DUT: ZNFQ720VS; Type: Portable Handset; Serial: 02807

Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1745 MHz; Duty Cycle: 1:1 Medium: 1750 Body Medium parameters used (interpolated): $f = 1745 \text{ MHz}; \ \sigma = 1.486 \text{ S/m}; \ \epsilon_r = 51.666; \ \rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section; Space: 0.0 cm

Test Date: 06-03-2019; Ambient Temp: 22.8°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN3914; ConvF(7.89, 7.89, 7.89) @ 1745 MHz; Calibrated: 2/19/2019 Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/14/2019

Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646

Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

Mode: LTE Band 66 (AWS), Phablet SAR, Bottom Edge, Mid.ch 20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

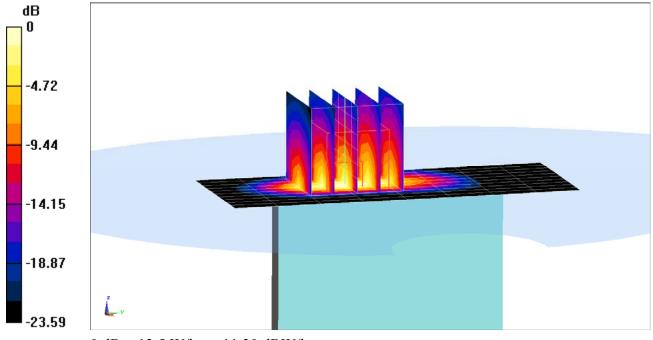
Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 73.33 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 16.5 W/kg

SAR(10 g) = 2.69 W/kg



0 dB = 13.5 W/kg = 11.30 dBW/kg

DUT: ZNFQ720VS; Type: Portable Handset; Serial: 02906

Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5280 MHz; Duty Cycle: 1:1 Medium: 5 GHz Body Medium parameters used: f = 5280 MHz; $\sigma = 5.441$ S/m; $\varepsilon_r = 47.288$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 0.0 cm

Test Date: 05-20-2019; Ambient Temp: 21.1°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7308; ConvF(4.48, 4.48, 4.48) @ 5280 MHz; Calibrated: 8/23/2018 Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10 (2):SEMCAD X Version 14.6.12 (7450)

Mode: IEEE 802.11a, U-NII-2A, 20 MHz Bandwidth, Phablet SAR, Ch 56, 6 Mbps, Back Side

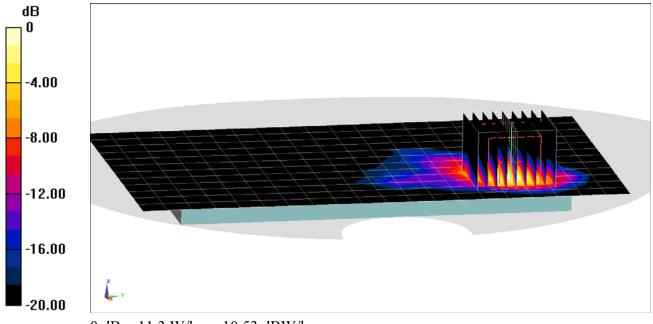
Area Scan (13x21x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 31.47 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 20.6 W/kg

SAR(10 g) = 1.39 W/kg



APPENDIX B: SYSTEM VERIFICATION

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

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1 Medium: 750 Head Medium parameters used (interpolated): f = 750 MHz; $\sigma = 0.913$ S/m; $\varepsilon_r = 42.614$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-30-2019; Ambient Temp: 23.1°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3914; ConvF(10, 10, 10) @ 750 MHz; Calibrated: 2/19/2019 Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAE4 Sn1272; Calibrated: 2/14/2019

Phantom: Left For Head SAM with CRP v5.0; Type: QD000P40CD; Serial: TP:1687 Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

750 MHz System Verification at 23.0 dBm (200 mW)

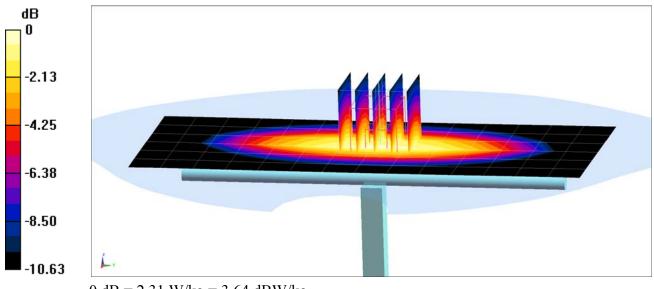
Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 2.62 W/kg

SAR(1 g) = 1.71 W/kg

Deviation(1 g) = 6.48%



0 dB = 2.31 W/kg = 3.64 dBW/kg

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; $\sigma = 0.882$ S/m; $\varepsilon_r = 39.692$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-23-2019; Ambient Temp: 21.1°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN7409; ConvF(9.67, 9.67, 9.67) @ 835 MHz; Calibrated: 6/25/2018 Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2018 Phantom: Left 30-SAM V5.0; Type: QD 000 P40 CD; Serial: 1715

Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

835 MHz System Verification at 23.0 dBm (200 mW)

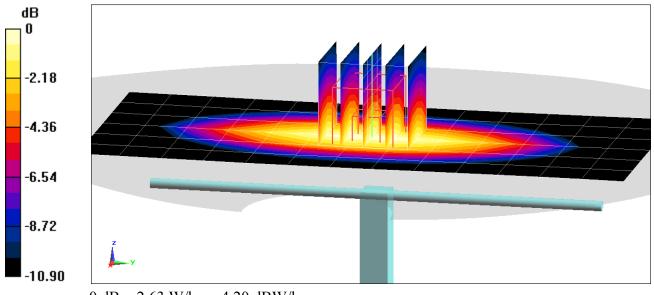
Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 2.98 W/kg

SAR(1 g) = 1.95 W/kg

Deviation(1 g) = 1.67%



0 dB = 2.63 W/kg = 4.20 dBW/kg

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1 Medium: 1750 Head; Medium parameters used: $f = 1750 \text{ MHz}; \ \sigma = 1.368 \text{ S/m}; \ \epsilon_r = 40.344; \ \rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-28-2019; Ambient Temp: 22.0°C; Tissue Temp: 21.0°C

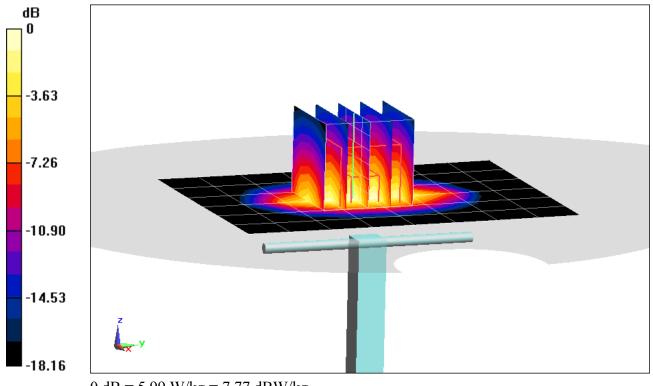
Probe: EX3DV4 - SN7357; ConvF(8.69, 8.69, 8.69) @ 1750 MHz; Calibrated: 4/24/2019 Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/18/2019
Phantom: Twin-SAM V5.0 Back Right; Type: QD 000 P40 CD; Serial: 1692
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

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) = 7.25 W/kgSAR(1 g) = 3.87 W/kgDeviation(1 g) = 6.91%



0 dB = 5.99 W/kg = 7.77 dBW/kg

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

Communication System: UID 10000, CW; Frequency: 1900 MHz; Duty Cycle: 1:1 Medium: 1900 Head Medium parameters used (interpolated): $f = 1900 \text{ MHz}; \ \sigma = 1.45 \text{ S/m}; \ \epsilon_r = 38.2; \ \rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-22-2019; Ambient Temp: 22.6°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7308; ConvF(8.26, 8.26, 8.26) @ 1900 MHz; Calibrated: 8/23/2018 Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 10/3/2018

Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966

Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

1900 MHz System Verification at 20.0 dBm (100 mW)

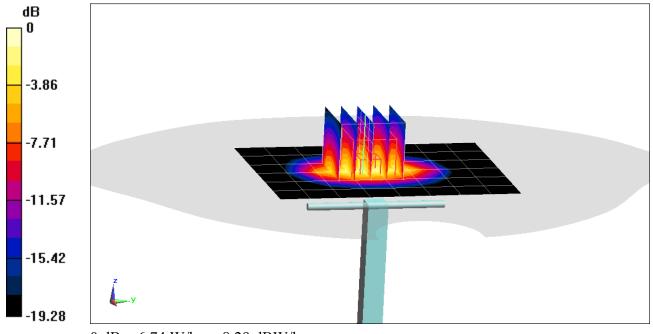
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 8.39 W/kg

SAR(1 g) = 4.21 W/kg

Deviation(1 g) = 5.78%



0 dB = 6.74 W/kg = 8.29 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; $\sigma = 1.448$ S/m; $\epsilon_r = 38.914$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-29-2019; Ambient Temp: 21.1°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7308; ConvF(8.26, 8.26, 8.26) @ 1900 MHz; Calibrated: 8/23/2018 Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966
Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

1900 MHz System Verification at 20.0 dBm (100 mW)

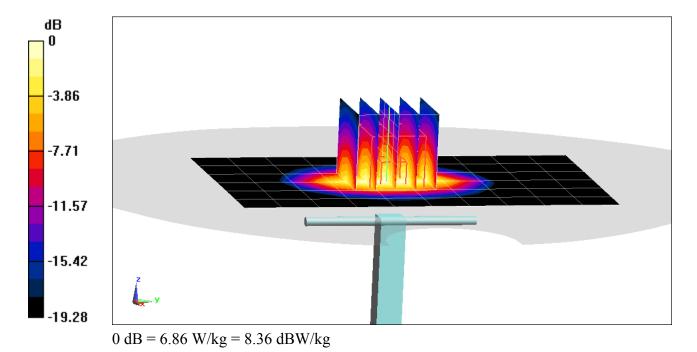
Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 8.55 W/kg

SAR(1 g) = 4.25 W/kg

Deviation(1 g) = 6.78%



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; $\sigma = 1.816$ S/m; $\varepsilon_r = 38.797$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-20-2019; Ambient Temp: 23.1°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3589; ConvF(6.46, 6.46, 6.46) @ 2450 MHz; Calibrated: 1/25/2019 Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1450; Calibrated: 8/22/2018

Phantom: Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1647 Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

2450 MHz System Verification at 20.0 dBm (100 mW)

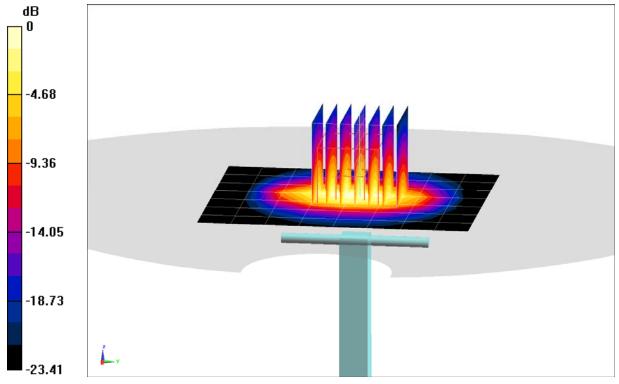
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 11.4 W/kg

SAR(1 g) = 5.28 W/kg

Deviation(1 g) = 0.19%



0 dB = 8.94 W/kg = 9.51 dBW/kg

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; $\sigma = 1.853$ S/m; $\varepsilon_r = 38.184$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-03-2019; Ambient Temp: 22.5°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN3589; ConvF(6.46, 6.46, 6.46) @ 2450 MHz; Calibrated: 1/25/2019 Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1450; Calibrated: 8/22/2018

Phantom: Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1647 Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

2450 MHz System Verification at 20.0 dBm (100 mW)

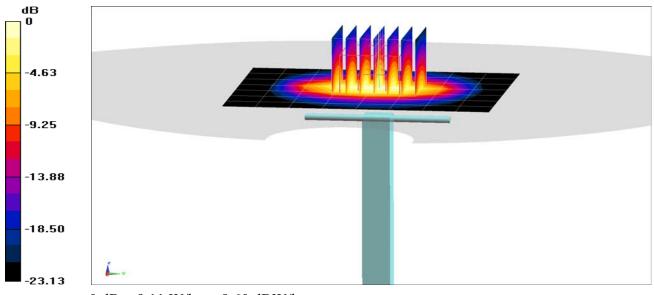
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 11.6 W/kg

SAR(1 g) = 5.34 W/kg

Deviation(1 g) = 1.33%



0 dB = 9.11 W/kg = 9.60 dBW/kg

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1191

Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1 Medium: 5GHz Head Medium parameters used (interpolated): f = 5250 MHz; $\sigma = 4.614 \text{ S/m}$; $\varepsilon_r = 35.413$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-03-2019; Ambient Temp: 19.8°C; Tissue Temp: 20.4°C

Probe: EX3DV4 - SN7409; ConvF(5.2, 5.2, 5.2) @ 5250 MHz; Calibrated: 6/25/2018

Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAE4 Sn1334; Calibrated: 6/18/2018

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759 Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

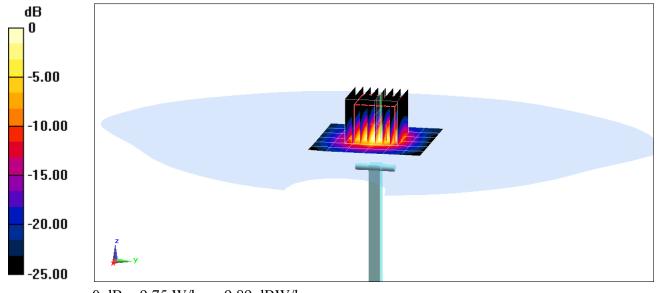
5250 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 16.1 W/kg

SAR(1 g) = 3.88 W/kg Deviation(1 g) = -1.65%



0 dB = 9.75 W/kg = 9.89 dBW/kg

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1191

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1 Medium: 5GHz Head Medium parameters used: f = 5600 MHz; $\sigma = 5.016$ S/m; $\varepsilon_r = 34.796$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-03-2019; Ambient Temp: 19.8°C; Tissue Temp: 20.4°C

Probe: EX3DV4 - SN7409; ConvF(4.77, 4.77, 4.77) @ 5600 MHz; Calibrated: 6/25/2018

Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAE4 Sn1334; Calibrated: 6/18/2018

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759 Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

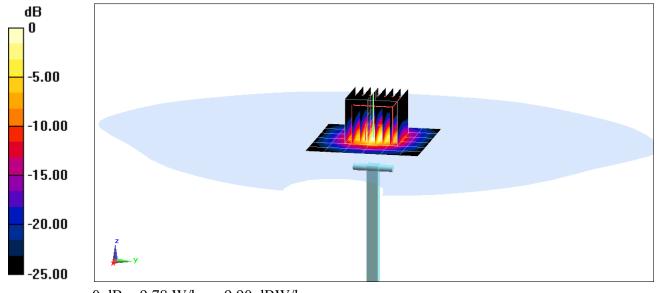
5600 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.3 W/kg

SAR(1 g) = 4.01 W/kg Deviation(1 g) = -4.07%



0 dB = 9.78 W/kg = 9.90 dBW/kg

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1191

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1 Medium: 5GHz Head Medium parameters used (interpolated): f = 5750 MHz; $\sigma = 5.198$ S/m; $\varepsilon_r = 34.517$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-03-2019; Ambient Temp: 19.8°C; Tissue Temp: 20.4°C

Probe: EX3DV4 - SN7409; ConvF(4.82, 4.82, 4.82) @ 5750 MHz; Calibrated: 6/25/2018

Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAE4 Sn1334; Calibrated: 6/18/2018

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759 Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

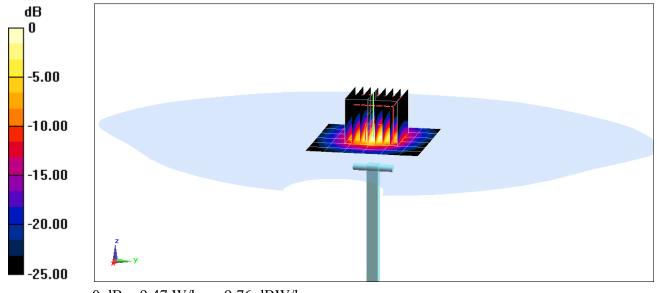
5750 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.0 W/kg

SAR(1 g) = 3.77 W/kg Deviation(1 g) = -4.68%



0 dB = 9.47 W/kg = 9.76 dBW/kg

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

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1 Medium: 750 Body; Medium parameters used (interpolated): f = 750 MHz; $\sigma = 0.937 \text{ S/m}$; $\epsilon_r = 56.986$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section; Space: 1.5 cm

Test Date: 05-20-2019; Ambient Temp: 22.4°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7357; ConvF(10.19, 10.19, 10.19) @ 750 MHz; Calibrated: 4/24/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAE4 Sn1407; Calibrated: 4/18/2019

Phantom: Twin-SAM V4.0 Front Right; Type: QD 000 P40 CC; Serial: 1167 Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

750 MHz System Verification at 23.0 dBm (200 mW)

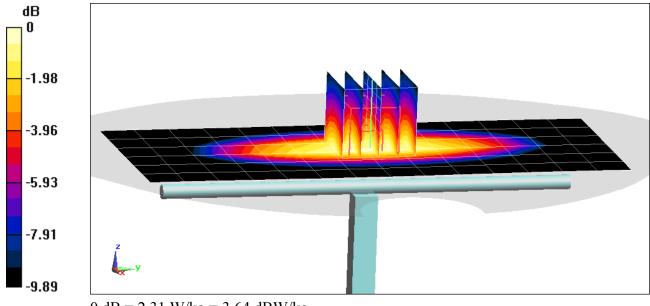
Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 2.60 W/kg

SAR(1 g) = 1.76 W/kg

Deviation(1 g) = 2.56%



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; $\sigma = 0.998$ S/m; $\epsilon_r = 53.285$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.5 cm

Test Date: 5-22-2019; Ambient Temp: 19.8°C; Tissue Temp: 20.1°C

Probe: EX3DV4 - SN7488; ConvF(11.03, 11.03, 11.03) @ 835 MHz; Calibrated: 1/24/2019 Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1530; Calibrated: 1/15/2019 Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

835 MHz System Verification at 23.0 dBm (200 mW)

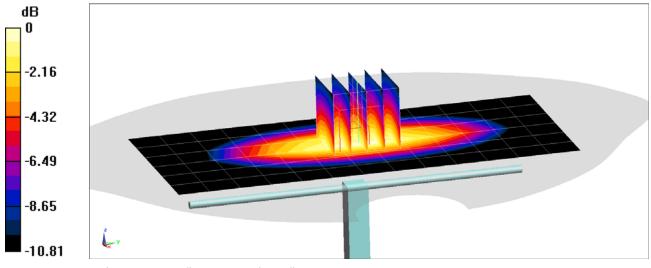
Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 2.97 W/kg

SAR(1 g) = 1.94 W/kg

Deviation(1 g) = 0.31%



0 dB = 2.61 W/kg = 4.17 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; $\sigma = 0.987$ S/m; $\epsilon_r = 53.895$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.5 cm

Test Date:5-27-2019; Ambient Temp: 20.2°C; Tissue Temp: 19.9°C

Probe: EX3DV4 - SN7488; ConvF(11.03, 11.03, 11.03) @ 835 MHz; Calibrated: 1/24/2019 Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1530; Calibrated: 1/15/2019
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1800

Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

835 MHz System Verification at 23.0 dBm (200 mW)

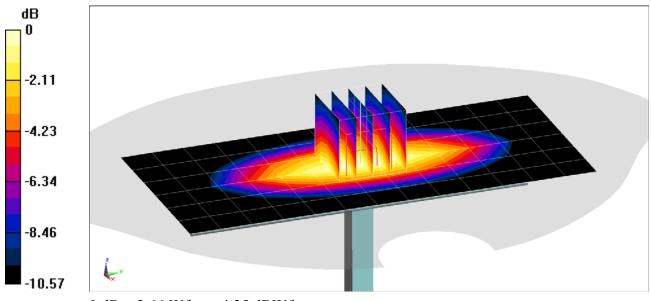
Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 3.03 W/kg

SAR(1 g) = 1.98 W/kg

Deviation(1 g) = 2.38%



0 dB = 2.66 W/kg = 4.25 dBW/kg

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1 Medium: 1750 Body Medium parameters used: f = 1750 MHz; $\sigma = 1.491$ S/m; $\varepsilon_r = 51.644$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-03-2019; Ambient Temp: 22.8°C; Tissue Temp: 21.8°C

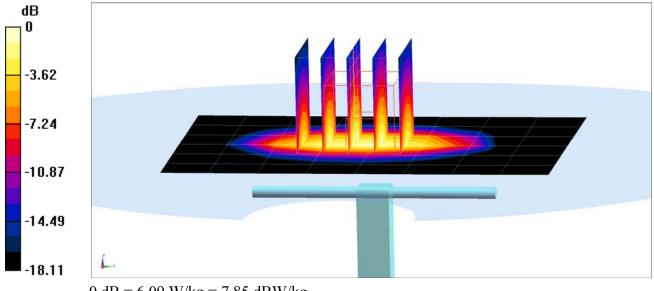
Probe: EX3DV4 - SN3914; ConvF(7.89, 7.89, 7.89) @ 1750 MHz; Calibrated: 2/19/2019 Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1272; Calibrated: 2/14/2019
Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: 1646
Measurement SW: DASY52, Version 52.10 (2);SEMCAD X Version 14.6.12 (7450)

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) = 7.36 W/kgSAR(1 g) = 3.95 W/kg; SAR(10 g) = 2.06 W/kgDeviation(1 g) = 5.61%; Deviation(10 g) = 3.52%



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): $f = 1900 \text{ MHz}; \ \sigma = 1.57 \text{ S/m}; \ \epsilon_r = 53.05; \ \rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 5-27-2019; Ambient Temp: 21.3°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN7410; ConvF(7.78, 7.78, 7.78) @ 1900 MHz; Calibrated: 7/20/2018

Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAE4 Sn1322; Calibrated: 7/11/2018

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

1900 MHz System Verification at 20.0 dBm (100 mW)

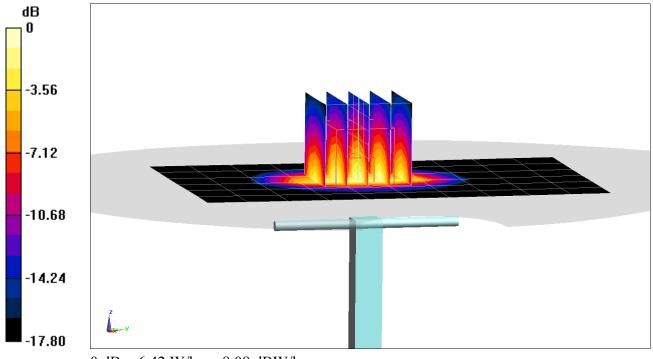
Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 7.59 W/kg

SAR(1 g) = 4.12 W/kg

Deviation(1 g) = 5.37%



0 dB = 6.42 W/kg = 8.08 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; $\sigma = 1.584$ S/m; $\epsilon_r = 52.248$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-29-2019; Ambient Temp: 23.1°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN7410; ConvF(7.78, 7.78, 7.78) @ 1900 MHz; Calibrated: 7/20/2018

Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAE4 Sn1322; Calibrated: 7/11/2018 Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

1900 MHz System Verification at 20.0 dBm (100 mW)

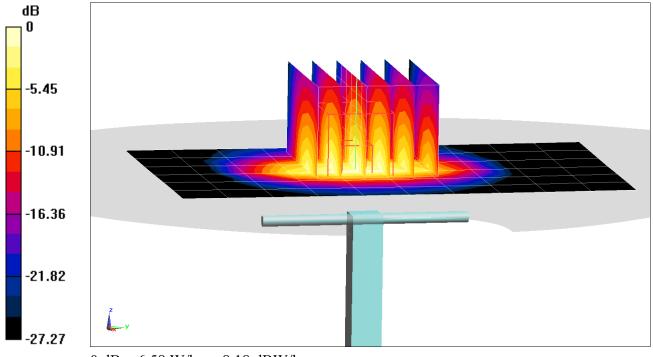
Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (7x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 7.75 W/kg

SAR(1 g) = 4.22 W/kg

Deviation(1 g) = 7.93%



0 dB = 6.58 W/kg = 8.18 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): $f = 1900 \text{ MHz}; \sigma = 1.577 \text{ S/m}; \varepsilon_r = 52.841; \rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06-03-2019; Ambient Temp: 21.9°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN7410; ConvF(7.78, 7.78, 7.78) @ 1900 MHz; Calibrated: 7/20/2018

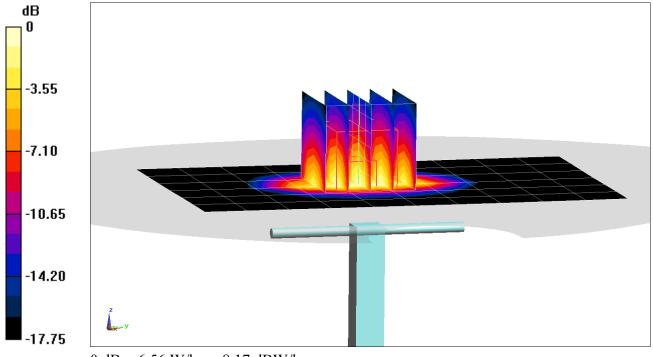
Sensor-Surface: 1.4mm (Mechanical Surface Detection) Electronics: DAE4 Sn1322; Calibrated: 7/11/2018

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

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) = 7.74 W/kgSAR(1 g) = 4.21 W/kgDeviation(1 g) = 7.67%



0 dB = 6.56 W/kg = 8.17 dBW/kg

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium: 2450 Body; Medium parameters used: f = 2450 MHz; $\sigma = 2.018$ S/m; $\varepsilon_r = 51.829$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-22-2019; Ambient Temp: 23.7°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN7417; ConvF(7.51, 7.51, 7.51) @ 2450 MHz; Calibrated: 2/19/2019 Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/13/2019

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

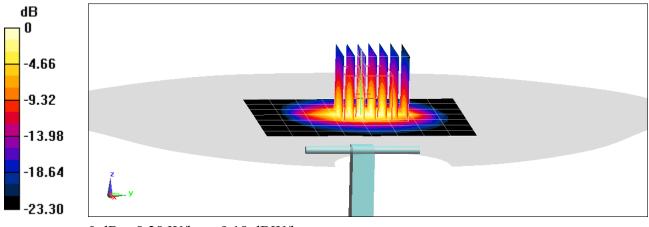
Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

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) = 10.3 W/kgSAR(1 g) = 4.95 W/kgDeviation(1 g) = -1.20%



DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1 Medium: 2450 Body; Medium parameters used: $f = 2450 \text{ MHz}; \ \sigma = 2.044 \text{ S/m}; \ \epsilon_r = 50.749; \ \rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-30-2019; Ambient Temp: 24.6°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN7417; ConvF(7.51, 7.51, 7.51) @ 2450 MHz; Calibrated: 2/19/2019 Sensor-Surface: 1.4mm (Mechanical Surface Detection)

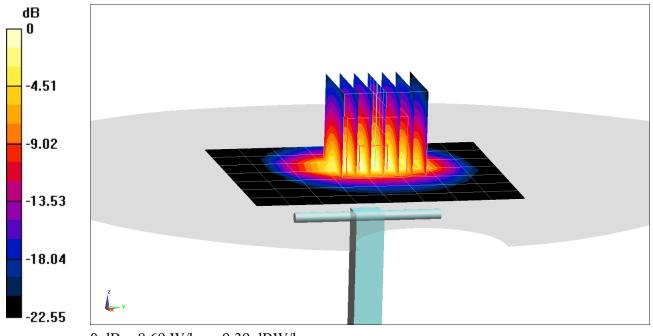
Electronics: DAE4 Sn665; Calibrated: 2/13/2019

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mmZoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mmPeak SAR (extrapolated) = 10.7 W/kg SAR(1 g) = 5.17 W/kg Deviation(1 g) = 3.19%



0 dB = 8.69 W/kg = 9.39 dBW/kg

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1057

Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1 Medium: 5 GHz Body Medium parameters used (interpolated): f = 5250 MHz; $\sigma = 5.404$ S/m; $\varepsilon_r = 47.332$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-20-2019; Ambient Temp: 21.1°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7308; ConvF(4.48, 4.48, 4.48) @ 5250 MHz; Calibrated: 8/23/2018 Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630

Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

5250 MHz System Verification at 17.0 dBm (50 mW)

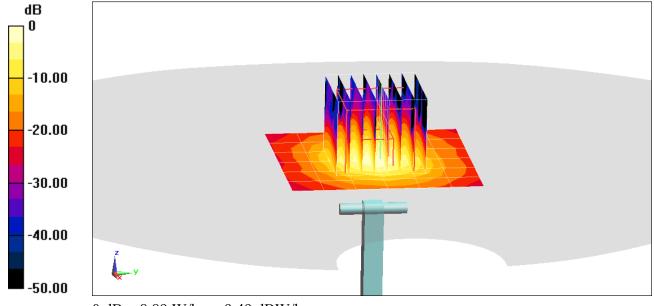
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 15.4 W/kg

SAR(1 g) = 3.77 W/kg; SAR(10 g) = 1.03 W/kg

Deviation(1 g) = -0.66%; Deviation(10 g) = -2.37%



0 dB = 8.89 W/kg = 9.49 dBW/kg

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1057

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1 Medium: 5 GHz Body Medium parameters used: f = 5600 MHz; $\sigma = 5.91$ S/m; $\varepsilon_r = 46.67$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-20-2019; Ambient Temp: 21.1°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7308; ConvF(4, 4, 4) @ 5600 MHz; Calibrated: 8/23/2018 Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1558; Calibrated: 10/3/2018
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630
Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

5600 MHz System Verification at 17.0 dBm (50 mW)

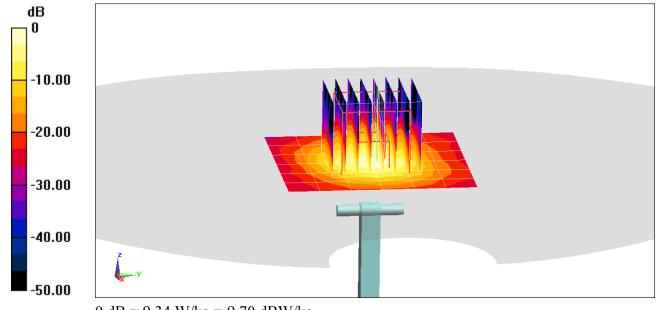
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 17.5 W/kg

SAR(1 g) = 3.87 W/kg; SAR(10 g) = 1.06 W/kg

Deviation(1 g) = -3.13%; Deviation(10 g) = -4.93%



DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1057

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1 Medium: 5 GHz Body Medium parameters used (interpolated): f = 5750 MHz; $\sigma = 6.137$ S/m; $\varepsilon_r = 46.401$; $\rho = 1000$ kg/m³ Phantom section: Flat Section; Space: 1.0 cm

Test Date: 05-20-2019; Ambient Temp: 21.1°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7308; ConvF(4.18, 4.18, 4.18) @ 5750 MHz; Calibrated: 8/23/2018 Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 10/3/2018

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630

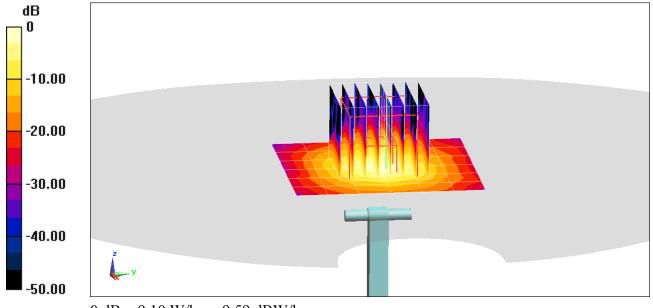
Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

5750 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 16.9 W/kgSAR(1 g) = 3.62 W/kg; SAR(10 g) = 1 W/kgDeviation(1 g) = -5.61%; Deviation(10 g) = -5.66%



APPENDIX C: PROBE CALIBRATION

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





Schweizerischer Kalibrierdienst Service suisse d'étalonnage

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

炒へ -01-25-2013

This callbration 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.

12/06/201

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 \pm 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)	Арг-18 Арг-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
Nelwork Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18
	Name	Function	Signature
Calibrated by:	Lelf Klysner	Laboratory Technician	Sed Wen
Approved by:	Kalja Pokovic	Technical Manager	leace.

Issued: January 15, 2018

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

Calibration Laboratory of

Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





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

Glossarv:

TSL

tissue simulating liquid

ConvF N/A

sensitivity in TSL / NORM x,y,z not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Measurement procedure for 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 cm ³ (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 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	8.58 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	5.71 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
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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 cm ³ (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 cm ³ (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 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.52 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Neck)

SAR averaged over 1 cm ³ (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 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.52 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Ear)

SAR averaged over 1 cm ³ (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 cm ³ (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)

DASY5 Validation Report 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; $\sigma = 0.9$ S/m; $\varepsilon_r = 40.9$; $\rho = 1000$ kg/m³

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:

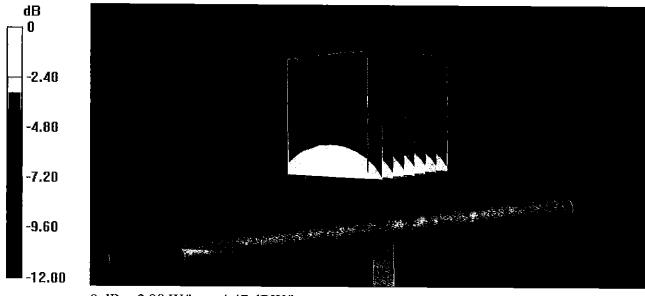
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 59.11 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.15 W/kg

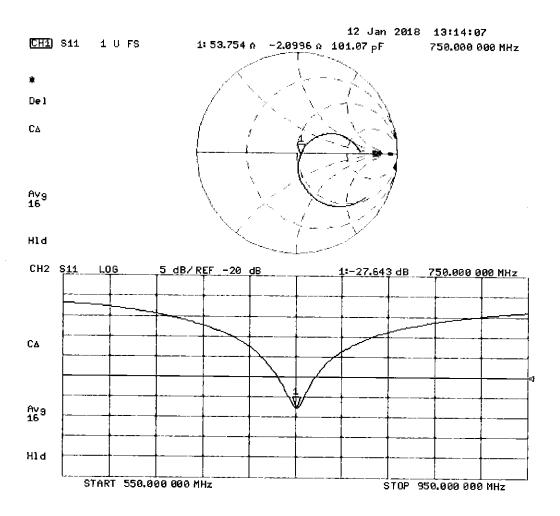
SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.37 W/kg

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



DASY5 Validation Report for Body 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; $\sigma = 0.96$ S/m; $\varepsilon_r = 55$; $\rho = 1000$ kg/m³

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:

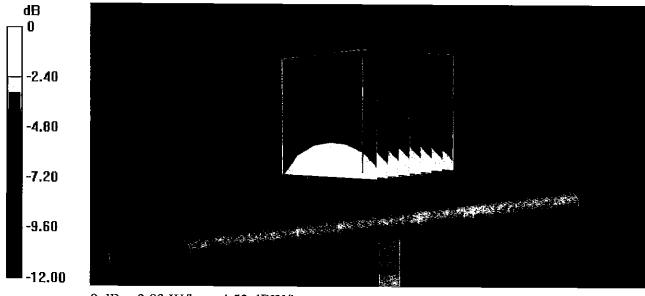
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.31 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.17 W/kg

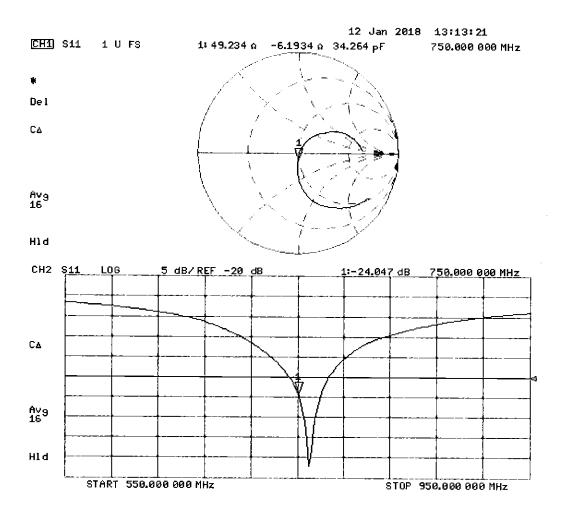
SAR(1 g) = 2.15 W/kg; SAR(10 g) = 1.43 W/kg

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



DASY5 Validation Report for SAM Head

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; $\sigma = 0.9$ S/m; $\varepsilon_r = 44.2$; $\rho = 1000$ kg/m³

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

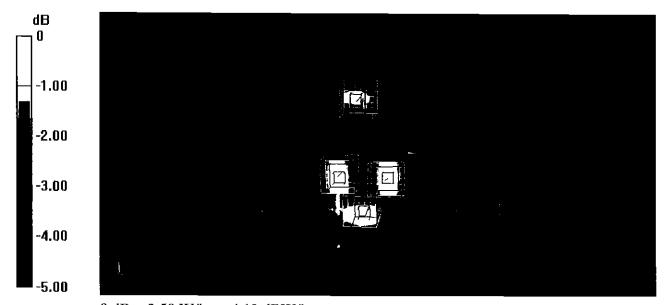
SAM Head/Ear/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

PCTEST ENGINEERING LABORATORY, INC.



7185 Oakland Mills Road, Columbia, MD 21046 USA Tel. +1.410.290.6652 / Fax +1.410.290.6654 http://www.pctest.com



Certification of Calibration

Object D750V3 – SN: 1003

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extension Calibration date: 1/15/2019

Description: SAR Validation Dipole at 750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	2/8/2018	Annual	2/8/2019	US39170122
Agilent	N5182A	MXG Vector Signal Generator	4/18/2018	Annual	4/18/2019	MY47420800
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1207364
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1339018
Anritsu	ML2495A	Power Meter	10/21/2018	Annual	10/21/2019	941001
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
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annual	6/4/2019	MY53401181
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Seekonk	NC-100	Torque Wrench	7/11/2018	Annual	7/11/2019	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/3/2018	Annual	10/3/2019	1558
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/18/2018	Annual	6/18/2019	1334
SPEAG	DAK-3.5	Dielectric Assessment Kit	9/11/2018	Annual	9/11/2019	1091
SPEAG	EX3DV4	SAR Probe	8/23/2018	Annual	8/23/2019	7308
SPEAG	EX3DV4	SAR Probe	6/25/2018	Annual	6/25/2019	7409

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODTE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	304

Object:	Date Issued:	Page 1 of 4
D750V3 - SN: 1003	01/15/2019	rage ror4

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:

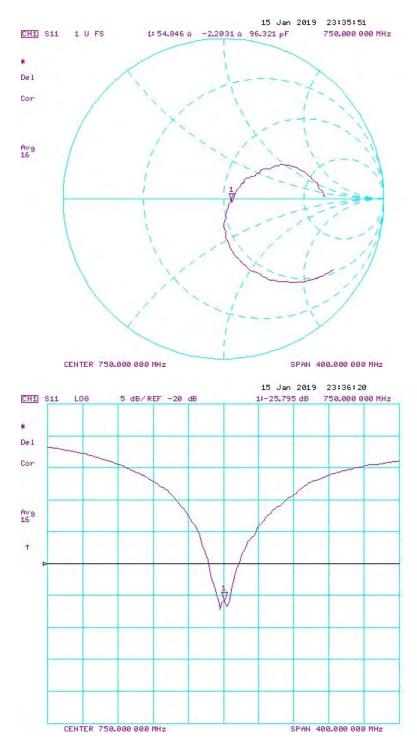
- 1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
- 2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
- 3. The measurement of real or imaginary parts of impedance 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	Head SAR (1g)	(0/)	Certificate SAR Target Head (10g) W/kg @ 23.0 dBm	Head SAR	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
1/15/2018	1/15/2019	1.043	1.656	1.75	5.68%	1.08	1.15	6.09%	53.8	54.8	1	-2.1	-2.2	0.1	-27.6	-25.8	6.50%	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	(96)	Certificate SAR Target Body (10g) W/kg @ 23.0 dBm	(10a) W/ka @	Deviation 10g (%)		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
1/15/2018	1/15/2019	1.043	1.716	1.84	7.23%	1.14	1.23	7.71%	49.2	49	0.2	-6.2	-5.1	1.1	-24	-25.6	-6.80%	PASS

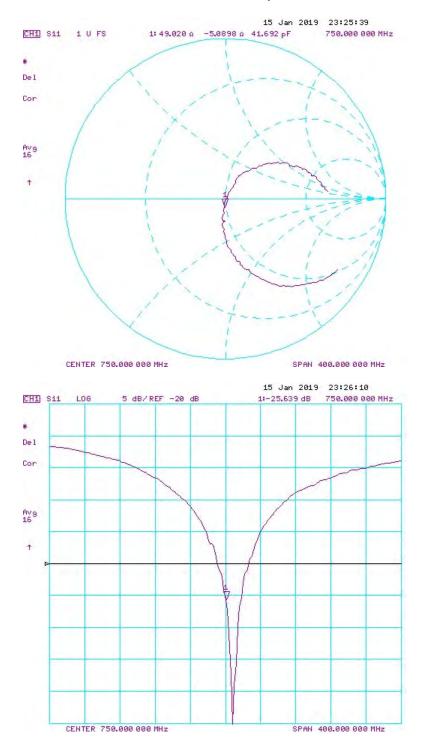
Object:	Date Issued:	Page 2 of 4
D750V3 - SN: 1003	01/15/2019	Fage 2 01 4

Impedance & Return-Loss Measurement Plot for Head TSL



Object:	Date Issued:	Page 2 of 4
D750V3 - SN: 1003	01/15/2019	Page 3 of 4

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

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Client

PC Test

Certificate No: D750V3-1161 Oct18

CALIBRATION CERTIFICATE

Object D750V3 - SN:1161

Calibration procedure(s) QA CAL-05.v10

Calibration procedure for dipole validation kits above 700 MHz

Calibration date: October 19, 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	1D #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	04-Oct-18 (No. DAE4-601_Oct18)	Oct-19
Secondary Standards	ID#	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19
	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	Æ
		Z	
Approved by:	Katja Pokovic	Technical Manager	ALBS-

Issued: October 22, 2018

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Certificate No: D750V3-1161_Oct18

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Accreditation No.: SCS 0108

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Glossary:

TSL tissue simulating liquid

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Certificate No: D750V3-1161_Oct18 Page 2 of 8

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
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	40.8 ± 6 %	0.89 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	2.02 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.03 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.32 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.26 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 %	0.96 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	2.11 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	1.39 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	5.55 W/kg ± 16.5 % (k=2)

Certificate No: D750V3-1161_Oct18 Page 3 of 8

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.6 Ω - 1.9 jΩ
Return Loss	- 25.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.6 Ω - 4.2 jΩ
Return Loss	- 27.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.032 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

Certificate No: D750V3-1161_Oct18 Page 4 of 8

DASY5 Validation Report for Head TSL

Date: 19.10.2018

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; $\sigma = 0.89 \text{ S/m}$; $\varepsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

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) @ 750 MHz; Calibrated: 30.12.2017

• Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 04.10.2018

• Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001

DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

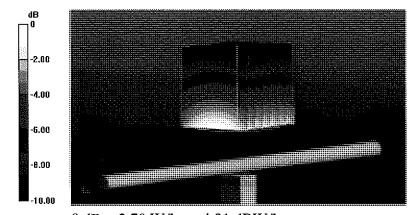
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 58.51 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.04 W/kg

SAR(1 g) = 2.02 W/kg; SAR(10 g) = 1.32 W/kg

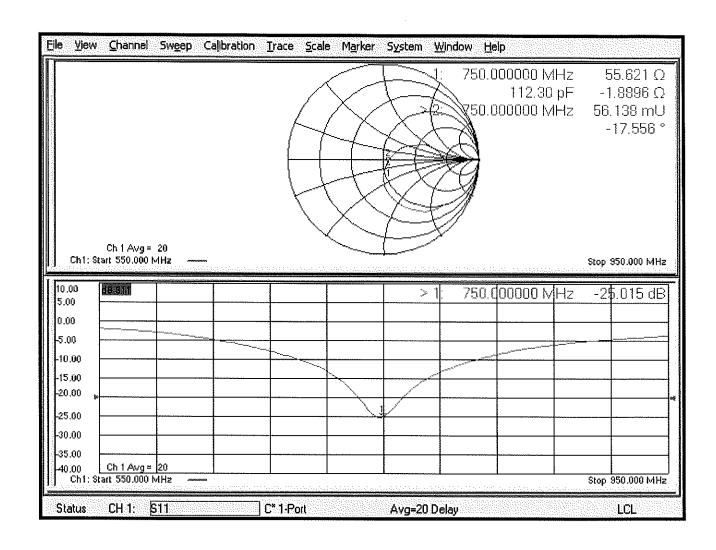
Maximum value of SAR (measured) = 2.70 W/kg



0 dB = 2.70 W/kg = 4.31 dBW/kg

Certificate No: D750V3-1161_Oct18

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 19.10.2018

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; $\sigma = 0.96 \text{ S/m}$; $\varepsilon_r = 55.1$; $\rho = 1000 \text{ kg/m}^3$

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) @ 750 MHz; Calibrated: 30.12.2017

• Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 04.10.2018

Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005

DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

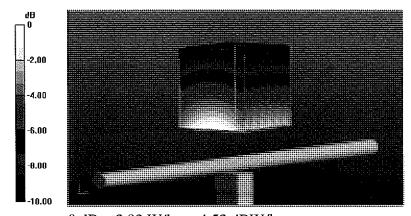
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.57 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.18 W/kg

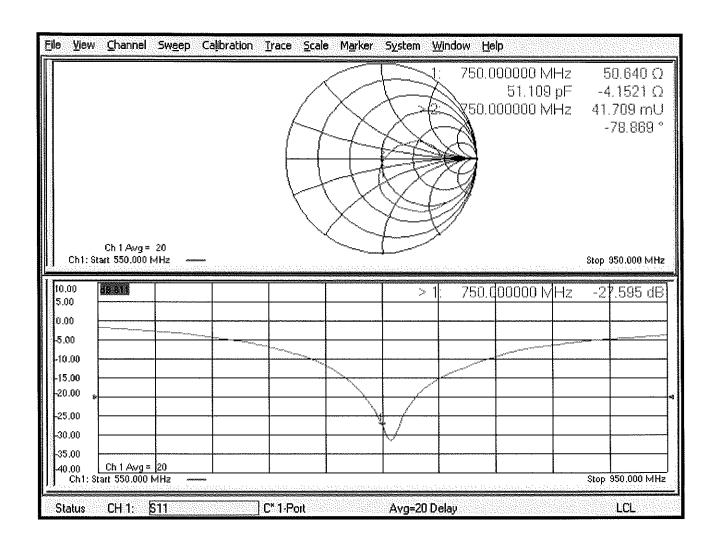
SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.39 W/kg

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



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Client

PC Test

Certificate No: D835V2-4d132_Jan19

CALIBRATION CERTIFICATE

Object

D835V2 - SN:4d132

Calibration procedure(s)

QA CAL-05.v11

ne 06/2019

Calibration Procedure for SAR Validation Sources between 0.7-3 GHz

Calibration date:

January 22, 2019

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-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	31-Dec-18 (No. EX3-7349_Dec18)	Dec-19
DAE4	SN: 601	04-Oct-18 (No. DAE4-601_Oct18)	Oct-19
Secondary Standards	ID#	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19
	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	S. D. 911
			ay my
Approved by:	Katja Pok ovi c	Technical Manager	MUL

Issued: January 22, 2019

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Certificate No: D835V2-4d132_Jan19

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Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

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Glossary:

TSL

tissue simulating liquid

ConvF

sensitivity in TSL / NORM x,y,z not applicable or not measured

N/A

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Certificate No: D835V2-4d132_Jan19 Page 2 of 11

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
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	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.3 ± 6 %	0.92 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		A 10 A 14

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.44 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.59 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head ⊤SL	condition	
SAR measured	250 mW input power	1.58 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.23 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	54.6 ± 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	2.46 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.67 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.61 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.35 W/kg ± 16.5 % (k=2)

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Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.6 Ω - 3.6 jΩ
Return Loss	- 28.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.4 Ω - 6.2 jΩ
Return Loss	- 23.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.387 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

Certificate No: D835V2-4d132_Jan19 Page 4 of 11

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	2.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.38 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.5 7 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.26 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Mouth)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.4 7 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.86 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.65 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.58 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Neck)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.42 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.60 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.38 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	2.02 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	1.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.42 W/kg ± 16.9 % (k=2)

Certificate No: D835V2-4d132_Jan19 Page 5 of 11

DASY5 Validation Report for Head TSL

Date: 17.01.2019

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; $\sigma = 0.92 \text{ S/m}$; $\varepsilon_f = 41.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

• Probe: EX3DV4 - SN7349; ConvF(10, 10, 10) @ 835 MHz; Calibrated: 31.12.2018

• Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 04.10.2018

• Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001

• DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

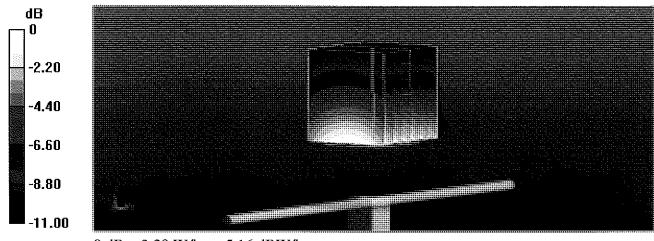
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 34.24 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 3.73 W/kg

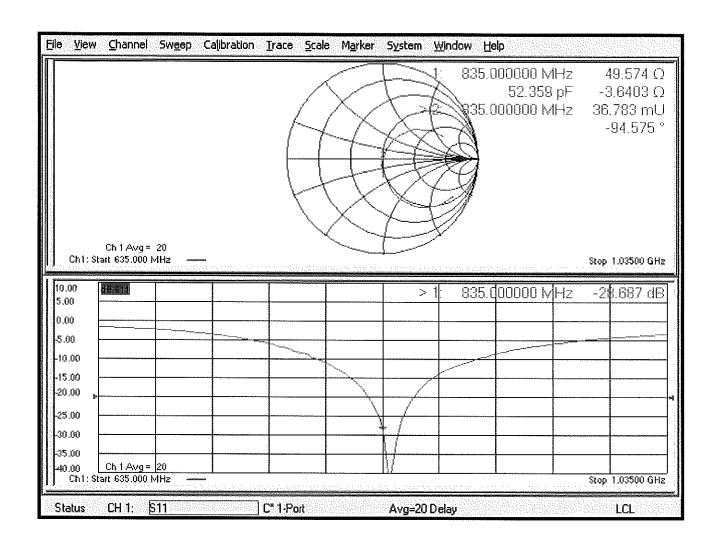
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.58 W/kg

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: 17.01.2019

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; $\sigma = 0.99$ S/m; $\varepsilon_r = 54.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

Probe: EX3DV4 - SN7349; ConvF(10.15, 10.15, 10.15) @ 835 MHz; Calibrated: 31.12.2018

• Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 04.10.2018

• Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005

• DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

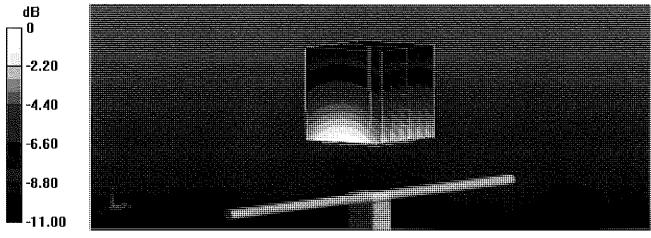
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 63.32 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 3.64 W/kg

SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.61 W/kg

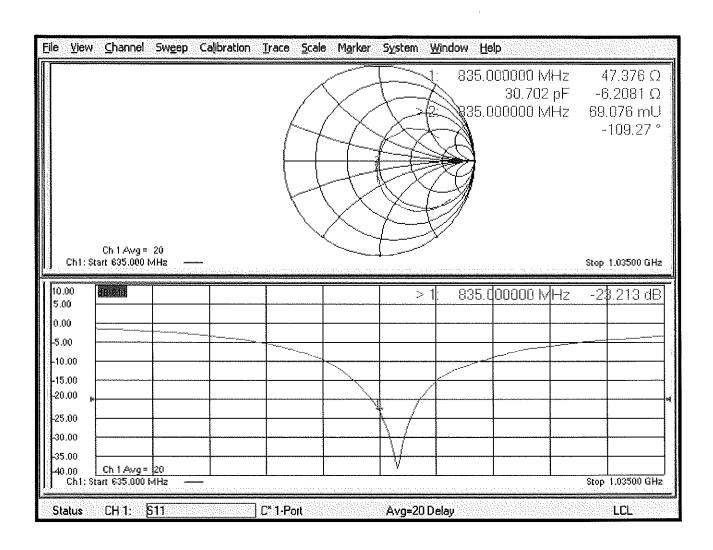
Maximum value of SAR (measured) = 3.26 W/kg



0 dB = 3.26 W/kg = 5.13 dBW/kg

Certificate No: D835V2-4d132_Jan19

Impedance Measurement Plot for Body TSL



DASY5 Validation Report for SAM Head

Date: 22.01.2019

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; $\sigma = 0.92 \text{ S/m}$; $\varepsilon_r = 44.4$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(10, 10, 10) @ 835 MHz; Calibrated: 31.12.2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: SAM Head
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

SAM/Head/Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 61.32 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.51 W/kg

SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.57 W/kg

Maximum value of SAR (measured) = 3.12 W/kg

SAM/Head/Mouth/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 62.25 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.67 W/kg

SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.65 W/kg

Maximum value of SAR (measured) = 3.24 W/kg

SAM/Head/Neck/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 60.69 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 3.43 W/kg

SAR(1 g) = 2.36 W/kg; SAR(10 g) = 1.6 W/kg

Maximum value of SAR (measured) = 3.08 W/kg

SAM/Head/Ear/Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

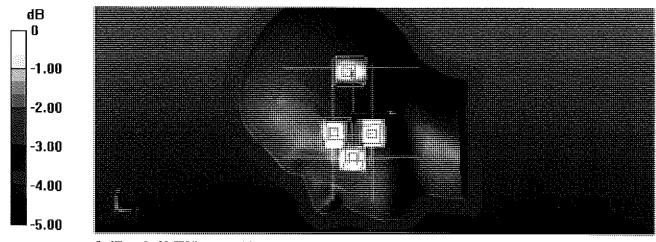
Reference Value = 55.79 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 2.94 W/kg

SAR(1 g) = 2.02 W/kg; SAR(10 g) = 1.36 W/kg

Maximum value of SAR (measured) = 2.62 W/kg

Certificate No: D835V2-4d132_Jan19



0 dB = 2.62 W/kg = 4.18 dBW/kg

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





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CALIBRATION CERTIFICATE

Accreditation No.: SCS 0108

Issued: May 23, 2018

Client

PC Test

Certificate No: D1765V2-1008_May18

	D1765V2 - SN:1	008	
Calibration procedure(s)	QA CAL-05.v10 Calibration proce	edure for dipole validation kits ab	OVE 700 MHz 7/16/2018 BNV 05/2012
Calibration date:	May 23, 2018		BN 05/2012
This calibration certificate docum The measurements and the unce	ents the traceability to nat rtainties with confidence p	ional standards, which realize the physical ur probability are given on the following pages ar	nits of measurements (SI). nd are part of the certificate.
All calibrations have been conduc	cted in the closed laborato	ory facility: environment temperature (22 ± 3)°	C and humidity < 70%.
Calibration Equipment used (M&7	ΓE critical for calibration)		
Primary Standards	iD#	Cal Date (Certificate No.)	Scheduled Calibration
ower meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
ower sensor NRP-Z91	SN: 104778 SN: 103244	04-Apr-18 (No. 217-02672/02673) 04-Apr-18 (No. 217-02672)	Apr-19 Apr-19
Power sensor NRP-Z91 Power sensor NRP-Z91			Apr-19
Power sensor NRP-Z91 Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19 Apr-19
Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator	SN: 103244 SN: 103245	04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02673)	Apr-19 Apr-19 Apr-19
Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination	SN: 103244 SN: 103245 SN: 5058 (20k)	04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02673) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02683)	Apr-19 Apr-19 Apr-19 Apr-19
Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327	04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02673) 04-Apr-18 (No. 217-02682)	Apr-19 Apr-19 Apr-19
Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349	04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02673) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02683) 30-Dec-17 (No. EX3-7349_Dec17)	Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Oct-18
Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Recondary Standards	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349 SN: 601	04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02673) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02683) 30-Dec-17 (No. EX3-7349_Dec17) 26-Oct-17 (No. DAE4-601_Oct17) Check Date (in house)	Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Oct-18 Scheduled Check
Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Recondary Standards Power meter EPM-442A	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349 SN: 601	04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02673) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02683) 30-Dec-17 (No. EX3-7349_Dec17) 26-Oct-17 (No. DAE4-601_Oct17)	Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Oct-18
Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter EPM-442A Power sensor HP 8481A	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349 SN: 601 ID #	04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02673) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02683) 30-Dec-17 (No. EX3-7349_Dec17) 26-Oct-17 (No. DAE4-601_Oct17) Check Date (in house) 07-Oct-15 (in house check Oct-16)	Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Oct-18 Scheduled Check In house check: Oct-18 In house check: Oct-18
Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter EPM-442A Power sensor HP 8481A Power sensor HP 8481A RF generator R&S SMT-06	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349 SN: 601 ID # SN: GB374B0704 SN: US37292783	04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02673) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02683) 30-Dec-17 (No. EX3-7349_Dec17) 26-Oct-17 (No. DAE4-601_Oct17) Check Date (in house) 07-Oct-15 (in house check Oct-16) 07-Oct-15 (in house check Oct-16)	Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Oct-18 Scheduled Check In house check: Oct-18
Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter EPM-442A Power sensor HP 8481A RF generator R&S SMT-06	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349 SN: 601 ID # SN: GB37480704 SN: US37292783 SN: MY41092317	04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02673) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02683) 30-Dec-17 (No. EX3-7349_Dec17) 26-Oct-17 (No. DAE4-601_Oct17) Check Date (in house) 07-Oct-15 (in house check Oct-16) 07-Oct-15 (in house check Oct-16) 07-Oct-15 (in house check Oct-16)	Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Oct-18 Scheduled Check In house check: Oct-18 In house check: Oct-18 In house check: Oct-18
Power meter NRP Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter EPM-442A Power sensor HP 8481A RF generator R&S SMT-06 Network Analyzer HP 8753E	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349 SN: 601 ID # SN: GB37480704 SN: US37292783 SN: MY41092317 SN: 100972 SN: US37390585 Name	04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02673) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02683) 30-Dec-17 (No. EX3-7349_Dec17) 26-Oct-17 (No. DAE4-601_Oct17) Check Date (in house) 07-Oct-15 (in house check Oct-16) 07-Oct-15 (in house check Oct-16) 15-Jun-15 (in house check Oct-16) 15-Jun-15 (in house check Oct-16) 18-Oct-01 (in house check Oct-17)	Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Oct-18 Scheduled Check In house check: Oct-18
Power sensor NRP-Z91 Power sensor NRP-Z91 Reference 20 dB Attenuator Type-N mismatch combination Reference Probe EX3DV4 DAE4 Secondary Standards Power meter EPM-442A Power sensor HP 8481A RF generator R&S SMT-06	SN: 103244 SN: 103245 SN: 5058 (20k) SN: 5047.2 / 06327 SN: 7349 SN: 601 ID # SN: GB37480704 SN: US37292783 SN: MY41092317 SN: 100972 SN: US37390585	04-Apr-18 (No. 217-02672) 04-Apr-18 (No. 217-02673) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02682) 04-Apr-18 (No. 217-02683) 30-Dec-17 (No. EX3-7349_Dec17) 26-Oct-17 (No. DAE4-601_Oct17) Check Date (in house) 07-Oct-15 (in house check Oct-16) 07-Oct-15 (in house check Oct-16) 15-Jun-15 (in house check Oct-16) 18-Oct-01 (in house check Oct-17)	Apr-19 Apr-19 Apr-19 Apr-19 Dec-18 Oct-18 Scheduled Check In house check: Oct-18

Certificate No: D1765V2-1008_May18

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Calibration Laboratory of

Schmid & Partner
Engineering AG
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Servizio svizzero di taratura
Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

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Glossary:

TSL

tissue simulating liquid

ConvF

sensitivity in TSL / NORM x,y,z

N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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Measurement Conditions

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

DASY Version	DASY5	V52.10.1
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	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permitti∨ity	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 %	1.34 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	8.94 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	36.2 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.71 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	19.0 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	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.2 ± 6 %	1.46 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	9.21 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	37.4 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.92 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	19.9 W/kg ± 16.5 % (k=2)

Certificate No: D1765V2-1008_May18 Page 3 of 11

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.7 Ω - 6.5 jΩ
Return Loss	- 23.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	43.3 Ω - 6.0 jΩ
Return Loss	- 20.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.210 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	October 06, 2005

Certificate No: D1765V2-1008_May18 Page 4 of 11

Appendix (Additional assessments outside the scope of SCS 0108)

Measurement Conditions

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

SAR result with SAM Head (Top)

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.26 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	37.4 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.95 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	19.9 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	9.47 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	38.2 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.06 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.4 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Neck)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.26 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	37.4 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.02 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.2 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Ear)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	7 .12 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	28.7 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.01 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	16.1 W/kg ± 16.9 % (k=2)

Certificate No: D1765V2-1008_May18 Page 5 of 11

DASY5 Validation Report for Head TSL

Date: 15.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1765 MHz; Type: D1765V2; Serial: D1765V2 - SN:1008

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: f = 1750 MHz; $\sigma = 1.34 \text{ S/m}$; $\varepsilon_r = 39$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

• Probe: EX3DV4 - SN7349; ConvF(8.5, 8.5, 8.5) @ 1750 MHz; 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 52.10.1(1476); SEMCAD X 14.6.11(7439)

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

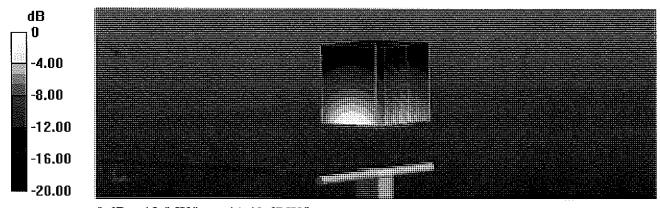
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 106.6 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 16.4 W/kg

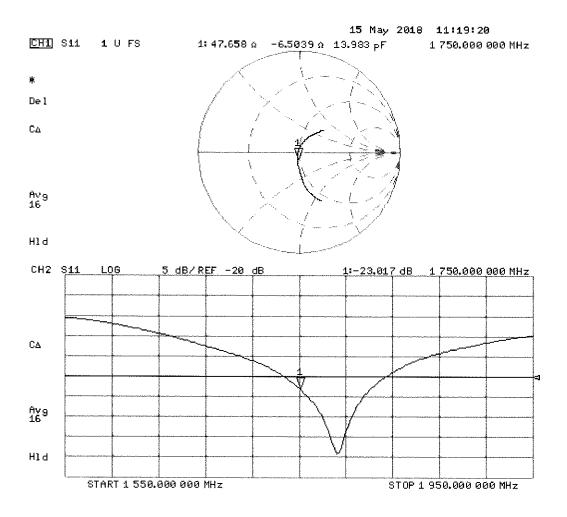
SAR(1 g) = 8.94 W/kg; SAR(10 g) = 4.71 W/kg

Maximum value of SAR (measured) = 13.8 W/kg



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

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 15.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1765 MHz; Type: D1765V2; Serial: D1765V2 - SN:1008

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: f = 1750 MHz; $\sigma = 1.46 \text{ S/m}$; $\varepsilon_r = 53.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

Probe: EX3DV4 - SN7349; ConvF(8.35, 8.35, 8.35) @ 1750 MHz; 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 52.10.1(1476); SEMCAD X 14.6.11(7439)

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

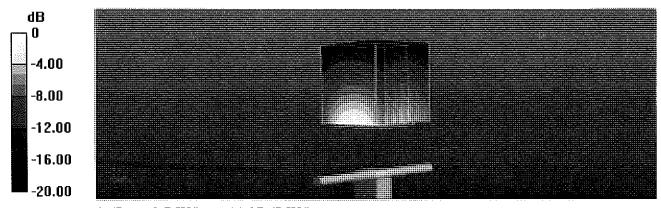
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 102.4 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 16.1 W/kg

SAR(1 g) = 9.21 W/kg; SAR(10 g) = 4.92 W/kg

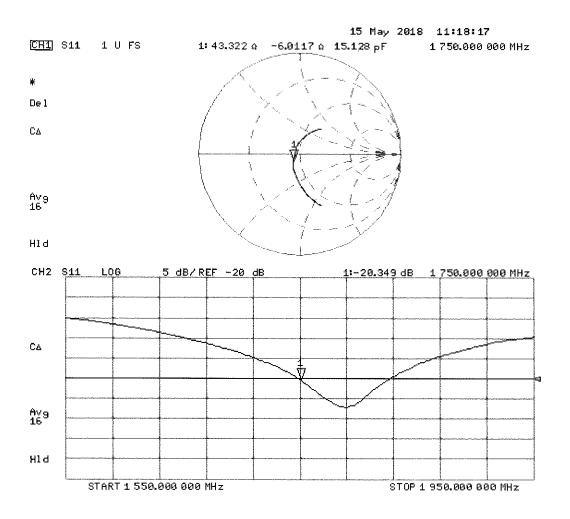
Maximum value of SAR (measured) = 13.7 W/kg



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

Certificate No: D1765V2-1008_May18 Page 8 of 11

Impedance Measurement Plot for Body TSL



DASY5 Validation Report for SAM Head

Date: 23.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1765 MHz; Type: D1765V2; Serial: D1765V2 - SN:1008

Communication System: UID 0 - CW; Frequency: 1750 MHz

Medium parameters used: f = 1750 MHz; $\sigma = 1.37 \text{ S/m}$; $\varepsilon_r = 41.8$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

• Probe: EX3DV4 - SN7349; ConvF(8.5, 8.5, 8.5) @ 1750 MHz; Calibrated: 30.12.2017

• Sensor-Surface: 1.4mm (Mechanical Surface Detection)

• Electronics: DAE4 Sn601; Calibrated: 26.10.2017

· Phantom: SAM Head

• DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

SAM/Head/Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 105.8 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 16.4 W/kg

SAR(1 g) = 9.26 W/kg; SAR(10 g) = 4.95 W/kg

Maximum value of SAR (measured) = 13.9 W/kg

SAM/Head/Mouth/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 104.2 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 16.6 W/kg

SAR(1 g) = 9.47 W/kg; SAR(10 g) = 5.06 W/kg

Maximum value of SAR (measured) = 13.7 W/kg

SAM/Head/Neck/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 104.7 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 15.8 W/kg

SAR(1 g) = 9.26 W/kg; SAR(10 g) = 5.02 W/kg

Maximum value of SAR (measured) = 13.8 W/kg

SAM/Head/Ear/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

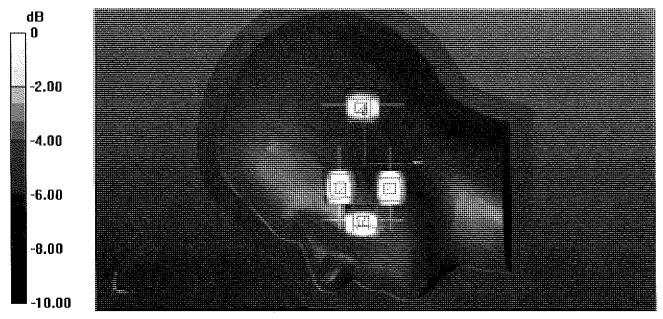
Reference Value = 90.46 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 11.8 W/kg

SAR(1 g) = 7.12 W/kg; SAR(10 g) = 4.01 W/kg

Maximum value of SAR (measured) = 10.3 W/kg

Certificate No: D1765V2-1008_May18



0 dB = 10.3 W/kg = 10.13 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.



7185 Oakland Mills Road, Columbia, MD 21046 USA Tel. +1.410.290.6652 / Fax +1.410.290.6654 http://www.pctest.com



Certification of Calibration

Object D1765V2 – SN: 1008

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extension Calibration date: 5/17/2019

Description: SAR Validation Dipole at 1750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	3/11/2019	Annual	3/11/2020	US39170122
Agilent	N5182A	MXG Vector Signal Generator	11/28/2018	Annual	11/28/2019	MY47420603
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Anritsu	MA2411B	Pulse Power Sensor	11/20/2018	Annual	11/20/2019	1027293
Anritsu	MA2411B	Pulse Power Sensor	10/30/2018	Annual	10/30/2019	1126066
Anritsu	ML2495A	Power Meter	10/21/2018	Annual	10/21/2019	941001
Control Company	4040	Therm./ Clock/ Humidity Monitor	10/9/2018	Biennial	10/9/2020	181647811
Control Company	4352	Ultra Long Stem Thermometer	6/6/2018	Biennial	6/6/2020	181334678
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annual	6/4/2019	MY53401181
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Seekonk	NC-100	Torque Wrench	7/11/2018	Annual	7/11/2019	N/A
SPEAG	EX3DV4	SAR Probe	6/25/2018	Annual	6/25/2019	7409
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/18/2018	Annual	6/18/2019	1334
SPEAG	EX3DV4	SAR Probe	2/19/2019	Annual	2/19/2020	3914
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/14/2019	Annual	2/14/2020	1272
SPEAG	DAK-3.5	Dielectric Assessment Kit	9/11/2018	Annual	9/11/2019	1091

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	30K

Object:	Date Issued:	Page 1 of 4	
D1765V2 – SN: 1008	05/17/2019	Page 1 of 4	

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:

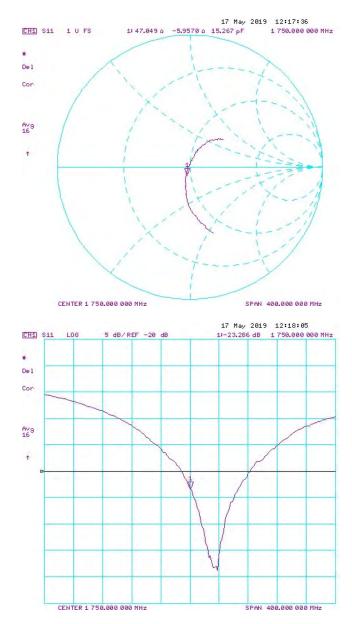
- 1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
- 2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
- 3. The measurement of real or imaginary parts of impedance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

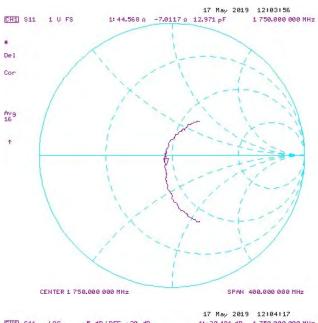
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Head SAR (1g)	(9/)		(10a) M//ka @	Deviation 10g (%)		Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
5/23/2019	5/17/2019	1.21	3.62	3.63	0.28%	1.9	1.92	1.05%	47.7	47	0.7	-6.5	-6	0.5	-23	-23.3	-1.20%	PASS
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 20.0 dBm	M/kg @ 20.0	(0/.)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	(10a) M//ka @	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
5/23/2019	5/17/2019	1.21	3.74	3.95	5.61%	1.99	2.08	4.52%	43.3	44.6	1.3	-6	-7	1	-20.3	-20.5	-0.90%	PASS

Object:	Date Issued:	Page 2 of 4
D1765V2 - SN: 1008	05/17/2019	Fage 2 01 4

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





Calibration Laboratory of Schmid & Partner Engineering AG

Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





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Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

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

Client

PC Test

Certificate No: D1900V2-5d080_Oct18

CALIBRATION CERTIFICATE

Object D

D1900V2 - SN:5d080

Calibration procedure(s)

QA CAL-05.v10

Calibration procedure for dipole validation kits above 700 MHz

Calibration date:

October 23, 2018

BN 201

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-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	04-Oct-18 (No. DAE4-601_Oct18)	Oct-19
		•	
Secondary Standards	1D #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19
	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	1-1/-
		\sim	te Wi
Approved by:	Katla Pokovio	Technical Manager	v
Approved by:	Katja Pokovic	т өспінсаі мападег	ELAG-

Issued: October 23, 2018

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

Certificate No: D1900V2-5d080_Oct18

Page 1 of 8

Calibration Laboratory of

Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





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Service suisse d'étalonnage
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The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL tissue simulating liquid

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Certificate No: D1900V2-5d080_Oct18 Page 2 of 8

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, 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	40.3 ± 6 %	1.40 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	do to to	

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.93 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	39.8 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.18 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.7 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	52.9 ± 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	9.62 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	39.2 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.09 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	20.6 W/kg ± 16.5 % (k=2)

Certificate No: D1900V2-5d080_Oct18

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.5 Ω + 7.9 jΩ
Return Loss	- 21.8 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.1 Ω + 8.1 jΩ
Return Loss	- 21.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.193 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

Certificate No: D1900V2-5d080_Oct18

DASY5 Validation Report for Head TSL

Date: 23.10.2018

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; $\sigma = 1.4 \text{ S/m}$; $\varepsilon_r = 40.3$; $\rho = 1000 \text{ kg/m}^3$

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) @ 1900 MHz; Calibrated: 30.12.2017

• Sensor-Surface: 1.4mm (Mechanical Surface Detection)

• Electronics: DAE4 Sn601; Calibrated: 04.10.2018

• Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001

DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

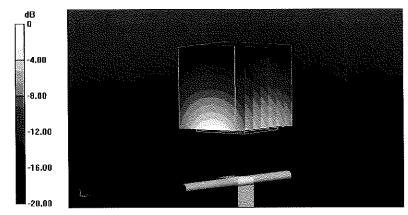
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 110.0 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 18.7 W/kg

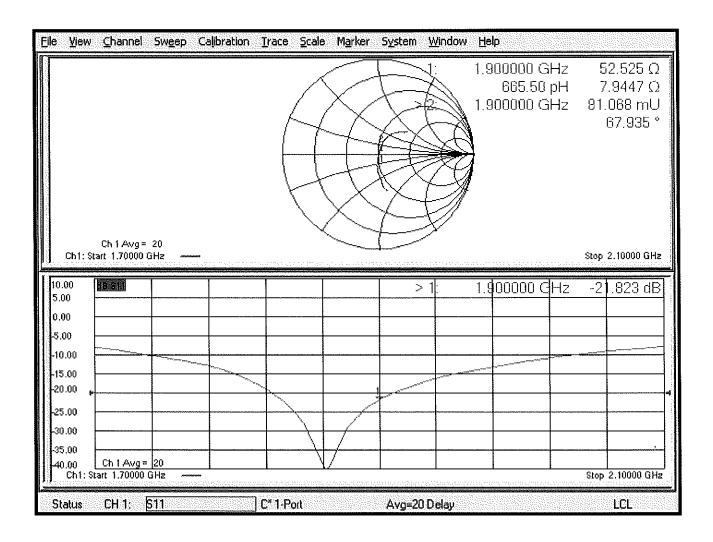
SAR(1 g) = 9.93 W/kg; SAR(10 g) = 5.18 W/kg

Maximum value of SAR (measured) = 15.6 W/kg



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

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 23.10.2018

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; $\sigma = 1.47 \text{ S/m}$; $\varepsilon_r = 52.9$; $\rho = 1000 \text{ kg/m}^3$

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) @ 1900 MHz; Calibrated: 30.12.2017

• Sensor-Surface: 1.4mm (Mechanical Surface Detection)

• Electronics: DAE4 Sn601; Calibrated: 04.10.2018

Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002

• DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

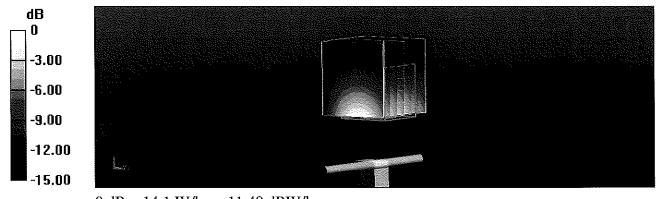
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 99.86 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 17.3 W/kg

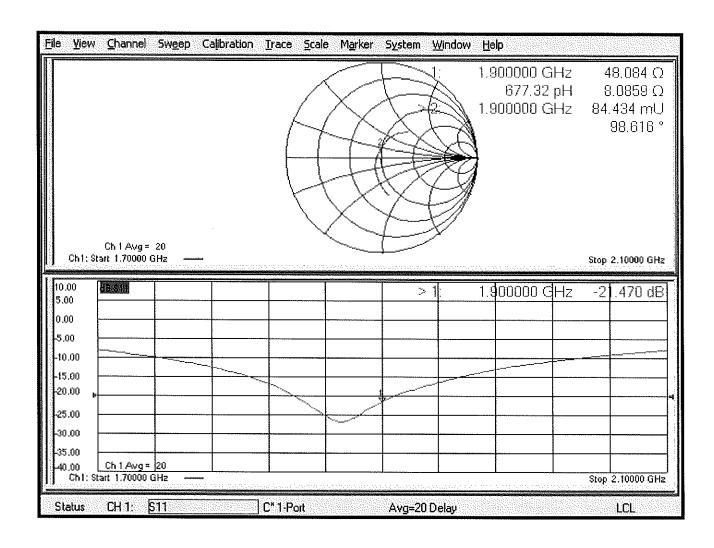
SAR(1 g) = 9.62 W/kg; SAR(10 g) = 5.09 W/kg

Maximum value of SAR (measured) = 14.1 W/kg



0 dB = 14.1 W/kg = 11.49 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
Servizio svizzero di taratura
S Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA

Multilateral Agreement for the recognition of calibration certificates

Client

PC Test

Certificate No: D1900V2-5d148 Feb19

CALIBRATION CERTIFICATE

Object

D1900V2 - SN:5d148

Calibration procedure(s)

QA CAL-05.v11

Calibration Procedure for SAR Validation Sources between 0.7-3 GHz

1300

Calibration date:

February 21, 2019

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 \pm 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-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	31-Dec-18 (No. EX3-7349_Dec18)	Dec-19
DAE4	SN: 601	04-Oct-18 (No. DAE4-601_Oct18)	Oct-19
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	07-Oct-15 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19
	Name	Function	Signature
Calibrated by:	Manu Seltz	Laboratory Technician	- Pi
			770
Approved by:	Katja Pokovic	Technical Manager	AUG

Issued: February 21, 2019

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

ConvF N/A sensitivity in TSL / NORM x,y,z

not applicable or not measured

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Certificate No: D1900V2-5d148_Feb19

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Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, 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	40.9 ± 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	9.65 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	39.1 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.05 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	20.4 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	53.6 ± 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	9.56 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	5.05 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	20.5 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	51.8 Ω + 6.8 jΩ
Return Loss	- 23.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.4 Ω + 7.8 jΩ
Return Loss	- 21.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	4 4 = 0
Licetical Delay (one direction)	1.170 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
-	

DASY5 Validation Report for Head TSL

Date: 21.02,2019

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; $\sigma = 1.38 \text{ S/m}$; $\varepsilon_r = 40.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

Probe: EX3DV4 - SN7349; ConvF(8.26, 8.26, 8.26) @ 1900 MHz; Calibrated: 31.12.2018

• Sensor-Surface: 1.4mm (Mechanical Surface Detection)

• Electronics: DAE4 Sn601; Calibrated: 04.10.2018

Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001

DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

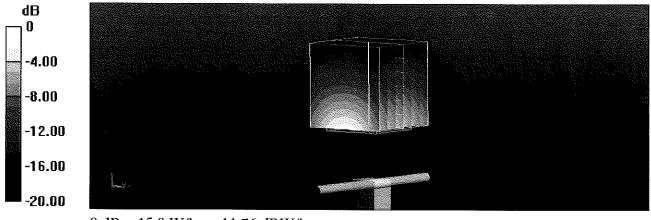
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 109.4 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 17.8 W/kg

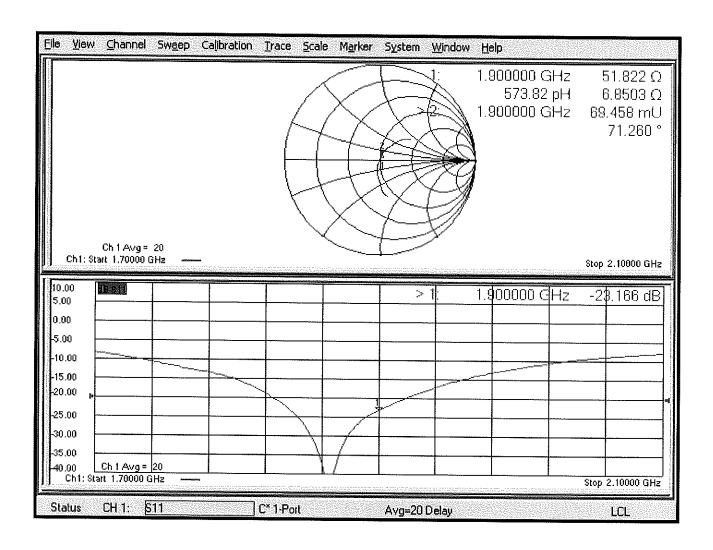
SAR(1 g) = 9.65 W/kg; SAR(10 g) = 5.05 W/kg

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: 21.02.2019

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; $\sigma = 1.47 \text{ S/m}$; $\varepsilon_r = 53.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

Probe: EX3DV4 - SN7349; ConvF(8.23, 8.23, 8.23) @ 1900 MHz; Calibrated: 31.12.2018

• Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 04.10,2018

Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002

DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

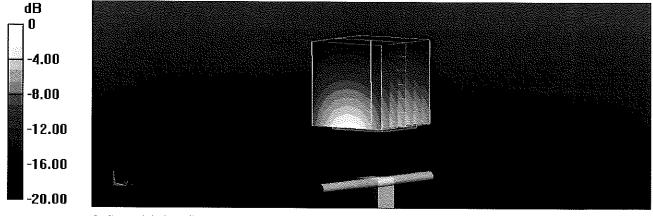
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.7 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 17.0 W/kg

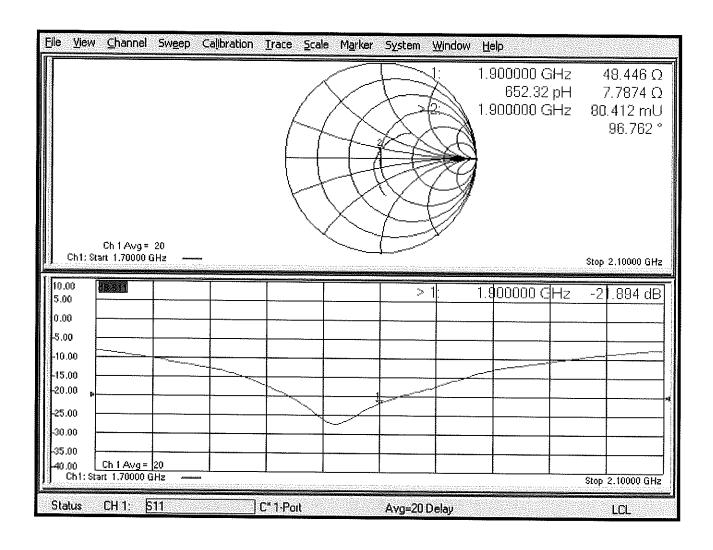
SAR(1 g) = 9.56 W/kg; SAR(10 g) = 5.05 W/kg

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



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: D2450V2-719_Aug17

CALIBRATION CERTIFICATE

Object

D2450V2 - SN:719

Calibration procedure(s)

QA CAL-05.v9

Calibration procedure for dipole validation kits above 700 MHz

8/27/17

Extended

Calibration date:

August 17, 2017

7/19/2012

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 $(22 \pm 3)^{\circ}$ 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 d8 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	1D #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	în 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	H.Hebes
Approved by:	Katja Pokovic	Technical Manager	All H

Issued; August 17, 2017

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Glossary:

TSL

tissue simulating liquid

ConvF

sensitivity in TSL / NORM x,y,z

N/A

not applicable or not measured

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Certificate No: D2450V2-719_Aug17

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Measurement Conditions

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

DASY Version	DASY5	V 52.10.0
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	W

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 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.3 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	51.9 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.15 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.3 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	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.9 ± 6 %	2.03 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	12.8 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	50.1 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.00 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	23.7 W/kg ± 16.5 % (k=2)

Certificate No: D2450V2-719_Aug17

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$55.7 \Omega + 7.0 j\Omega$
Return Loss	- 21.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.4 Ω + 8.1 jΩ
Return Loss	- 21.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.150 ns
	<u> </u>

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 10, 2002

DASY5 Validation Report for Head TSL

Date: 17.08.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 719

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: f = 2450 MHz; $\sigma = 1.86$ S/m; $\epsilon_r = 37.8$; $\rho = 1000$ kg/m³

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:

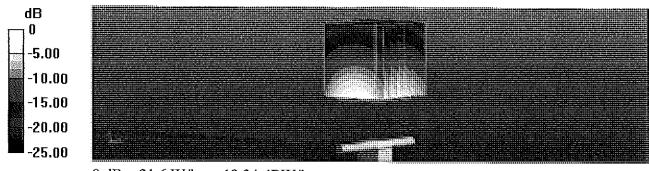
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 112.8 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 26.9 W/kg

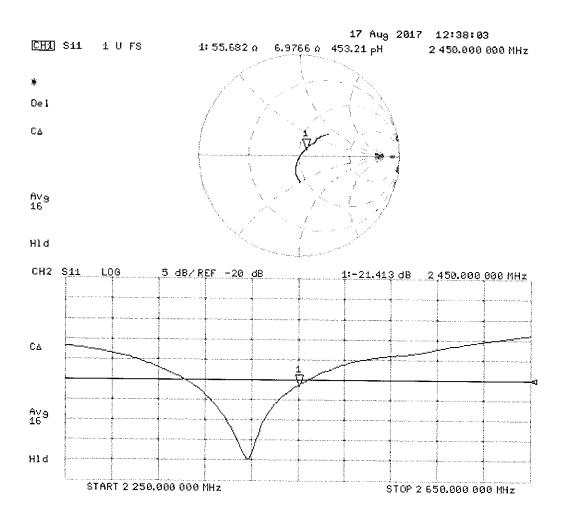
SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.15 W/kg

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: 17.08.2017

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 719

Communication System: UID 0 - CW; Frequency: 2450 MHz

Medium parameters used: f = 2450 MHz; $\sigma = 2.03$ S/m; $\varepsilon_r = 51.9$; $\rho = 1000$ kg/m³

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:

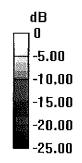
Measurement grid: dx=5mm, dy=5mm, dz=5mm

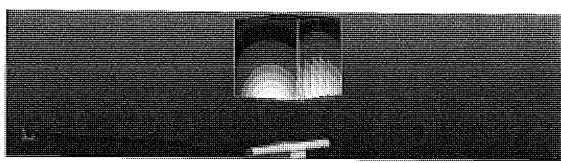
Reference Value = 103.0 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 25.2 W/kg

SAR(1 g) = 12.8 W/kg; SAR(10 g) = 6 W/kg

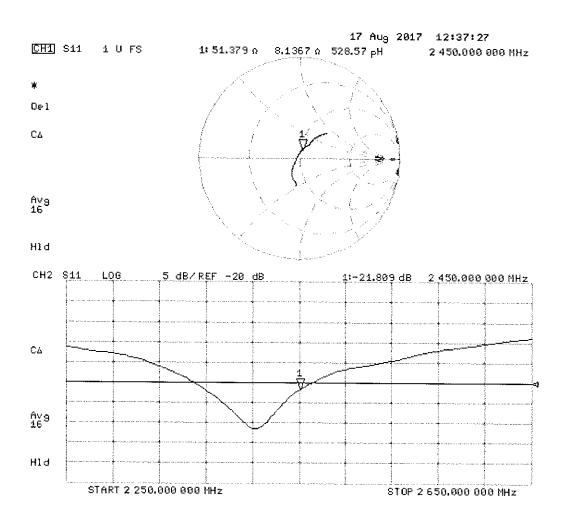
Maximum value of SAR (measured) = 19.8 W/kg





0 dB = 19.8 W/kg = 12.97 dBW/kg

Impedance Measurement Plot for Body TSL



PCTEST ENGINEERING LABORATORY, INC.



7185 Oakland Mills Road, Columbia, MD 21046 USA Tel. +1.410.290.6652 / Fax +1.410.290.6654 http://www.pctest.com



Certification of Calibration

Object D2450V2 – SN: 719

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extended Calibration date: 07/18/2018

Description: SAR Validation Dipole at 2450 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E4438C	ESG Vector Signal Generator	3/24/2017	Biennial	3/24/2019	MY42082385
Agilent	8753ES	S-Parameter Network Analyzer	9/14/2017	Annual	9/14/2018	US39170118
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Anritsu	ML2495A	Power Meter	11/28/2017	Annual	11/28/2018	1039008
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1207364
Anritsu	MA2411B	Pulse Power Sensor	11/15/2017	Annual	11/15/2018	1339007
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
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annual	6/4/2019	MY53401181
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE5011-1	Torque Wrench	7/19/2017	Biennial	7/19/2019	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/7/2018	Annual	3/7/2019	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/9/2017	Annual	8/9/2018	1323
SPEAG	DAK-3.5	Dielectric Assessment Kit	9/12/2017	Annual	9/12/2018	1091
SPEAG	ES3DV3	SAR Probe	3/13/2018	Annual	3/13/2019	3319
SPEAG	ES3DV3	SAR Probe	8/14/2017	Annual	8/14/2018	3332

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	20K

Object:	Date Issued:	Da 4 - f 4
D2450V2 - SN: 719	07/18/2018	Page 1 of 4

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:

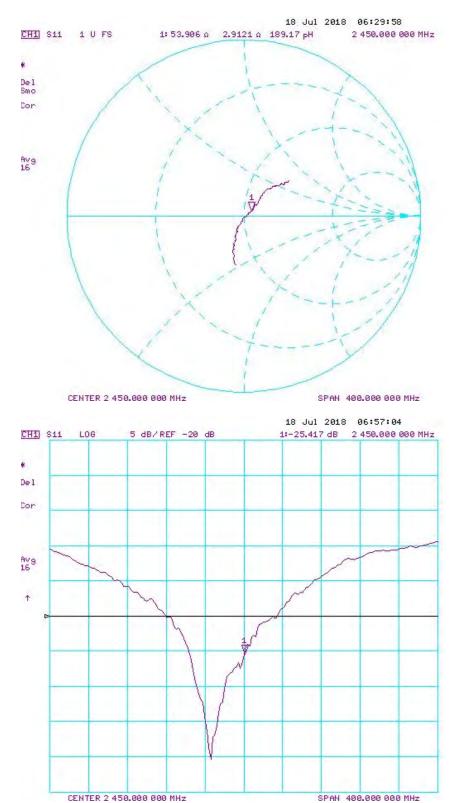
- 1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
- 2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
- 3. The measurement of real or imaginary parts of impedance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

Date	Extension Date	Certificate Electrical Delay (ns)	Head (1g) W/kg @ 20.0 dBm	dBm	(%)	W/kg @ 20.0 dBm	(10g) W/kg @ 20.0 dBm		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)	Head (dB)	Deviation (%)	
8/17/2017	7/18/2018	1.150	5.19	5.46	5.20%	2.43	2.51	3.29%	55.7	53.9	1.8	7.0	2.9	4.1	-21.4	-25.4	-18.70%	PASS
Calibration Date	Extension Date	Certificate Electrical Delay (ns)		Body SAR (1g)	(9/)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	(10a) W/ka @	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
8/17/2017	7/18/2018	1.150	5.01	5.19	3.59%	2.37	2.38	0.42%	51.4	50.2	1.2	8.1	5.9	2.2	-21.8	-24.6	-12.80%	PASS

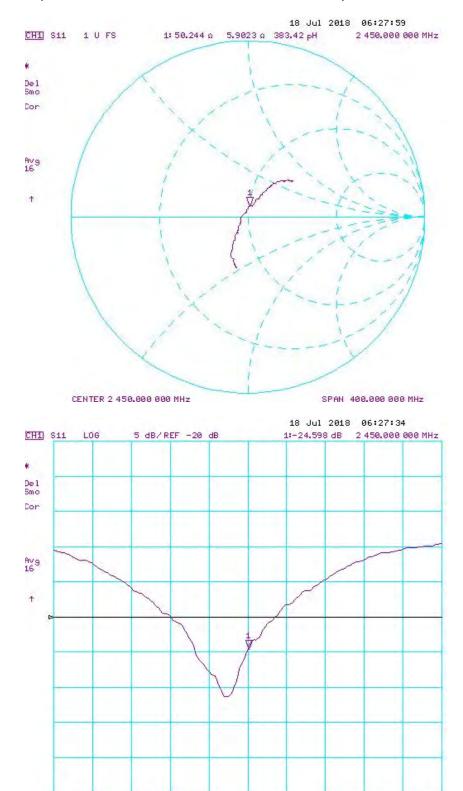
Object:	Date Issued:	Dogo 2 of 4
D2450V2 – SN: 719	07/18/2018	Page 2 of 4

Impedance & Return-Loss Measurement Plot for Head TSL



Object:	Date Issued:	Dogo 2 of 4
D2450V2 – SN: 719	07/18/2018	Page 3 of 4

Impedance & Return-Loss Measurement Plot for Body TSL



CENTER 2 450.000 000 MHz

Object:	Date Issued:	Dogo 4 of 4
D2450V2 – SN: 719	07/18/2018	Page 4 of 4

SPAN 400.000 000 MHz

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





Schweizerischer Kallbrierdienst Service suisse d'étalonnage Servizio svizzero di taratura **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

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

Calibration date:

September 11, 2017

700 MHz 360 17 10/03/2019 Extended PMV J/20/2018

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 / 08327	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-08	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	MULCO
			11110X
Approved by:	Katja Pokovic	Technical Manager	DOM.
		· · · · · · · · · · · · · · · · · · ·	10-00

Issued: September 11, 2017

Certificate No: D2450V2-797_Sep17

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

Calibration Laboratory of

Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

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

Glossarv:

TSL

tissue simulating liquid

ConvF

sensitivity in TSL / NORM x,v,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 , $dz = 5 mm$	- Annual Control of the Control of t
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 cm ³ (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 cm ³ (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)

à

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	Military and	

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 cm ³ (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

	, ·
I Fleatrical Delay (one direction)	1.152 ns
Electrical Delay (one direction)	I 1.152 ns I

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

-در در در

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; $\sigma = 1.86$ S/m; $\varepsilon_r = 37.8$; $\rho = 1000$ kg/m³

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

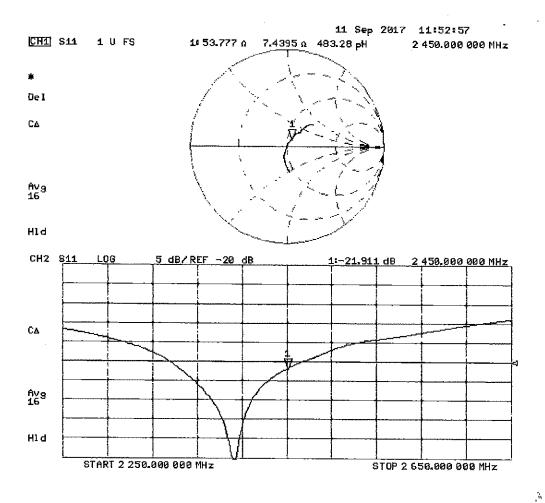
SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.28 W/kg

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; $\sigma = 2.04$ S/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

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:

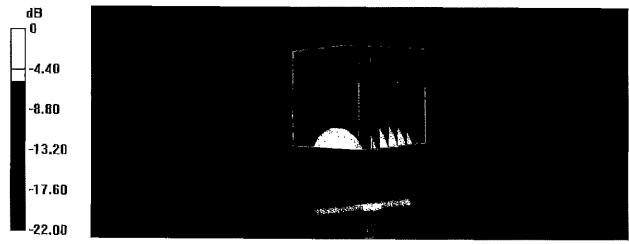
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 105.4 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 25.6 W/kg

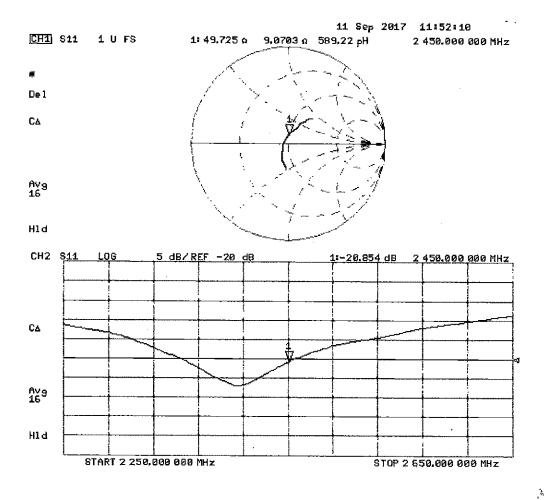
SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.14 W/kg

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



PCTEST ENGINEERING LABORATORY, INC.



18855 Adams Ct, Morgan Hill, CA 95037 USA Tel, +1.410.290.6652 / Fax +1.410.290.6654 http://www.pctest.com



Certification of Calibration

Object

D2450V2 - SN: 797

Calibration procedure(s)

Procedure for Calibration Extension for SAR Dipoles.

Extended Calibration date:

September 11, 2018

Description:

SAR Validation Dipole at 2450 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	7720	Dual Directional Coupler	CBT	N/A	CBT	MY52180215			
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annuai	6/4/2019	MY53401181			
Agilent	8753ES	S-Parameter Vector Network Analyzer	8/30/2018	Annuai	8/30/2019	MY40003841			
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT .	N/A	CBT	N/A			
SPEAG	DAK-3,5	Dielectric Assessment Kit	5/15/2018	Annual	5/15/2019	1070			
SPEAG	EX3DV4	SAR Probe	7/20/2018	Annual	7/20/2019	7410			
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/11/2018	Annual	7/11/2019	1322			
SPEAG	ES3DV3	SAR Probe	3/13/2018	Annual	3/13/2019	3319			
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/7/2018	Annual	3/7/2019	1368			
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1207364			
Anritsu	MA2411B	Puise Power Sensor	3/2/2018	Annual	3/2/2019	1339018			
Anritsu	ML2495A	Power Meter	10/22/2017	Annual	10/22/2018	1328004			
Aglient	N5182A	MXG Vector Signal Generator	4/18/2018	Annual	4/18/2019	MY47420800			
Seekonk	NC-100	Torque Wrench	7/11/2018	Annual	7/11/2019	N/A			
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	СВТ	N/A			
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	СВТ	N/A	CBT	N/A			

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path.

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Team Lead Engineer	BAODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	30K

Object:	Date Issued:	Page 1 of 4
D2450V2 - SN; 797	09/11/2018	

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.

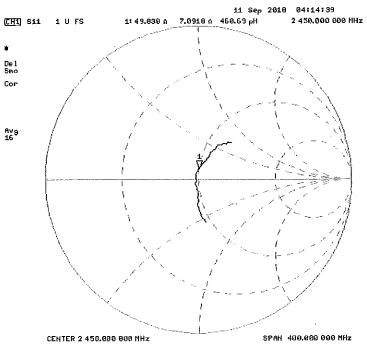
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

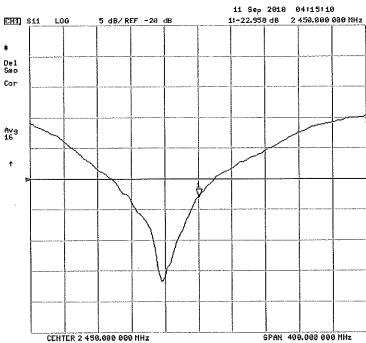
Calibration Date	Extension Date		Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Measured Head SAR (1g)	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 20.0 dBm	Measured Head SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	(Ohm)	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)		PASS/FAIL
9/11/2017	9/11/2018	1.152	5.27	5.52	4.74%	2.48	2.54	2.42%	53.8	49.8	4	7.4	7.1	0.3	-21.9	-23	-4.80%	PASS

	Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 20.0 dBm	Body SAR (1g)	(%)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	Measured Body SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)		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
ſ	9/11/2017	9/11/2018	1.152	5.11	5.17	1.17%	2.42	2.37	-2.07%	49.7	49.8	0.1	9.1	7.2	1.9	-20.9	-22.6	-8.20%	PASS
		•		•														•	

Object:	Date Issued:	Page 2 of 4
D2450V2 – SN: 797	09/11/2018	Fage 2 01 4

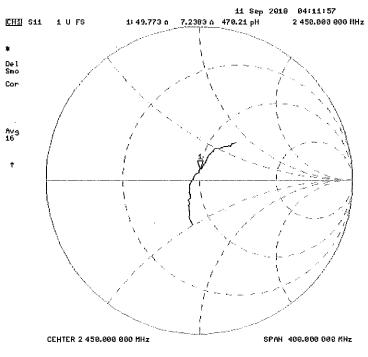
Impedance & Return-Loss Measurement Plot for Head TSL

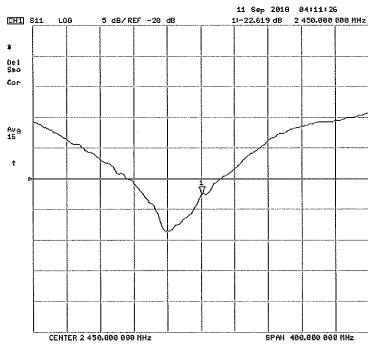




Object:	Date Issued:	Page 3 of 4
D2450V2 SN: 797	09/11/2018	r ago o or r

Impedance & Return-Loss Measurement Plot for Body TSL





Object:	Date Issued:	Page 4 of 4
D2450V2 - SN: 797	09/11/2018	Page 4 of 4

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





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client

PC Test

Certificate No: D5GHzV2-1057_Jan18

CALIBRATION CERTIFICATE

Object

D5GHzV2 - SN:1057

Calibration procedure(s)

QA CAL-22,v2

Calibration procedure for dipole validation kits between 3-6 GHz

Calibration date:

January 16, 2018

1-25-2018

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.

102/06/2010

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}$ 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-1B
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Atlenuator	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: 3503	30-Dec-17 (No. EX3-3503_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

Calibrated by:

Name Leif Klysner Function Laboratory Technician

Signature

Approved by:

Katja Pokovic

Technical Manager

Issued: January 18, 2018

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

Certificate No: D5GHzV2-1057_Jan18

Page 1 of 20

Calibration Laboratory of

Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





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Schweizerischer Kalibrierdienst Service sulsse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 0108

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The Swiss Accreditation Service is one of the signatories to the EA

Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL

tissue simulating liquid

ConvF

sensitivity in TSL / NORM x,y,z

N/A

not applicable or not measured

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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 V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz ± 1 MHz 5250 MHz ± 1 MHz 5600 MHz ± 1 MHz 5750 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.71 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.2 ± 6 %	4.55 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 5250 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.91 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	79.2 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.28 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.8 W/kg ± 19.5 % (k=2)

Head TSL parameters at 5600 MHz The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.8 ± 6 %	4.90 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	84.1 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.40 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.0 W/kg ± 19.5 % (k=2)

Head TSL parameters at 5750 MHz The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.4	5.22 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.5 ± 6 %	5.06 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 5750 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.06 W /kg
SAR for nominal Head TSL parameters	normalized to 1W	80.5 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.30 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.0 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5200 MHz The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.3 ± 6 %	5.41 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.36 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	73.1 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.06 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	20.4 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.36 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.2 ± 6 %	5.48 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

SAR result with Body TSL at 5250 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.64 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	75.9 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.13 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.1 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5600 MHz The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.6 ± 6 %	5.94 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	8.05 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	79.9 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.25 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	22.3 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5750 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.3	5.94 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.3 ± 6 %	6.15 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

SAR result with Body TSL at 5750 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.72 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	76.7 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.2 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5800 MHz The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.2 ± 6 %	6.22 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C		

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.68 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	76.3 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.13 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.1 W/kg ± 19.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5250 MHz

Impedance, transformed to feed point	50.0 Ω - 5.5 jΩ
Return Loss	- 25.2 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	54.7 Ω - 2.1 jΩ
Return Loss	- 26.2 dB

Antenna Parameters with Head TSL at 5750 MHz

Impedance, transformed to feed point	$52.7 \Omega + 0.0 j\Omega$
Return Loss	- 31.5 dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	49.3 Ω - 6.7 jΩ
Return Loss	- 23.4 dB

Antenna Parameters with Body TSL at 5250 MHz

Impedance, transformed to feed point	48.4 Ω - 3.9 jΩ
Return Loss	- 27.4 dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	55.3 Ω - 1.6 jΩ
Return Loss	- 25.6 dB

Antenna Parameters with Body TSL at 5750 MHz

Impedance, transformed to feed point	52.6 Ω + 1.1 jΩ
Return Loss	- 31.2 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	51.8 Ω - 0.4 jΩ
Return Loss	- 34.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.203 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 27, 2006

Appendix (Additional assessments outside the scope of SCS 0108)

Measurement Conditions (f=5200 MHz)

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

Phantom SAM Head Phantom For usage with cSAR3DV	2-R/L
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SAR result with SAM Head (Top)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.24 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	82.6 W/kg ± 20.3 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.6 W/kg ± 19.9 % (k=2)

SAR result with SAM Head (Mouth)

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.54 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	85.6 W/kg ± 20.3 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.7 W/kg ± 19.9 % (k=2)

SAR result with SAM Head (Neck)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.14 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	81.6 W/kg ± 20.3 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.7 W/kg ± 19.9 % (k=2)

SAR result with SAM Head (Ear)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	5.16 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	51.7 W/kg ± 20.3 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	1.76 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	17.7 W/kg ± 19.9 % (k=2)

Measurement Conditions (f=5800 MHz)

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

Phantom	SAM Head Phantom	For usage with cSAR3DV2-R/L
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SAR result with SAM Head (Top)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.62 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	86.3 W/kg ± 20.3 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.1 W/kg ± 19.9 % (k=2)

SAR result with SAM Head (Mouth)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.88 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	88.9 W/kg ± 20.3 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.44 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.4 W/kg ± 19.9 % (k=2)

SAR result with SAM Head (Neck)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.33 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	83.4 W/kg ± 20.3 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.5 W/kg ± 19.9 % (k=2)

SAR result with SAM Head (Ear)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	5.68 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	56.8 W/kg ± 20.3 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	1.89 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	18.9 W/kg ± 19.9 % (k=2)

DASY5 Validation Report for Head TSL

Date: 11.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1057

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz

Medium parameters used: f = 5250 MHz; $\sigma = 4.55$ S/m; $\varepsilon_r = 36.2$; $\rho = 1000$ kg/m³, Medium parameters used: f = 5600 MHz; $\sigma = 4.9$ S/m; $\varepsilon_r = 35.8$; $\rho = 1000$ kg/m³, Medium parameters used: f = 5750 MHz; $\sigma = 5.06$ S/m; $\varepsilon_r = 35.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(5.51, 5.51, 5.51); Calibrated: 30.12.2017, ConvF(5.05, 5.05, 5.05); Calibrated: 30.12.2017, ConvF(4.98, 4.98, 4.98); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601 modified; 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=100mW, dist=10mm, f=5250 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 72.54 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 27.5 W/kg

SAR(1 g) = 7.91 W/kg; SAR(10 g) = 2.28 W/kg

Maximum value of SAR (measured) = 17.7 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 72.77 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 32.2 W/kg

SAR(1 g) = 8.41 W/kg; SAR(10 g) = 2.4 W/kg

Maximum value of SAR (measured) = 19.7 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan,

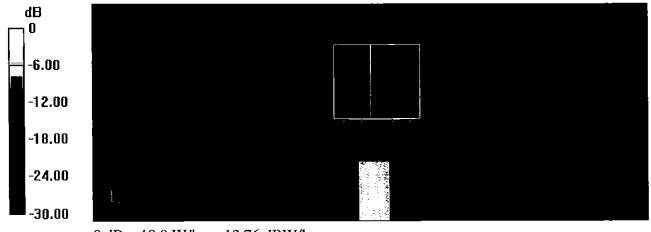
dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 70.93 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 31.4 W/kg

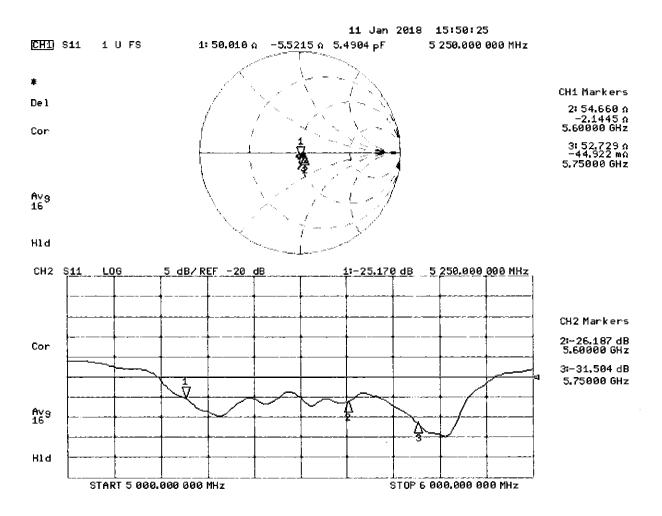
SAR(1 g) = 8.06 W/kg; SAR(10 g) = 2.3 W/kg

Maximum value of SAR (measured) = 18.9 W/kg



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

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 10.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1057

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5250 MHz, Frequency: 5600

MHz, Frequency: 5750 MHz, Frequency: 5800 MHz

Medium parameters used: f = 5200 MHz; $\sigma = 5.41 \text{ S/m}$; $\varepsilon_r = 47.3$; $\rho = 1000 \text{ kg/m}^3$

Medium parameters used: f = 5250 MHz; $\sigma = 5.48 \text{ S/m}$; $\varepsilon_r = 47.2$; $\rho = 1000 \text{ kg/m}^3$,

Medium parameters used: f = 5600 MHz; $\sigma = 5.94 \text{ S/m}$; $\varepsilon_r = 46.6$; $\rho = 1000 \text{ kg/m}^3$

Medium parameters used: f = 5750 MHz; $\sigma = 6.15 \text{ S/m}$; $\varepsilon_r = 46.3$; $\rho = 1000 \text{ kg/m}^3$

Medium parameters used: f = 5800 MHz; $\sigma = 6.22 \text{ S/m}$; $\varepsilon_r = 46.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(5.35, 5.35, 5.35); Calibrated: 30.12.2017, ConvF(5.26, 5.26, 5.26); Calibrated: 30.12.2017, ConvF(4.65, 4.65, 4.65); Calibrated: 30.12.2017, ConvF(4.57, 4.57, 4.57); Calibrated: 30.12.2017, ConvF(4.53, 4.53, 4.53); 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=100mW, dist=10mm, f=5200 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 64.05 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 27.6 W/kg

SAR(1 g) = 7.36 W/kg; SAR(10 g) = 2.06 W/kg

Maximum value of SAR (measured) = 17.1 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 64.53 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 29.4 W/kg

SAR(1 g) = 7.64 W/kg; SAR(10 g) = 2.13 W/kg

Maximum value of SAR (measured) = 17.9 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.09 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 34.0 W/kg

SAR(1 g) = 8.05 W/kg; SAR(10 g) = 2.25 W/kg

Maximum value of SAR (measured) = 19.5 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.45 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 32.9 W/kg

SAR(1 g) = 7.72 W/kg; SAR(10 g) = 2.14 W/kg

Maximum value of SAR (measured) = 18.9 W/kg

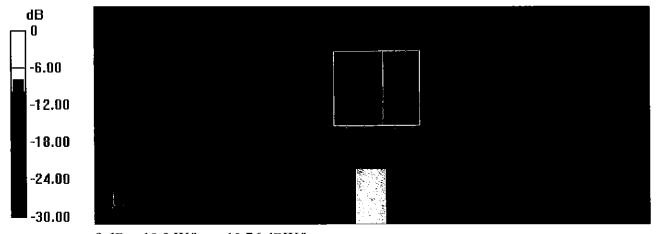
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.14 V/m; Power Drift = -0.08 dB

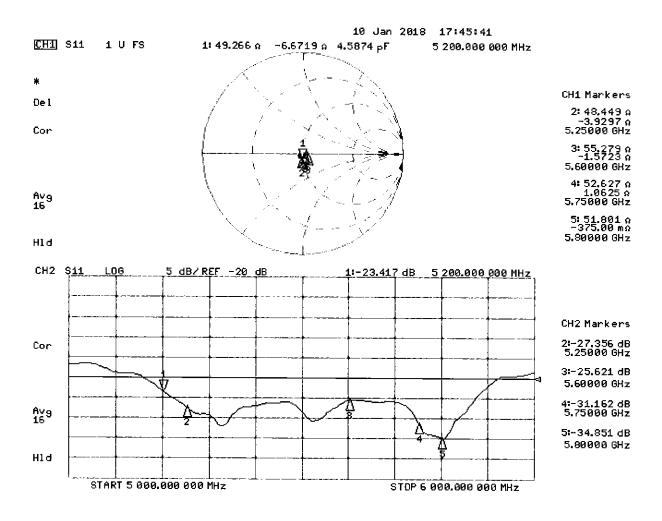
Peak SAR (extrapolated) = 33.3 W/kg

SAR(1 g) = 7.68 W/kg; SAR(10 g) = 2.13 W/kg



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

Impedance Measurement Plot for Body TSL



DASY5 Validation Report for SAM Head

Date: 16.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN:1057

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5800 MHz Medium parameters used: f = 5200 MHz; σ = 4.59 S/m; ϵ r = 36.5; ρ = 1000 kg/m³, Medium parameters used: f = 5800 MHz; σ = 5.28 S/m; ϵ r = 35.4; ρ = 1000 kg/m³

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

DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(5.75, 5.75, 5.75); Calibrated: 30.12.2017, ConvF(4.96, 4.96, 4.96); 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 - 5200/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 72.99 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 30.6 W/kg

SAR(1 g) = 8.24 W/kg; SAR(10 g) = 2.35 W/kg

Maximum value of SAR (measured) = 19.7 W/kg

SAM Head/Top - 5800/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 73.00 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 36.5 W/kg

SAR(1 g) = 8.62 W/kg; SAR(10 g) = 2.41 W/kg

Maximum value of SAR (measured) = 21.9 W/kg

SAM Head/Mouth - 5200/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 72.79 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 29.5 W/kg

SAR(1 g) = 8.54 W/kg; SAR(10 g) = 2.37 W/kg

Maximum value of SAR (measured) = 20.7 W/kg

SAM Head/Mouth - 5800/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm,

dz=1.4mm

Reference Value = 71.69 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 34.9 W/kg

SAR(1 g) = 8.88 W/kg; SAR(10 g) = 2.44 W/kg

Maximum value of SAR (measured) = 23.0 W/kg

SAM Head/Neck - 5200/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm,

dz=1.4mm

Reference Value = 72.48 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 27.9 W/kg

SAR(1 g) = 8.14 W/kg; SAR(10 g) = 2.37 W/kg

Maximum value of SAR (measured) = 19.3 W/kg

SAM Head/Neck - 5800/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 72.90 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 33.4 W/kg

SAR(1 g) = 8.33 W/kg; SAR(10 g) = 2.35 W/kg

Maximum value of SAR (measured) = 21.8 W/kg

SAM Head/Ear - 5200/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 54.68 V/m; Power Drift = 0.03 dB

D 1 CAD (1 1 1) 16 2 W/I

Peak SAR (extrapolated) = 16.3 W/kg

SAR(1 g) = 5.16 W/kg; SAR(10 g) = 1.76 W/kg

Maximum value of SAR (measured) = 11.1 W/kg

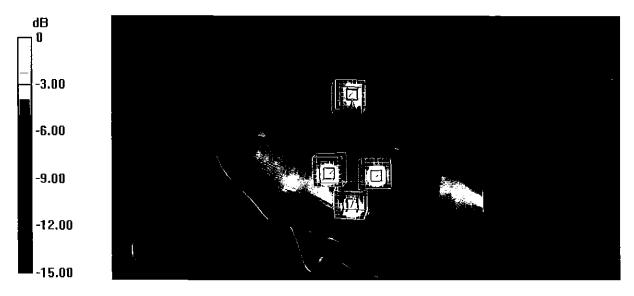
SAM Head/Ear - 5800/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 56.96 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 21.2 W/kg

SAR(1 g) = 5.68 W/kg; SAR(10 g) = 1.89 W/kg

Maximum value of SAR (measured) = 13.8 W/kg



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

PCTEST ENGINEERING LABORATORY, INC.



7185 Oakland Mills Road, Columbia, MD 21046 USA Tel. +1.410.290.6652 / Fax +1.410.290.6654 http://www.pctest.com



Certification of Calibration

Object D5GHzV2 – SN: 1057

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extension Calibration date: 1/16/2019

Description: SAR Validation Dipole at 5250, 5600, and 5750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	2/8/2018	Annual	2/8/2019	US39170122
Agilent	N5182A	MXG Vector Signal Generator	4/18/2018	Annual	4/18/2019	MY47420800
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1207364
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1339018
Anritsu	ML2495A	Power Meter	10/21/2018	Annual	10/21/2019	941001
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
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annual	6/4/2019	MY53401181
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Seekonk	NC-100	Torque Wrench	7/11/2018	Annual	7/11/2019	N/A
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/3/2018	Annual	10/3/2019	1558
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/18/2018	Annual	6/18/2019	1334
SPEAG	DAK-3.5	Dielectric Assessment Kit	9/11/2018	Annual	9/11/2019	1091
SPEAG	EX3DV4	SAR Probe	8/23/2018	Annual	8/23/2019	7308
SPEAG	EX3DV4	SAR Probe	6/25/2018	Annual	6/25/2019	7409

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	20K

Object:	Date Issued:	Page 1 of 4
D5GHzV2 – SN: 1057	01/16/2019	rage 1014

DIPOLE CALIBRATION EXTENSION

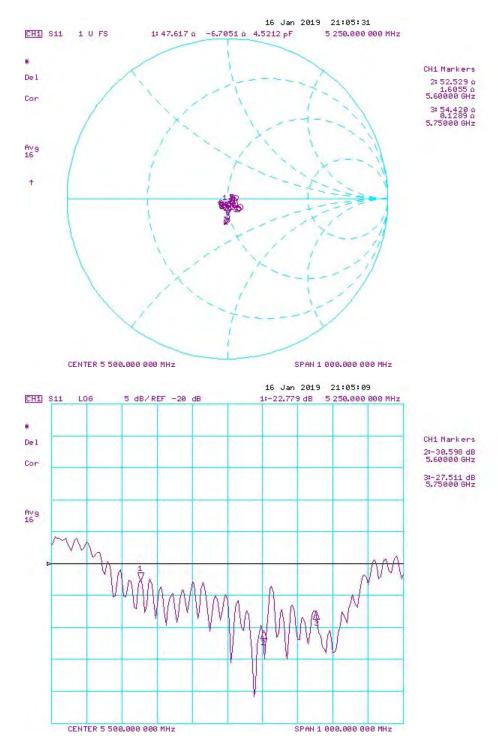
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

- 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:

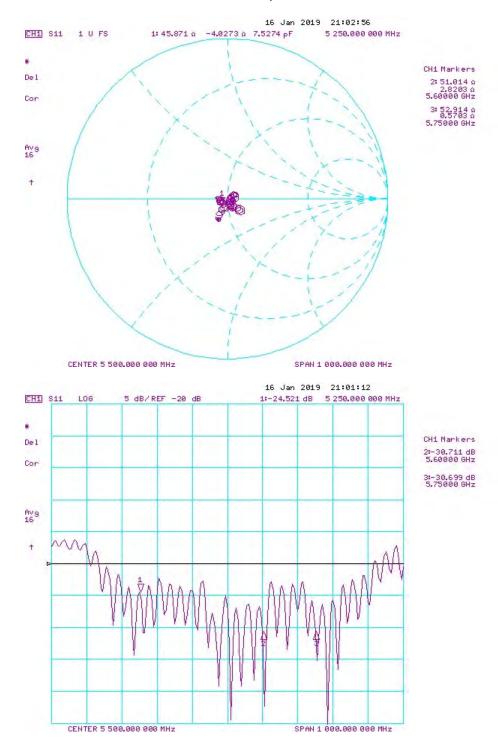
Frequency (MHz)	Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 17.0 dBm	Measured Head SAR (1g) W/kg @ 17.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 17.0 dBm	(40a) W/ka @	Deviation 10g (%)	Certificate Impedance Head (Ohm) 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
5250	1/16/2018	1/16/2019	1.203	3.96	3.63	-8.33%	1.14	1.04	-8.77%	50	47.6	2.4	-5.5	-6.7	1.2	-25.2	-22.8	9.60%	PASS
5600	1/16/2018	1/16/2019	1.203	4.205	3.84	-8.68%	1.2	1.09	-9.17%	54.7	52.5	2.2	-2.1	1.6	3.7	-26.2	-30.6	-16.80%	PASS
5750	1/16/2018	1/16/2019	1.203	4.025	3.76	-6.58%	1.15	1.07	-6.96%	52.7	54.4	1.7	0	0.1	0.1	-31.5	-27.5	12.70%	PASS
Frequency (MHz)	Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 17.0 dBm	Measured Body SAR (1g) W/kg @ 17.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 17.0 dBm	Measured Body SAR (10g) W/kg @ 17.0 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
5250	1/16/2018	1/16/2019	1.203	3.795	3.73	-1.71%	1.06	1.03	-2.37%	48.4	45.9	2.5	-3.9	-4	0.1	-27.4	-24.5	10.50%	PASS
5600	1/16/2018	1/16/2019	1.203	3.995	4.06	1.63%	1.12	1.12	0.45%	55.3	51	4.3	-1.6	2.8	4.4	-25.6	-30.7	-20.00%	PASS
5750	1/16/2018	1/16/2019	1.203	3.835	3.65	-4.82%	1.06	1.02	-3.77%	52.6	52.9	0.3	1.1	0.6	0.5	-31.2	-30.7	1.60%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Object:	Date Issued:	Page 3 of 4
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Impedance & Return-Loss Measurement Plot for Body TSL



Object:	Date Issued:	Page 4 of 4
D5GHzV2 – SN: 1057	01/16/2019	Page 4 of 4

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





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

Accreditation No.: SCS 0108

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

Client

PC Test

Certificate No: D5GHzV2-1191_Sep16

CALIBRATION CERTIFICATE

Object

D5GHzV2 - SN:1191

Calibration procedure(s)

QA CAL-22.v2

Calibration procedure for dipole validation kits between 3-6 GHz

Calibration date:

September 21, 2016

BNV WOON 3-6 GHz 09-28-2016 Extended PMV 9/20/2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (St). 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 \pm 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)	Арт-17
Power sensor NRP-Z91	SN: 103244	08-Apr-16 (No. 217-02288)	Apr-17
Power sensor NRP-Z91	SN: 103245	06-Apr-16 (No. 217-02289)	Apr-17
Reference 20 dB Altenuator	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: 3503	30-Jun-16 (No. EX3-3503_Jun16)	Jun-17
DAE4	SN: 601	30-Dec-15 (No. DAE4-601_Dec15)	Dec-16
	l		
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:	Leif Klysner	Laboratory Technician	Sid 4/4
			and large
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 22, 2016

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

Certificate No: D5GHzV2-1191_Sep16

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Calibration Laboratory of

Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





S Schweizerischer Kalibrierdienst
Service sulsse d'étalonnage
Servizio svizzero di taratura
S Swisa Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA

Multilateral Agreement for the recognition of calibration certificates

Glossary:

T\$L

tissue simulating liquid

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

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-2, "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
- c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) 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 V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5250 MHz ± 1 MHz 5600 MHz ± 1 MHz 5750 MHz ± 1 MHz	

Head TSL parameters at 5250 MHz
The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22,0 °C	35.9	4.71 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.5 ± 6 %	4.59 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		lan del 30 est

SAR result with Head TSL at 5250 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.96 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	78.9 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.29 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.6 W/kg ± 19.5 % (k≕2)

Head TSL parameters at 5600 MHz
The following parameters and calculations were applied.

-	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5,07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.0 ± 6 %	4.93 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8,45 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	83.6 W / kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.8 W/kg ± 19.5 % (k=2)

Head TSL parameters at 5750 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.4	5.22 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	33.8 ± 6 %	5,08 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	\$4.500 mile mile.	

SAR result with Head TSL at 5750 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.99 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	79.1 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.27 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	22.4 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5,36 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.4 ± 6 %	5.52 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	****	Ja Ne de Ar

SAR result with Body TSL at 5250 MHz

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.74 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	77.0 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.17 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.6 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5600 MHz
The following parameters and calculations were applied.

The following persons and the first state of the fi	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.8 ± 6 %	6.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	10.10.00.10	dat ya yak wal

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.96 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	79.2 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.24 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	22.2 W/kg ± 19.5 % (k=2)

Body TSL parameters at 5750 MHz

The following parameters and calculations were applied.

The fellening parents are	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.3	5.94 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.5 ± 6 %	6,21 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	мьтя	

SAR result with Body TSL at 5750 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.65 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	76.1 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	21.2 W/kg ± 19.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5250 MHz

Impedance, transformed to feed point	55.7 Ω - 4.3 jΩ
Return Loss	- 23.4 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	58.3 Ω - 3.2 jΩ
Return Loss	- 21.8 dB

Antenna Parameters with Head TSL at 5750 MHz

Impedance, transformed to feed point	58.1 Ω + 4.8 jΩ
Return Loss	- 21.2 dB

Antenna Parameters with Body TSL at 5250 MHz

Impedance, transformed to feed point	56.1 Ω - 3.7]Ω
Return Loss	- 23.4 dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	58.9 Ω - 1.7]Ω
Return Loss	- 21.7 dB

Antenna Parameters with Body TSL at 5750 MHz

Impedance, transformed to feed point	59.5 Ω + 6.9 jΩ
Return Loss	- 19.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.204 ns
Electrical Delay (one direction)	

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	August 28, 2003

Certificate No: D5GHzV2-1191_Sep16

DASY5 Validation Report for Head TSL

Date: 21,09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1191

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz Medium parameters used: f = 5250 MHz; $\sigma = 4.59$ S/m; $\varepsilon_r = 34.5$; $\rho = 1000$ kg/m³, Medium parameters used: f = 5600 MHz; $\sigma = 4.93$ S/m; $\varepsilon_r = 34$; $\rho = 1000$ kg/m³, Medium parameters used: f = 5750 MHz; $\sigma = 5.08$ S/m; $\varepsilon_r = 33.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 ~ SN3503; ConvF(5.42, 5.42, 5.42); Calibrated: 30.06.2016, ConvF(4.89, 4.89, 4.89); Calibrated: 30.06.2016, ConvF(4.85, 4.85); Calibrated: 30.06.2016;
- 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=100mW, dist=10mm, f=5250 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 68.49 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 28.6 W/kg

SAR(1 g) = 7.96 W/kg; SAR(10 g) = 2.29 W/kg

Maximum value of SAR (measured) = 18.2 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 69.34 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 32.9 W/kg

SAR(1 g) = 8.45 W/kg; SAR(10 g) = 2.41 W/kg

Maximum value of SAR (measured) = 20.0 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan,

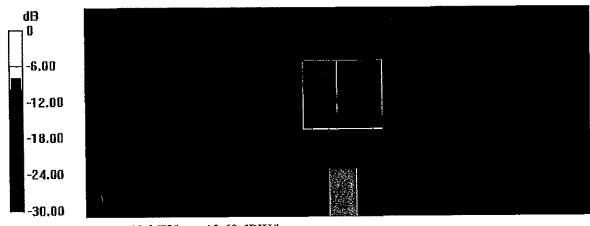
dist=1.4mm (8x8x7)/Cube 0: Measurement grid; dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 67.15 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 32.3 W/kg

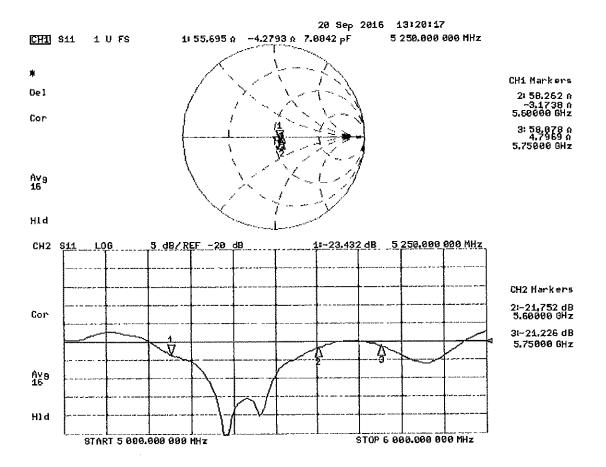
SAR(1 g) = 7.99 W/kg; SAR(10 g) = 2.27 W/kg

Maximum value of SAR (measured) = 19.3 W/kg



0 dB = 18.2 W/kg = 12.60 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 20.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1191

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz Medium parameters used: f = 5250 MHz; $\sigma = 5.52$ S/m; $\epsilon_r = 47.4$; $\rho = 1000$ kg/m³, Medium parameters used: f = 5600 MHz; $\sigma = 6$ S/m; $\epsilon_r = 46.8$; $\rho = 1000$ kg/m³, Medium parameters used: f = 5750 MHz; $\sigma = 6.21$ S/m; $\epsilon_r = 46.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN3503; ConvF(4.85, 4.85, 4.85); Calibrated: 30.06.2016, ConvF(4.35, 4.35, 4.35); Calibrated: 30.06.2016, ConvF(4.3, 4.3, 4.3); Calibrated: 30.06.2016;
- 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=100mW, dist=10mm, f=5250MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 66.49 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 29.1 W/kg

SAR(1 g) = 7.74 W/kg; SAR(10 g) = 2.17 W/kg

Maximum value of SAR (measured) = 17.7 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan,

dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.85 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 32.5 W/kg

SAR(1 g) = 7.96 W/kg; SAR(10 g) = 2.24 W/kg

Maximum value of SAR (measured) = 18.8 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan,

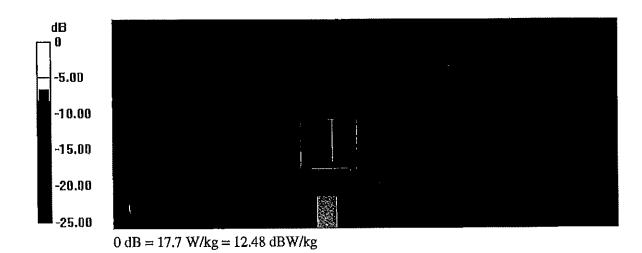
dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 64.21 V/m; Power Drift = -0.09 dB

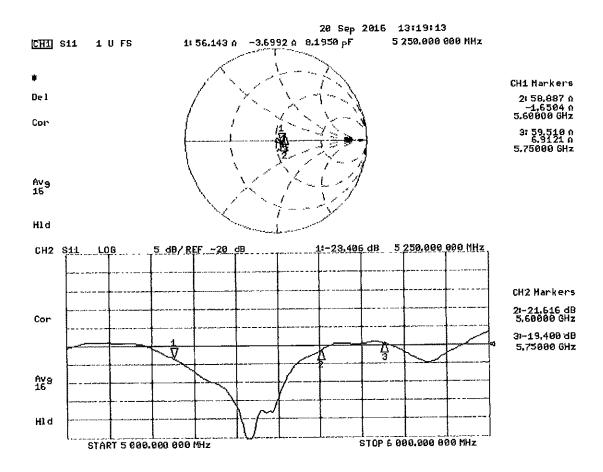
Peak SAR (extrapolated) = 32.7 W/kg

SAR(1 g) = 7.65 W/kg; SAR(10 g) = 2.14 W/kg

Maximum value of SAR (measured) = 18.5 W/kg



Impedance Measurement Plot for Body TSL



PCTEST

PCTEST ENGINEERING LABORATORY, INC. 7185 Oakland Mills Road, Columbia, MD 21046 USA

7185 Oakland Mills Road, Columbia, MD 21046 USA Tel. +1.410.290.6652 / Fax +1.410.290.6654 http://www.pctest.com



Certification of Calibration

Object

D5GHzV2 - SN: 1191

Calibration procedure(s)

Procedure for Calibration Extension for SAR Dipoles.

Extension Calibration date:

9/19/2017

Description:

SAR Validation Dipole at 5250, 5600, and 5750 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	Bienniai	5/2/2019	170330156
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3d8)	CBT	N/A	CBT	9406
Keysight	7720	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
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	C8T	N/A	CBT	N/A
SPEAG	DAK-3,S	Dielectric Assessment KIt	5/10/2017	Annual	5/10/2018	1070
SPEAG	EX3DV4	SAR Probe	1/13/2017	Annual	1/13/2018	3589
SPEAG	EX3DV4	SAR Probe	2/13/2017	Annual	2/13/2018	3914
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/16/2017	Annual	1/16/2018	1466
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/9/2017	Annual	2/9/2018	665
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	Bienniai	11/6/2017	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BAODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	90K

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Object:	Date Issued:	Page 1 of 4	
D5GHzV2 SN: 1191	09/19/2017	Page 1 of 4	ĺ

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.

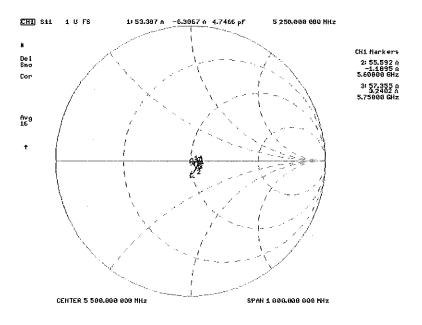
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

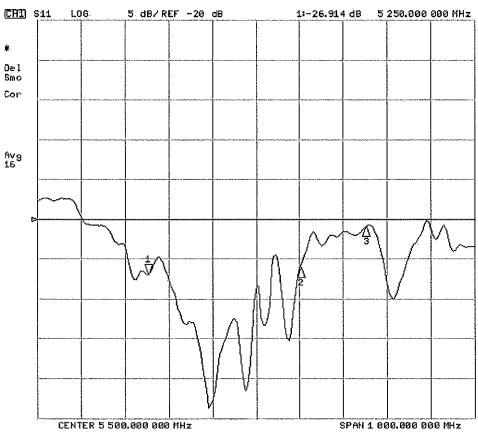
Frequency (MHz)	Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 17.0 dBm	Measured Head	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 17.0 dBm	Measured Head SAR (10g) W/kg @ 17.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) 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
5250	9/21/2016	9/19/2017	1.204	3.95	3.70	-6.21%	1.13	1.05	-7.08%	55.7	53.4	2.3	4.3	-6.4	2.1	-23.4	-26.9	-15.00%	PASS
5600	9/21/2016	9/19/2017	1.204	4.18	4.03	-3.59%	1.19	1.13	-5.04%	58.3	55.6	2.7	-3.2	-1.2	2.0	-21.8	-26.1	-19.80%	PASS
5750	9/21/2016	9/19/2017	1.204	3.96	3.94	-0.38%	1.12	1.10	-1.79%	58.1	57.4	0.7	4.8	3.2	1.6	-21.2	-21.0	0.90%	PASS

Frequency (MHz)	Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 17.0 dBm	Measured Body SAR (1g) W/kg @ 17.0 dBm	Desistion to (%)	Certificate SAR Target Body (10g) W/kg @ 17.0 dBm	Measured Body SAR (10g) W/kg @ 17.0 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 (%)	
5250	9/21/2016	9/19/2017	1.204	3.85	3.80	-1.30%	1.08	1.06	-1.85%	56.1	54.0	2.1	-3.7	-3.3	0.4	-23.4	-26.0	-11.10%	PASS
5600	9/21/2016	9/19/2017	1.204	3.96	4.06	2.53%	1.11	1.13	1.80%	58.9	56.5	2.4	-1.7	0.5	2.2	-21.7	-24.5	-12.80%	PASS
5750	9/21/2016	9/19/2017	1.204	3.81	3.66	-3.81%	1.06	1.02	-3.77%	59.5	58.0	1.5	6.9	5.2	1.7	-19.4	-21.1	-8.70%	PASS

Object:	Date Issued:	Page 2 of 4
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Impedance & Return-Loss Measurement Plot for Head TSL

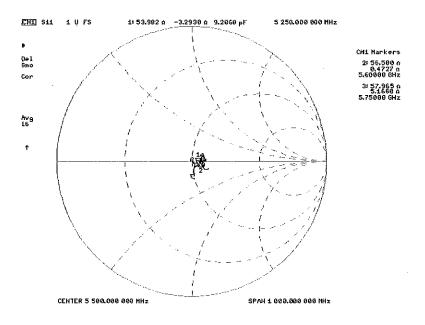


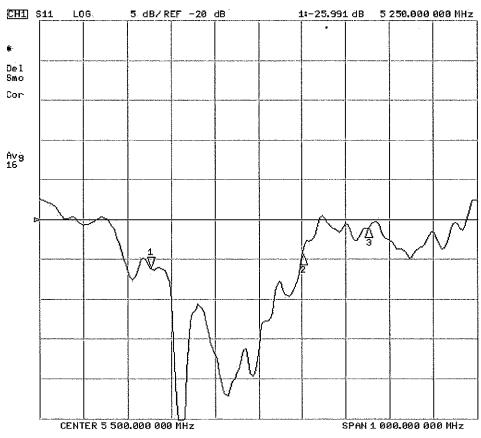


CH1 Markers 2:-26.108 dB 5.60000 GHz 3:-21.016 dB 5.75000 GHz

Object:	Date Issued:	Page 3 of 4
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Impedance & Return-Loss Measurement Plot for Body TSL





CH1 Markers 2:-24.481 dB 5.60000 GHz 3:-21.092 dB 5.75000 GHz

Object:	Date Issued:	D
D5GHzV2 – SN: 1191	09/19/2017	Page 4 of 4

.. PCIL

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7185 Oakland Mills Road, Columbia, MD 21046 USA Tel, +1.410.290.6652 / Fax +1.410.290.6654 http://www.pctest.com



Certification of Calibration

Object

D5GHzV2 - SN: 1191

Calibration procedure(s)

Procedure for Calibration Extension for SAR Dipoles.

Extension Calibration date:

9/11/2018

Description:

SAR Validation Dipole at 5250, 5600, and 5750 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	Blennial	3/31/2019	170232394
Control Company	4352	Ultra Long Stem Thermometer	5/2/2017	Biennial	5/2/2019	170330156
Amplifier Research	15\$166	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3d8)	CBT	N/A	CBT	9406
Keysight	772D	Dual Directional Coupler	CBT	N/A	СВТ	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annual	6/4/2019	MY53401181
Agilent	8753ES	S-Parameter Vector Network Analyzer	8/30/2018	Annual	8/30/2019	MY40003841
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/15/2018	Annual	5/15/2019	1070
SPEAG	EX3DV4	SAR Probe	6/25/2018	Annual	6/25/2019	7409
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/18/2018	Annual	6/18/2019	1334
SPEAG	EX3DV4	SAR Probe	4/18/2018	Annual	4/18/2019	7357
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/11/2018	Annual	4/11/2019	1407
Anritsu	MA2411B	Pulse Power Sensor	3/2/2018	Annua!	3/2/2019	1207364
Anritsu	MA24118	Pulse Power Sensor	3/2/2018	Annual	3/2/2019	1339018
Anritsu	ML2495A	Power Meter	10/22/2017	Annuai	10/22/2018	1328004
Agilent	N5182A	MXG Vector Signal Generator	4/18/2018	Annua!	4/18/2019	MY47420800
Seekonk	NC-100	Torque Wrench	7/11/2018	Annual	7/11/2019	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	СВТ	N/A
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	СВТ	N/A

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path.

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BAOPTE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	20K-

Object:	Date Issued:	Page 1 of 4
	09/11/2018	Page 1 of 4

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:

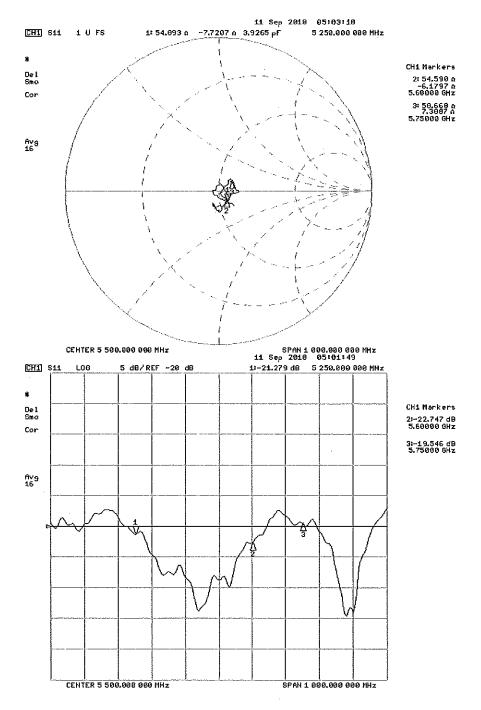
- 1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
- 2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
- 3. The measurement of real or imaginary parts of impedance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

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

Frequency (MHz)	Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 17.0 dBm	Measured Head SAR (1g) W/kg @ 17.0 dBm		Certificate SAR Target Head (10g) W/kg @ 17.0 dBm	Measured Head SAR (10g) W/kg @ 17.0 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
5250	9/21/2016	9/11/2018	1.204	3.945	3.9	-1.14%	1.13	1.11	-1.77%	55.7	54.9	0.8	-4.3	-7.7	3.4	-23.4	-21.3	9.10%	PASS
5600	9/21/2016	9/11/2018	1.204	4.18	4.19	0.24%	1.19	1.18	-0.84%	58.3	54.6	3.7	-3.2	-6.2	3	-21.8	-22.7	-4.30%	PASS
5750	9/21/2016	9/11/2018	1.204	3.955	3.82	-3.41%	1.12	1.08	-3.57%	58.1	58.7	0.6	4.8	7.4	2.6	-21.2	-19.5	7.80%	PASS
Frequency (MHz)	Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 17.0 dBm	Measured Body SAR (1g) W/kg @ 17.0 dBm		Certificate SAR Target Body (10g) W/kg @ 17.0 dBm	Measured Body SAR (10g) W/kg @ 17.0 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
5250	9/21/2016	9/11/2018	1.204	3.85	3.6	-6.49%	1.08	1.01	-6.48%	56.1	53.6	2.5	-3.7	-5.5	1.8	-23.4	-24	-2.40%	PASS
5600	9/21/2016	9/11/2018	1.204	3.96	4.01	1.26%	1.11	1.1	-0.90%	58.9	57	1.9	-1.7	0.1	1.8	-21.7	-23.8	-9.70%	PASS
5750	9/21/2016	9/11/2018	1.204	3.805	3.88	1.97%	1.06	1.06	0.00%	59.5	60.3	0.8	6.9	6.1	8.0	-19.4	-19.2	1.00%	PASS

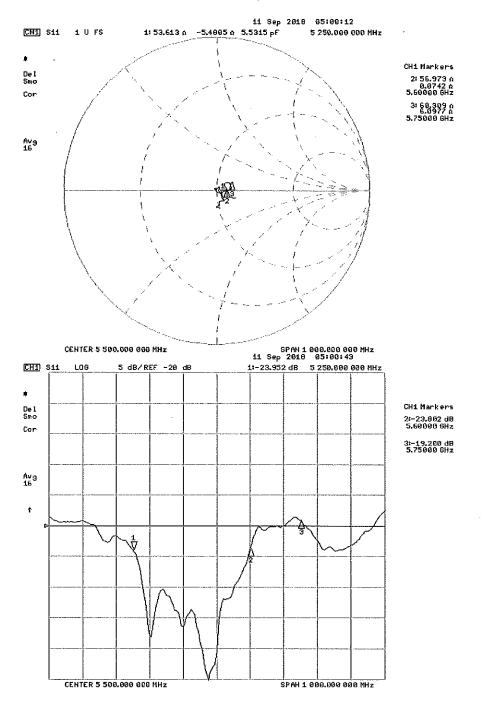
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D5GHzV2 – SN: 1191	09/11/2018	Fage 2 01 4

Impedance & Return-Loss Measurement Plot for Head TSL



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D5GHzV2 – SN: 1191	09/11/2018	Page 3 of 4

Impedance & Return-Loss Measurement Plot for Body TSL



Object:	Date Issued:	Page 4 of 4
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Calibration Laboratory of

Schmid & Partner **Engineering AG** Zeughausstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Certificate No: EX3-3589_Jan19

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

Client

Object

PC Test

CALIBRATION CERTIFICATE

EX3DV4 - SN:3589

Calibration procedure(s)

QA CAL-01.v9, QA CAL-14.v5, QA CAL-23.v5, QA CAL-25.v7 Calibration procedure for dosimetric E-field probes

Calibration date:

January 25, 2019

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)

Certificate No: EX3-3589_Jan19

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-18 (No. 217-02682)	Арг-19
DAE4	SN: 660	19-Dec-18 (No. DAE4-660_Dec18)	Dec-19
Reference Probe ES3DV2	SN: 3013	31-Dec-18 (No. ES3-3013_Dec18)	Dec-19
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	in house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

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

Issued: January 29, 2019

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

Calibration Laboratory of

Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





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

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

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

Glossary:

TSL NORMx,y,z tissue simulating liquid sensitivity in free space

ConvF DCP sensitivity in TSL / NORMx,y,z diode compression point

CF A, B, C, D crest factor (1/duty_cycle) of the RF signal modulation dependent linearization parameters

Polarization φ

φ rotation around probe axis

Polarization 9

notation around an axis that is in the plane normal to probe axis (at measurement center),

i.e., 9 = 0 is normal to probe axis

Connector Angle

Certificate No: EX3-3589_Jan19

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 handheld 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 9 = 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 E²-field uncertainty inside TSL (see below ConvF).

NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is
implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included
in the stated uncertainty of ConvF.

DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep 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).

January 25, 2019 EX3DV4 - SN:3589

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3589

Basic Calibration Parameters

Dasic Calibration I arai	Heters			1 11 (10)
	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (μV/(V/m) ²) ^A	0,44	0.40	0.39	± 10.1 %
DCP (mV) ^B	104.1	102.3	101.6	

Calibration Possite for Modulation Response

UID	ion Results for Modulation Communication System Name		A dB	B dBõV	С	D dB	VR mV	Max dev.	Max Unc ^E (k=2)
0	CW	X	0.00	0.00	1.00	0.00	161.0	± 2.2 %	± 4.7 %
U	044	Y	0.00	0.00	1.00		172.8		
		Z	0.00	0.00	1.00		161.9		
10352-	Pulse Waveform (200Hz, 10%)	X	15.00	89.05	22.73	10.00	60.0	± 1.8 %	± 9.6 %
AAA	Tuiso vidvoisiii (moorii)	Y	15.00	87.03	21.09		60.0		
,,,,,	ł	Z	15.00	88.89	22.24		60.0		
10353-	Pulse Waveform (200Hz, 20%)	X	15.00	89.55	21.62	6.99	80.0	± 0.9 %	± 9.6 %
AAA	, 4,55	Υ	15.00	87.28	19.70		80.0		
		Z	15.00	89.25	21.07		80.0		
10354-	Pulse Waveform (200Hz, 40%)	X	15.00	91.62	21.02	3.98	95.0	± 0.9 %	± 9.6 %
AAA	1 disc wavelenn (2501 iz, 1575)	Y	15.00	87.00	17.73		95.0		
		Z	15.00	91.02	20.33		95.0		
10355-	Pulse Waveform (200Hz, 60%)	X	15.00	97.72	22.56	2.22	120.0	± 1.3 %	± 9.6 %
AAA		Y	15.00	85.70	15.52		120.0		
		Z	15.00	94.39	20.55		120.0		
10387-	QPSK Waveform, 1 MHz	X	0.93	64.13	11.59	0.00	150.0	± 3.0 %	± 9.6 %
AAA	,	Y	0.57	60.00	7.45		150.0		
		Z	0.83	63.49	10.36		150.0		+
10388-	QPSK Waveform, 10 MHz	X	2.36	68.76	16.09	0.00	150.0	± 1.5 %	± 9.6 %
AAA		Y	1.95	66.09	14.43	<u> </u>	150.0	1	
		Z	2.37	69.14	16.27		150.0		
10396-	64-QAM Waveform, 100 kHz	X	3.76	72.95	19.72	3.01	150.0	± 0.7 %	± 9.6 %
AAA		Y	3.11	69.51	18.06		150.0	1	
		Z	4.24	75.35	20.59		150.0		
10399- AAA	64-QAM Waveform, 40 MHz	X	3.57	67.40	15.92	0.00	150.0	± 2.7 %	± 9.6 %
		Υ	3.33	66.26	15.18	_]	150.0	1	
		Z	3.47	67.09	15.77		150.0		
10414-	WLAN CCDF, 64-QAM, 40MHz	Х	4.95	65.72	15.56	0.00	150.0	± 4.8 %	± 9.6 %
AAA		Υ	4.74	65.16	15.23		150.0		
	}	Z	4.81	65.57	15.48		150.0	<u> </u>	

Note: For details on UID parameters see Appendix

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%.

^B Numerical linearization parameter: uncertainty not required.

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[^] The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

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

January 25, 2019

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3589

Sensor Model Parameters

,11301 1	C1 fF	C2 fF	α V ⁻¹	T1 ms.V ⁻²	T2 ms.V ⁻¹	T3 ms	T4 V ⁻²	T5 V⁻¹	Т6
X	55.3	407.97	34.85	27.50	1.34	5.10	1.23	0.50	1.01
$\frac{\lambda}{\nabla}$	46.7	357.99	37.12	21.71	1.59	5.07	0.00	0.73	1.01
- 	46.1	339.04	34.64	23.94	1.27	5.07	1.73	0.40	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-30.3
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3589

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	8.67	8.67	8.67	0.70	0.80	± 12.0 %
835	41.5	0.90	8.39	8.39	8.39	0.63	0.81	± 12.0 %
1750	40.1	1.37	7.31	7.31	7.31	0.40	0.80	± 12.0 %
1900	40.0	1.40	7.08	7.08	7.08	0.39	0.80	± 12.0 %
2300	39.5	1.67	6.77	6.77	6.77	0.31	0.85	± 12.0 %
2450	39.2	1.80	6.46	6.46	6.46	0.30	0.85	± 12.0 %
2600	39.0	1.96	6.25	6.25	6.25	0.40	0.83	± 12.0 %
3500	37.9	2.91	6.16	6.16	6.16	0.26	1.20	± 13.1 %
3700	37.7	3.12	6.02	6.02	6.02	0.26	1.20	± 13.1 %

^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. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

F At frequencies below 3 GHz, the validity of tissue parameters (a and o) can be relaxed to ± 10% if liquid compensation formula is applied to

F At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3589

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^c	Relative Permittivity ^F	Conductivity (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
750	55.5	0.96	8.34	8.34	8.34	0.42	0.84	± 12.0 %
835	55.2	0.97	8,29	8.29	8.29	0.41	0.84	± 12.0 %
1750	53.4	1.49	6.82	6.82	6.82	0.43	0.80	± 12.0 %
1900	53.3	1.52	6.75	6.75	6.75	0.35	0.85	± 12.0 %
2300	52.9	1.81	6.71	6.71	6.71	0.36	0.87	± 12.0 %
2450	52.7	1.95	6.66	6.66	6.66	0.34	0.88	± 12.0 %
2600	52.5	2.16	6.47	6.47	6.47	0.28	0.95	± 12.0 %
3500	51.3	3.31	6.21	6.21	6.21	0.25	1.25	± 13.1 %
3700	51.0	3.55	6.13	6.13	6.13	0.20	1.25	± 13.1 %

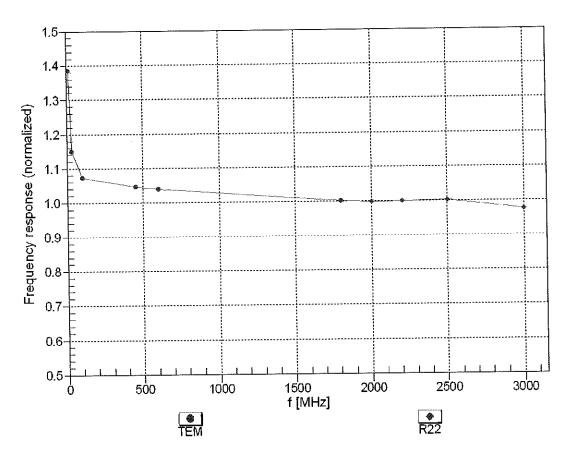
^c Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to \pm 110 MHz. frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to \pm 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.

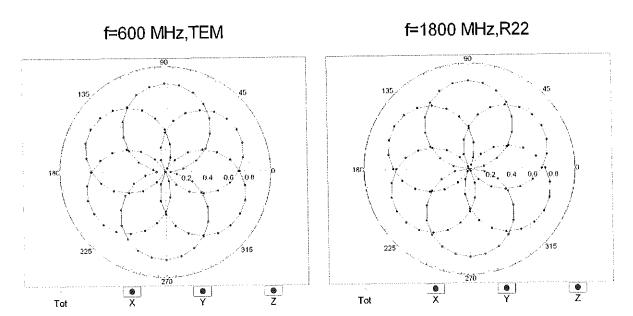
Galpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

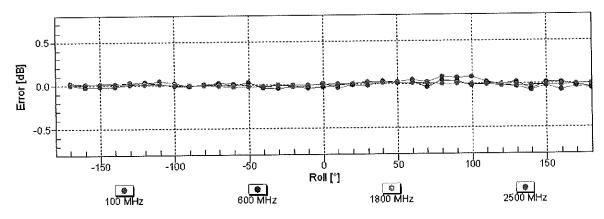
Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



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

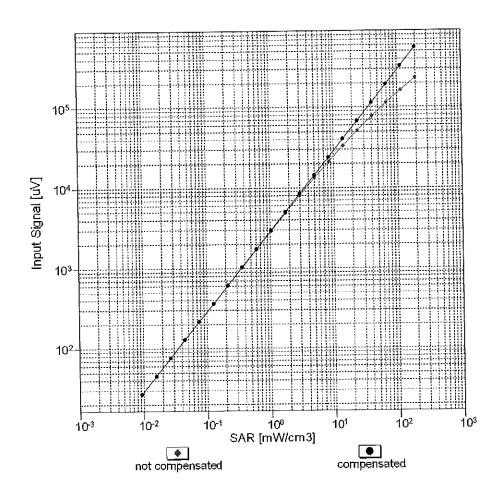
Receiving Pattern (ϕ), $\vartheta = 0^{\circ}$

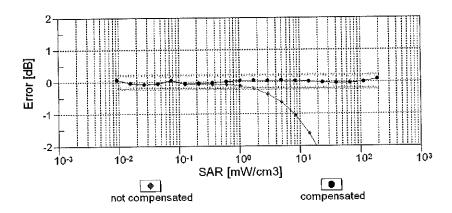




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

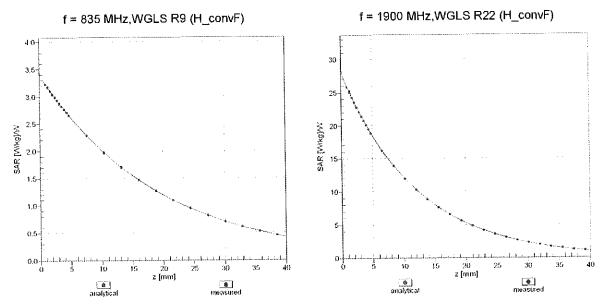
Dynamic Range f(SAR_{head}) (TEM cell , f_{eval}= 1900 MHz)



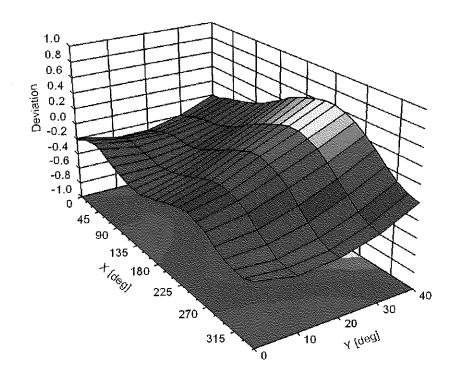


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (ϕ , ϑ), f = 900 MHz



Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR	Unc ^E
0	1	CW	cw	(dB)	(k=2)
10010	CAA	SAR Validation (Square, 100ms, 10ms)	Test	0.00 10.00	± 4.7 % ± 9.6 %
10011	CAB	UMTS-FDD (WCDMA)	WCDMA	2.91	±9.6 %
10012	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	± 9.6 %
10013	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	WLAN	9.46	± 9.6 %
10021	DAC	GSM-FDD (TDMA, GMSK)	GSM	9.39	±9.6 %
10023	DAC	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	± 9.6 %
10024	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	± 9.6 %
10025	DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	GSM	12.62	± 9.6 %
10026	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	GSM	9.55	± 9.6 %
10027	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	GSM	4.80	±9.6 %
10028	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	GSM	3.55	± 9.6 %
10029	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	GSM	7.78	± 9.6 %
10030	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.30	± 9.6 %
10031	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	Bluetooth	1.87	± 9.6 %
10032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	Bluetooth	1.16	±9.6 %
10033	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	Bluetooth	7.74	± 9.6 %
10034	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	Bluetooth	4.53	±9.6%
10035	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	Bluetooth	3.83	± 9.6 %
10036	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	Bluetooth	8.01	± 9.6 %
10037	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	Bluetooth	4.77	± 9.6 %
10038	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	Bluetooth	4.10	±9.6%
10039	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	±9.6%
10042	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	AMPS	7.78	±9.6%
10044	CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	AMPS	0.00	±96%
10048	CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	DECT	13.80	±9.6%
10049	CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	DECT	10.79	±9.6%
10056 10058	DAC	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	TD-SCDMA	11.01	±9.6%
10056	CAB	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3) IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	GSM WLAN	6.52	±9.6%
10059	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	WLAN	2.12 2.83	±9.6 %
10061	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1.1 Mbps)	WLAN	3.60	± 9.6 %
10062	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	WLAN	8.68	± 9.6 %
10063	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	8.63	± 9.6 %
10064	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	WLAN	9.09	± 9.6 %
10065	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	WLAN	9.00	± 9.6 %
10066	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	WLAN	9.38	± 9.6 %
10067	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	± 9.6 %
10068	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	WLAN	10.24	±9.6 %
10069	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	WLAN	10.56	± 9.6 %
10071	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	WLAN	9.83	± 9.6 %
10072	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.62	± 9.6 %
10073	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	9.94	± 9.6 %
10074	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	WLAN	10.30	± 9.6 %
10075	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	WLAN	10.77	±9.6 %
10076	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	WLAN	10.94	± 9.6 %
10077	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	WLAN	11.00	± 9.6 %
10081	CAB	CDMA2000 (1xRTT, RC3)	CDMA2000	3.97	± 9.6 %
10082	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	AMPS	4.77	± 9.6 %
10090	DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	GSM	6.56	±9.6%
10097 10098	CAB CAB	UMTS-FDD (HSDPA) UMTS-FDD (HSUPA, Subtest 2)	WCDMA WCDMA	3.98 3.98	± 9.6 % ± 9.6 %
10098	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	GSM	9.55	± 9.6 %
10100	CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	5.67	± 9.6 %
10101	CAE	LTE-FDD (SC-FDMA, 100 % RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	± 9.6 %
10101	CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-FDD	6,60	± 9.6 %
10103	CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-TDD	9.29	± 9.6 %
10104	CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-TDD	9.97	± 9.6 %
	CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-TDD	10.01	± 9.6 %
10105					

			TITE EDD	C 40	1060
10109	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-FDD LTE-FDD	6.43 5.75	± 9.6 % ± 9.6 %
10110	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-FDD	6.44	± 9.6 %
10111	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD	6.59	± 9.6 %
10112	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-FDD	6.62	±9.6 %
10113	CAC	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	WLAN	8.10	± 9.6 %
10115	CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	WLAN	8.46	± 9.6 %
10116	CAC	IEEE 802.11n (HT Greenfield, 91 Mbps, 10-QAM)	WLAN	8.15	± 9.6 %
10117	CAC	IEEE 802.11n (HT Greenlied, 13.5 Mbps, 64-44/M)	WLAN	8.07	± 9.6 %
10117	CAC	IEEE 802.11n (HT Mixed, 10.5 Mbps, 16-QAM)	WLAN	8.59	± 9.6 %
10119	CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	WLAN	8.13	± 9.6 %
10140	CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-FDD	6.49	± 9.6 %
10141	CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-FDD	6,53	± 9.6 %
10142	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10143	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-FDD	6.35	± 9.6 %
10144	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-FDD	6.65	± 9.6 %
10145	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-FDD	5.76	±9.6%
10146	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.41	±9.6%
10147	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.72	± 9.6 %
10149	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	± 9.6 %
10150	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-FDD	6.60	± 9.6 %
10151	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-TDD	9.28	± 9.6 %
10152	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TDD	9.92	±9.6 %
10153	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-TDD	10.05	± 9.6 %
10154	CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-FDD	5.75	± 9.6 %
10155	CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	± 9.6 %
10156	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-FDD	5.79	± 9.6 %
10157	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-FDD	6.49	± 9.6 %
10158	CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	± 9.6 %
10159	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-FDD	6,56	± 9.6 %
10160	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-FDD	5.82	± 9.6 %
10161	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-FDD	6.43	± 9.6 %
10162	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-FDD	6.58	± 9.6 %
10166	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.46	± 9.6 %
10167	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.21	± 9.6 %
10168	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.79	± 9.6 %
10169	CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-FDD	5.73	±9.6%
10170	CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10171	AAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-FDD	6.49	± 9.6 %
10172	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-TDD	9.21	±9.6 %
10173	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 % ± 9.6 %
10174	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TDD	10.25 5.72	± 9.6 %
10175	CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-FDD	6.52	± 9.6 %
10176	CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)		5.73	± 9.6 %
10177	CAL	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-FDD LTE-FDD	6.52	± 9.6 %
10178	CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM) LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10179	CAG		LTE-FDD	6.50	± 9.6 %
10180	CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM) LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-FDD	5.72	± 9.6 %
10181 10182	CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QFSR) LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
	CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.50	± 9.6 %
10183	CAE	LTE-FDD (SC-FDMA, 1 RB, 13 MHz, 04-QAW)	LTE-FDD	5.73	± 9.6 %
10184 10185	CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-FDD	6.51	± 9.6 %
10186	AAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 10-QAM)	LTE-FDD	6.50	± 9.6 %
10187	CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10188	CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10189	AAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10193	CAC	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	WLAN	8.09	±9.6 %
10193	CAC	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	WLAN	8.12	± 9.6 %
10195	CAC	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	WLAN	8.21	± 9.6 %
10196	CAC	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	WLAN	8.10	± 9.6 %
10196	CAC	IEEE 802.1111 (111 Mixed, 0.3 Mbps, 16-QAM)	WLAN	8.13	± 9.6 %
10198	CAC	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	WLAN	8.27	± 9.6 %
10219	CAC	IEEE 802.11n (HT Mixed, 35 Msps, 61 Salary)	WLAN	8.03	± 9.6 %
10210	1 0,10				

10220	CAC	IEEE 902 44p /UT Mixed 42 0 Mb - 42 CALD	T	I _ : =	
10220	CAC	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	WLAN	8.13	±9.6%
10221	CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM) IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	WLAN	8.27	±9.6%
10223	CAC	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	WLAN	8.06	± 9.6 %
10224	CAC	IEEE 802.11n (HT Mixed, 50 Mbps, 64-QAM)	WLAN WLAN	8.48 8.08	± 9.6 %
10225	CAB	UMTS-FDD (HSPA+)	WCDMA	5.97	±9.6%
10226	CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.49	± 9.6 % ± 9.6 %
10227	CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.26	± 9.6 %
10228	CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-TDD	9.22	± 9.6 %
10229	CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10230	CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10231	CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-TDD	9.19	± 9.6 %
10232	CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10233	CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10234	CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-TDD	9.21	± 9.6 %
10235	CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10236	CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10237	CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-TDD	9.21	±9.6%
10238	CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10239	CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10240 10241	CAF CAA	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-TDD	9.21	± 9.6 %
10241	CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.82	±9.6%
10242	CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM) LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-TDD	9.86	± 9.6 %
10243	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK) LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-TDD	9.46	±9.6%
10245	CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-TDD LTE-TDD	10.06 10.06	±9.6 % ±9.6 %
10246	CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-TDD	9.30	±9.6 %
10247	CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-TDD	9.91	± 9.6 %
10248	CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-TDD	10.09	± 9.6 %
10249	CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-TDD	9.29	± 9.6 %
10250	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-TDD	9.81	± 9.6 %
10251	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-TDD	10.17	± 9.6 %
10252	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-TDD	9.24	±9.6%
10253	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-TDD	9.90	± 9.6 %
10254	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TDD	10.14	±9.6%
10255	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-TDD	9.20	± 9.6 %
10256	CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.96	± 9.6 %
10257	CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.08	± 9.6 %
10258	CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-TDD	9.34	± 9.6 %
10259 10260	CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-TDD	9.98	± 9.6 %
10260	CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-TDD	9.97	± 9.6 %
10261		LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK) LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-TDD	9.24	± 9.6 %
10263	CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-TDD	9.83	± 9.6 %
10264	CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM) LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-TDD LTE-TDD	10.16 9.23	± 9.6 %
10265	CAF	LTE-TDD (3C-FDMA, 100% RB, 10 MHz, QF3K) LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-TDD	9.23	± 9.6 % ± 9.6 %
10266	CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-TDD	10.07	± 9.6 %
10267	CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-TDD	9.30	± 9.6 %
10268	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-TDD	10.06	± 9.6 %
10269	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-TDD	10.13	± 9.6 %
10270	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-TDD	9.58	± 9.6 %
10274	CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	WCDMA	4.87	± 9.6 %
10275	CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	WCDMA	3.96	± 9.6 %
10277	CAA	PHS (QPSK)	PHS	11.81	± 9.6 %
10278	CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	PHS	11.81	± 9.6 %
10279	CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	PHS	12.18	± 9.6 %
10290	AAB	CDMA2000, RC1, SO55, Full Rate	CDMA2000	3.91	±9.6%
10291	AAB	CDMA2000, RC3, SO55, Full Rate	CDMA2000	3.46	± 9.6 %
10292	AAB	CDMA2000, RC3, SO32, Full Rate	CDMA2000	3.39	± 9.6 %
10293	AAB	CDMA2000, RC3, SO3, Full Rate	CDMA2000	3.50	± 9.6 %
10295 10297	AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	CDMA2000	12.49	± 9.6 %
10297	AAD AAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-FDD	5.81	± 9.6 %
10298	AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK) LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-FDD	5.72	±9.6%
10233	עאט	LILI DD (OCI DIVIA, OU /6 ND, O WIFIZ, TO-WAIVI)	LTE-FDD	6.39	± 9.6 %

40000	A A D	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-FDD	6.60	± 9.6 %
10300	AAD	IEEE 802.16e WIMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	WiMAX	12.03	± 9.6 %
10301 10302	AAA	IEEE 802.16e WIMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL	WIMAX	12.57	± 9.6 %
10302	700	symbols)			
10303	AAA	IEEE 802.16e WIMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	WiMAX	12.52	± 9.6 % ± 9.6 %
10304	AAA	IEEE 802.16e WIMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	WiMAX		
10305	AAA	IEEE 802.16e WIMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15	WiMAX 15.24		± 9.6 %
		symbols)	14/14/14	44.67	1.0.6.9/
10306	AAA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18	WiMAX	14.67	± 9.6 %
40007		symbols) IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18	WiMAX	14.49	± 9.6 %
10307	AAA	symbols)	A A HAIL-TO	17,10	_ 0.0 /0
10308	AAA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	WiMAX	14.46	± 9.6 %
10309	AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18	WiMAX	14.58	± 9.6 %
10000		symbols)			
10310	AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18	WIMAX	14.57	± 9.6 %
		symbols)		0.00	1000
10311	AAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-FDD iDEN	6.06 10.51	± 9.6 %
10313	AAA	IDEN 1:3	IDEN	13.48	± 9.6 %
10314	AAA	IDEN 1:6	WLAN	1.71	± 9.6 %
10315	AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle) IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	WLAN	8.36	± 9.6 %
10316	AAB	IEEE 802.11g WIFI 5.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	WLAN	8.36	± 9.6 %
10317 10352	AAC	Pulse Waveform (200Hz, 10%)	Generic	10.00	± 9.6 %
10352	AAA	Pulse Waveform (200Hz, 20%)	Generic	6.99	± 9.6 %
10353	AAA	Pulse Waveform (200Hz, 40%)	Generic	3.98	± 9.6 %
10355	AAA	Pulse Waveform (200Hz, 60%)	Generic	2.22	± 9.6 %
10356	AAA	Pulse Waveform (200Hz, 80%)	Generic	0.97	± 9.6 %
10387	AAA	QPSK Waveform, 1 MHz	Generic	5.10	± 9.6 %
10388	AAA	QPSK Waveform, 10 MHz	Generic	5.22	± 9.6 %
10396	AAA	64-QAM Waveform, 100 kHz	Generic	6.27	± 9.6 %
10399	AAA	64-QAM Waveform, 40 MHz	Generic	6.27	± 9.6 %
10400	AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	WLAN	8.37	±9.6 %
10401	AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	WLAN	8.60	± 9.6 %
10402	AAD	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	WLAN CDMA2000	8.53 3.76	± 9.6 % ± 9.6 %
10403	AAB	CDMA2000 (1xEV-DO, Rev. 0)	CDMA2000	3.77	± 9.6 %
10404	AAB	CDMA2000 (1xEV-DO, Rev. A) CDMA2000, RC3, SO32, SCH0, Full Rate	CDMA2000	5.22	± 9.6 %
10406	AAB AAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL	LTE-TDD	7.82	± 9.6 %
10410	AAF	Subframe=2,3,4,7,8,9, Subframe Conf=4)			
10414	AAA	WLAN CCDF, 64-QAM, 40MHz	Generic	8.54	± 9.6 %
10415	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	WLAN	1.54	± 9.6 %
10416	AAA	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	WLAN	8.23	± 9.6 %
10417	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	WLAN	8.23	± 9.6 %
10418	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle,	WLAN	8.14	± 9.6 %
		Long preambule)	NACI ANI	8.19	± 9.6 %
10419	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle,	WLAN	0.19	± 9.0 %
40400	A 4 D	Short preambule) IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	WLAN	8.32	± 9.6 %
10422	AAB	IEEE 802.11n (H1 Greenfield, 7.2 Mbps, BF3N) IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	WLAN	8.47	± 9.6 %
10423 10424	AAB AAB	IEEE 802.11n (HT Greenfield, 40.3 Mbps, 16 4d M)	WLAN	8.40	± 9.6 %
10424	AAB	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	WLAN	8.41	± 9.6 %
10425	AAB	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	WLAN	8.45	± 9.6 %
10427	AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	WLAN	8.41	± 9.6 %
10430	AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	LTE-FDD	8.28	± 9.6 %
10431	AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	LTE-FDD	8.38	± 9.6 %
10432	AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	LTE-FDD	8.34	± 9.6 %
10433	AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	LTE-FDD	8.34	± 9.6 %
10434	AAA	W-CDMA (BS Test Model 1, 64 DPCH)	WCDMA	8.60	± 9.6 %
10435	AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL	LTE-TDD	7.82	± 9.6 %
1	 	Subframe=2,3,4,7,8,9)	LTE-FDD	7.56	± 9.6 %
10447	AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%) LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	LTE-FDD	7.53	± 9.6 %
10448	AAD		LTE-FDD	7.51	± 9.6 %
10449	AAC AAC	LTE-FDD (OFDMA, 13 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.48	± 9.6 %
10450	AAC	LIL-I DD (OI DWA 20 WIR, L 1W 0.1] Capping 1.779			

10451 10456	AAA				
	AAD	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	WCDMA	7.59	±9.6%
40457	AAB	IEEE 802.11ac WIFI (160MHz, 64-QAM, 99pc duty cycle)	WLAN	8.63	±9.6%
10457	AAA	UMTS-FDD (DC-HSDPA)	WCDMA	6.62	± 9.6 %
10458	AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	CDMA2000	6.55	± 9.6 %
10459	AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	CDMA2000	8.25	± 9.6 %
10460	AAA	UMTS-FDD (WCDMA, AMR)	WCDMA	2.39	± 9.6 %
10461	AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	± 9.6 %
10462	AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.30	± 9.6 %
10463	AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.56	± 9.6 %
10464	AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	± 9.6 %
10465	AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	± 9.6 %
10466	AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	± 9.6 %
10467	AAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL	LTE-TDD	7.82	± 9.6 %
10468	AAE	Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL	LTE-TDD	8.32	± 9.6 %
10469	AAE	Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL	LTE-TDD	8.56	± 9.6 %
10470	AAE	Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL	LTE-TDD	7.82	± 9.6 %
10471	AAE	Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL. Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	± 9.6 %
10472	AAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	± 9.6 %
10473	AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	± 9.6 %
10474	AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	± 9.6 %
10475	AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	± 9.6 %
10477	AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	± 9.6 %
10478	AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	± 9.6 %
10479	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	± 9.6 %
10480	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.18	± 9.6 %
10481	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.45	± 9.6 %
10482	AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.71	± 9.6 %
10483	AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.39	± 9.6 %
10484	AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.47	± 9.6 %
10485	AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.59	± 9.6 %
10486	AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.38	± 9.6 %
10487	AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.60	± 9.6 %
10488	AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.70	± 9.6 %
10489	AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.31	±9.6%
10490	AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.54	± 9.6 %
10491	AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	± 9.6 %

10492	AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL	LTE-TDD	8.41	± 9.6 %
		Subframe=2,3,4,7,8,9)			
10493	AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	=2,3,4,7,8,9)		± 9.6 %
10494	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	± 9.6 %
10495	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.37	± 9.6 %
10496	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.54	± 9.6 %
10497	AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.67	± 9.6 %
10498	AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.40	± 9.6 %
10499	AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.68	± 9.6 %
10500	AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.67	± 9.6 %
10501	AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.44	± 9.6 %
10502	AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.52	± 9.6 %
10503	AAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.72	± 9.6 %
10504	AAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.31	± 9.6 %
10505	AAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.54	± 9.6 %
10506	AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	± 9.6 %
10507	AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.36	± 9.6 %
10508	AAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.55	± 9.6 %
10509	AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.99	± 9.6 %
10510	AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.49	± 9.6 %
10511	AAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.51	± 9.6 %
10512	AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	± 9.6 %
10513	AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.42	± 9.6 %
10514	AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.45	± 9.6 %
10515	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	WLAN	1.58	± 9.6 %
10516	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	WLAN	1.57	± 9.6 %
10517	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	WLAN	1.58	± 9.6 %
10518	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	WLAN	8.23	± 9.6 %
10519	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	WLAN	8.39	± 9.6 %
10520	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	WLAN	8.12	± 9.6 %
10521	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	WLAN	7.97	± 9.6 %
10522	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	WLAN	8.45	± 9.6 %
10523	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	WLAN	8.08	± 9.6 %
10524	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	WLAN	8.27	± 9.6 %
10525	AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	WLAN	8,36	± 9.6 %
10526	AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	WLAN	8.42	± 9.6 %
10527	AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	WLAN	8.21	± 9.6 %
10528	AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	WLAN	8.36	± 9.6 %
10529	AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	WLAN	8.36	± 9.6 %
10531	AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	WLAN	8.43	± 9.6 %
10532	AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	WLAN	8.29	± 9.6 %
10533	AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	WLAN	8.38	± 9.6 % ± 9.6 %
10534	AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	WLAN	8.45	1 + 4 15 %

	T				
10535	AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	WLAN	8.45	± 9.6 %
10536	AAB	IEEE 802.11ac WiFl (40MHz, MCS2, 99pc duty cycle)	WLAN	8.32	± 9.6 %
10537	AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	WLAN	8.44	± 9.6 %
10538	AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	WLAN	8.54	± 9.6 %
10540	AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	WLAN	8.39	± 9.6 %
10541	AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	WLAN	8.46	±9.6%
10542	AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	WLAN	8.65	± 9.6 %
10543	AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	WLAN	8.65	± 9.6 %
10544	AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	WLAN	8.47	±9.6%
10545	AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	WLAN	8.55	± 9.6 %
10546	AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	WLAN	8.35	± 9.6 %
10547	AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	WLAN	8.49	± 9.6 %
10548	AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	WLAN	8.37	± 9.6 %
10550	AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	WLAN	8.38	± 9.6 %
10551	AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	WLAN	8.50	±9.6%
10552	AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	WLAN	8.42	± 9.6 %
10553	AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	WLAN	8.45	± 9.6 %
10554	AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	WLAN	8.48	± 9.6 %
10555	AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	WLAN	8.47	± 9.6 %
10556	AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	WLAN	8.50	± 9.6 %
10557	AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	WLAN	8.52	±9.6 %
10558	AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	WLAN	8.61	± 9.6 %
10560	AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	WLAN	8.73	± 9.6 %
10561	AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	WLAN	8.56	± 9.6 %
10562	AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	WLAN	8.69	± 9.6 %
10563	AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	WLAN	8.77	± 9.6 %
10564	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty	WLAN	8.25	± 9.6 %
		cycle)		0.20	- 0.0 /0
10565	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty	WLAN	8.45	± 9.6 %
		cycle)			
10566	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty	WLAN	8.13	±9.6%
		cycle)			
10567	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty	WLAN	8.00	± 9.6 %
		cycle)			
10568	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty	WLAN	8.37	±9.6%
		cycle)			
10569	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty	WLAN	8.10	± 9.6 %
ļ		cycle)			
10570	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty	WLAN	8.30	± 9.6 %
		cycle)			
10571	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	WLAN	1.99	±9.6 %
10572	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	WLAN	1.99	± 9.6 %
10573	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	WLAN	1.98	± 9.6 %
10574	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	WLAN	1.98	± 9.6 %
10575	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty	WLAN	8.59	± 9.6 %
4.2		cycle)			
10576	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty	WLAN	8.60	± 9.6 %
	L	cycle)			
10577	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty	WLAN	8.70	± 9.6 %
40===	-	cycle)			
10578	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty	WLAN	8.49	± 9.6 %
		cycle)	···		
10579	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty	WLAN	8.36	± 9.6 %
4077		cycle)			
10580	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty	WLAN	8.76	± 9.6 %
10501		cycle)			
10581	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty	WLAN	8.35	±9.6%
40500		cycle)			
10582	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty	WLAN	8.67	± 9.6 %
40500	A A 5	cycle)		 	
10583	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	WLAN	8.59	± 9.6 %
10584	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	WLAN	8.60	± 9.6 %
10585	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.70	±9.6 %
10586	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	WLAN	8.49	±9.6 %
10587	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.36	±9.6 %

40500	AAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.76	±9.6%
10588 10589	AAB AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 36pc duty cycle)	WLAN	8.35	± 9.6 %
		IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	WLAN	8.67	± 9.6 %
10590	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	WLAN	8.63	± 9.6 %
10591	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	WLAN	8.79	± 9.6 %
10592	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	WLAN	8.64	± 9.6 %
10593	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	WLAN	8.74	± 9.6 %
10594	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	WLAN	8.74	± 9.6 %
10595	AAB		WLAN	8.71	± 9.6 %
10596	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	WLAN	8,72	±9.6 %
10597	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	WLAN	8.50	± 9.6 %
10598	AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	WLAN	8.79	± 9.6 %
10599	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	WLAN	8.88	± 9.6 %
10600	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	WLAN	8.82	± 9.6 %
10601	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	WLAN	8.94	± 9.6 %
10602	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	WLAN	9.03	± 9.6 %
10603	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	WLAN	8.76	± 9.6 %
10604	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)		8.97	± 9.6 %
10605	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	WLAN		
10606	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	WLAN	8,82	± 9.6 %
10607	AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	WLAN	8.64	± 9.6 %
10608	AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	WLAN	8.77	± 9.6 %
10609	AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	WLAN	8.57	± 9.6 %
10610	AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	WLAN	8.78	± 9.6 %
10611	AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	WLAN	8.70	± 9.6 %
10612	AAB	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	WLAN	8.77	±9.6 %
10613	AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	WLAN	8.94	± 9.6 %
10614	AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	WLAN	8.59	± 9.6 %
10615	AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	WLAN	8.82	±9.6 %
10616	AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	WLAN	8.82	± 9.6 %
10617	AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	WLAN	8.81	± 9.6 %
10618	AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	WLAN	8.58	± 9.6 %
10619	AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	WLAN	8.86	± 9.6 %
10620	AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	WLAN	8.87	± 9.6 %
10621	AAB	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	WLAN	8.77	± 9.6 %
10622	AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	WLAN	8.68	±9.6%
10623	AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	WLAN	8.82	± 9.6 %
10624	AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	WLAN	8.96	± 9.6 %
10625	AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	WLAN	8.96	± 9.6 %
10626	AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	WLAN	8.83	± 9.6 %
10627	AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	WLAN	8.88	± 9.6 %
10628	AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	WLAN	8.71	± 9.6 %
10629	AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	WLAN	8.85	± 9.6 %
10623	AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	WLAN	8.72	± 9.6 %
10631	AAB	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	WLAN	8.81	± 9.6 %
10632	AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	WLAN	8.74	± 9.6 %
10632	AAB	IEEE 802.11ac WiF (80MHz, MCS7, 90pc duty cycle)	WLAN	8.83	± 9.6 %
10634	AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	WLAN	8.80	± 9.6 %
10634	AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	WLAN	8.81	±9.6 %
10635	AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	WLAN	8.83	± 9.6 %
		IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	WLAN	8.79	± 9.6 %
10637	AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 30pc duty cycle)	WLAN	8.86	± 9.6 %
10638	AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	WLAN	8.85	± 9.6 %
10639	AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	WLAN	8.98	± 9.6 %
10640	AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	WLAN	9.06	± 9.6 %
10641	AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	WLAN	9.06	± 9.6 %
10642	AAC	IEEE 802.11ac WiFi (160MHz, MCS6, sope daty cycle)	WLAN	8.89	± 9.6 %
10643	AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	WLAN	9.05	± 9.6 %
10644	AAC	THEE 802.TTAC WIFT (TOUMITZ, MICSO, SUPE duty cycle)	WLAN	9.11	± 9.6 %
10645	AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	LTE-TDD	11.96	± 9.6 %
10646	AAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	LTE-TDD	11.96	± 9.6 %
10647	AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	CDMA2000	3,45	± 9.6 %
10648	AAA	CDMA2000 (1x Advanced)		6.91	± 9.6 %
10652	AAD	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD LTE-TDD	7.42	± 9.6 %
10653	AAD	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)			± 9.6 %
10654	AAD	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.96	(± 3.0 76

10655	AAE	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.21	± 9.6 %
10658	AAA	Pulse Waveform (200Hz, 10%)	Test	10.00	± 9.6 %
10659	AAA	Pulse Waveform (200Hz, 20%)	Test	6.99	±9.6%
10660	AAA	Pulse Waveform (200Hz, 40%)	Test	3.98	±9.6%
10661	AAA	Pulse Waveform (200Hz, 60%)	Test	2.22	±9.6%
10662	AAA	Pulse Waveform (200Hz, 80%)	Test	0.97	±9.6%
10670	AAA	Bluetooth Low Energy	Bluetooth	2.19	± 9.6 %

^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





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

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

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

Client

PC Test

Certificate No: EX3-3914_Feb19

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CALIBRATION CERTIFICATE

EX3DV4 - SN:3914 Object

Calibration procedure(s)

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Calibration date:

February 19, 2019

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-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-18 (No. 217-02682)	Apr-19
DAE4	SN: 660	19-Dec-18 (No. DAE4-660_Dec18)	Dec-19
Reference Probe ES3DV2	SN: 3013	31-Dec-18 (No. ES3-3013_Dec18)	Dec-19
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

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

Issued: February 20, 2019

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

Calibration Laboratory of

Schmid & Partner

Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





S Schweizerischer Kalibrierdienst
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Swiss Calibration Service

Accreditation No.: SCS 0108

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Glossary:

TSL NORMx,y,z tissue simulating liquid sensitivity in free space

ConvF DCP sensitivity in TSL / NORMx,y,z 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 9

§ rotation around an axis that is in the plane normal to probe axis (at measurement center),

i.e., 9 = 0 is normal to probe axis

Connector Angle

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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 handheld 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 9 = 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 E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is
 implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included
 in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep 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).

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3914

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (μV/(V/m) ²) ^A	0.46	0.41	0.44	± 10.1 %
DCP (mV) ^B	98.0	104.4	100.8	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	dB√hΛ B	С	D dB	VR mV	Max dev.	Max Unc ^E (k=2)
0	CW	Х	0.00	0.00	1.00	0.00	135.8	± 3.3 %	± 4.7 %
		Y	0.00	0.00	1.00		149.1		
		Z	0.00	0.00	1.00		130.4		
10352-	Pulse Waveform (200Hz, 10%)	Х	11.50	82.25	17.46	10.00	60.0	± 2.9 %	± 9.6 %
AAA		Y	13.06	84.85	18.88		60.0		
		Z	15.00	85.74	19.04		60.0		
10353-	Pulse Waveform (200Hz, 20%)	Х	15.00	85.61	17.12	6.99	80.0	± 1.7 %	± 9.6 %
AAA		Υ	15.00	87.20	18.40		80.0		
		Z	15.00	86.88	18.11		80.0		
10354-	Pulse Waveform (200Hz, 40%)	Χ	15.00	85.07	15.18	3.98	95.0	± 1.1 %	± 9.6 %
AAA		Y	15.00	89.57	18.09		95.0		
		Z	15.00	87.22	16.52		95.0		
10355-	Pulse Waveform (200Hz, 60%)	Х	0.82	65.05	7.38	2.22	120.0	± 1.2 %	± 9.6 %
AAA		Y	15.00	94.17	19.03		120.0		
		Z	15.00	84.14	13.59		120.0		
10387-	QPSK Waveform, 1 MHz	Х	0.56	60.35	7.26	0.00	150.0	± 2.8 %	± 9.6 %
AAA		Υ	0.80	64.04	10.54		150.0		•
		Z	0.51	60.00	6.79		150.0		
10388-	QPSK Waveform, 10 MHz	X	2.18	68.24	15.67	0.00	150.0	± 1.2 %	± 9.6 %
AAA		Υ	2.41	70.06	16.91		150.0		
		Z	2.04	67.38	15.28		150.0		
10396-	64-QAM Waveform, 100 kHz	Х	2.71	69.05	18.06	3.01	150.0	± 0.7 %	± 9.6 %
AAA		Υ	3.50	74.05	20.22		150.0		
		Z	2.76	69.32	18.16		150.0		
10399-	64-QAM Waveform, 40 MHz	X	3.50	67.38	15.86	0.00	150.0	± 2.2 %	± 9.6 %
AAA		Υ	3.57	67.89	16.25		150.0]	
		Z	3.38	66.82	15.58		150.0		
10414-	WLAN CCDF, 64-QAM, 40MHz	Х	4.87	65.94	15.72	0.00	150.0	± 4.2 %	± 9.6 %
AAA		Υ	4.84	65.99	15.74]	150.0		
		Z	4.71	65.47	15.46	1	150.0		

Note: For details on UID parameters see Appendix

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

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[^] The uncertainties of Norm X,Y,Z do not affect the E²-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.

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3914

Sensor Model Parameters

	C1	C2	α	T1	T2	Т3	T4	T5	Т6
	fF	fF	V-1	ms.V⁻²	ms.V⁻¹	ms	V⁻2	V-1	
X	42.5	324.17	36.82	9.95	0.55	5.06	0.00	0.49	1.01
Υ	42.9	310.45	33.81	12.34	0.63	5.02	2.00	0.15	1.01
Z	39.7	301.66	36.55	9.75	0.75	5.05	0.45	0.44	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	0.5
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

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DASY/EASY - Parameters of Probe: EX3DV4 - SN:3914

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)
6	55.5	0.75	21.24	21.24	21.24	0.00	1.00	± 13.3 %
13	55.5	0.75	18.06	18.06	18.06	0.00	1.00	± 13.3 %
750	41.9	0.89	10.00	10.00	10.00	0.54	0.82	± 12.0 %
835	41.5	0.90	9.50	9.50	9.50	0.50	0.86	± 12.0 %
1750	40.1	1.37	8.16	8.16	8.16	0.41	0.80	± 12.0 %
1900	40.0	1.40	7.80	7.80	7.80	0.40	0.84	± 12.0 %
2300	39.5	1.67	7.44	7.44	7.44	0.37	0.84	± 12.0 %
2450	39.2	1.80	7.13	7.13	7.13	0.39	0.86	± 12.0 %
2600	39.0	1.96	7.11	7.11	7.11	0.39	0.89	± 12.0 %
3500	37.9	2.91	6.99	6.99	6.99	0.25	1.20	± 13.1 %
3700	37.7	3.12	6.75	6.75	6.75	0.25	1.20	± 13.1 %
5250	35.9	4.71	5.19	5.19	5.19	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.73	4.73	4.73	0.40	1.80	± 13.1 %
5750	35.4	5.22	4.90	4.90	4.90	0.40	1.80	± 13.1 %

^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. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. 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 \pm 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 \pm 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.

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	9.73	9.73	9.73	0.54	0.84	± 12.0 %
835	55.2	0.97	9.46	9.46	9.46	0.50	0.80	± 12.0 %
1750	53.4	1,49	7.89	7.89	7.89	0.38	0.84	± 12.0 %
1900	53.3	1.52	7.60	7.60	7.60	0.29	1.03	± 12.0 %
2300	52.9	1.81	7.43	7.43	7.43	0.38	0.84	± 12.0 %
2450	52.7	1.95	7.34	7.34	7.34	0.33	0.87	± 12.0 %
2600	52.5	2.16	7.15	7.15	7.15	0.26	0.97	± 12.0 %
3500	51.3	3.31	6.88	6.88	6.88	0.25	1.15	± 13.1 %
3700	51.0	3.55	6.58	6.58	6.58	0.30	1.15	± 13.1 %
5250	48.9	5.36	4.61	4.61	4.61	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.92	3.92	3.92	0.50	1.90	± 13.1 %
5750	48.3	5.94	4.05	4.05	4.05	0.50	1,90	± 13.1 %

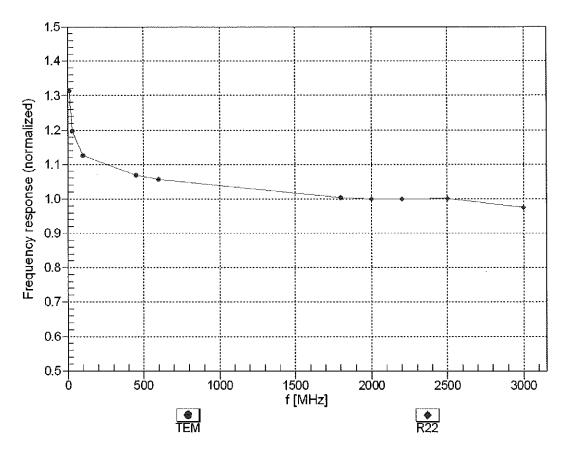
^C Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. 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 \pm 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 \pm 5%. The uncertainty is the RSS of the Copy 5 properties for indicated to properties.

the ConvF uncertainty for indicated target tissue parameters.

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)

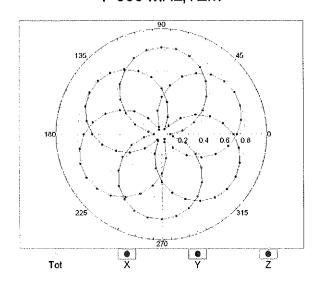
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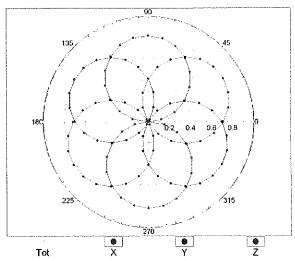
Receiving Pattern (ϕ), $\vartheta = 0^{\circ}$

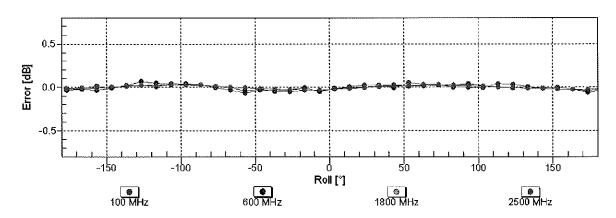


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f=1800 MHz,R22

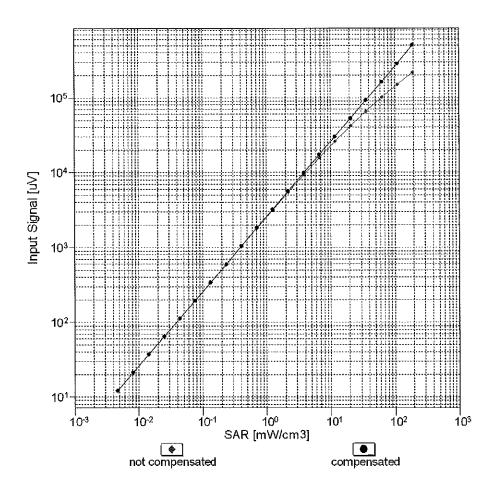


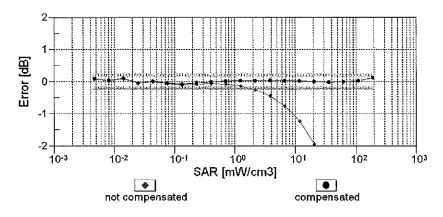




Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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

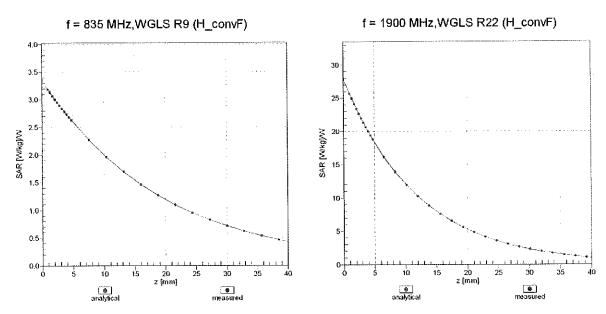




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

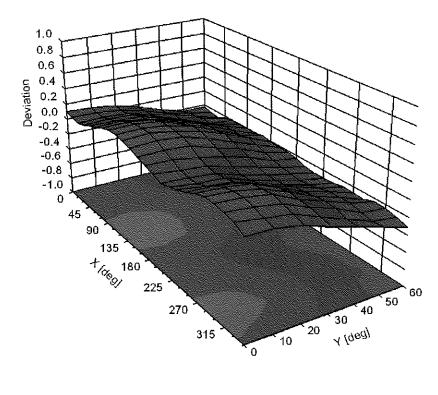
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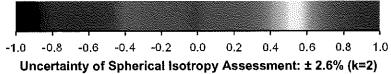
Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, ϑ) , f = 900 MHz





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Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR	Unc
		444444444444444444444444444444444444444		(dB)	(k=2)
0		CW	CW	0.00	± 4.7 %
10010	CAA	SAR Validation (Square, 100ms, 10ms)	Test	10.00	± 9.6 %
10011	CAB	UMTS-FDD (WCDMA)	WCDMA	2.91	± 9.6 %
10012	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	± 9.6 %
10013	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	WLAN	9.46	± 9.6 %
10021	DAC	GSM-FDD (TDMA, GMSK)	GSM	9.39	± 9.6 %
10023	DAC	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	± 9.6 %
10024	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	± 9.6 %
10025	DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	GSM	12.62	± 9.6 %
10026	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	GSM	9.55	± 9.6 %
10027	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	GSM	4.80	± 9.6 %
10028	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	GSM	3.55	± 9.6 %
10029	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	GSM	7.78	± 9.6 %
10030	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.30	± 9.6 %
10031	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	Bluetooth	1.87	± 9.6 %
10032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	Bluetooth	1.16	± 9.6 %
10033	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	Bluetooth	7.74	± 9.6 %
10034	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	Bluetooth	4.53	± 9.6 %
10035	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	Bluetooth	3.83	± 9.6 %
10036	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	Bluetooth	8.01	±9.6 %
10037	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	Bluetooth	4.77	±9.6 %
10038	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	Bluetooth	4.10	± 9.6 %
10039	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	± 9.6 %
10042	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	AMPS	7.78	± 9.6 %
10044	CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	AMPS	0.00	±9.6 %
10048	CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	DECT	13.80	±9.6%
10049	CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	DECT	10.79	±9.6%
10056	CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	TD-SCDMA	11.01	± 9.6 %
10058	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	GSM	6.52	± 9.6 %
10059	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	WLAN	2.12	± 9.6 %
10060	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	WLAN	2.83	± 9.6 %
10061	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	WLAN	3.60	±9.6 %
10062	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	WLAN	8.68	± 9.6 %
10063	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	8.63	±9.6%
10064	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	WLAN	9.09	± 9.6 %
10065	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	WLAN	9.00	± 9.6 %
10066	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	WLAN	9.38	± 9.6 %
10067	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	±9.6%
10068	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	WLAN	10.24	± 9.6 %
10069	CAC	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	WLAN	10.56	± 9.6 %
10071	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	WLAN	9.83	± 9.6 %
10072	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.62	± 9.6 %
10073	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	9.94	± 9.6 %
10074	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	WLAN	10.30	± 9.6 %
10075	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	WLAN	10.77	± 9.6 %
10076	CAB	IEEE 802.11g WiFl 2.4 GHz (DSSS/OFDM, 48 Mbps)	WLAN	10.94	± 9.6 %
10077	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	WLAN	11.00	± 9.6 %
10081	CAB	CDMA2000 (1xRTT, RC3)	CDMA2000	3.97	± 9.6 %
10082	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	AMPS	4.77	± 9.6 %
10090	DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	GSM	6.56	± 9.6 %
10097	CAB	UMTS-FDD (HSDPA)	WCDMA	3.98	± 9.6 %
10098	CAB	UMTS-FDD (HSUPA, Subtest 2)	WCDMA	3.98	± 9.6 %
10099	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	GSM	9.55	± 9.6 %
10100	CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	5.67	± 9.6 %
10101	CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	±9.6 %
10102	CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-FDD	6.60	±9.6 %
10103	CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-TDD	9.29	±9.6 %
	CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-TDD	9.97	± 9.6 %
10104) UMG				
10104 10105	CAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-TDD	10.01	± 9.6 %

1 40400 T	~ ~ ~	LTE EDD (OO ED) (A (OO) DD (O.)	LITE EDD	0.40	
10109	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	± 9.6 %
	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-FDD	5.75	± 9.6 %
\$	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM) LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD LTE-FDD	6.44 6.59	± 9.6 % ± 9.6 %
	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	± 9.6 %
	CAC	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	WLAN	8.10	±9.6 %
	CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	WLAN	8.46	± 9.6 %
<u>_</u>	CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	WLAN	8.15	± 9.6 %
	CAC	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	WLAN	8.07	± 9.6 %
	CAC	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	WLAN	8.59	± 9.6 %
	CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	WLAN	8.13	± 9.6 %
	CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-FDD	6.49	± 9.6 %
10141	CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-FDD	6.53	± 9.6 %
10142	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-FDD	6.35	± 9.6 %
	CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-FDD	6.65	± 9.6 %
	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-FDD	5.76	± 9.6 %
	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.41	± 9.6 %
10147	CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.72	± 9.6 %
10149	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	± 9.6 %
<u></u>	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-FDD	6.60	± 9.6 %
10151	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-TDD	9.28	± 9.6 %
10152	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TDD	9.92	± 9.6 %
10153	CAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM) LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-TDD LTE-FDD	10.05 5.75	± 9.6 % ± 9.6 %
	CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK) LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	±9.6 %
10155	CAG CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 10-QAM) LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-FDD	5.79	± 9.6 %
10156	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QFSK) LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-FDD	6.49	± 9.6 %
10157	CAG	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	± 9.6 %
	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-FDD	6.56	± 9.6 %
10160	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-FDD	5.82	± 9.6 %
	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-FDD	6.43	± 9.6 %
	CAE	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-FDD	6.58	± 9.6 %
10166	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.46	± 9.6 %
10167	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.21	± 9.6 %
10168	CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.79	± 9.6 %
10169	CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10170	CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
	AAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-FDD	6.49	± 9.6 %
10172	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-TDD	9.21	±9.6%
10173	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10174	CAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10175		LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-FDD	5.72	±9.6 %
10176	CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-FDD	6.52	±9.6 %
10177	CAC	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-FDD LTE-FDD	5.73 6.52	± 9.6 % ± 9.6 %
10178 10179	CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM) LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 % ± 9.6 %
10179	CAG	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10180	CAE	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 04-QAM) LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-FDD	5.72	± 9.6 %
10181	CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10183	AAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10184	CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10185	CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-FDD	6.51	± 9.6 %
10186	AAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10187	CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-FDD	5.73	± 9.6 %
10188	CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.52	± 9.6 %
10189	AAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.50	± 9.6 %
10193	CAC	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	WLAN	8.09	± 9.6 %
10194	CAC	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	WLAN	8.12	± 9.6 %
10195	CAC	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	WLAN	8.21	± 9.6 %
10196	CAC	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	WLAN	8.10	± 9.6 %
10197	CAC	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	WLAN	8.13	± 9.6 %
10198	CAC	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	WLAN	8.27	± 9.6 %
10219	CAC	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	WLAN	8.03	± 9.6 %

10220	CAC	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	100 000		
10221	CAC		WLAN	8.13	± 9.6 %
10221	CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	WLAN	8.27	± 9.6 %
10223	CAC	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	WLAN	8.06	±9.6%
10223		IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	WLAN	8.48	± 9.6 %
10224	CAC	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	WLAN	8.08	± 9.6 %
10225	CAB	UMTS-FDD (HSPA+)	WCDMA	5.97	±9.6%
	CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.49	±9.6%
10227	CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.26	±9.6%
10228		LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-TDD	9.22	± 9.6 %
10229	CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10230	CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-TDD	10.25	±9.6%
10231 10232	CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-TDD	9.19	±9.6%
	CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-TDD	9.48	±9.6%
10233	CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10234	CAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-TDD	9.21	± 9.6 %
10235	CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10236	CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-TDD	10.25	±9.6%
10237	CAF	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-TDD	9.21	± 9.6 %
10238	CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-TDD	9.48	± 9.6 %
10239	CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-TDD	10.25	± 9.6 %
10240	CAF	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-TDD	9.21	±9.6%
10241	CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.82	± 9.6 %
10242	CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-TDD	9.86	±9.6%
10243	CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-TDD	9.46	±9.6%
10244	CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-TDD	10.06	± 9.6 %
10245	CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-TDD	10.06	± 9.6 %
10246	CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-TDD	9.30	± 9.6 %
10247	CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-TDD	9.91	±9.6%
10248	CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-TDD	10.09	± 9.6 %
10249	CAF	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-TDD	9.29	±9.6%
10250	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-TDD	9.81	±9.6%
10251	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-TDD	10.17	±9.6%
10252	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-TDD	9.24	±9.6%
10253	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-TDD	9.90	± 9.6 %
10254	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TDD	10.14	± 9.6 %
10255	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-TDD	9.20	± 9.6 %
10256	CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.96	± 9.6 %
10257	CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.08	± 9.6 %
10258	CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-TDD	9.34	± 9.6 %
10259	CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-TDD	9.98	± 9.6 %
10260	CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-TDD	9.97	± 9.6 %
10261	CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-TDD	9.24	± 9.6 %
10262	CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-TDD	9.83	± 9.6 %
10263	CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-TDD	10.16	± 9.6 %
10264	CAF	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-TDD	9.23	± 9.6 %
10265	CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-TOD	9.92	± 9.6 %
10266	CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-TDD	10.07	±9.6 %
10267 10268	CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-TDD	9.30	± 9.6 %
	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-TDD	10.06	± 9.6 %
10269	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-TDD	10.13	± 9.6 %
10270	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-TDD	9.58	± 9.6 %
10274 10275	CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rei8.10)	WCDMA	4.87	± 9.6 %
	CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	WCDMA	3.96	± 9.6 %
10277	CAA	PHS (QPSK)	PHS	11.81	±9.6 %
10278	CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	PHS	11.81	± 9.6 %
10279	CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	PHS	12.18	± 9.6 %
10290	AAB	CDMA2000, RC1, SO55, Full Rate	CDMA2000	3.91	± 9.6 %
10291	AAB	CDMA2000, RC3, SO55, Full Rate	CDMA2000	3.46	± 9.6 %
10292	AAB	CDMA2000, RC3, SO32, Full Rate	CDMA2000	3.39	± 9.6 %
10293	AAB	CDMA2000, RC3, SO3, Full Rate	CDMA2000	3.50	± 9.6 %
10295	AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	CDMA2000	12.49	± 9.6 %
10297	AAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-FDD	5.81	± 9.6 %
10298 10299	AAD AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-FDD	5.72	±9.6%
10299	HAU	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-FDD	6.39	± 9.6 %

10300	AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-FDD	6.60	± 9.6 %
10301	AAA	IEEE 802.16e WIMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	WiMAX	12.03	± 9.6 %
10301	AAA	IEEE 802.16e WIMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL	WiMAX	12.57	±9.6 %
10002	''' '	symbols)	***************************************	12.01	= 0.0 /0
10303	AAA	IEEE 802.16e WiMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	WiMAX	12.52	±9.6%
10304	AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	WIMAX	11.86	± 9.6 %
10305	AAA	IEEE 802.16e WIMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15	WiMAX	15.24	± 9.6 %
10000	7001	symbols)	V 11V4 () (,0.2.	20.0 %
10306	AAA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18	WiMAX	14.67	±9.6%
10000	' ' ' '	symbols)	171111111111111111111111111111111111111	, ,,,,,,	- 515 ,5
10307	AAA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18	WiMAX	14.49	±9.6%
1000.	/ 0 0 \	symbols)			
10308	AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	WiMAX	14.46	± 9.6 %
10309	AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18	WiMAX	14.58	± 9.6 %
		symbols)			Í
10310	AAA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18	WiMAX	14.57	±9.6%
		symbols)			
10311	AAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-FDD	6.06	±9.6 %
10313	AAA	IDEN 1:3	iDEN	10.51	± 9.6 %
10314	AAA	iDEN 1:6	iDEN	13.48	± 9.6 %
10315	AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	WLAN	1.71	± 9.6 %
10316	AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc duty cycle)	WLAN	8.36	±9.6 %
10317	AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	WLAN	8.36	± 9.6 %
10352	AAA	Pulse Waveform (200Hz, 10%)	Generic	10.00	±9.6%
10353	AAA	Pulse Waveform (200Hz, 20%)	Generic	6.99	± 9.6 %
10354	AAA	Pulse Waveform (200Hz, 40%)	Generic	3.98	± 9.6 %
10355	AAA	Pulse Waveform (200Hz, 40%)	Generic	2.22	± 9.6 %
10356	AAA	Pulse Waveform (200Hz, 80%)	Generic	0.97	± 9.6 %
10330	AAA	QPSK Waveform, 1 MHz	Generic	5.10	± 9.6 %
10388	AAA	QPSK Waveform, 10 MHz	Generic	5.22	± 9.6 %
10396	+	64-QAM Waveform, 100 kHz	Generic	6.27	± 9.6 %
10399	AAA	64-QAM Waveform, 40 MHz	Generic	6.27	± 9.6 %
10399	AAA AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	WLAN	8.37	± 9.6 %
10400	AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	WLAN	8.60	± 9.6 %
10401	AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	WLAN	8.53	± 9.6 %
10402	AAB	CDMA2000 (1xEV-DO, Rev. 0)	CDMA2000	3.76	± 9.6 %
10403	AAB	CDMA2000 (1xEV-DO, Rev. 0)	CDMA2000	3.77	± 9.6 %
1		CDMA2000 (1XEV-DO, Rev. A) CDMA2000, RC3, SO32, SCH0, Full Rate	CDMA2000	5.22	± 9.6 %
10406 10410	AAB	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL	LTE-TDD	7.82	± 9.6 %
10410	AAF	Subframe=2,3,4,7,8,9, Subframe Conf=4)		7.02	2 3.0 %
10414	AAA	WLAN CCDF, 64-QAM, 40MHz	Generic	8.54	± 9.6 %
10414	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	WLAN	1.54	± 9.6 %
		IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	WLAN	8.23	± 9.6 %
10416 10417	AAA AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	WLAN	8.23	± 9.6 %
		IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle,	WLAN	8.14	± 9.6 %
10418	AAA		VVLAN	0.14	J. 9.0 70
10419	AAA	Long preambule) IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle,	WLAN	8.19	± 9.6 %
10415	\~~~	Short preambule)	44	0.19	± 0.0 /0
10422	AAB	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	WLAN	8.32	± 9.6 %
10422	AAB	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BF3R)	WLAN	8.47	± 9.6 %
10423		IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	WLAN	8.40	± 9.6 %
	AAB	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	WLAN	8.41	± 9.6 %
10425	AAB	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	WLAN	8.45	± 9.6 %
10426	AAB		WLAN	8.41	± 9.6 %
10427	AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	LTE-FDD	8.28	± 9.6 %
10430	AAD	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	LTE-FDD	8.38	± 9.6 %
10431	AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	LTE-FDD	8.34	± 9.6 %
10432	AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	LTE-FDD	8.34	± 9.6 %
10433	AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)			± 9.6 %
10434	AAA	W-CDMA (BS Test Model 1, 64 DPCH)	WCDMA	8.60	
10435	AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL	LTE-TDD	7.82	± 9.6 %
40447	A A D	Subframe=2,3,4,7,8,9)	I TE EDD	7.56	± 9.6 %
10447	AAD_	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD LTE-FDD		± 9.6 %
10448	AAD	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)		7.53	
10449	AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	LTE-FDD	7.51	± 9.6 %
10450	AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.48	± 9.6 %

10451	AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	WCDMA	7.59	± 9.6 %
10456	AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	WLAN	8.63	± 9.6 %
10457	AAA	UMTS-FDD (DC-HSDPA)	WCDMA	6.62	±9.6 %
10458	AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	CDMA2000	6.55	± 9.6 %
10459	AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	CDMA2000	8.25	± 9.6 %
10460	AAA	UMTS-FDD (WCDMA, AMR)	WCDMA	2.39	± 9.6 %
10461	AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	± 9.6 %
10462	AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.30	± 9.6 %
10463	AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.56	± 9.6 %
10464	AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	± 9.6 %
10465	AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	± 9.6 %
10466	AAB	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	± 9.6 %
10467	AAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	± 9.6 %
10468	AAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	± 9.6 %
10469	AAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.56	± 9.6 %
10470	AAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	± 9.6 %
10471	AAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	± 9.6 %
10472	AAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	± 9.6 %
10473	AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	± 9.6 %
10474	AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	± 9.6 %
10475	AAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	± 9.6 %
10477	AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	± 9.6 %
10478	AAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	± 9.6 %
10479	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±9.6 %
10480	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.18	± 9.6 %
10481	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.45	± 9.6 %
10482	AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL. Subframe=2,3,4,7,8,9)	LTE-TDD	7.71	±9.6%
10483	AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.39	± 9.6 %
10484	AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.47	± 9.6 %
10485	AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.59	± 9.6 %
10486	AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.38	± 9.6 %
10487	AAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.60	± 9.6 %
10488	AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.70	± 9.6 %
10489	AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.31	± 9.6 %
10490	AAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.54	± 9.6 %
10491	AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	± 9.6 %

10492 AAE LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL LTE-TDD B.41 ± 9.6 % Subframe-2, 34, 78, 9)						
10493 AAE LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL LTE-TDD 8.55 ± 9.6 % Subframe-2, 34, 78, 9)	10492	AAE		LTE-TDD	8.41	± 9.6 %
10494	10493	AAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL	LTE-TDD	8.55	± 9.6 %
10496	10494	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL	LTE-TDD	7.74	± 9.6 %
10496	10495	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL	LTE-TDD	8.37	± 9.6 %
10498	10496	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL	LTE-TDD	8.54	± 9.6 %
10498	10497	AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL	LTE-TDD	7.67	± 9.6 %
10499	10498	AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL	LTE-TDD	8.40	± 9.6 %
10500	10499	AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2.3.4.7.8.9)	LTE-TDD	8.68	± 9.6 %
Subframe=2,3,4,7,8,9	10500	AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.67	± 9.6 %
Subframe=2,3,4,7,8,9 10504 AAE	10501	AAB	Subframe=2,3,4,7,8,9)			
Subframe=2,3,4,7,8,9 LTE-TDD S.5FDMA, 100% RB, 5 MHz, 16-QAM, UL LTE-TDD S.5FDMA, 100% RB, 5 MHz, 16-QAM, UL LTE-TDD S.5FDMA, 100% RB, 5 MHz, 64-QAM, UL LTE-TDD S.5FDMA, 100% RB, 5 MHz, 64-QAM, UL LTE-TDD S.5FDMA, 100% RB, 10 MHz, QPSK, UL LTE-TDD T.7.4 19.6 % Subframe=2,3,4,7,8,9 Subframe=2,3,4,7,8,9 LTE-TDD S.5FDMA, 100% RB, 10 MHz, 16-QAM, UL LTE-TDD S.5EDMA, 100% RB, 10 MHz, 16-QAM, UL LTE-TDD S.5EDMA, 100% RB, 10 MHz, 64-QAM, UL LTE-TDD S.5EDMA, 100% RB, 10 MHz, 64-QAM, UL LTE-TDD S.5EDMA, 100% RB, 15 MHz, QPSK, UL LTE-TDD T.99 19.6 % Subframe=2,3,4,7,8,9 Subframe=2,3,4,7,8,9	10502	AAB	Subframe=2,3,4,7,8,9)			
Subframe=2,3,4,7,8,9 LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL LTE-TDD R.54			LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)			
Subframe=2,3,4,7,8,9 LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL LTE-TDD R.36			Subframe=2,3,4,7,8,9)			
Subframe=2,3,4,7,8,9 LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL LTE-TDD S.36			Subframe=2,3,4,7,8,9)			
Subframe=2,3,4,7,8,9 LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL LTE-TDD S.55		AAE	Subframe=2,3,4,7,8,9)			
Subframe=2,3,4,7,8,9 LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL LTE-TDD S.49			Subframe=2,3,4,7,8,9)			
Subframe=2,3,4,7,8,9 LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 20			Subframe=2,3,4,7,8,9)			
Subframe=2,3,4,7,8,9 LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL			Subframe=2,3,4,7,8,9)			
Subframe=2,3,4,7,8,9 LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle) WLAN			Subframe=2,3,4,7,8,9)			
Subframe=2,3,4,7,8,9 LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9) LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 90 MLAN 1.58			Subframe=2,3,4,7,8,9)			
Subframe=2,3,4,7,8,9			Subframe=2,3,4,7,8,9)		Ì	
Subframe=2,3,4,7,8,9	ù.		Subframe=2,3,4,7,8,9)			
10516 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle) WLAN 1.57 ± 9.6 % 10517 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle) WLAN 1.58 ± 9.6 % 10518 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle) WLAN 8.23 ± 9.6 % 10519 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle) WLAN 8.39 ± 9.6 % 10520 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle) WLAN 8.12 ± 9.6 % 10521 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) WLAN 7.97 ± 9.6 % 10522 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) WLAN 8.45 ± 9.6 % 10523 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) WLAN 8.08 ± 9.6 % 10524 AAB IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) WLAN 8.27 ± 9.6 % 10525 AAB IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle) WLAN 8.42 ± 9.6	10514	AAF	Subframe=2,3,4,7,8,9)			
10517 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle) WLAN 1.58 ± 9.6 % 10518 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle) WLAN 8.23 ± 9.6 % 10519 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle) WLAN 8.39 ± 9.6 % 10520 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle) WLAN 8.12 ± 9.6 % 10521 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) WLAN 7.97 ± 9.6 % 10522 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) WLAN 8.45 ± 9.6 % 10523 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) WLAN 8.08 ± 9.6 % 10524 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) WLAN 8.27 ± 9.6 % 10525 AAB IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10526 AAB IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) WLAN 8.21 ± 9.6	10515	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	WLAN	1.58	<u> ± 9.6 %</u>
10517 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle) WLAN 1.58 ± 9.6 % 10518 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle) WLAN 8.23 ± 9.6 % 10519 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle) WLAN 8.39 ± 9.6 % 10520 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle) WLAN 8.12 ± 9.6 % 10521 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) WLAN 7.97 ± 9.6 % 10522 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) WLAN 8.45 ± 9.6 % 10523 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) WLAN 8.08 ± 9.6 % 10524 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) WLAN 8.27 ± 9.6 % 10525 AAB IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10526 AAB IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) WLAN 8.21 ± 9.6	10516	AAA	IEEE 802,11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	WLAN	1.57	± 9.6 %
10518 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle) WLAN 8.23 ± 9.6 % 10519 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle) WLAN 8.39 ± 9.6 % 10520 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle) WLAN 8.12 ± 9.6 % 10521 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) WLAN 7.97 ± 9.6 % 10522 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) WLAN 8.45 ± 9.6 % 10523 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) WLAN 8.08 ± 9.6 % 10524 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) WLAN 8.27 ± 9.6 % 10525 AAB IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10526 AAB IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle) WLAN 8.42 ± 9.6 % 10527 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) WLAN 8.36 ± 9.6 %				WLAN	1.58	
10519 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle) WLAN 8.39 ± 9.6 % 10520 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle) WLAN 8.12 ± 9.6 % 10521 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) WLAN 7.97 ± 9.6 % 10522 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) WLAN 8.45 ± 9.6 % 10523 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) WLAN 8.08 ± 9.6 % 10524 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) WLAN 8.27 ± 9.6 % 10525 AAB IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10526 AAB IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle) WLAN 8.42 ± 9.6 % 10527 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) WLAN 8.21 ± 9.6 % 10529 AAB IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle) WLAN 8.36 ± 9.6 %						
10520 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle) WLAN 8.12 ± 9.6 % 10521 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) WLAN 7.97 ± 9.6 % 10522 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) WLAN 8.45 ± 9.6 % 10523 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) WLAN 8.08 ± 9.6 % 10524 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) WLAN 8.27 ± 9.6 % 10525 AAB IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10526 AAB IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle) WLAN 8.42 ± 9.6 % 10527 AAB IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) WLAN 8.21 ± 9.6 % 10528 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10531 AAB IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) WLAN 8.43 ± 9.6 % 10532 AAB IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)						
10521 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle) WLAN 7.97 ± 9.6 % 10522 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle) WLAN 8.45 ± 9.6 % 10523 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle) WLAN 8.08 ± 9.6 % 10524 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle) WLAN 8.27 ± 9.6 % 10525 AAB IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10526 AAB IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle) WLAN 8.42 ± 9.6 % 10527 AAB IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) WLAN 8.21 ± 9.6 % 10528 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10531 AAB IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle) WLAN 8.43 ± 9.6 % 10532 AAB IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) WLAN 8.43 ± 9.6 % 10533 AAB IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) WLAN						
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10525 AAB IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10526 AAB IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle) WLAN 8.42 ± 9.6 % 10527 AAB IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) WLAN 8.21 ± 9.6 % 10528 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10529 AAB IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10531 AAB IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) WLAN 8.43 ± 9.6 % 10532 AAB IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) WLAN 8.29 ± 9.6 % 10533 AAB IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) WLAN 8.38 ± 9.6 %						
10526 AAB IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle) WLAN 8.42 ± 9.6 % 10527 AAB IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) WLAN 8.21 ± 9.6 % 10528 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10529 AAB IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10531 AAB IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) WLAN 8.43 ± 9.6 % 10532 AAB IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) WLAN 8.29 ± 9.6 % 10533 AAB IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) WLAN 8.38 ± 9.6 %						
10527 AAB IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) WLAN 8.21 ± 9.6 % 10528 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10529 AAB IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10531 AAB IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) WLAN 8.43 ± 9.6 % 10532 AAB IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) WLAN 8.29 ± 9.6 % 10533 AAB IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) WLAN 8.38 ± 9.6 %						
10527 AAB IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle) WLAN 8.21 ± 9.6 % 10528 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10529 AAB IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10531 AAB IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) WLAN 8.43 ± 9.6 % 10532 AAB IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) WLAN 8.29 ± 9.6 % 10533 AAB IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) WLAN 8.38 ± 9.6 %	10526	AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	WLAN	8.42	± 9.6 %
10528 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10529 AAB IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle) WLAN 8.36 ± 9.6 % 10531 AAB IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) WLAN 8.43 ± 9.6 % 10532 AAB IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) WLAN 8.29 ± 9.6 % 10533 AAB IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) WLAN 8.38 ± 9.6 %						
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10531 AAB IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle) WLAN 8.43 ± 9.6 % 10532 AAB IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) WLAN 8.29 ± 9.6 % 10533 AAB IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) WLAN 8.38 ± 9.6 %						
10532 AAB IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle) WLAN 8.29 ± 9.6 % 10533 AAB IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) WLAN 8.38 ± 9.6 %						
10533 AAB IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle) WLAN 8.38 ± 9.6 %						
					-	
10004 AAD IEEE OUZ. I IBC WIFT (40MITZ, MOOU, 38PC QULY CYCLE) WEAR 0.40 £ 9.0 %						-
	10534	AAB	TIEEE OUZ.TTRC WIFT (40WIFZ, WIGSU, 99pc duty cycle)	VALMIN	0.45	I 5.0 %

10537 AAB EEE 802.11ac WFI (40MHz, MCS2, 99pc duty cycle) WLAN 8.44 9.6 10538 AAB EEE 802.11ac WFI (40MHz, MCS4, 99pc duty cycle) WLAN 8.44 9.6 10540 AAB EEE 802.11ac WFI (40MHz, MCS4, 99pc duty cycle) WLAN 8.39 9.6 10541 AAB EEE 802.11ac WFI (40MHz, MCS4, 99pc duty cycle) WLAN 8.40 9.6 10541 AAB EEE 802.11ac WFI (40MHz, MCS5, 99pc duty cycle) WLAN 8.65 9.6 10542 AAB EEE 802.11ac WFI (40MHz, MCS5, 99pc duty cycle) WLAN 8.65 9.6 10543 AAB EEE 802.11ac WFI (40MHz, MCS5, 99pc duty cycle) WLAN 8.65 9.6 10544 AAB EEE 802.11ac WFI (60MHz, MCS9, 99pc duty cycle) WLAN 8.65 9.6 10545 AAB EEE 802.11ac WFI (60MHz, MCS5, 99pc duty cycle) WLAN 8.47 9.6 10546 AAB EEE 802.11ac WFI (60MHz, MCS5, 99pc duty cycle) WLAN 8.35 9.6 10547 AAB EEE 802.11ac WFI (60MHz, MCS5, 99pc duty cycle) WLAN 8.37 9.6 10548 AAB EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.37 9.6 10550 AAB EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.37 9.6 10551 AAB EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.39 9.6 10552 AAB EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.42 9.6 10553 AAB EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.42 9.6 10556 AAC EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.42 9.6 10556 AAC EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.44 9.6 10556 AAC EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.48 9.6 10556 AAC EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.48 9.6 10556 AAC EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.48 9.6 10556 AAC EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.48 9.6 10566 AAC EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle) WLAN 8.49 9.6 10566 AAC EEE 802.11ac WFI (60MHz, MCS6, 99pc duty cycle)		T				
10533 AAB EEE 802.11ac WFI (40MHz, MCS3, 98pc duty cycle)	10535	AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	WLAN		±9.6 %
19559					8.32	±9.6 %
19540 AAB IEEE 802.11ac WIFI (40MHz, MCS6, 99bc duty cycle) WLAN 8.49 6.96				WLAN	8.44	± 9.6 %
10541 AAB IEEE 802.11ac WFI (40MHz, MCS6, 99pc duty cycle) WLAN 8.46 2.96	10538	AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	WLAN	8.54	± 9.6 %
10541 AAB IEEE 802.11ac WIFI (40MHz, MCS7, 99pc duty cycle) WLAN 8.65 9.6 c	10540	AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	WLAN	8.39	±9.6%
10842 AAB IEEE 80Z.11ac WIFI (40MHz, MCSS, 99pc duty cycle)	10541	AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)			±9.6%
10543 AAB IEEE 802.11ac WIFI (40MHz, MCS0, 99c duly cycle)	10542	AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)			
19544 AAB IEEE 802.11ac WIF (80MHz, MCS1, 99pc duty cycle)	10543					
10545			IEEE 802 11ac WiFi (80MHz, MCS0, 99pc duty cycle)			
10546 AAB IEEE 802.11ac WIFI (80MHz, MCS2, 99bc duty cycle)			IFFE 802 11ac WiFi (80MHz, MCS1, 99nc duty cycle)			
10547 AAB IEEE 802.11ac WiFi (80MHz, MCSA, 98pc duty cycle) WILAN 8.49 4.96 10550 AAB IEEE 802.11ac WiFi (80MHz, MCSA, 98pc duty cycle) WILAN 8.37 4.96 10550 AAB IEEE 802.11ac WiFi (80MHz, MCSA, 98pc duty cycle) WILAN 8.38 4.96 10551 AAB IEEE 802.11ac WiFi (80MHz, MCSA, 98pc duty cycle) WILAN 8.40 4.96 10552 AAB IEEE 802.11ac WiFi (80MHz, MCSA, 98pc duty cycle) WILAN 8.42 4.96 10553 AAB IEEE 802.11ac WiFi (80MHz, MCSA, 98pc duty cycle) WILAN 8.42 4.96 10553 AAB IEEE 802.11ac WiFi (80MHz, MCSB, 98pc duty cycle) WILAN 8.45 4.96 10554 AAC IEEE 802.11ac WiFi (80MHz, MCSA, 98pc duty cycle) WILAN 8.45 4.96 10555 AAC IEEE 802.11ac WiFi (80MHz, MCSA, 98pc duty cycle) WILAN 8.47 4.96 10555 AAC IEEE 802.11ac WiFi (160MHz, MCSA, 99pc duty cycle) WILAN 8.47 4.96 10556 AAC IEEE 802.11ac WiFi (160MHz, MCSA, 99pc duty cycle) WILAN 8.50 4.96 10556 AAC IEEE 802.11ac WiFi (160MHz, MCSA, 99pc duty cycle) WILAN 8.51 4.96 10566 AAC IEEE 802.11ac WiFi (160MHz, MCSA, 99pc duty cycle) WILAN 8.51 4.96 10566 AAC IEEE 802.11ac WiFi (160MHz, MCSA, 99pc duty cycle) WILAN 8.58 4.96 10566 AAC IEEE 802.11ac WiFi (160MHz, MCSA, 99pc duty cycle) WILAN 8.58 4.96 10566 AAC IEEE 802.11ac WiFi (160MHz, MCSA, 99pc duty cycle) WILAN 8.58 4.96 10566 AAC IEEE 802.11ac WiFi (160MHz, MCSA, 99pc duty cycle) WILAN 8.58 4.96 10566 AAC IEEE 802.11ac WiFi (160MHz, MCSA, 99pc duty cycle) WILAN 8.50 4.96 10566 AAA IEEE 802.11ac WiFi (160MHz, MCSA, 99pc duty cycle) WILAN 8.50 4.96 10566 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty WILAN 8.45 4.96 10566 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty WILAN 8.30 4.96 10566 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty WILAN 8.30 4.96 10566 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty WILA	7771-1-1-1					
10558			IEEE 902.11ac WiF (00MHz, MCS2, 99pc duty cycle)		·····•	
10550			IEEE 002.11ac WIFI (00MIE, MCC4, 00 and duty cycle)			
19551 AAB			IEEE 802, I Tac WIFT (80MHz, MCS4, 99pc duty cycle)			
10552 AAB IEEE 802.11ac WiFl (80MHz, MCS8, 99pc duty cycle)			TEEE 802.11ac WIFI (80IVIHZ, MICS6, 99pc duty cycle)			
10553			IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)			
10554					8.42	± 9.6 %
10555		_			8.45	±9.6 %
10566		AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	WLAN	8.48	±9.6 %
10566		AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	WLAN	8.47	± 9.6 %
10557 AAC IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle) WLAN 8.52 ± 9.6	10556	AAC		WLAN	8.50	±9.6%
10558	10557	AAC				±9.6 %
10560					·-···	± 9.6 %
10561						
10562						
10563						
10564			IEEE 002.11ac WIFT (100MHz, MCS0, 99pc duty cycle)			
10565			TEEE 002.1 Tab WIFT (TOUVIEZ, MCS9, 9900 duty cycle)			
10565	10564	AAA		WLAN	8.25	± 9.6 %
Cycle 10566 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty WLAN 8.13 ± 9.6 cycle 10567 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty WLAN 8.00 ± 9.6 cycle 10568 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty WLAN 8.37 ± 9.6 cycle 10569 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty WLAN 8.10 ± 9.6 cycle 10570 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty WLAN 8.30 ± 9.6 cycle 10571 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle WLAN 1.99 ± 9.6 cycle 10572 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle WLAN 1.99 ± 9.6 cycle 10573 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle WLAN 1.99 ± 9.6 cycle 10574 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle WLAN 1.98 ± 9.6 cycle 10575 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle WLAN 1.98 ± 9.6 cycle 10576 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty WLAN 8.59 ± 9.6 cycle 10576 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty WLAN 8.60 ± 9.6 cycle 10578 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty WLAN 8.70 ± 9.6 cycle 10578 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty WLAN 8.70 ± 9.6 cycle 10578 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty WLAN 8.70 ± 9.6 cycle 10578 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty WLAN 8.70 ± 9.6 cycle 10578 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty WLAN 8.70 ± 9.6 cycle 10580 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty WLAN 8.70 ± 9.6 cycle 10580 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty WLAN 8.70 ± 9.6 cycle 10580 AAA IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty 10580 WLAN 8.70 ± 9.6 cycle 10580 AA	40505				<u> </u>	
10566	10565	AAA	1	WLAN	8.45	± 9.6 %
Cycle 10567						
10567	10566	AAA	,	WLAN	8.13	± 9.6 %
10568						
10568	10567	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty	WLAN	8.00	± 9.6 %
10569					ļ	
10569	10568	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty	WLAN	8.37	± 9.6 %
10570			cycle)			
Cycle 10570	10569	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty	WLAN	8.10	± 9.6 %
10571			1			
10571	10570	AAA	IEEE 802,11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty	WLAN	8.30	± 9.6 %
10571 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle) WLAN 1.99 ± 9.6 strong 10572 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle) WLAN 1.99 ± 9.6 strong 10573 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle) WLAN 1.98 ± 9.6 strong 10574 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle) WLAN 1.98 ± 9.6 strong 10575 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.59 ± 9.6 strong 10576 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 strong 10577 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 strong 10578 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 strong 10579 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) WLAN 8.36 ± 9.6 strong 10580 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) WLAN 8.76 ± 9.6 strong 10581 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) WLAN 8.75 ± 9.6 strong 10582 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) WLAN 8.67 ± 9.6 strong 10583 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 strong 10584 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 strong 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 strong 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 strong 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 strong 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 strong 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 strong 10586 AAB IEEE 802.11a/h WiF		İ		1		7
10572 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle) WLAN 1.99 ± 9.6 s 10573 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle) WLAN 1.98 ± 9.6 s 10574 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle) WLAN 1.98 ± 9.6 s 10575 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.59 ± 9.6 s 10576 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 s 10577 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 s 10578 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 s 10579 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) WLAN 8.36 ± 9.6 s 10580 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) WLAN 8.35 ± 9.6 s 10581 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) <t< td=""><td>10571</td><td>AAA</td><td></td><td>WIAN</td><td>1 99</td><td>+96%</td></t<>	10571	AAA		WIAN	1 99	+96%
10573 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle) WLAN 1.98 ± 9.6 G 10574 AAA IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle) WLAN 1.98 ± 9.6 G 10575 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.59 ± 9.6 G 10576 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 G 10577 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 G 10578 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 G 10579 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) WLAN 8.36 ± 9.6 G 10580 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) WLAN 8.36 ± 9.6 G 10581 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) WLAN 8.67 ± 9.6 G 10582 AAA IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>						
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10575						
Cycle 10576						***************************************
10576	10070	AAA	, , , , , , , , , , , , , , , , , , , ,	WLAN	0.59	±9.6%
Cycle 10577	40570			14/1 001		1.000
10577	105/6	AAA		WLAN	8.60	±9.6 %
Cycle 10578 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	405==	L				
10578 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 Grade 10.579 10579 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) WLAN 8.36 ± 9.6 Grade 10.580 10580 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) WLAN 8.76 ± 9.6 Grade 10.581 10581 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) WLAN 8.35 ± 9.6 Grade 10.582 10582 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) WLAN 8.67 ± 9.6 Grade 10.583 10583 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.59 ± 9.6 Grade 10.585 10585 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 Grade 10.585 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 Grade 10.585	105/7	AAA		WLAN	8.70	± 9.6 %
Cycle 10579 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle) WLAN 8.36		L				
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cycle) cycle) 10580 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle) WLAN 8.76 ± 9.6 S 10581 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) WLAN 8.35 ± 9.6 S 10582 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) WLAN 8.67 ± 9.6 S 10583 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.59 ± 9.6 S 10584 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 S 10585 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 S 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 S	10579	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty	WLAN	8.36	± 9.6 %
cycle) cycle) 10581 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) WLAN 8.35 ± 9.6 °C 10582 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) WLAN 8.67 ± 9.6 °C 10583 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.59 ± 9.6 °C 10584 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 °C 10585 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 °C 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 °C			cycle)			
cycle) cycle) 10581 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) WLAN 8.35 ± 9.6 °C 10582 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) WLAN 8.67 ± 9.6 °C 10583 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.59 ± 9.6 °C 10584 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 °C 10585 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 °C 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 °C	10580	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty	WLAN	8.76	± 9.6 %
10581 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle) WLAN 8.35 ± 9.6 °C 10582 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) WLAN 8.67 ± 9.6 °C 10583 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.59 ± 9.6 °C 10584 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 °C 10585 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 °C 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 °C						
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10582 AAA IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle) WLAN 8.67 ± 9.6 G 10583 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.59 ± 9.6 G 10584 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 G 10585 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 G 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 G						- 3/3 /3
cycle) LEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.59 ± 9.6 G 10584 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 G 10585 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 G 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 G	10582	AAA		WLAN	8.67	+96%
10583 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle) WLAN 8.59 ± 9.6 °C 10584 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 °C 10585 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 °C 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 °C		" " "		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0.01	
10584 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle) WLAN 8.60 ± 9.6 °C 10585 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 °C 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 °C	10583	AAR		WI ANI	8.50	+08%
10585 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle) WLAN 8.70 ± 9.6 °C 10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 °C						
10586 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle) WLAN 8.49 ± 9.6 °						
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1.40E07 8.5D IEEE 000.44.0.340E08.014.00E044.04.50					~~~	
10587 AAB IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle) WLAN 8.36 ± 9.6 °	10587	AAB	IEEE 802.11a/n WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.36	± 9.6 %

19588 AAB IEEE 802.11an WHI 5 GHz (OFDM, 38 Mbps, 90pc duty cycle) VILAN 8.75 ±9.6 % 19590 AAB IEEE 802.11an WHI 5 GHz (OFDM, 48 Mbps, 90pc duty cycle) VILAN 8.35 ±9.6 % 19590 AAB IEEE 802.11an WHI 5 GHz (OFDM, 48 Mbps, 90pc duty cycle) VILAN 8.35 ±9.6 % 19592 AAB IEEE 802.11an (HT Msed, 20MHz, MCS3, 90pc duty cycle) VILAN 8.36 ±9.6 % 19592 AAB IEEE 802.11an (HT Msed, 20MHz, MCS3, 90pc duty cycle) VILAN 8.46 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 20MHz, MCS3, 90pc duty cycle) VILAN 8.47 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 20MHz, MCS3, 90pc duty cycle) VILAN 8.47 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 20MHz, MCS3, 90pc duty cycle) VILAN 8.47 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 20MHz, MCS3, 90pc duty cycle) VILAN 8.47 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 20MHz, MCS3, 90pc duty cycle) VILAN 8.47 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 20MHz, MCS3, 90pc duty cycle) VILAN 8.47 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 20MHz, MCS3, 90pc duty cycle) VILAN 8.47 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 20MHz, MCS3, 90pc duty cycle) VILAN 8.47 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 20MHz, MCS3, 90pc duty cycle) VILAN 8.47 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 40MHz, MCS3, 90pc duty cycle) VILAN 8.48 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 40MHz, MCS3, 90pc duty cycle) VILAN 8.48 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 40MHz, MCS3, 90pc duty cycle) VILAN 8.48 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 40MHz, MCS3, 90pc duty cycle) VILAN 8.48 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 40MHz, MCS3, 90pc duty cycle) VILAN 8.48 ±9.6 % 19593 AAB IEEE 802.11an (HT Msed, 40MHz, MCS3, 90pc duty cycle) VILAN 8.49 ±9.6 % 19593 AAB IEEE 802.11ac (HT (MMHz, MCS3, 90pc duty cycle) VILAN 8.49 ±9.6 % 19593 AAB IEEE 802.11ac WHz (MMHz, MCS3, 90pc duty cycle) VIL	,	,				
10599 AAB	10588	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.76	± 9.6 %
10592 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90p otthy cycle) WILAN 8.79 ± 9.6 % 10593 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90p otthy cycle) WILAN 8.74 ± 9.6 % 10594 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90p otthy cycle) WILAN 8.74 ± 9.6 % 10595 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90p otthy cycle) WILAN 8.74 ± 9.6 % 10595 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90p otthy cycle) WILAN 8.74 ± 9.6 % 10595 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90p otthy cycle) WILAN 8.71 ± 9.6 % 10599 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90p otthy cycle) WILAN 8.72 ± 9.6 % 10599 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90p otthy cycle) WILAN 8.72 ± 9.6 % 10599 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90p otthy cycle) WILAN 8.70 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90p otthy cycle) WILAN 8.79 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90p otthy cycle) WILAN 8.80 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90p otthy cycle) WILAN 8.82 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90p otthy cycle) WILAN 8.82 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90p otthy cycle) WILAN 8.82 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90p otthy cycle) WILAN 8.97 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90p otthy cycle) WILAN 8.97 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90p otthy cycle) WILAN 8.97 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90p otthy cycle) WILAN 8.62 ± 9.6 % 10590 AAB IEEE 802.11n (WIT AMBER, 40MHz, MCS3, 90p otthy cycle) WILAN 8.67 ± 9.6 % 10590 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 90p otthy cycle) WILAN 8.67 ± 9.6 % 10590 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 90p otthy cycle) WILAN 8.67 ± 9.6 % 10590 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 90p otthy cycle) WILAN 8.67 ± 9.6 % 10590 A	10589	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	WLAN	8.35	± 9.6 %
10592 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90p otthy cycle) WILAN 8.79 ± 9.6 % 10593 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90p otthy cycle) WILAN 8.74 ± 9.6 % 10594 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90p otthy cycle) WILAN 8.74 ± 9.6 % 10595 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90p otthy cycle) WILAN 8.74 ± 9.6 % 10595 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90p otthy cycle) WILAN 8.74 ± 9.6 % 10595 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90p otthy cycle) WILAN 8.71 ± 9.6 % 10599 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90p otthy cycle) WILAN 8.72 ± 9.6 % 10599 AAB IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90p otthy cycle) WILAN 8.72 ± 9.6 % 10599 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90p otthy cycle) WILAN 8.70 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90p otthy cycle) WILAN 8.79 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90p otthy cycle) WILAN 8.80 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90p otthy cycle) WILAN 8.82 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90p otthy cycle) WILAN 8.82 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90p otthy cycle) WILAN 8.82 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90p otthy cycle) WILAN 8.97 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90p otthy cycle) WILAN 8.97 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90p otthy cycle) WILAN 8.97 ± 9.6 % 10590 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90p otthy cycle) WILAN 8.62 ± 9.6 % 10590 AAB IEEE 802.11n (WIT AMBER, 40MHz, MCS3, 90p otthy cycle) WILAN 8.67 ± 9.6 % 10590 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 90p otthy cycle) WILAN 8.67 ± 9.6 % 10590 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 90p otthy cycle) WILAN 8.67 ± 9.6 % 10590 AAB IEEE 802.11ac WiFi (20MHz, MCS3, 90p otthy cycle) WILAN 8.67 ± 9.6 % 10590 A	10590	AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	WLAN	8.67	± 9.6 %
10592 AAB EEE 802.11n (hT Mixed; 20MHz, MCS2, 90pc duty cycle) WLAN 8.79 ± 9.6 % 10594 AAB EEE 802.11n (hT Mixed; 20MHz, MCS2, 90pc duty cycle) WLAN 8.74 ± 9.6 % 10594 AAB EEE 802.11n (hT Mixed; 20MHz, MCS3, 90pc duty cycle) WLAN 8.74 ± 9.6 % 10596 AAB EEE 802.11n (hT Mixed; 20MHz, MCS3, 90pc duty cycle) WLAN 8.71 ± 9.6 % 10599 AAB EEE 802.11n (hT Mixed; 20MHz, MCS3, 90pc duty cycle) WLAN 8.71 ± 9.6 % 10599 AAB EEE 802.11n (hT Mixed; 20MHz, MCS3, 90pc duty cycle) WLAN 8.72 ± 9.6 % 10599 AAB EEE 802.11n (hT Mixed; 20MHz, MCS3, 90pc duty cycle) WLAN 8.75 ± 9.6 % 10599 AAB EEE 802.11n (hT Mixed; 40MHz, MCS3, 90pc duty cycle) WLAN 8.75 ± 9.6 % 10600 AAB EEE 802.11n (hT Mixed; 40MHz, MCS3, 90pc duty cycle) WLAN 8.88 ± 9.6 % 10600 AAB EEE 802.11n (hT Mixed; 40MHz, MCS3, 90pc duty cycle) WLAN 8.84 ± 9.6 % 10600 AAB EEE 802.11n (hT Mixed; 40MHz, MCS3, 90pc duty cycle) WLAN 8.94 ± 9.6 % 10600 AAB EEE 802.11n (hT Mixed; 40MHz, MCS3, 90pc duty cycle) WLAN 8.94 ± 9.6 % 10600 AAB EEE 802.11n (hT Mixed; 40MHz, MCS3, 90pc duty cycle) WLAN 8.94 ± 9.6 % 10600 AAB EEE 802.11n (hT Mixed; 40MHz, MCS3, 90pc duty cycle) WLAN 8.76 ± 9.6 % 10600 AAB EEE 802.11n (hT Mixed; 40MHz, MCS3, 90pc duty cycle) WLAN 8.76 ± 9.6 % 10600 AAB EEE 802.11n (hT Mixed; 40MHz, MCS3, 90pc duty cycle) WLAN 8.76 ± 9.6 % 10600 AAB EEE 802.11n (hT Mixed; 40MHz, MCS3, 90pc duty cycle) WLAN 8.76 ± 9.6 % 10600 AAB EEE 802.11ac Wirl (20MHz, MCS3, 90pc duty cycle) WLAN 8.77 ± 9.6 % 10600 AAB EEE 802.11ac Wirl (20MHz, MCS3, 90pc duty cycle) WLAN 8.77 ± 9.6 % 10600 AAB EEE 802.11ac Wirl (20MHz, MCS3, 90pc duty cycle) WLAN 8.77 ± 9.6 % 10600 AAB EEE 802.11ac Wirl (20MHz, MCS3, 90pc duty cycle) WLAN 8.77 ± 9.6 % 10600 AAB EEE 802.11ac Wirl (20MHz, MCS3, 90pc duty cycle)				WLAN	8.63	± 9.6 %
10593 AAB						
10595 AAB EEE 802.111 ()+T Mixed, 20MHz, MCS3, 90pc duty cycle)						
10595 AAB EEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle) WLAN 8.74 ± 9.8 % 10597 AAB EEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle) WLAN 8.72 ± 9.8 % 10597 AAB EEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle) WLAN 8.72 ± 9.8 % 10599 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.79 ± 9.8 % 10599 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.79 ± 9.8 % 10590 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.82 ± 9.8 % 10591 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.82 ± 9.8 % 10591 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.82 ± 9.8 % 10592 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.82 ± 9.8 % 10592 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.94 5 % 10593 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.93 ± 9.6 % 10593 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.93 ± 9.6 % 10593 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.97 ± 9.6 % 10593 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.97 ± 9.6 % 10593 AAB EEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.97 ± 9.6 % 10593 AAB EEE 802.11n (HT Mixed, MCS6, 90pc duty cycle) WLAN 8.97 ± 9.6 % 10593 AAB EEE 802.11n (HT Mixed, MCS6, 90pc duty cycle) WLAN 8.97 ± 9.6 % 10593 AAB EEE 802.11n (HT Mixed, MCS6, 90pc duty cycle) WLAN 8.97 ± 9.6 % 10593 AAB EEE 802.11n (HT Mixed, MCS6, 90pc duty cycle) WLAN 8.97 ± 9.6 % 10593 AAB EEE 802.11n (HT Mixed, MCS6, 90pc duty cycle) WLAN 8.77 ± 9.6 % 10593 AAB EEE 802.11n (HT Mixed, MCS6, 90pc duty cycle) WLAN 8.78 ± 9.6 % 10593 AAB EEE 802.11n (HT Mixed, MCS6, 90pc duty cycle) WLAN 8.77 ± 9.6 % 10593 AAB EEE 802.11n (WT (20MHz, MCS6, 90pc du						
10599						
10699 AAB IEEE 802.11n (HT Mixed, 20MHz, MCSF, 90pc duty cycle) WLAN 8.70 ± 9.8 % 10699 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSD, 90pc duty cycle) WLAN 8.79 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSD, 90pc duty cycle) WLAN 8.79 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSC), 90pc duty cycle) WLAN 8.82 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSZ, 90pc duty cycle) WLAN 8.82 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSZ, 90pc duty cycle) WLAN 8.82 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSZ, 90pc duty cycle) WLAN 9.03 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSZ, 90pc duty cycle) WLAN 9.03 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSZ, 90pc duty cycle) WLAN 8.94 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSZ, 90pc duty cycle) WLAN 8.76 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSZ, 90pc duty cycle) WLAN 8.97 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSZ, 90pc duty cycle) WLAN 8.97 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCSZ, 90pc duty cycle) WLAN 8.97 ± 9.8 % 10690 AAB IEEE 802.11n (WH) (20MHz, MCSZ, 90pc duty cycle) WLAN 8.77 ± 9.8 % 10690 AAB IEEE 802.11n (WH) (20MHz, MCSZ, 90pc duty cycle) WLAN 8.77 ± 9.8 % 10690 AAB IEEE 802.11n (WH) (20MHz, MCSZ, 90pc duty cycle) WLAN 8.77 ± 9.8 % 10610 AAB IEEE 802.11n (WH) (20MHz, MCSZ, 90pc duty cycle) WLAN 8.78 ± 9.8 % 10610 AAB IEEE 802.11n (WH) (20MHz, MCSZ, 90pc duty cycle) WLAN 8.78 ± 9.8 % 10611 AAB IEEE 802.11n (WH) (20MHz, MCSZ, 90pc duty cycle) WLAN 8.78 ± 9.8 % 10611 AAB IEEE 802.11n (WH) (20MHz, MCSZ, 90pc duty cycle) WLAN 8.78 ± 9.8 % 10616 AAB IEEE 802.11n (WH) (20MHz, MCSZ, 90pc duty cycle) WLAN 8.78 ± 9.8 % 10616 AAB IEEE 802.11n (WH) (20MHz, MCSZ, 90pc duty cycle) WLAN 8.79 ± 9.8 % 10616 AAB IEEE 8						
10699 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle) WLAN 8.79 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle) WLAN 8.88 ± 9.8 % 10690 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle) WLAN 8.88 ± 9.8 % 10692 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle) WLAN 8.84 ± 9.8 % 10692 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle) WLAN 8.94 ± 9.6 % 10693 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle) WLAN 9.93 ± 9.6 % 10693 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle) WLAN 8.94 ± 9.6 % 10693 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle) WLAN 8.97 ± 9.6 % 10693 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle) WLAN 8.97 ± 9.6 % 10693 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle) WLAN 8.97 ± 9.6 % 10693 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle) WLAN 8.97 ± 9.6 % 10693 AAB IEEE 802.11ac WHI (20MHz, MCS5, 90pc duty cycle) WLAN 8.94 ± 9.6 % 10693 AAB IEEE 802.11ac WHI (20MHz, MCS5, 90pc duty cycle) WLAN 8.94 ± 9.6 % 10693 AAB IEEE 802.11ac WHI (20MHz, MCS5, 90pc duty cycle) WLAN 8.77 ± 9.6 % 10610 AAB IEEE 802.11ac WHI (20MHz, MCS5, 90pc duty cycle) WLAN 8.77 ± 9.6 % 10611 AAB IEEE 802.11ac WHI (20MHz, MCS5, 90pc duty cycle) WLAN 8.77 ± 9.6 % 10611 AAB IEEE 802.11ac WHI (20MHz, MCS5, 90pc duty cycle) WLAN 8.70 ± 9.6 % 10613 AAB IEEE 802.11ac WHI (20MHz, MCS6, 90pc duty cycle) WLAN 8.70 ± 9.6 % 10613 AAB IEEE 802.11ac WHI (20MHz, MCS6, 90pc duty cycle) WLAN 8.70 ± 9.6 % 10614 AAB IEEE 802.11ac WHI (20MHz, MCS6, 90pc duty cycle) WLAN 8.94 ± 9.6 % 10615 AAB IEEE 802.11ac WHI (40MHz, MCS6, 90pc duty cycle) WLAN 8.94 ± 9.6 % 10616 AAB IEEE 802.11ac WHI (40MHz, MCS6, 90pc duty cycle) WLAN 8.94 ± 9.6 % 10616 AAB IEEE 802.11ac WHI						***************************************
10690						
10600 AAB						
10601 AAB						
10602	10600	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	WLAN	8.88	± 9.6 %
19603 AAB	10601	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	WLAN	8.82	±9.6%
10603 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle) WLAN 9.03 ±9.6 % 10605 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle) WLAN 8.76 ±9.6 % 10606 AAB IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle) WLAN 8.87 ±9.6 % 10607 AAB IEEE 802.11n (WIT Mixed, 40MHz, MCS7, 90pc duty cycle) WLAN 8.84 ±9.6 % 10608 AAB IEEE 802.11nc WIFI (20MHz, MCS7, 90pc duty cycle) WLAN 8.74 ±9.6 % 10609 AAB IEEE 802.11nc WIFI (20MHz, MCS7, 90pc duty cycle) WLAN 8.77 ±9.6 % 10609 AAB IEEE 802.11nc WIFI (20MHz, MCS7, 90pc duty cycle) WLAN 8.77 ±9.6 % 10610 AAB IEEE 802.11nc WIFI (20MHz, MCS8, 90pc duty cycle) WLAN 8.77 ±9.6 % 10611 AAB IEEE 802.11nc WIFI (20MHz, MCS8, 90pc duty cycle) WLAN 8.78 ±9.6 % 10611 AAB IEEE 802.11nc WIFI (20MHz, MCS8, 90pc duty cycle) WLAN 8.70 ±9.6 % 10613 AAB IEEE 802.11nc WIFI (20MHz, MCS8, 90pc duty cycle) WLAN 8.77 ±9.6 % 10614 AAB IEEE 802.11nc WIFI (20MHz, MCS8, 90pc duty cycle) WLAN 8.77 ±9.6 % 10614 AAB IEEE 802.11nc WIFI (20MHz, MCS8, 90pc duty cycle) WLAN 8.79 ±9.6 % 10616 AAB IEEE 802.11nc WIFI (20MHz, MCS8, 90pc duty cycle) WLAN 8.59 ±9.6 % 10617 AAB IEEE 802.11nc WIFI (20MHz, MCS8, 90pc duty cycle) WLAN 8.59 ±9.6 % 10618 AAB IEEE 802.11nc WIFI (40MHz, MCS9, 90pc duty cycle) WLAN 8.82 ±9.6 % 10618 AAB IEEE 802.11nc WIFI (40MHz, MCS9, 90pc duty cycle) WLAN 8.82 ±9.6 % 10619 AAB IEEE 802.11nc WIFI (40MHz, MCS9, 90pc duty cycle) WLAN 8.81 ±9.6 % 10610 AAB IEEE 802.11nc WIFI (40MHz, MCS9, 90pc duty cycle) WLAN 8.81 ±9.6 % 10620 AAB IEEE 802.11nc WIFI (40MHz, MCS9, 90pc duty cycle) WLAN 8.81 ±9.6 % 10620 AAB IEEE 802.11nc WIFI (40MHz, MCS9, 90pc duty cycle) WLAN 8.87 ±9.6 % 10620 AAB IEEE 802.11nc WIFI (40MHz, MCS9, 90pc duty cycle) WLAN 8.81 ±9.6 % 10620 AAB IEEE 802.11nc WIFI (40MHz, MCS9, 90pc duty cycle) WLA	10602	AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	WLAN	8.94	± 9.6 %
10604 AAB				WLAN	9.03	± 9.6 %
10605						
10606						
10607 AAB IEEE 802.11ac WiFI (20MHz, MCS1, 90pc duty cycle) WLAN 8.64 £9.6 % 10609 AAB IEEE 802.11ac WiFI (20MHz, MCS1, 90pc duty cycle) WLAN 8.77 £9.6 % 10610 AAB IEEE 802.11ac WiFI (20MHz, MCS2, 90pc duty cycle) WLAN 8.77 £9.6 % 10610 AAB IEEE 802.11ac WiFI (20MHz, MCS3, 90pc duty cycle) WLAN 8.78 £9.6 % 10610 AAB IEEE 802.11ac WiFI (20MHz, MCS3, 90pc duty cycle) WLAN 8.70 £9.6 % 10611 AAB IEEE 802.11ac WiFI (20MHz, MCS5, 90pc duty cycle) WLAN 8.70 £9.6 % 10612 AAB IEEE 802.11ac WiFI (20MHz, MCS5, 90pc duty cycle) WLAN 8.77 £9.6 % 10613 AAB IEEE 802.11ac WiFI (20MHz, MCS5, 90pc duty cycle) WLAN 8.77 £9.6 % 10614 AAB IEEE 802.11ac WiFI (20MHz, MCS7, 90pc duty cycle) WLAN 8.94 £9.6 % 10616 AAB IEEE 802.11ac WiFI (20MHz, MCS7, 90pc duty cycle) WLAN 8.82 £9.6 % 10616 AAB IEEE 802.11ac WiFI (20MHz, MCS7, 90pc duty cycle) WLAN 8.82 £9.6 % 10616 AAB IEEE 802.11ac WiFI (40MHz, MCS0, 90pc duty cycle) WLAN 8.82 £9.6 % 10619 AAB IEEE 802.11ac WiFI (40MHz, MCS0, 90pc duty cycle) WLAN 8.82 £9.6 % 10619 AAB IEEE 802.11ac WiFI (40MHz, MCS1, 90pc duty cycle) WLAN 8.81 £9.6 % 10619 AAB IEEE 802.11ac WiFI (40MHz, MCS3, 90pc duty cycle) WLAN 8.81 £9.6 % 10620 AAB IEEE 802.11ac WiFI (40MHz, MCS3, 90pc duty cycle) WLAN 8.86 £9.6 % 10622 AAB IEEE 802.11ac WiFI (40MHz, MCS3, 90pc duty cycle) WLAN 8.87 £9.6 % 10622 AAB IEEE 802.11ac WiFI (40MHz, MCS3, 90pc duty cycle) WLAN 8.87 £9.6 % 10622 AAB IEEE 802.11ac WiFI (40MHz, MCS3, 90pc duty cycle) WLAN 8.87 £9.6 % 10623 AAB IEEE 802.11ac WiFI (40MHz, MCS3, 90pc duty cycle) WLAN 8.88 £9.6 % 10623 AAB IEEE 802.11ac WiFI (60MHz, MCS3, 90pc duty cycle) WLAN 8.88 £9.6 % 10626 AAB IEEE 802.11ac WiFI (80MHz, MCS3, 90pc duty cycle) WLAN 8.88 £9.6 % 10626 AAB IEEE 802.11ac WiFI (80MHz, MCS3, 90pc duty cycle) WLAN 8.89 £9.6 %						
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10617 AAB			IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	WLAN	8.82	± 9.6 %
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10653 AAD LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%) LTE-TDD 7.42 ± 9.6 %						

10654 AAD LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%) LTE-TDD 6.96 ± 9.6 %					·	
	10654	AAD	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LIE-IUU	6.96	1 ± 9.6 %

10655	AAE	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.21	± 9.6 %
10658	AAA	Pulse Waveform (200Hz, 10%)	Test	10.00	± 9.6 %
10659	AAA	Pulse Waveform (200Hz, 20%)	Test	6.99	± 9.6 %
10660	AAA	Pulse Waveform (200Hz, 40%)	Test	3.98	± 9.6 %
10661	AAA	Pulse Waveform (200Hz, 60%)	Test	2.22	± 9.6 %
10662	AAA	Pulse Waveform (200Hz, 80%)	Test	0.97	±9.6 %
10670	AAA	Bluetooth Low Energy	Bluetooth	2.19	± 9.6 %

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

	2/2	
-		

Certificate No: EX3-7308_Aug18

CALIBRATION	CERTIFICATE	
Object	EX3DV4 - SN:7308	
Calibration procedure(s)	QA CAL-01:v9; QA CAL-14:v4; QA CAL-23:v5; QA CAL-25.v6 Calibration procedure for dosimetric E-field probes	
Calibration date:	August 23, 2018 09-06	 -201
This calibration certificate docu The measurements and the un	iments the traceability to national standards, which realize the physical units of measurements (SI). certainties with confidence probability are given on the following pages and are part of the certificate.	
All calibrations have been cond	ducted in the closed laboratory facility: environment temperature (22 \pm 3)°C and humidity < 70%.	
Calibration Equipment used (M	&TE critical for calibration)	

Primary Standards	ID	Cal Date (Certificate No.)	School and California
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Scheduled Calibration
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-18 (No. 217-02682)	Apr-19
Reference Probe ES3DV2	SN: 3013	30-Dec-17 (No. ES3-3013_Dec17)	Apr-19 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-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check; Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-17)	In house check: Jun-20

0.5	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	Jell
Approved by:	Katja Pokovic	Tiechnical Manager	Mas

Issued: August 24, 2018

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

Certificate No: EX3-7308_Aug18

Calibration Laboratory of

Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland





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Swiss Calibration Service

Accreditation No.: SCS 0108

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Glossary:

TSL NORMx,y,z tissue simulating liquid sensitivity in free space

ConvF DCP sensitivity in TSL / NORMx,y,z diode compression point

CF A, B, C, D crest factor (1/duty_cycle) of the RF signal modulation dependent linearization parameters

Polarization φ

φ rotation around probe axis

Polarization 9

9 rotation around an axis that is in the plane normal to probe axis (at measurement center),

i.e., 9 = 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 9 = 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 E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is
 implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included
 in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep 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).

Certificate No: EX3-7308_Aug18 Page 2 of 39

Probe EX3DV4

SN:7308

Manufactured:

March 11, 2014 August 23, 2018

Calibrated:

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (μV/(V/m) ²) ^A	0.49	0.60	0.44	± 10.1 %
DCP (mV) ^B	99.6	97.1	102.5	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	С	D dB	VR mV	Unc ^E (k=2)
0	CW	X	0.0	0.0	1.0	0.00	177.2	±3.5 %
		Y	0.0	0.0	1.0		165.4	_
		Z	0.0	0.0	1.0		159.6	

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	53.71	401.2	35.76	12.80	0.351	5.077	0.717	0.413	1.005
Y	56.67	439.8	38.08	13.44	0.524	5.100	0.000	0.597	1.012
<u>Z</u>	40.98	304.1	35.29	8.573	0.334	5.045	1.531	0.174	1.005

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%.

⁸ Numerical linearization parameter: uncertainty not required.

 $^{^{\}rm A}$ The uncertainties of Norm X,Y,Z do not affect the E $^{\rm 2}$ -field uncertainty inside TSL (see Pages 5 and 6).

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 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	10.23	10.23	10.23	0.57	0.81	± 12.0 %
835	41.5	0.90	9.96	9.96	9.96	0.58	0.81	± 12.0 %
1750	40.1	1.37	8.66	8.66	8.66	0.36	0.80	± 12.0 %
1900	40.0	1.40	8.26	8.26	8.26	0.29	0.85	± 12.0 %
2300	39.5	1.67	7.81	7.81	7.81	0.29	0.85	± 12.0 %
2450	39.2	1.80	7.45	7.45	7.45	0.35	0.91	± 12.0 %
2600	39.0	1.96	7.30	7.30	7.30	0.35	0.87	± 12.0 %
5250	35.9	4.71	5.10	5.10	5.10	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.85	4.85	4.85	0.40	1.80	± 13.1 %
5750	35.4	5.22	5.04	5.04	5.04	0.40	1.80	± 13.1 %

 $^{^{\}rm C}$ Frequency validity above 300 MHz of \pm 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to \pm 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity validity can be extended to \pm 100 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency

F At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to \pm 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 \pm 5%. The uncertainty is the RSS of Alpha/Depth are determined during as the same applied to the convE uncertainty for indicated target tissue parameters.

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.

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)
<u>75</u> 0	55.5	0.96	10.38	10.38	10.38	0.36	0.99	± 12.0 %
835	55.2	0.97	10.19	10.19	10.19	0.50	0.82	± 12.0 %
1750_	53.4	1.49	8.13	8.13	8.13	0.27	1.04	± 12.0 %
1900	53.3	1.52	7.79	7.79	7.79	0.38	0.85	± 12.0 %
2300	52.9	1.81	7.73	7.73	7.73	0.37	0.80	± 12.0 %
2450	52.7	1.95	7.57	7.57	7.57	0.34	0.88	± 12.0 %
2600	52.5	2.16	7.40	7.40	7.40	0.29	0.95	± 12.0 %
5250	48.9	5.36	4.48	4.48	4.48	0.50	1.90	± 13.1 %
5600	48.5	5.77	4.00	4.00	4.00	0.50	1.90	± 13.1 %
5750	48.3	5.94	4.18	4.18	4.18	0.50	1.90	± 13.1 %

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

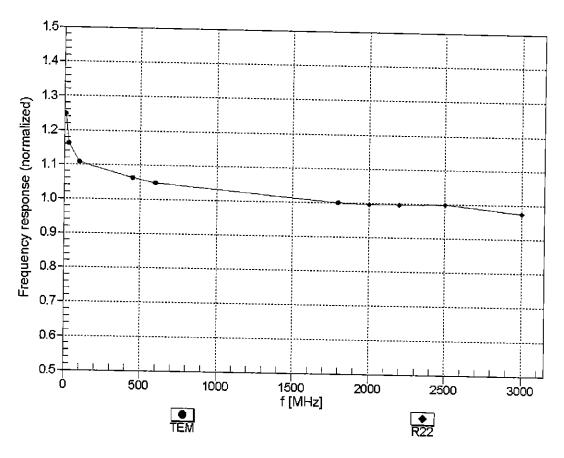
validity can be extended to ± 110 MHz.

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.

the ConvF uncertainty for indicated target tissue parameters.

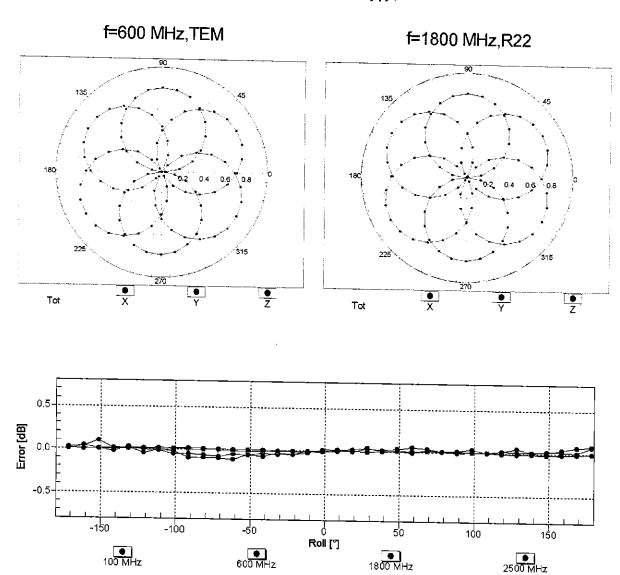
Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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



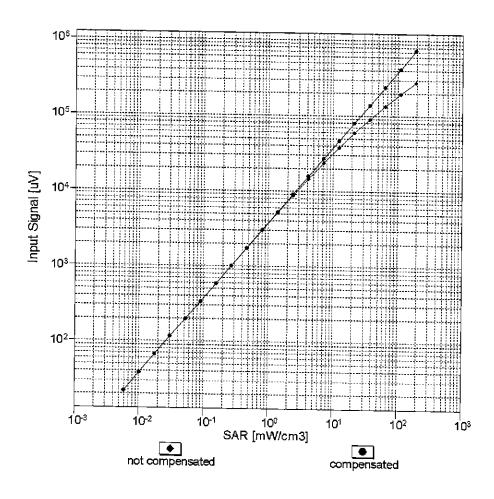
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

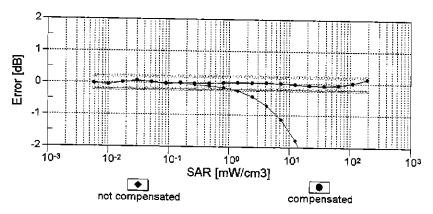
Receiving Pattern (ϕ), $\vartheta = 0^{\circ}$



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

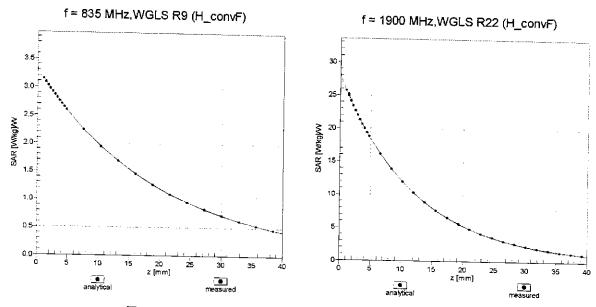
Dynamic Range f(SAR_{head}) (TEM cell , f_{eval}= 1900 MHz)



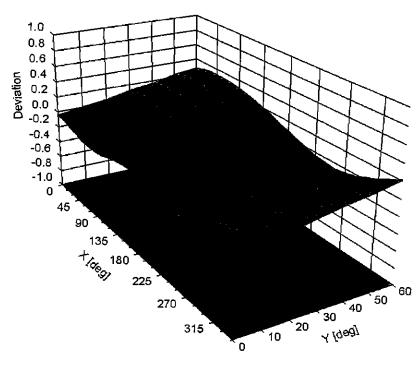


Uncertainty of Linearity Assessment: \pm 0.6% (k=2)

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (φ, θ), f = 900 MHz



Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	
Mechanical Surface Detection Mode	108.5
Optical Surface Detection Mode	enabled
	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	
Tip Diameter	9 mm
Probe Tip to Sensor X Calibration Point	2.5 mm
	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	
	1.4 mm

Appendix: Modulation Calibration Parameters

UID	Communication System Name	mete	A dB	B dBõV	С	D dB	VR mV	Max Unc ^E
0	CW	X	0.00	0.00	1.00	0.00	177.2	(k=2) ± 3.5 %
		Y	0.00	0.00	1.00	0.00	165.4	<u> </u>
		Z	0.00	0.00	1.00	-	159.6	
10010- CAA	SAR Validation (Square, 100ms, 10ms)	X	2.71	68.17	11.26	10.00	20.0	± 9.6 %
		Υ	2.39	66.64	10.67		20.0	
		Z	1.90	64.26	9.03		20.0	
10011- CAB	UMTS-FDD (WCDMA)	X	1.19	70.37	17.06	0.00	150.0	±9.6 %
		Y	0.96	66.50	14.51		150.0	
40040	IEEE 000 441 1485 0 4 14 14 14 15 15 15 15 15 15 15 15 15 15 15 15 15	Z	1.05	68.92	16.00		150.0	
10012- CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	X	1.18	64.67	16.08	0.41	150.0	± 9.6 %
	 	Υ	1.11	63.43	15.04		150.0	
10013-	IEEE 000 44 - NATE O 4 DO 4	Z	1.13	64.11	15.48		150.0	
CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 6 Mbps)	X	4.93	66.75	17.26	1.46	150.0	± 9.6 %
	 	Ϋ́	4.92	66.47	17.15		150.0	
10021-	GSM-FDD (TDMA, GMSK)	Z	4.74	66.75	17.08	<u></u>	150.0	
DAC	GSW-FDD (TDWA, GMSK)	X	100.00	114.38	27.28	9.39	50.0	± 9.6 %
		Y	100.00	114.83	27.64		50.0	
10023-	GPRS-FDD (TDMA, GMSK, TN 0)	Z	100.00	109.69	24.90		50.0	
DAC	GFRS-FDD (TDIVIA, GIVISK, TN U)	X	100.00	113.94	27.13	9.57	50.0	± 9.6 %
	 	Y	100.00	114.49	27.54		50.0	
10024- DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	X	100.00 100.00	109.21 115.48	24.74 26.77	6.56	50.0 60.0	± 9.6 %
57.10		Y	100.00	114.18	20.00			
		Z	100.00	109.85	26.29		60.0	
10025- DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	X	6.22	84.66	23.86 34.29	12.57	60.0 50.0	± 9.6 %
		Y	4.94	76.24	29.94		50.0	
		Z	5.36	79.88	31.57		50.0	
10026- DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	Х	11.81	100.22	36.35	9.56	60.0	± 9.6 %
		Υ	11.10	97.75	35.30		60.0	
		Z	7.89	90.81	32.78		60.0	
10027- DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	X	100.00	118.27	27.22	4.80	80.0	± 9.6 %
_	<u> </u>	Υ	100.00	114.44	25.61		80.0	
40000		Z	_100.00	111.67	23.86		80.0	
10028- DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	X	100.00	122.72	28.40	3.55	100.0	± 9.6 %
<u> </u>	<u> </u>	Y	100.00	114.80	25.04		100.0	
10000	EDOE EDD /TDMA OBOX TVO	<u>Z</u>	100.00	114.83	24.49		100.0	
10029- DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	X	6.56	85.50	29.56	7.80	80.0	± 9.6 %
		Υ	6.53	84.80	29.16		80.0	
10030- CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Z	4.80 100.00	79.03 114.96	26.78 26.10	5.30	80.0 70.0	± 9.6 %
<u>: • • • </u>		Y	100.00	112.69	25.18		70.0	
		Z	100.00	108.37	22.73		70.0 70.0	
10031- CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	X	100.00	126.84	28.53	1.88	100.0	± 9.6 %
<u> </u>		Ÿ	100.00	105.21	19.68	 	100.0	
		Y	[[[]]]		M n A	l	1111111	

10032-	IEEE 802.15.1 Bluetooth (GFSK, DH5)	T 🗸	400.00	440.50	0=00	·		T
CAA	TELE 802.19.1 Bidelootif (GFSK, DHS)	X	100.00	146.53	35.02	1.17	100.0	± 9.6 %
		Ý	100.00	95.65	15.05	 	100.0	
		Z	100.00	112.23	21.08	 	100.0	
10033-	IEEE 802.15.1 Bluetooth (PI/4-DQPSK,	X	100.00	133.98	36.90	5.30	70.0	± 9.6 %
CAA	DH1)	``	100.00	100.50	30.30	3.30	70.0	19.0%
		Y	94.91	132.14	36.35		70.0	
		Z	24.70	106.96	28.52	ļ · · · -	70.0	
10034-	IEEE 802.15.1 Bluetooth (PI/4-DQPSK,	X	8.70	95.28	25.33	1.88	100.0	± 9.6 %
CAA	DH3)						100.0	2 0.0 %
		Υ	4.18	83.23	21.11		100.0	
		Z	3.97	82.01	19.44		100.0	
10035-	IEEE 802.15.1 Bluetooth (PI/4-DQPSK,	X	3.83	83.82	21.38	1.17	100.0	± 9.6 %
CAA	DH5)	ļ					_	
		Υ	2.23	74.99	17.69		100.0	
10036-	IEEE 000 45 4 DI A A DI	Z	2.33	75.94	16.98		100.0	
CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	Х	100.00	134.50	37.14	5.30	70.0	± 9.6 %
		Υ	100.00	133.48	36.76		70.0	
		Z	56.60	119.91	31.85		70.0	
10037-	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	X	7.69	93.53	24.78	1.88	100.0	± 9.6 %
CAA		<u> </u>					L	
	 	Υ	3.89	82.31	20.76		100.0	
10038-	JEEE 000 45 4 Division to 40 DD045 Division	Z	3.40	80.12	18.77		100.0	
CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	Х	3.93	84.59	21.78	1.17	100.0	± 9.6 %
		Υ	2.28	75.57	18.03		100.0	
		Z	2.38	76.51	17.34		100.0	
10039- CAB	CDMA2000 (1xRTT, RC1)	X	2.78	78.14	18.71	0.00	150.0	± 9.6 %
-		Y	1.67	70.12	14.94		1500	
		ż	2.00	74.01	15.76	 	150.0	
10042- CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4- DQPSK, Halfrate)	X	100.00	110.92	24.96	7.78	150.0 50.0	± 9.6 %
		Υ	100.00	110.22	04.75	<u> </u>		
		Z	100.00		24.75	<u> </u>	50.0	
10044-	IS-91/EIA/TIA-553 FDD (FDMA, FM)	X	0.00	106.01 112.58	22.46		50.0	
CAA	(1 510) (1 110)				4.43	0.00	150.0	± 9.6 %
		Y	0.07	121.95	9.84		150.0	
10048-	DECT /TDD TDMA/EDM OFOX F II	Z	0.01	118.94	9.83		150.0	
CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	Х	100.00	111.48	27.44	13.80	25.0	± 9.6 %
		Υ	100.00	112.85	28.28		25.0	
40040	DE07.45	Z	18.65	86.54	19.90		25.0	
10049- CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	Х	100.00	112.40	26.75	10.79	40.0	± 9.6 %
		Y	100.00	113.42	27.38		40.0	
400=5		Z	46.23	99.19	22.45		40.0	
10056- CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	X	100.00	126.85	34.82	9.03	50.0	± 9.6 %
		Υ	100.00	126.84	34.96		50.0	
		Z	73.14	116.99	30.84		50.0	
10058- DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	X	4.87	79.06	26.07	6.55	100.0	± 9.6 %
		Υ	4.89	78.72	25.82		100.0	-
		Ž	3.78	74.24	23.87		100.0	
10059- CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	Х	1.24	66.08	16.89	0.61	110.0	± 9.6 %
		Y	1.15	64.70	15.80		110.0	
		Z	1.15	65.12	16.08		110.0	
10060- CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	X	100.00	145.11	38.67	1.30	110.0 110.0	± 9.6 %
	po/							
	l l							
		Y	100.00 100.00	138.14 143.13	35.54 37.45		110.0 110.0	

10062- IE CAC MI 10063- IE CAC MI 10064- IE CAC MI 10065- IEI CAC MI 10066- IEI CAC MI 10067- IEI CAC MI 10068- IEI CAC MI 10071- IEI CAB (Di	EEE 802.11a/h WiFi 5 GHz (OFDM, 6 bps) EEE 802.11a/h WiFi 5 GHz (OFDM, 9 bps) EEE 802.11a/h WiFi 5 GHz (OFDM, 12 bps) EEE 802.11a/h WiFi 5 GHz (OFDM, 18 bps) EEE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EEE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EEE 802.11a/h WiFi 5 GHz (OFDM, 36 bps)	X Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X	5.01 3.88 2.64 4.74 4.72 4.55 4.76 4.74 4.57 5.07 5.06 4.83 4.93 4.92 4.69 4.95 4.94 4.70 5.22 5.23 4.99 5.28	92.44 86.79 81.37 66.80 66.44 66.78 66.90 66.55 66.86 67.18 66.88 67.08 67.08 66.95 67.11 66.84 66.94 67.15 66.94 67.15 67.31	27.34 24.94 23.02 16.70 16.52 16.53 16.81 16.64 16.62 17.05 16.91 17.03 16.91 17.33 17.15 17.03 16.91 17.33	0.49 0.72 0.86 1.21	110.0 110.0 110.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 % ± 9.6 % ± 9.6 % ± 9.6 % ± 9.6 %
10063- IEI CAC Mt 10064- IEI CAC Mt 10065- IEI CAC Mt 10066- IEI CAC Mt 10067- IEI CAC Mt 10069- IEI CAC Mt 10071- IEI CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 9 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 12 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 18 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps)	X	2.64 4.74 4.72 4.55 4.76 4.74 4.57 5.07 5.06 4.83 4.93 4.92 4.69 4.95 4.95 4.90 5.22 5.23 4.99 5.28	81.37 66.80 66.44 66.78 66.90 66.55 66.86 67.18 66.88 67.08 67.08 66.95 67.11 66.84 66.94 67.17	23.02 16.70 16.52 16.53 16.81 16.64 16.62 17.05 16.91 16.83 17.15 17.03 16.91 17.33 17.22 17.07 17.72	0.72	110.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 % ± 9.6 % ± 9.6 %
10063- IEI CAC Mt 10064- IEI CAC Mt 10065- IEI CAC Mt 10066- IEI CAC Mt 10067- IEI CAC Mt 10069- IEI CAC Mt 10071- IEI CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 9 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 12 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 18 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps)	X Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X	4.74 4.72 4.55 4.76 4.74 4.57 5.07 5.06 4.83 4.93 4.92 4.69 4.95 4.94 4.70 5.22 5.23 4.99 5.28	66.80 66.44 66.78 66.90 66.55 66.86 67.18 66.88 67.08 67.08 66.80 66.95 67.11 66.84 66.94 67.17	16.70 16.52 16.53 16.81 16.64 16.62 17.05 16.91 16.83 17.15 17.03 16.91 17.33 17.22 17.07 17.72	0.72	110.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 % ± 9.6 % ± 9.6 %
10063- IEI CAC Mt 10064- IEI CAC Mt 10065- IEI CAC Mt 10066- IEI CAC Mt 10067- IEI CAC Mt 10069- IEI CAC Mt 10071- IEI CAB (D:	EE 802.11a/h WiFi 5 GHz (OFDM, 9 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 12 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 18 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps)	Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X Y Y Z X Y Y Z X Y Y Z X Y Y Z X Y Y Z X X Y Y Z X X Y Y Z X X Y Y Z X X Y Y Z X X Y Y X X Y Y X X Y Y X X Y Y X X Y Y X X X Y Y X X X Y Y X X X Y Y X X X Y Y X X X Y Y X X X Y Y X X X X Y Y X X X X Y Y X X X X Y Y X X X X X Y Y X	4.72 4.55 4.76 4.74 4.57 5.07 5.06 4.83 4.93 4.92 4.69 4.95 4.94 4.70 5.22 5.23 4.99 5.28	66.44 66.78 66.90 66.55 66.86 67.18 66.88 67.08 67.08 67.08 66.95 67.11 66.84 66.94 67.17	16.52 16.53 16.81 16.64 16.62 17.05 16.91 16.83 17.15 17.03 16.91 17.33 17.22 17.07 17.72	0.72	100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 % ± 9.6 % ± 9.6 %
10064- IEI CAC Mt 10065- IEI CAC Mt 10066- IEI CAC Mt 10068- IEI CAC Mt 10068- IEI CAC Mt 10069- IEI CAC Mt 10071- IEI CAB (D: 10072- IEI CAB (D: 10072- IEI CAB (D: 10072- IEI CAB)	EE 802.11a/h WiFi 5 GHz (OFDM, 12 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 18 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	X	4.55 4.76 4.74 4.57 5.07 5.06 4.83 4.93 4.92 4.69 4.95 4.95 5.22 5.23 4.99 5.28	66.78 66.90 66.55 66.86 67.18 66.88 67.08 67.08 67.08 66.80 66.95 67.11 66.84 66.94 67.17	16.53 16.81 16.64 16.62 17.05 16.91 16.83 17.15 17.03 16.91 17.33 17.22 17.07 17.72	1.21	100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 % ± 9.6 %
10064- IEI CAC Mt 10065- IEI CAC Mt 10066- IEI CAC Mt 10068- IEI CAC Mt 10068- IEI CAC Mt 10069- IEI CAC Mt 10071- IEI CAB (D: 10072- IEI CAB (D: 10072- IEI CAB (D: 10072- IEI CAB)	EE 802.11a/h WiFi 5 GHz (OFDM, 12 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 18 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	X Y Z X Y Z X Y Z X Y Z X Y Z X Y Z X	4.76 4.74 4.57 5.07 5.06 4.83 4.93 4.92 4.69 4.95 4.94 4.70 5.22 5.23 4.99 5.28	66.90 66.55 66.86 67.18 66.88 67.08 67.08 66.80 66.95 67.11 66.84 66.94 67.17 66.94 67.15	16.81 16.64 16.62 17.05 16.91 16.83 17.15 17.03 16.91 17.33 17.22 17.07 17.72 17.65 17.52	1.21	100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 % ± 9.6 %
10064- IEI CAC Mt 10065- IEI CAC Mt 10066- IEI CAC Mt 10068- IEI CAC Mt 10068- IEI CAC Mt 10069- IEI CAC Mt 10071- IEI CAB (D: 10072- IEI CAB (D: 10072- IEI CAB)	EE 802.11a/h WiFi 5 GHz (OFDM, 12 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 18 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	Y Z X Y Z X Y Z X Y Z X Y Z X Y Y Z X Y Y Z X Y Y Z X Y Y Z X Y Y Z X X Y Y Z X X Y Y X X Y Y X X Y Y X X Y Y X X Y Y X X Y Y X X Y Y X X X Y Y X X X Y Y X X X Y Y X X X Y Y X X X Y Y X X X X Y Y X X X X X Y Y X	4.74 4.57 5.07 5.06 4.83 4.93 4.92 4.69 4.95 4.94 4.70 5.22 5.23 4.99 5.28	66.55 66.86 67.18 66.88 67.08 67.08 66.80 66.95 67.11 66.84 66.94 67.17	16.64 16.62 17.05 16.91 16.83 17.15 17.03 16.91 17.33 17.22 17.07 17.72	1.21	100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 % ± 9.6 %
10065- IEI CAC Mt 10066- IEI CAC Mt 10067- IEI CAC Mt 10068- IEI CAC Mt 10068- IEI CAC Mt 10071- CAC Mt 10071- CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 18 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	X	4.57 5.06 4.83 4.93 4.92 4.69 4.95 4.94 4.70 5.22 5.23 4.99 5.28	66.86 67.18 66.88 67.08 67.08 66.80 66.95 67.11 66.84 66.94 67.17	16.62 17.05 16.91 16.83 17.15 17.03 16.91 17.33 17.22 17.07 17.72	1.21	100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 %
10065- IEI CAC Mt 10066- IEI CAC Mt 10067- IEI CAC Mt 10068- CAC Mt 10069- CAC Mt 10071- CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 18 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	X	5.07 5.06 4.83 4.93 4.92 4.69 4.95 4.94 4.70 5.22 5.23 4.99 5.28	67.18 66.88 67.08 67.08 66.80 66.95 67.11 66.84 66.94 67.17	17.05 16.91 16.83 17.15 17.03 16.91 17.33 17.22 17.07 17.72 17.65 17.52	1.21	100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 %
10065- IEI CAC Mt 10066- IEI CAC Mt 10067- IEI CAC Mt 10068- CAC Mt 10069- CAC Mt 10071- CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 18 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	Y Z X Y Z X Y Z X Y Z X Y Y Z X Y Y Z X Y Y Z X Y Y Z X Y Y X Y Y X X Y Y X X Y Y X X Y Y X X Y Y X X Y Y X X Y Y X X Y Y X X X Y Y X X X Y Y X X X Y Y X X X Y Y X X X Y Y X X X X Y Y X X X X X Y X	5.06 4.83 4.93 4.92 4.69 4.95 4.94 4.70 5.22 5.23 4.99 5.28	66.88 67.08 67.08 66.80 66.95 67.11 66.84 66.94 67.17	16.91 16.83 17.15 17.03 16.91 17.33 17.22 17.07 17.72 17.65 17.52	1.21	100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 %
10066- IEI CAC Mb 10067- IEI CAC Mb 10068- IEI CAC Mb 10069- IEI CAC Mb 10071- IEI CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	X	4.83 4.93 4.92 4.69 4.95 4.70 5.22 5.23 4.99 5.28	67.08 67.08 66.80 66.95 67.11 66.84 66.94 67.17	16.83 17.15 17.03 16.91 17.33 17.22 17.07 17.72 17.65 17.52	1.46	100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 %
10066- IEI CAC Mb 10067- IEI CAC Mb 10068- IEI CAC Mb 10069- IEI CAC Mb 10071- IEI CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	X Y Z X Y Z X Y Z X	4.93 4.92 4.69 4.95 4.94 4.70 5.22 5.23 4.99 5.28	67.08 66.80 66.95 67.11 66.84 66.94 67.17 66.94 67.15	17.15 17.03 16.91 17.33 17.22 17.07 17.72 17.65 17.52	1.46	100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 %
10066- IEI CAC Mb 10067- IEI CAC Mb 10068- IEI CAC Mb 10069- IEI CAC Mb 10071- IEI CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 24 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	Y Z X Y Z X Y Z X Y Y Z X Y Y	4.92 4.69 4.95 4.94 4.70 5.22 5.23 4.99 5.28	66.80 66.95 67.11 66.84 66.94 67.17 66.94 67.15	17.03 16.91 17.33 17.22 17.07 17.72 17.65 17.52	1.46	100.0 100.0 100.0 100.0 100.0 100.0 100.0	± 9.6 %
10067- IEI CAC Mb 10068- IEI CAC Mb 10069- IEI CAC Mb 10071- IEI CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	Z X Y Z X Y Z X Y Z X Y Y Y Y Y Y Y Y Y	4.69 4.95 4.94 4.70 5.22 5.23 4.99 5.28	66.95 67.11 66.84 66.94 67.17 66.94 67.15	16.91 17.33 17.22 17.07 17.72 17.65 17.52		100.0 100.0 100.0 100.0 100.0	
10067- IEI CAC Mb 10068- IEI CAC Mb 10069- IEI CAC Mb 10071- IEI CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	X Y Z X Y Z X	4.95 4.94 4.70 5.22 5.23 4.99 5.28	67.11 66.84 66.94 67.17 66.94 67.15	17.33 17.22 17.07 17.72 17.65 17.52		100.0 100.0 100.0 100.0 100.0	
10067- IEI CAC Mb 10068- IEI CAC Mb 10069- IEI CAC Mb 10071- IEI CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 36 bps) EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	Y Z X Y Z X	4.94 4.70 5.22 5.23 4.99 5.28	66.84 66.94 67.17 66.94 67.15	17.33 17.22 17.07 17.72 17.65 17.52		100.0 100.0 100.0 100.0	
10068- IEI CAC Mb 10069- IEI CAC Mb 10071- IEI CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	X Y Z X	4.70 5.22 5.23 4.99 5.28	66.94 67.17 66.94 67.15	17.07 17.72 17.65 17.52	2.04	100.0 100.0	± 9.6 %
10068- IEI CAC Mb 10069- IEI CAC Mb 10071- IEI CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	X Y Z X	5.22 5.23 4.99 5.28	67.17 66.94 67.15	17.72 17.65 17.52	2.04	100.0 100.0	± 9.6 %
10068- IEI CAC Mb 10069- IEI CAC Mb 10071- IEI CAB (Di	EE 802.11a/h WiFi 5 GHz (OFDM, 48 bps)	Y Z X	5.23 4.99 5.28	66.94 67.15	17.72 17.65 17.52	2.04	100.0	± 9.6 %
10069- IEI CAC Mb 10071- CAB (Di 10072- IEI	bps)	Z X Y	4.99 5.28	67.15	17.52		100.0	
10069- IEI CAC Mb 10071- CAB (Di 10072- IEI	bps)	X	5.28					ı
10069- IEI CAC Mb 10071- CAB (Di 10072- IEI	bps)	Y		67.31			100.0	
10071- IEI CAB (D	FF 000 44 % W/F: F 011 40 FF			l	17.99	2.55	100.0	± 9.6 %
10071- IEI CAB (D	EE 000 44 - 11 - 12 - 12 - 12 - 12 - 12 - 12 -		5.30	67.12	17.95		100.0	_
10071- IEI CAB (D	EE 000 44 . 0 M/E: 5 OH (000)	Z	5.01	67.08	17.69		100.0	
10072- IEI	EE 802.11a/h WiFi 5 GHz (OFDM, 54 bps)	Х	5.36	67.24	18.15	2.67	100.0	± 9.6 %
10072- IEI		Υ	5.38	67.05	18.11		100.0	
10072- IEI		Z	5.09	67.11	17.88	·	100.0	
	EE 802.11g WiFi 2.4 GHz SSS/OFDM, 9 Mbps)	Х	5.01	66.83	17.56	1.99	100.0	± 9.6 %
		Y	5.01	66.58	17.48		100.0	
		Ž	4.83	66.80	17.36		100.0	-
<u> </u>	EE 802.11g WiFi 2.4 GHz SSS/OFDM, 12 Mbps)	X	5.00	67.20	17.81	2.30	100.0	± 9.6 %
		Y	5.01	66.96	17.73		100.0	<u> </u>
		Z	4.79	67.07	17.56		100.0	
10073- IEI CAB (D:	EE 802.11g WiFi 2.4 GHz SSS/OFDM, 18 Mbps)	X	5.05	67.32	18.13	2.83	100.0	± 9.6 %
		Y	5.06	67.11	18.07		100.0	
		Z	4.84	67.21	17.87		100.0	
	EE 802.11g WiFi 2.4 GHz SSS/OFDM, 24 Mbps)	X	5.01	67.17	18.27	3.30	100.0	± 9.6 %
		Y	5.03	66.98	18.23	<u> </u>	100.0	-
		Z	4.82	67.10	18.01		100.0	
	EE 802.11g WiFi 2.4 GHz SSS/OFDM, 36 Mbps)	Х	5.05	67.33	18.61	3.82	90.0	± 9.6 %
		Υ	5.08	67.18	18.60		90.0	
		Z	4.84	67.13	18.28		90.0	
	EE 802.11g WiFi 2.4 GHz SSS/OFDM, 48 Mbps)	X	5.04	67.01	18.67	4.15	90.0	± 9.6 %
		Y	5.06	66.85	18.66	· · · · · · ·	90.0	
		Z	4.86	66.95	18.41		90.0	
		Х	5.05	67.06	18.76	4.30	90.0	± 9.6 %
	EE 802.11g WiFi 2.4 GHz SSS/OFDM, 54 Mbps)	Y	5.07	66.89	18.74		90.0	
	EE 802.11g WiFi 2.4 GHz SSS/OFDM, 54 Mbps)			67.03	18.52		90.0	

10081- CAB	CDMA2000 (1xRTT, RC3)	X	1.10	69.87	14.99	0.00	150.0	± 9.6 %
<u> </u>		Y	0.78	64.74	11.83		450.0	
		 'z	0.78	66.34	11.97	 	150.0 150.0	
10082- CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4- DQPSK, Fullrate)	X	0.69	60.00	4.39	4.77	80.0	± 9.6 %
		Y	0.71	60.00	4.39		80.0	
		Z	7.97	68.50	6.36		80.0	 -
10090- DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	X	100.00	115.53	26.81	6.56	60.0	± 9.6 %
		Y	100.00	114.29	26.36		60.0	
10007	THATO EDD (LIOPE)	<u> </u>	100.00	109.90	23.90		60.0	
10097- CAB	UMTS-FDD (HSDPA)	X	1.95	68.97	16.62	0.00	150.0	± 9.6 %
		Y	1.75	66.81	15.24		150.0	
10098-	LIMTO EDD (HOUDA O LL LO)	Z	1.87	68.90	_16.13		150.0	
CAB	UMTS-FDD (HSUPA, Subtest 2)	X	1.91	68.95	16.60	0.00	150.0	± 9.6 %
<u> </u>		Y	1.71	66.77	15.20		150.0	
10099-	EDGE EDD (TDMA ADOX TO A	Z	1.83	68.86	16.11		150.0	
DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	X	11.93	100.45	36.42	9.56	60.0	± 9.6 %
		Y	11.20	97.95	35.37		60.0	
10100-	LITE EDD (OG EDMA 4000) DE 00	Z	7.96	90.99	32.84		60.0	
CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	Х	3.40	71.76	17.45	0.00	150.0	± 9.6 %
		Υ	3.10	69.82	16.33		150.0	
10101-	LITE FOR (SO FRAM 4000) PR 00	Z	3.12	70.91	17.03		150.0	
CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	3.36	68.15	16.35	0.00	150.0	± 9.6 %
		Y	3.24	67.23	15.77		150.0	
10102-	LITE EDD (DO ED) (A 4000) ED -00	Z	3.17	67.74	16.07		150.0	
CAE	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	Х	3.45	68.05	16.42	0.00	150.0	± 9.6 %
<u> </u>		Υ	3.34	67.19	15.87		150.0	
10103-	LTE TOP (OO FD) (A COO)	Z	3.28	67.71	16.16		150.0	
CAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	X	6.86 	77.75	21.56	3.98	65.0	± 9.6 %
		Ϋ́	6.56	76.62	21.10		65.0	
10104	LTE TRE (0.0 This	Z	5.69	75.27	20.45		65.0	
10104- CAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	X	6.41	74.58	21.07	3.98	65.0	± 9.6 %
		Υ	6.33	74.04	20.86		65.0	
10105-	LTE TOD (CO FDIA 4000) DD 00	Z	5.58	72.74	20.11		65.0	
CAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	×	6.09	73.43	20.88	3.98	65.0	± 9.6 %
	 	Y	6.03	72.95	20.69		65.0	
10108-	LTE-FDD (SC-FDMA, 100% RB, 10	Z	5.24	71.29	19.75		65.0	
CAF	MHz, QPSK)	Х	2.97	70.94	17.29	0.00	150.0	± 9.6 %
		Y	2.72	69.08	16.17		150.0	
10109-	LTE-FDD (SC-FDMA, 100% RB, 10	Z	2.70	70.20	16.88		150.0	
CAF	MHz, 16-QAM)	X	3.02	68.05	16.32	0.00	150.0	± 9.6 %
		Y	2.90	67.02	1 <u>5.6</u> 6		150.0	
10110-	LTE-FDD (SC-FDMA, 100% RB, 5 MHz,	Z	2.83	67.71	15.99		150.0	
CAF	QPSK)	X	2.42	70.09	17.00	0.00	150.0	± 9.6 %
		Y	2.21	68.14	15.78		150.0	
10111-	LTE-FDD (SC-FDMA, 100% RB, 5 MHz,	<u>Z</u>	2.18	69.46	16.49		150.0	
CAF	16-QAM) RB, 5 MHz,	X	2.76	69.06	16.78	0.00	150.0	± 9.6 %
		Υ	2.59	67.59	15.88		150.0	
	<u> </u>	Z	2.59	68.99	16.39		150.0	

10112-	LTE EDD (OC FONA 1000)						•	just 23, 201
CAF	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	X	3.14	67.97	16.35	0.00	150.0	± 9.6 %
		Y	3.03	67.00	15.72		150.0	
10113-	THE EDD (SC EDMA 4000) DD EAST	Z	2.95	67.72	16.05		150.0	
CAF	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	2.92	69.11	16.87	0.00	150.0	± 9.6 %
		Υ	2.75	67.72	16.02		150.0	
10114-	IEEE DOO 44 (UE O	Z	2.74	69.14	16.51		150.0	
CAC_	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	X	5.18	67.31	16.57	0.00	150.0	± 9.6 %
		Υ	5.14	66.93	16.36		150.0	
10115-	IEEE 000 44 /4/E	Z	5.02	67.26	16.48		150.0	
CAC	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	X	5.52	67.57	16.70	0.00	150.0	± 9.6 %
		Υ	5.51	67.29	16.56		150.0	
10110		Z	5.27	67.30	16.50		150.0	
10116- CAC	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	X	5.29	67.56	16.61	0.00	150.0	± 9.6 %
		Υ	5.27	67.21	16.43		150.0	
40447	UEEE 000 44 # # ***	Z	5.10	67.44	16.50		150.0	
10117- CAC	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	X	5.16	67.25	16.55	0.00	150.0	± 9.6 %
		Υ	5.13	66.89	16.36		150.0	
		Ζ	4.99	67.15	16.44		150.0	
10118- CAC	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	X	5.59	67.74	16.79	0.00	150.0	± 9.6 %
		Υ	5.60	67.49	16.67		150.0	
		Z	5.34	67.49	16.60		150.0	
10119- CAC	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	Х	5.26	67.49	16.59	0.00	150.0	± 9.6 %
		Υ	5.24	67.15	16.41		150.0	-
		Z	5.09	67.40	16.49		150.0	
10140- CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	Х	3.50	68.05	16.33	0.00	150.0	± 9.6 %
		Ÿ	3.39	67.19	15.79		150.0	
		Z	3.30	67.72	16.07		150.0	
10141- CAE	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	Х	3.62	68.10	16.48	0.00	150.0	± 9.6 %
		Υ	3.51	67.27	15.96		150.0	
		Z	3.43	67.85	16.25		150.0	
10142- CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	x	2.22	70.35	16.88	0.00	150.0	± 9.6 %
		Υ	1.98	67.98	15.45		150.0	
		Z	1.97	69.67	16.10		150.0	
10143- CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	Х	2.70	70.21	16.79	0.00	150.0	± 9.6 %
		Υ	2.44	68.12	15.58		150.0	
		Z	2.48	69.97	16.00	-	150.0	
10144- CAE	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	Х	2.42	67.64	15.07	0.00	150.0	± 9.6 %
		Υ	2.26	66.15	14.15	_	150.0	
		Z	2.13	66.86	13.96		150.0	
10145- CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	Х	1.54	68.23	14.00	0.00	150.0	± 9.6 %
		Y	1.25	64.93	12.03		150.0	
10146-	LTE EDD (SC EDMA 4000) ED 4 4	Z	1.00	63.72	10.21		150.0	
CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	Х	2.38	68.67	13.30	0.00	150.0	± 9.6 %
	 	Y	2.63	70.03	14.41		150.0	
10147	LTE EDD (CO EDMA 4000) CD 1	_ Z	1.37	62.94	8.80		150.0	
10147- CAF	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	Х	3.01	71.74	14.81	0.00	150.0	± 9.6 %
		Υ	3,44	73.73	16.16		150.0	
		Z	1.50	63.86	9.38		150.0	

Y 291 6708 1571 1500	10149- CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	Х	3.03	68.12	16.37	0.00	150.0	± 9.6 %
TEF-FDD (SC-FDMA, 50% RB, 20 MHz, X 3.15 88.03 163.99 0.00 150.00 19.63			Y	2.91	67.08	15.71		150.0	
10150- LTE-FDD (SC-FDMA, 50% RB, 20 MHz, X 3.15									
Tight				3.15			0.00		± 9.6 %
10151- LTE-TDD (SC-FDMA, 50% RB, 20 MHz, X 7.33 80.62 22.85 3.98 65.0 ±9.69				3.03	67.05	15.76		150.0	
Te-TDD (SC-FDMA, 50% RB, 20 MHz, CAF C			Z	2.96	67.78	16.09		150.0	
10152- LTE-TDD (SC-FDMA, 50% RB, 20 MHz, X 5.98		LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)					3.98		± 9.6 %
10152- CAF 16-QAM) 10153- CAF 16-QAM						22.28		65.0	
CAF	40.50			6.07	78.22	21.74			
TIE-FDD (SC-FDMA, 50% RB, 20 MHz, CAF S.12 T2.74 19.76 S.0 \$6.0 \$	1	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)					3.98	65.0	± 9.6 %
10153- LTE-TDD (SC-FDMA, 50% RB, 20 MHz, CAF G4-QAM)	-							65.0	
CAF 64-QAM Y 6.23 74.94 21.41 65.0 29.6	40450	LTE TER (OR EXAMPLE)				19.78		65.0	
10154- LTE-FDD (SC-FDMA, 50% RB, 10 MHz, X 2.49 73.78 20.61 65.0 150.0 ±9.6					<u></u>		3.98	65.0	± 9.6 %
10164- LTE-FDD (SC-FDMA, 50% RB, 10 MHz, X 2.49						21.41		65.0	
Tits-FD (SC-FDMA, 50% RB, 10 MHz, CAF	40454	LITE EDD (OO ====					L		
10155- LTE-FDD (SC-FDMA, 50% RB, 10 MHz, X 2.77 89.07 16.79 0.00 150.0 ±9.6 % 16.74 16.79 150.0 150.0 ±9.6 % 16.75 16.79 150.0 ±9.6 % 16.75 16.79 150.0 ±9.6 % 16.75 16.79 150.0 ±9.6 % 16.75 16.79 150.0 ±9.6 % 16.75 16.79 150.0 ±9.6 % 16.75 16.79 150.0 ±9.6 % 16.75 16.79 150.0 ±9.6 % 16.75 16.70 150.0 ±9.6 % 16.75 16.					70.63	17.32	0.00	150.0	± 9.6 %
Total					68.57			150.0	
Tight	40455				69.92	16.77			
Time		LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)				16.79	0.00		± 9.6 %
Tile-Fide Cape Tile-Fide				2.59	67.59	15.89		150.0	<u> </u>
TITE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)			Z	2.59	69.02	16.41			
Total			X	2.11	70.85	16.93	0.00		±9.6 %
Total	·		Y	1.83	68.04	15.26		150.0	_
10157- LTE-FDD (SC-FDMA, 50% RB, 5 MHz, CAF 16-QAM)				1.82	69.80				
10158- CAF C			Х				0.00		± 9.6 %
Total			Y	2.08	66.62	14.16		150.0	 -
10168- CAF C			Z						
10159- LTE-FDD (SC-FDMA, 50% RB, 5 MHz, X 2.44 69.17 15.69 0.00 150.0 ± 9.6 %			Х				0.00		± 9.6 %
10159- LTE-FDD (SC-FDMA, 50% RB, 5 MHz, CAF			Y	2.75	67.77	16.06	_	150.0	
CAF			Z	2.75					
10160- CAE		LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)		2.44			0.00		± 9.6 %
10160- LTE-FDD (SC-FDMA, 50% RB, 15 MHz, CAE QPSK)				2.19	67.06	14.45		150.0	
CAE QPSK) CAE QPSK	10100		Z	2.09	67.96				
10161- LTE-FDD (SC-FDMA, 50% RB, 15 MHz, CAE 16-QAM)							0.00		± 9.6 %
10161- LTE-FDD (SC-FDMA, 50% RB, 15 MHz, CAE 16-QAM) 150.0 1					68.24	16.05		150.0	
10161- CAE 16-QAM)	40404			2.70	69.25				
10162- CAE LTE-FDD (SC-FDMA, 50% RB, 15 MHz, K				3.05	67.98		0.00		± 9.6 %
10162- LTE-FDD (SC-FDMA, 50% RB, 15 MHz, X 3.15 68.06 16.42 0.00 150.0 ± 9.6 %		<u> </u>		2.93	66.95	15.69		150.0	
10162- CAE 64-QAM)	4040#	T							
10166- CAF UTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, X QPSK) Y 3.71 69.61 19.37 150.0 Z 3.45 70.11 19.35 150.0 LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, X 4.61 72.92 19.78 3.01 150.0 ± 9.6 % Y 4.57 72.37 19.78 150.0		LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)		3.15			0.00		± 9.6 %
10166- LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, X 3.67 69.77 19.22 3.01 150.0 ± 9.6 %					67.06	15.79		150.0	-
10166- CAF QPSK) Y 3.71 69.61 19.37 150.0 ± 9.6 % Y 3.71 69.61 19.37 150.0 Z 3.45 70.11 19.35 150.0 CAF 16-QAM) Y 4.57 72.37 19.78 150.0	10400	LTE FDD (OD TEXT)		2.97	67.96				
10167- LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, X 4.61 72.92 19.78 3.01 150.0 ± 9.6 % Y 4.57 72.37 19.78 150.0		QPSK) (SC-FDMA, 50% RB, 1.4 MHz,					3.01		± 9.6 %
10167- LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, X 4.61 72.92 19.78 3.01 150.0 ± 9.6 % Y 4.57 72.37 19.78 150.0					69.61	19.37		150.0	
10167- LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, X 4.61 72.92 19.78 3.01 150.0 ± 9.6 % Y 4.57 72.37 19.78 150.0	4046=		Z	3.45					
150.0		LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)					3.01		± 9.6 %
150.0			Y	4.57	72.37	19 78		150.0	
			ż	4.42	74.02	20.14		150.0	

10168- CAF	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz,	X	5.13	75.25	21.12	3.01	150.0	± 9.6 %
OA!	64-QAM)	Y	5.05	74.54	04.07		<u> </u>	
		Z	5.13	74.54 77.22	21.07	<u> </u>	150.0	
10169- CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	X	3.12	70.03	21.87 19.37	3.01	150.0 150.0	± 9.6 %
		Υ	3.15	69.73	19.46		150.0	
 		Z	2.86	69.57	19.15	 	150.0	
10170- CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	X	4.58	77.10	22.08	3.01	150.0	± 9.6 %
	<u> </u>	Υ	4.39	75.79	21.81		150.0	
10171-	LTE SON (00 TOLL)	Ζ	4.44	78.23	22.53		150.0	
AAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	X	3.64	72.24	19.05	3.01	150.0	± 9.6 %
	 	Y	3.59	71.47	18.98		150.0	
10172-	LTE-TDD (SC-FDMA, 1 RB, 20 MHz,	Z	3.36	72.39	19.02		150.0	
CAF	QPSK)	X	12.64	100.34	31.84	6.02	65.0	± 9.6 %
		Y	12.97	100.68	32.37		65.0	
10173-	LTE-TDD (SC-FDMA, 1 RB, 20 MHz,	Z	5.77	87.24	27.51	ļ <u> </u>	65.0	
CAF	16-QAM)	Х	36.96	114.71	33.67	6.02	65.0	± 9.6 %
		<u>Y</u> .	30.92	112.16	33.64		65.0	
10174-	LTE-TDD (SC-FDMA, 1 RB, 20 MHz,	Z	22.36	108.00	31.61		65.0	
CAF	64-QAM)	×	22.92	104.35	30.17	6.02	65.0	± 9.6 %
		Y	21.96	104.04	30.70		65.0	
10175-	LTE EDD (SO EDMA 4 DD 40 M)	Z	11.65	95.24	27.25		65.0	
CAF_	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	X	3.08	69.68	19.10	3.01	150.0	± 9.6 %
	<u> </u>	Υ	<u>3.</u> 11	69.39	19.20		150.0	
10176	LTE EDD (00 ED) 40 HI	Z	2.82	69.22	18.88		150.0	
10176- CAF	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	X	4.59	77.13	22.09	3.01	150.0	± 9.6 %
		Y	4.40	75.82	21.82		150.0	
10177-	LTE EDD /CC EDMA 4 DD E MIL	<u>Z</u>	4.45	78.26	22.55		150.0	
CAH	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	X	3.11	69.85	19.21	3.01	150.0	± 9.6 %
	 	Y	3.14	69.56	19.30		150.0	
10178-	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-	Z_	2.84	69.38	18.97		150.0	,
CAF	QAM)	X	4.53	76.83	21.94	3.01	150.0	± 9.6 %
		Y	4.34	75.53	21.68		150.0	
10179- CAF	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	4.39 4.06	77.99 74.50	22.42	3.01	150.0 150.0	± 9.6 %
		Y	3.95	73.49	20.26		150.0	
		Ż	3.83	75.09	20.61	_	150.0	
10180- CAF	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	×	3.62	72.15	18.99	3.01	150.0	± 9.6 %
		Υ	3.58	71.38	18.93	_	150.0	
		Ž	3.35	72.32	18.97		150.0	
10181- CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	3.10	69.83	19.20	3.01	150.0	± 9.6 %
		Ÿ	3.13	69.54	19.29		150.0	
40400		Z	2.84	69.36	18.97		150.0	
10182- CAE	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	×	4.52	76.80	21.93	3.01	150.0	± 9.6 %
_		Υ	4.33	75.51	21.66		150.0	
40460		Z	4.38	77.96	22.40		150.0	
10183- AAD	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	3.62	72.12	18.97	3.01	150.0	± 9.6 %
		Υ	3.57	71.35	18.91		150.0	
		Z	3.34	72.29	18.96		150.0	

10184- CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	Х	3.11	69.88	19.22	3.01	150.0	± 9.6 %
		Y	3.14	69.58	19.32		150.0	
		ż	2.85	69.41	18.99	 	150.0	
10185- CAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	Х	4.54	76.88	21.97	3.01	150.0	± 9.6 %
		Υ	4.35	75.59	21.70		150.0	
		Z	4.41	78.06	22.45		150.0	
10186- AAE	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	Х	3.64	72.20	19.01	3.01	150.0	± 9.6 %
	<u> </u>	Υ	3.59	71.42	18.95		150.0	
40407		Z	3.36	72.37	19.00		150.0	
10187- CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	3.12	69.93	19.28	3.01	150.0	± 9.6 %
		Υ	3.15	69.63	19.37		150.0	
10188-	LTE EDD (CO EDIA) A DD A ()	Z	2.86	69.48	19.07		150.0	
CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	Х	4.72	77.70	22.40	3.01	150.0	± 9.6 %
<u> </u>		Υ	4.51	76.33	22.11		150.0	
10189-	LTE EDD (OC EDM) + DD + + + +	Z	4.61	78.98	22.92		150.0	
10189- AAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	Х	3.73	72.70	19.32	3.01	150.0	± 9.6 %
	 	Y	3.67	71.88	19.24		150.0	
10193-	JEEE 900 445 /UT Out - State O 5 M	Z	3.46	72.92	19.33		150.0	
CAC	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	Х	4.59	66.76	16.33	0.00	150.0	± 9.6 %
		Υ	4.55	66.31	16.09		150.0	
10194-	1555 900 445 (UT On 15 14 90 14)	Z	4.42	66.80	16.19		150.0	
CAC_	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	X	4.77	67.10	16.45	0.00	150.0	± 9.6 %
		Y_	4.74	66.66	16.21		150.0	
10105	VEEL 000 44 /VE O	Z	4.58	67.08	16.32		150.0	
10195- CAC	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	Х	4.82	67.12	16.46	0.00	150.0	± 9.6 %
		Υ	4.78	66.69	16.22		150.0	
10100	IEEE 000 44 (IEEE	Z	4.62	67.10	16.34		150.0	
10196- CAC	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	X	4.60	66.84	16.36	0.00	150.0	±9.6 %
		Υ	4.56	66.40	16.12		150.0	
40407		Z	4.41	66.83	16.20		150.0	
10197- CAC	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	X	4.79	67.12	16.46	0.00	150.0	± 9.6 %
		Υ	4.75	66.69	16.22		150.0	
10198-	JEEE 900 145 / JEAN OF AU	Z	4.59	67.09	16.33		150.0	
CAC	IEEE 802.11n (HT Mixed, 65 Mbps, 64- QAM)	X	4.82	67.14	16.47	0.00	150.0	± 9.6 %
		\ \ \	4.78	66.71	16.24		150.0	
10219-	IEEE 802.11n (HT Mixed, 7.2 Mbps,	Z	4.61	67.11	16.35		150.0	
CAC	BPSK)	X	4.55	66.86	16.33	0.00	150.0	± 9.6 %
	 	Y	4.51	66.41	16.08		150.0	
10220-	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-	Z	4.37	66.86	16.17	<u> </u>	150.0	
CAC	QAM)	X	4.79	67.10	16.45	0.00	150.0	±9.6 %
		Y	4.75	66.67	16.22	ļ	150.0	_
10221- CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	X	4.58 4.83	67.05 67.06	16.32 16.45	0.00	150.0 150.0	± 9.6 %
		Υ	4.79	66.64	10.00		450.0	
		Z	4.62	67.04	16.23		150.0	
10222-	IEEE 802.11n (HT Mixed, 15 Mbps,	X	5.14		16.33	0.00	150.0	
CAC	BPSK)			67.26	16.55	0.00	150.0	± 9.6 %
		Ŷ	5.11	66.90	16.36		150.0	
		<u>Z</u>	4.97	67.15	16.43		150.0	

10223-	IEEE 802.11n (HT Mixed, 90 Mbps, 16-	T 52			,			_
CAC	QAM)	X	5.45	67.43	16.65	0.00	150.0	± 9.6 %
<u> </u>		Y	5.45	67.18	16.52		150.0	
10224-	IEEE 802.11n (HT Mixed, 150 Mbps, 64-	Z	5.25	67.35	16.55		150.0	
CAC	QAM)	X	5.19	67.37	16.53	0.00	150.0	± 9.6 %
	 	Y	5.15	66.99	16.33		150.0	
10225-	LIMITE COD (LICENA)	Z	5.01	67.26	16.42		150.0	<u> </u>
CAB	UMTS-FDD (HSPA+)	X	2.89	66.55	15.78	0.00	150.0	± 9.6 %
	<u> </u>	Y	2.80	6 <u>5.7</u> 1	15.24		150.0	
10226-	LTE TOO (OO ED) (A 1 ED)	Z	2.72	66.49	15.32		150.0	
CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	X	42.12	117.30	34.47	6.02	65.0	± 9.6 %
		Y	34.39	114.35	34.35		65.0	
10227-	LITE TOP (00 FDIA 4 PP	Z	25.78	110.75	32.49		65.0	
CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	X	33.34	110.83	32.01	6.02	65.0	± 9.6 %
		Υ	29.14	109.23	32.25		65.0	
10000	LITE TOP (OO FD)	Z	23.91	107.08	30.63		65.0	
10228- CAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	X	15.66	105.06	33.38	6.02	65.0	± 9.6 %
		Υ	15.84	105.37	33.95		65.0	
40000	LITE TOD (DO DO	Z	7.75	93.33	29.68	<u> </u>	65.0	
10229- CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	Х	37.28	114.84	33.72	6.02	65.0	± 9.6 %
		Υ	31.13	112.26	33.67		65.0	
40000		Z	22.62	108.17	31.67		65.0	-
10230- CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	X	29.88	108.76	31.36	6.02	65.0	± 9.6 %
		Y	26.58	107.43	31.66		65.0	
		Z	20.85	104.61	29.86		65.0	
10231- CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	X	14.65	103.59	32.85	6.02	65.0	± 9.6 %
		Y	14.88	103.95	33.43		65.0	
_		Z	7.34	92.15	29.19		65.0	
10232- CAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	X	37.25	114.84	33.71	6.02	65.0	± 9.6 %
		Ý	31.10	112.26	33.67		65.0	
		Z	22.58	108.16	31.67		65.0	
10233- CAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	Х	29.82	108.74	31.35	6.02	65.0	± 9.6 %
		Υ	26.53	107.41	31.66		65.0	
		Ž	20.76	104.56	29.85	<u>-</u>	65.0	
10234- CAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	×	13.83	102.21	32.30	6.02	65.0	± 9.6 %
		Y	14.10	102.64	32.91		65.0	
		Z	7.03	91.14	28.71		65.0	
10235- CAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	Х	37.39	114.93	33.74	6.02	65.0	± 9.6 %
		_Y	31.21	112.34	33.70		65.0	
		Z	22.65	108.24	31.69		65.0	
10236- CAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	X	30.43	109.05	31.43	6.02	65.0	± 9.6 %
		Υ	27.03	107.71	31.73		65.0	
		Z	21.22	104.87	29.93		65.0	
10237- CAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	Х	14.73	103.74	32.90	6.02	65.0	± 9.6 %
		Υ	14.96	104.11	33.48		65.0	
		Z	7.35	92.21	29.22		65.0	
10238- CAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	X	37.20	114.83	33.71	6.02	65.0	± 9.6 %
		Y	31.07	112.26	33.67	-	65.0	
			01.01	1 2 20	JJ.07		יו כסן	

10239- CAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	X	29.73	108.72	31.35	6.02	65.0	± 9.6 %
		Υ	26.48	107.40	31.66		65.0	
		Z	20.66	104.50	29.83		65.0	
10240- CAE	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	X	14.67	103.66	32.88	6.02	65.0	± 9.6 %
		Υ	14.89	104.03	33.46		65.0	
		Z	7.33	92.17	29.20		65.0	
10241- CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	X	8.22	81.62	25.84	6.98	65.0	± 9.6 %
		Υ	8.21	81.11	25.93	_	65.0	- <u>-</u>
		Z	7.55	81.89	25.74		65.0	
10242- C <u>AA</u>	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	X	7.60	79.92	25.06	6.98	65.0	±9.6 %
		Υ	7.70	79.68	25.24		65.0	
		Z	6.63	79.21	24.57		65.0	
10243- CAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	Х	6.06	76.28	24.43	6.98	65.0	± 9.6 %
		Y	6.20	76.29	24.69		65.0	
		Ζ	5.27	75.02	23.70		65.0	
10244- CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	Х	6.94	79.13	20.40	3.98	65.0	± 9.6 %
		Y	7.61	80.93	21.65		65.0	
10015		Z	4.63	73.01	16.54		65.0	
10245- CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	Х	6.74	78.35	20.03	3.98	65.0	± 9.6 %
		Υ	7.38	80.11	21.28		65.0	
		Z	4.46	72.20	16.14		65.0	-
10246- CAC	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	X	8.26	86.16	23.38	3.98	65.0	± 9.6 %
	<u> </u>	Υ	7.07	83.23	22.34		65.0	
		Z	4.76	77.46	19.00		65.0	-
10247- CAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	X	5.60	76.50	20.35	3.98	65.0	± 9.6 %
		Υ	5.37	75.45	19.96		65.0	_
		Z	4.29	72.64	17.71		65.0	
10248- CAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	X	5.54	75.70	19.98	3.98	65.0	± 9.6 %
		Υ	5.35	74.79	19.65		65.0	
		Z	4.24	71.91	17.36		65.0	
10249- CAE	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	X	9.19	88.24	24.95	3.98	65.0	± 9.6 %
	<u> </u>	Υ	7.96	85.32	23.90		65.0	
40000		Ζ	6.28	82.28	22.02		65.0	
10250- _CAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	X	6.20	77.76	22.32	3.98	65.0	± 9.6 %
		Υ	6.01	76.85	21.97		65.0	
10057	LT5 700 (00 == 1)	Z	5.20	75.42	20.86		65.0	
10251- _CAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	Х	5.85 	75.32	20.92	3.98	65.0	± 9.6 %
		Υ	5.73	74.58	20.63		65.0	
40050	LTS TOD (00 FD)	Z	4.92	73.12	19.45		65.0	
10252- CAE	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	X	8.09	84.95	24.58	3.98	65.0	± 9.6 %
	<u> </u>	Y	7.42	82.94	23.81		65.0	
10050	LITE TOP (00 FPM)	Z	6.31	81.52	22.96		65.0	
10253- CAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	Х	5.80	74.00	20.63	3.98	65.0	± 9.6 %
		Y	5.72	73.40	20.39		65.0	
10051	LITE TOP (00 Providence)	Z	5.04	72.28	19.52		65.0	
10254- CAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	Х	6.14	74.84	21.30	3.98	65.0	± 9.6 %
		1						
	-	Υ	6.05	74.22	21.07		65.0	

10255- CAE	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	Х	6.81	79.50	22.67	3.98	65.0	± 9.6 %
		Y	6.50	78.25	22.16	 	65.0	 -
		Z	5.72	77.37	21.59		65.0	+
10256- CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	X	5.54	75.38	17.88	3.98	65.0	± 9.6 %
		Y	6.45	78.02	19.55		65.0	
		Z	3.15	67.52	12.83		65.0	
10257- CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	X	5.31	74.31	17.34	3.98	65.0	± 9.6 %
		Y	6.14	76.80	18.96		65.0	
		Z	3.05	66.79	12.37		65.0	
10258- CAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	X	6.24	81.13	20.76	3.98	65.0	± 9.6 %
	<u> </u>	Υ	5.52	78.91	19.97		65.0	
10050		Z	3.09	70.62	15.05		65.0	-
10259- CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	X	5.84	76.93	21.04	3.98	65.0	± 9.6 %
		Y	5.63	75.94	20.66	-	65.0	
10000	LTE TOP (OR TOUR	Z	4.68	73.82	18.92		65.0	
10260- CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	X	5.84	76.54	20.88	3.98	65.0	± 9.6 %
	 	Y	5.65	75.62	20.54		65.0	
10004	LTE TOP (00 ET)	Z	4.68	73.47	18.76		65.0	
10261- CAC	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	X	7.94	85.32	24.30	3.98	65.0	± 9.6 %
	<u> </u>	Υ	7.17	83.07	23.45		65.0	
		Z_	5.90	80.89	22.01		65.0	
10262- CAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	X	6.19	77.72	22.28	3.98	65.0	± 9.6 %
		Υ	6.00	76.81	21.93		65.0	
		Z	5.19	75.36	20.81		65.0	
10263- CAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	X	5.84	75.30	20.91	3.98	65.0	± 9.6 %
		Y	5.72	74.57	20.63		65.0	
		Z	4.91	73.09	19.44		65.0	
10264- CAE	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	X	8.00	84.72	24.48	3.98	65.0	± 9.6 %
		Y	7.34	82.73	23.71		65.0	
		Z	6.24	81.28	22.84		65.0	
10265- CAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	Х	5.98	74.73	20.93	3.98	65.0	± 9.6 %
		Y	5.89	74.12	20.69		65.0	
		Z	5.12	72.74	19.78		65.0	
10266- _CAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	Х	6.33	75.56	21.64	3.98	65.0	± 9.6 %
		Υ	6.22	74.93	21.40		65.0	
1005		Z	5.49	73.76	20.60		65.0	
10267- CAE	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	Х	7.32	80.56	22.82	3.98	65.0	± 9.6 %
		Y	6.92	79.16	22.26		65.0	
40000		Z	6.05	78.17	21.72		65.0	
10268- CAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	X	6.52	74.24	21.04	3.98	65.0	± 9.6 %
<u>-</u>	<u> </u>	Y	6.45	73.73	20.85		65.0	
40000	LITE TOP (OO FELL)	Z	<u>5.</u> 74	72.63	20.16		65.0	
10269- CAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	Х	6.46	73.71	20.87	3.98	65.0	± 9.6 %
	 	Υ	6.39	73.22	20.69		65.0	
40070	LITE TOP (0.0 E	Z	5.73	72.22	20.02		65.0	
10270- CAE	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	Х	6.79	76.82	21.42	3.98	65.0	± 9.6 %
		Υ	6.57	75.90	21.04		65.0	<u> </u>
		Z	5.88	75.11	20.59		65.0	

10274-	UMTS-FDD (HSUPA, Subtest 5, 3GPP	Х	2.66	66.98	15.73	0.00	150.0	± 9.6 %
CAB	Rel8.10)	ļ. <u>.</u> .			<u> </u>			
	 	Y	2.54	65.90	15.04		150.0	
10275-	LIMTO EDD (HOUDA O L. A. CODD	Z	2.55	67.07	15.35	<u> </u>	150.0	
CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	X	1.78	69.77	16.72	0.00	150.0	± 9.6 %
		Y	1.55	67.13	15.03		150.0	
400==		Z	1.62	69.04	16.02		150.0	
10277- CAA	PHS (QPSK)	Х	2.12	61.97	7.55	9.03	50.0	± 9.6 %
		Y	2.25	62.30	7.96		50.0	1
40070	PILO (O DOLG PILO O DOLG PILO DOLG PILO O DOLG PILO O DOLG PILO O DOLG PILO DOLG PILO O DOLG PILO PILO PILO PILO PILO PILO PILO PILO	Z	1.72	60.31	5.78		50.0	
10278- CAA	PHS (QPSK, BW 884MHz, Rolloff 0.5)	X	10.93	86.19	21.29	9.03	50.0	± 9.6 %
		Y	9.64	84.41	20.95		50.0	
10279-	PLIC (OPOIS BUY 00 AND 1 TO 10 AND 10	Z	3.57	69.00	13.15		50.0	
10279- CAA	PHS (QPSK, BW 884MHz, Rolloff 0.38)	X	11.22	86.49	21.46	9.03	50.0	± 9.6 %
		Y	9.91	84.71	21.11		50.0	
40000		Z	3.69	69.35	13.38		50.0	
10290- AAB	CDMA2000, RC1, SO55, Full Rate	Х	1.95	72.86	16.32	0.00	150.0	± 9.6 %
		Υ	1.38	67.46	13.46		150.0	
40004	00000	Z	1.34	68.81	13.27		150.0	
10291- AAB	CDMA2000, RC3, SO55, Full Rate	Х	1.06	69.47	14.79	0.00	150.0	± 9.6 %
	_ 	Y	0.76	64.53	11.71		150.0	
40000		Z	0.76	66.05	11.81		150.0	
10292- AAB	CDMA2000, RC3, SO32, Full Rate	X	1.83	78.35	18.94	0.00	150.0	± 9.6 %
		Y	0.91	67.73	13.68		150.0	-
		Z	1.34	73.93	15.68		150.0	
10293- AAB	CDMA2000, RC3, SO3, Full Rate	X	4.73	93.04	24.47	0.00	150.0	± 9.6 %
	<u> </u>	Υ	1.31	72.72	16.40		150.0	
40005		Z .	6.43	94.81	23.11		150.0	
10295- AAB	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	Х	10.60	89.87	26.40	9.03	50.0	± 9.6 %
		Υ	10.25	88.78	26.08		50.0	- -
1000		Z	12.25	89.80	24.68		50.0	
10297- AAD	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	Х	2.99	71.06	17.36	0.00	150.0	± 9.6 %
·		Υ	2.73	69.18	16.24		150.0	
10000		Z	2.72	70.32	16.96		150.0	
10298- AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	Х	1.90	70.47	15.90	0.00	150.0	± 9.6 %
		Υ	1.56	67.01	13.91		150.0	
10299-	LTE EDD (OO TELL)	Z_	1.44	67.67	13.50		150.0	-
10299- AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	X	3.07	71.64	15.53	0.00	150.0	± 9.6 %
		Υ	3.23	72.42	16.33		150.0	
10200	LITE EDD (OO ED)	Z	2.17	67.61	12.32		150.0	
10300- _AAD	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	X	2.19	66.26	12.34	0.00	150.0	± 9.6 %
	·	Ϋ́	2.31	66.80	13.02		150.0	
10201	IEEE 000 40 1171 1271	Z	1.57	63.33	9.50		150.0	
10301- AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, QPSK, PUSC)	Х	4.82	65.43	17.57	4.17	50.0	± 9.6 %
		Υ	4.87	65.32	17.50		50.0	
40000	UESS 000 to	Z	4.60	65.72	17.49		50.0	
10302- AAA	IEEE 802.16e WIMAX (29:18, 5ms, 10MHz, QPSK, PUSC, 3 CTRL symbols)	X	5.31	66.17	18.35	4.96	50.0	± 9.6 %
	<u> </u>	Ÿ	5.36	66.00	18.25		50.0	
	_ · _ _ ·	Ż	5.00	66.00	18.02		30.0	<u></u>

10303-	IEEE 902 46- WENANY (04 45 5							
AAA	IEEE 802.16e WIMAX (31:15, 5ms, 10MHz, 64QAM, PUSC)	X	5.06	65.83	18.21	4.96	50.0	± 9.6 %
		Y	5.11	65.70	18.12		50.0	
10304-	IEEE 000 40 MINAN 100	Z	4.75	65.61	17.82		50.0	
AAA	IEEE 802.16e WiMAX (29:18, 5ms, 10MHz, 64QAM, PUSC)	X	4.87	65.69	17.69	4.17	50.0	± 9.6 %
	- 	ΙÝ	4.90	65.47	17.55		50.0	
40005	IEEE CO. 40 AMERICAN	Z	4.58	65.56	17.35		50.0	
10305- AAA	IEEE 802.16e WiMAX (31:15, 10ms, 10MHz, 64QAM, PUSC, 15 symbols)	X	4.43	67.35	19.83	6.02	35.0	± 9.6 %
		Υ	4.56	67.70	19.98		35.0	
10306-	IEEE 000 40 James 40	Z	4.15	67.17	19.10		35.0	<u> </u>
AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, 64QAM, PUSC, 18 symbols)	X	4.77	66.43	19.36	6.02	35.0	± 9.6 %
	<u> </u>	Y	4.86	66.61	19.45		35.0	
10007	IEEE 000 40 NW NW	Z	4.49	66.31	18.82		35.0	
10307- AAA	IEEE 802.16e WiMAX (29:18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	Х	4.67	66.65	19.36	6.02	35.0	± 9.6 %
		Υ	4.78	66.88	19.46		35.0	
10308-	IEEE 900 40 AND	Z	4.37	66.39	18.75		35.0	
AAA 	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, 16QAM, PUSC)	Х	4.64	66.81	19.48	6.02	35.0	± 9.6 %
		Y	4.74	67.03	19.58		35.0	
10309-	1555 000 40- 147544 V 105 10 15	Z	4.35	66.60	18.90		35.0	
AAA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	X	4.84 	66.72	19.54	6.02	35.0	± 9.6 %
		Υ	4.94	66.92	19.63		35.0	
40040	IEEE 000 40 ANII MAAAA	Z	4.52	66.47	18.95		35.0	
10310- AAA	IEEE 802.16e WIMAX (29:18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	Х	4.71	66.49	19.33	6.02	35.0	± 9.6 %
	·	L Y	4.81	66.68	19.42		35.0	
10011		Z	4.43	66.37	18.80		35.0	_
10311- AAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	X	3.36	70.26	16.95	0.00	150.0	± 9.6 %
		Y	3.08	68.46	15.91		150.0	
		Z	3.08	69.51	16.57		150.0	
10313- AAA	IDEN 1:3	X	5.95	81.40	19.48	6.99	70.0	± 9.6 %
		Y	4.30	76.35	17.48		70.0	
		Z	3.21	73.80	16.43		70.0	
10314- AAA	iDEN 1:6	X	12.17	97.07	27.72	10.00	30.0	± 9.6 %
		Y	7.44	87.94	24.60		30.0	
		Z	6.18	85.76	23.72		30.0	
10315- AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle)	X	1.10	64.61	16.02	0.17	150.0	± 9.6 %
		Y	1.01	63.21	14.85		150.0	-
		Z	1.05	64.14	15.48		150.0	
10316- AAB	IEEE 802.11g WiFi 2.4 GHz (ERP- OFDM, 6 Mbps, 96pc duty cycle)	Х	4.65	66.81	16.47	0.17	150.0	± 9.6 %
		Υ	4.62	66.42	16.27		150.0	
	<u> </u>	Z	4.46	66.78	16.31		150.0	
10317- AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc duty cycle)	X.	4.65	66.81	16.47	0.17	150.0	± 9.6 %
		Y	4.62	66.42	16.27		150.0	
40400	LEEF COD 44	Z	4.46	66.78	16.31		150.0	
10400- AAD	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	X	4.78	67.16	16.44	0.00	150.0	± 9.6 %
	<u> </u>	Υ	4.74	66.73	16.21		150.0	
40/0/	UEEE 000 44	Z	4.55	67.11	16.31		150.0	
10401- AAD	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	X	5.43	67.23	16.53	0.00	150.0	± 9.6 %
		Υ	5.42	66.92	16.38		150.0	
		Z	5.24	67.11	16.40		150.0	

10402- AAD	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	Х	5.71	67.66	16.59	0.00	150.0	± 9.6 %
		Y	5.70	67.34	16.43	-	150.0	
		Z	5.52	67.48	16.45		150.0	
10403- AAB	CDMA2000 (1xEV-DO, Rev. 0)	X	1.95	72.86	16.32	0.00	115.0	± 9.6 %
		Y	1.38	67.46	13.46		115.0	
		Z	1.34	68.81	13.27		115.0	
10404- AAB	CDMA2000 (1xEV-DO, Rev. A)	Х	1.95	72.86	16.32	0.00	115.0	± 9.6 %
	<u> </u>	Y	1.38	67.46	13.46		115.0	
40.00		Z	1.34	68.81	13.27		115.0	
10406- AAB	CDMA2000, RC3, SO32, SCH0, Full Rate	X	100.00	122.38	30.73	0.00	100.0	± 9.6 %
		Y	81.48	123.67	32.28		100.0	
10110		Z	100.00	114.83	26.66		100.0	
10410- AAE	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9, Subframe Conf=4)	X	100.00	123.65	31.04	3.23	80.0	± 9.6 %
	<u> </u>	Υ	100.00	127.30	33.02		80.0	1 —
101:=	<u> </u>	Z	100.00	122.18	29.60		80.0	<u> </u>
10415- AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle)	X	1.02	63.74	15.40	0.00	150.0	± 9.6 %
		Υ	0.94	62.36	14.20		150.0	
40.440		Z	0.99	63.49	14.99		150.0	
10416- AAA	IEEE 802.11g WiFi 2.4 GHz (ERP- OFDM, 6 Mbps, 99pc duty cycle)	X	4.59	66.79	16.39	0.00	150.0	± 9.6 %
		Y	4.55	66.36	16.15		150.0	
40/45		Z	4.42	66.82	16.27		150.0	
10417- _AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle)	X	4.59	66.79	16.39	0.00	150.0	± 9.6 %
	<u> </u>	Y	4.55	66.36	16.15		150.0	
	· 	Z	4.42	66.82	16.27		150.0	
10418- AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 6 Mbps, 99pc duty cycle, Long preambule)	Х	4.58	66.96	16.41	0.00	150.0	± 9.6 %
	·	Υ	4.54	66.49	16.15		150.0	
40440		Z	4.42	67.01	16.31	-	150.0	
10419- AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 6 Mbps, 99pc duty cycle, Short preambule)	X	4.61	66.90	16.41	0.00	150.0	± 9.6 %
		Υ	4.56	66.45	16.16		150.0	
40.000		Z	4.43	66.95	16.30	<u> </u>	150.0	
10422- AAB	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	X	4.73	66.90	16.41	0.00	150.0	± 9.6 %
	 	Y	4.69	66.47	16.18		150.0	
10400	IEEE OOD 44 WIT 6	Z	4.54	66.92	16.31		150.0	
10423- AAB	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	X	4.91	67.24	16.54	0.00	150.0	± 9.6 %
		Y	4.87	66.82	16.31		150.0	
10424	IEEE 000 44- 01T 0	Z	4.68	67.21	16.40		150.0	
10424- AAB	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	Х	4.82	67.19	16.51	0.00	150.0	± 9.6 %
	 	Y	4.79	66.76	16.28		150.0	
10425-	IEEE 902 11n /UT Consession 45 by	Z	4.61	67.16	16.38		150.0	
AAB	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	X	5.41	67.47	16.65	0.00	150.0	± 9.6 %
		<u>Y</u>	5.40	67.17	16.50		150.0	
10426-	IEEE 900 44	Z	5.21	67.35	16.53		150.0	
AAB	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	X	5.41	67.47	16.65	0.00	150.0	± 9.6 %
		Y	5.40	67.19	16.50		150.0	
	1	Z	5.23	67.42	16.56		150.0	

10427- AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.42	67.47	16.64	0.00	150.0	± 9.6 %
		Y	5.41	67.16	16.48	 	450.0	 -
		Ż	5.22	67.32	16.51	 	150.0	 -
10430- AAC	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	Х	4.40	71.17	18.58	0.00	150.0 150.0	± 9.6 %
	-	Y	4.23	70.08	17.99		150.0	 -
10101		L Z ¯	4.30	72.10	18.56	 	150.0	
10431- AAC	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	4.31	67.42	16.46	0.00	150.0	± 9.6 %
		Υ	4.26	66.88	16.15		150.0	<u> </u>
10432-	LTE EDD (OFBLIA)	Z	4.07	67.45	16.24		150.0	
AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.60	67.26	16.49	0.00	150.0	± 9.6 %
	 	Y	4.56	66.79	16.22		150.0	
10433-	LTE EDD (CEDMA COARS)	Z	4.38	67.26	16.33		150.0	
AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.84	67.23	16.53	0.00	150.0	± 9.6 %
		Υ	4.80	66.80	16.30		150.0	
10434-	MAY ODNAM (DO Tarrista de la casa	Z	4.63	67.20	16.40		150.0	
10434- AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.54	72.17	18.64	0.00	150.0	± 9.6 %
		Υ	4.31	70.81	17.94		150.0	
10435-	LITE TOD (CO EDIMA 4 ET CO STILL	Z	4.47	73.20	18.53		150.0	
10435- AAE	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	123.43	30.93	3.23	80.0	± 9.6 %
		Y	100.00	127.09	32.93		80.0	
10447-	LITE EDD (OFDIA) E MIL E TOLO	Z	100.00	121.88	29.46		80.0	
AAC AAC	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.63 	67.60	15.97	0.00	150.0	± 9.6 %
	 	Υ _	3.55	66.82	15.51		150.0	
40440	1 TE ED 2 (O ED 2)	<u>Z</u>	3.36	67.49	15.39		150.0	_
10448- AAC	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	X	4.14 	67.21	16.33	0.00	150.0	± 9.6 %
		Υ	4.08	66.64	16.00		150.0	
10449-	LTE EDD (OFDIA) 45 MILES	Ζ	3.93	67.24	16.11		150.0	
AAC AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	Х	4.40	67.10	16.39	0.00	150.0	± 9.6 %
		Υ	4.35	66.60	16.11		150.0	
40450	LTC FDD (OFD)	_Z_	4.21	67.10	16.24		150.0	
10450- AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.59	67.00	16.40	0.00	150.0	± 9.6 %
		Υ	4.54	66.54	16.14		150.0	
40454	W ODIA (DO T	<u>Z</u>	4.41	66.98	16.27		150.0	
10451- AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	Х	3.56	67.91	15.68	0.00	150.0	± 9.6 %
		Y	3.45	67.01	<u>15</u> .16		150.0	
10456-	IEEE 000 44 14/15/ /4001411 04 0444	Z	3.21	<u>67.</u> 51	14.85		150.0	
AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	Х	6.26	68.01	16.78	0.00	150.0	± 9.6 %
		Y	6.26	67.75	16.66	<u></u>	150.0	
104E7	LIMTS FDD (DO HODBA)	Z	6.13	67.97	16.72		150.0	
10457- AAA	UMTS-FDD (DC-HSDPA)	X	3.81	65.42	16.11	0.00	150.0	± 9.6 %
	 	Y	3.77	64.98	15.86		150.0	
104E9	CDMA2000 (4×EV/ DO B: D 3	Z	3.73	65.50	15.98	<u></u>	150.0	
10458- AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	4.16	71.37	18.08	0.00	150.0	± 9.6 %
	 	Y	3.92	69.91	17.32		150.0	
10459-	CDMA2000 (4:-E) / BO B B B	Z	4.02	72.11	17.63		150.0	
AAA 	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	5.19	68.40	18.36	0.00	150.0	± 9.6 %
		Y	5.10	67.75	18.06		150.0	
		Z	5.01	69.18	18.25		150.0	

10460-	UMTS-FDD (WCDMA, AMR)	Х	1.07	72.05	18.39	0.00	150.0	± 9.6 %
AAA								
	 	Y	0.81	67.05	15.17		150.0	
10461-	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz,	Z	0.95	70.49	17.24		150.0	
AAA	QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	129.11	33.59	3.29	80.0	±9.6 %
	 	Y	100.00	132.68	35.56	<u> </u>	80.0	
10462-	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz,	Z	100.00	128.17	32.38	<u></u>	80.0	
AAA	16-QAM, UL Subframe=2,3,4,7,8,9)	X	29.76	94.39	20.32	3.23	80.0	± 9.6 %
		Y	100.00	112.07	25.94		80.0	
10463-	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz,	Z	0.79	60.49	7.76		80.0	<u> </u>
AAA	64-QAM, UL Subframe=2,3,4,7,8,9)		2.50	68.97	12.20	3.23	80.0	± 9.6 %
	 	Y Z	100.00	107.58	23.85		80.0	<u> </u>
10464-	LTE-TDD (SC-FDMA, 1 RB, 3 MHz,	X	0.77 100.00	60.00 126.29	6.89	0.00	80.0	
AAB	QPSK, UL Subframe=2,3,4,7,8,9)				32.12	3.23	80.0	± 9.6 %
		Y_	100.00	130.29	34.26		80.0	
10465-	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-	Z	100.00	124.25	30.42		80.0	
10465- AAB	QAM, UL Subframe=2,3,4,7,8,9)		9.13	82.53	17.12	3.23	80.0	± 9.6 %
		Y 7	100.00	111.30	25.58	<u> </u>	80.0	
10466-	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-	Z	0.75	60.00	7.44		80.0	
AAB	QAM, UL Subframe=2,3,4,7,8,9)		1.98	66.71	11.27	3.23	80.0	± 9.6 %
-		Y	99.88	106.88	23.53		80.0	
10467-	LTE-TDD (SC-FDMA, 1 RB, 5 MHz,	Z	0.78	60.00	6.83		80.0	
AAD	QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	126.60	32.25	3.23	80.0	± 9.6 %
	+ <u>-</u>	Y	100.00	130.59	34.40		80.0	
10468-	LTE TOP /00 FOLIA	Z	100.00	124.67	30.60		80.0	
AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16- QAM, UL Subframe=2,3,4,7,8,9)	Х	11.66	85.00	17.83	3.23	80.0	± 9.6 %
		Y	100.00	111.53	25.68		80.0	
10469-	LTE TOP (OC ED)	Z	0.75	60.09	7.51		80.0	
AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64- QAM, UL Subframe=2,3,4,7,8,9)	X	1.98	66.75	11.28	3.23	80.0	± 9.6 %
		Υ	100.00	106.90	23.54		80.0	
40470	LTE TOD (04 TO)	Z_	0.77	60.00	6.83		80.0	
10470- AAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	Х	100.00	126.64	32.26	3.23	80.0	± 9.6 %
		Y	100.00	130.65	34.41		80.0	
10471-	LEE EDD (CO ED)	Z	100.00	124.69	30.60		80.0	
AAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	Х	11.32	84.67	17.72	3.23	80.0	±9.6 %
		Y	100.00	111.46	25.64		80.0	
10472-	LTE TOD (CC FDM) 4 DD 10111	Z	0.75	60.04	7.47		80.0	
AAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64- QAM, UL Subframe=2,3,4,7,8,9)	Х	1.96	66.63	11.22	3.23	80.0	± 9.6 %
		Υ	100.00	106.82	23.49		80.0	
10473-	LTE-TOD (SC EDMA 4 DD 45 M	Z	0.77	60.00	6.81		80.0	
AAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	100.00	126.60	32.24	3.23	80.0	± 9.6 %
	 	_<	100.00	130.61	34.39		80.0	
10474-	LTE TOD (SC EDMA 4 DD 45 MILL)	Z	100.00	124.64	30.58		80.0	
AAD_	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16- QAM, UL Subframe=2,3,4,7,8,9)	Х	11.06	84.45	17.66	3.23	80.0	± 9.6 %
		Υ	100.00	111.47	25.64		80.0	·· <u> </u>
10/75		Z	0.74	60.02	7.45		80.0	
10475- AAD			4.0=	00 50	14.00	2.22		. 0.0 0/
AAD	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64- QAM, UL Subframe=2,3,4,7,8,9)	×	1.95	66.59	11.20	3.23	80.0	± 9.6 %
	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64- QAM, UL Subframe=2,3,4,7,8,9)	X	99.99	106.84	23.50	3.23	80.0	± 9.6 %

10477-	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-							
AAE	QAM, UL Subframe=2,3,4,7,8,9)	X_	9.10	82.47	17.07	3.23	80.0	± 9.6 %
	 	Y	100.00	111.24	25.54		80.0	
10478-	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-		0.74	60.00	7.42		80.0	
AAE	QAM, UL Subframe=2,3,4,7,8,9)	X	1.93	66.47	11.14	3.23	80.0	± 9.6 %
		Υ	96.81	106.44	23.40		80.0	
10479-	1 TE TOD (CO EDIM 500) DE LA LIVIE	Z	0.77	60.00	6.80		80.0	
AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	9.68	90.97	25.10	3.23	80.0	± 9.6 %
		Y	13.83	97.37	27.65		80.0	
10480-	LTC TDD (0.0 TD)	Z	12.23	94.71	25.17		80.0	
AAA AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	11.91	88.02	22.17	3.23	80.0	± 9.6 %
		Y	19.25	95.65	25.10		80.0	
10404	1 TE TOO (00 FELL)	Z	7.50	81.30	18.54		80.0	
10481- AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	9.15	83.59	20.38	3.23	80.0	± 9.6 %
	<u> </u>	Υ	15.12	91.18	23.39		80.0	
40400	LTC TDD (00 TD)		4.40	74.24	15.71		80.0	
10482- AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.76	79.70	20.44	2.23	80.0	± 9.6 %
		Y	3.53	74.74	18.45		80.0	
10400	LITE TOP (OO TO)	Z	2.62	71.60	16.13		80.0	
10483- AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	5.87	78.17	19.16	2.23	80.0	± 9.6 %
		_ Y	8.24	83.44	21.55		80.0	
40.40.4	 	Z	2.93	69.04	14.15		80.0	
10484- AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	5.35	76.61	18.60	2.23	80.0	± 9.6 %
		Υ	7.24	81.28	20.83		80.0	
		Ζ	2.73	67.94	13.69		80.0	
10485- AAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.47	78.87	21.04	2.23	80.0	± 9.6 %
		Ϋ́	3.68	75.23	19.49		80.0	
40400		Z	3.15	74.27	18.50		80.0	
10486- AAD	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.79	72.50	18.04	2.23	80.0	± 9.6 %
_		Y	3.38	70.29	17.05		80.0	
40.40=		Z	2.84	69.02	15.57		80.0	
10487- <u>AAD</u>	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.74	71.89	17.77	2.23	80.0	± 9.6 %
		Υ	3.37	69.86	16.85		80.0	
10400	LITE TOP (OR TOWN	Z	2.81	68.50	15.32		80.0	
10488- AAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	Х	4.24	75.86	20.43	2.23	80.0	± 9.6 %
		Ŷ	3.83	73.65	19.40		80.0	
10100	LITE TOP (OO ED) (CO	Z	3.28	72.72	18.85		80.0	
10489- AAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.72	70.49	18.27	2.23	80.0	± 9.6 %
		Y	3.53	69.26	17.66		80.0	
10100	LTE TOP (OO ET)	Z	3.19	68.97	17.14		80.0	
10490- AAD	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.79	70.18	18.14	2.23	80.0	± 9.6 %
		Y	3.62	69.04	17.58		80.0	
10/01	LITE TOD (OC EDMA 50% DD 45 : "	Z	3.27	68.77	17.05		80.0	
10491- _AAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	Х	4.23	73.19	19.42	2.23	80.0	± 9.6 %
		Y	3.95	71.65	18.67		80.0	
10400	LIE TOD (OO EDMA 500) DD 45 iiii	_Z	3.47	70.90	18.25	_	80.0	
10492- AAD	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.97	69.24	17.95	2.23	80.0	± 9.6 %
		Y	3.85	68.36	17.51		80.0	
		Z	3.50	68.04	17.11		80.0	

10493-	LTE-TDD (SC-FDMA, 50% RB, 15 MHz,	X	4.03	69.04	17.87	2.23	80.0	± 9.6 %
AAD	64-QAM, UL Subframe=2,3,4,7,8,9)	_		ļ	L			
		Y	3.92	68.21	17.46		80.0	
10494-	LTE TOD (CC CDMA FOX DD CO MILE	Z	3.56	67.90	17.04		80.0	
AAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.79 ———	75.46	20.14	2.23	80.0	± 9.6 %
		Υ	4.38	73.53	19.24		80.0	
	- 	Z	3.78	72.48	18.78		80.0	
10495- AAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.03	69.76	18.19	2.23	80.0	± 9.6 %
	 	Y	3.90	68.85	17.73		80.0	_
		Z	3.53	68.35	17.31		80.0	
10496- AAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	Х	4.08	69.35	18.04	2.23	80.0	± 9.6 %
		Y]	3.97	68.51	17.62		80.0	
		Z	3.60	68.09	17.22		80.0	
10497- AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	Х	3.72	75.87	18.08	2.23	80.0	± 9.6 %
		Y	2.64	70.76	15.98		80.0	
		Z	1.51	64.60	11.77		80.0	
10498- AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	×	2.30	66.27	12.99	2.23	80.0	± 9.6 %
		Y	2.02	64.31	12.06		80.0	†
		Z	1.20	60.00	8.21		80.0	
10499- AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.18	65.35	12.41	2.23	80.0	± 9.6 %
		Y	1.97	63.70	11.62		80.0	
		Z	1.22	60.00	8.05		80.0	
10500- AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.19	76.87	20.53	2.23	80.0	± 9.6 %
		Y	3.63	74.04	19.27		80.0	-
		Z	3.15	73.35	18.54		80.0	
10501- AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	Х	3.74	71.57	18.07	2.23	80.0	± 9.6 %
		Y	3.44	69.83	17.26		80.0	
		Z	3.03	69.25	16.29		80.0	
10502- AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	Х	3.79	71.34	17.92	2.23	80.0	± 9.6 %
		LY	3.50	69.66	17.14		80.0	
		Ζ	3.07	69.05	16.12		80.0	
10503- AAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.18	75.62	20.32	2.23	80.0	± 9.6 %
		Y	3.77	73.43	19.30		80.0	
10=0		Z	3.23	72.50	18.74	_	80.0	
10504- AAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.70	70.40	18.21	2.23	80.0	± 9.6 %
		Υ	3.52	69.18	17.61		80.0	
40505	LTC TDD (00 TO	Z	3.17	68.86	17.07		80.0	
10505- AAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	Х	3.77	70.08	18.09	2.23	80.0	± 9.6 %
- -		Υ	3.60	68.95	17.53		80.0	
10500	LTE TOP (00 = 200)	Z	3.25	68.67	16.99		80.0	
10506- AAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.74	75.29	20.06	2.23	80.0	±9.6%
		Ý	4.34	73.37	19.17		80.0	
10507	LTE TOD (OO ED)	Z	3.74	72.32	18.70		80.0	
10507- AAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.01	69.69	18.15	2.23	80.0	± 9.6 %
	7-1-6-7-1-6							
		Y	3.88	68.79	17.69		80.0	

10508- AAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.07	69.28	18.00	2.23	80.0	± 9.6 %
	55516116-2,0,4,7,0,9)	+ _Y -	200	1	 	<u> </u>		
		T Z	3.96	68.45	17.58	<u> </u>	80.0	
10509-	LTE-TDD (SC-FDMA, 100% RB, 15	Z	3.59 4.87	68.02	17.17		80.0	ļ <u>.</u>
AAD	MHz, QPSK, UL Subframe=2,3,4,7,8,9)			73.12	19.15	2.23	80.0	± 9.6 %
		Y	4.57	71.69	18.46		80.0	
10510-	LTE-TDD (SC-FDMA, 100% RB, 15	X	4.08	70.95	18.12		80.0	
AAD	MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	^	4.46	69.19	17.97	2.23	80.0	± 9.6 %
		Υ	4.36	68.46	17.61		80.0	
10511-	THE TOP (OO FPMA 4000) PD 45	Z	3.98	67.93	17.23		80.0	
AAD	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.49	68.83	17.85	2.23	80.0	± 9.6 %
		Y	4.40	68.15	17.52		80.0	-
10E10	LITE TOP (00 STANK)	Z	4.03	67.70	17.16		80.0	
10512- AAE	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	5.35	75.53	19.95	2.23	80.0	± 9.6 %
		Y	4.89	73.64	19.09		80.0	
10513-	LTE TOD (SC FOMA 4000) TO	Z	4.27	72.56	18.64		80.0	
AAE	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.37	69.62	18.15	2.23	80.0	± 9.6 %
		Y	4.26	68.83	17.75		80.0	
40544	LITE TOD (OC STANCE)	Z	3.86	68.15	17.33		80.0	
10514- AAE	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.36	69.04	17.95	2.23	80.0	± 9.6 %
		Υ	4.26	68.32	17.60		80.0	
		Z	3.89	67.75	17.20		80.0	
10515- AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	Х	0.98	64.01	15.52	0.00	150.0	± 9.6 %
-		Y	0.90	62.52	14.23		150.0	
10516-	1555 000 445 M65 0 4 015 (5000 5 5	Z	0.95	63.71	15.08		150.0	
AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	0.96	80.43	22.24	0.00	150.0	± 9.6 %
	 	Y	0.52	69.16	15.73	<u> </u>	150.0	
10517-	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11	Z	0.74	75.71	19.80		<u>15</u> 0.0	
AAA	Mbps, 99pc duty cycle)	×	0.87	66.95	16.73	0.00	150.0	± 9.6 %
		Y	0.75	64.30	14.64		150.0	
10518- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	<u>0.81</u> 4.59	66.10 66.88	15.98 16.37	0.00	150.0 150.0	± 9.6 %
		Y	4.55	66.43	16.12		150.0	- -
		Z	4.41	66.91	16.25		150.0	
10519- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.79	67.13	16.49	0.00	150.0	± 9.6 %
		Y	4.75	66.71	16.26		150.0	-
10555		Z	4.57	67.10	16.35		150.0	-
10520- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.64	67.11	16.43	0.00	150.0	± 9.6 %
		Y	4.60	66.67	16.18		150.0	
10521- AAB	IEEE 802.11a/h WIFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.43 4.57	67.05 67.12	16.27 16.42	0.00	150.0 150.0	± 9.6 %
		Y	4.53	66.66	16.16		150.0	-
		Ż	4.36	67.04	16.26		150.0	
10522- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.63	67.16	16.48	0.00	150.0	± 9.6 %
		Υ	4.59	66.70	16.22		150.0	
		Z	4.42	67.17	16.36	_	150.0	

10523-	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48	Х	4.51	67.05	16.34	0.00	150.0	± 9.6 %
AAB	Mbps, 99pc duty cycle)							
		Y_	4.46	66.56	16.06		150.0	
10524-	LEEE 902 110/b W/F F OUT (OFD) 4 54	Z	4.33	67.10	16.24		150.0	
AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	4.58	67.09	16.46	0.00	150.0	±9.6 %
		Y	4.53	66.64	16.20		150.0	
40.50		Z	4.37	67.10	16.33		150.0	
10525- AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	Х	4.55	66.14	16.05	0.00	150.0	± 9.6 %
		Υ	4.50	65.66	15.78		150.0	
1000		Ζ	4.38	66.18	15.95		150.0	
10526- AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	Х	4.74	66.53	16.19	0.00	150.0	± 9.6 %
	<u> </u>	Y	4.69	66.05	15.93		150.0	
40505		Z	4.52	66.50	16.07		150.0	
10527- AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	4.66	66.50	16.15	0.00	150.0	± 9.6 %
	<u> </u>	Υ	4.61	66.01	15.87		150.0	i
40.00		Ζ	4.45	66.47	16.02		150.0	
10528- AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	Х	4.67	66.52	16.18	0.00	150.0	± 9.6 %
		Y	4.62	66.03	15.91		150.0	
		Z	4.47	66.48	16.05		150.0	
10529- AAB_	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	Х	4.67	66.52	16.18	0.00	150.0	± 9.6 %
		Y	4.62	66.03	15.91		150.0	
		Z	4.47	66.48	16.05		150.0	
10531- AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	4.67	66.65	16.20	0.00	150.0	± 9.6 %
		Y	4.63	66.16	15.93	 	150.0	
		Z	4.44	66.54	16.04	 	150.0	
10532- AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	Х	4.53	66.51	16.14	0.00	150.0	± 9.6 %
		Y	4.48	66.01	15.86		150.0	
		Z	4.32	66.41	15.98		150.0	
10533- AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	4.68	66.56	16.16	0.00	150.0	± 9.6 %
		Y	4.63	66.06	15.89		150.0	
		Z	4.48	66.56	16.05		150.0	·
10534- AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	5.19	66.60	16.20	0.00	150.0	± 9.6 %
		Y	5.16	66.20	15.99		150.0	
		Z	5.01	66.50	16.09		150.0	<u> </u>
10535- AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	5.26	66.75	16.27	0.00	150.0	± 9.6 %
		Υ	5.22	66.35	16.06		150.0	
40-44-		Z	5.06	66.65	16.16	<u> </u>	150.0	
10536- AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	Х	5.13	66.73	16.24	0.00	150.0	± 9.6 %
		Υ	5.09	66.32	16.02		150.0	
		Z	4.95	66.64	16.13		150.0	
10537- AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	Х	5.19	66.69	16.22	0.00	150.0	± 9.6 %
		Υ	5.15	66.30	16.01		150.0	
40500		Z	5.00	66.59	16.11		150.0	
10538- AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	5.28	66.73	16.28	0.00	150.0	± 9.6 %
		Υ	5.26	66.36	16.08		150.0	
40515		Z	5.08	66.58	16.14	-	150.0	
10540- AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	5.21	66.72	16.29	0.00	150.0	± 9.6 %
		Y	5.17	66.33	16.08		150.0	
		. ' '	J. 17	00.55	10.00		150.0	

10541-	IEEE 802.11ac WiFi (40MHz, MCS7,			, <u> </u>				
AAB	99pc duty cycle)	X	5.18	66.60	16.22	0.00	150.0	± 9.6 %
		Y	5.14	66.20	16.01		150.0	
10542-	IEEE 802.11ac WiFi (40MHz, MCS8,		4.99	66.47	16.09		150.0	
AAB	99pc duty cycle)	X	5.33	66.65	16.26	0.00	150.0	± 9.6 %
	 	Y	5.31	66.28	16.07		150.0	
10543-	IEEE 000 44 NOTE 1400	Z	5.14	66.55	16.15		150.0	
AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.41 ——————	66.68	16.29	0.00	150.0	± 9.6 %
		Y	5.39	66.31	16.11		150.0	
10544-	LEEE COO AL LANGUE LE	Z	5.20	66.56	16.18		150.0	
AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.49 	66.70	16.18	0.00	150.0	± 9.6 %
		. Y	5.45	66.31	15.98		150.0	
10E4E	LEEE 000 44 NOTE 100	Z	5.34	66.58	16.07		150.0	
10545- AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.68	67.09	16.32	0.00	150.0	± 9.6 %
		Y	5.66	66.76	16.15		150.0	
10510	IEEE 000 da 140E: 150E	Z	5.51	66.98	16.23		150.0	
10546- AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.57	66.94	16.26	0.00	150.0	± 9.6 %
	<u> </u>	Y	5.54	66.57	16.08		150.0	
40547	LIEFE CO. 44	Z	5.38	66.73	16.11	_	150.0	
10547- AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	×	5.64	66.98	16.27	0.00	150.0	± 9.6 %
	<u> </u>	Y	5.63	66.66	16.11		150.0	
		Z	5.45	66.79	16.14		150.0	
10548- AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	5.90	67.92	16.71	0.00	150.0	± 9.6 %
		Y	5.97	67.87	16.68		150.0	
		Z	5.63	67.50	16.47		150.0	
10550- AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	×	5.59	66.92	16.26	0.00	150.0	± 9.6 %
		Y	5.55	66.54	16.07		150.0	
		Ż	5.42	66.82	16.17	-	150.0	·
10551- AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.60	66.98	16.25	0.00	150.0	± 9.6 %
		Y	5.56	66.60	16.06		150.0	 -
		Ż	5.40	66.75	16.10		150.0	
10552- AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.51	66.77	16.16	0.00	150.0	± 9.6 %
		Y	5.47	66.37	15.96		150.0	
		Z	5.35	66.67	16.06		150.0	
10553- AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.60	66.81	16.21	0.00	150.0	± 9.6 %
		Y	5.56	66.43	16.01		150.0	
		Z	5.41	66.65	16.08		150.0	
10554- AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	5.89	67.05	16.26	0.00	150.0	± 9.6 %
		Y	5.86	66.69	16.08		150.0	
		Z	5.75	66.91	16.14		150.0	
10555- AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	6.02	67.35	16.38	0.00	150.0	± 9.6 %
		Y	6.00	67.02	16.22		150.0	
105-1		Z	5.86	67.17	16.25		150.0	
10556- AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	6.04	67.39	16.40	0.00	150.0	± 9.6 %
		Y	6.02	67.06	16.23	_	150.0	
		Z	5.88	67.24	16.28		150.0	
10557- AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	6.01	67.32	16.38	0.00	150.0	± 9.6 %
		Y	5.99	66.98	40.00		450.0	
	<u> </u>	T	5.99	96.90	16.22		150.0	

10558- AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	6.07	67.49	16.48	0.00	150.0	± 9.6 %
_		Y	6.05	67.17	16.33		150.0	
	-	Z	5.88	67.26	16.33		150.0	
10560- AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	Х	6.06	67.34	16.44	0.00	150.0	± 9.6 %
		Y	6.04	66.99	16.28		150.0	
		Z	5.88	67.13	16.30		150.0	
10561- _AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	5.98	67.30	16.46	0.00	150.0	± 9.6 %
		Υ	5.96	66.96	16.30		150.0	
		Ż	5.81	67.11	16.32		150.0	
10562- AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	6.11	67.72	16.67	0.00	150.0	± 9.6 %
		Y	6.12	67.46	16.55		150.0	
	<u> </u>	Z	5.89	67.37	16.45		150.0	
10563- AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	Х	6.43	68.23	16.87	0.00	150.0	± 9.6 %
	 	Y	<u>6.5</u> 0	68.16	16.85		150.0	
40=0:	<u></u>	Z	5.96	67.23	16.35		150.0	_
10564- AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 9 Mbps, 99pc duty cycle)	X	4.91	66.93	16.51	0.46	150.0	± 9.6 %
		Y	4.88	66.54	16.31		150.0	
		Z	4.73	66.93	16.37		150.0	
10565- AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 12 Mbps, 99pc duty cycle)	Х	5.16	67.40	16.83	0.46	150.0	± 9.6 %
		_ Y _	5.13	67.02	16.64		150.0	
		Z	4.93	67.35	16.69		150.0	
10566- _AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 18 Mbps, 99pc duty cycle)	X	4.99	67.26	16.66	0.46	150.0	± 9.6 %
		Y	4.96	66.87	16.45		150.0	
		Z	4.77	67.18	16.50		150.0	
10567- AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 24 Mbps, 99pc duty cycle)	Х	5.02	67.67	17.02	0.46	150.0	± 9.6 %
		Y	4.98	67.25	16.79		150.0	
		Z	4.81	67.60	16.88		150.0	
10568- AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 36 Mbps, 99pc duty cycle)	Х	4.90	67.00	16.42	0.46	150.0	± 9.6 %
		Y_	4.87	66.62	16.22		150.0	
		Z	4.67	66.94	16.26		150.0	
10569- AAA	JEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 48 Mbps, 99pc duty cycle)	Х	4.97	67.73	17.07	0.46	150.0	± 9.6 %
		Υ	4.93	67.29	16.83		150.0	
		Z	4.78	67.78	16.99		150.0	
10570- AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 54 Mbps, 99pc duty cycle)	X	5.01	67.57	17.00	0.46	150.0	± 9.6 %
		Y	4.97	67.15	16.77		150.0	
10574		Z	4.80	67.57	16.89		150.0	
10571- AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.17	65.22	16.39	0.46	130.0	± 9.6 %
	<u> </u>	Υ	1.09	63.89	15.30		130.0	
10E70	IEEE 000 445 MEET 0 4 000 FEET	Z	1.10	64.48	15.68		130.0	
10572- AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.19	65.91	16.81	0.46	130.0	± 9.6 %
	 	Y	1.10	64.45	15.65		130.0	
10E70	JEEE 000 446 1997 6 4 500	Z	1.12	65.08	16.07		130.0	
10573- AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	11.95	118.97	33.95	0.46	130.0	± 9.6 %
		Υ	2.10	86.50	22.92		130.0	
10571	IEEE 000 to the second	Z	2.78	93.83	26.37		130.0	
10574- AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	1.42	73.69	20.72	0.46	130.0	± 9.6 %
		Y	1.20	70.19	18.52		130.0	
		Z	1.24	71.54				

10575-	IEEE 802.11g WiFi 2.4 GHz (DSSS-	$\overline{}$	1.00	1 00 74	T . = ==			
AAA	OFDM, 6 Mbps, 90pc duty cycle)	X	4.69	66.71	16.57	0.46	130.0	± 9.6 %
		+ <u>Y</u>	4.67	66.34	16.38		130.0	
10576-	IEEE 802.11g WiFi 2.4 GHz (DSSS-	Z	4.50	66.68	16.40		130.0	
AAA	OFDM, 9 Mbps, 90pc duty cycle)	Х	4.72	66.88	16.64	0.46	130.0	± 9.6 %
		Y	4.69	66.50	16.44		130.0	
10577-	IEEE 802.11g WiFi 2.4 GHz (DSSS-	Z	4.53	66.88	16.48		130.0	
AAA	OFDM, 12 Mbps, 90pc duty cycle)	X	4.94 ————	67.20	16.81	0.46	130.0	± 9.6 %
		Y	<u>4.91</u>	66.83	16.62		130.0	
10578-	IEEE 900 44 - WEE: 0 4 OU FROM	Z	4.71	67.13	16.63		130.0	
AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 18 Mbps, 90pc duty cycle)	Х	4.83 ————	67.37	16.92	0.46	130.0	± 9.6 %
	 	Y	4.81	66.98	16.72		130.0	-
10579-	IFFE 900 (A - MET) O (OUT (DOOD	Z	<u>4.61</u>	67.29	16.74		130.0	
AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 24 Mbps, 90pc duty cycle)	X	4.60	66.66	16.24	0.46	130.0	± 9.6 %
		Y	4.57	66.30	16.05		130.0	
10580-	IEEE 900 44a WEE; 0 4 OUT (DOOG	Z	4.37	66.49	16.00		130.0	
_AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 36 Mbps, 90pc duty cycle)	Х	4.64	66.67	16.25	0.46	130.0	± 9.6 %
	<u> </u>	Y	4.62	66.31	16.06		130.0	
10581-	1555 000 44 MISS 0 4 OU 15 5	<u> Z </u>	4.41	66.55	16.03		130.0	
_AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 48 Mbps, 90pc duty cycle)	Х	4.73	67.42	16.87	0.46	130.0	± 9.6 %
		Y	4.70	67.02	16.65		130.0	
10582-	IEEE 900 44+ W/E: 0.4 OLD: /D000	Z	4.52	67.36	16.71		130.0	
AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS- OFDM, 54 Mbps, 90pc duty cycle)	Х	4.54	66.41	16.03	0.46	130.0	± 9.6 %
		Y	4.53	66.07	15.85		130.0	_
40500		LZ	4.30	66.25	15.78		130.0	
10583- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.69	66.71	16.57	0.46	130.0	± 9.6 %
		Υ	4.67	66.34	16.38		130.0	
40504	ISSE DOD 44 II WAR	Z	4.50	66.68	16.40		130.0	
10584- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.72	66.88	16.64	0.46	130.0	± 9.6 %
		Y	4.69	66.50	16.44		130.0	
40505		Z	4.53	66.88	16.48		130.0	
10585- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	4.94	67.20	16.81	0.46	130.0	± 9.6 %
		Υ	4.91	66.83	16.62		130.0	
		Z	4.71	67.13	16.63		130.0	
10586- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	4.83	67.37	16.92	0.46	130.0	± 9.6 %
		Υ	4.81	66.98	16.72		130.0	
40507	IEEE non de la commentation de l	Z	4.61	67.29	16.74		130.0	
10587- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.60	66.66	16.24	0.46	130.0	± 9.6 %
		Υ	4.57	66.30	16.05		130.0	
40E00	IEEE OOO AA III JANEE	Ζ	4.37	66.49	16.00		130.0	
10588- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	Х	4 .64	66.67	16.25	0.46	130.0	±9.6 %
		Υ	4.62	66.31	16.06		130.0	
10500		Z	4.41	66.55	16.03		130.0	
10589- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	4.73	67.42	16.87	0.46	130.0	± 9.6 %
		<u> Y</u>	4.70	67.02	16.65		130.0	
10500	IEEE 000 44-/h)A//E' E OU (OED)	Z	4.52	67.36	16.71		130.0	
10590- AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.54 	66.41	16.03	0.46	130.0	± 9.6 %
	<u> </u>	Υ	4.53	66.07	15.85		130.0	
		Z	4.30	66.25	15.78		130.0	_

10591- AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	4.84	66.77	16.66	0.46	130.0	± 9.6 %
		Y	4.82	66.41	16.48	_	130.0	
		Z	4.66	66.76	16.51		130.0	- -
10592- AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	Х	5.01	67.12	16.79	0.46	130.0	± 9.6 %
		Υ	4.99	66.76	16.61		130.0	
		Z	4.79	67.07	16.64		130.0	
10593- AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	4.93	67.04	16.68	0.46	130.0	± 9.6 %
		Y 🚶	4.91	66.69	16.51		130.0	
		Z	4.71	66.95	16.50		130.0	
10594- AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	4.98	67.20	16.83	0.46	130.0	± 9.6 %
		Y	4.96	66.84	16.65		130.0	
		Z	4.76	67.13	16.67		130.0	
10595- AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	Х	4.95	67.16	16.73	0.46	130.0	± 9.6 %
		_ Y	4.93	66.80	16.55		130.0	
		Z	4.73	67.10	16.57	<u> </u>	130.0	·
10596- AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	4.89	67.16	16.74	0.46	130.0	± 9.6 %
		Υ	4.87	66.79	16.55		130.0	
		Z	4.66	67.08	16.56		130.0	 :_
10597- AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	_ X	4.84	67.08	16.63	0.46	130.0	± 9.6 %
		Y	4.82	66.71	16.44		130.0	
		Z	4.61	66.96	16.43		130.0	-
10598- AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	4.82	67.33	16.90	0.46	130.0	± 9.6 %
		Y	4.80	66.95	16.70		130.0	-
		Z	4.60	67.20	16.70		130.0	
10599- AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	Х	5.51	67.30	16.83	0.46	130.0	± 9.6 %
		Υ	5.50	67.04	16.72		130.0	
		Z	5.31	67.18	16.69		130.0	 -
10600- AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	5.66	67.75	17.03	0.46	130.0	± 9.6 %
		Y	5.70	67.66	17.00		130.0	
		Z	5.42	67.55	16.85		130.0	
10601- AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.54	67.49	16.91	0.46	130.0	± 9.6 %
		Y	5.55	67.29	16.83		130.0	
1000		Z	5.33	67.34	16.76		130.0	
10602- AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	Х	5.62	67.47	16.82	0.46	130.0	± 9.6 %
	 	Υ	5.64	67.27	16.74		130.0	
40000		Z	5.46	67.51	16.77		130.0	_
10603- AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	5.72	67.83	17.13	0.46	130.0	±9.6 %
		Y	5.72	67.56	17.01		130.0	
10004		Z	5.53	67.80	17.05		130.0	
10604- AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.51	67.26	16.84	0.46	130.0	± 9.6 %
	 	Y	5,51	67.00	16.72		130.0	
10605	IFFE 900 44. G ITAG	Z	5.40	67.44	16.85		130.0	
10605- AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.62	67.58	16.99	0.46	130.0	± 9.6 %
		Y	5.63	67.37	16.91		130.0	
40000	UEEE DOO 44 WINNESS	Z	5.43	67.48	16.86		130.0	
10606- AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	Х	5.39	67.04	16.59	0.46	130.0	± 9.6 %
		Y	5.38	66.75	16.46		130.0	

10607-	IEEE 802.11ac WiFi (20MHz, MCS0,	TX	4.69	66.11	16.30	0.46	100.0	Т
AAB	90pc duty cycle)		<u>-</u>	00.11	10.30	0.46	130.0	± 9.6 %
		Y	4.65	65.70	16.09		130.0	
10608-	IEEE 802.11ac WiFi (20MHz, MCS1,	Ž	4.51	66.12	16.16		130.0	
AAB	90pc duty cycle)	X	4.89	66.54	16.47	0.46	130.0	± 9.6 %
		Y	4.86	66.13	16.26		130.0	
10609-	IEEE 802.11ac WiFi (20MHz, MCS2,	Z	4.67	66.48	16.32		130.0	
AAB	90pc duty cycle)	X	4.78 	66.40	16.32	0.46	130.0	± 9.6 %
		Y	4.74	65.99	16.10		130.0	
10610-	IEEE 802.11ac WiFi (20MHz, MCS3,	Z	4.56	66.32	<u>1</u> 6.14		130.0	
AAB	90pc duty cycle)	X	4.83	66.56	16.48	0.46	130.0	± 9.6 %
	-	Y	4.80	66.15	16.27		130.0	
10611-	IEEE 802.11ac WiFi (20MHz, MCS4,	Z	4.61	66.49	16.31		130.0	
AAB	90pc duty cycle)	X	4.74	66.37	16.33	0.46	130.0	± 9.6 %
		<u> </u>	4.71	65.96	16.12		130.0	
10612-	IEEE 802.11ac WiFi (20MHz, MCS5,	Z	4.52	66.28	16.15		130.0	
AAB	90pc duty cycle)	Х	4.76	66.53	16.38	0.46	130.0	±9.6 %
		<u> </u>	4.73	66.12	16.16		130.0	
10613-	IEEE 900 44e-18/5 (0034) - \$4000	Z	4.52	66.43	16.20		130.0	
AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.76	66.43	16.27	0.46	130.0	± 9.6 %
		Y	4.74	66.03	16.06		130.0	
10614-	IEEE 902 1100 W/E: (00MH - 14007	Z	4.52	66.26	16.05		130.0	
AAB_	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.70 	66.62	16.50	0.46	130.0	± 9.6 %
		Υ	4.67	66.19	16.28		130.0	
10015	1555 000 44 1455 000 44	Z	4.48	66.49	16.31		130.0	
10615- AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.74	66.19	16.10	0.46	130.0	± 9.6 %
		Y	4.72	65.79	15.90		130.0	
10616-	IEEE 000 44 100E: /401 III - 1400	Z	4.52	<u>66</u> .11	15.92		130.0	
AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	5.34	66.61	16.47	0.46	130.0	± 9.6 %
		Y	5.32	66.28	16.32		130.0	
10617-	IEEE 000 44 - INSEL (401)	Z	5.14	66.47	16.32		130.0	
AAB_	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.40	66.74	16.51	0.46	130.0	± 9.6 %
		Y	5.38	66.41	16.35		130.0	
10610	IEEE 000 44 - 1405 440 44	Z	5.21	66.65	16.39		130.0	
10618- AAB	IEEE 802.11ac WIFI (40MHz, MCS2, 90pc duty cycle)	×	5.29	66.79	16.56	0.46	130.0	± 9.6 %
	 	Y	5.27	66.46	16.39		130.0	
10619-	IFFE 900 44 - 140Ft (401 to 1 to 1 to 1	Z	5.11	66.70	16.43		130.0	
AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	5.31	66.61	16.40	0.46	130.0	± 9.6 %
	 	Y	5.30	66.30	16.25		130.0	
10620	IEEE 900 44 MEET (40) #1	_ Z	5.11	66.46	16.24		130.0	
10620- AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.41	66.67	16.47	0.46	130.0	± 9.6 %
	 	Y	5.41	66.38	16.34		130.0	
10624	JEEE 200 445-1475 (4017)	Z	5.19	66.48	16.30		130.0	
10621- AAB	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.40	66.76	16.64	0.46	130.0	± 9.6 %
	 	Ý	5.38	66.43	16.48		130.0	
10622	JEEE 000 44 - 14/51 (40) 11 - 14/5 5	Z	5.21	66.64	16.50		130.0	
10622- AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.41	66.91	16.70	0.46	130.0	± 9.6 %
		Y	5.39	66.60	16.55		130.0	
		Z	5.20	66.74	16.55	-	130.0	

10623-	IEEE 802.11ac WiFi (40MHz, MCS7,	X	5.29	66.45	16.36	0.46	130.0	± 9.6 %
AAB	90pc duty cycle)					00	100.0	20.070
		Y	5.27	66.12	16.20		130.0	
		Z	5.08	66.28	16.19		_130.0	Ī
10624- AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.48	66.64	16.51	0.46	130.0	± 9.6 %
	 	Y	5.47	66.35	16.38		130.0	
		Z	5.28	66.51	16.36		130.0	
10625- AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	5.87	67.67	17.07	0.46	130.0	± 9.6 %
	 	Y	5.92	67.56	17.03		130.0	_
10626-	IEEE 000 44 as 1455; (001411; 14000	Z	5.48	66.99	16.66		130.0	
AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.62	66.65	16.41	0.46	130.0	± 9.6 %
	 	Y	5.59	66.32	16.26		130.0	
10627-	IEEE 802.11ac WiFi (80MHz, MCS1,	Z	5.46	66.52	16.28		130.0	
AAB	90pc duty cycle)	X	5.86	67.19	16.64	0.46	130.0	± 9.6 %
	 	Y	5.87	66.96	16.54		130.0	
10628-	IEEE 802 1100 WIE: (90M) - MOOC	Z	5.68	67.07	16.52		130.0	_
AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.67	66.78	16.37	0.46	130.0	± 9.6 %
	 	Y	5.65	66.49	16.24		130.0	
10629-	IEEE 902 44 co \A/EE (00\A/E = \A/OOO	Z	5.47	66.52	16.18		130.0	
AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	5.76	66.87	16.41	0.46	130.0	± 9.6 %
	 	Y	5.74	66.55	16.26		130.0	
10630-	!EEE 802.11ac WiFi (80MHz, MCS4,	Z	5.55	66.62	16.22		130.0	
AAB	90pc duty cycle)	X	6.21	68.41	17.17	0.46	130.0	± 9.6 %
	 	Y	6.36	68.57	17.26		130.0	
10631-	IEEE 902 1100 M/SE (000 MILE \$400 E	Z	5.84	67.72	16.78		130.0	
AAB_	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	6.11	68.22	17.27	0.46	130.0	± 9.6 %
	 	<u> </u>	6.15	68.07	17.21		130.0	
10632-	IEEE 902 1100 MGE: (90MH = MOOO	Z	5.81	67.73	16.97		130.0	
AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	5.83	67.26	16.81	0.46	130.0	± 9.6 %
	 	<u> </u>	5.82	66.98	16.68		130.0	
10633-		Z	5.67	67.19	16.73		130.0	
AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	Х	5.73	66.95	16.48	0.46	130.0	± 9.6 %
	 	Y	5.72	66.66	16.35		130.0	
10634-	IEEE 802.11ac WiFi (80MHz, MCS8,	Z	5.54	66.74	16.32		130.0	
AAB	90pc duty cycle)	X	5.72	66.98	16.56	0.46	130.0	± 9.6 %
-	 	Y	5.70	66.65	16.41		130.0	
10635-	IEEE 802.11ac WiFi (80MHz, MCS9,	Z	5.52	66.78	16.40		130.0	
AAB	90pc duty cycle)	Х	5.60	66.32	15.97	0.46	130.0	± 9.6 %
	 	Y	5.59	66.03	15.84		130.0	
10636-	IEEE 802.11ac WiFi (160MHz, MCS0,	Z	5.39	66.04	15.76	<u> </u>	130.0	<u> </u>
AAC	90pc duty cycle)	X	6.03	67.02	16.50	0.46	130.0	± 9.6 %
		Y 7	6.02	66.74	16.37		130.0	
10637- AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	Z	5.89 6.19	66.87 67.40	16.36 16.66	0.46	130.0	± 9.6 %
		Y	6.19	67.15	16 56		120.0	-
		Ż	6.02	67.15	16.56 16.51	 -	130.0	
10638-	IEEE 802.11ac WiFi (160MHz, MCS2,	$\frac{1}{X}$	6.19	67.38	16.63	0.46	130.0	1000
AAC	90pc duty cycle)	Y				0.40	130.0	± 9.6 %
			6.19	67.12	16.52		130.0	
		Z	6.03	67.21	16.49	L	130.0	

10639-	IEEE 000 44 - William						,	gust 23, 201
AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	6.18	67.36	16.66	0.46	130.0	± 9.6 %
		Y	6.17	67.09	16.55	†	130.0	
10640-	IEEE 900 44 - 2 20/21 / 400 41	Z	6.00	67.13	16.50		130.0	
AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	6.19	67.39	16.62	0.46	130.0	± 9.6 %
		Y	6.20	67.16	16.53	 	130.0	
10641-	LEGE COO AL COMPANION DE LA CO	Z	5.99	67.11	16.43		130.0	
AAC AAC	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	6.21	67.22	16.56	0.46	130.0	± 9.6 %
	<u> </u>	Υ	6.20	66.94	16.44		130.0	
10010	1555 000 44	Z	6.05	67.08	16.43		130.0	
10642- AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	6.27	67.52	16.87	0.46	130.0	± 9.6 %
	-	Υ	6.26	67.23	16.75		130.0	
40040		Z	6.09	67.31	16.72		130.0	
10643- AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	6.10	67.19	16.61	0.46	130.0	± 9.6 %
		Υ	6.09	66.93	16.50		130.0	
10011	IEEE OOO 44	Z	5.93	67.00	16.46	T	130.0	 -
10644- AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	6.29	67.77	16.92	0.46	130.0	± 9.6 %
		Y	6.32	67.61	16.86		130.0	_
10015		Z	6.02	67.30	16.63		130.0	
10645- AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	6.72	68.61	17.29	0.46	130.0	± 9.6 %
		Y	6.81	68.60	17.31		130.0	
		Z	6.13	67.29	16.58		130.0	
10646- AAE	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	Х	26.22	119.06	40.53	9.30	60.0	± 9.6 %
		Y	23.98	116.77	40.23		60.0	_
		Z	13.39	105.96	36.68		60.0	
10647- AAE	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	21.91	115.56	39.67	9.30	60.0	± 9.6 %
		Y	20.79	114.08	39.59		60.0	
_		Ž	11.12	102.25	35.63		60.0	-
10648- AAA	CDMA2000 (1x Advanced)	Х	0.80	65.60	12.34	0.00	150.0	± 9.6 %
		Υ	0.65	62.69	10.17		150.0	
		Z	0.58	62.96	9.61		150.0	
10652- AAC	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.70	67.38	17.08	2.23	80.0	± 9.6 %
		Y	3.59	66.56	16.66		80.0	
		Z	3.39	66.83	16.41		80.0	
10653- AAC	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	4.17	66.50	17.03	2.23	80.0	± 9.6 %
		Y	4.11	65.95	16.76		80.0	
		Z	3.90	66.02	16.55	_	80.0	_
10654- AAC	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	4.13	66.12	17.00	2.23	80.0	± 9.6 %
		Υ	4.07	65.60	16.75	_	80.0	
		Z	3.90	65.62	16.55		80.0	
10655- AAD	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	Х	4.19	66.12	17.04	2.23	80.0	± 9.6 %
		Y	4.13	65.62	16.79		80.0	
10658-	Pulse Waveform (200Hz, 10%)	Z	3.96	65.57	16.58	40.00	80.0	
AAA	- dise vvaveioiiii (200nz, 10%)	X	100.00	111.27	26.15	10.00	50.0	± 9.6 %
		Y_	100.00	112.15	26.71		50.0	
10659-	Pulso Mayoform (2001)- 200()	Z	14.35	85.50	18.40		50.0	
AAA	Pulse Waveform (200Hz, 20%)	X	100.00	110.66	24.83	6.99	60.0	± 9.6 %
	-	Y	100.00	110.25	24.76		60.0	
	<u> </u>	Z	100.00	105.29	22.07		60.0	

10660- AAA	Pulse Waveform (200Hz, 40%)	X	100.00	112.93	24.53	3.98	80.0	± 9.6 %
		Y	100.00	108.47	22.64		80.0	
		Ż	100.00	104.83	20.58		80.0	
10661- AAA	Pulse Waveform (200Hz, 60%)	X	100.00	118.71	25.68	2.22	100.0	± 9.6 %
		Y	100.00	104.33	19.70		100.0	
		Z	100.00	104.48	19.32		100.0	
10662- AAA	Pulse Waveform (200Hz, 80%)	X	100.00	138.66	31.49	0.97	120.0	± 9.6 %
		Υ	0.19	60.00	4.09		120.0	
		Z	100.00	91.23	12.90		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.