



US 20240222961A1

(19) **United States**

(12) **Patent Application Publication**  
**Zhou et al.**

(10) **Pub. No.: US 2024/0222961 A1**

(43) **Pub. Date: Jul. 4, 2024**

(54) **ASYMMETRIC BIDIRECTIONAL SURGE PROTECTION DEVICE**

(30) **Foreign Application Priority Data**

Dec. 30, 2022 (CN) ..... 2022117207583

(71) Applicant: **Littelfuse Semiconductor (Wuxi) Co., Ltd., Wuxi (CN)**

**Publication Classification**

(72) Inventors: **Jifeng Zhou, Wuxi (CN); Tsung-Wen Mou, Wuxi (CN)**

(51) **Int. Cl.**  
**H02H 9/04** (2006.01)

(52) **U.S. Cl.**  
CPC ..... **H02H 9/041** (2013.01)

(73) Assignee: **Littelfuse Semiconductor (Wuxi) Co., Ltd., Wuxi (CN)**

(57) **ABSTRACT**

In one embodiment, an asymmetric bidirectional surge protection device is provided, including a crowbar device, and a clamping device, wherein the crowbar device is formed in a first area of a semiconductor die, and wherein the clamping device is formed in a second area of the semiconductor die, wherein the second area surrounds the first area.

(21) Appl. No.: **18/526,607**

(22) Filed: **Dec. 1, 2023**

