

Project: Design and Simulation of a Maximally Flat Microstrip Bandpass Filter

I. Design Specifications & Requirements:

Bandpass Filter Design (Simulation) using both ADS circuit and EM Simulations. Estimate the attenuation at a frequency that is 0.5 GHz higher than the assigned center frequency. Make comparisons and comments.

- A specified center frequency from 2.4-6.1 GHz will be assigned individually;
- The relative bandwidth is 10%;
- Maximum flat within pass band;
- The order $N = 4$;
- The port impedance is $50\ \Omega$;
- Substrate: RO4350B, thickness of 0.76mm, conductor thickness 35um, loss tangent: 0.002, relative permittivity: 3.66, Cond = $4.1\text{E}+7\ \text{S/m}$, rough:0.001mm.

II. Workflow & Contents:

1. Design this filter using ideal lumped components.
2. Convert the lumped-element design into a distributed microstrip-coupled-line structure using ADS LineCalc.
3. Create a physical layout of the microstrip filter. Then perform an EM-Circuit co-simulation using Momentum for improved performance.