A METHOD TO REDUCE TRENCH CONE FORMATION IN THE FABRICATION OF SHALLOW TRENCH ISOLATIONS

ABSTRACT

A new method of fabricating shallow trench isolations has been achieved. A silicon dioxide layer is formed overlying a semiconductor substrate. A silicon nitride layer is deposited overlying the silicon dioxide layer. The silicon nitride layer is patterned to expose the semiconductor substrate where shallow trench isolations are planned. Ions are implanted into the exposed semiconductor substrate. The implanting damages any passive surface materials overlying the semiconductor substrate. The exposed semiconductor substrate is etched down to form trenches. The damaged passive surface materials are removed during the etching down to thereby prevent trench cone formation. A trench filling layer is deposited to fill the trenches. The trench filling layer is polished down to complete the shallow trench isolations in the manufacture of the integrated circuit device.

(Figure 7)