ABSTRACT

A new method for forming a silicon-on-insulator MOSFET while eliminating floating body effects is described. A silicon-on-insulator substrate is provided comprising a silicon semiconductor substrate underlying an oxide layer underlying a silicon layer. A first trench is etched partially through the silicon layer and not to the underlying oxide layer. Second trenches are etched fully through the silicon layer to the underlying oxide layer wherein the second trenches separate active areas of the semiconductor substrate and wherein one of the first trenches lies within each of the active areas. The first and second trenches are filled with an insulating layer. Gate electrodes and associated source and drain regions are formed in and on the silicon layer in each active area. An interlevel dielectric layer is deposited overlying the gate electrodes. First contacts are opened through the interlevel dielectric layer to the underlying source and drain regions. A second contact opening is made through the interlevel dielectric layer in each of the active regions wherein the second contact opening contacts both the first trench and one of the second trenches. The first and second contact openings are filled with a conducting layer to complete formation of a silicon-on-insulator device in the fabrication of integrated circuits.

Fig. 7