Abstracts

2 x 2 Optical Waveguide Matrix Switch Using Nematic Liquid Crystal

M. Kobayashi, H. Terui, M. Kawachi and J. Noda. "2 x 2 Optical Waveguide Matrix Switch Using Nematic Liquid Crystal." 1982 Transactions on Microwave Theory and Techniques 30.10 (Oct. 1982 [T-MTT] (Special Issue on Optical Guided Wave Technology)): 1591-1598.

A 2 X 2 nonblocking optical matrix switch, composed of four elemental switches formed in a slab waveguide, is described. Switching action is based on total internal reflection caused by an electrically controlled change in refractive index of the liquid crystal. Propagation loss was remarkably reduced to 2.3 dB/cm, both by using liquid crystal as a cladding layer and by operating at the 1.31 µm wavelength. The experimental matrix switch exhibited 7.3-7.7 dB insertion loss, -17.3 to -18.2 dB crosstalk, and a 14° switching angle.

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