

# Low-Temperature Microwave Annealing Process for Dopant Activation and Thermal Stability of TiN Material

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## Abstract

In this study, using microwave annealing for dopant activation and thermal stability of the TiN gate electrode is investigated. Workfunction shift of TiN materials was suppressed due to the low temperature process. Implanted species, such as phosphorus, arsenic, and boron, can also be well-activated and diffusionless in Si after microwave annealing. Moreover, analysis of X-ray diffraction intensity can be used to explain the workfunction shift of the TiN materials.

Keyword : Microwave Annealing, Dopant Activation, Thermal Stability, TiN