

# 應用於直流-直流轉換器之脈波寬度調變控制器積體電路

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## 摘要

本論文對於切換式電源轉換器描述兩種脈波寬度調變積體電路，一種是類比式脈波寬度調變器，另一種是數位式脈波寬度調變器。由於近來互補金屬氧化半導體技術的發展，愈來愈多的電晶體能夠製作在單一晶片上，消費性電子產品也在近幾年來蓬勃發展，電源管理積體電路像是高效率低電壓的切換式直流 – 直流轉換器均被設計在這些產品上，用來增加產品的運作時間。應用於切換式直流 – 直流轉換器的類比式控制系統已經發展一段時間，它是個很成熟的技術；而近幾年來，數位式控制系統也經常被提及與討論，此兩種架構的優缺點將在本論文中被探討。類比式控制積體電路的主要架構包含兩級式放大器、壓控震盪器、三角波產生器和遲滯比較器；數位式控制積體電路的主要架構包含類比 – 數位轉換器、補償器和數位脈波寬度調變器。這兩種控制器積體電路透過財團法人國家實驗研究院晶片系統設計中心製造，使用台灣積體電路製造股份有限公司所提供的0.35um 2P4M 3.3V/5V Mixed Signal CMOS 製造技術。類比式脈波寬度調變的晶片面積為0.35\*0.37mm<sup>2</sup>，類比-數位轉換器的晶片面積為0.555\*0.555mm<sup>2</sup>，數位式脈波寬度調變的晶片面積為0.65\*0.56mm<sup>2</sup>。

關鍵詞：直流-直流轉換器；類比式脈波寬度調變；數位式脈波寬度調變

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