



US 20240244835A1

(19) **United States**

(12) **Patent Application Publication**  
**RIM et al.**

(10) **Pub. No.: US 2024/0244835 A1**

(43) **Pub. Date: Jul. 18, 2024**

(54) **SEMICONDUCTOR DEVICE**

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(21) Appl. No.: **18/517,325**

(22) Filed: **Nov. 22, 2023**

(30) **Foreign Application Priority Data**

Jan. 18, 2023 (KR) ..... 10-2023-0007620

**Publication Classification**

(51) **Int. Cl.**  
**H10B 12/00** (2006.01)

(52) **U.S. Cl.**

CPC ..... **H10B 12/50** (2023.02); **H10B 12/09** (2023.02); **H10B 12/315** (2023.02)

(57)

**ABSTRACT**

A semiconductor device may include a substrate including a cell region and a peripheral circuit region, a first gate structure in the cell region of the substrate, the first gate structure extending in a first direction parallel to an upper surface of the substrate, bit line structures on the cell region of the substrate, the bit line structures extending in a second direction perpendicular to the first direction and parallel to the upper surface of the substrate, a second gate structure on the peripheral circuit region of the substrate, contact plug structures between the bit line structures, the contact plug structures contacting the substrate, first conductive structures on peripheral circuit region of the substrate, the first conductive structures being electrically connected to the peripheral circuit region of the substrate, a first upper insulation structure between the first conductive structures, the first upper insulation structure including a first upper insulation pattern and a hydrogen diffusing insulation pattern surrounding a bottom and sidewalls of the first upper insulation pattern, and a second upper insulation pattern between upper portions of the contact plug structures.

