Abstracts

A design of the novel coupled-line bandpass filter using defected ground structure with wide stopband performance

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In this paper, a novel three-pole coupled-line bandpass filter with a microstrip configuration is presented. Presented bandpass filters use defected ground structure (DGS) sections to simultaneously realize a resonator and an inverter. The proposed coupled-line bandpass filter provides compact size with low insertion-loss characteristic. Furthermore, a DGS shape for a microstrip line is newly proposed. The proposed DGS unit structure has a resonance characteristic in some frequency band. The proposed coupled-line filter can provide attenuation poles for wide stopband characteristic due to resonance characteristic of DGS. The equivalent circuit for the proposed DGS unit section is described. The equivalent-circuit parameters for DGS are extracted by using a three-dimensional finite-element-method calculation and simple circuit analysis method. A design method for the proposed coupled-line filter is derived based on coupled-line filter theory and the equivalent circuit of the DGS. The experimental results show excellent agreements with theoretical simulation results.

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