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METHOD FOR FORMING REFRACTORY METAL-SILICON-NITROGEN CAPACITORS AND STRUCTURES FORMED

Abstract of the Disclosure

A method for forming a refractory metal-silicon-nitrogen capacitor (20) in a semiconductor structure (10) and the structure formed are described. In the method, a pre-processed semiconductor substrate is first positioned in a sputtering chamber. Ar gas is then flowed into the sputtering chamber to sputter deposit a first refractory metal-silicon-nitrogen layer (14) on the substrate from a refractory metal silicide target, or from two targets of a refractory metal and a silicon. N_2 gas is then flowed into the sputtering chamber until the concentration of N_2 gas in the chamber is at least 35% to sputter deposit a second refractory metal-silicon-nitrogen layer (16) on top of the first refractory metal-silicon-nitrogen layer. The N_2 gas flow is then stopped to sputter deposit a third refractory metal-silicon-nitrogen layer (18) on top of the second refractory metal-silicon-nitrogen layer. The multi-layer stack of the refractory metal-silicon-nitrogen is then photolithographically formed into a capacitor.

FIG. 1



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