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CHOI et al.(10) **Pub. No.: US 2024/0215248 A1**(43) **Pub. Date: Jun. 27, 2024**(54) **SEMICONDUCTOR DEVICE AND
ELECTRONIC SYSTEM INCLUDING THE
SAME**(52) **U.S. Cl.**
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(2023.02)(71) Applicant: **Samsung Electronics Co., Ltd.**,
Suwon-si (KR)(72) Inventors: **HYUN-MOOK CHOI**, Suwon-si (KR);
CHAE LYOUNG KIM, Suwon-si
(KR); **JIHONG KIM**, Suwon-si (KR)(21) Appl. No.: **18/219,755**(22) Filed: **Jul. 10, 2023**(30) **Foreign Application Priority Data**

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H10B 43/27 (2006.01)(57) **ABSTRACT**

A semiconductor device includes gate layers and lower insulating layers that are alternately stacked on an upper surface of a substrate, a channel structure passing through the gate layers and the lower insulating layers and extending in a vertical direction, a string select gate layer disposed on the channel structure, a string select channel structure passing through the string select gate layer and extending in the vertical direction, and a contact pad disposed in a space between the channel structure and the string select channel structure and connecting the channel structure to the string select channel structure. A lower surface of the contact pad contacts the channel structure and an upper surface of the contact pad contacts the string select channel structure. A first width of the lower surface of the contact pad is greater than a second width of a central portion of the contact pad. A third width of the upper surface of the contact pad is greater than the second width of the central portion of the contact pad.

