A NOVEL METHOD OF COBALT SILICIDATION USING AN OXIDE-TITANIUM INTERLAYER

ABSTRACT

A new method for forming a high quality cobalt disilicide film in the fabrication of an integrated circuit is described. A semiconductor substrate is provided having silicon regions to be silicided. A thermal oxide layer is grown overlying the semiconductor substrate. A titanium layer is deposited overlying the thermal oxide layer. A cobalt layer is deposited overlying the titanium layer. A titanium nitride capping layer is deposited over 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. The substrate is subjected to a second rapid thermal anneal whereby the cobalt monosilicide is transformed to cobalt disilicide to complete formation of a cobalt disilicide film in the manufacture of an integrated circuit.

Fig. 5