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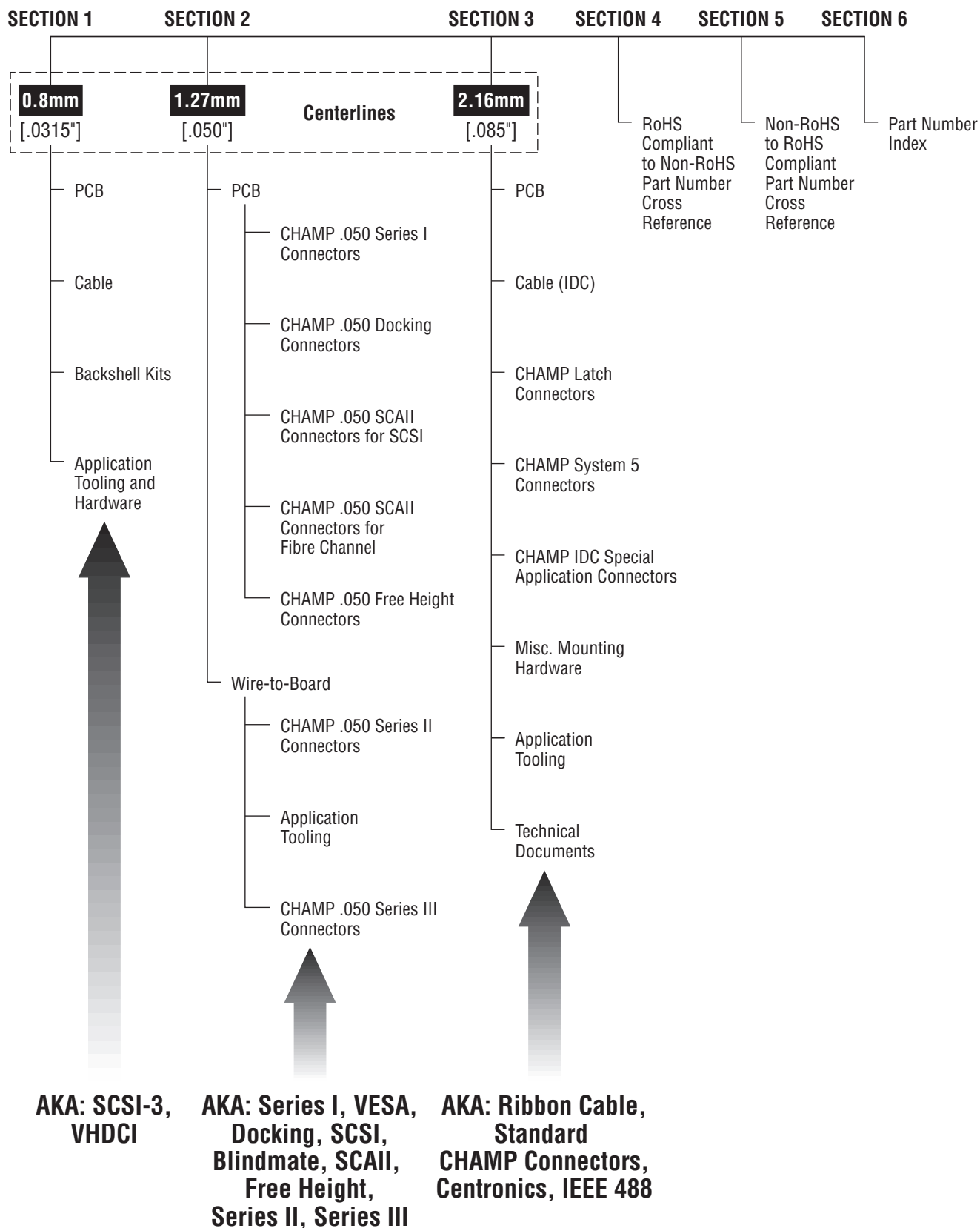
Electronics

CHAMP Interconnection System



AMP

Flowchart of CHAMP Connectors: How This Catalog is Organized...



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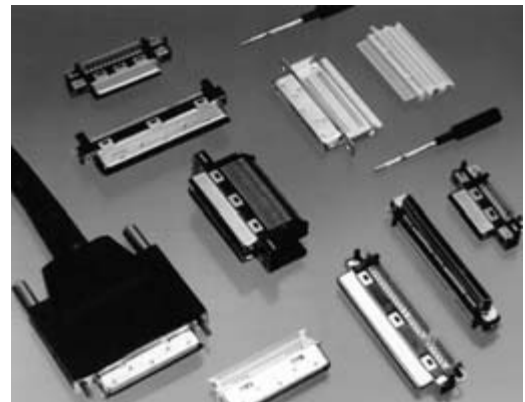
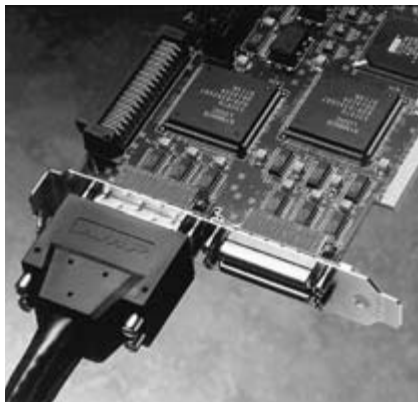
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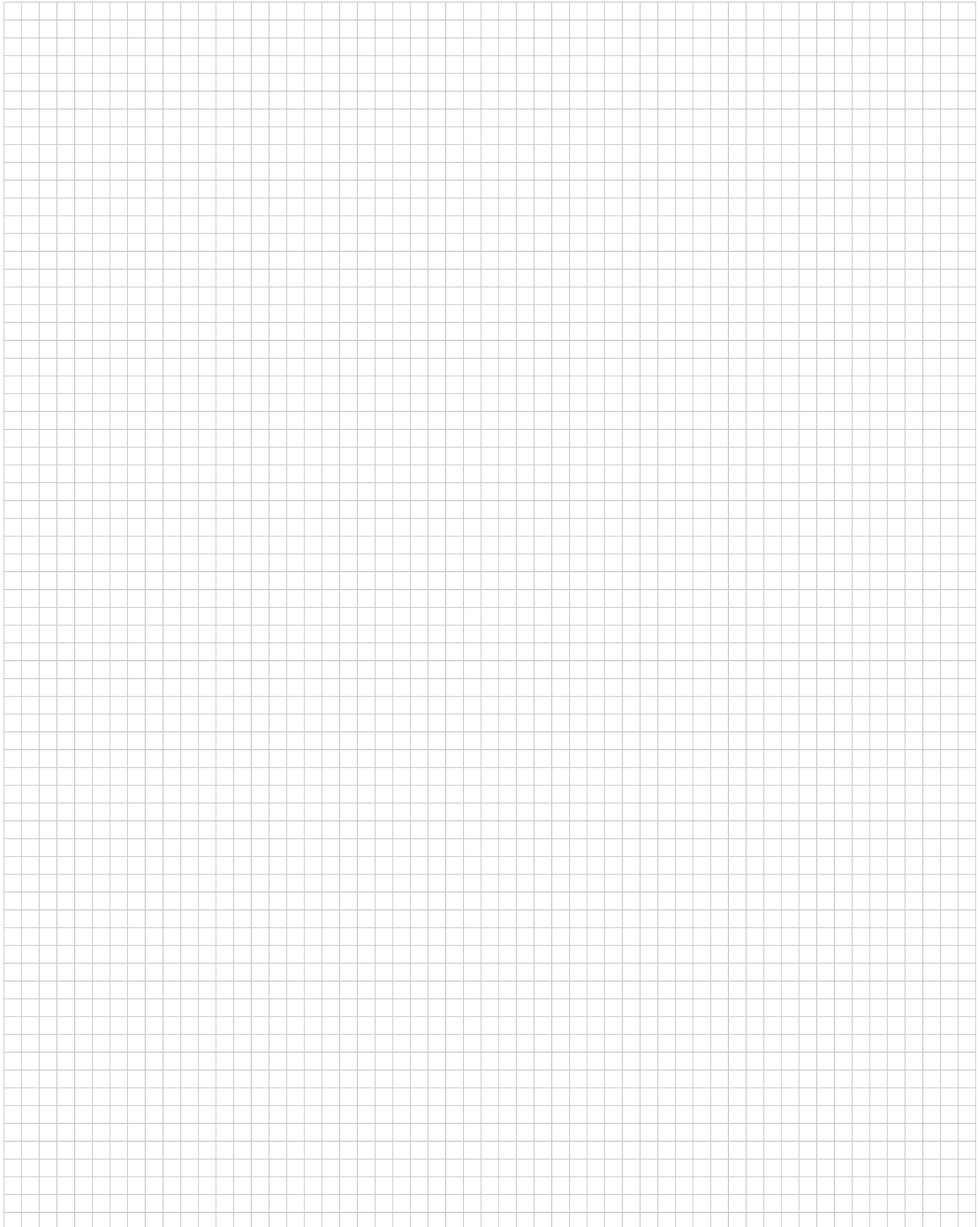
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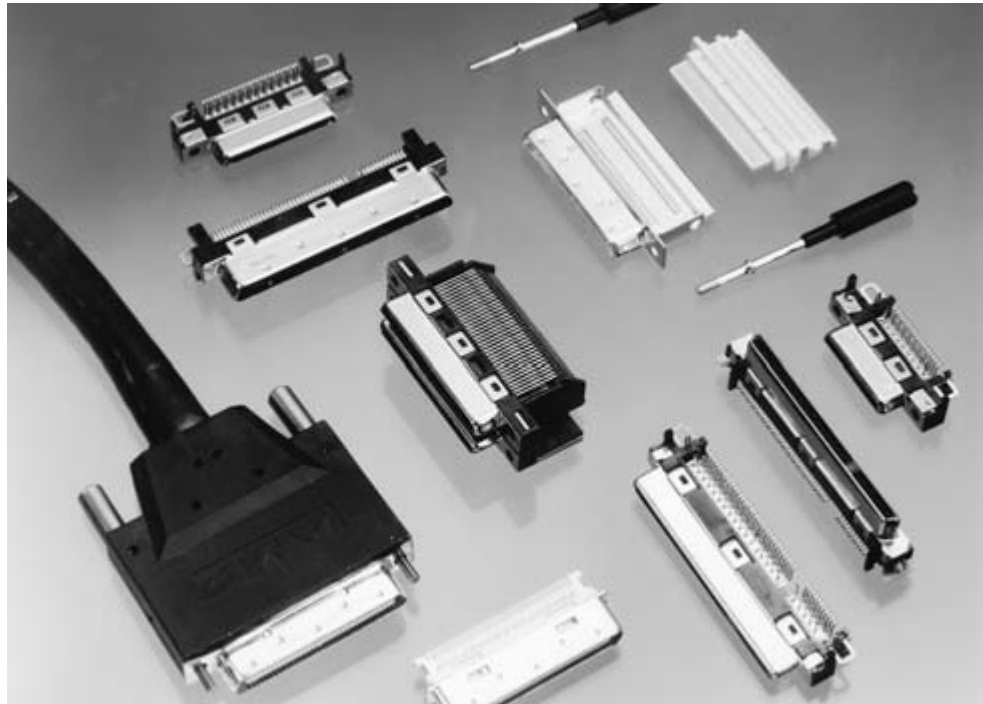
Engineering Notes

Product Facts

- EMI shielded high density and low profile I/O system
- Contacts on 0.8mm centerlines—offer 30% linear PC board space savings
- Low profile right angle PC connector, 5.0mm high—a 50% reduction in height
- Available in thru-hole, surface mount, and hybrid PC board lead configuration—combination of surface mount and thru-hole leads
- Depending on contact design, durability cycles range from 500 up to 2000 insertion cycles
- Contact tips recessed for ESD and damage protection
- M2 threaded hardware for panel mounting
- PC board connectors available in 50- and 68-position receptacle assemblies, and 50-position plug assemblies
- Cable plug connectors accept 30 AWG [0.05mm²] solid or stranded wire and are available in 36-, 50- and 68-position assemblies
- Contacts are insulation displacement type (IDC) and can be quickly terminated by the CHAMPOMATOR 2.5 Semi-Automatic Termination Machine
- Metal-shell backshell kits feature integral cable braid termination and a choice of squeeze-to-release latches or jackscrew mating hardware
- Enclosure cover for backshell kit made of UL 94V-0 rated ABS
- Die cast backshell with integral cable braid termination and strain relief for 68-position offset cable plugs
- Produced under a Quality Management System certified to ISO 9001

A copy of the certificate is available upon request.

CHAMP 0.8mm Centerline Connectors (SCSI-3, VHDCI)



The CHAMP 0.8mm High Density Interconnection System is designed for high density, low profile (5.0mm), shielded applications featuring two rows of contacts on 0.8mm centerlines. Typical applications include:

- Docking Connectors
- Shielded I/O Connectors
- Removable Floppy / CD-ROM drives
- Network Bridges / Routers / Hubs
 - Multiple Low Profile and High Density I/O's
- Severely Limited "Backpanel" I/O Area
- PC / File Server Controller Cards
 - Next Generation SCSI I/O or VHDCI

The CHAMP 0.8mm 68-position connector system was developed to support the VHDCI (Very High Density Cable Interconnect) specification. Multiple options are available including single and stacked right angle receptacles and standard as well as offset cable plugs.

Contacts on 0.8mm centerlines provide 30% linear board space savings, and 5.0mm low profile housing provide approximately 50% reduction in height when compared to other interconnection systems.

Cable plug connectors accept 30 AWG [0.05mm²] solid or stranded wire, and feature insulation displacement crimp (IDC) terminations. Incorporated in the design are precision insert molded contacts with tips recessed for ESD and damage protection.

Backshell kits offer additional protection and are composed of: a) Hermaphroditic metal shells with integral cable braid termination and strain relief, b) Choice of squeeze-to-release latches or jackscrew mating hardware, c) Backshell covers made of UL 94V-0 rated ABS/PC complete the cable connector assembly, d) die cast backshell with integral cable braid termination and strain relief for 68-position offset cable plugs.

Application tooling for the cable plug connectors consists of the CHAMPOMATOR 2.5 semi-automatic termination machine, and a bench mounted arbor press and die set for terminating and installing the backshell kit.

Technical Documents

Product Specification

108-1471

Application Specification

114-6057

Test Report

501-335

**Standard Receptacle,
Right Angle**

Material and Finish

Housing and Pin Spacer —

UL 94V-0 rated thermoplastic, black,
SMT compatible

Inserts — UL 94V-0 rated thermoplastic,
natural, SMT compatible

Shell — Steel, plated .000197
[0.00500] min. bright tin over .000098
[0.00250] min. copper

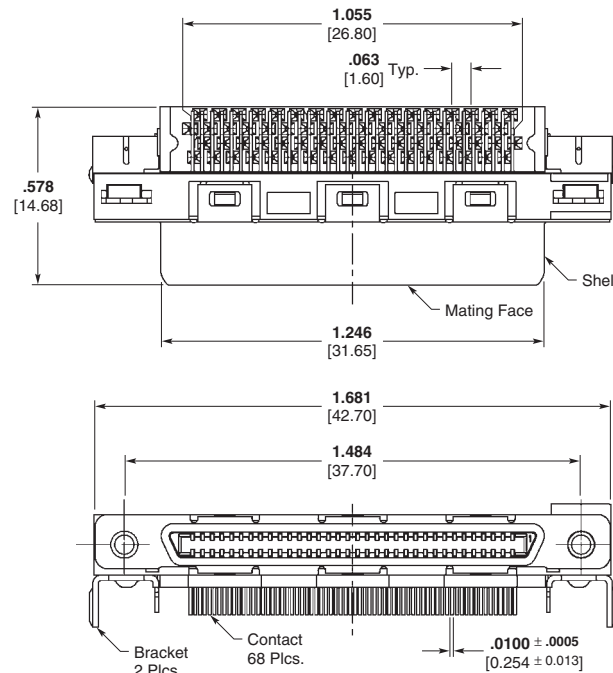
Contacts — Phosphor bronze, duplex
plated .000003 [0.000076] min. gold
over .000029 [0.00076] min. palladium
nickel on mating end, .000148
[0.00375] min. bright tin-lead on solder
end, all over .000050 [0.00127] min.
nickel under plating

Boardlocks — Brass, plated .000148
[0.00375] min. bright tin-lead over
.000050 [0.00127] min. nickel

Durability — 500 insertion cycles

Base Part Number 796055-x

CHAMP 0.8mm Centerline Printed Circuit Board Connectors



Product Facts

- EMI shielded high density and low profile I/O system
- Precision insert molded contacts on 0.8mm centerlines offer 30% linear PC board space savings
- Low profile right angle PC connector, 5.0mm high — a 50% reduction in height
- Contact tips recessed for ESD and damage protection
- Contacts are insulation displacement (IDC) and can be quickly terminated by the CHAMPOMATOR 2.5 Semi-Automatic Termination Machine
- Metal-shell backshell kits feature integral cable braid termination

Part Number	No. of Pos.	Mount Type	Mount Style	Style	Description/ Finish	Mating Part
787973-1	36	Thru-Hole	Solder	Single	30μ" Au & Sn	787131-2
1658751-1	50	Thru-Hole	Solder	Single	30μ" Au & Sn	786930-1 (Kit 787131-1)
796055-1	68	Thru-Hole	Solder	Single	30μ" Au & Sn	787131-3 or Offset 787979-1, 787775-1, 787801-1
787254-1	68	Thru Hole	Solder	Single	3μ Au/30μ" Pb & Sn. 4.70 (.185) posts	787775-1
787254-2	68	Thru Hole	Solder	Single	3μ Au/30μ" Pb & Sn. 4.70 (.185) posts	787775-1
787254-3	68	Thru Hole	Solder	Single	3μ Au/30μ" Pb & Sn. 3.75 (.148) posts	787775-1
787254-4	68	Thru Hole	Solder	Single	3μ Au/30μ" Pb & Sn. 4.70 (.185) posts	787775-1
796055-1	68	Thru-Hole	Solder	Single	30μ" Au & Sn	786930-3
796055-2	68	Thru-Hole	Solder	Single	30μ" Au & Sn	786930-3
1364973-2	68	Thru-Hole	Solder	Single	30μ" Au & Sn	787254-1 w/ pre-installed screwlocks

**Hybrid Receptacle,
Low Profile, Shielded,
Hybrid Leads**

Material and Finish

Housing — UL 94V-0 rated thermo-
plastic, black, SMT compatible

Inserts — UL 94V-0 rated thermoplas-
tic, natural, SMT compatible

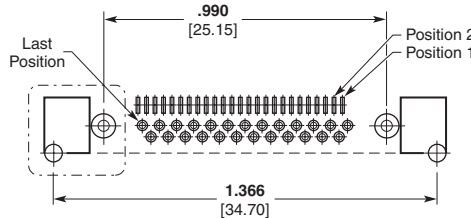
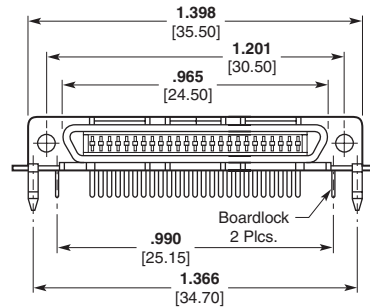
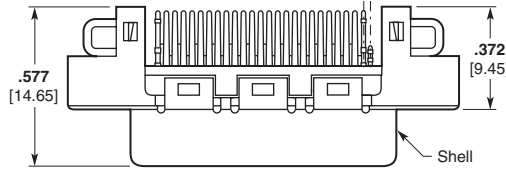
Shell — Steel, plated .000197
[0.00500] min. bright tin over .000098
[0.00250] min. copper

Contacts — Phosphor bronze, duplex
plated .000003 [0.000076] min. gold
over .000029 [0.00076] min. palladium
nickel on mating end, .000148
[0.00375] min. bright tin-lead on solder
end, all over .000050 [0.00127] min.
nickel under plating

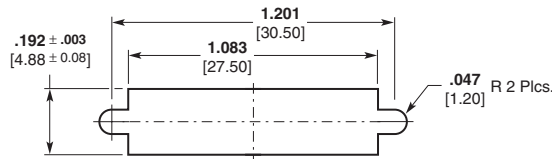
Boardlocks — Brass, plated .000148
[0.00375] min. bright tin-lead over
.000050 [0.00127] min. nickel

CHAMP 0.8mm Centerline Printed Circuit Board Connectors (Continued)

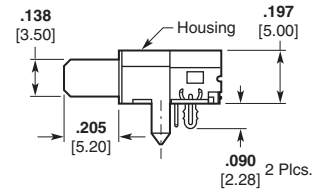
**Receptacle
Part Number 787096-1**



**Recommended PC Board Layout
(50-Position Only)**



Recommended Panel Cutout



Part Number	No. of Pos.	Mount Type	Mount Style	Style	Description/ Finish	Mating Part
787641-1	36	Thru-Hole	Solder	Single	3μ Au/30μ" Pb & Sn.	786930-2
787096-1	50	Thru-Hole	Solder	Single	3μ Au/30μ" Pb & Sn.	—

CHAMP 0.8mm Centerline Printed Circuit Board Connectors (Continued)

**Stacked Receptacle
Right Angle**

Part Number 787962-1 (2.08mm*)

Part Number 787962-2 (3.55mm*)

Material and Finish

Housing and Pin Spacer —

UL 94V-0 rated thermoplastic, black,
SMT compatible

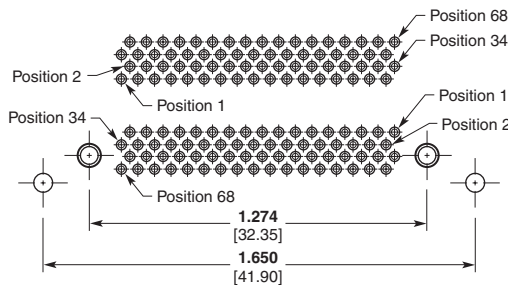
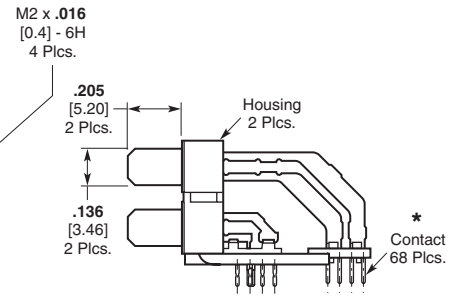
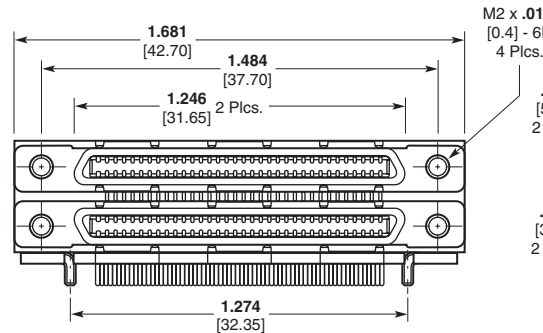
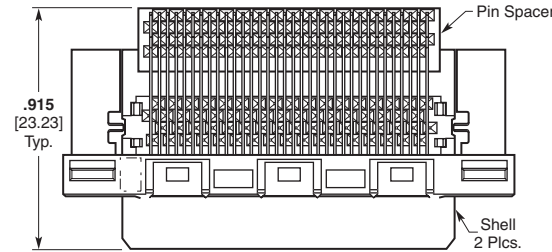
Inserts — UL 94V-0 rated thermoplas-
tic, natural, SMT compatible

Shell — Steel, plated .000197
[0.00500] min. bright tin over .000098
[0.00250] min. copper

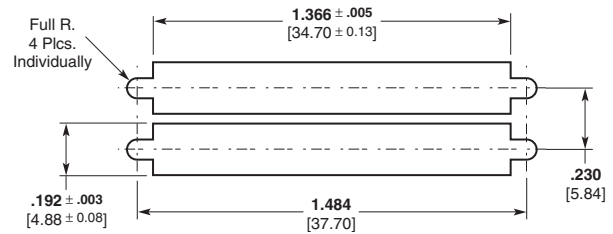
Contacts — Phosphor bronze, duplex
plated .000003 [0.000076] min. gold
over .000029 [0.00076] min. palladium
nickel on mating end, .000148
[0.00375] min. bright tin-lead on solder
end, all over .000050 [0.00127] min.
nickel under plating

Boardlocks — Brass, plated .000148
[0.00375] min. bright tin-lead over
.000050 [0.00127] min. nickel

Durability — 500 insertion cycles



Recommended PC Board Layout

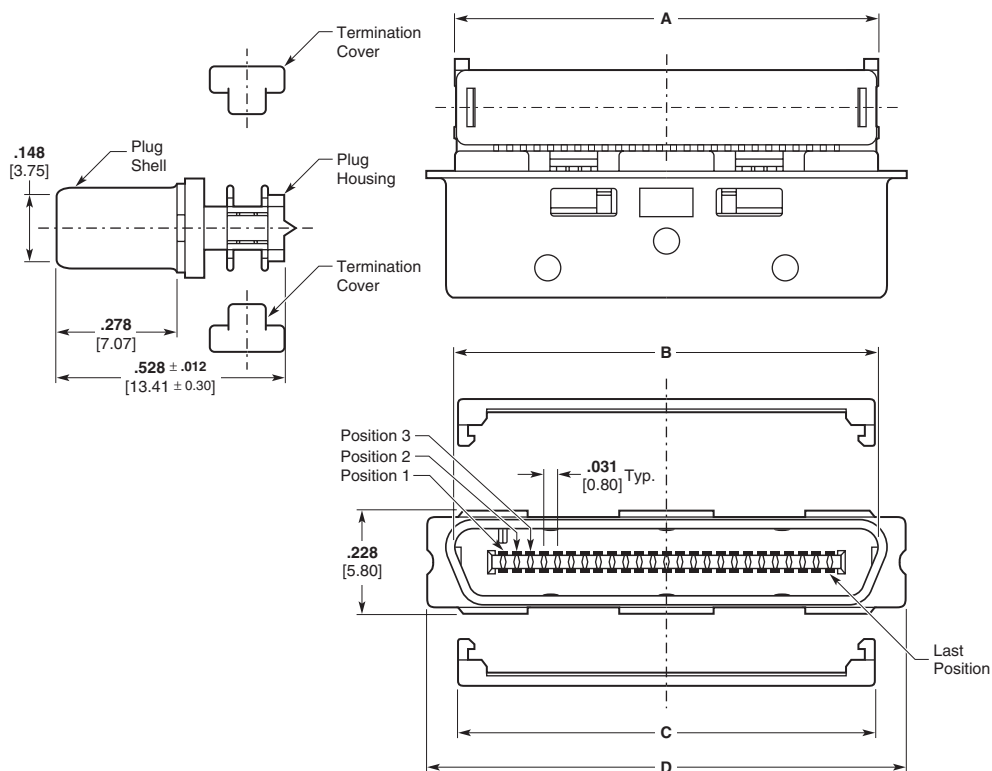


Recommended Panel Cutout

Part Number	No. of Pos.	Mount Type	Mount Style	Style	Description/ Finish	Mating Part
787962-1	68	Thru Hole	Solder	Stacked	30μ" Au & Sn. Top D inverted (Kit 796063-1 has 4 screwlocks 787004-1)	787979-1, 787775-1, 787801-1
787962-2	68	Thru Hole	Solder	Stacked	30μ" Au & Sn. Top D inverted (Kit 796063-1 has 4 screwlocks 787004-1)	787979-1, 787775-1, 787801-1
1489050-1	68	Thru Hole	Solder	Stacked	30μ" Au & Sn. Top D inverted, no alignment posts	796064-1, 787979-1, 787775-1, 787801-1, 1364308-1
1364306-1	68	Thru Hole	Solder	Stacked	30μ" Au & Sn. Top D inverted, with cover. Kit 1489192-1 has 2 screwlocks 787004-1	796064-1, 787979-1, 787775-1, 787801-1, 1364308-1
1489232-1	68	Thru Hole	Solder	Stacked	30μ" Au & Sn. Top D inverted, no alignment posts, with cover	796064-1, 787979-1, 787775-1, 787801-1, 1364308-1
1489232-2	68	Thru Hole	Solder	Stacked	30μ" Au & Sn. Top D inverted, no alignment posts, with cover	796064-1, 787979-1, 787775-1, 787801-1, 1364308-1

Standard Plugs

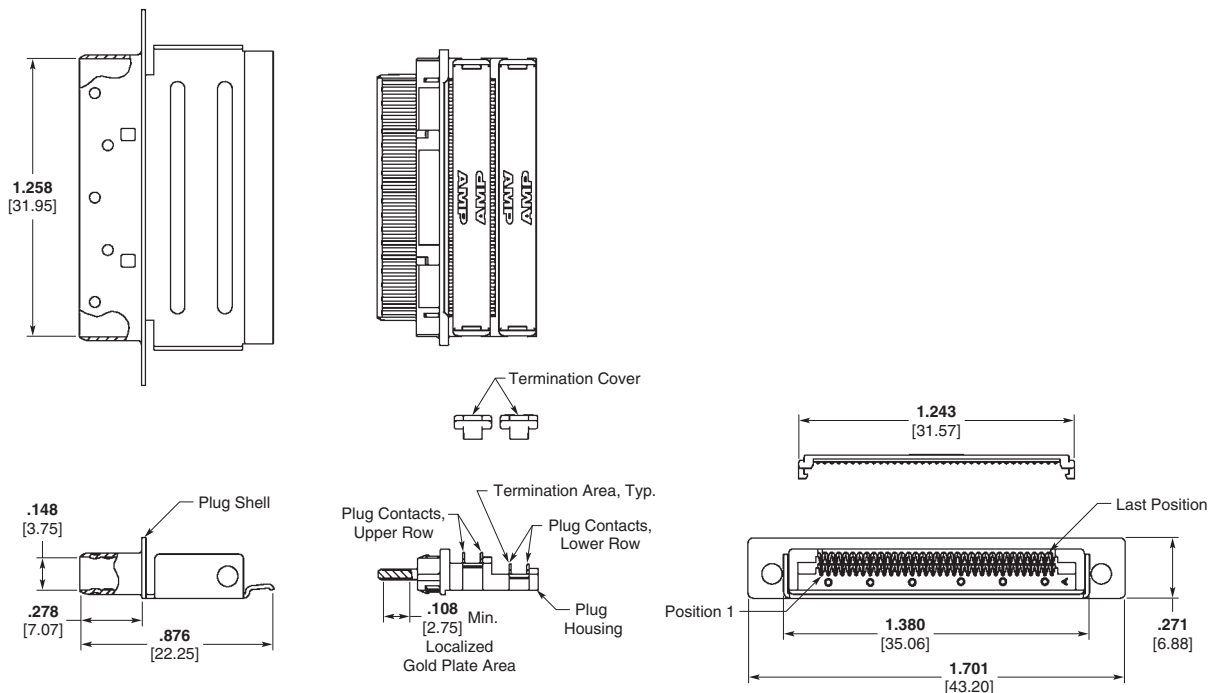
CHAMP 0.8mm Centerline Cable Connectors



No. of Positions	Dimensions				Part Numbers	Mating Part
	A	B	C	D		
36	.750 19.05	.754 19.15	.739 18.77	.877 22.28	787131-2	787641-1, 787973-1
50	.970 24.65	.974 24.75	.959 24.37	1.098 27.88	787131-1	1658751-1, 787096-1
68	1.254 31.85	1.258 31.95	1.243 31.57	1.381 35.08	787131-3	787254-1, 787254-2, 787254-3, 796055-1, 796055-2

CHAMP 0.8mm Centerline Cable Connectors (Continued)

**Offset Plugs for
Stacked Receptacles**



Part Number	No. of Pos.	Mount Type	Termination	Style	Description/ Finish	Mating Part
796064-1	68	Thru-Hole, Cable Connector	Solder IDC	Offset	30μ" Au & Sn. Unassembled Kit, Small shell (30 AWG)	787962-1, 787962-2
787979-1	68	Thru-Hole Cable Connector	Solder IDC	Offset	30μ" Au & Sn. Unassembled Kit Unshielded (30 AWG)	787962-1, 787962-2
787775-1	68	Thru-Hole Cable Connector	Solder IDC	Offset	30μ" Au & Sn. Unassembled Kit (30 AWG)	787962-1, 787962-2
787801-1	68	Thru-Hole Cable Connector	Solder IDC	Offset	30μ" Au & Sn. Unassembled Kit, /jackscrews (30 AWG)	787962-1, 787962-2



Standard

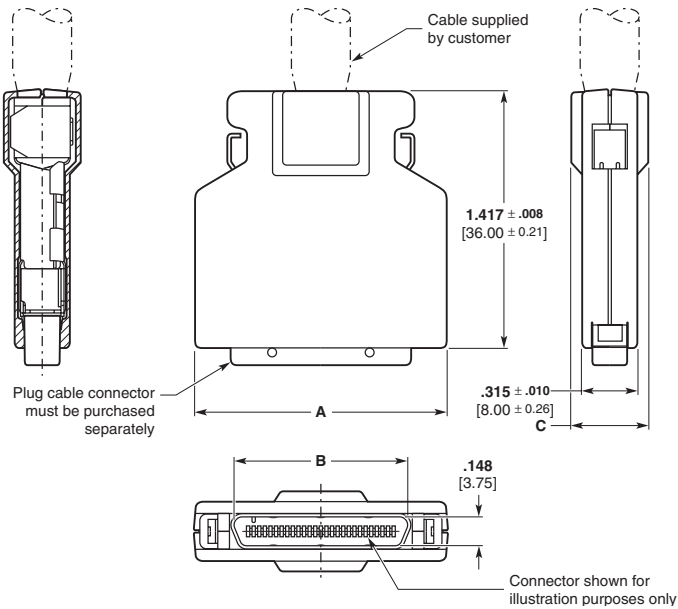
With Squeeze-to-Release Latches

Material and Finish

Backshells — Steel, plated .000197 [0.005] min. bright tin-lead over .000098 [0.0025] min. copper

Spring Latches — Stainless Steel

Spring Latch Covers — UL 94V-0 rated, ABS/PC alloy, black



No. of Positions	Dimensions			Part Nos. Bulk Kits (100 Assemblies)
	A	B	C	
36	1.197 30.40	.754 19.15	.394 10.00	787231-1
50	1.417 36.00	.974 24.75	.433 11.00	787133-1
68	1.701 43.20	1.258 31.95	.442 11.22	787229-1

With Jackscrew Fastener

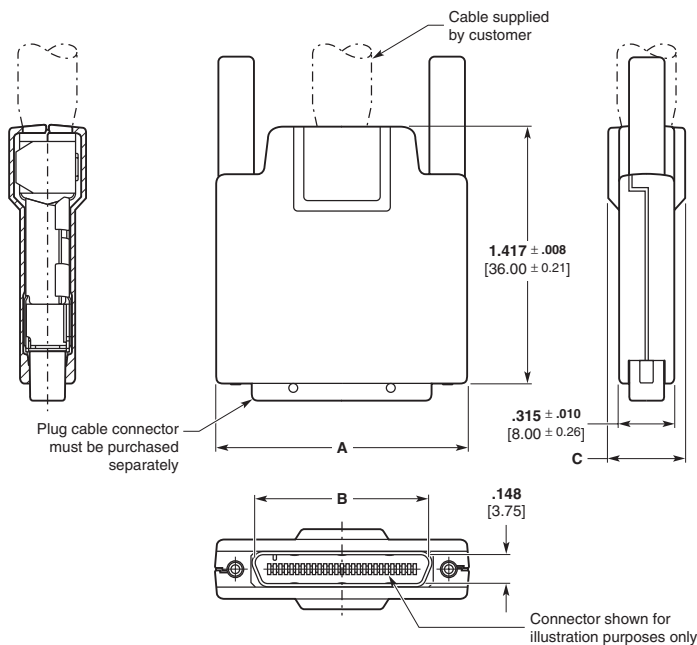
Material and Finish

Backshells — Steel, plated .000197 [0.005] min. bright tin-lead over .000098 [0.0025] min. copper

Jackscrews — Steel, plated blue chromate over zinc

Jackscrew Head — ABS/PC, black

Jackscrew Covers — UL 94V-0 rated, ABS/PC alloy, black



No. of Positions	Dimensions			Part Nos. Bulk Kits (100 Assemblies)
	A	B	C	
50	1.417 36.00	.974 24.75	.433 11.00	787233-1
68	1.701 43.20	1.258 31.95	.442 11.22	787191-1

Note: Recommended wire size — 30 AWG [0.05mm²], insulation diameter range — .022-.025 [0.56-0.64]

Wire must be approved by Tyco Electronics.

CHAMP 0.8mm Centerline Connector Backshell Kits (Continued)

Offset, 68-Position Plug Kit

Material and Finish

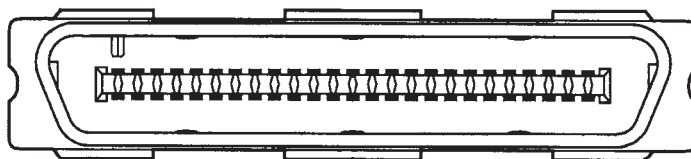
Backshells — LCP, 94V-0, natural

Termination Covers — LCP, 94V-0, natural

Shell — Carbon steel, plated .000200 [0.00508] min. tin-lead over .000050 [0.00127] min. copper

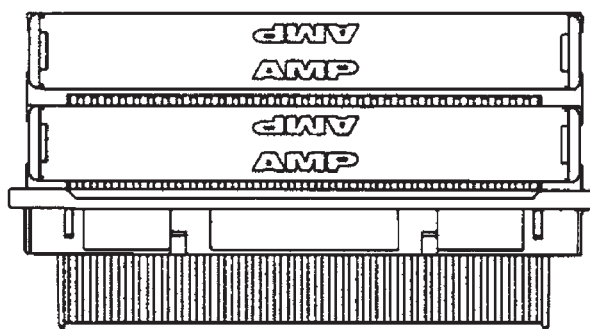
Contacts — Phosphor bronze, AMP-DURAGOLD plated .0000030 [0.000076] min. gold on mating end, .000050 [0.00127] min. tin-lead on solder end, all over .000050 [0.00127] min. nickel underplate

Plug Kit — Unassembled, Shielded Cable Connector



68-Position — Part Number 787131-3

Plug Kit — Unassembled, Shielded Cable Offset Cable Connector



68-Position — Part Number 787775-1

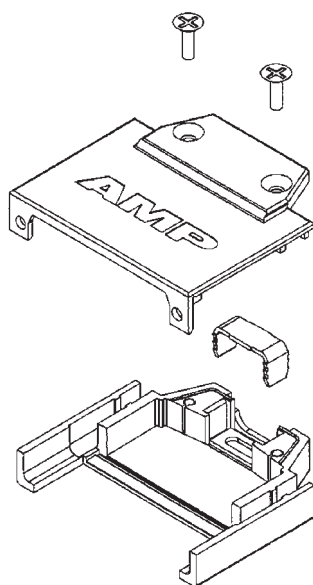
68-Position Backshell Kit, (Unassembled)

Material and Finish

Backshells — Zinc plated .000100 [0.00254] min. nickel over .000200 [0.00508] min. copper

Strain Relief — Carbon steel plated .000050 [0.00127] min. bright tin-lead over .000050 [0.00127] min. nickel

Screws — Stainless steel



Part Number 788362-1

Part Number	No. of Pos.	Mount Type	Style	Description/ Finish	Mating Part
787231-1 (ROHS)	36	B/Shell Kit	180	With Latchspring (needs 787003-3 latch posts)	STD 787973-1, 787973-2 ¹ HYBRID 787641-1
787133-1 (ROHS)	50	B/Shell Kit	180	With Latchspring (needs 787003-3 latch posts)	1658751-1, 787096-1
787233-1	50	B/Shell Kit	180	With jackscrews (needs 787004-3)	1658751-1, 787096-1
787229-1 (ROHS)	68	B/Shell Kit	180	With Latchspring (needs 787003-3 latch posts)	787254-1, 787254-2, 787254-3, 787254-4, 796055-1, 796055-2
787191-1	68	B/Shell Kit	180	Used with 787801-1, w/o jackscrews	787254-1, 787254-2, 787254-3, 787254-4, 796055-1, 796055-2
788362-1	68	B/Shell Kit	Offset	Used with 787801-1, w/o jackscrews	787962-1, 787962-2, 1489050-1, 1364306-1, 1489232-1, 1489232-2

¹ Contact Tyco Electronics for RoHS Part Number information.

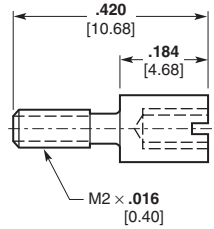


Screwlock, Boardmount

Part Number 787004-3—
Bulk (quantity 200)

Material and Finish

Stainless steel



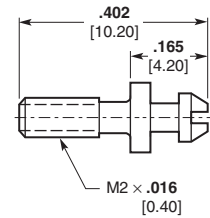
Designed for Use with
.044 ± .003 [1.12 ± 0.08] Thick Panel

Latching Post, Boardmount

Part Number 787003-3—
Bulk (quantity 200)

Material and Finish

Stainless steel



Designed for Use with
.044 ± .003 [1.12 ± 0.08] Thick Panel

Backshell Kit Tooling

To crimp and assemble backshell kits over the plastic housings, use the following:

Description	Part Number	Instruction Sheet
Arbor Press	91085-2	408-7777
Die Set	122842-1 for 50-Position 122842-2 for 68-Position 122842-3 for 36-Position	408-4040

Standard Cable Connectors

Manual Tooling

Description	Part Number	Instruction Sheet
Mini Manual Arbor Frame Assy.	91295-1	408-9817
Manual Arbor Frame Assy.	91085-2	408-7777
Mass Termination Assy.	543580-1	408-4264
Cutter Assembly	543610-1	408-4264

Semiautomatic (Medium to High Volume) Tooling

Description	Part Number	Customer Manual
CHAMPOMATOR 2.5 Machine	354786-7	409-5839
Control Module	852423-1 (120 VAC)	409-5791

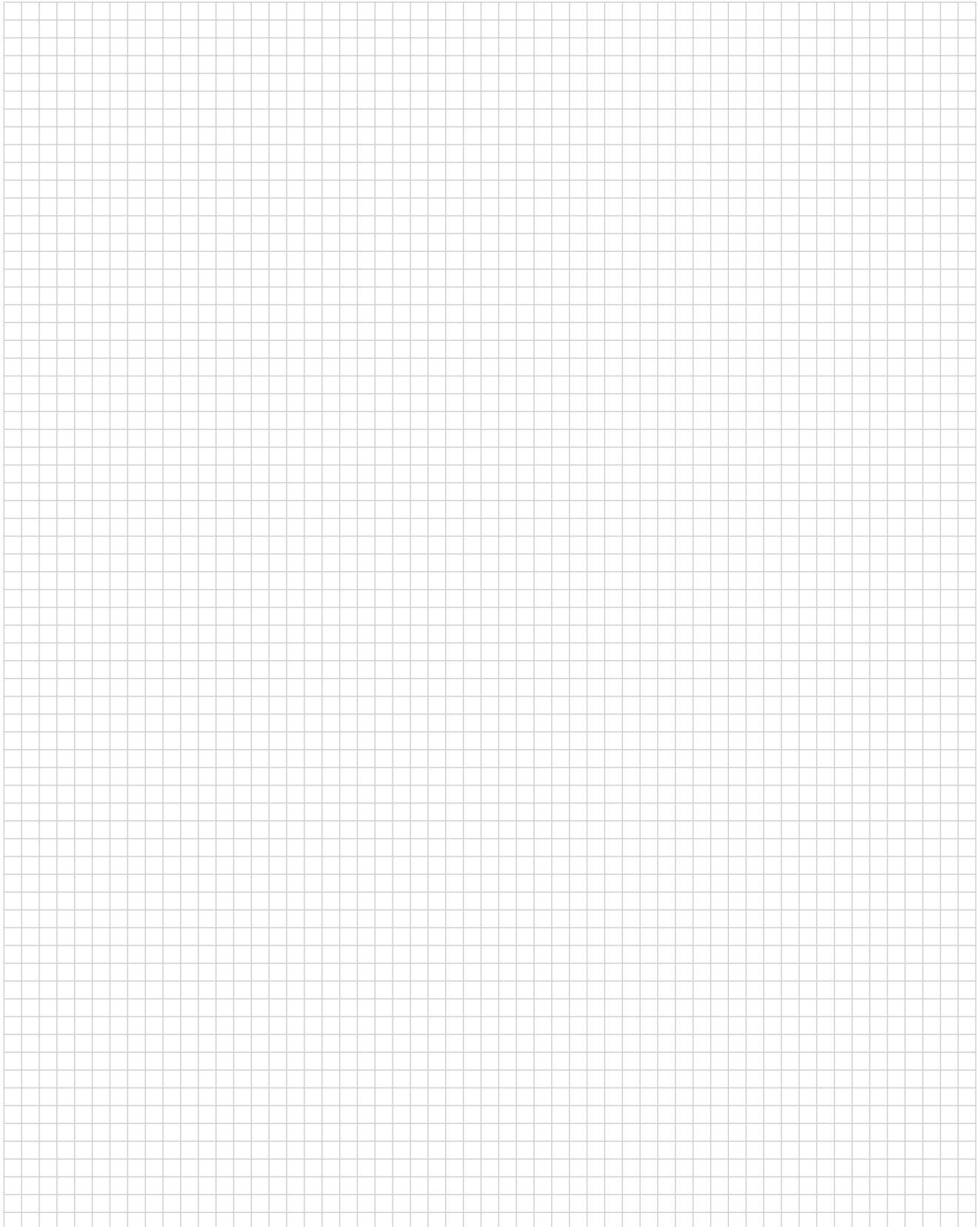
Offset Cable Connectors

Manual Tooling

Description	Part Number	Instruction Sheet
Mini Manual Arbor Frame Assy.	91295-1	408-9817
Manual Arbor Frame Assy.	58024-1	408-6923
Mass Termination Assy.	543630-1	408-4333

Semiautomatic (Medium to High Volume) Tooling

Description	Part Number	Customer Manual
CHAMPOMATOR 2.6 Machine	662300-1	409-5892
Control Module	852423-4 (120 VAC)	409-5791

Engineering Notes

CHAMP .050 Centerline Connectors (Series I, VESA, Docking, SCSI, Blindmate, SCAII, Free Height, Series II, Series III)

CHAMP .050 Series Connectors meet the needs for high density .050 inch [1.27mm] contact centerlines required by constantly emerging miniaturized designs. These connectors allow the printed circuit board designer to maximize valuable PC board real estate without sacrificing interconnection capability.

The trapezoidal, D-shaped mating face is a familiar industry standard, along with the ribbon, or leaf, contact design that is durable enough to withstand the rigors of repeated mating.

Whether the application need is for board-to-board, or wire-to-board interconnections, the CHAMP .050 Series connector family provides a solution.

Board-to-Board Connectors

The **Series I** is an all-plastic connector system used for internal board-to-board interconnections. The Right

Angle and Vertical connectors are available in both plug and receptacle genders, which permits parallel, perpendicular, and in-line interconnection geometries. Receptacle connectors also serve as card edge connectors. Position sizes available range from 20 to 200 positions.

Series I connectors use a single spring fixed plug and compliant receptacle contact combination that is tolerant of variations in mating depth. This tolerance allows the connectors to accommodate printed circuit board warpage.

In addition to the high density and unique contact design, Series I connector's options include a high temperature LCP plastic housing material, polarization to PC board.

Both connector configurations can provide parallel, perpendicular, and in-line interconnections.

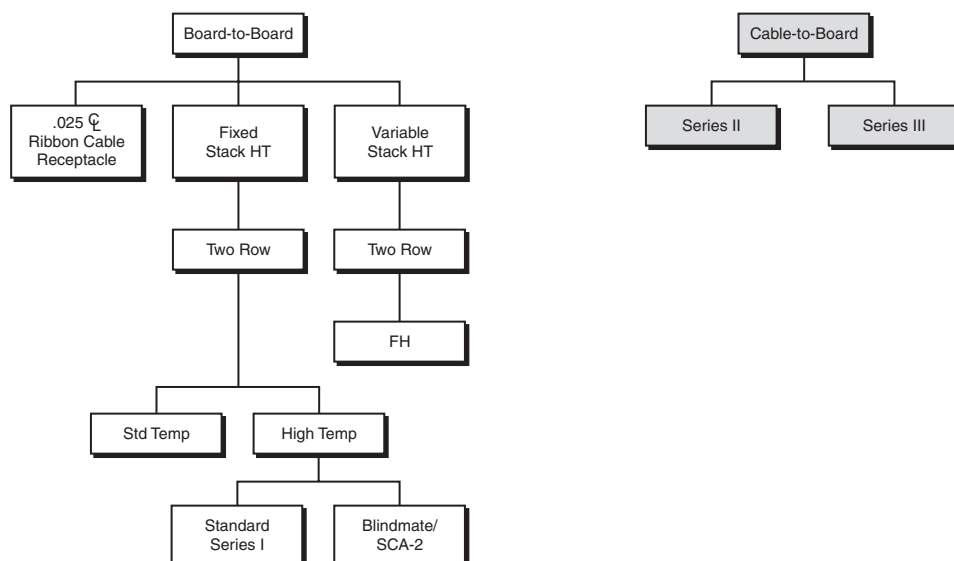
CHAMP .050 Series I Docking Connector

is designed for use on new notebook type PCs. This product group has been developed to provide an improved ESD (Electrostatic Discharge) protection by means of shielding. Two versions are available, board-to-board connector and board-mount connector to mate with wiremount plug connectors.

CHAMP .050 Series I, Blindmate Single Connector Attachment (SCA 2)

is an 80-position configuration with integral blindmating capabilities. It is capable of carrying required SCSI data, control, power and auxiliary signals. Interconnections are simplified by the SCA 2 connector's diverse architecture design that will support the requirements for narrow and wide SCSI operations.

High Density Interconnection System CHAMP .050 Series Connector Family



CHAMP .050 Centerline Connectors (Series I, VESA, Docking, SCSI, Blindmate, SCAII, Free Height, Series II, Series III) (Continued)

The 40-position CHAMP .050 Series I, Blindmate Single Connector attachment (SCA 2) answers the industry's need for one connector that is suitable for the direct attachment of Fibre Channel disk drives to backplanes and motherboards.

The CHAMP .050 Series, SCA 2 connector in a 40-position configuration has been designed for serial transfer Fibre Channel devices, and carries all signals as required by the Fibre Channel Physical Interface and the Fibre Channel Arbitrated Loop Standards. In addition, all required power and auxiliary signals are carried by the same single attachment connector.

Designed and manufactured with the Disk Drive Industry's quality requirements as the driving motivation, the 40-position SCA 2 connector features the industry accepted polarized "D" connector interface. Features include housings made of UL 94V-0 rated IR reflow process compatible high temperature material, gold-over-nickel plated ribbon style contacts, Advanced Ground Contacts (AGC) with integral metal hold-down, and complete power sequencing capabilities. In addition to these features, the CHAMP Series I, Blindmate SCA 2 connector is fully compatible with existing CHAMP .050 Series I connectors.

Blindmate SCA 2 connectors are the interface for 3.5 Fibre Channel disk drives

and will permit direct drive attachment to backplane arrays, which can eliminate costly cable assemblies and adapter boards while improving system reliability.

The CHAMP .050 Series, SCA 2 Connector in a 20-position configuration has been designated the interface for the Gigabit Interface Converter specification. A straddle-mount plug is used on the GBIC, a vertical receptacle is available for direct attachment to a backplane and a right angle receptacle is available for adapter card applications.

For additional information on this new technology, contact Tyco Electronics.

The **FH**, or Free Height, connectors are also an all-plastic connector system for internal board-to-board interconnections with a single spring leaf contact design. These connectors may be considered as an alternative to the Series I product line, with the added feature of variable stacking heights. The vertical receptacle is available in various housing profiles to permit board stacking heights from .315 inch [8.0mm] to .709 inch [18.0mm] in .040 inch [1.0mm] increments.

Position sizes available range from 40 to 180 positions in both plug and receptacle for right angle and vertical configurations. A feature unique to the FH system is the closed bottom in the housing, which further inhibits contact contamination from flux and solder during processing.

Wire-to-Board Connectors

The **Series II** is a shielded I/O connector system for wire-to-board connections offering maximum EMI protection. The series includes right angle and vertical printed circuit board receptacles and cable plug connectors. The right angle board connectors are available with retention board locks and a stamped metal shield. The vertical connectors incorporate a die cast metal shield. Selected sizes are available in high temperature housing material.

The cable plug connectors use insulation displacement contacts for fast, accurate termination of 28 AWG [0.008 mm²] stranded, discrete wire, jacketed cable. The cable plug offers a stamped metal backshell with a 180° exit for ESD (Electrostatic Discharge) protection. A plastic enclosure fits over the backshell to provide an aesthetically pleasing appearance. A "squeeze-to-release latch" captivation mechanism is used on the cable plug.

A wide range of position offerings of 14 to 100 are available.

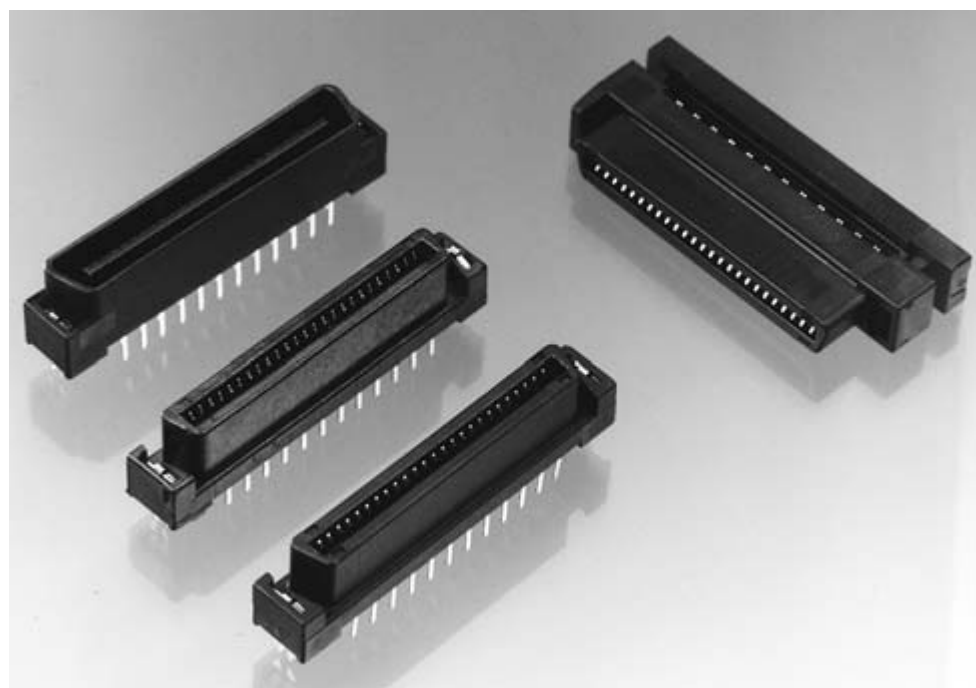
General Product Facts

- **High density .050 [1.27] contact centerlines**
- **Leaf contacts accommodate minor mating misalignment**
- **D-shaped polarized mating face**
- **Variety of application tooling available to meet a wide range of production volumes**

CHAMP .050 Series I Connectors, Printed Circuit Board Connectors

Series I Connectors for Internal Applications

- All-plastic PC board mounting
- Vertical and right angle plugs and receptacles
- Parallel, perpendicular, and in-line interconnections
- Single-spring contact design for high tolerance to mating depth variations
- Receptacle connectors will mate with .062 [1.57] printed circuit boards to allow service as card edge connectors
- 20 through 200 selected positions
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E-28476 
- Certified by Canadian Standards Association File No. LR 7189 
- Produced under a quality management system certified to ISO 9001



Performance Specifications

Operating Temperature Range —

–55°C to +85°C for standard
–55°C to +105°C for high temperature

Current Rating — 1 ampere max.

Voltage Rating — 250 VAC max.

Termination Resistance —
35 milliohms maximum initial

Insulation Resistance —
1,000 megohms minimum initial

Mating Force — 90 grams per
contact maximum

Rated Cycle Life — 500 cycles

Technical Documents

Product Specification —
108-5290 — Standard temperature
108-1367 — High temperature

Application Specification —
114-6045

Instruction Sheet —
411-5499

CHAMP .050 Series Connectors meet the needs for high density .050 inch [1.27mm] contact centerlines required by constantly emerging miniaturized designs. These connectors allow the printed circuit board designer to maximize valuable PC board real estate without sacrificing interconnection capability.

The trapezoidal, D-shaped mating face is a familiar industry standard, along with the ribbon, or leaf, contact design that is durable enough to withstand the rigors of repeated mating.

Whether the application need is for board-to-board, or wire-to-board interconnections, the CHAMP .050 Series connector family provides a solution.

Board-to-Board Connectors

The **Series I** is an all-plastic connector system used for internal board-to-board interconnections. The Right

Angle and Vertical connectors are available in both plug and receptacle genders, which permits parallel, perpendicular, and in-line interconnection geometries. Receptacle connectors also serve as card edge connectors. Position sizes available range from 20 to 200 positions.

Series I connectors use a single spring fixed plug and compliant receptacle contact combination that is tolerant of variations in mating depth. This tolerance allows the connectors to accommodate printed circuit board warpage.

In addition to the high density and unique contact design, Series I connector's options include a high temperature LCP plastic housing material, polarization to PC board.

Both connector configurations can provide parallel, perpendicular, and in-line interconnections.

CHAMP .050 Series I Connectors, Printed Circuit Board Connectors (Continued)

Right Angle Plugs

Materials and Finish

Housing and Tine Plate — Glass filled nylon, rated 94V-0, black for standard. LCP, rated 94V-0, black for High Temp.

Contacts — Phosphor bronze selectively plated with minimum of .000030 [0.00076] gold in mating area and tin-lead in solder tail area.

Retention Leg (Board Lock) — Brass, tin-lead plated.

Performance Specifications — Page 19

PC Board Accommodation — .031 [0.79] to .063 [1.60] nominal thickness

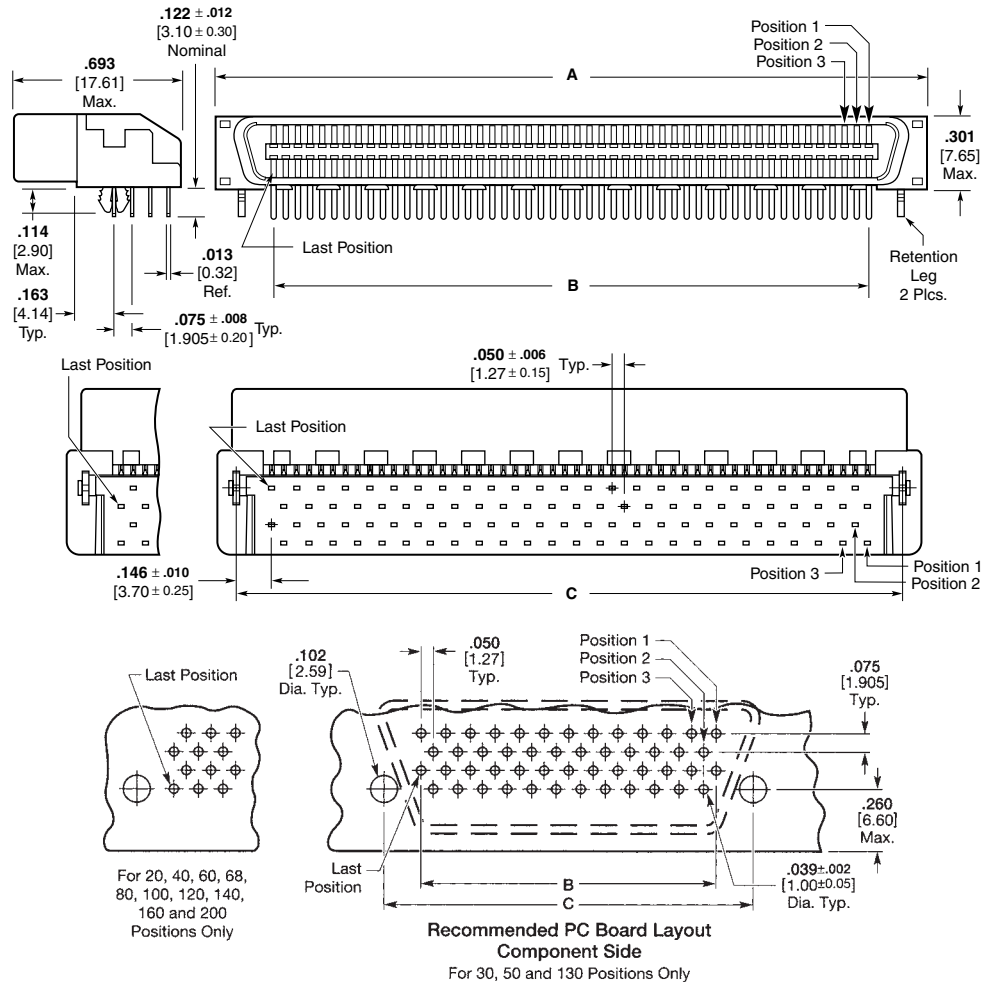
Mating Receptacle Connectors —

Right Angle — Page 21

Vertical — Page 24

Ribbon Cable — Page 26

Mating Configurations — Page 28



Pos.	Dimensions			Part Number High Temp.	Part Number Standard Temp.
	A	B	C		
20	.891 22.63	.450 11.43	.741 18.82	N/A	5-175472-1
30	1.141 28.98	.700 17.78	.991 25.17	N/A	5-175472-3
40	1.391 35.33	.950 24.13	1.241 31.52	557100-5	5-175472-5
50	1.641 41.68	1.200 30.48	1.491 37.87	557100-9	5-175472-6
60	1.891 48.03	1.450 36.83	1.741 44.22	1-557100-3	*3-175472-7
68	2.091 53.11	1.650 41.91	1.941 49.30	1-557100-7	5-175472-8
80	2.391 60.73	1.950 49.53	2.241 56.92	2-557100-1	5-175472-9
100	2.891 73.43	2.450 62.23	2.741 69.62	2-557100-5	6-175472-0
120	3.391 86.13	2.950 74.93	3.241 82.32	2-557100-9	6-175472-1
130	3.641 92.48	3.200 81.28	3.491 88.67	N/A	6-175472-2
140	3.891 98.83	3.450 87.63	3.741 95.02	4-557100-9	N/A
160	4.391 111.53	3.950 100.33	4.241 107.72	3-557100-7 ¹	N/A
200	5.391 136.93	4.950 125.73	5.241 133.12	4-557100-11 ¹	N/A

*Plating — .000020 [0.00050] Minimum Gold.

¹ Contact Tyco Electronics for RoHS Part Number information.

CHAMP .050 Series I Connectors, Printed Circuit Board Connectors (Continued)

Right Angle Receptacles

Materials and Finish

Housing and Tine Plate — Glass filled nylon, rated 94V-0, black for standard. LCP, rated 94V-0, black for High Temp.

Contacts — Phosphor bronze selectively plated with minimum of .000030 [.00076] gold in mating area and tin-lead in solder tail area.

Retention Leg (Board Lock) — Brass, tin-lead plated.

Performance Specifications — Page 19

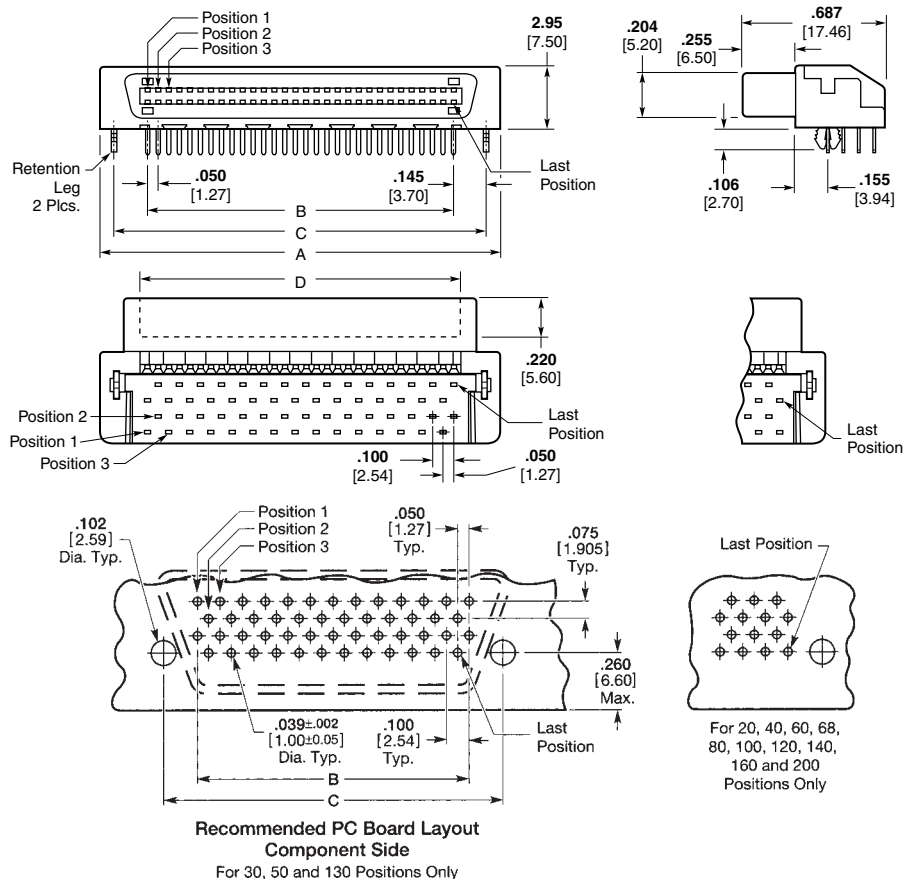
PC Board Accommodation — .031 [0.79] to .063 [1.60] nominal thickness

Mating Plug Connectors —

Right Angle — Page 20

Vertical — Page 22

Mating Configurations — Page 28



Pos.	Dimensions				Part Number High Temp.	Part Number Standard Temp.
	A	B	C	D		
20	.891 22.63	.450 11.43	.741 18.83	.524 13.33	N/A	5-175474-1
30	1.141 28.98	.700 17.78	.991 25.18	.774 19.68	N/A	5-175474-3
40	1.391 35.33	.950 24.13	1.241 31.53	1.024 26.03	557101-5	5-175474-5
50	1.641 41.68	1.200 30.48	1.491 37.88	1.274 32.38	557101-9	5-175474-6
60	1.891 48.03	1.450 36.83	1.741 44.23	1.524 38.73	N/A	5-175474-7
68	2.091 53.11	1.650 41.91	1.941 49.31	1.724 43.81	1-557101-7	**175474-8
80	2.391 60.73	1.950 49.53	2.241 56.93	2.024 51.43	2-557101-1	5-175474-9
100	2.891 73.43	2.450 62.23	2.741 69.63	2.524 64.13	*2-557101-5	6-175474-0
120	3.391 86.13	2.950 74.93	3.241 82.33	3.024 76.83	2-557101-9	***4-175474-1
130	3.641 92.48	3.200 81.28	3.491 88.68	3.274 83.18	N/A	***4-175474-2
140	3.891 98.83	3.450 87.63	3.741 95.03	3.524 89.51	4-557101-9	N/A
160	4.391 111.53	3.950 100.33	4.241 107.73	4.024 102.21	3-557101-7	N/A

*Part Number without board locks is available — Contact Tyco Electronics at the numbers listed below.
 **Plating — .000008 [0.00020] Minimum Gold.
 ***Plating — .000020 [0.00050] Minimum Gold.

CHAMP .050 Series I Connectors, Printed Circuit Board Connectors (Continued)

Vertical Plugs

Materials and Finish

Housing — Glass filled nylon, rated 94V-0, black for standard. LCP, rated 94V-0, black for High Temp.

Contacts — Phosphor bronze selectively plated with minimum of .000030 [0.00076] gold in mating area and tin-lead in solder tail area.

Retention Leg (Board Lock) — Brass, tin-lead plated.

Performance Specifications — Page 19

PC Board Accommodation — .031 [0.79] to .063 [1.60] nominal thickness

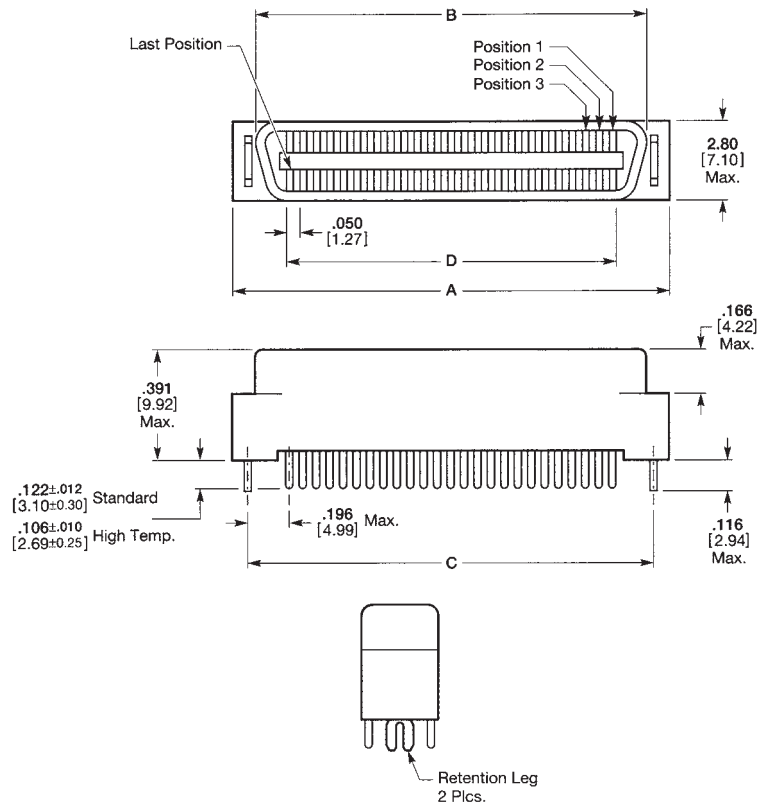
Mating Receptacles —

Right Angle — Page 21

Vertical — Page 24

Ribbon Cable — Page 26

Mating Configurations — Page 28



Pos.	Dimensions					Keying Post ²	Part Number Standard Temp. w/o Post ¹
	A	B	C	D	E ³		
20	.947 24.05	.776 19.73	.843 21.41	.450 11.43	—	5-557102-4	5-175473-1
30	1.197 30.40	1.028 26.12	1.093 27.76	.700 17.78	—	N/A	*0-175473-3 ⁴
40	1.447 36.75	1.278 32.47	1.343 34.11	.950 24.13	—	5-557102-5	*0-175473-5 ⁴
50	1.697 43.10	1.528 38.82	1.593 40.46	1.200 30.48	—	5-557102-9 ⁴	5-175473-6
60	1.947 49.45	1.778 45.17	1.843 46.81	1.450 36.83	—	1-557102-3	5-175473-7
68	2.147 54.53	1.978 50.25	2.043 51.89	1.650 41.91	—	1-557102-7	**3-175473-8
80	2.447 62.15	2.278 57.87	2.343 59.51	1.950 49.53	—	***2-557102-1	5-175473-9
100	2.947 74.85	2.778 70.57	2.843 72.21	2.450 62.23	—	2-557102-5	6-175473-0
120	3.447 87.55	3.278 83.27	3.343 84.91	2.950 74.93	1.671 42.44	2-557102-9	**4-175473-1
130	3.697 93.90	3.528 89.62	3.593 91.26	3.200 81.28	1.795 45.59	3-557102-3	6-175473-2
160	4.447 112.95	4.278 108.67	4.343 110.31	3.950 100.33	2.171 55.14	3-557102-7	N/A
180	4.947 125.65	4.843 123.01	4.450 113.03	4.778 121.37	—	5-557102-3	N/A

¹ End Board Locks.

² End Board Locks and Keying Post. (See PC Board Layout Page 8).

³ End and Center Board Locks and Keying Post.

⁴ Contact Tyco Electronics for RoHS Part Number information.

*Plating — .000008 [.00020] Minimum Gold.

**Plating — .000020 [.00050] Minimum Gold.

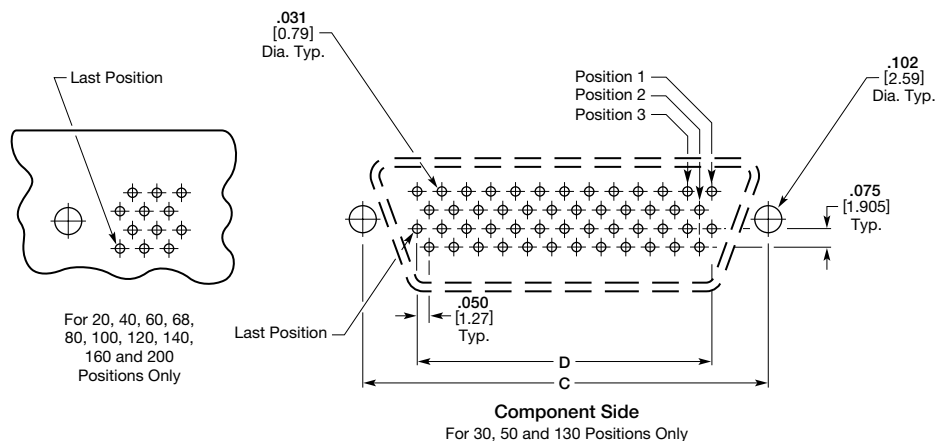
***Part Number without board locks is available — Contact Tyco Electronics at the numbers listed below.

CHAMP .050 Series I Connectors, Printed Circuit Board Connectors (Continued)

**Vertical Plug
Recommended
PC Board Layout**

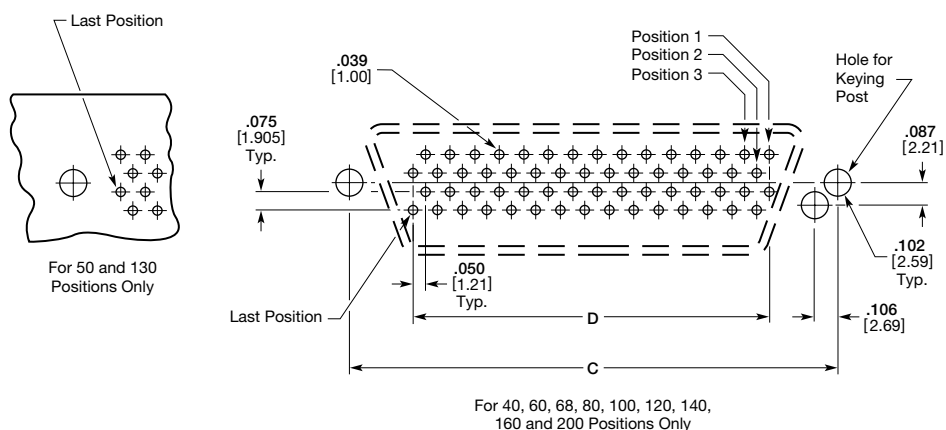
Standard

**Base Part Numbers
175473 and 557170**



Keying Post

Base Part Number 557102



CHAMP .050 Series I Connectors, Printed Circuit Board Connectors (Continued)

Vertical Receptacles

Materials and Finish

Housing — Glass filled nylon, rated 94V-0, black for standard. PPA, rated 94V-0 for High Temp.

Contacts — Phosphor bronze selectively plated with minimum of .000030 [0.00076] gold in mating area and tin-lead in solder tail area.

Retention Leg (Board Lock) — Brass, tin-lead plated.

Performance Specifications — Page 19

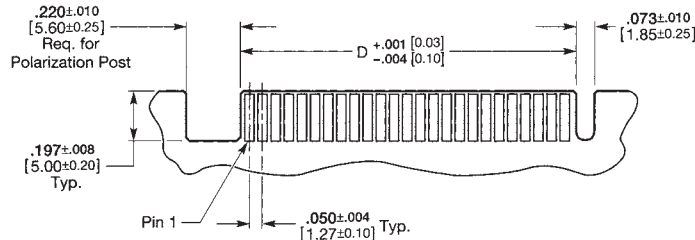
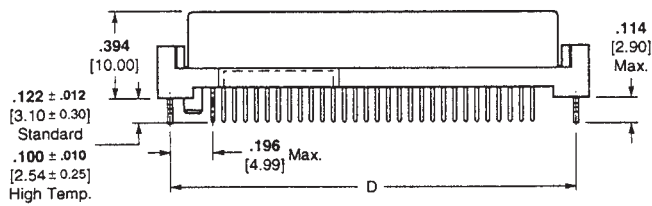
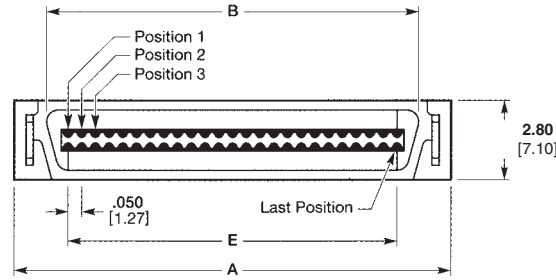
PC Board Accommodation — .031 [0.79] to .063 [1.60] nominal thickness

Mating Plug Connectors —

Right Angle — Page 20

Vertical — Page 22

Mating Configurations — Page 28



Recommended PC Board Layout for Card-edge Applications

Pos.	Dimensions						Keying Post ²	w/o Post ¹	Part Number Standard Temp. w/o Post ¹
	A	B	C	D	E	F ³			
20	.947 24.05	.668 16.97	.524 13.33	.843 21.41	.450 11.43	—	N/A	N/A	**3-175475-1
30	1.197 30.40	.918 23.32	.770 19.58	1.093 27.76	.700 17.78	—	—	N/A	5-175475-3
40	1.447 36.75	1.168 29.67	.985 25.03	1.343 34.11	.950 24.13	—	557103-5	N/A	5-175475-5
50	1.697 43.10	1.418 36.02	1.274 32.38	1.593 40.46	1.200 30.48	—	557103-9	786925-9 ⁴	5-175475-6
60	1.947 49.45	1.668 42.37	1.524 38.73	1.843 46.81	1.450 36.83	—	1-557103-3	—	5-175475-7
68	2.147 54.53	1.868 47.45	1.724 43.81	2.043 51.89	1.650 41.91	—	1-557103-7	1-786925-7 ⁴	5-175475-8
80	2.447 62.15	2.168 55.07	2.024 51.43	2.343 59.51	1.950 49.53	—	*2-557103-1	2-786925-1 ⁴	5-175475-9
100	2.947 74.85	2.668 67.77	2.131 54.13	2.843 72.21	2.450 62.23	—	*2-557103-5	N/A	6-175475-0
120	3.447 87.55	3.418 86.82	3.024 76.83	3.343 84.91	2.950 74.93	1.671 42.44	2-557103-9	N/A	6-175475-1
130	3.697 93.90	3.406 86.52	3.274 83.18	3.593 91.26	3.200 81.28	1.796 45.59	—	3-786925-3 ⁴	6-175475-2
140	3.947 100.25	3.668 93.17	3.524 89.51	3.843 97.61	3.450 87.63	1.922 48.82	—	N/A	N/A
160	4.447 112.95	4.160 105.87	4.024 102.21	4.343 110.31	3.950 100.33	2.171 55.14	3-557103-7	N/A	N/A
200	5.447 138.35	5.168 131.27	5.024 127.61	5.343 135.71	4.950 125.73	2.671 67.84	4-557103-1	N/A	N/A

¹ End Board Locks.

² End Board Locks and Keying Post.

³ End and Center Board Locks and Keying Post. (See PC Board Layout Page 10).

⁴ Contact Tyco Electronics for RoHS Part Number information.

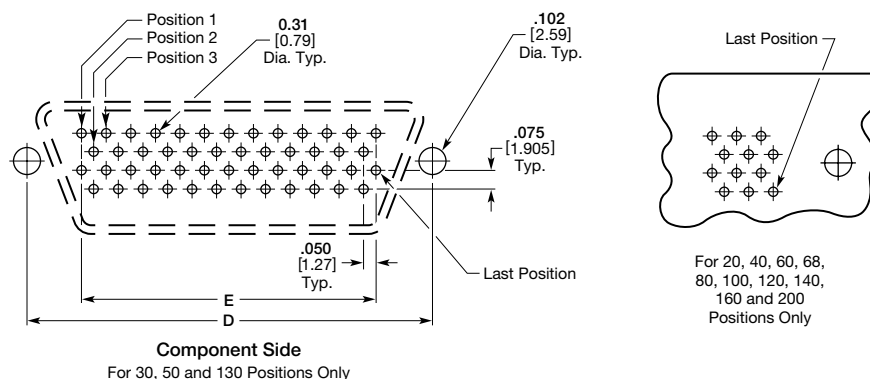
*Part Numbers without board locks are available — Contact Tyco Electronics at the numbers listed below.

**Plating — .000020 [.00050] Minimum Gold.

**Vertical Receptacle
Recommended
PC Board Layout**

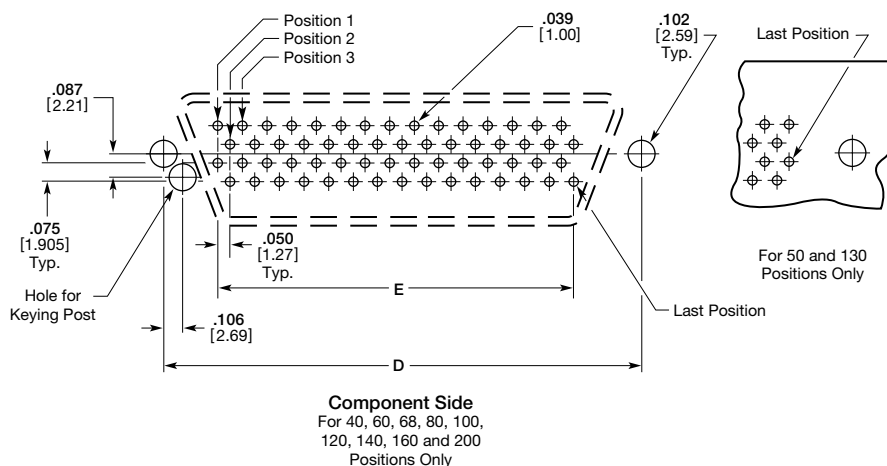
Standard

**Base Part Numbers
175475 and 786925**



Keying Post

Base Part Number 557103



CHAMP .050 Series I Connectors, Printed Circuit Board Connectors (Continued)

**Receptacle Assembly for
.025 [0.64] Ribbon Cable**

Materials and Finish

Housing and Stuffer — 94V-0 rated LCP, black

Contacts — Phosphor bronze, plated .000030 [0.00076] min. gold in mating area, .000150 [0.00381] min. tin-lead on terminating end, all over .000050 [0.00127] min. nickel

Performance Specifications —
Page 19

Mating Plug Connectors —

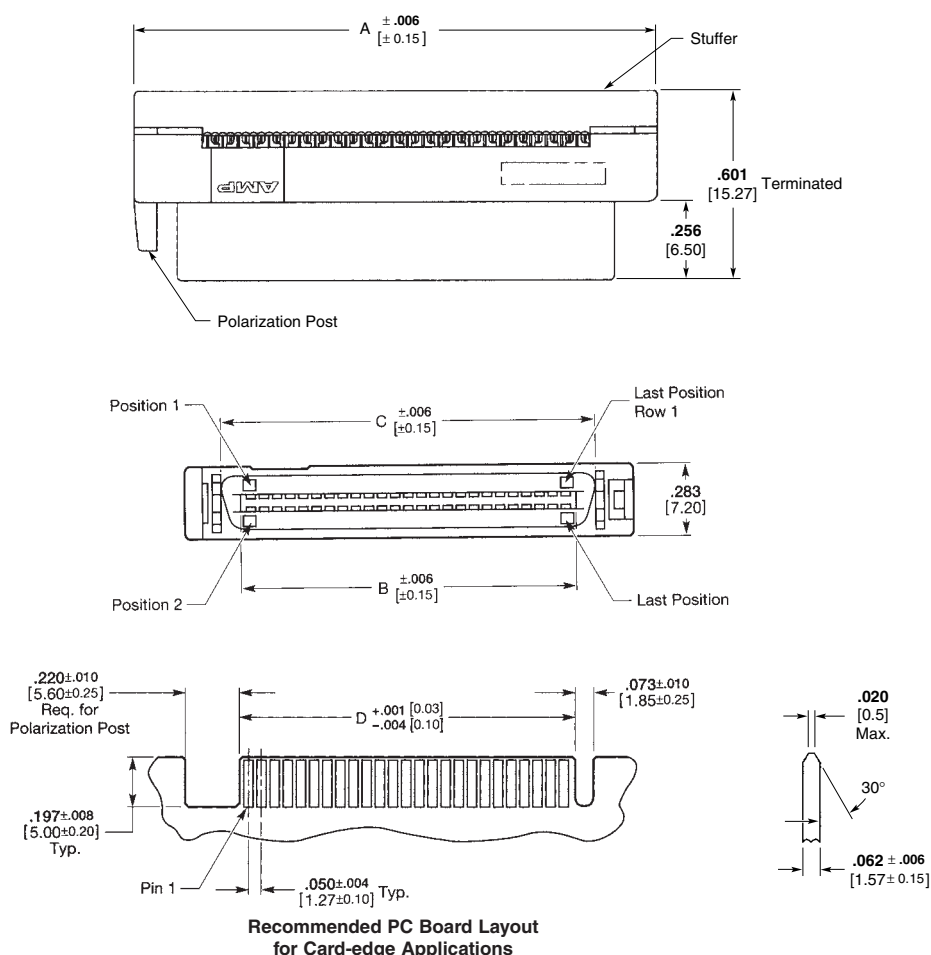
Right Angle — Page 20

Vertical — Page 22

Mating Configurations — Page 28

Packaging — Tubes

Application Tooling — Page 27



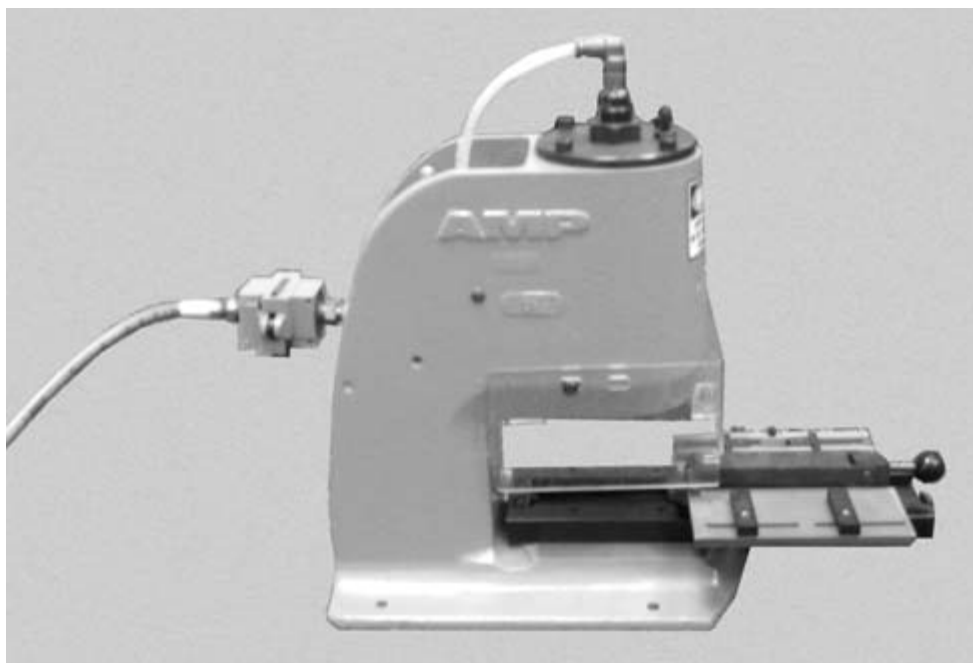
No. of Positions	Dimensions				Part Numbers with Polarization Post
	A	B	C	D	
40	1.447 36.75	1.025 26.03	1.168 29.67	1.012 25.70	1-557089-6
50	1.697 43.10	1.275 32.38	1.418 36.02	1.267 32.18	1-557089-1
68	2.147 54.53	1.725 43.81	1.868 47.25	1.717 43.61	1-557089-2
80	2.447 62.15	2.025 51.43	2.168 55.07	2.017 51.23	1-557089-3
100	2.947 74.85	2.525 64.13	2.668 67.77	2.517 63.93	1-557089-5

CHAMP .050 Series I Connectors, Printed Circuit Board Connectors (Continued)

**Application Tooling
(.025 Centerline Ribbon
Cable Receptacle)**

**Pneumatic Auto-Cycle Unit
Part Number 91112-3**

This tool, equipped with **AMP Connector-Specific Kit Part Number 679177-1**, and used with **Base Assembly Universal Arbor Tool Part Number 768338-2**, terminates CHAMP .050 Series I connectors to **.025 [0.64] centerline ribbon cable**.



**Manual Arbor Tool
Part Number 91085-2**

This Manual Arbor Tool is ideal for small to medium size runs, while the Pneumatic Auto-Cycle Unit satisfies most needs for medium to large runs. Both machines offer quality termination and minimum waste.

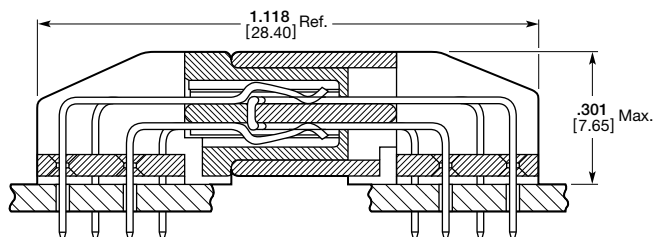
For additional information on CHAMP .050 Series I application tooling call Tyco Electronics at the numbers listed below.



CHAMP .050 Series I Connectors, Printed Circuit Board Connectors (Continued)

Mating Configurations

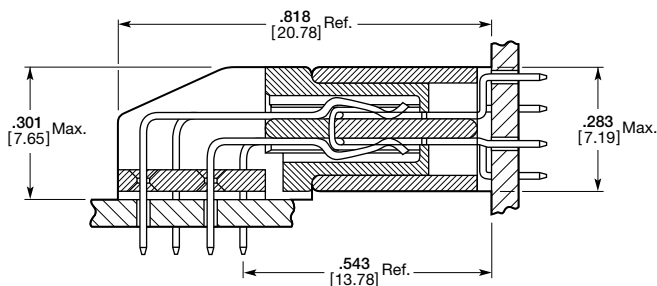
In-Line Mating



Right-Angle Receptacle

Right-Angle Plug

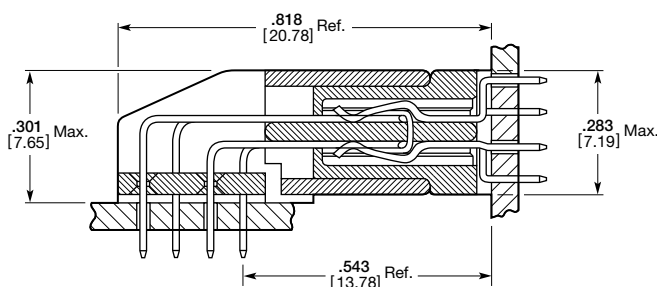
Perpendicular Mating



Right-Angle Receptacle

Vertical Plug

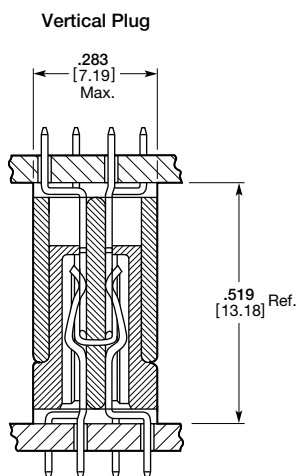
Perpendicular Mating



Right-Angle Plug

Vertical Receptacle

Parallel Mating



Vertical Receptacle

CHAMP .050 Series, Low Profile Docking Connectors Box-to-Box Applications

Product Facts

- Contacts on .050 [1.27] centerlines
- Single leaf contact design provides low mating force
- 4-row high density contact arrangement
- Low profile, only .374 [9.50] high
- Choice of .000008 [0.00020] min. or .000030 [0.00076] min. selective gold plated in mating area; tin-lead plated on solder end, all over nickel underplating
- Designed for blind mating
- ESD protection
- Housings made of high temperature LCP material, SMT compatible
- Choice of right angle or vertical mount headers
- Available in 160 and 200 positions, right angle receptacle and plug assemblies, and 200-position, vertical mount plug assemblies
- Boardlocks provide stability prior to soldering
- Produced under a Quality Management System certified to ISO 9001

A copy of the certificate is available upon request

Need more information?

Call Technical Support at the numbers listed below.

Technical Support is staffed with specialists well versed in all Tyco Electronics products. They can provide you with:

- Technical Support
- Catalogs
- Technical Documents
- Product Samples
- Tyco Electronics Authorized Distributor Locations



The CHAMP .050 Series, low profile connectors provide a shielded I/O system for box-to-box interconnection. These headers offer four-row contact configuration, minimizing total PC board real estate requirements, coupled with a low profile, only .374 [9.50] high. In addition, they are designed to facilitate blind mating. CHAMP .050 Series connectors use the industry recognized and accepted ribbon leaf contact design to provide low mating force.

The subminiature D type interface affords positive polarization to assure proper mating. Housings made of high temperature LCP are compatible with IR reflow and other surface mount soldering techniques. These right angle plugs and receptacles, and vertical mount plugs offer both perpendicular and horizontal dock-to-dock mating.

CHAMP .050 Series I Docking Connector is designed for use on new notebook type PCs. This product group has been developed to provide an improved ESD (Electrostatic Discharge) protection by means of shielding. Two versions are available, board-to-board connector and board-mount connector to mate with wiremount plug connectors.

Technical Documents

Product Specification

108-5386

Electrical Characteristics

Termination Resistance —

50 milliohms, max. (initial)
25 milliohms, max. increasing (final)

Dielectric Withstanding Voltage —

500V AC

Insulation Resistance —

100 megohms, min.

Current Rating — 0.5 amp per contact

Voltage Rating — 250V AC

Soldering Heat Resistance —

260°C ±5°C for 10 seconds

Temperature Rating —

-55°C to +85°C

Electrical Modeling —

Available Upon Request

Mechanical Characteristics

Mating Force

Insertion — 90g max. per contact

Extraction — 15g max. per contact

Durability — 5000 cycles

CHAMP .050 Series I Low Profile Docking Connectors

.050 [1.27] Thru-Hole CHAMP Connectors

Material and Finish

Housing — Liquid Crystal Polymer

Contacts — Copper alloy, plated gold in contact area; tin-lead in solder area; all over nickel underplate

Time Plate — Liquid Crystal Polymer

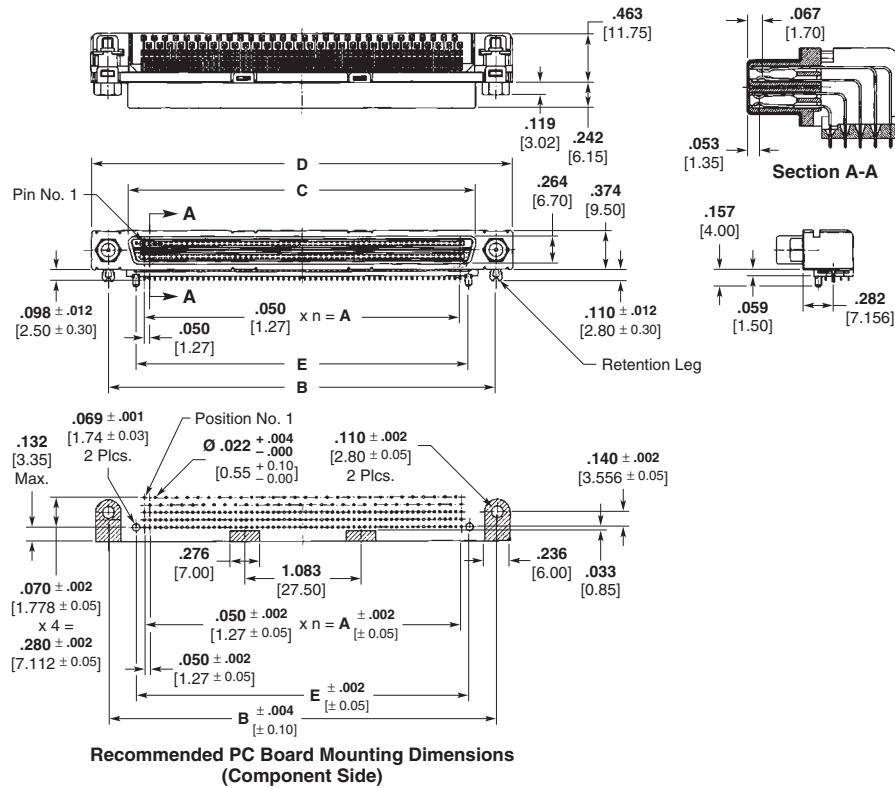
Shell — Steel, plated nickel

Retention Leg — Brass, plated tin-lead

Guide Socket/Pin — Brass, plated nickel

Ground Plate — Stainless steel

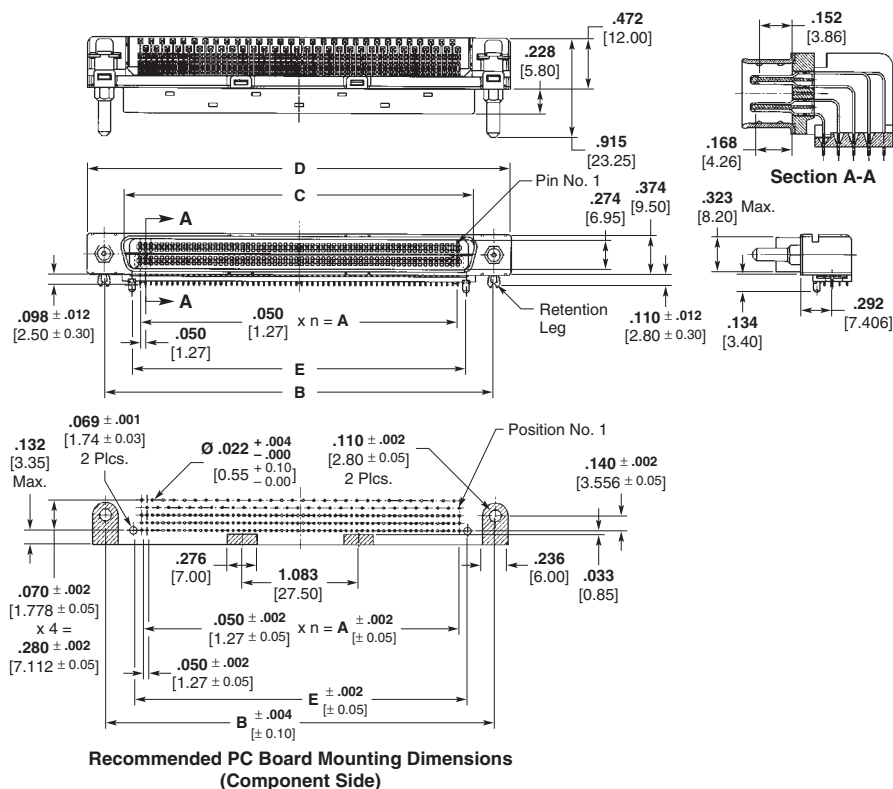
160 Position, Right Angle Receptacles with Retention Legs



Part Number	Au Thickness	No. of Positions	Dimensions					
			n	A	B	C	D	E
917302-2	.000008	200	49	2.450	3.122	2.758	3.437	2.604
	0.00020			62.23	79.30	70.05	87.30	66.13

**.050 [1.27] Thru-Hole
CHAMP Connectors**
(Continued)

160 Position, Right Angle Plugs with Retention Legs



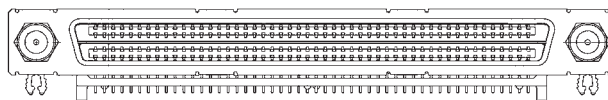
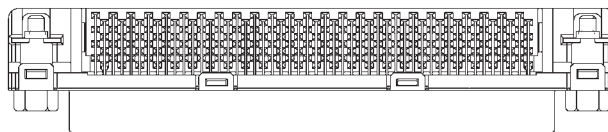
Part Number	Au Thickness	No. of Positions	Dimensions					
			n	A	B	C	D	E
917301-2	.000008	200	49	2.450	3.122	2.748	3.437	2.604
	0.00020			62.23	79.30	69.80	87.30	66.13

**.050 [1.27] Thru-Hole
CHAMP Connectors**

(Continued)



200 Position, Right Angle Receptacles



Material and Finish

Housing and Time Plate — Polyester, natural

Contacts — Copper alloy, plated .000030 [0.00076] min. gold on mating area; .000100 [0.00254] min. tin-lead on solder area; all over .000050 [0.00127] min. nickel underplate

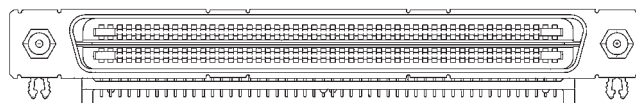
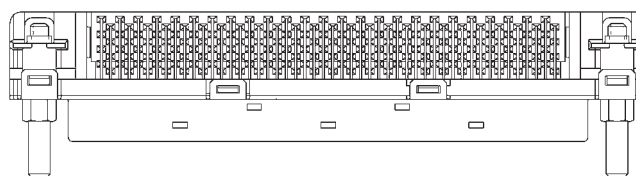
Shell — Carbon steel, plated nickel over copper

G-Plate — Stainless steel

Guide Socket — Brass, plated nickel over copper

Retention Leg — Brass, plated tin-lead over nickel

200 Position, Right Angle Plug



Material and Finish

Housing and Time Plate — Polyester, natural

Contacts — Copper alloy, plated .000030 [0.00076] min. gold on mating area; .000100 [0.00254] min. tin-lead on solder area; all over .000050 [0.00127] min. nickel underplate

Shell — Carbon steel, plated nickel over copper

G-Plate — Stainless steel

Retention Leg — Brass, plated tin-lead over nickel

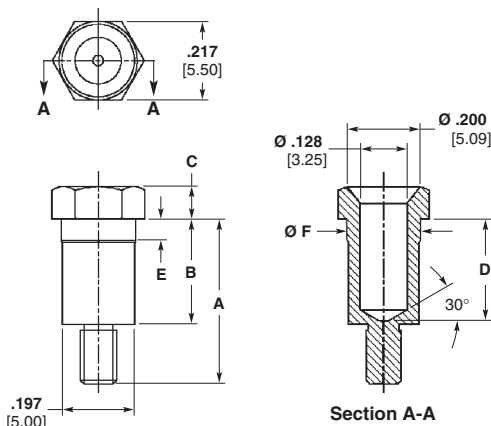
Assy. Part Number	Pos.	Style	Type	Solder Tail Length	Alignment Post	Retention Leg	Mating Face Hardware	Sequenced Pins	Comments
787855-1	200	Right Angle	Plug	.0039 [0.098]	Yes	Yes	Guide Pin	1, 2, 4 9, 50, 51, 52, 99, 100	
787855-2	200	Right Angle	Plug	.0049 [0.125]	Yes	Yes	Guide Pin	1, 2, 4 9, 50, 51, 52, 99, 100	
787885-1	200	Right Angle	Plug	.0053 [0.134]	No	Yes	.110 Holes	1, 2, 49, 50, 51, 52, 99, 100	
787913-2	200	Right Angle	Plug	.0039 [0.098]	No	Yes	.110 Holes	101, 102, 149, 150, 151, 152, 199, 200	
1658240-1	200	Right Angle	Plug	.0039 [0.098]	No	Yes	.110 Holes	101, 102, 149, 150, 151, 152, 199, 200	Improved Contact Position
787859-1	200	Vertical	Plug	.0057 [0.145]	Yes	Yes	Guide Pin	1, 2, 4 9, 50, 51, 52, 99, 100	
787886-1	200	Vertical	Plug	.0057 [0.145]	No	Yes	Guide Pin	1, 2, 49, 50, 51, 52, 99, 100	
787887-1	200	Vertical	Plug	.0039 [0.098]	No	Yes	Guide Pin	101, 102, 149, 150, 151, 152, 199, 200	
788451-1	200	Vertical	Plug	.0057 [0.146]	No	Yes	.110 Holes	1, 2, 49, 50, 51, 52, 99, 100	
787851-1	200	Right Angle	Receptacle	.0039 [0.098]	Yes	Yes	Guide Socket	152, 200	
787851-2	200	Right Angle	Receptacle	.0049 [0.125]	Yes	Yes	Guide Socket	152, 200	
787882-1	200	Right Angle	Receptacle	.0039 [0.098]	No	Yes	Guide Socket	101, 102, 149, 150, 151, 152, 199, 200	
1658203-1	200	Right Angle	Receptacle	.0039 [0.098]	No	Yes	Guide Socket	152, 200	Improved Contact Position
787883-1	200	Right Angle	Receptacle	.0039 [0.098]	No	Yes	Guide Socket	152, 200	
788450-1	200	Right Angle	Receptacle	.0039 [0.098]	No	Yes	Special	101, 102, 149, 150, 151, 152, 199, 200	

**Hardware —
Docking Connectors**

Material and Finish

Brass, nickel plate

Guide Sockets

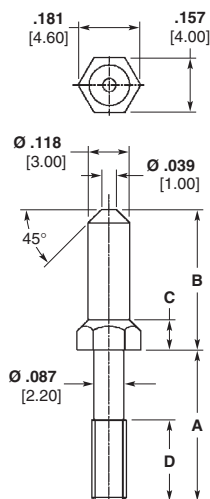


Part Number	Dimensions					
	A	B	C	D	E	F
177728-1	.454 11.54	.291 7.40	.087 2.22	.280 7.10	.059 1.50	.203 5.15
177728-2	.423 10.74	.260 6.60	.119 3.02	.248 6.30	.059 1.50	.203 5.15
2-177728-2 ^{1,2}	.423 10.74	.260 6.60	.119 3.02	.248 6.30	.059 1.50	.203 5.15
5-177728-1	.454 11.54	.291 7.40	.087 2.22	.280 7.10	.059 1.50	.203 5.15

¹ Make from -2

² Thread locking material applied, except for thread tip area. (Equivalent LOCTITE DRI-LOC 202, 203)

**Guide Pin
Part Number 177734-1**



Part Number	Dimensions			
	A	B	C	D
177734-1	.441 11.20	.411 10.45	.087 2.22	.236 6.00
177734-2	.307 7.80	.411 10.45	.087 2.22	.236 6.00
177734-3	.276 7.00	.443 11.25	.119 3.02	.236 6.00
177734-4	.409 10.40	.443 11.25	.119 3.02	.236 6.00
177734-5	.220 5.60	.411 10.45	.087 2.22	.181 4.60
2-177734-1 ^{1,2}	.441 11.20	.411 10.45	.087 2.22	.236 6.00

¹ Make from -1

² Thread locking material applied, except for thread tip area. (Equivalent LOCTITE DRI-LOC 202, 203)

LOCTITE DRI-LOC is a trademark of
Loctite Corporation.

CHAMP .050 Series I Blindmate, Single Connector Attachment (SCA 2) For SCSI Disk Drives

Product Facts

- Single I/O connector for 3.5 SCSI Disk Drives
- Capable of carrying required SCSI data, control, power and auxiliary signals
- Meets the requirements of SFF-8046 and SFF-8048 Specifications & SFF-8451
- Supports narrow and wide SCSI
- Transitions to Ultra SCSI:
 - 40 Megabyte/Sec
- Designed for backplane applications:
 - Eliminates cable related problems
 - SCSI bus termination in backplane
 - No drive termination required
- Integral blindmate capabilities with ± 2 mm misalignment tolerances
- Receptacle has power sequencing capabilities with two level sequencing pattern
- Advanced Ground Contact (AGC) with integral metal hold-down
- Completely backward compatible with CHAMP .050 Series I connectors
- Disk drive connector options:
 - Straddle mount plug
 - Vertical plug with thru-hole leads
 - Surface mount plug
- Backplane Connector options:
 - Vertical receptacle with thru-hole leads
 - Vertical receptacle with press-fit leads
 - Extended height vertical receptacle with thru-hole leads
 - Extended height vertical receptacle with press-fit leads
 - Extended height right angle receptacles with thru-hole leads
- Durable phosphor bronze contacts, plated 0.00076 min. gold on the mating end, 0.00381 min. tin-lead on the solder lead end, all over 0.00127 min. nickel underplating



The 80-position CHAMP .050 Series I, Blindmate Single Connector Attachment (SCA 2) answers the industry's need for one connector that is suitable for the direct attachment of SCSI disk drives to backplanes and motherboards.

The CHAMP SCA 2 connector, in an 80-position configuration, has been designed for 8-bit and 16-bit SCSI devices, and carries all required SCSI signals as defined by the SPI (SCSI-3 Parallel Interface) proposed Standard. Featuring sequenced contacts, it is capable of carrying all the required SCSI data, control, power and auxiliary signals.

Designed and manufactured with the Disk Drive Industry's quality requirements as the driving motivation, the 80-position SCA 2 connector features the industry accepted polarized "D" interface. Housings are made of UL 94V-0 rated, IR reflow process compatible, high temperature material. The connector has gold-over-nickel plated ribbon-style contacts and

Advanced Ground Contacts (AGC) with integral metal hold-down. The receptacle has complete power sequencing capabilities. In addition to these features, the CHAMP Series 1, Blindmate SCA 2 connector is fully compatible with existing CHAMP .050 Series I connectors.

Blindmate SCA 2 connectors are the interface for 3.5 SCSI disk drives and will permit direct drive attachment to backplane arrays, which can eliminate costly cable assemblies and adapter boards while improving system reliability.

Performance Specifications

- Current rating** — 1 amp max.
- Voltage rating** — 250 VAC max.
- Durability** — 500 cycles
- Operating Temperature Range** — -55°C to +105°C
- Mating Force** — 110 grams/contact pair, max.
- Termination Resistance** — 35 milliohms max. initial
- Insulation Resistance** — 1000 megohms min. initial
- Vibration Resistance** — 10-55-10 Hz for 2 hours

Technical Documents

- Product Specification** — 108-1548
- Application Specification** — 114-6061

■ Produced under a Quality Management System certified to ISO 9001

A copy of the certificate is available upon request.

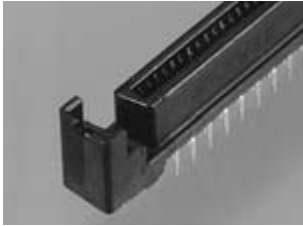
■ Recognized under the Component Program of Underwriters Laboratories Inc., File No. E-81956



■ Certified by Canadian Standards Association File No. LR7189



**Receptacle Assembly,
Vertical Mount
Part Number 787311-1
(with solder tines) &
Standard retention legs**



Material and Finish

Housing—LCP, 94V-0 rated, black

Contacts—Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min nickel underplating

Retention Leg—Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel

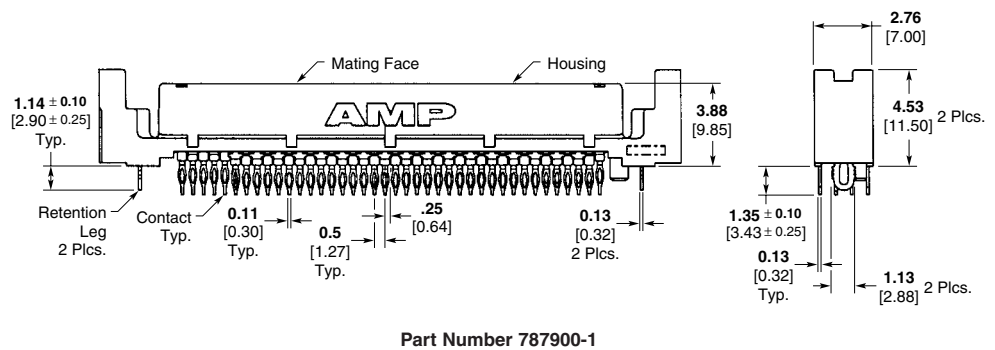
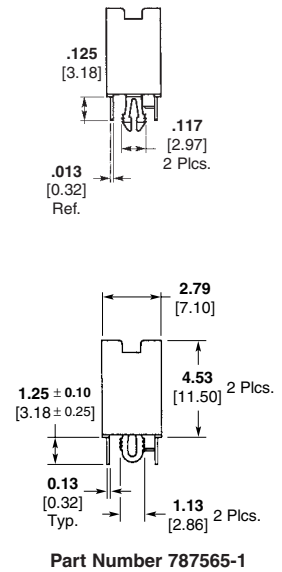
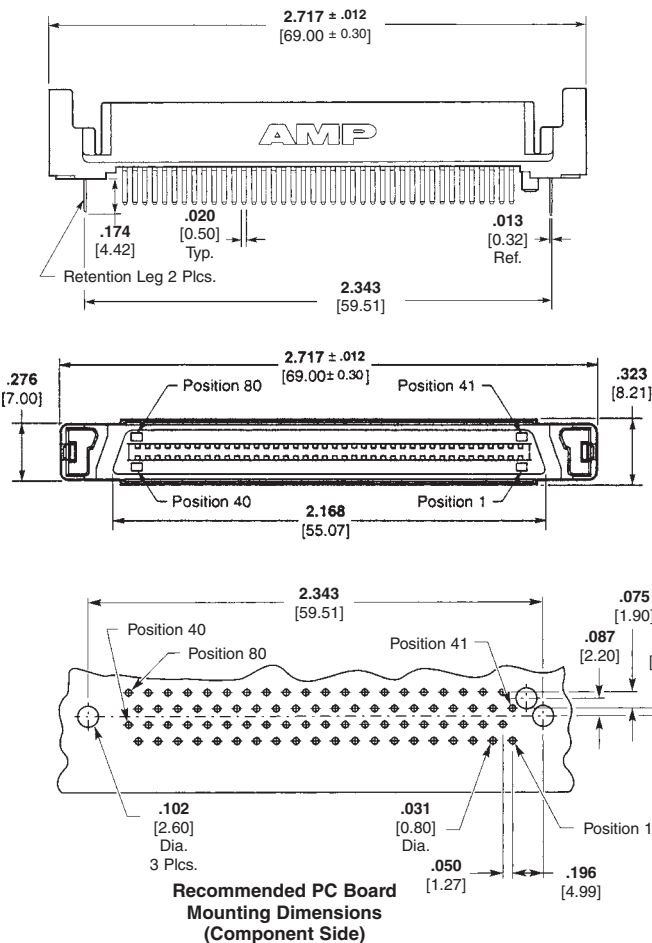
Note: Connector will accommodate mating PC board .063 [1.60] thick.

Part Number 787565-1

Recpt. Assembly—Vertical mount and solder tines (with high-force retention legs)

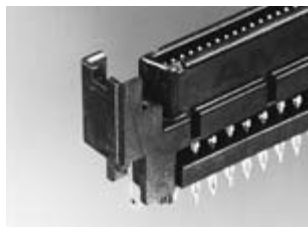
Part Number 787900-1

Recpt. Assembly—Vertical mount (with press-fit tines and high-force retention legs)



Receptacle Assembly, Vertical Mount, Extended Height Press-Fit

**Part Number 788395-1
Press-Fit Contacts**



Material and Finish

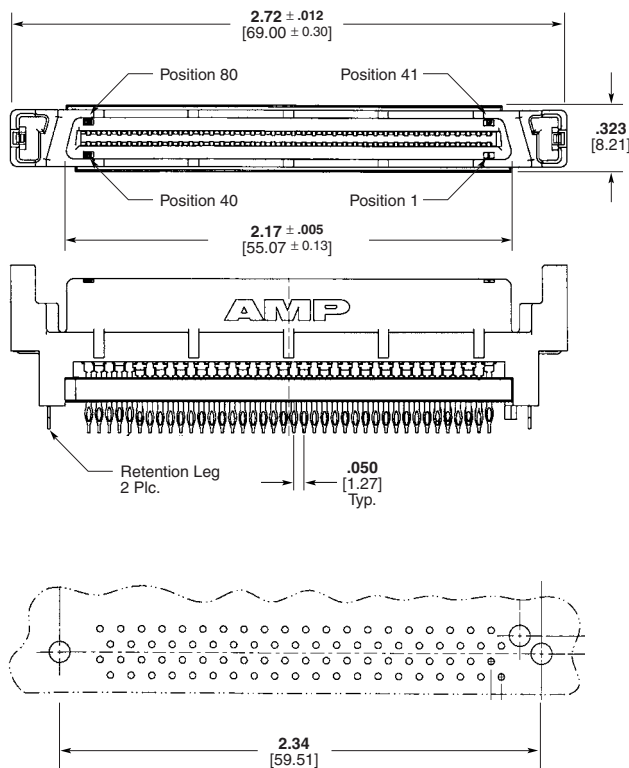
Housing — LCP, 94V-0 rated, black

Contacts — Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min nickel underplating

Retention Leg — Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel

Note: Connector will accommodate mating PC board .063 [1.60] thick.

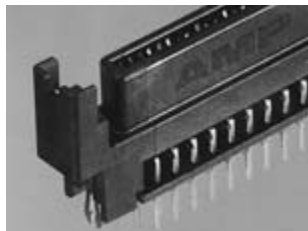
CHAMP .050 Series I Blindmate Receptacle Assemblies (Continued)



**Recommended Printed Circuit Board
Mounting Dimensions – Component Side**

CHAMP .050 Series I Blindmate Receptacle Assemblies (Continued)

**Receptacle Assembly,
Vertical Mount,
Extended Height
Part Number 787596-1,
4.57mm Contact Tail
Part Number 787596-3,
3.18mm Contact Tail**



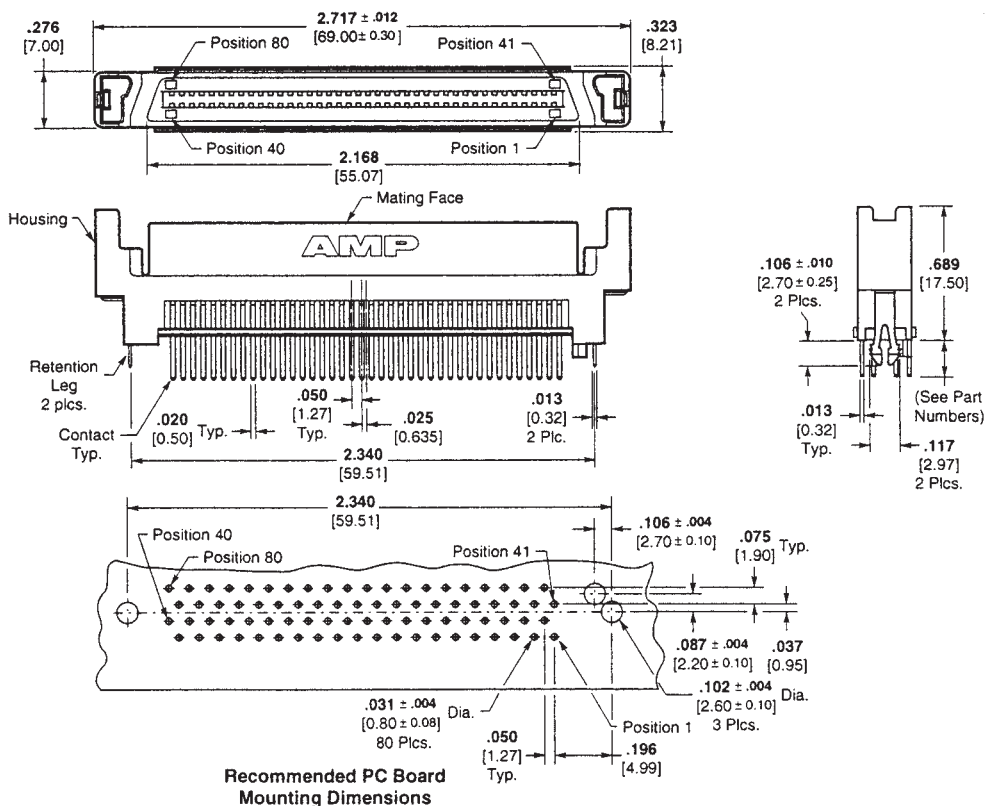
Material and Finish

Housing — Thermoplastic, 94V-0 rated, black

Contacts — Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min nickel underplating

Retention Leg — Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel

Note: Connector will accommodate mating PC board .063 [1.60] thick.



**Receptacle Assembly,
Right Angle, Extended Height
Part Number 787535-1**



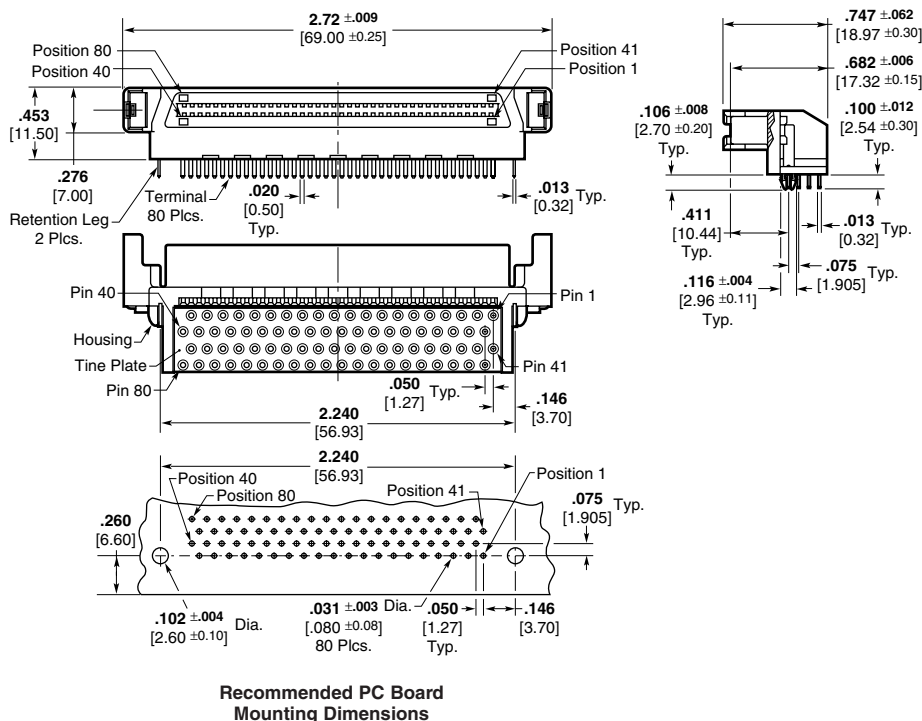
Material and Finish

Housing and Time Plate — LCP, 94V-0 rated, black

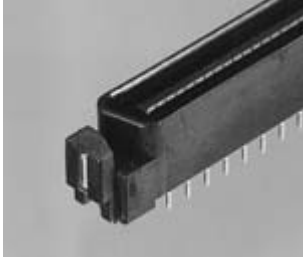
Contacts — Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min nickel underplating

Retention Leg — Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel

Note: Connector will accommodate mating PC board .063 [1.60] thick.



**Plug Assembly,
Vertical Mount
Part Number 84488-1
(With Polarization Post)**

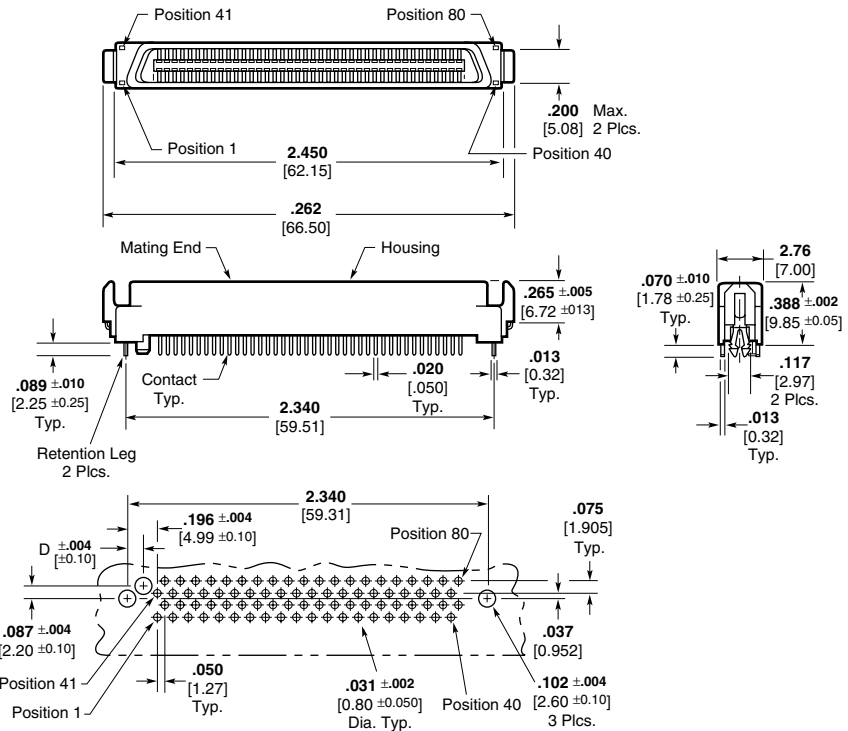


Material and Finish

Housing—LCP, 94V-0 rated, black

Contacts—Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min nickel underplating

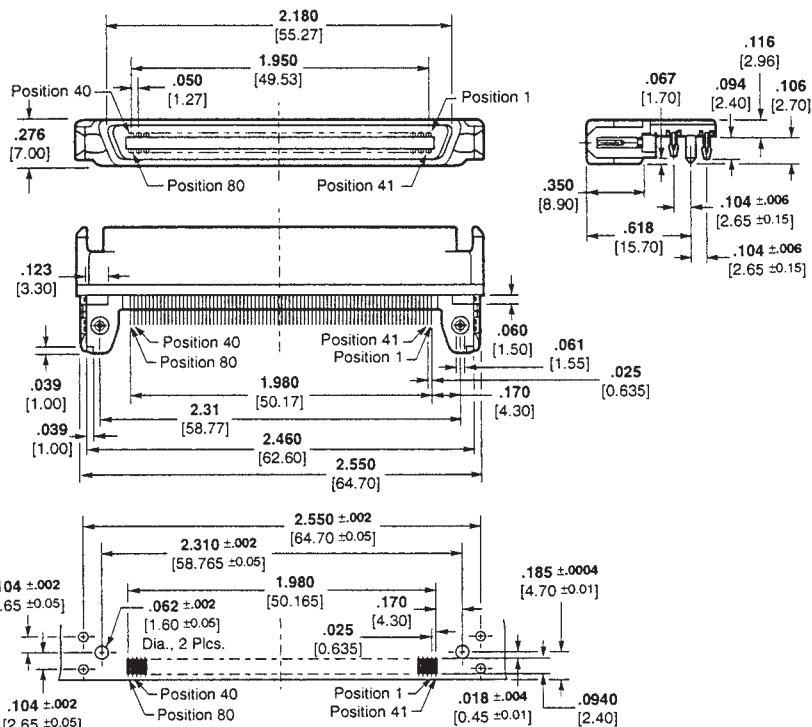
Retention Leg—Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel



**Recommended PC Board
Mounting Dimensions**

**Plug Assembly, Right Angle,
Surface Mount
Part Number 5-917593-9
(With .000030 [0.00076] min.
Gold Plating)**

**Part Number 917593-9
(With .000008 [0.0002] min.
Gold Plating)**



Recommended PCB Layout

Material and Finish

Housing—LCP, 94V-0 rated, black

Contacts—Phosphor bronze, plated .000030 [0.00076] or .000008 [0.0002] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min nickel underplating

Retention Leg—Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel

**Plug Assembly,
Straddle Mount
Part Number 84487-1**



Material and Finish

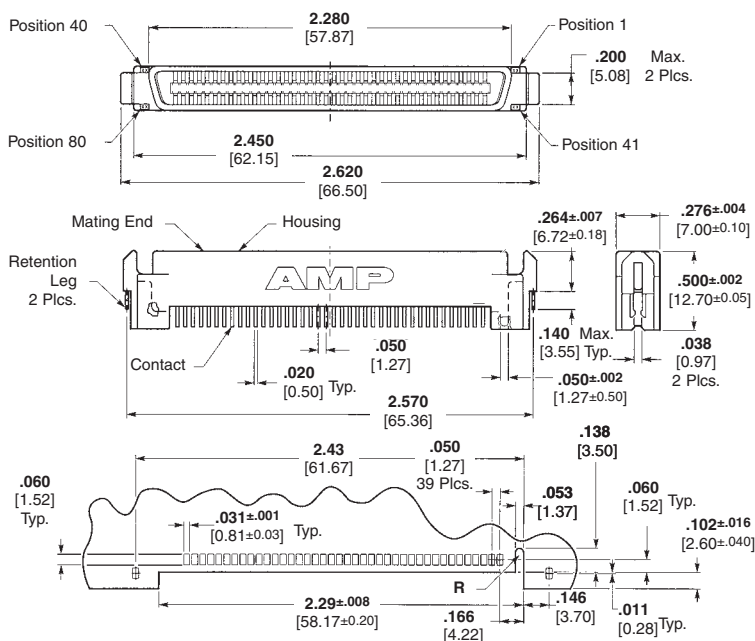
Housing — LCP, 94V-0 rated, black

Contacts — Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min. nickel underplating

Retention Leg — Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel

Note:

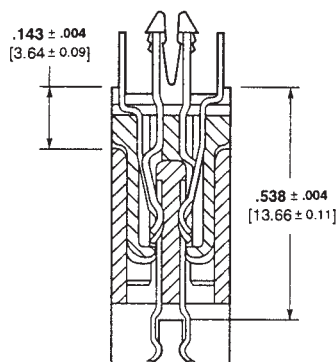
Connector will accommodate PC board .052 [1.32] max. thickness



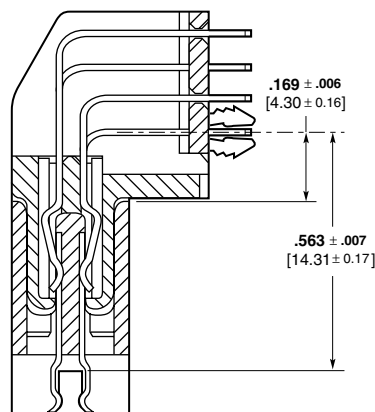
**Recommended PC Board
Mounting Dimensions**

CHAMP .050 Series I Blindmate, Single Connector Attachment (SCA 2) for SCSI Disk Drives

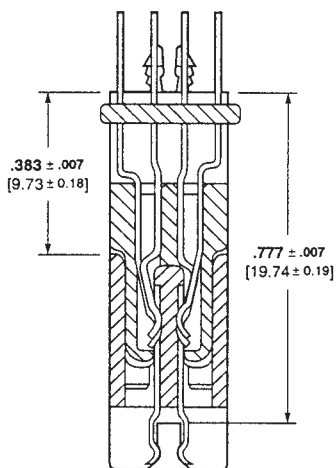
Mating Configurations



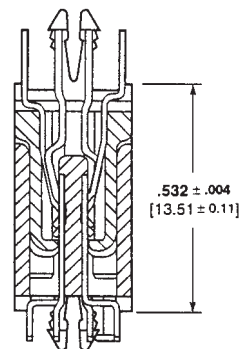
Vertical Receptacle
Straddle Mount Plug



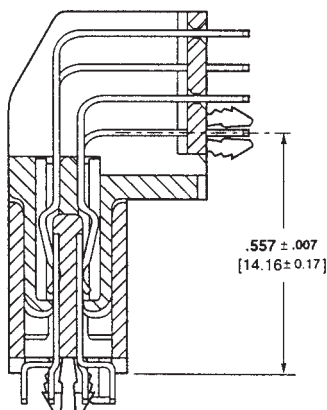
Right Angle Receptacle
Straddle Mount Plug
(Extended Height)



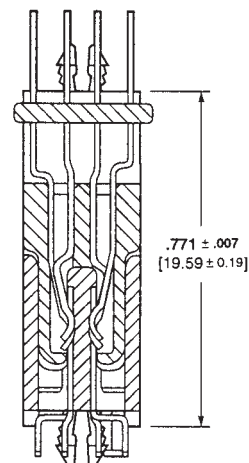
Vertical Receptacle
Straddle Mount Plug
(Extended Height)



Vertical Receptacle
Vertical Plug



(Extended Height)
Right Angle Receptacle
Vertical Plug

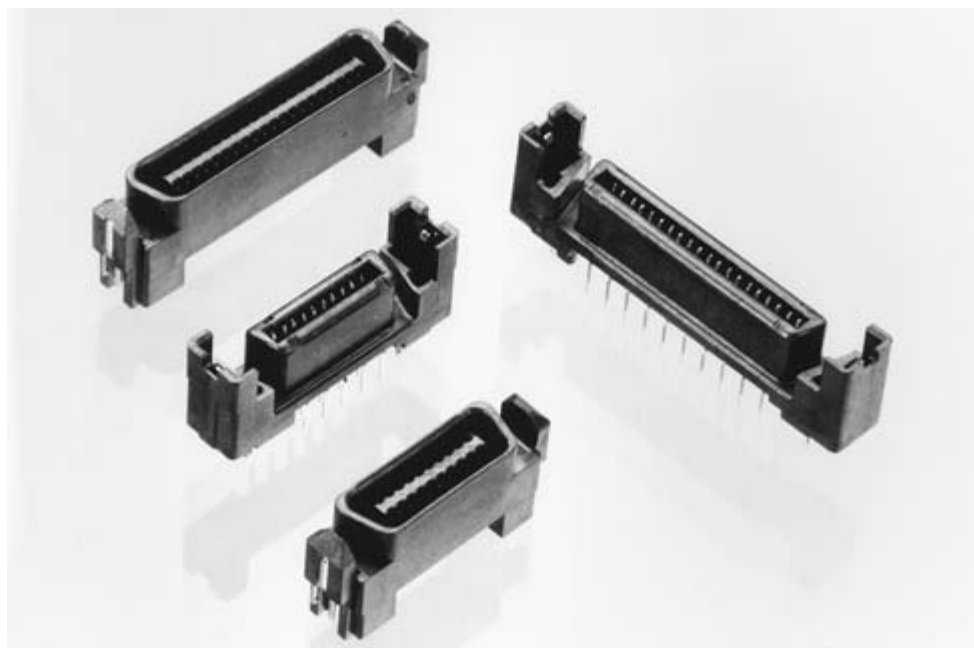


Vertical Plug
Vertical Receptacle
(Extended Height)

CHAMP .050 Series I Blindmate, Single Connector Attachment (SCA-2) for Fibre Channel — Introduction

Product Facts

- Capable of carrying all data, control, power and auxiliary signals required by the Fibre Channel Physical Interface, the Fibre Channel Loop Standards, and the Gigabit Interface Converter (GBIC) Specification
- Integral blindmate capabilities with ± 2 mm misalignment tolerances
- Power sequencing capabilities with two level sequencing patterns
- Advanced Ground Contact (AGC) with integral metal hold-down
- Completely backward compatible with CHAMP .050 Series I connectors
- Durable phosphor bronze contacts, plated 0.00076 min. gold on the mating end, 0.00381 min. tin-lead on the solder lead end, all over 0.00127 min. nickel underplating
- Popular ribbon-style contacts
- Produced under a Quality Management System certified to ISO 9001
A copy of the certificate is available upon request.
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E-81956 
- Certified by Canadian Standards Association File No. LR7189 



Performance Specifications

Current Rating — 1 amp max.
Voltage Rating — 250 VAC max.
Durability — 500 cycles
Operating Temperature Range — -55°C — $+105^{\circ}\text{C}$
Mating Force — 90 grams/contact pair
Termination Resistance — 35 milliohms max. initial
Insulation Resistance — 1000 megohms min. initial
Vibration Resistance — 10-55-10 Hz for 2 hours

Technical Documents

Product Specifications — 108-1548
Application Specifications — 114-6061

The 40-position CHAMP .050 Series I, Blindmate Single Connector attachment (SCA 2) answers the industry's need for one connector that is suitable for the direct attachment of Fibre Channel disk drives to backplanes and motherboards.

The CHAMP .050 Series, SCA 2 connector in a 40-position configuration has been designed for serial transfer Fibre Channel devices, and carries all signals as required by the Fibre Channel Physical Interface and the Fibre Channel Arbitrated Loop Standards. In addition, all required power and auxiliary signals are carried by the same single attachment connector.

Designed and manufactured with the Disk Drive Industry's quality requirements as the driving motivation, the 40-position SCA 2 connector features the industry accepted polarized "D" connector interface. Features include housings made of UL 94V-0 rated IR reflow process compatible

high temperature material, gold-over-nickel plated ribbon style contacts, Advanced Ground Contacts (AGC) with integral metal hold-down, and complete power sequencing capabilities. In addition to these features, the CHAMP Series I, Blindmate SCA 2 connector is fully compatible with existing CHAMP .050 Series I connectors.

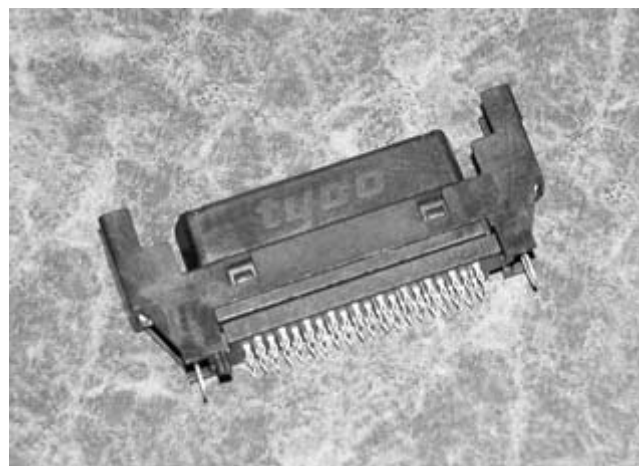
Blindmate SCA 2 connectors are the interface for 3.5 Fibre Channel disk drives and will permit direct drive attachment to backplane arrays, which can eliminate costly cable assemblies and adapter boards while improving system reliability.

The CHAMP .050 Series, SCA 2 Connector in a 20-position configuration has been designated the interface for the Gigabit Interface Converter specification. A straddle-mount plug is used on the GBIC, a vertical receptacle is available for direct attachment to a backplane and a right angle receptacle is available for adapter card applications.

8.5 Gb/s Fibre Channel SCAII Backplane Receptacle

Product Facts

- 8.5 Gb/s speeds
- Backward compatible mating (interface compatible)
- Meets SFF-8451 with exception of foot print
- Meets EIA-700A0AE with exception of foot print
- RoHS compliant
- Same size as existing product
- Power sequencing capabilities with two-level sequencing patterns
- ESD ground contact with integral metal hold-down



Capable of carrying all data, control, power and auxiliary signals required by the Fibre Channel Physical Interface and the Fibre Channel Loop Standards. Integral blindmate capability with $\pm 2\text{mm}$ misalignment tolerances. Power sequencing capabilities with two level sequencing patterns. Durable phosphor bronze contacts plated .000030 [0.00076] min. gold on the mating end, tin plating on the contact tails, all over .000050 [0.00127] min. nickel under plating.

Application

Interface for 3.5 Fibre Channel disk drives and will permit direct drive attachment to backplane arrays, which can eliminate costly cable assemblies and adapter boards while improving system reliability.

Part Number

New Part Number
1761884-1. Enhancement
to Tyco Electronics Part
Number 788389-1.

Typical Properties

Dielectric Strength — 300 V AC
Durability — 500 cycles
Mating Force — Approx. 4.4kg
(9.7 lbs) maximum

Electrical Improvements

Significant reduction in NEXT
Reduction in FEXT
Improved Impedance Profiles

Improved Insertion Loss —
3dB improvement at 4 to 5 GHz
frequencies
Elimination of 4.25 GHz resonance point
present in existing product

Improved Return Loss —
5dB improvement at 4 to 5 GHz
frequencies

**Designed for data rates up to
8.5 Gb/s**

Environmental Parameters

Operating Temperature —
-55°C to +105°C

Summary Comparison between Existing SCA-2 and New Tyco Electronics High Speed SCA-2, .063" Board:

Electrical Improvements

Significant reduction in NEXT

Reduction in FEXT

Improved Impedance Profiles

Improved Insertion Loss —
3 to 4dB improvement at 4 to 5 GHz
frequencies

Elimination of 4.25 GHz resonance point
present in existing product

Improved Return Loss —
5dB improvement at 4 to 5 GHz
frequencies

**Designed for data rates in excess
of 8.5 Gb/s**

Mechanical

Same size as existing product —
Mating Interface compatible to existing
products

**Requires minor changes to board
layout**

RoHS compliant

**40-Position Plug Assembly,
Straddle Mount
Part Number 84487-2**



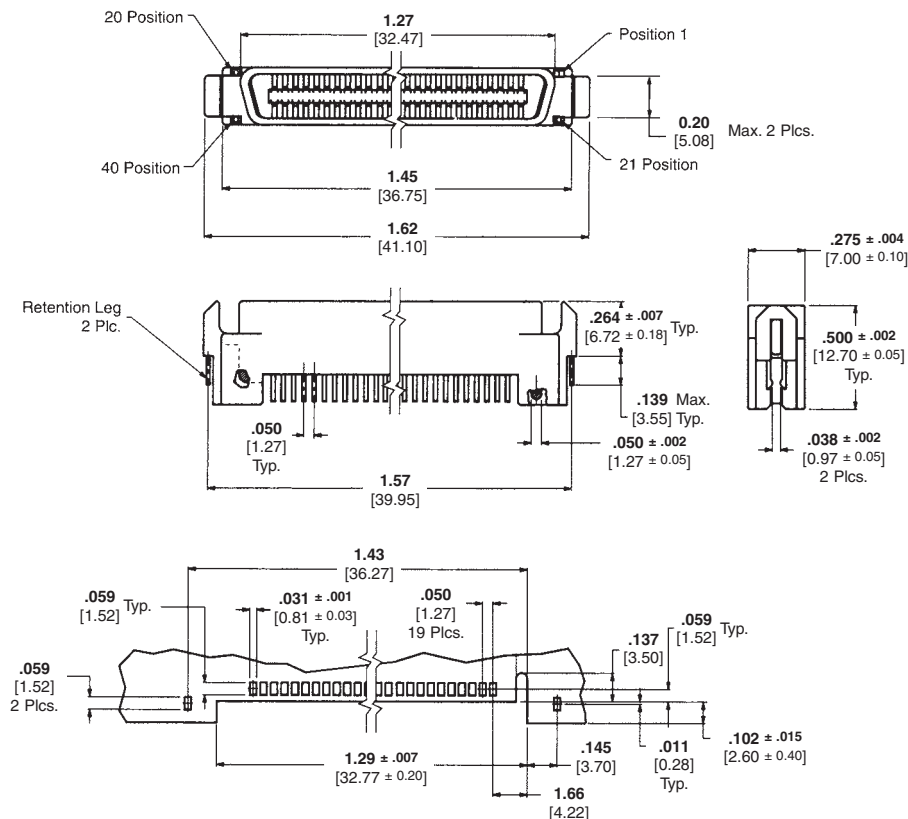
Material and Finish

Housing—Thermoplastic, 94V-0 rated, black

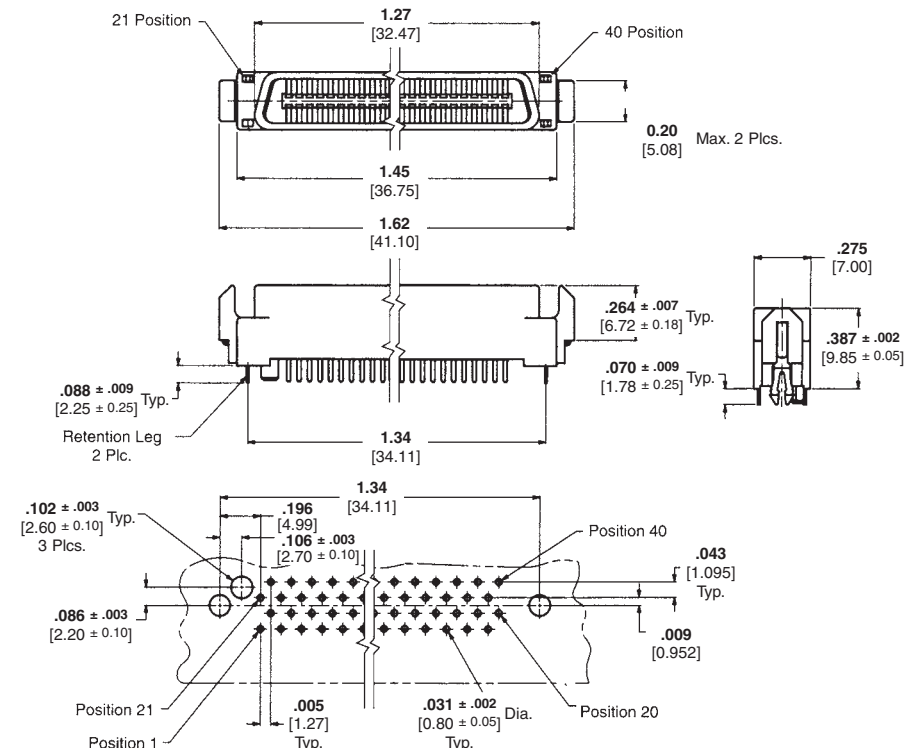
Contacts—Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min. nickel underplating

Retention Leg—Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel

Note: Will accept PCB .052 [1.32] thick, max.

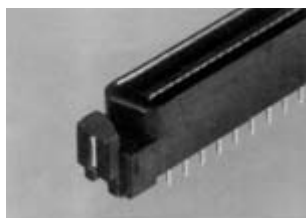


**Recommended Printed Circuit Board
Mounting Dimensions – Component Side**



**40-Position Plug Assembly,
Vertical Mount
Part Number 84488-3**

(with Polarization Post)



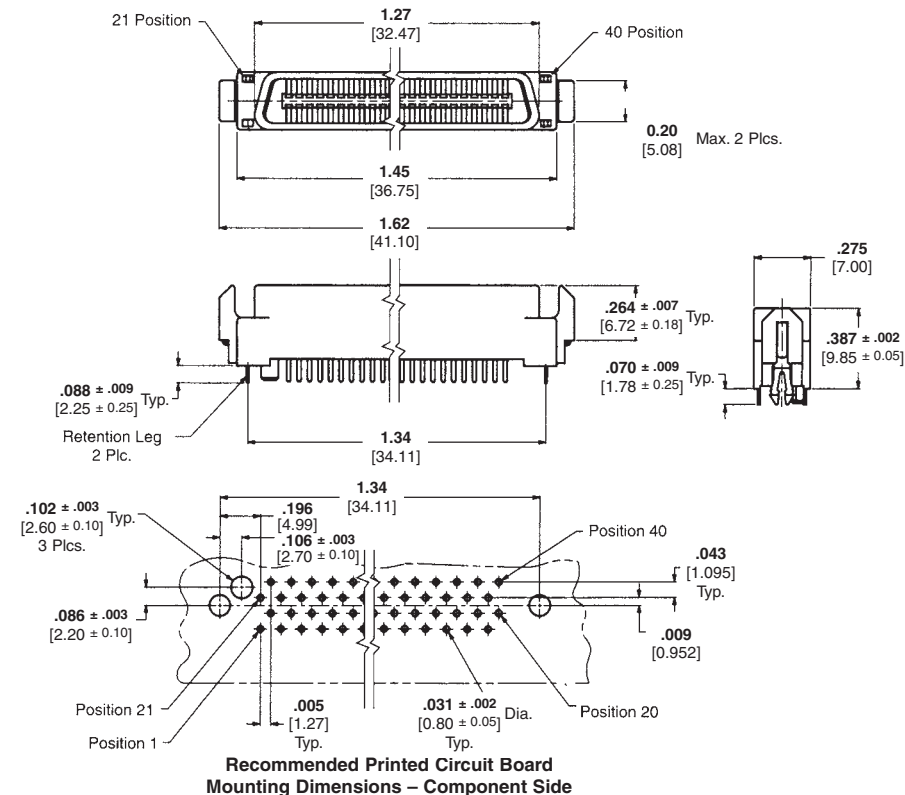
Material and Finish

Housing—Thermoplastic, 94V-0 rated, black

Contacts—Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min. nickel underplating

Retention Leg—Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel

Note: Will accept PCB .039 [1.00] thick, max.



**Recommended Printed Circuit Board
Mounting Dimensions – Component Side**

**CHAMP .050 Series I Blindmate,
Single Connector Attachment (SCA-2) for Fibre Channel** (Continued)

**40-Position Plug Assembly,
Blindmate**

Part Number 1123283-5

Part Number 1123283-9

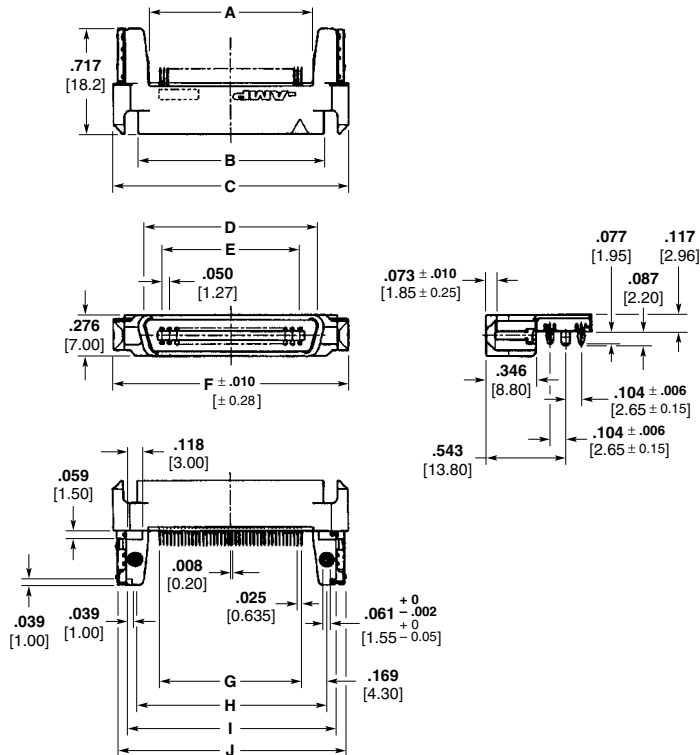
(80-Position)



Material and Finish

Housing — LCP, 94V-0 rated, black

Contacts — Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min. nickel underplating



**40-Position Receptacle
Assembly, Vertical Mount**

Part Number 787317-1

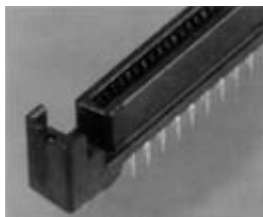
(with Polarization Post,

with Solder Tines)

Part Number 796068-1

(with Polarization Post and

Press Fit Tines)



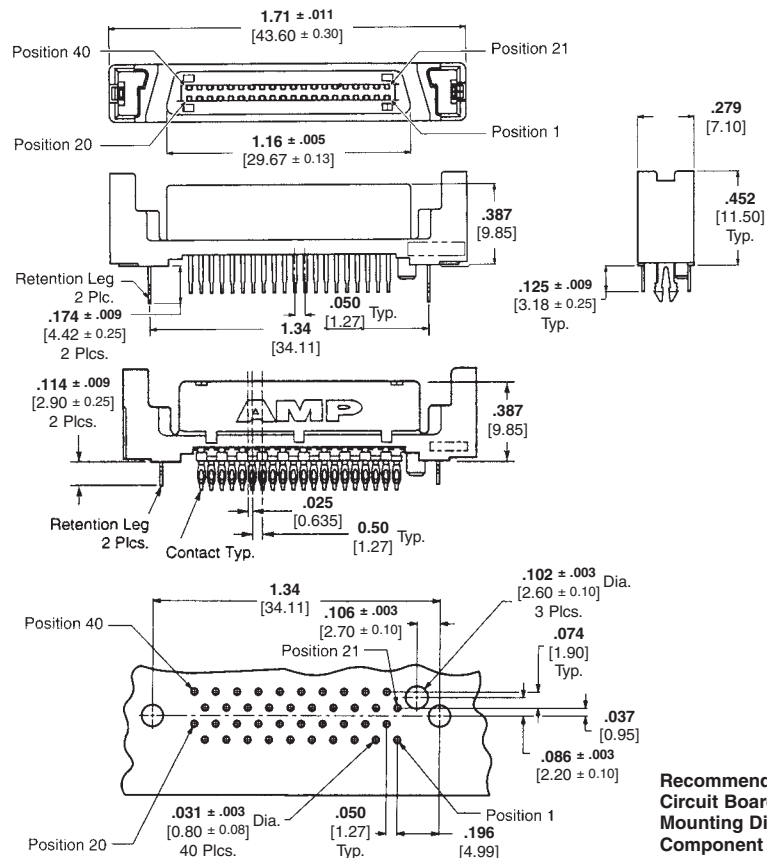
Material and Finish

Housing — Thermoplastic, 94V-0 rated, black

Contacts — Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min. nickel underplating

Retention Leg — Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel

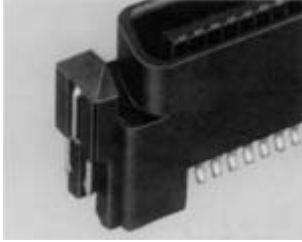
Note: Will accept mating PCB .063 [1.60] thick, max.



**Recommended Printed
Circuit Board
Mounting Dimensions –
Component Side**

**CHAMP .050 Series I Blindmate,
Single Connector Attachment (SCA-2) for Fibre Channel** (Continued)

**20-Position Plug Assembly,
Straddle Mount
Part Number 84598-1**



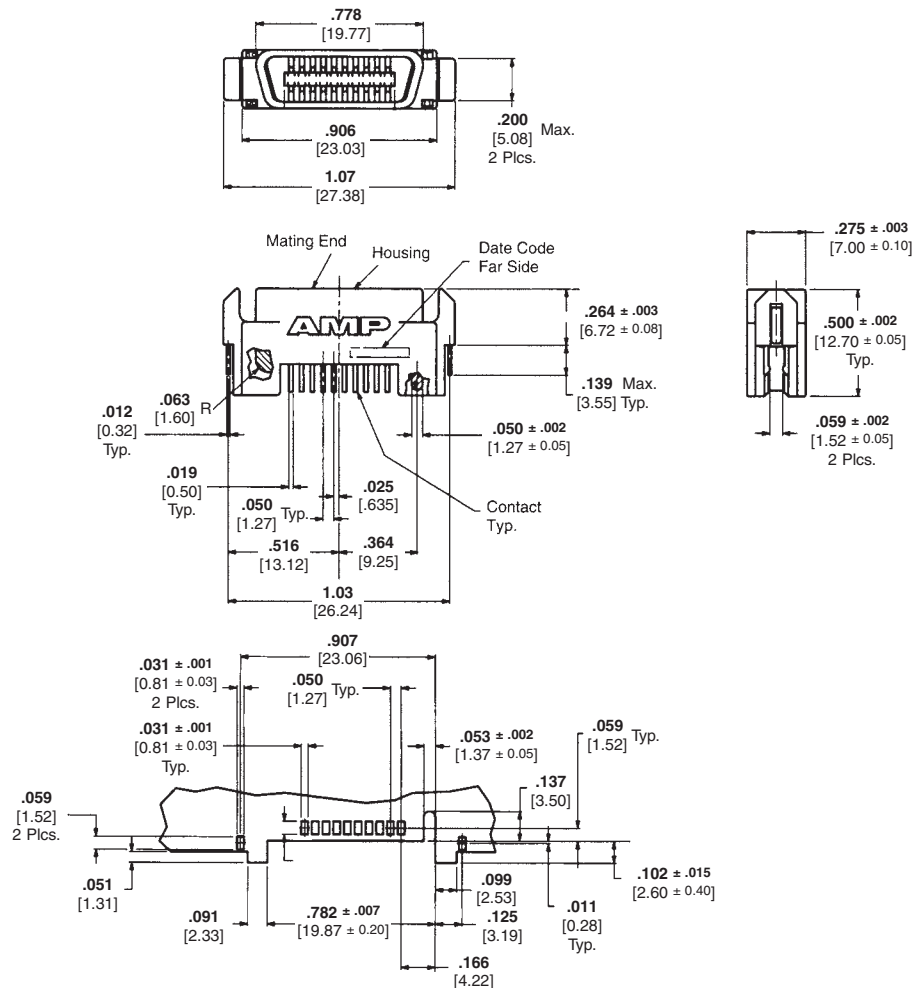
Material and Finish

Housing—Thermoplastic, 94V-0 rated, black

Contacts—Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min. nickel underplating

Retention Leg—Brass, plated .000030 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel

Note: Will accept PCB .072 [1.82] thick, max.



**Recommended PC Board
Mounting Dimensions**

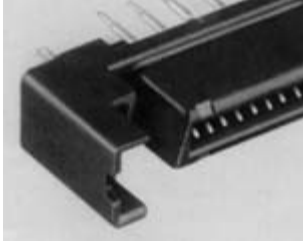
**CHAMP .050 Series I Blindmate,
Single Connector Attachment (SCA-2) for Fibre Channel** (Continued)

**20-Position Receptacle
Assembly, Vertical Mount
Part Number 787646-2**

(with Solder Tines, No Polarizing
Post)

Part Number 796067-2¹

(with Press-Fit Tines, No Polarizing
Post)



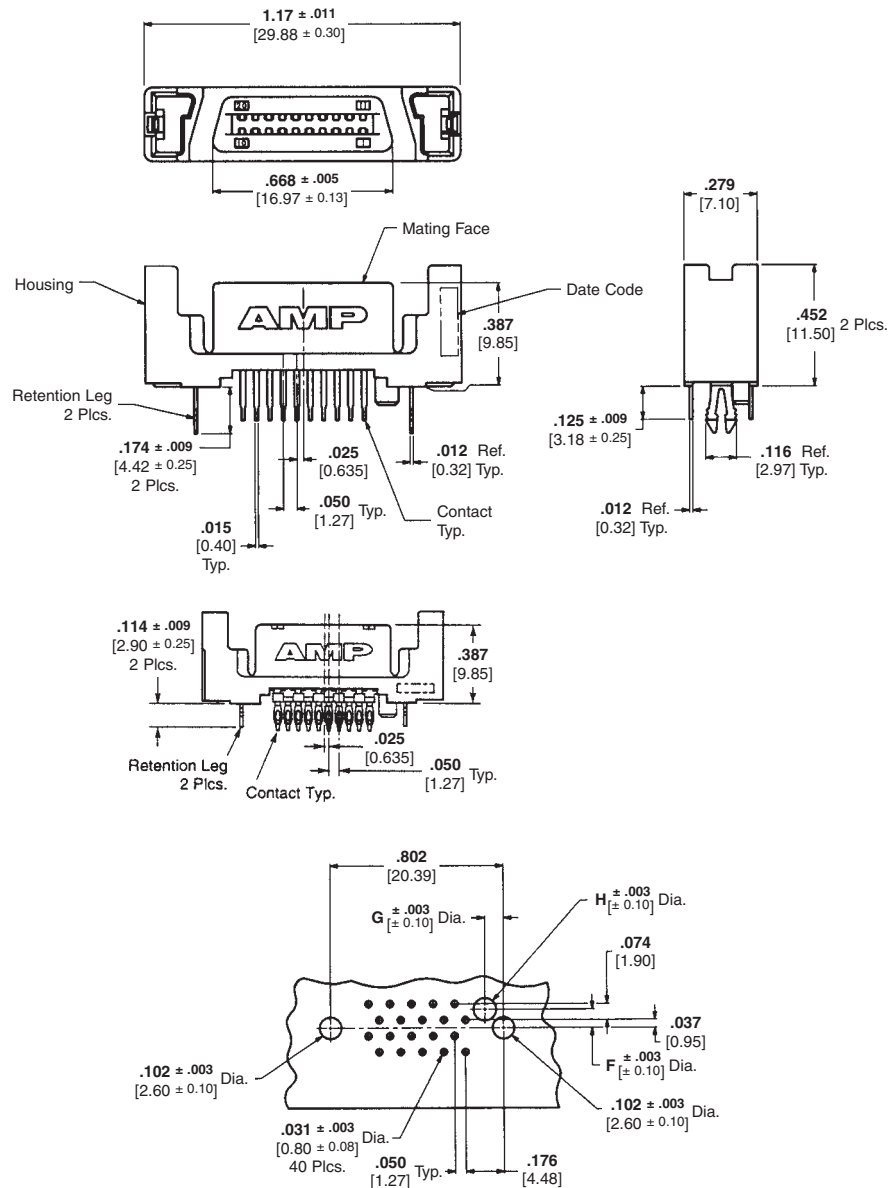
Material and Finish

Housing — Thermoplastic, 94V-0
rated, black

Contacts — Phosphor bronze, plated
.000030 [0.00076] min. gold on mating
end, .000150 [0.00381] min. tin-lead on
solder end, both over .000050 [0.00127]
min. nickel underplating

Retention Leg — Brass, plated
.000150 [0.00381] min. tin-lead over
.000050 [0.00127] min. nickel

Note: Will accept PCB .039 [1.00]
thick, max.



¹ Contact Tyco Electronics for RoHS
Part Number information.

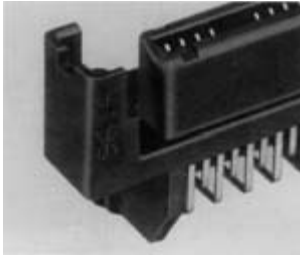
**CHAMP .050 Series I Blindmate,
Single Connector Attachment (SCA-2) for Fibre Channel** (Continued)

**20-Position Right Angle
Receptacle Assembly,
Board-to-Board
Part Number 787653-1**

(2.54 mm Tails)

Part Number 787653-2

(3.05 mm Tails)

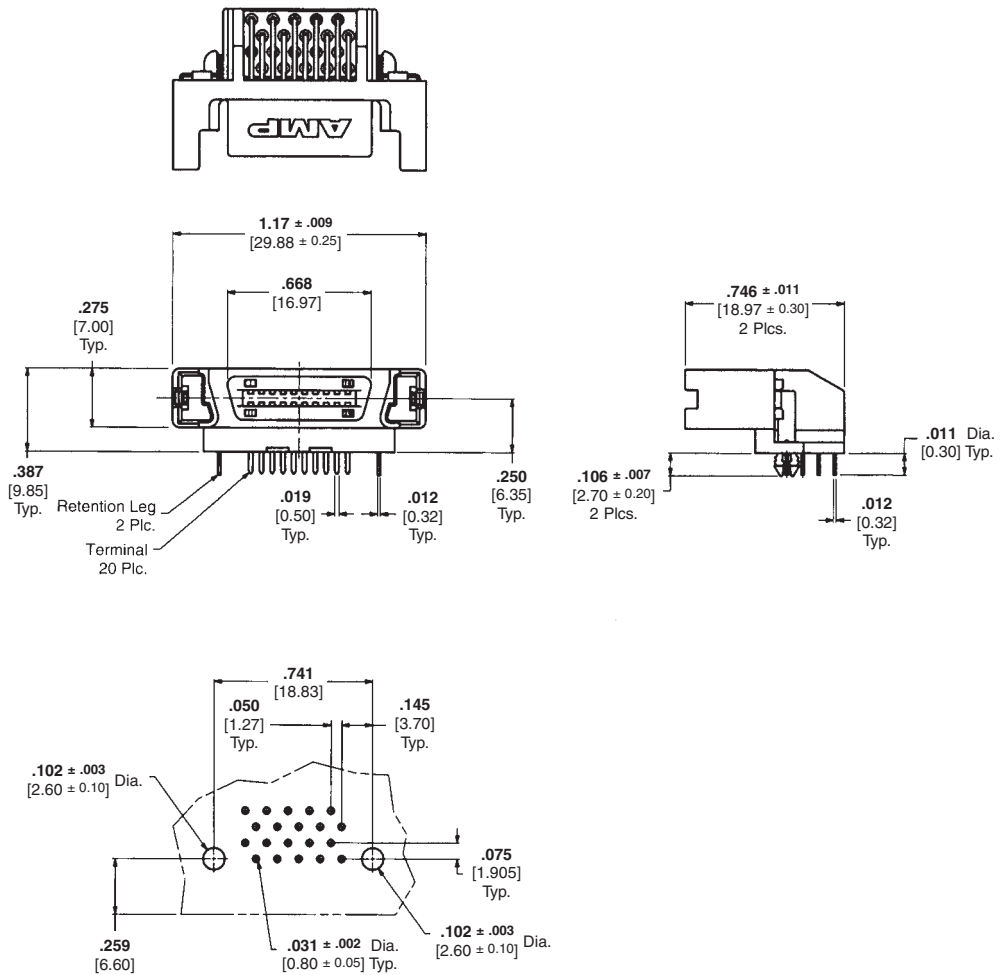


Material and Finish

Housing—Thermoplastic, 94V-0 rated, black

Contacts—Phosphor bronze, plated .000030 [0.00076] min. gold on mating end, .000150 [0.00381] min. tin-lead on solder end, both over .000050 [0.00127] min. nickel underplating

Retention Leg—Brass, plated .000150 [0.00381] min. tin-lead over .000050 [0.00127] min. nickel



**Recommended PC Board
Mounting Dimensions**

CHAMP .050 Series I Free Height (FH) Connectors, Board-to-Board Applications

CHAMP .050 Series I FH Connectors for Interconnections Requiring Variable Stacking Heights

- All plastic headers for board-to-board interconnections
- Proprietary single-spring leaf contact design
- Right angle and vertical headers available in both plug and receptacle for full range of interconnections including parallel, perpendicular and in-line
- Vertical receptacles available in eleven heights for variation of stack height (8mm–18mm in 1mm increments)
- 40 through 180 positions available in most stack heights
- Vertical plug, surface mount, available in 60 and 100 positions
- Alternative to Series I
- Closed bottom inhibits flux/solder contamination
- Detent locking system with tactile feedback
- Recognized under the Component Program of Underwriters Laboratories Inc.,  File No. E28476
- Certified by Canadian Standards Association  File No. LR7189A-319



The **FH**, or Free Height, connectors are also an all-plastic connector system for internal board-to-board interconnections with a single spring leaf contact design. These connectors may be considered as an alternative to the Series I product line, with the added feature of variable stacking heights. The vertical receptacle is available in various housing profiles to permit board stacking heights from

.315 inch [8.0mm] to .709 inch [18.0mm] in .040 inch [1.0mm] increments.

Position sizes available range from 40 to 180 positions in both plug and receptacle for right angle and vertical configurations. A feature unique to the FH system is the closed bottom in the housing, which further inhibits contact contamination from flux and solder during processing.

Performance Specifications

Operating Temperature Range — –55°C to +85°C for Standard

Current Rating — 1 Ampere Max.

Voltage Rating — 250 VAC Max.

Termination Resistance — 35 Milliohms Maximum Initial

Insulation Resistance — 1,000 Megohms Minimum Initial

Mating Force — Refer to Product Specification

Rated Cycle Life — 2000 Cycles

Technical Documents

Product Specification — 108-5309

Instruction Sheet — 411-5519

CHAMP .050 Series I Free Height (FH) Connectors, Board-to-Board Applications (Continued)

Vertical Receptacles, 8mm Stack

Materials and Finish

Housing, Standard Temperature —
Glass-filled nylon 6/6, rated UL 94V-0,
black

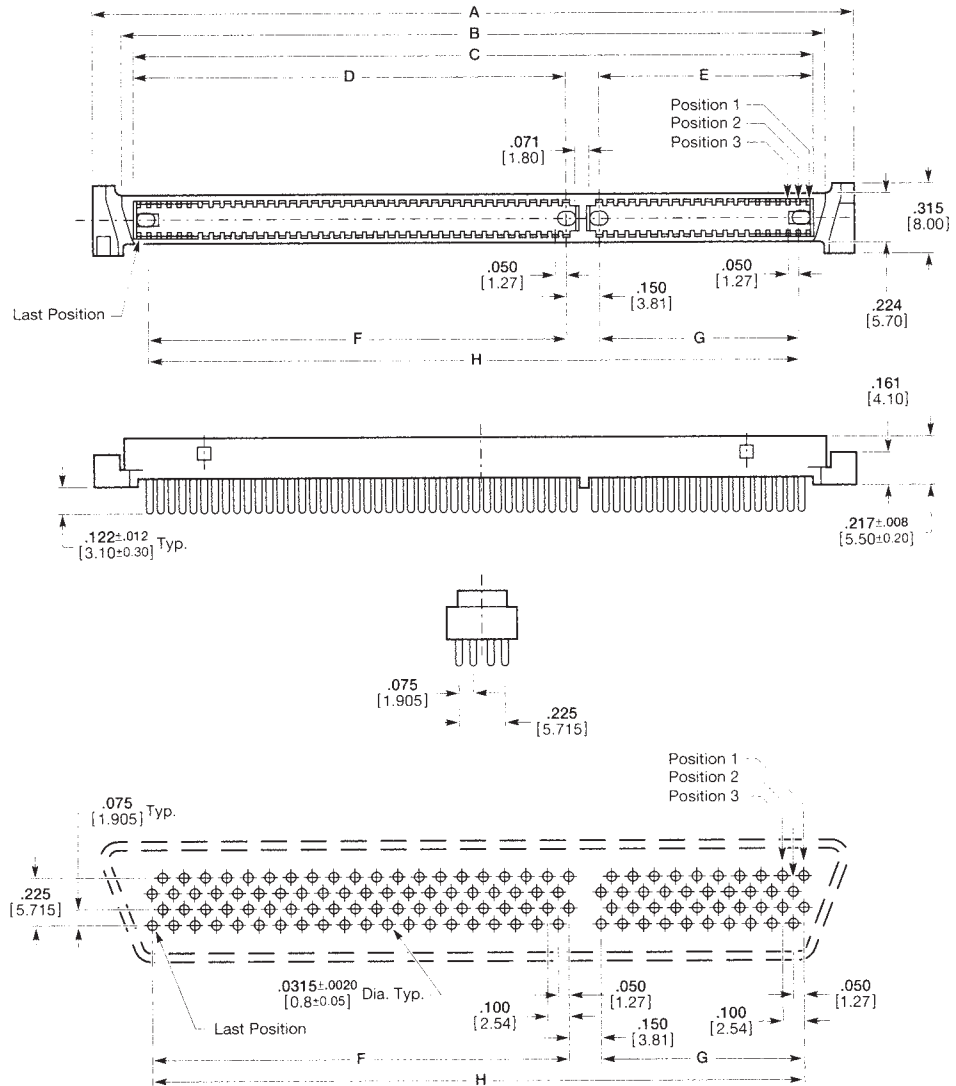
Contacts — Phosphor bronze, selec-
tively plated with minimum of .000012
[0.00030] gold in mating area and tin-
lead in solder tail area. Contacts are
coated with an anti-flux migration agent.

Performance Specifications —
Page 49

PC Board Accommodation —
.031 [0.79] to .093 [2.36] nominal
thickness

Mating Plug Connectors —
Right Angle — Page 57
Vertical — Page 55

Mating Configurations — Page 58



Recommended PC Board Layout
Component Side

Pos.	Dimensions								Standard Temp. Part Number
	A	B	C	D	E	F	G	H	
40	1.447 36.75	1.150 29.22	1.029 26.13	—	—	—	—	.950 24.13	917628-1
60	1.947 49.45	1.650 41.92	1.529 38.83	—	—	—	—	1.450 36.83	917628-2
80	2.447 62.15	2.150 54.62	2.029 51.53	—	—	—	—	1.950 49.53	917628-3
100	2.947 74.85	2.650 67.32	2.529 64.23	—	—	—	—	2.450 62.23	917628-4
120	3.547 90.09	3.250 82.56	3.129 79.47	2.029 51.53	1.029 26.13	1.950 49.53	0.950 24.13	3.050 77.47	917628-5
140	4.047 102.79	3.750 95.26	3.629 92.17	2.029 51.53	1.529 38.83	1.950 49.53	1.450 36.83	3.550 90.17	917628-6
160	4.547 115.49	4.250 107.96	4.129 104.87	2.529 64.23	1.529 38.83	2.450 62.23	1.450 36.83	4.050 102.87	917628-7
180	5.047 128.19	4.750 120.66	4.629 117.57	2.529 64.23	2.029 51.53	2.450 62.23	1.950 49.53	4.550 115.57	917628-8

CHAMP .050 Series I Free Height (FH) Connectors, Board-to-Board Applications (Continued)

Vertical Receptacles, 9 and 10mm Stack

Materials and Finish

Housing, Standard Temperature —
Glass-filled nylon 6/6, rated UL 94V-0,
black

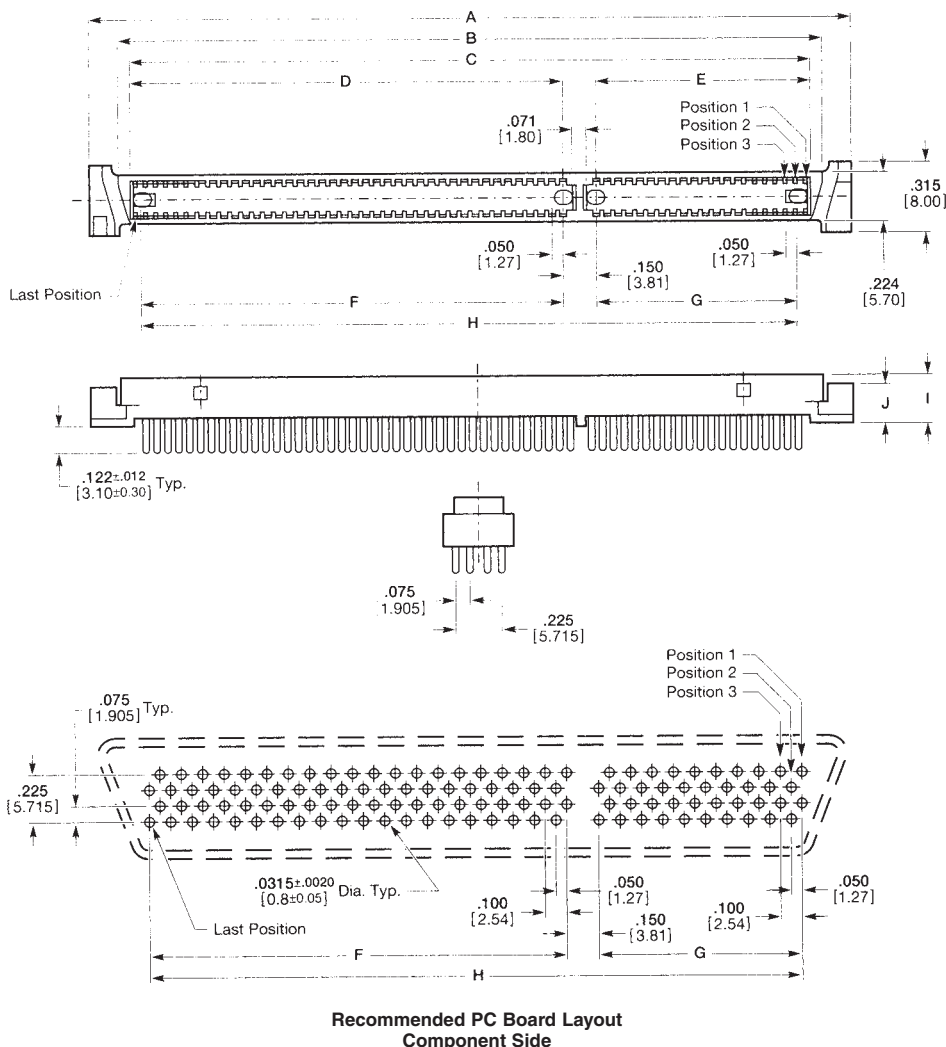
Contacts — Phosphor bronze, selec-
tively plated with minimum of .000012
[0.00030] gold in mating area and tin-
lead in solder tail area. Contacts are
coated with an anti-flux migration agent.

Performance Specifications —
Page 49

PC Board Accommodation —
.031 [0.79] to .093 [2.36] nominal
thickness

Mating Plug Connectors —
Right Angle — Page 57
Vertical — Page 55

Mating Configurations — Page 58



Recommended PC Board Layout
Component Side

Pos.	Dimensions								Standard Temp. Part Number	
	A	B	C	D	E	F	G	H	I =	J =
									.256 [6.50]	.295 [7.50]
									.201 [5.10]	.240 [6.10]
40	1.447 36.75	1.150 29.22	1.028 26.13	—	—	—	—	.950 24.13	917629-1	917630-1
60	1.947 49.45	1.650 41.92	1.528 38.83	—	—	—	—	1.450 36.83	917629-2	917630-2
80	2.447 62.15	2.150 54.62	2.028 51.53	—	—	—	—	1.950 49.53	917629-3	917630-3
100	2.947 74.85	2.650 67.32	2.528 64.23	—	—	—	—	2.450 62.23	917629-4	917630-4
120	3.547 90.09	3.250 82.56	3.128 79.47	2.028 51.53	1.028 26.13	1.950 49.53	0.950 24.13	3.050 77.47	917629-5	917630-5
140	4.047 102.79	3.750 95.26	3.628 92.17	2.028 51.53	1.528 38.83	1.950 49.53	1.450 36.83	3.550 90.17	917629-6	917630-6
160	4.547 115.49	4.250 107.96	4.128 104.87	2.528 64.23	1.528 38.83	2.450 62.23	1.450 36.83	4.050 102.87	N/A	917630-7
180	5.047 128.19	4.750 120.66	4.628 117.57	2.528 64.23	2.028 51.53	2.450 62.23	1.950 49.53	4.550 115.57	N/A	917630-8

CHAMP .050 Series I Free Height (FH) Connectors, Board-to-Board Applications (Continued)

Vertical Receptacles, 11mm to 18mm Stack

Materials and Finish

Housing, Standard Temperature — Glass-filled nylon 6/6, rated UL 94V-0, black

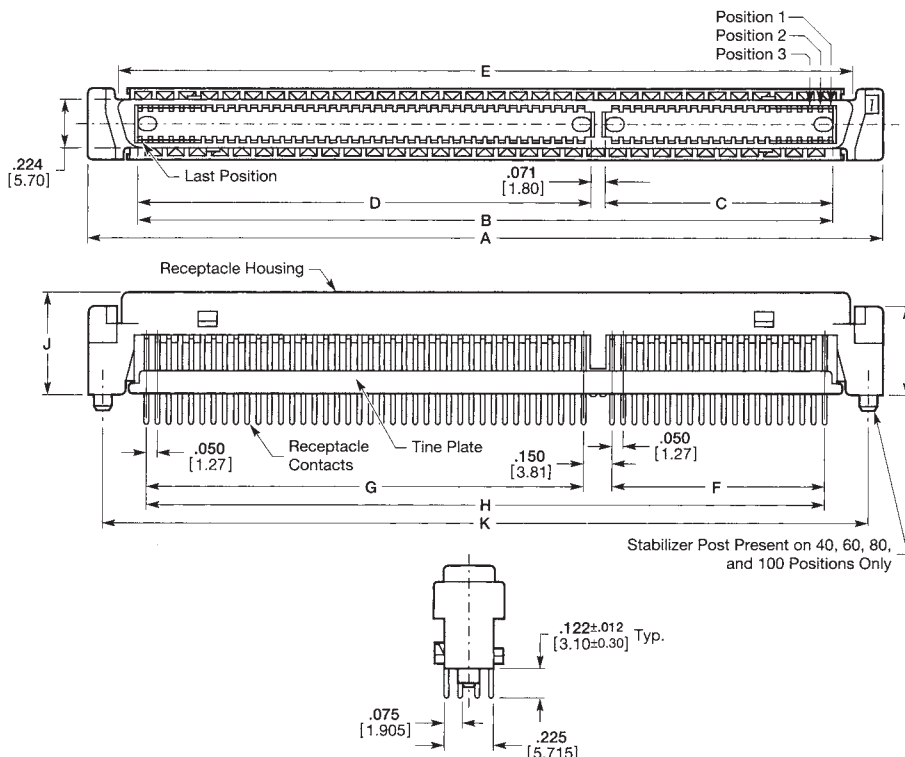
Contacts — Phosphor bronze, selectively plated with minimum of .000012 [0.00030] gold in mating area and tin-lead in solder tail area

Performance Specifications — Page 49

PC Board Accommodation — .031 [0.79] to .093 [2.36] nominal thickness

Mating Plug Connectors — Right Angle — Page 57
Vertical — Page 55

Mating Configurations — Page 58

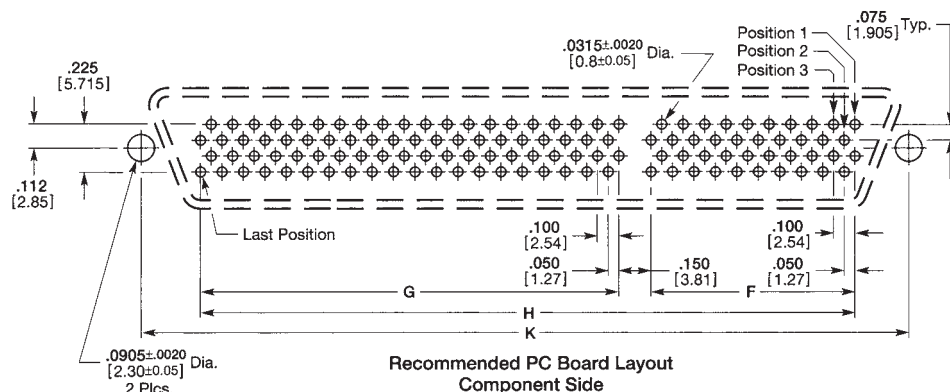


Pos.	Part Numbers—Standard Temp.							
	Stack Height							
	11mm	12mm	13mm	14mm	15mm	16mm	17mm	18mm
40	176371-1	176372-1	176373-1	176374-1	N/A	176376-1	176377-1	176378-1
60	176371-2	176372-2	176373-2	176374-2	176375-2	176376-2	N/A	176378-2
80	176371-3	176372-3	176373-3	176374-3	176375-3	176376-3	176377-3	176378-3
100	176371-4	176372-4	176373-4	176374-4	N/A	176376-4	176377-4	176378-4
120	176371-5	176372-5	N/A	176374-5	N/A	176376-5	176377-5	176378-5
140	176371-6	176372-6	N/A	176374-6	N/A	176376-6	N/A	176378-6
160	N/A	N/A	N/A	176374-7	N/A	N/A	N/A	176378-7
180	N/A	N/A	N/A	N/A	N/A	N/A	176377-8	176378-8
I	.280 7.10	.319 8.10	.358 9.10	.398 10.10	.437 11.10	.476 12.10	.516 13.10	.555 14.10
J	.335 8.50	.374 9.50	.413 10.50	.453 11.50	.492 12.50	.531 13.50	.571 14.50	.610 15.50

Vertical Receptacles, 11mm to 18mm Stack

(Continued)

CHAMP .050 Series I Free Height (FH) Connectors, Board-to-Board Applications (Continued)



Pos.	Dimensions								
	A	B	C	D	E	F	G	H	K
40	1.447	1.029	—	—	1.150	—	—	.950	1.343
	36.75	26.13			29.22			24.13	34.10
60	1.947	1.529	—	—	1.650	—	—	1.450	1.843
	49.45	38.83			41.92			36.83	46.80
80	2.447	2.029	—	—	2.150	—	—	1.950	2.343
	62.15	51.53			54.62			49.53	59.50
100	2.947	2.529	—	—	2.650	—	—	2.450	2.843
	74.85	64.23			67.32			62.23	72.20
120	3.547	3.129	1.029	2.029	3.250	.950	1.950	3.050	—
	90.09	79.47	26.13	51.53	82.56	24.13	49.53	77.47	
140	4.047	3.629	1.529	2.029	3.750	1.450	1.950	3.550	—
	102.79	92.17	38.83	51.53	95.26	36.83	49.53	90.17	
160	4.547	4.129	1.529	2.529	4.250	1.450	2.450	4.050	—
	115.49	104.87	38.83	64.23	107.96	36.83	62.23	102.87	
180	5.047	4.629	2.029	2.529	4.750	1.950	2.450	4.550	—
	128.19	117.57	51.53	64.23	120.66	49.53	62.23	115.57	

CHAMP .050 Series I Free Height (FH) Connectors, Board-to-Board Applications (Continued)

Right Angle Receptacles

Materials and Finish

Housing, Standard Temperature — Glass-filled nylon 6/6, rated UL 94V-0, black

Contacts — Phosphor bronze, selectively plated with minimum of .000012 [0.00030] gold in mating area and tin-lead in solder tail area

Retention Leg — Brass, tin-lead plated

Performance Specifications — Page 49

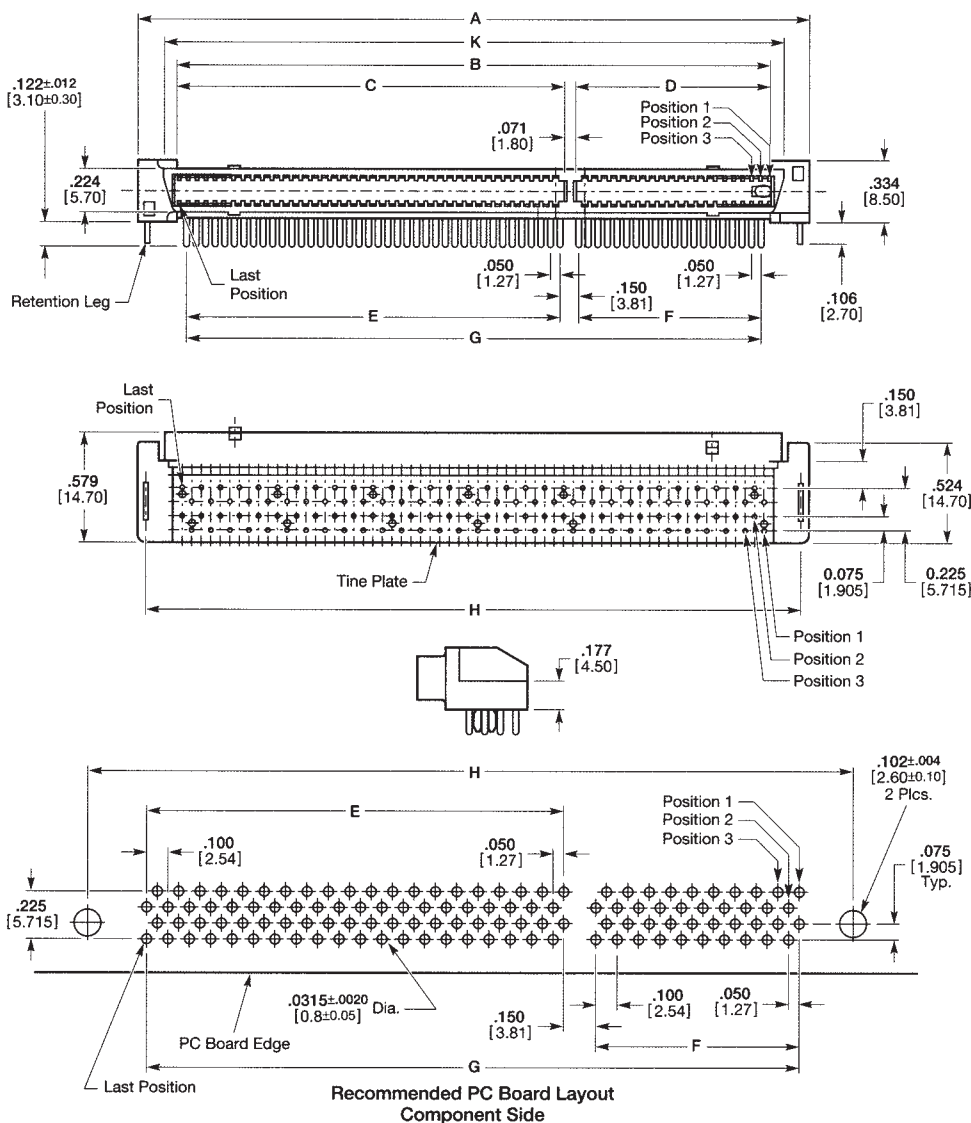
PC Board Accommodation — .031 [0.79] to .093 [2.36] nominal thickness

Mating Plug Connectors —

Right Angle — Page 57

Vertical — Page 55

Mating Configurations — Page 58



Pos.	Dimensions									Standard Temp. Part Number
	A	B	C	D	E	F	G	H	K	
40	1.447 36.75	1.029 26.13	—	—	—	—	.950 24.13	1.343 34.10	1.150 29.22	N/A
60	1.947 49.45	1.529 38.83	—	—	—	—	1.450 36.83	1.843 46.80	1.650 41.92	176379-2
80	2.447 62.15	2.029 51.53	—	—	—	—	1.950 49.53	2.343 59.50	2.150 54.62	176379-3
100	2.947 74.85	2.529 64.23	—	—	—	—	2.450 62.23	2.843 72.20	2.650 67.32	176379-4
120	3.547 90.09	3.129 79.47	2.029 51.53	1.029 26.13	1.950 49.53	.950 24.13	3.050 77.47	3.443 87.44	3.250 82.56	176379-5
140	4.047 102.79	3.629 92.17	2.029 51.53	1.529 38.83	1.950 49.53	1.450 36.83	3.550 90.17	3.943 100.14	3.750 95.26	176379-6
160	4.547 115.49	4.129 104.87	2.529 64.23	1.529 38.83	2.450 62.23	1.450 36.83	4.050 102.87	4.443 112.84	4.250 107.96	176379-7
180	5.047 128.19	4.629 117.57	2.529 64.23	2.029 51.53	2.450 62.23	1.950 49.53	4.550 115.57	4.943 125.54	4.750 120.66	176379-8

CHAMP .050 Series I Free Height (FH) Connectors, Board-to-Board Applications (Continued)

Vertical Plugs

Materials and Finish

Housing, Standard Temperature —
Glass-filled nylon 6/6, rated UL 94V-0,
black

Contacts — Phosphor bronze, selec-
tively plated with minimum of .000012
[0.00030] gold in mating area and tin-
lead in solder tail area

Performance Specifications —
Page 49

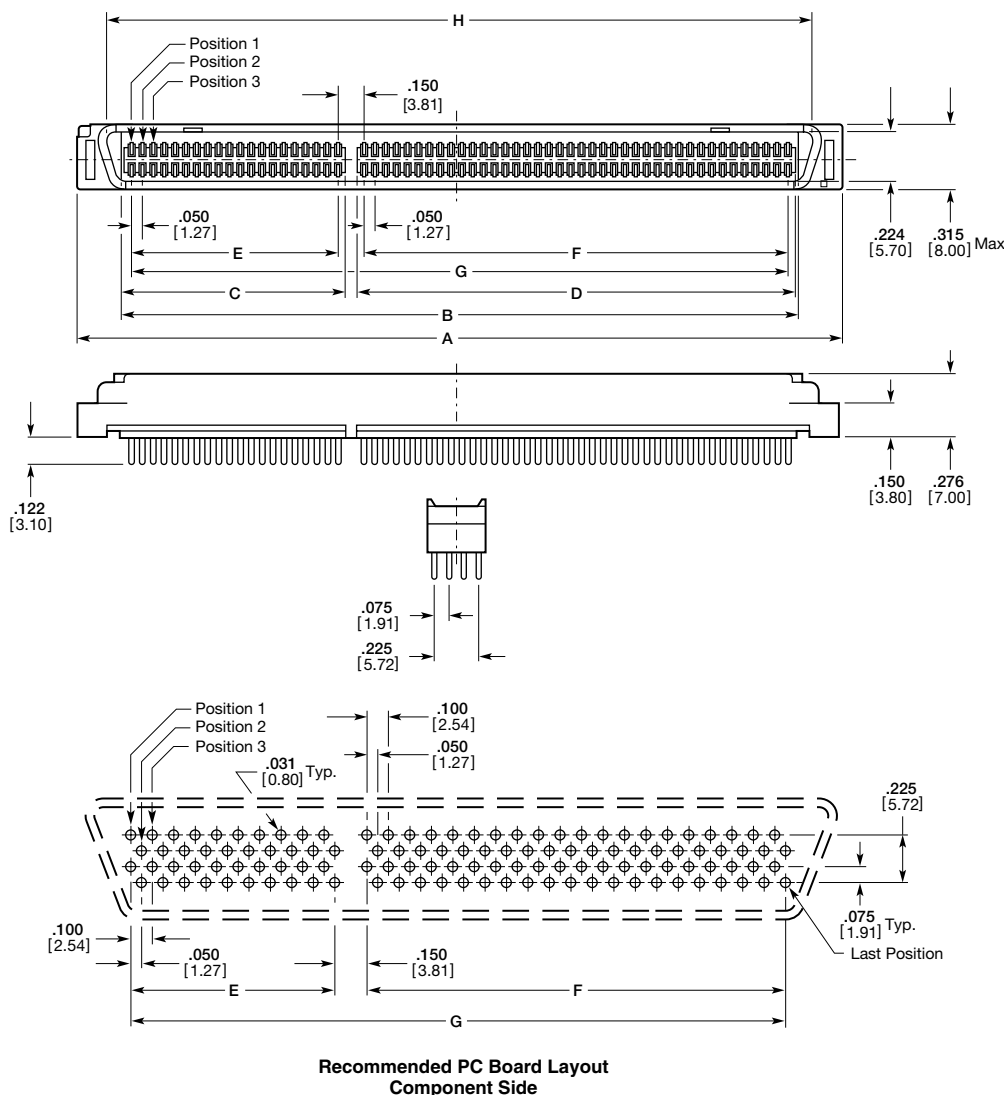
PC Board Accommodation —
.031 [0.79] to .093 [2.36] nominal
thickness

Mating Receptacles

Right Angle — Page 54

Vertical — Pages 50-53

Mating Configurations — Page 58



Recommended PC Board Layout
Component Side

Pos.	Dimensions								Standard Temp. Part Number
	A	B	C	D	E	F	G	H	
40	1.447 36.75	1.021 25.93	—	—	—	—	.950 24.13	1.156 29.37	917631-1
60	1.947 49.45	1.521 38.63	—	—	—	—	1.450 36.83	1.656 42.07	917631-2
80	2.447 62.15	2.021 51.33	—	—	—	—	1.950 49.53	2.156 54.77	917631-3
100	2.947 74.85	2.521 64.03	—	—	—	—	2.450 62.23	2.656 67.47	917631-4
120	3.547 90.09	3.121 79.27	1.021 25.93	2.021 51.33	.950 24.13	1.950 49.53	3.050 77.47	3.256 82.71	917631-5
140	4.047 102.79	3.621 91.97	1.521 38.63	2.021 51.33	1.450 36.83	1.950 49.53	3.550 90.17	3.756 95.41	917631-6
160	4.547 115.49	4.121 104.67	1.521 38.63	2.521 64.03	1.450 36.83	2.450 62.23	4.050 102.87	4.256 108.11	917631-7
180	5.047 128.19	4.621 117.37	2.021 51.33	2.521 64.03	1.950 49.53	2.450 62.23	4.550 115.57	4.756 120.81	917631-8

CHAMP .050 Series I Free Height (FH) Connectors, Board-to-Board Applications (Continued)

Vertical Plug, Surface Mount with Solder Peg

Materials and Finish

Housing — LCP, rated 94V-0, black

Contacts — Phosphor bronze, selectively plated with minimum of .000012 [0.00030] gold in mating area and tin-lead in solder tail area

Solder Peg — Steel, plated tin-lead over copper

Performance Specifications —
Page 49

Mating Receptacles —
Right Angle — Page 54
Vertical — Pages 50-53

Mating Configurations — Page 58

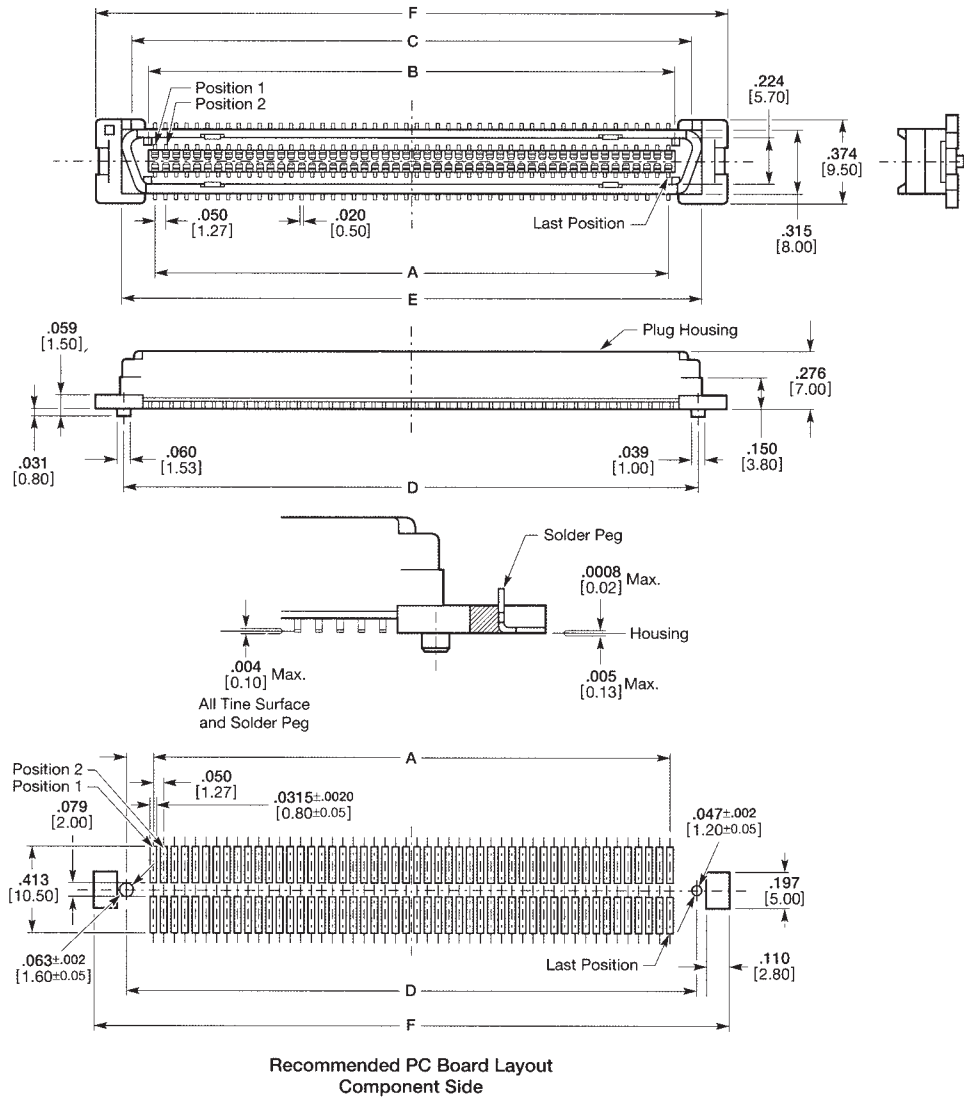
Technical Documents

Product Specification

108-5309

Instruction Sheet

411-5519



Pos.	Dimensions						Part Number
	A	B	C	D	E	F	
60	1.450 36.83	1.521 38.63	1.656 42.07	1.717 43.60	1.756 44.60	1.992 50.60	179656-2

Note: A 60-position version is available with mounting flanges in an extended height configuration to generate stack heights from 13mm to 23mm. Part Number 1-917815-2

CHAMP .050 Series I Free Height (FH) Connectors, Board-to-Board Applications (Continued)

Right Angle Plugs

Materials and Finish

Housing — Glass filled nylon 6/6, rated 94V-0, black

Contacts — Phosphor bronze, selectively plated with minimum of .000012 [0.00030] gold in mating area and tin-lead in solder tail area

Retention Leg — Brass, tin-lead plated

Performance Specifications — Page 49

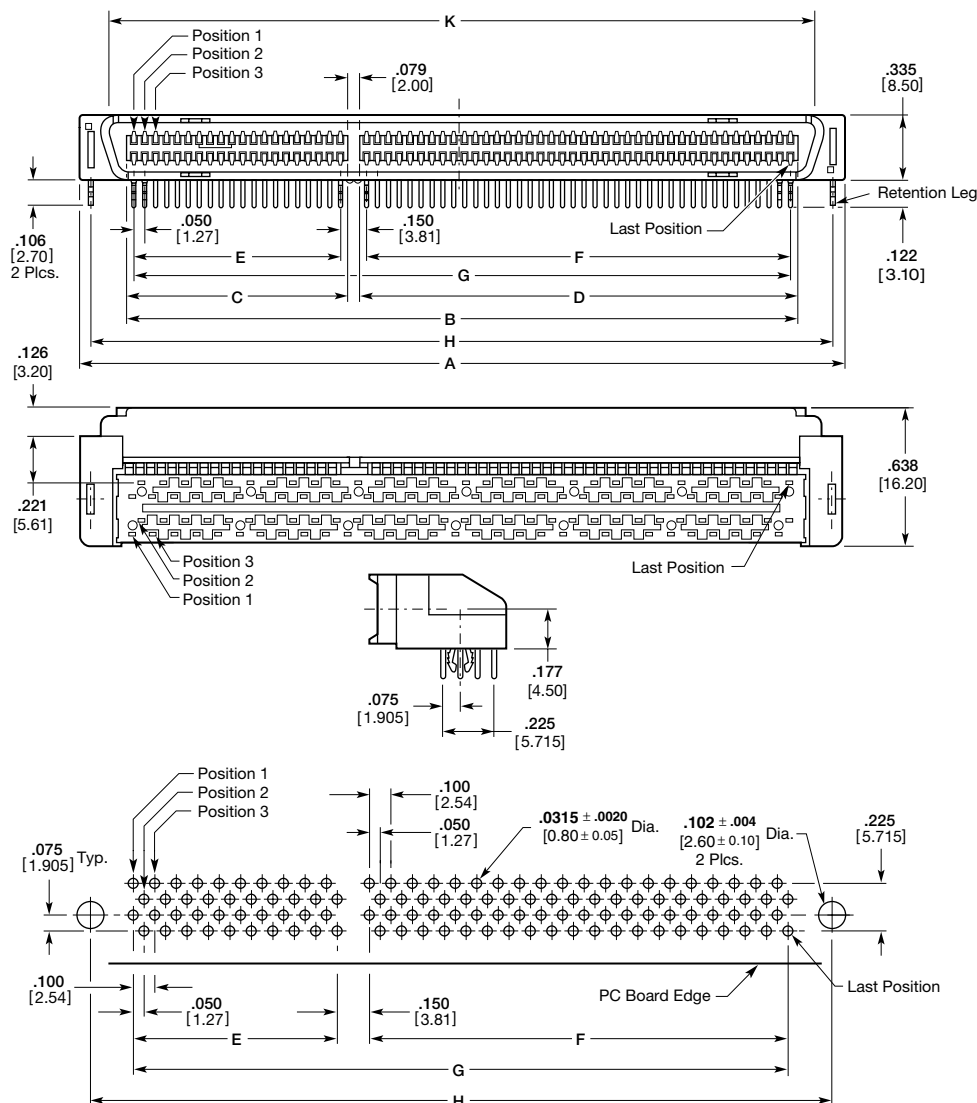
PC Board Accommodation — .031 [0.79] to .093 [2.36] nominal thickness

Mating Receptacles

Right Angle — Page 54

Vertical — Pages 50-53

Mating Configurations — Page 58



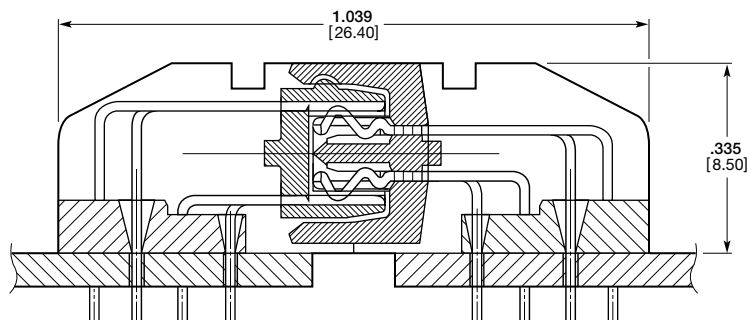
Recommended PC Board Layout
Component Side

Pos.	Dimensions									Part Number
	A	B	C	D	E	F	G	H	K	
40	1.447 36.75	1.021 25.93	—	—	—	—	.950 24.13	1.343 34.10	1.156 29.37	176381-1
60	1.947 49.45	1.521 38.63	—	—	—	—	1.450 36.83	1.843 46.80	1.656 42.07	176381-2
80	2.447 62.15	2.021 51.33	—	—	—	—	1.950 49.53	2.343 59.50	2.156 54.77	176381-3
100	2.947 74.85	2.521 64.03	—	—	—	—	2.450 62.23	2.843 72.20	2.656 67.47	176381-4
120	3.547 90.09	3.121 79.27	1.021 25.93	2.021 51.33	.950 24.13	1.950 49.53	3.050 77.47	3.443 87.44	3.256 82.71	176381-5
140	4.047 102.79	3.621 91.97	1.521 38.63	2.021 51.33	1.450 36.83	1.950 49.53	3.550 90.17	3.943 100.14	3.756 95.41	176381-6
160	4.547 115.49	4.121 104.67	1.521 38.63	2.521 64.03	1.450 36.83	2.450 62.23	4.050 102.87	4.443 112.84	4.256 108.11	176381-7
180	5.047 128.19	4.621 117.37	2.021 51.33	2.521 64.03	1.950 49.53	2.450 62.23	4.550 115.57	4.943 125.54	4.756 120.81	176381-8

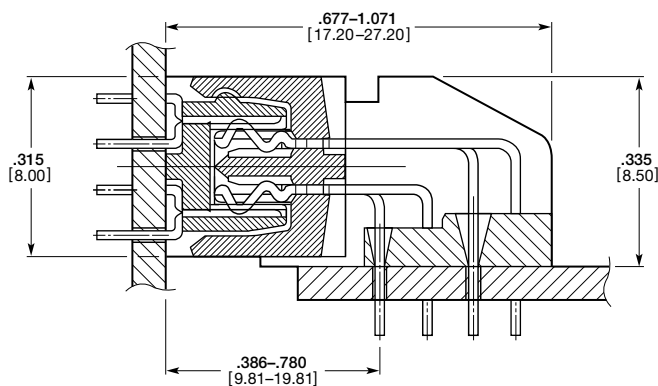
**CHAMP .050 Series I Free Height (FH) Connectors,
Board-to-Board Applications** (Continued)

Mating Configurations

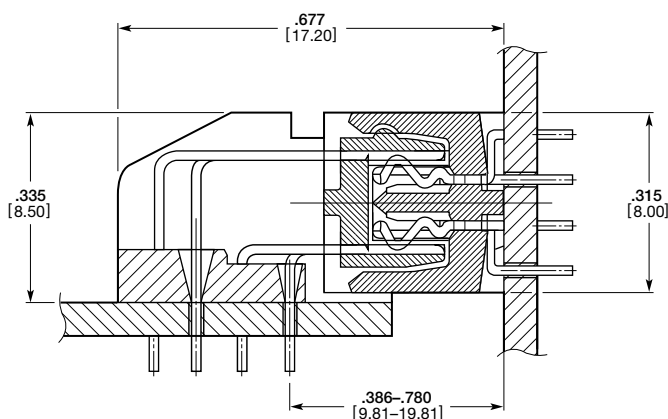
In-Line Mating



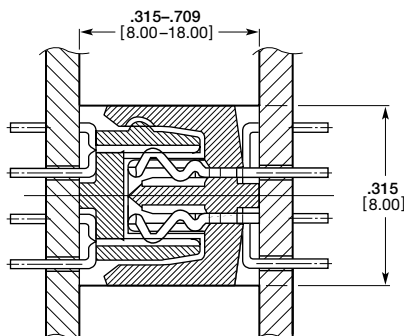
Perpendicular Mating



Perpendicular Mating



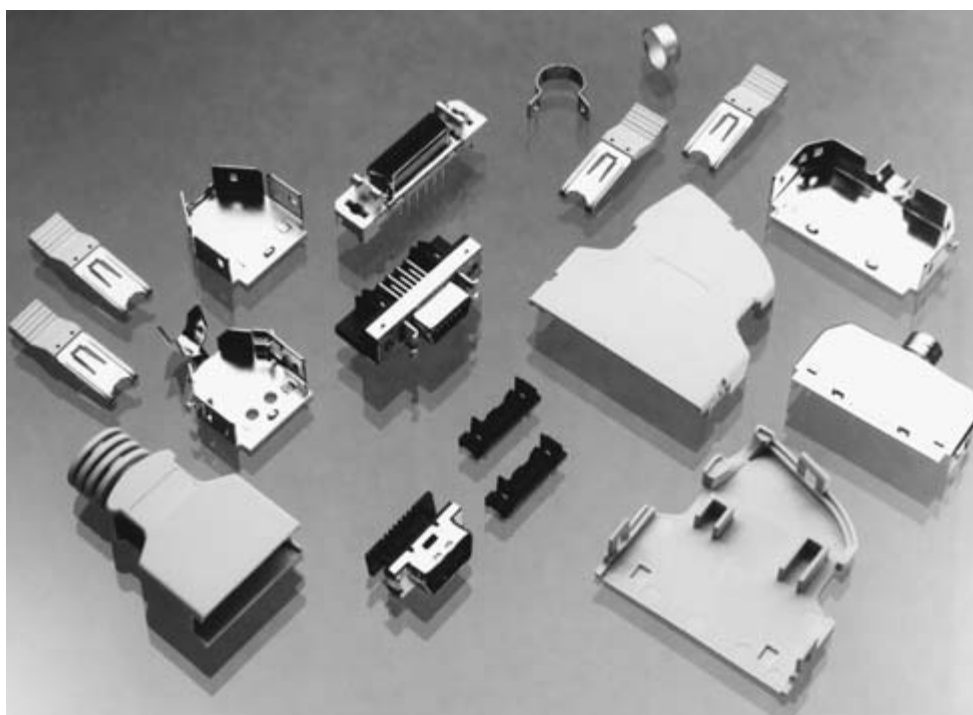
Parallel Mating



CHAMP .050 Series II Connectors, Wire-to-Board Applications

CHAMP .050 Series II Connectors for Shielded I/O Applications

- Cable plug connectors terminate 28–30 AWG [.08–.09 mm²] wire
- 180° cable exit
- PC board mounting receptacle connectors with rugged zinc die cast body and stamped metal shield
- Double-spring contact design to ensure intermateability and conformance to standards
- 14 through 100 selected positions available



Performance Specifications

Series II Connector

Operating Temperature Range —

–55°C to +85°C for Standard
–55°C to +105°C for High Temp

Current Rating — 1 Ampere
Maximum—28 AWG [0.08 mm²]

Voltage Rating — 250 VAC Maximum

Termination Resistance —
35 Milliohms Maximum Initial

Insulation Resistance —
500 Megohms Minimum Initial

Mating Force — 75 Grams Maximum
Per Contact

Rated Cycle Life — 500 Cycles

Technical Documents

Product Specification

102-5288

Application Specifications

114-5166 — Integral Cable Clamp

114-5124 — Wire Terminations

Wire-to-Board Connectors

The **Series II** is a shielded I/O connector system for wire-to-board connections offering maximum EMI protection. The series includes right angle and vertical printed circuit board receptacles and cable plug connectors. The right angle board connectors are available with retention board locks and a stamped metal shield. The vertical connectors incorporate a die cast metal shield. Selected sizes are available in high temperature housing material.

The cable plug connectors use insulation displacement contacts for fast, accurate termination of 28 AWG [0.008 mm²] stranded, discrete wire, jacketed cable. The cable plug offers a stamped metal backshell

with a 180° exit for ESD (Electrostatic Discharge) protection. A plastic enclosure fits over the backshell to provide an aesthetically pleasing appearance. A "squeeze-to-release latch" captivation mechanism is used on the cable plug.

A wide range of position offerings of 14 to 100 are available.

General Product Facts

- **High density .050 [1.27] contact centerlines**
- **Leaf contacts accommodate minor mating misalignment**
- **D-shaped polarized mating face**
- **Variety of application tooling available to meet a wide range of production volumes**

CHAMP .050 Series II Connectors, Wire-to-Board Applications (Continued)

Plug Cable Connectors

Materials and Finish

Housing, Covers — Glass-filled PBT, rated 94V-0, black

Contacts — Phosphor bronze, selectively plated with minimum of .000030 [0.00076] gold in mating area and tin-lead in termination area

Performance Specifications —
Page 59

Wire Accommodation —
28 AWG [0.08mm²] 7 Strand with
.020-.028 [0.51-.0.71]* insulation
diameter. Most UL Type 2789 wires
meet these dimensional requirements

*Depending on type of insulation
and applicator tooling.

Mating Receptacle Connectors —
Right Angle — Page 62
Vertical — Page 63

Technical Documents

Product Specification

108-5288

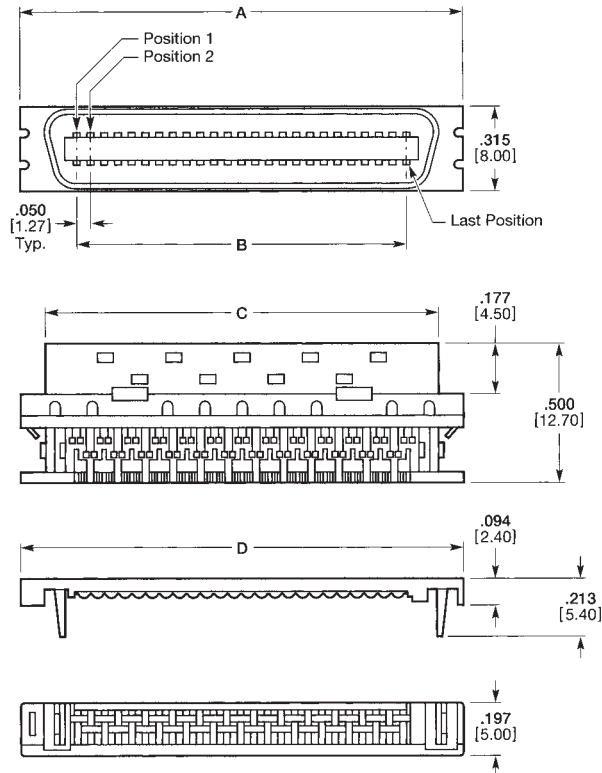
Application Specification

114-5166 — integral clamp
114-5124 — wire terminations

Recommended Cable

Montrose/CDT —

Part Number CBL-7334
Phone: 1-800-346-6626



Pos.	Dimensions				Part Number 28 AWG [0.08mm ²]
	A	B	C	D	
14	.724 18.40	.300 7.62	.539 13.70	.720 18.30	2-175677-1
20	.874 22.20	.450 11.43	.693 17.60	.870 22.10	2-175677-2
26	1.024 26.00	.600 15.24	.843 21.40	1.020 25.90	2-175677-4
36	1.276 32.40	.850 21.59	1.091 27.70	1.272 32.30	2-175677-5
50	1.626 41.30	1.200 30.48	1.441 36.60	1.622 41.20	2-175677-7
68	2.075 52.70	1.650 41.91	1.890 48.00	2.071 52.60	2-175677-8
80	2.374 60.30	2.450 62.23	2.693 68.40	2.870 72.90	3-175677-0
100	2.874 73.00	1.950 49.53	2.193 55.70	2.370 60.20	2-175677-9

CHAMP .050 Series II Connectors, Wire-to-Board Applications (Continued)

Enclosure Kits

Materials and Finish

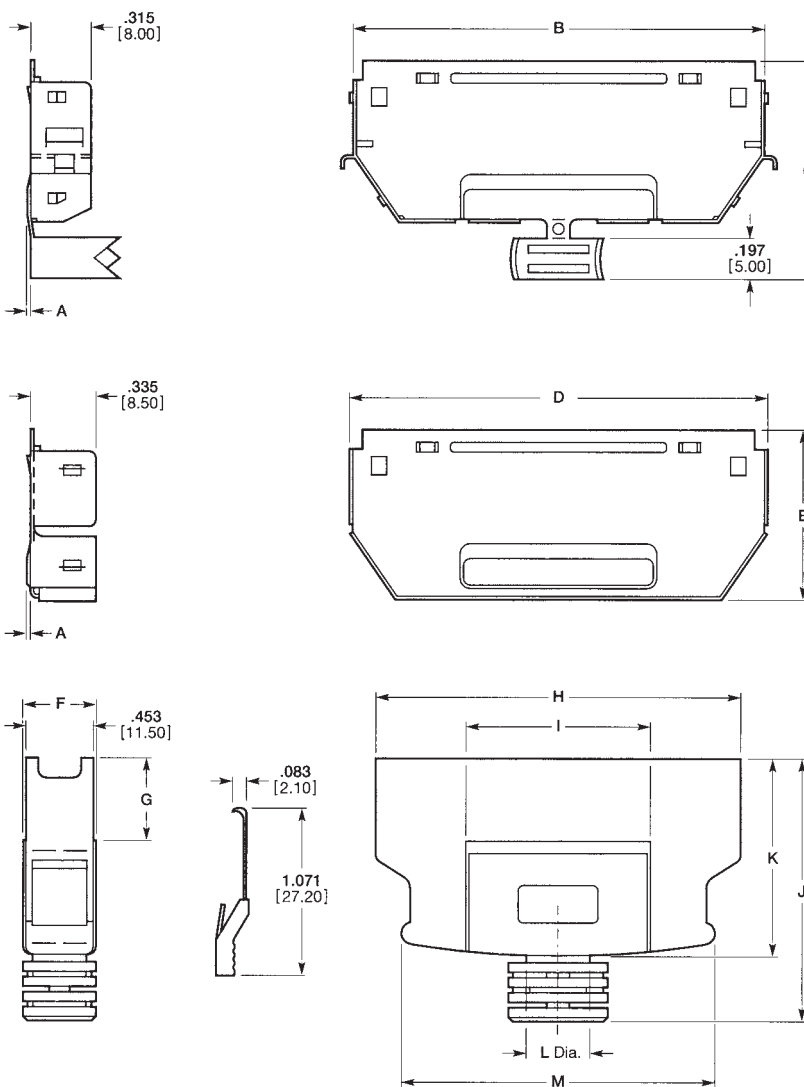
Enclosure — PBT, rated 94V-0, beige white (other colors available, contact Tyco Electronics)

Shields — Steel, plated nickel over copper underplating

Locking Spring — Stainless steel, overmolded with PBT, rated UL 94V-0, beige white

Performance Specifications — Page 59

Cable Connectors — Plug — Page 60



Pos.	Cable Dia.	Dimensions													Part Number
		A	B	C	D	E	F	G	H	I	J	K	L	M	
14	.169–.240 4.29–6.10	—	.783 19.89	1.102 28.00	0.834 21.18	.866 22.00	.453 11.51	—	1.017 25.83	.512 13.00	1.654 42.00	1.260 32.00	.248 6.30	0.675 17.14	176793-1
20	.212–.256 5.38–6.50	—	.933 23.70	1.102 28.00	0.984 24.99	.866 22.00	.453 11.51	—	1.167 29.64	.512 13.00	1.654 42.00	1.260 32.00	.264 6.70	0.825 20.95	176793-2
26	.232–.272 5.89–6.91	—	1.083 27.51	1.102 28.00	1.134 28.80	.866 22.00	.453 11.51	—	1.317 33.46	.512 13.00	1.654 42.00	1.260 32.00	.280 7.10	0.975 24.76	176793-4
36	.252–.311 6.40–7.90	—	1.333 33.86	1.102 28.00	1.384 35.15	.866 22.00	.453 11.51	—	1.567 39.80	.512 13.00	1.654 42.00	1.260 32.00	.319 8.10	1.225 31.11	176793-5
50	.283–.335 7.18–8.51	—	1.683 42.75	1.102 28.00	1.734 44.04	.866 22.00	.453 11.51	—	1.917 48.69	.512 13.00	1.654 42.00	1.260 32.00	.343 8.70	1.575 40.00	176793-7
68	.319–.378 8.10–9.60	.024 0.60	2.133 54.18	1.102 28.00	2.184 55.47	.866 22.00	.472 12.00	.563 14.30	2.367 60.12	1.181 30.00	1.654 42.00	1.260 32.00	.386 9.80	2.025 51.43	176793-8
80	.335–.401 8.51–10.19	.024 0.60	2.433 61.80	1.220 31.00	2.484 63.09	.984 25.00	.465 11.80	.614 15.60	2.667 67.74	1.338 34.00	1.772 45.00	1.378 35.00	.406 10.30	2.325 59.05	1-176793-0
100	.390–.433 9.91–11.00	.051 1.30	2.933 74.50	1.299 33.00	2.984 75.79	1.063 27.00	.531 13.50	.492 12.50	3.167 80.44	1.496 38.00	1.850 47.00	1.457 37.01	.441 11.20	2.825 71.75	176793-9

CHAMP .050 Series II Connectors, Wire-to-Board Applications (Continued)

Right Angle Receptacles with Boardlocks

Materials and Finish

Housing — Glass-filled nylon, rated 94V-0, black

Contacts — Phosphor bronze, selectively plated with minimum of .000030 [0.00076] gold in mating area and tin-lead in solder tail area

Retention Leg (Boardlock) — Phosphor bronze, tin-lead over nickel underplate

Shield — Steel, nickel plated over copper underplate

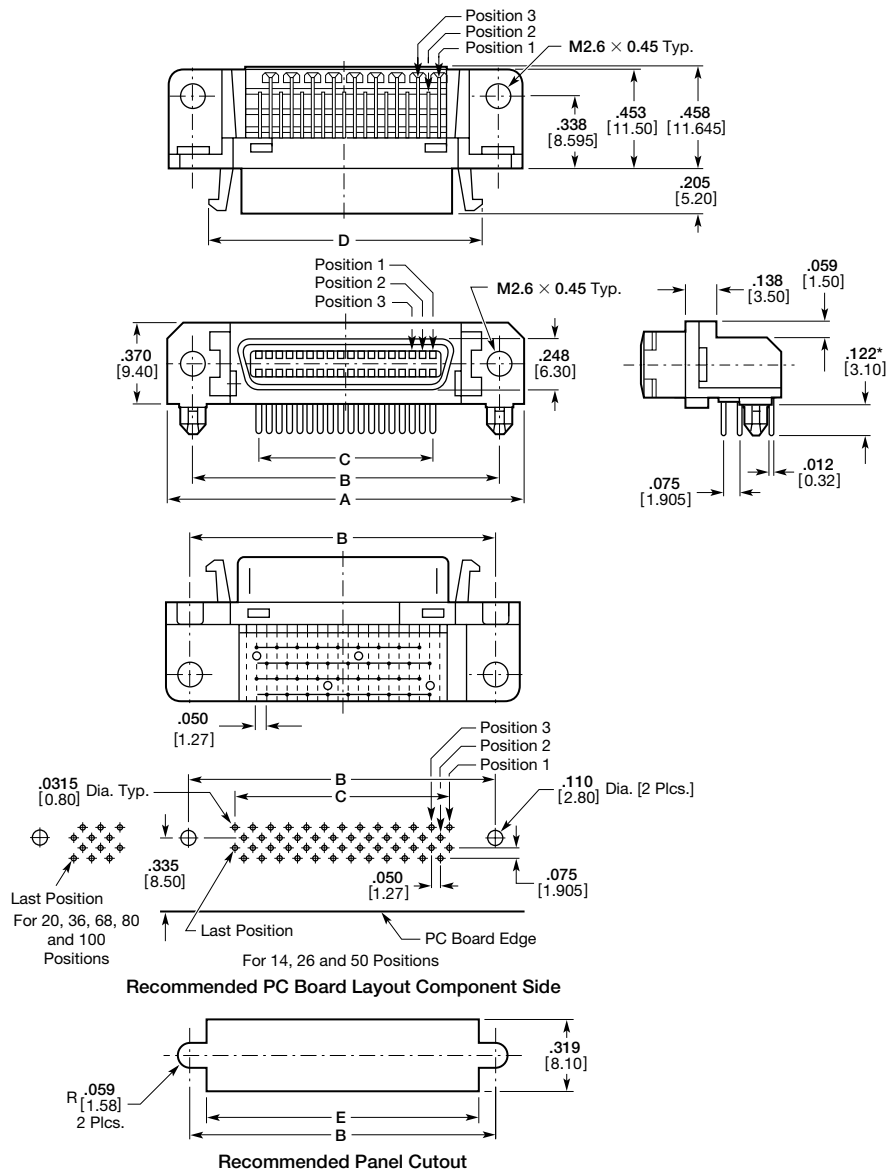
Frame — Die cast zinc, nickel plated

Performance Specifications — Page 59

PC Board Accommodation — .062 [1.60]–.093 [2.36] nominal thickness

Panel Accommodation — .079 [2.00] maximum thickness

Mating Plug Connectors — Cable — Page 60



Pos.	Dimensions					Part Number
	A	B	C	D	E	
14	.300 7.62	.931 23.64	.497 12.62	.773 19.64	1.163 29.54	917738-1
20	.450 11.43	1.081 27.45	.647 16.43	.923 23.45	1.313 33.35	917738-2
26	.600 15.24	1.231 31.26	.797 20.24	1.073 27.26	1.463 37.16	917738-4
36	.850 21.59	1.481 37.61	1.047 26.59	1.323 33.61	1.713 43.51	917738-5 1-917738-5
50	1.200 30.48	1.831 46.50	1.397 35.48	1.673 42.50	2.063 52.40	917738-7 1-917738-7
68	2.513 63.83	2.281 57.93	1.650 41.91	2.123 53.93	2.134 54.20	2-178238-8
80	2.813 71.45	2.581 65.55	1.950 49.53	2.423 61.55	2.437 61.90	3-178238-0
100	3.313 84.15	3.081 78.25	2.450 62.23	2.923 74.25	2.937 74.60	2-178238-9

*Alternate tail lengths: .153 [3.90] and .087 [2.20] available. Contact Tyco Electronics at the numbers listed below.

CHAMP .050 Series II Connectors, Wire-to-Board Applications (Continued)

Vertical Receptacles

Materials and Finish

Housing — Glass-filled nylon, rated 94V-0, black

Contacts — Phosphor bronze, selectively plated with minimum of .000030 [0.00076] gold in mating area and tin-lead in solder tail area

Shield — Steel, plated nickel over copper underplate

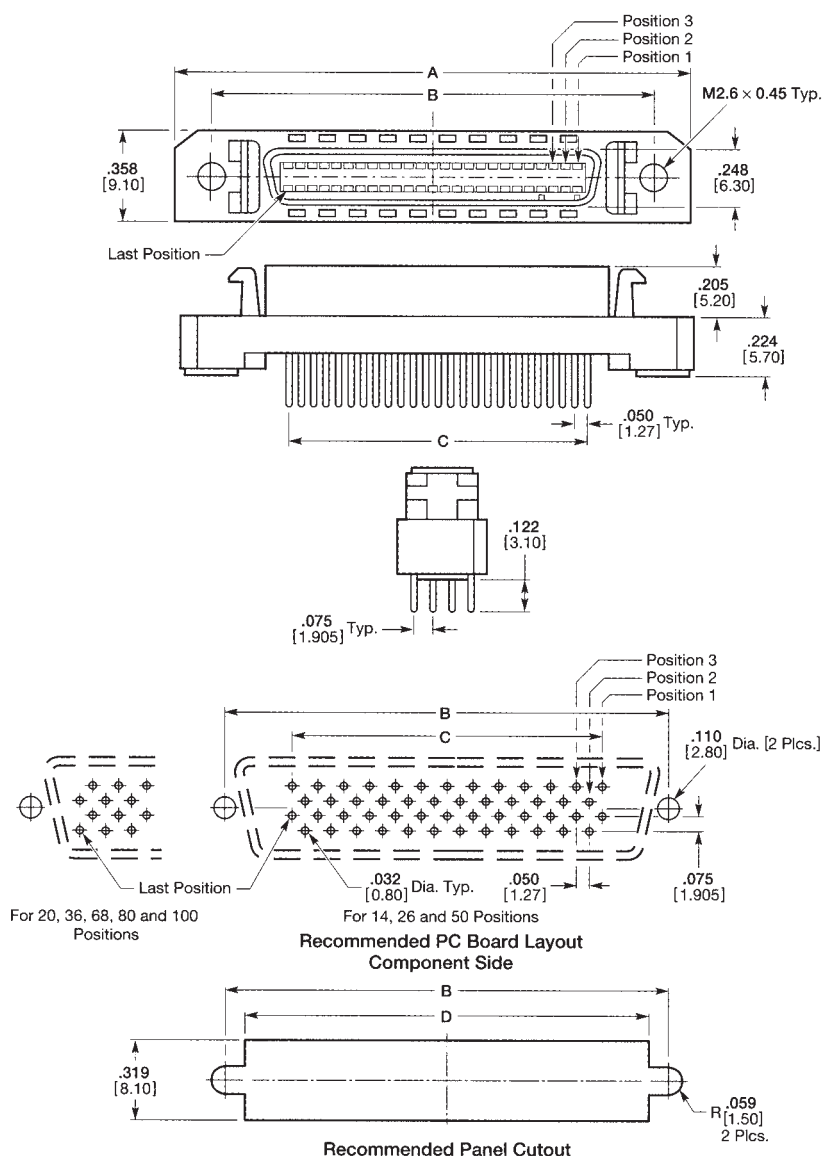
Frame — Die cast zinc, plated nickel over copper underplate

Performance Specifications — Page 59

PC Board Accommodation — .062 [1.60]–.093 [2.40] nominal thickness

Panel Accommodation — .079 [2.0] maximum thickness

Mating Plug Connectors — Cable — Page 60



Pos.	Dimensions				Part Number
	A	B	C	D	
14	1.163 29.54	0.931 23.64	0.300 7.62	.783 19.90	2-175887-1
20	1.313 33.35	1.081 27.45	0.450 11.43	.973 23.80	2-175887-2
26	1.463 37.16	1.231 31.26	0.600 15.24	1.087 27.60	2-175887-4
36	1.713 43.51	1.481 37.61	0.850 21.59	1.335 33.90	2-175887-5
50	2.063 52.40	1.831 46.50	1.200 30.48	1.685 42.80	2-175887-7
68	2.513 63.83	2.281 57.93	1.650 41.91	2.134 54.20	2-175887-8
80	2.813 71.45	2.581 65.55	1.950 49.53	2.437 61.90	3-175887-0
100	3.313 84.15	3.081 78.25	2.450 62.23	2.937 74.60	2-175887-9

**Discrete Wire
Application Tooling**

**For Terminating Cable to
Series II Plug Connectors
(Base Part Number 175677)
(for low to medium volume
production)**

**CHAMPOMATOR 2.5
Terminating Machine
Part Number 354786-6
(less accessories)
Controller Part Number
852423-1 (USA/120 VAC)**

Accessories available
separately; contact
your Tyco Electronics
Representative at the
numbers listed below.

**Series II Tooling Package
Part Number 768900-5**

Instruction Sheet — 408-4054
Connector Size — 14 through 100

**Hand Applicator, Series II
Part Number 911123-1**

Connector Sizes — 14 through 50 positions
Instruction Sheet — 411-5389



Arbor Tool & Tooling Package

Connector Sizes —

14 through 68 positions — 911149-6

14 through 120 positions — 911149-7

Extra Lacing Stations available. Order Wire Comb Kit

14 through 68 positions — 911432-6

14 through 120 positions — 911432-7

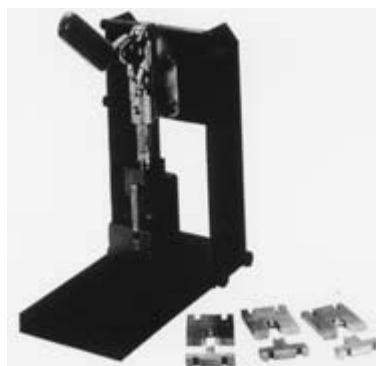
Instruction Sheet — 411-5547



**For Crimping Integral
Ferrules of Enclosure Kits
(Base Part Number 176793)**

**Toggle Bench Tool
Part Number 919620-1**

Instruction Sheet — 411-5628



**Manual Arbor Tool
Part Number 915697-2**

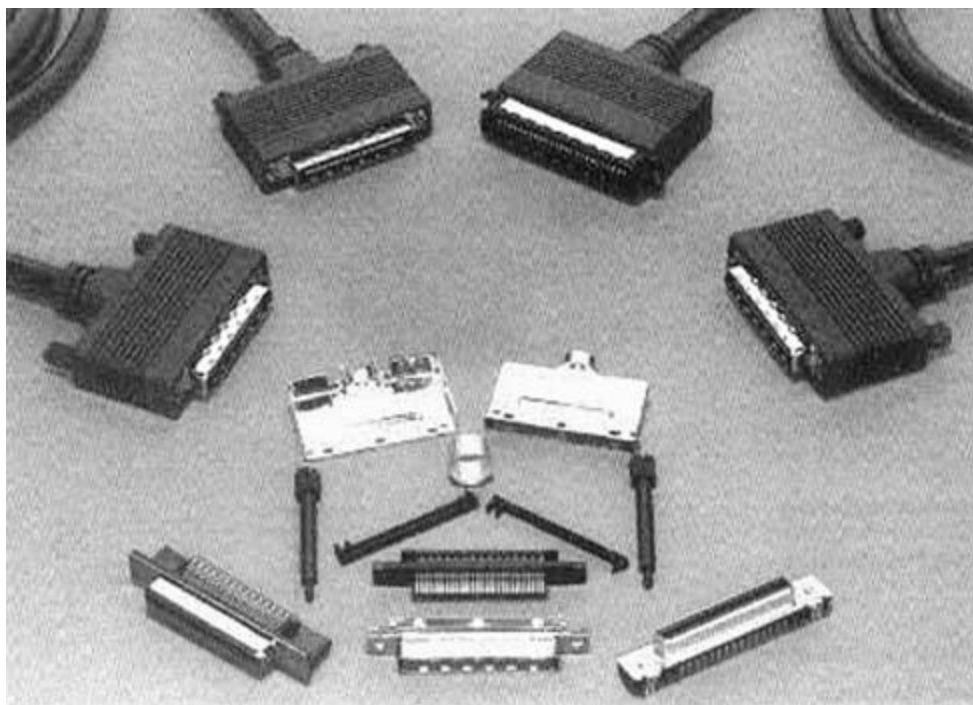
Instruction Sheet — 411-5558



Series III Connectors for Shielded I/O Applications

Product Facts

- Proprietary single-spring leaf contact design
- Screw lock captivation
- 132 ohm differential impedance cable for demanding transmission requirements
- Right angle and vertical receptacle headers
- Post molded cable assemblies with 180° exit
- Available in 60-position only



Performance Specifications

Operating Temperature Range — -55°C to +105°C

Current Rating — 1 amp max.

Voltage Rating — 250 VAC max.

Termination Resistance — 65 milliohms max. initial

Insulation Resistance — 100 megohms, min.

Mating Force — 200 grams max. per contact pair

Rated Cycle Life — 500 Cycles

Panel Attachment	Mount Angle	Status	Part Number
No	Vertical	Active	557038-2 ¹
Yes	Right Angle	Active	557104-5 ¹

¹ Contact Tyco Electronics for RoHS Part Number information.

Common Features

Brand — Tyco Electronics

RoHS/ELV Compliance — Not reviewed for ELV/RoHS compliance

Lead Free Solder Processes — Not reviewed for lead free solder process

Mating Type — Receptacle

Number of Positions — 60

Terminate To — Printed circuit board

Special PCB Retention — Yes

Mating Connector Lock — Without

Housing Material Temperature — High

Contact Mating Area Plating — Gold (50)

Product Series — Series III

Common Properties

Centerline — .050 [1.27]

PCB Thickness — .063 [1.60]

Termination Post Length — .118 [3.00]

Housing Material — Liquid Crystal Polymer (LCP)

Housing Flammability Rating — UL 94V-0

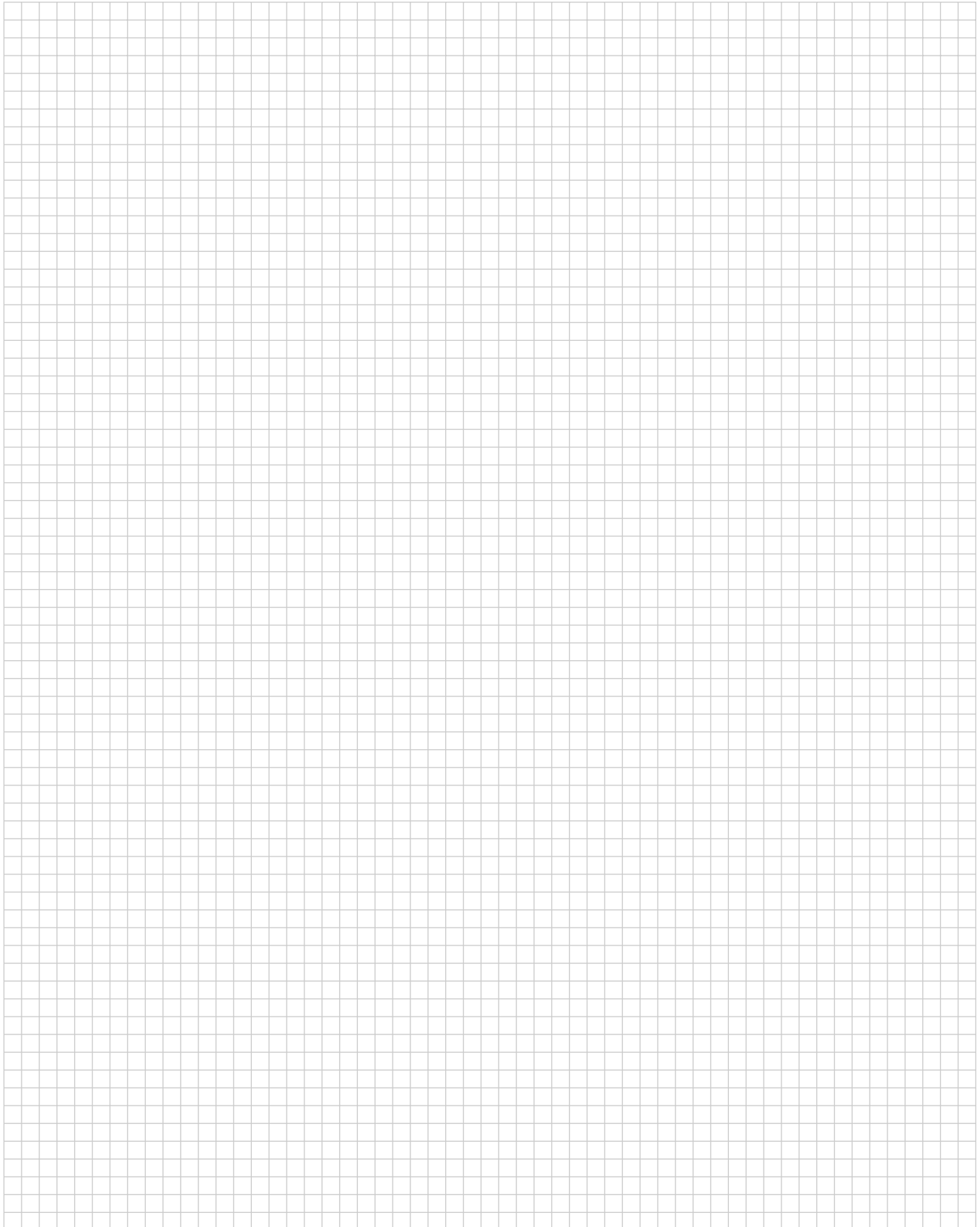
Color — Black

Contact Material — Phosphor bronze

Solder Tail Plating — Tin-lead

Shield Material — Carbon steel

Shield Plating — Tin-cobalt

Engineering Notes

CHAMP .085 Centerline Miniature Ribbon Connector Systems (Ribbon Cable, Standard CHAMP Connectors, Centronics, IEEE 488)

The CHAMP Connector is fully intermateable and interchangeable with existing connectors of a similar design. Applications for this type of connector are widely diversified and include all phases of the Telecommunications industry, including original telephone manufacturing, Operating Telephone Companies, Cable Reclamation, Cable Manufacturing and Bay Connectorization. In addition, the CHAMP Connector line is ideally suited for use in computer terminals, test equipment, business and copying machines, telemetering and various equipment used in the security industry.

The CHAMP Connector product line includes not only the network of Standard CHAMP Connectors, but

also a growing network of Shielded CHAMP connectors and other capabilities to meet various Federal Communications Commission (FCC) requirements for the control of electromagnetic interface (EMI).

This catalog is organized to provide you with the basic information necessary to select the CHAMP connector system best suited for your specific application. It contains general information to acquaint you with the complete family of connectors, accessories and application tooling.

Illustrations and descriptions are provided in this catalog to assist in the selection of a connector and appropriate hardware and accessories recommended for the most common applications.

Included is information on insulation displacement concept (IDC) connectors and printed circuit board connectors which are designed for specific field and industrial applications. Tyco Electronics offers connectors for Small Computer Systems Interface (SCSI) application. Our 50-position Shielded CHAMP Connectors with bail lock hardware serves this important standard.

Part numbers are contained for all individual plugs and receptacles with their vital dimensions. Part numbers for the various types of mounting hardware are also contained. Panel cutout dimensions are provided for all connector configurations for panel mount applications.

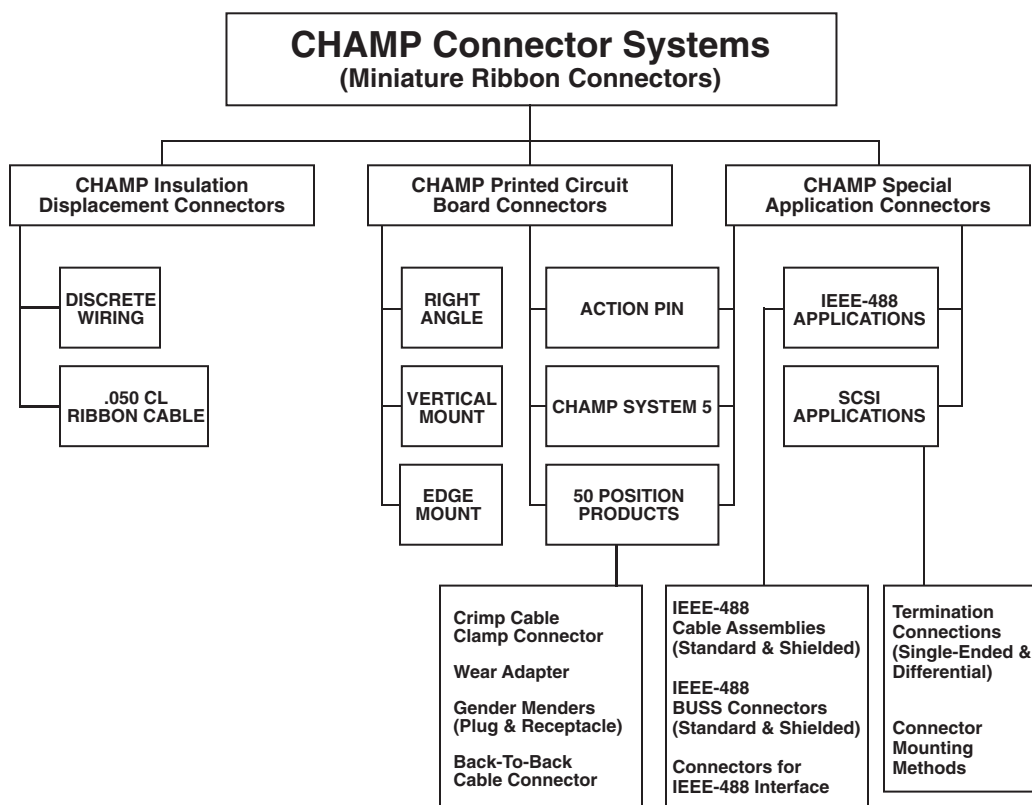
All accessory items are illustrated and dimensioned. These include standard

snap-on strain relief covers, standard slide-on covers, tapered slide-on covers, snap-on strain reliefs and dust covers.

Since your specific application will determine the degree of semi-automatic or manual applicator tooling required, complete specifications on applicator tooling are included in the applicator tooling section.

If you have an unusual request or application, Tyco Electronics welcomes the opportunity to help you solve it. Ask your Tyco Electronics Sales Engineer, or contact Tyco Electronics at the numbers listed below.

Bellcore/Telecordia GR-1217-CORE Generic requirements for separable electrical connectors used in telecommunications hardware.



CHAMP Cable Connectors have been classified by Underwriters Laboratories for use in "Environmental Air Spaces as described in Articles 300-22C and 800-3D of the National Electrical Code".

CHAMP Cable Connectors have been Listed by Underwriters Laboratories for use as Communication Circuit Accessories File No. E81956



Recognized under the Component Recognition Program of Underwriters Laboratories Inc., File No. E-28476



Certified by Canadian Standard Association File No. LR 16455



Conforms to FCC Rules, Part 68, Subpart F.

Need more information?

Call Technical Support at the numbers listed below.

Technical Support is staffed with specialists well versed in Tyco Electronics products. They can provide you with:

- Technical support
- Catalogs
- Technical Documents
- Product Samples
- Authorized Distributor Locations

Use of CHAMP connector systems involves other important decisions; choice of locking hardware, and choice of strain relief system/covers. Since the finished connection includes two connector halves (plug/male and receptacle/female), careful planning is essential to mechanically protect contact terminations and to maintain electrical integrity of mated connectors.

Locking Hardware Options

Locking hardware is used to secure mating CHAMP connectors and to prevent unintentional separation. The following choices grew from widely-varied application needs—for reasons of economics, convenience, sophistication, or standardization, for example. Refer to Instruction Sheet IS 3160.

Locking Latch (CHAMP-LOK Connector Design)

Standard CHAMP connectors (except those for IEEE and shielded applications) are provided with guide tracks and slots (on plugs) and lead-in ramps (on receptacles) to allow use of a simple metal locking clip for securing mated connectors. The U-shaped locking latch is designed in three sizes—with the same basic part number, but with different dash numbers: No. 552723-1 is used for 36- and 50-position connectors, 552723-2 for 14- and 24-position connectors, and 552723-3 for 64-position connectors.

No tools are required for this locking system. Simply slide the latch onto guide tracks until tabs snap into slots. As connector halves are mated, tabs engage with lead-in ramps and spring over locking shoulder into receptacle slots. Locking is assured by an

audible click. To release, push the latch forward to free tabs from slots. Note that locking latches cannot be used in rear-panel-mount applications because of panel interference, nor can they be used with CHAMP shielded and competitive connectors. However, when CHAMP-LOK latches are used in conjunction with snap-in strain relief covers (panel-mount applications only), no other hardware is necessary.

Screw Lock Hardware

Screw lock hardware is generally used in sensitive or sophisticated applications *where positive locking is required*—to secure connectors to PC boards, to panels, and/or to each other. In cable-to-cable applications, two captive screws threaded into pre-tapped holes are generally the only screw lock requirements. In mounted applications, receptacle assemblies are usually fastened to boards or panels—with standoff screws, nuts, and bolts. The head of this special standoff screw has a threaded hole that accepts a captive screw, used to secure the mating connector. Screw lock hardware kits vary with connector types and applications—panel or board thickness, front- or rear-panel mount, for example.

Bail Lock Hardware (Standard or Bent)

Bail Lock hardware provides both locking and quick-release capabilities at both ends of mated connectors. *Flanges on CHAMP plug connectors must be open ended for all bail lock applications.* The open-end flanges accept bail clips (straight or bent 90°) mounted to a mating

receptacle connector. Standard bail clips are used where access to lock and release is not a problem. Bent bail locks are used primarily with right angle (90°) cable terminations where space is limited. Typical hardware kits include bail clips, flat and lock washers, mounting screws and nuts.

CHAMP Connectors with Integral Latches

These special CHAMP connectors are designed with an integral latching system that eliminates the need for additional locking hardware. Receptacle assemblies are preassembled with two plated steel spring catches (one at each end) that latch into cutout slots in mating plug connectors. To release a mated pair, simply depress catches into recessed areas and disengage. Note, however, that integral latches are not repairable or replaceable. Integral-latch connectors are presently available in 24-, 36-, 50- and 64-position sizes.

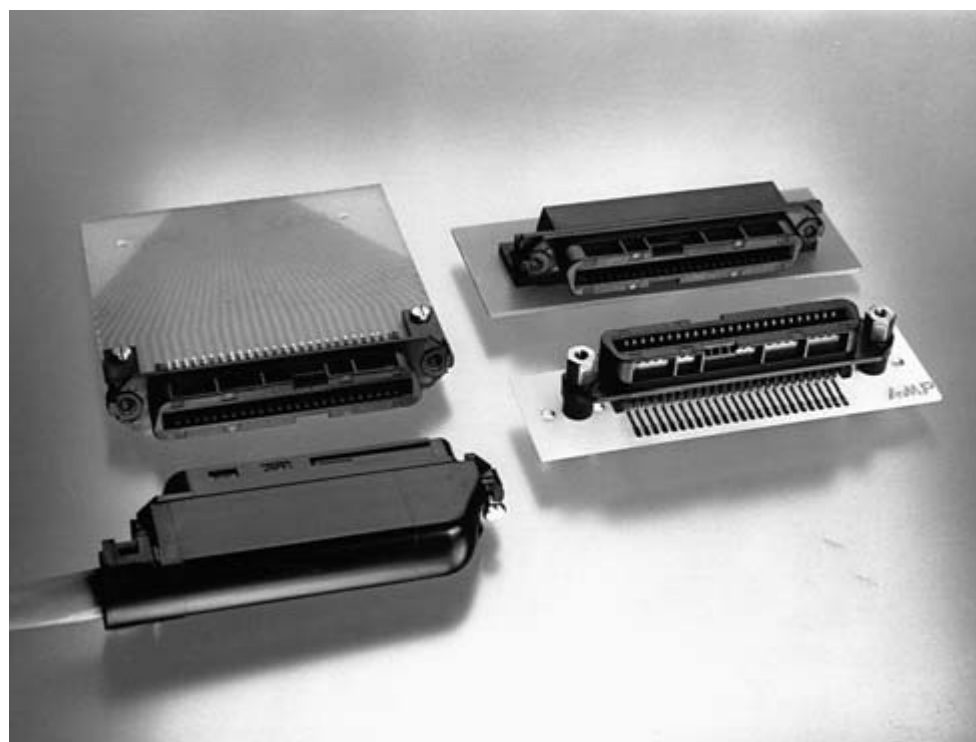
J-Hook Hardware

The J-hook is a precision-formed metal bracket used as an alternate quick-fastening method for assembly hardware. Two tabs fit into recesses in the connector housing flange for screw-fastening. The inverted end of the J-hook snaps on the end of a mating connector, and holds it in place. This hardware is also used in confined areas instead of bent bail lock—with 90° two-piece, low- or standard-profile strain relief covers.

CHAMP Printed Circuit Board (PCB) Connectors

Product Facts

- Capable of being used with single- or double-sided printed circuit boards
- Eliminates the need to hand solder, except for Edge Mount Connectors
- Connectors fully intermateable with others of similar design
- UL 94V-0 self-extinguishing thermoplastic housings and accessories
- Connectors available in 14, 24, 36, 50 and 64 positions with a choice of mounting methods: screw, bail mount, or locking latch types
- Capable of accommodating printed circuit board thicknesses of .062 [1.57], .093 [2.36] or .125 [3.18]
- Diversified applications throughout the following markets — medical equipment, data control systems, telephone interconnect systems and electronic instrumentation (commercial and industrial)
- Operating temperature range of -40°C to +105°C



CHAMP Printed Circuit Board Connectors are fully intermateable with existing connectors of a similar design. They are capable of accommodating printed circuit board thicknesses from .062-.125 [1.57-3.18].

Applications for this type of connector are widely diversified and are used in the following markets:

- Medical Equipment
- Data Control Systems
- Telephone Interconnect Systems
- Electronic Instrumentation (Commercial and Industrial)

The connector is designed for high density wave solderable applications, eliminating the need for hand soldering, except for Edge Mount Connectors and can be applied to either single- or double-sided boards. The surface mounting area is minimal and allows full usage of available printed circuit land area.

These connectors are available in 14, 24, 36, 50 and 64 positions with a choice of mounting methods for your specific needs, i.e. screw, bail mount or locking latch types. Board mounting for Right Angle Connectors is accomplished by nut and bolt, pop riveting or an optional self-tapping screw

arrangement. Edge and Vertical Mount Connectors are board mounted by a wide choice of hardware applicable to your specific applications.

The connector requires minimum hardware and installation time and is compatible with conventional printed circuit mass production soldering processes, thereby providing cost savings.

For additional information concerning the CHAMP Printed Circuit Board Connectors, contact your Tyco Electronics Sales Engineer or contact Tyco Electronics at the numbers listed below.

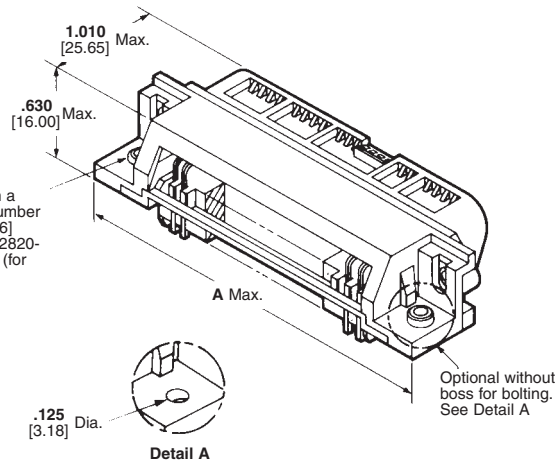
CHAMP PCB Connectors, Right Angle Connector Specifications

Material and Finish

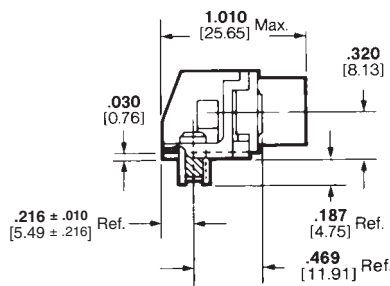
Housing, Bracket, Plate and Comb — Black thermoplastic, 94V-0 rated

Terminal — Selectively plated gold over nickel plated high strength copper alloy, tin plated tails

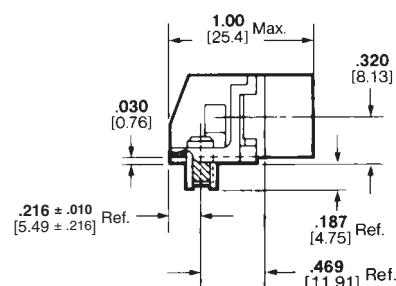
.102 [2.59] Dia. Ref. (for use with a No. 4 self-tapping screw) Part Number 552820-1 for .062-.093 [1.57-2.36] board thickness Part Number 552820-2 for .125 [3.18] board thickness (for thru-bolt mounting).



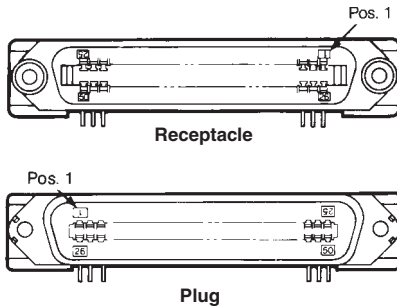
Receptacle-Side View



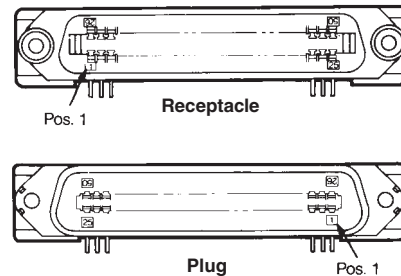
Plug-Side View



Standard Orientation



Reverse Orientation



Self-Tapping

No. of Pos.	Dim. A	Part Numbers			
		Standard Orientation		Reverse Orientation	
		Receptacle	Plug	Receptacle	Plug
14	1.750 44.45	552738-1	—	552738-2	—
24	2.175 55.25	552740-1 552791-1 ¹	552741-1	—	—
36	2.685 68.20	552742-1	552743-1	—	—
50	3.280 83.31	552725-1 ²	552726-1	552725-3	552726-3
64	3.875 98.43	552744-1	552745-1	552744-2	—

¹ For IEEE-488 applications.

² For Part Number 552725-1, net wt = 24.384 g.

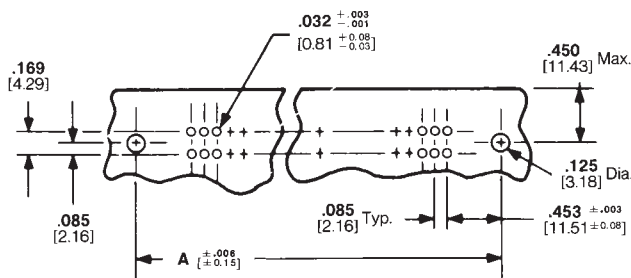
Thru-Bolt Mounting (See Detail A)

No. of Pos.	Dim. A	Part Numbers	
		Standard Orientation Receptacle	Reverse Orientation Receptacle
24	2.175 55.25	—	552791-4 ¹
36	2.685 68.20	552742-3	—
50	3.280 83.31	552725-2	—
64	2.175 55.25	—	552741-1

¹ For IEEE-488 applications.

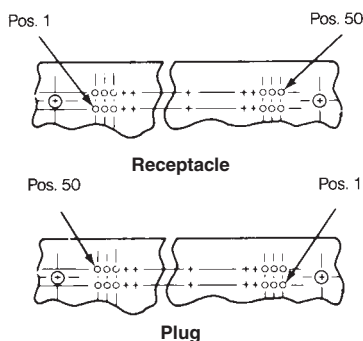
CHAMP PCB Connectors, Right Angle Connector Specifications (Continued)

Recommended PC Board Mounting Dimensions

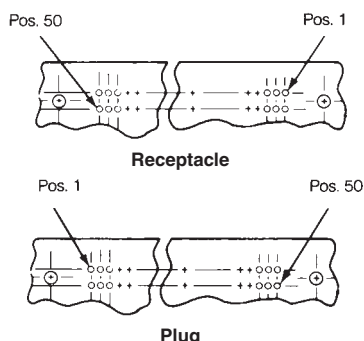


No. of Positions	Dimension A
14	1.416 35.97
24	1.842 46.79
36	2.352 59.74
50	2.946 74.83
64	3.542 89.97

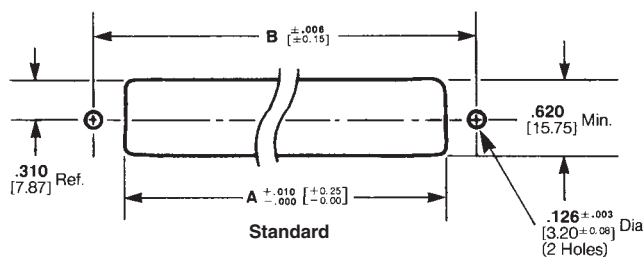
Standard Orientation



Reverse Orientation

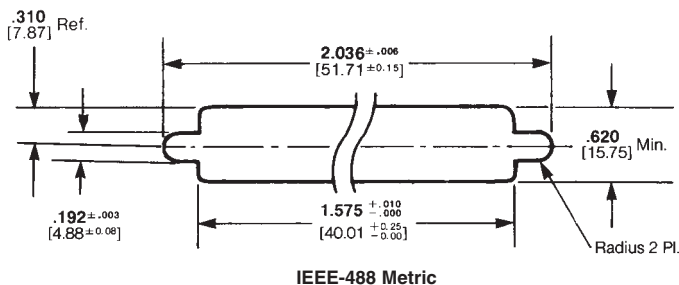


Panel Mount Cutout Dimensions (Rear Panel Mount Only)



No. of Positions	Dimensions	
	A	B
14	1.152 29.26	1.416 35.97
24	1.575 40.01	1.842 46.79
36	2.085 52.96	2.352 59.74
50	2.700 68.58	2.946 74.83
64	3.275 83.19	3.542 89.97

Panel thickness range: .062 [1.57] for rear panel mount applications. For 24-position IEEE-488 metric version, .062-.093 [1.57-2.36] may be used.



CHAMP PCB Connectors, Right Angle Connector Hardware Kits

Only fastening hardware supplied, other items shown for reference purposes



Screw Lock Hardware Kit
Part Number 552631-1
Rear Panel Mount Only
(One kit required per assembly)
For PC board-to-panel applications
(Panel thickness .062 [1.57] max.)



Bent Bail Lock Hardware Kit
Part Number 552561-4
(For use with 90° Strain Relief Cover)
(One kit required per assembly)
For PC board-to-cable applications



Bail Lock Hardware Kit
Part Number 552561-3
(For use with 180° Strain Relief Cover)
(One kit required per assembly)
For PC board-to-cable applications



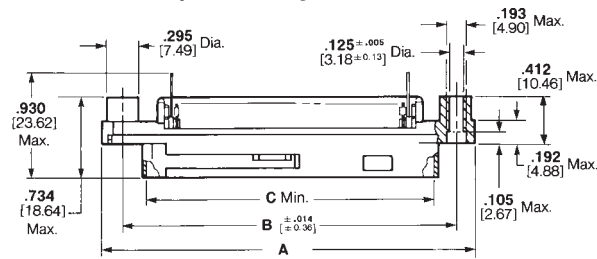
CHAMP-LOK Connector Kit
Part Numbers 552723-1 (36- and 50-Position),
552723-2 (14- and 24-Position)
and 552723-3 (64-Position Only)
(One latch required per assembly)
For PC board-to-cable applications



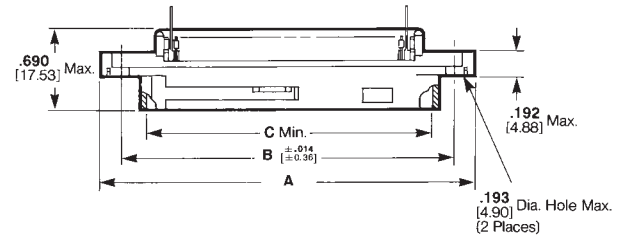
Screw Lock Hardware Kit
Part Number 229911-1
(two required per assembly)
For PC board-to-cable applications

- Notes:**
1. Recommended right angle connector PC board mounting hardware to be a No. 4 self-tapping screw, Part Number 552820-1 for .062-.093 [1.57-2.36] and Part Number 552820-2 for .125 [3.18] board thickness.
 2. Metric hardware is also available for use with the 24-Position Right Angle Receptacle per IEEE-488 Part Number 552791-1.
 - For Standard Mount—Part Number 552633-3
 - For Rear Panel Mount—Part Number 552633-4

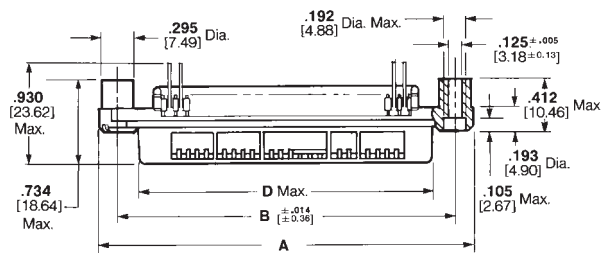
Plug
Vertical Mount Style PV—Plug, Screw Lock



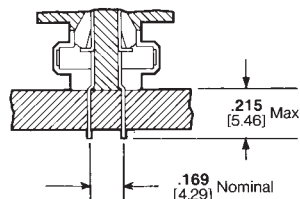
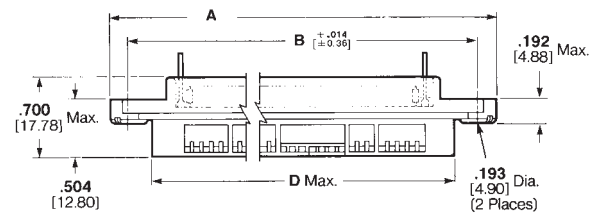
Edge Mount Style PE—Plug, Screw Lock



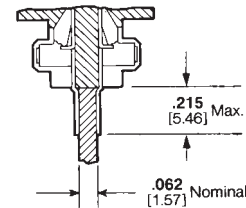
Receptacle
Style RV—Receptacle, Screw or Bail Lock



Style RE—Receptacle, Screw or Bail Lock

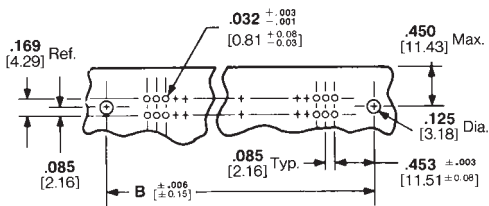


End View
Vertical Mount



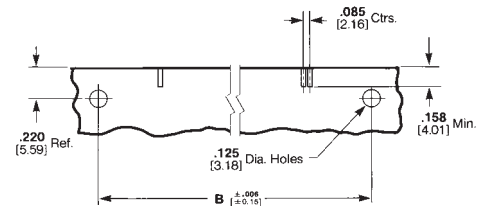
End View
Edge Mount

PC Board Thickness Range: .062-.125 [1.57-3.18]



Recommended PC Board
Mounting Dimensions

PC Board Thickness .062 [1.57]



Recommended PC Board
Mounting Dimensions

No. of Positions	Dimensions				Part Numbers			
	A	B	C	D	Plug		Receptacle	
					Style PV Vertical Mount	Style PE Edge Mount	Style RV Vertical Mount	Style RE Edge Mount
14	1.750 44.45	1.416 35.97	1.001 25.43	1.000 25.40	552209-1	—	552212-1	—
24	2.175 55.25	1.842 46.79	1.426 36.22	1.425 36.20	552221-1	—	552224-1 ¹	—
36	2.685 68.20	2.352 59.74	1.936 49.17	1.935 49.15	552232-1	—	552235-1	552241-1
50	3.280 83.31	2.946 74.83	2.531 64.29	2.530 64.26	552116-1	552126-1	552118-1	552130-1
64	3.875 98.43	3.542 89.97	3.126 79.40	3.125 79.38	552243-1	—	552246-1	—

¹ .189 [4.80] Diameter Mounting Hole, for IEEE Application.

² Printed circuit board material—glass-filled polyester 94V-0 rated.

³ Order all hardware required separately.

CHAMP PCB Connectors, Vertical Mount Connector Hardware Kits

Only fastening hardware supplied, other items shown for reference purpose



Screw Lock Hardware Kit—Part Number 552563-1
(One kit required per assembly)



Bent Bail Lock Hardware Kit—Part Number 552562-2
(One kit required per assembly)



Bail Lock Hardware Kit—Part Number 552562-1
(One kit required per assembly)



J-Hook Screw Lock Hardware Kit—Part Number 552690-1
(One kit required per assembly)

CHAMP PCB Connectors, Edge Mount Connector Hardware Kits

Only fastening hardware supplied, other items shown for reference purpose

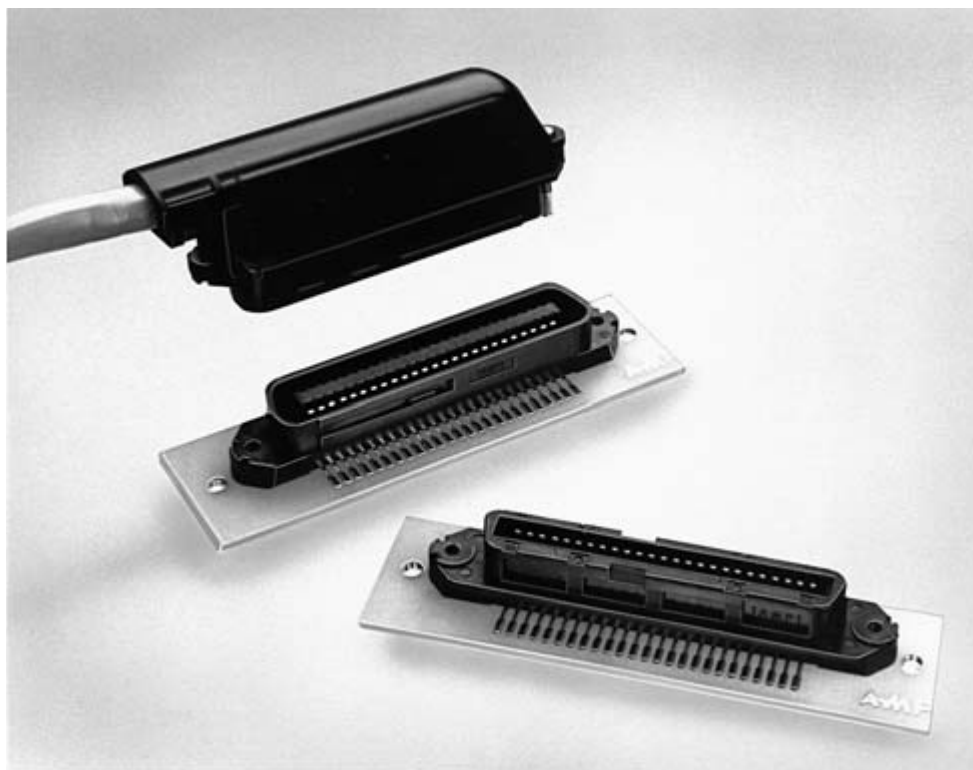


Screw Lock Hardware Kit—Part Number 552675-1
(One kit required per assembly)

CHAMP PCB Connectors, ACTION PIN Connectors

Product Facts

- Capable of being used with single- or double-sided printed circuit boards
- Eliminates the need to hand solder, except for Edge Mount Connectors
- Connectors fully inter-mateable with others of similar design
- UL 94V-0 self-extinguishing thermoplastic housings and accessories
- Capable of accommodating printed circuit board thicknesses of .062 [1.57], .093 [2.36] or .125 [3.18]
- Diversified applications throughout the following markets — medical equipment, data control systems, telephone interconnect systems and electronic instrumentation (commercial and industrial)
- Operating temperature range of -40°C to +105°C



ACTION PIN connectors for printed circuit board applications combine the high reliability of the CHAMP Insulation Displacement connector interface with the utilization and cost savings of ACTION PIN terminals. They are available in both plug and receptacles in 14-, 24-, 36-, 50- and 64-position sizes.

The connectors are supplied preloaded with contacts and a plastic cover which serves as the bearing surface to press the connector into the board. Rapid assembly is made possible by use of a simple

arbor tool. The plastic cover also serves as a dust cover which may be left in place until ready to use.

The connectors may be mounted on PC boards with a thickness of .062 [1.57] to .125 [3.18]. They are designed for interface with standard CHAMP IDC cable-to-panel plugs or receptacles and are available for use with screw lock, bail lock or unique CHAMP-LOK connector locking clip hardware.

The design of the ACTION PIN terminal permits insertion into printed circuit boards having either plated-thru or

unplated holes. In plated-thru holes, completely reliable termination may be accomplished either by press fit of the pins or by both press fitting and subsequent conventional soldering. In unplated holes, the pins must be soldered in place.

For the connectors with self-retained contacts, hardware to secure connector to the PC board may not be required if unmating force of mating connectors does not exceed 1 lb. [4.45 N] per terminal (50 lbs. [222.4 N] for 50 positions.)

CHAMP PCB Connectors, ACTION PIN Connectors (Continued)

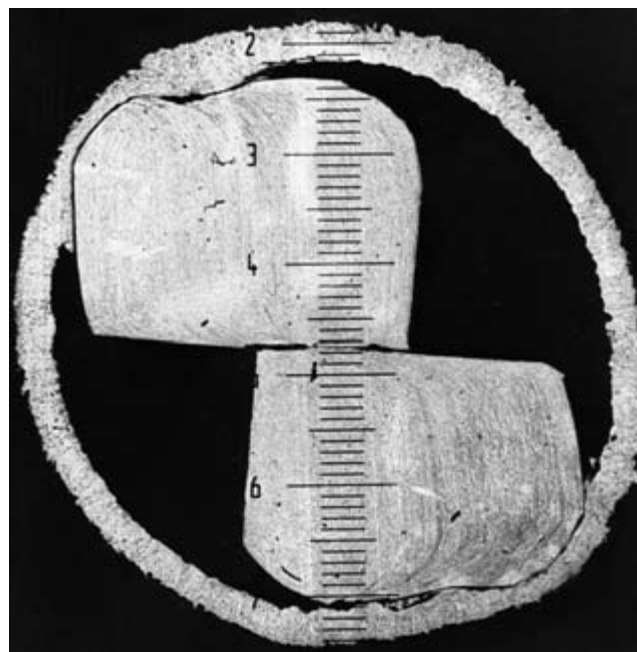
ACTION PIN connectors make a gas-tight press-fit connection when properly applied in plated thru holes. Proper hole diameters and plating thickness must be maintained to assure optimal performance.

No damage to plated-thru holes

Rupturing just one layer of a PC board can render the board useless. The fact that there are frequently as many as 10,000 plated-thru holes in a multilayer board underlies the importance of using a pin-joining method which is inherently rupture-free.

Relaxed tolerances

ACTION PIN contacts allow printed circuit panels to be processed more economically by permitting greater tolerance in hole size. Finished plated-thru hole diameters .030-.035 [0.76-0.89] for press fit are acceptable as illustrated at right.

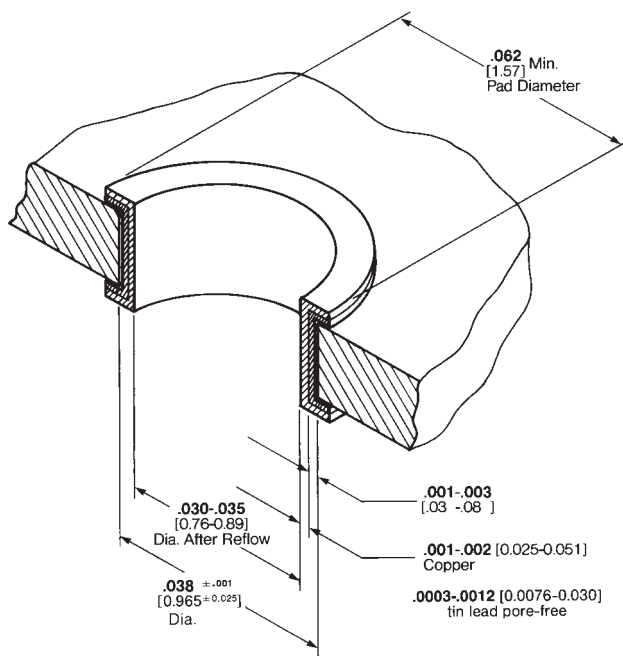


Gas-tight, stored-energy connection

The spring properties of the ACTION PIN contact assure a constant supply of stored energy to keep the pin securely in the hole and to keep the electrical contact between the pin and hole wall gas tight.

Multiple insertion

Insertion forces significantly lower than interference-fit pins allow mass insertion of ACTION PIN contacts with a simple insertion tool. ACTION PIN contacts require an insertion force of less than 40lb. [177.9N] per contact.

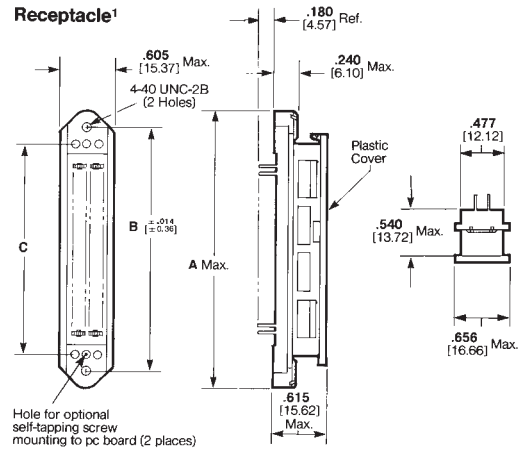
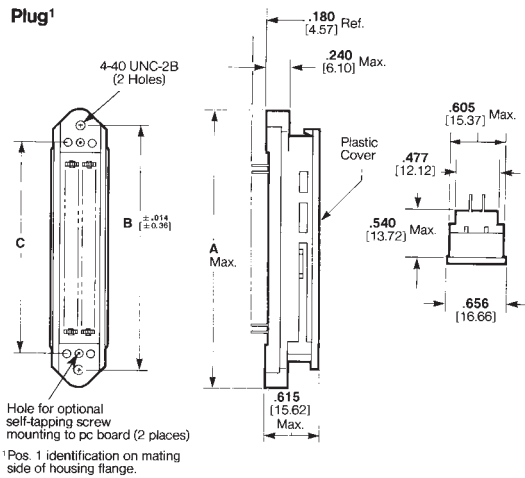


Consult Handbook HB 5697 for assembly procedures.

For more information on Tyco Electronics ACTION PIN Contacts request specification 108-26003.

Plated-Thru Hole Dimensions

Hole Type	Drill Size	Drilled Hole Dia. ±.0010 [±0.025]	Plating Thickness		Hole Dia. After Plating	Copper Hardness (Knoop)	Reference Pad Diameter
			Copper	Tin/Lead			
Plated Thru	No. 62 or 0.98 mm	.038 0.97	.001-.002 0.03-0.05	.0003-.0012 .0076-.030	.030-.035 0.76-0.89	150 Max.	.062 1.57
Non-Plated Thru	No. 62 or 0.98 mm	.038 0.97	—	—	—	—	.062 1.57



No. of Positions	Dimensions			Part Numbers	
	A	B	C	Plug	Receptacle
14	1.750 44.45	1.416 35.97	1.016 25.81	—	553443-1
24	2.175 55.25	1.842 46.79	1.442 36.63	553444-2	553443-2
36	2.685 68.20	2.352 59.74	1.952 49.58	553444-3	553443-3
50	3.280 83.31	2.946 74.83	2.546 64.67	553444-4 554758-11,2	553443-4 554753-11 557984-13
64	3.875 98.43	3.542 89.97	3.142 79.81	553444-5 554759-11	553443-5

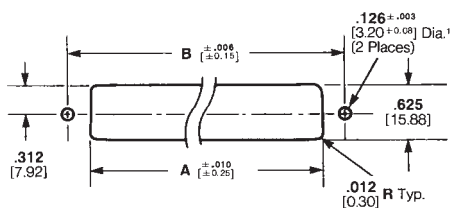
¹ Connector contains self retained terminals and net wt. = 15.946 g.

² For capacitive filtered connector, order Part Number 93510-X.

³ Shielded for screw lock application.



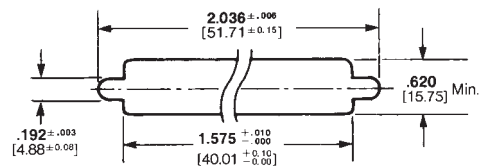
Panel Cutout Dimensions (Rear Panel Mount)



No. of Positions	Dimensions	
	A	B
14	1.151 29.24	1.416 35.97
24	1.575 ¹ 40.01	1.842 46.79
36	2.085 52.96	2.352 59.74
50	2.700 68.58	2.946 74.83
64	3.275 83.19	3.542 89.67

¹ See Panel Cutout for IEEE-488.

Panel Cutout for 24-Position IEEE-488 Metric



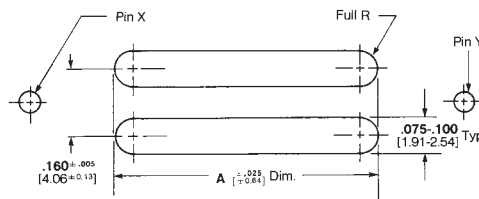
Note: Panel thickness range .062-.093 [1.57-2.36] for metric applications; .062 [1.57] for standard 4-40 hardware applications.

**ACTION PIN
PC Board Nesting Fixture
Requirements**

Preferred Material: G-10 or FR-4 glass filled epoxy, aluminum is acceptable.

Note: PC board slot pattern shall be true positioned on fixture within .010 [0.25] by pin X and pin Y. Pin location and size to be determined by customer.

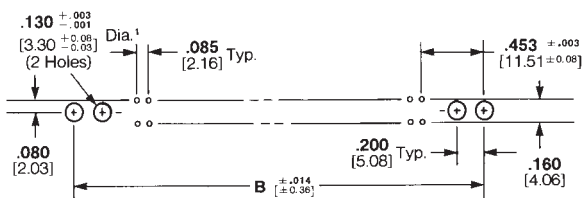
Minimum of .275 [6.99] slot depth minus customer board thickness.



No. of Positions	Dimension
	A
14	.625 15.88
24	1.050 26.67
36	1.560 39.62
50	2.155 54.74
64	2.750 69.85

CHAMP PCB Connectors, ACTION PIN Connector Specifications (Continued)

**Recommended PC Board
Mounting Dimensions**

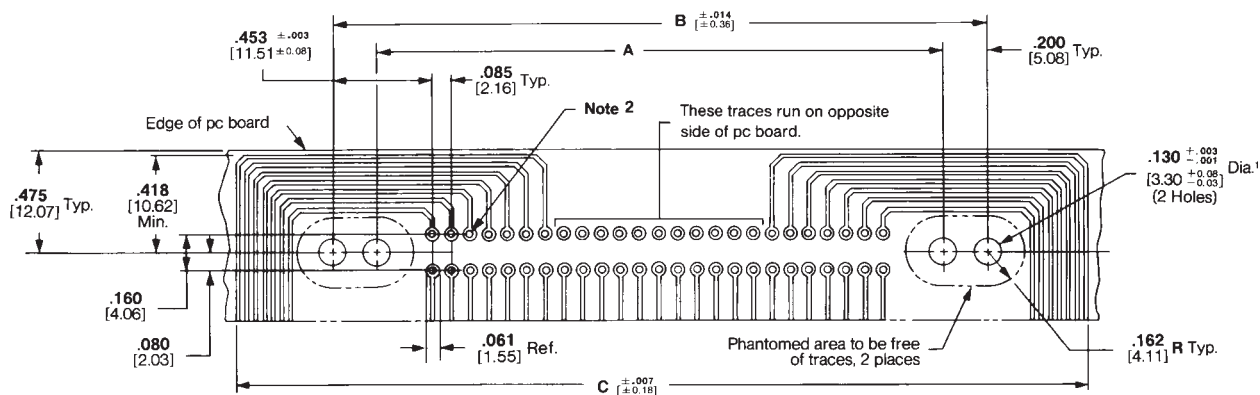


¹ For IEEE-488 applications hole in PC board to be .171 [4.34] to accommodate standoff.

Notes:

1. Recommended PC Board Hole Information:
 - A. Before thru-hole plating—.037-.039 [0.94-0.99] Dia.
 - B. Copper thru-hole plating thickness—.001-.002 [0.03-0.05]
 - C. Tin-Lead thru-hole plating thickness—.0003-.0012 [.008-0.030] pore free
 - D. Finished hole after reflow—.030-.035 [0.76-0.89] Dia.
 - E. Non-plated thru-hole—.032-.034 [0.81-0.86] Diameter
 - F. Terminal holes located within true position of .008 [0.20]
2. Optional .125 [3.18] Dia. hole for mounting with self-tapping screw for .062 [1.57] and .093 [2.36] PC board thk. use 1/4" [6.35 mm] screw length; for .125 [3.18] PC board thk. use .312 [7.93] length.

**ACTION PIN
Double Sided PC Board Dimensions**



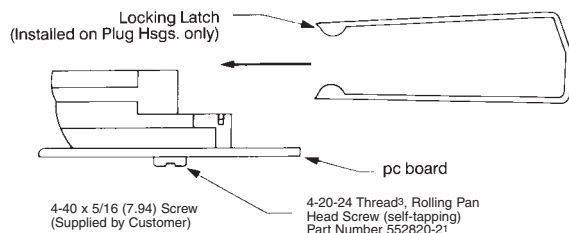
¹ For IEEE-488 applications hole in PC board to be .171 [4.34] to accommodate standoff.

No. of Positions	Dimensions		
	A	B	C
14	1.016 25.81	1.416 35.97	1.852 47.04
24	1.442 36.63	1.842 46.79	2.358 59.89
36	1.952 49.58	2.352 59.74	3.028 76.91
50	2.546 64.67	2.946 74.83	3.782 96.06
64	3.142 79.81	3.542 89.97	4.458 113.23

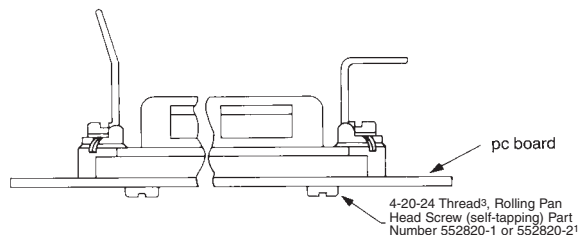
- Notes:**
1. Optional hole for mounting with self-tapping screw—.125 [3.18] Dia. (2 Places).
 2. Suggested printed circuit board hole information.
 - A. Before thru-hole plating—.037-.039 [0.94-0.99] Dia.
 - B. Copper thru-hole plating thickness—.001-.002 [0.03-0.05]
 - C. Tin-Lead thru-hole plating thickness—.0003-.0012 [.008-0.030] pore free
 - D. Finished hole after reflow—.030-.035 [0.76-0.89] Dia.
 - E. Non-plated thru-hole—.032-.034 [0.81-0.86] Diameter

CHAMP PCB Connectors, ACTION PIN Connector Hardware

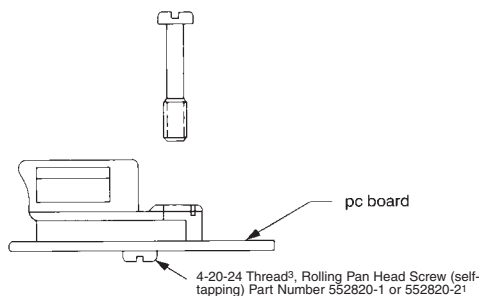
Only fastening hardware supplied. Other items shown for reference purposes.



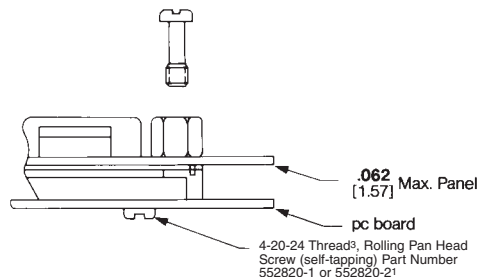
CHAMP-LOK Connector Hardware
Part Number 552723-1 (36- or 50-Position Locking Latch)
Part Number 552723-2 (14- or 24-Position Locking Latch)
Part Number 552723-3 (64-Position Locking Latch)
(one latch required per assembly)
For PC Board-to-Cable applications



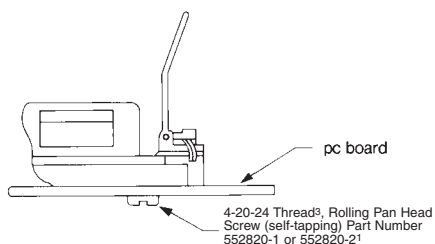
Bent Bail Lock Hardware Kit
Part Number 552561-4
(one kit required per assembly)
For PC Board-to-Cable with 90° cover applications



Screw Lock Hardware
Part Number 229911-1
(two screws required per assembly)
For PC Board-to-Cable applications



Screw Lock Hardware Kit
Part Number 552631-1
(Rear panel mount applications)
(one kit required per assembly)
For PC Board-to-Panel-to-Cable applications



Bail Lock Hardware Kit
Part Number 552561-3
(one kit required per assembly)
For PC Board-to-Cable with 180° cover applications

¹ Part Number 552820-1 used for board thickness .062-.093 [1.57-2.36]; Part Number 552820-2 used for board thickness .125 [3.18].

² Hole in PC board .171 [4.34] to accommodate standoff.

³ If unmated force of mating connector does not exceed 1 lb. per terminal, 4-40 rolling pan head screw may not be required (for self-retained terminals only.)

Shielded CHAMP PCB Connectors

CHAMP .085 Centerline
Miniature Ribbon Connector Systems

3

Product Facts

- Excellent protection from electromagnetic interference or electrostatic discharge to sensitive circuitry
- Connectors compatible and intermateable with all others of similar design
- Available in three different panel-mount styles
- The shielded right angle, edge-mount and vertical-mount CHAMP connectors for PC board application are rear panel-mounted
- Choice of fastening hardware—standard screw lock, bail lock, metric screw locks per IEEE-488 applications
- Connectors available in kit form or preassembled versions
- Thick die-cast metal shell offers superior shielding over a wide frequency range
- Shell protects equipment from inadvertent electrostatic discharge
- Housings are stackable
- Applied cost savings
- Available in 24, 36 and 50 positions



Shielded CHAMP Connectors afford excellent protection from electromagnetic interference or electrostatic discharge to sensitive circuitry. These connectors are completely compatible and intermateable with all others of a similar design, yet they are unique because of their superior construction.

They are available in three different panel-mount styles. Each style consists of an appropriate CHAMP connector and a rugged die-cast metal shell. The shielded right angle, edge mount and vertical mount CHAMP connector versions for PC board applications must be rear panel-mounted.

A choice of fastening hardware is available in each of the styles noted above.

They include standard screw lock, bail lock or metric screw lock as required by IEEE-488.

Each connector is shipped in bulk or individual kit form and consists of the die cast metal shell and appropriate style connector. After PC board mounting, it is easily installed to the panel with the appropriate hardware kit, which is ordered separately.

The thick die-cast metal shell offers superior shielding over a wider frequency range than drawn sheet metal or plated/filled plastics. This shell also protects the equipment from inadvertent electrostatic discharge because the die-casting, together with the fastening hardware, assures a reliable chassis ground connection.

Due to its inherent rigidity, the die-cast housing may be stacked without distortion or bending of connector flanges and panel. This advantage contributes to the overall effectiveness of the system.

The Shielded CHAMP right angle PC board connector offers a low-cost transition to or from double-sided circuitry, the Shielded CHAMP edge-mount and vertical-mount connectors also allow accessibility to both sides of double-sided boards. All three of these styles are available in 24-, 36- and 50-position sizes.

A 50-position Shielded ACTION PIN receptacle is also available. See page 78 for part numbers and dimensions.

Shielded CHAMP Right Angle PCB Connectors

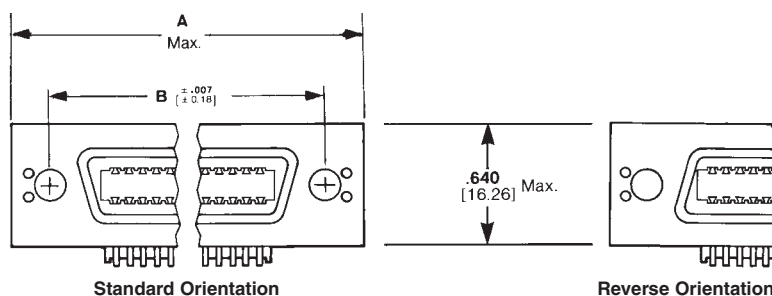
Preassembled Screw Lock

Material and Finish

Housing, Bracket, Connector Comb and Terminal Support Plate — Thermoplastic (black)

Terminals — Selectively plated gold over nickel plated high strength copper alloy, tin plated tails

EMI Shield — Nickel plated die casting

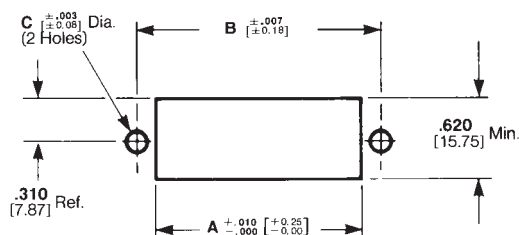


No. of Positions	Preassembled Screw Lock				
	Dimensions		Screw Size	Part Numbers	
	A	B		Standard	Reverse
24	2.205 56.01	1.842 46.79	6-32	553811-1 ¹	553811-2 ¹
50	3.305 83.95	2.946 74.83	4-40	553813-3 ²	553813-4 ²

¹ Can be used with Interface Bus Application per IEEE-488.

² For capacitive filtered connector, order Part Number. 93533-X.

Recommended Panel Cutout (Rear Panel Mounting Only)



No. of Positions	Preassembled Screw Lock		
	Dimensions		
	A	B	C
24	1.575 40.01	1.842 46.79	.152 3.86
50	2.700 68.58	2.946 74.83	.126 3.20

Panel thickness range: .062 [1.57] max. Loose Piece and Preassembled Connector, .062-.093 [1.57-2.36] for metric per IEEE-488 on loose piece connectors.

¹ Dimensions C=.192 ± .003 [4.88± 0.08] for metric hardware per IEEE-488 applications.

Shielded CHAMP Right Angle PCB Connectors (Continued)

Preassembled Bail Lock

Material and Finish

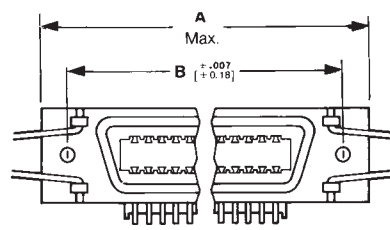
Housing, Bracket Adaptor Comb and Terminal Support Plate — Polyester, black

Bail-Clip — Passivated stainless steel

Receptacle Shield — Bright nickel over copper plated die casting

Terminals — Selectively plated gold over nickel plated high strength copper alloy, tin plated tails

Ground Bracket — Zinc plated carbon steel

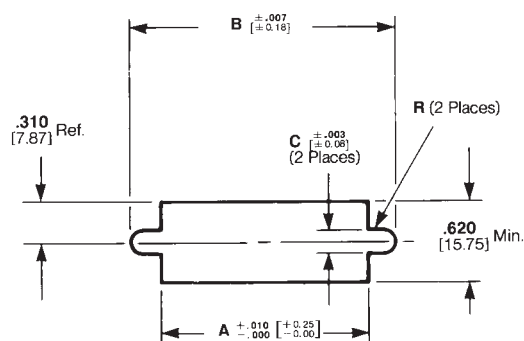


Standard Orientation

No. of Positions	Preassembled Shielded Bail Lock			Part Number Standard
	Dimensions		Screw Size	
	A	B		
36	2.710 68.83	2.352 59.74	4-40	555233-1
50	3.305 83.95	2.946 74.83	4-40	554901-11

¹ SCSI applicable

Recommended Panel Mount Cutout (Rear Panel Mounting Only)



No. of Positions	Preassembled Shielded Bail Lock		
	Dimensions		
	A	B	C
36	2.316 58.83	2.478 62.94	.126 3.20
50	2.910 73.91	3.072 78.03	.126 3.20

Panel Thickness Range: 0.62 [1.57] Max., Preassembled Connectors

Shielded CHAMP Right Angle PCB Connectors (Continued)

Board Locking Grounding

Material and Finish

Housing, Bracket Adapter Comb and Terminal Support Plate — Polyester, black

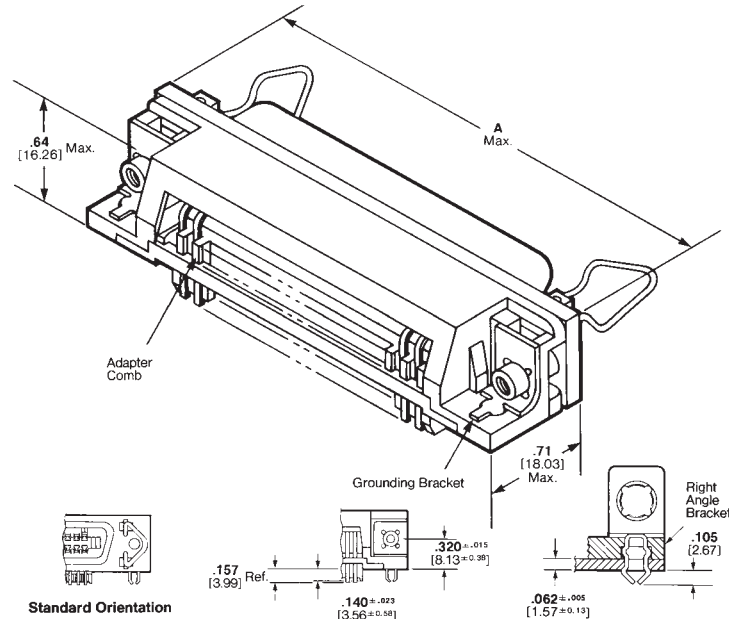
Bail-Clip — Passivated stainless steel

Receptacle Shield — Bright nickel over copper plated die casting

Terminals — Selectively plated gold over nickel plated high strength copper alloy, tin plated tails

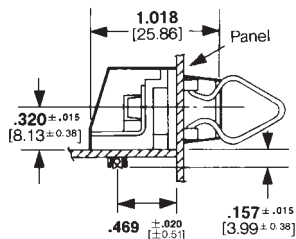
Ground Bracket — Tin-lead plated carbon steel

Note: See page 82 for Suggested Panel Cutout, Rear Panel Mounting Dimensions

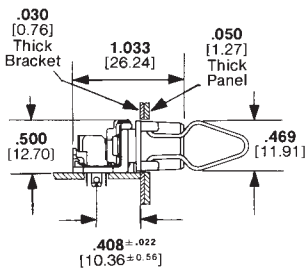


Rear Panel Mounting Detail (Shown for reference only)

Standard Profile Connector



Low Profile Connector



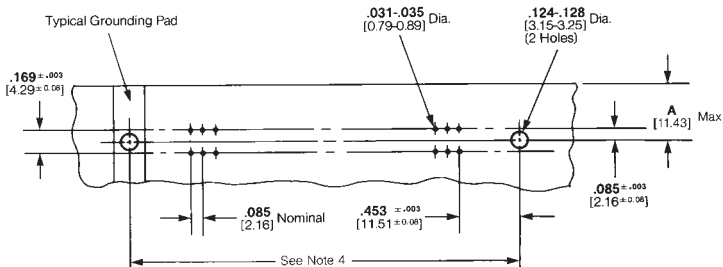
(See chart footnotes)

No. of Positions	Dimension A	Hardware Type	Screw Size	Part Numbers		
				Standard	Reverse	Low-Profile
24	2.205 56.01	Screw Lock	6-32	554923-21	554923-11	557724-16 555139-17 555139-27
36	2.715 68.96	Bail Lock	4-40	555119-11 555520-21.5	—	
50	3.320 84.33	Screw Lock	4-40	557932-28	557932-18	

Special Low-Profile Connectors—Compatible with IBM PC AT and PC XT Computer Modules

No. of Positions	Dimension A	Hardware Type	Screw Size	Part Numbers	
				Standard	Reverse
50	3.310 84.07	Bail Lock	4-40	555149-12,3	555149-33

Recommended PC Board Mounting Dimensions



1. Maximum PC board thickness is .062 [1.57], A = .450
2. SCSI applicable
3. Maximum PC board thickness is .062 [1.57], A = .386
4. 1.842 ± .006 [46.79 ± 0.15] 24 Pos. 2.352 ± .006 [59.74 ± 0.15] 36 Pos. and 2.946 ± .006 [74.83 ± 0.15] 50 Pos.
5. Has drawn metal shield
6. Shielded, standard orientation, board lock, compatible with vapor phase & IR reflow
7. Shielded with ground bracket 4-40 thread (low profile)
8. Plated Backshell

IBM, AT and XT are trademarks of IBM Corporation.

Shielded CHAMP Right Angle PCB Connector Hardware Kits

(Only fastening hardware supplied; other items shown for reference purposes.)

Material and Finish

Bracket — Zinc plated carbon steel

Pan Head Screw — Passivated stainless steel

Screw Lock — Zinc plated with yellow chromate over steel

Metric Screw Lock — Black oxide coated carbon steel

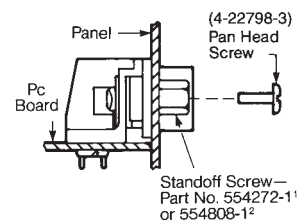


Screw Lock Hardware Kit
Part Number 554272-1
(one kit required per assembly)



Metric Screw Lock Hardware Kit
for 24-Pos. IEEE-488 Application Only
Part Number 554808-1
(one kit required per assembly)

Preassembled Shield Hardware Mounted View

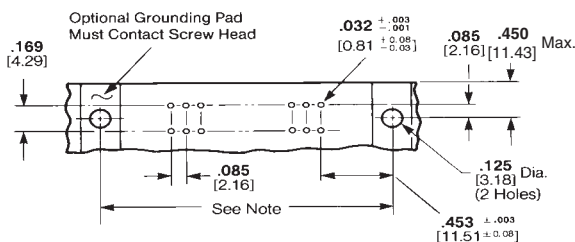


- ¹ Contains two 4-40 X .65 [16.51] long standoff screws, plus two 4-40 X .312 [7.92] long pan head screws.
- ² Contains two metric standoff screws with M 3.5 X 0.6-H (internal threads) and 6-32 UNC-2A (external threads), for IEEE-488 applications.

CHAMP .085 Centerline
Miniature Ribbon Connector Systems

3

Recommended PC Board Mounting Dimensions



Note: 1.842 ± .006 [46.79 ± 0.15] 24-Position, 2.352 ± .006 [59.74 ± 0.15] 36-Position, and 2.946 ± .006 [74.83 ± 0.15] 50-Position.

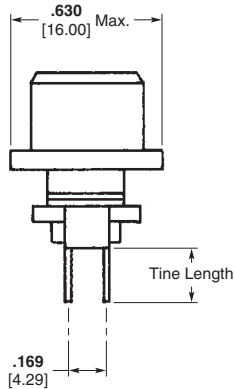
Shielded CHAMP Vertical Mount PCB Connectors

Material and Finish

Housing — Thermoplastic (black)

Terminals — Selectively plated gold over nickel plated high strength copper alloy, tin plated tails

EMI Shield — Nickel plated die casting



Screw Lock



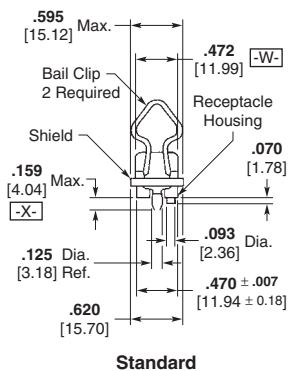
Bail Lock

No. of Positions	Tine Length	Screw Lock 6-32 Hole	Bail Lock 4-40 Hole	Board Lock w/Bail Lock
24	.115 2.92	554501-1 ¹	—	—
36	.215 5.46	—	554145-4	—
50	.180 4.57	—	—	406874-1 ²

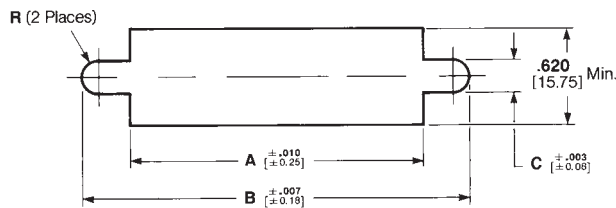
¹ Can be used with Interface Bus Applications per IEEE-488.

² See view A.

Recommended Panel Cutout for Preassembled and Metric Application per IEEE-488 (Rear Panel Mount Only)

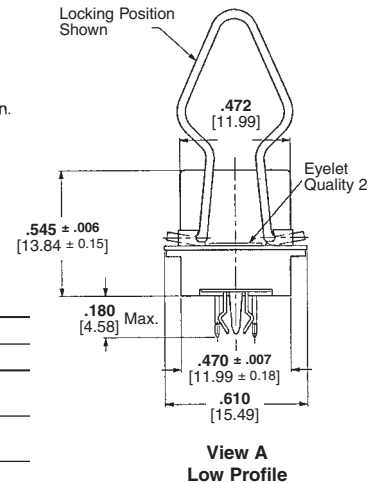


Standard



No. of Positions	Screw Lock			Bail Lock		
	A	B	C	A	B	C
24	1.575 40.01	1.994 ¹ 50.65	.152 ¹ 3.86	1.806 45.87	1.968 49.99	.126 3.20
36	2.085 52.96	2.478 62.94	.126 3.20	2.316 58.83	2.478 62.94	.126 3.20
50	2.700 68.58	3.072 78.03	.126 3.20	2.910 73.91	3.072 78.03	.126 3.20

¹ For IEEE-488 Metric Applications Dimension—B = 2.036 [51.71] (Screw Lock Only), C = .192 [4.88].



View A
Low Profile

Only fastening hardware supplied, other items shown for reference purposes.

Material and Finish

Pan Head Screw — Zinc plated steel

Metric Standoff Screw — Black oxide coated steel

Screw Lock

Part Number 554043-2 (Screw)

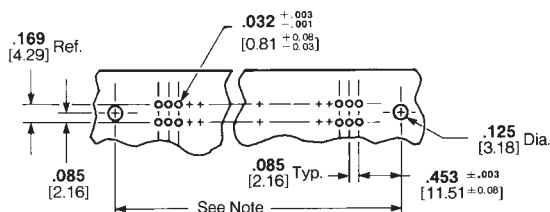


Metric
Part Number 554858-1 (Kit)

Recommended PC Board Mounting Hardware Screw Length for PC Board Thickness

Screw Length (Maximum)	PC Board Thickness
.260 6.60	.062 1.57
.290 7.37	.093 2.36

Recommended PC Board Mounting Dimensions



PC Board Thickness Range: .062-.125 [1.58-3.18]

Note: 1.842 ± .006 [46.79 ± 0.15] 24-Position, 2.352 ± .006 [59.74 ± 0.15] 36-Position, and 2.946 ± .006 [74.83 ± 0.15] 50-Position.

CHAMP Insulation Displacement Concept (IDC) Connectors

Product Facts

- Wide wire range
- Connectors available in 14, 24, 36, 50 and 64 positions with a choice of mounting methods: screw lock type, bail lock type and locking latch type
- Self-extinguishing thermoplastic housings and accessories
- Contacts on .085 [2.16] centers in dual position arrangements
- Optional dust covers and snap-on strain relief covers



CHAMP Insulation Displacement Concept (IDC) Connectors provide a low cost method of terminating unstripped solid or stranded copper wires and cables to connectors. Application for the CHAMP IDC Connectors are widely diversified and are designed for specific field and industrial applications.

Connectors and Housing

Plug and receptacle connectors are furnished pre-loaded with contacts on .085 [2.16] centers. Connectors are available in 14, 24, 36, 50 and 64 positions, in standard black housings and molded from self-extinguishing plastic material for high impact and dielectric strength. Housing material is rated at an Oxygen Index Rating of 28% minimum.

Terminals

The terminal is precision formed of high conductivity, high strength copper alloy with 30 microinch gold minimum over 50 microinch

nickel plating in contact area. The wire terminating area (rear of terminal) is stamped like a slotted reversed "U" and each leg contains a wire slot and strain relief slot with precisely controlled dimensions.

Wire Range and Types

The terminal is designed to accept 26-22 AWG [0.4-0.64 mm] solid wire and 28-22 AWG [0.08-0.4 mm²] stranded wire (7 strands). The terminal is designed to accommodate most types of insulation — PVC, polyethylene, irradiated polyethylene and polypropylene.

Covers and Strain Relief

Several types of accessories are available to complete the connector assembly and to provide strain relief and protection. Made of high impact strength thermoplastic materials, all covers and strain relief have inner ribs that confine each wire in the wire termination slots.

Testing

Extensive testing, both laboratory and actual application have been conducted on this entire product line. These tests included heat aging, temperature cycling as well as shock and vibration. Both electrical and mechanical test results have met or exceeded performance objectives and copies of these test results are available from Tyco Electronics.

Applicator Tooling

Since your specific application will determine the degree of tooling required, consult pages 128 thru 132 in the application tooling section.

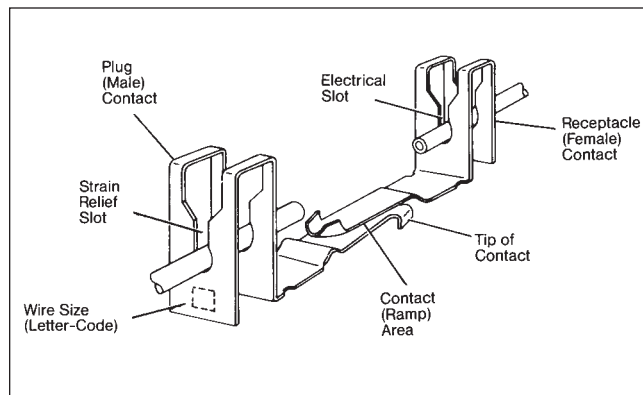
CHAMP IDC Connectors (Continued)

The Insulation Displacement Concept

The process of terminating unstripped wires and cable by using insulation displacement technology was developed for the telephone industry over two decades ago. However, Tyco Electronics was one of the first manufacturers to recognize, research, and produce slotted beam terminations for widespread commercial use. The 50-position CHAMP connector was a creditable forerunner in this reliable technique which is used for both discrete and mass terminations. Illustration shows how the system works. As an unstripped insulated wire is

forced into a slot which is narrower than the conductor diameter, the following phenomena occur:

1. Insulation is displaced from the sides of the conductor.
2. As the wire is pushed deeper into the slot, the bared conductor is deformed by the sides of the slot. This wiping interaction creates a clean metal-to-metal union.
3. The sides of the slot deflect to a final wire/slot dimension, like a spring member, and bear against the wire with a residual force that maintains high contact pressure during the life of the termination.



Terminal Materials and Performance

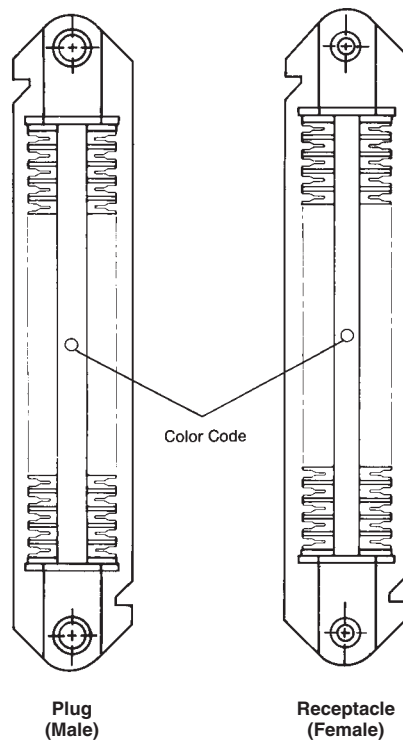
All slotted terminals in CHAMP connector systems are precision formed from high-strength copper alloy, and are selectively plated by a technique called AccuPlate plating process. This highly advanced method provides 30 microinches minimum gold

plating over 50 microinches minimum of nickel underplate on contact areas, and nickel plating (noted for its proven wear characteristics) on ramp or wear area. Durability rating for mating/unmating is 200 cycles, minimum.

Note: The CHAMP connector contacts are current-rated at up to three and one half amperes. Exceptions are CHAMP Latch contacts, rated at one ampere. Keep in mind, however, that indicated current ratings do not necessarily mean that all contacts in a connector can be operated simultaneously at full-rated current. Variables must be considered, such as: connector size, contact density and material, wire size and type, ambient temperature, and PC board design (in cable-to-board applications). Consult connector product specifications for contact ratings.

CHAMP Connector and Terminal Identification

Slotted terminals in CHAMP connector systems will accept solid or stranded (7 strands, maximum) copper conductors within 22 to 28 AWG range. Note that contact slots are designed with carefully-calibrated dimensions and accept a specific wire range and insulation diameter. The following chart shows how color-coded housings (center dot on wire side) and letter-coded terminals (stamped on outside slot) work in tandem for proper wire selection and terminations:



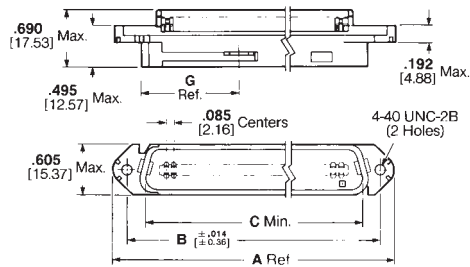
Color Code (HSG.)	Letter Code (Contact)	Wire Range (AWG)	Ins.Dia.* (Max.In.)
Red	A	One No. 24 Solid (Use B Slot)	.045 [1.14]
Blue	B	One No. 24-26 Solid or 24 Stranded	.045 [1.14]
Green	C	One No. 22 Solid or Stranded	.045 [1.14]
Yellow	E	One No. 26, 27, or 28 Stranded	.045 [1.14]
Orange	H	Two No. 26 Solid... Each Wire	.034 [0.86]
Pink	J	Two No. 24 Solid... Each Wire	.034 [0.86]
Brown	F	One No. 22 Solid or Stranded	.056 [1.42]
White	K	No. 24-26 Solid or Stranded (F Slot)	.056 [1.42]

* Depends upon type of insulation and applicator tool.

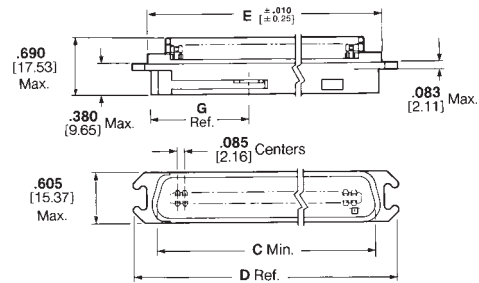
CHAMP IDC Connector Specifications

Plug

Style PS—Plug, Screw Lock (Thick Flange)¹

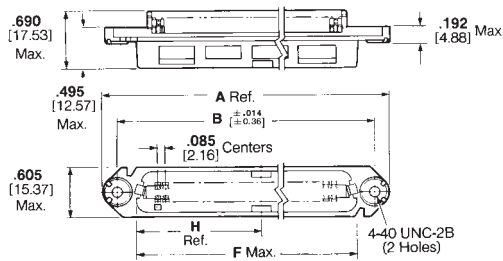


Style PB—Plug, Bail Lock

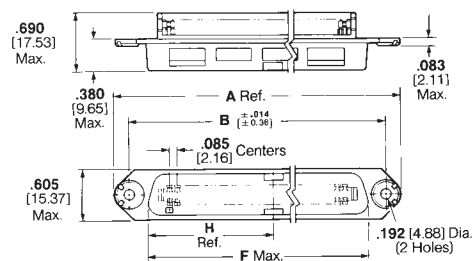


Receptacle

Style RS—Receptacle, Screw or Bail Lock (Thick Flange)¹



Style RP—Receptacle, Panel Mount, Screw or Bail Lock (Thin Flange)²



¹Thick flange connectors are typically for cable-to-cable screw lock applications.

²Thin flange connectors are typically for panel mount applications.

No. of Positions	Dimensions							
	A	B	C	D	E	F	G	H
14	1.750 44.45	1.416 35.97	1.001 25.43	1.526 38.76	1.196 30.38	1.000 25.40	.644 16.36	.401 10.19
24	2.175 55.25	1.842 46.79	1.426 36.22	1.951 49.56	1.621 41.17	1.425 36.20	.646 16.41	.825 20.96
36	2.685 68.20	2.352 59.74	1.936 49.17	2.462 62.53	2.132 54.15	1.935 49.15	1.118 28.40	.854 21.69
50	3.280 83.31	2.946 74.83	2.531 64.29	3.056 77.62	2.726 69.24	2.530 64.26	1.123 28.52	1.461 37.11
64	3.875 98.43	3.542 89.97	3.126 79.40	3.651 92.74	3.321 84.35	3.125 79.38	1.608 40.84	1.562 39.67

Note: These dimensions apply to all mating faces of all types of CHAMP Connectors.

No. of Positions	Wire Size				Housing Color Dot Des.	Contact Letter Code	Part Numbers			
	Solid		7 Strand				Plug		Receptacle	
	AWG	mm	AWG	mm ²			Style PS	Style PB	Style RS	Style RP
14	22	0.65	22	0.40	Green	C	552300-1	—	—	—
24							552301-1	552317-1	552305-1	2-552322-1
36							—	552318-1	—	—
50							552173-1	552319-1	552064-1	2-552324-1
64							552303-1	552320-1	552307-1	—
14	24-26	0.51-0.40	24	0.20	Blue	B	552282-1	552270-1	552312-1	2-552271-1
24							552283-1	552272-1	552313-1	2-552273-1
36							552284-1	552274-1	552314-1	2-552275-1
50							229974-1	552032-1	229975-1	2-552001-1
64							552285-1	552276-1	552315-1	2-552277-1
24	—	—	26-27-28	0.14, 0.10, 0.09	Yellow	E	552443-1	552469-1	—	2-552474-1
36							552444-1	552470-1	—	2-552475-1
50							552390-1	552471-1	552391-1	—
64							552488-1	—	—	—

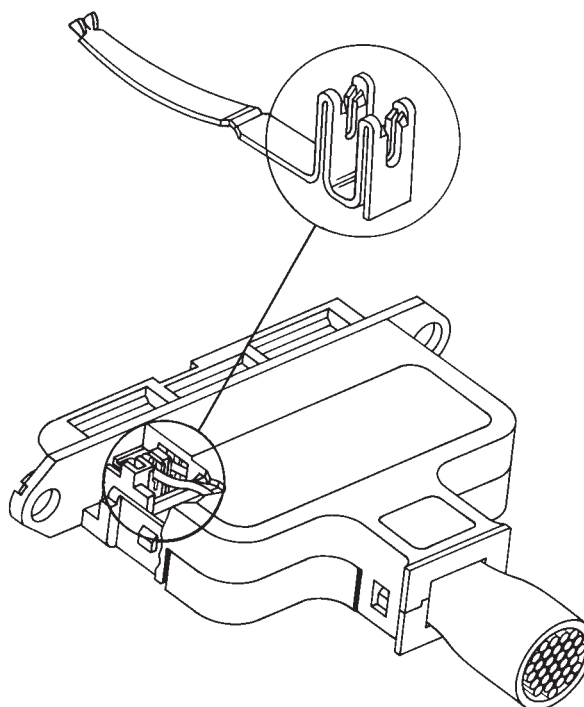
- Notes:**
1. A panel mount 50-position plug connector is available in thin flange with .187 [4.75] diameter mounting hole, Part Number 552686-1, which has B slot contacts.
 2. Style RP is not compatible with integral locking latch receptacle. For thin flange panel mount plug connectors all standard mounting hardware may be utilized with the exception of bail lock mounting hardware.
 3. Acceptable conductor insulations are polyvinyl chloride (PVC), polyethylene, irradiated polyethylene, polypropylene and TEFLON. **Maximum insulation diameter .045 [1.14] for tools that mass terminate conductors on one side at a time. For tools that insert one conductor per side at a time, .043 [1.09] insulation diameter is the maximum.** As a rule, harder insulations require smaller conductor insulation diameters.

TEFLON is a trademark of E. I. du Pont de Nemours and Company.

Large Insulation Wire Connectors

Miniature Ribbon IDC Connectors that can accommodate 22 AWG wire with insulation diameters up to .056 [1.42]. The F-slot contacts handle large insulation diameter conductors using a folded beam contact design.

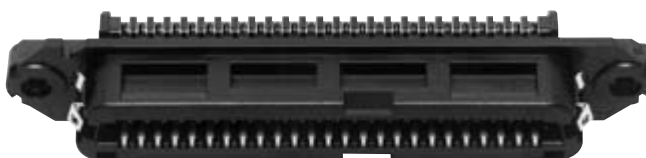
Only connector supplied.
180° Cover and Cable shown for reference



No. of Positions	Wire Size				Housing Color Dot Des.	Part Numbers	
	Solid AWG	mm	7 Strand AWG	mm ²		Plug Style PS	Receptacle Style RS
50	22	0.64	22	0.40	Brown	556039-1	555227-1
64						556409-1	—

These special CHAMP connectors are designed with an integral latching system that eliminates the need for additional locking hardware. Receptacle assemblies are pre-assembled with two plated steel spring latches (one at each end) that latch into cutout slots in mating plug connectors. To release a mated pair, simply depress latches into recessed areas and disengage. Note, however, that integral latches are not repairable nor replaceable. Integral-latch connectors are presently available in 50- and 64-position sizes.

Integral Locking Latch Receptacle



No. of Positions	Housing Color Dot Des.	Contact Letter Code	Part Numbers
50	Blue	B	553921-1
64			554381-2

CHAMP IDC Connectors Cable-to-Cable Applications for 50-Position Connector Kits

Cable-to-Cable Plug and Receptacle with Tapered Cover and Screw

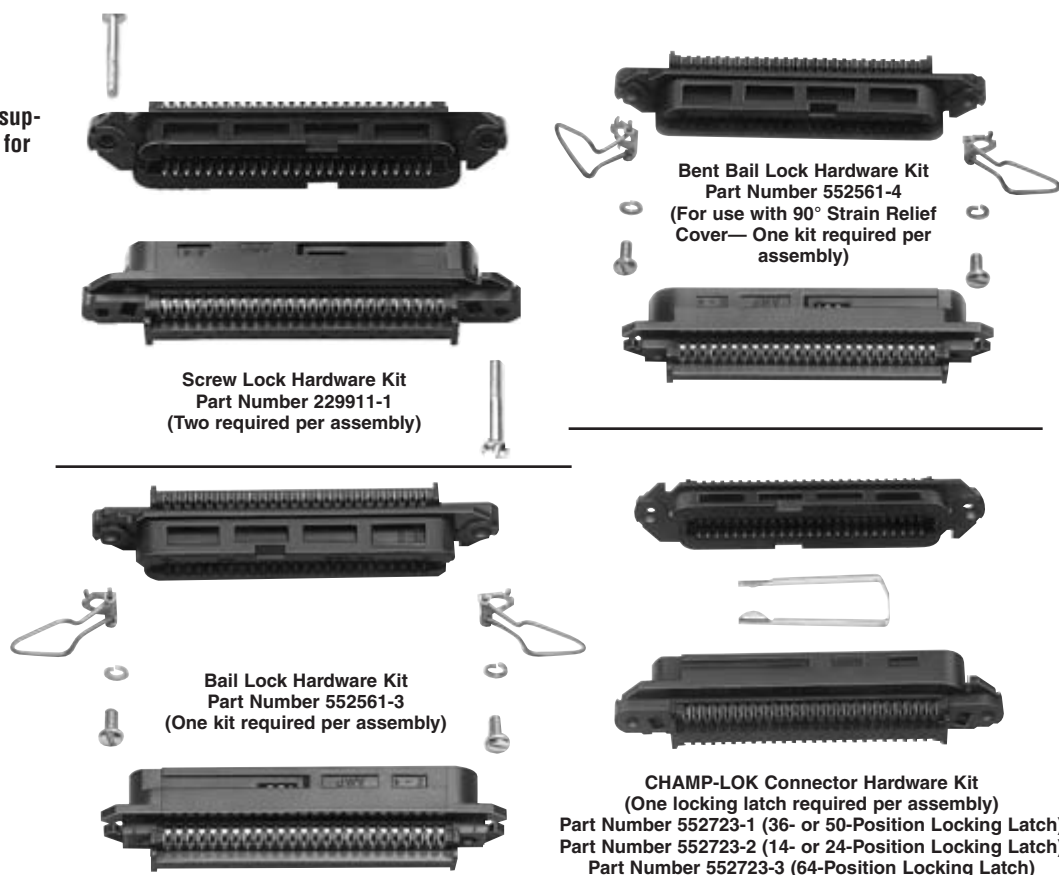


Wire Size				Housing Color Dot Des.	Contact Letter Code	Cable Diameter Range	Dust Cover	Kit Part Numbers			
Solid		7 Strand						Plug		Receptacle	
AWG	mm	AWG	mm ²					Black	Gray	Black	Gray
22	0.64	22	0.4	Green	C	Up to .550 13.97	No	552382-1	—	552383-1	—
24-26	0.51-0.40	24	0.20	Blue	B	.350-.425 8.89-10.80	No	229912-1	229912-4	229913-1	229913-4
							No	—	*6-229912-2	*6-229913-1	—
							Yes	1-229912-1	—	1-229913-1	—
						.425-.500 10.80-12.70	Yes	*6-229912-3	*6-229912-4	*6-229913-3	—
							No	2-229912-1	—	2-229913-1	—
							Yes	3-229912-1	—	3-229913-1	—
—	—	26, 27, 28	0.14-0.10, 0.09	Yellow	E	.350-.425 8.26-10.80	No	552402-1	—	552403-1	—

* Part Numbers with prefix of "6" are bulk packed in quantities of 500.

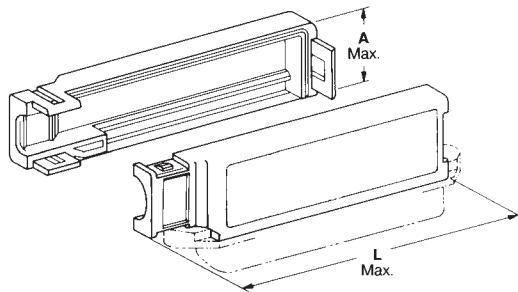
Cable-to-Cable Hardware Kits

Only fastening hardware supplied, other items shown for reference purposes.



CHAMP IDC Connectors Cable-to-Cable Accessories

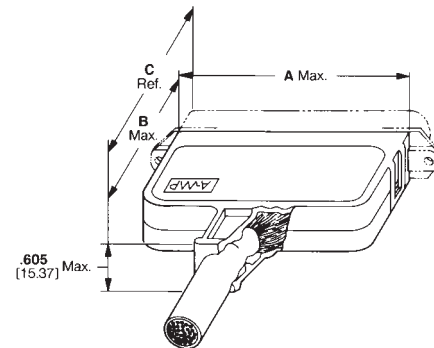
90° Snap-On Strain Relief Cover



No. of Pos.	Dimensions		Cable Range Diameter*	Part Numbers
	A	L		
14	.684 17.37	1.863 47.32	.185-.230 4.70-5.84	552412-1
			.250-.300 6.35-7.62	1-552412-1
24	.684 17.37	2.288 58.12	.250-.300 6.35-7.62	552413-1
			.305-.360 7.75-9.14	1-552413-1
36	.684 17.37	2.798 71.07	.305-.360 7.75-9.14	552414-1
			.330-.380 8.38-9.65	3-552414-1
50	.684 17.37	3.388 86.06	.340-.400 8.64-10.16	552014-1
			.315-.415 8.00-10.54	1-552011-1
	.922 23.42	3.388 86.06	.415-.465 10.54-11.81	552011-1
			.475-.540 12.07-13.72	552731-1
64	1.127 28.63	4.183 106.25	.410-.475 10.41-12.07	552496-1
			.475-.540 12.07-13.72	1-552496-1
			.540-.605 13.72-15.37	2-552496-1

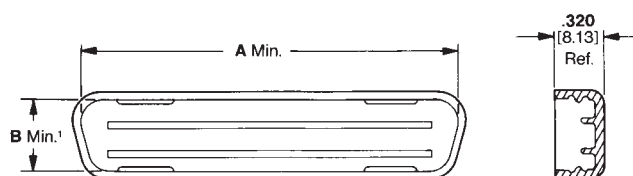
*Strain relief cover cable diameter range is a guideline. The appropriate strain relief cover depends on cable stiffness, cable packing and fillers.

180° Snap-On Strain Relief Cover



No. of Pos.	Dimensions			Cable Range Diameter*	Part Numbers
	A	B	C		
14	.994 25.25	1.455 36.96	1.824 46.33	.175-.220 4.45-5.59	552079-1
				.220-.265 5.59-6.73	1-552079-1
24	1.419 36.04	1.455 36.96	1.824 46.33	.265-.310 6.73-7.87	2-552079-1
				.230-.280 5.84-7.11	552076-1
				.280-.320 7.11-8.13	1-552076-1
				.320-.380 8.13-9.65	2-552076-1
36	1.934 49.12	1.455 36.96	1.824 46.33	.290-.360 7.37-9.14	552073-1
				.360-.430 9.14-10.92	552073-5
				.430-.500 10.92-12.70	552073-6
				.330-.380 8.38-9.65	3-552008-1
50	2.520 64.01	1.555 39.50	1.924 48.87	.380-.430 9.65-10.92	2-552008-1
				.430-.490 10.92-12.45	552008-1
				.480-.550 12.19-13.97	4-552008-1
				.430-.500 10.92-12.70	—
64	3.119 79.22	1.655 42.04	2.024 51.41	.480-.540 12.19-13.72	552082-1
				.540-.610 13.72-15.49	569025-1

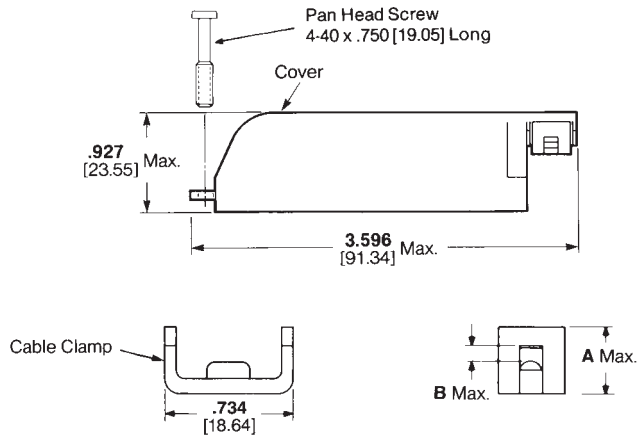
Dust Cover



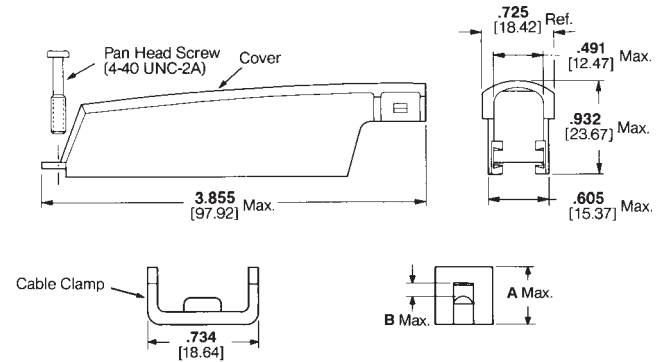
1B Dimension—.610 [15.49] Plug and .478 [12.14] Receptacles

No. of Pos.	Plug Cover (Blue)		Receptacle Cover (Red)	
	A	Part No.	A	Part No.
24	1.575 40.01	229968-4	1.421 36.09	229969-4
36	2.085 52.96	—	1.931 49.05	229969-3
50	2.700 68.58	229968-1	2.526 64.16	229969-1
64	3.275 83.19	229968-2	3.121 79.27	229969-2

**90° Standard Slide-On Strain Relief Cover Kit
(for 50 Position Only)**



**90° Tapered Slide-On Strain Relief Cover Kit
(for 50-Position Only)**

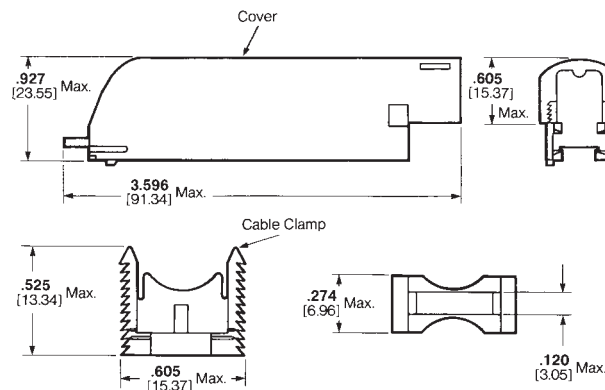


Cable Range Diameter	Dimensions		Kit Part Numbers		Component Part Numbers			
	A	B	Standard Cover	Tapered Cover	Cable Clamp	Screw	90° Tapered Cover	90° Slide-On Cover
.425-.500 10.80-12.70	.475 12.07	.202 5.13	552960-1	552560-5	1-229910-1	229911-1	229909-1	552617-1
.350-.425 8.89-10.80	.380 9.65	.107 2.72	552960-2	552560-1	229910-1	229911-1	229909-1	552617-1
.325-.370 8.26-9.40	.380 9.65	.057 1.45	—	—	2-229910-1	229911-1	229909-1	552617-1
.300-.325 7.62-8.26	.380 9.65	.022 .056	—	—	3-229910-1	229911-1	229909-1	552617-1
.500-.550 12.70-13.97	.540 13.72	.267 6.78	552960-5	—	4-229910-1	229911-1	229909-1	552617-1

90° Standard Slide-On Strain Relief Cover and Adjustable Cable Clamp (for 50-Position Only)

(recommended for use with CHAMP-LOK Connector or Screw Lock hardware)

Cable Dia. — .425 [10.80] Max.
Cover — Black—Part Number 552760-1,
 Gray—Part Number 552760-2
Cable Clamp — Black—Part Number 552763-1,
 Gray—Part Number 552763-2

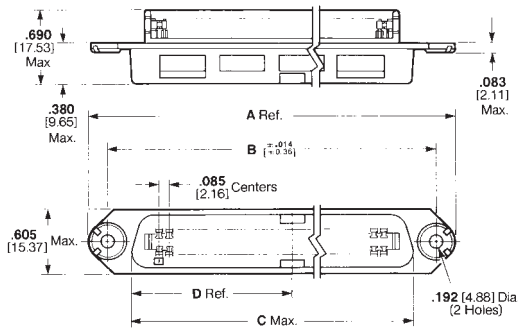


CHAMP IDC Connectors Cable-to-Panel Applications

Panel Mount Accessories

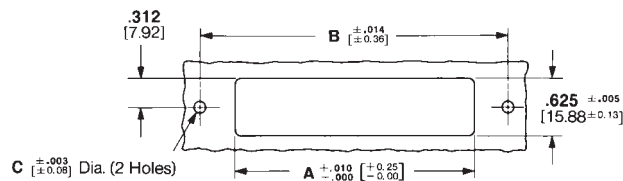
Style RP—Receptacle, Panel Mount, Screw or Bail Lock (Thin Flange)

Note: See page 90 for Style RP part numbers.



No. of Positions	Dimensions			
	A	B	C	D
14	1.750 44.45	1.416 35.97	1.000 25.40	.401 10.19
24	2.175 55.25	1.842 46.79	1.425 36.20	.825 20.96
36	2.685 68.20	2.352 59.74	1.935 49.15	.854 21.69
50	3.280 83.31	2.946 74.83	2.530 64.26	1.461 37.11
64	3.875 98.43	3.542 89.97	3.125 79.38	1.562 39.67

Panel Cutout Dimensions



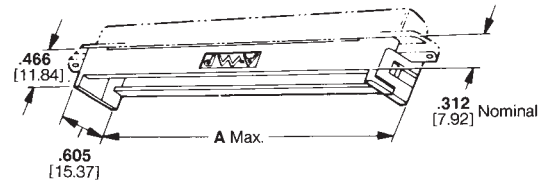
Note: Panel thickness range—.062-.125 [1.57-3.18] for front panel mount—Panel range .062-.093 [1.57-2.36] for rear panel mount with metric hardware per IEEE-488 and .062 [1.57] max. with standard hardware.

No. of Positions	Dimensions			Rear Panel Mount ¹		
	A	B	C	A	B	C
14	1.063 27.00	1.416 35.97	.126 3.20	1.151 29.24	1.416 35.97	.149 3.78
24	1.488 37.80	1.842 46.79	.126 3.20	1.575 40.01	1.842 46.79	.149 ² 3.78
36	1.998 50.75	2.352 59.74	.126 3.20	2.085 52.96	2.352 59.74	.149 3.78
50	2.593 65.86	2.946 74.83	.126 3.20	2.700 68.58	2.946 74.83	.149 3.78
64	3.188 80.98	3.542 89.97	.126 3.20	3.275 83.19	3.542 89.97	.149 3.78

¹ For screw lock hardware version only.

² .192 [4.88] for IEEE-488 metric applications.

Snap-On Strain Relief

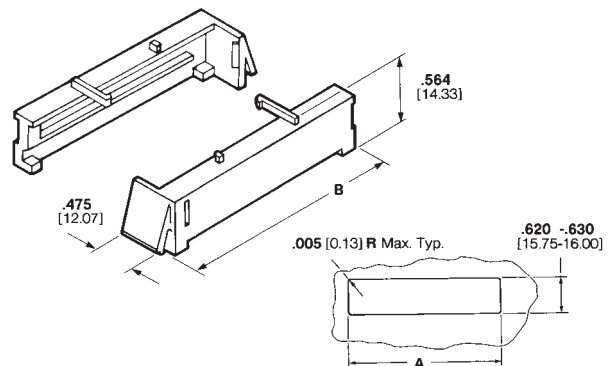


Note: Two required per connector assembly.

No. of Positions	Dimensions A	Low Profile Part Number
24	1.467 37.26	1-552298-1
36	1.977 50.22	1-552297-1
50	2.572 65.33	1-552027-1
64	3.167 80.44	1-552296-1

Snap-In Panel Mount Strain Relief

No additional panel mounting hardware required.



Note: Two required per assembly.

No. of Positions	Dimensions		Panel Thickness	Color	Part Number
	A	B			
50	2.695-2.700 68.45-68.58	2.514 63.86	.090 2.29	Black	552962-3

- Notes:**
1. For use with thin flange connectors only.
 2. Recommended for use with CHAMP-LOK Connector Assembly Hardware. No panel mounting hardware necessary when utilized.
 3. Strain Relief recommended for installation of Panel Mount Connectors to prevent inadvertent contact or conductor damage.

CHAMP IDC Connectors Cable-to-Panel Hardware Kits

Only fastening hardware supplied, other items shown for reference purposes.



Screw Lock Hardware Kit
Part Number 552568-1
 (For rear panel mount applications,
 max. panel thickness shall be .062 [1.57].)
 (One kit required per assembly)



Bail Lock Hardware Kit
Part Number 552567-1
 (One kit required per assembly)



Bent Bail Lock Hardware Kit
Part Number 552567-2
 (For use with 90° strain relief cover—One kit required per assembly)

Shielded CHAMP Cable Connectors

Product Facts

- Designed for shielding, NOT just as metal shell connector
- Available in 24-, 36- and 50-position plugs and receptacles
- Available in bail and screw lock plug and thru-hole receptacle styles with pre-loaded insulation displacement contacts in a choice of two wire slot sizes
- Capable of using any standard CHAMP connector applicator tooling
- Unique, high tensile strain relief with adjustable ratchet
- Conductive to post molding simply by deleting 180° cover kit
- No outer crimp ferrule required
- Fully compatible with all die cast, metal shell panel mount CHAMP connectors in a variety of termination styles, and intermateable with all those of a similar design



The CHAMP Connector product line continues to expand, fulfilling the needs of the various industries. The Shielded CHAMP Cable Connectors have been specifically designed to produce the optimum in shielding effectiveness while still offering low initial cost and ease of assembly with the applied-cost-savings of a proven insulation displacement system.

Shielded CHAMP Cable Connectors are available in 24-, 36- and 50-position plugs and receptacles with either bail lock or screw lock plug and thru-hole receptacle styles.

Connectors are shipped

with contacts preloaded and are ready for termination in all standard CHAMP Connector applicator tooling. Two different contact sizes are available—B-slot, 24 AWG [0.51 mm] and 26 AWG [0.04 mm] (solid) or 24 AWG [0.20 mm²] (7-strand); and E-slot, 26-27-28 AWG [0.14-0.10-0.09 mm²] (7-strand) wire.

Superior shielding performance is achieved due to minimal leakage from a specially designed two-piece, precision formed shield. Positive contact with the panel mounted connector is obtained by the interface of metal “spring fingers” which

protrude through small openings around the perimeter of the plug and contact plate on receptacle. Highly effective braid termination is achieved with an outstanding stored energy design incorporated into the two-piece shield.

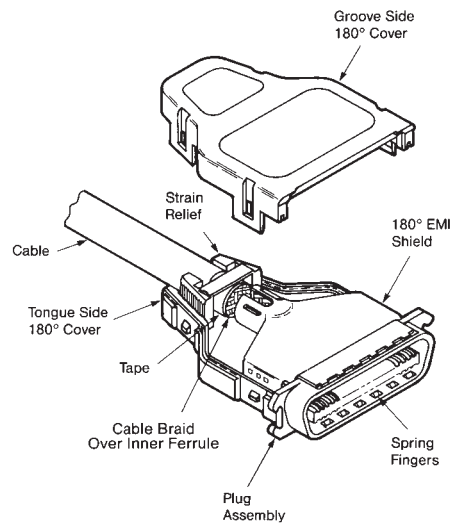
In addition to the superior shielding effectiveness, another important feature of the connector is the design of the outer plastic strain relief cover, which uses a ratcheting wedge that provides greater strain relief as more tension is applied to the cable. Should post molding be desired, the 180° cover kit may be deleted.

Shielded CHAMP Cable Connector Kits

Plug Connectors and Kits

How to determine proper kit part number:

- 1) Select 24-, 36- or 50- Position plug connector
- 2) Select bail or screw lock connector
- 3) Select B or E slot for wire to be terminated
- 4) Measure cable jacket outside diameter and wire bundle diameter for correct size ferrule selection
- 5) See chart for ordering information on page 100



Material and Finish

Housing and Cover — Thermoplastic, black

Terminals — Gold over nickel plated high strength copper alloy

Shield — Bright nickel plated carbon steel

Strain Relief — Flame retardant nylon, black

Ferrule — Copper alloy

Hardware — Zinc plated steel

Metric Shoulder Screw — Black oxide plated, carbon steel

Specifications

Insulation Diameter — .045 [1.14] max.

Terminal Center-to-Center Spacing — .085 [2.16]

Slot Designation (stamped on contacts which are preloaded in housing):

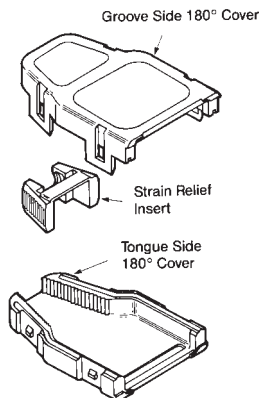
B-Slot — 24 AWG [0.51 mm] and 26 AWG [0.40 mm] (solid) or 24 AWG [0.20 mm²] (7 strand)

E-Slot — 26-27-28 AWG [0.12-0.10-0.09 mm²] (7 strand) wire

Note: Connector kits shipped unassembled.

Accessories

Cover Kit (Sold Separately)



Captive Pan Head Screw Part Number 554726-1



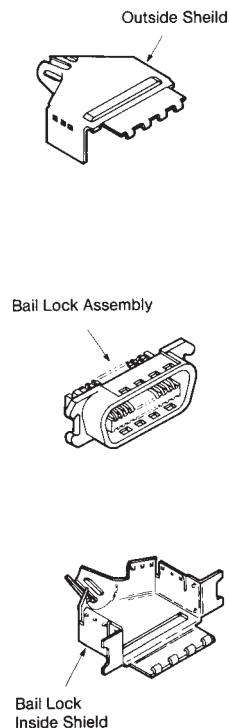
4-40 X .265[6.73] long (2 required)

(Sold Separately—Bulk packed in quantities of 500)

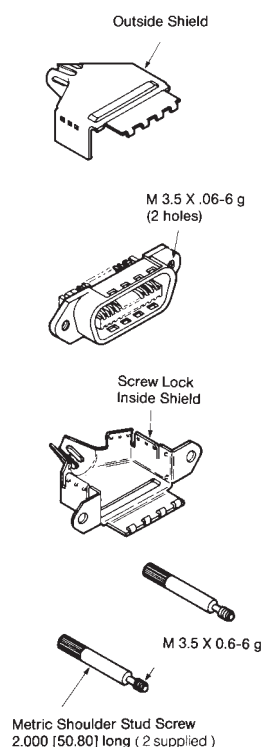
Inner Ferrule (Sold Separately) (See Page 99)



Bail Lock Connector Kit

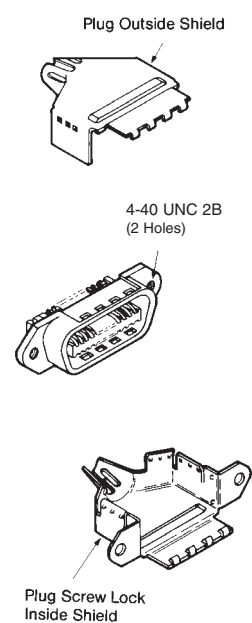


Connector Kit (Metric)



Screw Lock

Standard Connector Kit



Receptacle Connectors and Kits

How to determine proper kit part number:

- 1) Select 36- or 50-Position receptacle connector
- 2) Select B or E slot for wire to be terminated
- 3) Measure cable jacket outside diameter and wire bundle diameter for correct size ferrule selection
- 4) See chart for ordering information on page 100

Material and Finish

Housing and Cover — thermoplastic, black

Terminals — gold over nickel plated high strength copper alloy

Shield — bright nickel plated carbon steel

Strain Relief — flame retardant nylon, black

Ferrule — copper alloy

Hardware — zinc plated steel

Specifications

Insulation Diameter — .045 [1.14] max.

Terminal Center-to-Center Spacing — .085 [2.16]

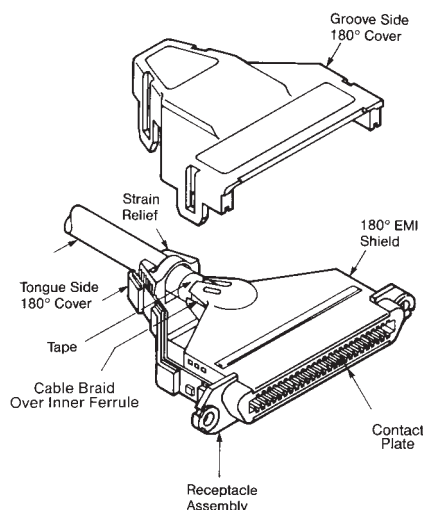
Slot Designation (stamped on contacts which are preloaded in housing):

B-Slot — 24 AWG [0.51 mm] and 26 AWG [0.40 mm] (solid) or 24 AWG [0.20 mm²] (7 strand)

E-Slot — 26-27-28 AWG [0.12-0.10-0.09 mm²] (7 strand) wire

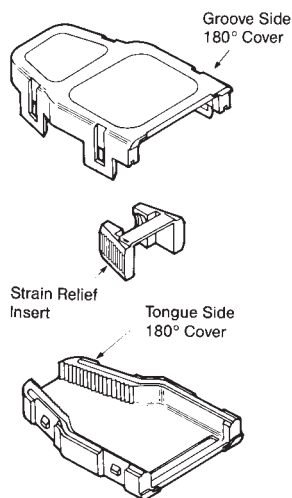
Note: Connector kits shipped unassembled.

Shielded CHAMP Cable Connector Kits (Continued)



Screw or Bail Lock Connector Assemblies

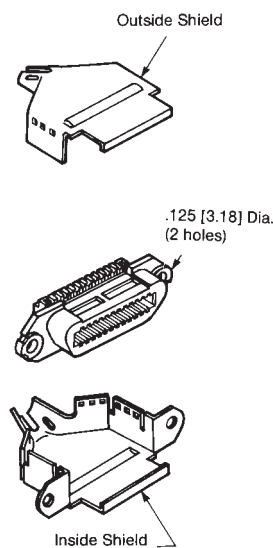
Cover Kit (Sold Separately)



Inner Ferrule (Sold Separately)



Connector Kit — Supplied



Ferrule Part Numbers¹

Inside Diameter	Part Number
.250 6.35	554725-1 554266-3
.300 7.62	554725-2 554266-4
.350 8.89	554725-3 554266-5

Ferrule Part Numbers¹

Inside Diameter	Part Number
.400 10.16	554725-4 554266-6
.450 11.43	554725-5 554266-7
.500 12.7	554725-6 554266-8

¹ Bulk packed in quantities of 100 per bag.

Shielded CHAMP Cable Connector Kits (Continued)

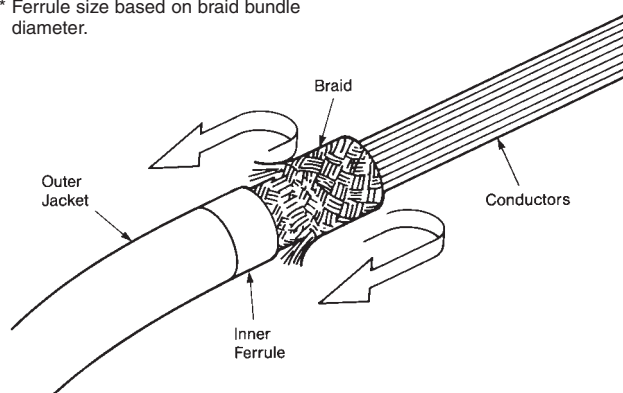
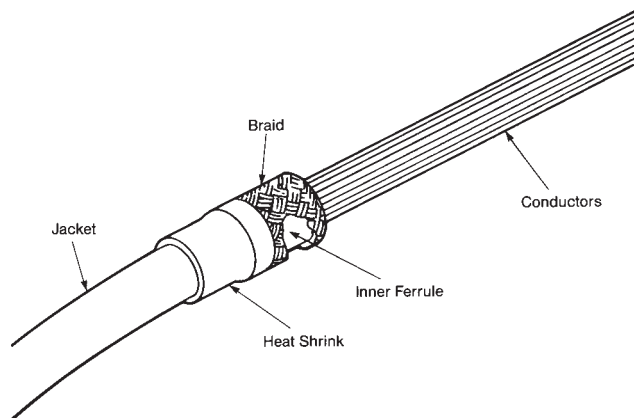
Inner Ferrule on Jacket

No. of Positions	Cable Diameter (Less Than)
24	.300 7.62
36	.350 8.89
50	.400 10.16

Inner Ferrule on Braid*

No. of Positions	Cable Diameter (Greater Than)
24	.300 7.62
36	.350 8.89
50	.400 10.16

* Ferrule size based on braid bundle diameter.



No. of Positions	Cable Range	Part Numbers						
		Shielded Plug Kit				Shielded Receptacle Kit		Cover Kits
		Screw Lock		Bail Lock		Screw or Bail Lock		
		B Slot	E Slot	B Slot	E Slot	B Slot	E Slot	
24	.250-500 6.35-12.70	554948-4 ⁵ 554948-24	554948-3 ³	—	—	—	—	554944-1
36	.250-500 6.35-12.70	554951-2	—	554950-2	554950-1	—	—	554945-1
50	.350-625 8.89-15.88	554945-2 ⁶	554954-1	554953-2 ¹	554953-1 ¹	554955-2	554955-1	554946-1 ² 554946-2

¹ SCSI applicable.

² For cable diameter of .500 [12.70] or less use -1 kit. For cable diameter greater than .500 [12.70] use -2 kit.

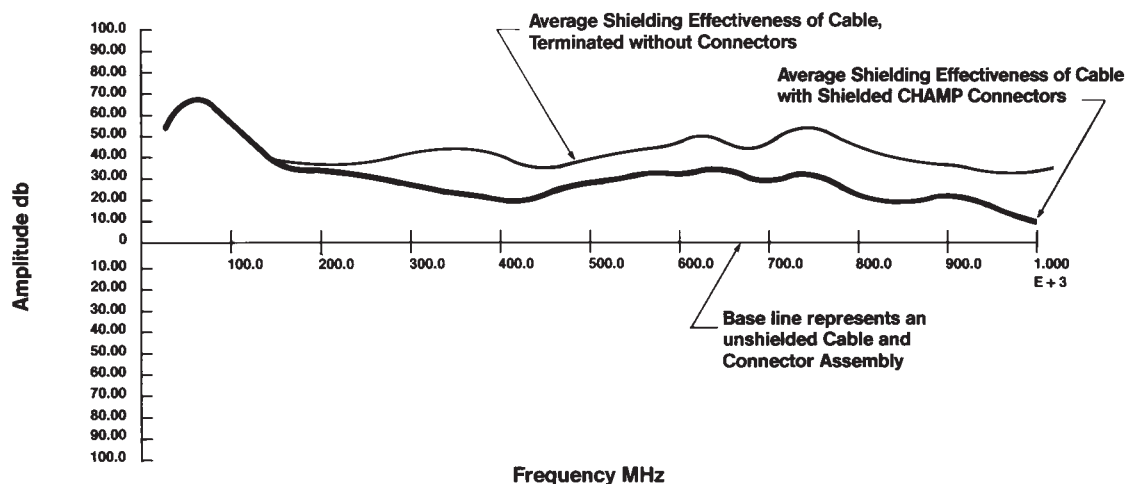
³ Connector with M3.5 threads kits includes M3.5 x 2.00 [50.80] standoff stud.

⁴ 4-40 UNC-2B hole size.

⁵ M3.5 x 0.6-6G, shoulder stud screws (2) supplied.

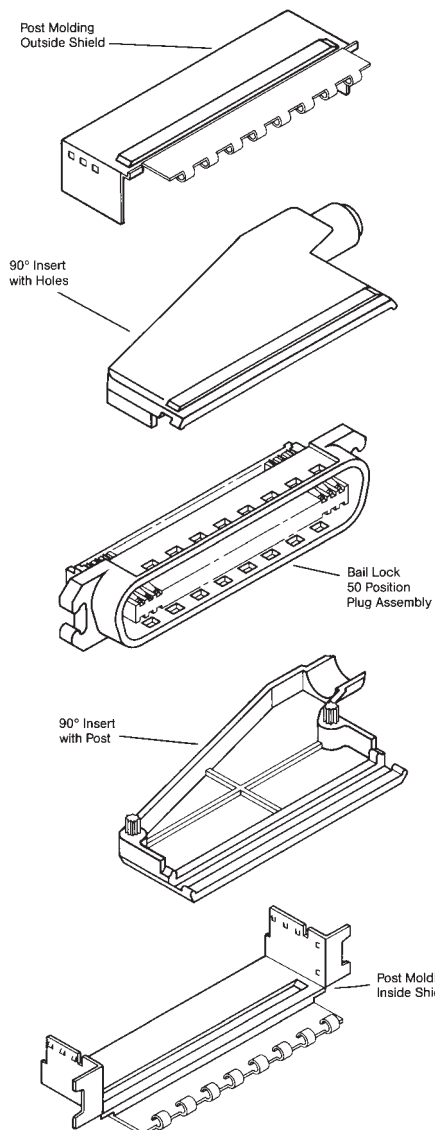
⁶ Contact Tyco Electronics for RoHS Part Number information.

**Typical Cable Assembly
(Shielding Effectiveness)**



**50-Position Plug Kit
90° Cable Exit for Post
Molding Operation**

(Available in 50-position
only)



Wire Size				Housing Color Dot Description	Connector Color	Kit Part Number
Solid		7 Strand				
AWG	mm	AWG	mm ²			
24-26	0.51-0.40	24	0.20	Blue	Gray	5-555012-1
—	—	26-27-28	0.14, 0.10, 0.09	Yellow	Gray	5-555012-2

Notes: Kit components only supplied (500 pcs. bulk packaged).
Copper foil wrap. Solder operation and post molding is completed by customer.
For post mold application, contact Tyco Electronics.
Maximum cable bundle diameter is .370 [9.40].

Shielded CHAMP Panel Mount Connector Hardware

Screwlock Hardware Components (Order separately)
(Only fastening hardware supplied, other items shown for reference purposes)

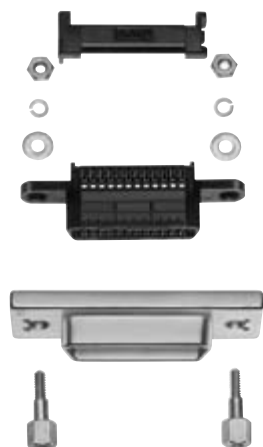
Material and Finish

Strain Relief — Thermoplastic (black)

Nut and Washers — Zinc plated carbon steel

Screw Lock — Zinc plate with yellow chromate over carbon steel

Metric Screw Lock — Black oxide coated carbon steel



Screw Lock Hardware

Snap-on Strain Relief
Part Number 1-552298-1
(2 required)

Nut Part Number 21068-4*
(2 required)

Washer Part Number 21074-2*
(2 required)

Flat Washer Part Number 21108-4
(2 required)

Connector and Shield
not included

Standoff Mounting Stud
Part Number 229995-1
(2 required)



Metric Screw Lock Hardware

Snap-on Strain Relief
Part Number 1-552298-1
(2 required)

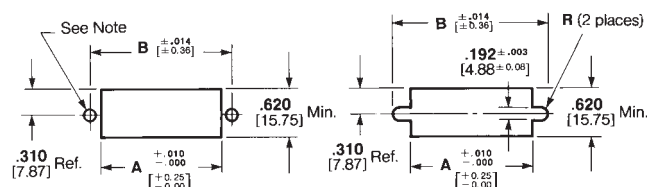
Connector and Shield
not included

For Front Panel Mount Metric Screw Lock
Hardware Kit Part Number 553636-2

For Rear Panel Mount Metric Screw Lock
Hardware Kit Part Number 553636-3

*Commercial item

Recommended Panel Cutout for Front and Rear Panel Mounting



Standard Hardware Application

Metric Hardware per IEEE-488 Application

Note: .126 ± .003 [3.2 ± 0.08] for front panel mount and .149 ± .003 [3.78 ± 0.08] for rear panel mount.

No. of Positions	Standard Hardware		Metric Hardware	
	Front Panel Mount	Rear Panel Mount	Front or Rear Panel Mount	
	A	B	A	B
24	1.488 37.80	1.842 46.79	1.575 40.01	2.036 51.71

Panel Thickness Range: .125 [3.18] max. for front panel mount; .062 [1.57] max. for standard rear panel mount, .062-.093 [1.57-2.36] for metric rear panel mount.

Note: For application tooling, see pages 128 thru 132.

CHAMP Latch Low Profile Connectors

Product Facts

- Ready to use connectors—strain relief covers preassembled to connector bodies
- Overall assembled dimension of .820 [20.83]
- Simple one-step termination operation
- May be used in “dead-end” or “daisy-chain” applications
- Hardware kits available for Cable-to-Cable or Cable-to-Panel applications
- Available in 24, 36 and 50 positions
- Capable of mass termination without time consuming soldering and prestripping of wire
- Terminates .050 [1.27] centerline 26 AWG [0.40 mm] (solid); 28 AWG [0.08-0.09 mm²] (stranded); 28 AWG [0.32 mm] (solid) or 30 AWG [0.25 mm] (solid) copper ribbon cable, including certain twisted pair types from .032-.045 [0.81-1.14] thick
- Available in standard connectors, preassembled and loose-piece shielded



The CHAMP Latch Low Profile Connector comes ready to use—just slide the cable in and squeeze. The underside of the strain relief cover is fluted to assist in proper cable orientation. Plastic “barbs” sticking up from the connector body act as guides for proper cable alignment during insertion. When terminated, these “barbs” pierce the cable insulation between the conductors and lock on to the strain relief cover.

Another advantage to this connector is its overall assembled dimension (.820 [20.83]), which takes up less space inside or outside of the equipment.

Standard connectors are available in 14-, 24-, 36- and 50-position plugs or receptacles. Shielded CHAMP Latch Connector version receptacles are available loose piece and preassembled in 24, 36, and 50 positions. A 64-position plug or receptacle can be supplied with an assembled height of 1.130 [28.70]. For 64-position plug and receptacle part numbers and specifications,

contact Tyco Electronics at the numbers listed below. CHAMP Latch Connectors provide a fast, reliable means of mass terminating .050 [1.27] centerline ribbon cable without time-consuming soldering and prestripping of wire. They are capable of terminating 26 AWG [0.40 mm] (solid); 28 AWG [0.08-0.09 mm²] (stranded) 28 AWG [0.32 mm] (solid) or 30 AWG [0.25 mm] (solid) copper ribbon cable.

Termination of CHAMP Latch Low Profile Connectors is accomplished in a simple one-step operation using the appropriate CHAMP Latch tooling. See page 132. The ability to make “daisy chain” terminations requires nothing more than depressing the stop bar on the hand tool or repositioning the stop bar provided on the base plate for the manual applicator.

The housings and covers are constructed of black thermoplastic. The terminals are gold over nickel plated high strength copper alloy

on the mating face and gold flash over nickel plate on the terminating side. The mating face consists of 2 rows of terminals on .085 [2.16] centers. Terminating side consists of terminals on .100 [2.54] centers for an effective .050 [1.27] staggered termination. EMI Shield, for Shielded Connectors, are die cast zinc with nickel plating.

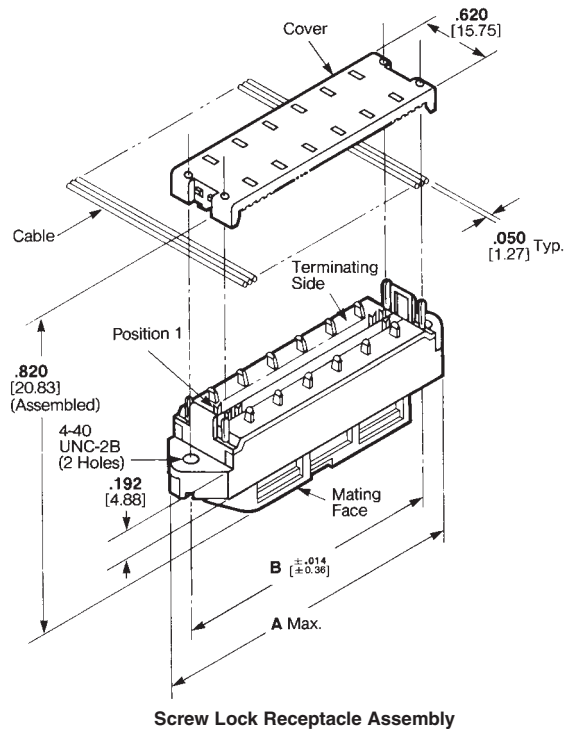
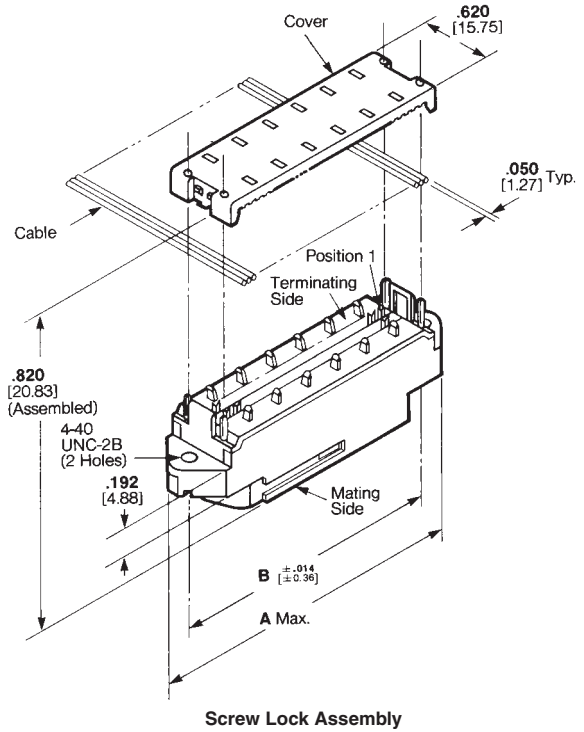
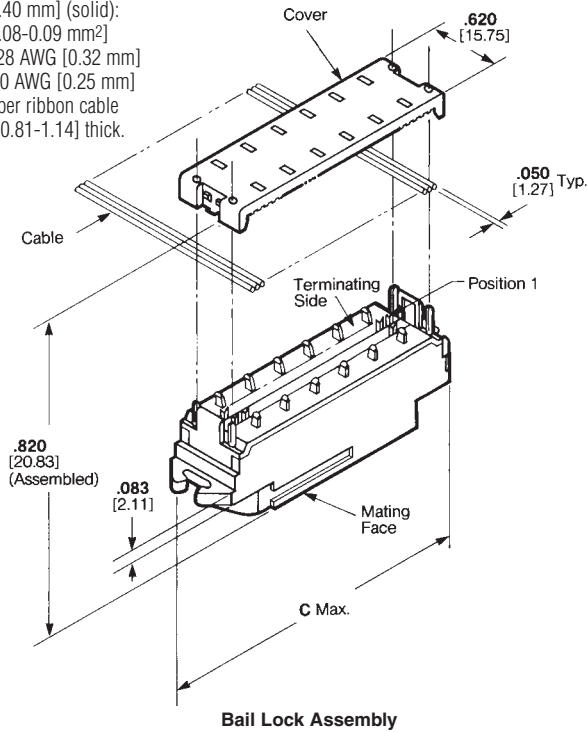
Connector hardware kits are available for Cable-to-Cable (Screw Lock, Bail Lock and CHAMP-LOK connectors) applications, and Cable-to-Panel (Screw Lock, Bail Lock, Metric Screw Lock for IEEE-488 Applications and CHAMP-LOK connector) applications.

Note: CHAMP Latch connectors have been tested on a wide variety of .050 [1.27] centerline cables conforming to Tyco Electronics drawings 746395, 746396 and 86901. If cables other than those specified are used, forward sample of cable for approval to Tyco Electronics at the address listed at the back of this catalog.

CHAMP Latch Low Profile Connectors—Standard

Wire Range:

26 AWG [0.40 mm] (solid);
28 AWG [0.08-0.09 mm²]
(stranded; 28 AWG [0.32 mm]
(solid) or 30 AWG [0.25 mm]
(solid) copper ribbon cable
.032-.045 [0.81-1.14] thick.

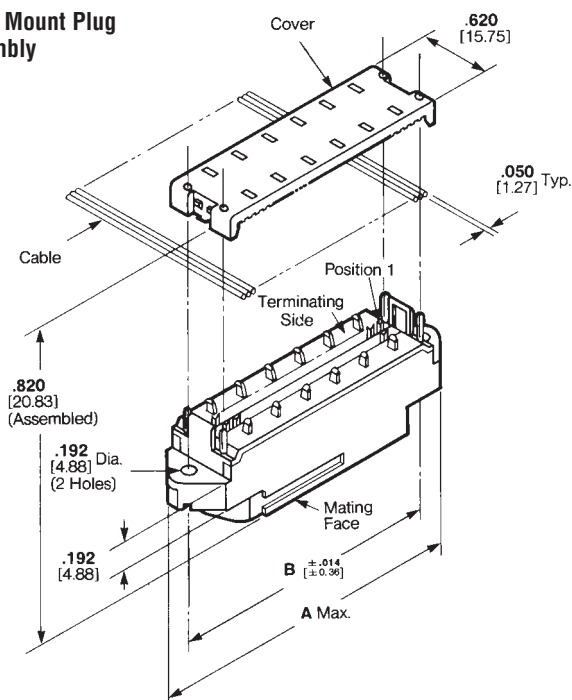


Notes:

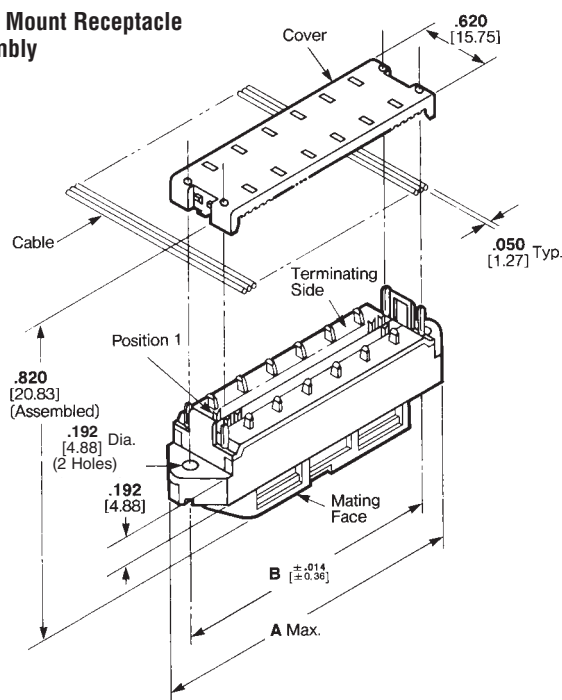
1. Cover shown loose but shipped ready to terminate.
2. Cable conforming to Tyco Electronics specifications to be furnished by customer.
3. Mating face consists of 2 rows of terminals on .085 [2.16] centers.
Terminating side consists of terminals on .100 [2.54] centers for an effective .050 [1.27] termination.

CHAMP Latch Low Profile Connectors—Standard (Continued)

Panel Mount Plug Assembly

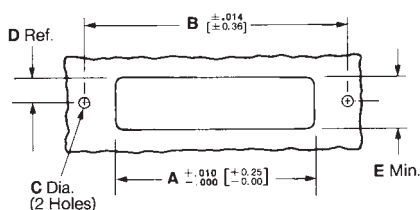


Panel Mount Receptacle Assembly



No. of Positions	Dimensions		Part Numbers				
	A	B	Bail Lock Plug Assembly	Screw Lock Plug Assembly	Screw Lock Receptacle Assembly	Panel Mount Plug Assembly	Panel Mount Receptacle Assembly
14	1.750 44.45	1.416 35.97	—	553596-1	553597-1	—	—
24	2.175 55.25	1.842 46.79	—	553598-1	553599-1	554103-1	554088-1
36	2.685 68.20	2.352 59.74	554084-1	553600-1	553601-1	—	554089-1
50	3.280 83.31	2.946 74.83	554085-1	553602-1	553603-1	—	554090-1

Recommended Panel Cutout



No. of Pos.	Front Panel Mount ¹					Rear Panel Mount ²				
	A	B	C	D	E	A	B	C	D	E
14	1.063 27.00	1.416 35.97	.126 3.20	.320 8.13	.640 16.26	1.151 29.24	1.416 35.97	.149 3.78	.310 7.87	.620 15.75
24	1.488 37.80	1.842 46.79	.126 3.20	.320 8.13	.640 16.26	1.575 40.01	1.842 46.79	.149 ³ 3.78	.310 7.87	.620 15.75
36	2.000 50.80	2.352 59.74	.126 3.20	.320 8.13	.640 16.26	2.085 52.96	2.352 59.74	.149 3.78	.310 7.87	.620 15.75
50	2.700 68.58	2.946 74.83	.126 3.20	.320 8.13	.640 16.26	2.700 68.58	2.946 74.83	.149 3.78	.310 7.87	.620 15.75

Front Panel Mount Panel Thickness Range: .062-.125 [1.57-3.18].

Rear Panel Mount Panel Thickness Range: .062 [1.57] Max. Standard Hardware—.062-.093 [1.57-2.36] Metric Hardware.

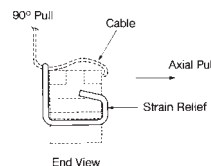
¹ For front panel mount application, install from the front of the panel to avoid excessive bending of the cable. Bending of the cable will occur if cable assembly is mounted from the rear of the panel.

² Screw Lock version only.

³ For IEEE-488 applications, refer to preassembled shielded panel cutouts page 110.

CHAMP Latch Cable Strain Relief Clip

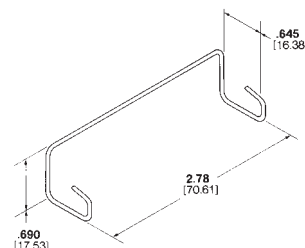
The CHAMP Latch Cable Strain Relief Clip, 50-position, is used only with a Low Profile Standard CHAMP Latch Connector.



The Strain Relief Clip snaps on the connector and over the cable. The clip provides a positive strain relief for cable in axial and 90° directions.

Material

Stainless steel wire, .050 [.127] diameter

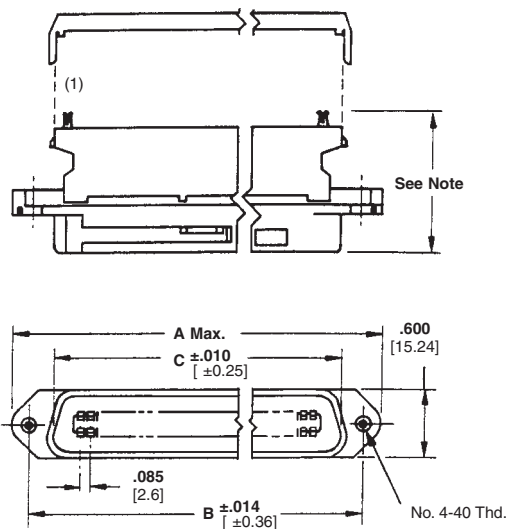


CHAMP Latch Cable Strain Relief Clip Part Number 554099-1

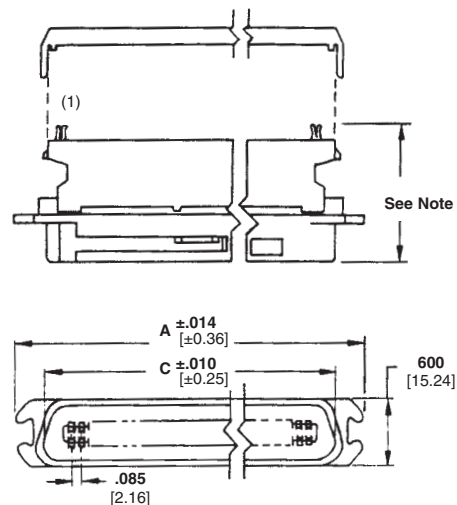
CHAMP Latch Low Profile Connectors 64-Position

CHAMP Latch Connectors 64-Position

Style PS



Style PB



Connector Code:

PS = Plug, Screw Lock

PB = Plug, Bail Lock

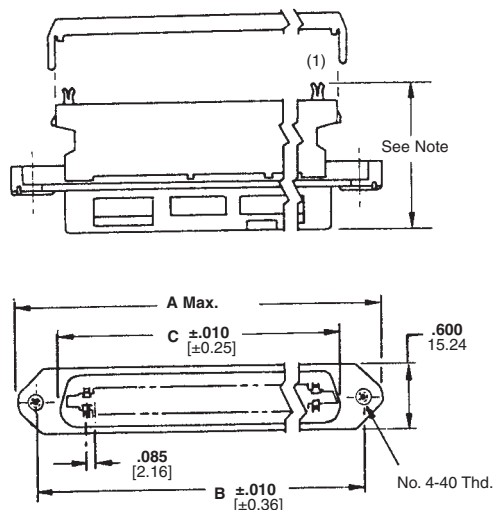
RS = Receptacle, Screw or Bail Lock

RP = Receptacle, Panel Mount, Screw or Bail Lock

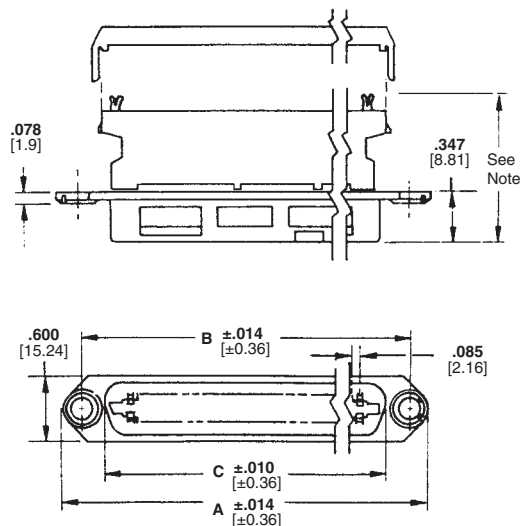
Note: 1.130 [28.7]
without strain relief cover
1.168 [29.67]
with strain relief cover

Style	Dimension			Part Number
	A	B	C	
PS	3.875 98.43	3.542 89.97	3.135 79.63	552837-1
PB	3.651 92.74	—	3.135 79.63	552933-1
RS	3.875 98.43	3.542 89.97	3.115 79.12	552838-1
RP	3.875 98.43	3.542 89.97	3.115 79.12	552843-1

Style RS



Style RP



CHAMP Latch Low Profile Connectors Cable-to-Cable Hardware Kits

Only fastening hardware supplied, other items shown for reference purposes.



Screw Lock Hardware Kit
Part Number 229911-1
(two required per assembly)



CHAMP-LOK Connector Hardware Kit
Part Number 552723-1 (36- and 50-Position)
Part Number 552723-2 (14- and 24-Position)
(one locking latch required per assembly)



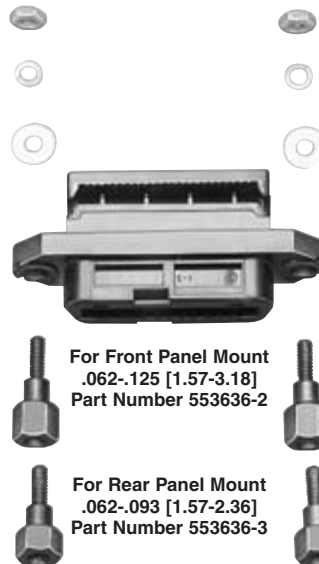
Bail Lock Hardware Kit
Part Number 552561-3
(one kit required per assembly)

CHAMP Latch Low Profile Connectors Cable-to-Cable Hardware Kits (Continued)

Only fastening hardware supplied, other items shown for reference purposes.



Screw Lock Hardware Kit
Part Number 552568-2
(Rear Panel Mount Application—.062 [1.57] max.
panel thickness—one kit required per assembly)



Metric Screw Lock Hardware Kit for IEEE-488 Application
(one kit required per assembly)



Bail Lock Hardware Kit
Part Number 552567-3
(one kit required per assembly)

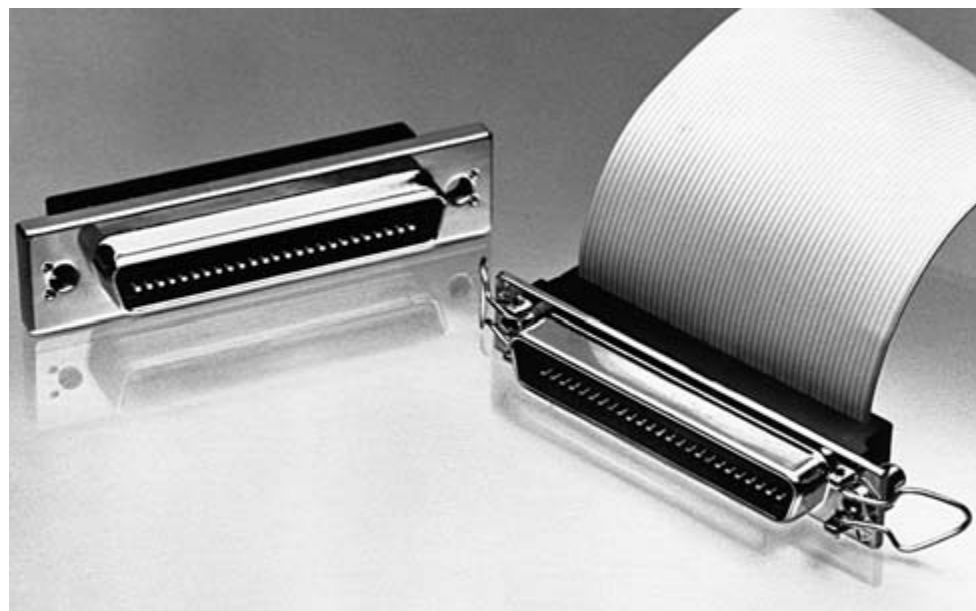
Shielded CHAMP Latch Connectors

CHAMP .085 Centerline
Miniature Ribbon Connector Systems

3

Product Facts

- Ready to use strain relief covers preassembled to connectors
- Simple one-step termination
- Dead end or daisy-chain applications
- Hardware kits available for panel mounting
- Terminates conductors without time-consuming soldering
- Terminates .050 [1.27] centerline 26 AWG [0.40 mm], 28 AWG [0.32 mm] and 30 AWG [0.25 mm] (solid) or 28 AWG [0.08-0.09 mm²] (stranded) wire
- Connectors Recognized under the Component Program of Underwriters Laboratories Inc.  File No. E28476
- Cable Recognized under the Component Program of Underwriters Laboratories Inc. 
- Connectors CSA Certified, File No. LR-7189 
- No cable stripping; simultaneous termination of all conductors
- One-step termination with Tyco Electronics application tooling
- Terminates varying thicknesses of flat, woven, shielded (properly prepared) and other ribbon cable with conductors on .050 [1.27] centers as well as discrete wires
- Self-registration of wires — compatible product and tooling designs eliminate registration problems
- Wide selection of sizes in all configurations
- Positive, uniform latching of contacts and housing with cover eliminates cover warpage



- Easy, visual inspection of terminations during assembly; electrical probing capability after assembly
- All polymeric parts manufactured from a UL Recognized 94 V-0 rated material 
- Receptacles with recessed covers provide positive locking feature for ejection style pin headers with latches
- Shielded connectors provide RFI/EMI protection

Shielded CHAMP Latch panel mount connectors are designed to provide the optimum in EMI protection at the chassis and still permit mating with CHAMP Connectors and other compatible connectors in 24-, 36- and 50-position sizes.

The housing and covers are constructed of black thermoplastic. The terminals are gold over nickel plated high strength copper alloy on the mating face and

gold flash over nickel plate on the terminal side. The mating face consists of 2 rows of terminals on .085 [2.16] centers. Terminating side consists of terminals on .100 [2.54] centers for an effective .050 [1.27] staggered termination. Die cast shields are die cast zinc with nickel plating. Hardware kits are available for panel mount in standard or IEEE metric screw lock.

Shielded CHAMP Latch Panel Mount Connectors

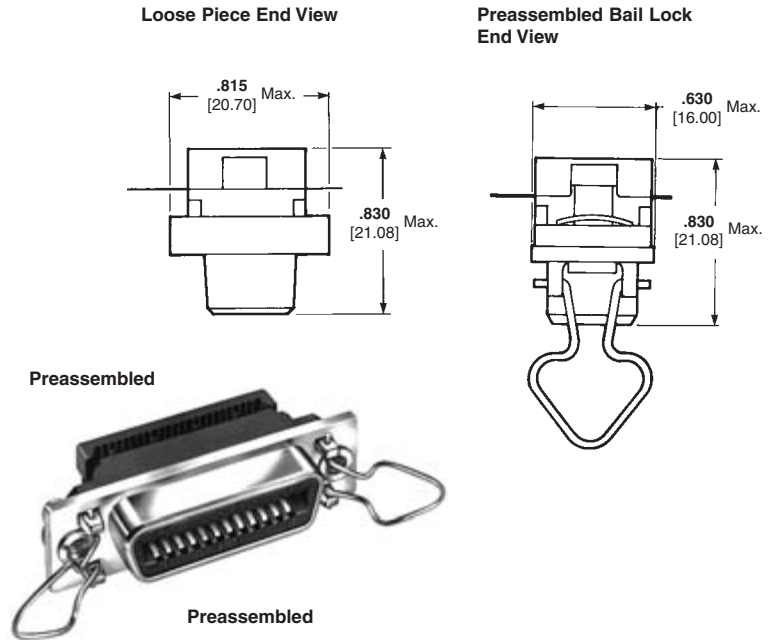
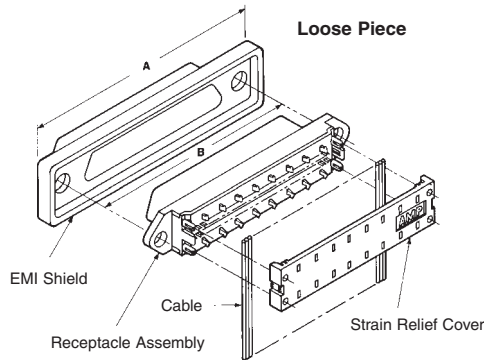
CHAMP Latch Connectors for .050 [1.27] Ribbon Cable

Material and Finish

Housing and Strain Relief Clip — Thermoplastic (black)

Terminals — Gold over nickel plated high strength copper alloy on mating face and gold flash over nickel plate on terminating side

EMI Shield — Nickel plated die casting



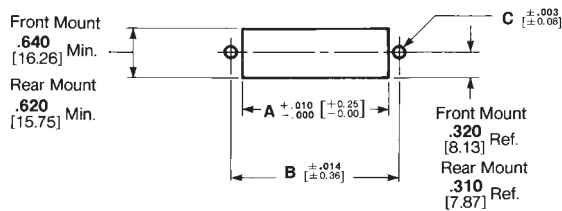
Number of Positions	Loose Piece			Preassembled				
	Dimension		Part Number	Bail Lock		Part Number	Screw Lock	
	A	B		A	B		6-32 Hole	4-40 Hole
24	2.380 60.45	1.842 46.79	554349-1 ³	2.205 56.01	1.842 46.79	—	554434-1 ³	—
36	2.380 60.45	2.352 59.74	554348-1	2.715 68.96	2.352 59.74	554436-2 555983-1 ¹	—	—
50	3.475 88.27	2.946 74.83	554350-1	3.310 84.07	2.947 74.85	554902-11.2	—	554436-2 ²

¹ Does not have boss feature. Boss is a .040 [1.02] shoulder on front of shield.

² SCSI applicable.

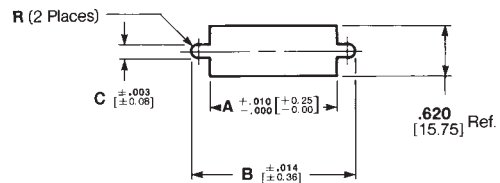
³ Can be used with Interface Bus Applications per IEEE-488.

Recommended Panel Cutouts for Front and Rear Panel Mountings



Loose Piece Standard Hardware Application

Recommended Panel Cutouts for Rear Panel Mounts Only.



Preassembled and Metric Application for IEEE-488

No. of Pos.	Loose Piece					
	Front Panel Mount			Rear Panel Mount		
	A	B	C	A	B	C
24	1.488 37.80	1.842 46.79	.126 3.20	1.575 40.01	1.842 46.79	.149 3.78
36	2.000 50.80	2.352 59.74	.126 3.20	2.085 52.96	2.352 59.74	.149 3.78
50	2.700 68.58	2.946 74.83	.126 3.20	2.700 68.58	2.946 74.83	.149 3.78

No. of Pos.	Preassembled					
	Ball Lock			Screw Lock		
	A	B	C	A	B	C
24	1.806 45.87	1.968 49.99	.152 3.86	1.575 40.01	1.994 50.65	.152 ¹ 3.78
36	2.316 58.83	2.478 62.94	.126 3.20	2.085 52.96	2.478 62.94	.126 3.20
50	2.910 73.91	3.072 78.03	.126 3.20	2.700 68.58	3.072 78.03	.126 3.20

¹ For IEEE-488 Metric Applications Dimension.
C = .192 [4.88] B = 2.036 [51.71]

Material and Finish

Mounting Stud — Bright zinc plated carbon steel

Pan Head Screw — Passivated stainless steel

Metric Standoff Stud — Black oxide coated carbon steel

CHAMP Latch Connector Hardware Kits

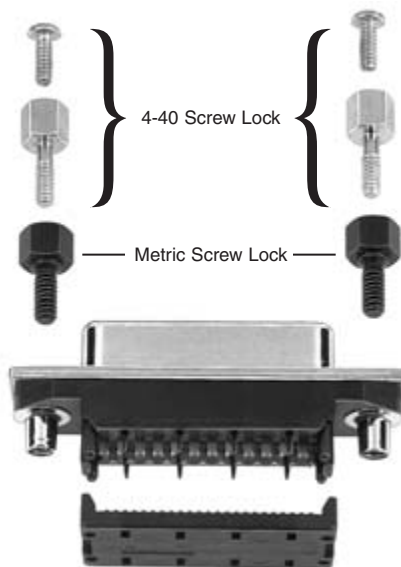
Only fastening hardware supplied, other items shown for reference purposes.

Loose Piece Shield



Metric Screw Lock Hardware Kit per IEEE-488 Application
For Front Panel Mount Part Number 553636-2
For Rear Panel Mount Part Number 553636-3

Preassembled Shield



Part Number 554272-1
(for use with 4-40 Screw Lock, Rear Panel Mount Only)
Metric Screw Lock Hardware Kit for 24-Position IEEE-488,
Preassembled, Part Number 554808-1 Rear Panel Mount Only

CHAMP System 5 Connectors

Product Facts

- Concentrated I/O hub port with Category 5 performance
- 12 Ports in one hub connection
- Category 5 performance without board compensation
- Supported by a complete LAN cabling system
(Request Publication 296129)



The proven, reliable CHAMP Connector, with its many years of experience, is now available as a Category 5 connector to meet the high-speed data requirements of today's LAN applications.

Category 5 is a performance specification for cable and connectors defined for a frequency bandwidth to 100 MHz. A Category 5 cabling system will accommodate high data rates such as 100 Mbps for 100BASE-T Ethernet or 155 Mbps ATM.

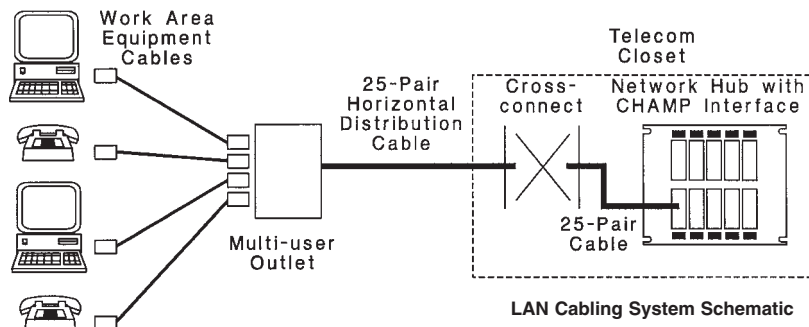
With CHAMP System 5 Connectors, only the plug

(male) connector is compensated to achieve Category 5 performance. When mated with any standard CHAMP receptacle, PC board or cable mount, Category 5 performance is achieved. Mating receptacles do not require any compensation.

The plug has been designed using flex-film circuitry, as well as a change in the wiring pattern, to reduce Near-End Crosstalk (NEXT). NEXT is the undesirable coupling of signals between pairs in cables and connectors.

In addition to Category 5 performance, CHAMP System 5 Connectors provide a concentrated I/O port which can support up to twelve 2-pair ports in a single connection. This concentrated I/O saves on both panel space and PC board real estate to support the constant effort in the miniaturization of electronics.

CHAMP System 5 Connectors are also supported by a complete LAN cabling system that extends from the hub out to the individual workstations.



LAN Cabling System Schematic

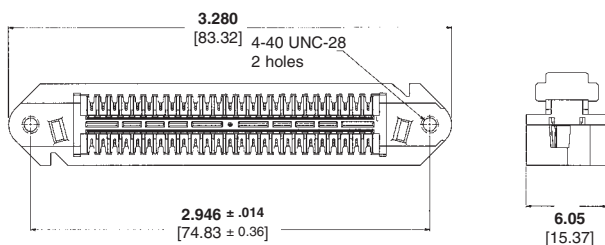
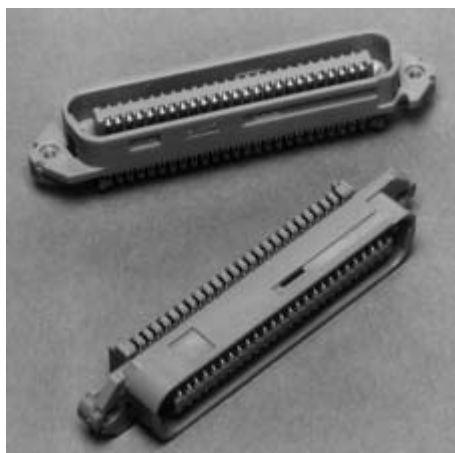
CHAMP System 5 Connectors (Continued)

Plugs

Material and Finish

Housing — Red thermoplastic

Terminals — Selectively plated gold over nickel plated high strength copper alloy

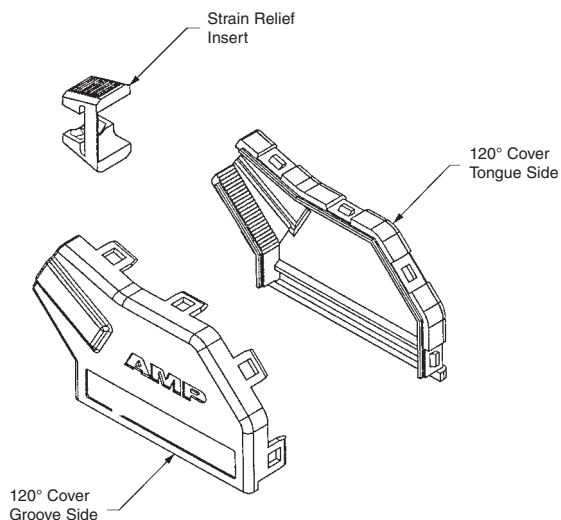


Description	Dim A	Dim B	Dim C	Part No.
24 AWG Solid Wire	3.280 83.32	2.946 74.83	.690 17.53	1-558693-1

120° Strain Relief

Material and Finish

Housing — Light almond thermoplastic

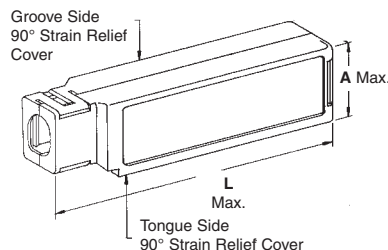


Cable Diameter Range	Part Number
.350-.680 8.89-17.27	569336-1

**90° Strain Relief
Material and Finish**

Housing — Light almond thermoplastic

CHAMP System 5 Connectors (Continued)



Part Number 552731

Cable Diameter Range	Dimensions		Part Number	
	A	L	Connector (Red)	Cover (Almond)
.650-.750 16.51-19.05	.685 17.40	3.878 98.50	1-558693-1	569335-1
.475-.540 12.07-13.72	.112 2.845	3.878 98.50	1-558693-1	552731-1

PC Board Mount Options

Although any CHAMP receptacle will provide Category 5 performance when mated with the CHAMP System 5 plug, following are two popular right angle, board mount styles:

Part Number 557932-1: Right Angle, Shielded Receptacle; Shielded Backshell

Part Number 553813-3: Right Angle, Shielded Receptacle; Backshell Not Shielded

See page 82 for more details on these receptacles

Tooling

The standard portable hand-operated tool (MI-1) is designed for field applications and medium volume production and is capable of terminating the CHAMP System 5 Plugs. The proper color-code bar must be used and the CHAMP System 5 Connector wiring pattern followed.

MI-1 Portable Hand Operated Tool (Butterfly)

Part Number 229378-1

Color Code Bar

Part Number 224105-1

CHAMP System 5 Connector

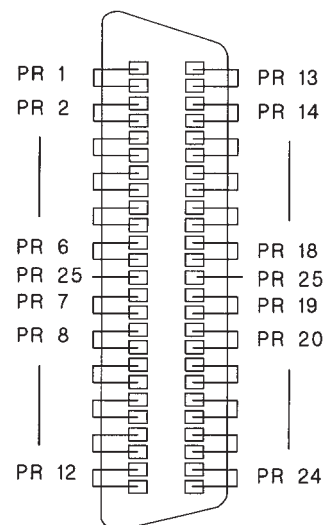
CHAMPOMATOR 2.5

Terminating Machine

(See Page 131)



Wiring Pattern



CHAMP IDC Connectors for Special Applications

Product Facts

- For factory cable assembly applications
- Provides for up to a 10% savings in time over conventional cable strain relief methods when used in mass production cable assembly operations
- May be utilized for booted cables
- Metal cable clamp may only be engaged with a special CHAMPOMATOR semi-automatic wire insertion tool
- Once cable clamp is engaged, strain relief is provided
- Maximum cable diameter .450 [11.43]
- Provided with dust covers



The CHAMP Connector Systems are widely diversified and have expanded to meet not only the demands of the telecommunications industry, but also the needs of the computer markets. The CHAMP Connector product lines includes not only the Standard Connectors, but a growing network of Special and Shielded CHAMP Connectors for various special applications. All special items are illustrated and dimensioned on the following pages (51 thru 60) to assist you in selecting the proper application for your needs.

CHAMP Connector with Crimp Cable Clamp (50-Position Only)

This connector is used for the mass production of 25 Pair Cable Assemblies. The Tyco Electronics CHAMPOMATOR Machine is used to terminate this style connector. The connector is also available in an Integral Latch version.

Wear Adapter (50-Position Only)

This one-piece disposable assembly saves wear on more expensive mounted test equipment and is applicable when frequent plugging/unplugging is necessary. The Wear Adapter is prewired and can be used with all connectors of similar design.

Multiple Wire Connector (50-Position Only)

This special connector is designed to terminate two unstripped conductors into one terminal position for economical half tapping and daisy chain (bridging) applications. The panel mount receptacles are preloaded with contacts for 24 or 26 AWG [0.51 or 0.40 mm] solid wire with a maximum insulation diameter of .034 [0.86] per wire.

CHAMP Back-to-Back Connector (50-Position Only)

The 25 pair connector allows systems to grow by

adding an electrical connection into an existing cable-to-cable or cable-to-panel application. The kit includes a bonded plug/receptacle assembly, two-piece cover to outer cable diameter range of .380 to .400 [9.65 to 10.16] and two pan head screws. Instruction Sheet 6503 describes terminating procedures with a Tyco Electronics arbor frame applicator and special assembly.

Other specials available are the CHAMP IEEE-488 Cable Assemblies and Connectors in Standard and Shielded versions. The connectors are available in panel mount and PC board styles.

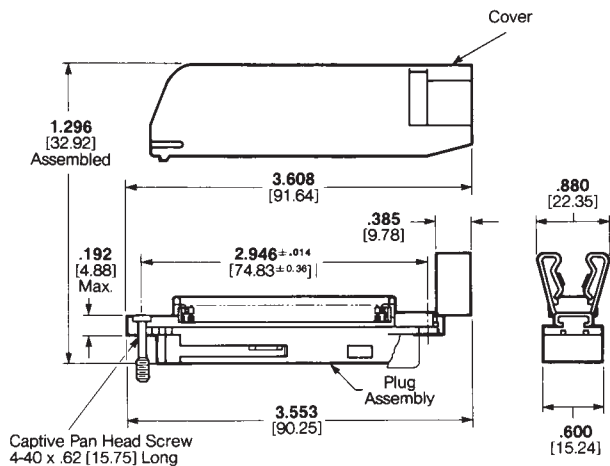
Methods of panel mounting the Small Computer System Interface (SCSI) 50-position Connectors are shown on page 125 for reference purposes.

CHAMP IDC Connectors for Special Applications (Continued)

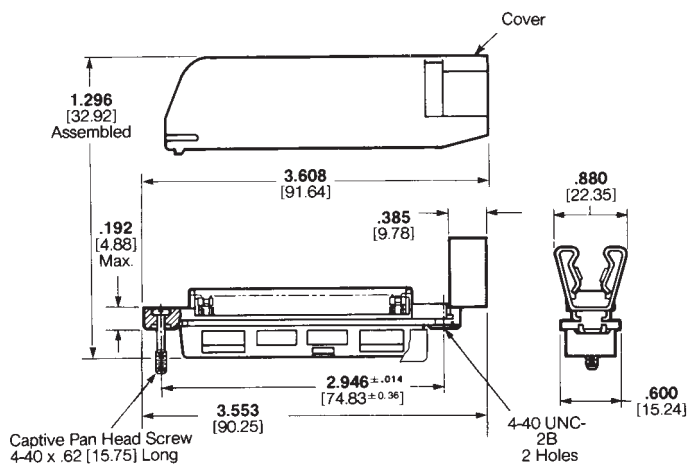
**CHAMP Connector with Crimp Cable Clamp
(For 50-Position Only)**

Note: A Special Tyco Electronics CHAMPOMATOR Machine is used to terminate this style connector.

Consists of:
CHAMPOMATOR 3A Terminating Machine Part Number 1-761420-4.



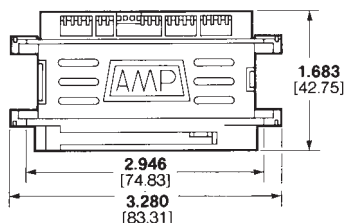
50-Position Plug Assembly



50-Position Receptacle Assembly

Wire Size				Housing Color Dot Description	Contact Letter Code	Housing Color	Part Numbers	
Solid	7 Strand						Plug	Receptacle
AWG	mm	AWG	mm ²					
24-26	0.51-0.40	24	0.20	Blue	B	Gray	553213-3	553212-3

**50-Position
Wear Adapter (Plug to Receptacle Assembly)
Part Number 552705-1**



Product Facts

- No prestripping of wire required
- Positive electrical contact through redundant contact points
- Eliminates time-consuming soldering
- Standard 50-position receptacle connector configuration
- Terminals constructed of high strength copper alloy with gold over nickel plating in contact area
- Utilizes standard CHAMP connector screw lock, bail lock and locking latch hardware
- Economical approach to half-tapping and daisy chain applications

Product Facts

- No prestripping of wire required
- Positive electrical contact through redundant contact points
- Leads can be dressed to desired configuration
- Terminals constructed of high strength copper alloy with gold over nickel plating
- Easy plug-in insertion into existing cables

Notes:

1. Cable to customer supplied.
2. Acceptable cable diameter range is .380-.400 [9.65-10.16].

Wire Ranges —

1. 24 AWG [0.20 mm²] (7 strand) or 26 AWG [0.40 mm] (solid) and 24 AWG [0.51 mm] (solid)—B Slot.
2. 26 AWG [0.14 mm²], 27 AWG [0.10 mm²] or 28 AWG [0.09 mm²] (strand)—E Slot.

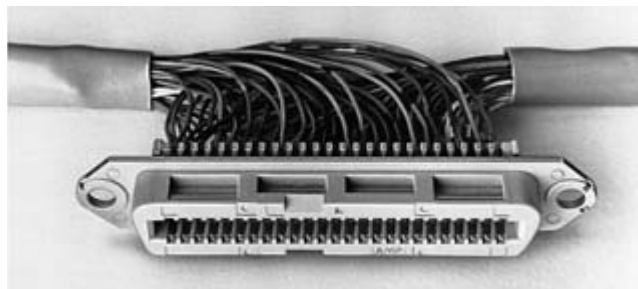
Multiple Wire Connectors (50-Position Only)

The Multiple Wire CHAMP Connector extends the unique technology of the regular CHAMP connector to provide the capability of terminating two conductors into one terminal position. Use of the Multiple Wire connector offers the labor savings of insulation displacement technology versus the conventional means of hand soldering the terminals. They are available in 50-position receptacle configurations with a molded strain relief and the necessary hardware for panel mount applications. The connector consists of a molded thermoplastic housing with receptacle contacts constructed of high strength copper alloy with gold over nickel plate.

Back-to-Back Connector Assembly (50-Position Only)

The 50-Position CHAMP Back-to-Back Connector provides the customer with the ability to make an electrical connection into existing cable-to-cable and cable-to-panel applications. The male-to-female connector can be utilized as a bridging connector in central office or PBX Bussing. It also provides a readily accessible interface for test scanning, maintenance or telephone monitoring equipment.

This connector utilizes the insulation displacement technology. To terminate the connector, one half of the unstripped wires are laced through the applicator tool and mass terminated. Reversing the connector allows the mass termination of the remaining connectors. For applicator tooling, see page 65.



Receptacle Assembly—J Slot
Part Numbers 552827-1 (Gray) and 552827-2 (Black)

Multiple Wire Strain Relief¹
Part Number 552851-2 (Black)

- ¹ Available for use with 50-position thin flange connector only.
Notes: 1. J Slot for 24 AWG [0.51 mm] solid wire only. (Pink Color Dot)
2. Max. insulation dia. .034 (0.86)

For Snap-In Panel Mount Strain Relief, see Panel Mount Connector Accessories on page 95.

Application Tooling

Termination is accomplished by using the special MI-1 applicator for 26 AWG [0.40 mm] solid wire only, Part Number 2-229378-0 or the CHAMP discrete wire applicator for 26-24 AWG [0.40-0.51] solid wire, Part Number 231593-1.



Plug/Receptacle 50-Position, B-Slot Kit
Part Number 553257-1 (Cable-to-Cable Application)

CHAMP IDC Connectors for Special Applications, Gender Menders

Product Facts

- Kit is preassembled
- Like numbered contacts on both connectors are electrically common
- Allows connections between plug and plug or receptacle and receptacle interfaces
- Terminals constructed of high strength copper alloy with selectively plated gold over nickel plating in contact area
- Hardware is zinc plated steel
- Housing and covers are polyphenylene black

Receptacle Assembly



Plug Assembly



**Gender Menders
50-Position with J-Hook
Hardware**

Materials

Housing and Covers — Polyphenylene, black

Terminals — Selectively plated gold over nickel plating high strength copper alloy

Hardware — Zinc plated steel

Style	With J-Hook Hardware	W/O J-Hook Hardware
Receptacle	—	554875-2
Plug	554876-1	554876-2

**24-Position Shielded
CHAMP IEEE-488
Cable Assemblies**

Material and Finish

Housing — Thermoplastic, black

Terminals — Selectively plated gold over nickel plated high strength copper alloy

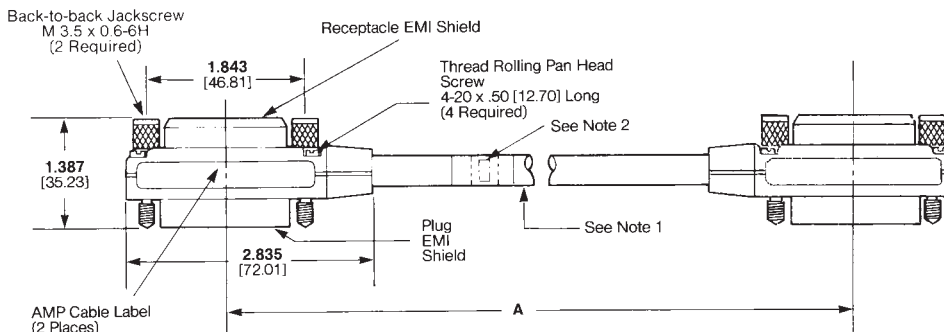
Metric Jackscrew — Black oxide plated, carbon steel

EMI Shield — Nickel plated non-ferrous die casting

Notes:

1. Cable (24) conductors 26 AWG [0.12-0.15 mm²], (2) 24 AWG [0.20 mm²] drain wires with double foil and braided shields.
2. Manufacturer's data code.
3. Cable assemblies are available in special lengths. For further information contact Tyco Electronics at the numbers listed below.

**CHAMP IDC Connectors for Special Applications,
Shielded Cable Assemblies**



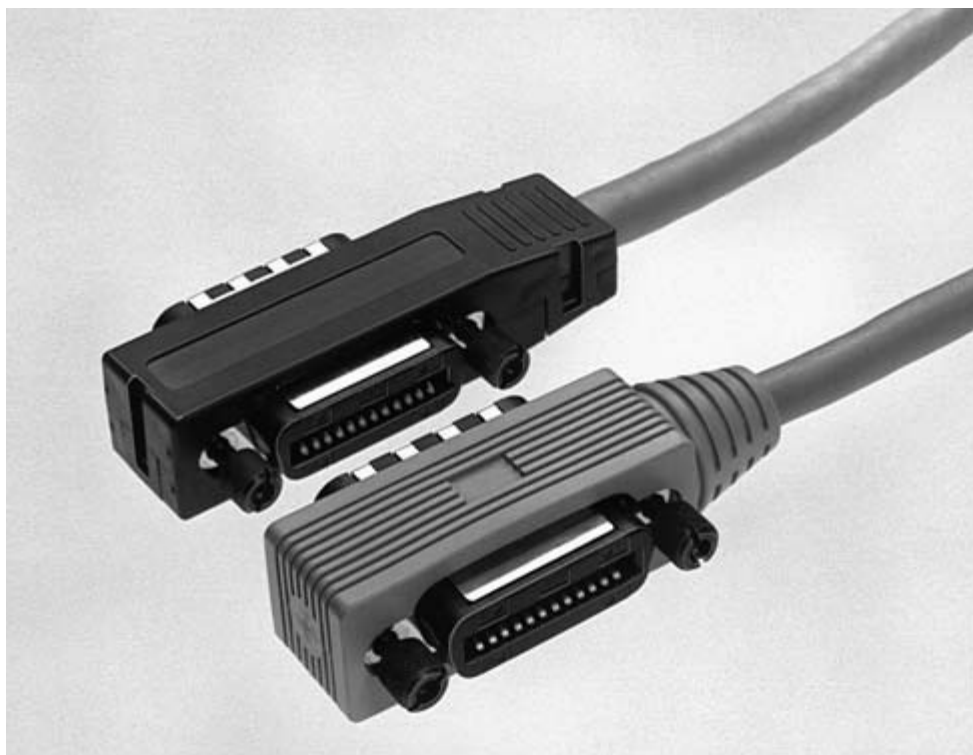
Dimension A		Part Numbers
in.	m	
19.68	0.5	553577-1 ¹
39.37	1.0	553577-2 ¹
78.74	2.0	553577-3 ¹
118.11	3.0	553577-4 ¹
157.48	4.0	553577-5 ¹
236.22	6.0	553577-6 ¹
314.96	8.0	553577-7 ¹

¹ Contact Tyco Electronics for RoHS Part Number information.

CHAMP IDC Connectors for Special Applications, Shielded Back-to-Back Cable Connectors

Product Facts

- Conforms to IEEE-488 specifications
- Superior shielding effectiveness
- Fully intermateable and compatible with all other IEEE-488 interfaces
- Conductive to post molding techniques
- Available in back-to-back configuration
- Design includes a two-piece, precision stamped metal shell that encloses the 24-position back-to-back connector
- Connector design allows shields to accept a cable range of .300 to .450 [7.62 to 11.43] diameter
- Acceptable wire sizes of 26, 27 and 28 AWG [0.12, 0.10 and 0.09 mm²] 7 strand



The Shielded CHAMP Connector

Back-to-Back Cable Connector Kit is currently available in a true 24-position IEEE-488 configuration.

The IEEE-488 Kit consists of a 24-position back-to-back connector assembly, a plug shield, a receptacle shield and two jackscrews. By ordering different dash numbers of the ferrule, you may obtain the appropriate diameter inner ferrule to accommodate the particular size cable to be terminated.

A two-piece, snap-on strain relief cover kit is also available for those who do not wish to post mold the terminated assembly.

Wire termination of the back-to-back (plug-to-receptacle) connector assembly is facilitated by the unique, one-piece insulation displacement contact design. Applicator tooling is specifically designed to mass terminate unstripped wires into their respective slotted beams. Each wire is cut to length simultaneously as termination occurs, and 24 wires are terminated at the same time. See pages 128 thru 131 for application tooling.

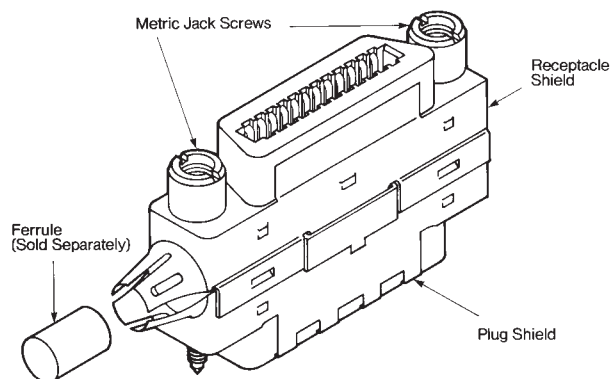
The two precision-stamped shields are then assembled over the terminated connector assembly. The spring fingers of these shield halves captivate and reliably maintain contact with the braid of

the cable, previously positioned over the inner ferrule prior to connector assembly termination.

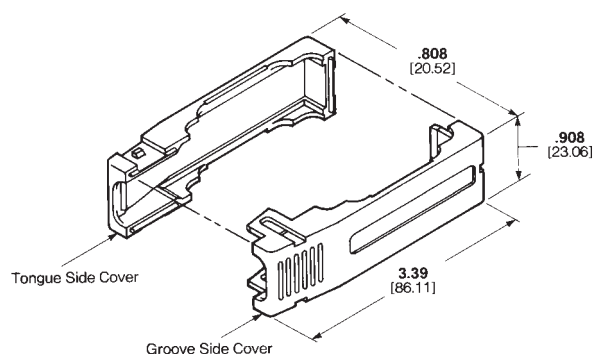
The spring fingers allow the shields to accept a cable range of .300 to .450 [7.62 to 11.43] in diameter, and due to their stored energy design, provide continuity of shield to braid regardless of temperature, shock, vibration and other external influence. Installation of the black, plated metric jackscrews in accordance with IEEE-488 specifications finalize the assembly.

CHAMP IDC Connectors for Special Applications, Shielded Back-to-Back Cable Connectors (Continued)

24-Position Back-to-Back Kit



24-Position Back-to-Back Cover Kit



Cable Connectors

Connector Styles	Cable Diameter Range	Post Moldable	Kit Part Number	Snap-on Cover Part Number
Back-to-Back	.300-.375 7.62-9.53	Yes	555182-1	554831-1

Inner Ferrules

Inside Diameter	Part Numbers
.300 7.62	554725-2
.350 8.89	554725-3
.400 10.16	554725-4

24-Position Interface Bus Connector

Part Number 554815-1

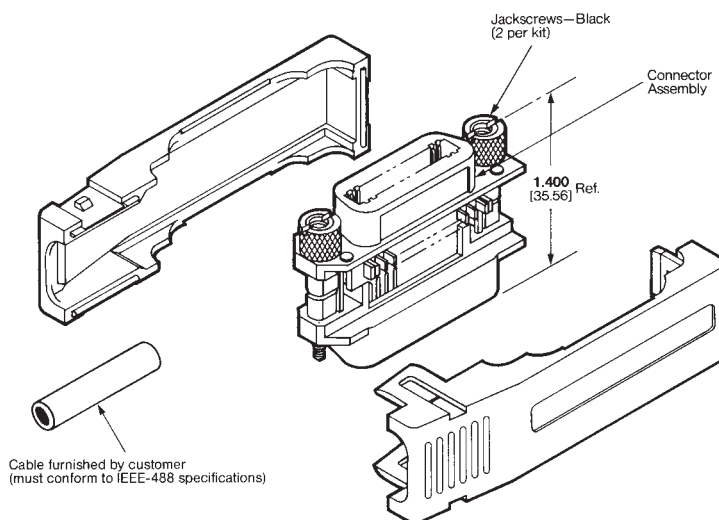
Snap-on Covers—
Part Number 554831-1

Material and Finish

Housing and Cover — Black, thermoplastic

Jackscrews — Black oxide plated carbon

Terminals — High strength copper alloy with gold over nickel plating in contact area



CHAMP IDC Connectors for Special Applications, Interface Bus IDC Connector Panel Mount Applications

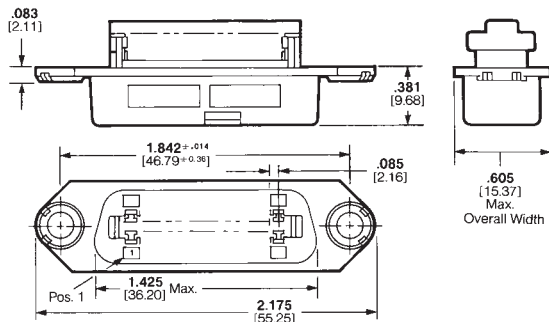
Panel Mount Receptacle (24-Position)

Material and Finish

Housing — Black thermoplastic

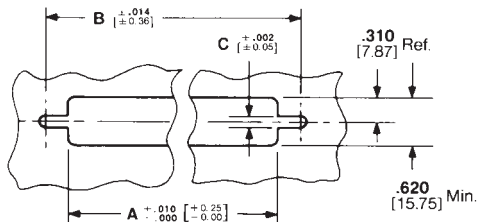
Contacts — Selectively plated gold over nickel plated on high strength copper alloy

Note: For tooling, see pages 128 thru 132.



Wire Size				Housing Color Dot Designation	Contact Letter Designation	Part Number (thin flange)
Solid	7-Strand					
AWG	mm	AWG	mm ²			
22	0.64	22	0.40	Green	C	2-552322-1
24-26	0.51- 0.40	24	0.20	Blue	B	2-552273-1
—	—	26-27-28	0.14- 0.10-0.09	Yellow	E	2-552474-1

Panel Cutout Dimensions



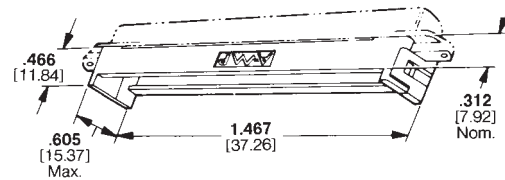
Description	Dimensions		
	A	B	C
Front Panel	1.488 37.80	2.036 51.71	.126 3.20
Rear Panel	1.575 40.01	2.036 51.71	.192 4.88

Note: Panel Thickness Range .062-.125 [1.57-3.18] for front panel mount applications.
Panel Thickness Range .062-.093 [1.57-2.36] for rear panel mount applications.

Snap-On Strain Relief, 24-Position (2 parts required per each assembly)

Material and Finish

Black thermoplastic



Low Profile
Part Number 1-552298-1

Panel Mount Metric Screw Lock Hardware Kits (one kit required per each assembly)

Material and Finish

Nut and Lock Washer — Zinc plated carbon steel

Metric Mounting Screw — Black oxide plated carbon steel



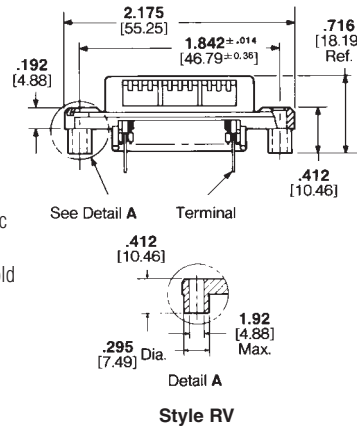
CHAMP IDC Connectors for Special Applications, Interface Bus PCB Connector Applications

Vertical Mount Receptacle (24-Position) Part Number 552224-1

Material and Finish

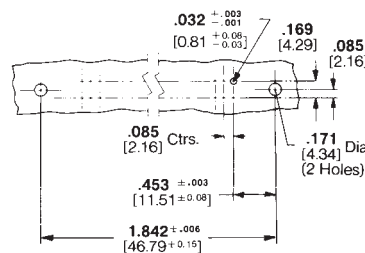
Housing — Polyester thermoplastic (black)

Terminals — Selectively plated gold over nickel plated on high strength copper alloy, tin plated tails



Recommended Printed Circuit Board Mounting Dimensions (24-Position Only)

Note:
PC Board Thickness—
.125 [3.18] maximum



Edge Mount Screw Lock Hardware Kits (one kit required per assembly)

Mounting Bracket
Part Number 552656-1

Metric Standoff Stud
Part Number 552634-3



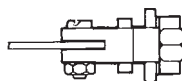
Note: 4.40 x 3/8 [9.53] screws and nuts for mounting brackets are customer supplied items.

Vertical Mount Screw Lock Hardware Kits (one kit required per assembly) Order all hardware separately

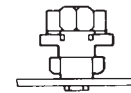


For Standard Mount
Part Number
552767-1

Standard Mount



Standard Mount



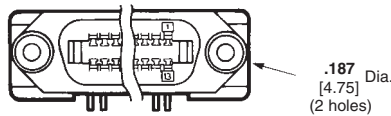
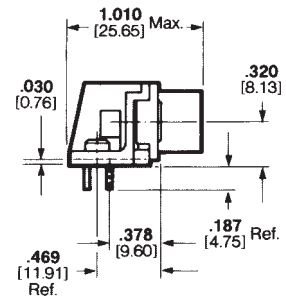
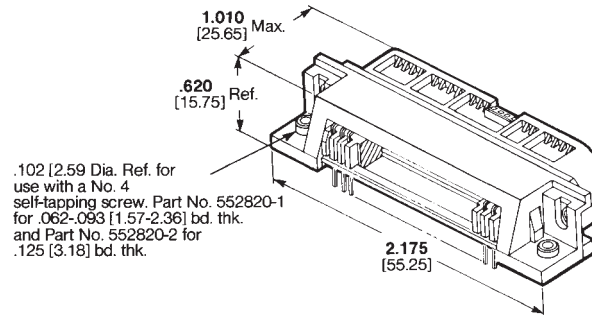
CHAMP IDC Connectors for Special Applications, Interface Bus PCB Connector Applications (Continued)

Right Angle Mount Receptacles (24-Position)

Material and Finish

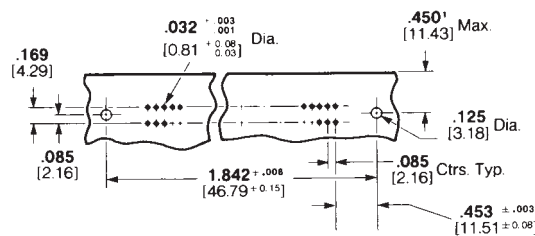
Housing, Bracket and Plate — Polyester thermoplastic (black)

Terminals — Selectively plated gold over nickel plated high strength copper alloy, tin plated tails



Part Number 552791-1
(Standard Orientation)

Recommended PC Board Mounting Dimensions (24-Position Only)



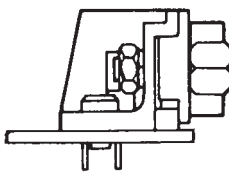
¹ For rear panel mounting applications.

Right Angle Mount Hardware Kit

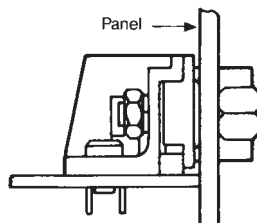
Note: Only fastening hardware supplied, other items shown for reference purposes.



Standard Mount



Rear Panel Mount¹



¹ Panel Thickness Range: .062-.093 [1.57-2.36] for rear panel mount metric applications.

Shielded CHAMP Connectors

Connectors to be used with
24-Position Interface Bus Applications per IEEE-488

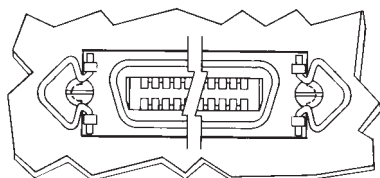
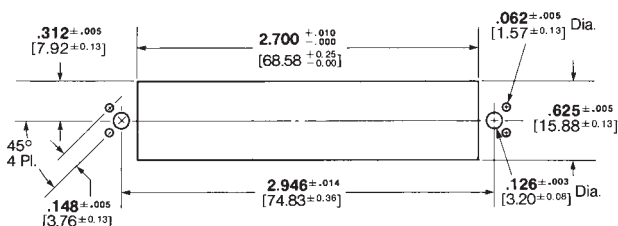
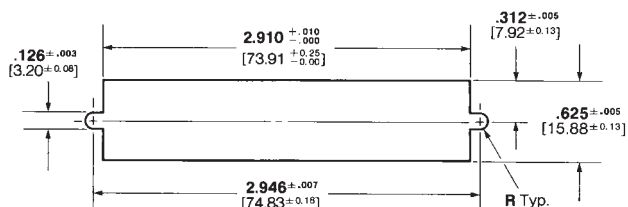
Type of Connector	For Part Numbers and Specifications, See Pages:
Discrete Wire	102
CHAMP Latch	109
Right Angle	82-85
Vertical Mount	86-87

CHAMP IDC Connectors for Special Applications, Connector Panel Cutouts for SCSI Applications

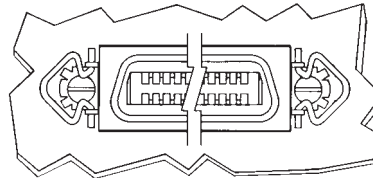
Methods of panel mounting
the Small Computer System
Interface (SCSI) 50-Position
Connectors

CHAMP .085 Centerline
Miniature Ribbon Connector Systems

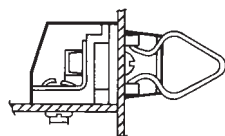
3



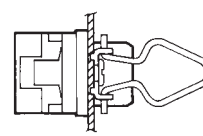
Connector Position
from Front of Panel



Connector Position
from Front of Panel



SCSI Mounted Preassembled
Screw Lock Connector



SCSI Mounted Preassembled
Bail Lock Connector

Loose Piece Shielded Connectors (Rear Mount of Bails)¹

Connector Type	Applicable Base Part Number
CHAMP Latch	554350 ²

Preassembled Shielded Bail Lock Connectors¹

Connector Type	Applicable Base Part Number
CHAMP Latch	554902
Right Angle	554901

¹ Panel Thickness: .062 [1.57] Max.

² For SCSI mount of bails, two 4-40 screws .750 [19.05] long and two 4-40 hex nuts are required.

Loose Piece Shielded Connectors (Front Mount of Bails)

Connector Type	Applicable Base Part Number
CHAMP Latch	554350 ²

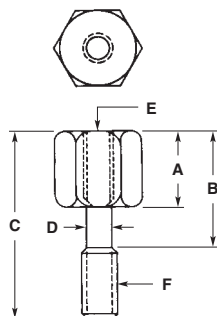
Preassembled Shielded Screw Lock Connectors (Front Mount of Bail Clips by Use of Hardware Kit No. 554818-2)

Connector Type	Applicable Base Part Number
CHAMP Latch	554436
Right Angle	553813

CHAMP .085 Centerline Connectors Miscellaneous Mounting Hardware

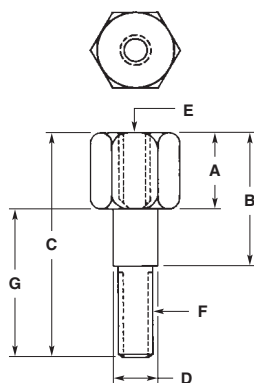
The following information on miscellaneous mounting screws and hardware components is offered for individuals designing Panel Mount or Cable-to-Cable Screw Locking Systems. For more information concerning this subject, contact Tyco Electronics at the numbers listed below.

Standoff Mounting Screw Part Number 552657-1



Dimensions					
A	B	C	D	E	F
.250 6.35	.400 10.16	.650 16.51	.091 2.31	4-40	4-40

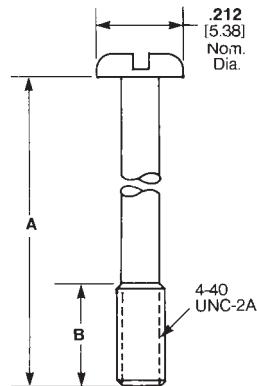
Standoff Mounting Studs



Dimensions							Part Number
A	B	C	D	E	F	G	
.239 6.07	.347 8.81	.640 16.26	.141 3.58	4-40	4-40	.401 10.20	229995-2
.250 6.35	.605 15.37	1.000 25.40	.112 2.84	4-40	4-40	.750 19.05	552113-1
.256 6.50	.339 8.61	.650 16.51	.165 4.19	M 3.5 x .6	4-40	.394 10.01	552634-3
.193 4.90	.335 8.51	.650 16.51	.185 4.70	M 3.5 x .6	4-40	.457 11.61	552634-4
.256 6.50	.457 11.61	.750 19.05	.183 4.65	M 3.5 x .6	4-40	.494 12.55	552634-7
.193 4.90	.394 10.00	.688 17.48	.183 4.65	M 3.5 x .6	4-40	.495 12.57	552634-9

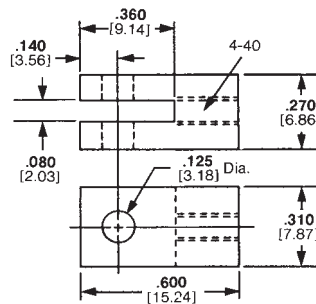
CHAMP .085 Centerline Connectors Miscellaneous Mounting Hardware (Continued)

Captive Pan Head Screw

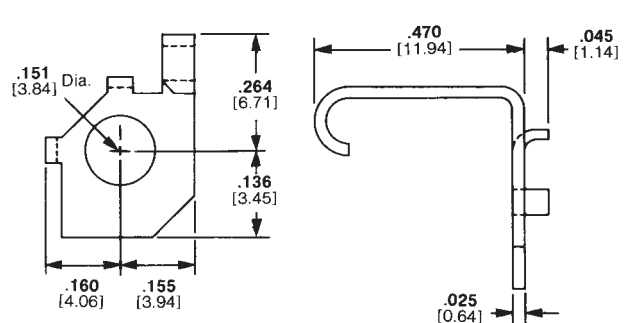


Dimensions		Part Number
A	B	
.750 19.05	.250 6.35	229911-1
.620 15.75	.250 6.35	229911-2
1.750 44.45	.130 3.30	229911-3
1.000 25.40	.200 5.08	229911-4
.425 10.80	.100 2.54	229996-2
.350 8.89	.100 2.54	229996-3

**Mounting Bracket
Part Number 552656-1**



**J-Hook Latch for Panel Mount Receptacle
to 90° Cable Exit Plug Part Number 552655-1**



CHAMP .085 Centerline Connectors Application Tooling

Portable Hand Operated Tool (MI-1)
Refer to IS 408-7559



Lacing Fixture
Refer to IS 408-7559

Standard Tool Part Number 229378-1

The standard portable hand-operated tool (MI-1) is designed for field applications and medium volume production and is capable of terminating all connectors up to 50 positions with 90° wire dress.

Lacing Fixture Part Number 230328-3

90° or 180° wire dress can be obtained with the MI-1 tool by using the removable lacing combs and placing them in the lacing fixture (shown above and ordered separately) all connectors up to 50 positions. Will not accommodate 64 positions.

Comb Kit* (6 per kit) Part Number 230327-1

For greater productivity, additional operators can use additional comb sets and lacing fixtures with a single tool.

*50-position Comb No. 231619-1 is for small conductor diameter insulation (less than .035 [0.89]) and two are required per MI-1 Tool.

Note: Best results obtained with conductor diameter to .045 [1.14] Max. with PVC insulation.

Half-Tap Tool Part Number 229378-3

For half-tap (daisy chain), 90° wire dress applications.

Multiple Wire Tool (90° wire dress) Part Number 2-229378-0

Multiple Wire Conversion Kit Part Number 230596-1

If required, the standard tool may be converted to multiple wire termination capability by use of separate multiple wire tools or a simple conversion kit.

50-Position Tool Part Number 231925-1

64-Position Tool Part Number 231880-2

F-Slot conversion tool for existing MI-1 Part Number 231928-1

For termination of F-Slot Cable Connectors.

64-Position Tool Part Number 231880-1

Reference IS 408-9412

The 64-position Comb Kit No. 231619-3 for small conductor diameter insulation (less than .035 [0.89]).

For termination of 64-position, 90° wire dress connectors only.

Back-to-Back Connector Tool Part Number 2-229378-3

For termination of IEEE-488 back-to-back cable connectors, Part Numbers. 554815, 555182 and 555183.

Conversion Kit, Color Code Bar Part Number 224105-1

For termination of CHAMP System 5 Connectors.

Palm Grip Hand Tool Kit
Part Number 229764-2, 14-64 Positions
Part Number 229451-2, 50-Position Only
Refer to IS 408-7642



The Palm Grip Hand Tool Kit is recommended for field application and low volume production. The kit includes the items listed in the chart below.

Item	Part Number
Palm Grip Tool	229451-1
Index Slides for:	
14 Positions	229706-1
24 Positions	229707-1
36 Positions	229708-1
50 Positions	229621-1
64 Positions	229709-1
Cable Clamp	229622-1
Ratchet Release	229765-1
Insertion/Extraction Tool	230238-1
Tool Carrying Case	229710-1

T-Handle Wire Insertion Tool
Part Number 229384-1
Refer to IS 408-7558



The T-Handle Wire Insertion Tool is designed for minor repair work on all CHAMP connectors. It does not have the capacity of shearing the wire in the termination process.

Terminal Insertion/Extraction Tool
Part Number 230238-1
Refer to IS 408-7787



The Insertion/Extract tool is designed to replace damaged contacts in the CHAMP plug and receptacle connectors.

CHAMP .085 Centerline Connectors Application Tooling (Continued)

Product Facts

- Terminates discrete wire and laminated cable using the insulation displacement termination technique
- Accepts 14-, 24-, 36-, 50- or 64-Position CHAMP Connectors
- Contains tooling assembly and conversion kits for each position
- Designed to terminate laminated cable with 28-24 AWG [0.08-0.2mm²] (stranded) or 28-24 AWG [0.32-0.51mm] (solid) conductors on .085 [2.16] centerline spacing
- Produces reliable electrical path between conductor and contact
- Able to terminate most conductors up to .045 [1.14] insulation diameter

Arbor Tooling

CHAMP Miniature Applicator System

The CHAMP Arbor Tool System is capable of terminating approved laminated cables on .085 [2.16] centers without cable preparation and discrete wires in 14-, 24-, 36-, 50- and 64-position CHAMP insulation displacement connectors.

The system consists of a manual Arbor Tool and Applicator.

Applicators are compatible with Arbor Tooling currently applying other Tyco Electronics products.

The Arbor Tool offers speed gained by true mass termination and a production oriented system offering maximum flexibility and efficiency. Connector and cable size conversions can be accomplished with a minimum of downtime.



90° Dress CHAMP Applicator and Manual Arbor Tool



180° Dress CHAMP Applicator and Manual Arbor Tool

Description	Connector Positions	Part Numbers	
		Laminated Cable on .085 [2.16] Centerline	Discrete Wire Cable 90°/180° Dress
CHAMP Applicator Only	14 thru 64	231592-2 ¹	231593-2 ²
CHAMP Applicator with Manual Arbor Tool for large wire (.058 [1.47]Max.)	24 thru 64	—	820805-1 ³

Use with Manual Arbor Tool Part Number 91085-2 refer to Instruction Sheet 408-7777

¹ Refer to Instruction Sheet 408-3137

² Refer to Instruction Sheet 408-3133

³ Refer to Instruction Sheet 408-9856

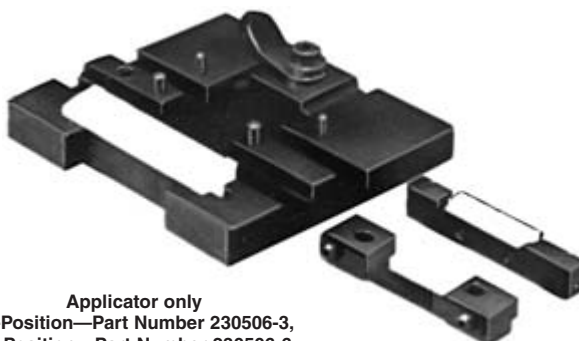
CHAMP .085 Centerline Connectors Application Tooling (Continued)

**Tooling for
24- and 50-Position
Back-to-Back
Connectors Only**

Tooling consists of the manual arbor tool and applicator which accepts the preassembled "back-to-back" connectors. The operator positions the connector and laces wires of the cable through the combs across the connector and by actuating the handle, terminates one side of the connector. This process is repeated on the other side of the connector. The terminated connector assembly is removed from the tool and the strain relief cover and jackscrews are installed to complete the connector assembly.



**Manual Arbor Tool and Applicator
50-Position—Part Number 230506-1,
24-Position—Part Number 230506-5
Refer to Instruction Sheet 408-6503**



**Applicator only
50-Position—Part Number 230506-3,
24-Position—Part Number 230506-6
Refer to Instruction Sheet 408-6503**

**CHAMPOMATOR 2.5
Terminating Machine
Part Number 354786-X**

Product Facts

- Low applied costs
- Automatic termination of jacket cable
- Single-or double-ended assemblies
- Microprocessor controlled
- Stored program capability
- Selective termination of connector positions
- Rapid tooling changeover for different connector types
- Handles a variety of Tyco Electronics insulation-displacement connectors
- Terminated most jacketed cable
- Remote programming and data retrieval
- 180° or 90° wire dress

Controller required.
Accessories available separately.



CHAMPOMATOR 2.5 Terminating Machine

Part Number	Customer Description	Manual	IS
354786-2	180° Wire Dress		
354786-3	90° Wire Dress		
1-354786-5	CAT 5 180° Wire Dress	409-5786	408-9867
354786-8	CAT 5 90° Wire Dress		

The CHAMPOMATOR 2.5 terminating machine is the compact, high-productivity way to terminate a variety of Tyco Electronics connectors using insulation-displacement contacts. The machine efficiently terminates wires manually sorted from multi-conductor cables. The user-determined termination sequence may include full termination of all contacts or selective termination of some, such as for various RE-232 wiring patterns.

The machine is micro-processor controlled and programmed by a membrane switch key-board. The easy programming simplifies the process and reduces training requirements. The machine's internal storage capability can retain up to 350 cable

assemblies, which can be easily retrieved by number or name. Production data and diagnostics can also be accessed through the controller. Off-line programming is also possible with a host or personal computer.

The machine can accommodate a variety of connectors through a change in tooling packages, that may be purchased separately.

A Category 5 tooling kit includes the necessary tooling to terminate the 50-position CHAMP System 5 connector 1-558693-1 on 24 AWG [0.2 mm²] conductors with .038 [.965] maximum insulation diameter.

Connectors can be terminated with straight (180°) or right angle (90°) wire dress.

Specifications

Length — 25 [635]

Width — 23 [584]

Height — 10 [254]

Weight — 95 lb [43 kg] approx.

Electrical Requirements — 120 VAC, 50/60 Hz, single phase, 1A

Air Requirements — 80 psi [5.52 bars*] at .75 scfm

* One bar = 100 kPa

Production Rates

Net production rates for fully loaded connectors depend on cable type, connector style and connector size. The machine cycle rate is one pair per second.

For more detailed information, request Catalog 82247.

CHAMP .085 Centerline Connectors Application Tooling (Continued)

CHAMP Latch Hand Tool Part Number 231561-1

IS 408-3135



This tool is capable of terminating ribbon cable with 26 AWG [0.46 mm] (solid); 28 AWG [0.32 mm] (solid) and 28 AWG [0.08-0.09 mm²] (stranded) or 30 AWG [0.25 mm] (solid) conductors to 24-, 36- and 50-position low profile connectors.

If using other AMP-LATCH Ribbon Cable Connectors, use Hand Tool Kit Part Number 768340-1 (IS 408-9828) and Locator Kit Part Number 768351-1 (IS 408-9839). Tool Kit includes bench mount for increased productivity. This provides the most versatile and economical tooling.

CHAMP Latch Applicator (only) Part Number 231576-1

IS 408-3134

Shown installed in
Manual Arbor Tool
Part Number 91085-2
IS-408-7777



This tooling is capable of terminating the same solid or stranded conductors as the hand tool. The tooling is a two-piece kit that includes a locator and a cable stop insert.

The locator features a connector track to support the connector, a connector stop to position the connector and a cable guide to align the cable with the connector.

The reversible cable stop insert accommodates dead-end (flush) or daisy-chain (feed-thru) terminations with .200 [5.08] minimum spacing between connectors.

If using other AMP-LATCH Ribbon Cable Connectors use Arbor Tool Part Number 91085-2 or Pneumatic Auto-Cycle Tool, Part Number 91112-3 (IS 408-6732) with base tool Part Number 768338-1 (IS 408-9827), and Locator Kit, Part Number 768351-1 (IS 408-9839).

For 64-Position
CHAMP Latch Connectors
use tooling only, Part
Number 230536-1.

IS 408-6504

CHAMP .085 Centerline Connectors Technical Documents

Various technical documents are available for your use:

Product Specifications describe technical performance characteristics and verification tests. Intended for the design engineer, the component engineer and the quality engineer.

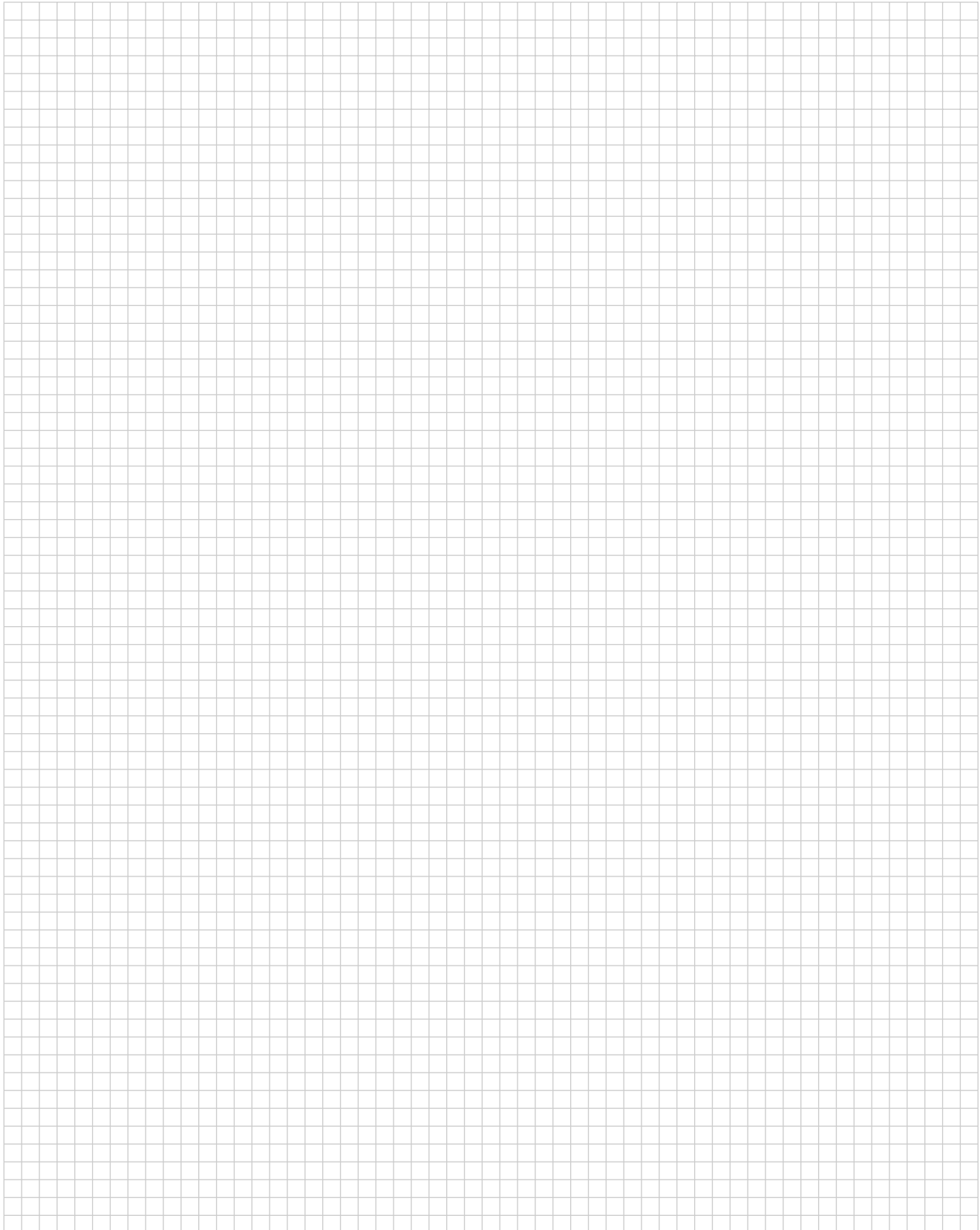
108-1287	CHAMP Termination Connectors
108-1698	CHAMP System 5 Connectors
108-6005	CHAMP Connectors
108-6019	CHAMP ACTION PIN Connectors
108-6040	CHAMP Interface Bus, EMI/RFI Shielded Cable Assembly
108-6076	CHAMP Latch Low Profile Connectors
108-6078	CHAMP Printed Circuit Board Connectors

Application Specifications describe requirements for using the product in its intended application and/or crimping information. They are intended for the Packaging and Design Engineer and the Setup person.

114-6027	CHAMP ACTION PIN Connectors
114-6030	CHAMP Latch Low Profile Connectors
114-6036	CHAMP Printed Circuit Board Connectors
114-6041	CHAMP Cable Connectors

Instruction Sheets provide instructions for assembling or applying the product. Intended for the manufacturing assembler or operator.

408-3117	CHAMP ACTION PIN Connectors
408-3133	CHAMP Discrete Wire Tooling Assembly Part Number 231593-2
408-3134	CHAMP Latch Tooling Kit Part Number 231576-1
408-3135	CHAMP Hand Tool Part Number 231561-1 for CHAMP Latch Low Profile Connectors
408-3137	CHAMP Connector Applicator 231592-2 for Laminated Cable
408-3158	CHAMP Latch Low Profile Connectors
408-3159	Strain Relief Hardware for CHAMP Connectors
408-3160	Mounting Hardware for CHAMP Connectors
408-3170	CHAMP Shielded Connectors 90° IEEE-488 Kit
408-3171	CHAMP Shielded Connectors Back-to-Back IEEE-488 Kit
408-3182	CHAMP Self Retained ACTION PIN Connectors
408-3188	CHAMP Shielded Connectors
408-3201	CHAMP Edge Mount Printed Circuit Board Connectors
408-3381	CHAMP System 5 Connectors
408-6503	CHAMP Back-to-Back Tooling Assemblies
408-6504	CHAMP Latch (64-Position) Tooling Assembly Part Number 230536-1
408-7558	CHAMP T-Handle Wire Insertion Tool Part Number 229384-1
408-7559	Application and Maintenance of CHAMP Multi-Insertion (MI-1) Hand Tool 14-, 24-, 36- and 50-Position
408-7564	CHAMP Cable-to-Cable and Cable-to-Panel Connectors
408-7642	CHAMP Palm Grip Insertion Tool
408-7672	CHAMP Printed Circuit Board Connectors
408-7787	CHAMP Insertion/Extraction Tool Part Number 230238-1
408-8329	Part Numbers 1339220-1 and 1339220-3
408-9412	Application and Maintenance of CHAMP Multi-Insertion (MI-1) Hand Tool, 64-Position
408-9856	CHAMP Discrete Wire Tooling Assembly Part Number 820805-1
408-9867	CHAMPOMATOR 2.5 Tooling Kit

Engineering Notes

RoHS Compliant to Non-RoHS Part Number Cross Reference

RoHS Compliant Part No.	Non-RoHS Part No.
58024-1	58024-1
91085-2	91085-2
91112-3	91112-3
91295-1	91295-1
122842-1	122842-1
122842-2	122842-2
122842-3	122842-3
176793-1	176793-1
176793-2	176793-2
176793-4	176793-4
176793-5	176793-5
176793-7	176793-7
176793-8	176793-8
176793-9	176793-9
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177728-1	177728-1
177728-2	177728-2
177734-1	177734-1
177734-4	177734-4
224105-1	224105-1
229378-1	229378-1
229378-3	229378-3
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2-229378-3	2-229378-3
229384-1	229384-1
229451-1	229451-1
229451-2	229451-2
229621-1	229621-1
229622-1	229622-1
229706-1	229706-1
229707-1	229707-1
229708-1	229708-1
229709-1	229709-1
229710-1	229710-1
229764-2	229764-2
229765-1	229765-1
229909-1	229909-1
229910-1	229910-1
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229968-2	229968-2
229968-4	229968-4
229969-1	229969-1
229969-2	229969-2
229969-3	229969-3
229969-4	229969-4
229974-1	229974-1
229975-1	229975-1
230238-1	230238-1
230327-1	230327-1
230328-3	230328-3
230506-1	230506-1
230506-3	230506-3
230506-5	230506-5
230506-6	230506-6
230536-1	230536-1
230596-1	230596-1
231561-1	231561-1

RoHS Compliant Part No.	Non-RoHS Part No.
231576-1	231576-1
231592-2	231592-2
231593-1	231593-1
231593-2	231593-2
231619-3	231619-3
231880-1	231880-1
231880-2	231880-2
231925-1	231925-1
231928-1	231928-1
354786-2	354786-2
354786-3	354786-3
354786-6	354786-6
354786-7	354786-7
354786-8	354786-8
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543580-1	543580-1
543610-1	543610-1
543630-1	543630-1
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552008-1	552008-1
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552011-1	552011-1
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552076-1	552076-1
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552082-1	552082-1
552113-1	552113-1
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1-552298-1	1-552298-1
552300-1	552300-1
552301-1	552301-1
552303-1	552303-1
552305-1	552305-1

RoHS Compliant Part No.	Non-RoHS Part No.
552307-1	552307-1
552312-1	552312-1
552313-1	552313-1
552314-1	552314-1
552315-1	552315-1
552317-1	552317-1
552318-1	552318-1
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552320-1	552320-1
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552390-1	552390-1
552391-1	552391-1
552412-1	552412-1
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552686-1	552686-1
552705-1	552705-1
552723-1	552723-1
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552731-1	552731-1
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552763-1	552763-1
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552837-1	552837-1
552838-1	552838-1
552843-1	552843-1
552851-2	552851-2
552933-1	552933-1
552962-3	552962-3
553212-3	553212-3
553213-3	553213-3
553443-1	553443-1
553443-2	553443-2
553443-3	553443-3

RoHS Compliant Part No.	Non-RoHS Part No.
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553443-5	553443-5
553444-2	553444-2
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553444-5	553444-5
553596-1	553596-1
553597-1	553597-1
553599-1	553599-1
553600-1	553600-1
553601-1	553601-1
553602-1	553602-1
553603-1	553603-1
554043-2	554043-2
554084-1	554084-1
554085-1	554085-1
554088-1	554088-1
554089-1	554089-1
554090-1	554090-1
554099-1	554099-1
554103-1	554103-1
554266-3	554266-3
554266-4	554266-4
554266-5	554266-5
554266-6	554266-6
554266-7	554266-7
554266-8	554266-8
554725-1	554725-1
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554815-1	554815-1
554831-1	554831-1
554902-1	554902-1
554944-1	554944-1
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554946-1	554946-1
554946-2	554946-2
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554950-2	554950-2
554951-2	554951-2
554953-1	554953-1
554953-2	554953-2
554954-1	554954-1
554955-1	554955-1
554955-2	554955-2
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555182-1	555182-1
555227-1	555227-1
556039-1	556039-1
556409-1	556409-1

RoHS Compliant to Non-RoHS Part Number Cross Reference (Continued)

RoHS Compliant Part No.	Non-RoHS Part No.
557984-1	557984-1
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569025-1	569025-1
569335-1	569335-1
569336-1	569336-1
662300-1	662300-1
679177-1	679177-1
1-761420-4	1-761420-4
768338-1	768338-1
768338-2	768338-2
768340-1	768340-1
768351-1	768351-1
768900-5	768900-5
786930-4	786930-1
786930-5	786930-2
786930-6	786930-3
787003-3	787003-3
787004-3	787004-3
787096-2	787096-1
787133-1	787133-1
787229-1	787229-1
787231-1	787231-1
787311-4	787311-1
787317-4	787317-1
787535-3	787535-1
787565-2	787565-1
787596-4	787596-1
787596-5	787596-3
787597-3	787597-1
787646-4	787646-2
787653-3	787653-1
787653-4	787653-2
787900-2	787900-1
788389-2	788389-1
788395-2	788395-1
796068-3	796068-1
820805-1	820805-1
852423-1	852423-1
852423-4	852423-4
911123-1	911123-1
911149-6	911149-6
911149-7	911149-7
911432-6	911432-6
911432-7	911432-7
915697-2	915697-2
919620-1	919620-1
1734037-1	2-557101-1
1734037-4	557101-5
1734037-5	557101-9
1734037-7	1-557101-7
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1734098-4	1-557089-6
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1734098-7	1-557089-2
1734098-8	1-557089-3
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1734099-6	1-557100-3
1734099-7	1-557100-7

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1734099-8	2-557100-1
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1734100-2	5-557102-4
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1734100-7	1-557102-7
1734100-8	2-557102-1
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1-1734101-2	2-557103-9
1-1734101-4	3-557103-7
1-1734101-5	4-557103-1
1761371-1	1761371-1
1761983-1	21108-4
5021068-4	21068-4
5021074-2	21074-2
5084487-1	84487-1
5084487-2	84487-2
5084488-1	84488-1
5084488-3	84488-3
5084598-1	84598-1
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3-5175475-1	3-175475-1

RoHS Compliant Part No.	Non-RoHS Part No.
5-5175475-3	5-175475-3
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2-5175887-4	2-175887-4
2-5175887-5	2-175887-5
2-5175887-7	2-175887-7
2-5175887-8	2-175887-8
2-5175887-9	2-175887-9
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5176371-1	176371-1
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5176377-4	176377-4
5176377-5	176377-5
5176377-8	176377-8

RoHS Compliant Part No.	Non-RoHS Part No.
5176378-1	176378-1
5176378-2	176378-2
5176378-3	176378-3
5176378-4	176378-4
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5176379-5	176379-5
5176379-6	176379-6
5176379-7	176379-7
5176379-8	176379-8
5176381-1	176381-1
5176381-2	176381-2
5176381-3	176381-3
5176381-4	176381-4
5176381-5	176381-5
5176381-6	176381-6
5176381-7	176381-7
5176381-8	176381-8
2-5178238-8	2-178238-8
2-5178238-9	2-178238-9
3-5178238-0	3-178238-0
5179656-2	179656-2
5229911-1	229911-1
5229911-2	229911-2
5229911-3	229911-3
5229911-4	229911-4
5229912-1	229912-1
5229912-4	229912-4
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2-5229912-1	2-229912-1
3-5229912-1	3-229912-1
6-5229912-1	6-229912-1
6-5229912-3	6-229912-3
6-5229912-4	6-229912-4
5229913-1	229913-1
5229913-4	229913-4
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2-5229913-1	2-229913-1
3-5229913-1	3-229913-1
6-5229913-1	6-229913-1
6-5229913-3	6-229913-3
5229995-1	229995-1
5229995-2	229995-2
5229996-2	229996-2
5229996-3	229996-3
5406874-1	406874-1
5552116-1	552116-1
5552118-1	552118-1
5552126-1	552126-1
5552130-1	552130-1
5552209-1	552209-1
5552212-1	552212-1
5552221-1	552221-1
5552224-1	552224-1
5552232-1	552232-1
5552235-1	552235-1

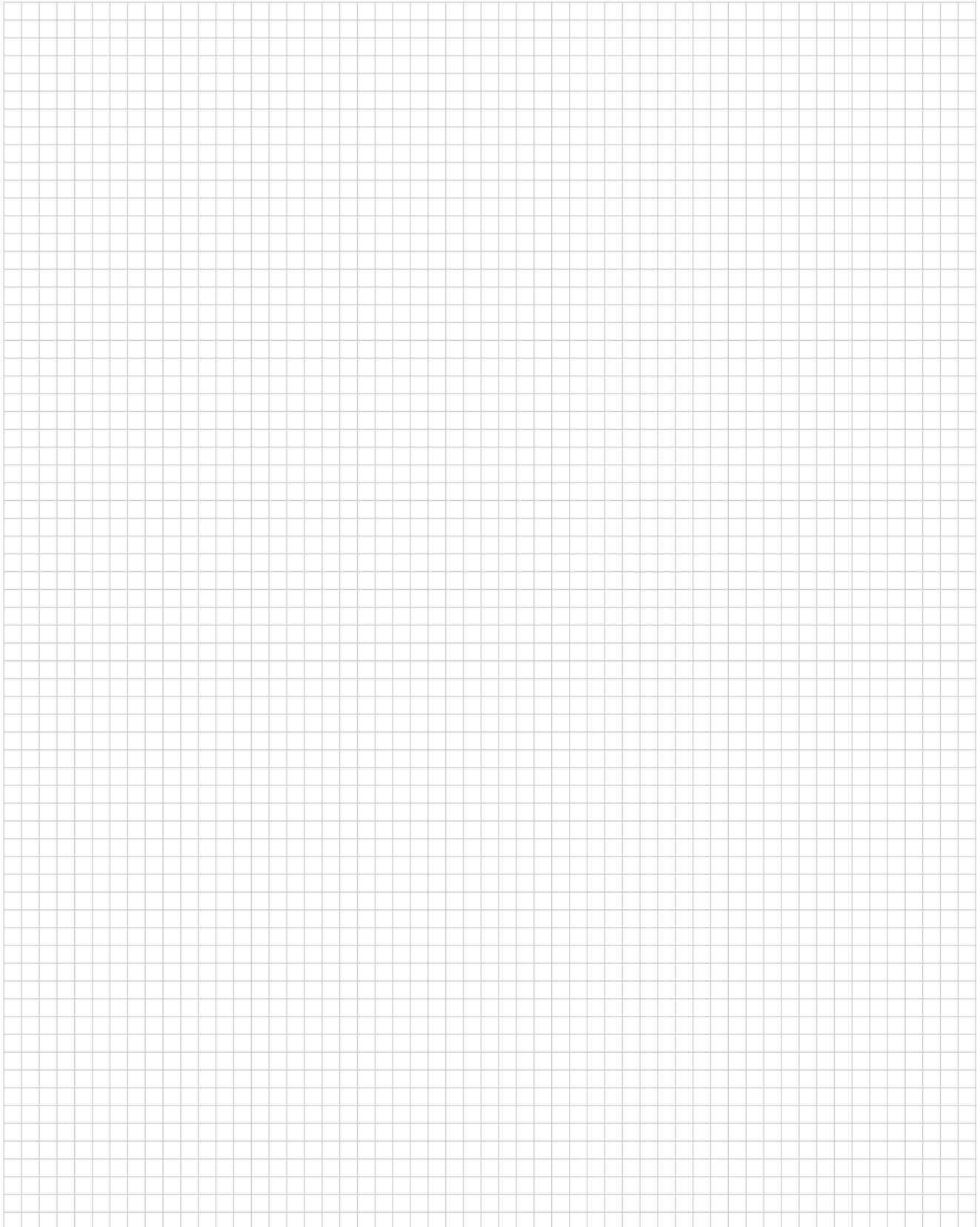
RoHS Compliant to Non-RoHS Part Number Cross Reference (Continued)

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5552246-1	552246-1
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5552383-1	552383-1
5552402-1	552402-1
5552403-1	552403-1
5552560-1	552560-1
5552560-5	552560-5
5552561-3	552561-3
5552561-4	552561-4
5552562-1	552562-1
5552562-2	552562-2
5552563-1	552563-1
5552567-1	552567-1
5552567-2	552567-2
5552567-3	552567-3
5552568-1	552568-1
5552568-2	552568-2
5552631-1	552631-1
5552633-3	552633-3
5552633-4	552633-4
5552657-1	552657-1
5552675-1	552675-1
5552690-1	552690-1
5552725-1	552725-1
5552725-2	552725-2
5552725-3	552725-3
5552726-1	552726-1
5552726-3	552726-3
5552738-1	552738-1
5552738-2	552738-2
5552740-1	552740-1
5552741-1	552741-1
5552742-1	552742-1
5552742-3	552742-3
5552743-1	552743-1
5552744-1	552744-1
5552744-2	552744-2
5552745-1	552745-1
5552791-1	552791-1
5552791-4	552791-4
5552820-1	552820-1
5552820-2	552820-2
5552960-1	552960-1

RoHS Compliant Part No.	Non-RoHS Part No.
5552960-2	552960-2
5552960-5	552960-5
5553257-1	553257-1
5553636-2	553636-2
5553636-3	553636-3
5553811-1	553811-1
5553811-2	553811-2
5553813-3	553813-3
5553813-4	553813-4
5553813	553813
5553921-1	553921-1
5554145-4	554145-4
5554216-3	554216-3
5554217-4	554217-4
5554272-1	554272-1
5554348-1	554348-1
5554349-1	554349-1
5554350-1	554350-1
5554350	554350
5554381-2	554381-2
5554434-1	554434-1
5554436-2	554436-2
5554436	554436
5554501-1	554501-1
5554726-1	554726-1
5554815	554815
5554858-1	554858-1
5554875-2	554875-2
5554876-1	554876-1
5554876-2	554876-2
5554901-1	554901-1
5554901	554901
5554902	554902
5554923-1	554923-1
5554923-2	554923-2
5555057-1	555057-1
5555119-1	555119-1
5555139-1	555139-1
5555139-2	555139-2
5555149-1	555149-1
5555149-3	555149-3
5555182	555182
5555183	555183
5555233-1	555233-1
5555520-2	555520-2

RoHS Compliant Part No.	Non-RoHS Part No.
5555983-1	555983-1
5557724-1	557724-1
5557932-1	557932-1
5557932-2	557932-2
5787096-1	787096-1
5787131-1	787131-1
5787131-2	787131-2
5787131-3	787131-3
5787191-1	787191-1
5787233-1	787233-1
5787254-1	787254-1
5787254-2	787254-2
5787254-3	787254-3
5787641-1	787641-1
5787775-1	787775-1
5787801-1	787801-1
5787851-1	787851-1
5787851-2	787851-2
5787855-1	787855-1
5787855-2	787855-2
5787859-1	787859-1
5787882-1	787882-1
5787883-1	787883-1
5787885-1	787885-1
5787886-1	787886-1
5787887-1	787887-1
5787913-2	787913-2
5787962-1	787962-1
5787962-2	787962-2
5787973-1	787973-1
5787979-1	787979-1
5788362-1	788362-1
5788450-1	788450-1
5788451-1	788451-1
5796055-1	796055-1
5796055-2	796055-2
5796064-1	796064-1
5917593-9	917593-9
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5917628-1	917628-1
5917628-2	917628-2
5917628-3	917628-3
5917628-4	917628-4
5917628-5	917628-5
5917628-6	917628-6

RoHS Compliant Part No.	Non-RoHS Part No.
5917628-7	917628-7
5917628-8	917628-8
5917629-1	917629-1
5917629-2	917629-2
5917629-3	917629-3
5917629-4	917629-4
5917629-5	917629-5
5917629-6	917629-6
5917630-1	917630-1
5917630-2	917630-2
5917630-3	917630-3
5917630-4	917630-4
5917630-5	917630-5
5917630-6	917630-6
5917630-7	917630-7
5917630-8	917630-8
5917631-1	917631-1
5917631-2	917631-2
5917631-3	917631-3
5917631-4	917631-4
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5917631-6	917631-6
5917631-7	917631-7
5917631-8	917631-8
5917738-1	917738-1
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5917738-5	917738-5
5917738-7	917738-7
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1-5917738-7	1-917738-7
6123283-5	1123283-5
6123283-9	1123283-9
6364306-1	1364306-1
6364308-1	1364308-1
6364973-2	1364973-2
6489050-1	1489050-1
6489232-1	1489232-1
6489232-2	1489232-2
6658203-1	1658203-1
6658240-1	1658240-1
6658751-1	1658751-1

Engineering Notes

Non-RoHS to RoHS Compliant Part Number Cross Reference

Non-RoHS Part No.	RoHS Compliant Part No.
21068-4	5021068-4
21074-2	5021074-2
21108-4	1761983-1
58024-1	58024-1
84487-1	5084487-1
84487-2	5084487-2
84488-1	5084488-1
84488-3	5084488-3
84598-1	5084598-1
91085-2	91085-2
91112-3	91112-3
91295-1	91295-1
122842-1	122842-1
122842-2	122842-2
122842-3	122842-3
3-175472-7	3-5175472-7
5-175472-1	5-5175472-1
5-175472-3	5-5175472-3
5-175472-5	5-5175472-5
5-175472-6	5-5175472-6
5-175472-8	5-5175472-8
5-175472-9	5-5175472-9
6-175472-0	6-5175472-0
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6-175472-2	6-5175472-2
3-175473-8	3-5175473-8
4-175473-1	4-5175473-1
5-175473-1	5-5175473-1
5-175473-6	5-5175473-6
5-175473-7	5-5175473-7
5-175473-9	5-5175473-9
6-175473-0	6-5175473-0
6-175473-2	6-5175473-2
175474-8	5175474-8
4-175474-1	4-5175474-1
4-175474-2	4-5175474-2
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6-175475-2	6-5175475-2
2-175677-1	2-5175677-1
2-175677-2	2-5175677-2
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2-175677-7	2-5175677-7
2-175677-8	2-5175677-8
2-175677-9	2-5175677-9
3-175677-0	3-5175677-0

Non-RoHS Part No.	RoHS Compliant Part No.
2-175887-1	2-5175887-1
2-175887-2	2-5175887-2
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2-175887-8	2-5175887-8
2-175887-9	2-5175887-9
3-175887-0	3-5175887-0
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176371-2	5176371-2
176371-3	5176371-3
176371-4	5176371-4
176371-5	5176371-5
176371-6	5176371-6
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176372-3	5176372-3
176372-4	5176372-4
176372-5	5176372-5
176372-6	5176372-6
176373-1	5176373-1
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176373-3	5176373-3
176373-4	5176373-4
176374-1	5176374-1
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176376-4	5176376-4
176376-5	5176376-5
176376-6	5176376-6
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176379-6	5176379-6
176379-7	5176379-7
176379-8	5176379-8
176381-1	5176381-1
176381-2	5176381-2

Non-RoHS Part No.	RoHS Compliant Part No.
176381-3	5176381-3
176381-4	5176381-4
176381-5	5176381-5
176381-6	5176381-6
176381-7	5176381-7
176381-8	5176381-8
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176793-7	176793-7
176793-8	176793-8
176793-9	176793-9
177728-1	177728-1
177728-2	177728-2
177734-1	177734-1
177734-4	177734-4
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179656-2	5179656-2
224105-1	224105-1
229378-1	229378-1
229378-3	229378-3
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229384-1	229384-1
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229451-2	229451-2
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229710-1	229710-1
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229913-1	5229913-1
229913-4	5229913-4
1-229913-1	1-5229913-1
2-229913-1	2-5229913-1

Non-RoHS Part No.	RoHS Compliant Part No.
3-229913-1	3-5229913-1
6-229913-1	6-5229913-1
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229968-1	229968-1
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229968-4	229968-4
229969-1	229969-1
229969-2	229969-2
229969-3	229969-3
229969-4	229969-4
229974-1	229974-1
229975-1	229975-1
229995-1	5229995-1
229995-2	5229995-2
229996-2	5229996-2
229996-3	5229996-3
230238-1	230238-1
230327-1	230327-1
230328-3	230328-3
230506-1	230506-1
230506-3	230506-3
230506-5	230506-5
230506-6	230506-6
230536-1	230536-1
230596-1	230596-1
231561-1	231561-1
231576-1	231576-1
231592-2	231592-2
231593-1	231593-1
231593-2	231593-2
231619-3	231619-3
231880-1	231880-1
231880-2	231880-2
231925-1	231925-1
231928-1	231928-1
354786-2	354786-2
354786-3	354786-3
354786-6	354786-6
354786-7	354786-7
354786-8	354786-8
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543580-1	543580-1
543610-1	543610-1
543630-1	543630-1
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552008-1	552008-1
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552011-1	552011-1
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552014-1	552014-1
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552064-1	552064-1
552073-1	552073-1
552073-5	552073-5
552073-6	552073-6
552076-1	552076-1
1-552076-1	1-552076-1

Non-RoHS to RoHS Compliant Part Number Cross Reference (Continued)

Non-RoHS Part No.	RoHS Compliant Part No.
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552079-1	552079-1
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552126-1	552126-1
552130-1	552130-1
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552413-1	552413-1
1-552413-1	1-552413-1

Non-RoHS Part No.	RoHS Compliant Part No.
552414-1	552414-1
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552444-1	552444-1
552469-1	552469-1
552470-1	552470-1
552471-1	552471-1
2-552474-1	2-552474-1
2-552475-1	2-552475-1
552488-1	552488-1
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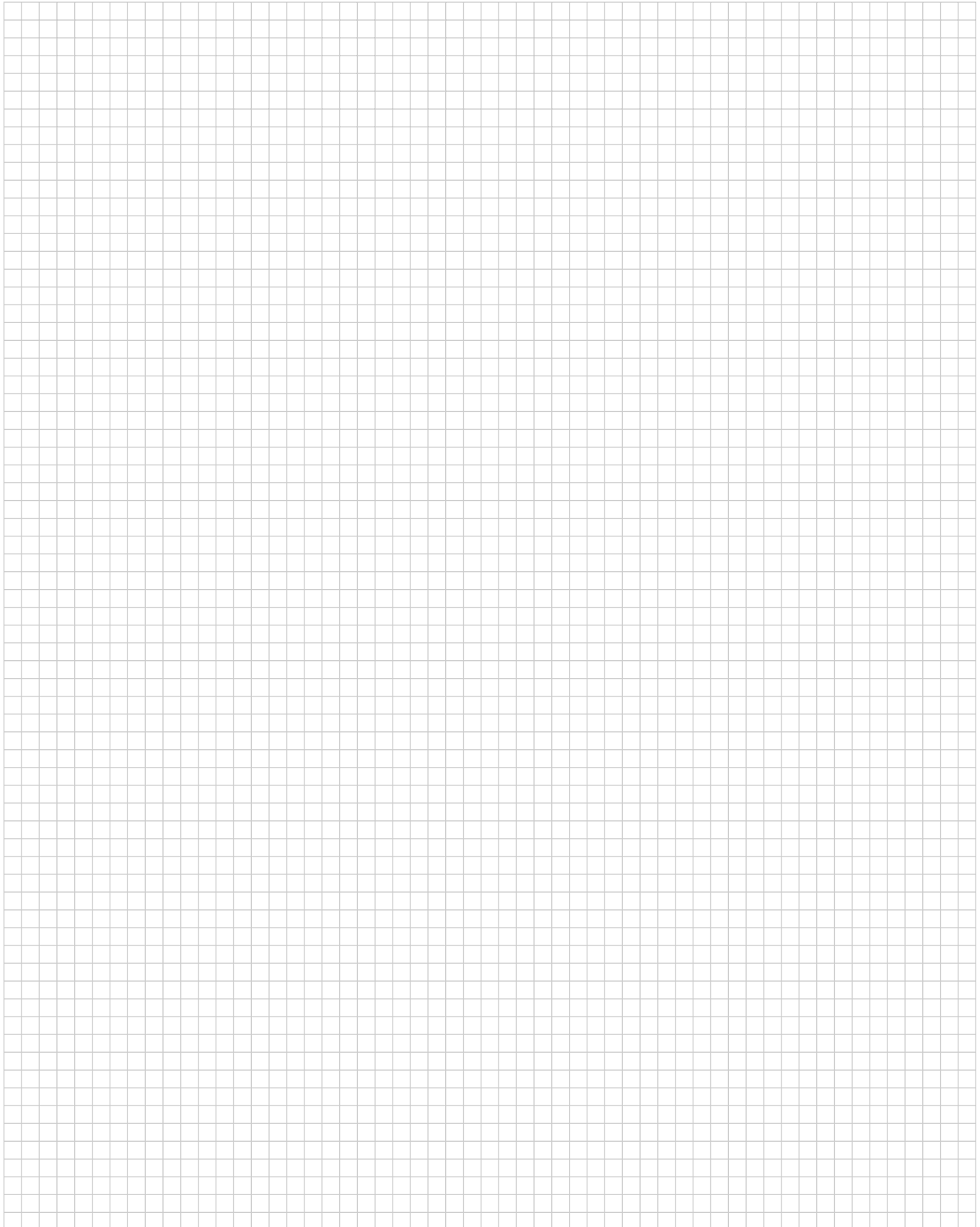
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768351-1	768351-1
768900-5	768900-5
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786930-3	786930-6
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787004-3	787004-3
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787641-1	5787641-1
787646-2	787646-4
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796055-2	5796055-2
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796068-1	796068-3
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911149-7	911149-7
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1123283-9	6123283-9
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1364308-1	6364308-1
1364973-2	6364973-2
1489050-1	6489050-1
1489232-1	6489232-1
1489232-2	6489232-2
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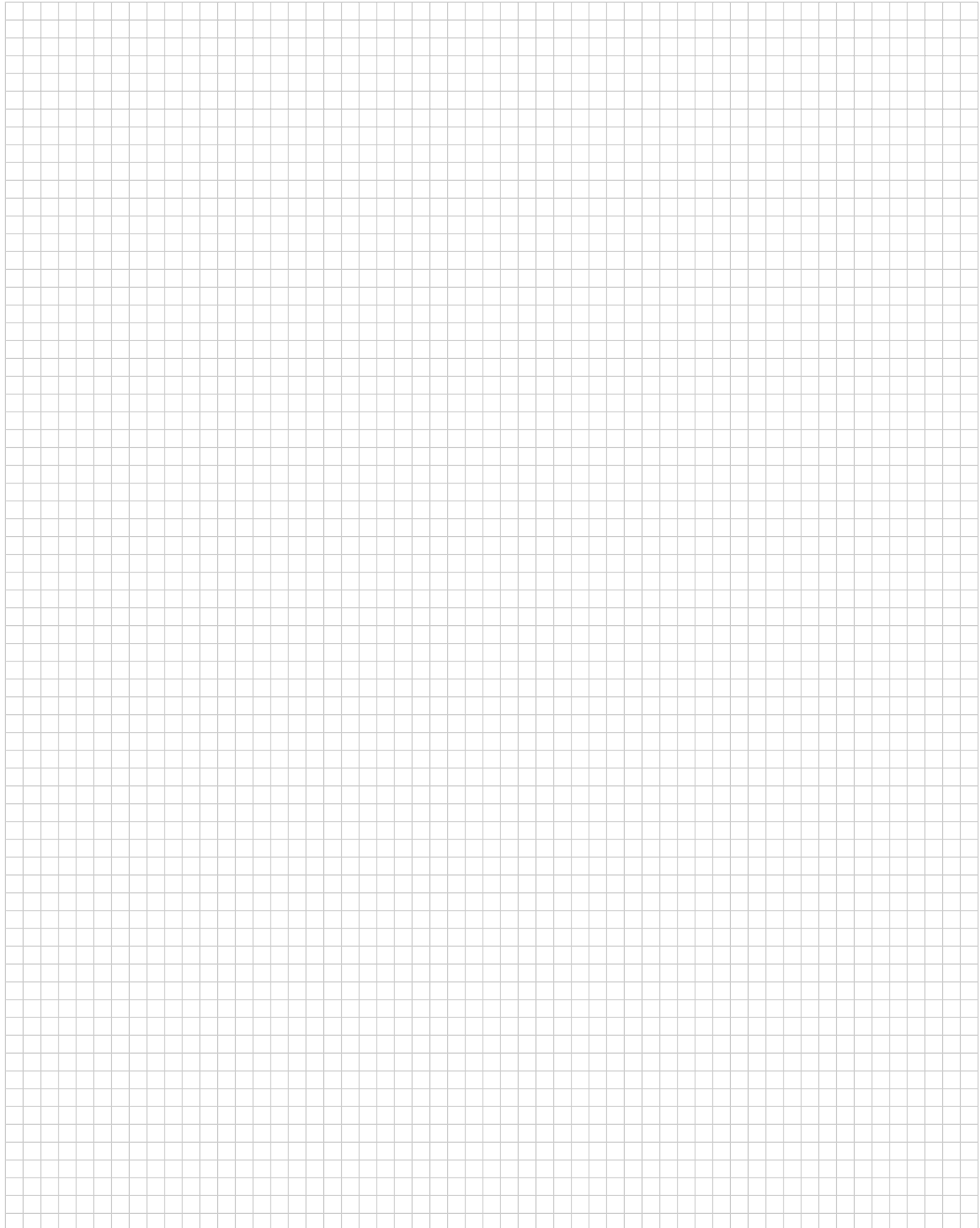
Note: This index lists all cataloged parts by base no. only. Complete part nos. (with prefixes and/or suffixes) are shown on the page(s) indicated.

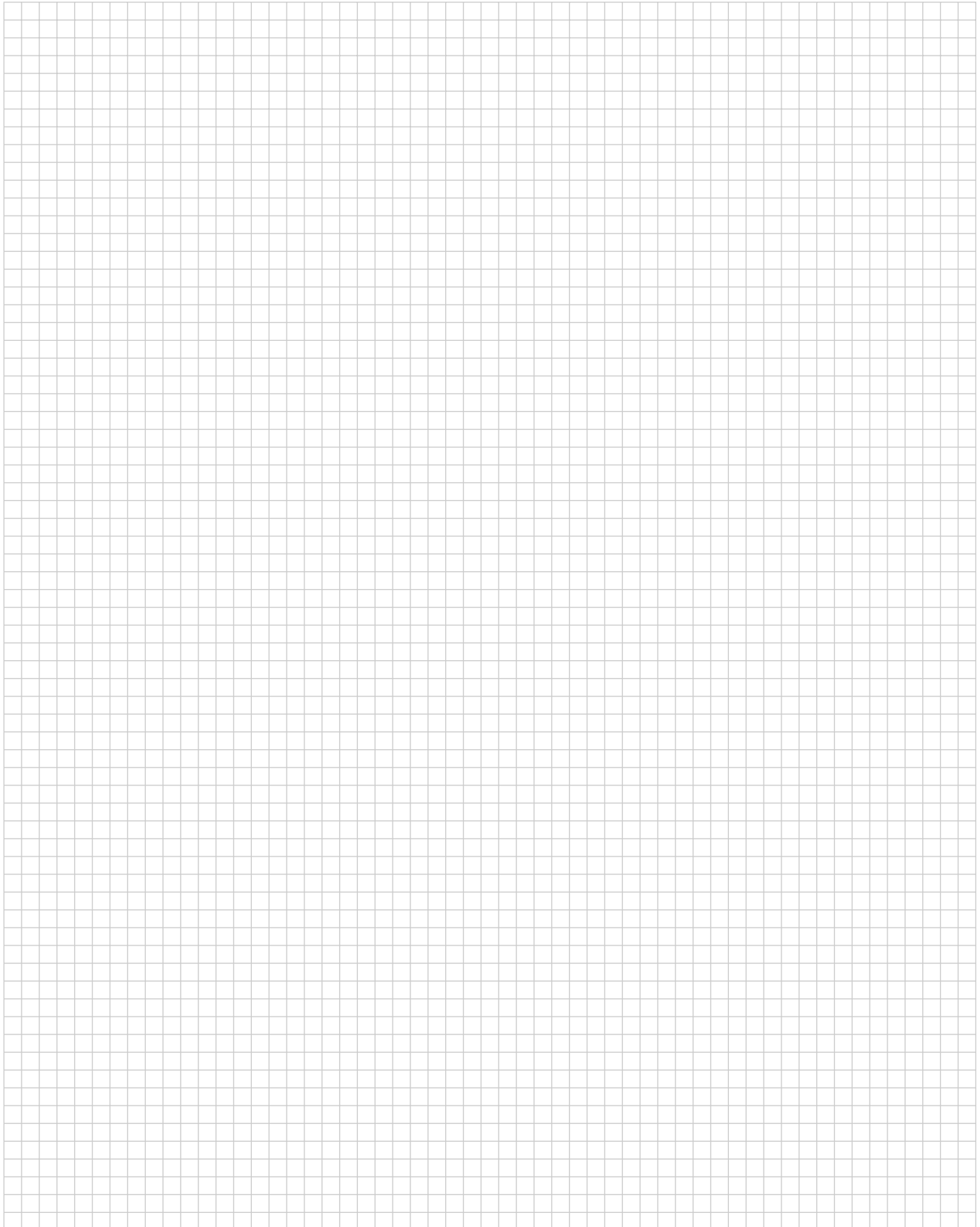
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Fax: +33-1-3420-8600
Product Information Center:
(Technical Support)
Phone: +33-1-3420-8943
Fax: +33-1-3420-8623

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St Ouen L'Aumone
Phone: +33-1-3440-7200
Fax: +33-1-3440-7220 or
+33-1-3440-7230

Germany – Bensheim
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Fax: +49-6251-133-1600
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Germany – Langen
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Fax: +49-6103-709-1223

Germany – Speyer
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Fax: +49-6232-30-2243

Germany
HTS Division – Neunkirchen
Phone: +49-2247-305-0
Fax: +49-2247-305-122

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Stanmore Middlesex
Phone: +44-208-954-2356
Fax: +44-208-954-6234
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Freephone GB: 0800-267-666
Phone: +44-141 810 8968
Fax: +44-141 810 8971
Great Britain – Dorcan, Swindon
Raychem Products
Phone: +44-1793-528171
Fax: +44-1793-572516

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Fax: +30-1-9370-655

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Phone: +36-1-289-1000
Fax: +36-1-289-1010

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