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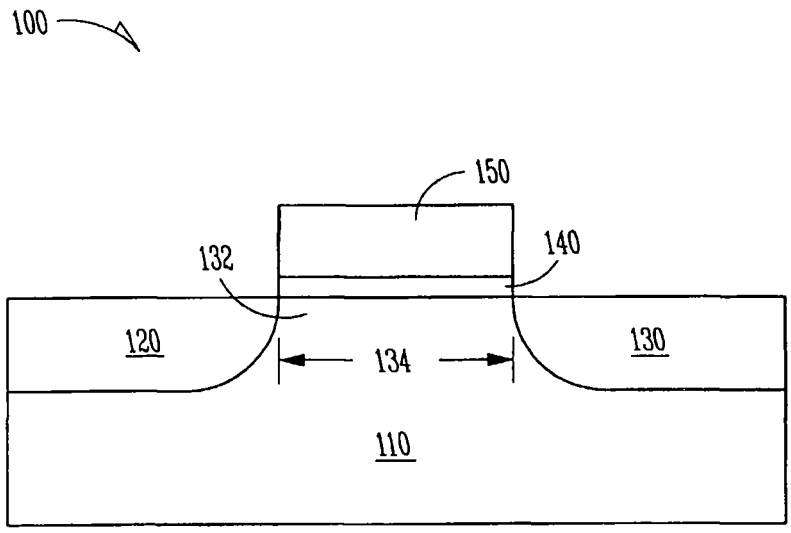
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(54) Title: HAFNIUM-ALUMINUM OXIDE DIELECTRIC FILMS



(57) Abstract: A dielectric film containing $HfA1O_3$ and a method of fabricating such a dielectric film produce a reliable gate dielectric having an equivalent oxide thickness thinner than attainable using SIO_2. A gate dielectric is formed by atomic layer deposition employing a hafnium sequence and an aluminum sequence. The hafnium sequence uses $HfCl_4$ and water vapor. The aluminum sequence uses either trimethylaluminium, $A+(CH_3)_3$, or DMEAA, an adduct of alane (AlH_3) and dimethylehtylamine $[N(CH_3)_2(C_2H_5)]$, with distilled water vapor. These gate dielectrics containing of $HfA1O_3$film are thermodynamically stable such that the $HfAlO_3$ film will have minimal reactions with a silicon substrate or other structures during processing.

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