

## Paste-in-Hole Processing: Thick PCB's

Various Samtec surface-mount-technology (SMT) components utilize additional through-hole features that are designed to be soldered with paste-in-hole (PIH) techniques. These through-hole features include weld tabs, solder nails and counter-weights, which are all designed to provide additional mechanical strength and stability to the soldered component. PCB and Stencil Layout recommendations for individual components are provided on the Samtec website. The PIH stencil aperture sizes are designed to provide optimal solder paste volume for solder joint formation in the through-hole barrel. The combination of recommended through-hole size and stencil aperture size results in encapsulation of the feature within the barrel.

In many cases, these features are designed so that they do not protrude from the bottom side of standard, .062" [1.57mm] or .093" [2.36mm] thick PCB's. Customers more familiar with traditional through hole technology are not always comfortable with this and sometimes question the integrity of the solder joint. The main driver of this design is that protrusion would interfere with the screen printing process on the second reflow side of a double-sided assembly. IPC acceptance criteria includes an allowance for non-protrusion of through-hole features. At the time this document was created, this information could be found in IPC-A-610G, Section 7.3.3, Note 1 which states that for components having pre-established lead lengths that are less than board thickness, and the components or lead shoulders are flush to the board surface, the lead end is not required to be visible in the subsequent solder connection.

Samtec has conducted studies, including pull testing, and has confirmed that while using thick PCB's (up to 4mm), as long as the through-hole mechanical features (weld tabs, solder nails, etc.) are encapsulated with solder, they will yield maximal mechanical strength. In fact, test results show that the board fails before the mechanical features or solder joints, often resulting in the plated barrel being pulled from the PCB.

The image below shows the encapsulation of a weld tab in the barrel of a thick PCB.



Further information on the Samtec website regarding PIH processing can be found [here](#).

Questions? Please contact the Samtec Interconnect Processing Group [ipg@samtec.com](mailto:ipg@samtec.com)