~~What is claimed is:~~

CLAIMS

1. A method of manufacturing a semiconductor device comprising:

directing extreme ultraviolet (EUV) light from an EUV light source through a reflective lens system;

interposing an EUV mask in the reflective lens system, the EUV mask having a substrate and a multi-layer stack forming a Bragg reflector, the multi-layer stack and the substrate having a thermally conducting smooth substrate with a predetermined substrate flatness of 0.5 nanometer (nm) RMS (root-mean-square) or less held on a surface of a chuck being thermally conducting and smooth having a predetermined chuck flatness; and

reflecting a pattern of the EUV mask on a semiconductor substrate for forming the semiconductor device, wherein interposing the EUV mask held on the surface of the chuck includes interposing the EUV mask held on the surface of the chuck having a textured mounting surface, wherein the textured mounting surface has mesas, grooves, holes, or a combination thereof.

2. The method as claimed in claim 1, wherein interposing the EUV mask having the substrate includes interposing the EUV mask having a specialized thin rigid material ~~substrates~~substrate, a silicon wafer, or a metallic ~~substrates.~~ substrate.

3. The method as claimed in claim 1, wherein interposing the EUV mask includes holding the EUV mask electrostatically on the surface of the chuck with a combined thickness of ~~1 mm~~the chuck and the mask is 1 mm or less and the surface of the chuck has a predetermined chuck flatness of 3 nm RMS or less.

~~4. The method as claimed in claim 1, wherein interposing the EUV mask held on the surface of the chuck includes interposing the EUV mask held on the surface of the chuck having a textured mounting surface, wherein the textured mounting surface has mesas, grooves, holes, or a combination thereof.~~

~~5.~~

4. The method as claimed in claim 1, wherein interposing the EUV mask held on the surface of the chuck includes interposing the EUV mask held on the surface of the chuck having a cooling system using a gas or liquid coolant close to the EUV mask, at an operating temperature range of 100 degrees Centigrade of lower.

~~6. An EUV lithography system comprising:~~

~~an EUV light source;~~

~~a chuck being thermally conducting and smooth having a surface with a predetermined chuck flatness ; and~~

~~a reflective lens system for directing EUV light from the EUV light source over the surface of the chuck.~~

~~7.~~

5. The ~~system~~ method as claimed in claim ~~6,~~ 1, wherein ~~the chuck is at an operating temperature range of 100 degrees Centigrade or lower.~~

~~8. The system as claimed in claim 6, wherein the chuck includes a cooling system using a gas or liquid coolant close to an EUV mask.~~

~~9. The system as claimed in claim 6, wherein the chuck includes a~~ the textured mounting surface reduces particle contamination.

6. The method as claimed in claim 1, wherein the textured mounting surface reduces distortion of the mask caused by the heat.

7. The method as claimed in claim 1, wherein the EUV mask has of 154 mm x 154 mm or greater.

8. The method as claimed in claim 1, wherein the predetermined substrate flatness is 0.5 nanometer root-mean-square or less when held on the surface of the chuck.

9. The method as claimed in claim 8, wherein the substrate is a metallic substrate.

10. The method as claimed in claim 1, wherein the substrate is a metallic substrate.

11. The method of claim 1, wherein the substrate has a thermal conductivity of 50 $W \cdot m^{-1} \cdot K^{-1}$.

12. The method of claim 1, wherein the textured mounting surface has mesas~~, grooves, holes, or a combination thereof.~~ .

~~10. The system as claimed in claim 6, wherein the chuck is an electrostatic chuck.~~

~~11. An EUV mask comprising:~~

~~a multi-layer stack in the form of a Bragg reflector; and~~

~~a substrate under the multi-layer stack, the multi-layer stack and the substrate having a thermally conducting smooth surface and a predetermined substrate flatness held on a surface of a chuck being thermally conducting and smooth having a predetermined chuck flatness.~~

~~12. The mask as claimed in claim 11, wherein the substrate is a silicon wafer or metallic substrate electrostatically held on the surface of the chuck with a combined thickness of 1 mm or less.~~

13. ~~The mask as claimed in claim 11, wherein the chuck is an ESC having a cooling system using a gas or liquid coolant close to the substrate, at an operating temperature range~~ The method of ~~100 degrees Centigrade or lower.~~claim 1

~~14. The mask as claimed in claim 11, wherein the chuck includes a textured mounting surface~~, wherein the textured mounting surface has ~~mesas,~~ grooves~~, holes, or a combination thereof.~~ .

14.~~15.~~ The ~~mask as claimed in~~ method of claim ~~11~~1, wherein the ~~EUV mask~~textured mounting surface has ~~plurality of shapes and dimensions of 154 mm x 154 mm or greater.~~ holes.