ABSTRACT

A SIMPLIFIED METHOD TO REDUCE OR ELIMINATE STI OXIDE DIVOTS

A method for forming shallow trench isolation wherein oxide divots at the edge of the isolation and active regions are reduced or eliminated is described. A trench is etched into a semiconductor substrate. An oxide layer is deposited overlying the semiconductor substrate and filling the trench. Nitrogen atoms are implanted into the oxide layer overlying the trench. The substrate is annealed whereby a layer of nitrogen-rich oxide is formed at the surface of the oxide layer overlying the trench. The oxide layer is planarized to the semiconductor substrate wherein the nitrogen-rich oxide layer is planarized more slowly than the oxide layer resulting in a portion of the oxide layer remaining overlying the trench after the oxide layer overlying swthe aid semiconductor substrate has been removed wherein the portion of the oxide layer remaining provides a smooth transition between the shallow trench isolation and the active areas completing the formation of shallow trench isolation in the fabrication of an integrated circuit device.

Fig. 9