



Lab 5: Band pass Filter Lab

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Objective:

- Design, build, and test two bandpass filters for your wireless local area network.

Equipment:

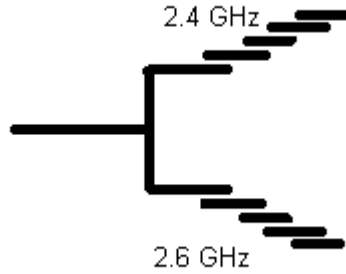
- Agilent 8510C Microwave Vector Network Analyzer
- TRL Calibration Kit

Design Specifications:

1. 2.4 GHz filter:
 - a. Match to 50 ohm line
 - b. Center frequency = 2.4 GHz
 - c. Attenuation at 2.6 GHz > 20 dB
 - d. Maximum ripple 0.5 dB
2. 2.6 GHz filter:
 - e. Match to 50 ohm line
 - f. Center frequency = 2.6 GHz
 - g. Attenuation at 2.4 GHz > 20 dB
 - h. Maximum ripple 0.5 dB

Notes to remember:

- A. You will need to connect these filters to your power divider to build the WLAN. Be certain to allow enough physical space for these to fit together without having to remill either the power divider or the filter. It will probably be useful to configure the filters as shown below. Since the arms of your power divider have been optimized for different frequencies, be sure the filters you mill to fit on them correspond to the correct arms of the power divider....
- B. The maximum impedance we can reliably mill is about 175 ohms.
- C. Be sure to leave room to connect your circuit to the circuit board holder (add length of THRU / 2)



Testing:

- a. Measure the S11 and S12 parameters on the network analyzer and compare them to your predicted results.
- b. Connect the filters (via circuit board holder) to the signal generator (transmitter) and spectrum analyzer (receiver) and verify the operation of your filter. The results you obtain should be very close to those you obtain on the network analyzer, less loss from cables or connectors.