電腦風扇驅動ic輸出埠esd能力改善之研究=a study of esd immunity improvemnet for the output driver in computer fan ics

范德安、陳勝利

E-mail: 9019861@mail.dyu.edu.tw

摘 要

本論文係針對具有大電流驅動能力之電腦風扇驅動IC輸出埠(Output Buffer)，做了抗HBM (Human Body Model) 靜電放電破壞(Electrostatic Discharge, ESD) 的能力測試，其中並設計不同佈局參數、結構之保護電路，做為改善輸出埠ESD能力之研究。 從測試結果發現，此大面積的電腦風扇驅動IC輸出埠對於PS Mode ESD電壓有較低的免疫能力，因此我們選擇了厚場氧化元件(Field-Oxide Device, FOD)及寄生的矽控閘流體(Silicon Controlled Rectifier, SCR) 做為保護電路元件，並將保護電路的元件裝置在Output Pad、VDD與Output Pad、Ground之間，以達全晶片防護的目的。使用TSMC 0.6um製程所設計的FOD保護電路元件時，在通道長度L = 4um，並且閘極有耦合的情況下，以及具有大基極電阻時，對於PS Mode ESD能力有明顯的改善；而低電壓觸發的SCR (Low Voltage Trigger SCR, LVTSCR) 同樣在drain-tap寬度4um時，在PS Mode ESD能力亦有非常明顯的改善。

關鍵詞 : 輸出緩衝埠 ; 人體放電模式 ; 靜電放電破壞 ; 厚場氧化元件 ; 矽控閘流體 ; 低電壓觸發矽控閘流體

目錄

封面內頁 簽名頁 授權書. . . . . iii 中文摘要. . . . . iv 英文摘要. . . . . v 誌謝. . . . . vi 目錄. . . . . vii 圖目錄. . . . . ix 表目錄. . . . . xii 第一章　緒論. . . . . 1 1.1 靜電放電之影響. . . . . 1 1.2 輸出緩衝器之靜電問題. . . . . 2 1.3 本文提要. . . . . 6 第二章　靜電放電概述及測試. . . . . 7 2.1 靜電的產生. . . . . 7 2.2 靜電放電模式. . . . . 8 2.2.1 人體放電模式. . . . . 9 2.2.2 機器放電模式. . . . . 11 2.2.3 元件充電模式. . . . . 12 2.2.4 電場感應模式. . . . . 13 2.3 靜電放電測試組合. . . . . 13 2.3.1 I/O Pin的靜電放電測試 . . . . 14 2.3.2 Pin to Pin的靜電放電測試. . . . . . . 15 2.3.3 VDD to VSS的靜電放電測試. . . . . . . 17 2.3.4 Analog Pin的靜電放電測試. . . . . . . 17 2.4 靜電放電破壞之測試程序. . . . . 18 2.5 靜電放電破壞之失效判定. . . . . 19 2.6 靜電放電測試結果的判讀. . . . . 20 第三章　ESD保護電路之基本元件 . . . . 22 3.1 ESD保護電路之概念 . . . . 22 3.2 電阻. . . . . 24 3.3 二極體. . . . . 24 3.4 雙載子電晶體. . . . . 26 3.5 MOS電晶體 . . . . 29 3.6 厚場氧化元件. . . . . 32 3.7 矽控閘流體. . . . . 34 第四章　輸出埠之ESD保護電路設計 . . . . 41 4.1 輸出埠之ESD保護電路設計 . . . . 41 4.2 結果與討論. 54 第五章　結論. . . . . 62 參考文獻. . . . . 63 附錄. 66

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