Appendix C – Measurement report

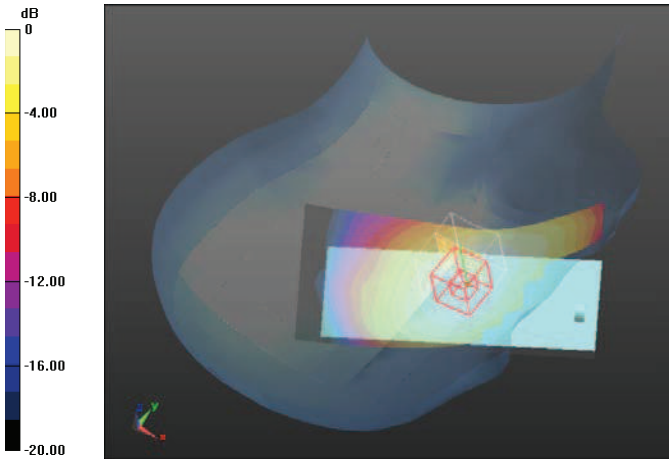
GSM 850 MHz – Right hand side – Cheek position – Middle Channel – Plot Nº 1

Test Laboratory: AT4 Wireless; Date: 06/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038263
Communication System: UID 10021 - DAB, GSM-FDD (TDMA, GMSK); Frequency: 848.6 MHz; Duty Cycle: 1:8.6896
Medium parameters used (interpolated): f = 848.6 MHz; σ = 0.88 S/m; ε_r = 40.308; ρ = 1000 kg/m^3
Phantom section: Right Section

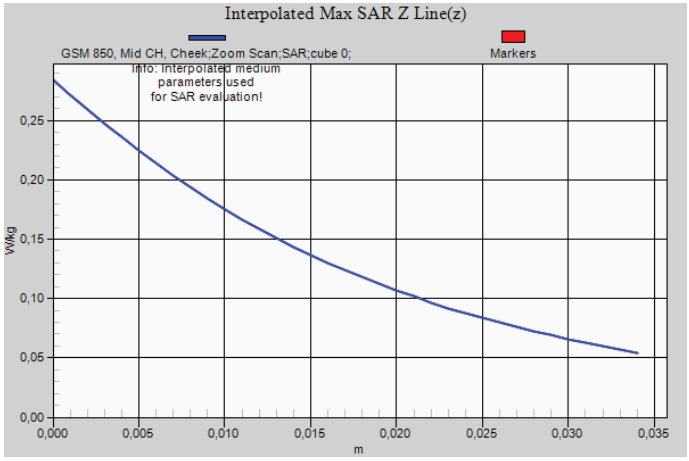
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(6.5, 6.5, 6.5); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Right Hand Side - 900 MHz/GSM 850, Mid CH, Cheek/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.258 W/kg

Right Hand Side - 900 MHz/GSM 850, Mid CH, Cheek/Zoom Scan (7x8x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.75 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.284 W/kg
SAR(1 g) = 0.236 W/kg; SAR(10 g) = 0.179 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.241 W/kg



0 dB = 0.241 W/kg = -6.18 dBW/kg

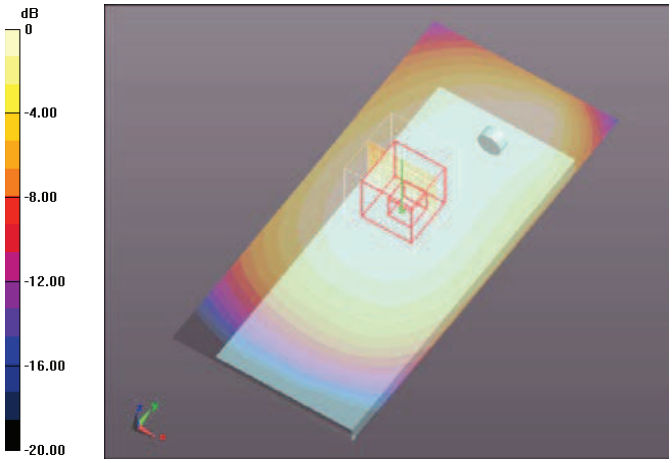


GSM 850 MHz – Body – Back Face 10 mm – Middle Channel – Plot Nº 2

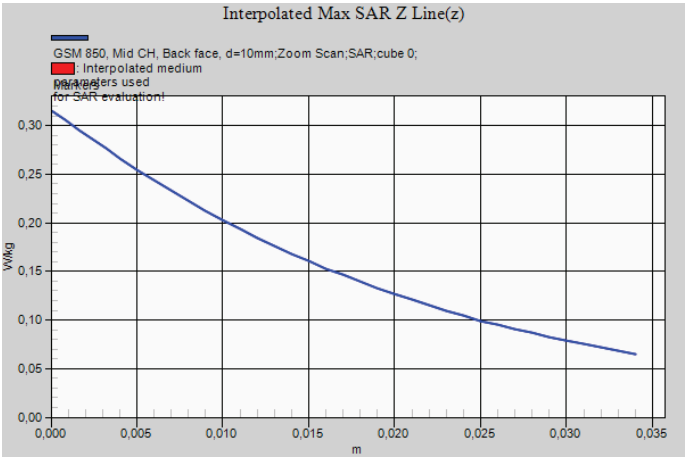
Test Laboratory: AT4 Wireless; Date: 07/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038263
Communication System: UID 10021 - DAB, GSM-FDD (TDMA, GMSK); Frequency: 848.6 MHz; Duty Cycle: 1:8.6896
Medium parameters used (interpolated): f = 848.6 MHz; σ = 1.007 S/m; ε_r = 55.179; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(6.26, 6.26, 6.26); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom Side - 900 MHz/GSM 850, Mid CH, Back face, d=10mm/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.280 W/kg

Flat Phantom Side - 900 MHz/GSM 850, Mid CH, Back face, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.72 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.316 W/kg
SAR(1 g) = 0.256 W/kg; SAR(10 g) = 0.199 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.267 W/kg



0 dB = 0.267 W/kg = -5.73 dBW/kg

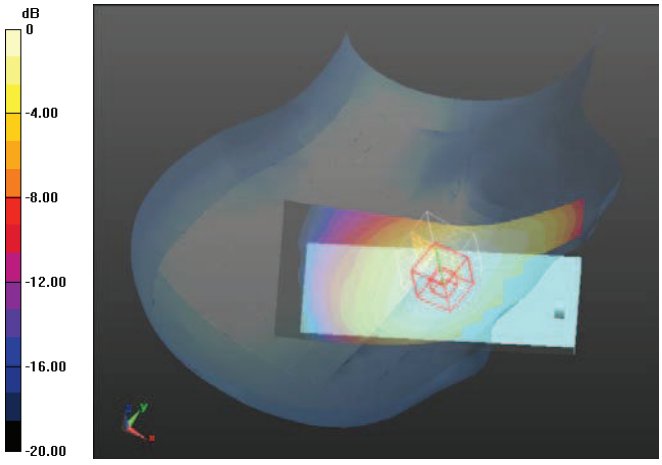


GPRS 850 MHz 2 slots – Right and side – Cheek position – Middle Channel – Plot Nº 3

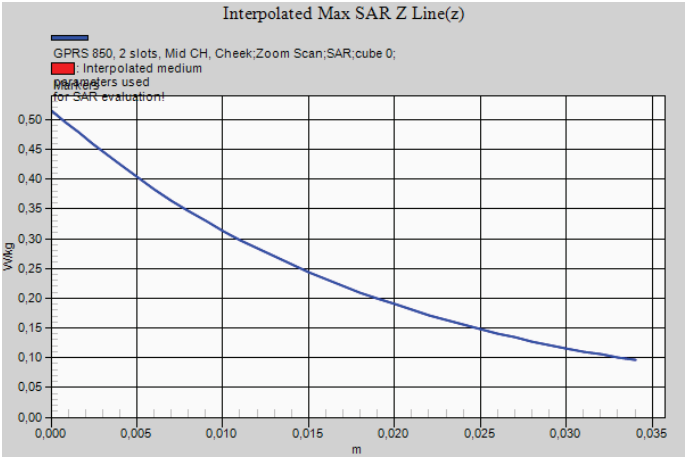
Test Laboratory: AT4 Wireless; Date: 06/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038263
Communication System: UID 10024 - DAB, GPRS-FDD (TDMA, GMSK, TN 0-1); Frequency: 836.6 MHz; Duty Cycle: 1:4.52898
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.863 S/m; ε_r = 40.636; ρ = 1000 kg/m^3
Phantom section: Right Section
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(6.5, 6.5, 6.5); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Right Hand Side - 900 MHz/GPRS 850, 2 slots, Mid CH, Cheek/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.463 W/kg

Right Hand Side - 900 MHz/GPRS 850, 2 slots, Mid CH, Cheek/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.28 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.515 W/kg
SAR(1 g) = 0.428 W/kg; SAR(10 g) = 0.324 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.437 W/kg



0 dB = 0.437 W/kg = -3.60 dBW/kg

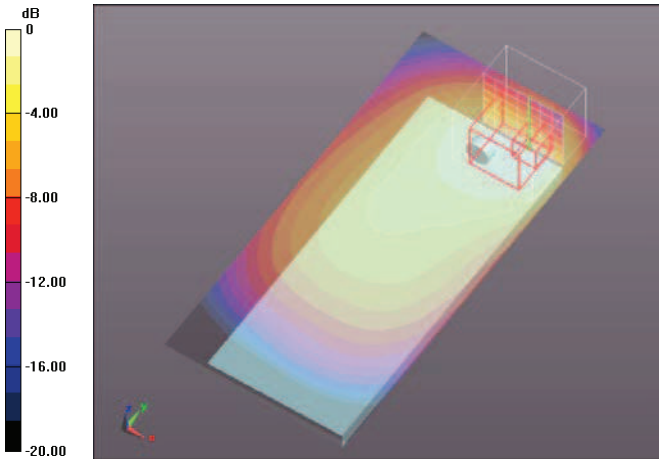


GPRS 850 MHz 2 slots – Body – Back Face 10 mm – Middle Channel – Plot Nº 4

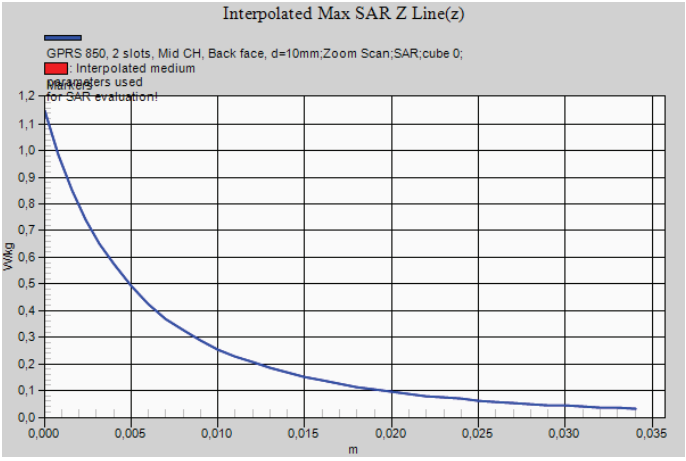
Test Laboratory: AT4 Wireless; Date: 08/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038263
Communication System: UID 10024 - DAB, GPRS-FDD (TDMA, GMSK, TN 0-1); Frequency: 836.6 MHz; Duty Cycle: 1:4.52898
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.966 S/m; ε_r = 55.05; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(6.26, 6.26, 6.26); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom Side - 900 MHz/GPRS 850, 2 slots, Mid CH, Back face, d=10mm/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.701 W/kg

Flat Phantom Side - 900 MHz/GPRS 850, 2 slots, Mid CH, Back face, d=10mm/Zoom Scan (8x8x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.70 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.525 W/kg; SAR(10 g) = 0.308 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.575 W/kg



0 dB = 0.575 W/kg = -2.40 dBW/kg



GSM 1900 MHz – Right hand side – Cheek position – Middle Channel – Plot Nº 5

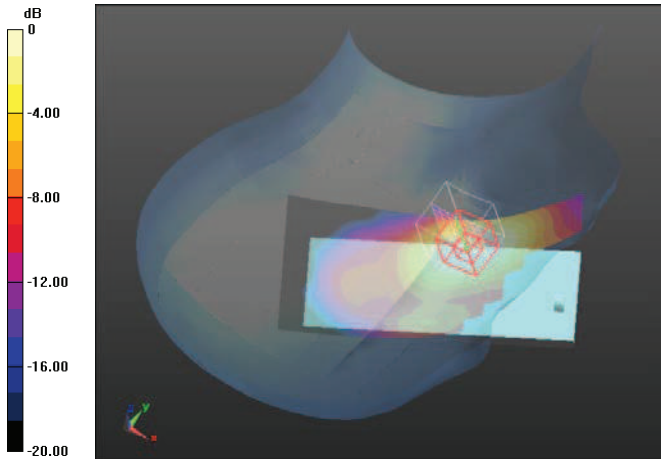
Test Laboratory: AT4 Wireless; Date: 02/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370

Communication System: UID 10021 - DAB, GSM-FDD (TDMA, GMSK); Frequency: 1880 MHz; Duty Cycle: 1:8.6896
Medium parameters used: f = 1880 MHz; σ = 1.43 S/m; ε_r = 40.84; ρ = 1000 kg/m^3
Phantom section: Right Section

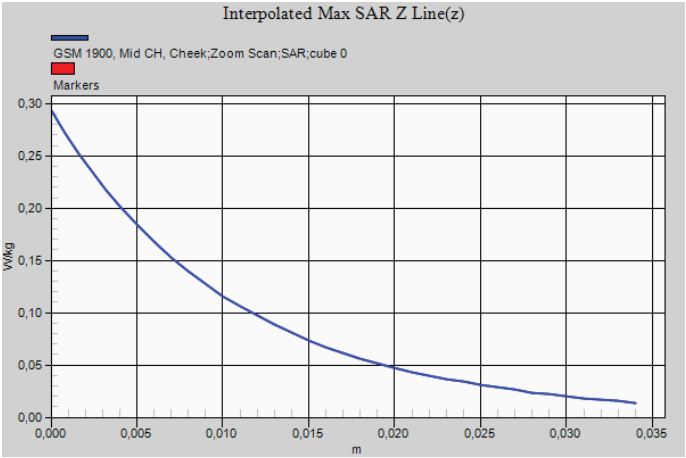
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(5.12, 5.12, 5.12); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Right Hand Side - 1800 MHz/GSM 1900, Mid CH, Cheek/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.228 W/kg

Right Hand Side - 1800 MHz/GSM 1900, Mid CH, Cheek/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.95 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.293 W/kg
SAR(1 g) = 0.186 W/kg; SAR(10 g) = 0.108 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.204 W/kg



0 dB = 0.204 W/kg = -6.90 dBW/kg



GSM 1900 MHz – Body – FrontFace 10 mm – Middle Channel – Plot Nº 6

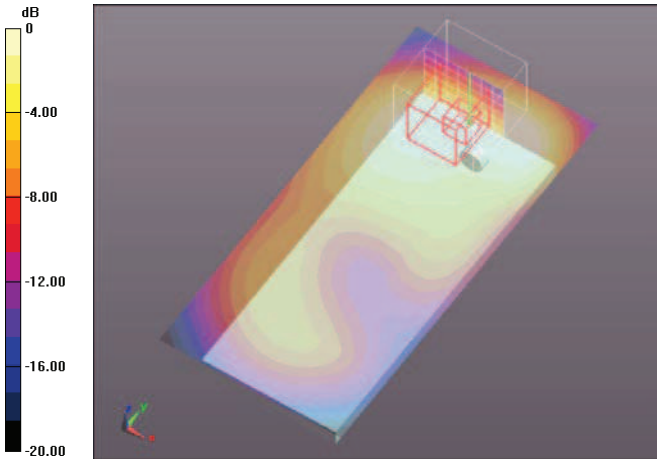
Test Laboratory: AT4 Wireless; Date: 03/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370

Communication System: UID 10021 - DAB, GSM-FDD (TDMA, GMSK); Frequency: 1880 MHz; Duty Cycle: 1:8.6896
Medium parameters used: f = 1880 MHz; σ = 1.59 S/m; ε_r = 51.98; ρ = 1000 kg/m^3
Phantom section: Flat Section

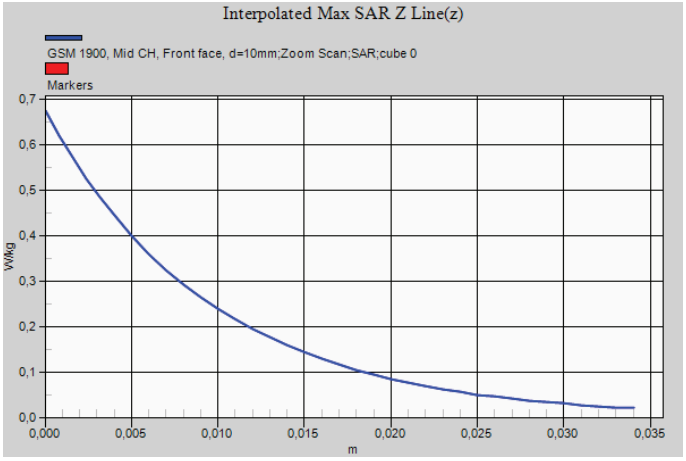
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(4.71, 4.71, 4.71); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom Side - 1800 MHz/GSM 1900, Mid CH, Front face, d=10mm/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.490 W/kg

Flat Phantom Side - 1800 MHz/GSM 1900, Mid CH, Front face, d=10mm/Zoom Scan (8x8x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.08 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.675 W/kg
SAR(1 g) = 0.405 W/kg; SAR(10 g) = 0.242 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.446 W/kg



0 dB = 0.446 W/kg = -3.51 dBW/kg



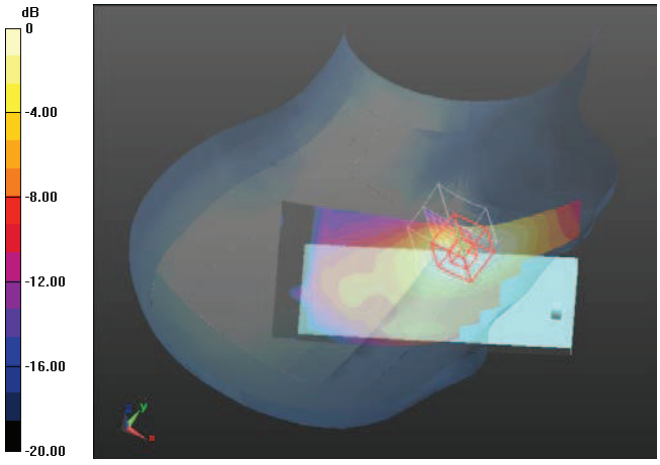
GPRS 1900 MHz 2 slots – Righthand side – Cheek position – Middle Channel – Plot Nº 7

Test Laboratory: AT4 Wireless; Date: 02/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370

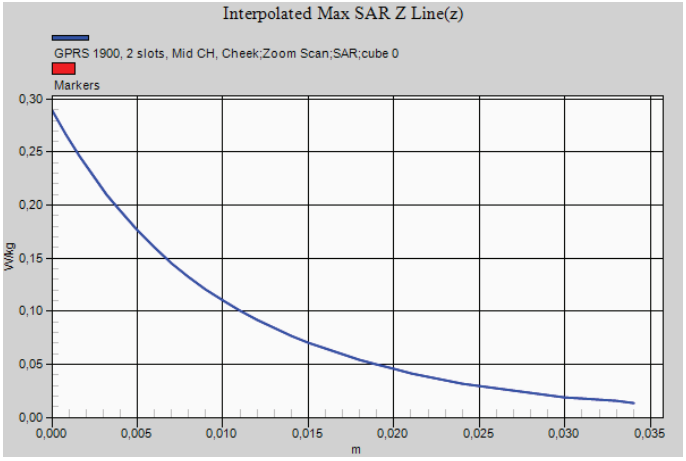
Communication System: UID 10024 - DAB, GPRS-FDD (TDMA, GMSK, TN 0-1); Frequency: 1880 MHz; Duty Cycle: 1:4.52898
Medium parameters used: f = 1880 MHz; σ = 1.43 S/m; ε_r = 40.84; ρ = 1000 kg/m^3
Phantom section: Right Section
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(5.12, 5.12, 5.12); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Right Hand Side - 1800 MHz/GPRS 1900, 2 slots, Mid CH, Cheek/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.225 W/kg

Right Hand Side - 1800 MHz/GPRS 1900, 2 slots, Mid CH, Cheek/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.081 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 0.289 W/kg
SAR(1 g) = 0.179 W/kg; SAR(10 g) = 0.105 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.194 W/kg



0 dB = 0.194 W/kg = -7.12 dBW/kg



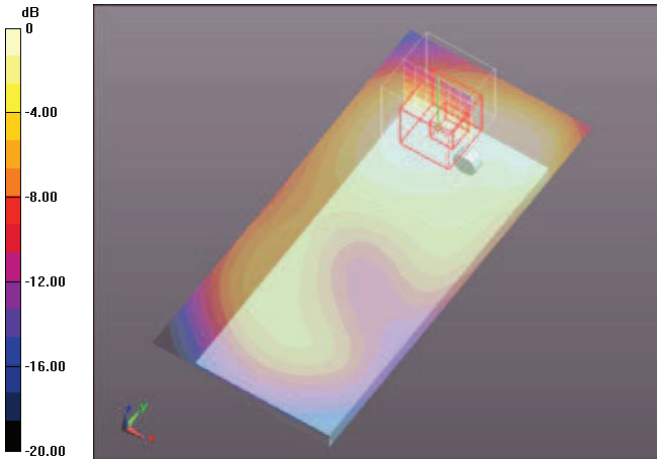
GPRS 1900 MHz 2 slots – Body – Front Face 10 mm – Middle Channel – Plot Nº 8

Test Laboratory: AT4 Wireless; Date: 03/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370

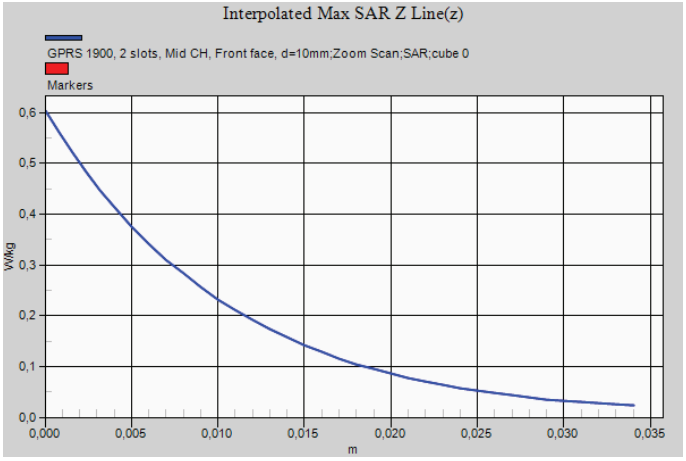
Communication System: UID 10026 - DAB, EDGE-FDD (TDMA, 8PSK, TN 0-1); Frequency: 1880 MHz; Duty Cycle: 1:9.01571
Medium parameters used: f = 1880 MHz; σ = 1.59 S/m; ε_r = 51.98; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(4.71, 4.71, 4.71); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom Side - 1800 MHz/GPRS 1900, 2 slots, Mid CH, Front face, d=10mm/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.471 W/kg

Flat Phantom Side - 1800 MHz/GPRS 1900, 2 slots, Mid CH, Front face, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.44 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.604 W/kg
SAR(1 g) = 0.386 W/kg; SAR(10 g) = 0.238 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.415 W/kg



0 dB = 0.415 W/kg = -3.82 dBW/kg



WCDMA Band II – Right hand side – Cheek position – Middle Channel – Plot Nº 9

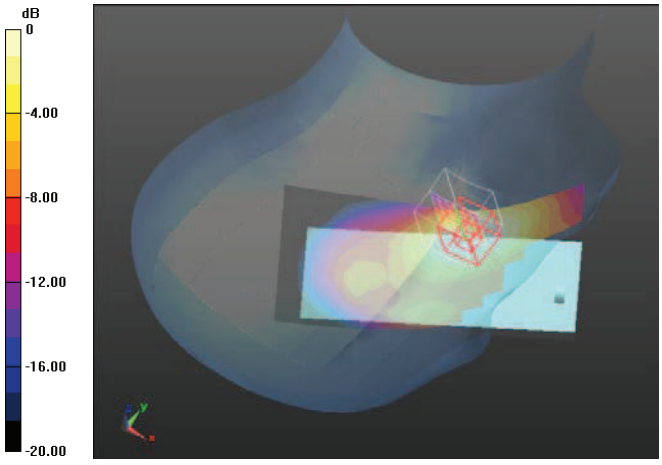
Test Laboratory: AT4 Wireless; Date: 02/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370

Communication System: UID 10011 - CAB, UMTS-FDD (WCDMA); Frequency: 1880 MHz; Duty Cycle: 1:1.95434
Medium parameters used: f = 1880 MHz; σ = 1.43 S/m; ε_r = 40.84; ρ = 1000 kg/m^3
Phantom section: Right Section

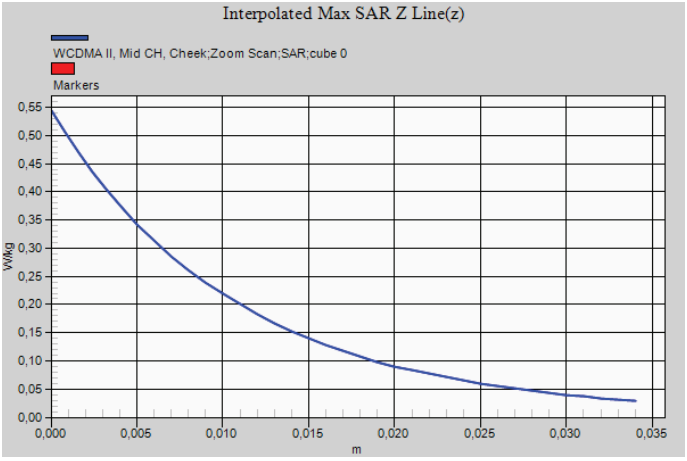
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(5.12, 5.12, 5.12); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Right Hand Side - 1800 MHz/WCDMA II, Mid CH, Cheek/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.415 W/kg

Right Hand Side - 1800 MHz/WCDMA II, Mid CH, Cheek/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.43 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.544 W/kg
SAR(1 g) = 0.342 W/kg; SAR(10 g) = 0.203 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.378 W/kg



0 dB = 0.378 W/kg = -4.23 dBW/kg



WCDMA Band II – Body – Back Face 10 mm – Middle Channel – Plot Nº 10

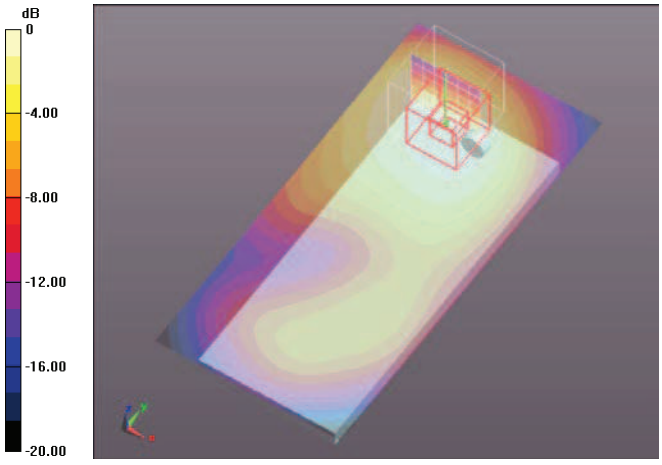
Test Laboratory: AT4 Wireless; Date: 03/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370

Communication System: UID 10011 - CAB, UMTS-FDD (WCDMA); Frequency: 1880 MHz; Duty Cycle: 1:1.95434
Medium parameters used: f = 1880 MHz; σ = 1.59 S/m; ε_r = 51.98; ρ = 1000 kg/m^3
Phantom section: Flat Section

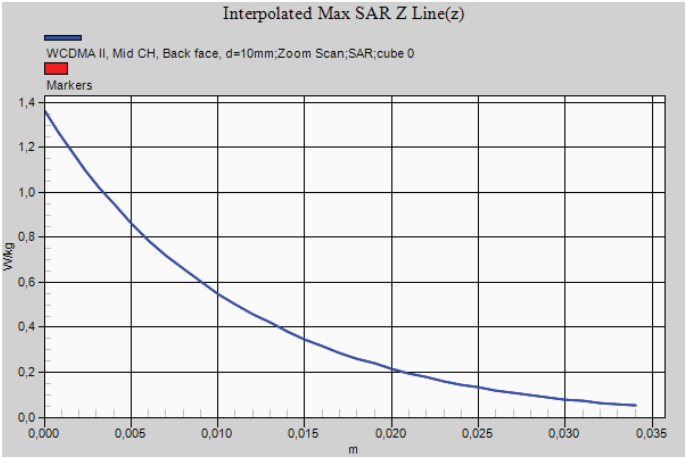
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(4.71, 4.71, 4.71); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom Side - 1800 MHz/WCDMA II, Mid CH, Back face, d=10mm/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.03 W/kg

Flat Phantom Side - 1800 MHz/WCDMA II, Mid CH, Back face, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.88 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.867 W/kg; SAR(10 g) = 0.534 W/kg (SAR correcte
d for target medium)
Maximum value of SAR (measured) = 0.948 W/kg



0 dB = 0.948 W/kg = -0.23 dBW/kg



WCDMA Band II VARIABILTY– Body – Back Face 10 mm – Middle Channel – Plot Nº 11

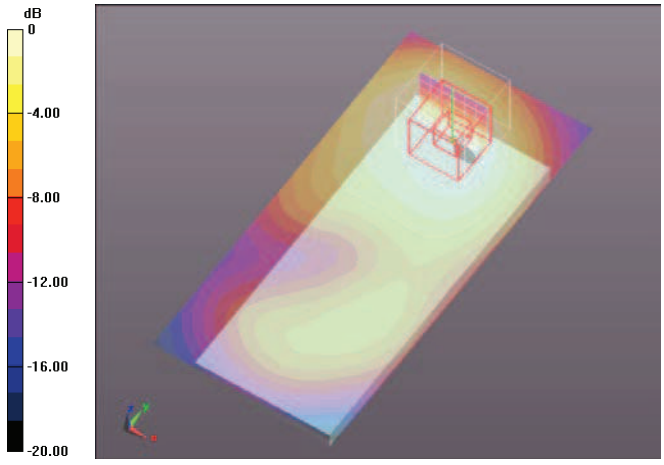
Test Laboratory: AT4 Wireless; Date: 03/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370

Communication System: UID 10011 - CAB, UMTS-FDD (WCDMA); Frequency: 1880 MHz; Duty Cycle: 1:1.95434
Medium parameters used: f = 1880 MHz; σ = 1.59 S/m; ε_r = 51.98; ρ = 1000 kg/m^3
Phantom section: Flat Section

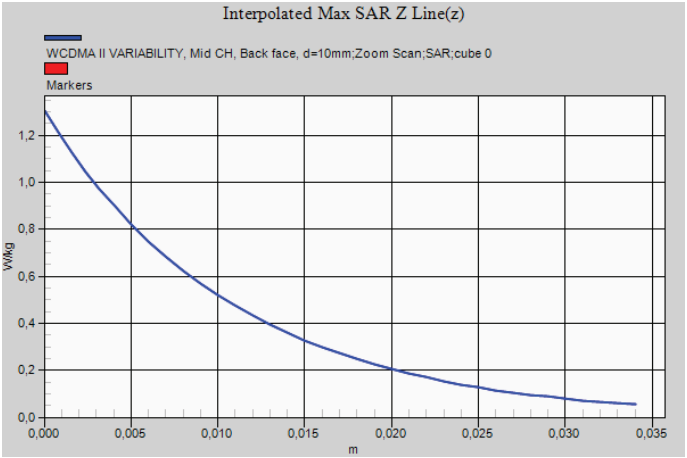
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(4.71, 4.71, 4.71); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom Side - 1800 MHz/WCDMA II VARIABILITY, Mid CH, Back face, d=10mm/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.01 W/kg

Flat Phantom Side - 1800 MHz/WCDMA II VARIABILITY, Mid CH, Back face, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.30 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.836 W/kg; SAR(10 g) = 0.519 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.900 W/kg



0 dB = 0.900 W/kg = -0.46 dBW/kg



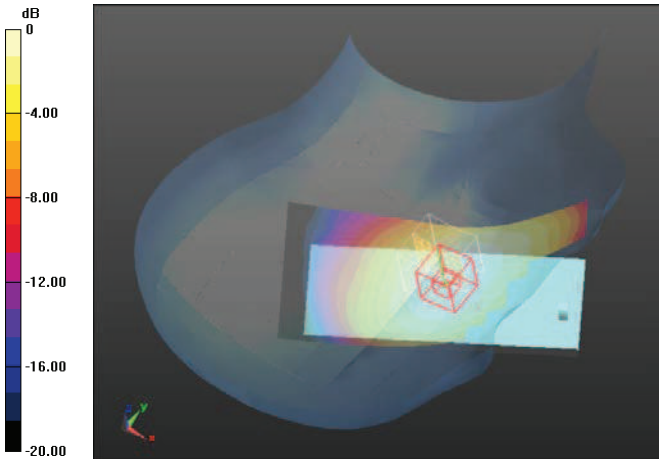
WCDMA Band V – Right hand side – Cheek position – Middle Channel – Plot Nº 12

Test Laboratory: AT4 Wireless; Date: 06/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038263

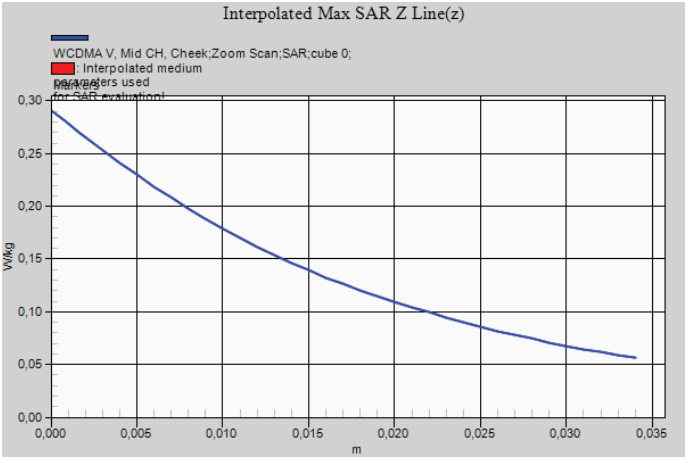
Communication System: UID 10011 - CAB, UMTS-FDD (WCDMA); Frequency: 836.6 MHz; Duty Cycle: 1:1.95434
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.863 S/m; ε_r = 40.636; ρ = 1000 kg/m^3
Phantom section: Right Section
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(6.5, 6.5, 6.5); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Right Hand Side - 900 MHz/WCDMA V, Mid CH, Cheek/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.263 W/kg

Right Hand Side - 900 MHz/WCDMA V, Mid CH, Cheek/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.440 V/m; Power Drift = 0.35 dB
Peak SAR (extrapolated) = 0.291 W/kg
SAR(1 g) = 0.243 W/kg; SAR(10 g) = 0.185 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.247 W/kg



0 dB = 0.247 W/kg = -6.07 dBW/kg

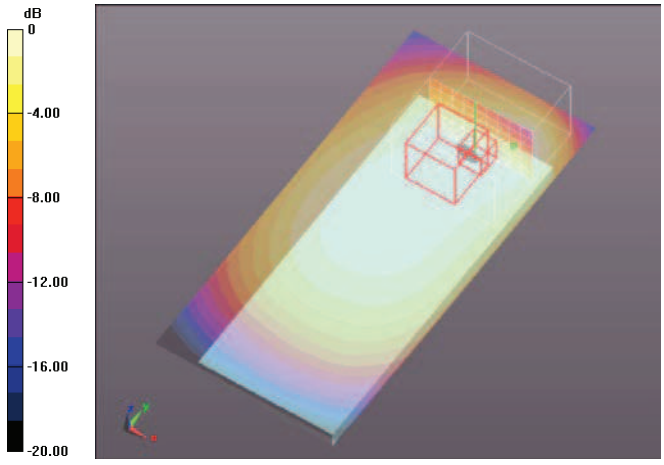


WCDMA Band V – Body – Back Face 10 mm – Middle Channel – Plot Nº 13

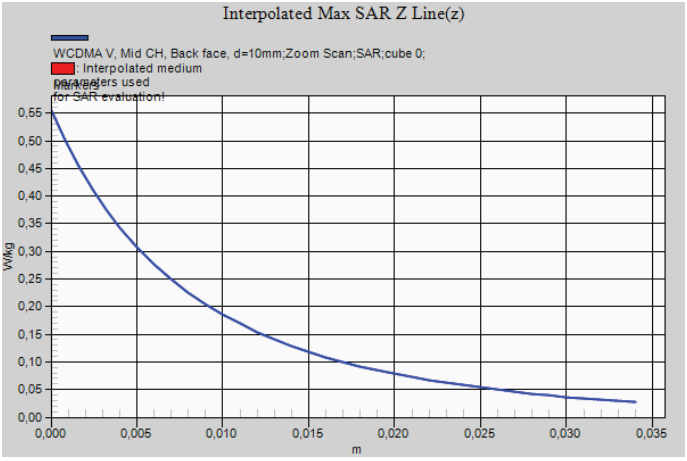
Test Laboratory: AT4 Wireless; Date: 07/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038263
Communication System: UID 10011 - CAB, UMTS-FDD (WCDMA); Frequency: 836.6 MHz; Duty Cycle: 1:1.95434
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.966 S/m; ε_r = 55.05; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(6.26, 6.26, 6.26); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom Side - 900 MHz/WCDMA V, Mid CH, Back face, d=10mm/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.426 W/kg

Flat Phantom Side - 900 MHz/WCDMA V, Mid CH, Back face, d=10mm/Zoom Scan (10x11x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.58 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.555 W/kg
SAR(1 g) = 0.360 W/kg; SAR(10 g) = 0.261 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.380 W/kg



0 dB = 0.380 W/kg = -4.20 dBW/kg

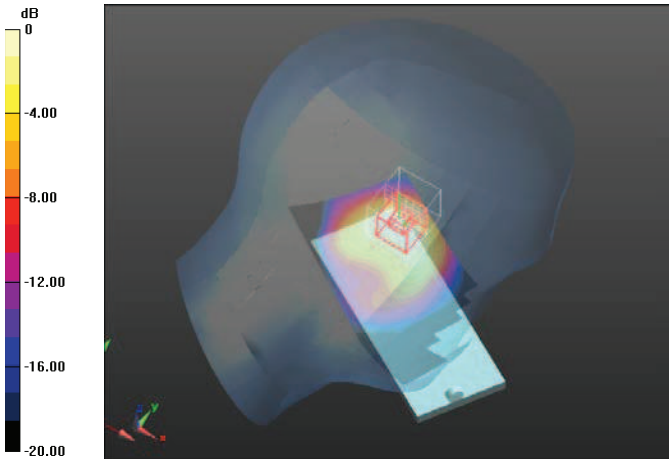


802.11g – Left hand side – Cheek position – Middle Channel – Plot Nº 14

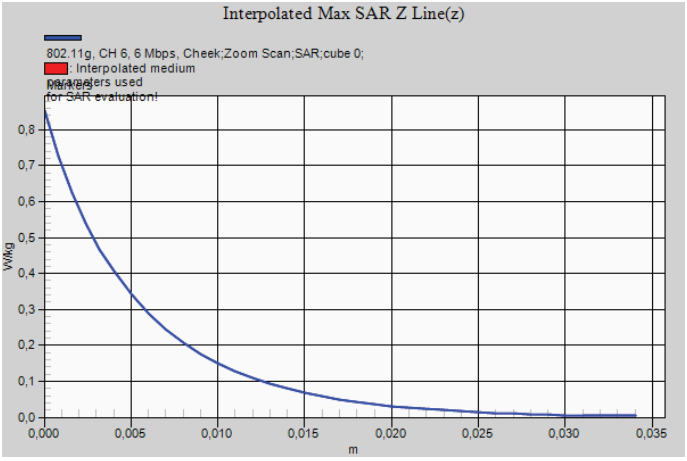
Test Laboratory: AT4 Wireless; Date: 15/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370
Communication System: UID 10013 - CAA, IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps); Frequency: 2437 MHz; Duty Cycle: 1:8.8308
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.804 S/m; ε_r = 39.547; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(4.52, 4.52, 4.52); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side - 2450MHz/802.11g, CH 6, 6 Mbps, Cheek/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.482 W/kg

Left Hand Side - 2450MHz/802.11g, CH 6, 6 Mbps, Cheek/Zoom Scan (7x8x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.72 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 0.853 W/kg
SAR(1 g) = 0.379 W/kg; SAR(10 g) = 0.193 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.418 W/kg



0 dB = 0.418 W/kg = -3.79 dBW/kg

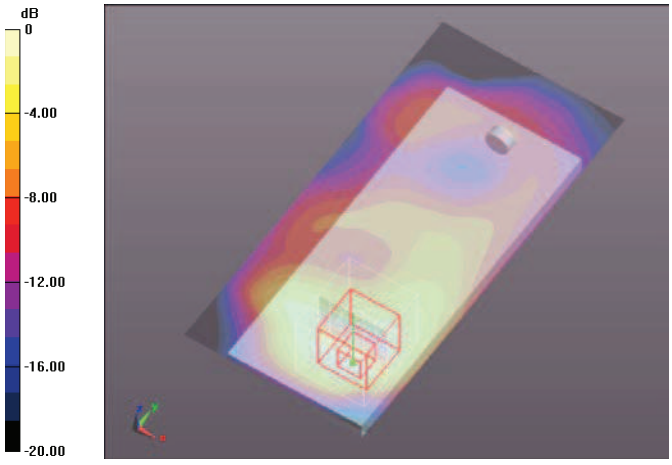


802.11b – Back Face 10 mm – Middle Channel – Plot Nº 15

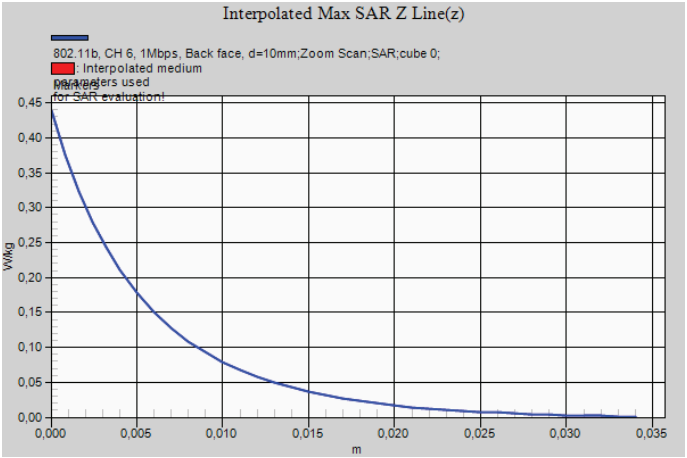
Test Laboratory: AT4 Wireless; Date: 09/10/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370
Communication System: UID 10012 - CAA, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps); Frequency: 2437 MHz; Duty Cycle: 1:1.53815
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.998 S/m; ε_r = 52.023; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(4.3, 4.3, 4.3); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom Side - 2450MHz/802.11b, CH 6, 1Mbps, Back face, d=10mm/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.263 W/kg

Flat Phantom Side - 2450MHz/802.11b, CH 6, 1Mbps, Back face, d=10mm/Zoom Scan (7x8x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.586 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 0.439 W/kg
SAR(1 g) = 0.187 W/kg; SAR(10 g) = 0.088 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.211 W/kg



0 dB = 0.211 W/kg = -6.76 dBW/kg

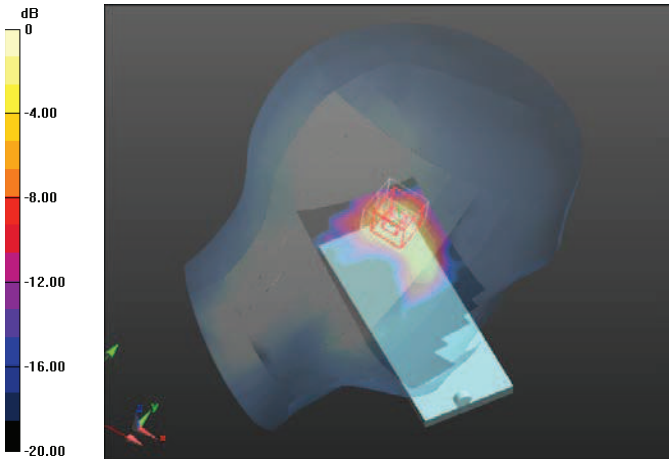


802.11n40 – 5.2 GHz – Head – Left Hand Side – Middle Channel – Plot Nº 16

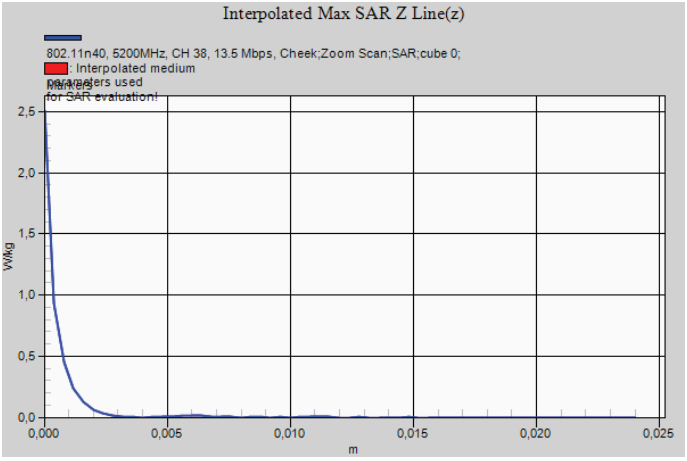
Test Laboratory: AT4 Wireless; Date: 25/09/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370
Communication System: UID 10117 - CAA, IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK); Frequency: 5190 MHz; Duty Cycle: 1:6.4121
Medium parameters used (interpolated): f = 5190 MHz; σ = 4.48 S/m; ε_r = 35.67; ρ = 1000 kg/m^3
Phantom section: Left Section DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(4.77, 4.77, 4.77); Calibrated: 14/07/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side - 5GHz/802.11n40, 5200MHz, CH 38, 13.5 Mbps, Cheek/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.356 W/kg

Left Hand Side - 5GHz/802.11n40, 5200MHz, CH 38, 13.5 Mbps, Cheek/Zoom Scan (8x8x12)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 6.946 V/m; Power Drift = -0.26 dB
Peak SAR (extrapolated) = 2.51 W/kg
SAR(1 g) = 0.252 W/kg; SAR(10 g) = 0.084 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.478 W/kg



0 dB = 0.478 W/kg = -3.21 dBW/kg

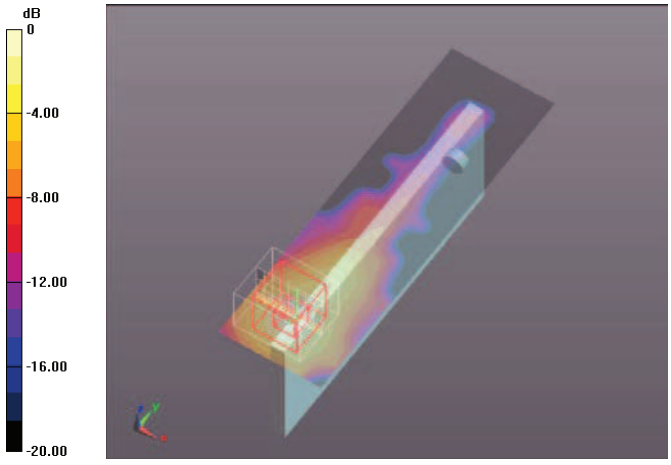


802.11n40 – 5.2 GHz – Body – Right Edge, d=10mm – Middle Channel – Plot Nº 17

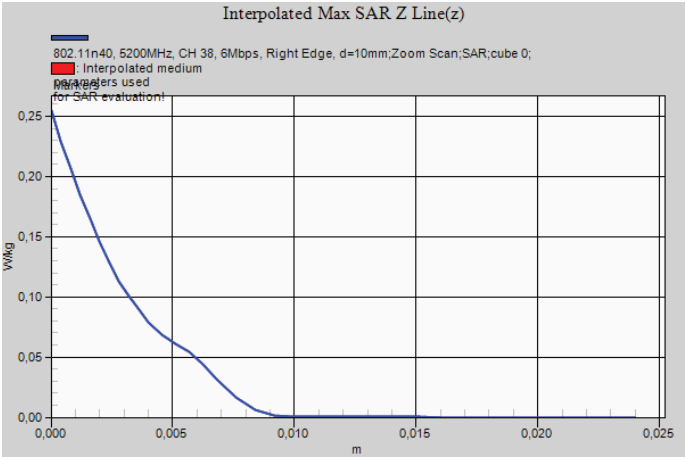
Test Laboratory: AT4 Wireless; Date: 29/09/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370
Communication System: UID 10117 - CAA, IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK); Frequency: 5190 MHz; Duty Cycle: 1:6.4121
Medium parameters used (interpolated): f = 5190 MHz; σ = 5.07 S/m; ε_r = 47.19; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(4.32, 4.32, 4.32); Calibrated: 14/07/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom Side - 5GHz Edges/802.11n40, 5200MHz, CH 38, 6Mbps, Right Edge, d=10mm/Area Scan (51x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.123 W/kg

Flat Phantom Side - 5GHz Edges/802.11n40, 5200MHz, CH 38, 6Mbps, Right Edge, d=10mm/Zoom Scan (9x8x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.221 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.255 W/kg
SAR(1 g) = 0.075 W/kg; SAR(10 g) = 0.028 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.153 W/kg



0 dB = 0.153 W/kg = -8.15 dBW/kg

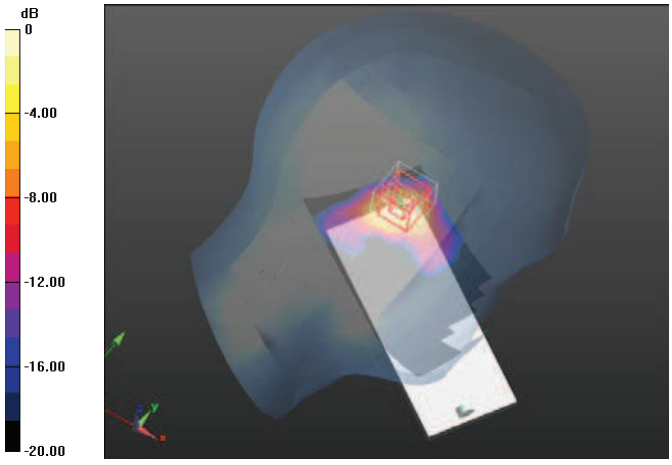


802.11n40 – 5.3 GHz – Head – Left Hand Side – Middle Channel – Plot Nº 18

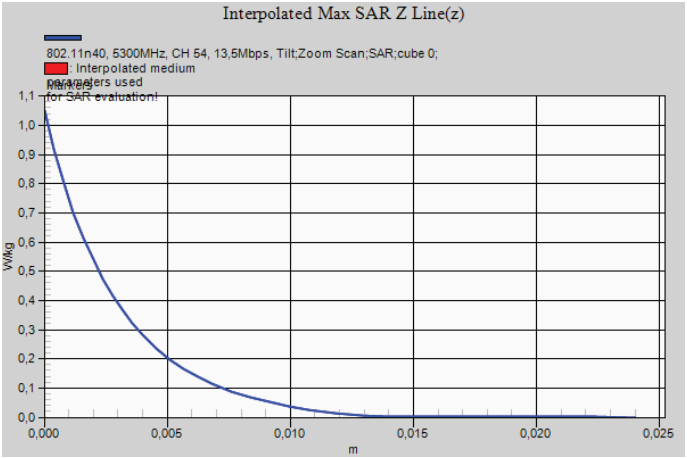
Test Laboratory: AT4 Wireless; Date: 24/09/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370
Communication System: UID 10117 - CAA, IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK); Frequency: 5270 MHz; Duty Cycle: 1:6.4121
Medium parameters used (interpolated): f = 5270 MHz; σ = 4.59 S/m; ε_r = 36.05; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(4.6, 4.6, 4.6); Calibrated: 14/07/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side - 5GHz/802.11n40, 5300MHz, CH 54, 13,5Mbps, Tilt/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.401 W/kg

Left Hand Side - 5GHz/802.11n40, 5300MHz, CH 54, 13,5Mbps, Tilt/Zoom Scan (8x8x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 7.914 V/m; Power Drift = 0.20 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.264 W/kg; SAR(10 g) = 0.086 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.523 W/kg



0 dB = 0.523 W/kg = -2.81 dBW/kg



802.11a – 5.3 GHz – Body – Back Face, d=10mm – Middle Channel – Plot Nº 19

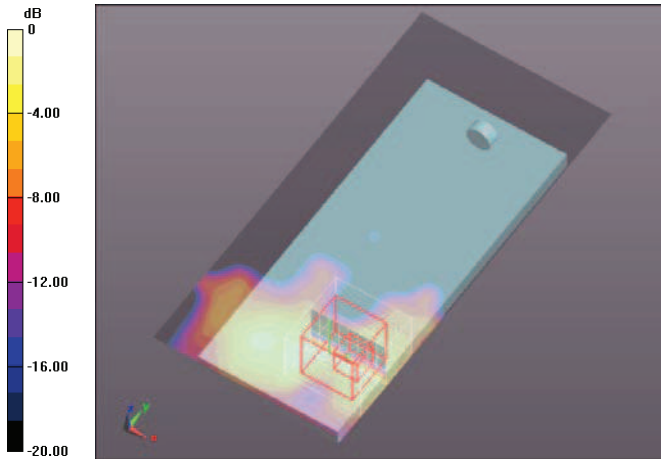
Test Laboratory: AT4 Wireless; Date: 29/09/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370

Communication System: UID 10062 - CAA, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps); Frequency: 5260 MHz; Duty Cycle: 1:7.37904
Medium parameters used: f = 5260 MHz; σ = 5.47 S/m; ε_r = 47.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(4.15, 4.15, 4.15); Calibrated: 14/07/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

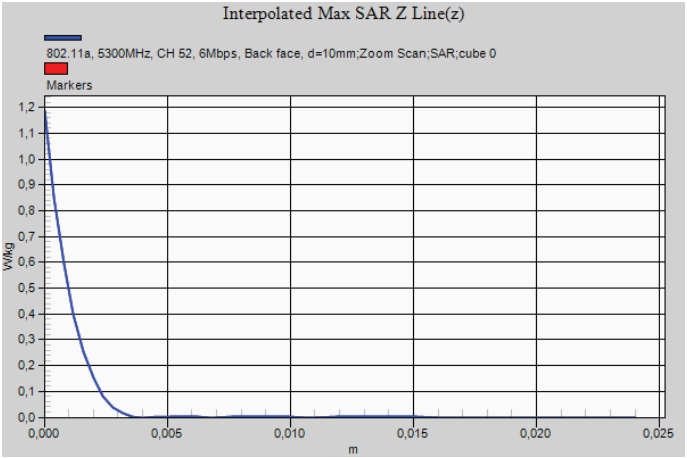
Flat Phantom Side - 5GHz/802.11a, 5300MHz, CH 52, 6Mbps, Back face, d=10mm/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.125 W/kg

Flat Phantom Side - 5GHz/802.11a, 5300MHz, CH 52, 6Mbps, Back face, d=10mm/Zoom Scan (9x9x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 4.012 V/m; Power Drift = 0.36 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.103 W/kg; SAR(10 g) = 0.030 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 0.179 W/kg

3



0 dB = 0.179 W/kg = -7.47 dBW/kg

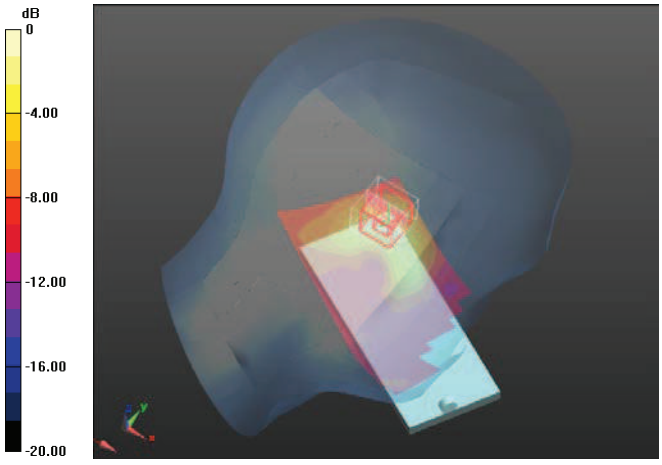


802.11n40 – 5.6 GHz – Head – Left Hand Side – Middle Channel – Plot Nº 20

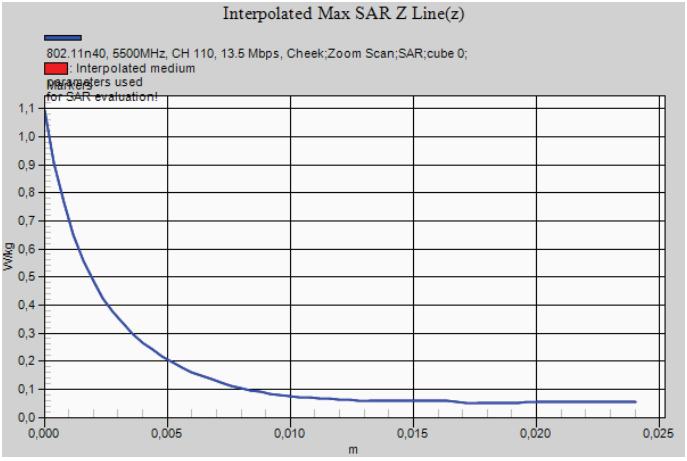
Test Laboratory: AT4 Wireless; Date: 25/09/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370
Communication System: UID 10117 - CAA, IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK); Frequency: 5550 MHz; Duty Cycle: 1:6.4121
Medium parameters used (interpolated): f = 5550 MHz; σ = 5.025 S/m; ε_r = 35.38; ρ = 1000 kg/m^3
Phantom section: Left Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(4.25, 4.25, 4.25); Calibrated: 14/07/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Left Hand Side - 5GHz/802.11n40, 5500MHz, CH 110, 13.5 Mbps, Cheek/Area Scan (81x171x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.388 W/kg

Left Hand Side - 5GHz/802.11n40, 5500MHz, CH 110, 13.5 Mbps, Cheek/Zoom Scan (8x8x12)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 7.342 V/m; Power Drift = 0.27 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.281 W/kg; SAR(10 g) = 0.129 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.486 W/kg



0 dB = 0.486 W/kg = -3.13 dBW/kg

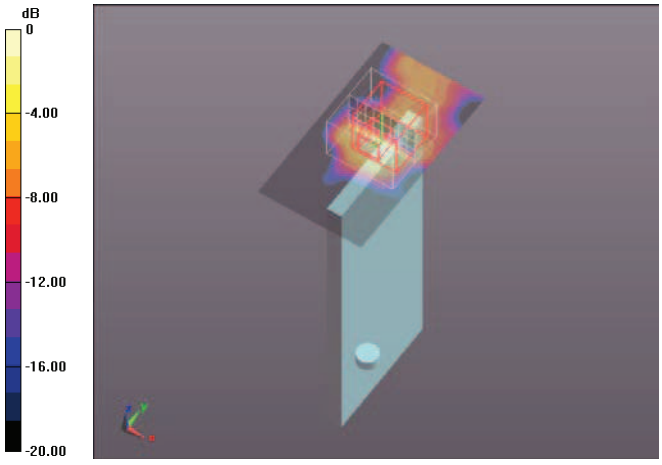


802.11n40 – 5.6 GHz – Body – Top Edge d=10mm – Middle Channel – Plot Nº 21

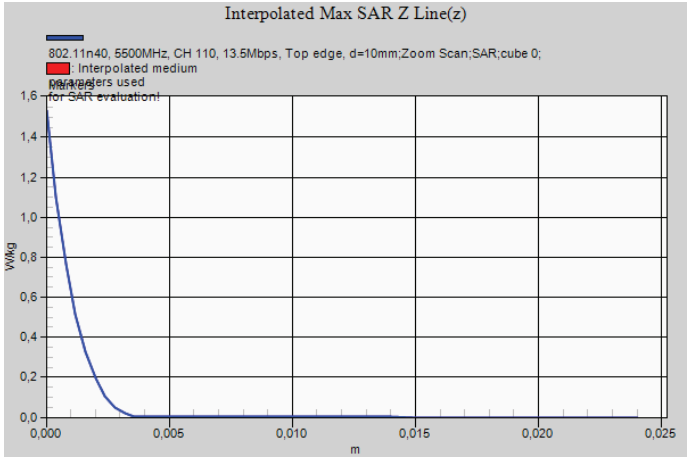
Test Laboratory: AT4 Wireless; Date: 29/09/2014
DUT: YotaPhone2; Type: Handset; Serial: IMEI:004402600038370
Communication System: UID 10117 - CAA, IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK); Frequency: 5550 MHz; Duty Cycle: 1:6.4121
Medium parameters used (interpolated): f = 5550 MHz; σ = 5.86 S/m; ε_r = 46.26; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(3.67, 3.67, 3.67); Calibrated: 14/07/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Flat Phantom Side - 5GHz/802.11n40, 5500MHz, CH 110, 13.5Mbps, Top edge, d=10mm/Area Scan (51x91x1):
Interpolated grid: dx=1.000 mm, dy=1.000 mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.141 W/kg

Flat Phantom Side - 5GHz/802.11n40, 5500MHz, CH 110, 13.5Mbps, Top edge, d=10mm/Zoom Scan (9x9x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 3.601 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.53 W/kg
SAR(1 g) = 0.129 W/kg; SAR(10 g) = 0.030 W/kg (SAR corrected for target medium)
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.199 W/kg



0 dB = 0.199 W/kg = -7.01 dBW/kg



Appendix D – System Validation Reports

Validation results in 900 MHz Band for Head TSL

Test Laboratory: AT4 Wireless; Date: 06/10/2014

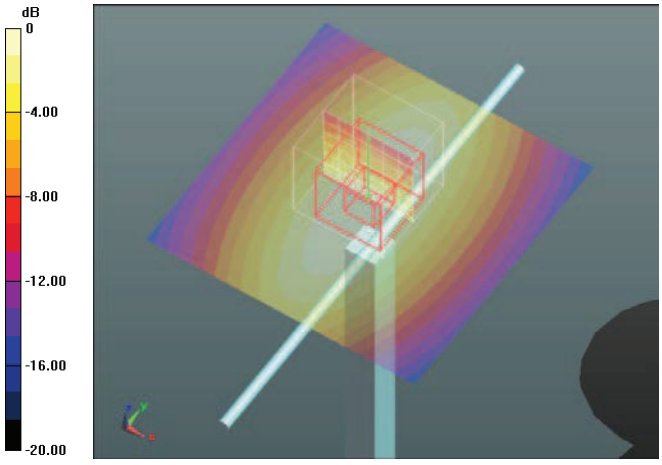
DUT: Dipole 900 MHz D900V2; Type: D900V2; Serial: D900V2 - SN:1d007

Communication System: UID 0, CW; Frequency: 900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; σ = 0.94 S/m; ε_r = 39.98; ρ = 1000 kg/m^3
Phantom section: Flat Section

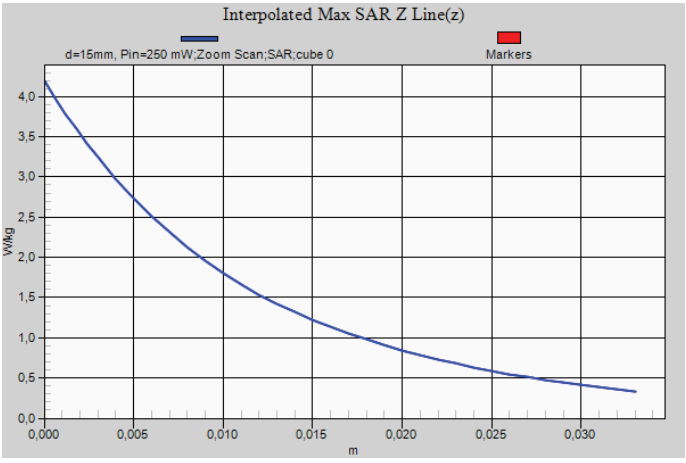
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(6.4, 6.4, 6.4); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D900V2 Dipole Head/d=15mm, Pin=250 mW/Area Scan (61x61x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.25 W/kg

System Performance Check with D900V2 Dipole Head/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.81 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 4.19 W/kg
SAR(1 g) = 2.8 W/kg; SAR(10 g) = 1.8 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 3.24 W/kg



0 dB = 3.24 W/kg = 5.11 dBW/kg



Validation results in 900 MHz Band for Body TSL

Test Laboratory: AT4 Wireless; Date: 07/10/2014

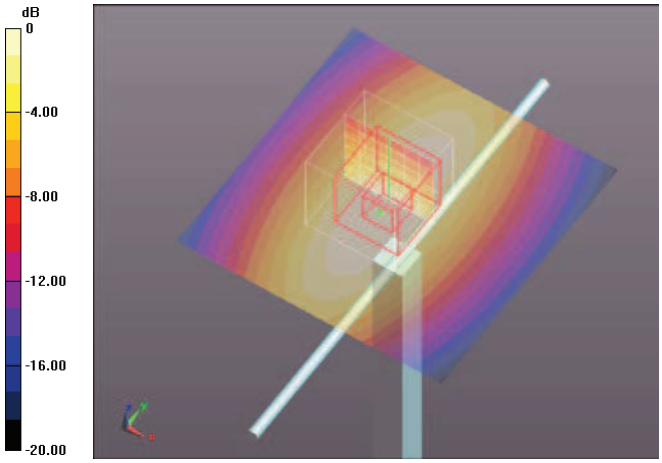
DUT: Dipole 900 MHz D900V2; Type: D900V2; Serial: D900V2 - SN:1d007

Communication System: UID 0, CW; Frequency: 900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; σ = 1 S/m; ε_r = 55.44; ρ = 1000 kg/m^3
Phantom section: Flat Section

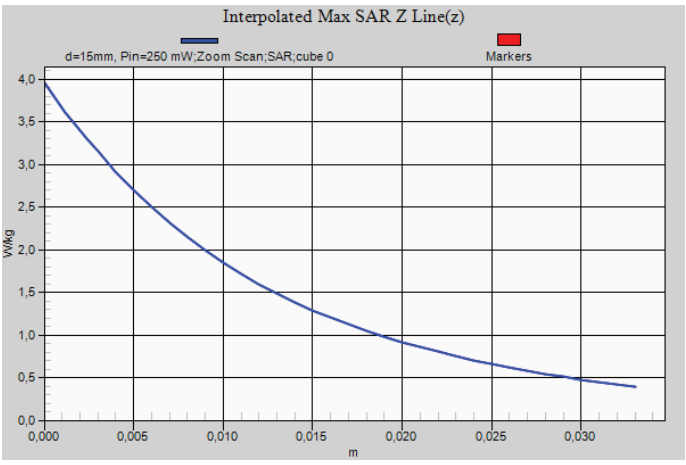
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(6.14, 6.14, 6.14); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D900V2 Dipole Body/d=15mm, Pin=250 mW/Area Scan (61x61x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.15 W/kg

System Performance Check with D900V2 Dipole Body/d=15mm, Pin=250 mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.56 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.95 W/kg
SAR(1 g) = 2.79 W/kg; SAR(10 g) = 1.81 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 3.15 W/kg



0 dB = 3.15 W/kg = 4.98 dBW/kg



Validation results in 1800 MHz Band for Head TSL

Test Laboratory: AT4 Wireless; Date: 01/10/2014

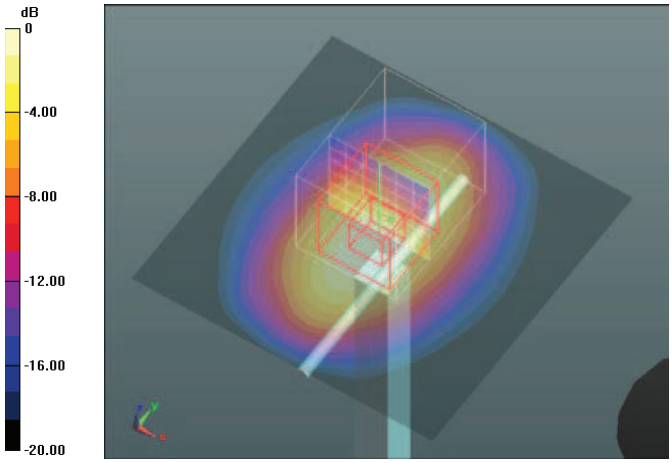
DUT: Dipole 1800 MHz D1800V2; Type: D1800V2; Serial: D1800V2 - SN:2d099

Communication System: UID 0, CW; Frequency: 1800 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.37 S/m; ε_r = 41.28; ρ = 1000 kg/m^3
Phantom section: Flat Section

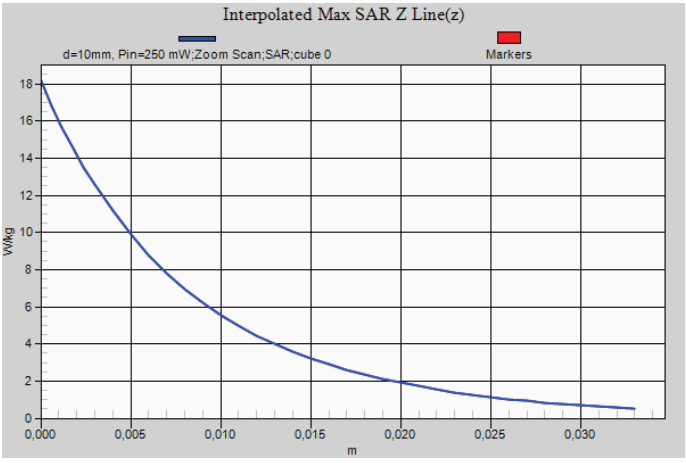
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(5.28, 5.28, 5.28); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D1800V2 Dipole Head/d=10mm, Pin=250 mW/Area Scan (61x61x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.9 W/kg

System Performance Check with D1800V2 Dipole Head/d=10mm, Pin=250 mW/Zoom Scan (7x9x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 98.91 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 18.1 W/kg
SAR(1 g) = 10.1 W/kg; SAR(10 g) = 5.23 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 12.6 W/kg



0 dB = 12.6 W/kg = 11.00 dBW/kg



Validation results in 1800 MHz Band for Body TSL

Test Laboratory: AT4 Wireless; Date: 02/10/2014

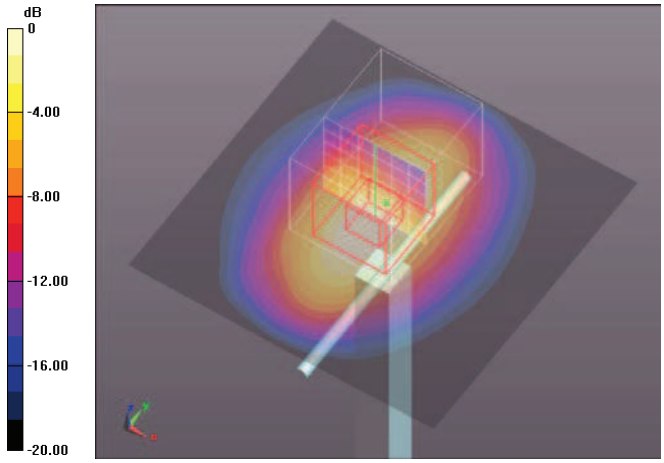
DUT: Dipole 1800 MHz D1800V2; Type: D1800V2; Serial: D1800V2 - SN:2d099

Communication System: UID 0, CW (0); Frequency: 1800 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.55 S/m; ε_r = 52.15; ρ = 1000 kg/m^3
Phantom section: Flat Section

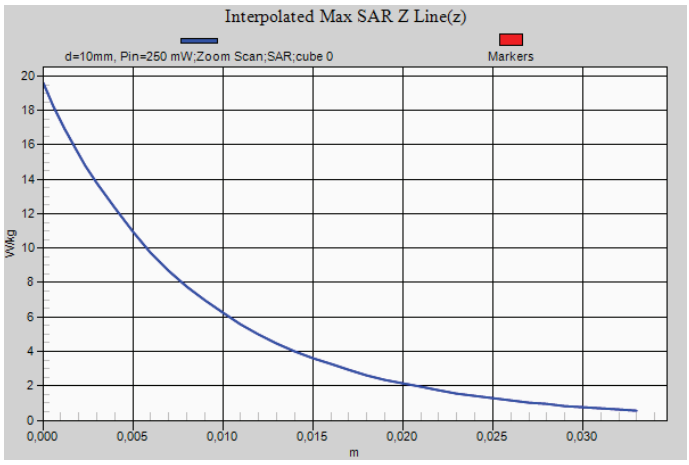
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(4.94, 4.94, 4.94); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D1800V2 Dipole Body/d=10mm, Pin=250 mW/Area Scan (61x61x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 14.3 W/kg

System Performance Check with D1800V2 Dipole Body/d=10mm, Pin=250 mW/Zoom Scan (7x9x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.96 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 19.6 W/kg
SAR(1 g) = 10.8 W/kg; SAR(10 g) = 5.63 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 13.8 W/kg



0 dB = 13.8 W/kg = 11.40 dBW/kg



Validation results in 2450 MHz Band for Head TSL

Test Laboratory: AT4 Wireless; Date: 08/10/2014

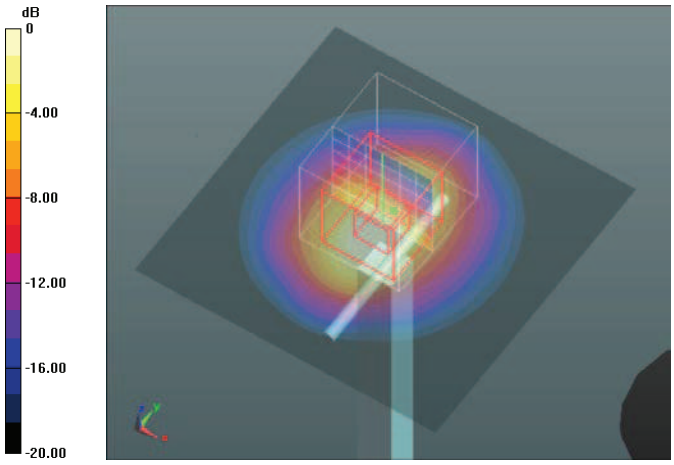
DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:xxx

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.86 S/m; ε_r = 39.55; ρ = 1000 kg/m^3
Phantom section: Flat Section

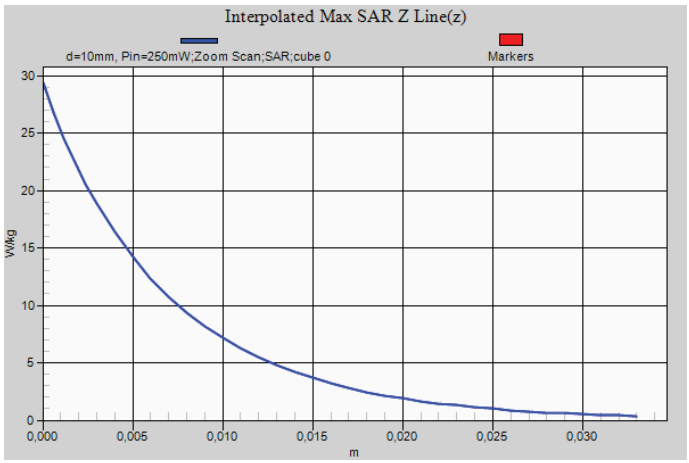
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(4.52, 4.52, 4.52); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D2450V2 Dipole Head 2/d=10mm, Pin=250mW/Area Scan (61x61x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 19.3 W/kg

System Performance Check with D2450V2 Dipole Head 2/d=10mm, Pin=250mW/Zoom Scan (7x8x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.0 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 29.3 W/kg
SAR(1 g) = 14.3 W/kg; SAR(10 g) = 6.65 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 18.9 W/kg



0 dB = 18.9 W/kg = 12.76 dBW/kg



Validation results in 2450 MHz Band for Body TSL

Test Laboratory: AT4 Wireless; Date: 09/10/2014

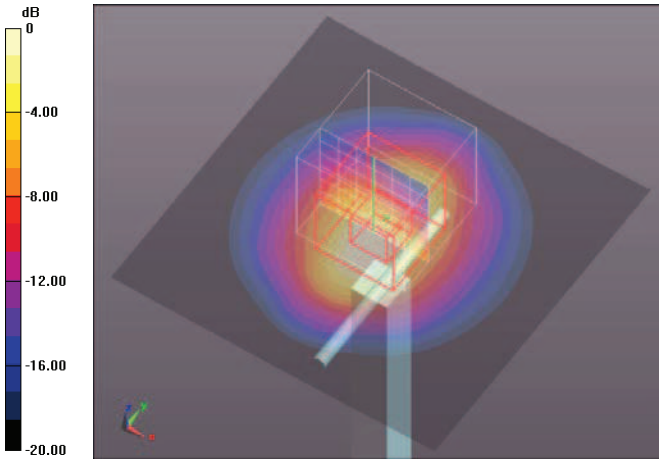
DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:xxx

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 2 S/m; ε_r = 52.39; ρ = 1000 kg/m^3
Phantom section: Flat Section

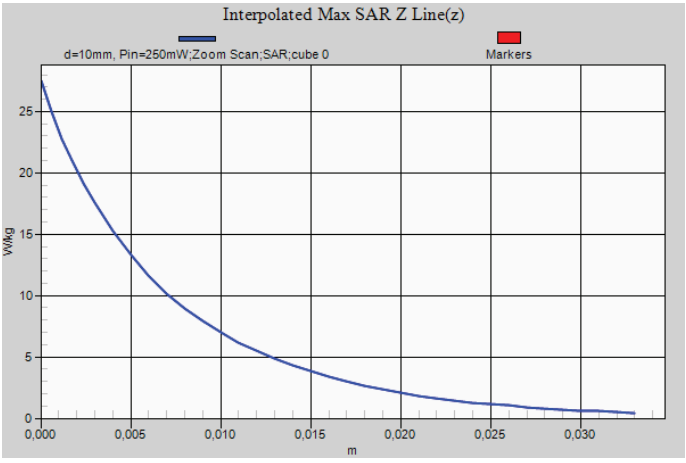
DASY5 Configuration:
- Probe: ES3DV3 - SN3052; ConvF(4.3, 4.3, 4.3); Calibrated: 24/09/2014;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D2450V2 Dipole Body/d=10mm, Pin=250mW/Area Scan (61x61x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 17.9 W/kg

System Performance Check with D2450V2 Dipole Body/d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.04 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 27.5 W/kg
SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.18 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 17.3 W/kg



0 dB = 17.3 W/kg = 12.38 dBW/kg



Validation results in 5200 MHz Band for Head TSL

Test Laboratory: AT4 Wireless; Date: 24/09/2014

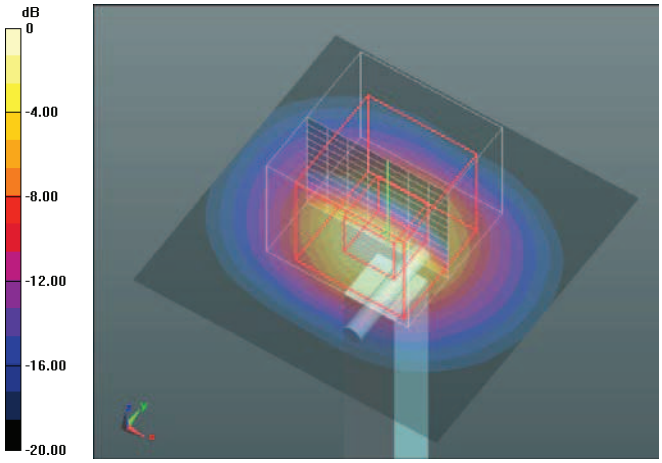
DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:3687

Communication System: UID 0, CW-5GHz; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5200 MHz; σ = 4.51 S/m; ε_r = 35.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

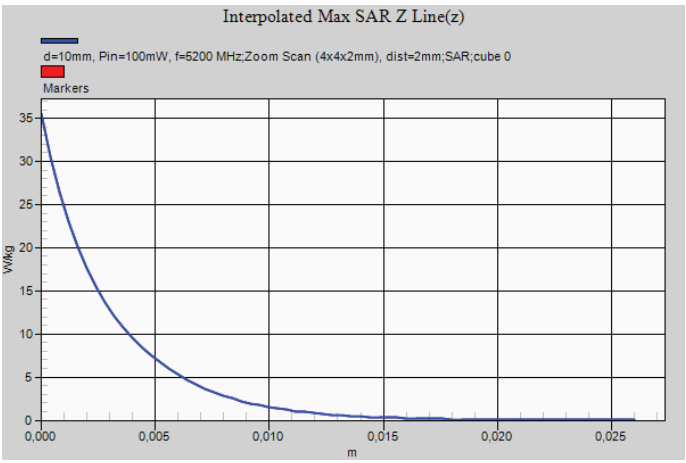
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(4.77, 4.77, 4.77); Calibrated: 14/07/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D5GHzV2 Dipole (5200 MHz) Head/d=10mm, Pin=100mW, f=5200 MHz/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.8 W/kg

System Performance Check with D5GHzV2 Dipole (5200 MHz) Head/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x2mm), dist=2mm (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 66.23 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 35.6 W/kg
SAR(1 g) = 8.51 W/kg; SAR(10 g) = 2.42 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 16.3 W/kg



0 dB = 16.3 W/kg = 12.12 dBW/kg



Validation results in 5200 MHz Band for Body TSL

Test Laboratory: AT4 Wireless; Date: 29/09/2014

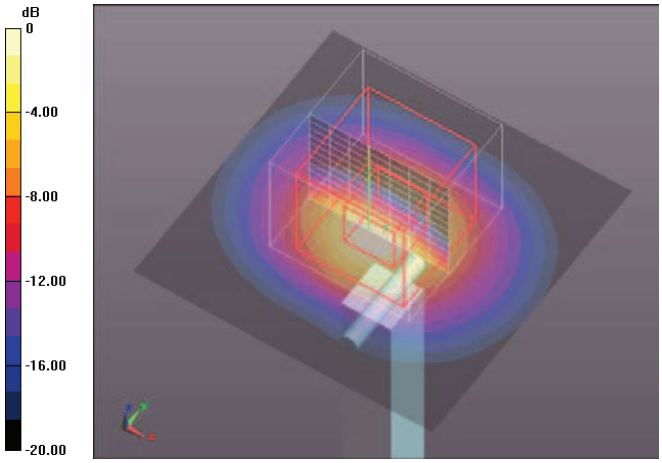
DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:3687

Communication System: UID 0, CW-5GHz; Frequency: 5200 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5200 MHz; σ = 5.08 S/m; ε_r = 47.01; ρ = 1000 kg/m^3
Phantom section: Flat Section

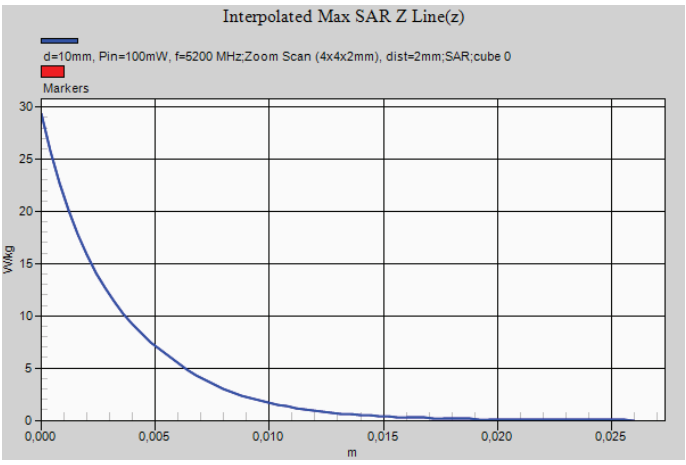
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(4.32, 4.32, 4.32); Calibrated: 14/07/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D5GHzV2 Dipole (5200 MHz) Body/d=10mm, Pin=100mW, f=5200 MHz/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 15.9 W/kg

System Performance Check with D5GHzV2 Dipole (5200 MHz) Body/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x2mm), dist=2mm (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 60.76 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 29.4 W/kg
SAR(1 g) = 7.75 W/kg; SAR(10 g) = 2.21 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 14.5 W/kg



0 dB = 14.5 W/kg = 11.61 dBW/kg



Validation results in 5500 MHz Band for Head TSL

Test Laboratory: AT4 Wireless; Date: 25/09/2014

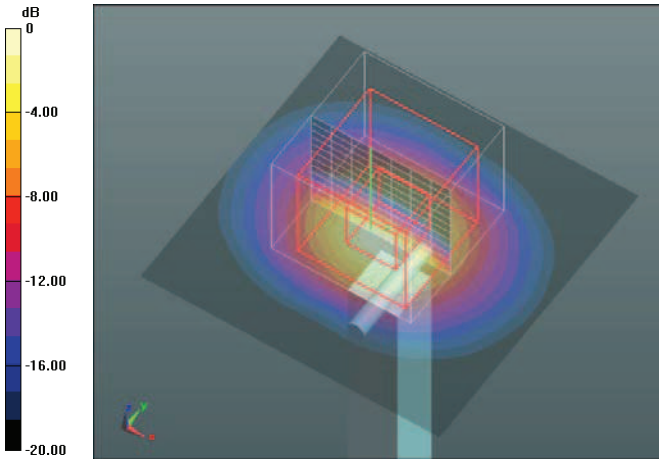
DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:3687

Communication System: UID 0, CW-5GHz; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5500 MHz; σ = 4.87 S/m; ε_r = 35.58; ρ = 1000 kg/m^3
Phantom section: Flat Section

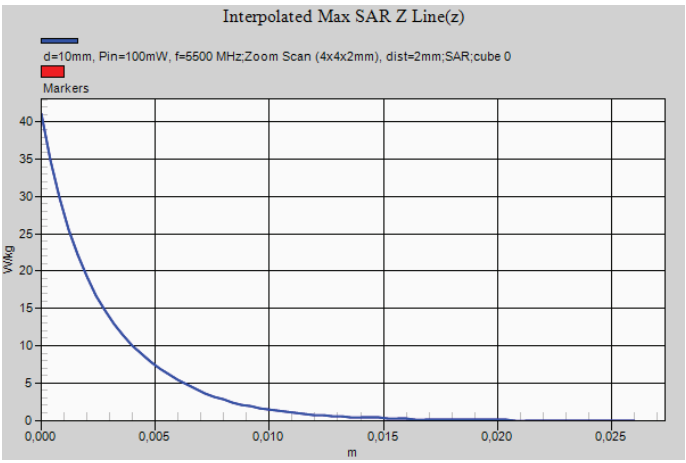
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(4.25, 4.25, 4.25); Calibrated: 14/07/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: SAM head-body simulator ; Type: Twin SAM V4.0; Serial: ---
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D5GHzV2 Dipole (5500 MHz) Head/d=10mm, Pin=100mW, f=5500 MHz/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.2 W/kg

System Performance Check with D5GHzV2 Dipole (5500 MHz) Head/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x2mm), dist=2mm (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 66.72 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 41.1 W/kg
SAR(1 g) = 9.18 W/kg; SAR(10 g) = 2.57 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 17.8 W/kg



0 dB = 17.8 W/kg = 12.50 dBW/kg



Validation results in 5500 MHz Band for Body TSL

Test Laboratory: AT4 Wireless; Date: 26/09/2014

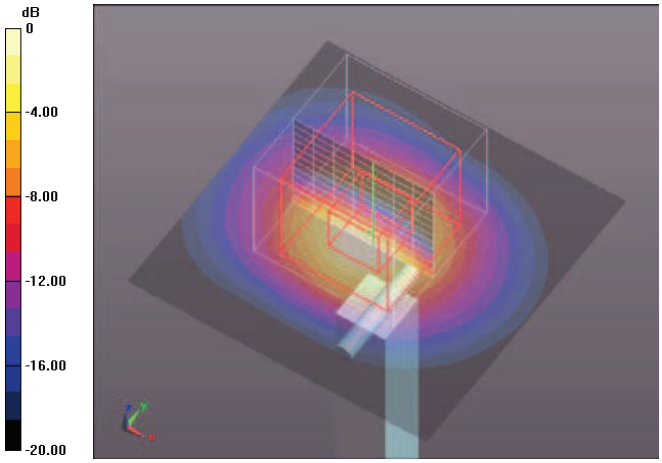
DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:3687

Communication System: UID 0, CW-5GHz; Frequency: 5500 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5500 MHz; σ = 5.45 S/m; ε_r = 46.45; ρ = 1000 kg/m^3
Phantom section: Flat Section

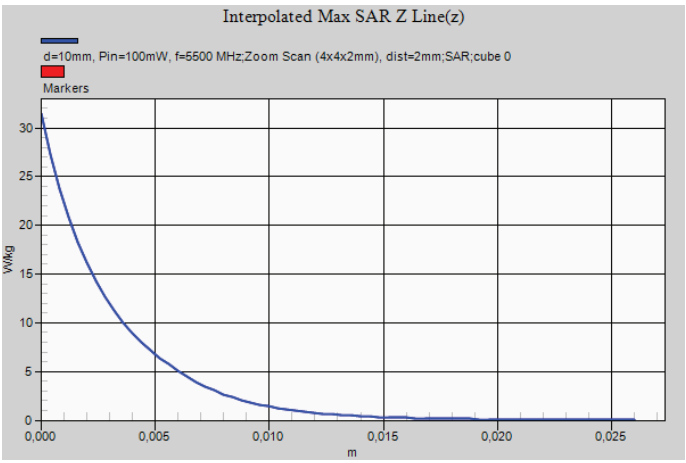
DASY5 Configuration:
- Probe: EX3DV4 - SN3687; ConvF(3.67, 3.67, 3.67); Calibrated: 14/07/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn669; Calibrated: 08/07/2014
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1060
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

System Performance Check with D5GHzV2 Dipole (5500 MHz) Body/d=10mm, Pin=100mW, f=5500 MHz/Area Scan (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 16.2 W/kg

System Performance Check with D5GHzV2 Dipole (5500 MHz) Body/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x2mm), dist=2mm (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 57.95 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 7.89 W/kg; SAR(10 g) = 2.31 W/kg (SAR corrected for target medium)
Maximum value of SAR (measured) = 14.9 W/kg



0 dB = 14.9 W/kg = 11.73 dBW/kg



Appendix E – Calibration data

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Accreditation No.: SCS 108

Client AT4 Wireless

Certificate No: DAE4-669_Jul14

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BM - SN: 669
Calibration procedure(s)	QA CAL-06.v26 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	July 08, 2014

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
Keithley Multimeter Type 2001	SN: 0810278	01-Oct-13 (No:13976)	Oct-14
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Auto DAE Calibration Unit	SE UWS 053 AA 1001	07-Jan-14 (in house check)	In house check: Jan-15
Calibrator Box V2.1	SE UMS 006 AA 1002	07-Jan-14 (in house check)	In house check: Jan-15

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	
Approved by:	Fin Bomholt	Deputy Technical Manager	i.V.

Issued: July 8, 2014

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

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Accreditation No.: **SCS 108**

Glossary

DAE	data acquisition electronics
Connector angle	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 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.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

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

Calibration Factors	X	Y	Z
High Range	403.321 ± 0.02% (k=2)	403.870 ± 0.02% (k=2)	404.236 ± 0.02% (k=2)
Low Range	3.95654 ± 1.50% (k=2)	3.97463 ± 1.50% (k=2)	3.97450 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	193.0 ° ± 1 °

Appendix (Additional assessments outside the scope of SCS108)

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	199998.19	1.59	0.00
Channel X	+ Input	20005.64	5.16	0.03
Channel X	- Input	-19996.31	4.81	-0.02
Channel Y	+ Input	199995.73	-1.00	-0.00
Channel Y	+ Input	20004.06	3.54	0.02
Channel Y	- Input	-19997.93	3.28	-0.02
Channel Z	+ Input	199997.38	0.79	0.00
Channel Z	+ Input	20004.17	3.55	0.02
Channel Z	- Input	-19997.90	3.31	-0.02

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.84	0.28	0.01
Channel X	+ Input	201.50	0.42	0.21
Channel X	- Input	-197.83	0.90	-0.45
Channel Y	+ Input	2001.06	0.57	0.03
Channel Y	+ Input	200.71	-0.32	-0.16
Channel Y	- Input	-199.39	-0.60	0.30
Channel Z	+ Input	2001.12	0.68	0.03
Channel Z	+ Input	199.84	-1.25	-0.62
Channel Z	- Input	-200.65	-1.79	0.90

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	2.02	0.88
	- 200	1.03	-0.74
Channel Y	200	11.55	10.93
	- 200	-12.37	-12.38
Channel Z	200	-9.56	-9.90
	- 200	8.49	8.06

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	-	-2.27	-2.78
Channel Y	200	9.49	-	-1.75
Channel Z	200	3.99	7.50	-

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	16079	16148
Channel Y	15795	15263
Channel Z	15997	15243

5. Input Offset Measurement

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

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.48	-0.54	1.65	0.44
Channel Y	-0.35	-1.84	1.53	0.54
Channel Z	0.15	-1.16	0.99	0.42

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

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Accreditation No.: SCS 108

Client **AT4 Wireless**

Certificate No: **ES3-3052_Sep14**

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3052

Calibration procedure(s) QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: September 24, 2014

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 E4419B	GB41293874	03-Apr-14 (No. 217-01911)	Apr-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN: S5054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN: S5277 (20x)	03-Apr-14 (No. 217-01919)	Apr-15
Reference 30 dB Attenuator	SN: S5129 (30b)	03-Apr-14 (No. 217-01920)	Apr-15
Reference Probe ES3DV2	SN: 3013	30-Dec-13 (No. ES3-3013_Dec13)	Dec-14
DAE4	SN: 660	13-Dec-13 (No. DAE4-660_Dec13)	Dec-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 24, 2014

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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 ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 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, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-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 with CW signal (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; Dx,y,z; VRx,y,z: A, B, C, D* 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 ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values 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 ± 50 MHz to ± 100 MHz.
- *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).

Probe ES3DV3

SN:3052

Manufactured: September 30, 2003
Repaired: September 18, 2014
Calibrated: September 24, 2014

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3052

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.13	0.42	1.10	± 10.1 %
DCP (mV)[B]	104.3	98.3	102.9	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	199.5	±3.5 %
		Y	0.0	0.0	1.0		180.7	
		Z	0.0	0.0	1.0		199.0	
10011-CAB	UMTS-FDD (WCDMA)	X	3.36	67.7	18.9	2.91	136.2	±0.7 %
		Y	3.05	64.3	16.5		144.5	
		Z	3.24	66.7	18.2		136.3	
10012-CAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	2.93	69.1	19.0	1.87	138.2	±0.7 %
		Y	2.41	64.0	15.8		143.3	
		Z	2.90	68.5	18.4		137.9	
10013-CAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	11.13	70.8	23.4	9.46	135.8	±3.3 %
		Y	10.99	69.1	21.9		143.7	
		Z	11.06	70.4	23.1		135.3	
10021-DAB	GSM-FDD (TDMA, GMSK)	X	10.62	86.4	23.2	9.39	144.0	±1.9 %
		Y	2.75	68.5	16.2		87.9	
		Z	17.37	95.8	26.8		144.4	
10023-DAB	GPRS-FDD (TDMA, GMSK, TN 0)	X	15.14	93.2	25.8	9.57	145.2	±2.2 %
		Y	2.61	67.2	15.9		82.8	
		Z	19.74	98.0	27.4		130.3	
10024-DAB	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	32.39	99.8	25.1	6.56	128.1	±1.4 %
		Y	4.81	76.8	17.9		126.8	
		Z	34.20	99.8	25.0		141.2	
10025-DAB	EDGE-FDD (TDMA, 8PSK, TN 0)	X	13.71	99.1	38.4	12.62	139.8	±3.0 %
		Y	4.87	67.9	23.1		59.1	
		Z	13.94	99.6	38.7		126.3	
10026-DAB	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	11.01	90.1	31.4	9.55	126.7	±2.5 %
		Y	5.75	74.5	24.4		124.5	
		Z	12.89	93.9	33.0		139.8	
10027-DAB	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	32.71	94.5	21.4	4.80	144.2	±1.4 %
		Y	2.79	69.7	13.7		132.6	
		Z	50.44	99.9	22.9		130.7	
10028-DAB	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	47.66	99.5	22.1	3.55	126.6	±2.2 %
		Y	24.59	92.3	19.6		146.3	
		Z	55.77	99.6	21.9		143.7	
10029-DAB	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	16.20	99.3	33.6	7.78	147.3	±3.3 %
		Y	5.14	72.9	22.5		132.6	
		Z	10.86	89.3	29.7		137.0	

10048-CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	X	7.45	83.0	25.7	13.80	90.0	±1.9 %
		Y	2.39	62.3	15.5		32.0	
		Z	7.27	82.6	25.8		84.7	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	13.92	91.7	26.1	10.79	148.8	±1.7 %
		Y	3.21	69.9	17.8		65.7	
		Z	14.37	92.6	26.6		138.7	
10058-DAB	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	7.02	80.2	25.3	6.52	128.8	±2.2 %
		Y	5.09	73.7	22.3		141.9	
		Z	14.75	96.3	31.4		144.1	
10098-CAB	UMTS-FDD (HSUPA, Subtest 2)	X	4.49	66.4	18.4	3.98	127.8	±0.9 %
		Y	4.51	65.2	17.4		150.0	
		Z	4.62	66.8	18.7		140.4	
10100-CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	6.34	67.3	19.6	5.67	134.3	±1.4 %
		Y	6.31	66.1	18.5		134.8	
		Z	6.54	68.0	20.0		148.0	
10102-CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	7.72	67.9	20.3	6.60	147.1	±1.9 %
		Y	7.76	66.9	19.3		148.6	
		Z	7.62	67.5	20.1		134.4	
10101-CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	7.72	67.9	20.3	6.42	147.1	±12.2 %
		Y	7.76	66.9	19.3		148.6	
		Z	7.62	67.5	20.1		134.4	
10110-CAB	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	5.87	66.2	19.2	5.75	129.6	±1.4 %
		Y	5.91	65.3	18.3		130.0	
		Z	6.06	67.0	19.7		141.4	
10154-CAB	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	5.87	66.2	19.2	5.75	129.6	±12.2 %
		Y	5.91	65.3	18.3		130.0	
		Z	6.06	67.0	19.7		141.4	
10112-CAB	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	7.44	67.6	20.2	6.59	142.4	±1.9 %
		Y	7.48	66.6	19.2		144.0	
		Z	7.35	67.3	20.0		130.5	
10109-CAB	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	7.44	67.6	20.2	6.43	142.4	±12.2 %
		Y	7.48	66.6	19.2		144.0	
		Z	7.35	67.3	20.0		130.5	
10150-CAB	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	7.44	67.6	20.2	6.60	142.4	±12.2 %
		Y	7.48	66.6	19.2		144.0	
		Z	7.35	67.3	20.0		130.5	
10149-CAB	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	7.44	67.6	20.2	6.42	142.4	±12.2 %
		Y	7.48	66.6	19.2		144.0	
		Z	7.35	67.3	20.0		130.5	
10117-CAA	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	10.44	69.6	21.7	8.07	149.5	±2.7 %
		Y	10.10	67.7	20.2		124.9	
		Z	10.31	69.2	21.5		136.0	
10140-CAB	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	7.66	68.0	20.2	6.49	147.5	±1.7 %
		Y	7.46	66.2	18.9		124.4	
		Z	7.58	67.6	20.1		134.6	

10141-CAB	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	7.66	68.0	20.2	6.53	147.5	±12.2 %
		Y	7.46	66.2	18.9		124.4	
		Z	7.58	67.6	20.1		134.6	
10146-CAB	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	6.36	66.9	19.8	6.41	127.6	±1.4 %
		Y	6.30	65.7	18.7		128.9	
		Z	6.55	67.6	20.2		139.3	
10147-CAB	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	6.63	67.1	20.0	6.72	127.1	±1.7 %
		Y	6.58	65.9	19.0		128.3	
		Z	6.83	67.8	20.5		139.2	
10157-CAB	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	6.62	66.8	19.8	6.49	130.4	±1.7 %
		Y	6.65	65.8	18.9		133.0	
		Z	6.83	67.5	20.2		142.9	
10158-CAB	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	7.15	67.3	20.0	6.62	137.7	±1.9 %
		Y	7.22	66.4	19.2		140.7	
		Z	7.05	66.9	19.9		125.4	
10111-CAB	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	7.15	67.3	20.0	6.44	137.7	±12.2 %
		Y	7.22	66.4	19.2		140.7	
		Z	7.05	66.9	19.9		125.4	
10113-CAB	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	7.15	67.3	20.0	6.62	137.7	±12.2 %
		Y	7.22	66.4	19.2		140.7	
		Z	7.05	66.9	19.9		125.4	
10155-CAB	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	7.15	67.3	20.0	6.43	137.7	±12.2 %
		Y	7.22	66.4	19.2		140.7	
		Z	7.05	66.9	19.9		125.4	
10161-CAB	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	7.15	67.3	20.0	6.43	137.7	±12.2 %
		Y	7.22	66.4	19.2		140.7	
		Z	7.05	66.9	19.9		125.4	
10162-CAB	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	7.15	67.3	20.0	6.58	137.7	±12.2 %
		Y	7.22	66.4	19.2		140.7	
		Z	7.05	66.9	19.9		125.4	
10159-CAB	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	6.78	67.1	20.0	6.56	132.1	±1.9 %
		Y	6.79	66.1	19.0		135.6	
		Z	6.97	67.8	20.4		144.2	
10173-CAB	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	8.21	77.1	27.3	9.48	128.8	±2.7 %
		Y	6.63	70.6	23.3		143.3	
		Z	9.09	80.2	29.0		142.6	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	8.21	77.1	27.3	9.49	128.8	±12.2 %
		Y	6.63	70.6	23.3		143.3	
		Z	9.09	80.2	29.0		142.6	
10235-CAB	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	8.21	77.1	27.3	9.48	128.8	±12.2 %
		Y	6.63	70.6	23.3		143.3	
		Z	9.09	80.2	29.0		142.6	
10229-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	8.21	77.1	27.3	9.48	128.8	±12.2 %
		Y	6.63	70.6	23.3		143.3	
		Z	9.09	80.2	29.0		142.6	

10232-CAB	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	8.21	77.1	27.3	9.48	128.8	±12.2 %
		Y	6.63	70.6	23.3		143.3	
		Z	9.09	80.2	29.0		142.6	
10238-CAB	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	8.21	77.1	27.3	9.48	128.8	±12.2 %
		Y	6.63	70.6	23.3		143.3	
		Z	9.09	80.2	29.0		142.6	
10179-CAB	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	5.61	67.5	20.4	6.50	131.2	±1.9 %
		Y	5.52	66.6	19.5		149.2	
		Z	5.78	68.2	20.8		142.1	
10170-CAB	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	5.61	67.5	20.4	6.52	131.2	±12.2 %
		Y	5.52	66.6	19.5		149.2	
		Z	5.78	68.2	20.8		142.1	
10176-CAB	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	5.61	67.5	20.4	6.52	131.2	±12.2 %
		Y	5.52	66.6	19.5		149.2	
		Z	5.78	68.2	20.8		142.1	
10188-CAB	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	5.61	67.5	20.4	6.52	131.2	±12.2 %
		Y	5.52	66.6	19.5		149.2	
		Z	5.78	68.2	20.8		142.1	
10180-CAB	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	5.61	67.5	20.4	6.50	131.2	±12.2 %
		Y	5.52	66.6	19.5		149.2	
		Z	5.78	68.2	20.8		142.1	
10178-CAB	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	5.61	67.5	20.4	6.52	131.2	±12.2 %
		Y	5.52	66.6	19.5		149.2	
		Z	5.78	68.2	20.8		142.1	
10182-CAB	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	5.61	67.5	20.4	6.52	131.2	±12.2 %
		Y	5.52	66.6	19.5		149.2	
		Z	5.78	68.2	20.8		142.1	
10185-CAB	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	5.61	67.5	20.4	6.51	131.2	±12.2 %
		Y	5.52	66.6	19.5		149.2	
		Z	5.78	68.2	20.8		142.1	
10187-CAB	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	4.91	66.6	19.6	5.73	132.5	±1.7 %
		Y	4.82	65.4	18.6		149.1	
		Z	5.03	67.1	19.9		144.0	
10166-CAB	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	4.91	66.6	19.6	5.46	132.5	±12.2 %
		Y	4.82	65.4	18.6		149.1	
		Z	5.03	67.1	19.9		144.0	
10181-CAB	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	4.91	66.6	19.6	5.72	132.5	±12.2 %
		Y	4.82	65.4	18.6		149.1	
		Z	5.03	67.1	19.9		144.0	
10169-CAB	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	4.91	66.6	19.6	5.73	132.5	±12.2 %
		Y	4.82	65.4	18.6		149.1	
		Z	5.03	67.1	19.9		144.0	
10175-CAB	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	4.91	66.6	19.6	5.72	132.5	±12.2 %
		Y	4.82	65.4	18.6		149.1	
		Z	5.03	67.1	19.9		144.0	

10177-CAD	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	4.91	66.6	19.6	5.73	132.5	±12.2 %
		Y	4.82	65.4	18.6		149.1	
		Z	5.03	67.1	19.9		144.0	
10184-CAB	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	4.91	66.6	19.6	5.73	132.5	±12.2 %
		Y	4.82	65.4	18.6		149.1	
		Z	5.03	67.1	19.9		144.0	
10196-CAA	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	9.98	69.0	21.5	8.10	140.6	±2.7 %
		Y	10.10	68.2	20.6		140.7	
		Z	9.90	68.8	21.4		129.4	
10225-CAB	UMTS-FDD (HSPA+)	X	6.99	67.1	19.5	5.97	143.6	±1.4 %
		Y	7.11	66.4	18.8		149.0	
		Z	6.91	66.8	19.3		133.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	8.00	76.7	27.1	9.22	132.0	±2.7 %
		Y	6.43	70.1	23.1		147.2	
		Z	8.85	79.7	28.7		146.7	
10237-CAB	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	8.00	76.7	27.1	9.21	132.0	±12.2 %
		Y	6.43	70.1	23.1		147.2	
		Z	8.85	79.7	28.7		146.7	
10172-CAB	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	8.00	76.7	27.1	9.21	132.0	±12.2 %
		Y	6.43	70.1	23.1		147.2	
		Z	8.85	79.7	28.7		146.7	
10231-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	8.00	76.7	27.1	9.19	132.0	±12.2 %
		Y	6.43	70.1	23.1		147.2	
		Z	8.85	79.7	28.7		146.7	
10234-CAB	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	8.00	76.7	27.1	9.21	132.0	±12.2 %
		Y	6.43	70.1	23.1		147.2	
		Z	8.85	79.7	28.7		146.7	
10240-CAB	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	8.00	76.7	27.1	9.21	132.0	±12.2 %
		Y	6.43	70.1	23.1		147.2	
		Z	8.85	79.7	28.7		146.7	
10246-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	8.24	73.2	25.3	9.30	124.9	±3.8 %
		Y	7.22	68.4	22.2		139.6	
		Z	8.98	75.8	26.8		140.1	
10249-CAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	8.24	73.2	25.3	9.29	124.9	±12.2 %
		Y	7.22	68.4	22.2		139.6	
		Z	8.98	75.8	26.8		140.1	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	8.24	73.2	25.3	9.34	124.9	±12.2 %
		Y	7.22	68.4	22.2		139.6	
		Z	8.98	75.8	26.8		140.1	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	9.05	73.9	26.0	9.96	128.6	±3.8 %
		Y	8.03	69.3	22.9		146.6	
		Z	9.83	76.5	27.6		144.6	
10247-CAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	9.05	73.9	26.0	9.91	128.6	±12.2 %
		Y	8.03	69.3	22.9		146.6	
		Z	9.83	76.5	27.6		144.6	

10244-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	9.05	73.9	26.0	10.06	128.6	±12.2 %
		Y	8.03	69.3	22.9		146.6	
		Z	9.83	76.5	27.6		144.6	
10262-CAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	10.05	74.8	26.4	9.83	145.4	±3.3 %
		Y	8.44	68.3	22.1		138.9	
		Z	9.81	74.1	26.1		133.2	
10250-CAB	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	10.05	74.8	26.4	9.81	145.4	±12.2 %
		Y	8.44	68.3	22.1		138.9	
		Z	9.81	74.1	26.1		133.2	
10259-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	10.05	74.8	26.4	9.98	145.4	±12.2 %
		Y	8.44	68.3	22.1		138.9	
		Z	9.81	74.1	26.1		133.2	
10264-CAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	9.03	74.4	25.8	9.23	135.1	±3.3 %
		Y	7.47	67.7	21.5		132.4	
		Z	8.83	73.7	25.5		124.7	
10252-CAB	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	9.03	74.4	25.8	9.24	135.1	±12.2 %
		Y	7.47	67.7	21.5		132.4	
		Z	8.83	73.7	25.5		124.7	
10261-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	9.03	74.4	25.8	9.24	135.1	±12.2 %
		Y	7.47	67.7	21.5		132.4	
		Z	8.83	73.7	25.5		124.7	
10265-CAB	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	9.82	72.7	25.2	9.92	127.0	±3.8 %
		Y	8.92	68.6	22.3		145.9	
		Z	10.52	74.9	26.6		142.0	
10152-CAB	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	9.82	72.7	25.2	9.92	127.0	±12.2 %
		Y	8.92	68.6	22.3		145.9	
		Z	10.52	74.9	26.6		142.0	
10267-CAB	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	9.90	75.7	26.4	9.30	144.2	±3.5 %
		Y	7.92	68.2	21.7		136.6	
		Z	9.53	74.6	25.9		131.7	
10151-CAB	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	9.90	75.7	26.4	9.28	144.2	±12.2 %
		Y	7.92	68.2	21.7		136.6	
		Z	9.53	74.6	25.9		131.7	
10297-AAA	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	6.25	67.0	19.6	5.81	133.5	±1.4 %
		Y	6.26	65.9	18.6		134.7	
		Z	6.44	67.6	19.9		147.8	
10299-AAA	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	6.52	67.2	19.9	6.39	130.9	±1.7 %
		Y	6.48	66.0	18.9		130.5	
		Z	6.68	67.7	20.2		144.1	
10300-AAA	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	6.71	67.2	20.0	6.60	131.2	±1.7 %
		Y	6.66	66.0	19.0		129.6	
		Z	6.89	67.9	20.4		143.8	
10415-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	2.67	68.6	18.7	1.54	145.7	±0.5 %
		Y	2.30	64.3	16.0		141.9	
		Z	2.54	67.4	18.1		135.2	

10416-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	X	10.13	69.3	21.7	8.23	143.5	±2.7 %
		Y	10.20	68.2	20.7		142.2	
		Z	10.02	68.9	21.5		131.6	
10418-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	X	10.01	69.2	21.6	8.14	142.9	±2.5 %
		Y	10.10	68.3	20.7		142.3	
		Z	9.92	69.0	21.6		132.0	
10419-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	X	10.08	69.2	21.7	8.19	144.0	±2.7 %
		Y	10.19	68.3	20.8		143.7	
		Z	10.00	69.0	21.6		132.9	

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 NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 11 and 12.
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3052

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	6.73	6.73	6.73	0.80	1.13	± 12.0 %
835	41.5	0.90	6.50	6.50	6.50	0.52	1.40	± 12.0 %
900	41.5	0.97	6.40	6.40	6.40	0.77	1.16	± 12.0 %
1750	40.1	1.37	5.28	5.28	5.28	0.41	1.60	± 12.0 %
1900	40.0	1.40	5.12	5.12	5.12	0.43	1.62	± 12.0 %
2000	40.0	1.40	5.10	5.10	5.10	0.41	1.60	± 12.0 %
2450	39.2	1.80	4.52	4.52	4.52	0.71	1.28	± 12.0 %
2600	39.0	1.96	4.37	4.37	4.37	0.80	1.21	± 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 ± 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 frequencies 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 frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3052

Calibration Parameter Determined in Body 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	55.5	0.96	6.34	6.34	6.34	0.80	1.14	± 12.0 %
835	55.2	0.97	6.26	6.26	6.26	0.75	1.18	± 12.0 %
900	55.0	1.05	6.14	6.14	6.14	0.44	1.56	± 12.0 %
1750	53.4	1.49	4.94	4.94	4.94	0.46	1.68	± 12.0 %
1900	53.3	1.52	4.71	4.71	4.71	0.45	1.73	± 12.0 %
2000	53.3	1.52	4.75	4.75	4.75	0.55	1.56	± 12.0 %
2450	52.7	1.95	4.30	4.30	4.30	0.74	1.10	± 12.0 %
2600	52.5	2.16	4.16	4.16	4.16	0.80	1.01	± 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 ± 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 frequencies 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 frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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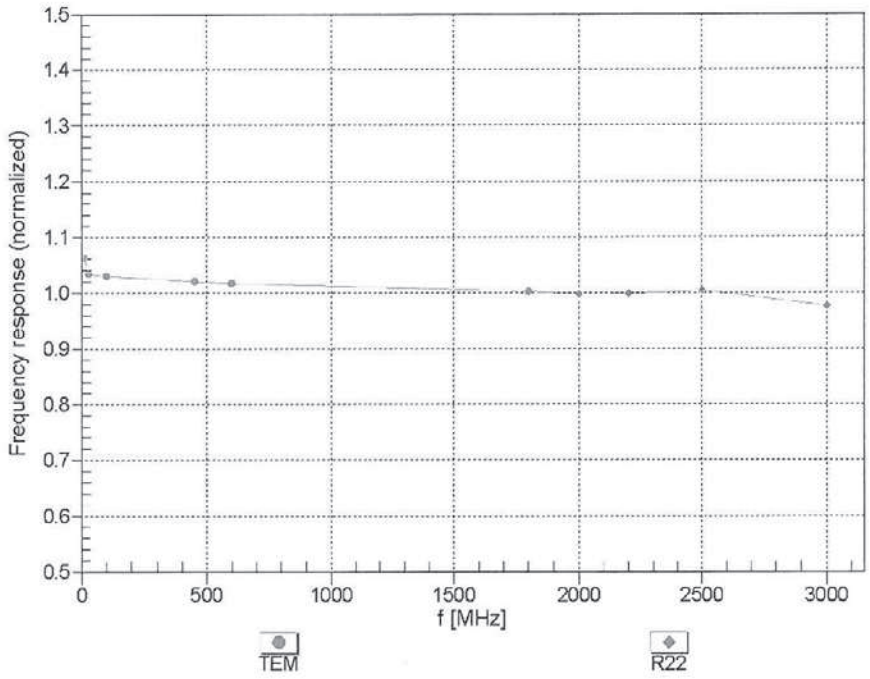
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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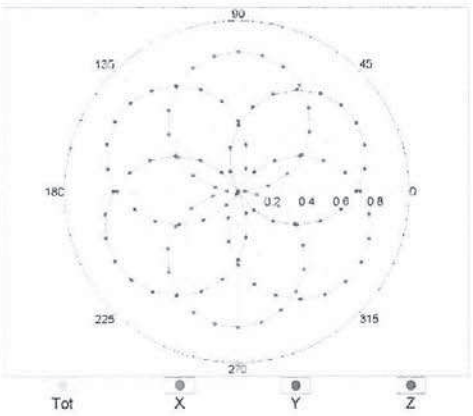
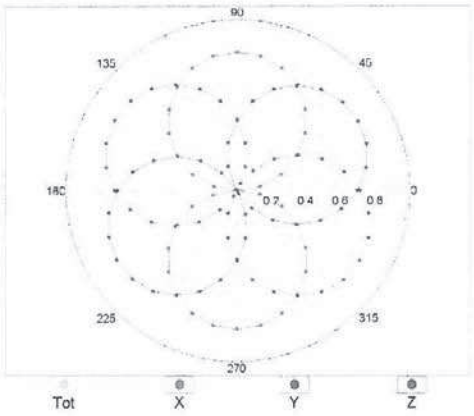
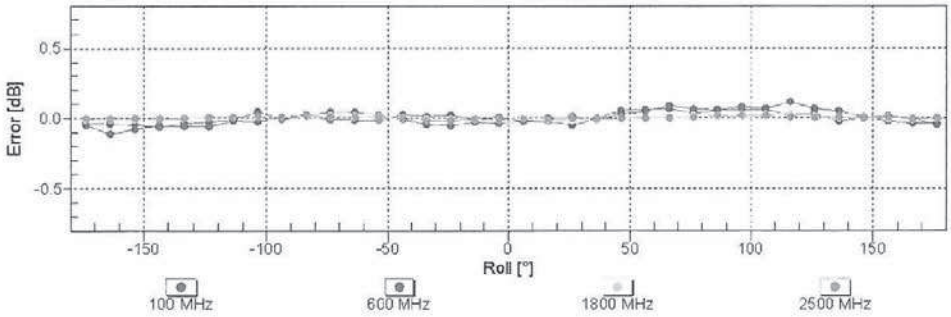
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



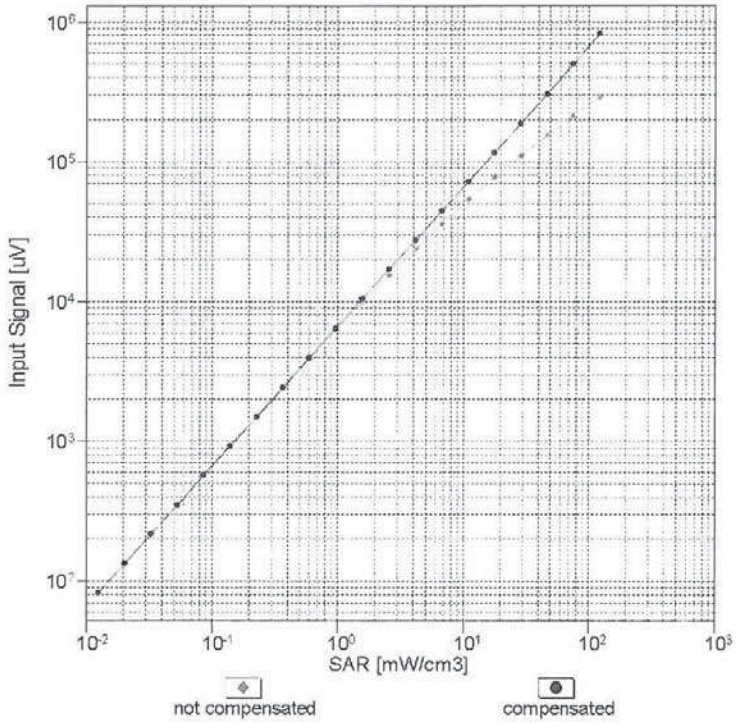
f=1800 MHz,R22

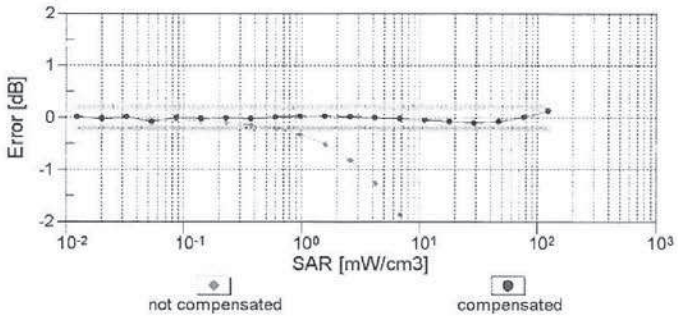




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})
(TEM cell , f_{eval}= 1900 MHz)

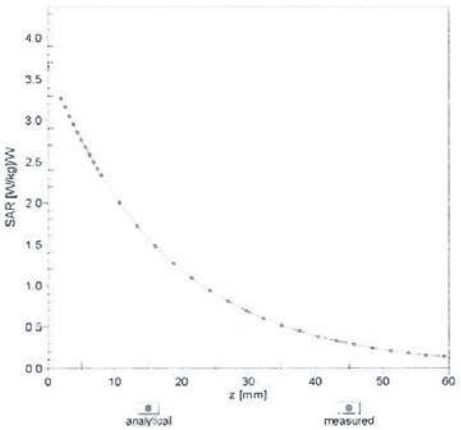




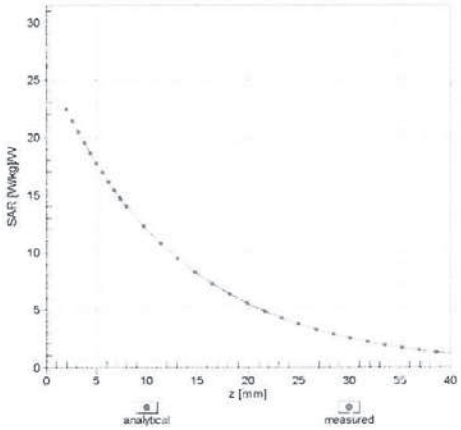
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 900 MHz,WGLS R9 (H_convF)

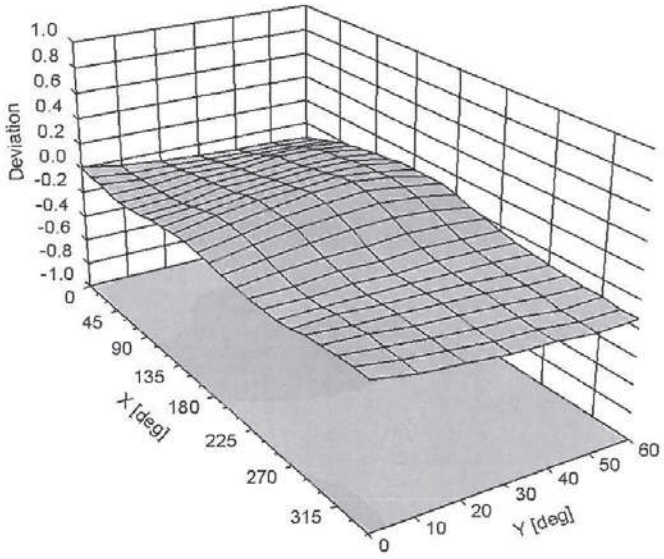


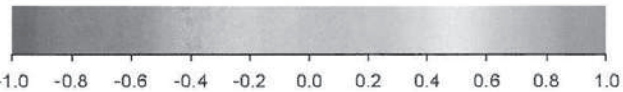
f = 1750 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3052

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-53.7
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	2 mm

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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Accreditation No.: SCS 108

Client AT4 Wireless

Certificate No: EX3-3687_Jul14

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3687

Calibration procedure(s): QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: July 14, 2014

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 E4419B	GB41293874	03-Apr-14 (No. 217-01911)	Apr-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN: S5054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN: S5277 (20x)	03-Apr-14 (No. 217-01919)	Apr-15
Reference 30 dB Attenuator	SN: S5129 (30b)	03-Apr-14 (No. 217-01920)	Apr-15
Reference Probe ES3DV2	SN: 3013	30-Dec-13 (No. ES3-3013_Dec13)	Dec-14
DAE4	SN: 660	13-Dec-13 (No. DAE4-660_Dec13)	Dec-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 17, 2014

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS) **Accreditation No.: SCS 108**
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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 ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 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, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-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 with CW signal (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; Dx,y,z; VRx,y,z*: *A, B, C, D* 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 ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values 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 ± 50 MHz to ± 100 MHz.
- *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).