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Flexible and High Noise Margin Organic Enhancement Inverter Using Hybrid Insulator

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Abstract

We demonstrate a high noise margin and highly flexible enhancement inverter based on the organic-inorganic hybrid insulator. Organic insulators generally show high leakage current and inorganic insulator are brittle. In this work, hybrid insulator was used in pentacene based organic thin film transistors (OTFTs) to overcome the limitations of each single type of insulator. We report highly flexible OTFTs with reduced threshold voltage and negligible hysteresis using a poly(methyl methacrylate)/silicon nitride hybrid insulator. Using the optimized hybrid insulator, we also demonstrate an enhancement inverter which shows high noise margin with noise margin low of 2.2 V, a noise margin high of 14.1 V and gain of 2.1.

Keywords: Thin film transistors, Flexible structures, Electrical engineering, Inverters

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