

Appendix E

Dipole Antenna self-calibration

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1. Calibration Date

Calibration Date Oct.20,2023, Due to Oct.19,2024

2. Calibration Items

Dipole Antenna self-calibration

1、 Calibration Method

Immediate re-calibration is required for the following conditions.

1) According to KDB 865664 D01, When the most recent return-loss result, measured at least annually, deviates by more than 20% from the previous measurement (i.e. value in dB \times 0.2) or not meeting the required 20 dB minimum return-loss requirement.

2) When the most recent measurement of the real or imaginary parts of the impedance, measured at least annually, deviates by more than 5 Ω from the previous measurement.

3) When the measured SAR deviates from the calibrated SAR value by more than 10% due to changes in physical, mechanical, electrical or other relevant dipole conditions; i.e., the error is not introduced by incorrect measurement procedures or other issues relating to the SAR measurement system.

2、 Calibration Purpose

Demonstrate that SAR target, the impedance and return loss of the dipole remain stable as required

3、 Test The Product

Manufacturer	Speag
Name	2450MHz Dipole antenna
Model number	D2450V2
Environment temperature	20.8 $^{\circ}$ C
Look pictures	As shown in figure 1

Manufacturer	Speag
Name	5GHz Dipole antenna
Model number	D5GHZV2
Environment temperature	20.8 $^{\circ}$ C
Look pictures	As shown in figure 2



Figure 1 Test signal source



Figure 2 Test signal source

3. Standards

This antenna calibration is conducted according to KDB 865664 D01

4. Laboratory

The following personnel participated in this laboratory:

Table 1: Participate in the measurement laboratory

Laboratory Name	Temp °C	Test person
Guangdong Dongdian Testing Service Co., Ltd.	20.8 °C	Johnson Huang

5. Calibration Results

The quality control test results are shown in Table 2 and Table 3, and the detailed test data is in the attachment

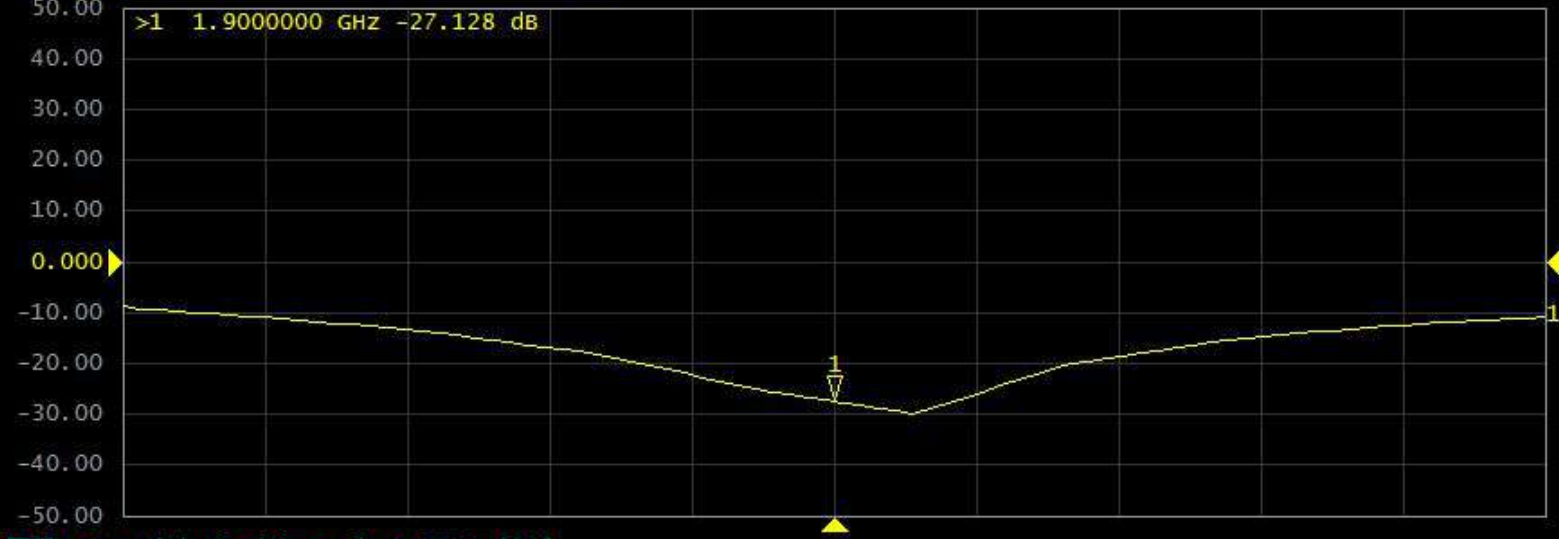
Table 2

Calibrated Antenna	Target Return loss	Test Return loss	Deviation	Result
2450	-28.825	-28.394	1.50%	OK
5200	-24.780	-20.041	19.12%	OK
5300	-24.151	-27.179	12.54%	OK
5500	-23.082	-25.183	9.10%	OK
5600	-22.239	-23.471	5.54%	OK

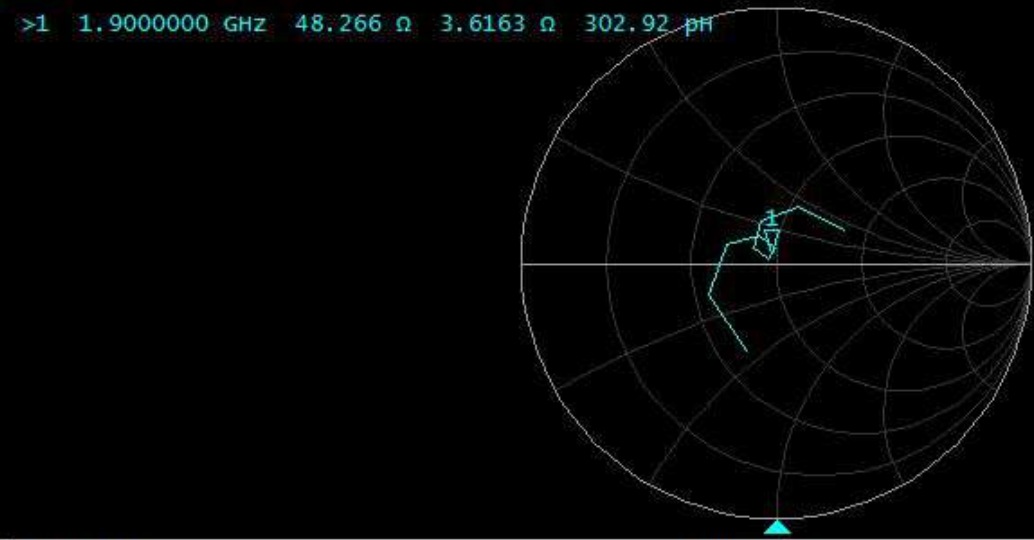
Table 3

Calibrated Antenna	Target Impedance (Real)	Target Impedance (Imaginary)	Test Impedance (Real)	Test Impedance (Imaginary)	Deviation (Real)	Deviation (Imaginary)	Result
2450	53.391	1.586	50.607	2.878	2.784	1.292	OK
5200	49.477	-8.009	52.310	-8.448	2.833	0.439	OK
5300	54.645	-5.723	49.946	-3.293	4.699	2.43	OK
5500	56.887	-4.538	52.061	-5.591	4.826	1.053	OK
5600	56.214	-5.378	52.520	-4.505	3.694	0.873	OK

Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]



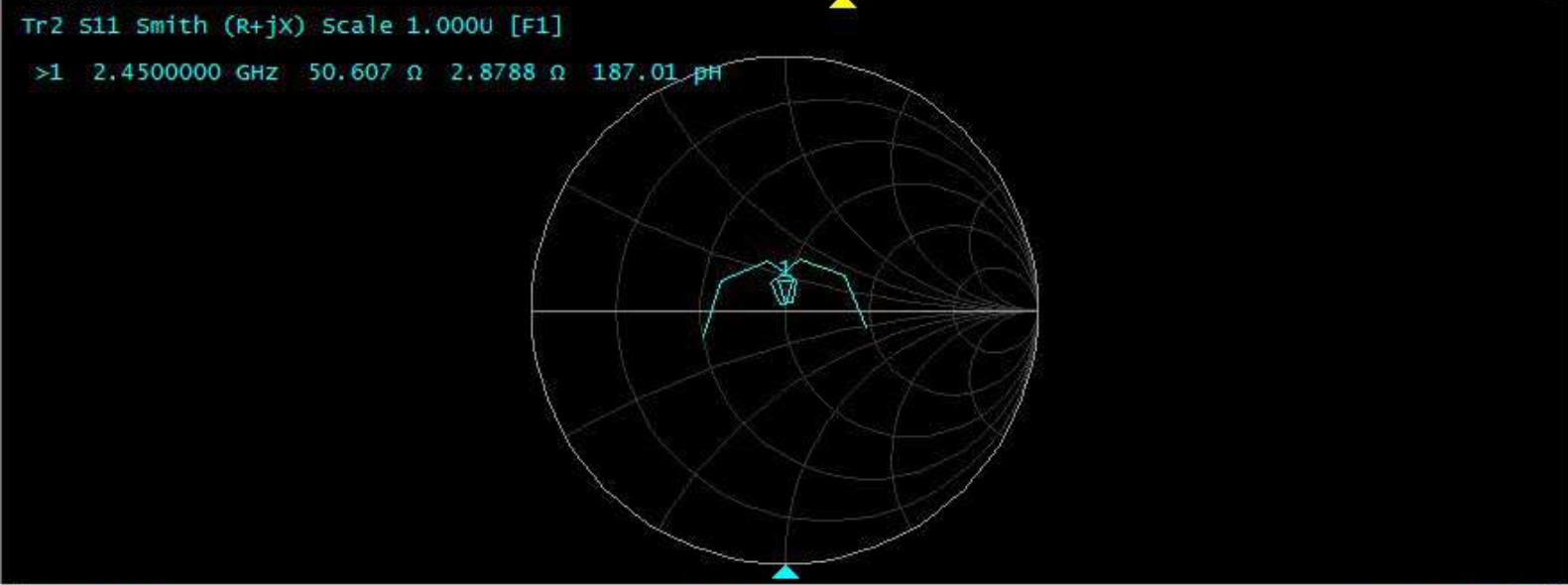
Tr2 S11 Smith (R+jX) scale 1.000U [F1]



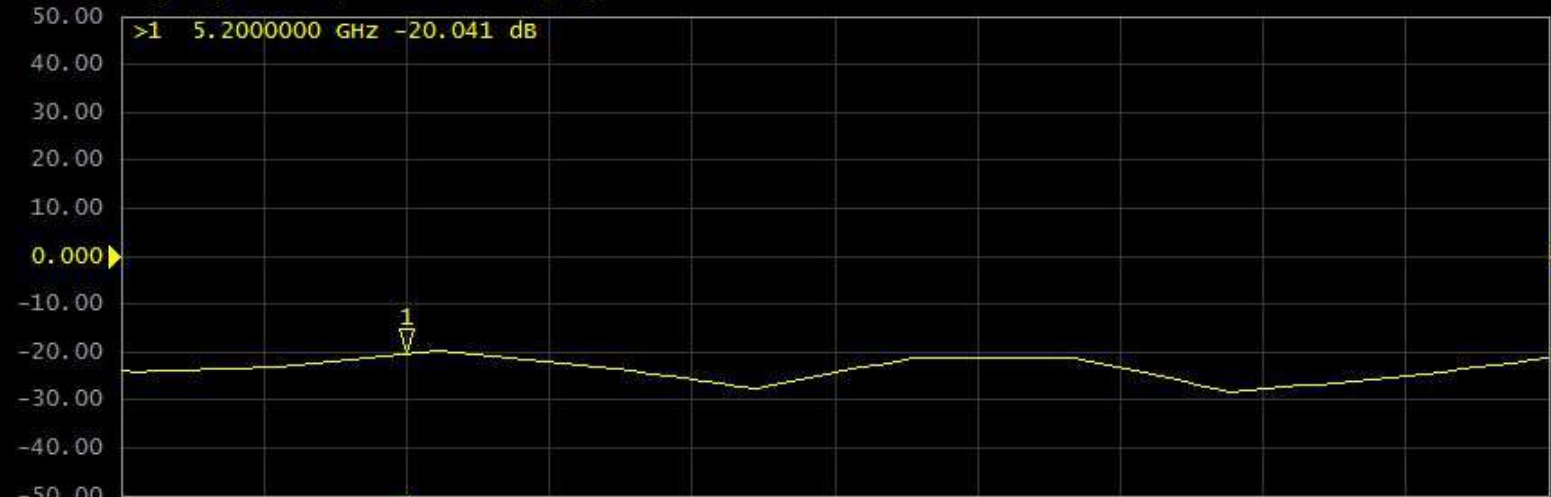
Start 1.7 GHz

IFBW 100 Hz

Stop 2.1 GHz Cor

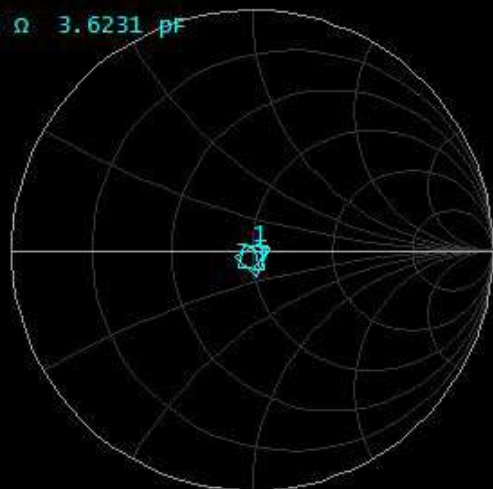


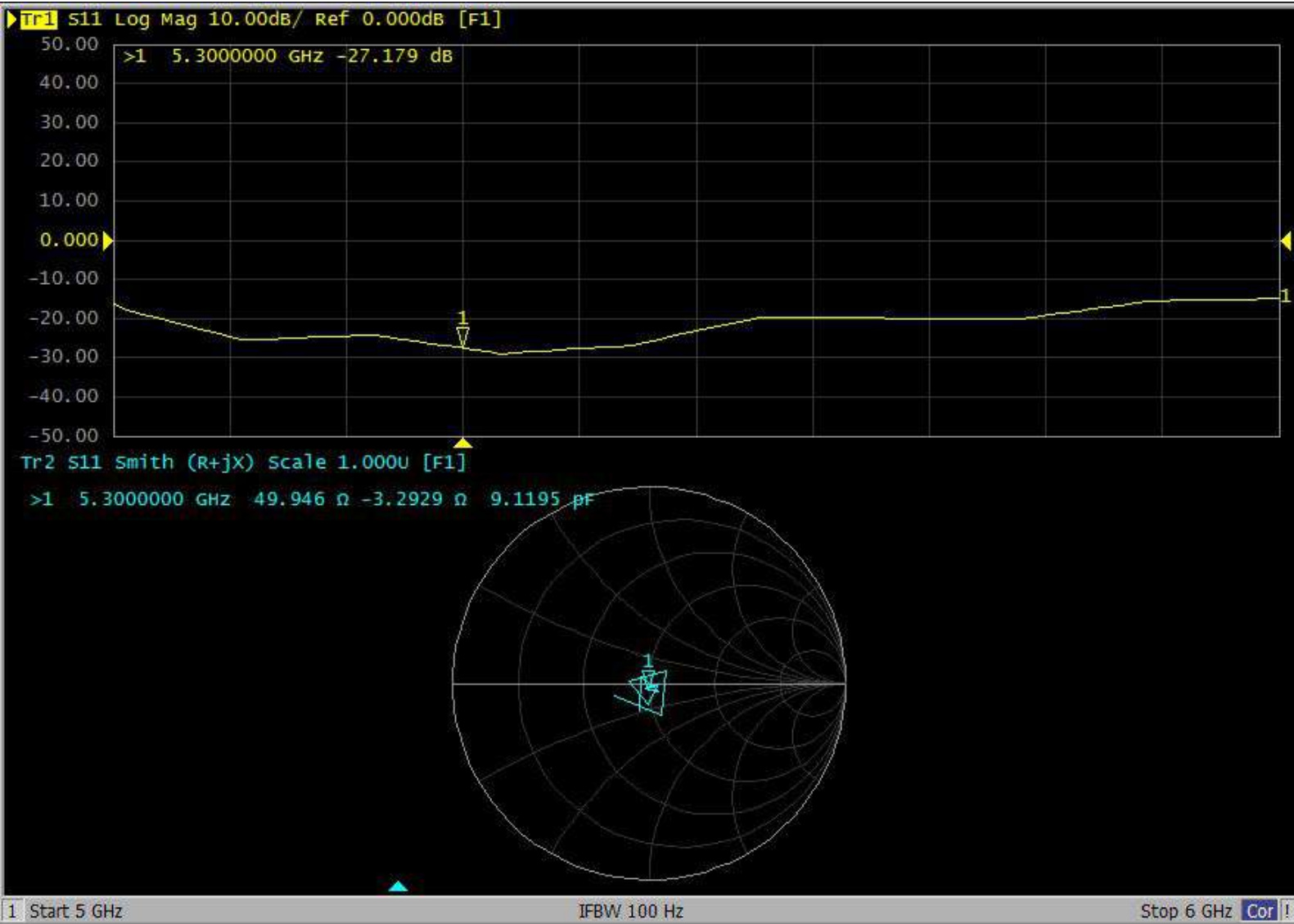
Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]

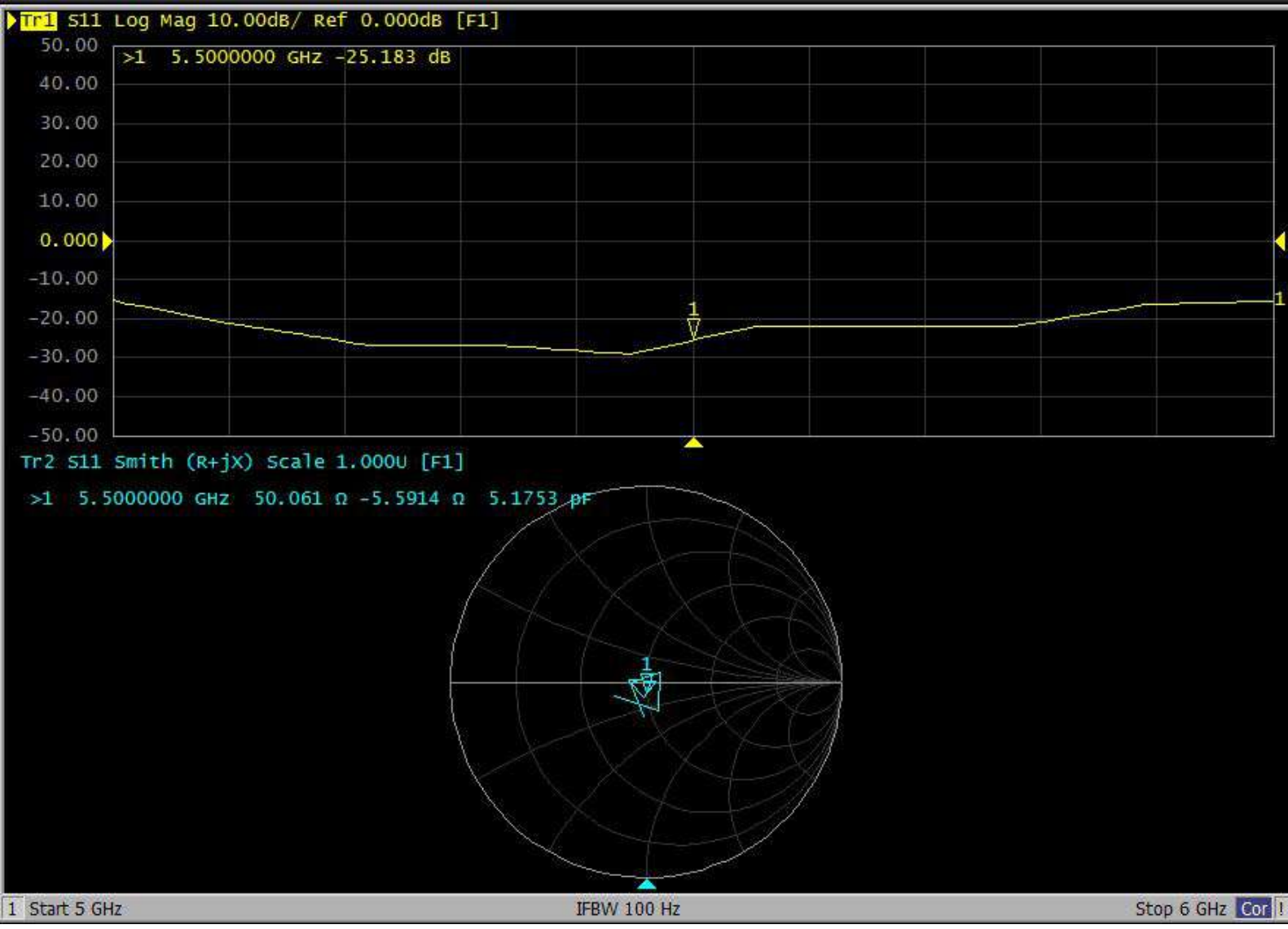


► Tr2 S11 Smith (R+jX) scale 1.000U [F1]

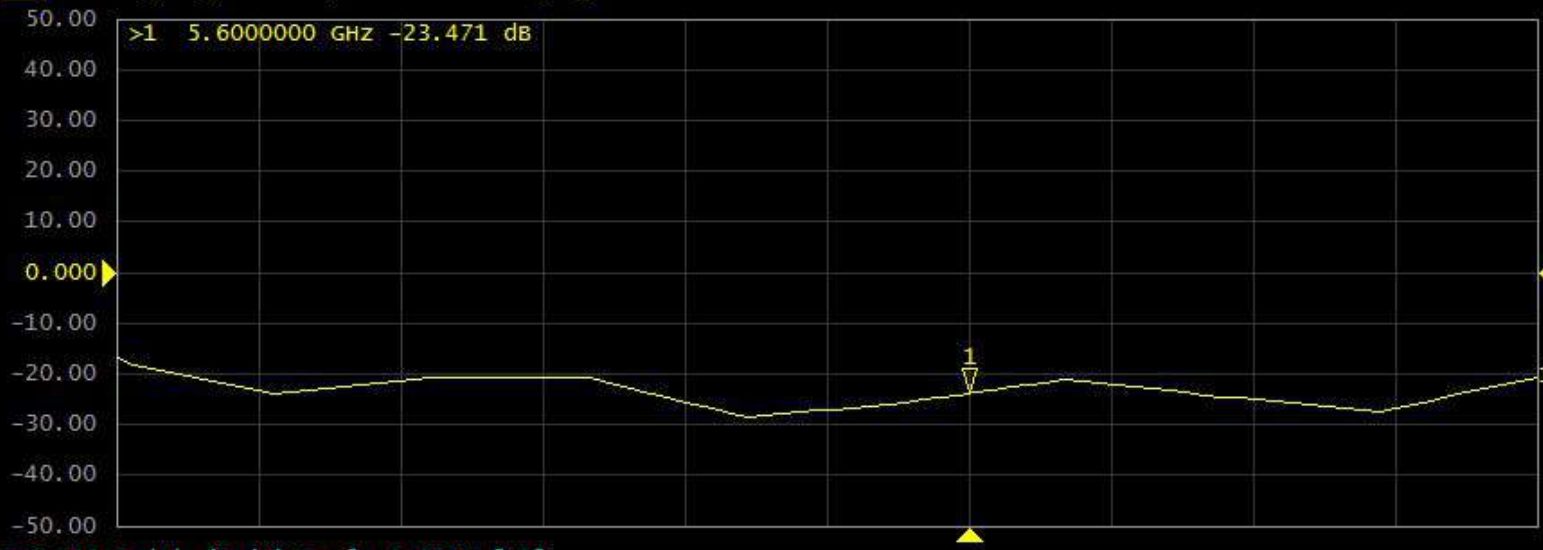
>1 5.2000000 GHz 52.310 Ω -8.4476 Ω 3.6231 pF







Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]



Tr2 S11 Smith (R+jX) Scale 1.000U [F1]

