

## ABSTRACT

A semiconductor device includes a stack structure of alternating interlayer insulating layers and gate electrodes, a separation structure vertically penetrating the stack structure and extending in a first direction, to separate the gate electrodes in a second direction, and vertical structures vertically penetrating the stack structure and arranged at a constant pitch. The vertical structures are arranged along array lines sequentially arranged in the second direction away from a side of the separation structure in a plan view. The vertical structures include a channel structure including a channel layer, a contact structure including a metal plug having an upper surface on a level higher than that of an upper surface of the channel structure, and a dummy structure disposed adjacent to the contact structure. The channel structure, the dummy structure, and the contact structure are disposed to be aligned with each other on at least one of the array lines.

FIG. 2B