CLAIMS

What is claimed is:

1. A carrier ring, the carrier ring comprising:

an outer ring formed a dielectric material and having an engagement feature; and

an inner ring formed from a metal, wherein the inner ring engages with the engagement feature of the outer ring and wherein the inner ring is configured to support a semiconductor wafer during processing within a processing chamber.

2. The carrier ring of claim 1 wherein the dielectric material comprises ceramic.

3. The carrier ring of any one of claims 1 or 2 wherein the metal comprises aluminum.

4. The carrier ring of any one of claims 1 or 2 wherein the outer ring comprises first mating structures, wherein the inner ring comprises second mating structures, and wherein the first and second mating structures engage with each other to hold the inner ring and the outer ring in rotational alignment.

5. The carrier ring of claim 4, wherein the first mating structures of the outer ring and the second mating structures of the inner ring are collectively configured to prevent rotation of the outer ring relative to the inner ring in a first direction about an axis and in a second direction about the axis.

6. The carrier ring of claim 5, wherein the first mating structures comprise at least one recess in the outer ring and wherein the second mating structures comprise at least one protrusion on the inner ring.

7. The carrier ring of any one of claims 1 or 2, wherein the engagement feature comprises a ledge and wherein the inner ring is configured to rest on the ledge.

8. A plasma processing system, comprising,

a shower-pedestal; and

a substrate support, wherein the substrate support comprises:

an inner portion with a first plasma impedance, the inner portion being configured to hold a substrate at a spaced apart relationship from the shower-pedestal; and

an outer portion with a second plasma impedance, the second plasma impedance being different than the first plasma impedance.

9. The plasma processing system of claim 8, wherein the substrate support further

comprises an additional inner portion with a third plasma impedance, wherein the third plasma impedance is different than both the first plasma impedance and the second plasma impedance, and wherein the substrate support is configured such that the inner portion can be swapped out for the additional inner portion such that the additional inner portion, rather than the inner portion, is configured to hold the substrate at the spaced apart relationship from the shower-pedestal.

10. The plasma processing system of any one of claims 8 or 9, wherein the inner portion comprises an inner ring, wherein the outer portion comprises an outer ring, and wherein the inner ring and the outer ring each comprise one or more mating structures configured to hold the inner ring in rotational alignment with the outer ring.

11. The plasma processing system of claim 10, wherein the one or mating structures of the outer ring and the one or more mating structures of the inner ring are collectively configured to prevent rotation of the outer ring relative to the inner ring in a first direction about an axis and in a second direction about the axis.

12. The plasma processing system of any one of claims 8 or 9, wherein the inner portion comprises metal.

13. The plasma processing system of claim 12, wherein the outer portion comprises dielectric.

14. The plasma processing system of claim 12, wherein the outer portion comprises a ceramic.

15. The plasma processing system of any one of claims 8 or 9, wherein the substrate support comprises a carrier ring, the plasma processing system further comprising:

a first processing chamber including the shower-pedestal;

a second processing chamber; and

an indexer configured to move the carrier ring from the first processing chamber to the second processing chamber, wherein the carrier ring is configured to hold the substrate while the indexer moves the carrier ring from the first processing chamber to the second processing chamber.

16. The plasma processing system of any one of claims 8 or 9, further comprising:

a gas manifest coupled to the shower-pedestal and configured to provide a gas from a gas source; and

a radio-frequency (RF) power supply configured to provide power to the shower-pedestal to generate a plasma from the gas as part of depositing a film on a backside of the substrate while the substrate is supported by the inner portion in the spaced apart relationship from the shower-pedestal.

17. The plasma processing system of any one of claims 8 or 9, wherein the inner portion and the outer portion are formed of a common material, wherein the inner portion has a first thickness, wherein the outer portion has a second thickness, and wherein the first thickness is less than the second thickness such that the second plasma impedance is different than the first plasma impedance.

18. The plasma processing system of any one of claims 8 or 9, wherein the inner portion and the outer portion are formed of a first material and a radially-varying concentration of a second material, wherein the inner portion has a first concentration of the second material, wherein the outer portion has a second concentration of the second material, and wherein the first concentration is different than the second concentration such that the second plasma impedance is different than the first plasma impedance.

19. The plasma processing system of any one of claims 8 or 9, wherein the inner portion and the outer portion are formed of a first material and a radially-varying concentration of a conductor within the first material, wherein the inner portion has a first concentration of the conductor, wherein the outer portion has a second concentration of the conductor, and wherein the first concentration is greater than the second concentration such that the first plasma impedance, associated with the inner portion, is greater than the second plasma impedance, associated with the outer portion.

20. The plasma processing system of any one of claims 8 or 9, wherein the inner portion comprises an inner circumference having a ledge, the ledge being configured to hold the substrate at the spaced apart relationship from the shower-pedestal.