Claims

Claim 1. A method of shaping a substrate comprising:

providing a first support layer;

providing a first shaping pattern on the first support layer;

providing a substrate on the first shaping pattern;

performing a first chemical mechanical polishing (CMP) process on the substrate positioned on the first shaping pattern; and

removing the once polished substrate from the first shaping pattern.

Claim 2. The method of claim 1, wherein the substrate comprises a silicon based substrate.

Claim 3. The method of claim 1, wherein the shaping pattern comprises at least one void area.

Claim 4. The method of claim 1, further comprising:

providing a second support layer;

providing a second shaping pattern on the second support layer;

positioning the once polished substrate on the second shaping pattern;

performing a second CMP process on the once polished substrate positioned on the second shaping pattern; and

removing the twice polished substrate from the second shaping pattern.

Claim 5. The method of claim 4, wherein:

a first surface of the substrate is polished during the first CMP process; and

a second surface of the substrate is polished during the second CMP process.

Claim 6. The method of claim 5, wherein:

performing a first CMP process on the substrate comprises removing an increased amount of substrate material from a first substrate portion;

positioning the once polished substrate on the second shaping pattern comprises

aligning the first substrate portion with a positive feature of the second shaping pattern, and

positioning the first substrate portion on the positive feature; and

performing a second CMP process on the substrate comprises removing an increased amount of substrate material from a second substrate portion, the second substrate portion located on a portion of the substrate directly opposite to the first substrate portion.

Claim 7. The method of claim 1, wherein the first shaping pattern comprises:

at least one first positive feature; and

at least one first negative feature.

Claim 8. The method of claim 7, wherein the first shaping pattern comprises:

at least one second positive feature, the at least one first positive feature having a shape different from the shape of the at least one second positive feature.

Claim 9. The method of claim 7, wherein the first shaping pattern comprises:

at least one second positive feature, the at least one first positive feature having a thickness different from the thickness of the at least one second positive feature.

Claim 10. The method of claim 7, wherein the first shaping pattern comprises:

at least one second negative feature, the at least one first negative feature having a shape different from the shape of the at least one second negative feature.

Claim 11. The method of claim 7, wherein the first shaping pattern comprises:

at least one second negative feature, the at least one first negative feature having a thickness different from the thickness of the at least one second negative feature.

Claim 12. A method of shaping a substrate comprising:

providing a first shaping pattern on a first support layer;

positioning a substrate on the first shaping pattern;

performing a first chemical mechanical polishing (CMP) process on the substrate positioned on the first shaping pattern;

generating first pressure at a first location on an upper surface of the substrate as a result of the first shaping pattern;

generating a second pressure at a second location on the upper surface of the substrate as a result of the first shaping pattern, wherein the first pressure is greater than the second pressure;

removing an increased amount of material from the first location compared to the second location; and

removing the once polished substrate from the first shaping pattern.

Claim 13. The method of claim 12, wherein the substrate comprises a silicon based substrate.

Claim 14. The method of claim 12, wherein the first shaping pattern comprises:

at least one first positive feature; and

at least one first negative feature.

Claim 15. The method of claim 14, wherein the first shaping pattern comprises:

at least one second positive feature, the at least one first positive feature having a shape different from the shape of the at least one second positive feature.

Claim 16. The method of claim 14, wherein the first shaping pattern comprises:

at least one second positive feature, the at least one first positive feature having a thickness different from the thickness of the at least one second positive feature.

Claim 17. The method of claim 14, wherein the first shaping pattern comprises:

at least one second negative feature, the at least one first negative feature having a shape different from the shape of the at least one second negative feature.

Claim 18. The method of claim 14, wherein the first shaping pattern comprises:

at least one second negative feature, the at least one first negative feature having a thickness different from the thickness of the at least one second negative feature.

The invention claimed is:

1. A method of shaping a substrate comprising: providing a first support layer; providing a first shaping pattern on the first support layer; providing a substrate on the first shaping pattern; performing a first chemical mechanical polishing (CMP) process on the substrate positioned on the first shaping pattern; removing the once polished substrate from the first shaping pattern; providing a second support layer; providing a second shaping pattern on the second support layer; positioning the once polished substrate on the second shaping pattern; performing a second CMP process on the once polished substrate positioned on the second shaping pattern; and removing the twice polished substrate from the second shaping pattern.

2. The method of claim 1, wherein the substrate comprises a silicon based substrate.

3. The method of claim 1, wherein the shaping pattern comprises at least one void area.

4. The method of claim 1, wherein: a first surface of the substrate is polished during the first CMP process; and a second surface of the substrate is polished during the second CMP process.

5. The method of claim 4, wherein: performing a first CMP process on the substrate comprises removing an increased amount of substrate material from a first substrate portion; positioning the once polished substrate on the second shaping pattern comprises aligning the first substrate portion with a positive feature of the second shaping pattern, and positioning the first substrate portion on the positive feature; and performing a second CMP process on the substrate comprises removing an increased amount of substrate material from a second substrate portion, the second substrate portion located on a portion of the substrate directly opposite to the first substrate portion.

6. The method of claim 1, wherein the first shaping pattern comprises: at least one first positive feature; and at least one first negative feature.

7. The method of claim 6, wherein the first shaping pattern comprises: at least one second positive feature, the at least one first positive feature having a shape different from the shape of the at least one second positive feature.

8. The method of claim 6, wherein the first shaping pattern comprises: at least one second positive feature, the at least one first positive feature having a thickness different from the thickness of the at least one second positive feature.

9. The method of claim 6, wherein the first shaping pattern comprises: at least one second negative feature, the at least one first negative feature having a shape different from the shape of the at least one second negative feature.

10. The method of claim 6, wherein the first shaping pattern comprises: at least one second negative feature, the at least one first negative feature having a thickness different from the thickness of the at least one second negative feature.

11. A method of shaping a substrate comprising: providing a first shaping pattern on a first support layer, the first shaping pattern having at least one first negative feature surrounded by a first positive feature; positioning a substrate on the first shaping pattern; performing a first chemical mechanical polishing (CMP) process on the substrate positioned on the first shaping pattern; generating first pressure at a first location on an upper surface of the substrate as a result of the first shaping pattern; generating a second pressure at a second location on the upper surface of the substrate as a result of the first shaping pattern, wherein the first pressure is greater than the second pressure; removing an increased amount of material from the first location compared to the second location; and removing the once polished substrate from the first shaping pattern.

12. The method of claim 11, wherein the substrate comprises a silicon based substrate.

13. The method of claim 11, wherein the first shaping pattern comprises: a second positive feature, the first positive feature having a shape different from the shape of the second positive feature.

14. The method of claim 11, wherein the first shaping pattern comprises: a second positive feature, the first positive feature having a thickness different from the thickness of the second positive feature.

15. The method of claim 11, wherein the first shaping pattern comprises: at least one second negative feature, the at least one first negative feature having a shape different from the shape of the at least one second negative feature.

16. The method of claim 11, wherein the first shaping pattern comprises: at least one second negative feature, the at least one first negative feature having a thickness different from the thickness of the at least one second negative feature.