Design of microstrip single-wide-band balanced bandpass filter with SIR and circuit model for X-band application

Morteza Khajavi
Khuzestan Hydropower Plant Installation and
Maintenance Company (Khpimc)-Ahwaz

Amir Mahmoudi
Khuzestan Hydropower Plant Installation and
Maintenance Company (Khpimc)-Ahwaz

Abstract

In this paper, a new design of Wide-Band microstrip single band bandpass filter using step impedance resonators (SIR) and parallel stubs is presented. A step impedance resonator with 2 parallel studs and an air gap between them in the middle of the structure is selected as the base resonator, then even and odd mode capacitors are calculated for the air distance and by adding a step impedance resonator to the base resonator and optimizing the filter dimensions Come. To examine the design simulation results of the designed LC equivalent circuit in more detail, we draw it. Simplicity of design and compact dimensions are the advantages of this single-band bandpass filter. The simulation results for the proposed filter include performance in the frequency band of 10.02 GHz and insertion losses of -0.108 dB, return losses of -23.279 dB and bandwidth of 1.33 GHz, respectively.

Keywords: step impedance resonators (SIR), insertion Loss, return Loss, LC model.