US 20230403871A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2023/0403871 A1**

HIRAMATSU et al. (43) **Pub. Date: Dec. 14, 2023**

(54) **SOLID-STATE IMAGING DEVICE AND ELECTRONIC APPARATUS**

(71) Applicant: **SONY SEMICONDUCTOR SOLUTIONS CORPORATION**, Kanagawa (JP)

(72) Inventors: **Tomoki HIRAMATSU**, Kanagawa (JP); **Hideaki TOGASHI**, Kanagawa (JP); **Nobuhiro KAWAI**, Kanagawa (JP)

(73) Assignee: **SONY SEMICONDUCTOR SOLUTIONS CORPORATION**, Kanagawa (JP)

(21) Appl. No.: **18/043,969**

(22) PCT Filed: **Sep. 15, 2021**

(86) PCT No.: **PCT/JP2021/033897**

§ 371 (c)(1),
(2) Date: **Mar. 3, 2023**

(30) **Foreign Application Priority Data**

Sep. 25, 2020 (JP) 2020-161366

Publication Classification

(51) **Int. Cl.**
H10K 39/32 (2006.01)
H01L 27/146 (2006.01)

(52) **U.S. Cl.**
CPC ***H10K 39/32*** (2023.02); ***H01L 27/14647*** (2013.01); ***H01L 27/14612*** (2013.01); ***H01L 27/14621*** (2013.01); ***H01L 27/14636*** (2013.01); ***H01L 27/14607*** (2013.01); ***H01L 27/1463*** (2013.01)

(57) **ABSTRACT**

The quantum efficiency can be improved. A solid-state imaging device according to an embodiment includes: a plurality of pixels arranged in a matrix, in which each of the pixels includes a first semiconductor layer, a photoelectric conversion section disposed on the first semiconductor layer on a side of a first surface, an accumulation electrode disposed on the first semiconductor layer close to a side of a second surface on a side opposite to the first surface, a wiring extending from the second surface of the first semiconductor layer, a floating diffusion region connected to the first semiconductor layer via the wiring, and a first gate electrode disposed close to the wiring.