MILL-MAX®

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SPRING-LOADED CONNECTORS

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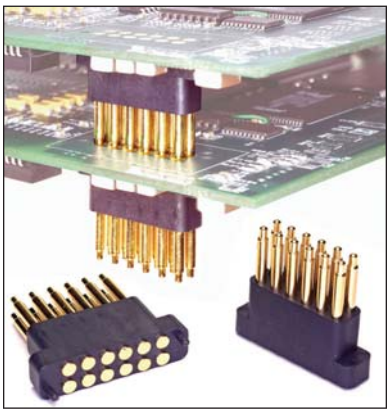
MILL-MAX SPRING-LOADED CONNECTORS ARE IDEAL FOR A WIDE RANGE OF APPLICATIONS, from portable data acquisition units and mobile communication to medical and military equipment applications. Their unique design can be the perfect solution for many situations where establishing an electrical path between mating points is a challenge, including problematic vibratory environments.

When strategically placed within an assembly and utilized correctly (shielded from over compression and direct side load forces,) spring-loaded connectors provide a reliable connection exceeding a million cycles.



SOME TYPICAL APPLICATIONS INCLUDE:

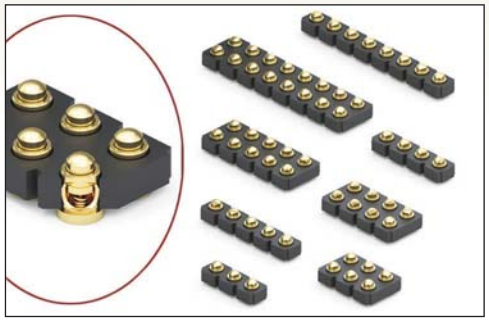
- The internal battery connection in portable instruments, or as the external battery connection for charging these instruments (docking stations).
- As a method for stacking printed circuit boards in an assembly. Utilizing spring pin connectors is a convenient approach to creating mezzanine-tiered board modules that can be assembled and disassembled quickly.
- 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. In situations where the assembly process doesn't allow for visibility, spring pins are the optimum choice.

MILL-MAX SPRING-LOADED CONNECTORS 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, flat gold-plated circuit path to the board.

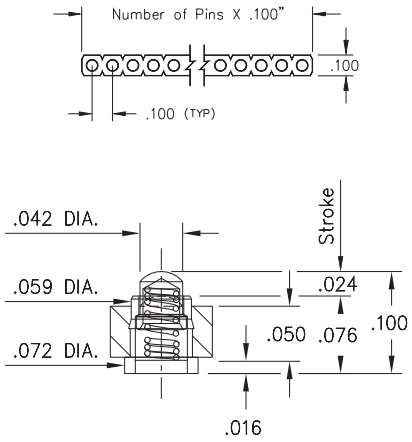
SPRING-LOADED CONNECTORS

SERIES 815 & 817 • .100" GRID SURFACE MOUNT, ULTRA LOW PROFILE • SINGLE AND DOUBLE ROW STRIPS

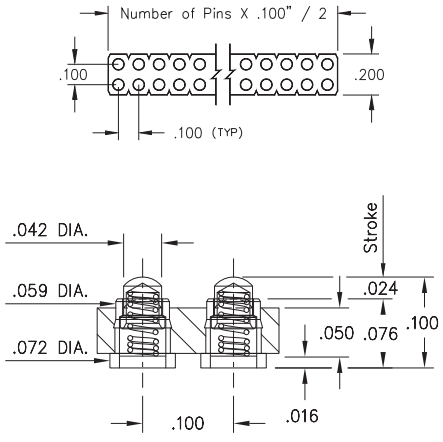


- Modular contacts for use on .100" grid, available in a height of .100", supplied in single and double row contact strips
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Pistons have a .012" mid. stroke and a .024" max. stroke
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for surface mount processes
- 815 & 817 series contact strips are designed for manual placement onto a .082" Ø solder pad prior to reflow soldering

SINGLE ROW Series 815



DOUBLE ROW Series 817



ORDERING INFORMATION

Single Row Series 815

815-22-0XX-30-001101

Specify number of contacts 01-32

Double Row Series 817

817-22-0XX-30-001101

Specify number of contacts 04-72

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height: 25 grams
Spring force @ mid stroke (.012"): 60 grams
Durability: 1,000,000 cycles
Coplanarity: .005" (Single Row up to 10 pins; Double Row up to 20 pins), For higher pin counts, contact Technical Support

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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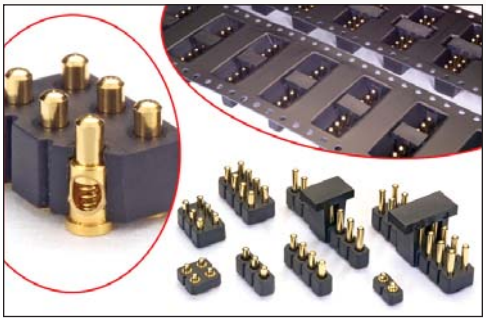
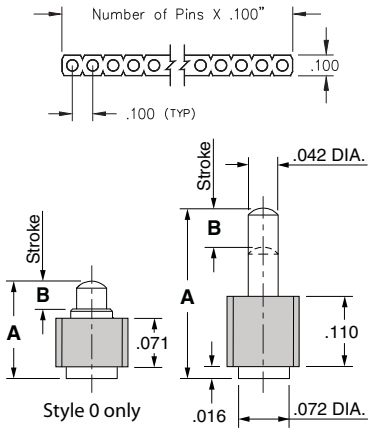
SPRING-LOADED CONNECTORS

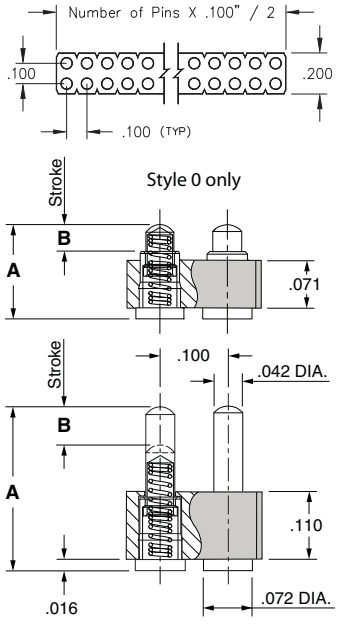
SERIES 811 & 813 • .100" GRID SURFACE MOUNT, LOW PROFILE • SINGLE AND DOUBLE ROW STRIPS



SINGLE ROW Series 811



DOUBLE ROW Series 813



- Modular contacts for use on .100" grid, available in five heights from .137" to .236", supplied in single and double row contact strips
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Pistons have a long stroke relative to the low profile of the assembly
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for surface mount processes
- Both 811 & 813 series, contact styles 1 through 4, are available on 32mm wide carrier tape and fitted with vacuum pick-up clips for automated pick and place assembly. Tape and Reel packaging per EIA-481. See page 12 for strip lengths available and ordering information

ORDERING INFORMATION

Single Row Series 811

811-22-0XX-30-00X101

Specify number of contacts 01-64 — **Specify contact style** 0-4

Double Row Series 813

813-22-0XX-30-00X101

Specify number of contacts 04-72 — **Specify contact style** 0-4

For 811 and 813 Tape & Reel packaging, see page 12

CONTACT STYLE	INITIAL HEIGHT A	MAX. STROKE B
0	.137	.039
1	.177	.045
2	.197	.055
3	.217	.055
4	.236	.055

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height (A): 25 grams
Spring force @ mid stroke (B/2): 60 grams
Durability: 1,000,000 cycles
Coplanarity: .005" (Single Row up to 10 pins; Double Row up to 20 pins), For higher pin counts, contact Technical Support

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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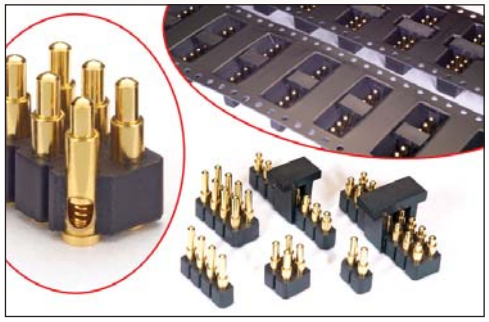
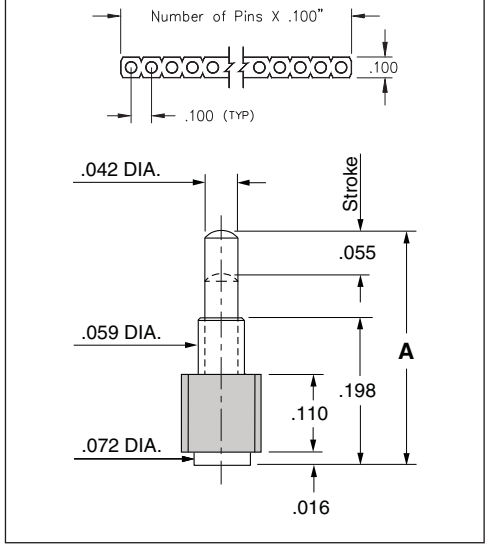
SPRING-LOADED CONNECTORS

SERIES 812 & 814 • .100" GRID SURFACE MOUNT, MID PROFILE • SINGLE AND DOUBLE ROW STRIPS

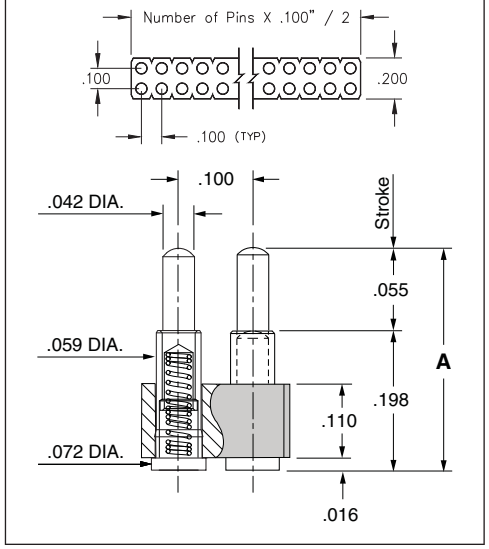


- Modular contacts for use on .100" grid, available in ten heights from .255" to .430", supplied in single and double row contact strips
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Extended body provides greater bearing surface for increased strength & plunger protection
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for surface mount processes
- Both 812 & 814 series, contact styles 0 through 9, are available on 32mm or 44mm wide carrier tape and fitted with vacuum pick-up clips for automated pick and place assembly. Tape and Reel packaging per EIA-481. See page 12 for strip lengths available and ordering information

SINGLE ROW Series 812



DOUBLE ROW Series 814



ORDERING INFORMATION

Single Row Series 812

812-22-0XX-30-00X101

Specify number of contacts 02-64 — **Specify contact style** 0-9

Double Row Series 814

814-22-0XX-30-00X101

Specify number of contacts 04-72 — **Specify contact style** 0-9

For 812 and 814 Tape & Reel packaging, see page 12

CONTACT STYLE	INITIAL HEIGHT A	CONTACT STYLE	INITIAL HEIGHT A
0	.255	5	.350
1	.275	6	.370
2	.295	7	.390
3	.315	8	.410
4	.335	9	.430

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height (A): 25 grams
Spring force @ mid stroke (.0275"): 60 grams
Durability: 1,000,000 cycles
Coplanarity: .005" (Single Row up to 10 pins; Double Row up to 20 pins), For higher pin counts, contact Technical Support

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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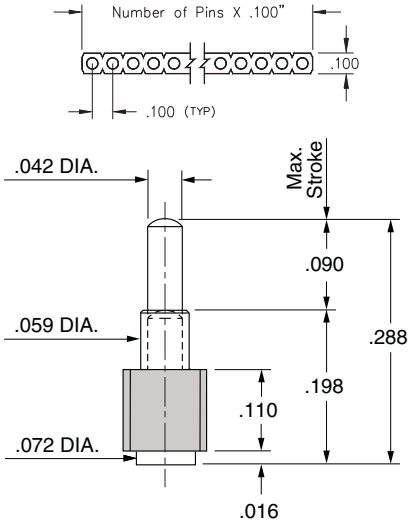
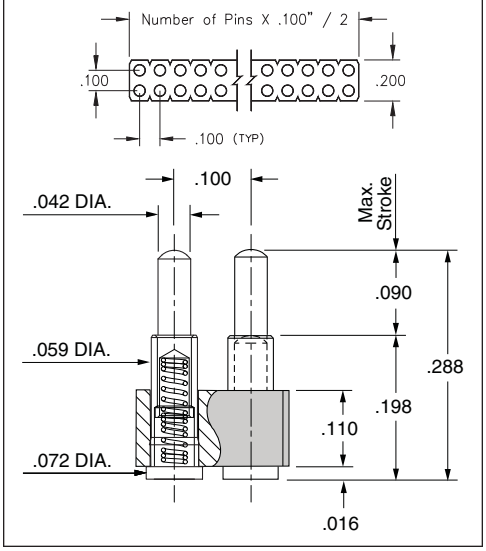
SPRING-LOADED CONNECTORS

SERIES 819 & 820 • .100" GRID SURFACE MOUNT, LONG STROKE • SINGLE AND DOUBLE ROW STRIPS

SINGLE ROW Series 819



DOUBLE ROW Series 820



- Modular contacts for use on .100" grid, available in a height of .288", supplied in single and double row contact strips
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Pistons have a .045" mid. stroke and a .090" max. stroke
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for surface mount processes
- Both 819 & 820 series contact strips are designed for placement onto a Ø .082" solder pad prior to reflow soldering
- Tape and Reel packaging available, contact Technical Support

ORDERING INFORMATION

Single Row Series 819

819-22-0XX-30-001101

Specify number of contacts 01-64

Double Row Series 820

820-22-0XX-30-001101

Specify number of contacts 04-72

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height: 25 grams
Spring force @ mid stroke (.045"): 60 grams
Durability: 1,000,000 cycles

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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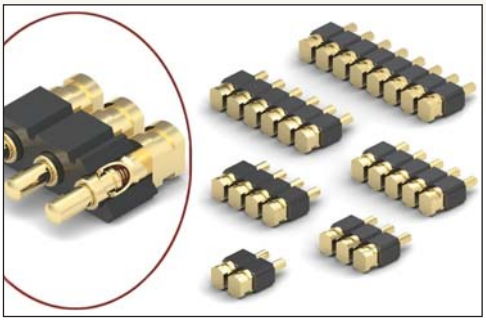
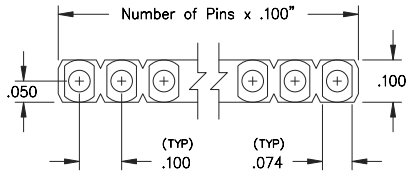
SPRING-LOADED CONNECTORS

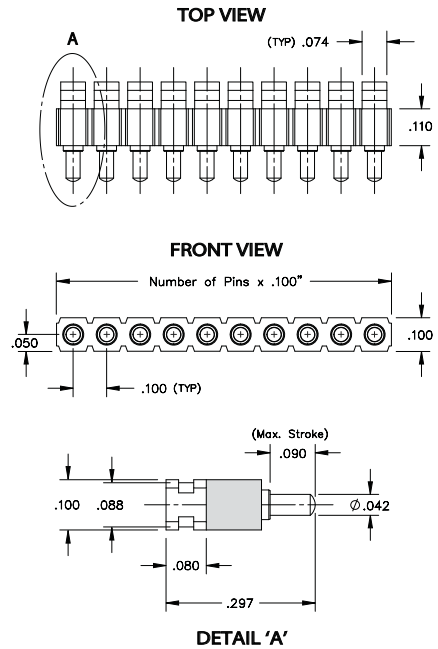
SERIES 810 • .100" GRID HORIZONTAL SURFACE MOUNT • SINGLE ROW STRIPS



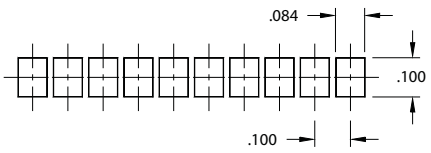
- Modular contacts for use on .100" grid, supplied in single row contact strips. Piston action is parallel to the board surface
- Ideal for daisy chaining of P.C.B.'s when mated with right angle target connectors (series 399...10-008) or for mating boards in a perpendicular orientation
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Pistons have a .045" mid. stroke & .090" max. stroke
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for surface mount processes
- 810 series contact strips are designed for manual placement onto solder pads

SINGLE ROW Series 810





Suggested P.C.B. FOOTPRINT



Coplanarity .005". For Pin Counts >10 positions consult Technical Support

ORDERING INFORMATION

Single Row Series 810

810-22-0XX-40-001101

Specify number of contacts 01-10

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height: 25 grams
Spring force @ mid stroke (.045"): 60 grams
Durability: 1,000,000 cycles

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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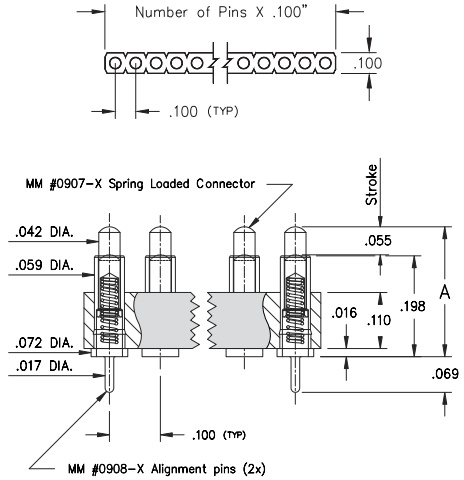
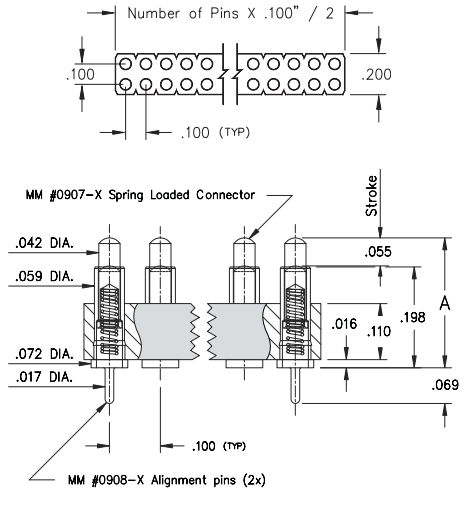
SPRING-LOADED CONNECTORS

SERIES 812 & 814 • .100" GRID SURFACE MOUNT WITH ALIGNMENT PINS • SINGLE AND DOUBLE ROW STRIPS

SINGLE ROW Series 812



DOUBLE ROW Series 814



- Modular contacts for use on .100" grid, available in ten heights from .255" to .430", supplied in single and double row contact strips
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Pistons have a .0275" mid stroke & .055" max. stroke
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for surface mount processes
- Both 812 & 814 series contact strips are designed for manual placement, .023 ±.003" plated through-holes in the circuit board are required for the alignment pins prior to intrusive reflow soldering

ORDERING INFORMATION

Single Row Series 812...01X101

812-22-0XX-30-01X101

Specify number of contacts 03-64 — **Specify contact style** 0-9

Double Row Series 814...01X101

814-22-0XX-30-01X101

Specify number of contacts 06-72 — **Specify contact style** 0-9

CONTACT STYLE	INITIAL HEIGHT A	CONTACT STYLE	INITIAL HEIGHT A
0	.255	5	.350
1	.275	6	.370
2	.295	7	.390
3	.315	8	.410
4	.335	9	.430

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height (A): 25 grams
Spring force @ mid stroke (.0275"): 60 grams
Durability: 1,000,000 cycles

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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SPRING-LOADED CONNECTORS

SERIES 811, 812, 813, 814 • .100" GRID SURFACE MOUNT • CARRIER TAPE AND PACKAGING

Ordering Information for Series 811/812/813/814 in Carrier Tape

Single Row Series 811

811-22-0XX-30-00X191

Specify contact style 0-4
Specify number of contacts 02-08

(32mm wide tape, 400 parts per 13" reel)

Double Row Series 813

813-22-0XX-30-00X191

Specify contact style 0-4
Specify number of contacts 04-16

(32mm wide tape, 400 parts per 13" reel)

Single Row Series 811

811-22-0XX-30-00X191

Specify contact style 1-4
Specify number of contacts 09-12

(44mm wide tape, 200 parts per 13" reel)

Double Row Series 813

813-22-0XX-30-00X191

Specify contact style 1-4
Specify number of contacts 18-24

(44mm wide tape, 200 parts per 13" reel)

Single Row Series 812

812-22-0XX-30-00X191

Specify contact style 0-2
Specify number of contacts 02-08

(32mm wide tape, 400 parts per 13" reel)

Double Row Series 814

814-22-0XX-30-00X191

Specify contact style 0-2
Specify number of contacts 04-16

(32mm wide tape, 400 parts per 13" reel)

Single Row Series 812

812-22-0XX-30-00X191

Specify contact style 0-2
Specify number of contacts 09-12

(44mm wide tape, 200 parts per 13" reel)

Double Row Series 814

814-22-0XX-30-00X191

Specify contact style 0-2
Specify number of contacts 18-24

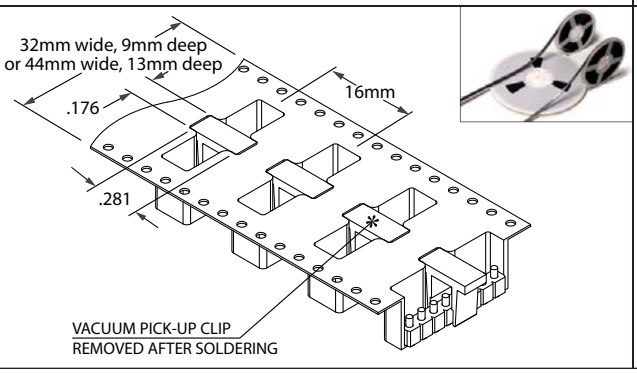
(44mm wide tape, 200 parts per 13" reel)

Single Row Series 812

812-22-0XX-30-00X191

Specify contact style 3-9
Specify number of contacts 02-12

(44mm wide tape, 200 parts per 13" reel)

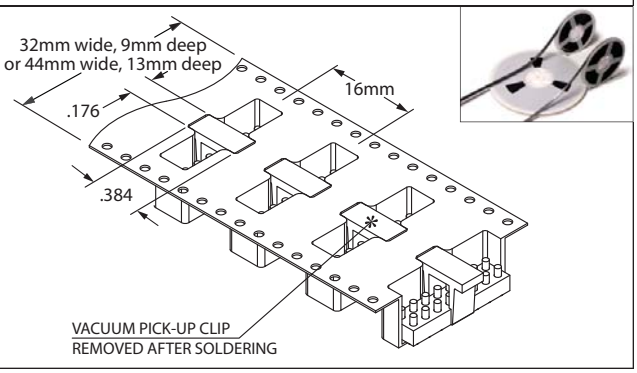


Double Row Series 814

814-22-0XX-30-00X191

Specify contact style 3-9
Specify number of contacts 04-24

(44mm wide tape, 200 parts per 13" reel)



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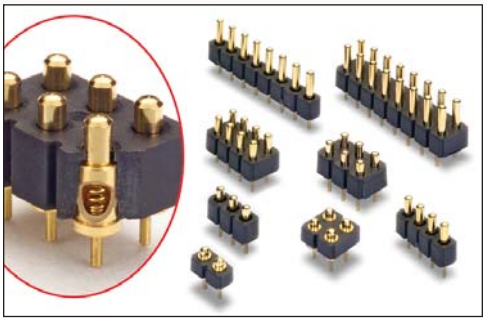
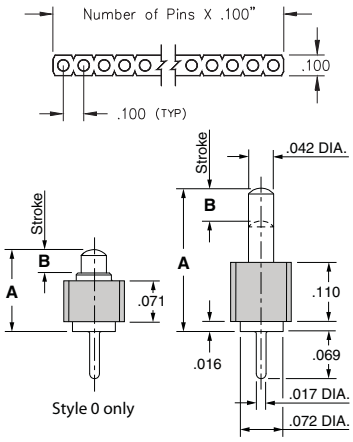
SPRING-LOADED CONNECTORS

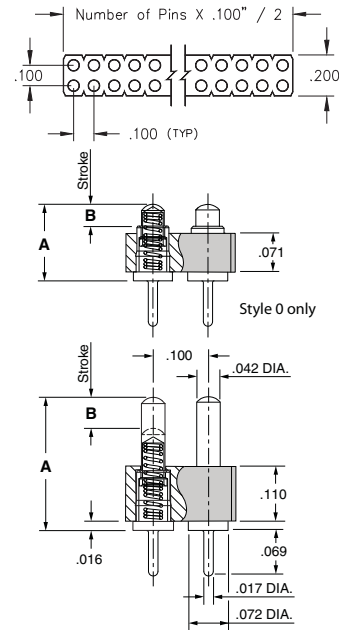
SERIES 821 & 823 • .100" GRID THROUGH-HOLE MOUNT • SINGLE AND DOUBLE ROW STRIPS



SINGLE ROW Series 821



DOUBLE ROW Series 823



- Modular contacts for use on .100" grid, available in five heights from .137" to .236", supplied in single and double row contact strips
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Pistons have a long stroke relative to the low profile of the assembly
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for surface mount processes
- Both 821 & 823 series contact strips are designed for manual placement into Ø .022±.003" plated through-holes in the circuit board prior to hand, wave or reflow soldering

ORDERING INFORMATION

Single Row Series 821

821-22-0XX-10-00X101

Specify number of contacts 02-64 — **Specify contact style** 0-4

Double Row Series 823

823-22-0XX-10-00X101

Specify number of contacts 04-72 — **Specify contact style** 0-4

CONTACT STYLE	INITIAL HEIGHT A	MAX. STROKE B
0	.137	.039
1	.177	.045
2	.197	.055
3	.217	.055
4	.236	.055

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height (A): 25 grams
Spring force @ mid stroke (B/2): 60 grams
Durability: 1,000,000 cycles

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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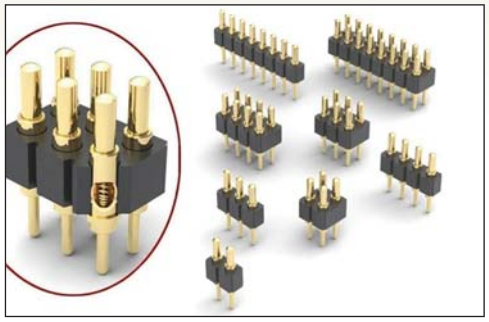
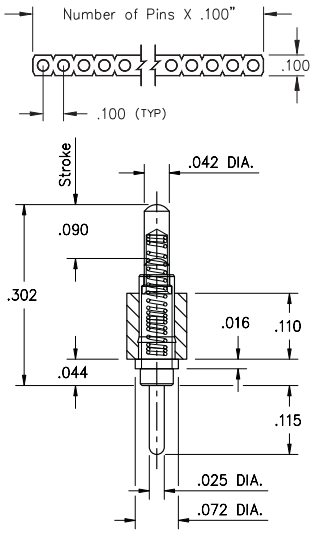
SPRING-LOADED CONNECTORS

SERIES 825 & 827 • .100" GRID THROUGH-HOLE MOUNT, LONG STROKE • SINGLE AND DOUBLE ROW STRIPS

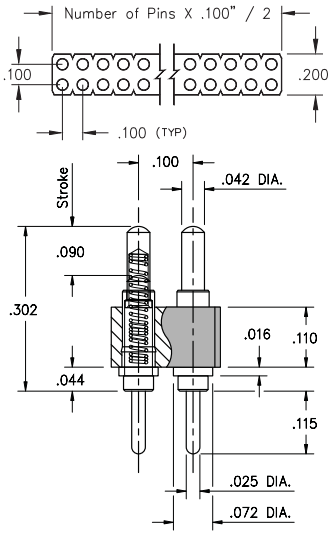


- Modular contacts for use on .100" grid, available in a height of .302", supplied in single and double row contact strips
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Pistons have a .045" mid. stroke and a .090" max. stroke
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for surface mount processes
- Both 825 & 827 series contact strips are designed for manual placement into Ø .030±.003" plated through-holes in the circuit board prior to hand, wave or reflow soldering

SINGLE ROW Series 825



DOUBLE ROW Series 827



ORDERING INFORMATION

Single Row Series 825

825-22-0XX-10-001101

Specify number of contacts 02-64

Double Row Series 827

827-22-0XX-10-001101

Specify number of contacts 04-72

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height: 25 grams
Spring force @ mid stroke (.045"): 60 grams
Durability: 1,000,000 cycles

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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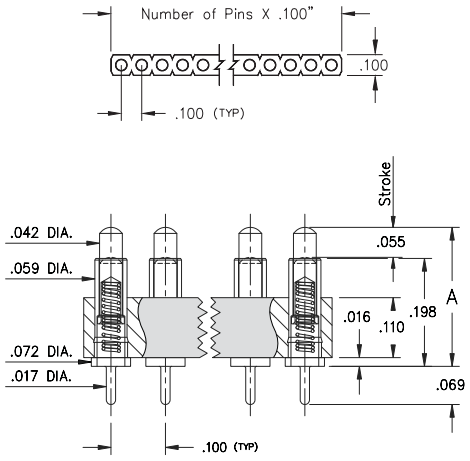
SPRING-LOADED CONNECTORS

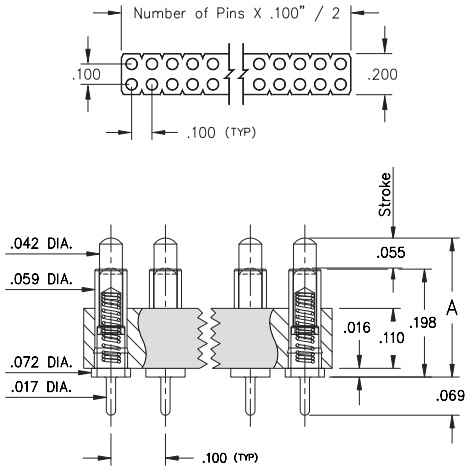
SERIES 816 & 818 • .100" GRID THROUGH-HOLE MOUNT, MID PROFILE • SINGLE AND DOUBLE ROW STRIPS

- Modular contacts for use on .100" grid, available in ten heights from .255" to .430", supplied in single and double row contact strips
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Pistons have a .0275" mid stroke & .055" max. stroke
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for surface mount processes
- Both 816 & 818 series contact strips are designed for manual placement into Ø .023±.003" plated through-holes in the circuit board prior to intrusive reflow soldering

SINGLE ROW Series 816...00X101



DOUBLE ROW Series 818...00X101



ORDERING INFORMATION

Single Row Series 816...00X101

816-22-0XX-10-00X101

Specify number of contacts 02-64 — **Specify contact style** 0-9

Double Row Series 818...00X101

818-22-0XX-10-00X101

Specify number of contacts 04-72 — **Specify contact style** 0-9

CONTACT STYLE	INITIAL HEIGHT A	CONTACT STYLE	INITIAL HEIGHT A
0	.255	5	.350
1	.275	6	.370
2	.295	7	.390
3	.315	8	.410
4	.335	9	.430

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height (A): 25 grams
Spring force @ mid stroke (.0275"): 60 grams
Durability: 1,000,000 cycles

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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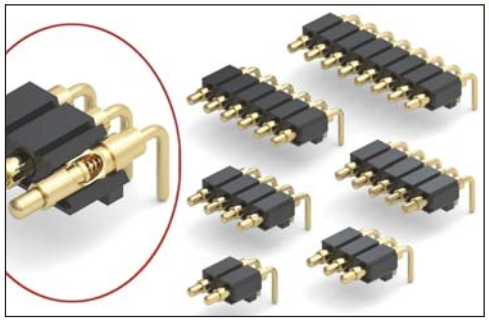
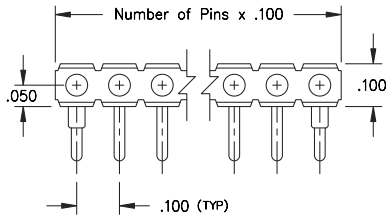
SPRING-LOADED CONNECTORS

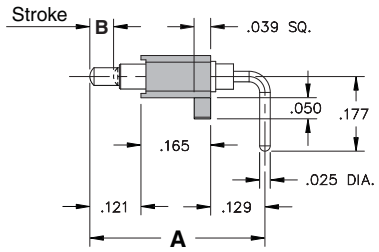
SERIES 829 • .100" GRID RIGHT ANGLE MOUNT • SINGLE ROW STRIPS



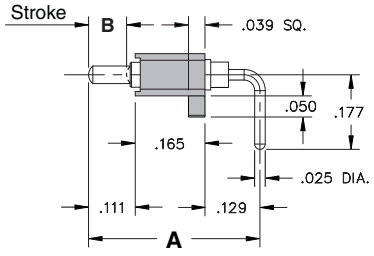
- Modular contacts for use on .100" grid. Supplied in single row strips with mounting pegs for support
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for wave and reflow processes
- 829 series contact strips are designed for manual placement into Ø .032±.003" plated through-holes in the circuit board prior to wave or reflow soldering

SINGLE ROW Series 829



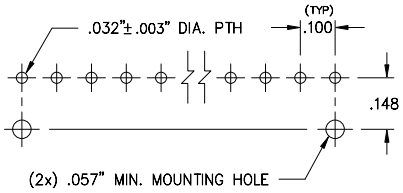


Contact style 1 only



Contact style 2 only

Suggested P.C.B Footprint



ORDERING INFORMATION

Single Row Series 829

829-22-0XX-20-00X101

Specify number of contacts 01-20 — **Specify contact style** 1 or 2

CONTACT STYLE	INITIAL LENGTH A	MAX. STROKE B
1	.415	.055
2	.406	.090

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial length (A): 25 grams
Spring force @ mid stroke (B/2): 60 grams
Durability: 1,000,000 cycles

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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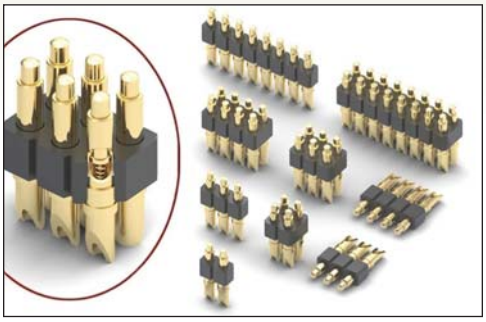
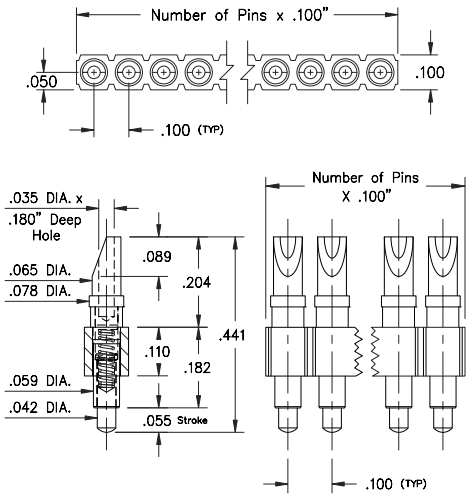
SPRING-LOADED CONNECTORS

SERIES 824 & 826 • .100" GRID SOLDERCUP HEADER • SINGLE AND DOUBLE ROW STRIPS

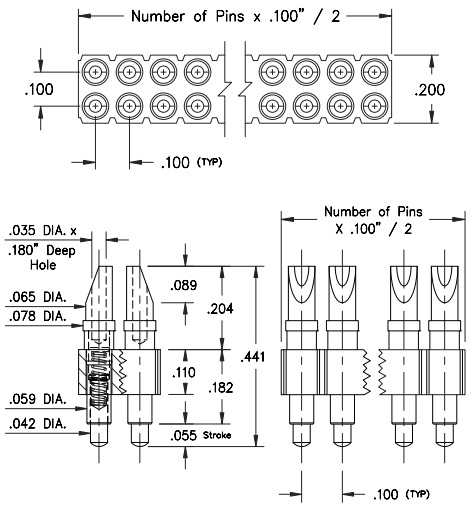


- Modular contacts for use on .100" grid, supplied in single and double row contact strips
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Pistons have a .0275" mid. stroke and a .055" max. stroke
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- Insulators are high temperature thermoplastic
- Both 824 & 826 series strips have spring pins with wire termination soldercups. The soldercups are aligned to provide easy access for soldering up to size 22 AWG wires

SINGLE ROW Series 824



DOUBLE ROW Series 826



ORDERING INFORMATION

Single Row Series 824

824-22-0XX-00-001000

Specify number of contacts 01-64

Double Row Series 826

826-22-0XX-00-001000

Specify number of contacts 04-72

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height: 25 grams
Spring force @ mid stroke (.0275"): 60 grams
Durability: 1,000,000 cycles

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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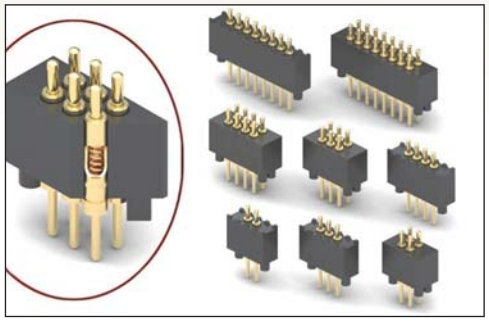
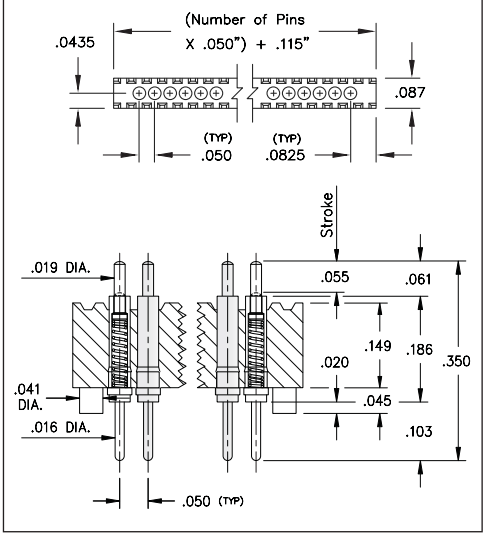
SPRING-LOADED CONNECTORS

SERIES 854 & 855 • .050" GRID THROUGH-HOLE MOUNT • SINGLE AND DOUBLE ROW STRIPS

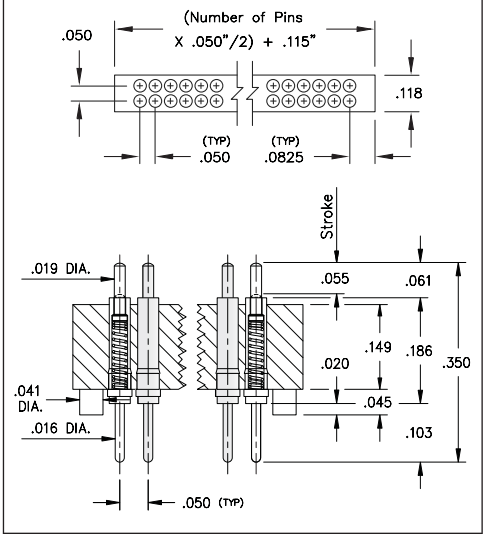


- Modular contacts for use on .050" grid, supplied in single and double row contact strips
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Pistons have a .0275" mid. stroke and a .055" max. stroke
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for wave and reflow processes
- Both 854 & 855 series contact strips are designed for manual placement into Ø .023±.003" plated through-holes in the circuit board prior to hand, wave or reflow soldering

SINGLE ROW Series 854



DOUBLE ROW Series 855



ORDERING INFORMATION

Single Row Series 854

854-22-0XX-10-001101

Specify number of contacts 02-20

Double Row Series 855

855-22-0XX-10-001101

Specify number of contacts 04-40

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height: 25 grams
Spring force @ mid stroke (.0275"): 60 grams
Durability: 1,000,000 cycles

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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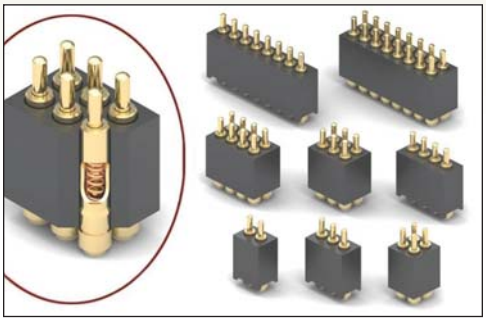
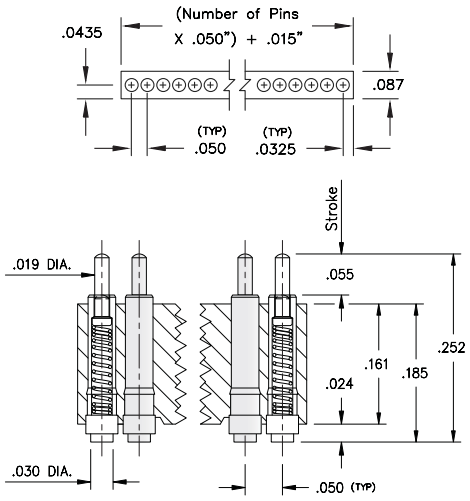
SPRING-LOADED CONNECTORS

SERIES 854 & 855 • .050" GRID SURFACE MOUNT, HIGH DENSITY • SINGLE AND DOUBLE ROW STRIPS

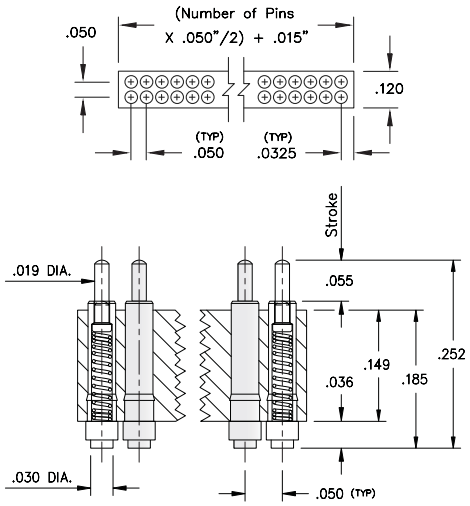


- Modular contacts for use on .050" grid, supplied in single and double row contact strips
- Precision-machined piston / base and gold-plated components assure a 1,000,000 cycle life durability
- Pistons have a .0275" mid. stroke and a .055" max. stroke
- Low resistance, high current contacts are rated at 2 amps continuous, 3 amps peak
- High temperature thermoplastic insulators are suitable for surface mount processes
- 854 & 855 series contact strips are designed for manual placement onto .040" Ø solder pads

SINGLE ROW Series 854



DOUBLE ROW Series 855



ORDERING INFORMATION

Single Row Series 854

854-22-0XX-30-001101

Specify number of contacts 02-20

Double Row Series 855

855-22-0XX-30-001101

Specify number of contacts 04-40

Technical Specifications

Materials:

Contact piston & base: Machined copper alloy plated 20µ" gold over 100µ" nickel
Spring: Beryllium copper-plated 10µ" gold
Insulator: High temperature thermoplastic, rated UL94 V-0

Mechanical:

Spring force @ initial height: 25 grams
Spring force @ mid stroke (.0275"): 60 grams
Durability: 1,000,000 cycles

Electrical:

Voltage rating: 100Vrms/150Vdc
Current rating: 2A (continous), 3A (peak) per contact
Contact resistance: 20mΩ max.
Insulation resistance: 10,000MΩ min.
Dielectric strength: 700Vrms min.
Capacitance: 1pF max.

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SPRING-LOADED CONNECTORS

SERIES 319, 330, 399 • .100" GRID TARGET CONNECTORS FOR SPRING-LOADED ASSEMBLIES • SINGLE ROW STRIPS

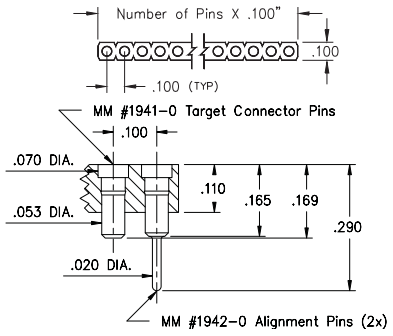


FIG. 1

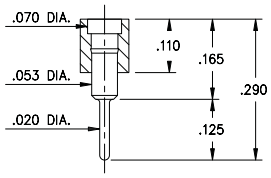


FIG. 2

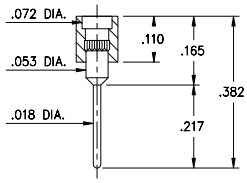


FIG. 3

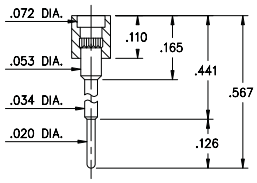


FIG. 4

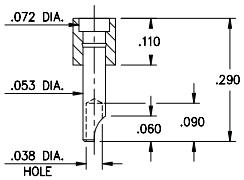


FIG. 5

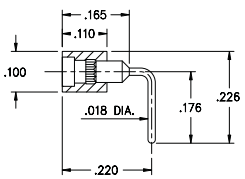
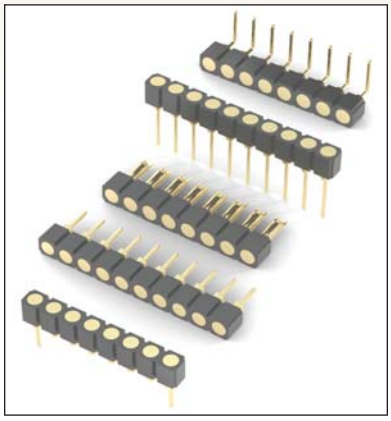


FIG. 6

- Series 319, 330 and 399 Spring Target Connectors, supplied in single row strips
- Spring Target Connectors present a large flat surface for making contact with our standard .042" dia. spring pin plungers. The target connectors provide an excellent gold-plated conductive path back to the board mounted spring pin connector
- Target connectors use MM #1938, #1940, #1941, #1942 and #3024 pins. See page 218 for details
- Insulators are high temperature thermoplastic



ORDERING INFORMATION

FIG. 1	**Series 319...041**	**Surface Mount w/ Alignments Pins**
	319-10-1__-30-041000	
	Specify number of pins	03-64
FIG. 2	**Series 319...001**	**Standard Solder Tails**
	319-10-1__-00-001000	
	Specify number of pins	01-64
FIG. 3	**Series 319...002**	**Long Solder Tails**
	319-10-1__-00-002000	
	Specify number of pins	01-64
FIG. 4	**Series 319...005**	**Elevated with Solder Tails**
	319-10-1__-00-005000	
	Specify number of pins	01-64
FIG. 5	**Series 330...240**	**Solder Cups**
	330-10-1__-00-240000	
	Specify number of pins	01-64
FIG. 6	**Series 399...008**	**Right Angle Solder Tails**
	399-10-1__-10-008000	
	Specify number of pins	01-64

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XX=Plating Code See Below

For Electrical, Mechanical & Enviromental Data, See page 264

SPECIFY PLATING CODE XX=	10 ◆			
Pin Plating	10 µ" Au			

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SPRING-LOADED CONNECTORS

SERIES 419, 430, 499 • .100" GRID TARGET CONNECTORS FOR SPRING-LOADED ASSEMBLIES • DOUBLE ROW STRIPS

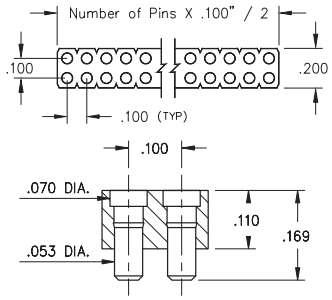


Fig. 1 and Fig. 2 Coplanarity .005". For pin counts >20 positions, consult Technical Support.

FIG. 1

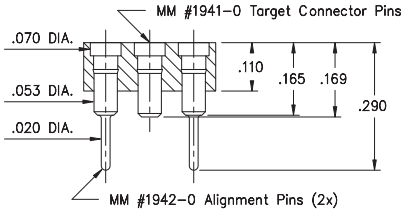


FIG. 2

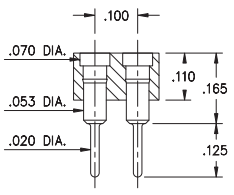


FIG. 3

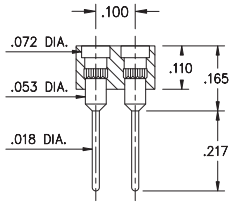


FIG. 4

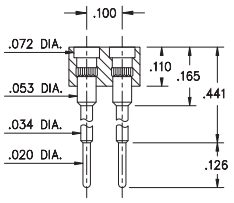


FIG. 5

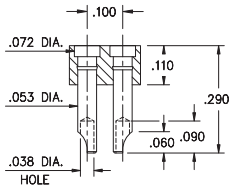


FIG. 6

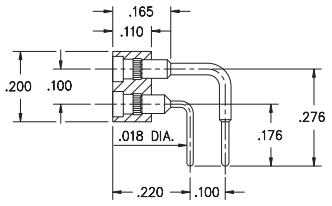
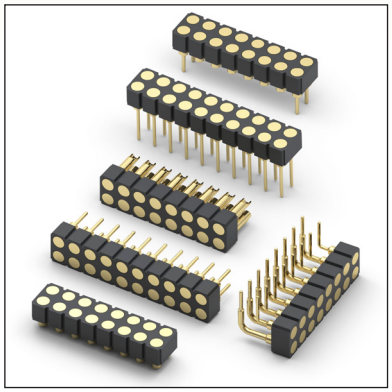


FIG. 7

- Series 419, 430 and 499 Spring Target Connectors, supplied in double row strips
- Spring Target Connectors present a large flat surface for making contact with our standard .042" dia. spring pin plungers. The target connectors provide an excellent gold-plated conductive path back to the board mounted spring pin connector
- Target connectors use MM #1938, #1940, #1941, #1942 and #3024 pins. See page 218 for details
- Insulators are high temperature thermoplastic



ORDERING INFORMATION

FIG. 1	**Series 419...041**	**Surface Mount**
	419-10-2__-30-041000	
	Specify number of pins ↑ 04-64	
FIG. 2	**Series 419...042**	**Surface Mount w/ Alignments Pins**
	419-10-2__-30-042000	
	Specify number of pins ↑ 06-64	
FIG. 3	**Series 419...001**	**Standard Solder Tails**
	419-10-2__-00-001000	
	Specify number of pins ↑ 04-64	
FIG. 4	**Series 419...002**	**Long Solder Tails**
	419-10-2__-00-002000	
	Specify number of pins ↑ 04-64	
FIG. 5	**Series 419...005**	**Elevated with Solder Tails**
	419-10-2__-00-005000	
	Specify number of pins ↑ 04-64	
FIG. 6	**Series 430...240**	**Solder Cups**
	430-10-2__-00-240000	
	Specify number of pins ↑ 04-64	
FIG. 7	**Series 499...008**	**Right Angle Solder Tails**
	499-10-2__-10-008000	
	Specify number of pins ↑ 04-64	

RoHS-2 2011/65/EU

XX=Plating Code See Below

For Electrical, Mechanical & Enviromental Data, See page 264

SPECIFY PLATING CODE XX=	10 ◆			
Pin Plating	10 µ" Au			

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SPRING-LOADED CONNECTORS

SERIES 856, 857 • .050" GRID TARGET CONNECTORS FOR SPRING-LOADED ASSEMBLIES • SINGLE AND DOUBLE ROW STRIPS

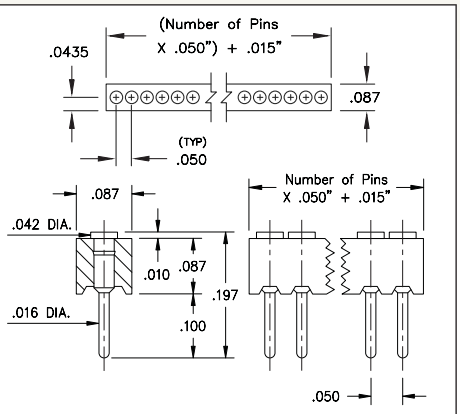
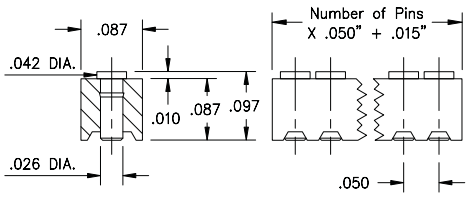


FIG. 1



Coplanarity .005". For Pin counts >20 positions, consult Technical Support.

FIG. 2

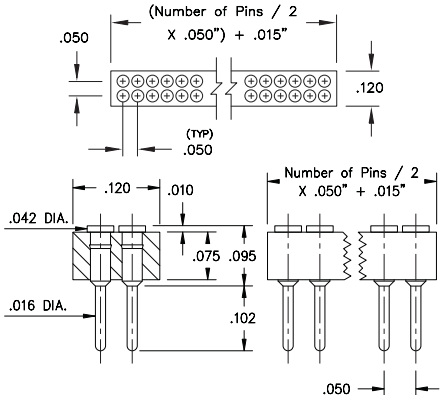
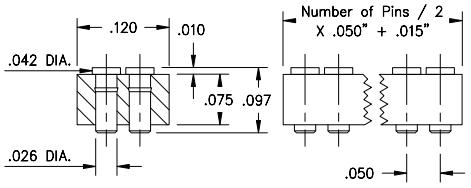


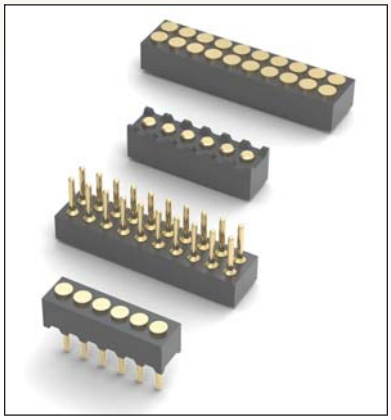
FIG. 3



Coplanarity .005". For Pin counts >40 positions, consult Technical Support.

FIG. 4

- Series 856 and 857 Spring Target Connectors, supplied in single and double row strips
- Spring Target Connectors present a large flat surface for making contact with our standard .019" dia. spring pin plungers. The target connectors provide an excellent gold-plated conductive path back to the board-mounted spring pin connector
- Target connectors use MM #1933 and #1935 pins. See page 213 for details
- Insulators are high temperature thermoplastic



ORDERING INFORMATION

FIG. 1	**Series 856...051**	**Standard Solder Tails**
	856-10-0__-10-051000	
	Specify number of pins ↑	01-20
FIG. 2	**Series 856...051**	**Surface Mount**
	856-10-0__-30-051000	
	Specify number of pins ↑	02-20
FIG. 3	**Series 857...051**	**Standard Solder Tails**
	857-10-0__-10-051000	
	Specify number of pins ↑	04-40
FIG. 4	**Series 857...051**	**Surface Mount**
	857-10-0__-30-051000	
	Specify number of pins ↑	04-40

RoHS-2 2011/65/EU

XX=Plating Code See Below

For Electrical, Mechanical & Enviromental Data, See page 264

SPECIFY PLATING CODE XX=	10 ◆			
Pin Plating	10 µ" Au			

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SPRING-LOADED PINS

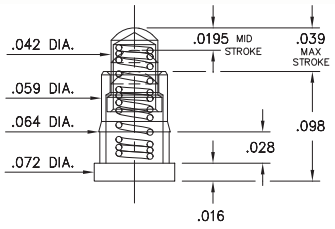
DISCRETE SPRING-LOADED CONTACTS • SURFACE MOUNT

0900-0

0900-0-15-20-76-14-11-0

"Legacy P/N 0900-0-00-00-00-00-11-0"

Short stroke, Surface mount

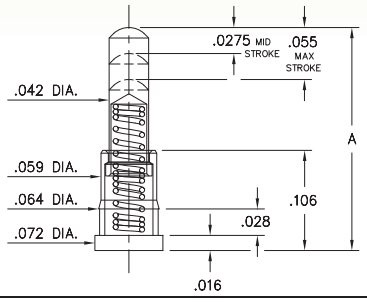


0900-1⇨4,8

0900-X-15-20-75-14-11-0

"Legacy P/N 0900-X-00-00-00-00-11-0"

Standard stroke, Surface mount



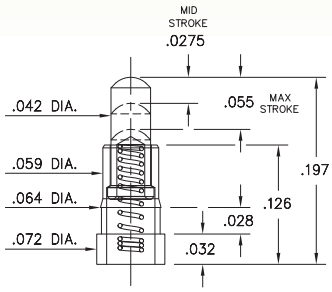
Basic Part Number	Length A
0900-1	.177
0900-2	.197
0900-3	.217
0900-4	.236
*0900-8	.155

*0900-8 has a .0195 Mid. Stroke & .039 Max. Stoke
Order as:
0900-8-15-20-76-14-11-0

0934

0934-0-15-20-74-14-26-0

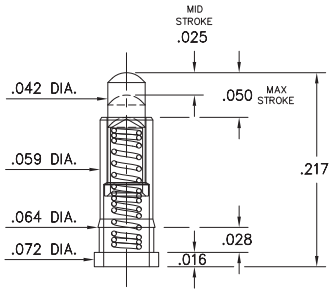
Standard stroke, Surface mount



0936

0936-0-15-20-75-14-11-0

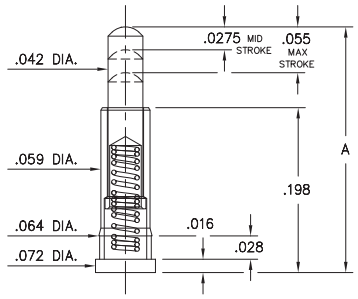
Standard stroke, Surface mount



0907-0⇨9

0907-X-15-20-75-14-11-0

Standard stroke, Surface mount, Mid profile

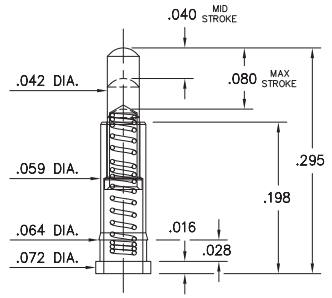


Basic Part Number	Length A
0907-0	.255
0907-1	.275
0907-2	.295
0907-3	.315
0907-4	.335
0907-5	.350
0907-6	.370
0907-7	.390
0907-8	.410
0907-9	.430

0928

0928-0-15-20-77-14-11-0

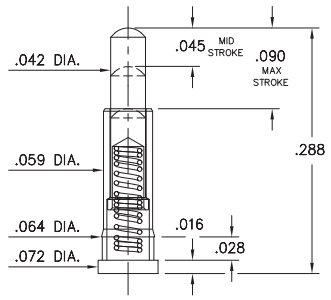
Long stroke, Surface mount



0913

0913-0-15-20-77-14-11-0

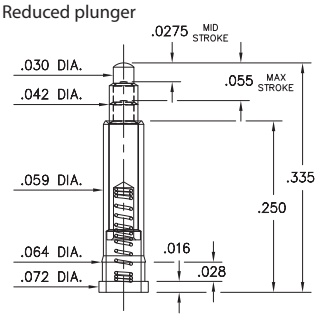
Long stroke, Surface mount, Mid profile



0925

0925-0-15-20-73-14-26-0

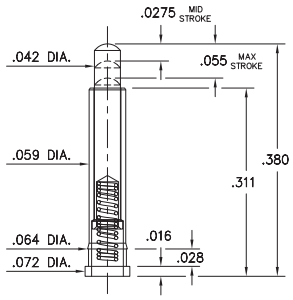
Standard stroke, Surface mount
Reduced plunger



0927

0927-0-15-20-75-14-11-0

Standard stroke, Surface mount, Mid profile

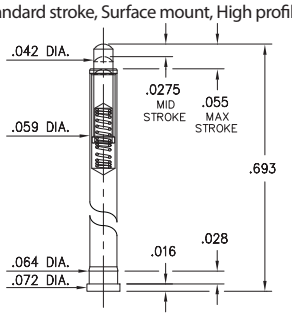


0905

0905-0-15-20-75-14-11-0

"Legacy P/N 0905-0-00-00-00-00-11-0"

Standard stroke, Surface mount, High profile



Material Specifications:

Sleeve & Plunger Material: Copper Alloy
Spring Material: Beryllium Copper
Sleeve & Plunger Finish: 20 µ" Gold over Nickel
Spring Finish: 10 µ" Gold over Nickel
Dimensions: Inches
Tolerances On: Lengths: ± .006
Diameters: ± .002
Angles: ± 2 °

RoHS-2 2011/65/EU

Mechanical & Electrical Specifications:

Durability: 1,000,000 cycles
Current Rating: 2A continuous, 3A peak
Contact Resistance: 20 mΩ max.

Environmental Specifications:

Operating temperature range: -55/+125° C

73, 74, 75, 76, 77 Springs are not interchangeable

Order Code: 09XX - X - 15 - 20 - 7X - 14 - XX - 0

Spring Number

Spring Number	Mid. Stroke	Max. Stroke	Force @ Mid. Stroke	Initial Force (Pre-Load)
73	.0275	.055	60 g	25 g
74	.0275	.055	50 g	15 g
75	.0275	.055	60 g	25 g
76	.0195	.039	60 g	25 g
77	.045	.090	60 g	25 g

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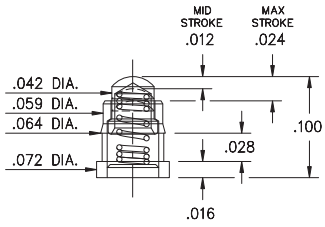
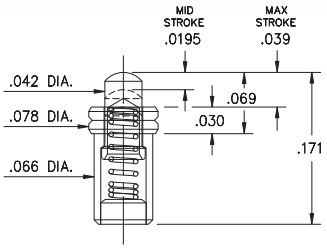
SPRING-LOADED PINS

DISCRETE SPRING-LOADED CONTACTS

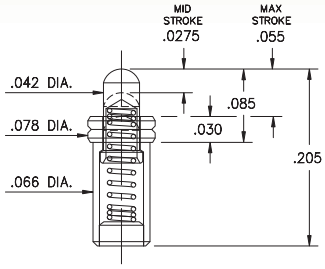
0965
0965-0-15-20-80-14-11-0
Ultra low profile, Surface mount
* Stainless steel spring



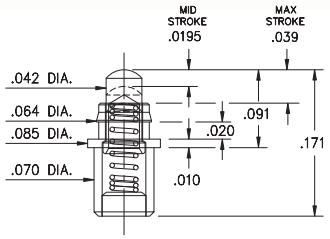
0921-0
0921-0-15-20-76-14-11-0
Ultra low profile, Short stroke
Solder mount in .070 min. mounting hole



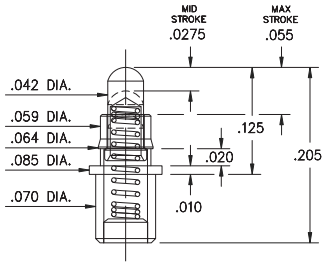
0921-1
0921-1-15-20-75-14-11-0
Low profile, Standard stroke
Solder mount in .070 min. mounting hole



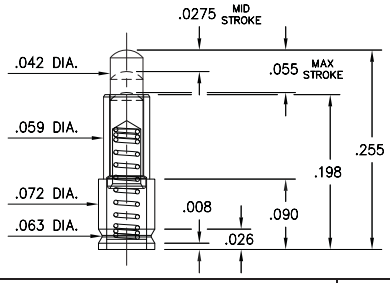
0926-0
0926-0-15-20-76-14-11-0
Low Profile, Short Stroke
Solder mount in .074 min. mounting hole



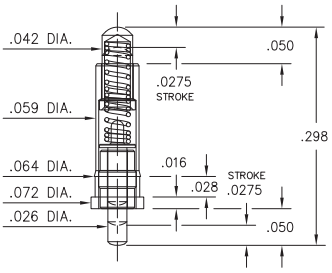
0926-1
0926-1-15-20-75-14-11-0
Low profile, Standard stroke
Solder mount in .074 min. mounting hole



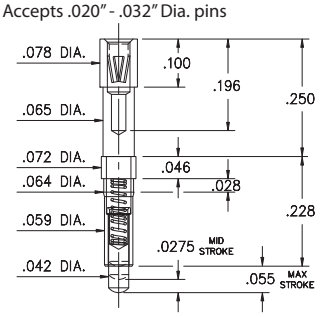
0977
0977-0-15-20-75-14-11-0
Standard stroke, Surface mount
Also available on 24mm wide carrier tape: 1,100 parts per 13″ reel. Order as: 0977-0-57-20-75-14-11-0



0980
0980-0-15-20-75-14-11-0
Double action, .055 Combined stroke
Mount between parallel circuit boards



0959
0959-0-54-20-75-14-11-0
Receptacle spring pin, Standard stroke
Accepts .020″ - .032″ Dia. pins



Material Specifications:

Sleeve & Plunger Material: Copper Alloy
Spring Material: BeCu or Stainless Steel 302 *
Sleeve & Plunger Finish: 20 µ″ Gold over Nickel
Spring Finish: 10 µ″ Gold over Nickel
Dimensions: Inches
Tolerances On: Lengths: ± .006
Diameters: ± .002
Angles: ± 2 °

RoHS-2 2011/65/EU

Mechanical & Electrical Specifications:

Durability: 1,000,000 cycles
Current Rating: 2A continuous, 3A peak
Contact Resistance: 20 mΩ max.

Environmental Specifications:

Operating temperature range: -55/+125° C

75, 76, 80, 85 Springs are not interchangeable

Order Code: 09XX - X - 15 - 20 - XX - 14 - 11 - 0
Spring Number

Spring Number	Mid. Stroke	Max. Stroke	Force @ Mid. Stroke	Initial Force (Pre-Load)
75	.0275	.055	60 g	25 g
76	.0195	.039	60 g	25 g
80	.012	.024	70 g	25 g
85	.040	.080	60 g	25 g

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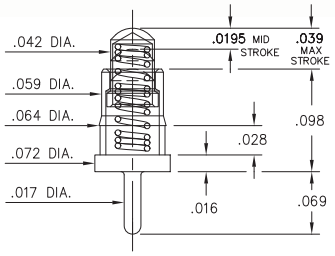
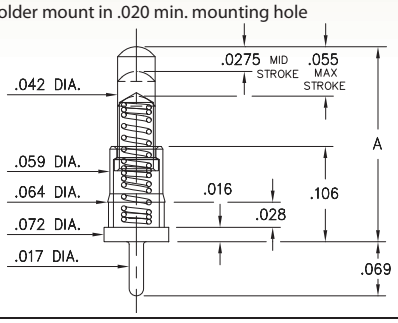
SPRING-LOADED PINS

DISCRETE SPRING-LOADED CONTACTS • THROUGH-HOLE MOUNT

0906-0
0906-0-15-20-76-14-11-0
Short stroke
Solder mount in .020 min. mounting hole



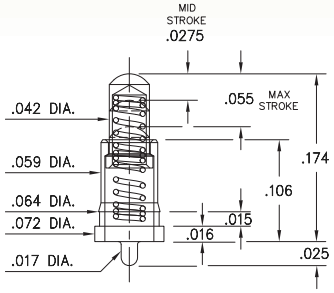
0906-1⇨4,8
0906-X-15-20-7X-14-11-0
Standard stroke
Solder mount in .020 min. mounting hole



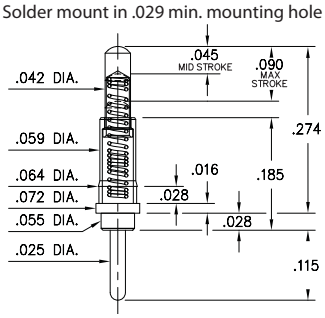
Basic Part Number	Length A
0906-1	.177
0906-2	.197
0906-3	.217
0906-4	.236
∗0906-8	.155

∗0906-8 has a .0195 Mid. Stroke & .039 Max. Stoke

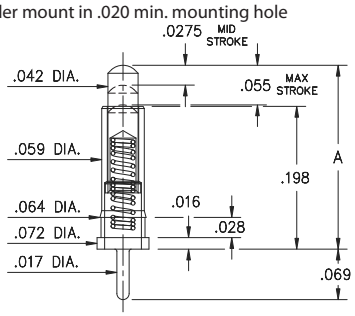
0930
0930-0-15-20-75-14-11-0
Standard stroke
Solder mount in .020 min. mounting hole



0914
0914-0-15-20-77-14-11-0
Long stroke
Solder mount in .029 min. mounting hole

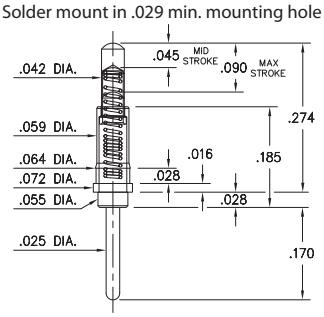


0908-0⇨9
0908-X-15-20-75-14-11-0
Standard stroke
Solder mount in .020 min. mounting hole

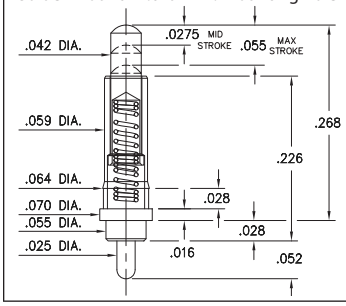


Basic Part Number	Length A
0908-0	.255
0908-1	.275
0908-2	.295
0908-3	.315
0908-4	.335
0908-5	.350
0908-6	.370
0908-7	.390
0908-8	.410
0908-9	.430

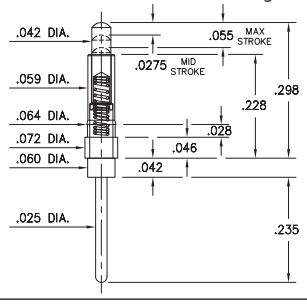
0932
0932-0-15-20-77-14-11-0
Long stroke
Solder mount in .029 min. mounting hole



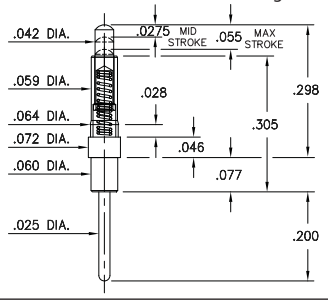
0901
0901-0-15-20-75-14-11-0
"Legacy P/N 0901-0-00-00-00-00-11-0"
Solder mount in .029 min. mounting hole



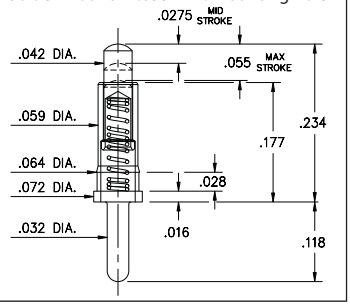
0929
0929-0-15-20-75-14-11-0
Standard stroke
Solder mount in .029 min. mounting hole



0922
0922-0-15-20-75-14-11-0
Standard stroke
Solder mount in .029 min. mounting hole



0956
0956-0-15-20-75-14-11-0
Standard stroke
Solder mount in .035 min. mounting hole



Material Specifications:

Sleeve & Plunger Material: Copper Alloy
Spring Material: Beryllium Copper
Sleeve & Plunger Finish: 20 µ" Gold over Nickel
Spring Finish: 10 µ" Gold over Nickel
Dimensions: Inches
Tolerances On: Lengths: ± .006
Diameters: ± .002
Angles: ± 2 °

RoHS-2 2011/65/EU

Mechanical & Electrical Specifications:

Durability: 1,000,000 cycles
Current Rating: 2A continuous, 3A peak
Contact Resistance: 20 mΩ max.

Environmental Specifications:

Operating temperature range: -55/+125° C

75, 76, 77 Springs are not interchangeable

Order Code: 09XX - X - 15 - 20 - 7X - 14 - 11 - 0
Spring Number

Spring Number	Mid. Stroke	Max. Stroke	Force @ Mid. Stroke	Initial Force (Pre-Load)
75	.0275	.055	60 g	25 g
76	.0195	.039	60 g	25 g
77	.045	.090	60 g	25 g

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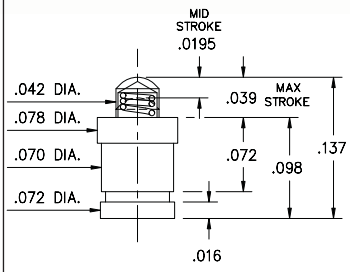
SPRING-LOADED PINS

DISCRETE SPRING-LOADED CONTACTS • SURFACE MOUNT

0910-0

0910-0-57-20-76-14-11-0

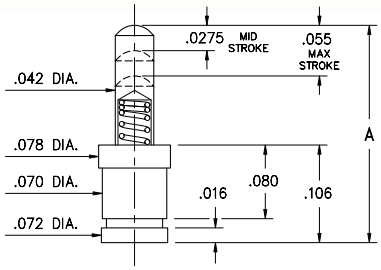
Short stroke, Surface mount
Packaged on 16mm wide carrier tape:
2,000 parts per 13" reel.



0910-1⇨4

0910-X-57-20-75-14-11-0

Standard stroke, Surface mount
Packaged on carrier tape.
See chart for tape width and qty. per reel



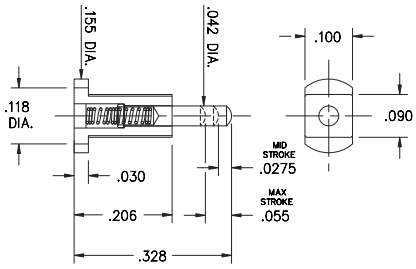
Basic Part Number	Length A
0910-1	.177
0910-2	.197
0910-3	.217
0910-4	.236

Basic Part Number	Tape Width	Quantity per Reel
0910-1	16mm	1,500
0910-2	24mm	1,100
0910-3	24mm	1,100
0910-4	24mm	1,100

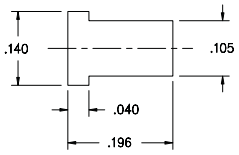
0967

0967-0-15-20-75-14-11-0

Standard stroke, Horizontal surface mount
Also available on 16mm wide carrier tape: 2,200 parts per 13" reel. Order as: 0967-0-58-20-75-14-11-0



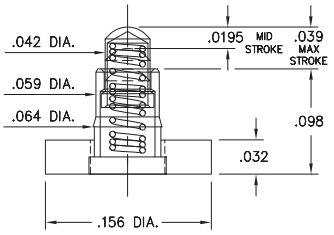
P.C.B. Layout



0990-0

0990-0-50-20-76-14-11-0

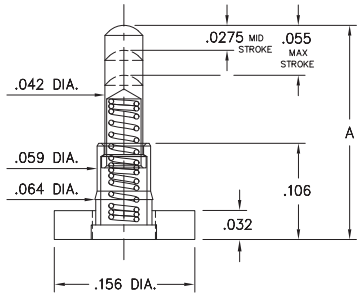
Short stroke, Surface mount, Large base



0990-1⇨4

0990-X-50-20-75-14-11-0

Standard stroke, Surface mount, Large base

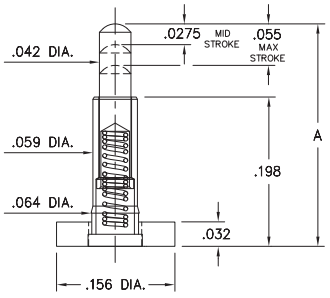


Basic Part Number	Length A
0990-1	.177
0990-2	.197
0990-3	.217
0990-4	.236

0997-0⇨9

0997-X-50-20-75-14-11-0

Standard stroke, Surface mount, Large base, Mid profile



Basic Part Number	Length A
0997-0	.255
0997-1	.275
0997-2	.295
0997-3	.315
0997-4	.335
0997-5	.350
0997-6	.370
0997-7	.390
0997-8	.410
0997-9	.430

Material Specifications:

Sleeve & Plunger Material: Copper Alloy
Spring Material: Beryllium Copper
Sleeve & Plunger Finish: 20 µ" Gold over Nickel
Spring Finish: 10 µ" Gold over Nickel
Dimensions: Inches
Tolerances On: Lengths: ± .006
Diameters: ± .002
Angles: ± 2 °

RoHS-2 2011/65/EU

Mechanical & Electrical Specifications:

Durability: 1,000,000 cycles
Current Rating: 2A continuous, 3A peak
Contact Resistance: 20 mΩ max.

Environmental Specifications:

Operating temperature range: -55/+125° C

75, 76 Springs are not interchangeable

Order Code: 09XX - X - XX - 20 - 7X - 14 - 11 - 0
Spring Number

Spring Number	Mid. Stroke	Max. Stroke	Force @ Mid. Stroke	Initial Force (Pre-Load)
75	.0275	.055	60 g	25 g
76	.0195	.039	60 g	25 g

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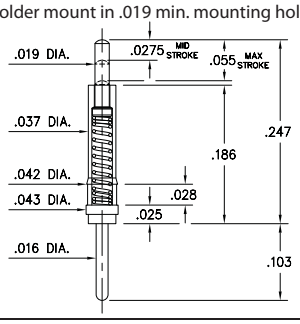
SPRING-LOADED PINS

DISCRETE SPRING-LOADED CONTACTS

0985

0985-0-15-20-71-14-11-0

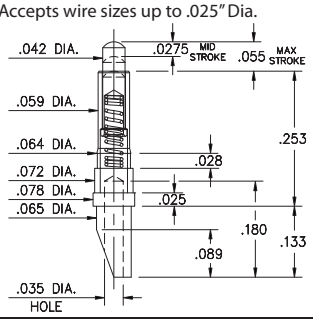
Standard stroke
Solder mount in .019 min. mounting hole



0933

0933-0-15-20-75-14-11-0

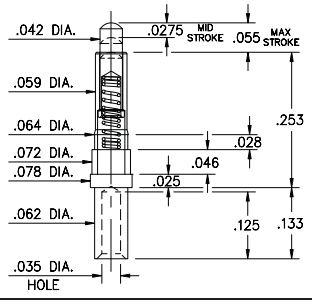
Standard stroke, Soldercup
Accepts wire sizes up to .025" Dia.



0962

0962-0-15-20-75-14-11-0

Standard stroke, Wire termination for wire sizes 24 AWG Max. / 28 AWG Min.



Material Specifications:

Sleeve & Plunger Material: Copper Alloy
Spring Material: Beryllium Copper
Sleeve & Plunger Finish: 20 µ" Gold over Nickel
Spring Finish: 10 µ" Gold over Nickel
Dimensions: Inches
Tolerances On: Lengths: ± .006
Diameters: ± .002
Angles: ± 2 °

RoHS-2 2011/65/EU

Mechanical & Electrical Specifications:

Durability: 1,000,000 cycles
Current Rating: 2A continuous, 3A peak
Contact Resistance: 20 mΩ max.

Environmental Specifications:

Operating temperature range: -55/+125° C

71, 75 Springs are not interchangeable

Order Code: 09XX - X - 15 - 20 - 7X - 14 - 11 - 0

Spring Number

Spring Number	Mid. Stroke	Max. Stroke	Force @ Mid. Stroke	Initial Force (Pre-Load)
71	.0275	.055	50 g	15 g
75	.0275	.055	60 g	25 g

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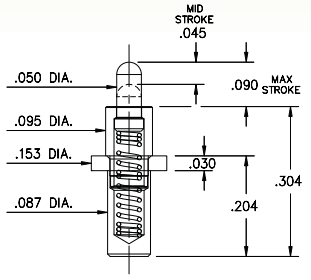
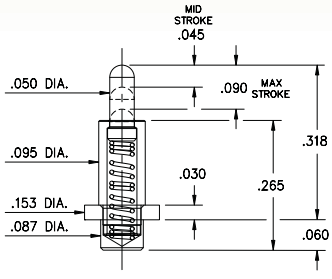
SPRING-LOADED PINS

DISCRETE SPRING-LOADED CONTACTS • POWER SPRING PINS

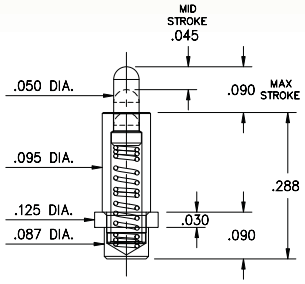
0850
0850-0-15-20-83-14-11-0
Power spring pin
Solder Mount in .090 min. mounting hole



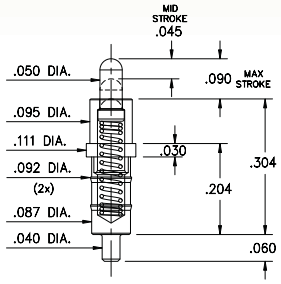
0851
0851-0-15-20-82-14-11-0
Power spring pin
Solder Mount in .090 min. mounting hole



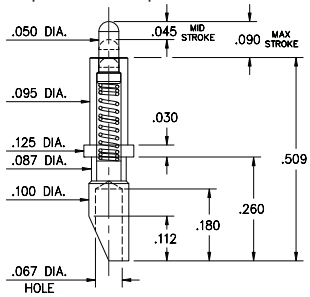
0853
0853-0-15-20-82-14-11-0
Power spring pin
Solder Mount in .090 min. mounting hole



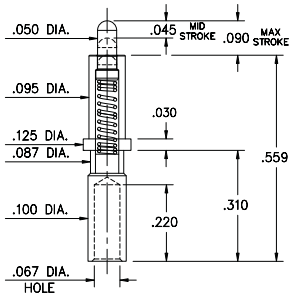
0852
0852-0-15-20-83-14-11-0
Power spring pin
Solder Mount in .043 min. mounting hole



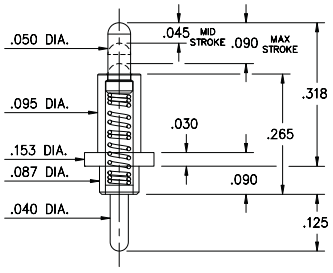
0854
0854-0-15-20-82-14-11-0
Power spring pin, Soldercup
Accepts wire sizes up to .057" Dia.



0855
0855-0-15-20-82-14-11-0
Power spring pin, Wire termination for wire sizes 16 AWG Max. / 20 AWG Min.



0856
0856-0-15-20-82-14-11-0
Power spring pin
Solder Mount in .043 min. mounting hole



Material Specifications:

Sleeve & Plunger Material: Copper Alloy
Spring Material: Stainless Steel 302
Sleeve & Plunger Finish: 20 µ" Gold over Nickel
Spring Finish: 10 µ" Gold over Nickel
Dimensions: Inches
Tolerances On: Lengths: ± .006
Diameters: ± .002
Angles: ± 2 °

RoHS-2 2011/65/EU

Mechanical & Electrical Specifications:

Durability: 1,000,000 cycles
Rated Current (Free air):
Continuous 9 amps @ 10° C temperature rise
Contact Resistance: 20 mΩ max.

Environmental Specifications:

Operating temperature range: -55/+125° C

82, 83 Springs are not interchangeable

Order Code: 08XX - X - 15 - 20 - 8X - 14 - 11 - 0
Spring Number

Spring Number	Mid. Stroke	Max. Stroke	Force @ Mid. Stroke	Initial Force (Pre-Load)
82	.045	.090	120 g	25 g
83	.045	.090	120 g	25 g

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