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论文

载流子色散型硅基CMOS光子器件

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摘要：

为了实现硅基单片光电子集成器件的实用化，介绍了采用P-I-N、双极型场效应晶体管、金属氧化物半导体和PN结结构的载流子色散型硅基CMOS光子器件的发展状况和特点，并汇报了硅基CMOS光子器件的设计和制作方面的工作.利用商业的CMOS工艺线制作的器件获得了较好的结果，光调制器消光比约18 dB，1×2光开关消光比约21 dB，谐振环的消光比8～12 dB.采用CMOS技术研制硅基光子器件，将能使集成光子学的发展上一个新的台阶.

关键词：

Silicon-based CMOS Photonic Devices Using Carrier Dispersion Effect

Abstract:

In order to realize the practical application of the Silicon-based optoelectronic devices,the progress and characteristics of Silicon-based CMOS photonic devices using carrier dispersion effect with structures of P-I-N,Bipolar Mode Field Effect Transistor(BMFET),Metal Oxide Semiconductor(MOS) and PN junction are reviewed.And our work in design and fabrication of Silicon-based CMOS photonic devices is reported.The devices fabricated by commercial CMOS process have expected results.The extinction ratios of an optical modulator,a 1×2 optical switch and a ring resonator are about 18 dB,21 dB and 8～12 dB,respectively.The introduction of CMOS technology to the design and fabrication of Silicon-based photonic devices will make integrated optics be on a new level.

Keywords:

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