Abstracts

Narrow-Band Microstrip Bandpass Filters with Low Radiation Losses for Millimeter-Wave Applications

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Microstrip lines are attractive for the lower millimeter-wave ranges, but use of relatively thick substrates would be desirable in order to minimize losses. On such substrates the usual types of microstrip narrow-band bandpass filters (formed from, e.g., coupled line segments with open ends) tend to radiate strongly, giving very poor performance. It has been found that a grating technique initially developed for use with dielectric waveguide can be adapted for microstrip to obtain narrow-band millimeter-wave microstrip filters with little radiation and strong filter characteristics. The stopbands are broad, the second passband occurring at three times the frequency of the first passband. These filters use parallel-coupled gratings with a single grating in cascade at each end. In this paper, we detail the modifications to the dielectric waveguide filter theory which are necessary for use with microstrip. We also present experimental results from microstrip realizations which demonstrate their potential for mm-wave microstrip applications.

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