ABSTRACT

METHOD OF PRESERVING THE TOP OXIDE OF AN ONO DIELECTRIC LAYER VIA USE OF A CAPPING MATERIAL

Methods of protecting, and increasing the thickness of, the oxidized silicon nitride (ON), component of an oxidized silicon nitride on silicon oxide (ONO), layer of a non-volatile memory device, during the hydrofluoric (HF), acid type procedures used for peripheral devices simultaneously fabricated with the non-volatile memory device, has been developed. A first method features a silicon nitride layer located only overlying the ONO layer of the non-volatile memory device, formed prior to HF type pre-clean procedures performed prior to gate oxidation procedures used for peripheral devices. After the gate oxidation procedures the silicon nitride capping layer is selectively removed. A second method features a polysilicon capping layer again

located only overlying the ONO layer of the non-volatile memory device, again formed prior to HF type pre-clean procedures. For this iteration the protective polysilicon capping layer is

oxidized during subsequent gate oxidation procedures and adds onto the ONO layer, subsequently

overlaid by a control gate structure of the non-volatile memory device.

FIGURE 10