



US 20240213335A1

(19) **United States**(12) **Patent Application Publication**
HOSAKA et al.(10) **Pub. No.: US 2024/0213335 A1**(43) **Pub. Date: Jun. 27, 2024**(54) **SEMICONDUCTOR DEVICE, DISPLAY
APPARATUS, AND MANUFACTURING
METHOD OF THE SEMICONDUCTOR
DEVICE***H01L 29/66* (2006.01)*H01L 29/786* (2006.01)*H10K 59/12* (2006.01)*H10K 59/121* (2006.01)(71) Applicant: **Semiconductor Energy Laboratory
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(JP)(52) **U.S. Cl.**CPC .. *H01L 29/41733* (2013.01); *H01L 29/66969*(2013.01); *H01L 29/7869* (2013.01); *H10K**59/1201* (2023.02); *H10K 59/1213* (2023.02);*H01L 29/45* (2013.01)(72) Inventors: **Yasuharu HOSAKA**, Tochigi (JP);
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(57)

ABSTRACT

A miniaturized semiconductor device is provided. The semiconductor device includes a semiconductor layer over a substrate, a first conductive layer and a second conductive layer being apart from each other over the semiconductor layer, a mask layer in contact with a top surface of the first conductive layer, a first insulating layer covering the semiconductor layer, the first conductive layer, the second conductive layer, and the mask layer, and a third conductive layer overlapping with the semiconductor layer and being over the first insulating layer. The first insulating layer is in contact with a top surface and a side surface of the mask layer, a side surface of the first conductive layer, a top surface and a side surface of the second conductive layer, and a top surface of the semiconductor layer. The semiconductor device includes a region in which the distance between opposite end portions of the first conductive layer and the second conductive layer is less than or equal to 1 μm .

(21) Appl. No.: **18/288,599**(22) PCT Filed: **Apr. 28, 2022**(86) PCT No.: **PCT/IB2022/053937**

§ 371 (c)(1),

(2) Date: **Oct. 27, 2023**(30) **Foreign Application Priority Data**

May 13, 2021 (JP) 2021-081615

Publication Classification(51) **Int. Cl.***H01L 29/417* (2006.01)*H01L 29/45* (2006.01)