ABSTRACT

NEW METHOD FOR IMPROVING OXIDE EROSION OF TUNGSTEN CMP OPERATIONS

A new method to prevent oxide erosion in a metal plug process by employing a silicon nitride layer over the oxide is described. An oxide layer is deposited overlying a semiconductor substrate. A silicon nitride layer is deposited overlying the oxide layer. An opening is etched through the silicon nitride layer and into the oxide layer. A barrier metal layer is deposited overlying the silicon nitride layer and into the opening. A metal layer is deposited overlying the barrier metal layer. The metal layer and barrier metal layer are polished away using chemical mechanical polishing (CMP) with a polish stop at the silicon nitride layer. The metal layer forms a metal plug. The silicon nitride layer prevents erosion of the oxide layer during the polishing step to complete formation of a metal plug in the fabrication of an integrated circuit device.

FIGURE 4



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