

PLASMA PROCESSING APPARATUS AND METHOD FOR CONTROLLING SOURCE FREQUENCY OF SOURCE RADIO-FREQUENCY POWER

ABSTRACT

A plasma processing apparatus includes a chamber, a substrate support, a radio-frequency power supply, and a bias power supply controller. The radio-frequency power supply generates source radio-frequency power to generate plasma in the chamber. The bias power supply periodically provides bias energy having a waveform cycle to a bias electrode on the substrate support. The radio-frequency power supply adjusts a source frequency of the source radio-frequency power in an n-th phase period in an m-th waveform cycle of a plurality of waveform cycles based on a change in a degree of reflection of the source radio-frequency power. The change in the degree of reflection is identified with the source frequency being set differently in the n-th phase period in each of two or more waveform cycles preceding the m-th waveform cycle.

[FIG. 2]