

ABSTRACT OF THE DISCLOSURE

A semiconductor device includes an active region in a substrate, at least one nano-sheet on the substrate and spaced apart from a top surface of the active region, a gate above or below the nano-sheet, a gate insulating layer between the at least one nano-sheet and the gate, and source/drain regions on the active region at both sides of the at least one nano-sheet. The at least one nano-sheet includes a channel region; a gate disposed above or below the nano-sheet and including a single metal layer having different compositions of metal atoms of a surface and an inside thereof; a gate insulating layer between the nano-sheet and the gate; and source/drain regions disposed in the active region of both sides of the at least one nano-sheet.

FIG. 2