BEVEL PLASMA TREATMENT TO ENHANCE WET EDGE CLEAN

ABSTRACT OF THE DISCLOSURE

The various embodiments described in the specification provide improved mechanisms of removal of unwanted deposits on the bevel edge to improve process yield. The embodiments provide apparatus and methods of treating the bevel edge of a copper plated substrate to convert the copper at the bevel edge to a copper compound that can be wet etched with a fluid at a high etch selectivity in comparison to copper. In one embodiment, the wet etch of the copper compound at high selectivity to copper allows the removal of the non-volatile copper at substrate bevel edge in a wet etch processing chamber. The plasma treatment at bevel edge allows the copper at bevel edge to be removed at precise spatial control to about 2 mm or below, such as about 1 mm, about 0.5 mm or about 0.25 mm, to the very edge of substrate. In addition, the apparatus and methods described above for bevel edge copper removal do not have the problems of copper etching fluid being splashed on the device regions to cause defects and thinning of copper films. Therefore, device yield can be greatly improved.

Figure 2A