In Collaboration with
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CALIBRATION LABORATORY

CAICT

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## Measurement Conditions

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

| | | |
|---|---|---|
| **DASY Version** | DASY52 | 52.10.4 |
| **Extrapolation** | Advanced Extrapolation | |
| **Phantom** | Triple Flat Phantom 5.1C | |
| **Distance Dipole Center - TSL** | 10 mm | with Spacer |
| **Zoom Scan Resolution** | dx, dy, dz = 5 mm | |
| **Frequency** | 2600 MHz ± 1 MHz | |

## Head TSL parameters

The following parameters and calculations were applied.

| | **Temperature** | **Permittivity** | **Conductivity** |
|---|---|---|---|
| **Nominal Head TSL parameters** | 22.0 °C | 39.0 | 1.96 mho/m |
| **Measured Head TSL parameters** | (22.0 ± 0.2) °C | 39.8 ± 6 % | 1.98 mho/m ± 6 % |
| **Head TSL temperature change during test** | <1.0 °C | ---- | ---- |

## SAR result with Head TSL

| **SAR averaged over 1 $cm^3$ (1 g) of Head TSL** | Condition | |
|---|---|---|
| SAR measured | 250 mW input power | 14.2 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **56.8 W/kg ± 18.8 % (*k*=2)** |
| **SAR averaged over 10 $cm^3$ (10 g) of Head TSL** | Condition | |
| SAR measured | 250 mW input power | 6.36 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | **25.5 W/kg ± 18.7 % (*k*=2)** |

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

### Antenna Parameters with Head TSL

| | |
|---|---|
| Impedance, transformed to feed point | 48.6Ω- 6.32jΩ |
| Return Loss | - 23.7dB |

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.058 ns |

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

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

### Additional EUT Data

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

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**DASY5 Validation Report for Head TSL** Date: 2023-02-17

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 2600 MHz; Type: D2600V2; Serial: D2600V2 - SN: 1073**

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

Medium parameters used: f = 2600 MHz; $\sigma$ = 1.98 S/m; $\varepsilon_r$ = 39.75; $\rho$ = 1000 kg/m$^3$

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(7.5, 7.5, 7.5) @ 2600 MHz; Calibrated: 2023-01-19
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2023-01-11
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

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

Reference Value = 98.06 V/m; Power Drift = -0.04 dB

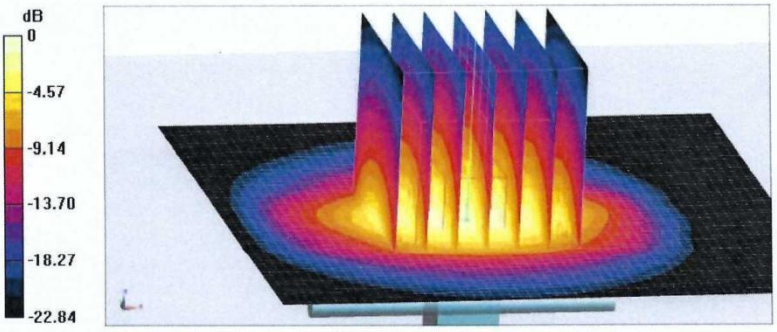
Peak SAR (extrapolated) = 30.6 W/kg

**SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.36 W/kg**

Smallest distance from peaks to all points 3 dB below = 8.9 mm

Ratio of SAR at M2 to SAR at M1 = 47.1%

Maximum value of SAR (measured) = 24.5 W/kg




0 dB = 24.5 W/kg = 13.89 dBW/kg

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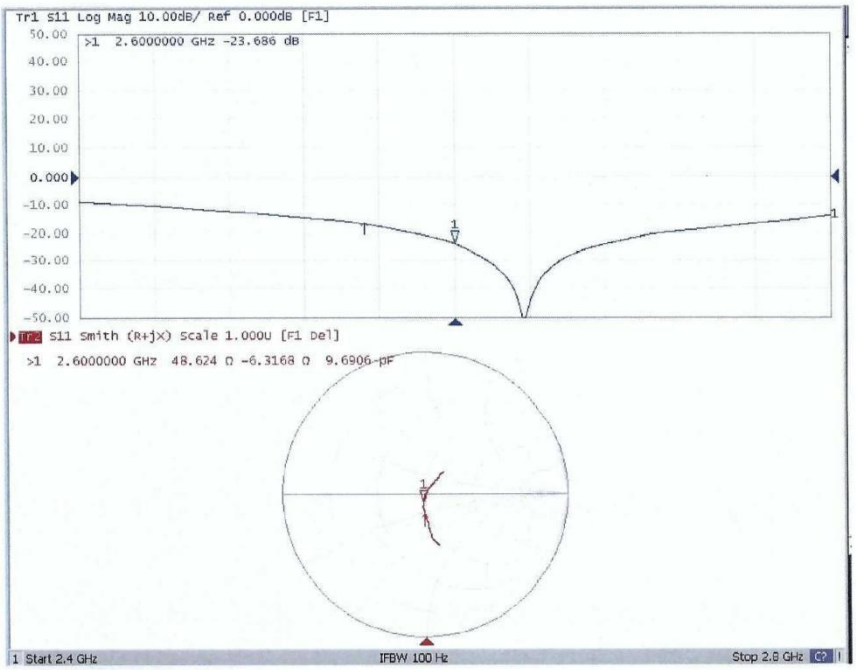
## Impedance Measurement Plot for Head TSL



Referring to KDB 865664D01V01r03, 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.

| D835V2, SN.484 | | | | |
|---|---|---|---|---|
| | 835 Head | | | |
| Date of. Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) |
| 2023-08-25 | -31.2 | | 49.8 | |
| 2024-08-24 | -31.25 | 0.16 | 49.6 | -0.2 |

| D1800V2, SN. 2d158 | | | | |
|---|---|---|---|---|
| | 1800 Head | | | |
| Date of. Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) |
| 2021-12-17 | -29.8 | | 49.7 | |
| 2022-12-16 | -29.78 | -0.07 | 49.4 | -0.3 |
| 2023-12-15 | -29.74 | -0.13 | 49.3 | -0.1 |

| D1900V2, SN. 5d002 | | | | |
|---|---|---|---|---|
| | 1900 Head | | | |
| Date of. Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) |
| 2023-08-25 | -35.7 | | 50.6 | |
| 2024-08-24 | -35.64 | -0.17 | 50.3 | -0.3 |

| D2300V2, SN. 1103 | | | | |
|---|---|---|---|---|
| | 2300 Head | | | |
| Date of. Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) |
| 2023-02-16 | -31.5 | | 48.2 | |
| 2024-02-15 | -31.2 | -0.01 | 48.4 | 0.2 |

| D2450V2, SN. 745 | | | | |
|---|---|---|---|---|
| | 2450 Head | | | |
| Date of. Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) |
| 2023-08-28 | -23.7 | | 54.2 | |
| 2024-08-27 | -23.68 | -0.08 | 54.1 | -0.1 |

| D2600V2, SN. 1073 | | | | |
|---|---|---|---|---|
| | 2600 Head | | | |
| Date of. Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) |
| 2023-02-17 | -23.7 | | 48.6 | |
| 2024-02-16 | -23.73 | 0.13 | 48.7 | 0.1 |

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.

*****END OF REPORT*****