

ABSTRACT

A non-volatile memory device includes a substrate, a stack structure that includes a first gate layer that extends in a horizontal direction and a second gate layer that extends in the horizontal direction and is disposed apart from the first gate layer in a vertical direction, a plurality of first channel structures that penetrate in the vertical direction through a first channel region of the stack structure, a plurality of second channel structures that penetrate in the vertical direction through a second channel region of the stack structure, a first anti-fuse structure and a second anti-fuse structure that each penetrate in the vertical direction through an anti-fuse region of the stack structure, a first anti-fuse transistor that is electrically connected to the first gate layer through the first anti-fuse structure, and a second anti-fuse transistor that is electrically connected to the second gate layer through the second anti-fuse structure.

FIG. 4