MAXIMUM SOLUTIONS

A Superior Solution for Press-Fit Pin and Receptacle Applications

Sometimes, the products that we take for granted are among the most important. For example, the quality of the fasteners that secure the skin to the air frame on an ultra-high-tech aircraft are integral, as failure could be catastrophic. The press-fit pins and receptacles that we apply to interconnect electronic modules are another such example. Electronic circuitry interconnected by press-fit pins and receptacles is so broad in application that their critical role in system performance cannot be given short shrift. Recognizing this, Mill-Max Mfg. has approached the design and manufacture of press-fit pins and receptacles with an uncompromising attention to detail.

Press-fit-style pins and receptacles are among the most versatile types of interconnection components for electrical and electronic applications. Individual pins and receptacles are available in sizes suited to particular form factors. They may be used for the transmission of signals from power on down to logic level.

Pins or receptacles, used individually or in pairs, can be useful to terminate a single wire to a PC board. Used in groups, press-fit pins and receptacles are perfect for applications such as:

- Daughterboard to PC Motherboard
- Component to PC Board
- Module to PC Board
- Cable to PC Board
- Cable to Cable
- Fuse

Applications can be in power, control functions, signal, data, even RF. The Mill-Max approach to press-fit pins and receptacles is unique, applying specialized precision-machined pin technology, offering multiple advantages over stamped-and-formed connectors:

- Seamless construction prevents contact contamination from wave or reflow soldering.
- Specialized press-fit feature geometries – triangle, square, hexagon, octagon – to meet the hole size requirements of specific applications.
- Lead-in countersinks on pin receptacles to facilitate pin alignment.
- Pin and receptacle shells are brass alloy, 360 ½ hard, for strength, conductive and thermal properties.
- Multi-finger beryllium copper contact clip scores the mating device lead for gas-tight electrical connection and provides best power and force distribution.
- Two-piece receptacle construction (shell and contact clip) allows for cost-efficient plating combinations for best solderability and conductivity.

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Press-fit pins and receptacles fall into two distinct categories: those for PC board plated through-holes (solderless press-fit) and those for non-plated through-holes such as bare PC board holes, plastic housings and insulators. Press-fitting utilizes material displacement, where the pin deforms both the mating hole shape and diameter; one exception is compliant press-fit pins, as they conform to the hole size as they are pressed in.

Solderless press-fit pins and receptacles are utilized in applications where soldering is not reliable or economical, such as, thick printed circuit boards and backplanes. Oftentimes press-fitting is just the more efficient manufacturing solution for:

- Bringing power or control signals onto SMT boards via cable, discreet wires or a daughter card.
- Board stacking applications.
- Adapter boards for footprint translation (useful when a chip is converted from through-hole to an SMT package).

When pressed into plated holes on circuit boards, a properly sized hole and press-fit will form a gas tight connection. A gas tight connection provides a reliable electrical interface characterized by stable impedance and no oxidization. Because the applications vary greatly, the physical configurations of how the pins and receptacles mount and function also vary.

Press-Fit Barb for Non-Plated Through-Holes

Many pins, receptacles and spring pin connectors use this design for retention purposes, in insulators or plastic housings.

Press-Fit Knurl for Non-Plated Through-Holes

Vertical serrations are machined around the diameter of an interconnect pin, providing a retention feature for press-fitting in a non-plated PC board hole or insulator, while also preventing rotation of the pin.

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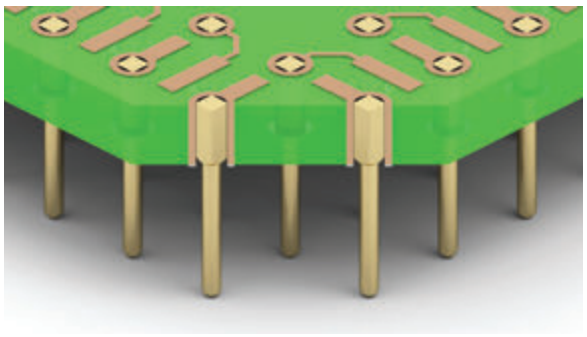
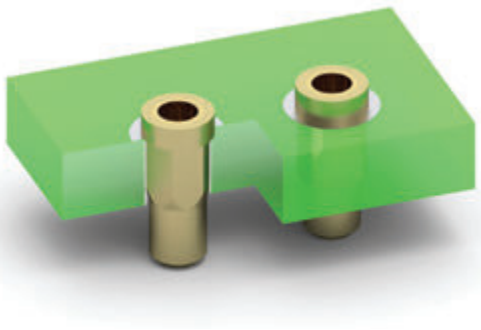
Press-Fit Polygons for Plated Through-Holes

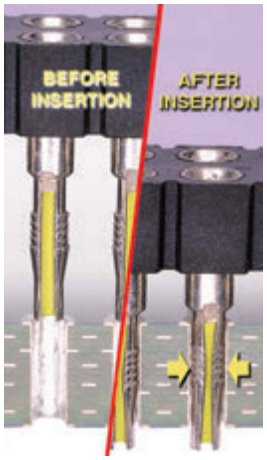
These unique designs provide a solderless press-fit interconnect for PC boards. They are especially useful for troublesome, hard-to-solder thick PC boards and backplanes.





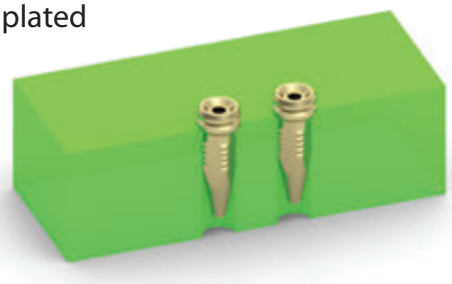
Press-Fit Compliant Tail for Plated Through-Holes

A drilled and slotted receptacle or pin tail is pressed into a plated 0.040" ±0.003" PC board through-hole, to mount an interconnect component to a PC board without damaging the hole. No post-assembly soldering is required.



Press-Fit Compliant Body for Plated Through-Holes

These receptacles can be press-fit into non-plated or plated through-holes. Soldering is optional for plated through-holes. An important benefit of this design is that it allows the receptacle to have a low profile, only 0.030" above the PC board.



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Quality is Critical

The quality and construction of pins and receptacles can vary considerably by manufacturer. For highest quality and reliability, press-fit pins and receptacles should be machined to tight tolerances and plated with metals that provide the highest conductivity and corrosion protection.
Mill-Max press-fit pins and receptacles are designed and manufactured in this manner, to the electronic industry's highest standards. Each pin and receptacle is high speed turned to precision tolerances as tight as ±0.0005" and even tighter when necessary.

Conclusion

Mill-Max Mfg. Corp. is the leading U.S. manufacturer of machined PC board contact pins, terminals, and interconnects. From an electrical standpoint, Mill-Max press-fit pins and receptacles perform similar functions. Pins and receptacles are available in different shapes and configurations to best match the intended application and assembly technique. All are precision-machined, not stamped. Customers achieve the highest degree of design flexibility and performance without paying for tooling costs.

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