Abstracts

GaAs Nonlinear Transmission Lines for Picosecond Pulse Generation and Millimeter-Wave Sampling

M.J.W. Rodwell, M. Kamegawa, R. Yu, M. Case, E. Carman and K.S. Giboney. "GaAs Nonlinear Transmission Lines for Picosecond Pulse Generation and Millimeter-Wave Sampling." 1991 Transactions on Microwave Theory and Techniques 39.7 (Jul. 1991 [T-MTT]): 1194-1204.

The GaAs nonlinear transmission line (NLTL) is a monolithic millimeter-wave integrated circuit consisting of a high-impedance transmission line loaded by reverse-biased Schottky contacts. Through generation of shock waves on the NLTL, we have generated electrical step functions with ~5 V magnitude and less than 1.4 ps fall time. Diode sampling bridges strobed by NLTL shock-wave generators have attained bandwidths approaching 300 GHz and have applications in instruments for millimeter-wave waveform and network measurements. We discuss the circuit design and diode design requirements for picosecond NLTL shock-wave generators and NLTL-driven sampling circuits.

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