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**Low Field Electronic Behavior and Contact Impedance of Organic Single Crystal Transistors** EMILY BITTLE, JAMES BASHAM, National Institute of Standards and Technology, THOMAS JACKSON, Penn State University, OANA JURCHESCU, Wake Forest University, DAVID GUNDLACH, National Institute of Standards and Technology — Organic electronic devices are attractive for a range of existing and emerging electronic applications. Most technological demonstrations of organic transistors rely on their large signal response for pixel control or logic. However, considerable application space requires analog circuits, e.g. distributed signal conditioning in sensor arrays. Charge transport and trapping mechanisms differ significantly in organic as compared to inorganic transistors, and as a result commonly used analogies to inorganic band transport theory can break down in response to small signal stimulus and at high frequencies required in some analog circuit applications. Therefore, a detailed investigation of organic transistor behavior at small signals is needed and is critical to developing design models for analog circuit applications. In this study, we look at the small signal AC impedance of small molecule, single crystal transistors to investigate "ideal" low field, high frequency electronic behavior. Using a transmission line model to fit the transistor channel coupled with a parallel resistor-capacitor model of the contact impedance, we are able to observe the behavior of the transistor channel and contacts separately at low field and high frequency. We determine the low field mobility of the device independent of contact resistance and show that rapidly changing contact resistance dominates the current flow at low gate voltage in DC current-voltage measurements.

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