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(54) Title: A SYSTEM AND METHOD FOR MONITORING TEMPERATURES OF AND CONTROLLING MULTIPLEXED HEATER ARRAY

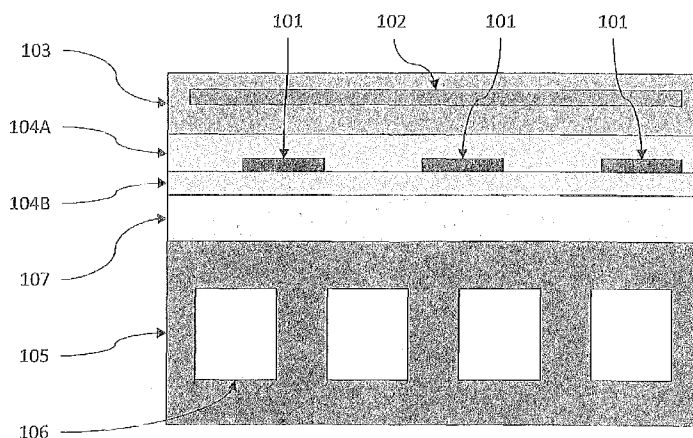


Fig. 1

(57) Abstract: A system for measuring temperatures of and controlling a multi-zone heating plate in a substrate support assembly used to support a semiconductor substrate in a semiconductor processing includes a current measurement device and switching arrangements. A first switching arrangement connects power return lines selectively to an electrical ground, a voltage supply or an electrically isolated terminal, independent of the other power return lines. A second switching arrangement connects power supply lines selectively to the electrical ground, a power supply, the current measurement device or an electrically isolated terminal, independent of the other power supply lines. The system can be used to maintain a desired temperature profile of the heater plate by taking current readings of reverse saturation currents of diodes serially connected to planar heating zones, calculating temperatures of the heating zones and powering each heater zone to achieve the desired temperature profile.

