

# eeprom記憶元特性的理論分析與研究

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## 摘要

近幾年來，拜半導體技術的蓬勃發展，記憶體IC在市場上已具舉足輕重的地位。一般而言，記憶體可區分為揮發性記憶體(Volatile Memory)和非揮發性記憶體(Nonvolatile Memory)兩種。所謂的揮發性記憶體乃指記憶體在電源消失後即無法保存原來的資料，諸如DRAM、SRAM等即是屬於揮發性記憶體；而非揮發性記憶體乃指記憶體在電源消失後仍能保存其原來的資料：EPROM、EEPROM及FLASH等即是屬於非揮發性記憶體。其中EEPROM雖然其Memory Cell和其他非揮發性記憶體比較起來實在不小，然而其優良的可靠性及耐久性(Endurance)特性相較於其他非揮發性記憶體仍佔有優勢；IC卡、電話卡等類的應用產品仍以其為主，而在軍事導彈應用上，EEPROM也是最可靠的選擇。一般EEPROM在開發上所遭遇到的幾個關鍵性技術，分別為Memory Cell design、High Voltage Charge Pump design、Serial I/O circuit design、Sense Amp. design及Memory Cell可靠度的考量等。這些包括製程、元件及線路設計等的種種技術在全盤開發整合後，才可設計出此類產品。然而，在設計之初，如能透過理論模型分析計算，對某些元件的特性預先加以考量，做出正確的設計方向，將可減少設計上的風險。

關鍵詞：揮發性記憶體；非揮發性記憶體；臨界電壓；抹除；寫入

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