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Drift mobility and frequency response of diode connected organic field effect transistors BRIAN COBB, ANANTH DODABALAPUR, University of Texas at Austin — Common methods of estimating the mobility of carriers in organic field effect transistors (OFETs) include extraction from output or transfer characteristics. Mobilities extracted from transfer curves are realistic only in certain steady-state regimes. Optical time-of-flight methods measure charge mobility in directions perpendicular to the semiconductor-dielectric interface, perpendicular to the direction of transport in a functioning OFET. We have developed a method that allows the extraction of the drift mobility of charges through an active channel in an OFET by measuring the frequency response of a diode connected device. An AC signal of varying frequency was applied to both the Gate and Drain nodes, while the rectified output voltage was measured at the Source node using an oscilloscope. This rectified voltage remains relatively steady at lower frequencies, then displays a marked fall. This pole was found to correspond to the transit time of the carriers through the channel. The fabrication of the OFETs, calculation of drift mobility from the frequency of the pole, and the effects of varying channel length will be reported.

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