Claims:

1. A method of depositing a dielectric oxide layer atop one or more substrates in one or more film stacks in a physical vapor deposition (PVD) chamber, comprising:

sputtering source material from a target assembly onto a first substrate while the source material is at a first erosion state and while providing a first amount of RF power to the target assembly to deposit a dielectric oxide layer onto a first substrate having a desired resistance-area; and

subsequently sputtering source material from the target assembly onto a second substrate while the source material is at a second erosion state and while providing a second amount of RF power to the target assembly, wherein the second amount of RF power is lower than the first amount of RF power by a predetermined amount calculated to maintain the desired resistance-area.

2. The method of claim 1, wherein the predetermined amount is calculated to maintain a desired resistance-area of the one or more film stacks over a lifespan of the target assembly.

3. The methods of claims 1 or 2, wherein the source material at the second erosion state is partially or substantially eroded.

4. The methods of any of claims 1-3, wherein source material at the first erosion state is substantially uneroded.

5. The methods of any of claims 1-4,, wherein the first amount of RF power provided to the target assembly at the first erosion state is decreased at a linear rate to the second amount of RF power provided to the target assembly at the second erosion state.

6. The methods of any of claims 1-5,, wherein the source material is one of magnesium, magnesium oxide, titanium (Ti), tantalum (Ta), cobalt (Co), tungsten (W), or aluminum (Al).

7. The methods of any of claims 1-6,, further comprising providing a plasma forming gas comprising one or more of argon (Ar), helium (He), xenon (Xe), neon (Ne), hydrogen (H_2), nitrogen (N_2), or oxygen (O_2) while sputtering source material.

8. The methods of any of claims 1-7, wherein the first amount of RF power is about 500 W to about 20000 W.

9. The method of claim 8, wherein second amount of RF power is about 1 to 200 W lower than the first amount of RF power.

10. A method of depositing a magnesium oxide layer atop one or more substrates in a physical vapor deposition (PVD) chamber, comprising:

sputtering magnesium oxide source material from a target assembly onto a first substrate while the magnesium oxide source material is at a first erosion state and while providing a first amount of RF power to the target assembly to deposit a magnesium oxide layer onto the first substrate having a desired resistance-area; and

subsequently sputtering magnesium oxide source material from the target assembly onto a second substrate while the magnesium oxide source material is at a second erosion state and while providing a second amount of RF power to the target assembly, wherein the second amount of RF power is lower than the first amount of RF power by a predetermined amount calculated to maintain a desired resistance-area.

11. The method of claim 10, wherein the desired resistance-area of the first substrate and second substrate is between 2 and 20 ohm[um^2].

12. The method of claims 10 to 11, wherein the desired resistance-area has a consistency of ± 0.2 ohm[um^2] throughout the life of a target assembly.

13. The method of any of claims 10 to 12, wherein the magnesium oxide source material at the first erosion state has not been substantially eroded and wherein the magnesium oxide source material at the second erosion state has been substantially eroded.

14. A method of depositing a dielectric oxide layer atop one or more substrates in a physical vapor deposition (PVD) chamber, comprising:

sputtering source material from a target assembly onto a first substrate for a first deposit duration while the source material is at a first erosion state and while providing a first amount of RF power to the target assembly to deposit a first dielectric oxide layer onto a first substrate having a desired resistance-area; and

subsequently sputtering source material from the target assembly to deposit a second dielectric oxide layer having the desired resistance-area onto a second substrate for a second deposit duration while the source material is at a second erosion state and while providing the first amount of RF power to the target assembly, wherein the second deposit duration is lower than the first deposit duration by a predetermined amount calculated to maintain the desired resistance-area.

15. The method of claim 14, wherein the desired resistance-area of the one or more substrates has a consistency of ± 0.2 ohm[um^2] throughout the life of a target assembly.

Claims

1. An invention not claimed in any divisional application.