US 20240213304A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2024/0213304 A1**

Lin et al. (43) **Pub. Date: Jun. 27, 2024**

(54) **MIM CAPACITOR STRUCTURE AND FABRICATING METHOD OF THE SAME**

(71) Applicant: **UNITED MICROELECTRONICS CORP.**, Hsin-Chu City (TW)

(72) Inventors: **Da-Jun Lin**, Kaohsiung City (TW); **Bin-Siang Tsai**, Changhua County (TW); **Fu-Yu Tsai**, Tainan City (TW); **Chung-Yi Chiu**, Tainan City (TW)

(73) Assignee: **UNITED MICROELECTRONICS CORP.**, Hsin-Chu City (TW)

(21) Appl. No.: **18/107,521**

(22) Filed: **Feb. 9, 2023**

(30) **Foreign Application Priority Data**

Dec. 21, 2022 (CN) 202211649778.6

Publication Classification

(51) **Int. Cl.**

H01L 27/06	(2006.01)
H01L 21/285	(2006.01)
H01L 21/768	(2006.01)
H01L 23/522	(2006.01)
H01L 23/532	(2006.01)

(52) **U.S. Cl.**

CPC ***H01L 28/60*** (2013.01); ***H01L 21/28556*** (2013.01); ***H01L 21/76843*** (2013.01); ***H01L 21/76877*** (2013.01); ***H01L 23/5226*** (2013.01); ***H01L 23/53228*** (2013.01); ***H01L 23/53295*** (2013.01); ***H01L 27/0629*** (2013.01); ***H01L 27/0647*** (2013.01)

(57) **ABSTRACT**

An MIM capacitor structure includes numerous inter-metal dielectrics. A trench is embedded within the inter-metal dielectrics. A capacitor is disposed within the trench. The capacitor includes a first electrode layer, a capacitor dielectric layer and a second electrode layer. The first electrode layer, the capacitor dielectric layer and the second electrode layer fill in and surround the trench. The capacitor dielectric layer is between the first electrode layer and the second electrode layer. A silicon oxide liner surrounds a sidewall of the trench and contacts the first electrode layer.