Abstracts

A novel periodic electromagnetic bandgap structure for finite-width conductor-backed coplanar waveguides

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The one-dimensional (1-D) periodic electromagnetic bandgap (EBG) structure for the finite-width conductor-backed coplanar waveguide (FW-CBCPW) is proposed. Unlike the conventional EBG structures for the microstrip line and the coplanar waveguide (CPW), which are typically placed on one of the signal strips and the ground plane, this EBG cell is etched on both the signal strip and the upper ground plane of FW-CBCPW resulting in a novel circuit element. The equivalent circuit is also used to model the EBG cell. Measured and full-wave simulated results show that the cell exhibits remarkable stopband effect. The low-pass filter with lower cutoff frequency and wider rejection bandwidth is constructed from a serial connection of the EBG cells. The effect of back metallization on the guiding characteristic is also discussed. Compared to the published EBG cells, the proposed structure has the advantages of relative flexibility, higher compactness, lower radiation loss, and easier integration with the uniplanar circuits.

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