Abstracts

Passive Phase-Distortionless Parametric Limiting with Varactor Diodes

I.T. Ho and A.E. Siegman. "Passive Phase-Distortionless Parametric Limiting with Varactor Diodes." 1961 Transactions on Microwave Theory and Techniques 9.6 (Nov. 1961 [T-MTT]): 459-472.

The theory of passive parametric limiting with a varactor diode as the nonlinear element is developed and verified experimentally. The limiting is found to be flat and phase-distortionless. Expressions are given for threshold level, dynamic range, bandwidth, and power dissipation. The transient phenomena, comprising leading- and trailing-edge leakage spikes, are studied theoretically and experimentally, and found to be small in typical instances. Experimental results reported upon include a simple waveguide limiter structure at S band; a lumped-circuit limiter at 126 Mc; and a strip-line limiter using a pill varactor at S band. The latter has an insertion loss of 2.5 db below threshold, a threshold level of 2 mw, a dynamic range in excess of 20 db, and less than 5° of phase distortion. Agreement between theory and experimental results is excellent.

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