ABSTRACT

A REPEATABLE END POINT METHOD FOR ANISOTROPIC ETCH OF INORGANIC BURIED ANTI-REFLECTIVE COATING LAYER OVER SILICON

A method for anisotropically etching a partially manufactured semiconductor structure, more specifically, a stacked FET gate structure containing a bottom anti-reflective coating (Barc) layer is described. The structure is covered with a photoresist layer which is patterned to defines the gate region. The processing chemistry is predominantly carbon tetrafluoride, (CF_4) with the inclusion of chlorine (Cl_2) where fluorine (F) is generated in the plasma as the etchant for the structure. During processing, the wafer is cooled with helium (He) that lowers the wafer temperature and promotes sidewall deposition from the fluorine species which acts as a passivation layer producing a anisotropic or vertical etch profile. The process reduces etch time and results in very repeatable end point control of the Bark etch and poly cap etch improving the control of the structure critical dimensions and improving process throughput. The reduction in the use of fluorine based species reduces any potential environmental impact.

(FIGURE 1 IS SUGGESTED FOR PUBLICATION)