改良式反電動勢偵測法之直流無刷馬達無感測控制

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摘 要

本文主要以反電動勢偵測方式達到永磁直流無刷馬達(PMBLDCM)的無感測控制。控制核心採用Microchip公司所生產之33FJ32MC204晶片，此晶片結合了類比與數位控制的特殊技術，並且擁有PWM模組，是整合直流無刷馬達無感測控制及驅動功率模組設計的關鍵。在無感測控制方面，本文以反電動勢過零點法為基礎，偵測端電壓訊號與馬達中性點電壓比較，並使用數位濾波器正確的判斷出反電動勢過零點位置，使PMBLDCM達到無感測換相控制。依啟動程序使馬達從靜止以開迴路運轉，隨後將馬達轉速提高到足以偵測BEMF過零點訊號，即切換至無感測驅動模式。並透過使用六個PWM訊號調變技術來達成轉速控制。由於本文完全不需要外加位置感測器，且使用數位濾波器來降低PMBLDCM製作成本，節省了馬達驅動電路的體積，使PMBLDCM的運用範圍更為廣泛。

關鍵詞 : 永磁直流無刷馬達、反電動勢、無感測控制、脈衝寬度調變

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