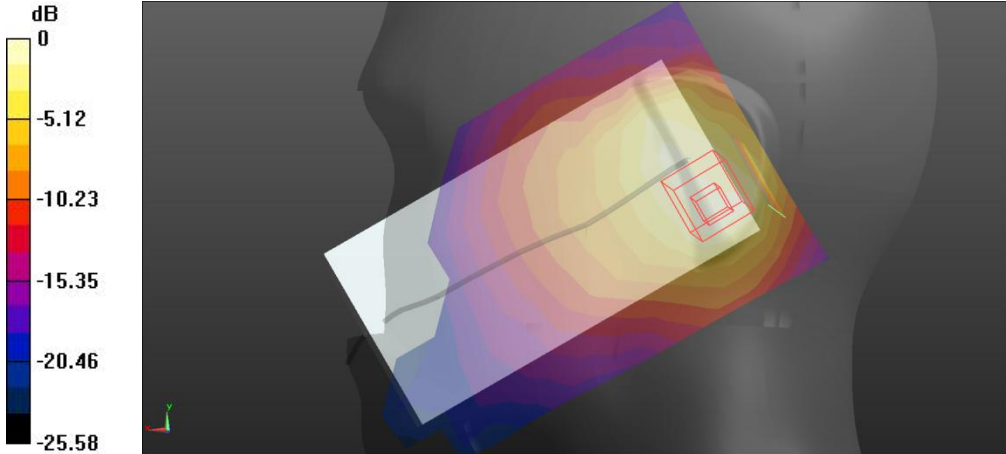
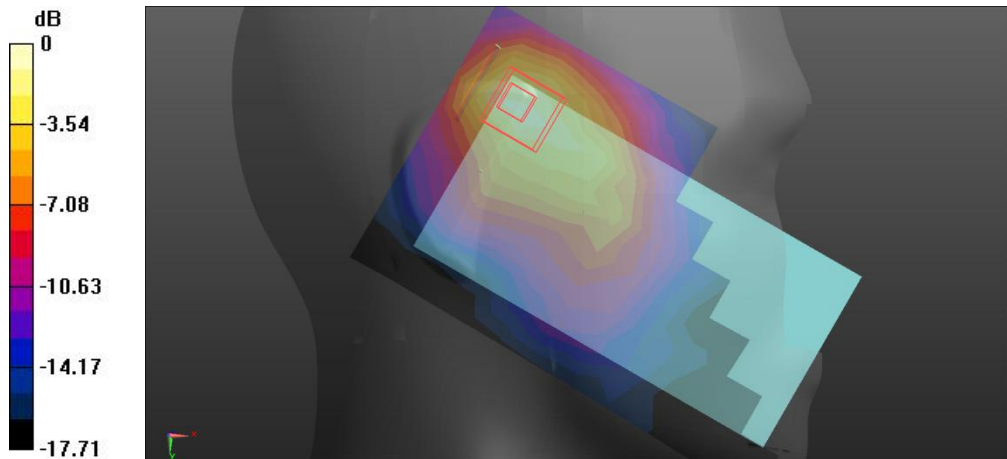


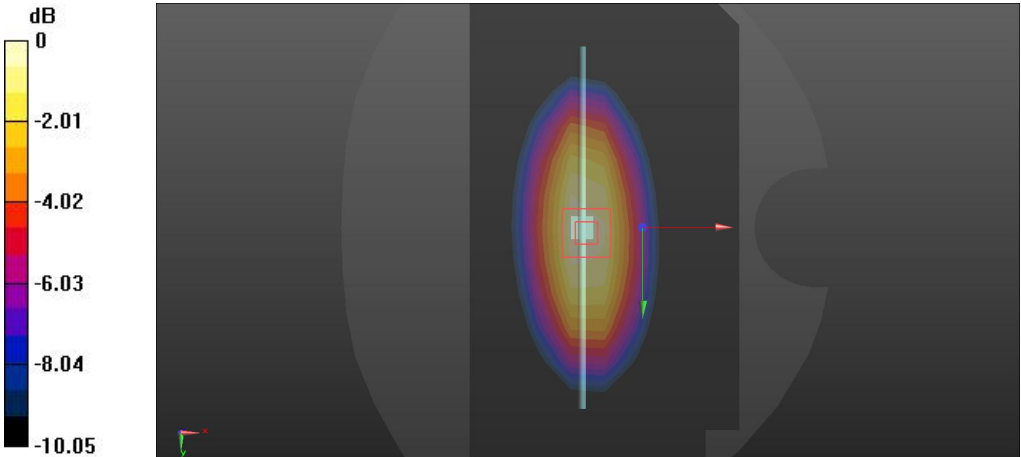
Left Side	Tilt
Communication System: UID 10012 - CAB, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Frequency: 2437 MHz Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.782 \text{ S/m}$; $\epsilon_r = 39.236$; $\rho = 1000 \text{ kg/m}^3$ DASY5 Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.61, 4.61, 4.61); Calibrated: 8/29/2016; - Sensor-Surface: 3mm (Mechanical Surface Detection) - Electronics: DAE4 Sn546; Calibrated: 8/22/2016 - Phantom: SAM 1560; Type: QD000P40CD; Serial: TP:1560 - Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 Head-Section Left HSL WIFI/WIFI tilt M/Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$ Maximum value of SAR (measured) = 0.056 W/kg Head-Section Left HSL WIFI/WIFI tilt M/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 9.24 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 0.32 W/kg SAR(1 g) = 0.086 W/kg; SAR(10 g) = 0.029 W/kg Maximum value of SAR (measured) = 0.074 W/kg	
 0 dB = 0.074 W/kg = -11.31 dBW/kg	

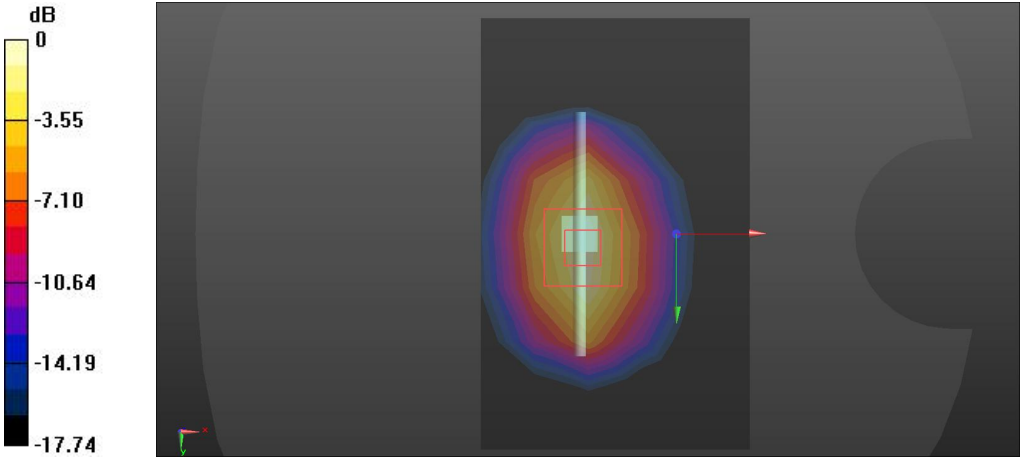
Right Side	Cheek
Communication System: UID 10012 - CAB, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Frequency: 2437 MHz Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.782 \text{ S/m}$; $\epsilon_r = 39.236$; $\rho = 1000 \text{ kg/m}^3$ DASY5 Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.61, 4.61, 4.61); Calibrated: 8/29/2016; - Sensor-Surface: 3mm (Mechanical Surface Detection) - Electronics: DAE4 Sn546; Calibrated: 8/22/2016 - Phantom: SAM 1560; Type: QD000P40CD; Serial: TP:1560 - Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 Head-Section Right HSL WIFI/WIFI touch M/Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$ Maximum value of SAR (measured) = 0.084 W/kg Head-Section Right HSL WIFI/WIFI touch M/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 5.324 V/m; Power Drift = 0.12 dB Peak SAR (extrapolated) = 0.186 W/kg SAR(1 g) = 0.103 W/kg; SAR(10 g) = 0.048 W/kg Maximum value of SAR (measured) = 0.095 W/kg	
 0 dB = 0.095 W/kg = -10.22 dBW/kg	

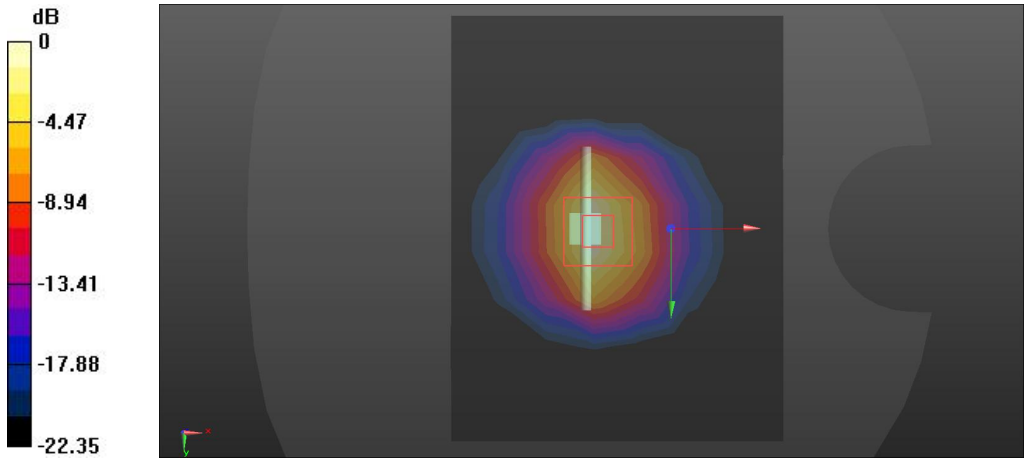
Right Side	Tilt
Communication System: UID 10012 - CAB, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Frequency: 2437 MHz Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.782 \text{ S/m}$; $\epsilon_r = 39.236$; $\rho = 1000 \text{ kg/m}^3$ DASY5 Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.61, 4.61, 4.61); Calibrated: 8/29/2016; - Sensor-Surface: 3mm (Mechanical Surface Detection) - Electronics: DAE4 Sn546; Calibrated: 8/22/2016 - Phantom: SAM 1560; Type: QD000P40CD; Serial: TP:1560 - Measurement SW: DASY52, Version 52.8 (7); SEMCAD X Version 14.6.10 Head-Section Right HSL WIFI/WIFI tilt M/Area Scan (8x13x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$ Maximum value of SAR (measured) = 0.041 W/kg Head-Section Right HSL WIFI/WIFI tilt M/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 4.243 V/m; Power Drift = -0.15 dB Peak SAR (extrapolated) = 0.080 W/kg SAR(1 g) = 0.077 W/kg; SAR(10 g) = 0.029 W/kg Maximum value of SAR (measured) = 0.043 W/kg dB 0 -4.15 -8.31 -12.46 -16.62 -20.77 0 dB = 0.043 W/kg = -13.67 dBW/kg	

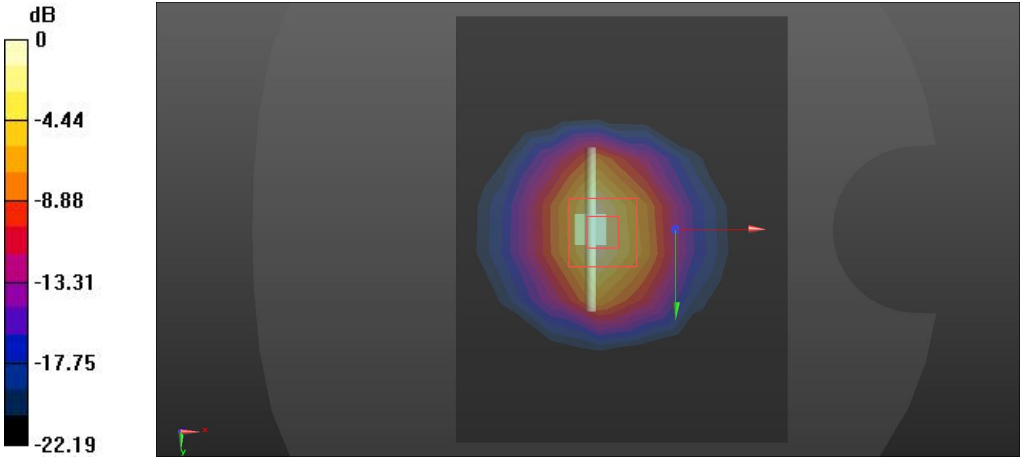
NEW TEST

SYSTEM CHECK

SYSTEM CHECKING SCANS	835MHz Flat
Communication System: UID 0, CW (0); Frequency: 835 MHz Medium parameters used (interpolated): $f = 835 \text{ MHz}$; $\sigma = 0.98 \text{ S/m}$; $\epsilon_r = 54.36$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(6.06, 6.06, 6.06); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) System Performance Check at Frequencies 835MHz Body/d=15mm, Pin=250 mW, dist=4.0mm (ES-Probe)/Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$ Maximum value of SAR (measured) = 2.49 W/kg System Performance Check at Frequencies 835MHz Body/d=15mm, Pin=250 mW, dist=4.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 47.61 V/m; Power Drift = 0.16 dB Peak SAR (extrapolated) = 3.56 W/kg SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.61 W/kg Maximum value of SAR (measured) = 2.64 W/kg	
 0 dB = $2.64 \text{ W/kg} = 4.22 \text{ dBW/kg}$	

SYSTEM CHECKING SCANS	1900MHz Flat
Communication System: UID 0, CW (0); Frequency: 1900 MHz Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.51 \text{ S/m}$; $\epsilon_r = 54.74$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.83, 4.83, 4.83); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) System Performance Check at Frequencies 1900MHz Body/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Area Scan (6x9x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$ Maximum value of SAR (measured) = 11.7 W/kg System Performance Check at Frequencies 1900MHz Body/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 68.14 V/m; Power Drift = 0.04 dB Peak SAR (extrapolated) = 17.5 W/kg SAR(1 g) = 9.8 W/kg; SAR(10 g) = 5.15 W/kg Maximum value of SAR (measured) = 12.4 W/kg  0 dB = 12.4 W/kg = 10.93 dBW/kg	

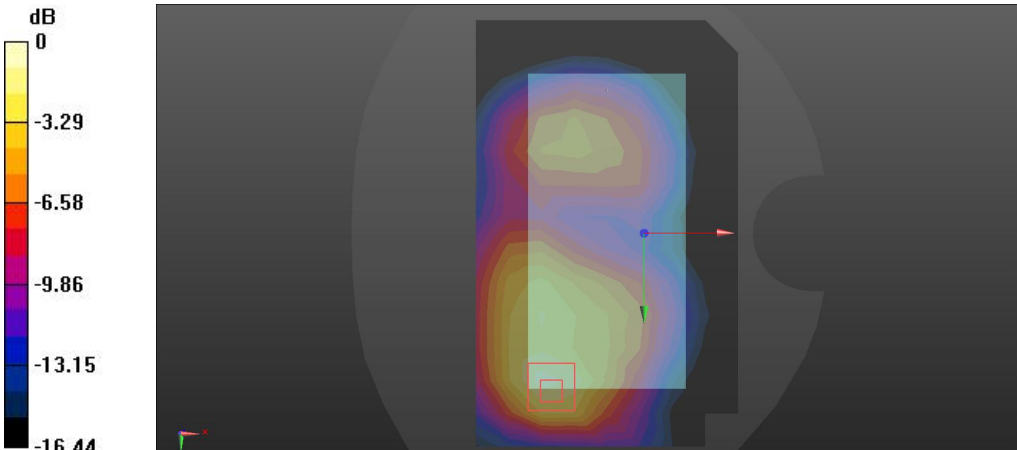
SYSTEM CHECKING SCANS	2450MHz Head
Communication System: UID 0, CW (0); Frequency: 2450 MHz Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.84 \text{ S/m}$; $\epsilon_r = 39.95$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.58, 4.58, 4.58); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: SAM 1559; Type: QD 000 P40 CD; Serial: 1559 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) System Performance Check at Frequencies 2450 MHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Area Scan (8x10x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$ Maximum value of SAR (measured) = 14.7 W/kg System Performance Check at Frequencies 2450 MHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 88.14 V/m; Power Drift = 0.12 dB Peak SAR (extrapolated) = 25.5 W/kg SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.11 W/kg Maximum value of SAR (measured) = 16.7 W/kg	
 0 dB = $16.7 \text{ W/kg} = 12.23 \text{ dBW/kg}$	

SYSTEM CHECKING SCANS	2450MHz Flat
Communication System: UID 0, CW (0); Frequency: 2450 MHz Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.97 \text{ S/m}$; $\epsilon_r = 53.48$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.28, 4.28, 4.28); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) System Performance Check at Frequencies 2450 MHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Area Scan (8x10x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$ Maximum value of SAR (measured) = 14.5 W/kg System Performance Check at Frequencies 2450 MHz/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$ Reference Value = 81.32 V/m; Power Drift = 0.15 dB Peak SAR (extrapolated) = 25.8 W/kg SAR(1 g) = 12.6 W/kg; SAR(10 g) = 5.81 W/kg Maximum value of SAR (measured) = 16.6 W/kg  0 dB = $16.6 \text{ W/kg} = 12.20 \text{ dBW/kg}$	

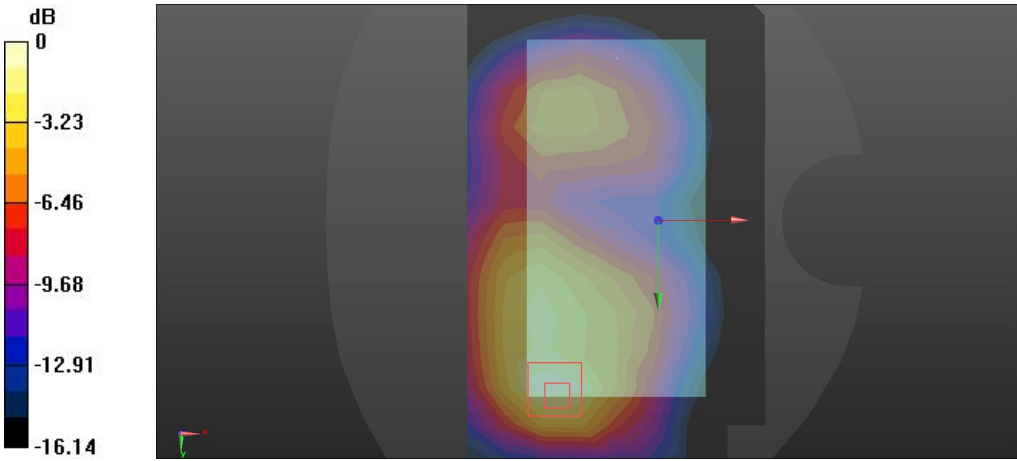
GSM850 (EGPRS)

FLAT	Towards Ground
Communication System: UID 0, Generic GSM (0); Frequency: 836.6 MHz Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.976$ S/m; $\epsilon_r = 55.195$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(6.06, 6.06, 6.06); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) Flat-Section GSM850 TG/EGPRS850 TG M/Area Scan (9x13x1): Measurement grid: $dx=15$mm, $dy=15$mm Maximum value of SAR (measured) = 0.731 W/kg Flat-Section GSM850 TG/EGPRS850 TG M/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$mm, $dy=5$mm, $dz=5$mm Reference Value = 28.61 V/m; Power Drift = -0.07 dB Peak SAR (extrapolated) = 1.09 W/kg SAR(1 g) = 0.693 W/kg; SAR(10 g) = 0.388 W/kg Maximum value of SAR (measured) = 0.744 W/kg dB 0 -2.48 -4.96 -7.43 -9.91 -12.39 0 dB = 0.744 W/kg = -1.28 dBW/kg	

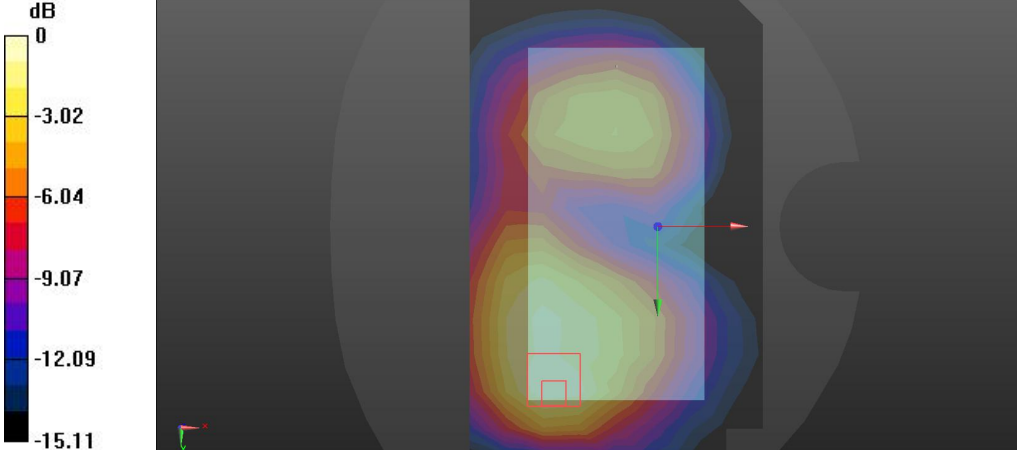
GSM1900 (EGPRS)

FLAT	Towards Ground
Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.526$ S/m; $\epsilon_r = 53.291$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.83, 4.83, 4.83); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) Flat-Section GSM1900 TG/EGPRS1900 TG M/Area Scan (9x14x1): Measurement grid: $dx=15$mm, $dy=15$mm Maximum value of SAR (measured) = 0.538 W/kg Flat-Section GSM1900 TG/EGPRS1900 TG M/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$mm, $dy=5$mm, $dz=5$mm Reference Value = 6.016 V/m; Power Drift = -0.00 dB Peak SAR (extrapolated) = 1.76 W/kg SAR(1 g) = 0.575 W/kg; SAR(10 g) = 0.206 W/kg Maximum value of SAR (measured) = 0.562 W/kg  0 dB = 0.562 W/kg = -2.50 dBW/kg	

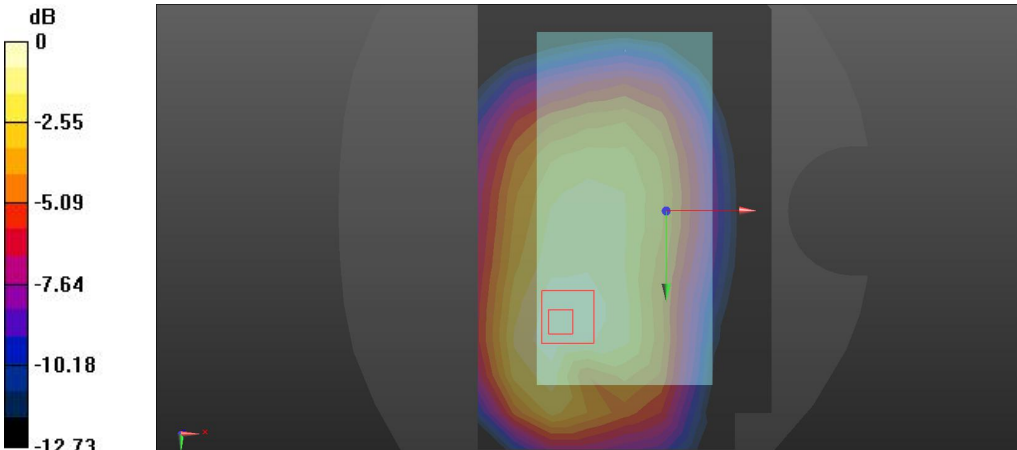
WCDMA Band2 (Voice)

FLAT	Towards Ground
Communication System: UID 0, WCDMA band 02 (0); Frequency: 1880 MHz Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.526$ S/m; $\epsilon_r = 53.291$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.83, 4.83, 4.83); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) Flat-Section WCDMA Band2 TG/WCDMA Band2 TG M Voice/Area Scan (9x14x1): Measurement grid: $dx=15$mm, $dy=15$mm Maximum value of SAR (measured) = 0.615 W/kg Flat-Section WCDMA Band2 TG/WCDMA Band2 TG M Voice/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$mm, $dy=5$mm, $dz=5$mm Reference Value = 5.098 V/m; Power Drift = 0.05 dB Peak SAR (extrapolated) = 1.02 W/kg SAR(1 g) = 0.554 W/kg; SAR(10 g) = 0.301 W/kg Maximum value of SAR (measured) = 0.648 W/kg  0 dB = 0.648 W/kg = -1.88 dBW/kg	

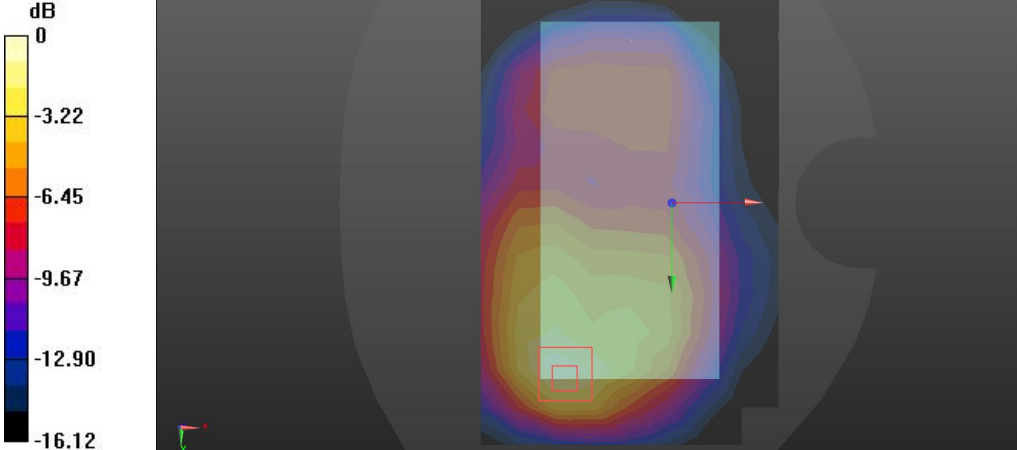
WCDMA Band4 (Data)

FLAT	Towards Ground
Communication System: UID 0, WCDMA band 04 (0); Frequency: 1732.4 MHz Medium parameters used (interpolated): $f = 1732.4$ MHz; $\sigma = 1.477$ S/m; $\epsilon_r = 53.461$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.83, 4.83, 4.83); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) Flat-Section WCDMA Band4 TG/WCDMA Band4 TG M Data/Area Scan (9x14x1): Measurement grid: $dx=15$mm, $dy=15$mm Maximum value of SAR (measured) = 0.493 W/kg Flat-Section WCDMA Band4 TG/WCDMA Band4 TG M Data/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$mm, $dy=5$mm, $dz=5$mm Reference Value = 4.935 V/m; Power Drift = -0.04 dB Peak SAR (extrapolated) = 0.819 W/kg SAR(1 g) = 0.548 W/kg; SAR(10 g) = 0.295 W/kg Maximum value of SAR (measured) = 0.504 W/kg  0 dB = 0.504 W/kg = -2.98 dBW/kg	

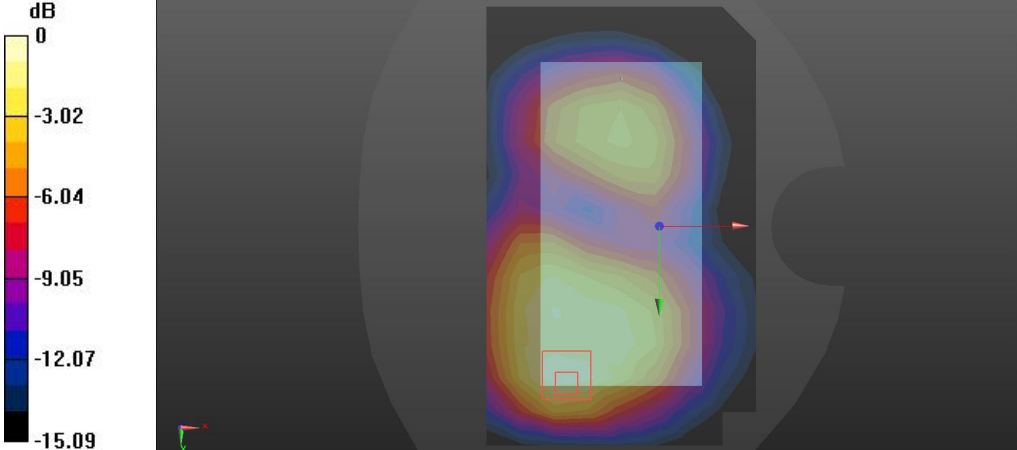
WCDMA Band5 (Voice)

FLAT	Towards Ground
Communication System: UID 0, wcdma band5 (0); Frequency: 836.6 MHz Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.976$ S/m; $\epsilon_r = 55.195$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(6.06, 6.06, 6.06); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) Flat-Section WCDMA Band5 TG/WCDMA Band5 TG M Voice/Area Scan (9x14x1): Measurement grid: $dx=15$mm, $dy=15$mm Maximum value of SAR (measured) = 0.316 W/kg Flat-Section WCDMA Band5 TG/WCDMA Band5 TG M Voice/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$mm, $dy=5$mm, $dz=5$mm Reference Value = 15.46 V/m; Power Drift = 0.00 dB Peak SAR (extrapolated) = 0.441 W/kg SAR(1 g) = 0.317 W/kg; SAR(10 g) = 0.210 W/kg Maximum value of SAR (measured) = 0.324 W/kg  0 dB = 0.324 W/kg = -4.89 dBW/kg	

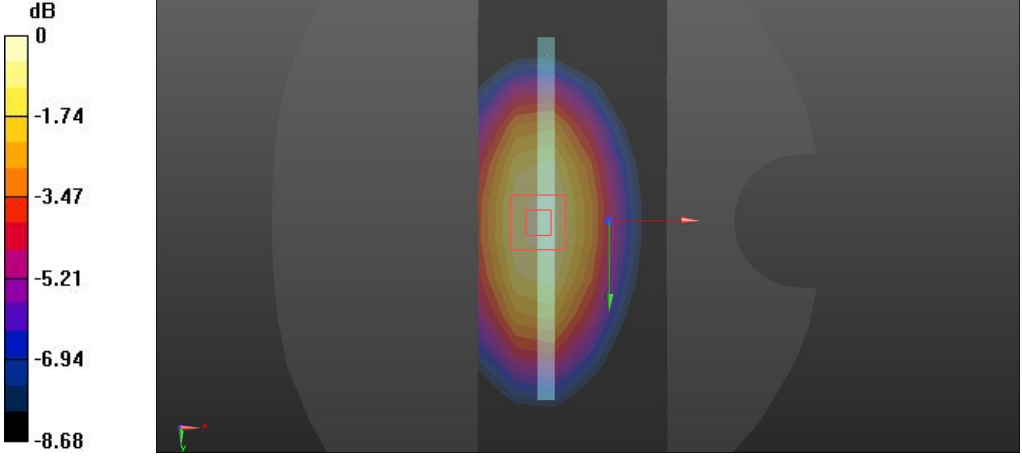
LTE Band2 (1RB)

FLAT	Towards Ground
Communication System: UID 10169 - CAB, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 1880 MHz Medium parameters used (interpolated): $f = 1880$ MHz; $\sigma = 1.526$ S/m; $\epsilon_r = 53.291$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.83, 4.83, 4.83); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) Flat-Section LTE Band2 TG/LTE Band2 TG M 1RB/Area Scan (9x14x1): Measurement grid: $dx=15$mm, $dy=15$mm Maximum value of SAR (measured) = 0.776 W/kg Flat-Section LTE Band2 TG/LTE Band2 TG M 1RB/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$mm, $dy=5$mm, $dz=5$mm Reference Value = 8.187 V/m; Power Drift = -0.11 dB Peak SAR (extrapolated) = 1.144 W/kg SAR(1 g) = 0.636 W/kg; SAR(10 g) = 0.302 W/kg Maximum value of SAR (measured) = 0.605 W/kg  0 dB = 0.605 W/kg = -2.18 dBW/kg	

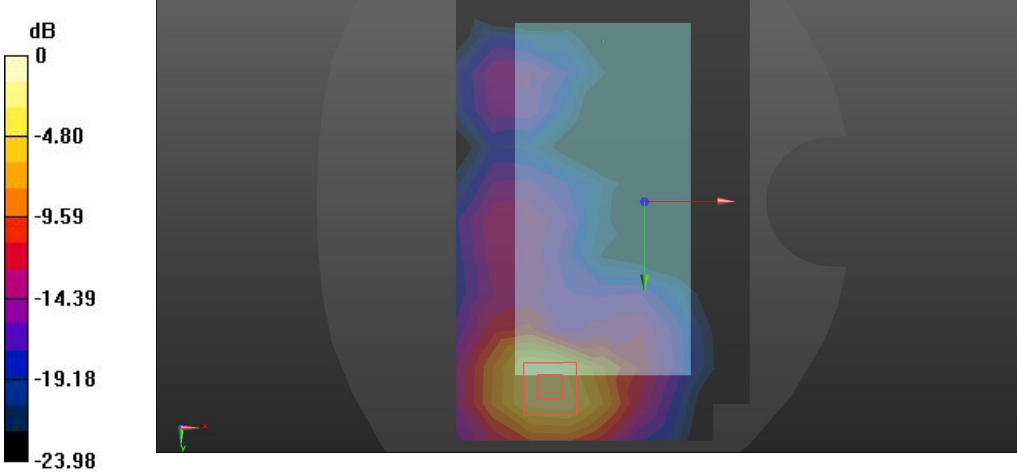
LTE Band4 (50%RB)

FLAT	Towards Ground
Communication System: UID 10297 - AAA, LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK); Frequency: 1732.5 MHz Medium parameters used (interpolated): $f = 1732.5$ MHz; $\sigma = 1.477$ S/m; $\epsilon_r = 53.46$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.83, 4.83, 4.83); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) Flat-Section LTE Band4 TG/LTE Band4 TG M 50%RB/Area Scan (9x14x1): Measurement grid: $dx=15$mm, $dy=15$mm Maximum value of SAR (measured) = 0.308 W/kg Flat-Section LTE Band4 TG/LTE Band4 TG M 50%RB/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$mm, $dy=5$mm, $dz=5$mm Reference Value = 4.725 V/m; Power Drift = -0.12 dB Peak SAR (extrapolated) = 0.494 W/kg SAR(1 g) = 0.334 W/kg; SAR(10 g) = 0.173 W/kg Maximum value of SAR (measured) = 0.323 W/kg  0 dB = 0.323 W/kg = -4.91 dBW/kg	

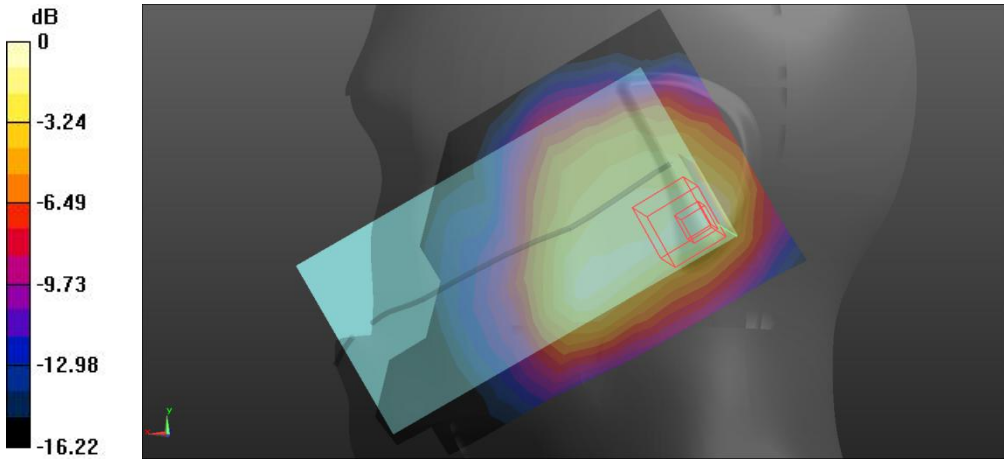
LTE Band5 (1RB)

FLAT	EDGE3
Communication System: UID 10175 - CAC, LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK); Frequency: 836.5 MHz Medium parameters used (interpolated): $f = 836.5$ MHz; $\sigma = 0.976$ S/m; $\epsilon_r = 55.195$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(6.06, 6.06, 6.06); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) Flat-Section LTE Band5 TG/LTE Band5 Edge3 M 1RB/Area Scan (6x14x1): Measurement grid: $dx=15$mm, $dy=15$mm Maximum value of SAR (measured) = 0.218 W/kg Flat-Section LTE Band5 TG/LTE Band5 Edge3 M 1RB/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$mm, $dy=5$mm, $dz=5$mm Reference Value = 14.30 V/m; Power Drift = 0.17 dB Peak SAR (extrapolated) = 0.293 W/kg SAR(1 g) = 0.208 W/kg; SAR(10 g) = 0.154 W/kg Maximum value of SAR (measured) = 0.232 W/kg  0 dB = 0.232 W/kg = -6.35 dBW/kg	

LTE Band7 (1RB)

FLAT	Towards Ground
Communication System: UID 10169 - CAB, LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK); Frequency: 2535 MHz Medium parameters used (interpolated): $f = 2535$ MHz; $\sigma = 2.067$ S/m; $\epsilon_r = 52.592$; $\rho = 1000$ kg/m³ Phantom section: Flat Section Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.07, 4.07, 4.07); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = -3.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: Twin-SAM 1560; Type: QD 000 P40 CD; Serial: 1560 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) Flat-Section LTE Band7 TG/LTE Band7 TG M 1RB/Area Scan (9x14x1): Measurement grid: $dx=15$mm, $dy=15$mm Maximum value of SAR (measured) = 0.553 W/kg Flat-Section LTE Band7 TG/LTE Band7 TG M 1RB/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$mm, $dy=5$mm, $dz=5$mm Reference Value = 3.311 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 0.964 W/kg SAR(1 g) = 0.651 W/kg; SAR(10 g) = 0.350 W/kg Maximum value of SAR (measured) = 0.673 W/kg  0 dB = 0.673 W/kg = -1.72 dBW/kg	

Wifi 2.4GHz

Left Side	Cheek
Communication System: UID 10012 - CAB, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Frequency: 2437 MHz Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.818$ S/m; $\epsilon_r = 39.619$; $\rho = 1000$ kg/m³ Phantom section: Left Section Measurement Standard: DASYS (IEEE/IEC/ANSI C63.19-2007) DASY Configuration: - Probe: ES3DV3 - SN3127; ConvF(4.58, 4.58, 4.58); Calibrated: 10/11/2017; - Sensor-Surface: 3mm (Mechanical Surface Detection), $z = 2.0, 32.0$ - Electronics: DAE4 Sn546; Calibrated: 9/15/2017 - Phantom: SAM 1559; Type: QD 000 P40 CD; Serial: 1559 - DASY52 52.8.8(1258); SEMCAD X 14.6.10(7373) Head-Section Left HSL WIFI/WIFI touch M 2/Area Scan (8x13x1): Measurement grid: $dx=15$mm, $dy=15$mm Maximum value of SAR (measured) = 0.108 W/kg Head-Section Left HSL WIFI/WIFI touch M 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$mm, $dy=5$mm, $dz=5$mm Reference Value = 5.638 V/m; Power Drift = 0.03 dB Peak SAR (extrapolated) = 0.203 W/kg SAR(1 g) = 0.092 W/kg; SAR(10 g) = 0.052 W/kg Maximum value of SAR (measured) = 0.108 W/kg	
 0 dB = 0.108 W/kg = -9.67 dBW/kg	

ANNEX B - RELEVANT PAGES FROM CALIBRATION REPORTS

DAE4 Sn:546

Calibration Laboratory of Schert & Partner Engineering AG (Boehringerstrasse 10, 8090 Fetsch, Switzerland)	 	Referenznummer: Kalibrierprotokoll Revision: Kalibrierprotokoll Revision: Kalibrierprotokoll Serien: Kalibrierprotokoll
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Authorised by: (Swiss Accreditation Service (SAS))
 The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client: **SWTC (YHAG)**

Certificate No.: **DAE4-546, Aug16**

CALIBRATION CERTIFICATE

Object:	DAE4: SD-500 D04 (DA: SPN 3448)
Calibration procedure(s):	DA-CAL-06 v09 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	August 22, 2016

This calibration certificate documents the capability to: national standards, which require the physical units of these parameters (kg, the mass constant) and the uncertainties with confidence probability, you give us the following, origin and use of the certificate

All calibrations have been performed in the client's facility (facility: environmental temperature (20 ± 0.2) °C and humidity < 10%).

Calibration Equipment used (SWTC) (calibrator for calibration):

Working Standard:	E-4	Cal. Date (Certificate No.):	Calibration Certificate:
Accuracy Standard: Type 204	0.01	06-Nov-14 (p=17126)	DAE-46
Reference Standard:	E-4	Check Date (Certificate No.):	Reference Date:
Actual DAQ Calibration date	01.08.2016 (DA: 546, 452)	06-Nov-14 (p=17126)	06-Nov-14 (p=17126)
Calibration Date (E-4):	01.08.2016 (DA: 546, 452)	06-Nov-14 (p=17126)	06-Nov-14 (p=17126)

Technician:	Name:	Function:	Signature:
	Technique Master	Technician	
Approved by:	Technician	Quality Technical Manager	

Issued: August 22, 2016

This calibration certificate shall not be reproduced without or in full without written approval of the customer.

Calibration No.: DAE4-546, Aug16
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Calibration Laboratory of Schweiss & Partner Engineering AG Hauptstrasse 100-10, 8100 Opfikon, Switzerland	 	BSC-IMEA Schweizerische Eidgenossenschaft Confédération suisse Confederaziun svizra Confederaziun svizra
Accredited by Swiss Accreditation Service (SAS) The Swiss Accreditation Service is a sole authority responsible for the DA Multilateral Agreement for the recognition of calibration authorities		Accreditation No.: SCS 0188
Glossary		
Connector angle	data acquisition electronics information used in DASY system to align probe sensor X to the robot coordinate system.	
Methods Applied and Interpretation of Parameters		
• DC Voltage Measurement: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.		
• Connector angle: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.		
• The following parameters as documented in the Appendix contain technical information as result from the performance test and require no uncertainty.		
• DC Voltage Measurement Linearity: Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.		
• Common mode sensitivity: Influence of a positive or negative common mode voltage on the differential measurement.		
• Channel separation: Influence of a voltage on the neighbor channels not subject to an input voltage.		
• AD Converter Values with inputs shorted: Values on the internal AD converter corresponding to zero input voltage.		
• Input Offset Current: Output voltage and statistical results over a large number of zero voltage measurements.		
• Input Offset Current: Typical value for information. Maximum channel input offset current, not considering input resistance.		
• Input resistance: Typical value for information. DAQ input resistance at the connectors, during internal auto ranging and during measurement.		
• Low Battery Alarm Voltage: Typical value for information. Below this voltage, a battery alarm signal is generated.		
• Power consumption: Typical value for information. Supply currents in various operating modes.		

Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

DC Voltage Linearity		Reading (μV)	Difference (μV)	Error (%)
High Range				
Channel X	+ Input	200031.74	-2.15	-0.00
Channel X	- Input	200033.66	-0.75	-0.00
Channel X	- Input	-20001.68	3.77	-0.02
Channel Y	+ Input	200021.10	-12.53	-0.01
Channel Y	+ Input	200022.22	-2.13	-0.01
Channel Y	- Input	-20003.78	1.68	-0.01
Channel Z	+ Input	200025.91	-7.99	-0.00
Channel Z	+ Input	19999.97	-4.36	-0.02
Channel Z	- Input	-20005.55	0.07	0.00

Low Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	2000.62	-0.12	-0.01
Channel X + Input	201.00	0.23	0.11
Channel X - Input	-188.76	0.38	-0.19
Channel Y + Input	2000.36	-0.29	-0.01
Channel Y + Input	200.22	-0.57	-0.29
Channel Y - Input	-200.24	-0.93	0.47
Channel Z + Input	2000.61	0.13	0.01
Channel Z + Input	199.06	-1.52	-0.76
Channel Z - Input	201.43	-1.99	1.00

2. Common mode sensitivity

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

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	1.49	0.15
	-200	1.41	-0.23
Channel Y	200	-0.40	-0.13
	-200	-1.08	-1.50
Channel Z	200	2.19	2.17
	-200	-4.93	-4.90

3. Channel separation

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

	Input Voltage (mV)	Channel X (μ V)	Channel Y (μ V)	Channel Z (μ V)
Channel X	200	-	-3.01	-3.43
Channel Y	200	9.77	-	-1.00
Channel Z	200	5.39	7.02	-

Certificate No: DAE4-546 Aug16

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4. AD-Converter Values with inputs shorted

4. AD-Converter values with inputs shorted
DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15845	16442
Channel Y	16150	14493
Channel Z	15907	16531

5. Input Offset Measurement

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

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	1.22	0.21	1.94	0.35
Channel Y	0.27	-1.07	1.43	0.50
Channel Z	-0.65	-1.46	0.11	0.35

6. Input Offset Current

Nominal Input circuitry offset current on all channels: $<25\text{fA}$

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm level (VDC)
----------------	-------------------

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Quiescent (I _{off} for 10)
----------------	-------------------------------------

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

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DAE4 Sn:546

4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	15845	16442
Channel Y	16150	14493
Channel Z	15807	16531

5. Input Offset Measurement

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

Input (0mV)	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	1.22	0.21	1.94	0.35
Channel Y	0.27	-1.07	1.43	0.50
Channel Z	-0.85	-1.46	0.11	0.35

6. Input Offset Current

Nominal input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

Certificate No: DAE4-546_Aug16

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DAE4 Sn:720

Calibration Laboratory of
Sofrad & Partner
Engineering AG
Bergstrasse 10, 8060 Zurich, Switzerland

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is also the signatory to the IAF
Multilateral Agreement for the recognition of calibration certificates

Client: SRTC (Tibet) Certificate No: DAE4-720_S016

CALIBRATION CERTIFICATE

Item: DAE4-720 DAE4-720 SN: 720

Calibration procedure: QA CAL-001-01
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: October 31, 2016

This calibration certificate documents the traceability to national standards, which realize the physical units of measurement (SI).
The measurement and the calibration self-assessment uncertainty are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility, environmental temperature (20 ± 0.5 °C) and humidity < 10%.

Calibration equipment used (DAE) verified for calibration

Primary Standard	SI	SI Unit (Certificate No.)	Expected Uncertainty
Measuring Microscope 1 um, 0.01	SI	SI Unit (Certificate No.)	0.1 μm
Secondary Standard	SI	SI Unit (Certificate No.)	0.1 μm
Peak DAC Calibration (DAE)	SI	SI Unit (Certificate No.)	0.1 μm
Calibration Risk (V)	SI	SI Unit (Certificate No.)	0.1 μm

Calibrated by: Name: Christoph Boller Position: Technician Signature: [Signature]

Reviewed by: Name: [Name] Position: Quality Technician Manager Signature: [Signature]

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

Certificate No: DAE4-720_S016 Page 1 of 3

DAE4 Sn:720

Calibration Laboratory of
Suzhou & Fuzhou
Engineering AG
Baugrabenstrasse 10, 8000 Zurich, Switzerland



Servicecenter Elektrosteck
Servicecenter Elektrosteck
Service Calibration Service

Accreditation No.: SCS 0108

Recognized by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the ILAC
Mutual Recognition Agreement for the recognition of calibration certificates

Glossary

DAS: data acquisition electronics
Connector angle: information used in DAS system to align probe sensor X to the robot
coordinate system.

Methods Applied and Interpretation of Parameters

- DC Voltage Measurement: Calibration Factor assessed for use in DAS system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- Connector angle: This angle of the connector is assessed measuring the angle mechanically by a test inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
 - DC Voltage Measurement Linearity: Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
 - Common mode sensitivity: Influence of a positive or negative common mode voltage on the differential measurement.
 - Channel separation: Influence of a voltage on the neighbor channels not subject to an input voltage.
 - AD Converter Values with inputs shorted: Values on the internal AD converter corresponding to zero input voltage.
 - Input Offset Measurement: Output voltage and statistical results over a large number of zero voltage measurements.
 - Input Offset Current: Typical value for information. Maximum channel input offset current, not considering the input resistance.
 - Input resistance: Typical value for information. DAE input resistance at the connector, during internal auto-zeroing and during measurement.
 - Low Battery Alarm Voltage: Typical value for information. Below this voltage, a battery alarm signal is generated.
 - Power consumption: Typical value for information. Supply currents in various operating modes.

Certificate No: DAE4-720_Oct16

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DC Voltage Measurement

AD-Converter Resolution (nominal)
High Range: 11.99 mV Full range: -100...+200 mV
Low Range: 11.99 mV Full range: -1...+100 mV
DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	-400.000 ± 0.001% (3=0)	-400.000 ± 0.001% (3=0)	-400.000 ± 0.001% (3=0)
Low Range	-0.00000 ± 1.001% (3=0)	-0.00000 ± 1.001% (3=0)	-0.00000 ± 1.001% (3=0)

Connector Angle

Connector angle to be used in DAS system	89.0° ± 1°
--	------------

Certificate No: DAE4-720_Oct16

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Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	200030.00	-2.83	-0.00
Channel X + Input	20005.59	1.21	0.01
Channel X - Input	-20002.63	2.74	-0.01
Channel Y + Input	200031.46	-1.44	-0.00
Channel Y + Input	20003.49	-0.90	-0.00
Channel Y - Input	-20003.62	1.72	-0.01
Channel Z + Input	200030.86	-1.63	-0.00
Channel Z + Input	20001.58	-2.67	-0.01
Channel Z - Input	-20009.93	-4.50	0.02

	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	1999.86	-0.99	-0.05
Channel X + Input	200.42	-0.42	-0.21
Channel X - Input	-199.45	-0.24	0.12
Channel Y + Input	2000.78	-0.01	-0.00
Channel Y + Input	200.66	-0.06	-0.03
Channel Y - Input	-199.50	-0.28	0.14
Channel Z + Input	2000.45	-0.29	-0.01
Channel Z + Input	199.41	-1.33	-0.66
Channel Z - Input	-200.21	-0.92	0.46

2. Common mode sensitivity

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

	Common mode Input Voltage (mV)	High Range Average Reading (µV)	Low Range Average Reading (µV)
Channel X	200	-2.59	-3.72
	-200	7.16	5.57
Channel Y	200	15.89	15.82
	-200	-16.62	-17.01
Channel Z	200	-16.19	-16.08
	-200	14.56	14.81

3. Channel separation

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

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (µV)
Channel X	200	-	0.26	-3.89
Channel Y	200	8.74	-	0.77
Channel Z	200	6.36	7.07	-

Certificate No: DAE4-720_Oct16

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4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	16156	16521
Channel Y	16178	16048
Channel Z	16424	15774

5. Input Offset Measurement

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

	Average (µV)	min. Offset (µV)	max. Offset (µV)	Std. Deviation (µV)
Channel X	0.75	-1.14	2.77	0.62
Channel Y	-0.03	-1.04	0.90	0.43
Channel Z	-0.18	-2.07	1.75	0.69

6. Input Offset Current

Nominal input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

Certificate No: DAE4-720_Oct16

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ES3DV3 Sn:3127

ES3DV3-SN:3127

August 29, 2016

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3127

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz)	Relative Permittivity ϵ_r	Conductivity σ (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha $^\circ$	Depth (mm)	Unc (k=2)
450	43.5	0.87	6.74	6.74	6.74	0.21	2.30	$\pm 13.3\%$
750	41.9	0.89	6.55	6.55	6.55	0.62	1.37	$\pm 12.0\%$
900	41.5	0.97	6.20	6.20	6.20	0.54	1.41	$\pm 12.0\%$
1450	40.5	1.20	5.44	5.44	5.44	0.80	1.06	$\pm 12.0\%$
1810	40.0	1.40	5.15	5.15	5.15	0.80	1.16	$\pm 12.0\%$
2000	40.0	1.40	5.11	5.11	5.11	0.68	1.28	$\pm 12.0\%$
2300	39.5	1.67	4.83	4.83	4.83	0.80	1.19	$\pm 12.0\%$
2450	39.2	1.80	4.61	4.61	4.61	0.67	1.38	$\pm 12.0\%$
2600	39.0	1.96	4.40	4.40	4.40	0.70	1.36	$\pm 12.0\%$

^c Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is $\pm 10, 25, 40, 50$ 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.
At frequencies below 3 GHz, the validity of tissue parameters (ϵ_r and σ) can be relaxed to $\pm 10\%$ if liquid compensation formula is applied to measured S4S values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ_r and σ) is restricted to $\pm 5\%$. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
^d AlphaDepth are determined during calibration. SP5ACD warrants that the remaining deviation due to the boundary effect after compensation is always less than $\pm 1\%$ for frequencies below 3 GHz and below $\pm 2\%$ for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

Certificate No: ES3-3127_Aug16

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ES3DV3-SN:3127

August 29, 2016

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3127

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz)	Relative Permittivity ϵ_r	Conductivity σ (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha $^\circ$	Depth (mm)	Unc (k=2)
450	56.7	0.94	6.99	6.99	6.99	0.12	2.10	$\pm 13.3\%$
750	55.5	0.96	6.12	6.12	6.12	0.80	1.14	$\pm 12.0\%$
900	55.0	1.05	6.16	6.16	6.16	0.46	1.53	$\pm 12.0\%$
1450	54.0	1.30	5.29	5.29	5.29	0.74	1.21	$\pm 12.0\%$
1810	53.3	1.52	4.90	4.90	4.90	0.43	1.69	$\pm 12.0\%$
2000	53.3	1.52	4.92	4.92	4.92	0.55	1.48	$\pm 12.0\%$
2300	52.9	1.81	4.63	4.63	4.63	0.80	1.24	$\pm 12.0\%$
2450	52.7	1.95	4.36	4.36	4.36	0.71	1.22	$\pm 12.0\%$
2600	52.5	2.16	4.17	4.17	4.17	0.80	1.11	$\pm 12.0\%$

^c Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is $\pm 10, 25, 40, 50$ 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.
At frequencies below 3 GHz, the validity of tissue parameters (ϵ_r and σ) can be relaxed to $\pm 10\%$ if liquid compensation formula is applied to measured S4S values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ_r and σ) is restricted to $\pm 5\%$. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
^d AlphaDepth are determined during calibration. SP5ACD warrants that the remaining deviation due to the boundary effect after compensation is always less than $\pm 1\%$ for frequencies below 3 GHz and below $\pm 2\%$ for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

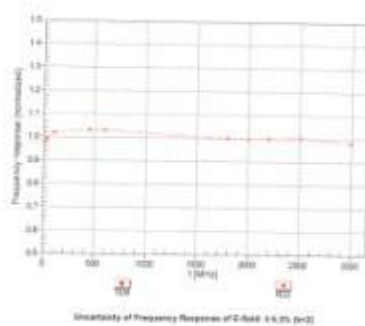
Certificate No: ES3-3127_Aug16

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ES3DV3-SN:3127

Aug 16, 2016

Frequency Response of E-Field (TEM-Cal: 6110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-Field: $\pm 0.2\%$ (k=2)

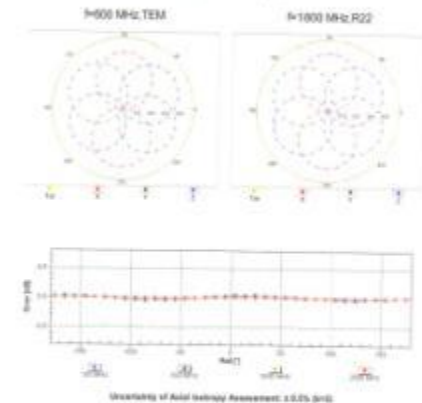
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ES3DV3-SN:3127

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Receiving Pattern (ϕ), $\theta = 0^\circ$

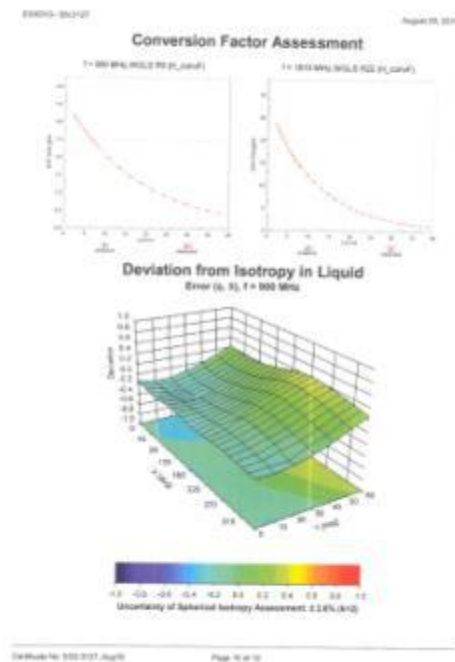
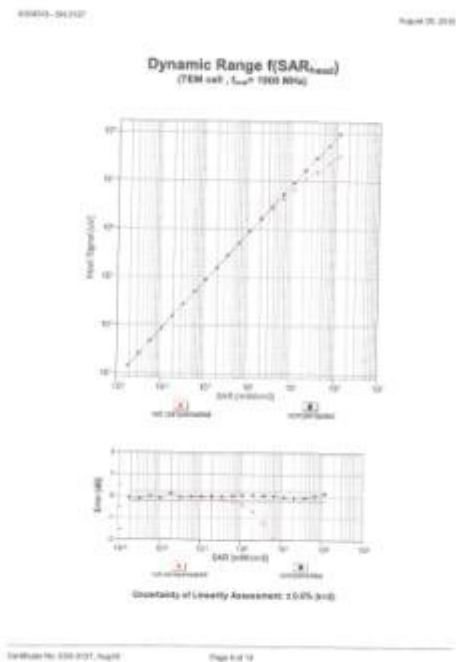


Uncertainty of Axial Geometry Assessment: $\pm 0.5\%$ (k=2)

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ES3DV3 Sn:3127



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DASY/EASY - Parameters of Probe: ES3DV3 - SN:3127

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	~15.8
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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Appendix: Modulation Calibration Parameters

UID	Communication System Name	A dB	B dBμV	C	D dB	VR mV	Unc ¹ (k=2)
0	CW	X: 0.0 Y: 0.0 Z: 0.0	0.0 0.0 0.0	1.0 1.0 1.0	0.00	200.2	±5.3 %
10012-CAB	IEEE 802.11b WIF 2.4 GHz (DSSS, 1 Mbps)	X: 3.29 Y: 2.75 Z: 3.10	71.4 67.3 70.4	20.2 17.9 19.7	1.87	125.8	±0.7 %
10108-CAC	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X: 6.43 Y: 6.43 Z: 6.36	67.7 67.5 67.6	20.1 19.7 20.0	5.80	137.8	±1.4 %
10110-CAC	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X: 6.17 Y: 6.14 Z: 6.02	67.4 67.0 67.0	20.0 19.8 19.7	5.79	134.4	±1.4 %
10154-CAC	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X: 6.13 Y: 6.19 Z: 6.04	67.3 67.3 67.1	19.9 19.8 19.8	5.75	133.5	±1.2 %
10169-CAB	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X: 5.00 Y: 5.04 Z: 4.89	66.6 66.9 66.5	19.8 19.7 19.7	5.73	117.2	±0.9 %
10175-CAC	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X: 4.97 Y: 4.93 Z: 4.87	66.6 66.3 66.5	19.7 19.4 18.6	5.72	117.2	±0.9 %
10297-AAA	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X: 4.51 Y: 4.46 Z: 6.37	68.0 67.6 67.6	20.3 19.9 20.0	5.81	137.1	±1.4 %
						140.9	
						130.4	

¹ Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the test value.

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EX3DV4 Sn:3708

November 10, 2014

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3708

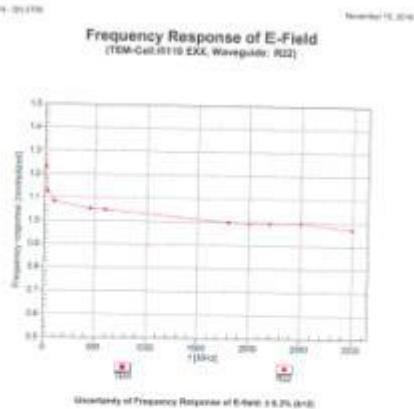
Calibration Performed Determined in Head Tissue Stimulating Media

Time (sec)	Average results					
	Success Probability	Correctness (%)	Correct #	Correct %	Average #	Success Rate
300	0.13	0.17	0.02	0.00	0.44	0.00 ± 0.02
500	0.17	1.40	7.04	7.04	0.00	0.00 ± 0.02
700	0.12	1.40	7.00	7.00	0.71	0.00 ± 0.02
900	0.12	1.40	7.11	7.11	0.00	0.00 ± 0.02
1100	0.10	4.38	5.13	5.13	0.18	1.00 ± 0.02
1300	0.10	4.19	5.93	5.93	0.10	1.00 ± 0.02
1500	0.18	4.00	5.00	5.00	0.40	1.00 ± 0.02
1700	0.15	5.07	6.07	6.07	0.00	1.00 ± 0.02
1900	0.15	5.22	6.11	6.11	0.00	1.00 ± 0.02

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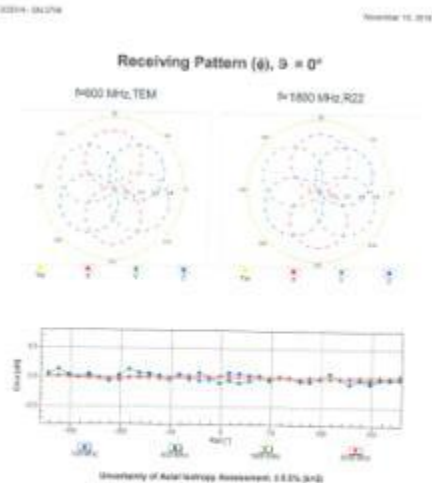
DASY/EASY - Parameters of Probe: EX3DV4 - SN:3708

Calibration Parameter Determined in Body Tissue Simulating Media

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