Filter Design

Start with an equal-element value 3rd order low-pass prototype at \( \omega = 1 \) and \( R = 1 \). The two capacitors are 1.157 Farads and the Inductor is 1.157 Henries. Design a 5% bandwidth filter centered at 50 kHz with an impedance of 50 ohms.

A 100 MHz filter with the schematic shown below has the measured response shown at the right. You have drawn the schematic by looking at a circuit board. Use your understanding of filters and LTSpice to design a 100 MHz filter with the same response, and the same schematic.

The microstrip hairpin filter shown at the right is printed on 0.0625" FR-4 glass-epoxy circuit board. Assume the drawing is to scale. What is the frequency? If the bandwidth is 15% and the ripple is 2 dB, what change could be made to reduce the bandwidth and ripple?

Scale the microstrip filter shown above to 600 MHz, and sketch the layout. Which parameters change and which do not. If the filter passband is not symmetrical, which element should you change first?