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(19) **United States**(12) **Patent Application Publication****Chen et al.**(10) **Pub. No.: US 2023/0230909 A1**(43) **Pub. Date: Jul. 20, 2023**(54) **PACKAGES WITH SI-SUBSTRATE-FREE INTERPOSER AND METHOD FORMING SAME***H01L 25/065* (2006.01)*H01L 21/768* (2006.01)*H01L 23/48* (2006.01)(71) Applicant: **Taiwan Semiconductor Manufacturing Co., Ltd.**, Hsinchu (TW)(72) Inventors: **Ming-Fa Chen**, Taichung City (TW);
Chen-Hua Yu, Hsinchu (TW)(21) Appl. No.: **18/186,525**(22) Filed: **Mar. 20, 2023**(52) **U.S. Cl.**CPC *H01L 23/49822* (2013.01); *H01L 24/05* (2013.01); *H01L 24/80* (2013.01); *H01L 25/0657* (2013.01); *H01L 21/76805* (2013.01); *H01L 21/76898* (2013.01); *H01L 23/481* (2013.01); *H01L 21/76877* (2013.01); *H01L 21/76807* (2013.01); *H01L 2224/80895* (2013.01); *H01L 2224/05571* (2013.01); *H01L 2224/05569* (2013.01); *H01L 2225/06544* (2013.01); *H01L 2924/0695* (2013.01)**Related U.S. Application Data**

- (63) Continuation of application No. 17/106,744, filed on Nov. 30, 2020, now Pat. No. 11,610,858, which is a continuation of application No. 15/647,704, filed on Jul. 12, 2017, now Pat. No. 10,854,568.
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ABSTRACT

A method includes forming a plurality of dielectric layers, forming a plurality of redistribution lines in the plurality of dielectric layers, etching the plurality of dielectric layers to form an opening, filling the opening to form a through-dielectric via penetrating through the plurality of dielectric layers, forming an insulation layer over the through-dielectric via and the plurality of dielectric layers, forming a plurality of bond pads in the dielectric layer, and bonding a device to the insulation layer and a portion of the plurality of bond pads through hybrid bonding.

