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METHOD OF FORMING A SHALLOW TRENCH ISOLATION STRUCTURE FEATURING A GROUP OF INSULATOR LINER LAYERS LOCATED ON THE SURFACES OF A SHALLOW TRENCH SHAPE

ABSTRACT

A process for forming a shallow trench isolation (STI), structure in a semiconductor substrate, featuring a group of insulator liner layers located on the surfaces of the shallow trench shape used to accommodate the STI structure, has been developed. After defining a shallow trench shape featuring rounded corners, a group of thin insulator liner layers, each comprised of either silicon oxide or silicon nitride, is deposited on the exposed surfaces of the shallow trench shape via atomic layer depositing (ALD), procedures. A high density plasma procedure is used for deposition of silicon oxide, filling the shallow trench shape which is lined with the group of thin insulator liner layers. The silicon nitride component of the insulator liner layers, prevents diffusion or segregation of P type dopants from an adjacent P well region to the silicon oxide of the STI structure.

(Figure 7)

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