CLAIMS

1. A method of forming a semiconductor structure, the method comprising:

forming a first silicon oxide layer overlying a semiconductor substrate;

forming a first silicon layer overlying the first silicon oxide layer;

forming a silicon nitride layer overlying the first silicon layer;

forming a second silicon layer overlying the silicon nitride layer;

forming a second silicon oxide layer overlying the second silicon layer;

removing the silicon nitride layer;

removing the first silicon layer and the second silicon layer; and

forming a metal layer between each of the first silicon oxide layer and the second silicon oxide layer.

2. The method of forming a semiconductor structure of claim 1, wherein the silicon nitride layer is removed by a wet etch process.

3. The method of forming a semiconductor structure of claim 1, wherein the first silicon layer and the second silicon layer are removed by a dry etch process.

4. The method of forming a semiconductor structure of claim 1, wherein the second silicon layer and the second silicon oxide layer form a composite film characterized by a Young's modulus of greater than or equal to 90 GPa.

5. The method of forming a semiconductor structure of claim 1, wherein the metal layer comprises tungsten.

6. The method of forming a semiconductor structure of claim 1, further comprising:

forming a liner layer along the first silicon oxide layer and the second silicon oxide layer subsequent to removing the first silicon layer and the second silicon layer.

7. The method of forming a semiconductor structure of claim 1, wherein forming the first silicon oxide layer occurs in a first processing chamber, wherein removing the first silicon layer and the second silicon layer occurs in a second processing chamber, the method further comprising:

transferring the semiconductor substrate from the first processing chamber to the second processing chamber while maintaining vacuum conditions.

8. The method of forming a semiconductor structure of claim 1, wherein the first silicon oxide layer and the second silicon oxide layer are characterized by a thickness of less than or equal to 50 nm.

9. A method of forming a semiconductor structure, the method comprising:

forming a first silicon oxide layer overlying a semiconductor substrate;

forming a first amorphous silicon layer overlying the first silicon oxide layer;

forming a silicon nitride layer overlying the first amorphous silicon layer;

forming a second amorphous silicon layer overlying the silicon nitride layer;

forming a second silicon oxide layer overlying the second amorphous silicon layer;

removing the silicon nitride layer; and

converting the first amorphous silicon layer and the second amorphous silicon layer to a metal material respectively in contact with the first silicon oxide layer and the second silicon oxide layer.

10. The method of forming a semiconductor structure of claim 9, wherein the converting comprises:

flowing a metal-containing precursor to contact the first amorphous silicon layer and the second amorphous silicon layer; and

forming a volatile silicon-containing byproduct while forming a layer of the metal material.

11. The method of forming a semiconductor structure of claim 9, further comprising:

forming a layer of metal material extending between the first silicon oxide layer and the second silicon oxide layer.

12. The method of forming a semiconductor structure of claim 9, wherein the silicon nitride layer is removed by a wet etch process.

13. The method of forming a semiconductor structure of claim 9, wherein the first amorphous silicon layer and the second amorphous silicon layer are characterized by a thickness of less than or equal to 5 nm.