

# SAR TEST REPORT

For

**Upper Arm Electronic Blood Pressure Monitor**

**Model Number: A02-SE4**

**FCC ID: 2BERFA02SE4002**

**Report Number : WT238002115**

Test Laboratory : Shenzhen Academy of Metrology and Quality Inspection  
Site Location : No.4, Tongfa Road, Xili Street, Nanshan District,  
Shenzhen, Guangdong, China  
Tel : 0086-755-86928965  
Fax : 0086-755-86009898-31396  
Web : [www.smq.com.cn](http://www.smq.com.cn)  
Email : [emcrf@smq.com.cn](mailto:emcrf@smq.com.cn)

The "important statement" on the back of report's homepage is an element of the report, and any copy that does not contain the "important statement" is incomplete.

## Test report declaration

Applicant : ShenZhen GoodlyMed Technology Co.,Ltd.  
701, Building C, Area C, Datianyang Industrial Zone, Shiwei Commu  
Address : nity, Matian Street, Guangming District, 518107 Shenzhen, Guangdon  
g, PEOPLE'S REPUBLIC OF CHINA  
Manufacturer : ShenZhen GoodlyMed Technology Co.,Ltd.  
701, Building C, Area C, Datianyang Industrial Zone, Shiwei Commu  
Address : nity, Matian Street, Guangming District, 518107 Shenzhen, Guangdon  
g, PEOPLE'S REPUBLIC OF CHINA  
EUT Description : Upper Arm Electronic Blood Pressure Monitor  
Model No. : A02-SE4  
Brand : GoodlyMed  
FCC ID : 2BERFA02SE4002

### Test Standards:

**FCC 47CFR Part 2(2.1093) IEC/IEEE 62209-1528 KDB 447498 D04v01 KDB 865664 D01v01r04  
KDB 865664 D02v01r02 KDB 941225 D05v02r05 KDB 941225 D06v02r01**

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the compliance of the applicable standards stated above. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results.

The results documented in this report only apply to the tested sample, under the conditions and modes of operation as described herein.

The test report shall not be reproduced in part without written approval of the laboratory.

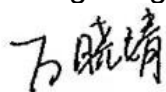
Project Engineer:



(Zhong Langpeng)

Date: Jan. 31, 2024

Checked by:



(Wan Xiao Jing)

Date: Jan. 31, 2024

Approved by:



(Lin Bin)

Date: Jan. 31, 2024

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## 1. REPORTED SAR SUMMARY

### 1. 1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing are as follows.

Band		Highest SAR Summary
		Body-worn (Gap0m)
		1g SAR (W/kg)
LTE	LTE Band 2	0.39
	LTE Band 4	0.23
	LTE Band 5	0.24
	LTE Band 12	0.05
	LTE Band 13	0.18

Maximum Report SAR 1g(W/kg)	Body-worn(0mm)	0.39	Limit(W/kg): 1.6 W/kg
--------------------------------	----------------	------	-----------------------

**Note:**

1. This device is in compliance with Specific Absorption Rate (SAR) for general population or uncontrolled exposure limits (1.6W/kg as averaged over any 1 gram of tissue; specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992), and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.
2. When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% risk level.

## 1. 2. RF exposure limits (ICNIRP Guidelines)

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR*(Brain/Body)	<b>1.60mW/g</b>	8.00mW/g
Spatial Average SAR** (Whole Body)	0.08mW/g	0.40mW/g
Spatial Peak SAR*** (Limbs)	4.00mW/g	20.00mW/g

**Table 2: RF exposure limits**

The limit applied in this test report is shown in bold letters

Notes:

- \* The Spatial Peak value of the SAR averaged over any 1 grams 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 1 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.)

## 1.3. Ratings and System Details

EUT Description	Upper Arm Electronic Blood Pressure Monitor
Model No.	A02-SE4
Brand	GoodlyMed
EUT Supports Radios application:	LTE Band 2: TX 1850MHz~1910MHz LTE Band 4: TX 1710MHz~1755MHz LTE Band 5: TX 824MHz~849MHz LTE Band 12: TX 699MHz~716MHz LTE Band 13: TX 777MHz~787MHz
Modulation Mode	LTE: QPSK, 16QAM
Battery	4*1.5AA size batteries
Hardware version:	GA1.0
Software version:	BG95M3LAR02A03_01

## 1.4. Test specification(s)

FCC 47CFR Part 2(2.1093)	Radio frequency Radiation Exposure Evaluation: Portable Devices
IEC/IEEE 62209-1528	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate(SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 447498 D04v01	General RF Exposure Guidance No deviation
KDB 865664 D01v01r04	SAR Measurement 100 MHz to 6 GHz
KDB 865664 D02v01r02	RF Exposure Reporting
KDB 941225 D05v02r05	SAR Evaluation Consideration for LTE Devices
KDB 941225 D06v02r01	SAR Evaluation Procedures For Portable Devices With Wireless Router Capabilities

**Note 1:** The test item is not applicable.

**Note 2:** Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

### 1.5.List of Test and Measurement Instruments

	Equipment	Model No.	Serial No.	Manufacturer	Last Calibration Date	Period
<input checked="" type="checkbox"/>	SAR test system	TX60L	F08/5AY8A1/A/01+F08/	SPEAG	NCR	NCR
<input checked="" type="checkbox"/>	SAR Probe	EX3DV4	7623	SPEAG	2023.02.28	1year
<input checked="" type="checkbox"/>	Electronic Data Transmitter	DAE4	1637	SPEAG	2023.10.20	1year
<input checked="" type="checkbox"/>	Software	85070	--	Agilent	--	--
<input checked="" type="checkbox"/>	Software	DASY5	--	SPEAG	--	--
<input checked="" type="checkbox"/>	System Validation Dipole,750MHz	D750V3	1103	SPEAG	2023.01.05	3year
<input checked="" type="checkbox"/>	System Validation Dipole,835MHz	D835V2	4d141	SPEAG	2021.08.31	3year
<input checked="" type="checkbox"/>	System Validation Dipole,1750MHz	D1750V2	1108	SPEAG	2023.01.05	3year
<input checked="" type="checkbox"/>	System Validation Dipole,1900MHz	D1900V2	5d162	SPEAG	2021.09.01	3year
<input checked="" type="checkbox"/>	Dielectric Probe Kit	85070E	MY44300455	Agilent	NCR	NCR
<input checked="" type="checkbox"/>	Dual-directional coupler,0.10-2.0GHz	778D	MY48220198	Agilent	NCR	NCR
<input checked="" type="checkbox"/>	Dual-directional coupler,2.00-18GHz	772D	MY46151160	Agilent	NCR	NCR
<input checked="" type="checkbox"/>	Power Amplifier	ZVE-8G	SC280800926	MINI-CIRCUITS	NCR	NCR
<input checked="" type="checkbox"/>	Power Amplifier	ZHL42W	81709	MINI-CIRCUITS	NCR	NCR
<input checked="" type="checkbox"/>	Signal Generator	SMR20	100047	R&S	2023.04.19	1year
<input checked="" type="checkbox"/>	Power Sensor	NRP-Z21	102626	R&S	2023.04.24	1year
<input checked="" type="checkbox"/>	Power Sensor	NRP-Z21	102627	R&S	2023.04.24	1year
<input checked="" type="checkbox"/>	Network Analyzer	E5071C	MY46109550	Agilent	2023.05.05	1Year
<input checked="" type="checkbox"/>	Flat Phantom	ELI4.0	TP-1904	SPEAG	NCR	NCR
<input checked="" type="checkbox"/>	Twin Phantom	SAM	TP-1504	SPEAG	NCR	NCR
<input checked="" type="checkbox"/>	Wideband Radio Communication Tester	CMW500	125469	R&S	2023.04.24	1Year
<input checked="" type="checkbox"/>	Precision Thermometer	--	--	--	2023.06.26	1Year

**Table 2: List of Test and Measurement Equipment**

Note: All the test equipments are calibrated once a year, except the dipoles, which are calibrated every three years. Moreover, we have self-calibration every year to the dipoles.

## **2. GENERAL INFORMATION**

### **2.1. Report information**

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

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### **2.2. Laboratory Accreditation and Relationship to Customer**

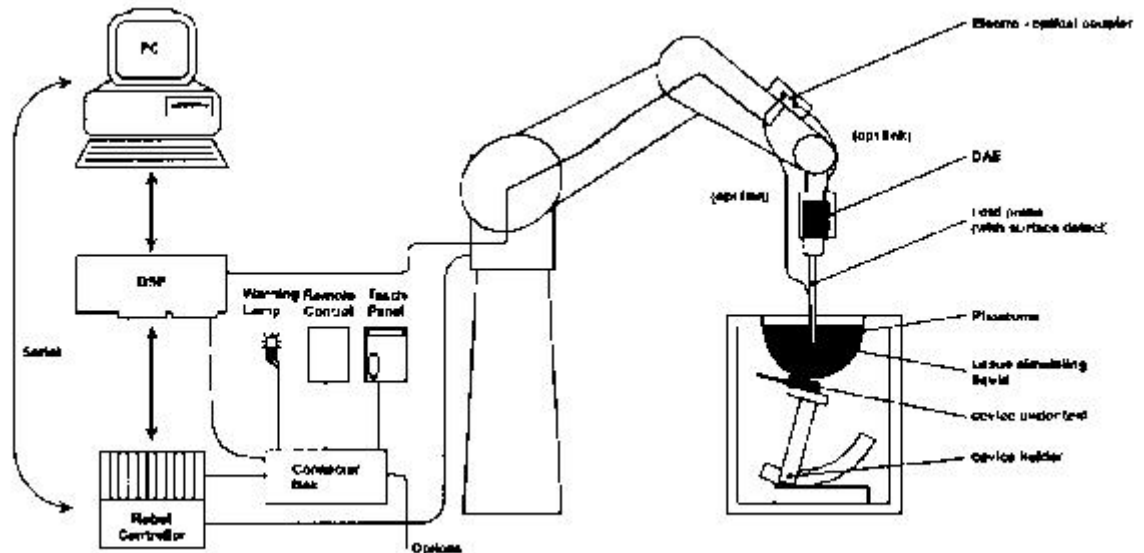
The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations: China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579. The Laboratory is Accredited Testing Laboratory of FCC with Designation number

CN1165 and Site registration number 582918. The Laboratory is registered to perform emission tests with Innovation, Science and Economic Development (ISED), and the registration number is 11177A. The Laboratory is registered to perform emission tests with VCCI, and the registration number are C-20048, G20076, R-20077, R-20078, and T-20047.

The Laboratory is Accredited Testing Laboratory of American Association for Laboratory Accreditation (A2LA) and certificate number is 3292.01.

### 3. SAR MEASUREMENT SYSTEM CONFIGURATION

#### 3.1. SAR Measurement Set-up



The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating 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 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.
  - A unit to operate the optical surface detector which is connected to the EOC.
  - 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 DASY5 measurement server.
  - The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation.
  - A computer operating Windows XP.
  - DASY5 software and SEMCAD data evaluation software.
- Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
- The generic twin phantom enabling the testing of left-hand and right-hand usage.
  - The device holder for handheld mobile phones.
  - Tissue simulating liquid mixed according to the given recipes.
  - System checks dipoles allowing validating the proper functioning of the system.
  - Test environment
  - The DASY5 measurement system is placed at the head end of a room with dimensions: 4.5 x 4 x 3 m<sup>3</sup>, the SAM phantom is placed in a distance of 1.3 m from the side walls and 1.1 m





from the rear wall.

Picture 1 of the photo documentation shows a complete view of the test environment.

### 3. 2. Probe description

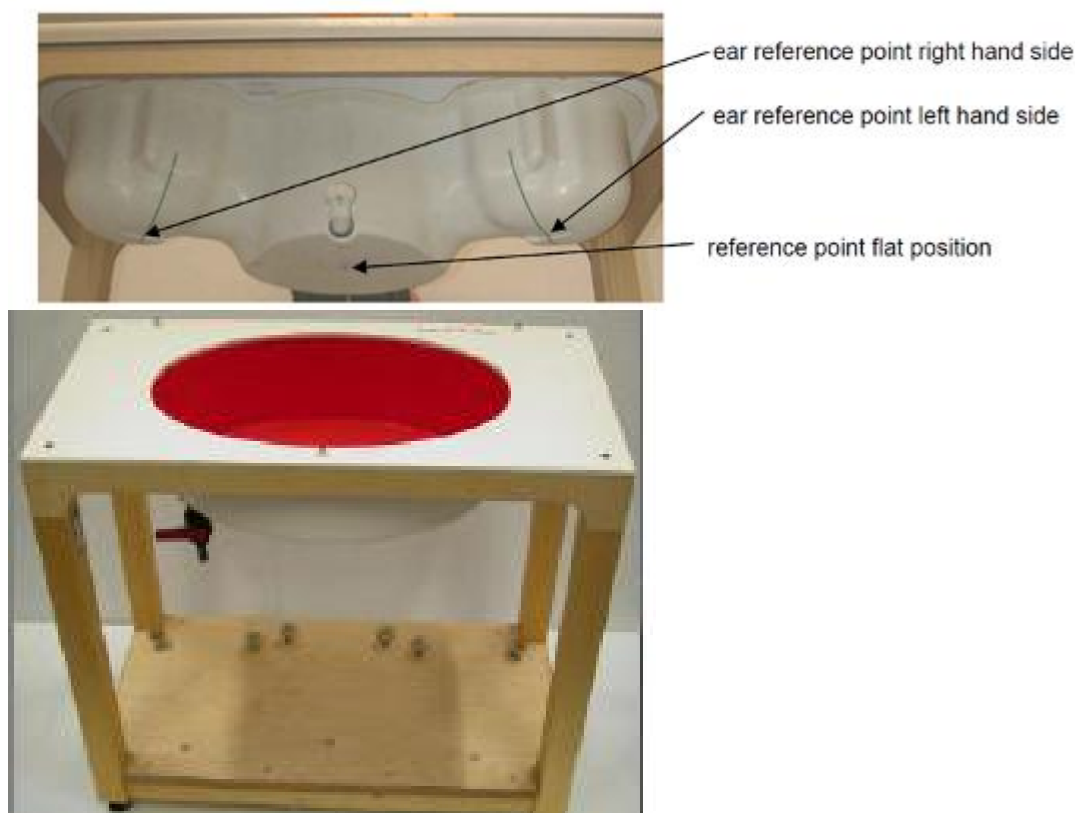
#### Isotropic E-Field Probe EX3DV4 for Dosimetric Measurements

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Calibration	ISO/IEC 17025 calibration service available.	
Frequency	10 MHz to >6 GHz (dosimetry); Linearity: $\pm 0.2$ dB (30 MHz to 6 GHz)	
Directivity	$\pm 0.3$ dB in HSL (rotation around probe axis) $\pm 0.5$ dB in tissue material (rotation normal to probe axis)	
Dynamic range	10 $\mu$ W/g to > 100 mW/g; Linearity: $\pm 0.2$ dB (noise: typically <1 $\mu$ W/g)	
Dimensions	Overall length: 337 mm (Tip: 20mm) Tip length: 2.5 mm (Body: 12mm) Typical distance from probe tip to dipole centers: 1mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

### 3. 3. Phantom description

The used SAM Phantom meets the requirements specified in Edition 01-01 of Supplement C to OET Bulletin 65 for Specific Absorption Rate (SAR) measurements.

The phantom consists of a fibreglass shell integrated in a wooden table. It allows left-hand and right-hand head as well as body-worn measurements with a maximum liquid depth of 18 cm in head position and 22 cm in planar position (body measurements). The thickness of the Phantom shell is 2 mm  $\pm$  0.1 mm.



ELI4 Phantom

Shell Thickness	2mm+/- 0.2mm
Filling Volume	Approximately 30 liters
Measurement Areas	Flat phantom
The ELI4 phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30MHz to 6GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209-2 and all known tissue simulating liquids.	

The phantom shell material is resistant to all ingredients used in the tissue-equivalent liquid recipes. The shell of the phantom including ear spacers is constructed from low permittivity and low loss material, with a relative permittivity  $\leq 5$  and a loss tangent  $\leq 0.05$ .

### 3. 4. Device holder description

The DASY5 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  $65^\circ$ . 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.

## 4. SAR MEASUREMENT PROCEDURE

### 4.1. Scanning procedure

- The DASY5 installation includes predefined files with recommended procedures for measurements and system check. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.
- 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. The indicated drift is mainly the variation of the DUT's output power and should vary max.  $\pm 5\%$ .
- The surface check measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above  $\pm 0.1\text{mm}$ ). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within  $\pm 30^\circ$ .)
- The area scan measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strength is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement. Standard grid spacing for head measurements is 15 mm in x- and y- dimension ( $\leq 2\text{GHz}$ ), 12 mm in x- and y- dimension (2-4 GHz) and 10mm in x- and y- dimension (4-6GHz). If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation.

Results of this coarse scan are shown in Appendix B.

- A “zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous “coarse” scan. This is a fine grid with maximum scan spatial resolution:  $\Delta x_{\text{zoom}}, \Delta y_{\text{zoom}} \leq 2\text{GHz} \leq 8\text{ mm}$ , 2-4GHz -  $\leq 5\text{ mm}$  and 4-6 GHz-  $\leq 4\text{ mm}$ ;  $\Delta z_{\text{zoom}} \leq 3\text{GHz} - \leq 5\text{ mm}$ , 3-4 GHz-  $\leq 4\text{ mm}$  and 4-6GHz-  $\leq 2\text{mm}$  where the robot additionally moves the probe along the z-axis away from the bottom of the Phantom. DASY5 is also able to perform repeated zoom scans if more than 1 peak is found during area scan. Test results relevant for the specified standard (see chapter 1.5.) are shown in table form in chapter 3.2.
- A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 2mm steps. This measurement shows the continuity of the liquid and can – depending in the field strength- also show the liquid depth. A z-axis scan of the measurement with maximum SAR value is shown in Appendix B.

The following table summarizes the area scan and zoom scan resolutions per FCC KDB 865664D01:

Frequency	Maximum Area Scan resolution (Δxarea,Δ yarea)	Maximum Zoom Scan spatial resolution(Δxz oomΔyzoom)	Maximum Zoom Scan spatial resolution			Minimum zoom scan volume (x,y,z)
			Uniform Grid	Graded Grad		
			Δzzoom(n)	Δzzoom(1)	Δzzoom(n>1)	
≤2GHz	≤15mm	≤8mm	≤5mm	≤4mm	1. ≤1.5*Δzzoom(n-1)	2. ≥30mm
2-3GHz	≤12mm	≤5mm	≤5mm	≤4mm	≤1.5*Δzzoom(n-1)	≥30mm
3-4GHz	≤10mm	≤5mm	≤4mm	≤3mm	≤1.5*Δzzoom(n-1)	≥28mm
4-5GHz	≤10mm	≤4mm	≤3mm	≤2.5mm	≤1.5*Δzzoom(n-1)	≥25mm
5-6GHz	≤10mm	≤4mm	≤2mm	≤2mm	≤1.5*Δzzoom(n-1)	≥22mm

#### Spatial Peak SAR Evaluation

- The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done. The bases of the evaluation are the SAR values measured at the points of the fine cube grid consisting of  $5 \times 5 \times 7$  points (with 8mm horizontal resolution) or  $7 \times 7 \times 7$  points (with 5mm horizontal resolution).
- The algorithm that finds the maximal averaged volume is separated into three different stages.
- The data between the dipole center of the probe and the surface of the phantom are extrapolated. This data cannot be measured since the center of the dipole is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is about 1 mm (see probe calibration sheet). The extrapolated data from a cube measurement can be visualized by selecting 'Graph Evaluated'.
- The maximum interpolated value is searched with a straight-forward algorithm. Around this maximum the SAR - values averaged over the spatial volumes (1g or 10 g) are computed using the 3d-spline interpolation algorithm. If the volume cannot be evaluated (i.e., if a part of the grid was cut off by the boundary of the measurement area) the evaluation will be started on the corners of the bottom plane of the cube.
- All neighboring volumes are evaluated until no neighboring volume with a higher average value is found.
- Extrapolation
- The extrapolation is based on a least square algorithm [W. Gander, Computermathematik, p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

#### Interpolation

- The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computermathematik, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff].
- Volume Averaging
- At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points ( $20 \times 20 \times 20$ ) are interpolated to calculate the average.
- Advanced Extrapolation
- DASY5 uses the advanced extrapolation option which is able to compensate boundary effects on

E-field probes.

Data Storage and Evaluation

Data Storage

The DASY5 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], [mW/g], [mW/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.

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	$\sigma$
- Density	$\rho$	

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 DASY5 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:

$$V_i = U_i + U_{i2} \bullet cf/dcpi$$

with  $V_i$  = compensated signal of channel i (i = x, y, z)

$U_i$  = input signal of channel i (i = x, y, z)

cf = crest factor of exciting field (DASY parameter)

dcpi = diode compression point (DASY parameter)

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

evaluated:

E-field probes:  $E_i = (V_i / \text{Norm}_i \bullet \text{ConvF})^{1/2}$

H-field probes:  $H_i = (V_i)^{1/2} \bullet (a_{i0} + a_{i1}f + a_{i2}f^2)/f$

with  $V_i$  = compensated signal of channel i (i = x, y, z)

$\text{Norm}_i$  = sensor sensitivity of channel i (i = x, y, z)  
[mV/(V/m)<sup>2</sup>] for E-field Probes

$\text{ConvF}$  = sensitivity enhancement in solution

$a_{ij}$  = sensor sensitivity factors for H-field probes

$f$  = carrier frequency [GHz]

$E_i$  = electric field strength of channel i in V/m

$H_i$  = magnetic field strength of channel i in A/m

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

$$E_{\text{tot}} = (E_x^2 + E_y^2 + E_z^2)^{1/2}$$

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

$$\text{SAR} = (E_{\text{tot}}^2 \bullet \sigma) / (\rho \bullet 1000)$$

with  $\text{SAR}$  = local specific absorption rate in mW/g

$E_{\text{tot}}$  = total field strength in V/m

$\sigma$  = conductivity in [mho/m] or [Siemens/m]

$\rho$  = equivalent tissue density in g/cm<sup>3</sup>

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.

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

with  $P_{\text{pwe}}$  = equivalent power density of a plane wave in mW/cm<sup>2</sup>

$E_{\text{tot}}$  = total electric field strength in V/m

$H_{\text{tot}}$  = total magnetic field strength in A/m

## 5. SYSTEM VERIFICATION PROCEDURE

### 5.1. Tissue Verification

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine if the dielectric parameters are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within  $\pm 5\%$  of the target values.

The following materials are used for producing the tissue-equivalent materials

Ingredient (% by weight )	Head Tissue				
	750	835	1750	1900	2450
Water	34.4	41.45	52.64	55.24	62.7
Salt(NaCl)	0.79	1.45	0.36	0.306	0.5
Sugar	64.81	56.0	0.0	0.0	0.0
HEC	0.0	1.0	0.0	0.0	0.0
Bactericide	0.0	0.1	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	47.0	44.54	36.8

**Table 4 : Tissue Dielectric Properties**

Salt: 99+% Pure Sodium Chloride; Sugar: 98+% Pure Sucrose; Water: De-ionized, 16M $\Omega$ + resistivity  
HEC: Hydroxyethyl Cellulose; DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]  
Triton X-100(ultra pure): Polyethylene glycol mono[4-(1,1,3,3-tetramethylbutyl)phenyl]ether

Tissue-equivalent liquid measurements:

f/MHz	Date Tested	Dielectric Parameters	Target	Tolerance (%)	Temp (°C)
750	2024.01.25	$\epsilon_r=43.11$	41.9 (39.81~43.99)	±5	20
		$\sigma=0.89$	0.89 (0.85~0.93)		
835	2024.01.25	$\epsilon_r =42.71$	41.5 (39.43~43.57)	±5	20
		$\sigma=0.92$	0.90 (0.86~0.94)		
1750	2024.01.25	$\epsilon_r =41.13$	40.1 (38.10~42.10)	±5	20
		$\sigma=1.34$	1.37 (1.31~1.43)		
1900	2024.01.25	$\epsilon_r =40.99$	40.0 (38.00~42.00)	±5	20
		$\sigma=1.41$	1.40 (1.33~1.47)		

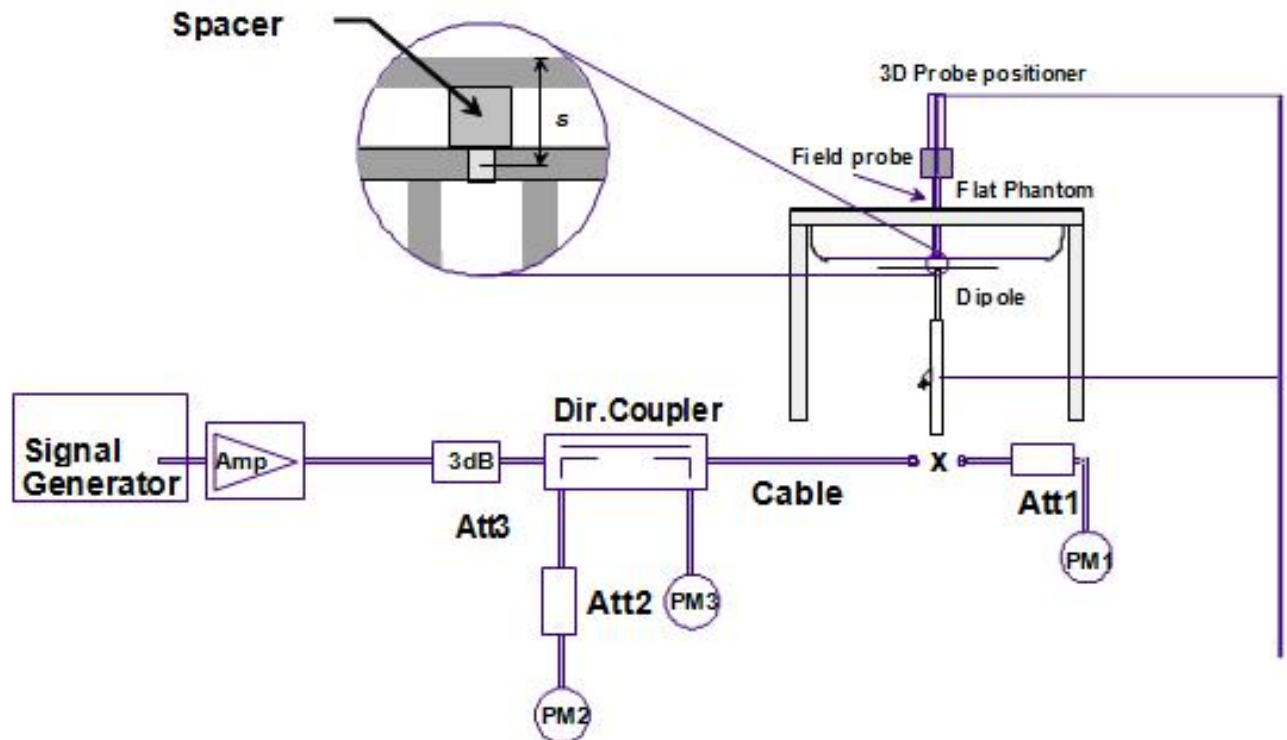
System check, Tissue-equivalent liquid:

f/MHz	Date Tested	Power (mW)	SAR(W/kg), 1g	SAR(W/kg), 10g	Target 1g	Target 10g	Tolerance (%)	Temp (°C)
750	2024.01.25	250	7.84	5.28	8.42 (7.58 ~9.26 )	5.53 (4.98 ~6.08 )	±10	20
835	2024.01.25	250	9.48	6.08	9.58 (8.63 ~10.53 )	6.19 (5.58 ~6.80 )	±10	20
1750	2024.01.25	250	35.92	19.24	35.90 (32.31 ~39.49 )	19.30 (17.37 ~21.23 )	±10	20
1900	2024.01.25	250	40.40	20.52	39.70 (35.73 ~43.67 )	20.20 (18.18 ~22.22 )	±10	20



### System Checking

The manufacturer calibrates the probes annually. A system check measurement was made following the determination of the dielectric parameters of the tissue-equivalent liquid, using the dipole validation kit. A power level of 250mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom.



The system checking results (dielectric parameters and SAR values) are given in the table below.

The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEEE P1528 (described above). The following table shows system check results for all frequency bands and tissue liquids used during the tests (Graphic Plot(s) see Appendix A).

## 6. SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

### 6.1. SAR measurement variability

Per KDB865664 D01 SAR measurement 100MHz to 6GHz 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 measurement 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; step 2) through 4) do not apply.
- 2) When the original highest measured SAR is  $\geq 0.8$  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  $\geq 1.45$  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  $\geq 1.5$  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.

### 6.2. SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100MHz to 6GHz v01r03, 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 1528-2003 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.

## 7. Test Configuration

### LTE Test Configuration

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02r05. The CMW500 WideBand Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR test were performed with the same number of RB and RB offsets transmitting on all TTI frames (Maximum TTI)

#### 1) Spectrum Plots for RB configurations

A properly configured base station simulator was used for LTE output power measurements and SAR testing. Therefore, spectrum plots for RB configurations were not required to be included in this report.

## 2) MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR. The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101:

**Maximum Power Reduction(MPR) for Power Class 3**

Modulation	Channel bandwidth / Transmission bandwidth( $N_{RB}$ )						MPR(dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	>5	>4	>8	>12	>16	>18	$\leq 1$
16 QAM	$\leq 5$	$\leq 4$	$\leq 8$	$\leq 12$	$\leq 16$	$\leq 18$	$\leq 1$
64 QAM	>5	>4	>8	>12	>16	>18	$\leq 2$

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

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

### Uplink-downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

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

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle =  $5120 \times [1/(15000 \times 2048)] \times 2 + 6 \text{ ms} = 63.33\%$

Where Ts =  $1/(15000 \times 2048)$  seconds

### LTE Test Configuration

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02r05. The CMW500 WideBand Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR test were performed with the same number of RB and RB offsets transmitting on all TTI frames (Maximum TTI)

#### 1) Spectrum Plots for RB configurations

A properly configured base station simulator was used for LTE output power measurements and SAR testing. Therefore, spectrum plots for RB configurations were not required to be included in this report.

#### 2) MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR. The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101:

**Maximum Power Reduction(MPR) for Power Class 3**

Modulation	Channel bandwidth / Transmission bandwidth(N <sub>RB</sub> )						MPR(dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	>5	>4	>8	>12	>16	>18	≤1
16 QAM	≤5	≤4	≤8	≤12	≤16	≤18	≤1
64 QAM	>5	>4	>8	>12	>16	>18	≤2

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

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

### Uplink-downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

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

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle =  $5120 \times [1/(15000 \times 2048)] \times 2 + 6 \text{ ms} = 63.33\%$

Where Ts =  $1/(15000 \times 2048)$  seconds

#### 3) A-MPR

A-MPR(Additional MPR) has been disabled for all SAR tests by using Network Signalling Value of "NS\_01" on the base station simulator.

#### 4) LTE procedures for SAR testing

A) Largest channel bandwidth standalone SAR test requirements

##### i) 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 for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is  $\leq 0.8 \text{ W/kg}$ , testing of the remaining RB offset configurations and required test channels is not required for 1RB 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. When the reported SAR of a required test channel is  $> 1.45 \text{ W/kg}$ , SAR is required for all three RB offset configurations for that required test channel.

##### ii) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in i) are applied to measure the SAR for QPSK with 50% RB allocation.

##### iii) 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 i) and ii) are  $\leq 0.8 \text{ W/kg}$ . Otherwise, SAR is measured for the highest output power channel and if the reported SAR is  $> 1.45 \text{ W/kg}$ , the remaining required test channels must also be tested.

##### iv) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is  $> \frac{1}{2}$  dB higher than the same configuration in QPSK or when the reported SAR for the QPSK

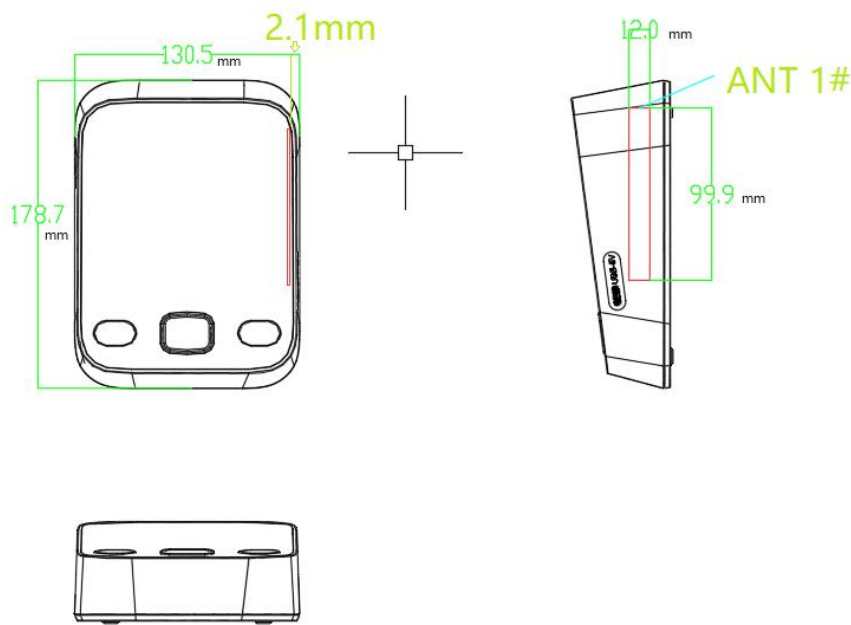
configuration is  $> 1.45 \text{ W/kg}$ .

B) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is  $> \frac{1}{2} \text{ dB}$  higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is  $> 1.45 \text{ W/kg}$ .

8. SAR TEST RESULTS

8. 1. EUT Antenna Locations



ANT 1#	LTE:B2/4/5/12/13
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## 9. MEASUREMENT RESULTS

Result: Passed

Date of testing : 2024.01.25  
Ambient temperature : 20°C~22°C  
Relative humidity : 50~68%

### 9. 1. SAR measurement Results

#### General Notes:

- 1) Per KDB447498 D01v06, all measurement SAR results are scaled to the maximum tune-up tolerance limit to demonstrate compliant.
- 2) Per KDB447498 D01v06, 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  $\leq 0.8$  W/kg or 2.0W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz. When the maximum output power variation across the required test channels is  $> 1/2$  dB, instead of the middle channel, the highest output power channel must be used.
- 3) Per KDB865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measure SAR is  $\geq 0.8$  W/kg; if the deviation among the repeated measurement is  $\leq 20\%$ , and the measured SAR  $< 1.45$  W/kg, only one repeated measurement is required.
- 4) Per KDB 941225 D06 Hotspot Mode SAR v02:r01, the DUT dimension is bigger than 9cm\*5cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.
- 5) Per KDB648474 D04v01r03, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is  $\leq 1.2$  W/kg, no additional SAR evaluations using a headset are required.
- 6) Per KDB865664 D02v01r02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; plots are also required when the measured SAR is  $> 1.5$  W/kg, or  $> 7.0$  W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan plots-processing (refer to appendix B for details).

#### LTE Notes:

- 7) 1. Per KDB 941225 D05v02r05, 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 for RB offsets at the upper edge, middle and lower edge of each required test channel.
- 8) 2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
- 9) 3. Per KDB 941225 D05v02r05, 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
- 10) reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  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.

- 11)4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not Vs dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
- 12)5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is > not % dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
- 13)6. For LTE B41/B5/B12/B17 1 B26 1 B38 1 B71 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
- 14)7. LTE band 2/4/17/38 SAR test was covered by Band 25/66/12/41; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
- 15)a. The maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

## 9.2. LTE Band 2 SAR results

Configuration	Power Level	BW	Modulation	RB Num	RB Start	Position	Dist. mm	Ch.	Freq. (MHz)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	1g Meas SAR (W/kg)	1g Scaled SAR (W/kg)
Ant1	original Power	15MHz	QPSK	1	0	Front	0	19125	1902.5	20.61	22.0	1.377	0.035	0.05
	original Power	15MHz	QPSK	1	0	Back	0	19125	1902.5	20.61	22.0	1.377	0.036	0.05
	original Power	15MHz	QPSK	1	0	Left	0	19125	1902.5	20.61	22.0	1.377	0.009	0.01
	<b>original Power</b>	<b>15MHz</b>	<b>QPSK</b>	<b>1</b>	<b>0</b>	<b>Right</b>	<b>0</b>	<b>19125</b>	<b>1902.5</b>	<b>20.61</b>	<b>22.0</b>	<b>1.377</b>	<b>0.282</b>	<b>0.39</b>
	original Power	15MHz	QPSK	1	0	Top	0	19125	1902.5	20.61	22.0	1.377	0.011	0.02
	original Power	15MHz	QPSK	1	0	Bottom	0	19125	1902.5	20.61	22.0	1.377	0.010	0.01

### 9.3. LTE Band 4 SAR results

Configuration	Power Level	BW	Modulation	RB Num	RB Start	Position	Dist. mm	Ch.	Freq. (MHz)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	1g Meas SAR (W/kg)	1g Scaled SAR (W/kg)
Ant1	original Power	3MHz	QPSK	1	0	Front	0	19965	1711.5	20.10	21.0	1.230	0.031	0.04
	original Power	3MHz	QPSK	1	0	Back	0	19965	1711.5	20.10	21.0	1.230	0.027	0.03
	original Power	3MHz	QPSK	1	0	Left	0	19965	1711.5	20.10	21.0	1.230	0.009	0.01
	<b>original Power</b>	<b>3MHz</b>	<b>QPSK</b>	<b>1</b>	<b>0</b>	<b>Right</b>	<b>0</b>	<b>19965</b>	<b>1711.5</b>	<b>20.10</b>	<b>21.0</b>	<b>1.230</b>	<b>0.183</b>	<b>0.23</b>
	original Power	3MHz	QPSK	1	0	Top	0	19965	1711.5	20.10	21.0	1.230	0.010	0.01
	original Power	3MHz	QPSK	1	0	Bottom	0	19965	1711.5	20.10	21.0	1.230	0.010	0.01

#### 9. 4.      **LTE Band 5 SAR results**

Configuration	Power Level	BW	Modulation	RB Num	RB Start	Position	Dist. mm	Ch.	Freq. (MHz)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	1g Meas SAR (W/kg)	1g Scaled SAR (W/kg)
Ant1	original Power	10MHz	16QAM	5	0	Front	0	20600	844	20.71	22.0	1.346	0.030	0.04
	original Power	10MHz	16QAM	5	0	Back	0	20600	844	20.71	22.0	1.346	0.026	0.03
	original Power	10MHz	16QAM	5	0	Left	0	20600	844	20.71	22.0	1.346	0.009	0.01
	<b>original Power</b>	<b>10MHz</b>	<b>16QAM</b>	<b>5</b>	<b>0</b>	<b>Right</b>	<b>0</b>	<b>20600</b>	<b>844</b>	<b>20.71</b>	<b>22.0</b>	<b>1.346</b>	<b>0.177</b>	<b>0.24</b>
	original Power	10MHz	16QAM	5	0	Top	0	20600	844	20.71	22.0	1.346	0.010	0.01
	original Power	10MHz	16QAM	5	0	Bottom	0	20600	844	20.71	22.0	1.346	0.009	0.01

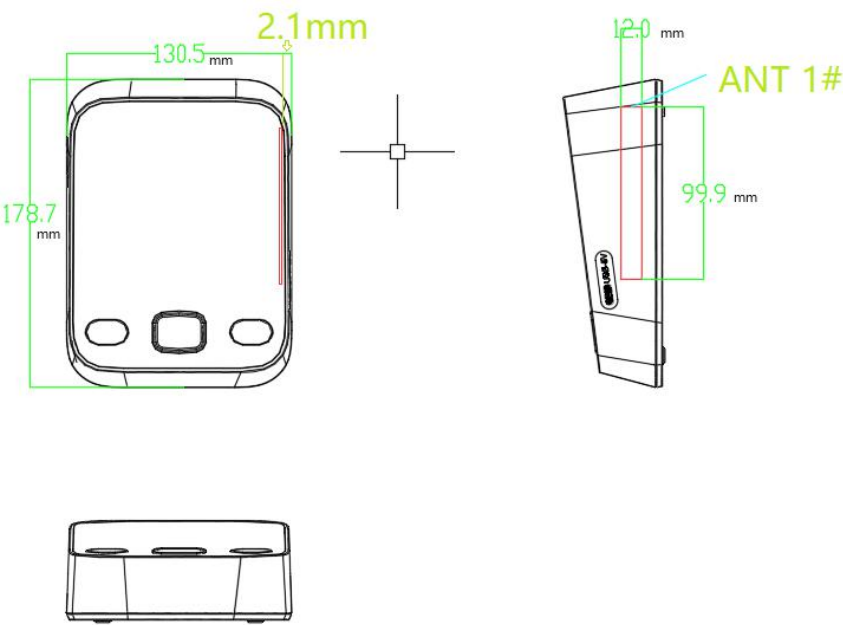
## 9.5. LTE Band12 SAR results

Configuration	Power Level	BW	Modulation	RB Num	RB Start	Position	Dist. mm	Ch.	Freq. (MHz)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	1g Meas SAR (W/kg)	1g Scaled SAR (W/kg)
Ant1	original Power	10MHz	QPSK	1	0	Front	0	23095	707.5	20.45	21.5	1.274	0.014	0.02
	original Power	10MHz	QPSK	1	0	Back	0	23095	707.5	20.45	21.5	1.274	0.011	0.01
	original Power	10MHz	QPSK	1	0	Left	0	23095	707.5	20.45	21.5	1.274	0.005	0.01
	<b>original Power</b>	<b>10MHz</b>	<b>QPSK</b>	<b>1</b>	<b>0</b>	<b>Right</b>	<b>0</b>	<b>23095</b>	<b>707.5</b>	<b>20.45</b>	<b>21.5</b>	<b>1.274</b>	<b>0.038</b>	<b>0.05</b>
	original Power	10MHz	QPSK	1	0	Top	0	23095	707.5	20.45	21.5	1.274	0.006	0.01
	original Power	10MHz	QPSK	1	0	Bottom	0	23095	707.5	20.45	21.5	1.274	0.006	0.01
	original Power	10MHz	QPSK	1	0	Right	0	23060	704	20.45	21.5	1.274	0.037	0.05

## 9. 6.      LTE Band13 SAR results

Configuration	Power Level	BW	Modulation	RB Num	RB Start	Position	Dist. mm	Ch.	Freq. (MHz)	Meas. Power (dBm)	Max. tune-up power (dBm)	Scaling Factor	1g Meas SAR (W/kg)	1g Scaled SAR (W/kg)
Ant1	original Power	5MHz	16QAM	1	0	Front	0	23230	782	20.71	22.0	1.346	0.023	0.03
	original Power	5MHz	16QAM	1	0	Back	0	23230	782	20.71	22.0	1.346	0.021	0.03
	original Power	5MHz	16QAM	1	0	Left	0	23230	782	20.71	22.0	1.346	0.007	0.01
	<b>original Power</b>	<b>5MHz</b>	<b>16QAM</b>	<b>1</b>	<b>0</b>	<b>Right</b>	<b>0</b>	<b>23230</b>	<b>782</b>	<b>20.71</b>	<b>22.0</b>	<b>1.346</b>	<b>0.132</b>	<b>0.18</b>
	original Power	5MHz	16QAM	1	0	Top	0	23230	782	20.71	22.0	1.346	0.008	0.01
	original Power	5MHz	16QAM	1	0	Bottom	0	23230	782	20.71	22.0	1.346	0.008	0.01

10. EXPOSURE POSITIONS CONSIDERATION



Antennas	Distance of the Antenna to the EUT surface edge					
	Front	Back	Left	Right	Top	Bottom
ANT1	≤25mm	≤25mm	>25mm	≤25mm	≤25mm	>25mm



**Appendix A. System Check Plots**  
(Pls see Appendix A)

**Appendix B. MEASUREMENT SCANS**  
(Pls see Appendix B)

**AppendixC RELEVANT PAGES FROM PROBE CALIBRATION REPORT(S)**  
(Pls see Appendix C)

**Appendix D. RELEVANT PAGES FROM DAE&DIPOLE VALIDATION KIT REPORT(S)**  
(Pls see Appendix D)

**Appendix E. Photographs of the Test Set-Up**  
(Pls see Appendix E)

**Appendix F. Conducted RF Output Power Table and Tune-up**  
(Pls see Appendix F)

-----END Report-----