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COLORADO SPRINGS, CO -- Results of joint research by **Plexus** and **Photo Stencil** for printing solder fillets on very small gold Kovar tabs have been released.

The project entailed an effort by Plexus to print solder fillets on gold Kovar tabs. The tab was 0.063" +/- 0.002" x 0.125" +/-0.002" and plated with 150 microinches (minimum) of nickel and then plated with 100 microinches (minimum) of gold. The solder fillet needed to align precisely with the tab. Reflow had to be perfect. There could be no gas pockets or voids anywhere on the fillet. The plan was to use a stencil and a squeegee to transfer the solder onto the fillet. However, getting a successful plot was extremely difficult.

The stencils Plexus had been using had six apertures distributed over the large pad for the Kovar tab. Using this configuration of apertures to print the solder paste did not permit sufficient solder paste solvent to escape during reflow. This caused voids under the Kovar tab and poor solder fillets on the edge of the Kovar tab during reflow.

"We had set extremely high standards because the fillet of the solder on this part needed to be perfect," said Travis Tanner, CIM/CAM tech Sr., Plexus Manufacturing Solutions. "We had tried many stencils and made many plots, but they all resulted in failures."

Plexus then teamed with **Photo Stencil** engineers to design several test stencil apertures in an attempt to solve the outgassing problem that was causing the defective fillets and solder voids. The solution was found in the aperture design, a honeycomb type aperture structure; and ground plane aperture designs for quad flat pack no lead (QFN) stencil printing.

The resultant paper, *Screen Printing Solutions for Small Die and Precision Alignment Challenges,* by Plexus' Tanner and Photo Stencil's William Coleman, Ph.D, details the process and solution. For the full paper visit www.photostencil.com/pdf/Screen-Printing-Small-Die.pdf

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