ABSTRACT

A METHOD TO IMPROVE SHALLOW TRENCH ISOLATION PERFORMANCE

A new method for forming shallow trench isolation having a smooth transition between active areas and isolation regions is described. A pad oxide layer is deposited on the surface of a semiconductor substrate. A nitride layer is deposited overlying the pad oxide layer. The nitride layer and pad oxide layer are etched through where they are not covered by a mask to provide openings where the surface of the semiconductor substrate is exposed. A trench is etched into the semiconductor substrate where it is exposed within the opening. A liner oxide is grown within the trench. Thereafter, the nitride layer is isotropically etched away from the edges of the trench. An oxide layer is deposited overlying the nitride layer and filling the trench wherein the oxide layer filling the trench forms a shallow trench isolation region. The oxide layer is polished away with a polish stop at the nitride layer. The nitride layer is removed. The pad oxide layer is removed whereby the corners of the oxide layer within the trench are rounded completing formation of the shallow trench isolation region in the fabrication of an integrated circuit device.

(FIGURE 1 IS SUGGESTED FOR PUBLICATION)