正弦脈波調變與向量控制技術之交流伺服馬達驅動

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摘 要

本文主旨為研製三相交流伺服馬達之驅動電路，並以Microchip公司開發的數位訊號處理器(DSP) dsPIC30F4011晶片為控制核心，以提高伺服系統之數學運算能力並大幅縮小硬體開發空間，進而發展出一套數位式伺服驅動系統。 在硬體電路方面，主要使用dsPIC30F4011晶片作為驅動控制與數學運算之核心單元，PWM切換開關採用Toshiba公司所生產的智慧型功率模組(IPM)TPD4125K晶體。驅動方式則擷取定位編碼器模組(QEI) A、B相之輸出獲知馬達之位置，進而透過數學換算得到馬達速度，並擷取A、B相電流訊號後獲得d-q軸電流信號，接著再透過座標轉換後由dsPIC輸出三相電流，再經由閘極驅動器完成正弦脈波調變SPWM電子驅動換向，達成伺服馬達電流向量控制與速度控制之目的。

關鍵詞 : 交流伺服馬達、正弦脈波調變、d-q軸

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