Protruded Contact and Insertion of Inter-Layer-Dielectric Material To Improve Undercut For Low-K Interconnects

Abstract

An embodiment of the invention shows a process to form a damascene opening preferably without hardmask overhang or dielectric layer undercut/void. The low-k dielectric material can be sandwiched in two hardmask films to form the dielectric film through which an interconnect opening is etched. A first example embodiment comprises the following. We form a lower interconnect and an insulating layer over a semiconductor structure. We form a first hardmask a dielectric layer, and a second hardmask layer, over the lower interconnect and insulating layer. We etch a first interconnect opening in the first hardmask, the dielectric layer and the second hardmask layer. Lastly, we form an interconnect in the first interconnect opening.

Figure 4