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(54) **SEMICONDUCTOR DIE AND METHOD FOR FORMING THE SAME**

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(57) **ABSTRACT**

The method includes forming a multi-layered stack having insulating layers and spacer layers alternately stacked on top of each other in a vertical direction over a substrate in a chip area having a first memory region and a second memory region; forming a first mask layer covering the second memory region, while leaving the first memory region partially exposed; etching the multi-layered stack to form first trenches in the first memory region; forming first gate layers, a first memory layer, and a first channel layer; removing the first mask layer; forming a second mask layer covering the first memory region, while leaving the second memory region partially exposed; etching the multi-layered stack to form second trenches; forming second gate layers, a second memory layer, and a second channel layer in the second trenches.