Abstracts

A traveling-wave-type LiNbO/sub 3/ optical modulator with superconducting electrodes

K. Yoshida, Y. Kanda and S. Kohjiro. "A traveling-wave-type LiNbO/sub 3/ optical modulator with superconducting electrodes." 1999 Transactions on Microwave Theory and Techniques 47.7 (Jul. 1999, Part II [T-MTT] (Special Issue on Microwave and Millimeter-Wave Photonics)): 1201-1205.

The design and performance of a LiNbO/sub 3/ optical modulator employing low-loss superconducting electrodes as a transmission line for a traveling-wave signal have been studied. In the case of velocity matching between signal and optical waves using a shielding plane on top of a coplanar waveguide electrode, numerical calculations of the attenuation constants of superconducting transmission lines indicate that the performance of the optical modulator can be much superior to that using normal metals, with respect to the figure-of-merit of bandwidth/driving voltage in the case of extended coupling lengths. Microwave operation of a velocity-matched traveling-wave-type optical modulator with superconductor electrodes has been confirmed at low temperatures down to 4.2 K in the frequency range between DC and 26.5 GHz.

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