台灣靜電放電防護工程學會
Taiwan ESD Association

積體電路與電子系統之
靜電放電防護技術產學聯盟

2022 台灣靜電放電防護技術論壇--第二場 (CDM 靜電放電防護設計實例)
2022 Taiwan ESD Workshop (II) -- (On-Chip CDM ESD Protection Design)

活動內容

時間(Time)	課程 (Course Agenda)
13:00-13:30	Registration
13:30-14:50	**Stacking-MOS Protection Design for Interface Circuits against Cross-Domain CDM ESD Stresses** **Speaker: Cheng-Yun Hsueh (薛承昀)** ***Phison Electronics CO., LTD***
14:50-15:10	Coffee Break
15:10-16:30	**Study of CDM ESD Robustness among On-Chip Decoupling Capacitors in CMOS Integrated Circuits** **Speaker: Yi-Chun Huang (黃逸君)** ***National Yang Ming Chiao Tung University***
16:30-17:00	Q&A

時間與地點

2022 年 2 月 16 日 (三)

國立陽明交通大學光復校區交映樓 1F 國際會議廳

主辦單位

(1) **積體電路與電子系統之靜電放電防護技術產學聯盟 (ESD 產學聯盟)**
http://www.alab.ee.nctu.edu.tw/~esd/

(2) **台灣靜電放電防護工程學會 (Taiwan ESD Association, T-ESDA)**
http://t-esda.org/

報名費用（含當日講義）

1. T-ESDA 或 ESD 產學聯盟會員：NT$ 1,000 元/人。
2. 非會員：NT$ 1,500 元/人。
3. 學生：NT$ 500 元/人。

課程摘要

Stacking-MOS Protection Design for Interface Circuits against Cross-Domain CDM ESD Stresses

Electrostatic discharge (ESD) is still a challenging reliability issue for integrated circuits (ICs) in advanced CMOS technology. With the development of ICs toward system-on-chip (SoC) applications, it has been common to integrate multiple separated power domains into a single chip for power management or noise isolation considerations. Besides, the fabricated transistors with thinner gate oxide for high-speed operation cause the ICs more sensitive to charged-device model (CDM) ESD events, especially under cross-domain stresses. The traditional cross-domain CDM ESD protection designs like local ESD clamp were used to mitigate overstress on interface, but may be suffered from power-up sequence and performance degradation. For better integration in chip-level design, interface circuits were should be optimized for higher area efficiency and CDM robustness. Thus, new protection schemes with stacking footer/header MOS structures and various gate connections were proposed and verified in 0.18-μm CMOS technology. In this work, proposed designs have been implemented at the transmitter (TX) and receiver (RX) module for validating higher ESD level under cross-domain CDM and HBM (Human Body Model) tests. Moreover, the impact of area, speed and power consumption between different structures was also investigated in detail. Finally, the CDM failure on the interface circuit was discovered by electrical and physical failure analysis. The de-layer SEM results presented the gate-oxide damage only in the receiver (RX) of the interface circuit after cross-domain CDM stresses.

Study of CDM ESD Robustness among On-Chip Decoupling Capacitors in CMOS Integrated Circuits

The integrated circuit (IC) products fabricated in the scaled-down CMOS processes with higher clock rate and lower power supply voltage (VDD) are more sensitive to the transient/switching noises on the power lines with the parasitic inductance induced by the bonding wire. The typical method to suppress the power line noise is to add on-chip decoupling capacitors. Meanwhile, electrostatic discharge (ESD) is also a challenging issue on IC reliability in advanced CMOS technology. For the ICs fabricated in an advanced process, with the thinner gate oxide, the circuits are particularly vulnerable to the charged-device model (CDM) ESD events. However, there was very limited research to investigate the ESD robustness on the decoupling capacitors, especially during the CDM ESD events. In this work, the CDM ESD robustness among different types of decoupling capacitors in ICs was investigated in a 0.18-μm CMOS technology.

台灣靜電放電防護工程學會
Taiwan ESD Association

積體電路與電子系統之
靜電放電防護技術產學聯盟

線上報名網站

http://www.alab.ee.nctu.edu.tw/~esd/TESDW/reg.html

報名注意事項

1. 報名期限：至活動前一週為止，名額有限，敬請把握機會以免向隅。
2. 學生報名時請附**學生證影印本**。
3. 填妥報名表後，請於報名期限內完成繳費。
4. 已報名者請於當天自行前往會場報到，收據、講義於報到時領取。
5. **因應疫情變化，主辦單位保留隨時變更或取消本次活動之權利。若本次活動因故取消，已收取之報名費用將扣除必要手續費後，以原付款方式退還。**

繳費方式（請於下列三種方式中擇一完成）

1. ATM 轉帳：請轉帳至郵局帳戶，郵局代號 700、局號 0061251、帳號 0124704、戶名『台灣靜電放電防護工程學會陳東暘』(轉帳所需之銀行手續費由報名者自行負擔)，並將轉帳收據註明姓名，將檔案以 e-mail 寄到 service@t-esda.org 劉小姐收。
2. 信用卡繳費:請連結至歐付寶付款系統 https://p.opay.tw/TS95M 線上刷卡(須加入歐付寶會員)。
3. 使用 ESD 產學聯盟會費折抵：請於報名系統之備註欄註明 ESD 產學聯盟會員名稱。

報名聯絡

[T-ESDA]
Tel: 03-6681457 劉小姐
Fax: 03-6682676
E-mail: service@t-esda.org
地址: 302 新竹縣竹北市高鐵一路 36 號 3 樓

[ESD 產學聯盟]
Tel: 03-5131370 卓小姐
Fax: 03-5715412
E-mail: jeancho@nycu.edu.tw
地址: 300 新竹市大學路 1001 號交映樓 601 室

Follow us on Facebook