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(57) Abstract :

A junction less drain extended field effect transistor 100 comprising: a source 101 and a drain 104 electrodes made of a platinum deposition with a thin film of a source drain junction free  $\beta$ -Ga2O3 on insulator which is heavily doped thin active region is fully depleted during off state and near to flat band during on state to provide better insulation and reduce a leakage current through a silicon substrate 107; a gate 102 electrode made of gold where an extensive gate leakage due to thin film is suppressed by a high K HfO2 dielectric layer 103 present below the gate 102 where the Hafnium dioxide (HfO2) is a high K material with higher dielectric constant; a HfO2 buried oxide layer 106 used as a gate oxide to increases the equivalent oxide thickness (EOT) of the device and controllability of the gate 102 over a channel and to reduce a short channel effect, wherein the junction less drain extended field effect transistor 100 incorporate a breakdown voltage of 8MV/cm by drain extension and provide high power capability due to their material property. << FIG. 1 >>

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