Abstracts

GaAs on Quartz Coplanar Waveguide Phase Shifter

M.S. Islam, A.J. Tsao, V.K. Reddy and D.P. Neikirk. "GaAs on Quartz Coplanar Waveguide Phase Shifter." 1991 Microwave and Guided Wave Letters 1.11 (Nov. 1991 [MGWL]): 328-330.

An optically controlled Schottky-contacted coplanar waveguide (CPW) phase shifter on a thin epitaxial GaAs film bonded to a quartz substrate has been fabricated using the epitaxial lift off (ELO) technique. This allows the original semi-insulating GaAs substrate to be replaced by an optically transparent, low dielectric constant quartz substrate. A significant reduction in insertion loss and increase in phase shift was observed after lift-off. The ELO device allows the use of backside illumination for optical control, avoiding any metal shadowing effects, thus producing higher sensitivity to the optical signal. From 5 to 40 GHz, the ELO device gave an insertion loss of approximately -0.1 dB per degree of phase shift. At a backside illumination intensity of 0.65 mW/cm², a one centimeter long device produced over 350° of phase shift at 30 GHz.

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