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(54) METHOD OF ETCHING A SUBSTANTIALLY AMORPHOUS TA_2O_5 COMPRISING LAYER

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(58) **Field of Search** 438/459

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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.

13 Claims, 7 Drawing Sheets