

ABSTRACT

The present invention discloses a thin-film deposition apparatus. Upon the completion of one thin-film deposition, a rotating mechanism drives a heating tray to rotate together with a substrate from a first angular position to a second angular position; upon the completion of the rotation, the heating tray is separated from the substrate, and the substrate is supported by a support ring; the rotating mechanism drives the heating tray to rotate to a third angular position, while the support ring and the substrate remain at the second angular position; after the heating tray contacts the substrate, the next thin-film deposition is performed. The present invention compensates for the non-uniform thickness of the thin films deposited on the substrate, achieves the uniformity and stability of PECVD layer-stack thin-film deposition, and avoids the phenomenon that the through-holes to be etched on the thin films deposited on the substrate deviate from the vertical direction during subsequent etching process, thereby further ensuring the performance stability of the semiconductor device.