

BONDING APPARATUS, SYSTEM, AND METHOD OF BONDING**Abstract**

Various embodiments may provide a bonding apparatus. The bonding apparatus may include a chamber configured to receive a bond-chuck, and a plate that is configured to cooperate with the bond-chuck to hold a first arrangement and a second arrangement. The first arrangement may include a first substrate and an aluminum bond structure, and the second arrangement may include a second substrate and a germanium bond structure. The bonding apparatus may additionally include a scanner configured to provide an infrared beam through the plate, the second substrate, and the germanium bond structure to heat the aluminum bond structure in contact with the germanium bond structure. The bonding apparatus may further include an actuator configured to configured to apply a bonding force on the aluminum bond structure and the germanium bond structure, thereby forming an aluminum-germanium (AlGe) bond structure bonding the first substrate and the second substrate.

FIG. 6B