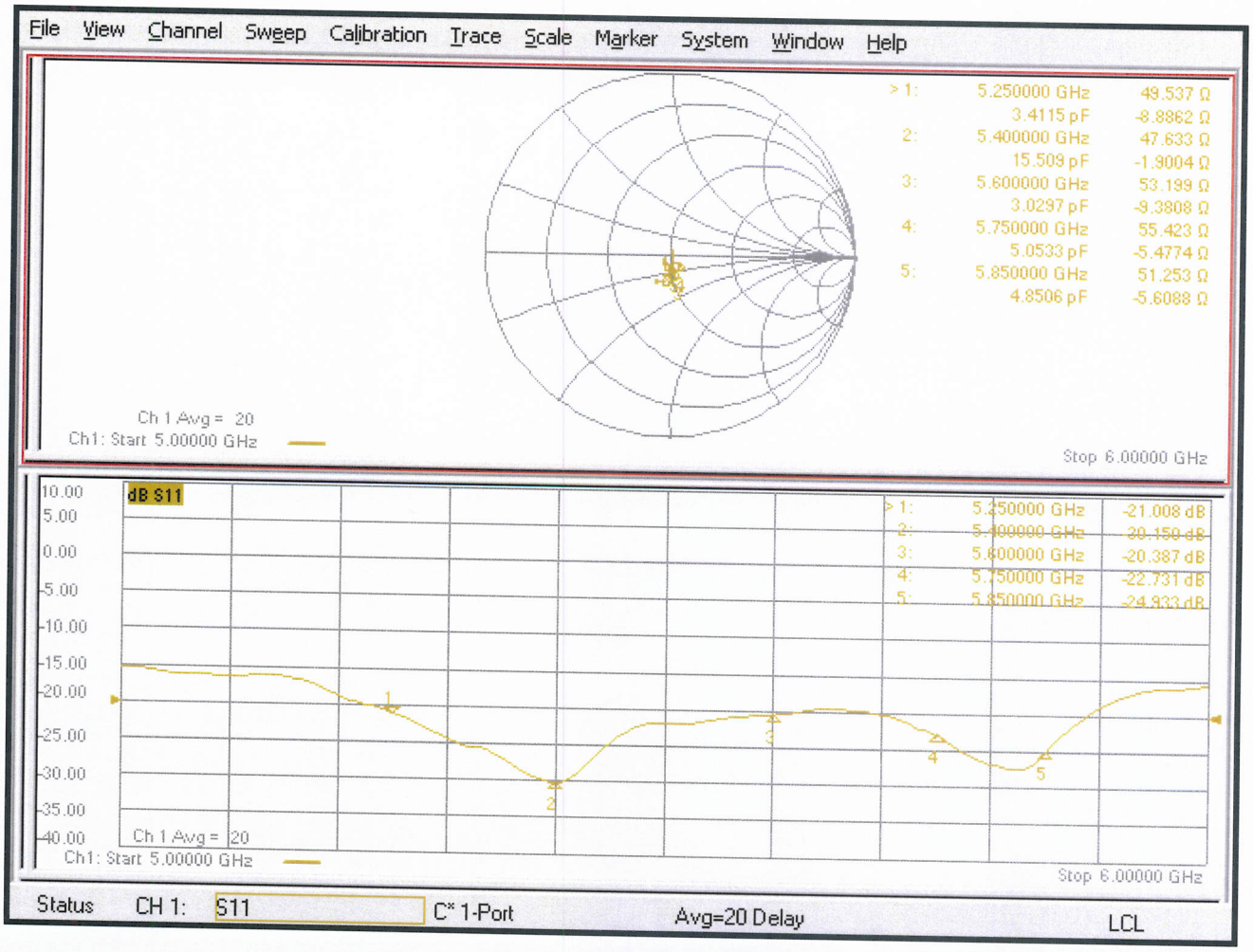
Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 24.04.2020

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; σ = 5.52 S/m; ε_r = 47.3; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5400 MHz; σ = 5.73 S/m; ε_r = 47; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5600 MHz; σ = 6 S/m; ε_r = 46.6; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5750 MHz; σ = 6.21 S/m; ε_r = 46.3; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5850 MHz; σ = 6.35 S/m; ε_r = 46.2; ρ = 1000 kg/m^3
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(5.07, 5.07, 5.07) @ 5400 MHz, ConvF(4.79, 4.79, 4.79) @ 5600 MHz, ConvF(4.66, 4.66, 4.66) @ 5750 MHz, ConvF(4.61, 4.61, 4.61) @ 5850 MHz; Calibrated: 31.12.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

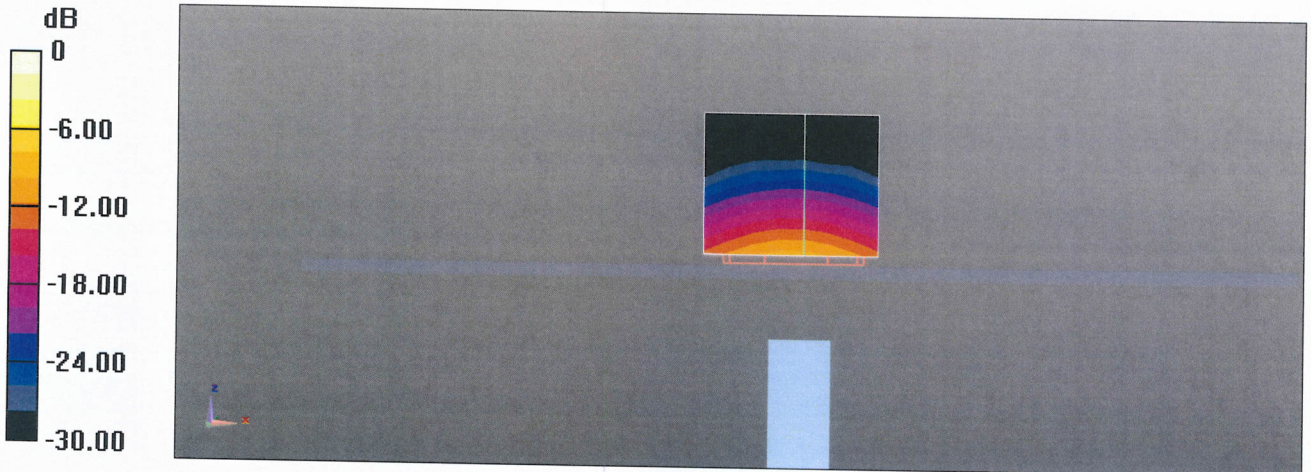
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.24 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 28.3 W/kg
SAR(1 g) = 7.35 W/kg; SAR(10 g) = 2.06 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 66.9%
Maximum value of SAR (measured) = 17.4 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 = 67.41 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 31.4 W/kg
SAR(1 g) = 7.79 W/kg; SAR(10 g) = 2.17 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 65.5%
Maximum value of SAR (measured) = 18.8 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 = 66.39 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 33.4 W/kg
SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.15 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 63.5%
Maximum value of SAR (measured) = 19.1 W/kg

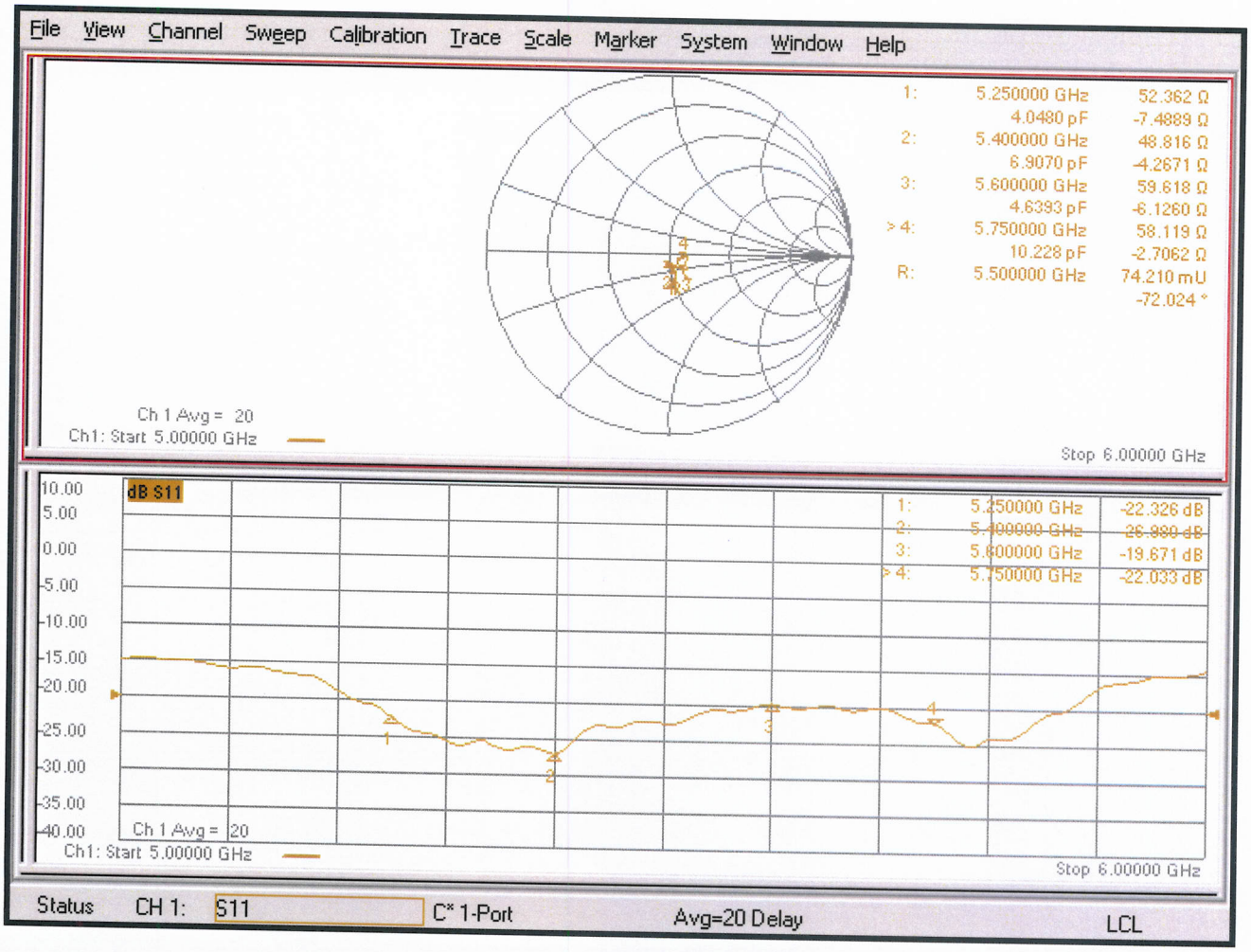
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.83 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 33.3 W/kg
SAR(1 g) = 7.39 W/kg; SAR(10 g) = 2.06 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 62%
Maximum value of SAR (measured) = 18.4 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 = 65.87 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 34.6 W/kg
SAR(1 g) = 7.71 W/kg; SAR(10 g) = 2.13 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 62.1%
Maximum value of SAR (measured) = 19.2 W/kg

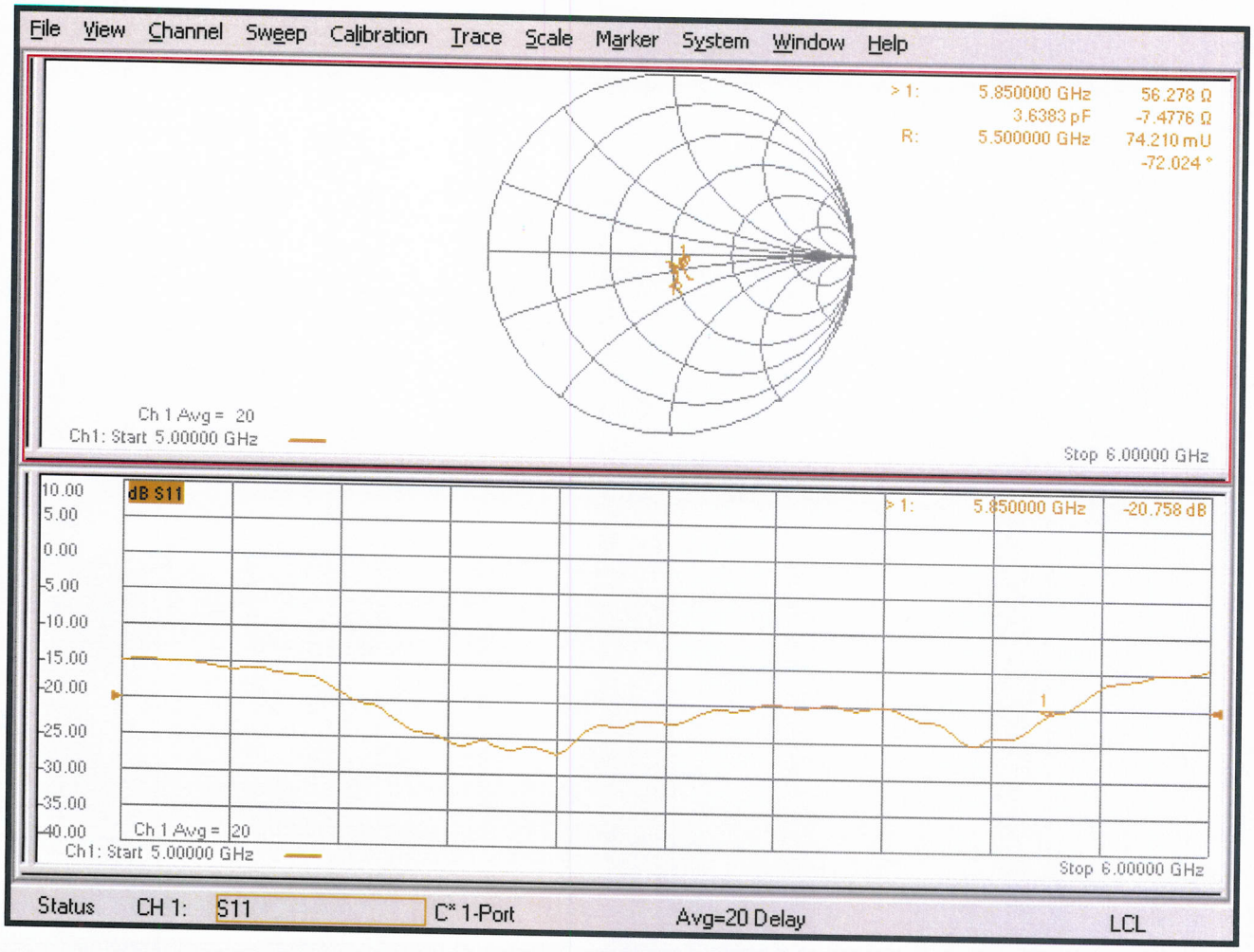


0 dB = 17.4 W/kg = 12.41 dBW/kg

Impedance Measurement Plot for Body TSL (5250, 5400, 5600, 5750 MHz)



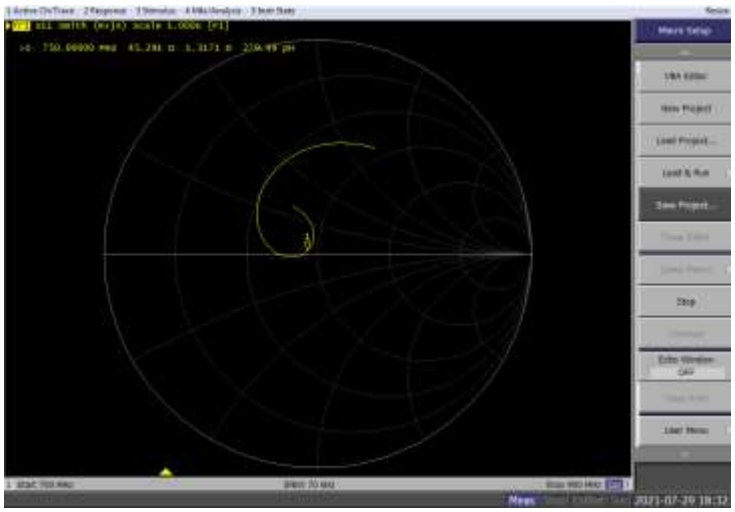
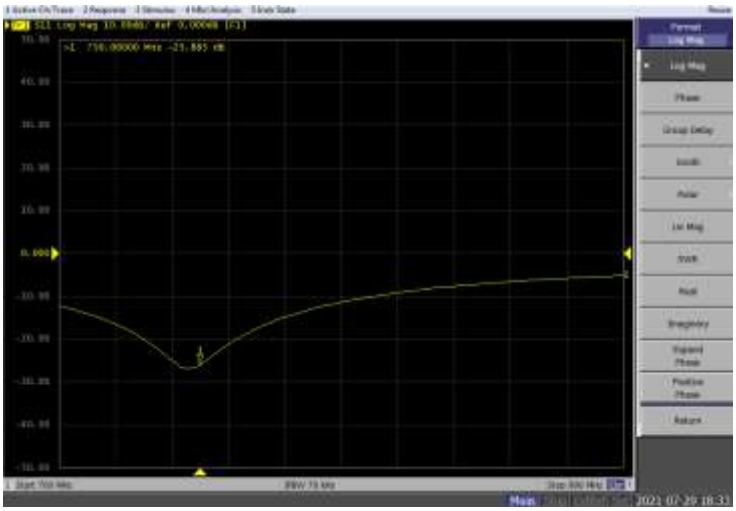
Impedance Measurement Plot for Body TSL (5850 MHz)



Justification of the extended calibration of Dipole D750V3 SN:1044

Per KDB 865664, we have Measured the Impedance and Return Loss as below, and the return loss is <-20dB, with 20% of prior calibration; the real or imaginary parts of the impedance is with 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

Dipole SN	Tissue Type	Target Tissue		Measured Tissue		Deviation		Ambiet Temp	Test Date	Test Engineer
		Impedance transformed to feed point	Return Loss(dB)	Impedance transformed to feed point	Return Loss	Δ(5Ω)	Δ(Within +/- 20%)			
1044	750MHz Head	54.6Ω+0.2jΩ	-27.0	54.3Ω+1.3jΩ	-25.9	R=-0.3Ω, X=1.1jΩ	-4.1%	22°C	2021/7/29	Zeng yongguang

Impedance Test-Head	Return Loss Test-Head
	

Self-confirmation results:

■ After self-confirmation, the performance meets the requirements and can continue to be used. (PASS)

□ After self-confirmation, the performance exceeds the deviation, and suspend to use. (Fail)

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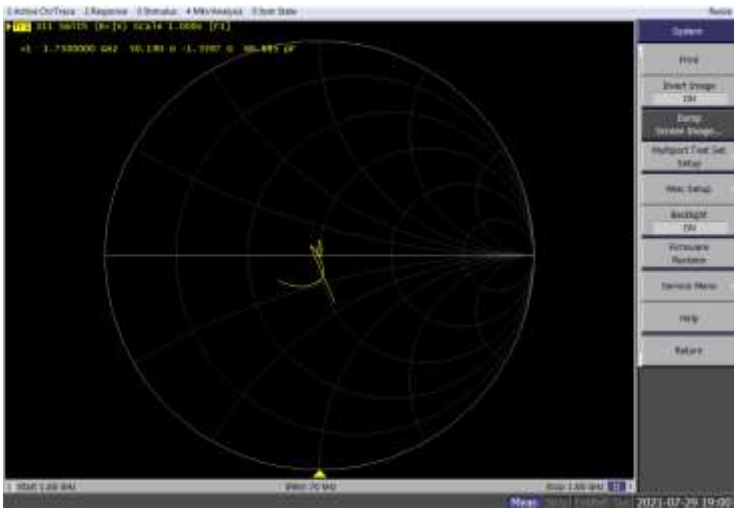
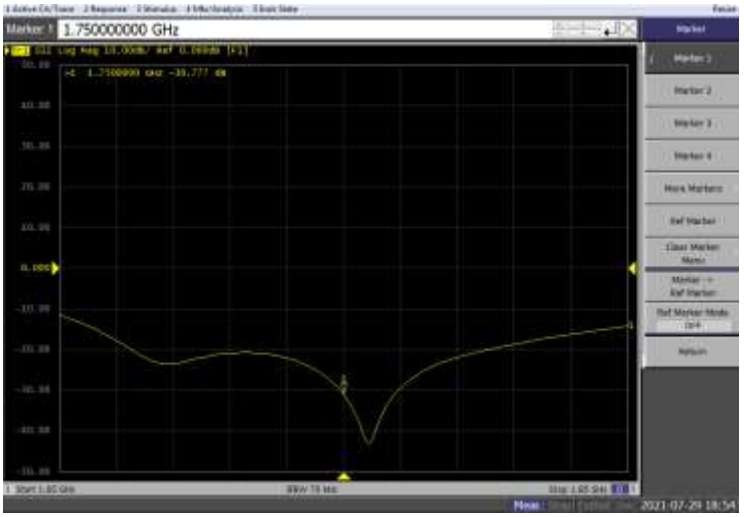
Justification of the extended calibration of Dipole D1750V2 SN:1123

Per KDB 865664, we have Measured the Impedance and Return Loss as below, and the return loss is <-20dB, with 20% of prior calibration; the real or imaginary parts of the impedance is with 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

Dipole SN	Tissue Type	Target Tissue		Measured Tissue		Deviation		Ambiet Temp	Test Date	Test Engineer
		Impedance transformed to feed point	Return Loss(dB)	Impedance transformed to feed point	Return Loss	Δ(5Ω)	Δ(Within +/-20%)			
1123	1750MHz Head	49.3Ω-2.3jΩ	-32.3	50.2Ω-1.4jΩ	-30.8	R=0.9Ω, X=0.9jΩ	-4.6%	22°C	2021/7/29	Zeng yongguang

Impedance Test-Head	Return Loss Test-Head
	

Self-confirmation results:

■ After self-confirmation, the performance meets the requirements and can continue to be used. (PASS)

□ After self-confirmation, the performance exceeds the deviation, and suspend to use. (Fail)

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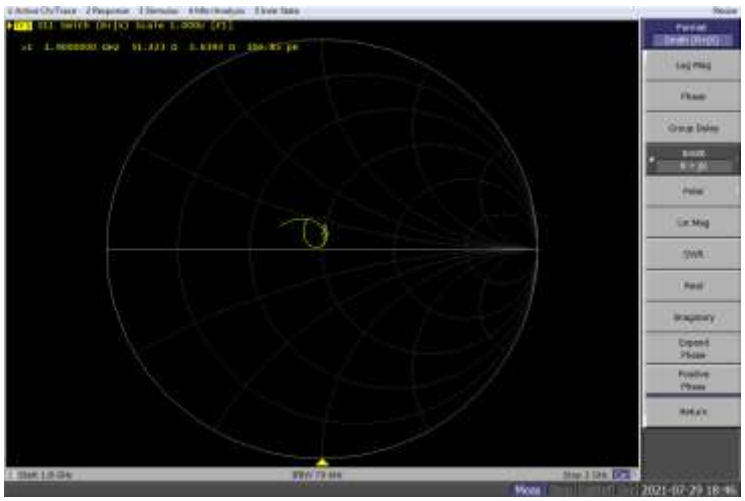
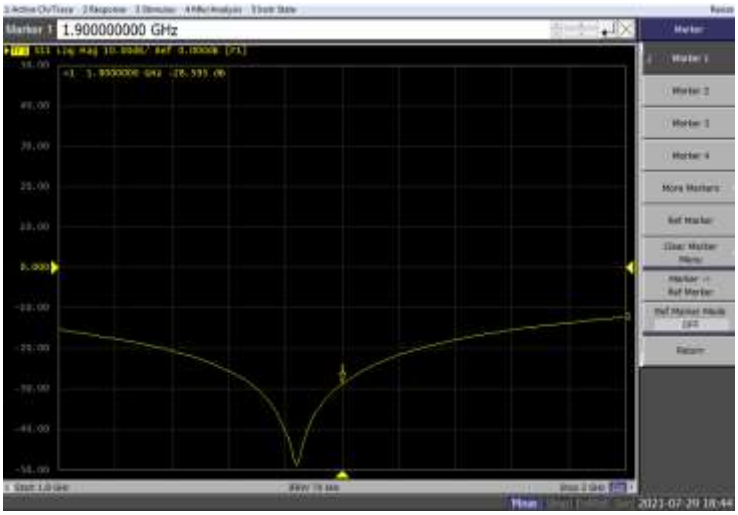
Justification of the extended calibration of Dipole D1900V2 SN:5d143

Per KDB 865664, we have Measured the Impedance and Return Loss as below, and the return loss is <-20dB, with 20% of prior calibration; the real or imaginary parts of the impedance is with 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

Dipole SN	Tissue Type	Target Tissue		Measured Tissue		Deviation		Ambiet Temp	Test Date	Test Engineer
		Impedance transformed to feed point	Return Loss(dB)	Impedance transformed to feed point	Return Loss	Δ(5Ω)	Δ(Within +/- 20%)			
5d143	1900MHz Head	52.2Ω+5.0jΩ	-25.4	51.4Ω+3.6jΩ	-28.6	R=-0.8Ω, X=-1.4jΩ	12.6%	22°C	2021/7/29	Zeng yongguang

Impedance Test-Head	Return Loss Test-Head
	

Self-confirmation results:

■ After self-confirmation, the performance meets the requirements and can continue to be used. (PASS)

□ After self-confirmation, the performance exceeds the deviation, and suspend to use. (Fail)

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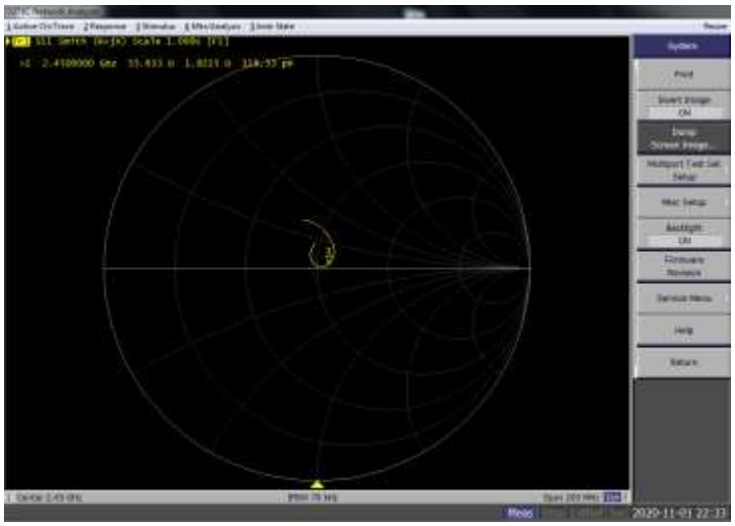
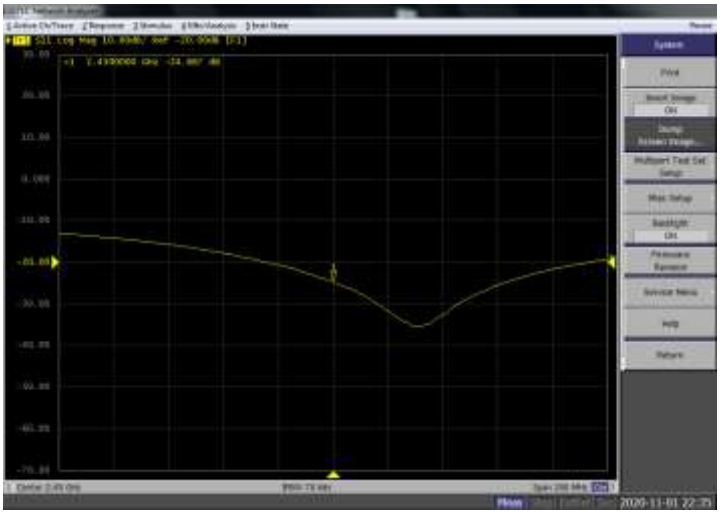
Justification of the extended calibration of Dipole D2450V2 SN:860

Per KDB 865664, we have Measured the Impedance and Return Loss as below, and the return loss is <-20dB, with 20% of prior calibration; the real or imaginary parts of the impedance is with 5 ohm of prior calibration. Therefore the verification result should support extended calibration.

Dipole SN	Tissue Type	Target Tissue		Measured Tissue		Deviation		Ambient Temp	Test Date	Test Engineer
		Impedance transformed to feed point	Return Loss(dB)	Impedance transformed to feed point	Return Loss(dB)	Δ(5Ω)	Δ(Within +/-20%)			
860	2450MHz Head	55.0Ω+4.0jΩ	-24.3	55.6Ω+1.8jΩ	-24.7	R=0.6Ω, X=-2.2jΩ	1.6%	22°C	2020/11/01	Zeng yongguang

Impedance Test-Head	Return Loss Test-Head
	

Self-confirmation results:

■ After self-confirmation, the performance meets the requirements and can continue to be used. (PASS)

□ After self-confirmation, the performance exceeds the deviation, and suspend to use. (Fail)

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