GRAIN BOUNDARY BLOCKING FOR STRESS MIGRATION AND ELECTROMIGRATION IMPROVEMENT IN CU INTERCONNECTS

Abstract

Example embodiments of a structure and method for forming a copper interconnect having a doped region near a top surface. The doped region has implanted alloying elements that block grain boundaries and reduce stress and electro migration. In a first example embodiment, the barrier layer is left over the inter metal dielectric layer during the alloying element implant. The barrier layer is later removed with a planarization process. In a second example embodiment the barrier layer is removed before the alloying element implant and a hard mask blocks the alloying element from being implanted in the inter metal dielectric layer.

Figure 1E