硅中介层中高速互连的优化设计

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摘要： 基于硅中介层的新型集成方法可以实现高速光电互连，其中的互连设计面临信号完整性的挑战.为适应硅中介层中高速光电互连的需求，本文对高速差分互连线设计，提出采用交叉的设计方法来提高传输信噪比.基于电磁场仿真工具，对于差分互连线进行建模与仿真，仿真结果表明本文提出的采用交叉的差分互连线具有显著的串扰抑制作用.本文还对互连线的尺寸和交叉位置提出进一步的优化设计方法，进一步改进了互连性能.仿真结果表明，本文中提出的设计方法，可以用来改进硅中介层的高速互连线设计.
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Design Optimization of High Speed Interconnect on Silicon Interposer

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Abstract： Silicon interposer based integration methodology can achieve high-speed optoelectronic interconnection, but there are many signal integrity problems. In order to meet the demand of high-speed optoelectronic interconnection on silicon interposer, this paper proposes a twisting method to improve the signal-to-noise ratio. Base on the electromagnetic simulation tool, the high-speed differential interconnects are modeled and simulated. The simulation results show that the proposed twisted differential interconnect has significant performance improvement on crosstalk cancelling. This paper also proposes optimization methods for the differential wires by adjusting the size and twisting position, which can further improve the transmission performance. Base on the simulation results, the proposed method can be used to improve the design of high-speed interconnect of silicon interposer.
Key words： Silicon interposer; high-speed interconnect; crosstalk; design optimization

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