## **SAR Test Report**

Report No.: LCSA03184030E

Report No.: LCSA03184030E

Issued for

Shenzhen Yuejia Technology Co., Ltd.

3F-0301, Xintianxia Phase I Building, Longgang, Shenzhen, China

Product Name: Bluetooth Open-Ear headset

Brand Name: Blue Air

Model Name: Blue Air

Blue Air-OP10, Blue Air-OP20,

Series Model(s): Blue Air-OP30, Blue Air-OP40,

Blue Air-OP50, Blue Air-OP60

ANSI/IEEE Std. C95.1

Test Standard: FCC 47 CFR Part 2 (2.1093)

IEEE 1528: 2013

Max. SAR (1g) Head:0.353 W/kg

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#### **Test Report Certification**

Report No.: LCSA03184030E

Applicant's name ...... Shenzhen Yuejia Technology Co., Ltd.

3F-0301, Xintianxia Phase I Building, Longgang, Shenzhen, Address ....:

China

Manufacturer's Name.........: Shenzhen Yuejia Technology Co., Ltd.

3F-0301, Xintianxia Phase I Building, Longgang, Shenzhen,

**Product description** 

Product name ....... Open-Ear Wireless Headset

Brand name .....: Blue Air

Model name ...... Blue Air-OP10

Blue Air-OP20, Blue Air-OP30, Blue Air-OP40, Blue Air-OP50, Series Model....:

Blue Air-OP60

ANSI/IEEE Std. C95.1-1992 **Standards** ...... FCC 47 CFR Part 2 ( 2.1093)

IEEE 1528: 2013

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#### **Date of Test**

Date of Issue .....: 20 Mar. 2024

Test Result....:

Compiled by:

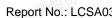
**Supervised by:** 

Approved by:

Jay Zhan / File administrators

Cary Luo / Technique principal

Gavin Liang/ Manager



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SETUP	PHOTOGRAPHS

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**EUT PHOTOGRAPHS** 

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# Revision History

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ALL Initial Issue								
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#### 1. General Information

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

1.1 EUT Description

i.i Loi Description									
Product Name	Open-Ear Wireless Headset								
Brand Name	Blue Air	Blue Air							
Model Name	Blue Air-OP10	40 m 医2 ft 7							
Series Model		Blue Air-OP20, Blue Air-OP30, Blue Air-OP40, Blue Air-OP50, Blue Air-OP60							
Model difference	Only the model nam	ne is different							
Device Category	Portable								
Product stage	Production unit								
RF Exposure Environment	General Population	General Population / Uncontrolled							
Hardware Version	RD-QCC34-ESOP-V4.0								
Software Version/FVIN	V1.11								
Frequency Range	Bluetooth: 2402 MH	z to 2480 MHz							
Max. Reported	Mode	Head (W/kg)							
SAR(1g):	DSS Bluetooth	0.353							
FCC Equipment Class		ctrum Transmitter (DSS)							
Operating Mode:	Bluetooth: GFSK	Bluetooth: GFSK							
Antenna Specification:	Bluetooth: Ceramic	antenna							
Hotspot Mode	Not Support	Not Support							
DTM Mode	Not Support								











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#### 1.2 Test Environment

Ambient conditions in the SAR laboratory:

Items	Required
Temperature (°C)	18-25
Humidity (%RH)	30-70

#### 1.3 Test Factory

Shenzhen LCS Compliance Testing Laboratory Ltd..

101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China FCC test Firm Registration No.: 625569

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

ISED Designation Number is 9642A

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#### 2. Test Standards and Limits

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	ANSI/IEEE Std. C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
3	IEC/IEEE 62209-1528	Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz)
4	FCC KDB 447498 D04 v01	RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices
5	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 865664 D02 v01r02	RF Exposure Reporting
7	FCC KDB 648474 D04 v01r03	SAR Evaluation Considerations for Wireless Handsets
8	FCC KDB 248227 D01 Wi-Fi SAR v02r02	SAR Considerations for 802.11 Devices

(A). Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body Partial-Body Hands, Wrists, Feet and Ankles

0.4 8.0 20.0

(B). Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body Partial-Body Hands, Wrists, Feet and Ankles

0.08 1.6 4.0

NOTE: Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

#### **Population/Uncontrolled Environments:**

Are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

#### Occupational/Controlled Environments:

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

# NOTE GENERAL POPULATION/UNCONTROLLED EXPOSURE PARTIAL BODY LIMIT 1.6 W/kg



#### 3. SAR Measurement System

#### 3.1 SAR Measurement Set-up

The OPENSAR system for performing compliance tests consist of the following items:

A standard high precision 6-axis robot (KUKA) with controller and software.

KUKA Control Panel (KCP)

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with a Video Positioning System(VPS).

The stress sensor is composed with mechanical and electronic when the electronic part detects a change on the electro-mechanical switch, It sends an "Emergency signal" to the robot controller that to stop robot's moves

A computer operating Windows XP.

**OPENSAR** software

Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.

The SAM phantom enabling testing left-hand right-hand and body usage.

The Position device for handheld EUT

Tissue simulating liquid mixed according to the given recipes.

System validation dipoles to validate the proper functioning of the system.

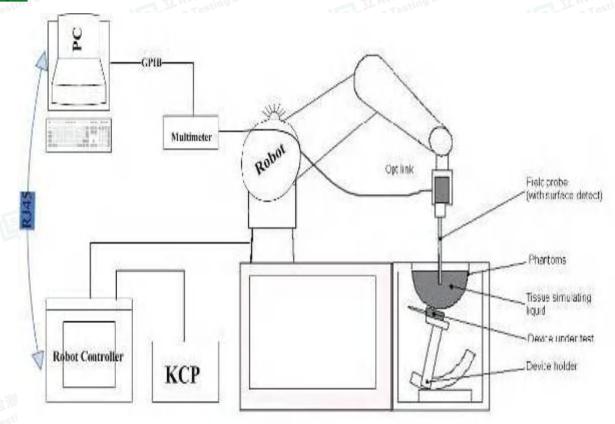




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#### 3.20PENSAR E-field Probe System

The SAR measurements were conducted with the dosimetric probe EPGO376(manufactured by SATIMO), designed in the classical triangular configuration and optimized for dosimetric evaluation.

#### **Probe Specification**

ConstructionSymmetrical design with triangular core

Interleaved sensors

Built-in shielding against static charges

PEEK enclosure material (resistant to organic solvents, e.g., DGBE)

CalibrationISO/IEC 17025 calibration service available.

Frequency 450 MHz to 6 GHz;

Linearity:0.25dB(450 MHz to 6GHz)

**Directivity** 0.25 dB in HSL (rotation around probe axis)

0.5 dB in tissue material (rotation normal to

probe axis)

**Dynamic** 0.01W/kg to > 100 W/kg;

Linearity: 0.25 dB



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Overall length: 330 mm (Tip: 16mm)

Tip diameter: 5 mm (Body: 8 mm)

Distance from probe tip to sensor centers: 2.5

mm

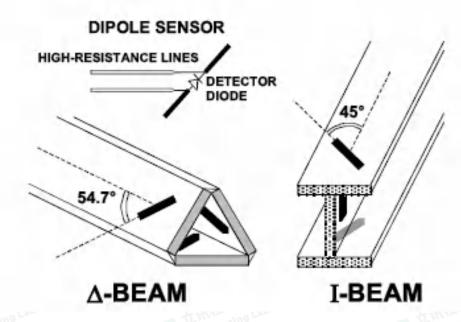
**Application** General dosimetry up to 6 GHz

Dosimetry in strong gradient fields Compliance tests of Mobile Phones

#### Isotropic E-Field Probe

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



#### 3.3Phantoms

The SAM Phantom SAM117 is constructed of a fiberglass shell ntegrated in a wooden table. The shape of the shell is in compliance with the specification set in IEEE P1528 and CENELEC EN62209-1, EN62209-2:2010. The phantom enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of allpredefined phantom positions and measurement grids by manually teaching three points in the robo

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

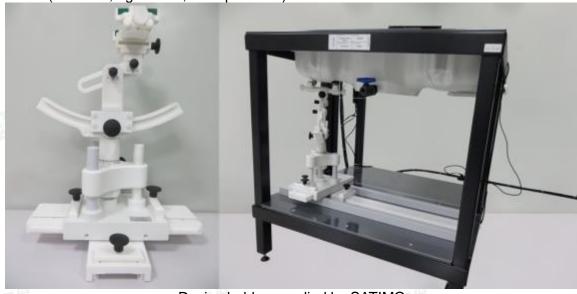


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SAM Twin Phantom

#### 3.4Device Holder

In combination with the Generic Twin PhantomSAM117, the Mounting Device enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatedly positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).



Device holder supplied by SATIMO

#### 3.5Scanning Procedure

The procedure for assessing the peak spatial-average SAR value consists of the following steps

Power Reference Measurement

The reference and drift jobs are useful jobs for monitoring the power drift of the device under test





in the batch process. Both jobs measure the field at a specified reference position, at a selectable distance from the phantom surface. The reference position can be either the selected section's grid reference point or a user point in this section. The reference job projects the selected point onto the phantom surface, orients the probe perpendicularly to the surface, and approaches the surface using the selected detection method.

#### Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot.Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

≤3 GHz	> 3 GHz
$5 \text{ mm} \pm 1 \text{ mm}$	$\frac{1}{2} \cdot \delta \cdot \ln(2) \text{ mm} \pm 0.5 \text{ mm}$
$30^{\circ}\pm1^{\circ}$	20° ± 1°
$\leq$ 2 GHz: $\leq$ 15 mm 2 – 3 GHz: $\leq$ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
When the x or y dimension measurement plane orientat above, the measurement rescorresponding x or y dimenat least one measurement po	ion, is smaller than the olution must be $\leq$ the sion of the test device with
	$5 \text{ mm} \pm 1 \text{ mm}$ $30^{\circ} \pm 1^{\circ}$ $\leq 2 \text{ GHz: } \leq 15 \text{ mm}$ $2 - 3 \text{ GHz: } \leq 12 \text{ mm}$ When the x or y dimension measurement plane orientat above, the measurement rescorresponding x or y dimension

#### Zoom Scan

Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centered around the maxima found in the preceding area scan.

Maximum zoom scan	spatial res	olution: $\Delta x_{Zoom}$ , $\Delta y_{Zoom}$	$\leq$ 2 GHz: $\leq$ 8 mm 2 - 3 GHz: $\leq$ 5 mm	$3 - 4 \text{ GHz: } \le 5 \text{ mm}^*$ $4 - 6 \text{ GHz: } \le 4 \text{ mm}^*$	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform	grid: Δz <sub>Zoom</sub> (n)	≤ 5 mm	$3-4$ GHz: $\leq 4$ mm $4-5$ GHz: $\leq 3$ mm $5-6$ GHz: $\leq 2$ mm	
	graded	Δz <sub>Zoom</sub> (1): between 1 <sup>st</sup> two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz; ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm	
	grid	Δz <sub>Zoom</sub> (n>1): between subsequent points	≤1.5·Δz <sub>Z</sub>	oom(n-1) mm	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm	

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.

<sup>\*</sup> When zoom scan is required and the <u>reported</u> SAR from the <u>area scan based 1-g SAR estimation</u> procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

#### Power Drift measurement

The drift job measures the field at the same location as the most recent reference job within the same procedure, and with the same settings. The drift measurement gives the field difference in dB from the reading conducted within the last reference measurement. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under test within a batch process. In the properties of the Drift job, the user can specify a limit for the drift and have OPENSAR software stop the measurements if this limit is exceeded.

#### 3.6Data Storage and Evaluation

#### **Data Storage**

The OPENSAR 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. 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**

The OPENSAR 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 I			
- Crest factor	cf			
Media parameters: - Conductivity	σ			
- Density	ρ			

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

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

With Vi = compensated signal of channel i (i = x, y, z) Ui = input signal of channel i (i = x, y, z)



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cf = crest factor of exciting field dcpi = diode compression point

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

E – fieldprobes : 
$$E_i = \sqrt{\frac{V_i}{Norm_i \cdot Conv}}$$

$$\mbox{H} - \mbox{fieldprobes}: \qquad \mbox{$H_i$} = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1}f + a_{i2}f^2}{f}$$

With Vi = compensated signal of channel i 
$$(i = x, y, z)$$
  
Normi = sensor sensitivity of channel i  $(i = x, y, z)$ 

[mV/(V/m)2] for E-field Probes

ConvF = sensitivity enhancement in solution

= sensor sensitivity factors for H-field probes

= carrier frequency [GHz] f

= electric field strength of channel i in V/m Εi = magnetic field strength of channel i in A/m Hi

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

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.  $SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$ 

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

= equivalent tissue density in g/cm3 ρ

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.

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#### 4. Tissue Simulating Liquids

#### 4.1 Simulating Liquids Parameter Check

The liquid is consisted of water, salt, Glycol, Sugar, Preventol and Cellulose. The liquid has previously been proven to be suited for worst-case. It's satisfying the latest tissue dielectric parameters requirements proposed by the KDB865664.

The composition of the tissue simulating liquid

	The composition of the assac simulating liquid													
Ingredient	750	ИHz	8351	MHz	1800	MHz	1900	MHz	2450	MHz	2600	MHz	5000	MHz
(% Weight)	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	39.28	51.3	41.45	52.5	54.5	40.2	54.9	40.4	62.7	73.2	60.3	71.4	65.5	78.6
Preventol	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HEC	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DGBE	0.00	0.00	0.00	0.00	45.33	59.31	44.92	59.10	36.80	26.70	39.10	28.40	0.00	0.00
Triton X-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.2	10.7

Target Frequency	Head					
(MHz)	$\epsilon_{\rm r}$	σ(S/m)				
450	43.5	0.87				
750 Till	41.9	0.89				
835	41.5	0.90				
900	41.5	0.97				
1450	40.5	1.20				
1640	40.2	1.31				
1800	40.0	1.40				
1900	40.0	1.40				
2000	40.0	1.40				
2450	39.2	1.80				
2600	39.0	1.96				
3000	38.5	2.40				
5200	36.0	4.66				
5800	35.3	5.27				









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#### **LIQUID MEASUREMENT RESULTS**

Date	Ambient		Simulating Liquid		Parameters	Target	Measured	Deviation	Limited				
Date	Temp.	Humidity	Frequency	Temp.	1 arameters	raiget	IVICASUICU	%	%				
	[°C]	%	(MHz)	[°C]									
2022-07-25	21.7	45	2402	21.4	Permittivity	39.29	39.56	0.69	±5				
2022-07-25	21.7	Ing 1.40	2402	21.4	Conductivity	1.76	1.69	-3.98	±5				
2022 07 25	24.6	40	0444	2441	0.4.44	0444	24.2	Permittivity	39.22	40.48	3.21	±5	
2022-07-25	21.6	40	46		21.3	Conductivity	1.79	1.82	1.68	±5			
2022 07 25	24.4	40	2450	2450	2450	2450	2450	24.0	Permittivity	39.20	39.46	0.66	±5
2022-07-25	21.4	48				2450 21.2	Conductivity	1.80	1.78	-1.11	±5		
2022 07 25	24.4	45	2490	21.3	Permittivity	39.15	39.69	1.38	±5				
2022-07-25	21.4	45	2480	21.3	Conductivity	1.83	1.81	-1.09	±5				
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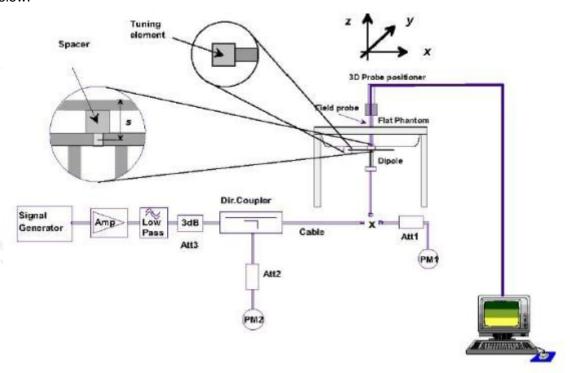


#### 5. SAR System Validation

#### 5.1 Validation System

Each MVG system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the MVG software, enable the user to conduct the system performance check and system validation. System kit includes a dipole, and dipole device holder.

The system check verifies that the system operates within its specifications. It's performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system validation setup is shown as below.



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NSA 立语检测股份

北京 文语检测极锐











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#### 5.2 Validation Result

#### **Justification for Extended SAR Dipole Calibrations**

Referring to KDB 865664D01V01r04, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended. While calibration intervals not exceed 3 years.

#### SID2450 SN 07/14 DIP 2G450-306 Extend Dipole Calibrations

Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)
2021-09-29	-25.59	15	44.7		-1.1	
2022-09-29	-25.68	0.35	44.8	0.1	-1.0	0.1
2023-09-29	-25.70	0.43	44.5	-0.2	-1.1	0.0

Date	Freq.	Power	Tested Value	Normalized SAR	Target SAR	Tolerance	Limit	
6	(MHz)	(mW)	(W/Kg)	(W/kg)	1g(W/kg)	(%)	(%)	
2022-07-25	2450	100	5.354	53.54	52.40	2.18	10	

#### Note:

- 1. The tolerance limit of System validation ±10%.
- 2. The dipole input power (forward power) was 100 mW.
- 3. The results are normalized to 1 W input power.















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#### 6. SAR Evaluation Procedures

The procedure for assessing the average SAR value consists of the following steps: The following steps are used for each test position

- 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
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with a grid of 8 to 16mm \* 8 to 16 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.
- 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.

#### Area Scan& Zoom Scan:

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 D01v01r01 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. EUT Antenna Location Sketch

It is a Open-Ear Wireless Headset, support BT mode.

















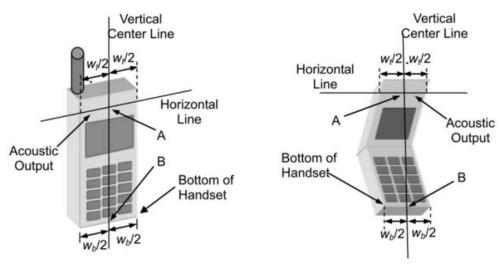


#### 8. EUT Test Position

The EUT was tested on the inside of the left ear.

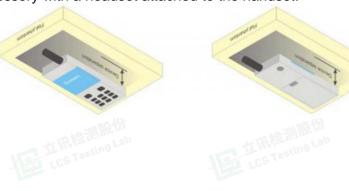
#### 8.1 Define Two Imaginary Lines On The Handset

- (1) The vertical centerline passes through two points on the front side of the handset the midpoint of the width wt of the handset at the level of the acoustic output, and the midpoint of the width wb of the handset.
- (2) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
- (3) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.



**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 Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative test separation distance configuration may be used to support both SAR conditions. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.



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#### 9. Uncertainty

#### 9.1 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEEE 1528: 2013. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	Veff
Measurement System								
Probe calibration	5.8	NA	gill by	ab 1	1	5.80	5.80	∞
Axial Isotropy	3.5	R	√3	$\sqrt{1-C_p}$	$\sqrt{1-C_p}$	1.43	1.43	8
Hemispherical Isotropy	5.9	R	√3	$\sqrt{C_p}$	$\sqrt{C_p}$	2.41	2.41	∞
Boundary effect	1.0	R	√3	1	1	0.58	0.58	∞
Linearity	4.7	R	√3	1	1	2.71	2.71	∞
System detection limits	1.0	R	√3	1	1	0.58	0.58	∞
Readout Electronics	0.5	N	1	1	1	0.50	0.50	∞
Response Time	0.0	R	√3	1	测影1,	0.00	0.00	∞
Integration Time	1.4	R	√3 ]	15 1 cs 1	1	0.81	0.81	∞
RF ambient Conditions - Noise	3.0	R	√3	1	1	1.73	1.73	∞
RF ambient Conditions - Reflections	3.0	R	√3	1	1	1.73	1.73	∞
Probe positioner Mechanical Tolerance	1.4	R	√3	1	1	0.81	0.81	∞
Probe positioning with respect to Phantom Shell	1.4	R	√3	1	1	0.81	0.81	∞
Max. SAR Evaluation	1.0	R	√3	1	1	0.6	0.6	∞
Test sample Related		_						
Device positioning	2.6	N <sub>C</sub> S	les jua	1	1	2.6	2.6	11
Device holder	3.0	N	1	1	1	3.0	3.0	7
Drift of output power	5.0	Ν	√3	1	1	2.89	2.89	∞
System check source(dipole)								
Deviation between experimental dipoles	2.0	N	1	1	1	2.0	2.0	∞
Input power and SAR drift measurement	4.7	R	√3	1	1	2.7	2.7	∞
Dipole axis to liquid distance	1.0	R	√3	1	1) Same	0.6	0.6	∞
System check source								
Deviation between experimental source	——————————————————————————————————————	N	1	0	0	_	TEST ICO	7
Input power and SAR drift measurement	_	R	√3	1	1	_	_	∞
Other source contributions	_	R	√3	1	1	_	_	8



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A Testino						2 Testille		
Phantom uncertainty	4.00	R	√3	Par 1 Co	1	2.31	2.31	∞
Liquid conductivity (target)	2.50	N	1	0.78	0.71	1.95	1.78	5
Liquid conductivity (meas)	4.00	N	1	0.23	0.26	0.92	1.04	5
Liquid Permittivity (target)	2.50	N	1	0.78	0.71	1.95	1.78	∞
Liquid Permittivity (meas)	5.00	N	1	0.23	0.26	1.15	1.30	∞
Combined Standard		RSS	$U_c = \sqrt{\sum_{i=1}^n C_i^2 U_i^2}$		10.63	10.54 %		
Expanded Uncertainty (95% Confidence interval)	U = k U <sub>C</sub> , k=2					21.26	21.08 %	

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#### 10. Output Power Measurement

#### 10.1 Maximum test Result

#### **Bluetooth**

Mode	Frequency (MHz)	Average Power (dBm)	Average Power (mW)		
	2402	2.6	1.82		
GFSK(1Mbps)	2441	2.05	1.60		
T. CS Testing La	2480	1.15	1.30		
	2402	2.57	1.81		
π/4-QPSK(2Mbps)	2441	2.24	1.67		
	2480	1.22	1.32		
	2402	2.27	1.69		
8DPSK(3Mbps)	2441	2.1	1.62		
	2480	1.11	1.29		













