**Lab06:**

**ECEN 452**

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**Dr. Huff**

**Given:**

**Characteristic Impedance = 50 ohm**

**Thickness of substrate = 62 mil = 1.5748 mm**

**Dielectric constant of substrate = 4.1**

**Loss tangent of substrate = 0.01**

**Task 1: Synthesis and implementation of a maximally-flat low-pass filter.**

**Given:**

**Cut-off Frequency = 2.5 GHz**

**Minimum attenuation of 10 dB at 3.25 GHz**

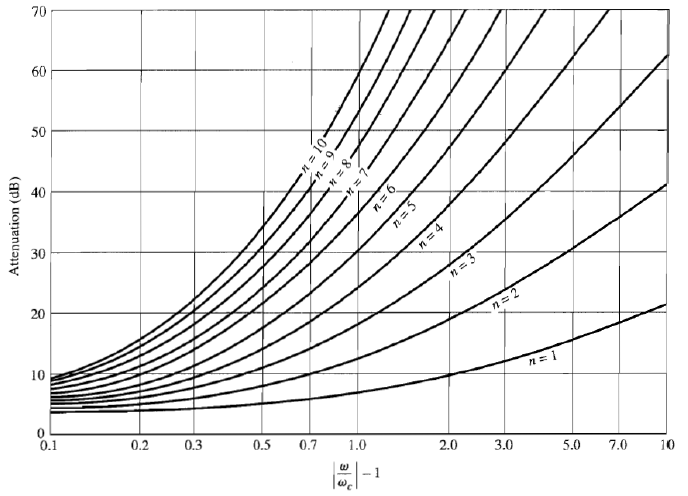
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Figure . Attenuation [dB] in terms of frequency

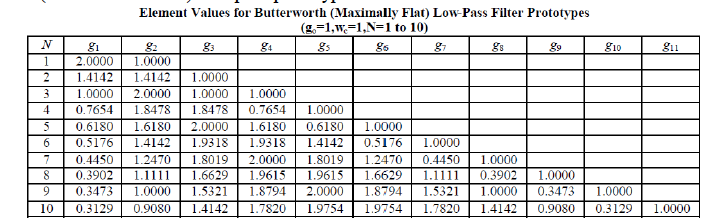


Figure . Element values for Butterworth Low-Pass Filter Prototypes

**Task 2: Synthesis and implementation of an Equi-ripple band-stop filter.**

**Given:**

**Center Frequency = 3 GHz**

**Bandwidth of 2.25 GHz to 3.75 GHz**

**Micro strip line**

**Characteristic Impedance = 50 ohm**

**Thickness of substrate = 62 mil = 1.5748 mm**

**Dielectric Constant = 4.1**

**Loss Tangent = 0.01**

**Calculation:**

Scaled Impedance values of the equivalent open-circuit stubs using the following equation:

**Plot:**

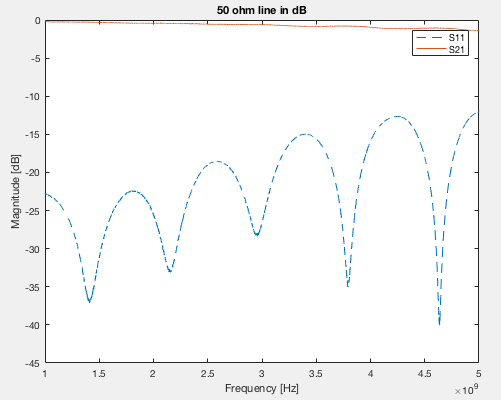


Figure . 50ohm line dB

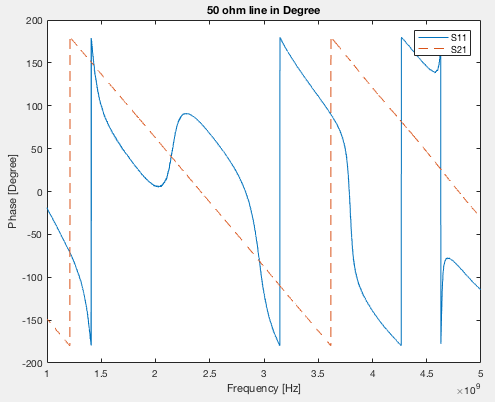


Figure . 50ohm line phase

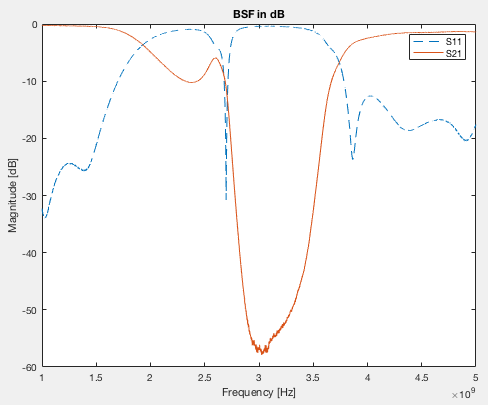


Figure . BSF dB

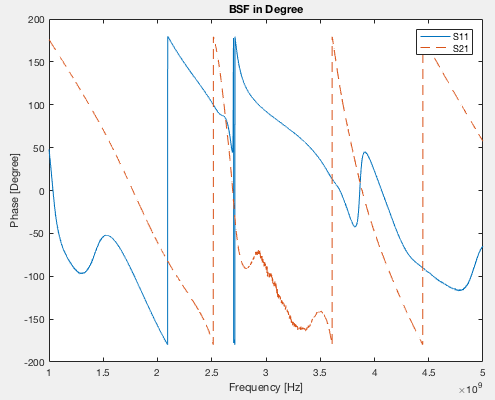


Figure . BSF phase