

Technology Computer Aided Design Simulation of Space Charge Limited Conduction in Polycrystalline Thin Films

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Abstract : TCAD numerical simulation is one of the most tried and tested powerful tools for designing devices in semiconductor foundries worldwide. It has also been used to explain conduction in organic thin films where the processing temperature is often enough to make homogeneous samples (often imperfect, but homogeneously imperfect). In this report, we have presented the results of TCAD simulation in multi-grain thin films. The work has addressed the inhomogeneity in one dimension, but can easily be extended to two and three dimensions. The effect of grain boundaries has mainly been approximated as barriers located at the junction between two adjacent grains. The effect of the value of grain boundary barrier, the bulk traps, and the measurement temperature have been investigated.

Keywords : polycrystalline thin films, space charge limited conduction, Technology Computer-Aided Design (TCAD) simulation, traps

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