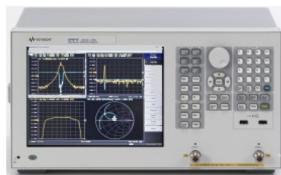


## Quick Demo Guide

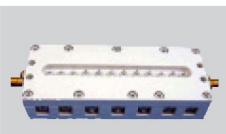
# E5061B ENA Series Network Analyzer, Option 1x5/2x5 RF NA Options

## Procedure overview

1. Procedure overview
2. Connect DUT to E5061B
3. Set measurement parameters
4. Perform calibration (optional)
5. Measure insertion loss
6. Measure bandwidth parameters



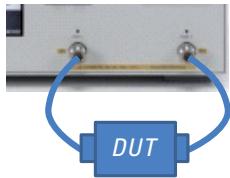
N-Type Cable



Band pass filter (BPF)

In this demo, we will use BPF (Center frequency = 1.09 GHz, BW = 15 MHz) but you can use another filter. Prepare appropriate cable and adapter to connect between ENA and DUT.

## 1. Connect DUT to E5061B



## In this demo...

- Setting up typical measurement for band pass filter
- Performing calibration (mechanical or Ecal)
- Measuring insertion loss and bandwidth parameters

## Required Instrument and fixture

E5061B-115/135/215/235 or E5061BEP-115/235  
(also E5061B-117/137/217/237 available for 75 Ω DUT)

Legend: **[Key name]** = front panel hardware key  
**Key name** = soft key  
**Number** = front panel hardware numeric key

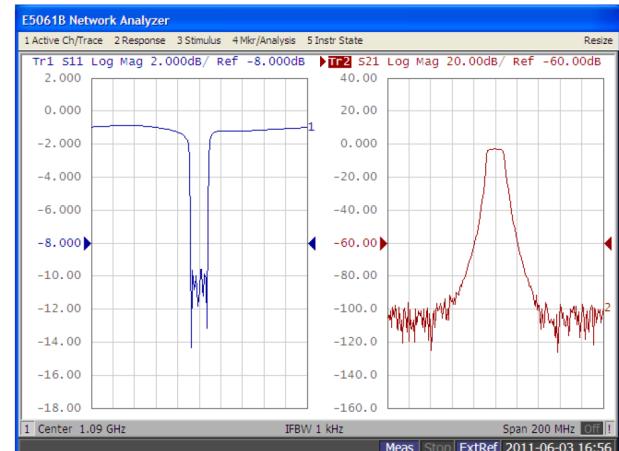
## 2. Set measurement parameters

- Press **[Preset]** then press **OK**
- Set Frequency  
Press **[Center]** then enter **1.09 GHz**  
Press **[Span]** then enter **200 MHz**
- Set measurement traces  
Press **[Display]** then press **Num of traces**, and **2**  
Press **Allocate Traces** and **x2**
- Set measurement parameters for trace2  
Activate trace2  
Press **[Meas]** then press **S21**  
Press **[Scale]** then press **Auto Scale All**
- Set IFBW  
Press **[Avg]** then enter **1 kHz**

What is the active trace? How to activate the trace?

► to the right of the trace name indicates the active trace (the trace for which set up is being performed). To make a trace active, use **[Trace Next]** or **[Trace Prev.]**. Clicking the line where the trace name is placed also makes a trace active.

What happens by changing IFBW?  
Narrowing the receiver IFBW enables you to reduce the effect of random noise on measurements. Narrowing the IFBW to 1/10 the original bandwidth causes the receiver noise floor to decrease by 10 dB. Lowering the noise floor of the receiver enables you to expand the dynamic range. In evaluating a characteristics accompanied by large change in the amplitude such as filter, it is important to expand dynamic range.



# E5061B ENA Series Network Analyzer, Option 1x5/2x5 RF NA Options

To measure S-parameter accurately, recommend to perform calibration. However, if you don't have calibration kit, you can skip step 3. In this demo, we use 85032E economy mechanical calibration kit.

## 3. Perform calibration (Mechanical Cal)

- Select calibration kit and calibration type  
Press **[Cal]** then press **Cal Kit**, and press **85032B/E**  
Press **Calibrate**, then press **Enhanced Response**
- Measure calibration standard  
Connect open std. to port1 then press **Open**  
Connect short std. to port1 then press **Short**  
Connect load std. to port1 then press **Load**  
Connect thru std. between port1 and port2 then press **Thru**
- Activate calibration  
Press **Done**

If you have Ecal (electric calibration) module, you can also perform calibration kit with Ecal.

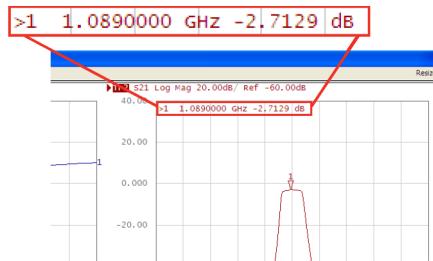
## 3. Perform calibration (Ecal)

- Connect Ecal to USB portNeed to allow the Ecal module to warm up for 20 min until the module indicator changes from WAIT to READY.
- Perform Calibration  
Connect RF port of Ecal and ENA.  
Press **[Cal]** then press **Ecal**  
Press **Enhanced Response** then press **2-1 (S21 S11)**

In this demo, we performed "enhanced response" for the type of calibration method. For more detail on the calibration method, refer to help.

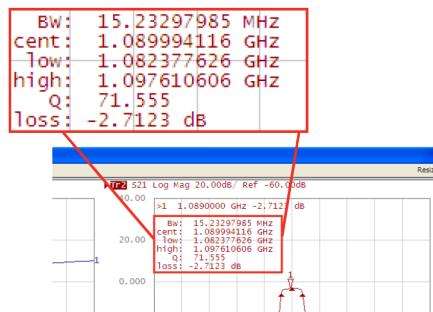
## 4. Measure the insertion loss

- Connect DUT to E5061B if you performed calibration
- Display marker on peak of the S21 measurement  
Activate trace2, then press **[Marker]**  
Press **[Marker Search]** then press **Max**
- Measure the marker value displayed as shown in the figure below. In this example, the response value denotes the insertion loss.



## 5. Measure the bandwidth parameters

- Perform bandwidths search  
Press **[Marker Search]** then press **Bandwidth**
- The bandwidth data items (BW, cent, low, high, Q, loss) is displayed as shown in the figure below.



## What are bandwidth parameters?

Using the bandwidth search functions, parameters below are read out.

**BW (Bandwidth):** Stimulus width between two cutoff frequency points (low and high)

**Cent (Center Frequency):** Center point between cutoff frequency points (low and high)

**Low (Left-side Cutoff Frequency):** The lower frequency of the tow cutoff frequency points

**High (Right-side Cutoff Frequency):** The higher frequency of the two cutoff frequency points

**Q (Q value):**  $Q = \text{cent}/\text{BW}$

**Loss (Insertion Loss):** The measured value of the active marker

## Additional Demo: Bandwidth limit test

The test result of the trace can be indicated in the upper-right section of the graph.

- Bandwidth test setup  
Press **[Analysis]** then press **Bandwidth Limit**  
Press **[Min Bandwidth]** then enter smaller value than actual bandwidth  
Press **[Max Bandwidth]** then enter grater value than actual bandwidth
- Turning on the bandwidth limit test function  
Press **BW Test**

[www.keysight.com/find/e5061b](http://www.keysight.com/find/e5061b)

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