

The Dual-Band Bandpass Filters Using Doubly Parallel-Coupled SIRs with Multiple Zeros for WLAN Applications

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Abstract

Two dual-band bandpass filters (BPFs) based on the doubly parallel-coupled stepped impedance resonators (SIRs) structures have been proposed in this paper. The coupled-SIRs with/without open-stub-loads are introduced in the filter design. The dual-band filters exhibiting multiple zeros design operate at 2.45/5.2-GHz for the WLAN applications. Two three-staged filters composed of four SIRs have been proposed with the tapped-line adapted in the I/O sections. A five-staged filter is constructed based on the same design principle to achieve a better band-rejection. The proposed filters have the advantages of a much wider bandwidth in both the passbands without sacrificing the passband's insertion loss and passband flatness. The design procedure for a conventional parallel-coupled microstrip lines model is still suitable to design the proposed filters. The proposed filters have achieved almost twice the band-width of a conventional parallel-coupled lines configuration under the same design parameters. The experiments have been conducted to verify filter performance. Measured results are in good agreement with the full-wave simulation results.

Key words : Doubly parallel-coupling; Multiple zeros
assignment; Dual-band BPF; WLAN