Abstracts

Status of Lumped Elements in Microwave Integrated Circuits---Present and Future

M. Caulton, B. Hershenov, S.P. Knight and R.E. DeBrecht. "Status of Lumped Elements in Microwave Integrated Circuits---Present and Future." 1971 Transactions on Microwave Theory and Techniques 19.7 (Jul. 1971 [T-MTT] (Special Issue on Microwave Integrated Circuits)): 588-599.

The use of lumped elements in microwave integrated circuits (MICS) is discussed. The design, fabrication, and performance of networks used in both active and passive circuits are described. Studies on amplifier impedance matching and transforming networks have resulted in the achievement of a 35-dB-gain 6-W-CW 26-percent-efficient amplifier at 2.25 GHz using only lumped elements. Construction of lumped-element low-pass filters and 3-dB quadrature hybrids at S band have produced circuits much smaller than, but with performance comparable to, microstrip distributed circuits. At C band a large-impedance transformer operating as a filter had less than 0.4-dB loss for an impedance transformation close to 20:1. The performance of lumped-element circuits through X band is compared with that of distributed circuits from the standpoint of size, economy, and technological applications. Lumped-element circuits are competitive with distributed circuits through 6 GHz and are practical through 12 GHz.

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