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A TRIPLE GATE OXIDE PROCESS WITH HIGH-K GATE DIELECTRIC

ABSTRACT

A method for forming, on a semiconductor substrate, a dielectric layer having a variable thickness and composition. The dielectric layer so formed can be used to form electronic devices such as MOSFETS and CMOSFETS that require gate dielectrics of different thicknesses. On a silicon substrate in accord with the preferred embodiment, the method requires the formation of three regions, two with SiO_2 layers of different thicknesses and a third region of substrate with no oxide. A final thin layer of high-k dielectric is formed covering the three regions, so that the region with no oxide has the thinnest dielectric layer of only high-k material and the other two regions have the high-k dielectric over SiO_2 layers of different thickness. A final layer of gate electrode material can be formed and patterned to form the required device structure.



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