# PCTEST ENGINEERING LABORATORY, INC.

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

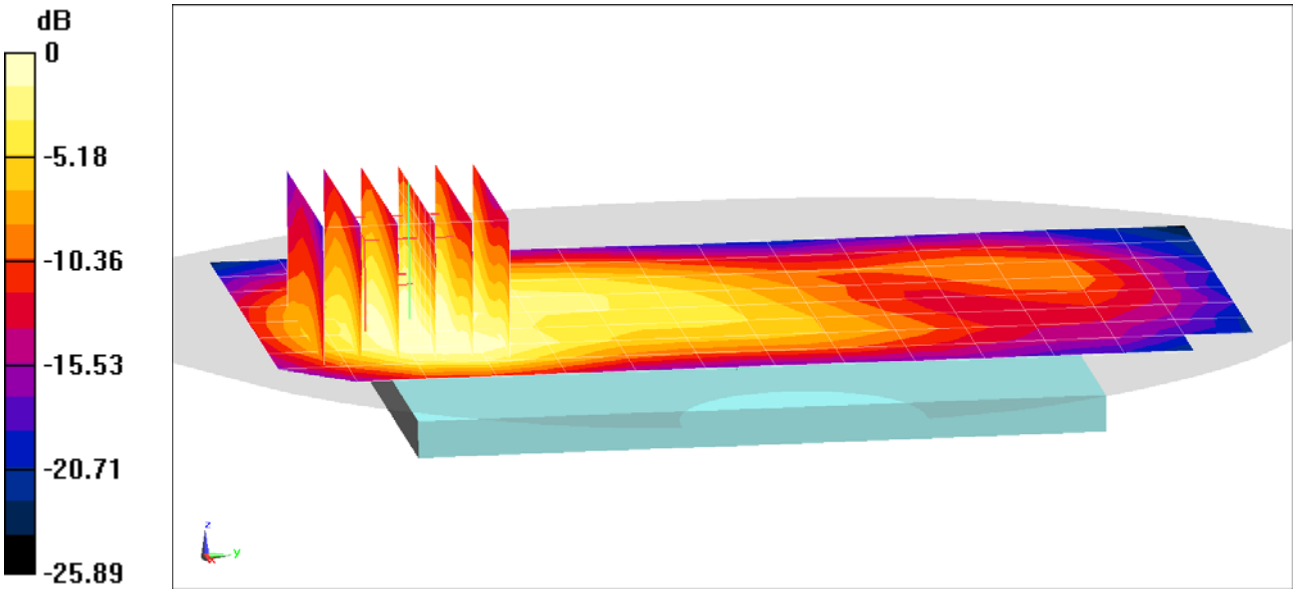
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1860 MHz; $\sigma$ = 1.526 S/m; $\varepsilon_r$ = 53.67; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

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

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

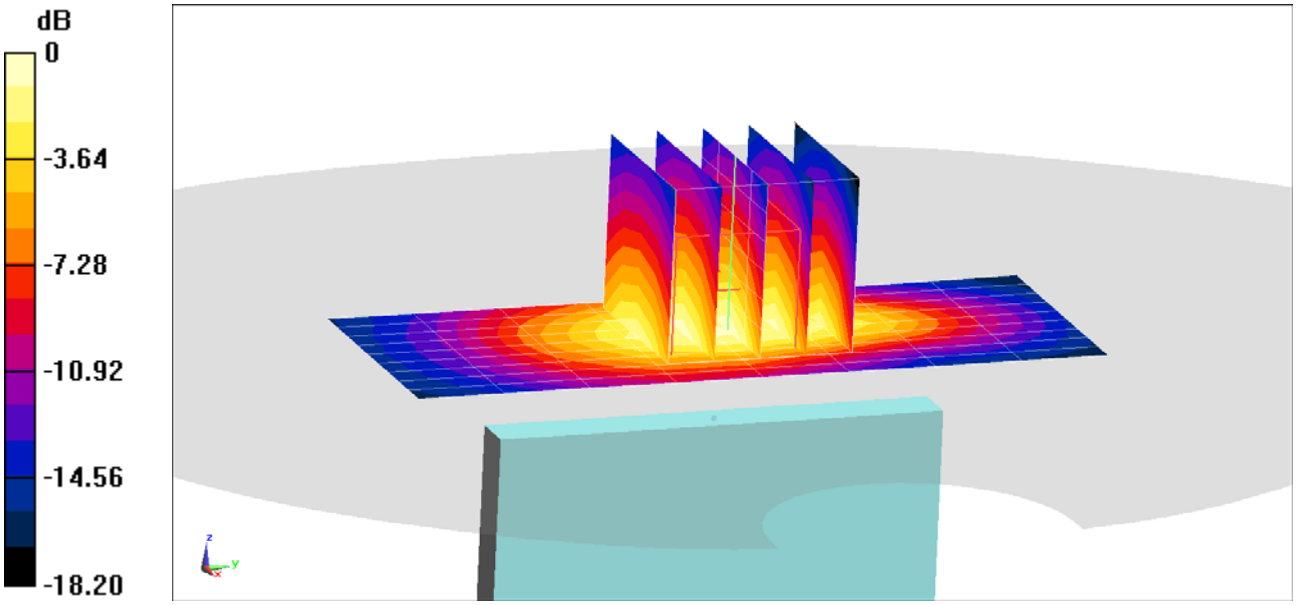
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; $\sigma$ = 1.571 S/m; $\varepsilon_r$ = 53.584; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

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

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

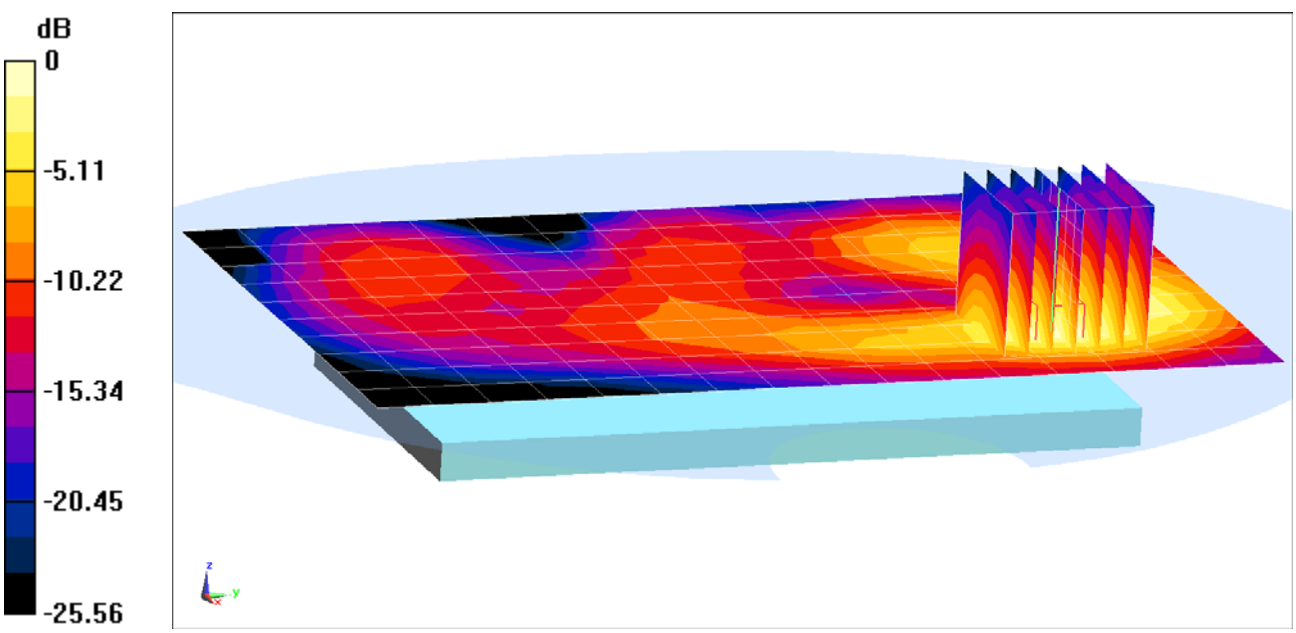
Communication System: UID 0, _IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2412 MHz; $\sigma$ = 1.97 S/m; $\varepsilon_r$ = 51.982; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

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

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

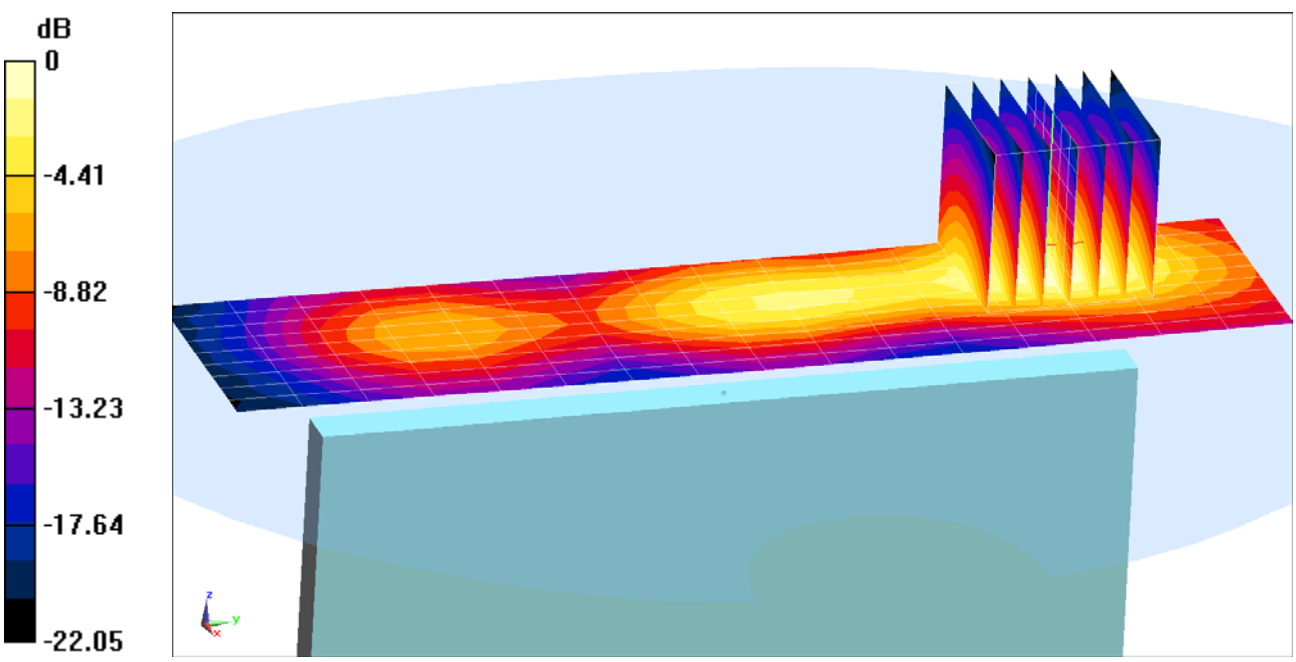
Communication System: UID 0, _IEEE 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used (interpolated):
f = 2462 MHz; $\sigma$ = 2.021 S/m; $\varepsilon_r$ = 51.826; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

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

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

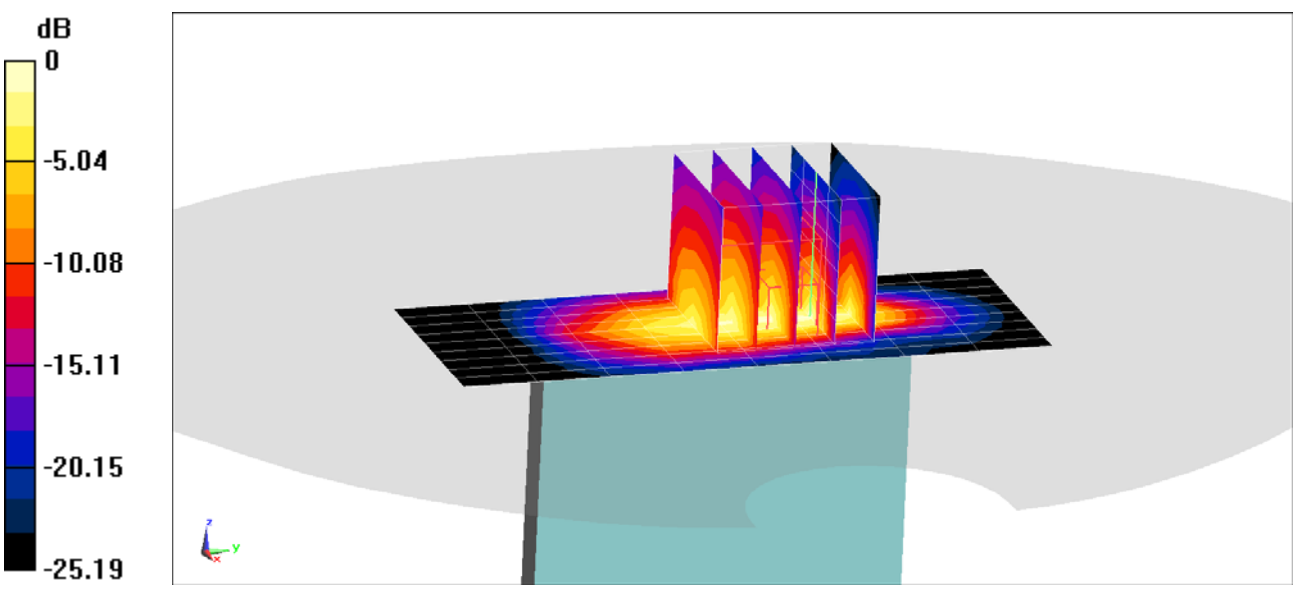
Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1732.4 MHz; $\sigma$ = 1.489 S/m; $\varepsilon_r$ = 51.351; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 0.0 cm

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

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

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

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

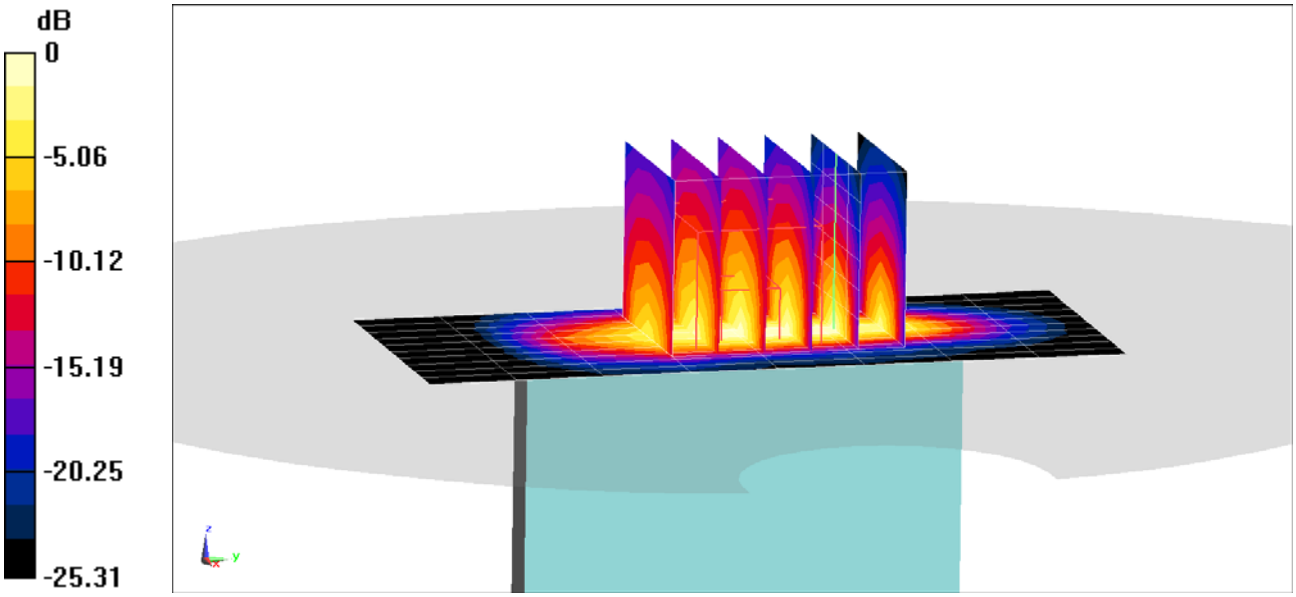
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1880 MHz; $\sigma$ = 1.558 S/m; $\varepsilon_r$ = 52.748; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 0.0 cm

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

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

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

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

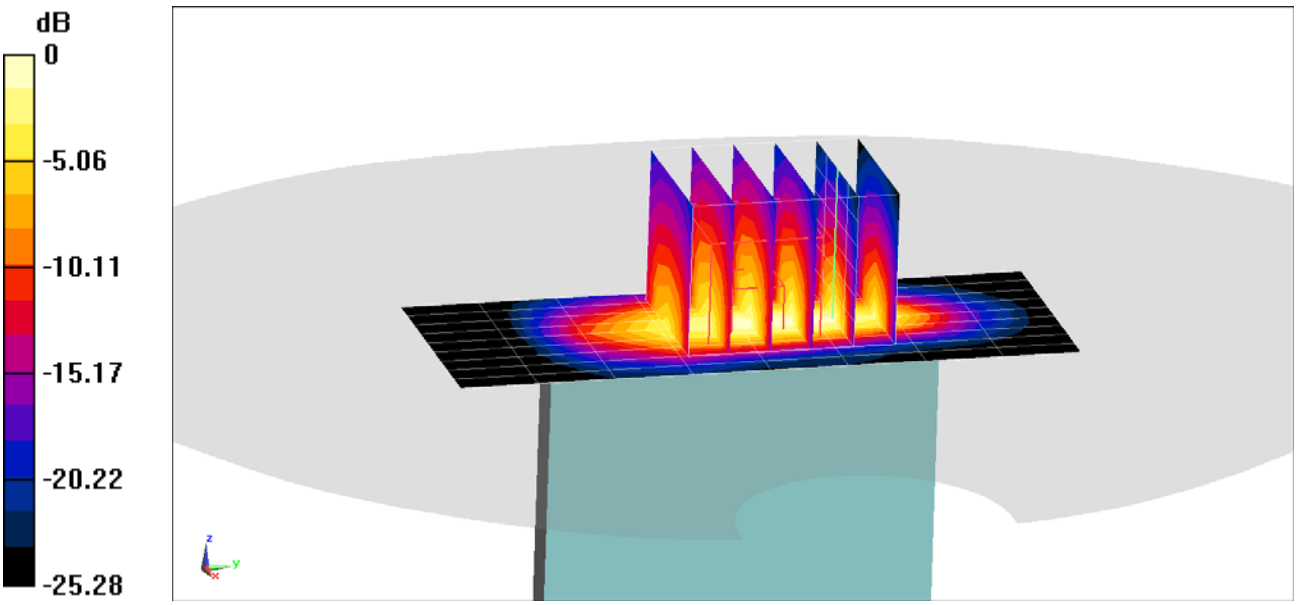
Communication System: UID 0, CDMA, CDMA; Frequency: 1908.75 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1908.75 MHz; $\sigma$ = 1.59 S/m; $\varepsilon_r$ = 53.495; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 0.0 cm

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

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

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

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

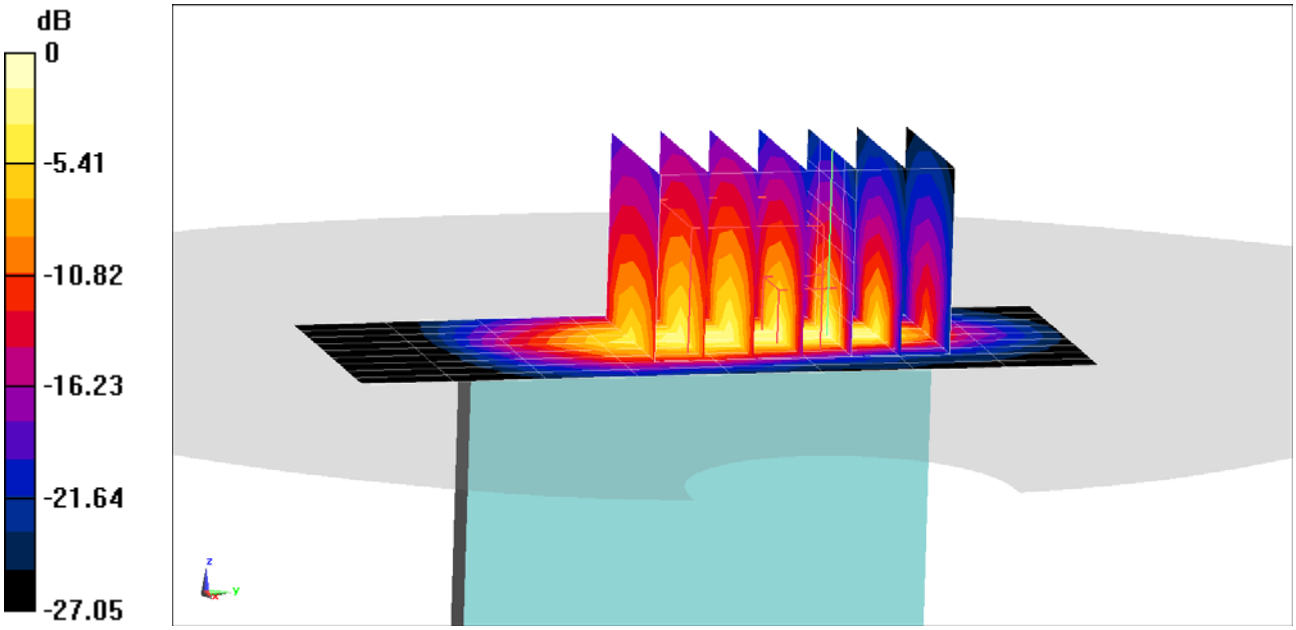
Communication System: UID 0, _LTE Band 66 (AWS); Frequency: 1770 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used (interpolated):
f = 1770 MHz; $\sigma$ = 1.533 S/m; $\varepsilon_r$ = 51.201; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 0.0 cm

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

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

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

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

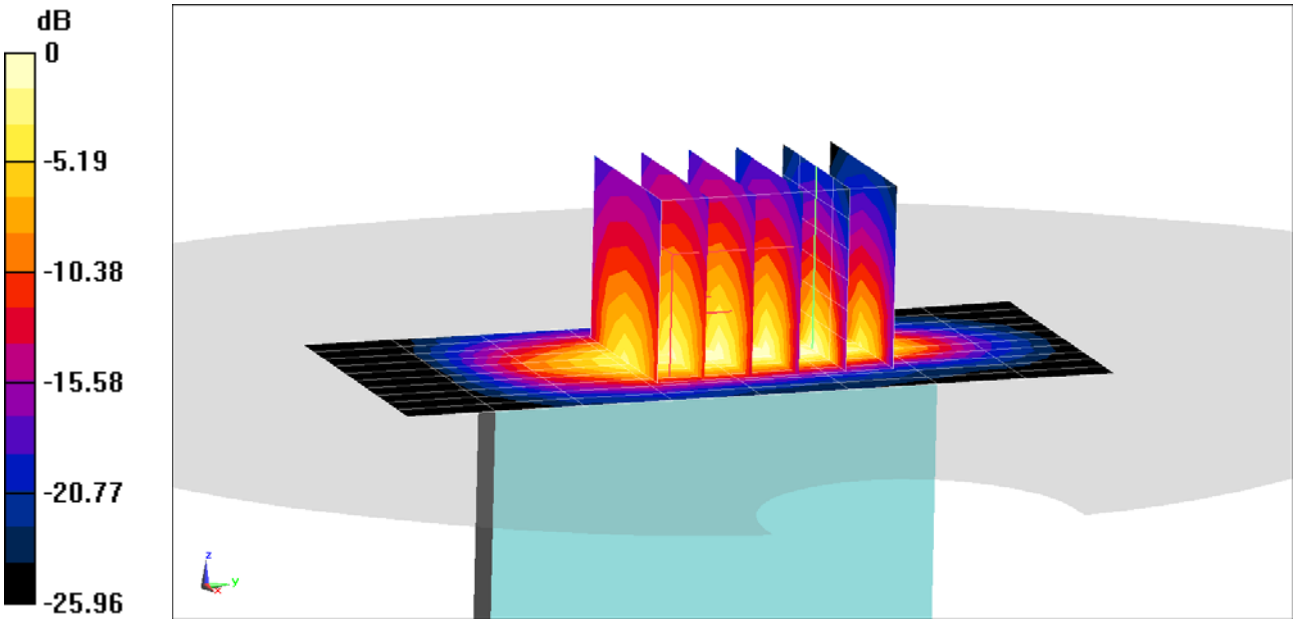
Communication System: UID 0, LTE Band 2 (PCS); Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; $\sigma$ = 1.581 S/m; $\varepsilon_r$ = 52.699; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 0.0 cm

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

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

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

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




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

# APPENDIX B: SYSTEM VERIFICATION

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# PCTEST ENGINEERING LABORATORY, INC.

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

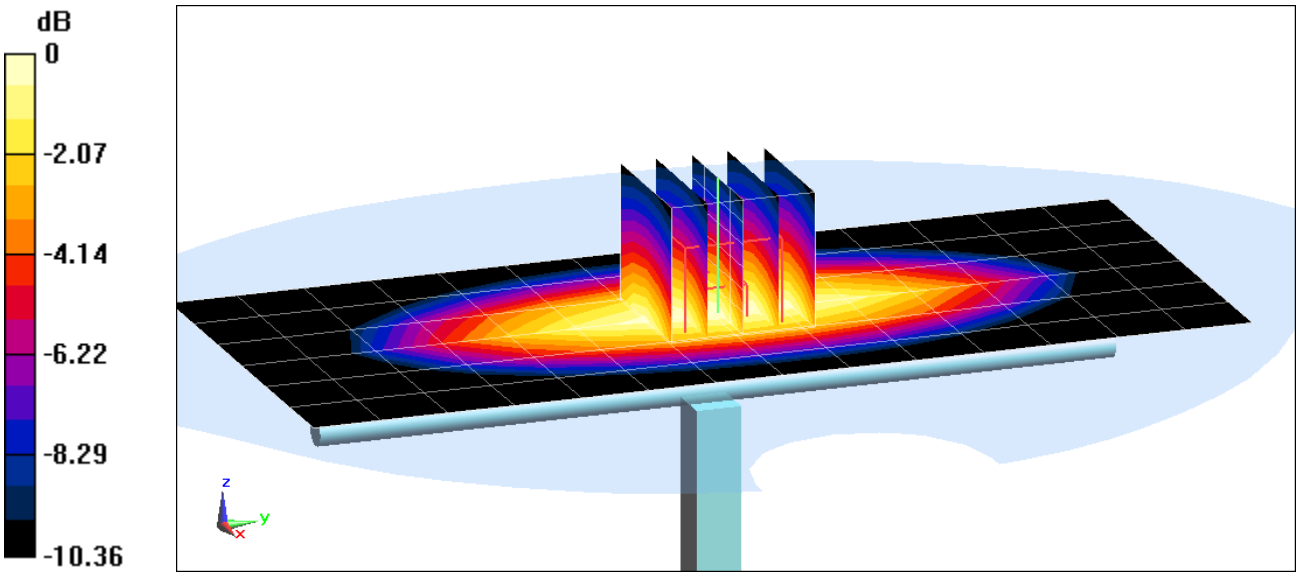
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used (interpolated):
f = 750 MHz; $\sigma$ = 0.877 S/m; $\varepsilon_r$ = 40.704; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.5 cm

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

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

## 750 MHz System Verification at 23.0 dBm (200 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

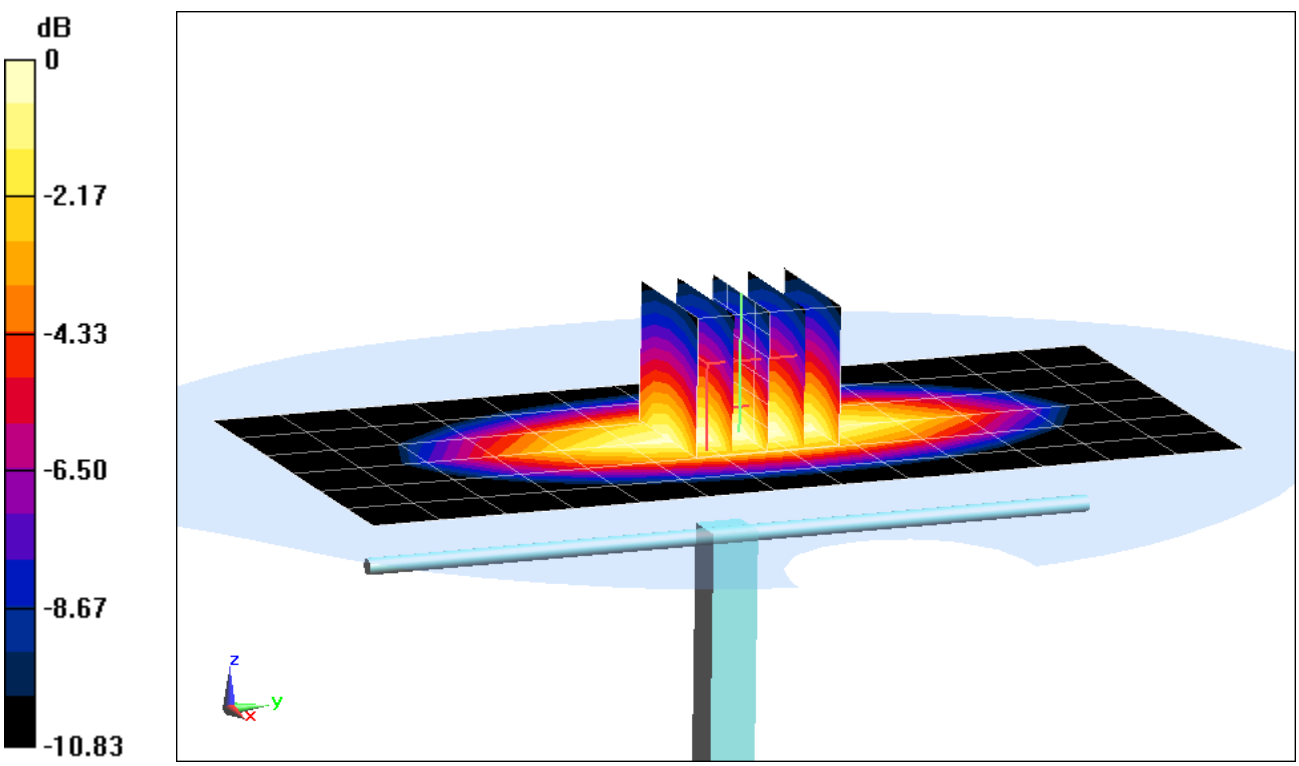
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; $\sigma$ = 0.94 S/m; $\varepsilon_r$ = 39.773; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.5 cm

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

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

## 835 MHz System Verification at 23.0 dBm (200 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

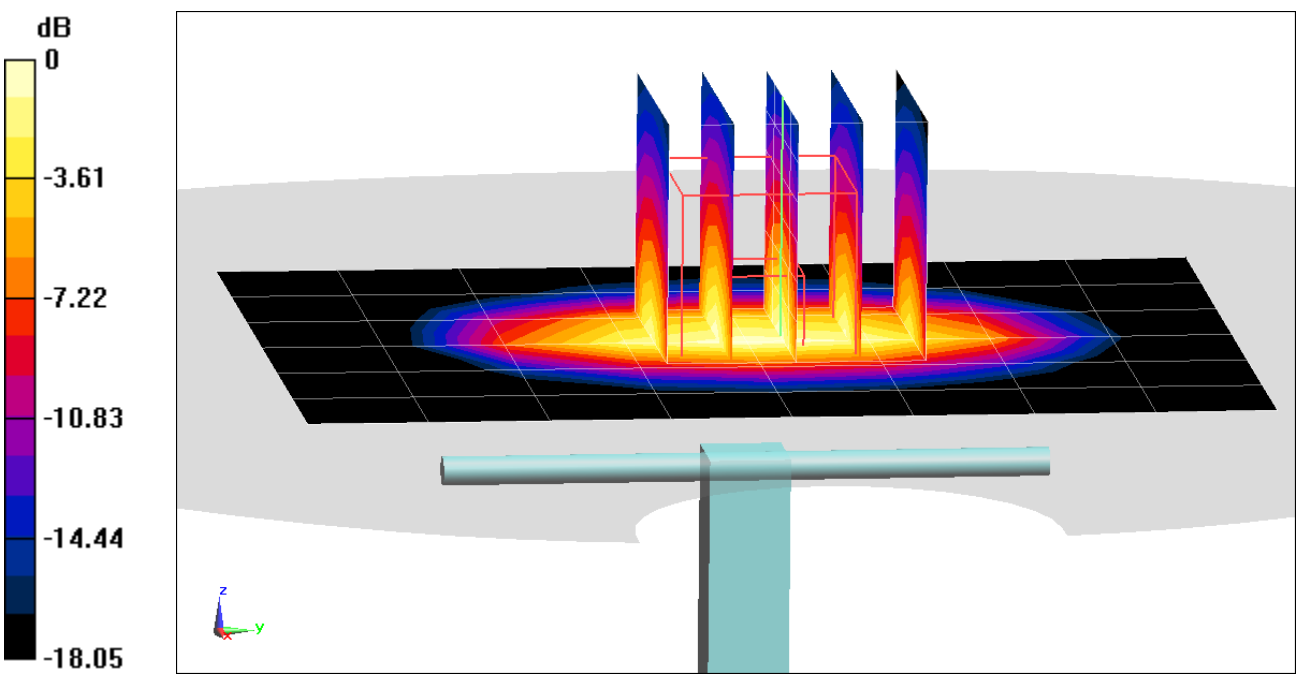
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; $\sigma$ = 1.404 S/m; $\varepsilon_r$ = 39.175; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

## 1750 MHz System Verification at 20.0 dBm (100 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

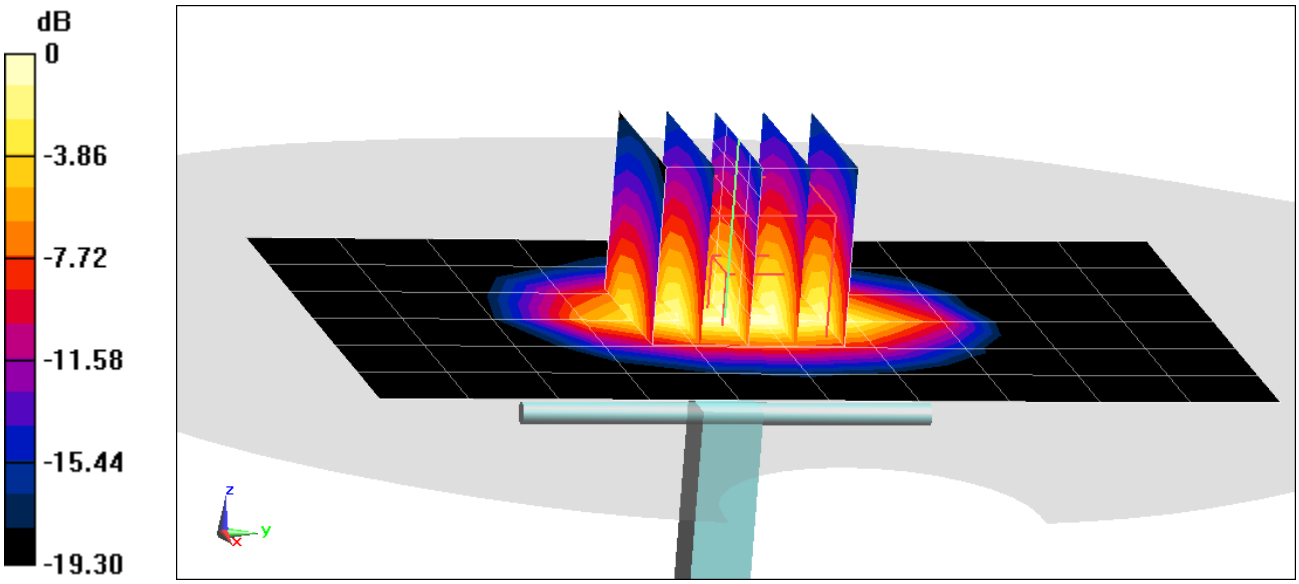
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; $\sigma$ = 1.439 S/m; $\varepsilon_r$ = 39.507; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

## 1900 MHz System Verification at 20.0 dBm (100 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

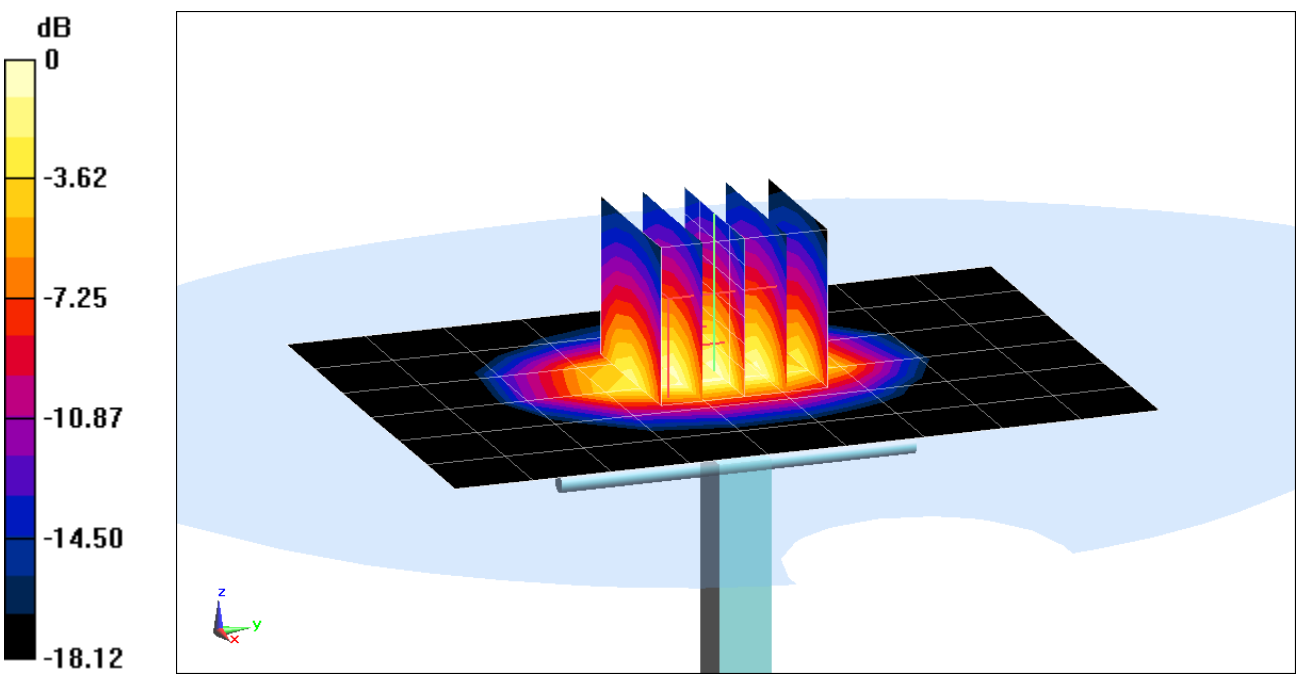
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used (interpolated):
f = 1900 MHz; $\sigma$ = 1.434 S/m; $\varepsilon_r$ = 39.818; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

## 1900 MHz System Verification at 20.0 dBm (100 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

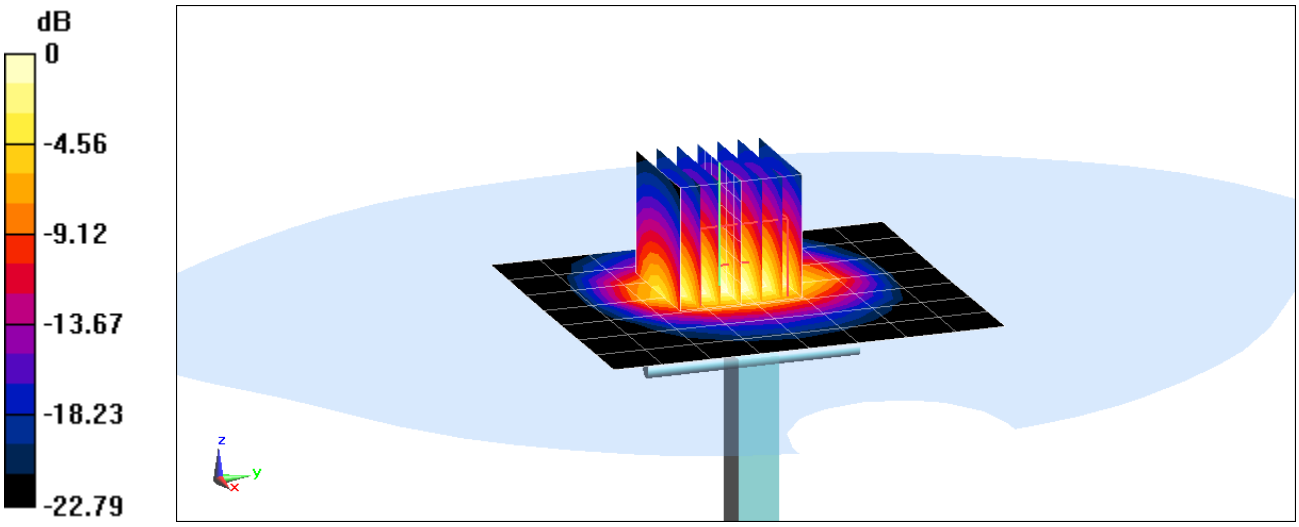
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; $\sigma$ = 1.764 S/m; $\varepsilon_r$ = 40.568; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

## 2450 MHz System Verification at 20.0 dBm (100 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

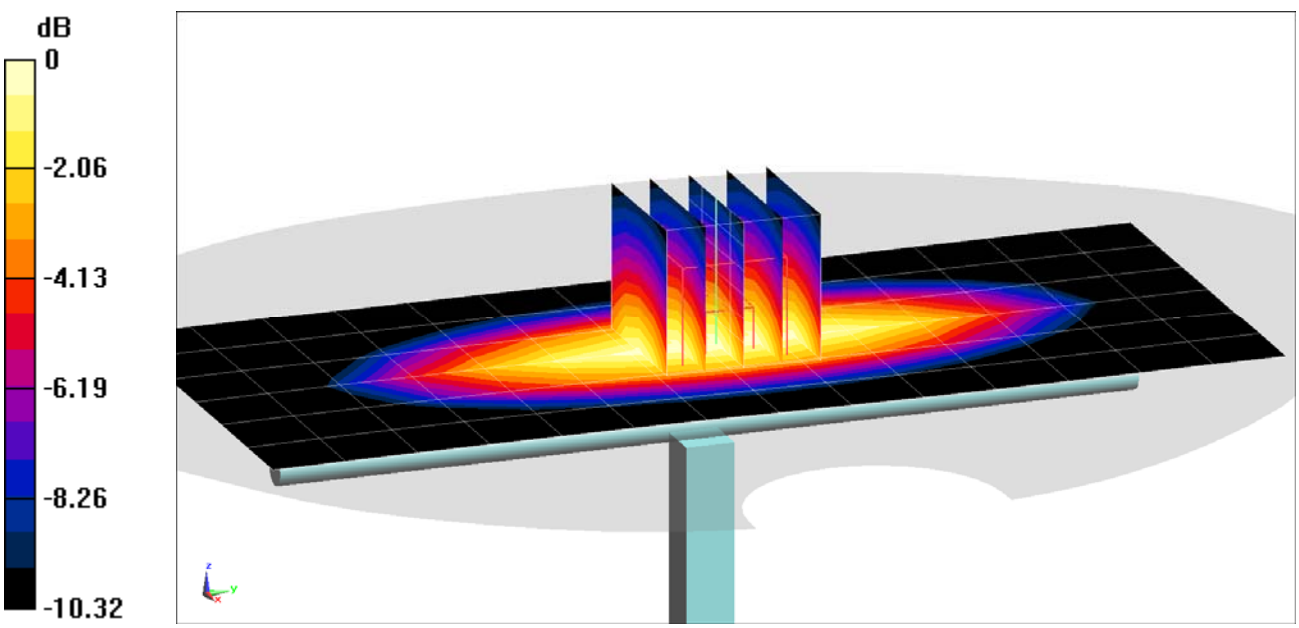
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; $\sigma$ = 0.978 S/m; $\varepsilon_r$ = 56.107; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.5 cm

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

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

## 750 MHz System Verification at 23.0 dBm (200 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

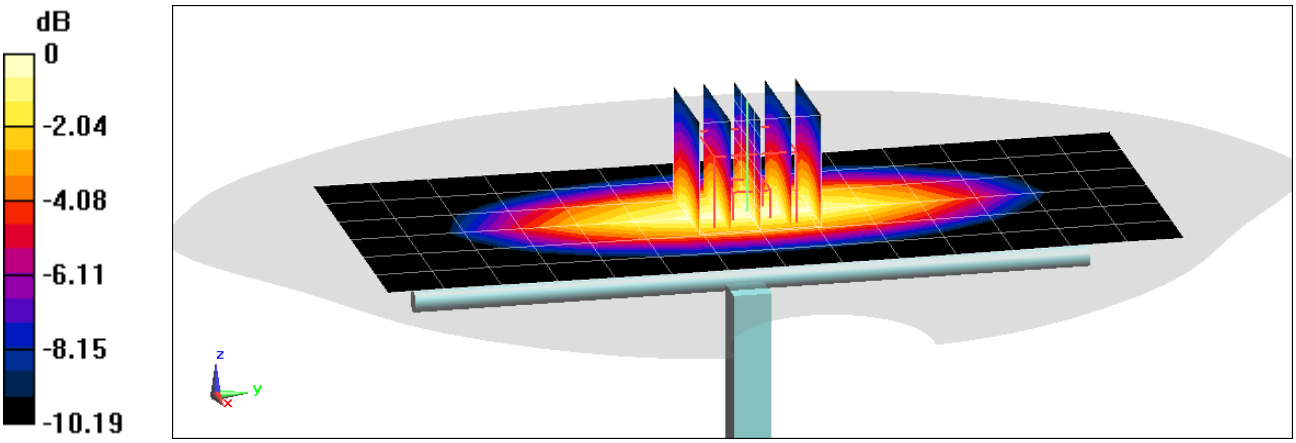
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used (interpolated):
f = 750 MHz; $\sigma$ = 0.974 S/m; $\varepsilon_r$ = 53.724; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.5 cm

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

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

## 750 MHz System Verification at 23.0 dBm (200 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

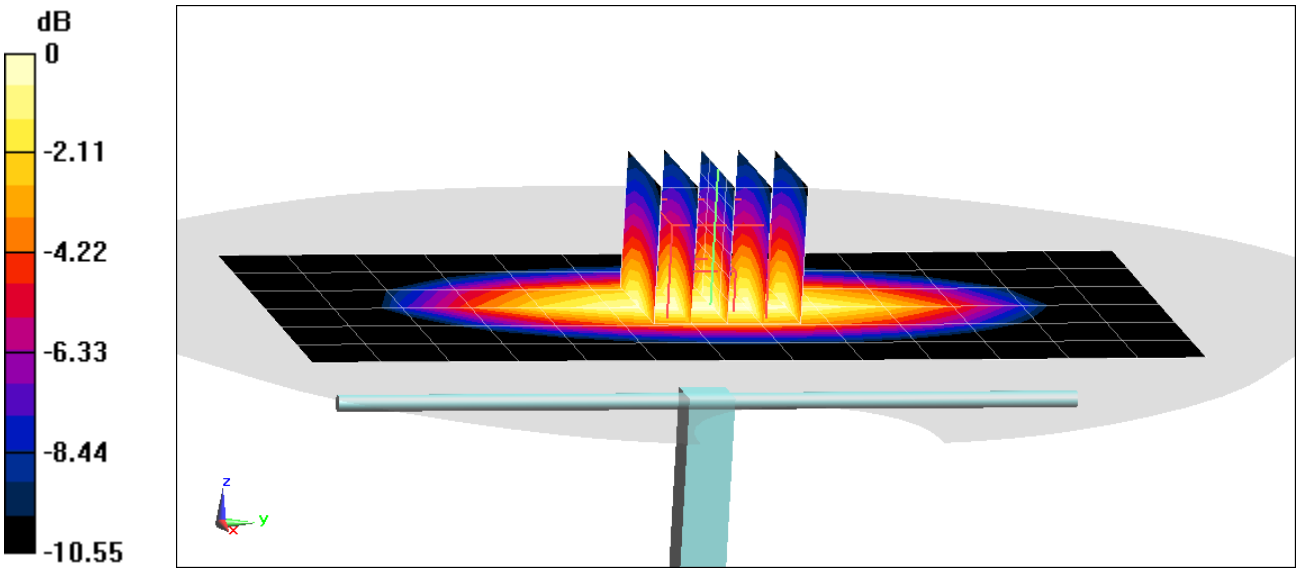
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; $\sigma$ = 0.985 S/m; $\varepsilon_r$ = 53.465; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.5 cm

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

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

## 835 MHz System Verification at 23.0 dBm (200 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

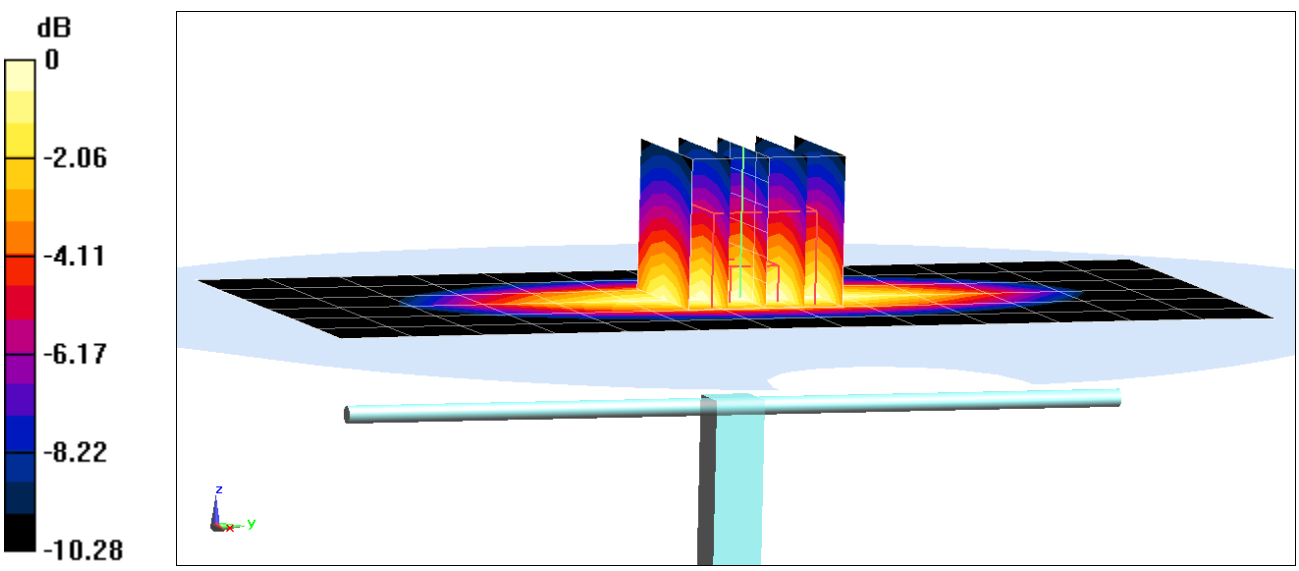
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; $\sigma$ = 0.964 S/m; $\varepsilon_r$ = 53.907; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.5 cm

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

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

## 835 MHz System Verification at 23.0 dBm (200 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

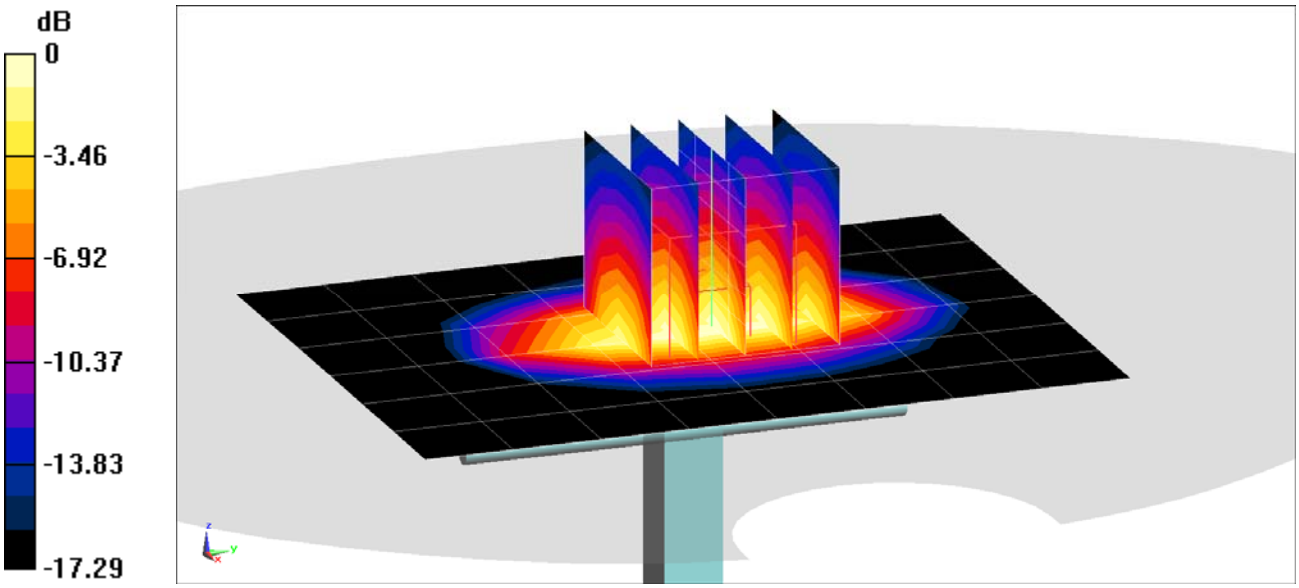
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; $\sigma$ = 1.51 S/m; $\varepsilon_r$ = 51.282; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

## 1750 MHz System Verification at 20.0 dBm (100 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

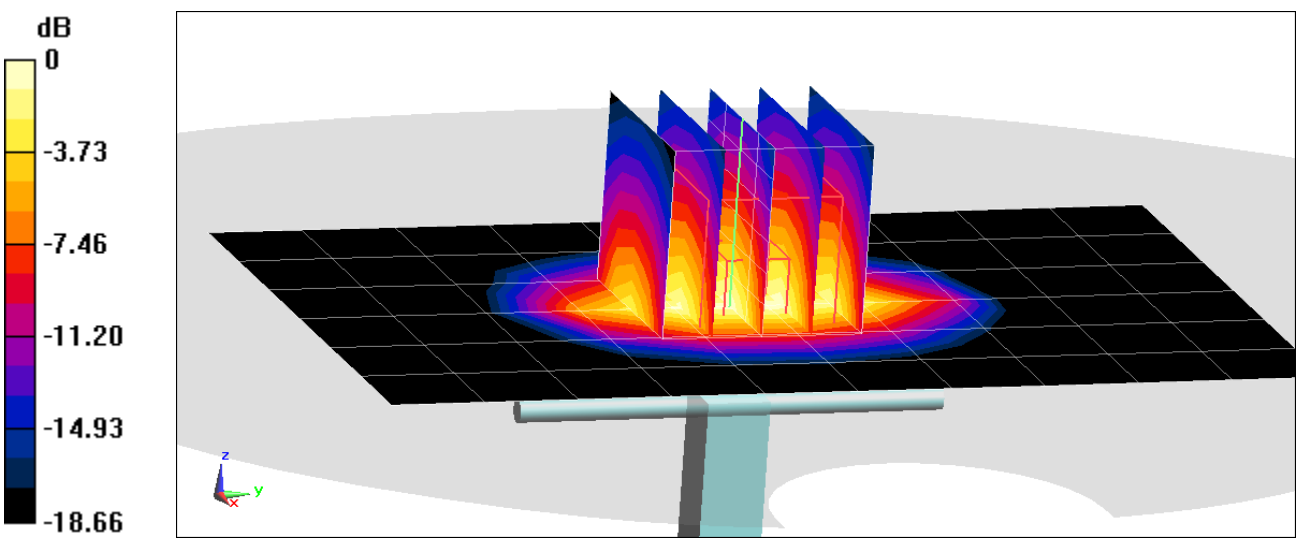
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; $\sigma$ = 1.571 S/m; $\varepsilon_r$ = 53.584; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

## 1900 MHz System Verification at 20.0 dBm (100 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

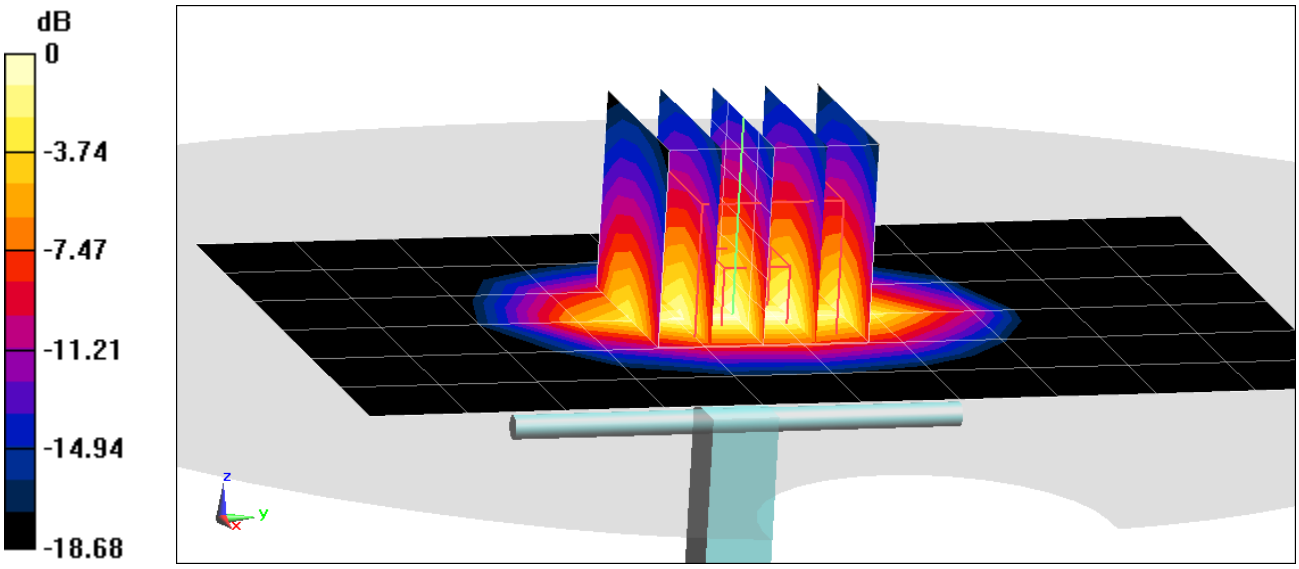
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; $\sigma$ = 1.581 S/m; $\varepsilon_r$ = 52.699; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

## 1900 MHz System Verification at 20.0 dBm (100 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

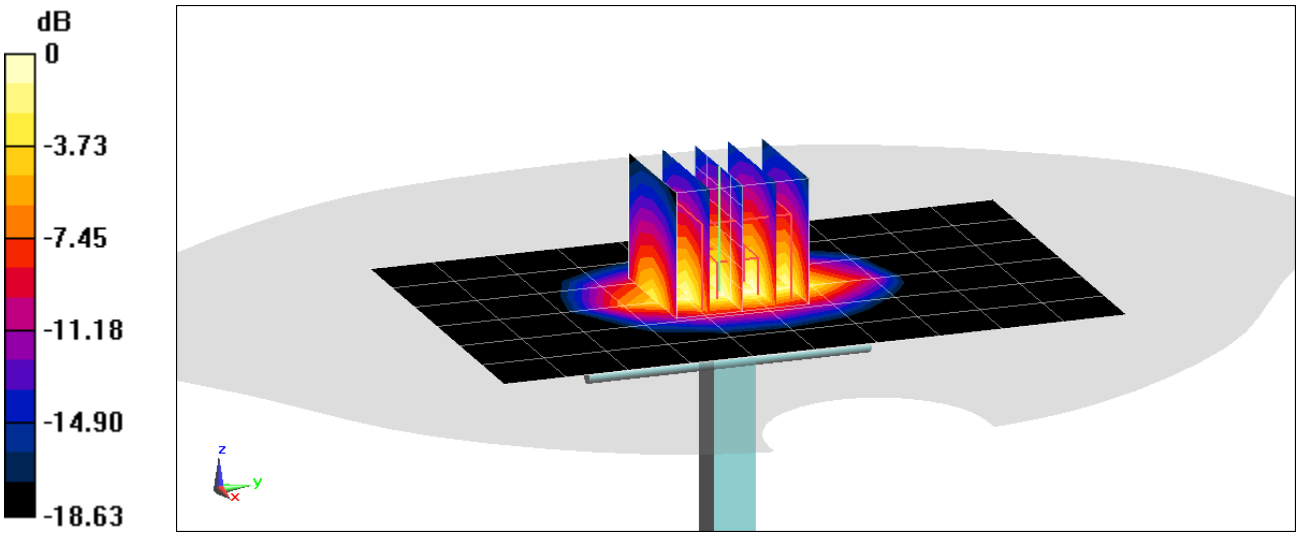
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used (interpolated):
f = 1900 MHz; $\sigma$ = 1.579 S/m; $\varepsilon_r$ = 53.528; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

## 1900 MHz System Verification at 20.0 dBm (100 mW)

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




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

# PCTEST ENGINEERING LABORATORY, INC.

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

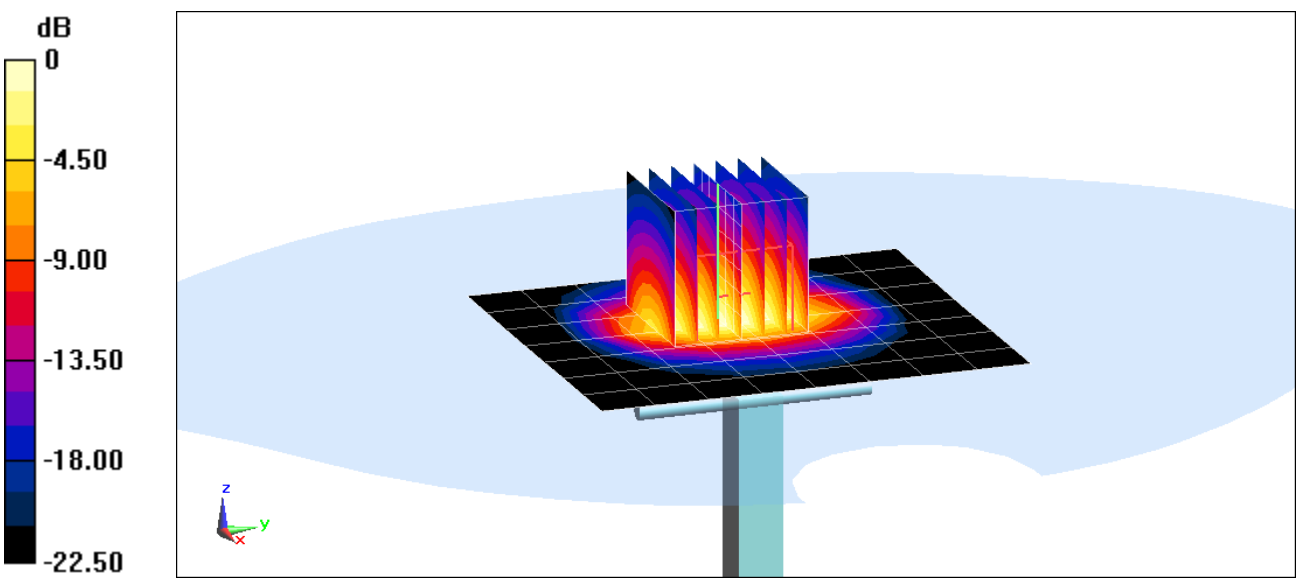
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; $\sigma$ = 2.006 S/m; $\varepsilon_r$ = 51.873; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section; Space: 1.0 cm

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

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

## 2450 MHz System Verification at 20.0 dBm (100 mW)

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




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

# APPENDIX C: PROBE CALIBRATION

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

**S** Schweizerischer Kalibrierdienst
**C** Service suisse d'étalonnage
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<br>Calibration procedure for dipole validation kits above 700 MHz |
| Calibration date: | January 15, 2018 |

BN
01-25-2018

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: January 15, 2018

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

## Glossary:

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

## Calibration is Performed According to the Following Standards:

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

## Additional Documentation:

e) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

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

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

## Measurement Conditions

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

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

## Head TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Head TSL

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

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

## Body TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Body TSL

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

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

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

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

### Antenna Parameters with Body TSL

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

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.043 ns |

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

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

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | January 21, 2009 |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Measurement Conditions

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

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

### SAR result with SAM Head (Top)

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

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

### SAR result with SAM Head (Mouth)

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

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

### SAR result with SAM Head (Neck)

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

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

### SAR result with SAM Head (Ear)

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

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

## 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**

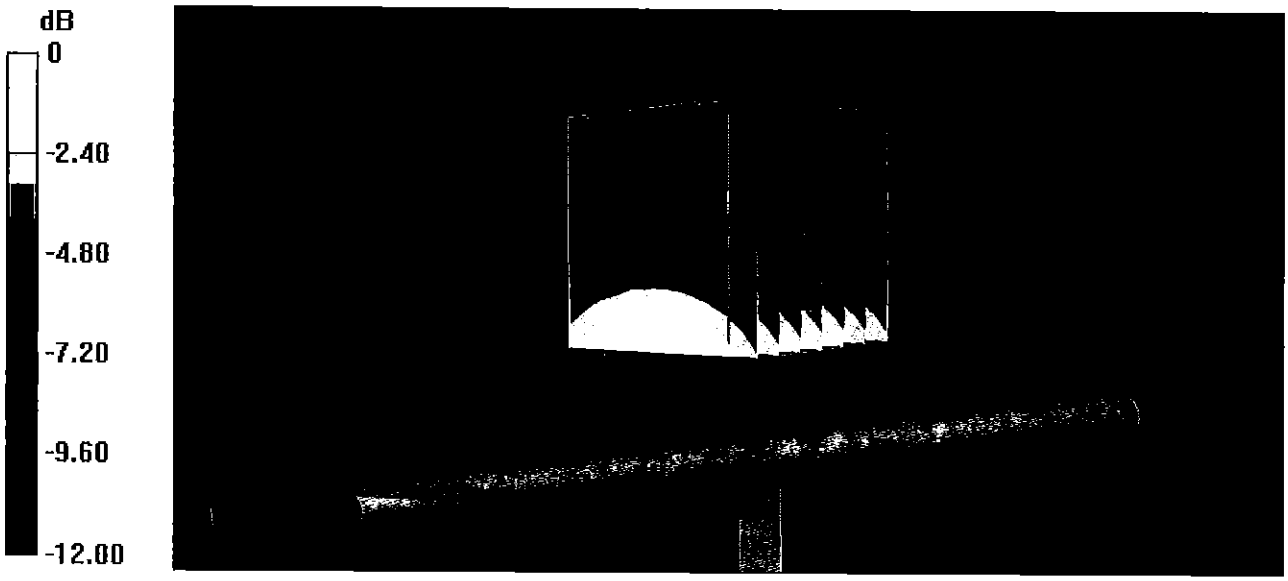
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; $\sigma$ = 0.9 S/m; $\varepsilon_r$ = 40.9; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

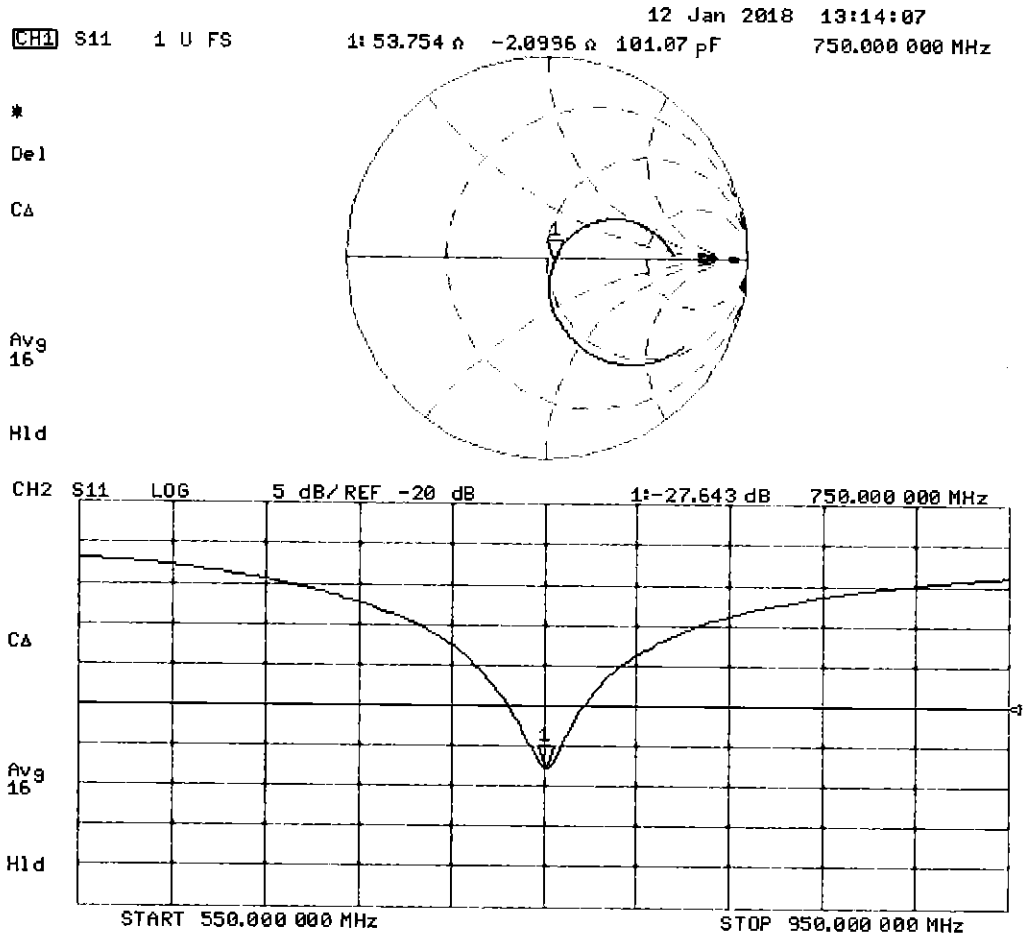
### Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Head TSL



## 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**

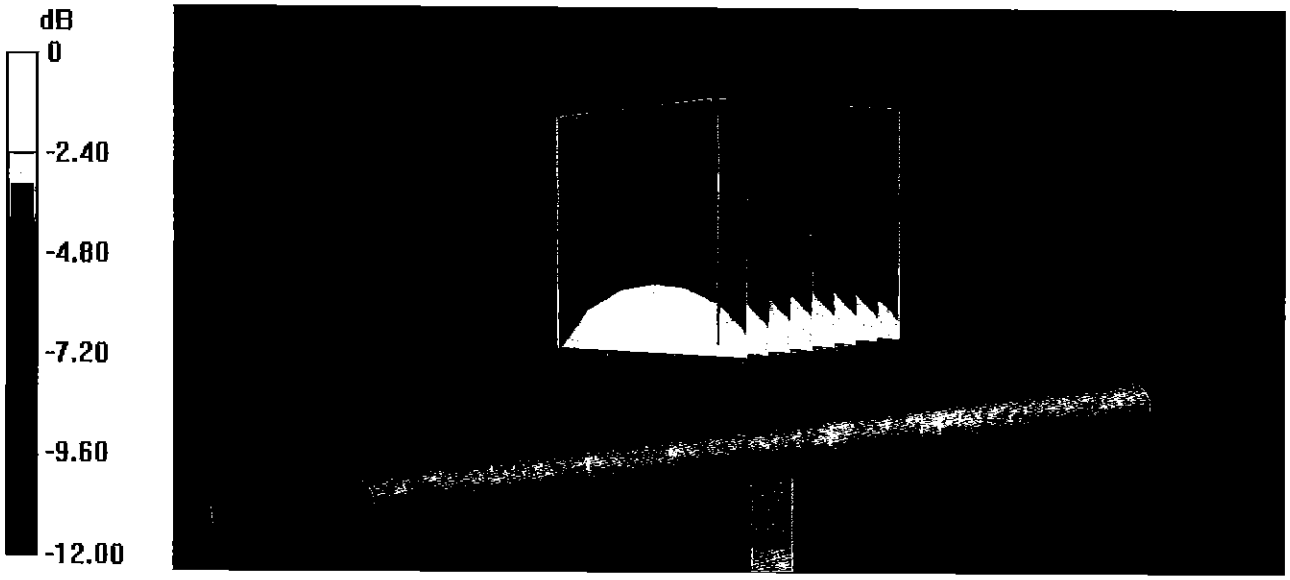
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; $\sigma$ = 0.96 S/m; $\varepsilon_r$ = 55; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

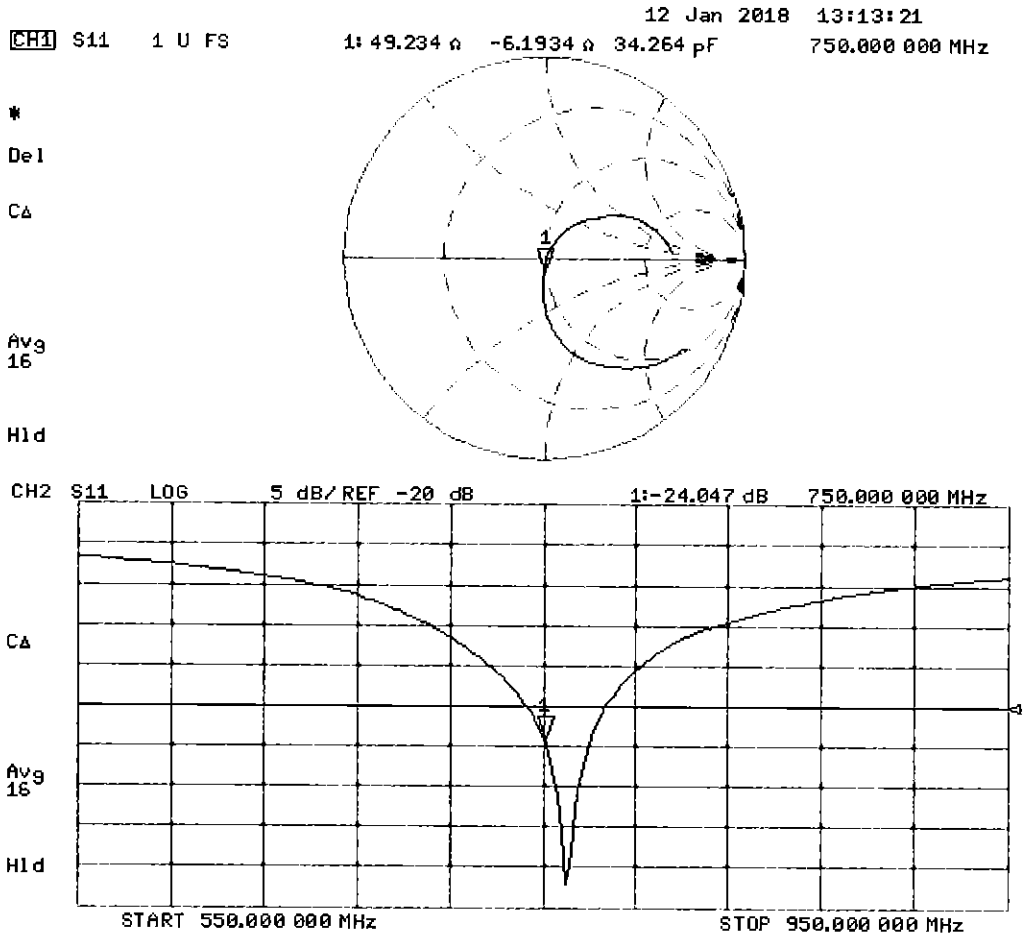
### Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x8x7)/Cube 0:

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




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

## Impedance Measurement Plot for Body TSL



## 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/m$^3$
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

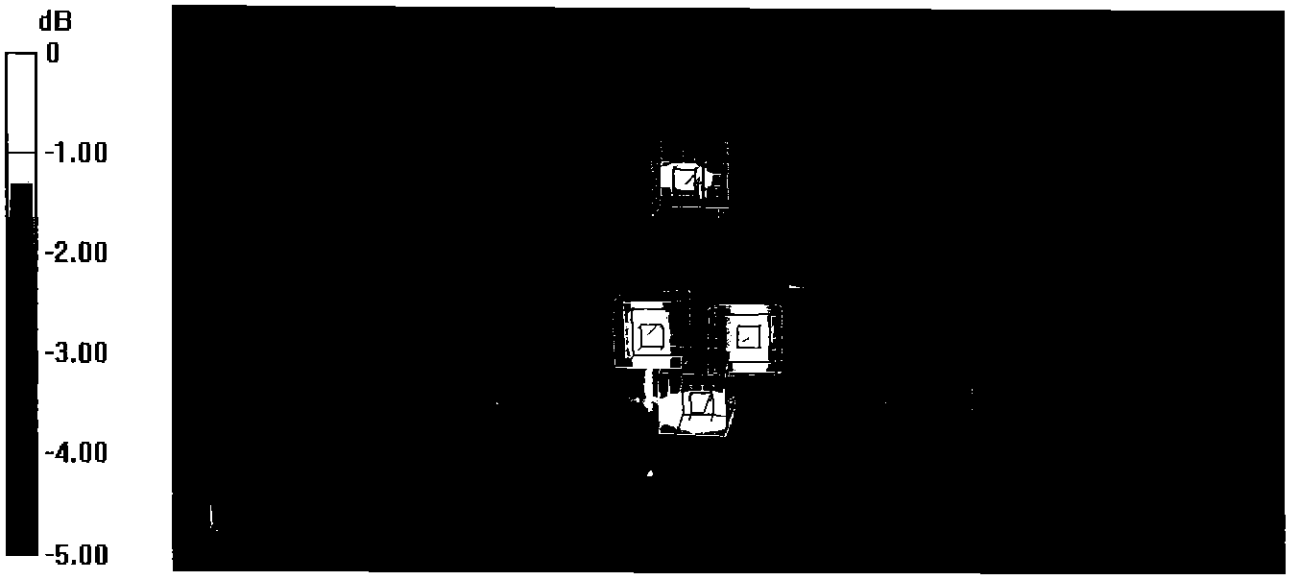
- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: SAM Head
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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

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

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

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




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

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**Zeughausstrasse 43, 8004 Zurich, Switzerland**

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**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: D750V3-1046_Feb18**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D750V3 - SN:1046 |
| Calibration procedure(s) | QA CAL-05.v9<br>Calibration procedure for dipole validation kits above 700 MHz |
| Calibration date: | February 07, 2018 |

BNV 03-02-2018

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: February 7, 2018

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

## Glossary:

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

## Calibration is Performed According to the Following Standards:

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

## Additional Documentation:

e) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

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

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

## Measurement Conditions

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

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

## Head TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Head TSL

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

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

## Body TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Body TSL

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

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

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

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

### Antenna Parameters with Body TSL

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

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.040 ns |

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

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

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | September 02, 2011 |

## DASY5 Validation Report for Head TSL

Date: 07.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

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

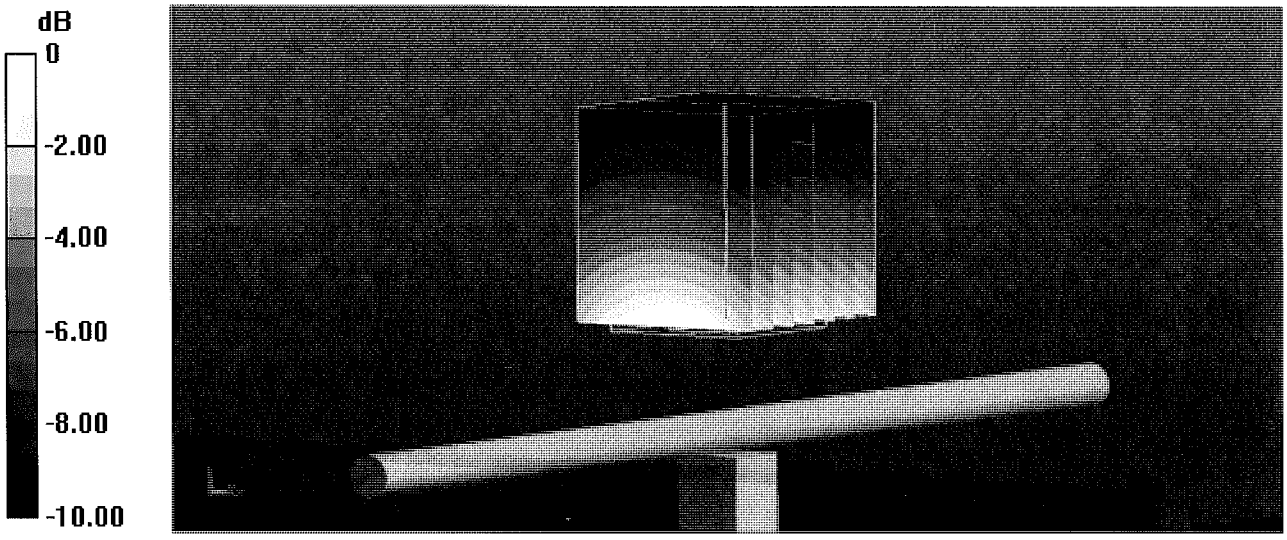
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; $\sigma$ = 0.89 S/m; $\varepsilon_r$ = 41.4; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

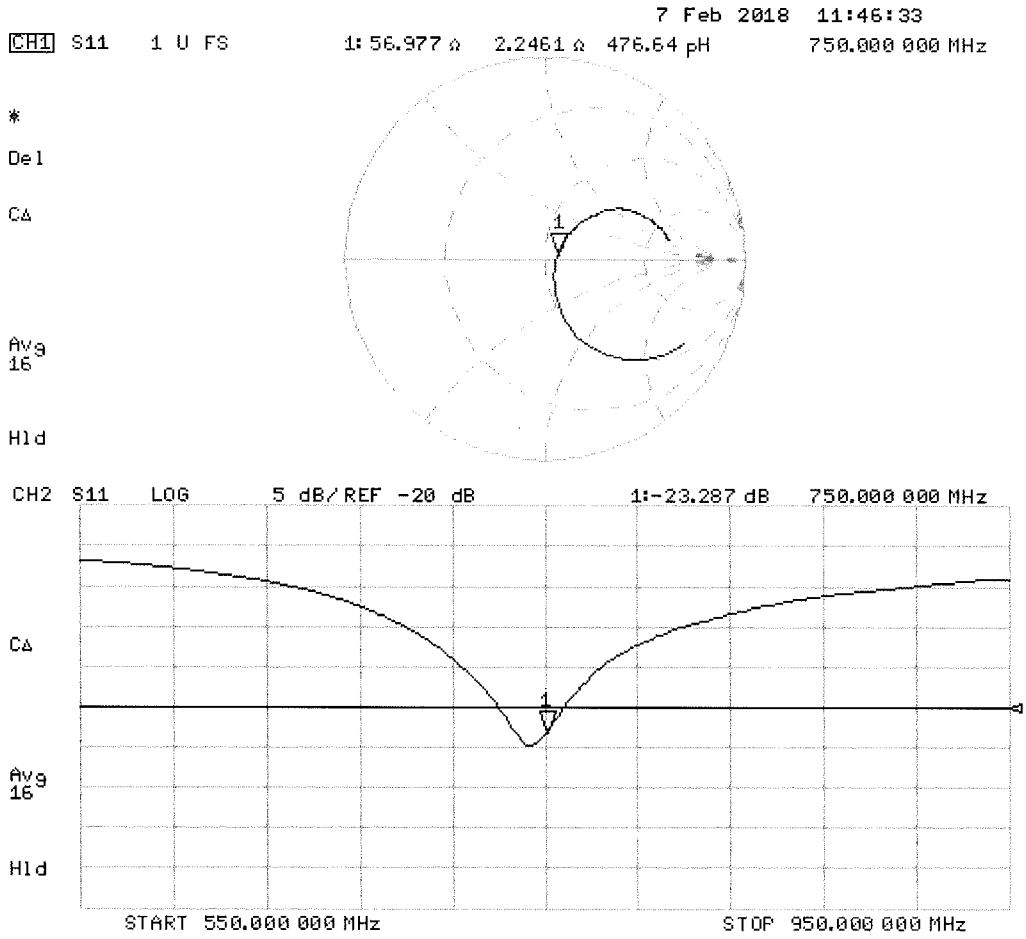
### Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 07.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

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

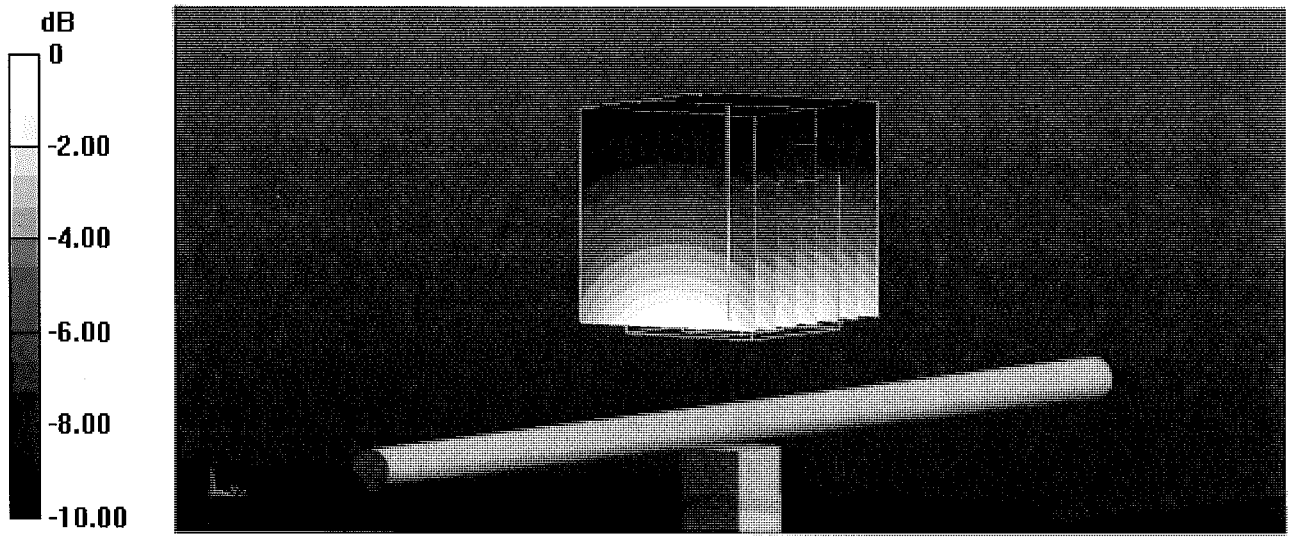
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; $\sigma$ = 0.96 S/m; $\varepsilon_r$ = 55.2; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

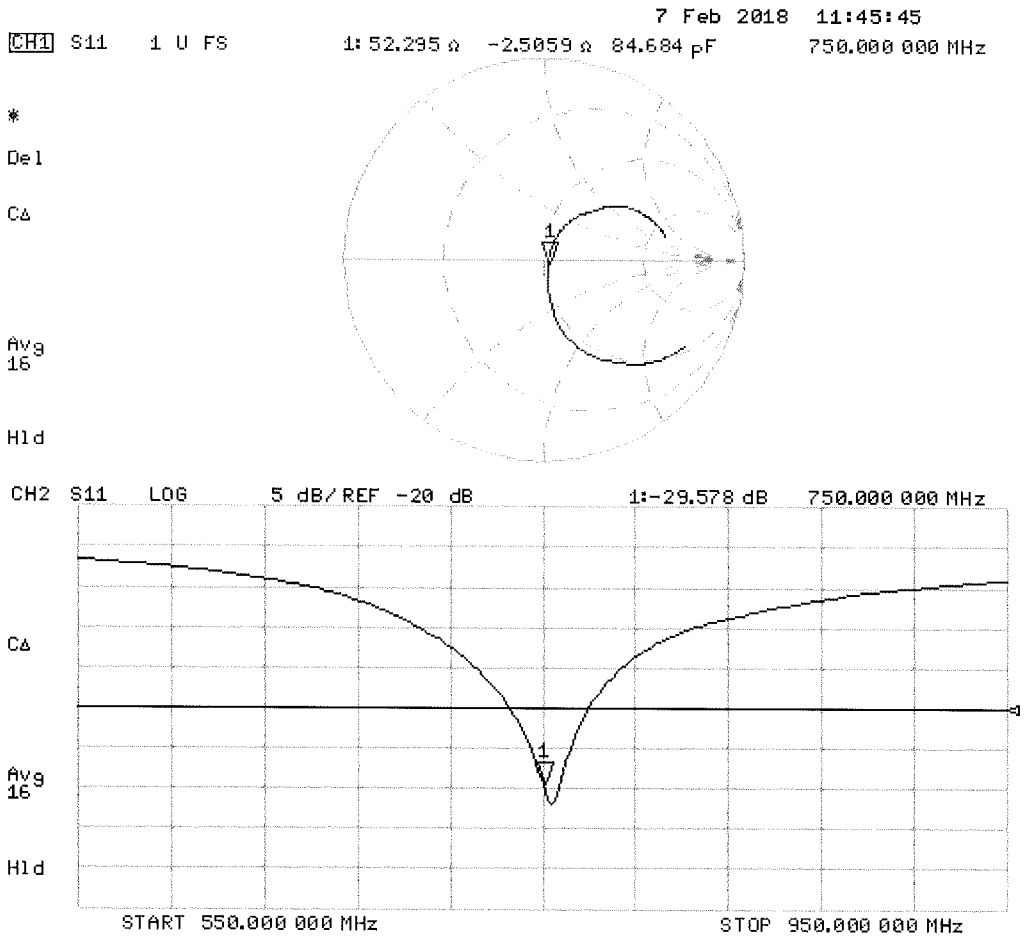
### Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Body TSL



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**Accreditation No.: SCS 0108**

**Client** **PC Test**

**Certificate No: D750V3-1161_Jul16**

# CALIBRATION CERTIFICATE

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

√PN
8/9/16
Extended
7/2017
SC

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: July 13, 2016

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

## Glossary:

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

## Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Additional Documentation:

e) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

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

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

## Measurement Conditions

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

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

## Head TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Head TSL

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

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

## Body TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Body TSL

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

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

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

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

### Antenna Parameters with Body TSL

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

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.033 ns |

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

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

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | November 19, 2015 |

## DASY5 Validation Report for Head TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

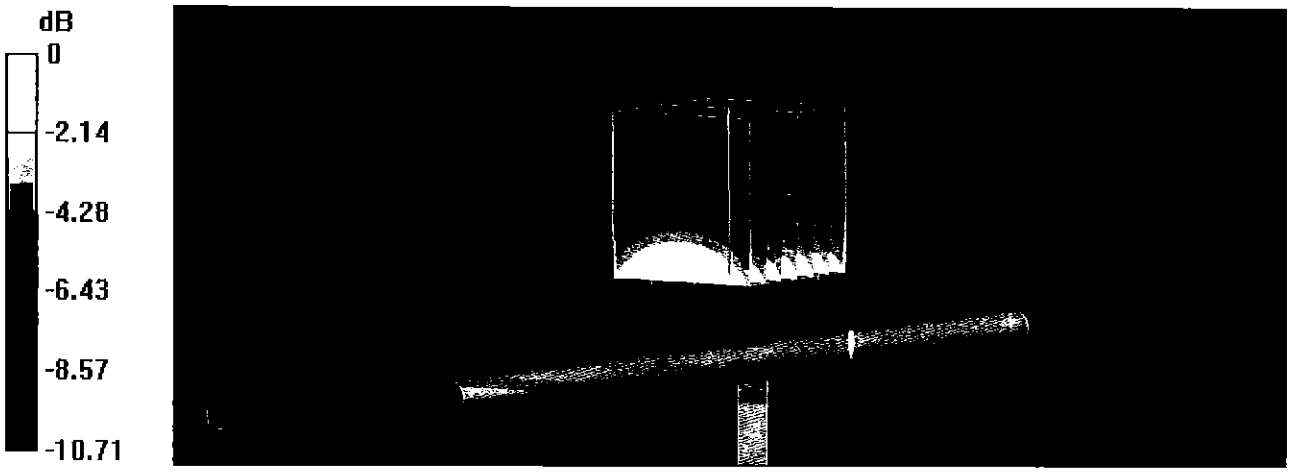
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; $\sigma$ = 0.91 S/m; $\varepsilon_r$ = 40.9; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

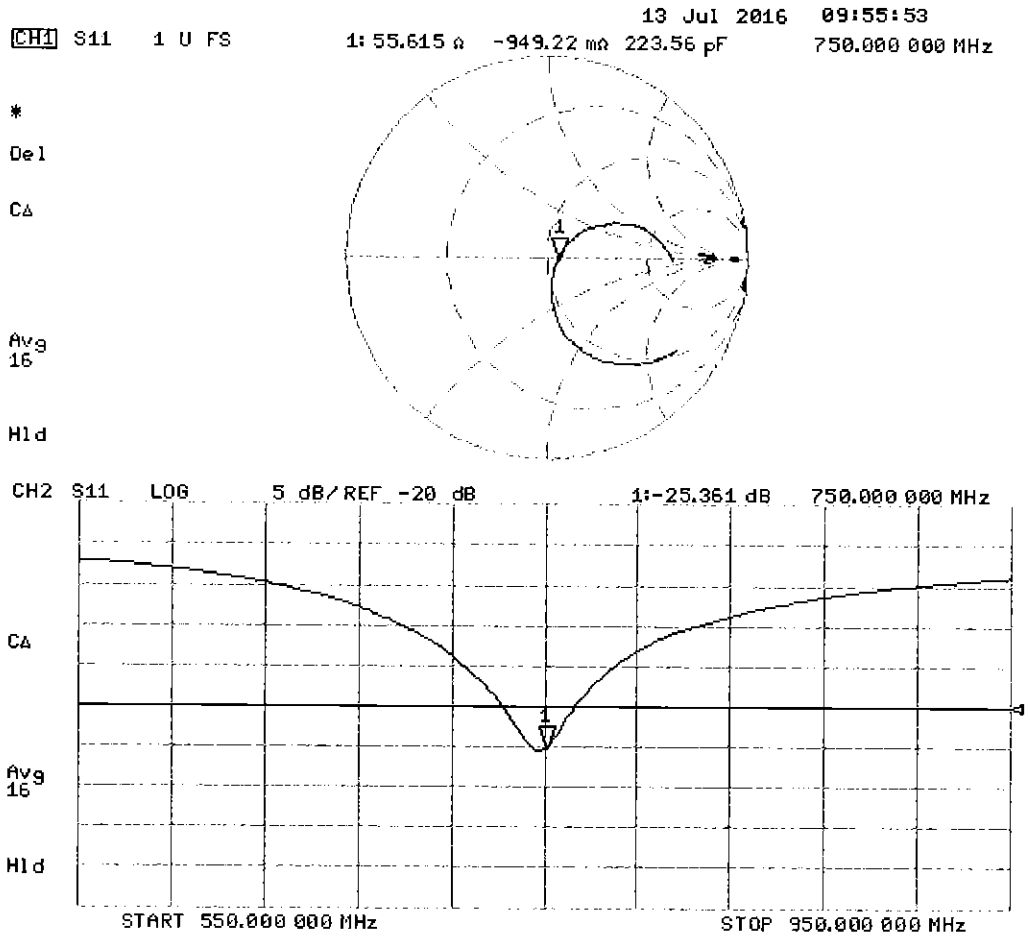
### Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 13.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

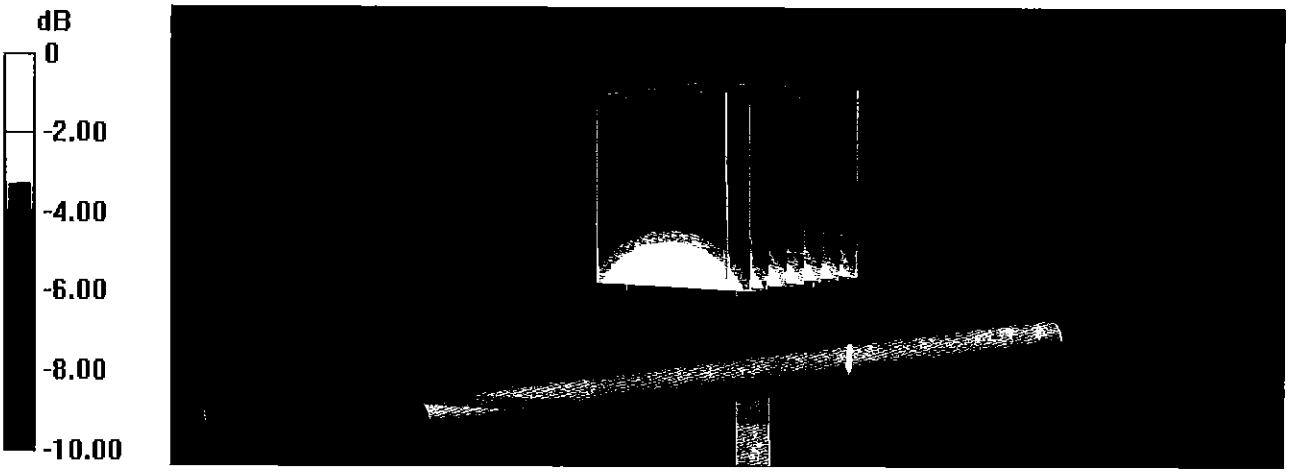
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; $\sigma$ = 0.99 S/m; $\varepsilon_r$ = 55.1; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

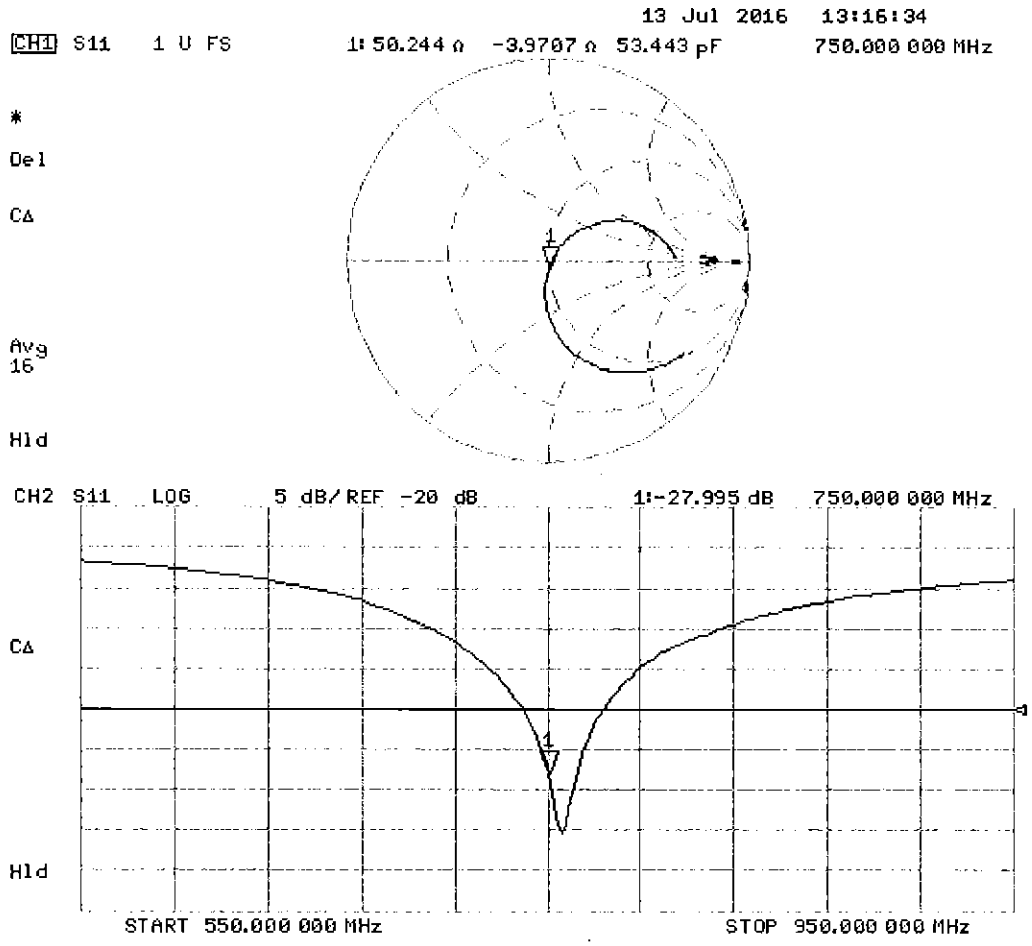
### Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Body TSL



# Certification of Calibration

Object D750V3 – SN: 1161

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

Calibration date: July 12, 2017

Description: SAR Validation Dipole at 750 MHz.

Calibration Equipment used:

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

Measurement Uncertainty = ±23% (k=2)

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

# DIPOLE CALIBRATION EXTENSION

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

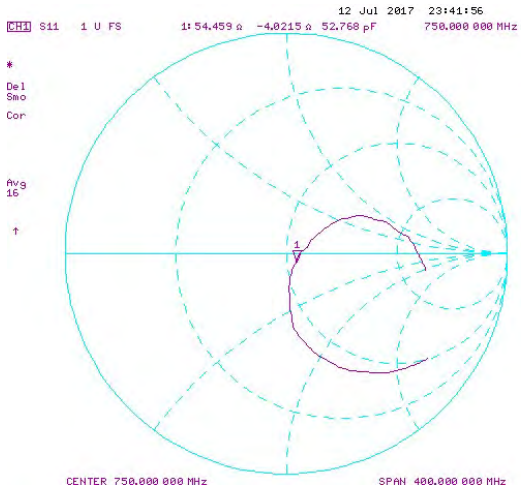
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does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

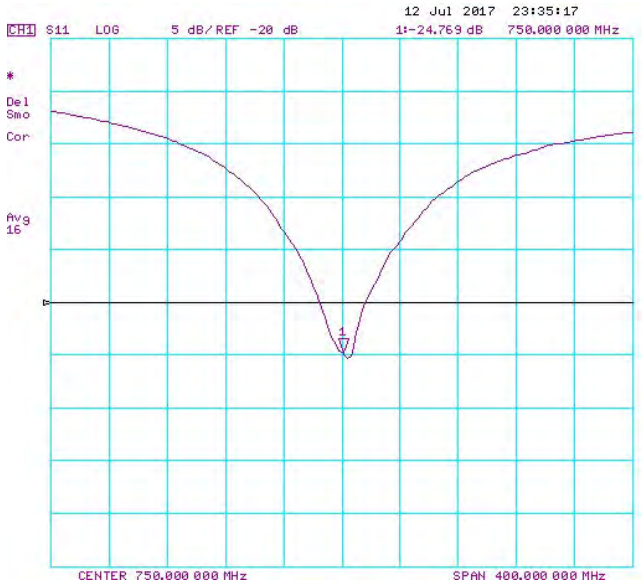
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

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

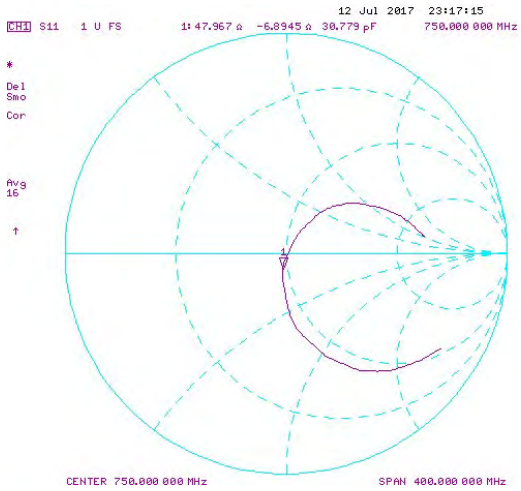
| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Body (1g) W/kg @ 23.0 dBm | Measured Body SAR (1g) W/kg @ 23.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 23.0 dBm | Measured Body SAR (10g) W/kg @ 23.0 dBm | Deviation 10g (%) | Certificate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

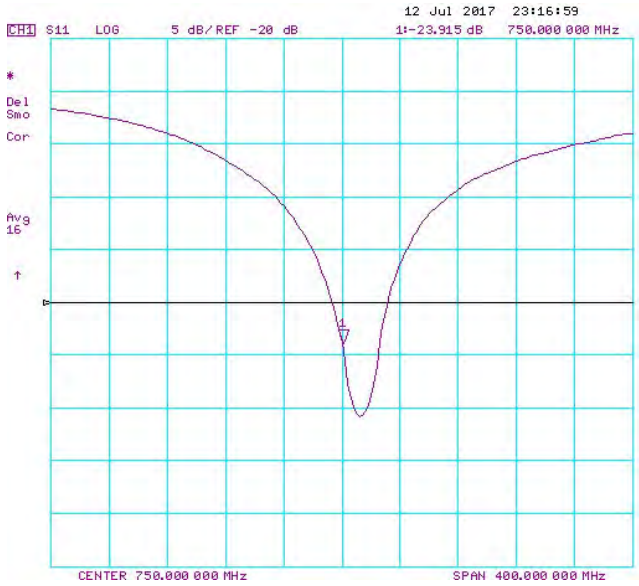
Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL



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

**S** Schweizerischer Kalibrierdienst
**C** 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**

**Accreditation No.: SCS 0108**

**Client** **PC Test**

**Certificate No: D835V2-4d132_Jan18**

# CALIBRATION CERTIFICATE

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

BN ✓
01-25-2018

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: January 15, 2018

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

## Glossary:

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

## Calibration is Performed According to the Following Standards:

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

## Additional Documentation:

e) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

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

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

## Measurement Conditions

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

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

## Head TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Head TSL

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

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

## Body TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Body TSL

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

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

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

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

### Antenna Parameters with Body TSL

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

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.386 ns |

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

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

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | July 22, 2011 |

## Appendix (Additional assessments outside the scope of SCS 0108)

### Measurement Conditions

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

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

### SAR result with SAM Head (Top)

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

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

### SAR result with SAM Head (Mouth)

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

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

### SAR result with SAM Head (Neck)

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

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

### SAR result with SAM Head (Ear)

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

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

## DASY5 Validation Report for Head TSL

Date: 08.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

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

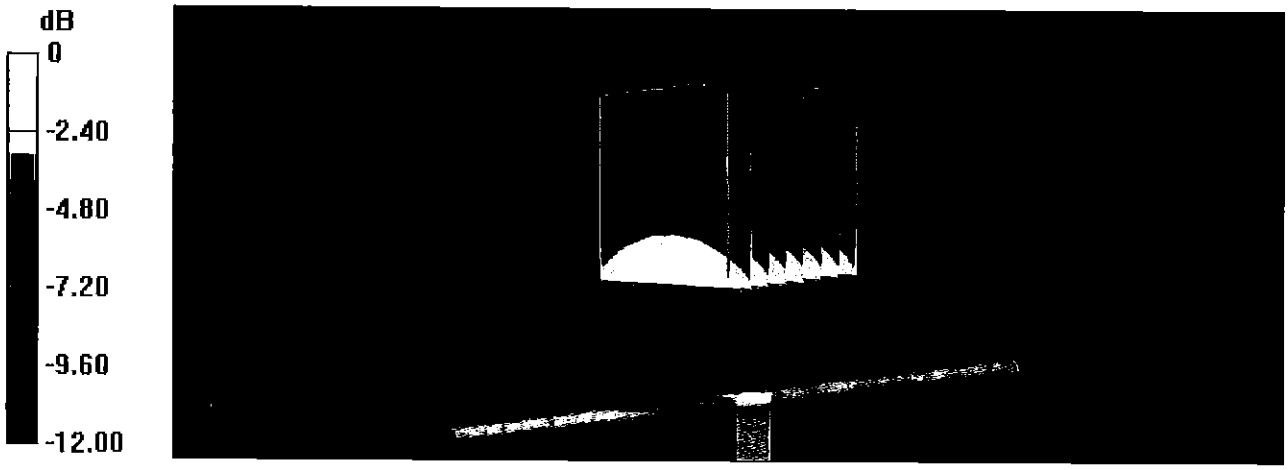
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma$ = 0.92 S/m; $\varepsilon_r$ = 40.7; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

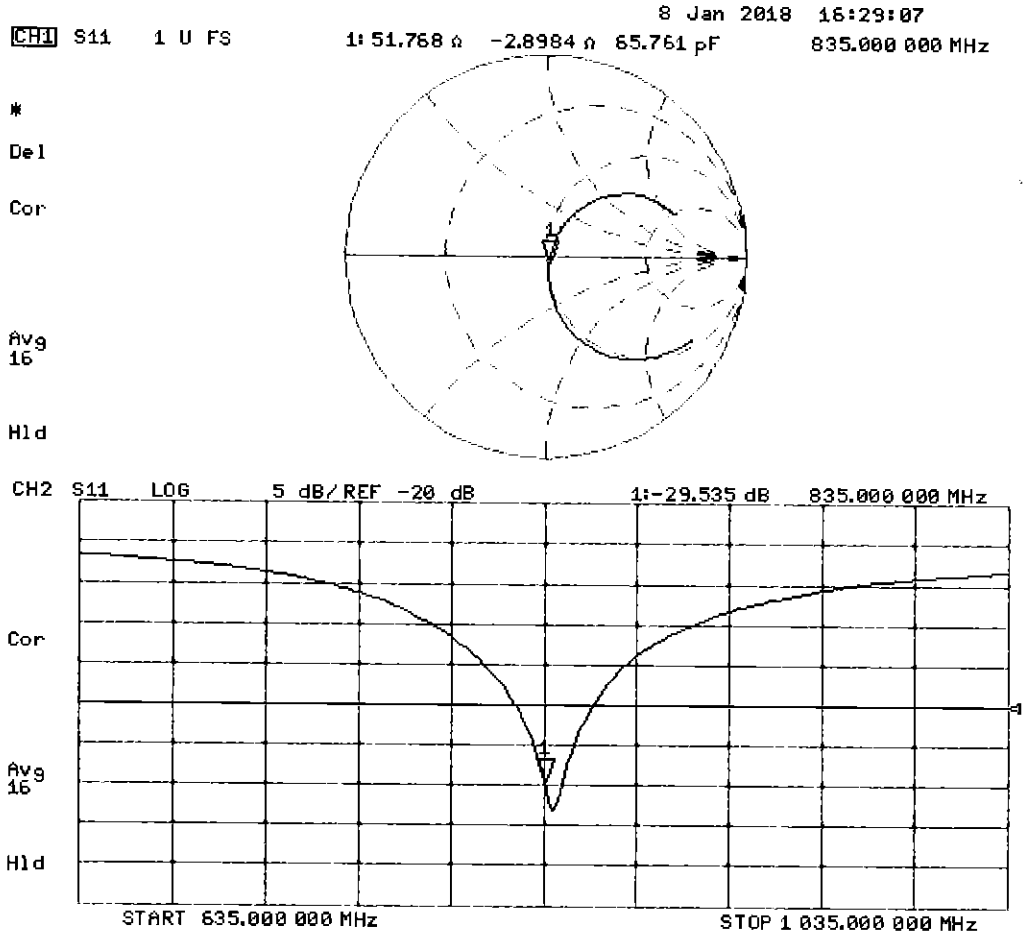
### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 08.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

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

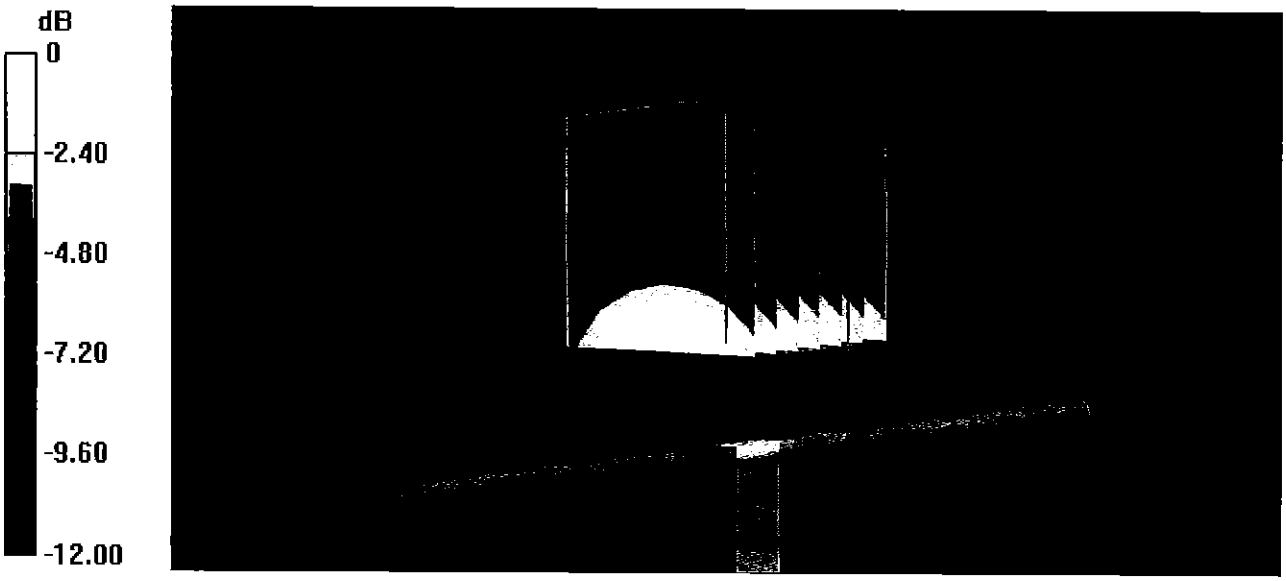
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma$ = 0.99 S/m; $\varepsilon_r$ = 54.8; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

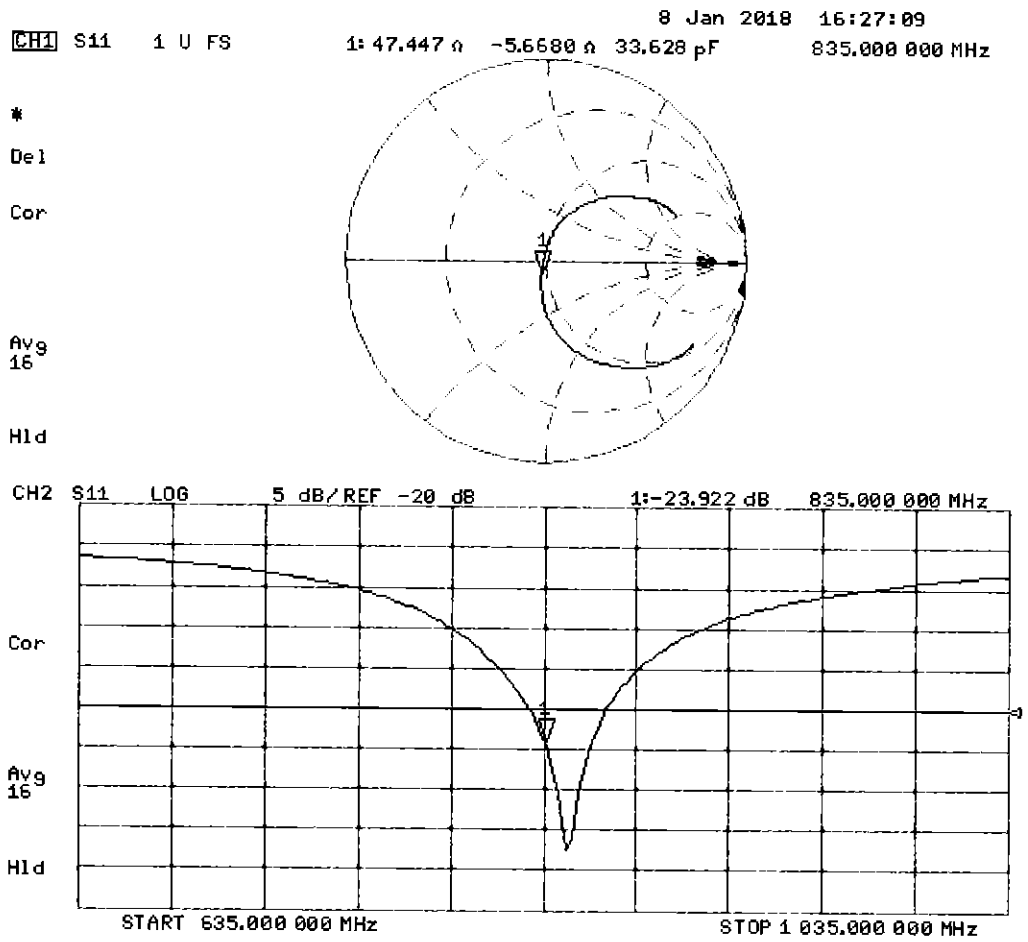
### Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Body TSL



## DASY5 Validation Report for SAM Head

Date: 15.01.2018

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

DASY52 Configuration:

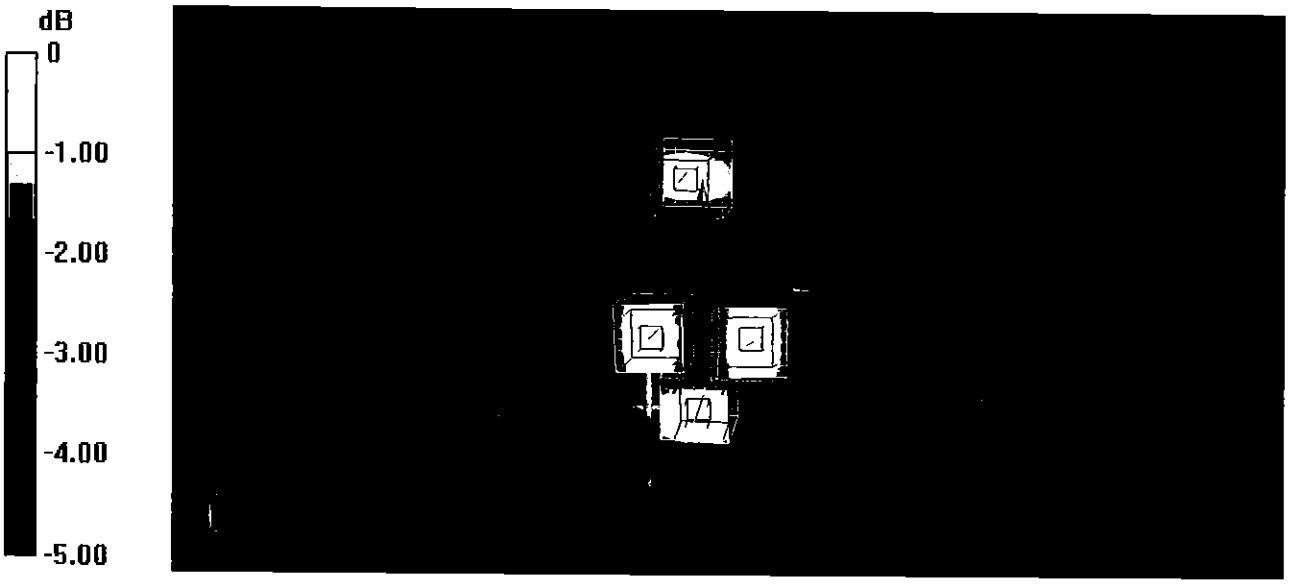
- Probe: EX3DV4 - SN7349; ConvF(9.9, 9.9, 9.9); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: SAM Head
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

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

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

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

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




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

**Calibration Laboratory of**
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**Zeughausstrasse 43, 8004 Zurich, Switzerland**

**S** Schweizerischer Kalibrierdienst
**C** 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: D835V2-4d133_Jul17**

# CALIBRATION CERTIFICATE

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

BN ✓ 8/3/2017

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: July 12, 2017

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

## Glossary:

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

## Calibration is Performed According to the Following Standards:

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

## Additional Documentation:

e) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

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

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

## Measurement Conditions

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

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

## Head TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Head TSL

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

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

## Body TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Body TSL

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

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

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

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

### Antenna Parameters with Body TSL

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

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.196 ns |

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

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

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | July 22, 2011 |

## DASY5 Validation Report for Head TSL

Date: 11.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

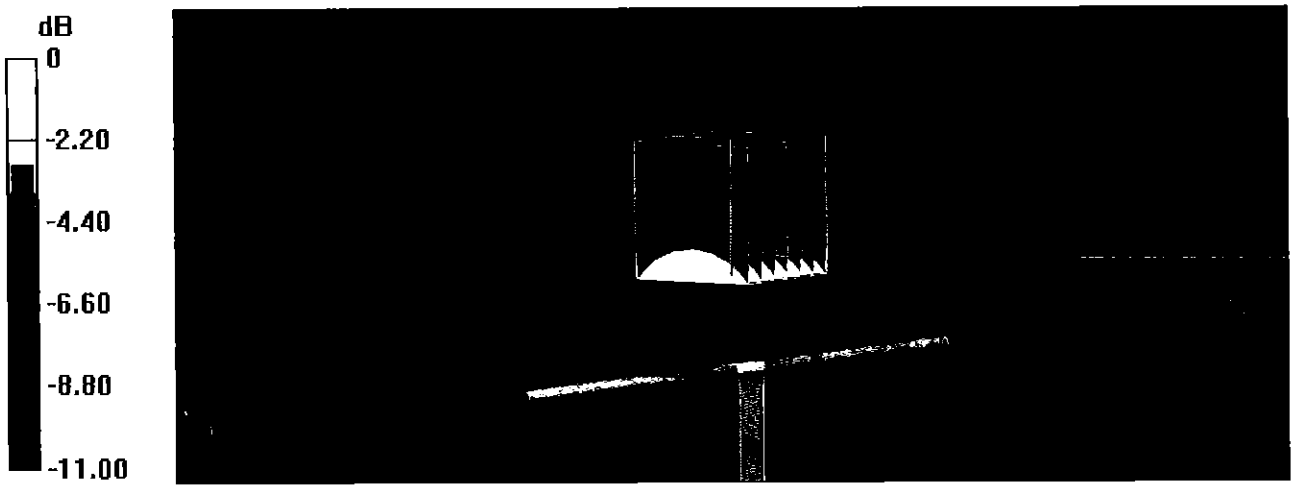
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma$ = 0.91 S/m; $\varepsilon_r$ = 40.8; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

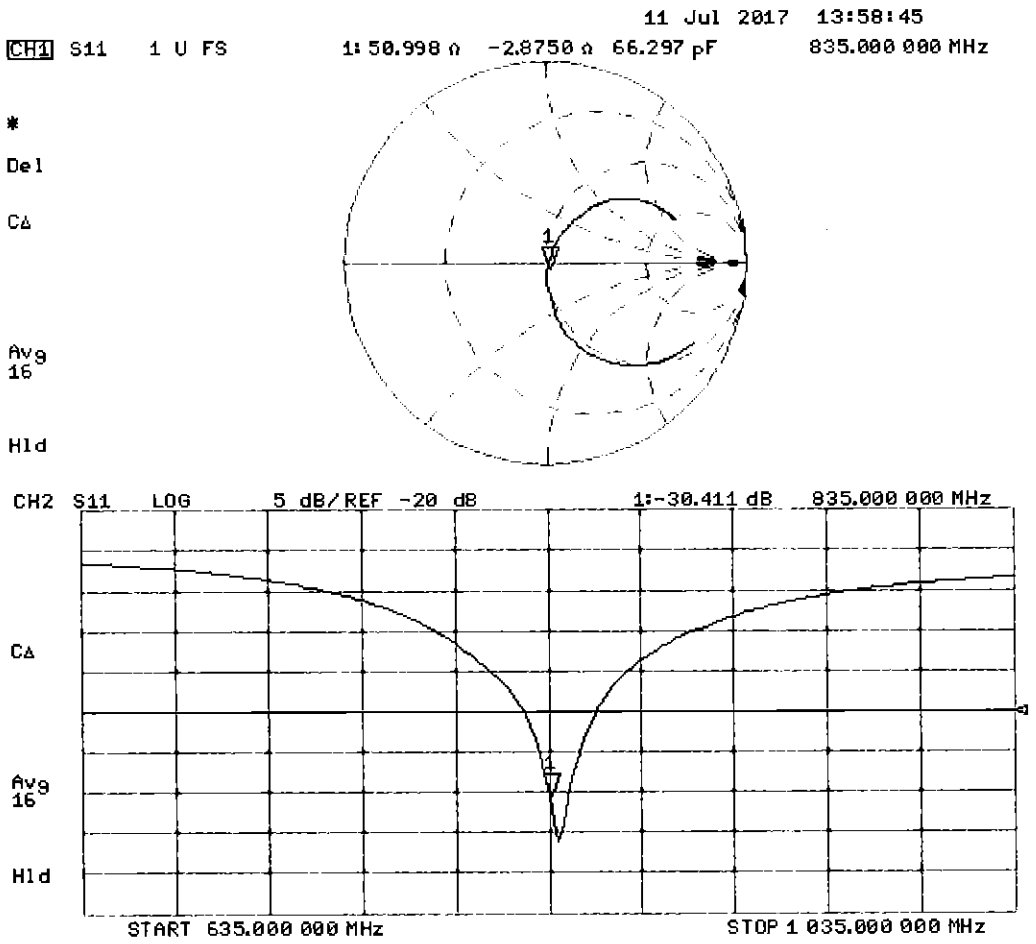
### Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 11.07.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

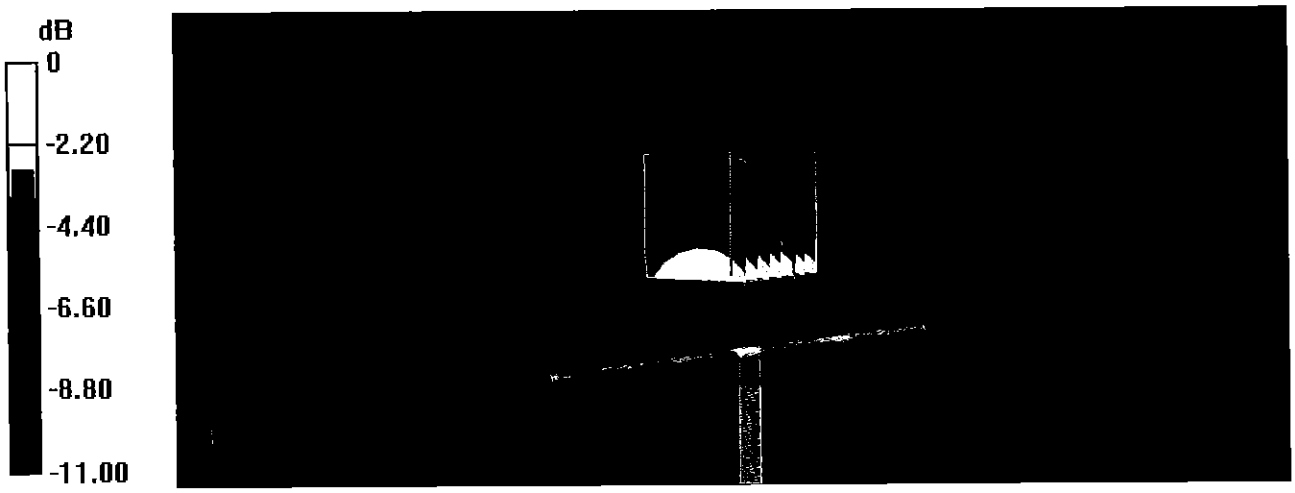
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma$ = 1.01 S/m; $\varepsilon_r$ = 54.8; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

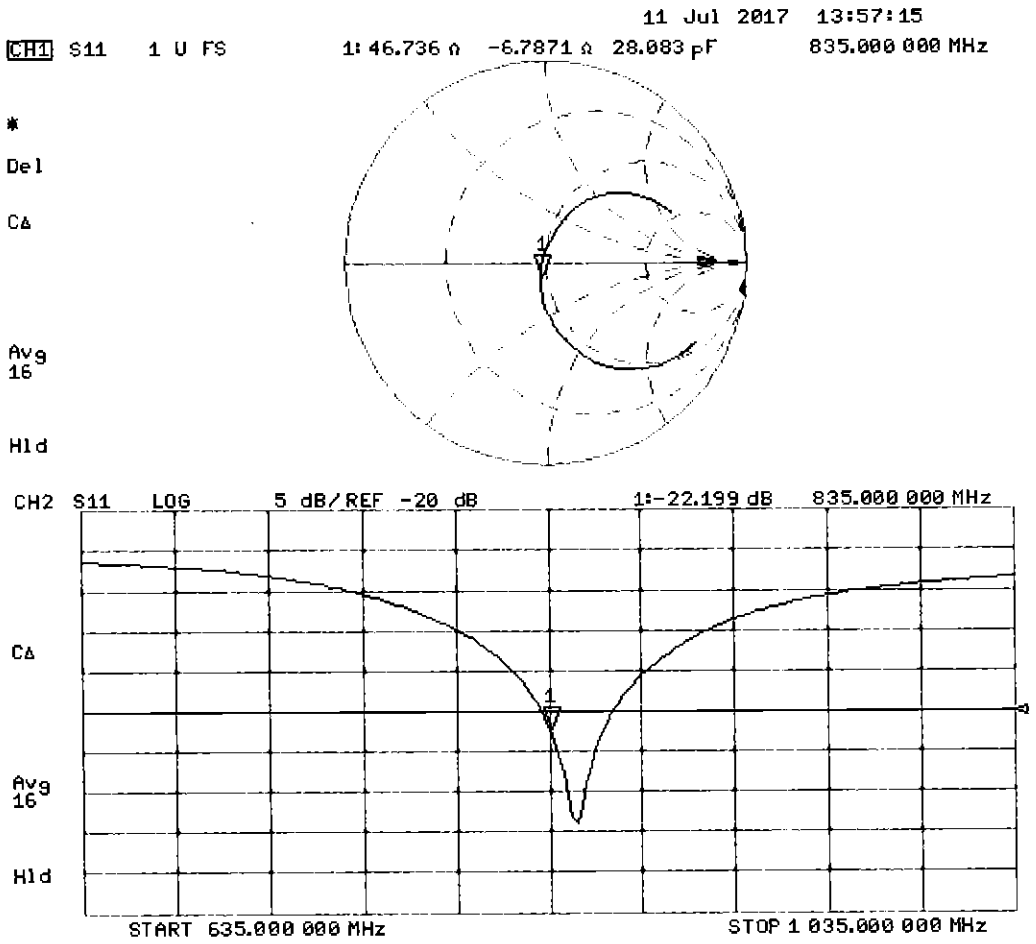
### Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Body TSL



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**Accreditation No.: SCS 0108**

**Client** **PC Test**

**Certificate No: D1750V2-1148_May17**

# CALIBRATION CERTIFICATE

Object: D1750V2 - SN:1148

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

BN
05-23-2017

Calibration date: May 09, 2017

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: May 11, 2017

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

## Glossary:

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

## Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Additional Documentation:

e) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

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

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

## Measurement Conditions

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

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

## Head TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Head TSL

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

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

## Body TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Body TSL

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

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

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

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

### Antenna Parameters with Body TSL

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

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.223 ns |

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

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

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | September 30, 2014 |

## DASY5 Validation Report for Head TSL

Date: 09.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

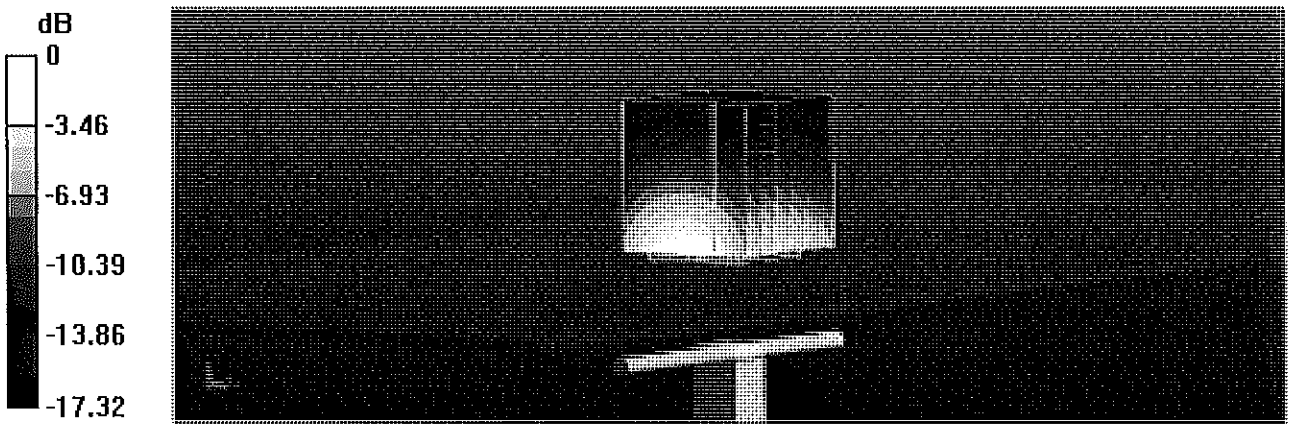
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; $\sigma$ = 1.36 S/m; $\varepsilon_r$ = 39; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

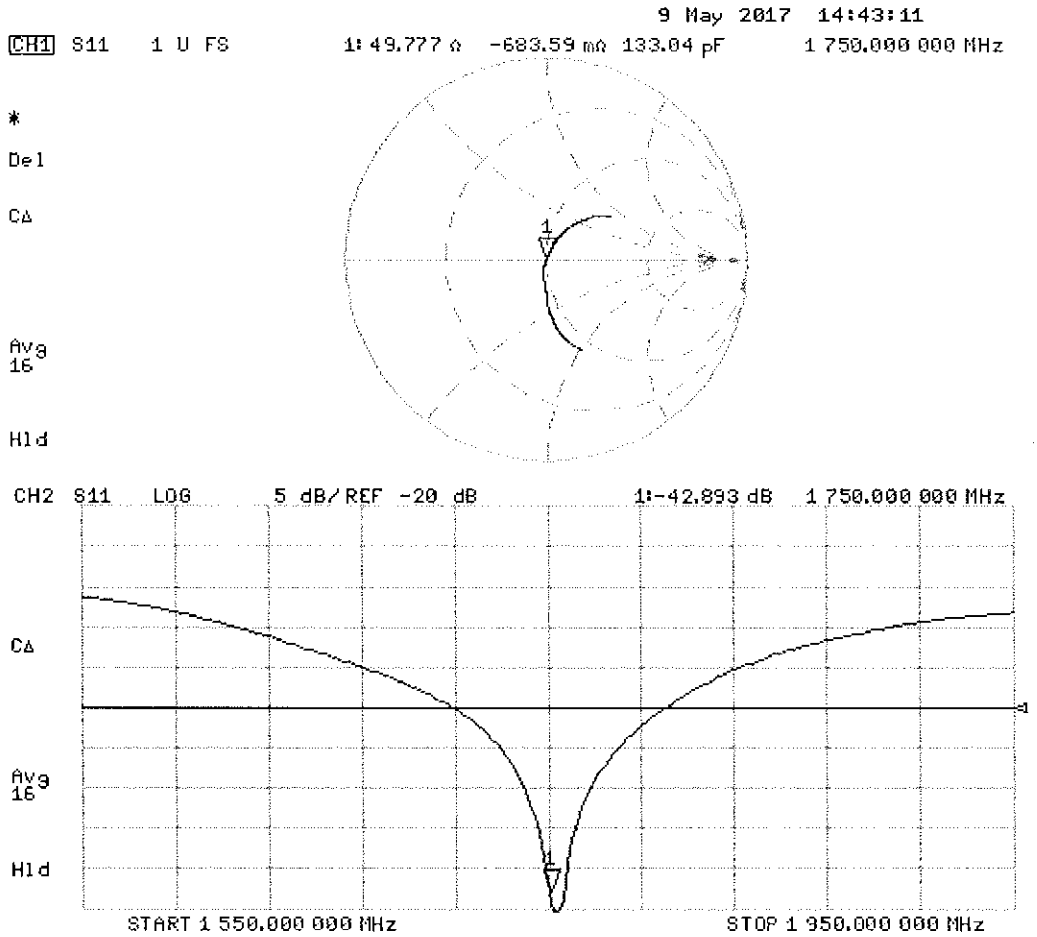
### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 09.05.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

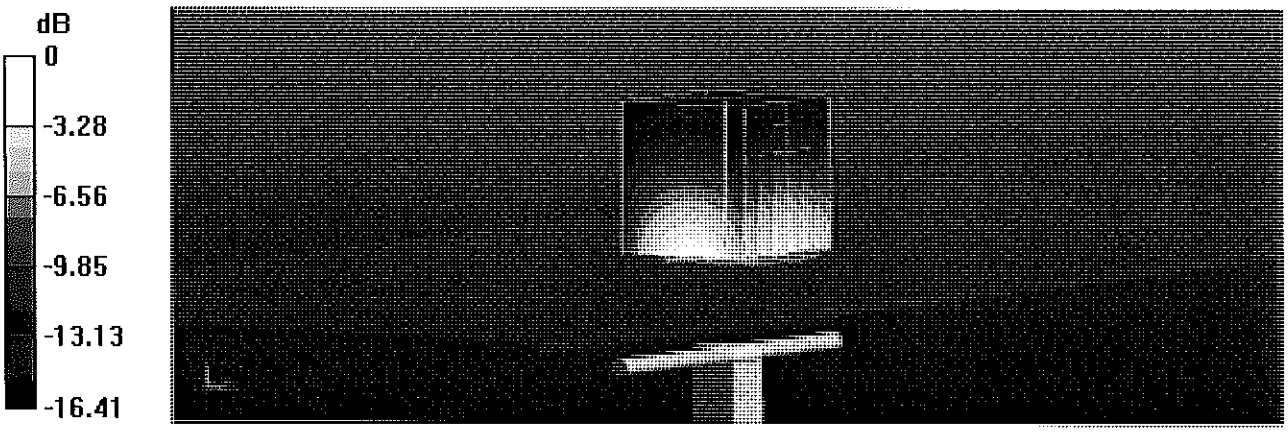
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; $\sigma$ = 1.47 S/m; $\varepsilon_r$ = 53.7; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

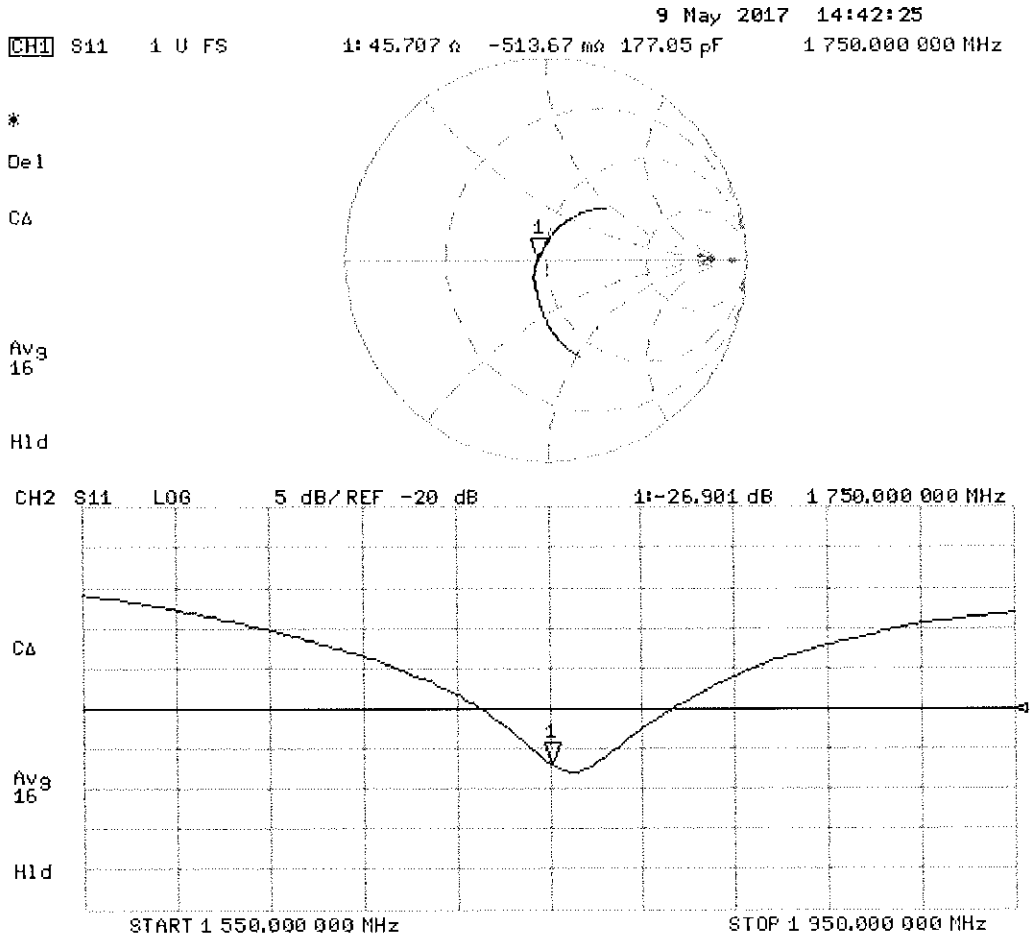
### Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Body TSL



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

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**Accreditation No.: SCS 0108**

**Client** **PC Test**

**Certificate No: D1750V2-1150_Jul16**

# CALIBRATION CERTIFICATE

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

PN 8/9/16
Extended 7/2017 SC

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: July 14, 2016

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

## Glossary:

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

## Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Additional Documentation:

e) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

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

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

## Measurement Conditions

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

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

## Head TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Head TSL

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

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

## Body TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Body TSL

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

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

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

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

### Antenna Parameters with Body TSL

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

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.218 ns |

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

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

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | April 10, 2015 |

## DASY5 Validation Report for Head TSL

Date: 14.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

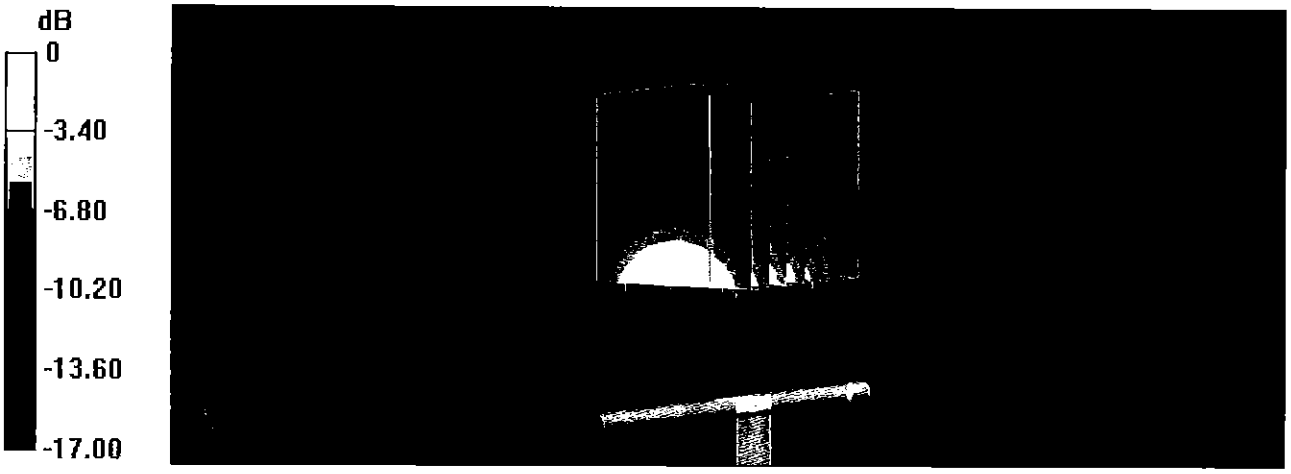
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; $\sigma$ = 1.36 S/m; $\varepsilon_r$ = 38.8; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

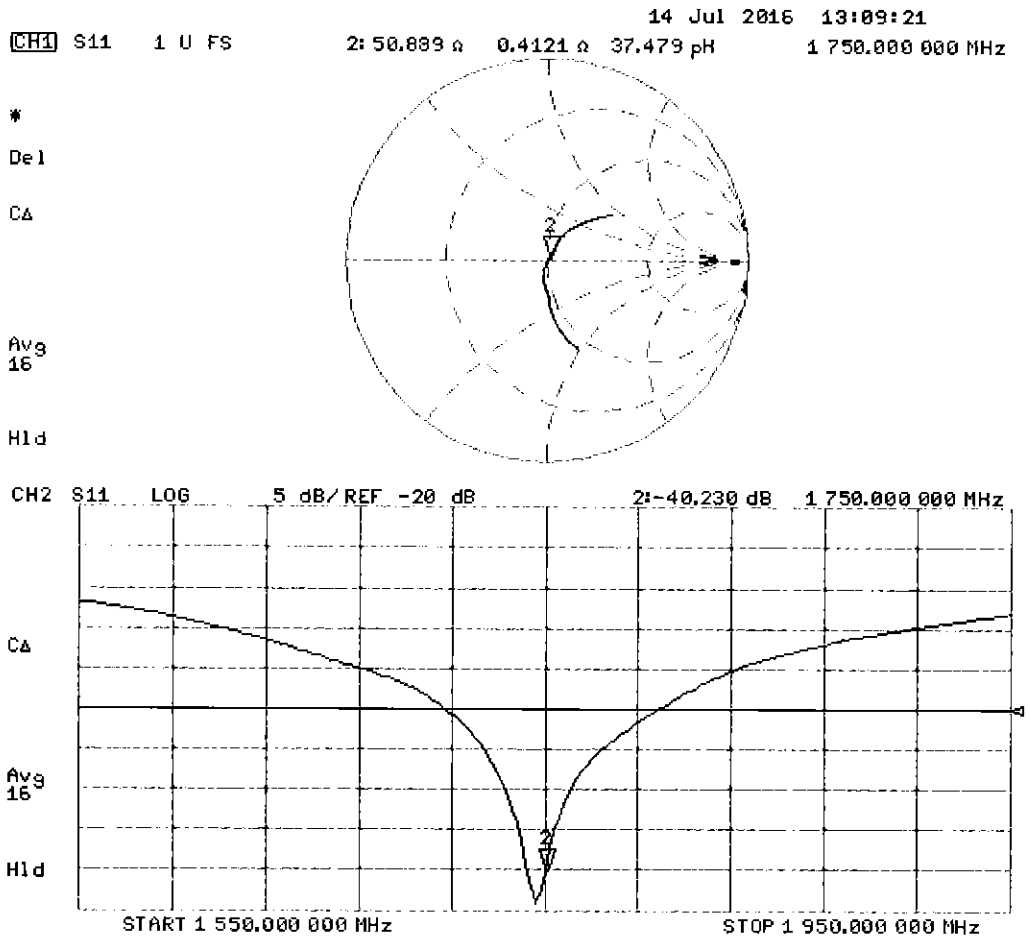
### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 14.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

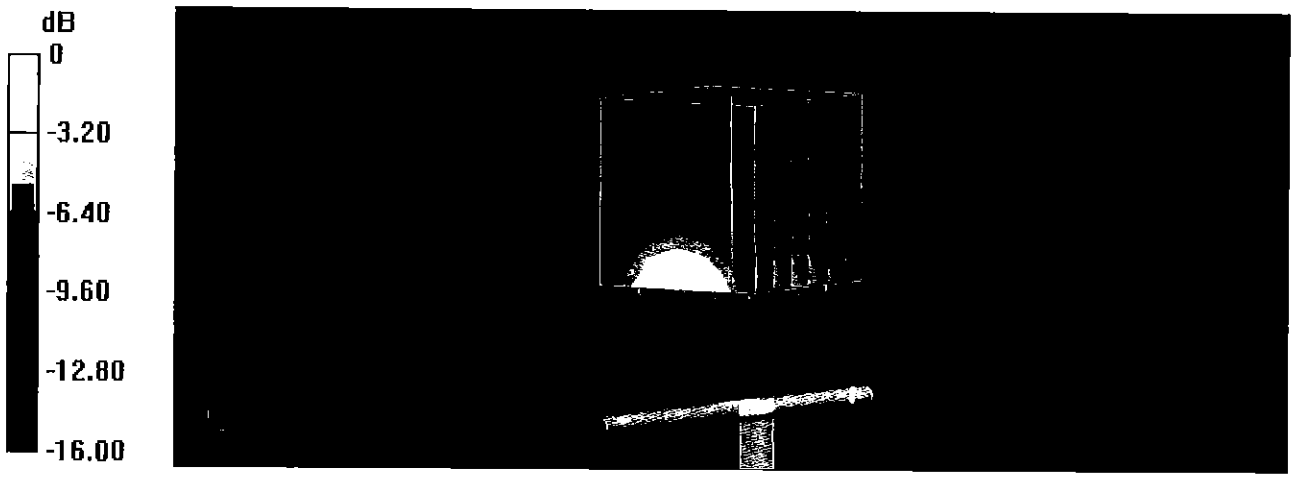
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; $\sigma$ = 1.48 S/m; $\varepsilon_r$ = 53.4; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

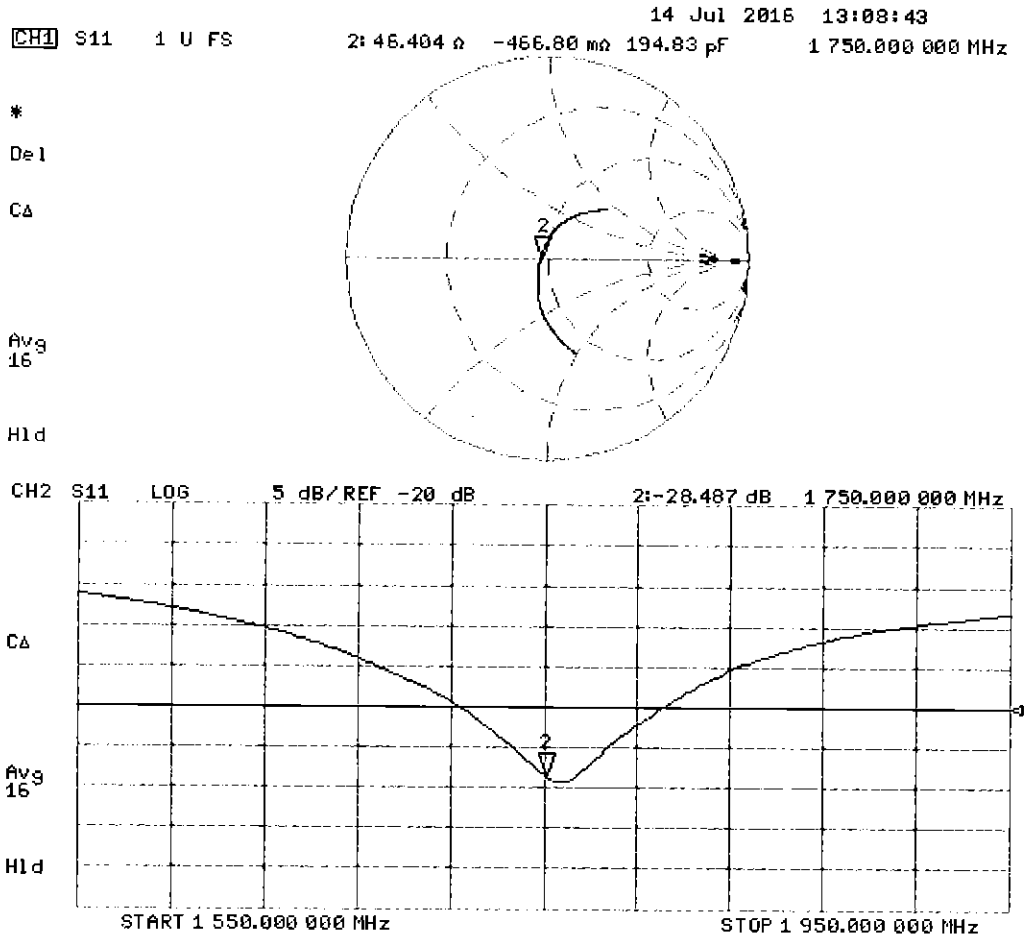
### Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Body TSL



# Certification of Calibration

Object D1750V2 – SN: 1150

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

Calibration date: July 07, 2017

Description: SAR Validation Dipole at 1750 MHz.

Calibration Equipment used:

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

Measurement Uncertainty = ±23% (k=2)

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

# DIPOLE CALIBRATION EXTENSION

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

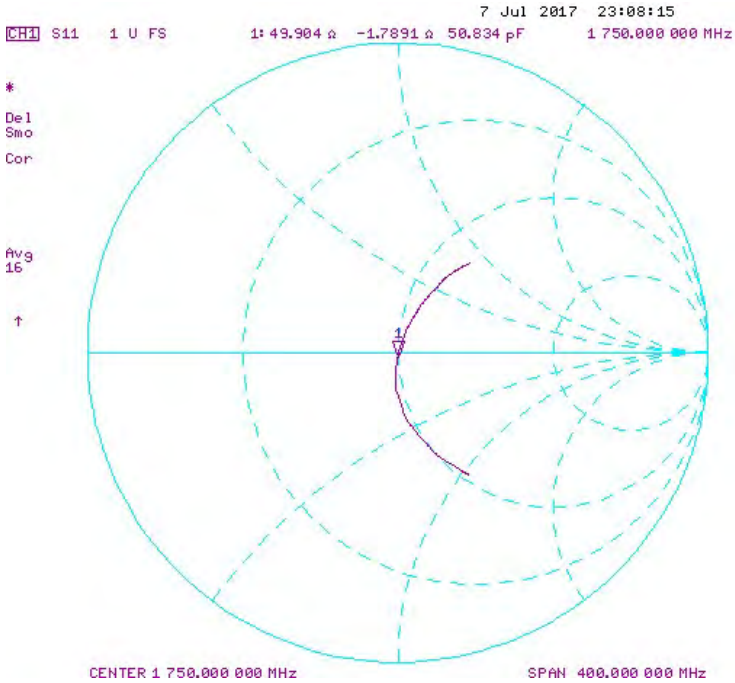
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does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

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

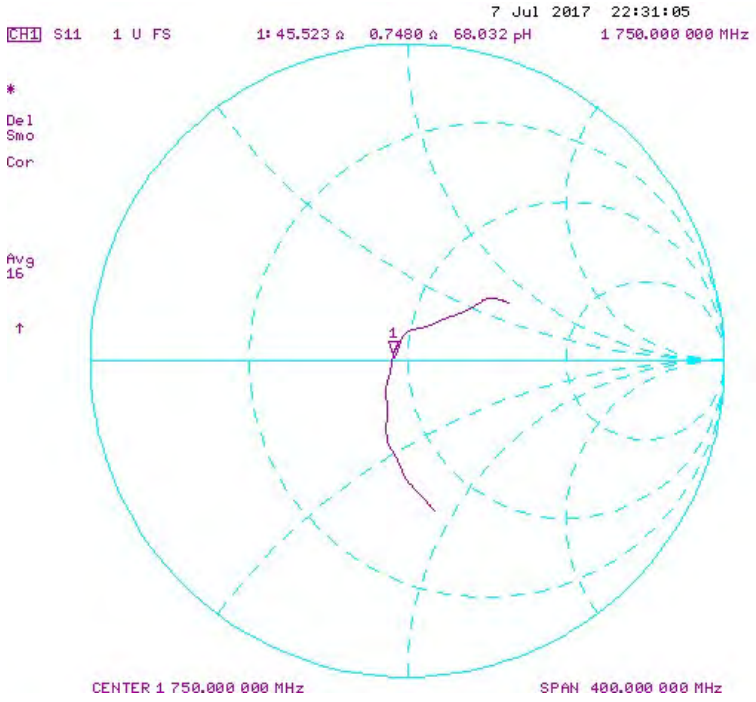
| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Head (1g) W/kg @ 20.0 dBm | Measured Head SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Head (10g) W/kg @ 20.0 dBm | Measured Head SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate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

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

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL



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

**S** Schweizerischer Kalibrierdienst
**C** 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: D1900V2-5d080_Jul16**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D1900V2 - SN:5d080 |
| Calibration procedure(s) | QA CAL-05.v9<br>Calibration procedure for dipole validation kits above 700 MHz |
| Calibration date: | July 08, 2016 |

BN ✓
7/16/2016
Extended
7/2017
SL ✓

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: July 13, 2016

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

## Glossary:

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

## Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Additional Documentation:

e) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

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

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

## Measurement Conditions

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

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

## Head TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Head TSL

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

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

## Body TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Body TSL

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

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

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

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

### Antenna Parameters with Body TSL

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

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.192 ns |

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

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

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | June 28, 2006 |

## DASY5 Validation Report for Head TSL

Date: 08.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

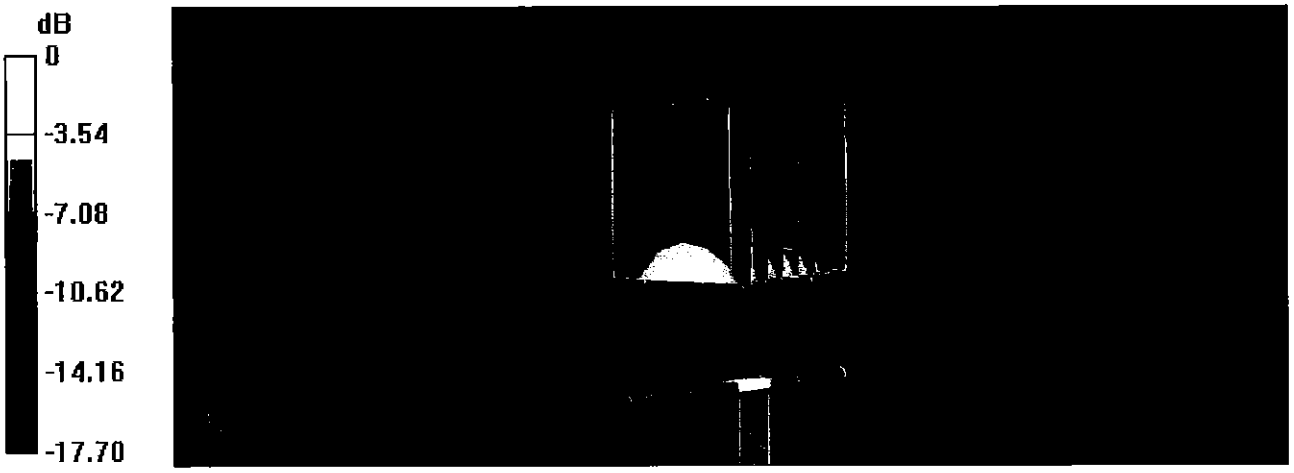
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; $\sigma$ = 1.38 S/m; $\varepsilon_r$ = 39.8; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

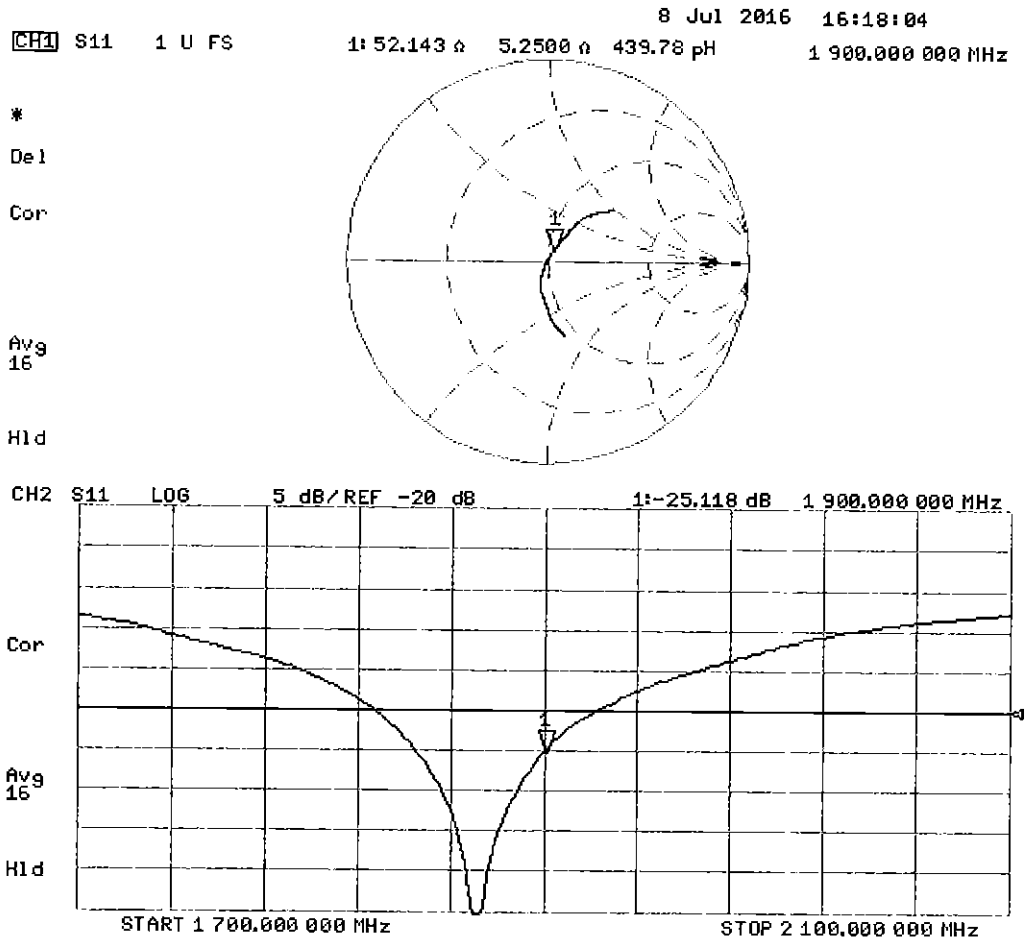
### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 08.07.2016

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

DASY52 Configuration:

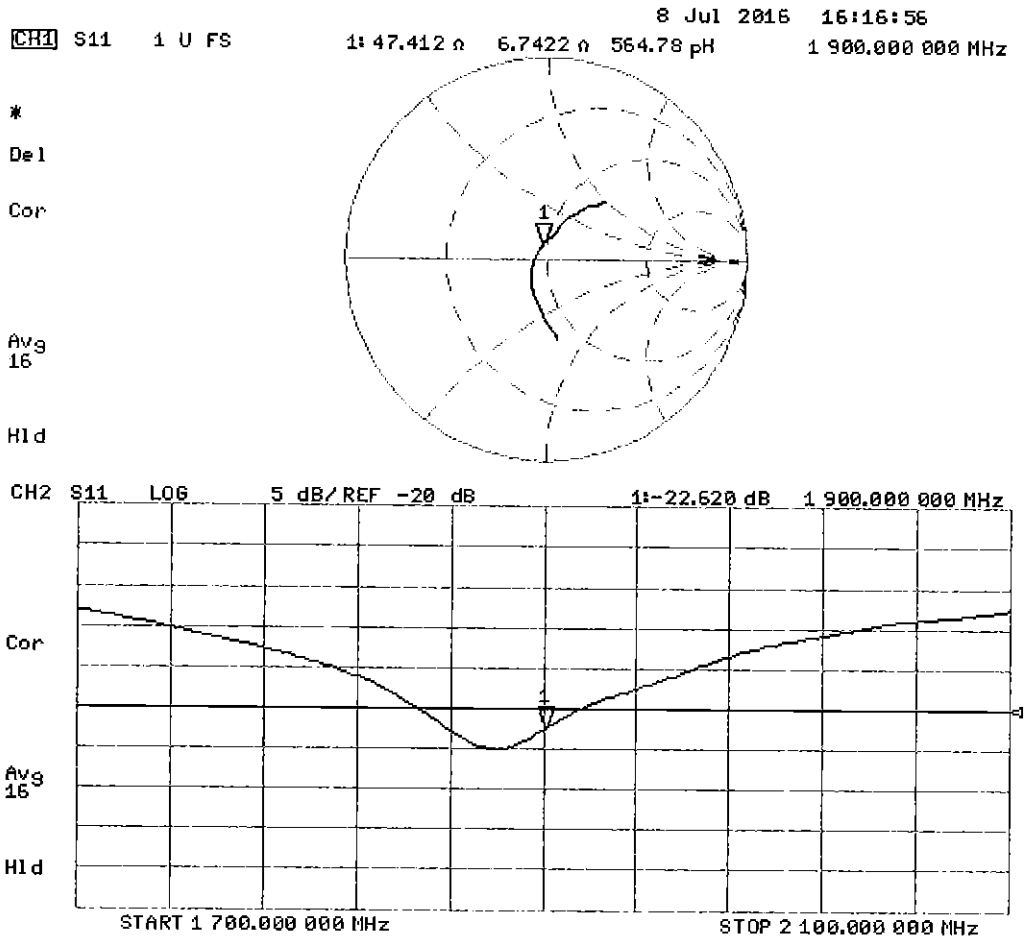
- Probe: EX3DV4 - SN7349; ConvF(8.03, 8.03, 8.03); Calibrated: 15.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

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

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

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

## Impedance Measurement Plot for Body TSL



# Certification of Calibration

Object D1900V2 – SN: 5d080

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

Calibration date: July 06, 2017

Description: SAR Validation Dipole at 1900 MHz.

Calibration Equipment used:

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

Measurement Uncertainty = ±23% (k=2)

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

# DIPOLE CALIBRATION EXTENSION

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

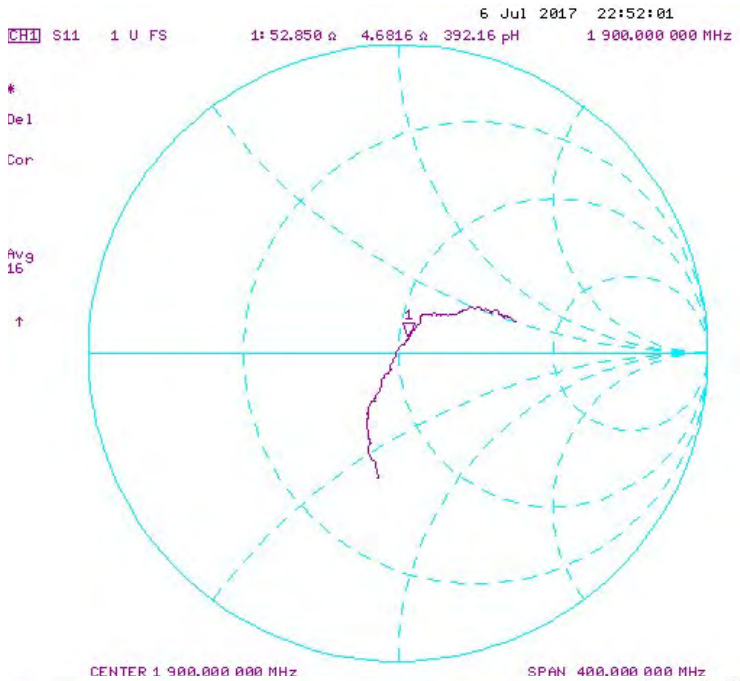
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does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

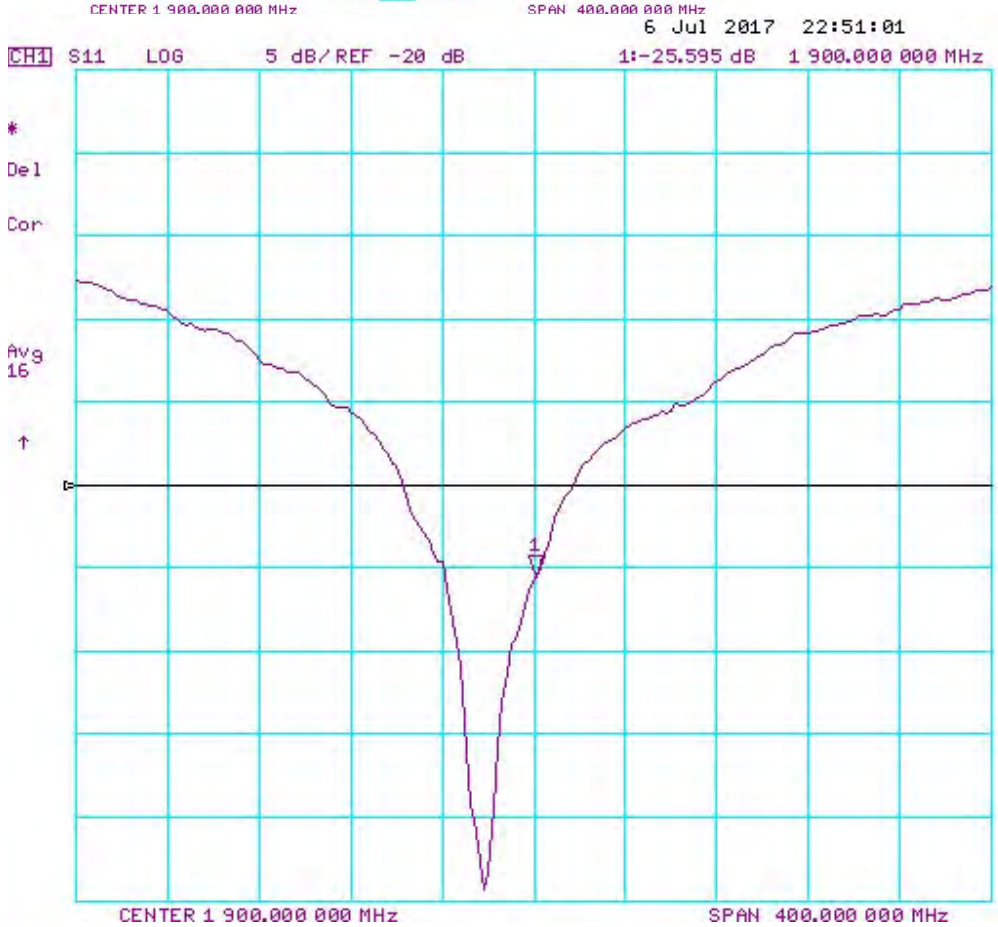
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

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

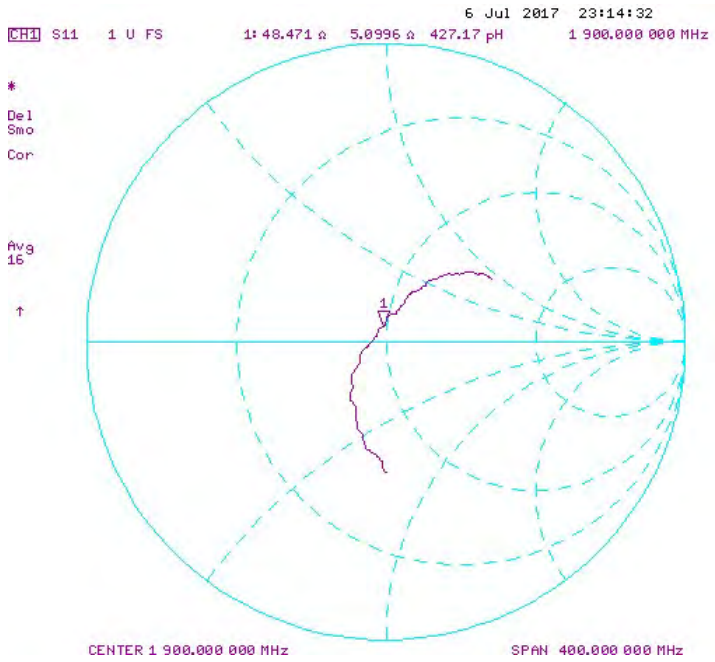
| Calibration Date | Extension Date | Certificate Electrical Delay (ns) | Certificate SAR Target Body (1g) W/kg @ 20.0 dBm | Measured Body SAR (1g) W/kg @ 20.0 dBm | Deviation 1g (%) | Certificate SAR Target Body (10g) W/kg @ 20.0 dBm | Measured Body SAR (10g) W/kg @ 20.0 dBm | Deviation 10g (%) | Certificate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

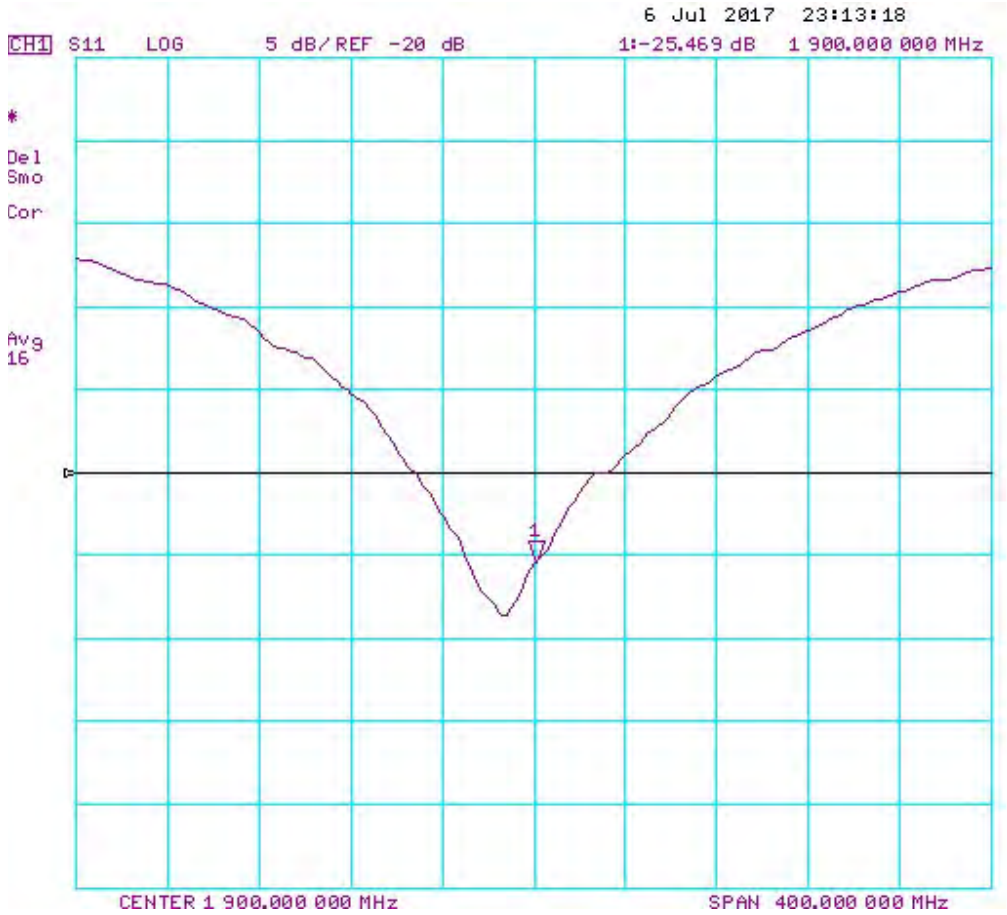
Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL



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**C** Service suisse d'étalonnage
Servizio svizzero di taratura
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**Accreditation No.: SCS 0108**

**Client** **PC Test**

**Certificate No: D1900V2-5d148_Feb18**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D1900V2 - SN:5d148 |
| Calibration procedure(s) | QA CAL-05.v9<br>Calibration procedure for dipole validation kits above 700 MHz |
| Calibration date: | February 07, 2018 |

BN 03-02-2018

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: February 7, 2018

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

## Glossary:

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

## Calibration is Performed According to the Following Standards:

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

## Additional Documentation:

e) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

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

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

## Measurement Conditions

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

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

## Head TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Head TSL

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

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

## Body TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Body TSL

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

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

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

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

### Antenna Parameters with Body TSL

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

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.199 ns |

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

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

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | March 11, 2011 |

## DASY5 Validation Report for Head TSL

Date: 07.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

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

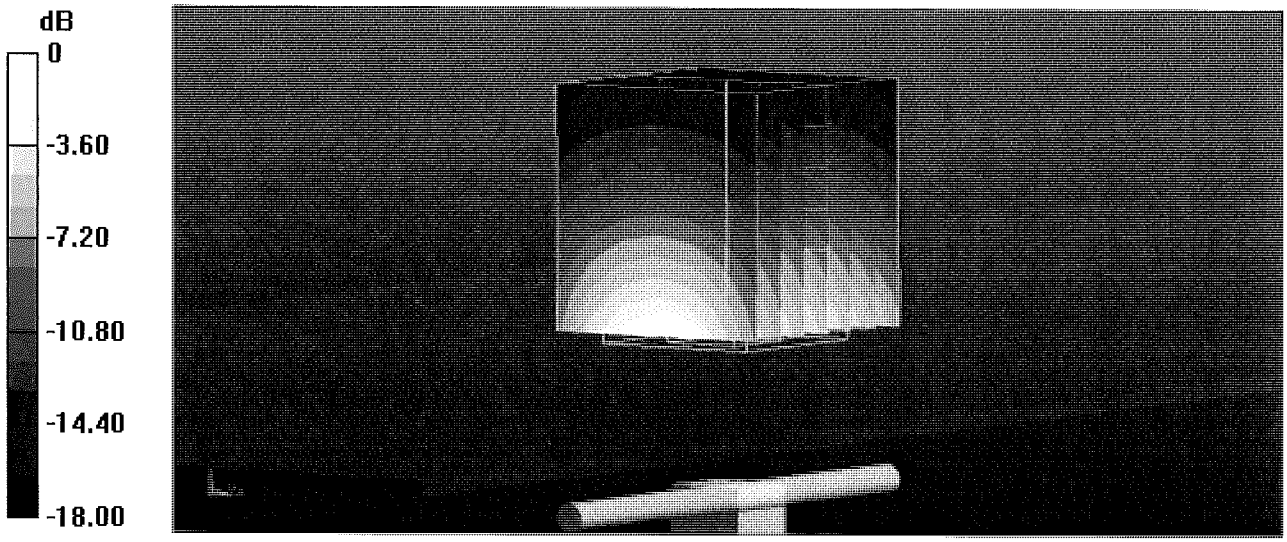
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; $\sigma$ = 1.39 S/m; $\varepsilon_r$ = 40.7; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

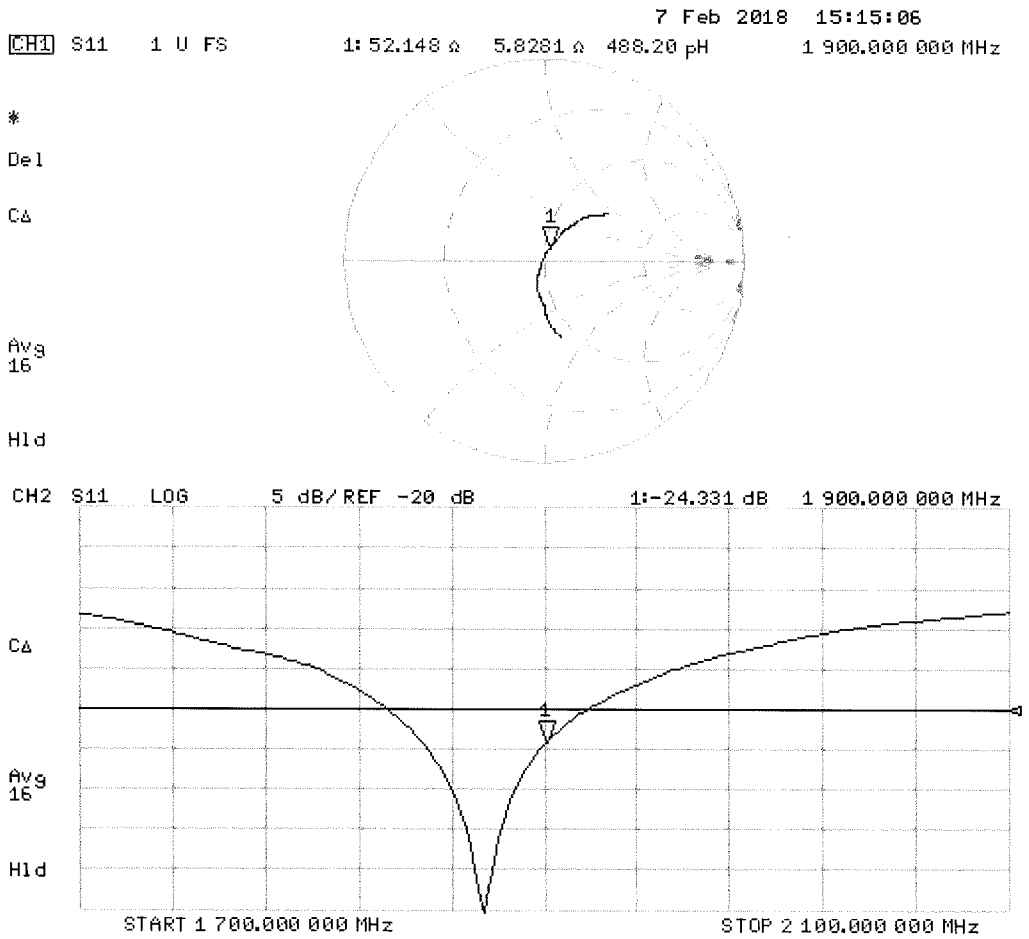
### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 07.02.2018

Test Laboratory: SPEAG, Zurich, Switzerland

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

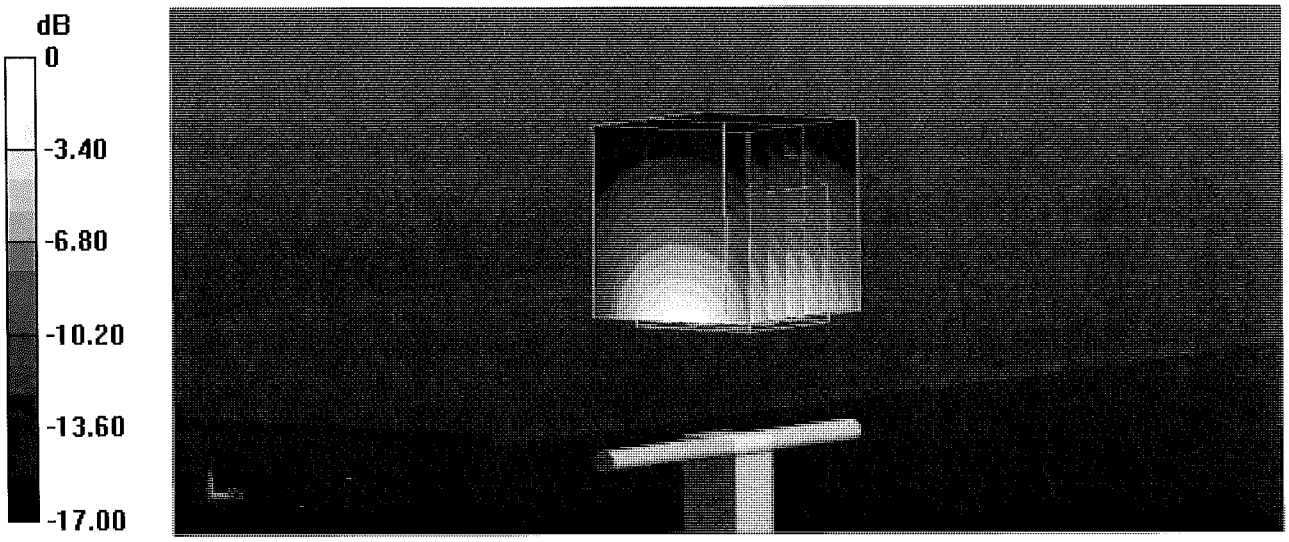
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; $\sigma$ = 1.48 S/m; $\varepsilon_r$ = 55.2; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

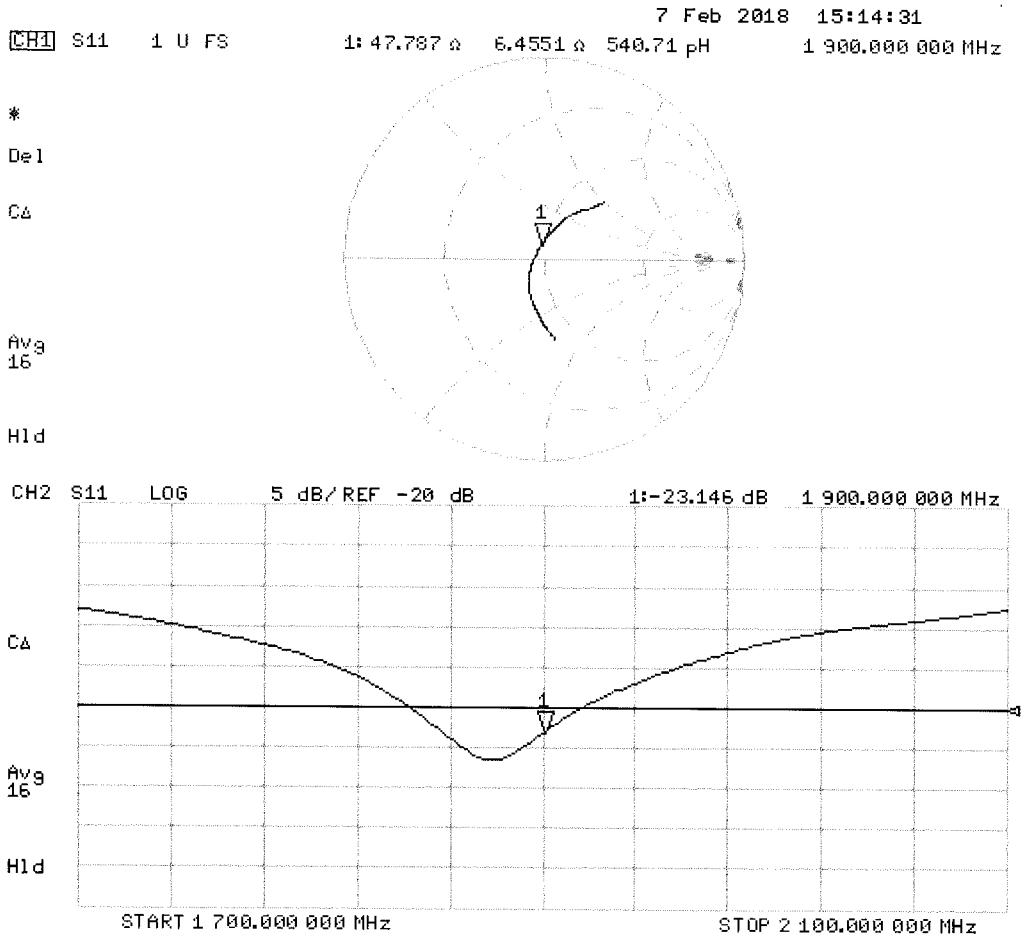
### Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Body TSL



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

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**Accreditation No.: SCS 0108**

**Client** **PC Test**

**Certificate No: D2450V2-797_Sep17**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | D2450V2 - SN:797 |
| Calibration procedure(s) | QA CAL-05.v9<br>Calibration procedure for dipole validation kits above 700 MHz |
| Calibration date: | September 11, 2017 |

SC ✓
10/03/2017

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Michael Weber | Laboratory Technician | M.Weber |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: September 11, 2017

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

## Glossary:

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

## Calibration is Performed According to the Following Standards:

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

## Additional Documentation:

e) DASY4/5 System Handbook

## Methods Applied and Interpretation of Parameters:

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

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

## Measurement Conditions

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

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

## Head TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Head TSL

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

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

## Body TSL parameters

The following parameters and calculations were applied.

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

## SAR result with Body TSL

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

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

## Appendix (Additional assessments outside the scope of SCS 0108)

### Antenna Parameters with Head TSL

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

### Antenna Parameters with Body TSL

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

### General Antenna Parameters and Design

| | |
|---|---|
| Electrical Delay (one direction) | 1.152 ns |

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

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

### Additional EUT Data

| | |
|---|---|
| Manufactured by | SPEAG |
| Manufactured on | January 24, 2006 |

## DASY5 Validation Report for Head TSL

Date: 11.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

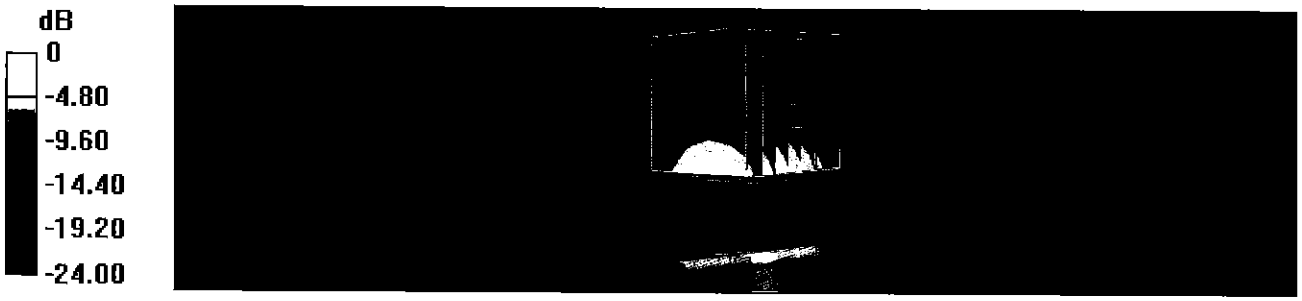
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; $\sigma$ = 1.86 S/m; $\varepsilon_r$ = 37.8; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

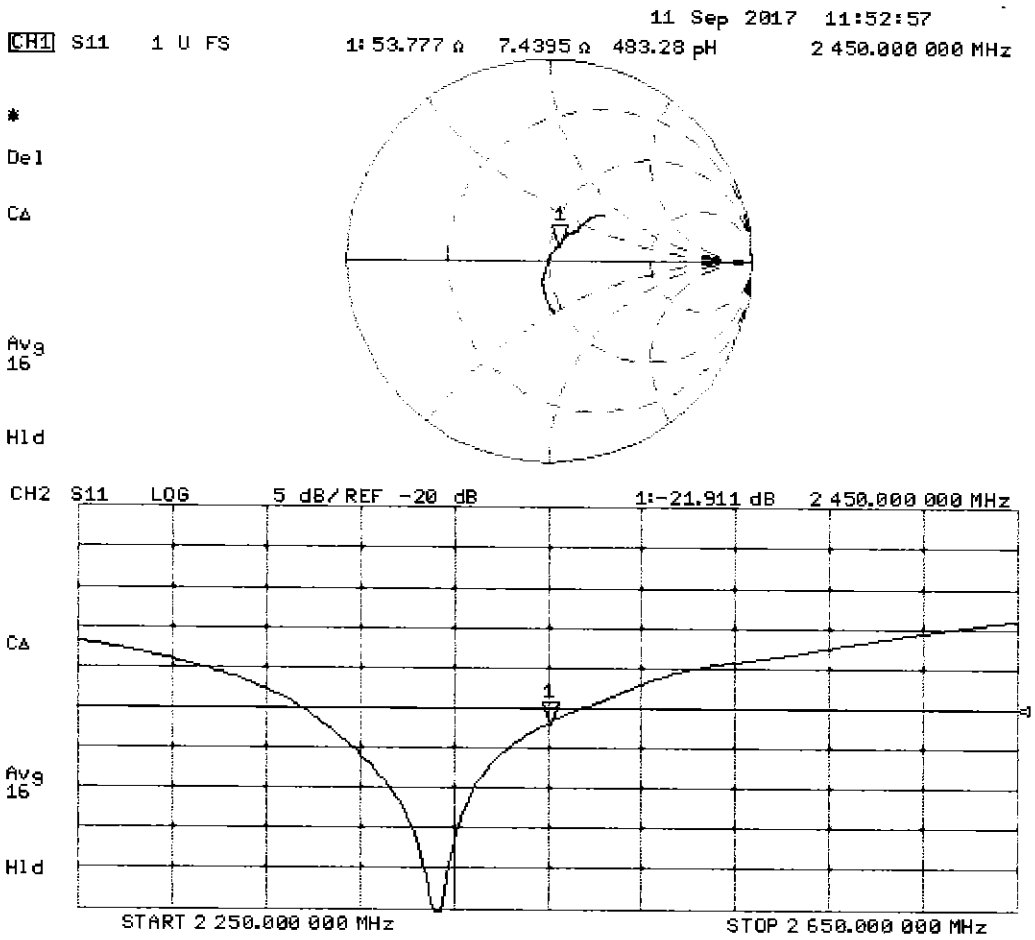
### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Head TSL



## DASY5 Validation Report for Body TSL

Date: 11.09.2017

Test Laboratory: SPEAG, Zurich, Switzerland

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

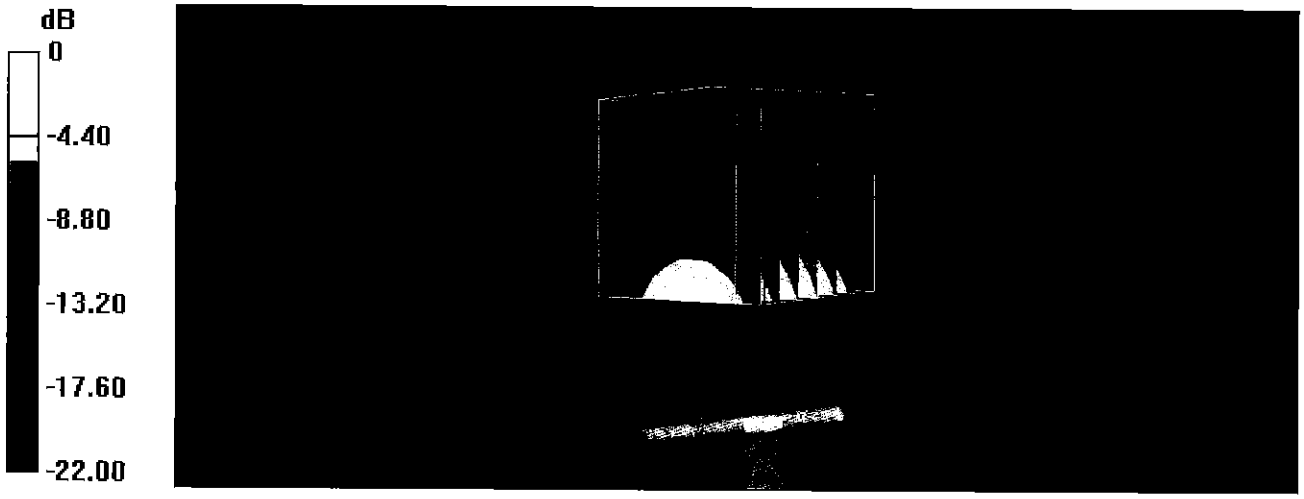
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; $\sigma$ = 2.04 S/m; $\varepsilon_r$ = 51.9; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

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

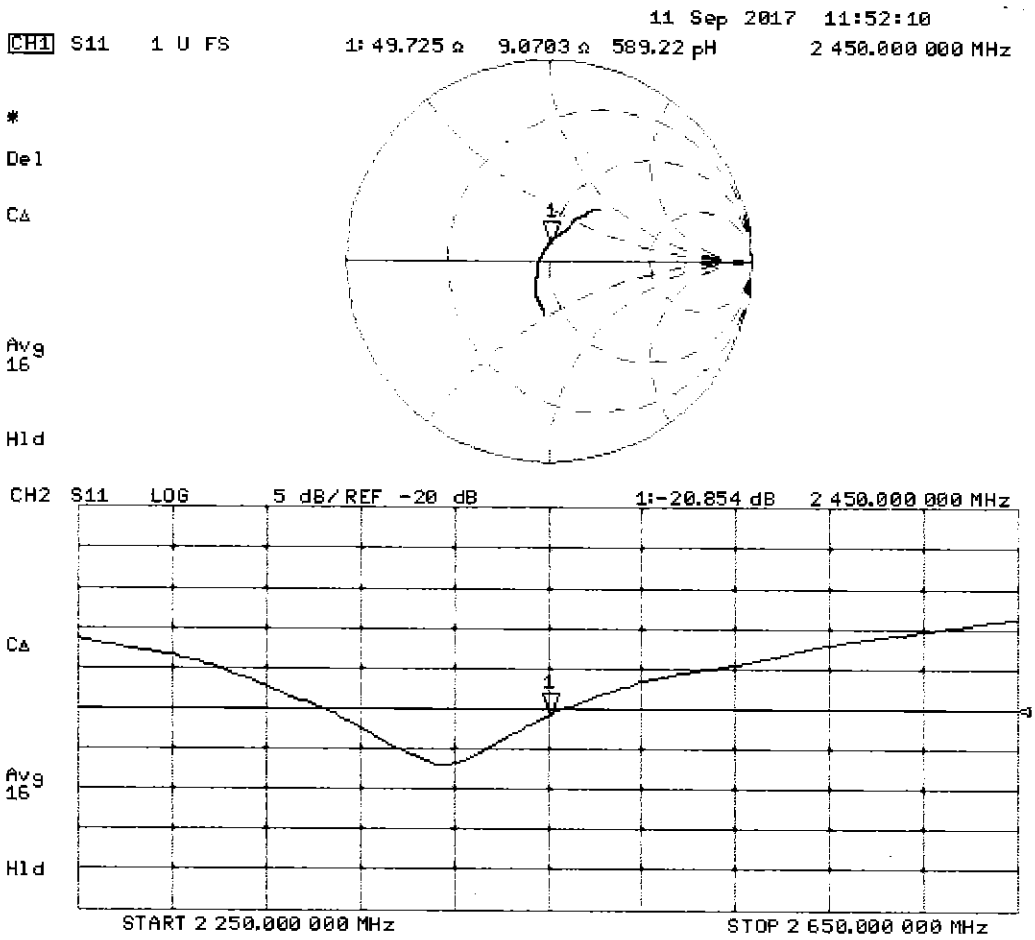
### Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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




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

## Impedance Measurement Plot for Body TSL



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

**S** Schweizerischer Kalibrierdienst
**C** Service suisse d'étalonnage
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**Accreditation No.: SCS 0108**

**Client** **PC Test**

**Certificate No: ES3-3213_Feb18**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | ES3DV3 - SN:3213 |
| Calibration procedure(s) | QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6<br>Calibration procedure for dosimetric E-field probes |
| Calibration date: | February 13, 2018 |

BN 03-02-2018

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

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

Calibration Equipment used (M&TE critical for calibration)

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

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Michael Weber | Laboratory Technician | M.Weber |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: February 13, 2018

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

## Glossary:

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A, B, C, D | modulation dependent linearization parameters |
| Polarization φ | φ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis |
| Connector Angle | information used in DASY system to align probe sensor X to the robot coordinate system |

## Calibration is Performed According to the Following Standards:

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

## Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the $E^2$-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

# Probe ES3DV3

## SN:3213

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

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

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

## Basic Calibration Parameters

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

## Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB√μV | C | D dB | VR mV | Unc[E] (k=2) |
|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.0 | 0.0 | 1.0 | 0.00 | 219.3 | ±2.7 % |
| | | Y | 0.0 | 0.0 | 1.0 | | 219.1 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 213.7 | |

Note: For details on UID parameters see Appendix.

## Sensor Model Parameters

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

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

[A] The uncertainties of Norm X,Y,Z do not affect the $E^2$-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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

## Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) [C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha [G] | Depth [G] (mm) | Unc (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 6.75 | 6.75 | 6.75 | 0.64 | 1.30 | ± 12.0 % |
| 835 | 41.5 | 0.90 | 6.42 | 6.42 | 6.42 | 0.48 | 1.50 | ± 12.0 % |
| 1750 | 40.1 | 1.37 | 5.45 | 5.45 | 5.45 | 0.52 | 1.41 | ± 12.0 % |
| 1900 | 40.0 | 1.40 | 5.30 | 5.30 | 5.30 | 0.79 | 1.17 | ± 12.0 % |
| 2300 | 39.5 | 1.67 | 4.94 | 4.94 | 4.94 | 0.59 | 1.37 | ± 12.0 % |
| 2450 | 39.2 | 1.80 | 4.72 | 4.72 | 4.72 | 0.80 | 1.21 | ± 12.0 % |
| 2600 | 39.0 | 1.96 | 4.53 | 4.53 | 4.53 | 0.72 | 1.33 | ± 12.0 % |

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

[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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

## Calibration Parameter Determined in Body Tissue Simulating Media

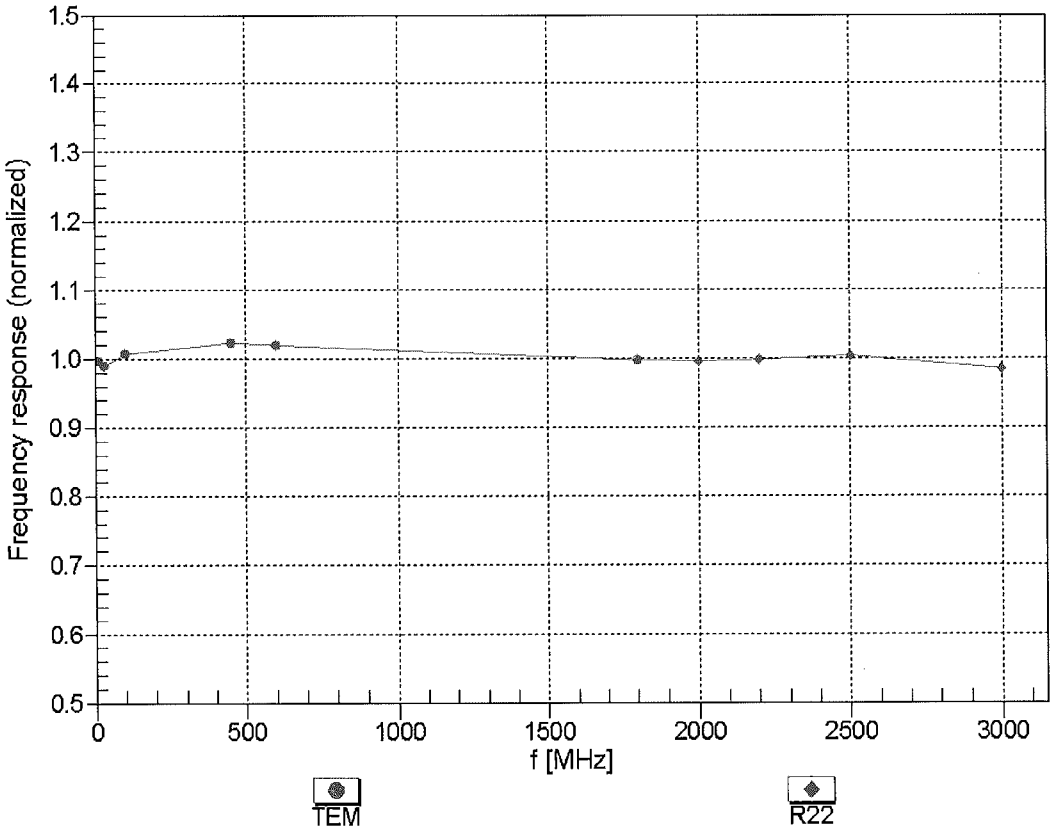
| f (MHz) [C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha [G] | Depth [G] (mm) | Unc (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 55.5 | 0.96 | 6.30 | 6.30 | 6.30 | 0.80 | 1.13 | ± 12.0 % |
| 835 | 55.2 | 0.97 | 6.20 | 6.20 | 6.20 | 0.41 | 1.66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

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

[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

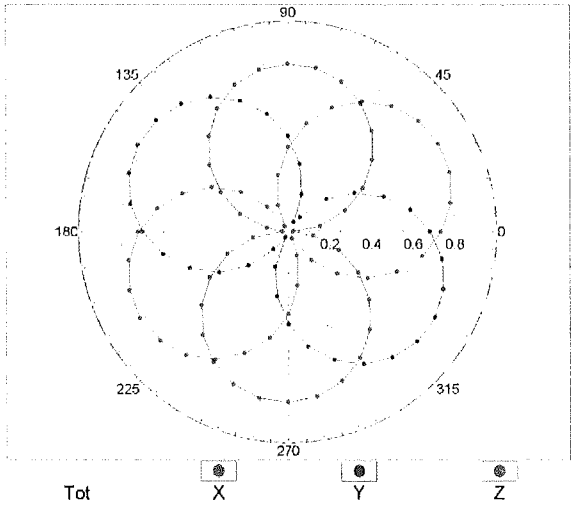
# Frequency Response of E-Field
## (TEM-Cell:ifi110 EXX, Waveguide: R22)



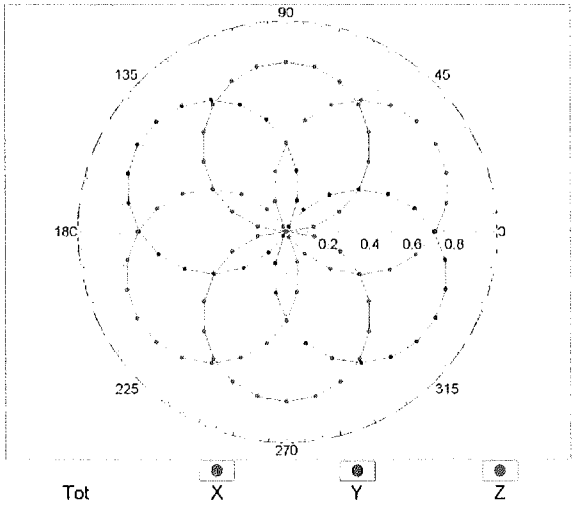

**Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)**

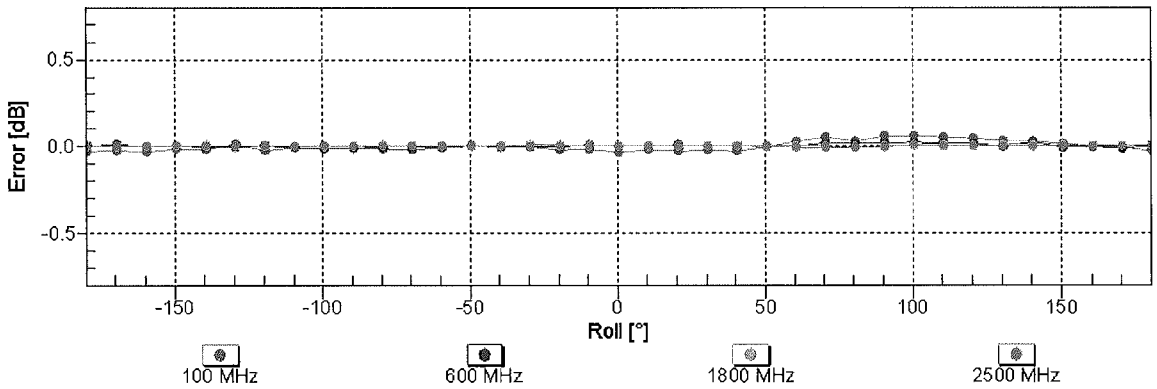
# Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM




f=1800 MHz,R22

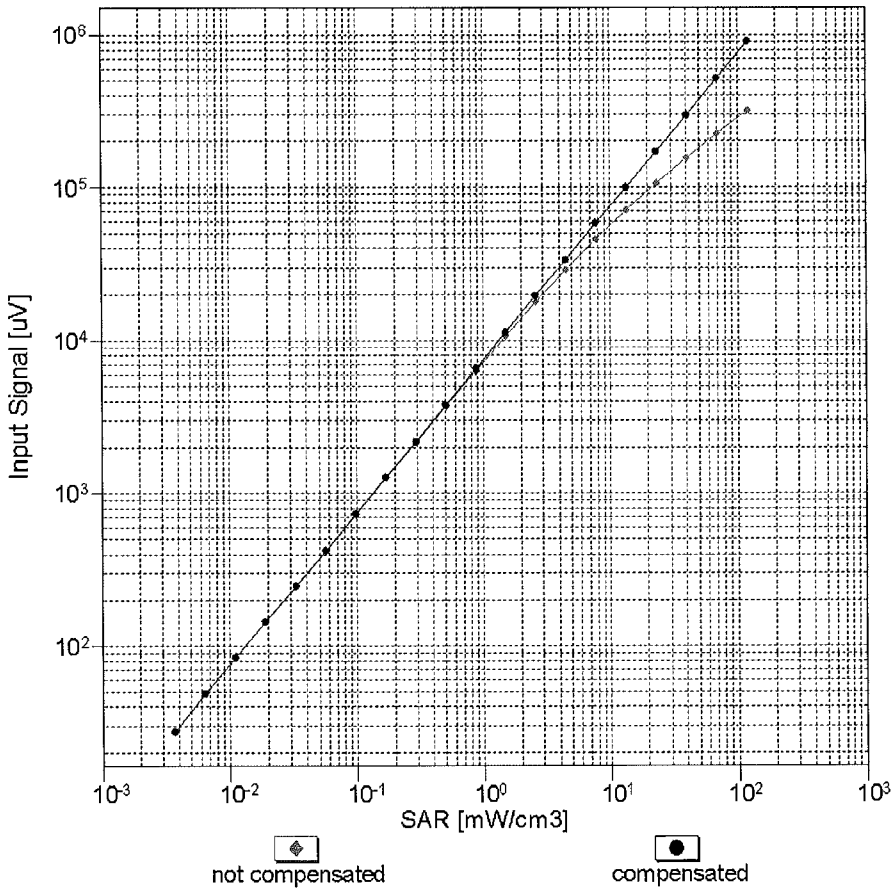


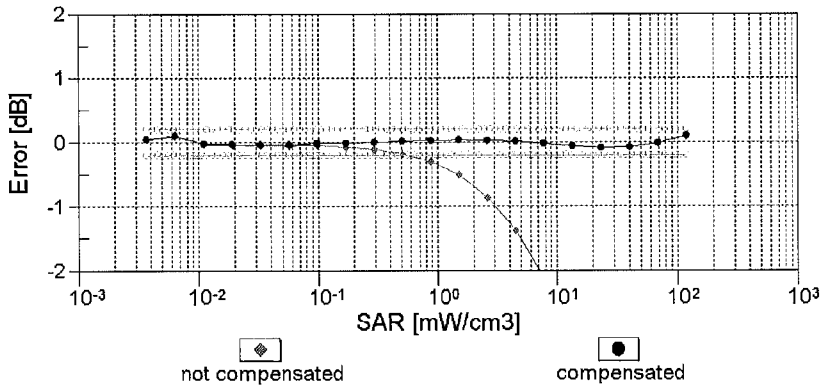




**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

# Dynamic Range f($SAR_{head}$)

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

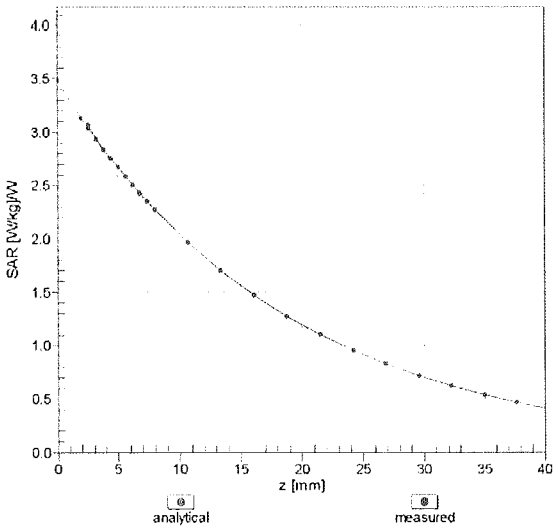


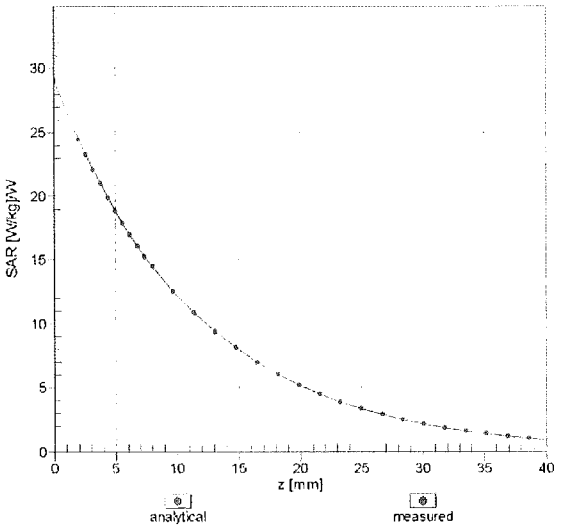

**Uncertainty of Linearity Assessment: ± 0.6% (k=2)**

# Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

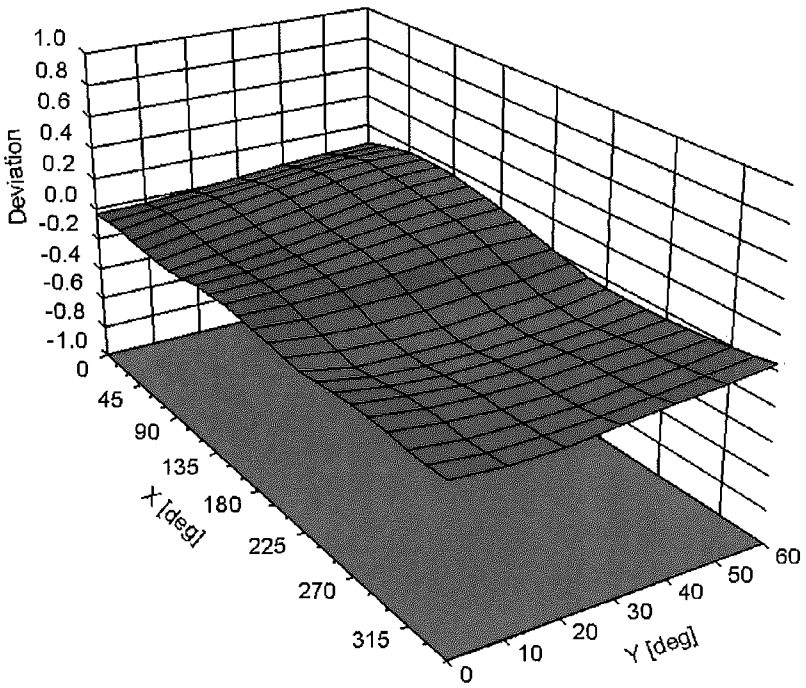


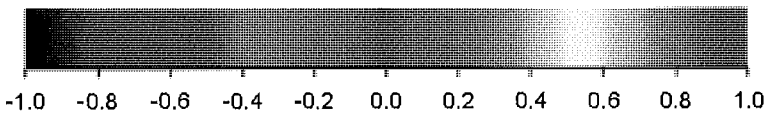

f = 1900 MHz,WGLS R22 (H_convF)




# Deviation from Isotropy in Liquid

**Error (ϕ, ϑ), f = 900 MHz**




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

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

## Other Probe Parameters

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

## Appendix: Modulation Calibration Parameters

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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**Client** **PC Test**

**Certificate No: ES3-3287_Sep17**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | ES3DV3 - SN:3287 |
| Calibration procedure(s) | QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6<br>Calibration procedure for dosimetric E-field probes |
| Calibration date: | September 18, 2017 |

SC ✓
10/03/2017

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

Issued: September 19, 2017

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

## Glossary:

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A, B, C, D | modulation dependent linearization parameters |
| Polarization φ | φ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis |
| Connector Angle | information used in DASY system to align probe sensor X to the robot coordinate system |

## Calibration is Performed According to the Following Standards:

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

## Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the $E^2$-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

# Probe ES3DV3

# SN:3287

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

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

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

## Basic Calibration Parameters

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

## Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB$\sqrt{\mu V}$ | C | D dB | VR mV | Unc[E] (k=2) |
|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.0 | 0.0 | 1.0 | 0.00 | 191.5 | ±3.3 % |
| | | Y | 0.0 | 0.0 | 1.0 | | 198.9 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 180.8 | |

Note: For details on UID parameters see Appendix.

## Sensor Model Parameters

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

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

[A] The uncertainties of Norm X,Y,Z do not affect the $E^2$-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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

## Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) [C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha [G] | Depth [G] (mm) | Unc (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 7.00 | 7.00 | 7.00 | 0.26 | 1.80 | ± 12.0 % |
| 835 | 41.5 | 0.90 | 6.70 | 6.70 | 6.70 | 0.56 | 1.23 | ± 12.0 % |
| 1750 | 40.1 | 1.37 | 5.57 | 5.57 | 5.57 | 0.53 | 1.28 | ± 12.0 % |
| 1900 | 40.0 | 1.40 | 5.34 | 5.34 | 5.34 | 0.41 | 1.52 | ± 12.0 % |
| 2300 | 39.5 | 1.67 | 4.94 | 4.94 | 4.94 | 0.42 | 1.57 | ± 12.0 % |
| 2450 | 39.2 | 1.80 | 4.64 | 4.64 | 4.64 | 0.55 | 1.39 | ± 12.0 % |
| 2600 | 39.0 | 1.96 | 4.44 | 4.44 | 4.44 | 0.58 | 1.43 | ± 12.0 % |

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

[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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

## Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) [C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha [G] | Depth [G] (mm) | Unc (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 55.5 | 0.96 | 6.71 | 6.71 | 6.71 | 0.45 | 1.38 | ± 12.0 % |
| 835 | 55.2 | 0.97 | 6.56 | 6.56 | 6.56 | 0.80 | 1.05 | ± 12.0 % |
| 1750 | 53.4 | 1.49 | 5.19 | 5.19 | 5.19 | 0.37 | 1.73 | ± 12.0 % |
| 1900 | 53.3 | 1.52 | 5.00 | 5.00 | 5.00 | 0.47 | 1.51 | ± 12.0 % |
| 2300 | 52.9 | 1.81 | 4.66 | 4.66 | 4.66 | 0.59 | 1.36 | ± 12.0 % |
| 2450 | 52.7 | 1.95 | 4.47 | 4.47 | 4.47 | 0.55 | 1.20 | ± 12.0 % |
| 2600 | 52.5 | 2.16 | 4.28 | 4.28 | 4.28 | 0.50 | 1.20 | ± 12.0 % |

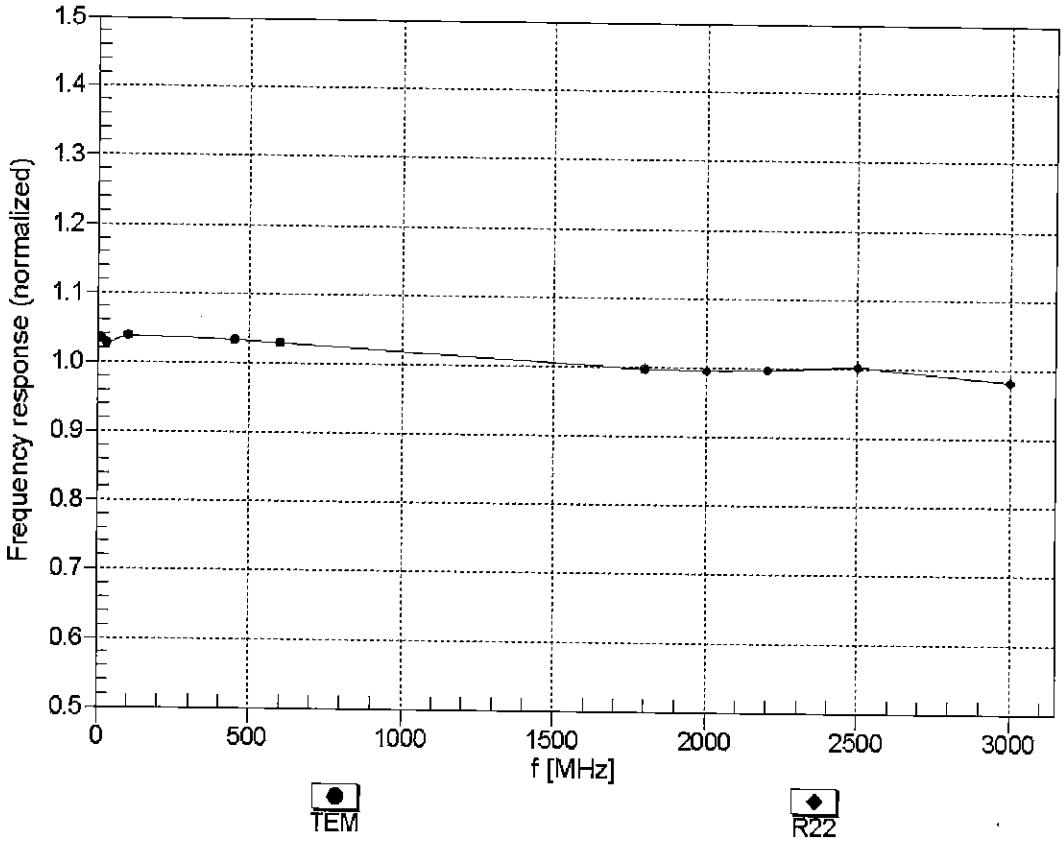
[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz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

[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

# Frequency Response of E-Field

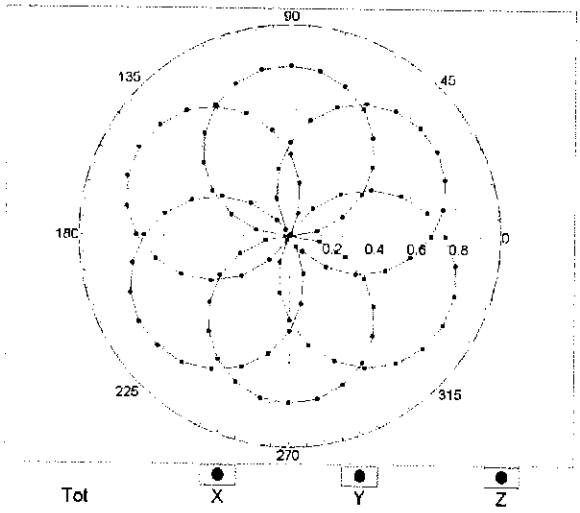
**(TEM-Cell:ifi110 EXX, Waveguide: R22)**



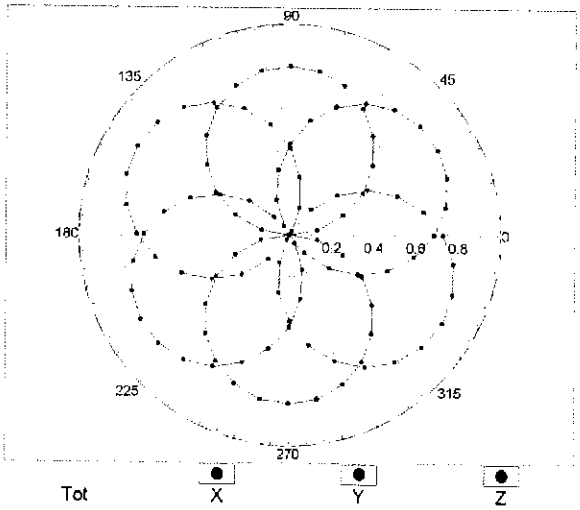

**Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)**

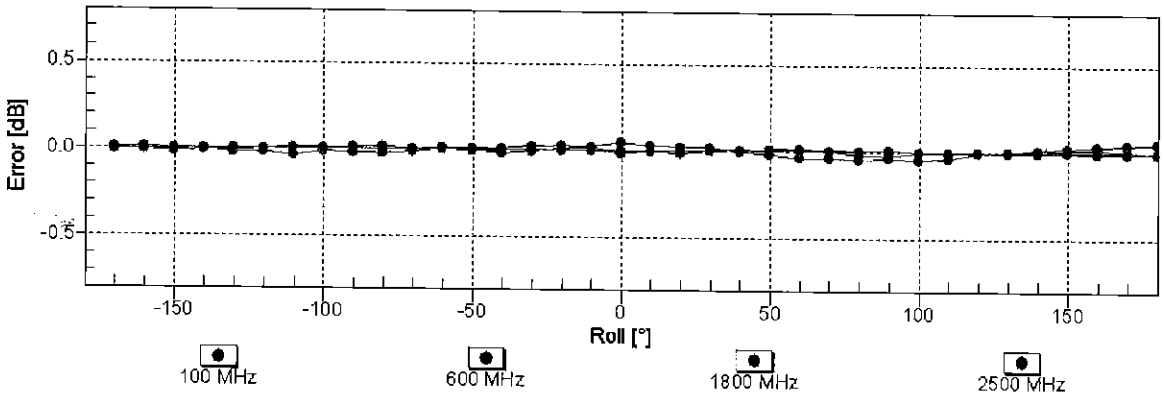
# Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM




f=1800 MHz,R22

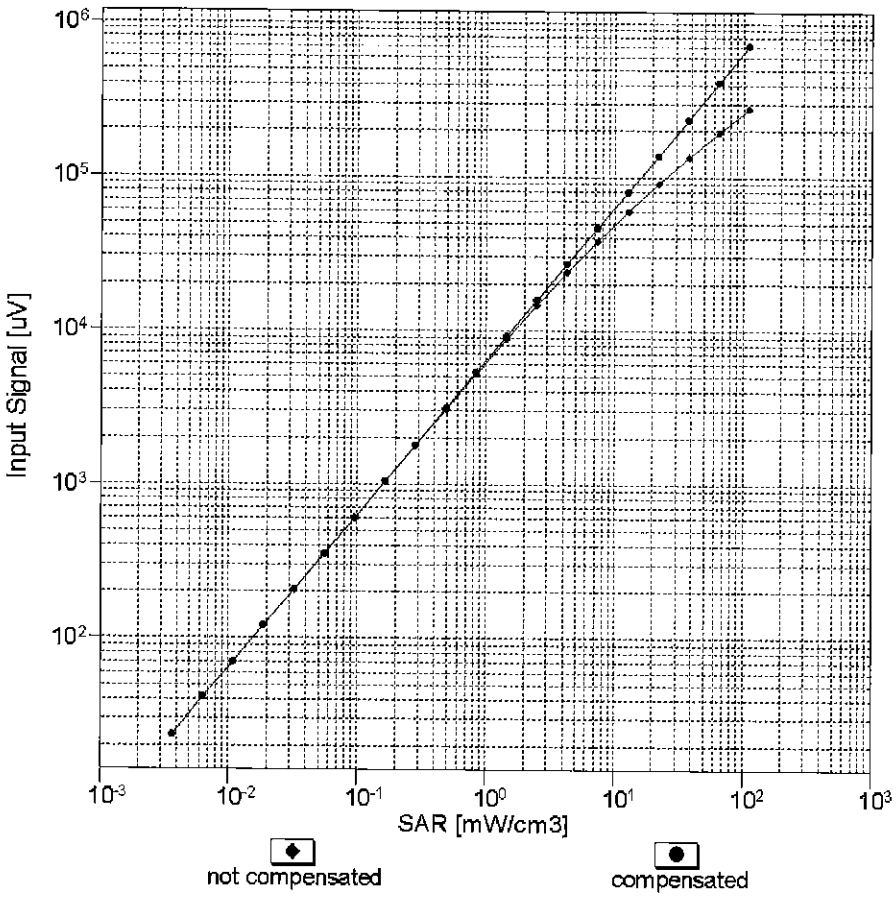


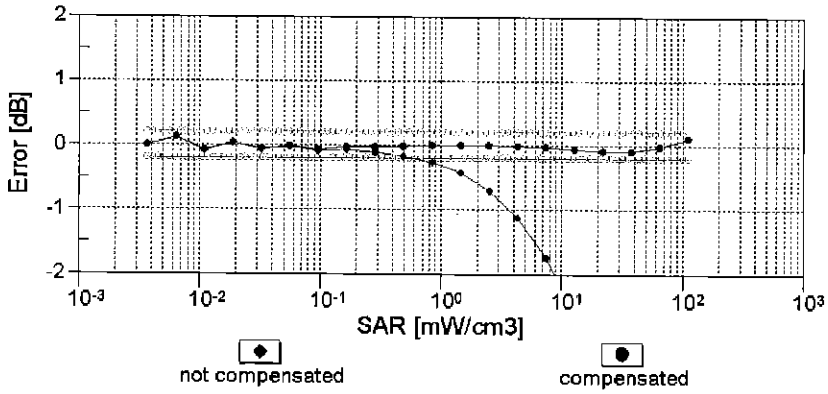




**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

# Dynamic Range f($SAR_{head}$)

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

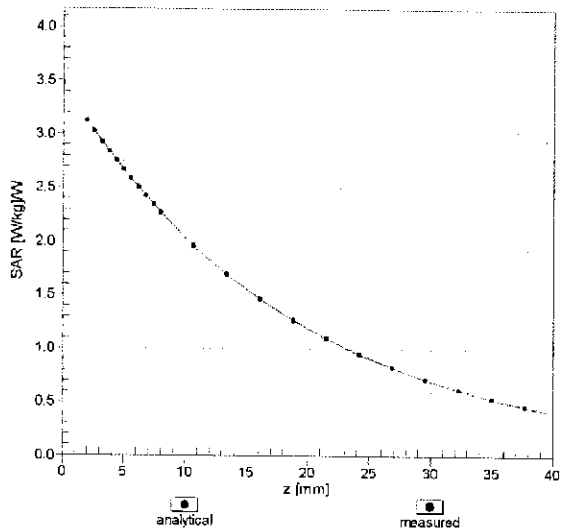


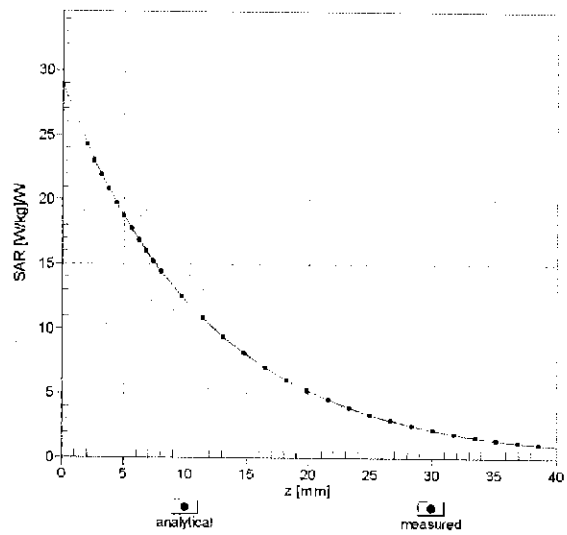

**Uncertainty of Linearity Assessment: ± 0.6% (k=2)**

# Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

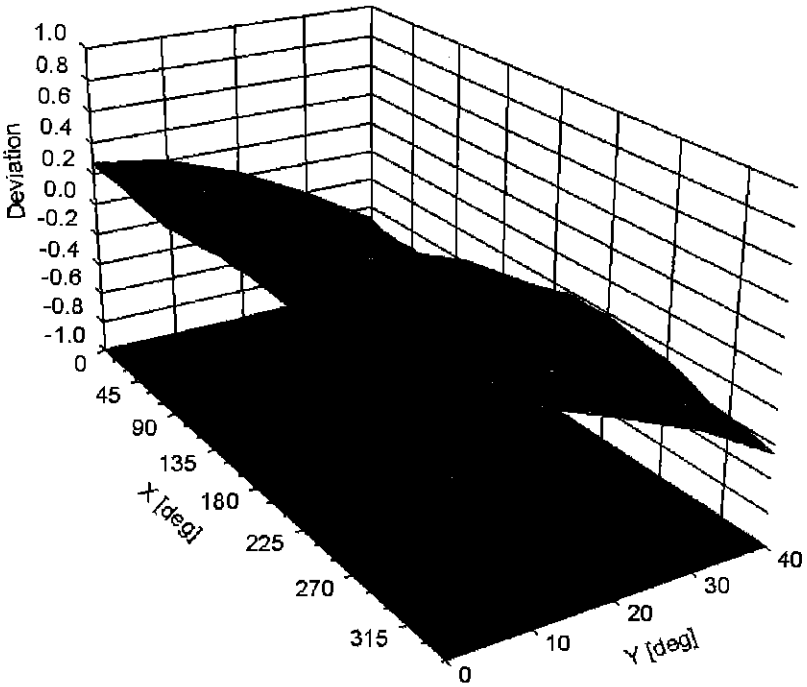


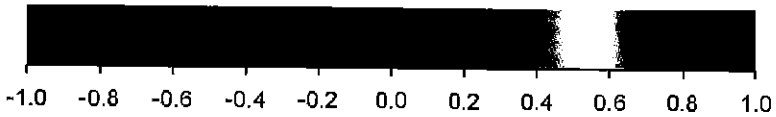

f = 1900 MHz,WGLS R22 (H_convF)




# Deviation from Isotropy in Liquid

**Error (ϕ, ϑ), f = 900 MHz**




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

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

## Other Probe Parameters

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

## Appendix: Modulation Calibration Parameters

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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**Client** PC Test

**Certificate No: ES3-3332_Aug17**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | ES3DV3 - SN:3332 |
| Calibration procedure(s) | QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6<br>Calibration procedure for dosimetric E-field probes |
| Calibration date: | August 14, 2017 |

PMV
8/27/17

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

Issued: August 16, 2017

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

## Glossary:

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A, B, C, D | modulation dependent linearization parameters |
| Polarization φ | φ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis |
| Connector Angle | information used in DASY system to align probe sensor X to the robot coordinate system |

## Calibration is Performed According to the Following Standards:

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

## Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the $E^2$-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

# Probe ES3DV3

## SN:3332

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

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

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

## Basic Calibration Parameters

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

## Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB$\sqrt{\mu V}$ | C | D dB | VR mV | Unc[E] (k=2) |
|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.0 | 0.0 | 1.0 | 0.00 | 192.0 | ±3.5 % |
| | | Y | 0.0 | 0.0 | 1.0 | | 194.3 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 179.9 | |

Note: For details on UID parameters see Appendix.

## Sensor Model Parameters

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

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

[A] The uncertainties of Norm X,Y,Z do not affect the $E^2$-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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

## Calibration Parameter Determined in Head Tissue Simulating Media

| f (MHz) [C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha [G] | Depth [G] (mm) | Unc (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 41.9 | 0.89 | 6.81 | 6.81 | 6.81 | 0.72 | 1.31 | ± 12.0 % |
| 835 | 41.5 | 0.90 | 6.64 | 6.64 | 6.64 | 0.80 | 1.21 | ± 12.0 % |
| 1750 | 40.1 | 1.37 | 5.56 | 5.56 | 5.56 | 0.80 | 1.20 | ± 12.0 % |
| 1900 | 40.0 | 1.40 | 5.33 | 5.33 | 5.33 | 0.76 | 1.26 | ± 12.0 % |
| 2300 | 39.5 | 1.67 | 4.99 | 4.99 | 4.99 | 0.70 | 1.36 | ± 12.0 % |
| 2450 | 39.2 | 1.80 | 4.68 | 4.68 | 4.68 | 0.63 | 1.48 | ± 12.0 % |
| 2600 | 39.0 | 1.96 | 4.56 | 4.56 | 4.56 | 0.80 | 1.23 | ± 12.0 % |

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

[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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

## Calibration Parameter Determined in Body Tissue Simulating Media

| f (MHz) [C] | Relative Permittivity [F] | Conductivity (S/m) [F] | ConvF X | ConvF Y | ConvF Z | Alpha [G] | Depth [G] (mm) | Unc (k=2) |
|---|---|---|---|---|---|---|---|---|
| 750 | 55.5 | 0.96 | 6.54 | 6.54 | 6.54 | 0.55 | 1.43 | ± 12.0 % |
| 835 | 55.2 | 0.97 | 6.47 | 6.47 | 6.47 | 0.71 | 1.27 | ± 12.0 % |
| 1750 | 53.4 | 1.49 | 5.16 | 5.16 | 5.16 | 0.80 | 1.22 | ± 12.0 % |
| 1900 | 53.3 | 1.52 | 4.95 | 4.95 | 4.95 | 0.54 | 1.56 | ± 12.0 % |
| 2300 | 52.9 | 1.81 | 4.74 | 4.74 | 4.74 | 0.80 | 1.30 | ± 12.0 % |
| 2450 | 52.7 | 1.95 | 4.55 | 4.55 | 4.55 | 0.80 | 1.17 | ± 12.0 % |
| 2600 | 52.5 | 2.16 | 4.43 | 4.43 | 4.43 | 0.80 | 1.12 | ± 12.0 % |

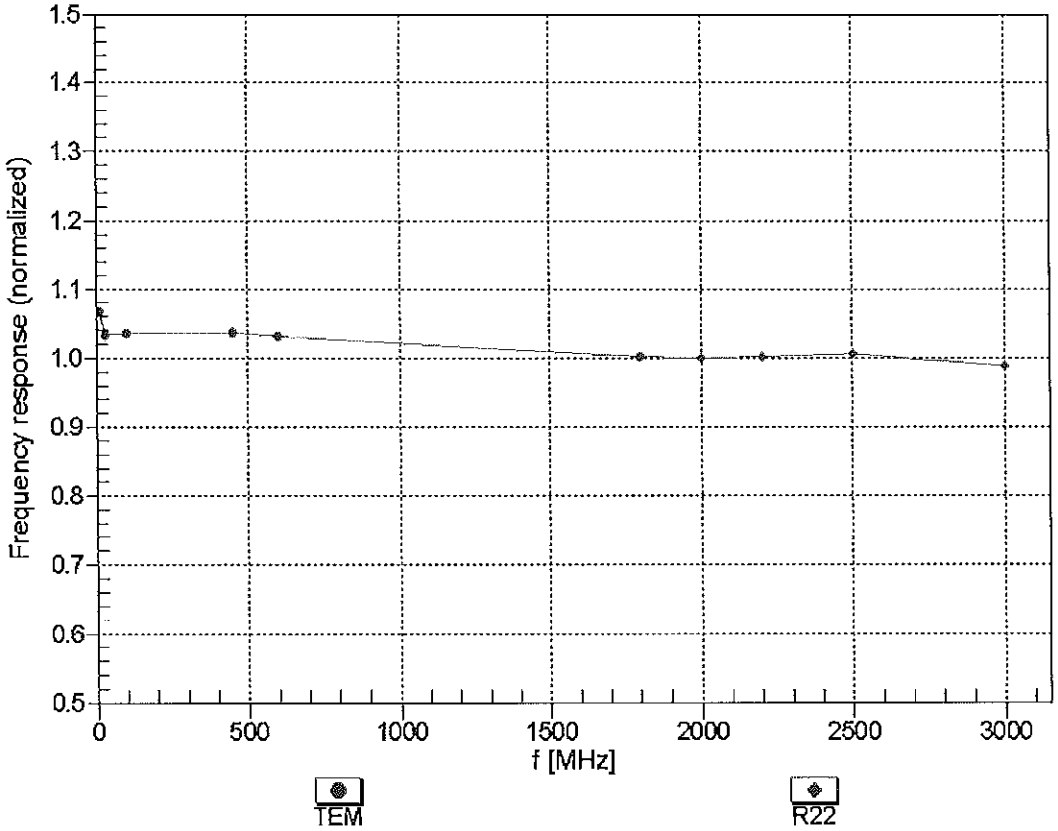
[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz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

[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

# Frequency Response of E-Field

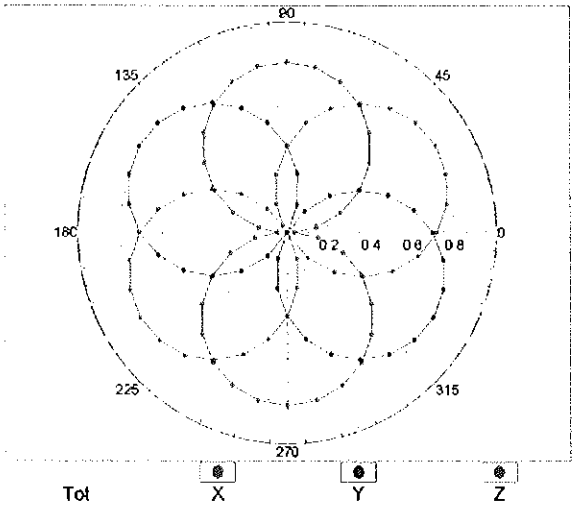
**(TEM-Cell:ifi110 EXX, Waveguide: R22)**



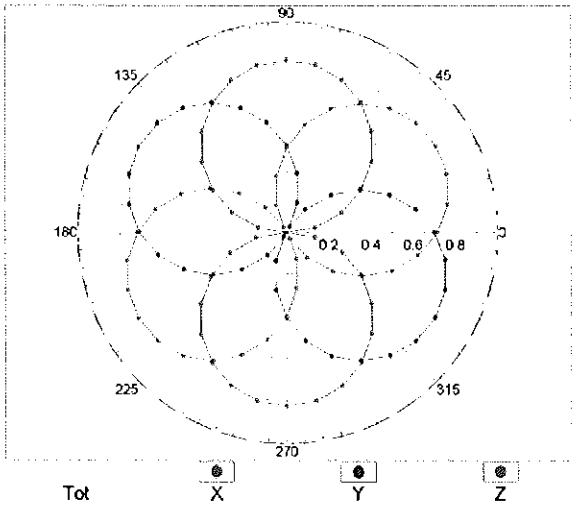

**Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)**

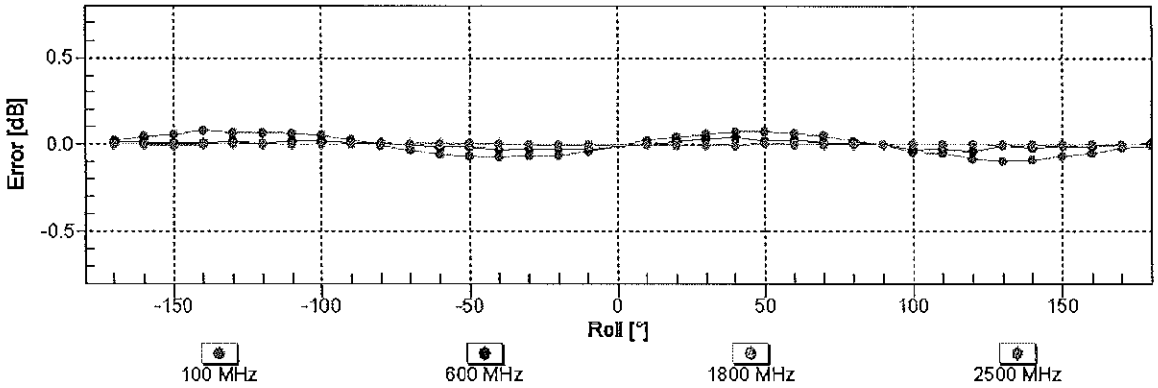
# Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM




f=1800 MHz,R22

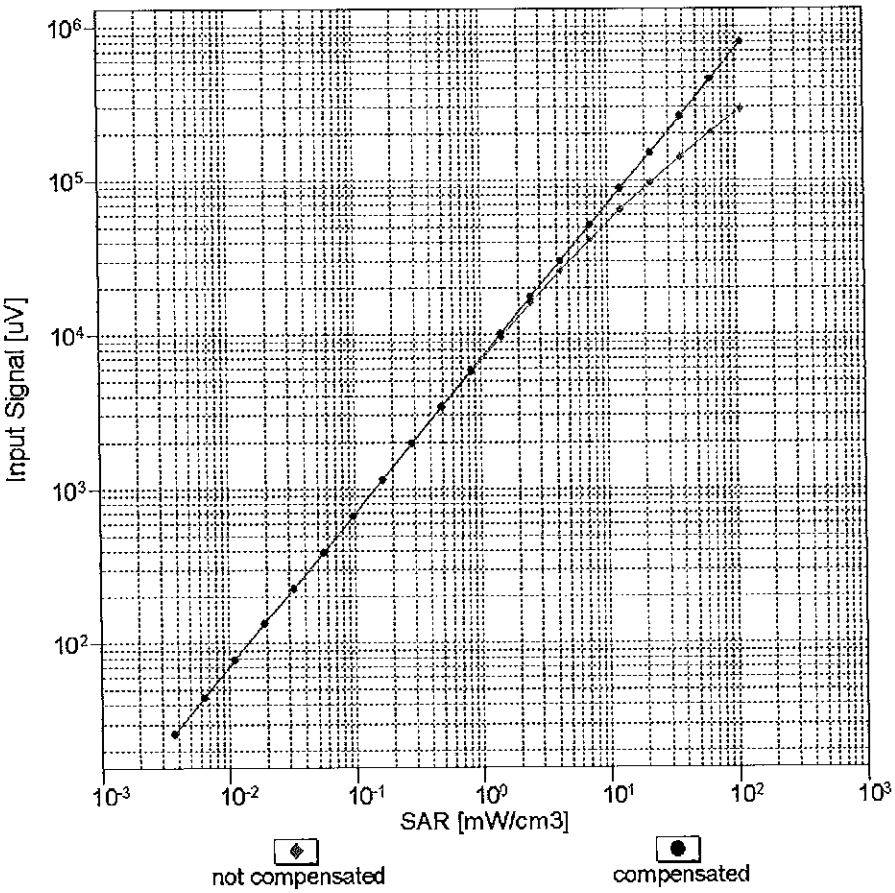


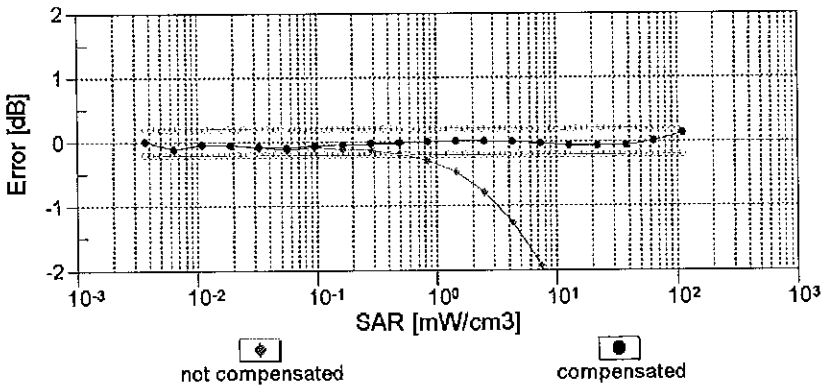




**Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)**

# Dynamic Range f(SAR$_{head}$)

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

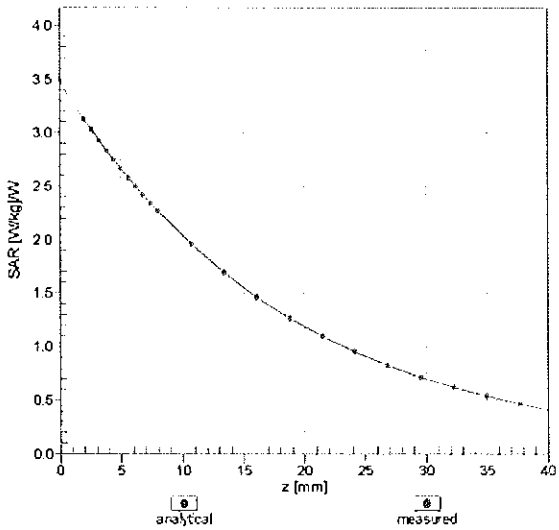


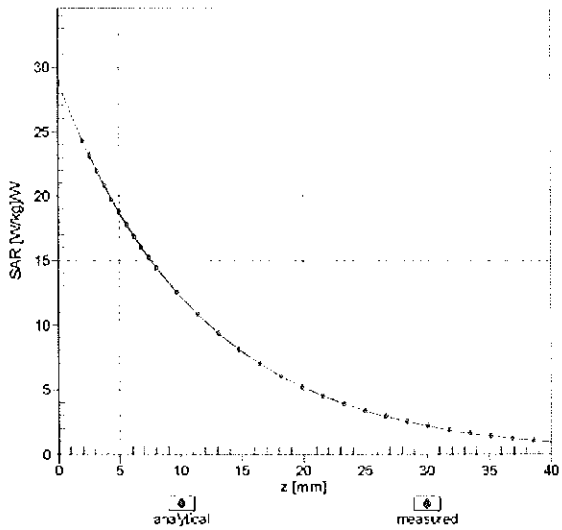

**Uncertainty of Linearity Assessment: ± 0.6% (k=2)**

# Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

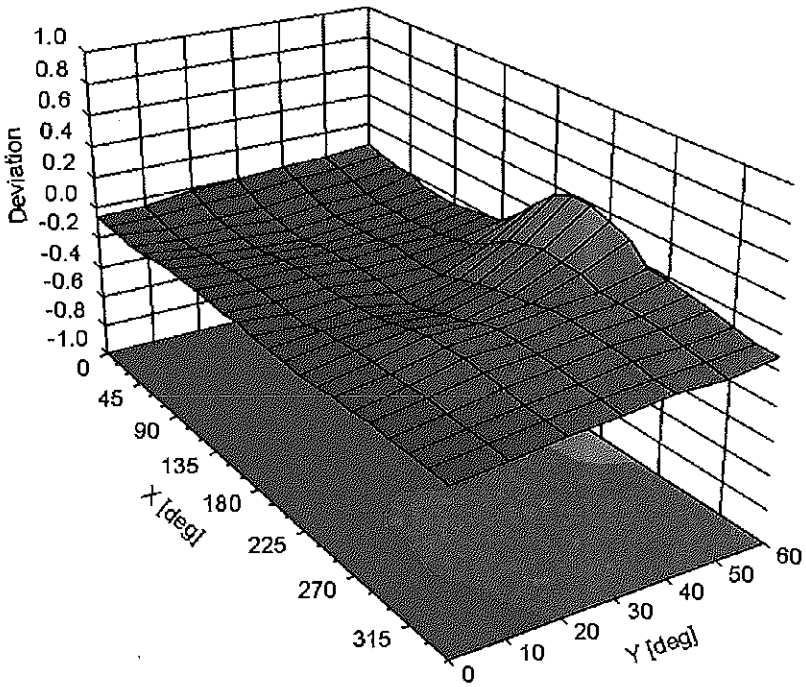


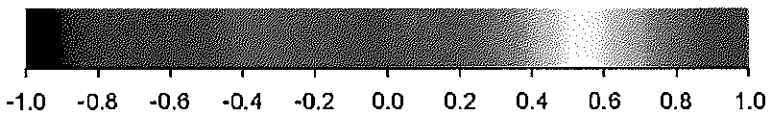

f = 1900 MHz,WGLS R22 (H_convF)




# Deviation from Isotropy in Liquid

**Error (ϕ, ϑ), f = 900 MHz**




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

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

## Other Probe Parameters

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

## Appendix: Modulation Calibration Parameters

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**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: EX3-3914_Feb18**

# CALIBRATION CERTIFICATE

| | |
|---|---|
| Object | EX3DV4 - SN:3914 |
| Calibration procedure(s) | QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6<br>Calibration procedure for dosimetric E-field probes |
| Calibration date: | February 14, 2018 |

BN 02-23-2018

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

Issued: February 14, 2018

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

## Glossary:

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A, B, C, D | modulation dependent linearization parameters |
| Polarization φ | φ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis |
| Connector Angle | information used in DASY system to align probe sensor X to the robot coordinate system |

## Calibration is Performed According to the Following Standards:

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

## Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the $E^2$-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).