

EE 298-12
Solid State Technology and Devices Seminar

Friday, 22 November 2013
1-2pm
Hogan Room - 521 Cory Hall

Printable Low Voltage Organic Transistors and Circuits
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Abstract

Development of soluble organic semiconductor materials enables high-throughput printing of circuits and systems on arbitrary substrates (such as plastics, papers, etc.) for a wide range of low cost, intelligent or friendly interfacing applications, which cannot be well addressed by current silicon based semiconductor technologies. In this field, most of previous work was focusing on improving the material and device mobility. This presentation will show that it becomes more important to achieve low voltage and low power operation of organic transistors to move printed organic electronics towards practical applications. Low voltage device architecture with a channel engineering approach was developed, which doesn't relying on increasing the gate dielectric capacitance by taking ultra-thin or high-k dielectric layer. This device technology is shown to be more compatible with low cost printing and available material systems. Based on this architecture, fabrication of all solution processed low voltage organic transistor circuits on plastic substrates will then be presented, followed by discussions and simple demonstrations of potential applications.