“Large-area chip attachment by sintering nanosilver paste: process improvement by nondestructive characterization”

ABSTRACT

Low-temperature joining with sintered silver is being developed as a lead-free, non-solder, die-attach solution for packaging power devices and modules. While its feasibility has been demonstrated, one major drawback of sintered silver joint is the high applied pressure during sintering to produce the desired bond strength. A high percentage of voids could also remain in the sintered joints. Applying the technique to large-area attachments also means a correspondingly higher applied pressure, and damage to the devices and substrates is possible. This study focused on the use of nanosilver paste as an attachment material that can be sintered at relatively low temperatures and pressures. Because of the difficulty of obtaining the die-shear strength of very large attachments, two non-destructive methods, micro X-ray computed tomography (CT) and curvature measurement using a laser-scanning technique, were used to characterize the bonded structures. Effects of different drying and sintering conditions on the bonding qualities were discussed.

BIO

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