CLAIMS

1. An apparatus for providing signals to a device, comprising:

one or more radiofrequency (RF) signal generators;

one or more electrically-small transmission lines to couple signals from the one or more RF signal generators to a fabrication chamber; and

a reactive circuit to transform impedance of each of the one or more electrically-small transmission lines from a region having a first impedance-sensitivity to a region having a second impedance-sensitivity.

2. The apparatus of claim 1, wherein the reactive circuit comprises at least series reactance.

3. The apparatus of claim 1, wherein the reactive circuit comprises at least shunt susceptance.

4. The apparatus of claim 1, wherein the reactive circuit comprises at least series reactance and shunt susceptance.

5. The apparatus of claim 1, wherein the region having the first impedance-sensitivity corresponds to a region of relatively high impedance-sensitivity in an impedance space and wherein the real part of the impedance corresponds to a value greater than about 100 ohms.

6. The apparatus of claim 1, wherein the region having the second impedance-sensitivity corresponds to a region of relatively low impedance-sensitivity in an impedance space and wherein the real part of the impedance corresponds to a value less than about 100 ohms.

7. The apparatus of claim 1, wherein the reactive circuit to transform the impedance avoids the possibility of a resonant transmission line at any frequency less than the frequency of the signals from the one or more RF signal generators.

8. The apparatus of claim 1, wherein an electrically-small transmission line of the one or more electrically-small transmission lines corresponds to a transmission line that transforms an impedance from a region of relatively high impedance-sensitivity to a region of relatively low impedance-sensitivity without traversing a transmission line resonance at a frequency less than the frequency of the signal generated by an RF signal generator of the one or more RF signal generators in a medium of the transmission line.

9. The apparatus of claim 1, wherein a resistive loss of the electrically-small transmission line combined with a loss of the reactive circuit correspond to less than about 20%.

10. The apparatus of claim 1, wherein a resistive loss of the electrically-small transmission line corresponds to less than 10%.

11. An apparatus, comprising:

an electrically-small transmission line to couple signals from one or more of RF signal generators to a fabrication chamber; and

a reactive circuit to transform impedance of the electrically-small transmission line from a region of relatively high impedance-sensitivity to a region of relatively low impedance-sensitivity, the reactive circuit operating to move an impedance control point in a direction opposite to the direction moved by a length of transmission line.

12. The apparatus of claim 11, wherein the electrically-small transmission line corresponds to a transmission line that moves the impedance control point from the region of relatively high impedance-sensitivity to the region of relatively low impedance-sensitivity without traversing a transmission line resonance at a frequency

less than the frequency of the signal generated by the RF signal generator in a medium of the transmission line.

13. The apparatus of claim 11, wherein the reactive circuit comprises series capacitive reactance.

14. The apparatus of claim 11, wherein the reactive circuit comprises at least shunt inductive susceptance.

15. The apparatus of claim 11, wherein the reactive circuit comprises series capacitive reactance and shunt inductive susceptance.

16. The apparatus of claim 11, wherein the resistive loss of the electrically-small transmission line combined with the loss of the reactive circuit correspond to less than about 20%.

17. The apparatus of claim 12, wherein the resistive loss of the electrically-small transmission line corresponds to less than 10%.

18. An integrated circuit fabrication chamber, comprising:

a plurality of integrated circuit fabrication stations;

one or more input ports for coupling a radio frequency (RF) signal to at least one of the plurality of integrated circuit fabrication stations;

an electrically-small transmission line to couple signals from one or more of RF signal generators to the integrated circuit fabrication chamber; and

a reactive circuit to transform impedance of the electrically-small transmission line from a region of relatively high impedance-sensitivity to a region of relatively low impedance-sensitivity.

19. The apparatus of claim 18, wherein the region of relatively high impedance-sensitivity corresponds to a region in an impedance space and wherein the real part of the impedance corresponds to a value greater than about 100 ohms.

20. The apparatus of claim 18, wherein the region of relatively low impedance-sensitivity corresponds to a region in an impedance space and wherein the real part of the impedance corresponds to a value less than about 100 ohms.

21. The apparatus of claim 1, wherein the region having the first impedance-sensitivity corresponds to a region having low impedance-sensitivity and wherein the region having the second impedance-sensitivity corresponds to a region having high impedance-sensitivity.