

# Effect of Surface-Modified Copper Substrate by Photolithography On the Solderability of Lead-Free Solder Alloy

## Abstract

Various modifications of copper substrates have been developed for soldering applications due to their promising properties. The present study aimed to investigate the effect of dimple micro-texture on a copper substrate surface on soldering. Photolithography technique was used to fabricate a dimple micro-texture onto copper substrate. After surface texturing, the copper substrate was reflowed with Sn–0.7Cu solder. The surface microstructural was determined using optical microscopy (OM), the 3D surface profiler, and visual tests. The spreading area of the Sn–0.7Cu solder and the copper substrate was also examined. In comparison with Sn–0.7Cu solder on textured surface, TD500 has larger spreading area as the diameter was large nearly equivalent to non-textured surface. However, Sn–0.7Cu textured substrate exhibits low spreading area than non-textured surface that is beneficial for solderability properties.

## Keywords

Lead-free solder; Photolithography; Sn–0.7Cu solder; Surface texture