Abstracts

A 1.4-2.7-GHz analog MMIC vector modulator for a crossbar beamforming network

J. Grajal, J. Gismero, M. Mahfoudi and F.A. Petz. "A 1.4-2.7-GHz analog MMIC vector modulator for a crossbar beamforming network." 1997 Transactions on Microwave Theory and Techniques 45.10 (Oct. 1997, Part I [T-MTT]): 1705-1714.

The design and performance of a monolithic 1.4-2.7-GHz vector modulator with analog amplitude and phase control are presented in this paper. A full 360/spl deg/ coverage range and a dynamic range greater than 13 dB is achieved by combining two out of three vectors 120/spl deg/ apart with variable amplitude. Amplitude control is performed by three sets of quasi-dual-gate MESFETs (two single-gate MESFETs in cascade) while the 120/spl deg/ shift among the vectors is achieved through LC filters covering the 1.4-2.7-GHz band. Since the active devices throughout the circuit are not working in saturation, large-signal models must be used in the simulations. The circuit is used as the matrix node element in an analog crossbar beamforming network (CBFN) and as the general-purpose wide-band vector modulator device.

❑ Return to main document.