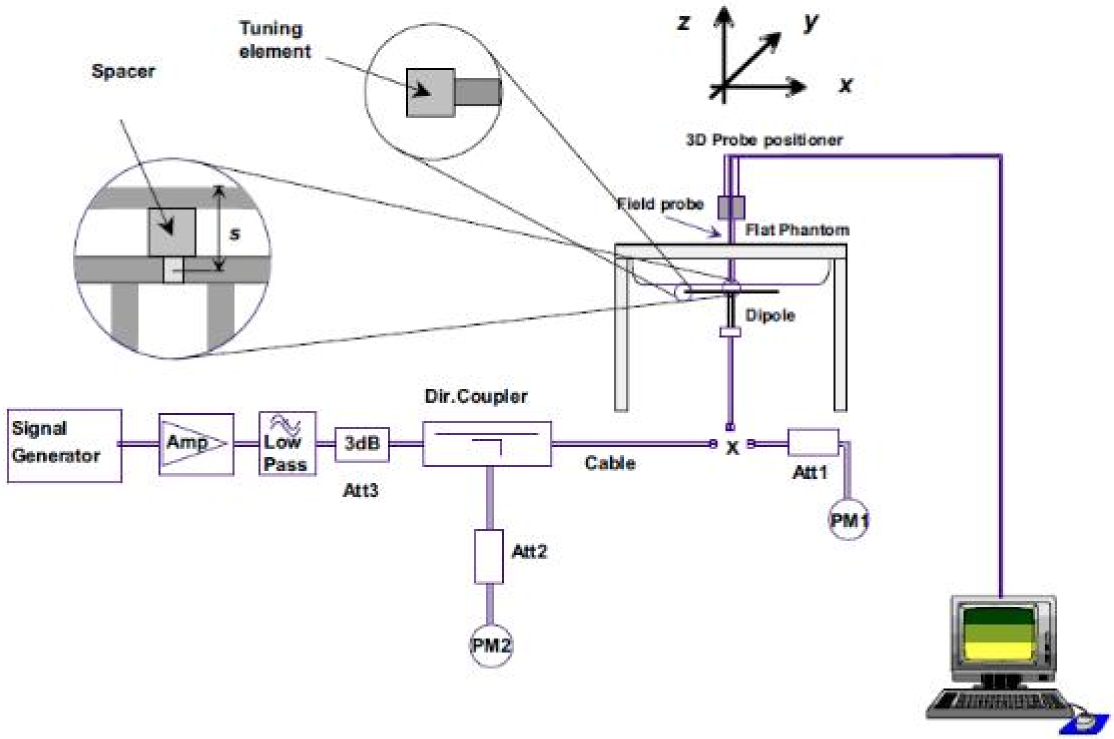
The dielectric properties for this Tissue Simulate Liquids were measured by using the DAKS. The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was 22±2°C.

| Tissue Type | Measured Frequency (MHz) | Target Tissue (±5%) | | Measured Tissue | | Liquid Temp. (℃) | Measured Date |
|---|---|---|---|---|---|---|---|
| | | $\varepsilon_r$ | σ(S/m) | $\varepsilon_r$ | σ(S/m) | | |
| 835 Head | 835 | 41.5 (39.43~43.58) | 0.9 (0.86~0.95) | 40.985 | 0.875 | 22.8 | June 10, 2024 |
| 2450 Head | 2450 | 39.2 (37.24~41.16) | 1.8 (1.71~1.89) | 39.421 | 1.833 | 22.4 | June 14, 2024 |

Table 2: Measurement result of Tissue electric parameters

## 5.2. SAR System Check

The microwave circuit arrangement for system Check is sketched in F-1. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% 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 following table (A power level of 250mW (below 3GHz) or 100mW (3-6GHz) was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range 22±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15±0.5 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.




F-1. the microwave circuit arrangement used for SAR system check

### 5.2.1. Justification for Extended SAR Dipole Calibrations

1) Referring to KDB865664 D01 requirements for dipole calibration, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

a) There is no physical damage on the dipole;
b) System check with specific dipole is within 10% of calibrated value;
c) Return-loss is within 20% of calibrated measurement;
d) Impedance is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

### 5.2.2. Summary System Check Result(s)

| Validation Kit | | Measured SAR 250mW | Measured SAR 250mW | Measured SAR (normalized to 1W) | Measured SAR (normalized to 1W) | Target SAR (normalized to 1W) (±10%) | Target SAR (normalized to 1W) (±10%) | Liquid Temp. (℃) | Measured Date |
|---|---|---|---|---|---|---|---|---|---|
| | | 1g (W/kg) | 10g (W/kg) | 1g (W/kg) | 10g (W/kg) | 1-g(W/kg) | 10-g(W/kg) | | |
| D835V2 | Head | 2.44 | 1.48 | 9.40 | 6.08 | 9.59 (8.63~10.55) | 6.37 (5.73~7.01) | 22.8 | June 10, 2024 |
| D2450 V2 | Head | 12.60 | 5.66 | 50.4 | 23.28 | 53.5 (48.15~58.85) | 24.8 (22.32~27.28) | 22.4 | June 14, 2024 |

Table 3: Please see the Appendx A

# 6. SAR measurement procedure

The measurement procedures are as follows:

## 6.1. Conducted power measurement

a. For WWAN power measurement, use base station simulator connection with RF cable, at maximum power in each supported wireless interface and frequency band.
b. Read the WWAN RF power level from the base station simulator.
c. For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously Transmission, at maximum RF power in each supported wireless interface and frequency band.
d. Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power.

## 6.2. GSM Test Configuration

SAR tests for GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. Using CMU200 the power level is set to "5" for GSM 850, set to "0" for GSM 1900. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 4. the EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 4.

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. GSM voice and GPRS data use GMSK, which is a constant amplitude modulation with minimal peak to average power difference within the time-slot burst. For EDGE, GMSK is used for MCS 1 – MCS 4 and 8-PSK is used for MCS 5 – MCS 9; where 8-PSK has an inherently higher peak-to-average power ratio. The GMSK and 8-PSK EDGE configurations are considered separately for SAR compliance. The GMSK EDGE configurations are grouped with GPRS and considered with respect to time-averaged maximum output power to determine compliance. The 3G SAR test reduction procedure is applied to 8-PSK EDGE with GMSK GPRS/EDGE as the primary mode.

## 6.3. UMTS Test Configuration

3G SAR Test Reduction Procedure
In the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. 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.3 This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as "otherwise" in the applicable procedures; SAR measurement is required for the secondary mode.

Output power Verification

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1's" for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) are requied in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.

Head SAR

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode.

Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

1) Body-Worn Accessory SAR

SAR for body-worn accessory configurations is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreaing code or DPDCHn, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When more than 2 DPDCHn are supported by the handset, it may be necessary to configure additional DPDCHn using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC.

2) Handsets with Release 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures in the "Release 5 HSDPA Data Devices" section of this document, for the highest reported SAR body-worn accessory exposure configuration in 12.2 kbps RMC. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

HSDPA should be configured according to the UE category of a test device.The number of HSDSCH/ HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors(βc, βd), and HS-DPCCH power offset parameters (ΔACK, ΔNACK, ΔCQI) should be set according to values indicated in the Table below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set

**Table 2: Subtests for UMTS Release 5 HSDPA**

| Sub-set | $\beta_c$ | $\beta_d$ | $\beta_d$ (SF) | $\beta_c/\beta_d$ | $\beta_{hs}$ (note 1, note 2) | CM(dB) (note 3) | MPR(dB) |
|---|---|---|---|---|---|---|---|
| 1 | 2/15 | 15/15 | 64 | 2/15 | 4/15 | 0.0 | 0.0 |
| 2 | 12/15 (note 4) | 15/15 (note 4) | 64 | 12/15 (note 4) | 24/15 | 1.0 | 0.0 |
| 3 | 15/15 | 8/15 | 64 | 15/8 | 30/15 | 1.5 | 0.5 |
| 4 | 15/15 | 4/15 | 64 | 15/4 | 30/15 | 1.5 | 0.5 |

Note1: $\Delta_{ACK}$, $\Delta_{NACK}$ and $\Delta_{CQI}$= 8 ⇔ $A_{hs}$ = $\beta_{hs}/\beta_c$=30/15 ⇔ $\beta_{hs}$=30/15*$\beta_c$
Note2: CM=1 for $\beta_c/\beta_d$ =12/15, $\beta_{hs}/\beta_c$=24/15.
Note3: For subtest 2 the $\beta_c\beta_d$ ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC (TFC1,TF1) to $\beta_c$=11/15 and $\beta_d$=15/15.

HSUPA Test Configuration

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures in the "Release 6 HSPA Data Devices" section of this document, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When VOIP is applicable for next to the ear head exposure in HSPA, the 3G SAR test reduction procedure is applied to HSPA with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body-worn accessory measurements is tested for next to the ear head exposure.

Due to inner loop power control requirements in HSPA, a communication test set is required for output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA are configured according to the β values indicated in Table 2 and other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of this document

**Table 3: Sub-Test 5 Setup for Release 6 HSUPA**

| Sub-set | $\beta_c$ | $\beta_d$ | $\beta_d$ (SF) | $\beta_c/\beta_d$ | $\beta_{hs}$ (1) | $\beta_{ec}$ | $\beta_{ed}$ | $\beta_{ed}$ (SF) | $\beta_{ed}$ (codes) | CM (2) (dB) | MPR (dB) | AG (4) Index | E-TFCI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11/15 (3) | 15/15 (3) | 64 | 11/15 (3) | 22/15 | 209/225 | 1039/225 | 4 | 1 | 1.0 | 0.0 | 20 | 75 |
| 2 | 6/15 | 15/15 | 64 | 6/15 | 12/15 | 12/15 | 94/75 | 4 | 1 | 3.0 | 2.0 | 12 | 67 |
| 3 | 15/15 | 9/15 | 64 | 15/9 | 30/15 | 30/15 | $\beta_{ed1}$:47/15<br>$\beta_{ed2}$:47/15 | 4 | 2 | 2.0 | 1.0 | 15 | 92 |
| 4 | 2/15 | 15/15 | 64 | 2/15 | 4/15 | 2/15 | 56/75 | 4 | 1 | 3.0 | 2.0 | 17 | 71 |
| 5 | 15/15 (4) | 15/15 (4) | 64 | 15/15 (4) | 30/15 | 24/15 | 134/15 | 4 | 1 | 1.0 | 0.0 | 21 | 81 |

Note 1: $\Delta_{ACK}$, $\Delta$NACK and $\Delta_{CQI}$ = 8 ⇔ $A_{hs} = \beta_{hs}/\beta_c = 30/15$ ⇔ $\beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for βc/βd =12/15, $\beta_{hs}/\beta_c$ =24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the βc/βd ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 10/15 and βd = 15/15.
Note 4: For subtest 5 the βc/βd ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 14/15 and βd = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Figure 5.1g.
Note 6: βed can not be set directly; it is set by Absolute Grant Value.

## 6.4. LTE Test Configuration

QPSK with 1 RB allocation
Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, 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 for 1 RB allocation; 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.8 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.

QPSK with 50% RB allocation
The procedures required for 1 RB allocation in section 4.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.9

QPSK with 100% RB allocation
For 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 in sections 4.2.1 and 4.2.2 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.

## 6.5. WIFI Test Configuration

The SAR measurement and test reduction procedures are structured according to either the DSSS or OFDM transmission mode configurations used in each standalone frequency band and aggregated band. For devices that operate in exposure configurations that require multiple test positions, additional SAR test reduction may be applied. The maximum output power specified for production units, including tune-up tolerance, are used to determine initial SAR test requirements for the 802.11 transmission modes in a frequency band. SAR is measured using the highest measured maximum output power channel for the initial test configuration. SAR measurement and test reduction for the remaining 802.11 modes and test channels are determined according to measured or specified maximum output power and reported SAR of the initial measurements. The general test reduction and SAR measurement approaches are summarized in the following:
1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.
2. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, an “initial test configuration” is first determined for each standalone and aggregated frequency band according to the maximum output power and tune-up tolerance specified for production units.
a. When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for

SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
b. SAR is measured for OFDM configurations using the initial test configuration procedures. Additional frequency band specific SAR test reduction may be considered for individual frequency bands
c. Depending on the reported SAR of the highest maximum output power channel tested in the initial test configuration, SAR test reduction may apply to subsequent highest output channels in the initial test configuration to reduce the number of SAR measurements.
3. The Initial test configuration does not apply to DSSS. The 2.4 GHz band SAR test requirements and 802.11b DSSS procedures are used to establish the transmission configurations required for SAR measurement.
4. An “initial test position”is applied to further reduce the number of SAR tests for devices operating in next to the ear, UMPC mini-tablet or hotspot mode exposure configurations that require multiple test positions .
a. SAR is measured for 802.11b according to the 2.4 GHz DSSS procedure using the exposure condition established by the initial test position.
b. SAR is measured for 2.4 GHz and 5 GHz OFDM configurations using the initial test configuration. 802.11b/g/n operating modes are tested independently according to the service requirements in each frequency band. 802.11b/g/n modes are tested on the maximum average output channel.
5. The Initial test position does not apply to devices that require a fixed exposure test position. SAR is measured in a fixed exposure test position for these devices in 802.11b according to the 2.4 GHz DSSS procedure or in 2.4 GHz and 5 GHz OFDM configurations using the initial test configuration procedures .
6. The “subsequent test configuration”procedures are applied to determine if additional SAR measurements are required for the remaining OFDM transmission modes that have not been tested in the initial test configuration. SAR test exclusion is determined according to reported SAR in the initial test configuration and maximum output power specified or measured for these other OFDM configurations.

2.4 GHz and 5GHz SAR Procedures
Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in section 5.2.2.
1. 802.11b DSSS SAR Test Requirements
SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:
a. When the reported SAR of the highest measured maximum output power channel (section 3.1) for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
b. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.
1. 2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements
When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3). SAR is not required for the following 2.4 GHz OFDM conditions.
a. When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration
b. When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. SAR Test Requirements for OFDM Configurations
When SAR measurement is required for 802.11 a/g/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements.20 In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.
3. OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements
The initial test configuration for 2.4 GHz and 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the

highest maximum output power channel determined by the default power measurement procedures (section 4). When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

a. The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
b. If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
c. If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
d. When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n.

After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.

a. Channels with measured maximum output power within ¼ dB of each other are considered to have the same maximum output.
b. When there are multiple test channels with the same measured maximum output power, the channel closest to mid-band frequency is selected for SAR measurement.
c. When there are multiple test channels with the same measured maximum output power and equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

Initial Test Configuration Procedures

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required (see section 5.3.2). SAR test reduction of subsequent highest output test channels is based on the reported SAR of the initial test configuration.

For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode.23 For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration. When the reported SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

4. Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, the procedures in section 5.3.2 are applied to determine the test configuration. Additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. The subsequent test configuration and SAR measurement procedures are described in the following.

a. When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated band and exposure configuration.
b. When the highest reported SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.
c. The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power

measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.

1). SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.

2). SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the reported SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested.

a) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.

d. SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:

1) replace “subsequent test configuration” with “next subsequent test configuration” (i.e., subsequent next highest specified maximum output power configuration)

2) replace “initial test configuration” with “all tested higher output power configurations.

## 6.6. Power Reduction

The product without any power reduction.

## 6.7. Power Drift

To control the output power stability during the SAR test, SAR system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. This ensures that the power drift during one measurement is within ±0.2dB.

# 7. TEST CONDITIONS AND RESULTS

## 7.1. Conducted Power Results

According KDB 447498 D01 General RF Exposure Guidance v06 Section 4.1 2) states that "Unless it is specified differently in the published RF exposure KDB procedures, these requirements also apply to test reduction and test exclusion considerations. Time-averaged maximum conducted output power applies to SAR and, as required by § 2.1091(c), time-averaged ERP applies to MPE. When an antenna port is not available on the device to support conducted power measurement, such as FRS and certain Part 15 transmitters with built-in integral antennas, the maximum output power allowed for production units should be used to determine RF exposure test exclusion and compliance."

### 7.1.1. Conducted Power Measurement Results(LTE Band 5)

| Band | Bandwidth | Modulation | Channel | RB Configuration | Result(dBm) | Tune UP |
|---|---|---|---|---|---|---|
| Band5 | 1.4MHz | QPSK | 20407 | 1RB#0 | 23.28 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20407 | 1RB#0 | 23.21 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20407 | 1RB#2 | 23.33 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20407 | 1RB#2 | 23.62 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20407 | 1RB#5 | 23.29 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20407 | 1RB#5 | 23.81 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20407 | 3RB#0 | 23.45 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20407 | 3RB#0 | 22.73 | 23.00 |
| Band5 | 1.4MHz | QPSK | 20407 | 3RB#1 | 23.42 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20407 | 3RB#1 | 22.74 | 23.00 |
| Band5 | 1.4MHz | QPSK | 20407 | 3RB#3 | 23.27 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20407 | 3RB#3 | 22.73 | 23.00 |
| Band5 | 1.4MHz | QPSK | 20407 | 6RB#0 | 22.65 | 23.00 |
| Band5 | 1.4MHz | 16QAM | 20407 | 6RB#0 | 22.22 | 23.00 |
| Band5 | 1.4MHz | QPSK | 20525 | 1RB#0 | 23.31 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20525 | 1RB#0 | 23.28 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20525 | 1RB#2 | 23.16 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20525 | 1RB#2 | 23.40 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20525 | 1RB#5 | 23.33 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20525 | 1RB#5 | 23.30 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20525 | 3RB#0 | 23.57 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20525 | 3RB#0 | 22.56 | 23.00 |
| Band5 | 1.4MHz | QPSK | 20525 | 3RB#1 | 23.56 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20525 | 3RB#1 | 22.54 | 23.00 |
| Band5 | 1.4MHz | QPSK | 20525 | 3RB#3 | 23.50 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20525 | 3RB#3 | 22.89 | 23.00 |
| Band5 | 1.4MHz | QPSK | 20525 | 6RB#0 | 22.58 | 23.00 |
| Band5 | 1.4MHz | 16QAM | 20525 | 6RB#0 | 22.42 | 23.00 |
| Band5 | 1.4MHz | QPSK | 20643 | 1RB#0 | 23.30 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20643 | 1RB#0 | 23.29 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20643 | 1RB#2 | 23.26 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20643 | 1RB#2 | 23.18 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20643 | 1RB#5 | 23.18 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20643 | 1RB#5 | 23.11 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20643 | 3RB#0 | 23.29 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20643 | 3RB#0 | 23.13 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20643 | 3RB#1 | 23.55 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20643 | 3RB#1 | 23.11 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20643 | 3RB#3 | 23.59 | 24.00 |
| Band5 | 1.4MHz | 16QAM | 20643 | 3RB#3 | 23.06 | 24.00 |
| Band5 | 1.4MHz | QPSK | 20643 | 6RB#0 | 22.74 | 23.00 |
| Band5 | 1.4MHz | 16QAM | 20643 | 6RB#0 | 22.18 | 23.00 |
| Band5 | 3MHz | QPSK | 20415 | 1RB#0 | 23.43 | 24.00 |
| Band5 | 3MHz | 16QAM | 20415 | 1RB#0 | 22.93 | 23.00 |
| Band5 | 3MHz | QPSK | 20415 | 1RB#8 | 23.52 | 24.00 |
| Band5 | 3MHz | 16QAM | 20415 | 1RB#8 | 23.01 | 24.00 |
| Band5 | 3MHz | QPSK | 20415 | 1RB#14 | 23.58 | 24.00 |
| Band5 | 3MHz | 16QAM | 20415 | 1RB#14 | 22.96 | 23.00 |
| Band5 | 3MHz | QPSK | 20415 | 8RB#0 | 22.67 | 23.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Band5 | 3MHz | 16QAM | 20415 | 8RB#0 | 22.20 | 23.00 |
| Band5 | 3MHz | QPSK | 20415 | 8RB#4 | 22.67 | 23.00 |
| Band5 | 3MHz | 16QAM | 20415 | 8RB#4 | 22.17 | 23.00 |
| Band5 | 3MHz | QPSK | 20415 | 8RB#7 | 22.62 | 23.00 |
| Band5 | 3MHz | 16QAM | 20415 | 8RB#7 | 22.29 | 23.00 |
| Band5 | 3MHz | QPSK | 20415 | 15RB#0 | 22.53 | 23.00 |
| Band5 | 3MHz | 16QAM | 20415 | 15RB#0 | 22.05 | 23.00 |
| Band5 | 3MHz | QPSK | 20525 | 1RB#0 | 23.62 | 24.00 |
| Band5 | 3MHz | 16QAM | 20525 | 1RB#0 | 22.43 | 23.00 |
| Band5 | 3MHz | QPSK | 20525 | 1RB#8 | 23.59 | 24.00 |
| Band5 | 3MHz | 16QAM | 20525 | 1RB#8 | 22.46 | 23.00 |
| Band5 | 3MHz | QPSK | 20525 | 1RB#14 | 23.88 | 24.00 |
| Band5 | 3MHz | 16QAM | 20525 | 1RB#14 | 23.22 | 24.00 |
| Band5 | 3MHz | QPSK | 20525 | 8RB#0 | 22.83 | 23.00 |
| Band5 | 3MHz | 16QAM | 20525 | 8RB#0 | 22.47 | 23.00 |
| Band5 | 3MHz | QPSK | 20525 | 8RB#4 | 22.85 | 23.00 |
| Band5 | 3MHz | 16QAM | 20525 | 8RB#4 | 22.48 | 23.00 |
| Band5 | 3MHz | QPSK | 20525 | 8RB#7 | 22.96 | 23.00 |
| Band5 | 3MHz | 16QAM | 20525 | 8RB#7 | 22.45 | 23.00 |
| Band5 | 3MHz | QPSK | 20525 | 15RB#0 | 22.81 | 23.00 |
| Band5 | 3MHz | 16QAM | 20525 | 15RB#0 | 22.13 | 23.00 |
| Band5 | 3MHz | QPSK | 20635 | 1RB#0 | 23.54 | 24.00 |
| Band5 | 3MHz | 16QAM | 20635 | 1RB#0 | 23.68 | 24.00 |
| Band5 | 3MHz | QPSK | 20635 | 1RB#8 | 23.44 | 24.00 |
| Band5 | 3MHz | 16QAM | 20635 | 1RB#8 | 23.67 | 24.00 |
| Band5 | 3MHz | QPSK | 20635 | 1RB#14 | 22.38 | 23.00 |
| Band5 | 3MHz | 16QAM | 20635 | 1RB#14 | 22.22 | 23.00 |
| Band5 | 3MHz | QPSK | 20635 | 8RB#0 | 22.85 | 23.00 |
| Band5 | 3MHz | 16QAM | 20635 | 8RB#0 | 22.35 | 23.00 |
| Band5 | 3MHz | QPSK | 20635 | 8RB#4 | 22.87 | 23.00 |
| Band5 | 3MHz | 16QAM | 20635 | 8RB#4 | 22.41 | 23.00 |
| Band5 | 3MHz | QPSK | 20635 | 8RB#7 | 22.74 | 23.00 |
| Band5 | 3MHz | 16QAM | 20635 | 8RB#7 | 22.34 | 23.00 |
| Band5 | 3MHz | QPSK | 20635 | 15RB#0 | 22.81 | 23.00 |
| Band5 | 3MHz | 16QAM | 20635 | 15RB#0 | 22.19 | 23.00 |
| Band5 | 5MHz | QPSK | 20425 | 1RB#0 | 23.57 | 24.00 |
| Band5 | 5MHz | 16QAM | 20425 | 1RB#0 | 22.38 | 23.00 |
| Band5 | 5MHz | QPSK | 20425 | 1RB#12 | 23.60 | 24.00 |
| Band5 | 5MHz | 16QAM | 20425 | 1RB#12 | 22.38 | 23.00 |
| Band5 | 5MHz | QPSK | 20425 | 1RB#24 | 23.65 | 24.00 |
| Band5 | 5MHz | 16QAM | 20425 | 1RB#24 | 22.40 | 23.00 |
| Band5 | 5MHz | QPSK | 20425 | 12RB#0 | 22.65 | 23.00 |
| Band5 | 5MHz | 16QAM | 20425 | 12RB#0 | 22.07 | 23.00 |
| Band5 | 5MHz | QPSK | 20425 | 12RB#6 | 22.65 | 23.00 |
| Band5 | 5MHz | 16QAM | 20425 | 12RB#6 | 22.07 | 23.00 |
| Band5 | 5MHz | QPSK | 20425 | 12RB#13 | 22.68 | 23.00 |
| Band5 | 5MHz | 16QAM | 20425 | 12RB#13 | 22.06 | 23.00 |
| Band5 | 5MHz | QPSK | 20425 | 25RB#0 | 22.74 | 23.00 |
| Band5 | 5MHz | 16QAM | 20425 | 25RB#0 | 22.22 | 23.00 |
| Band5 | 5MHz | QPSK | 20525 | 1RB#0 | 23.47 | 24.00 |
| Band5 | 5MHz | 16QAM | 20525 | 1RB#0 | 23.55 | 24.00 |
| Band5 | 5MHz | QPSK | 20525 | 1RB#12 | 23.57 | 24.00 |
| Band5 | 5MHz | 16QAM | 20525 | 1RB#12 | 23.60 | 24.00 |
| Band5 | 5MHz | QPSK | 20525 | 1RB#24 | 23.67 | 24.00 |
| Band5 | 5MHz | 16QAM | 20525 | 1RB#24 | 23.70 | 24.00 |
| Band5 | 5MHz | QPSK | 20525 | 12RB#0 | 22.90 | 23.00 |
| Band5 | 5MHz | 16QAM | 20525 | 12RB#0 | 22.30 | 23.00 |
| Band5 | 5MHz | QPSK | 20525 | 12RB#6 | 22.76 | 23.00 |
| Band5 | 5MHz | 16QAM | 20525 | 12RB#6 | 22.31 | 23.00 |
| Band5 | 5MHz | QPSK | 20525 | 12RB#13 | 22.81 | 23.00 |
| Band5 | 5MHz | 16QAM | 20525 | 12RB#13 | 22.49 | 23.00 |
| Band5 | 5MHz | QPSK | 20525 | 25RB#0 | 22.92 | 23.00 |
| Band5 | 5MHz | 16QAM | 20525 | 25RB#0 | 22.35 | 23.00 |
| Band5 | 5MHz | QPSK | 20625 | 1RB#0 | 23.76 | 24.00 |
| Band5 | 5MHz | 16QAM | 20625 | 1RB#0 | 23.16 | 24.00 |
| Band5 | 5MHz | QPSK | 20625 | 1RB#12 | 23.57 | 24.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Band5 | 5MHz | 16QAM | 20625 | 1RB#12 | 22.97 | 23.00 |
| Band5 | 5MHz | QPSK | 20625 | 1RB#24 | 22.59 | 23.00 |
| Band5 | 5MHz | 16QAM | 20625 | 1RB#24 | 22.32 | 23.00 |
| Band5 | 5MHz | QPSK | 20625 | 12RB#0 | 23.06 | 24.00 |
| Band5 | 5MHz | 16QAM | 20625 | 12RB#0 | 22.31 | 23.00 |
| Band5 | 5MHz | QPSK | 20625 | 12RB#6 | 23.13 | 24.00 |
| Band5 | 5MHz | 16QAM | 20625 | 12RB#6 | 22.33 | 23.00 |
| Band5 | 5MHz | QPSK | 20625 | 12RB#13 | 22.77 | 23.00 |
| Band5 | 5MHz | 16QAM | 20625 | 12RB#13 | 22.17 | 23.00 |
| Band5 | 5MHz | QPSK | 20625 | 25RB#0 | 22.93 | 23.00 |
| Band5 | 5MHz | 16QAM | 20625 | 25RB#0 | 22.39 | 23.00 |
| Band5 | 10MHz | QPSK | 20450 | 1RB#0 | 23.54 | 24.00 |
| Band5 | 10MHz | 16QAM | 20450 | 1RB#0 | 22.98 | 23.00 |
| Band5 | 10MHz | QPSK | 20450 | 1RB#24 | 23.56 | 24.00 |
| Band5 | 10MHz | 16QAM | 20450 | 1RB#24 | 23.13 | 24.00 |
| Band5 | 10MHz | QPSK | 20450 | 1RB#49 | 23.68 | 24.00 |
| Band5 | 10MHz | 16QAM | 20450 | 1RB#49 | 23.23 | 24.00 |
| Band5 | 10MHz | QPSK | 20450 | 25RB#0 | 22.60 | 23.00 |
| Band5 | 10MHz | 16QAM | 20450 | 25RB#0 | 22.08 | 23.00 |
| Band5 | 10MHz | QPSK | 20450 | 25RB#12 | 22.67 | 23.00 |
| Band5 | 10MHz | 16QAM | 20450 | 25RB#12 | 22.09 | 23.00 |
| Band5 | 10MHz | QPSK | 20450 | 25RB#25 | 22.72 | 23.00 |
| Band5 | 10MHz | 16QAM | 20450 | 25RB#25 | 22.17 | 23.00 |
| Band5 | 10MHz | QPSK | 20450 | 50RB#0 | 22.69 | 23.00 |
| Band5 | 10MHz | 16QAM | 20450 | 50RB#0 | 22.21 | 23.00 |
| Band5 | 10MHz | QPSK | 20525 | 1RB#0 | 23.63 | 24.00 |
| Band5 | 10MHz | 16QAM | 20525 | 1RB#0 | 23.26 | 24.00 |
| Band5 | 10MHz | QPSK | 20525 | 1RB#24 | 23.79 | 24.00 |
| Band5 | 10MHz | 16QAM | 20525 | 1RB#24 | 23.38 | 24.00 |
| Band5 | 10MHz | QPSK | 20525 | 1RB#49 | 23.86 | 24.00 |
| Band5 | 10MHz | 16QAM | 20525 | 1RB#49 | 23.38 | 24.00 |
| Band5 | 10MHz | QPSK | 20525 | 25RB#0 | 22.86 | 23.00 |
| Band5 | 10MHz | 16QAM | 20525 | 25RB#0 | 22.39 | 23.00 |
| Band5 | 10MHz | QPSK | 20525 | 25RB#12 | 22.72 | 23.00 |
| Band5 | 10MHz | 16QAM | 20525 | 25RB#12 | 22.40 | 23.00 |
| Band5 | 10MHz | QPSK | 20525 | 25RB#25 | 22.87 | 23.00 |
| Band5 | 10MHz | 16QAM | 20525 | 25RB#25 | 22.52 | 23.00 |
| Band5 | 10MHz | QPSK | 20525 | 50RB#0 | 22.86 | 23.00 |
| Band5 | 10MHz | 16QAM | 20525 | 50RB#0 | 22.50 | 23.00 |
| Band5 | 10MHz | QPSK | 20600 | 1RB#0 | 23.88 | 24.00 |
| Band5 | 10MHz | 16QAM | 20600 | 1RB#0 | 23.92 | 24.00 |
| Band5 | 10MHz | QPSK | 20600 | 1RB#24 | 23.71 | 24.00 |
| Band5 | 10MHz | 16QAM | 20600 | 1RB#24 | 23.75 | 24.00 |
| Band5 | 10MHz | QPSK | 20600 | 1RB#49 | 23.11 | 24.00 |
| Band5 | 10MHz | 16QAM | 20600 | 1RB#49 | 22.81 | 23.00 |
| Band5 | 10MHz | QPSK | 20600 | 25RB#0 | 22.93 | 23.00 |
| Band5 | 10MHz | 16QAM | 20600 | 25RB#0 | 22.49 | 23.00 |
| Band5 | 10MHz | QPSK | 20600 | 25RB#12 | 23.04 | 24.00 |
| Band5 | 10MHz | 16QAM | 20600 | 25RB#12 | 22.40 | 23.00 |
| Band5 | 10MHz | QPSK | 20600 | 25RB#25 | 22.94 | 23.00 |
| Band5 | 10MHz | 16QAM | 20600 | 25RB#25 | 22.51 | 23.00 |
| Band5 | 10MHz | QPSK | 20600 | 50RB#0 | 23.02 | 24.00 |
| Band5 | 10MHz | 16QAM | 20600 | 50RB#0 | 22.32 | 23.00 |

## 7.1.2. Conducted Power Measurement Results(LTE Band 41)

| Band | Bandwidth | Modulation | Channel | RB Configuration | Result(dBm) | Tune Up |
|---|---|---|---|---|---|---|
| Band41 | 5MHz | QPSK | 39675 | 1RB#0 | 21.09 | 22.00 |
| Band41 | 5MHz | 16QAM | 39675 | 1RB#0 | 20.91 | 21.00 |
| Band41 | 5MHz | QPSK | 39675 | 1RB#12 | 21.06 | 22.00 |
| Band41 | 5MHz | 16QAM | 39675 | 1RB#12 | 20.91 | 21.00 |
| Band41 | 5MHz | QPSK | 39675 | 1RB#24 | 21.08 | 22.00 |
| Band41 | 5MHz | 16QAM | 39675 | 1RB#24 | 20.91 | 21.00 |
| Band41 | 5MHz | QPSK | 39675 | 12RB#0 | 20.29 | 21.00 |
| Band41 | 5MHz | 16QAM | 39675 | 12RB#0 | 19.58 | 20.00 |
| Band41 | 5MHz | QPSK | 39675 | 12RB#6 | 20.26 | 21.00 |
| Band41 | 5MHz | 16QAM | 39675 | 12RB#6 | 19.58 | 20.00 |
| Band41 | 5MHz | QPSK | 39675 | 12RB#13 | 20.36 | 21.00 |
| Band41 | 5MHz | 16QAM | 39675 | 12RB#13 | 19.55 | 20.00 |
| Band41 | 5MHz | QPSK | 39675 | 25RB#0 | 20.33 | 21.00 |
| Band41 | 5MHz | 16QAM | 39675 | 25RB#0 | 19.62 | 20.00 |
| Band41 | 5MHz | QPSK | 40620 | 1RB#0 | 21.41 | 22.00 |
| Band41 | 5MHz | 16QAM | 40620 | 1RB#0 | 20.72 | 21.00 |
| Band41 | 5MHz | QPSK | 40620 | 1RB#12 | 21.34 | 22.00 |
| Band41 | 5MHz | 16QAM | 40620 | 1RB#12 | 21.09 | 22.00 |
| Band41 | 5MHz | QPSK | 40620 | 1RB#24 | 21.46 | 22.00 |
| Band41 | 5MHz | 16QAM | 40620 | 1RB#24 | 20.98 | 21.00 |
| Band41 | 5MHz | QPSK | 40620 | 12RB#0 | 20.43 | 21.00 |
| Band41 | 5MHz | 16QAM | 40620 | 12RB#0 | 19.75 | 20.00 |
| Band41 | 5MHz | QPSK | 40620 | 12RB#6 | 20.43 | 21.00 |
| Band41 | 5MHz | 16QAM | 40620 | 12RB#6 | 19.76 | 20.00 |
| Band41 | 5MHz | QPSK | 40620 | 12RB#13 | 20.58 | 21.00 |
| Band41 | 5MHz | 16QAM | 40620 | 12RB#13 | 19.76 | 20.00 |
| Band41 | 5MHz | QPSK | 40620 | 25RB#0 | 20.57 | 21.00 |
| Band41 | 5MHz | 16QAM | 40620 | 25RB#0 | 19.81 | 20.00 |
| Band41 | 5MHz | QPSK | 41565 | 1RB#0 | 21.45 | 22.00 |
| Band41 | 5MHz | 16QAM | 41565 | 1RB#0 | 21.12 | 22.00 |
| Band41 | 5MHz | QPSK | 41565 | 1RB#12 | 21.42 | 22.00 |
| Band41 | 5MHz | 16QAM | 41565 | 1RB#12 | 21.04 | 22.00 |
| Band41 | 5MHz | QPSK | 41565 | 1RB#24 | 21.41 | 22.00 |
| Band41 | 5MHz | 16QAM | 41565 | 1RB#24 | 20.91 | 21.00 |
| Band41 | 5MHz | QPSK | 41565 | 12RB#0 | 20.54 | 21.00 |
| Band41 | 5MHz | 16QAM | 41565 | 12RB#0 | 19.82 | 20.00 |
| Band41 | 5MHz | QPSK | 41565 | 12RB#6 | 20.55 | 21.00 |
| Band41 | 5MHz | 16QAM | 41565 | 12RB#6 | 19.83 | 20.00 |
| Band41 | 5MHz | QPSK | 41565 | 12RB#13 | 20.61 | 21.00 |
| Band41 | 5MHz | 16QAM | 41565 | 12RB#13 | 19.71 | 20.00 |
| Band41 | 5MHz | QPSK | 41565 | 25RB#0 | 20.54 | 21.00 |
| Band41 | 5MHz | 16QAM | 41565 | 25RB#0 | 19.83 | 20.00 |
| Band41 | 10MHz | QPSK | 39700 | 1RB#0 | 21.44 | 22.00 |
| Band41 | 10MHz | 16QAM | 39700 | 1RB#0 | 20.83 | 21.00 |
| Band41 | 10MHz | QPSK | 39700 | 1RB#24 | 21.44 | 22.00 |
| Band41 | 10MHz | 16QAM | 39700 | 1RB#24 | 20.80 | 21.00 |
| Band41 | 10MHz | QPSK | 39700 | 1RB#49 | 21.63 | 22.00 |
| Band41 | 10MHz | 16QAM | 39700 | 1RB#49 | 21.00 | 22.00 |
| Band41 | 10MHz | QPSK | 39700 | 25RB#0 | 20.57 | 21.00 |
| Band41 | 10MHz | 16QAM | 39700 | 25RB#0 | 19.93 | 20.00 |
| Band41 | 10MHz | QPSK | 39700 | 25RB#12 | 20.57 | 21.00 |
| Band41 | 10MHz | 16QAM | 39700 | 25RB#12 | 19.93 | 20.00 |
| Band41 | 10MHz | QPSK | 39700 | 25RB#25 | 20.70 | 21.00 |
| Band41 | 10MHz | 16QAM | 39700 | 25RB#25 | 20.03 | 21.00 |
| Band41 | 10MHz | QPSK | 39700 | 50RB#0 | 20.58 | 21.00 |
| Band41 | 10MHz | 16QAM | 39700 | 50RB#0 | 19.99 | 20.00 |
| Band41 | 10MHz | QPSK | 40620 | 1RB#0 | 21.64 | 22.00 |
| Band41 | 10MHz | 16QAM | 40620 | 1RB#0 | 21.30 | 22.00 |
| Band41 | 10MHz | QPSK | 40620 | 1RB#24 | 21.73 | 22.00 |
| Band41 | 10MHz | 16QAM | 40620 | 1RB#24 | 21.35 | 22.00 |
| Band41 | 10MHz | QPSK | 40620 | 1RB#49 | 21.79 | 22.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Band41 | 10MHz | 16QAM | 40620 | 1RB#49 | 21.48 | 22.00 |
| Band41 | 10MHz | QPSK | 40620 | 25RB#0 | 20.64 | 21.00 |
| Band41 | 10MHz | 16QAM | 40620 | 25RB#0 | 19.81 | 20.00 |
| Band41 | 10MHz | QPSK | 40620 | 25RB#12 | 20.64 | 21.00 |
| Band41 | 10MHz | 16QAM | 40620 | 25RB#12 | 19.82 | 20.00 |
| Band41 | 10MHz | QPSK | 40620 | 25RB#25 | 20.68 | 21.00 |
| Band41 | 10MHz | 16QAM | 40620 | 25RB#25 | 19.91 | 20.00 |
| Band41 | 10MHz | QPSK | 40620 | 50RB#0 | 20.78 | 21.00 |
| Band41 | 10MHz | 16QAM | 40620 | 50RB#0 | 19.90 | 20.00 |
| Band41 | 10MHz | QPSK | 41540 | 1RB#0 | 21.81 | 22.00 |
| Band41 | 10MHz | 16QAM | 41540 | 1RB#0 | 21.47 | 22.00 |
| Band41 | 10MHz | QPSK | 41540 | 1RB#24 | 21.76 | 22.00 |
| Band41 | 10MHz | 16QAM | 41540 | 1RB#24 | 21.43 | 22.00 |
| Band41 | 10MHz | QPSK | 41540 | 1RB#49 | 21.73 | 22.00 |
| Band41 | 10MHz | 16QAM | 41540 | 1RB#49 | 21.40 | 22.00 |
| Band41 | 10MHz | QPSK | 41540 | 25RB#0 | 20.71 | 21.00 |
| Band41 | 10MHz | 16QAM | 41540 | 25RB#0 | 19.96 | 20.00 |
| Band41 | 10MHz | QPSK | 41540 | 25RB#12 | 20.72 | 21.00 |
| Band41 | 10MHz | 16QAM | 41540 | 25RB#12 | 19.93 | 20.00 |
| Band41 | 10MHz | QPSK | 41540 | 25RB#25 | 20.72 | 21.00 |
| Band41 | 10MHz | 16QAM | 41540 | 25RB#25 | 19.90 | 20.00 |
| Band41 | 10MHz | QPSK | 41540 | 50RB#0 | 20.72 | 21.00 |
| Band41 | 10MHz | 16QAM | 41540 | 50RB#0 | 20.01 | 21.00 |
| Band41 | 15MHz | QPSK | 39725 | 1RB#0 | 21.88 | 22.00 |
| Band41 | 15MHz | 16QAM | 39725 | 1RB#0 | 21.47 | 22.00 |
| Band41 | 15MHz | QPSK | 39725 | 1RB#38 | 22.05 | 23.00 |
| Band41 | 15MHz | 16QAM | 39725 | 1RB#38 | 21.70 | 22.00 |
| Band41 | 15MHz | QPSK | 39725 | 1RB#74 | 22.37 | 23.00 |
| Band41 | 15MHz | 16QAM | 39725 | 1RB#74 | 22.08 | 23.00 |
| Band41 | 15MHz | QPSK | 39725 | 38RB#0 | 21.10 | 22.00 |
| Band41 | 15MHz | 16QAM | 39725 | 38RB#0 | 21.09 | 22.00 |
| Band41 | 15MHz | QPSK | 39725 | 38RB#18 | 21.09 | 22.00 |
| Band41 | 15MHz | 16QAM | 39725 | 38RB#18 | 21.09 | 22.00 |
| Band41 | 15MHz | QPSK | 39725 | 38RB#37 | 21.08 | 22.00 |
| Band41 | 15MHz | 16QAM | 39725 | 38RB#37 | 21.08 | 22.00 |
| Band41 | 15MHz | QPSK | 39725 | 75RB#0 | 21.08 | 22.00 |
| Band41 | 15MHz | 16QAM | 39725 | 75RB#0 | 20.40 | 21.00 |
| Band41 | 15MHz | QPSK | 40620 | 1RB#0 | 21.71 | 22.00 |
| Band41 | 15MHz | 16QAM | 40620 | 1RB#0 | 21.33 | 22.00 |
| Band41 | 15MHz | QPSK | 40620 | 1RB#38 | 21.72 | 22.00 |
| Band41 | 15MHz | 16QAM | 40620 | 1RB#38 | 21.35 | 22.00 |
| Band41 | 15MHz | QPSK | 40620 | 1RB#74 | 21.91 | 22.00 |
| Band41 | 15MHz | 16QAM | 40620 | 1RB#74 | 21.39 | 22.00 |
| Band41 | 15MHz | QPSK | 40620 | 38RB#0 | 20.68 | 21.00 |
| Band41 | 15MHz | 16QAM | 40620 | 38RB#0 | 20.69 | 21.00 |
| Band41 | 15MHz | QPSK | 40620 | 38RB#18 | 20.69 | 21.00 |
| Band41 | 15MHz | 16QAM | 40620 | 38RB#18 | 20.69 | 21.00 |
| Band41 | 15MHz | QPSK | 40620 | 38RB#37 | 20.69 | 21.00 |
| Band41 | 15MHz | 16QAM | 40620 | 38RB#37 | 20.69 | 21.00 |
| Band41 | 15MHz | QPSK | 40620 | 75RB#0 | 20.69 | 21.00 |
| Band41 | 15MHz | 16QAM | 40620 | 75RB#0 | 19.96 | 20.00 |
| Band41 | 15MHz | QPSK | 41515 | 1RB#0 | 21.83 | 22.00 |
| Band41 | 15MHz | 16QAM | 41515 | 1RB#0 | 21.47 | 22.00 |
| Band41 | 15MHz | QPSK | 41515 | 1RB#38 | 21.79 | 22.00 |
| Band41 | 15MHz | 16QAM | 41515 | 1RB#38 | 21.41 | 22.00 |
| Band41 | 15MHz | QPSK | 41515 | 1RB#74 | 21.69 | 22.00 |
| Band41 | 15MHz | 16QAM | 41515 | 1RB#74 | 21.38 | 22.00 |
| Band41 | 15MHz | QPSK | 41515 | 38RB#0 | 20.75 | 21.00 |
| Band41 | 15MHz | 16QAM | 41515 | 38RB#0 | 20.75 | 21.00 |
| Band41 | 15MHz | QPSK | 41515 | 38RB#18 | 20.75 | 21.00 |
| Band41 | 15MHz | 16QAM | 41515 | 38RB#18 | 20.77 | 21.00 |
| Band41 | 15MHz | QPSK | 41515 | 38RB#37 | 20.77 | 21.00 |
| Band41 | 15MHz | 16QAM | 41515 | 38RB#37 | 20.76 | 21.00 |
| Band41 | 15MHz | QPSK | 41515 | 75RB#0 | 20.77 | 21.00 |
| Band41 | 15MHz | 16QAM | 41515 | 75RB#0 | 20.06 | 21.00 |
| Band41 | 20MHz | QPSK | 39750 | 1RB#0 | 21.53 | 22.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Band41 | 20MHz | 16QAM | 39750 | 1RB#0 | 21.02 | 22.00 |
| Band41 | 20MHz | QPSK | 39750 | 1RB#49 | 21.76 | 22.00 |
| Band41 | 20MHz | 16QAM | 39750 | 1RB#49 | 21.18 | 22.00 |
| Band41 | 20MHz | QPSK | 39750 | 1RB#99 | 22.14 | 23.00 |
| Band41 | 20MHz | 16QAM | 39750 | 1RB#99 | 21.66 | 22.00 |
| Band41 | 20MHz | QPSK | 39750 | 50RB#0 | 20.98 | 21.00 |
| Band41 | 20MHz | 16QAM | 39750 | 50RB#0 | 20.37 | 21.00 |
| Band41 | 20MHz | QPSK | 39750 | 50RB#25 | 20.97 | 21.00 |
| Band41 | 20MHz | 16QAM | 39750 | 50RB#25 | 20.37 | 21.00 |
| Band41 | 20MHz | QPSK | 39750 | 50RB#50 | 21.36 | 22.00 |
| Band41 | 20MHz | 16QAM | 39750 | 50RB#50 | 20.89 | 21.00 |
| Band41 | 20MHz | QPSK | 39750 | 100RB#0 | 21.13 | 22.00 |
| Band41 | 20MHz | 16QAM | 39750 | 100RB#0 | 20.48 | 21.00 |
| Band41 | 20MHz | QPSK | 40620 | 1RB#0 | 21.33 | 22.00 |
| Band41 | 20MHz | 16QAM | 40620 | 1RB#0 | 21.10 | 22.00 |
| Band41 | 20MHz | QPSK | 40620 | 1RB#49 | 21.36 | 22.00 |
| Band41 | 20MHz | 16QAM | 40620 | 1RB#49 | 21.18 | 22.00 |
| Band41 | 20MHz | QPSK | 40620 | 1RB#99 | 21.66 | 22.00 |
| Band41 | 20MHz | 16QAM | 40620 | 1RB#99 | 21.64 | 22.00 |
| Band41 | 20MHz | QPSK | 40620 | 50RB#0 | 20.44 | 21.00 |
| Band41 | 20MHz | 16QAM | 40620 | 50RB#0 | 19.79 | 20.00 |
| Band41 | 20MHz | QPSK | 40620 | 50RB#25 | 20.45 | 21.00 |
| Band41 | 20MHz | 16QAM | 40620 | 50RB#25 | 19.84 | 20.00 |
| Band41 | 20MHz | QPSK | 40620 | 50RB#50 | 20.64 | 21.00 |
| Band41 | 20MHz | 16QAM | 40620 | 50RB#50 | 20.00 | 21.00 |
| Band41 | 20MHz | QPSK | 40620 | 100RB#0 | 20.50 | 21.00 |
| Band41 | 20MHz | 16QAM | 40620 | 100RB#0 | 19.80 | 20.00 |
| Band41 | 20MHz | QPSK | 41490 | 1RB#0 | 21.51 | 22.00 |
| Band41 | 20MHz | 16QAM | 41490 | 1RB#0 | 21.47 | 22.00 |
| Band41 | 20MHz | QPSK | 41490 | 1RB#49 | 21.61 | 22.00 |
| Band41 | 20MHz | 16QAM | 41490 | 1RB#49 | 21.46 | 22.00 |
| Band41 | 20MHz | QPSK | 41490 | 1RB#99 | 21.44 | 22.00 |
| Band41 | 20MHz | 16QAM | 41490 | 1RB#99 | 21.44 | 22.00 |
| Band41 | 20MHz | QPSK | 41490 | 50RB#0 | 20.82 | 21.00 |
| Band41 | 20MHz | 16QAM | 41490 | 50RB#0 | 20.11 | 21.00 |
| Band41 | 20MHz | QPSK | 41490 | 50RB#25 | 20.64 | 21.00 |
| Band41 | 20MHz | 16QAM | 41490 | 50RB#25 | 20.06 | 21.00 |
| Band41 | 20MHz | QPSK | 41490 | 50RB#50 | 20.68 | 21.00 |
| Band41 | 20MHz | 16QAM | 41490 | 50RB#50 | 20.12 | 21.00 |
| Band41 | 20MHz | QPSK | 41490 | 100RB#0 | 20.76 | 21.00 |
| Band41 | 20MHz | 16QAM | 41490 | 100RB#0 | 19.96 | 20.00 |

## 7.2. SAR Measurement Results

The calculated SAR is obtained by the following formula:

Reported SAR=Measured SAR*$10^{(Ptarget-Pmeasured))/10}$

Scaling factor=$10^{(Ptarget-Pmeasured))/10}$

Reported SAR= Measured SAR* Scaling factor

Where

$P_{target}$ is the power of manufacturing upper limit;

$P_{measured}$ is the measured power;

Measured SAR is measured SAR at measured power which including power drift)

Reported SAR which including Power Drift and Scaling factor

### 7.2.1. SAR Results [LTE Band 5]

| SAR Values [LTE Band 5] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ch/ Freq. (MHz) | BW. | Channel Type | Test Position | Conducted Power (dBm) | Maximum Allowed Power (dBm) | Power Drift (dB) | Scaling Factor | $SAR_{1-g}$ results(W/kg) | |
| | | | | | | | | Measured | Reported |
| measured / reported SAR numbers - Body (distance 0mm)<1RB> | | | | | | | | | |
| 20600/844 | 10M | QPSK 1RB_0 | Front side | 23.88 | 24.00 | -0.05 | 1.028 | **0.221** | **0.227** |
| 20600/844 | 10M | QPSK 1RB_0 | Rear side | 23.88 | 24.00 | 0.05 | 1.028 | 0.165 | 0.170 |
| 20600/844 | 10M | QPSK 1RB_0 | Left side | 23.88 | 24.00 | -0.09 | 1.028 | 0.060 | 0.062 |
| 20600/844 | 10M | QPSK 1RB_0 | Right side | 23.88 | 24.00 | -0.01 | 1.028 | 0.206 | 0.212 |
| 20600/844 | 10M | QPSK 1RB_0 | Top side | 23.88 | 24.00 | 0.02 | 1.028 | 0.120 | 0.123 |
| 20600/844 | 10M | QPSK 1RB_0 | Bottom side | 23.88 | 24.00 | -0.16 | 1.028 | 0.065 | 0.067 |
| measured / reported SAR numbers - Body (distance 0mm)<50%RB> | | | | | | | | | |
| 20600/844 | 10M | QPSK 25RB_12 | Front side | 23.04 | 24.00 | -0.19 | 1.247 | 0.174 | 0.217 |
| 20600/844 | 10M | QPSK 25RB_12 | Rear side | 23.04 | 24.00 | -0.12 | 1.247 | 0.125 | 0.156 |
| 20600/844 | 10M | QPSK 25RB_12 | Left side | 23.04 | 24.00 | -0.03 | 1.247 | 0.041 | 0.051 |
| 20600/844 | 10M | QPSK 25RB_12 | Right side | 23.04 | 24.00 | 0.02 | 1.247 | 0.166 | 0.207 |
| 20600/844 | 10M | QPSK 25RB_12 | Top side | 23.04 | 24.00 | -0.12 | 1.247 | 0.075 | 0.094 |
| 20600/844 | 10M | QPSK 25RB_12 | Bottom side | 23.04 | 24.00 | 0.88 | 1.247 | 0.046 | 0.057 |

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.
2) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ⩽ 0.8W/kg for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is ⩽ 100MHz.
   - ⩽ 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.
   - ⩽ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ⩾ 200 MHz.

## 7.2.2. SAR Results [LTE Band 41]

| SAR Values [LTE Band 41] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ch/ Freq. (MHz) | BW. | Channel Type | Test Position | Conducted Power (dBm) | Maximum Allowed Power (dBm) | Power Drift (dB) | Scaling Factor | $SAR_{1-g}$ results(W/kg) | |
| | | | | | | | | Measured | Reported |
| measured / reported SAR numbers - Body (distance 0mm)<1RB> | | | | | | | | | |
| 39750/2506 | 20M | QPSK 1RB_99 | Front side | 22.14 | 23.00 | -0.12 | 1.219 | **0.405** | **0.494** |
| 39750/2506 | 20M | QPSK 1RB_99 | Rear side | 22.14 | 23.00 | 0.19 | 1.219 | 0.365 | 0.445 |
| 39750/2506 | 20M | QPSK 1RB_99 | Left side | 22.14 | 23.00 | 0.17 | 1.219 | 0.118 | 0.144 |
| 39750/2506 | 20M | QPSK 1RB_99 | Right side | 22.14 | 23.00 | 0.12 | 1.219 | 0.389 | 0.474 |
| 39750/2506 | 20M | QPSK 1RB_99 | Top side | 22.14 | 23.00 | 0.19 | 1.219 | 0.354 | 0.432 |
| 39750/2506 | 20M | QPSK 1RB_99 | Bottom side | 22.14 | 23.00 | 0.13 | 1.219 | 0.124 | 0.151 |
| measured / reported SAR numbers - Body (distance 0mm)<50%RB> | | | | | | | | | |
| 39750/2506 | 20M | QPSK 50RB_50 | Front side | 21.36 | 22.00 | 0.19 | 1.159 | 0.365 | 0.423 |
| 39750/2506 | 20M | QPSK 50RB_50 | Rear side | 21.36 | 22.00 | 0.15 | 1.159 | 0.321 | 0.372 |
| 39750/2506 | 20M | QPSK 50RB_50 | Left side | 21.36 | 22.00 | -0.10 | 1.159 | 0.074 | 0.086 |
| 39750/2506 | 20M | QPSK 50RB_50 | Right side | 21.36 | 22.00 | 0.06 | 1.159 | 0.344 | 0.399 |
| 39750/2506 | 20M | QPSK 50RB_50 | Top side | 21.36 | 22.00 | -0.18 | 1.159 | 0.315 | 0.365 |
| 39750/2506 | 20M | QPSK 50RB_50 | Bottom side | 21.36 | 22.00 | 0.17 | 1.159 | 0.080 | 0.093 |

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.
2) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8W/kg for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is ≤ 100MHz.
   - ≤ 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.
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz.

## Appendix A: Detailed System Check Results

## Appendix B: Detailed Test Results

## Appendix C: Calibration certificate

## Appendix D: Photographs

**.....................The End of Test Report.........................**