



In Collaboration with  
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**Appendix (Additional assessments outside the scope of CNAS L0570)**

**Antenna Parameters with Head TSL at 5250MHz**

Impedance, transformed to feed point	44.6Ω+ 1.50jΩ
Return Loss	- 24.6dB

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

Impedance, transformed to feed point	49.2Ω+ 8.48jΩ
Return Loss	- 21.4dB

**Antenna Parameters with Head TSL at 5750MHz**

Impedance, transformed to feed point	46.4Ω+ 5.71jΩ
Return Loss	- 23.1dB

**General Antenna Parameters and Design**

Electrical Delay (one direction)	1.097 ns
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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: 2024-05-09

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1200**

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

Frequency: 5750 MHz

Medium parameters used:  $f = 5250$  MHz;  $\sigma = 4.637$  S/m;  $\epsilon_r = 36.01$ ;  $\rho = 1000$  kg/m<sup>3</sup>Medium parameters used:  $f = 5600$  MHz;  $\sigma = 5.011$  S/m;  $\epsilon_r = 35.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>Medium parameters used:  $f = 5750$  MHz;  $\sigma = 5.173$  S/m;  $\epsilon_r = 35.18$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3846; ConvF(5.05, 5.27, 5.51) @ 5250 MHz; ConvF(4.27, 4.47, 4.7) @ 5600 MHz; ConvF(4.54, 4.76, 4.98) @ 5750 MHz; Calibrated: 2023-05-31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1556; Calibrated: 2024-01-03
- 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 /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 = 56.74 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 31.3 W/kg

**SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.2 W/kg**

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

Ratio of SAR at M2 to SAR at M1 = 64.6%

Maximum value of SAR (measured) = 18.6 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 = 56.54 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 36.0 W/kg

**SAR(1 g) = 8.14 W/kg; SAR(10 g) = 2.31 W/kg**

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

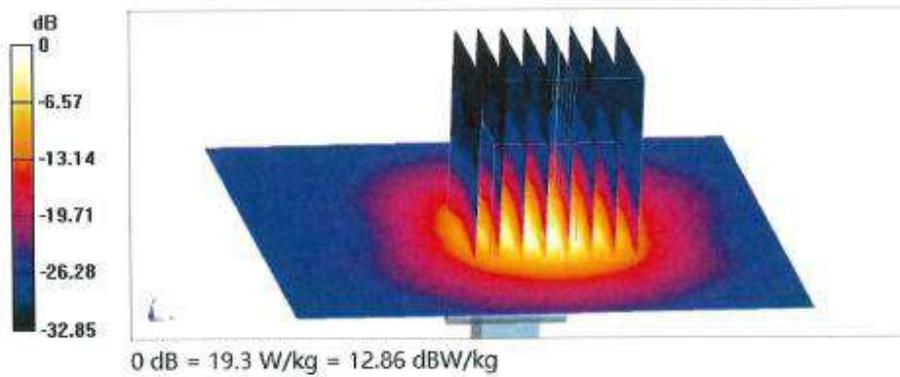
Ratio of SAR at M2 to SAR at M1 = 61.7%

Maximum value of SAR (measured) = 19.9 W/kg



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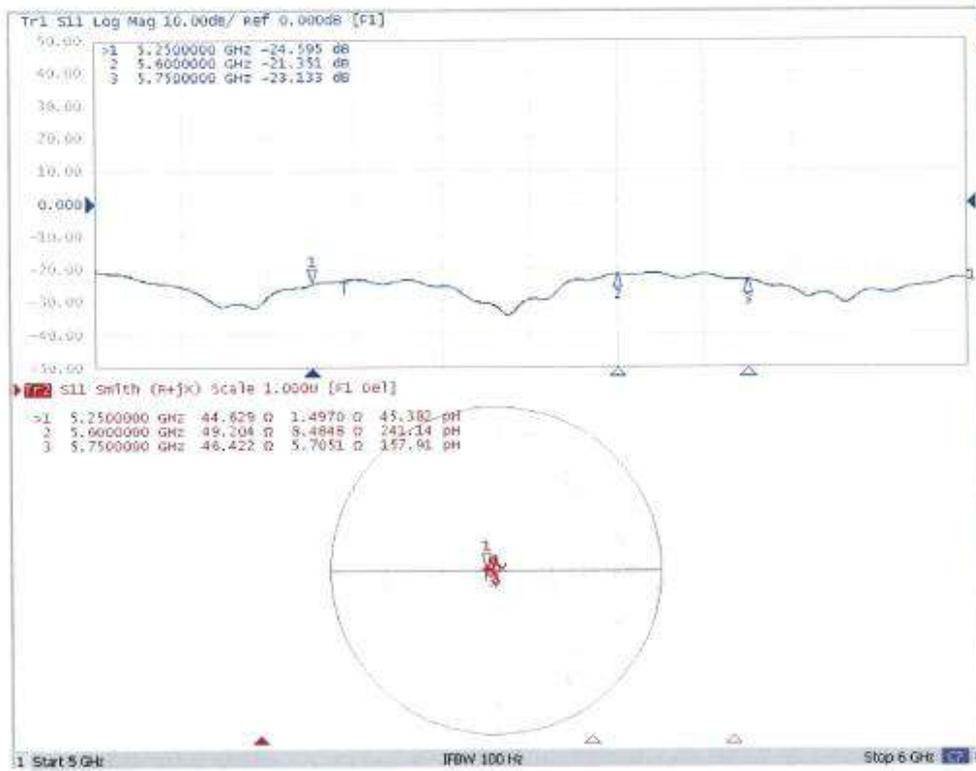
**Dipole Calibration /Pin=100mW, d=10mm, f=5750 MHz/Zoom Scan,**  
**dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm  
Reference Value = 54.93 V/m; Power Drift = -0.04 dB  
Peak SAR (extrapolated) = 35.2 W/kg  
**SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.19 W/kg**  
Smallest distance from peaks to all points 3 dB below = 7.2 mm  
Ratio of SAR at M2 to SAR at M1 = 61%  
Maximum value of SAR (measured) = 19.3 W/kg





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### Impedance Measurement Plot for Head TSL



## D5GHzV2 Dipole impedance and return loss Validation

Meas. Results	Current Meas.	Previous Meas.	Max. Deviation
Meas. Data	2025.05.07	2024.05.09	/
5.25GHz Return Loss(dB)	-22.281	-24.595	-9.41%
5.25GHz Impedance	44.914 $\Omega$ - 2.717 j $\Omega$	44.629 $\Omega$ +1.497 j $\Omega$	-4.214 $\Omega$ (Imaginary part)
5.6GHz Return Loss(dB)	-23.755	-21.351	11.26%
5.6GHz Impedance	50.946 $\Omega$ +9.147 j $\Omega$	49.204 $\Omega$ +8.485 j $\Omega$	1.742 $\Omega$ (Real part)
5.75GHz Return Loss(dB)	-21.053	-23.133	-8.99%
5.75GHz Impedance	42.621 $\Omega$ +2.112 j $\Omega$	46.422 $\Omega$ +5.705 j $\Omega$	-3.593 $\Omega$ (Real part)