

**-- 75 Word Abstract --**

## **High Performance Sub-50nm CMOS with Advanced Gate Stack**

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### **Abstract**

Down to 40nm CMOS devices were fabricated with a gate stack consisting of ultra-thin nitride/oxynitride stack dielectrics (9Å EOT), pre-doped poly-Si gates, and NiSi. NiSi improves gate  $R_s$  ( $<3\Omega/\text{sq}$ ), S/D  $R_{sd}$ , inversion  $T_{ox}$ , and, consequently,  $I_{dsat}$ . At 0.9V  $V_{dd}$ ,  $I_{dsat}$  of 657 $\mu\text{A}/\mu\text{m}$  (NMOS) and 290 $\mu\text{A}/\mu\text{m}$  (PMOS) are obtained at 100nA/ $\mu\text{m}$   $I_{doff}$ . These data are among the best reported to date.