Abstracts

Improved planar spiral transformer theory applied to a miniature lumped element quadrature hybrid

J. Hogerheiden, M. Ciminera and G. Jue. "Improved planar spiral transformer theory applied to a miniature lumped element quadrature hybrid." 1997 Transactions on Microwave Theory and Techniques 45.4 (Apr. 1997 [T-MTT]): 543-545.

In this paper, an improved method of determining the primary-to-secondary coupling capacitance for planar spiral transformers (PST's) is presented, which enhances previous work. A more general monolithic microwave integrated circuit (MMIC) compatible lumped element multisection model is also presented based on symmetric-width uniformly coupled transmission lines. These techniques were developed to design a 90/spl deg/ hybrid as a MMIC with a center frequency of 2.5 GHz. The design was frequency scaled to 0.5 GHz and fabricated in the microwave integrated circuit (MIC) for verification. Producibility is enhanced and coupling is effectively increased with the novel use of series capacitors which cancel some of the self-inductance of the transformers. Measured results are presented for both a quadrature hybrid and the individual PST used in the quadrature hybrid. The measured results show excellent agreement with the computer models.

❑ Return to main document.