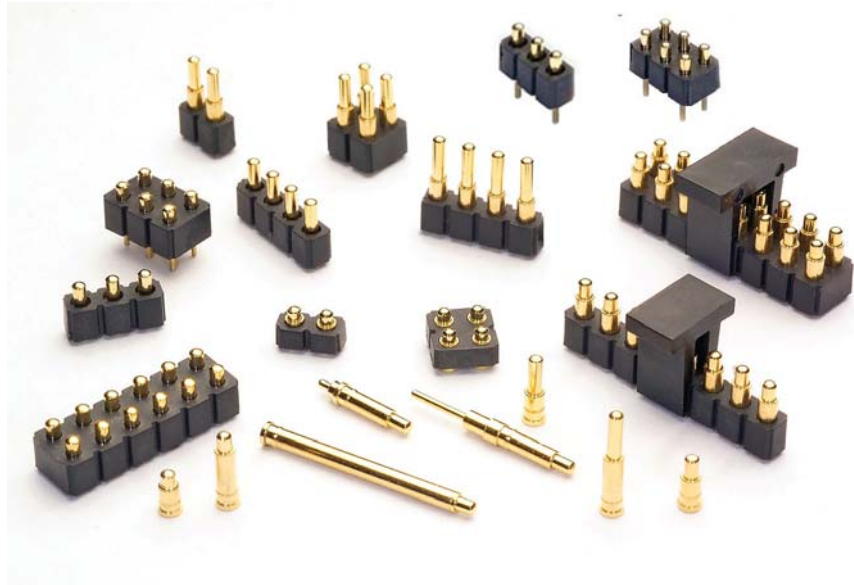


MAXIMUM SOLUTIONS

MILL-MAX SPRING-LOADED CONNECTORS (SLC)

www.mill-max.com/PR561



Mill-Max SLCs are button type contacts interconnecting two parallel conductive surfaces inside an electronic device or instrument. The stroking movement of the spring pin piston accommodates uneven, non-parallel conditions due to mechanical tolerances in the assembly.

Mill-Max Spring-Loaded Connector (SLC) Manufacturing

Mill-Max SLCs are manufactured from gold-plated, precision-machined brass alloy components and a high-reliability, gold-plated spring. Mill-Max stocks 50 plus styles of discrete spring-loaded pins.

Mill-Max SLCs are manufactured to precise tolerances and designed to perform reliably over a long cycle life. Mill-Max spring-loaded pins and connectors are RoHs compliant.

Mill-Max Spring-Loaded Connector (SLC) Packaging

Mill-Max individual spring-loaded pins are easily configurable into customer-specific footprint assemblies. For small, quick prototype runs, spring pin insulators are manufactured from FR-4 epoxy. For large production runs, insulators are molded from high-temperature, RoHs compliant, Nylon 46 thermoplastics.

Mill-Max SLC strips are available as single or double row assemblies with contacts on a .050" or .100" grid. They are available for both through-hole and surface mount soldering. The surface mount types are available with a removable vacuum pick-up clip and packaged on carrier tape to feed industry standard pick 'n' place machines.

For pattern alignment of large SMT Mill-Max SLC footprints, alignment pins can be integrated into the insulator.

The different families offer different heights to accommodate various PCB spacing.

Mill-Max Spring-Loaded Connector (SLC) Applications

Mill-Max SLCs are often used as the internal battery connection in portable instruments, or as the external battery connection for charging these instruments (docking stations).

Another popular application is stacking printed circuit boards in an assembly. Our customers will find utilizing spring pin connectors a convenient approach to creating mezzanine-tiered board modules that can be assembled and disassembled quickly.

Mill-Max SLCs are a good choice for blind-mating applications. The spring pin piston need only make contact with its mating surface. This is typically a land or pad that is larger than the plunger diameter. Compare this to a pin and socket connection where alignment must be more precise for the pin to enter the socket.

Mill-Max SLCs can mate to the following surfaces:

- A conductive input/output pad found on the instrument pack itself.
- A gold-plated land on a circuit board. A hard gold over nickel plated surface is recommended for the mating surface. This is the same as would be used for the printed circuit fingers associated with card edge connectors.
- Individual Mill-Max gold-plated nail head pins which can be soldered to the mating circuit board to serve as targets.
- Mill-Max Target Connectors which provide a large .070" diameter flat, gold-plated circuit path to the board.

Mill-Max Spring-Loaded Connector (SLC) Assembly

(Please note: The following helpful guidelines are from customer feedback; they are solely intended for reference and do not imply a standard procedure.)

When our customers are planning to use SMT versions of Mill-Max SLCs in their assembly, they typically specify a round pad aperture, a minimum of .005" greater than the base diameter of the spring pin, to ensure a proper solder fillet.

Typically, our customers screen a solder paste thickness of .005-.006" thick and utilize a SAC alloy solder paste to inhibit gold embrittlement.

For Mill-Max SMT SLC's in SIP and STRIP packages up to one inch long:

A coplanarity of .005" is print specified and maintained between the spring pin bases that sit upon the PCB.

Mill-Max Spring-Loaded Connector (SLC) Performance

Mill-Max SLCs should not be exposed to any contaminant creating a film. This promotes a binding condition between precision-machined surfaces.

Cycle life testing of Mill-Max 0900 Series Spring-Loaded Connectors has been conducted in a controlled environment achieving a million stroke cycle life. Based upon similarity of design, other Mill-Max spring products should exhibit a

long cycle life too. Customers should test Mill-Max Spring-Loaded Connectors in an environment similar to their application to quantify cycle life.

Three Stroke Force parameters are specified with Mill-Max SLCs: Minimum Stroke Force, Mid-Stroke Force and Maximum Stroke Force.

- The Minimum Stroke Force is the force required to overcome pre-load and begin depressing the spring plunger.
- The Mid-Stroke Force is the force required to depress the spring plunger to mid-travel.
- The Maximum Stroke Force is the force required to fully depress the spring to maximum travel.

It is always best to design a spring pin application to operate in the Mid-Stroke range. Operating at the Minimum Stroke Force range may produce unpredictable results and operating at the Maximum Stroke Force may over-compress and damage the spring pin. Utilization of stand-off hardware is recommended in any load bearing application involving Mill-Max SLCs to prevent over-compression.

Mill-Max SLCs are designed to be used with pressure applied along the axis of the piston. Angular and lateral engagement of the piston should be avoided since this may result in bending, fracturing or binding of the piston.

Mechanical Performance Parameters:

25 grams @ Minimum Stroke

60 grams @ Mid-Stroke

95 grams @ Maximum Stroke

Electrical Performance Parameters:

Rated Current: 2 amps continuous/3amps peak

Rated Voltage: 100Vrms/150Vdc

Contact Resistance: 20 milliohm maximum

Mating Target Connectors for Mill-Max Spring-Loaded Connectors (SLC)

Mill-Max Target Connectors provide a convenient mating surface to connect with Mill-Max Spring-Loaded Connectors (SLC). Mill-Max Target Connectors are a very convenient solution to applications requiring a conductive extension from the surface of one module up to another. If a non-standard solution is required, it is much more cost effective to modify a Mill-Max Target Connector than a spring pin assembly.

For more information on Spring-Loaded or Target Connectors, please visit: www.mill-max.comPR561.