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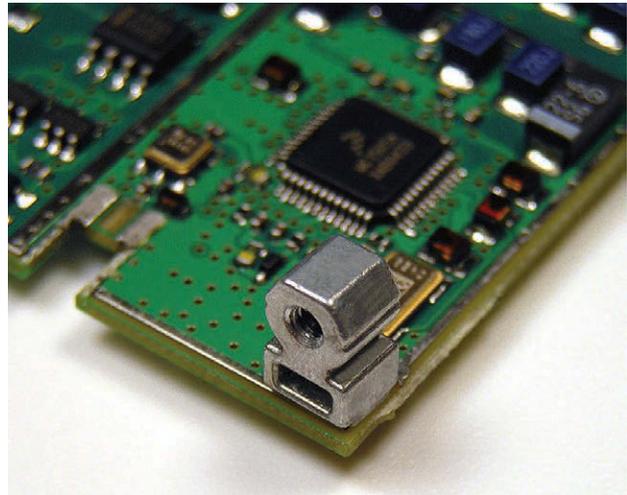
SURFACE MOUNT FASTENERS FOR PRINTED CIRCUIT BOARDS by Michael J. Rossi, Marketing Services Supervisor

Surface mount fastening technology has come a long way in recent years with increasingly more fastener types and functions. Regardless of type, surface mount fasteners install permanently onto a printed circuit board by employing existing production infrastructure. By surface mounting a fastener to a board, significant cost savings can be achieved without compromising the performance of a design.

Such fasteners fed on a tape and reel, assembled with pick and place equipment, and reflowed alongside other electronic components ultimately offer the potential to save handling time and money and reduce the possibility of board quality failures, which sometimes can occur as an offshoot of working with other kinds of hardware.

The hardware – supplied on tape and reel consistent with SMT automated installation equipment – is positioned where designed while a board is being processed and then permanently installed with pick-and-place robotics in the same manner and at the same time as other surface mount components prior to the automated reflow solder process. The fasteners simply become another non-intrusive component on a board. And since the parts are packaged on a tape and reel (neither loose nor dumped into bowls), there is no chance of inadvertently mixing the parts with other hardware.

The portfolio of surface mount fasteners is growing and many types and styles have been engineered, each serving one or multiple purposes. Depending on type, surface mount fasteners can be specified to mount,



SURFACE MOUNT FASTENER SOLUTIONS FOR PRINTED CIRCUIT BOARDS INCLUDE RIGHT-ANGLE VERSIONS CREATING PERMANENT RIGHT-ANGLE ATTACHMENT POINTS.

stack, or space boards; attach components to boards; or create right-angle attachment points on boards. Some integrate captive screws – eliminating loose screws and all the related hassles – ideally suiting applications where removal and reinstallation of boards is anticipated.

Surface Mount Spacers, Nuts and Standoffs

These threaded or unthreaded types offer the capabilities to stack, space, and/or attach and can be installed in boards as thin as .020" / 0.5mm. Reels carry up to 3,500 parts, depending on fastener size. A polyimide patch is supplied to allow for reliable vacuum pickup. Fasteners are also available without a patch, which may provide a lower-cost alternative, depending on installation methods/requirements. Fasteners are available either in brass or steel.

Surface Mount Captive Panel Screw Assemblies

These fastener assemblies in several styles can be installed in boards as thin as .063" / 1.6mm and permit easy removal and reinstallation of boards. They can be provided as a two-piece assembly with a plastic cap or as a spring-loaded, all-metal fastener that is installed preassembled in one piece. The screws can be finger or tool actuated after installation.

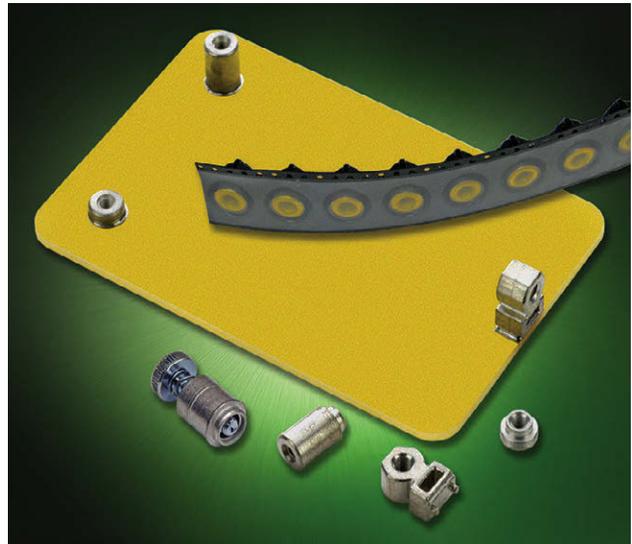
Surface Mount Right-Angle Fasteners

These offer an efficient and reliable method to create permanent right-angle attachment points on printed circuit boards as thin as .040" / 1mm. They provide reusable threads parallel to a board to accommodate a component for mounting 90° to the board. They can serve as viable alternatives to conventional angle brackets or threaded right-angle blocks for attaching board to chassis, chassis to board, or component to board.

The shape of right-angle types readily allows the part to be picked up by a pick-and-place machine without requiring a patch. The fastener is presented in the tape and reel with two small pins downward and the flat portion of the fastener's head exposed to the pneumatic finger. The two pins at the bottom act as two very small pilots, providing both stability and locational accuracy during placement.

In addition, a "step" along the bottom allows the solder fillet to be formed along this edge, even while the face of the fastener is flush against an edge of the board. The fastener's rectangular hole reduces the mass and promotes quicker heating to minimize heat draw away from surrounding components on the board.

The rapid rise in attachment applications for compact consumer electronic assemblies has led to extremely small "micro" versions of surface mount fasteners for the jobs.



SURFACE MOUNT FASTENERS ARE SUPPLIED ON TAPE AND REEL CONSISTENT WITH SMT AUTOMATED INSTALLATION EQUIPMENT.

Note that micro fasteners are not simply scaled-down versions of their larger counterparts. Special engineering comes into play. As fasteners are "downsized," issues relating to tight tolerances and performance values, among others, become magnified and special features engineered into the fastener often become both critical and essential.

As an example of a special feature, micro versions of spacers, nuts, and standoffs integrate a unique hex-shaped barrel by design to create a larger solder area for enhanced reliability in service. Variations have added even more functionality: Tin-plated brass versions offer superior electrical and mechanical attachment points for a board, in addition to fulfilling requirements for spacing, stacking, mounting, and/or attaching components.

Across the board, surface mount fastening technology can help to streamline production and promote reliable attachment of components.

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