3. The method of claim 1, further comprising communicating and/or calculating target control parameters of each heater zone based on the target etching temperatures at the predetermined locations on the substrate.

4. The method of claim 1, wherein when the number of the heater zones and the number of the device die locations are equal, the step of adjusting temperature using the controllable heater zones comprises:

determining heater power setpoints for the heater zones by multiplying an inversed matrix describing a relationship of the target control parameters of the heater zones and the target etching temperatures of the device die locations by a vector whose elements are the target etching temperatures of the device die locations.

5. The method of claim 1, wherein the plasma etching system comprises one or more temperature sensors configured to measure etching temperature of each heater zone location, the method further comprising calculating target control parameters of each heater zone based on outputs from the temperature sensors.

~~6. A plasma etching system for carrying out the method of claim 1, comprising a substrate support assembly for supporting a substrate during plasma etching, the substrate support assembly comprising a plurality of independently controllable heater zones in an arrangement under the substrate, and a controller unit that controls each heater zone.~~

~~7. A plasma etching system for carrying out the method of claim 6, comprising an interface which receives the pre-etch or the post critical device parameters from an off-board inspection tool via a host communication network.~~

6~~8~~. The method of claim 1, wherein when the number of the heater zones and the number of the device die locations are not equal, the step of adjusting temperature using the controllable heater zones includes:

determining heater power setpoints for the heater zones based on a matrix describing a relationship of the target control parameters of the heater zones and predicted etching temperatures of the predetermined locations on the substrate,

wherein the difference between the predicted etching temperatures of the device die locations and the target etching temperatures of the device die locations is minimized by an optimization technique.

79. The method of claim 68, wherein the optimization technique is a least squares optimization.

810. A method of using a plasma etching system, the plasma etching system comprising a substrate support assembly for supporting a substrate during plasma etching, the substrate support assembly comprising independently controllable heater zones in an arrangement under device die locations on the substrate, and a controller unit that controls each heater zone; the method comprising:

measuring pre-etch critical device parameters at a first set of predetermined locations on the substrate;

communicating at least one of the pre-etch critical device parameters and post-etch critical device parameters from previously etched substrate to the plasma etching system;

subsequently supporting the substrate on the substrate support assembly;

communicating at least one of process recipe parameters and loading process recipe parameters from a memory to the plasma etching system;

deducing target etching temperatures at a second set of predetermined locations on the substrate based on at least one of the process recipe parameters, target post-etch critical device parameters, the pre-etch critical device parameters, and the post-etch critical device parameters;

determining heater power setpoints for the controllable heater zones based on a relationship between the heater power for each of the heater zones and the predicted etching temperatures at the second set of predetermined locations, wherein the heater power setpoints are determined such that the difference between the

predicted etching temperatures and the target etching temperatures is minimized by an optimization technique;

plasma etching the substrate.

911. The method of claim 810, wherein the optimization technique is a least squares optimization.

1012. The method of claim 810, wherein deducing target etching temperatures includes estimating data of pre-etch or post-etch critical device parameters at the second set of predetermined locations based on the data of the pre-etch or post-etch critical device parameters at the first set of predetermined locations.

1113. The method of claim 1012, wherein the estimating includes interpolating the data of pre-etch or post-etch critical device parameters at the second set of predetermined locations based on the data of the pre-etch or post-etch critical device parameters at the second set of predetermined locations.

1214. The method of claim 810, wherein a relationship between the heater power for each of the heater zones and the predicted etching temperatures at the second set of predetermined locations is described by a matrix.

1315. The method of claim 1113, wherein the interpolating is a linear interpolation.

1416. The method of claim 1113, wherein the interpolating is a non-linear interpolation.

15. The method of claim 1, the method comprising deducing a target etching temperature for the predetermined locations on the substrate from at least one of the process recipe parameters and target post-etch critical device parameters.

16. The method of claim 8, the method comprising deducing target etching temperatures at the second set of predetermined locations on the substrate based on at least one of the process recipe parameters and target post-etch critical device parameters.