

عنوان مقاله:

A Compact Wide Bandpass Filter based on Substrate Integrated Waveguide (SIW) Structure

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خلاصه مقاله:

In this paper, a wideband three-order bandpass filter (BPF) is proposed. The proposed wideband filter is designed using the substrate integrated waveguide (SIW) structure by loading T-shape slots. A BPF with two resonators is formed by etching T-shape slots with different size on the top metal plane of the SIW structure. The filter is investigated with the theory of coupled resonator circuits. The T-shape slots, etched on the SIW structure, are used to form up a new multiple-mode resonator (MMR) in order to achieve a wide passband of operation while keeping the overall size of the proposed filter to be much compact. The design procedure as well as design curves of the filter are given and discussed here. Compared with some other reported BPFs with SIW technique, the presented BPF using the SIW structure loaded by T-shape slot has great improvements on size reduction and selectivity. In order to prove the validity, the proposed wideband SIW BPF on a single layer printed circuit board (PCB) is designed and experimentally examined. The measured results show that the filter achieves an insertion loss of 1.1 dB at 6.4 GHz and a return loss of higher than 21 dB. The proposed filter has a pass-band covers 5.1 to 7.99 GHz and its simulated and measured 3 dB fractional bandwidth is about 44.3%. The measured results are in a good agreement with the simulated results.

کلمات کلیدی:

microwave filter, substrate integrated waveguide (SIW), wide bandpass

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