Abstracts

Modal Dispersion Control and Distortion Suppression of Picosecond Pulses in Suspended Coplanar Waveguides

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In this paper we investigate the propagation and dispersion characteristics of picosecond electrical pulses in a suspended coplanar waveguide (SCPW) and show that the SCPW is a very promising transmission structure for ultra-short pulses with picosecond and subpicosecond durations, compared with conventional coplanar waveguides (CPWs). Numerical results of modal dispersion of the SCPW are presented and compared to those of the conventional CPW, and a field coupling theory is employed to explain the evolution in the dispersion behavior. An evaluation based on the numerical analysis shows that the SCPW with properly controlled dispersion can result in an improvement of about 5 times in pulse transmission capability than the conventional CPW. The propagation of picosecond pulses along the SCPW has been studied by both computer simulations and experimental measurements, both showing a substantial suppression in pulse distortion compared to the case of conventional coplanar waveguides.

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