

## 전사기법을 이용한 실리콘 나노선 트랜지스터의 제작

구자민, 정은애, 이명원, 강정민, 정동영, 김상식\*  
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### **Fabrication of Silicon Nanowire Field-effect Transistors on Flexible Substrates using Direct Transfer Method**

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**Abstract :** Silicon nanowires (Si NWs)-based top-gate field-effect transistors (FETs) are constructed by using Si NWs transferred onto flexible plastic substrates. Si NWs are obtained from the silicon wafers using photolithography and anisotropic etching process, and transferred onto flexible plastic substrates. To evaluate the electrical performance of the silicon nanowires, we examined the output and transfer characteristics of a top-gate field-effect transistor with a channel composed of a silicon nanowire selected from the nanowires on the plastic substrate. From these FETs, a field-effect mobility and transconductance are evaluated to be  $47 \text{ cm}^2/\text{Vs}$  and  $272 \text{ nS}$ , respectively.

**Key Words :** Silicon, Nanowire, Direct Transfer, Field-Effect Transistor, Flexible electronics