Agilent E5061B Network Analyzer

Band Pass Filter Test Demo VBA Operation Manual

Rev. 01.00

Sep 2011

Notices

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Sample Program

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Table of Contents

1. Revision History

Revision	Comments	Issue Date
1.00	First version.	Sep 08, 2011

2. Introduction

This operation manual describes how to use the Band Pass Filter (BPF) Test Demo VBA program. With this program you can easily develop an intuitive GUI by the built-in VBA programming environment on the ENA series network analyzer.

2.1. Outline of the program

This VBA macro shows a band pass filter (BPF) test Demo with user friendly GUI. The VBA GUI enables you to modify and save/recall the segment sweep and test limit settings. You can modify test settings appropriately for the specifications of your test devices.

2.2. Typeface Conventions

[Sample]	Indicates the hard key whose key label is “Sample”.
Sample	Indicates the soft key whose key label is Sample.
Sample	Shaded test is used when a file name or emphasized.

3. Preparation

3.1. Instrumentation Requirements

- E5061B Network Analyzer
- A band pass filter (BPF) and a type-N RF cable
  (Recommended BPF specification for the default settings)
  Center frequency: around 170 MHz
  Filter pass-band: From 150 MHz to 190 MHz

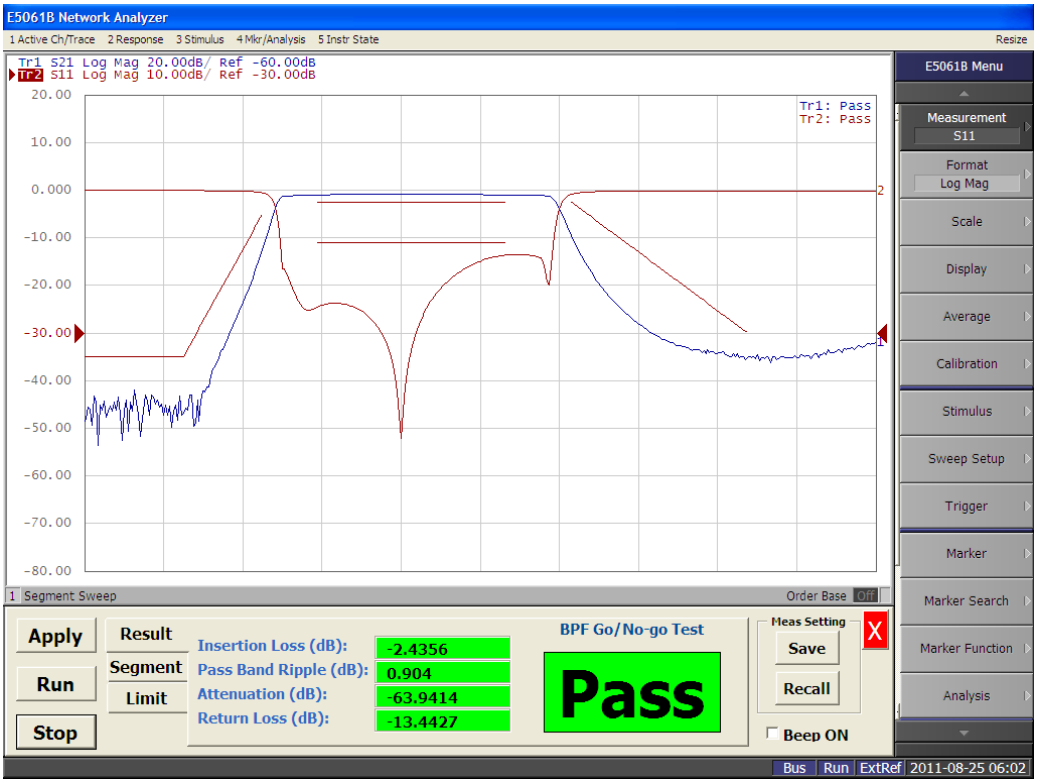
[Note]

- *You can use a different characteristic BPF device by modifying measurement settings on the VBA GUI. Refer to "Description of Tabs" section for more detail.*
- *The sample VBA program (.vba) needs to be saved in the D:¥VBA of the E5061B*

[Warning]

- *Check the test port impedance (50 or 75 ohm) of the network analyzer before connecting the BPF device and the cable. The test port impedance is indicated beside the test port of the E5061B. Connecting a wrong impedance device could cause irreparable connector damage.*

4. Basic operation procedure



Press **[Macro Setup]** , **Load&Run**

- Select BPF_TEST_DEMO_E5061B_xxx.vba
- Connect 50 ohm type N cable with band pass filter between port 1 and port 2 of the E5061B.
- Press **Apply** button, then **Run** button on the VBA GUI.

[Note]

If you need to modify the segment table or the limit table, refer to the following "Description of Tabs" section.

*You must press **Apply** button after you modify the segment table or the limit table, because the modification will be applied to the E5061B instrument when you press **Apply** button.*

5. Description of Tabs

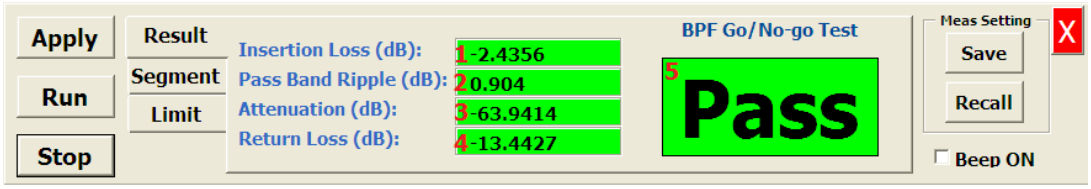
Result This tab displays the value of insertion loss, pass band ripple, attenuation, return loss and pass/fail judgment.

Segment This tab sets the segment sweep settings.

Limit This tab sets the limit settings.

5.1. Items in each Tab page

Under "Result" tab



1 Display the worst insertion loss in the filter pass-band (segment #3) of S21.
Test Limit = -5 dB

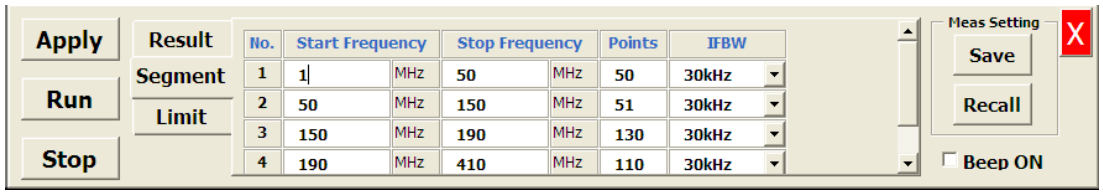
2 Display the worst attenuation in segment #1 and #5 of S21.
Test Limit = -60 dB

3 Display the ripple value in the filter pass-band (segment #3) of S21. It is calculated by subtracting the minimum value from the maximum value in the filter pass-band.
Test Limit = 1.5 dB

4 Display the worst return loss in the filter pass-band (segment #3) of S11.
Test Limit = -9.5 dB

5 Display Pass/Fail judgment. This judgment includes limit test, insertion loss, attenuation, ripple and return loss.

Under "Segment" tab

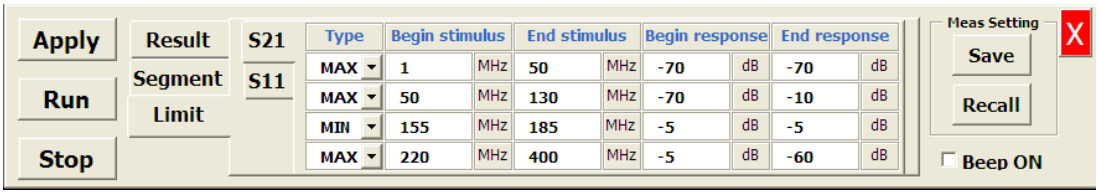


Define the five segments sweep settings for this band pass filter test program. You can modify start frequency, stop frequency, points and IFBW of each segment. The default setting is as follows.

Segment sweep setting

No.	Start Frequency	Stop Frequency	Points	IFBW
1	1 MHz	50 MHz	50	30 kHz
2	50 MHz	150 MHz	51	30 kHz
3	150 MHz	190 MHz	130	30 kHz
4	190 MHz	410 MHz	110	30 kHz
5	410 MHz	1 GHz	60	30 kHz

Under "Limit" tab



Define limit tables for this band pass filter test program. You can set 4 limit lines for S21 trace, and 1 limit line for S11 trace.

You can modify the limit type, begin stimulus, end stimulus, begin response and end response of the limit table. The default settings are as follows.

Limit Table for S21

Type	Begin Stimulus	End Stimulus	Begin Response	End Response
Max	1 MHz	50 MHz	-70 dB	-70 dB
Max	50 MHz	130 MHz	-70 dB	-10 dB
Min	155 MHz	185 MHz	-5 dB	-5 dB
Max	220 MHz	400 MHz	-5 dB	-60 dB

Limit Table for S11

Type	Begin Stimulus	End Stimulus	Begin Response	End Response
Max	155 MHz	185 MHz	-11 dB	-11 dB

5.2. Description of buttons in the main form of the VBA GUI

1 **Apply**: Apply the segment table and the limit table settings to the E5061B firmware. Then perform one cycle of measurement and auto scale.

2 **Run**: Run the measurement continuously, and display test results in “Result” Tab.

[Run] button is grayed-out when you start-up the VBA program. It is enabled by pressing [Apply] button which executes auto scale of the traces.

3 **Stop**: Stop the continuous measurement.

4 **Save**: Save the segment table and the limit table. The file is saved in CSV format.

It saves the current measurement settings of the E5061B firmware. The [Save] button becomes grayed-out when you modify any settings under “Segment” or “Limit” Tab. If you modify the settings under “Segment” or “Limit” Tab, you need to press [Apply] button prior to pressing [Save] button.

5 **Recall**: Recall the saved file. Select a saved file, and click **Open** to call the segment table and limit table saved in the CSV formatted file.

6 **Beep ON**: Checking **Beep ON** allows you to hear the failing beeper. The default setting is unchecked (Beep OFF).

7 **X**: End the program.