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## Hardware based thermally adaptive control of ABS ECU

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Modern vehicles are becoming more electronically controlled for low cost design, environmental regulation, and also safety issues. This 'Vetronics' trend brings great demand of thermally robust design and technology for Electronic Control Unit (ECU). Generally, ECUs placed near the engine room (such as ABS ECU) provide Over Heat Protection (OHP) function to ensure the normal operation without damage in 125 ambient temperature condition. However, OHP function requires additional ADC pins of MCU and peripheral circuits to monitor temperature, and consequentially increases cost and size of ECU. These kinds of disadvantages can be avoided by calculating the actuator power dissipation without temperature monitoring, but the accuracy cannot be guaranteed. In order to overcome the disadvantages of software based thermal management, this paper suggests purely hardware based thermal management method. The key point of this hardware based method is using the temperature dependent characteristics of passive components, which sensitively affect the operation of thermally critical circuit, especially the power MOSFET of actuators. To verify the performance of hardware based thermal management method, certain simulation will be proceeded, and high temperature test result of ABS ECU will be provided. Finally, the effectiveness of this method will be analyzed through the calculation of power MOSFET junction temperature and by comparing the value of existing circuit and thermally adaptive circuit.

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