

ABSTRACT

A stack structure includes conductive layer patterns and interlayer insulating layer patterns alternately stacked on one another. A channel hole penetrates the stack structure. A dielectric layer is disposed on a sidewall of the channel hole. A channel layer is disposed on the dielectric layer and in the channel hole. A passivation layer is disposed on the channel layer and in the channel hole. The channel layer is interposed between the passivation layer and the dielectric layer. An air gap is surrounded by the passivation layer. A width of the air gap is larger than a width of the passivation layer.

FIG. 2