

研究简报

防护线减小微带线间串扰的FDTD分析

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摘要

随着信号转换速度日益提高, 高速电路设计中的串扰问题也日趋严重。该文分析了使用防护线减小PCB微带线间串扰的效果, 并运用FDTD对长耦合微带线进行了仿真实验。仿真结果表明, 只要: (1) 添加有接地过孔的防护线并使过孔间距小于信号在 $RT/2$ (RT : 传输信号的上升时间) 时段内的传输距离; (2) 在满足线间距布线规则的前提下, 将防护线适当加宽而又维持三条线 (防护线和两条微带线) 中两两之间的中心距不变, 就能够有效减小线间的远端和近端串扰。

关键词 [微带线](#) [串扰](#) [防护线](#) [FDTD](#)

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FDTD Analysis of the Crosstalk Reduction with Guard Trace Between Microstrips

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Abstract

As the velocity of signal switch becoming fast, the crosstalk in high-speed circuit design is becoming worse than ever. The performance of guard traces in reducing the crosstalk between microstrips is analyzed and simulated with FDTD method in this paper. The simulation results show that the far-end and near-end crosstalks are reduced largely and efficiently by the following useful measures: (1) The guard trace with several grounded vias should be inserted between microstrips and the distance between two adjacent vias should be less than propagating distance during $RT/2$, the half rising time of signal. (2) By obeying the smallest side-to-side distance routing rule and keeping the center-to-center distances between arbitrary two of three lines (microstrips and the guard trace) constant, the guard trace inserted should be as wide as possible.

Key words [Microstrip](#) [Crosstalk](#) [Guard trace](#) [FDTD](#)

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