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**Crystalline-like temperature dependence of the electrical characteristics in  
amorphous Indium-Gallium-Zinc-Oxide thin film transistors.**

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**Abstract:**

A crystalline-like temperature dependence of the electrical characteristics of amorphous Indium-Gallium-Zinc-Oxide (a-IGZO) thin film transistors (TFTs) is reported, in which the drain current reduces as the temperature is increased. This behavior appears for values of drain and gate voltages above which a change in the predominant conduction mechanism occurs. After studying the possible conduction mechanisms, it was determined that, for gate and drain voltages below these values, hopping is the predominant mechanism with the current increasing with temperature, while for values above, the predominant conduction mechanism becomes percolation in the conduction band or band conduction and  $I_{DS}$  reduces as the temperature increases. It was determined that this behavior appears, when the effect of trapping is reduced, either by varying the density of states, their

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