

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1155

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5400 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz, Frequency: 5850 MHz

Medium parameters used: $f = 5250$ MHz; $\sigma = 4.57$ S/m; $\epsilon_r = 36.2$; $\rho = 1000$ kg/m³Medium parameters used: $f = 5400$ MHz; $\sigma = 4.73$ S/m; $\epsilon_r = 35.9$; $\rho = 1000$ kg/m³Medium parameters used: $f = 5600$ MHz; $\sigma = 4.94$ S/m; $\epsilon_r = 35.7$; $\rho = 1000$ kg/m³Medium parameters used: $f = 5750$ MHz; $\sigma = 5.09$ S/m; $\epsilon_r = 35.4$; $\rho = 1000$ kg/m³Medium parameters used: $f = 5850$ MHz; $\sigma = 5.2$ S/m; $\epsilon_r = 35.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.51, 5.51, 5.51) @ 5250 MHz, ConvF(5.5, 5.5, 5.5) @ 5400 MHz, ConvF(5.05, 5.05, 5.05) @ 5600 MHz, ConvF(4.98, 4.98, 4.98) @ 5750 MHz, ConvF(4.94, 4.94, 4.94) @ 5850 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601 (5GHz); Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 76.63 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 28.2 W/kg

SAR(1 g) = 8.14 W/kg; SAR(10 g) = 2.35 W/kg

Maximum value of SAR (measured) = 18.4 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5400 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 75.16 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 31.4 W/kg

SAR(1 g) = 8.33 W/kg; SAR(10 g) = 2.39 W/kg

Maximum value of SAR (measured) = 19.4 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 75.94 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 32.5 W/kg

SAR(1 g) = 8.52 W/kg; SAR(10 g) = 2.43 W/kg

Maximum value of SAR (measured) = 20.1 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 72.32 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 30.9 W/kg

SAR(1 g) = 7.85 W/kg; SAR(10 g) = 2.23 W/kg

Maximum value of SAR (measured) = 18.7 W/kg

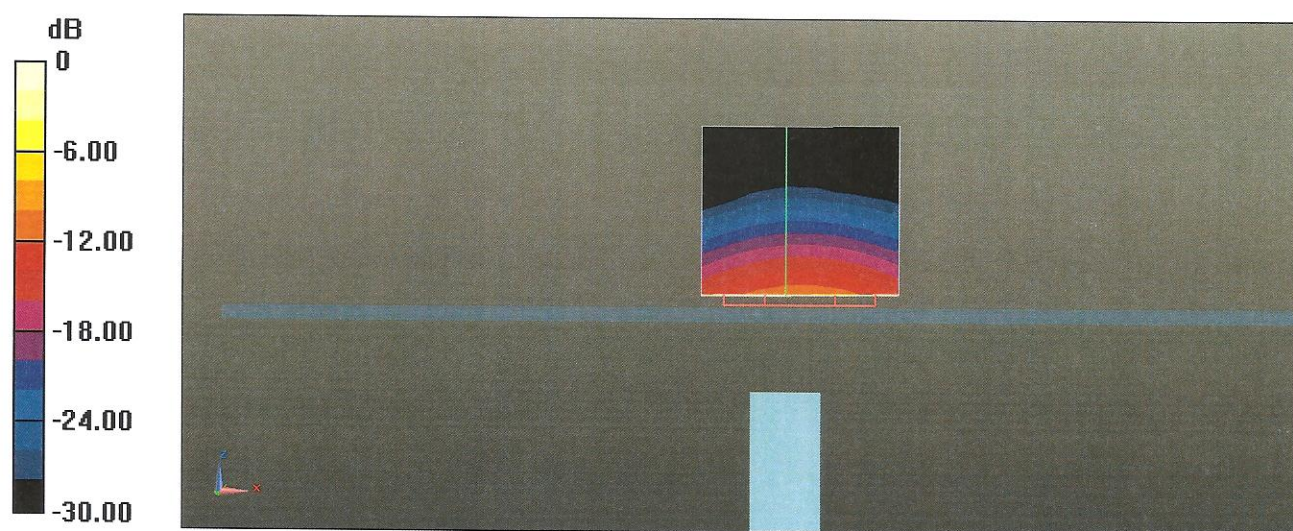
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5850 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 73.54 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 36.0 W/kg

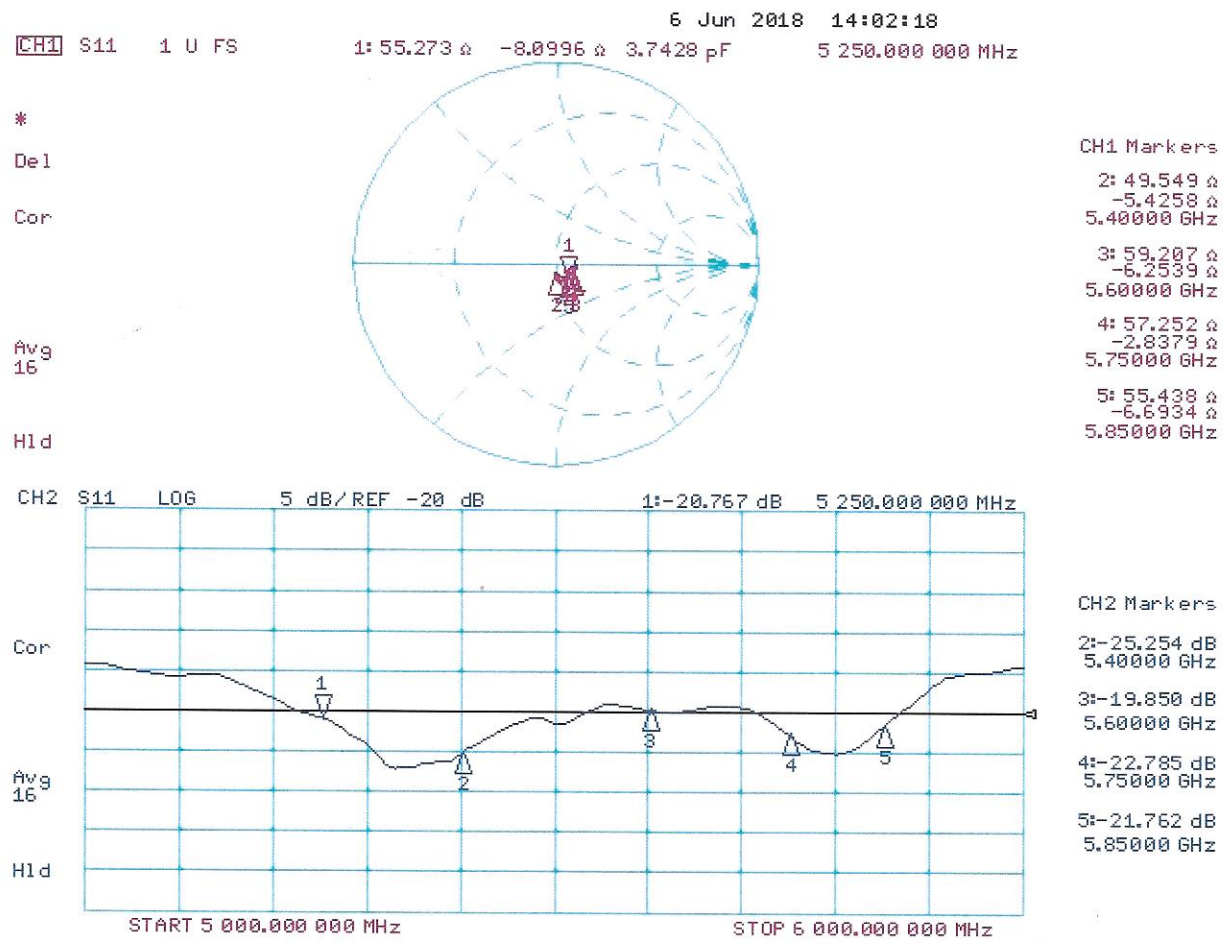
SAR(1 g) = 8.5 W/kg; SAR(10 g) = 2.41 W/kg

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



0 dB = 18.4 W/kg = 12.65 dBW/kg

Impedance Measurement Plot for Head TSL



Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1155

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5400 MHz, Frequency: 5600 MHz, Frequency: 5750 MHz, Frequency: 5850 MHz

Medium parameters used: $f = 5250$ MHz; $\sigma = 5.51$ S/m; $\epsilon_r = 46.9$; $\rho = 1000$ kg/m³Medium parameters used: $f = 5400$ MHz; $\sigma = 5.71$ S/m; $\epsilon_r = 46.7$; $\rho = 1000$ kg/m³Medium parameters used: $f = 5600$ MHz; $\sigma = 5.99$ S/m; $\epsilon_r = 46.3$; $\rho = 1000$ kg/m³Medium parameters used: $f = 5750$ MHz; $\sigma = 6.19$ S/m; $\epsilon_r = 46$; $\rho = 1000$ kg/m³Medium parameters used: $f = 5850$ MHz; $\sigma = 6.33$ S/m; $\epsilon_r = 45.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.26, 5.26, 5.26) @ 5250 MHz, ConvF(4.7, 4.7, 4.7) @ 5400 MHz, ConvF(4.65, 4.65, 4.65) @ 5600 MHz, ConvF(4.57, 4.57, 4.57) @ 5750 MHz, ConvF(4.47, 4.47, 4.47) @ 5850 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601 (5GHz); Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 67.19 V/m; Power Drift = -0.06dB

Peak SAR (extrapolated) = 28.5 W/kg

SAR(1 g) = 7.53 W/kg; SAR(10 g) = 2.11 W/kg

Maximum value of SAR (measured) = 17.2 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5400 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 68.41 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 31.3 W/kg

SAR(1 g) = 7.93 W/kg; SAR(10 g) = 2.22 W/kg

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

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 67.66 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 33.5 W/kg

SAR(1 g) = 8.02 W/kg; SAR(10 g) = 2.23 W/kg

Maximum value of SAR (measured) = 19.2 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 64.78 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 31.5 W/kg

SAR(1 g) = 7.39 W/kg; SAR(10 g) = 2.06 W/kg

Maximum value of SAR (measured) = 17.8 W/kg

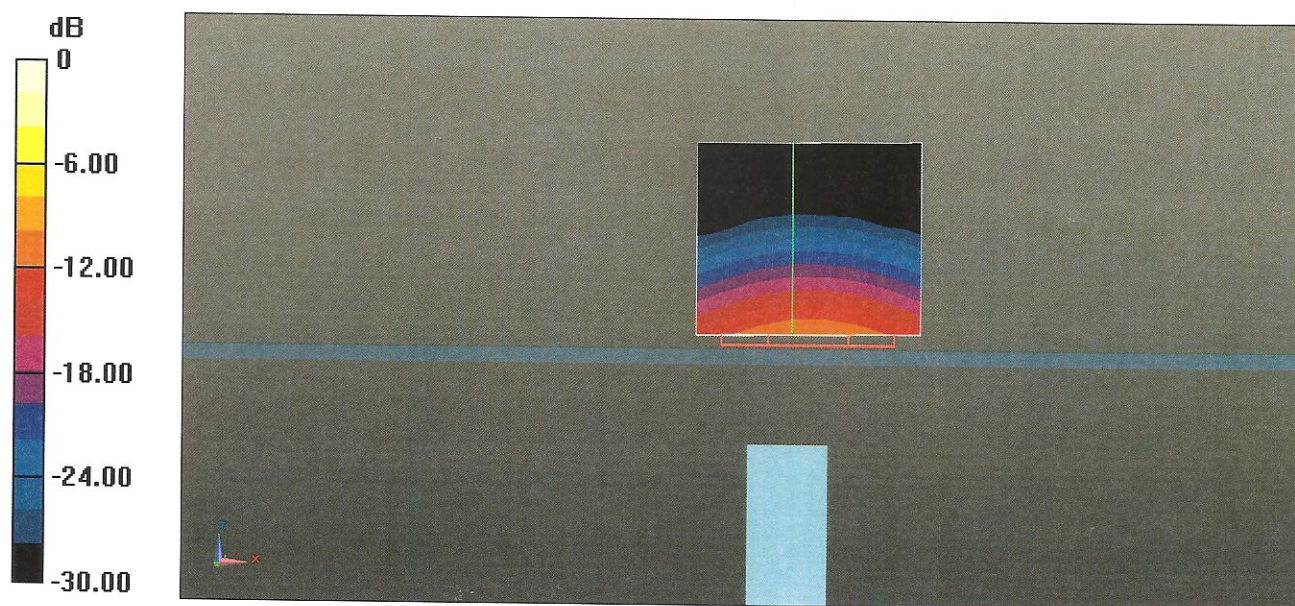
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5850 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.90 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 34.8 W/kg

SAR(1 g) = 7.85 W/kg; SAR(10 g) = 2.18 W/kg

Maximum value of SAR (measured) = 19.1 W/kg

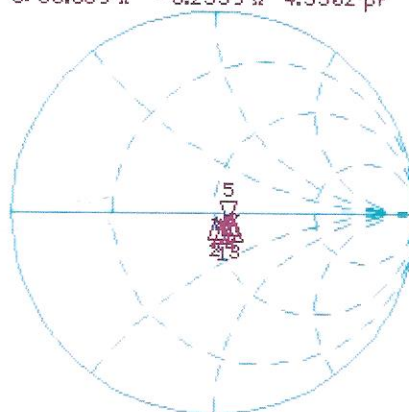


0 dB = 17.2 W/kg = 12.36 dBW/kg

Impedance Measurement Plot for Body TSL

8 Jun 2018 17:23:01
 CH1 S11 1 U FS 5: 56.309 Ω -6.2539 Ω 4.3502 pF 5.850.000 000 MHz

*
 Del
 Cor
 Avg
 16
 H1d

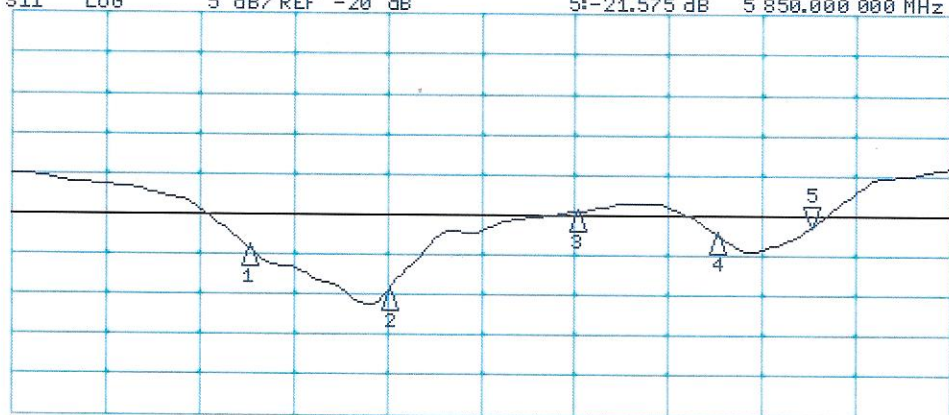


CH1 Markers

1: 53.424 Ω
 -5.5078 Ω
 5.25000 GHz
 2: 49.893 Ω
 -3.3242 Ω
 5.40000 GHz
 3: 60.596 Ω
 -4.9629 Ω
 5.60000 GHz
 4: 58.160 Ω
 -1.5859 Ω
 5.75000 GHz

CH2 S11 LOG 5 dB/REF -20 dB 5:-21.575 dB 5.850.000 000 MHz

Cor
 Avg
 16
 H1d



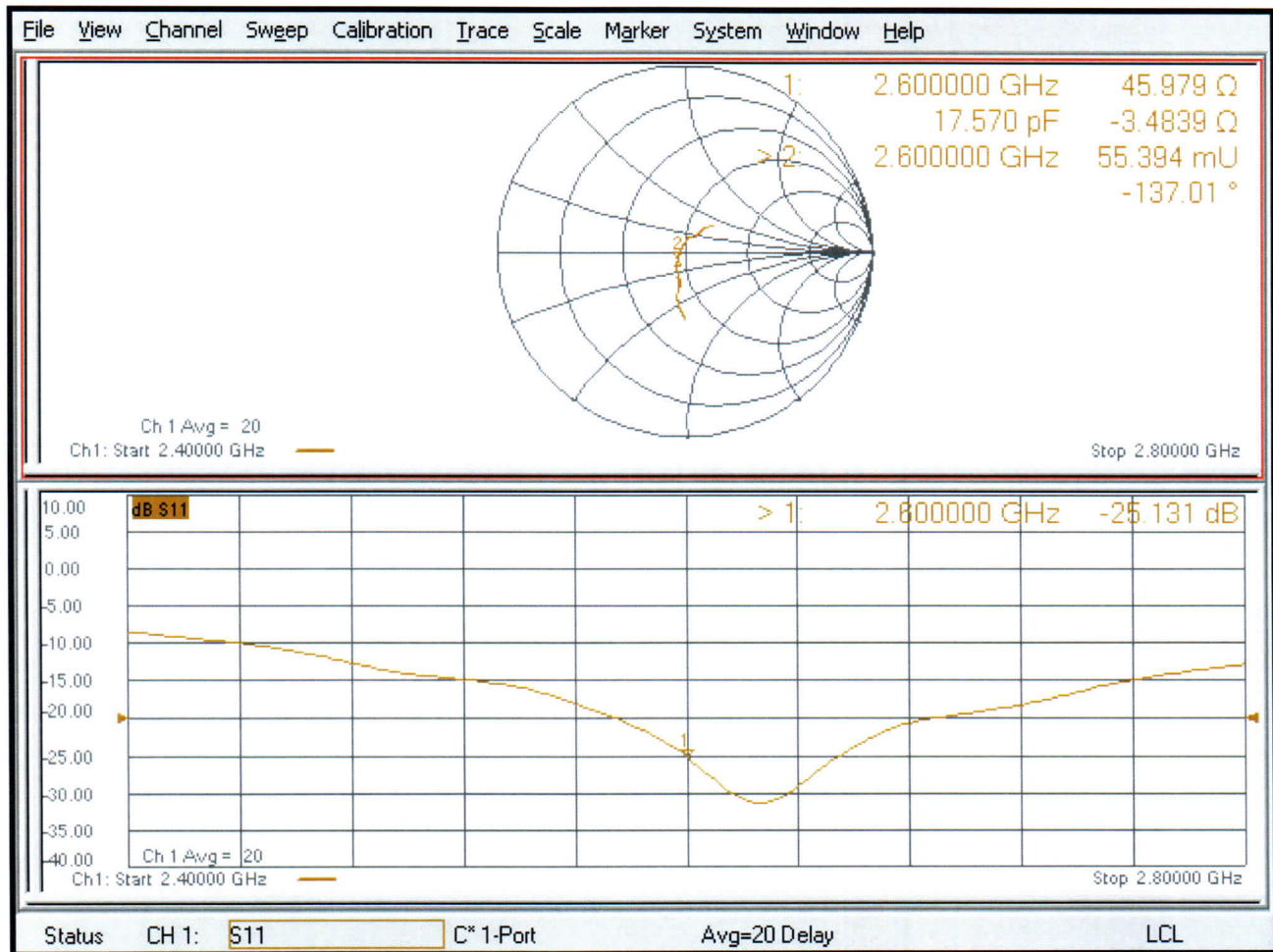
CH2 Markers

1:-24.061 dB
 5.25000 GHz
 2:-29.552 dB
 5.40000 GHz
 3:-19.521 dB
 5.60000 GHz
 4:-22.289 dB
 5.75000 GHz
 5:-21.575 dB
 5.85000 GHz

START 5.000.000 000 MHz

STOP 6.000.000 000 MHz

Impedance Measurement Plot for Body TSL

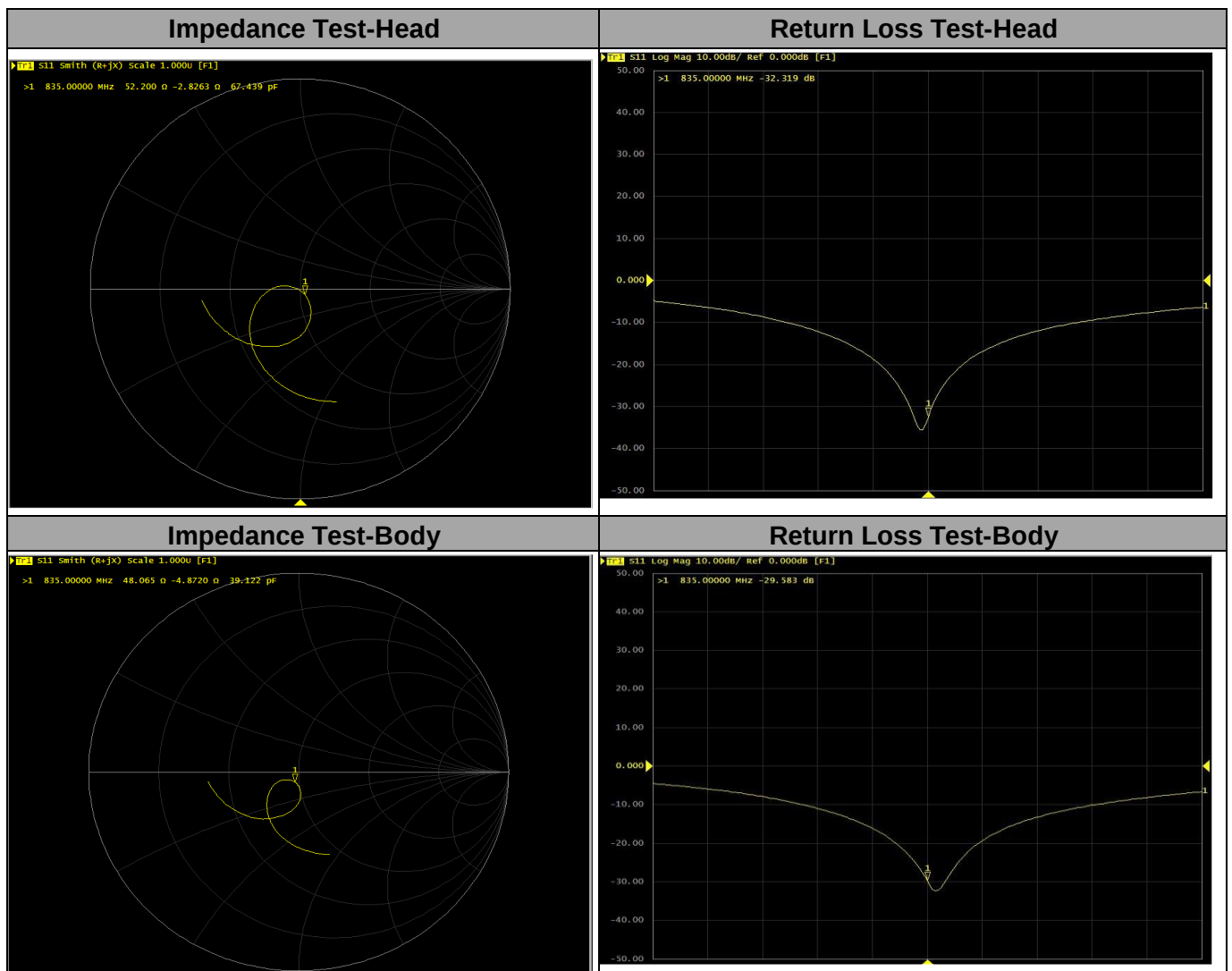


Justification of the extended calibration of Dipole D835V2 SN:4d059

Per KDB 865664, we have measured the Impedance and Return Loss as below.

- 1) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.
- 2) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5 ohm from the previous measurement.

Dipole 835 Head TST	Target Value	Measured Value	Difference
Impedance transformed to feed point	52.0Ω-1.8j Ω	52.2Ω-2.83j Ω	R=0.2Ω,X=-1.03Ω
Return Loss	-31.4dB	-32.32 dB	-2.92%
Dipole 835 Body TST	Target Value	Measured Value	Difference
Impedance transformed to feed point	48.7Ω-4.2j Ω	48.07Ω-4.87j Ω	R=-0.63Ω,X=-0.67Ω
Return Loss	-27.1 dB	-29.58 dB	-9.15%
Measured Date	2016-04-20	2018-04-15	-----



Justification of the extended calibration of Dipole D1900V2 SN:5d143

Per KDB 865664, we have measured the Impedance and Return Loss as below.

- 1) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.
- 2) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5 ohm from the previous measurement.

Dipole 1900 Head TST	Target Value	Measured Value	Difference
Impedance transformed to feed point	53.4Ω+4.3j Ω	49.75Ω+7.52j Ω	R=-3.65Ω,X=3.22Ω
Return Loss	-25.6dB	-25.32 dB	-1.09%
Dipole 1900 Body TST	Target Value	Measured Value	Difference
Impedance transformed to feed point	49.1Ω+5.9j Ω	46.18Ω+2.21j Ω	R=-2.92Ω,X=-3.69Ω
Return Loss	-24.4 dB	-24.5 dB	0.41%
Measured Date	2017-09-20	2018-09-20	-----

