G00002

22 NOV 2002

SEMICONDUCTOR PROCESS CHAMBER ELECTRODE AND METHOD FOR MAKING THE SAME

ABSTRACT OF THE DISCLOSURE

Disclosed is a system for processing a semiconductor wafer through plasma etching operations. The system has a process chamber that includes a support chuck for holding the semiconductor wafer and a pair of RF power sources. In another case, the system can be configured such that the electrode is grounded and the pair of RF frequencies are fed to the support chuck (bottom electrode). The system therefore includes an electrode that is positioned within the system and over the semiconductor wafer. The electrode has a center region, a first surface and a second surface. The first surface is configured to receive processing gases from a source that is external to the system and flow the processing gases into the center region. The second surface has a plurality of gas feed holes that are continuously coupled to a corresponding plurality of electrode openings that have electrode opening diameters that are greater than gas feed hole diameters of the plurality of gas feed holes. The plurality of electrode openings are configured to define an electrode surface that is defined over a wafer surface of the semiconductor wafer. The electrode surface assists in increasing an electrode plasma sheath area in order to cause a shift in bias voltage onto the wafer surface, thereby increasing the ion bombardment energy over the wafer without increasing the plasma density.

162162