Claims~~:~~

1. A method, comprising:

heating a substrate disposed in a process chamber to a temperature ranging from about 150 degrees Celsius to about 650 degrees Celsius;

flowing a ~~silane~~silicon-containing precursor into the process chamber;

depositing a first amorphous silicon layer on a bottom of a feature formed in the substrate and a second amorphous silicon layer on a surface of the substrate, a first portion of each sidewall of the feature being in contact with the first amorphous silicon layer and a second portion of each sidewall being exposed; and

removing the second amorphous silicon layer.

2. The method of claim 1, further comprising depositing a third amorphous silicon layer on the first amorphous silicon layer and a fourth amorphous silicon layer on the surface of the substrate.

3. The method of claim 2, further comprising removing the fourth amorphous silicon layer.

4. The method of claim 1, wherein the ~~silane~~silicon-containing precursor comprises a silane ~~and disilane.~~precursor.

5. The method of claim 1, wherein the first amorphous silicon layer and the second amorphous silicon layer are deposited by a plasma enhanced chemical vapor deposition process.

6. The method of claim 5, wherein a plasma power density of the plasma enhanced chemical vapor deposition process ranges from about 0.14 W/cm2 to about 2.83 W/cm2.

7. The method of claim 1, wherein the depositing and the removing ~~processes~~ are performed in a single process chamber.

~~8. The method of claim 7, wherein the single process chamber is a plasma enhanced chemical vapor deposition chamber.~~

~~9~~8. The method of claim 1, wherein the removing the second amorphous silicon layer comprises a plasma etch process.

~~10. The method of claim~~ 9. The method of claim 8, wherein the plasma etch process utilizes hydrogen gas as an etchant.

~~11~~10. The method of claim ~~9~~8, wherein a plasma power density of the plasma etch process ranges from about 0.14 W/cm2 to about 2.83 W/cm2.

~~12. A~~11. The method~~, comprising:~~

~~heating a~~ of claim 1, wherein the substrate ~~disposed in a process chamber~~is heated to a temperature ~~ranging from~~of about 200 degrees Celsius to about 550 degrees Celsius~~;~~

~~flowing silane or disilane into the process chamber;~~

~~forming~~ and a plasma ~~in the process chamber; and~~

~~depositing a first amorphous silicon layer on a bottom of a feature~~is formed in the ~~substrate, the feature having one or more sidewalls, the first amorphous silicon layer being in contact with a first portion of each sidewall of the feature and a second portion of each sidewall being exposed.~~

~~13. The method of claim 12, wherein a plasma power density ranges from about 0.14 W/cm^2 to about 2.83 W/cm^2.~~

~~14. A method, comprising:~~

~~depositing a first amorphous silicon layer on a bottom of a feature formed in a substrate and a second amorphous silicon layer on a surface of the substrate, a first portion of each sidewall of the feature being in contact with the first amorphous silicon layer and a second portion of each sidewall being exposed, the depositing the first and second amorphous silicon layers comprising:~~

~~heating the substrate disposed in a process chamber to a temperature ranging from about 150 degrees Celsius to about 650 degrees Celsius; and~~

~~flowing a silane-containing precursor into the process chamber;~~

~~removing the second amorphous silicon layer; and~~

~~repeating the depositing the first and second amorphous silicon layers and removing the second amorphous silicon layer until the feature is filled with amorphous silicon.~~

~~15. The method of claim 14, wherein the first amorphous silicon layer and the second amorphous silicon layer are deposited by a plasma enhanced chemical vapor deposition process, and wherein a plasma power density of the plasma enhanced chemical vapor deposition process ranges from about 0.14 W/cm^2 to about 2.83 W/cm^2.~~
process chamber.