PLASMA PROCESSING DEVICE, BIAS POWER SUPPLY SYSTEM, AND PLASMA PROCESSING METHOD

ABSTRACT

A disclosed plasma processing apparatus includes a chamber, a substrate support, a plasma generator, and a bias power supply system. The substrate support has a bias electrode. The bias power supply system is configured to intermittently apply a voltage pulse to the bias electrode to draw ions from plasma into a substrate. The bias power supply system includes at least one DC power supply, a switching circuit, and a pulse controller. The switching circuit is electrically connected between the bias electrode and the at least one DC power supply. The pulse controller is configured to control the switching circuit to cause a voltage level of the voltage pulse to stepwise reach a target voltage level thereof having a maximum potential difference in a negative direction with respect to a reference potential.

Fig. 3