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(54) **METHOD OF FORMING A PATTERNED SUBSTANTIALLY CRYSTALLINE TA_2O_5 COMPRISING MATERIAL, AND METHOD OF FORMING A CAPACITOR HAVING A CAPACITOR DIELECTRIC REGION COMPRISING SUBSTANTIALLY CRYSTALLINE TA_2O_5 COMPRISING MATERIAL**

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(52) **U.S. Cl.** **438/487**; 438/486
(58) **Field of Search** 438/459, 486, 438/487, 240

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(57) **ABSTRACT**

In part, disclosed are semiconductor processing methods, methods of depositing a tungsten comprising layer over a substrate, methods of depositing a tungsten nitride comprising layer over a substrate, methods of depositing a tungsten silicide comprising layer over a substrate, methods of forming a transistor gate line over a substrate, methods of forming a patterned substantially crystalline Ta_2O_5 comprising material, and methods of forming a capacitor dielectric region comprising substantially crystalline Ta_2O_5 comprising material. In one implementation, a semiconductor processing method includes forming a substantially amorphous Ta_2O_5 comprising layer over a semiconductive substrate. The layer is exposed to WF_6 under conditions effective to etch substantially amorphous Ta_2O_5 from the substrate. In one implementation, the layer is exposed to WF_6 under conditions effective to both etch substantially amorphous Ta_2O_5 from the substrate and deposit a tungsten comprising layer over the substrate during the exposing.

30 Claims, 7 Drawing Sheets