

The effect of thermal annealing on the properties of IGZO TFT prepared by atmospheric pressure plasma jet

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Abstract

We fabricated bottom gate TFTs with IGZO channel layer deposited by atmospheric pressure plasma jet (APPJ). The effect of thermal annealing on the properties of IGZO TFTs was studied. After post annealing, the IGZO thin films showed a smooth and dense structure. The transistors annealed at 300°C showed clear switching behavior with a negative threshold voltage of -0.571 V and a mobility of 2.6 cm²/V-s. After 500°C post annealing, IGZO thin film showed an amorphous-like phase and the average transmittance is more than 80% in the visible range. Good electrical characteristics were achieved, including a threshold voltage of 6.74V, a subthreshold swing of 1.54 V/dec, a mobility of 10.31 cm²/V-s and a large I_{on}/I_{off} ratio of 3.28x10⁸.

Keyword : IGZO