

CLAIMS

1. A processing method comprising:

depositing a glue layer comprising TiN with a thickness in a range of 1 Å to 30 Å on a substrate surface;

exposing the glue layer to a silicon precursor and a dopant to form a doped amorphous silicon layer at a temperature less than or equal to 100°C; and

forming a metal layer on the doped amorphous silicon layer.

2. The method of claim 1, wherein the substrate surface is exposed to the silicon precursor and the dopant simultaneously.

3. The method of claim 1, wherein the silicon precursor comprises a silane or a halosilane.

4. The method of claim 3, wherein the silane comprises one or more of silane, disilane, trisilane, tetrasilane, isotetrasilane, neopentasilane, cyclopentasilane, hexasilane or cyclohexasilane.

5. The method of claim 3, wherein the halosilane comprises one or more of dihalosilane, trihalosilane, tetrahalosilane, or hexahalodisilane.

6. The method of claim 5, wherein the halogen of the halosilane consists of chlorine.

7. The method of claim 1, wherein the doped amorphous silicon layer comprises one or more of boron, phosphorous, arsenic or germanium.

8. The method of claim 7, wherein the dopant comprises one or more of borane, diborane, phosphine, germane or digermane.

9. The method of claim 7, wherein the doped amorphous silicon layer comprises one or more of phosphorous, arsenic or germanium.

10. The method of claim 1, wherein the metal layer is deposited by atomic layer deposition.

11. The method of claim 1, wherein the metal layer is formed by exposing the doped amorphous silicon layer to a metal precursor and a reactant, the metal precursor comprising one or more of WF_6 and MoF_6 and the reactant comprising hydrogen.

12. The method of claim 1, wherein a thickness of the silicon layer is in the range of about 20 Å to about 100 Å.

13. The method of claim 1, wherein the metal layer comprises one or more of tungsten and molybdenum.

14. A processing method comprising:

providing a silicon substrate having a silicon oxide surface;

forming a glue layer on the silicon substrate, the glue layer comprising TiN with a thickness in the range of about 1 Å to about 30 Å;

forming a doped amorphous silicon layer on the glue layer by exposing the glue layer to a silicon precursor comprising disilane and a dopant comprising diborane, the substrate maintained at a temperature less than or equal to about 100°C; and forming a metal layer on the doped amorphous silicon layer.

15. The method of claim 14, wherein the metal layer is formed by atomic layer deposition.

16. The method of claim 15, wherein the metal layer comprises one or more of tungsten and molybdenum.

17. The method of claim 16, wherein the metal layer is deposited by exposing the doped amorphous silicon layer to a metal precursor and a reactant, the metal precursor comprising one or more of WF_6 and MoF_6 and the reactant comprising hydrogen.

18. A stack comprising:

a substrate having an oxide surface;

a glue layer comprising TiN on the oxide surface with a thickness in a range of 1 Å to 30 Å;

a doped amorphous silicon layer on the glue layer, the doped amorphous silicon layer comprising one or more of boron, phosphorous, arsenic or germanium; and

a metal layer directly on the doped amorphous silicon layer, the metal layer comprising one or more of tungsten or molybdenum.