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Low Resistivity *bcc*-Ta/TaNx Metal Gate MNSFETs Having Plane Gate Structure Featuring Fully Low-Temperature Processing below 450°C

Abstract for web

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We have developed a low-resistivity metal gate Metal-Nitride-Semiconductor (MNS) FET technology having conventional plane gate structure featuring fully low-temperature processing. The gate stack consists of directly grown Silicon Nitride (Si_3N_4) dielectric using high-density plasma and sputtered *bcc*-phase Tantalum (~15μΩcm) / Tantalum Nitride (*bcc*-Ta/TaNx) stacked metal gate below 1.0ohm/sq. In this paper, we demonstrate an excellent characteristic of Fully-Depleted SOI metal gate MNSFETs using fully low-temperature processing below 450°C.