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(54) Title: ALUMINUM OXIDE ISOLATION FOR HYBRID BONDING

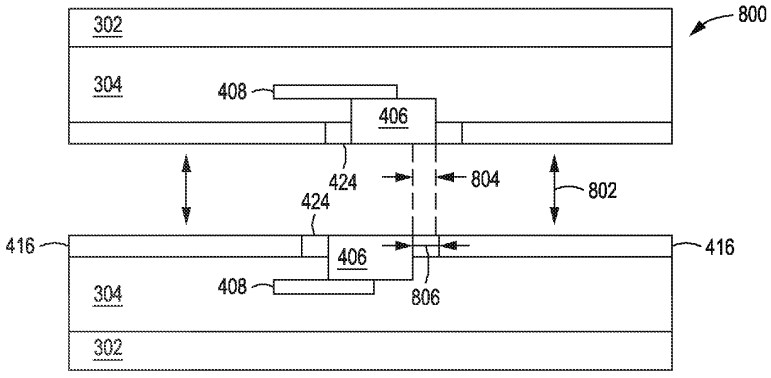


FIG. 8

(57) Abstract: A method for preparing a substrate for hybrid bonding by forming an isolation barrier around metal contacts on the substrate to separate the metal contacts from an aluminum oxide (Al_2O_3) bonding layer prior to performing the hybrid bonding process. A method may include forming an aluminum oxide layer on the substrate as a bonding layer for a hybrid bonding process where the aluminum oxide layer is formed on a dielectric material on the substrate that is different from a material of the aluminum oxide layer, forming a metal contact on the substrate that penetrates through the aluminum oxide layer, and forming an isolation barrier around the metal contact where the isolation barrier prevents adjacent portions of the aluminum oxide layer next to the metal contact from completely covering an uppermost bonding surface of the metal contact during an annealing process of the hybrid bonding process.

WO 2025/188732 A1

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