Guangdong Dongdian Testing Service Co., Ltd.

广东东电检测技术有限公司

Dipole Antenna self-calibration Report

偶极子天线自校报告

Monitor method/ 监控方法	:	According to KDB 865664 D01 依据 KDB 865664 D01
Monitor projects/ 监控项目	:	Dipole Antenna self-calibration /偶极子天线自校
Monitoring purposes/ 监控目的	:	Demonstrate that the SAR target, impedance and return loss of the dipole remain stable as required /证明偶极子的 SAR 目标，阻抗和回波损耗根据要求保持稳定
Monitoring implementation Date/ 监控实施日期	:	2023-10-20
Report date/ 报告日期	:	2023-10-21
Report number/ 报告编号	:	DDT-ZLJK20231021-2
Conclusion/ monitoring 监控结论	:	Qualify/合格
Executor/ 实 施 人	:	邓秋秋
Audit/ 审 核	:	胡鹏鸟

Note: This report is only for the internal quality control of Dongdian Testing

说明： 本报告仅供东电检测内部质量控制用

REPORT

1、 Monitoring items 监控项目

Dipole Antenna self-calibration /偶极子天线自校

2、 Monitoring method 监控方法

Immediate re-calibration is required for the following conditions.

在下列情况下需要立即重新校准。

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 × 0.2) or not meeting the required 20 dB minimum return-loss requirement.

根据 KDB 865664 D01，当最近的收益损失结果，至少每年测量一次，与以前的测量偏差超过 20%(即以 dB*0.2 为单位的值)或满足要求的最小 20 dB 收益损失要求。

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.

当阻抗的实部或虚部最近的测量值，至少每年测量一次，与以前的测量值偏差超过 5 Ω 。

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.

由于物理、机械、电气或其他相关偶极子条件的变化，测量 SAR 与校准 SAR 值偏差超过 10%;即误差不是由不正确的测量程序或与 SAR 测量系统有关的其他问题引起的。

3、 Monitoring purpose 监控目的

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

证明偶极子 SAR 目标，阻抗和回波损耗根据要求保持稳定

4、 Test the product 检测产品

The quality control uses the same sample as follows for comparison/本次质量监控采用如下样品进行校准：

Manufacturer/制造商	Speag
name/名称：	2450MHz Dipole antenna
Model number/型号：	D2450V2
Environment temperature/环境温度：	20.8℃
Look pictures/外观图片	As shown in figure /见图一

Manufacturer/制造商	Speag
name/名称：	5GHz Dipole antenna
Model number/型号：	D5GHZV2
Environment temperature/环境温度：	20.8℃
Look pictures/外观图片	As shown in figure /见图二

Figure 1 Test signal source/ 图 1 测试样品

Figure 2 Test signal source/ 图二 测试样品

5、 Standards and specifications adopted 采用的标准与规范

This antenna calibration is conducted according to KDB 865664 D01

本次天线校准依据 KDB 865664 D01 进行检测

6、 Participate in the laboratory/Testers 参与实验室/测试人员

The following personnel participated in this laboratory:/本次实验室有以下人员参与：

Table 1： Participate in the measurement laboratory/Testers

表一：参加测量实验室/测试人员

Laboratory Name 实验室名称	Temp℃ 温度℃	1 号测试人员
Guangdong Dongdian Testing Service Co., Ltd. 广东东电检测技术有限公司	20.8℃	Johnson Huang 黄荣辉

7、 Monitoring results 监控结果

The quality control test results are shown in Table 2 and Table 3, and the detailed test data is in the attachment/本次质量监控测试结果如表二和表三，详细测试数据见附件

Table 2

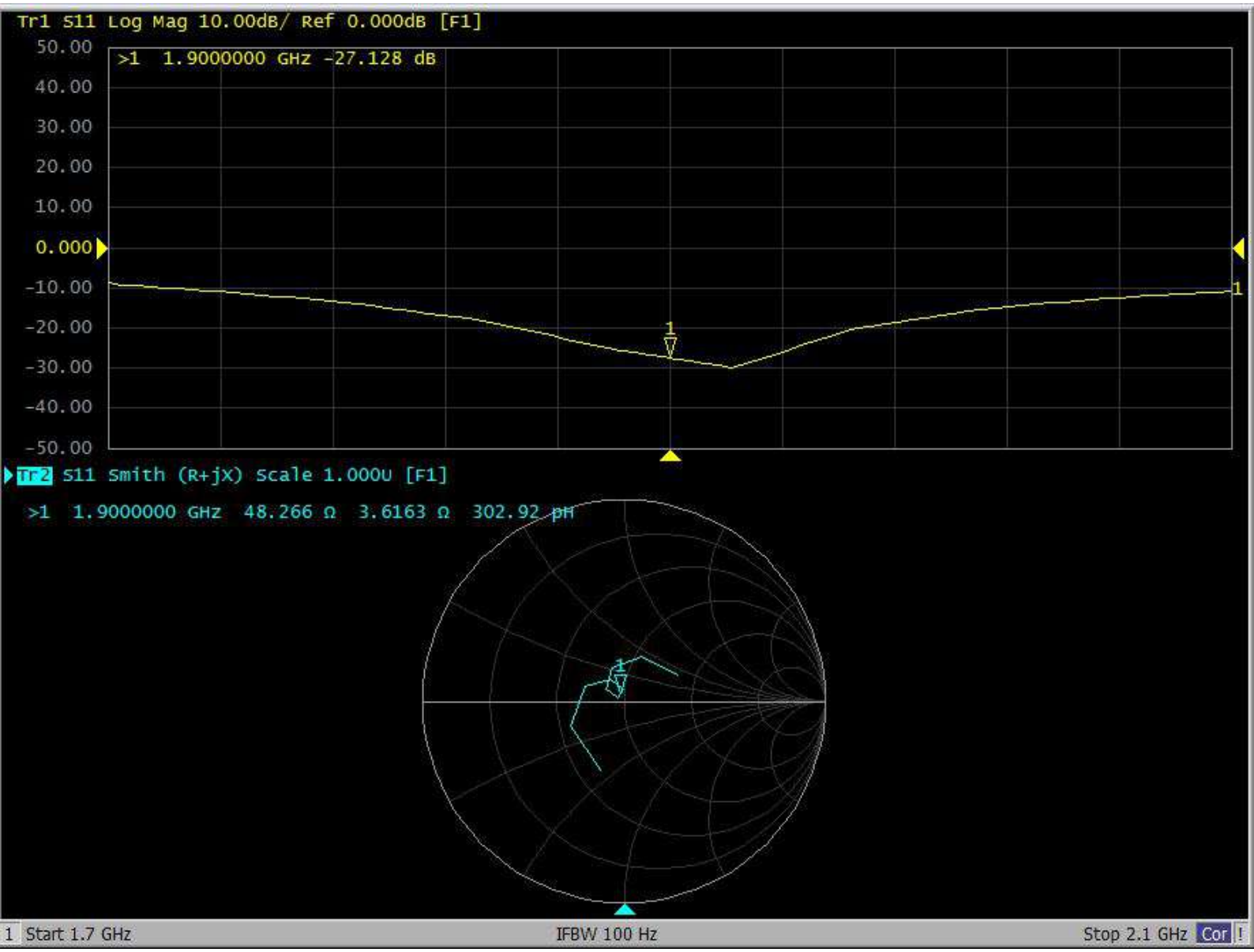
表二

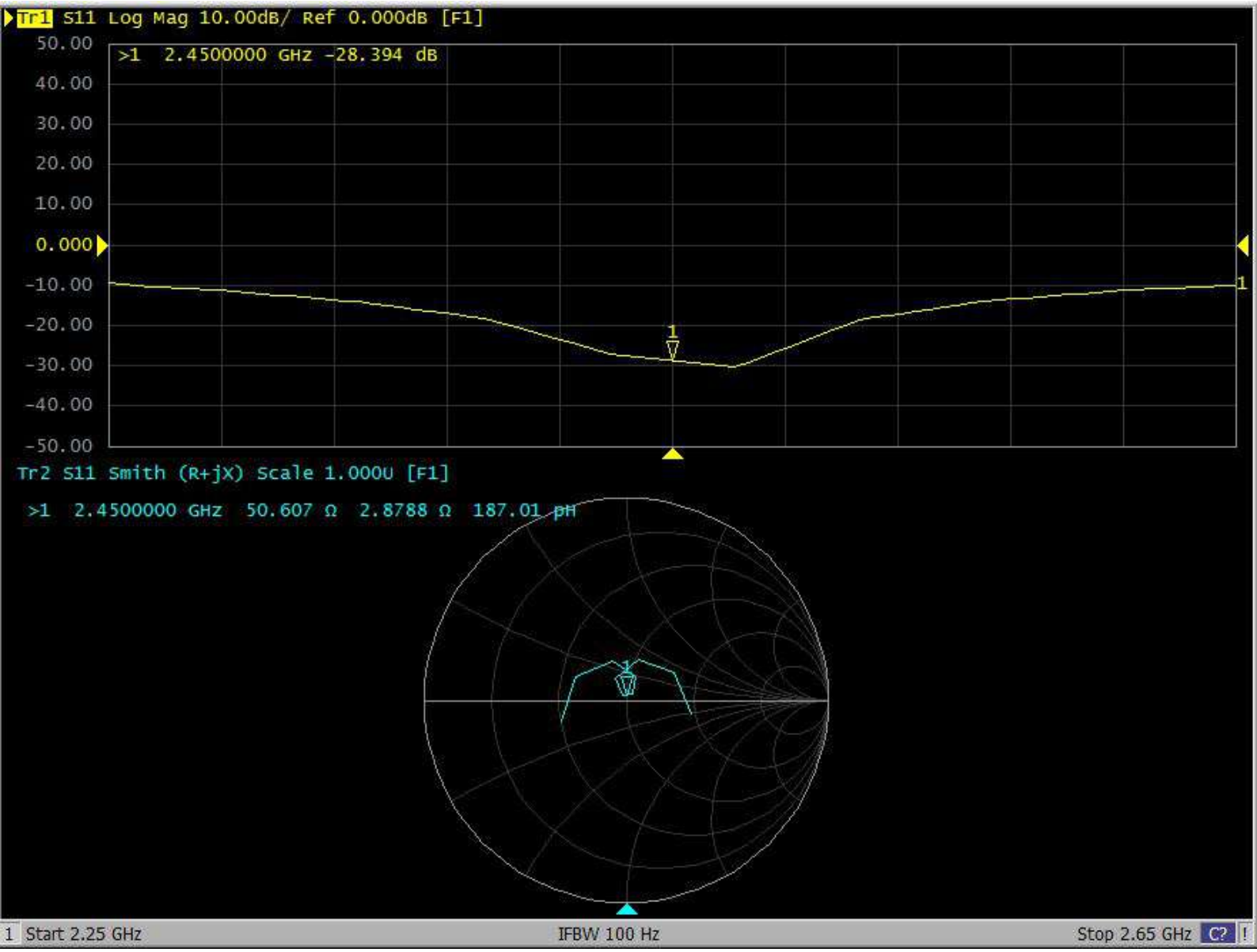
Calibrated Antenna 校准天线	Target Return loss 目标回波损耗	Test Return loss 测试回波损耗	Deviation 偏差	Result 结果
2450	-28.825	-28.394	1.50%	OK
5200	-24.780	-20.041	19.12%	OK
5300	-24.151	-27.179	12.54%	OK
5500	-23.082	-25.183	9.10%	OK
5600	-22.239	-23.471	5.54%	OK

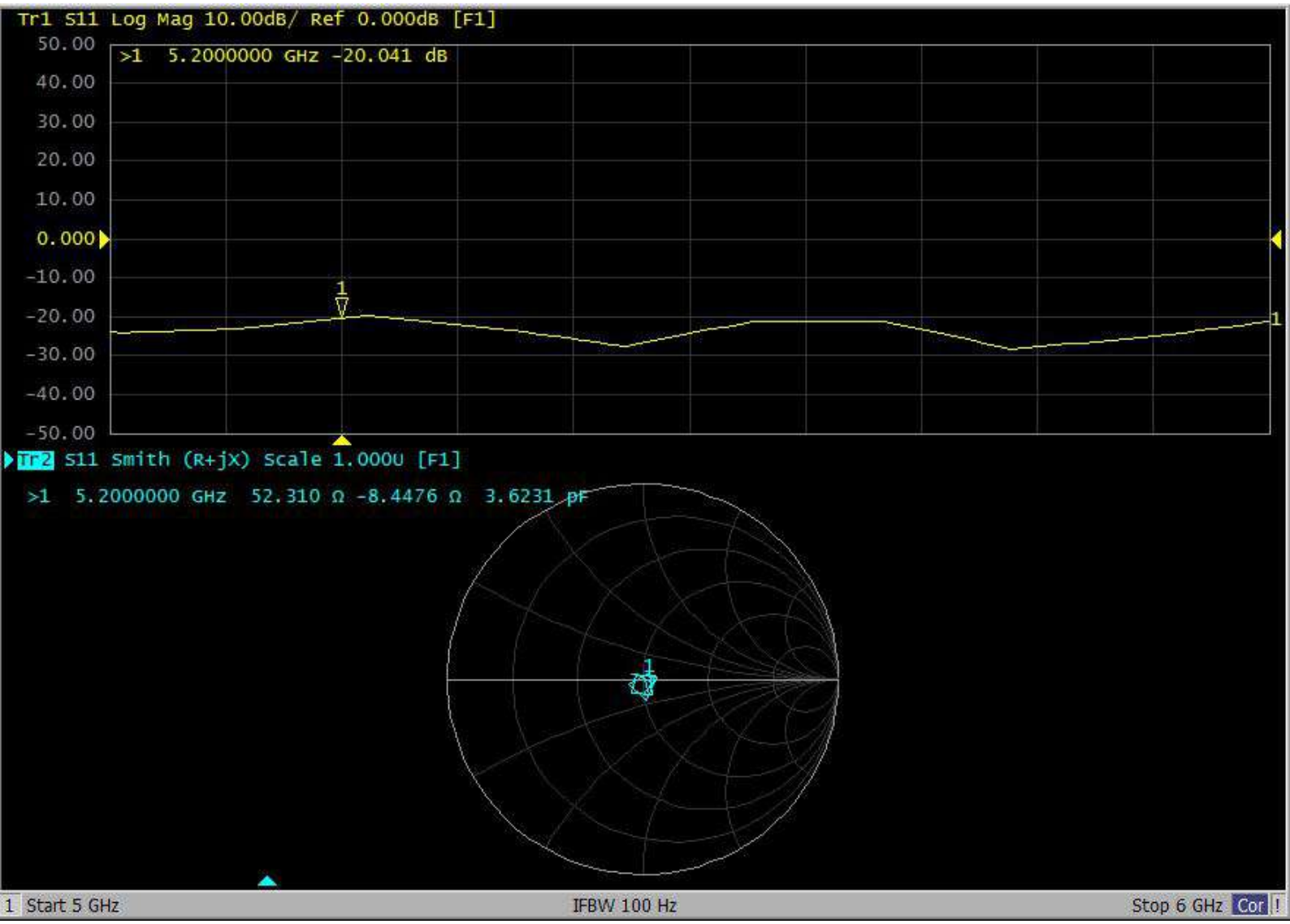
Table 3

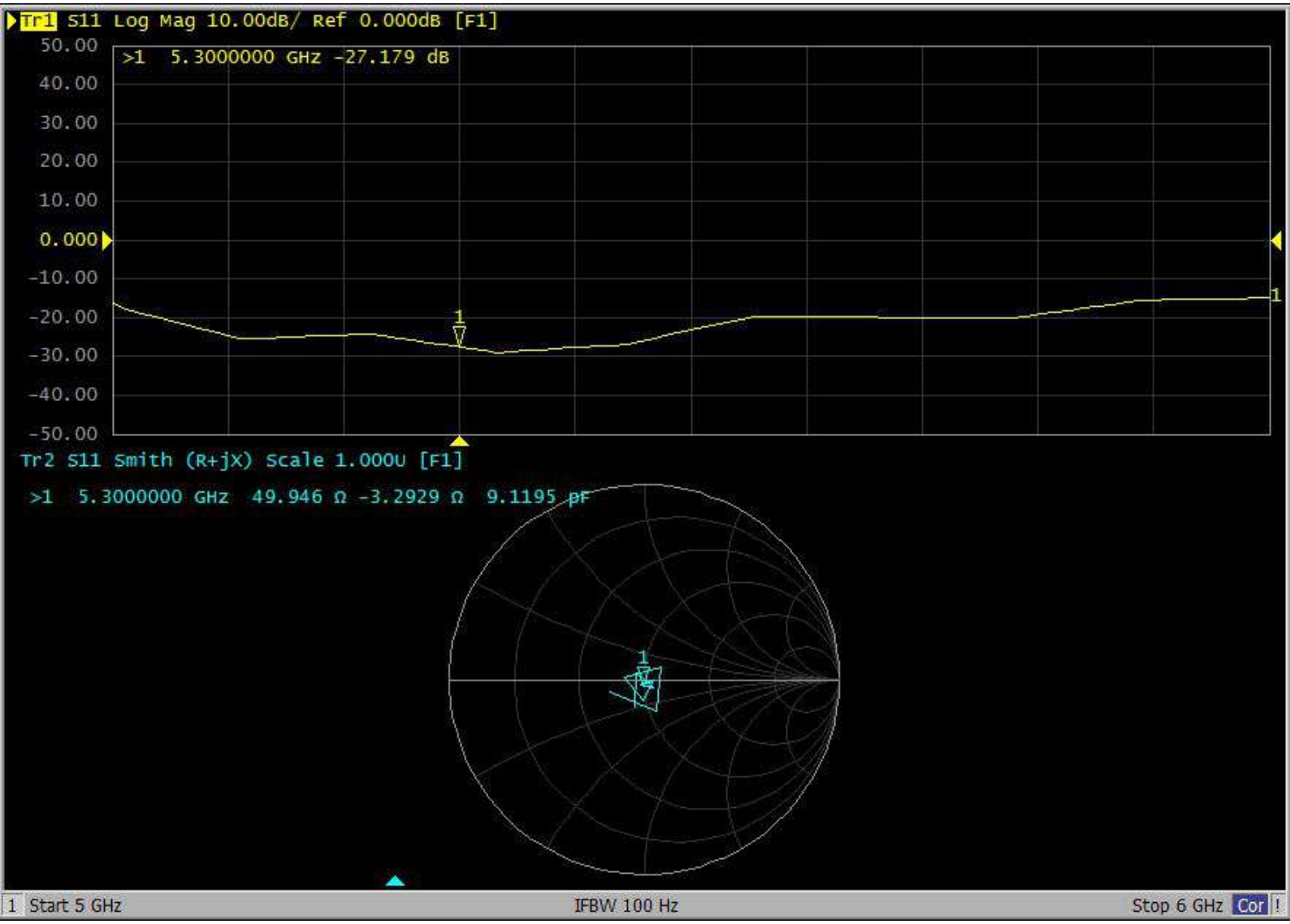
表三

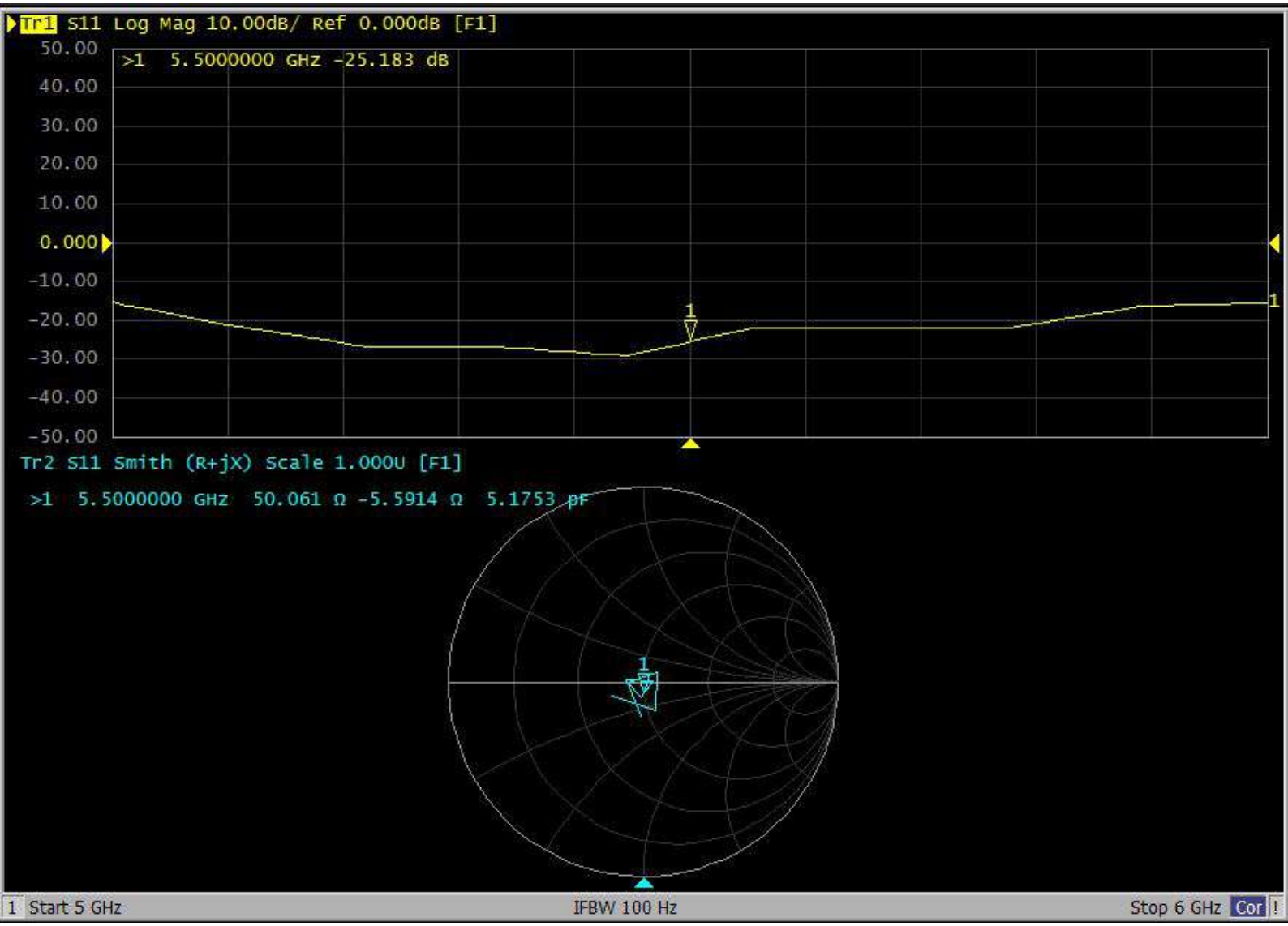
Calibrated Antenna 校准天线	Target Impedance（Real）目标阻抗（实部）	Target Impedance（Imaginary）目标阻抗（虚部）	Test Impedance（Real）测试阻抗（实部）	Test Impedance（Imaginary）测试阻抗（虚部）	Deviation 偏差（实部）	Deviation 偏差（虚部）	Result 结果
2450	53.391	1.586	50.607	2.878	2.784	1.292	OK
5200	49.477	-8.009	52.310	-8.448	2.833	0.439	OK
5300	54.645	-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

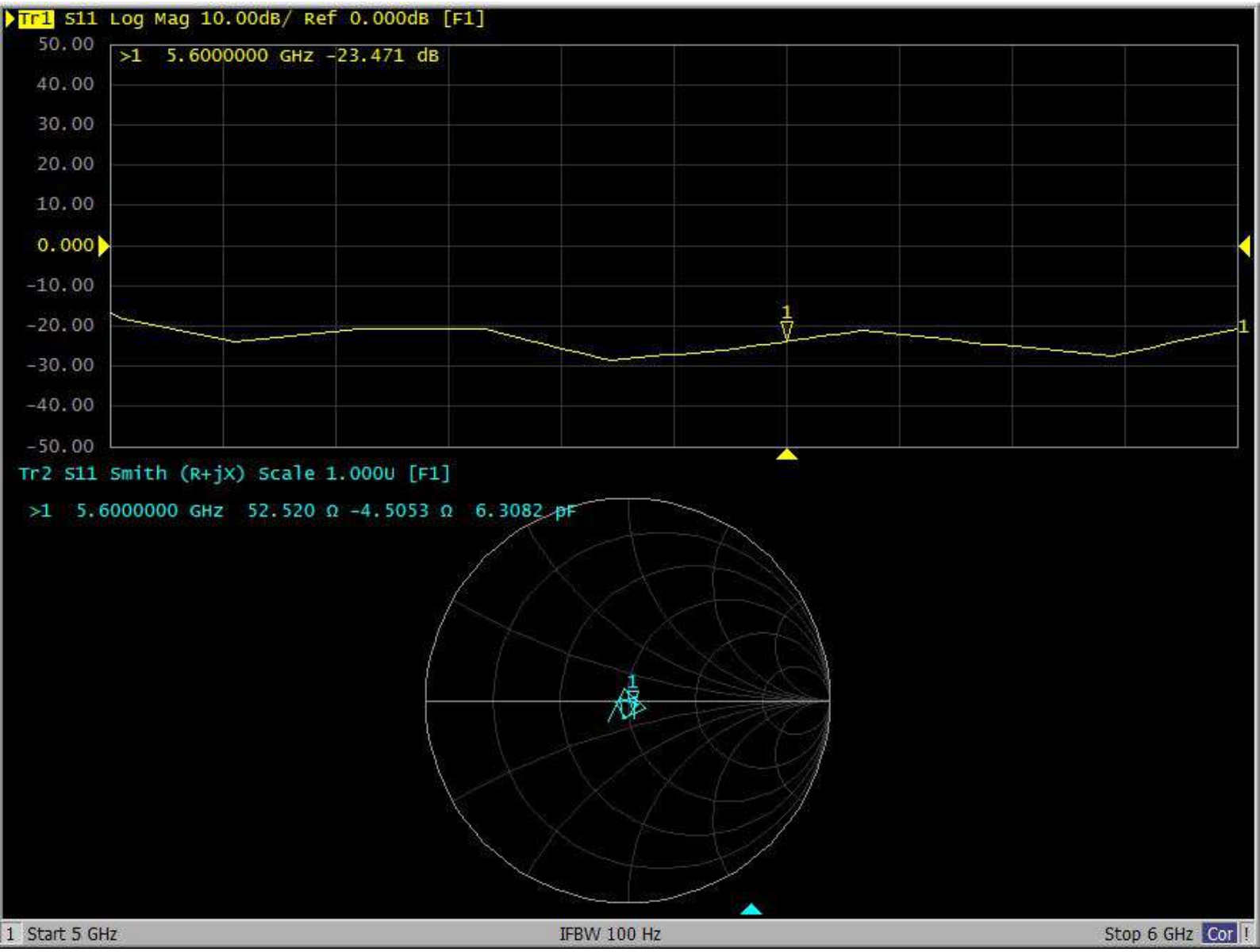

Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 1.9000000 GHz -27.128 dB
50.00
40.00
30.00
20.00
10.00
0.000
-10.00
-20.00
-30.00
-40.00
-50.00
1
1
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 1.9000000 GHz 48.266 Ω 3.6163 Ω 302.92 pH
1
1 Start 1.7 GHz
IFBW 100 Hz
Stop 2.1 GHz
Cor


Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 2.4500000 GHz -28.394 dB
50.00
40.00
30.00
20.00
10.00
0.000
-10.00
-20.00
-30.00
-40.00
-50.00
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 2.4500000 GHz 50.607 Ω 2.8788 Ω 187.01 pH
1 Start 2.25 GHz
IFBW 100 Hz
Stop 2.65 GHz


Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 5.2000000 GHz -20.041 dB
50.00
40.00
30.00
20.00
10.00
0.000
-10.00
-20.00
-30.00
-40.00
-50.00
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 5.2000000 GHz 52.310 Ω -8.4476 Ω 3.6231 pF
1 Start 5 GHz
IFBW 100 Hz
Stop 6 GHz
Cor


Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 5.3000000 GHz -27.179 dB
50.00
40.00
30.00
20.00
10.00
0.000
-10.00
-20.00
-30.00
-40.00
-50.00
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 5.3000000 GHz 49.946 Ω -3.2929 Ω 9.1195 pF
1 Start 5 GHz
IFBW 100 Hz
Stop 6 GHz
Cor


Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 5.5000000 GHz -25.183 dB
50.00
40.00
30.00
20.00
10.00
0.000
-10.00
-20.00
-30.00
-40.00
-50.00
1
1
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 5.5000000 GHz 50.061 Ω -5.5914 Ω 5.1753 pF
1
1 Start 5 GHz
IFBW 100 Hz
Stop 6 GHz
Cor


Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 5.6000000 GHz -23.471 dB
50.00
40.00
30.00
20.00
10.00
0.000
-10.00
-20.00
-30.00
-40.00
-50.00
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 5.6000000 GHz 52.520 Ω -4.5053 Ω 6.3082 pF
1 Start 5 GHz
IFBW 100 Hz
Stop 6 GHz
Cor