

저용량 가전용 40V급 Power MOSFET 소자의 설계 및 제작에  
관한 연구

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**A Design of 40V Power MOSFET for Low Power Electronic Appliances**

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**Abstract** : Current sensing in power semiconductors involves sensing of over-current in order to protect the device from harsh conditions. This technique is one of the most important functions in stabilizing power semiconductor device modules. The Power MOSFET is very efficient method with low power consumption, fast sensing speed and accuracy. In this paper, we have analyzed the characteristics of proposed sense FET and optimized its electrical characteristics to apply conventional 40 V power MOSFET by numerical and simulation analysis. The proposed sense FET has the n-drift doping concentration  $1.5 \times 10^{14} \text{ cm}^{-3}$ , size of  $600 \mu\text{m}^2$  with  $4.5 \Omega$ , and off-state leakage current below  $50 \mu\text{A}$ . We offer the layout of the proposed Power MOSFET to process actually. The offered design and optimization methods are meaningful, which the methods can be applied to the power devices having various breakdown voltages for protection.

**Key Words** : Sense FET, Current sensing

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