ABSTRACT

METAL BARRIER CAP FABRICATION BY POLYMER LIFT-OFF

A new method is provided for the creation of copper interconnects. A pattern of copper interconnects is created, a protective layer of semiconductor material is deposited over the surface of the created copper interconnects. The protective layer is patterned and etched, exposing the surface of the pattern of copper interconnects. The exposed copper surface is Ar sputtered after which a first barrier layer is deposited. The patterned and etched layer of protective material is removed, leaving in place overlying the pattern of copper interconnects a protective layer of first barrier material. A dielectric barrier layer, in the form of a layer of etch stop material, is deposited after which additional layers of dielectric interspersed with layers of etch stop material are deposited. Via and trench patterns are etched aligned with a copper pattern to which an electrical contact is to be established, the copper pattern being protected by the first layer of barrier material. A second barrier layer is deposited, the via and trench pattern is filled with copper after which excess copper is removed by polishing the surface of the deposited layer of copper.

FIGURE 12