

FIG. 1

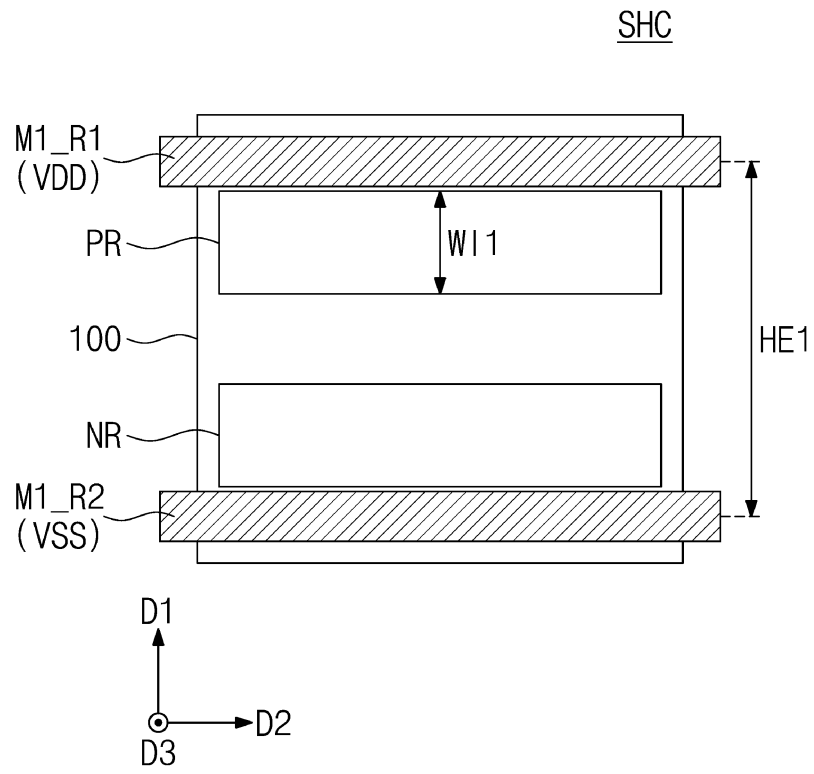


FIG. 2

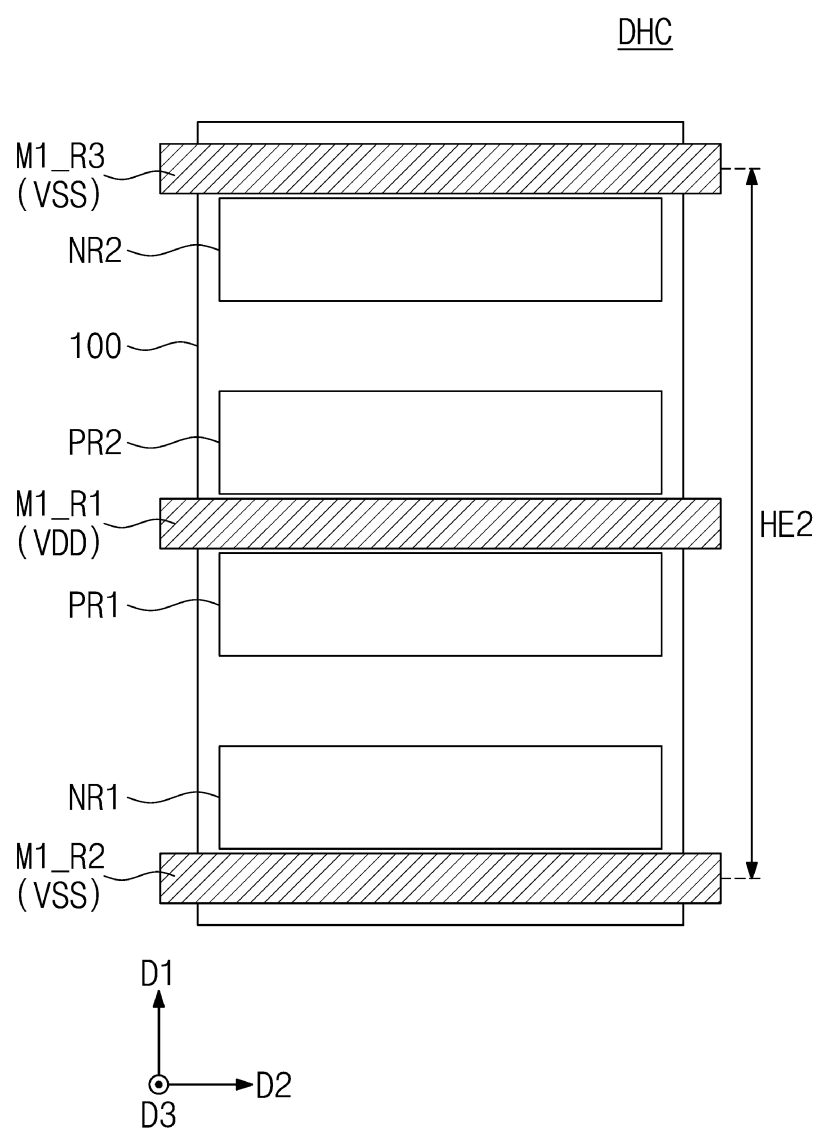


FIG. 3

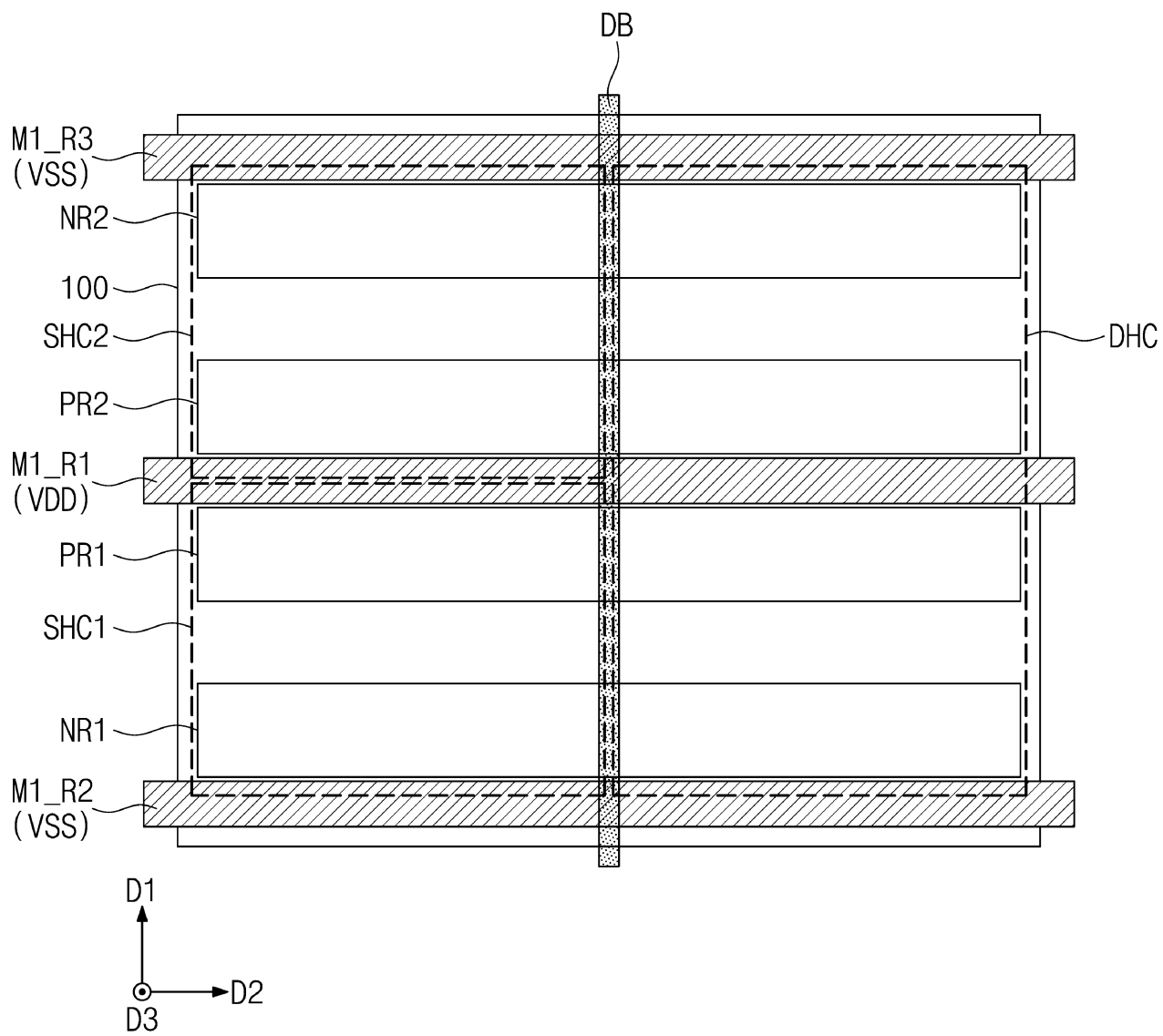
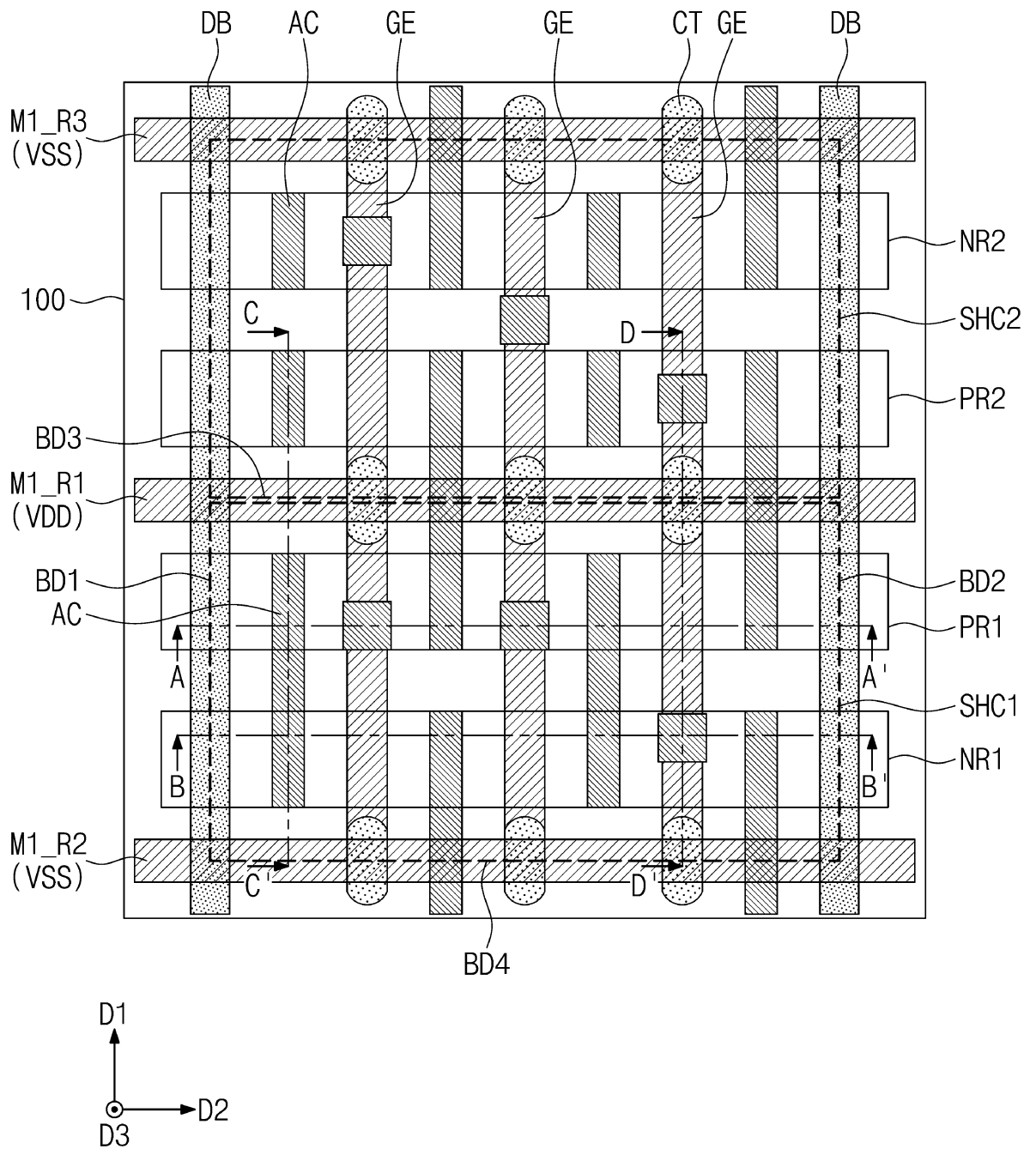


FIG. 4



This cross-sectional view shows the device structure along line A-A'. The substrate 100 is at the base. A series of layers and structures are built upon it: a DB layer, a SC layer, a GI layer, a GE(P04) layer, a GS layer, a UIP layer, a GC layer (containing BM and FM sub-layers), a BM layer, an FM layer, a GP layer, and an AC layer. Above these are two main metal layers, M1 and M2, with interconnects VI1 and VI2. M1_I and M2_I are specific regions of these metal layers. The top surface is labeled 140. A dashed line L indicates a specific depth or interface. The structure is divided into several functional regions: SD1 (containing BFL and MAL), GE (containing P01, P02, and P03), CH1 (containing SP2 and SP1), and RS1 (containing SP3). A bracket labeled AP1 groups the SD1, GE, CH1, and RS1 regions. A coordinate system at the bottom left shows D3 as the vertical axis and D2 as the horizontal axis.

FIG. 5B

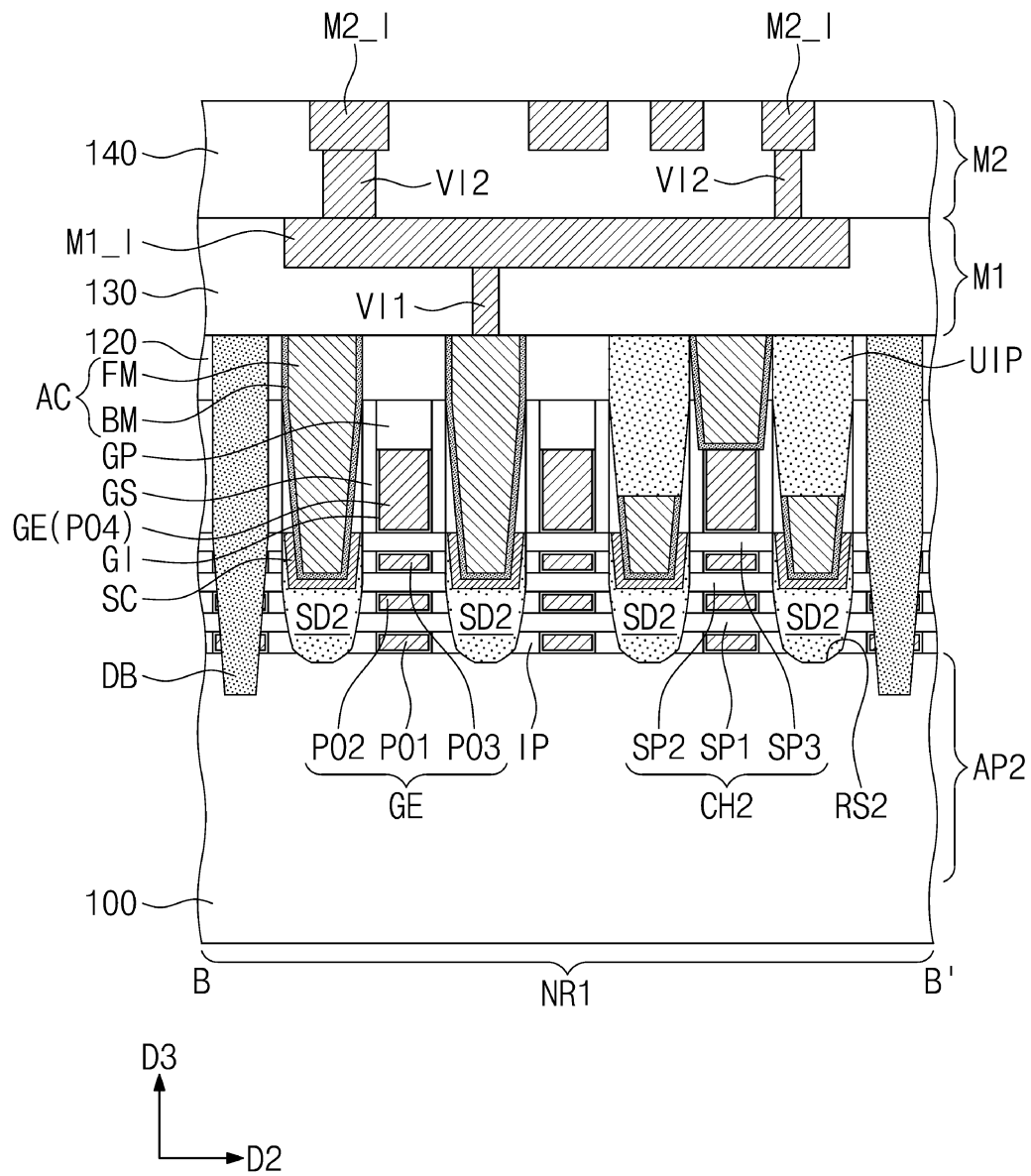


FIG. 5C

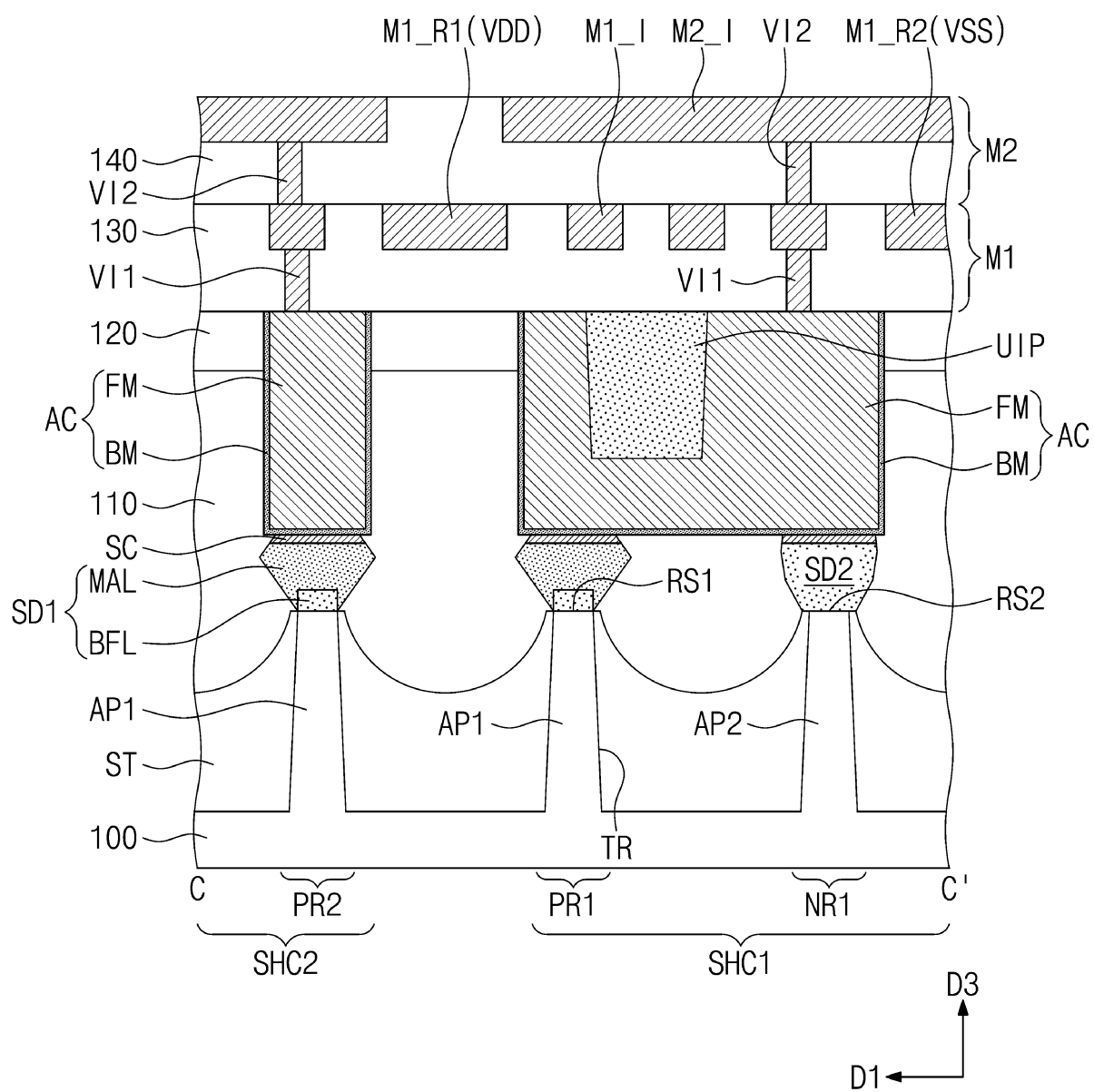


FIG. 5D

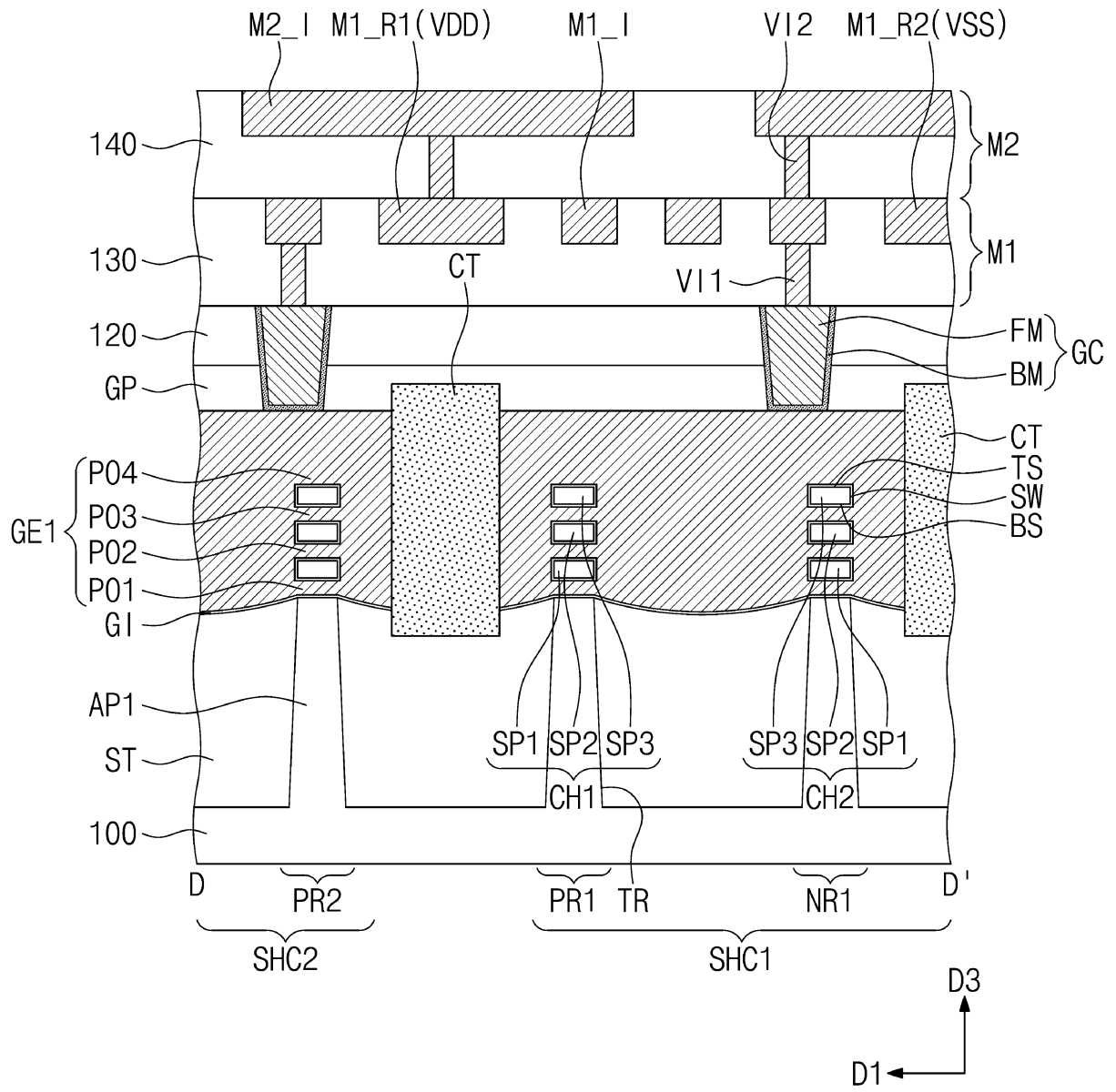


FIG. 6

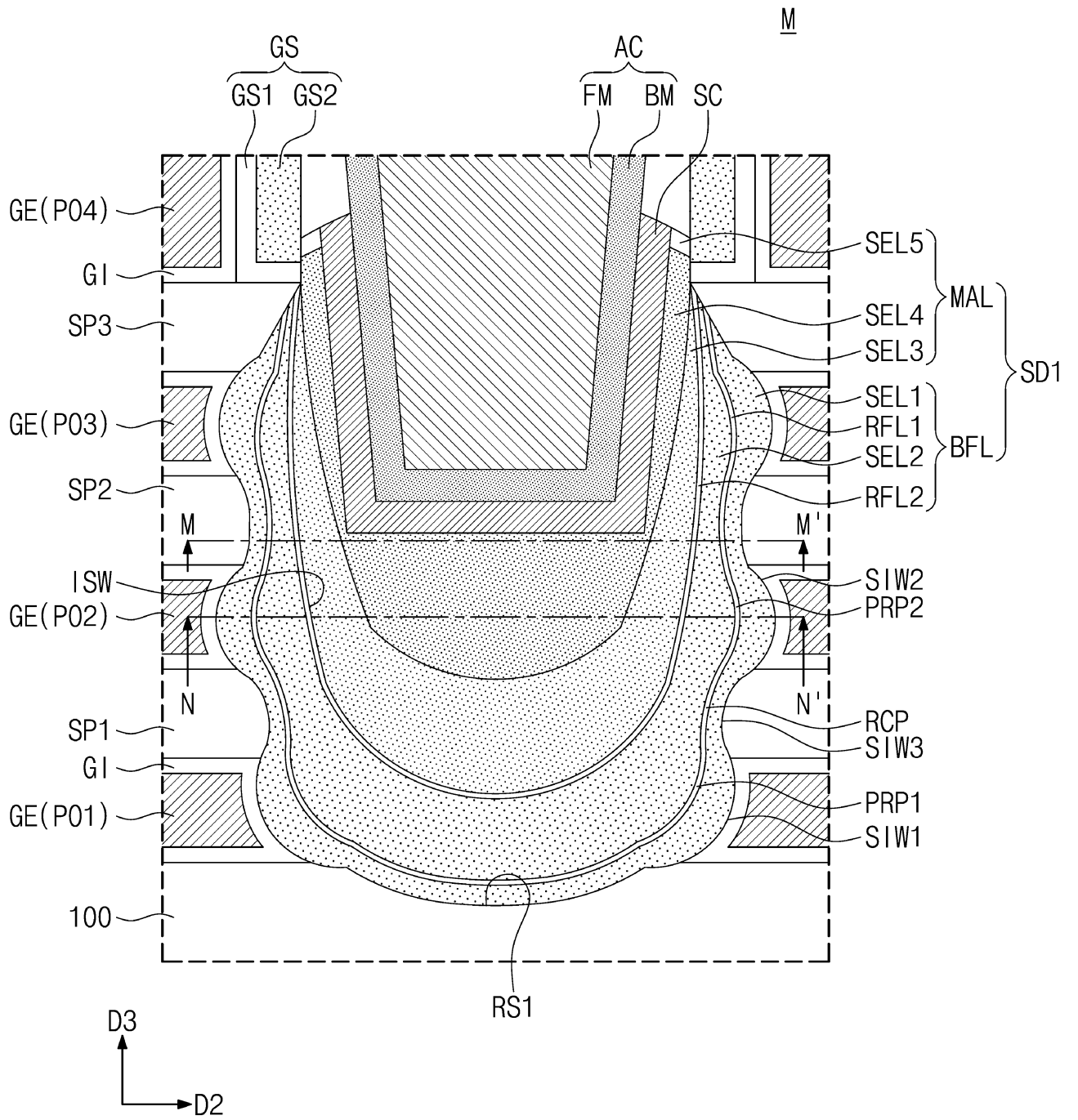


FIG. 7A

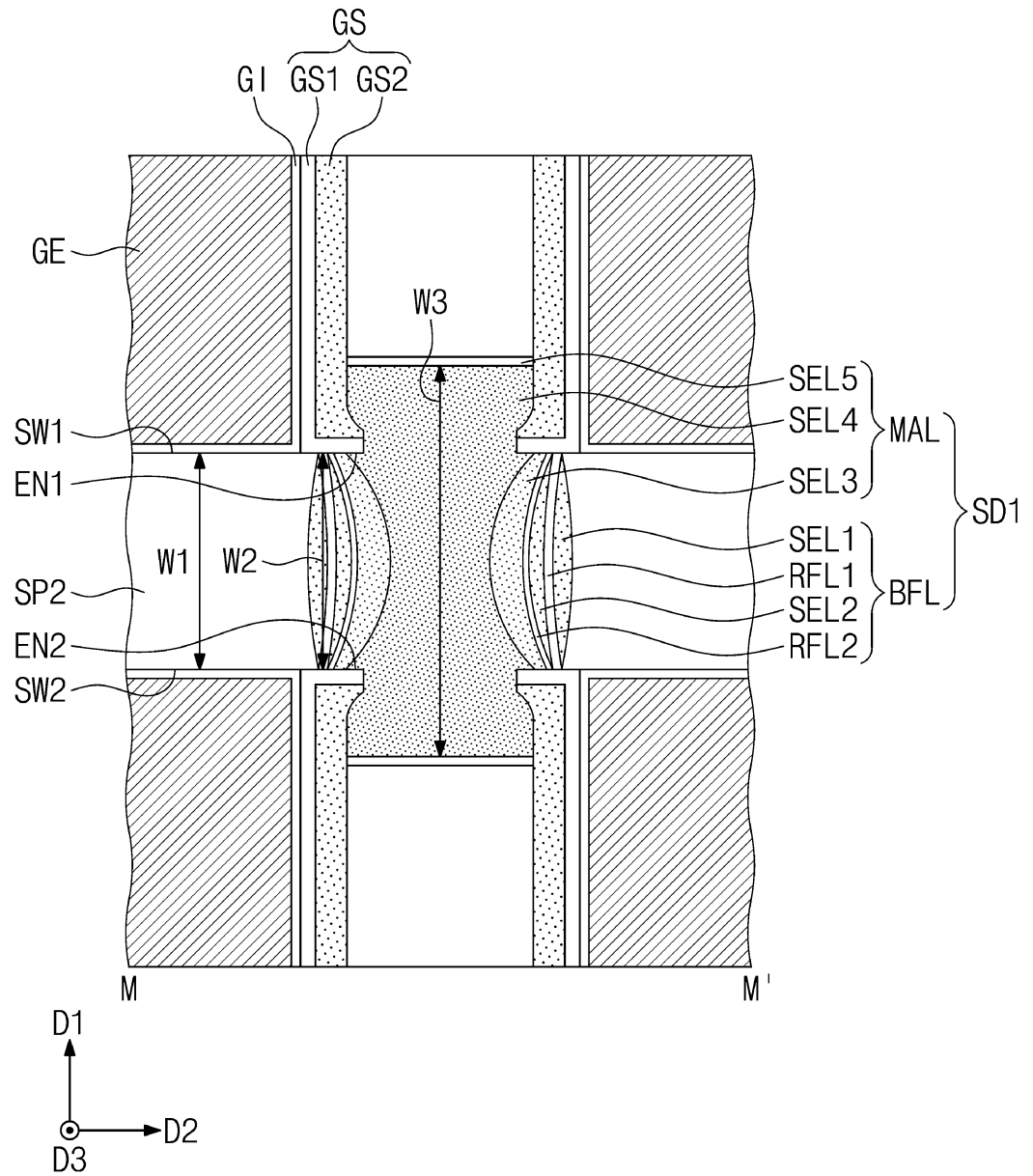


FIG. 7B

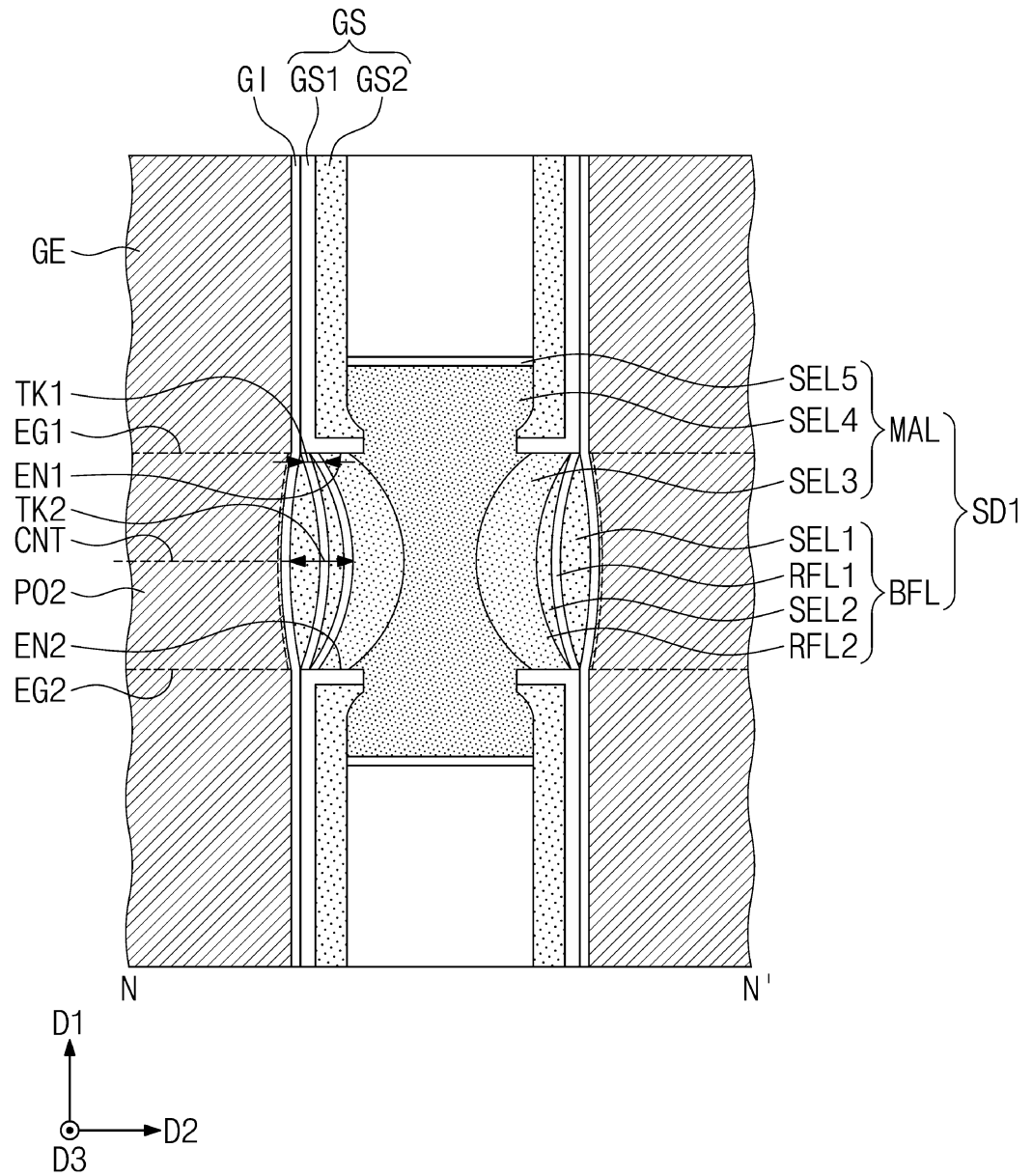


FIG. 8

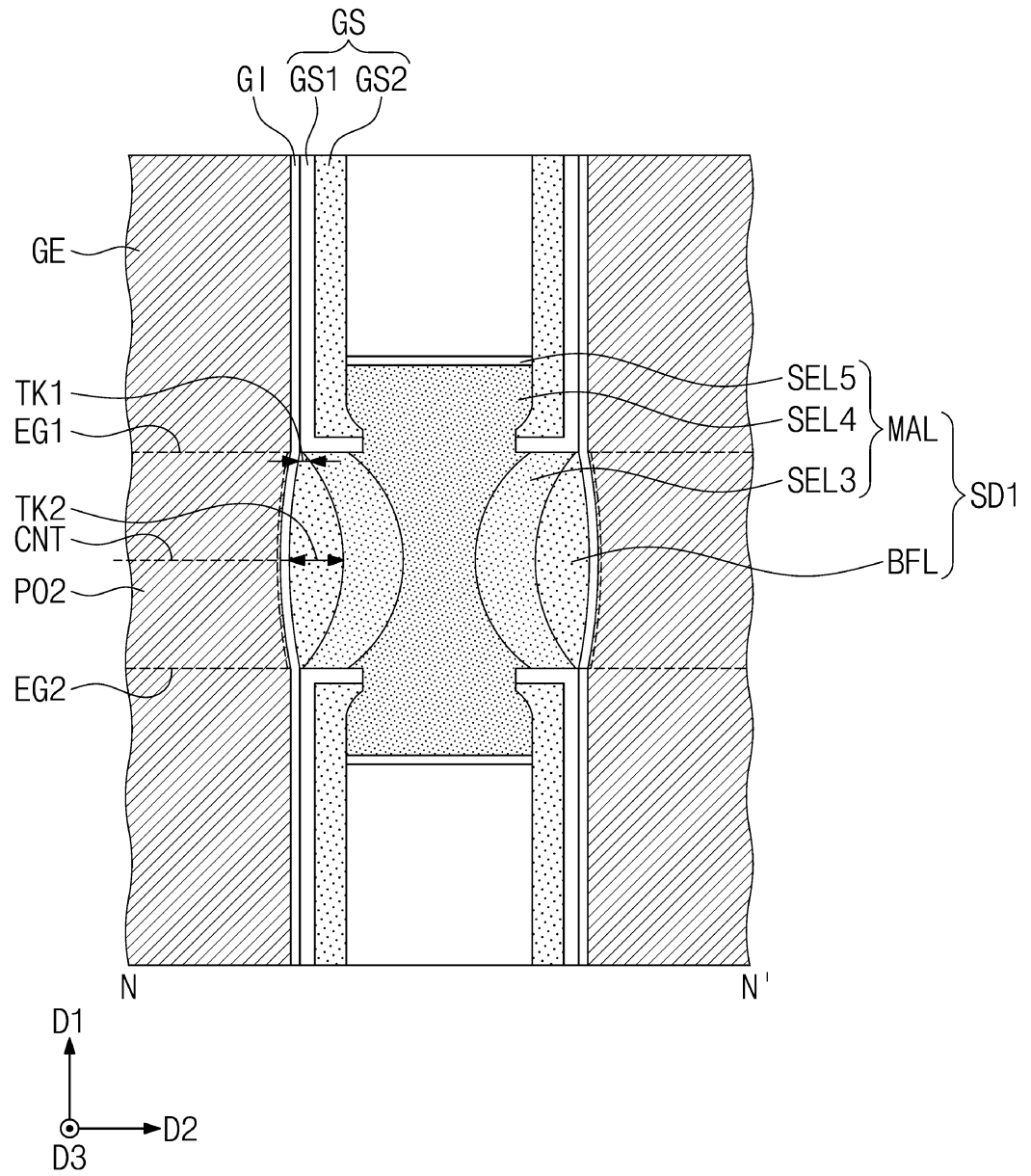


FIG. 9A

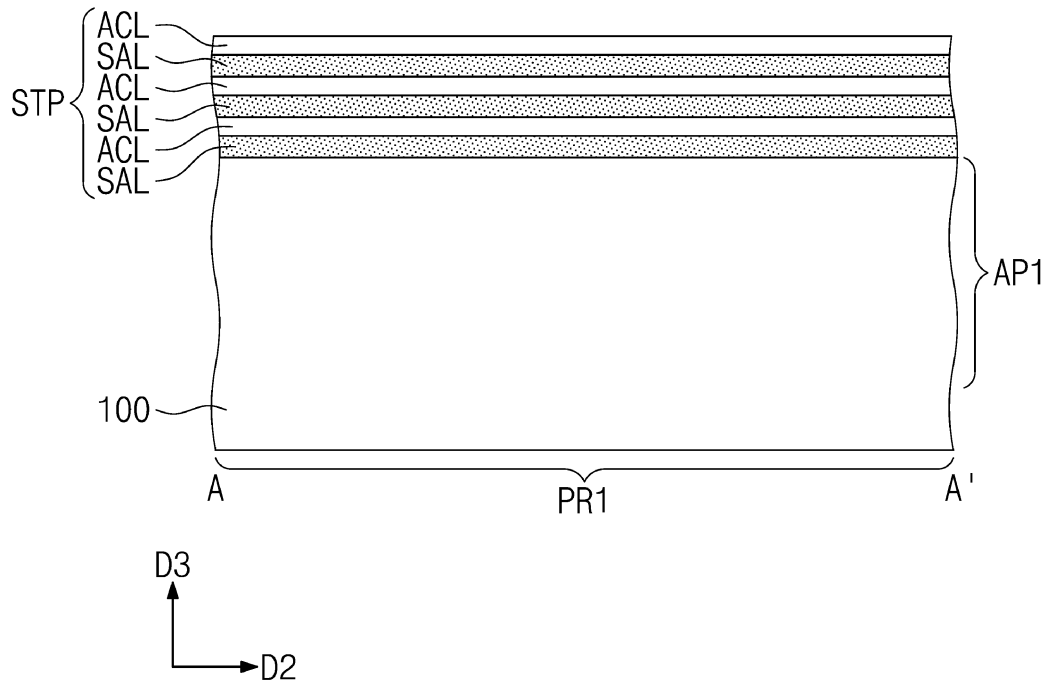


FIG. 9B

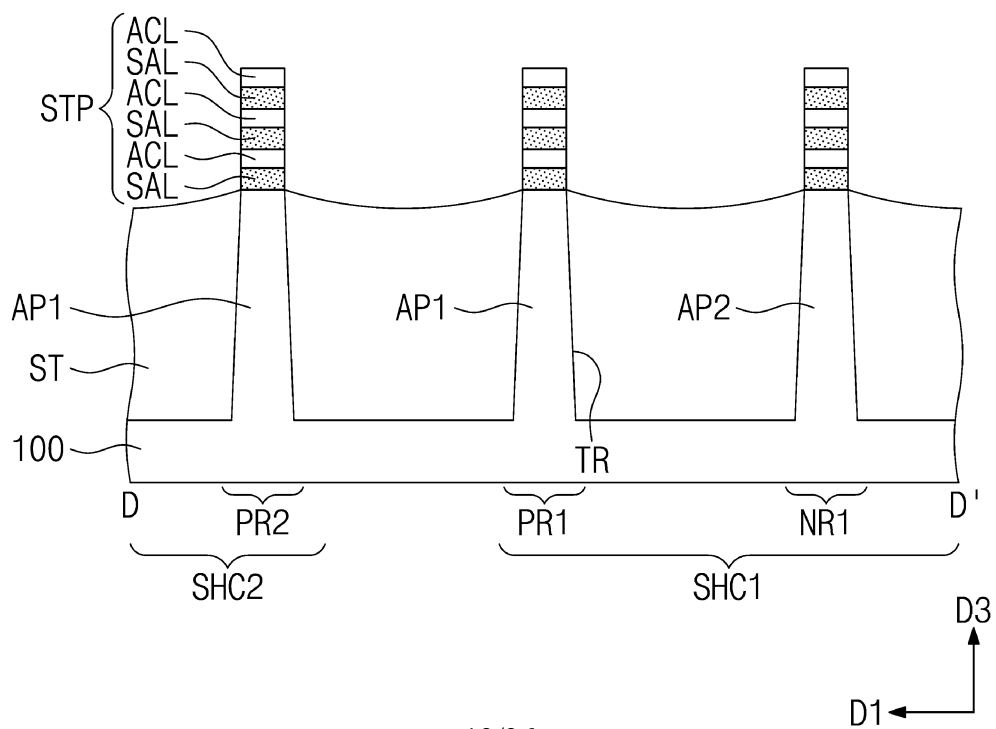


FIG. 10A

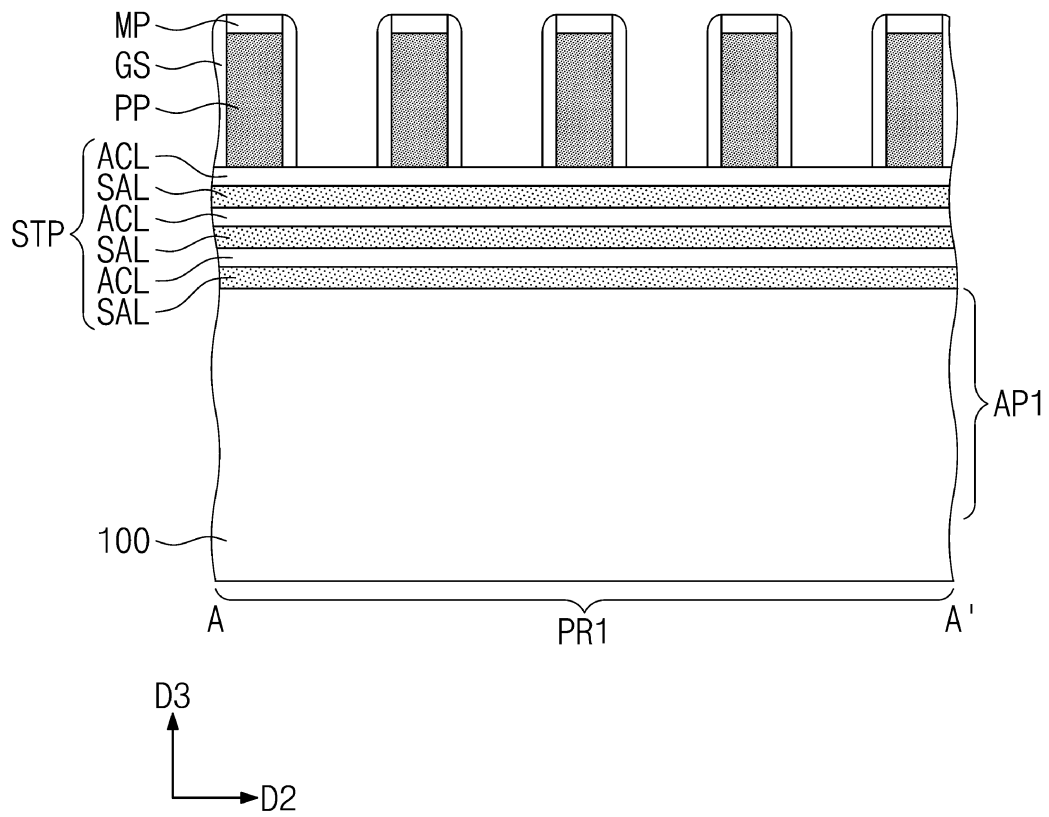


FIG. 10B

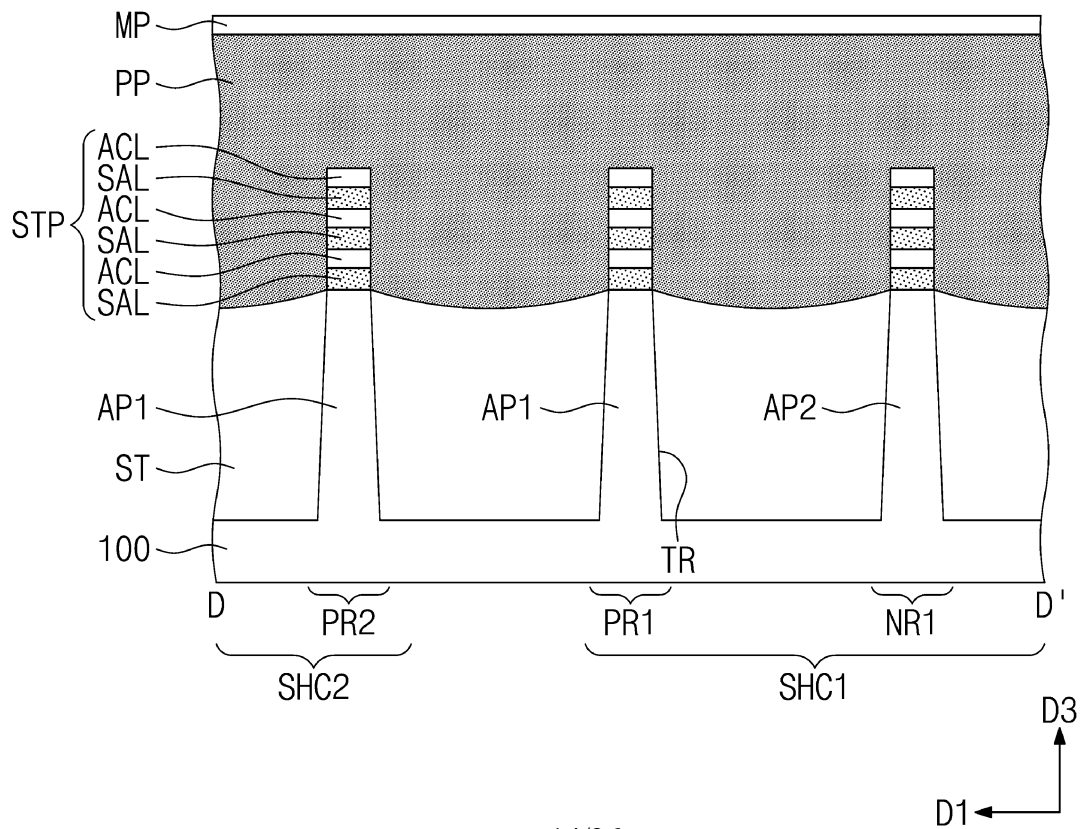


FIG. 11A

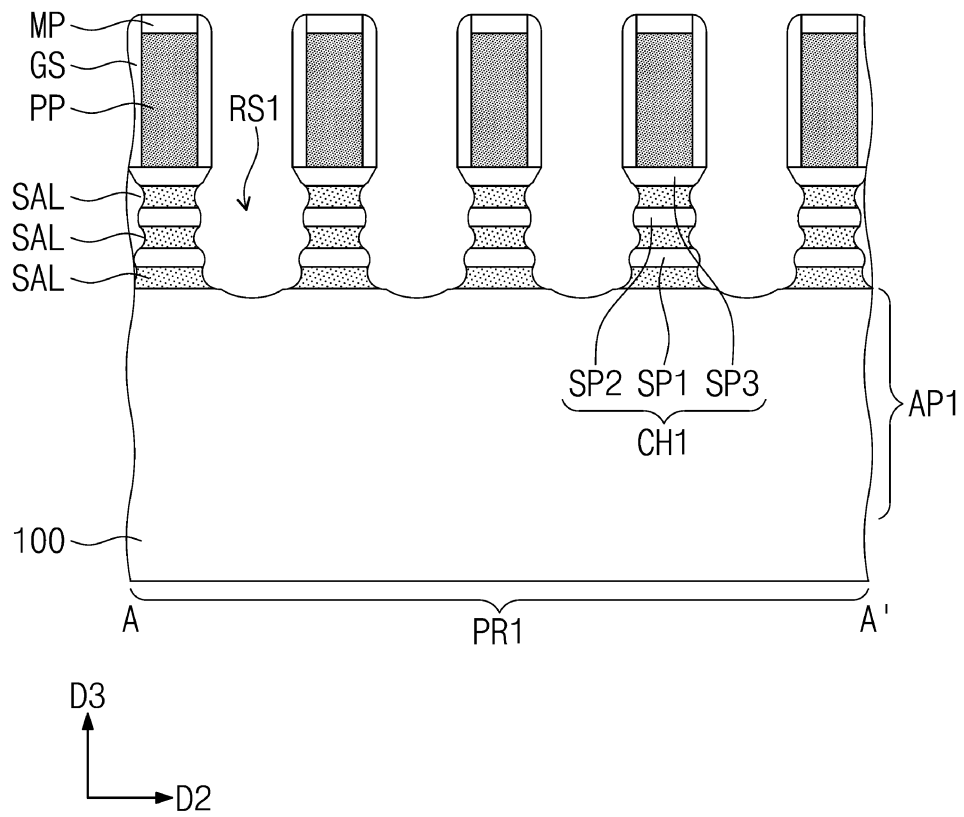


FIG. 11B

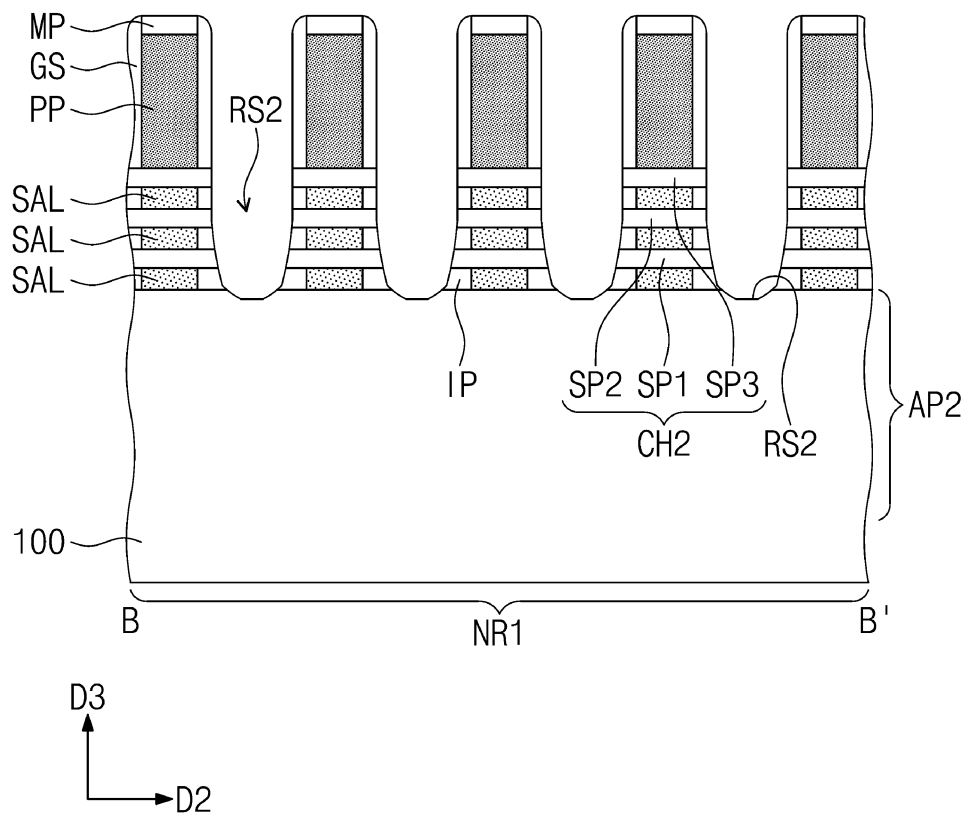


FIG. 11C

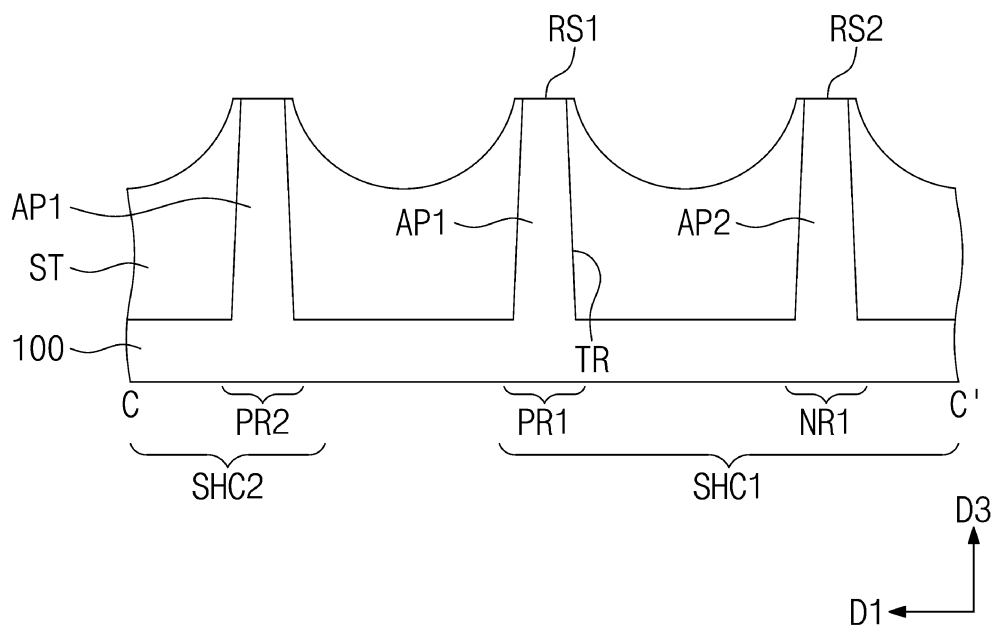


FIG. 11D

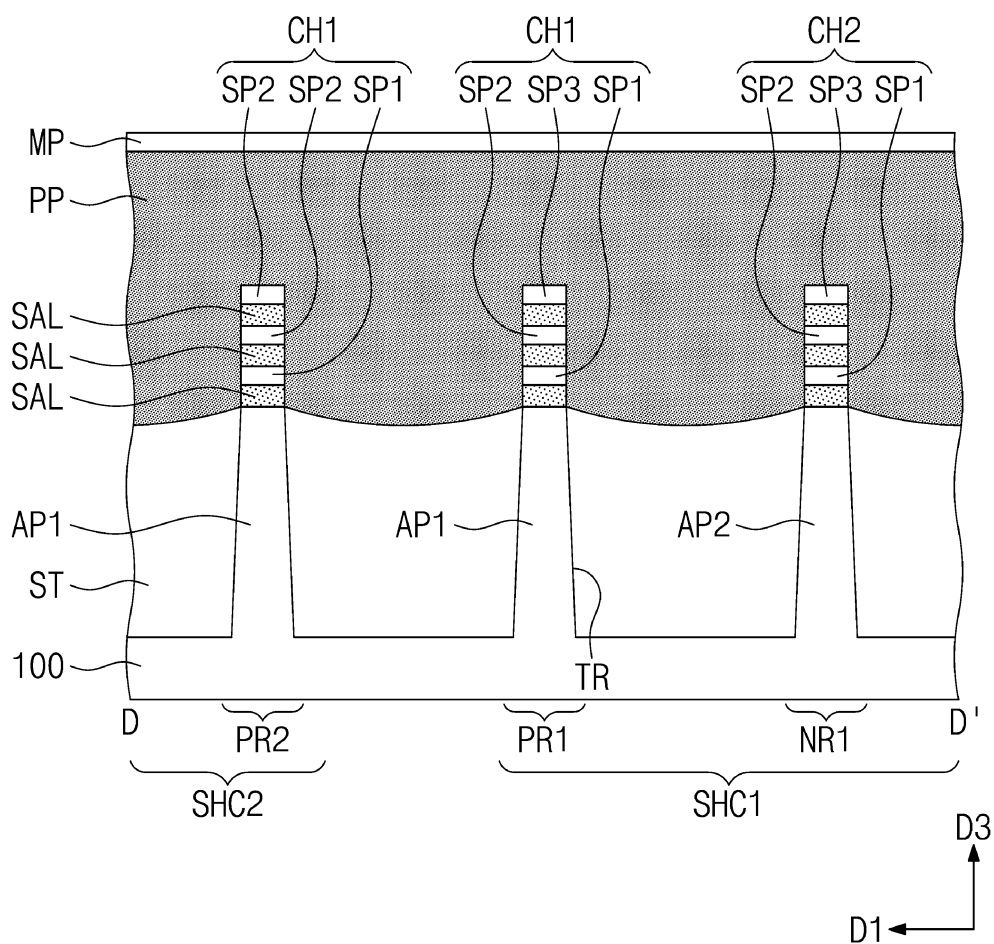


FIG. 12A

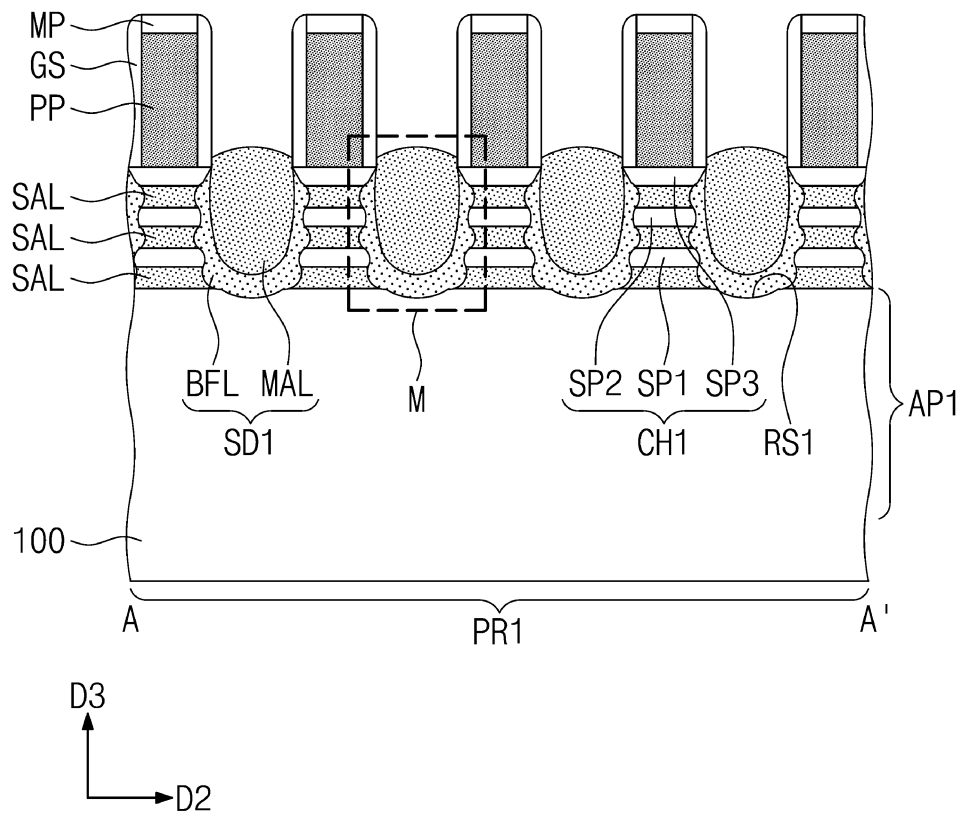


FIG. 12B

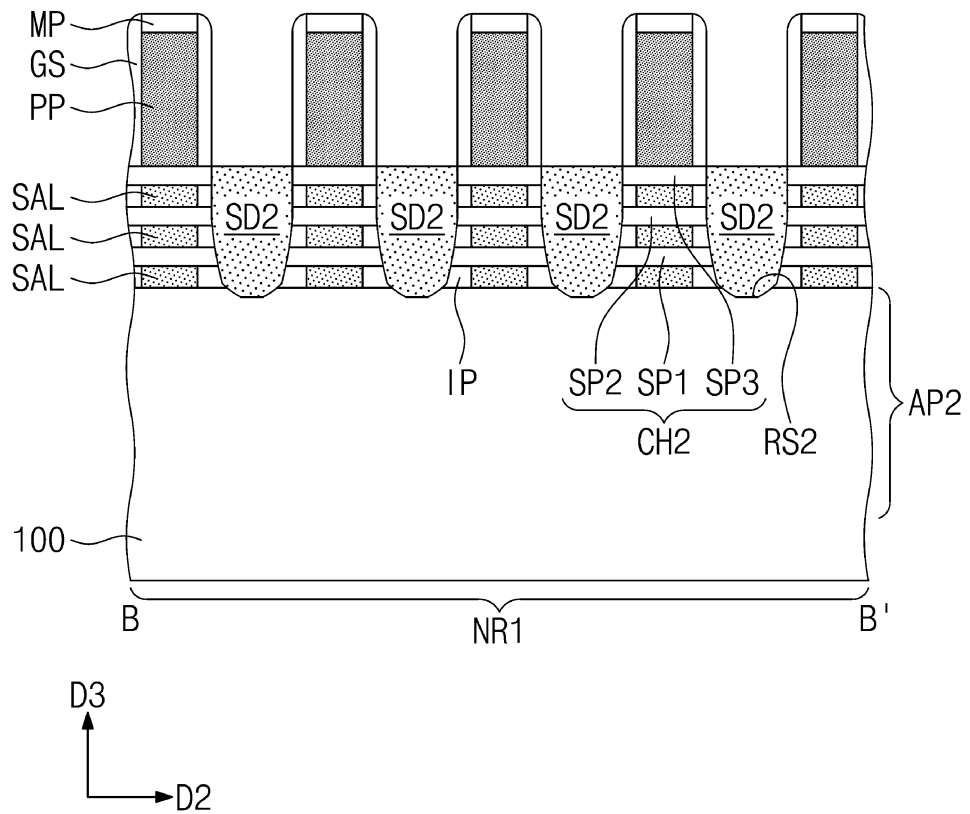


FIG. 12C

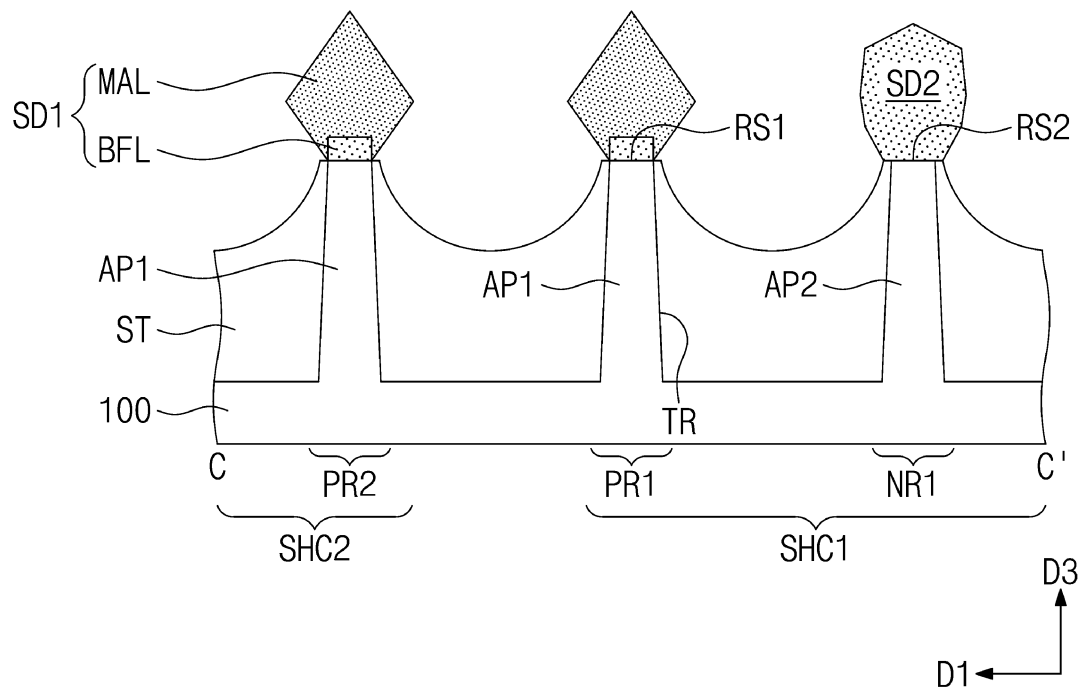


FIG. 12D

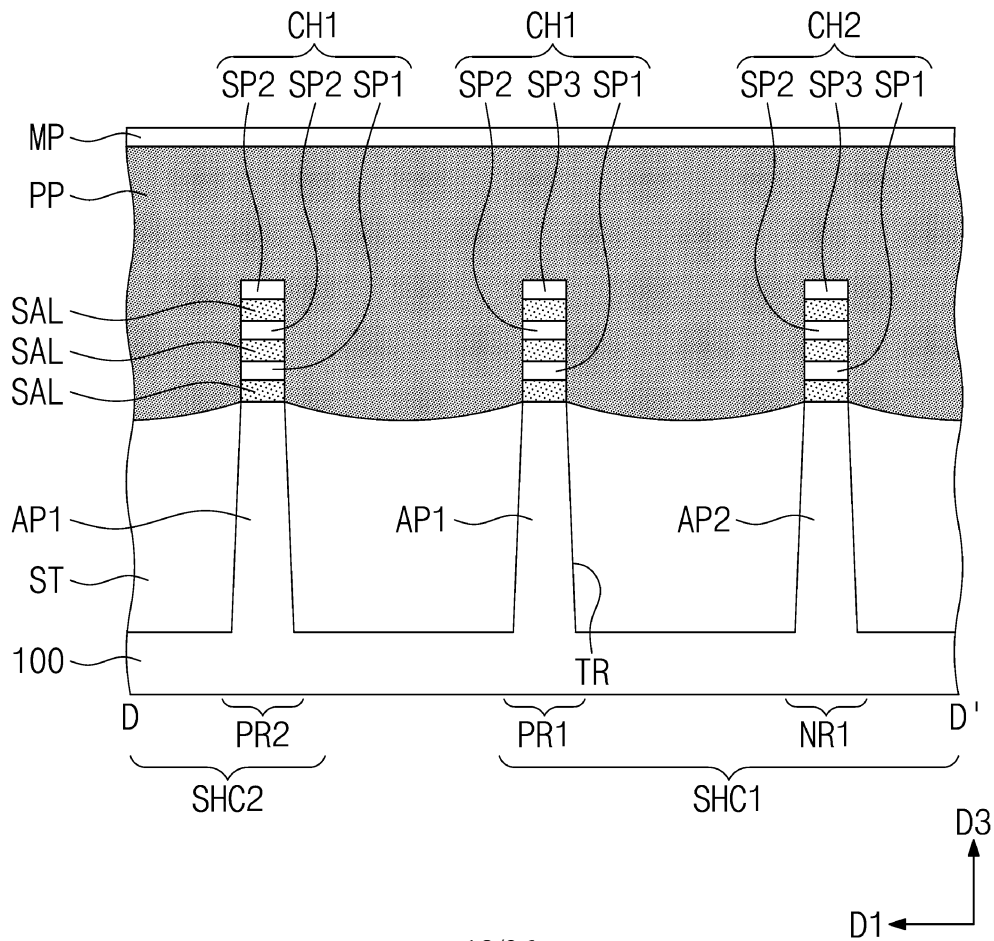


FIG. 13A

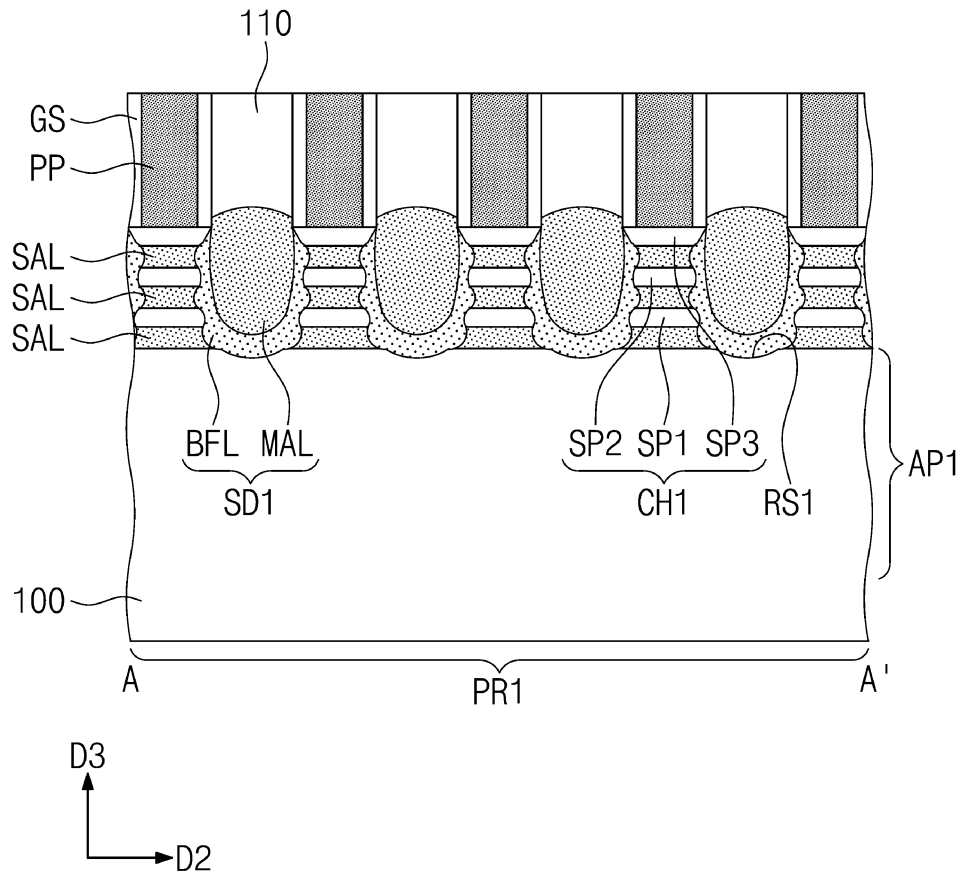


FIG. 13B

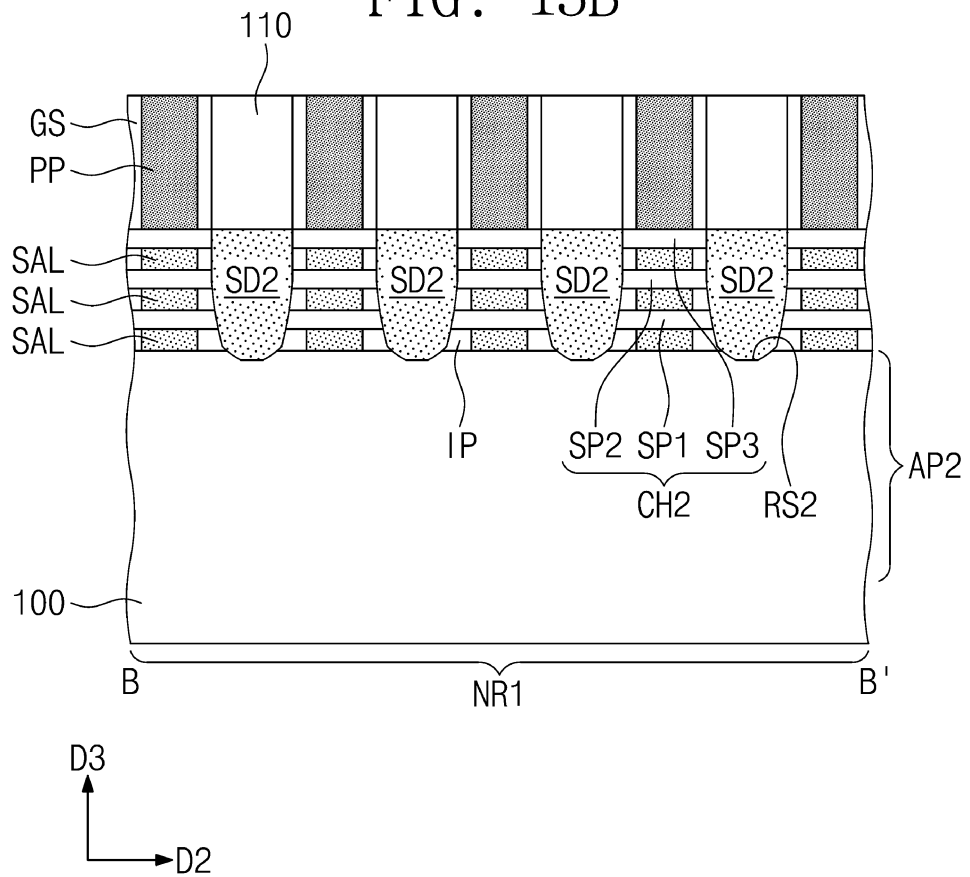


FIG. 13C

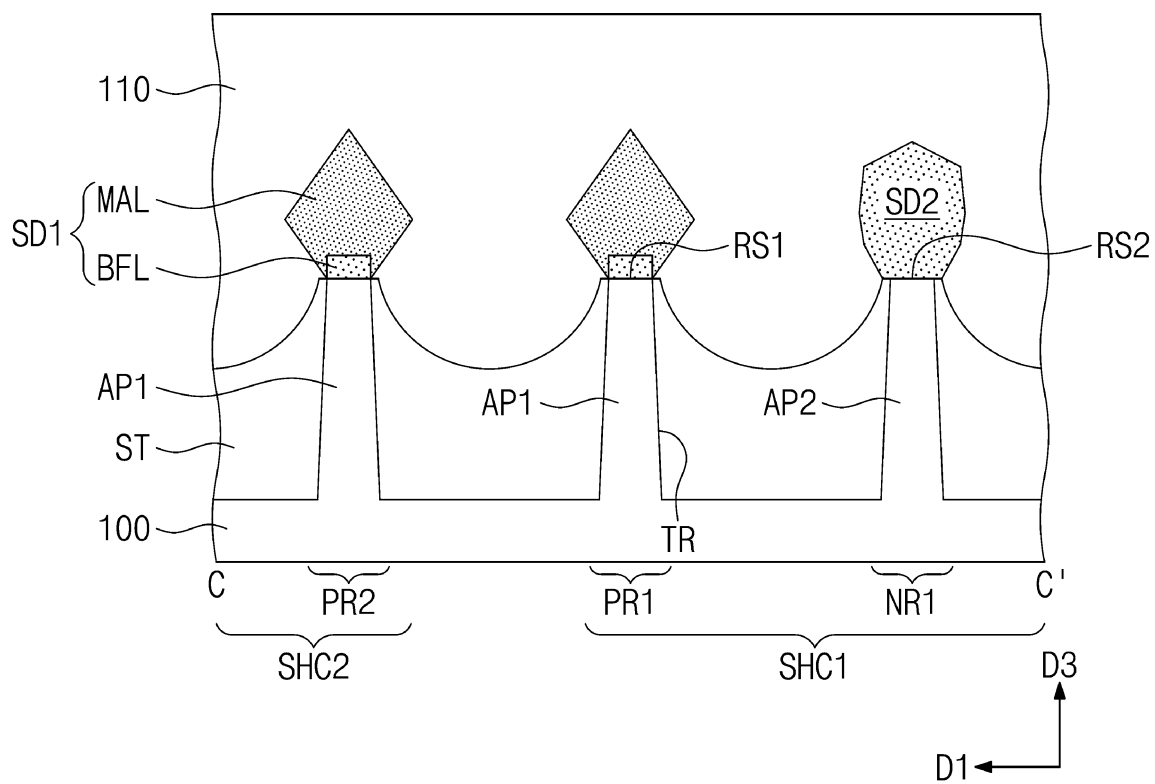


FIG. 13D

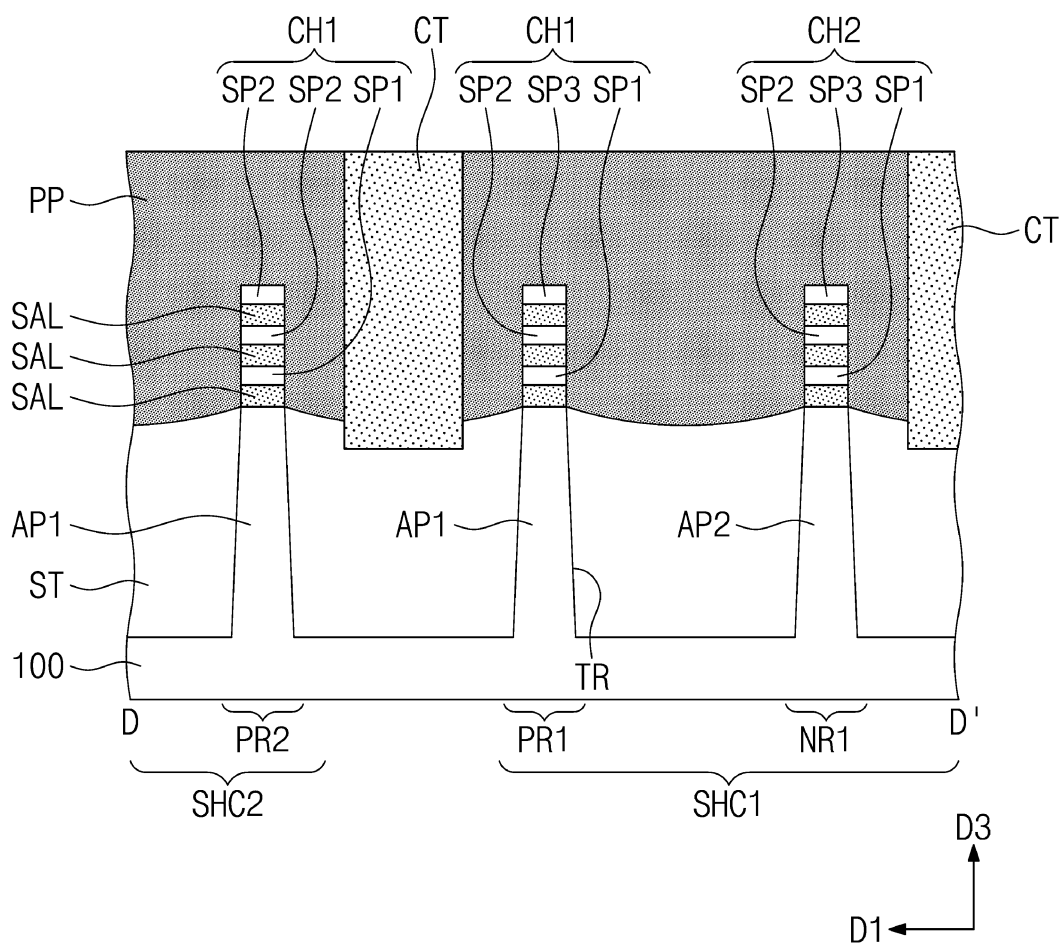


FIG. 14A

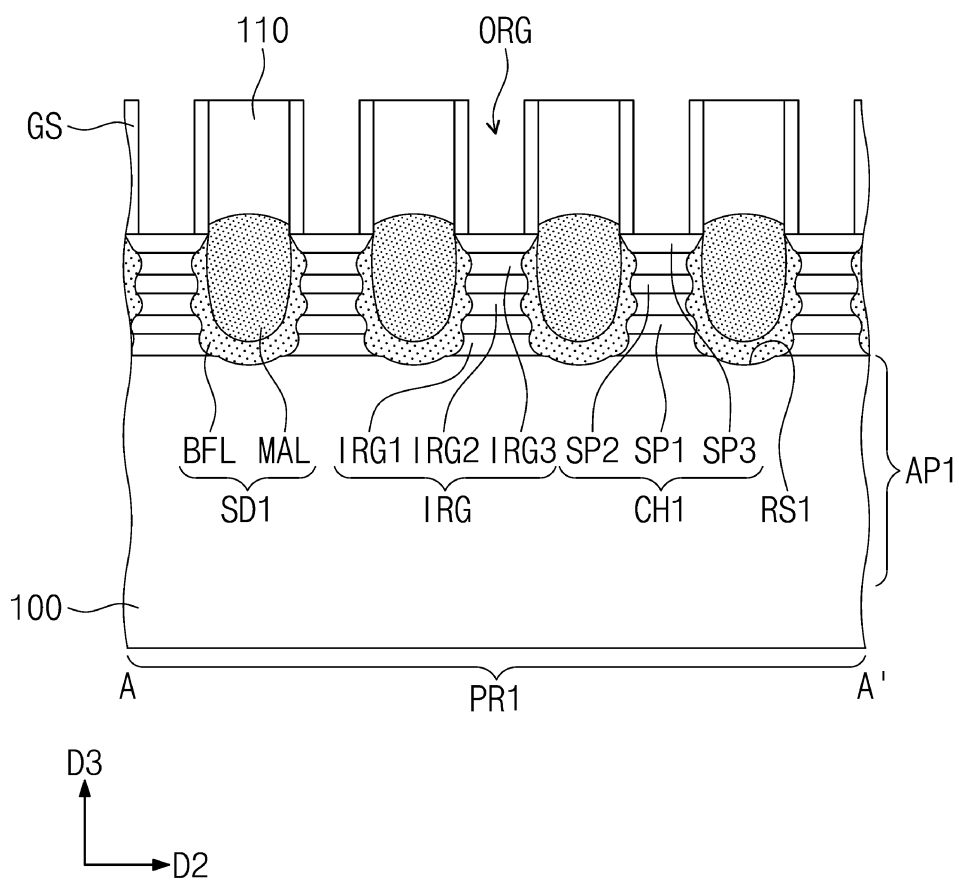


FIG. 14B

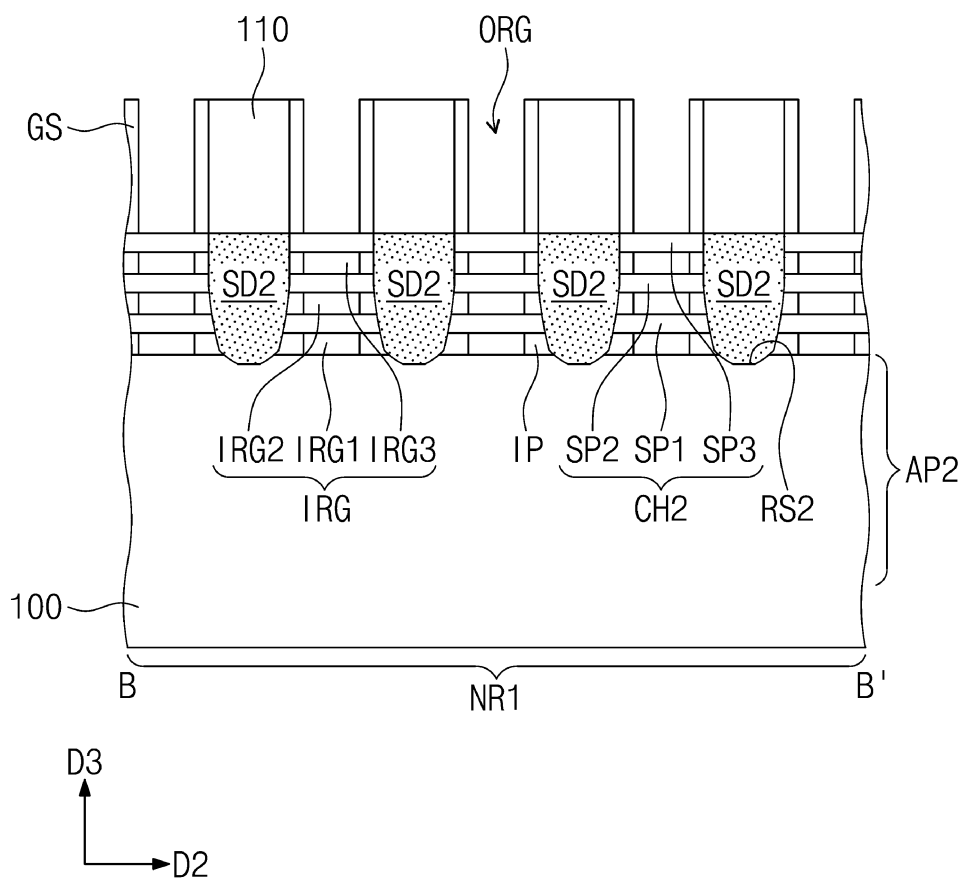


FIG. 14C

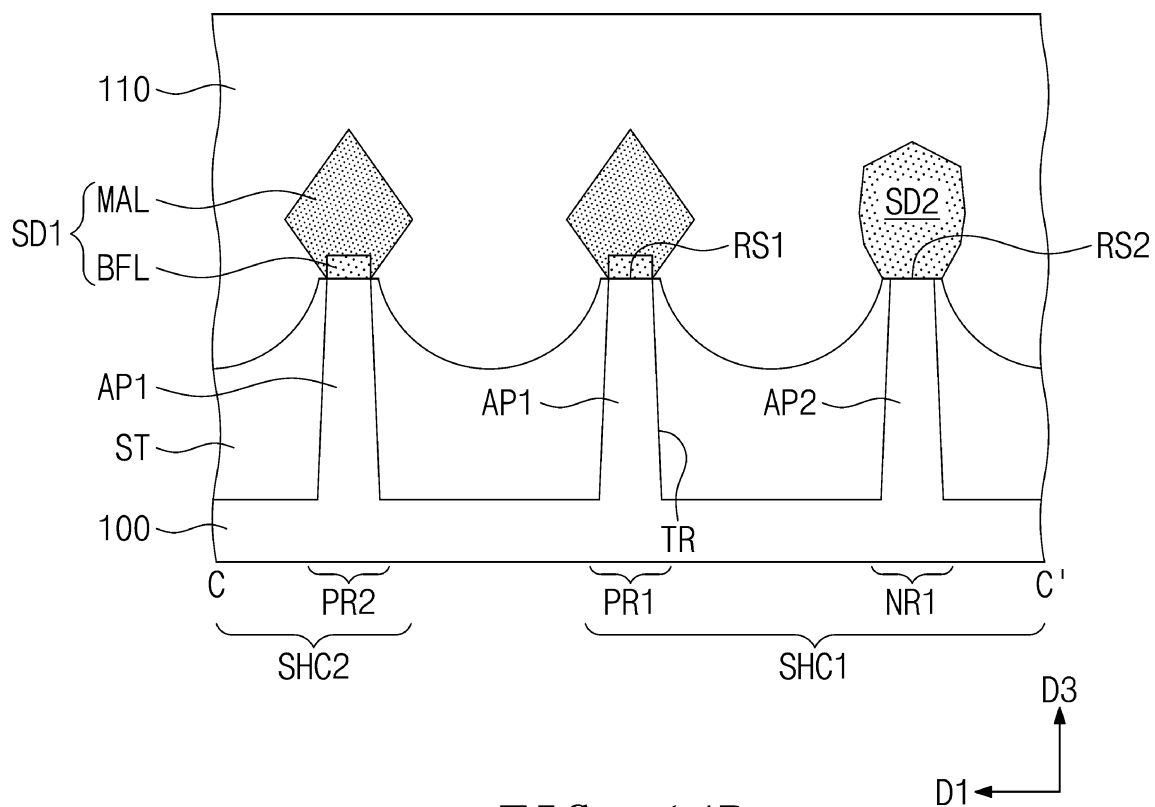


FIG. 14D

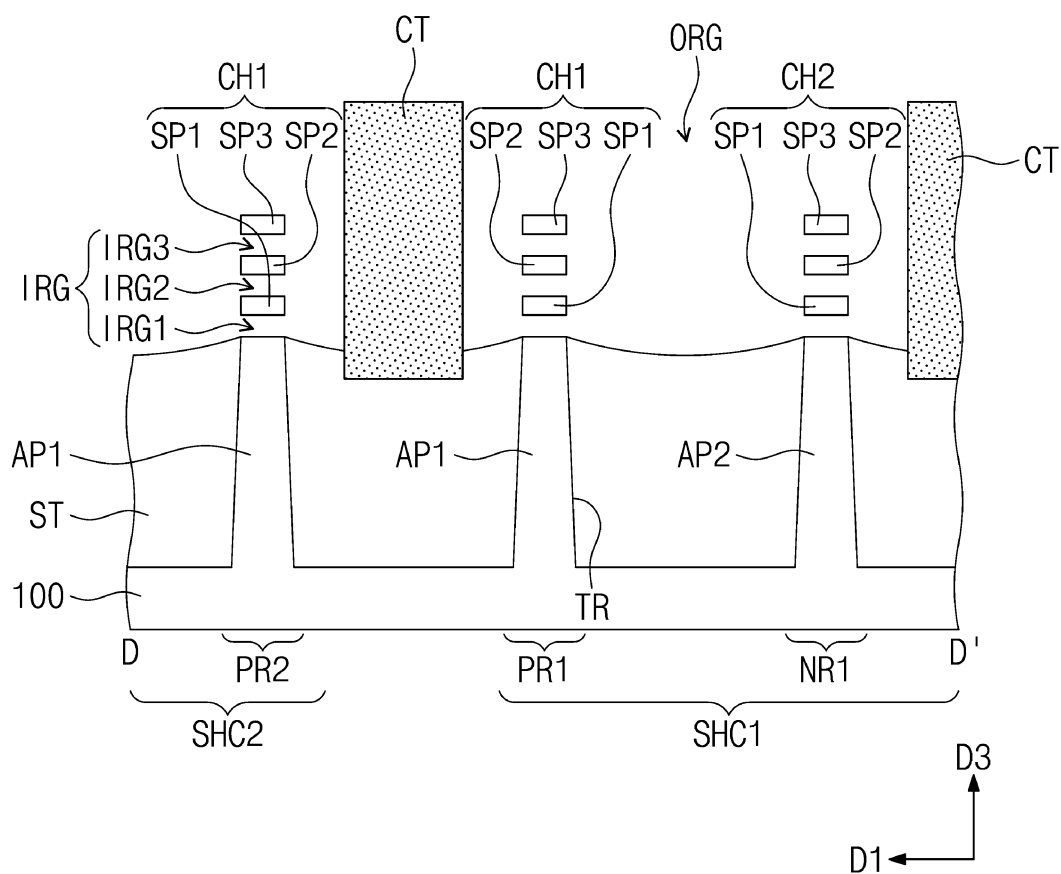


FIG. 15A

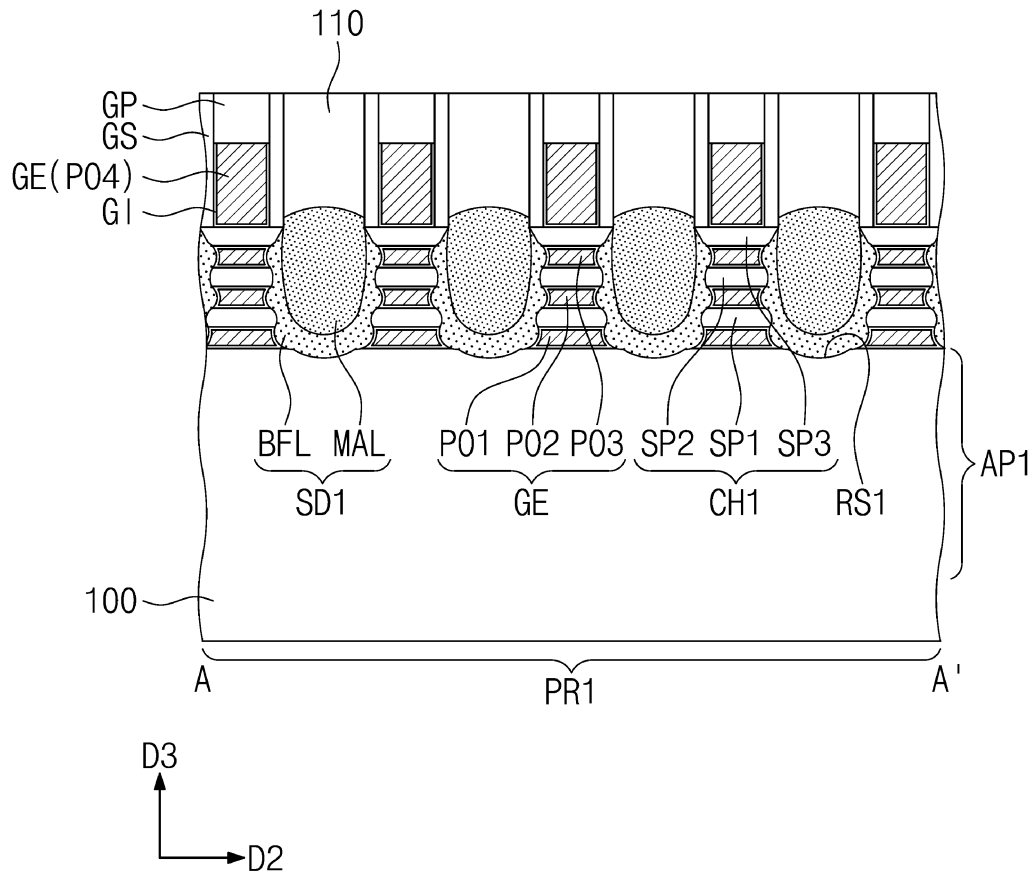


FIG. 15B

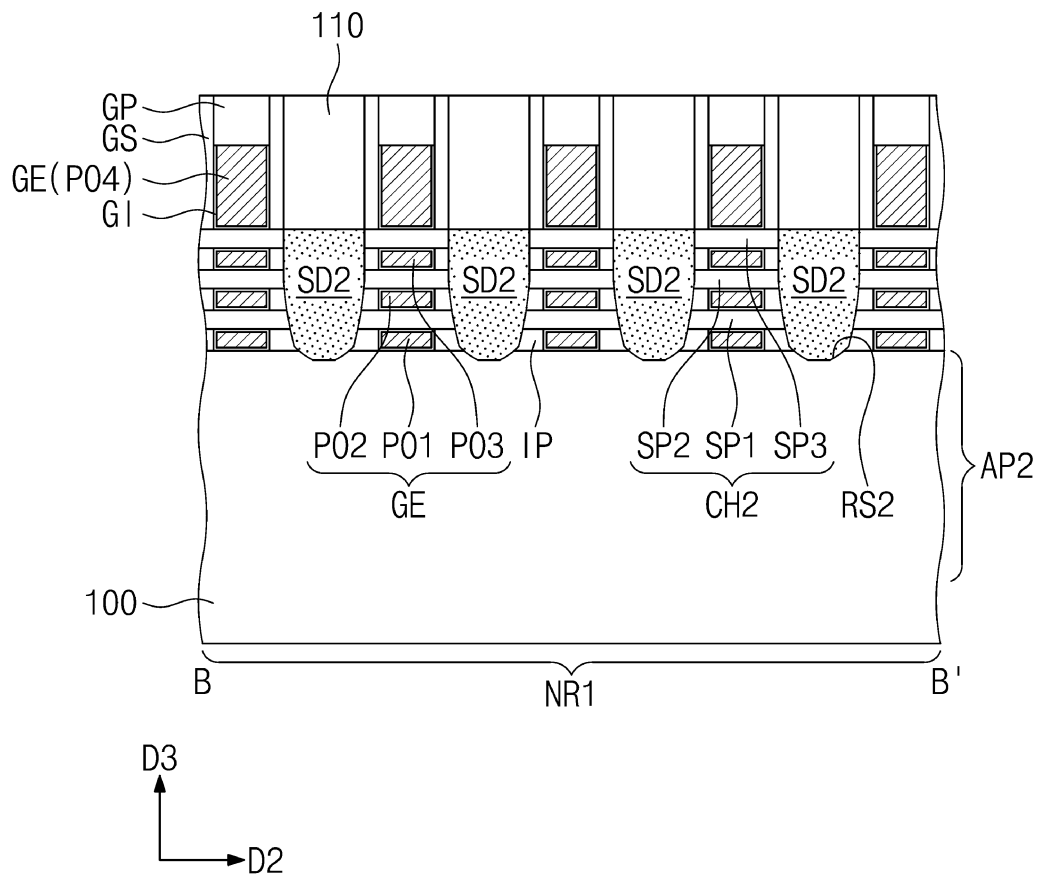


FIG. 15C

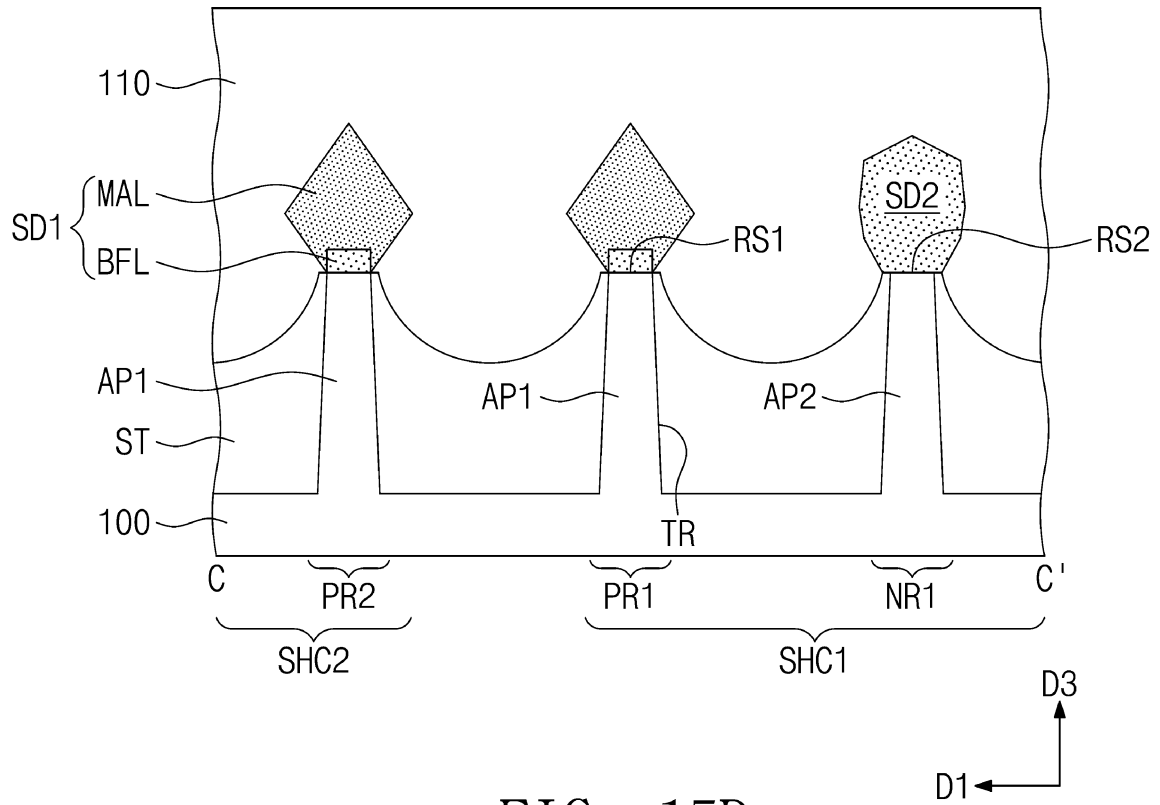


FIG. 15D

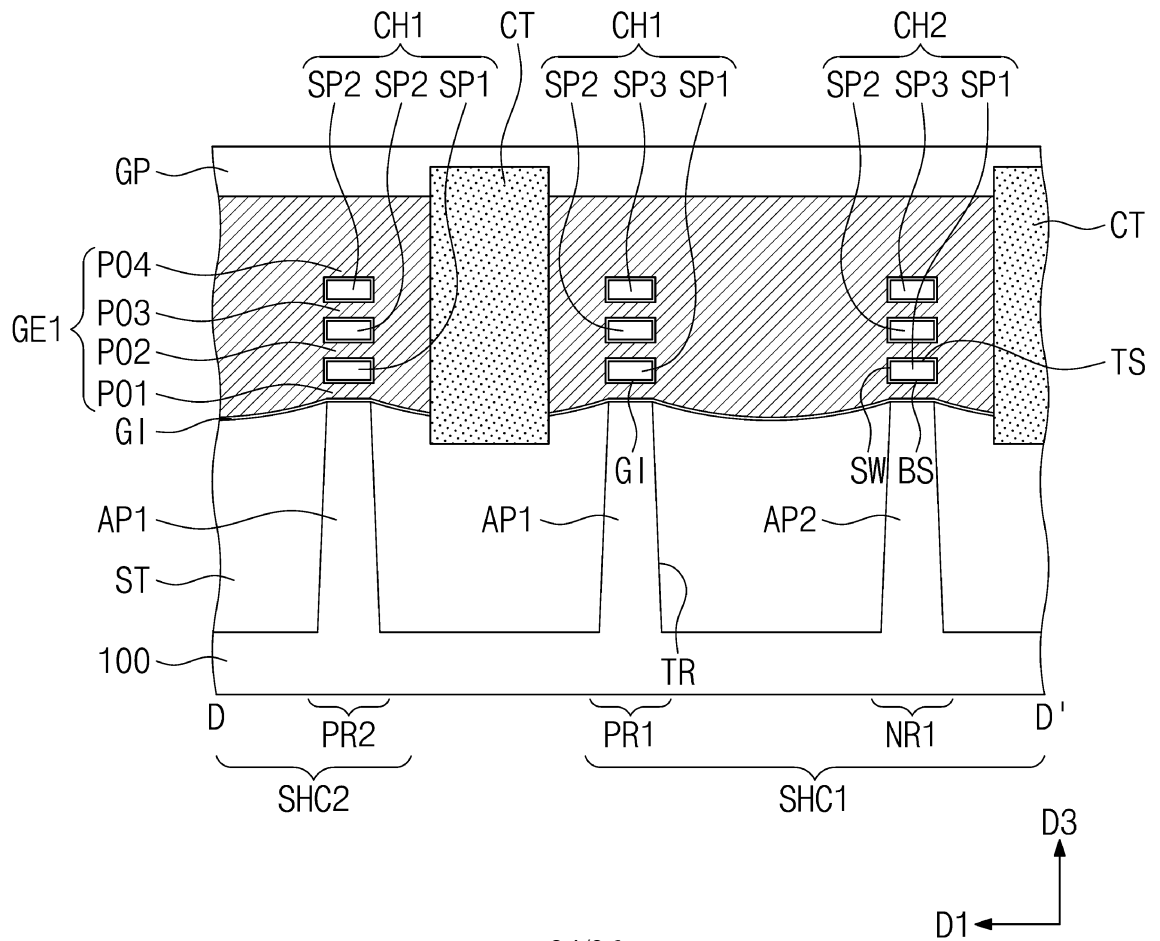


FIG. 16A

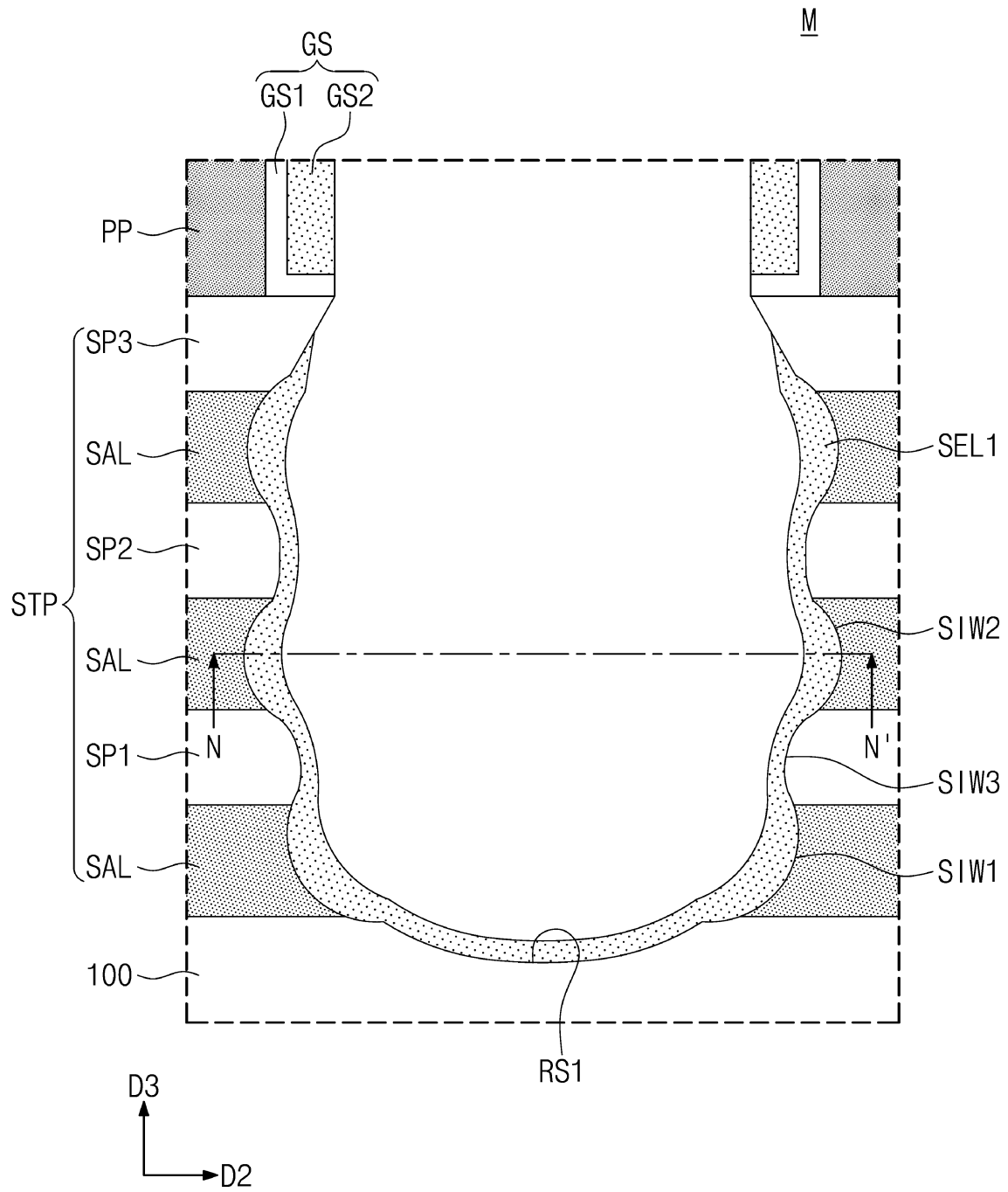


FIG. 16B

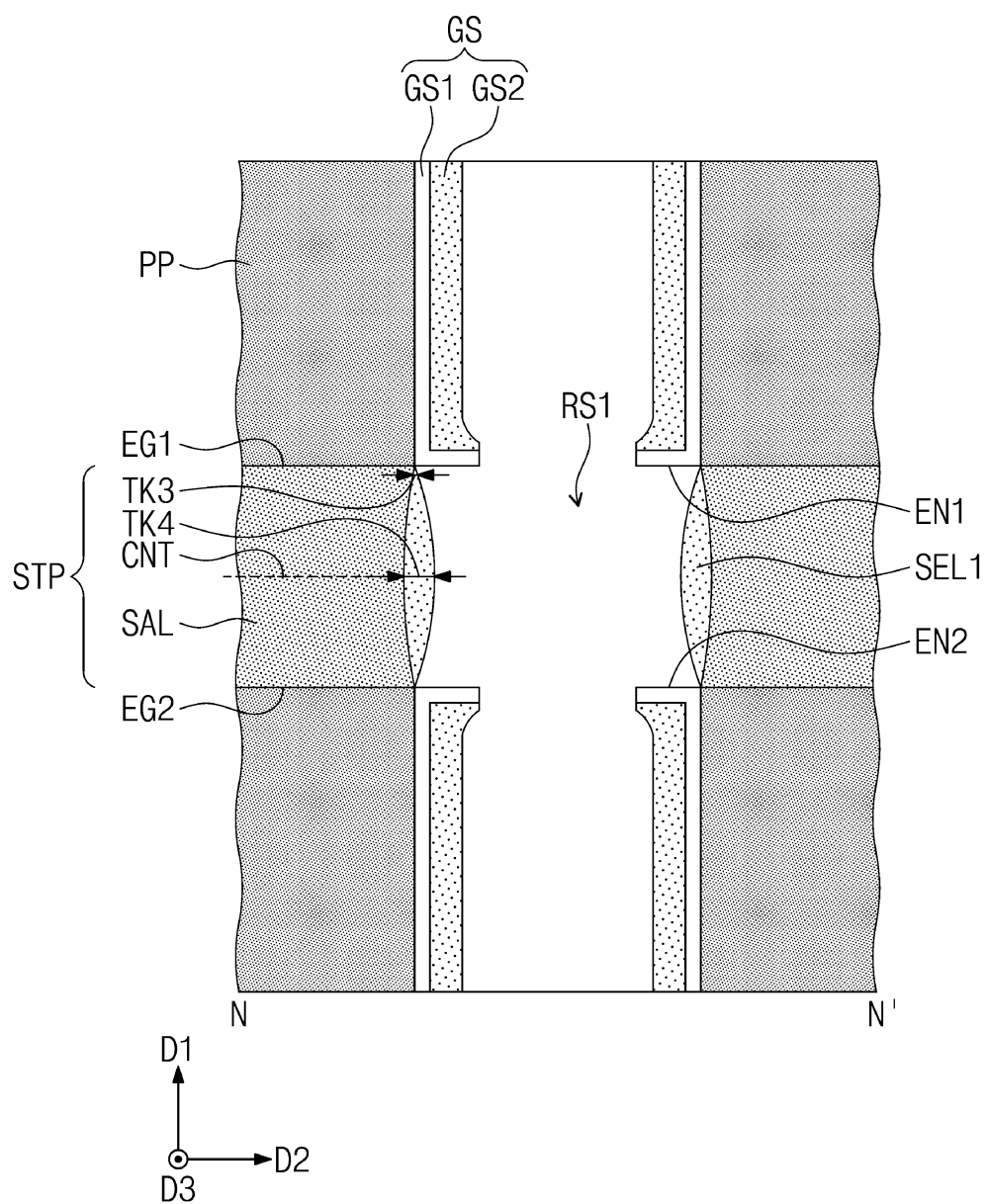


FIG. 17A

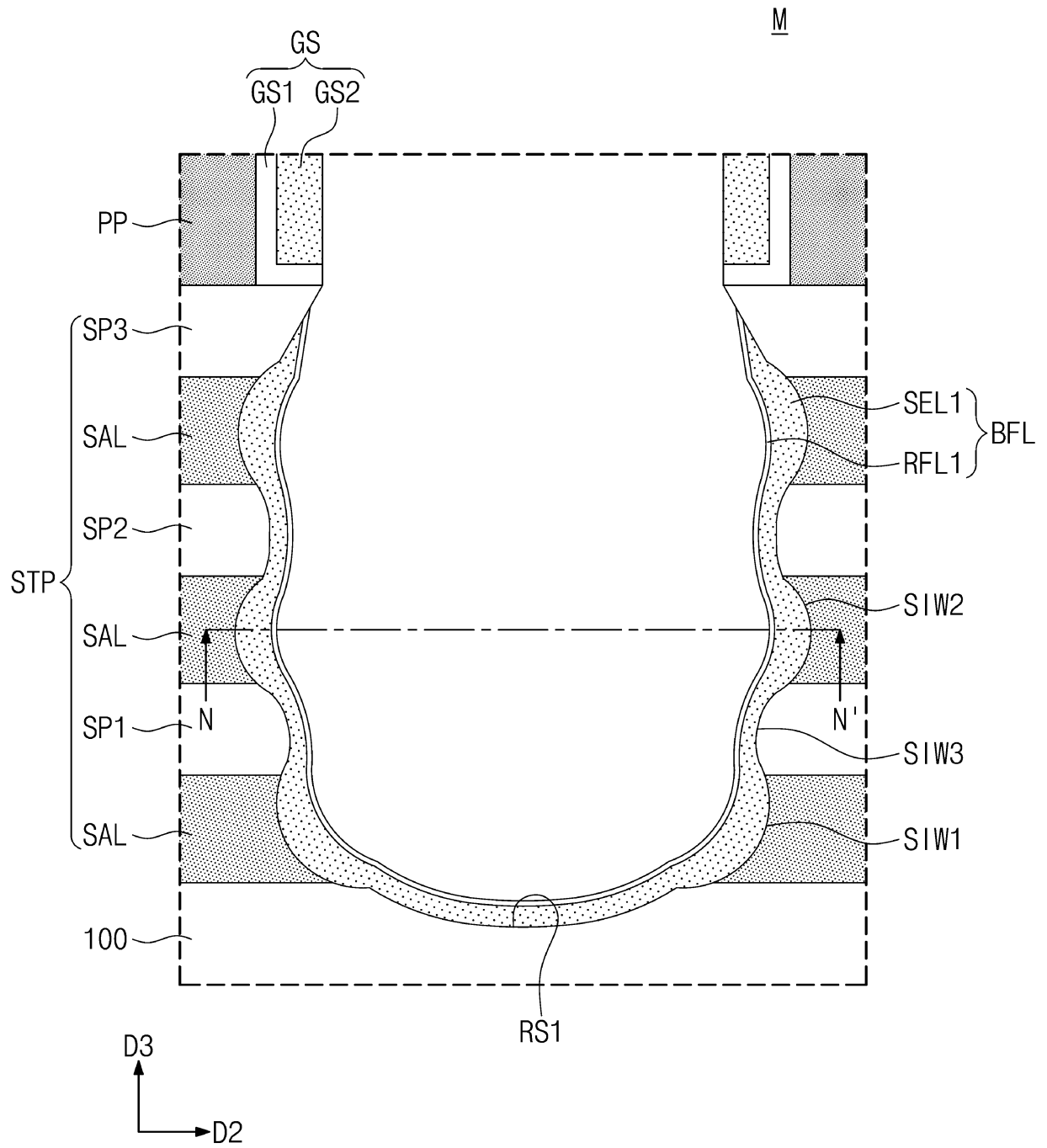
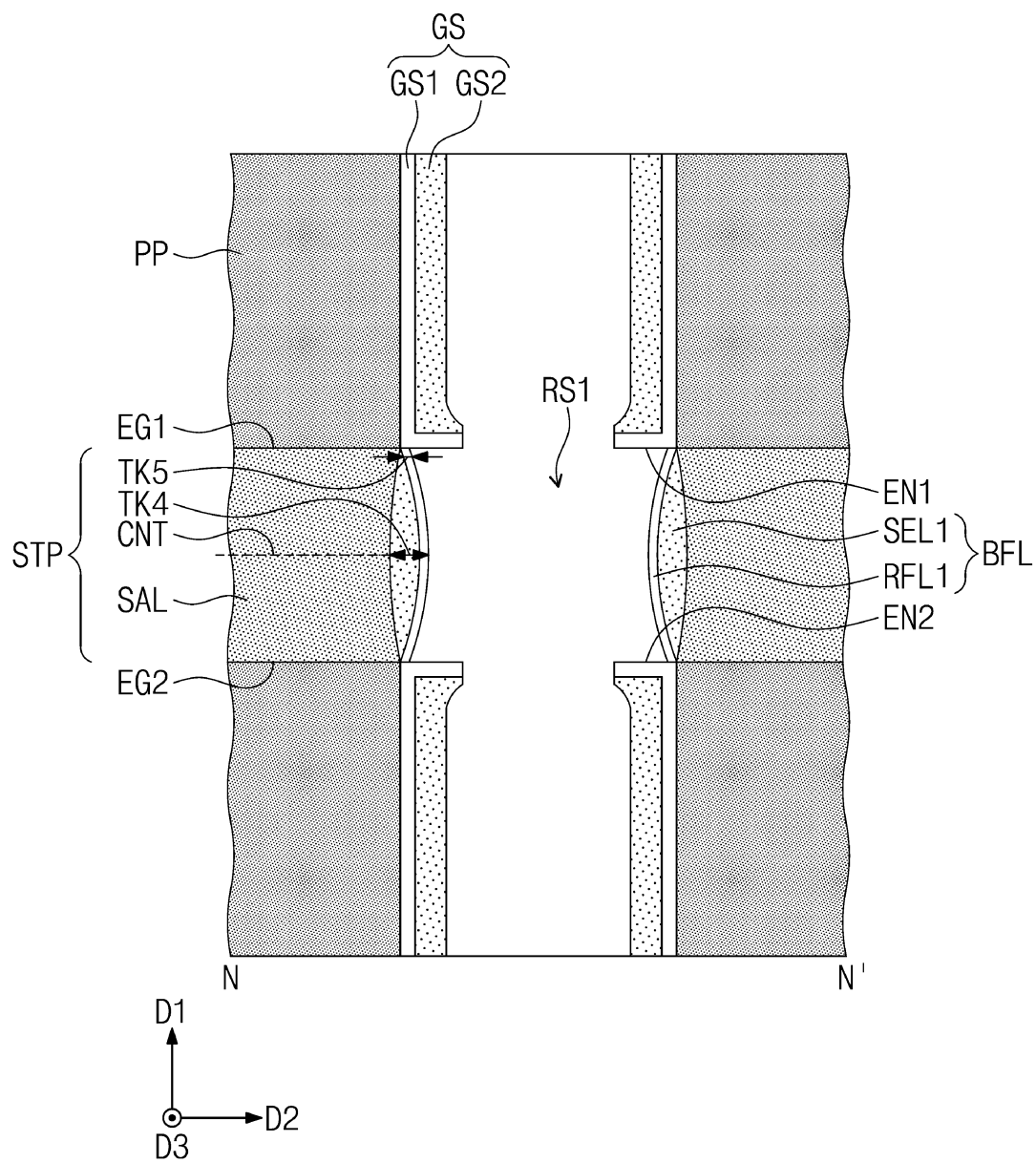


FIG. 17B



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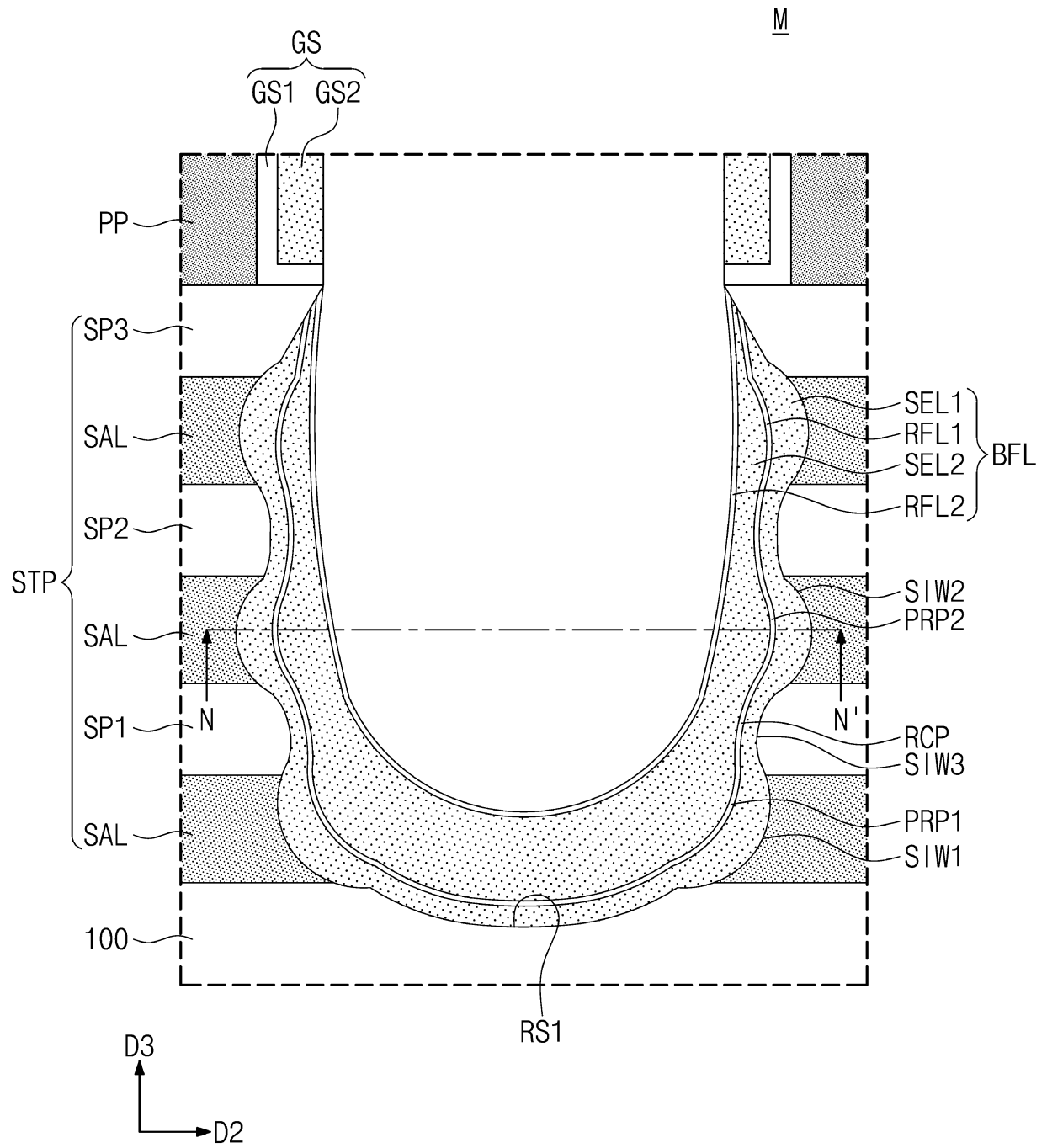


FIG. 18B

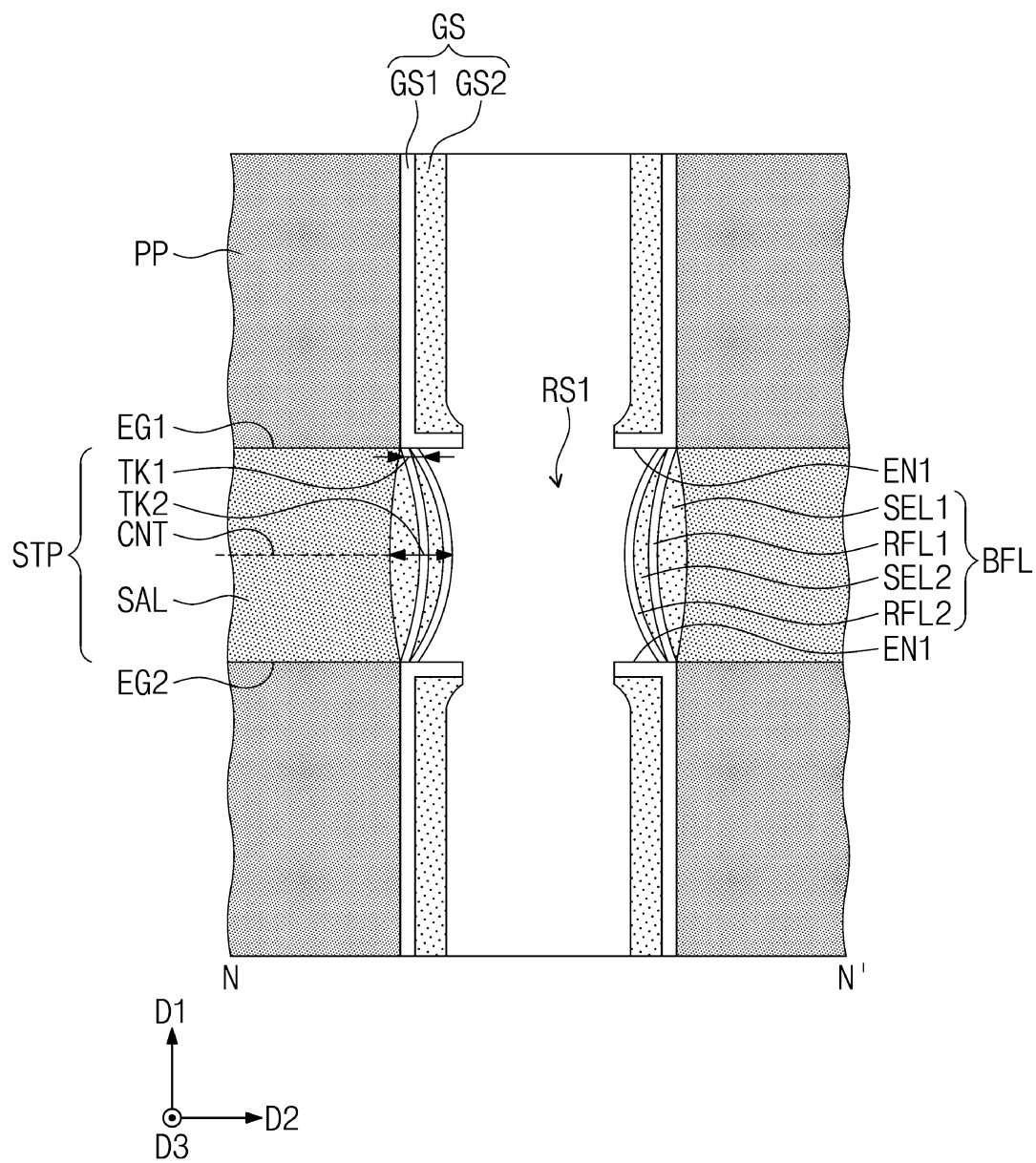


FIG. 19A

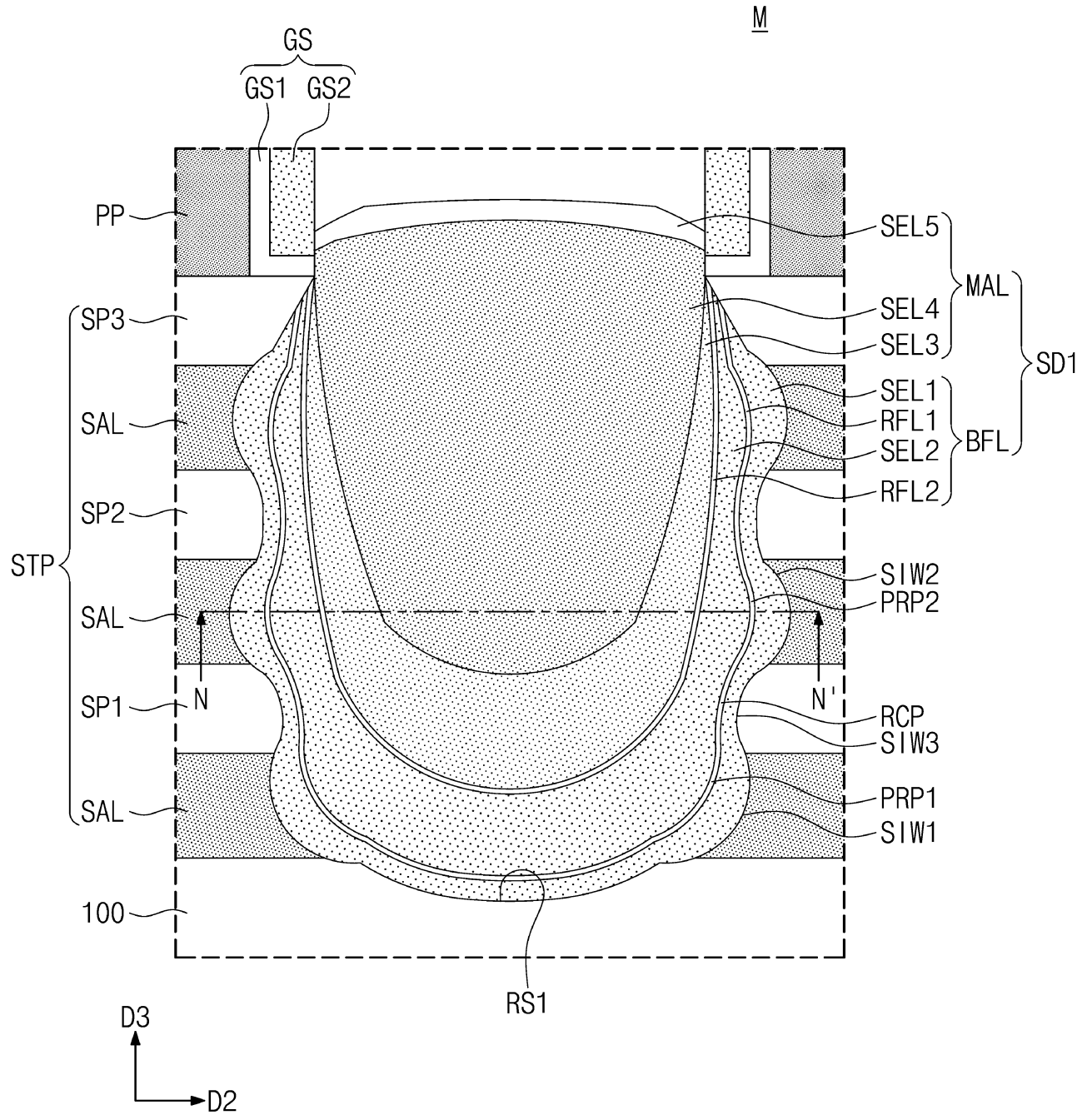


FIG. 19B

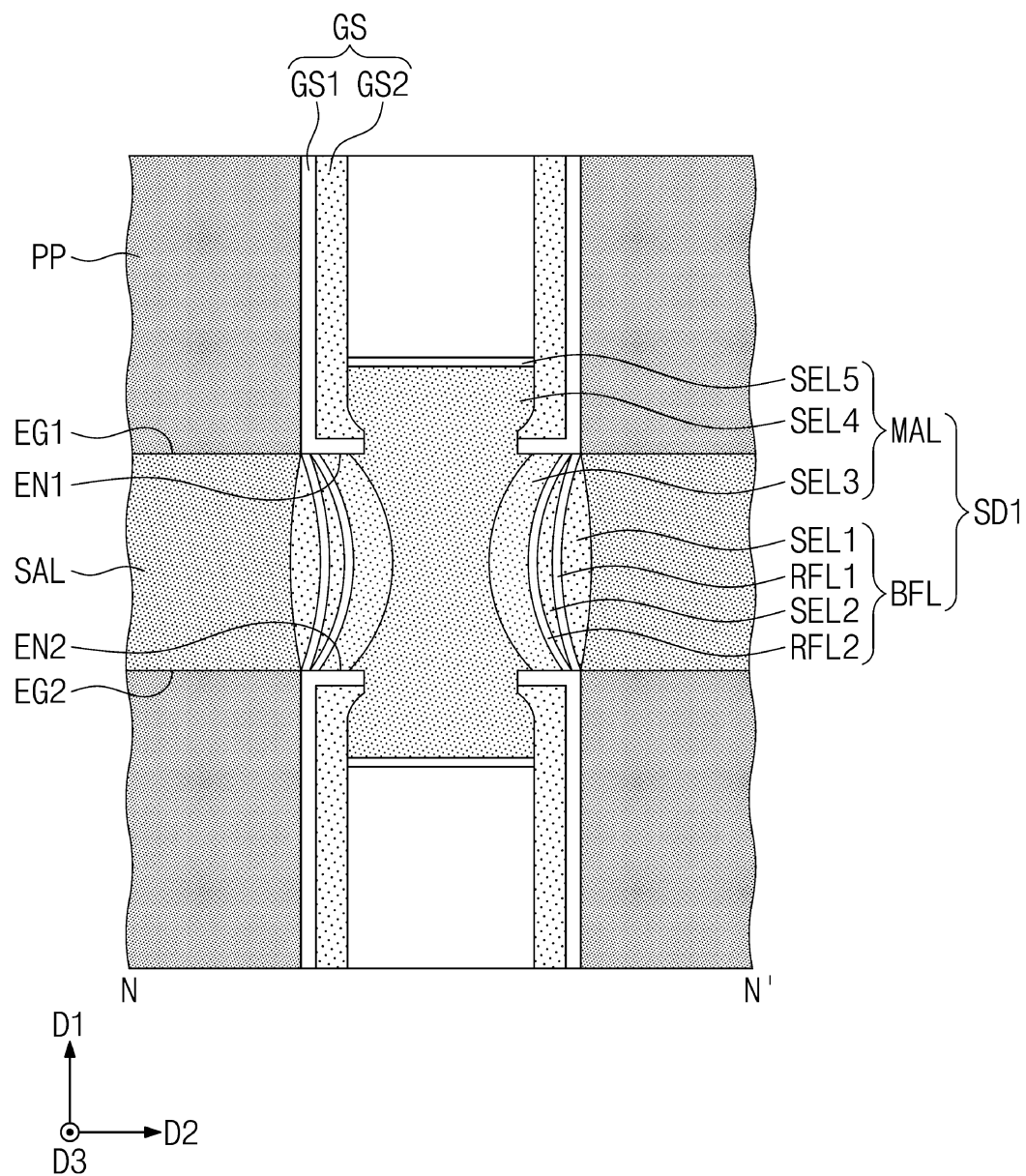
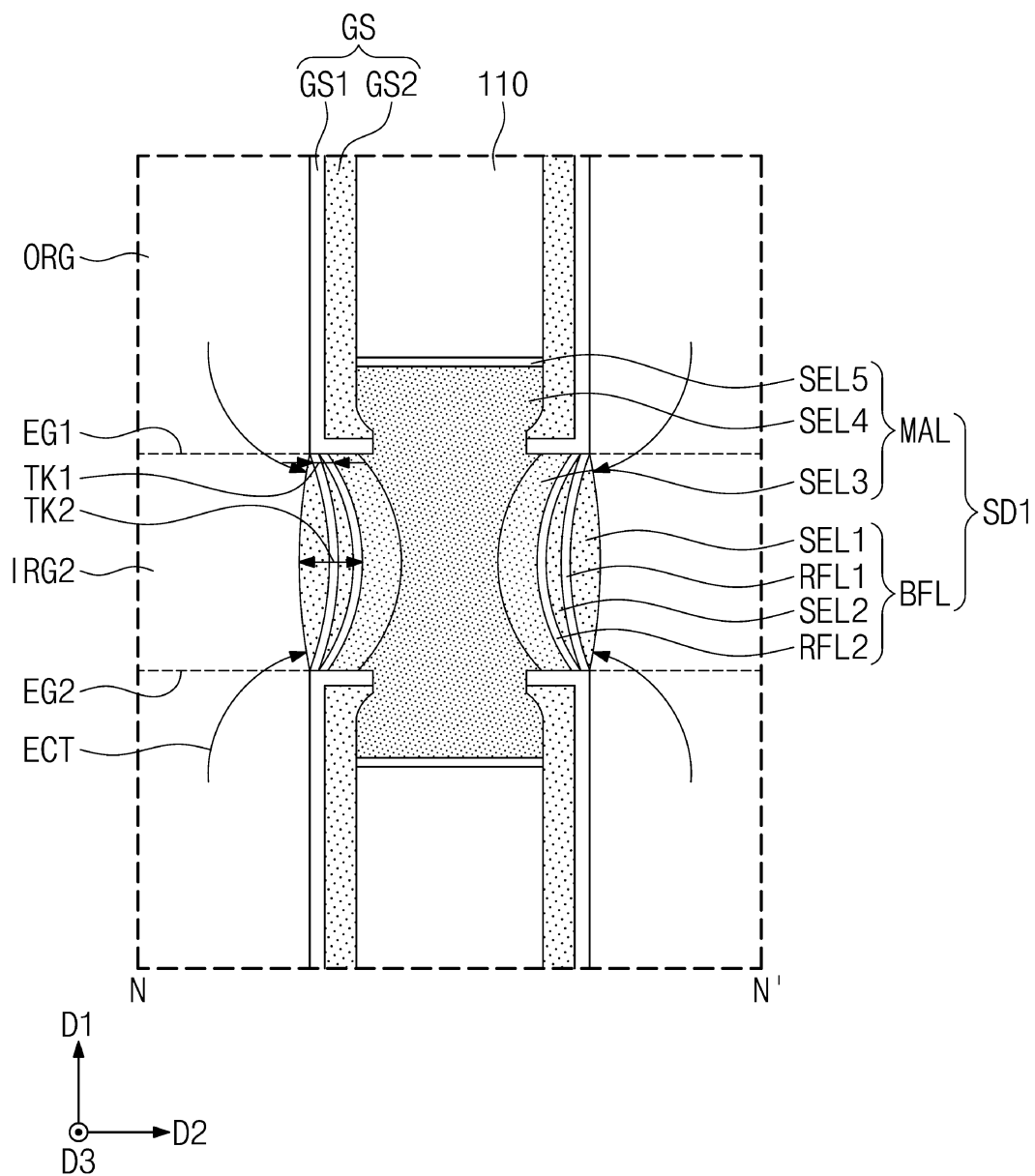


FIG. 20



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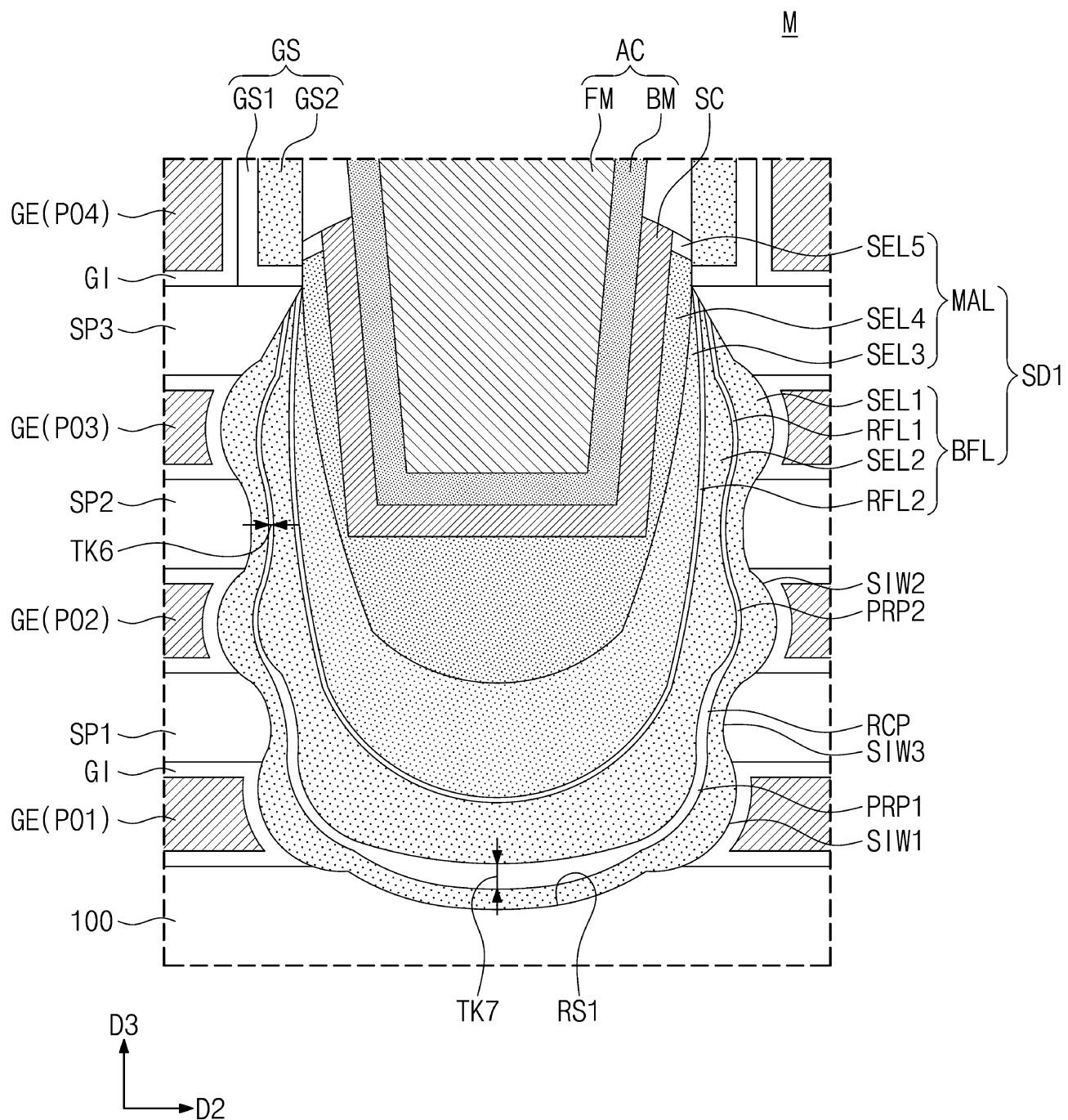


FIG. 22

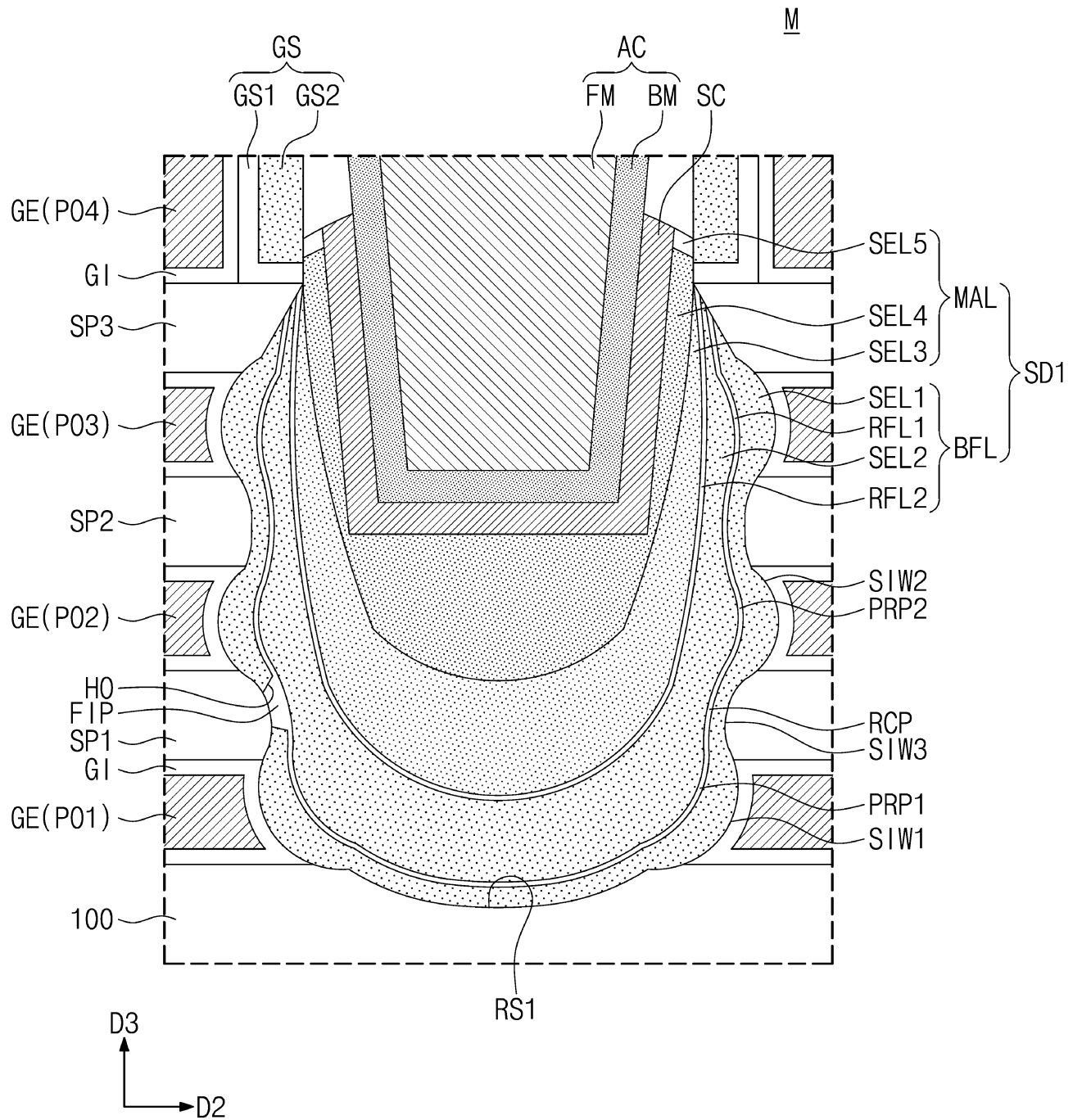


FIG. 23

