

Claims:

1. A substrate support for use in a substrate processing chamber, comprising:
a lower assembly having a base plate assembly, wherein the base plate assembly includes a plurality of electrical feedthroughs disposed about a central protrusion;
a ceramic puck disposed on the lower assembly and removably coupled to the base plate assembly, wherein the ceramic puck has an electrode disposed therein that is electrically coupled to a first pair of electrical feedthroughs of the plurality of electrical feedthroughs; and
a flexible connector having a spiral portion disposed between the ceramic puck and each of the plurality of electrical feedthroughs to allow for differences in thermal expansion of the ceramic puck and the base plate assembly.
2. The substrate support of claim 1, wherein the ceramic puck is coupled to the lower assembly via fasteners, wherein each of the fasteners are coupled to a floating nut in the base plate assembly to allow for thermal expansion of the ceramic puck.
3. The substrate support of claim 2, wherein each of the fasteners are disposed through an opening in a tab that extends radially outwards from the central protrusion of the base plate assembly.
4. The substrate support of claim 1, wherein the flexible connector includes an opening at a first end to receive a terminal extending from a lower surface of the ceramic puck and an opening at a second end to receive a conductive core of one of the plurality of electrical feedthroughs.
5. The substrate support of claim 4, wherein the flexible connector includes an annular groove, and a canted spring is disposed between the annular groove and the terminal.

6. The substrate support of any of claims 1 to 5, wherein the ceramic puck has an interface ring extending from a lower surface of the ceramic puck, wherein the interface ring includes a central through hole that is fluidly coupled to an opening in the central protrusion of the base plate assembly and configured to flow gas therethrough.
7. The substrate support of any of claims 1 to 5, wherein an isolator ring is disposed about the central protrusion and includes openings for the plurality of electrical feedthroughs to prevent arcing between adjacent electrical feedthroughs of the plurality of electrical feedthroughs.
8. The substrate support of any of claims 1 to 5, wherein a thermocouple is disposed through the central protrusion of the base plate assembly and extends into the ceramic puck.
9. The substrate support of any of claims 1 to 5, wherein the ceramic puck includes one or more heating elements embedded therein, and wherein the one or more heating elements are electrically coupled to the plurality of electrical feedthroughs.
10. The substrate support of claim 1, wherein the plurality of electrical feedthroughs include a second pair of electrical feedthroughs coupled to a first resistive heater embedded in the ceramic puck, wherein the ceramic puck is removably coupled to the base plate assembly via fasteners coupled to a respective floating nut, wherein the ceramic puck has a first side for receiving a substrate and a second side opposite the first side having an interface ring extending from the second side, and wherein, when coupled, the base plate assembly and the ceramic puck contact each other only at an interface between the central protrusion and the interface ring.
11. The substrate support of claim 10, further comprising a second resistive heater embedded in the ceramic puck and electrically coupled to a third pair of electrical feedthroughs.

12. The substrate support of claim 10, wherein each of the fasteners is disposed through an opening in an upper tab extending from the central protrusion and within an opening in a lower tab extending from the central protrusion, and wherein each floating nut is partially disposed in the opening of the lower tab.

13. The substrate support of claim 10, wherein each electrical feedthrough of the plurality of electrical feedthroughs includes a conductive core surrounded by a ceramic sleeve.

14. The substrate support of any of claims 10 to 13, wherein a flexible connector is disposed between the ceramic puck and each electrical feedthrough to allow for thermal expansion of the ceramic puck while maintaining electrical coupling.

15. A process chamber, comprising:
a chamber body having the substrate support of any of claims 1 to 5 disposed within an inner volume of the chamber body, wherein the substrate support further comprises:
a cooling plate configured to circulate a coolant therethrough, wherein the base plate assembly is disposed on the cooling plate, and wherein the base plate assembly includes a second pair of electrical feedthroughs, wherein the second pair of electrical feedthroughs are electrically coupled to a heater embedded in the ceramic puck.

16. The process chamber of claim 15, wherein the flexible connector includes an annular groove, and a canted spring is disposed between the annular groove and the terminal.

17. The process chamber of claim 15, wherein the plurality of electrical feedthroughs comprise seven electrical feedthroughs.

18. The process chamber of claim 15, wherein a thermocouple having a spring member is disposed through the central protrusion of the base plate assembly and extends into the ceramic puck.

19. The process chamber of claim 15, further comprising a backside gas supply fluidly coupled to a first side of the ceramic puck via a central through hole of the ceramic puck and a central opening of the base plate assembly.

20. The process chamber of claim 15, wherein the base plate assembly includes a central plate and an outer lip, and wherein the cooling plate is disposed between the central plate and the outer lip.