A METHOD TO FORM A RECESSED SOURCE DRAIN ON A TRENCH SIDE WALL WITH A REPLACEMENT GATE TECHNIQUE

ABSTRACT

An improved MOS transistor and method of making an improved MOS transistor. An MOS transistor having a recessed source drain on a trench sidewall with a replacement gate technique. Holes are formed in the shallow trench isolations, which exposes sidewall of the substrate in the active area. Sidewalls of the substrate are doped in the active area where holes are. Conductive material is then formed in the holes and the conductive material becomes the source and drain regions. The etch stop layer is then removed exposing sidewalls of the conductive material, and oxidizing exposed sidewalls of the conductive material is preformed. Spacers are formed on top of the pad oxide and on the sidewalls of the oxidized portions of the conductive material. The pad oxide layer is removed from the structure but not from under the spacers. A gate dielectric layer is formed on the substrate in the active area between the spacers; and a gate electrode is formed on said gate dielectric layer.

Figure 7