

Abstract

In this article, a new compact quasi-arrow head defected ground structure (DGS) lowpass filter (LPF) is proposed. The proposed DGS behaves as a resonant element which allows size compactness and harmonic suppression in the rejection band. The proposed LPF presents the advantages of compactness, low insertion loss, and ultrawide stopband with 20 dB attenuation from 6 GHz to >20 GHz. The length of the proposed multilayer LPF is reduced to 0.143g at 3 GHz in comparison with 0.2g for the cascaded topology with $g=0.157m$. A novel compact bandpass filter (BPF) is presented by utilizing a simple transformation from LPF based on J-inverter technique. The proposed BPF has low insertion loss and compact size. Finally, the simulated and experimental results of proposed structure are found to be in good agreement with the simulation results.