# TEST REPORT

| | |
|---|---|
| **Applicant:** | Shenzhen Jimi IoT Co., Ltd. |
| **Address:** | 3-4/F, Block A, Building #7, Shenzhen International Innovation Valley, Dashi 1st Road, Nanshan District, Shenzhen, Guangdong, China |
| **Equipment Type:** | LTE Vehicle Terminal |
| **Model Name:** | VL111 (refer to section 2.3) |
| **Brand Name:** | JimiIoT |
| **FCC ID:** | 2AMLF-VL111 |
| **Test Standard:** | FCC 47 CFR Part 2.1093 (refer to section 3.1) |
| **Maximum SAR:** | Body (1 g@5mm): 1.28 W/kg |
| **Sample Arrival Date:** | Jan. 11, 2024 |
| **Test Date:** | Apr. 24, 2024 - Apr. 26, 2024 |
| **Date of Issue:** | Apr. 28, 2024 |

**ISSUED BY:**

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Ruan Zhaoyi **Checked by:** Xu Rui **Approved by:** Tolan Tu (Testing Director)

**Revision History**

| Version | Issue Date | Revisions Content |
|---|---|---|
| Rev. 01 | Apr. 28, 2024 | Initial Issue |

# TABLE OF CONTENTS

# 1 GENERAL INFORMATION

## 1.1 Test Laboratory

| | |
|---|---|
| Name | Shenzhen BALUN Technology Co., Ltd. |
| Address | Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China |
| Phone Number | +86 755 6685 0100 |

## 1.2 Test Location

| | |
|---|---|
| Name | Shenzhen BALUN Technology Co., Ltd. |
| Location | ☑ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China |
| | ☐ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China |
| Accreditation Certificate | The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196. |

## 1.3 Test Environment Condition

| | |
|---|---|
| Ambient Temperature | 18℃ to 25℃ |
| Ambient Relative Humidity | 30% to 70% |

# 2 PRODUCT INFORMATION

## 2.1 Applicant Information

| | |
|---|---|
| Applicant | Shenzhen Jimi IoT Co., Ltd. |
| Address | 3-4/F, Block A, Building #7, Shenzhen International Innovation Valley, Dashi 1st Road, Nanshan District, Shenzhen, Guangdong, China |

## 2.2 Manufacturer Information

| | |
|---|---|
| Manufacturer | Shenzhen Jimi IoT Co., Ltd. |
| Address | 3-4/F, Block A, Building #7, Shenzhen International Innovation Valley, Dashi 1st Road, Nanshan District, Shenzhen, Guangdong, China |

## 2.3 General Description for Equipment under Test (EUT)

| | |
|---|---|
| EUT Name | LTE Vehicle Terminal |
| Model Name Under Test | VL111 |
| Series Model Name | V1411, C45 |
| Description of Model Name Differentiation | All models are same with electrical parameters and internal circuit structure, but only differ in model name.<br>(this information provided by the customer) |
| Hardware Version | N/A |
| Software Version | N/A |
| Dimensions (Approx.) | N/A |
| Weight (Approx.) | N/A |

## 2.4 Ancillary Equipment

| | | |
|---|---|---|
| Ancillary Equipment 1 | Battery | |
| | Brand Name | N/A |
| | Model No. | HT422033 |
| | Serial No. | N/A |
| | Capacitance | 270 mAh |
| | Rated Voltage | 3.70 V |
| | Limited Voltage | 4.20 V |

## 2.5 Technical Information

| | |
|---|---|
| Network and Wireless connectivity | 2G Network GSM/GPRS/EDGE 850/1900 MHz<br>4G Network FDD LTE Band 2/4//5/7<br>Bluetooth (BR+EDR+BLE) |

The requirement for the following technical information of the EUT was tested in this report:

| | | | |
|---|---|---|---|
| Operating Mode | GSM, LTE, Bluetooth | | |
| Frequency Range | GSM 850 | TX: 824 ~ 849 MHz | RX: 869 ~ 894 MHz |
| | GSM 1900 | TX: 1850 ~ 1910 MHz | RX: 1930 ~ 1990 MHz |
| | LTE Band 2 | TX: 1850 ~ 1910 MHz | RX: 1930 ~ 1990 MHz |
| | LTE Band 4 | TX: 1710 ~ 1755 MHz | RX: 2110 ~ 2155 MHz |
| | LTE Band 5 | TX: 824 ~ 849 MHz | RX: 869 ~ 894 MHz |
| | LTE Band 7 | TX: 2500 ~ 2570 MHz | RX: 2620 ~ 2690 MHz |
| | Bluetooth | 2400 ~ 2483.5 MHz | |
| Antenna Type | WWAN: PIFA Antenna<br>Bluetooth: PIFA Antenna | | |
| Hotspot Function | N/A | | |
| Exposure Category | General Population/Uncontrolled exposure | | |
| Product Type | Portable Device | | |
| EUT Type | ☒ Production unit | ☐ Identical prototype | |

# 3 SUMMARY OF TEST RESULT

## 3.1 Test Standards

| No. | Identity | Document Title |
|---|---|---|
| 1 | 47 CFR Part 2.1093 | Radiofrequency radiation exposure evaluation: portable devices |
| 2 | ANSI C95.1-1992 | IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz |
| 3 | KDB 447498 D04 v01 | 447498 D04 Interim General RF Exposure Guidance v01 |
| 4 | KDB 941225 D01 v03r01 | 3G SAR MEAUREMENT PROCEDURES |
| 5 | KDB 941225 D05 v02r05 | SAR Evaluation Considerations for LTE Devices |
| 6 | KDB 865664 D01 v01r04 | SAR Measurement 100 MHz to 6 GHz |
| 7 | KDB 865664 D02 v01r02 | RF Exposure Reporting |

## 3.2 Device Category and SAR Limit

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user.

Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

Table of Exposure Limits:

| Body Position | SAR Value (W/Kg) | |
|---|---|---|
| | General Population/ Uncontrolled Exposure | Occupational/ ControlledExposure |
| Whole-Body SAR (averaged over the entire body) | 0.08 | 0.4 |
| Partial-Body SAR (averaged over any 1 gram of tissue) | 1.60 | 8.0 |
| SAR for hands, wrists, feet and ankles (averaged over any 10 grams of tissue) | 4.0 | 20.0 |

NOTE:

**General Population/Uncontrolled Exposure:** Locations where there is the exposure of individuals who have no knowledge or control of their exposure. General population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

**Occupational/Controlled Exposure:** Locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

## 3.3 Test Result Summary

### 3.3.1 Highest SAR (1 g Value)

| Equipment Class | Band | Maximum Scaled SAR (W/kg) | Maximum Report SAR (W/kg) |
|---|---|---|---|
| | | Body (5mm) | Body (5mm) |
| | | 1g SAR | 1g SAR |
| PCE | GSM 850 | 0.28 | 1.28 |
| | GSM 1900 | 0.82 | |
| | LTE Band 2 | 1.20 | |
| | LTE Band 4 | 0.73 | |
| | LTE Band 5 | 0.40 | |
| | LTE Band 7 | **1.28** | |
| DSS | Bluetooth | 0.02 | |
| Limit (W/kg) | | 1.6 | 1.6 |
| Verdict | | PASS | |

### 3.3.2 Highest Simultaneous Transmission SAR Values (1 g Value)

| Equipment Class | Maximum Report SAR (W/kg) |
|---|---|
| | Body(5mm) |
| | 1g SAR |
| PCE | **1.30** |
| DSS | **1.30** |
| Limit (W/Kg) | 1.6 |
| Verdict | Pass |

Note: The simultaneous transmission SAR detail please refer to section 12.

## 3.4 Test Uncertainty

According to KDB 865664 D01, when the highest measured 1 g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis is not required in SAR reports submitted for equipment approval.

The maximum 1 g SAR for the EUT in this report is 1.28 W/kg, which is lower than 1.5 W/kg, so the extensive SAR measurement uncertainty analysis is not required in this report.

# 4 MEASUREMENT SYSTEM

## 4.1 Specific Absorption Rate (SAR) Definition

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

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

SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

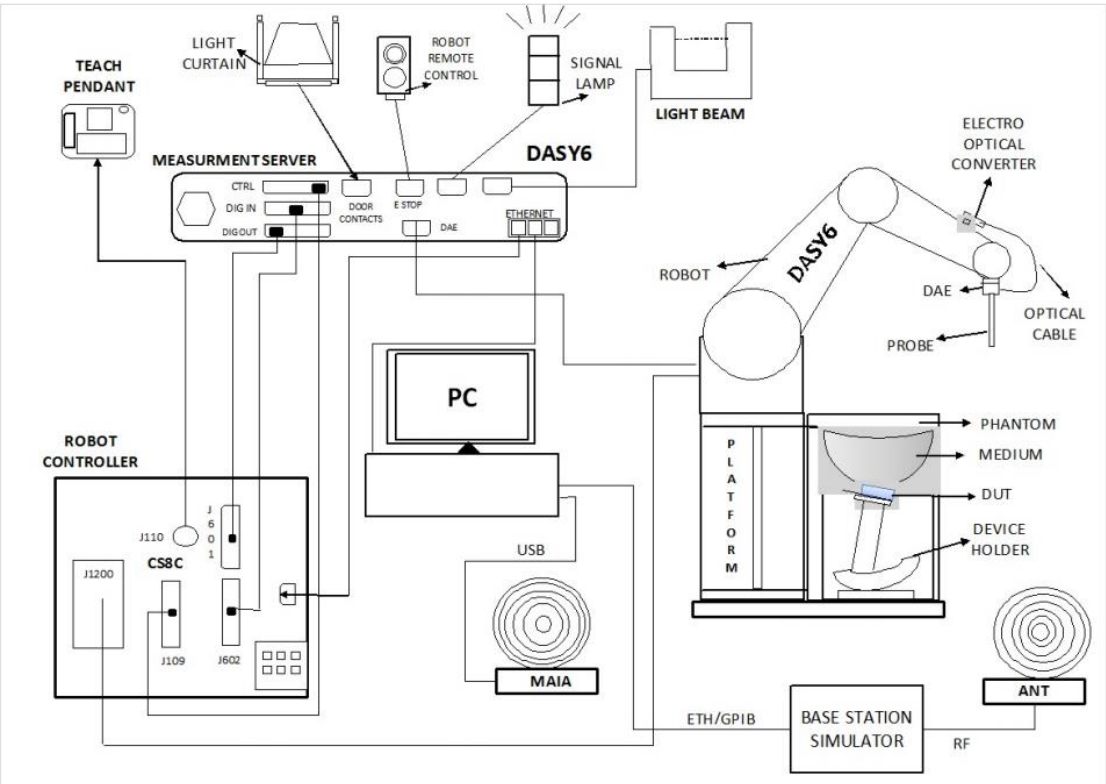
$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}\mathbf{E}^{2}}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue,

ρis the mass density of the tissue and E is the RMS electrical field strength.

## 4.2 DASY SAR System

### 4.2.1 DASY SAR System Diagram

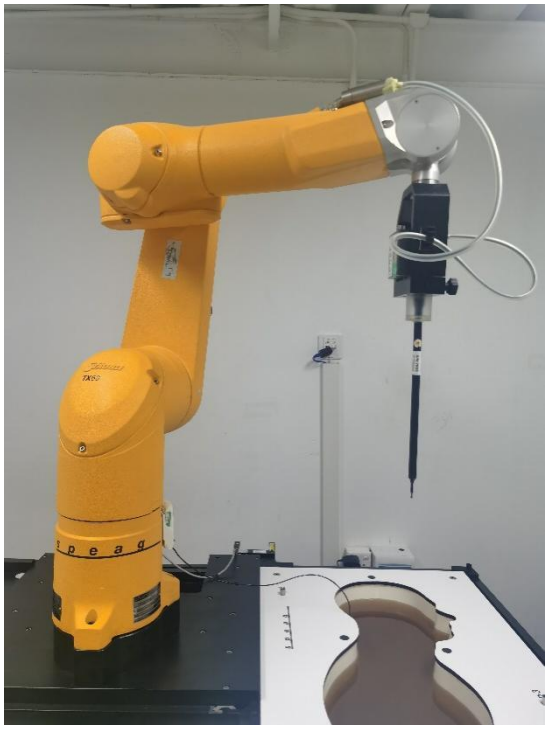



The DASY system for performing compliance tests consists of the following items:

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. 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.
3. A data acquisition electronic (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.
4. A unit to operate the optical surface detector which is connected to the EOC.
5. The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY measurement server.
6. The DASY measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation.
7. DASY software and SEMCAD data evaluation software.
8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. System validation dipoles allowing to validate the proper functioning of the system.

### 4.2.2 Robot

The Dasy SAR system uses the high precision robots. Symmetrical design with triangular core Built-in optical fiber for surface detection system For the 6-axis controller system, Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents). The robot series have many features that are important for our application:

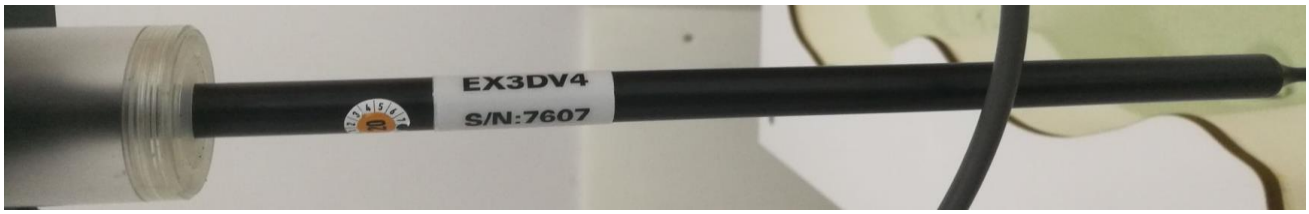


- High precision
  (repeatability ±0.02 mm)
- High reliability
  (industrial design)
- Low maintenance costs
  (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements
  (brush less synchron motors; no stepper motors)
- Low ELF interference
  (motor control _elds shielded via the closed metallic construction shields)

### 4.2.3 E-Field Probe

The probe is specially designed and calibrated for use in liquids with high permittivities for the measurements the Specific Dosimetric E-Field Probe EX3DV4-SN:7607 following specifications is used.

| | |
|---|---|
| Construction | Symmetrical design with triangular core Built-in optical fiber for surface detection system Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycolether) |
| Calibration | ISO/IEC 17025 calibration service available |
| Frequency | 4 MHz to 10 GHz; Linearity: ± 0.2 dB |
| Directivity | ± 0.2 dB in HSL (rotation around probe axis) ; ± 0.4 dB in HSL (rotation normal to probe axis) |
| Dynamic range | 5 μW/g to > 100 mW/g; Linearity: ± 0.2 dB |
| Dimensions | Overall length: 337 mm (Tip: 9 mm) Tip diameter: 2.5 mm (Body: 10 mm) Distance from probe tip to dipole centers: 1.0 mm |
| Application | General dosimetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms (EX3DV4) |

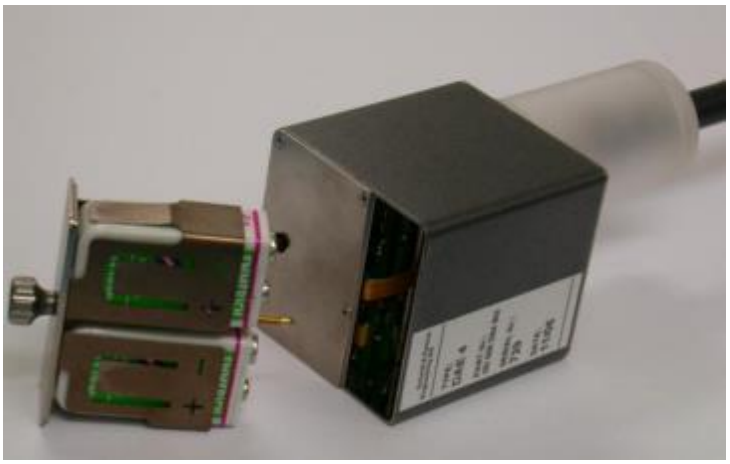



**E-Field Probe Calibration Process**

Probe calibration is realized, in compliance with IEC/IEEE 62209-1528 and IEEE 1528 std, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the IEC/IEEE 62209-1528 annexe technique using reference guide at the five frequencies.

### 4.2.4 Data Acquisition Electronics

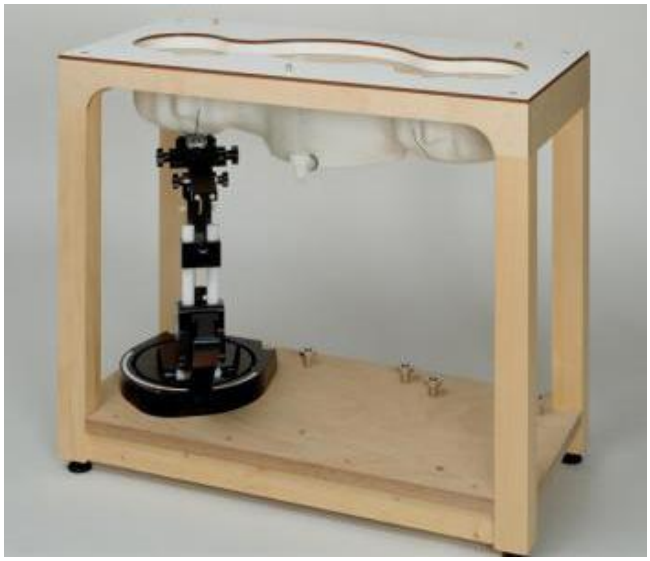
The data acquisition electronics (DAE) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converte and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.



- Input Impedance: 200MOhm
- The Inputs: Symmetrical and Floating
- Commom Mode Rejection: Above 80dB

### 4.2.5 Phantoms

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.



- Left hand
- Right hand
- Flat phantom

**Photo of Phantom SN1859**

| Serial Number | Material | Length | Height |
|---|---|---|---|
| **SN 1859 SAM** | Vinylester, glass fiber reinforced | 1000 | 500 |

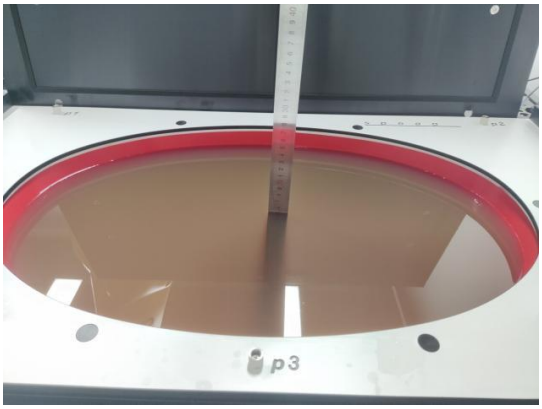
### 4.2.6 Device Holder

The DASY device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA‟s only. If necessary an additional support of polystyrene material is used. Larger DUT‟s (e.g. notebooks) cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values. Therefore those devices are normally only tested at the flat part of the SAM.

The positioning system allows obtaining cheek and tilting position with a very good accuracy. Incompliance with CENELEC, the tilt angle uncertainty is lower than 1°.

### 4.2.7 Simulating Liquid

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5%.

| Head Liquid Depth | Body Liquid Depth |
|---|---|
|  |  |

The following table gives the recipes for tissue simulating liquid and the theoretical Conductivity/Permittivity.

The following table gives the recipes for tissue simulating liquid.

| TSL | Manufacturer / Model | Freq Range (MHz) | Main Ingredients |
|---|---|---|---|
| Head WideBand | SPEAG HBBL600-10000V6 | 600-10000 | Ethanediol, Sodium petroleum sulfonate, Hexylene Glycol / 2-Methyl-pentane-2.4-diol, Alkoxylated alcohol |

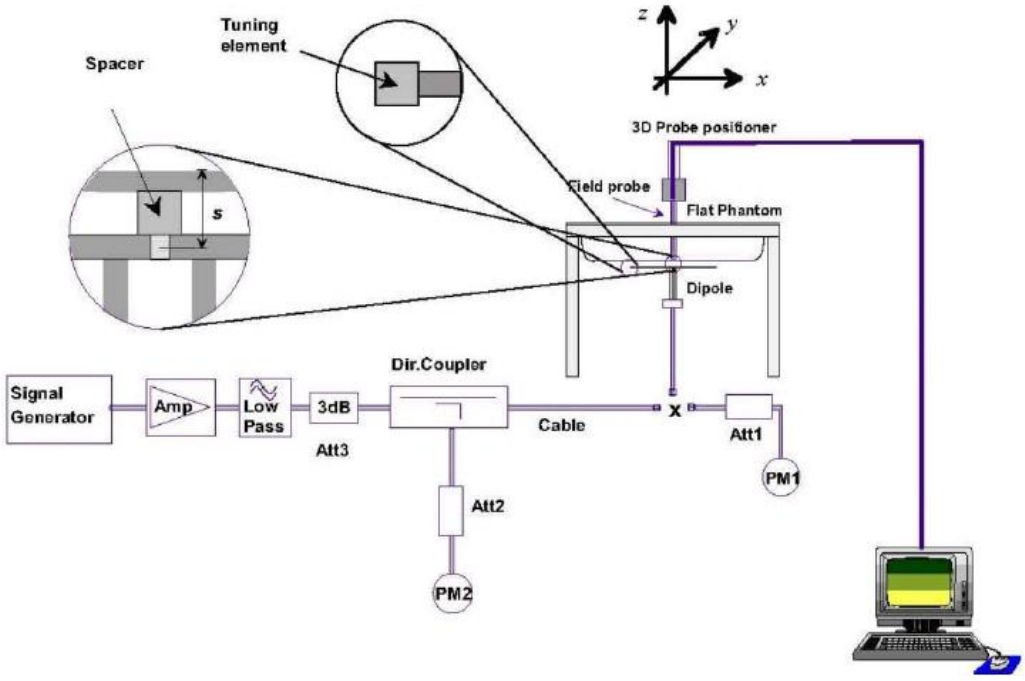
# 5 SYSTEM VERIFICATION

## 5.1 Purpose of System Check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

## 5.2 System Check Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:



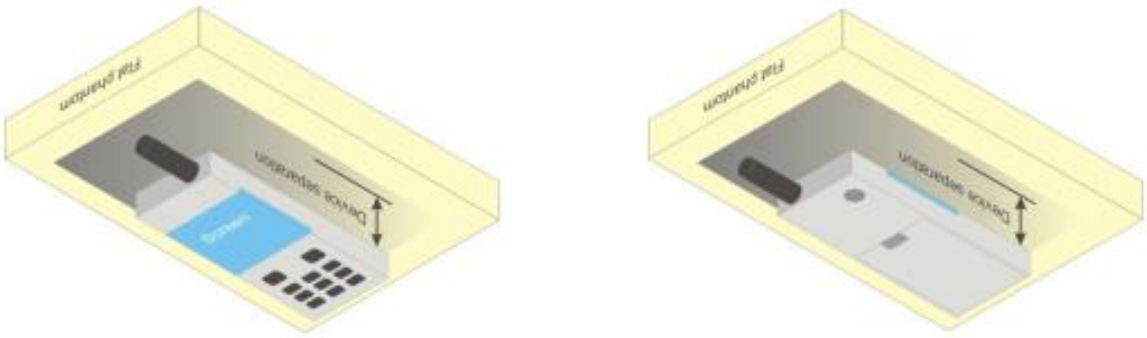
# 6 TEST POSITION CONFIGURATIONS

## 6.1 Body-worn Position Conditions

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 KDB 447498 are 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 the reported SAR for a body-worn accessory.

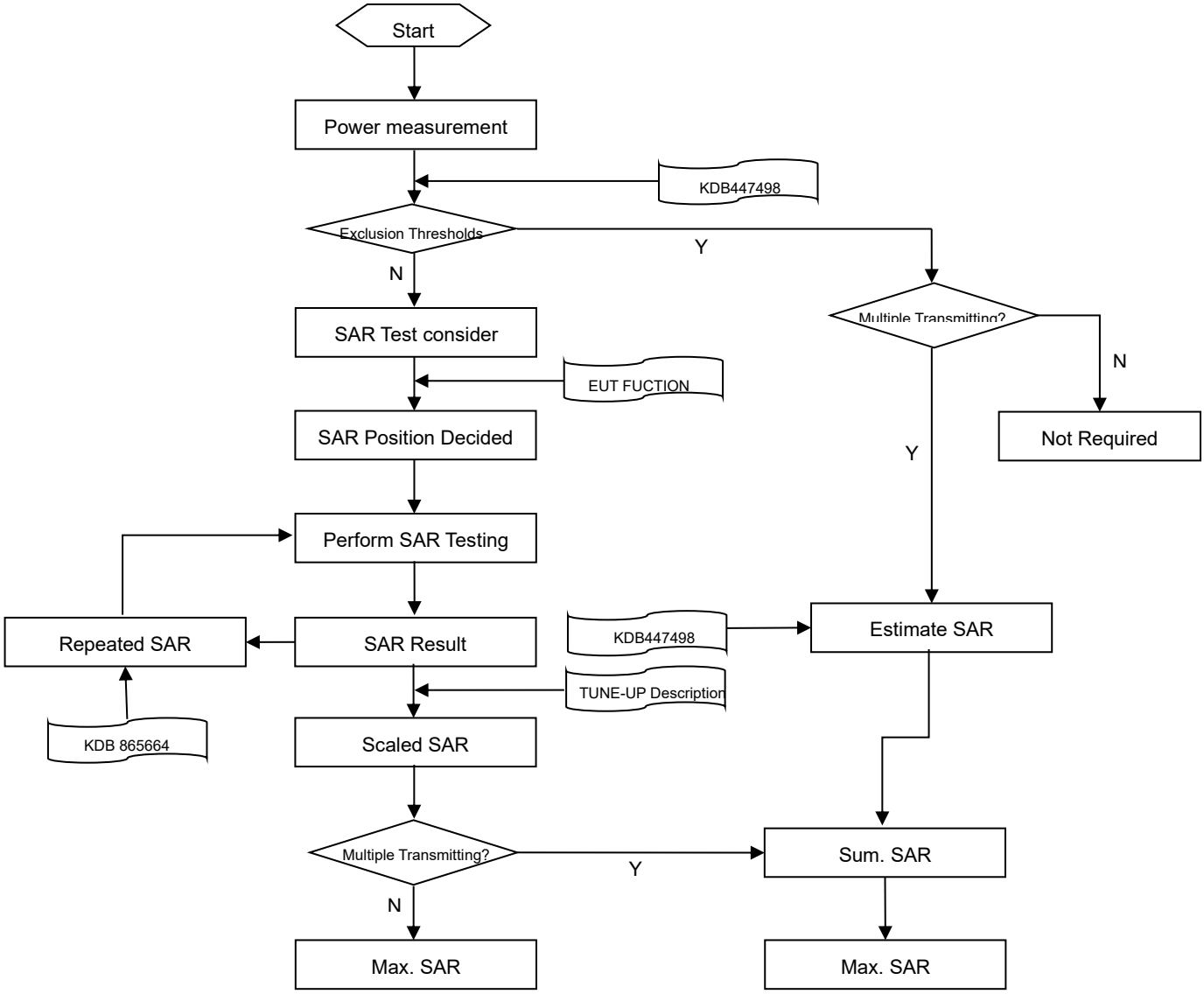
Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.

Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required. A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets is used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer, according to the requirements of Supplement C 01-01. Devices that are designed to operate on the body of users using lanyards and straps, or without requiring additional body-worn accessories, will be tested using a conservative minimum test separation distance <= 5 mm to support compliance.



# 7 MEASUREMENT PROCEDURE

## 7.1 Measurement Process Diagram



## 7.2 SAR Scan General Requirement

Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Boththe 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.

<table>
<tr><th colspan="3"></th><th>≤3GHz</th><th>>3GHz</th></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5±1 mm</td><td>½·δ·ln(2)±0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30°±1°</td><td>20°±1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx Area , Δy Area</td><td>≤ 2 GHz: ≤ 15 mm<br>2 – 3 GHz: ≤ 12 mm</td><td>3–4 GHz: ≤ 12 mm<br>4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx Zoom , Δy Zoom</td><td>≤ 2 GHz: ≤ 8 mm<br>2 –3 GHz: ≤ 5 mm*</td><td>3–4 GHz: ≤ 5 mm*<br>4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="7">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2" rowspan="3">uniform grid: Δz Zoom (n)</td><td rowspan="3">≤ 5 mm</td><td>3–4 GHz: ≤ 4 mm</td></tr>
<tr><td>4–5 GHz: ≤ 3 mm</td></tr>
<tr><td>5–6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="4">graded grid</td><td rowspan="2">Δz Zoom (1): between 1st two points closest to phantom surface</td><td rowspan="2">≤ 4 mm</td><td>3–4 GHz: ≤ 3 mm</td></tr>
<tr><td>4–5 GHz: ≤ 2.5 mm</td></tr>
<tr><td>5–6 GHz: ≤ 2 mm</td></tr>
<tr><td>Δz Zoom (n>1): between subsequent points</td><td colspan="2">≤ 1.5·Δz Zoom (n-1)</td></tr>
<tr><td rowspan="3">Minimum zoom scan volume</td><td colspan="2" rowspan="3">x, y, z</td><td rowspan="3">≥30 mm</td><td>3–4 GHz: ≥ 28 mm</td></tr>
<tr><td>4–5 GHz: ≥ 25 mm</td></tr>
<tr><td>5–6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note:<br>1. δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.<br>2. * When zoom scan is required and the reported SAR from the area scan based 1 g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

## 7.3 Measurement Procedure

The following steps are used for each test position

a. Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface

b. Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.

c. Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.

d. Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 *32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

## 7.4 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r04 quoted below.

When the 1 g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

## 7.5 Interim Procedures for WLAN 6E

Interim procedures for FCC radio frequency (RF) exposure evaluations of U-NII 6-7 GHz band portable devices have been made available during the TCB workshop in April 2021. The procedure is summarized below:

a. Evaluate SAR / APD with DASY6 Module SAR V16.0 or higher. The configurations to be tested are defined in the relevant Knowledge Database (KDB). The psSAR and absorbed psPD are reported.

b. 2. For the configuration with the highest SAR, evaluate the incident power density with DASY6 Module mmWave V2.4.2 or higher. The incident psPD must be adjusted per amount that the measurement uncertainty exceeds 30% before it is included in the test report.

# 8 CONDUCTED RF OUPUT POWER

## 8.1 GSM

Please refer the document “BL-SZ2410367-AP Power List.pdf”.

## 8.2 LTE

Please refer the document “BL-SZ2410367-AP Power List.pdf”.

## 8.3 Bluetooth

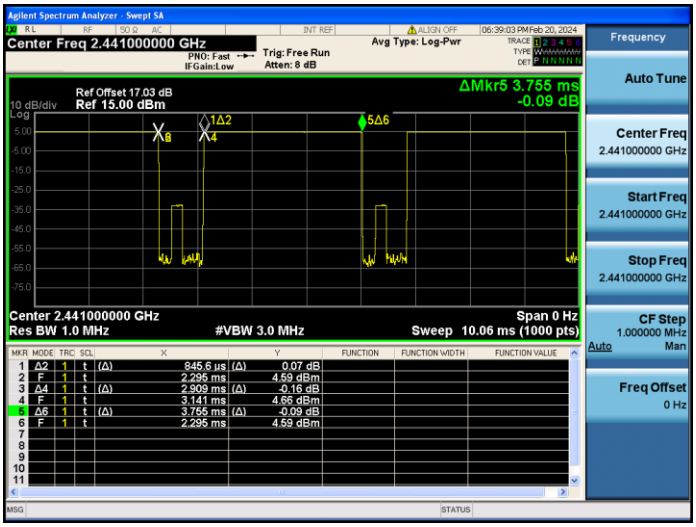
### 8.3.1 Bluetooth

| Mode | GFSK | | | π/4-DQPSK | | |
|---|---|---|---|---|---|---|
| Channel | 0 | 39 | 78 | 0 | 39 | 78 |
| Frequency (MHz) | 2402 | 2441 | 2480 | 2402 | 2441 | 2480 |
| Average Power (dBm) | 3.73 | **5.04** | 0.42 | 2.61 | 3.85 | -0.72 |
| Tune-Up Limit (dBm) | 4.00 | 5.50 | 1.00 | 3.00 | 4.00 | 0.00 |
| SAR Test Require | No | Yes | No | No | No | No |
| Mode | 8-DPSK | | | / | | |
| Channel | 0 | 39 | 78 | / | / | / |
| Frequency (MHz) | 2402 | 2441 | 2480 | / | / | / |
| Average Power (dBm) | 2.50 | 3.71 | -080 | / | / | / |
| Tune-Up Limit (dBm) | 3.00 | 4.00 | 0.00 | / | / | / |
| SAR Test Require | No | No | No | / | / | / |
| Mode | BLE-1Mbps | | | BLE-2Mbps | | |
| Channel | 0 | 19 | 39 | 1 | 19 | 38 |
| Frequency (MHz) | 2402 | 2440 | 2480 | 2404 | 2440 | 2478 |
| Average Power (dBm) | 3.24 | 4.39 | 0.29 | 2.98 | 4.63 | 0.95 |
| Tune-Up Limit (dBm) | 3.50 | 4.50 | 0.50 | 3.00 | 5.00 | 1.50 |
| SAR Test Require | No | No | No | No | No | No |
| Note: Since Bluetooth BR mode is the maximum output power mode，SAR measurements were performed with test software using DH5 modulation, and SAR measurement is not required for the EDR and LE. When the secondary mode is ≤ ¼ dB higher than the primary mode. | | | | | | |

The Bluetooth duty cycle is 77.48 % as following figure, according to 2016 Oct. TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 100%, therefore the actual duty cycle will be scaled up to 100% for Bluetooth reported SAR calculation.

Duty Cycle

Bluetooth-GFSK



# 9 TEST EXCLUSION CONSIDERATION

Please refer the document “BL-SZ2410367-AI EUT internal photo.pdf”.

# 10 TEST RESULT

## 10.1 GSM 850

| Mode | Position | Dist. (mm) | Ch. | Freq. (MHz) | Power Drift (dB) | 1 g Meas SAR (W/kg) | Meas. Power (dBm) | Max. tune-up power (dBm) | Scaling Factor | 1g Report SAR (W/kg) | Meas. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Body** | | | | | | | | | | | |
| GPRS 3Slots | Front Side | 5 | 251 | 848.8 | -0.02 | 0.164 | 30.62 | 31.00 | 1.091 | 0.179 | / |
| | Back Side | 5 | 251 | 848.8 | -0.10 | 0.256 | 30.62 | 31.00 | 1.091 | **0.279** | 1# |
| | Left Edge | 5 | 251 | 848.8 | -0.14 | 0.067 | 30.62 | 31.00 | 1.091 | 0.073 | / |
| | Right Edge | 5 | 251 | 848.8 | -0.10 | 0.115 | 30.62 | 31.00 | 1.091 | 0.125 | / |
| | Top Edge | 5 | 251 | 848.8 | 0.12 | 0.021 | 30.62 | 31.00 | 1.091 | 0.023 | / |
| Note: Refer to ANNEX C for the detailed test data for each test configuration. | | | | | | | | | | | |

## 10.2 GSM 1900

| Mode | Position | Dist. (mm) | Ch. | Freq. (MHz) | Power Drift(dB) | 1 g Meas SAR(W/kg) | Meas. Power (dBm) | Max. tune-up power(dBm) | Scaling Factor | 1g Report SAR (W/kg) | Meas. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Body** | | | | | | | | | | | |
| GPRS 4slots | Front Side | 5 | 512 | 1710.2 | 0.02 | 0.378 | 28.07 | 28.50 | 1.104 | 0.417 | / |
| | Back Side | 5 | 512 | 1710.2 | 0.01 | 0.738 | 28.07 | 28.50 | 1.104 | **0.815** | 2# |
| | Left Edge | 5 | 512 | 1710.2 | 0.08 | 0.417 | 28.07 | 28.50 | 1.104 | 0.460 | / |
| | Right Edge | 5 | 512 | 1710.2 | -0.03 | 0.463 | 28.07 | 28.50 | 1.104 | 0.511 | / |
| | Top Edge | 5 | 512 | 1710.2 | 0.00 | 0.071 | 28.07 | 28.50 | 1.104 | 0.078 | / |
| | Back Side | 5 | 661 | 1880.0 | -0.19 | 0.650 | 27.79 | 28.50 | 1.178 | 0.766 | / |
| | Back Side | 5 | 810 | 1769.8 | 0.16 | 0.507 | 27.84 | 28.50 | 1.164 | 0.590 | / |
| Note: Refer to ANNEX C for the detailed test data for each test configuration. | | | | | | | | | | | |

## 10.3 LTE Band 2 (20MHz Bandwidth)

| Mode | Position | Dist. (mm) | Ch. | Freq. (MHz) | RB Num. | RB Start | Power Drift (dB) | 1 g Meas SAR (W/kg) | Meas. Power (dBm) | Max. tune-up power (dBm) | Scaling Factor | 1g Report SAR (W/kg) | Meas. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Body** | | | | | | | | | | | | | |
| QPSK | Front Side | 5 | 19100 | 1900 | 1 | Low | 0.15 | 0.521 | 24.26 | 24.50 | 1.057 | 0.551 | / |
| | | 5 | 19100 | 1900 | 50 | HIGH | -0.18 | 0.330 | 22.77 | 23.50 | 1.183 | 0.390 | / |
| | Back Side | 5 | 19100 | 1900 | 1 | Low | 0.13 | 0.827 | 24.26 | 24.50 | 1.057 | 0.874 | / |
| | | 5 | 19100 | 1900 | 50 | HIGH | -0.14 | 0.560 | 22.77 | 23.50 | 1.183 | 0.662 | / |
| | Left Edge | 5 | 19100 | 1900 | 1 | Low | -0.15 | 0.449 | 24.26 | 24.50 | 1.057 | 0.475 | / |
| | | 5 | 19100 | 1900 | 50 | HIGH | -0.03 | 0.320 | 22.77 | 23.50 | 1.183 | 0.379 | / |
| | Right Edge | 5 | 19100 | 1900 | 1 | Low | 0.18 | 0.554 | 24.26 | 24.50 | 1.057 | 0.586 | / |
| | | 5 | 19100 | 1900 | 50 | HIGH | -0.01 | 0.409 | 22.77 | 23.50 | 1.183 | 0.484 | / |
| | Top Edge | 5 | 19100 | 1900 | 1 | Low | -0.06 | 0.108 | 24.26 | 24.50 | 1.057 | 0.114 | / |
| | | 5 | 19100 | 1900 | 50 | HIGH | 0.09 | 0.060 | 22.77 | 23.50 | 1.183 | 0.071 | / |
| | Back Side | 5 | 18700 | 1860 | 1 | MID | 0.12 | 0.822 | 23.89 | 24.50 | 1.151 | 0.946 | / |
| | | 5 | 18900 | 1900 | 1 | HIGH | 0.01 | 1.120 | 24.21 | 24.50 | 1.069 | **1.197** | 3# |
| | | 5 | 18700 | 1860 | 50 | MID | -0.18 | 0.577 | 22.53 | 23.50 | 1.250 | 0.721 | / |
| | | 5 | 18900 | 1900 | 50 | MID | -0.08 | 0.863 | 22.62 | 23.50 | 1.225 | 1.057 | / |
| | | 5 | 19100 | 1900 | 100 | Low | -0.15 | 0.742 | 23.36 | 23.50 | 1.033 | 0.766 | / |
| Note: Refer to ANNEX C for the detailed test data for each test configuration. | | | | | | | | | | | | | |

## 10.4LTE Band 4 (20MHz Bandwidth)

| Mode | Position | Dist. (mm) | Ch. | Freq. (MHz) | RB Num. | RB Start | Power Drift (dB) | 1 g Meas SAR (W/kg) | Meas. Power (dBm) | Max. tune-up power (dBm) | Scaling Factor | 1g Report SAR (W/kg) | Meas. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Body** | | | | | | | | | | | | | |
| QPSK | Front Side | 5 | 20175 | 1732.5 | 1 | Low | -0.09 | 0.345 | 23.72 | 24.00 | 1.067 | 0.368 | / |
| | | 5 | 20175 | 1732.5 | 50 | Low | -0.02 | 0.236 | 22.42 | 23.00 | 1.143 | 0.270 | / |
| | Back Side | 5 | 20175 | 1732.5 | 1 | Low | -0.09 | 0.688 | 23.72 | 24.00 | 1.067 | **0.734** | 4# |
| | | 5 | 20175 | 1732.5 | 50 | Low | 0.10 | 0.478 | 22.42 | 23.00 | 1.143 | 0.546 | / |
| | Left Edge | 5 | 20175 | 1732.5 | 1 | Low | 0.00 | 0.280 | 23.72 | 24.00 | 1.067 | 0.299 | / |
| | | 5 | 20175 | 1732.5 | 50 | Low | 0.13 | 0.248 | 22.42 | 23.00 | 1.143 | 0.283 | / |
| | Right Edge | 5 | 20175 | 1732.5 | 1 | Low | -0.05 | 0.518 | 23.72 | 24.00 | 1.067 | 0.553 | / |
| | | 5 | 20175 | 1732.5 | 50 | Low | -0.07 | 0.419 | 22.42 | 23.00 | 1.143 | 0.479 | / |
| | Top Edge | 5 | 20175 | 1732.5 | 1 | Low | 0.11 | 0.065 | 23.72 | 24.00 | 1.067 | 0.069 | / |
| | | 5 | 20175 | 1732.5 | 50 | Low | -0.03 | 0.057 | 22.42 | 23.00 | 1.143 | 0.065 | / |
| Note: Refer to ANNEX C for the detailed test data for each test configuration. | | | | | | | | | | | | | |

## 10.5LTE Band 5 (10MHz Bandwidth)

| Mode | Position | Dist. (mm) | Ch. | Freq. (MHz) | RB Num. | RB Start | Power Drift (dB) | 1 g Meas SAR (W/kg) | Meas. Power (dBm) | Max. tune-up power (dBm) | Scaling Factor | 1g Report SAR (W/kg) | Meas. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Body** | | | | | | | | | | | | | |
| QPSK | Front Side | 5 | 20525 | 836.5 | 1 | HIGH | 0.10 | 0.341 | 24.49 | 24.50 | 1.002 | 0.342 | / |
| | | 5 | 20600 | 844 | 50 | HIGH | 0.15 | 0.279 | 22.57 | 23.50 | 1.239 | 0.346 | / |
| | Back Side | 5 | 20525 | 836.5 | 1 | HIGH | 0.03 | 0.400 | 24.49 | 24.50 | 1.002 | **0.401** | 5# |
| | | 5 | 20600 | 844 | 50 | HIGH | 0.14 | 0.316 | 22.57 | 23.50 | 1.239 | 0.392 | / |
| | Left Edge | 5 | 20525 | 836.5 | 1 | HIGH | -0.11 | 0.157 | 24.49 | 24.50 | 1.002 | 0.157 | / |
| | | 5 | 20600 | 844 | 50 | HIGH | -0.18 | 0.140 | 22.57 | 23.50 | 1.239 | 0.173 | / |
| | Right Edge | 5 | 20525 | 836.5 | 1 | HIGH | 0.12 | 0.237 | 24.49 | 24.50 | 1.002 | 0.237 | / |
| | | 5 | 20600 | 844 | 50 | HIGH | 0.06 | 0.186 | 22.57 | 23.50 | 1.239 | 0.230 | / |
| | Top Edge | 5 | 20525 | 836.5 | 1 | HIGH | -0.13 | 0.059 | 24.49 | 24.50 | 1.002 | 0.059 | / |
| | | 5 | 20600 | 844 | 50 | HIGH | -0.08 | 0.040 | 22.57 | 23.50 | 1.239 | 0.050 | / |
| Note: Refer to ANNEX C for the detailed test data for each test configuration. | | | | | | | | | | | | | |

## 10.6 LTE Band 7 (20MHz Bandwidth)

| Mode | Position | Dist. (mm) | Ch. | Freq. (MHz) | RB Num. | RB Start | Power Drift (dB) | 1 g Meas SAR (W/kg) | Meas. Power (dBm) | Max. tune-up power (dBm) | Scaling Factor | 1g Report SAR (W/kg) | Meas. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Body** | | | | | | | | | | | | | |
| QPSK | Front Side | 5 | 20850 | 2510 | 1 | Low | -0.06 | 0.874 | 23.90 | 24.00 | 1.023 | 0.894 | / |
| | | 5 | 20850 | 2510 | 50 | MID | -0.05 | 0.457 | 22.32 | 23.00 | 1.169 | 0.534 | / |
| | Back Side | 5 | 20850 | 2510 | 1 | Low | -0.09 | 0.819 | 23.90 | 24.00 | 1.023 | 0.838 | / |
| | | 5 | 20850 | 2510 | 50 | MID | -0.06 | 0.593 | 22.32 | 23.00 | 1.169 | 0.693 | / |
| | Left Edge | 5 | 20850 | 2510 | 1 | Low | 0.15 | 0.400 | 23.90 | 24.00 | 1.023 | 0.409 | / |
| | | 5 | 20850 | 2510 | 50 | MID | -0.08 | 0.255 | 22.32 | 23.00 | 1.169 | 0.298 | / |
| | Right Edge | 5 | 20850 | 2510 | 1 | Low | -0.07 | 0.733 | 23.90 | 24.00 | 1.023 | 0.750 | / |
| | | 5 | 20850 | 2510 | 50 | MID | 0.15 | 0.427 | 22.32 | 23.00 | 1.169 | 0.499 | / |
| | Top Edge | 5 | 20850 | 2510 | 1 | Low | 0.13 | 0.223 | 23.90 | 24.00 | 1.023 | 0.228 | / |
| | | 5 | 20850 | 2510 | 50 | MID | 0.00 | 0.089 | 22.32 | 23.00 | 1.169 | 0.104 | / |
| | Back Side | 5 | 21100 | 2535 | 1 | MID | -0.06 | 1.110 | 23.38 | 24.00 | 1.153 | **1.280** | 6# |
| | | 5 | 21350 | 2560 | 1 | HIGH | 0.16 | 0.786 | 22.87 | 24.00 | 1.297 | 1.019 | / |
| | | 5 | 21100 | 2535 | 50 | MID | -0.05 | 0.605 | 21.92 | 23.00 | 1.282 | 0.776 | / |
| | | 5 | 21350 | 2560 | 50 | Low | 0.05 | 0.687 | 21.52 | 23.00 | 1.406 | 0.966 | / |
| | | 5 | 20850 | 2510 | 100 | Low | -0.16 | 0.711 | 22.79 | 23.00 | 1.050 | 0.747 | / |
| Note: Refer to ANNEX C for the detailed test data for each test configuration. | | | | | | | | | | | | | |

## 10.7 Bluetooth

| Mode | Position | Dist. (mm) | Ch. | Freq. (MHz) | Power Drift (dB) | 1 g Meas SAR (W/kg) | Meas. Power (dBm) | Max. tune power (dBm) | Scaling Factor | Duty cycle (%) | Duty cycle Factor | 1g Report SAR (W/kg) | Meas. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Body** | | | | | | | | | | | | | |
| Bluetooth | Front Side | 5 | 39 | 2441 | 0.10 | 0.009 | 5.04 | 5.5 | 1.112 | 77.48 | 1.291 | 0.013 | / |
| | Back Side | 5 | 39 | 2441 | -0.04 | 0.011 | 5.04 | 5.5 | 1.112 | 77.48 | 1.291 | **0.016** | 7# |
| | Left Edge | 5 | 39 | 2441 | -0.05 | 0.003 | 5.04 | 5.5 | 1.112 | 77.48 | 1.291 | 0.004 | / |
| | Right Edge | 5 | 39 | 2441 | -0.05 | 0.005 | 5.04 | 5.5 | 1.112 | 77.48 | 1.291 | 0.007 | / |
| | Top Edge | 5 | 39 | 2441 | 0.12 | 0.001 | 5.04 | 5.5 | 1.112 | 77.48 | 1.291 | 0.001 | / |
| Note: Refer to ANNEX C for the detailed test data for each test configuration. | | | | | | | | | | | | | |

# 11 SAR Measurement Variability

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10, the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These 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.

SAR repeated measurement procedure:

1. When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
2. When the highest measured SAR is >= 0.80 W/kg, repeat that measurement once.
3. 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, perform a second repeated measurement.
4. If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20, and the original, first or second repeated measurement is >= 1.5 W/kg, perform a third repeated measurement.

| Frequency Band (MHz) | Wireless Band | RF Exposure Conditions | Test Position | Highest Measured SAR (W/kg) | Repeated SAR (Yes/No) | Repeated$^{1th}$ Measured SAR (W/kg) | Largest to Smallest SAR Radio |
|---|---|---|---|---|---|---|---|
| 1900 | LTE Band2 | Body | Back Side | 1.120 | Yes | 1.060 | 1.06 |
| 2600 | LTE Ban7 | Body | Back Side | 1.110 | Yes | 1.080 | 1.03 |
| Note: The ratio of largest to smallest SAR for the original and first repeated measurements is < 1.20, the second repeated measurement. is not required. | | | | | | | |

# 12 SIMULTANEOUS TRANSMISSION

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR 1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR 1g 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR 1g is greater than the SAR limit (SAR 1g 1.6 W/kg), SAR test exclusion is determined by the SAR to Peak Location Ratio (SPLSR). According KDB 447498 D04, simultaneous transmission:

a) SPLSR = (SAR1 + SAR2)^1.5 / $R_i$ (min. separation distance, mm), and the peak separation distance is determined from the square root of [$(x1-x2)^2$ + $(y1-y2)^2$ + $(z1-z2)^2$], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
SAR1 is the highest reported or estimated SAR for the first of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition.
SAR2 is the highest reported or estimated SAR for the second of a pair of simultaneous transmitting antennas, in a specific test operating mode and exposure condition as the first.

b) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.

c) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

## 12.1 Simultaneous Transmission Mode Considerations

| No. | Simultaneous Tx Combination | Body |
|---|---|---|
| 1 | WWAN+BT | Yes |
| Note:<br>1. The maximum SAR summation is calculated based on the same configuration and test position. | | |

## 12.2 Sum SAR of Simultaneous Transmission

| Band | Position | Stand alone SAR | | SUM SAR |
|---|---|---|---|---|
| | | 1 | 2 | 1+2 |
| | | WWAN | BT | |
| GSM850 | Front Side | 0.179 | 0.013 | 0.192 |
| | Back Side | 0.279 | 0.016 | 0.295 |
| | Left Edge | 0.073 | 0.004 | 0.077 |
| | Right Edge | 0.125 | 0.007 | 0.132 |
| | Top Edge | 0.023 | 0.001 | 0.024 |
| GSM1900 | Front Side | 0.417 | 0.013 | 0.43 |
| | Back Side | 0.815 | 0.016 | 0.831 |
| | Left Edge | 0.46 | 0.004 | 0.464 |
| | Right Edge | 0.511 | 0.007 | 0.518 |
| | Top Edge | 0.078 | 0.001 | 0.079 |
| LTE B2 | Front Side | 0.551 | 0.013 | 0.564 |
| | Back Side | 1.197 | 0.016 | 1.213 |
| | Left Edge | 0.475 | 0.004 | 0.479 |
| | Right Edge | 0.586 | 0.007 | 0.593 |
| | Top Edge | 0.114 | 0.001 | 0.115 |
| LTE B4 | Front Side | 0.368 | 0.013 | 0.381 |
| | Back Side | 0.734 | 0.016 | 0.75 |
| | Left Edge | 0.299 | 0.004 | 0.303 |
| | Right Edge | 0.553 | 0.007 | 0.56 |
| | Top Edge | 0.069 | 0.001 | 0.07 |
| LTE B5 | Front Side | 0.342 | 0.013 | 0.355 |
| | Back Side | 0.401 | 0.016 | 0.417 |
| | Left Edge | 0.157 | 0.004 | 0.161 |
| | Right Edge | 0.237 | 0.007 | 0.244 |
| | Top Edge | 0.059 | 0.001 | 0.06 |
| LTE B7 | Front Side | 0.894 | 0.013 | 0.907 |
| | Back Side | 1.28 | 0.016 | **1.296** |
| | Left Edge | 0.409 | 0.004 | 0.413 |
| | Right Edge | 0.75 | 0.007 | 0.757 |
| | Top Edge | 0.228 | 0.001 | 0.229 |

Note:

1: The highest Summed 1g SAR is 1.296 W/Kg < 1.6 W/kg, so Simultaneous Transmission SAR test is not required.

# 13 TEST EQUIPMENTS LIST

| | | | | | |
|---|---|---|---|---|---|
| PC | Dell | N/A | N/A | N/A | N/A |
| Test Software | Speag | DASY6 | 16.0.0.116 | N/A | N/A |
| 835MHz Validation Dipole | Speag | D835V2 | SN: 4d187 | 2021/05/17 | 2024/05/17 |
| 1750MHz Validation Dipole | Speag | D1750V2 | SN: 1130 | 2021/05/17 | 2024/05/17 |
| 1900MHz Validation Dipole | Speag | D1900V2 | SN: 5d193 | 2021/05/20 | 2024/05/20 |
| 2450MHz Validation Dipole | Speag | D2450V2 | SN: 952 | 2021/05/19 | 2024/05/19 |
| 2600MHz Validation Dipole | Speag | D2600V2 | SN: 1095 | 2021/05/19 | 2024/05/19 |
| Data Acquisition Electronicsr | Speag | DAE4 | SN: 1710 | 2024/01/03 | 2025/01/03 |
| E-Field Probe | Speag | EX3DV4 | SN: 7607 | 2023/07/04 | 2024/07/04 |
| Signal Generator | R&S | SMB100A | 177746 | 2023/05/10 | 2024/05/10 |
| Power Meter | R&S | NRVD-B2 | 835843/014 | 2023/09/05 | 2024/09/05 |
| Power Sensor | R&S | NRV-Z4 | 100381 | 2023/09/05 | 2024/09/05 |
| Power Sensor | R&S | NRV-Z2 | 100211 | 2023/09/05 | 2024/09/05 |
| Wireless Communication Test Set | R&S | CMW500 | 104946 | 2023/09/01 | 2024/09/01 |
| Network Analyzer | Agilent | E5071C | MY46103472 | 2023/11/14 | 2024/11/14 |
| Thermometer | Elitech | RC-4 | EF5238001629 | 2023/10/09 | 2024/10/09 |
| Thermometer | Elitech | RC-4HC | EF7239002655 | 2023/11/17 | 2024/11/17 |
| Power Amplifier | SATIMO | 6552B | 22374 | N/A | N/A |
| Dielectric Probe Kit | Speag | DAK3.5 | SN: 1312 | N/A | N/A |
| Phantom | Speag | SAM | SN: 1859 | N/A | N/A |
| Attenuator | COM-MW | ZA-S1-31 | 1305003187 | N/A | N/A |
| Directional coupler | AA-MCS | AAMCS-UDC | 000272 | N/A | N/A |

Note: For dipole antennas, BALUN has adopted 3 years as calibration intervals, and on annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss in within 20% of calibrated measurement.
4. Impedance (real or imaginary parts) in within 5 Ohms of calibrated measurement.

# ANNEX A SIMULATING LIQUID VERIFICATION RESULT

The dielectric parameters of the liquids were verified prior to the SAR evaluation using a DAK3.5 Dielectric Probe Kit.

| Date | Liquid Type | Fre. (MHz) | Temp. (℃) | Meas. Conductivity (σ) (S/m) | Meas. Permittivity (ε) | Target Conductivity (σ) (S/m) | Target Permittivity (ε) | Conductivity Tolerance (%) | Permittivity Tolerance (%) |
|---|---|---|---|---|---|---|---|---|---|
| 2024.04.24 | Head | 835 | 21.3 | 0.90 | 41.94 | 0.90 | 41.50 | 0.00 | 1.06 |
| 2024.04.24 | Head | 1750 | 21.3 | 1.38 | 40.02 | 1.37 | 40.08 | 0.73 | -0.15 |
| 2024.04.25 | Head | 1900 | 21.1 | 1.40 | 39.93 | 1.40 | 40.00 | 0.00 | -0.18 |
| 2024.04.26 | Head | 2450 | 21.5 | 1.80 | 39.51 | 1.80 | 39.20 | 0.00 | 0.79 |
| 2024.04.26 | Head | 2600 | 21.5 | 1.98 | 38.51 | 1.96 | 39.01 | 1.02 | -1.28 |
| Note: The tolerance limit of Conductivity and Permittivity is± 5%. | | | | | | | | | |

# ANNEX B SYSTEM CHECK RESULT

Comparing to the original SAR value provided by SPEAG, the validation data should be within itsspecification of 10 %(for 1 g).

| Date | Liquid Type | Freq. (MHz) | Power (mW) | Measured SAR (W/kg) | Normalized SAR (W/kg) | Dipole SAR (W/kg) | Tolerance (%) |
|---|---|---|---|---|---|---|---|
| 2024.04.24 | Head | 835 | 100 | 1.00 | 9.96 | 9.76 | 2.05 |
| 2024.04.24 | Head | 1750 | 100 | 3.83 | 38.30 | 36.70 | 4.36 |
| 2024.04.25 | Head | 1900 | 100 | 4.18 | 41.80 | 40.30 | 3.72 |
| 2024.04.26 | Head | 2450 | 100 | 5.44 | 54.40 | 53.00 | 2.64 |
| 2024.04.26 | Head | 2600 | 100 | 5.84 | 58.40 | 56.80 | 2.82 |
| Note: The tolerance limit of System validation ±10%. | | | | | | | |

# System Performance Check Data (835MHz)

## Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| CD835V2, SPEAG | 10.0 x 10.0 x 3.0 | Dipole |

## Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | | CD835 | CW, 0-- | 835.0, 50 | 9.96 | 0.90 | 41.9 | 22.1 | 21.3 |

## Hardware Setup

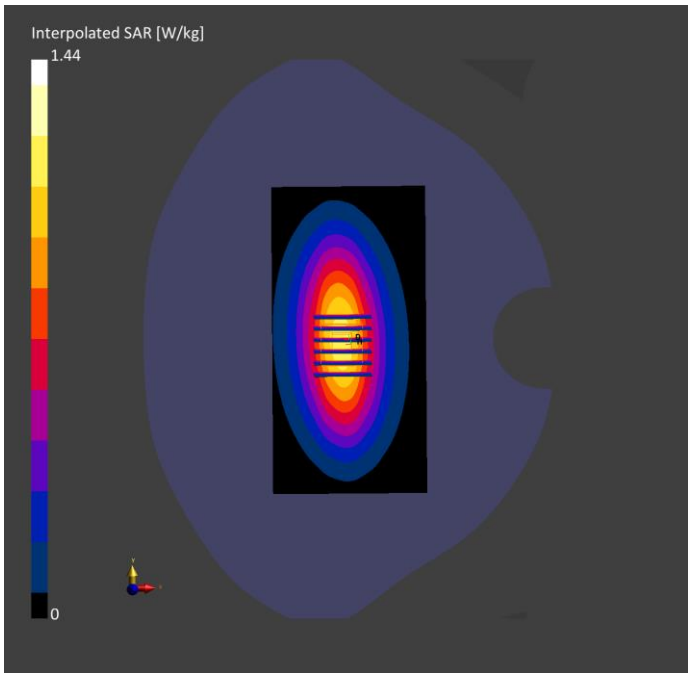
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-24 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

## Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 80.0 x 160.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 10.0 x 10.0 | 6.0 x 6.0 x 1.5 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | N/A | N/A |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

## Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-24 | 2024-04-24 |
| psSAR1g [W/kg] | 1.01 | 0.996 |
| psSAR10g [W/kg] | 0.645 | 0.612 |
| Power Drift [dB] | -0.01 | 0.03 |
| Power Scaling Scaling Factor [dB] | Disabled | Disabled |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 83.9 |
| Dist 3dB Peak [mm] | | 12.8 |


Interpolated SAR [W/kg]
1.44
0

# System Performance Check Data (1750MHz)

## Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| D1750V2, SPEAG | 10.0 x 10.0 x 3.0 | Dipole |

## Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | | D1750 | CW, 0-- | 1750.0, 50 | 8.52 | 1.38 | 40.0 | 22.1 | 21.3 |

## Hardware Setup

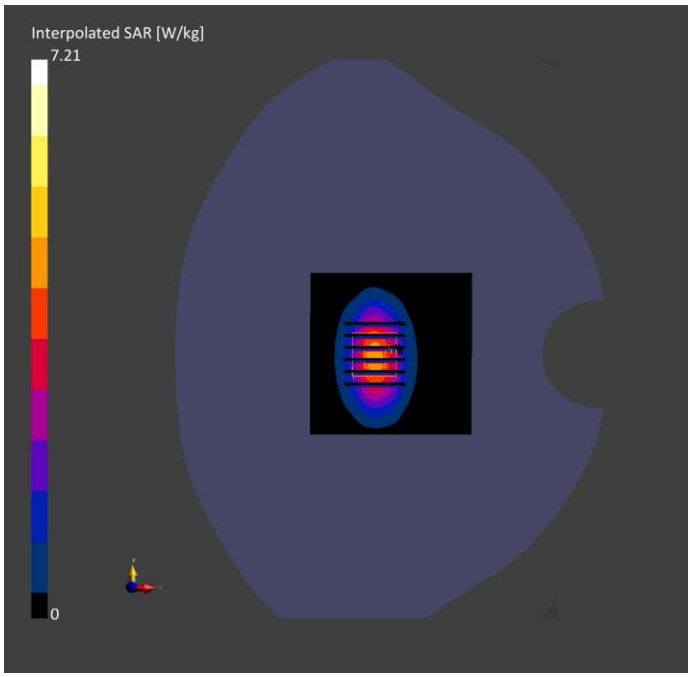
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-24 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

## Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 80.0 x 80.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 10.0 x 10.0 | 6.0 x 6.0 x 1.5 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | N/A | N/A |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

## Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-24 | 2024-04-24 |
| psSAR1g [W/kg] | 4.02 | 3.83 |
| psSAR10g [W/kg] | 2.15 | 2.02 |
| Power Drift [dB] | -0.03 | -0.04 |
| Power Scaling Scaling Factor [dB] | Disabled | Disabled |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 81.7 |
| Dist 3dB Peak [mm] | | 10.1 |


Interpolated SAR [W/kg]
7.21
0

# System Performance Check Data (1900MHz)

## Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| D1900V2, SPEAG | 10.0 x 10.0 x 3.0 | Dipole |

## Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | | D1900 | CW, 0-- | 1900.0, 50 | 7.98 | 1.40 | 39.9 | 22.3 | 21.1 |

## Hardware Setup

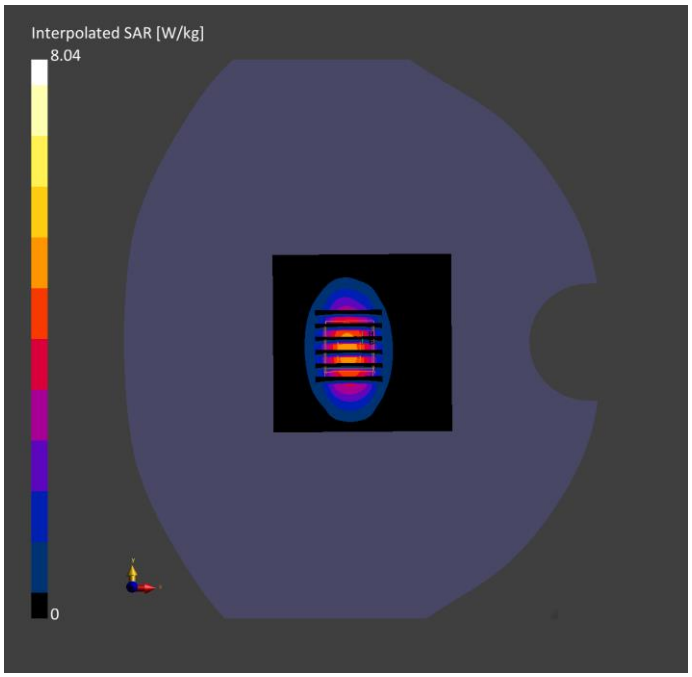
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-25 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

## Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 80.0 x 80.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 10.0 x 10.0 | 6.0 x 6.0 x 1.5 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | N/A | N/A |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

## Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-25 | 2024-04-25 |
| psSAR1g [W/kg] | 4.21 | 4.18 |
| psSAR10g [W/kg] | 2.24 | 2.15 |
| Power Drift [dB] | -0.16 | -0.03 |
| Power Scaling | Disabled | Disabled |
| Scaling Factor [dB] | | |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 81.6 |
| Dist 3dB Peak [mm] | | 9.6 |


Interpolated SAR [W/kg]
8.04
0

# System Performance Check Data (2450MHz)

## Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| D2450V2, SPEAG | 40.0 x 8.0 x 8.0 | Dipole |

## Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | | D2450 | CW, 0-- | 2450.0, 50 | 7.47 | 1.80 | 39.5 | 22.4 | 21.5 |

## Hardware Setup

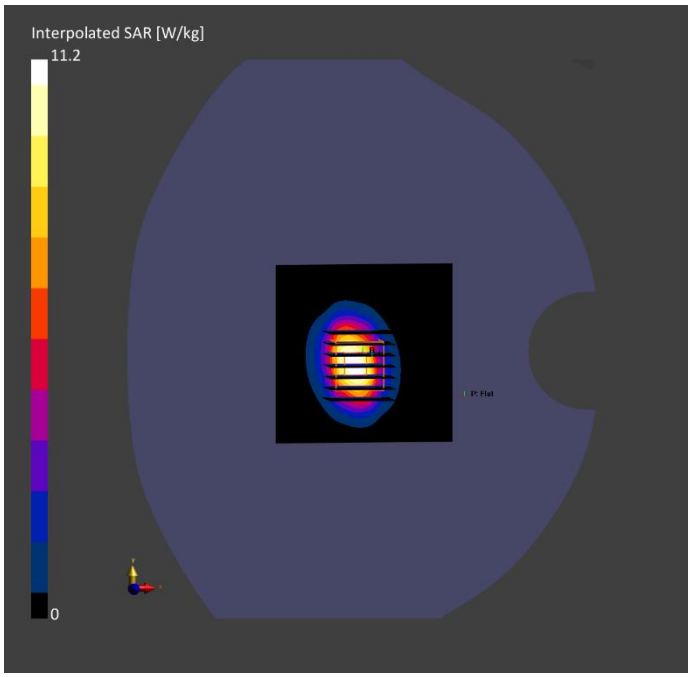
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-26 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

## Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 80.0 x 80.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 10.0 x 10.0 | 5.0 x 5.0 x 1.5 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | N/A | N/A |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

## Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-26 | 2024-04-26 |
| psSAR1g [W/kg] | 5.38 | 5.44 |
| psSAR10g [W/kg] | 2.58 | 2.51 |
| Power Drift [dB] | -0.02 | 0.01 |
| Power Scaling | Disabled | Disabled |
| Scaling Factor [dB] | | |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 80.4 |
| Dist 3dB Peak [mm] | | 8.9 |


Interpolated SAR [W/kg]
11.2
0

# System Performance Check Data (2600MHz)

## Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| CD2600V3, SPEAG | 10.0 x 10.0 x 3.0 | Dipole |

## Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | | CD2600 V3 | CW, 0-- | 2600.0, 50 | 7.41 | 1.98 | 38.5 | 22.4 | 21.5 |

## Hardware Setup

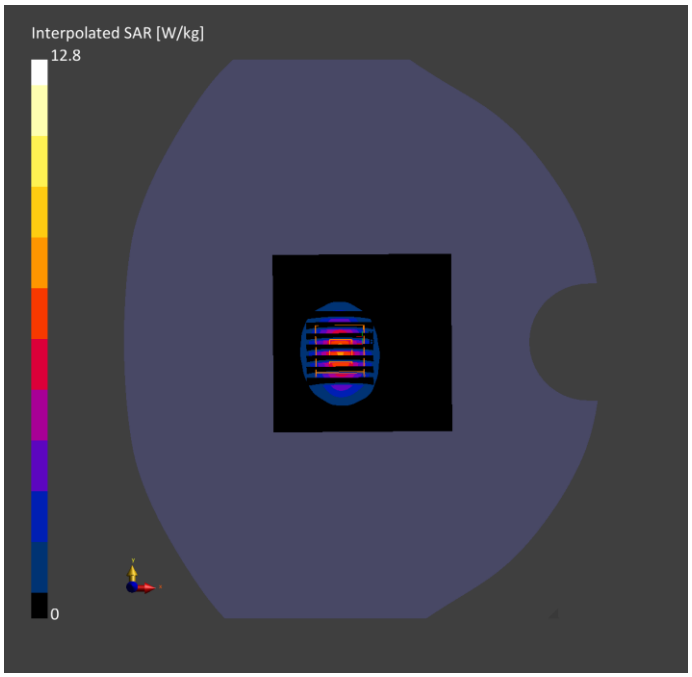
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-26 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

## Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 80.0 x 80.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 10.0 x 10.0 | 5.0 x 5.0 x 1.5 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | N/A | N/A |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

## Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-26 | 2024-04-26 |
| psSAR1g [W/kg] | 5.85 | 5.84 |
| psSAR10g [W/kg] | 2.65 | 2.62 |
| Power Drift [dB] | -0.04 | -0.05 |
| Power Scaling | Disabled | Disabled |
| Scaling Factor [dB] | | |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 80.5 |
| Dist 3dB Peak [mm] | | 9.5 |


Interpolated SAR [W/kg]
12.8
0

# ANNEX C TEST DATA

### Meas.1 Body Plane with Back Side 5mm on High Channel in GPRS850 3slots mode with Antenna 4

### Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| VL1111 | 90.0 x 30.0 x 15.0 | LTE Vehicle Terminal |

### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | BACK, 5.00 | GSM 850 | GSM, 10028-DAC | 848.8, 251 | 9.96 | 0.91 | 41.5 | 22.1 | 21.3 |

### Hardware Setup

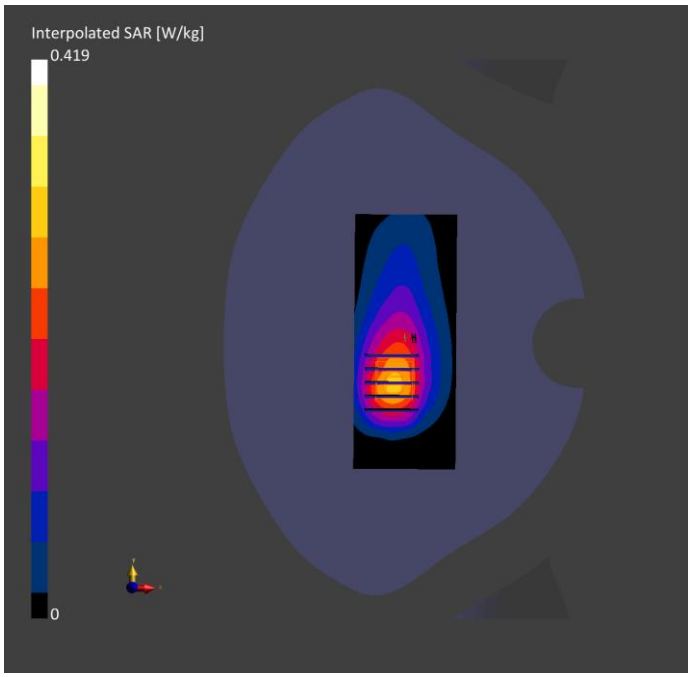
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-24 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

### Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 60.0 x 150.0 | 32.0 x 32.0 x 30.0 |
| Grid Steps [mm] | 15.0 x 15.0 | 8.0 x 8.0 x 5.0 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | N/A | N/A |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

### Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-24 | 2024-04-24 |
| psSAR1g [W/kg] | 0.255 | 0.256 |
| psSAR10g [W/kg] | 0.168 | 0.161 |
| Power Drift [dB] | -0.12 | -0.10 |
| Power Scaling | Disabled | Disabled |
| Scaling Factor [dB] | | |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 57.8 |
| Dist 3dB Peak [mm] | | 14.3 |


Interpolated SAR [W/kg]
0.419
0

## Meas.2 Body Plane with Back Side 5mm on Middle Channel in GPRS1900 4slots mode with Antenna 4

### Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| VL1111 | 90.0 x 30.0 x 15.0 | LTE Vehicle Terminal |

### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | BACK, 5.00 | PCS 1900 | GSM, 10028-DAC | 1850.2, 512 | 7.98 | 1.37 | 40.6 | 22.3 | 21.1 |

### Hardware Setup

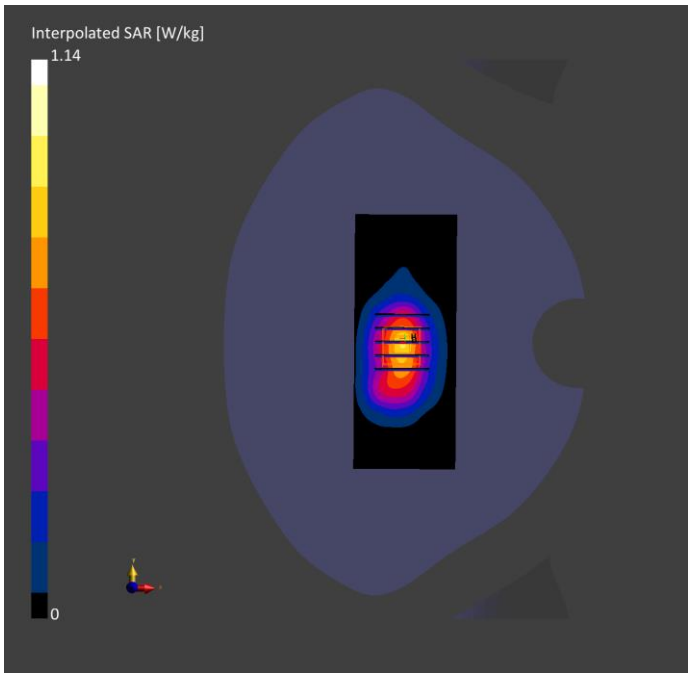
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-25 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

### Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 60.0 x 150.0 | 32.0 x 32.0 x 30.0 |
| Grid Steps [mm] | 15.0 x 15.0 | 8.0 x 8.0 x 5.0 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | N/A | N/A |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

### Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-25 | 2024-04-25 |
| psSAR1g [W/kg] | 0.706 | 0.738 |
| psSAR10g [W/kg] | 0.396 | 0.438 |
| Power Drift [dB] | -0.07 | 0.01 |
| Power Scaling | Disabled | Disabled |
| Scaling Factor [dB] | | |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 64.6 |
| Dist 3dB Peak [mm] | | 14.3 |


Interpolated SAR [W/kg]
1.14
0

## Meas.3 Body Plane with Back Side 5mm on High Channel in LTE Band2 mode with Antenna 4

### Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| VL1111 | 90.0 x 30.0 x 15.0 | LTE Vehicle Terminal |

### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | BACK, 5.00 | Band 2 | LTE - FDD, 10169-CAF | 1880.0, 18900 | 7.98 | 1.39 | 40.2 | 22.3 | 21.1 |

### Hardware Setup

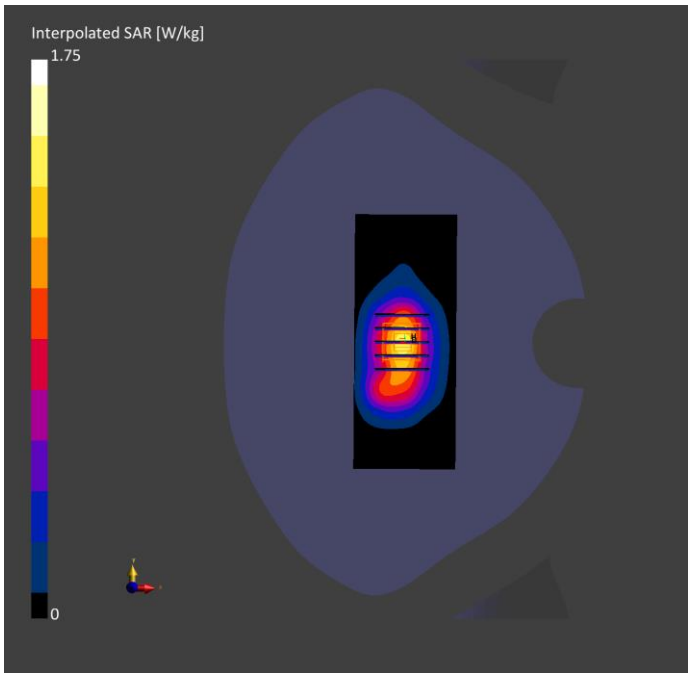
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-25 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

### Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 60.0 x 150.0 | 32.0 x 32.0 x 30.0 |
| Grid Steps [mm] | 15.0 x 15.0 | 8.0 x 8.0 x 5.0 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | N/A | N/A |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

### Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-25 | 2024-04-25 |
| psSAR1g [W/kg] | 1.17 | 1.12 |
| psSAR10g [W/kg] | 0.652 | 0.661 |
| Power Drift [dB] | -0.01 | 0.01 |
| Power Scaling | Disabled | Disabled |
| Scaling Factor [dB] | | |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 64.4 |
| Dist 3dB Peak [mm] | | 14.3 |


Interpolated SAR [W/kg]
1.75
0

## Meas.4 Body Plane with Back Side 5mm on Middle Channel in LTE Band4 mode with Antenna 4

### Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| VL1111 | 90.0 x 30.0 x 15.0 | LTE Vehicle Terminal |

### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | BACK, 5.00 | Band 4 | LTE - FDD, 10169-CAF | 1732.5, 20175 | 8.52 | 1.36 | 40.3 | 22.1 | 21.3 |

### Hardware Setup

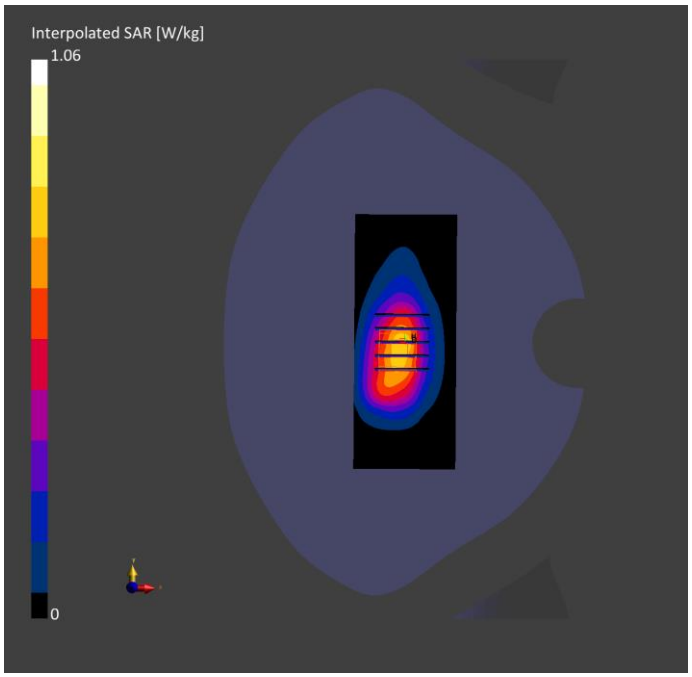
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-24 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

### Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 60.0 x 150.0 | 32.0 x 32.0 x 30.0 |
| Grid Steps [mm] | 15.0 x 15.0 | 8.0 x 8.0 x 5.0 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | N/A | N/A |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

### Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-24 | 2024-04-24 |
| psSAR1g [W/kg] | 0.660 | 0.688 |
| psSAR10g [W/kg] | 0.386 | 0.417 |
| Power Drift [dB] | -0.04 | -0.09 |
| Power Scaling | Disabled | Disabled |
| Scaling Factor [dB] | | |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 64.1 |
| Dist 3dB Peak [mm] | | 14.4 |


Interpolated SAR [W/kg]
1.06
0

## Meas.5 Body Plane with Back Side 5mm on Middle Channel in LTE Band5 mode with Antenna 4

### Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| VL1111 | 90.0 x 30.0 x 15.0 | LTE Vehicle Terminal |

### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | BACK, 5.00 | Band 5 | LTE - FDD, 10175-CAH | 836.5, 20525 | 9.96 | 0.90 | 41.9 | 22.1 | 21.3 |

### Hardware Setup

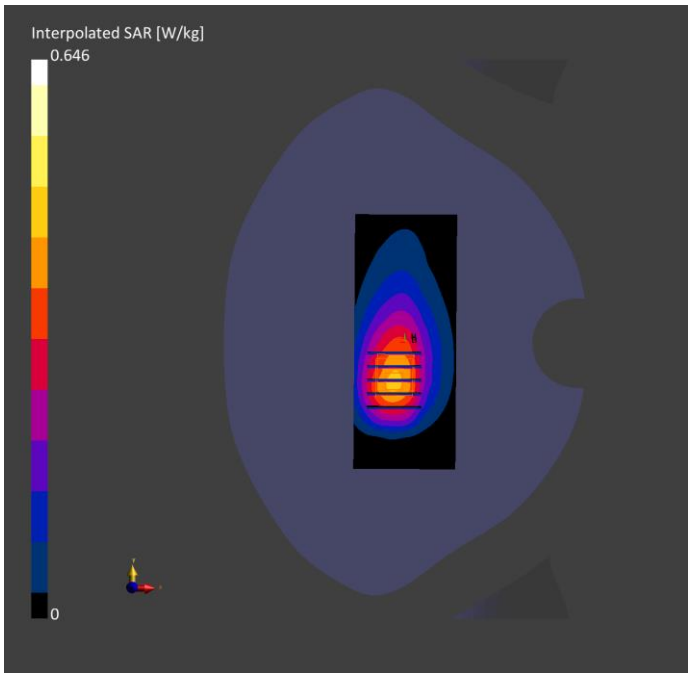
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-24 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

### Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 60.0 x 150.0 | 32.0 x 32.0 x 30.0 |
| Grid Steps [mm] | 15.0 x 15.0 | 8.0 x 8.0 x 5.0 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | N/A | N/A |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

### Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-24 | 2024-04-24 |
| psSAR1g [W/kg] | 0.390 | 0.400 |
| psSAR10g [W/kg] | 0.259 | 0.256 |
| Power Drift [dB] | -0.00 | 0.03 |
| Power Scaling | Disabled | Disabled |
| Scaling Factor [dB] | | |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 59.2 |
| Dist 3dB Peak [mm] | | 14.4 |


Interpolated SAR [W/kg]
0.646
0

## Meas.6 Body Plane with Back Side 5mm on Middle Channel in LTE Band7 mode with Antenna 4

### Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| VL1111 | 90.0 x 30.0 x 15.0 | LTE Vehicle Terminal |

### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | BACK, 5.00 | Band 7 | LTE - FDD, 10169-CAF | 2535.0, 21100 | 7.41 | 1.90 | 39.0 | 22.4 | 21.5 |

### Hardware Setup

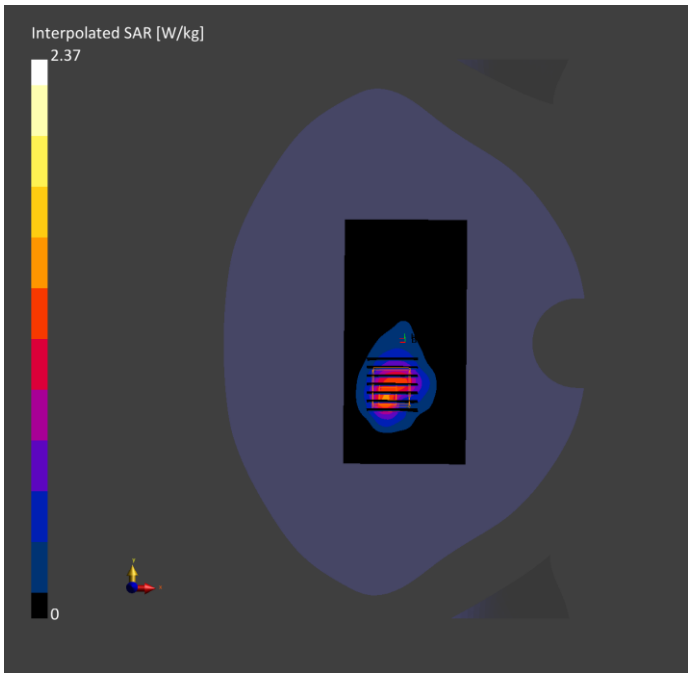
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-26 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

### Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 72.0 x 144.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 12.0 x 12.0 | 5.0 x 5.0 x 5.0 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | N/A | N/A |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

### Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-26 | 2024-04-26 |
| psSAR1g [W/kg] | 1.10 | 1.11 |
| psSAR10g [W/kg] | 0.539 | 0.538 |
| Power Drift [dB] | 0.01 | -0.06 |
| Power Scaling | Disabled | Disabled |
| Scaling Factor [dB] | | |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 47.1 |
| Dist 3dB Peak [mm] | | 8.1 |


Interpolated SAR [W/kg]
2.37
0

## Meas.7 Body Plane with Back Side 5mm on 39 Channel in Bluetooth mode with Antenna 1

### Device under Test Properties

| Model, Manufacturer | Dimensions [mm] | DUT Type |
|---|---|---|
| VL1111 | 90.0 x 30.0 x 15.0 | LTE Vehicle Terminal |

### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity | Ambient Temperature [℃] | Liquid Temperature [℃] |
|---|---|---|---|---|---|---|---|---|---|
| Flat, HSL | BACK, 5.00 | ISM 2.4 GHz Band | Bluetooth, 10032-CAA | 2441.0, 39 | 7.47 | 1.79 | 39.6 | 22.4 | 21.5 |

### Hardware Setup

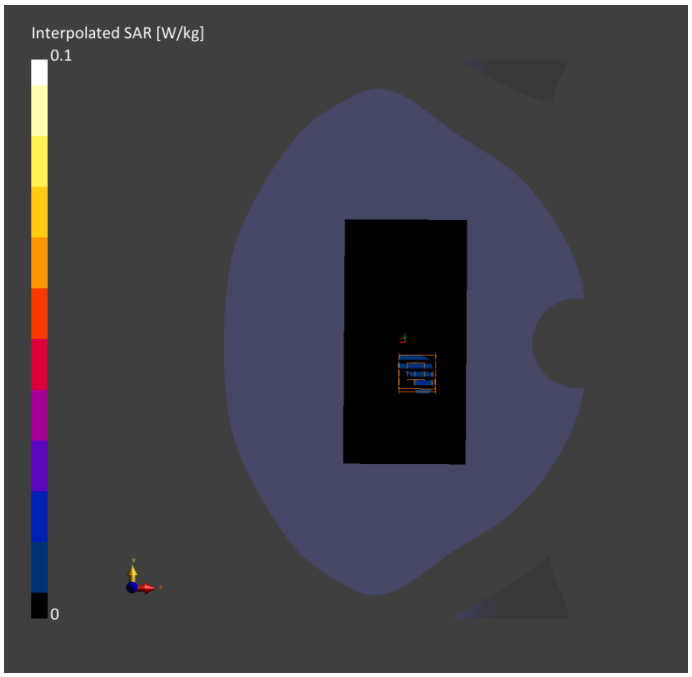
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Twin-SAM V5.0 (30deg probe tilt) - 1859 | HBBL-600-10000 2024-04-26 | EX3DV4 - SN7607, 2023-07-04 | DAE4 Sn1710, 2024-01-03 |

### Scan Setup

| | Area Scan | Zoom Scan |
|---|---|---|
| Grid Extents [mm] | 72.0 x 144.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm] | 12.0 x 12.0 | 5.0 x 5.0 x 5.0 |
| Sensor Surface [mm] | 3.0 | 1.4 |
| Graded Grid | Yes | Yes |
| Grading Ratio | 1.5 | 1.5 |
| MAIA | Y | Y |
| Surface Detection | VMS + 6p | VMS + 6p |
| Scan Method | Measured | Measured |

### Measurement Results

| | Area Scan | Zoom Scan |
|---|---|---|
| Date | 2024-04-26 | 2024-04-26 |
| psSAR1g [W/kg] | 0.012 | 0.011 |
| psSAR10g [W/kg] | 0.005 | 0.003 |
| Power Drift [dB] | -0.01 | -0.04 |
| Power Scaling | Disabled | Disabled |
| Scaling Factor [dB] | | |
| TSL Correction | No correction | No correction |
| M2/M1 [%] | | 44.2 |
| Dist 3dB Peak [mm] | | > 15.0 |


Interpolated SAR [W/kg]
0.1
0

# ANNEX D EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2410367-AW.pdf”.

# ANNEX E SAR TEST SETUP PHOTOS

Please refer the document “BL-SZ2410367-AS.pdf”.

# ANNEX F CALIBRATION REPORT

Please refer the document “BL-SZ2410367-AC.pdf”.

# ANNEX G TUNE-UP PROCEDURE

Please refer the document “BL-SZ2410367-AT.pdf”.

# Statement

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
2. The report without China inspection body and laboratory Mandatory Approval (CMA) mark has no effect of proving to the society.
3. For the report with CNAS mark or A2LA mark, the items marked with "☆" are not within the accredited scope.
4. This report is invalid if it is altered, without the signature of the testing and approval personnel, or without the “inspection and testing dedicated stamp” or test report stamp.
5. The test data and results are only valid for the tested samples provided by the customer.
6. This report shall not be partially reproduced without the written permission of the laboratory.
7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--