Abstract

METHOD FOR FORMING A LIGHTLY DOPED SOURCE AND DRAIN STRUCTURE USING AN L-SHAPED SPACER

A method for forming an L-shaped spacer using a sacrificial organic top coating, then using the L-shaped spacer to simultaneously implant lightly doped source and drain extensions through the L-shaped spacer while implanting source and drain regions beyond the L-shaped spacer. A semiconductor structure is provided having a gate structure thereon. A liner oxide layer is formed on the gate structure. A dielectric spacer layer is formed on the liner oxide layer. In the preferred embodiments, the dielectric spacer layer comprises a silicon nitride layer or a silicon oxynitride layer. A sacrificial organic layer is formed on the dielectric spacer layer. The sacrificial organic layer and the dielectric spacer layer are anisotropically etched to form spacers comprising a triangle-shaped sacrificial organic structure and an L-shaped dielectric spacer. The triangle-shaped sacrificial organic structure is removed leaving an L-shaped dielectric spacer. Impurity ions are implanted into the surface of the semiconductor structure forming lightly doped source and drain extensions where the ions are implanted through the L-shaped spacer, and forming source and drain regions beyond the L-shaped spacer where the ions are implanted without passing through the L-shaped spacer.

(FIGURE 1 IS SUGGESTED FOR PUBLICATION)