Abstracts

Experimental Analysis of Millimeter Wave Coplanar Waveguide Slow Wave Structures on GaAs

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Microwave coplanar waveguide slow wave structures suitable for use in traveling wave electrooptic modulators were experimentally investigated to 40 GHz. Velocity slowing is achieved by introducing periodic slots in the ground planes. Structures both on semiinsulating GaAs substrates and on epitaxial layers grown by molecular beam epitaxy on semi-insulating GaAs substrates were examined. In the measurements the thru-reflect-line calibration method was used and its limitations are discussed. The characteristic impedance, phase velocity and loss coefficient of these lines were extracted from measured S-parameters. Effects of various dimensions on these line properties are presented and discussed. Results indicate that significant phase velocity slowing without dispersion at least up to 40 GHz is possible with this approach. This is true both on semi-insulating GaAs substrates and specially designed epitaxial layers. A design approach to achieve a specified phase velocity and characteristic impedance is given.

❑ Return to main document.