

DESIGN OF A NOVEL POLARIZATION DEPENDENT 1X2 OPTICAL SWITCH AND A 2X1 MUX/DEMUX BASED ON POLARIZATION CONTROLLERS, POLARIZATION BEAM SPLITTERS AND COMBINERS

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In this paper, we present a 1x2 electro-optical switch based on a 1x2 polarization beam splitter (PBS), a 2x2 polarization beam combiner (PBC) and two TE/TM polarization converters. By applying a voltage of 0/+5 V simultaneously on the two converters, an optical signal is routed to the cross port or to the bar port. We have used the light polarization principle to eliminate the polarization dependent loss. The total insertion loss obtained through simulation is 0.6 dB, while the switching time is estimated to 20 μ s. The estimated extinction ratio of this switch is 30 dB. We present also on this paper, an all-optical 2x1 multiplexer based also on PBSs, PBCs and a polarization controller. The insertion loss found by simulation is 0.5 dB. The demultiplexing function is done by placing only a 1x2 polarization beam splitter after this multiplexer. The two proposed devices operate on the 1550 nm wavelength with a 40 nm pass band.

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