

US 20240237327A9

## (19) United States

# (12) Patent Application Publication KUAN et al.

### (54) SEMICONDUCTOR DEVICE INCLUDING MEMORY STRUCTURE AND METHOD FOR MANUFACTURING THE SAME

(71) Applicant: NANYA TECHNOLOGY CORPORATION, NEW TAIPEI CITY

(72) Inventors: SHIH-FAN KUAN, TAOYUAN CITY (TW); WEI-CHEN PAN, NEW TAIPEI CITY (TW); YU-TING LIN, NEW TAIPEI CITY (TW); HUEI-RU LIN, TOUFEN CITY (TW)

(21) Appl. No.: 18/223,166

(22) Filed: Jul. 18, 2023

#### **Prior Publication Data**

- (15) Correction of US 2024/0138139 A1 Apr. 25, 2024 See (22) Filed.
- (65) US 2024/0138139 A1 Apr. 25, 2024

#### Related U.S. Application Data

(62) Division of application No. 17/973,202, filed on Oct. 25, 2022.

## (10) Pub. No.: US 2024/0237327 A9

(48) **Pub. Date: Jul. 11, 2024 CORRECTED PUBLICATION** 

#### **Publication Classification**

(51) Int. Cl. *H10B 12/00* (2006.01) *G11C 5/06* (2006.01)

(52) U.S. Cl. CPC ...... *H10B 12/00* (2023.02); *G11C 5/063* (2013.01)

#### (57) ABSTRACT

A semiconductor device and a method of manufacturing the same are provided. The semiconductor device includes a substrate, a plurality of capacitors, and a first supporting layer. The plurality of capacitors are disposed on the substrate. Each of the capacitors extends along a first direction. Each of the plurality of capacitors includes a first capacitor electrode, a second capacitor electrode, and a capacitor dielectric separating the first capacitor electrode from the second capacitor electrode. The first supporting layer is disposed on the substrate. The first supporting layer extends along a second direction different from the first direction. The capacitor dielectric includes a first surface and a second surface which are disposed on two opposite sides along the first direction. The second surface is exposed by the first capacitor electrode. The first supporting layer is disposed between the first surface and the second surface of the capacitor dielectric.



