Appendix E

Dipole Antenna self-calibration

Table of Contents

1. Calibration Date

Calibration Date Feb.23,2026, Due to Feb.22,2027

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 × 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	1900MHz Dipole antenna
Model number	D1900V2
Environment temperature	22.5℃
Look pictures	As shown in figure 1

Manufacturer	Speag
Name	2450MHz Dipole antenna
Model number	D2450V2
Environment temperature	22.5℃
Look pictures	As shown in figure 2

Manufacturer	Speag
Name	5GHz Dipole antenna
Model numbe	D5GHZV2
Environment temperature	22.5℃
Look pictures	As shown in figure 3

Figure 1 Test signal source

Figure 2 Test signal source

Figure 3 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℃	Test person
Guangdong Dongdian Testing Service Co., Ltd.	22.5℃	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 Appendix.

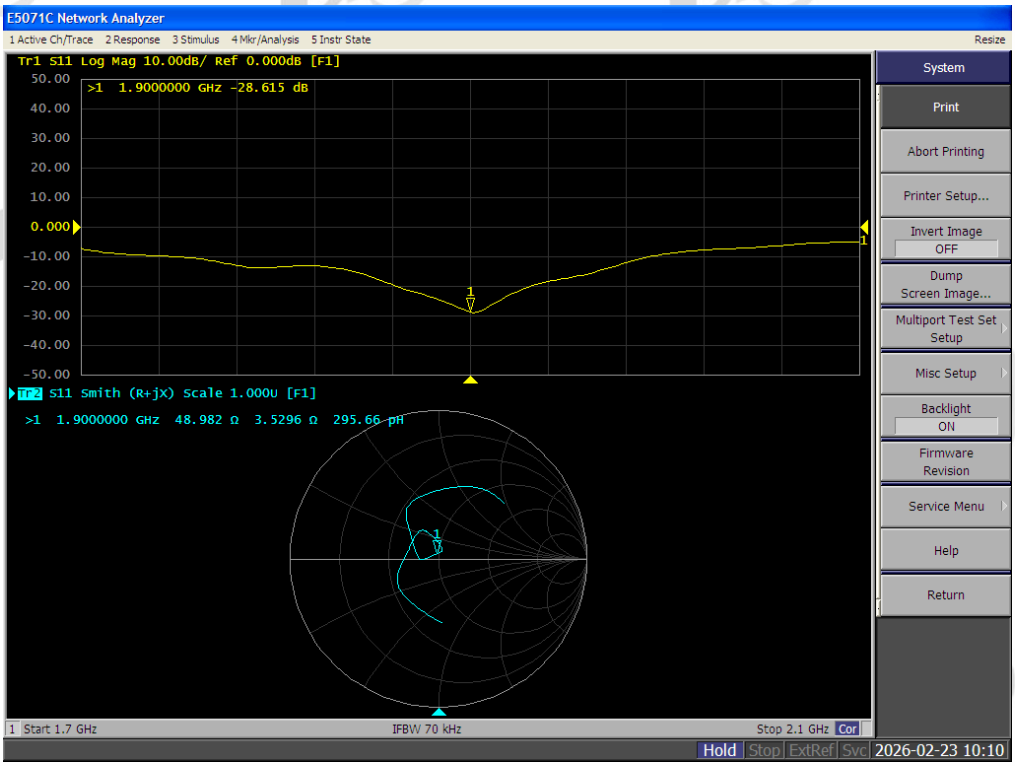
Table 2

Calibrated Antenna	Target Return loss	Test Return loss	Deviation	Result
1900	-25.239	-28.615	-13.38%	Pass
2450	-29.342	-27.398	6.63%	Pass
5200	-22.307	-24.392	-9.35%	Pass
5300	-24.020	-22.804	5.06%	Pass
5500	-25.127	-27.433	-9.18%	Pass
5600	-23.627	-25.494	-7.90%	Pass
5800	-22.061	-22.015	0.21%	Pass

Table 3

Calibrated Antenna	Target Impedance （Real）	Target Impedance （Imaginary）	Test Impedance （Real）	Test Impedance （Imaginary）	Deviation （Real） Ω	Deviation （Imaginary） Ω	Result
1900	51.139	5.4224	48.982	3.5296	-2.157	-1.8928	Pass
2450	52.591	2.3537	49.150	4.1479	-3.441	1.7942	Pass
5200	49.512	-7.6366	47.671	-5.4209	-1.841	2.2157	Pass
5300	48.960	-6.1547	45.870	-5.5950	-3.09	0.5597	Pass
5500	53.939	-4.2094	54.184	-1.4493	0.245	2.7601	Pass
5600	56.654	-2.2552	54.407	-3.3729	-2.247	-1.1177	Pass
5800	57.008	-4.7182	57.485	-4.0893	0.477	0.6289	Pass

6. Appendix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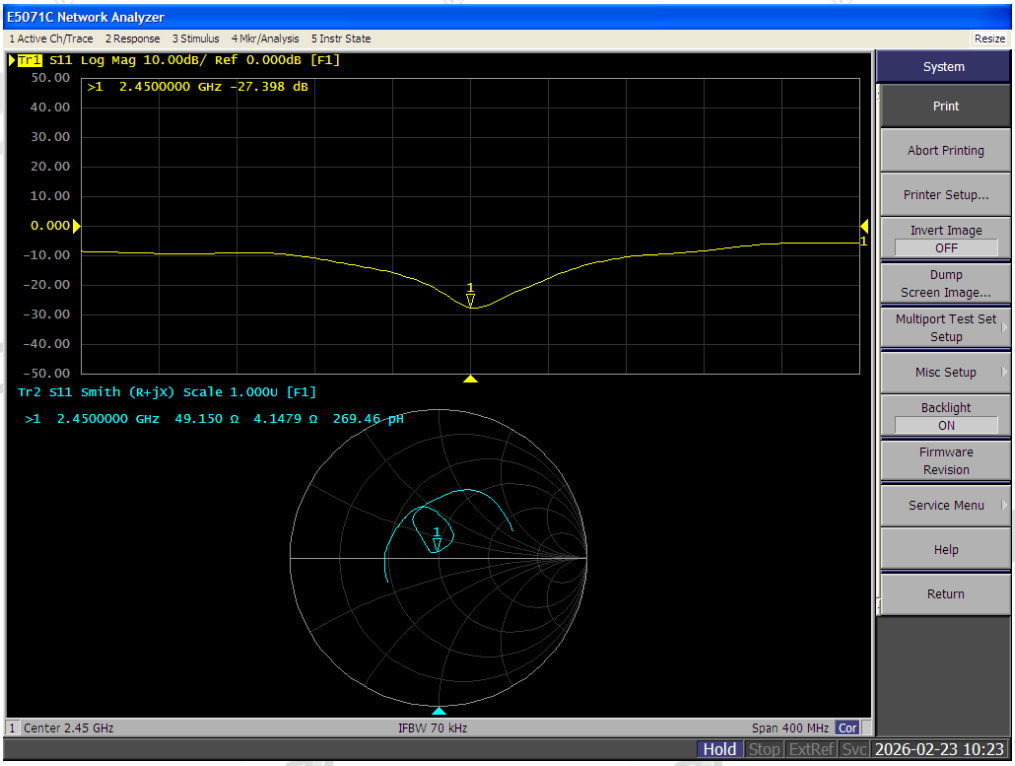
1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Resize
Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 1.9000000 GHz -28.615 dB
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 1.9000000 GHz 48.982 Ω 3.5296 Ω 295.66 pH
1 Start 1.7 GHz
IFBW 70 kHz
Stop 2.1 GHz
Cor
Hold Stop ExtRef Svc 2026-02-23 10:10
System
Print
Abort Printing
Printer Setup...
Invert Image OFF
Dump Screen Image...
Multiport Test Set Setup
Misc Setup
Backlight ON
Firmware Revision
Service Menu
Help
Return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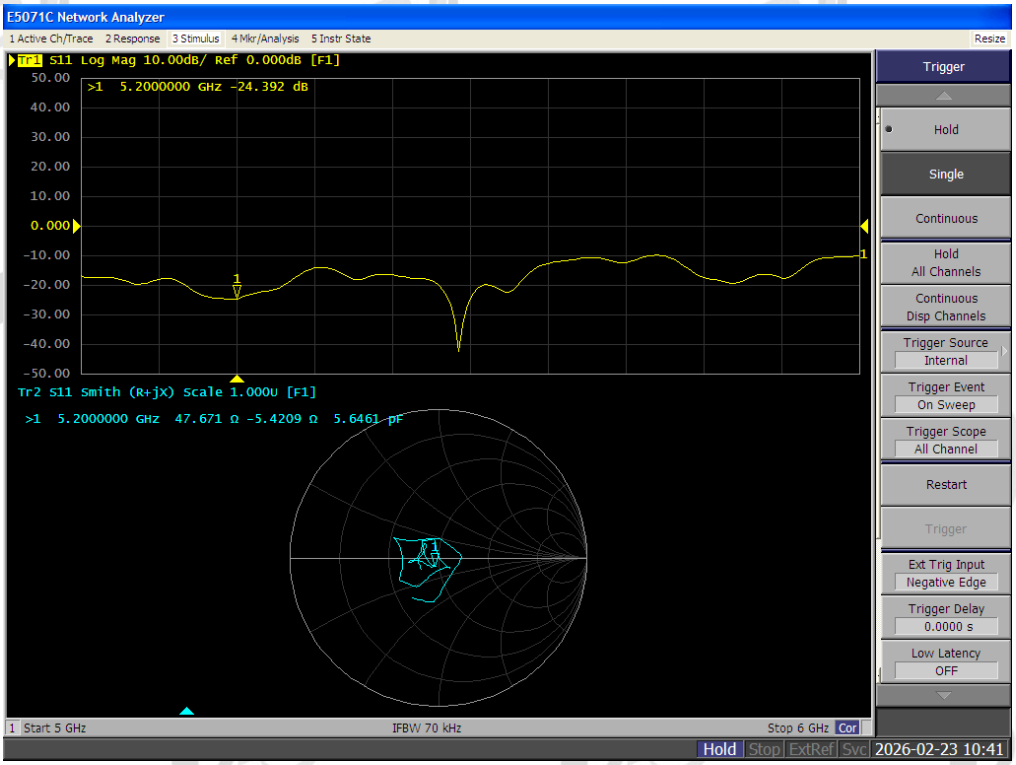
Resize
Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 2.4500000 GHz -27.398 dB
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 2.4500000 GHz 49.150 Ω 4.1479 Ω 269.46 pH
1 Center 2.45 GHz
IFBW 70 kHz
Span 400 MHz
Cor
Hold Stop ExtRef Svc 2026-02-23 10:23
System
Print
Abort Printing
Printer Setup...
Invert Image OFF
Dump Screen Image...
Multiport Test Set Setup
Misc Setup
Backlight ON
Firmware Revision
Service Menu
Help
Return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1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Resize
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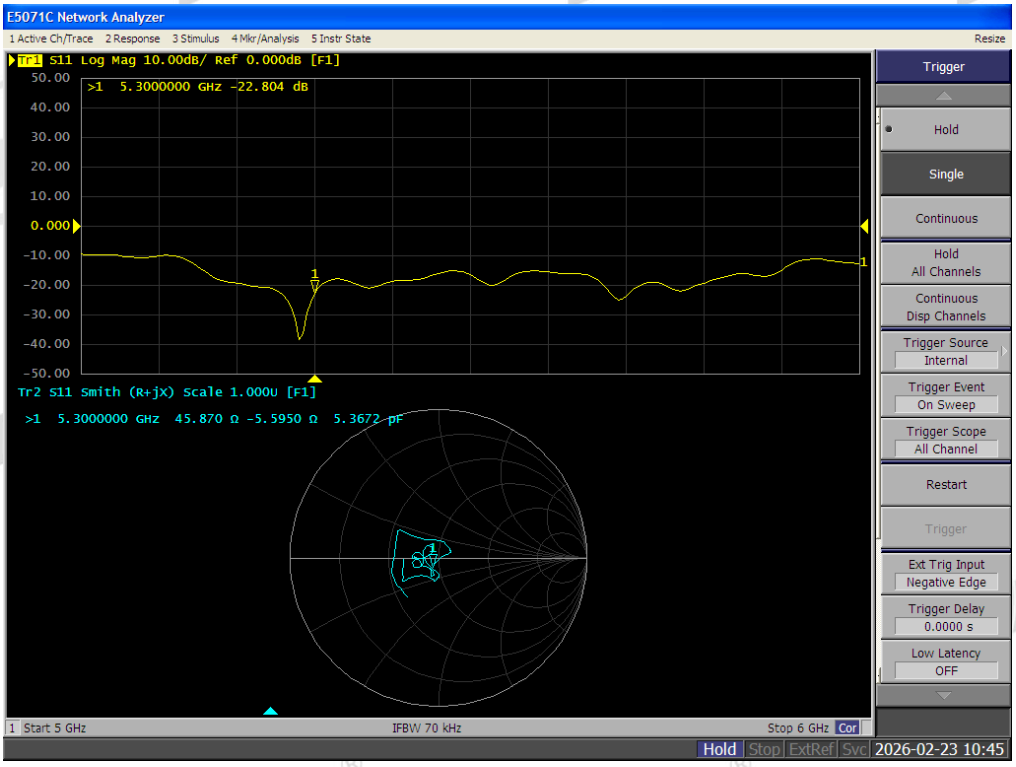
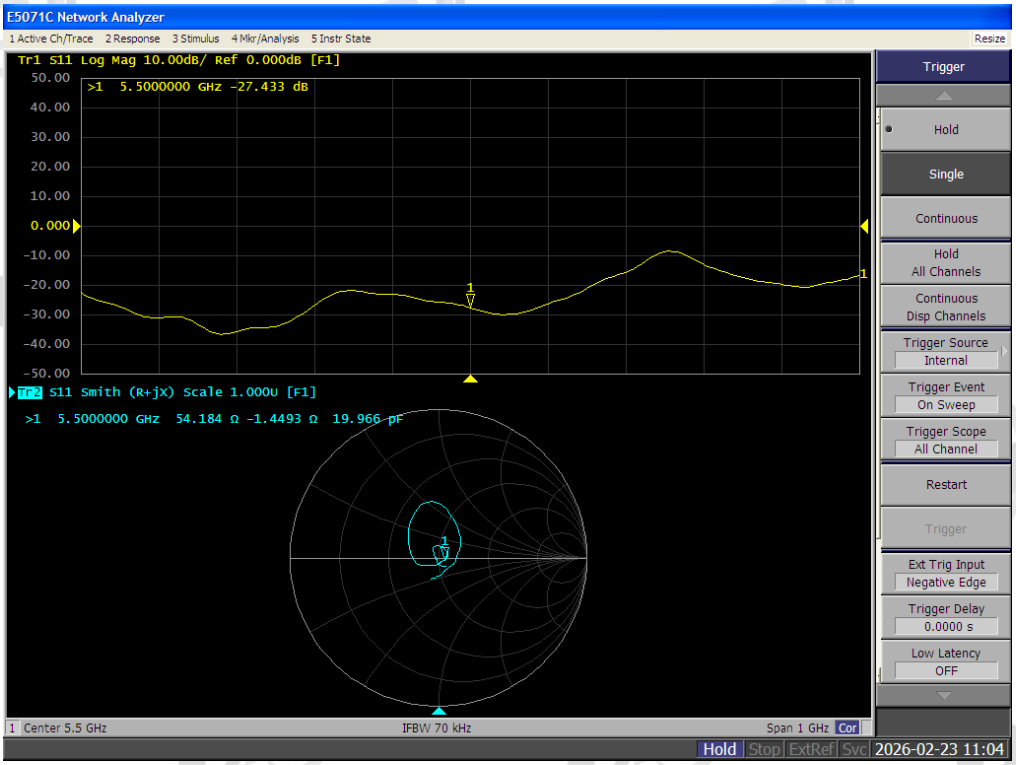
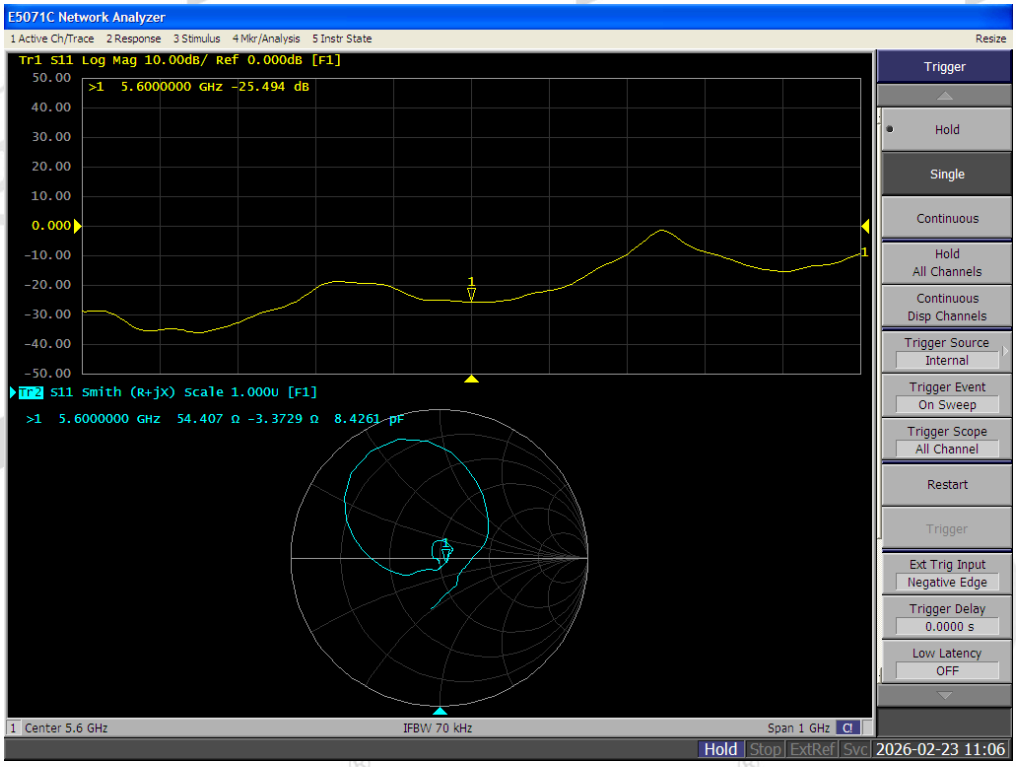
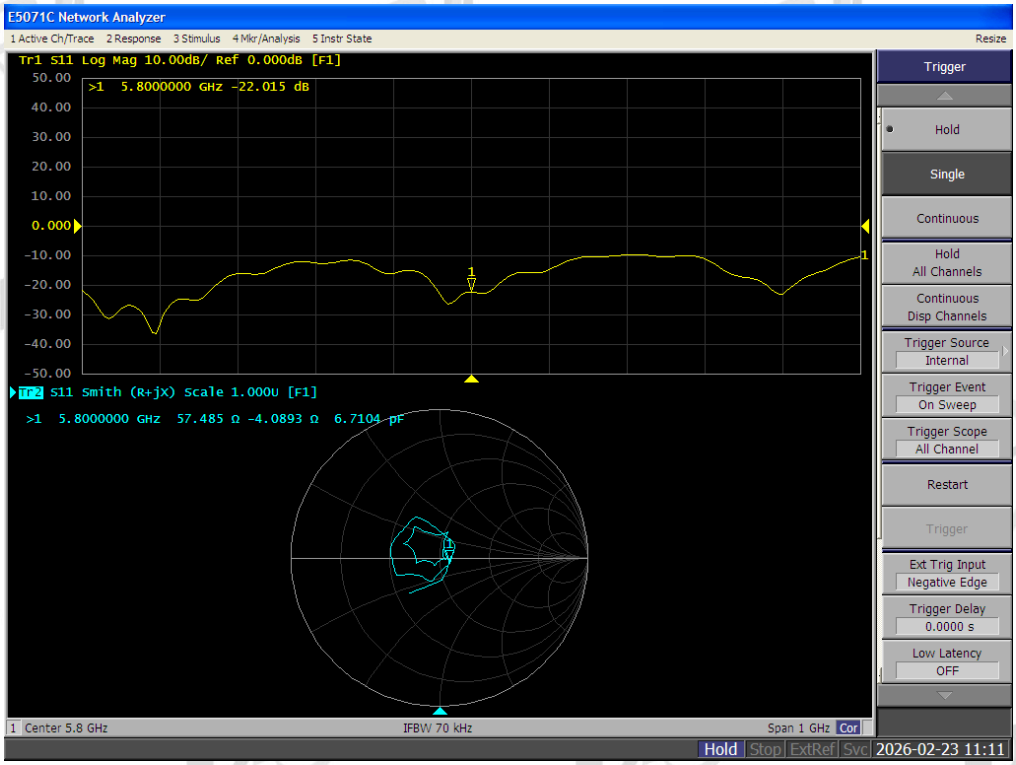
>1 5.2000000 GHz -24.392 dB
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 5.2000000 GHz 47.671 Ω -5.4209 Ω 5.6461 pF
1 Start 5 GHz
IFBW 70 kHz
Stop 6 GHz
Cor
Trigger
Hold
Single
Continuous
Hold All Channels
Continuous Disp Channels
Trigger Source Internal
Trigger Event On Sweep
Trigger Scope All Channel
Restart
Trigger
Ext Trig Input Negative Edge
Trigger Delay 0.0000 s
Low Latency OFF
Hold Stop ExtRef Svc 2026-02-23 10:41


E5071C Network Analyzer
1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Resize
Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 5.3000000 GHz -22.804 dB
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 5.3000000 GHz 45.870 Ω -5.5950 Ω 5.3672 pF
1 Start 5 GHz
IFBW 70 kHz
Stop 6 GHz
Cor
Trigger
Hold
Single
Continuous
Hold All Channels
Continuous Disp Channels
Trigger Source Internal
Trigger Event On Sweep
Trigger Scope All Channel
Restart
Trigger
Ext Trig Input Negative Edge
Trigger Delay 0.0000 s
Low Latency OFF
Hold Stop ExtRef Svc 2026-02-23 10:45


E5071C Network Analyzer
1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Resize
Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 5.5000000 GHz -27.433 dB
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 5.5000000 GHz 54.184 Ω -1.4493 Ω 19.966 pF
1 Center 5.5 GHz
IFBW 70 kHz
Span 1 GHz
Cor
Trigger
Hold
Single
Continuous
Hold All Channels
Continuous Disp Channels
Trigger Source Internal
Trigger Event On Sweep
Trigger Scope All Channel
Restart
Trigger
Ext Trig Input Negative Edge
Trigger Delay 0.0000 s
Low Latency OFF
Hold Stop ExtRef Svc 2026-02-23 11:04


E5071C Network Analyzer
1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Resize
Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 5.6000000 GHz -25.494 dB
Tr2 S11 Smith (R+jX) Scale 1.000U [F1]
>1 5.6000000 GHz 54.407 Ω -3.3729 Ω 8.4261 pF
1 Center 5.6 GHz
IFBW 70 kHz
Span 1 GHz
Cor
Trigger
Hold
Single
Continuous
Hold All Channels
Continuous Disp Channels
Trigger Source Internal
Trigger Event On Sweep
Trigger Scope All Channel
Restart
Trigger
Ext Trig Input Negative Edge
Trigger Delay 0.0000 s
Low Latency OFF
Hold Stop ExtRef Svc 2026-02-23 11:06


E5071C Network Analyzer
1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State
Resize
Tr1 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]
>1 5.8000000 GHz -22.015 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 5.8000000 GHz 57.485 Ω -4.0893 Ω 6.7104 pF
1 Center 5.8 GHz
IFBW 70 kHz
Span 1 GHz
Cor
Hold Stop ExtRef Svc 2026-02-23 11:11
Trigger
Hold
Single
Continuous
Hold All Channels
Continuous Disp Channels
Trigger Source Internal
Trigger Event On Sweep
Trigger Scope All Channel
Restart
Trigger
Ext Trig Input Negative Edge
Trigger Delay 0.0000 s
Low Latency OFF

END