CLAIMS

1. An apparatus, comprising:

(a) a processing chamber defining a volume therein,

(i) wherein the processing chamber forms the volume by a chamber body and a chamber lid; and

(ii) wherein the chamber body includes a wall and a bottom;

(b) a substrate support disposed in the volume opposite the chamber lid, the substrate support comprising:

(i) a support body disposed on a stem, the support body configured to be coupled to a radiofrequency source fed through the stem;

(ii) a ground plate disposed between the support body and the stem, wherein the ground plate is electrically coupled to a grounded conductive rod extending through the stem; and

(iii) an isolation plate disposed between the support body and the ground plate, the isolation plate at least partially providing electrical isolation between the support body and the ground plate;

(c) a circular top flange coupled to a lower peripheral surface of the ground plate, wherein the circular top flange comprises a central opening disposed therethrough for providing access for a radio frequency supply feedthrough;

(d) a circular bottom flange coupled to the bottom of the chamber body; and

(e) a plurality of straps,

(i) wherein each of the straps comprises a first end coupled to the circular bottom flange and a second end coupled to the circular top flange; and

(ii) wherein the plurality of straps provide an RF path from the bottom of the chamber body to the ground plate to ground.

2. The apparatus of claim 1, wherein the plurality of straps comprises 10 to 20 straps.

3. The apparatus of claim 2, wherein the plurality of straps comprises 12 to 16 straps.

4. The apparatus of claim 1, wherein each of the plurality of straps is composed of a metallic alloy comprising stainless steel, inconel, carbon, chromium, nickel, manganese, silicon, nitrogen, phosphorus, sulfur, or combinations thereof.

5. The apparatus of claim 1, wherein the first end of each of the plurality of straps is coupled to a recessed portion of a top surface of the circular bottom flange using screws and

the second end of each strap is coupled to a recessed portion of a bottom surface of the circular top flange using screws.

6. The apparatus of claim 5, wherein each of the screws comprises stainless steel.

7. The apparatus of claim 1, wherein the circular top flange comprises a metal comprising steel, aluminum, alloys thereof, or combinations thereof.

8. The apparatus of claim 1, wherein the circular bottom flange is coupled to the bottom of the chamber body using a plurality of stainless steel fasteners.

9. The apparatus of claim 1, wherein each of the plurality of straps are configured to bend radially inward when the substrate support is in a retracted position.

10. The apparatus of claim 1, wherein each strap comprises a spring constant of from 3.0 N/mm to 3.5 N/mm.

11. The apparatus of claim 1, wherein a minimum distance between the circular top flange and the circular bottom flange is greater than 6 mm.

12. A method of processing a substrate, comprising:

(a) positioning a substrate on a substrate support in a volume of a processing chamber,

(i) wherein the processing chamber forms the volume by a chamber body and a chamber lid;

(ii) wherein the chamber body includes a wall and a bottom;

(iii) wherein the substrate support is disposed in the volume opposite the chamber lid, the substrate support comprising:

(1) a support body disposed on a stem, the support body configured to be coupled to a radiofrequency source fed through the stem;

(2) a ground plate disposed between the support body and the stem, wherein the ground plate is electrically coupled to a grounded conductive rod extending through the stem; and

(3) an isolation plate disposed between the support body and the ground plate, the isolation plate at least partially providing electrical isolation between the support body and the ground plate; and

(iv) wherein the processing chamber includes:

(1) a circular top flange coupled to a lower peripheral surface of the ground plate, wherein the circular top flange comprises a central opening disposed therethrough for providing access for a radio frequency supply feedthrough;

(2) a circular bottom flange coupled to the bottom of the chamber body; and

(3) a plurality of straps,

(a) wherein each of the straps comprises a first end coupled to the circular bottom flange and a second end coupled to the circular top flange; and

(b) wherein the plurality of straps provide an RF path from the bottom of the chamber body to the ground plate to ground;

(b) raising the substrate support to a raised position forming an upper portion of the volume;

(c) introducing a gas to the upper portion of the volume; and

(d) activating the gas using radio frequency energy.

13. The method of claim 12, wherein the lower portion of the volume is substantially free of plasma.

14. The method of claim 12, comprising processing the substrate in a plasma enhanced chemical vapor deposition or an etch process.

15. A system comprising an algorithm stored in a memory of the system, wherein the algorithm comprises a number of instructions which, when executed by a processor, cause the method of claim 12 to be performed.