

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2024/0213155 A1 BAE et al.

Jun. 27, 2024 (43) Pub. Date:

(54) SEMICONDUCTOR DEVICE WITH FINE METAL LINES FOR BEOL STRUCTURE AND METHOD OF MANUFACTURING THE SAME

(71) Applicant: SAMSUNG ELECTRONICS CO., LTD., Suwon-si (KR)

(72) Inventors: Taeyong BAE, Albany, NY (US); Hoonseok SEO, Niskayuna, NY (US)

(73) Assignee: SAMSUNG ELECTRONICS CO., LTD., Suwon-si (KR)

(21) Appl. No.: 18/600,031

(22) Filed: Mar. 8, 2024

Related U.S. Application Data

- (62) Division of application No. 17/354,593, filed on Jun. 22, 2021.
- (60) Provisional application No. 63/176,688, filed on Apr. 19, 2021.

Publication Classification

(51) Int. Cl. H01L 23/528 (2006.01)H01L 21/768 (2006.01)H01L 23/522 (2006.01)

(52) U.S. Cl. CPC H01L 23/5283 (2013.01); H01L 21/76877 (2013.01); H01L 23/5226 (2013.01); H01L 23/528 (2013.01)

ABSTRACT (57)

Provided is a semiconductor device including a a front-endof-line (FEOL) structure and a back-end-of-line (BEOL) structure connected to the FEOL structure, wherein the FEOL structure includes at least one source/drain region and at least one gate structure, and the BEOL structure includes: a plurality of 1st fine metal lines arranged in a row with a same pitch, each of the plurality of 1st fine metal lines having a same width; and at least one 1st wide metal line formed at a side of the plurality of 1st fine metal lines, the 1st wide metal line having a width greater than the width of the 1st fine metal line, and wherein each of the plurality of 1st fine metal lines includes a material different from a material included in the 1^{st} wide metal line

