

ABSTRACT

SEMICONDUCTOR MEMORY DEVICE AND MANUFACTURING METHOD THEREOF

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A process of forming a 3D memory device includes forming a stacked structure with a plurality of stacked layers, etching the stacked structure to form stepped trenches each comprising a plurality of steps, forming a hard mask layer with a plurality of openings over the stepped
10 trenches, forming a photoresist layer over the hard mask layer, and etching through the plurality of openings using the hard mask layer and the photoresist layers as an etch mask to extend a bottom of the stepped trenches to a lower depth.

15 FIG. 5A