**Calibration Laboratory of**
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
C 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**

| | | | |
|---|---|---|---|
| **Client** | **Sporton**<br>**Taoyuan City** | **Certificate No.** | **D750V3-1117_Mar25** |

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D750V3 - SN: 1117 |
| Calibration procedure(s) | QA CAL-05.v12<br>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 ± 3)°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.

## 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 ±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 ±0.2)°C | 42.7 ±6% | 0.890 mho/m ±6% |
| **HSL temperature change during test** | < 0.5 °C | | |

## SAR result with HSL at 750 MHz

| **SAR averaged over 1 $cm^3$ (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 ±17.0% (k = 2) |

| **SAR averaged over 10 $cm^3$ (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 ±16.5% (k = 2) |

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

### Antenna Parameters with HSL at 750 MHz

| | |
|---|---|
| Impedance | 52.2 Ω – 3.3 jΩ |
| 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

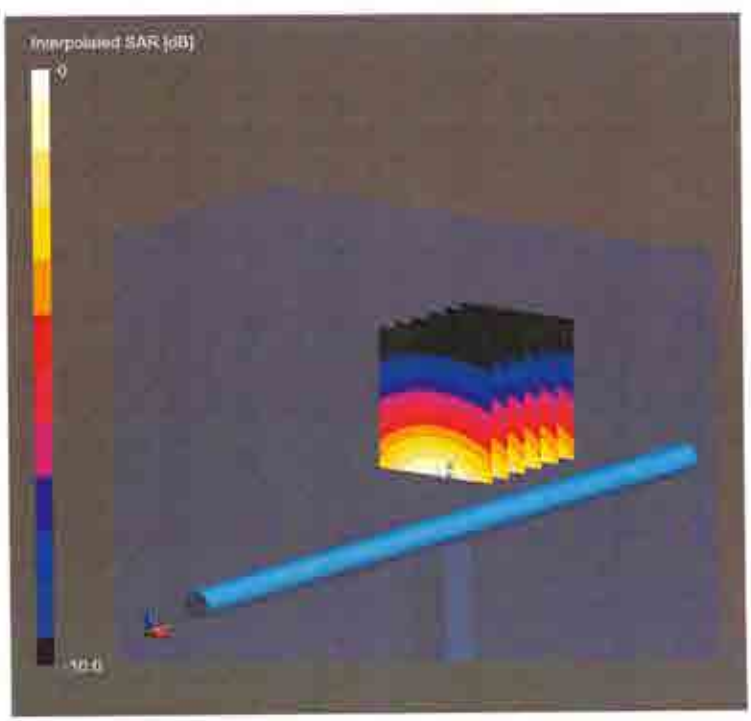
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Flat V4.9 mod | HSL, 2025-03-12 | EX3DV4 – SN7349, 2025-01-10 | DAE4ip Sn1836, 2024-10-28 |

### 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 |

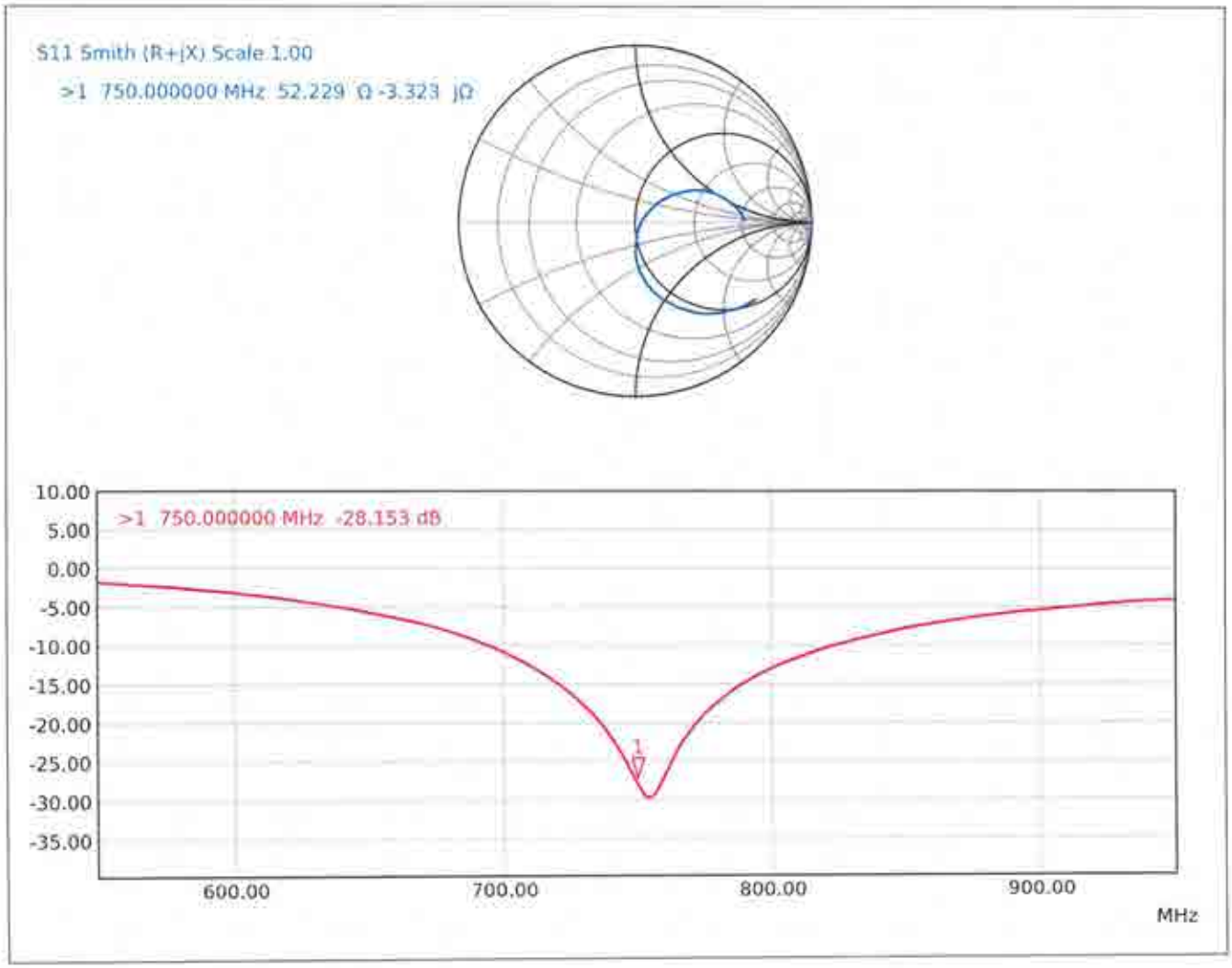
### Measurement Results

| | 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 (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

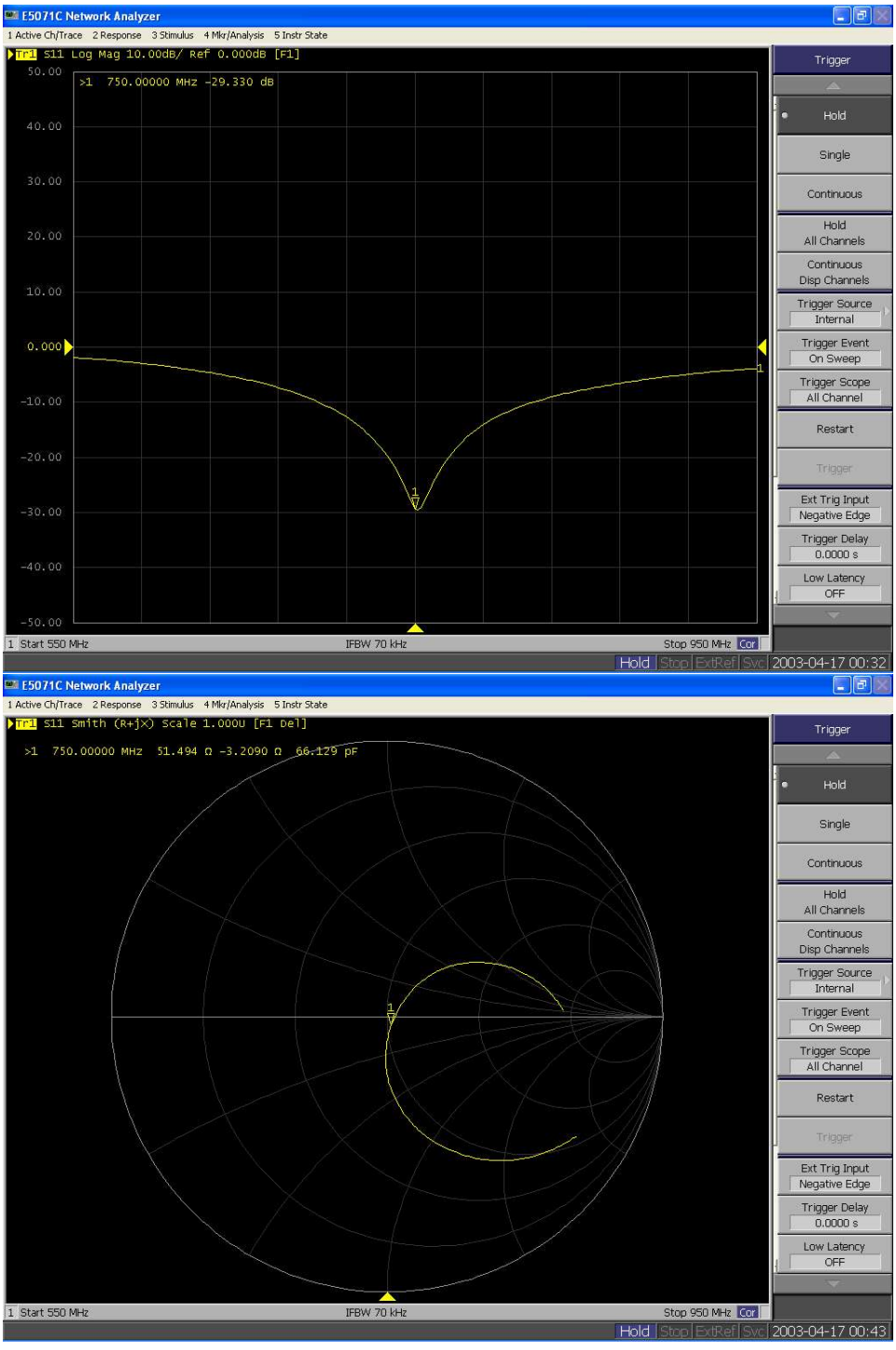
**<Justification of the extended calibration>**

| 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 (Cal. Report) | -28.2 | | 52.2 | | -3.3 | |
| 03.11.2026 (extended) | -29.33 | -4 | 51.494 | -0.706 | -3.209 | 0.091 |

The return loss is < -20dB, 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**

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**Accreditation No.: SCS 0108**

**Client** Sporton
Taoyuan City

**Certificate No.** D835V2-4d167_Dec25

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D835V2 - SN: 4d167 |
| Calibration procedure(s) | QA CAL-05.v13<br>Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz |
| Calibration date | December 2, 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 $(22 \pm 3)^{\circ}C$ 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 | Paulo Pina | Laboratory Technician | |
| Approved by | Sven Kühn | Technical Manager | |

Issued: December 2, 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 | 17.0.2 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Modular Flat Phantom | |
| **Distance Dipole Center - TSL** | 15 mm | with spacer |
| **Frequency** | 835MHz ±1MHz | |

## HSL parameters at 835 MHz

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal HSL parameters** | 22.0 °C | 41.5 | 0.90 mho/m |
| **Measured HSL parameters** | (22.0 ±0.2)°C | 41.6 ±6% | 0.91 mho/m ±6% |
| **HSL temperature change during test** | < 0.5 °C | | |

## SAR result with HSL at 835 MHz

| **SAR averaged over 1 $cm^3$ (1 g) of HSL** | Condition | |
|---|---|---|
| SAR for nominal HSL parameters | 24 dBm input power | 2.35 W/kg |
| SAR for nominal HSL parameters | normalized to 1W | 9.36 W/kg ±17.0% (k = 2) |

| **SAR averaged over 10 $cm^3$ (10 g) of HSL** | Condition | |
|---|---|---|
| SAR for nominal HSL parameters | 24 dBm input power | 1.52 W/kg |
| SAR for nominal HSL parameters | normalized to 1W | 6.05 W/kg ±16.5% (k = 2) |

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

### Antenna Parameters with HSL at 835 MHz

| | |
|---|---|
| Impedance | 52.5 Ω - 3.1 jΩ |
| Return Loss | -28.2 dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.392 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 - SN4d167 | 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 | 0.91 | 41.6 |

### Hardware Setup

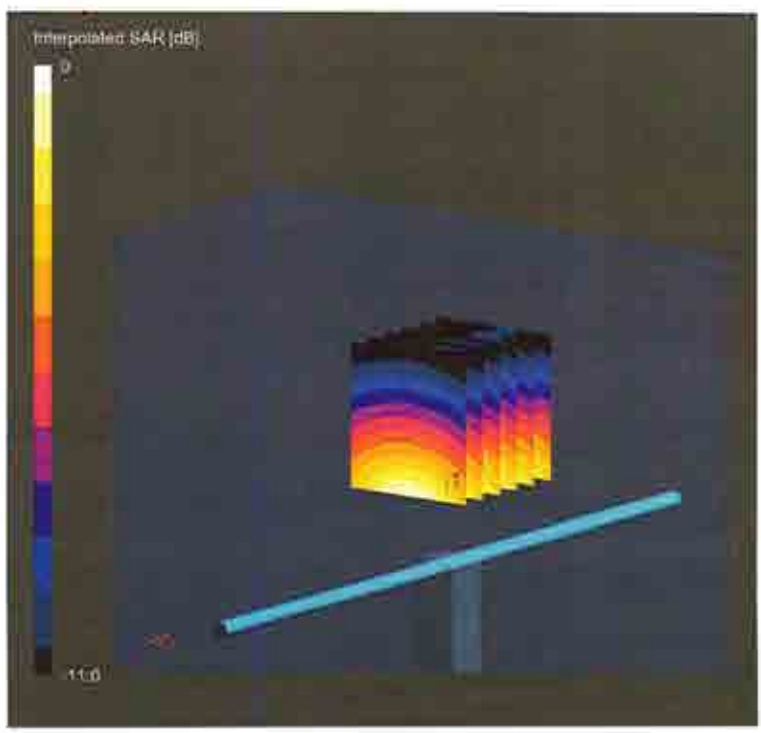
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| Flat V4.9 mod | HSL, 2025-12-02 | EX3DV4 - SN7349, 2025-01-10 | DAE4ip Sn1836, 2025-11-26 |

### Scans Setup

| | Zoom Scan |
|---|---|
| Grid Extents [mm] | 30 x 30 x 30 |
| Grid Steps [mm] | 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 |

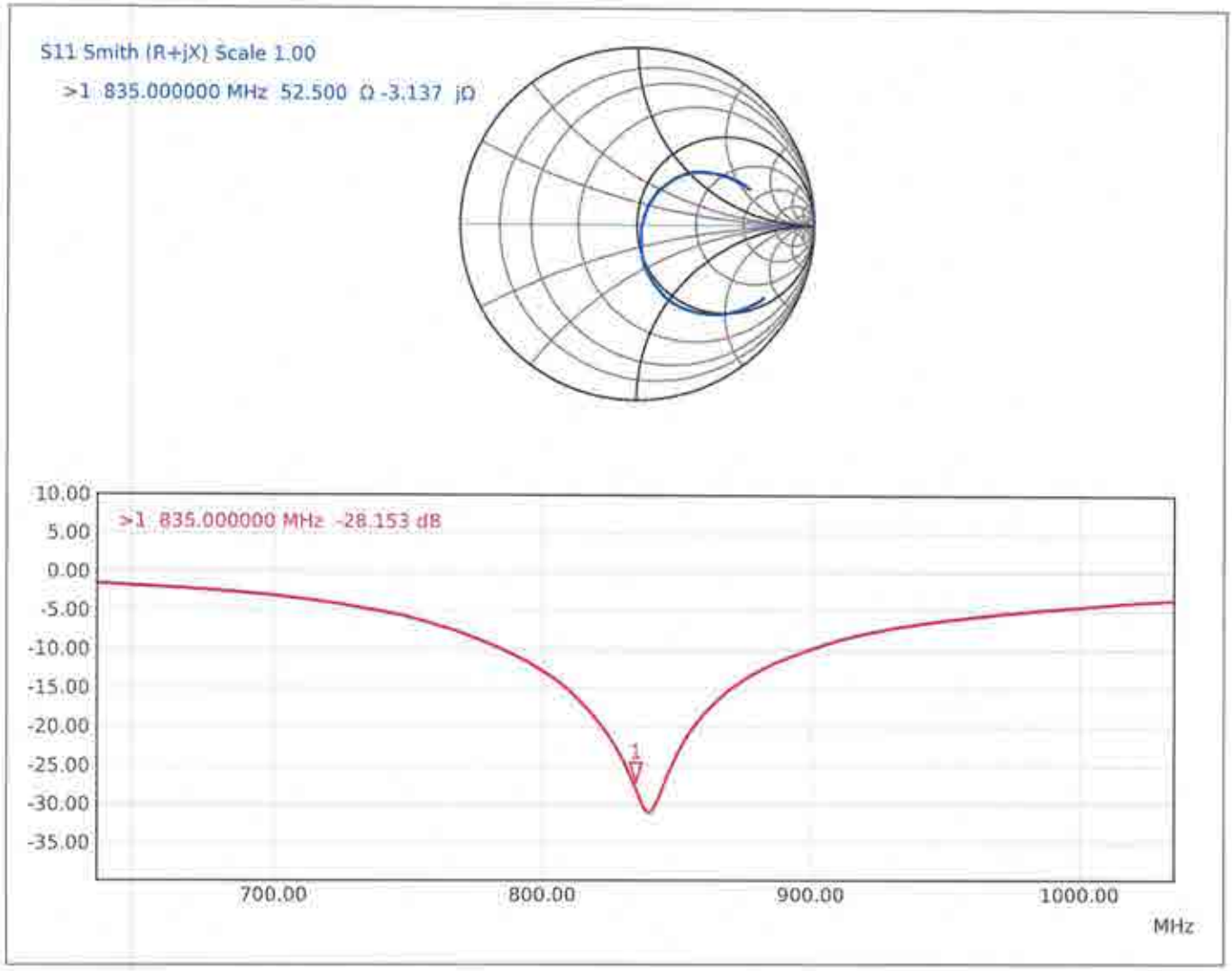
### Measurement Results

| | Zoom Scan |
|---|---|
| Date | 2025-12-02 |
| psSAR1g [W/Kg] | 2.35 |
| psSAR10g [W/Kg] | 1.52 |
| Power Drift [dB] | 0.00 |
| Power Scaling | Disabled |
| Scaling Factor [dB] | |
| TSL Correction | Positive / Negative |




0 dB = 3.65 W/Kg

## Impedance Measurement Plot for HSL



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**Accreditation No.: SCS 0108**

| Client | **Sporton**<br>**Taoyuan City** | Certificate No. | **D1750V2-1112_Feb25** |
|---|---|---|---|

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D1750V2 - SN: 1112 |
| Calibration procedure(s) | QA CAL-05.v12<br>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.

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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 | Krešimir Franjić | Laboratory Technician | |
| Approved by | Sven Kühn | Technical Manager | |

Issued: February 20, 2025

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

## 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 ±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 ±0.2)°C | 39.7 ±6% | 1.32 mho/m ±6% |
| **Head TSL temperature change during test** | < 0.5 °C | | |

## SAR result with Head TSL at 1750 MHz

| **SAR averaged over 1 $cm^3$ (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 ±17.0% (k = 2) |

| **SAR averaged over 10 $cm^3$ (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 ±16.5% (k = 2) |

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

### Antenna Parameters with Head TSL at 1750 MHz

| | |
|---|---|
| Impedance | 51.2 Ω + 1.8 jΩ |
| 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

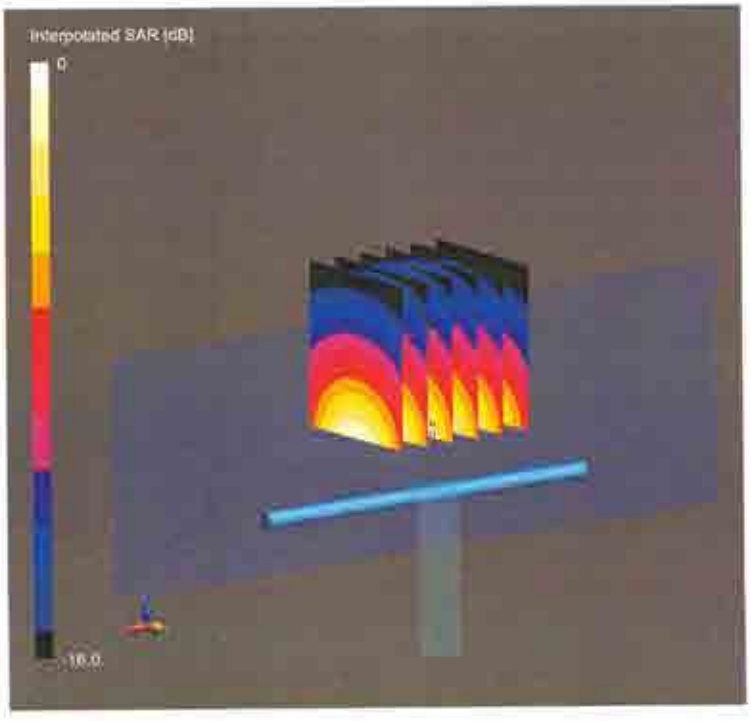
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| MFP V8.0 Center | HSL, 2025-02-20 | EX3DV4 - SN7349, 2025-01-10 | DAE4ip Sn1836, 2024-10-28 |

### 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 |

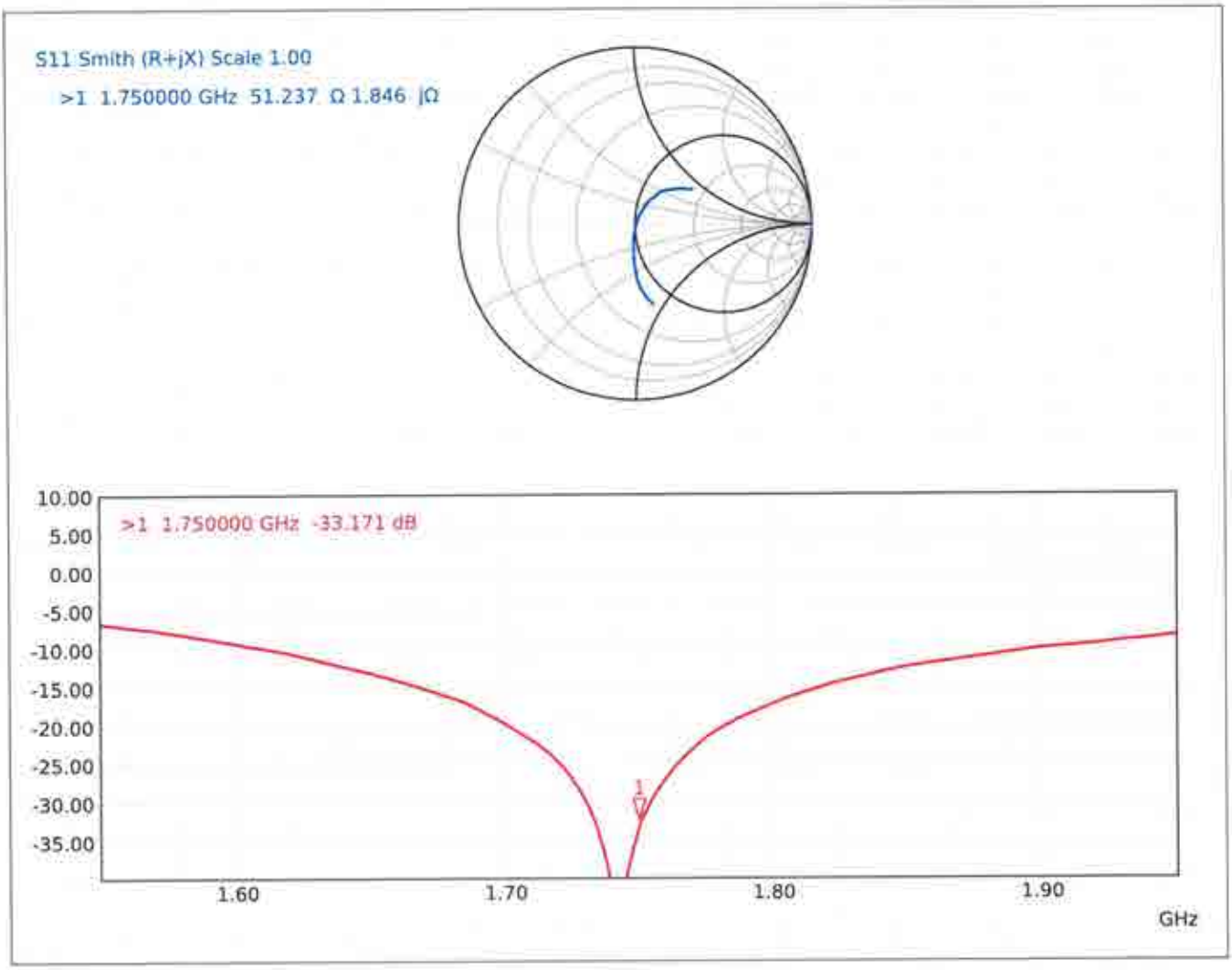
### Measurement Results

| | Zoom Scan |
|---|---|
| Date | 2025-02-20 |
| 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 (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

**<Justification of the extended calibration>**

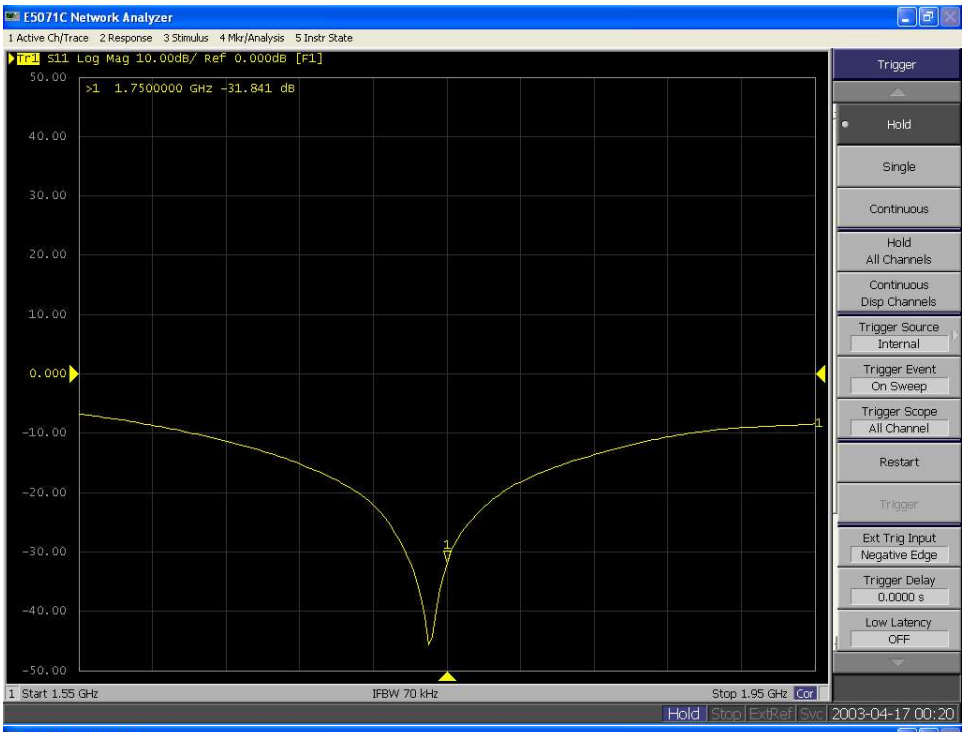
| D1750V2 – serial no. 1112 | | | | | | |
|---|---|---|---|---|---|---|
| | 1750MHZ | | | | | |
| Date of Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (ohm) | Delta (ohm) |
| 02.20.2025 (Cal. Report) | -33.2 | | 51.2 | | 1.8 | |
| 02.19.2026 (extended)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

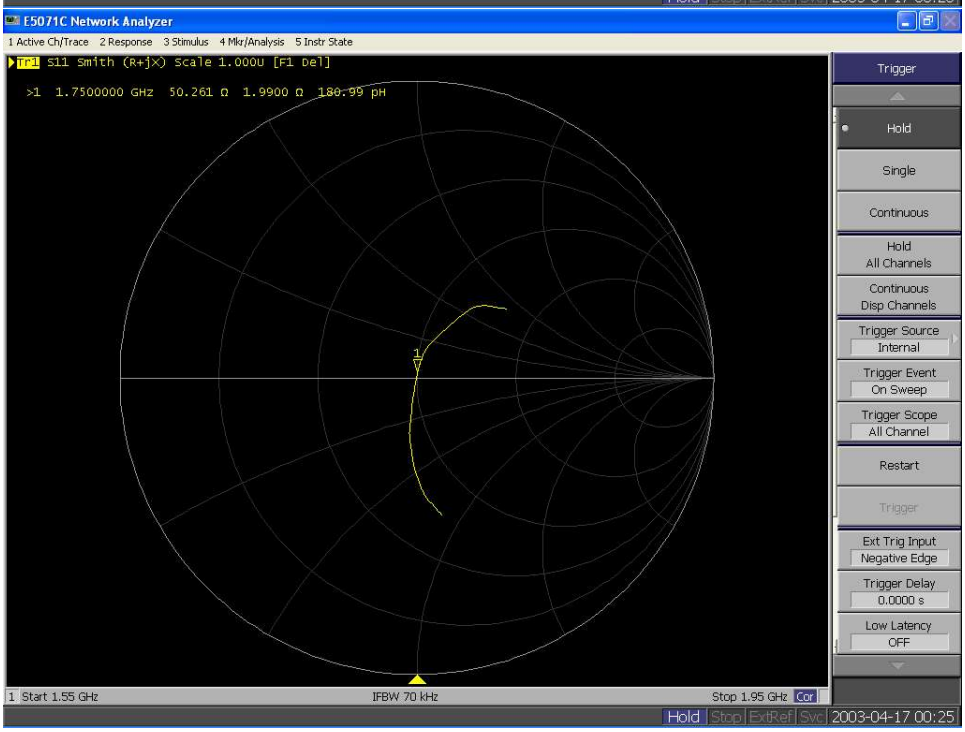
The return loss is < -20dB, within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

**SPORTON INTERNATIONAL INC.**
TEL : 886-3-327-3456
FAX : 886-3-328-4978

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

**1750MHz - Head**



**Calibration Laboratory of**
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Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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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**

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

**Certificate No.** **D3700V2-1006_Jun25**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D3700V2 - SN: 1006 |
| Calibration procedure(s) | QA CAL-22.v7<br>Calibration Procedure for SAR Validation Sources between 3 - 10 GHz |
| Calibration date | June 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 ± 3)°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 12, 2025

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

## 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 = 1.4mm | Graded Ratio = 1.5 mm (Z direction) |
| **Frequency** | 3700MHz ±1MHz | |

## HSL parameters at 3700 MHz

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal HSL parameters** | 22.0 °C | 37.7 | 3.12 mho/m |
| **Measured HSL parameters** | (22.0 ±0.2)°C | 38.8 ±6% | 3.11 mho/m ±6% |
| **HSL temperature change during test** | < 0.5 °C | | |

## SAR result with HSL at 3700 MHz

| **SAR averaged over 1 $cm^3$ (1 g) of HSL** | Condition | |
|---|---|---|
| SAR for nominal HSL parameters | 20 dBm input power | 6.99 W/kg |
| SAR for nominal HSL parameters | normalized to 1W | 69.9 W/kg ±19.9% (k=2) |

| **SAR averaged over 10 $cm^3$ (10 g) of HSL** | Condition | |
|---|---|---|
| SAR for nominal HSL parameters | 20 dBm input power | 2.56 W/kg |
| SAR for nominal HSL parameters | normalized to 1W | 25.6 W/kg ±19.5% (k=2) |

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

### Antenna Parameters with HSL at 3700 MHz

| | |
|---|---|
| Impedance | 50.6 Ω – 7.8 jΩ |
| Return Loss | -22.2 dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.137 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] |
|---|---|---|---|
| D3700V2 - SN1006 | 3700 | 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 — | 3700, 0 | 6.45 | 3.11 | 38.8 |

## Hardware Setup

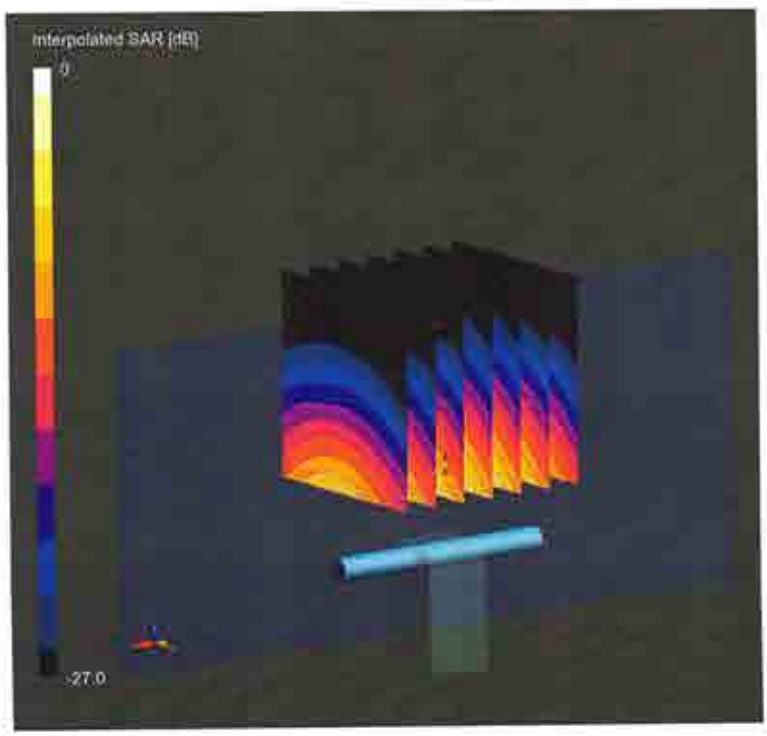
| Phantom | TSL, Measured Date | Probe, Calibration Date | DAE, Calibration Date |
|---|---|---|---|
| MFP V8.0 Center | HSL, 2025-06-12 | EX3DV4 - SN7349, 2025-01-10 | DAE4ip Sn1836, 2025-04-17 |

## Scans Setup

| | Zoom Scan |
|---|---|
| Grid Extents [mm] | 28 x 28 x 28 |
| Grid Steps [mm] | 5.0 x 5.0 x 1.4 |
| Sensor Surface [mm] | 1.4 |
| Graded Grid | Yes |
| Grading Ratio | 1.5 |
| MAIA | N/A |
| Surface Detection | All points |
| Scan Method | Measured |

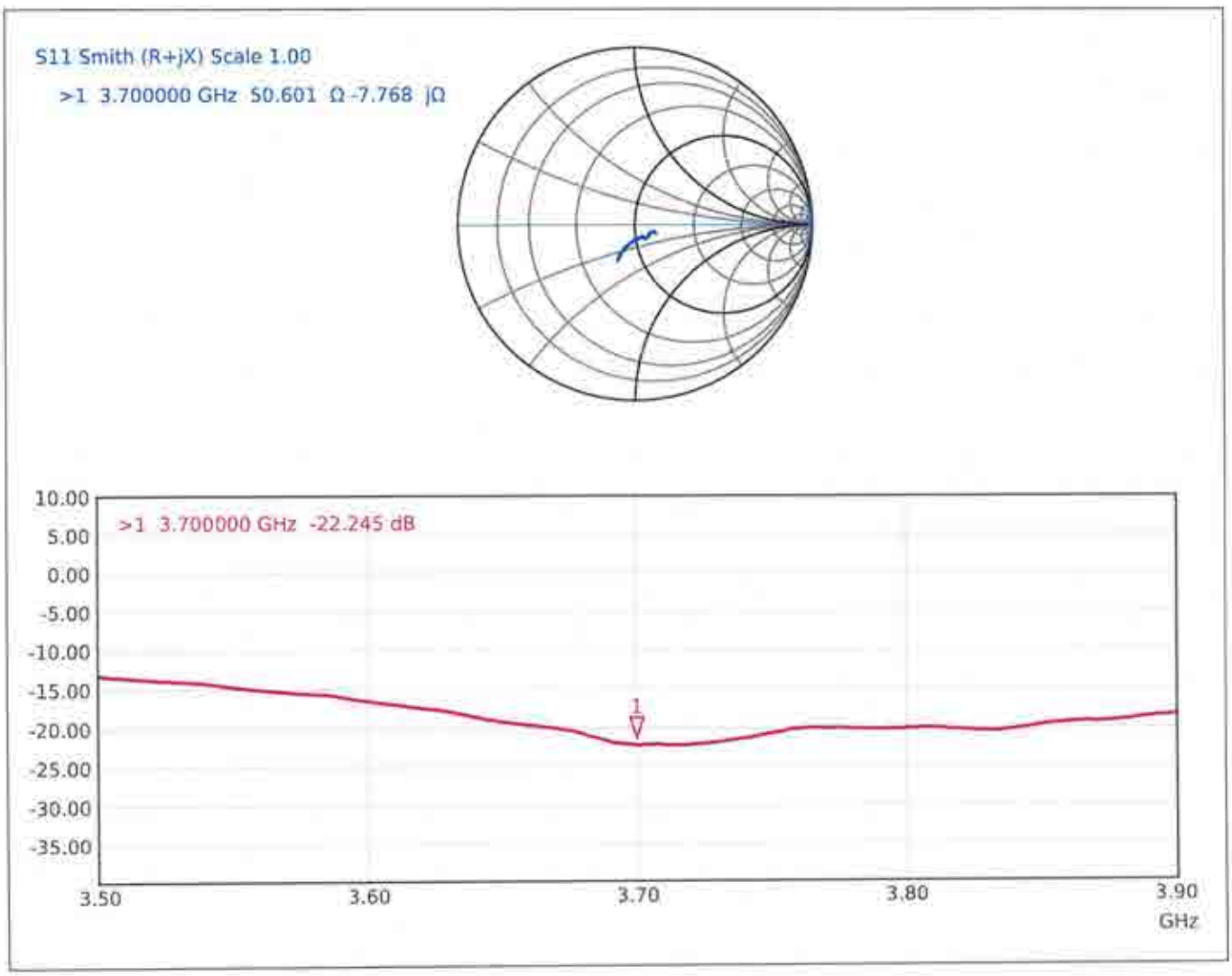
## Measurement Results

| | Zoom Scan |
|---|---|
| Date | 2025-06-12 |
| psSAR1g [W/Kg] | 6.99 |
| psSAR10g [W/Kg] | 2.56 |
| Power Drift [dB] | 0.00 |
| Power Scaling | Disabled |
| Scaling Factor [dB] | |
| TSL Correction | Positive / Negative |




0 dB = 18.6 W/Kg

## Impedance Measurement Plot for HSL



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

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**Accreditation No.: SCS 0108**

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

**Certificate No.** **D3900V2-1092_May23**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D3900V2 - SN:1092 |
| Calibration procedure(s) | QA CAL-22.v7<br>Calibration Procedure for SAR Validation Sources between 3-10 GHz |
| Calibration date: | May 15, 2023 |

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Power meter NRP2 | SN: 104778 | 30-Mar-23 (No. 217-03804/03805) | Mar-24 |
| Power sensor NRP-Z91 | SN: 103244 | 30-Mar-23 (No. 217-03804) | Mar-24 |
| Power sensor NRP-Z91 | SN: 103245 | 30-Mar-23 (No. 217-03805) | Mar-24 |
| Reference 20 dB Attenuator | SN: BH9394 (20k) | 30-Mar-23 (No. 217-03809) | Mar-24 |
| Type-N mismatch combination | SN: 310982 / 06327 | 30-Mar-23 (No. 217-03810) | Mar-24 |
| Reference Probe EX3DV4 | SN: 3503 | 07-Mar-23 (No. EX3-3503_Mar23) | Mar-24 |
| DAE4 | SN: 601 | 19-Dec-22 (No. DAE4-601_Dec22) | Dec-23 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---|---|---|---|
| Power meter E4419B | SN: GB39512475 | 30-Oct-14 (in house check Oct-22) | In house check: Oct-24 |
| Power sensor HP 8481A | SN: US37292783 | 07-Oct-15 (in house check Oct-22) | In house check: Oct-24 |
| Power sensor HP 8481A | SN: MY41093315 | 07-Oct-15 (in house check Oct-22) | In house check: Oct-24 |
| RF generator R&S SMT-06 | SN: 100972 | 15-Jun-15 (in house check Oct-22) | In house check: Oct-24 |
| Network Analyzer Agilent E8358A | SN: US41080477 | 31-Mar-14 (in house check Oct-22) | In house check: Oct-24 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Jeton Kastrati | Laboratory Technician | |
| Approved by: | Sven Kühn | Technical Manager | |

Issued: May 17, 2023

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

## 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:

a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Additional Documentation:

c) 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 source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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

## Measurement Conditions

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

| | | |
|---|---|---|
| **DASY Version** | DASY52 | V52.10.4 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Modular Flat Phantom V5.0 | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy = 4.0 mm, dz = 1.4 mm | Graded Ratio = 1.4 (Z direction) |
| **Frequency** | 3900 MHz ± 1 MHz<br>4100 MHz ± 1 MHz | |

## Head TSL parameters at 3900 MHz

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 37.5 | 3.32 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 37.0 ± 6 % | 3.23 mho/m ± 6 % |
| **Head TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Head TSL at 3900 MHz

| **SAR averaged over 1 cm³ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 100 mW input power | 6.69 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **67.0 W/kg ± 19.9 % (k=2)** |

| **SAR averaged over 10 cm³ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 100 mW input power | 2.32 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **23.2 W/kg ± 19.5 % (k=2)** |

## Head TSL parameters at 4100 MHz

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 37.2 | 3.53 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 36.7 ± 6 % | 3.40 mho/m ± 6 % |
| **Head TSL temperature change during test** | < 0.5 °C | ---- | ---- |

## SAR result with Head TSL at 4100 MHz

| **SAR averaged over 1 cm³ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 100 mW input power | 6.67 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **66.8 W/kg ± 19.9 % (k=2)** |

| **SAR averaged over 10 cm³ (10 g) of Head TSL** | condition | |
|---|---|---|
| SAR measured | 100 mW input power | 2.31 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **23.0 W/kg ± 19.5 % (k=2)** |

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

### Antenna Parameters with Head TSL at 3900 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 49.2 Ω - 4.0 jΩ |
| Return Loss | - 27.7 dB |

### Antenna Parameters with Head TSL at 4100 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 56.0 Ω + 5.0 jΩ |
| Return Loss | - 22.6 dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.112 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 |

## DASY5 Validation Report for Head TSL

Date: 15.05.2023

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 3900 MHz; Type: D3900V2; Serial: D3900V2 - SN:1092**

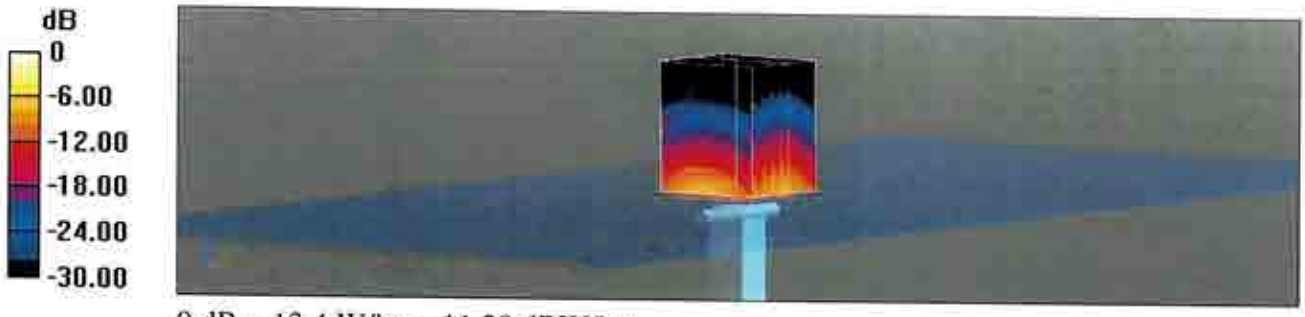
Communication System: UID 0 - CW; Frequency: 3900 MHz, Frequency: 4100 MHz
Medium parameters used: f = 3900 MHz; $\sigma$ = 3.23 S/m; $\varepsilon_r$ = 37.0; $\rho$ = 1000 kg/m$^3$ ,
Medium parameters used: f = 4100 MHz; $\sigma$ = 3.40 S/m; $\varepsilon_r$ = 36.7; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(7.39, 7.39, 7.39) @ 3900 MHz, ConvF(7.26, 7.26, 7.26) @ 4100 MHz; Calibrated: 07.03.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 19.12.2022
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

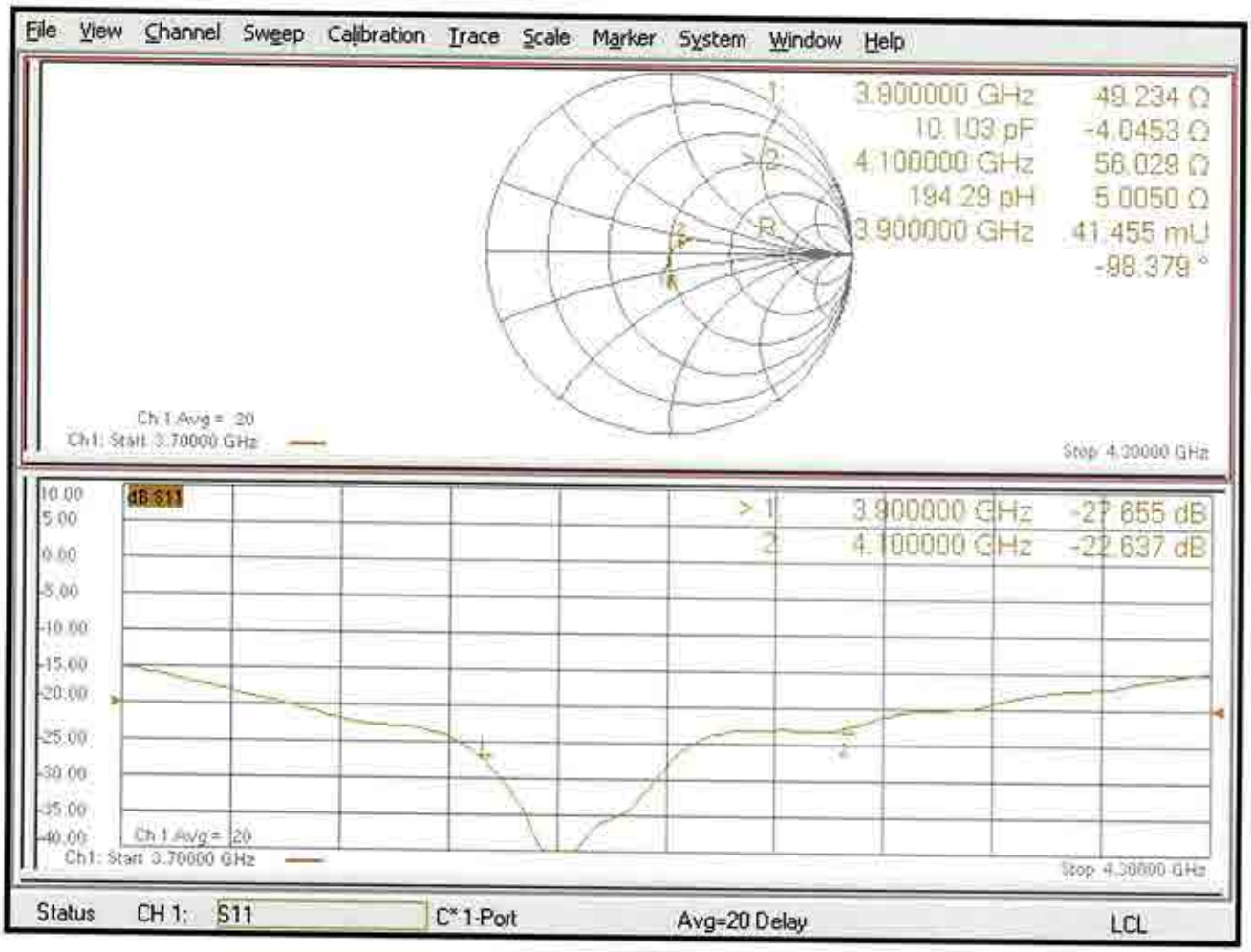
**Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm, f=3900MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.57 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 18.8 W/kg
**SAR(1 g) = 6.69 W/kg; SAR(10 g) = 2.32 W/kg**
Smallest distance from peaks to all points 3 dB below = 7.9 mm
Ratio of SAR at M2 to SAR at M1 = 74.2%
Maximum value of SAR (measured) = 13.3 W/kg

**Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm, f=4100MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 68.75 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 18.9 W/kg
**SAR(1 g) = 6.67 W/kg; SAR(10 g) = 2.31 W/kg**
Smallest distance from peaks to all points 3 dB below = 7.9 mm
Ratio of SAR at M2 to SAR at M1 = 74%
Maximum value of SAR (measured) = 13.4 W/kg




0 dB = 13.4 W/kg = 11.28 dBW/kg

## Impedance Measurement Plot for Head TSL



## D3900HzV2, serial no. 1092 Extended Dipole Calibrations

If dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

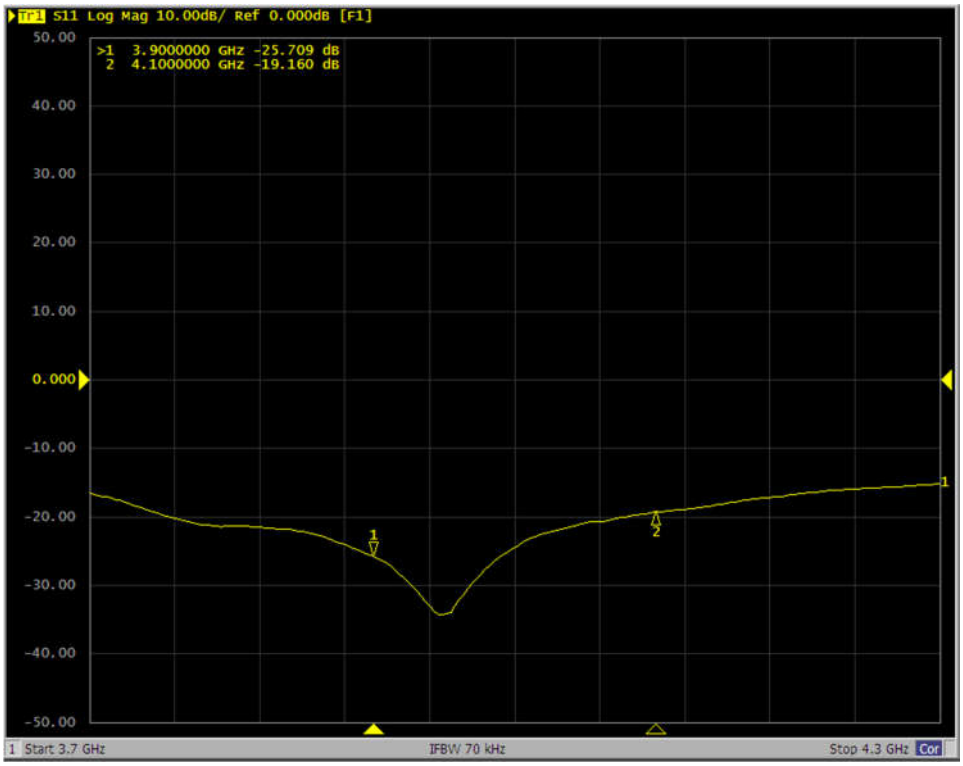
**<Justification of the extended calibration>**

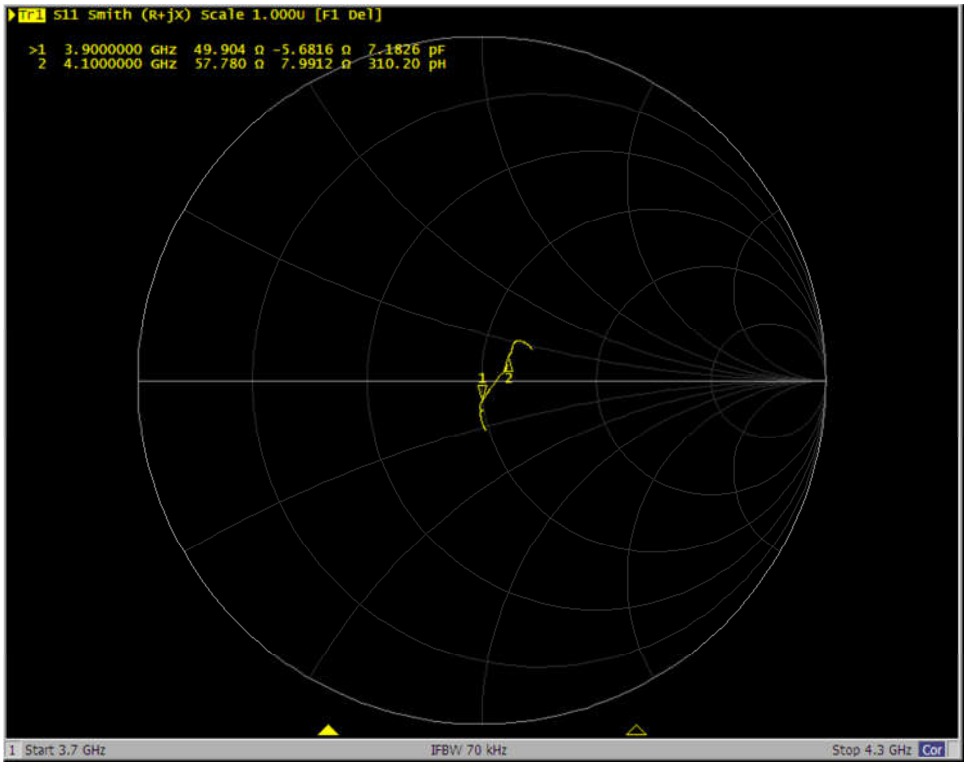
| D**3900**HzV2 – serial no. **1092** | | | | | | |
|---|---|---|---|---|---|---|
| | **3900MHZ** | | | | | |
| Date of Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (ohm) | Delta (ohm) |
| 05.15.2023 (Cal. Report) | -27.655 | | 49.234 | | -4.0453 | |
| 05.14.2024 (extended) | -25.709 | 7.037 | 49.904 | 0.670 | -5.6816 | -1.6363 |
| 05.13.2025 (extended) | -27.817 | 0.586 | 50.762 | 1.528 | -2.0149 | 2.0304 |
| | **4100MHZ** | | | | | |
| Date of Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (ohm) | Delta (ohm) |
| 05.15.2023 (Cal. Report) | -22.637 | | 56.029 | | 5.0050 | |
| 05.14.2024 (extended) | -19.160 | 15.360 | 57.780 | 1.751 | 7.9912 | 2.9862 |
| 05.13.2025 (extended) | -21.524 | 4.917 | 55.724 | -0.305 | 7.8687 | 2.8637 |

The return loss is < -20dB, 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> - D3900V2, serial no. 1092 (Data of Measurement : 05.14.2024)**

**3900MHz - Head**

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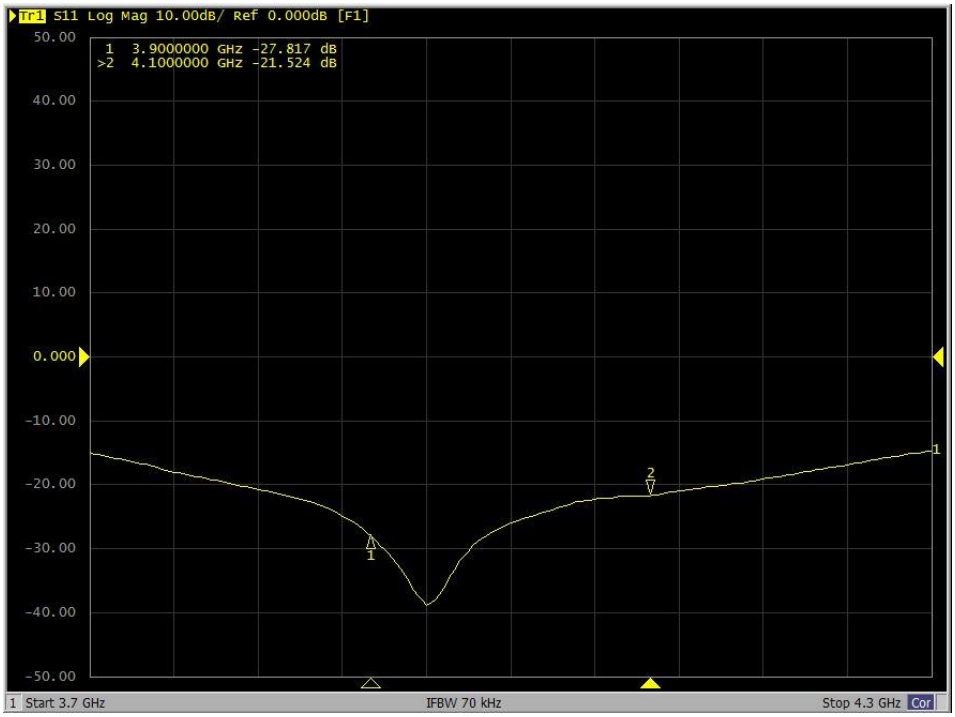
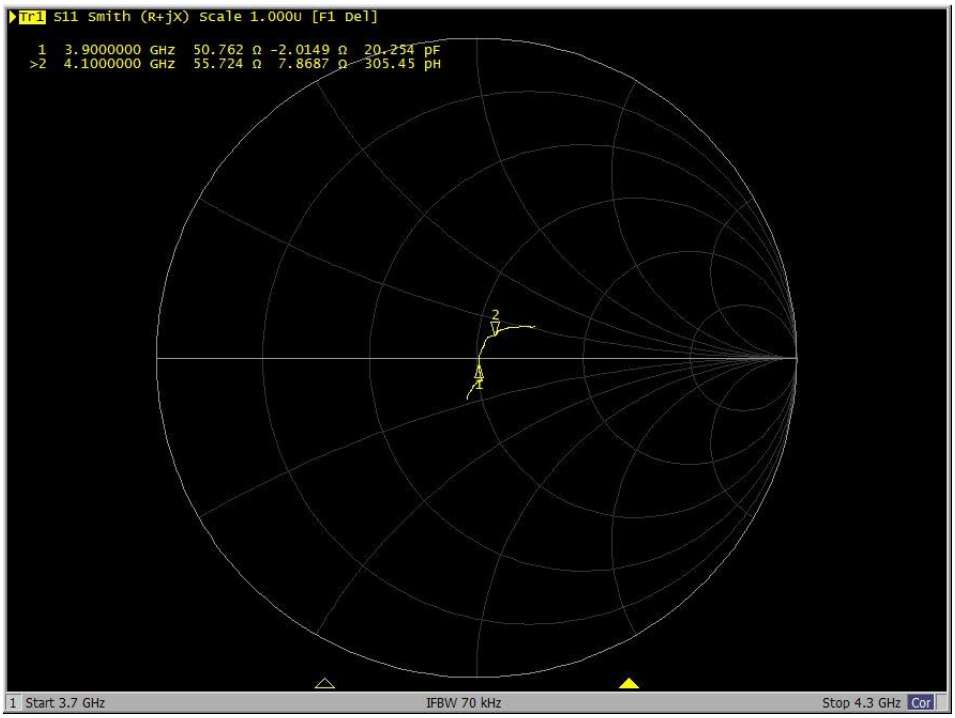
FAX : 886-3-328-4978

**<Dipole Verification Data> - D3900 V2, serial no. 1092 (Data of Measurement : 05.13.2025)**

**3900 MHz - Head**

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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<br>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 ± 3)°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 |

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

Issued: November 21, 2025

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

## 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 = | 6.1μV , | full range = | -100...+300 mV |
| Low Range: | 1LSB = | 61nV , | 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 ± 0.02% (k=2) | 404.055 ± 0.02% (k=2) | 403.898 ± 0.02% (k=2) |
| Low Range | 3.98055 ± 1.50% (k=2) | 3.97249 ± 1.50% (k=2) | 3.97532 ± 1.50% (k=2) |

## Connector Angle

| | |
|---|---|
| **Connector Angle** to be used in DASY system | 27.0 ° ± 1 ° |

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

### 1. DC Voltage Linearity

| High Range | | Reading (μV) | Difference (μV) | 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 (μV) | Difference (μV) | 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 (μV) | Low Range Average Reading (μV) |
|---|---|---|---|
| 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 (μV) | Channel Y (μV) | Channel Z (μV) |
|---|---|---|---|---|
| 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 10MΩ

| | Average (μV) | min. Offset (μV) | max. Offset (μV) | Std. Deviation (μV) |
|---|---|---|---|---|
| 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: **DAE4ip-1800_Jun25**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | DAE4ip - SD 000 D14 AG - SN: 1800 |
| Calibration procedure(s) | QA CAL-06.v30<br>Calibration procedure for the data acquisition electronics (DAE) |
| Calibration date: | June 16, 2025 |

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Certificate No.) | Scheduled Calibration |
|---|---|---|---|
| Keithley Multimeter Type 2001 | SN: 0810278 | 27-Aug-24 (No:40547) | Aug-25 |
| **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 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Adrian Gehring | Laboratory Technician | |
| Approved by: | Sven Kühn | Technical Manager | |

Issued: June 16, 2025

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

## 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.
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  - *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 = | 6.1μV , | full range = | -100...+300 mV |
| Low Range: | 1LSB = | 61nV , | full range = | -1.....+3mV |

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

| Calibration Factors | X | Y | Z |
|---|---|---|---|
| High Range | 405.057 ± 0.02% (k=2) | 404.861 ± 0.02% (k=2) | 404.959 ± 0.02% (k=2) |
| Low Range | 4.00148 ± 1.50% (k=2) | 3.99101 ± 1.50% (k=2) | 4.01075 ± 1.50% (k=2) |

## Connector Angle

| | |
|---|---|
| **Connector Angle** to be used in DASY system | 121.5 ° ± 1 ° |

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

### 1. DC Voltage Linearity

| High Range | | Reading (μV) | Difference (μV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 200031.87 | -2.76 | -0.00 |
| Channel X | + Input | 20002.22 | -1.35 | -0.01 |
| Channel X | - Input | -20009.01 | 0.47 | -0.00 |
| Channel Y | + Input | 200033.67 | -1.34 | -0.00 |
| Channel Y | + Input | 20000.52 | -3.08 | -0.02 |
| Channel Y | - Input | -20010.50 | -1.07 | 0.01 |
| Channel Z | + Input | 200034.02 | -0.54 | -0.00 |
| Channel Z | + Input | 20001.72 | -1.73 | -0.01 |
| Channel Z | - Input | -20011.09 | -1.54 | 0.01 |

| Low Range | | Reading (μV) | Difference (μV) | Error (%) |
|---|---|---|---|---|
| Channel X | + Input | 1998.23 | -0.31 | -0.02 |
| Channel X | + Input | 197.85 | -0.44 | -0.22 |
| Channel X | - Input | -202.18 | -0.68 | 0.34 |
| Channel Y | + Input | 1998.26 | -0.20 | -0.01 |
| Channel Y | + Input | 197.41 | -0.85 | -0.43 |
| Channel Y | - Input | -203.21 | -1.64 | 0.81 |
| Channel Z | + Input | 1998.51 | 0.20 | 0.01 |
| Channel Z | + Input | 197.50 | -0.63 | -0.32 |
| Channel Z | - Input | -202.27 | -0.59 | 0.29 |

### 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 (μV) | Low Range Average Reading (μV) |
|---|---|---|---|
| Channel X | 200 | -16.98 | -19.02 |
| | - 200 | 19.97 | 18.46 |
| Channel Y | 200 | -11.31 | -11.64 |
| | - 200 | 10.07 | 9.63 |
| Channel Z | 200 | 0.66 | 1.19 |
| | - 200 | -3.32 | -2.92 |

### 3. Channel separation

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

| | Input Voltage (mV) | Channel X (μV) | Channel Y (μV) | Channel Z (μV) |
|---|---|---|---|---|
| Channel X | 200 | - | 0.93 | -2.90 |
| Channel Y | 200 | 4.65 | - | 2.94 |
| Channel Z | 200 | 7.65 | 2.26 | - |

## 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 | 16174 | 16621 |
| Channel Y | 15848 | 15908 |
| Channel Z | 15935 | 13213 |

## 5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

| | Average (μV) | min. Offset (μV) | max. Offset (μV) | Std. Deviation (μV) |
|---|---|---|---|---|
| Channel X | 0.11 | -0.66 | 0.73 | 0.30 |
| Channel Y | -0.97 | -2.40 | -0.06 | 0.37 |
| Channel Z | -0.46 | -1.32 | 0.57 | 0.29 |

## 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<br>Taoyuan City | Certificate No. | EX-7625_Dec25 |
|---|---|---|---|

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | EX3DV4 - SN:7625 |
| 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<br>Calibration procedure for dosimetric E-field probes |
| Calibration date | December 09, 2025 |

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID | Calibration Date (Certificate No.) | Sched. Cal. |
|---|---|---|---|
| Power Sensor R&S NRP40T | SN: 101861 | 29-Apr-25 (No. 2025-001450) | 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 | 30-Oct-25 (No. DAE4-1301_Oct25) | Oct-26 |

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

Issued: December 09, 2025

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**Accreditation No.: SCS 0108**

## Glossary

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| 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 $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ 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:

a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices – Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Methods Applied and Interpretation of Parameters:

- *NORMx,y,z*: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the $E^2$-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * 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.
- *DCPx,y,z*: 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
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: 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 *NORMx,y,z * 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 ±50 MHz to ±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 *NORMx* (no uncertainty required).

# Parameters of Probe: EX3DV4 - SN:7625

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc ($k = 2$) |
|---|---|---|---|---|
| Norm ($\mu V/(V/m)^2$) [A] | 0.71 | 0.63 | 0.58 | ±10.1% |
| DCP (mV) [B] | 108.6 | 108.5 | 108.9 | ±4.7% |

## Calibration Results for Modulation Response

| UID | Communication System Name | | A dB | B $dB\sqrt{\mu V}$ | C | D dB | VR mV | Max dev. | Max Unc[E] $k = 2$ |
|---|---|---|---|---|---|---|---|---|---|
| 0 | Continuous Wave | X | 0.00 | 0.00 | 1.00 | 0.00 | 135.1 | ±1.9% | ±4.7% |
| | | Y | 0.00 | 0.00 | 1.00 | | 132.2 | | |
| | | Z | 0.00 | 0.00 | 1.00 | | 120.2 | | |
| 10352 | Pulse (D=10%, T=5 ms) | X | 0.93 | 69.99 | 17.34 | 10.00 | 23.0 | ±1.9% | ±9.6% |
| | | Y | 0.38 | 62.10 | 15.43 | | 24.0 | | |
| | | Z | 0.36 | 61.51 | 15.34 | | 24.0 | | |
| 10353 | Pulse (D=20%, T=5 ms) | X | 0.87 | 73.00 | 17.38 | 6.99 | 47.0 | ±1.6% | ±9.6% |
| | | Y | 0.35 | 65.11 | 15.48 | | 48.0 | | |
| | | Z | 0.33 | 64.52 | 15.40 | | 48.0 | | |
| 10354 | Pulse (D=40%, T=5 ms) | X | 0.82 | 76.01 | 17.42 | 3.98 | 93.0 | ±1.4% | ±9.6% |
| | | Y | 0.33 | 68.12 | 15.53 | | 96.0 | | |
| | | Z | 0.31 | 67.53 | 15.46 | | 95.0 | | |
| 10355 | Pulse (D=60%, T=5 ms) | X | 0.78 | 77.77 | 17.44 | 2.22 | 139.0 | ±1.3% | ±9.6% |
| | | Y | 0.31 | 69.88 | 15.57 | | 144.0 | | |
| | | Z | 0.29 | 69.29 | 15.51 | | 143.0 | | |
| 10387 | Random (BW=1 MHz, MOD=QPSK) | X | 0.01 | 74.89 | 18.88 | 0.22 | 106.0 | ±1.4% | ±9.6% |
| | | Y | 0.01 | 85.35 | 16.95 | | 110.0 | | |
| | | Z | 0.01 | 66.41 | 16.99 | | 110.0 | | |
| 10388 | Random (BW=10 MHz, MOD=QPSK) | X | 1.61 | 74.77 | 17.08 | 0.00 | 112.0 | ±2.3% | ±9.6% |
| | | Y | 0.75 | 66.88 | 14.79 | | 116.0 | | |
| | | Z | 0.70 | 66.30 | 14.63 | | 116.0 | | |
| 10396 | Random (BW=100 kHz, MOD=64QAM) | X | 0.02 | 73.71 | 19.68 | 1.52 | 80.0 | ±2.7% | ±9.6% |
| | | Y | 0.00 | 85.01 | 18.27 | | 83.0 | | |
| | | Z | 0.00 | 84.42 | 18.44 | | 82.0 | | |
| 10399 | Random (BW=40 MHz, MOD=64QAM) | X | 3.86 | 73.72 | 16.98 | 0.00 | 103.0 | ±3.7% | ±9.6% |
| | | Y | 1.98 | 65.83 | 14.01 | | 108.0 | | |
| | | Z | 1.88 | 65.24 | 13.69 | | 107.0 | | |
| 10414 | Random (BW=40 MHz, HIGH PAR) | X | 4.65 | 71.45 | 16.97 | 0.00 | 75.0 | ±1.7% | ±9.6% |
| | | Y | 2.34 | 63.56 | 13.96 | | 78.0 | | |
| | | Z | 2.21 | 62.97 | 13.63 | | 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%.

[A] The uncertainties of Norm X,Y,Z do not affect the $E^2$-field uncertainty inside TSL (see Pages 5 and 6).
[B] Linearization parameter uncertainty for maximum specified field strength.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

# Parameters of Probe: EX3DV4 - SN:7625

## Sensor Model Parameters

| | C1 fF | C2 fF | $\alpha$ $V^{-1}$ | T1 ms $V^{-2}$ | T2 ms $V^{-1}$ | T3 ms | T4 $V^{-2}$ | T5 $V^{-1}$ | T6 |
|---|---|---|---|---|---|---|---|---|---|
| x | 9.2 | 65.69 | 32.83 | 5.05 | 0.00 | 4.91 | 0.61 | 0.00 | 1.00 |
| y | 8.6 | 61.39 | 33.08 | 3.38 | 0.00 | 4.90 | 0.46 | 0.00 | 1.00 |
| z | 8.6 | 61.65 | 32.92 | 3.56 | 0.00 | 4.93 | 0.48 | 0.00 | 1.00 |

## Other Probe Parameters

| | |
|---|---|
| Sensor Arrangement | Triangular |
| Connector Angle | 26.4° |
| Mechanical Surface Detection Mode | enabled |
| Optical Surface Detection Mode | disabled |
| Probe Overall Length | 337 mm |
| Probe Body Diameter | 12 mm |
| Tip Length | 9 mm |
| Tip Diameter | 2.5 mm |
| Probe Tip to Sensor X Calibration Point | 1 mm |
| Probe Tip to Sensor Y Calibration Point | 1 mm |
| Probe Tip to Sensor Z Calibration Point | 1 mm |
| Recommended Measurement Distance from Surface | 1.4 mm |

**Note:** Measurement distance from surface can be increased to 3–4 mm for an *Area Scan* job.

# Parameters of Probe: EX3DV4 - SN:7625

## Calibration Parameter Determined in HSL

| f (MHz)[C] | Relative Permittivity[F] | Conductivity[F] (S/m) | ConvF X | ConvF Y | ConvF Z | Alpha[G] | Depth[G] (mm) | Unc[H] ($k = 2$) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 9.69 | 9.27 | 10.31 | 0.36 | 1.27 | ±11.0% |
| 835 | 41.5 | 0.90 | 9.56 | 9.14 | 10.17 | 0.36 | 1.27 | ±11.0% |
| 900 | 41.5 | 0.97 | 9.37 | 8.97 | 9.97 | 0.36 | 1.27 | ±11.0% |
| 1750 | 40.1 | 1.37 | 7.90 | 7.56 | 8.41 | 0.36 | 1.27 | ±11.0% |
| 1900 | 40.0 | 1.40 | 7.54 | 7.21 | 8.01 | 0.36 | 1.27 | ±11.0% |
| 2000 | 40.0 | 1.40 | 7.45 | 7.13 | 7.92 | 0.36 | 1.27 | ±11.0% |
| 2300 | 39.5 | 1.67 | 7.21 | 6.90 | 7.67 | 0.36 | 1.27 | ±11.0% |
| 2450 | 39.2 | 1.80 | 7.06 | 6.75 | 7.51 | 0.36 | 1.27 | ±11.0% |
| 2600 | 39.0 | 1.96 | 6.95 | 6.65 | 7.39 | 0.36 | 1.27 | ±11.0% |
| 3300 | 38.2 | 2.71 | 6.69 | 6.40 | 7.11 | 0.36 | 1.27 | ±13.1% |
| 3500 | 37.9 | 2.91 | 6.61 | 6.32 | 7.03 | 0.36 | 1.27 | ±13.1% |
| 3700 | 37.7 | 3.12 | 6.53 | 6.24 | 6.94 | 0.36 | 1.27 | ±13.1% |
| 3900 | 37.5 | 3.32 | 6.45 | 6.17 | 6.86 | 0.36 | 1.27 | ±13.1% |
| 4100 | 37.2 | 3.53 | 6.34 | 6.06 | 6.74 | 0.36 | 1.27 | ±13.1% |
| 4400 | 36.9 | 3.84 | 6.18 | 5.91 | 6.57 | 0.36 | 1.27 | ±13.1% |
| 4600 | 36.7 | 4.04 | 6.09 | 5.82 | 6.47 | 0.36 | 1.27 | ±13.1% |
| 4800 | 36.4 | 4.25 | 6.04 | 5.78 | 6.42 | 0.36 | 1.27 | ±13.1% |
| 4950 | 36.3 | 4.40 | 5.93 | 5.68 | 6.31 | 0.35 | 1.27 | ±13.1% |
| 5250 | 35.9 | 4.71 | 5.46 | 5.22 | 5.81 | 0.32 | 1.27 | ±13.1% |
| 5600 | 35.5 | 5.07 | 5.03 | 4.81 | 5.35 | 0.29 | 1.27 | ±13.1% |
| 5800 | 35.3 | 5.27 | 4.92 | 4.71 | 5.23 | 0.27 | 1.27 | ±13.1% |

[C] Frequency validity above 300 MHz of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ±10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4–9 MHz, and ConvF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.

[F] The probes are calibrated using tissue simulating liquids (TSL) that deviate for $\varepsilon$ and $\sigma$ by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10% if SAR correction is applied.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3–6 GHz at any distance larger than half the probe tip diameter from the boundary.

[H] The stated uncertainty is the total calibration uncertainty ($k = 2$) of Norm-ConvF. This is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2020.

# Parameters of Probe: EX3DV4 - SN:7625

## Calibration Parameter Determined in HSL

| f (MHz)[C] | Relative Permittivity[F] | Conductivity[F] (S/m) | ConvF X | ConvF Y | ConvF Z | Alpha[G] | Depth[G] (mm) | Unc[H] ($k = 2$) |
|---|---|---|---|---|---|---|---|---|
| 6500 | 34.5 | 6.07 | 5.30 | 5.07 | 5.63 | 0.20 | 1.27 | ±18.6% |

[C] Frequency validity is −600/+700 MHz at 6.5 GHz, ±700 MHz at or above 7 GHz, and ±150 MHz at 9.85 GHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

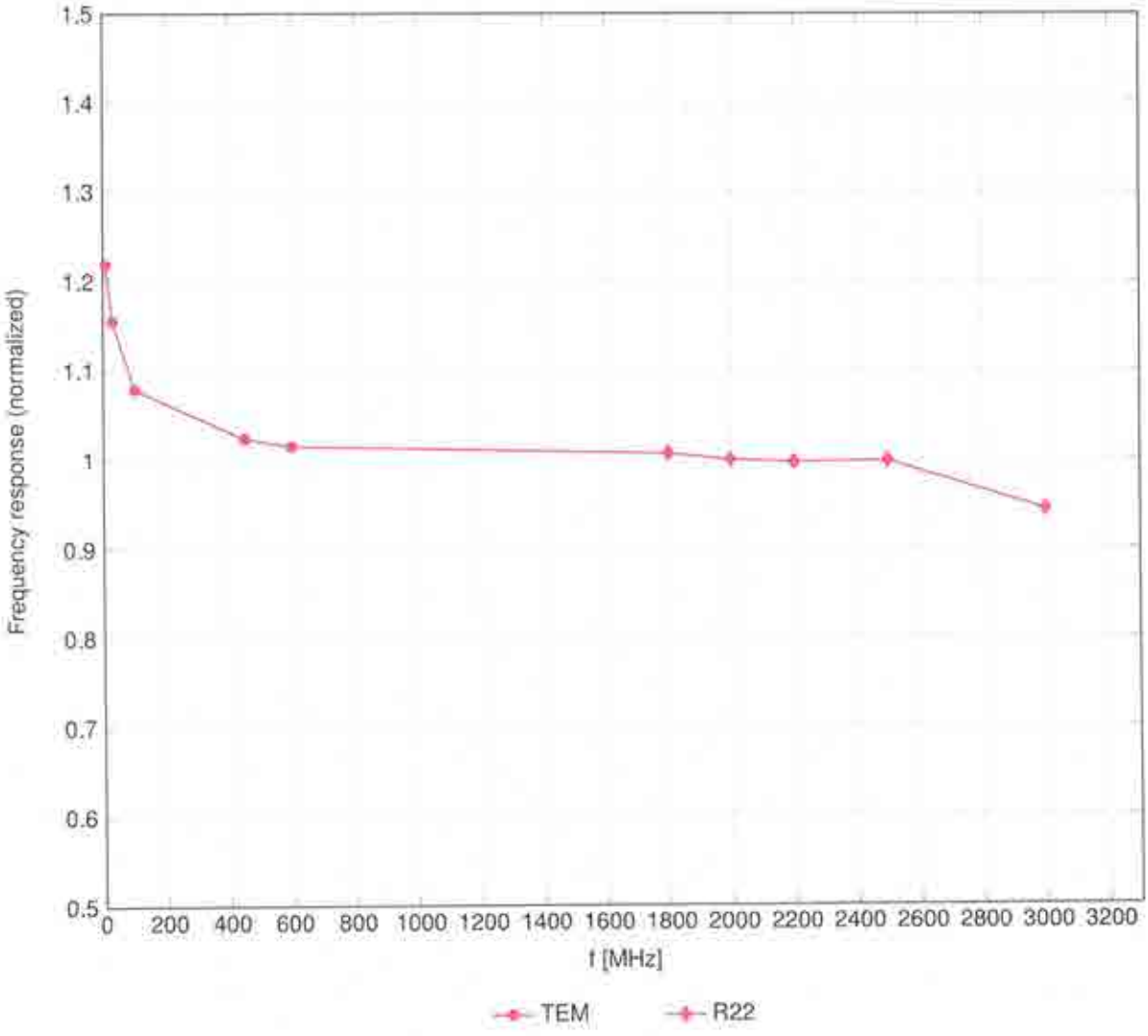
[F] The probes are calibrated using tissue simulating liquids (TSL) that deviate for $\varepsilon$ and $\sigma$ by less than ±10% from the target values (typically better than ±6%) and are valid for TSL with deviations of up to ±10%.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz; below ±2% for frequencies between 3–6 GHz; and below ±4% for frequencies between 6–10 GHz at any distance larger than half the probe tip diameter from the boundary.

[H] The stated uncertainty is the total calibration uncertainty ($k = 2$) of Norm·ConvF. This is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2020.

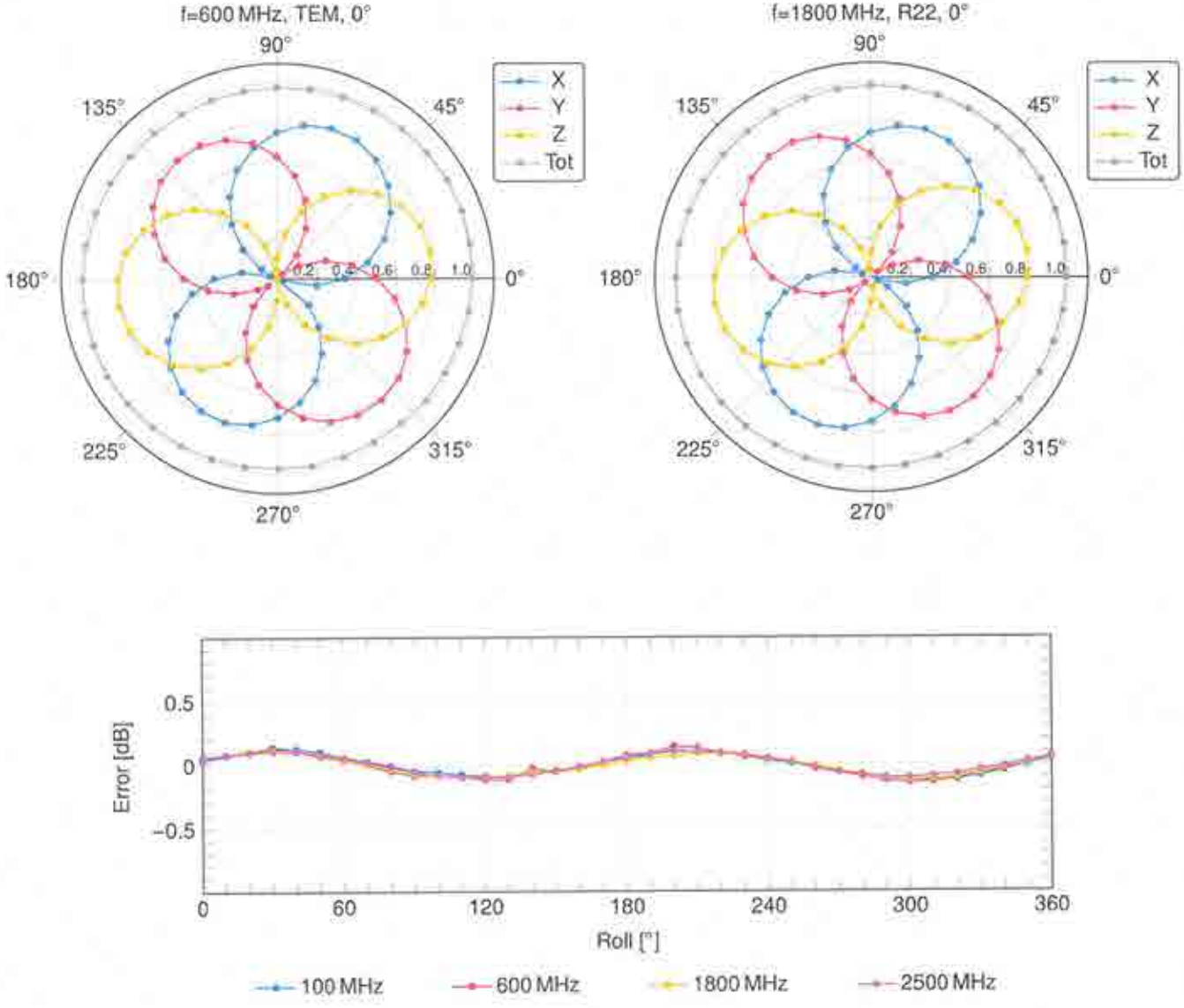
## Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide:R22)




Uncertainty of Frequency Response of E-field: ±6.3% (k=2)

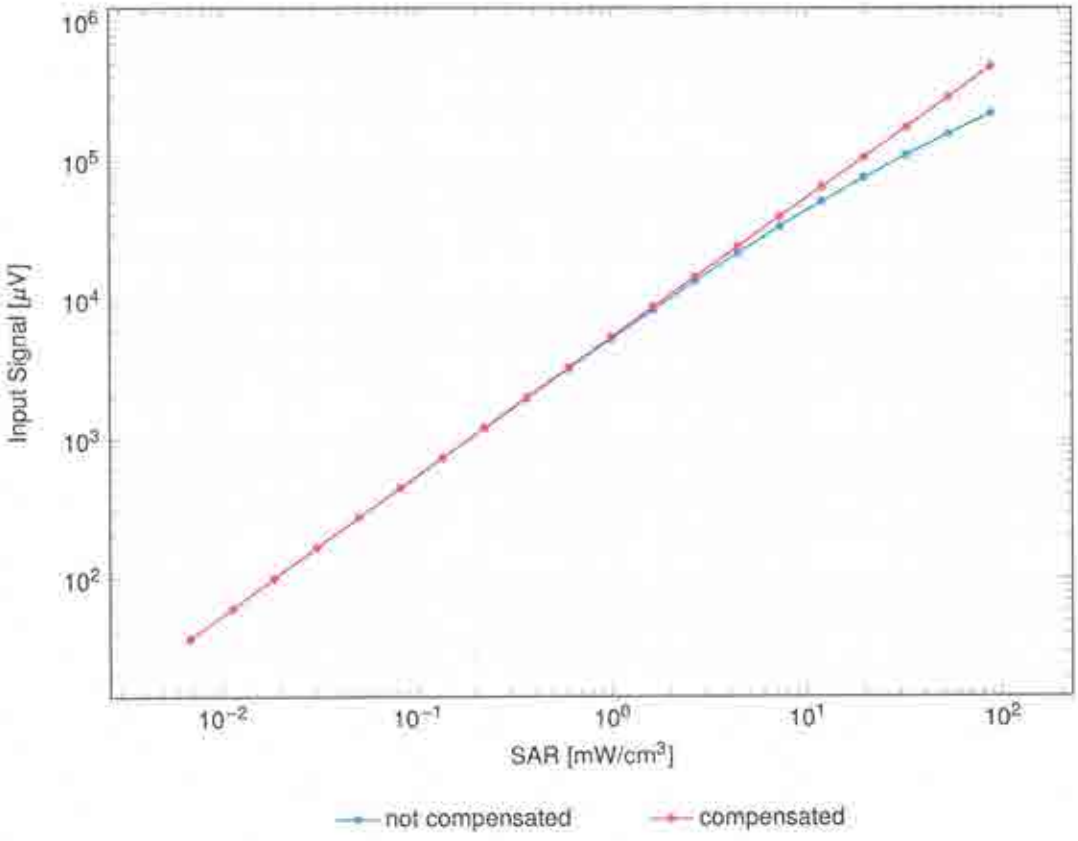
## Receiving Pattern ($\phi$), $\vartheta = 0°$

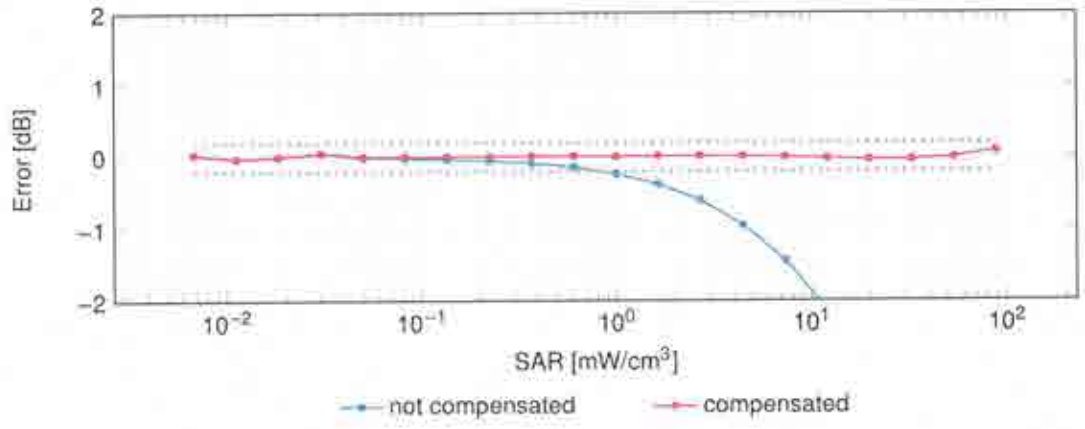



Uncertainty of Axial Isotropy Assessment: ±0.5% (k=2)

## Dynamic Range f($SAR_{HSL}$)

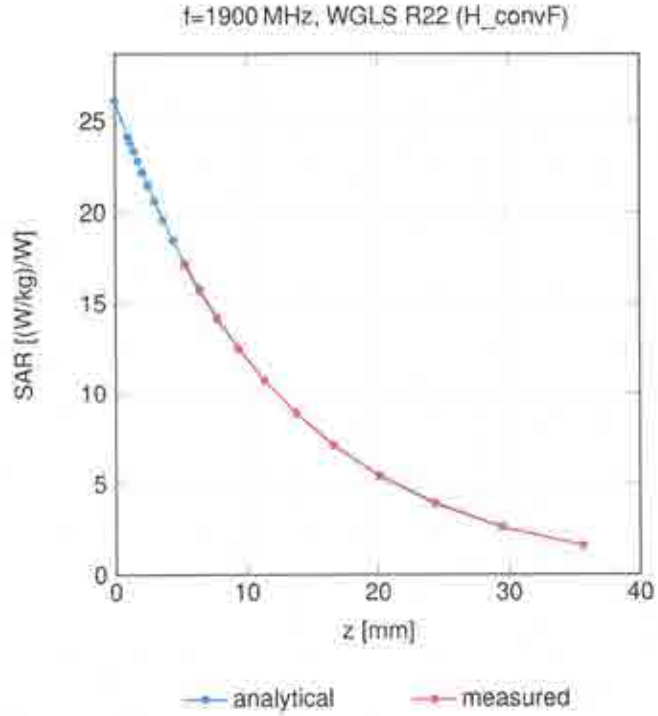
(TEM cell, $f_{eval}$ = 1900 MHz)



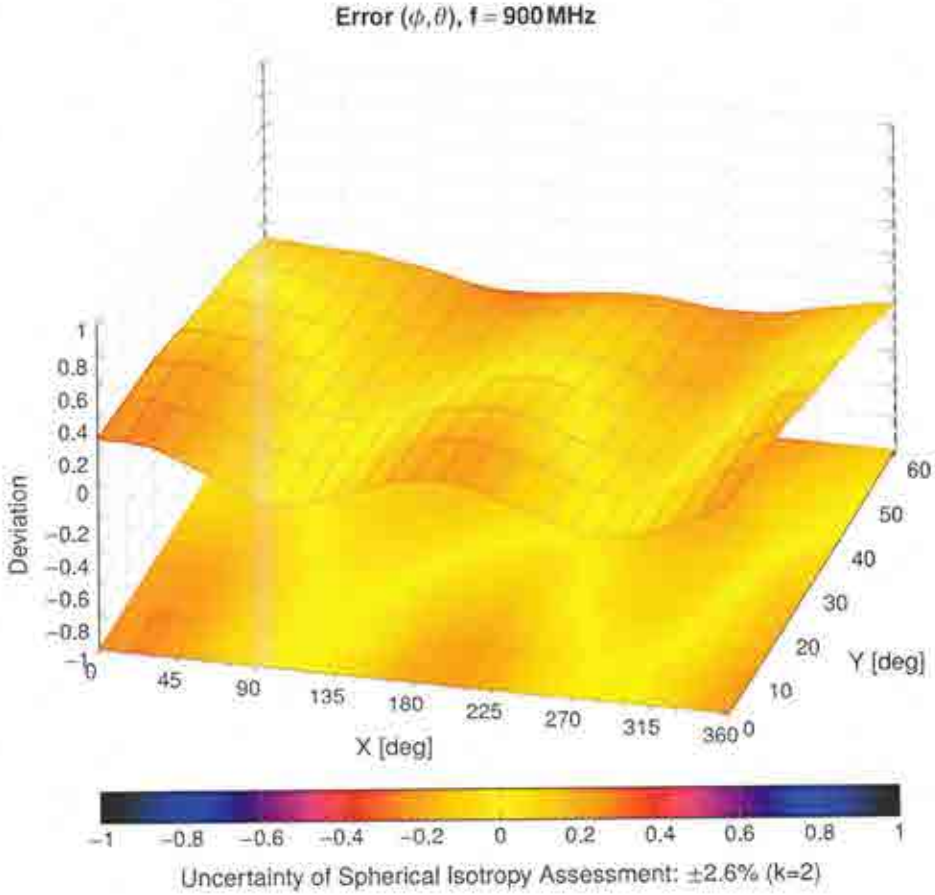




Uncertainty of Linearity Assessment: ±0.6% (k=2)

## Conversion Factor Assessment




## Deviation from Isotropy in Liquid



# Appendix: Modulation Calibration Parameters

| UID | Rev | Communication System Name | Group | PAR (dB) | Unc[E] k = 2 |
|---|---|---|---|---|---|
| 0 | | Continuous Wave | CW | 0.00 | ±4.7 |
| 10010 | CAB | Pulse (D=10%, T=100 ms) | Test | 10.00 | ±9.6 |
| 10011 | CAC | Rel. 99, RMC, QPSK, 5.0 MHz | WCDMA | 2.91 | ±9.6 |
| 10012 | CAB | DSSS, DBPSK, 1.0 Mbps, 92.5% DC | WLAN | 1.87 | ±9.6 |
| 10013 | CAB | OFDM, BPSK, 6.0 Mbps, 72.1% DC | WLAN | 9.46 | ±9.6 |
| 10021 | DAC | Voice, GMSK, 1 slot(s) | GSM | 9.39 | ±9.6 |
| 10023 | DAC | Data, GSMK, 1 slot(s) | GSM | 9.57 | ±9.6 |
| 10024 | DAC | Data, GSMK, 2 slot(s) | GSM | 6.56 | ±9.6 |
| 10025 | DAC | Data, 8PSK, 1 slot(s) | GSM | 12.62 | ±9.6 |
| 10026 | DAC | Data, 8PSK, 2 slot(s) | GSM | 9.55 | ±9.6 |
| 10027 | DAC | Data, GSMK, 3 slot(s) | GSM | 4.80 | ±9.6 |
| 10028 | DAC | Data, GSMK, 4 slot(s) | GSM | 3.55 | ±9.6 |
| 10029 | DAC | Data, 8PSK, 3 slot(s) | GSM | 7.78 | ±9.6 |
| 10030 | CAA | BR, DH1, GFSK | Bluetooth | 5.30 | ±9.6 |
| 10031 | CAA | BR, DH3, GFSK | Bluetooth | 1.87 | ±9.6 |
| 10032 | CAA | BR, DH5, GFSK | Bluetooth | 1.16 | ±9.6 |
| 10033 | CAA | EDR, DH1, pi/4-DQPSK | Bluetooth | 7.74 | ±9.6 |
| 10034 | CAA | EDR, DH3, pi/4-DQPSK | Bluetooth | 4.53 | ±9.6 |
| 10035 | CAA | EDR, DH5, pi/4-DQPSK | Bluetooth | 3.83 | ±9.6 |
| 10036 | CAA | EDR, DH1, 8-DPSK | Bluetooth | 8.01 | ±9.6 |
| 10037 | CAA | EDR, DH3, 8-DPSK | Bluetooth | 4.77 | ±9.6 |
| 10038 | CAA | EDR, DH5, 8-DPSK | Bluetooth | 4.10 | ±9.6 |
| 10039 | CAB | RC1, 1xRTT | CDMA2000 | 4.57 | ±9.6 |
| 10048 | CAA | Full Slot, GFSK, 1 slot(s) | DECT | 13.80 | ±9.6 |
| 10049 | CAA | Double Slot, GFSK, 2 slot(s) | DECT | 10.79 | ±9.6 |
| 10056 | CAA | TD-SCDMA, QPSK, 1.6 MHz | TD-SCDMA | 11.01 | ±9.6 |
| 10058 | DAC | Data, 8PSK, 4 slot(s) | GSM | 6.52 | ±9.6 |
| 10059 | CAB | DSSS, DQPSK, 2.0 Mbps, 87.4% DC | WLAN | 2.12 | ±9.6 |
| 10060 | CAB | HR-DSSS, DQPSK, 5.5 Mbps, 72.7% DC | WLAN | 2.83 | ±9.6 |
| 10061 | CAB | HR-DSSS, DQPSK, 11.0 Mbps, 57.5% DC | WLAN | 3.60 | ±9.6 |
| 10062 | CAE | OFDM, BPSK, 6.0 Mbps, 89.1% DC | WLAN | 8.68 | ±9.6 |
| 10063 | CAE | OFDM, BPSK, 9.0 Mbps, 85.3% DC | WLAN | 8.63 | ±9.6 |
| 10064 | CAE | OFDM, QPSK, 12.0 Mbps, 82.0% DC | WLAN | 9.09 | ±9.6 |
| 10065 | CAE | OFDM, QPSK, 18.0 Mbps, 76.0% DC | WLAN | 9.00 | ±9.6 |
| 10066 | CAE | OFDM, 16QAM, 24.0 Mbps, 70.6% DC | WLAN | 9.38 | ±9.6 |
| 10067 | CAE | OFDM, 16QAM, 36.0 Mbps, 62.9% DC | WLAN | 10.12 | ±9.6 |
| 10068 | CAE | OFDM, 64QAM, 48.0 Mbps, 56.6% DC | WLAN | 10.24 | ±9.6 |
| 10069 | CAE | OFDM, 64QAM, 54.0 Mbps, 54.4% DC | WLAN | 10.56 | ±9.6 |
| 10071 | CAB | OFDM, BPSK, 9.0 Mbps, 65.1% DC | WLAN | 9.83 | ±9.6 |
| 10072 | CAB | OFDM, QPSK, 12.0 Mbps, 60.1% DC | WLAN | 9.62 | ±9.6 |
| 10073 | CAB | OFDM, QPSK, 18.0 Mbps, 53.1% DC | WLAN | 9.94 | ±9.6 |
| 10074 | CAB | OFDM, 16QAM, 24.0 Mbps, 48.5% DC | WLAN | 10.30 | ±9.6 |
| 10075 | CAB | OFDM, 16QAM, 36.0 Mbps, 42.9% DC | WLAN | 10.77 | ±9.6 |
| 10076 | CAB | OFDM, 64QAM, 48.0 Mbps, 39.5% DC | WLAN | 10.94 | ±9.6 |
| 10077 | CAB | OFDM, 64QAM, 54.0 Mbps, 38.5% DC | WLAN | 11.00 | ±9.6 |
| 10081 | CAB | RC3, 1xRTT | CDMA2000 | 3.97 | ±9.6 |
| 10097 | CAC | Rel. 5 HSDPA, QPSK, 5.0 MHz | WCDMA | 3.98 | ±9.6 |
| 10098 | CAC | Rel. 6 HSUPA, Subset 2, QPSK, 5.0 MHz | WCDMA | 3.98 | ±9.6 |
| 10100 | CAF | 20.0 MHz, QPSK, 100% RB | LTE-FDD | 5.67 | ±9.6 |
| 10101 | CAF | 20.0 MHz, 16QAM, 100% RB | LTE-FDD | 6.42 | ±9.6 |
| 10102 | CAF | 20.0 MHz, 64QAM, 100% RB | LTE-FDD | 6.60 | ±9.6 |
| 10103 | CAH | 20.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.29 | ±9.6 |
| 10104 | CAH | 20.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.97 | ±9.6 |
| 10105 | CAH | 20.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 10.01 | ±9.6 |
| 10106 | CAH | 10.0 MHz, QPSK, 100% RB | LTE-FDD | 5.80 | ±9.6 |
| 10109 | CAH | 10.0 MHz, 16QAM, 100% RB | LTE-FDD | 6.43 | ±9.6 |
| 10110 | CAH | 5.0 MHz, QPSK, 100% RB | LTE-FDD | 5.75 | ±9.6 |
| 10111 | CAH | 5.0 MHz, 16QAM, 100% RB | LTE-FDD | 6.44 | ±9.6 |
| 10112 | CAH | 10.0 MHz, 64QAM, 100% RB | LTE-FDD | 6.59 | ±9.6 |
| 10113 | CAH | 5.0 MHz, 64QAM, 100% RB | LTE-FDD | 6.62 | ±9.6 |
| 10114 | CAE | HT40 Greenfield, MCS0 (13.5 Mbps), 99.7% DC | WLAN | 8.10 | ±9.6 |
| 10115 | CAE | HT40 Greenfield, MCS4 (81.0 Mbps), 99.7% DC | WLAN | 8.46 | ±9.6 |
| 10116 | CAE | HT40 Greenfield, MCS7 (135.0 Mbps), 99.7% DC | WLAN | 8.15 | ±9.6 |

| UID | Rev | Communication System Name | Group | PAR (dB) | Unc$^E$ $k=2$ |
|---|---|---|---|---|---|
| 10117 | CAE | HT40 Mixed, MCS0 (13.5 Mbps), 99.7% DC | WLAN | 8.07 | ±9.6 |
| 10118 | CAE | HT40 Mixed, MCS4 (81.0 Mbps), 99.7% DC | WLAN | 8.59 | ±9.6 |
| 10119 | CAE | HT40 Mixed, MCS7 (135.0 Mbps), 99.7% DC | WLAN | 8.13 | ±9.6 |
| 10140 | CAF | 15.0 MHz, 16QAM, 100% RB | LTE-FDD | 6.49 | ±9.6 |
| 10141 | CAF | 15.0 MHz, 64QAM, 100% RB | LTE-FDD | 6.53 | ±9.6 |
| 10142 | CAF | 3.0 MHz, QPSK, 100% RB | LTE-FDD | 5.73 | ±9.6 |
| 10143 | CAF | 3.0 MHz, 16QAM, 100% RB | LTE-FDD | 6.35 | ±9.6 |
| 10144 | CAF | 3.0 MHz, 64QAM, 100% RB | LTE-FDD | 6.65 | ±9.6 |
| 10145 | CAG | 1.4 MHz, QPSK, 100% RB | LTE-FDD | 5.76 | ±9.6 |
| 10146 | CAG | 1.4 MHz, 16QAM, 100% RB | LTE-FDD | 6.41 | ±9.6 |
| 10147 | CAG | 1.4 MHz, 64QAM, 100% RB | LTE-FDD | 6.72 | ±9.6 |
| 10149 | CAF | 20.0 MHz, 16QAM, 50% RB | LTE-FDD | 6.42 | ±9.6 |
| 10150 | CAF | 20.0 MHz, 64QAM, 50% RB | LTE-FDD | 6.60 | ±9.6 |
| 10151 | CAH | 20.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.28 | ±9.6 |
| 10152 | CAH | 20.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.92 | ±9.6 |
| 10153 | CAH | 20.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 10.05 | ±9.6 |
| 10154 | CAH | 10.0 MHz, QPSK, 50% RB | LTE-FDD | 5.75 | ±9.6 |
| 10155 | CAH | 10.0 MHz, 16QAM, 50% RB | LTE-FDD | 6.43 | ±9.6 |
| 10156 | CAH | 5.0 MHz, QPSK, 50% RB | LTE-FDD | 5.79 | ±9.6 |
| 10157 | CAH | 5.0 MHz, 16QAM, 50% RB | LTE-FDD | 6.49 | ±9.6 |
| 10158 | CAH | 10.0 MHz, 64QAM, 50% RB | LTE-FDD | 6.62 | ±9.6 |
| 10159 | CAH | 5.0 MHz, 64QAM, 50% RB | LTE-FDD | 6.56 | ±9.6 |
| 10160 | CAF | 15.0 MHz, QPSK, 50% RB | LTE-FDD | 5.82 | ±9.6 |
| 10161 | CAF | 15.0 MHz, 16QAM, 50% RB | LTE-FDD | 6.43 | ±9.6 |
| 10162 | CAF | 15.0 MHz, 64QAM, 50% RB | LTE-FDD | 6.58 | ±9.6 |
| 10166 | CAG | 1.4 MHz, QPSK, 50% RB | LTE-FDD | 5.46 | ±9.6 |
| 10167 | CAG | 1.4 MHz, 16QAM, 50% RB | LTE-FDD | 6.21 | ±9.6 |
| 10168 | CAG | 1.4 MHz, 64QAM, 50% RB | LTE-FDD | 6.79 | ±9.6 |
| 10169 | CAF | 20.0 MHz, QPSK, 1 RB | LTE-FDD | 5.73 | ±9.6 |
| 10170 | CAF | 20.0 MHz, 16QAM, 1 RB | LTE-FDD | 6.52 | ±9.6 |
| 10171 | AAF | 20.0 MHz, 64QAM, 1 RB | LTE-FDD | 6.49 | ±9.6 |
| 10172 | CAH | 20.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.21 | ±9.6 |
| 10173 | CAH | 20.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.48 | ±9.6 |
| 10174 | CAH | 20.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 10.25 | ±9.6 |
| 10175 | CAH | 10.0 MHz, QPSK, 1 RB | LTE-FDD | 5.72 | ±9.6 |
| 10176 | CAH | 10.0 MHz, 16QAM, 1 RB | LTE-FDD | 6.52 | ±9.6 |
| 10177 | CAJ | 5.0 MHz, QPSK, 1 RB | LTE-FDD | 5.73 | ±9.6 |
| 10178 | CAH | 5.0 MHz, 16QAM, 1 RB | LTE-FDD | 6.52 | ±9.6 |
| 10179 | CAH | 10.0 MHz, 64QAM, 1 RB | LTE-FDD | 6.50 | ±9.6 |
| 10180 | CAH | 5.0 MHz, 64QAM, 1 RB | LTE-FDD | 6.50 | ±9.6 |
| 10181 | CAF | 15.0 MHz, QPSK, 1 RB | LTE-FDD | 5.72 | ±9.6 |
| 10182 | CAF | 15.0 MHz, 16QAM, 1 RB | LTE-FDD | 6.52 | ±9.6 |
| 10183 | AAE | 15.0 MHz, 64QAM, 1 RB | LTE-FDD | 6.50 | ±9.6 |
| 10184 | CAF | 3.0 MHz, QPSK, 1 RB | LTE-FDD | 5.73 | ±9.6 |
| 10185 | CAF | 3.0 MHz, 16QAM, 1 RB | LTE-FDD | 6.51 | ±9.6 |
| 10186 | AAF | 3.0 MHz, 64QAM, 1 RB | LTE-FDD | 6.50 | ±9.6 |
| 10187 | CAG | 1.4 MHz, QPSK, 1 RB | LTE-FDD | 5.73 | ±9.6 |
| 10188 | CAG | 1.4 MHz, 16QAM, 1 RB | LTE-FDD | 6.52 | ±9.6 |
| 10189 | AAG | 1.4 MHz, 64QAM, 1 RB | LTE-FDD | 6.50 | ±9.6 |
| 10193 | CAE | HT20 Greenfield, MCS0 (6.5 Mbps), 99.4% DC | WLAN | 8.09 | ±9.6 |
| 10194 | CAE | HT20 Greenfield, MCS4 (39.0 Mbps), 99.5% DC | WLAN | 8.12 | ±9.6 |
| 10195 | CAE | HT20 Greenfield, MCS7 (65.0 Mbps), 99.5% DC | WLAN | 8.21 | ±9.6 |
| 10196 | CAE | HT20 Mixed, MCS0 (6.5 Mbps), 99.4% DC | WLAN | 8.10 | ±9.6 |
| 10197 | CAE | HT20 Mixed, MCS4 (39.0 Mbps), 99.5% DC | WLAN | 8.13 | ±9.6 |
| 10198 | CAE | HT20 Mixed, MCS7 (65.0 Mbps), 99.5% DC | WLAN | 8.27 | ±9.6 |
| 10219 | CAE | HT20 Mixed, MCS0 (7.2 Mbps), 99.3% DC | WLAN | 8.03 | ±9.6 |
| 10220 | CAE | HT20 Mixed, MCS4 (43.3 Mbps), 99.4% DC | WLAN | 8.13 | ±9.6 |
| 10221 | CAE | HT20 Mixed, MCS7 (72.2 Mbps), 99.4% DC | WLAN | 8.27 | ±9.6 |
| 10222 | CAE | HT40 Mixed, MCS0 (15.0 Mbps), 99.7% DC | WLAN | 8.06 | ±9.6 |
| 10223 | CAE | HT40 Mixed, MCS4 (90.0 Mbps), 99.7% DC | WLAN | 8.48 | ±9.6 |
| 10224 | CAE | HT40 Mixed, MCS7 (150.0 Mbps), 99.7% DC | WLAN | 8.08 | ±9.6 |
| 10225 | CAC | Rel. 7 HSPA+, 16QAM, 5.0 MHz | WCDMA | 5.97 | ±9.6 |
| 10226 | CAC | 1.4 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.49 | ±9.6 |
| 10227 | CAC | 1.4 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 10.26 | ±9.6 |
| 10228 | CAC | 1.4 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.22 | ±9.6 |
| 10229 | CAE | 3.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.48 | ±9.6 |

| UID | Rev | Communication System Name | Group | PAR (dB) | Unc$^E$ $k=2$ |
|---|---|---|---|---|---|
| 10230 | CAE | 3.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 10.25 | ±9.6 |
| 10231 | CAE | 3.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.19 | ±9.6 |
| 10232 | CAH | 5.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.48 | ±9.6 |
| 10233 | CAH | 5.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 10.25 | ±9.6 |
| 10234 | CAH | 5.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.21 | ±9.6 |
| 10235 | CAH | 10.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.48 | ±9.6 |
| 10236 | CAH | 10.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 10.25 | ±9.6 |
| 10237 | CAH | 10.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.21 | ±9.6 |
| 10238 | CAG | 15.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.48 | ±9.6 |
| 10239 | CAG | 15.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 10.25 | ±9.6 |
| 10240 | CAG | 15.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 1 RB | LTE-TDD | 9.21 | ±9.6 |
| 10241 | CAC | 1.4 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.82 | ±9.6 |
| 10242 | CAC | 1.4 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.86 | ±9.6 |
| 10243 | CAC | 1.4 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.46 | ±9.6 |
| 10244 | CAE | 3.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 10.06 | ±9.6 |
| 10245 | CAE | 3.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 10.06 | ±9.6 |
| 10246 | CAE | 3.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.30 | ±9.6 |
| 10247 | CAH | 5.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.91 | ±9.6 |
| 10248 | CAH | 5.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 10.09 | ±9.6 |
| 10249 | CAH | 5.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.29 | ±9.6 |
| 10250 | CAH | 10.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.81 | ±9.6 |
| 10251 | CAH | 10.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 10.17 | ±9.6 |
| 10252 | CAH | 10.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.24 | ±9.6 |
| 10253 | CAG | 15.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.90 | ±9.6 |
| 10254 | CAG | 15.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 10.14 | ±9.6 |
| 10255 | CAG | 15.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 50% RB | LTE-TDD | 9.20 | ±9.6 |
| 10256 | CAC | 1.4 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.96 | ±9.6 |
| 10257 | CAC | 1.4 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 10.08 | ±9.6 |
| 10258 | CAC | 1.4 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.34 | ±9.6 |
| 10259 | CAE | 3.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.98 | ±9.6 |
| 10260 | CAE | 3.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.97 | ±9.6 |
| 10261 | CAE | 3.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.24 | ±9.6 |
| 10262 | CAH | 5.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.83 | ±9.6 |
| 10263 | CAH | 5.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 10.16 | ±9.6 |
| 10264 | CAH | 5.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.23 | ±9.6 |
| 10265 | CAH | 10.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.92 | ±9.6 |
| 10266 | CAH | 10.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 10.07 | ±9.6 |
| 10267 | CAH | 10.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.30 | ±9.6 |
| 10268 | CAG | 15.0 MHz, 16QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 10.06 | ±9.6 |
| 10269 | CAG | 15.0 MHz, 64QAM, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 10.13 | ±9.6 |
| 10270 | CAG | 15.0 MHz, QPSK, UL/DL CFG: 1, SSC: 4, 100% RB | LTE-TDD | 9.58 | ±9.6 |
| 10274 | CAC | Rel. 6 HSUPA Subset 2, beta_d 0, QPSK, 5.0 MHz | WCDMA | 4.87 | ±9.6 |
| 10275 | CAC | Rel. 6 HSUPA Subset 2,beta_d 15, QPSK, 5.0 MHz | WCDMA | 3.96 | ±9.6 |
| 10290 | AAB | RC1, SO55, Full frame rate, 1xRTT | CDMA2000 | 3.91 | ±9.6 |
| 10291 | AAB | RC3, SO55, Full frame rate, 1xRTT | CDMA2000 | 3.46 | ±9.6 |
| 10292 | AAB | RC3, SO32, Full frame rate, SCH0 disabled, 1xRTT | CDMA2000 | 3.39 | ±9.6 |
| 10293 | AAB | RC3, SO3, Full frame rate, 1xRTT | CDMA2000 | 3.50 | ±9.6 |
| 10295 | AAB | RC3, SO3, 1/8 frame rate, 1xRTT | CDMA2000 | 12.49 | ±9.6 |
| 10297 | AAE | 20.0 MHz, QPSK, 50% RB | LTE-FDD | 5.81 | ±9.6 |
| 10298 | AAE | 3.0 MHz, QPSK, 50% RB | LTE-FDD | 5.72 | ±9.6 |
| 10299 | AAE | 3.0 MHz, 16QAM, 50% RB | LTE-FDD | 6.39 | ±9.6 |
| 10300 | AAE | 3.0 MHz, 64QAM, 50% RB | LTE-FDD | 6.60 | ±9.6 |
| 10301 | AAA | PUSC, 29:18, QPSK, 5.0 ms, 18 TRAF SYM | WiMAX | 12.03 | ±9.6 |
| 10302 | AAA | PUSC, 29:18, QPSK, 5.0 ms, 15 TRAF SYM | WiMAX | 12.57 | ±9.6 |
| 10303 | AAA | PUSC, 31:15, 64QAM, 5.0 ms, 15 TRAF SYM | WiMAX | 12.52 | ±9.6 |
| 10304 | AAA | PUSC, 29:18, 64QAM, 5.0 ms, 18 TRAF SYM | WiMAX | 11.86 | ±9.6 |
| 10305 | AAA | PUSC, 31:15, 64QAM, 10.0 ms, 15 TRAF SYM | WiMAX | 15.24 | ±9.6 |
| 10306 | AAA | PUSC, 29:18, 64QAM, 10.0 ms, 18 TRAF SYM | WiMAX | 14.67 | ±9.6 |
| 10307 | AAA | PUSC, 29:18, QPSK, 10.0 ms, 18 TRAF SYM | WiMAX | 14.49 | ±9.6 |
| 10308 | AAA | PUSC, 29:18, 16QAM, 10.0 ms, 18 TRAF SYM | WiMAX | 14.46 | ±9.6 |
| 10309 | AAA | AMC 2x3, 29:18, 16QAM, 10.0 ms, 18 TRAF SYM | WiMAX | 14.58 | ±9.6 |
| 10310 | AAA | AMC 2x3, 29:18, QPSK, 10.0 ms, 18 TRAF SYM | WiMAX | 14.57 | ±9.6 |
| 10311 | AAE | 15.0 MHz, QPSK, 100% RB | LTE-FDD | 6.06 | ±9.6 |
| 10315 | AAB | DSSS, DBPSK, 1.0 Mbps, 95.0% DC | WLAN | 1.71 | ±9.6 |
| 10316 | AAB | OFDM, BPSK, 6.0 Mbps, 95.9% DC | WLAN | 8.36 | ±9.6 |
| 10317 | AAE | OFDM, BPSK, 6.0 Mbps, 95.9% DC | WLAN | 8.36 | ±9.6 |