Abstracts

Pulse Dispersion and Shaping in Microstrip Lines

J.F. Whitaker, T.B. Norris, G. Mourou and T.Y. Hsiang. "Pulse Dispersion and Shaping in Microstrip Lines." 1987 Transactions on Microwave Theory and Techniques 35.1 (Jan. 1987 [T-MTT]): 41-46.

A method for determining the modal dispersion of gigahertz-bandwidth pulses on microstrip transmission lines is described. We have investigated the evolution of temporal waveforms propagating on microstrips, with very good agreement noted between experimental pulse shapes and numerical simulations. The resulting pulse distortion contributed to a pulse-shaping application where 100-ps rise times were stretched to the nanosecond durations necessary to control the shape of high-energy optical pulses used in fusion research. The tunability of the shape of the rising edge was investigated through variation of the stripline geometry and the substrate material. Additional effects due to high-frequency attenuation in several dipolar liquid dielectrics were substantiated experimentally, and the relevance of the results has been discussed.

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