

# METHOD TO FORM A GATE INSULATOR LAYER COMPRISED WITH MULTIPLE DIELECTRIC CONSTANTS AND MULTIPLE THICKNESSES

## ABSTRACT

A method of forming a dielectric layer on a semiconductor substrate, comprised with multiple dielectric constants and multiple equivalent oxide thicknesses (EOT), has been developed. After formation of a high dielectric constant (high k), layer, on a semiconductor substrate, a first region of the high k layer is subjected to a process directed at incorporating elements into a top portion of the high k layer, while a second region of the high k layer remains protected during this procedure. An anneal treatment results in the processed high k layer now exhibiting a different dielectric constant, as well as a different EOT, than the unprocessed, second region of the high k layer, not exposed to the above procedures.

(Figure 6)



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