DUT: ZNFL713DL; Type: Portable Handset; Serial: 19027

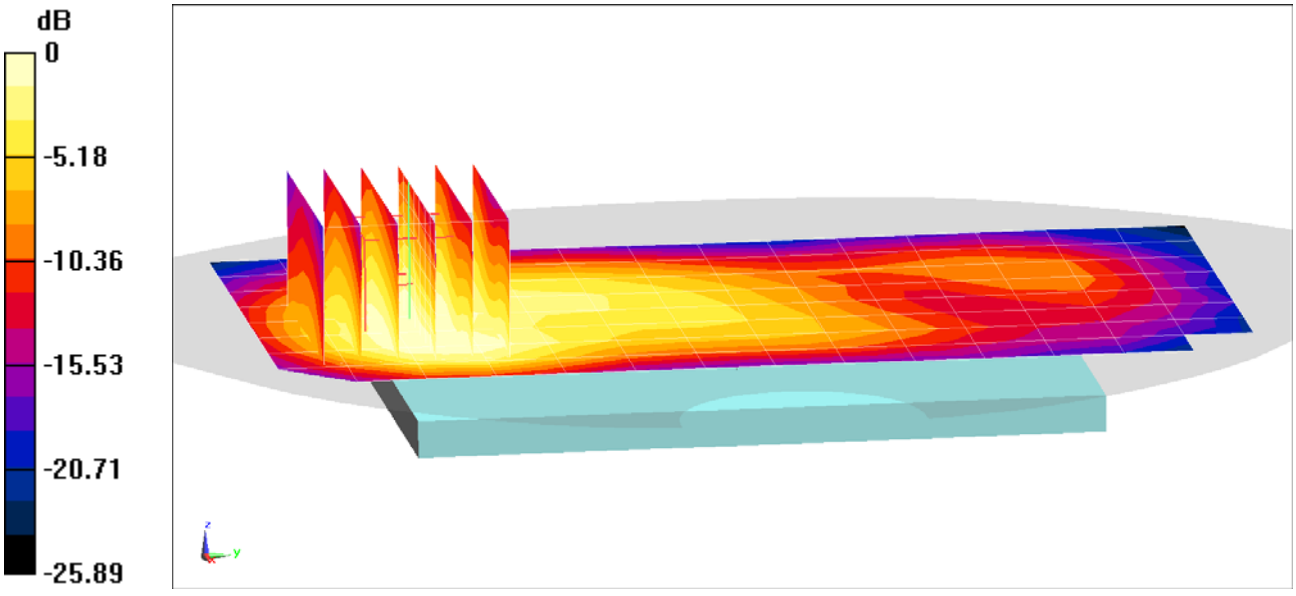
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
$f = 1860$ MHz; $\sigma = 1.526$ S/m; $\varepsilon_r = 53.67$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-17-2018; Ambient Temp: 22.0°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN3914; ConvF(7.62, 7.62, 7.62); Calibrated: 2/14/2018;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 2 (PCS), Body SAR, Back side, Low.ch
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (8x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.34 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 0.926 W/kg
SAR(1 g) = 0.594 W/kg



0 dB = 0.747 W/kg = -1.27 dBW/kg

DUT: ZNFL713DL; Type: Portable Handset; Serial: 19027

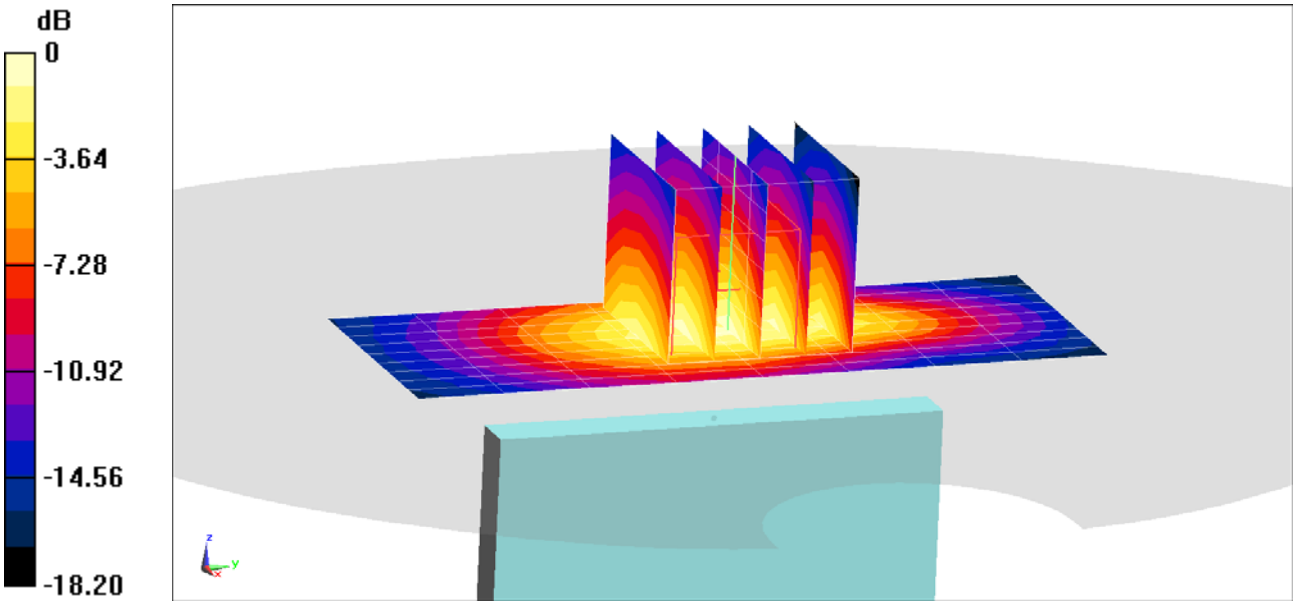
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.571 S/m; ε_r = 53.584; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-17-2018; Ambient Temp: 22.0°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN3914; ConvF(7.62, 7.62, 7.62); Calibrated: 2/14/2018;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 2 (PCS), Body SAR, Bottom Edge, High.ch
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.34 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.95 W/kg
SAR(1 g) = 1.14 W/kg



0 dB = 1.65 W/kg = 2.17 dBW/kg

DUT: ZNFL713DL; Type: Portable Handset; Serial: 19100

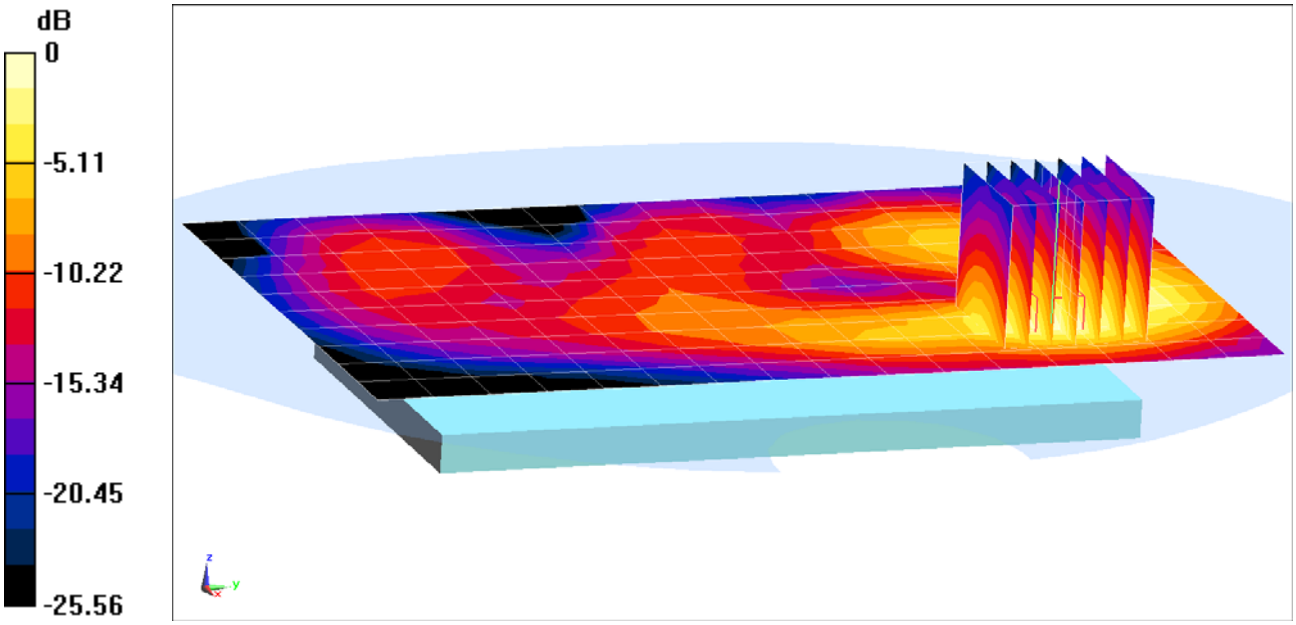
Communication System: UID 0, _IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.97 S/m; ε_r = 51.982; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-15-2018; Ambient Temp: 22.6°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3332; ConvF(4.55, 4.55, 4.55); Calibrated: 8/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/9/2017
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Body SAR, Ch 1, 1 Mbps, Back Side

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.46 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.841 W/kg
SAR(1 g) = 0.388 W/kg



0 dB = 0.526 W/kg = -2.79 dBW/kg

DUT: ZNFL713DL; Type: Portable Handset; Serial: 19100

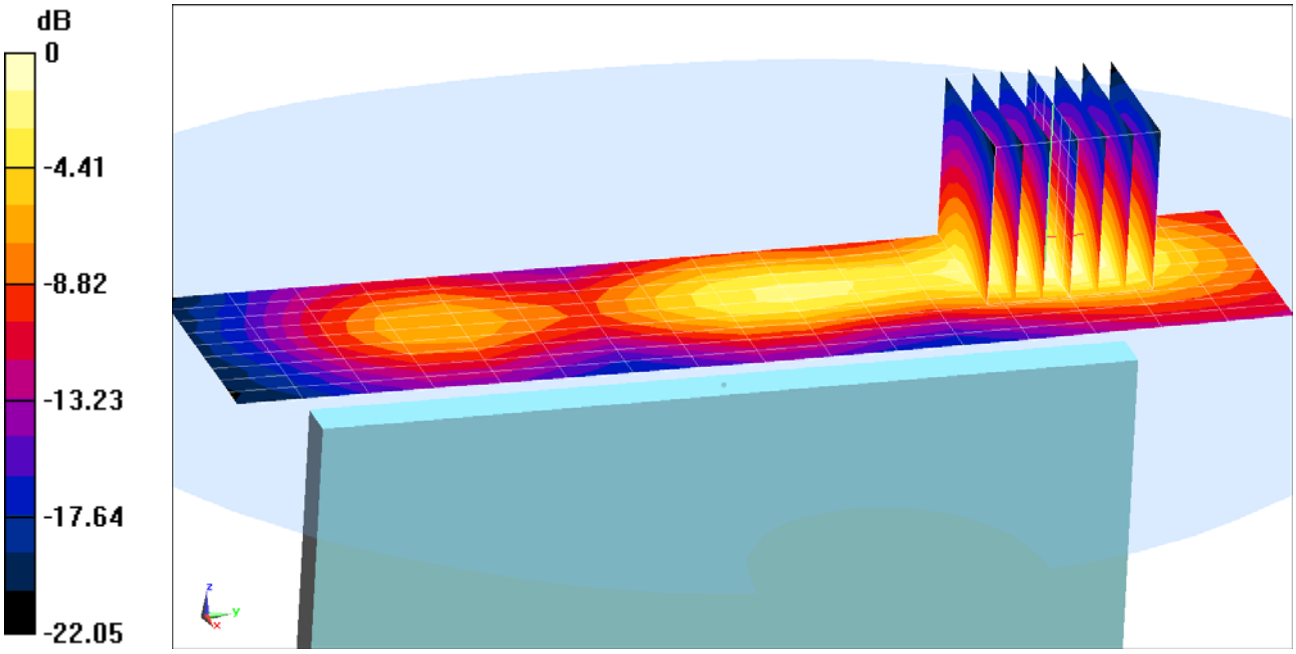
Communication System: UID 0, _IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
$f = 2462$ MHz; $\sigma = 2.021$ S/m; $\varepsilon_r = 51.826$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-15-2018; Ambient Temp: 22.6°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3332; ConvF(4.55, 4.55, 4.55); Calibrated: 8/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/9/2017
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Body SAR, Ch 11, 1 Mbps, Left Edge

Area Scan (10x17x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.94 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.598 W/kg



0 dB = 0.780 W/kg = -1.08 dBW/kg

DUT: ZNFL713DL; Type: Portable Handset; Serial: 19019

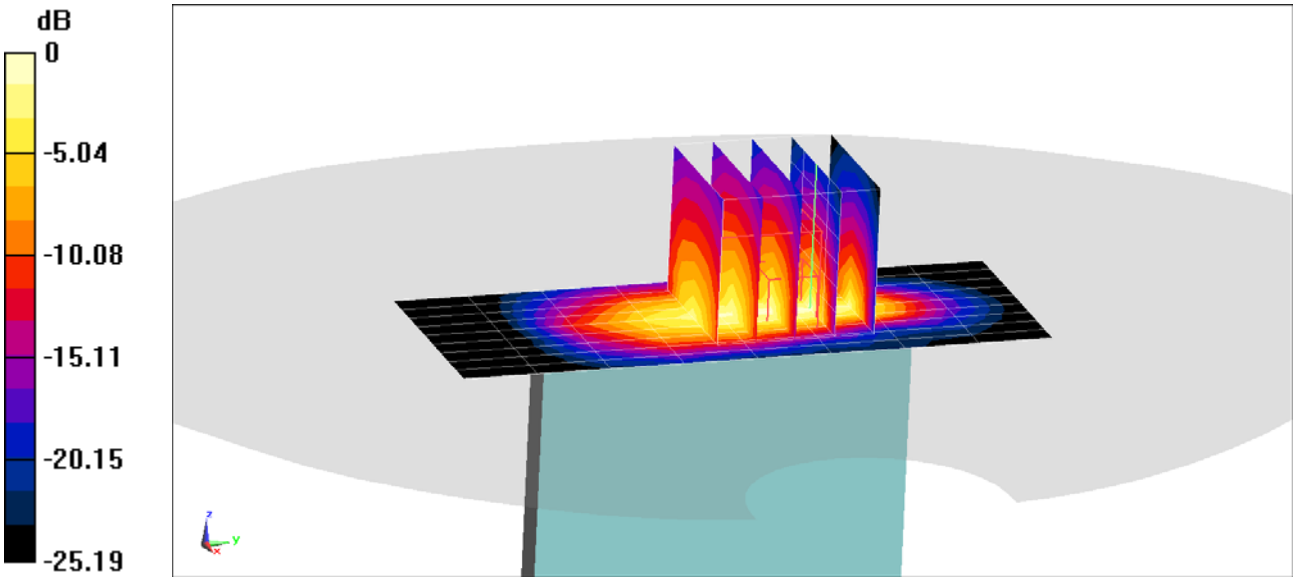
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.4 MHz; σ = 1.489 S/m; ε_r = 51.351; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-20-2018; Ambient Temp: 23.0°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7406; ConvF(8.08, 8.08, 8.08); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 1750, Phablet SAR, Bottom Edge, Mid.ch

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 67.35 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 16.2 W/kg
SAR(10 g) = 2.76 W/kg



0 dB = 13.1 W/kg = 11.17 dBW/kg

DUT: ZNFL713DL; Type: Portable Handset; Serial: 19019

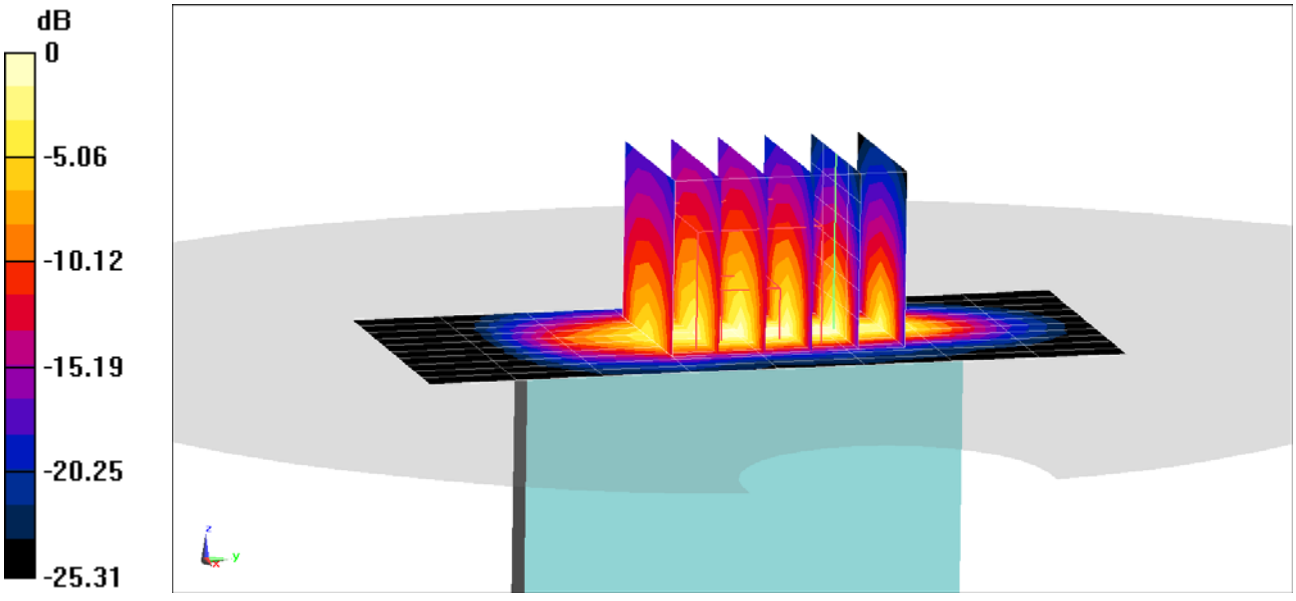
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; σ = 1.558 S/m; ε_r = 52.748; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 3-19-2018; Ambient Temp: 20.7°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3914; ConvF(7.62, 7.62, 7.62); Calibrated: 2/14/2018;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: UMTS 1900, Phablet SAR, Bottom Edge, Mid.ch

Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 69.56 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 17.0 W/kg
SAR(10 g) = 3.12 W/kg



0 dB = 13.6 W/kg = 11.34 dBW/kg

DUT: ZNFL713DL; Type: Portable Handset; Serial: 19167

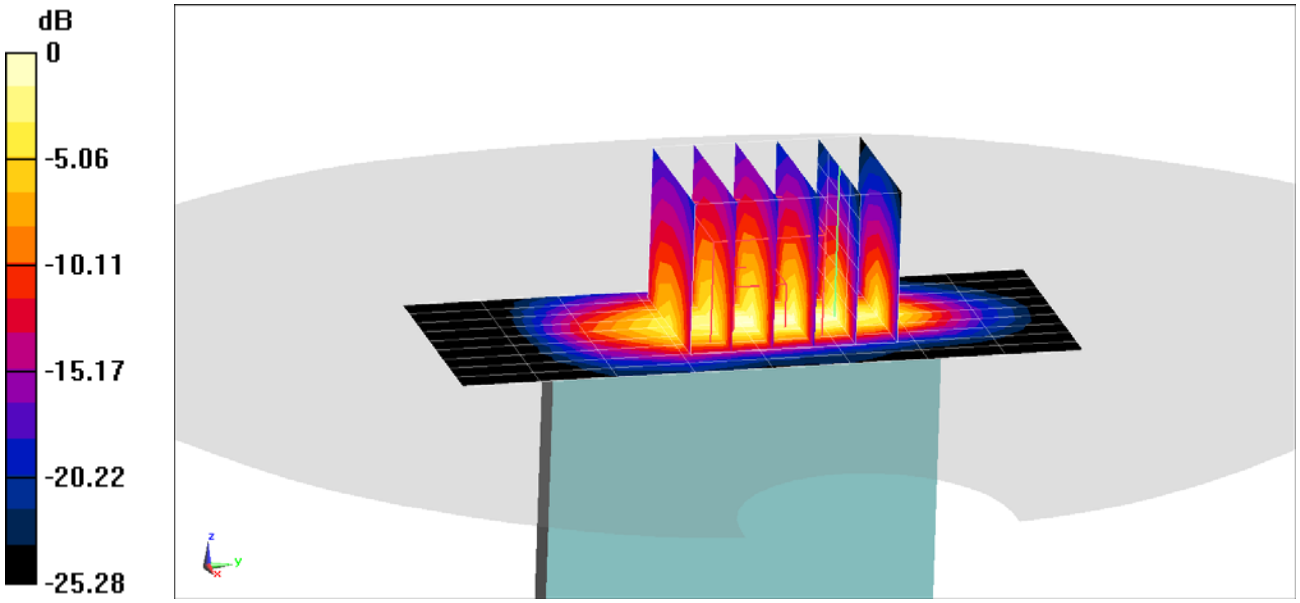
Communication System: UID 0, CDMA, CDMA; Frequency: 1908.75 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
$f = 1908.75$ MHz; $\sigma = 1.59$ S/m; $\varepsilon_r = 53.495$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-30-2018; Ambient Temp: 22.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN3914; ConvF(7.62, 7.62, 7.62); Calibrated: 2/14/2018;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: PCS EVDO, Phablet SAR, Bottom Edge, High ch.

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 72.34 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 18.2 W/kg
SAR(10 g) = 3.07 W/kg



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

DUT: ZNFL713DL; Type: Portable Handset; Serial: 19027

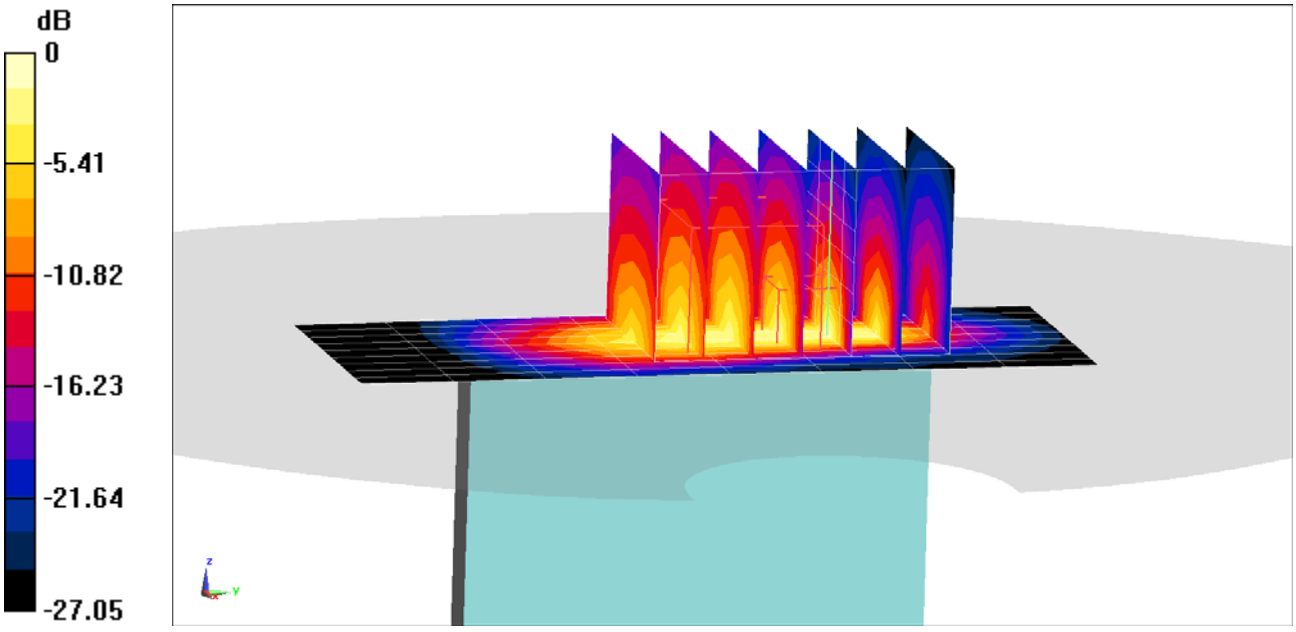
Communication System: UID 0, _LTE Band 66 (AWS); Frequency: 1770 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
$f = 1770$ MHz; $\sigma = 1.533$ S/m; $\varepsilon_r = 51.201$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-20-2018; Ambient Temp: 23.0°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7406; ConvF(8.08, 8.08, 8.08); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 66 (AWS), Phablet SAR, Bottom Edge, High.ch
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 70.21 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 19.8 W/kg
SAR(10 g) = 2.88 W/kg



0 dB = 15.2 W/kg = 11.82 dBW/kg

DUT: ZNFL713DL; Type: Portable Handset; Serial: 19027

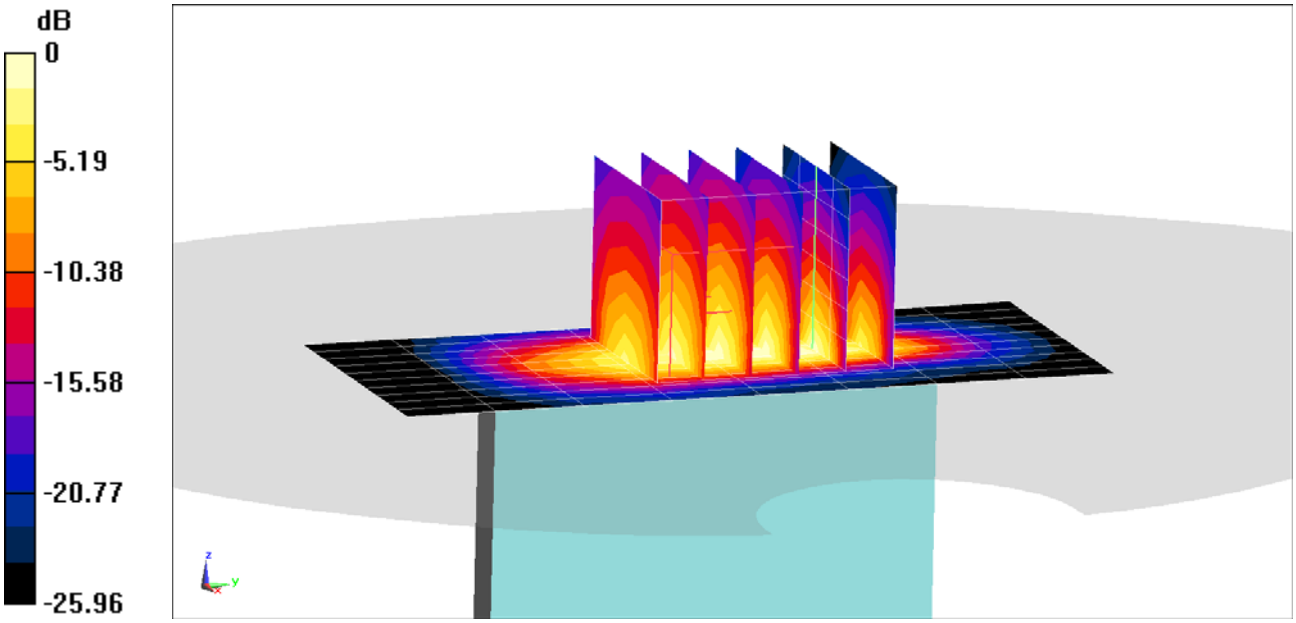
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
$f = 1900$ MHz; $\sigma = 1.581$ S/m; $\varepsilon_r = 52.699$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 3-19-2018; Ambient Temp: 20.7°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3914; ConvF(7.62, 7.62, 7.62); Calibrated: 2/14/2018;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

Mode: LTE Band 2 (PCS), Phablet SAR, Bottom Edge, High.ch
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 68.08 V/m; Power Drift = -0.17 dB
Peak SAR (extrapolated) = 17.0 W/kg
SAR(10 g) = 3.08 W/kg



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

APPENDIX B: SYSTEM VERIFICATION

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PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1003

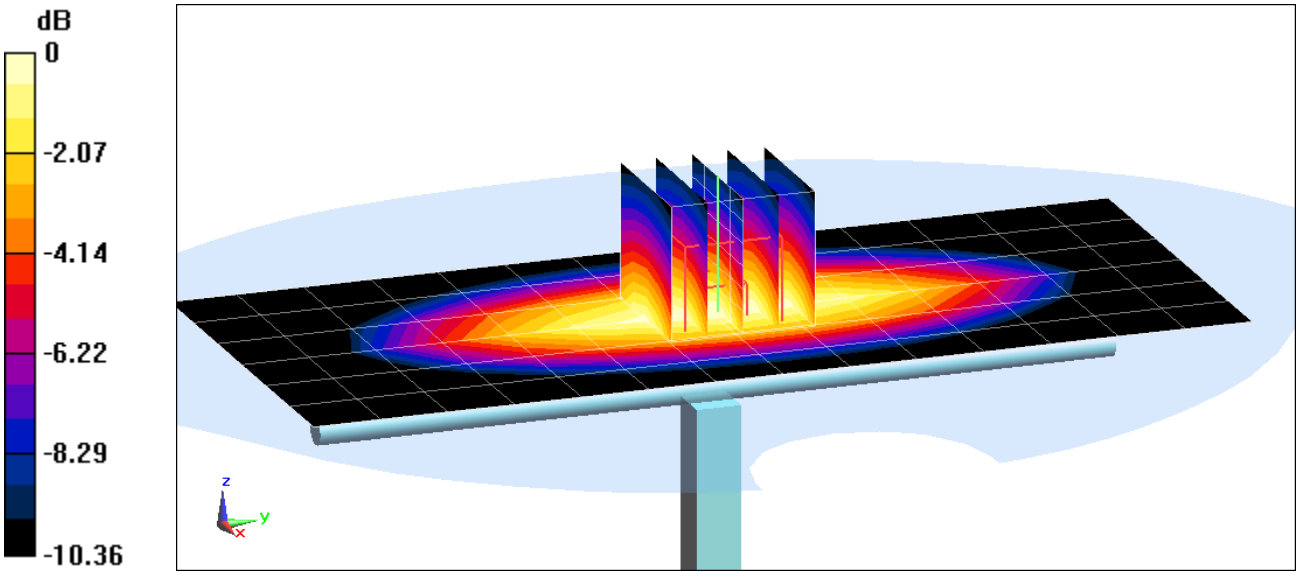
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
$f = 750$ MHz; $\sigma = 0.877$ S/m; $\varepsilon_r = 40.704$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-14-2018; Ambient Temp: 23.9°C; Tissue Temp: 20.7°C

Probe: ES3DV3 - SN3213; ConvF(6.75, 6.75, 6.75); Calibrated: 2/13/2018;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: 1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.29 W/kg
SAR(1 g) = 1.55 W/kg
Deviation(1 g) = -6.40%



0 dB = 1.81 W/kg = 2.58 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d132

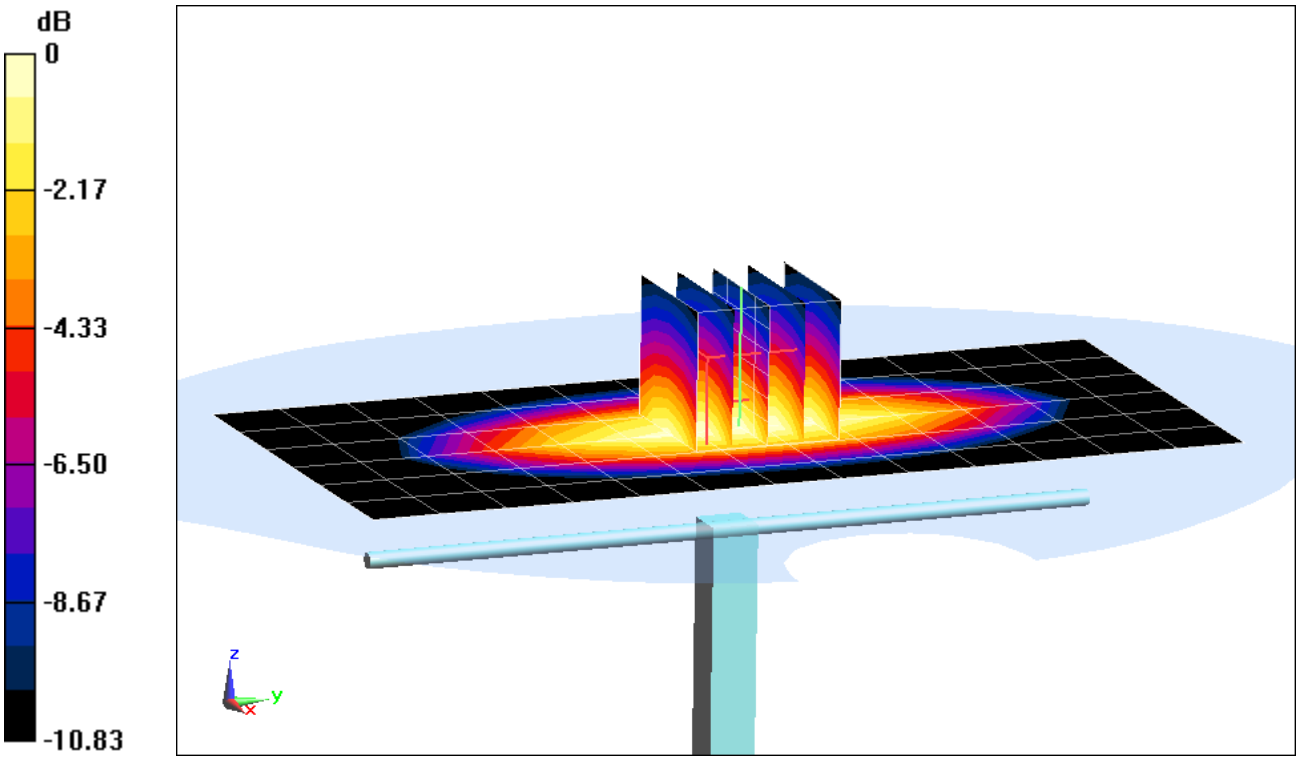
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.94 S/m; ε_r = 39.773; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-13-2018; Ambient Temp: 23.4°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.42, 6.42, 6.42); Calibrated: 2/13/2018;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: 1648
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 3.01 W/kg
SAR(1 g) = 2.01 W/kg
Deviation(1 g) = 7.37%



0 dB = 2.36 W/kg = 3.73 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1150

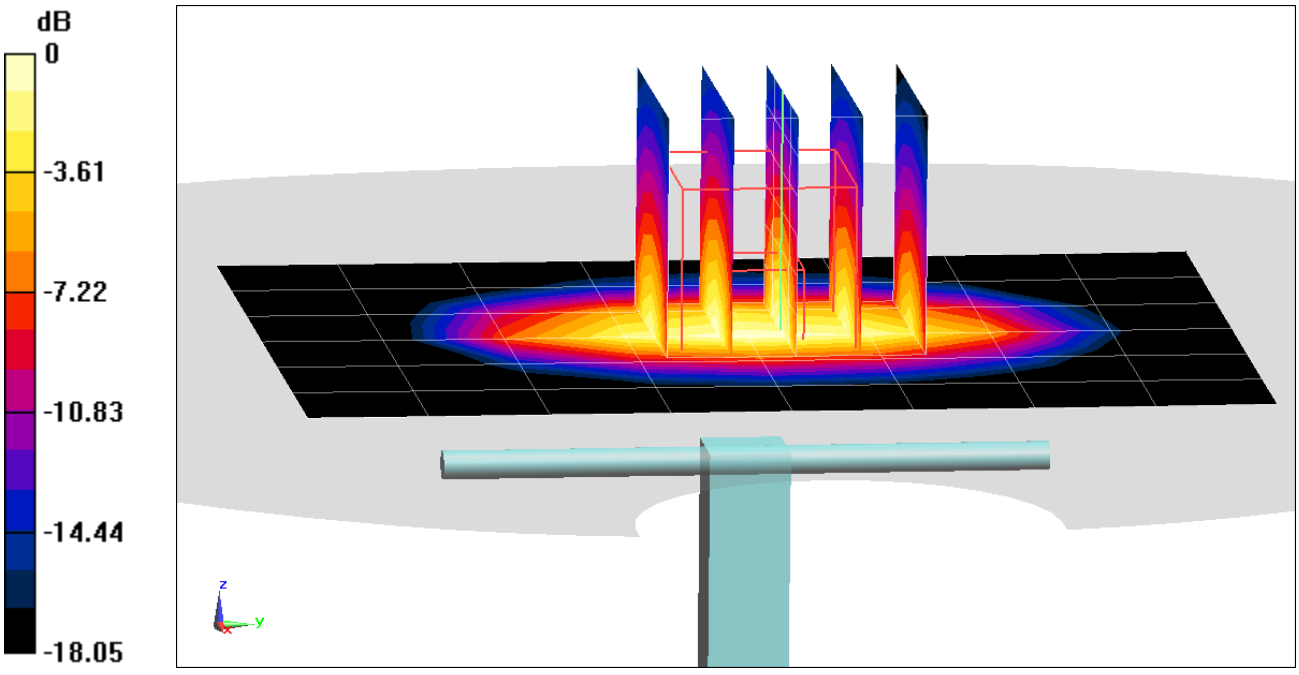
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.404 S/m; ε_r = 39.175; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-13-2018; Ambient Temp: 22.3°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3914; ConvF(8.34, 8.34, 8.34); Calibrated: 2/14/2018;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.89 W/kg
SAR(1 g) = 3.69 W/kg
Deviation(1 g) = 2.22%



0 dB = 5.70 W/kg = 7.56 dBW/kg

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

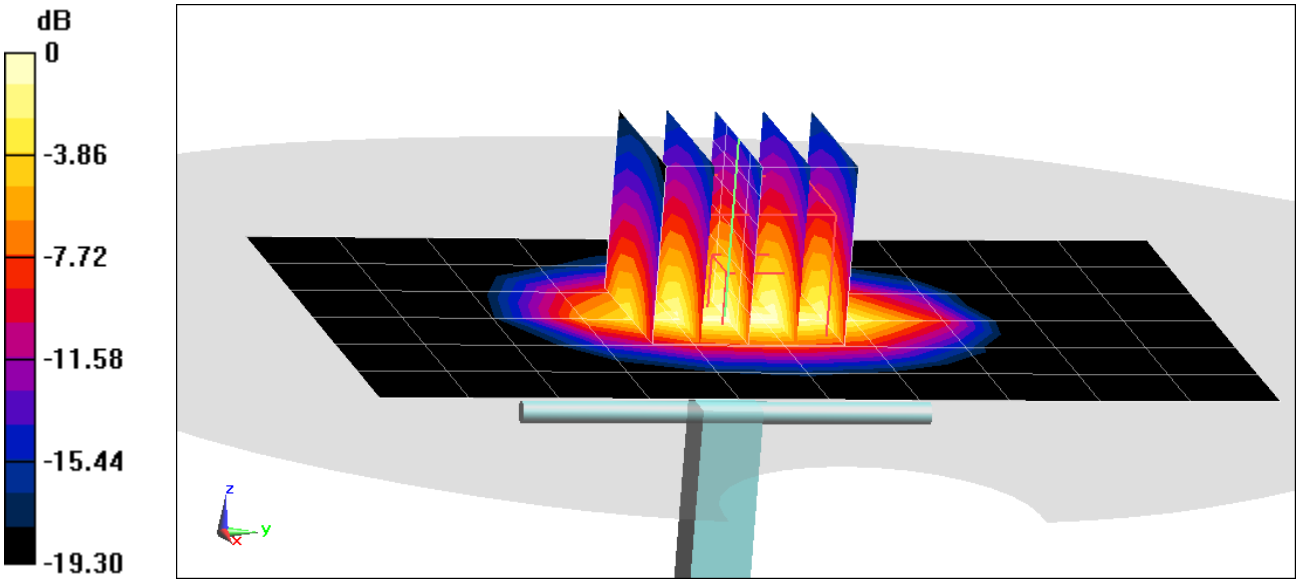
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.439 S/m; ε_r = 39.507; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-15-2018; Ambient Temp: 21.5°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3914; ConvF(7.98, 7.98, 7.98); Calibrated: 2/14/2018;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.68 W/kg
SAR(1 g) = 4.14 W/kg
Deviation(1 g) = 5.34%



0 dB = 6.31 W/kg = 8.00 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

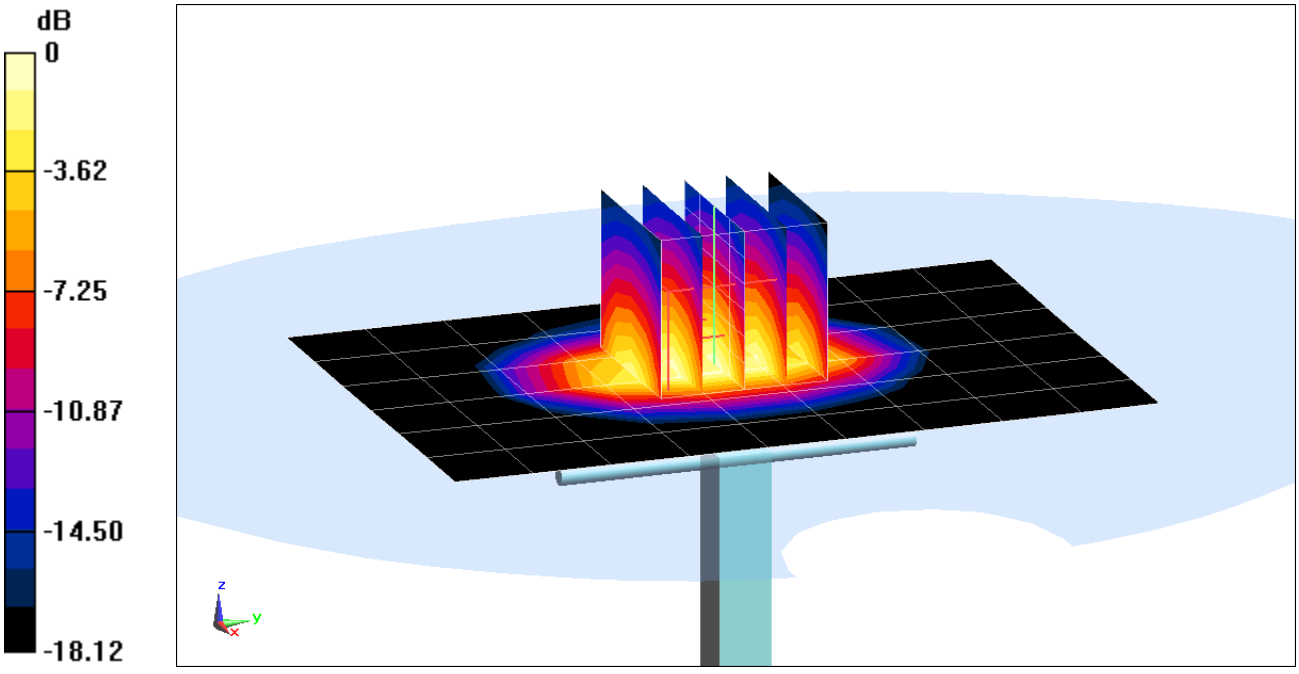
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
$f = 1900$ MHz; $\sigma = 1.434$ S/m; $\varepsilon_r = 39.818$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-30-2018; Ambient Temp: 22.4°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3332; ConvF(5.33, 5.33, 5.33); Calibrated: 8/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/9/2017
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.65 W/kg
SAR(1 g) = 4.23 W/kg
Deviation(1 g) = 5.49%



0 dB = 5.37 W/kg = 7.30 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 797

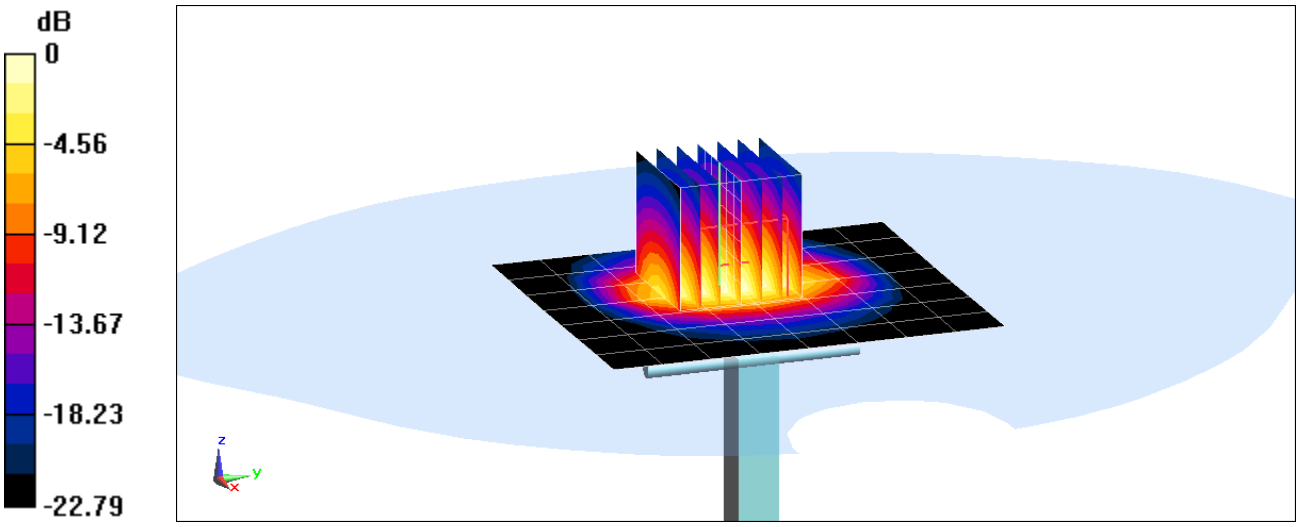
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.764 S/m; ε_r = 40.568; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-25-2018; Ambient Temp: 23.2°C; Tissue Temp: 23.1°C

Probe: ES3DV3 - SN3332; ConvF(4.68, 4.68, 4.68); Calibrated: 8/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/9/2017
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 9.98 W/kg
SAR(1 g) = 4.92 W/kg
Deviation(1 g) = -6.64%



0 dB = 6.43 W/kg = 8.08 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1161

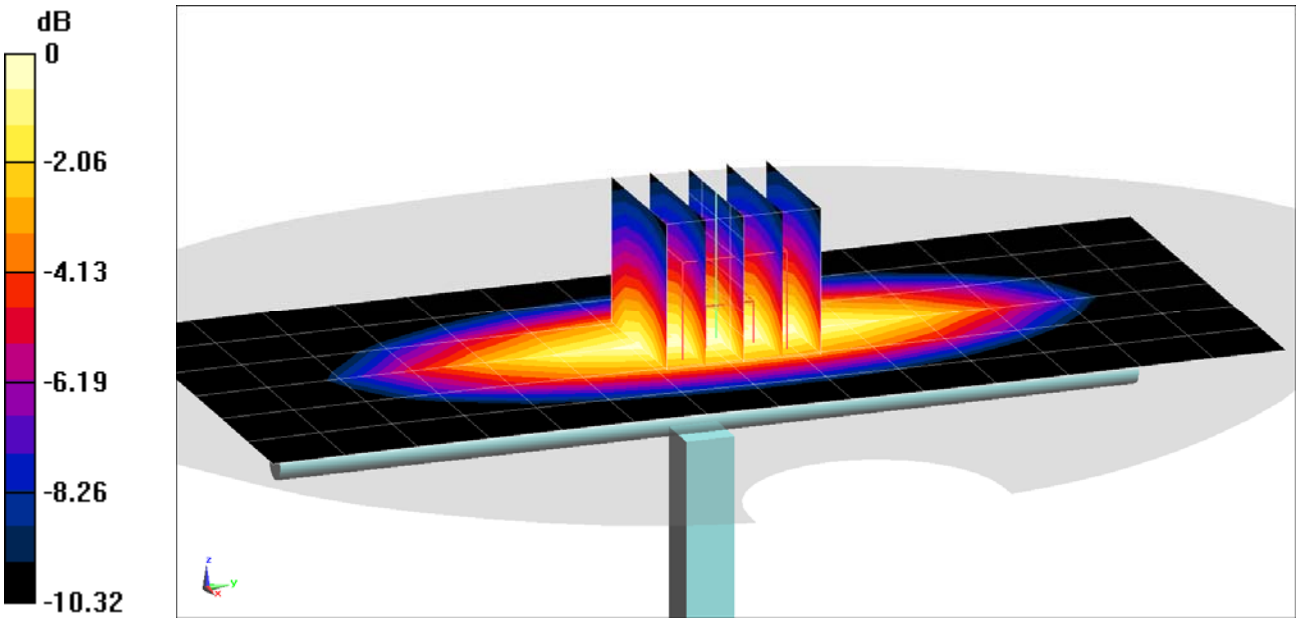
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.978 S/m; ε_r = 56.107; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-12-2018; Ambient Temp: 21.9°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN7406; ConvF(9.9, 9.9, 9.9); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: Right Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1797
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.69 W/kg
SAR(1 g) = 1.8 W/kg
Deviation(1 g) = 6.76%



0 dB = 2.40 W/kg = 3.80 dBW/kg

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1046

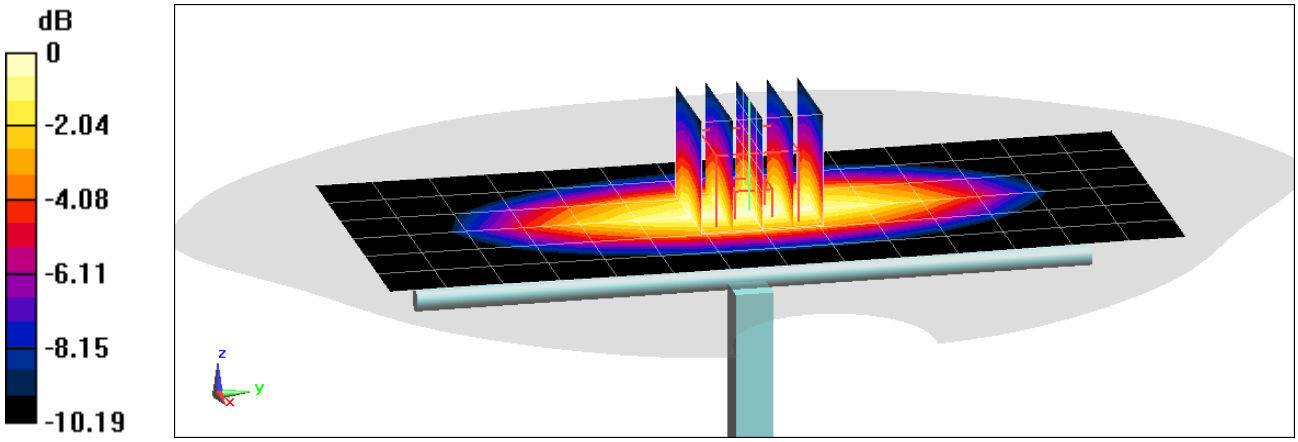
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; σ = 0.974 S/m; ε_r = 53.724; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-19-2018; Ambient Temp: 22.2°C; Tissue Temp: 21.0°C

Probe: ES3DV3 - SN3287; ConvF(6.71, 6.71, 6.71); Calibrated: 9/18/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 6/21/2017
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

750 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.69 W/kg
SAR(1 g) = 1.82 W/kg
Deviation(1 g) = 5.94%



0 dB = 2.12 W/kg = 3.26 dBW/kg

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d133

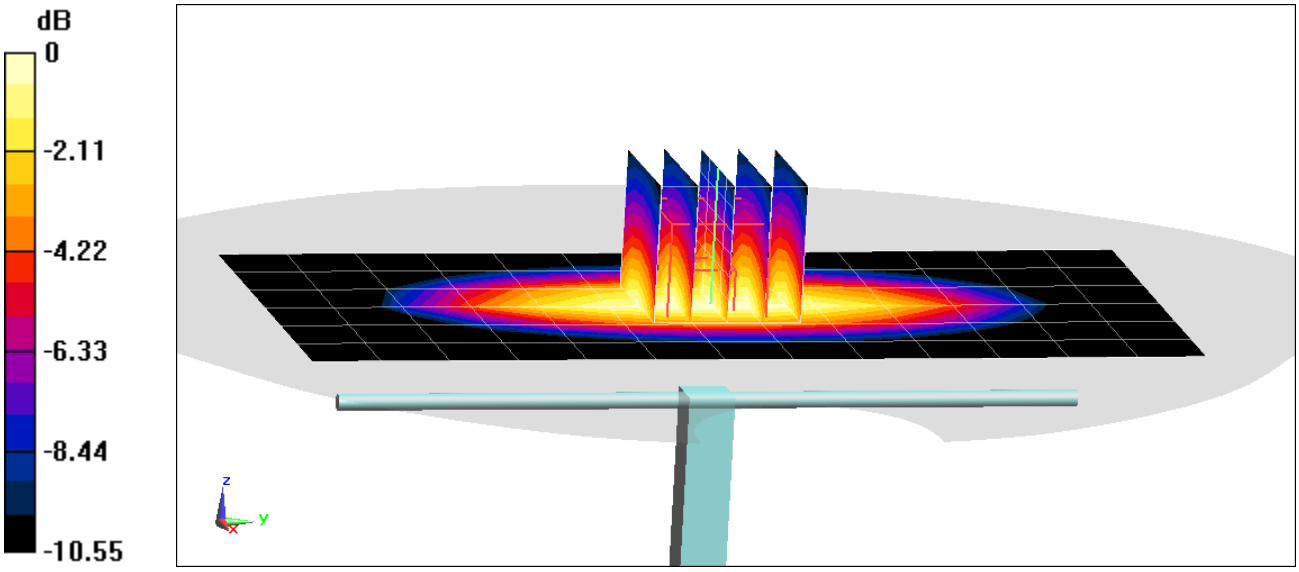
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.985 S/m; ε_r = 53.465; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-07-2018; Ambient Temp: 21.0°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3914; ConvF(9.57, 9.57, 9.57); Calibrated: 2/14/2018;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.73 W/kg
SAR(1 g) = 1.83 W/kg
Deviation(1 g) = -2.76%



0 dB = 2.43 W/kg = 3.86 dBW/kg

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d132

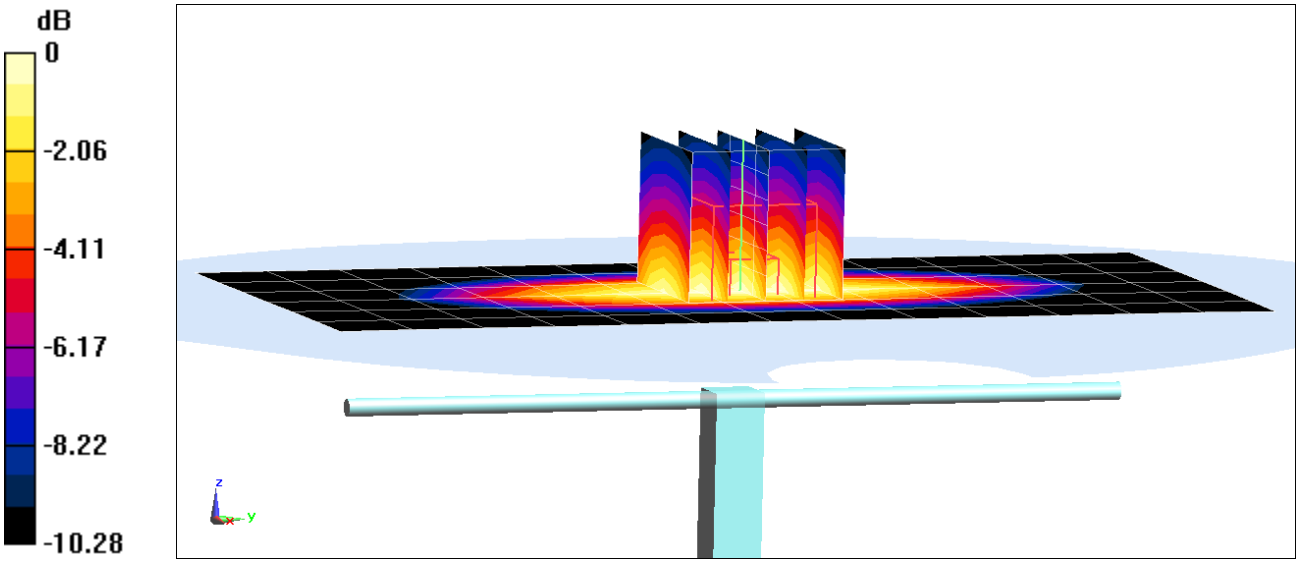
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.964 S/m; ε_r = 53.907; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-28-2018; Ambient Temp: 20.8°C; Tissue Temp: 21.2°C

Probe: ES3DV3 - SN3213; ConvF(6.2, 6.2, 6.2); Calibrated: 2/13/2018;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/9/2018
Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 3.02 W/kg
SAR(1 g) = 2.06 W/kg
Deviation(1 g) = 6.08%



0 dB = 2.40 W/kg = 3.80 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1148

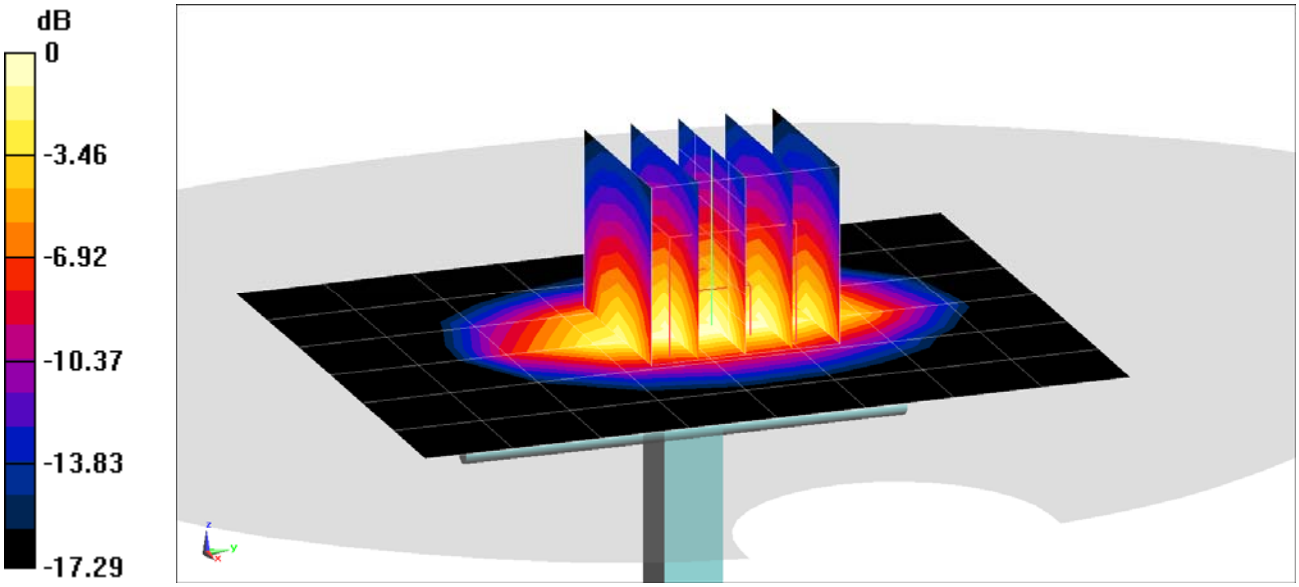
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.51 S/m; ε_r = 51.282; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-20-2018; Ambient Temp: 23.0°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7406; ConvF(8.08, 8.08, 8.08); Calibrated: 4/18/2017;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/11/2017
Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1375
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

1750 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 6.80 W/kg
SAR(1 g) = 3.79 W/kg; SAR(10 g) = 2.01 W/kg
Deviation(1 g) = 2.43%; Deviation(10 g) = 1.52%



0 dB = 5.60 W/kg = 7.48 dBW/kg

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

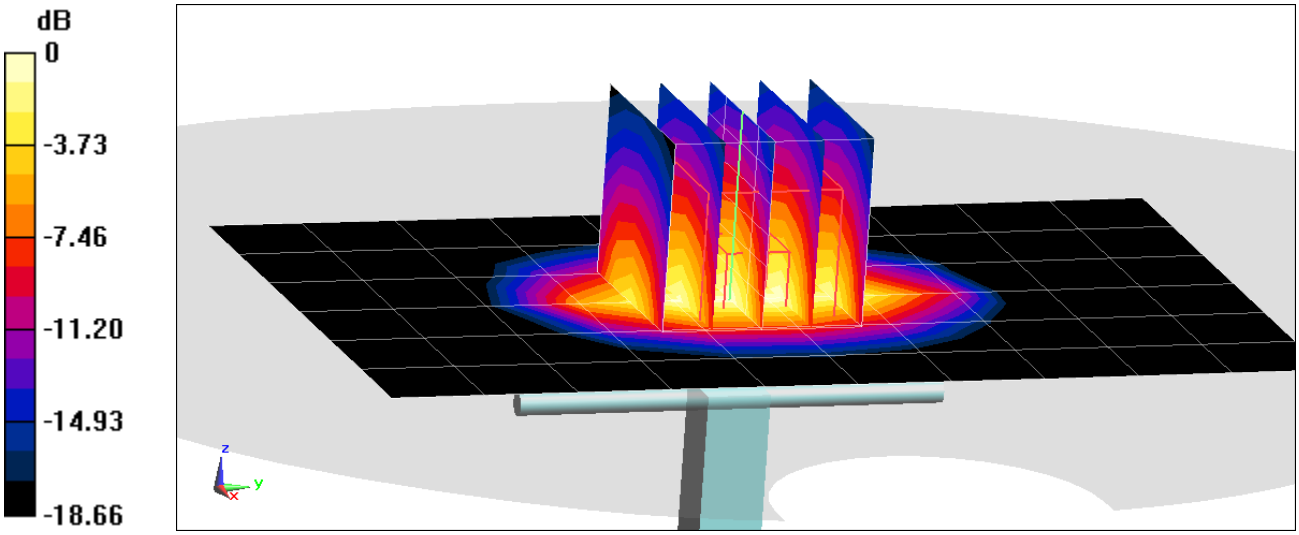
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.571 S/m; ε_r = 53.584; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-17-2018; Ambient Temp: 22.0°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN3914; ConvF(7.62, 7.62, 7.62); Calibrated: 2/14/2018;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.84 W/kg
SAR(1 g) = 4.28 W/kg
Deviation(1 g) = 9.46%



0 dB = 6.54 W/kg = 8.16 dBW/kg

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

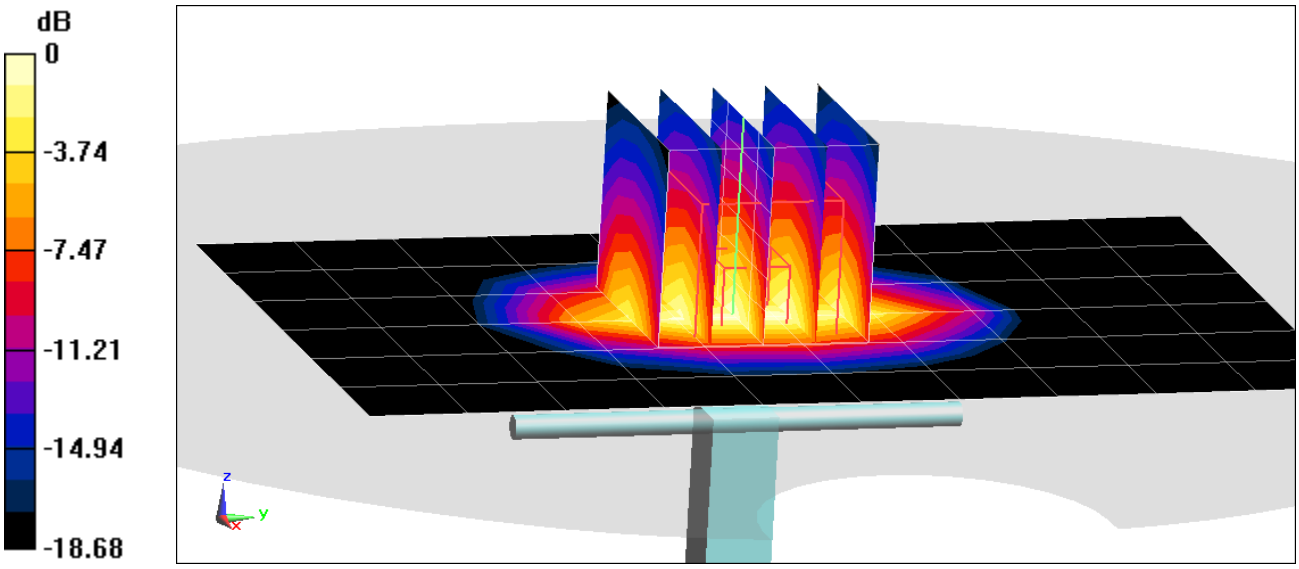
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.581 S/m; ε_r = 52.699; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 3-19-2018; Ambient Temp: 20.7°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3914; ConvF(7.62, 7.62, 7.62); Calibrated: 2/14/2018;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10; SEMCAD X Version 14.6.10 (7417)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.80 W/kg
SAR(1 g) = 4.18 W/kg; SAR(10 g) = 2.14 W/kg
Deviation(1 g) = 6.91%; Deviation(10 g) = 3.38%



0 dB = 6.53 W/kg = 8.15 dBW/kg

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

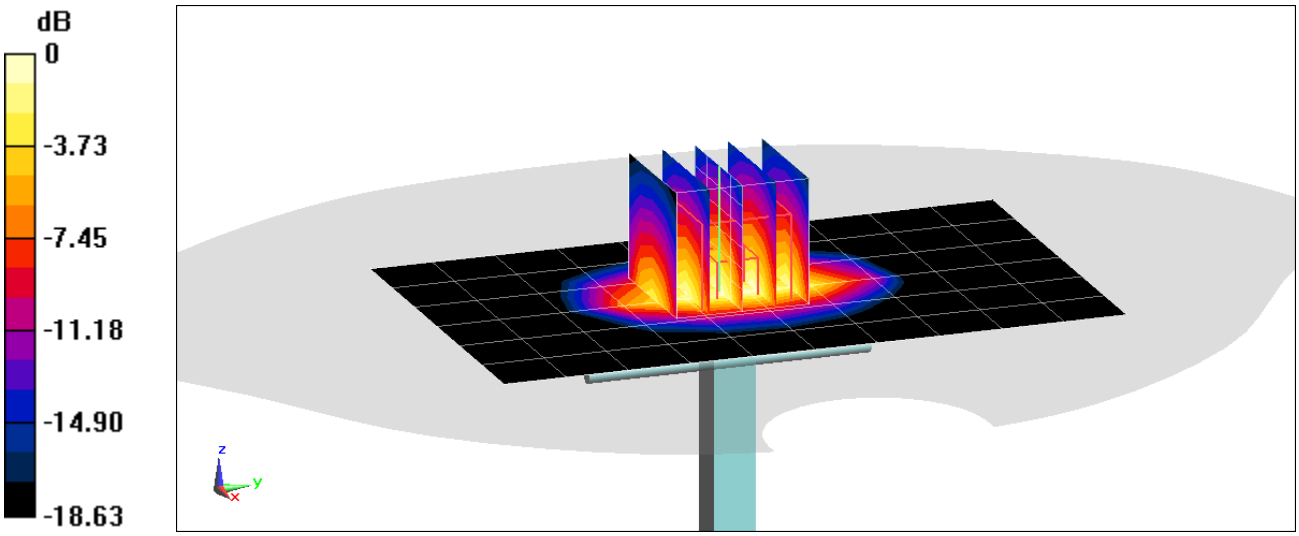
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; σ = 1.579 S/m; ε_r = 53.528; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-30-2018; Ambient Temp: 22.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN3914; ConvF(7.62, 7.62, 7.62); Calibrated: 2/14/2018;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn665; Calibrated: 2/15/2018
Phantom: Twin-SAM V5.0 Right; Type: QD 000 P40 CD; Serial: 1800
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

1900 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.80 W/kg
SAR(1 g) = 4.25 W/kg; SAR(10 g) = 2.19 W/kg
Deviation(1 g) = 7.32%; Deviation(10 g) = 4.78%



0 dB = 6.51 W/kg = 8.14 dBW/kg

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 797

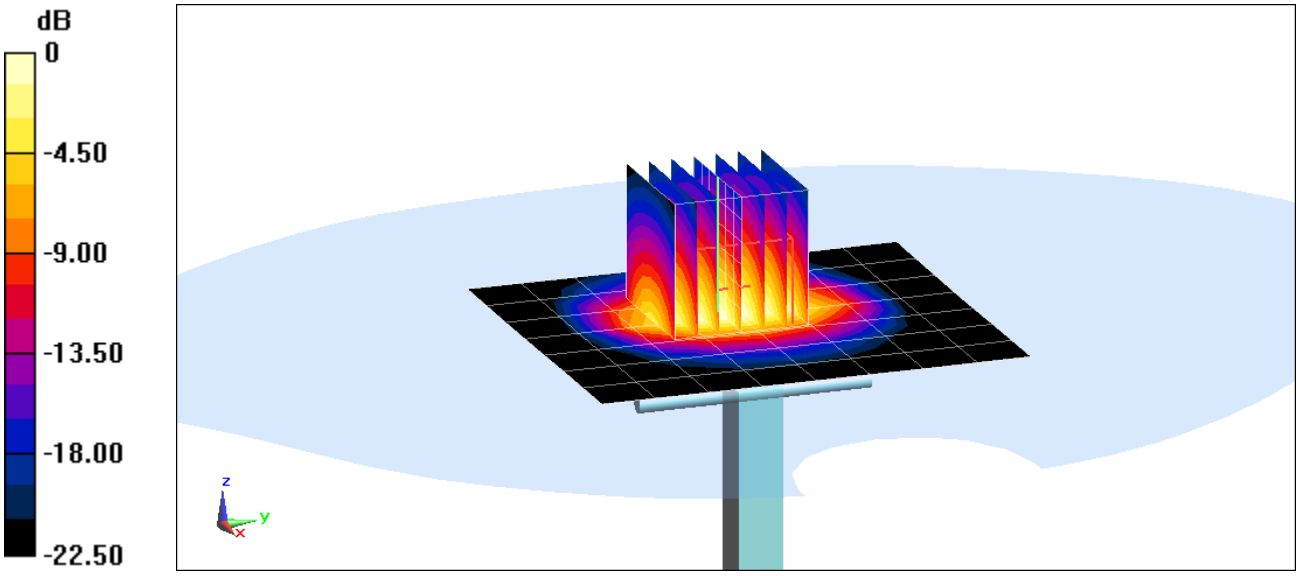
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.006 S/m; ε_r = 51.873; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-15-2018; Ambient Temp: 22.6°C; Tissue Temp: 21.4°C

Probe: ES3DV3 - SN3332; ConvF(4.55, 4.55, 4.55); Calibrated: 8/14/2017;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/9/2017
Phantom: SAM Front; Type: SAM; Serial: 1686
Measurement SW: DASY52, Version 52.10;SEMCAD X Version 14.6.10 (7417)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.9 W/kg
SAR(1 g) = 5.26 W/kg
Deviation(1 g) = 2.94%



0 dB = 6.91 W/kg = 8.39 dBW/kg

APPENDIX C: PROBE CALIBRATION

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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)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D750V3-1003_Jan18

CALIBRATION CERTIFICATE

Object D750V3 - SN:1003

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: January 15, 2018

BN ✓
01-25-2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

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

Issued: January 15, 2018

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

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5.0 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.9 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.28 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.42 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.0 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.15 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.58 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.43 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.71 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.8 Ω - 2.1 jΩ
Return Loss	- 27.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.2 Ω - 6.2 jΩ
Return Loss	- 24.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.043 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	January 21, 2009

Appendix (Additional assessments outside the scope of SCS 0108)

Measurement Conditions

DASY system configuration, as far as not given on page 1 and 3.

Phantom	SAM Head Phantom	For usage with cSAR3DV2-R/L

SAR result with SAM Head (Top)

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.98 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**7.94 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.33 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.32 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Mouth)

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.05 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.22 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.52 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Neck)

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.01 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.06 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.52 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Ear)

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.67 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.70 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.15 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**4.60 W/kg ± 16.9 % (k=2)**

Date: 12.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1003

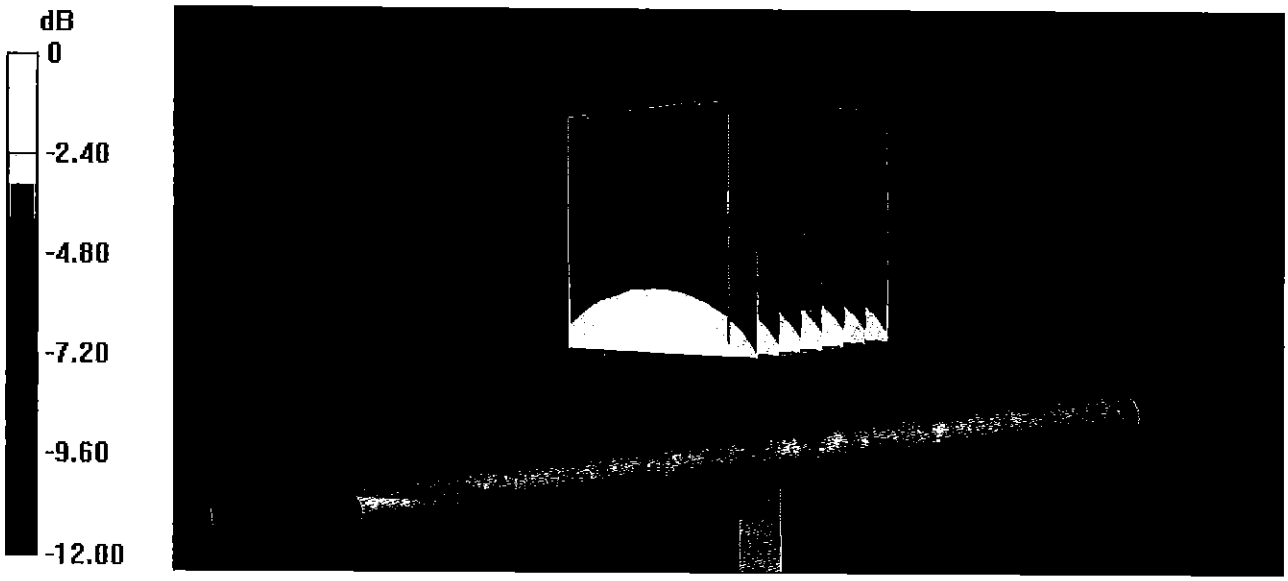
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.9 S/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

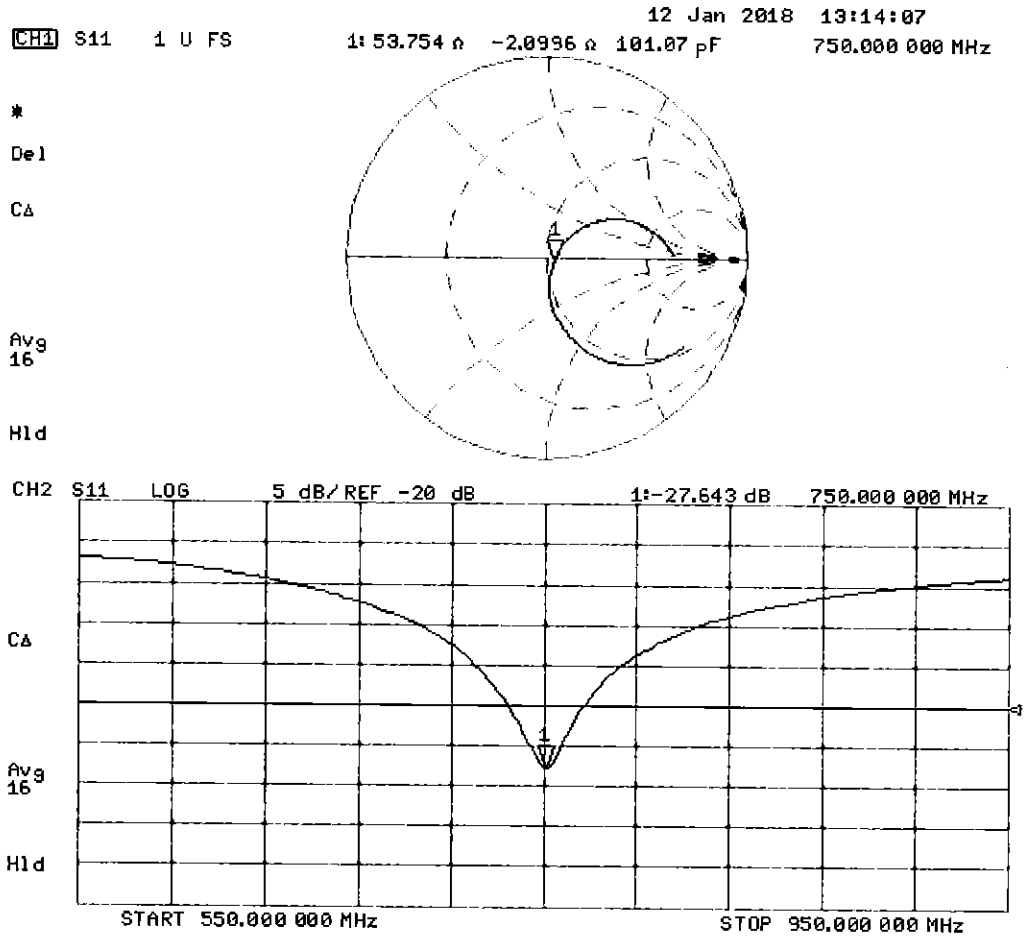
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.11 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.15 W/kg
SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (measured) = 2.80 W/kg



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

Impedance Measurement Plot for Head TSL



Date: 12.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1003

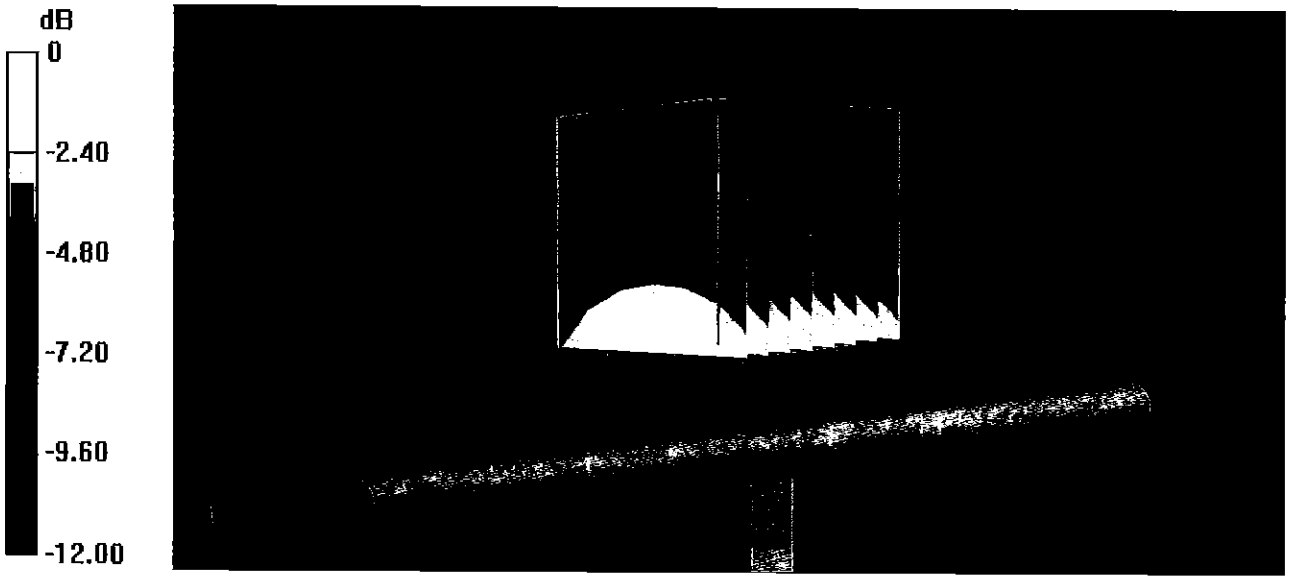
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.96 S/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.19, 10.19, 10.19); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

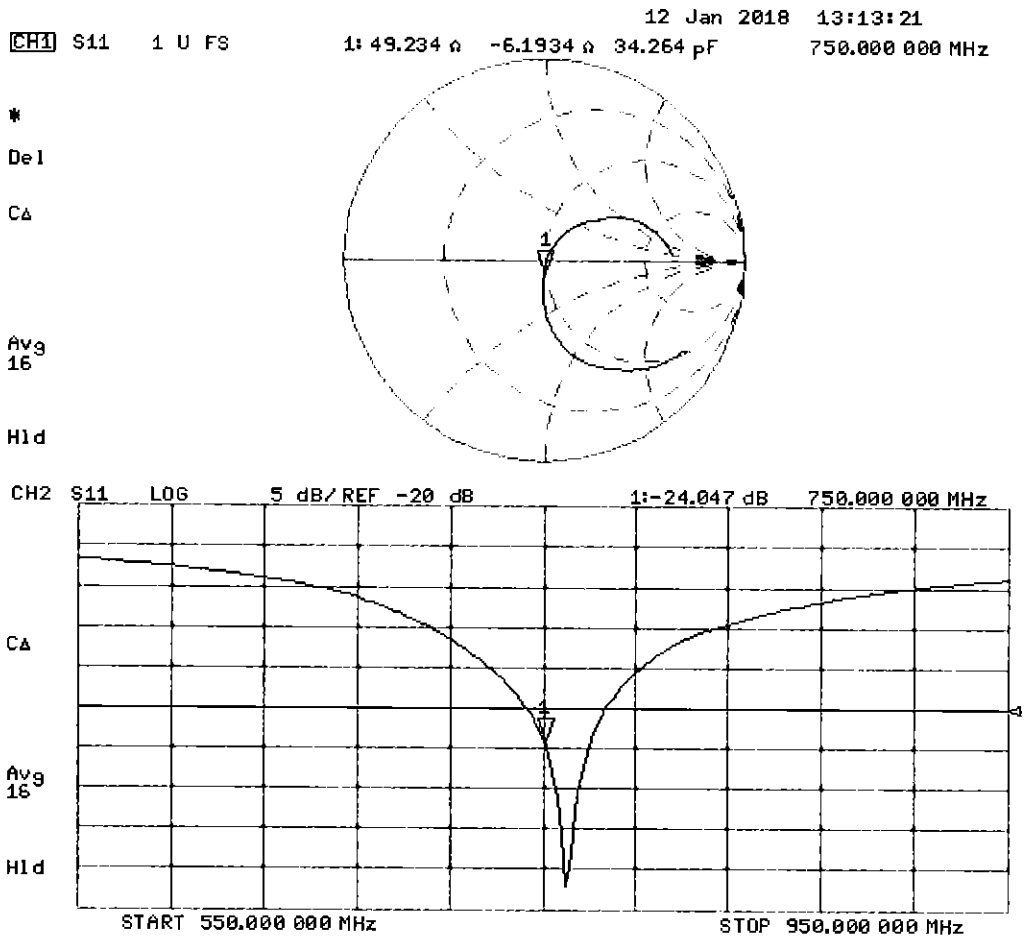
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x8x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.31 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.17 W/kg
SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.43 W/kg
Maximum value of SAR (measured) = 2.83 W/kg



0 dB = 2.83 W/kg = 4.52 dBW/kg

Impedance Measurement Plot for Body TSL



Date: 15.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1003

Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.9 S/m; ε_r = 44.2; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

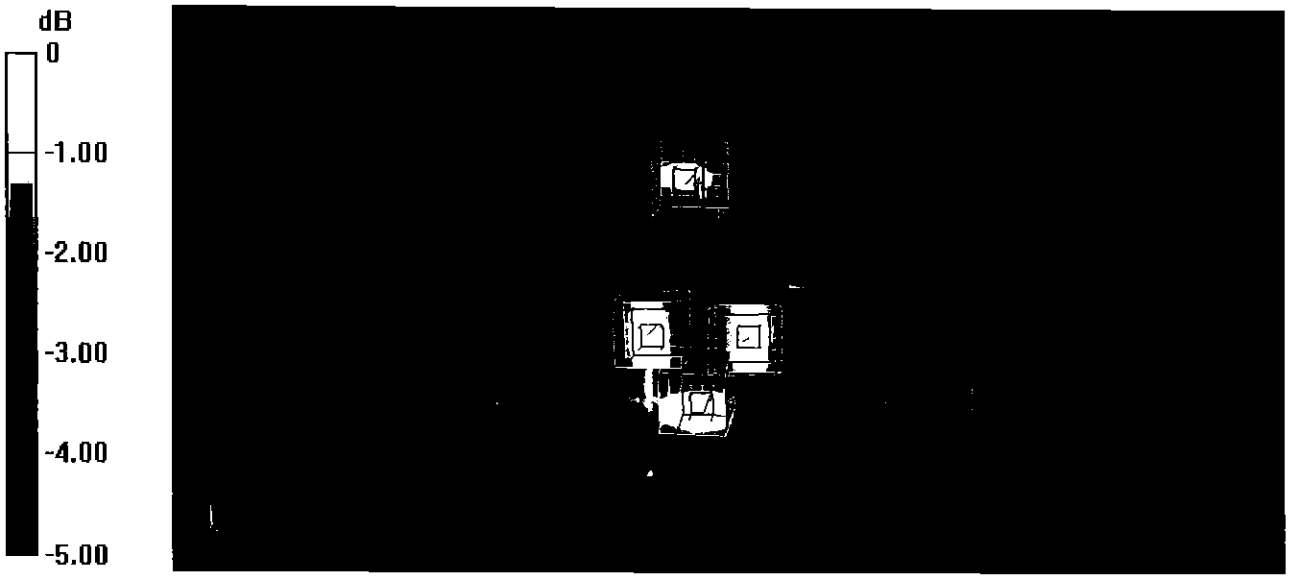
- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: SAM Head
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

SAM Head/Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.79 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.89 W/kg
SAR(1 g) = 1.98 W/kg; SAR(10 g) = 1.33 W/kg
Maximum value of SAR (measured) = 2.58 W/kg

SAM Head/Mouth/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.85 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 2.94 W/kg
SAR(1 g) = 2.05 W/kg; SAR(10 g) = 1.38 W/kg
Maximum value of SAR (measured) = 2.62 W/kg

SAM Head/Neck/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.29 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 2.78 W/kg
SAR(1 g) = 2.01 W/kg; SAR(10 g) = 1.38 W/kg
Maximum value of SAR (measured) = 2.56 W/kg

SAM Head/Ear/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.01 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 2.31 W/kg
SAR(1 g) = 1.67 W/kg; SAR(10 g) = 1.15 W/kg
Maximum value of SAR (measured) = 2.11 W/kg



0 dB = 2.58 W/kg = 4.12 dBW/kg

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Accreditation No.: SCS 0108

Client PC Test

Certificate No: D750V3-1046_Feb18

CALIBRATION CERTIFICATE

Object: D750V3 - SN:1046

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

BNV 03-02-2018

Calibration date: February 07, 2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 7, 2018

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

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.4 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.26 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.39 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.2 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.15 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.59 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.43 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.72 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	57.0 Ω + 2.2 jΩ
Return Loss	- 23.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	52.3 Ω - 2.5 jΩ
Return Loss	- 29.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.040 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 02, 2011

DASY5 Validation Report for Head TSL

Date: 07.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1046

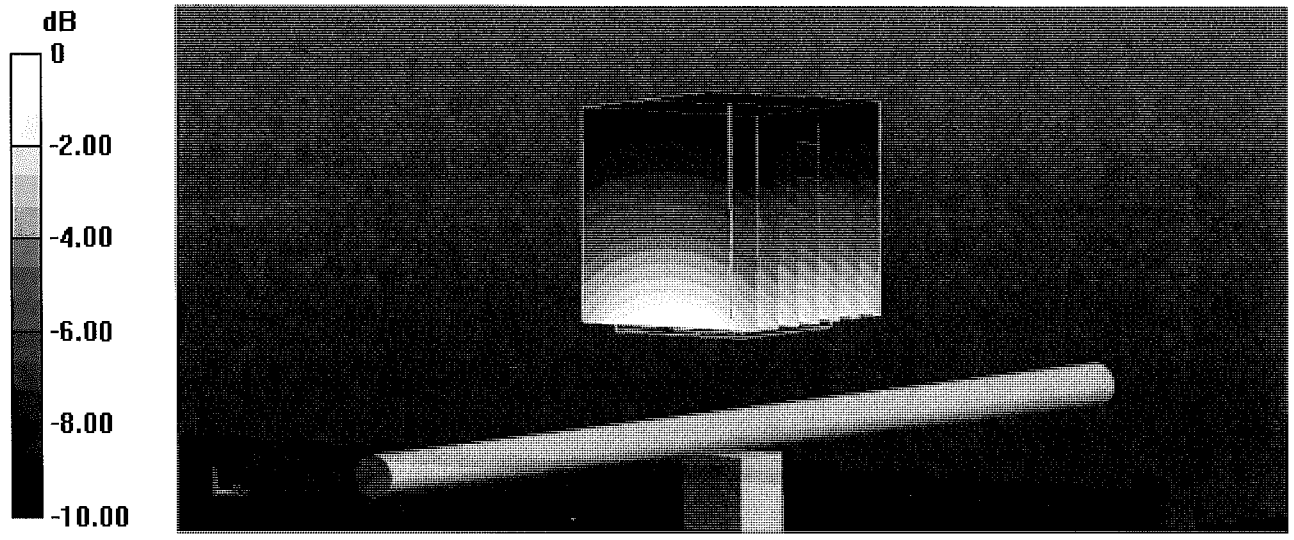
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.89 S/m; ε_r = 41.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

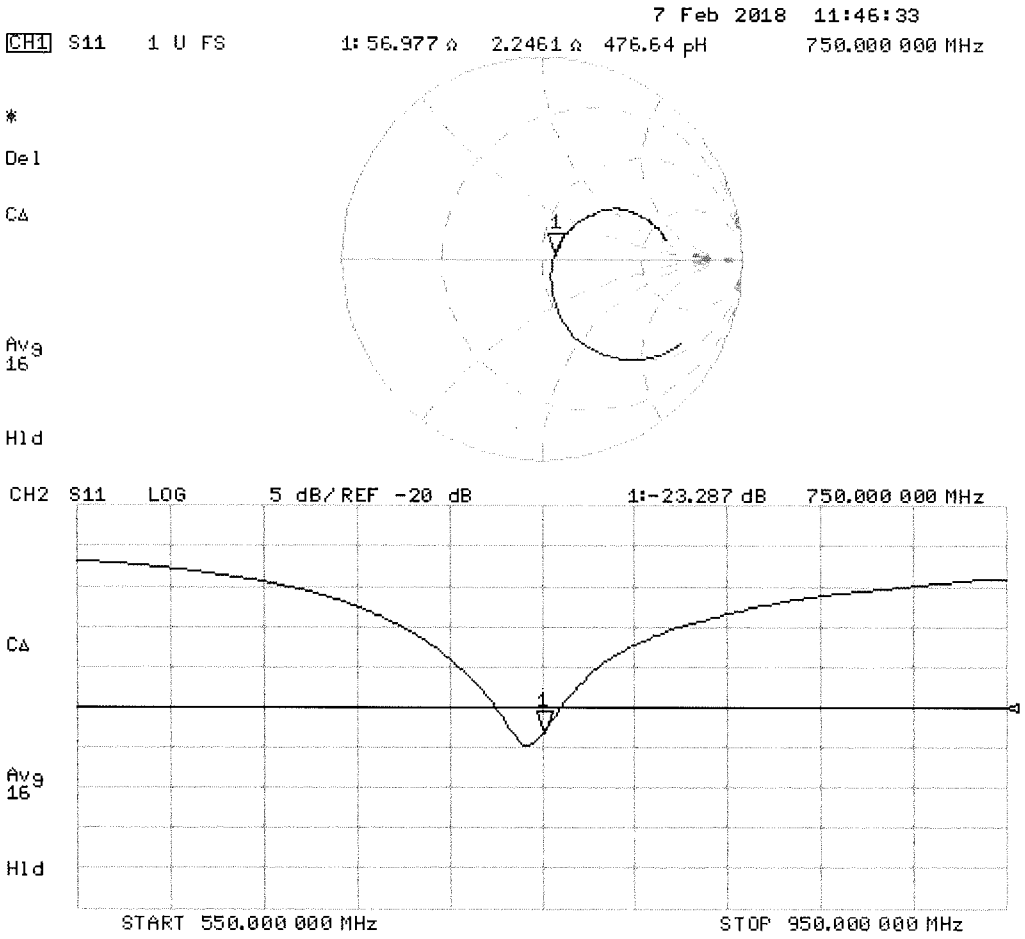
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.39 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.11 W/kg
SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.35 W/kg
Maximum value of SAR (measured) = 2.76 W/kg



0 dB = 2.76 W/kg = 4.41 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 07.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1046

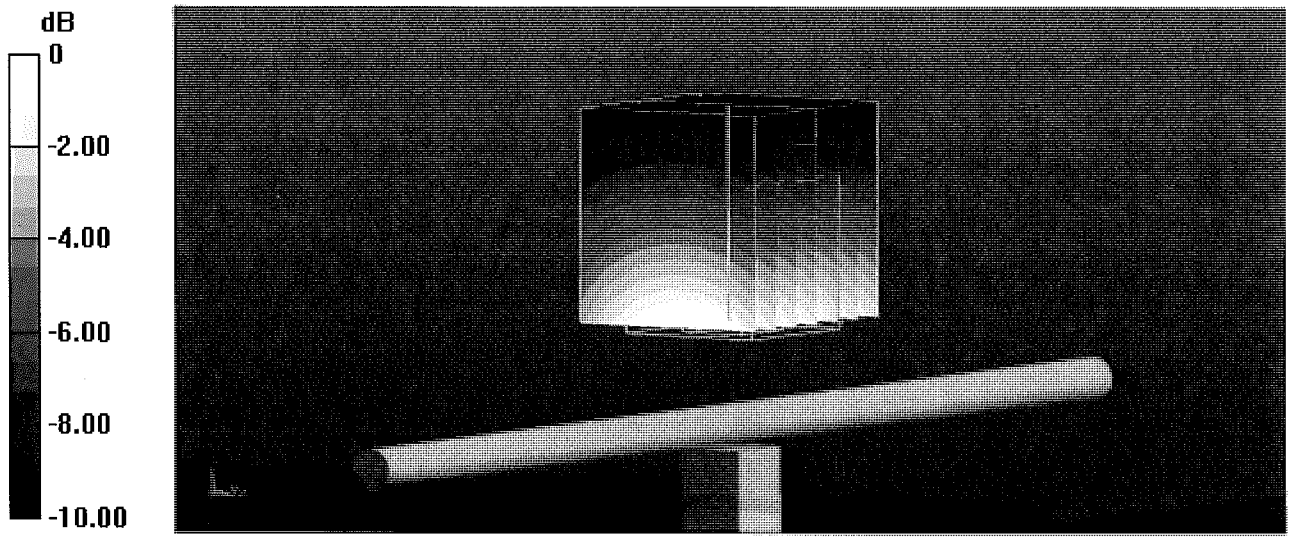
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.96 S/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.19, 10.19, 10.19); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

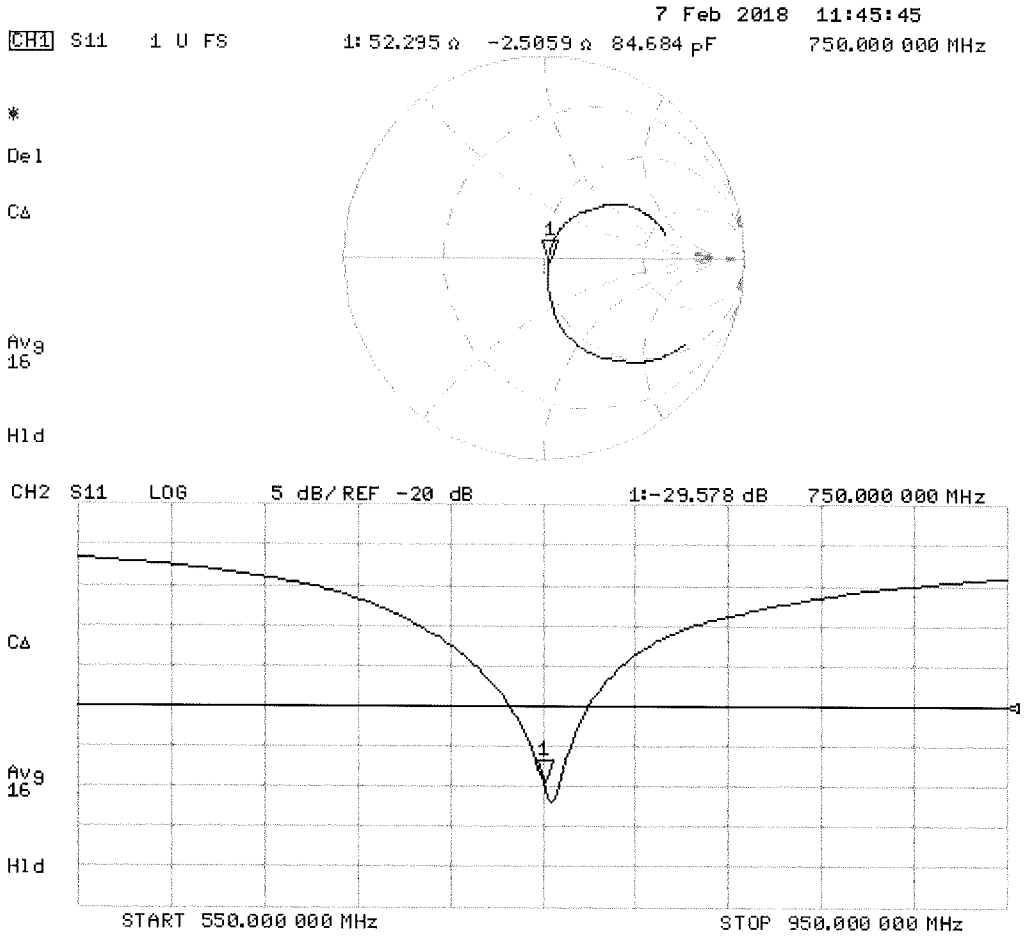
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.54 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.19 W/kg
SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.43 W/kg
Maximum value of SAR (measured) = 2.82 W/kg



0 dB = 2.82 W/kg = 4.50 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D750V3-1161_Jul16

CALIBRATION CERTIFICATE

Object	D750V3 - SN:1161
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	July 13, 2016

√PN
8/9/16
Extended
7/2017
SC

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 13, 2016

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

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "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
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.9 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.09 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.17 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.39 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.1 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.16 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.43 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.41 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.53 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.6 Ω - 0.9 jΩ
Return Loss	- 25.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.2 Ω - 4.0 jΩ
Return Loss	- 28.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.033 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 19, 2015

DASY5 Validation Report for Head TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1161

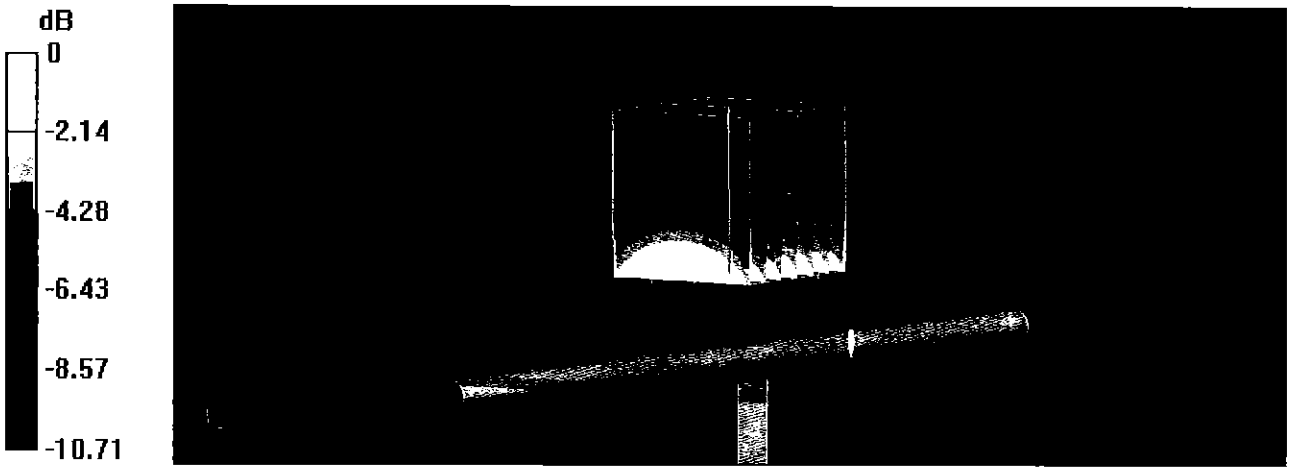
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.91 S/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.07, 10.07, 10.07); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

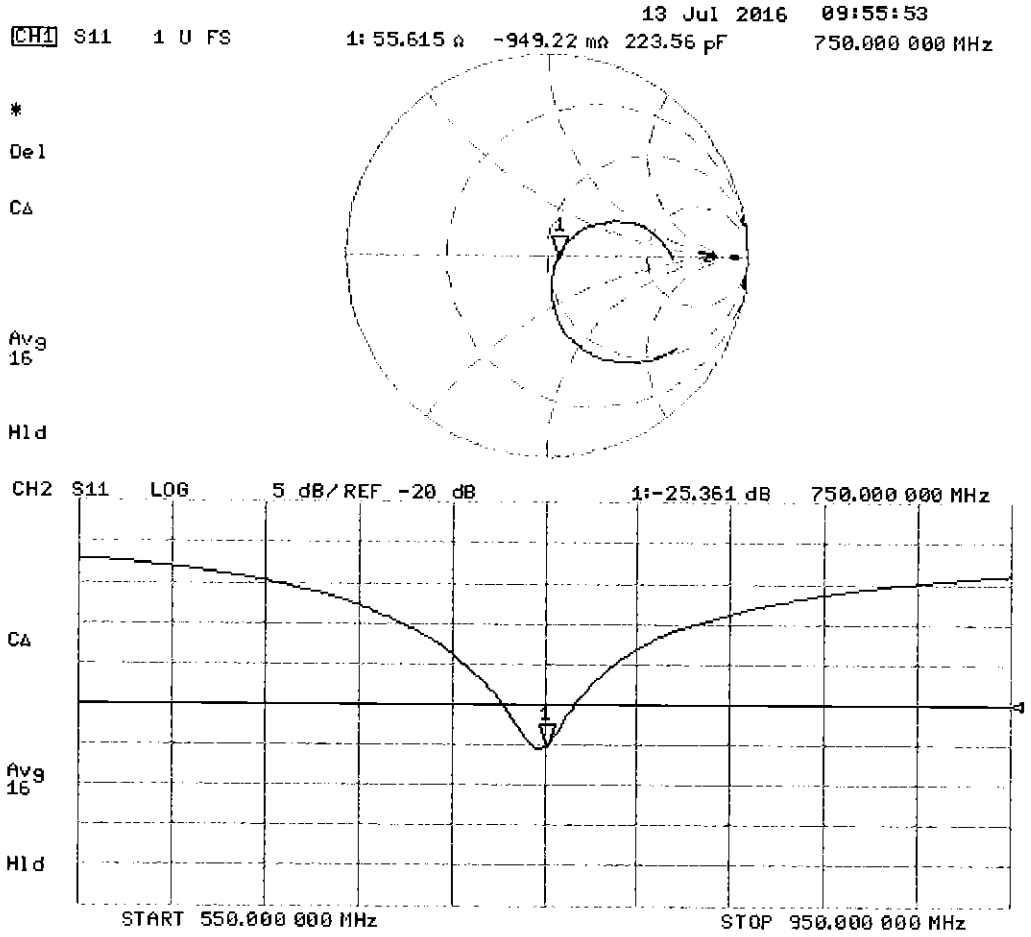
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.07 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.13 W/kg
SAR(1 g) = 2.09 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (measured) = 2.80 W/kg



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

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1161

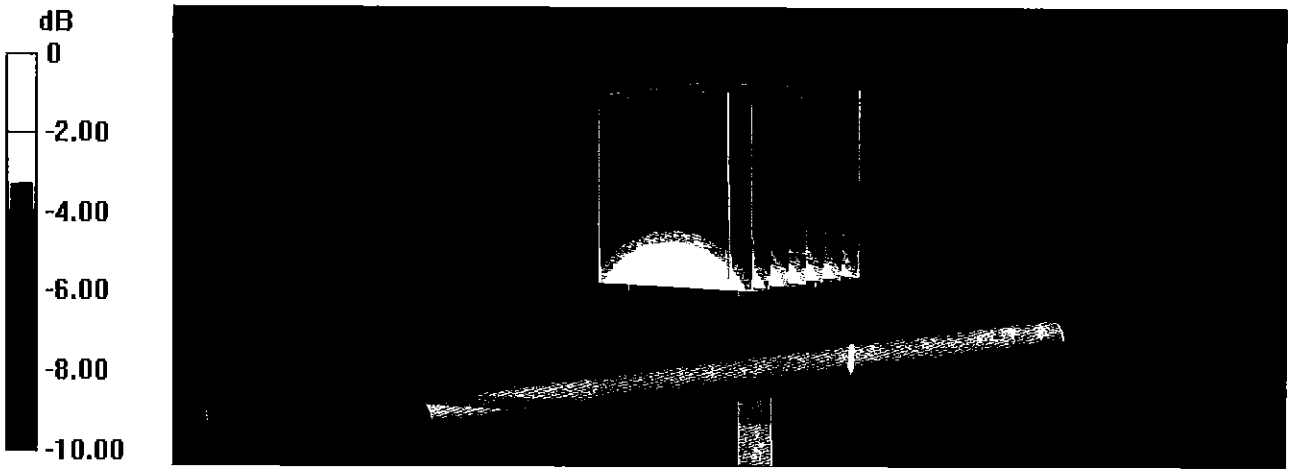
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.99 S/m; ε_r = 55.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.99, 9.99, 9.99); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

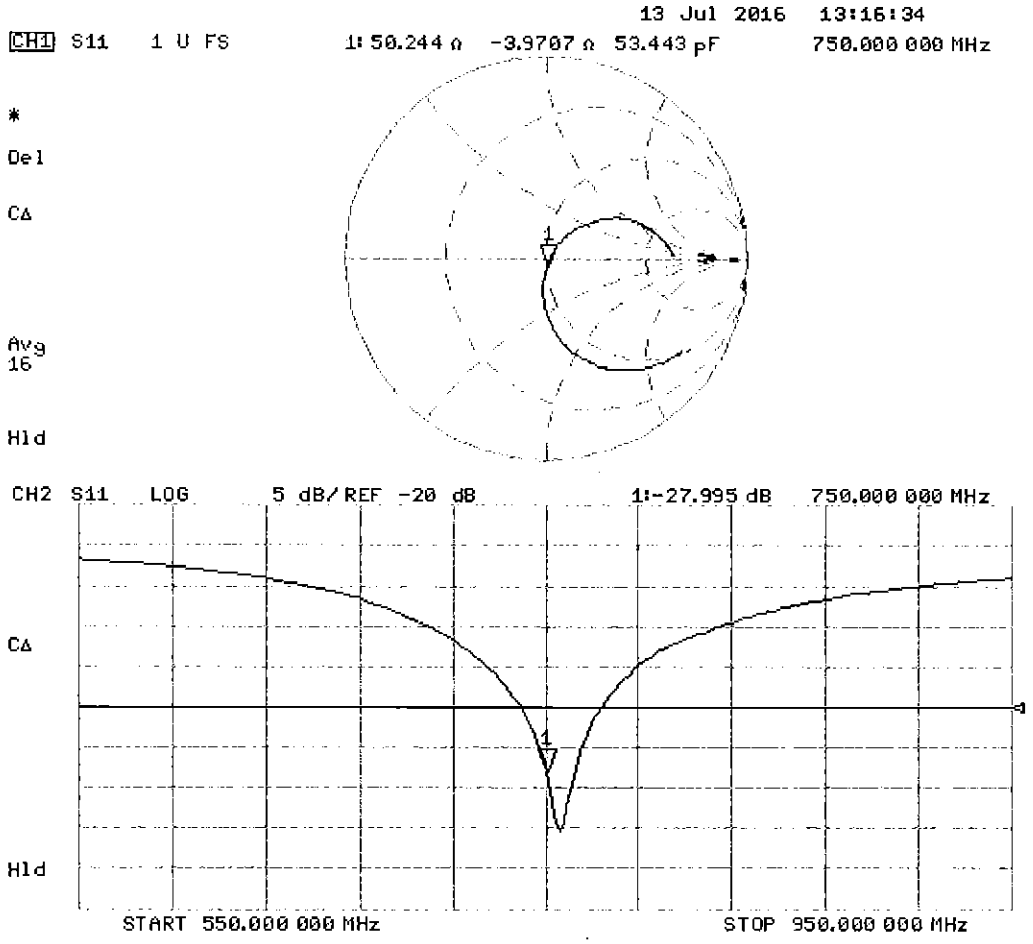
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.33 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.22 W/kg
SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.41 W/kg
Maximum value of SAR (measured) = 2.87 W/kg



0 dB = 2.87 W/kg = 4.58 dBW/kg

Impedance Measurement Plot for Body TSL



Certification of Calibration

Object	D750V3 – SN: 1161
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Calibration date:	July 12, 2017
Description:	SAR Validation Dipole at 750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2017	Annual	3/8/2018	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/14/2017	Annual	6/14/2018	1334
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	ES3DV3	SAR Probe	11/15/2016	Annual	11/15/2017	3334
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3319
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

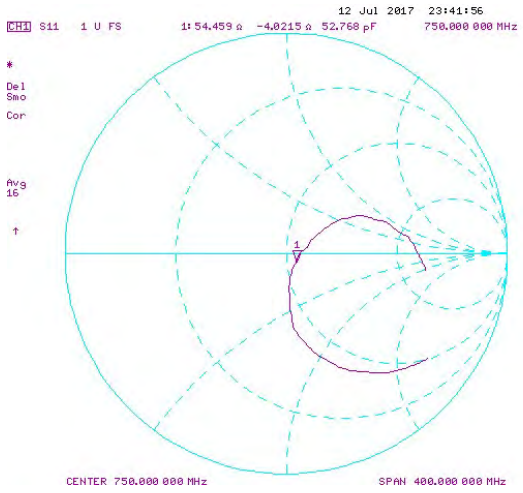
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

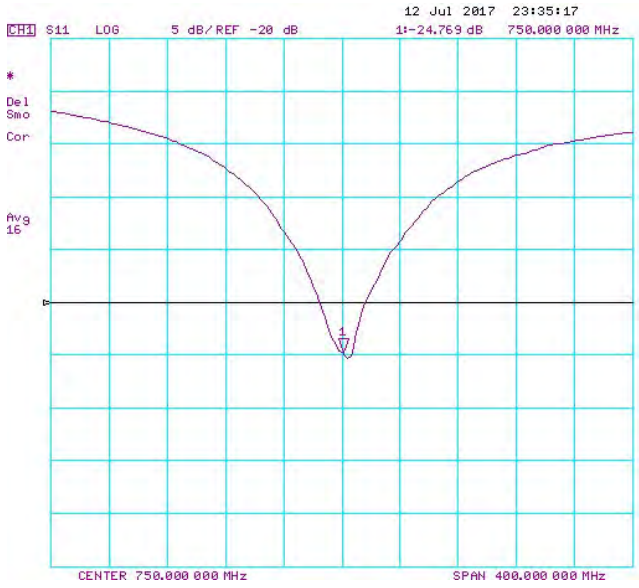
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 23.0 dBm	Measured Head SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 23.0 dBm	Measured Head SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
7/13/2016	7/12/2017	1.033	1.63	1.65	0.98%	1.08	1.09	1.11%	55.6	54.5	1.1	-0.9	-4.0	3.1	-25.4	-24.8	2.40%	PASS

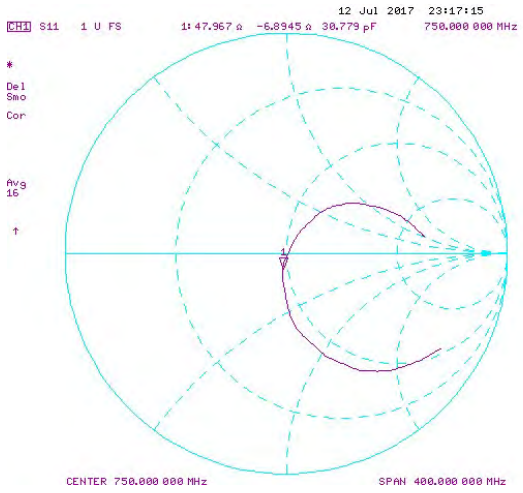
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 23.0 dBm	Measured Body SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 23.0 dBm	Measured Body SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
7/13/2016	7/12/2017	1.033	1.69	1.75	3.80%	1.11	1.17	5.79%	50.2	48.0	2.2	-4.0	-6.9	2.9	-28.0	-23.9	14.60%	PASS

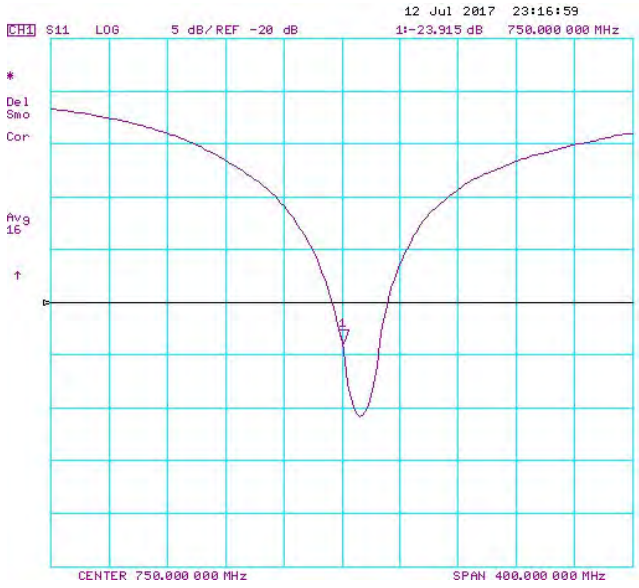
Impedance & Return-Loss Measurement Plot for Head TSL





Impedance & Return-Loss Measurement Plot for Body TSL





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

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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D835V2-4d132_Jan18

CALIBRATION CERTIFICATE

Object	D835V2 - SN:4d132
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	January 15, 2018

BN ✓
01-25-2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

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

Issued: January 15, 2018

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

Calibration Laboratory of
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Accreditation No.: SCS 0108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5.0 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.7 ± 6 %	0.92 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.39 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.36 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.55 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.10 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.8 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.47 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.71 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.62 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.39 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.8 Ω - 2.9 jΩ
Return Loss	- 29.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.4 Ω - 5.7 jΩ
Return Loss	- 23.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.386 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 22, 2011

Appendix (Additional assessments outside the scope of SCS 0108)

Measurement Conditions

DASY system configuration, as far as not given on page 1 and 3.

Phantom	SAM Head Phantom	For usage with cSAR3DV2-R/L

SAR result with SAM Head (Top)

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.41 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.58 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.21 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Mouth)

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.47 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.69 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.64 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.45 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Neck)

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.22 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.59 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.25 W/kg ± 16.9 % (k=2)**

SAR result with SAM Head (Ear)

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.03 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**7.96 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.39 W/kg ± 16.9 % (k=2)**

DASY5 Validation Report for Head TSL

Date: 08.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d132

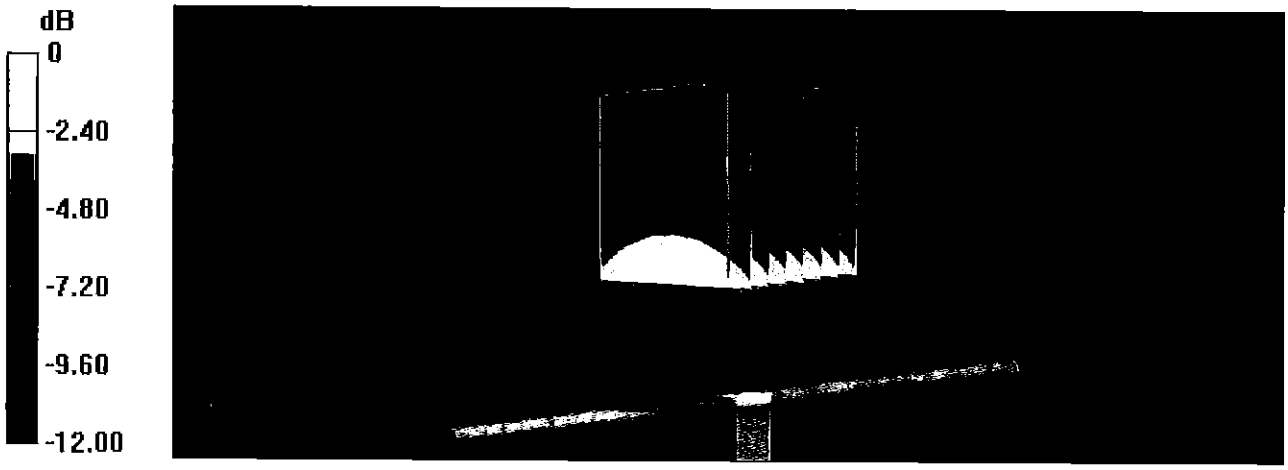
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.92 S/m; ε_r = 40.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.9, 9.9, 9.9); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

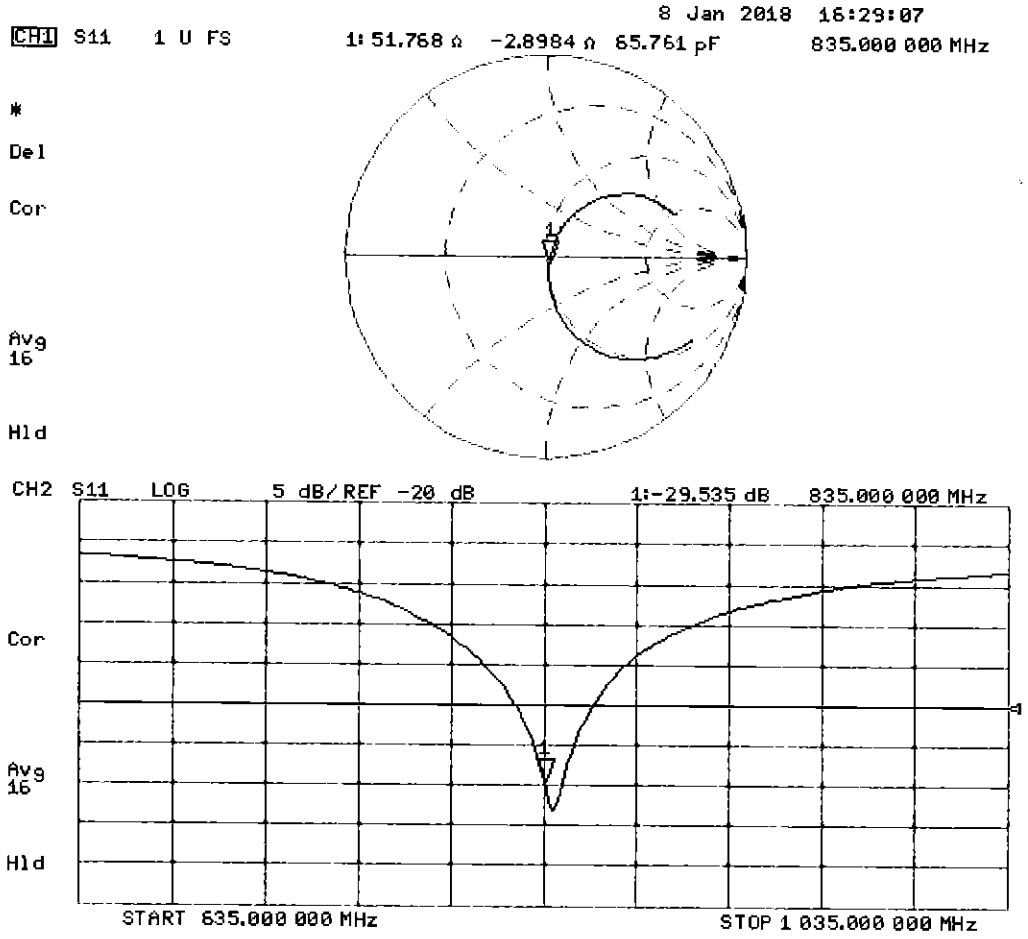
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 63.23 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.64 W/kg
SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 3.22 W/kg



0 dB = 3.22 W/kg = 5.08 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 08.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d132

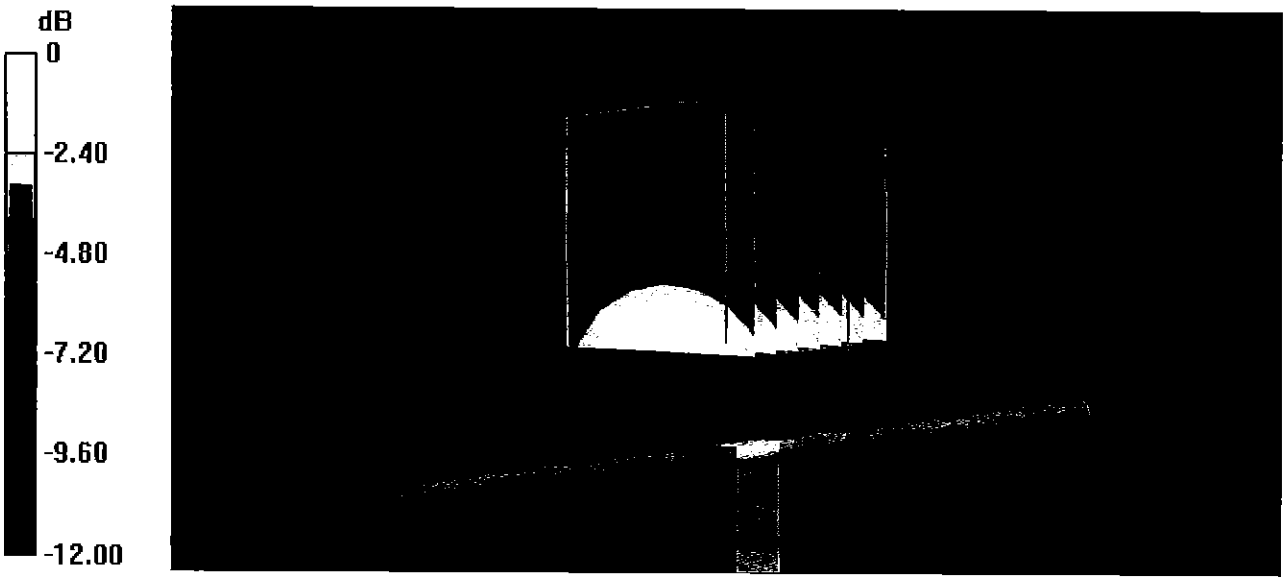
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.99 S/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.05, 10.05, 10.05); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

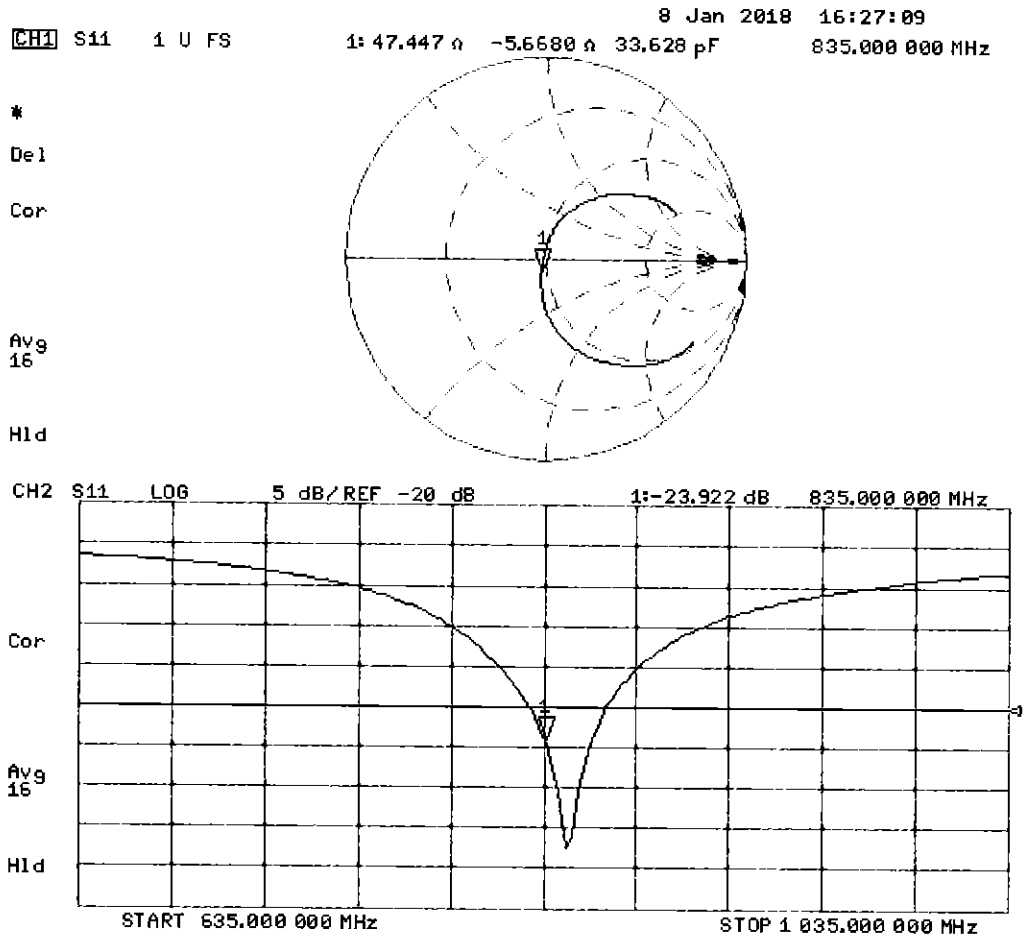
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.55 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.66 W/kg
SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.62 W/kg
Maximum value of SAR (measured) = 3.24 W/kg



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

Impedance Measurement Plot for Body TSL



DASY5 Validation Report for SAM Head

Date: 15.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d132

Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.94 S/m; ε_r = 44.1; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

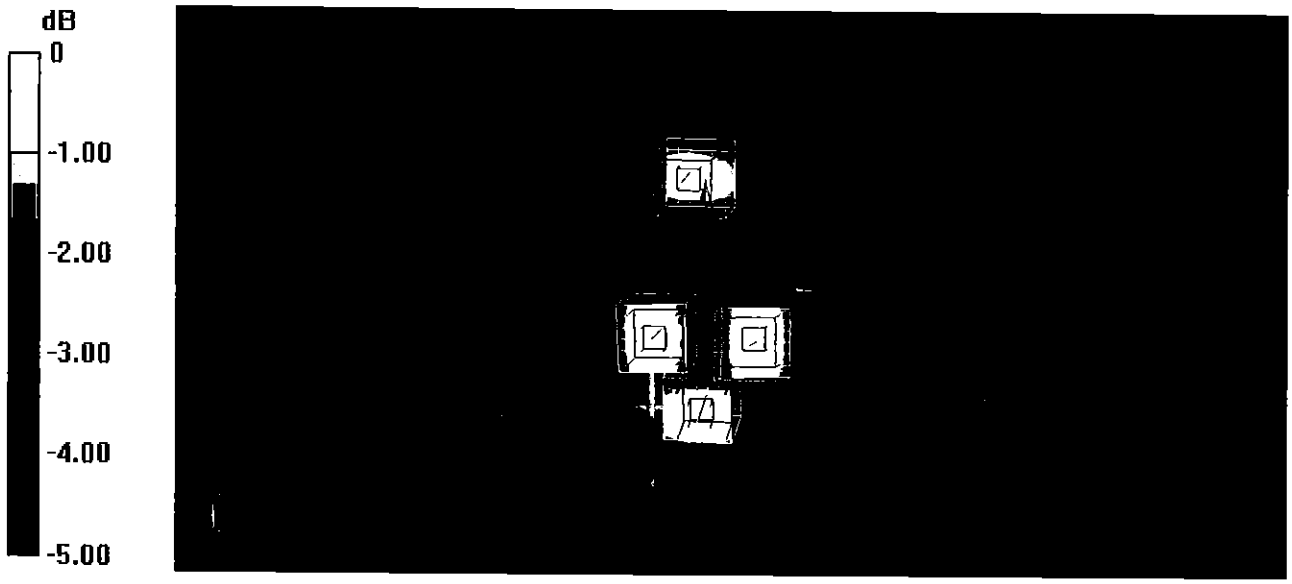
- Probe: EX3DV4 - SN7349; ConvF(9.9, 9.9, 9.9); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: SAM Head
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

SAM Head/Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 61.00 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.56 W/kg
SAR(1 g) = 2.4 W/kg; SAR(10 g) = 1.58 W/kg
Maximum value of SAR (measured) = 3.16 W/kg

SAM Head/Mouth/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.99 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 3.65 W/kg
SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.64 W/kg
Maximum value of SAR (measured) = 3.19 W/kg

SAM Head/Neck/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.20 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.33 W/kg
SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.59 W/kg
Maximum value of SAR (measured) = 3.04 W/kg

SAM Head/Ear/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.03 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 2.90 W/kg
SAR(1 g) = 2.03 W/kg; SAR(10 g) = 1.37 W/kg
Maximum value of SAR (measured) = 2.61 W/kg



0 dB = 2.61 W/kg = 4.17 dBW/kg

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

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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D835V2-4d133_Jul17

CALIBRATION CERTIFICATE

Object	D835V2 - SN:4d133
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	July 11, 2017

PN ✓ 8/3/2017

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Johannes Kurikka	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 12, 2017

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

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.8 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.52 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.54 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.10 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.8 ± 6 %	1.01 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.43 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.41 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.58 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.16 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.0 Ω - 2.9 jΩ
Return Loss	- 30.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.7 Ω - 6.8 jΩ
Return Loss	- 22.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.196 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 22, 2011

DASY5 Validation Report for Head TSL

Date: 11.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d133

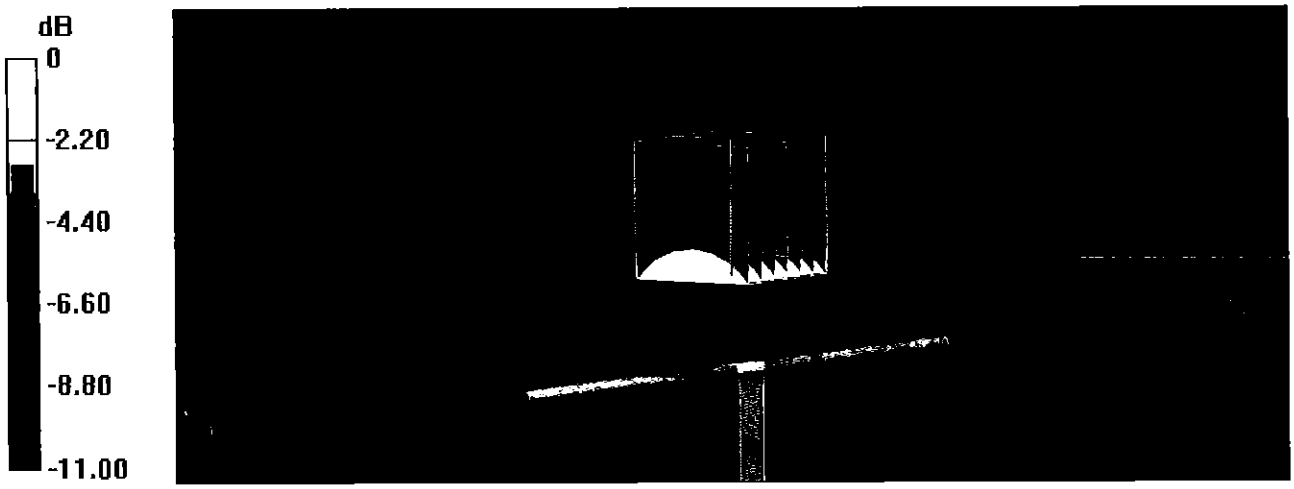
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.91 S/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.07, 10.07, 10.07); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

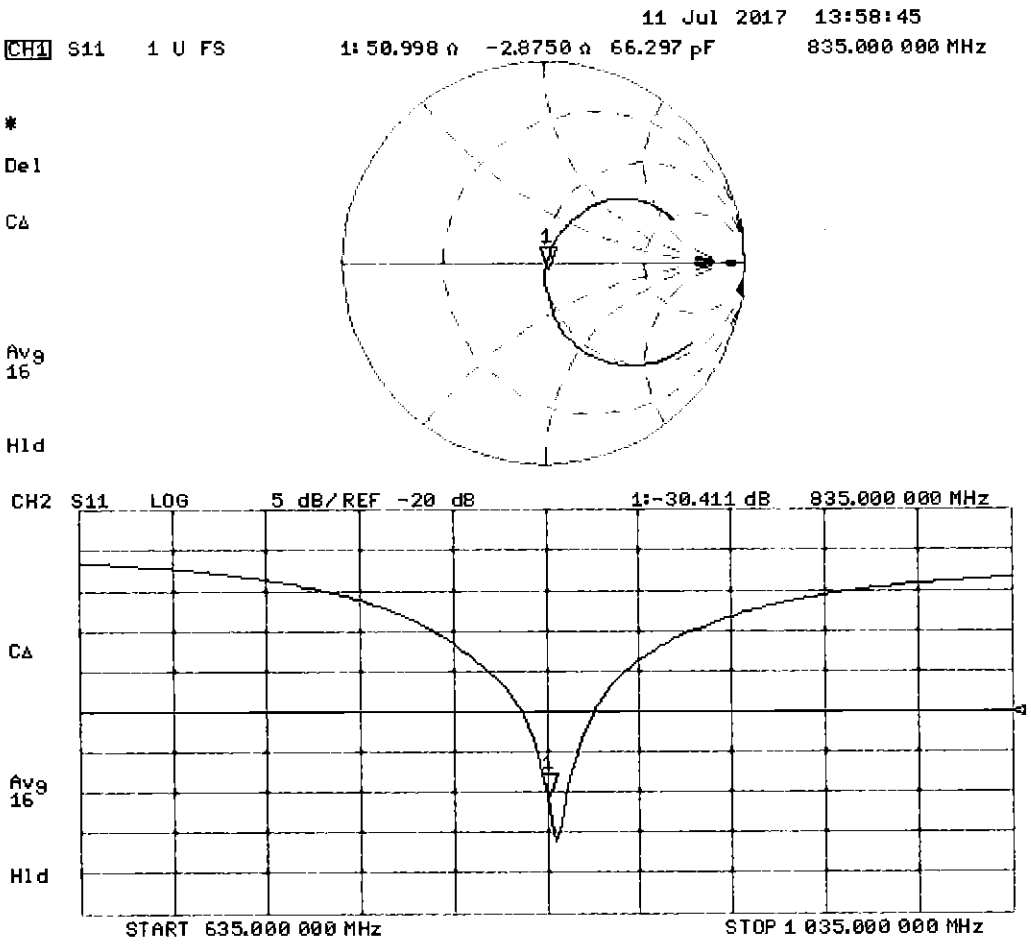
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 62.84 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.74 W/kg
SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.54 W/kg
Maximum value of SAR (measured) = 3.28 W/kg



0 dB = 3.28 W/kg = 5.16 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 11.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d133

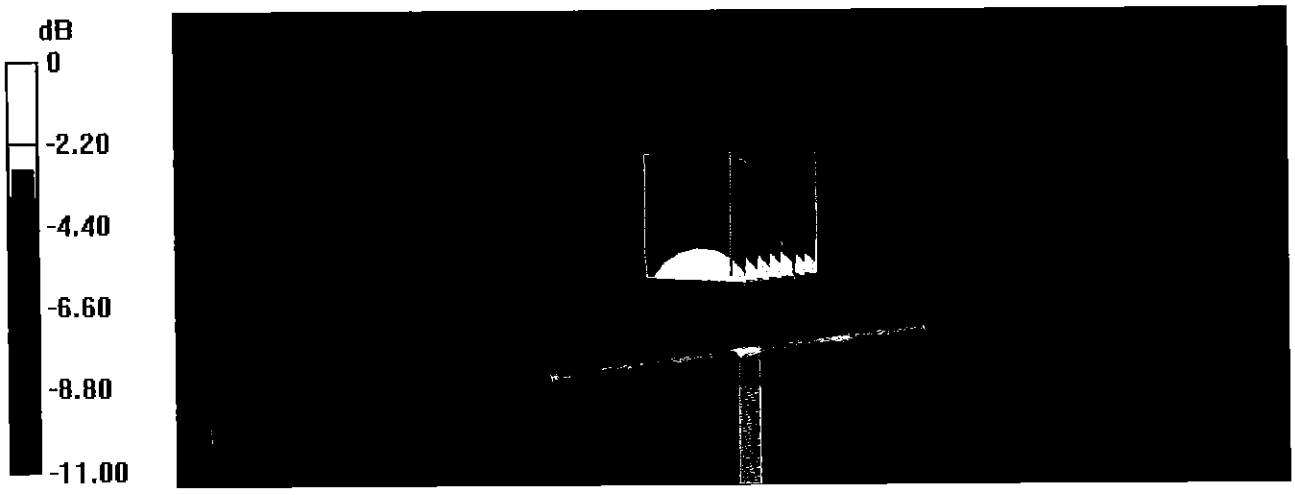
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.01 S/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.2, 10.2, 10.2); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

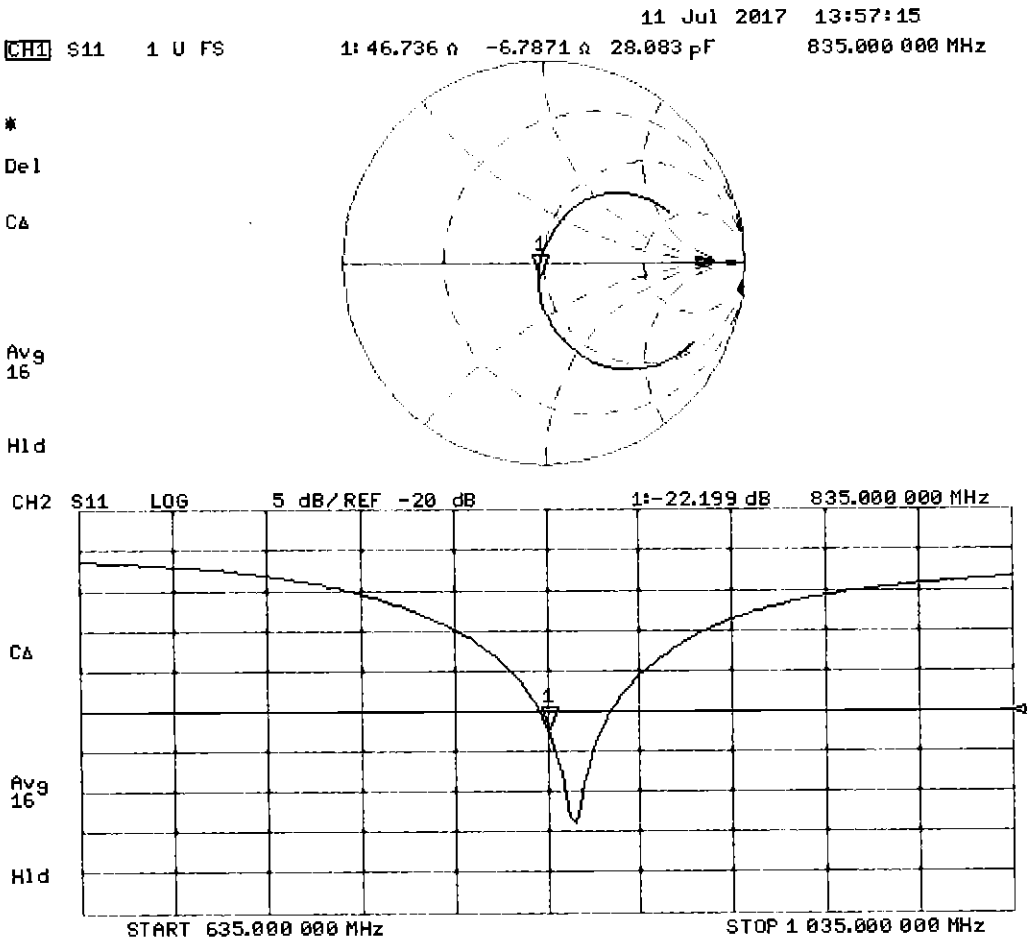
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 59.25 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.67 W/kg
SAR(1 g) = 2.43 W/kg; SAR(10 g) = 1.58 W/kg
Maximum value of SAR (measured) = 3.21 W/kg



0 dB = 3.21 W/kg = 5.07 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **PC Test** **Certificate No: D1750V2-1148_May17**

CALIBRATION CERTIFICATE

Object D1750V2 - SN:1148

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

BN ✓
05-23-2017

Calibration date: May 09, 2017

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-Dec-16 (No. EX3-7349_Dec16)	Dec-17
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 11, 2017

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

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "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
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.0 ± 6 %	1.36 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.11 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.83 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.3 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.7 ± 6 %	1.47 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.17 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**37.0 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.93 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.8 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.8 Ω - 0.7 jΩ
Return Loss	- 42.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.7 Ω - 0.5 jΩ
Return Loss	- 26.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.223 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 30, 2014

DASY5 Validation Report for Head TSL

Date: 09.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1148

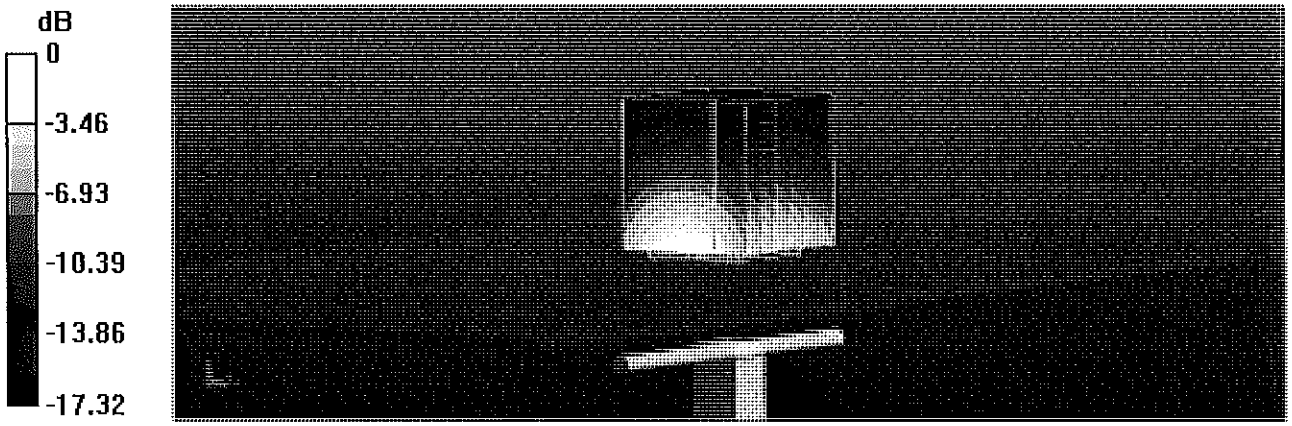
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.46, 8.46, 8.46); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.10.0(1442); SEMCAD X 14.6.10(7413)

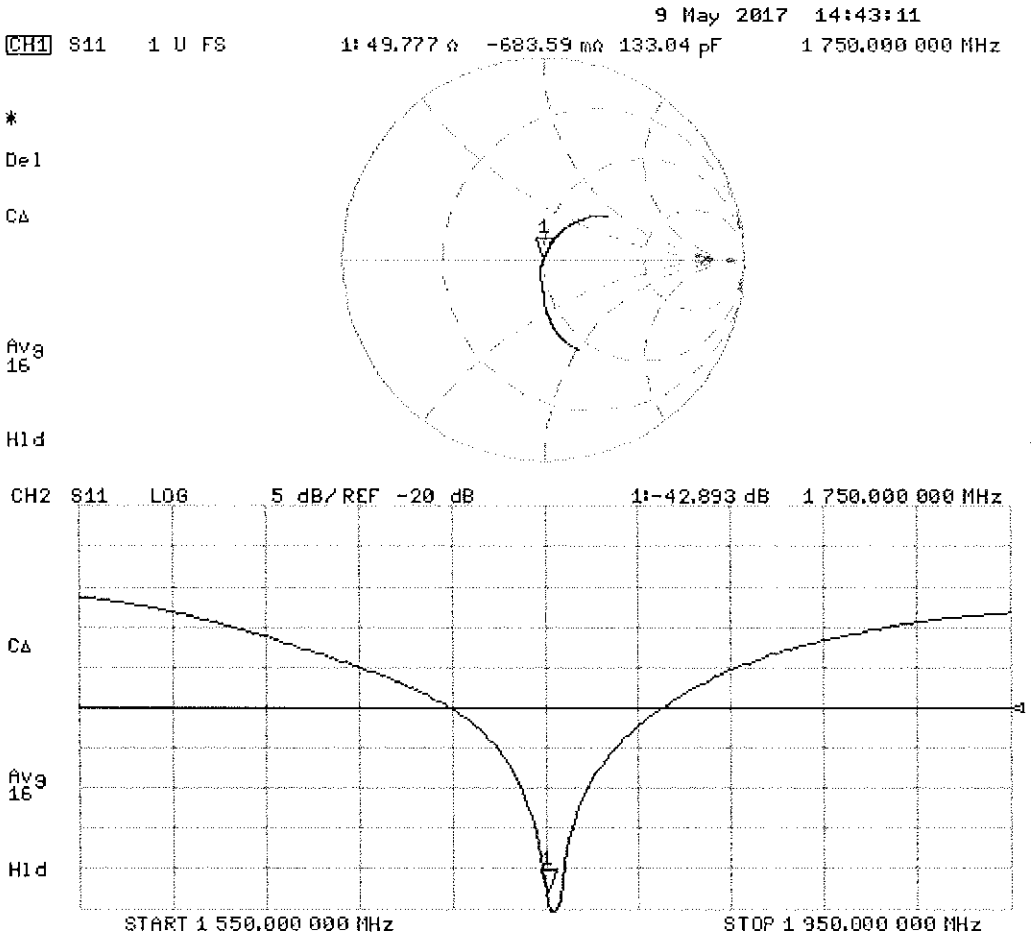
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.4 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 16.5 W/kg
SAR(1 g) = 9.11 W/kg; SAR(10 g) = 4.83 W/kg
Maximum value of SAR (measured) = 13.9 W/kg



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

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 09.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN:1148

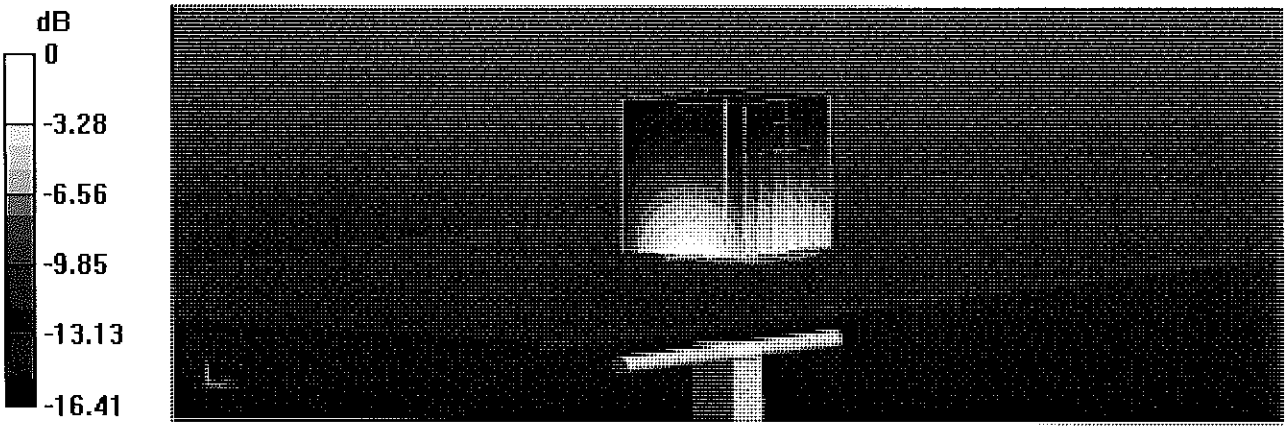
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.47 S/m; ε_r = 53.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.25, 8.25, 8.25); Calibrated: 31.12.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1442); SEMCAD X 14.6.10(7413)

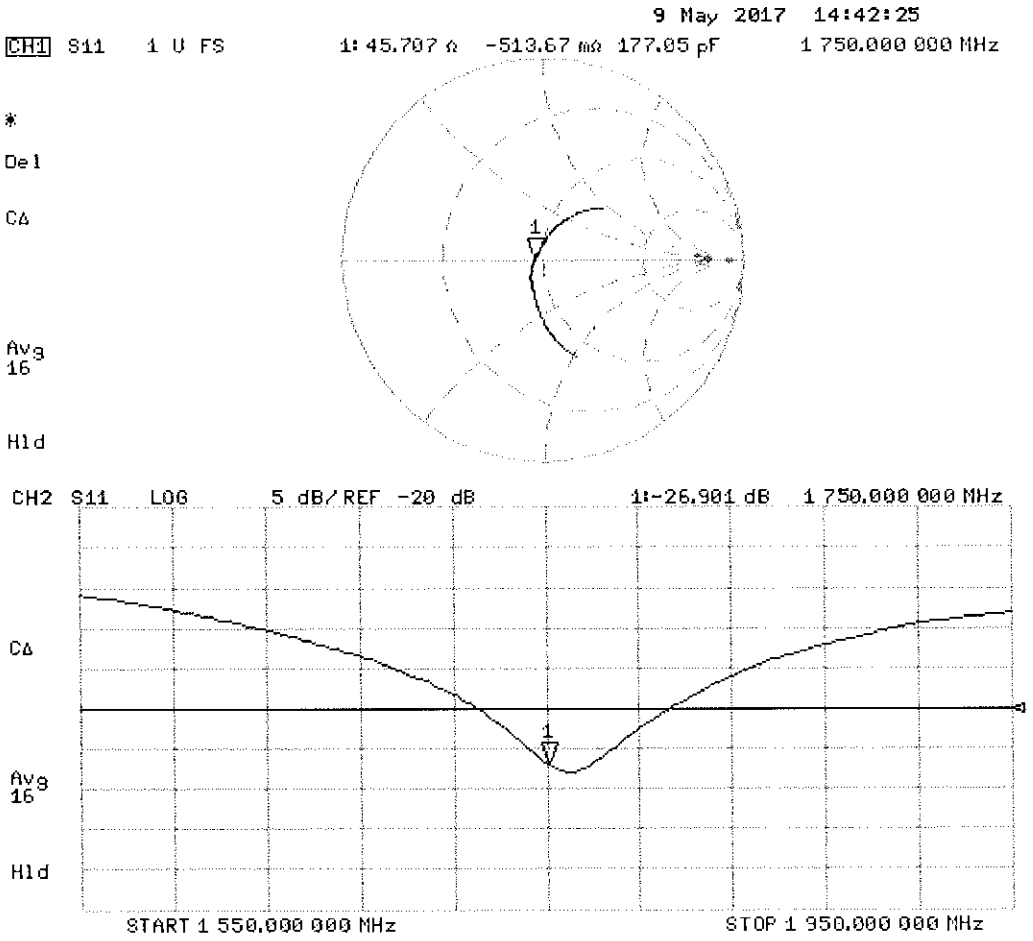
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 99.49 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 15.9 W/kg
SAR(1 g) = 9.17 W/kg; SAR(10 g) = 4.93 W/kg
Maximum value of SAR (measured) = 13.1 W/kg



0 dB = 13.1 W/kg = 11.17 dBW/kg

Impedance Measurement Plot for Body TSL



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)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D1750V2-1150_Jul16

CALIBRATION CERTIFICATE

Object	D1750V2 - SN:1150
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	July 14, 2016

PM 8/9/16
Extended 7/2017 SC

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 14, 2016

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

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "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
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.8 ± 6 %	1.36 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.06 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.80 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.2 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.4 ± 6 %	1.48 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.09 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**36.5 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.85 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.5 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.9 Ω + 0.4 jΩ
Return Loss	- 40.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.4 Ω - 0.5 jΩ
Return Loss	- 28.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.218 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 10, 2015

DASY5 Validation Report for Head TSL

Date: 14.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:1150

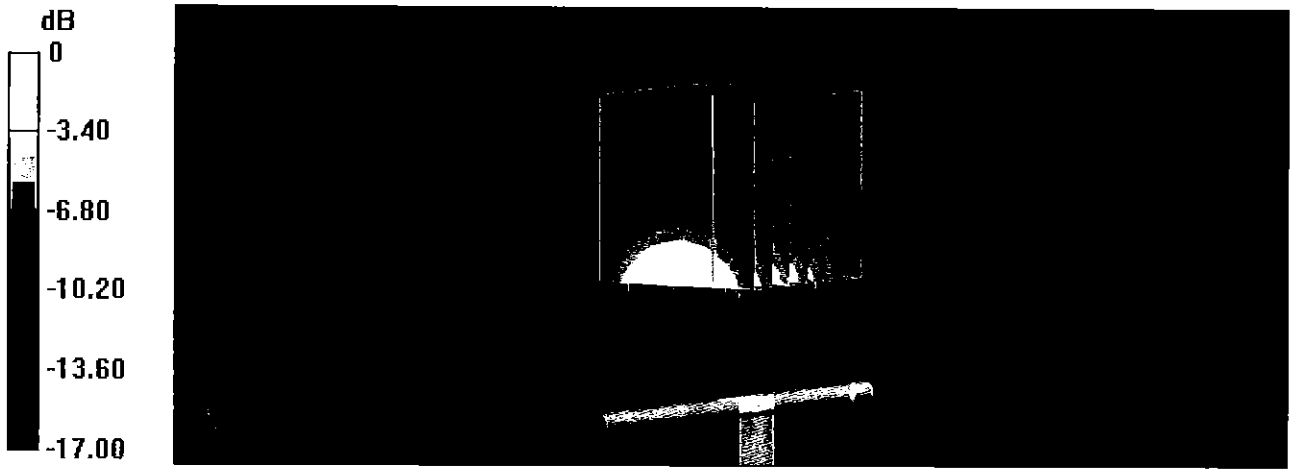
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.36 S/m; ε_r = 38.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.46, 8.46, 8.46); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

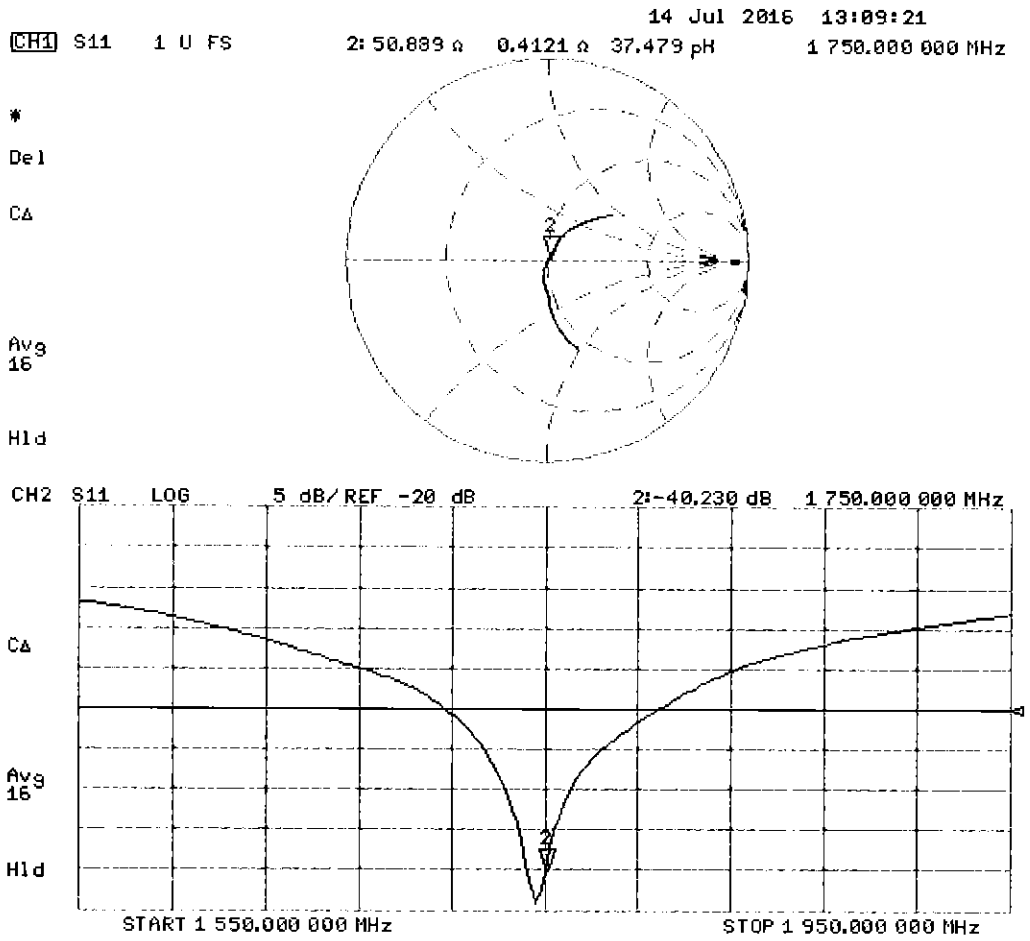
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.4 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 16.6 W/kg
SAR(1 g) = 9.06 W/kg; SAR(10 g) = 4.8 W/kg
Maximum value of SAR (measured) = 13.9 W/kg



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

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 14.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz D1750V2; Type: D1750V2; Serial: D1750V2 - SN:1150

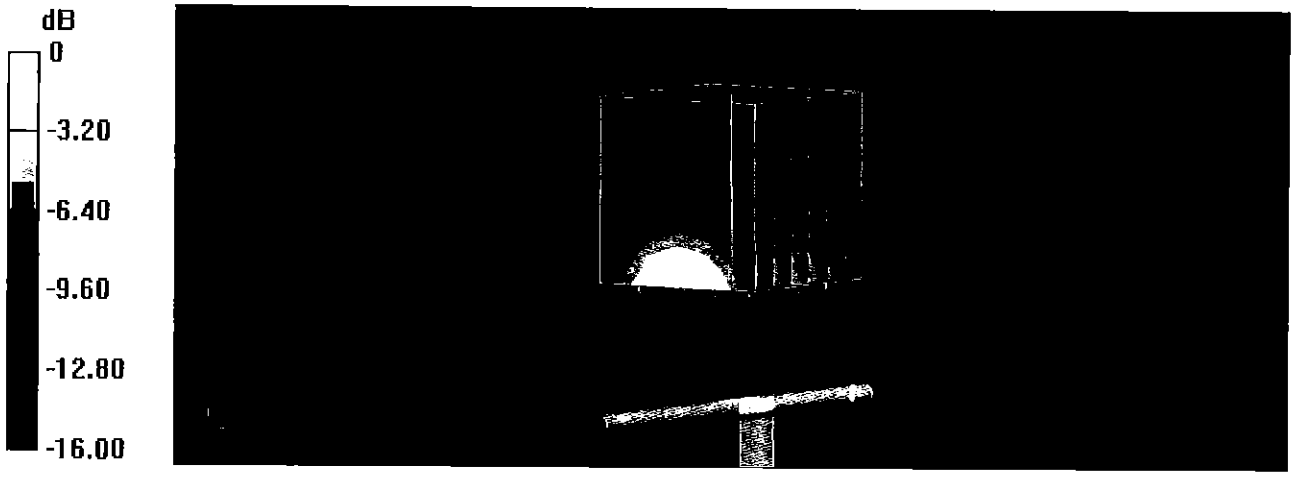
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.48 S/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.25, 8.25, 8.25); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

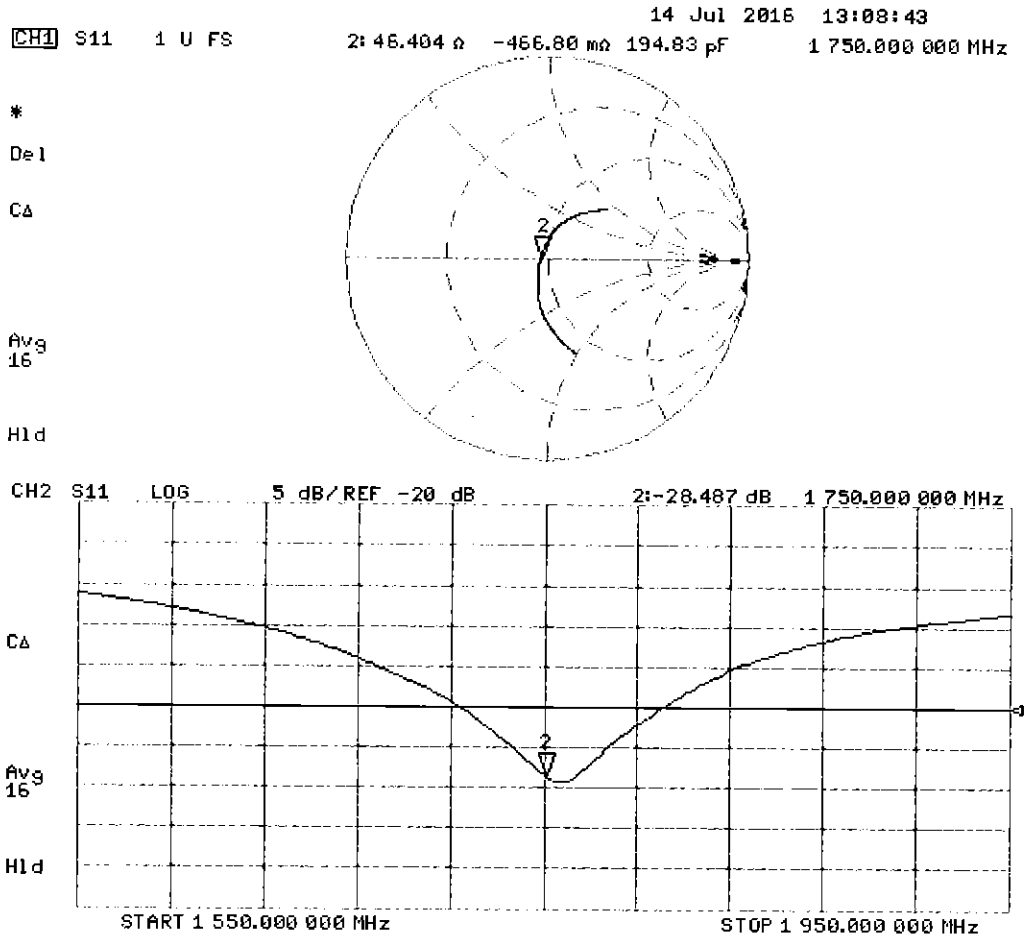
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 100.4 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 16.0 W/kg
SAR(1 g) = 9.09 W/kg; SAR(10 g) = 4.85 W/kg
Maximum value of SAR (measured) = 13.7 W/kg



0 dB = 13.7 W/kg = 11.37 dBW/kg

Impedance Measurement Plot for Body TSL



Certification of Calibration

Object	D1750V2 – SN: 1150
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Calibration date:	July 07, 2017
Description:	SAR Validation Dipole at 1750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/8/2017	Annual	3/8/2018	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2017	Annual	3/13/2018	1415
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3209
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3319
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

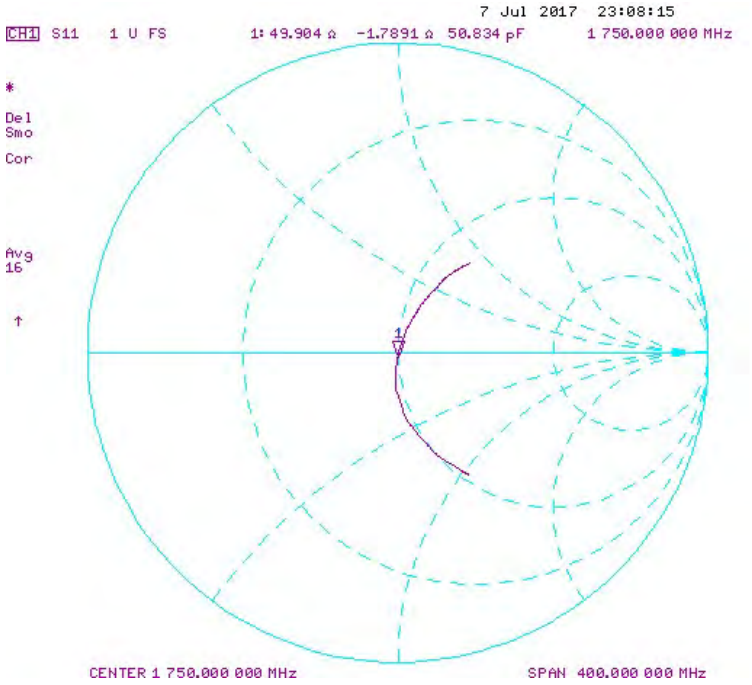
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

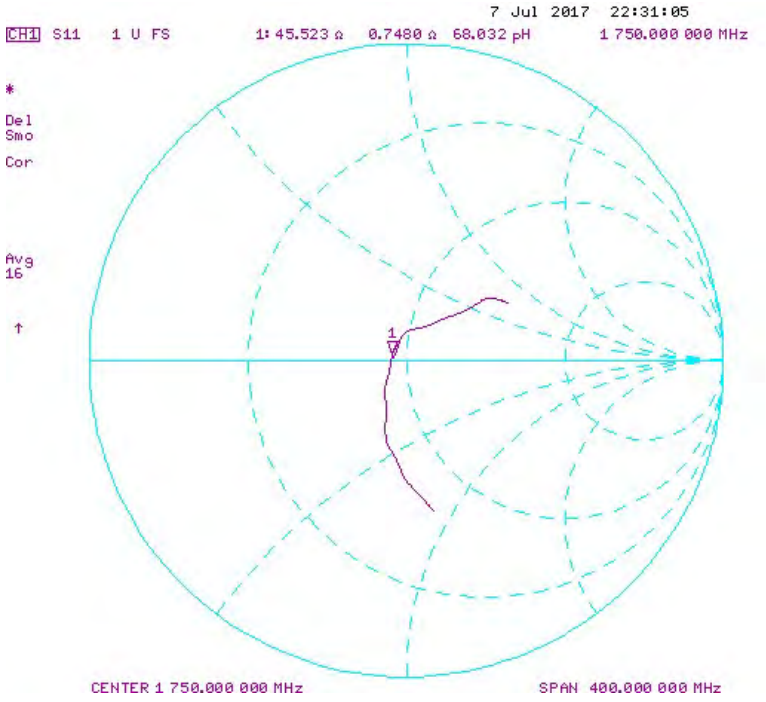
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Measured Head SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 20.0 dBm	Measured Head SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
7/14/2016	7/7/2017	1.218	3.61	3.57	-1.11%	1.92	1.88	-2.08%	50.9	49.9	1	0.4	-1.8	2.1	-40.2	-33.4	16.90%	PASS

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 20.0 dBm	Measured Body SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	Measured Body SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
7/14/2016	7/7/2017	1.218	3.65	3.68	0.82%	1.95	1.97	1.03%	46.4	45.5	0.9	-0.5	0.7	1.2	-28.5	-23.6	17.20%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL



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

S Schweizerischer Kalibrierdienst
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S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client PC Test

Certificate No: D1900V2-5d080_Jul16

CALIBRATION CERTIFICATE

Object: D1900V2 - SN:5d080

Calibration procedure(s): QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

BN ✓
7/16/2016
Extended
7/2017
SL ✓

Calibration date: July 08, 2016

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	06-Apr-16 (No. 217-02288/02289)	Apr-17
Power sensor NRP-Z91	SN: 103244	06-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Attenuator	SN: 5058 (20k)	05-Apr-16 (No. 217-02292)	Apr-17
Type-N mismatch combination	SN: 5047.2 / 06327	05-Apr-16 (No. 217-02295)	Apr-17
Reference Probe EX3DV4	SN: 7349	15-Jun-16 (No. EX3-7349_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (No. 217-02222)	In house check: Oct-16
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (No. 217-02223)	In house check: Oct-16
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Jun-15)	In house check: Oct-16
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 13, 2016

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

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "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
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.8 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.76 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**39.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.5 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.7 ± 6 %	1.51 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.75 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**39.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.17 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.7 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.1 Ω + 5.3 jΩ
Return Loss	- 25.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.4 Ω + 6.8 jΩ
Return Loss	- 22.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.192 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	June 28, 2006

DASY5 Validation Report for Head TSL

Date: 08.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d080

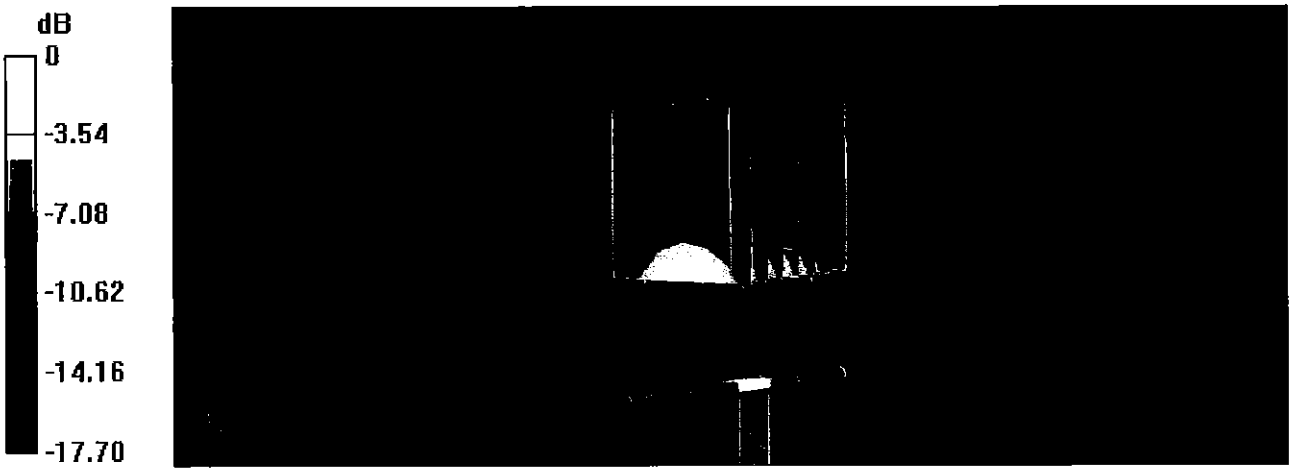
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 S/m; ε_r = 39.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.99, 7.99, 7.99); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

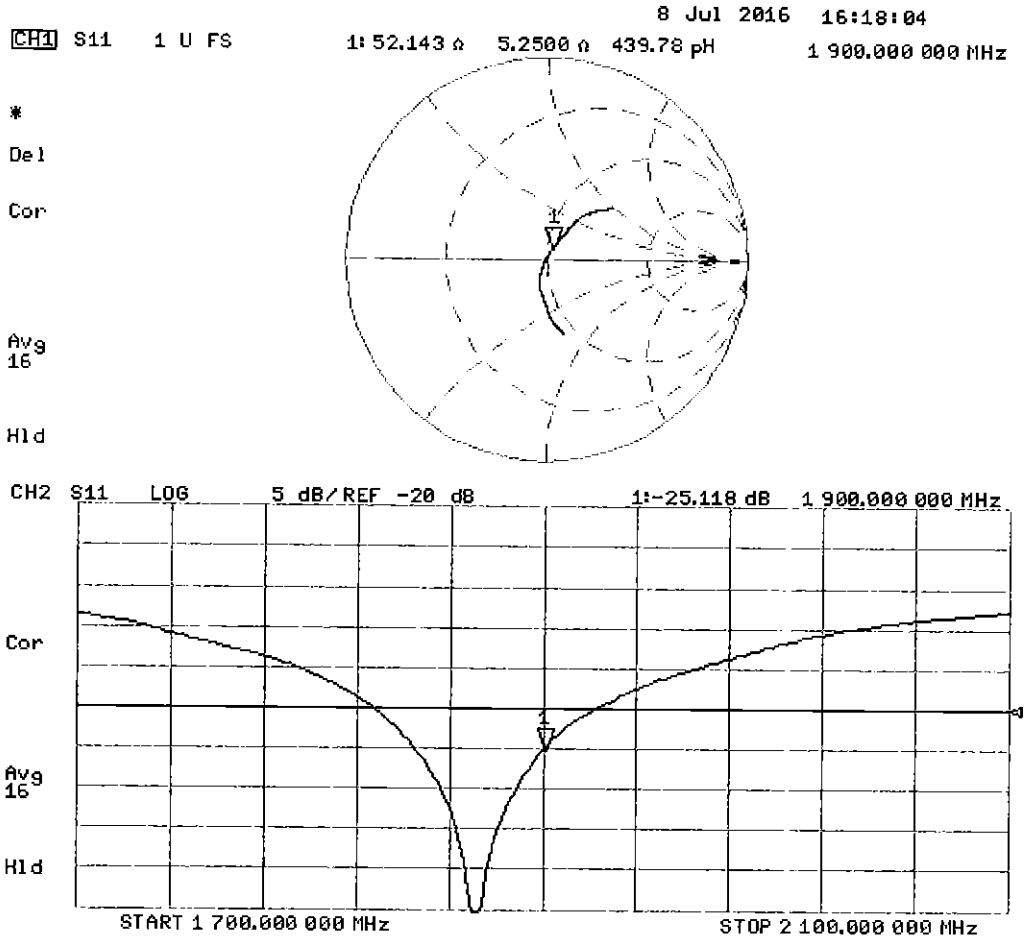
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.6 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 18.4 W/kg
SAR(1 g) = 9.76 W/kg; SAR(10 g) = 5.1 W/kg
Maximum value of SAR (measured) = 15.0 W/kg



0 dB = 15.0 W/kg = 11.76 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 08.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d080

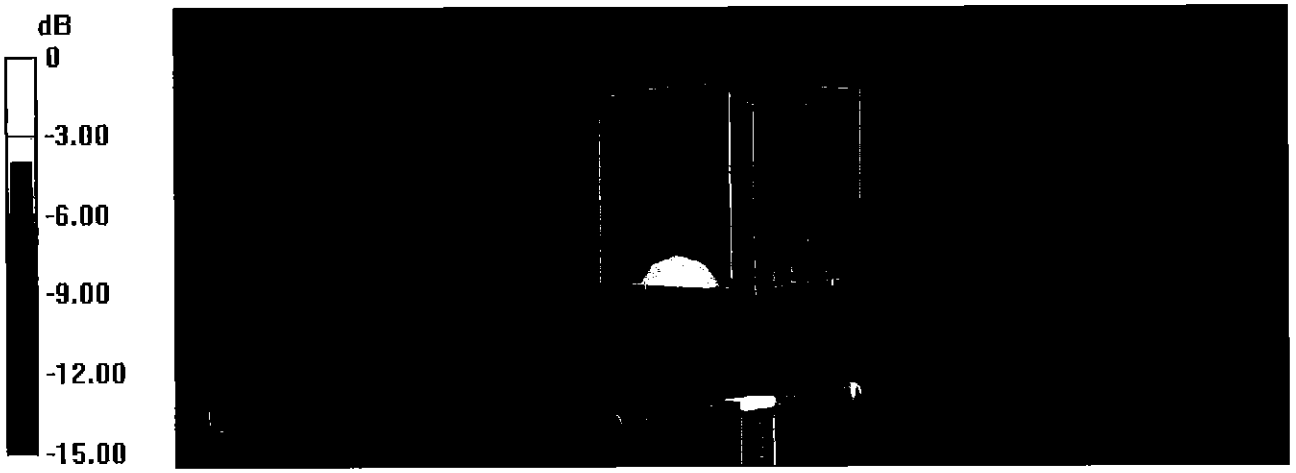
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.51 S/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.03, 8.03, 8.03); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

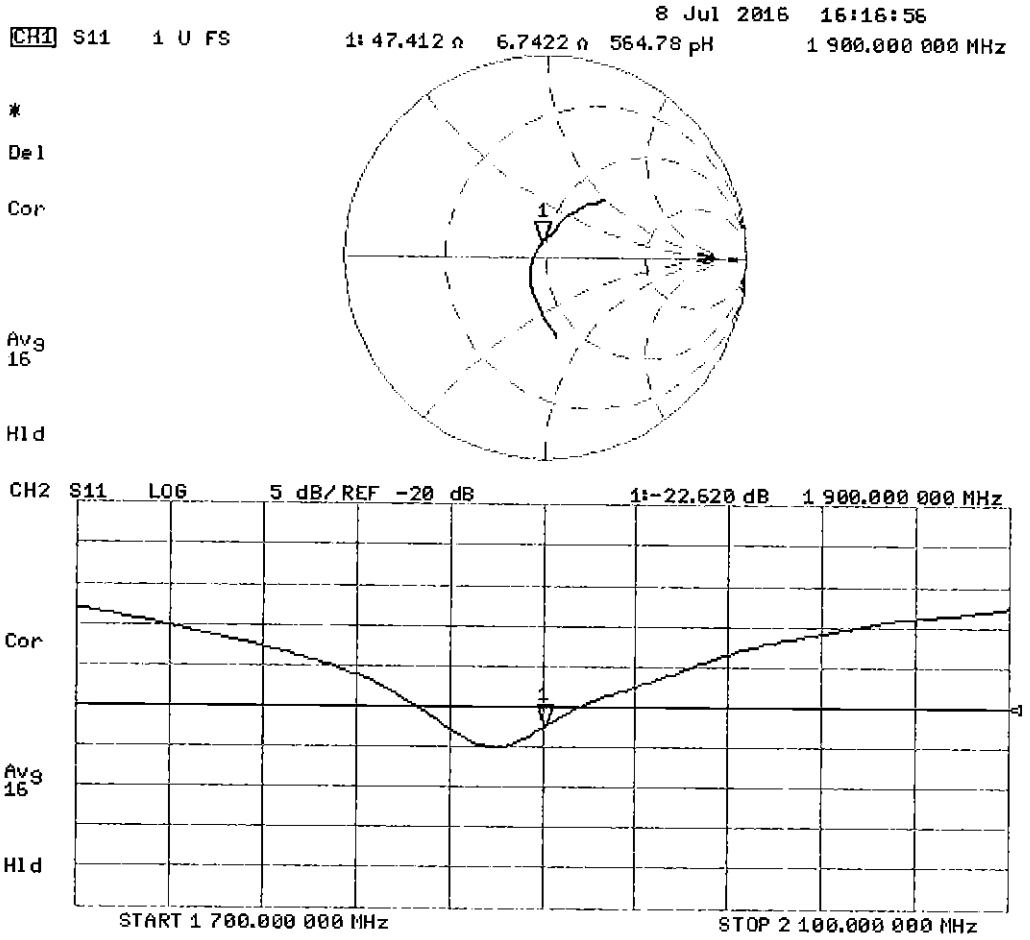
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 103.1 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 17.1 W/kg
SAR(1 g) = 9.75 W/kg; SAR(10 g) = 5.17 W/kg
Maximum value of SAR (measured) = 14.7 W/kg



0 dB = 14.7 W/kg = 11.67 dBW/kg

Impedance Measurement Plot for Body TSL



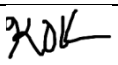
Certification of Calibration

Object	D1900V2 – SN: 5d080
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Calibration date:	July 06, 2017
Description:	SAR Validation Dipole at 1900 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	3/31/2017	Biennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/1/2017	Annual	6/1/2018	MY53401181
Agilent	8753ES	S-Parameter Network Analyzer	10/26/2016	Annual	10/26/2017	US39170118
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/13/2017	Annual	3/13/2018	1415
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2017	Annual	5/10/2018	1070
SPEAG	ES3DV3	SAR Probe	3/14/2017	Annual	3/14/2018	3209
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1207364
Anritsu	MA2411B	Pulse Power Sensor	2/10/2017	Annual	2/10/2018	1339018
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Agilent	N5182A	MXG Vector Signal Generator	2/28/2017	Annual	2/28/2018	MY47420800
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	

DIPOLE CALIBRATION EXTENSION

Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

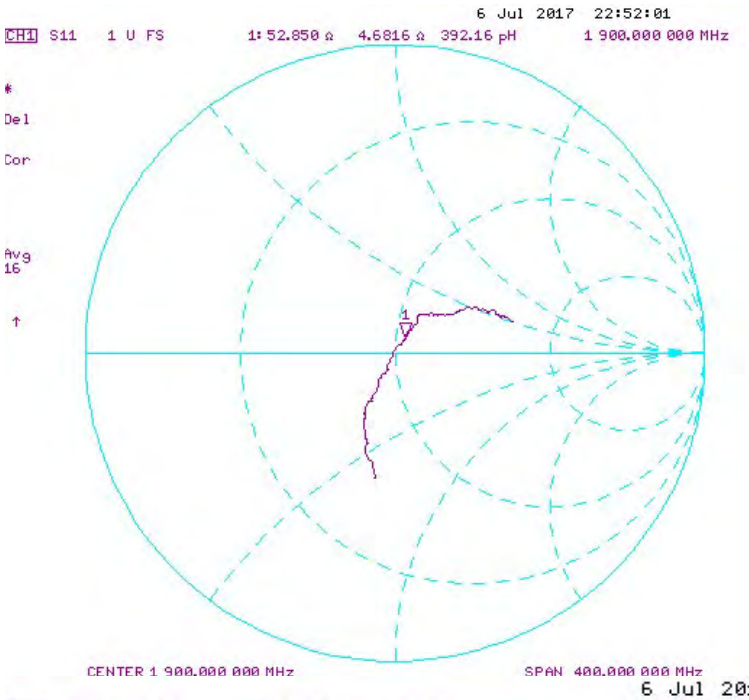
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

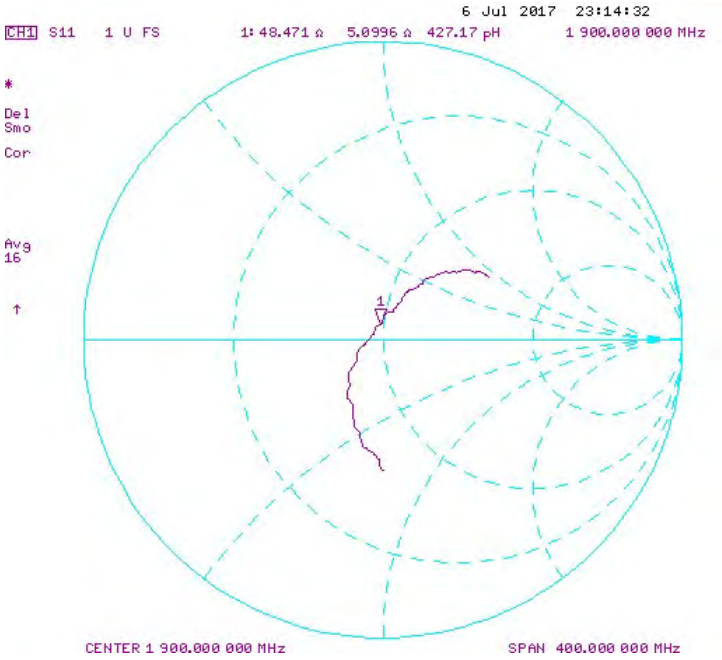
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Measured Head SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 20.0 dBm	Measured Head SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
7/8/2016	7/6/2017	1.192	3.93	3.86	-1.78%	2.05	2	-2.44%	52.1	52.9	0.8	5.3	4.7	0.6	-25.1	-25.6	-2.00%	PASS

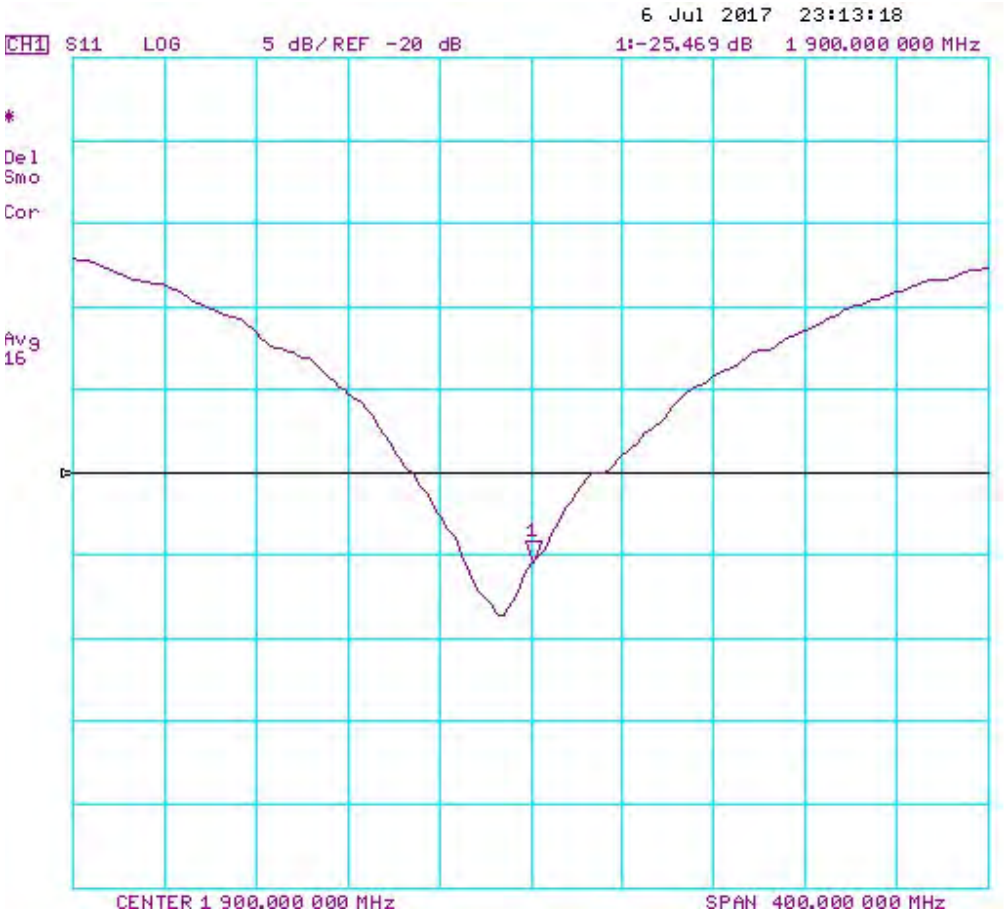
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 20.0 dBm	Measured Body SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	Measured Body SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
7/8/2016	7/6/2017	1.192	3.91	4.05	3.58%	2.07	2.11	1.93%	47.4	48.5	1.1	6.8	5.1	1.7	-22.6	-25.5	-12.80%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





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)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D1900V2-5d148_Feb18

CALIBRATION CERTIFICATE

Object D1900V2 - SN:5d148

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

BN✓ 03-02-2018

Calibration date: February 07, 2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 7, 2018

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

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.7 ± 6 %	1.39 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.95 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**40.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.22 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**21.0 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.2 ± 6 %	1.48 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.68 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**39.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.9 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.1 Ω + 5.8 jΩ
Return Loss	- 24.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.8 Ω + 6.5 jΩ
Return Loss	- 23.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.199 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 11, 2011

DASY5 Validation Report for Head TSL

Date: 07.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d148

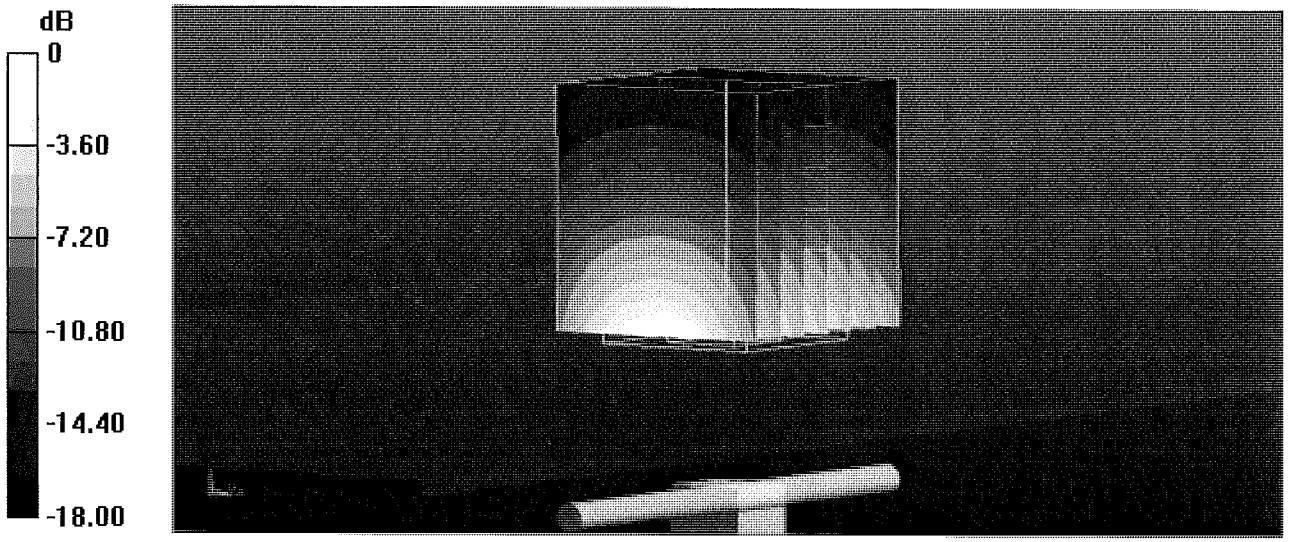
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.39 S/m; ε_r = 40.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.18, 8.18, 8.18); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

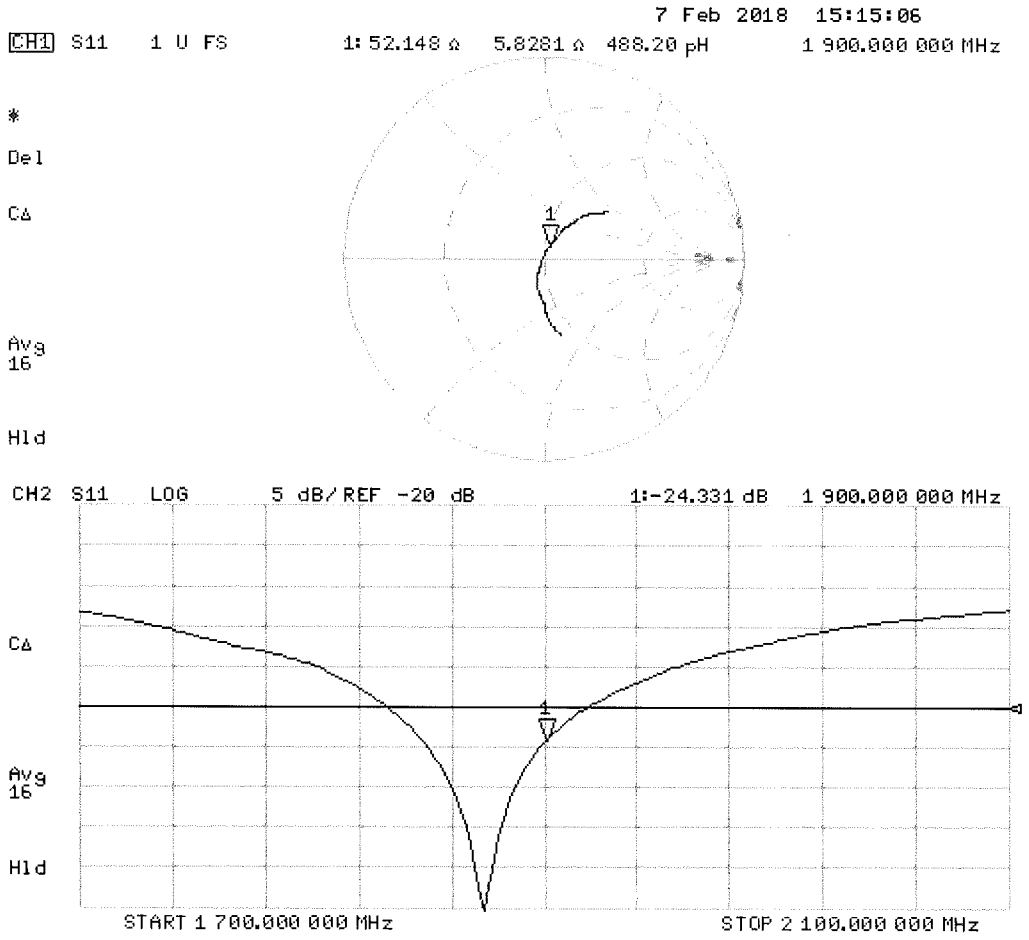
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.6 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 18.5 W/kg
SAR(1 g) = 9.95 W/kg; SAR(10 g) = 5.22 W/kg
Maximum value of SAR (measured) = 15.3 W/kg



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

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 07.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d148

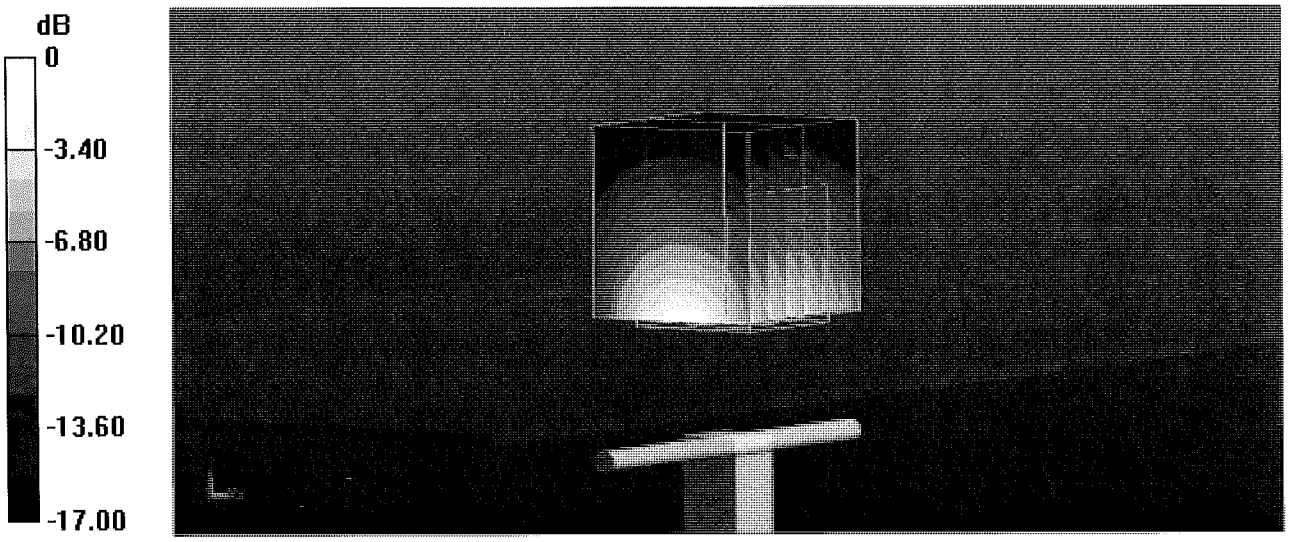
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.48 S/m; ε_r = 55.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.15, 8.15, 8.15); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

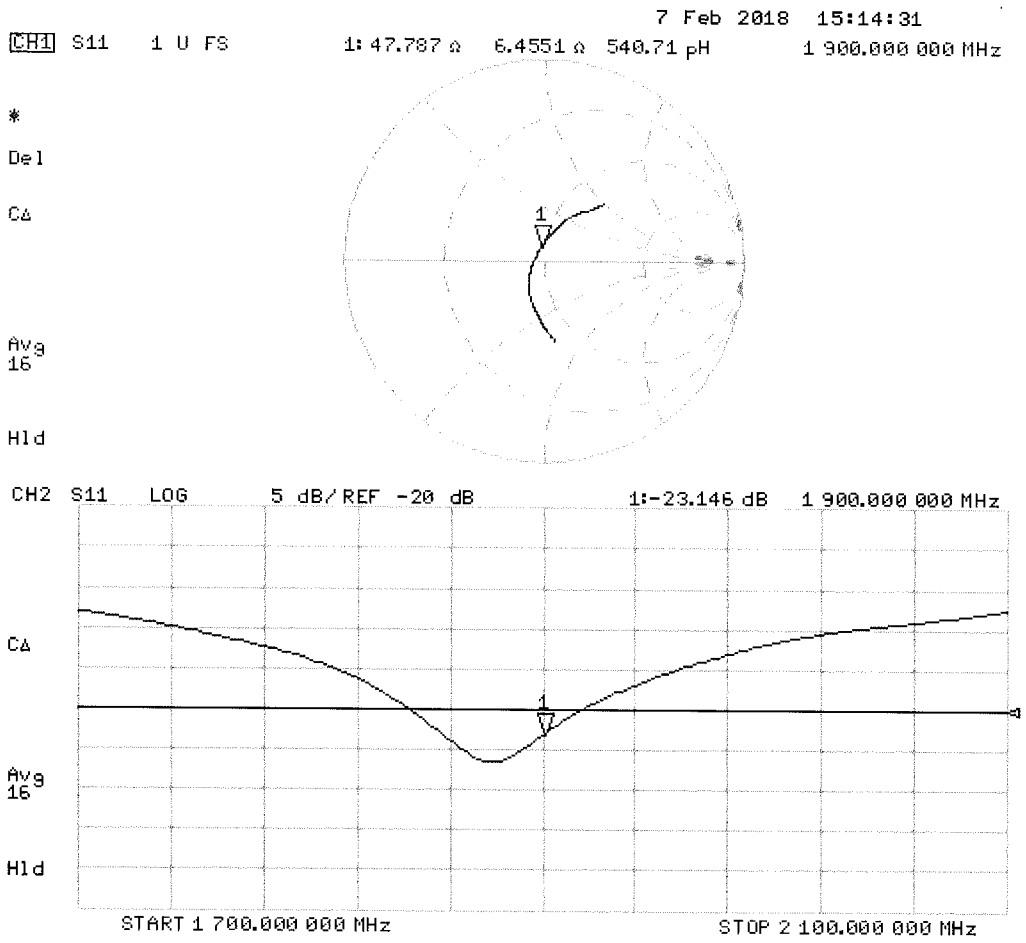
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 103.0 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 17.2 W/kg
SAR(1 g) = 9.68 W/kg; SAR(10 g) = 5.14 W/kg
Maximum value of SAR (measured) = 14.4 W/kg



0 dB = 14.4 W/kg = 11.58 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: D2450V2-797_Sep17

CALIBRATION CERTIFICATE

Object D2450V2 - SN:797

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

SCV
10/03/2017

Calibration date: September 11, 2017

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	31-May-17 (No. EX3-7349_May17)	May-18
DAE4	SN: 601	28-Mar-17 (No. DAE4-601_Mar17)	Mar-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 11, 2017

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Accreditation No.: SCS 0108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.8 ± 6 %	1.86 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.5 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**52.7 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.28 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.8 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.9 ± 6 %	2.04 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.1 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**51.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**24.2 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.8 Ω + 7.4 jΩ
Return Loss	- 21.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.7 Ω + 9.1 jΩ
Return Loss	- 20.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.152 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	January 24, 2006

DASY5 Validation Report for Head TSL

Date: 11.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 797

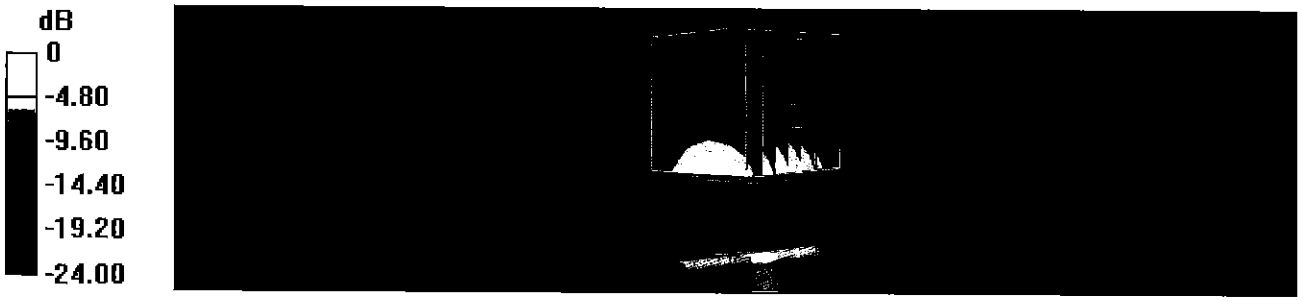
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.86 S/m; ε_r = 37.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.12, 8.12, 8.12); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

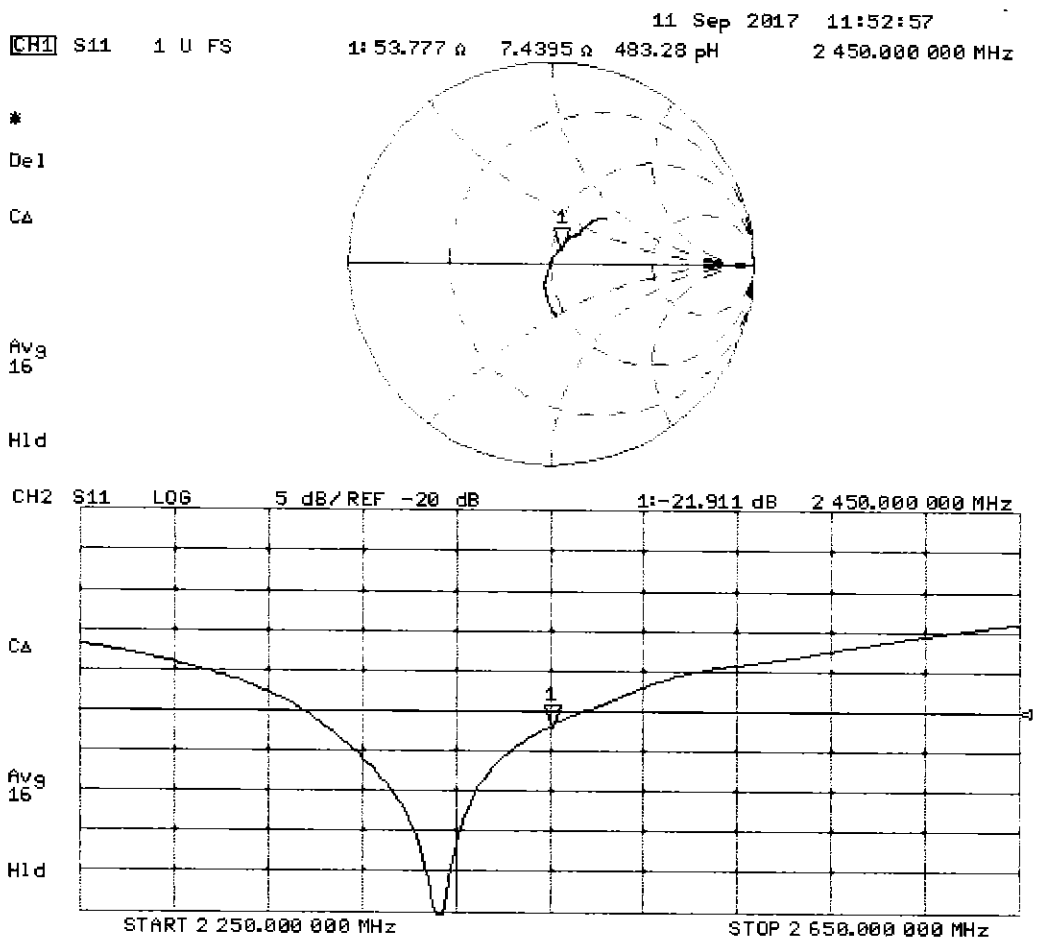
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 113.5 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 26.9 W/kg
SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.28 W/kg
Maximum value of SAR (measured) = 21.6 W/kg



0 dB = 21.6 W/kg = 13.34 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 11.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 797

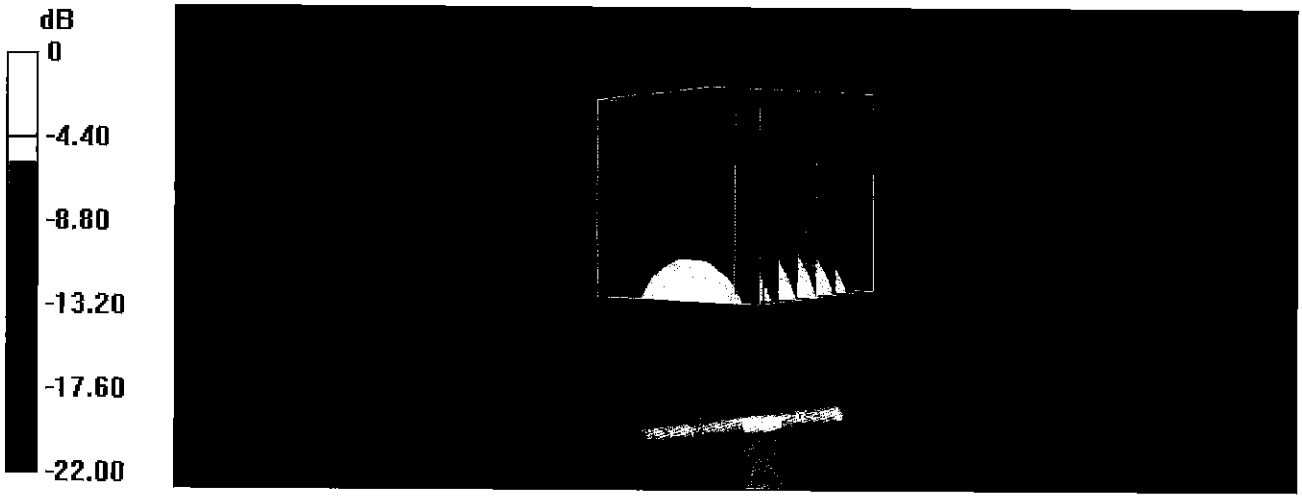
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.04 S/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.1, 8.1, 8.1); Calibrated: 31.05.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 28.03.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

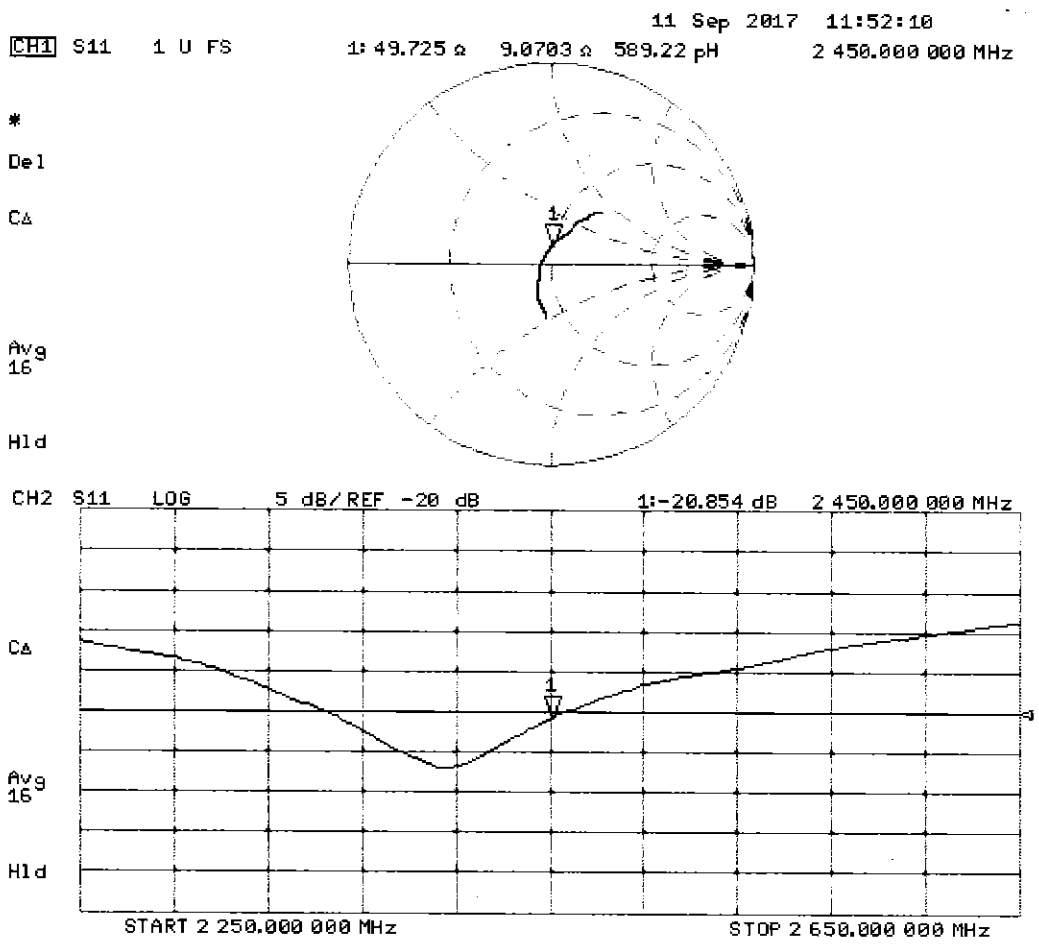
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.4 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 25.6 W/kg
SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.14 W/kg
Maximum value of SAR (measured) = 20.3 W/kg



0 dB = 20.3 W/kg = 13.07 dBW/kg

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 0108

Client PC Test

Certificate No: ES3-3213_Feb18

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3213

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

BN 03-02-2018

Calibration date: February 13, 2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02525)	Apr-18
Reference 20 dB Attenuator	SN: S5277 (20x)	07-Apr-17 (No. 217-02528)	Apr-18
Reference Probe ES3DV2	SN: 3013	30-Dec-17 (No. ES3-3013_Dec17)	Dec-18
DAE4	SN: 660	21-Dec-17 (No. DAE4-660_Dec17)	Dec-18
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-16)	In house check: Jun-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 13, 2018

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

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 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:3213

Manufactured: October 14, 2008
Calibrated: February 13, 2018

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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3213

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.43	1.32	1.29	± 10.1 %
DCP (mV)[B]	100.3	104.3	100.0	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB$\sqrt{\mu V}$	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	219.3	±2.7 %
		Y	0.0	0.0	1.0		219.1	
		Z	0.0	0.0	1.0		213.7	

Note: For details on UID parameters see Appendix.

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	55.43	404.4	36.34	28.23	1.967	5.10	0.398	0.555	1.011
Y	56.36	406.4	35.71	28.34	2.153	5.10	1.040	0.438	1.013
Z	52.80	385.3	36.34	28.19	1.829	5.10	0.000	0.541	1.011

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of Norm X,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[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:3213

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)	Unc (k=2)
750	41.9	0.89	6.75	6.75	6.75	0.64	1.30	± 12.0 %
835	41.5	0.90	6.42	6.42	6.42	0.48	1.50	± 12.0 %
1750	40.1	1.37	5.45	5.45	5.45	0.52	1.41	± 12.0 %
1900	40.0	1.40	5.30	5.30	5.30	0.79	1.17	± 12.0 %
2300	39.5	1.67	4.94	4.94	4.94	0.59	1.37	± 12.0 %
2450	39.2	1.80	4.72	4.72	4.72	0.80	1.21	± 12.0 %
2600	39.0	1.96	4.53	4.53	4.53	0.72	1.33	± 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:3213

Calibration Parameter Determined in Body Tissue Simulating Media

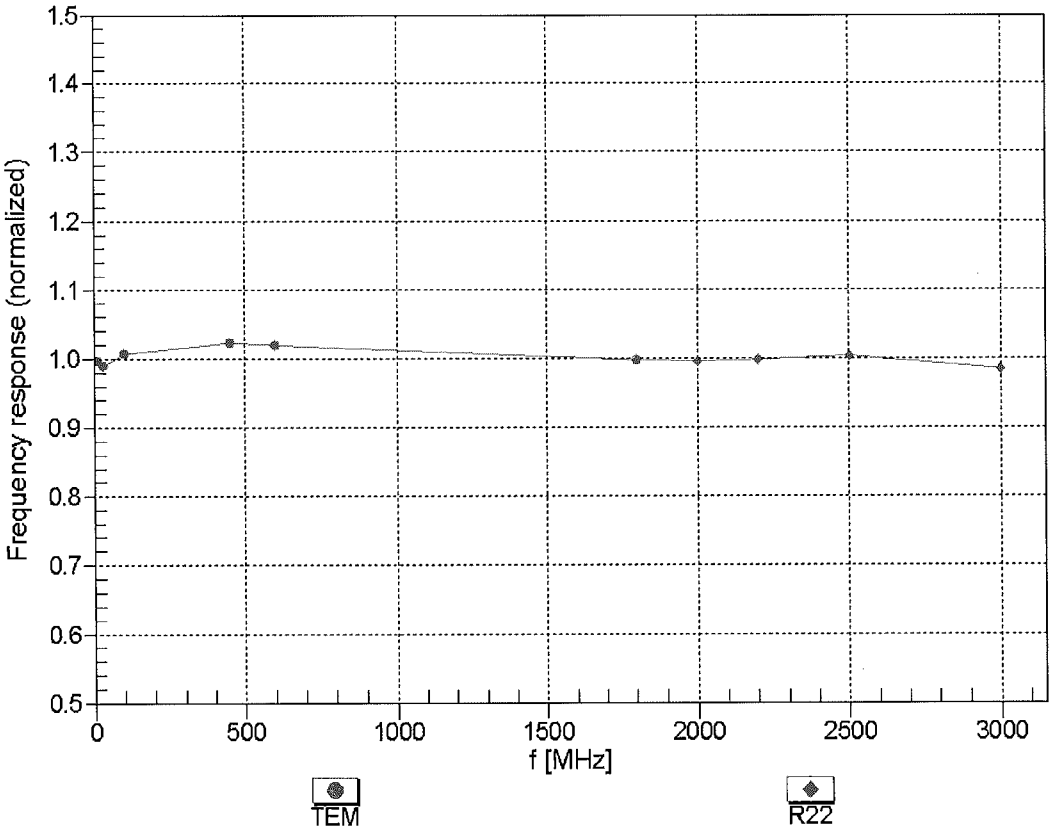
f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
750	55.5	0.96	6.30	6.30	6.30	0.80	1.13	± 12.0 %
835	55.2	0.97	6.20	6.20	6.20	0.41	1.66	± 12.0 %
1750	53.4	1.49	5.10	5.10	5.10	0.37	1.82	± 12.0 %
1900	53.3	1.52	4.88	4.88	4.88	0.59	1.51	± 12.0 %
2300	52.9	1.81	4.62	4.62	4.62	0.80	1.30	± 12.0 %
2450	52.7	1.95	4.53	4.53	4.53	0.80	1.25	± 12.0 %
2600	52.5	2.16	4.33	4.33	4.33	0.80	1.25	± 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.

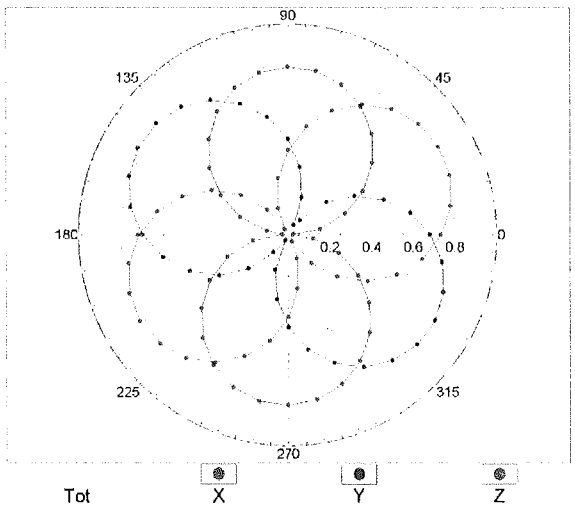
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



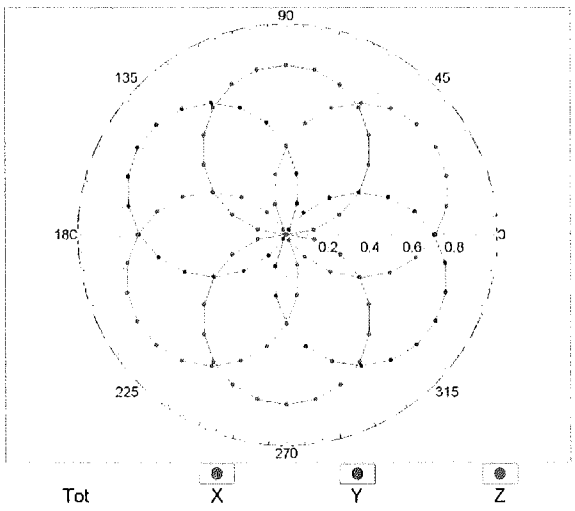
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

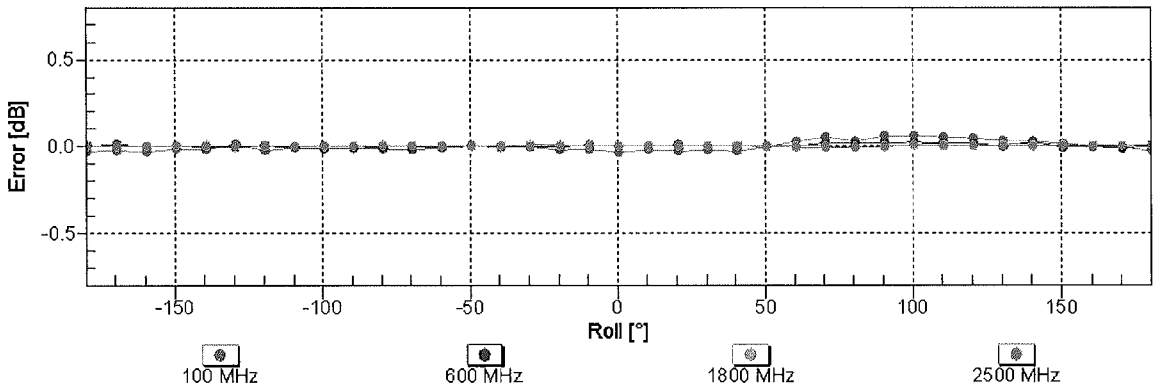
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



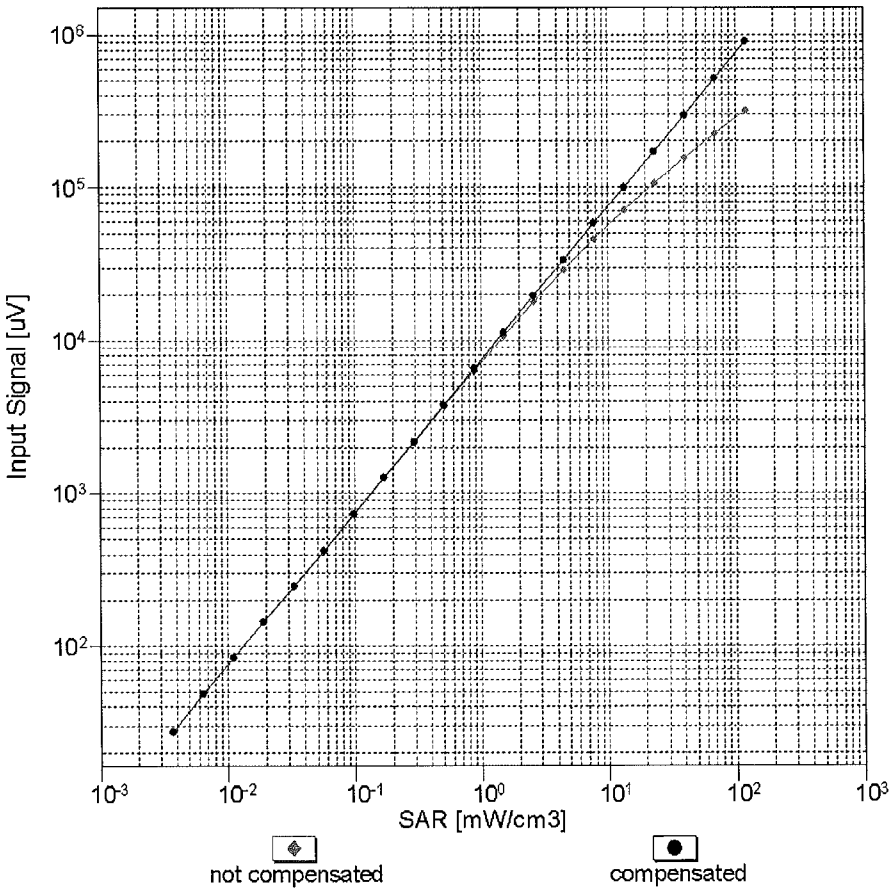
f=1800 MHz,R22

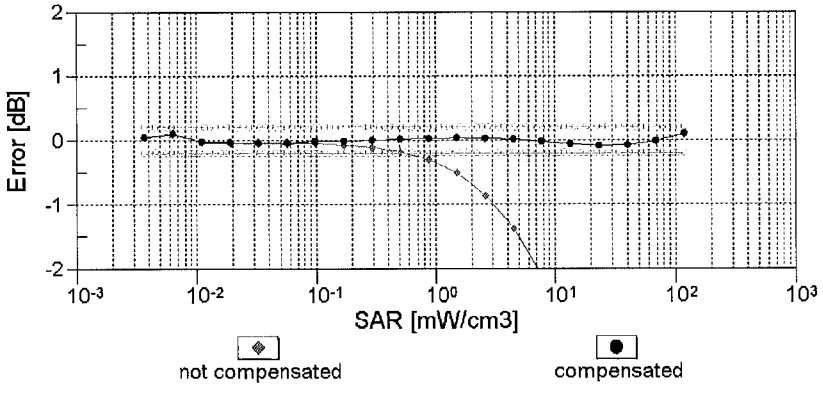




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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

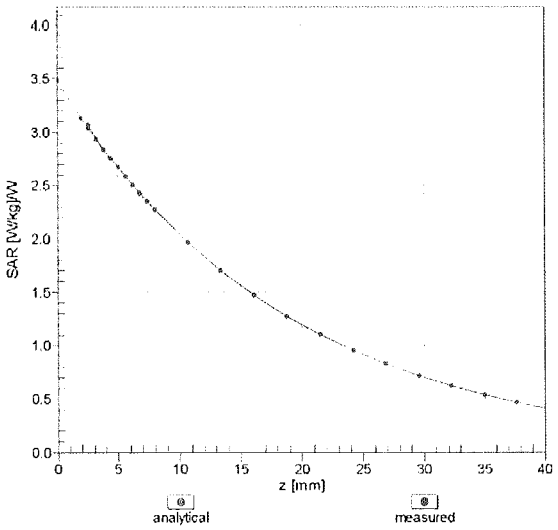




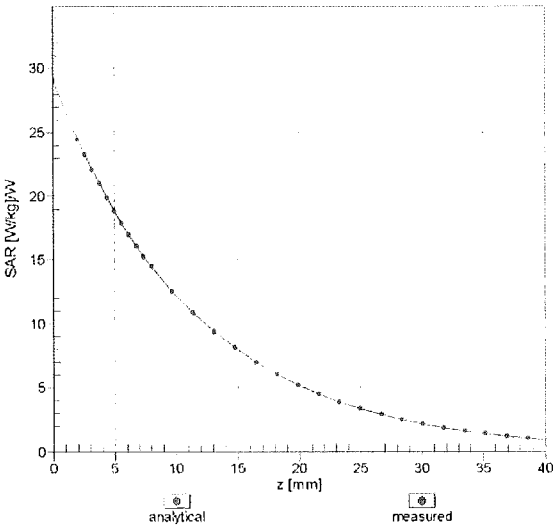
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

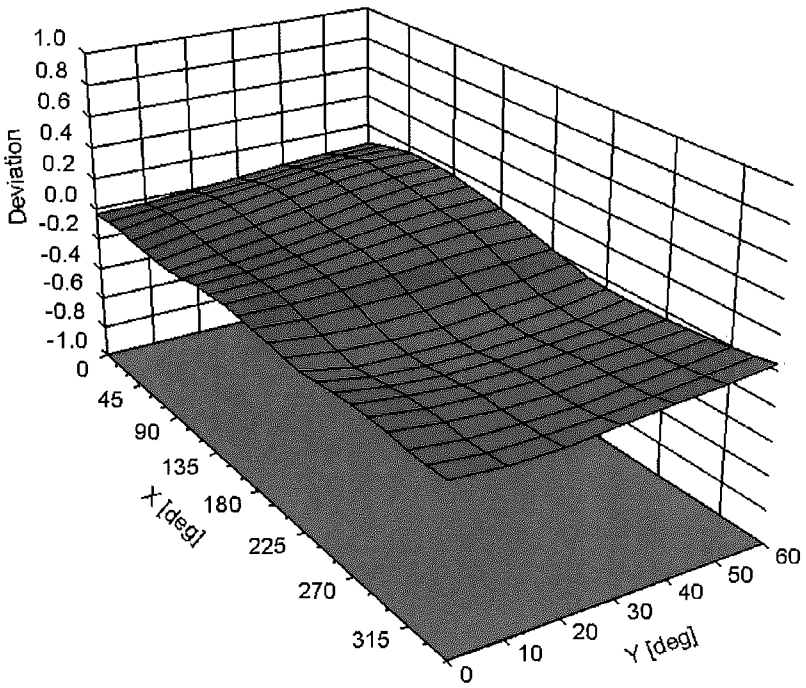


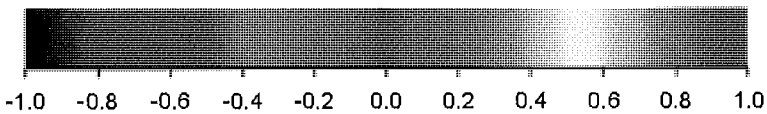
f = 1900 MHz,WGLS R22 (H_convF)



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:3213

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	100.6
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max Unc^E (k=2)
0	CW	X	0.00	0.00	1.00	0.00	219.3	± 2.7 %
		Y	0.00	0.00	1.00		219.1	
		Z	0.00	0.00	1.00		213.7	
10010-CAA	SAR Validation (Square, 100ms, 10ms)	X	7.64	78.36	17.77	10.00	25.0	± 9.6 %
		Y	8.93	80.69	18.99		25.0	
		Z	7.43	77.97	17.46		25.0	
10011-CAB	UMTS-FDD (WCDMA)	X	0.94	65.73	13.94	0.00	150.0	± 9.6 %
		Y	1.08	67.98	15.48		150.0	
		Z	0.93	65.52	13.77		150.0	
10012-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.23	64.18	15.06	0.41	150.0	± 9.6 %
		Y	1.29	65.11	15.84		150.0	
		Z	1.22	64.10	14.97		150.0	
10013-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	5.06	67.01	17.27	1.46	150.0	± 9.6 %
		Y	5.11	67.24	17.46		150.0	
		Z	5.03	67.01	17.25		150.0	
10021-DAC	GSM-FDD (TDMA, GMSK)	X	58.23	111.57	29.90	9.39	50.0	± 9.6 %
		Y	38.28	105.54	28.67		50.0	
		Z	83.35	116.76	31.01		50.0	
10023-DAC	GPRS-FDD (TDMA, GMSK, TN 0)	X	42.41	106.55	28.63	9.57	50.0	± 9.6 %
		Y	31.06	102.12	27.76		50.0	
		Z	55.17	110.35	29.43		50.0	
10024-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	100.00	116.42	29.15	6.56	60.0	± 9.6 %
		Y	100.00	117.64	29.89		60.0	
		Z	100.00	115.95	28.84		60.0	
10025-DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	22.66	114.16	43.61	12.57	50.0	± 9.6 %
		Y	32.36	125.54	47.77		50.0	
		Z	20.92	112.18	42.96		50.0	
10026-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	22.06	107.62	37.21	9.56	60.0	± 9.6 %
		Y	29.09	114.84	39.79		60.0	
		Z	22.32	108.24	37.43		60.0	
10027-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	100.00	114.90	27.59	4.80	80.0	± 9.6 %
		Y	100.00	116.49	28.47		80.0	
		Z	100.00	114.42	27.29		80.0	
10028-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	114.37	26.58	3.55	100.0	± 9.6 %
		Y	100.00	116.53	27.70		100.0	
		Z	100.00	113.85	26.28		100.0	
10029-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	13.21	95.56	31.98	7.80	80.0	± 9.6 %
		Y	16.23	100.64	33.98		80.0	
		Z	13.05	95.55	31.99		80.0	
10030-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	X	100.00	114.59	27.76	5.30	70.0	± 9.6 %
		Y	100.00	116.05	28.60		70.0	
		Z	100.00	114.06	27.44		70.0	
10031-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	100.00	112.38	24.24	1.88	100.0	± 9.6 %
		Y	100.00	116.66	26.24		100.0	
		Z	100.00	111.54	23.82		100.0	

10032-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	X	100.00	112.51	23.27	1.17	100.0	± 9.6 %
		Y	100.00	119.82	26.49		100.0	
		Z	100.00	111.35	22.74		100.0	
10033-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	X	19.77	98.57	26.87	5.30	70.0	± 9.6 %
		Y	22.51	101.06	27.89		70.0	
		Z	20.62	99.03	26.84		70.0	
10034-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	X	5.26	81.87	19.91	1.88	100.0	± 9.6 %
		Y	7.30	87.04	22.01		100.0	
		Z	5.17	81.44	19.55		100.0	
10035-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	X	2.97	75.56	17.30	1.17	100.0	± 9.6 %
		Y	4.02	80.17	19.40		100.0	
		Z	2.90	75.11	16.93		100.0	
10036-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	X	25.61	102.92	28.18	5.30	70.0	± 9.6 %
		Y	28.89	105.33	29.15		70.0	
		Z	27.23	103.63	28.21		70.0	
10037-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	X	5.03	81.31	19.68	1.88	100.0	± 9.6 %
		Y	7.01	86.52	21.80		100.0	
		Z	4.92	80.81	19.30		100.0	
10038-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	X	3.05	76.11	17.60	1.17	100.0	± 9.6 %
		Y	4.14	80.86	19.74		100.0	
		Z	2.97	75.64	17.22		100.0	
10039-CAB	CDMA2000 (1xRTT, RC1)	X	1.52	68.64	14.11	0.00	150.0	± 9.6 %
		Y	1.86	71.69	15.85		150.0	
		Z	1.44	68.18	13.70		150.0	
10042-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	X	100.00	115.25	28.83	7.78	50.0	± 9.6 %
		Y	100.00	116.43	29.57		50.0	
		Z	100.00	114.73	28.50		50.0	
10044-CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	X	0.00	111.44	0.10	0.00	150.0	± 9.6 %
		Y	0.00	116.05	0.75		150.0	
		Z	0.00	113.36	0.21		150.0	
10048-CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	X	15.69	90.02	25.55	13.80	25.0	± 9.6 %
		Y	13.84	87.79	25.13		25.0	
		Z	17.52	91.95	25.99		25.0	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	19.88	94.41	25.54	10.79	40.0	± 9.6 %
		Y	17.39	92.41	25.24		40.0	
		Z	22.32	96.16	25.89		40.0	
10056-CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	X	15.96	91.92	25.75	9.03	50.0	± 9.6 %
		Y	16.02	92.06	26.04		50.0	
		Z	16.84	92.83	25.91		50.0	
10058-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	9.21	88.16	28.55	6.55	100.0	± 9.6 %
		Y	10.78	91.87	30.15		100.0	
		Z	9.04	87.96	28.49		100.0	
10059-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	X	1.36	66.07	16.00	0.61	110.0	± 9.6 %
		Y	1.46	67.28	16.91		110.0	
		Z	1.35	65.96	15.91		110.0	
10060-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	52.62	119.34	30.14	1.30	110.0	± 9.6 %
		Y	100.00	130.86	33.40		110.0	
		Z	47.54	117.73	29.68		110.0	

10061-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	7.64	91.52	25.20	2.04	110.0	± 9.6 %
		Y	11.51	98.81	27.78		110.0	
		Z	7.56	91.41	25.11		110.0	
10062-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	X	4.79	66.76	16.54	0.49	100.0	± 9.6 %
		Y	4.84	66.99	16.73		100.0	
		Z	4.76	66.76	16.52		100.0	
10063-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	X	4.82	66.91	16.68	0.72	100.0	± 9.6 %
		Y	4.87	67.15	16.87		100.0	
		Z	4.79	66.91	16.65		100.0	
10064-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	X	5.14	67.25	16.96	0.86	100.0	± 9.6 %
		Y	5.20	67.49	17.14		100.0	
		Z	5.10	67.24	16.93		100.0	
10065-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	X	5.04	67.27	17.12	1.21	100.0	± 9.6 %
		Y	5.10	67.51	17.31		100.0	
		Z	5.00	67.25	17.09		100.0	
10066-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	X	5.09	67.39	17.35	1.46	100.0	± 9.6 %
		Y	5.15	67.65	17.54		100.0	
		Z	5.06	67.37	17.32		100.0	
10067-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	X	5.41	67.60	17.83	2.04	100.0	± 9.6 %
		Y	5.47	67.85	18.03		100.0	
		Z	5.38	67.60	17.82		100.0	
10068-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	X	5.53	67.90	18.19	2.55	100.0	± 9.6 %
		Y	5.60	68.19	18.41		100.0	
		Z	5.49	67.88	18.16		100.0	
10069-CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	X	5.62	67.88	18.39	2.67	100.0	± 9.6 %
		Y	5.69	68.17	18.62		100.0	
		Z	5.57	67.88	18.36		100.0	
10071-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	5.20	67.23	17.66	1.99	100.0	± 9.6 %
		Y	5.25	67.48	17.85		100.0	
		Z	5.17	67.24	17.64		100.0	
10072-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	5.24	67.75	17.96	2.30	100.0	± 9.6 %
		Y	5.31	68.03	18.18		100.0	
		Z	5.21	67.74	17.94		100.0	
10073-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	5.36	68.08	18.38	2.83	100.0	± 9.6 %
		Y	5.44	68.38	18.61		100.0	
		Z	5.33	68.07	18.36		100.0	
10074-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	5.39	68.13	18.62	3.30	100.0	± 9.6 %
		Y	5.47	68.45	18.87		100.0	
		Z	5.36	68.12	18.60		100.0	
10075-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	5.52	68.55	19.10	3.82	90.0	± 9.6 %
		Y	5.61	68.93	19.38		90.0	
		Z	5.48	68.52	19.07		90.0	
10076-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	5.53	68.37	19.24	4.15	90.0	± 9.6 %
		Y	5.62	68.75	19.52		90.0	
		Z	5.50	68.36	19.22		90.0	
10077-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	5.57	68.46	19.34	4.30	90.0	± 9.6 %
		Y	5.66	68.84	19.63		90.0	
		Z	5.54	68.44	19.32		90.0	

10081-CAB	CDMA2000 (1xRTT, RC3)	X	0.76	64.13	11.38	0.00	150.0	± 9.6 %
		Y	0.90	66.35	12.99		150.0	
		Z	0.73	63.81	11.00		150.0	
10082-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	X	1.73	62.47	7.53	4.77	80.0	± 9.6 %
		Y	1.91	63.29	8.22		80.0	
		Z	1.67	62.23	7.30		80.0	
10090-DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	X	100.00	116.51	29.21	6.56	60.0	± 9.6 %
		Y	100.00	117.72	29.95		60.0	
		Z	100.00	116.03	28.90		60.0	
10097-CAB	UMTS-FDD (HSDPA)	X	1.73	66.45	14.86	0.00	150.0	± 9.6 %
		Y	1.84	67.58	15.67		150.0	
		Z	1.71	66.38	14.75		150.0	
10098-CAB	UMTS-FDD (HSUPA, Subtest 2)	X	1.70	66.40	14.82	0.00	150.0	± 9.6 %
		Y	1.81	67.56	15.65		150.0	
		Z	1.68	66.33	14.71		150.0	
10099-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	X	22.00	107.50	37.17	9.56	60.0	± 9.6 %
		Y	28.88	114.61	39.71		60.0	
		Z	22.27	108.13	37.40		60.0	
10100-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	3.03	69.43	16.03	0.00	150.0	± 9.6 %
		Y	3.22	70.56	16.70		150.0	
		Z	2.99	69.29	15.96		150.0	
10101-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	3.23	67.20	15.61	0.00	150.0	± 9.6 %
		Y	3.33	67.78	16.01		150.0	
		Z	3.20	67.12	15.56		150.0	
10102-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	3.34	67.17	15.71	0.00	150.0	± 9.6 %
		Y	3.42	67.69	16.08		150.0	
		Z	3.31	67.10	15.66		150.0	
10103-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	8.49	78.45	21.33	3.98	65.0	± 9.6 %
		Y	8.79	79.00	21.62		65.0	
		Z	8.39	78.42	21.32		65.0	
10104-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	8.27	76.76	21.53	3.98	65.0	± 9.6 %
		Y	8.57	77.41	21.89		65.0	
		Z	8.21	76.79	21.53		65.0	
10105-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	8.13	76.44	21.71	3.98	65.0	± 9.6 %
		Y	7.83	75.63	21.42		65.0	
		Z	7.93	76.10	21.55		65.0	
10108-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	2.67	68.71	15.86	0.00	150.0	± 9.6 %
		Y	2.83	69.80	16.55		150.0	
		Z	2.63	68.57	15.78		150.0	
10109-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	2.89	66.95	15.47	0.00	150.0	± 9.6 %
		Y	2.98	67.57	15.91		150.0	
		Z	2.86	66.87	15.40		150.0	
10110-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	2.17	67.76	15.45	0.00	150.0	± 9.6 %
		Y	2.32	68.94	16.22		150.0	
		Z	2.13	67.62	15.34		150.0	
10111-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	2.56	67.34	15.57	0.00	150.0	± 9.6 %
		Y	2.66	68.04	16.08		150.0	
		Z	2.53	67.28	15.48		150.0	

10112-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	3.02	66.95	15.54	0.00	150.0	± 9.6 %
		Y	3.10	67.51	15.95		150.0	
		Z	2.98	66.88	15.48		150.0	
10113-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	2.72	67.49	15.72	0.00	150.0	± 9.6 %
		Y	2.81	68.13	16.19		150.0	
		Z	2.68	67.45	15.64		150.0	
10114-CAC	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	5.17	67.15	16.34	0.00	150.0	± 9.6 %
		Y	5.21	67.35	16.50		150.0	
		Z	5.15	67.16	16.34		150.0	
10115-CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	5.53	67.49	16.54	0.00	150.0	± 9.6 %
		Y	5.58	67.70	16.70		150.0	
		Z	5.48	67.42	16.49		150.0	
10116-CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	5.30	67.42	16.41	0.00	150.0	± 9.6 %
		Y	5.34	67.62	16.57		150.0	
		Z	5.27	67.41	16.40		150.0	
10117-CAC	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	5.15	67.08	16.33	0.00	150.0	± 9.6 %
		Y	5.20	67.30	16.50		150.0	
		Z	5.12	67.04	16.30		150.0	
10118-CAC	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	5.63	67.73	16.67	0.00	150.0	± 9.6 %
		Y	5.66	67.91	16.81		150.0	
		Z	5.59	67.70	16.64		150.0	
10119-CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	5.27	67.36	16.39	0.00	150.0	± 9.6 %
		Y	5.31	67.56	16.55		150.0	
		Z	5.24	67.35	16.38		150.0	
10140-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	3.38	67.18	15.64	0.00	150.0	± 9.6 %
		Y	3.47	67.70	16.01		150.0	
		Z	3.35	67.11	15.59		150.0	
10141-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	3.50	67.27	15.81	0.00	150.0	± 9.6 %
		Y	3.59	67.74	16.15		150.0	
		Z	3.47	67.21	15.77		150.0	
10142-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	1.93	67.51	15.04	0.00	150.0	± 9.6 %
		Y	2.09	68.84	15.93		150.0	
		Z	1.89	67.35	14.89		150.0	
10143-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	2.38	67.70	15.18	0.00	150.0	± 9.6 %
		Y	2.51	68.61	15.82		150.0	
		Z	2.34	67.60	15.02		150.0	
10144-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	2.24	66.02	13.89	0.00	150.0	± 9.6 %
		Y	2.36	66.87	14.53		150.0	
		Z	2.19	65.88	13.71		150.0	
10145-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	1.22	64.47	11.59	0.00	150.0	± 9.6 %
		Y	1.37	66.07	12.76		150.0	
		Z	1.15	64.01	11.10		150.0	
10146-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	2.40	68.51	13.38	0.00	150.0	± 9.6 %
		Y	3.25	72.57	15.44		150.0	
		Z	2.13	67.36	12.68		150.0	
10147-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	2.86	70.85	14.59	0.00	150.0	± 9.6 %
		Y	4.17	75.98	16.98		150.0	
		Z	2.50	69.50	13.83		150.0	

10149-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	2.90	67.00	15.51	0.00	150.0	± 9.6 %
		Y	2.99	67.62	15.95		150.0	
		Z	2.86	66.92	15.44		150.0	
10150-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	3.02	66.99	15.58	0.00	150.0	± 9.6 %
		Y	3.11	67.55	15.98		150.0	
		Z	2.99	66.93	15.52		150.0	
10151-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	8.96	80.66	22.26	3.98	65.0	± 9.6 %
		Y	9.32	81.32	22.60		65.0	
		Z	9.00	80.93	22.35		65.0	
10152-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	7.88	76.96	21.35	3.98	65.0	± 9.6 %
		Y	8.23	77.73	21.78		65.0	
		Z	7.82	76.98	21.33		65.0	
10153-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	8.28	77.78	22.03	3.98	65.0	± 9.6 %
		Y	8.58	78.42	22.39		65.0	
		Z	8.24	77.86	22.04		65.0	
10154-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	2.21	68.11	15.68	0.00	150.0	± 9.6 %
		Y	2.36	69.30	16.45		150.0	
		Z	2.17	67.96	15.57		150.0	
10155-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	2.56	67.35	15.58	0.00	150.0	± 9.6 %
		Y	2.66	68.05	16.10		150.0	
		Z	2.53	67.29	15.50		150.0	
10156-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	1.77	67.43	14.78	0.00	150.0	± 9.6 %
		Y	1.94	68.94	15.78		150.0	
		Z	1.72	67.23	14.58		150.0	
10157-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	2.05	66.34	13.82	0.00	150.0	± 9.6 %
		Y	2.19	67.38	14.58		150.0	
		Z	2.00	66.16	13.59		150.0	
10158-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	2.72	67.54	15.76	0.00	150.0	± 9.6 %
		Y	2.82	68.17	16.23		150.0	
		Z	2.68	67.50	15.68		150.0	
10159-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	2.14	66.71	14.07	0.00	150.0	± 9.6 %
		Y	2.28	67.74	14.81		150.0	
		Z	2.09	66.52	13.84		150.0	
10160-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	2.72	68.07	15.82	0.00	150.0	± 9.6 %
		Y	2.84	68.89	16.38		150.0	
		Z	2.69	68.00	15.76		150.0	
10161-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	2.91	66.88	15.50	0.00	150.0	± 9.6 %
		Y	3.00	67.45	15.91		150.0	
		Z	2.88	66.82	15.43		150.0	
10162-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	3.02	67.01	15.60	0.00	150.0	± 9.6 %
		Y	3.11	67.54	16.00		150.0	
		Z	2.99	66.96	15.54		150.0	
10166-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	3.77	69.87	19.29	3.01	150.0	± 9.6 %
		Y	3.99	71.07	20.04		150.0	
		Z	3.62	69.43	19.11		150.0	
10167-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	4.72	72.88	19.79	3.01	150.0	± 9.6 %
		Y	5.23	74.95	20.86		150.0	
		Z	4.39	72.04	19.48		150.0	

10168-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	5.18	74.86	20.97	3.01	150.0	± 9.6 %
		Y	5.75	76.97	22.01		150.0	
		Z	4.80	74.00	20.67		150.0	
10169-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	3.27	70.16	19.42	3.01	150.0	± 9.6 %
		Y	3.60	72.33	20.65		150.0	
		Z	3.01	68.98	18.94		150.0	
10170-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	4.60	76.17	21.67	3.01	150.0	± 9.6 %
		Y	5.62	80.32	23.51		150.0	
		Z	3.98	74.14	20.96		150.0	
10171-AAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	3.81	72.17	19.05	3.01	150.0	± 9.6 %
		Y	4.54	75.67	20.74		150.0	
		Z	3.36	70.59	18.47		150.0	
10172-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	30.28	111.82	34.48	6.02	65.0	± 9.6 %
		Y	76.86	130.98	39.85		65.0	
		Z	23.60	107.83	33.49		65.0	
10173-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	34.72	108.92	31.80	6.02	65.0	± 9.6 %
		Y	74.54	122.99	35.68		65.0	
		Z	31.06	107.91	31.67		65.0	
10174-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	26.76	102.85	29.55	6.02	65.0	± 9.6 %
		Y	50.48	114.18	32.83		65.0	
		Z	23.63	101.61	29.31		65.0	
10175-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	3.23	69.86	19.18	3.01	150.0	± 9.6 %
		Y	3.55	72.01	20.41		150.0	
		Z	2.98	68.71	18.72		150.0	
10176-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	4.60	76.19	21.68	3.01	150.0	± 9.6 %
		Y	5.63	80.35	23.53		150.0	
		Z	3.98	74.16	20.97		150.0	
10177-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	3.26	70.01	19.27	3.01	150.0	± 9.6 %
		Y	3.58	72.16	20.50		150.0	
		Z	3.00	68.84	18.80		150.0	
10178-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	4.55	75.95	21.56	3.01	150.0	± 9.6 %
		Y	5.56	80.06	23.39		150.0	
		Z	3.95	73.96	20.86		150.0	
10179-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	4.17	74.04	20.23	3.01	150.0	± 9.6 %
		Y	5.04	77.87	21.99		150.0	
		Z	3.65	72.28	19.60		150.0	
10180-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	3.80	72.10	19.00	3.01	150.0	± 9.6 %
		Y	4.52	75.59	20.69		150.0	
		Z	3.36	70.53	18.43		150.0	
10181-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	3.25	69.99	19.27	3.01	150.0	± 9.6 %
		Y	3.58	72.15	20.49		150.0	
		Z	3.00	68.83	18.80		150.0	
10182-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	4.54	75.93	21.54	3.01	150.0	± 9.6 %
		Y	5.55	80.04	23.38		150.0	
		Z	3.94	73.93	20.85		150.0	
10183-AAC	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	3.79	72.07	18.99	3.01	150.0	± 9.6 %
		Y	4.51	75.56	20.68		150.0	
		Z	3.35	70.51	18.42		150.0	

10184-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	3.26	70.03	19.29	3.01	150.0	± 9.6 %
		Y	3.59	72.19	20.51		150.0	
		Z	3.01	68.87	18.82		150.0	
10185-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	4.56	76.00	21.58	3.01	150.0	± 9.6 %
		Y	5.57	80.12	23.42		150.0	
		Z	3.96	74.00	20.89		150.0	
10186-AAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	3.81	72.14	19.03	3.01	150.0	± 9.6 %
		Y	4.54	75.64	20.72		150.0	
		Z	3.37	70.57	18.45		150.0	
10187-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	3.27	70.08	19.34	3.01	150.0	± 9.6 %
		Y	3.60	72.24	20.57		150.0	
		Z	3.02	68.91	18.87		150.0	
10188-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	4.71	76.65	21.94	3.01	150.0	± 9.6 %
		Y	5.78	80.88	23.80		150.0	
		Z	4.07	74.57	21.23		150.0	
10189-AAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	3.89	72.56	19.29	3.01	150.0	± 9.6 %
		Y	4.65	76.13	21.00		150.0	
		Z	3.43	70.95	18.70		150.0	
10193-CAC	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	X	4.57	66.50	16.04	0.00	150.0	± 9.6 %
		Y	4.61	66.73	16.23		150.0	
		Z	4.54	66.49	16.01		150.0	
10194-CAC	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	X	4.75	66.84	16.16	0.00	150.0	± 9.6 %
		Y	4.80	67.09	16.35		150.0	
		Z	4.71	66.82	16.14		150.0	
10195-CAC	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	X	4.79	66.87	16.18	0.00	150.0	± 9.6 %
		Y	4.84	67.11	16.37		150.0	
		Z	4.76	66.85	16.15		150.0	
10196-CAC	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	4.58	66.58	16.07	0.00	150.0	± 9.6 %
		Y	4.63	66.82	16.26		150.0	
		Z	4.54	66.56	16.03		150.0	
10197-CAC	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	X	4.77	66.86	16.18	0.00	150.0	± 9.6 %
		Y	4.82	67.11	16.37		150.0	
		Z	4.73	66.84	16.15		150.0	
10198-CAC	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	X	4.80	66.89	16.19	0.00	150.0	± 9.6 %
		Y	4.85	67.13	16.38		150.0	
		Z	4.76	66.87	16.17		150.0	
10219-CAC	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	X	4.52	66.58	16.02	0.00	150.0	± 9.6 %
		Y	4.58	66.83	16.22		150.0	
		Z	4.49	66.56	15.99		150.0	
10220-CAC	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	X	4.76	66.85	16.17	0.00	150.0	± 9.6 %
		Y	4.81	67.09	16.36		150.0	
		Z	4.72	66.82	16.14		150.0	
10221-CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	X	4.80	66.82	16.18	0.00	150.0	± 9.6 %
		Y	4.86	67.06	16.37		150.0	
		Z	4.77	66.80	16.16		150.0	
10222-CAC	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	X	5.13	67.08	16.32	0.00	150.0	± 9.6 %
		Y	5.18	67.32	16.50		150.0	
		Z	5.10	67.04	16.29		150.0	

10223-CAC	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	X	5.46	67.35	16.49	0.00	150.0	± 9.6 %
		Y	5.51	67.58	16.66		150.0	
		Z	5.42	67.30	16.45		150.0	
10224-CAC	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	X	5.17	67.18	16.29	0.00	150.0	± 9.6 %
		Y	5.22	67.40	16.46		150.0	
		Z	5.14	67.14	16.27		150.0	
10225-CAB	UMTS-FDD (HSPA+)	X	2.80	65.74	15.07	0.00	150.0	± 9.6 %
		Y	2.87	66.19	15.45		150.0	
		Z	2.77	65.70	14.98		150.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	37.38	110.41	32.30	6.02	65.0	± 9.6 %
		Y	81.50	124.82	36.22		65.0	
		Z	33.47	109.42	32.18		65.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	29.60	104.69	30.14	6.02	65.0	± 9.6 %
		Y	53.65	115.37	33.21		65.0	
		Z	27.65	104.42	30.19		65.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	32.41	113.60	35.07	6.02	65.0	± 9.6 %
		Y	69.82	129.54	39.59		65.0	
		Z	28.33	111.82	34.72		65.0	
10229-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	34.78	108.94	31.81	6.02	65.0	± 9.6 %
		Y	74.32	122.93	35.67		65.0	
		Z	31.14	107.94	31.68		65.0	
10230-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	27.87	103.54	29.74	6.02	65.0	± 9.6 %
		Y	50.12	114.03	32.79		65.0	
		Z	25.97	103.21	29.78		65.0	
10231-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	30.34	112.17	34.60	6.02	65.0	± 9.6 %
		Y	64.44	127.76	39.06		65.0	
		Z	26.54	110.39	34.24		65.0	
10232-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	34.78	108.95	31.81	6.02	65.0	± 9.6 %
		Y	74.45	122.97	35.68		65.0	
		Z	31.13	107.95	31.68		65.0	
10233-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	27.88	103.55	29.75	6.02	65.0	± 9.6 %
		Y	50.22	114.08	32.80		65.0	
		Z	25.97	103.22	29.78		65.0	
10234-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	28.47	110.69	34.07	6.02	65.0	± 9.6 %
		Y	59.28	125.81	38.45		65.0	
		Z	24.97	108.97	33.72		65.0	
10235-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	34.92	109.04	31.84	6.02	65.0	± 9.6 %
		Y	75.02	123.12	35.72		65.0	
		Z	31.25	108.03	31.71		65.0	
10236-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	28.18	103.71	29.79	6.02	65.0	± 9.6 %
		Y	50.93	114.30	32.85		65.0	
		Z	26.26	103.39	29.82		65.0	
10237-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	30.66	112.40	34.66	6.02	65.0	± 9.6 %
		Y	65.75	128.19	39.17		65.0	
		Z	26.79	110.61	34.30		65.0	
10238-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	34.79	108.97	31.82	6.02	65.0	± 9.6 %
		Y	74.62	123.02	35.69		65.0	
		Z	31.13	107.96	31.69		65.0	

10239-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	27.87	103.57	29.75	6.02	65.0	± 9.6 %
		Y	50.30	114.13	32.82		65.0	
		Z	25.95	103.23	29.78		65.0	
10240-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	30.53	112.33	34.64	6.02	65.0	± 9.6 %
		Y	65.39	128.09	39.15		65.0	
		Z	26.68	110.54	34.28		65.0	
10241-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	11.82	86.67	27.53	6.98	65.0	± 9.6 %
		Y	13.66	90.07	29.00		65.0	
		Z	11.24	86.07	27.33		65.0	
10242-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	11.41	85.92	27.17	6.98	65.0	± 9.6 %
		Y	13.45	89.74	28.82		65.0	
		Z	10.57	84.73	26.73		65.0	
10243-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	9.24	83.16	27.04	6.98	65.0	± 9.6 %
		Y	10.64	86.64	28.68		65.0	
		Z	8.64	81.99	26.56		65.0	
10244-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	9.03	80.20	20.72	3.98	65.0	± 9.6 %
		Y	9.95	81.82	21.52		65.0	
		Z	8.70	79.77	20.42		65.0	
10245-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	8.84	79.62	20.45	3.98	65.0	± 9.6 %
		Y	9.72	81.20	21.24		65.0	
		Z	8.49	79.13	20.13		65.0	
10246-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	8.67	82.28	21.37	3.98	65.0	± 9.6 %
		Y	9.40	83.61	22.04		65.0	
		Z	8.57	82.11	21.15		65.0	
10247-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	7.23	77.21	20.08	3.98	65.0	± 9.6 %
		Y	7.59	77.99	20.54		65.0	
		Z	7.13	77.07	19.88		65.0	
10248-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	7.20	76.70	19.86	3.98	65.0	± 9.6 %
		Y	7.57	77.51	20.35		65.0	
		Z	7.09	76.52	19.65		65.0	
10249-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	9.92	84.79	23.00	3.98	65.0	± 9.6 %
		Y	10.62	85.95	23.57		65.0	
		Z	10.01	85.03	22.98		65.0	
10250-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	8.21	79.48	22.35	3.98	65.0	± 9.6 %
		Y	8.54	80.13	22.71		65.0	
		Z	8.20	79.60	22.34		65.0	
10251-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	7.75	77.32	21.20	3.98	65.0	± 9.6 %
		Y	8.11	78.10	21.64		65.0	
		Z	7.70	77.35	21.14		65.0	
10252-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	9.77	84.02	23.49	3.98	65.0	± 9.6 %
		Y	10.31	84.92	23.94		65.0	
		Z	9.89	84.42	23.60		65.0	
10253-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	7.68	76.36	21.13	3.98	65.0	± 9.6 %
		Y	8.00	77.10	21.55		65.0	
		Z	7.63	76.40	21.10		65.0	
10254-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	8.06	77.17	21.76	3.98	65.0	± 9.6 %
		Y	8.36	77.82	22.13		65.0	
		Z	8.03	77.25	21.75		65.0	

10255-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	8.65	80.28	22.35	3.98	65.0	± 9.6 %
		Y	9.02	80.99	22.72		65.0	
		Z	8.68	80.54	22.43		65.0	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	7.67	77.22	18.70	3.98	65.0	± 9.6 %
		Y	8.58	78.99	19.61		65.0	
		Z	7.24	76.45	18.22		65.0	
10257-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	7.44	76.40	18.29	3.98	65.0	± 9.6 %
		Y	8.29	78.12	19.18		65.0	
		Z	6.99	75.59	17.78		65.0	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	7.04	78.52	19.29	3.98	65.0	± 9.6 %
		Y	7.71	79.96	20.05		65.0	
		Z	6.74	77.86	18.83		65.0	
10259-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	7.62	78.03	20.88	3.98	65.0	± 9.6 %
		Y	7.97	78.76	21.31		65.0	
		Z	7.55	78.00	20.76		65.0	
10260-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	7.62	77.74	20.79	3.98	65.0	± 9.6 %
		Y	7.97	78.46	21.21		65.0	
		Z	7.55	77.69	20.65		65.0	
10261-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	9.43	83.76	22.98	3.98	65.0	± 9.6 %
		Y	10.04	84.84	23.52		65.0	
		Z	9.50	84.03	22.99		65.0	
10262-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	8.20	79.43	22.31	3.98	65.0	± 9.6 %
		Y	8.53	80.09	22.68		65.0	
		Z	8.18	79.55	22.30		65.0	
10263-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	7.75	77.31	21.19	3.98	65.0	± 9.6 %
		Y	8.10	78.09	21.64		65.0	
		Z	7.69	77.34	21.14		65.0	
10264-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	9.70	83.85	23.41	3.98	65.0	± 9.6 %
		Y	10.24	84.77	23.87		65.0	
		Z	9.81	84.24	23.51		65.0	
10265-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	7.88	76.96	21.35	3.98	65.0	± 9.6 %
		Y	8.22	77.73	21.78		65.0	
		Z	7.82	76.99	21.33		65.0	
10266-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	8.27	77.77	22.03	3.98	65.0	± 9.6 %
		Y	8.58	78.42	22.39		65.0	
		Z	8.23	77.85	22.03		65.0	
10267-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	8.94	80.62	22.25	3.98	65.0	± 9.6 %
		Y	9.31	81.28	22.59		65.0	
		Z	8.98	80.89	22.34		65.0	
10268-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	8.36	76.49	21.55	3.98	65.0	± 9.6 %
		Y	8.63	77.08	21.88		65.0	
		Z	8.31	76.53	21.55		65.0	
10269-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	8.29	76.07	21.45	3.98	65.0	± 9.6 %
		Y	8.55	76.65	21.78		65.0	
		Z	8.24	76.11	21.45		65.0	
10270-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	8.43	77.83	21.33	3.98	65.0	± 9.6 %
		Y	8.69	78.31	21.60		65.0	
		Z	8.42	77.98	21.39		65.0	

10274-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	X	2.55	65.90	14.85	0.00	150.0	± 9.6 %
		Y	2.63	66.48	15.31		150.0	
		Z	2.53	65.88	14.78		150.0	
10275-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	X	1.52	66.64	14.62	0.00	150.0	± 9.6 %
		Y	1.66	68.17	15.66		150.0	
		Z	1.50	66.49	14.49		150.0	
10277-CAA	PHS (QPSK)	X	4.62	67.49	12.27	9.03	50.0	± 9.6 %
		Y	5.00	68.49	13.05		50.0	
		Z	4.42	66.98	11.81		50.0	
10278-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	8.56	79.12	19.84	9.03	50.0	± 9.6 %
		Y	9.04	80.04	20.47		50.0	
		Z	8.20	78.37	19.32		50.0	
10279-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	X	8.72	79.33	19.94	9.03	50.0	± 9.6 %
		Y	9.22	80.28	20.58		50.0	
		Z	8.35	78.58	19.43		50.0	
10290-AAB	CDMA2000, RC1, SO55, Full Rate	X	1.31	66.62	12.89	0.00	150.0	± 9.6 %
		Y	1.55	69.01	14.40		150.0	
		Z	1.25	66.21	12.49		150.0	
10291-AAB	CDMA2000, RC3, SO55, Full Rate	X	0.75	63.97	11.28	0.00	150.0	± 9.6 %
		Y	0.88	66.12	12.85		150.0	
		Z	0.72	63.66	10.91		150.0	
10292-AAB	CDMA2000, RC3, SO32, Full Rate	X	0.85	66.24	12.81	0.00	150.0	± 9.6 %
		Y	1.08	69.81	15.02		150.0	
		Z	0.81	65.82	12.39		150.0	
10293-AAB	CDMA2000, RC3, SO3, Full Rate	X	1.07	69.43	14.80	0.00	150.0	± 9.6 %
		Y	1.49	74.49	17.52		150.0	
		Z	1.02	68.94	14.36		150.0	
10295-AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	X	11.66	86.40	24.85	9.03	50.0	± 9.6 %
		Y	11.94	86.89	25.26		50.0	
		Z	12.14	87.13	24.94		50.0	
10297-AAC	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	2.68	68.79	15.92	0.00	150.0	± 9.6 %
		Y	2.84	69.89	16.60		150.0	
		Z	2.64	68.65	15.84		150.0	
10298-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	1.50	66.36	13.40	0.00	150.0	± 9.6 %
		Y	1.68	68.07	14.56		150.0	
		Z	1.44	66.01	13.05		150.0	
10299-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	2.99	70.93	15.34	0.00	150.0	± 9.6 %
		Y	3.88	74.74	17.20		150.0	
		Z	2.71	70.03	14.84		150.0	
10300-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	2.29	66.50	12.57	0.00	150.0	± 9.6 %
		Y	2.73	68.87	13.94		150.0	
		Z	2.09	65.76	12.08		150.0	
10301-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	X	5.48	67.66	18.50	4.17	80.0	± 9.6 %
		Y	5.78	68.84	19.23		80.0	
		Z	5.37	67.36	18.28		80.0	
10302-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)	X	5.94	68.12	19.14	4.96	80.0	± 9.6 %
		Y	6.22	69.31	19.91		80.0	
		Z	5.87	68.03	19.05		80.0	

10303-AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	5.76	68.09	19.15	4.96	80.0	± 9.6 %
		Y	6.07	69.41	19.99		80.0	
		Z	5.69	67.97	19.02		80.0	
10304-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	X	5.43	67.45	18.35	4.17	80.0	± 9.6 %
		Y	5.68	68.54	19.05		80.0	
		Z	5.37	67.37	18.26		80.0	
10305-AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	7.18	77.42	24.28	6.02	50.0	± 9.6 %
		Y	9.01	83.08	27.04		50.0	
		Z	7.00	76.95	23.93		50.0	
10306-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	5.96	70.23	20.82	6.02	50.0	± 9.6 %
		Y	6.58	72.76	22.30		50.0	
		Z	5.86	69.99	20.61		50.0	
10307-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	6.41	73.34	22.47	6.02	50.0	± 9.6 %
		Y	6.70	73.58	22.50		50.0	
		Z	6.29	73.03	22.22		50.0	
10308-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	6.49	73.92	22.75	6.02	50.0	± 9.6 %
		Y	6.78	74.12	22.76		50.0	
		Z	6.37	73.60	22.50		50.0	
10309-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	6.06	70.55	21.00	6.02	50.0	± 9.6 %
		Y	6.71	73.17	22.53		50.0	
		Z	5.95	70.29	20.78		50.0	
10310-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	5.95	70.41	20.82	6.02	50.0	± 9.6 %
		Y	6.61	73.05	22.35		50.0	
		Z	6.20	72.46	22.04		50.0	
10311-AAC	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	3.02	68.11	15.62	0.00	150.0	± 9.6 %
		Y	3.19	69.13	16.23		150.0	
		Z	2.98	67.98	15.55		150.0	
10313-AAA	iDEN 1:3	X	6.80	77.50	18.05	6.99	70.0	± 9.6 %
		Y	7.71	79.38	18.97		70.0	
		Z	6.80	77.56	18.00		70.0	
10314-AAA	iDEN 1:6	X	9.17	84.53	23.10	10.00	30.0	± 9.6 %
		Y	10.17	86.19	23.87		30.0	
		Z	9.47	85.21	23.28		30.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	1.09	63.63	14.71	0.17	150.0	± 9.6 %
		Y	1.15	64.55	15.51		150.0	
		Z	1.08	63.56	14.63		150.0	
10316-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	X	4.67	66.69	16.26	0.17	150.0	± 9.6 %
		Y	4.72	66.94	16.46		150.0	
		Z	4.64	66.69	16.24		150.0	
10317-AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	X	4.67	66.69	16.26	0.17	150.0	± 9.6 %
		Y	4.72	66.94	16.46		150.0	
		Z	4.64	66.69	16.24		150.0	
10400-AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	4.75	66.92	16.17	0.00	150.0	± 9.6 %
		Y	4.81	67.18	16.37		150.0	
		Z	4.72	66.89	16.14		150.0	
10401-AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	5.45	67.19	16.39	0.00	150.0	± 9.6 %
		Y	5.49	67.37	16.55		150.0	
		Z	5.44	67.22	16.40		150.0	

10402-AAD	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	X	5.72	67.54	16.41	0.00	150.0	± 9.6 %
		Y	5.76	67.75	16.56		150.0	
		Z	5.68	67.48	16.38		150.0	
10403-AAB	CDMA2000 (1xEV-DO, Rev. 0)	X	1.31	66.62	12.89	0.00	115.0	± 9.6 %
		Y	1.55	69.01	14.40		115.0	
		Z	1.25	66.21	12.49		115.0	
10404-AAB	CDMA2000 (1xEV-DO, Rev. A)	X	1.31	66.62	12.89	0.00	115.0	± 9.6 %
		Y	1.55	69.01	14.40		115.0	
		Z	1.25	66.21	12.49		115.0	
10406-AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	X	25.28	103.83	26.72	0.00	100.0	± 9.6 %
		Y	100.00	122.83	31.28		100.0	
		Z	15.62	98.87	25.67		100.0	
10410-AAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4)	X	100.00	120.77	30.63	3.23	80.0	± 9.6 %
		Y	100.00	121.50	31.09		80.0	
		Z	100.00	121.84	30.99		80.0	
10415-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	0.97	62.31	13.89	0.00	150.0	± 9.6 %
		Y	1.01	63.10	14.65		150.0	
		Z	0.96	62.25	13.81		150.0	
10416-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	X	4.57	66.54	16.10	0.00	150.0	± 9.6 %
		Y	4.62	66.78	16.29		150.0	
		Z	4.54	66.53	16.07		150.0	
10417-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	X	4.57	66.54	16.10	0.00	150.0	± 9.6 %
		Y	4.62	66.78	16.29		150.0	
		Z	4.54	66.53	16.07		150.0	
10418-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	X	4.55	66.67	16.10	0.00	150.0	± 9.6 %
		Y	4.61	66.92	16.30		150.0	
		Z	4.53	66.67	16.08		150.0	
10419-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	X	4.58	66.63	16.11	0.00	150.0	± 9.6 %
		Y	4.63	66.88	16.30		150.0	
		Z	4.55	66.63	16.09		150.0	
10422-AAB	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	X	4.70	66.66	16.14	0.00	150.0	± 9.6 %
		Y	4.75	66.89	16.33		150.0	
		Z	4.67	66.65	16.12		150.0	
10423-AAB	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	X	4.89	67.00	16.27	0.00	150.0	± 9.6 %
		Y	4.94	67.25	16.46		150.0	
		Z	4.85	66.98	16.24		150.0	
10424-AAB	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	X	4.80	66.94	16.23	0.00	150.0	± 9.6 %
		Y	4.85	67.19	16.42		150.0	
		Z	4.76	66.92	16.20		150.0	
10425-AAB	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	X	5.43	67.40	16.49	0.00	150.0	± 9.6 %
		Y	5.46	67.59	16.64		150.0	
		Z	5.40	67.39	16.48		150.0	
10426-AAB	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	X	5.43	67.42	16.49	0.00	150.0	± 9.6 %
		Y	5.47	67.60	16.64		150.0	
		Z	5.40	67.41	16.48		150.0	

10427-AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.43	67.37	16.46	0.00	150.0	± 9.6 %
		Y	5.47	67.57	16.62		150.0	
		Z	5.41	67.36	16.45		150.0	
10430-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.15	69.76	17.63	0.00	150.0	± 9.6 %
		Y	4.19	69.88	17.76		150.0	
		Z	4.12	69.84	17.60		150.0	
10431-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	4.26	67.02	16.07	0.00	150.0	± 9.6 %
		Y	4.33	67.32	16.31		150.0	
		Z	4.22	67.00	16.02		150.0	
10432-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.56	66.95	16.16	0.00	150.0	± 9.6 %
		Y	4.62	67.22	16.37		150.0	
		Z	4.52	66.93	16.13		150.0	
10433-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.81	66.98	16.25	0.00	150.0	± 9.6 %
		Y	4.87	67.22	16.44		150.0	
		Z	4.78	66.96	16.22		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.20	70.38	17.52	0.00	150.0	± 9.6 %
		Y	4.25	70.53	17.68		150.0	
		Z	4.16	70.46	17.47		150.0	
10435-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	120.59	30.55	3.23	80.0	± 9.6 %
		Y	100.00	121.33	31.01		80.0	
		Z	100.00	121.65	30.91		80.0	
10447-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.54	66.87	15.35	0.00	150.0	± 9.6 %
		Y	3.62	67.29	15.69		150.0	
		Z	3.49	66.83	15.25		150.0	
10448-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	X	4.09	66.78	15.91	0.00	150.0	± 9.6 %
		Y	4.15	67.09	16.16		150.0	
		Z	4.05	66.76	15.87		150.0	
10449-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	X	4.36	66.75	16.04	0.00	150.0	± 9.6 %
		Y	4.42	67.03	16.26		150.0	
		Z	4.33	66.74	16.01		150.0	
10450-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.56	66.71	16.09	0.00	150.0	± 9.6 %
		Y	4.61	66.97	16.29		150.0	
		Z	4.53	66.69	16.06		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	3.43	67.01	14.98	0.00	150.0	± 9.6 %
		Y	3.53	67.50	15.37		150.0	
		Z	3.37	66.93	14.84		150.0	
10456-AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.29	67.98	16.66	0.00	150.0	± 9.6 %
		Y	6.32	68.16	16.79		150.0	
		Z	6.26	67.96	16.65		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.79	65.17	15.80	0.00	150.0	± 9.6 %
		Y	3.83	65.41	16.01		150.0	
		Z	3.78	65.16	15.77		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	3.84	69.59	16.93	0.00	150.0	± 9.6 %
		Y	3.91	69.84	17.18		150.0	
		Z	3.81	69.69	16.86		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	5.05	67.70	17.82	0.00	150.0	± 9.6 %
		Y	5.09	67.77	17.90		150.0	
		Z	5.00	67.75	17.77		150.0	

10460-AAA	UMTS-FDD (WCDMA, AMR)	X	0.79	65.91	14.37	0.00	150.0	± 9.6 %
		Y	0.92	68.57	16.19		150.0	
		Z	0.78	65.69	14.19		150.0	
10461-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	124.09	32.24	3.29	80.0	± 9.6 %
		Y	100.00	125.81	33.13		80.0	
		Z	100.00	125.28	32.66		80.0	
10462-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	82.18	106.66	24.50	3.23	80.0	± 9.6 %
		Y	100.00	110.22	25.68		80.0	
		Z	90.90	108.32	24.86		80.0	
10463-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	13.11	84.75	18.36	3.23	80.0	± 9.6 %
		Y	100.00	107.13	24.20		80.0	
		Z	11.64	83.97	18.10		80.0	
10464-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	122.05	31.13	3.23	80.0	± 9.6 %
		Y	100.00	123.91	32.10		80.0	
		Z	100.00	123.17	31.52		80.0	
10465-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	34.70	96.83	22.08	3.23	80.0	± 9.6 %
		Y	100.00	109.74	25.45		80.0	
		Z	33.97	97.14	22.15		80.0	
10466-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	8.66	80.23	16.95	3.23	80.0	± 9.6 %
		Y	88.88	105.43	23.71		80.0	
		Z	7.53	79.24	16.62		80.0	
10467-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	122.26	31.23	3.23	80.0	± 9.6 %
		Y	100.00	124.12	32.19		80.0	
		Z	100.00	123.40	31.62		80.0	
10468-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	42.56	99.17	22.68	3.23	80.0	± 9.6 %
		Y	100.00	109.90	25.52		80.0	
		Z	42.79	99.79	22.82		80.0	
10469-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	8.79	80.40	17.00	3.23	80.0	± 9.6 %
		Y	94.78	106.12	23.86		80.0	
		Z	7.65	79.43	16.67		80.0	
10470-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	122.29	31.23	3.23	80.0	± 9.6 %
		Y	100.00	124.15	32.20		80.0	
		Z	100.00	123.43	31.63		80.0	
10471-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	42.39	99.09	22.65	3.23	80.0	± 9.6 %
		Y	100.00	109.85	25.49		80.0	
		Z	42.62	99.70	22.79		80.0	
10472-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	8.75	80.33	16.97	3.23	80.0	± 9.6 %
		Y	95.63	106.16	23.85		80.0	
		Z	7.61	79.36	16.63		80.0	
10473-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	122.26	31.22	3.23	80.0	± 9.6 %
		Y	100.00	124.13	32.18		80.0	
		Z	100.00	123.40	31.61		80.0	
10474-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	41.57	98.89	22.60	3.23	80.0	± 9.6 %
		Y	100.00	109.86	25.49		80.0	
		Z	41.71	99.48	22.73		80.0	
10475-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	8.66	80.23	16.94	3.23	80.0	± 9.6 %
		Y	92.76	105.86	23.79		80.0	
		Z	7.52	79.25	16.60		80.0	

10477-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	36.02	97.20	22.15	3.23	80.0	± 9.6 %
		Y	100.00	109.70	25.42		80.0	
		Z	35.46	97.58	22.24		80.0	
10478-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	8.55	80.07	16.88	3.23	80.0	± 9.6 %
		Y	89.69	105.45	23.69		80.0	
		Z	7.42	79.08	16.54		80.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	12.76	92.36	25.32	3.23	80.0	± 9.6 %
		Y	18.65	98.88	27.57		80.0	
		Z	13.95	94.12	25.81		80.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	12.57	87.00	22.01	3.23	80.0	± 9.6 %
		Y	19.95	93.91	24.32		80.0	
		Z	12.93	87.73	22.15		80.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	10.42	83.70	20.62	3.23	80.0	± 9.6 %
		Y	16.05	89.97	22.81		80.0	
		Z	10.45	84.04	20.63		80.0	
10482-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.39	75.05	18.02	2.23	80.0	± 9.6 %
		Y	5.40	78.13	19.40		80.0	
		Z	4.23	74.62	17.69		80.0	
10483-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	7.31	79.21	19.52	2.23	80.0	± 9.6 %
		Y	9.15	82.68	20.99		80.0	
		Z	7.17	79.05	19.31		80.0	
10484-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.75	77.88	19.05	2.23	80.0	± 9.6 %
		Y	8.31	81.08	20.44		80.0	
		Z	6.55	77.60	18.79		80.0	
10485-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.80	76.47	19.36	2.23	80.0	± 9.6 %
		Y	5.70	79.15	20.55		80.0	
		Z	4.72	76.35	19.21		80.0	
10486-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.16	71.40	17.03	2.23	80.0	± 9.6 %
		Y	4.57	72.84	17.80		80.0	
		Z	4.07	71.21	16.82		80.0	
10487-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.14	70.99	16.86	2.23	80.0	± 9.6 %
		Y	4.52	72.34	17.60		80.0	
		Z	4.04	70.79	16.64		80.0	
10488-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.95	75.43	19.57	2.23	80.0	± 9.6 %
		Y	5.59	77.40	20.48		80.0	
		Z	4.87	75.36	19.51		80.0	
10489-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.39	71.05	17.97	2.23	80.0	± 9.6 %
		Y	4.67	72.07	18.53		80.0	
		Z	4.33	71.01	17.90		80.0	
10490-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.47	70.81	17.90	2.23	80.0	± 9.6 %
		Y	4.74	71.76	18.43		80.0	
		Z	4.41	70.77	17.83		80.0	
10491-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.94	73.38	18.92	2.23	80.0	± 9.6 %
		Y	5.38	74.76	19.60		80.0	
		Z	4.87	73.32	18.89		80.0	
10492-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.67	70.17	17.91	2.23	80.0	± 9.6 %
		Y	4.91	70.97	18.36		80.0	
		Z	4.62	70.13	17.86		80.0	

10493-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.74	70.00	17.86	2.23	80.0	± 9.6 %
		Y	4.96	70.77	18.30		80.0	
		Z	4.68	69.97	17.81		80.0	
10494-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	5.42	74.96	19.36	2.23	80.0	± 9.6 %
		Y	5.98	76.57	20.11		80.0	
		Z	5.33	74.86	19.31		80.0	
10495-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.74	70.64	18.10	2.23	80.0	± 9.6 %
		Y	4.99	71.49	18.58		80.0	
		Z	4.68	70.58	18.06		80.0	
10496-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.80	70.29	18.01	2.23	80.0	± 9.6 %
		Y	5.03	71.08	18.45		80.0	
		Z	4.74	70.24	17.97		80.0	
10497-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.26	70.91	15.58	2.23	80.0	± 9.6 %
		Y	4.08	73.99	17.07		80.0	
		Z	3.04	70.05	15.01		80.0	
10498-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.52	65.21	12.20	2.23	80.0	± 9.6 %
		Y	2.96	67.17	13.35		80.0	
		Z	2.32	64.31	11.53		80.0	
10499-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.46	64.66	11.82	2.23	80.0	± 9.6 %
		Y	2.87	66.51	12.93		80.0	
		Z	2.25	63.75	11.14		80.0	
10500-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.75	75.65	19.32	2.23	80.0	± 9.6 %
		Y	5.48	77.92	20.36		80.0	
		Z	4.68	75.58	19.22		80.0	
10501-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.26	71.24	17.39	2.23	80.0	± 9.6 %
		Y	4.61	72.46	18.05		80.0	
		Z	4.19	71.15	17.24		80.0	
10502-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.30	71.03	17.26	2.23	80.0	± 9.6 %
		Y	4.65	72.20	17.90		80.0	
		Z	4.23	70.93	17.11		80.0	
10503-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.89	75.24	19.48	2.23	80.0	± 9.6 %
		Y	5.52	77.21	20.39		80.0	
		Z	4.81	75.16	19.42		80.0	
10504-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.37	70.96	17.92	2.23	80.0	± 9.6 %
		Y	4.66	71.99	18.49		80.0	
		Z	4.31	70.92	17.85		80.0	
10505-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.44	70.72	17.85	2.23	80.0	± 9.6 %
		Y	4.72	71.68	18.38		80.0	
		Z	4.39	70.68	17.78		80.0	
10506-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	5.37	74.82	19.29	2.23	80.0	± 9.6 %
		Y	5.93	76.44	20.05		80.0	
		Z	5.29	74.72	19.25		80.0	
10507-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.72	70.58	18.07	2.23	80.0	± 9.6 %
		Y	4.98	71.44	18.54		80.0	
		Z	4.67	70.52	18.02		80.0	

10508-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.78	70.23	17.97	2.23	80.0	± 9.6 %
		Y	5.02	71.02	18.41		80.0	
		Z	4.72	70.18	17.93		80.0	
10509-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	5.48	73.02	18.63	2.23	80.0	± 9.6 %
		Y	5.87	74.15	19.19		80.0	
		Z	5.41	72.94	18.60		80.0	
10510-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.18	70.13	17.99	2.23	80.0	± 9.6 %
		Y	5.40	70.84	18.39		80.0	
		Z	5.12	70.07	17.96		80.0	
10511-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.21	69.83	17.92	2.23	80.0	± 9.6 %
		Y	5.42	70.49	18.29		80.0	
		Z	5.15	69.78	17.89		80.0	
10512-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	5.85	74.74	19.13	2.23	80.0	± 9.6 %
		Y	6.39	76.18	19.80		80.0	
		Z	5.76	74.62	19.09		80.0	
10513-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.10	70.52	18.13	2.23	80.0	± 9.6 %
		Y	5.34	71.31	18.56		80.0	
		Z	5.03	70.43	18.08		80.0	
10514-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.08	70.03	18.00	2.23	80.0	± 9.6 %
		Y	5.29	70.75	18.40		80.0	
		Z	5.02	69.96	17.96		80.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	0.93	62.43	13.89	0.00	150.0	± 9.6 %
		Y	0.97	63.29	14.71		150.0	
		Z	0.92	62.37	13.81		150.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	0.48	66.52	14.26	0.00	150.0	± 9.6 %
		Y	0.65	71.79	17.60		150.0	
		Z	0.47	66.19	14.01		150.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	0.76	63.81	14.08	0.00	150.0	± 9.6 %
		Y	0.83	65.38	15.37		150.0	
		Z	0.75	63.68	13.95		150.0	
10518-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	4.56	66.61	16.07	0.00	150.0	± 9.6 %
		Y	4.61	66.85	16.27		150.0	
		Z	4.53	66.60	16.05		150.0	
10519-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.76	66.88	16.21	0.00	150.0	± 9.6 %
		Y	4.82	67.13	16.41		150.0	
		Z	4.73	66.86	16.18		150.0	
10520-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.61	66.83	16.12	0.00	150.0	± 9.6 %
		Y	4.67	67.09	16.32		150.0	
		Z	4.57	66.81	16.09		150.0	
10521-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.54	66.82	16.10	0.00	150.0	± 9.6 %
		Y	4.60	67.09	16.31		150.0	
		Z	4.51	66.79	16.07		150.0	
10522-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.60	66.88	16.17	0.00	150.0	± 9.6 %
		Y	4.65	67.13	16.37		150.0	
		Z	4.56	66.87	16.15		150.0	

10523-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	X	4.47	66.73	16.00	0.00	150.0	± 9.6 %
		Y	4.52	66.99	16.21		150.0	
		Z	4.44	66.72	15.98		150.0	
10524-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	4.55	66.81	16.14	0.00	150.0	± 9.6 %
		Y	4.60	67.07	16.35		150.0	
		Z	4.51	66.79	16.12		150.0	
10525-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	X	4.52	65.83	15.72	0.00	150.0	± 9.6 %
		Y	4.57	66.08	15.92		150.0	
		Z	4.49	65.82	15.70		150.0	
10526-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	X	4.70	66.21	15.87	0.00	150.0	± 9.6 %
		Y	4.76	66.48	16.07		150.0	
		Z	4.66	66.20	15.85		150.0	
10527-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	4.61	66.17	15.81	0.00	150.0	± 9.6 %
		Y	4.67	66.44	16.02		150.0	
		Z	4.58	66.15	15.78		150.0	
10528-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	X	4.63	66.19	15.85	0.00	150.0	± 9.6 %
		Y	4.69	66.46	16.05		150.0	
		Z	4.60	66.17	15.82		150.0	
10529-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	X	4.63	66.19	15.85	0.00	150.0	± 9.6 %
		Y	4.69	66.46	16.05		150.0	
		Z	4.60	66.17	15.82		150.0	
10531-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	4.63	66.31	15.86	0.00	150.0	± 9.6 %
		Y	4.69	66.59	16.07		150.0	
		Z	4.59	66.28	15.83		150.0	
10532-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	X	4.48	66.15	15.79	0.00	150.0	± 9.6 %
		Y	4.55	66.44	16.01		150.0	
		Z	4.45	66.12	15.75		150.0	
10533-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	4.64	66.22	15.83	0.00	150.0	± 9.6 %
		Y	4.70	66.49	16.03		150.0	
		Z	4.60	66.20	15.80		150.0	
10534-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	5.17	66.38	15.95	0.00	150.0	± 9.6 %
		Y	5.22	66.61	16.12		150.0	
		Z	5.14	66.36	15.93		150.0	
10535-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	5.24	66.55	16.02	0.00	150.0	± 9.6 %
		Y	5.29	66.77	16.19		150.0	
		Z	5.21	66.54	16.01		150.0	
10536-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	5.11	66.49	15.97	0.00	150.0	± 9.6 %
		Y	5.16	66.73	16.15		150.0	
		Z	5.07	66.46	15.95		150.0	
10537-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	X	5.17	66.48	15.97	0.00	150.0	± 9.6 %
		Y	5.22	66.71	16.14		150.0	
		Z	5.14	66.45	15.95		150.0	
10538-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	5.27	66.54	16.05	0.00	150.0	± 9.6 %
		Y	5.32	66.77	16.22		150.0	
		Z	5.23	66.49	16.02		150.0	
10540-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	5.19	66.52	16.05	0.00	150.0	± 9.6 %
		Y	5.24	66.75	16.22		150.0	
		Z	5.16	66.50	16.03		150.0	

10541-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	5.16	66.38	15.97	0.00	150.0	± 9.6 %
		Y	5.21	66.61	16.15		150.0	
		Z	5.13	66.35	15.95		150.0	
10542-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	5.32	66.47	16.04	0.00	150.0	± 9.6 %
		Y	5.37	66.69	16.20		150.0	
		Z	5.29	66.44	16.02		150.0	
10543-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.41	66.52	16.08	0.00	150.0	± 9.6 %
		Y	5.45	66.73	16.24		150.0	
		Z	5.38	66.51	16.07		150.0	
10544-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.47	66.50	15.95	0.00	150.0	± 9.6 %
		Y	5.51	66.71	16.11		150.0	
		Z	5.45	66.47	15.93		150.0	
10545-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.69	66.97	16.13	0.00	150.0	± 9.6 %
		Y	5.73	67.17	16.28		150.0	
		Z	5.66	66.95	16.12		150.0	
10546-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.56	66.76	16.04	0.00	150.0	± 9.6 %
		Y	5.60	66.98	16.21		150.0	
		Z	5.52	66.71	16.02		150.0	
10547-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	5.64	66.85	16.08	0.00	150.0	± 9.6 %
		Y	5.69	67.07	16.24		150.0	
		Z	5.60	66.78	16.04		150.0	
10548-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	6.00	68.11	16.68	0.00	150.0	± 9.6 %
		Y	6.04	68.30	16.83		150.0	
		Z	5.95	68.00	16.63		150.0	
10550-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	5.58	66.74	16.04	0.00	150.0	± 9.6 %
		Y	5.62	66.95	16.20		150.0	
		Z	5.55	66.72	16.03		150.0	
10551-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.58	66.77	16.02	0.00	150.0	± 9.6 %
		Y	5.63	67.00	16.18		150.0	
		Z	5.55	66.74	16.00		150.0	
10552-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.49	66.55	15.92	0.00	150.0	± 9.6 %
		Y	5.53	66.77	16.08		150.0	
		Z	5.46	66.52	15.90		150.0	
10553-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.58	66.61	15.98	0.00	150.0	± 9.6 %
		Y	5.63	66.83	16.14		150.0	
		Z	5.55	66.57	15.96		150.0	
10554-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	5.88	66.89	16.06	0.00	150.0	± 9.6 %
		Y	5.92	67.10	16.21		150.0	
		Z	5.86	66.86	16.04		150.0	
10555-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	6.03	67.23	16.21	0.00	150.0	± 9.6 %
		Y	6.07	67.43	16.35		150.0	
		Z	6.00	67.20	16.19		150.0	
10556-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	6.04	67.26	16.21	0.00	150.0	± 9.6 %
		Y	6.08	67.46	16.36		150.0	
		Z	6.02	67.23	16.20		150.0	
10557-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	6.01	67.18	16.19	0.00	150.0	± 9.6 %
		Y	6.06	67.39	16.35		150.0	
		Z	5.98	67.14	16.17		150.0	

10558-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	6.07	67.37	16.30	0.00	150.0	± 9.6 %
		Y	6.12	67.58	16.46		150.0	
		Z	6.04	67.31	16.27		150.0	
10560-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	X	6.06	67.18	16.25	0.00	150.0	± 9.6 %
		Y	6.10	67.40	16.41		150.0	
		Z	6.03	67.14	16.23		150.0	
10561-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	5.98	67.16	16.28	0.00	150.0	± 9.6 %
		Y	6.02	67.38	16.43		150.0	
		Z	5.95	67.13	16.26		150.0	
10562-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	6.14	67.65	16.52	0.00	150.0	± 9.6 %
		Y	6.18	67.88	16.69		150.0	
		Z	6.10	67.57	16.48		150.0	
10563-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	X	6.53	68.40	16.85	0.00	150.0	± 9.6 %
		Y	6.57	68.59	17.00		150.0	
		Z	6.44	68.19	16.75		150.0	
10564-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	X	4.91	66.77	16.29	0.46	150.0	± 9.6 %
		Y	4.96	67.01	16.49		150.0	
		Z	4.88	66.76	16.26		150.0	
10565-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	X	5.15	67.23	16.61	0.46	150.0	± 9.6 %
		Y	5.20	67.46	16.79		150.0	
		Z	5.11	67.20	16.58		150.0	
10566-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	X	4.98	67.08	16.43	0.46	150.0	± 9.6 %
		Y	5.04	67.33	16.62		150.0	
		Z	4.94	67.05	16.40		150.0	
10567-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	X	5.00	67.42	16.74	0.46	150.0	± 9.6 %
		Y	5.05	67.64	16.92		150.0	
		Z	4.96	67.39	16.72		150.0	
10568-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	X	4.90	66.88	16.22	0.46	150.0	± 9.6 %
		Y	4.96	67.15	16.44		150.0	
		Z	4.87	66.87	16.19		150.0	
10569-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	X	4.95	67.46	16.77	0.46	150.0	± 9.6 %
		Y	5.00	67.68	16.94		150.0	
		Z	4.91	67.46	16.76		150.0	
10570-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	X	4.99	67.34	16.73	0.46	150.0	± 9.6 %
		Y	5.04	67.57	16.91		150.0	
		Z	4.95	67.33	16.71		150.0	
10571-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.25	64.93	15.40	0.46	130.0	± 9.6 %
		Y	1.32	65.99	16.25		130.0	
		Z	1.24	64.84	15.31		130.0	
10572-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.27	65.48	15.72	0.46	130.0	± 9.6 %
		Y	1.35	66.62	16.60		130.0	
		Z	1.26	65.38	15.63		130.0	
10573-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	2.10	81.92	20.57	0.46	130.0	± 9.6 %
		Y	6.18	99.59	26.88		130.0	
		Z	1.98	81.02	20.18		130.0	
10574-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	1.40	70.72	18.14	0.46	130.0	± 9.6 %
		Y	1.59	73.16	19.61		130.0	
		Z	1.38	70.53	18.01		130.0	

10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	4.72	66.64	16.39	0.46	130.0	± 9.6 %
		Y	4.77	66.88	16.58		130.0	
		Z	4.69	66.63	16.36		130.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	4.74	66.78	16.44	0.46	130.0	± 9.6 %
		Y	4.79	67.02	16.63		130.0	
		Z	4.71	66.78	16.41		130.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	4.96	67.10	16.62	0.46	130.0	± 9.6 %
		Y	5.01	67.33	16.80		130.0	
		Z	4.92	67.08	16.59		130.0	
10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	4.85	67.23	16.70	0.46	130.0	± 9.6 %
		Y	4.90	67.46	16.88		130.0	
		Z	4.81	67.21	16.67		130.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	4.63	66.62	16.07	0.46	130.0	± 9.6 %
		Y	4.70	66.91	16.30		130.0	
		Z	4.60	66.59	16.04		130.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	4.68	66.64	16.09	0.46	130.0	± 9.6 %
		Y	4.74	66.93	16.33		130.0	
		Z	4.64	66.62	16.06		130.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	4.75	67.28	16.64	0.46	130.0	± 9.6 %
		Y	4.81	67.52	16.83		130.0	
		Z	4.71	67.26	16.61		130.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	4.59	66.41	15.89	0.46	130.0	± 9.6 %
		Y	4.65	66.72	16.14		130.0	
		Z	4.55	66.37	15.85		130.0	
10583-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.72	66.64	16.39	0.46	130.0	± 9.6 %
		Y	4.77	66.88	16.58		130.0	
		Z	4.69	66.63	16.36		130.0	
10584-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.74	66.78	16.44	0.46	130.0	± 9.6 %
		Y	4.79	67.02	16.63		130.0	
		Z	4.71	66.78	16.41		130.0	
10585-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	4.96	67.10	16.62	0.46	130.0	± 9.6 %
		Y	5.01	67.33	16.80		130.0	
		Z	4.92	67.08	16.59		130.0	
10586-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	4.85	67.23	16.70	0.46	130.0	± 9.6 %
		Y	4.90	67.46	16.88		130.0	
		Z	4.81	67.21	16.67		130.0	
10587-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.63	66.62	16.07	0.46	130.0	± 9.6 %
		Y	4.70	66.91	16.30		130.0	
		Z	4.60	66.59	16.04		130.0	
10588-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.68	66.64	16.09	0.46	130.0	± 9.6 %
		Y	4.74	66.93	16.33		130.0	
		Z	4.64	66.62	16.06		130.0	
10589-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	4.75	67.28	16.64	0.46	130.0	± 9.6 %
		Y	4.81	67.52	16.83		130.0	
		Z	4.71	67.26	16.61		130.0	
10590-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.59	66.41	15.89	0.46	130.0	± 9.6 %
		Y	4.65	66.72	16.14		130.0	
		Z	4.55	66.37	15.85		130.0	

10591-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	4.87	66.69	16.48	0.46	130.0	± 9.6 %
		Y	4.92	66.92	16.67		130.0	
		Z	4.84	66.69	16.46		130.0	
10592-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	5.03	67.03	16.61	0.46	130.0	± 9.6 %
		Y	5.08	67.26	16.79		130.0	
		Z	5.00	67.02	16.59		130.0	
10593-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	4.96	66.97	16.51	0.46	130.0	± 9.6 %
		Y	5.01	67.21	16.70		130.0	
		Z	4.92	66.95	16.48		130.0	
10594-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	5.01	67.11	16.65	0.46	130.0	± 9.6 %
		Y	5.06	67.34	16.83		130.0	
		Z	4.97	67.10	16.62		130.0	
10595-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	4.98	67.08	16.55	0.46	130.0	± 9.6 %
		Y	5.04	67.32	16.74		130.0	
		Z	4.94	67.06	16.53		130.0	
10596-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	4.92	67.08	16.55	0.46	130.0	± 9.6 %
		Y	4.98	67.33	16.75		130.0	
		Z	4.88	67.06	16.53		130.0	
10597-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	4.87	67.00	16.45	0.46	130.0	± 9.6 %
		Y	4.93	67.26	16.65		130.0	
		Z	4.83	66.97	16.42		130.0	
10598-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	4.85	67.21	16.69	0.46	130.0	± 9.6 %
		Y	4.90	67.45	16.87		130.0	
		Z	4.81	67.18	16.66		130.0	
10599-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	5.55	67.30	16.72	0.46	130.0	± 9.6 %
		Y	5.59	67.50	16.88		130.0	
		Z	5.52	67.28	16.71		130.0	
10600-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	5.76	67.97	17.04	0.46	130.0	± 9.6 %
		Y	5.80	68.15	17.19		130.0	
		Z	5.71	67.90	16.99		130.0	
10601-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.61	67.58	16.85	0.46	130.0	± 9.6 %
		Y	5.65	67.77	17.00		130.0	
		Z	5.57	67.54	16.83		130.0	
10602-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	5.69	67.58	16.77	0.46	130.0	± 9.6 %
		Y	5.73	67.78	16.94		130.0	
		Z	5.66	67.57	16.76		130.0	
10603-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	5.77	67.85	17.03	0.46	130.0	± 9.6 %
		Y	5.81	68.03	17.18		130.0	
		Z	5.73	67.82	17.01		130.0	
10604-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.55	67.27	16.73	0.46	130.0	± 9.6 %
		Y	5.60	67.47	16.89		130.0	
		Z	5.52	67.24	16.71		130.0	
10605-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.69	67.68	16.94	0.46	130.0	± 9.6 %
		Y	5.73	67.87	17.10		130.0	
		Z	5.66	67.69	16.94		130.0	
10606-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	5.43	67.03	16.48	0.46	130.0	± 9.6 %
		Y	5.48	67.26	16.66		130.0	
		Z	5.41	67.03	16.47		130.0	

10607-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.70	65.95	16.07	0.46	130.0	± 9.6 %
		Y	4.75	66.19	16.26		130.0	
		Z	4.67	65.95	16.05		130.0	
10608-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	4.89	66.37	16.24	0.46	130.0	± 9.6 %
		Y	4.95	66.62	16.43		130.0	
		Z	4.86	66.36	16.22		130.0	
10609-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	4.78	66.23	16.09	0.46	130.0	± 9.6 %
		Y	4.84	66.50	16.29		130.0	
		Z	4.75	66.21	16.06		130.0	
10610-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	4.83	66.38	16.24	0.46	130.0	± 9.6 %
		Y	4.89	66.63	16.43		130.0	
		Z	4.80	66.36	16.22		130.0	
10611-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	4.75	66.21	16.10	0.46	130.0	± 9.6 %
		Y	4.81	66.47	16.30		130.0	
		Z	4.72	66.18	16.07		130.0	
10612-AAB	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	4.77	66.37	16.14	0.46	130.0	± 9.6 %
		Y	4.83	66.65	16.36		130.0	
		Z	4.73	66.35	16.12		130.0	
10613-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.78	66.28	16.05	0.46	130.0	± 9.6 %
		Y	4.84	66.57	16.26		130.0	
		Z	4.74	66.25	16.02		130.0	
10614-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.71	66.42	16.24	0.46	130.0	± 9.6 %
		Y	4.77	66.68	16.44		130.0	
		Z	4.67	66.39	16.22		130.0	
10615-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.76	66.06	15.90	0.46	130.0	± 9.6 %
		Y	4.82	66.34	16.11		130.0	
		Z	4.72	66.04	15.87		130.0	
10616-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	5.36	66.52	16.31	0.46	130.0	± 9.6 %
		Y	5.40	66.73	16.47		130.0	
		Z	5.33	66.49	16.29		130.0	
10617-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.42	66.67	16.35	0.46	130.0	± 9.6 %
		Y	5.47	66.87	16.51		130.0	
		Z	5.40	66.69	16.36		130.0	
10618-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	5.31	66.69	16.37	0.46	130.0	± 9.6 %
		Y	5.36	66.91	16.54		130.0	
		Z	5.28	66.66	16.36		130.0	
10619-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	5.34	66.55	16.24	0.46	130.0	± 9.6 %
		Y	5.39	66.77	16.41		130.0	
		Z	5.31	66.53	16.23		130.0	
10620-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.44	66.61	16.33	0.46	130.0	± 9.6 %
		Y	5.49	66.85	16.50		130.0	
		Z	5.40	66.57	16.30		130.0	
10621-AAB	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.41	66.65	16.46	0.46	130.0	± 9.6 %
		Y	5.46	66.85	16.61		130.0	
		Z	5.38	66.63	16.44		130.0	
10622-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.43	66.83	16.54	0.46	130.0	± 9.6 %
		Y	5.47	67.03	16.69		130.0	
		Z	5.41	66.83	16.53		130.0	

10623-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	5.31	66.37	16.20	0.46	130.0	± 9.6 %
		Y	5.36	66.60	16.37		130.0	
		Z	5.28	66.35	16.18		130.0	
10624-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.51	66.60	16.37	0.46	130.0	± 9.6 %
		Y	5.55	66.80	16.53		130.0	
		Z	5.48	66.57	16.35		130.0	
10625-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	5.96	67.84	17.04	0.46	130.0	± 9.6 %
		Y	6.00	68.03	17.20		130.0	
		Z	5.91	67.77	17.00		130.0	
10626-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.63	66.56	16.25	0.46	130.0	± 9.6 %
		Y	5.67	66.76	16.40		130.0	
		Z	5.61	66.54	16.24		130.0	
10627-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	5.91	67.22	16.54	0.46	130.0	± 9.6 %
		Y	5.95	67.40	16.68		130.0	
		Z	5.89	67.20	16.54		130.0	
10628-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.69	66.73	16.24	0.46	130.0	± 9.6 %
		Y	5.74	66.95	16.40		130.0	
		Z	5.67	66.70	16.22		130.0	
10629-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	5.78	66.80	16.27	0.46	130.0	± 9.6 %
		Y	5.82	67.01	16.42		130.0	
		Z	5.76	66.81	16.27		130.0	
10630-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	6.42	68.87	17.30	0.46	130.0	± 9.6 %
		Y	6.45	69.07	17.46		130.0	
		Z	6.35	68.76	17.24		130.0	
10631-AAB	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	6.17	68.24	17.17	0.46	130.0	± 9.6 %
		Y	6.22	68.45	17.31		130.0	
		Z	6.11	68.14	17.12		130.0	
10632-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	5.86	67.20	16.67	0.46	130.0	± 9.6 %
		Y	5.89	67.37	16.79		130.0	
		Z	5.84	67.20	16.66		130.0	
10633-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	5.75	66.86	16.33	0.46	130.0	± 9.6 %
		Y	5.80	67.09	16.49		130.0	
		Z	5.72	66.81	16.30		130.0	
10634-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	5.73	66.86	16.39	0.46	130.0	± 9.6 %
		Y	5.78	67.07	16.54		130.0	
		Z	5.70	66.82	16.36		130.0	
10635-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	5.63	66.29	15.85	0.46	130.0	± 9.6 %
		Y	5.69	66.55	16.05		130.0	
		Z	5.60	66.24	15.82		130.0	
10636-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	6.06	66.98	16.37	0.46	130.0	± 9.6 %
		Y	6.09	67.16	16.51		130.0	
		Z	6.04	66.95	16.36		130.0	
10637-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	6.23	67.40	16.57	0.46	130.0	± 9.6 %
		Y	6.27	67.58	16.70		130.0	
		Z	6.21	67.38	16.55		130.0	
10638-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	6.23	67.37	16.53	0.46	130.0	± 9.6 %
		Y	6.27	67.56	16.67		130.0	
		Z	6.21	67.35	16.52		130.0	

10639-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	6.21	67.31	16.55	0.46	130.0	± 9.6 %
		Y	6.25	67.51	16.69		130.0	
		Z	6.18	67.27	16.52		130.0	
10640-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	6.23	67.39	16.53	0.46	130.0	± 9.6 %
		Y	6.28	67.61	16.69		130.0	
		Z	6.20	67.33	16.50		130.0	
10641-AAC	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	6.24	67.19	16.45	0.46	130.0	± 9.6 %
		Y	6.28	67.39	16.60		130.0	
		Z	6.22	67.18	16.44		130.0	
10642-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	6.29	67.45	16.73	0.46	130.0	± 9.6 %
		Y	6.33	67.63	16.87		130.0	
		Z	6.26	67.41	16.72		130.0	
10643-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	6.13	67.18	16.51	0.46	130.0	± 9.6 %
		Y	6.18	67.38	16.66		130.0	
		Z	6.11	67.15	16.49		130.0	
10644-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	6.35	67.83	16.86	0.46	130.0	± 9.6 %
		Y	6.40	68.06	17.03		130.0	
		Z	6.30	67.74	16.80		130.0	
10645-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	6.89	68.98	17.38	0.46	130.0	± 9.6 %
		Y	6.90	69.10	17.50		130.0	
		Z	6.83	68.87	17.33		130.0	
10646-AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	48.50	125.76	41.37	9.30	60.0	± 9.6 %
		Y	90.47	140.91	45.72		60.0	
		Z	50.32	127.46	41.96		60.0	
10647-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	48.77	126.82	41.82	9.30	60.0	± 9.6 %
		Y	98.14	143.92	46.67		60.0	
		Z	49.92	128.24	42.34		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	0.66	62.51	9.96	0.00	150.0	± 9.6 %
		Y	0.73	63.91	11.18		150.0	
		Z	0.63	62.25	9.61		150.0	
10652-AAB	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	4.17	68.03	16.99	2.23	80.0	± 9.6 %
		Y	4.34	68.67	17.39		80.0	
		Z	4.13	68.01	16.93		80.0	
10653-AAB	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	4.68	67.42	17.15	2.23	80.0	± 9.6 %
		Y	4.82	67.93	17.48		80.0	
		Z	4.65	67.40	17.11		80.0	
10654-AAB	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	4.64	67.10	17.16	2.23	80.0	± 9.6 %
		Y	4.76	67.59	17.48		80.0	
		Z	4.61	67.07	17.13		80.0	
10655-AAB	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.70	67.12	17.21	2.23	80.0	± 9.6 %
		Y	4.82	67.61	17.53		80.0	
		Z	4.67	67.08	17.17		80.0	
10658-AAA	Pulse Waveform (200Hz, 10%)	X	17.27	91.20	23.98	10.00	50.0	± 9.6 %
		Y	16.02	90.22	23.99		50.0	
		Z	18.59	92.23	24.12		50.0	
10659-AAA	Pulse Waveform (200Hz, 20%)	X	100.00	114.98	28.67	6.99	60.0	± 9.6 %
		Y	100.00	116.21	29.42		60.0	
		Z	100.00	114.43	28.33		60.0	

10660-AAA	Pulse Waveform (200Hz, 40%)	X	100.00	112.03	25.82	3.98	80.0	± 9.6 %
		Y	100.00	113.99	26.86		80.0	
		Z	100.00	111.43	25.48		80.0	
10661-AAA	Pulse Waveform (200Hz, 60%)	X	100.00	111.06	24.05	2.22	100.0	± 9.6 %
		Y	100.00	114.62	25.75		100.0	
		Z	100.00	110.31	23.67		100.0	
10662-AAA	Pulse Waveform (200Hz, 80%)	X	100.00	108.64	21.32	0.97	120.0	± 9.6 %
		Y	100.00	117.33	25.06		120.0	
		Z	100.00	107.31	20.72		120.0	

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

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

S Schweizerischer Kalibrierdienst
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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: ES3-3287_Sep17

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3287

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

SC ✓
10/03/2017

Calibration date: September 18, 2017

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02525)	Apr-18
Reference 20 dB Attenuator	SN: S5277 (20x)	07-Apr-17 (No. 217-02528)	Apr-18
Reference Probe ES3DV2	SN: 3013	31-Dec-16 (No. ES3-3013_Dec16)	Dec-17
DAE4	SN: 660	7-Dec-16 (No. DAE4-660_Dec16)	Dec-17
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-16)	In house check: Jun-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

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

Issued: September 19, 2017

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

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 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:3287

Manufactured: June 7, 2010
Calibrated: September 18, 2017

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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3287

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.87	0.98	1.00	± 10.1 %
DCP (mV)[B]	107.7	103.1	105.0	

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	191.5	±3.3 %
		Y	0.0	0.0	1.0		198.9	
		Z	0.0	0.0	1.0		180.8	

Note: For details on UID parameters see Appendix.

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	54.28	378.7	33.99	28.46	2.430	5.072	1.313	0.408	1.009
Y	59.16	422.2	35.13	29.85	3.583	5.094	0.041	0.732	1.008
Z	43.70	307.8	34.40	28.00	2.236	5.100	1.282	0.347	1.010

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of Norm X,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[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:3287

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)	Unc (k=2)
750	41.9	0.89	7.00	7.00	7.00	0.26	1.80	± 12.0 %
835	41.5	0.90	6.70	6.70	6.70	0.56	1.23	± 12.0 %
1750	40.1	1.37	5.57	5.57	5.57	0.53	1.28	± 12.0 %
1900	40.0	1.40	5.34	5.34	5.34	0.41	1.52	± 12.0 %
2300	39.5	1.67	4.94	4.94	4.94	0.42	1.57	± 12.0 %
2450	39.2	1.80	4.64	4.64	4.64	0.55	1.39	± 12.0 %
2600	39.0	1.96	4.44	4.44	4.44	0.58	1.43	± 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:3287

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)	Unc (k=2)
750	55.5	0.96	6.71	6.71	6.71	0.45	1.38	± 12.0 %
835	55.2	0.97	6.56	6.56	6.56	0.80	1.05	± 12.0 %
1750	53.4	1.49	5.19	5.19	5.19	0.37	1.73	± 12.0 %
1900	53.3	1.52	5.00	5.00	5.00	0.47	1.51	± 12.0 %
2300	52.9	1.81	4.66	4.66	4.66	0.59	1.36	± 12.0 %
2450	52.7	1.95	4.47	4.47	4.47	0.55	1.20	± 12.0 %
2600	52.5	2.16	4.28	4.28	4.28	0.50	1.20	± 12.0 %

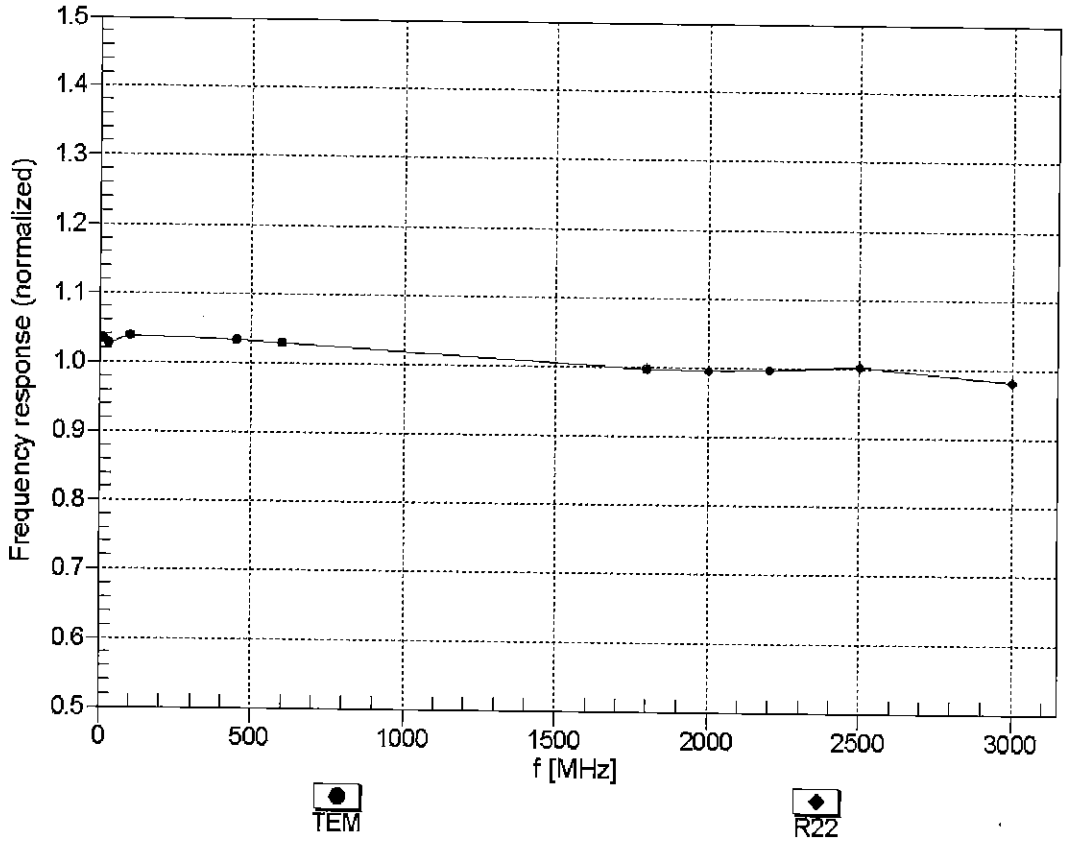
[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz 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.

Frequency Response of E-Field

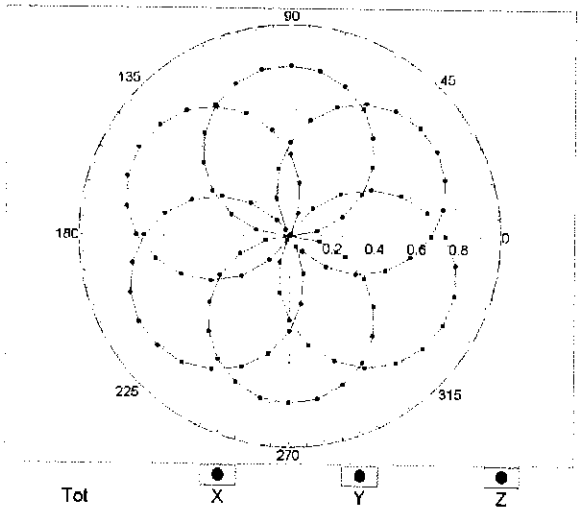
(TEM-Cell:ifi110 EXX, Waveguide: R22)



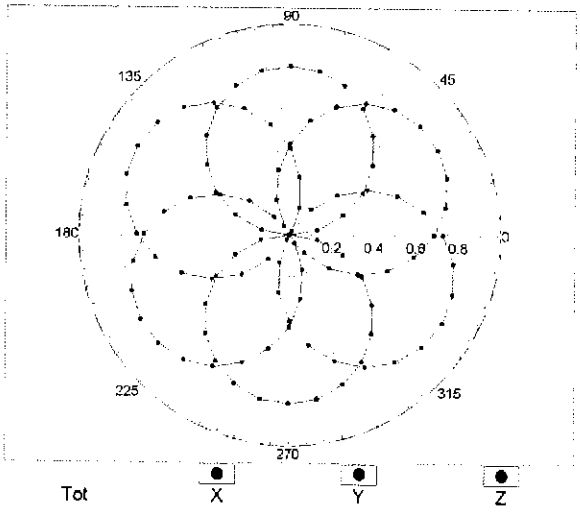
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

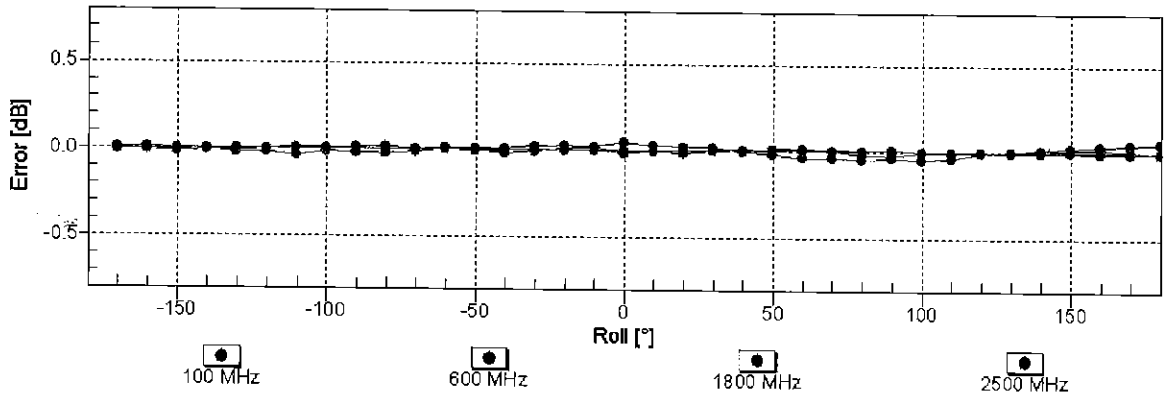
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



f=1800 MHz,R22

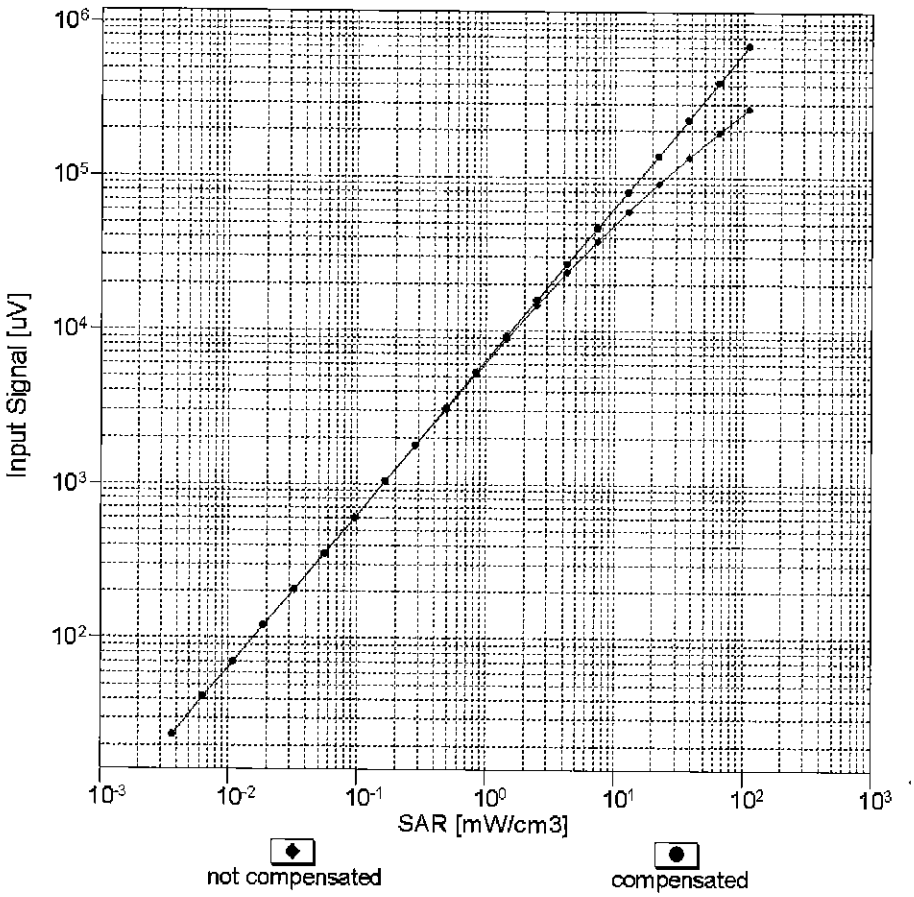


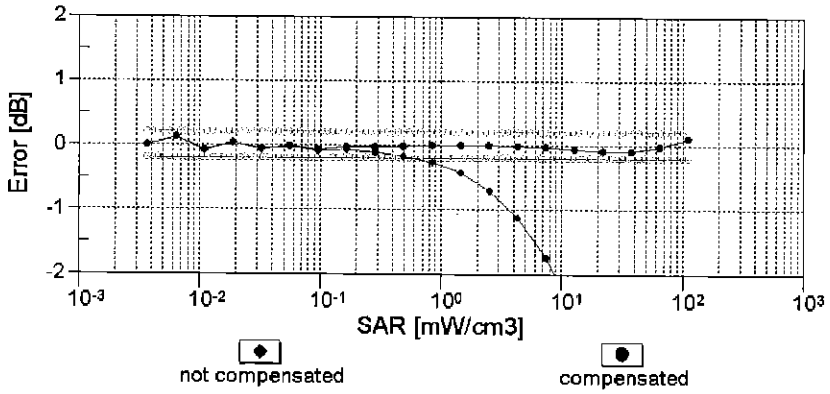


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

(TEM cell , f_{eval}= 1900 MHz)

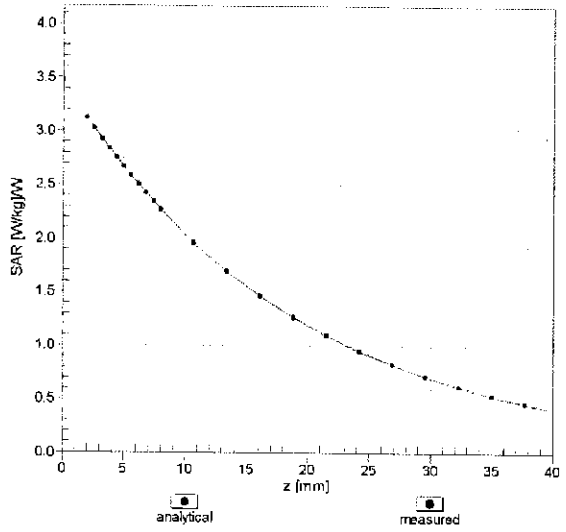




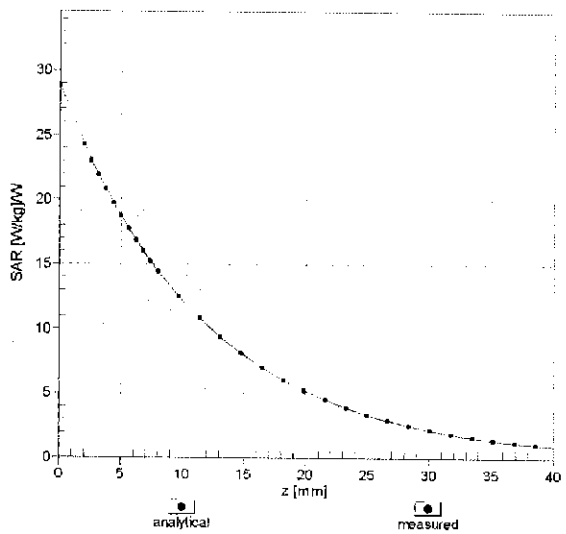
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

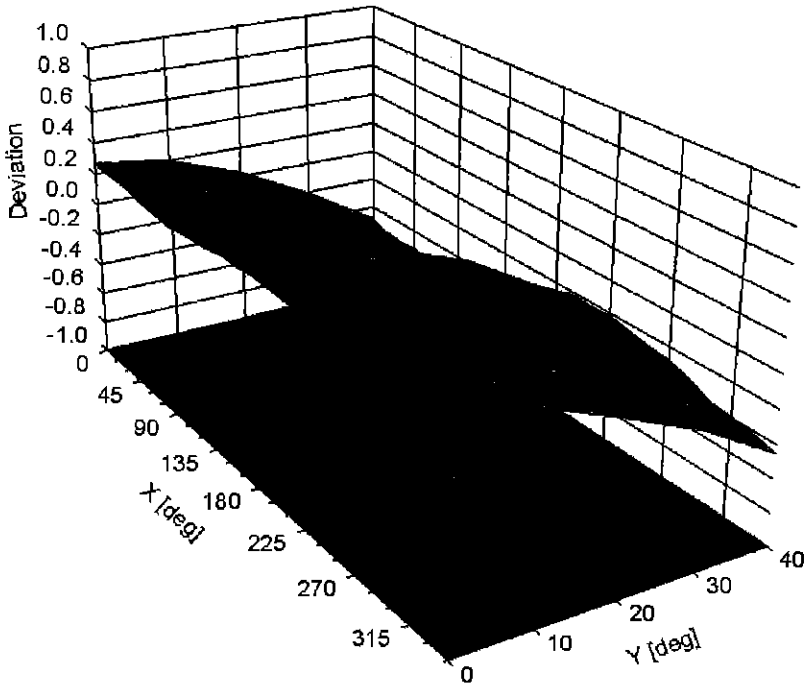


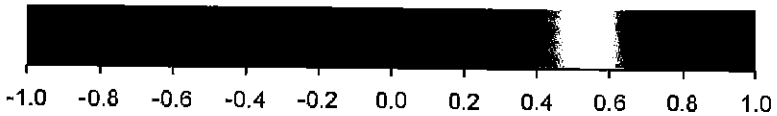
f = 1900 MHz,WGLS R22 (H_convF)



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:3287

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	89.6
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max Unc[E] (k=2)
0	CW	X	0.00	0.00	1.00	0.00	191.5	± 3.3 %
		Y	0.00	0.00	1.00		198.9	
		Z	0.00	0.00	1.00		180.8	
10010-CAA	SAR Validation (Square, 100ms, 10ms)	X	10.31	82.54	19.92	10.00	25.0	± 9.6 %
		Y	9.70	81.57	20.65		25.0	
		Z	13.02	86.61	21.44		25.0	
10011-CAB	UMTS-FDD (WCDMA)	X	1.65	76.64	20.39	0.00	150.0	± 9.6 %
		Y	1.11	68.31	15.89		150.0	
		Z	1.20	70.53	17.08		150.0	
10012-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.42	67.62	17.77	0.41	150.0	± 9.6 %
		Y	1.35	65.44	16.09		150.0	
		Z	1.35	66.18	16.60		150.0	
10013-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	5.13	67.63	17.69	1.46	150.0	± 9.6 %
		Y	5.21	67.37	17.49		150.0	
		Z	5.05	67.67	17.63		150.0	
10021-DAC	GSM-FDD (TDMA, GMSK)	X	36.11	104.66	28.70	9.39	50.0	± 9.6 %
		Y	17.06	92.75	26.26		50.0	
		Z	74.47	117.68	32.39		50.0	
10023-DAC	GPRS-FDD (TDMA, GMSK, TN 0)	X	29.01	100.99	27.69	9.57	50.0	± 9.6 %
		Y	15.70	91.12	25.76		50.0	
		Z	50.86	111.27	30.76		50.0	
10024-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	100.00	118.25	30.37	6.56	60.0	± 9.6 %
		Y	79.14	117.46	31.45		60.0	
		Z	100.00	119.51	30.92		60.0	
10025-DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	18.01	104.77	39.73	12.57	50.0	± 9.6 %
		Y	13.85	93.70	35.01		50.0	
		Z	19.28	108.70	41.83		50.0	
10026-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	22.37	106.73	36.71	9.56	60.0	± 9.6 %
		Y	15.21	95.13	32.50		60.0	
		Z	23.85	109.99	38.29		60.0	
10027-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	100.00	117.60	29.16	4.80	80.0	± 9.6 %
		Y	100.00	119.86	30.73		80.0	
		Z	100.00	118.96	29.76		80.0	
10028-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	118.56	28.79	3.55	100.0	± 9.6 %
		Y	100.00	119.98	29.90		100.0	
		Z	100.00	119.90	29.38		100.0	
10029-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	14.79	97.42	32.53	7.80	80.0	± 9.6 %
		Y	11.52	89.75	29.55		80.0	
		Z	14.18	97.61	32.99		80.0	
10030-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	X	100.00	116.89	29.16	5.30	70.0	± 9.6 %
		Y	100.00	119.53	30.94		70.0	
		Z	100.00	118.05	29.66		70.0	
10031-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	100.00	122.60	28.99	1.88	100.0	± 9.6 %
		Y	100.00	121.51	28.91		100.0	
		Z	100.00	122.48	28.93		100.0	

10032-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	X	100.00	133.16	32.27	1.17	100.0	± 9.6 %
		Y	100.00	126.43	29.83		100.0	
		Z	100.00	130.02	30.96		100.0	
10033-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	X	32.57	106.74	29.49	5.30	70.0	± 9.6 %
		Y	13.39	91.56	25.42		70.0	
		Z	28.98	104.37	28.55		70.0	
10034-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	X	45.93	114.88	30.10	1.88	100.0	± 9.6 %
		Y	7.50	87.12	22.45		100.0	
		Z	20.04	100.44	25.46		100.0	
10035-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	X	21.96	105.92	27.68	1.17	100.0	± 9.6 %
		Y	4.51	81.47	20.26		100.0	
		Z	9.42	91.44	22.56		100.0	
10036-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	X	45.23	112.33	31.05	5.30	70.0	± 9.6 %
		Y	15.39	94.09	26.30		70.0	
		Z	38.95	109.34	29.96		70.0	
10037-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	X	39.94	112.82	29.55	1.88	100.0	± 9.6 %
		Y	7.15	86.45	22.19		100.0	
		Z	17.08	98.28	24.84		100.0	
10038-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	X	24.74	108.13	28.38	1.17	100.0	± 9.6 %
		Y	4.66	82.21	20.61		100.0	
		Z	9.87	92.45	22.99		100.0	
10039-CAB	CDMA2000 (1xRTT, RC1)	X	7.01	92.94	24.21	0.00	150.0	± 9.6 %
		Y	2.15	73.76	17.15		150.0	
		Z	2.61	77.73	17.80		150.0	
10042-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	X	100.00	117.06	30.06	7.78	50.0	± 9.6 %
		Y	33.54	102.85	27.66		50.0	
		Z	100.00	118.08	30.50		50.0	
10044-CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	X	0.00	127.60	2.39	0.00	150.0	± 9.6 %
		Y	0.00	96.78	0.00		150.0	
		Z	0.01	122.93	2.94		150.0	
10048-CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	X	13.06	86.13	24.73	13.80	25.0	± 9.6 %
		Y	11.09	82.14	24.36		25.0	
		Z	16.17	90.99	26.57		25.0	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	16.50	91.24	25.09	10.79	40.0	± 9.6 %
		Y	12.58	86.37	24.53		40.0	
		Z	22.30	97.25	27.17		40.0	
10056-CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	X	15.28	90.62	25.52	9.03	50.0	± 9.6 %
		Y	11.72	85.08	24.19		50.0	
		Z	17.40	93.38	26.42		50.0	
10058-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	10.69	91.04	29.62	6.55	100.0	± 9.6 %
		Y	9.07	85.67	27.37		100.0	
		Z	9.88	90.10	29.57		100.0	
10059-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	X	1.68	70.66	19.16	0.61	110.0	± 9.6 %
		Y	1.55	67.69	17.16		110.0	
		Z	1.56	68.66	17.81		110.0	
10060-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	100.00	135.64	35.63	1.30	110.0	± 9.6 %
		Y	100.00	131.50	34.05		110.0	
		Z	100.00	134.30	35.03		110.0	

10061-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	54.02	125.97	35.38	2.04	110.0	± 9.6 %
		Y	8.96	93.29	26.14		110.0	
		Z	19.56	108.50	30.84		110.0	
10062-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	X	4.87	67.49	17.06	0.49	100.0	± 9.6 %
		Y	4.91	67.10	16.78		100.0	
		Z	4.75	67.38	16.89		100.0	
10063-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	X	4.91	67.64	17.19	0.72	100.0	± 9.6 %
		Y	4.96	67.27	16.93		100.0	
		Z	4.80	67.55	17.03		100.0	
10064-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	X	5.22	67.92	17.42	0.86	100.0	± 9.6 %
		Y	5.29	67.61	17.19		100.0	
		Z	5.08	67.80	17.26		100.0	
10065-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	X	5.13	67.94	17.58	1.21	100.0	± 9.6 %
		Y	5.21	67.67	17.37		100.0	
		Z	5.00	67.84	17.45		100.0	
10066-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	X	5.18	68.06	17.79	1.46	100.0	± 9.6 %
		Y	5.27	67.81	17.60		100.0	
		Z	5.05	67.98	17.68		100.0	
10067-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	X	5.49	68.19	18.21	2.04	100.0	± 9.6 %
		Y	5.60	67.98	18.05		100.0	
		Z	5.39	68.30	18.20		100.0	
10068-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	X	5.62	68.50	18.55	2.55	100.0	± 9.6 %
		Y	5.76	68.37	18.43		100.0	
		Z	5.50	68.48	18.50		100.0	
10069-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	X	5.69	68.44	18.72	2.67	100.0	± 9.6 %
		Y	5.84	68.31	18.60		100.0	
		Z	5.58	68.54	18.73		100.0	
10071-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	5.27	67.84	18.05	1.99	100.0	± 9.6 %
		Y	5.37	67.63	17.89		100.0	
		Z	5.20	67.92	18.02		100.0	
10072-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	5.34	68.42	18.38	2.30	100.0	± 9.6 %
		Y	5.45	68.23	18.22		100.0	
		Z	5.25	68.45	18.35		100.0	
10073-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	5.47	68.76	18.79	2.83	100.0	± 9.6 %
		Y	5.61	68.62	18.66		100.0	
		Z	5.40	68.87	18.81		100.0	
10074-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	5.51	68.83	19.02	3.30	100.0	± 9.6 %
		Y	5.66	68.73	18.92		100.0	
		Z	5.46	68.99	19.07		100.0	
10075-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	5.65	69.27	19.49	3.82	90.0	± 9.6 %
		Y	5.85	69.26	19.43		90.0	
		Z	5.60	69.37	19.53		90.0	
10076-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	5.67	69.08	19.61	4.15	90.0	± 9.6 %
		Y	5.87	69.08	19.56		90.0	
		Z	5.65	69.30	19.73		90.0	
10077-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	5.72	69.19	19.72	4.30	90.0	± 9.6 %
		Y	5.92	69.19	19.67		90.0	
		Z	5.70	69.44	19.85		90.0	

10081-CAB	CDMA2000 (1xRTT, RC3)	X	2.28	81.48	20.27	0.00	150.0	± 9.6 %
		Y	1.00	67.64	14.10		150.0	
		Z	1.04	69.66	14.21		150.0	
10082-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	X	2.13	64.08	8.83	4.77	80.0	± 9.6 %
		Y	2.57	65.34	10.16		80.0	
		Z	2.13	64.35	9.02		80.0	
10090-DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	X	100.00	118.32	30.42	6.56	60.0	± 9.6 %
		Y	75.01	116.70	31.30		60.0	
		Z	100.00	119.58	30.97		60.0	
10097-CAB	UMTS-FDD (HSDPA)	X	2.20	71.50	18.09	0.00	150.0	± 9.6 %
		Y	1.90	67.97	16.04		150.0	
		Z	1.97	69.50	16.62		150.0	
10098-CAB	UMTS-FDD (HSUPA, Subtest 2)	X	2.16	71.55	18.11	0.00	150.0	± 9.6 %
		Y	1.86	67.93	16.01		150.0	
		Z	1.93	69.49	16.61		150.0	
10099-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	X	22.24	106.54	36.64	9.56	60.0	± 9.6 %
		Y	15.16	95.02	32.46		60.0	
		Z	23.72	109.80	38.22		60.0	
10100-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	3.77	73.97	18.60	0.00	150.0	± 9.6 %
		Y	3.32	71.02	16.99		150.0	
		Z	3.27	71.57	17.41		150.0	
10101-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	3.50	69.24	17.00	0.00	150.0	± 9.6 %
		Y	3.39	67.99	16.16		150.0	
		Z	3.29	68.22	16.35		150.0	
10102-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	3.59	69.07	17.02	0.00	150.0	± 9.6 %
		Y	3.49	67.92	16.24		150.0	
		Z	3.39	68.14	16.41		150.0	
10103-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	9.27	79.88	21.95	3.98	65.0	± 9.6 %
		Y	8.43	77.27	20.93		65.0	
		Z	9.22	80.33	22.26		65.0	
10104-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	8.81	77.80	21.97	3.98	65.0	± 9.6 %
		Y	8.62	76.41	21.37		65.0	
		Z	8.59	77.82	22.06		65.0	
10105-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	8.19	76.36	21.65	3.98	65.0	± 9.6 %
		Y	7.71	74.18	20.67		65.0	
		Z	7.86	76.00	21.56		65.0	
10108-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	3.29	73.14	18.47	0.00	150.0	± 9.6 %
		Y	2.93	70.22	16.82		150.0	
		Z	2.85	70.87	17.28		150.0	
10109-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	3.18	69.27	17.05	0.00	150.0	± 9.6 %
		Y	3.05	67.82	16.11		150.0	
		Z	2.94	68.18	16.29		150.0	
10110-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	2.72	72.52	18.35	0.00	150.0	± 9.6 %
		Y	2.40	69.28	16.49		150.0	
		Z	2.33	70.22	16.99		150.0	
10111-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	2.96	70.65	17.72	0.00	150.0	± 9.6 %
		Y	2.76	68.51	16.45		150.0	
		Z	2.69	69.33	16.67		150.0	

10112-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	3.29	69.10	17.02	0.00	150.0	± 9.6 %
		Y	3.17	67.76	16.14		150.0	
		Z	3.06	68.15	16.32		150.0	
10113-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	3.11	70.58	17.73	0.00	150.0	± 9.6 %
		Y	2.92	68.59	16.56		150.0	
		Z	2.83	69.41	16.76		150.0	
10114-CAB	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	5.26	67.86	16.86	0.00	150.0	± 9.6 %
		Y	5.25	67.40	16.53		150.0	
		Z	5.14	67.65	16.68		150.0	
10115-CAB	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	5.60	68.11	16.98	0.00	150.0	± 9.6 %
		Y	5.62	67.73	16.70		150.0	
		Z	5.40	67.70	16.71		150.0	
10116-CAB	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	5.38	68.12	16.91	0.00	150.0	± 9.6 %
		Y	5.38	67.68	16.59		150.0	
		Z	5.23	67.82	16.70		150.0	
10117-CAB	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	5.24	67.79	16.84	0.00	150.0	± 9.6 %
		Y	5.25	67.40	16.55		150.0	
		Z	5.10	67.49	16.62		150.0	
10118-CAB	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	5.68	68.30	17.08	0.00	150.0	± 9.6 %
		Y	5.70	67.92	16.80		150.0	
		Z	5.48	67.91	16.83		150.0	
10119-CAB	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	5.35	68.04	16.89	0.00	150.0	± 9.6 %
		Y	5.35	67.63	16.58		150.0	
		Z	5.21	67.79	16.69		150.0	
10140-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	3.63	69.06	16.93	0.00	150.0	± 9.6 %
		Y	3.53	67.92	16.17		150.0	
		Z	3.42	68.16	16.33		150.0	
10141-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	3.75	69.06	17.04	0.00	150.0	± 9.6 %
		Y	3.65	67.98	16.31		150.0	
		Z	3.54	68.23	16.48		150.0	
10142-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	2.58	73.34	18.51	0.00	150.0	± 9.6 %
		Y	2.18	69.29	16.31		150.0	
		Z	2.13	70.56	16.73		150.0	
10143-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	3.01	72.46	18.03	0.00	150.0	± 9.6 %
		Y	2.65	69.32	16.38		150.0	
		Z	2.60	70.44	16.44		150.0	
10144-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	2.64	69.45	16.13	0.00	150.0	± 9.6 %
		Y	2.44	67.23	14.90		150.0	
		Z	2.30	67.73	14.62		150.0	
10145-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	2.19	73.84	16.83	0.00	150.0	± 9.6 %
		Y	1.54	67.56	13.92		150.0	
		Z	1.24	66.10	11.96		150.0	
10146-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	6.00	80.94	18.56	0.00	150.0	± 9.6 %
		Y	2.97	71.15	15.11		150.0	
		Z	2.39	68.87	12.55		150.0	
10147-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	13.14	91.59	22.17	0.00	150.0	± 9.6 %
		Y	3.76	74.52	16.70		150.0	
		Z	3.21	72.37	14.16		150.0	

10149-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	3.19	69.34	17.10	0.00	150.0	± 9.6 %
		Y	3.06	67.89	16.15		150.0	
		Z	2.95	68.25	16.34		150.0	
10150-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	3.29	69.16	17.06	0.00	150.0	± 9.6 %
		Y	3.18	67.81	16.18		150.0	
		Z	3.07	68.20	16.36		150.0	
10151-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	10.08	82.65	23.10	3.98	65.0	± 9.6 %
		Y	9.04	79.65	21.96		65.0	
		Z	10.06	83.26	23.42		65.0	
10152-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	8.50	78.17	21.88	3.98	65.0	± 9.6 %
		Y	8.23	76.54	21.20		65.0	
		Z	8.27	78.18	21.88		65.0	
10153-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	8.91	78.99	22.55	3.98	65.0	± 9.6 %
		Y	8.60	77.29	21.85		65.0	
		Z	8.71	79.10	22.58		65.0	
10154-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	2.81	73.15	18.70	0.00	150.0	± 9.6 %
		Y	2.46	69.77	16.80		150.0	
		Z	2.38	70.62	17.23		150.0	
10155-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	2.96	70.66	17.73	0.00	150.0	± 9.6 %
		Y	2.76	68.51	16.46		150.0	
		Z	2.69	69.35	16.69		150.0	
10156-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	2.55	74.52	18.86	0.00	150.0	± 9.6 %
		Y	2.05	69.58	16.30		150.0	
		Z	2.00	70.89	16.58		150.0	
10157-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	2.62	71.06	16.72	0.00	150.0	± 9.6 %
		Y	2.30	67.95	15.09		150.0	
		Z	2.17	68.55	14.74		150.0	
10158-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	3.11	70.65	17.78	0.00	150.0	± 9.6 %
		Y	2.92	68.65	16.60		150.0	
		Z	2.84	69.48	16.81		150.0	
10159-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	2.77	71.67	17.06	0.00	150.0	± 9.6 %
		Y	2.42	68.44	15.40		150.0	
		Z	2.27	68.98	14.99		150.0	
10160-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	3.14	71.31	17.89	0.00	150.0	± 9.6 %
		Y	2.90	69.12	16.57		150.0	
		Z	2.85	69.90	17.00		150.0	
10161-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	3.19	69.15	17.05	0.00	150.0	± 9.6 %
		Y	3.08	67.73	16.13		150.0	
		Z	2.97	68.19	16.30		150.0	
10162-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	3.30	69.19	17.10	0.00	150.0	± 9.6 %
		Y	3.18	67.80	16.21		150.0	
		Z	3.08	68.34	16.41		150.0	
10166-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	4.14	72.27	20.63	3.01	150.0	± 9.6 %
		Y	3.92	70.06	19.35		150.0	
		Z	3.85	71.64	20.32		150.0	
10167-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	5.70	76.91	21.68	3.01	150.0	± 9.6 %
		Y	4.94	72.92	19.80		150.0	
		Z	5.14	76.11	21.32		150.0	

10168-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	6.50	79.76	23.17	3.01	150.0	± 9.6 %
		Y	5.42	74.94	21.01		150.0	
		Z	5.85	78.93	22.82		150.0	
10169-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	3.88	74.16	21.49	3.01	150.0	± 9.6 %
		Y	3.53	70.80	19.64		150.0	
		Z	3.37	71.79	20.43		150.0	
10170-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	7.14	85.17	25.38	3.01	150.0	± 9.6 %
		Y	5.02	76.66	21.81		150.0	
		Z	5.41	80.65	23.72		150.0	
10171-AAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	5.21	78.32	21.78	3.01	150.0	± 9.6 %
		Y	4.13	72.50	19.15		150.0	
		Z	4.25	75.40	20.64		150.0	
10172-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	82.16	130.26	39.09	6.02	65.0	± 9.6 %
		Y	17.62	97.94	29.93		65.0	
		Z	65.78	128.99	39.45		65.0	
10173-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	91.21	124.95	35.70	6.02	65.0	± 9.6 %
		Y	19.75	96.35	28.03		65.0	
		Z	100.00	129.35	37.29		65.0	
10174-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	55.61	114.43	32.46	6.02	65.0	± 9.6 %
		Y	16.76	92.45	26.36		65.0	
		Z	70.56	121.14	34.65		65.0	
10175-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	3.81	73.71	21.19	3.01	150.0	± 9.6 %
		Y	3.48	70.45	19.37		150.0	
		Z	3.32	71.46	20.19		150.0	
10176-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	7.15	85.21	25.39	3.01	150.0	± 9.6 %
		Y	5.03	76.68	21.82		150.0	
		Z	5.42	80.68	23.74		150.0	
10177-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	3.85	73.93	21.31	3.01	150.0	± 9.6 %
		Y	3.51	70.63	19.48		150.0	
		Z	3.35	71.61	20.27		150.0	
10178-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	7.01	84.77	25.21	3.01	150.0	± 9.6 %
		Y	4.96	76.40	21.67		150.0	
		Z	5.36	80.45	23.62		150.0	
10179-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	6.07	81.52	23.41	3.01	150.0	± 9.6 %
		Y	4.53	74.41	20.33		150.0	
		Z	4.79	77.92	22.06		150.0	
10180-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	5.18	78.18	21.70	3.01	150.0	± 9.6 %
		Y	4.12	72.40	19.09		150.0	
		Z	4.24	75.33	20.60		150.0	
10181-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	3.84	73.91	21.30	3.01	150.0	± 9.6 %
		Y	3.51	70.61	19.47		150.0	
		Z	3.35	71.60	20.27		150.0	
10182-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	6.99	84.74	25.19	3.01	150.0	± 9.6 %
		Y	4.95	76.38	21.66		150.0	
		Z	5.35	80.42	23.61		150.0	
10183-AAC	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	5.17	78.15	21.69	3.01	150.0	± 9.6 %
		Y	4.11	72.38	19.08		150.0	
		Z	4.23	75.30	20.59		150.0	

10184-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	3.86	73.96	21.33	3.01	150.0	± 9.6 %
		Y	3.52	70.65	19.50		150.0	
		Z	3.36	71.64	20.29		150.0	
10185-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	7.04	84.85	25.24	3.01	150.0	± 9.6 %
		Y	4.98	76.45	21.70		150.0	
		Z	5.38	80.50	23.65		150.0	
10186-AAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	5.20	78.24	21.73	3.01	150.0	± 9.6 %
		Y	4.13	72.45	19.11		150.0	
		Z	4.25	75.38	20.62		150.0	
10187-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	3.87	74.02	21.39	3.01	150.0	± 9.6 %
		Y	3.53	70.69	19.55		150.0	
		Z	3.37	71.71	20.36		150.0	
10188-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	7.44	86.01	25.76	3.01	150.0	± 9.6 %
		Y	5.15	77.16	22.09		150.0	
		Z	5.58	81.30	24.05		150.0	
10189-AAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	5.39	78.94	22.10	3.01	150.0	± 9.6 %
		Y	4.22	72.89	19.39		150.0	
		Z	4.36	75.91	20.93		150.0	
10193-CAB	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	X	4.67	67.32	16.65	0.00	150.0	± 9.6 %
		Y	4.67	66.82	16.30		150.0	
		Z	4.53	67.11	16.38		150.0	
10194-CAB	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	X	4.85	67.66	16.76	0.00	150.0	± 9.6 %
		Y	4.86	67.18	16.41		150.0	
		Z	4.69	67.40	16.51		150.0	
10195-CAB	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	X	4.89	67.68	16.77	0.00	150.0	± 9.6 %
		Y	4.90	67.20	16.42		150.0	
		Z	4.73	67.43	16.52		150.0	
10196-CAB	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	4.68	67.41	16.68	0.00	150.0	± 9.6 %
		Y	4.68	66.91	16.33		150.0	
		Z	4.52	67.15	16.39		150.0	
10197-CAB	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	X	4.87	67.69	16.78	0.00	150.0	± 9.6 %
		Y	4.88	67.20	16.42		150.0	
		Z	4.70	67.42	16.52		150.0	
10198-CAB	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	X	4.90	67.70	16.79	0.00	150.0	± 9.6 %
		Y	4.91	67.21	16.43		150.0	
		Z	4.73	67.45	16.54		150.0	
10219-CAB	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	X	4.63	67.43	16.65	0.00	150.0	± 9.6 %
		Y	4.63	66.93	16.29		150.0	
		Z	4.47	67.18	16.36		150.0	
10220-CAB	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	X	4.86	67.66	16.77	0.00	150.0	± 9.6 %
		Y	4.88	67.19	16.42		150.0	
		Z	4.69	67.38	16.50		150.0	
10221-CAB	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	X	4.90	67.62	16.76	0.00	150.0	± 9.6 %
		Y	4.91	67.14	16.42		150.0	
		Z	4.74	67.37	16.52		150.0	
10222-CAB	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	X	5.22	67.81	16.85	0.00	150.0	± 9.6 %
		Y	5.23	67.42	16.55		150.0	
		Z	5.08	67.50	16.62		150.0	

10223-CAB	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	X	5.53	67.97	16.94	0.00	150.0	± 9.6 %
		Y	5.59	67.74	16.73		150.0	
		Z	5.38	67.75	16.76		150.0	
10224-CAB	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	X	5.26	67.91	16.83	0.00	150.0	± 9.6 %
		Y	5.27	67.51	16.52		150.0	
		Z	5.12	67.61	16.60		150.0	
10225-CAB	UMTS-FDD (HSPA+)	X	3.00	67.51	16.39	0.00	150.0	± 9.6 %
		Y	2.93	66.39	15.65		150.0	
		Z	2.82	66.88	15.63		150.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	100.00	126.81	36.25	6.02	65.0	± 9.6 %
		Y	20.60	97.21	28.37		65.0	
		Z	100.00	129.54	37.41		65.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	65.64	117.49	33.34	6.02	65.0	± 9.6 %
		Y	18.22	94.00	26.93		65.0	
		Z	85.61	124.65	35.59		65.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	79.85	130.36	39.26	6.02	65.0	± 9.6 %
		Y	20.21	101.07	31.01		65.0	
		Z	65.84	129.47	39.67		65.0	
10229-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	91.11	124.93	35.70	6.02	65.0	± 9.6 %
		Y	19.80	96.38	28.04		65.0	
		Z	100.00	129.35	37.29		65.0	
10230-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	60.15	115.83	32.84	6.02	65.0	± 9.6 %
		Y	17.60	93.31	26.65		65.0	
		Z	77.12	122.67	35.03		65.0	
10231-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	72.28	128.22	38.64	6.02	65.0	± 9.6 %
		Y	19.39	100.17	30.67		65.0	
		Z	59.87	127.39	39.07		65.0	
10232-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	91.25	124.96	35.71	6.02	65.0	± 9.6 %
		Y	19.78	96.37	28.04		65.0	
		Z	100.00	129.36	37.30		65.0	
10233-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	60.26	115.87	32.85	6.02	65.0	± 9.6 %
		Y	17.59	93.32	26.66		65.0	
		Z	77.19	122.70	35.04		65.0	
10234-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	65.41	125.97	37.96	6.02	65.0	± 9.6 %
		Y	18.62	99.23	30.29		65.0	
		Z	54.84	125.34	38.42		65.0	
10235-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	91.93	125.11	35.75	6.02	65.0	± 9.6 %
		Y	19.81	96.41	28.05		65.0	
		Z	100.00	129.37	37.30		65.0	
10236-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	61.00	116.05	32.90	6.02	65.0	± 9.6 %
		Y	17.69	93.40	26.68		65.0	
		Z	78.43	122.94	35.10		65.0	
10237-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	73.61	128.60	38.74	6.02	65.0	± 9.6 %
		Y	19.49	100.29	30.70		65.0	
		Z	60.90	127.76	39.16		65.0	
10238-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	91.47	125.02	35.72	6.02	65.0	± 9.6 %
		Y	19.78	96.38	28.04		65.0	
		Z	100.00	129.37	37.30		65.0	

10239-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	60.36	115.92	32.87	6.02	65.0	± 9.6 %
		Y	17.58	93.32	26.66		65.0	
		Z	77.24	122.72	35.05		65.0	
10240-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	73.31	128.53	38.72	6.02	65.0	± 9.6 %
		Y	19.44	100.25	30.69		65.0	
		Z	60.69	127.70	39.15		65.0	
10241-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	14.22	90.30	28.70	6.98	65.0	± 9.6 %
		Y	11.91	84.78	26.56		65.0	
		Z	15.04	92.96	29.82		65.0	
10242-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	12.20	86.96	27.37	6.98	65.0	± 9.6 %
		Y	11.04	83.09	25.82		65.0	
		Z	14.66	92.40	29.55		65.0	
10243-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	9.46	83.32	26.91	6.98	65.0	± 9.6 %
		Y	9.15	80.79	25.71		65.0	
		Z	10.96	87.97	28.96		65.0	
10244-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	10.76	82.68	21.60	3.98	65.0	± 9.6 %
		Y	9.17	79.37	20.74		65.0	
		Z	9.65	80.90	20.36		65.0	
10245-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	10.44	81.95	21.29	3.98	65.0	± 9.6 %
		Y	9.07	78.96	20.54		65.0	
		Z	9.24	79.99	19.97		65.0	
10246-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	11.35	86.57	23.09	3.98	65.0	± 9.6 %
		Y	8.94	81.85	21.69		65.0	
		Z	10.01	84.49	21.88		65.0	
10247-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	8.24	79.27	21.01	3.98	65.0	± 9.6 %
		Y	7.74	77.28	20.43		65.0	
		Z	7.64	78.13	20.10		65.0	
10248-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	8.11	78.56	20.72	3.98	65.0	± 9.6 %
		Y	7.73	76.82	20.23		65.0	
		Z	7.48	77.39	19.79		65.0	
10249-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	12.62	88.79	24.56	3.98	65.0	± 9.6 %
		Y	9.64	83.20	22.76		65.0	
		Z	12.16	88.40	24.15		65.0	
10250-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	9.13	81.24	23.10	3.98	65.0	± 9.6 %
		Y	8.50	78.84	22.20		65.0	
		Z	8.86	81.11	22.89		65.0	
10251-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	8.47	78.74	21.83	3.98	65.0	± 9.6 %
		Y	8.10	76.89	21.13		65.0	
		Z	8.20	78.63	21.61		65.0	
10252-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	11.59	86.92	24.65	3.98	65.0	± 9.6 %
		Y	9.53	82.29	23.01		65.0	
		Z	11.63	87.60	24.87		65.0	
10253-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	8.27	77.55	21.65	3.98	65.0	± 9.6 %
		Y	8.04	76.02	21.02		65.0	
		Z	8.09	77.65	21.62		65.0	
10254-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	8.67	78.35	22.26	3.98	65.0	± 9.6 %
		Y	8.41	76.75	21.61		65.0	
		Z	8.50	78.49	22.25		65.0	

10255-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	9.69	82.20	23.16	3.98	65.0	± 9.6 %
		Y	8.77	79.29	22.03		65.0	
		Z	9.70	82.84	23.45		65.0	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	9.10	79.45	19.54	3.98	65.0	± 9.6 %
		Y	8.28	77.46	19.27		65.0	
		Z	7.50	76.38	17.64		65.0	
10257-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	8.71	78.44	19.07	3.98	65.0	± 9.6 %
		Y	8.14	76.86	18.96		65.0	
		Z	7.10	75.27	17.09		65.0	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	9.16	82.49	20.98	3.98	65.0	± 9.6 %
		Y	7.92	79.54	20.28		65.0	
		Z	7.29	78.75	18.94		65.0	
10259-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	8.59	79.95	21.73	3.98	65.0	± 9.6 %
		Y	8.03	77.80	21.03		65.0	
		Z	8.13	79.27	21.11		65.0	
10260-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	8.53	79.55	21.59	3.98	65.0	± 9.6 %
		Y	8.06	77.57	20.96		65.0	
		Z	8.06	78.82	20.93		65.0	
10261-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	11.51	87.11	24.32	3.98	65.0	± 9.6 %
		Y	9.26	82.24	22.68		65.0	
		Z	11.28	87.12	24.13		65.0	
10262-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	9.12	81.19	23.06	3.98	65.0	± 9.6 %
		Y	8.49	78.79	22.16		65.0	
		Z	8.84	81.05	22.85		65.0	
10263-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	8.46	78.73	21.82	3.98	65.0	± 9.6 %
		Y	8.09	76.88	21.13		65.0	
		Z	8.19	78.61	21.60		65.0	
10264-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	11.49	86.74	24.57	3.98	65.0	± 9.6 %
		Y	9.47	82.16	22.94		65.0	
		Z	11.51	87.39	24.78		65.0	
10265-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	8.50	78.18	21.88	3.98	65.0	± 9.6 %
		Y	8.22	76.54	21.21		65.0	
		Z	8.27	78.18	21.88		65.0	
10266-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	8.90	78.98	22.54	3.98	65.0	± 9.6 %
		Y	8.60	77.28	21.84		65.0	
		Z	8.71	79.09	22.57		65.0	
10267-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	10.06	82.61	23.09	3.98	65.0	± 9.6 %
		Y	9.03	79.62	21.95		65.0	
		Z	10.04	83.22	23.41		65.0	
10268-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	8.87	77.45	21.95	3.98	65.0	± 9.6 %
		Y	8.72	76.18	21.40		65.0	
		Z	8.67	77.54	22.05		65.0	
10269-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	8.77	76.99	21.83	3.98	65.0	± 9.6 %
		Y	8.66	75.80	21.31		65.0	
		Z	8.60	77.10	21.92		65.0	
10270-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	9.16	79.20	21.93	3.98	65.0	± 9.6 %
		Y	8.71	77.35	21.19		65.0	
		Z	9.06	79.57	22.19		65.0	

10274-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	X	2.80	68.17	16.47	0.00	150.0	± 9.6 %
		Y	2.67	66.63	15.50		150.0	
		Z	2.65	67.51	15.70		150.0	
10275-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	X	2.12	73.27	18.65	0.00	150.0	± 9.6 %
		Y	1.72	68.53	16.00		150.0	
		Z	1.76	70.05	16.72		150.0	
10277-CAA	PHS (QPSK)	X	5.32	68.96	13.42	9.03	50.0	± 9.6 %
		Y	6.41	71.20	15.49		50.0	
		Z	5.12	68.74	13.08		50.0	
10278-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	9.11	79.62	20.31	9.03	50.0	± 9.6 %
		Y	9.22	79.31	21.03		50.0	
		Z	8.20	77.78	19.21		50.0	
10279-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	X	9.25	79.80	20.39	9.03	50.0	± 9.6 %
		Y	9.36	79.46	21.09		50.0	
		Z	8.30	77.91	19.28		50.0	
10290-AAB	CDMA2000, RC1, SO55, Full Rate	X	3.59	82.57	20.48	0.00	150.0	± 9.6 %
		Y	1.73	70.44	15.45		150.0	
		Z	1.75	72.09	15.26		150.0	
10291-AAB	CDMA2000, RC3, SO55, Full Rate	X	2.13	80.55	19.92	0.00	150.0	± 9.6 %
		Y	0.98	67.37	13.95		150.0	
		Z	1.01	69.27	14.02		150.0	
10292-AAB	CDMA2000, RC3, SO32, Full Rate	X	12.02	108.71	29.17	0.00	150.0	± 9.6 %
		Y	1.26	72.03	16.54		150.0	
		Z	1.93	79.12	18.49		150.0	
10293-AAB	CDMA2000, RC3, SO3, Full Rate	X	100.00	144.61	38.38	0.00	150.0	± 9.6 %
		Y	1.90	78.46	19.68		150.0	
		Z	6.64	97.19	24.86		150.0	
10295-AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	X	11.58	85.59	24.60	9.03	50.0	± 9.6 %
		Y	10.44	82.50	23.85		50.0	
		Z	13.98	88.93	25.45		50.0	
10297-AAC	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	3.31	73.28	18.55	0.00	150.0	± 9.6 %
		Y	2.94	70.32	16.89		150.0	
		Z	2.86	70.97	17.35		150.0	
10298-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	2.53	75.50	18.42	0.00	150.0	± 9.6 %
		Y	1.83	69.14	15.39		150.0	
		Z	1.69	69.62	14.84		150.0	
10299-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	6.61	82.78	20.21	0.00	150.0	± 9.6 %
		Y	3.43	72.67	16.51		150.0	
		Z	3.82	74.80	16.21		150.0	
10300-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	3.24	71.51	15.06	0.00	150.0	± 9.6 %
		Y	2.57	67.68	13.54		150.0	
		Z	2.21	66.93	12.03		150.0	
10301-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	X	5.62	68.28	18.87	4.17	80.0	± 9.6 %
		Y	5.93	68.63	18.94		80.0	
		Z	5.89	69.91	19.47		80.0	
10302-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)	X	6.17	69.25	19.82	4.96	80.0	± 9.6 %
		Y	6.38	69.08	19.58		80.0	
		Z	6.23	69.95	19.93		80.0	

10303-AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	6.02	69.32	19.87	4.96	80.0	± 9.6 %
		Y	6.26	69.22	19.66		80.0	
		Z	6.09	70.04	19.96		80.0	
10304-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	X	5.67	68.65	19.09	4.17	80.0	± 9.6 %
		Y	5.85	68.42	18.82		80.0	
		Z	5.71	69.28	19.12		80.0	
10305-AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	9.13	83.00	26.75	6.02	50.0	± 9.6 %
		Y	11.08	85.83	27.58		50.0	
		Z	11.97	88.64	28.23		50.0	
10306-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	6.47	72.26	21.90	6.02	50.0	± 9.6 %
		Y	6.84	72.27	21.68		50.0	
		Z	6.81	73.77	22.17		50.0	
10307-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	6.58	73.04	22.08	6.02	50.0	± 9.6 %
		Y	8.34	78.37	24.64		50.0	
		Z	6.92	74.46	22.29		50.0	
10308-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	6.66	73.56	22.34	6.02	50.0	± 9.6 %
		Y	8.60	79.30	25.04		50.0	
		Z	7.08	75.16	22.62		50.0	
10309-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	6.58	72.60	22.09	6.02	50.0	± 9.6 %
		Y	6.95	72.58	21.85		50.0	
		Z	6.90	74.05	22.35		50.0	
10310-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	6.50	72.56	21.95	6.02	50.0	± 9.6 %
		Y	6.87	72.52	21.70		50.0	
		Z	6.86	74.10	22.23		50.0	
10311-AAC	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	3.70	72.28	18.01	0.00	150.0	± 9.6 %
		Y	3.30	69.61	16.53		150.0	
		Z	3.23	70.11	16.90		150.0	
10313-AAA	iDEN 1:3	X	9.18	81.61	19.86	6.99	70.0	± 9.6 %
		Y	7.64	78.40	19.13		70.0	
		Z	9.78	83.14	20.58		70.0	
10314-AAA	iDEN 1:6	X	13.83	90.60	25.32	10.00	30.0	± 9.6 %
		Y	9.35	83.01	23.15		30.0	
		Z	14.01	91.81	25.99		30.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	1.27	67.24	17.67	0.17	150.0	± 9.6 %
		Y	1.20	64.93	15.83		150.0	
		Z	1.21	65.68	16.36		150.0	
10316-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	X	4.76	67.47	16.83	0.17	150.0	± 9.6 %
		Y	4.78	67.03	16.51		150.0	
		Z	4.63	67.31	16.62		150.0	
10317-AAB	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	X	4.76	67.47	16.83	0.17	150.0	± 9.6 %
		Y	4.78	67.03	16.51		150.0	
		Z	4.63	67.31	16.62		150.0	
10400-AAC	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	4.86	67.74	16.77	0.00	150.0	± 9.6 %
		Y	4.87	67.24	16.40		150.0	
		Z	4.68	67.47	16.52		150.0	
10401-AAC	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	5.51	67.76	16.81	0.00	150.0	± 9.6 %
		Y	5.52	67.36	16.52		150.0	
		Z	5.41	67.67	16.70		150.0	

10402-AAC	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	X	5.79	68.18	16.86	0.00	150.0	± 9.6 %
		Y	5.81	67.85	16.61		150.0	
		Z	5.64	67.83	16.63		150.0	
10403-AAB	CDMA2000 (1xEV-DO, Rev. 0)	X	3.59	82.57	20.48	0.00	115.0	± 9.6 %
		Y	1.73	70.44	15.45		115.0	
		Z	1.75	72.09	15.26		115.0	
10404-AAB	CDMA2000 (1xEV-DO, Rev. A)	X	3.59	82.57	20.48	0.00	115.0	± 9.6 %
		Y	1.73	70.44	15.45		115.0	
		Z	1.75	72.09	15.26		115.0	
10406-AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	X	100.00	122.57	31.18	0.00	100.0	± 9.6 %
		Y	18.35	99.60	26.20		100.0	
		Z	100.00	120.33	29.78		100.0	
10410-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	120.29	30.51	3.23	80.0	± 9.6 %
		Y	100.00	120.68	31.13		80.0	
		Z	100.00	122.62	31.38		80.0	
10415-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	1.09	65.33	16.67	0.00	150.0	± 9.6 %
		Y	1.03	63.31	14.91		150.0	
		Z	1.05	64.05	15.43		150.0	
10416-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	X	4.67	67.36	16.71	0.00	150.0	± 9.6 %
		Y	4.67	66.86	16.34		150.0	
		Z	4.53	67.14	16.45		150.0	
10417-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	X	4.67	67.36	16.71	0.00	150.0	± 9.6 %
		Y	4.67	66.86	16.34		150.0	
		Z	4.53	67.14	16.45		150.0	
10418-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	X	4.66	67.53	16.73	0.00	150.0	± 9.6 %
		Y	4.66	67.00	16.35		150.0	
		Z	4.52	67.33	16.49		150.0	
10419-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	X	4.68	67.47	16.73	0.00	150.0	± 9.6 %
		Y	4.68	66.95	16.36		150.0	
		Z	4.54	67.26	16.48		150.0	
10422-AAA	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	X	4.80	67.45	16.73	0.00	150.0	± 9.6 %
		Y	4.81	66.96	16.37		150.0	
		Z	4.65	67.24	16.49		150.0	
10423-AAA	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	X	4.99	67.80	16.85	0.00	150.0	± 9.6 %
		Y	5.00	67.33	16.51		150.0	
		Z	4.80	67.54	16.59		150.0	
10424-AAA	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	X	4.90	67.76	16.83	0.00	150.0	± 9.6 %
		Y	4.91	67.27	16.47		150.0	
		Z	4.73	67.50	16.57		150.0	
10425-AAA	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	X	5.49	68.02	16.94	0.00	150.0	± 9.6 %
		Y	5.50	67.62	16.64		150.0	
		Z	5.34	67.73	16.73		150.0	
10426-AAA	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	X	5.49	68.02	16.94	0.00	150.0	± 9.6 %
		Y	5.51	67.65	16.65		150.0	
		Z	5.36	67.83	16.78		150.0	

10427-AAA	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.50	68.00	16.93	0.00	150.0	± 9.6 %
		Y	5.52	67.64	16.64		150.0	
		Z	5.36	67.74	16.73		150.0	
10430-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.54	72.09	19.09	0.00	150.0	± 9.6 %
		Y	4.40	70.73	18.36		150.0	
		Z	4.26	71.56	18.37		150.0	
10431-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	4.40	68.10	16.85	0.00	150.0	± 9.6 %
		Y	4.40	67.42	16.40		150.0	
		Z	4.19	67.79	16.46		150.0	
10432-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.68	67.87	16.83	0.00	150.0	± 9.6 %
		Y	4.69	67.31	16.44		150.0	
		Z	4.50	67.59	16.53		150.0	
10433-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.92	67.80	16.85	0.00	150.0	± 9.6 %
		Y	4.93	67.31	16.50		150.0	
		Z	4.74	67.53	16.59		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.73	73.25	19.23	0.00	150.0	± 9.6 %
		Y	4.51	71.54	18.38		150.0	
		Z	4.38	72.53	18.34		150.0	
10435-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	120.11	30.42	3.23	80.0	± 9.6 %
		Y	100.00	120.53	31.07		80.0	
		Z	100.00	122.42	31.29		80.0	
10447-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.76	68.51	16.50	0.00	150.0	± 9.6 %
		Y	3.71	67.48	15.90		150.0	
		Z	3.49	67.91	15.73		150.0	
10448-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	X	4.23	67.89	16.73	0.00	150.0	± 9.6 %
		Y	4.22	67.19	16.26		150.0	
		Z	4.04	67.58	16.33		150.0	
10449-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	X	4.49	67.72	16.75	0.00	150.0	± 9.6 %
		Y	4.48	67.13	16.34		150.0	
		Z	4.32	67.42	16.43		150.0	
10450-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.67	67.59	16.73	0.00	150.0	± 9.6 %
		Y	4.66	67.07	16.35		150.0	
		Z	4.52	67.31	16.45		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	3.71	68.96	16.29	0.00	150.0	± 9.6 %
		Y	3.63	67.76	15.64		150.0	
		Z	3.37	68.05	15.28		150.0	
10456-AAA	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.34	68.51	17.03	0.00	150.0	± 9.6 %
		Y	6.36	68.23	16.81		150.0	
		Z	6.24	68.31	16.89		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.87	65.97	16.44	0.00	150.0	± 9.6 %
		Y	3.87	65.48	16.06		150.0	
		Z	3.81	65.79	16.17		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	4.35	72.54	18.72	0.00	150.0	± 9.6 %
		Y	4.10	70.59	17.78		150.0	
		Z	4.02	71.83	17.67		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	5.25	68.89	18.60	0.00	150.0	± 9.6 %
		Y	5.22	68.08	18.20		150.0	
		Z	4.96	68.66	18.04		150.0	

10460-AAA	UMTS-FDD (WCDMA, AMR)	X	1.62	80.44	22.68	0.00	150.0	± 9.6 %
		Y	0.96	69.05	16.73		150.0	
		Z	1.09	72.04	18.32		150.0	
10461-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	125.40	32.90	3.29	80.0	± 9.6 %
		Y	100.00	122.42	32.02		80.0	
		Z	100.00	127.89	33.84		80.0	
10462-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	109.25	25.21	3.23	80.0	± 9.6 %
		Y	100.00	110.42	26.29		80.0	
		Z	100.00	110.45	25.54		80.0	
10463-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	106.10	23.70	3.23	80.0	± 9.6 %
		Y	31.87	95.11	22.04		80.0	
		Z	100.00	107.01	23.88		80.0	
10464-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	123.48	31.85	3.23	80.0	± 9.6 %
		Y	100.00	120.78	31.11		80.0	
		Z	100.00	125.94	32.77		80.0	
10465-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	108.73	24.95	3.23	80.0	± 9.6 %
		Y	57.38	103.50	24.59		80.0	
		Z	100.00	109.93	25.28		80.0	
10466-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	105.62	23.47	3.23	80.0	± 9.6 %
		Y	19.30	89.18	20.39		80.0	
		Z	100.00	106.51	23.65		80.0	
10467-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	123.71	31.96	3.23	80.0	± 9.6 %
		Y	100.00	120.96	31.19		80.0	
		Z	100.00	126.19	32.89		80.0	
10468-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	108.89	25.03	3.23	80.0	± 9.6 %
		Y	68.69	105.73	25.14		80.0	
		Z	100.00	110.12	25.37		80.0	
10469-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	105.63	23.47	3.23	80.0	± 9.6 %
		Y	19.75	89.45	20.46		80.0	
		Z	100.00	106.53	23.66		80.0	
10470-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	123.74	31.96	3.23	80.0	± 9.6 %
		Y	100.00	120.98	31.20		80.0	
		Z	100.00	126.22	32.89		80.0	
10471-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	108.84	25.00	3.23	80.0	± 9.6 %
		Y	69.00	105.75	25.13		80.0	
		Z	100.00	110.07	25.35		80.0	
10472-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	105.58	23.44	3.23	80.0	± 9.6 %
		Y	19.79	89.46	20.45		80.0	
		Z	100.00	106.47	23.62		80.0	
10473-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	123.71	31.95	3.23	80.0	± 9.6 %
		Y	100.00	120.96	31.18		80.0	
		Z	100.00	126.20	32.88		80.0	
10474-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	108.85	25.00	3.23	80.0	± 9.6 %
		Y	67.79	105.55	25.09		80.0	
		Z	100.00	110.08	25.35		80.0	
10475-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	105.59	23.45	3.23	80.0	± 9.6 %
		Y	19.52	89.31	20.41		80.0	
		Z	100.00	106.49	23.63		80.0	

10477-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	108.68	24.92	3.23	80.0	± 9.6 %
		Y	60.00	104.00	24.69		80.0	
		Z	100.00	109.90	25.26		80.0	
10478-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	105.53	23.42	3.23	80.0	± 9.6 %
		Y	19.24	89.12	20.35		80.0	
		Z	100.00	106.43	23.60		80.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	94.50	124.14	33.84	3.23	80.0	± 9.6 %
		Y	12.50	90.83	25.02		80.0	
		Z	100.00	124.95	33.67		80.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	95.67	115.16	29.54	3.23	80.0	± 9.6 %
		Y	12.83	86.63	22.28		80.0	
		Z	100.00	114.83	28.84		80.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	58.64	107.02	27.16	3.23	80.0	± 9.6 %
		Y	11.35	84.25	21.22		80.0	
		Z	80.09	110.11	27.23		80.0	
10482-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	12.89	91.14	23.86	2.23	80.0	± 9.6 %
		Y	6.25	79.51	20.15		80.0	
		Z	8.39	84.42	21.05		80.0	
10483-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	18.92	92.85	24.00	2.23	80.0	± 9.6 %
		Y	8.58	80.90	20.47		80.0	
		Z	13.62	87.31	21.48		80.0	
10484-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	15.36	89.71	23.07	2.23	80.0	± 9.6 %
		Y	7.99	79.65	20.04		80.0	
		Z	10.91	84.16	20.49		80.0	
10485-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	10.83	89.50	24.25	2.23	80.0	± 9.6 %
		Y	6.29	79.77	20.91		80.0	
		Z	8.35	85.48	22.54		80.0	
10486-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	6.33	78.08	19.97	2.23	80.0	± 9.6 %
		Y	5.11	73.82	18.38		80.0	
		Z	5.40	75.74	18.50		80.0	
10487-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.09	77.15	19.61	2.23	80.0	± 9.6 %
		Y	5.06	73.33	18.18		80.0	
		Z	5.20	74.88	18.15		80.0	
10488-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	7.97	83.54	22.89	2.23	80.0	± 9.6 %
		Y	6.02	77.67	20.60		80.0	
		Z	6.66	81.06	21.92		80.0	
10489-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.54	75.17	19.93	2.23	80.0	± 9.6 %
		Y	5.05	72.55	18.77		80.0	
		Z	5.10	74.15	19.29		80.0	
10490-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.52	74.58	19.72	2.23	80.0	± 9.6 %
		Y	5.10	72.20	18.66		80.0	
		Z	5.11	73.70	19.12		80.0	
10491-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	6.68	78.67	21.27	2.23	80.0	± 9.6 %
		Y	5.75	75.05	19.71		80.0	
		Z	5.90	77.08	20.64		80.0	
10492-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.47	73.05	19.35	2.23	80.0	± 9.6 %
		Y	5.22	71.31	18.50		80.0	
		Z	5.12	72.35	18.92		80.0	

10493-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.48	72.72	19.22	2.23	80.0	± 9.6 %
		Y	5.27	71.08	18.43		80.0	
		Z	5.15	72.07	18.82		80.0	
10494-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	7.90	81.45	22.09	2.23	80.0	± 9.6 %
		Y	6.41	76.92	20.25		80.0	
		Z	6.69	79.16	21.27		80.0	
10495-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.61	73.73	19.62	2.23	80.0	± 9.6 %
		Y	5.32	71.86	18.72		80.0	
		Z	5.21	72.81	19.16		80.0	
10496-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.57	73.09	19.41	2.23	80.0	± 9.6 %
		Y	5.35	71.43	18.59		80.0	
		Z	5.21	72.31	18.99		80.0	
10497-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	10.14	86.59	21.54	2.23	80.0	± 9.6 %
		Y	5.12	76.51	18.39		80.0	
		Z	5.35	77.20	17.46		80.0	
10498-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.29	72.00	15.43	2.23	80.0	± 9.6 %
		Y	3.72	69.52	14.77		80.0	
		Z	2.43	65.17	11.54		80.0	
10499-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.97	70.70	14.77	2.23	80.0	± 9.6 %
		Y	3.61	68.83	14.36		80.0	
		Z	2.26	64.14	10.91		80.0	
10500-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	8.79	85.79	23.33	2.23	80.0	± 9.6 %
		Y	5.95	78.30	20.59		80.0	
		Z	7.25	82.97	22.08		80.0	
10501-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.90	76.65	19.85	2.23	80.0	± 9.6 %
		Y	5.06	73.18	18.47		80.0	
		Z	5.28	75.13	18.80		80.0	
10502-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.87	76.18	19.62	2.23	80.0	± 9.6 %
		Y	5.09	72.91	18.33		80.0	
		Z	5.26	74.71	18.58		80.0	
10503-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	7.83	83.24	22.77	2.23	80.0	± 9.6 %
		Y	5.94	77.45	20.51		80.0	
		Z	6.55	80.79	21.81		80.0	
10504-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.51	75.05	19.87	2.23	80.0	± 9.6 %
		Y	5.02	72.46	18.72		80.0	
		Z	5.07	74.04	19.23		80.0	
10505-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.49	74.47	19.66	2.23	80.0	± 9.6 %
		Y	5.07	72.10	18.60		80.0	
		Z	5.08	73.60	19.06		80.0	
10506-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	7.81	81.23	22.00	2.23	80.0	± 9.6 %
		Y	6.35	76.76	20.18		80.0	
		Z	6.62	78.99	21.19		80.0	
10507-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.58	73.65	19.59	2.23	80.0	± 9.6 %
		Y	5.30	71.80	18.69		80.0	
		Z	5.19	72.75	19.13		80.0	

10508-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.55	73.01	19.36	2.23	80.0	± 9.6 %
		Y	5.33	71.35	18.55		80.0	
		Z	5.19	72.24	18.95		80.0	
10509-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	7.03	77.40	20.60	2.23	80.0	± 9.6 %
		Y	6.25	74.54	19.35		80.0	
		Z	6.27	75.89	20.05		80.0	
10510-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.86	72.49	19.18	2.23	80.0	± 9.6 %
		Y	5.70	71.14	18.49		80.0	
		Z	5.51	71.73	18.83		80.0	
10511-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.83	72.01	19.03	2.23	80.0	± 9.6 %
		Y	5.71	70.79	18.40		80.0	
		Z	5.52	71.35	18.71		80.0	
10512-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	8.18	80.50	21.58	2.23	80.0	± 9.6 %
		Y	6.82	76.59	19.98		80.0	
		Z	6.97	78.23	20.79		80.0	
10513-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.86	73.15	19.44	2.23	80.0	± 9.6 %
		Y	5.65	71.64	18.67		80.0	
		Z	5.45	72.18	19.02		80.0	
10514-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.75	72.41	19.20	2.23	80.0	± 9.6 %
		Y	5.60	71.07	18.51		80.0	
		Z	5.40	71.58	18.82		80.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	1.06	65.76	16.90	0.00	150.0	± 9.6 %
		Y	1.00	63.51	14.99		150.0	
		Z	1.02	64.32	15.55		150.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	5.87	117.81	35.86	0.00	150.0	± 9.6 %
		Y	0.66	71.85	18.17		150.0	
		Z	0.94	79.02	21.78		150.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	1.03	70.61	19.18	0.00	150.0	± 9.6 %
		Y	0.86	65.67	15.75		150.0	
		Z	0.90	67.08	16.71		150.0	
10518-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	4.67	67.45	16.69	0.00	150.0	± 9.6 %
		Y	4.67	66.94	16.33		150.0	
		Z	4.52	67.23	16.44		150.0	
10519-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.87	67.70	16.81	0.00	150.0	± 9.6 %
		Y	4.88	67.22	16.46		150.0	
		Z	4.69	67.43	16.54		150.0	
10520-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.72	67.70	16.76	0.00	150.0	± 9.6 %
		Y	4.73	67.19	16.39		150.0	
		Z	4.54	67.39	16.47		150.0	
10521-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.66	67.72	16.76	0.00	150.0	± 9.6 %
		Y	4.66	67.20	16.38		150.0	
		Z	4.48	67.38	16.46		150.0	
10522-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.71	67.76	16.82	0.00	150.0	± 9.6 %
		Y	4.71	67.20	16.42		150.0	
		Z	4.54	67.51	16.56		150.0	

10523-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	X	4.59	67.65	16.68	0.00	150.0	± 9.6 %
		Y	4.58	67.09	16.28		150.0	
		Z	4.43	67.41	16.42		150.0	
10524-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	4.66	67.69	16.79	0.00	150.0	± 9.6 %
		Y	4.66	67.15	16.40		150.0	
		Z	4.48	67.43	16.53		150.0	
10525-AAA	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	X	4.63	66.73	16.38	0.00	150.0	± 9.6 %
		Y	4.62	66.18	15.99		150.0	
		Z	4.49	66.49	16.12		150.0	
10526-AAA	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	X	4.82	67.13	16.53	0.00	150.0	± 9.6 %
		Y	4.82	66.58	16.14		150.0	
		Z	4.64	66.83	16.26		150.0	
10527-AAA	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	4.74	67.11	16.49	0.00	150.0	± 9.6 %
		Y	4.73	66.55	16.09		150.0	
		Z	4.57	66.80	16.20		150.0	
10528-AAA	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	X	4.76	67.13	16.52	0.00	150.0	± 9.6 %
		Y	4.75	66.57	16.12		150.0	
		Z	4.58	66.81	16.23		150.0	
10529-AAA	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	X	4.76	67.13	16.52	0.00	150.0	± 9.6 %
		Y	4.75	66.57	16.12		150.0	
		Z	4.58	66.81	16.23		150.0	
10531-AAA	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	4.77	67.27	16.55	0.00	150.0	± 9.6 %
		Y	4.76	66.71	16.15		150.0	
		Z	4.56	66.89	16.24		150.0	
10532-AAA	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	X	4.62	67.15	16.50	0.00	150.0	± 9.6 %
		Y	4.61	66.57	16.09		150.0	
		Z	4.43	66.75	16.17		150.0	
10533-AAA	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	4.77	67.17	16.50	0.00	150.0	± 9.6 %
		Y	4.76	66.59	16.10		150.0	
		Z	4.59	66.88	16.23		150.0	
10534-AAA	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	5.27	67.15	16.50	0.00	150.0	± 9.6 %
		Y	5.27	66.72	16.17		150.0	
		Z	5.12	66.84	16.26		150.0	
10535-AAA	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	5.34	67.31	16.57	0.00	150.0	± 9.6 %
		Y	5.34	66.86	16.23		150.0	
		Z	5.19	67.03	16.35		150.0	
10536-AAA	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	5.22	67.31	16.55	0.00	150.0	± 9.6 %
		Y	5.21	66.84	16.21		150.0	
		Z	5.06	66.99	16.32		150.0	
10537-AAA	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	X	5.27	67.26	16.52	0.00	150.0	± 9.6 %
		Y	5.28	66.82	16.20		150.0	
		Z	5.12	66.94	16.29		150.0	
10538-AAA	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	5.37	67.28	16.57	0.00	150.0	± 9.6 %
		Y	5.39	66.89	16.27		150.0	
		Z	5.20	66.94	16.33		150.0	
10540-AAA	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	5.29	67.28	16.59	0.00	150.0	± 9.6 %
		Y	5.29	66.84	16.26		150.0	
		Z	5.13	66.94	16.35		150.0	

10541-AAA	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	5.26	67.15	16.52	0.00	150.0	± 9.6 %
		Y	5.27	66.73	16.20		150.0	
		Z	5.11	66.82	16.27		150.0	
10542-AAA	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	5.42	67.19	16.55	0.00	150.0	± 9.6 %
		Y	5.42	66.79	16.25		150.0	
		Z	5.26	66.90	16.33		150.0	
10543-AAA	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.49	67.21	16.57	0.00	150.0	± 9.6 %
		Y	5.51	66.80	16.27		150.0	
		Z	5.32	66.91	16.36		150.0	
10544-AAA	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.57	67.22	16.46	0.00	150.0	± 9.6 %
		Y	5.56	66.82	16.16		150.0	
		Z	5.45	66.92	16.24		150.0	
10545-AAA	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.77	67.65	16.61	0.00	150.0	± 9.6 %
		Y	5.78	67.25	16.32		150.0	
		Z	5.64	67.38	16.42		150.0	
10546-AAA	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.65	67.48	16.55	0.00	150.0	± 9.6 %
		Y	5.65	67.10	16.26		150.0	
		Z	5.50	67.09	16.30		150.0	
10547-AAA	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	5.73	67.53	16.56	0.00	150.0	± 9.6 %
		Y	5.74	67.18	16.29		150.0	
		Z	5.57	67.16	16.32		150.0	
10548-AAA	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	6.02	68.59	17.06	0.00	150.0	± 9.6 %
		Y	6.08	68.34	16.83		150.0	
		Z	5.80	68.04	16.74		150.0	
10550-AAA	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	5.67	67.46	16.54	0.00	150.0	± 9.6 %
		Y	5.67	67.06	16.25		150.0	
		Z	5.54	67.19	16.36		150.0	
10551-AAA	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.68	67.52	16.53	0.00	150.0	± 9.6 %
		Y	5.69	67.13	16.25		150.0	
		Z	5.53	67.15	16.30		150.0	
10552-AAA	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.59	67.30	16.44	0.00	150.0	± 9.6 %
		Y	5.59	66.90	16.14		150.0	
		Z	5.46	67.00	16.23		150.0	
10553-AAA	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.68	67.34	16.48	0.00	150.0	± 9.6 %
		Y	5.68	66.95	16.20		150.0	
		Z	5.53	67.00	16.26		150.0	
10554-AAB	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	5.97	67.57	16.52	0.00	150.0	± 9.6 %
		Y	5.97	67.21	16.26		150.0	
		Z	5.86	67.27	16.32		150.0	
10555-AAB	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	6.11	67.88	16.66	0.00	150.0	± 9.6 %
		Y	6.11	67.54	16.39		150.0	
		Z	5.98	67.57	16.45		150.0	
10556-AAB	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	6.13	67.93	16.67	0.00	150.0	± 9.6 %
		Y	6.13	67.56	16.40		150.0	
		Z	6.01	67.63	16.48		150.0	
10557-AAB	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	6.10	67.85	16.65	0.00	150.0	± 9.6 %
		Y	6.11	67.51	16.40		150.0	
		Z	5.97	67.50	16.43		150.0	

10558-AAB	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	6.16	68.03	16.76	0.00	150.0	± 9.6 %
		Y	6.17	67.70	16.50		150.0	
		Z	6.01	67.66	16.53		150.0	
10560-AAB	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	X	6.15	67.86	16.71	0.00	150.0	± 9.6 %
		Y	6.16	67.52	16.45		150.0	
		Z	6.00	67.50	16.49		150.0	
10561-AAB	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	6.06	67.83	16.73	0.00	150.0	± 9.6 %
		Y	6.07	67.48	16.47		150.0	
		Z	5.94	67.50	16.52		150.0	
10562-AAB	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	6.21	68.28	16.96	0.00	150.0	± 9.6 %
		Y	6.23	67.97	16.72		150.0	
		Z	6.03	67.79	16.67		150.0	
10563-AAB	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	X	6.55	68.85	17.19	0.00	150.0	± 9.6 %
		Y	6.59	68.58	16.96		150.0	
		Z	6.12	67.71	16.59		150.0	
10564-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	X	4.99	67.50	16.82	0.46	150.0	± 9.6 %
		Y	5.01	67.06	16.50		150.0	
		Z	4.85	67.32	16.61		150.0	
10565-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	X	5.24	67.95	17.13	0.46	150.0	± 9.6 %
		Y	5.26	67.54	16.83		150.0	
		Z	5.06	67.72	16.90		150.0	
10566-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	X	5.07	67.84	16.98	0.46	150.0	± 9.6 %
		Y	5.10	67.41	16.66		150.0	
		Z	4.90	67.58	16.73		150.0	
10567-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	X	5.11	68.24	17.33	0.46	150.0	± 9.6 %
		Y	5.13	67.80	17.01		150.0	
		Z	4.93	67.94	17.07		150.0	
10568-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	X	4.99	67.61	16.75	0.46	150.0	± 9.6 %
		Y	5.01	67.15	16.42		150.0	
		Z	4.83	67.42	16.55		150.0	
10569-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	X	5.06	68.33	17.39	0.46	150.0	± 9.6 %
		Y	5.07	67.85	17.05		150.0	
		Z	4.91	68.11	17.17		150.0	
10570-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	X	5.09	68.14	17.31	0.46	150.0	± 9.6 %
		Y	5.11	67.68	16.98		150.0	
		Z	4.92	67.93	17.09		150.0	
10571-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.50	68.95	18.38	0.46	130.0	± 9.6 %
		Y	1.40	66.38	16.51		130.0	
		Z	1.40	67.23	17.09		130.0	
10572-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.55	69.98	18.93	0.46	130.0	± 9.6 %
		Y	1.43	67.06	16.91		130.0	
		Z	1.44	67.99	17.53		130.0	
10573-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	100.00	153.35	41.94	0.46	130.0	± 9.6 %
		Y	5.15	96.81	26.53		130.0	
		Z	50.11	136.49	37.17		130.0	
10574-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	2.59	83.81	24.92	0.46	130.0	± 9.6 %
		Y	1.75	74.27	20.26		130.0	
		Z	1.86	76.56	21.49		130.0	

10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	4.81	67.37	16.92	0.46	130.0	± 9.6 %
		Y	4.84	66.96	16.62		130.0	
		Z	4.68	67.23	16.73		130.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	4.84	67.54	16.99	0.46	130.0	± 9.6 %
		Y	4.86	67.12	16.68		130.0	
		Z	4.71	67.40	16.79		130.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	5.05	67.83	17.14	0.46	130.0	± 9.6 %
		Y	5.09	67.44	16.86		130.0	
		Z	4.89	67.64	16.94		130.0	
10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	4.96	68.04	17.27	0.46	130.0	± 9.6 %
		Y	4.99	67.62	16.97		130.0	
		Z	4.79	67.80	17.04		130.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	4.73	67.38	16.62	0.46	130.0	± 9.6 %
		Y	4.76	66.96	16.31		130.0	
		Z	4.57	67.14	16.40		130.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	4.77	67.37	16.62	0.46	130.0	± 9.6 %
		Y	4.80	66.94	16.31		130.0	
		Z	4.61	67.21	16.43		130.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	4.86	68.14	17.25	0.46	130.0	± 9.6 %
		Y	4.89	67.70	16.92		130.0	
		Z	4.70	67.90	17.02		130.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	4.67	67.12	16.41	0.46	130.0	± 9.6 %
		Y	4.71	66.71	16.10		130.0	
		Z	4.51	66.92	16.20		130.0	
10583-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.81	67.37	16.92	0.46	130.0	± 9.6 %
		Y	4.84	66.96	16.62		130.0	
		Z	4.68	67.23	16.73		130.0	
10584-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.84	67.54	16.99	0.46	130.0	± 9.6 %
		Y	4.86	67.12	16.68		130.0	
		Z	4.71	67.40	16.79		130.0	
10585-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	5.05	67.83	17.14	0.46	130.0	± 9.6 %
		Y	5.09	67.44	16.86		130.0	
		Z	4.89	67.64	16.94		130.0	
10586-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	4.96	68.04	17.27	0.46	130.0	± 9.6 %
		Y	4.99	67.62	16.97		130.0	
		Z	4.79	67.80	17.04		130.0	
10587-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.73	67.38	16.62	0.46	130.0	± 9.6 %
		Y	4.76	66.96	16.31		130.0	
		Z	4.57	67.14	16.40		130.0	
10588-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.77	67.37	16.62	0.46	130.0	± 9.6 %
		Y	4.80	66.94	16.31		130.0	
		Z	4.61	67.21	16.43		130.0	
10589-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	4.86	68.14	17.25	0.46	130.0	± 9.6 %
		Y	4.89	67.70	16.92		130.0	
		Z	4.70	67.90	17.02		130.0	
10590-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.67	67.12	16.41	0.46	130.0	± 9.6 %
		Y	4.71	66.71	16.10		130.0	
		Z	4.51	66.92	16.20		130.0	

10591-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	4.95	67.39	16.99	0.46	130.0	± 9.6 %
		Y	4.98	67.01	16.71		130.0	
		Z	4.83	67.26	16.81		130.0	
10592-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	5.12	67.74	17.12	0.46	130.0	± 9.6 %
		Y	5.15	67.35	16.84		130.0	
		Z	4.97	67.58	16.94		130.0	
10593-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	5.04	67.68	17.02	0.46	130.0	± 9.6 %
		Y	5.08	67.30	16.74		130.0	
		Z	4.89	67.49	16.82		130.0	
10594-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	5.10	67.84	17.17	0.46	130.0	± 9.6 %
		Y	5.14	67.45	16.88		130.0	
		Z	4.94	67.65	16.97		130.0	
10595-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	5.07	67.81	17.07	0.46	130.0	± 9.6 %
		Y	5.11	67.42	16.78		130.0	
		Z	4.91	67.63	16.88		130.0	
10596-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	5.01	67.82	17.09	0.46	130.0	± 9.6 %
		Y	5.05	67.42	16.79		130.0	
		Z	4.85	67.64	16.90		130.0	
10597-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	4.96	67.75	16.98	0.46	130.0	± 9.6 %
		Y	5.00	67.35	16.69		130.0	
		Z	4.80	67.53	16.77		130.0	
10598-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	4.95	68.01	17.26	0.46	130.0	± 9.6 %
		Y	4.98	67.61	16.96		130.0	
		Z	4.78	67.73	17.01		130.0	
10599-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	5.60	67.86	17.12	0.46	130.0	± 9.6 %
		Y	5.66	67.61	16.91		130.0	
		Z	5.48	67.70	16.99		130.0	
10600-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	5.78	68.39	17.36	0.46	130.0	± 9.6 %
		Y	5.85	68.19	17.17		130.0	
		Z	5.62	68.16	17.20		130.0	
10601-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.65	68.09	17.22	0.46	130.0	± 9.6 %
		Y	5.71	67.83	17.01		130.0	
		Z	5.51	67.89	17.08		130.0	
10602-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	5.73	68.07	17.13	0.46	130.0	± 9.6 %
		Y	5.79	67.82	16.93		130.0	
		Z	5.63	68.04	17.07		130.0	
10603-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	5.82	68.41	17.43	0.46	130.0	± 9.6 %
		Y	5.87	68.11	17.19		130.0	
		Z	5.69	68.27	17.32		130.0	
10604-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.61	67.82	17.13	0.46	130.0	± 9.6 %
		Y	5.66	67.56	16.91		130.0	
		Z	5.56	67.91	17.12		130.0	
10605-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.73	68.17	17.30	0.46	130.0	± 9.6 %
		Y	5.77	67.87	17.07		130.0	
		Z	5.62	68.08	17.21		130.0	
10606-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	5.50	67.62	16.90	0.46	130.0	± 9.6 %
		Y	5.53	67.31	16.65		130.0	
		Z	5.35	67.34	16.70		130.0	

10607-AAA	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.80	66.75	16.64	0.46	130.0	± 9.6 %
		Y	4.81	66.30	16.32		130.0	
		Z	4.67	66.60	16.45		130.0	
10608-AAA	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	5.00	67.18	16.81	0.46	130.0	± 9.6 %
		Y	5.02	66.72	16.48		130.0	
		Z	4.84	66.98	16.61		130.0	
10609-AAA	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	4.89	67.06	16.67	0.46	130.0	± 9.6 %
		Y	4.91	66.60	16.34		130.0	
		Z	4.73	66.84	16.45		130.0	
10610-AAA	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	4.94	67.21	16.82	0.46	130.0	± 9.6 %
		Y	4.96	66.76	16.50		130.0	
		Z	4.78	66.99	16.61		130.0	
10611-AAA	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	4.86	67.03	16.68	0.46	130.0	± 9.6 %
		Y	4.89	66.59	16.36		130.0	
		Z	4.70	66.81	16.46		130.0	
10612-AAA	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	4.88	67.21	16.74	0.46	130.0	± 9.6 %
		Y	4.90	66.74	16.40		130.0	
		Z	4.71	66.99	16.53		130.0	
10613-AAA	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.89	67.11	16.63	0.46	130.0	± 9.6 %
		Y	4.91	66.65	16.30		130.0	
		Z	4.71	66.83	16.39		130.0	
10614-AAA	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.83	67.31	16.87	0.46	130.0	± 9.6 %
		Y	4.85	66.84	16.53		130.0	
		Z	4.66	67.02	16.61		130.0	
10615-AAA	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.86	66.85	16.46	0.46	130.0	± 9.6 %
		Y	4.89	66.40	16.13		130.0	
		Z	4.70	66.67	16.26		130.0	
10616-AAA	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	5.44	67.18	16.77	0.46	130.0	± 9.6 %
		Y	5.47	66.84	16.51		130.0	
		Z	5.30	66.94	16.59		130.0	
10617-AAA	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.50	67.33	16.81	0.46	130.0	± 9.6 %
		Y	5.52	66.94	16.53		130.0	
		Z	5.38	67.17	16.68		130.0	
10618-AAA	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	5.40	67.39	16.87	0.46	130.0	± 9.6 %
		Y	5.42	67.02	16.59		130.0	
		Z	5.27	67.18	16.70		130.0	
10619-AAA	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	5.42	67.21	16.71	0.46	130.0	± 9.6 %
		Y	5.44	66.85	16.44		130.0	
		Z	5.28	66.96	16.53		130.0	
10620-AAA	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.51	67.25	16.78	0.46	130.0	± 9.6 %
		Y	5.56	66.94	16.53		130.0	
		Z	5.36	66.98	16.59		130.0	
10621-AAA	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.50	67.33	16.93	0.46	130.0	± 9.6 %
		Y	5.53	67.00	16.68		130.0	
		Z	5.36	67.10	16.76		130.0	
10622-AAA	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.51	67.50	17.01	0.46	130.0	± 9.6 %
		Y	5.53	67.13	16.73		130.0	
		Z	5.38	67.30	16.85		130.0	

10623-AAA	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	5.39	67.03	16.66	0.46	130.0	± 9.6 %
		Y	5.41	66.69	16.40		130.0	
		Z	5.25	66.80	16.48		130.0	
10624-AAA	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.58	67.21	16.80	0.46	130.0	± 9.6 %
		Y	5.61	66.88	16.56		130.0	
		Z	5.44	66.99	16.64		130.0	
10625-AAA	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	5.99	68.31	17.39	0.46	130.0	± 9.6 %
		Y	6.04	68.02	17.17		130.0	
		Z	5.71	67.69	17.04		130.0	
10626-AAA	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.71	67.19	16.69	0.46	130.0	± 9.6 %
		Y	5.72	66.86	16.44		130.0	
		Z	5.61	66.97	16.54		130.0	
10627-AAA	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	5.96	67.77	16.93	0.46	130.0	± 9.6 %
		Y	5.99	67.46	16.69		130.0	
		Z	5.86	67.59	16.81		130.0	
10628-AAA	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.76	67.34	16.66	0.46	130.0	± 9.6 %
		Y	5.79	67.03	16.42		130.0	
		Z	5.63	67.03	16.47		130.0	
10629-AAA	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	5.85	67.42	16.69	0.46	130.0	± 9.6 %
		Y	5.87	67.09	16.44		130.0	
		Z	5.71	67.12	16.51		130.0	
10630-AAA	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	6.37	69.15	17.55	0.46	130.0	± 9.6 %
		Y	6.48	69.04	17.41		130.0	
		Z	6.10	68.51	17.21		130.0	
10631-AAA	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	6.23	68.84	17.58	0.46	130.0	± 9.6 %
		Y	6.30	68.64	17.40		130.0	
		Z	6.00	68.26	17.26		130.0	
10632-AAA	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	5.93	67.81	17.09	0.46	130.0	± 9.6 %
		Y	5.96	67.50	16.85		130.0	
		Z	5.82	67.64	16.97		130.0	
10633-AAA	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	5.83	67.50	16.76	0.46	130.0	± 9.6 %
		Y	5.88	67.25	16.56		130.0	
		Z	5.69	67.21	16.59		130.0	
10634-AAA	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	5.81	67.52	16.84	0.46	130.0	± 9.6 %
		Y	5.85	67.23	16.61		130.0	
		Z	5.67	67.21	16.64		130.0	
10635-AAA	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	5.70	66.87	16.25	0.46	130.0	± 9.6 %
		Y	5.74	66.58	16.02		130.0	
		Z	5.55	66.58	16.07		130.0	
10636-AAB	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	6.12	67.55	16.76	0.46	130.0	± 9.6 %
		Y	6.14	67.26	16.54		130.0	
		Z	6.03	67.32	16.61		130.0	
10637-AAB	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	6.28	67.94	16.93	0.46	130.0	± 9.6 %
		Y	6.31	67.65	16.72		130.0	
		Z	6.19	67.72	16.79		130.0	
10638-AAB	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	6.28	67.91	16.90	0.46	130.0	± 9.6 %
		Y	6.31	67.62	16.68		130.0	
		Z	6.18	67.68	16.75		130.0	

10639-AAB	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	6.27	67.88	16.93	0.46	130.0	± 9.6 %
		Y	6.30	67.62	16.73		130.0	
		Z	6.15	67.59	16.75		130.0	
10640-AAB	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	6.29	67.93	16.90	0.46	130.0	± 9.6 %
		Y	6.33	67.70	16.71		130.0	
		Z	6.15	67.62	16.71		130.0	
10641-AAB	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	6.30	67.74	16.81	0.46	130.0	± 9.6 %
		Y	6.32	67.44	16.59		130.0	
		Z	6.22	67.59	16.72		130.0	
10642-AAB	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	6.36	68.03	17.13	0.46	130.0	± 9.6 %
		Y	6.39	67.76	16.92		130.0	
		Z	6.23	67.75	16.95		130.0	
10643-AAB	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	6.19	67.72	16.88	0.46	130.0	± 9.6 %
		Y	6.22	67.45	16.67		130.0	
		Z	6.09	67.50	16.74		130.0	
10644-AAB	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	6.39	68.34	17.21	0.46	130.0	± 9.6 %
		Y	6.45	68.14	17.04		130.0	
		Z	6.20	67.86	16.93		130.0	
10645-AAB	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	6.86	69.27	17.61	0.46	130.0	± 9.6 %
		Y	6.87	68.89	17.35		130.0	
		Z	6.34	67.93	16.93		130.0	
10646-AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	58.91	128.47	41.72	9.30	60.0	± 9.6 %
		Y	22.23	103.66	34.19		60.0	
		Z	97.77	144.05	46.65		60.0	
10647-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	62.96	130.94	42.54	9.30	60.0	± 9.6 %
		Y	22.84	105.02	34.74		60.0	
		Z	100.00	145.78	47.28		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	1.21	71.90	15.83	0.00	150.0	± 9.6 %
		Y	0.81	64.89	12.16		150.0	
		Z	0.74	65.22	11.47		150.0	
10652-AAB	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	4.72	70.40	18.28	2.23	80.0	± 9.6 %
		Y	4.59	69.04	17.59		80.0	
		Z	4.50	69.96	17.82		80.0	
10653-AAB	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	5.05	69.01	18.05	2.23	80.0	± 9.6 %
		Y	5.03	68.18	17.58		80.0	
		Z	4.88	68.67	17.76		80.0	
10654-AAB	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	4.97	68.58	18.01	2.23	80.0	± 9.6 %
		Y	4.96	67.84	17.57		80.0	
		Z	4.83	68.24	17.75		80.0	
10655-AAB	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	5.02	68.56	18.04	2.23	80.0	± 9.6 %
		Y	5.02	67.86	17.60		80.0	
		Z	4.89	68.17	17.77		80.0	

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

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

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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: ES3-3332_Aug17

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3332

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

PMV 8/27/17

Calibration date: August 14, 2017

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02525)	Apr-18
Reference 20 dB Attenuator	SN: S5277 (20x)	07-Apr-17 (No. 217-02528)	Apr-18
Reference Probe ES3DV2	SN: 3013	31-Dec-16 (No. ES3-3013_Dec16)	Dec-17
DAE4	SN: 660	7-Dec-16 (No. DAE4-660_Dec16)	Dec-17
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-16)	In house check: Jun-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-16)	In house check: Oct-17

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 16, 2017

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

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 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:3332

Manufactured: January 24, 2012
Calibrated: August 14, 2017

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

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3332

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.00	0.93	0.88	± 10.1 %
DCP (mV)[B]	104.0	103.0	103.0	

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	192.0	±3.5 %
		Y	0.0	0.0	1.0		194.3	
		Z	0.0	0.0	1.0		179.9	

Note: For details on UID parameters see Appendix.

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	76.72	548.9	35.46	56.44	4.600	5.1	0.000	0.903	1.011
Y	44.78	323.3	35.85	29.01	2.529	5.1	0.000	0.546	1.009
Z	38.01	268.3	34.56	26.38	1.777	5.1	0.096	0.424	1.004

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of Norm X,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[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:3332

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)	Unc (k=2)
750	41.9	0.89	6.81	6.81	6.81	0.72	1.31	± 12.0 %
835	41.5	0.90	6.64	6.64	6.64	0.80	1.21	± 12.0 %
1750	40.1	1.37	5.56	5.56	5.56	0.80	1.20	± 12.0 %
1900	40.0	1.40	5.33	5.33	5.33	0.76	1.26	± 12.0 %
2300	39.5	1.67	4.99	4.99	4.99	0.70	1.36	± 12.0 %
2450	39.2	1.80	4.68	4.68	4.68	0.63	1.48	± 12.0 %
2600	39.0	1.96	4.56	4.56	4.56	0.80	1.23	± 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:3332

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)	Unc (k=2)
750	55.5	0.96	6.54	6.54	6.54	0.55	1.43	± 12.0 %
835	55.2	0.97	6.47	6.47	6.47	0.71	1.27	± 12.0 %
1750	53.4	1.49	5.16	5.16	5.16	0.80	1.22	± 12.0 %
1900	53.3	1.52	4.95	4.95	4.95	0.54	1.56	± 12.0 %
2300	52.9	1.81	4.74	4.74	4.74	0.80	1.30	± 12.0 %
2450	52.7	1.95	4.55	4.55	4.55	0.80	1.17	± 12.0 %
2600	52.5	2.16	4.43	4.43	4.43	0.80	1.12	± 12.0 %

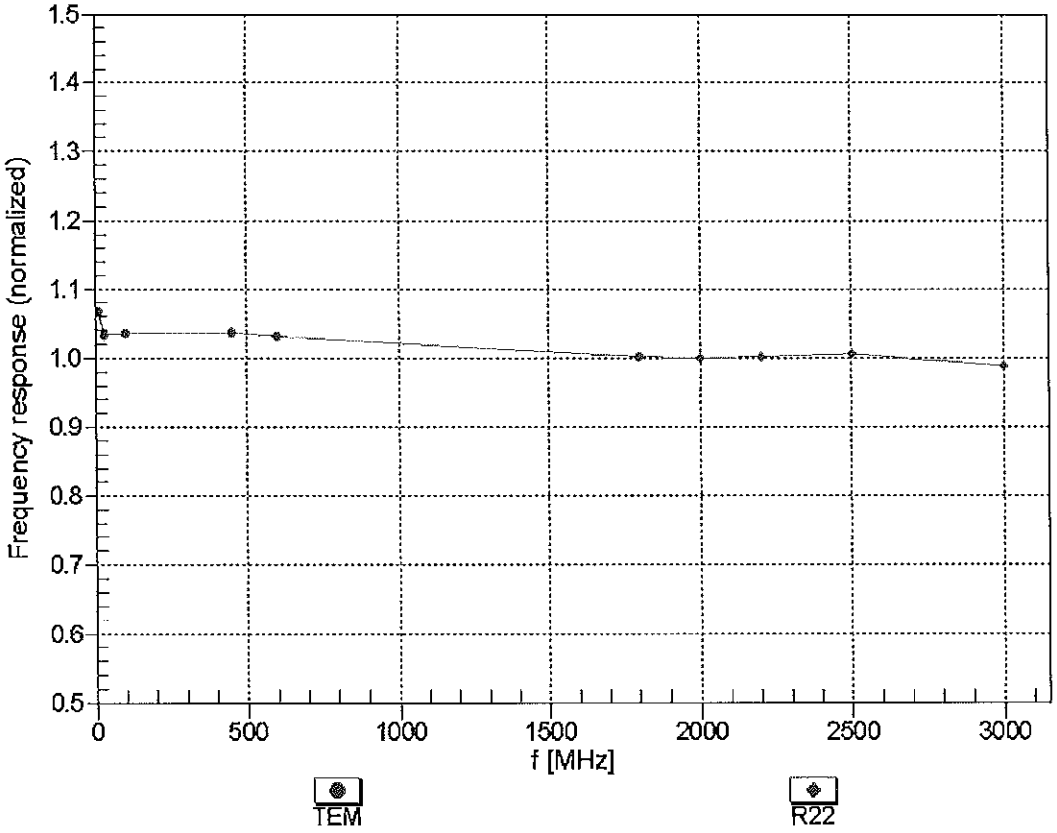
[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz 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.

Frequency Response of E-Field

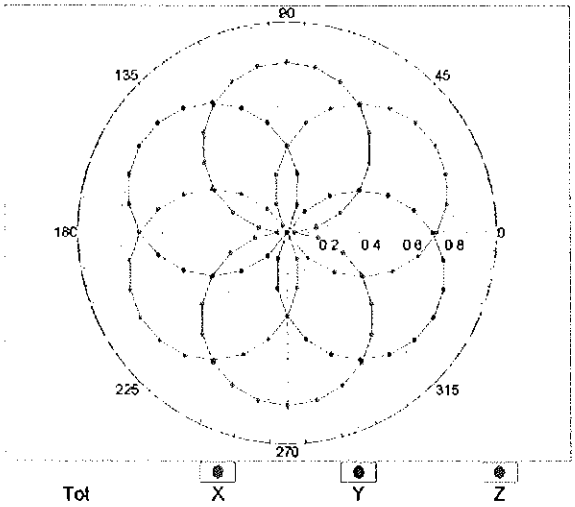
(TEM-Cell:ifi110 EXX, Waveguide: R22)



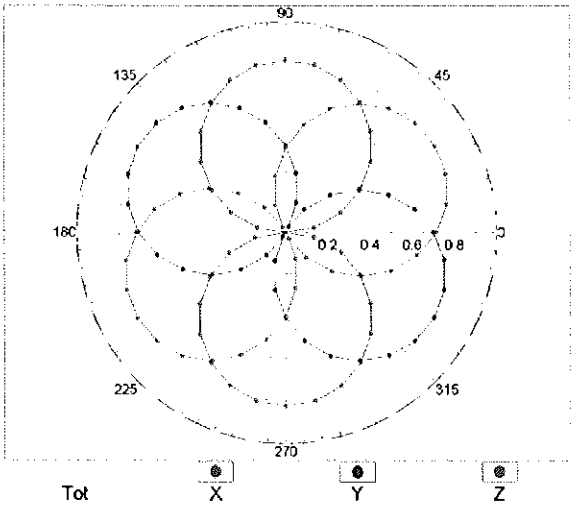
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

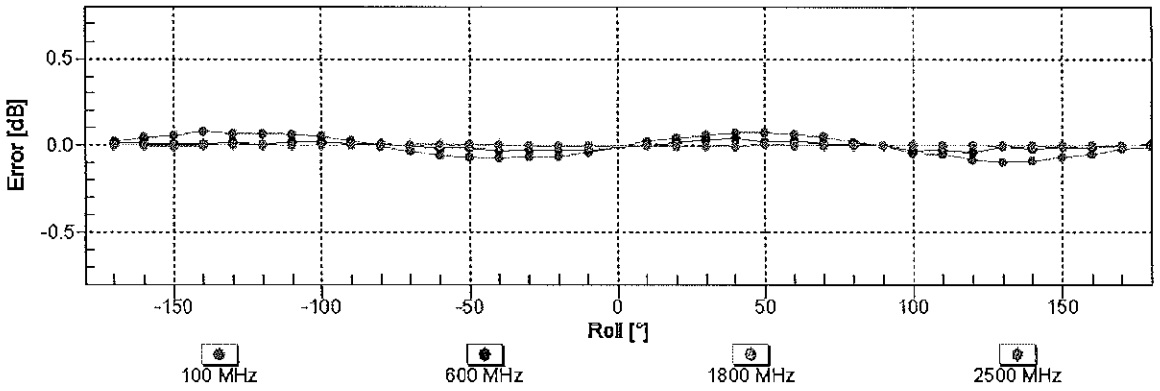
Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM



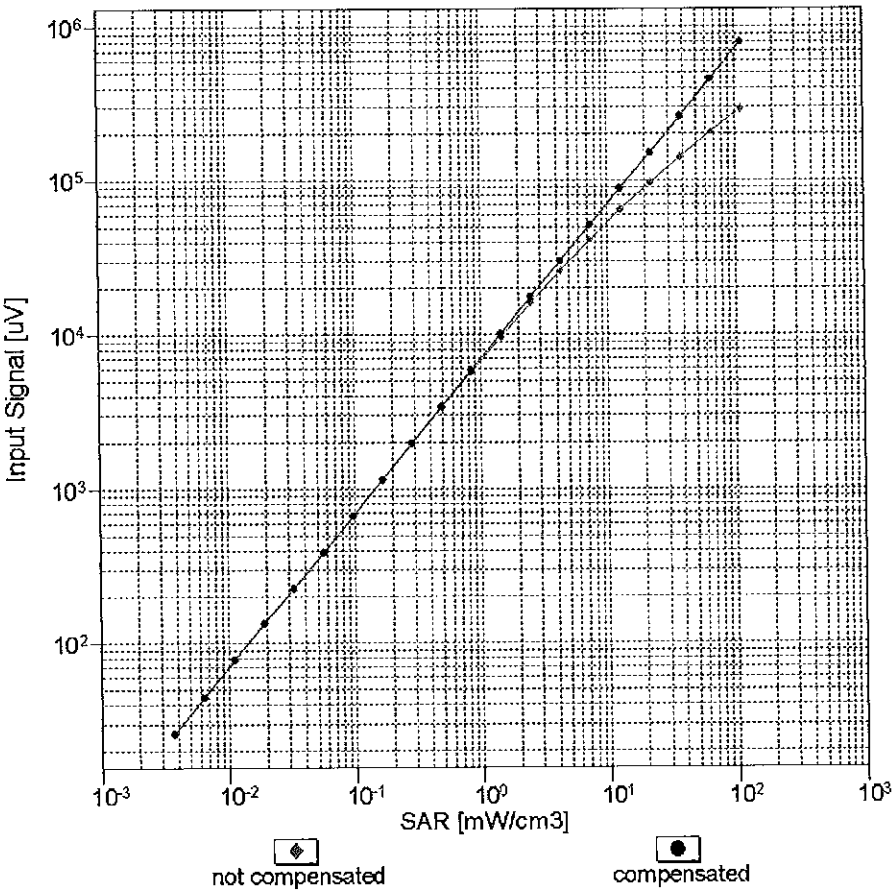
f=1800 MHz,R22

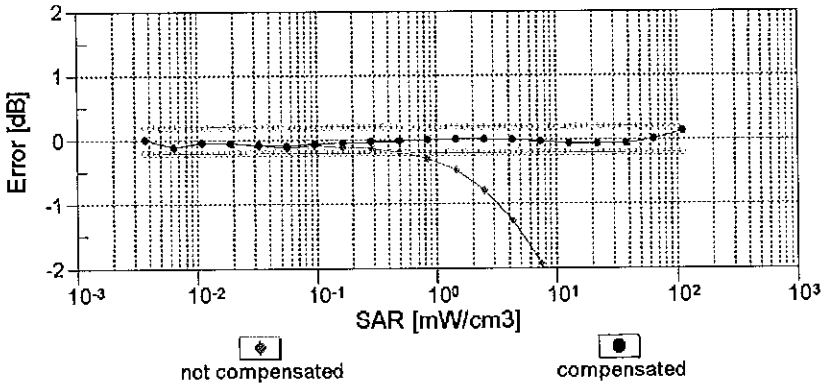




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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

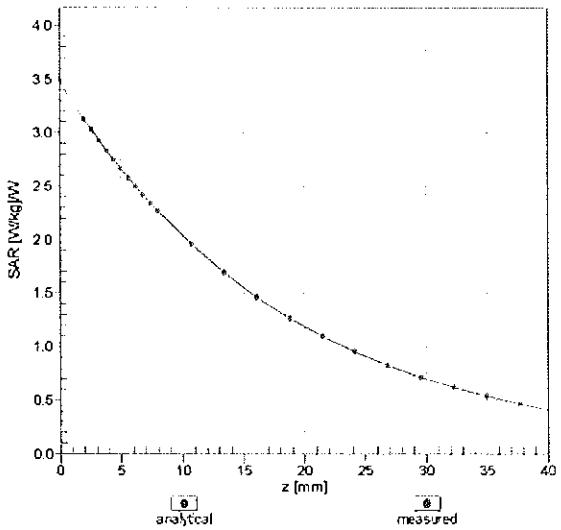




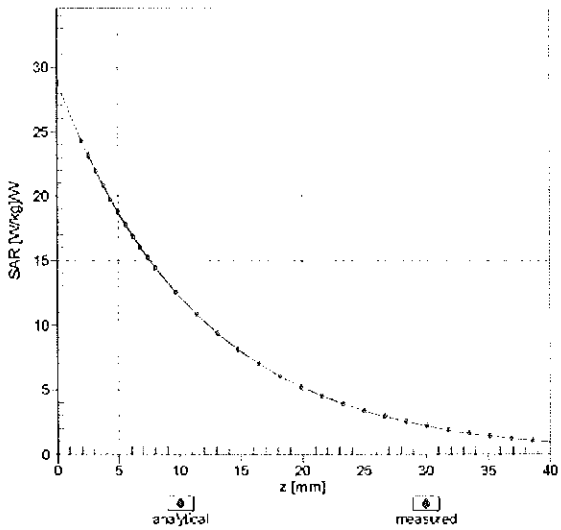
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

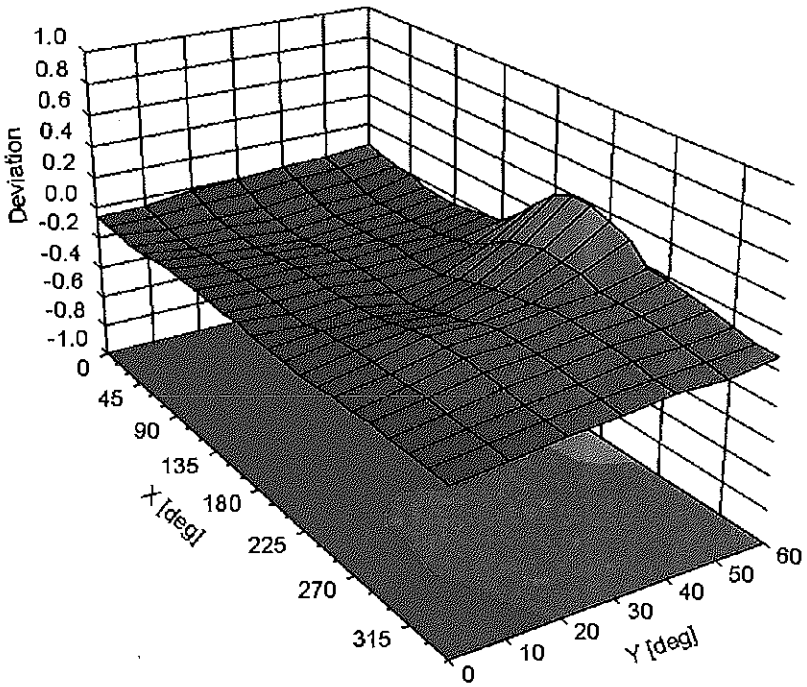


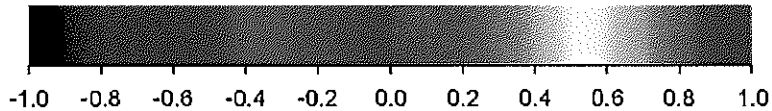
f = 1900 MHz,WGLS R22 (H_convF)



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:3332

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	50
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

Appendix: Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max Unc[E] (k=2)
0	CW	X	0.00	0.00	1.00	0.00	192.0	± 3.5 %
		Y	0.00	0.00	1.00		194.3	
		Z	0.00	0.00	1.00		179.9	
10010-CAA	SAR Validation (Square, 100ms, 10ms)	X	9.02	77.08	18.94	10.00	25.0	± 9.6 %
		Y	12.19	85.73	21.41		25.0	
		Z	23.02	95.31	23.86		25.0	
10011-CAB	UMTS-FDD (WCDMA)	X	1.60	76.05	19.77	0.00	150.0	± 9.6 %
		Y	1.08	68.15	15.73		150.0	
		Z	1.25	71.36	17.60		150.0	
10012-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.52	68.53	17.98	0.41	150.0	± 9.6 %
		Y	1.33	65.39	16.06		150.0	
		Z	1.37	66.35	16.79		150.0	
10013-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	X	5.37	67.71	17.82	1.46	150.0	± 9.6 %
		Y	5.07	67.50	17.57		150.0	
		Z	4.99	67.81	17.71		150.0	
10021-DAC	GSM-FDD (TDMA, GMSK)	X	11.16	81.48	22.11	9.39	50.0	± 9.6 %
		Y	61.59	115.23	32.13		50.0	
		Z	100.00	122.78	33.35		50.0	
10023-DAC	GPRS-FDD (TDMA, GMSK, TN 0)	X	11.07	81.20	22.06	9.57	50.0	± 9.6 %
		Y	43.11	109.07	30.52		50.0	
		Z	100.00	122.63	33.33		50.0	
10024-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	12.88	85.34	22.06	6.56	60.0	± 9.6 %
		Y	100.00	120.15	31.36		60.0	
		Z	100.00	120.25	30.99		60.0	
10025-DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	19.49	99.22	36.41	12.57	50.0	± 9.6 %
		Y	15.67	100.74	38.44		50.0	
		Z	29.43	124.69	47.97		50.0	
10026-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	X	18.92	96.32	32.19	9.56	60.0	± 9.6 %
		Y	17.33	101.02	35.08		60.0	
		Z	24.89	113.23	39.81		60.0	
10027-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	24.19	95.70	24.33	4.80	80.0	± 9.6 %
		Y	100.00	119.30	30.03		80.0	
		Z	100.00	120.36	30.17		80.0	
10028-DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	115.36	28.49	3.55	100.0	± 9.6 %
		Y	100.00	119.83	29.45		100.0	
		Z	100.00	122.10	30.18		100.0	
10029-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	16.27	93.78	30.32	7.80	80.0	± 9.6 %
		Y	11.67	92.24	30.90		80.0	
		Z	13.37	97.80	33.46		80.0	
10030-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	X	15.68	88.86	22.54	5.30	70.0	± 9.6 %
		Y	100.00	118.49	29.99		70.0	
		Z	100.00	118.88	29.80		70.0	
10031-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	100.00	116.01	27.12	1.88	100.0	± 9.6 %
		Y	100.00	121.13	28.42		100.0	
		Z	100.00	126.03	30.32		100.0	

10032-CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	X	100.00	119.38	27.36	1.17	100.0	± 9.6 %
		Y	100.00	126.54	29.58		100.0	
		Z	100.00	136.16	33.43		100.0	
10033-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	X	13.27	88.21	24.10	5.30	70.0	± 9.6 %
		Y	20.91	99.02	27.13		70.0	
		Z	58.05	115.59	31.27		70.0	
10034-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	X	16.18	96.67	25.44	1.88	100.0	± 9.6 %
		Y	10.83	91.57	22.94		100.0	
		Z	52.78	113.06	28.24		100.0	
10035-CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	X	12.45	95.04	24.79	1.17	100.0	± 9.6 %
		Y	5.49	83.70	20.10		100.0	
		Z	18.62	100.06	24.56		100.0	
10036-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	X	14.34	89.63	24.62	5.30	70.0	± 9.6 %
		Y	26.79	103.24	28.41		70.0	
		Z	95.10	123.67	33.30		70.0	
10037-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	X	15.98	96.45	25.32	1.88	100.0	± 9.6 %
		Y	9.62	89.98	22.43		100.0	
		Z	37.04	108.35	27.08		100.0	
10038-CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	X	13.91	96.94	25.41	1.17	100.0	± 9.6 %
		Y	5.69	84.50	20.47		100.0	
		Z	19.52	101.18	25.01		100.0	
10039-CAB	CDMA2000 (1xRTT, RC1)	X	3.28	80.46	20.53	0.00	150.0	± 9.6 %
		Y	1.92	73.09	15.89		150.0	
		Z	3.08	80.13	18.22		150.0	
10042-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	X	11.60	82.51	21.10	7.78	50.0	± 9.6 %
		Y	100.00	118.83	31.00		50.0	
		Z	100.00	118.47	30.39		50.0	
10044-CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	X	0.02	128.88	9.05	0.00	150.0	± 9.6 %
		Y	0.00	96.92	0.26		150.0	
		Z	0.02	60.00	140.78		150.0	
10048-CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	X	10.75	78.30	22.86	13.80	25.0	± 9.6 %
		Y	15.61	90.30	26.65		25.0	
		Z	32.75	104.57	30.45		25.0	
10049-CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	X	10.92	80.23	22.15	10.79	40.0	± 9.6 %
		Y	20.87	96.36	27.22		40.0	
		Z	64.62	115.72	32.06		40.0	
10056-CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	X	11.51	81.76	22.84	9.03	50.0	± 9.6 %
		Y	15.28	90.93	25.77		50.0	
		Z	25.94	101.11	28.65		50.0	
10058-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	14.19	91.88	29.00	6.55	100.0	± 9.6 %
		Y	8.68	86.53	28.09		100.0	
		Z	9.12	89.51	29.70		100.0	
10059-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	X	2.01	72.72	19.70	0.61	110.0	± 9.6 %
		Y	1.51	67.62	17.16		110.0	
		Z	1.56	68.78	17.99		110.0	
10060-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	100.00	126.29	32.07	1.30	110.0	± 9.6 %
		Y	100.00	132.71	34.39		110.0	
		Z	100.00	137.07	36.21		110.0	

10061-CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	X	36.66	112.50	30.92	2.04	110.0	± 9.6 %
		Y	11.07	98.15	27.76		110.0	
		Z	22.12	112.16	32.18		110.0	
10062-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	X	5.03	67.33	17.05	0.49	100.0	± 9.6 %
		Y	4.77	67.19	16.82		100.0	
		Z	4.70	67.51	16.97		100.0	
10063-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	X	5.09	67.56	17.23	0.72	100.0	± 9.6 %
		Y	4.81	67.36	16.96		100.0	
		Z	4.74	67.68	17.11		100.0	
10064-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	X	5.47	67.93	17.49	0.86	100.0	± 9.6 %
		Y	5.10	67.63	17.20		100.0	
		Z	5.00	67.90	17.32		100.0	
10065-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	X	5.40	68.08	17.70	1.21	100.0	± 9.6 %
		Y	5.02	67.68	17.39		100.0	
		Z	4.92	67.92	17.50		100.0	
10066-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	X	5.49	68.31	17.98	1.46	100.0	± 9.6 %
		Y	5.08	67.82	17.62		100.0	
		Z	4.97	68.04	17.73		100.0	
10067-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	X	5.84	68.47	18.45	2.04	100.0	± 9.6 %
		Y	5.42	68.13	18.14		100.0	
		Z	5.31	68.42	18.28		100.0	
10068-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	X	6.07	69.08	18.91	2.55	100.0	± 9.6 %
		Y	5.53	68.32	18.44		100.0	
		Z	5.39	68.51	18.54		100.0	
10069-CAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	X	6.13	68.90	19.06	2.67	100.0	± 9.6 %
		Y	5.61	68.37	18.66		100.0	
		Z	5.48	68.58	18.76		100.0	
10071-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	X	5.56	68.08	18.26	1.99	100.0	± 9.6 %
		Y	5.22	67.75	17.96		100.0	
		Z	5.14	68.03	18.10		100.0	
10072-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	X	5.71	68.87	18.66	2.30	100.0	± 9.6 %
		Y	5.28	68.28	18.29		100.0	
		Z	5.18	68.53	18.42		100.0	
10073-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	X	5.93	69.43	19.17	2.83	100.0	± 9.6 %
		Y	5.43	68.68	18.74		100.0	
		Z	5.32	68.95	18.89		100.0	
10074-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	X	6.04	69.75	19.56	3.30	100.0	± 9.6 %
		Y	5.49	68.80	18.99		100.0	
		Z	5.38	69.07	19.15		100.0	
10075-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	X	6.35	70.65	20.23	3.82	90.0	± 9.6 %
		Y	5.63	69.18	19.44		90.0	
		Z	5.49	69.37	19.56		90.0	
10076-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	X	6.37	70.50	20.38	4.15	90.0	± 9.6 %
		Y	5.68	69.10	19.63		90.0	
		Z	5.56	69.34	19.78		90.0	
10077-CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	X	6.43	70.65	20.50	4.30	90.0	± 9.6 %
		Y	5.73	69.22	19.75		90.0	
		Z	5.61	69.48	19.91		90.0	

10081-CAB	CDMA2000 (1xRTT, RC3)	X	1.62	75.66	18.40	0.00	150.0	± 9.6 %
		Y	0.87	66.71	12.69		150.0	
		Z	1.13	71.02	14.45		150.0	
10082-CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	X	3.53	66.20	10.93	4.77	80.0	± 9.6 %
		Y	2.19	64.40	9.18		80.0	
		Z	1.96	64.15	8.74		80.0	
10090-DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	X	12.79	85.25	22.06	6.56	60.0	± 9.6 %
		Y	100.00	120.23	31.42		60.0	
		Z	100.00	120.31	31.04		60.0	
10097-CAB	UMTS-FDD (HSDPA)	X	2.06	70.06	17.46	0.00	150.0	± 9.6 %
		Y	1.88	68.31	15.96		150.0	
		Z	2.04	70.38	16.98		150.0	
10098-CAB	UMTS-FDD (HSUPA, Subtest 2)	X	2.02	70.12	17.47	0.00	150.0	± 9.6 %
		Y	1.84	68.27	15.94		150.0	
		Z	2.00	70.37	16.98		150.0	
10099-DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	X	18.80	96.14	32.13	9.56	60.0	± 9.6 %
		Y	17.28	100.91	35.04		60.0	
		Z	24.81	113.10	39.77		60.0	
10100-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	3.84	73.61	18.19	0.00	150.0	± 9.6 %
		Y	3.15	70.58	16.91		150.0	
		Z	3.25	71.69	17.61		150.0	
10101-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	3.58	69.11	16.83	0.00	150.0	± 9.6 %
		Y	3.26	67.74	16.10		150.0	
		Z	3.26	68.29	16.47		150.0	
10102-CAD	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	3.66	68.88	16.84	0.00	150.0	± 9.6 %
		Y	3.36	67.71	16.19		150.0	
		Z	3.36	68.23	16.52		150.0	
10103-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	9.75	77.78	20.81	3.98	65.0	± 9.6 %
		Y	8.78	79.16	21.83		65.0	
		Z	9.34	81.38	22.82		65.0	
10104-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	9.87	77.22	21.49	3.98	65.0	± 9.6 %
		Y	8.42	77.09	21.77		65.0	
		Z	8.44	78.16	22.31		65.0	
10105-CAD	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	X	9.19	75.82	21.15	3.98	65.0	± 9.6 %
		Y	8.07	76.20	21.66		65.0	
		Z	8.27	77.70	22.41		65.0	
10108-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	3.37	72.69	18.02	0.00	150.0	± 9.6 %
		Y	2.75	69.90	16.77		150.0	
		Z	2.82	71.09	17.51		150.0	
10109-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	3.26	68.97	16.85	0.00	150.0	± 9.6 %
		Y	2.91	67.66	16.01		150.0	
		Z	2.92	68.36	16.42		150.0	
10110-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	2.79	71.81	17.85	0.00	150.0	± 9.6 %
		Y	2.23	69.12	16.39		150.0	
		Z	2.31	70.62	17.23		150.0	
10111-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	2.96	69.58	17.27	0.00	150.0	± 9.6 %
		Y	2.63	68.64	16.31		150.0	
		Z	2.69	69.84	16.85		150.0	

10112-CAE	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	3.36	68.71	16.80	0.00	150.0	± 9.6 %
		Y	3.03	67.66	16.06		150.0	
		Z	3.04	68.35	16.45		150.0	
10113-CAE	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	3.10	69.46	17.27	0.00	150.0	± 9.6 %
		Y	2.78	68.78	16.44		150.0	
		Z	2.83	69.92	16.93		150.0	
10114-CAB	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	5.34	67.65	16.76	0.00	150.0	± 9.6 %
		Y	5.17	67.50	16.64		150.0	
		Z	5.08	67.64	16.74		150.0	
10115-CAB	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	5.80	68.17	17.01	0.00	150.0	± 9.6 %
		Y	5.44	67.60	16.69		150.0	
		Z	5.33	67.71	16.77		150.0	
10116-CAB	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	5.47	67.90	16.79	0.00	150.0	± 9.6 %
		Y	5.25	67.68	16.65		150.0	
		Z	5.17	67.85	16.77		150.0	
10117-CAB	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	5.34	67.65	16.78	0.00	150.0	± 9.6 %
		Y	5.12	67.32	16.56		150.0	
		Z	5.07	67.59	16.73		150.0	
10118-CAB	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	5.79	68.04	16.95	0.00	150.0	± 9.6 %
		Y	5.52	67.82	16.81		150.0	
		Z	5.42	67.93	16.89		150.0	
10119-CAB	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	X	5.44	67.84	16.78	0.00	150.0	± 9.6 %
		Y	5.24	67.66	16.65		150.0	
		Z	5.17	67.84	16.77		150.0	
10140-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	3.72	68.86	16.76	0.00	150.0	± 9.6 %
		Y	3.39	67.72	16.10		150.0	
		Z	3.39	68.26	16.45		150.0	
10141-CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	3.82	68.79	16.84	0.00	150.0	± 9.6 %
		Y	3.51	67.83	16.27		150.0	
		Z	3.51	68.36	16.60		150.0	
10142-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	2.57	71.96	17.88	0.00	150.0	± 9.6 %
		Y	2.01	69.21	16.02		150.0	
		Z	2.13	71.18	16.95		150.0	
10143-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	2.89	70.53	17.42	0.00	150.0	± 9.6 %
		Y	2.49	69.45	15.95		150.0	
		Z	2.62	71.11	16.52		150.0	
10144-CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	2.69	68.52	16.05	0.00	150.0	± 9.6 %
		Y	2.23	66.92	14.20		150.0	
		Z	2.23	67.85	14.42		150.0	
10145-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	2.07	72.06	16.97	0.00	150.0	± 9.6 %
		Y	1.17	64.90	11.31		150.0	
		Z	1.08	64.84	10.72		150.0	
10146-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	4.64	77.66	18.95	0.00	150.0	± 9.6 %
		Y	1.89	66.33	11.57		150.0	
		Z	1.28	62.78	8.70		150.0	
10147-CAE	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	5.86	81.36	20.54	0.00	150.0	± 9.6 %
		Y	2.26	68.50	12.73		150.0	
		Z	1.39	63.59	9.24		150.0	

10149-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	3.27	69.03	16.89	0.00	150.0	± 9.6 %
		Y	2.92	67.72	16.06		150.0	
		Z	2.93	68.43	16.47		150.0	
10150-CAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	3.37	68.76	16.84	0.00	150.0	± 9.6 %
		Y	3.04	67.71	16.11		150.0	
		Z	3.05	68.41	16.50		150.0	
10151-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	9.88	78.98	21.39	3.98	65.0	± 9.6 %
		Y	9.54	82.00	22.98		65.0	
		Z	10.52	85.01	24.21		65.0	
10152-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	X	9.59	77.49	21.44	3.98	65.0	± 9.6 %
		Y	8.05	77.33	21.53		65.0	
		Z	8.15	78.63	22.11		65.0	
10153-CAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	X	9.88	78.01	21.96	3.98	65.0	± 9.6 %
		Y	8.51	78.32	22.28		65.0	
		Z	8.64	79.68	22.87		65.0	
10154-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	2.88	72.43	18.21	0.00	150.0	± 9.6 %
		Y	2.28	69.53	16.65		150.0	
		Z	2.36	71.01	17.47		150.0	
10155-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	2.96	69.57	17.27	0.00	150.0	± 9.6 %
		Y	2.63	68.66	16.33		150.0	
		Z	2.70	69.87	16.88		150.0	
10156-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	2.50	72.75	18.17	0.00	150.0	± 9.6 %
		Y	1.86	69.32	15.77		150.0	
		Z	2.00	71.53	16.72		150.0	
10157-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	2.58	69.56	16.46	0.00	150.0	± 9.6 %
		Y	2.07	67.52	14.21		150.0	
		Z	2.11	68.66	14.46		150.0	
10158-CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	3.11	69.51	17.31	0.00	150.0	± 9.6 %
		Y	2.79	68.85	16.49		150.0	
		Z	2.84	70.00	16.99		150.0	
10159-CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	2.70	69.94	16.71	0.00	150.0	± 9.6 %
		Y	2.17	67.94	14.47		150.0	
		Z	2.21	69.05	14.68		150.0	
10160-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	3.17	70.70	17.47	0.00	150.0	± 9.6 %
		Y	2.80	69.22	16.63		150.0	
		Z	2.84	70.27	17.24		150.0	
10161-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	3.25	68.62	16.80	0.00	150.0	± 9.6 %
		Y	2.93	67.68	16.03		150.0	
		Z	2.94	68.43	16.42		150.0	
10162-CAD	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	3.34	68.54	16.80	0.00	150.0	± 9.6 %
		Y	3.04	67.85	16.15		150.0	
		Z	3.05	68.62	16.54		150.0	
10166-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	4.29	71.19	20.11	3.01	150.0	± 9.6 %
		Y	3.58	69.86	19.45		150.0	
		Z	3.34	69.55	19.26		150.0	
10167-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	5.65	74.34	20.64	3.01	150.0	± 9.6 %
		Y	4.34	72.64	19.86		150.0	
		Z	3.97	72.28	19.65		150.0	

10168-CAE	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	6.08	75.90	21.58	3.01	150.0	± 9.6 %
		Y	4.83	75.01	21.26		150.0	
		Z	4.38	74.50	20.98		150.0	
10169-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	4.41	74.54	21.42	3.01	150.0	± 9.6 %
		Y	2.96	68.83	19.02		150.0	
		Z	2.72	67.99	18.57		150.0	
10170-CAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	6.70	80.82	23.44	3.01	150.0	± 9.6 %
		Y	3.91	74.17	21.18		150.0	
		Z	3.42	72.70	20.49		150.0	
10171-AAD	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	5.50	76.54	20.93	3.01	150.0	± 9.6 %
		Y	3.29	70.45	18.57		150.0	
		Z	2.94	69.58	18.14		150.0	
10172-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	25.76	101.07	30.32	6.02	65.0	± 9.6 %
		Y	18.45	102.75	32.10		65.0	
		Z	20.86	107.70	33.85		65.0	
10173-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	19.21	92.24	26.33	6.02	65.0	± 9.6 %
		Y	26.29	105.14	31.12		65.0	
		Z	28.49	108.55	32.12		65.0	
10174-CAD	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	17.46	89.68	25.13	6.02	65.0	± 9.6 %
		Y	21.35	100.13	29.12		65.0	
		Z	22.92	103.28	30.05		65.0	
10175-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	4.34	74.12	21.15	3.01	150.0	± 9.6 %
		Y	2.93	68.55	18.79		150.0	
		Z	2.70	67.77	18.36		150.0	
10176-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	6.71	80.84	23.45	3.01	150.0	± 9.6 %
		Y	3.92	74.20	21.19		150.0	
		Z	3.42	72.72	20.50		150.0	
10177-CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	4.38	74.32	21.26	3.01	150.0	± 9.6 %
		Y	2.95	68.69	18.87		150.0	
		Z	2.71	67.87	18.43		150.0	
10178-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	6.59	80.50	23.29	3.01	150.0	± 9.6 %
		Y	3.89	74.02	21.09		150.0	
		Z	3.41	72.61	20.43		150.0	
10179-CAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	6.03	78.45	22.01	3.01	150.0	± 9.6 %
		Y	3.58	72.24	19.76		150.0	
		Z	3.16	71.11	19.23		150.0	
10180-CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	5.47	76.42	20.86	3.01	150.0	± 9.6 %
		Y	3.28	70.40	18.53		150.0	
		Z	2.94	69.55	18.12		150.0	
10181-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	4.38	74.30	21.25	3.01	150.0	± 9.6 %
		Y	2.95	68.67	18.87		150.0	
		Z	2.71	67.86	18.43		150.0	
10182-CAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	6.58	80.48	23.29	3.01	150.0	± 9.6 %
		Y	3.88	74.00	21.08		150.0	
		Z	3.40	72.59	20.42		150.0	
10183-AAC	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	5.46	76.40	20.85	3.01	150.0	± 9.6 %
		Y	3.28	70.38	18.52		150.0	
		Z	2.93	69.53	18.11		150.0	

10184-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	4.39	74.34	21.27	3.01	150.0	± 9.6 %
		Y	2.96	68.71	18.89		150.0	
		Z	2.72	67.89	18.44		150.0	
10185-CAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	6.61	80.55	23.32	3.01	150.0	± 9.6 %
		Y	3.90	74.06	21.11		150.0	
		Z	3.42	72.64	20.45		150.0	
10186-AAD	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	5.49	76.46	20.88	3.01	150.0	± 9.6 %
		Y	3.29	70.44	18.55		150.0	
		Z	2.95	69.59	18.14		150.0	
10187-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	4.40	74.38	21.31	3.01	150.0	± 9.6 %
		Y	2.97	68.77	18.95		150.0	
		Z	2.73	67.95	18.51		150.0	
10188-CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	6.86	81.30	23.70	3.01	150.0	± 9.6 %
		Y	4.01	74.64	21.46		150.0	
		Z	3.49	73.09	20.74		150.0	
10189-AAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	5.63	76.95	21.16	3.01	150.0	± 9.6 %
		Y	3.36	70.82	18.81		150.0	
		Z	3.00	69.90	18.37		150.0	
10193-CAB	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	X	4.76	66.98	16.56	0.00	150.0	± 9.6 %
		Y	4.53	66.89	16.29		150.0	
		Z	4.48	67.27	16.46		150.0	
10194-CAB	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	X	4.98	67.40	16.66	0.00	150.0	± 9.6 %
		Y	4.70	67.19	16.42		150.0	
		Z	4.63	67.53	16.59		150.0	
10195-CAB	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	X	5.02	67.38	16.65	0.00	150.0	± 9.6 %
		Y	4.74	67.22	16.44		150.0	
		Z	4.67	67.55	16.61		150.0	
10196-CAB	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	4.79	67.12	16.61	0.00	150.0	± 9.6 %
		Y	4.53	66.94	16.30		150.0	
		Z	4.47	67.29	16.46		150.0	
10197-CAB	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	X	5.00	67.41	16.67	0.00	150.0	± 9.6 %
		Y	4.71	67.21	16.43		150.0	
		Z	4.64	67.54	16.60		150.0	
10198-CAB	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	X	5.02	67.39	16.66	0.00	150.0	± 9.6 %
		Y	4.74	67.23	16.45		150.0	
		Z	4.67	67.55	16.61		150.0	
10219-CAB	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	X	4.75	67.15	16.58	0.00	150.0	± 9.6 %
		Y	4.48	66.96	16.27		150.0	
		Z	4.43	67.33	16.43		150.0	
10220-CAB	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	X	5.00	67.42	16.67	0.00	150.0	± 9.6 %
		Y	4.70	67.17	16.42		150.0	
		Z	4.63	67.50	16.58		150.0	
10221-CAB	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	X	5.03	67.33	16.65	0.00	150.0	± 9.6 %
		Y	4.75	67.16	16.44		150.0	
		Z	4.68	67.49	16.60		150.0	
10222-CAB	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	X	5.32	67.70	16.79	0.00	150.0	± 9.6 %
		Y	5.10	67.32	16.56		150.0	
		Z	5.04	67.57	16.71		150.0	

10223-CAB	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	X	5.69	67.90	16.90	0.00	150.0	± 9.6 %
		Y	5.41	67.62	16.73		150.0	
		Z	5.32	67.79	16.83		150.0	
10224-CAB	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	X	5.40	67.86	16.79	0.00	150.0	± 9.6 %
		Y	5.14	67.44	16.54		150.0	
		Z	5.08	67.68	16.69		150.0	
10225-CAB	UMTS-FDD (HSPA+)	X	3.04	66.91	16.27	0.00	150.0	± 9.6 %
		Y	2.80	66.45	15.40		150.0	
		Z	2.79	67.13	15.62		150.0	
10226-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	19.62	92.68	26.54	6.02	65.0	± 9.6 %
		Y	28.14	106.53	31.60		65.0	
		Z	30.74	110.09	32.63		65.0	
10227-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	17.31	89.65	25.20	6.02	65.0	± 9.6 %
		Y	25.62	103.45	30.17		65.0	
		Z	27.71	106.63	31.05		65.0	
10228-CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	25.12	101.14	30.46	6.02	65.0	± 9.6 %
		Y	22.85	107.40	33.58		65.0	
		Z	23.56	110.42	34.69		65.0	
10229-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	X	19.21	92.22	26.33	6.02	65.0	± 9.6 %
		Y	26.37	105.18	31.14		65.0	
		Z	28.56	108.58	32.13		65.0	
10230-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	16.99	89.27	25.02	6.02	65.0	± 9.6 %
		Y	24.08	102.25	29.76		65.0	
		Z	25.76	105.25	30.60		65.0	
10231-CAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	24.47	100.57	30.23	6.02	65.0	± 9.6 %
		Y	21.54	106.10	33.13		65.0	
		Z	22.10	109.02	34.22		65.0	
10232-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	19.21	92.23	26.33	6.02	65.0	± 9.6 %
		Y	26.35	105.17	31.13		65.0	
		Z	28.56	108.59	32.14		65.0	
10233-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	X	16.99	89.29	25.03	6.02	65.0	± 9.6 %
		Y	24.05	102.24	29.76		65.0	
		Z	25.73	105.25	30.60		65.0	
10234-CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	23.75	99.87	29.94	6.02	65.0	± 9.6 %
		Y	20.44	104.88	32.66		65.0	
		Z	20.94	107.73	33.73		65.0	
10235-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	19.23	92.26	26.34	6.02	65.0	± 9.6 %
		Y	26.43	105.24	31.16		65.0	
		Z	28.68	108.68	32.16		65.0	
10236-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	17.05	89.34	25.04	6.02	65.0	± 9.6 %
		Y	24.28	102.38	29.79		65.0	
		Z	26.05	105.43	30.64		65.0	
10237-CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	24.65	100.72	30.28	6.02	65.0	± 9.6 %
		Y	21.67	106.26	33.17		65.0	
		Z	22.28	109.22	34.28		65.0	
10238-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	19.21	92.24	26.33	6.02	65.0	± 9.6 %
		Y	26.34	105.18	31.13		65.0	
		Z	28.55	108.60	32.14		65.0	

10239-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	17.00	89.31	25.04	6.02	65.0	± 9.6 %
		Y	24.00	102.22	29.75		65.0	
		Z	25.68	105.23	30.60		65.0	
10240-CAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	24.60	100.69	30.26	6.02	65.0	± 9.6 %
		Y	21.61	106.21	33.16		65.0	
		Z	22.24	109.18	34.27		65.0	
10241-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	14.83	87.15	27.43	6.98	65.0	± 9.6 %
		Y	11.87	87.25	27.69		65.0	
		Z	12.27	89.81	28.71		65.0	
10242-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	14.03	85.86	26.85	6.98	65.0	± 9.6 %
		Y	11.07	85.73	27.03		65.0	
		Z	11.88	89.15	28.39		65.0	
10243-CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	X	12.50	85.61	27.61	6.98	65.0	± 9.6 %
		Y	8.91	82.53	26.67		65.0	
		Z	9.40	85.62	28.06		65.0	
10244-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	10.84	80.28	21.46	3.98	65.0	± 9.6 %
		Y	8.60	79.06	19.82		65.0	
		Z	7.30	76.79	18.14		65.0	
10245-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	10.80	80.00	21.33	3.98	65.0	± 9.6 %
		Y	8.32	78.30	19.47		65.0	
		Z	7.01	75.95	17.75		65.0	
10246-CAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	10.19	81.67	21.72	3.98	65.0	± 9.6 %
		Y	9.19	82.92	21.40		65.0	
		Z	10.28	85.26	21.82		65.0	
10247-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	9.24	78.33	20.99	3.98	65.0	± 9.6 %
		Y	7.42	77.41	19.87		65.0	
		Z	7.44	78.18	19.81		65.0	
10248-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	9.29	78.02	20.88	3.98	65.0	± 9.6 %
		Y	7.28	76.69	19.57		65.0	
		Z	7.17	77.21	19.40		65.0	
10249-CAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	10.52	82.18	22.29	3.98	65.0	± 9.6 %
		Y	10.94	86.37	23.51		65.0	
		Z	13.59	90.89	24.82		65.0	
10250-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	9.84	79.38	22.27	3.98	65.0	± 9.6 %
		Y	8.59	80.24	22.59		65.0	
		Z	8.91	81.95	23.17		65.0	
10251-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	X	9.48	77.77	21.45	3.98	65.0	± 9.6 %
		Y	7.96	77.76	21.28		65.0	
		Z	8.06	79.03	21.69		65.0	
10252-CAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	10.35	81.23	22.32	3.98	65.0	± 9.6 %
		Y	10.67	85.75	24.25		65.0	
		Z	12.80	90.26	25.85		65.0	
10253-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	X	9.41	77.10	21.37	3.98	65.0	± 9.6 %
		Y	7.89	76.83	21.30		65.0	
		Z	7.98	78.11	21.82		65.0	
10254-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	X	9.73	77.64	21.86	3.98	65.0	± 9.6 %
		Y	8.31	77.74	21.96		65.0	
		Z	8.42	79.03	22.48		65.0	

10255-CAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	X	9.76	78.98	21.63	3.98	65.0	± 9.6 %
		Y	9.21	81.58	22.99		65.0	
		Z	10.10	84.50	24.17		65.0	
10256-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	10.36	79.33	20.55	3.98	65.0	± 9.6 %
		Y	6.89	75.10	17.29		65.0	
		Z	5.38	71.84	15.02		65.0	
10257-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	10.33	78.98	20.36	3.98	65.0	± 9.6 %
		Y	6.60	74.15	16.79		65.0	
		Z	5.14	70.90	14.50		65.0	
10258-CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	9.84	80.89	21.06	3.98	65.0	± 9.6 %
		Y	6.93	77.80	18.67		65.0	
		Z	6.67	77.68	18.06		65.0	
10259-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	9.48	78.65	21.42	3.98	65.0	± 9.6 %
		Y	7.89	78.48	20.85		65.0	
		Z	8.05	79.67	21.05		65.0	
10260-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	9.52	78.48	21.39	3.98	65.0	± 9.6 %
		Y	7.84	78.08	20.70		65.0	
		Z	7.93	79.11	20.83		65.0	
10261-CAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	10.28	81.56	22.27	3.98	65.0	± 9.6 %
		Y	10.28	85.25	23.51		65.0	
		Z	12.40	89.51	24.85		65.0	
10262-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	9.83	79.35	22.25	3.98	65.0	± 9.6 %
		Y	8.56	80.18	22.55		65.0	
		Z	8.88	81.87	23.12		65.0	
10263-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	9.48	77.78	21.46	3.98	65.0	± 9.6 %
		Y	7.94	77.74	21.28		65.0	
		Z	8.05	79.01	21.68		65.0	
10264-CAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	10.32	81.15	22.28	3.98	65.0	± 9.6 %
		Y	10.57	85.55	24.15		65.0	
		Z	12.63	90.00	25.74		65.0	
10265-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	X	9.59	77.50	21.45	3.98	65.0	± 9.6 %
		Y	8.04	77.33	21.54		65.0	
		Z	8.14	78.63	22.11		65.0	
10266-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	9.89	78.01	21.96	3.98	65.0	± 9.6 %
		Y	8.50	78.31	22.27		65.0	
		Z	8.64	79.67	22.86		65.0	
10267-CAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	X	9.88	78.96	21.38	3.98	65.0	± 9.6 %
		Y	9.52	81.96	22.96		65.0	
		Z	10.50	84.95	24.19		65.0	
10268-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	9.95	76.96	21.54	3.98	65.0	± 9.6 %
		Y	8.52	76.88	21.79		65.0	
		Z	8.53	77.92	22.30		65.0	
10269-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	X	9.89	76.68	21.52	3.98	65.0	± 9.6 %
		Y	8.46	76.46	21.67		65.0	
		Z	8.45	77.44	22.15		65.0	
10270-CAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	9.66	77.24	20.86	3.98	65.0	± 9.6 %
		Y	8.81	78.78	21.90		65.0	
		Z	9.16	80.58	22.73		65.0	

10274-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	X	2.74	67.26	16.17	0.00	150.0	± 9.6 %
		Y	2.61	66.92	15.38		150.0	
		Z	2.66	67.94	15.80		150.0	
10275-CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	X	2.05	72.21	18.03	0.00	150.0	± 9.6 %
		Y	1.65	68.50	15.87		150.0	
		Z	1.80	70.74	17.08		150.0	
10277-CAA	PHS (QPSK)	X	8.03	72.61	16.76	9.03	50.0	± 9.6 %
		Y	5.31	69.07	13.45		50.0	
		Z	4.52	67.70	12.08		50.0	
10278-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	10.53	79.27	21.29	9.03	50.0	± 9.6 %
		Y	8.21	77.64	19.35		50.0	
		Z	7.62	76.93	18.36		50.0	
10279-CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	X	10.71	79.48	21.37	9.03	50.0	± 9.6 %
		Y	8.29	77.74	19.41		50.0	
		Z	7.68	77.01	18.42		50.0	
10290-AAB	CDMA2000, RC1, SO55, Full Rate	X	2.46	75.92	18.53	0.00	150.0	± 9.6 %
		Y	1.45	69.17	13.90		150.0	
		Z	1.74	72.52	15.01		150.0	
10291-AAB	CDMA2000, RC3, SO55, Full Rate	X	1.54	75.02	18.13	0.00	150.0	± 9.6 %
		Y	0.85	66.46	12.55		150.0	
		Z	1.09	70.54	14.22		150.0	
10292-AAB	CDMA2000, RC3, SO32, Full Rate	X	2.85	86.00	22.76	0.00	150.0	± 9.6 %
		Y	1.20	72.00	15.52		150.0	
		Z	3.37	86.48	20.58		150.0	
10293-AAB	CDMA2000, RC3, SO3, Full Rate	X	6.08	98.98	27.50	0.00	150.0	± 9.6 %
		Y	2.38	81.80	19.81		150.0	
		Z	91.77	132.75	32.89		150.0	
10295-AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	X	11.42	82.00	23.75	9.03	50.0	± 9.6 %
		Y	13.54	88.04	25.23		50.0	
		Z	20.14	95.71	27.34		50.0	
10297-AAC	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	X	3.39	72.81	18.09	0.00	150.0	± 9.6 %
		Y	2.76	70.00	16.84		150.0	
		Z	2.84	71.20	17.58		150.0	
10298-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	2.33	72.89	17.78	0.00	150.0	± 9.6 %
		Y	1.54	67.89	13.96		150.0	
		Z	1.61	69.51	14.40		150.0	
10299-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	4.61	76.96	19.19	0.00	150.0	± 9.6 %
		Y	2.70	70.48	14.61		150.0	
		Z	1.96	66.96	12.10		150.0	
10300-AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	3.49	71.59	16.26	0.00	150.0	± 9.6 %
		Y	1.91	65.24	11.36		150.0	
		Z	1.47	63.13	9.40		150.0	
10301-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	X	6.59	70.34	20.04	4.17	80.0	± 9.6 %
		Y	5.68	68.74	18.85		80.0	
		Z	5.70	69.67	19.26		80.0	
10302-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)	X	7.28	71.73	21.22	4.96	80.0	± 9.6 %
		Y	6.10	69.04	19.43		80.0	
		Z	6.04	69.77	19.77		80.0	

10303-AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	7.35	72.51	21.62	4.96	80.0	± 9.6 %
		Y	5.94	69.06	19.41		80.0	
		Z	5.89	69.82	19.76		80.0	
10304-AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	X	6.69	70.97	20.39	4.17	80.0	± 9.6 %
		Y	5.59	68.42	18.66		80.0	
		Z	5.56	69.20	19.00		80.0	
10305-AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	14.75	90.64	29.58	6.02	50.0	± 9.6 %
		Y	10.18	84.38	26.41		50.0	
		Z	10.30	85.54	26.72		50.0	
10306-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	9.44	79.58	25.56	6.02	50.0	± 9.6 %
		Y	7.33	75.98	23.40		50.0	
		Z	6.44	73.04	21.64		50.0	
10307-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	X	10.22	81.50	26.08	6.02	50.0	± 9.6 %
		Y	7.67	77.32	23.80		50.0	
		Z	7.49	77.77	23.93		50.0	
10308-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	X	10.67	82.66	26.55	6.02	50.0	± 9.6 %
		Y	7.93	78.29	24.23		50.0	
		Z	7.77	78.85	24.42		50.0	
10309-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	9.59	79.83	25.67	6.02	50.0	± 9.6 %
		Y	7.43	76.26	23.57		50.0	
		Z	6.50	73.23	21.79		50.0	
10310-AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	X	9.69	80.24	25.70	6.02	50.0	± 9.6 %
		Y	7.48	76.59	23.59		50.0	
		Z	7.35	77.19	23.79		50.0	
10311-AAC	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	3.76	71.88	17.62	0.00	150.0	± 9.6 %
		Y	3.12	69.22	16.46		150.0	
		Z	3.20	70.27	17.11		150.0	
10313-AAA	iDEN 1:3	X	8.04	75.55	17.71	6.99	70.0	± 9.6 %
		Y	8.89	81.65	20.17		70.0	
		Z	12.54	87.83	22.26		70.0	
10314-AAA	iDEN 1:6	X	10.06	79.94	21.38	10.00	30.0	± 9.6 %
		Y	12.66	89.89	25.48		30.0	
		Z	20.06	99.62	28.65		30.0	
10315-AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	1.30	67.68	17.69	0.17	150.0	± 9.6 %
		Y	1.18	64.90	15.80		150.0	
		Z	1.23	65.94	16.59		150.0	
10316-AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	X	4.90	67.26	16.78	0.17	150.0	± 9.6 %
		Y	4.64	67.10	16.54		150.0	
		Z	4.58	67.43	16.69		150.0	
10317-AAB	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	X	4.90	67.26	16.78	0.17	150.0	± 9.6 %
		Y	4.64	67.10	16.54		150.0	
		Z	4.58	67.43	16.69		150.0	
10400-AAC	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	5.01	67.47	16.66	0.00	150.0	± 9.6 %
		Y	4.68	67.24	16.42		150.0	
		Z	4.61	67.58	16.60		150.0	
10401-AAC	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	5.58	67.43	16.66	0.00	150.0	± 9.6 %
		Y	5.46	67.62	16.70		150.0	
		Z	5.29	67.47	16.64		150.0	

10402-AAC	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	X	5.90	68.07	16.80	0.00	150.0	± 9.6 %
		Y	5.66	67.67	16.59		150.0	
		Z	5.60	67.87	16.71		150.0	
10403-AAB	CDMA2000 (1xEV-DO, Rev. 0)	X	2.46	75.92	18.53	0.00	115.0	± 9.6 %
		Y	1.45	69.17	13.90		115.0	
		Z	1.74	72.52	15.01		115.0	
10404-AAB	CDMA2000 (1xEV-DO, Rev. A)	X	2.46	75.92	18.53	0.00	115.0	± 9.6 %
		Y	1.45	69.17	13.90		115.0	
		Z	1.74	72.52	15.01		115.0	
10406-AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	X	38.96	111.40	30.01	0.00	100.0	± 9.6 %
		Y	96.63	125.46	32.24		100.0	
		Z	100.00	123.89	30.87		100.0	
10410-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	79.33	113.95	29.40	3.23	80.0	± 9.6 %
		Y	100.00	123.80	32.02		80.0	
		Z	100.00	124.20	31.74		80.0	
10415-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	1.01	64.64	16.23	0.00	150.0	± 9.6 %
		Y	1.03	63.36	14.90		150.0	
		Z	1.08	64.37	15.69		150.0	
10416-AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	X	4.76	67.00	16.58	0.00	150.0	± 9.6 %
		Y	4.53	66.92	16.37		150.0	
		Z	4.48	67.28	16.53		150.0	
10417-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	X	4.76	67.00	16.58	0.00	150.0	± 9.6 %
		Y	4.53	66.92	16.37		150.0	
		Z	4.48	67.28	16.53		150.0	
10418-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	X	4.74	67.14	16.57	0.00	150.0	± 9.6 %
		Y	4.53	67.10	16.40		150.0	
		Z	4.48	67.49	16.59		150.0	
10419-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	X	4.77	67.10	16.59	0.00	150.0	± 9.6 %
		Y	4.55	67.04	16.39		150.0	
		Z	4.49	67.42	16.58		150.0	
10422-AAA	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	X	4.90	67.10	16.59	0.00	150.0	± 9.6 %
		Y	4.66	67.03	16.41		150.0	
		Z	4.60	67.38	16.58		150.0	
10423-AAA	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	X	5.14	67.54	16.75	0.00	150.0	± 9.6 %
		Y	4.81	67.33	16.51		150.0	
		Z	4.74	67.65	16.67		150.0	
10424-AAA	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	X	5.04	67.47	16.71	0.00	150.0	± 9.6 %
		Y	4.74	67.28	16.49		150.0	
		Z	4.66	67.61	16.65		150.0	
10425-AAA	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	X	5.61	67.86	16.86	0.00	150.0	± 9.6 %
		Y	5.36	67.59	16.69		150.0	
		Z	5.29	67.80	16.81		150.0	
10426-AAA	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	X	5.62	67.87	16.86	0.00	150.0	± 9.6 %
		Y	5.40	67.74	16.76		150.0	
		Z	5.31	67.91	16.86		150.0	

10427-AAA	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.65	67.92	16.88	0.00	150.0	± 9.6 %
		Y	5.39	67.63	16.70		150.0	
		Z	5.28	67.70	16.75		150.0	
10430-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.50	70.33	18.46	0.00	150.0	± 9.6 %
		Y	4.28	71.46	18.38		150.0	
		Z	4.28	72.32	18.56		150.0	
10431-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	4.56	67.66	16.75	0.00	150.0	± 9.6 %
		Y	4.19	67.51	16.33		150.0	
		Z	4.12	67.97	16.50		150.0	
10432-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.83	67.55	16.72	0.00	150.0	± 9.6 %
		Y	4.50	67.35	16.43		150.0	
		Z	4.43	67.74	16.61		150.0	
10433-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	5.06	67.54	16.75	0.00	150.0	± 9.6 %
		Y	4.75	67.32	16.51		150.0	
		Z	4.68	67.64	16.67		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.58	70.97	18.48	0.00	150.0	± 9.6 %
		Y	4.39	72.38	18.32		150.0	
		Z	4.42	73.36	18.48		150.0	
10435-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	73.07	112.66	29.06	3.23	80.0	± 9.6 %
		Y	100.00	123.60	31.93		80.0	
		Z	100.00	123.98	31.64		80.0	
10447-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.91	67.87	16.49	0.00	150.0	± 9.6 %
		Y	3.47	67.50	15.53		150.0	
		Z	3.41	68.08	15.62		150.0	
10448-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	X	4.36	67.43	16.61	0.00	150.0	± 9.6 %
		Y	4.04	67.29	16.20		150.0	
		Z	3.99	67.77	16.38		150.0	
10449-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	X	4.59	67.37	16.63	0.00	150.0	± 9.6 %
		Y	4.32	67.18	16.33		150.0	
		Z	4.27	67.58	16.51		150.0	
10450-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.75	67.29	16.62	0.00	150.0	± 9.6 %
		Y	4.52	67.08	16.36		150.0	
		Z	4.47	67.43	16.54		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	3.88	68.25	16.35	0.00	150.0	± 9.6 %
		Y	3.34	67.60	15.06		150.0	
		Z	3.25	68.08	15.03		150.0	
10456-AAA	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.45	68.48	17.01	0.00	150.0	± 9.6 %
		Y	6.28	68.20	16.88		150.0	
		Z	6.24	68.43	17.01		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.87	65.68	16.38	0.00	150.0	± 9.6 %
		Y	3.81	65.57	16.07		150.0	
		Z	3.81	65.98	16.26		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	3.63	67.17	15.82	0.00	150.0	± 9.6 %
		Y	3.13	66.82	14.32		150.0	
		Z	2.97	66.93	13.99		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	4.79	65.36	16.37	0.00	150.0	± 9.6 %
		Y	4.24	65.27	15.46		150.0	
		Z	4.13	65.72	15.38		150.0	

10460-AAA	UMTS-FDD (WCDMA, AMR)	X	1.54	79.74	21.99	0.00	150.0	± 9.6 %
		Y	0.95	69.06	16.64		150.0	
		Z	1.16	73.20	19.00		150.0	
10461-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	118.00	30.59	3.29	80.0	± 9.6 %
		Y	100.00	127.27	33.69		80.0	
		Z	100.00	128.13	33.61		80.0	
10462-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	108.76	26.18	3.23	80.0	± 9.6 %
		Y	100.00	111.69	26.26		80.0	
		Z	100.00	109.78	24.92		80.0	
10463-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	61.06	101.21	23.94	3.23	80.0	± 9.6 %
		Y	100.00	108.45	24.70		80.0	
		Z	9.38	82.48	17.38		80.0	
10464-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	116.66	29.84	3.23	80.0	± 9.6 %
		Y	100.00	125.35	32.64		80.0	
		Z	100.00	125.94	32.43		80.0	
10465-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	108.47	26.02	3.23	80.0	± 9.6 %
		Y	100.00	111.17	26.01		80.0	
		Z	44.16	100.58	22.73		80.0	
10466-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	42.58	96.75	22.75	3.23	80.0	± 9.6 %
		Y	42.99	98.93	22.41		80.0	
		Z	5.89	77.61	15.84		80.0	
10467-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	116.79	29.90	3.23	80.0	± 9.6 %
		Y	100.00	125.60	32.75		80.0	
		Z	100.00	126.22	32.56		80.0	
10468-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	108.56	26.07	3.23	80.0	± 9.6 %
		Y	100.00	111.35	26.09		80.0	
		Z	61.74	104.33	23.64		80.0	
10469-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	43.83	97.08	22.83	3.23	80.0	± 9.6 %
		Y	46.06	99.70	22.59		80.0	
		Z	6.04	77.89	15.93		80.0	
10470-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	116.81	29.90	3.23	80.0	± 9.6 %
		Y	100.00	125.63	32.76		80.0	
		Z	100.00	126.25	32.56		80.0	
10471-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	108.53	26.05	3.23	80.0	± 9.6 %
		Y	100.00	111.31	26.07		80.0	
		Z	61.64	104.26	23.61		80.0	
10472-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	44.10	97.14	22.84	3.23	80.0	± 9.6 %
		Y	46.39	99.73	22.59		80.0	
		Z	6.02	77.83	15.90		80.0	
10473-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	116.79	29.89	3.23	80.0	± 9.6 %
		Y	100.00	125.60	32.74		80.0	
		Z	100.00	126.23	32.55		80.0	
10474-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	108.54	26.05	3.23	80.0	± 9.6 %
		Y	100.00	111.32	26.07		80.0	
		Z	60.20	104.02	23.55		80.0	
10475-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	43.66	97.03	22.81	3.23	80.0	± 9.6 %
		Y	44.87	99.39	22.51		80.0	
		Z	5.94	77.72	15.87		80.0	

10477-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	100.00	108.43	26.00	3.23	80.0	± 9.6 %
		Y	100.00	111.14	25.99		80.0	
		Z	48.11	101.47	22.92		80.0	
10478-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	43.04	96.84	22.76	3.23	80.0	± 9.6 %
		Y	43.24	98.94	22.39		80.0	
		Z	5.86	77.55	15.80		80.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	18.43	95.26	26.62	3.23	80.0	± 9.6 %
		Y	47.63	113.17	30.89		80.0	
		Z	79.42	120.84	32.18		80.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	15.38	87.90	23.16	3.23	80.0	± 9.6 %
		Y	35.80	101.51	25.84		80.0	
		Z	33.10	99.76	24.57		80.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	14.20	86.14	22.35	3.23	80.0	± 9.6 %
		Y	23.64	94.76	23.60		80.0	
		Z	17.83	90.68	21.64		80.0	
10482-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	11.00	86.13	22.59	2.23	80.0	± 9.6 %
		Y	6.54	80.66	19.81		80.0	
		Z	10.00	86.91	21.46		80.0	
10483-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	11.81	84.53	22.26	2.23	80.0	± 9.6 %
		Y	9.59	82.56	20.08		80.0	
		Z	5.79	75.74	16.81		80.0	
10484-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	11.16	83.50	21.93	2.23	80.0	± 9.6 %
		Y	8.15	80.18	19.27		80.0	
		Z	5.05	73.86	16.10		80.0	
10485-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	11.03	86.44	23.15	2.23	80.0	± 9.6 %
		Y	6.87	82.16	21.41		80.0	
		Z	9.87	88.59	23.41		80.0	
10486-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	6.95	77.02	19.85	2.23	80.0	± 9.6 %
		Y	4.98	74.27	17.96		80.0	
		Z	5.53	76.50	18.48		80.0	
10487-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.82	76.43	19.65	2.23	80.0	± 9.6 %
		Y	4.85	73.54	17.65		80.0	
		Z	5.25	75.41	18.04		80.0	
10488-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.46	82.96	22.30	2.23	80.0	± 9.6 %
		Y	5.99	78.96	21.12		80.0	
		Z	6.82	82.33	22.47		80.0	
10489-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	6.62	75.52	19.96	2.23	80.0	± 9.6 %
		Y	4.91	73.20	18.90		80.0	
		Z	5.11	74.84	19.54		80.0	
10490-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.56	74.88	19.76	2.23	80.0	± 9.6 %
		Y	4.94	72.82	18.76		80.0	
		Z	5.10	74.33	19.33		80.0	
10491-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	7.98	78.75	20.93	2.23	80.0	± 9.6 %
		Y	5.56	75.73	20.09		80.0	
		Z	5.84	77.68	21.00		80.0	
10492-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	6.52	73.74	19.47	2.23	80.0	± 9.6 %
		Y	5.01	71.66	18.63		80.0	
		Z	5.04	72.68	19.10		80.0	

10493-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.52	73.38	19.36	2.23	80.0	± 9.6 %
		Y	5.05	71.42	18.55		80.0	
		Z	5.05	72.38	18.97		80.0	
10494-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.30	81.16	21.56	2.23	80.0	± 9.6 %
		Y	6.19	77.55	20.65		80.0	
		Z	6.63	79.81	21.68		80.0	
10495-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	6.75	74.54	19.74	2.23	80.0	± 9.6 %
		Y	5.09	72.10	18.86		80.0	
		Z	5.10	73.07	19.34		80.0	
10496-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.67	73.87	19.53	2.23	80.0	± 9.6 %
		Y	5.11	71.66	18.72		80.0	
		Z	5.11	72.57	19.16		80.0	
10497-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.58	84.00	21.43	2.23	80.0	± 9.6 %
		Y	4.27	74.12	16.39		80.0	
		Z	5.12	76.54	16.66		80.0	
10498-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	6.19	75.19	17.72	2.23	80.0	± 9.6 %
		Y	2.33	64.39	11.23		80.0	
		Z	1.83	62.54	9.68		80.0	
10499-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.08	74.60	17.40	2.23	80.0	± 9.6 %
		Y	2.20	63.55	10.68		80.0	
		Z	1.70	61.64	9.07		80.0	
10500-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.69	83.97	22.50	2.23	80.0	± 9.6 %
		Y	6.26	80.30	21.12		80.0	
		Z	7.99	85.23	22.80		80.0	
10501-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	6.73	76.14	19.79	2.23	80.0	± 9.6 %
		Y	4.97	73.89	18.33		80.0	
		Z	5.41	76.03	18.94		80.0	
10502-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.66	75.65	19.59	2.23	80.0	± 9.6 %
		Y	4.97	73.54	18.13		80.0	
		Z	5.36	75.51	18.67		80.0	
10503-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.33	82.74	22.21	2.23	80.0	± 9.6 %
		Y	5.90	78.70	21.01		80.0	
		Z	6.71	82.03	22.35		80.0	
10504-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	6.59	75.44	19.92	2.23	80.0	± 9.6 %
		Y	4.88	73.08	18.84		80.0	
		Z	5.07	74.71	19.47		80.0	
10505-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.52	74.79	19.72	2.23	80.0	± 9.6 %
		Y	4.91	72.71	18.70		80.0	
		Z	5.07	74.21	19.27		80.0	
10506-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.21	81.00	21.50	2.23	80.0	± 9.6 %
		Y	6.13	77.37	20.57		80.0	
		Z	6.56	79.62	21.60		80.0	
10507-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	6.72	74.48	19.71	2.23	80.0	± 9.6 %
		Y	5.07	72.03	18.82		80.0	
		Z	5.08	73.01	19.31		80.0	

10508-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.65	73.80	19.50	2.23	80.0	± 9.6 %
		Y	5.09	71.58	18.67		80.0	
		Z	5.09	72.48	19.12		80.0	
10509-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	8.15	77.43	20.26	2.23	80.0	± 9.6 %
		Y	5.99	74.82	19.62		80.0	
		Z	6.17	76.24	20.35		80.0	
10510-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	6.94	73.36	19.32	2.23	80.0	± 9.6 %
		Y	5.42	71.16	18.60		80.0	
		Z	5.37	71.81	18.97		80.0	
10511-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.87	72.87	19.19	2.23	80.0	± 9.6 %
		Y	5.44	70.83	18.50		80.0	
		Z	5.39	71.45	18.85		80.0	
10512-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.41	80.22	21.09	2.23	80.0	± 9.6 %
		Y	6.52	76.83	20.24		80.0	
		Z	6.84	78.58	21.10		80.0	
10513-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	7.03	74.19	19.61	2.23	80.0	± 9.6 %
		Y	5.36	71.56	18.76		80.0	
		Z	5.31	72.21	19.14		80.0	
10514-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	6.85	73.42	19.39	2.23	80.0	± 9.6 %
		Y	5.32	71.03	18.59		80.0	
		Z	5.27	71.61	18.94		80.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	0.98	65.05	16.44	0.00	150.0	± 9.6 %
		Y	1.00	63.56	14.97		150.0	
		Z	1.05	64.66	15.82		150.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	100.00	168.11	45.87	0.00	150.0	± 9.6 %
		Y	0.67	71.83	18.15		150.0	
		Z	1.04	80.65	22.82		150.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	0.96	70.11	18.69	0.00	150.0	± 9.6 %
		Y	0.85	65.61	15.70		150.0	
		Z	0.93	67.57	17.12		150.0	
10518-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	4.76	67.10	16.57	0.00	150.0	± 9.6 %
		Y	4.53	67.01	16.35		150.0	
		Z	4.47	67.38	16.53		150.0	
10519-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	5.02	67.44	16.72	0.00	150.0	± 9.6 %
		Y	4.70	67.22	16.46		150.0	
		Z	4.63	67.55	16.62		150.0	
10520-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.86	67.45	16.66	0.00	150.0	± 9.6 %
		Y	4.55	67.17	16.38		150.0	
		Z	4.48	67.50	16.54		150.0	
10521-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.79	67.47	16.66	0.00	150.0	± 9.6 %
		Y	4.48	67.16	16.36		150.0	
		Z	4.42	67.48	16.53		150.0	
10522-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.82	67.32	16.63	0.00	150.0	± 9.6 %
		Y	4.55	67.29	16.46		150.0	
		Z	4.47	67.62	16.63		150.0	

10523-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	X	4.69	67.31	16.53	0.00	150.0	± 9.6 %
		Y	4.44	67.17	16.32		150.0	
		Z	4.39	67.59	16.54		150.0	
10524-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	4.78	67.32	16.64	0.00	150.0	± 9.6 %
		Y	4.49	67.20	16.43		150.0	
		Z	4.42	67.57	16.62		150.0	
10525-AAA	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	X	4.72	66.35	16.23	0.00	150.0	± 9.6 %
		Y	4.49	66.26	16.02		150.0	
		Z	4.45	66.66	16.22		150.0	
10526-AAA	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	X	4.95	66.78	16.37	0.00	150.0	± 9.6 %
		Y	4.64	66.60	16.16		150.0	
		Z	4.58	66.96	16.34		150.0	
10527-AAA	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	4.86	66.80	16.35	0.00	150.0	± 9.6 %
		Y	4.57	66.56	16.10		150.0	
		Z	4.51	66.93	16.29		150.0	
10528-AAA	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	X	4.89	66.82	16.38	0.00	150.0	± 9.6 %
		Y	4.58	66.57	16.13		150.0	
		Z	4.52	66.94	16.32		150.0	
10529-AAA	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	X	4.89	66.82	16.38	0.00	150.0	± 9.6 %
		Y	4.58	66.57	16.13		150.0	
		Z	4.52	66.94	16.32		150.0	
10531-AAA	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	4.92	67.00	16.42	0.00	150.0	± 9.6 %
		Y	4.57	66.66	16.14		150.0	
		Z	4.49	66.99	16.31		150.0	
10532-AAA	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	X	4.76	66.93	16.40	0.00	150.0	± 9.6 %
		Y	4.43	66.51	16.07		150.0	
		Z	4.37	66.85	16.25		150.0	
10533-AAA	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	4.90	66.82	16.35	0.00	150.0	± 9.6 %
		Y	4.59	66.64	16.13		150.0	
		Z	4.53	67.03	16.33		150.0	
10534-AAA	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	5.38	66.99	16.41	0.00	150.0	± 9.6 %
		Y	5.14	66.65	16.20		150.0	
		Z	5.08	66.89	16.34		150.0	
10535-AAA	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	5.47	67.13	16.46	0.00	150.0	± 9.6 %
		Y	5.21	66.87	16.30		150.0	
		Z	5.13	67.05	16.42		150.0	
10536-AAA	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	5.32	67.12	16.45	0.00	150.0	± 9.6 %
		Y	5.08	66.81	16.25		150.0	
		Z	5.02	67.06	16.40		150.0	
10537-AAA	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	X	5.39	67.07	16.42	0.00	150.0	± 9.6 %
		Y	5.13	66.76	16.23		150.0	
		Z	5.08	67.03	16.39		150.0	
10538-AAA	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	5.52	67.19	16.52	0.00	150.0	± 9.6 %
		Y	5.21	66.77	16.27		150.0	
		Z	5.14	66.99	16.41		150.0	
10540-AAA	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	5.40	67.10	16.49	0.00	150.0	± 9.6 %
		Y	5.15	66.79	16.30		150.0	
		Z	5.07	66.96	16.41		150.0	

10541-AAA	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	5.41	67.10	16.49	0.00	150.0	± 9.6 %
		Y	5.12	66.64	16.21		150.0	
		Z	5.05	66.85	16.34		150.0	
10542-AAA	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	5.53	67.02	16.46	0.00	150.0	± 9.6 %
		Y	5.28	66.73	16.27		150.0	
		Z	5.21	66.95	16.40		150.0	
10543-AAA	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.65	67.09	16.50	0.00	150.0	± 9.6 %
		Y	5.35	66.75	16.31		150.0	
		Z	5.28	67.01	16.46		150.0	
10544-AAA	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.63	67.05	16.36	0.00	150.0	± 9.6 %
		Y	5.46	66.75	16.19		150.0	
		Z	5.42	66.95	16.31		150.0	
10545-AAA	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.85	67.43	16.48	0.00	150.0	± 9.6 %
		Y	5.67	67.24	16.39		150.0	
		Z	5.61	67.44	16.52		150.0	
10546-AAA	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.76	67.40	16.49	0.00	150.0	± 9.6 %
		Y	5.52	66.93	16.25		150.0	
		Z	5.45	67.09	16.35		150.0	
10547-AAA	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	5.86	67.50	16.53	0.00	150.0	± 9.6 %
		Y	5.59	67.00	16.28		150.0	
		Z	5.54	67.20	16.40		150.0	
10548-AAA	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	6.21	68.68	17.08	0.00	150.0	± 9.6 %
		Y	5.87	68.02	16.76		150.0	
		Z	5.72	67.95	16.76		150.0	
10550-AAA	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	5.77	67.31	16.45	0.00	150.0	± 9.6 %
		Y	5.57	67.05	16.32		150.0	
		Z	5.52	67.30	16.47		150.0	
10551-AAA	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.80	67.45	16.48	0.00	150.0	± 9.6 %
		Y	5.55	67.00	16.26		150.0	
		Z	5.45	67.07	16.32		150.0	
10552-AAA	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.69	67.19	16.37	0.00	150.0	± 9.6 %
		Y	5.47	66.81	16.17		150.0	
		Z	5.43	67.06	16.31		150.0	
10553-AAA	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.78	67.21	16.40	0.00	150.0	± 9.6 %
		Y	5.54	66.82	16.20		150.0	
		Z	5.48	67.01	16.32		150.0	
10554-AAB	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	6.03	67.43	16.45	0.00	150.0	± 9.6 %
		Y	5.89	67.12	16.28		150.0	
		Z	5.84	67.28	16.38		150.0	
10555-AAB	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	6.22	67.88	16.64	0.00	150.0	± 9.6 %
		Y	6.02	67.44	16.43		150.0	
		Z	5.95	67.54	16.50		150.0	
10556-AAB	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	6.20	67.79	16.59	0.00	150.0	± 9.6 %
		Y	6.04	67.49	16.44		150.0	
		Z	5.99	67.66	16.55		150.0	
10557-AAB	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	6.21	67.81	16.62	0.00	150.0	± 9.6 %
		Y	5.99	67.35	16.39		150.0	
		Z	5.93	67.50	16.49		150.0	

10558-AAB	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	6.28	68.03	16.75	0.00	150.0	± 9.6 %
		Y	6.04	67.52	16.49		150.0	
		Z	5.95	67.59	16.55		150.0	
10560-AAB	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	X	6.28	67.87	16.71	0.00	150.0	± 9.6 %
		Y	6.03	67.35	16.44		150.0	
		Z	5.96	67.49	16.53		150.0	
10561-AAB	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	6.18	67.80	16.71	0.00	150.0	± 9.6 %
		Y	5.96	67.36	16.48		150.0	
		Z	5.90	67.49	16.57		150.0	
10562-AAB	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	6.37	68.38	17.01	0.00	150.0	± 9.6 %
		Y	6.06	67.66	16.63		150.0	
		Z	5.96	67.67	16.66		150.0	
10563-AAB	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	X	6.58	68.54	17.02	0.00	150.0	± 9.6 %
		Y	6.18	67.65	16.59		150.0	
		Z	6.05	67.62	16.60		150.0	
10564-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	X	5.11	67.26	16.76	0.46	150.0	± 9.6 %
		Y	4.86	67.10	16.52		150.0	
		Z	4.80	67.44	16.68		150.0	
10565-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	X	5.41	67.77	17.08	0.46	150.0	± 9.6 %
		Y	5.08	67.53	16.83		150.0	
		Z	5.00	67.82	16.97		150.0	
10566-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	X	5.23	67.67	16.93	0.46	150.0	± 9.6 %
		Y	4.92	67.38	16.66		150.0	
		Z	4.84	67.67	16.80		150.0	
10567-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	X	5.26	68.03	17.24	0.46	150.0	± 9.6 %
		Y	4.95	67.77	17.01		150.0	
		Z	4.87	68.04	17.15		150.0	
10568-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	X	5.14	67.36	16.67	0.46	150.0	± 9.6 %
		Y	4.84	67.19	16.45		150.0	
		Z	4.75	67.49	16.60		150.0	
10569-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	X	5.19	68.02	17.24	0.46	150.0	± 9.6 %
		Y	4.92	67.92	17.11		150.0	
		Z	4.86	68.27	17.29		150.0	
10570-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	X	5.23	67.81	17.17	0.46	150.0	± 9.6 %
		Y	4.94	67.74	17.02		150.0	
		Z	4.86	68.06	17.18		150.0	
10571-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.68	70.36	18.73	0.46	130.0	± 9.6 %
		Y	1.37	66.32	16.49		130.0	
		Z	1.41	67.39	17.29		130.0	
10572-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.75	71.47	19.28	0.46	130.0	± 9.6 %
		Y	1.40	67.01	16.89		130.0	
		Z	1.45	68.17	17.74		130.0	
10573-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	100.00	142.31	37.38	0.46	130.0	± 9.6 %
		Y	5.69	99.12	27.30		130.0	
		Z	66.26	143.73	39.41		130.0	
10574-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	3.57	87.71	25.60	0.46	130.0	± 9.6 %
		Y	1.70	74.22	20.29		130.0	
		Z	1.88	76.94	21.86		130.0	

10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	4.95	67.19	16.89	0.46	130.0	± 9.6 %
		Y	4.69	67.03	16.64		130.0	
		Z	4.63	67.35	16.80		130.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	4.98	67.35	16.96	0.46	130.0	± 9.6 %
		Y	4.72	67.20	16.72		130.0	
		Z	4.66	67.55	16.88		130.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	5.24	67.69	17.13	0.46	130.0	± 9.6 %
		Y	4.90	67.46	16.87		130.0	
		Z	4.82	67.76	17.01		130.0	
10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	5.14	67.89	17.23	0.46	130.0	± 9.6 %
		Y	4.81	67.63	16.98		130.0	
		Z	4.73	67.92	17.12		130.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	4.94	67.39	16.68	0.46	130.0	± 9.6 %
		Y	4.58	66.91	16.29		130.0	
		Z	4.50	67.21	16.45		130.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	4.98	67.29	16.65	0.46	130.0	± 9.6 %
		Y	4.62	66.97	16.32		130.0	
		Z	4.54	67.27	16.48		130.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	5.07	68.07	17.23	0.46	130.0	± 9.6 %
		Y	4.72	67.70	16.95		130.0	
		Z	4.65	68.04	17.12		130.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	4.90	67.13	16.49	0.46	130.0	± 9.6 %
		Y	4.51	66.68	16.07		130.0	
		Z	4.43	67.00	16.24		130.0	
10583-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.95	67.19	16.89	0.46	130.0	± 9.6 %
		Y	4.69	67.03	16.64		130.0	
		Z	4.63	67.35	16.80		130.0	
10584-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.98	67.35	16.96	0.46	130.0	± 9.6 %
		Y	4.72	67.20	16.72		130.0	
		Z	4.66	67.55	16.88		130.0	
10585-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	5.24	67.69	17.13	0.46	130.0	± 9.6 %
		Y	4.90	67.46	16.87		130.0	
		Z	4.82	67.76	17.01		130.0	
10586-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	5.14	67.89	17.23	0.46	130.0	± 9.6 %
		Y	4.81	67.63	16.98		130.0	
		Z	4.73	67.92	17.12		130.0	
10587-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.94	67.39	16.68	0.46	130.0	± 9.6 %
		Y	4.58	66.91	16.29		130.0	
		Z	4.50	67.21	16.45		130.0	
10588-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.98	67.29	16.65	0.46	130.0	± 9.6 %
		Y	4.62	66.97	16.32		130.0	
		Z	4.54	67.27	16.48		130.0	
10589-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	5.07	68.07	17.23	0.46	130.0	± 9.6 %
		Y	4.72	67.70	16.95		130.0	
		Z	4.65	68.04	17.12		130.0	
10590-AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.90	67.13	16.49	0.46	130.0	± 9.6 %
		Y	4.51	66.68	16.07		130.0	
		Z	4.43	67.00	16.24		130.0	

10591-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	5.10	67.21	16.96	0.46	130.0	± 9.6 %
		Y	4.84	67.07	16.74		130.0	
		Z	4.77	67.39	16.89		130.0	
10592-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	5.29	67.56	17.07	0.46	130.0	± 9.6 %
		Y	4.98	67.40	16.87		130.0	
		Z	4.90	67.69	17.01		130.0	
10593-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	5.23	67.57	17.01	0.46	130.0	± 9.6 %
		Y	4.90	67.30	16.75		130.0	
		Z	4.82	67.59	16.88		130.0	
10594-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	5.28	67.68	17.13	0.46	130.0	± 9.6 %
		Y	4.96	67.47	16.91		130.0	
		Z	4.88	67.75	17.04		130.0	
10595-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	5.27	67.71	17.06	0.46	130.0	± 9.6 %
		Y	4.93	67.44	16.81		130.0	
		Z	4.85	67.75	16.96		130.0	
10596-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	5.21	67.70	17.06	0.46	130.0	± 9.6 %
		Y	4.86	67.44	16.81		130.0	
		Z	4.78	67.74	16.97		130.0	
10597-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	5.16	67.68	17.00	0.46	130.0	± 9.6 %
		Y	4.81	67.32	16.68		130.0	
		Z	4.73	67.61	16.83		130.0	
10598-AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	5.15	67.96	17.27	0.46	130.0	± 9.6 %
		Y	4.80	67.55	16.95		130.0	
		Z	4.72	67.82	17.08		130.0	
10599-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	5.77	67.84	17.13	0.46	130.0	± 9.6 %
		Y	5.52	67.58	16.96		130.0	
		Z	5.45	67.81	17.10		130.0	
10600-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	6.05	68.67	17.52	0.46	130.0	± 9.6 %
		Y	5.68	68.13	17.21		130.0	
		Z	5.58	68.26	17.30		130.0	
10601-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.85	68.16	17.28	0.46	130.0	± 9.6 %
		Y	5.55	67.80	17.06		130.0	
		Z	5.46	67.98	17.17		130.0	
10602-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	5.99	68.30	17.27	0.46	130.0	± 9.6 %
		Y	5.68	67.95	17.06		130.0	
		Z	5.60	68.17	17.19		130.0	
10603-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	6.09	68.64	17.55	0.46	130.0	± 9.6 %
		Y	5.74	68.19	17.31		130.0	
		Z	5.66	68.42	17.44		130.0	
10604-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.79	67.86	17.16	0.46	130.0	± 9.6 %
		Y	5.59	67.76	17.08		130.0	
		Z	5.54	68.06	17.25		130.0	
10605-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.90	68.15	17.31	0.46	130.0	± 9.6 %
		Y	5.67	68.01	17.21		130.0	
		Z	5.56	68.12	17.28		130.0	
10606-AAA	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	5.65	67.59	16.91	0.46	130.0	± 9.6 %
		Y	5.37	67.19	16.65		130.0	
		Z	5.33	67.51	16.83		130.0	

10607-AAA	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.92	66.49	16.57	0.46	130.0	± 9.6 %
		Y	4.68	66.39	16.37		130.0	
		Z	4.62	66.76	16.54		130.0	
10608-AAA	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	5.16	66.93	16.72	0.46	130.0	± 9.6 %
		Y	4.85	66.77	16.53		130.0	
		Z	4.77	67.10	16.69		130.0	
10609-AAA	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	5.06	66.87	16.62	0.46	130.0	± 9.6 %
		Y	4.74	66.62	16.36		130.0	
		Z	4.67	66.96	16.53		130.0	
10610-AAA	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	5.11	67.01	16.76	0.46	130.0	± 9.6 %
		Y	4.79	66.78	16.53		130.0	
		Z	4.72	67.11	16.69		130.0	
10611-AAA	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	5.05	66.92	16.66	0.46	130.0	± 9.6 %
		Y	4.71	66.59	16.38		130.0	
		Z	4.64	66.93	16.55		130.0	
10612-AAA	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	5.07	67.04	16.68	0.46	130.0	± 9.6 %
		Y	4.72	66.76	16.43		130.0	
		Z	4.64	67.09	16.61		130.0	
10613-AAA	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	5.09	66.98	16.60	0.46	130.0	± 9.6 %
		Y	4.71	66.61	16.29		130.0	
		Z	4.63	66.91	16.45		130.0	
10614-AAA	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	5.02	67.21	16.84	0.46	130.0	± 9.6 %
		Y	4.67	66.81	16.53		130.0	
		Z	4.59	67.11	16.69		130.0	
10615-AAA	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	5.05	66.70	16.43	0.46	130.0	± 9.6 %
		Y	4.71	66.43	16.16		130.0	
		Z	4.64	66.79	16.34		130.0	
10616-AAA	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	5.58	67.10	16.74	0.46	130.0	± 9.6 %
		Y	5.33	66.79	16.55		130.0	
		Z	5.25	67.00	16.67		130.0	
10617-AAA	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.66	67.25	16.77	0.46	130.0	± 9.6 %
		Y	5.41	67.04	16.65		130.0	
		Z	5.31	67.19	16.74		130.0	
10618-AAA	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	5.54	67.29	16.82	0.46	130.0	± 9.6 %
		Y	5.29	67.03	16.66		130.0	
		Z	5.22	67.24	16.78		130.0	
10619-AAA	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	5.56	67.09	16.66	0.46	130.0	± 9.6 %
		Y	5.30	66.81	16.48		130.0	
		Z	5.23	67.05	16.63		130.0	
10620-AAA	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.71	67.30	16.81	0.46	130.0	± 9.6 %
		Y	5.38	66.84	16.54		130.0	
		Z	5.30	67.04	16.67		130.0	
10621-AAA	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.66	67.28	16.90	0.46	130.0	± 9.6 %
		Y	5.39	66.98	16.73		130.0	
		Z	5.30	67.12	16.82		130.0	
10622-AAA	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.65	67.37	16.94	0.46	130.0	± 9.6 %
		Y	5.40	67.13	16.80		130.0	
		Z	5.30	67.22	16.87		130.0	

10623-AAA	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	5.58	67.14	16.73	0.46	130.0	± 9.6 %
		Y	5.28	66.65	16.43		130.0	
		Z	5.18	66.78	16.52		130.0	
10624-AAA	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.72	67.10	16.77	0.46	130.0	± 9.6 %
		Y	5.47	66.85	16.60		130.0	
		Z	5.38	67.03	16.70		130.0	
10625-AAA	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	6.05	67.87	17.19	0.46	130.0	± 9.6 %
		Y	5.77	67.66	17.06		130.0	
		Z	5.49	67.24	16.87		130.0	
10626-AAA	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.80	67.08	16.64	0.46	130.0	± 9.6 %
		Y	5.63	66.82	16.50		130.0	
		Z	5.57	66.99	16.60		130.0	
10627-AAA	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	6.05	67.56	16.82	0.46	130.0	± 9.6 %
		Y	5.90	67.51	16.81		130.0	
		Z	5.83	67.67	16.91		130.0	
10628-AAA	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.89	67.33	16.66	0.46	130.0	± 9.6 %
		Y	5.66	66.90	16.43		130.0	
		Z	5.58	67.01	16.51		130.0	
10629-AAA	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	6.01	67.46	16.71	0.46	130.0	± 9.6 %
		Y	5.74	67.00	16.48		130.0	
		Z	5.68	67.19	16.60		130.0	
10630-AAA	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	6.66	69.52	17.74	0.46	130.0	± 9.6 %
		Y	6.23	68.64	17.29		130.0	
		Z	5.99	68.32	17.17		130.0	
10631-AAA	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	6.51	69.16	17.72	0.46	130.0	± 9.6 %
		Y	6.05	68.21	17.27		130.0	
		Z	5.91	68.16	17.27		130.0	
10632-AAA	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	6.07	67.76	17.04	0.46	130.0	± 9.6 %
		Y	5.87	67.57	16.97		130.0	
		Z	5.81	67.79	17.10		130.0	
10633-AAA	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	6.04	67.71	16.86	0.46	130.0	± 9.6 %
		Y	5.71	67.04	16.54		130.0	
		Z	5.62	67.14	16.61		130.0	
10634-AAA	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	6.01	67.64	16.89	0.46	130.0	± 9.6 %
		Y	5.69	67.06	16.60		130.0	
		Z	5.63	67.23	16.71		130.0	
10635-AAA	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	5.88	66.99	16.33	0.46	130.0	± 9.6 %
		Y	5.57	66.39	16.00		130.0	
		Z	5.49	66.55	16.11		130.0	
10636-AAB	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	6.20	67.47	16.73	0.46	130.0	± 9.6 %
		Y	6.06	67.19	16.58		130.0	
		Z	6.01	67.33	16.67		130.0	
10637-AAB	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	6.43	68.00	16.96	0.46	130.0	± 9.6 %
		Y	6.23	67.63	16.79		130.0	
		Z	6.14	67.69	16.84		130.0	
10638-AAB	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	6.38	67.82	16.85	0.46	130.0	± 9.6 %
		Y	6.23	67.59	16.75		130.0	
		Z	6.16	67.71	16.83		130.0	

10639-AAB	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	6.40	67.91	16.95	0.46	130.0	± 9.6 %
		Y	6.18	67.47	16.73		130.0	
		Z	6.11	67.58	16.80		130.0	
10640-AAB	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	6.45	68.06	16.97	0.46	130.0	± 9.6 %
		Y	6.19	67.49	16.68		130.0	
		Z	6.09	67.54	16.73		130.0	
10641-AAB	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	6.42	67.72	16.82	0.46	130.0	± 9.6 %
		Y	6.26	67.48	16.70		130.0	
		Z	6.18	67.60	16.78		130.0	
10642-AAB	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	6.51	68.09	17.16	0.46	130.0	± 9.6 %
		Y	6.27	67.64	16.94		130.0	
		Z	6.19	67.74	17.01		130.0	
10643-AAB	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	6.33	67.78	16.92	0.46	130.0	± 9.6 %
		Y	6.13	67.39	16.71		130.0	
		Z	6.05	67.49	16.79		130.0	
10644-AAB	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	6.62	68.66	17.38	0.46	130.0	± 9.6 %
		Y	6.24	67.74	16.91		130.0	
		Z	6.11	67.69	16.91		130.0	
10645-AAB	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	6.82	68.76	17.37	0.46	130.0	± 9.6 %
		Y	6.42	67.94	16.97		130.0	
		Z	6.29	67.89	16.97		130.0	
10646-AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	22.37	99.45	32.18	9.30	60.0	± 9.6 %
		Y	34.93	118.52	39.50		60.0	
		Z	65.31	137.01	45.15		60.0	
10647-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	23.87	101.54	32.95	9.30	60.0	± 9.6 %
		Y	35.03	119.53	39.96		60.0	
		Z	61.92	136.93	45.35		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	1.11	70.04	15.37	0.00	150.0	± 9.6 %
		Y	0.68	63.85	10.64		150.0	
		Z	0.72	65.39	11.21		150.0	
10652-AAB	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	5.43	70.91	18.53	2.23	80.0	± 9.6 %
		Y	4.44	69.41	17.59		80.0	
		Z	4.46	70.35	17.94		80.0	
10653-AAB	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	5.75	69.79	18.37	2.23	80.0	± 9.6 %
		Y	4.85	68.29	17.59		80.0	
		Z	4.80	68.81	17.83		80.0	
10654-AAB	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	5.63	69.47	18.36	2.23	80.0	± 9.6 %
		Y	4.81	67.88	17.59		80.0	
		Z	4.76	68.31	17.81		80.0	
10655-AAB	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	5.69	69.55	18.41	2.23	80.0	± 9.6 %
		Y	4.87	67.81	17.62		80.0	
		Z	4.82	68.18	17.82		80.0	

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

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Accreditation No.: SCS 0108

Client **PC Test**

Certificate No: EX3-3914_Feb18

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3914

Calibration procedure(s): QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

BN ✓ 02-23-2018

Calibration date: February 14, 2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02525)	Apr-18
Reference 20 dB Attenuator	SN: S5277 (20x)	07-Apr-17 (No. 217-02528)	Apr-18
Reference Probe ES3DV2	SN: 3013	30-Dec-17 (No. ES3-3013_Dec17)	Dec-18
DAE4	SN: 660	21-Dec-17 (No. DAE4-660_Dec17)	Dec-18
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-16)	In house check: Jun-18
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-16)	In house check: Jun-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 14, 2018

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

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 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).