METHOD OF PROCESSING A WORKPIECE IN A PLASMA REACTOR WITH VARIABLE HEIGHT GROUND RETURN PATH TO CONTROL PLASMA ION DENSITY UNIFORMITY

ABSTRACT

A method for processing a workpiece in a plasma reactor chamber includes coupling RF power at a first VHF frequency f1 to a plasma via one of the electrodes of the chamber, and providing a center ground return path for RF current passing directly between the ceiling electrode and the workpiece support electrode for the frequency f1. The method further includes providing a variable height edge ground annular element and providing a ground return path through the edge ground annular element for the frequency f1. The method controls the uniformity of plasma ion density distribution by controlling the distance between the variable height edge ground annular element and one of: (a) height of ceiling electrode or (b) height of workpiece support electrode.

FIG. 1A