ABSTRACT

NOVEL THICK OXIDE MOS DEVICE USED IN ESD PROTECTION CIRCUIT

A method for forming a novel thick oxide electrostatic discharge device using shallow trench isolation technology is described. A trench is etched into a semiconductor substrate. An oxide layer is deposited overlying the semiconductor substrate and filling the trench. The oxide within the trench is partially etched away leaving the oxide on the sidewalls and bottom of the trench. The oxide is polished away to the surface of the semiconductor substrate whereby oxide remains only on the sidewalls and bottom of the trench. A gate is formed within the trench whereby the gate is surrounded by the oxide. First ions are implanted into the semiconductor substrate adjacent to the trench to form N-wells. Second ions are implanted into the semiconductor substrate in a top portion of the N-wells to form source/drain regions. Third ions are implanted into the semiconductor substrate underlying the N-wells and underlying the trench to form electrostatic discharge trigger taps. This completes formation of an electrostatic discharge device in the fabrication of integrated circuits.

(FIGURE 4 IS SUGGESTED FOR PUBLICATION)