Abstracts

Piezoelectric Semiconductor Acoustic Delay Lines

F.S. Hickernell. "Piezoelectric Semiconductor Acoustic Delay Lines." 1969 Transactions on Microwave Theory and Techniques 17.11 (Nov. 1969 [T-MTT] (Special Issue on Microwave Acoustics)): 957-963.

The delay of signals for microsecond time periods in monolithic structures using piezoelectric semiconductors is described. Thin resistive regions were formed by the diffusion of compensating impurities in semiconducting crystals of ZnO, CdS, CdSe, and GaAs and used as transducers for the excitation and detection of acoustic waves in the 30-MHz to 1.0-GHZ region. Time delays from 200 ns to 5.0 µs were achieved using simple acoustic transmission structures. Insertion loss values less than 10 dB were achieved in ZnO for microsecond delays up to 600 MHz. Frequency-tuned bandwidths of 70 to 90 percent were obtained. The frequency-loss characteristics of the delay structures could be quantitatively related to a simple theoretical model. The performance characteristics of representative matched and packaged acoustic delay lines is described.

❑ Return to main document.