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(54) **ENHANCEMENT-MODE FIELD EFFECT TRANSISTOR HAVING METAL OXIDE CHANNEL LAYER**

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H01L 29/423	(2006.01)
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(58) **Field of Classification Search**
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See application file for complete search history.

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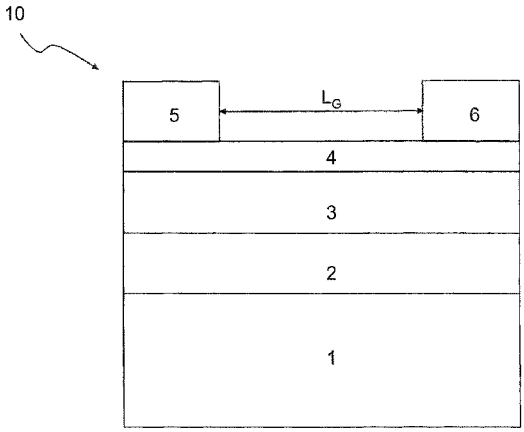
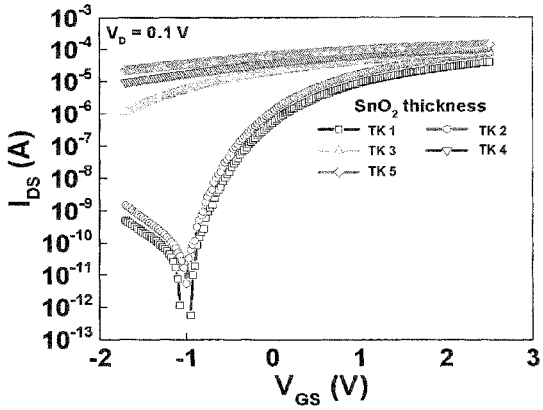
(57) **ABSTRACT**

An enhancement-mode n-type field effect transistor is disclosed to have a metal oxide channel layer, a gate dielectric layer, a gate electrode, a source electrode, and a drain electrode. The metal oxide channel layer has a material selected from SnO_2, ITO, ZnO, SnO_2 and $In2O_3$. The metal oxide channel layer has a thickness less than a threshold value to exhibit pinch-off behavior in transfer characteristics and has a mobility trend without saturation under positive operational voltage.

27 Claims, 11 Drawing Sheets