



(54) **3D IC POWER GRID**

**Publication Classification**

(71) Applicant: **Taiwan Semiconductor Manufacturing Company, Ltd.**,  
Hsinchu (TW)

(72) Inventors: **Noor E.V. Mohamed**, Hsinchu (TW);  
**Fong-Yuan Chang**, Hsinchu (TW);  
**Po-Hsiang Huang**, Hsinchu (TW);  
**Chin-Chou Liu**, Hsinchu (TW)

(51) **Int. Cl.**  
*H01L 23/48* (2006.01)  
*H01L 21/822* (2006.01)  
*H01L 23/00* (2006.01)  
*H01L 25/065* (2006.01)

(52) **U.S. Cl.**  
CPC ..... *H01L 23/481* (2013.01); *H01L 21/8221*  
(2013.01); *H01L 24/17* (2013.01); *H01L 25/0657* (2013.01)

(21) Appl. No.: **18/596,404**

(22) Filed: **Mar. 5, 2024**

**Related U.S. Application Data**

(63) Continuation of application No. 17/380,305, filed on Jul. 20, 2021, now Pat. No. 11,923,271, which is a continuation of application No. 16/516,966, filed on Jul. 19, 2019, now Pat. No. 11,081,426.

(60) Provisional application No. 62/712,718, filed on Jul. 31, 2018.

(57) **ABSTRACT**

A three dimensional Integrated Circuit (IC) Power Grid (PG) may be provided. The three dimensional IC PG may comprise a first IC die, a second IC die, an interface, and a power distribution structure. The interface may be disposed between the first IC die and the second IC die. The power distribution structure may be connected to the interface. The power distribution structure may comprise at least one Through-Silicon Vias (TSV) and a ladder structure connected to at least one TSV.

