

## **ABSTRACT**

### **VERTICAL SEMICONDUCTOR DEVICE AND FABRICATION METHOD THEREOF**

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A method for fabricating semiconductor device includes forming an alternating stack that includes a lower multi-layered stack and an upper multi-layered stack by alternately stacking a dielectric layer and a sacrificial layer over a substrate; forming a vertical trench that divides the upper multi-layered stack into dummy stacks; forming an asymmetric stepped trench that is extended downward from the vertical trench to divide the lower multi-layered stack into a pad stack and a dummy pad stack, wherein forming the asymmetric stepped trench includes forming a first stepped sidewall that is defined at an edge of the pad stack; and forming a second stepped sidewall that is defined at an edge of the dummy pad stack and occupies a less area than the first stepped sidewall.

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FIG. 1C