ABSTRACT

TRENCHLESS BURIED CONTACT PROCESS TECHNOLOGY

A new method of forming a buried contact junction without forming a buried contact trench and without a disconnection gap in the current path by using a tapered polysilicon profile and a large angle tilt buried contact implant is described. A layer of gate silicon oxide is provided over the surface of a semiconductor substrate. A first polysilicon layer is deposited overlying the gate silicon oxide layer. The first polysilicon layer is etched away where it is not covered by a buried contact mask to provide an opening to the semiconductor substrate wherein the first polysilicon layer is tapered such that the bottom of the opening has a width the size of the planned buried contact and wherein the top of the opening has a width larger than the size of the planned buried contact. Ions are implanted at a tilt angle into the substrate within the opening whereby the ions penetrate the substrate laterally underlying wthe said first polysilicon layer to form the buried contact. A second layer of polysilicon is deposited over the first polysilicon layer and over the semiconductor substrate within the opening and patterned to form a polysilicon contact overlying the buried contact junction to complete formation of a buried contact in the fabrication of an integrated circuit.

(FIGURE 5 IS SUGGESTED FOR PUBLICATION)