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CALIBRATION LABORATORY

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

### Antenna Parameters with Head TSL

|                                      |               |
|--------------------------------------|---------------|
| Impedance, transformed to feed point | 54.3Ω+ 2.55jΩ |
| Return Loss                          | - 26.4dB      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.056 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: 08.26.2021

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 914**

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 1.772$  S/m;  $\epsilon_r = 40.04$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7517; ConvF(7.34, 7.34, 7.34) @ 2450 MHz; Calibrated: 2021-02-03
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn536; Calibrated: 2020-11-06
- Phantom: MFP\_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

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

Reference Value = 108.2 V/m; Power Drift = -0.03 dB

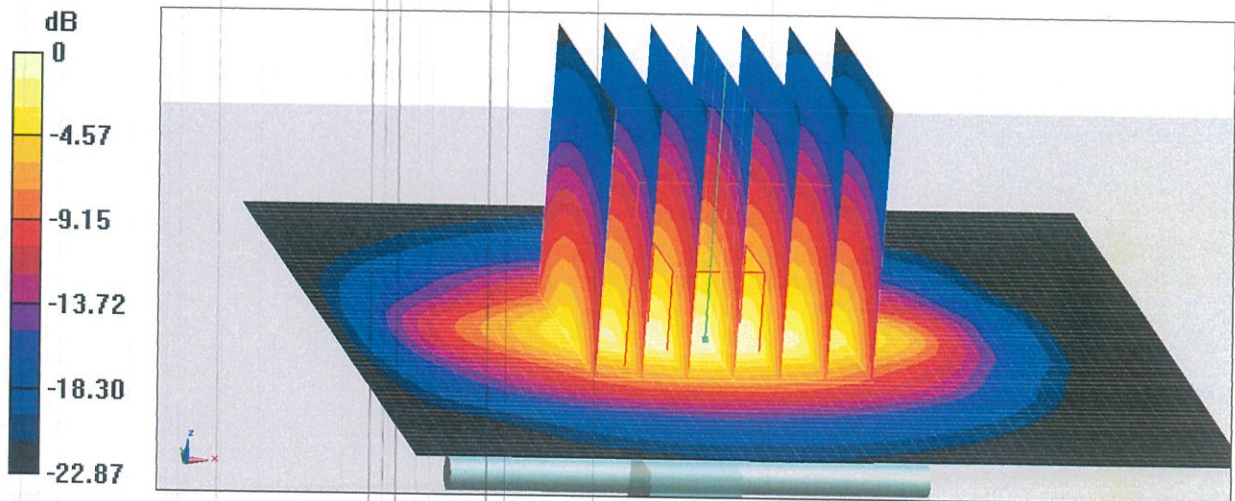
Peak SAR (extrapolated) = 27.7 W/kg

**SAR(1 g) = 13 W/kg; SAR(10 g) = 5.92 W/kg**

Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 46.8%

Maximum value of SAR (measured) = 22.2 W/kg



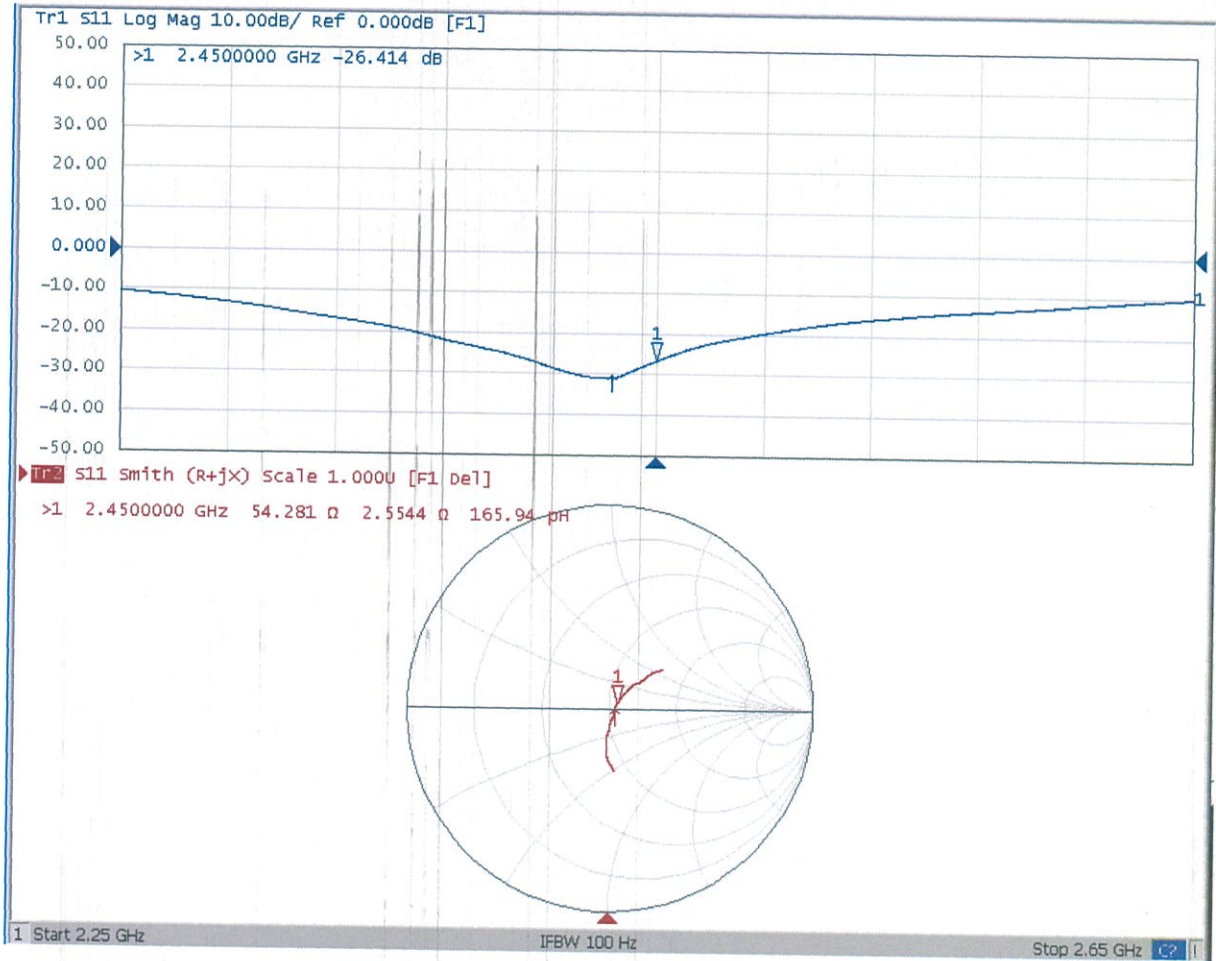
0 dB = 22.2 W/kg = 13.46 dBW/kg



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## Impedance Measurement Plot for Head TSL



Client

Cerpasp

Certificate No: Z21-60268

## CALIBRATION CERTIFICATE

Object

D5GHzV2 - SN: 1156

Calibration Procedure(s)

FF-Z11-003-01

Calibration Procedures for dipole validation kits

Calibration date:

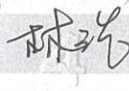
August 11, 2021

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

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22\pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards       | ID #       | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|-------------------------|------------|-------------------------------------------|-----------------------|
| Power Meter NRP2        | 106277     | 23-Sep-20 (CTTL, No.J20X08336)            | Sep-21                |
| Power sensor NRP8S      | 104291     | 23-Sep-20 (CTTL, No.J20X08336)            | Sep-21                |
| ReferenceProbe EX3DV4   | SN 3846    | 26-Apr-21(CTTL-SPEAG,No.Z21-60084)        | Apr-22                |
| DAE4                    | SN 549     | 08-Jan-21(CTTL-SPEAG,No.Z21-60002)        | Jan-22                |
| Secondary Standards     | ID #       | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
| Signal Generator E4438C | MY49071430 | 01-Feb-21 (CTTL, No.J21X00593)            | Jan-22                |
| NetworkAnalyzerE5071C   | MY46110673 | 14-Jan-21 (CTTL, No.J21X00232)            | Jan-22                |

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

Issued: August 14, 2021

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### Glossary:

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

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

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
- IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

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

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



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### Measurement Conditions

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

|                              |                                                                      |                                  |
|------------------------------|----------------------------------------------------------------------|----------------------------------|
| DASY Version                 | DASY52                                                               | V52.10.4                         |
| Extrapolation                | Advanced Extrapolation                                               |                                  |
| Phantom                      | Triple Flat Phantom 5.1C                                             |                                  |
| Distance Dipole Center - TSL | 10 mm                                                                | with Spacer                      |
| Zoom Scan Resolution         | dx, dy = 4 mm, dz = 1.4 mm                                           | Graded Ratio = 1.4 (Z direction) |
| Frequency                    | 5250 MHz $\pm$ 1 MHz<br>5600 MHz $\pm$ 1 MHz<br>5750 MHz $\pm$ 1 MHz |                                  |

### Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters             | 22.0 °C             | 35.9           | 4.71 mho/m           |
| Measured Head TSL parameters            | (22.0 $\pm$ 0.2) °C | 35.7 $\pm$ 6 % | 4.69 mho/m $\pm$ 6 % |
| Head TSL temperature change during test | <1.0 °C             | ----           | ----                 |

### SAR result with Head TSL at 5250 MHz

|                                                         |                    |                              |
|---------------------------------------------------------|--------------------|------------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL   | Condition          |                              |
| SAR measured                                            | 100 mW input power | 7.64 W/kg                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 76.3 W/kg $\pm$ 24.4 % (k=2) |
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                              |
| SAR measured                                            | 100 mW input power | 2.18 W/kg                    |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 21.8 W/kg $\pm$ 24.2 % (k=2) |



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### Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

|                                         | Temperature     | Permittivity | Conductivity     |
|-----------------------------------------|-----------------|--------------|------------------|
| Nominal Head TSL parameters             | 22.0 °C         | 35.5         | 5.07 mho/m       |
| Measured Head TSL parameters            | (22.0 ± 0.2) °C | 35.1 ± 6 %   | 5.07 mho/m ± 6 % |
| Head TSL temperature change during test | <1.0 °C         | ----         | ----             |

### SAR result with Head TSL at 5600 MHz

|                                                         |                    |                          |
|---------------------------------------------------------|--------------------|--------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL   | Condition          |                          |
| SAR measured                                            | 100 mW input power | 8.16 W/kg                |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 81.4 W/kg ± 24.4 % (k=2) |
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                          |
| SAR measured                                            | 100 mW input power | 2.33 W/kg                |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 23.2 W/kg ± 24.2 % (k=2) |

### Head TSL parameters at 5750 MHz

The following parameters and calculations were applied.

|                                         | Temperature     | Permittivity | Conductivity     |
|-----------------------------------------|-----------------|--------------|------------------|
| Nominal Head TSL parameters             | 22.0 °C         | 35.4         | 5.22 mho/m       |
| Measured Head TSL parameters            | (22.0 ± 0.2) °C | 34.8 ± 6 %   | 5.24 mho/m ± 6 % |
| Head TSL temperature change during test | <1.0 °C         | ----         | ----             |

### SAR result with Head TSL at 5750 MHz

|                                                         |                    |                          |
|---------------------------------------------------------|--------------------|--------------------------|
| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL   | Condition          |                          |
| SAR measured                                            | 100 mW input power | 7.88 W/kg                |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 78.5 W/kg ± 24.4 % (k=2) |
| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | Condition          |                          |
| SAR measured                                            | 100 mW input power | 2.24 W/kg                |
| SAR for nominal Head TSL parameters                     | normalized to 1W   | 22.3 W/kg ± 24.2 % (k=2) |



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

### Antenna Parameters with Head TSL at 5250 MHz

|                                      |                |
|--------------------------------------|----------------|
| Impedance, transformed to feed point | 50.5Ω - 5.84jΩ |
| Return Loss                          | - 24.7dB       |

### Antenna Parameters with Head TSL at 5600 MHz

|                                      |                |
|--------------------------------------|----------------|
| Impedance, transformed to feed point | 58.3Ω + 0.27jΩ |
| Return Loss                          | - 22.3dB       |

### Antenna Parameters with Head TSL at 5750 MHz

|                                      |                |
|--------------------------------------|----------------|
| Impedance, transformed to feed point | 55.7Ω - 4.12jΩ |
| Return Loss                          | - 23.6dB       |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.104 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 |
|-----------------|-------|



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## **DASY5 Validation Report for Head TSL**

Date: 08.11.2021

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1156**

Communication System: CW; Frequency: 5250 MHz, Frequency: 5600 MHz,  
Frequency: 5750 MHz,

Medium parameters used:  $f = 5250$  MHz;  $\sigma = 4.693$  S/m;  $\epsilon_r = 35.66$ ;  $\rho = 1000$  kg/m<sup>3</sup>,  
Medium parameters used:  $f = 5600$  MHz;  $\sigma = 5.072$  S/m;  $\epsilon_r = 35.06$ ;  $\rho = 1000$  kg/m<sup>3</sup>,  
Medium parameters used:  $f = 5750$  MHz;  $\sigma = 5.235$  S/m;  $\epsilon_r = 34.79$ ;  $\rho = 1000$  kg/m<sup>3</sup>,

Phantom section: Right Section

### **DASY5 Configuration:**

- Probe: EX3DV4 - SN3846; ConvF(5.43, 5.43, 5.43) @ 5250 MHz; ConvF(4.69, 4.69, 4.69) @ 5600 MHz; ConvF(4.9, 4.9, 4.9) @ 5750 MHz; Calibrated: 2021-04-26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn549; Calibrated: 2021-01-08
- Phantom: MFP\_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

### **Dipole Calibration /Pin=100mW, d=10mm, f=5250 MHz/Zoom Scan,**

**dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 69.95 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 31.8 W/kg

**SAR(1 g) = 7.64 W/kg; SAR(10 g) = 2.18 W/kg**

Smallest distance from peaks to all points 3 dB below = 7.2 mm

Ratio of SAR at M2 to SAR at M1 = 63.8%

Maximum value of SAR (measured) = 17.8 W/kg

### **Dipole Calibration /Pin=100mW, d=10mm, f=5600 MHz/Zoom Scan,**

**dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 72.09 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 35.2 W/kg

**SAR(1 g) = 8.16 W/kg; SAR(10 g) = 2.33 W/kg**

Smallest distance from peaks to all points 3 dB below = 7.4 mm

Ratio of SAR at M2 to SAR at M1 = 62.7%

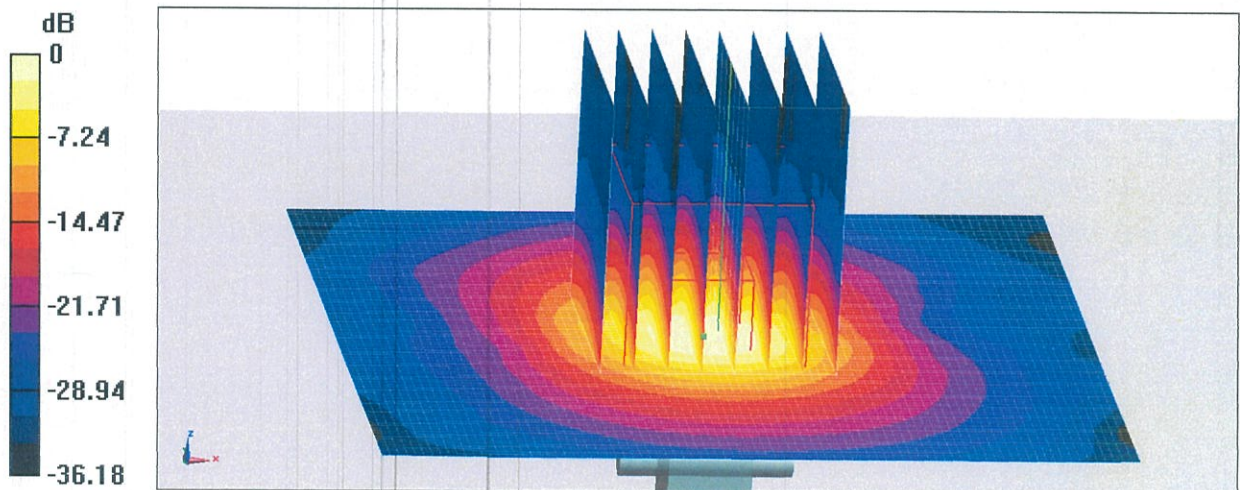
Maximum value of SAR (measured) = 20.0 W/kg



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**Dipole Calibration /Pin=100mW, d=10mm, f=5750 MHz/Zoom Scan,**  
**dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm**  
Reference Value = 70.06 V/m; Power Drift = -0.01 dB  
Peak SAR (extrapolated) = 34.2 W/kg  
**SAR(1 g) = 7.88 W/kg; SAR(10 g) = 2.24 W/kg**  
Smallest distance from peaks to all points 3 dB below = 7.5 mm  
Ratio of SAR at M2 to SAR at M1 = 62.7%  
Maximum value of SAR (measured) = 19.2 W/kg



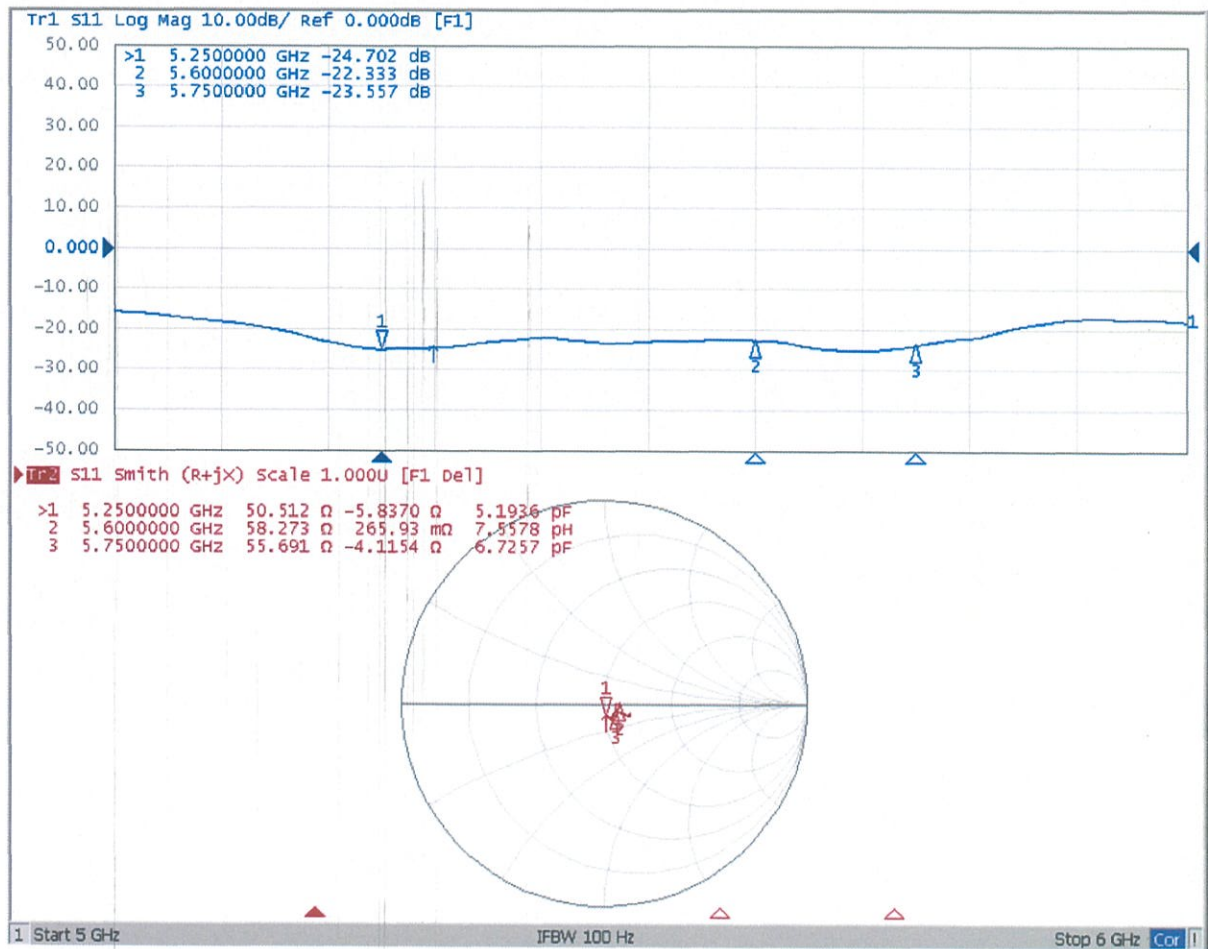
0 dB = 19.2 W/kg = 12.83 dBW/kg



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## Impedance Measurement Plot for Head TSL





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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **Cerpass (Auden)**

Certificate No: **D6.5GHzV2-1078\_Jun22**

## CALIBRATION CERTIFICATE

Object **D6.5GHzV2 - SN:1078**

Calibration procedure(s) **QA CAL-22.v6**  
**Calibration Procedure for SAR Validation Sources between 3-10 GHz**

Calibration date: **June 16, 2022**

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 ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID #             | Cal Date (Certificate No.)     | Scheduled Calibration |
|----------------------------|------------------|--------------------------------|-----------------------|
| Power sensor R&S NRP33T    | SN: 100967       | 01-Apr-22 (No. 217-03526)      | Apr-23                |
| Reference 20 dB Attenuator | SN: BH9394 (20k) | 04-Apr-22 (No. 217-03527)      | Apr-23                |
| Mismatch combination       | SN: 84224 / 360D | 26-Apr-21 (No. 217-03353)      | Apr-24                |
| Reference Probe EX3DV4     | SN: 7405         | 02-Jun-22 (No. EX3-7405_Jun22) | Jun-23                |
| DAE4                       | SN: 908          | 24-Jun-21 (No. DAE4-908_Jun21) | Jun-22                |

| Secondary Standards              | ID #          | Check Date (in house)             | Scheduled Check        |
|----------------------------------|---------------|-----------------------------------|------------------------|
| RF generator Anapico APSIN20G    | SN: 827       | 18-Dec-18 (in house check Dec-21) | In house check: Dec-23 |
| Network Analyzer Keysight E5063A | SN:MY54504221 | 31-Oct-19 (in house check Oct-19) | In house check: Oct-22 |

|                |                      |                                   |               |
|----------------|----------------------|-----------------------------------|---------------|
| Calibrated by: | Name<br>Leif Klysner | Function<br>Laboratory Technician | Signature<br> |
| Approved by:   | Sven Kühn            | Technical Manager                 |               |

Issued: June 16, 2022

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Accreditation No.: **SCS 0108**

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Multilateral Agreement for the recognition of calibration certificates

### 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.

### Additional Documentation:

- b) DASY System Handbook

### Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.
- *The absorbed power density (APD):* The absorbed power density is evaluated according to Samaras T, Christ A, Kuster N, "Compliance assessment of the epithelial or absorbed power density above 6 GHz using SAR measurement systems", Bioelectromagnetics, 2021 (submitted). The additional evaluation uncertainty of 0.55 dB (rectangular distribution) is considered.

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.

|                                     |                              |                                  |
|-------------------------------------|------------------------------|----------------------------------|
| <b>DASY Version</b>                 | DASY6                        | V16.0                            |
| <b>Extrapolation</b>                | Advanced Extrapolation       |                                  |
| <b>Phantom</b>                      | Modular Flat Phantom         |                                  |
| <b>Distance Dipole Center - TSL</b> | 5 mm                         | with Spacer                      |
| <b>Zoom Scan Resolution</b>         | dx, dy = 3.4 mm, dz = 1.4 mm | Graded Ratio = 1.4 (Z direction) |
| <b>Frequency</b>                    | 6500 MHz $\pm$ 1 MHz         |                                  |

## Head TSL parameters

The following parameters and calculations were applied.

|                                                | Temperature         | Permittivity   | Conductivity         |
|------------------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>             | 22.0 °C             | 34.5           | 6.07 mho/m           |
| <b>Measured Head TSL parameters</b>            | (22.0 $\pm$ 0.2) °C | 33.3 $\pm$ 6 % | 6.05 mho/m $\pm$ 6 % |
| <b>Head TSL temperature change during test</b> | < 0.5 °C            | ----           | ----                 |

## SAR result with Head TSL

|                                                             |                    |                                               |
|-------------------------------------------------------------|--------------------|-----------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | Condition          |                                               |
| SAR measured                                                | 100 mW input power | 29.5 W/kg                                     |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>293 W/kg <math>\pm</math> 24.7 % (k=2)</b> |

|                                                             |                    |                                                |
|-------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 8 cm<sup>3</sup> (8 g) of Head TSL</b> | Condition          |                                                |
| SAR measured                                                | 100 mW input power | 6.66 W/kg                                      |
| SAR for nominal Head TSL parameters                         | normalized to 1W   | <b>66.0 W/kg <math>\pm</math> 24.4 % (k=2)</b> |

|                                                               |                    |                                                |
|---------------------------------------------------------------|--------------------|------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | condition          |                                                |
| SAR measured                                                  | 100 mW input power | 5.45 W/kg                                      |
| SAR for nominal Head TSL parameters                           | normalized to 1W   | <b>54.0 W/kg <math>\pm</math> 24.4 % (k=2)</b> |

## Appendix

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 45.6 $\Omega$ - 3.5 j $\Omega$ |
| Return Loss                          | - 24.6 dB                      |

### APD (Absorbed Power Density)

| APD averaged over 1 cm <sup>2</sup> | Condition          |                                                           |
|-------------------------------------|--------------------|-----------------------------------------------------------|
| APD measured                        | 100 mW input power | 292 W/m <sup>2</sup>                                      |
| APD measured                        | normalized to 1W   | <b>2920 W/m<sup>2</sup> <math>\pm</math> 29.2 % (k=2)</b> |

| APD averaged over 4 cm <sup>2</sup> | condition          |                                                           |
|-------------------------------------|--------------------|-----------------------------------------------------------|
| APD measured                        | 100 mW input power | 133 W/m <sup>2</sup>                                      |
| APD measured                        | normalized to 1W   | <b>1330 W/m<sup>2</sup> <math>\pm</math> 28.9 % (k=2)</b> |

\*The reported APD values have been derived using psSAR8g.

### General Antenna Parameters and Design

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 |
|-----------------|-------|

# DASY6 Validation Report for Head TSL

Measurement Report for D6.5GHz-1078, UID 0 -, Channel 6500 (6500.0MHz)

## Device under Test Properties

| Name, Manufacturer | Dimensions [mm]    | IMEI     | DUT Type |
|--------------------|--------------------|----------|----------|
| D6.5GHz            | 16.0 x 6.0 x 300.0 | SN: 1078 | -        |

## Exposure Conditions

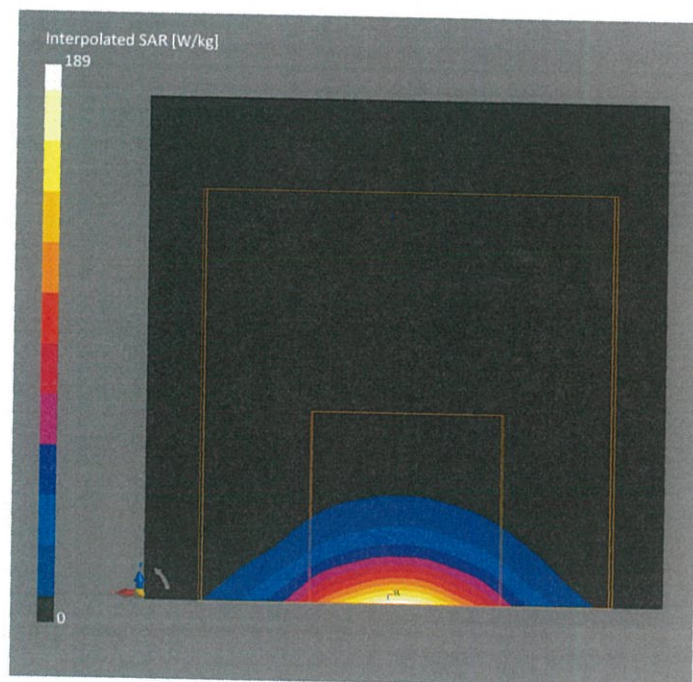
| Phantom Section, TSL | Position, Test Distance [mm] | Band | Group, UID | Frequency [MHz] | Conversion Factor | TSL Cond. [S/m] | TSL Permittivity |
|----------------------|------------------------------|------|------------|-----------------|-------------------|-----------------|------------------|
| Flat, HSL            | 5.00                         | Band | CW,        | 6500            | 5.50              | 6.05            | 33.3             |

## Hardware Setup

| Phantom                | TSL             | Probe, Calibration Date     | DAE, Calibration Date  |
|------------------------|-----------------|-----------------------------|------------------------|
| MFP V8.0 Center - 1182 | HBBL600-10000V6 | EX3DV4 - SN7405, 2022-06-02 | DAE4 Sn908, 2021-06-24 |

## Scan Setup

| Zoom Scan           |                    | Measurement Results |                   |
|---------------------|--------------------|---------------------|-------------------|
| Grid Extents [mm]   | 22.0 x 22.0 x 22.0 | Date                | 2022-06-16, 12:22 |
| Grid Steps [mm]     | 3.4 x 3.4 x 1.4    | psSAR1g [W/Kg]      | 29.5              |
| Sensor Surface [mm] | 1.4                | psSAR8g [W/Kg]      | 6.66              |
| Graded Grid         | Yes                | psSAR10g [W/Kg]     | 5.45              |
| Grading Ratio       | 1.4                | Power Drift [dB]    | 0.01              |
| MAIA                | N/A                | Power Scaling       | Disabled          |
| Surface Detection   | VMS + 6p           | Scaling Factor [dB] |                   |
| Scan Method         | Measured           | TSL Correction      | No correction     |
|                     |                    | M2/M1 [%]           | 54.8              |
|                     |                    | Dist 3dB Peak [mm]  | 4.8               |



## Impedance Measurement Plot for Head TSL

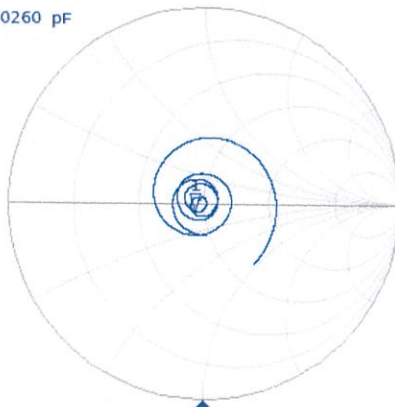
E5063A Network Analyzer

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State

Resize

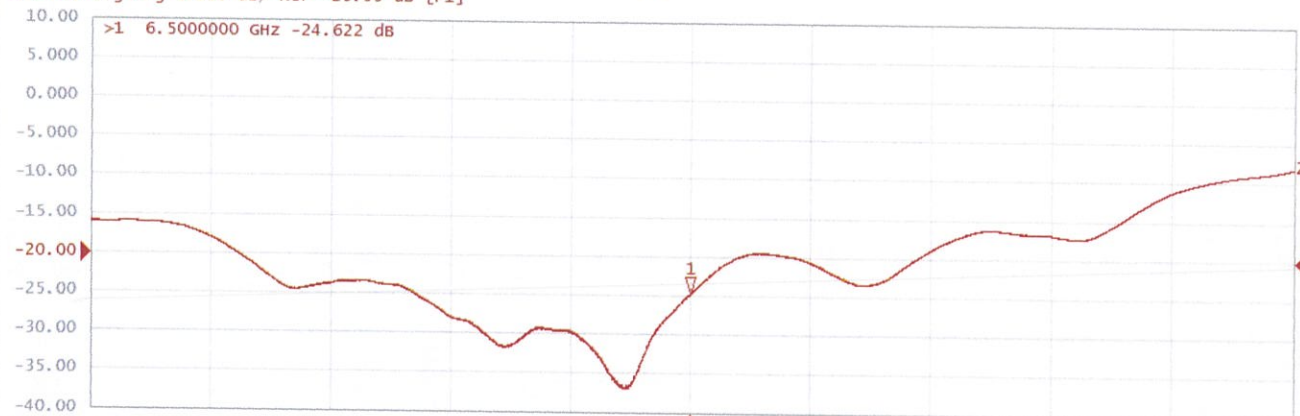
Tr1 S11 Smith (R+jX) Scale 1.000 U [F1]

>1 6.500000 GHz 45.593  $\Omega$  -3.4849  $\Omega$  7.0260 pF



Tr2 S11 Log Mag 5.000 dB/ Ref -20.00 dB [F1]

>1 6.500000 GHz -24.622 dB



1 Center 6.5 GHz

IFBW 70 kHz

Span 2 GHz 10/10 Cor II

Meas Extra



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 **Eurofins E&E Wireless Taiwan**

Certificate No: **5G-Veri10-1060\_Sep22**

## CALIBRATION CERTIFICATE

Object **5G Verification Source 10 GHz - SN: 1060**

Calibration procedure(s) **QA CAL-45.v3**  
 Calibration procedure for sources in air above 6 GHz

Calibration date: **September 27, 2022**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards             | ID #     | Cal Date (Certificate No.)         | Scheduled Calibration  |
|-------------------------------|----------|------------------------------------|------------------------|
| Reference Probe EUMmWV3       | SN: 9374 | 2021-12-21(No. EUMmWV3-9374_Dec21) | Dec-22                 |
| DAE4ip                        | SN: 1602 | 2022-06-27 (No. DAE4ip-1602_Jun22) | Jun-23                 |
| Secondary Standards           | ID #     | Check Date (in house)              | Scheduled Check        |
| RF generator Anapico APSIN20G | SN: 827  | 18-Dec-18 (in house check Dec-21)  | In house check: Dec-23 |

Calibrated by: **Name** **Leif Klysner** **Function** **Laboratory Technician**

Approved by: **Sven Kühn** **Technical Manager**

Signature

*Leif Klysner*  
*S. Kühn*

Issued: September 27, 2022

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



Accredited by the Swiss Accreditation Service (SAS)

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

## Glossary

CW                      Continuous wave

## Calibration is Performed According to the Following Standards

- Internal procedure QA CAL-45-5Gsources
- IEC TR 63170 ED1, "Measurement procedure for the evaluation of power density related to human exposure to radio frequency fields from wireless communication devices operating between 6 GHz and 100 GHz", January 2018

## Methods Applied and Interpretation of Parameters

- *Coordinate System:* z-axis in the waveguide horn boresight, x-axis is in the direction of the E-field, y-axis normal to the others in the field scanning plane parallel to the horn flare and horn flange.
- *Measurement Conditions:* (1) 10 GHz: The radiated power is the forward power to the horn antenna minus ohmic and mismatch loss. The forward power is measured prior and after the measurement with a power sensor. During the measurements, the horn is directly connected to the cable and the antenna ohmic and mismatch losses are determined by far-field measurements. (2) 30, 45, 60 and 90 GHz: The verification sources are switched on for at least 30 minutes. Absorbers are used around the probe cub and at the ceiling to minimize reflections.
- *Horn Positioning:* The waveguide horn is mounted vertically on the flange of the waveguide source to allow vertical positioning of the EUmmW probe during the scan. The plane is parallel to the phantom surface. Probe distance is verified using mechanical gauges positioned on the flare of the horn.
- *E- field distribution:* E field is measured in two x-y-plane (10mm, 10mm +  $\lambda/4$ ) with a vectorial E-field probe. The E-field value stated as calibration value represents the E-field-maxima and the averaged (1cm<sup>2</sup> and 4cm<sup>2</sup>) power density values at 10mm in front of the horn.
- *Field polarization:* Above the open horn, linear polarization of the field is expected. This is verified graphically in the field representation.

## Calibrated Quantity

- Local peak E-field (V/m) and average of peak spatial components of the poynting vector (W/m<sup>2</sup>) averaged over the surface area of 1 cm<sup>2</sup> and 4cm<sup>2</sup> at the nominal operational frequency of the verification source. Both square and circular averaging results are listed.

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.

|                                       |                               |      |
|---------------------------------------|-------------------------------|------|
| <b>DASY Version</b>                   | DASY8 Module mmWave           | V3.0 |
| <b>Phantom</b>                        | 5G Phantom                    |      |
| <b>Distance Horn Aperture - plane</b> | 10 mm                         |      |
| <b>XY Scan Resolution</b>             | dx, dy = 7.5 mm               |      |
| <b>Number of measured planes</b>      | 2 (10mm, 10mm + $\lambda/4$ ) |      |
| <b>Frequency</b>                      | 10 GHz $\pm$ 10 MHz           |      |

## Calibration Parameters, 10 GHz

### Circular Averaging

| Distance Horn Aperture<br>to Measured Plane | <b><i>Prad</i><sup>1</sup></b><br><b>(mW)</b> | <b>Max E-field</b><br><b>(V/m)</b> | Uncertainty<br>(k = 2) | Avg Power Density<br>Avg (psPDn+, psPDtot+, psPDmod+)<br>(W/m <sup>2</sup> ) |                   | Uncertainty<br>(k = 2) |
|---------------------------------------------|-----------------------------------------------|------------------------------------|------------------------|------------------------------------------------------------------------------|-------------------|------------------------|
|                                             |                                               |                                    |                        | 1 cm <sup>2</sup>                                                            | 4 cm <sup>2</sup> |                        |
| 10 mm                                       | 86.1                                          | <b>147</b>                         | 1.27 dB                | <b>54.3</b>                                                                  | <b>50.5</b>       | 1.28 dB                |

### Square Averaging

| Distance Horn Aperture<br>to Measured Plane | <b><i>Prad</i><sup>1</sup></b><br><b>(mW)</b> | <b>Max E-field</b><br><b>(V/m)</b> | Uncertainty<br>(k = 2) | Avg Power Density<br>Avg (psPDn+, psPDtot+, psPDmod+)<br>(W/m <sup>2</sup> ) |                   | Uncertainty<br>(k = 2) |
|---------------------------------------------|-----------------------------------------------|------------------------------------|------------------------|------------------------------------------------------------------------------|-------------------|------------------------|
|                                             |                                               |                                    |                        | 1 cm <sup>2</sup>                                                            | 4 cm <sup>2</sup> |                        |
| 10 mm                                       | 86.1                                          | <b>147</b>                         | 1.27 dB                | <b>54.4</b>                                                                  | <b>50.5</b>       | 1.28 dB                |

<sup>1</sup> Assessed ohmic and mismatch loss plus numerical offset: 0.55 dB

# DASY Report

## Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

### Device under Test Properties

| Name, Manufacturer            | Dimensions [mm]       | IMEI     | DUT Type |
|-------------------------------|-----------------------|----------|----------|
| 5G Verification Source 10 GHz | 100.0 x 100.0 x 172.0 | SN: 1060 | -        |

### Exposure Conditions

| Phantom Section | Position, Test Distance [mm] | Band            | Group, | Frequency [MHz], Channel Number | Conversion Factor |
|-----------------|------------------------------|-----------------|--------|---------------------------------|-------------------|
| 5G -            | 10.0 mm                      | Validation band | CW     | 10000.0, 10000                  | 1.0               |

### Hardware Setup

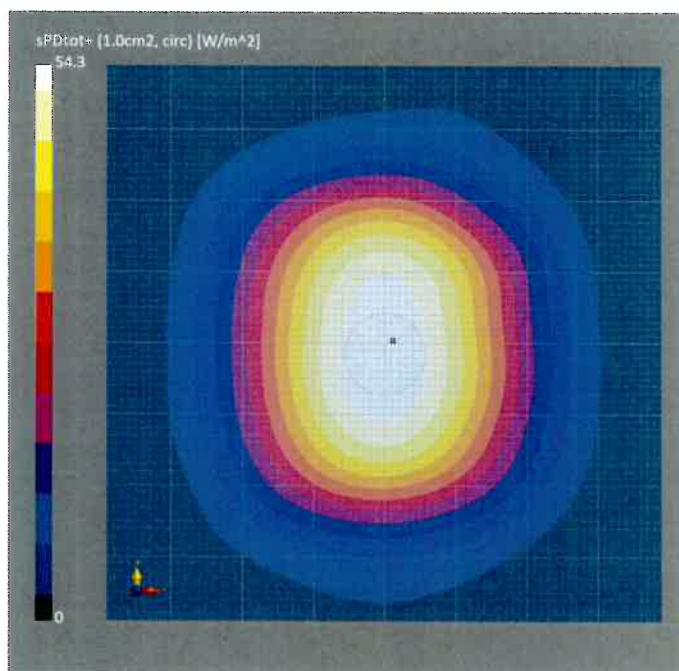
| Phantom               | Medium | Probe, Calibration Date               | DAE, Calibration Date     |
|-----------------------|--------|---------------------------------------|---------------------------|
| mmWave Phantom - 1002 | Air    | EUmmWV3 - SN9374_F1-55GHz, 2021-12-21 | DAE4ip Sn1602, 2022-06-27 |

### Scan Setup

|                     | 5G Scan       |
|---------------------|---------------|
| Grid Extents [mm]   | 120.0 x 120.0 |
| Grid Steps [lambda] | 0.25 x 0.25   |
| Sensor Surface [mm] | 10.0          |
| MAIA                | MAIA not used |

### Measurement Results

|                              | 5G Scan           |
|------------------------------|-------------------|
| Date                         | 2022-09-27, 16:48 |
| Avg. Area [cm <sup>2</sup> ] | 1.00              |
| psPDn+ [W/m <sup>2</sup> ]   | 54.2              |
| psPDtot+ [W/m <sup>2</sup> ] | 54.3              |
| psPDmod+ [W/m <sup>2</sup> ] | 54.5              |
| E <sub>max</sub> [V/m]       | 147               |
| Power Drift [dB]             | -0.00             |



DASY Report

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Device under Test Properties

| Name, Manufacturer            | Dimensions [mm]       | IMEI     | DUT Type |
|-------------------------------|-----------------------|----------|----------|
| 5G Verification Source 10 GHz | 100.0 x 100.0 x 172.0 | SN: 1060 | -        |

Exposure Conditions

| Phantom Section | Position, Test Distance [mm] | Band            | Group, | Frequency [MHz], Channel Number | Conversion Factor |
|-----------------|------------------------------|-----------------|--------|---------------------------------|-------------------|
| 5G -            | 10.0 mm                      | Validation band | CW     | 10000.0, 10000                  | 1.0               |

Hardware Setup

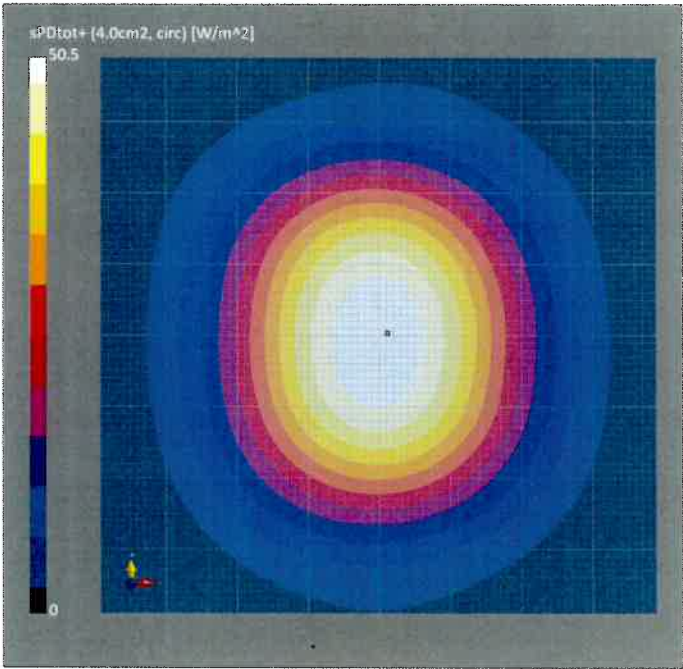
| Phantom               | Medium | Probe, Calibration Date               | DAE, Calibration Date     |
|-----------------------|--------|---------------------------------------|---------------------------|
| mmWave Phantom - 1002 | Air    | EUmmWV3 - SN9374_F1-55GHz, 2021-12-21 | DAE4ip Sn1602, 2022-06-27 |

Scan Setup

|                     | 5G Scan       |
|---------------------|---------------|
| Grid Extents [mm]   | 120.0 x 120.0 |
| Grid Steps [lambda] | 0.25 x 0.25   |
| Sensor Surface [mm] | 10.0          |
| MAIA                | MAIA not used |

Measurement Results

|                        | 5G Scan           |
|------------------------|-------------------|
| Date                   | 2022-09-27, 16:48 |
| Avg. Area [cm²]        | 4.00              |
| psPDn+ [W/m²]          | 50.3              |
| psPDtot+ [W/m²]        | 50.5              |
| psPDmod+ [W/m²]        | 50.7              |
| E <sub>max</sub> [V/m] | 147               |
| Power Drift [dB]       | -0.00             |



DASY Report

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Device under Test Properties

| Name, Manufacturer            | Dimensions [mm]       | IMEI     | DUT Type |
|-------------------------------|-----------------------|----------|----------|
| 5G Verification Source 10 GHz | 100.0 x 100.0 x 172.0 | SN: 1060 | -        |

Exposure Conditions

| Phantom Section | Position, Test Distance [mm] | Band            | Group, | Frequency [MHz], Channel Number | Conversion Factor |
|-----------------|------------------------------|-----------------|--------|---------------------------------|-------------------|
| 5G -            | 10.0 mm                      | Validation band | CW     | 10000.0, 10000                  | 1.0               |

Hardware Setup

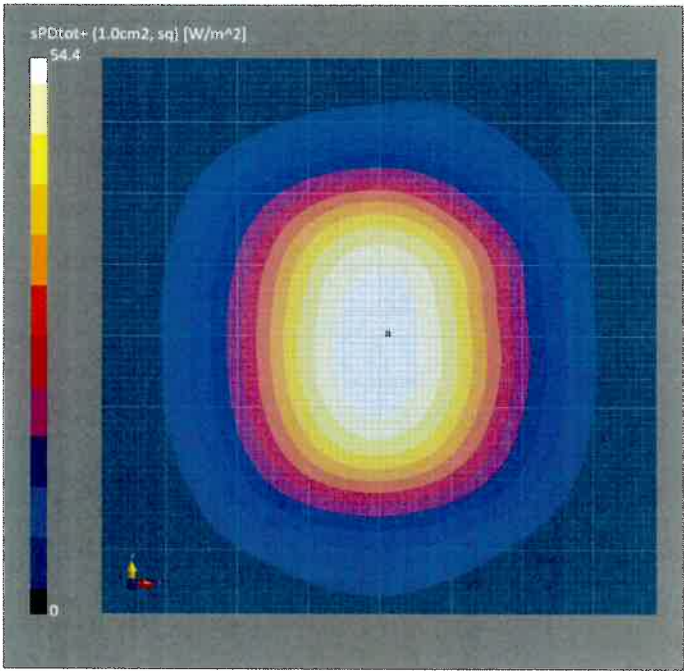
| Phantom               | Medium | Probe, Calibration Date               | DAE, Calibration Date     |
|-----------------------|--------|---------------------------------------|---------------------------|
| mmWave Phantom - 1002 | Air    | EUmmWV3 - SN9374_F1-55GHz, 2021-12-21 | DAE4ip Sn1602, 2022-06-27 |

Scan Setup

|                     | 5G Scan       |
|---------------------|---------------|
| Grid Extents [mm]   | 120.0 x 120.0 |
| Grid Steps [lambda] | 0.25 x 0.25   |
| Sensor Surface [mm] | 10.0          |
| MAIA                | MAIA not used |

Measurement Results

|                        | 5G Scan           |
|------------------------|-------------------|
| Date                   | 2022-09-27, 16:48 |
| Avg. Area [cm²]        | 1.00              |
| psPDn+ [W/m²]          | 54.3              |
| psPDtot+ [W/m²]        | 54.4              |
| psPDmod+ [W/m²]        | 54.6              |
| E <sub>max</sub> [V/m] | 147               |
| Power Drift [dB]       | -0.00             |



DASY Report

Measurement Report for 5G Verification Source 10 GHz, UID 0 -, Channel 10000 (10000.0MHz)

Device under Test Properties

|                               |                       |          |          |
|-------------------------------|-----------------------|----------|----------|
| Name, Manufacturer            | Dimensions [mm]       | IMEI     | DUT Type |
| 5G Verification Source 10 GHz | 100.0 x 100.0 x 172.0 | SN: 1060 | -        |

Exposure Conditions

|                 |                              |                 |        |                                 |                   |
|-----------------|------------------------------|-----------------|--------|---------------------------------|-------------------|
| Phantom Section | Position, Test Distance [mm] | Band            | Group, | Frequency [MHz], Channel Number | Conversion Factor |
| 5G -            | 10.0 mm                      | Validation band | CW     | 10000.0, 10000                  | 1.0               |

Hardware Setup

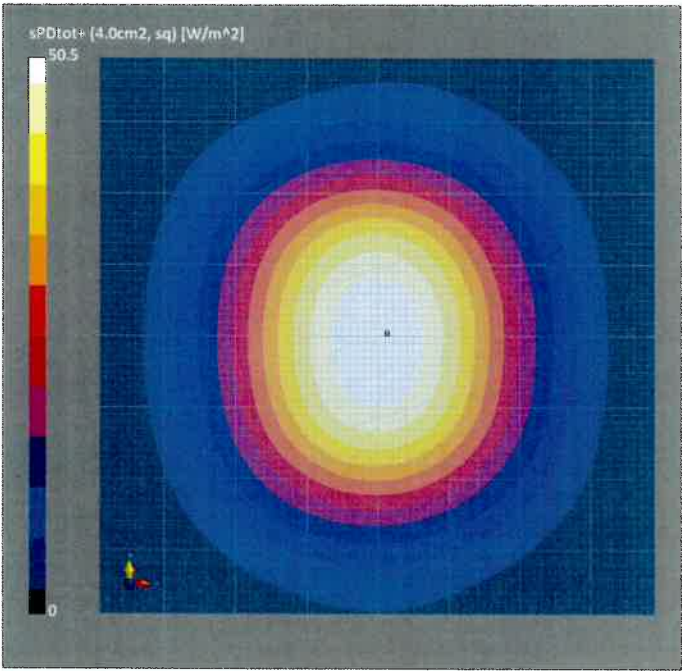
|                       |        |                                       |                           |
|-----------------------|--------|---------------------------------------|---------------------------|
| Phantom               | Medium | Probe, Calibration Date               | DAE, Calibration Date     |
| mmWave Phantom - 1002 | Air    | EUmmWV3 - SN9374_F1-55GHz, 2021-12-21 | DAE4ip Sn1602, 2022-06-27 |

Scan Setup

|                     |               |
|---------------------|---------------|
|                     | 5G Scan       |
| Grid Extents [mm]   | 120.0 x 120.0 |
| Grid Steps [lambda] | 0.25 x 0.25   |
| Sensor Surface [mm] | 10.0          |
| MAIA                | MAIA not used |

Measurement Results

|                        |                   |
|------------------------|-------------------|
|                        | 5G Scan           |
| Date                   | 2022-09-27, 16:48 |
| Avg. Area [cm²]        | 4.00              |
| psPDn+ [W/m²]          | 50.3              |
| psPDtot+ [W/m²]        | 50.5              |
| psPDmod+ [W/m²]        | 50.7              |
| E <sub>max</sub> [V/m] | 147               |
| Power Drift [dB]       | -0.00             |





## Appendix B. System Performance Check

### Tissue Calibration Result :

#### 7.1.3

| Frequency<br>(MHz) | Liquid Temp | Measured Values (W/kg) |                   | Target Values (W/kg) |                   | Deviation[%] |        | Limit | Measured. Date |
|--------------------|-------------|------------------------|-------------------|----------------------|-------------------|--------------|--------|-------|----------------|
|                    |             | $\sigma$               | $\epsilon_r$ (e') | $\sigma$             | $\epsilon_r$ (e') | 1g           | 10g    | %     |                |
| 2450               | 22.2        | 1.88                   | 40.5              | 1.8                  | 39.2              | 4.44%        | 3.32%  | ±5%   | 2023/6/30      |
| 5250               | 22.3        | 4.70                   | 37.1              | 4.71                 | 35.95             | -0.21%       | 3.20%  | ±5%   | 2023/7/1       |
| 5600               | 22.4        | 5.01                   | 35.4              | 5.07                 | 35.5              | -1.18%       | -0.28% | ±5%   | 2023/7/4       |
| 5750               | 22.4        | 5.32                   | 36.3              | 5.22                 | 35.3              | 1.92%        | 2.83%  | ±5%   | 2023/7/5       |
| 6500               | 22.5        | 5.87                   | 33.1              | 6.07                 | 34.5              | -3.29%       | -4.06% | ±5%   | 2023/7/11      |
| 6500               | 22.5        | 5.9                    | 34.2              | 6.07                 | 34.5              | -2.80%       | -0.87% | ±5%   | 2023/7/17      |
| 6500               | 22.5        | 5.89                   | 33                | 6.07                 | 34.5              | -2.97%       | -4.35% | ±5%   | 2023/7/18      |
| 6500               | 22.5        | 5.85                   | 33.7              | 6.07                 | 34.5              | -3.62%       | -2.32% | ±5%   | 2023/7/19      |

### Result of System Performance Check :

#### 7.1.7

| Frequency<br>(MHz) | Dipole<br>S/N | Measured SAR Values (W/kg) |      | Target SAR Values (W/kg) |      | Deviation[%] |       | Limit | Measured. Date |
|--------------------|---------------|----------------------------|------|--------------------------|------|--------------|-------|-------|----------------|
|                    |               | 1g                         | 10g  | 1g                       | 10g  | 1g           | 10g   | %     |                |
| 2450               | 914           | 13.1                       | 6.18 | 13                       | 5.92 | 0.77%        | 4.39% | ±10%  | 2023/6/30      |
| 5250               | 1156          | 7.64                       | 2.22 | 7.64                     | 2.18 | 0.00%        | 1.83% | ±10%  | 2023/7/1       |
| 5600               | 1156          | 8.19                       | 2.34 | 8.16                     | 2.33 | 0.37%        | 0.43% | ±10%  | 2023/7/4       |
| 5750               | 1156          | 7.86                       | 2.25 | 7.88                     | 2.24 | -0.25%       | 0.45% | ±10%  | 2023/7/5       |
| 6500               | 1078          | 29.8                       | 5.74 | 29.5                     | 5.45 | 1.02%        | 5.32% | ±10%  | 2023/7/11      |
| 6500               | 1078          | 29.0                       | 5.54 | 29.5                     | 5.45 | -1.69%       | 1.65% | ±10%  | 2023/7/17      |
| 6500               | 1078          | 29.7                       | 5.67 | 29.5                     | 5.45 | 0.68%        | 4.04% | ±10%  | 2023/7/18      |
| 6500               | 1078          | 29.8                       | 5.7  | 29.5                     | 5.45 | 1.02%        | 4.59% | ±10%  | 2023/7/19      |

### Power Density Verification Summary

#### 8.3.1

| Frequency<br>(MHz) | 5G Verification<br>Source | Measured Avg(W/m <sup>2</sup> ) |                  | Target Avg(W/m <sup>2</sup> ) |                  | Deviation(dB)    |                  | Limit(dB) | Measured. Date |
|--------------------|---------------------------|---------------------------------|------------------|-------------------------------|------------------|------------------|------------------|-----------|----------------|
|                    |                           | avg( PDn+Pdtot+PDmod)           |                  | avg( PDn+Pdtot+PDmod)         |                  |                  |                  |           |                |
|                    |                           | 1cm <sup>2</sup>                | 4cm <sup>2</sup> | 1cm <sup>2</sup>              | 4cm <sup>2</sup> | 1cm <sup>2</sup> | 4cm <sup>2</sup> |           |                |
| 10G                | 1060                      | /                               | 45.8             | /                             | 50.5             | /                | 0.42             | ±0.66     | 2023/8/10      |



## System Performance Check Report

### Summary

| Dipole          | Frequency [MHz] |
|-----------------|-----------------|
| D2450V2 - SN914 | 2450.0          |

### Exposure Conditions

| Phantom      | Test Distance | Band | Group, | Frequency [MHz], | Conversion | TSL Conductivity | TSL          |
|--------------|---------------|------|--------|------------------|------------|------------------|--------------|
| Section, TSL | [mm]          |      | UID    | Channel Number   | Factor     | [S/m]            | Permittivity |
| Flat,        | 10            |      | ,      | 2450.0,          | 7.26       | 1.88             | 40.5         |
| HSL          |               |      | 0--    | 0                |            |                  |              |

### Hardware Setup

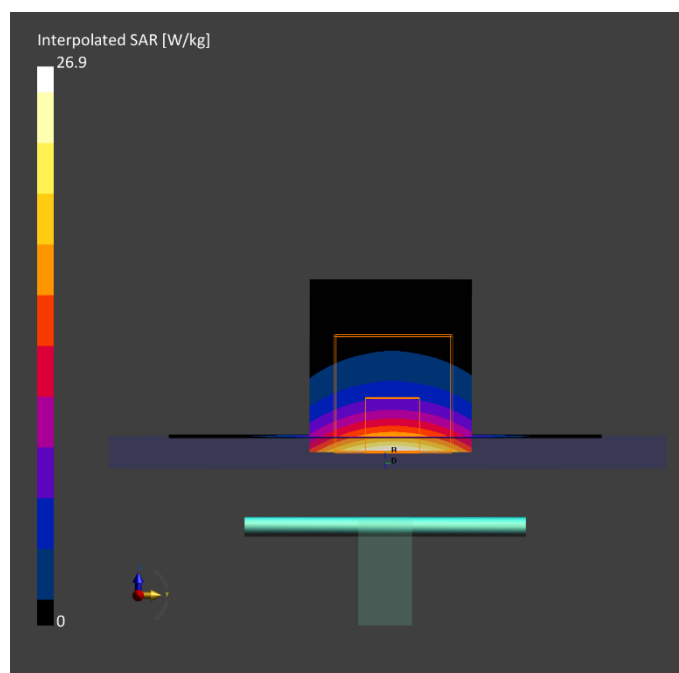
| Phantom                          | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date  |
|----------------------------------|--------------------|-----------------------------|------------------------|
| ELI V5.0 (20deg probe tilt) 1211 | HSL2450            | EX3DV4 - SN7375, 2022-12-30 | DAE4 Sn916, 2022-12-10 |

### Scan Setup

|                     | Area Scan   | Zoom Scan          |
|---------------------|-------------|--------------------|
| Grid Extents [mm]   | 40.0 x 80.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm]     | 10.0 x 10.0 | 5.0 x 5.0 x 1.5    |
| Sensor Surface [mm] | 3.0         | 1.4                |

### Measurement Results

|                  | Area Scan     | Zoom Scan     |
|------------------|---------------|---------------|
| Date             | 2023-06-30    | 2023-06-30    |
| psSAR1g [W/Kg]   | 13.0          | 13.1          |
| psSAR10g [W/Kg]  | 6.06          | 6.18          |
| Power Drift [dB] | -0.06         | -0.00         |
| TSL Correction   | No correction | No correction |





## System Performance Check Report

### Summary

| Dipole           | Frequency [MHz] |
|------------------|-----------------|
| D5GHzV2 - SN1156 | 5250.0          |

### Exposure Conditions

| Phantom      | Test Distance | Band | Group, | Frequency [MHz], | Conversion | TSL Conductivity | TSL          |
|--------------|---------------|------|--------|------------------|------------|------------------|--------------|
| Section, TSL | [mm]          |      | UID    | Channel Number   | Factor     | [S/m]            | Permittivity |
| Flat,        | 10            |      | ,      | 5250.0,          | 5.29       | 4.70             | 37.1         |
| HSL          |               |      | 0--    | 0                |            |                  |              |

### Hardware Setup

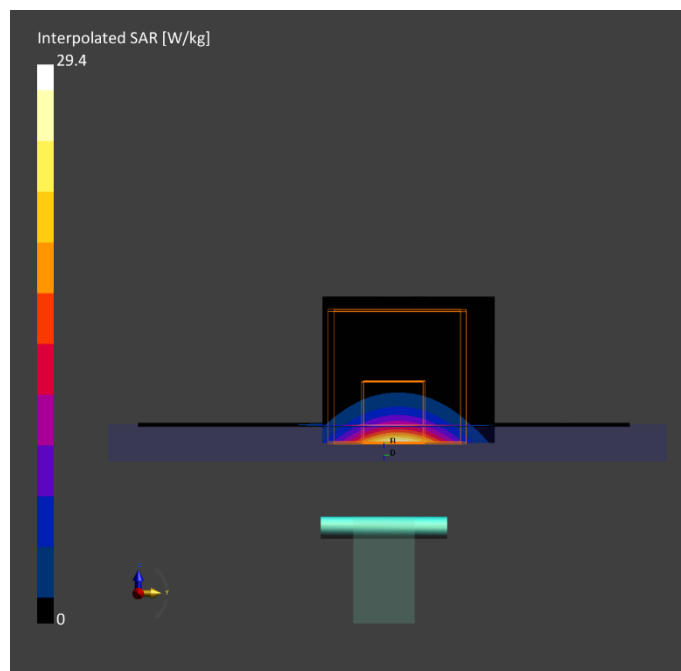
| Phantom                          | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date  |
|----------------------------------|--------------------|-----------------------------|------------------------|
| ELI V5.0 (20deg probe tilt) 1211 | HSL3-6GHz          | EX3DV4 - SN7375, 2022-12-30 | DAE4 Sn916, 2022-12-10 |

### Scan Setup

|                     | Area Scan   | Zoom Scan          |
|---------------------|-------------|--------------------|
| Grid Extents [mm]   | 40.0 x 80.0 | 24.0 x 22.0 x 22.0 |
| Grid Steps [mm]     | 10.0 x 10.0 | 4.0 x 4.0 x 1.4    |
| Sensor Surface [mm] | 3.0         | 1.4                |

### Measurement Results

|                  | Area Scan     | Zoom Scan     |
|------------------|---------------|---------------|
| Date             | 2023-07-01    | 2023-07-01    |
| psSAR1g [W/Kg]   | 7.17          | 7.64          |
| psSAR10g [W/Kg]  | 2.09          | 2.22          |
| Power Drift [dB] | -0.00         | -0.04         |
| TSL Correction   | No correction | No correction |





## System Performance Check Report

### Summary

| Dipole           | Frequency [MHz] |
|------------------|-----------------|
| D5GHzV2 - SN1156 | 5600.0          |

### Exposure Conditions

| Phantom      | Test Distance | Band | Group, | Frequency [MHz], | Conversion | TSL Conductivity | TSL          |
|--------------|---------------|------|--------|------------------|------------|------------------|--------------|
| Section, TSL | [mm]          |      | UID    | Channel Number   | Factor     | [S/m]            | Permittivity |
| Flat,        | 10            |      | ,      | 5600.0,          | 4.65       | 5.01             | 35.4         |
| HSL          |               |      | 0--    | 0                |            |                  |              |

### Hardware Setup

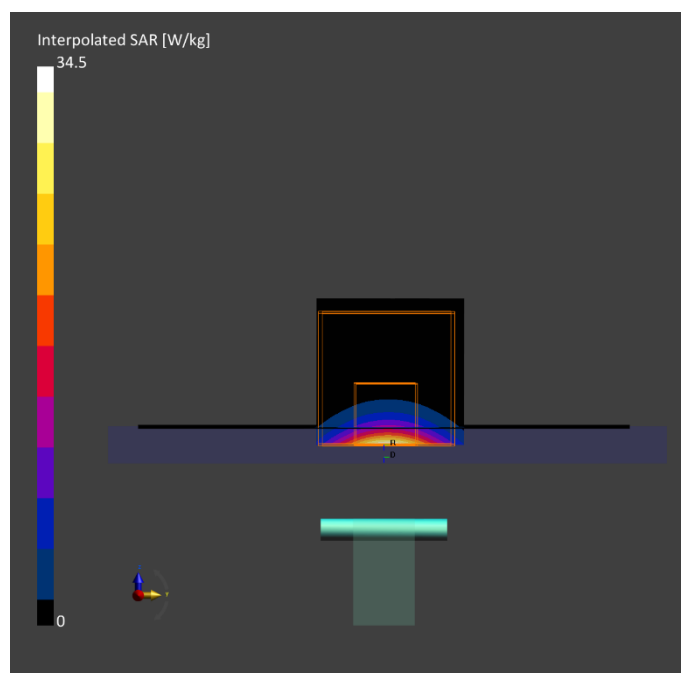
| Phantom                          | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date  |
|----------------------------------|--------------------|-----------------------------|------------------------|
| ELI V5.0 (20deg probe tilt) 1211 | HSL3-6GHz          | EX3DV4 - SN7375, 2022-12-30 | DAE4 Sn916, 2022-12-10 |

### Scan Setup

|                     | Area Scan   | Zoom Scan          |
|---------------------|-------------|--------------------|
| Grid Extents [mm]   | 40.0 x 80.0 | 24.0 x 22.0 x 22.0 |
| Grid Steps [mm]     | 10.0 x 10.0 | 4.0 x 4.0 x 1.4    |
| Sensor Surface [mm] | 3.0         | 1.4                |

### Measurement Results

|                  | Area Scan     | Zoom Scan     |
|------------------|---------------|---------------|
| Date             | 2023-07-04    | 2023-07-04    |
| psSAR1g [W/Kg]   | 7.87          | 8.19          |
| psSAR10g [W/Kg]  | 2.22          | 2.34          |
| Power Drift [dB] | 0.01          | 0.02          |
| TSL Correction   | No correction | No correction |





## System Performance Check Report

### Summary

| Dipole           | Frequency [MHz] |
|------------------|-----------------|
| D5GHzV2 - SN1156 | 5750.0          |

### Exposure Conditions

| Phantom<br>Section, TSL | Test Distance<br>[mm] | Band | Group,<br>UID | Frequency [MHz],<br>Channel Number | Conversion<br>Factor | TSL Conductivity<br>[S/m] | TSL<br>Permittivity |
|-------------------------|-----------------------|------|---------------|------------------------------------|----------------------|---------------------------|---------------------|
| Flat,                   | 10                    |      | ,             | 5750.0,                            | 4.69                 | 5.32                      | 36.3                |
| HSL                     |                       |      | 0--           | 0                                  |                      |                           |                     |

### Hardware Setup

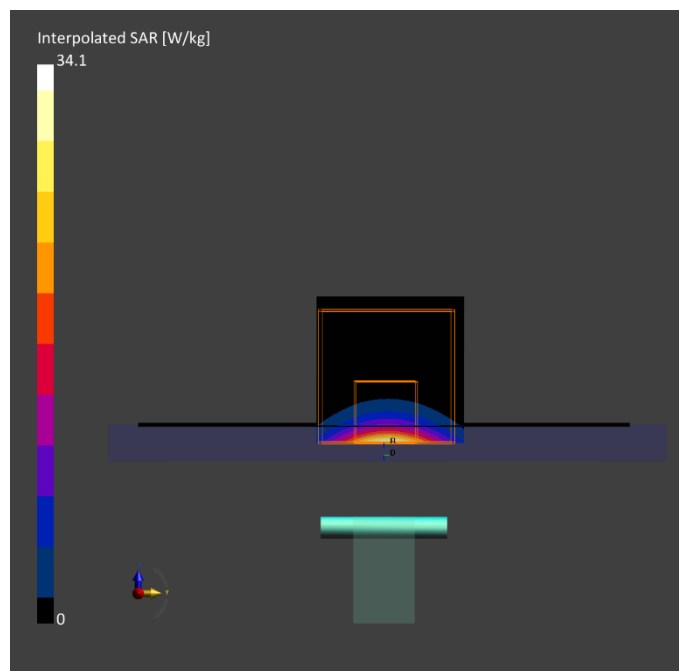
| Phantom                          | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date  |
|----------------------------------|--------------------|-----------------------------|------------------------|
| ELI V5.0 (20deg probe tilt) 1211 | HSL3-6GHz          | EX3DV4 - SN7375, 2022-12-30 | DAE4 Sn916, 2022-12-10 |

### Scan Setup

|                     | Area Scan   | Zoom Scan          |
|---------------------|-------------|--------------------|
| Grid Extents [mm]   | 40.0 x 80.0 | 24.0 x 22.0 x 22.0 |
| Grid Steps [mm]     | 10.0 x 10.0 | 4.0 x 4.0 x 1.4    |
| Sensor Surface [mm] | 3.0         | 1.4                |

### Measurement Results

|                  | Area Scan     | Zoom Scan     |
|------------------|---------------|---------------|
| Date             | 2023-07-05    | 2023-07-05    |
| psSAR1g [W/Kg]   | 7.50          | 7.86          |
| psSAR10g [W/Kg]  | 2.13          | 2.25          |
| Power Drift [dB] | 0.00          | 0.02          |
| TSL Correction   | No correction | No correction |





## System Performance Check Report

### Summary

| Dipole             | Frequency [MHz] |
|--------------------|-----------------|
| D6.5GHzV2 - SN1078 | 6500.0          |

### Exposure Conditions

| Phantom      | Test Distance | Band | Group, | Frequency [MHz], | Conversion | TSL Conductivity | TSL          |
|--------------|---------------|------|--------|------------------|------------|------------------|--------------|
| Section, TSL | [mm]          |      | UID    | Channel Number   | Factor     | [S/m]            | Permittivity |
| Flat,        | 5             |      | ,      | 6500.0,          | 5.51       | 5.87             | 33.1         |
| HSL          |               |      | 0--    | 0                |            |                  |              |

### Hardware Setup

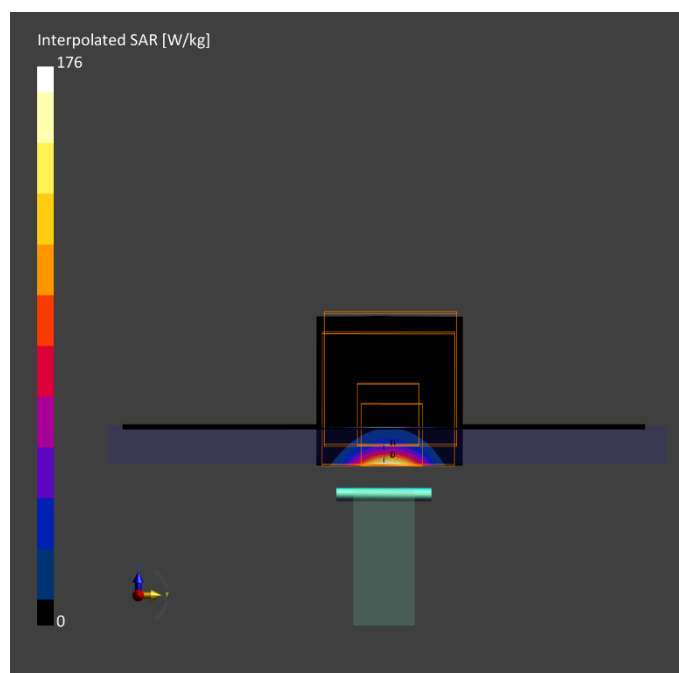
| Phantom                          | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date   |
|----------------------------------|--------------------|-----------------------------|-------------------------|
| ELI V5.0 (20deg probe tilt) 1211 | HSL3-6GHz          | EX3DV4 - SN3927, 2023-06-26 | DAE4 Sn1379, 2023-06-16 |

### Scan Setup

|                     | Area Scan   | Zoom Scan          |
|---------------------|-------------|--------------------|
| Grid Extents [mm]   | 51.0 x 85.0 | 22.0 x 22.0 x 22.0 |
| Grid Steps [mm]     | 8.5 x 8.5   | 3.4 x 3.4 x 1.4    |
| Sensor Surface [mm] | 3.0         | 1.4                |

### Measurement Results

|                  | Area Scan     | Zoom Scan     |
|------------------|---------------|---------------|
| Date             | 2023-07-11    | 2023-07-11    |
| psSAR1g [W/Kg]   | 27.9          | 29.8          |
| psSAR10g [W/Kg]  | 5.44          | 5.74          |
| Power Drift [dB] | 0.26          | 0.12          |
| TSL Correction   | No correction | No correction |





## System Performance Check Report

### Summary

| Dipole             | Frequency [MHz] |
|--------------------|-----------------|
| D6.5GHzV2 - SN1078 | 6500.0          |

### Exposure Conditions

| Phantom<br>Section, TSL | Test Distance<br>[mm] | Band | Group,<br>UID | Frequency [MHz],<br>Channel Number | Conversion<br>Factor | TSL Conductivity<br>[S/m] | TSL<br>Permittivity |
|-------------------------|-----------------------|------|---------------|------------------------------------|----------------------|---------------------------|---------------------|
| Flat,                   | 5                     |      | ,             | 6500.0,                            | 5.51                 | 5.90                      | 34.2                |
| HSL                     |                       |      | 0--           | 0                                  |                      |                           |                     |

### Hardware Setup

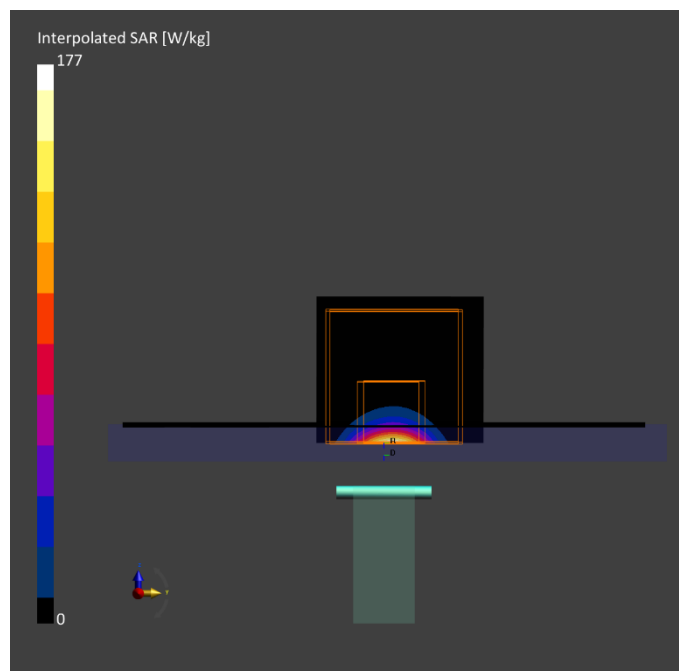
| Phantom                          | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date   |
|----------------------------------|--------------------|-----------------------------|-------------------------|
| ELI V5.0 (20deg probe tilt) 1211 | HSL3-6GHz          | EX3DV4 - SN3927, 2023-06-26 | DAE4 Sn1379, 2023-06-16 |

### Scan Setup

|                     | Area Scan   | Zoom Scan          |
|---------------------|-------------|--------------------|
| Grid Extents [mm]   | 51.0 x 85.0 | 22.0 x 22.0 x 22.0 |
| Grid Steps [mm]     | 8.5 x 8.5   | 3.4 x 3.4 x 1.4    |
| Sensor Surface [mm] | 3.0         | 1.4                |

### Measurement Results

|                  | Area Scan     | Zoom Scan     |
|------------------|---------------|---------------|
| Date             | 2023-07-17    | 2023-07-17    |
| psSAR1g [W/Kg]   | 26.4          | 29.0          |
| psSAR10g [W/Kg]  | 5.27          | 5.54          |
| Power Drift [dB] | 0.05          | -0.00         |
| TSL Correction   | No correction | No correction |





## System Performance Check Report

### Summary

| Dipole             | Frequency [MHz] |
|--------------------|-----------------|
| D6.5GHzV2 - SN1078 | 6500.0          |

### Exposure Conditions

| Phantom<br>Section, TSL | Test Distance<br>[mm] | Band | Group,<br>UID | Frequency [MHz],<br>Channel Number | Conversion<br>Factor | TSL Conductivity<br>[S/m] | TSL<br>Permittivity |
|-------------------------|-----------------------|------|---------------|------------------------------------|----------------------|---------------------------|---------------------|
| Flat,                   | 5                     |      | ,             | 6500.0,                            | 5.51                 | 5.89                      | 33.0                |
| HSL                     |                       |      | 0--           | 0                                  |                      |                           |                     |

### Hardware Setup

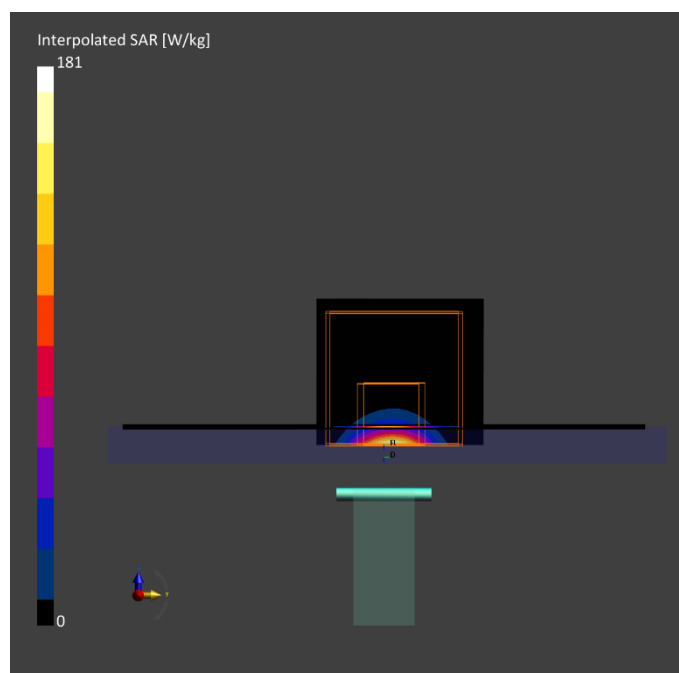
| Phantom                          | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date   |
|----------------------------------|--------------------|-----------------------------|-------------------------|
| ELI V5.0 (20deg probe tilt) 1211 | HSL3-6GHz          | EX3DV4 - SN3927, 2023-06-26 | DAE4 Sn1379, 2023-06-16 |

### Scan Setup

|                     | Area Scan   | Zoom Scan          |
|---------------------|-------------|--------------------|
| Grid Extents [mm]   | 51.0 x 85.0 | 22.0 x 22.0 x 22.0 |
| Grid Steps [mm]     | 8.5 x 8.5   | 3.4 x 3.4 x 1.4    |
| Sensor Surface [mm] | 3.0         | 1.4                |

### Measurement Results

|                  | Area Scan     | Zoom Scan     |
|------------------|---------------|---------------|
| Date             | 2023-07-18    | 2023-07-18    |
| psSAR1g [W/Kg]   | 26.7          | 29.7          |
| psSAR10g [W/Kg]  | 5.36          | 5.67          |
| Power Drift [dB] | -0.03         | -0.13         |
| TSL Correction   | No correction | No correction |





## System Performance Check Report

### Summary

| Dipole             | Frequency [MHz] |
|--------------------|-----------------|
| D6.5GHzV2 - SN1078 | 6500.0          |

### Exposure Conditions

| Phantom      | Test Distance | Band | Group, | Frequency [MHz], | Conversion | TSL Conductivity | TSL          |
|--------------|---------------|------|--------|------------------|------------|------------------|--------------|
| Section, TSL | [mm]          |      | UID    | Channel Number   | Factor     | [S/m]            | Permittivity |
| Flat,        | 5             |      | ,      | 6500.0,          | 5.51       | 5.85             | 33.7         |
| HSL          |               |      | 0--    | 0                |            |                  |              |

### Hardware Setup

| Phantom                          | TSL, Measured Date | Probe, Calibration Date     | DAE, Calibration Date   |
|----------------------------------|--------------------|-----------------------------|-------------------------|
| ELI V5.0 (20deg probe tilt) 1211 | HSL3-6GHz          | EX3DV4 - SN3927, 2023-06-26 | DAE4 Sn1379, 2023-06-16 |

### Scan Setup

|                     | Area Scan   | Zoom Scan          |
|---------------------|-------------|--------------------|
| Grid Extents [mm]   | 51.0 x 85.0 | 22.0 x 22.0 x 22.0 |
| Grid Steps [mm]     | 8.5 x 8.5   | 3.4 x 3.4 x 1.4    |
| Sensor Surface [mm] | 3.0         | 1.4                |

### Measurement Results

|                  | Area Scan     | Zoom Scan     |
|------------------|---------------|---------------|
| Date             | 2023-07-19    | 2023-07-19    |
| psSAR1g [W/Kg]   | 26.9          | 29.8          |
| psSAR10g [W/Kg]  | 5.42          | 5.70          |
| Power Drift [dB] | 0.01          | 0.06          |
| TSL Correction   | No correction | No correction |

