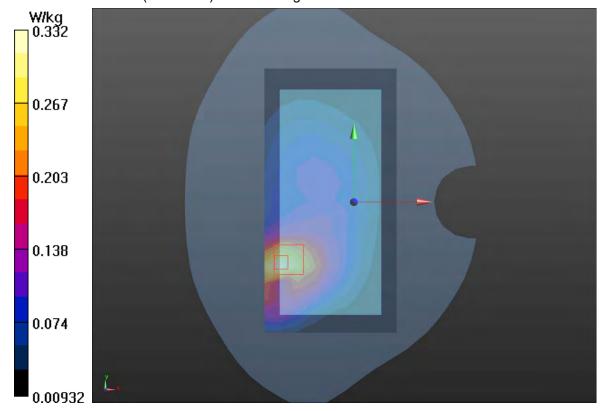


Plot 102 LTE Band 28A 1RB Back Side Low (Distance 10mm) Date: 2022/3/28 Communication System: UID 0, LTE (0); Frequency: 713 MHz;Duty Cycle: 1:1 Medium parameters used: f = 713 MHz; σ = 0.873 S/m; ε_r = 40.697; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(10.27, 10.27, 10.27); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Back Side Low/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.330 W/kg

Back Side Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 10.08 V/m; Power Drift = -0.080 dB Peak SAR (extrapolated) = 0.410 W/kg SAR(1 g) = 0.223 W/kg; SAR(10 g) = 0.138 W/kg Maximum value of SAR (measured) = 0.332 W/kg

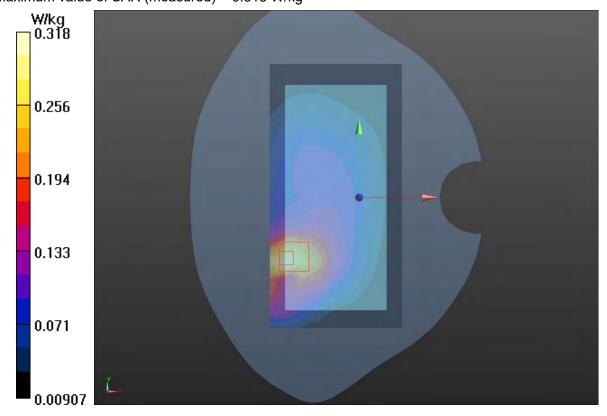




Plot 103 LTE Band 28B 1RB Back Side High (Distance 10mm) Date: 2022/4/2 Communication System: UID 0, LTE (0); Frequency: 738 MHz;Duty Cycle: 1:1 Medium parameters used: f = 738 MHz; σ = 0.889 S/m; ε_r = 40.525; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(10.27, 10.27, 10.27); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Back Side High/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.316 W/kg

Back Side High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 10.23 V/m; Power Drift = -0.040 dB Peak SAR (extrapolated) = 0.395 W/kg
SAR(1 g) = 0.216 W/kg; SAR(10 g) = 0.134 W/kg
Maximum value of SAR (measured) = 0.318 W/kg

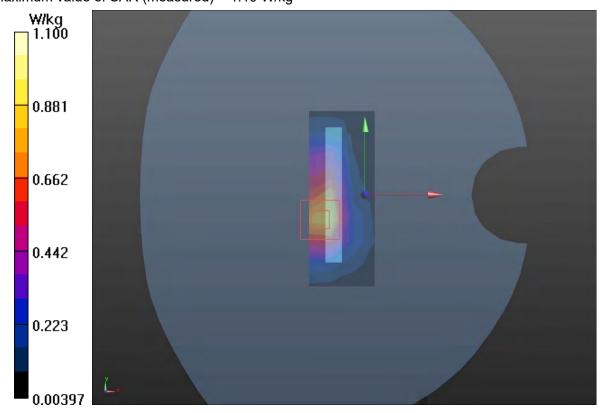




Plot 104 LTE Band 38 50%RB Bottom Edge High (Distance 10mm) Date: 2022/4/7 Communication System: UID 0, LTE (0); Frequency: 2610 MHz;Duty Cycle: 1:1.58 Medium parameters used: f = 2610 MHz; σ = 2.027 S/m; ε_r = 37.056; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(7.24, 7.24, 7.24); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Bottom Edge High/Area Scan (4x9x1): Measurement grid: dx=12mm, dy=12mm Maximum value of SAR (measured) = 0.857 W/kg

Bottom Edge High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 14.13 V/m; Power Drift = 0.030 dB Peak SAR (extrapolated) = 1.41 W/kg SAR(1 g) = 0.656 W/kg; SAR(10 g) = 0.310 W/kg Maximum value of SAR (measured) = 1.10 W/kg

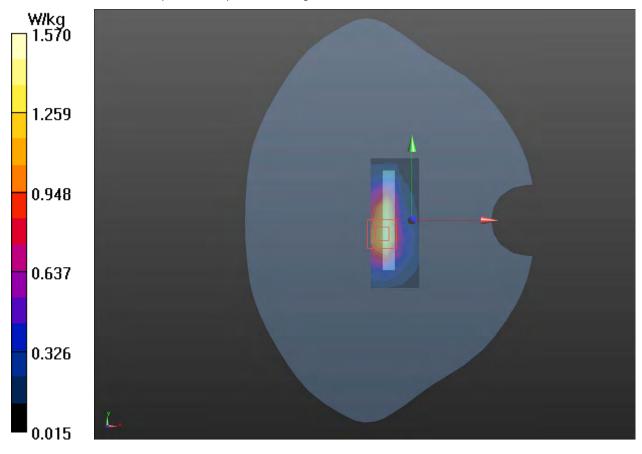




Plot 105 LTE Band 40 1RB Front Side Middle (Distance 10mm) Date: 2022/4/5 Communication System: UID 0, LTE (0); Frequency: 2350 MHz;Duty Cycle: 1:1.58 Medium parameters used: f = 2350 MHz; σ = 1.734 S/m; ε_r = 37.956; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(7.68, 7.68, 7.68); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Front Side Middle/Area Scan (9x17x1): Measurement grid: dx=12mm, dy=12mm Maximum value of SAR (measured) = 1.44 W/kg

Front Side Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 21.91 V/m; Power Drift = 0.047 dB Peak SAR (extrapolated) = 1.92 W/kg SAR(1 g) = 0.912 W/kg; SAR(10 g) = 0.465 W/kg Maximum value of SAR (measured) = 1.57 W/kg

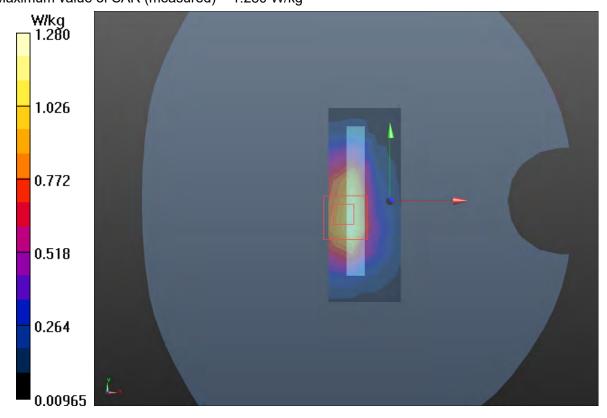




Plot 106 LTE Band 41 1RB Bottom Edge Low (Distance 10mm) Date: 2022/4/8 Communication System: UID 0, LTE (0); Frequency: 2506 MHz;Duty Cycle: 1:1.58 Medium parameters used: f = 2506 MHz; σ = 1.905 S/m; ε_r = 37.414; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(7.24, 7.24, 7.24); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Bottom Edge Low/Area Scan (4x9x1): Measurement grid: dx=12mm, dy=12mm Maximum value of SAR (measured) = 1.20 W/kg

Bottom Edge Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 19.38 V/m; Power Drift = 0.035 dB Peak SAR (extrapolated) = 1.59 W/kg SAR(1 g) = 0.812 W/kg; SAR(10 g) = 0.409 W/kg Maximum value of SAR (measured) = 1.280 W/kg

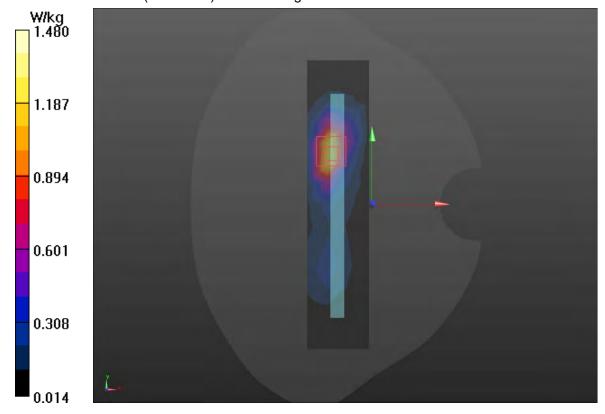




Plot 107 LTE Band 66 1RB Left Edge Low (Distance 10mm) Date: 2022/4/20 Communication System: UID 0, LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1 Medium parameters used: f = 1720 MHz; σ = 1.303 S/m; ε_r = 39.467; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(8.42, 8.42, 8.42); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Left Edge Low/Area Scan (4x15x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.32 W/kg

Left Edge Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 13.76 V/m; Power Drift = 0.160 dB Peak SAR (extrapolated) = 2.42 W/kg SAR(1 g) = 0.527 W/kg; SAR(10 g) = 0.264 W/kg Maximum value of SAR (measured) = 1.480 W/kg

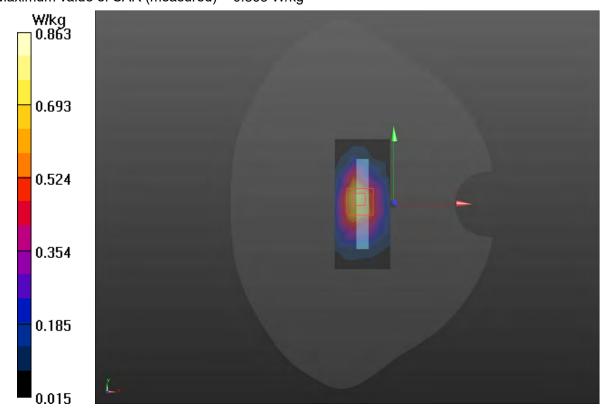




Plot 108 NR Band 2 1RB Bottom Edge Middle (Distance 10mm) Date: 2022/4/12 Communication System: UID 0, 5G NR (0); Frequency: 1880 MHz;Duty Cycle: 1:1 Medium parameters used: f = 1880 MHz; σ = 1.42 S/m; ε_r = 38.948; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(8.20, 8.20, 8.20); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Bottom Edge Middle/Area Scan (4x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.775 W/kg

Bottom Edge Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 24.44 V/m; Power Drift = -0.130 dB Peak SAR (extrapolated) = 1.37 W/kg SAR(1 g) = 0.767 W/kg; SAR(10 g) = 0.415 W/kg Maximum value of SAR (measured) = 0.863 W/kg

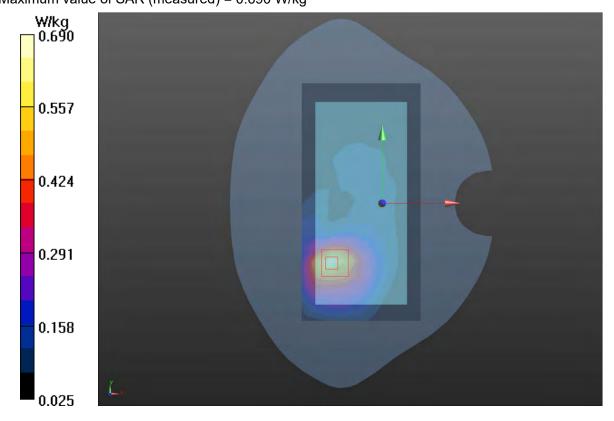




Plot 109 NR Band 5 1RB Back Side Low (Distance 10mm) Date: 2022/3/25 Communication System: UID 0, 5G NR (0); Frequency: 834 MHz;Duty Cycle: 1:1 Medium parameters used: f = 834 MHz; σ = 0.953 S/m; ε_r = 39.907; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(9.89, 9.89, 9.89); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Back Side Low/Area Scan (8x14x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.682 W/kg

Back Side Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.427 V/m; Power Drift = -0.090 dB
Peak SAR (extrapolated) = 0.834 W/kg
SAR(1 g) = 0.476 W/kg; SAR(10 g) = 0.281 W/kg
Maximum value of SAR (measured) = 0.690 W/kg

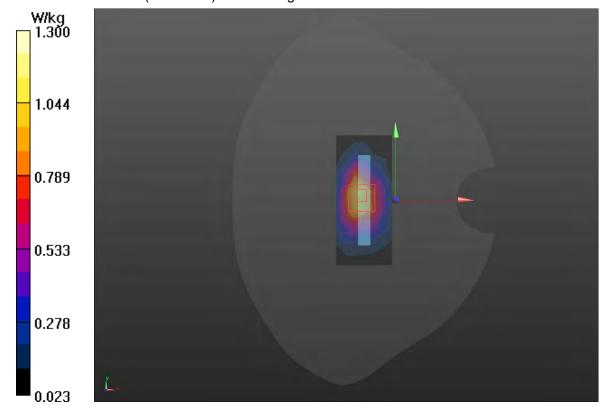




Plot 110 NR Band 7 1RB Bottom Edge High (Distance 10mm) Date: 2022/4/11 Communication System: UID 0, 5G NR (0); Frequency: 2560 MHz;Duty Cycle: 1:1 Medium parameters used: f = 2560 MHz; σ = 1.971 S/m; ε_r = 37.231; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(7.24, 7.24, 7.24); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Bottom Edge High/Area Scan (5x10x1): Measurement grid: dx=12mm, dy=12mm Maximum value of SAR (measured) = 1.17 W/kg

Bottom Edge High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 25.40 V/m; Power Drift = 0.032 dB Peak SAR (extrapolated) = 2.07 W/kg SAR(1 g) = 0.879 W/kg; SAR(10 g) = 0.442 W/kg Maximum value of SAR (measured) = 1.30 W/kg

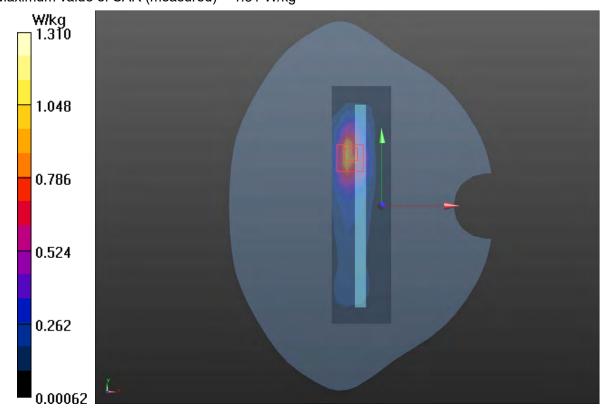




Plot 111 NR Band 38 1RB Left Edge Middle (Distance 10mm) Date: 2022/5/13 Communication System: UID 0, 5G NR (0); Frequency: 2595 MHz;Duty Cycle: 1:4 Medium parameters used: f = 2595 MHz; σ = 2.011 S/m; ε_r = 37.134; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(7.24, 7.24, 7.24); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Left Edge Middle/Area Scan (6x17x1): Measurement grid: dx=12mm, dy=12mm Maximum value of SAR (measured) = 1.01 W/kg

Left Edge Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 8.273 V/m; Power Drift = 0.015 dB Peak SAR (extrapolated) = 1.75 W/kg SAR(1 g) = 0.602 W/kg; SAR(10 g) = 0.272 W/kg Maximum value of SAR (measured) = 1.31 W/kg

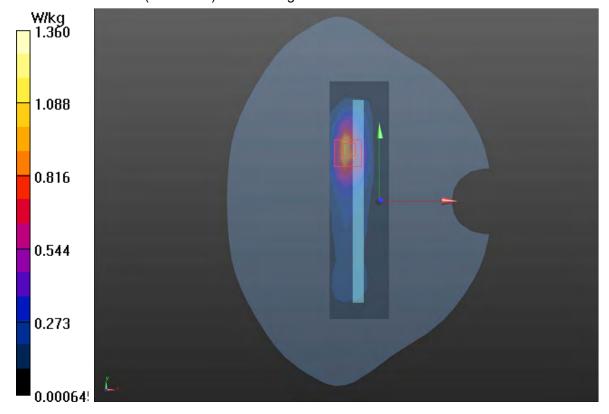




Plot 112 NR Band 41 50%RB Left Edge High (Distance 10mm) Date: 2022/4/21 Communication System: UID 0, 5G NR (0); Frequency: 2640 MHz;Duty Cycle: 1:4 Medium parameters used: f = 2640 MHz; σ = 2.058 S/m; ε_r = 36.937; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(7.24, 7.24, 7.24); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Left Edge High/Area Scan (5x17x1): Measurement grid: dx=12mm, dy=12mm Maximum value of SAR (measured) = 1.05 W/kg

Left Edge High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 8.335 V/m; Power Drift = 0.41 dB Peak SAR (extrapolated) = 1.82 W/kg SAR(1 g) = 0.733 W/kg; SAR(10 g) = 0.311 W/kg Maximum value of SAR (measured) = 1.36 W/kg

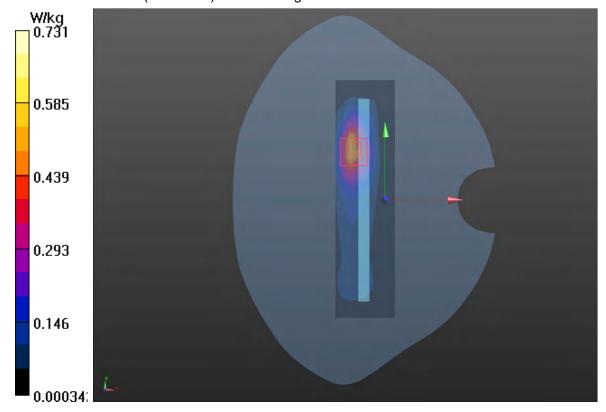




Plot 113 NR Band 66 1RB Left Edge Low (Distance 10mm) Date: 2022/4/20 Communication System: UID 0, 5G NR (0); Frequency: 1720 MHz;Duty Cycle: 1:1 Medium parameters used: f = 1720 MHz; σ = 1.303 S/m; ε_r = 39.467; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(8.42, 8.42, 8.42); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Left Edge Low/Area Scan (4x14x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.564 W/kg

Left Edge Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 7.630 V/m; Power Drift = 0.010 dB Peak SAR (extrapolated) = 0.989 W/kg SAR(1 g) = 0.381 W/kg; SAR(10 g) = 0.200 W/kg Maximum value of SAR (measured) = 0.731 W/kg

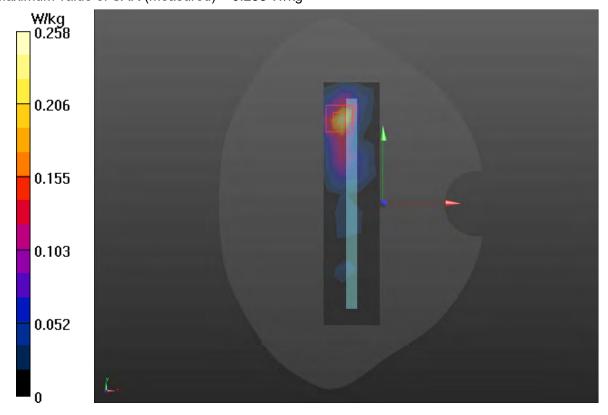




Plot 114 NR Band 77 50%RB Left Edge Middle (Distance 10mm) Date: 2022/4/9 Communication System: UID 0, 5G NR (0); Frequency: 3750 MHz;Duty Cycle: 1:4 Medium parameters used (interpolated): f = 3750 MHz; σ = 3.088 S/m; ϵ_r = 37.562; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(6.51, 6.51, 6.51); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Left Edge Middle/Area Scan (6x21x1): Measurement grid: dx=10mm, dy=10mm Maximum value of SAR (measured) = 0.255 W/kg

Left Edge Middle/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm Reference Value = 2.392 V/m; Power Drift = -0.050 dB Peak SAR (extrapolated) = 0.348 W/kg SAR(1 g) = 0.182 W/kg; SAR(10 g) = 0.075 W/kg Maximum value of SAR (measured) = 0.258 W/kg

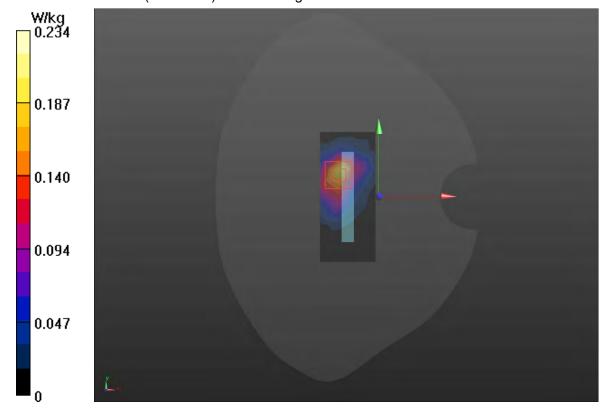




Plot 115 NR Band 78 1RB Top Edge Low (Distance 10mm) Date: 2022/4/6 Communication System: UID 0, 5G NR (0); Frequency: 3500 MHz;Duty Cycle: 1:4 Medium parameters used (interpolated): f = 3500 MHz; σ = 3.088 S/m; ϵ_r = 37.562; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(6.79, 6.79, 6.79); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Top Edge Low/Area Scan (6x21x1): Measurement grid: dx=10mm, dy=10mm Maximum value of SAR (measured) = 0.206 W/kg

Top Edge Low/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm Reference Value = 4.606 V/m; Power Drift = 0.028 dB Peak SAR (extrapolated) = 0.421 W/kg SAR(1 g) = 0.194 W/kg; SAR(10 g) = 0.078 W/kg Maximum value of SAR (measured) = 0.234 W/kg

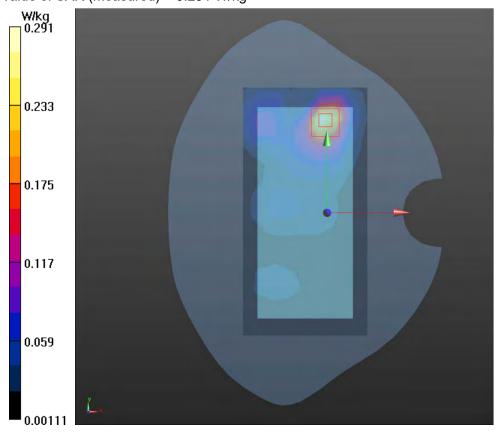


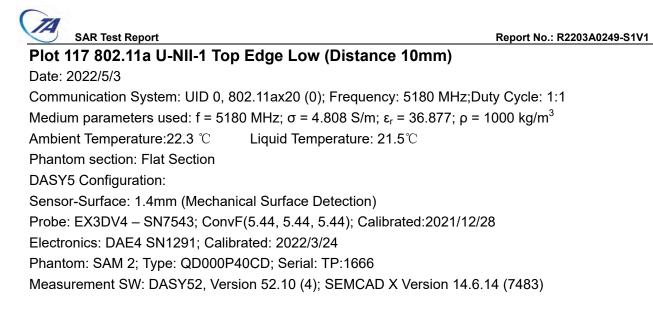


Plot 116 802.11b Front Side Low (Distance 10mm) Date: 2022/5/7 Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1 Medium parameters used: f = 2412 MHz; σ = 1.801 S/m; ε_r = 37.737; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(7.49, 7.49, 7.49); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Front Side Low/Area Scan (9x17x1): Measurement grid: dx=12mm, dy=12mm Maximum value of SAR (measured) = 0.251 W/kg

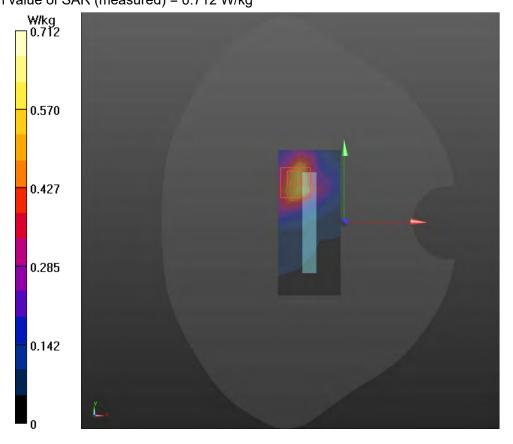
Front Side Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 4.085 V/m; Power Drift = 0.015 dB Peak SAR (extrapolated) = 0.392 W/kg SAR(1 g) = 0.247 W/kg; SAR(10 g) = 0.118 W/kg Maximum value of SAR (measured) = 0.291 W/kg





Top Edge Low /Area Scan (6x21x1): Measurement grid: dx=10mm, dy=10mm Maximum value of SAR (measured) = 0.691 W/kg

Top Edge Low /Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm Reference Value = 4.422 V/m; Power Drift = -0.039 dB Peak SAR (extrapolated) = 1.03 W/kg SAR(1 g) = 0.692W/kg; SAR(10 g) = 0.278 W/kg Maximum value of SAR (measured) = 0.712 W/kg



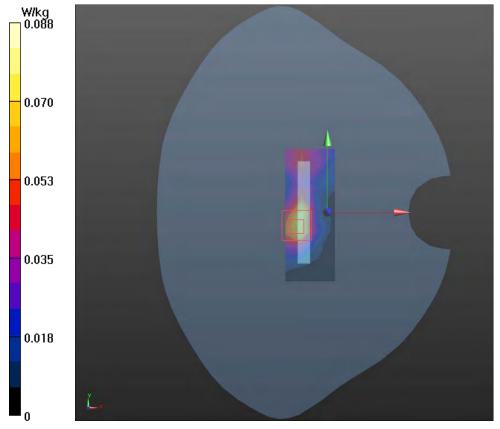


Plot 118 Bluetooth Top Edge High (Distance 10mm) Date: 2022/5/7 Communication System: UID 0, BT (0); Frequency: 2480 MHz;Duty Cycle: 1:1.31 Medium parameters used: f = 2480 MHz; σ = 1.878 S/m; ϵ_r = 37.511; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(7.49, 7.49, 7.49); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Top Edge High/Area Scan (4x9x1): Measurement grid: dx=12mm, dy=12mm Maximum value of SAR (measured) = 0.081 W/kg

Top Edge High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 2.616 V/m; Power Drift = 0.010 dB Peak SAR (extrapolated) = 0.111 W/kg SAR(1 g) = 0.075 W/kg; SAR(10 g) = 0.039 W/kg

Maximum value of SAR (measured) = 0.088 W/kg

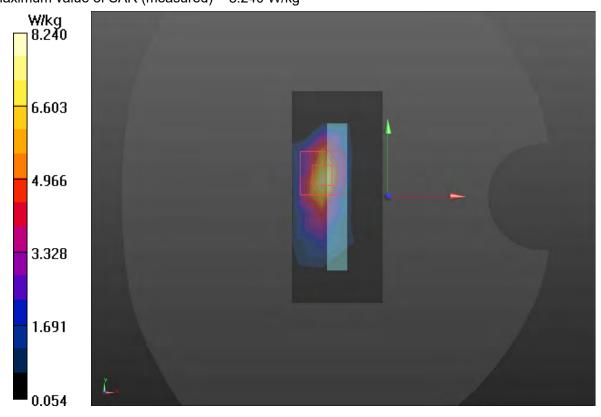




Plot 119 UMTS Band II Bottom Edge Middle (Distance 0mm) Date: 2022/4/1 Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz;Duty Cycle: 1:1 Medium parameters used: f = 1880 MHz; σ = 1.42 S/m; ε_r = 38.948; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(8.20, 8.20, 8.20); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Bottom Edge Middle/Area Scan (4x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 8.06 W/kg

Bottom Edge Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 42.67 V/m; Power Drift = -0.029 dB Peak SAR (extrapolated) = 17.6 W/kg SAR(1 g) = 6.53 W/kg; SAR(10 g) = 2.53 W/kg Maximum value of SAR (measured) = 8.240 W/kg

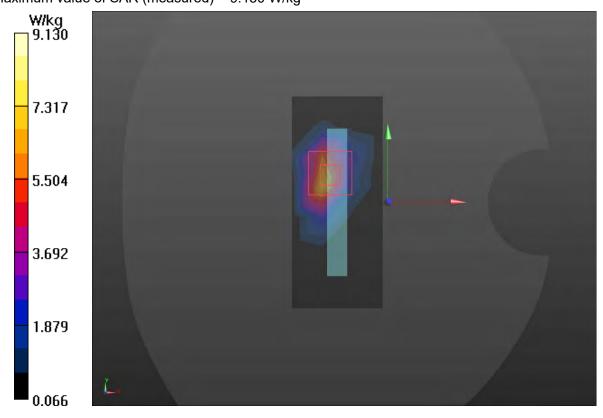




Plot 120 UMTS Band IV Bottom Edge Middle (Distance 0mm) Date: 2022/4/3 Communication System: UID 0, WCDMA (0); Frequency: 1732.6 MHz;Duty Cycle: 1:1 Medium parameters used: f = 1732.6 MHz; σ = 1.312 S/m; ϵ_r = 39.365; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(8.42, 8.42, 8.42); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Bottom Edge Middle/Area Scan (4x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 7.09 W/kg

Bottom Edge Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 53.63 V/m; Power Drift = 0.025 dB Peak SAR (extrapolated) = 19.0 W/kg SAR(1 g) = 7.55 W/kg; SAR(10 g) = 3.08 W/kg Maximum value of SAR (measured) = 9.130 W/kg

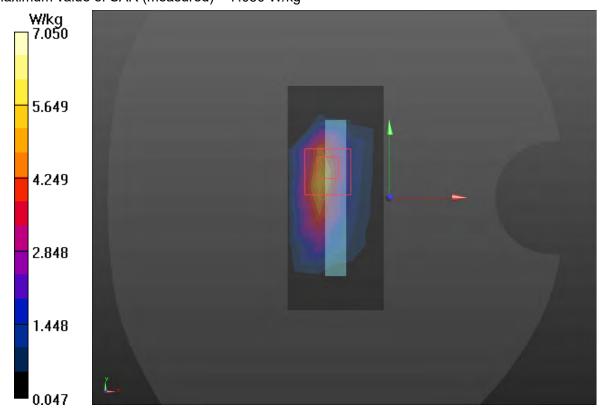




Plot 121 LTE Band 2 1RB Bottom Edge Middle (Distance 0mm) Date: 2022/3/20 Communication System: UID 0, LTE (0); Frequency: 1880 MHz;Duty Cycle: 1:1 Medium parameters used: f = 1880 MHz; σ = 1.42 S/m; ε_r = 38.948; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(8.20, 8.20, 8.20); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Bottom Edge Middle/Area Scan (4x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 6.90 W/kg

Bottom Edge Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 54.40 V/m; Power Drift = 0.130 dB Peak SAR (extrapolated) = 14.5 W/kg SAR(1 g) = 5.91 W/kg; SAR(10 g) = 2.47 W/kg Maximum value of SAR (measured) = 7.050 W/kg

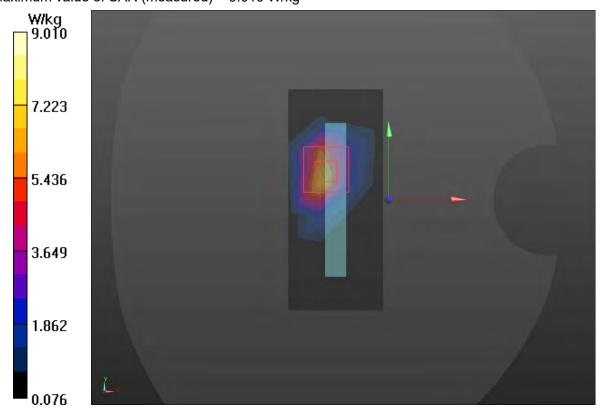




Plot 122 LTE Band 4 1RB Bottom Edge High (Distance 0mm) Date: 2022/4/15 Communication System: UID 0, LTE (0); Frequency: 1745 MHz;Duty Cycle: 1:1 Medium parameters used: f = 1745 MHz; σ = 1.323 S/m; ε_r = 39.378; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(8.42, 8.42, 8.42); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Bottom Edge High/Area Scan (4x8x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 7.80 W/kg

Bottom Edge High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 51.24 V/m; Power Drift = 0.190 dB Peak SAR (extrapolated) = 17.4 W/kg SAR(1 g) = 7.57 W/kg; SAR(10 g) = 3.23 W/kg Maximum value of SAR (measured) = 9.010 W/kg

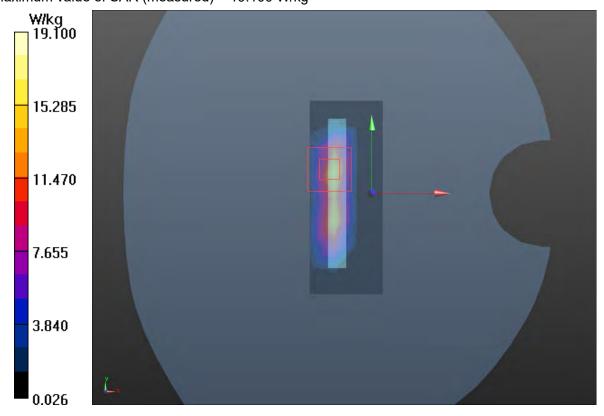




Plot 123 LTE Band 7 1RB Bottom Edge High (Distance 0mm) Date: 2022/3/31 Communication System: UID 0, LTE (0); Frequency: 2560 MHz;Duty Cycle: 1:1 Medium parameters used: f = 2560 MHz; σ = 1.971 S/m; ε_r = 37.231; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(7.24, 7.24, 7.24); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Bottom Edge High/Area Scan (4x9x1): Measurement grid: dx=12mm, dy=12mm Maximum value of SAR (measured) = 16.2 W/kg

Bottom Edge High/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 54.80 V/m; Power Drift = 0.011 dB Peak SAR (extrapolated) = 28.6 W/kg SAR(1 g) = 8.32 W/kg; SAR(10 g) = 2.89 W/kg Maximum value of SAR (measured) = 19.100 W/kg

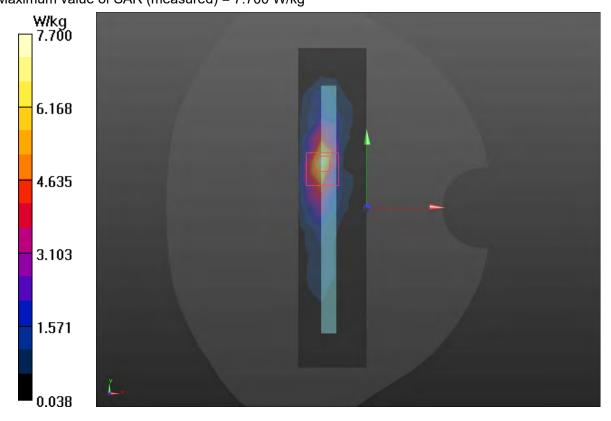




Plot 124 LTE Band 66 1RB Left Edge Middle (Distance 0mm) Date: 2022/4/15 Communication System: UID 0, LTE (0); Frequency: 1745 MHz;Duty Cycle: 1:1 Medium parameters used: f = 1745 MHz; σ = 1.323 S/m; ε_r = 39.378; ρ = 1000 kg/m³ Ambient Temperature:22.3 °C Liquid Temperature: 21.5 °C Phantom section: Flat Section DASY5 Configuration: Sensor-Surface: 1.4mm (Mechanical Surface Detection) Probe: EX3DV4 – SN7543; ConvF(8.42, 8.42, 8.42); Calibrated:2021/12/28 Electronics: DAE4 SN1291; Calibrated: 2022/3/24 Phantom: SAM 2; Type: QD000P40CD; Serial: TP:1666 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Left Edge Middle/Area Scan (4x15x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 7.00 W/kg

Left Edge Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 41.35 V/m; Power Drift = 0.050 dB Peak SAR (extrapolated) = 16.1 W/kg SAR(1 g) = 5.62 W/kg; SAR(10 g) = 2.15 W/kg Maximum value of SAR (measured) = 7.700 W/kg





ANNEX D: Probe Calibration Certificate (SN: 7543)

Client TA(Sh CALIBRATION CE Object Calibration Procedure(s) Calibration date:	anghai)	SN : 7543	Z21-60417
Object Calibration Procedure(s)	EX3DV4 - :	SN : 7543	
Calibration Procedure(s)		SN : 7543	
	FE-711-00		
Calibration date:	11-211-00-	4-02	
Calibration date:	Calibration	Procedures for Dosimetric E-field Probes	
	December	28, 2021	
All calibrations have been humidity<70%. Calibration Equipment used (tricate. conducted in the	uncertainties with confidence probability a closed laboratory facility: environment libration)	
	ID#	Cal Date(Calibrated by, Certificate No.)	
			Scheduled Calibration
Power Meter NRP2	101919	15-Jun-21(CTTL, No.J21X04466)	Scheduled Calibration Jun-22
Power Meter NRP2 Power sensor NRP-Z91	101547	15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466)	Jun-22 Jun-22
Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91	101547 101548	15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466)	Jun-22 Jun-22 Jun-22
Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator	101547 101548 18N50W-10dB	15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 10-Feb-20(CTTL, No.J20X00525)	Jun-22 Jun-22 Jun-22 Feb-22
Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator	101547 101548 18N50W-10dB 18N50W-20dB	15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 10-Feb-20(CTTL, No.J20X00525) 10-Feb-20(CTTL, No.J20X00526)	Jun-22 Jun-22 Jun-22 Feb-22 Feb-22
Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4	101547 101548 18N50W-10dB 18N50W-20dB	15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 10-Feb-20(CTTL, No.J20X00525)	Jun-22 Jun-22 Jun-22 Feb-22 Feb-22 1) Jan-22
Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 Secondary Standards	101547 101548 18N50W-10dB 18N50W-20dB SN 3617 SN 1555	15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 10-Feb-20(CTTL, No.J20X00525) 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Jan2 20-Aug-21(SPEAG, No.DAE4-1555_Aug	Jun-22 Jun-22 Jun-22 Feb-22 Feb-22 1) Jan-22 g21/2) Aug-22
Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 Secondary Standards SignalGenerator MG3700A	101547 101548 18N50W-10dB 18N50W-20dB SN 3617 SN 1555 ID # 6201052605	15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 10-Feb-20(CTTL, No.J20X00525) 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Jan2 20-Aug-21(SPEAG, No.DAE4-1555_Aug Cal Date(Calibrated by, Certificate No.)	Jun-22 Jun-22 Jun-22 Feb-22 1) Jan-22 g21/2) Aug-22 Scheduled Calibration
Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 Secondary Standards SignalGenerator MG3700A Network Analyzer E5071C	101547 101548 18N50W-10dB 18N50W-20dB SN 3617 SN 1555 ID # 6201052605 MY46110673	15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 10-Feb-20(CTTL, No.J20X00525) 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Jan2 20-Aug-21(SPEAG, No.DAE4-1555_Aug	Jun-22 Jun-22 Jun-22 Feb-22 1) Jan-22 g21/2) Aug-22 Scheduled Calibration Jun-22
Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 Secondary Standards SignalGenerator MG3700A Network Analyzer E5071C N	101547 101548 18N50W-10dB 18N50W-20dB SN 3617 SN 1555 ID # 6201052605 MY46110673 ame	15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 10-Feb-20(CTTL, No.J20X00525) 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Jan2 20-Aug-21(SPEAG, No.DAE4-1555_Aug Cal Date(Calibrated by, Certificate No.) 16-Jun-21(CTTL, No.J21X04467)	Jun-22 Jun-22 Jun-22 Feb-22 1) Jan-22 g21/2) Aug-22 Scheduled Calibration Jun-22 Jan-22
Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 Secondary Standards SignalGenerator MG3700A Network Analyzer E5071C N calibrated by:	101547 101548 18N50W-10dB 18N50W-20dB SN 3617 SN 1555 ID # 6201052605 MY46110673	15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 10-Feb-20(CTTL, No.J20X00525) 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Jan2 20-Aug-21(SPEAG, No.DAE4-1555_Aug Cal Date(Calibrated by, Certificate No.) 16-Jun-21(CTTL, No.J21X04467) 21-Jan-21(CTTL, No.J20X00515)	Jun-22 Jun-22 Jun-22 Feb-22 1) Jan-22 g21/2) Aug-22 Scheduled Calibration Jun-22
Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenuator Reference 20dBAttenuator Reference Probe EX3DV4 DAE4 Secondary Standards SignalGenerator MG3700A Network Analyzer E5071C National Standards	101547 101548 18N50W-10dB 18N50W-20dB SN 3617 SN 1555 ID # 6201052605 MY46110673 ame	15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 10-Feb-20(CTTL, No.J20X00525) 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Jan2 20-Aug-21(SPEAG, No.DAE4-1555_Aug Cal Date(Calibrated by, Certificate No.) 16-Jun-21(CTTL, No.J21X04467) 21-Jan-21(CTTL, No.J20X00515) Function	Jun-22 Jun-22 Jun-22 Feb-22 1) Jan-22 g21/2) Aug-22 Scheduled Calibration Jun-22 Jan-22

Certificate No: Z21-60417

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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 Φ	Φ rotation around probe axis
Polarization 0	8 rotation around an axis that is in the plane normal to probe axis (at measurement center)
1020257791C4	A=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) 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
- b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)". July 2016
- c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- d) 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 θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide) NORMx, y, z are only intermediate values, i.e., the uncertainties of NORMx, y, z does not effect the E²-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 (no uncertainty required). 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; VRx, y, z: A, B, C 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≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued 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±50MHz to±100MHz.
- 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).

Certificate No:Z21-60417





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DASY/EASY - Parameters of Probe: EX3DV4 - SN:7543

Basic Calibration Parameters

100 million (100 million)	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(µV/(V/m)2) *	0.62	0.69	0.55	±10.0%
DCP(mV) ⁶	100.4	104.2	102.3	

Modulation Calibration Parameters

UID	Communication System Name	1	A dB	B dBõV	C	D dB	VR mV	Unc ^E (k=2)
0 CW	CW	X	0.0	0.0	1.0	0.00	197.2	±2.7%
		Y	0.0	0.0	1.0		206.6	
		Z	0.0	0.0	1.0		180.8	

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 E2-field uncertainty inside TSL (see Page 4).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.





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DASY/EASY - Parameters of Probe: EX3DV4 - SN:7543

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz] ^c	Relative Permittivity ^F	Conductivity (S/m) F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unct. (k=2)
750	41.9	0.89	10.27	10.27	10.27	0.17	1.26	±12.1%
835	41.5	0.90	9.89	9.89	9.89	0.14	1.62	±12.1%
1750	40.1	1.37	8.42	8.42	8.42	0.28	0.95	±12.1%
1900	40.0	1.40	8.20	8.20	8.20	0.28	1.03	±12.1%
2000	40.0	1.40	8.23	8.23	8.23	0.26	1.08	±12.1%
2300	39.5	1.67	7.68	7.68	7.68	0.62	0.70	±12.1%
2450	39.2	1.80	7.49	7.49	7.49	0.68	0.69	±12.1%
2600	39.0	1.96	7.24	7.24	7.24	0.50	0.81	±12.1%
3300	38.2	2.71	6.94	6.94	6.94	0.41	1.05	±13.3%
3500	37.9	2.91	6.79	6.79	6.79	0.43	1.03	±13.3%
3700	37.7	3.12	6.51	6.51	6.51	0.44	1.01	±13.3%
3900	37.5	3.32	6.40	6.40	6.40	0.35	1.35	±13.3%
4100	37.2	3.53	6.49	6.49	6.49	0.40	1.15	±13.3%
4400	36.9	3.84	6.32	6.32	6.32	0.35	1.35	±13.3%
4600	36.7	4.04	6.22	6.22	6.22	0.45	1.20	±13.3%
4800	36.4	4.25	6.16	6.16	6.16	0.45	1.20	±13.3%
4950	36.3	4.40	5.95	5.95	5.95	0.45	1.25	±13.3%
5250	35.9	4.71	5.44	5.44	5.44	0.45	1.25	±13.3%
5600	35.5	5.07	4.81	4.81	4.81	0.55	1.20	±13.3%
5750	35.4	5.22	4.94	4.94	4.94	0.55	1.25	±13.3%

^c Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of 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. Above 5 GHz frequency validity can be extended to ± 110 MHz

^F At frequency below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters. ^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 the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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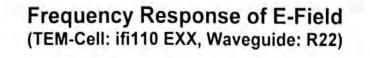


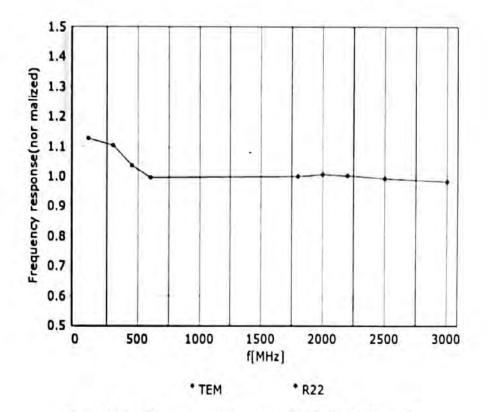


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Uncertainty of Frequency Response of E-field: ±7.4% (k=2)

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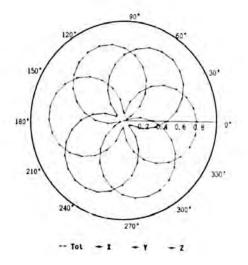
E-mail: cttl@chinattl.com

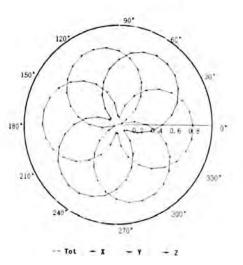
Add. No.52 HuaYuanBei Road, Haidian District, Beijing, 100191, China Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504 Http://www.chinattl.cn

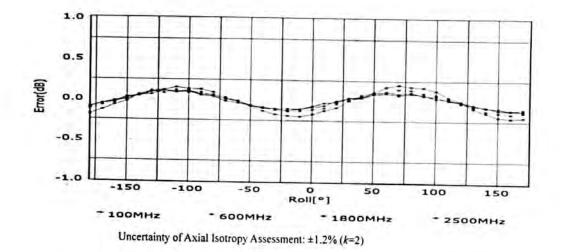
Receiving Pattern (Φ), θ=0°

f=600 MHz, TEM

f=1800 MHz, R22



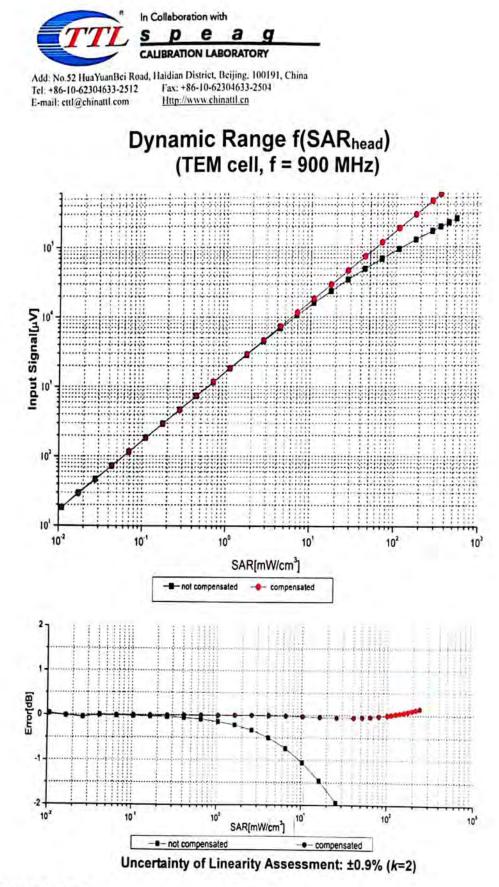




Certificate No:Z21-60417

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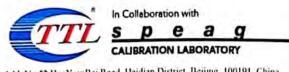




Certificate No:Z21-60417





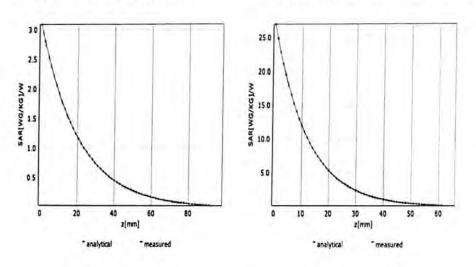


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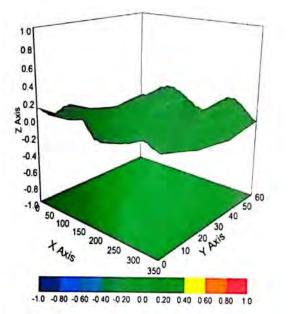
Conversion Factor Assessment

f=750 MHz,WGLS R9(H_convF)

f=1750 MHz,WGLS R22(H_convF)



Deviation from Isotropy in Liquid

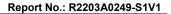


Uncertainty of Spherical Isotropy Assessment: ±3.2% (k=2)

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:7543

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	50.7
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	1.4mm

Certificate No:Z21-60417

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ANNEX E: Probe Calibration Certificate (SN: 3677)

E-mail: cttl@chi	Chanaball	0	
CALIBRATION C	Shanghai) CERTIFICATE		o: Z21-60285
Object	EX3DV4	- SN : 3677	
Calibration Procedure(s)	FF-Z11-00	04.00	
		n Procedures for Dosimetric E-field Prot	Des
Calibration date:	August 12		
	rugust 12	., 2021	the second second second
	Continuate.		
All calibrations have bee numidity<70%.		e closed laboratory facility: environme	nt temperature(22±3)°C and
All calibrations have bee numidity<70%. Calibration Equipment use	en conducted in the	calibration)	
All calibrations have bee numidity<70%. Calibration Equipment use	en conducted in the ed (M&TE critical for d		
All calibrations have been numidity<70%. Calibration Equipment use Primary Standards Power Meter NRP2 Power sensor NRP-Z91	en conducted in the ed (M&TE critical for d ID # 101919 I 101547	calibration) Cal Date(Calibrated by, Certificate No 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466)	 Scheduled Calibration
All calibrations have been numidity<70%. Calibration Equipment use Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91	en conducted in the ed (M&TE critical for d ID # 101919 1 101547 1 101548	Calibration) Cal Date(Calibrated by, Certificate No 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466)	 D.) Scheduled Calibration Jun-22
All calibrations have been numidity<70%. Calibration Equipment use Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenua	en conducted in the ed (M&TE critical for d ID # 101919 1 101547 1 101548 ator 18N50W-10di	Calibration) Cal Date(Calibrated by, Certificate No 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) B 10-Feb-20(CTTL, No.J20X00525)	 5.) Scheduled Calibration Jun-22 Jun-22
All calibrations have been humidity<70%. Calibration Equipment use Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenua Reference 20dBAttenua	en conducted in the ed (M&TE critical for d ID # 101919 1 101547 1 101548 ator 18N50W-10di ator 18N50W-20di	Calibration) Cal Date(Calibrated by, Certificate No. 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) B 10-Feb-20(CTTL, No.J20X00525) B 10-Feb-20(CTTL, No.J20X00526)	5.) Scheduled Calibration Jun-22 Jun-22 Jun-22 Feb-22 Feb-22 Feb-22
All calibrations have been humidity<70%. Calibration Equipment use Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenua	en conducted in the ed (M&TE critical for d ID # 101919 1 101547 1 101548 ator 18N50W-10di ator 18N50W-20di	Calibration) Cal Date(Calibrated by, Certificate No 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) B 10-Feb-20(CTTL, No.J20X00525)	5.) Scheduled Calibration Jun-22 Jun-22 Jun-22 Feb-22 Feb-22 Feb-22 an21) Jan-22
All calibrations have been humidity<70%. Calibration Equipment use Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenua Reference 20dBAttenua Reference Probe EX3D	en conducted in the ed (M&TE critical for of ID # 101919 101547 101548 ator 18N50W-10df ator 18N50W-20df V4 SN 3617	Calibration) Cal Date(Calibrated by, Certificate No. 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) B 10-Feb-20(CTTL, No.J20X00525) B 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Ja	o.) Scheduled Calibration Jun-22 Jun-22 Jun-22 Feb-22 Feb-22 an21) Jan-22 Jan21) Jan-22
All calibrations have been numidity<70%. Calibration Equipment use Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenua Reference 20dBAttenua Reference Probe EX3D DAE4 Secondary Standards SignalGenerator MG370	en conducted in the ed (M&TE critical for of ID # 101919 1 101547 1 101548 ator 18N50W-10df ator 18N50W-20df V4 SN 3617 SN 1556 ID # 00A 6201052605	Calibration) Cal Date(Calibrated by, Certificate No. 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) B 10-Feb-20(CTTL, No.J20X00525) B 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Ja 15-Jan-21(SPEAG, No.DAE4-1556_,	5.) Scheduled Calibration Jun-22 Jun-22 Jun-22 Feb-22 Feb-22 Feb-22 an21) Jan-22
All calibrations have been humidity<70%. Calibration Equipment use Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenua Reference 20dBAttenua Reference Probe EX3D DAE4 Secondary Standards SignalGenerator MG370	en conducted in the ed (M&TE critical for d ID # 101919 1 101547 1 101548 ator 18N50W-10df ator 18N50W-20df V4 SN 3617 SN 1556 ID # 00A 6201052605 1C MY46110673	Calibration) Cal Date(Calibrated by, Certificate No. 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) B 10-Feb-20(CTTL, No.J21X04466) B 10-Feb-20(CTTL, No.J20X00525) B 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Ja 15-Jan-21(SPEAG, No.DAE4-1556_x) Cal Date(Calibrated by, Certificate No.)	5.) Scheduled Calibration Jun-22 Jun-22 Jun-22 Feb-22 Feb-22 an21) Jan-22 Jan21) Jan-22 Scheduled Calibration
All calibrations have been humidity<70%. Calibration Equipment use Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenua Reference 20dBAttenua Reference Probe EX3D DAE4 Secondary Standards SignalGenerator MG370 Network Analyzer E5071	en conducted in the ed (M&TE critical for of ID # 101919 1 101547 1 101548 ator 18N50W-10df ator 18N50W-20df V4 SN 3617 SN 1556 ID # 00A 6201052605	Calibration) Cal Date(Calibrated by, Certificate No. 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) B 10-Feb-20(CTTL, No.J20X00525) B 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Ja 15-Jan-21(SPEAG, No.DAE4-1556_, Cal Date(Calibrated by, Certificate No.) 16-Jun-21(CTTL, No.J21X04467)	5.) Scheduled Calibration Jun-22 Jun-22 Jun-22 Feb-22 Feb-22 an21) Jan-22 Jan21) Jan-22 Scheduled Calibration Jun-22
All calibrations have been humidity<70%. Calibration Equipment use Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenua Reference 20dBAttenua Reference Probe EX3D DAE4 Secondary Standards SignalGenerator MG370 Network Analyzer E5071	en conducted in the ed (M&TE critical for d ID # 101919 1 101547 1 101548 ator 18N50W-10df ator 18N50W-20df V4 SN 3617 SN 1556 ID # 00A 6201052605 1C MY46110673	Calibration) Cal Date(Calibrated by, Certificate No. 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) B 10-Feb-20(CTTL, No.J20X00525) B 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Ja 15-Jan-21(SPEAG, No.DAE4-1556_, Cal Date(Calibrated by, Certificate No.) 16-Jun-21(CTTL, No.J21X04467) 21-Jan-21(CTTL, No.J20X00515)	5.) Scheduled Calibration Jun-22 Jun-22 Jun-22 Feb-22 Feb-22 an21) Jan-22 Jan21) Jan-22 Scheduled Calibration Jun-22 Jan-22
All calibrations have been humidity<70%. Calibration Equipment use Primary Standards Power Meter NRP2 Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 10dBAttenua Reference 20dBAttenua Reference Probe EX3D DAE4	en conducted in the ed (M&TE critical for d ID # 101919 101547 101548 ator 18N50W-10df ator 18N50W-20df V4 SN 3617 SN 1556 ID # 00A 6201052605 1C MY46110673 Name	Calibration) Cal Date(Calibrated by, Certificate No. 15-Jun-21(CTTL, No.J21X04466) 15-Jun-21(CTTL, No.J21X04466) B 10-Feb-20(CTTL, No.J21X04466) B 10-Feb-20(CTTL, No.J20X00526) 27-Jan-21(SPEAG, No.EX3-3617_Ja 15-Jan-21(SPEAG, No.DAE4-1556_, Cal Date(Calibrated by, Certificate No.) 16-Jun-21(CTTL, No.J21X04467) 21-Jan-21(CTTL, No.J20X00515) Function	5.) Scheduled Calibration Jun-22 Jun-22 Jun-22 Feb-22 Feb-22 an21) Jan-22 Jan21) Jan-22 Scheduled Calibration Jun-22 Jan-22

Certificate No: Z21-60285

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Glossary:

nter), i
nter

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) 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
- b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010

d) 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 θ=0 (f≤900MHz in TEM-cell; f>1800MHz: waveguide). NORMx, y, z are only intermediate values, i.e., the uncertainties of NORMx, y, z does not effect the E²-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 (no uncertainty required). 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; VRx,y,z:A,B,C 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<800MHz) and inside waveguide using analytical field distributions based on power measurements for f >800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty valued 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±50MHz to±100MHz.
- 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).

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:3677

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm(µV/(V/m)2)A	0.41	0.46	0.40	±10.0%
DCP(mV) ^B	99.3	101.9	101.5	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dBõV	C	D dB	VR mV	Unc ^E (k=2)
0 CW	CW	X	0.0	0.0	1.0	0.00	158.2	±2.0%
		Y	0.0	0.0		170.4		
		z	0.0	0.0	1.0		156.9	1

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 E²-field uncertainty inside TSL (see Page 4).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainly is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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DASY/EASY – Parameters of Probe: EX3DV4 – SN:3677

Relative Conductivity DepthG Unct. f [MHz]^C ConvF X ConvF Y ConvF Z Alpha^G Permittivity F (S/m) F (mm) (k=2) 750 9.64 9.64 0.40 0.80 41.9 0.89 $\pm 12.1\%$ 9.64 835 41.5 0.90 9.30 9.30 0.16 1.29 ±12.1% 9.30 1750 1.37 0.24 1.00 ±12.1% 40.1 8.22 8.22 8.22 0.24 1.10 1900 40.0 1.40 7.88 7.88 7.88 $\pm 12.1\%$ 2000 40.0 1.40 7.96 7.96 7.96 0.21 1.17 ±12.1% 2300 39.5 1.67 7.67 7.67 7.67 0.66 0.68 ±12.1% 0.70 2450 7.50 0.66 ±12.1% 39.2 1.80 7.50 7.50 2600 39.0 1.96 7.25 0.62 0.73 ±12.1% 7.25 7.25 3300 2.71 7.00 7.00 7.00 0.45 0.94 ±13.3% 38.2 3500 37.9 2.91 6.92 6.92 0.45 0.98 6.92 ±13.3% 3700 1.04 37.7 3.12 6.71 6.71 6.71 0.45 ±13.3% 3900 37.5 3.32 6.62 6.62 6.62 0.40 1.25 ±13.3% 4100 6.66 37.2 3.53 6.66 6.66 0.30 1.38 ±13.3% 6.43 6.43 6.43 4400 3.84 0.35 1.35 36.9 ±13.3% 4600 36.7 4.04 6.35 6.35 6.35 0.50 1.13 ±13.3% 6.30 4800 36.4 4.25 6.30 6.30 0.45 1.25 ±13.3% 4.40 6.13 6.13 6.13 4950 36.3 0.45 1.25 ±13.3% 4.71 5.45 5.45 5.45 5250 35.9 0.50 1.30 ±13.3% 5.00 5.00 5600 35.5 5.07 5.00 0.60 1.15 ±13.3% 5750 35.4 5.22 5.04 5.04 5.04 0.55 1.26 ±13.3%

Calibration Parameter Determined in Head Tissue Simulating Media

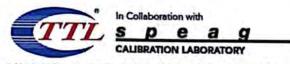
^c Frequency validity above 300 MHz of ±100MHz only applies for DASY v4.4 and higher (Page 2), else it is restricted to ±50MHz. The uncertainty is the RSS of ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25,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

^F At frequency below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters. ^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 the frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

Certificate No:Z21-60285

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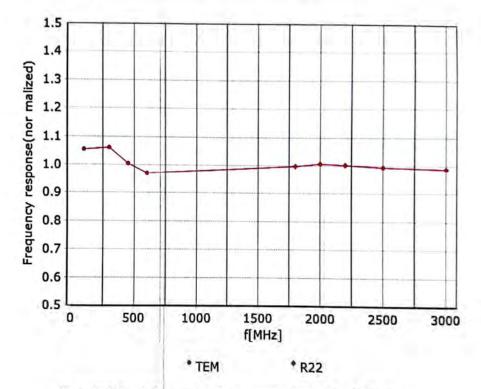




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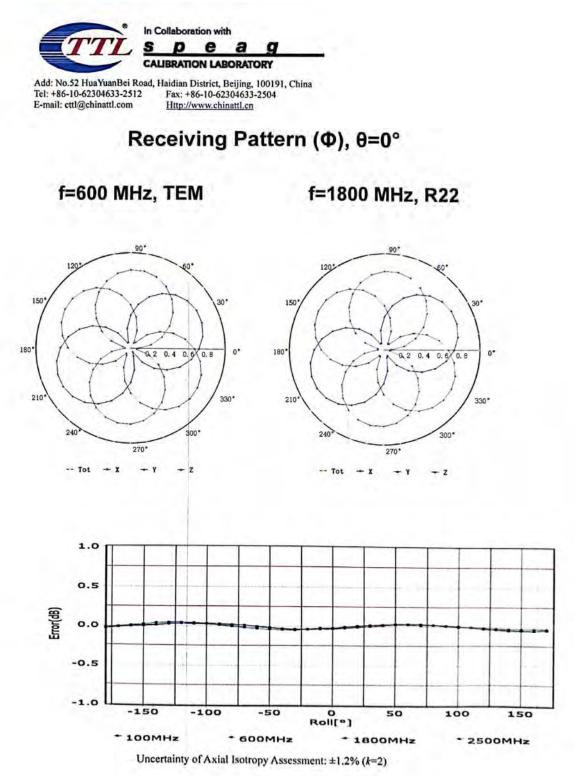
Frequency Response of E-Field (TEM-Cell: ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ±7.4% (k=2)

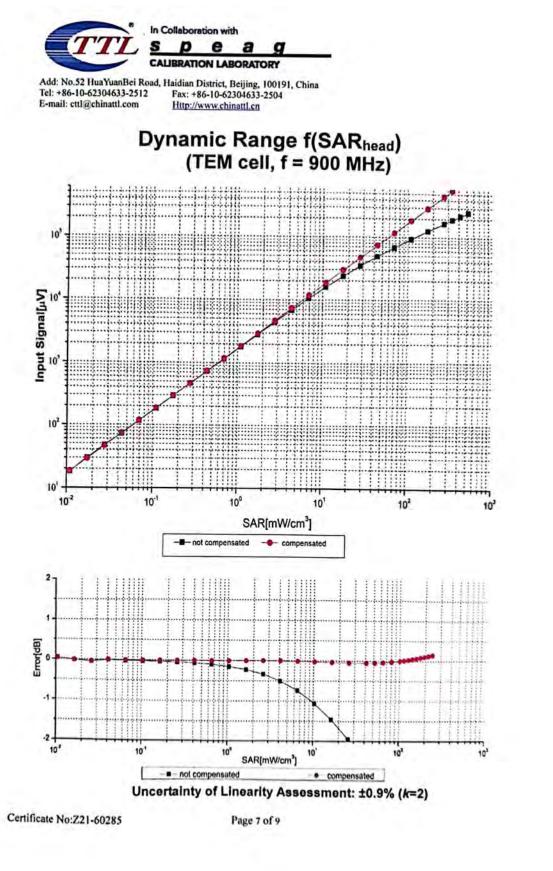
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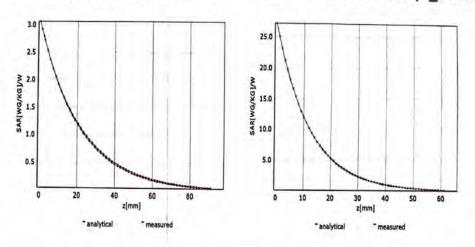




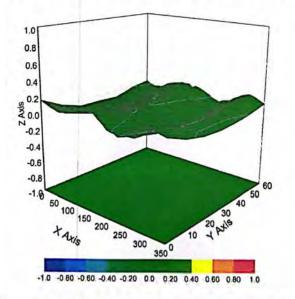
Conversion Factor Assessment

f=750 MHz,WGLS R9(H_convF)

f=1750 MHz,WGLS R22(H_convF)



Deviation from Isotropy in Liquid



Uncertainty of Spherical Isotropy Assessment: ±3.2% (k=2)

Certificate No:Z21-60285

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3677

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	117.4
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disable
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Probe Tip to Sensor X Calibration Point	1mm
Probe Tip to Sensor Y Calibration Point	1mm
Probe Tip to Sensor Z Calibration Point	1mm
Recommended Measurement Distance from Surface	1.4mm

Certificate No:Z21-60285

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ANNEX F: D750V3 Dipole Calibration Certificate

Client TA/S	and the second se		
Client TA(Shanghai)	Certificate No: Z2	0-60299
CALIBRATION C	ERTIFICAT	E	
Object	D750V	3 - SN: 1045	
Calibration Procedure(s)	FF-Z11	-003-01	
		tion Procedures for dipole validation kits	
Calibration date:	August	28, 2020	
	ertificate.		
pages and are part of the ce All calibrations have been humidity<70%.	ertificate.	the closed laboratory facility: environment	
pages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used	ertificate.	the closed laboratory facility: environment	
pages and are part of the contract of the cont	ID # 106276	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965)	temperature(22±3)°C an Scheduled Calibration May-21
pages and are part of the contract of the cont	ID # 106276 101369	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965)	temperature(22±3)°C an Scheduled Calibration May-21 May-21
pages and are part of the contract of the cont	ID # 106276 101369	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965)	temperature(22±3)°C an Scheduled Calibration May-21
pages and are part of the contract of the cont	ertificate. conducted in 1 (M&TE critical for ID # 106276 101369 SN 3617	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20)	temperature(22±3)°C an Scheduled Calibration May-21 May-21 Jan-21 Feb-21
pages and are part of the contract of the cont	ertificate. conducted in 1 (M&TE critical for 10 # 106276 101369 SN 3617 SN 771	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017)	temperature(22±3)°C an Scheduled Calibration May-21 May-21 Jan-21 Feb-21
pages and are part of the constraints have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards	ertificate. conducted in the conducted in the conducted in the critical for the critical f	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.)	temperature(22±3)°C an Scheduled Calibration May-21 May-21 Jan-21 Feb-21 Scheduled Calibration
pages and are part of the con- All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ertificate. conducted in 1 (M&TE critical for ID # 106276 101369 SN 3617 SN 771 ID # ID # ID # MY49071430	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516)	temperature(22±3)*C an Scheduled Calibration May-21 May-21 Jan-21 Feb-21 Scheduled Calibration Feb-21
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pages and are part of the con- All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ertificate. conducted in 1 (M&TE critical for 106276 101369 SN 3617 SN 771 ID # MY49071430 MY46110673 Name	the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515) Function	temperature(22±3)°C an Scheduled Calibration May-21 May-21 Jan-21 Feb-21 Scheduled Calibration Feb-21 Feb-21

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TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) 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
- b) 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
- c) 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
- d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz.

Additional Documentation:

e) 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	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.3 ± 6 %	0.87 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	2.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.37 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.57 W/kg ± 18.7 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

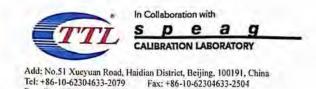
	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.4 ± 6 %	0.94 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C		

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.12 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	8.58 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.41 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	5.70 W/kg ±18.7 % (k=2)

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http://www.chinattl.cn Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

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Impedance, transformed to feed point	54.3Ω- 2.29jΩ
Return Loss	- 26.6dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.7Ω- 4.58jΩ	
Return Loss	- 25.6dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	0.900 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

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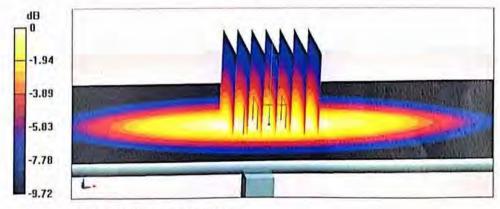
Date: 08.28.2020

Test Laboratory: CTTL, Beijing, China DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1045 Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1 Medium parameters used: f = 750 MHz; $\sigma = 0.873 \text{ S/m}$; $\varepsilon_r = 41.28$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Right Section **DASY5** Configuration:

- Probe: EX3DV4 SN3617; ConvF(10.07, 10.07, 10.07) @ 750 MHz; Calibrated: ٠ 2020-01-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- 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 = 54.97 V/m; Power Drift = -0.02 dB

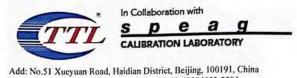
Peak SAR (extrapolated) = 3.00 W/kg SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.38 W/kg Smallest distance from peaks to all points 3 dB below: Larger than measurement grid Ratio of SAR at M2 to SAR at M1 = 68.7% Maximum value of SAR (measured) = 2.71 W/kg



0 dB = 2.71 W/kg = 4.33 dBW/kg

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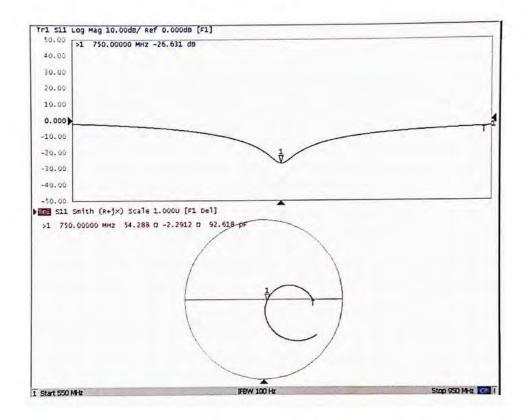
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Impedance Measurement Plot for Head TSL



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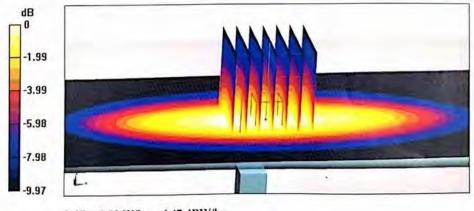


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DASY5 Validation Report for Body TSL Date: 08.28.2020 Test Laboratory: CTTL, Beijing, China DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1045 Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1 Medium parameters used: f = 750 MHz; $\sigma = 0.94 \text{ S/m}$; $\varepsilon_r = 54.36$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Center Section **DASY5** Configuration: Probe: EX3DV4 - SN3617; ConvF(9.8, 9.8, 9.8) @ 750 MHz; Calibrated: . 2020-01-30 Sensor-Surface: 1.4mm (Mechanical Surface Detection) . Electronics: DAE4 Sn771; Calibrated: 2020-02-10 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 = 53.84 V/m; Power Drift = -0.02 dB Peak SAR (extrapolated) = 3.14 W/kg SAR(1 g) = 2.12 W/kg; SAR(10 g) = 1.41 W/kg

Smallest distance from peaks to all points 3 dB below = 18.4 mm Ratio of SAR at M2 to SAR at M1 = 67.9% Maximum value of SAR (measured) = 2.80 W/kg

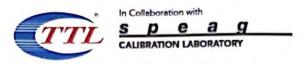


0 dB = 2.80 W/kg = 4.47 dBW/kg

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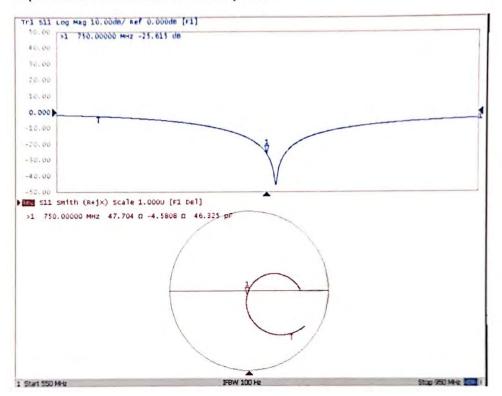


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Impedance Measurement Plot for Body TSL



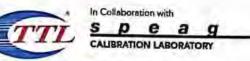
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ANNEX G: D835V2 Dipole Calibration Certificate

E-mail: cttl@chinat Client TA(Sh		www.chinattl.cn		
	langnal	Certificate No	: Z20-60296	_
CALIBRATION CE	RTIFICAT	E		-
Object	D835V	2 - SN: 4d020		
Calibration Procedure(s)		-003-01 tion Procedures for dipole validation k	kits	
Calibration date:		28, 2020		
pages and are part of the co All calibrations have been		the closed laboratory facility: enviro	onment temperature((22±3)℃ and
All calibrations have been humidity<70%. Calibration Equipment used	i conducted in	or calibration)		
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards	I conducted in	or calibration) Cal Date(Calibrated by, Certificate	No.) Scheduled	Calibration
All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2	I conducted in I (M&TE critical fr ID # 106276	or calibration) Cal Date(Calibrated by, Certificate 12-May-20 (CTTL, No.J20X02965)	No.) Scheduled Ma	Calibration ay-21
All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A	I conducted in (M&TE critical fr ID # 106276 101369	calibration) Cal Date(Calibrated by, Certificate 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965)	No.) Scheduled Ma Ma	Calibration ay-21 ay-21
All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2	I conducted in (M&TE critical fr ID # 106276 101369	or calibration) Cal Date(Calibrated by, Certificate 12-May-20 (CTTL, No.J20X02965)	No.) Scheduled Ma Ma an20) Ja	Calibration ay-21
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards	Conducted in (M&TE critical for 106276 101369 SN 3617 SN 771 ID #	Cal Date(Calibrated by, Certificate 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Ja 10-Feb-20(CTTL-SPEAG,No.Z20-60 Cal Date(Calibrated by, Certificate N	No.) Scheduled Ma Ma an20) Ja 0017) Fe No.) Scheduled	Calibration ay-21 ay-21 un-21 ub-21 Calibration
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	I conducted in I (M&TE critical fi 106276 101369 SN 3617 SN 771 ID # ID # MY49071430	Cal Date(Calibrated by, Certificate 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Ja 10-Feb-20(CTTL-SPEAG,No.Z20-60	No.) Scheduled Ma an20) Ja 0017) Fe lo.) Scheduled Fe	Calibration ay-21 ay-21 ay-21 an-21 bb-21
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	I conducted in I (M&TE critical fi 106276 101369 SN 3617 SN 771 ID # ID # MY49071430	or calibration) Cal Date(Calibrated by, Certificate 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Ja 10-Feb-20(CTTL-SPEAG,No.Z20-60 Cal Date(Calibrated by, Certificate N 25-Feb-20 (CTTL, No.J20X00516)	No.) Scheduled Ma an20) Ja 0017) Fe lo.) Scheduled Fe	Calibration ay-21 ay-21 ay-21 b-21 calibration ab-21 ab-21
All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	Conducted in (M&TE critical fe 106276 101369 SN 3617 SN 771 ID # MY49071430 MY46110673	Cal Date(Calibrated by, Certificate 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Ja 10-Feb-20(CTTL-SPEAG,No.Z20-60 Cal Date(Calibrated by, Certificate N 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515)	No.) Scheduled Ma an20) Ja 0017) Fe Io.) Scheduled Fe Fe	Calibration ay-21 ay-21 ay-21 b-21 calibration ab-21 ab-21
All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	A conducted in (M&TE critical for 10 # 106276 101369 SN 3617 SN 771 1D # MY49071430 MY46110673 Name	Cal Date(Calibrated by, Certificate 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Ja 10-Feb-20(CTTL-SPEAG,No.Z20-60 Cal Date(Calibrated by, Certificate N 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515)	No.) Scheduled Ma an20) Ja 0017) Fe Io.) Scheduled Fe Fe	Calibration ay-21 ay-21 ay-21 b-21 calibration ab-21 ab-21



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Glossary: tissue simulating liquid TSL ConvF sensitivity in TSL / NORMx,y,z N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) 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
- b) 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
- c) 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
- d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) 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	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.2 ± 6 %	0.88 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	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.65 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.57 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.37 W/kg ± 18.7 % (k=2)

Body TSL parameters The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.0 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	اسب	

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.42 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.76 W /kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	1000
SAR measured	250 mW input power	1.59 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.40 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	54.8Ω+ 1.73jΩ
Return Loss	- 26.2dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.0Ω- 2.47jΩ
Return Loss	- 26.2dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.258 ns
The contraction of the second se	A MANAGER CONTRACTOR

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

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Date: 08.28.2020

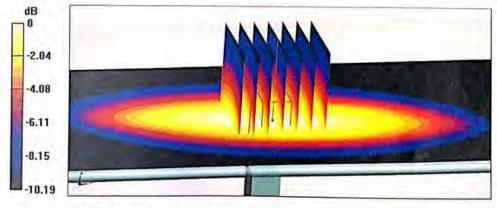
Test Laboratory: CTTL, Beijing, China DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d020 Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1 Medium parameters used: f = 835 MHz; $\sigma = 0.877$ S/m; $\varepsilon_r = 41.23$; $\rho = 1000$ kg/m³ Phantom section: Center Section

DASY5 Configuration:

- Probe: EX3DV4 SN3617; ConvF(9.66, 9.66, 9.66) @ 835 MHz; Calibrated: 2020-01-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- 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 = 58.09 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 3.46 W/kg SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.57 W/kg Smallest distance from peaks to all points 3 dB below = 16.6 mm Ratio of SAR at M2 to SAR at M1 = 68.1% Maximum value of SAR (measured) = 3.12 W/kg



0 dB = 3.12 W/kg = 4.94 dBW/kg

Certificate No: Z20-60296

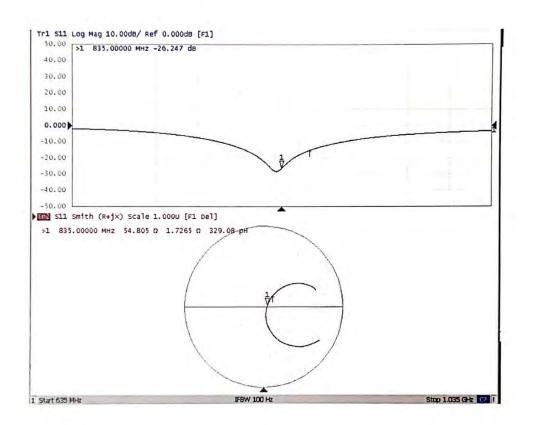
Page 5 of 8





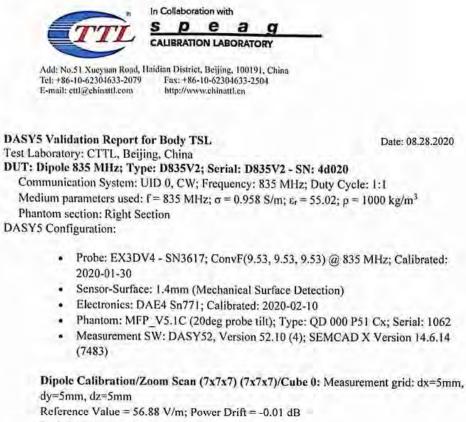
Impedance Measurement Plot for Head TSL

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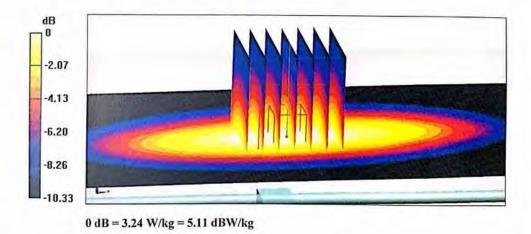


Certificate No: Z20-60296

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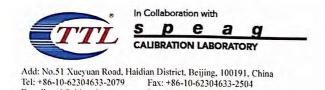
Reference Value = 56.88 V/m; Power Drift = -0.01 dBPeak SAR (extrapolated) = 3.65 W/kgSAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.59 W/kgSmallest distance from peaks to all points 3 dB below = 15.8 mmRatio of SAR at M2 to SAR at M1 = 66.5%Maximum value of SAR (measured) = 3.24 W/kg



Certificate No: Z20-60296

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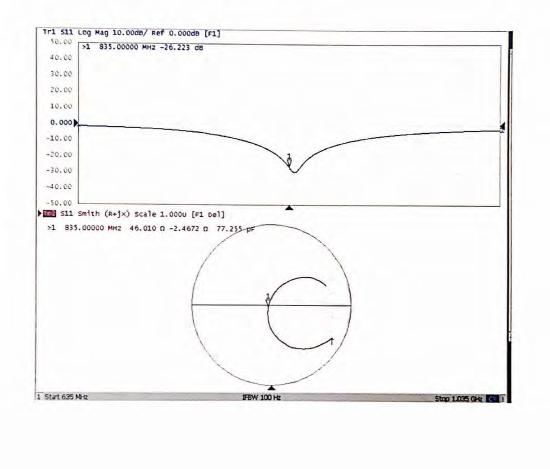




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Impedance Measurement Plot for Body TSL

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Certificate No: Z20-60296

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ANNEX H: D1750V2 Dipole Calibration Certificate

Tel: +86-10-623046 E-mail: cttl@chinat		86-10-62304633-2504 Mululululu	CNAS L0570
	tl.com http://	www.chinattl.cn	
Client TA(Sh	anghai)	Certificate No: Z20	0-60079
CALIBRATION C	ERTIFICAT	Е	
Object	D1750	V2 - SN: 1033	
Calibration Procedure(s)			
salibration Procedure(s)	FF-Z11	-003-01	
	Calibra	tion Procedures for dipole validation kits	
Calibration date:	Febura	ry 25, 2020	
pages and are part of the co	ertificate.	traceability to national standards, which re the uncertainties with confidence probability	are given on the following
pages and are part of the co	ertificate.	the uncertainties with confidence probability the closed laboratory facility: environment	are given on the following
bages and are part of the co All calibrations have been numidity<70%. Calibration Equipment used	ertificate.	the uncertainties with confidence probability the closed laboratory facility: environment	are given on the following
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All calibrations have been All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	ertificate. conducted in (M&TE critical for 10 # 106276 101369 SN 3846 SN 1555 ID # MY49071430 MY46110673	the uncertainties with confidence probability the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 11-Apr-19 (CTTL, No.J19X02605) 11-Apr-19 (CTTL, No.J19X02605) 25-Mar-19(CTTL-SPEAG,No.Z19-60064) 22-Aug-19(CTTL-SPEAG,No.Z19-60295) Cal Date(Calibrated by, Certificate No.) 10-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515)	are given on the following temperature(22±3)°C and Scheduled Calibration Apr-20 Apr-20 Mar-20 Aug-20 Scheduled Calibration Feb-21 Feb-21
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ertificate. a conducted in (M&TE critical for 10 # 106276 101369 SN 3846 SN 1555 ID # MY49071430 MY46110673 Name	the uncertainties with confidence probability the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 11-Apr-19 (CTTL, No.J19X02605) 11-Apr-19 (CTTL, No.J19X02605) 25-Mar-19(CTTL-SPEAG,No.Z19-60064) 22-Aug-19(CTTL-SPEAG,No.Z19-60295) Cal Date(Calibrated by, Certificate No.) 10-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515) Function	are given on the following temperature(22±3)°C and Scheduled Calibration Apr-20 Apr-20 Mar-20 Aug-20 Scheduled Calibration Feb-21 Feb-21

Certificate No: Z20-60079

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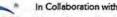


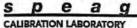
Glossary:

TSL

N/A

ConvF





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tissue simulating liquid sensitivity in TSL / NORMx,y,z not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) 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
- b) 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
- c) 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
- d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) 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, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

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	39.1 ± 6 %	1.35 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	8.93 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	35.9 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	4.71 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	18.9 W/kg ± 18.7 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.4 ± 6 %	1.48 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C		

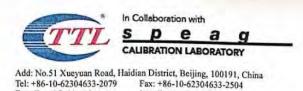
SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.24 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	36.9 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	4.95 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	19.8 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	48.8Ω- 0.06 jΩ	
Return Loss	- 38.3 dB	

Antenna Parameters with Body TSL

Impedance, transformed to feed point	44.5Ω- 0.85 jΩ	
Return Loss	- 24.5 dB	_

General Antenna Parameters and Design

Electrical Delay (one direction)	1.085 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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SAR Test Report



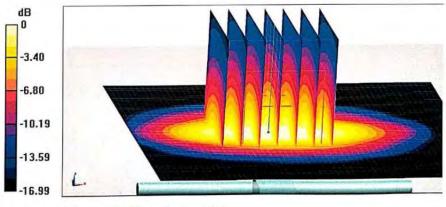
DASY5 Validation Report for Head TSL Test Laboratory: CTTL, Beijing, China

Date: 02.25.2020

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1033 Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1750 MHz; $\sigma = 1.349$ S/m; $\varepsilon_r = 39.06$; $\rho = 1000$ kg/m3 Phantom section: Right Section DASY5 Configuration:

- Probe: EX3DV4 SN3846; ConvF(8.2, 8.2, 8.2) @ 1750 MHz; Calibrated: 2019-03-25
- · Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1555; Calibrated: 2019-08-22
- 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)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 98.26 V/m; Power Drift = -0.02 dB Peak SAR (extrapolated) = 16.9 W/kg SAR(1 g) = 8.93 W/kg; SAR(10 g) = 4.71 W/kg Smallest distance from peaks to all points 3 dB below = 10 mm Ratio of SAR at M2 to SAR at M1 = 53.5% Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dBW/kg

Certificate No: Z20-60079

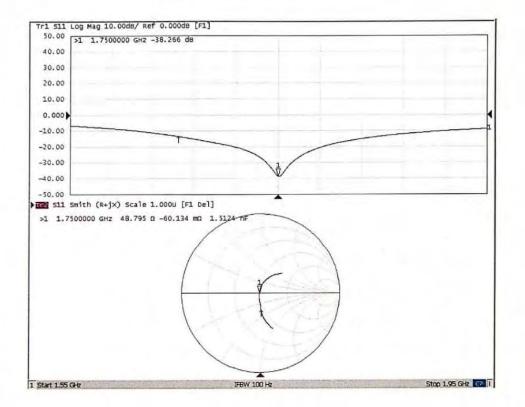
Page 5 of 8

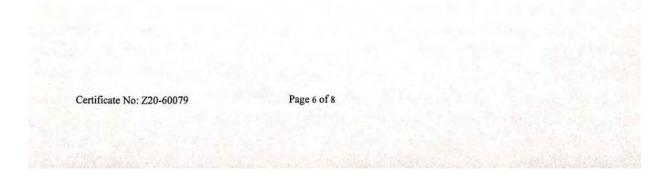




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Impedance Measurement Plot for Head TSL









DASY5 Validation Report for Body TSL Test Laboratory: CTTL, Beijing, China

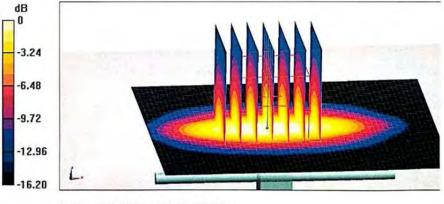
Date: 02.25.2020

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1033 Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1750 MHz; $\sigma = 1.482$ S/m; $\varepsilon_r = 52.35$; $\rho = 1000$ kg/m3 Phantom section: Center Section

DASY5 Configuration:

- Probe: EX3DV4 SN3846; ConvF(7.8, 7.8, 7.8) @ 1750 MHz; Calibrated: 2019-03-25
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1555; Calibrated: 2019-08-22
- 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)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 94.32 V/m; Power Drift = 0.00 dB Peak SAR (extrapolated) = 16.9 W/kg SAR(1 g) = 9.24 W/kg; SAR(10 g) = 4.95 W/kg Smallest distance from peaks to all points 3 dB below = 9.2 mm Ratio of SAR at M2 to SAR at M1 = 56% Maximum value of SAR (measured) = 14.1 W/kg



0 dB = 14.1 W/kg = 11.49 dBW/kg

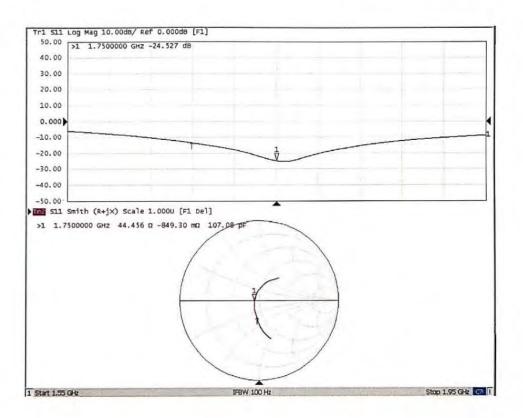
Certificate No: Z20-60079

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Impedance Measurement Plot for Body TSL



Certificate No: Z20-60079

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ANNEX I: D1900V2 Dipole Calibration Certificate

The state of the state of the		trict, Beijing, 100191, China 344444	CALIBRATIO CNAS L0570
Tel: +86-10-623046 E-mail: ettl@chinat	th.com http://	www.chinattl.cu	
Client TA(S	Shanghal)	Certificate No: Z	20-60297
CALIBRATION C	ERTIFICAT	E	
Object	D1900	V2 - SN: 5d060	
Calibration Procedure(s)	FE 744	-003-01	
		tion Procedures for dipole validation kits	
Calibration date:		27, 2020	
		traceability to national standards, which re-	
pages and are part of the ce All calibrations have been	asurements and ertificate.	the uncertainties with confidence probability the closed laboratory facility: environment	are given on the following
bages and are part of the ce All calibrations have been humidity<70%.	asurements and ertificate. n conducted in	the uncertainties with confidence probability the closed laboratory facility: environment	are given on the following
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bages and are part of the ce All calibrations have been numidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	asurements and ertificate. a conducted in (M&TE critical for ID # 106276 101369 SN 3617	the uncertainties with confidence probability the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20)	are given on the following t temperature(22±3)°C and Scheduled Calibration May-21 May-21 Jan-21
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All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	asurements and ertificate. a conducted in (M&TE critical for ID # 106276 101369 SN 3617 SN 771	the uncertainties with confidence probability the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017)	are given on the following temperature(22±3)°C and Scheduled Calibration May-21 May-21 Jan-21 Feb-21
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bages and are part of the ce All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	asurements and ertificate. a conducted in (M&TE critical for 10 # 106276 101369 SN 3617 SN 771 ID # ID # ID # MY49071430	the uncertainties with confidence probability the closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516)	are given on the following temperature(22±3)°C and Scheduled Calibration May-21 May-21 Jan-21 Feb-21 Scheduled Calibration Feb-21
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Certificate No: Z20-60297

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TSL	ficano simulatina linuid
ConvF	tissue simulating liquid sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) 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
- b) 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
- c) 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
- d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) 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%.

Certificate No: Z20-60297

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 http://www.chinattl.cn

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, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.1 ± 6 %	1.40 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C		1

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.82 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	39.5 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.04 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.2 W/kg ± 18.7 % (k=2)

Body TSL parameters The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.5 ± 6 %	1.51 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C		

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.89 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	39.8 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.13 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	20.6 W/kg ± 18.7 % (k=2)

Certificate No: Z20-60297

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.5Q+ 6.58jQ	
Return Loss	- 23.3dB	1

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.0Ω+ 6.72jΩ	
Return Loss	- 22.9dB	_

General Antenna Parameters and Design

Electrical Delay (one direction)	1.061 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

Certificate No: 720-60297

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DASY5 Validation Report for Head TSL Test Laboratory: CTTL, Beijing, China DUT: Dipole 1990 MUL: True D10001/2, Sec

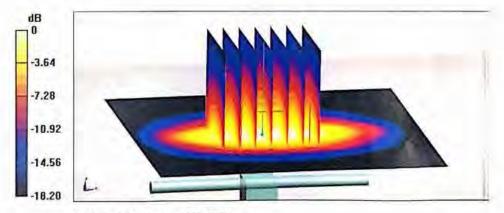
Date: 08.27.2020

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d060 Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium parameters used: f = 1900 MHz; $\sigma = 1.404$ S/m; $\varepsilon_r = 41.12$; $\rho = 1000$ kg/m3 Phantom section: Center Section

DASY5 Configuration:

- Probe: EX3DV4 SN3617; ConvF(8.14, 8.14, 8.14) @ 1900 MHz; Calibrated: 2020-01-30
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2020-02-10
- 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)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 100.3 V/m; Power Drift = -0.03 dB Peak SAR (extrapolated) = 19.0 W/kg SAR(1 g) = 9.82 W/kg; SAR(10 g) = 5.04 W/kg Smallest distance from peaks to all points 3 dB below = 10 mm Ratio of SAR at M2 to SAR at M1 = 51.9% Maximum value of SAR (measured) = 15.6 W/kg

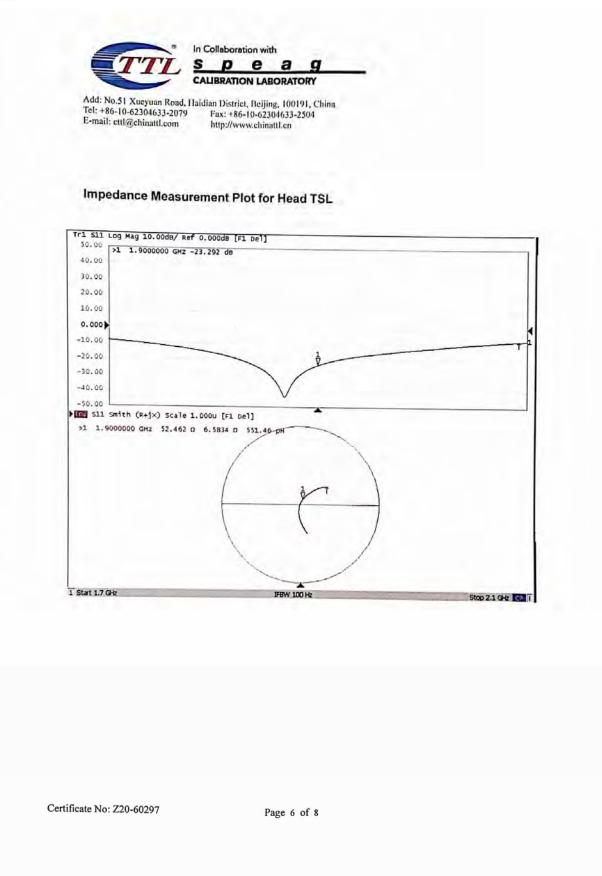


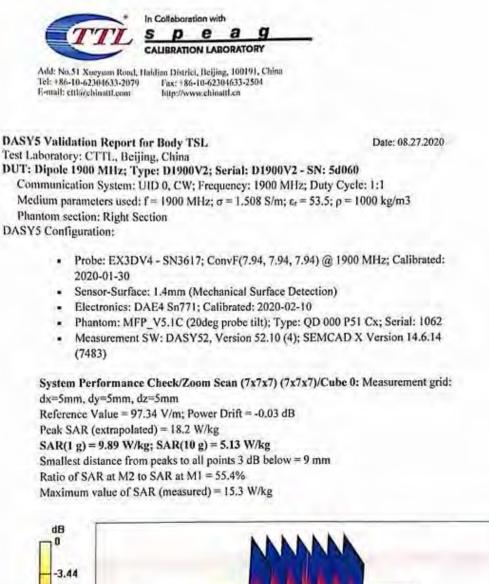
0 dB = 15.6 W/kg = 11.93 dBW/kg

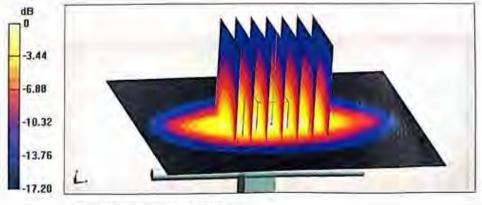
Certificate No: Z20-60297

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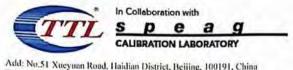


0 dB = 15.3 W/kg = 11.85 dBW/kg

Certificate No: Z20-60297

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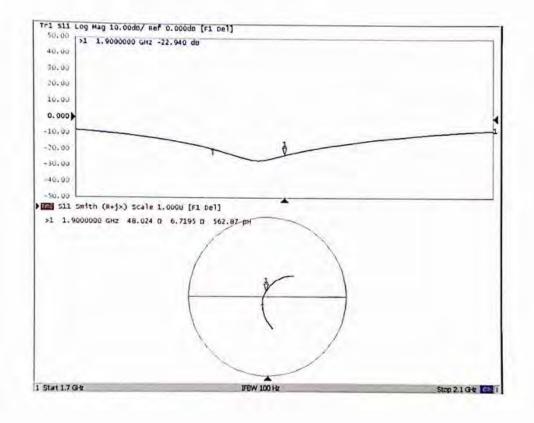


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Impedance Measurement Plot for Body TSL



Certificate No: Z20-60297

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ANNEX J: D2300V2 Dipole Calibration Certificate

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



Schweizerischer Kalibrierdienst Service suisse d'étalonnage

Servizio svizzero di taratura

Swiss Calibration Service

Accreditation No.: SCS 0108

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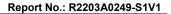
S

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

Certificate No: D2300V2-1110_Sep20 7 layers (Auden) Client **CALIBRATION CERTIFICATE** D2300V2 - SN:1110 Object QA CAL-05.v11 Calibration procedure(s) Calibration Procedure for SAR Validation Sources between 0.7-3 GHz September 28, 2020 Calibration date: 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 NRP SN: 104778 01-Apr-20 (No. 217-03100/03101) Apr-21 SN: 103244 01-Apr-20 (No. 217-03100) Apr-21 Power sensor NRP-Z91 Apr-21 Power sensor NRP-Z91 SN: 103245 01-Apr-20 (No. 217-03101) SN: BH9394 (20k) 31-Mar-20 (No. 217-03106) Apr-21 Reference 20 dB Attenuator Type-N mismatch combination SN: 310982 / 06327 31-Mar-20 (No. 217-03104) Apr-21 Reference Probe EX3DV4 SN: 7405 29-Jun-20 (No. EX3-7405_Jun20) Jun-21 DAE4 SN: 601 27-Dec-19 (No. DAE4-601_Dec19) Dec-20 Secondary Standards ID # Check Date (in house) Scheduled Check SN: GB39512475 In house check: Oct-20 30-Oct-14 (in house check Feb-19) Power meter E4419B Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-18) In house check: Oct-20 Power sensor HP 8481A SN: MY41092317 07-Oct-15 (in house check Oct-18) In house check: Oct-20 **RF** generator R&S SMT-06 SN: 100972 15-Jun-15 (in house check Oct-18) In house check: Oct-20 Network Analyzer Agilent E8358A SN: US41080477 31-Mar-14 (in house check Oct-19) In house check: Oct-20 Name Function Signature Michael Weber Calibrated by: Laboratory Technician Approved by: Katja Pokovic Technical Manager Issued: September 28, 2020 This calibration certificate shall not be reproduced except in full without written approval of the laboratory

Certificate No: D2300V2-1110_Sep20

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





S Schweizerischer Kalibrierdienst Service suisse d'étalonnage

- C Servizio svizzero di taratura
- S Swiss Calibration Service

Accreditation No.: SCS 0108

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

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) 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
- b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) 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%.

Certificate No: D2300V2-1110_Sep20

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Measurement Conditions

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

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2300 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.5	1.67 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.8 ± 6 %	1.68 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	12.0 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	47.7 W/kg ± 17.0 % (k=2)
		and the second se
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 250 mW input power	5.77 W/kg

Certificate No: D2300V2-1110_Sep20

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.2 Ω + 3.8 jΩ		
Return Loss	- 27.5 dB		

General Antenna Parameters and Design

Electrical Delay (one direction)	1.165 ns	
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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

PEAG
Sr

Certificate No: D2300V2-1110_Sep20

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DASY5 Validation Report for Head TSL

Date: 28.09.2020

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: D2300V2 - SN:1110

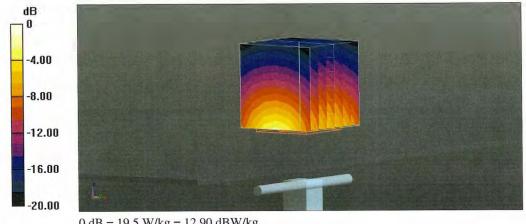
Communication System: UID 0 - CW; Frequency: 2300 MHz Medium parameters used: f = 2300 MHz; $\sigma = 1.68 \text{ S/m}$; $\varepsilon_r = 38.8$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7405; ConvF(8.03, 8.03, 8.03) @ 2300 MHz; Calibrated: 29.06.2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection) .
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019 .
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001 .
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 112.8 V/m; Power Drift = 0.01 dB Peak SAR (extrapolated) = 23.4 W/kg SAR(1 g) = 12 W/kg; SAR(10 g) = 5.77 W/kg Smallest distance from peaks to all points 3 dB below = 9 mm Ratio of SAR at M2 to SAR at M1 = 51.8% Maximum value of SAR (measured) = 19.5 W/kg



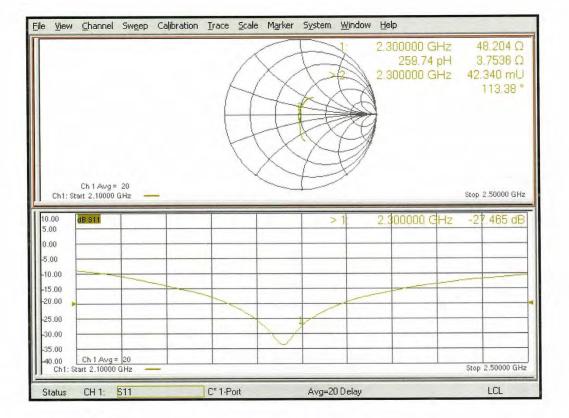
0 dB = 19.5 W/kg = 12.90 dBW/kg

Certificate No: D2300V2-1110_Sep20

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Impedance Measurement Plot for Head TSL



Certificate No: D2300V2-1110_Sep20

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ANNEX K: D2450V2 Dipole Calibration Certificate

Tel: +86-10-623046 E-mail: ettl@chinate Client TA(SI CALIBRATION CE	l.com http:/// hanghai)	Re-10-62304633-2504 www.chinatt.cn Certificate No: Z2	20-60298
	and and an other other	Certificate No: Z	20-60298
CALIBRATION CE			
	RTIFICAT	E	
Dbject	D2450	/2 - SN: 786	
Calibration Procedure(s)	FF-Z11	002.01	
		tion Procedures for dipole validation kits	
Calibration date:		27, 2020	
numidity<70%.		the burning out the second second second second second	
Calibration Equipment used	(M&TE critical for	or calibration)	
	(M&TE critical fo	or calibration) Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Primary Standards		Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965)	May-21
Primary Standards Power Meter NRP2 Power sensor NRP6A	ID # 106276 101369	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965)	May-21 May-21
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	ID # 106276 101369 SN 3617	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20)	May-21 May-21 Jan-21
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	ID # 106276 101369	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965)	May-21 May-21
Primary Standards Power Meter NRP2 Power sensor NRP6A	ID # 106276 101369 SN 3617	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20)	May-21 May-21 Jan-21
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	ID # 106276 101369 SN 3617 SN 771	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017)	May-21 May-21 Jan-21 Feb-21
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards	ID # 106276 101369 SN 3617 SN 771 ID #	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516)	May-21 May-21 Jan-21 Feb-21 Scheduled Calibration
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ID # 106276 101369 SN 3617 SN 771 ID # MY49071430	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516)	May-21 May-21 Jan-21 Feb-21 Scheduled Calibration Feb-21
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	ID # 106276 101369 SN 3617 SN 771 ID # MY49071430 MY46107873	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515)	May-21 May-21 Jan-21 Feb-21 Scheduled Calibration Feb-21 Feb-21
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C	ID # 106276 101369 SN 3617 SN 771 ID # MY49071430 MY46107873 Name	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515) Function	May-21 May-21 Jan-21 Feb-21 Scheduled Calibration Feb-21 Feb-21
Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C NetworkAnalyzer E5071C Calibrated by: Reviewed by:	ID # 106276 101369 SN 3617 SN 771 ID # MY49071430 MY46107873 Name Zhao Jing	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515) Function SAR Test Engineer	May-21 May-21 Jan-21 Feb-21 Scheduled Calibration Feb-21 Feb-21
Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	ID # 106276 101369 SN 3617 SN 771 ID # MY49071430 MY46107873 Name Zhao Jing Lin Hao	Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 30-Jan-20(SPEAG,No.EX3-3617_Jan20) 10-Feb-20(CTTL-SPEAG,No.Z20-60017) Cal Date(Calibrated by, Certificate No.) 25-Feb-20 (CTTL, No.J20X00516) 10-Feb-20 (CTTL, No.J20X00515) Function SAR Test Engineer SAR Test Engineer	May-21 May-21 Jan-21 Feb-21 Scheduled Calibration Feb-21 Feb-21

Certificate No: Z20-60298

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In Collaboration with s p e а CALIBRATION LABORATORY

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Glossary:	
TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) 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", September 2013
- b) 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
- c) 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
- d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) 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, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	2

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.5 ± 6 %	1.79 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	13.0 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.3 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.99 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.0 W/kg ± 18.7 % (k=2)

Body TSL parameters The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.1 ± 6 %	1.94 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	1 Sec.	

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.1 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	52.4 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	6.08 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	24.3 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	54.5Ω+ 1.44 jΩ		
Return Loss	- 26.9dB		

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.9Ω+ 5.09 jΩ		
Return Loss	- 25.8dB		

General Antenna Parameters and Design

Electrical Delay (one direction)	1.018 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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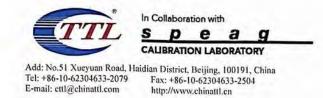


In Collaboration with s р e а CALIBRATION LABORATORY Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China Tel: 186-10-62304633-2079 Fax: 186-10-62304633-2504 E-mail: ettl@chinattl.com http://www.chinattl.cn DASY5 Validation Report for Head TSL Date: 08.27.2020 Test Laboratory: CTTL, Beijing, China DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 786 Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium parameters used: f = 2450 MHz; $\sigma = 1.787 \text{ S/m}$; $\epsilon_r = 39.53$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Center Section **DASY5** Configuration: Probe: EX3DV4 - SN3617; ConvF(7.65, 7.65, 7.65) @ 2450 MHz; Calibrated: 2020-01-30 Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAE4 Sn771; Calibrated: 2020-02-10 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 = 102.7 V/m; Power Drift = -0.04 dB Peak SAR (extrapolated) = 27.7 W/kg SAR(1 g) = 13 W/kg; SAR(10 g) = 5.99 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% Maximum value of SAR (measured) = 22.0 W/kg dB 0 -4.66 -9.31 -13.97 -18.62 -23.28 0 dB = 22.0 W/kg = 13.42 dBW/kg

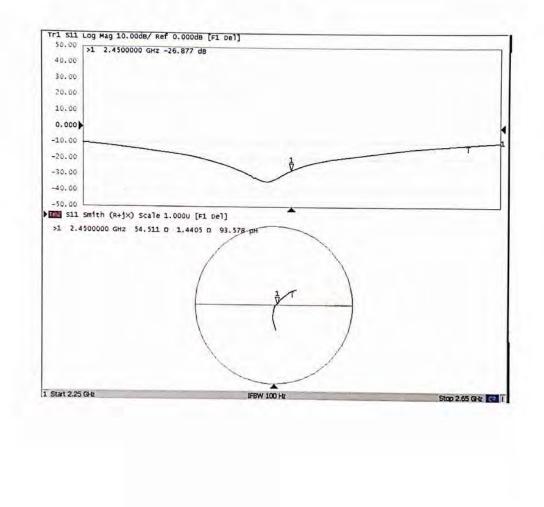
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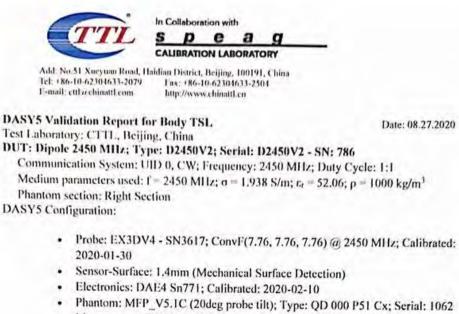
Impedance Measurement Plot for Head TSL



Certificate No: Z20-60298

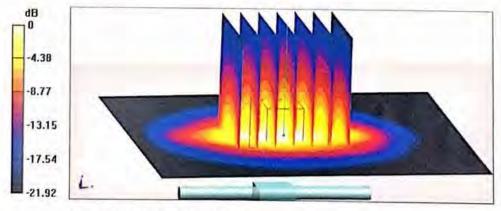
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 Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 102.9 V/m; Power Drift = -0.03 dB Peak SAR (extrapolated) = 26.9 W/kg SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.08 W/kg Smallest distance from peaks to all points 3 dB below = 8.5 mm Ratio of SAR at M2 to SAR at M1 = 49.9% Maximum value of SAR (measured) = 21.8 W/kg



0 dB = 21.8 W/kg = 13.38 dBW/kg

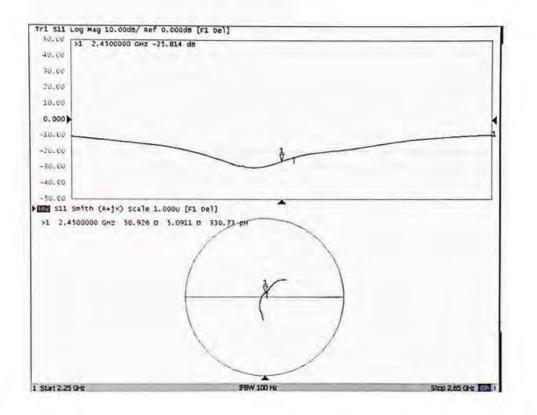
Certificate No: Z20-60298

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Impedance Measurement Plot for Body TSL



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ANNEX L: D2600V2 Dipole Calibration Certificate

E-mail: ent@chinatt Client TA(SI	hanghai)	Certificate No: Z	21-60156
CALIBRATION CE		E	
Object	D2600\	/2 - SN: 1025	
Calibration Procedure(s)			
valioration Procedure(s)	FF-211	-003-01	
	Calibra	tion Procedures for dipole validation kits	
Calibration date:	April 23	, 2021	
		the uncertainties with confidence probability	are given on the tollowing
pages and are part of the ce	ertificate.	he closed laboratory facility: environment	
bages and are part of the ce All calibrations have been humidity<70% Calibration Equipment used	ertificate.	he closed laboratory facility: environment or calibration)	temperature (22±3)°C ani
bages and are part of the ce All calibrations have been humidity<70% Calibration Equipment used	conducted in t	he closed laboratory facility: environment	temperature (22±3)°C an Scheduled Calibration
bages and are part of the ce All calibrations have been humidity<70% Calibration Equipment used Primary Standards	entificate. conducted in t (M&TE critical for ID #	he closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.)	temperature (22±3)°C an
bages and are part of the ce All calibrations have been humidity<70% Calibration Equipment used Primary Standards Power Meter NRP2	ID # 106276 101369	he closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965)	temperature (22±3)°C an Scheduled Calibration May-21
bages and are part of the ce All calibrations have been humidity<70% Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A	ID # 106276 101369	he closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965)	temperature (22±3)°C and Scheduled Calibration May-21 May-21
All calibrations have been humidity<70% Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4	inificate. conducted in t (M&TE critical fr ID # 106276 101369 SN 3617	he closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21(SPEAG,No.EX3-3617_Jan21)	temperature (22±3)°C and Scheduled Calibration May-21 May-21 Jan-22
All calibrations have been humidity<70% Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4	ID # 106276 101369 SN 3617 SN 777	he closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21(CTTL, SPEAG, No.EX3-3617_Jan21) 08-Jan-21(CTTL-SPEAG, No.Z21-60003)	temperature (22±3)°C and Scheduled Calibration May-21 May-21 Jan-22 Jan-22
ages and are part of the ce All calibrations have been humidity<70% Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards	inificate. conducted in t (M&TE critical fr ID # 106276 101369 SN 3617 SN 777 ID # MY49071430	he closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21(SPEAG,No.EX3-3617_Jan21) 08-Jan-21(CTTL-SPEAG,No.Z21-60003) Cal Date(Calibrated by, Certificate No.) 01-Feb-21 (CTTL, No.J21X00593)	temperature (22±3)°C and Scheduled Calibration May-21 May-21 Jan-22 Jan-22 Scheduled Calibration
All calibrations have been humidity<70% Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	inificate. conducted in t (M&TE critical fr ID # 106276 101369 SN 3617 SN 777 ID # MY49071430	he closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21(SPEAG,No.EX3-3617_Jan21) 08-Jan-21(CTTL-SPEAG,No.Z21-60003) Cal Date(Calibrated by, Certificate No.) 01-Feb-21 (CTTL, No.J21X00593)	temperature (22±3)°C and Scheduled Calibration May-21 May-21 Jan-22 Jan-22 Scheduled Calibration Jan-22 Jan-22
All calibrations have been humidity<70%. Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	entificate. conducted in t (M&TE critical for 10 # 106276 101369 SN 3617 SN 777 ID # MY49071430 MY46110673	he closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21 (CTTL, No.J20X02965) 27-Jan-21 (CTTL-SPEAG,No.Z21-60003) Cal Date(Calibrated by, Certificate No.) 01-Feb-21 (CTTL, No.J21X00593) 14-Jan-21 (CTTL, No.J21X00232)	temperature (22±3)°C and Scheduled Calibration May-21 May-21 Jan-22 Jan-22 Scheduled Calibration Jan-22
All calibrations have been humidity<70% Calibration Equipment used Primary Standards Power Meter NRP2 Power Sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C Network Analyzer E5071C	entificate. conducted in t (M&TE critical for 10 # 106276 101369 SN 3617 SN 777 ID # MY49071430 MY46110673 Name Zhao Jing	he closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21 (SPEAG, No.EX3-3617_Jan21) 08-Jan-21 (CTTL-SPEAG, No.Z21-60003) Cal Date(Calibrated by, Certificate No.) 01-Feb-21 (CTTL, No.J21X00593) 14-Jan-21 (CTTL, No.J21X00232) Function SAR Test Engineer	temperature (22±3)°C and Scheduled Calibration May-21 May-21 Jan-22 Jan-22 Scheduled Calibration Jan-22 Jan-22
All calibrations have been humidity<70% Calibration Equipment used Primary Standards Power Meter NRP2 Power sensor NRP6A Reference Probe EX3DV4 DAE4 Secondary Standards Signal Generator E4438C	entificate. conducted in t (M&TE critical for 10 # 106276 101369 SN 3617 SN 777 ID # MY49071430 MY46110673 Name	he closed laboratory facility: environment or calibration) Cal Date(Calibrated by, Certificate No.) 12-May-20 (CTTL, No.J20X02965) 12-May-20 (CTTL, No.J20X02965) 27-Jan-21 (CTTL, No.J20X02965) 27-Jan-21 (CTTL-SPEAG,No.Z21-60003) Cal Date(Calibrated by, Certificate No.) 01-Feb-21 (CTTL, No.J21X00593) 14-Jan-21 (CTTL, No.J21X00232) Function	temperature (22±3)°C and Scheduled Calibration May-21 May-21 Jan-22 Jan-22 Scheduled Calibration Jan-22 Jan-22

Certificate No: Z21-60156

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) 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
- b) 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

c) 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

d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) 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%.

Certificate No: Z21-60156

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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 , $dz = 5 mm$	
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	39.9 ± 6 %	1.94 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	13.9 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	56.1 W/kg ± 18.8 % (k=2)
SAR averaged over 10 cm3 (10 g) of Head TSL	Condition	-
SAR measured	250 mW input power	6.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.5 W/kg ± 18.7 % (k=2)

Certificate No: Z21-60156

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86-10-62304633-2079 cttl@chinattl.com	Fa	x: +86-1	0-62304	633-250	14

Appendix(Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.1Ω- 7.19/Ω
Return Loss	- 22 9dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.055 ns	
a fine an enterty	1055.05	

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.

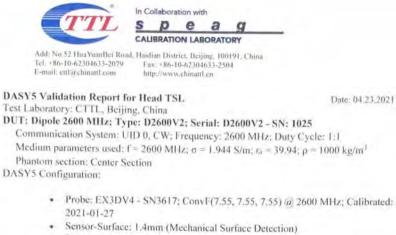
Additional EUT Data

SPEAG

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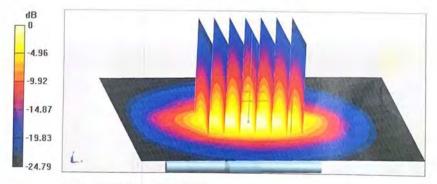




- Electronics: DAE4 Sn777; Calibrated: 2021-01-08
- Phantom: MFP_V5.1C (20deg probe tilt); Type: QD 000 P51 Cx; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 101.1 V/m; Power Drift = -0.09 dB Peak SAR (extrapolated) = 31.5 W/kg SAR(1 g) = 13.9 W/kg; SAR(10 g) = 6.1 W/kg Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 44% Maximum value of SAR (measured) = 24.4 W/kg



0 dB = 24.4 W/kg = 13.87 dBW/kg

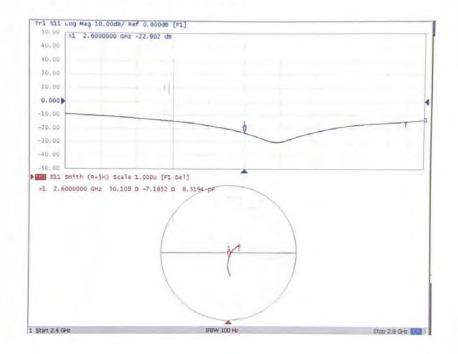
Certificate No: Z21-60156

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Impedance Measurement Plot for Head TSL



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ANNEX M: D3500V2 Dipole Calibration Certificate

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



Schwelzerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 0108

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

Client TA-SH (Auden)

Certificate No: D3500V2-1083_Sep19

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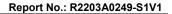
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Object	D3500V2 - SN:1	083	
Calibration procedure(s)	QA CAL-22.v4 Calibration Proce	edure for SAR Validation Sources	s between 3-6 GHz
Calibration date:	September 20, 2	019	
	the second se	ional standards, which realize the physical ur probability are given on the following pages a	and the second
All calibrations have been conducto Calibration Equipment used (M&TE		ry facility: environment temperature (22 \pm 3)°	C and humidity < 70%.
Primary Standards	lip#	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 3503	25-Mar-19 (No. EX3-3503_Mar19)	Mar-20
	SN: 601	30-Apr-19 (No. DAE4-601_Apr19)	Apr-20
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DAE4 Secondary Standards	ID #	Check Date (in house)	Scheduled Check
DAE4	A service -		
DAE4 Secondary Standards Power meter E4419B	ID #	Check Date (in house)	Scheduled Check
DAE4 Secondary Standards	ID # SN: GB39512475	Check Date (in house) 30-Oct-14 (in house check Feb-19)	Scheduled Check In house check: Oct-20
DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	ID # SN: GB39512475 SN: US37292783	Check Date (in house) 30-Oct-14 (in house check Feb-19) 07-Oct-15 (in house check Oct-18)	Scheduled Check In house check: Oct-20 In house check: Oct-20
DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	ID # SN: GB39512475 SN: US37292783 SN: MY41092317	Check Date (in house) 30-Oct-14 (in house check Feb-19) 07-Oct-15 (in house check Oct-18) 07-Oct-15 (in house check Oct-18)	Scheduled Check In house check: Oct-20 In house check: Oct-20 In house check: Oct-20
DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A	ID # SN: GB39512475 SN: US37292783 SN: MY41092317 SN: 100972	Check Date (in house) 30-Oct-14 (in house check Feb-19) 07-Oct-15 (in house check Oct-18) 07-Oct-15 (in house check Oct-18) 15-Jun-15 (in house check Oct-18)	Scheduled Check In house check: Oct-20 In house check: Oct-20 In house check: Oct-20 In house check: Oct-20
DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	ID # SN: GB39512475 SN: US37292783 SN: MY41092317 SN: 100972 SN: US41080477	Check Date (in house) 30-Oct-14 (in house check Feb-19) 07-Oct-15 (in house check Oct-18) 07-Oct-15 (in house check Oct-18) 15-Jun-15 (in house check Oct-18) 31-Mar-14 (in house check Oct-18)	Scheduled Check In house check: Oct-20 In house check: Oct-20 In house check: Oct-20 In house check: Oct-20 In house check: Oct-19 Signature
DAE4 Secondary Standards Power meter E4419B Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer Agilent EB358A	ID # SN: GB39512475 SN: US37292783 SN: MY41092317 SN: 100972 SN: US41080477 Name	Check Date (in house) 30-Oct-14 (in house check Feb-19) 07-Oct-15 (in house check Oct-18) 07-Oct-15 (in house check Oct-18) 15-Jun-15 (in house check Oct-18) 31-Mar-14 (in house check Oct-18) Function	Scheduled Check In house check: Oct-20 In house check: Oct-20 In house check: Oct-20 In house check: Oct-20 In house check: Oct-19

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





Schweizerischer Kalibrierdienst s Service suisse d'étalonnage С

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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) 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
- b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) 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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SAR Test Report

Measurement Conditions

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
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	3400 MHz ± 1 MHz 3500 MHz ± 1 MHz	

Head TSL parameters at 3400 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	37.4	2.81 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.7 ± 6 %	2.84 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 3400 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.97 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	69.6 W/kg ± 19.9 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 100 mW input power	2.62 W/kg

Head TSL parameters at 3500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	37.9	2.91 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.6 ± 6 %	2.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 3500 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.72 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	67.1 W/kg ± 19.9 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Head TSL SAR measured	condition 100 mW input power	2.53 W/kg

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Body TSL parameters at 3400 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	51.5	3.20 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	40.9 ± 6 %	3.25 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

SAR result with Body TSL at 3400 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	6.56 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	64.9 W/kg ± 19.9 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR averaged over 10 cm ³ (10 g) of Body TSL SAR measured	condition 100 mW input power	2.44 W/kg

Body TSL parameters at 3500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	51.3	3.31 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	49.8 ± 6 %	3.35 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

SAR result with Body TSL at 3500MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	6.52 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	64.6 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.42 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	24.0 W/kg ± 19.5 % (k=2)

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SAR Test Report

Appendix (Additional assessments outside the scope of SCS 0108)

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Antenna Parameters with Head TSL at 3400 MHz

Impedance, transformed to feed point	-44.5 Ω - 5.6 jΩ	
Return Loss	- 21.6 dB	

Antenna Parameters with Head TSL at 3500 MHz

Impedance, transformed to feed point	52.3 Ω - 1.5 jΩ	
Return Loss	- 31.4 dB	

Antenna Parameters with Body TSL at 3400 MHz

Impedance, transformed to feed point	42.8 Ω - 4.0 jΩ
Return Loss	- 21.1 dB

Antenna Parameters with Body TSL at 3500MHz

Impedance, transformed to feed point	50.2 Ω + 2.8 jΩ	
Return Loss	- 31.2 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.135 ns
	286.20

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: 20.09.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 3500 MHz; Type: D3500V2; Serial: D3500V2 - SN:1083

Communication System: UID 0 - CW; Frequency: 3400 MHz, Frequency: 3500 MHz Medium parameters used: f = 3400 MHz; $\sigma = 2.84$ S/m; $\varepsilon_r = 37.7$; $\rho = 1000$ kg/m³. Medium parameters used: f = 3500 MHz; $\sigma = 2.91$ S/m; $\varepsilon_r = 37.6$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(7.75, 7.75, 7.75) @ 3400 MHz, ConvF(7.75, 7.75, 7.75) @ 3500 MHz; Calibrated: 25.03.2019
- · Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- · Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm 3400/Zoom Scan, dist=1.4mm

(8x8x8)/Cube 0:Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 74.62 V/m; Power Drift = -0.08 dB Peak SAR (extrapolated) = 18.9 W/kg SAR(1 g) = 6.97 W/kg; SAR(10 g) = 2.62 W/kg Maximum value of SAR (measured) = 13.2 W/kg

Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm 3500/Zoom Scan, dist=1.4mm

(8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm Reference Value = 72.32 V/m; Power Drift = -0.07 dB Peak SAR (extrapolated) = 18.4 W/kg SAR(1 g) = 6.72 W/kg; SAR(10 g) = 2.53 W/kg Maximum value of SAR (measured) = 12.8 W/kg



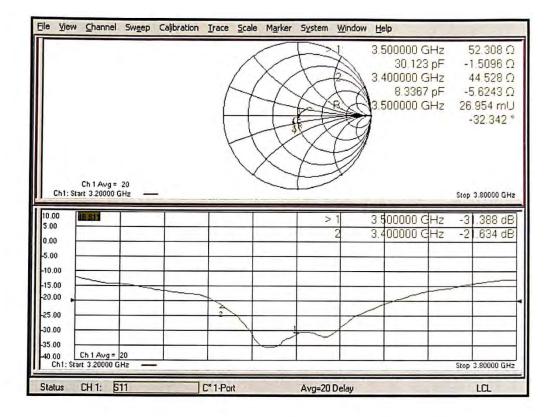
0 dB = 12.8 W/kg = 11.07 dBW/kg

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Impedance Measurement Plot for Head TSL



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