C: A METHOD TO ELIMINATE TOP METAL CORNER SHAPING DURING BOTTOM METAL PATTERNING FOR MIM CAPACITORS

ABSTRACT

A method for fabricating a metal-insulator-metal capacitor wherein top metal corner shaping during patterning is eliminated is described. An insulating layer is provided overlying a semiconductor substrate. A first metal layer is deposited over the insulating layer. A capacitor dielectric layer is deposited overlying the first metal layer. A second metal layer is deposited overlying the capacitor dielectric layer and patterned to form a top metal electrode. A flowable material layer is deposited overlying the capacitor dielectric and the top metal electrode and anisotropically etched away to leave spacers on sidewalls of the top metal electrode. A photoresist mask is formed overlying the capacitor dielectric and the top metal electrode wherein the spacers provide extra photoresist thickness at the sidewalls of the top metal layer. The capacitor dielectric layer and the first metal layer are patterned wherein the patterned first metal layer forms a bottom metal electrode and wherein the spacers protect the top metal layer from etching during the patterning. The photoresist mask is removed, completing fabrication of a metal-insulator-metal capacitor.

Fig. 8