



## SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZSAR-TRF-01-A01 Rev. A/1 Aug 16,2024

Report No.: SZCR260200054302

Page: 1 of 32

# PART2 Appendix C

## Calibration certificate

|                  |
|------------------|
| 1. Dipole        |
| D835V2-SN 4d105  |
| D1750V2-SN 1149  |
| D1900V2-SN 5d028 |
| D2600V2-SN 1125  |
| D3500V2-SN 1082  |



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: [CN.Doccheck@sgs.com](mailto:CN.Doccheck@sgs.com)

SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch Inspection & Testing Services Laboratory

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgs.com.cn  
中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

Client **SGS (Shenzhen)**

Certificate No: **25J02Z000726**

## CALIBRATION CERTIFICATE

Object **D835V2 - SN: 4d105**

Calibration Procedure(s) **FF-Z11-0003-02**  
**Calibration Procedures for dipole validation kits**

Calibration date: **October 14, 2025**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards      | ID #       | Cal Date (Calibrated by, Certificate No.)   | Scheduled Calibration |
|------------------------|------------|---------------------------------------------|-----------------------|
| Power Meter NRP2       | 106276     | 16-May-25 (CTTL, No. 25J02X003423)          | May-26                |
| Power sensor NRP6A     | 101369     | 16-May-25 (CTTL, No. 25J02X003423)          | May-26                |
| Reference Probe EX3DV4 | SN 7464    | 28-Jan-25(SPEAG, No. EX-7464_Jan25)         | Jan-26                |
| DAE4                   | SN 1588    | 13-Sep-24(CTTL-SPEAG, No. 24J02Z000713)     | Sep-25                |
| Secondary Standards    | ID #       | Cal Date (Calibrated by, Certificate No.)   | Scheduled Calibration |
| SignalGeneratorSMA200A | 107732     | 22-Jan-25 (CTTL, No. 25J02X000388)          | Jan-26                |
| NetworkAnalyzer E5071C | MY46110673 | 18-Dec-24 (CTTL, No. 24J02X103932)          | Dec-25                |
| OCP DAK-3.5            | 1040       | 20-Jan-25(SPEAG, No. OCP-DAK3.5-1040_Jan25) | Jan-26                |

|                |             |                    |                                                                                       |
|----------------|-------------|--------------------|---------------------------------------------------------------------------------------|
|                | Name        | Function           | Signature                                                                             |
| Calibrated by: | Zhao Jing   | SAR Test Engineer  |  |
| Reviewed by:   | Lin Jun     | SAR Test Engineer  |  |
| Approved by:   | Qi Dianyuan | SAR Project Leader |  |

Issued: October 21, 2025

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



In Collaboration with

**s p e a g**  
CALIBRATION LABORATORY



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2711

E-mail: emf@caict.ac.cn

<http://www.caict.ac.cn>

### Glossary:

|       |                                            |
|-------|--------------------------------------------|
| TSL   | tissue simulating liquid                   |
| ConvF | sensitivity in TSL / NORM <sub>x,y,z</sub> |
| N/A   | not applicable or not measured             |

### Calibration is Performed According to the Following Standards:

- 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)", October 2020
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- DASY System Handbook

### Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution Corresponds to a coverage probability of approximately 95%.

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2711  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                                     |                            |                                  |
|-------------------------------------|----------------------------|----------------------------------|
| <b>DASY Version</b>                 | DASY6                      | V17.0.0                          |
| <b>Extrapolation</b>                | Advanced Extrapolation     |                                  |
| <b>Phantom</b>                      | Modular Flat Phantom       |                                  |
| <b>Distance Dipole Center - TSL</b> | 15 mm                      | with Spacer                      |
| <b>Zoom Scan Resolution</b>         | dx, dy = 6 mm, dz = 1.5 mm | Graded Ratio = 1.5 (Z direction) |
| <b>Frequency</b>                    | 835 MHz $\pm$ 1 MHz        |                                  |

## Head TSL parameters at 835 MHz

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 41.5           | 0.90 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 42.0 $\pm$ 6 % | 0.91 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | <1.0 °C             | ----           | ----                 |

## SAR result with Head TSL at 835 MHz

|                                                               |                    |                                              |
|---------------------------------------------------------------|--------------------|----------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>   | Condition          |                                              |
| SAR measured                                                  | 24 dBm input power | 2.44 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>9.67 W/kg <math>\pm</math> 20 % (k=2)</b> |
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                                              |
| SAR measured                                                  | 24 dBm input power | 1.62 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>6.43 W/kg <math>\pm</math> 20 % (k=2)</b> |



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2711  
E-mail: emf@caict.ac.cn      <http://www.caict.ac.cn>

## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL at 835 MHz

|                                      |                |
|--------------------------------------|----------------|
| Impedance, transformed to feed point | 49.3Ω - 4.55jΩ |
| Return Loss                          | - 26.7dB       |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.302 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.  
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feed-point may be damaged.

### Additional EUT Data

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
 Tel: +86-10-62304633-2711  
 E-mail: emf@caict.ac.cn      http://www.caict.ac.cn

## DASY6 Validation Report for Head TSL

Date: 2025-10-14

Test Laboratory: CTTL, Beijing, China

### Summary

| Dipole            | Frequency [MHz] | TSL | Power [dBm] |
|-------------------|-----------------|-----|-------------|
| D835V2 – SN 4d105 | 835             | HSL | 24          |

### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band Group, UID | Frequency [MHz] | Conversion Factor | TSL Cond. [S/m] | TSL Permittivity |
|----------------------|------------------------------|-----------------|-----------------|-------------------|-----------------|------------------|
| Flat                 | 15                           | CW,             | 835             | 9.11              | 0.914           | 42.0             |

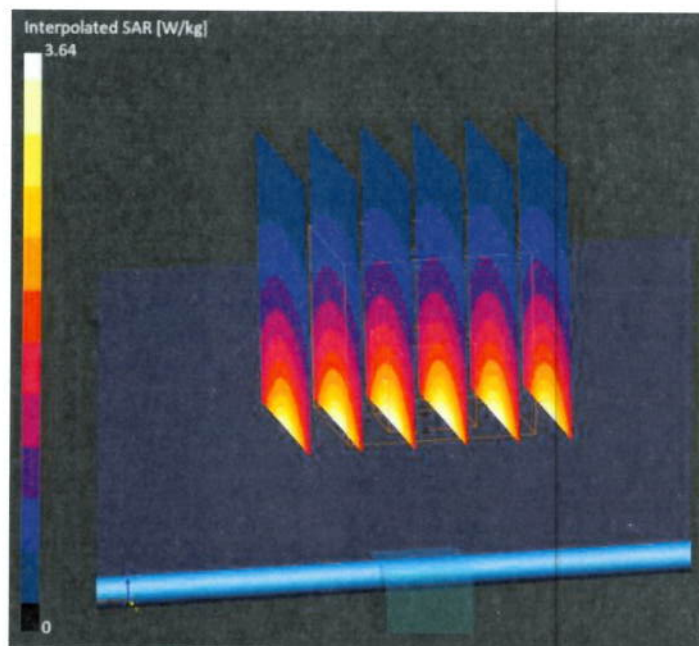
### Hardware Setup

| Phantom        | TSL       | Probe, Calibration Date     | DAE, Calibration Date   |
|----------------|-----------|-----------------------------|-------------------------|
| MFP V8.0 Right | 835 Head, | EX3DV4 - SN7464, 2025-01-28 | DAE4 Sn1588, 2025-08-29 |

### Scan Setup

### Measurement Results

| Zoom Scan           |                | Zoom Scan           |               |
|---------------------|----------------|---------------------|---------------|
| Grid Extents [mm]   | 30.0×30.0×30.0 | psSAR1g [W/kg]      | 2.44          |
| Grid Steps [mm]     | 6.0×6.0×1.5    | psSAR10g [W/kg]     | 1.62          |
| Sensor Surface [mm] | 1.4            | Power Drift [dB]    | 0.00          |
| Graded Grid         | Yes            | Power Scaling       | Disabled      |
| Grading Ratio       | 1.5            | Scaling Factor [dB] |               |
| MAIA                | N/A            | TSL Correction      | No correction |
| Surface Detection   | VMS + 6p       | M2/M1 [%]           | 87.9          |
| Scan Method         | Measured       | Dist 3dB Peak [mm]  | 16.4          |



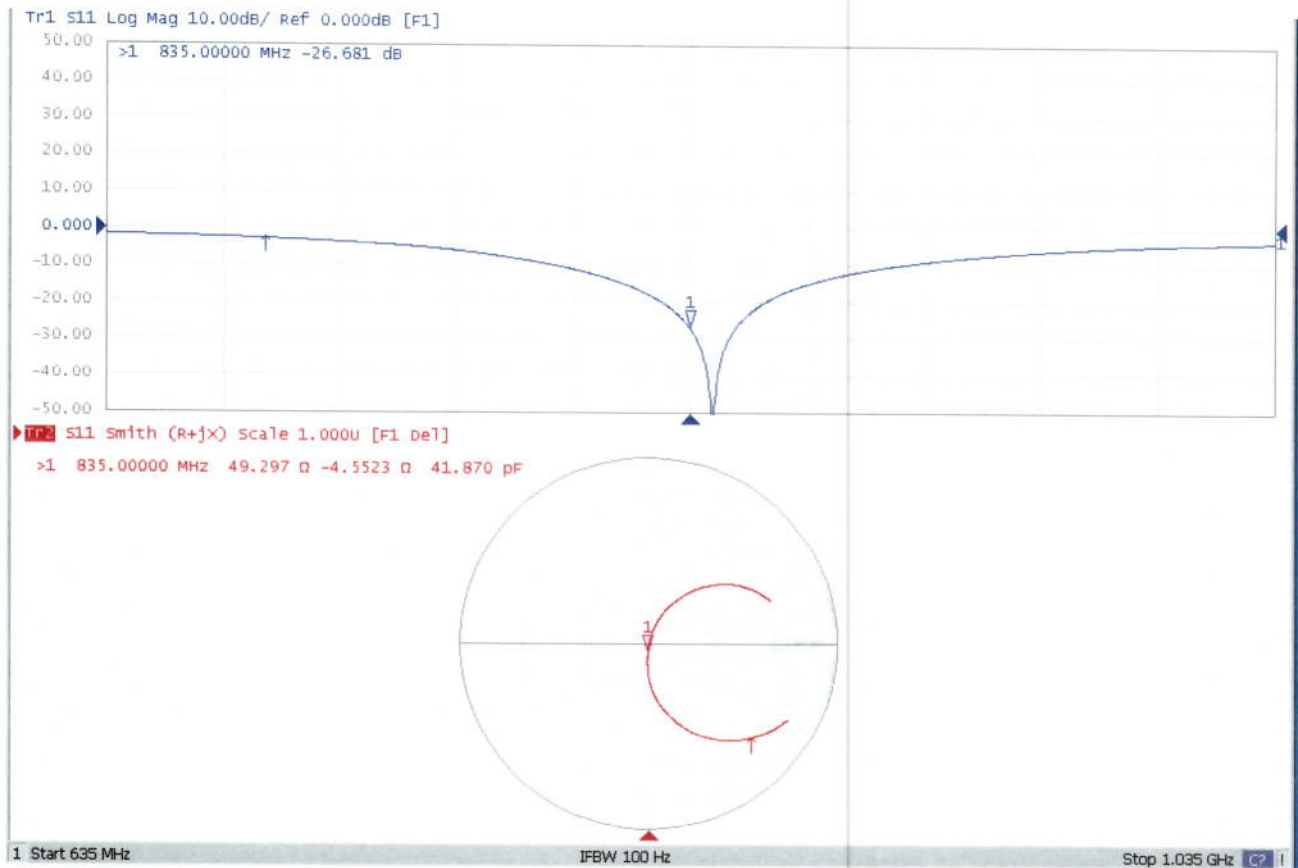


In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2711  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

## Impedance Measurement Plot for Head TSL



**Client:** SGS(Shenzhen)

**Certificate No:** 25J02Z000402

## CALIBRATION CERTIFICATE

**Object** D1750V2 - SN: 1149

**Calibration Procedure(s)** FF-Z11-003-01  
Calibration Procedures for dipole validation kits

**Calibration date:** June 18, 2025

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards       | ID #       | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|-------------------------------------------|-----------------------|
| Power Meter NRP2        | 106276     | 16-May-25 (CTTL, No. 25J02X003423)        | May-26                |
| Power sensor NRP6A      | 101369     | 16-May-25 (CTTL, No. 25J02X003423)        | May-26                |
| Reference Probe EX3DV4  | SN 3846    | 28-May-25(CTTL-SPEAG, No. 25J02Z000277)   | May-26                |
| DAE4                    | SN 1588    | 13-Sep-24(CTTL-SPEAG, No. 24J02Z000713)   | Sep-25                |
| Secondary Standards     | ID #       | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
| Signal Generator E4438C | MY49071430 | 19-Dec-24 (CTTL, No. 24J02X103931)        | Dec-25                |
| NetworkAnalyzer E5071C  | MY46110673 | 18-Dec-24 (CTTL, No. 24J02X103932)        | Dec-25                |
| OCP DAKS                | SN 0015    | 09-Oct-24(SPEAG, No. OCP-DAKS-0015_Oct24) | Oct -25               |

|                | Name        | Function           | Signature                                                                             |
|----------------|-------------|--------------------|---------------------------------------------------------------------------------------|
| Calibrated by: | Zhao Jing   | SAR Test Engineer  |  |
| Reviewed by:   | Lin Jun     | SAR Test Engineer  |  |
| Approved by:   | Qi Dianyuan | SAR Project Leader |  |

Issued: June 25, 2025

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



In Collaboration with

**s p e a g**  
CALIBRATION LABORATORY



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2117

E-mail: emf@caict.ac.cn

<http://www.caict.ac.cn>

### Glossary:

|       |                                            |
|-------|--------------------------------------------|
| TSL   | tissue simulating liquid                   |
| ConvF | sensitivity in TSL / NORM <sub>x,y,z</sub> |
| N/A   | not applicable or not measured             |

### Calibration is Performed According to the Following Standards:

- a) 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)", October 2020
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- c) DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution Corresponds to a coverage probability of approximately 95%.



In Collaboration with

**s p e a g**  
CALIBRATION LABORATORY

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2117

E-mail: emf@caict.ac.cn

<http://www.caict.ac.cn>**Measurement Conditions**

DASY system configuration, as far as not given on page 1.

|                                     |                          |             |
|-------------------------------------|--------------------------|-------------|
| <b>DASY Version</b>                 | DASY52                   | 52.10.4     |
| <b>Extrapolation</b>                | Advanced Extrapolation   |             |
| <b>Phantom</b>                      | Triple Flat Phantom 5.1C |             |
| <b>Distance Dipole Center - TSL</b> | 10 mm                    | with Spacer |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm        |             |
| <b>Frequency</b>                    | 1750 MHz $\pm$ 1 MHz     |             |

**Head TSL parameters**

The following parameters and calculations were applied.

|                                                | <b>Temperature</b>  | <b>Permittivity</b> | <b>Conductivity</b>  |
|------------------------------------------------|---------------------|---------------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 40.1                | 1.37 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 40.0 $\pm$ 6 %      | 1.39 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | <1.0 °C             | ---                 | ---                  |

**SAR result with Head TSL**

|                                                               |                    |                                              |
|---------------------------------------------------------------|--------------------|----------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>   | Condition          |                                              |
| SAR measured                                                  | 250 mW input power | 9.14 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>36.2 W/kg <math>\pm</math> 20 % (k=2)</b> |
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                                              |
| SAR measured                                                  | 250 mW input power | 4.82 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>19.1 W/kg <math>\pm</math> 20 % (k=2)</b> |



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2117  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 47.1Ω+ 0.47jΩ |
| Return Loss                          | - 30.2dB      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.124 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.  
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feed-point may be damaged.

### Additional EUT Data

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2117  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

## DASY5 Validation Report for Head TSL

Date: 2025-06-18

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1149**

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1750$  MHz;  $\sigma = 1.392$  S/m;  $\epsilon_r = 39.98$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(8.26, 8.26, 8.26) @ 1750 MHz; Calibrated: 2025-05-28
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1588; Calibrated: 2024-09-13
- Phantom: MFP\_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

**Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.30 V/m; Power Drift = -0.01 dB

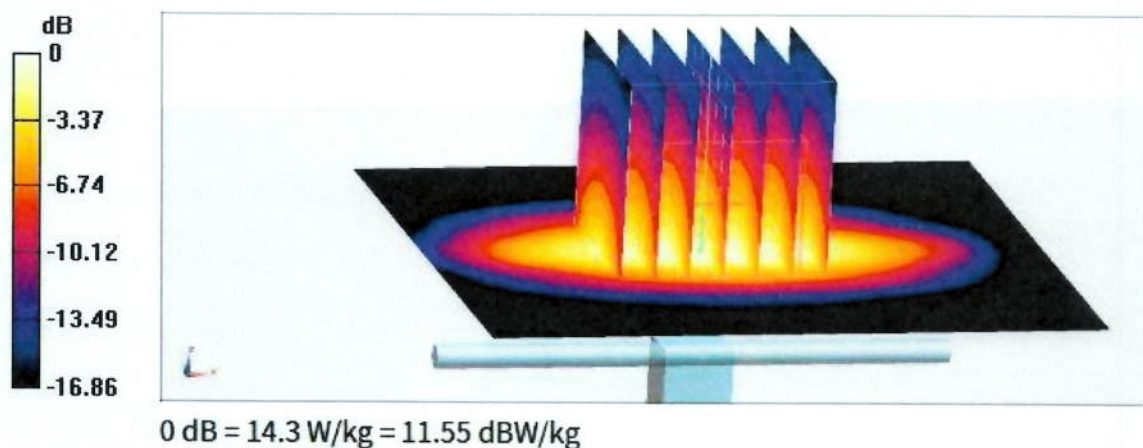
Peak SAR (extrapolated) = 17.3 W/kg

**SAR(1 g) = 9.14 W/kg; SAR(10 g) = 4.82 W/kg**

Smallest distance from peaks to all points 3 dB below = 9.1 mm

Ratio of SAR at M2 to SAR at M1 = 53.7%

Maximum value of SAR (measured) = 14.3 W/kg





In Collaboration with

**s p e a g**  
CALIBRATION LABORATORY



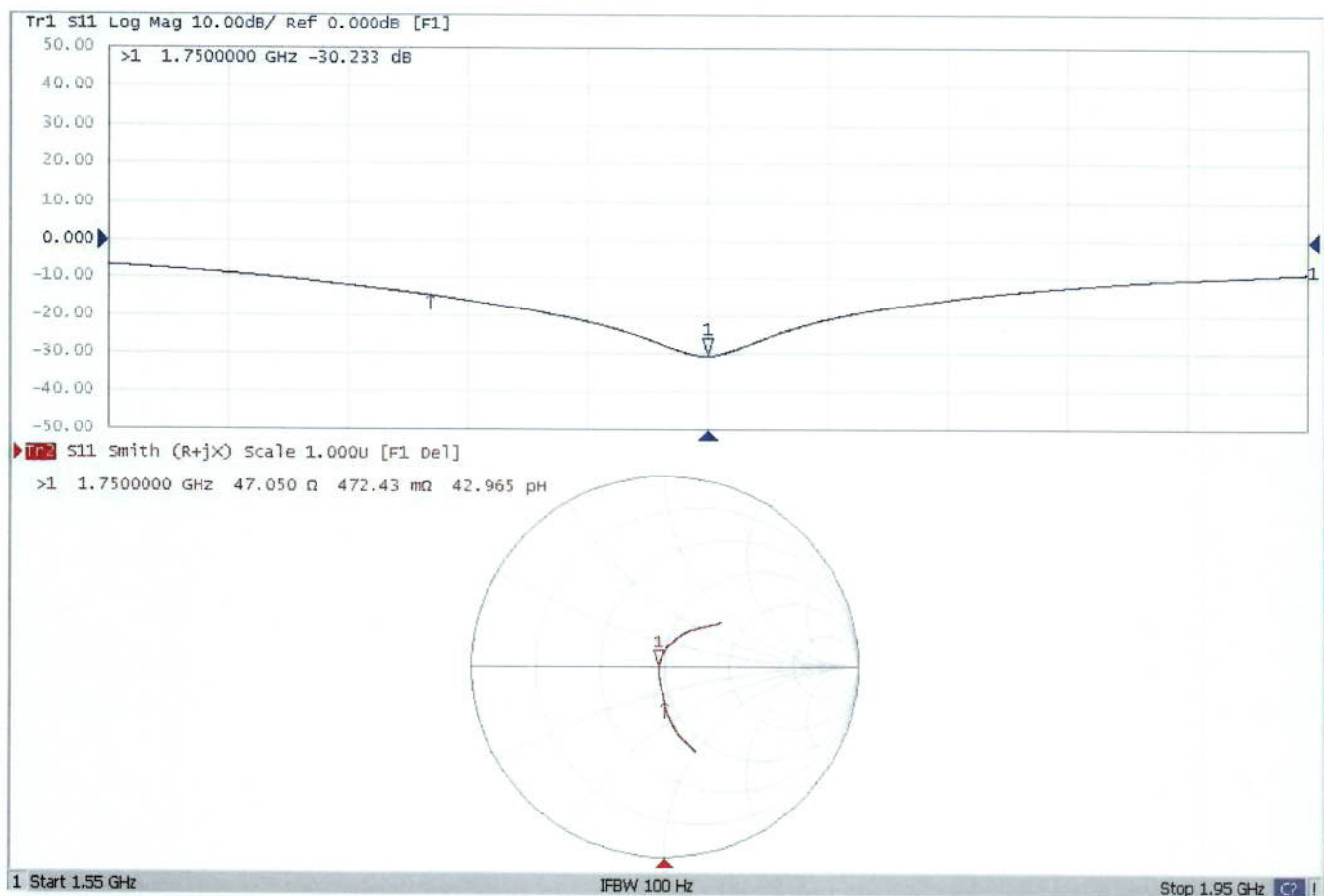
Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2117

E-mail: emf@caict.ac.cn

<http://www.caict.ac.cn>

## Impedance Measurement Plot for Head TSL



Client **SGS (Shenzhen)**

Certificate No: **25J02Z000727**

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d028**

Calibration Procedure(s) **FF-Z11-0003-02**  
**Calibration Procedures for dipole validation kits**

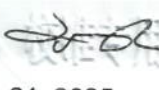
Calibration date: **October 13, 2025**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards      | ID #       | Cal Date (Calibrated by, Certificate No.)   | Scheduled Calibration |
|------------------------|------------|---------------------------------------------|-----------------------|
| Power Meter NRP2       | 106276     | 16-May-25 (CTTL, No. 25J02X003423)          | May-26                |
| Power sensor NRP6A     | 101369     | 16-May-25 (CTTL, No. 25J02X003423)          | May-26                |
| Reference Probe EX3DV4 | SN 7464    | 28-Jan-25(SPEAG, No. EX-7464_Jan25)         | Jan-26                |
| DAE4                   | SN 1588    | 29-Aug-25(CTTL-SPEAG, No. 25J02Z000631)     | Aug-26                |
| Secondary Standards    | ID #       | Cal Date (Calibrated by, Certificate No.)   | Scheduled Calibration |
| SignalGeneratorSMA200A | 107732     | 22-Jan-25 (CTTL, No. 25J02X000388)          | Jan-26                |
| NetworkAnalyzer E5071C | MY46110673 | 18-Dec-24 (CTTL, No. 24J02X103932)          | Dec-25                |
| OCP DAK-3.5            | 1040       | 20-Jan-25(SPEAG, No. OCP-DAK3.5-1040_Jan25) | Jan-26                |

|                | Name        | Function           | Signature                                                                             |
|----------------|-------------|--------------------|---------------------------------------------------------------------------------------|
| Calibrated by: | Zhao Jing   | SAR Test Engineer  |  |
| Reviewed by:   | Lin Jun     | SAR Test Engineer  |  |
| Approved by:   | Qi Dianyuan | SAR Project Leader |  |

Issued: October 21, 2025

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



In Collaboration with

**s p e a g**  
CALIBRATION LABORATORY



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2711

E-mail: emf@caict.ac.cn

<http://www.caict.ac.cn>

### Glossary:

|       |                                            |
|-------|--------------------------------------------|
| TSL   | tissue simulating liquid                   |
| ConvF | sensitivity in TSL / NORM <sub>x,y,z</sub> |
| N/A   | not applicable or not measured             |

### Calibration is Performed According to the Following Standards:

- 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)", October 2020
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- DASY System Handbook

### Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution Corresponds to a coverage probability of approximately 95%.

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2711  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                                     |                            |                                  |
|-------------------------------------|----------------------------|----------------------------------|
| <b>DASY Version</b>                 | DASY6                      | V17.0.0                          |
| <b>Extrapolation</b>                | Advanced Extrapolation     |                                  |
| <b>Phantom</b>                      | Modular Flat Phantom       |                                  |
| <b>Distance Dipole Center - TSL</b> | 10 mm                      | with Spacer                      |
| <b>Zoom Scan Resolution</b>         | dx, dy = 6 mm, dz = 1.5 mm | Graded Ratio = 1.5 (Z direction) |
| <b>Frequency</b>                    | 1900 MHz $\pm$ 1 MHz       |                                  |

## Head TSL parameters at 1900 MHz

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 40.0           | 1.40 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 40.7 $\pm$ 6 % | 1.41 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | <1.0 °C             | ----           | ----                 |

## SAR result with Head TSL at 1900 MHz

|                                                               |                    |                                              |
|---------------------------------------------------------------|--------------------|----------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>   | Condition          |                                              |
| SAR measured                                                  | 24 dBm input power | 10.0 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>39.9 W/kg <math>\pm</math> 20 % (k=2)</b> |
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                                              |
| SAR measured                                                  | 24 dBm input power | 5.27 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>21.1 W/kg <math>\pm</math> 20 % (k=2)</b> |



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2711

E-mail: emf@caict.ac.cn

http://www.caict.ac.cn

## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL at 1900 MHz

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 51.6Ω+ 8.95jΩ |
| Return Loss                          | - 21.0dB      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.106 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feed-point may be damaged.

### Additional EUT Data

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
 Tel: +86-10-62304633-2711  
 E-mail: emf@caict.ac.cn      http://www.caict.ac.cn

## DASY6 Validation Report for Head TSL

Date: 2025-10-13

Test Laboratory: CTTL, Beijing, China

### Summary

| Dipole             | Frequency [MHz] | TSL | Power [dBm] |
|--------------------|-----------------|-----|-------------|
| D1900V2 – SN 5d028 | 1900            | HSL | 24          |

### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band Group, UID | Frequency [MHz] | Conversion Factor | TSL Cond. [S/m] | TSL Permittivity |
|----------------------|------------------------------|-----------------|-----------------|-------------------|-----------------|------------------|
| Flat                 | 10                           | CW,             | 1900            | 7.46              | 1.41            | 40.7             |

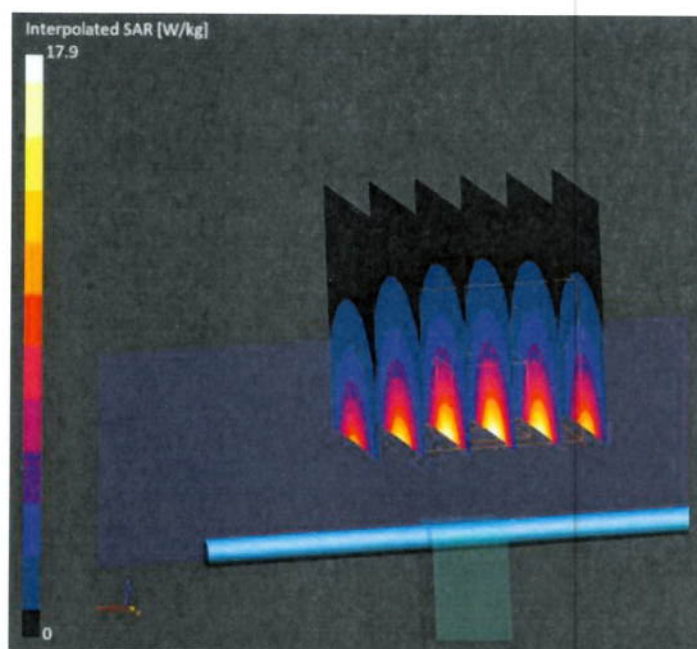
### Hardware Setup

| Phantom        | TSL          | Probe, Calibration Date     | DAE, Calibration Date   |
|----------------|--------------|-----------------------------|-------------------------|
| MFP V8.0 Right | 1900Head, -- | EX3DV4 - SN7464, 2025-01-28 | DAE4 Sn1588, 2025-08-29 |

### Scan Setup

### Measurement Results

| Zoom Scan           |                | Zoom Scan           |               |
|---------------------|----------------|---------------------|---------------|
| Grid Extents [mm]   | 30.0×30.0×30.0 | psSAR1g [W/kg]      | 10.0          |
| Grid Steps [mm]     | 6.0×6.0×1.5    | psSAR10g [W/kg]     | 5.27          |
| Sensor Surface [mm] | 1.4            | Power Drift [dB]    | 0.01          |
| Graded Grid         | Yes            | Power Scaling       | Disabled      |
| Grading Ratio       | 1.5            | Scaling Factor [dB] |               |
| MAIA                | N/A            | TSL Correction      | No correction |
| Surface Detection   | VMS + 6p       | M2/M1 [%]           | 84.3          |
| Scan Method         | Measured       | Dist 3dB Peak [mm]  | 9.6           |



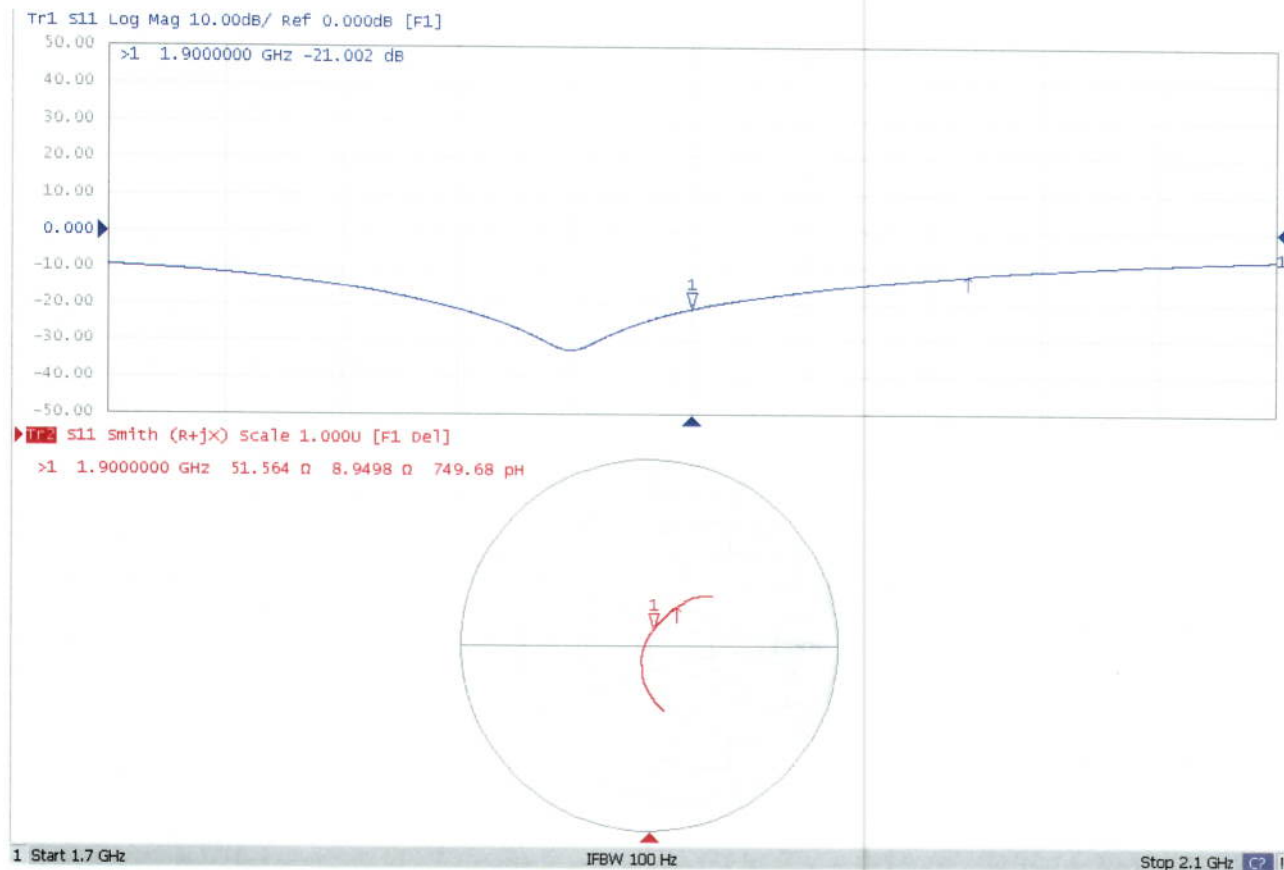


In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2711  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

## Impedance Measurement Plot for Head TSL



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191  
Tel: +86-10-62304633-2117  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

Client: **SGS(Shenzhen)**

Certificate No: **25J02Z000404**

## CALIBRATION CERTIFICATE

Object **D2600V2 - SN: 1125**

Calibration Procedure(s) **FF-Z11-003-01**  
**Calibration Procedures for dipole validation kits**

Calibration date: **June 17, 2025**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards       | ID #       | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|-------------------------------------------|-----------------------|
| Power Meter NRP2        | 106276     | 16-May-25 (CTTL, No. 25J02X003423)        | May-26                |
| Power sensor NRP6A      | 101369     | 16-May-25 (CTTL, No. 25J02X003423)        | May-26                |
| Reference Probe EX3DV4  | SN 3846    | 28-May-25(CTTL-SPEAG, No. 25J02Z000277)   | May-26                |
| DAE4                    | SN 1588    | 13-Sep-24(CTTL-SPEAG, No. 24J02Z000713)   | Sep-25                |
| Secondary Standards     | ID #       | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
| Signal Generator E4438C | MY49071430 | 19-Dec-24 (CTTL, No. 24J02X103931)        | Dec-25                |
| NetworkAnalyzer E5071C  | MY46110673 | 18-Dec-24 (CTTL, No. 24J02X103932)        | Dec-25                |
| OCP DAKS                | SN 0015    | 09-Oct-24(SPEAG, No. OCP-DAKS-0015_Oct24) | Oct -25               |

|                | Name        | Function           | Signature                                                                             |
|----------------|-------------|--------------------|---------------------------------------------------------------------------------------|
| Calibrated by: | Zhao Jing   | SAR Test Engineer  |  |
| Reviewed by:   | Lin Jun     | SAR Test Engineer  |  |
| Approved by:   | Qi Dianyuan | SAR Project Leader |  |

Issued: June 25, 2025

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



In Collaboration with

**s p e a g**  
CALIBRATION LABORATORY



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2117

E-mail: emf@caict.ac.cn

<http://www.caict.ac.cn>

### Glossary:

|       |                                            |
|-------|--------------------------------------------|
| TSL   | tissue simulating liquid                   |
| ConvF | sensitivity in TSL / NORM <sub>x,y,z</sub> |
| N/A   | not applicable or not measured             |

### Calibration is Performed According to the Following Standards:

- a) 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)", October 2020
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- c) DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

- **Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- **Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- **Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- **Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- **SAR measured:** SAR measured at the stated antenna input power.
- **SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- **SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution Corresponds to a coverage probability of approximately 95%.



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2117  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                                     |                          |             |
|-------------------------------------|--------------------------|-------------|
| <b>DASY Version</b>                 | DASY52                   | 52.10.4     |
| <b>Extrapolation</b>                | Advanced Extrapolation   |             |
| <b>Phantom</b>                      | Triple Flat Phantom 5.1C |             |
| <b>Distance Dipole Center - TSL</b> | 10 mm                    | with Spacer |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm        |             |
| <b>Frequency</b>                    | 2600 MHz $\pm$ 1 MHz     |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 39.0           | 1.96 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 39.7 $\pm$ 6 % | 2.00 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | <1.0 °C             | ---            | ---                  |

## SAR result with Head TSL

|                                                               |                    |                                              |
|---------------------------------------------------------------|--------------------|----------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>   | Condition          |                                              |
| SAR measured                                                  | 250 mW input power | 13.9 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>55.3 W/kg <math>\pm</math> 20 % (k=2)</b> |
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                                              |
| SAR measured                                                  | 250 mW input power | 6.19 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>24.7 W/kg <math>\pm</math> 20 % (k=2)</b> |

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
 Tel: +86-10-62304633-2117  
 E-mail: emf@caict.ac.cn      <http://www.caict.ac.cn>

## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 47.2Ω- 4.66jΩ |
| Return Loss                          | - 25.0dB      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.063 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feed-point may be damaged.

### Additional EUT Data

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2117  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

**DASY5 Validation Report for Head TSL**

Date: 2025-06-17

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1125**

Communication System: UID 0, CW; Frequency: 2600 MHz

Medium parameters used:  $f = 2600$  MHz;  $\sigma = 1.997$  S/m;  $\epsilon_r = 39.68$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(7.27, 7.27, 7.27) @ 2600 MHz; Calibrated: 2025-05-28
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1588; Calibrated: 2024-09-13
- Phantom: MFP\_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

**Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.1 V/m; Power Drift = 0.02 dB

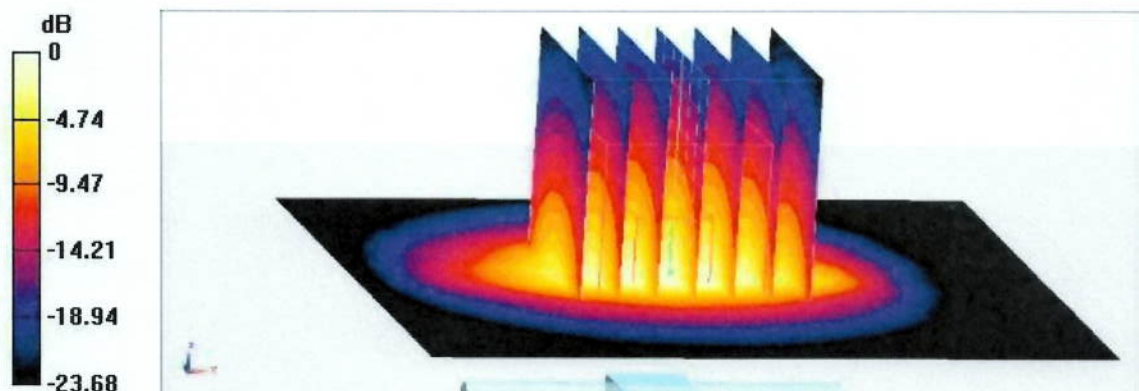
Peak SAR (extrapolated) = 30.1 W/kg

**SAR(1 g) = 13.9 W/kg; SAR(10 g) = 6.19 W/kg**

Smallest distance from peaks to all points 3 dB below = 8.2 mm

Ratio of SAR at M2 to SAR at M1 = 47%

Maximum value of SAR (measured) = 24.1 W/kg



0 dB = 24.1 W/kg = 13.82 dBW/kg



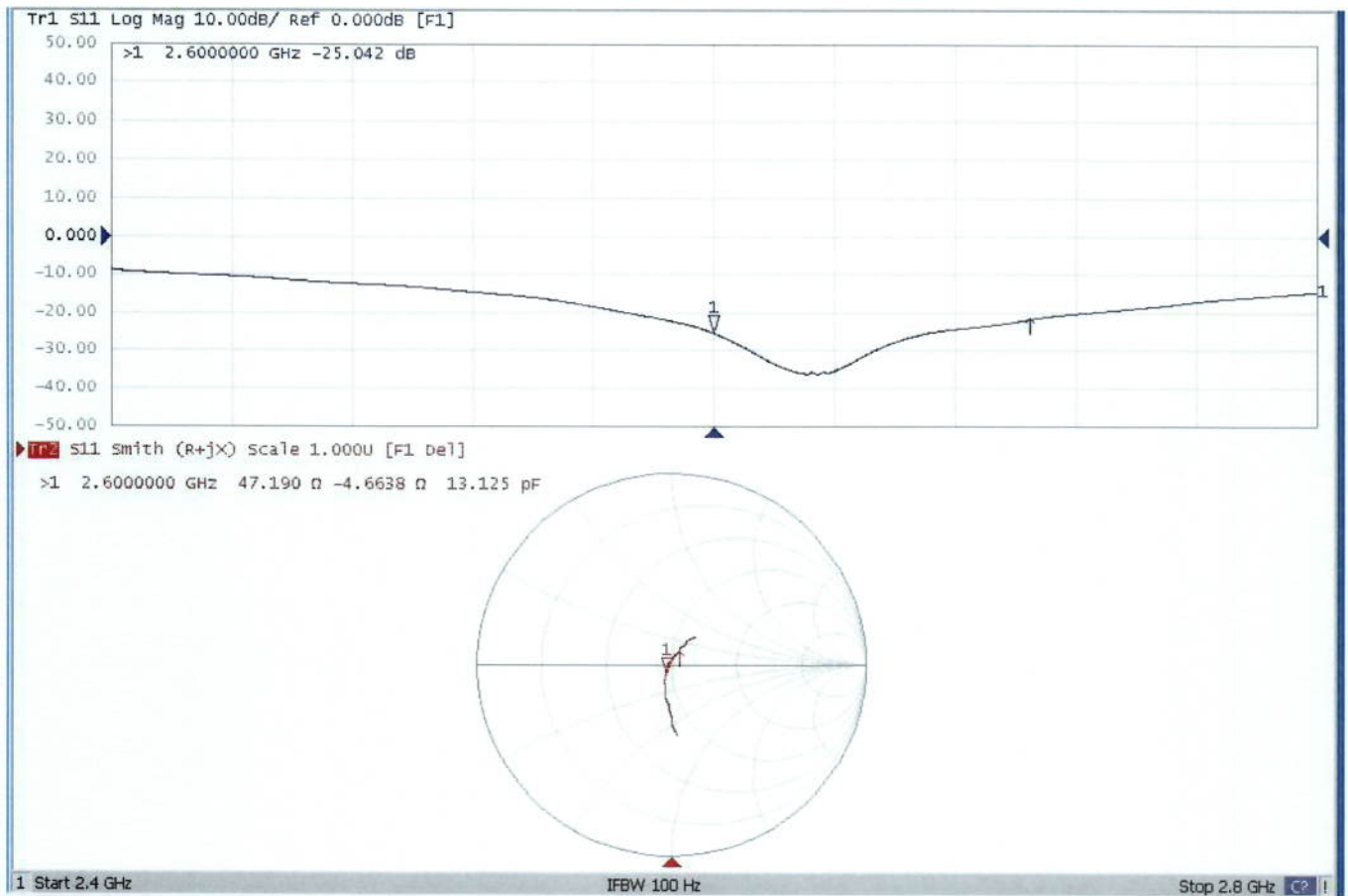
Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2117

E-mail: emf@caict.ac.cn

<http://www.caict.ac.cn>

## Impedance Measurement Plot for Head TSL



Client **SGS (Shenzhen)**

Certificate No: **25J02Z000730**

## CALIBRATION CERTIFICATE

Object **D3500V2 - SN: 1082**

Calibration Procedure(s) **FF-Z11-0003-02**  
**Calibration Procedures for dipole validation kits**

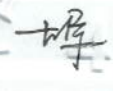
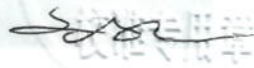
Calibration date: **October 15, 2025**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards      | ID #       | Cal Date (Calibrated by, Certificate No.)   | Scheduled Calibration |
|------------------------|------------|---------------------------------------------|-----------------------|
| Power Meter NRP2       | 106276     | 16-May-25 (CTTL, No. 25J02X003423)          | May-26                |
| Power sensor NRP6A     | 101369     | 16-May-25 (CTTL, No. 25J02X003423)          | May-26                |
| Reference Probe EX3DV4 | SN 7464    | 28-Jan-25(SPEAG, No. EX-7464_Jan25)         | Jan-26                |
| DAE4                   | SN 1588    | 29-Aug-25(CTTL-SPEAG, No. 25J02Z000631)     | Aug-26                |
| Secondary Standards    | ID #       | Cal Date (Calibrated by, Certificate No.)   | Scheduled Calibration |
| SignalGeneratorSMA200A | 107732     | 22-Jan-25 (CTTL, No. 25J02X000388)          | Jan-26                |
| NetworkAnalyzer E5071C | MY46110673 | 18-Dec-24 (CTTL, No. 24J02X103932)          | Dec-25                |
| OCP DAK-3.5            | 1040       | 20-Jan-25(SPEAG, No. OCP-DAK3.5-1040_Jan25) | Jan-26                |

|                |             |                    |                                                                                       |
|----------------|-------------|--------------------|---------------------------------------------------------------------------------------|
|                | Name        | Function           | Signature                                                                             |
| Calibrated by: | Zhao Jing   | SAR Test Engineer  |  |
| Reviewed by:   | Lin Jun     | SAR Test Engineer  |  |
| Approved by:   | Qi Dianyuan | SAR Project Leader |  |

Issued: October 21, 2025

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2711

E-mail: emf@caict.ac.cn

<http://www.caict.ac.cn>

### Glossary:

|       |                                            |
|-------|--------------------------------------------|
| TSL   | tissue simulating liquid                   |
| ConvF | sensitivity in TSL / NORM <sub>x,y,z</sub> |
| N/A   | not applicable or not measured             |

### Calibration is Performed According to the Following Standards:

- 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)", October 2020
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

### Additional Documentation:

- DASY System Handbook

### Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor  $k=2$ , which for a normal distribution Corresponds to a coverage probability of approximately 95%.

Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China

Tel: +86-10-62304633-2711

E-mail: emf@caict.ac.cn

http://www.caict.ac.cn

## Measurement Conditions

DASY system configuration, as far as not given on page 1.

|                                     |                                              |                                  |
|-------------------------------------|----------------------------------------------|----------------------------------|
| <b>DASY Version</b>                 | DASY6                                        | V17.0.0                          |
| <b>Extrapolation</b>                | Advanced Extrapolation                       |                                  |
| <b>Phantom</b>                      | Modular Flat Phantom                         |                                  |
| <b>Distance Dipole Center - TSL</b> | 10 mm                                        | with Spacer                      |
| <b>Zoom Scan Resolution</b>         | dx, dy = 5 mm, dz = 1.4 mm                   | Graded Ratio = 1.5 (Z direction) |
| <b>Frequency</b>                    | 3400 MHz $\pm$ 1 MHz<br>3500 MHz $\pm$ 1 MHz |                                  |

## Head TSL parameters at 3400MHz

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 38.0           | 2.81 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 37.8 $\pm$ 6 % | 2.80 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | <1.0 °C             | ----           | ----                 |

## SAR result with Head TSL at 3400MHz

|                                                               |                    |                                              |
|---------------------------------------------------------------|--------------------|----------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>   | Condition          |                                              |
| SAR measured                                                  | 20 dBm input power | 6.85 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>68.5 W/kg <math>\pm</math> 24 % (k=2)</b> |
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                                              |
| SAR measured                                                  | 20 dBm input power | 2.62 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>26.2 W/kg <math>\pm</math> 24 % (k=2)</b> |

## Head TSL parameters at 3500MHz

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 37.9           | 2.91 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 37.5 $\pm$ 6 % | 2.94 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | <1.0 °C             | ----           | ----                 |

## SAR result with Head TSL at 3500MHz

|                                                               |                    |                                              |
|---------------------------------------------------------------|--------------------|----------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b>   | Condition          |                                              |
| SAR measured                                                  | 20 dBm input power | 6.61 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>65.8 W/kg <math>\pm</math> 24 % (k=2)</b> |
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                                              |
| SAR measured                                                  | 20 dBm input power | 2.51 W/kg                                    |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>25.0 W/kg <math>\pm</math> 24 % (k=2)</b> |



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2711  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL at 3400MHz

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 41.0Ω- 0.55jΩ |
| Return Loss                          | - 20.1dB      |

### Antenna Parameters with Head TSL at 3500MHz

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 46.7Ω+ 4.89jΩ |
| Return Loss                          | - 24.3dB      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.044 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feed-point can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feed-point may be damaged.

### Additional EUT Data

|                 |       |
|-----------------|-------|
| Manufactured by | SPEAG |
|-----------------|-------|



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2711  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

## DASY6 Validation Report for Head TSL

Date: 2025-10-15

Test Laboratory: CTTL, Beijing, China

### Summary

| Dipole            | Frequency [MHz] | TSL | Power [dBm] |
|-------------------|-----------------|-----|-------------|
| D3500V2 – SN 1082 | 3400            | HSL | 20          |

### Exposure Conditions

| Phantom Section, TSL | Position, Test Distance [mm] | Band Group, UID | Frequency [MHz] | Conversion Factor | TSL Cond. [S/m] | TSL Permittivity |
|----------------------|------------------------------|-----------------|-----------------|-------------------|-----------------|------------------|
| Flat                 | 10                           | CW,             | 3400            | 6.35              | 2.80            | 37.8             |

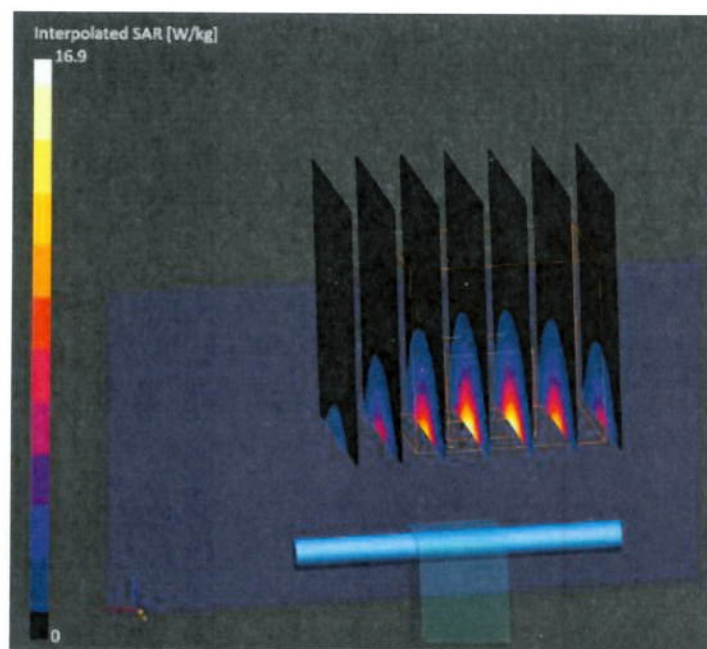
### Hardware Setup

| Phantom        | TSL      | Probe, Calibration Date     | DAE, Calibration Date   |
|----------------|----------|-----------------------------|-------------------------|
| MFP V8.0 Right | Head3500 | EX3DV4 – SN7464, 2025-01-28 | DAE4 Sn1588, 2025-08-29 |

### Scan Setup

### Measurement Results

|                     | Zoom Scan      |                     | Zoom Scan     |
|---------------------|----------------|---------------------|---------------|
| Grid Extents [mm]   | 28.0×28.0×28.0 | psSAR1g [W/kg]      | 6.85          |
| Grid Steps [mm]     | 5.0×5.0×1.4    | psSAR10g [W/kg]     | 2.62          |
| Sensor Surface [mm] | 1.4            | Power Drift [dB]    | 0.00          |
| Graded Grid         | Yes            | Power Scaling       | Disabled      |
| Grading Ratio       | 1.5            | Scaling Factor [dB] |               |
| MAIA                | N/A            | TSL Correction      | No correction |
| Surface Detection   | VMS + 6p       | M2/M1 [%]           | 76.9          |
| Scan Method         | Measured       | Dist 3dB Peak [mm]  | 8.0           |



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
 Tel: +86-10-62304633-2711  
 E-mail: emf@caict.ac.cn      http://www.caict.ac.cn

**DASY6 Validation Report for Head TSL**  
 Test Laboratory: CTTL, Beijing, China

Date: 2025-10-15

**Summary**

| Dipole            | Frequency [MHz] | TSL | Power [dBm] |
|-------------------|-----------------|-----|-------------|
| D3500V2 – SN 1082 | 3500            | HSL | 20          |

**Exposure Conditions**

| Phantom Section, TSL | Position, Test Distance [mm] | Band Group, UID | Frequency [MHz] | Conversion Factor | TSL Cond. [S/m] | TSL Permittivity |
|----------------------|------------------------------|-----------------|-----------------|-------------------|-----------------|------------------|
| Flat                 | 10                           | CW,             | 3500            | 6.43              | 2.94            | 37.5             |

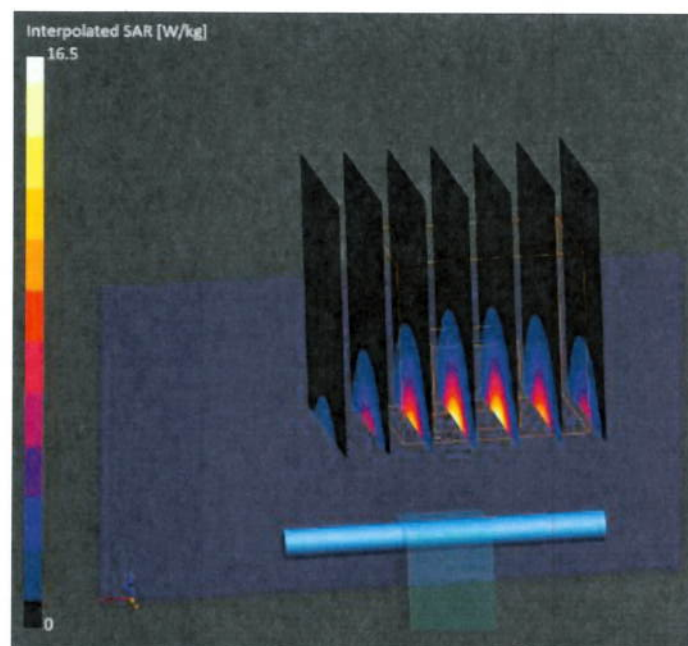
**Hardware Setup**

| Phantom        | TSL      | Probe, Calibration Date     | DAE, Calibration Date   |
|----------------|----------|-----------------------------|-------------------------|
| MFP V8.0 Right | Head3500 | EX3DV4 – SN7464, 2025-01-28 | DAE4 Sn1588, 2025-08-29 |

**Scan Setup**

**Measurement Results**

|                     | Zoom Scan      |                     | Zoom Scan     |
|---------------------|----------------|---------------------|---------------|
| Grid Extents [mm]   | 28.0×28.0×28.0 | psSAR1g [W/kg]      | 6.61          |
| Grid Steps [mm]     | 5.0×5.0×1.4    | psSAR10g [W/kg]     | 2.51          |
| Sensor Surface [mm] | 1.4            | Power Drift [dB]    | -0.00         |
| Graded Grid         | Yes            | Power Scaling       | Disabled      |
| Grading Ratio       | 1.5            | Scaling Factor [dB] |               |
| MAIA                | N/A            | TSL Correction      | No correction |
| Surface Detection   | VMS + 6p       | M2/M1 [%]           | 76.5          |
| Scan Method         | Measured       | Dist 3dB Peak [mm]  | 8.0           |





In Collaboration with  
**s p e a g**  
CALIBRATION LABORATORY



Add: No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China  
Tel: +86-10-62304633-2711  
E-mail: emf@caict.ac.cn <http://www.caict.ac.cn>

## Impedance Measurement Plot for Head TSL

