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Accreditation No.: SCS 0108

Client

**Sporton**  
Taoyuan City

Certificate No.

**D750V3-1117\_Mar25**

## CALIBRATION CERTIFICATE

Object

**D750V3 - SN: 1117**

Calibration procedure(s)

**QA CAL-05.v12**  
**Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz**

Calibration date

**March 12, 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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards                          | ID         | Cal Date (Certificate No.)            | Scheduled Cal |
|--------------------------------------------|------------|---------------------------------------|---------------|
| Power Sensor R&S NRP-33T                   | SN: 100967 | 28-Mar-24 (No. 217-04038)             | Mar-25        |
| Power Sensor R&S NRP18A                    | SN: 101859 | 06-Feb-25 (No. 4030A315009541)        | Feb-26        |
| Spectrum Analyzer R&S FSV40                | SN: 101832 | 29-Jan-25 (No. 4030A315009658)        | Jan-26        |
| Mismatch; Short [S4188] Attenuator [S4423] | SN: 1152   | 28-Mar-24 (No. 217-04050)             | Mar-25        |
| OCP DAK-12                                 | SN: 1016   | 24-Sep-24 (No. OCP-DAK12-1016_Sep24)  | Sep-25        |
| OCP DAK-3.5                                | SN: 1249   | 23-Sep-24 (No. OCP-DAK3.5-1249_Sep24) | Sep-25        |
| Reference Probe EX3DV4                     | SN: 7349   | 10-Jan-25 (No. EX3-7349_Jan25)        | Jan-26        |
| DAE4ip                                     | SN: 1836   | 28-Oct-24 (No. DAE4ip-1836_Oct24)     | Oct-25        |

| Secondary Standards          | ID         | Check Date (in house)                      | Scheduled Check |
|------------------------------|------------|--------------------------------------------|-----------------|
| ACAD Source Box              | SN: 1000   | 28-May-24 (No. 675-ACAD_Source_Box-240528) | May-25          |
| Signal Generator R&S SMB100A | SN: 182081 | 28-May-24 (No. 675-CAL16-S4588-240528)     | May-25          |
| Mismatch; SMA                | SN: 1102   | 22-May-24 (No. 675-Mismatch_SMA-240522)    | May-25          |

|                                                                                                                 |                  |                       |                        |
|-----------------------------------------------------------------------------------------------------------------|------------------|-----------------------|------------------------|
|                                                                                                                 | Name             | Function              | Signature              |
| Calibrated by                                                                                                   | Krešimir Franjić | Laboratory Technician |                        |
| Approved by                                                                                                     | Sven Kühn        | Technical Manager     |                        |
|                                                                                                                 |                  |                       | Issued: March 12, 2025 |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. |                  |                       |                        |



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**Accreditation No.: SCS 0108**

## Glossary

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| 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-Worn 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.
- *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%.

## Measurement Conditions

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

|                              |                          |                                     |
|------------------------------|--------------------------|-------------------------------------|
| DASY Version                 | DASY8 Module SAR         | 16.4.0                              |
| Extrapolation                | Advanced Extrapolation   |                                     |
| Phantom                      | Modular Flat Phantom     |                                     |
| Distance Dipole Center - TSL | 15 mm                    | with spacer                         |
| Zoom Scan Resolution         | dx, dy = 6mm, dz = 1.5mm | Graded Ratio = 1.5 mm (Z direction) |
| Frequency                    | 750MHz $\pm$ 1MHz        |                                     |

## HSL parameters at 750 MHz

The following parameters and calculations were applied.

|                                    | Temperature        | Permittivity  | Conductivity         |
|------------------------------------|--------------------|---------------|----------------------|
| Nominal HSL parameters             | 22.0 °C            | 41.9          | 0.890 mho/m          |
| Measured HSL parameters            | (22.0 $\pm$ 0.2)°C | 42.7 $\pm$ 6% | 0.890 mho/m $\pm$ 6% |
| HSL temperature change during test | < 0.5 °C           |               |                      |

## SAR result with HSL at 750 MHz

| SAR averaged over 1 cm <sup>3</sup> (1 g) of HSL | Condition          |                               |
|--------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal HSL parameters                   | 24 dBm input power | 2.16 W/kg                     |
| SAR for nominal HSL parameters                   | normalized to 1W   | 8.60 W/kg $\pm$ 17.0% (k = 2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of HSL | Condition          |                               |
|----------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal HSL parameters                     | 24 dBm input power | 1.40 W/kg                     |
| SAR for nominal HSL parameters                     | normalized to 1W   | 5.57 W/kg $\pm$ 16.5% (k = 2) |

**Appendix (Additional assessments outside the scope of SCS 0108)**

**Antenna Parameters with HSL at 750 MHz**

|             |                                |
|-------------|--------------------------------|
| Impedance   | 52.2 $\Omega$ – 3.3 j $\Omega$ |
| Return Loss | -28.2 dB                       |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.035 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint 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 feedpoint may be damaged.

**Additional EUT Data**

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

System Performance Check Report

Summary

| Dipole          | Frequency [MHz] | TSL | Power [dBm] |
|-----------------|-----------------|-----|-------------|
| D750V3 - SN1117 | 750             | HSL | -24         |

Exposure Conditions

| Phantom Section, TSL | Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|--------------------|------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat                 | 15                 |      | CW, 0---   | 750, 0                          | 9.55              | 0.89                   | 42.7             |

Hardware Setup

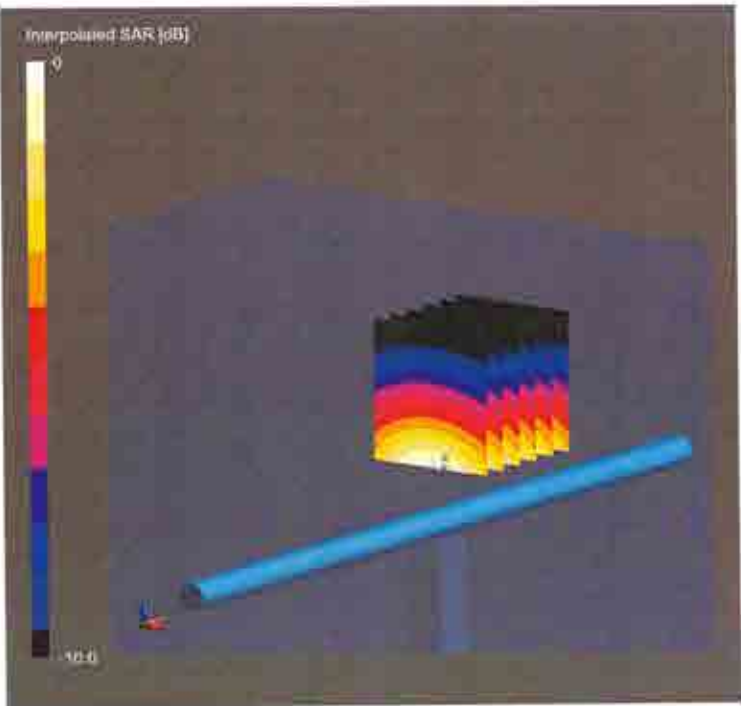
| Phantom       | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
|---------------|--------------------|-----------------------------|---------------------------|
| Flat V4.9 mod | HSL, 2025-03-12    | EX3DV4 - SN7349, 2025-01-10 | DAE4ip-Sn1836, 2024-10-28 |

Scans Setup

|                     | Zoom Scan       |
|---------------------|-----------------|
| Grid Extents [mm]   | 30 x 30 x 30    |
| Grid Steps [mm]     | 6.0 x 6.0 x 1.5 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.5             |
| MAIA                | N/A             |
| Surface Detection   | VMS = 6p        |
| Scan Method         | Measured        |

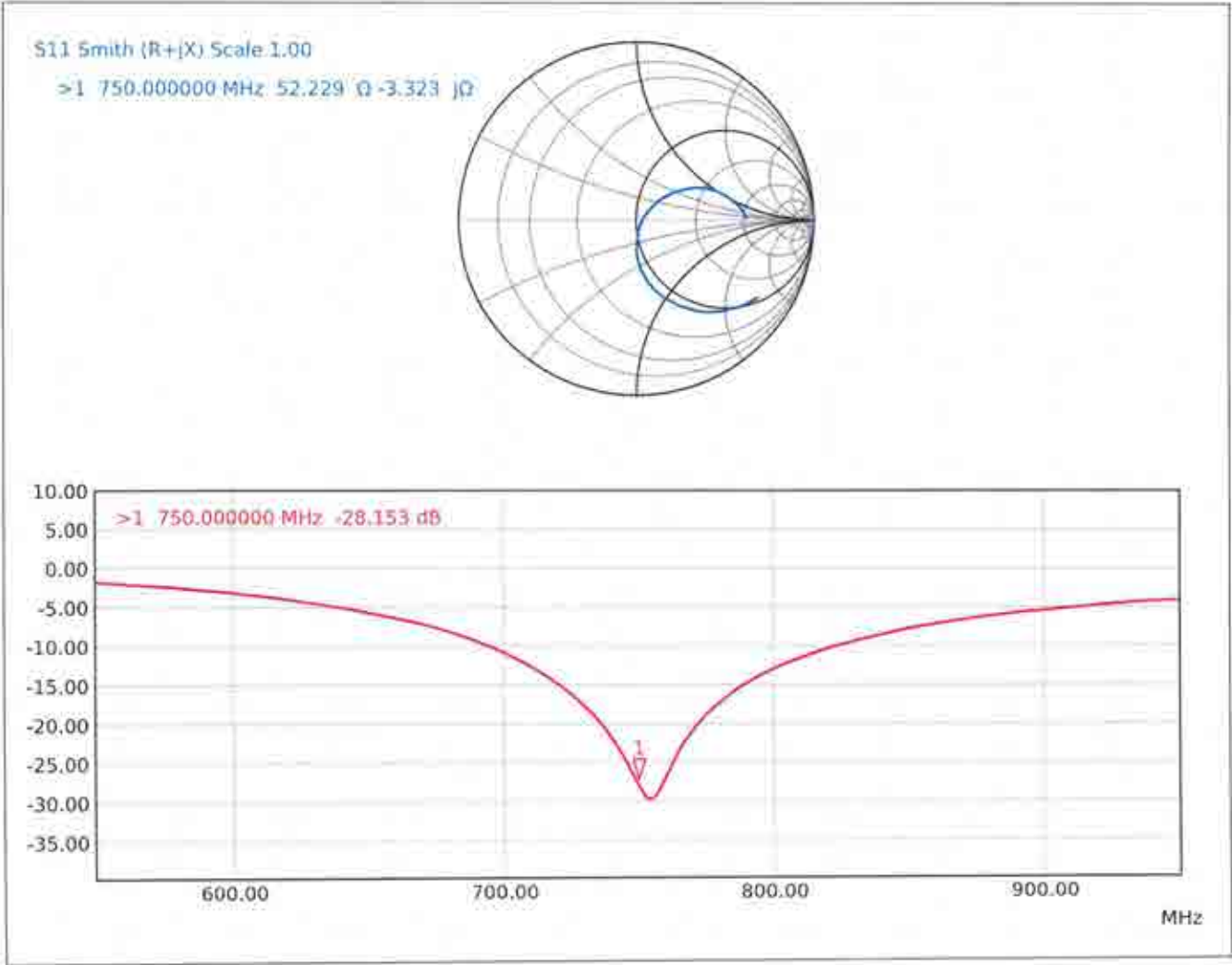
Measurement Results

|                     | Zoom Scan           |
|---------------------|---------------------|
| Date                | 2025-03-12          |
| psSAR1g [W/Kg]      | 2.16                |
| psSAR10g [W/Kg]     | 1.40                |
| Power Drift [dB]    | -0.04               |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Correction      | Positive / Negative |



0 dB = 3.31 W/Kg

Impedance Measurement Plot for HSL



## D750V3, serial no. 1117 Extended Dipole Calibrations

If dipoles are verified in return loss ( $< -20\text{dB}$ , 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.

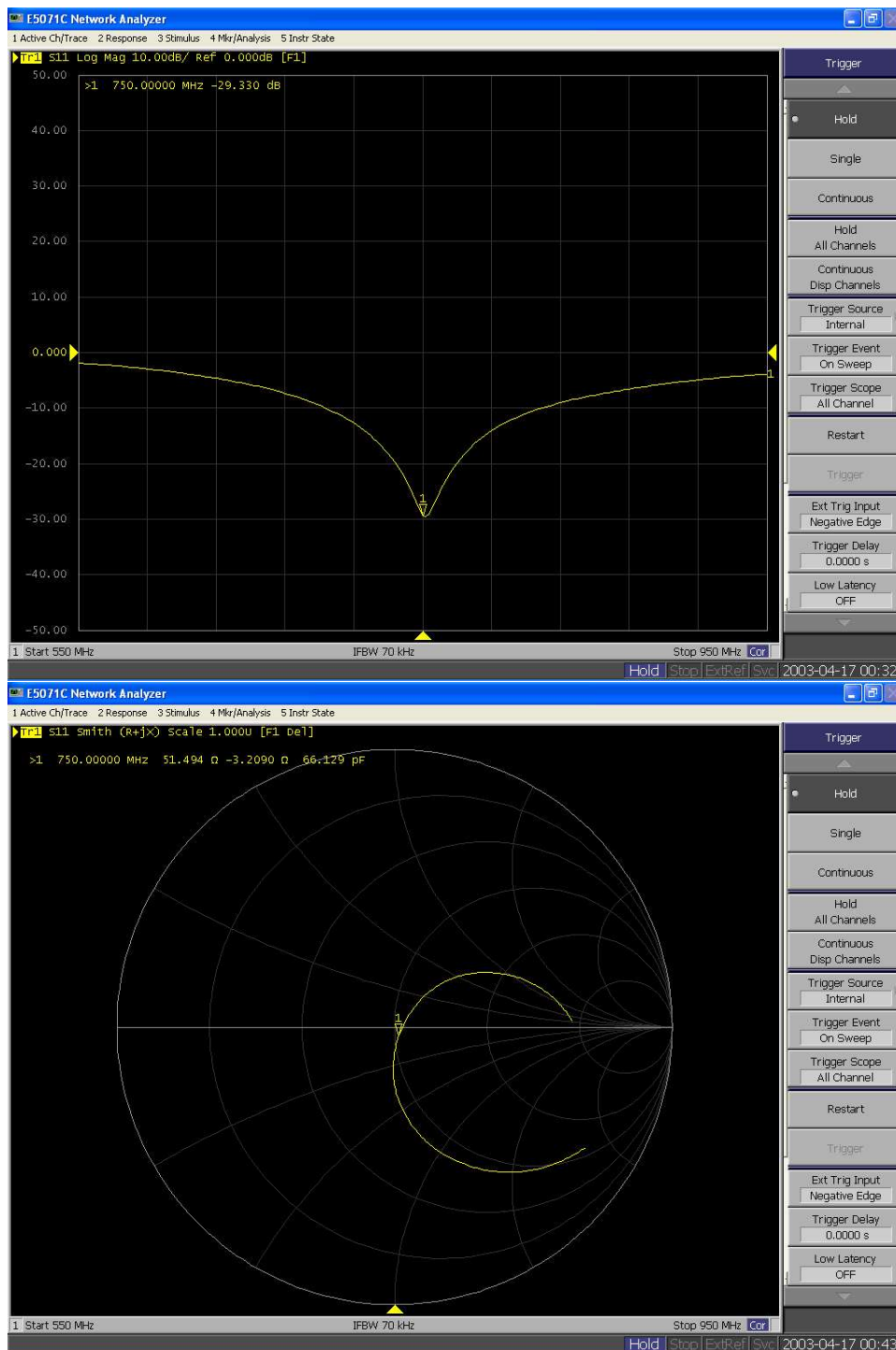
### <Justification of the extended calibration>

| D750V3 – serial no. 1117    |                  |           |                      |             |                           |             |
|-----------------------------|------------------|-----------|----------------------|-------------|---------------------------|-------------|
|                             | 750MHZ           |           |                      |             |                           |             |
| Date of Measurement         | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (ohm) | Delta (ohm) |
| 03.12.2025<br>(Cal. Report) | -28.2            |           | 52.2                 |             | -3.3                      |             |
| 03.11.2026<br>(extended)    | -29.33           | -4        | 51.494               | -0.706      | -3.209                    | 0.091       |

The return loss is  $< -20\text{dB}$ , within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

<Dipole Verification Data> - D750 V3, serial no. 1117 (Data of Measurement : 03.11.2026)

750MHz - Head



**Calibration Laboratory of****Schmid & Partner  
Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland

**S** Schweizerischer Kalibrierdienst  
**C** Service suisse d'étalonnage  
**S** Servizio svizzero di taratura  
**S** Swiss Calibration Service

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Multilateral Agreement for the recognition of calibration certificates**Accreditation No.: **SCS 0108**

Client

**Sporton**

Taoyuan City

Certificate No.

**D835V2-4d060\_Feb25****CALIBRATION CERTIFICATE**Object **D835V2 - SN: 4d060**Calibration procedure(s) **QA CAL-05.v12  
Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz**Calibration date **February 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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards                          | ID         | Cal Date (Certificate No.)             | Scheduled Cal |
|--------------------------------------------|------------|----------------------------------------|---------------|
| Power Sensor R&S NRP-33T                   | SN: 100967 | 28-Mar-24 (No. 217-04038)              | Mar-25        |
| Power Sensor R&S NRP18A                    | SN: 101859 | 06-Feb-25 (No. 4030A315009541)         | Feb-26        |
| Spectrum Analyzer R&S FSV40                | SN: 101832 | 29-Jan-25 (No. 4030A315009658)         | Jan-26        |
| Mismatch; Short [S4188] Attenuator [S4423] | SN: 1152   | 28-Mar-24 (No. 217-04050)              | Mar-25        |
| OCP DAK-12                                 | SN: 1016   | 24-Sept-24 (No. OCP-DAK12-1016_Sep24)  | Sep-25        |
| OCP DAK-3.5                                | SN: 1249   | 23-Sept-24 (No. OCP-DAK3.5-1249_Sep24) | Sep-25        |
| Reference Probe EX3DV4                     | SN: 7349   | 10-Jan-25 (No. EX3-7349_Jan25)         | Jan-26        |
| DAE4ip                                     | SN: 1836   | 28-Oct-24 (No. DAE4ip-1836_Oct24)      | Oct-25        |

| Secondary Standards          | ID         | Check Date (In house)                      | Scheduled Check |
|------------------------------|------------|--------------------------------------------|-----------------|
| ACAD Source Box              | SN: 1000   | 28-May-24 (No. 675-ACAD_Source_Box-240528) | May-25          |
| Signal Generator R&S SMB100A | SN: 182081 | 28-May-24 (No. 675-CAL16-S4588-240528)     | May-25          |
| Mismatch; SMA                | SN: 1102   | 22-May-24 (No. 675-Mismatch_SMA-240522)    | May-25          |

|                                                                                                                 | Name         | Function              | Signature |
|-----------------------------------------------------------------------------------------------------------------|--------------|-----------------------|-----------|
| Calibrated by                                                                                                   | Leif Klysner | Laboratory Technician |           |
| Approved by                                                                                                     | Sven Kühn    | Technical Manager     |           |
| Issued: February 18, 2025                                                                                       |              |                       |           |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. |              |                       |           |

## Calibration Laboratory of

Schmid & Partner  
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst  
C Service suisse d'étalonnage  
S Servizio svizzero di taratura  
S Swiss Calibration Service

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

## Glossary

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| 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-Worn 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.
- *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%.

## Measurement Conditions

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

|                              |                          |                                     |
|------------------------------|--------------------------|-------------------------------------|
| DASY Version                 | DASY8 Module SAR         | 16.4.0                              |
| Extrapolation                | Advanced Extrapolation   |                                     |
| Phantom                      | Modular Flat Phantom     |                                     |
| Distance Dipole Center - TSL | 15 mm                    | with spacer                         |
| Zoom Scan Resolution         | dx, dy = 6mm, dz = 1.5mm | Graded Ratio = 1.5 mm (Z direction) |
| Frequency                    | 835MHz $\pm$ 1MHz        |                                     |

## Head TSL parameters at 835 MHz

The following parameters and calculations were applied.

|                                         | Temperature        | Permittivity  | Conductivity         |
|-----------------------------------------|--------------------|---------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C            | 41.5          | 0.900 mho/m          |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2)°C | 41.4 $\pm$ 6% | 0.900 mho/m $\pm$ 6% |
| Head TSL temperature change during test | < 0.5 °C           |               |                      |

## SAR result with Head TSL at 835 MHz

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                               |
|-------------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal Head TSL parameters                   | 24 dBm input power | 2.33 W/kg                     |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 9.28 W/kg $\pm$ 17.0% (k = 2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                               |
|---------------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal Head TSL parameters                     | 24 dBm input power | 1.51 W/kg                     |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 6.01 W/kg $\pm$ 16.5% (k = 2) |

**Appendix (Additional assessments outside the scope of SCS 0108)****Antenna Parameters with Head TSL at 835 MHz**

|             |                                |
|-------------|--------------------------------|
| Impedance   | 52.3 $\Omega$ – 2.6 j $\Omega$ |
| Return Loss | -29.4 dB                       |

**General Antenna Parameters and Design**

|                                  |         |
|----------------------------------|---------|
| Electrical Delay (one direction) | 1.39 ns |
|----------------------------------|---------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint 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 feedpoint may be damaged.

**Additional EUT Data**

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

System Performance Check Report

Summary

| Dipole           | Frequency [MHz] | TSL | Power [dBm] |
|------------------|-----------------|-----|-------------|
| D835V2 - SN4d060 | 835             | HSL | 24          |

Exposure Conditions

| Phantom Section, TSL | Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|--------------------|------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat                 | 15                 |      | CW, 0      | 835, 0                          | -9.51             | 0.90                   | 41.4             |

Hardware Setup

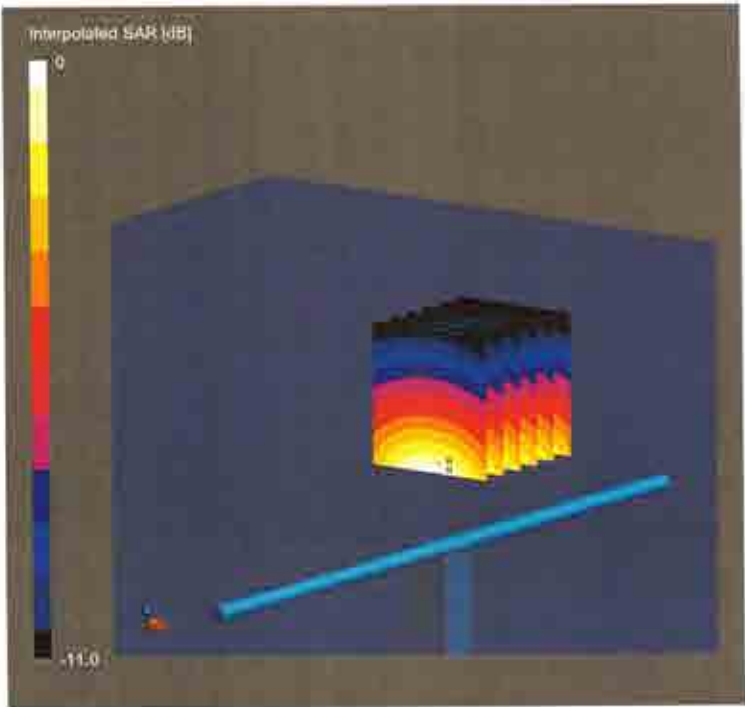
| Phantom       | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
|---------------|--------------------|-----------------------------|---------------------------|
| Flat V4.9 mod | HSL, 2025-02-17    | EX3DV4 - SN7349, 2025-01-10 | DAE4ip Sn1836, 2024-10-28 |

Scans Setup

|                     | Zoom Scan       |
|---------------------|-----------------|
| Grid Extents [mm]   | 30 x 30 x 30    |
| Grid Steps [mm]     | 6.0 x 6.0 x 1.5 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.5             |
| MAIA                | N/A             |
| Surface Detection   | VMS = 6p        |
| Scan Method         | Measured        |

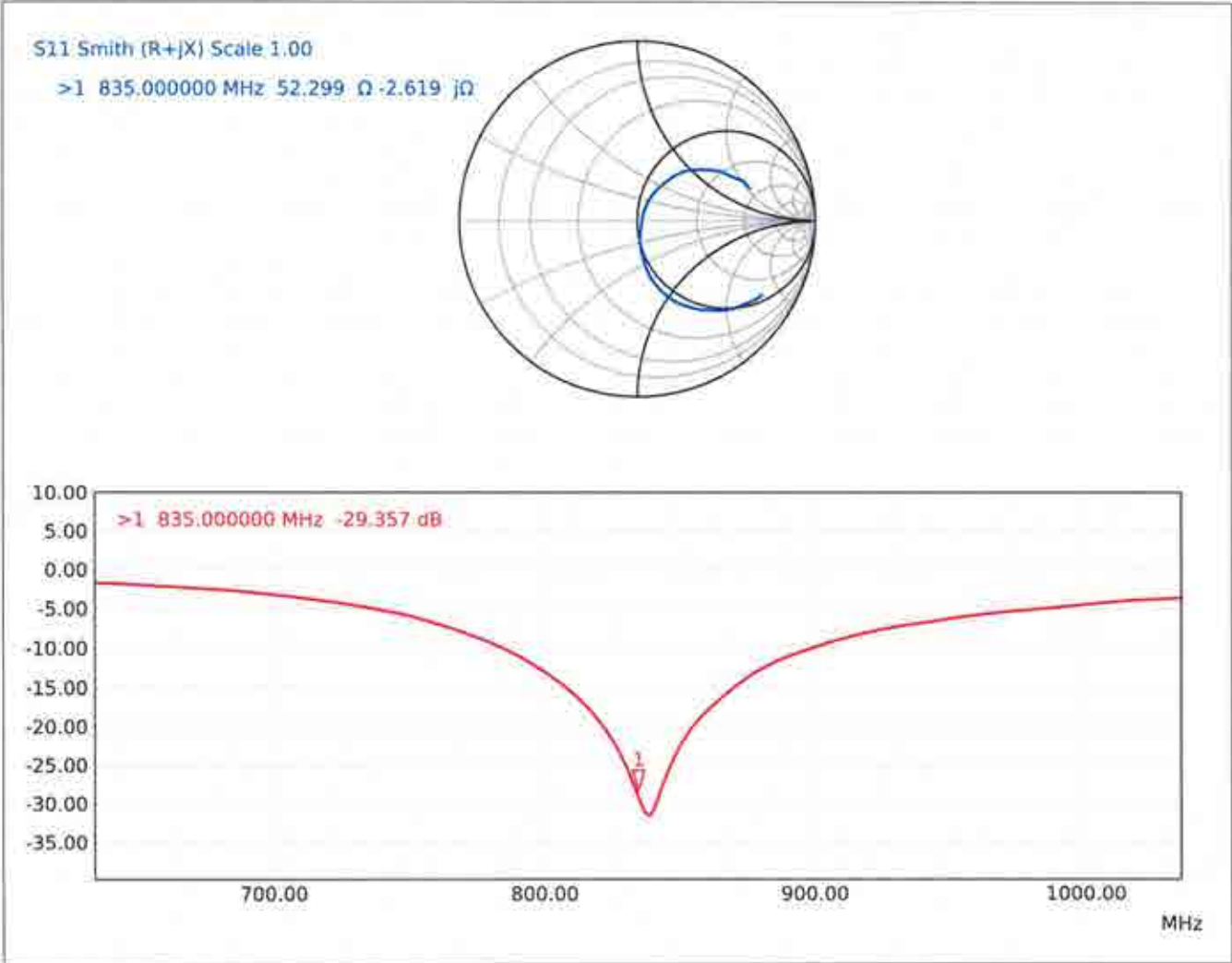
Measurement Results

|                     | Zoom Scan           |
|---------------------|---------------------|
| Date                | 2025-02-17          |
| psSAR1g [W/Kg]      | 2.33                |
| psSAR10g [W/Kg]     | 1.51                |
| Power Drift [dB]    | 0.01                |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Correction      | Positive / Negative |



0 dB = 3.60 W/Kg

Impedance Measurement Plot for Head TSL



## D835V2, serial no. 4D060 Extended Dipole Calibrations

If dipoles are verified in return loss ( $< -20\text{dB}$ , 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.

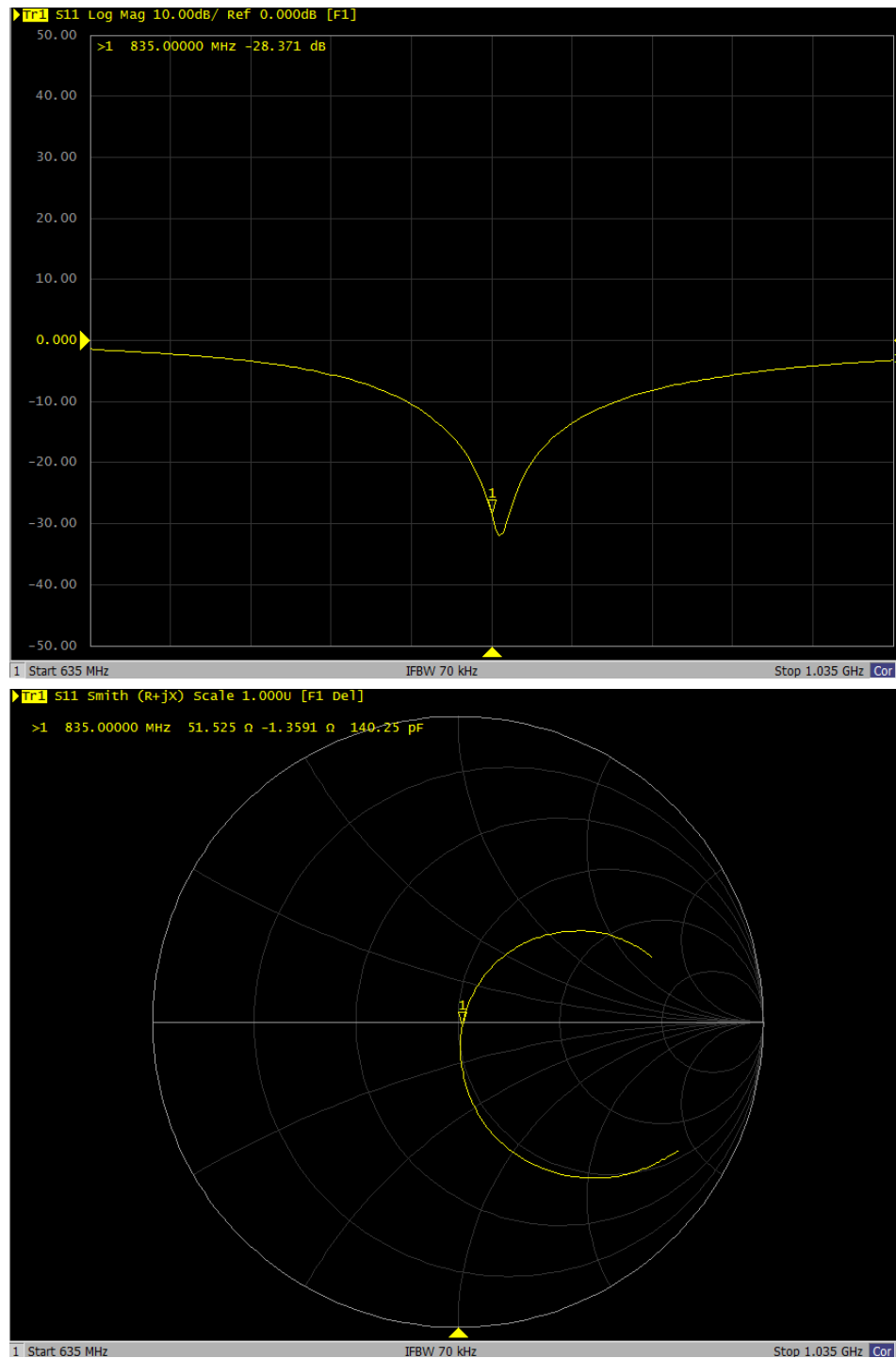
### <Justification of the extended calibration>

| D835V2 – serial no. 4D060   |                  |           |                      |             |                           |             |
|-----------------------------|------------------|-----------|----------------------|-------------|---------------------------|-------------|
| 835MHZ                      |                  |           |                      |             |                           |             |
| Date of Measurement         | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (ohm) | Delta (ohm) |
| 02.17.2025<br>(Cal. Report) | -29.357          |           | 52.299               |             | -2.619                    |             |
| 02.16.2026<br>(extended)    | -28.371          | 3.359     | 51.525               | -0.774      | -1.3591                   | 1.2599      |

The return loss is  $< -20\text{dB}$ , within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

<Dipole Verification Data> - D835V2, serial no. 4D060 (Data of Measurement : 02.16.2026)

835 MHz - Head





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Accreditation No.: SCS 0108

Client

Sporton  
Taoyuan City

Certificate No.

D1640V2-346\_Aug25

## CALIBRATION CERTIFICATE

Object: D1640V2 - SN: 346

Calibration procedure(s): QA CAL-05.v12  
Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz

Calibration date: August 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  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID         | Cal Date (Certificate No.)             | Scheduled Cal |
|-----------------------------|------------|----------------------------------------|---------------|
| Power Sensor R&S NRP-33T    | SN: 100957 | 30-Apr-25 (No. 1020-300791789)         | Apr-26        |
| Power Sensor R&S NRP18A     | SN: 101859 | 06-Feb-25 (No. 4030A315009541)         | Feb-26        |
| Spectrum Analyzer R&S FSV40 | SN: 101832 | 29-Jan-25 (No. 4030A315009658)         | Jan-26        |
| 3.5mm mismatch combination  | SN: 1152   | 24-Mar-25 (No. 217-04293)              | Mar-26        |
| OCP DAK-12                  | SN: 1016   | 24-Sept-24 (No. OCP-DAK12-1016_Sep24)  | Sep-25        |
| OCP DAK-3.5                 | SN: 1249   | 23-Sept-24 (No. OCP-DAK3.5-1249_Sep24) | Sep-25        |
| Reference Probe EX3DV4      | SN: 7349   | 10-Jan-25 (No. EX3-7349_Jan25)         | Jan-26        |
| DAE4ip                      | SN: 1836   | 17-Apr-25 (No. DAE4ip-1836_Apr25)      | Apr-26        |

| Secondary Standards          | ID         | Check Date (in house)                      | Scheduled Check |
|------------------------------|------------|--------------------------------------------|-----------------|
| ACAD Setup 1                 | SN: 1000   | 27-May-25 (No. 675-ACAD_Source_Box-250527) | May-26          |
| Signal Generator R&S SMB100A | SN: 182081 | 27-May-25 (No. 675-CAL16-S4588-250527)     | May-26          |
| Mismatch: SMA                | SN: 1102   | 24-Apr-25 (No. 675-Mismatch_SMA-250424)    | Apr-26          |
| OCP DAK-12                   | SN: 1029   | 27-Feb-25 (No. OCP-DAK12-1029_Feb25)       | Feb-26          |
| OCP DAK-3.5                  | SN: 1336   | 09-Dec-24 (No. OCP-DAK3.5-1336_Dec24)      | Dec-25          |

|               |            |                       |           |
|---------------|------------|-----------------------|-----------|
|               | Name       | Function              | Signature |
| Calibrated by | Paulo Pina | Laboratory Technician |           |
| Approved by   | Sven Kühn  | Technical Manager     |           |

Issued: August 14, 2025

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The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

## Glossary

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| 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-Worn 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.
- *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%.

## Measurement Conditions

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

|                              |                          |                                     |
|------------------------------|--------------------------|-------------------------------------|
| DASY Version                 | DASYB Module SAR         | 16.4.0                              |
| Extrapolation                | Advanced Extrapolation   |                                     |
| Phantom                      | Modular Flat Phantom     |                                     |
| Distance Dipole Center - TSL | 10 mm                    | with spacer                         |
| Zoom Scan Resolution         | dx, dy = 6mm, dz = 1.5mm | Graded Ratio = 1.5 mm (Z direction) |
| Frequency                    | 1640MHz $\pm$ 1MHz       |                                     |

## HSL parameters at 1640 MHz

The following parameters and calculations were applied.

|                                    | Temperature         | Permittivity  | Conductivity        |
|------------------------------------|---------------------|---------------|---------------------|
| Nominal HSL parameters             | 22.0 °C             | 40.2          | 1.31 mho/m          |
| Measured HSL parameters            | (22.0 $\pm$ 0.2) °C | 41.4 $\pm$ 6% | 1.30 mho/m $\pm$ 6% |
| HSL temperature change during test | < 0.5 °C            |               |                     |

## SAR result with HSL at 1640 MHz

| SAR averaged over 1 cm <sup>3</sup> (1 g) of HSL | Condition          |                               |
|--------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal HSL parameters                   | 24 dBm input power | 8.59 W/kg                     |
| SAR for nominal HSL parameters                   | normalized to 1W   | 34.2 W/kg $\pm$ 17.0% (k = 2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of HSL | Condition          |                               |
|----------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal HSL parameters                     | 24 dBm input power | 4.67 W/kg                     |
| SAR for nominal HSL parameters                     | normalized to 1W   | 18.6 W/kg $\pm$ 16.5% (k = 2) |

**Appendix (Additional assessments outside the scope of SCS 0108)****Antenna Parameters with HSL at 1640 MHz**

|             |                                |
|-------------|--------------------------------|
| Impedance   | 49.1 $\Omega$ + 4.2 j $\Omega$ |
| Return Loss | -27.3 dB                       |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.229 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint 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 feedpoint may be damaged.

**Additional EUT Data**

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

## System Performance Check Report

## Summary

| Dipole          | Frequency [MHz] | TSL | Power [dBm] |
|-----------------|-----------------|-----|-------------|
| D1640V2 - SN346 | 1640            | HSL | 24          |

## Exposure Conditions

| Phantom Section, TSL | Test Distance [mm] | Band  | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|--------------------|-------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat                 | 30                 | CW, D |            | 1640, D                         | 7.84              | 1.30                   | 11.4             |

## Hardware Setup

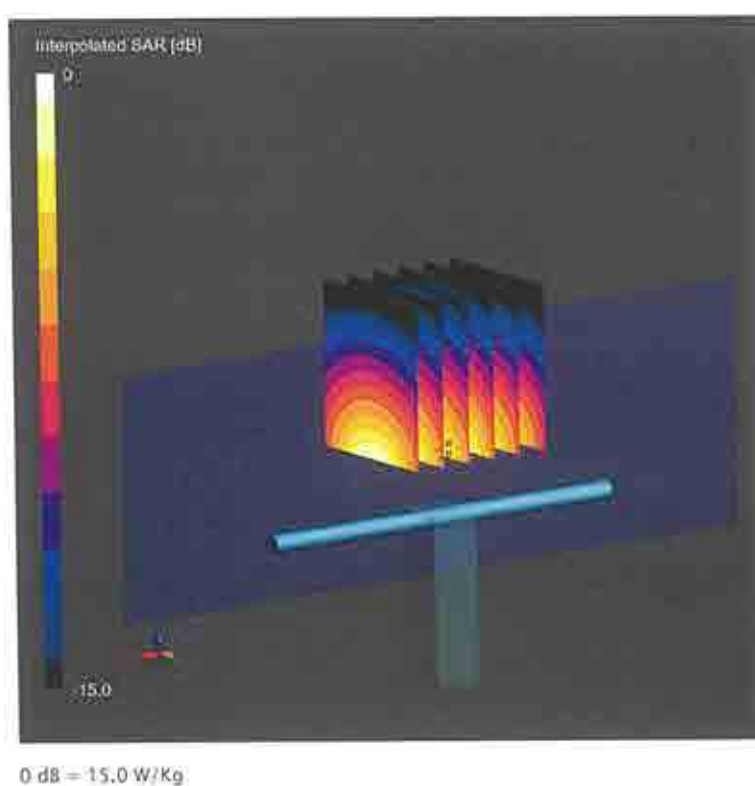
| Phantom         | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
|-----------------|--------------------|-----------------------------|---------------------------|
| MFP V8.0 Center | HSL, 2025-08-14    | EX30V4 - SN7349, 2025-01-16 | DAE4ip SN1836, 2025-04-17 |

## Scans Setup

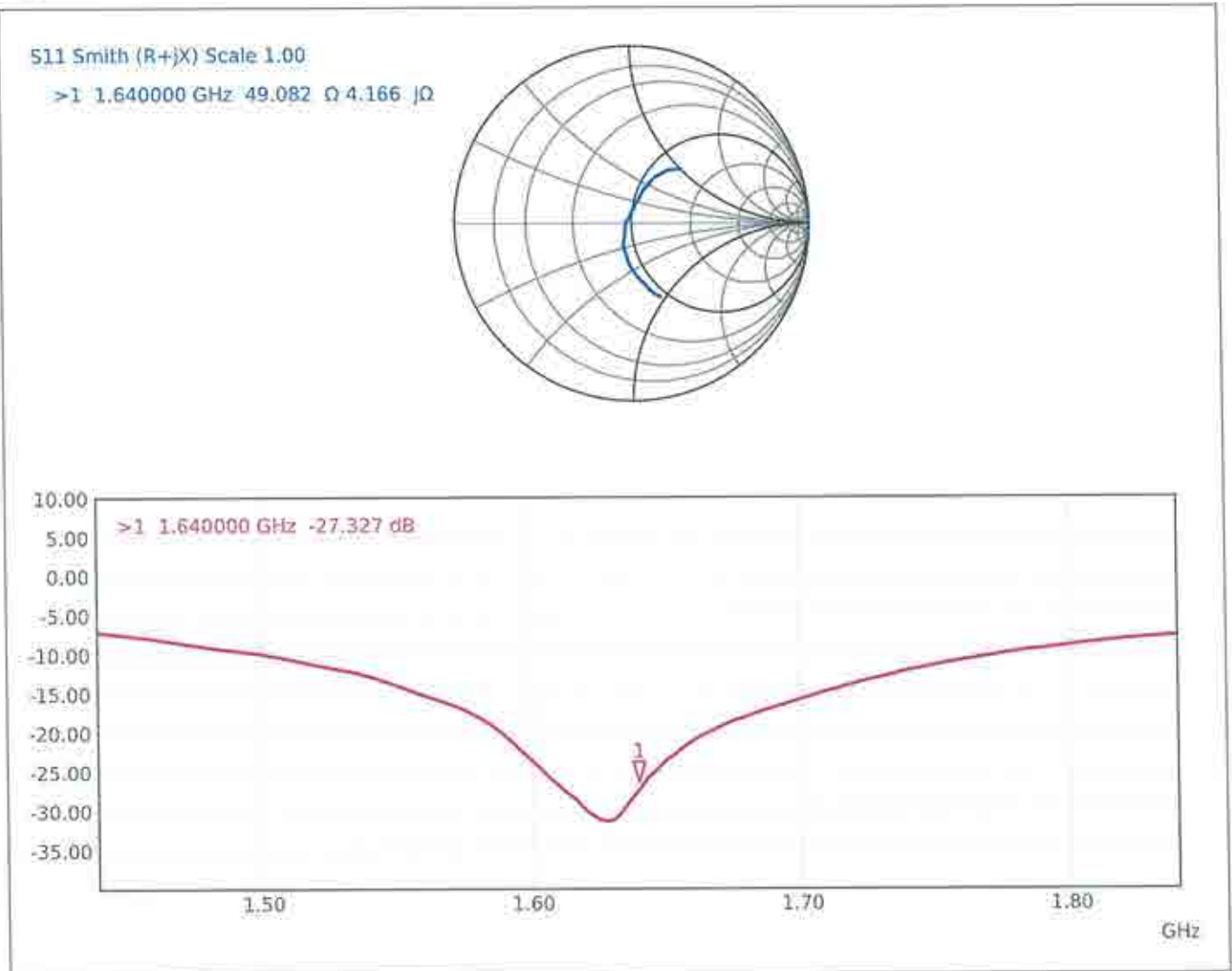
|                     | Zoom Scan       |
|---------------------|-----------------|
| Grid Extents [mm]   | 30 x 30 x 30    |
| Grid Steps [mm]     | 6.0 x 6.0 x 1.5 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.5             |
| MAIA                | N/A             |
| Surface Detection   | VMS + lip       |
| Scan Method         | Measured        |

## Measurement Results

|                     | Zoom Scan           |
|---------------------|---------------------|
| Date                | 2025-08-14          |
| psSAR1g [W/Kg]      | 8.59                |
| psSAR10g [W/Kg]     | 6.67                |
| Power Drift [dB]    | 0.00                |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Correction      | Positive / Negative |



## Impedance Measurement Plot for HSL





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Accreditation No.: **SCS 0108**

Client

**Sporton**  
Taoyuan City

Certificate No.

**D1750V2-1112\_Feb25**

## CALIBRATION CERTIFICATE

Object

**D1750V2 - SN: 1112**

Calibration procedure(s)

**QA CAL-05.v12**  
**Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz**

Calibration date

**February 20, 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  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

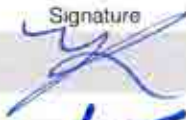
Calibration Equipment used (M&TE critical for calibration)

| Primary Standards                          | ID         | Cal Date (Certificate No.)             | Scheduled Cal |
|--------------------------------------------|------------|----------------------------------------|---------------|
| Power Sensor R&S NRP-33T                   | SN: 100967 | 28-Mar-24 (No. 217-04038)              | Mar-25        |
| Power Sensor R&S NRP18A                    | SN: 101859 | 06-Feb-25 (No. 4030A315009541)         | Feb-26        |
| Spectrum Analyzer R&S FSV40                | SN: 101832 | 29-Jan-25 (No. 4030A315009658)         | Jan-26        |
| Mismatch; Short [S4188] Attenuator [S4423] | SN: 1152   | 28-Mar-24 (No. 217-04050)              | Mar-25        |
| OCP DAK-12                                 | SN: 1016   | 24-Sept-24 (No. OCP-DAK12-1016_Sep24)  | Sep-25        |
| OCP DAK-3.5                                | SN: 1249   | 23-Sept-24 (No. OCP-DAK3.5-1249_Sep24) | Sep-25        |
| Reference Probe EX3DV4                     | SN: 7349   | 10-Jan-25 (No. EX3-7349_Jan25)         | Jan-26        |
| DAE4ip                                     | SN: 1836   | 28-Oct-24 (No. DAE4ip-1836_Oct24)      | Oct-25        |

| Secondary Standards          | ID         | Check Date (in house)                      | Scheduled Check |
|------------------------------|------------|--------------------------------------------|-----------------|
| ACAD Source Box              | SN: 1000   | 28-May-24 (No. 675-ACAD_Source_Box-240528) | May-25          |
| Signal Generator R&S SMB100A | SN: 182081 | 28-May-24 (No. 675-CAL16-S4588-240528)     | May-25          |
| Mismatch; SMA                | SN: 1102   | 22-May-24 (No. 675-Mismatch_SMA-240522)    | May-25          |

|               |                  |                       |
|---------------|------------------|-----------------------|
|               | Name             | Function              |
| Calibrated by | Krešimir Franjić | Laboratory Technician |
| Approved by   | Sven Kühn        | Technical Manager     |

Signature



Issued: February 20, 2025

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## Calibration Laboratory of

Schmid & Partner  
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



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S Servizio svizzero di taratura  
S Swiss Calibration Service

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Accreditation No.: SCS 0108

## Glossary

TSL tissue simulating liquid  
ConvF sensitivity in TSL / NORM x,y,z  
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-Worn 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.
- *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%.

## Measurement Conditions

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

|                              |                          |                                     |
|------------------------------|--------------------------|-------------------------------------|
| DASY Version                 | DASY8 Module SAR         | 16.4.0                              |
| Extrapolation                | Advanced Extrapolation   |                                     |
| Phantom                      | Modular Flat Phantom     |                                     |
| Distance Dipole Center - TSL | 10 mm                    | with spacer                         |
| Zoom Scan Resolution         | dx, dy = 6mm; dz = 1.5mm | Graded Ratio = 1.5 mm (Z direction) |
| Frequency                    | 1750MHz $\pm$ 1MHz       |                                     |

## Head TSL parameters at 1750 MHz

The following parameters and calculations were applied.

|                                         | Temperature        | Permittivity  | Conductivity        |
|-----------------------------------------|--------------------|---------------|---------------------|
| Nominal Head TSL parameters             | 22.0 °C            | 40.1          | 1.37 mho/m          |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2)°C | 39.7 $\pm$ 6% | 1.32 mho/m $\pm$ 6% |
| Head TSL temperature change during test | < 0.5 °C           |               |                     |

## SAR result with Head TSL at 1750 MHz

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                               |
|-------------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal Head TSL parameters                   | 24 dBm input power | 9.12 W/kg                     |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 36.3 W/kg $\pm$ 17.0% (k = 2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                               |
|---------------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal Head TSL parameters                     | 24 dBm input power | 4.84 W/kg                     |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 19.3 W/kg $\pm$ 16.5% (k = 2) |

**Appendix (Additional assessments outside the scope of SCS 0108)****Antenna Parameters with Head TSL at 1750 MHz**

|             |                             |
|-------------|-----------------------------|
| Impedance   | $51.2 \Omega + 1.8 j\Omega$ |
| Return Loss | -33.2 dB                    |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.212 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint 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 feedpoint may be damaged.

**Additional EUT Data**

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

System Performance Check Report

Summary

| Dipole           | Frequency (MHz) | TSL | Power (dBm) |
|------------------|-----------------|-----|-------------|
| D1750V2 - SN1112 | 1750            | HSL | 24          |

Exposure Conditions

| Phantom Section, TSL | Test Distance (mm) | Band | Group, UID | Frequency (MHz), Channel Number | Conversion Factor | TSL Conductivity (S/m) | TSL Permittivity |
|----------------------|--------------------|------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat                 | 10                 |      | CW, 0--    | 1750, 0                         | 7.96              | 1.32                   | 39.7             |

Hardware Setup

| Phantom         | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
|-----------------|--------------------|-----------------------------|---------------------------|
| MFP V8.0 Center | HSL, 2025-02-20    | EX3DV4 - SN7345, 2025-01-10 | DAE4ip Sn1836, 2024-10-28 |

Scans Setup

|                     | Zoom Scan       |
|---------------------|-----------------|
| Grid Extents (mm)   | 10 x 30 x 30    |
| Grid Steps (mm)     | 6.0 x 6.0 x 1.5 |
| Sensor Surface (mm) | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.5             |
| MAIA                | N/A             |
| Surface Detection   | VMS - 6p        |
| Scan Method         | Measured        |

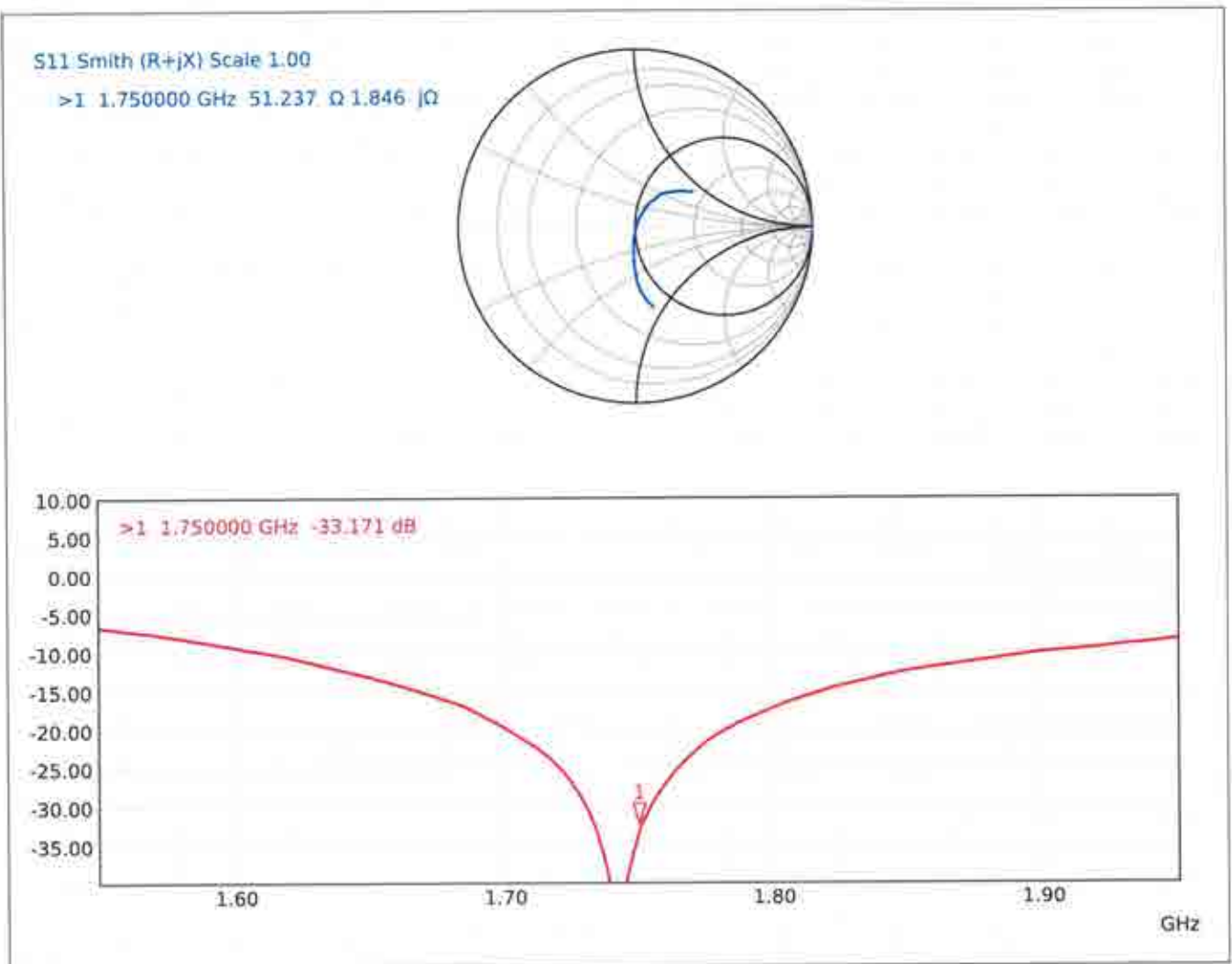
Measurement Results

|                     | Zoom Scan           |
|---------------------|---------------------|
| Date                | 2025-02-20          |
| psSAR1g (W/Kg)      | 9.12                |
| psSAR10g (W/Kg)     | 4.84                |
| Power Drift (dB)    | 0.00                |
| Power Scaling       | Disabled            |
| Scaling Factor (dB) |                     |
| TSL Correction      | Positive / Negative |



0 dB = 15.7 W/Kg

## Impedance Measurement Plot for Head TSL



## D1750V2, serial no. 1112 Extended Dipole Calibrations

If dipoles are verified in return loss ( $< -20\text{dB}$ , 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.

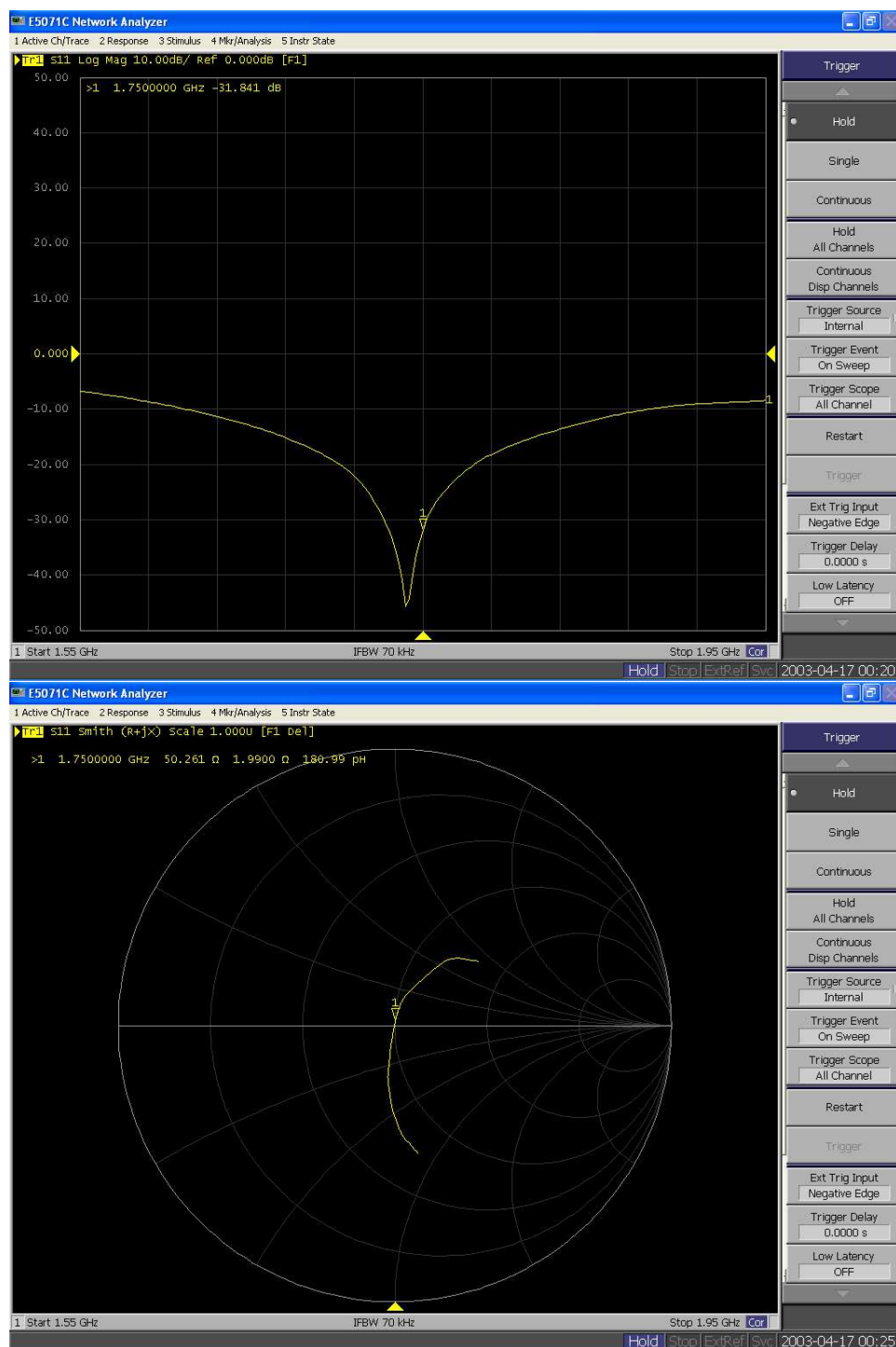
### <Justification of the extended calibration>

| D1750V2 – serial no. 1112   |                  |           |                      |             |                           |             |
|-----------------------------|------------------|-----------|----------------------|-------------|---------------------------|-------------|
|                             | 1750MHZ          |           |                      |             |                           |             |
| Date of Measurement         | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (ohm) | Delta (ohm) |
| 02.20.2025<br>(Cal. Report) | -33.2            |           | 51.2                 |             | 1.8                       |             |
| 02.19.2026<br>(extended)    | -31.841          | -4.09     | 50.261               | -0.939      | 1.99                      | 0.19        |

The return loss is  $< -20\text{dB}$ , within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

<Dipole Verification Data> - D1750 V2, serial no. 1112 (Data of Measurement : 02.19.2026)

1750MHz - Head





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Accreditation No.: **SCS 0108**

Client **Sporton**  
**Taoyuan City**

Certificate No. **D1900V2-5d185\_Jun25**

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d185**

Calibration procedure(s) **QA CAL-05.v12**  
**Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz**

Calibration date **June 11, 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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID         | Cal Date (Certificate No.)             | Scheduled Cal |
|-----------------------------|------------|----------------------------------------|---------------|
| Power Sensor R&S NRP-33T    | SN: 100967 | 26-Mar-25 (No. 217-04290)              | Mar-26        |
| Power Sensor R&S NRP18A     | SN: 101859 | 06-Feb-25 (No. 4030A315009541)         | Feb-26        |
| Spectrum Analyzer R&S FSV40 | SN: 101832 | 29-Jan-25 (No. 4030A315009658)         | Jan-26        |
| 3.5mm mismatch combination  | SN: 1152   | 24-Mar-25 (No. 217-04293)              | Mar-26        |
| OCP DAK-12                  | SN: 1016   | 24-Sept-24 (No. OCP-DAK12-1016_Sep24)  | Sep-25        |
| OCP DAK-3.5                 | SN: 1249   | 23-Sept-24 (No. OCP-DAK3.5-1249_Sep24) | Sep-25        |
| Reference Probe EX3DV4      | SN: 7349   | 10-Jan-25 (No. EX3-7349_Jan25)         | Jan-26        |
| DAE4ip                      | SN: 1836   | 17-Apr-25 (No. DAE4ip-1836_Apr25)      | Apr-26        |

| Secondary Standards          | ID         | Check Date (in house)                      | Scheduled Check |
|------------------------------|------------|--------------------------------------------|-----------------|
| ACAD Setup 1                 | SN: 1000   | 27-May-25 (No. 675-ACAD_Source_Box-250527) | May-26          |
| Signal Generator R&S SMB100A | SN: 182081 | 27-May-25 (No. 675-CAL16-S4588-250527)     | May-26          |
| Mismatch; SMA                | SN: 1102   | 24-Apr-25 (No. 675-Mismatch_SMA-250424)    | Apr-26          |
| OCP DAK-12                   | SN: 1029   | 27-Feb-25 (No. OCP-DAK12-1029_Feb25)       | Feb-26          |
| OCP DAK-3.5                  | SN: 1336   | 09-Dec-24 (No. OCP-DAK3.5-1336_Dec24)      | Dec-25          |

|               |            |                       |           |
|---------------|------------|-----------------------|-----------|
|               | Name       | Function              | Signature |
| Calibrated by | Paulo Pina | Laboratory Technician |           |
| Approved by   | Sven Kühn  | Technical Manager     |           |

Issued: June 11, 2025

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Accreditation No.: **SCS 0108**

## Glossary

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| 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-Worn 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.
- *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%.

## Measurement Conditions

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

|                              |                          |                                     |
|------------------------------|--------------------------|-------------------------------------|
| DASY Version                 | DASY8 Module SAR         | 16.4.0                              |
| Extrapolation                | Advanced Extrapolation   |                                     |
| Phantom                      | Modular Flat Phantom     |                                     |
| Distance Dipole Center - TSL | 10 mm                    | with spacer                         |
| Zoom Scan Resolution         | dx, dy = 6mm, dz = 1.5mm | Graded Ratio = 1.5 mm (Z direction) |
| Frequency                    | 1900MHz $\pm$ 1MHz       |                                     |

## HSL parameters at 1900 MHz

The following parameters and calculations were applied.

|                                    | Temperature         | Permittivity  | Conductivity        |
|------------------------------------|---------------------|---------------|---------------------|
| Nominal HSL parameters             | 22.0 °C             | 40.0          | 1.40 mho/m          |
| Measured HSL parameters            | (22.0 $\pm$ 0.2) °C | 40.2 $\pm$ 6% | 1.38 mho/m $\pm$ 6% |
| HSL temperature change during test | < 0.5 °C            |               |                     |

## SAR result with HSL at 1900 MHz

| SAR averaged over 1 cm <sup>3</sup> (1 g) of HSL | Condition          |                               |
|--------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal HSL parameters                   | 24 dBm input power | 9.94 W/kg                     |
| SAR for nominal HSL parameters                   | normalized to 1W   | 39.6 W/kg $\pm$ 17.0% (k = 2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of HSL | Condition          |                               |
|----------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal HSL parameters                     | 24 dBm input power | 5.23 W/kg                     |
| SAR for nominal HSL parameters                     | normalized to 1W   | 20.8 W/kg $\pm$ 16.5% (k = 2) |

**Appendix (Additional assessments outside the scope of SCS 0108)****Antenna Parameters with HSL at 1900 MHz**

|             |                                |
|-------------|--------------------------------|
| Impedance   | 53.2 $\Omega$ + 4.0 j $\Omega$ |
| Return Loss | -26.1 dB                       |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.203 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint 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 feedpoint may be damaged.

**Additional EUT Data**

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

System Performance Check Report

Summary

| Dipole            | Frequency [MHz] | TSL | Power [dBm] |
|-------------------|-----------------|-----|-------------|
| D1900V2 - 5N5d185 | 1900            | HSL | 24          |

Exposure Conditions

| Phantom Section, TSL | Test Distance [mm] | Band | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|--------------------|------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat                 | 10                 |      | CW, 0---   | 1900, 0                         | 7.68              | 1.38                   | 40.2             |

Hardware Setup

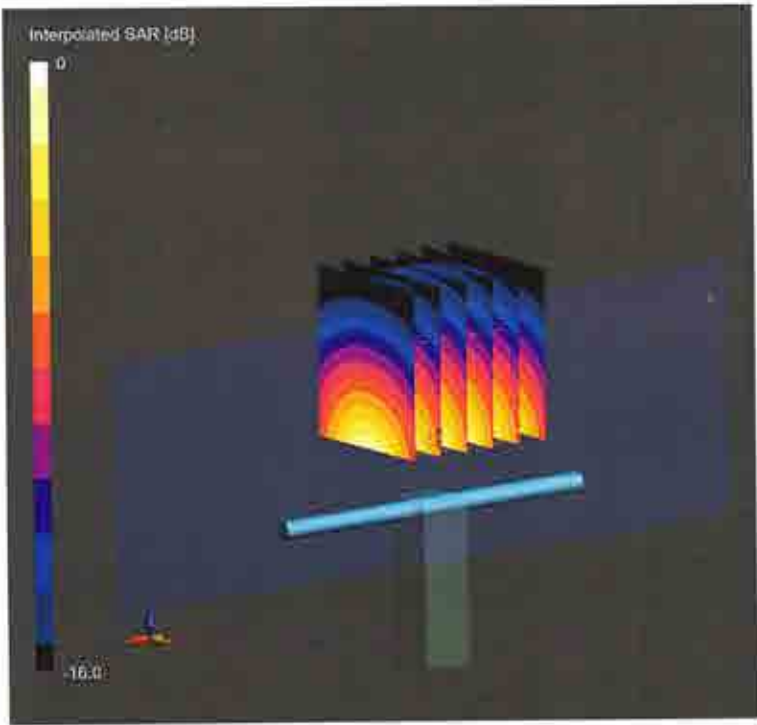
| Phantom        | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
|----------------|--------------------|-----------------------------|---------------------------|
| MFP V8.0 Right | HSL, 2025-06-11    | EX3DV4 - SN7349, 2025-01-10 | DAE4ip Sn1836, 2025-04-17 |

Scans Setup

|                     | Zoom Scan       |
|---------------------|-----------------|
| Grid Extents [mm]   | 30 x 30 x 30    |
| Grid Steps [mm]     | 6.0 x 6.0 x 1.5 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.5             |
| MAIA                | N/A             |
| Surface Detection   | VMS +/- 6p      |
| Scan Method         | Measured        |

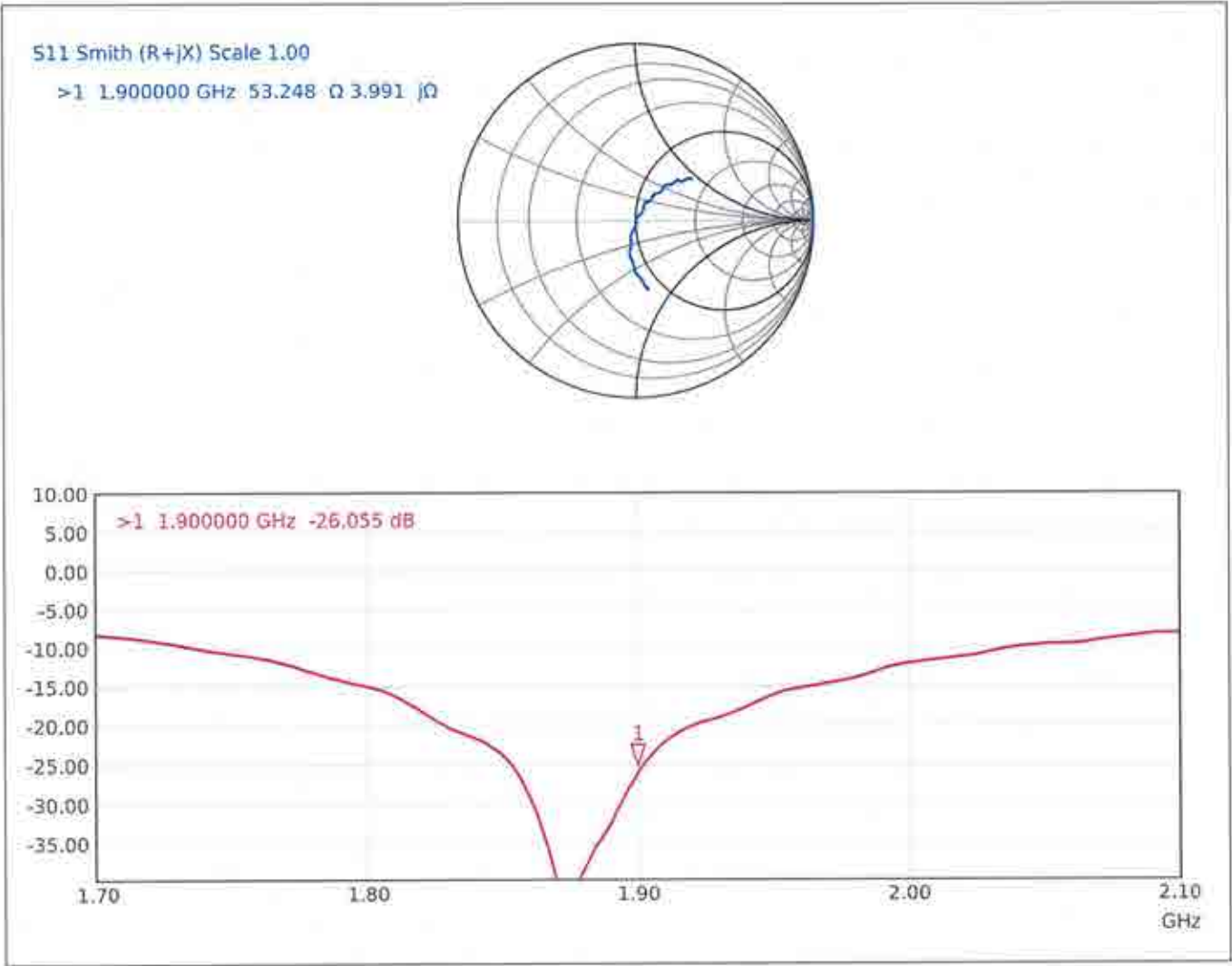
Measurement Results

|                     | Zoom Scan           |
|---------------------|---------------------|
| Date                | 2025-06-11          |
| psSAR1g [W/Kg]      | 9.94                |
| psSAR10g [W/Kg]     | 5.23                |
| Power Drift [dB]    | 0.00                |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Correction      | Positive / Negative |



0 dB = 17.4 W/Kg

Impedance Measurement Plot for HSL





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Accreditation No.: **SCS 0108**

Client **Sporton**  
**Taoyuan City**

Certificate No. **D2000V2-1010\_Dec25**

## CALIBRATION CERTIFICATE

Object **D2000V2 - SN: 1010**

Calibration procedure(s) **QA CAL-05.v13**  
**Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz**

Calibration date **December 4, 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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID         | Cal Date (Certificate No.)             | Scheduled Cal |
|-----------------------------|------------|----------------------------------------|---------------|
| Power Sensor R&S NRP40T     | SN: 101861 | 29-Apr-25 (No. 2025-001450)            | Apr-26        |
| Power Sensor R&S NRP18A     | SN: 101859 | 06-Feb-25 (No. 4030A315009541)         | Feb-26        |
| Spectrum Analyzer R&S FSV40 | SN: 101832 | 29-Jan-25 (No. 4030A315009658)         | Jan-26        |
| 3.5mm mismatch combination  | SN: 1152   | 24-Mar-25 (No. 217-04293)              | Mar-26        |
| OCP DAK-12                  | SN: 1016   | 16-Sept-25 (No. OCP-DAK12-1016_Sep25)  | Sep-26        |
| OCP DAK-3.5                 | SN: 1249   | 16-Sept-25 (No. OCP-DAK3.5-1249_Sep25) | Sep-26        |
| Reference Probe EX3DV4      | SN: 7349   | 10-Jan-25 (No. EX3-7349_Jan25)         | Jan-26        |
| DAE4ip                      | SN: 1836   | 26-Nov-25 (No. DAE4ip-1836_Nov25)      | Nov-26        |

| Secondary Standards          | ID         | Check Date (in house)                      | Scheduled Check |
|------------------------------|------------|--------------------------------------------|-----------------|
| ACAD Setup 1                 | SN: 1000   | 27-May-25 (No. 675-ACAD_Source_Box-250527) | May-26          |
| Signal Generator R&S SMB100A | SN: 182081 | 27-May-25 (No. 675-CAL16-S4588-250527)     | May-26          |
| Mismatch; SMA                | SN: 1102   | 24-Apr-25 (No. 675-Mismatch_SMA-250424)    | Apr-26          |
| OCP DAK-12                   | SN: 1029   | 27-Feb-25 (No. OCP-DAK12-1029_Feb25)       | Feb-26          |
| OCP DAK-3.5                  | SN: 1336   | 09-Dec-24 (No. OCP-DAK3.5-1336_Dec24)      | Dec-25          |

|               |                  |                       |                         |
|---------------|------------------|-----------------------|-------------------------|
|               | Name             | Function              | Signature               |
| Calibrated by | Henrique Almeida | Laboratory Technician | <i>Henrique Almeida</i> |
| Approved by   | Sven Kühn        | Technical Manager     | <i>I.A. A. Kühn</i>     |

Issued: December 4, 2025

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

## Glossary

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| 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-Worn 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.
- *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%.

## Measurement Conditions

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

|                              |                        |             |
|------------------------------|------------------------|-------------|
| DASY Version                 | DASY8 Module SAR       | 17.0.2      |
| Extrapolation                | Advanced Extrapolation |             |
| Phantom                      | Modular Flat Phantom   |             |
| Distance Dipole Center - TSL | 10 mm                  | with spacer |
| Frequency                    | 2000MHz $\pm$ 1MHz     |             |

## HSL parameters at 2000 MHz

The following parameters and calculations were applied.

|                                    | Temperature         | Permittivity  | Conductivity        |
|------------------------------------|---------------------|---------------|---------------------|
| Nominal HSL parameters             | 22.0 °C             | 40.0          | 1.40 mho/m          |
| Measured HSL parameters            | (22.0 $\pm$ 0.2) °C | 39.5 $\pm$ 6% | 1.40 mho/m $\pm$ 6% |
| HSL temperature change during test | < 0.5 °C            |               |                     |

## SAR result with HSL at 2000 MHz

| SAR averaged over 1 cm <sup>3</sup> (1 g) of HSL | Condition          |                               |
|--------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal HSL parameters                   | 24 dBm input power | 10.3 W/kg                     |
| SAR for nominal HSL parameters                   | normalized to 1W   | 41.0 W/kg $\pm$ 17.0% (k = 2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of HSL | Condition          |                               |
|----------------------------------------------------|--------------------|-------------------------------|
| SAR for nominal HSL parameters                     | 24 dBm input power | 5.39 W/kg                     |
| SAR for nominal HSL parameters                     | normalized to 1W   | 21.5 W/kg $\pm$ 16.5% (k = 2) |

**Appendix (Additional assessments outside the scope of SCS 0108)****Antenna Parameters with HSL at 2000 MHz**

|             |                                |
|-------------|--------------------------------|
| Impedance   | 50.9 $\Omega$ + 1.1 j $\Omega$ |
| Return Loss | -37.0 dB                       |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.188 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint 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 feedpoint may be damaged.

**Additional EUT Data**

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

System Performance Check Report

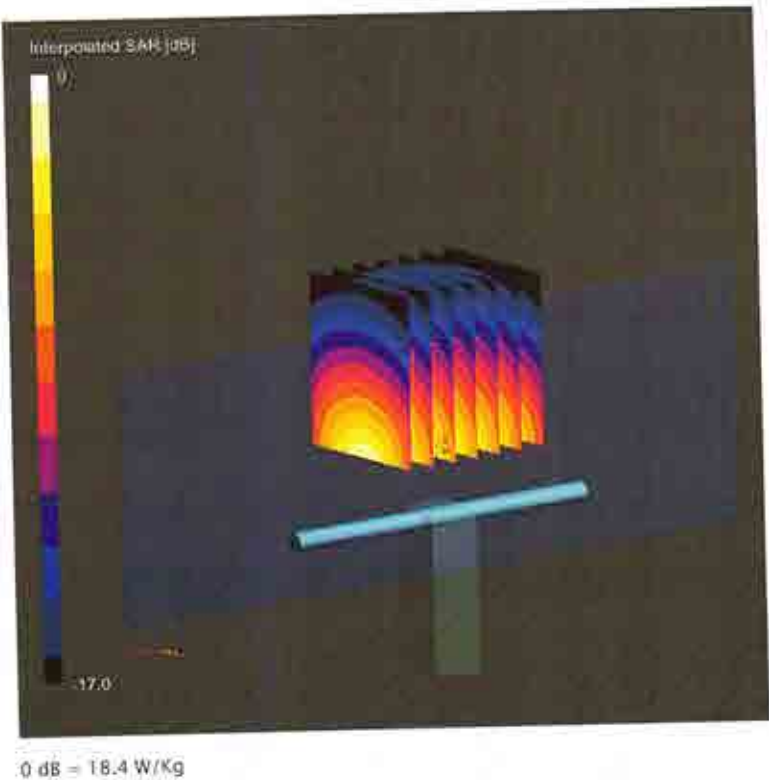
| Summary          |                 |     |             |
|------------------|-----------------|-----|-------------|
| Dipole           | Frequency [MHz] | TSL | Power [dBm] |
| D2000V2 - SN1010 | 2000            | HSL | 24          |

| Exposure Conditions  |                    |       |            |                                 |                   |                        |                  |
|----------------------|--------------------|-------|------------|---------------------------------|-------------------|------------------------|------------------|
| Phantom Section, TSL | Test Distance [mm] | Sampl | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
| Flat                 | 10                 |       | CW, 0—     | 2000, 0                         | 7.65              | 1.40                   | 39.5             |

| Hardware Setup  |                   |                             |                           |
|-----------------|-------------------|-----------------------------|---------------------------|
| Phantom         | TSL Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
| MCP V8.0 Center | HSL, 2025-12-04   | EX3DV4 - SN7349, 2025-01-10 | DAE4ip Sn1836, 2025-11-26 |

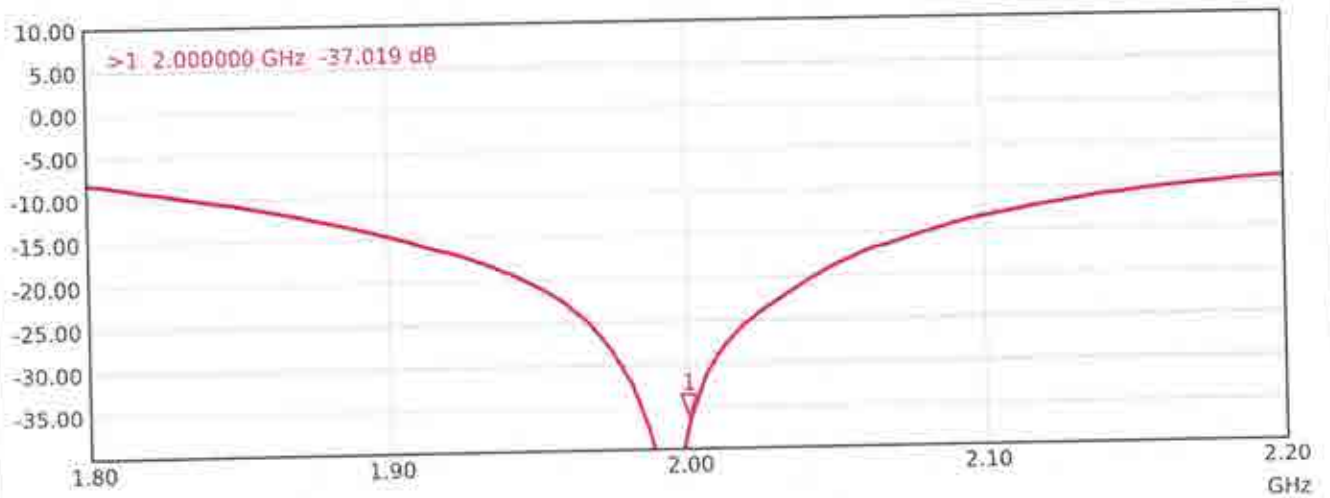
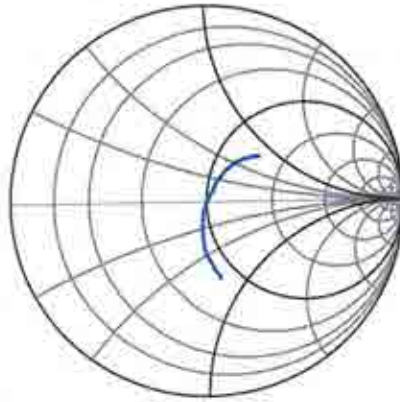
| Scans Setup         |                 |
|---------------------|-----------------|
|                     | Zoom Scan       |
| Grid Extents [mm]   | 30 x 30 x 30    |
| Grid Steps [mm]     | 5.0 x 5.0 x 1.5 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.5             |
| MAIA                | N/A             |
| Surface Detection   | VMS + Bp        |
| Scan Method         | Measured        |

| Measurement Results |                     |
|---------------------|---------------------|
|                     | Zoom Scan           |
| Date                | 2025-12-04          |
| psSAR1g [W/Kg]      | 10.3                |
| psSAR10g [W/Kg]     | 5.39                |
| Power Drift [dB]    | 0.00                |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Corrected       | Positive / Negative |



## Impedance Measurement Plot for HSL

S11 Smith (R+jX) Scale 1.00

>1 2.000000 GHz 50.867  $\Omega$  1.127 j $\Omega$ 

**Calibration Laboratory of****Schmid & Partner  
Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland

**S** Schweizerischer Kalibrierdienst  
**C** Service suisse d'étalonnage  
**S** Servizio svizzero di taratura  
**S** Swiss Calibration Service

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Multilateral Agreement for the recognition of calibration certificates**Accreditation No.: **SCS 0108**

Client

**Sporton**

Taoyuan City

Certificate No.

**D2450V2-736\_Aug24****CALIBRATION CERTIFICATE**Object **D2450V2 - SN: 736**Calibration procedure(s) **QA CAL-05.v12  
Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz**Calibration date **August 15, 2024**

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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards                          | ID         | Cal Date (Certificate No.)            | Scheduled Cal |
|--------------------------------------------|------------|---------------------------------------|---------------|
| Power Sensor R&S NRP-33T                   | SN: 100967 | 28-Mar-24 (No. 217-04038)             | Mar-25        |
| Power Sensor R&S NRP18A                    | SN: 101859 | 21-Mar-24 (No. 4030A315007801)        | Mar-25        |
| Spectrum Analyzer R&S FSV40                | SN: 101832 | 25-Jan-24 (No. 4030-315007551)        | Jan-25        |
| Mismatch; Short [S4188] Attenuator [S4423] | SN: 1152   | 28-Mar-24 (No. 217-04050)             | Mar-25        |
| OCP DAK-12                                 | SN: 1016   | 05-Oct-23 (No. OCP-DAK12-1016_Oct23)  | Oct-24        |
| OCP DAK-3.5                                | SN: 1249   | 05-Oct-23 (No. OCP-DAK3.5-1249_Oct23) | Oct-24        |
| Reference Probe EX3DV4                     | SN: 7349   | 03-Jun-24 (No. EX3-7349_Jun24)        | Jun-25        |
| DAE4ip                                     | SN: 1836   | 10-Jan-24 (No. DAE4ip-1836_Jan24)     | Jan-25        |

| Secondary Standards          | ID         | Check Date (in house)                      | Scheduled Check |
|------------------------------|------------|--------------------------------------------|-----------------|
| ACAD Source Box              | SN: 1000   | 28-May-24 (No. 675-ACAD_Source_Box-240528) | May-25          |
| Signal Generator R&S SMB100A | SN: 182081 | 28-May-24 (No. 0001-300719404)             | May-25          |
| Mismatch; SMA                | SN: 1102   | 22-May-24 (No. 675-Mismatch_SMA-240522)    | May-25          |

|               |                  |                       |
|---------------|------------------|-----------------------|
|               | Name             | Function              |
| Calibrated by | Krešimir Franjić | Laboratory Technician |
| Approved by   | Sven Kühn        | Technical Manager     |

Signature

Issued: August 16, 2024

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Engineering AG

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

## Glossary

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| 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-Worn 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.
- *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%.

Measurement Conditions

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

|                              |                          |                                     |
|------------------------------|--------------------------|-------------------------------------|
| DASY Version                 | DASY8 Module SAR         | 16.4.0                              |
| Extrapolation                | Advanced Extrapolation   |                                     |
| Phantom                      | Modular Flat Phantom     |                                     |
| Distance Dipole Center - TSL | 10 mm                    | with spacer                         |
| Zoom Scan Resolution         | dx, dy = 5mm, dz = 1.5mm | Graded Ratio = 1.5 mm (Z direction) |
| Frequency                    | 2450MHz ±1MHz            |                                     |

Head TSL parameters at 2450 MHz

The following parameters and calculations were applied.

|                                         |               |              |                |
|-----------------------------------------|---------------|--------------|----------------|
|                                         | Temperature   | Permittivity | Conductivity   |
| Nominal Head TSL parameters             | 22.0 °C       | 39.2         | 1.80 mho/m     |
| Measured Head TSL parameters            | (22.0 ±0.2)°C | 37.8 ±6%     | 1.84 mho/m ±6% |
| Head TSL temperature change during test | < 0.5 °C      |              |                |

SAR result with Head TSL at 2450 MHz

|                                           |                    |                          |
|-------------------------------------------|--------------------|--------------------------|
| SAR averaged over 1 cm³ (1 g) of Head TSL | Condition          |                          |
| SAR for nominal Head TSL parameters       | 24 dBm input power | 12.9 W/kg                |
| SAR for nominal Head TSL parameters       | normalized to 1W   | 51.4 W/kg ±17.0% (k = 2) |

|                                             |                    |                          |
|---------------------------------------------|--------------------|--------------------------|
| SAR averaged over 10 cm³ (10 g) of Head TSL | Condition          |                          |
| SAR for nominal Head TSL parameters         | 24 dBm input power | 6.07 W/kg                |
| SAR for nominal Head TSL parameters         | normalized to 1W   | 24.2 W/kg ±16.5% (k = 2) |

**Appendix (Additional assessments outside the scope of SCS 0108)****Antenna Parameters with Head TSL at 2450 MHz**

|             |                             |
|-------------|-----------------------------|
| Impedance   | $54.6 \Omega + 2.1 j\Omega$ |
| Return Loss | -26.2 dB                    |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1,158 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint 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 feedpoint may be damaged.

**Additional EUT Data**

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

System Performance Check Report

Summary

| Dipole          | Frequency [MHz] | TSL | Power [dBm] |
|-----------------|-----------------|-----|-------------|
| D2450V2 - SN736 | 2450            | HSL | 24          |

Exposure Conditions

| Phantom Section, TSL | Test Distance [mm] | Band    | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|--------------------|---------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat                 | 10                 | CW, D-- |            | 2450, 0                         | 7.24              | 1.84                   | 37.8             |

Hardware Setup

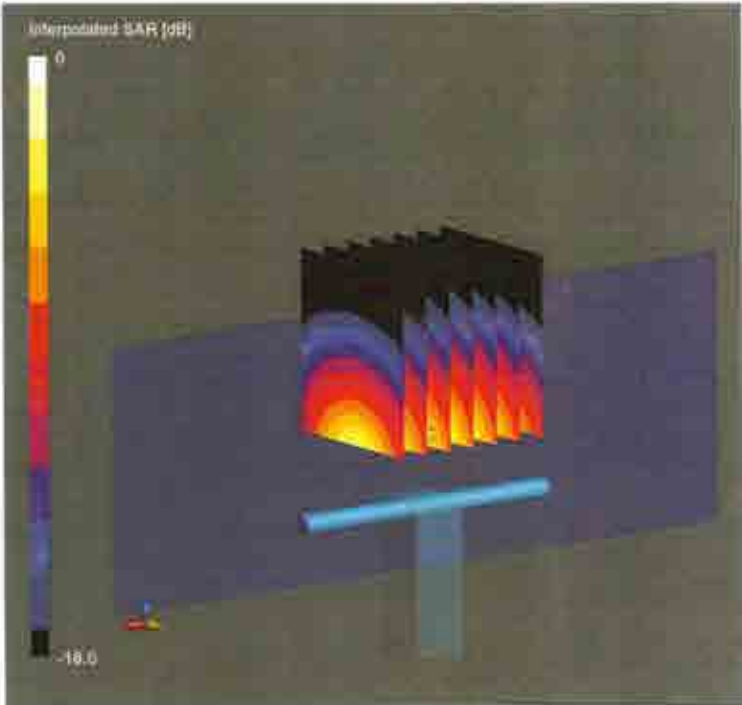
| Phantom         | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
|-----------------|--------------------|-----------------------------|---------------------------|
| MFP V8.0 Center | HSL 2024-08-15     | EX3DV4 - SN7349, 2024-06-03 | DAE4lp Sn1836, 2024-01-10 |

Scans Setup

|                     | Zoom Scan       |
|---------------------|-----------------|
| Grid Extents [mm]   | 30 x 30 x 30    |
| Grid Steps [mm]     | 5.0 x 5.0 x 1.5 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.5             |
| MAIA                | N/A             |
| Surface Detection   | VMS + 6p        |
| Scan Method         | Measured        |

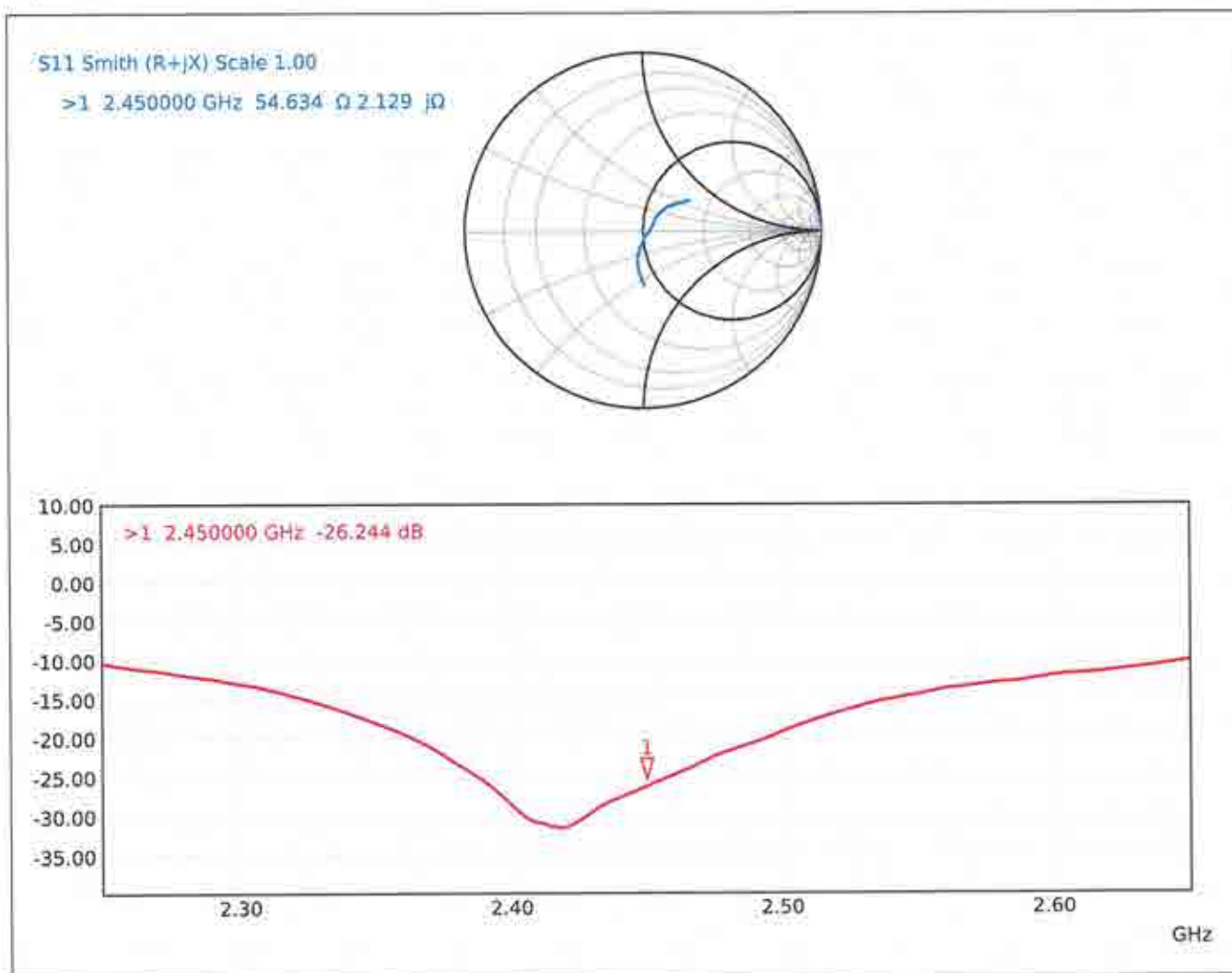
Measurement Results

|                     | Zoom Scan           |
|---------------------|---------------------|
| Date                | 2024-08-15          |
| psSAR1g [W/Kg]      | 12.9                |
| psSAR10g [W/Kg]     | 6.07                |
| Power Drift [dB]    | 0.00                |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Correction      | Positive / Negative |



0 dB = 26.6 W/Kg

## Impedance Measurement Plot for Head TSL



## D2450V2, serial no. 736 Extended Dipole Calibrations

If dipoles are verified in return loss ( $< -20\text{dB}$ , 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.

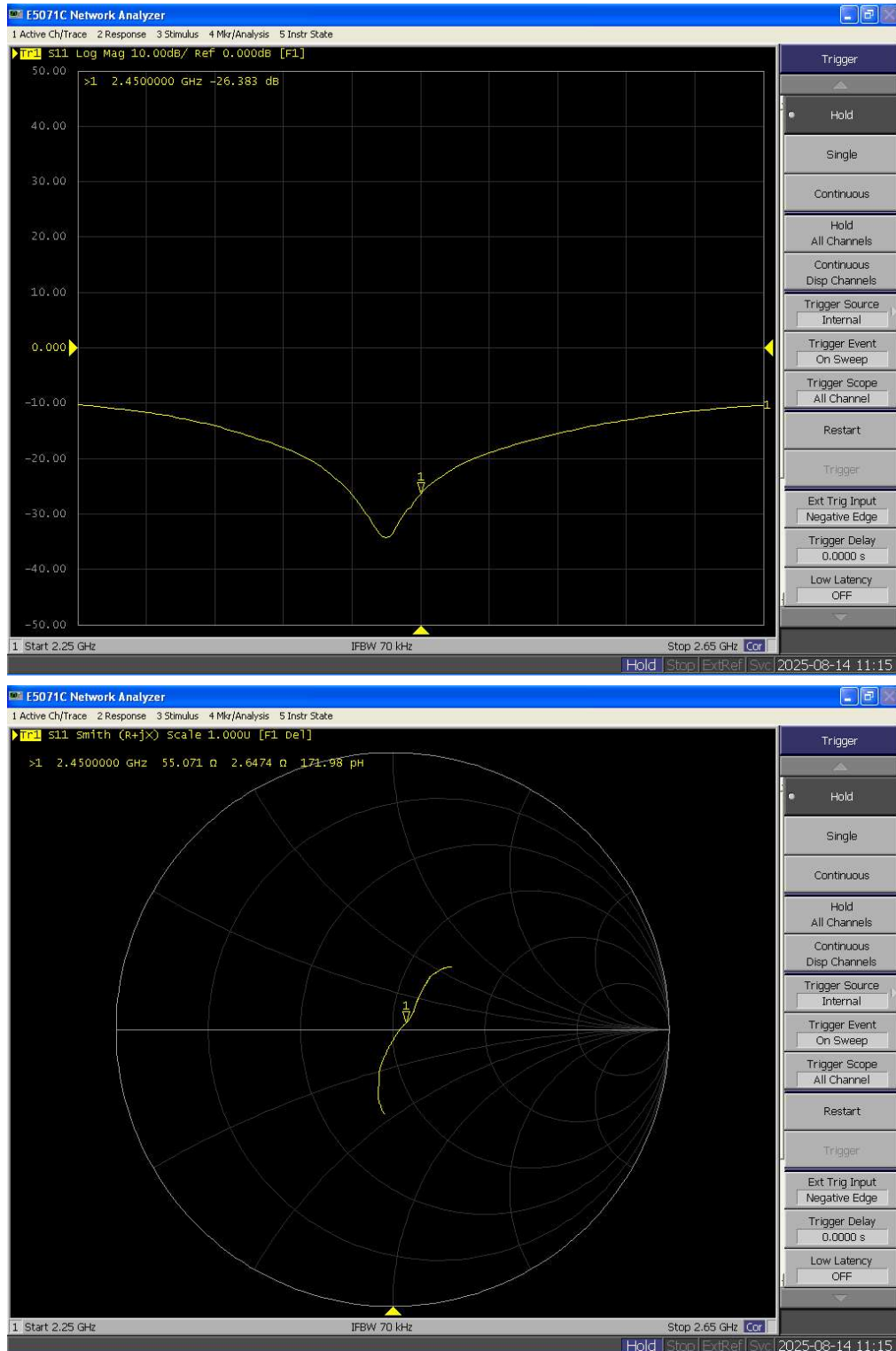
### <Justification of the extended calibration>

| D2450V2 – serial no. 736    |                  |           |                      |             |                           |             |
|-----------------------------|------------------|-----------|----------------------|-------------|---------------------------|-------------|
|                             | 2450MHZ          |           |                      |             |                           |             |
| Date of Measurement         | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (ohm) | Delta (ohm) |
| 08.15.2024<br>(Cal. Report) | -26.2            |           | 54.6                 |             | +2.1                      |             |
| 08.14.2025<br>(extended)    | -26.383          | 0.69      | 55.071               | 0.471       | +2.6474                   | 0.5474      |

The return loss is  $< -20\text{dB}$ , within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

<Dipole Verification Data> - D2450 V2, serial no. 736 (Data of Measurement : 08.14.2025)

2450MHz - Head



**Calibration Laboratory of****Schmid & Partner  
Engineering AG**

Zeughausstrasse 43, 8004 Zurich, Switzerland

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Client

**Sporton**

Taoyuan City

Certificate No.

**D2600V2-1008\_Aug24****CALIBRATION CERTIFICATE**Object **D2600V2 - SN: 1008**Calibration procedure(s) **QA CAL-05.v12  
Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz**Calibration date **August 15, 2024**

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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards                          | ID         | Cal Date (Certificate No.)            | Scheduled Cal |
|--------------------------------------------|------------|---------------------------------------|---------------|
| Power Sensor R&S NRP-33T                   | SN: 100967 | 28-Mar-24 (No. 217-04038)             | Mar-25        |
| Power Sensor R&S NRP18A                    | SN: 101859 | 21-Mar-24 (No. 4030A315007801)        | Mar-25        |
| Spectrum Analyzer R&S FSV40                | SN: 101832 | 25-Jan-24 (No. 4030-315007551)        | Jan-25        |
| Mismatch; Short [S4188] Attenuator [S4423] | SN: 1152   | 28-Mar-24 (No. 217-04050)             | Mar-25        |
| OCP DAK-12                                 | SN: 1016   | 05-Oct-23 (No. OCP-DAK12-1016_Oct23)  | Oct-24        |
| OCP DAK-3.5                                | SN: 1249   | 05-Oct-23 (No. OCP-DAK3.5-1249_Oct23) | Oct-24        |
| Reference Probe EX3DV4                     | SN: 7349   | 03-Jun-24 (No. EX3-7349_Jun24)        | Jun-25        |
| DAE4ip                                     | SN: 1836   | 10-Jan-24 (No. DAE4ip-1836_Jan24)     | Jan-25        |

| Secondary Standards          | ID         | Check Date (in house)                      | Scheduled Check |
|------------------------------|------------|--------------------------------------------|-----------------|
| ACAD Source Box              | SN: 1000   | 28-May-24 (No. 675-ACAD_Source_Box-240528) | May-25          |
| Signal Generator R&S SMB100A | SN: 182081 | 28-May-24 (No. 0001-300719404)             | May-25          |
| Mismatch; SMA                | SN: 1102   | 22-May-24 (No. 675-Mismatch_SMA-240522)    | May-25          |

|               |                  |                       |
|---------------|------------------|-----------------------|
|               | Name             | Function              |
| Calibrated by | Krešimir Franjić | Laboratory Technician |
| Approved by   | Sven Kühn        | Technical Manager     |

Signature

Issued: August 16, 2024

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

## Calibration Laboratory of

Schmid & Partner  
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



**S** Schweizerischer Kalibrierdienst  
**C** Service suisse d'étalonnage  
**S** Servizio svizzero di taratura  
**S** Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

## Glossary

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| 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-Worn 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.
- *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%.

Measurement Conditions

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

|                              |                          |                                     |
|------------------------------|--------------------------|-------------------------------------|
| DASY Version                 | DASY8 Module SAR         | 16.4.0                              |
| Extrapolation                | Advanced Extrapolation   |                                     |
| Phantom                      | Modular Flat Phantom     |                                     |
| Distance Dipole Center - TSL | 10 mm                    | with spacer                         |
| Zoom Scan Resolution         | dx, dy = 5mm, dz = 1.5mm | Graded Ratio = 1.5 mm (Z direction) |
| Frequency                    | 2600MHz ±1MHz            |                                     |

Head TSL parameters at 2600 MHz

The following parameters and calculations were applied.

|                                         |               |              |                |
|-----------------------------------------|---------------|--------------|----------------|
|                                         | Temperature   | Permittivity | Conductivity   |
| Nominal Head TSL parameters             | 22.0 °C       | 39.0         | 1.96 mho/m     |
| Measured Head TSL parameters            | (22.0 ±0.2)°C | 37.3 ±6%     | 2.00 mho/m ±6% |
| Head TSL temperature change during test | < 0.5 °C      |              |                |

SAR result with Head TSL at 2600 MHz

|                                                       |                    |                          |
|-------------------------------------------------------|--------------------|--------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                          |
| SAR for nominal Head TSL parameters                   | 24 dBm input power | 14.0 W/kg                |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 55.7 W/kg ±17.0% (k = 2) |

|                                                         |                    |                          |
|---------------------------------------------------------|--------------------|--------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                          |
| SAR for nominal Head TSL parameters                     | 24 dBm input power | 6.35 W/kg                |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 25.3 W/kg ±16.5% (k = 2) |

**Appendix (Additional assessments outside the scope of SCS 0108)****Antenna Parameters with Head TSL at 2600 MHz**

|             |                                |
|-------------|--------------------------------|
| Impedance   | 49.0 $\Omega$ – 3.7 j $\Omega$ |
| Return Loss | -28.2 dB                       |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.153 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint 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 feedpoint may be damaged.

**Additional EUT Data**

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

System Performance Check Report

Summary

| Dipole           | Frequency [MHz] | TSL | Power [dBm] |
|------------------|-----------------|-----|-------------|
| D2600V2 - SN1008 | 2600            | HSL | 24          |

Exposure Conditions

| Phantom Section, TSL | Test Distance [mm] | Band    | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|--------------------|---------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat                 | 10                 | CW, 0-- |            | 2600, 0                         | 7.29              | 2.00                   | 37.3             |

Hardware Setup

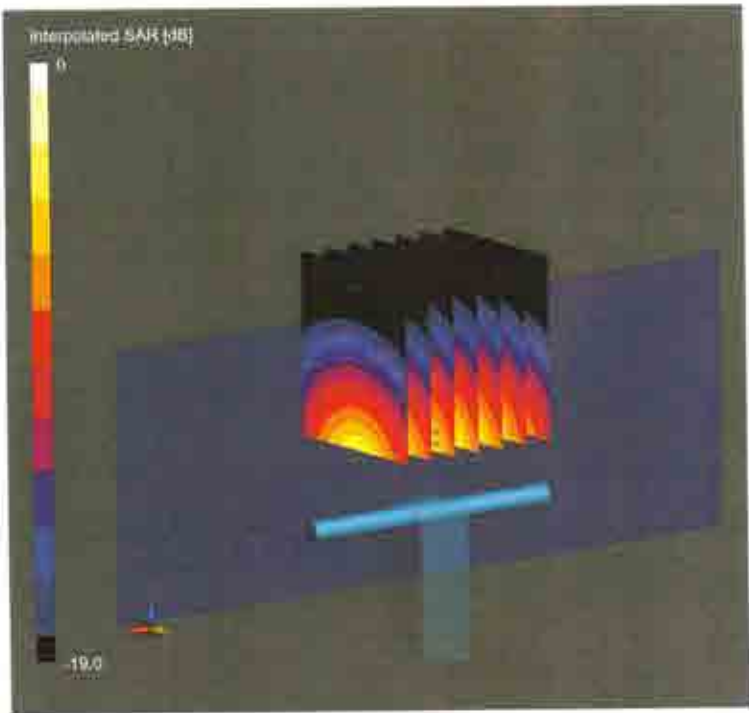
| Phantom         | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
|-----------------|--------------------|-----------------------------|---------------------------|
| MFP V8.0 Center | HSL, 2024-08-15    | EX3DV4 - SN7349, 2024-06-03 | DAE4ip Sn1836, 2024-01-10 |

Scans Setup

|                     | Zoom Scan       |
|---------------------|-----------------|
| Grid Extents [mm]   | 30 x 30 x 30    |
| Grid Steps [mm]     | 5.0 x 5.0 x 1.5 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.5             |
| MAIA                | N/A             |
| Surface Detection   | VMS + 6p        |
| Scan Method         | Measured        |

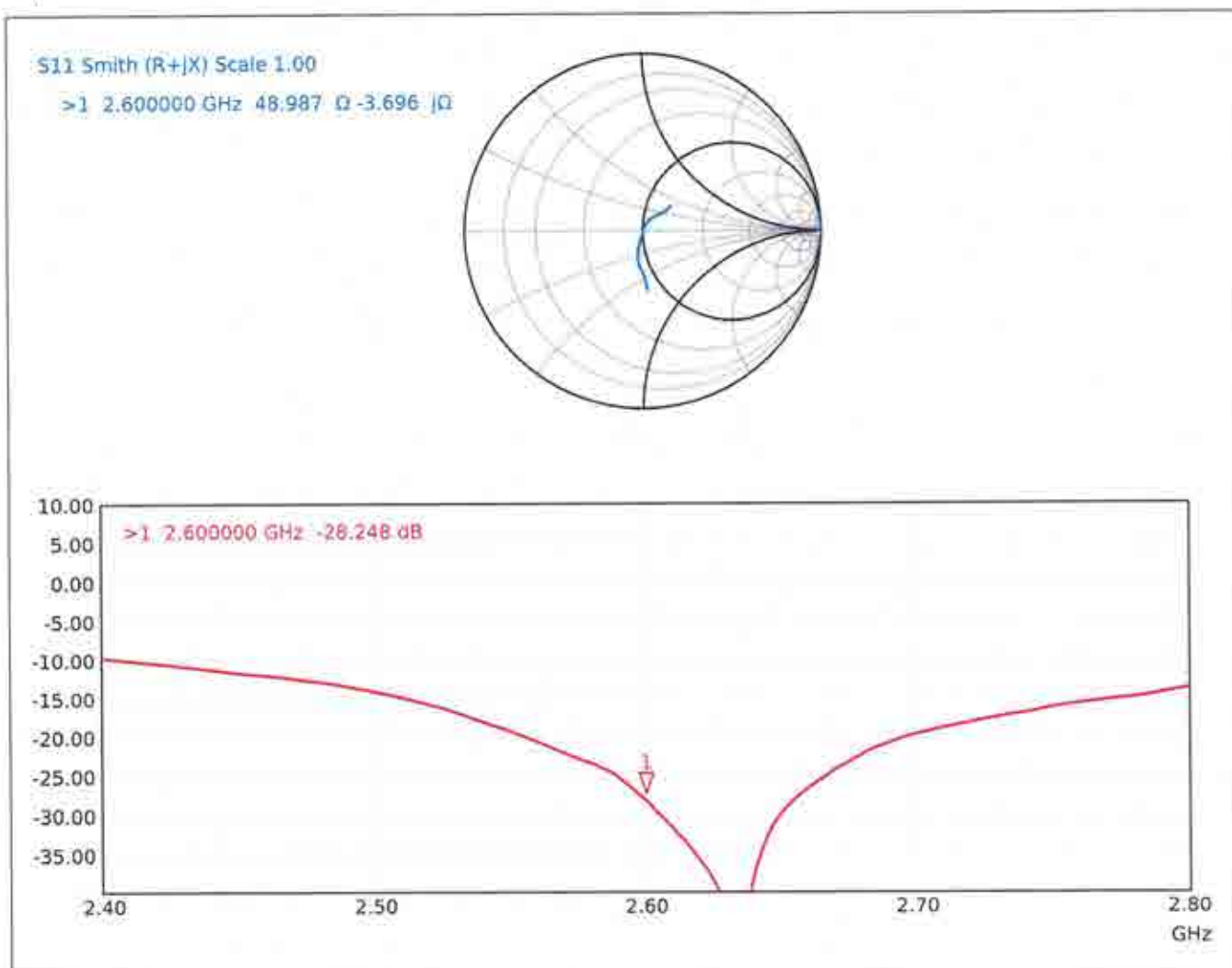
Measurement Results

|                     | Zoom Scan           |
|---------------------|---------------------|
| Date                | 2024-08-15          |
| psSAR1g [W/Kg]      | 14.0                |
| psSAR10g [W/Kg]     | 6.35                |
| Power Drift [dB]    | 0.00                |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Correction      | Positive / Negative |



0 dB = 30.2 W/Kg

## Impedance Measurement Plot for Head TSL



## D2600V2, serial no. 1008 Extended Dipole Calibrations

If dipoles are verified in return loss ( $< -20\text{dB}$ , 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.

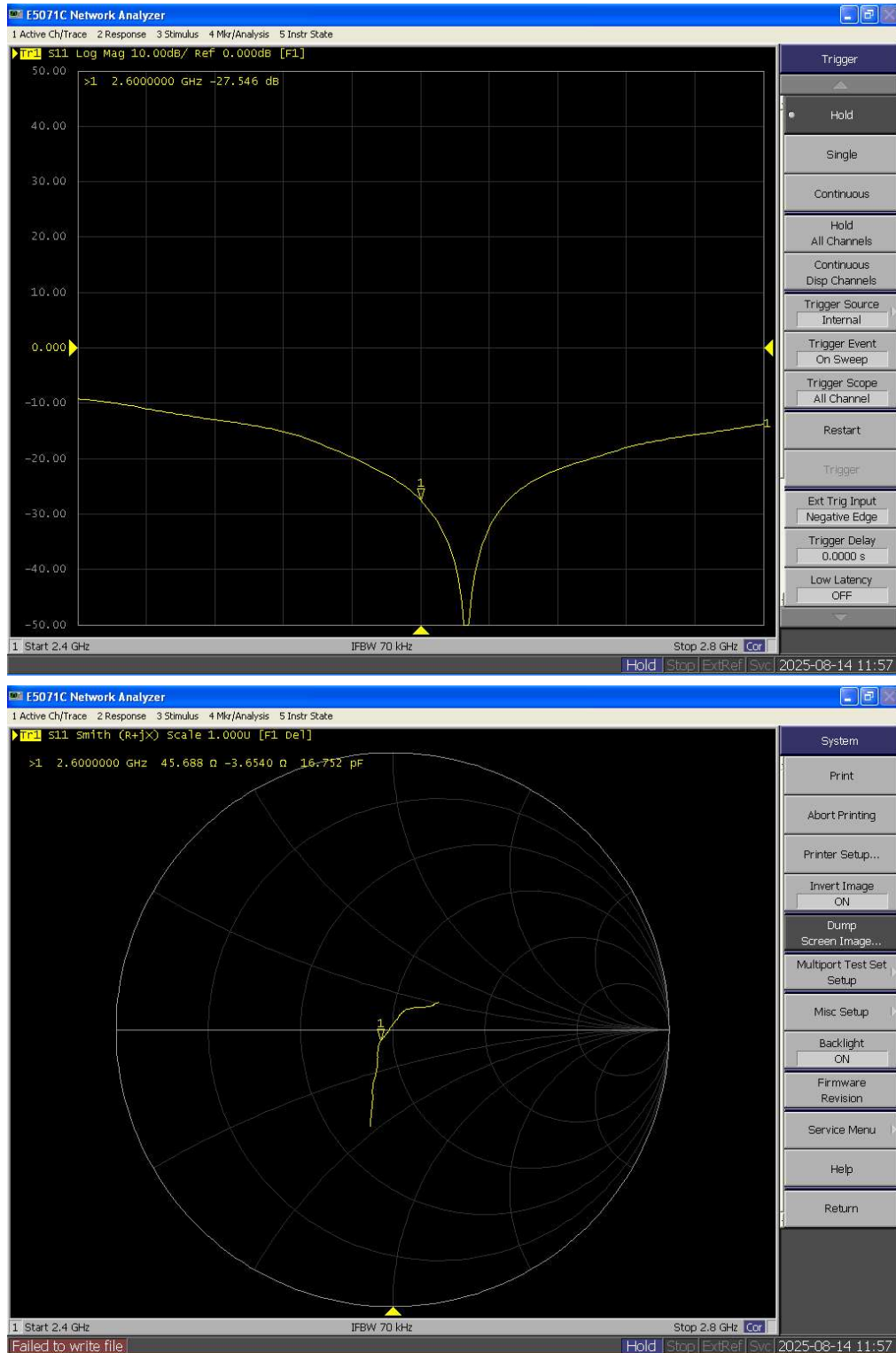
### <Justification of the extended calibration>

| D2600V2 – serial no. 1008   |                  |           |                      |             |                           |             |
|-----------------------------|------------------|-----------|----------------------|-------------|---------------------------|-------------|
|                             | 2600MHZ          |           |                      |             |                           |             |
| Date of Measurement         | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (ohm) | Delta (ohm) |
| 08.15.2024<br>(Cal. Report) | -28.2            |           | 49.0                 |             | -3.7                      |             |
| 08.14.2025<br>(extended)    | -27.546          | -2.31     | 45.688               | -3.312      | -3.654                    | 0.046       |

The return loss is  $< -20\text{dB}$ , within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

<Dipole Verification Data> - D2600 V2, serial no. 1008 (Data of Measurement : 08.14.2025)

2600MHz - Head



# Calibration Laboratory of

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client

**Sporton**

Taoyuan City

Certificate No.

**D5GHzV2-1006\_Oct24**

## CALIBRATION CERTIFICATE

Object

D5GHzV2 - SN: 1006

Calibration procedure(s)

QA CAL-22.v7

Calibration Procedure for SAR Validation Sources between 3 - 10 GHz

Calibration date

October 15, 2024

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  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards                          | ID         | Cal Date (Certificate No.)            | Scheduled Cal |
|--------------------------------------------|------------|---------------------------------------|---------------|
| Power Sensor R&S NRP-33T                   | SN: 100967 | 28-Mar-24 (No. 217-04038)             | Mar-25        |
| Power Sensor R&S NRP18A                    | SN: 101859 | 22-Jul-24 (No. 4030A315008547)        | Jul-25        |
| Spectrum Analyzer R&S FSV40                | SN: 101832 | 25-Jan-24 (No. 4030-315007551)        | Jan-25        |
| Mismatch; Short [S4188] Attenuator [S4423] | SN: 1152   | 28-Mar-24 (No. 217-04050)             | Mar-25        |
| OCP DAK-12                                 | SN: 1016   | 24-Sep-24 (No. OCP-DAK12-1016_Sep24)  | Sep-25        |
| OCP DAK-3.5                                | SN: 1249   | 23-Sep-24 (No. OCP-DAK3.5-1249_Sep24) | Sep-25        |
| Reference Probe EX3DV4                     | SN: 7349   | 03-Jun-24 (No. EX3-7349_Jun24)        | Jun-25        |
| DAE4ip                                     | SN: 1836   | 10-Jan-24 (No. DAE4ip-1836_Jan24)     | Jan-25        |

| Secondary Standards          | ID         | Check Date (in house)                      | Scheduled Check |
|------------------------------|------------|--------------------------------------------|-----------------|
| ACAD Source Box              | SN: 1000   | 28-May-24 (No. 675-ACAD_Source_Box-240528) | May-25          |
| Signal Generator R&S SMB100A | SN: 182081 | 28-May-24 (No. 675-CAL16-S4588-240528)     | May-25          |
| Mismatch; SMA                | SN: 1102   | 22-May-24 (No. 675-Mismatch_SMA-240522)    | May-25          |

|                                                                                                                 |            |                       |           |
|-----------------------------------------------------------------------------------------------------------------|------------|-----------------------|-----------|
|                                                                                                                 | Name       | Function              | Signature |
| Calibrated by                                                                                                   | Paulo Pina | Laboratory Technician |           |
| Approved by                                                                                                     | Sven Kühn  | Technical Manager     |           |
| Issued: October 15, 2024                                                                                        |            |                       |           |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. |            |                       |           |



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**Accreditation No.: SCS 0108**

## Glossary

|       |                                 |
|-------|---------------------------------|
| TSL   | tissue simulating liquid        |
| ConvF | sensitivity in TSL / NORM x,y,z |
| 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-Worn 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.
- *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%.

Measurement Conditions

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

|                              |                                                 |                                     |
|------------------------------|-------------------------------------------------|-------------------------------------|
| DASY Version                 | DASY8 Module SAR                                | 16.4.0                              |
| Extrapolation                | Advanced Extrapolation                          |                                     |
| Phantom                      | Modular Flat Phantom                            |                                     |
| Distance Dipole Center - TSL | 10 mm                                           | with spacer                         |
| Zoom Scan Resolution         | dx, dy = 4mm, dz = 1.4mm                        | Graded Ratio = 1.4 mm (Z direction) |
| Frequency                    | 5250MHz ±1MHz<br>5600MHz ±1MHz<br>5800MHz ±1MHz |                                     |

Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

|                                         |               |              |                |
|-----------------------------------------|---------------|--------------|----------------|
|                                         | Temperature   | Permittivity | Conductivity   |
| Nominal Head TSL parameters             | 22.0 °C       | 35.9         | 4.71 mho/m     |
| Measured Head TSL parameters            | (22.0 ±0.2)°C | 36.2 ±6%     | 4.64 mho/m ±6% |
| Head TSL temperature change during test | < 0.5 °C      |              |                |

SAR result with Head TSL at 5250 MHz

|                                                       |                    |                          |
|-------------------------------------------------------|--------------------|--------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                          |
| SAR for nominal Head TSL parameters                   | 20 dBm input power | 8.06 W/kg                |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 80.6 W/kg ±19.9% (k = 2) |

|                                                         |                    |                          |
|---------------------------------------------------------|--------------------|--------------------------|
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                          |
| SAR for nominal Head TSL parameters                     | 20 dBm input power | 2.28 W/kg                |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 22.8 W/kg ±19.5% (k = 2) |

**Head TSL parameters at 5600 MHz**

The following parameters and calculations were applied.

|                                         | Temperature   | Permittivity | Conductivity   |
|-----------------------------------------|---------------|--------------|----------------|
| Nominal Head TSL parameters             | 22.0 °C       | 35.5         | 5.07 mho/m     |
| Measured Head TSL parameters            | (22.0 ±0.2)°C | 35.8 ±6%     | 5.04 mho/m ±6% |
| Head TSL temperature change during test | < 0.5 °C      |              |                |

**SAR result with Head TSL at 5600 MHz**

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                          |
|-------------------------------------------------------|--------------------|--------------------------|
| SAR for nominal Head TSL parameters                   | 20 dBm input power | 8.34 W/kg                |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 83.4 W/kg ±19.9% (k = 2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                          |
|---------------------------------------------------------|--------------------|--------------------------|
| SAR for nominal Head TSL parameters                     | 20 dBm input power | 2.37 W/kg                |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 23.7 W/kg ±19.5% (k = 2) |

**Head TSL parameters at 5800 MHz**

The following parameters and calculations were applied.

|                                         | Temperature   | Permittivity | Conductivity   |
|-----------------------------------------|---------------|--------------|----------------|
| Nominal Head TSL parameters             | 22.0 °C       | 35.3         | 5.27 mho/m     |
| Measured Head TSL parameters            | (22.0 ±0.2)°C | 35.6 ±6%     | 5.21 mho/m ±6% |
| Head TSL temperature change during test | < 0.5 °C      |              |                |

**SAR result with Head TSL at 5800 MHz**

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                          |
|-------------------------------------------------------|--------------------|--------------------------|
| SAR for nominal Head TSL parameters                   | 20 dBm input power | 8.06 W/kg                |
| SAR for nominal Head TSL parameters                   | normalized to 1W   | 80.6 W/kg ±19.9% (k = 2) |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                          |
|---------------------------------------------------------|--------------------|--------------------------|
| SAR for nominal Head TSL parameters                     | 20 dBm input power | 2.27 W/kg                |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 22.7 W/kg ±19.5% (k = 2) |

**Appendix (Additional assessments outside the scope of SCS 0108)****Antenna Parameters with Head TSL at 5250 MHz**

|             |                                |
|-------------|--------------------------------|
| Impedance   | 53.0 $\Omega$ – 5.9 j $\Omega$ |
| Return Loss | -23.8 dB                       |

**Antenna Parameters with Head TSL at 5600 MHz**

|             |                                |
|-------------|--------------------------------|
| Impedance   | 57.2 $\Omega$ – 6.3 j $\Omega$ |
| Return Loss | -21.0 dB                       |

**Antenna Parameters with Head TSL at 5800 MHz**

|             |                                |
|-------------|--------------------------------|
| Impedance   | 55.5 $\Omega$ + 3.2 j $\Omega$ |
| Return Loss | -24.4 dB                       |

**General Antenna Parameters and Design**

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.201 ns |
|----------------------------------|----------|

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint 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 feedpoint may be damaged.

**Additional EUT Data**

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

System Performance Check Report

Summary

| Dipole           | Frequency [MHz] | TSL | Power [dBm] |
|------------------|-----------------|-----|-------------|
| D5GHzV2 - SN1006 | 5250            | HSL | 20          |

Exposure Conditions

| Phantom Section, TSL | Test Distance [mm] | Band    | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|--------------------|---------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat                 | 10                 | CW, 0-- |            | 5250, 0                         | 5.58              | 4.64                   | 36.2             |

Hardware Setup

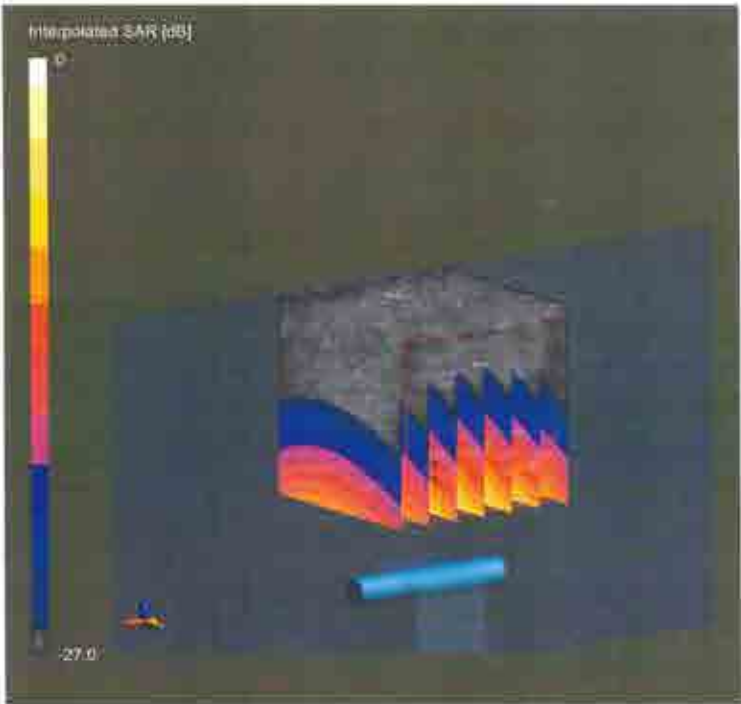
| Phantom         | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
|-----------------|--------------------|-----------------------------|---------------------------|
| MFP V8.0 Center | HSL, 2024-10-15    | EX3DV6 - SN7349, 2024-06-03 | DAE4ip Sn1836, 2024-01-10 |

Scans Setup

|                     | Zoom Scan       |
|---------------------|-----------------|
| Grid Extents [mm]   | 22 x 22 x 22    |
| Grid Steps [mm]     | 4.0 x 4.0 x 1.4 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.4             |
| MAIA                | N/A             |
| Surface Detection   | All points      |
| Scan Method         | Measured        |

Measurement Results

|                     | Zoom Scan           |
|---------------------|---------------------|
| Date                | 2024-10-15          |
| psSAR1g [W/Kg]      | 8.06                |
| psSAR10g [W/Kg]     | 2.28                |
| Power Drift [dB]    | -0.09               |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Correction      | Positive / Negative |



0 dB = 32.5 W/Kg

System Performance Check Report

Summary

|                  |                 |     |             |
|------------------|-----------------|-----|-------------|
| Dipole           | Frequency [MHz] | TSL | Power [dBm] |
| D5GHzV2 - SN1006 | 5600            | HSL | 20          |

Exposure Conditions

|                      |                    |         |            |                                 |                   |                        |                  |
|----------------------|--------------------|---------|------------|---------------------------------|-------------------|------------------------|------------------|
| Phantom Section, TSL | Test Distance [mm] | Band    | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
| Flat                 | 10                 | CW, 0-- |            | 5600, 0                         | 5.03              | 5.04                   | 35.8             |

Hardware Setup

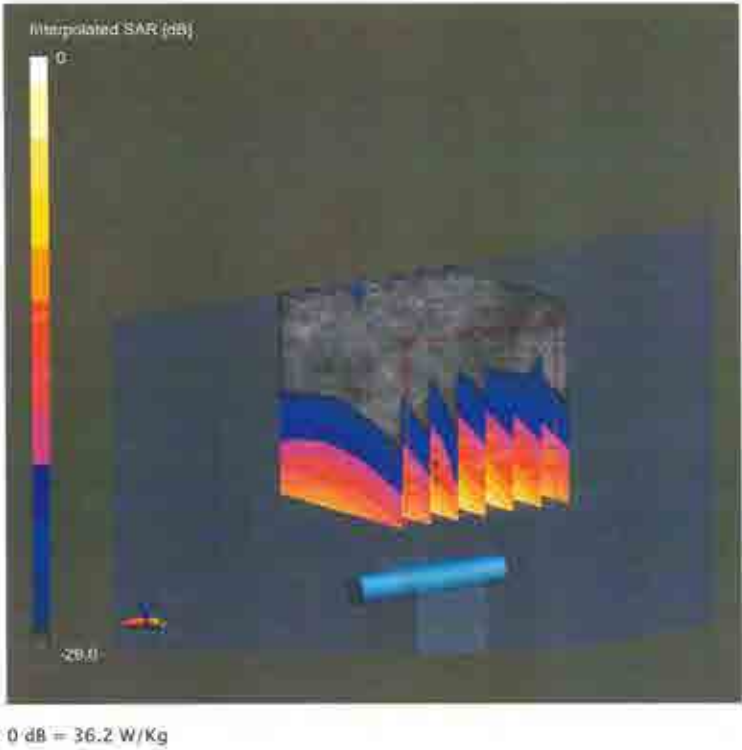
|                 |                    |                             |                           |
|-----------------|--------------------|-----------------------------|---------------------------|
| Phantom         | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
| MFP V8.0 Center | HSL, 2024-10-15    | EX3DV4 - SN7349, 2024-06-03 | DAE4ip Sn1836, 2024-01-10 |

Scans Setup

|                     |                 |
|---------------------|-----------------|
|                     | Zoom Scan       |
| Grid Extents [mm]   | 22 x 22 x 22    |
| Grid Steps [mm]     | 4.0 x 4.0 x 1.4 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.4             |
| MAIA                | N/A             |
| Surface Detection   | All points      |
| Scan Method         | Measured        |

Measurement Results

|                     |                     |
|---------------------|---------------------|
|                     | Zoom Scan           |
| Date                | 2024-10-15          |
| psSAR1g [W/Kg]      | 8.34                |
| psSAR10g [W/Kg]     | 2.37                |
| Power Drift [dB]    | -0.02               |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Correction      | Positive / Negative |



System Performance Check Report

Summary

| Dipole           | Frequency [MHz] | TSL | Power [dBm] |
|------------------|-----------------|-----|-------------|
| D5GHzV2 - SN1006 | 5800            | HSL | 20          |

Exposure Conditions

| Phantom Section, TSL | Test Distance [mm] | Band    | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|----------------------|--------------------|---------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat                 | 10                 | CW, 0-- |            | 5800, 0                         | 5.08              | 5.21                   | 35.6             |

Hardware Setup

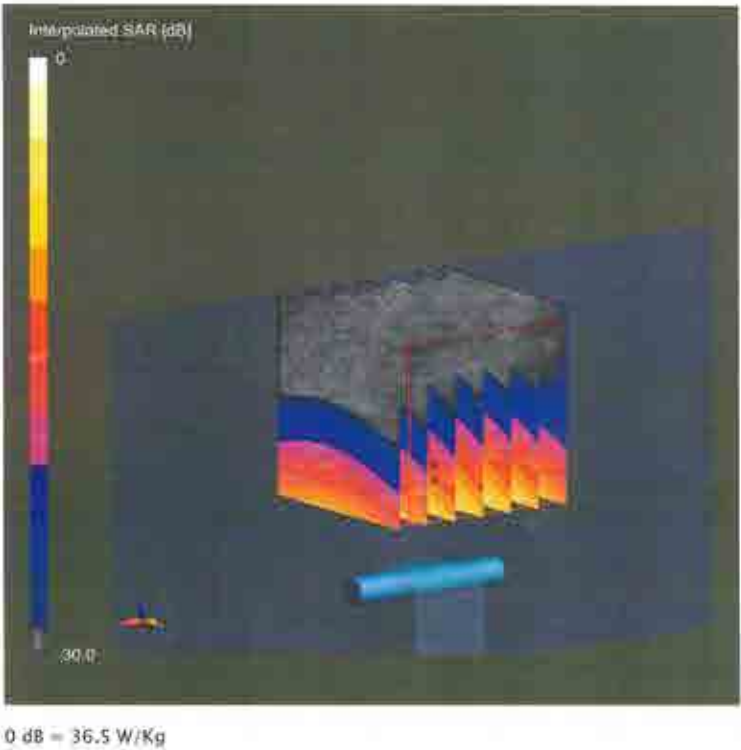
| Phantom         | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date     |
|-----------------|--------------------|-----------------------------|---------------------------|
| MFP V8.0 Center | HSL, 2024-10-15    | EX3DV4 - SN7349, 2024-06-03 | DAE4ip Sn1836, 2024-01-10 |

Scans Setup

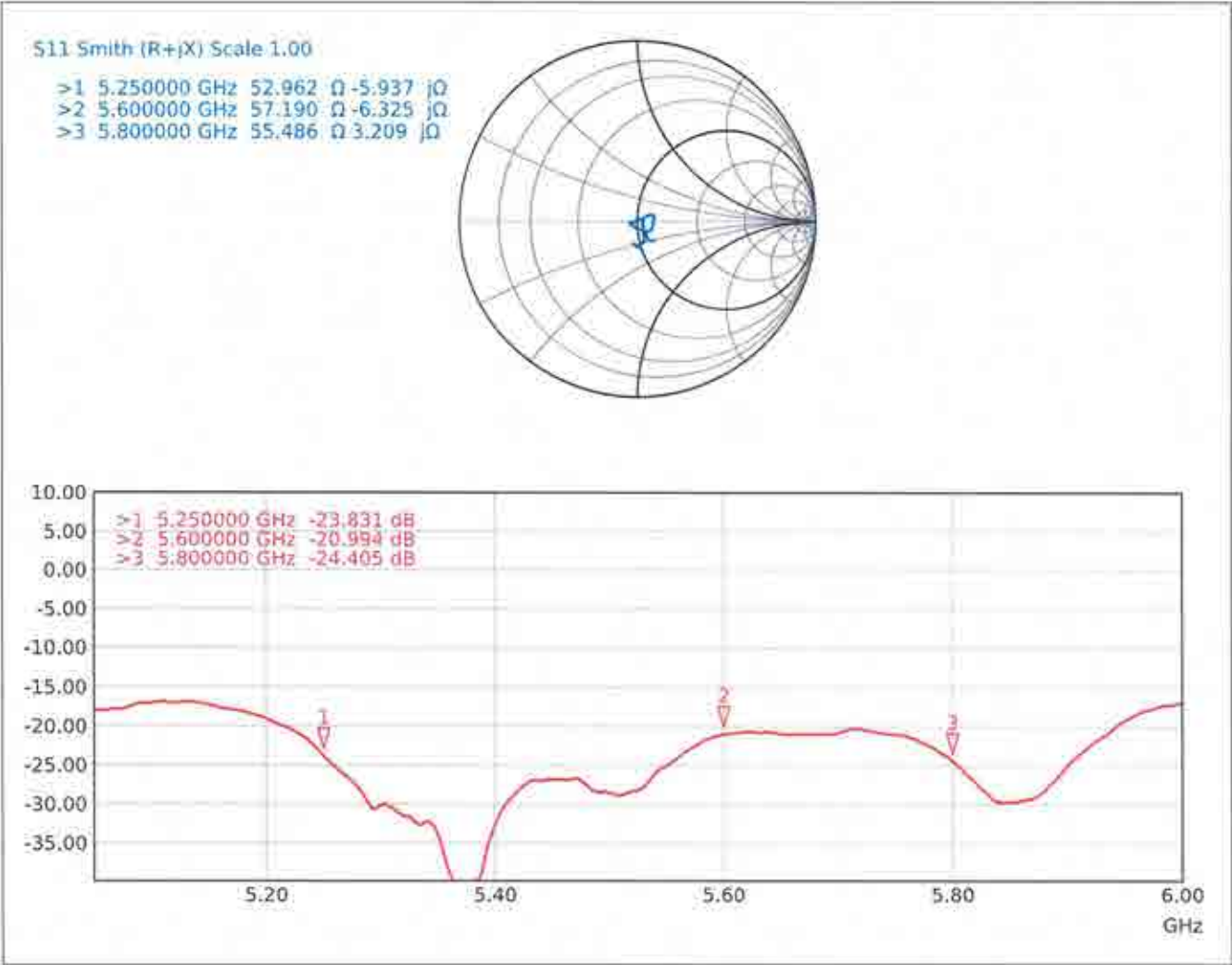
|                     | Zoom Scan       |
|---------------------|-----------------|
| Grid Extents [mm]   | 22 x 22 x 22    |
| Grid Steps [mm]     | 4.0 x 4.0 x 1.4 |
| Sensor Surface [mm] | 1.4             |
| Graded Grid         | Yes             |
| Grading Ratio       | 1.4             |
| MAIA                | N/A             |
| Surface Detection   | All points      |
| Scan Method         | Measured        |

Measurement Results

|                     | Zoom Scan           |
|---------------------|---------------------|
| Date                | 2024-10-15          |
| psSAR1g [W/Kg]      | 8.06                |
| psSAR10g [W/Kg]     | 2.27                |
| Power Drift [dB]    | -0.02               |
| Power Scaling       | Disabled            |
| Scaling Factor [dB] |                     |
| TSL Correction      | Positive / Negative |



Impedance Measurement Plot for Head TSL



## D5000V2, serial no. 1006 Extended Dipole Calibrations

If dipoles are verified in return loss ( $< -20\text{dB}$ , 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.

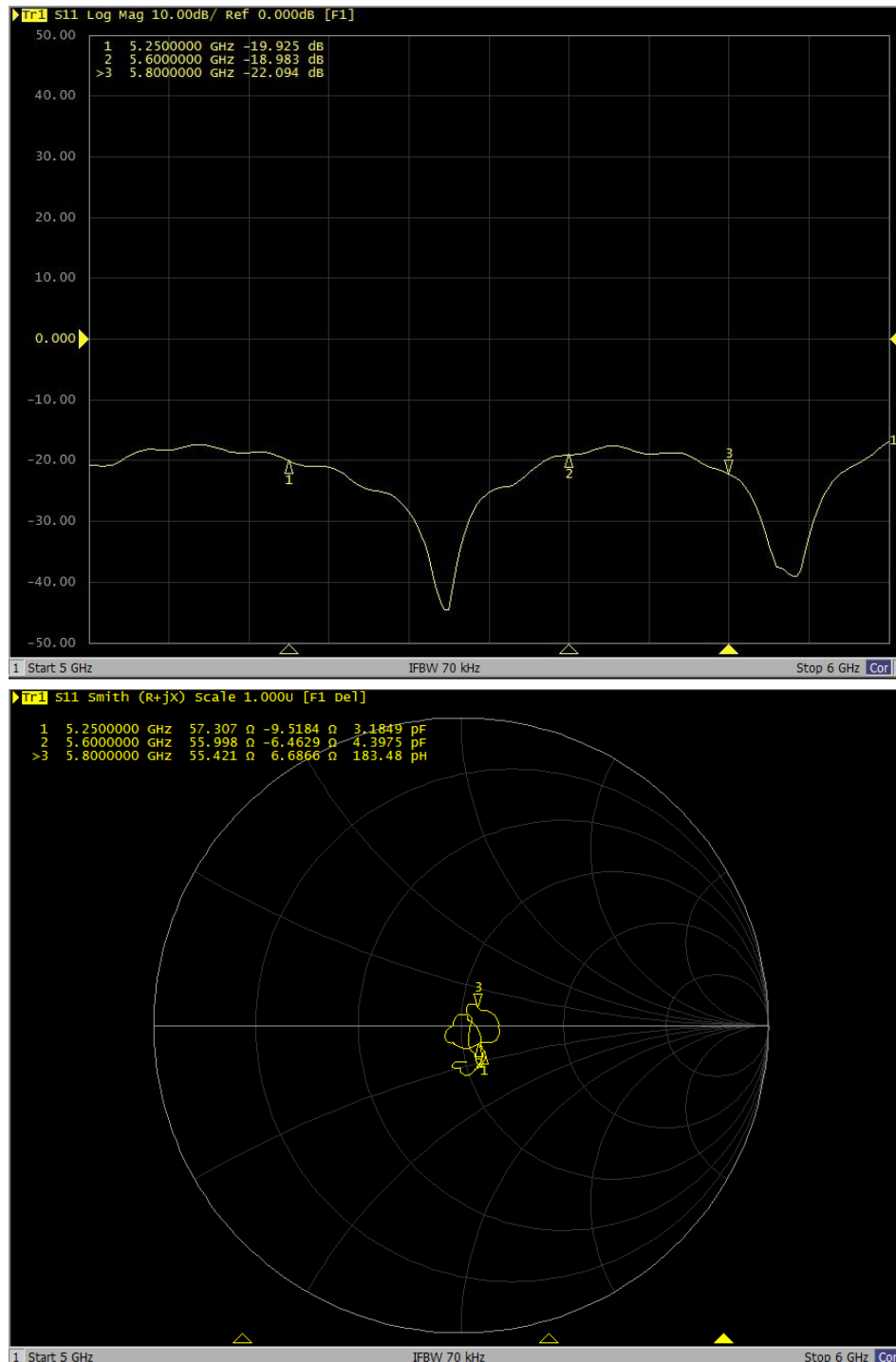
### <Justification of the extended calibration>

| D5000V2 – serial no. 1006   |                  |           |                      |             |                           |             |
|-----------------------------|------------------|-----------|----------------------|-------------|---------------------------|-------------|
| 5250MHZ                     |                  |           |                      |             |                           |             |
| Date of Measurement         | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (ohm) | Delta (ohm) |
| 10.15.2024<br>(Cal. Report) | -23.831          |           | 52.962               |             | -5.937                    |             |
| 10.14.2025<br>(extended)    | -19.925          | 16.39%    | 57.307               | 4.345       | -9.5184                   | -3.5814     |
| 5600MHZ                     |                  |           |                      |             |                           |             |
| Date of Measurement         | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (ohm) | Delta (ohm) |
| 10.15.2024<br>(Cal. Report) | -20.994          |           | 57.190               |             | -6.325                    |             |
| 10.14.2025<br>(extended)    | -18.983          | 9.579%    | 55.998               | -1.192      | -6.4629                   | -0.1379     |
| 5800MHZ                     |                  |           |                      |             |                           |             |
| Date of Measurement         | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (ohm) | Delta (ohm) |
| 10.15.2024<br>(Cal. Report) | -24.405          |           | 55.486               |             | 3.209                     |             |
| 10.14.2025<br>(extended)    | -22.094          | 9.469%    | 55.421               | -0.065      | 6.6866                    | 3.4776      |

The return loss is  $< -20\text{dB}$ , within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

<Dipole Verification Data> - D5000V2, serial no. 1006 (Data of Measurement : 10.14.2025)

5000 MHz - Head





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **Sporton**  
Taoyuan City

Certificate No: DAE4-1697\_Nov25

## CALIBRATION CERTIFICATE

Object DAE4 - SD 000 D04 BO - SN: 1697

Calibration procedure(s) QA CAL-06.v30  
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: November 19, 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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards             | ID #               | Cal Date (Certificate No.) | Scheduled Calibration  |
|-------------------------------|--------------------|----------------------------|------------------------|
| Keithley Multimeter Type 2001 | SN: 0810278        | 15-Aug-25 (No:43873)       | Aug-26                 |
| Secondary Standards           | ID #               | Check Date (in house)      | Scheduled Check        |
| Auto DAE Calibration Unit     | SE UWS 053 AA 1001 | 23-Jan-25 (in house check) | In house check: Jan-26 |
| Calibrator Box V2.1           | SE UMS 006 AA 1002 | 23-Jan-25 (in house check) | In house check: Jan-26 |

|                |                   |                                   |               |
|----------------|-------------------|-----------------------------------|---------------|
| Calibrated by: | Name<br>Timo Rott | Function<br>Laboratory Technician | Signature<br> |
|----------------|-------------------|-----------------------------------|---------------|

|              |           |                   |  |
|--------------|-----------|-------------------|--|
| Approved by: | Sven Kühn | Technical Manager |  |
|--------------|-----------|-------------------|--|

Issued: November 19, 2025

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

## Glossary

|                 |                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------|
| DAE             | data acquisition electronics                                                            |
| Connector angle | information used in DASY system to align probe sensor X to the robot coordinate system. |

## Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement:* Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1  $\mu$ V, full range = -100...+300 mV

Low Range: 1LSB = 61 nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X                          | Y                          | Z                          |
|---------------------|----------------------------|----------------------------|----------------------------|
| High Range          | $404.438 \pm 0.02\% (k=2)$ | $404.738 \pm 0.02\% (k=2)$ | $404.624 \pm 0.02\% (k=2)$ |
| Low Range           | $4.00215 \pm 1.50\% (k=2)$ | $4.00745 \pm 1.50\% (k=2)$ | $3.94531 \pm 1.50\% (k=2)$ |

## Connector Angle

|                                           |                              |
|-------------------------------------------|------------------------------|
| Connector Angle to be used in DASY system | $11.0^{\circ} \pm 1^{\circ}$ |
|-------------------------------------------|------------------------------|

## Appendix (Additional assessments outside the scope of SCS0108)

### 1. DC Voltage Linearity

| High Range |         | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|------------|---------|---------------------------|------------------------------|-----------|
| Channel X  | + Input | 199998.66                 | -0.71                        | -0.00     |
| Channel X  | + Input | 20004.07                  | -1.18                        | -0.01     |
| Channel X  | - Input | -19998.67                 | 1.11                         | -0.01     |
| Channel Y  | + Input | 199999.23                 | 0.22                         | 0.00      |
| Channel Y  | + Input | 20004.93                  | -0.24                        | -0.00     |
| Channel Y  | - Input | -19999.88                 | 0.05                         | -0.00     |
| Channel Z  | + Input | 199999.77                 | 0.48                         | 0.00      |
| Channel Z  | + Input | 20002.67                  | -2.40                        | -0.01     |
| Channel Z  | - Input | -20001.05                 | -1.08                        | 0.01      |

| Low Range |         | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-----------|---------|---------------------------|------------------------------|-----------|
| Channel X | + Input | 2004.89                   | 1.26                         | 0.06      |
| Channel X | + Input | 204.40                    | 0.53                         | 0.26      |
| Channel X | - Input | -195.63                   | 0.25                         | -0.13     |
| Channel Y | + Input | 2004.39                   | 0.77                         | 0.04      |
| Channel Y | + Input | 203.80                    | -0.04                        | -0.02     |
| Channel Y | - Input | -196.50                   | -0.63                        | 0.32      |
| Channel Z | + Input | 2004.52                   | 0.92                         | 0.05      |
| Channel Z | + Input | 202.93                    | -0.86                        | -0.42     |
| Channel Z | - Input | -197.29                   | -1.39                        | 0.71      |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Common mode Input Voltage (mV) | High Range Average Reading ( $\mu\text{V}$ ) | Low Range Average Reading ( $\mu\text{V}$ ) |
|-----------|--------------------------------|----------------------------------------------|---------------------------------------------|
| Channel X | 200                            | -2.84                                        | -4.58                                       |
|           | - 200                          | 6.22                                         | 4.24                                        |
| Channel Y | 200                            | -17.41                                       | -18.03                                      |
|           | - 200                          | 17.27                                        | 17.25                                       |
| Channel Z | 200                            | 5.50                                         | 5.15                                        |
|           | - 200                          | -7.99                                        | -7.91                                       |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Input Voltage (mV) | Channel X ( $\mu\text{V}$ ) | Channel Y ( $\mu\text{V}$ ) | Channel Z ( $\mu\text{V}$ ) |
|-----------|--------------------|-----------------------------|-----------------------------|-----------------------------|
| Channel X | 200                | -                           | 1.11                        | -3.09                       |
| Channel Y | 200                | 6.24                        | -                           | 2.43                        |
| Channel Z | 200                | 9.12                        | 4.09                        | -                           |

#### 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | High Range (LSB) | Low Range (LSB) |
|-----------|------------------|-----------------|
| Channel X | 16229            | 14208           |
| Channel Y | 16217            | 14348           |
| Channel Z | 16033            | 16567           |

#### 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M $\Omega$

|           | Average ( $\mu$ V) | min. Offset ( $\mu$ V) | max. Offset ( $\mu$ V) | Std. Deviation ( $\mu$ V) |
|-----------|--------------------|------------------------|------------------------|---------------------------|
| Channel X | 0.79               | 0.01                   | 2.22                   | 0.34                      |
| Channel Y | -0.21              | -0.86                  | 0.86                   | 0.33                      |
| Channel Z | -0.78              | -2.12                  | -0.03                  | 0.35                      |

#### 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

#### 7. Input Resistance (Typical values for information)

|           | Zeroing (kOhm) | Measuring (MOhm) |
|-----------|----------------|------------------|
| Channel X | 200            | 200              |
| Channel Y | 200            | 200              |
| Channel Z | 200            | 200              |

#### 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|----------------|-------------------|
| Supply (+ Vcc) | +7.9              |
| Supply (- Vcc) | -7.6              |

#### 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|----------------|-------------------|---------------|-------------------|
| Supply (+ Vcc) | +0.01             | +6            | +14               |
| Supply (- Vcc) | -0.01             | -8            | -9                |



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client: **Sporton**  
Taoyuan City

Certificate No: DAE4-1707\_Nov25

## CALIBRATION CERTIFICATE

Object: DAE4 - SD 000 D04 BO - SN: 1707

Calibration procedure(s): QA CAL-06.v30  
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: November 20, 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  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards             | ID #               | Cal Date (Certificate No.) | Scheduled Calibration  |
|-------------------------------|--------------------|----------------------------|------------------------|
| Keithley Multimeter Type 2001 | SN: 0810278        | 15-Aug-25 (No:43873)       | Aug-26                 |
| Secondary Standards           | ID #               | Check Date (in house)      | Scheduled Check        |
| Auto DAE Calibration Unit     | SE UWS 053 AA 1001 | 23-Jan-25 (in house check) | In house check: Jan-26 |
| Calibrator Box V2.1           | SE UMS 006 AA 1002 | 23-Jan-25 (in house check) | In house check: Jan-26 |

|               |                   |                                   |                                                                                                    |
|---------------|-------------------|-----------------------------------|----------------------------------------------------------------------------------------------------|
| Calibrated by | Name<br>Timo Rott | Function<br>Laboratory Technician | Signature<br> |
| Approved by   | Sven Kühn         | Technical Manager                 |               |

Issued: November 21, 2025

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Accreditation No.: **SCS 0108**

## Glossary

|                 |                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------|
| DAE             | data acquisition electronics                                                            |
| Connector angle | information used in DASY system to align probe sensor X to the robot coordinate system. |

## Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement*: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity*: Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity*: Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation*: Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted*: Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current*: Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance*: Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage*: Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption*: Typical value for information. Supply currents in various operating modes.

## DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1  $\mu$ V, full range = -100...+300 mV

Low Range: 1LSB = 61 nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

| Calibration Factors | X                         | Y                         | Z                         |
|---------------------|---------------------------|---------------------------|---------------------------|
| High Range          | 404.151 $\pm$ 0.02% (k=2) | 404.055 $\pm$ 0.02% (k=2) | 403.898 $\pm$ 0.02% (k=2) |
| Low Range           | 3.98055 $\pm$ 1.50% (k=2) | 3.97249 $\pm$ 1.50% (k=2) | 3.97532 $\pm$ 1.50% (k=2) |

## Connector Angle

|                                           |                  |
|-------------------------------------------|------------------|
| Connector Angle to be used in DASY system | 27.0 ° $\pm$ 1 ° |
|-------------------------------------------|------------------|

## Appendix (Additional assessments outside the scope of SCS0108)

### 1. DC Voltage Linearity

| High Range |         | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|------------|---------|---------------------------|------------------------------|-----------|
| Channel X  | + Input | 199995.76                 | -0.04                        | -0.00     |
| Channel X  | + Input | 20002.58                  | 0.56                         | 0.00      |
| Channel X  | - Input | -20001.01                 | 2.08                         | -0.01     |
| Channel Y  | + Input | 199995.93                 | -0.03                        | -0.00     |
| Channel Y  | + Input | 19999.26                  | -2.43                        | -0.01     |
| Channel Y  | - Input | -20004.50                 | -1.06                        | 0.01      |
| Channel Z  | + Input | 199995.85                 | -0.03                        | -0.00     |
| Channel Z  | + Input | 20000.08                  | -1.76                        | -0.01     |
| Channel Z  | - Input | -20005.07                 | -1.76                        | 0.01      |

| Low Range |         | Reading ( $\mu\text{V}$ ) | Difference ( $\mu\text{V}$ ) | Error (%) |
|-----------|---------|---------------------------|------------------------------|-----------|
| Channel X | + Input | 2000.46                   | 0.15                         | 0.01      |
| Channel X | + Input | 201.01                    | 0.36                         | 0.18      |
| Channel X | - Input | -198.53                   | 0.66                         | -0.33     |
| Channel Y | + Input | 2000.18                   | 0.03                         | 0.00      |
| Channel Y | + Input | 199.75                    | -0.59                        | -0.29     |
| Channel Y | - Input | -199.92                   | -0.41                        | 0.21      |
| Channel Z | + Input | 1999.98                   | -0.21                        | -0.01     |
| Channel Z | + Input | 199.12                    | -1.33                        | -0.66     |
| Channel Z | - Input | -201.40                   | -1.89                        | 0.95      |

### 2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Common mode Input Voltage (mV) | High Range Average Reading ( $\mu\text{V}$ ) | Low Range Average Reading ( $\mu\text{V}$ ) |
|-----------|--------------------------------|----------------------------------------------|---------------------------------------------|
| Channel X | 200                            | 6.87                                         | 5.11                                        |
|           | - 200                          | -4.04                                        | -5.44                                       |
| Channel Y | 200                            | 0.05                                         | -0.27                                       |
|           | - 200                          | -0.73                                        | -1.22                                       |
| Channel Z | 200                            | -5.18                                        | -5.80                                       |
|           | - 200                          | 3.55                                         | 2.86                                        |

### 3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | Input Voltage (mV) | Channel X ( $\mu\text{V}$ ) | Channel Y ( $\mu\text{V}$ ) | Channel Z ( $\mu\text{V}$ ) |
|-----------|--------------------|-----------------------------|-----------------------------|-----------------------------|
| Channel X | 200                | -                           | 3.19                        | -3.67                       |
| Channel Y | 200                | 6.56                        | -                           | 4.43                        |
| Channel Z | 200                | 7.97                        | 4.24                        | -                           |

#### 4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

|           | High Range (LSB) | Low Range (LSB) |
|-----------|------------------|-----------------|
| Channel X | 16123            | 16544           |
| Channel Y | 16230            | 14039           |
| Channel Z | 16093            | 17786           |

#### 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M $\Omega$

|           | Average ( $\mu$ V) | min. Offset ( $\mu$ V) | max. Offset ( $\mu$ V) | Std. Deviation ( $\mu$ V) |
|-----------|--------------------|------------------------|------------------------|---------------------------|
| Channel X | 0.47               | -0.39                  | 1.27                   | 0.32                      |
| Channel Y | -0.45              | -1.46                  | 0.30                   | 0.29                      |
| Channel Z | -0.93              | -2.06                  | -0.03                  | 0.42                      |

#### 6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

#### 7. Input Resistance (Typical values for information)

|           | Zeroing (kOhm) | Measuring (MOhm) |
|-----------|----------------|------------------|
| Channel X | 200            | 200              |
| Channel Y | 200            | 200              |
| Channel Z | 200            | 200              |

#### 8. Low Battery Alarm Voltage (Typical values for information)

| Typical values | Alarm Level (VDC) |
|----------------|-------------------|
| Supply (+ Vcc) | +7.9              |
| Supply (- Vcc) | -7.6              |

#### 9. Power Consumption (Typical values for information)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|----------------|-------------------|---------------|-------------------|
| Supply (+ Vcc) | +0.01             | +6            | +14               |
| Supply (- Vcc) | -0.01             | -8            | -9                |



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Accreditation No.: SCS 0108

Client

Sporton  
Taoyuan City

Certificate No.

EX-3931\_Oct25

## CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3931

Calibration procedure(s) QA CAL-01.v10, QA CAL-12.v10, QA CAL-14.v7, QA CAL-23.v6,  
QA CAL-25.v8, QA CAL-48.v2  
Calibration procedure for dosimetric E-field probes

Calibration date October 23, 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  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID         | Calibration Date (Certificate No.)     | Sched. Cal. |
|-----------------------------|------------|----------------------------------------|-------------|
| Power Sensor R&S NRP-33T    | SN: 100967 | 30-Apr-25 (No. 1020-300791789)         | Apr-26      |
| N-type mismatch combination | SN: L1119  | 26-Mar-25 (No. 217-04292)              | Mar-26      |
| OCP DAK-12                  | SN: 1016   | 16-Sept-25 (No. OCP-DAK12-1016_Sep25)  | Sep-26      |
| OCP DAK-3.5                 | SN: 1249   | 16-Sept-25 (No. OCP-DAK3.5-1249_Sep25) | Sep-26      |
| Reference Probe EX3DV4      | SN: 7349   | 10-Jan-25 (No. EX3-7349_Jan25)         | Jan-26      |
| DAE4                        | SN: 1301   | 07-Nov-24 (No. DAE4-1301_Nov24)        | Nov-25      |

| Secondary Standards | ID        | Check Date (in house)                 | Sched. Check |
|---------------------|-----------|---------------------------------------|--------------|
| ACAP 2020 Setup 1   | SN: L1404 | 01-Oct-25 (No. IHCK_ACAP2020-1_Oct25) | Oct-26       |
| OCP DAK-12          | SN: 1029  | 27-Feb-25 (No. OCP-DAK12-1029_Feb25)  | Feb-26       |
| OCP DAK-3.5         | SN: 1336  | 09-Dec-24 (No. OCP-DAK3.5-1336_Dec24) | Dec-25       |

|               |                |                       |
|---------------|----------------|-----------------------|
|               | Name           | Function              |
| Calibrated by | Joanna Lleshaj | Laboratory Technician |
| Approved by   | Sven Kühn      | Technical Manager     |

Signature

Issued: October 23, 2025

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Accreditation No.: **SCS 0108**

## Glossary

|                        |                                                                                                                                                |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                    | tissue simulating liquid                                                                                                                       |
| NORM <sub>x,y,z</sub>  | sensitivity in free space                                                                                                                      |
| ConvF                  | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                     |
| DCP                    | diode compression point                                                                                                                        |
| CF                     | crest factor (1/duty_cycle) of the RF signal                                                                                                   |
| A, B, C, D             | modulation dependent linearization parameters                                                                                                  |
| Polarization $\varphi$ | $\varphi$ rotation around probe axis                                                                                                           |
| Polarization $\theta$  | $\theta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ is normal to probe axis |
| Connector Angle        | information used in DASY system to align probe sensor X to the robot coordinate system                                                         |

## 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-Worn 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"

## Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\theta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below ConvF).
- NORM(f)<sub>x,y,z</sub> = NORM<sub>x,y,z</sub> \* frequency\_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal. DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM<sub>x</sub> (no uncertainty required).

## Parameters of Probe: EX3DV4 - SN:3931

## Basic Calibration Parameters

|                                                           | Sensor X | Sensor Y | Sensor Z | Unc (k = 2)  |
|-----------------------------------------------------------|----------|----------|----------|--------------|
| Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 0.61     | 0.61     | 0.60     | $\pm 10.1\%$ |
| DCP (mV) <sup>B</sup>                                     | 105.8    | 107.8    | 108.1    | $\pm 4.7\%$  |

## Calibration Results for Modulation Response

| UID   | Communication System Name      |   | A<br>dB | B<br>dB $\sqrt{\mu\text{V}}$ | C     | D<br>dB | VR<br>mV | Max<br>dev. | Max<br>Unc <sup>E</sup><br>k = 2 |
|-------|--------------------------------|---|---------|------------------------------|-------|---------|----------|-------------|----------------------------------|
| 0     | Continuous Wave                | X | 0.00    | 0.00                         | 1.00  | 0.00    | 121.1    | $\pm 1.1\%$ | $\pm 4.7\%$                      |
|       |                                | Y | 0.00    | 0.00                         | 1.00  |         | 146.0    |             |                                  |
|       |                                | Z | 0.00    | 0.00                         | 1.00  |         | 148.4    |             |                                  |
| 10352 | Pulse (D=10%, T=5 ms)          | X | 0.23    | 59.88                        | 14.91 | 10.00   | 23.0     | $\pm 1.8\%$ | $\pm 9.6\%$                      |
|       |                                | Y | 0.25    | 60.98                        | 14.99 |         | 23.0     |             |                                  |
|       |                                | Z | 0.25    | 63.18                        | 15.91 |         | 24.0     |             |                                  |
| 10353 | Pulse (D=20%, T=5 ms)          | X | 0.22    | 62.89                        | 14.95 | 6.99    | 46.0     | $\pm 1.5\%$ | $\pm 9.6\%$                      |
|       |                                | Y | 0.24    | 63.99                        | 15.02 |         | 47.0     |             |                                  |
|       |                                | Z | 0.23    | 66.19                        | 15.94 |         | 47.0     |             |                                  |
| 10354 | Pulse (D=40%, T=5 ms)          | X | 0.20    | 65.90                        | 14.99 | 3.98    | 93.0     | $\pm 1.3\%$ | $\pm 9.6\%$                      |
|       |                                | Y | 0.22    | 67.00                        | 15.06 |         | 94.0     |             |                                  |
|       |                                | Z | 0.21    | 69.20                        | 15.96 |         | 94.0     |             |                                  |
| 10355 | Pulse (D=60%, T=5 ms)          | X | 0.19    | 67.66                        | 15.02 | 2.22    | 139.0    | $\pm 1.2\%$ | $\pm 9.6\%$                      |
|       |                                | Y | 0.21    | 68.76                        | 15.07 |         | 141.0    |             |                                  |
|       |                                | Z | 0.20    | 70.96                        | 15.98 |         | 141.0    |             |                                  |
| 10387 | Random (BW=1 MHz, MOD=QPSK)    | X | 0.00    | 64.78                        | 16.25 | 0.34    | 107.0    | $\pm 1.2\%$ | $\pm 9.6\%$                      |
|       |                                | Y | 0.00    | 65.88                        | 16.03 |         | 108.0    |             |                                  |
|       |                                | Z | 0.00    | 68.08                        | 16.63 |         | 109.0    |             |                                  |
| 10388 | Random (BW=10 MHz, MOD=QPSK)   | X | 0.58    | 64.66                        | 14.13 | 0.00    | 113.0    | $\pm 2.7\%$ | $\pm 9.6\%$                      |
|       |                                | Y | 0.66    | 65.77                        | 14.37 |         | 114.0    |             |                                  |
|       |                                | Z | 0.81    | 67.97                        | 15.36 |         | 115.0    |             |                                  |
| 10396 | Random (BW=100 kHz, MOD=64QAM) | X | 0.00    | 63.60                        | 17.62 | 1.53    | 82.0     | $\pm 2.8\%$ | $\pm 9.6\%$                      |
|       |                                | Y | 0.00    | 64.71                        | 17.10 |         | 83.0     |             |                                  |
|       |                                | Z | 0.00    | 66.91                        | 17.44 |         | 83.0     |             |                                  |
| 10399 | Random (BW=40 MHz, MOD=64QAM)  | X | 1.62    | 63.60                        | 13.08 | 0.00    | 104.0    | $\pm 4.3\%$ | $\pm 9.6\%$                      |
|       |                                | Y | 1.75    | 64.71                        | 13.68 |         | 106.0    |             |                                  |
|       |                                | Z | 2.01    | 66.91                        | 14.97 |         | 107.0    |             |                                  |
| 10414 | Random (BW=40 MHz, HIGH PAR)   | X | 1.97    | 61.34                        | 12.98 | 0.00    | 75.0     | $\pm 2.3\%$ | $\pm 9.6\%$                      |
|       |                                | Y | 2.14    | 62.44                        | 13.62 |         | 76.0     |             |                                  |
|       |                                | Z | 2.53    | 64.64                        | 14.94 |         | 77.0     |             |                                  |

Note: For details on UID parameters see Appendix

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%.

<sup>A</sup> The uncertainties of Norm X,Y,Z do not affect the  $E^2$ -field uncertainty inside TSL (see Pages 5 and 6).

<sup>B</sup> Linearization parameter uncertainty for maximum specified field strength.

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.