

## 论文

### 微带线直角弯曲最佳斜切率研究

路宏敏<sup>1</sup>;吴保义<sup>1</sup>;姚志成<sup>2</sup>;万连城<sup>1</sup>

- (1. 西安电子科技大学 电子工程学院, 陕西 西安 710071;
2. 解放军第二炮兵工程学院, 陕西 西安 710025)

摘要:

PCB印制线直角弯曲引起的微带线特性阻抗不连续性严重影响高速电路信号传输质量. 基于微带线结构参数及相对介电常数对印制线直角弯曲45度外斜切最佳斜切率M影响的数值分析结果和最小二乘法原理, 应用MATLAB对数值结果进行曲线拟合, 提出了M与印制线宽厚比w/h的函数表达式, 以及50Ω特性阻抗微带线M与相对介电常数的线性关系. 结果显示: 具有最佳斜切率的印制线直角弯曲45度外斜切能够很好地保障最佳信号传输质量; 相对介电常数和印制线厚度t对M影响小, 而宽厚比w/h对M影响显著.

关键词: 微带线 直角弯曲 45°斜切 最佳斜切率

### Research on the optimal percentage miter of the microstrip right angle bend

- (1. School of Electronic Engineering, Xidian Univ., Xi'an 710071, China;
2. Second Artillery Eng. Inst., Xi'an 710025, China)

- (1. School of Electronic Engineering, Xidian Univ., Xi'an 710071, China;
2. Second Artillery Eng. Inst., Xi'an 710025, China)

Abstract:

In a high-speed circuit, microstrip characteristic impedance discontinuity caused by the right angle bend of PCB traces affects the quality of the signal transmission seriously. The numerical results of the impact of microstrip structure parameters and relative dielectric constant on the optimal percentage miter M of trace right angle bend with a 45°out miter are obtained. Based on the principle of least squares, the formula for M versus the width-to-height ratio w/h is presented by fitting the numerical results with MATLAB. Similarly, the linear expression for M versus the relative dielectric constant is also presented for the 50Ω line. The results show that the trace right-angle bend with a 45°out optimal percentage miter makes the quality of the signal transmission best. And the impact of relative dielectric constant and thickness of microstrip on M is not obvious, but the impact of w/h on M is significant.

Keywords: microstrip right angle bend 45°miter optimal percentage miter

收稿日期 2008-10-21 修回日期 网络版发布日期

DOI:

基金项目:

国家自然科学基金资助(60571059)

通讯作者: 路宏敏

作者简介:

### 参考文献:

- [1] Montrose M I. EMC and the PCB-Design, Theory and Layout Made Simple [M]. Piscataway: IEEE, 1998.
- [2] Bogatin E. Signal Integrity-simplified [M]. Upper Saddle River: Prentice Hall, 2004.
- [3] Montrose M I. Time and Frequency Domain Analysis for Right Angle Corners on Printed Circuit Board Traces [C] //IEEE International Symposium on Electromagnetic Compatibility. Denver: IEEE Press, 1998: 551-556.
- [4] Kergonou G, Drissi M, Zak T, et al. Frequency Dependence in High Speed Interconnection

扩展功能

本文信息

Supporting info

PDF(751KB)

[HTML全文](1KB)

参考文献[PDF]

参考文献

服务与反馈

把本文推荐给朋友

加入我的书架

加入引用管理器

引用本文

Email Alert

文章反馈

浏览反馈信息

本文关键词相关文章

▶ 微带线

▶ 直角弯曲

▶ 45°斜切

▶ 最佳斜切率

本文作者相关文章

▶ 路宏敏

PubMed

Article by Luo,H.M

[C] //IEEE International Symposium on Electromagnetic Compatibility. Montreal: IEEE Press, 2001: 632-634.

[5] 王克伟, 王均宏. 微带线拐角传输与反射特性的研究 [J]. 微波学报, 2006, 22(3): 33-35.

Wang Kewei, Wang Junhong. Study on the Transmission and Reflection Properties of the Microstrip Line Bend [J]. Journal of Microwaves, 2006, 22(3): 33-35.

[6] 路宏敏, 安晋元, 赵益民, 等. 印制线拐角的频域分析 [J]. 西安交通大学学报, 2007, 12(41): 1451-1454.

Lu Hongmin, An Jinyuan, Zhao Yimin, et al. Frequency Domain Analysis for Right Angle Corners [J]. Journal of Xi'an Jiaotong University, 2007, 12(41): 1451-1454.

[7] Silvester P, Benedek P. Microstrip Discontinuity Capacitances for Right-Angle Bends, T Junction, and Crossings [J]. IEEE Trans on Microwave Theory and Techniques, 1973, 21(5): 341-346.

[8] Douville R J P, James D S. Experiment Study of Symmetric Microstrip Bends and Their Compensation [J]. IEEE Trans on Microwave Theory Tech, 1978, 26(3): 175-182.

[9] Moore J, Hao Ling. Characterization of a 90°Microstrip Bend with Arbitrary Miter via the Time-domain Finite Difference Method [J]. IEEE Trans on Microwave Theory and Techniques, 1990, 38(4): 405-409.

[10] Feix N, Lalande M, Jecko B. Harmonic Characterization of a Microstrip Bend via the Finite Difference Time Domain Method [J]. IEEE Trans on Microwave Theory Tech, 1992, 40(5): 955-960.

[11] 梁昌洪, 谢拥军, 官伯然. 简明微波 [M]. 北京: 高等教育出版社, 2006: 172.

本刊中的类似文章

1. 魏峰<sup>1</sup>; 史小卫<sup>1</sup>; 陈蕾<sup>2</sup>; 黄丘林<sup>1</sup>. 一种改进型微带线定向耦合器及其应用 [J]. 西安电子科技大学学报, 2009, 36(2): 281-284
2. 赵建中; 杨瑾屏; 杨国; 吴文. 一种具有谐波抑制特性的窄带带通滤波器设计 [J]. 西安电子科技大学学报, 2009, 36(3): 568-572
3. 魏峰; 翟阳文; 史小卫; 陈蕾; 黄丘林. 一种新颖的缺陷地微带线低通滤波器 [J]. 西安电子科技大学学报, 2009, 36(4): 645-648

文章评论

序号	时间	反馈人	邮箱	标题	内容
1	2009-10-21	caragon	caragon@googlemail.com		?? £?????????????????????f???ugg ukugg saleugg bootsUGG Bailey Buttonsupra shoesnike dunkMBT Shoes discountugg sale ugg shoes ugg