

Low-Drive-Voltage Printable Organic Field Effect Transistor

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Photonics Research Institute (PRI) has been engaged in the development of organic semiconductor devices, such as an organic thin film transistor (TFT), which is expected to be a post-silicon technology. Recently PRI has developed a field effect transistor (FET) using a conducting polymer, which is prepared by a simple stacking process that requires no micromachining or related photolithography procedures. The organic FET has a very short channel length (ca. 0.5 μm), and demonstrated excellent performance at a low driving voltage (under 1 V). This new transistor is ex-

pected to act as a breakthrough for the development of plastic electronics.



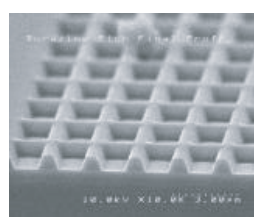
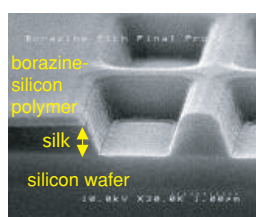
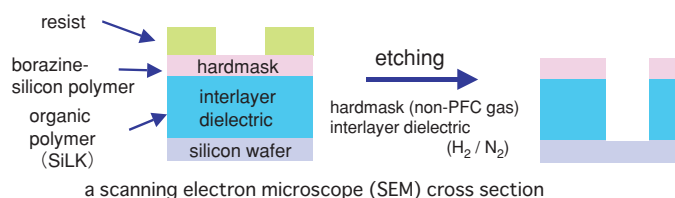
Organic thin film transistors prepared on a plastic substrate

A Novel Low-k Material for an Interlayer Insulator Film

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We have developed a novel low-k material, borazine-silicon polymer and its application as an interlayer insulator film for ULSI semiconductor circuits has been carried out in collaboration with the Association of Super-Advanced Electronics Technologies. Dielectric constant of the spin-coated thin films of the polymer was evaluated as

lower than 2.1, the required value for next-next generation semiconductor standards. This material also presents superb thermal resistance as well as excellent mechanical properties. As etching process of this material does not use any PFC gases which cause global warming, an environmentally friendly semiconductor process will be realized.



A borazine-silicon polymer as the hardmask of integrated circuit interconnect