

汽车电动助力转向控制器驱动电路可靠设计

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摘要: 分析了电动助力转向系统的工作原理及控制器可靠设计的关键技术。EPS控制器的模块化设计将信号处理电路和功率驱动电路进行分层设计, 增强系统的抗干扰能力和可靠性; PWM驱动频率的选择要考虑与机械系统固有频率的关系、对电枢电流纹波的影响及对人的噪声影响, 同时要考虑开关时电流脉冲对开关管及电动机安全的影响; 3个MOS管的并联工作要考虑经济性、电路板空间与发热功耗、可靠性的关系; MOS管的散热设计通过合理地选择散热片及其参数, 可以提高驱动效率和稳定运行能力。The working principle and key technologies for reliable design of EPS controller were analyzed. The signal processing circuit and the power drive circuit were hierarchically designed to improve the anti-jamming capability and reliability. The PWM frequency was selected considering the relationship between the PWM frequency and the natural frequency of the mechanical system, the influence on the armature current ripple and the noise impact on people. Meanwhile, the influence of switching current pulse on the safety of the transistors and the motor should be taken into account. Three MOS transistors were paralleled for the economy, the heat dissipation and the reliability. The heat dissipation flake and its relevant parameters were selected to improve the drive efficiency and the stable operation capability.

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