

METHOD TO FORM ALPHA PHASE TA AND ITS APPLICATION TO IC MANUFACTURING

Abstract

A method of sputtering a Ta layer comprised of alpha phase Ta on a Cu layer. An embodiment includes a Ta sputter deposition on a Cu surface at a substrate temperature less than 200°C. Another embodiment has a pre-cooling step at a temperature less than 100°C prior to Ta layer sputter deposition. In another non-limiting example embodiment, a pre-clean step comprising an inert gas sputter is performed prior to the tantalum sputter. Another non-limiting example embodiment provides a semiconductor structure comprising: a semiconductor structure; a copper layer over the semiconductor structure; a tantalum layer on the copper layer; the tantalum layer comprised alpha phase Ta; a metal layer on the tantalum layer.

FIGURE 5

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