Abstracts

Design of Surface Wave Delay Lines with Interdigital Transducers

W.R. Smith, H.M. Gerard, J.H. Collins, T.M. Reeder and H.J. Shaw. "Design of Surface Wave Delay Lines with Interdigital Transducers." 1969 Transactions on Microwave Theory and Techniques 17.11 (Nov. 1969 [T-MTT] (Special Issue on Microwave Acoustics)): 865-873.

Design aspects and tradeoffs are presented for nondispersive, analog Rayleigh wave delay lines with interdigital transducers. Design procedures are based on a one-dimensional piezoelectric transducer model whose applicability has been confirmed by experimental data taken on transducers operating at 100 MHz. For transducers with series inductive tuning, optimum aperture and number of interdigital periods are given for several attractive piezoelectrics, such that insertion loss and phase dispersion are minimized while bandwidth is maximized. High-triple transit suppression designs are given for bidirectional transducers, implying some sacrifice in insertion loss. Using directional transducers, low insertion loss and high triple transit suppression are achieved simultaneously at some sacrifice in bandwidth. Finally, two approaches are given for making with presently available piezoelectrics, bandwidths higher than those attainable with a single tuning inductor. The first of these uses a coupled resonator electrical matching network, while the second employs a transducer with graded periodicity.

❑ Return to main document.