A STUDY OF SIMULATION AND ANALYSIS IN TFT DEVICES

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ABSTRACT

RECENTLY, POLY-SILICON THIN FILM TRANSISTORS HAVE RECEIVED EXTENSIVE ATTENTION FOR THEIR POTENTIAL APPLICATIONS IN THE LARGE-SIZE ACTIVE-MATRIX LIQUID CRYSTAL DISPLAY (AMLCD) DRIVING CIRCUITS AND LOAD RESISTOR IN THE ULSI SRAM. IN THIS THESIS, WE WILL CONCENTRATE OUR EFFORTS ON SIMULATION SOME NOVEL KEY TECHNOLOGIES FOR IMPROVING TOP-GATE POLY-SI TFT PERFORMANCE. WE PROPOSED A GATE-OVERLAPPED LDD POLY-SI THIN FILM TRANSISTOR, AND INVESTIGATE ITS INFLUENCE ON THE POLY-SI DEVICE ELECTRICAL PERFORMANCE. THE SIMULATED RESULT SHOWS THAT THE LEAKAGE CURRENT OF GATE-OVERLAPPED LDD POLY-SI TFT IS REDUCED IN OFF STATE, BUT THE ON CURRENT IS ALMOST IDENTICAL WITH THAT OF CONVENTIONAL TFT, THE PHENOMENON INCREASES THE ON/OFF CURRENT RATIO AND THE CONVENTIONAL COMPLICATED PROCESS IS SIMPLIFIED. BESIDES AMORPHOUS AND POLY-SI, SILICON-GERMANIUM IS A PROMISING CANDIDATE FOR USE AS THE CHANNEL MATERIAL DUE TO ITS LOW THERMAL BUDGET REQUIREMENT. HENCE, WE ALSO USE THE SIGE THIN FILM AS THE CHANNEL LAYER, SIMULATION ITS ELECTRICAL CHARACTERISTIC AND ANALYZE THE RELATION BETWEEN EXPERIMENT PARAMETERS AND SIMULATED RESULTS.

Keywords : POLYSILICON, TFT, LDD

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