

Abstract

Metal Gate Work Function Adjustment for Future CMOS Technology

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CMOS transistors were fabricated using a single metal, (110)-Mo, as the gate material. (110)-Mo shows high work function value that is suitable for PMOSFETs, and, with nitrogen implantation, its work function can be reduced to meet the requirements of NMOSFETs. The change in Mo's work function can be controlled by the nitrogen implant parameters, which is potentially useful for multiple- V_T technology. TEM and EDS analysis show that Mo gate electrodes are stable after undergoing a conventional CMOS process.