CLAIMS

1. A method of forming an electronic device, the method comprising:

pre-cleaning the electronic device;

selectively depositing a metal layer on a bottom portion of an opening in an insulating layer on a first metallization layer, the opening comprising a trench and a via, the insulating layer comprising the opening extending from a top surface of the insulating layer to the first metallization layer, the opening having at least one sidewall, a top portion, and the bottom portion that is the via, the bottom portion not comprising a bottom barrier layer, the metal layer extending to the first metallization layer, wherein the metal layer does not form in the top portion of the opening;

selectively depositing a barrier layer on the at least one sidewall of the top portion of the opening and not on the metal layer and not on the bottom portion that is the via of the opening; and

forming a second metallization layer in the top portion of the opening on the metal layer and on the barrier layer, the method being performed in a cluster tool without breaking vacuum,

wherein the selectively depositing the barrier layer comprises forming a blocking layer on the metal layer and not the insulating layer;

wherein the forming the blocking layer comprises exposing the metal layer to a planar hydrocarbon; and

wherein the planar hydrocarbon comprises one or more of anthracene, benzene, naphthalene, toluene, ethylbenzene, phenanthrene, and mesitylene.

2. The method of claim 1, further comprising exposing the electronic device to a plasma to remove the blocking layer.

3. The method of claim 1, wherein the first metallization layer, the second metallization layer, and the metal layer independently comprise a metal selected from one or more of

copper (Cu), cobalt (Co), ruthenium (Ru), iridium (Ir), rhodium (Rh), molybdenum (Mo), tungsten (W), aluminum (Al), nickel (Ni), and platinum (Pt).

4. The method of claim 3, wherein the first metallization layer and the second metallization layer comprise the same metal.

5. The method of claim 1, wherein the insulating layer comprises one or more of silicon dioxide, silicon oxide, carbon doped oxide, silicon carbide, silicon nitride (SiN).

6. The method of claim 1, wherein one or more of the metal layer and the second metallization layer comprises molybdenum (Mo).

7. The method of claim 1, further comprising:

before selectively depositing the barrier layer on the at least one sidewall of the top portion, pre-cleaning the metal layer to remove a native oxide from a top surface of the metal layer.