順向轉換器同步整流驅動電路之研製

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摘 要

本論文提出直流對直流順向轉換器之新型二次側同步整流驅動電路(Synchronous Rectifier Driving Circuit)，在輸入電壓變動時，可維持驅動電壓之脈波高度，防止突波電壓損壞功率場效電晶體(Power MOSFET)，降低驅動損失及切換損失，提高轉換器整體效率。此外，本文利用一次側電流變動信號，與檢知電路之參考電壓比較，在輕載時轉由功率場效電晶體本身之寄生二極體(Body Diode)整流，可降低輕載損耗。在輸入電源關閉時，也可抑制突波電壓，保護功率場效電晶體。 本文分析二次側同步整流所衍生之問題，介紹及推導新型同步整流驅動電路，並以模擬及實作一個150W的直流轉換器進行驗證。實驗結果可維持驅動電壓在6VDC~8VDC之間，在輸入電壓等於36VDC時的滿載效率可提升1%，而輕載時的效率可大幅提高28.8%，無載損耗由7.5W下降至2.1W。

關鍵詞 : 順向轉換器 ; 同步整流驅動電路 ; 檢知電路

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