

ABSTRACT OF THE DISCLOSURE

A non-volatile memory device may include a first semiconductor layer including a peripheral region, the peripheral region including one or more peripheral transistors on a lower substrate. The non-volatile memory device may further include a second semiconductor layer on the peripheral region, the second semiconductor layer including an upper substrate, the second semiconductor layer further including a memory cell array on the upper substrate. The upper substrate may include a first upper substrate on the first semiconductor layer, a first layer on the first upper substrate, and a second upper substrate on the first layer.

FIG. 4A