

綠色能源產品效率之監控與可靠性確認之研究與實現

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摘要

本論文研究主要內容係針對高效率全橋式電源轉換器(high efficiency full-bridge converter)進行研究與實現。本研究採用Intersil零電壓切換(zero voltage switching, ZVS)全橋變換控制IC(規格ISL6754)。此ISL6754主要應用在ZVS全橋轉換器，電信，信息電源，無線基站電源，檔案服務電源和工業動力系統。此外，它可以在前級控制達到零電壓切換，在後級利用同步整流功能控制電晶體。因此，本研究使用ISL6754作為全橋式轉換器及同步整流器來改善傳導損失，使全橋電源轉換器的輸出效率達到96%以上，在實作上達到96%以上，大幅提升整體效率並在轉換過程減少不必要損失。根據過去文獻，最多只能達到90%左右，而此研究所提出效率高達96%以上的方法對於電力系統來說，可達到節能效果。為有效縮小電路體積，減少半導體開關上功率損失以及提高電源轉換效率，在傳統PWM電力轉換器加入了L-C共振電路發展出共振式電力轉換器也就是軟切換技術，可有效改善切換上的損失並確實達到切換時開關上無電壓/電流來降低切換損失。本論文為計畫案之一，主要為系統電源部份可達到最佳電源轉換。

關鍵詞：高效率全橋式電源轉換器、零電壓切換、無線基站電源、同步整流器

目錄

第一章 緒論	1.1 研究背景與目的	1.2 論文架構簡介
2 第二章 電力轉換器簡介	2.1 DC/DC轉換器簡介	4 2.2 軟、硬切式優缺點
	7 2.3 轉換器電路控制技術	10 2.3.1 轉換器電路控制技術
2.3.2 相移UCC3895簡介	12 2.3.3 PWM方式ISL6754 簡介	20 第三章 同步整流技術
3.1 同步整流技術	30 3.2 控制同步整流	32 第四章 昇壓式全橋
轉換器架構之分析	4.1 電路架構分析	35 4.2 各級電路損失分析
40 第五章 電路元件參數設計	5.1 設計規格參數	43 5.2 切換功率電晶體選擇
	43 5.3 高頻變壓器設計	44 5.4 輸出電容
UCC3895及ISL6754頻率設計	45 5.6 驅動器IR2110 說明	45 5.5
及4N35 光耦合器電路	52 第六章 電路實作及波形量測	48 5.7 TL491
56 6.1.1 規劃前級輸入和後級輸出電路	56 6.1.2 規劃UCC3895 開關頻率	59 6.1.3 規劃
驅動器IR2110 電路	64 6.2 利用ISL6754 設計電路	66 6.2.1 規劃ISL6754 開關
頻率電路	66 6.2.2 同步整流電路	69 第七章 實驗結果
實作輸出結果	74 7.2 前級利用ISL6754 實作輸出結果	76 7.1 前級利用UCC3895
結論	79 8.2 未來展望	76 第八章 結論與未來展望
		81 8.1 實驗

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