ABSTRACT

SELF ALIGNED T-TOP GATE PROCESS INTEGRATION

A new method is provided for the integration of the of T-top gate process. Active regions are defined and bounded by STI's on the surface of a substrate. The pad oxide is removed from the substrate and replaced by a layer of SAC oxide. A thin layer of nitride is deposited that covers the surface of the created layer of SAC oxide and the surface of the STI regions. A layer of TEOS is deposited and etched defining the regions where the gate electrodes need to be formed. Gate spacers are next formed on the sidewalls of the openings that have been created in the layer of TEOS. The required implants (such as channel implant and threshold implant) are performed, the gate structure is then grown in the openings that have been created in the layer of TEOS. After the gate structure has been completed, the surface of the created structure is polished and the remaining layer of TEOS is removed. Source and drain regions implants can now be performed, LDD regions are implanted using a tilted implant. This tilted implant penetrates underneath the body of the created gate structures thereby creating the LDD regions. The removal of the layer of TEOS leaves in place the gate structures, one such structure is located in the active region of the surface of the substrate, two additional structures that have been created on the surface of the STI regions.

FIGURE 1 IS SUGGESTED FOR PUBLICATION