Abstracts

Electronically Switchable and Tunable Coplanar Waveguide-Slotline Band-Pass Filters

Y.-H. Shu, J.A. Navarro and K. Chang. "Electronically Switchable and Tunable Coplanar Waveguide-Slotline Band-Pass Filters." 1991 Transactions on Microwave Theory and Techniques 39.3 (Mar. 1991 [T-MTT]): 548-554.

A novel coplanar waveguide (CPW) slotline band-pass filter has been developed. The circuit allows planar integration of active and passive semiconductor devices both in series and in shunt. To test the filter, a new microstrip to slotline transition was designed and two of these transitions exhibited an insertion loss of less than 1.0 dB over the 2.0 to 4.0 GHz range. A three-section CPW-slotline band-pass filter demonstrated an insertion loss of less than 0.2 dB over the passband centered at 2.9 GHz. A three-section CPW-slotline switchable band-pass filter integrated with three p-i-n diodes was developed with a 0.7 dB insertion loss in the passband when the p-i-n diodes are OFF and 25.0 dB isolation across the entire band when the p-i-n diodes are on. A three-section CPW-slotline varactor-tunable filter integrated with three varactor diodes was demonstrated with a 2.0 dB insertion loss and over 20% electronic tuning range. Simple transmission line circuit models were used to optimize the design.

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