MULTI-RADIOFREQUENCY IMPEDANCE CONTROL FOR PLASMA UNIFORMITY TUNING

ABSTRACT

Circuits, methods, chambers, systems, and computer programs are presented for processing wafers. A wafer processing apparatus includes top and bottom electrodes inside a processing chamber; a first, second, third, and fourth radio frequency (RF) power sources; and one or more resonant circuits. The first, second, and third RF power sources are coupled to the bottom electrode. The top electrode may be coupled to the fourth RF power source, to electrical ground, or to the one or more resonant circuits. Each of the one or more resonant circuits, which are coupled between the top electrode and electrical ground, include a tune-in element operable to vary a frequency-dependent impedance presented by the resonant circuit. The wafer processing apparatus is configurable to select the RF power sources for wafer processing operations, as well as the connections to the top electrode in order to provide plasma and etching uniformity for the wafer.

FIG. 1

