US 20240237544A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2024/0237544 A1**

Brew et al. (43) **Pub. Date: Jul. 11, 2024**

(54) **VERTICAL MAGNETIC TUNNEL JUNCTION DEVICE**

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(21) Appl. No.: **18/150,816**

(22) Filed: **Jan. 6, 2023**

Publication Classification

(51) **Int. Cl.**

H10N 50/10	(2006.01)
H01L 23/528	(2006.01)
H10N 50/01	(2006.01)

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

CPC ***H10N 50/10*** (2023.02); ***H01L 23/5283*** (2013.01); ***H10N 50/01*** (2023.02)

(57) **ABSTRACT**

Embodiments of present invention provide a vertical magnetic tunnel junction (MTJ) structure. The structure includes an L-shaped MTJ stack including an L-shaped reference layer conformally on an L-shaped performance enhancing layer; an L-shaped tunnel barrier layer conformally on the L-shaped reference layer; and an L-shaped free layer conformally on the L-shaped tunnel barrier layer, where a vertical portion of the L-shaped MTJ stack is adjacent to a sidewall of a metal stud, the metal stud being directly on top of a metal wire in a dielectric layer. The structure further includes a first and a second electrode contacting a horizontal portion and a vertical portion of the L-shaped MTJ stack. A method of forming the same is also provided.