Abstracts

Planar Millimeter-Wave Microstrip Lumped Elements Using Micro-Machining Techniques

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Planar millimeter-wave microstrip inductors and capacitors have been fabricated on high-resistivity silicon substrates using micro-machining techniques. The spiral inductors and interdigitated capacitors are suspended on a thin dielectric membrane to reduce the parasitic capacitance to ground. The resonant frequencies of a 1.2nH and a 1.7nH inductor fabricated on a high-resistivity silicon substrate and on a small dielectric membrane, have been increased from 22 GHz and 17 GHz to 73 GHz and 54 GHz, respectively. The planar micro-machined elements are compatible with the via-hole technology process in GaAs and InP MMIC, and can be used as true inductors and capacitors up to 50-60 GHz. The technique can be also applied to lumped elements in coplanar-waveguide transmission lines.

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