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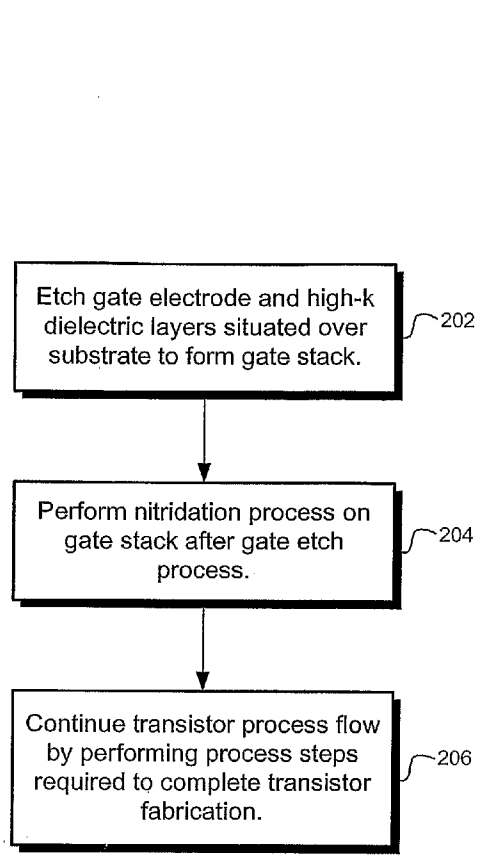
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(54) Title: METHOD FOR INTEGRATING A HIGH-K GATE DIELECTRIC IN A TRANSISTOR FABRICATION PROCESS



(57) Abstract: According to one exemplary embodiment, a method for forming a field-effect transistor on a substrate (104), where the substrate (104) includes a high-k dielectric layer situated over the substrate (104) and a gate electrode layer situated over the high-k dielectric layer, comprises a step of etching (202) the gate electrode layer and the high-k dielectric layer to form a gate stack (102), where the gate stack (102) comprises a high-k dielectric segment (106) situated over the substrate (104) and a gate electrode segment (108) situated over the high-k dielectric segment (106). According to this exemplary embodiment, the method further comprises performing (204) a nitridation process on the gate stack (102). The nitridation process can be performed by, for example, utilizing a plasma to nitridate sidewalls (110) of the gate stack (102), where the plasma comprises nitrogen. The nitridation process can cause nitrogen to enter the high-k dielectric segment (106) and form an oxygen diffusion barrier in the high-k dielectric segment (106), for example.

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