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ABSTRACT

THERMAL STABILITY IMPROVEMENT OF $CoSi_z$ FILM BY STUFFING IN TITANIUM

A method for forming a thermally stable cobalt disilicide film in the fabrication of an integrated circuit is described. A semiconductor substrate is provided having silicon regions to be silicided. A cobalt layer is deposited overlying the silicon regions to be silicided. A capping layer is deposited overlying the cobalt layer. The substrate is subjected to a first rapid thermal anneal whereby the cobalt is transformed to cobalt monosilicide where it overlies the silicon regions and wherein the cobalt not overlying the silicon regions is unreacted. The unreacted cobalt layer and the capping layer are removed. A titanium layer is deposited overlying the cobalt monosilicide layer. Thereafter the substrate is subjected to a second rapid thermal anneal whereby the cobalt monosilicide is transformed to cobalt disilicide. The titanium layer provides titanium atoms which diffuse into the cobalt disilicide thereby increasing its thermal stability. The titanium layer is removed to complete formation of a thermally stable cobalt disilicide film in the manufacture of an integrated circuit.

FIGURE 3

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