What is claimed is:

1. A method of semiconductor processing, comprising:

forming a silicon layer on a structure;

forming an opening through the silicon layer and into the structure; and

selectively forming a resistance variable material in the opening such that the resistance variable material does not form on the silicon layer.

2. The method of claim 1, wherein the method includes forming an oxygen barrier on the resistance variable material.

3. The method of claim 2, wherein forming the oxygen barrier includes sealing the resistance variable material in situ.

4. The method of claim 1, wherein selectively forming the resistance variable material includes:

reacting a germanium amidinate with NH_3; and

reacting $Sb(OR)_3$ with NH_3, wherein R is an alkyl.

5. The method of claim 1, wherein selectively forming the resistance variable material includes:

reacting a germanium amidinate with NH_3; and

reacting $Te(OR)_4$ with NH_3, wherein R is an alkyl.

6. The method of claim 1, wherein selectively forming the resistance variable material includes:

reacting $Ge(NR_2)_4$ with NH_3; and

reacting $Sb(OR)_3$ with NH_3;

wherein R is an alkyl.

7. The method of claim 1, wherein selectively forming the resistance variable material includes:

reacting $Ge(NR_2)_4$ with NH_3; and

reacting $Te(OR)_4$ with NH_3;

wherein R is an alkyl.

8. The method of any one of claims 1-7, wherein the opening has a width less than or equal to 35 nm.

9. A method of semiconductor processing, comprising:

depositing a silicon layer on a structure;

removing a portion of the silicon layer and a portion of the structure to form a cylindrical container therein; and

selectively depositing a phase change material in the cylindrical container such that no phase change material is deposited on the silicon layer.

10. The method of claim 9, wherein the method includes forming a cap in situ on the phase change material such that oxidation of the phase change material is prevented.

11. The method of claim 10, wherein the cap is an electrode.

12. The method of claim 9, wherein the phase change material is a Ge-Sb material.

13. The method of claim 9, wherein the phase change material is a Ge-Te material.

14. The method of any one of claims 9-13, wherein the cylindrical container has an aspect ratio greater than or equal to 2:1.

15. A method of semiconductor processing, comprising:

forming a structure on a substrate, wherein the substrate includes an electrode;

forming a silicon layer on the structure;

forming an opening through the silicon layer and the structure, wherein:

a surface of the electrode defines a bottom of the opening;

a first surface of the structure and a first surface of the silicon layer define a first sidewall of the opening; and

a second surface of the structure and a second surface of the silicon layer define a second sidewall of the opening; and

selectively forming a resistance variable material in the opening such that the resistance variable material does not form on the silicon layer.

16. The method of claim 15, wherein the method includes:

forming a cap in situ on the resistance variable material and silicon layer; and

removing a portion of the cap that is on the silicon layer.

17. The method of claim 16, wherein forming the cap in situ includes forming the cap in a same chamber in which the selective formation of the resistance variable material occurs.

18. The method of claim 15, wherein the method does not include removing any portion of the resistance variable material.

19. The method of claim 15, wherein selectively forming the resistance variable material includes selectively forming the resistance variable material such that the resistance variable material covers the bottom of the opening and the first and second surfaces of the structure but not the first and second surfaces of the silicon layer.

20. The method of any one of claims 15-19, wherein selectively forming the resistance variable material includes selectively forming the resistance variable material such that the resistance variable material fills a portion of the opening formed by the bottom of the opening and the first and second surfaces of the structure.

What is claimed is:

1. A method of semiconductor processing, comprising:

forming a silicon layer on a structure;

forming an opening through the silicon layer and into the structure;

forming in a selective area a resistance variable material in the opening such that the resistance variable material does not form on the silicon layer;

forming a cap in situ on the resistance variable material and silicon layer in a same chamber in which the formation of the resistance variable material occurs; and

removing a portion of the cap that is on the silicon layer.

2. The method of claim 1, wherein the method includes forming an oxygen barrier on the resistance variable material.

3. The method of claim 2, wherein forming the oxygen barrier includes sealing the resistance variable material in situ.

4. The method of claim 1, wherein forming the resistance variable material includes:

reacting a germanium amidinate with NH_3; and

reacting $Sb(OR)_3$ with NH_3, wherein R is an alkyl.

5. The method of claim 1, wherein forming the resistance variable material includes:

reacting a germanium amidinate with NH_3; and

reacting $Te(OR)_4$ with NH_3, wherein R is an alkyl.

6. The method of claim 1, wherein forming the resistance variable material includes:

reacting $Ge(NR_2)_4$ with NH_3; and

reacting $Sb(OR)_3$ with NH_3;

wherein R is an alkyl.

7. The method of claim 1, wherein forming the resistance variable material includes:

reacting $Ge(NR_2)_4$ with NH_3; and

reacting $Te(OR)_4$ with NH_3;

wherein R is an alkyl.

8. The method of claim 1, wherein the opening has a width less than or equal to 35 nm.

9. A method of semiconductor processing, comprising:

depositing a silicon layer on a structure;

removing a portion of the silicon layer and a portion of the structure to form a cylindrical container therein;

depositing in a selective area a phase change material in the cylindrical container such that no phase change material is deposited on the silicon layer;

forming a cap in situ on the phase change material and silicon layer in a same chamber in which the deposition of the phase change material occurs; and

removing a portion of the cap that is on the silicon layer.

10. The method of claim 9, wherein the method includes forming the cap in situ on the phase change material such that oxidation of the phase change material is prevented.

11. The method of claim 9, wherein the cap is an electrode.

12. The method of claim 9, wherein the phase change material is a Ge-Sb material.

13. The method of claim 9, wherein the phase change material is a Ge-Te material.

14. The method of claim 9, wherein the cylindrical container has an aspect ratio greater than or equal to 2:1.

15. A method of semiconductor processing, comprising:

forming a structure on a substrate, wherein the substrate includes an electrode;

forming a silicon layer on the structure;

forming an opening through the silicon layer and the structure, wherein:

a surface of the electrode defines a bottom of the opening;

a first surface of the structure and a first surface of the silicon layer define a first sidewall of the opening; and

a second surface of the structure and a second surface of the silicon layer define a second sidewall of the opening;

forming in a selective area a resistance variable material in the opening such that the resistance variable material does not form on the silicon layer;

forming a cap in situ on the resistance variable material and silicon layer in a same chamber in which the formation of the resistance variable material occurs; and

removing a portion of the cap that is on the silicon layer.

16. The method of claim 15, wherein the method does not include removing any portion of the resistance variable material.

17. The method of claim 15, wherein forming the resistance variable material includes forming the resistance variable material such that the resistance variable material covers the bottom of the opening and the first and second surfaces of the structure but not the first and second surfaces of the silicon layer.

18. The method of claim 15, wherein forming the resistance variable material includes forming the resistance variable material such that the resistance variable material fills a portion of the opening formed by the bottom of the opening and the first and second surfaces of the structure.