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MULTI-BEAM XL and MULTI-BEAM XLE Power Distribution Connector Systems

Board-to-Board Products

Board-Mount Connectors

Product Facts

- Single-piece molded housings
- Custom configurable modular design
- AC and DC power in the same connector — Meets UL safety requirements
- Current Interrupt ratings per UL 1977 — for “Hot-Plug” applications
- Compact size — suitable for distributed DC power applications
- Molded-in guide pins provide generous blind-mateability
- Up to 3 levels of contact sequencing:
 - 1st — Pwr/Gnd
 - 2nd — Pwr & Signals
 - 3rd — Trigger Signals
- Low Mating and Un-mating force
- Solder or press-fit termination to PCB
- Meets SSI power connector requirements for DPS, MPS and HPS applications
- 30 micro-inch [0.76 micro-meters] gold post-plated contacts for high reliability
- All MULTI-BEAM XL and MULTI-BEAM XLE products in this section are RoHS compliant



The MULTI-BEAM XL and MULTI-BEAM XLE modules are a blind-mateable board-to-board power distribution connector system. With a variety of available power contacts and a modular design, customers are able to customize this connector to their exact needs. In addition to selecting the number of power and signal contacts, customers are also able to choose the mating sequence of contacts they need for their specific application.

MULTI-BEAM XL connectors feature dual-beam and four-beam power contacts,

rated at 35A. The new MULTI-BEAM connector features a true hot-plug designed three-beam contact, rated at 43A.

The product is also available in versions complying with the Server Systems Infrastructure (SSI) Standard. MULTI-BEAM XL and MULTI-BEAM XLE products offer high reliability and high current density in a package designed specifically for modular hot-swappable power distribution systems. They are ideal for blind-mating in modular and rack mounted systems. The high perform-

ance design and heavy gold plated contacts meet requirements across many applications including power distribution for compact (1U) computer servers through high-end servers, fault-tolerant computers, networking equipment, telecommunication switches, medical instrumentation, and industrial control equipment.

The compact design also meets the I/O standard of modern modular and hot-swappable redundant (N+1) power supplies and uninterruptible power supplies.

Technical Documents

Product Specification
108-1973

Application Specification
114-13038



File # E28476

File # LR7189

For More Information

Check out product information at:
<http://mbxl.tycoelectronics.com>

Technical Support Center
1-800-522-6752

MULTI-BEAM XL and MULTI-BEAM XLE Power Distribution Connector Systems (Continued)

MULTI-BEAM XL Connector

- Expandable length to accommodate up to 36 power contacts
- Contact spacings are expandable to accommodate higher voltages and/or higher current requirements
- 4-beam or dual beam power contacts available
- Base metal made from high conductivity copper alloy (over 98% copper) offers superior performance compared to alternative materials

MULTI-BEAM XLE Connector

- Features new 3-beam power contact
- Two hot-pluggable power contacts to choose from:
 - 50A High power contact (35% increase compared to MULTI-BEAM XL connector)
 - 20A Low power contact (occupies 50% less PCB space than MULTI-BEAM XL power contact)
- Slimmer housing design allows 40% more current in the same space
- Over 40% lower mating force than original MULTI-BEAM XL connector
- Vented housing allows for better air flow

Evolution of MULTI-BEAM Power Contacts



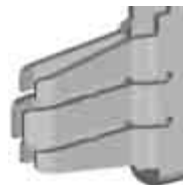
Dual-Beam Contact

- Original design
- .017" thick stock



4-Beam Contact

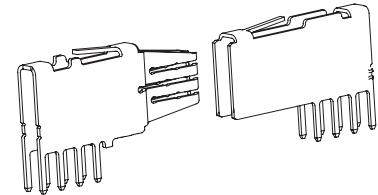
- .017" thick stock
- 35A current rating
- Features eight independent beams
- Parallel current paths yield a lower contact resistance
- Tuned beam design provides lower mating forces and higher durability life cycles



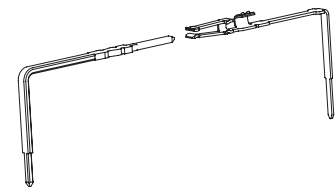
3-Beam Contact

- Offered on new MULTI-BEAM XLE connector
- .020" Thick Stock
- 50A Current Rating
- Improved design offers lowest mating force available in MULTI-BEAM product line
- True hot-plug design preserves the separable contact interface to provide long term reliability after hot-mate and un-mate cycles

Power Contacts



Signal Contacts



Contact Wipe

Contact Type	Description	Sequence	Minimum Wipe
Power (or GND) Contact	Make First Break Last (MFBL)	1	0.200" [5.08 mm]
Power Contact	Standard	2	0.150" [3.81 mm]
Signal Contact	Standard	2	0.150" [3.81 mm]
Signal (trigger) Contact	Make Last Break First (MLBF)	3	0.100" [2.54 mm]

The MLBF power contact and the Standard Signal contact are sequenced to mate at the same time ... sequence #2.

Product Configurations and Part Numbers

The connector configuration is described by reading Left-to-Right on the Plug mating interface and Right-to-Left on the Receptacle mating interface. Custom configurations can be produced due to the modular design of the product.

Configuration Description: ACP indicates AC Power, P indicates DC Power, HDP indicates High Density Power, LP indicates Low Power (MULTI-BEAM XLE connector only), S indicates Signal. The corresponding contact spacing and voltage ratings are shown below.

ACP	P	HDP	LP	S
0.300" [7.62 mm] spacing	0.250" [6.35 mm] spacing	0.200" [5.08 mm] spacing	.115" [3.81 mm] spacing	0.100" [2.54 mm] grid
300 Volts*	200 Volts*	Connection to same voltage*	200 Volts*	60 Volts*

* With circuit board designed to UL 1950, IEC 60950

MULTI-BEAM XL Power Distribution Connector Systems

Board-Mount Connectors

Right-Angle Receptacles



Configuration *	Part Number	Application	Overall Length" and [mm]	PCB Tail Type (Solder, Press-Fit)	Power Contact Sequencing
1P/24S/1P	6450160-3	SSI "DPS"	1.925" [48.90 mm]	Solder	No
2P/24S/2P	1-6450160-0	Distributed DC Power + Signal	2.250" [57.15 mm]	Solder	No
3P/24S/3P	6450570-2	Distributed DC Power + Signal	2.750" [69.85 mm]	Press-fit	Yes
3ACP/24S/6P	6450170-8	AC and DC Power + Signal	3.650" [92.71 mm]	Solder	Yes
5P/24S/6P	6450160-5	SSI "MPS"	4.350" [110.49 mm]	Solder	No
7P/32S/7P	6450560-4	Distributed DC Power + Signal	4.350" [110.49 mm]	Press-fit	No
8P/28S	6450172-2	Distributed DC Power + Signal	3.350" [85.09 mm]	Solder	Yes
8P/32S/8P	6450160-1	AC and DC Power + Signal	5.450" [138.43 mm]	Solder	No
3ACP	6450173-1	AC Power	1.550" [39.37 mm]	Solder	Yes
8P	6450163-2	DC Power	2.650" [67.31 mm]	Solder	No
14P/32S	6450172-1	Distributed DC Power + Signal	4.950" [125.73 mm]	Solder	Yes
16S/4P	6450161-1	Distributed DC Power + Signal	2.050" [52.07 mm]	Solder	No
24S/6P	6450161-2	Distributed DC Power + Signal	2.750" [69.85 mm]	Solder	No
24S/8P	6450161-6	Distributed DC Power + Signal	3.250" [82.55 mm]	Solder	No

* Custom configurations are available — see page 29 for instructions to have Tyco Electronics build your custom part.

Vertical Receptacles



Configuration *	Part Number	Application	Overall Length" and [mm]	PCB Tail Type (Solder, Press-Fit)	Power Contact Sequencing
1P/24S/1P	6450540-1	SSI "DPS"	1.925" [48.90 mm]	Press-fit	No
2P/24S/2P	6450140-5	Distributed DC Power + Signal	2.250" [57.15 mm]	Solder	No
3P/24S/3P	1-6450140-0	Distributed DC Power + Signal	2.750" [69.85 mm]	Solder	No
4P/24S/4P	6450150-6	Distributed DC Power + Signal	3.350" [85.09 mm]	Solder	Yes
4P/24S/3ACP	6450150-3	AC and DC Power + Signal	3.150" [80.01 mm]	Solder	Yes
5P/24S/6P	6450540-2	SSI "DPS"	4.350" [110.49 mm]	Press-fit	No
6P/24S/6P	4-6450550-5	Distributed DC Power + Signal	4.250" [107.95 mm]	Press-fit	No
10P/24S/12P	3-6450550-2	Distributed DC Power + Signal	5.800" [147.32 mm]	Press-fit	Yes
3P	6450543-1	DC Power	1.400" [35.56 mm]	Press-fit	No
3ACP	6450543-6	AC Power	1.550" [39.37 mm]	Press-fit	No
4P	6450543-5	DC Power	1.650" [41.91 mm]	Press-fit	No
6P	6450553-2	DC Power	2.050" [52.07 mm]	Press-fit	Yes
7P	6450543-3	DC Power	2.400" [60.96 mm]	Press-fit	No
8P/28S	6450142-3	Distributed DC Power + Signal	3.350" [85.09 mm]	Solder	No
14P/32S	6450152-1	Distributed DC Power + Signal	4.950" [125.73 mm]	Solder	Yes
24S/6P	6450551-1	Distributed DC Power + Signal	2.750" [69.85 mm]	Press-fit	Yes
24S/3ACP	6450151-3	Distributed DC Power + Signal	2.200" [55.88 mm]	Solder	Yes
24S/8P	6450541-5	Distributed DC Power + Signal	3.250" [82.55 mm]	Press-fit	No

* Custom configurations are available — see page 29 for instructions to have Tyco Electronics build your custom part.

Note: All part numbers are RoHS compliant.

MULTI-BEAM XL Power Distribution Connector Systems (Continued)

Board-Mount Connectors
Right-Angle Plugs


Configuration *	Part Number	Application	Overall Length" and [mm]	PCB Tail Type (Solder, Press-Fit)	Signal Contact Sequencing
1P/24S/1P	6450330-1	SSI "DPS"	1.925" [48.90 mm]	Solder	Yes
2P/24S/2P	6450120-2	Distributed DC Power + Signal	2.250" [57.15 mm]	Solder	No
3P/24S/3P	6450130-6	Distributed DC Power + Signal	2.750" [69.85 mm]	Solder	Yes
4P/24S/3ACP	6450130-4	AC and DC Power + Signal	3.150" [80.01 mm]	Solder	Yes
3ACP/24S/6P	1-6450130-4	AC and DC Power + Signal	3.650" [92.71 mm]	Solder	Yes
5P/24S/6P	6450230-1	SSI "DPS"	4.350" [110.49 mm]	Solder	Yes
5P/32S/5P	2-6450120-4	Distributed DC Power + Signal	3.950" [100.33 mm]	Solder	No
6P/24S/6P	2-6450120-7	Distributed DC Power + Signal	4.250" [107.95 mm]	Solder	No
8P/32S/8P	6450120-1	Distributed DC Power + Signal	5.450" [138.43 mm]	Solder	No
10P/24S/12P	4-6450130-6	Distributed DC Power + Signal	5.800" [147.32 mm]	Solder	Yes
16S/4P	6450231-1	Distributed DC Power + Signal	2.050" [52.07 mm]	Solder	Yes
24S/6P	6450131-7	Distributed DC Power + Signal	2.750" [69.85 mm]	Solder	Yes
24S/3ACP	6450121-3	Distributed DC Power + Signal	2.200" [55.88 mm]	Solder	No
3ACP	6450123-3	AC Power	1.550" [39.37 mm]	Solder	N/A
3P	6450123-1	DC Power	1.400" [35.56 mm]	Solder	N/A
4P	6450123-2	DC Power	1.650" [41.91 mm]	Solder	N/A
6P	6450523-2	DC Power	2.050" [52.07 mm]	Press-fit	N/A
7P	6450123-5	DC Power	2.400" [60.96 mm]	Solder	N/A
8P/28S	6450132-3	Distributed DC Power + Signal	3.350" [85.09 mm]	Solder	Yes
14P/32S	6450132-4	Distributed DC Power + Signal	4.950" [125.73 mm]	Solder	Yes

* Custom configurations are available — see page 29 for instructions to have Tyco Electronics build your custom part.

Vertical Plugs


Configuration *	Part Number	Application	Overall Length" and [mm]	PCB Tail Type (Solder, Press-Fit)	Signal Contact Sequencing
1P/16S/1P	6600333-9	Distributed DC Power + Signal	1.650" [41.91 mm]	Press-fit	Yes
1P/24S/1P	6600330-4	SSI "DPS"	1.925" [48.90 mm]	Solder	Yes
2P/16S/2P	1-6600333-0	Distributed DC Power + Signal	2.150" [54.61 mm]	Press-fit	Yes
2P/24S/2P	1-6600333-2	Distributed DC Power + Signal	2.250" [57.15 mm]	Press-fit	Yes
3P/16S/3P	6600333-7	Distributed DC Power + Signal	2.650" [67.31 mm]	Press-fit	Yes
3ACP/24S/3ACP	1-6600333-1	AC Power + Signal	3.150" [80.01 mm]	Press-fit	No
4P/24S/4P	6600333-6	Distributed DC Power + Signal	3.350" [85.09 mm]	Press-fit	Yes
5ACP/24S/5ACP	6600333-1	Distributed DC Power + Signal	4.350" [110.49 mm]	Press-fit	Yes
7P/32S/7P	6600330-5	Distributed DC Power + Signal	4.350" [110.49 mm]	Solder	No
24S/8P	6600323-2	Distributed DC Power + Signal	3.250" [82.55 mm]	Press-fit	No
3ACP	6450503-3	AC Power	1.550" [39.37 mm]	Press-fit	N/A
8P	6600303-1	DC Power	2.650" [67.31 mm]	Press-fit	N/A

* Custom configurations are available — see page 29 for instructions to have Tyco Electronics build your custom part.

Note: All part numbers are RoHS compliant.

MULTI-BEAM XL Power Distribution Connector Systems (Continued)

Board-Mount Connectors

Specifications

Materials

Housing — High temperature thermo-plastic, UL 94V-0

Power Contacts — High conductivity Copper alloy

Signal Contacts — Copper alloy

Boardlocks — Phosphor bronze

Finish

Power and Signal Contacts — 30 microinches [7.6 micrometers] min. gold over 50 microinches [1.27 micrometers] min. nickel on mating surfaces, 100 microinches [2.54 micrometers] min. tin over 50 microinches [1.27 micrometers] min. nickel at PCB terminations

Note: Tin-lead plating also available on press-fit connectors

Performance Specifications

Up to 55 Amps per power contact, de-rated to 35 Amps in equally energized (8 adjacent positions) connector.

Up to 4 Amps per signal contact, de-rated to 1.5 Amps in equally energized 24-position pin field.

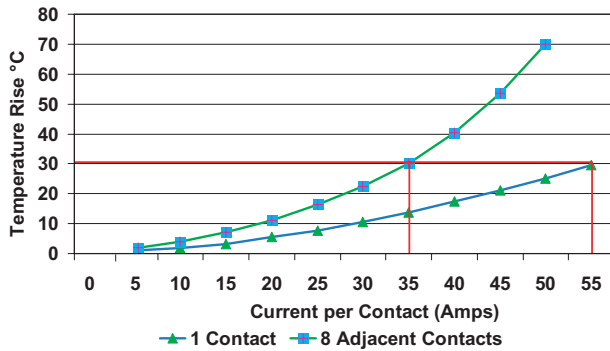
Maximum Continuous Operating Temperature — 105°C.

Contact Resistance — 0.7 milli-ohm

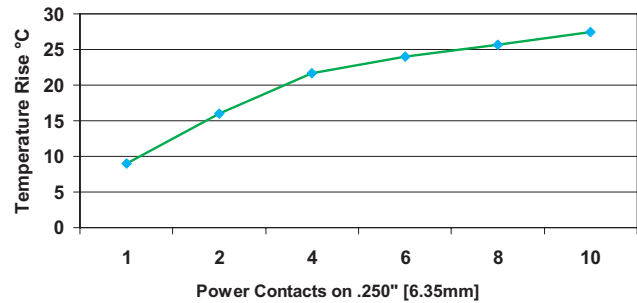
Durability — 250 cycle

Radial Mis-alignment Capability — ± 0.075" [1.91 mm]

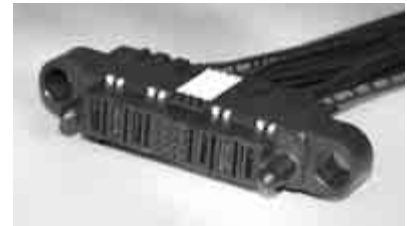
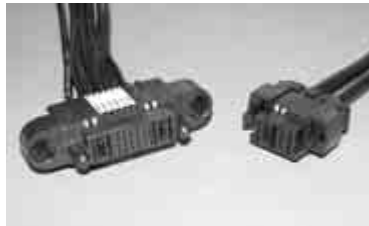
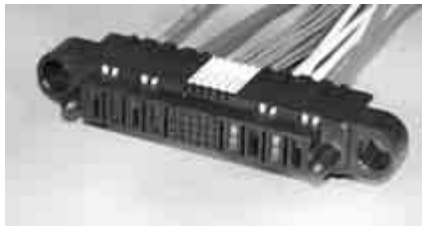
Minimum of 0.100" [2.45 mm] of contact wipe on shortest signal contact



Performance @ 30 Amps per Contact



See Cable Connectors on Pages 19-28



“NEW” MULTI-BEAM XLE Connectors

NEW

Product Facts

- Two NEW hot-pluggable power contacts to choose from:
 - 50 Amp high power contact
 - 20 Amp low power contact
- Over 35% lower mating force than original MULTI-BEAM XL connectors
- Over 40% more current in the same over all PCB space
- Low-wear contact design passes Telcordia environmental exposure requirements
- New design allows more angular mis-alignment



Tyco Electronics' new MULTI-BEAM XLE connectors are the latest addition to the MULTI-BEAM XL power connector product family. MULTI-BEAM XLE connectors feature a new 3-beam contact, made from a thicker/higher conductivity material than the original single beam or 4-beam designs.

The new 3-beam design allows for a greater angular mis-alignment between mating connectors and offers a lower mating force. In addition, MULTIBEAM XLE connectors offer a slimmer

housing design that reduces the overall PCB footprint and has the option of using a low power contact — the industry proven Universal Power Module (UPM) contact.

The new contacts and housing design allows more power in the same footprint — over 35% more current in the same space. MULTI-BEAM XLE connectors are as modular as the original MULTI-BEAM XL connectors in that they can be designed to fit specific customer needs.

Applications

- Modular Hot-Swappable Power Supplies
- 1U / 2U Servers
- High-end Computer & Telecommunications

Equipment

- Power Distribution Circuit Boards
- Power Distribution Cable Assemblies

“NEW” MULTI-BEAM XLE Connectors (Continued)

Specifications

Materials

Housing — High temperature thermo-plastic, UL 94V-0

Power Contacts — High conductivity Copper alloy

Signal Contacts — Copper alloy

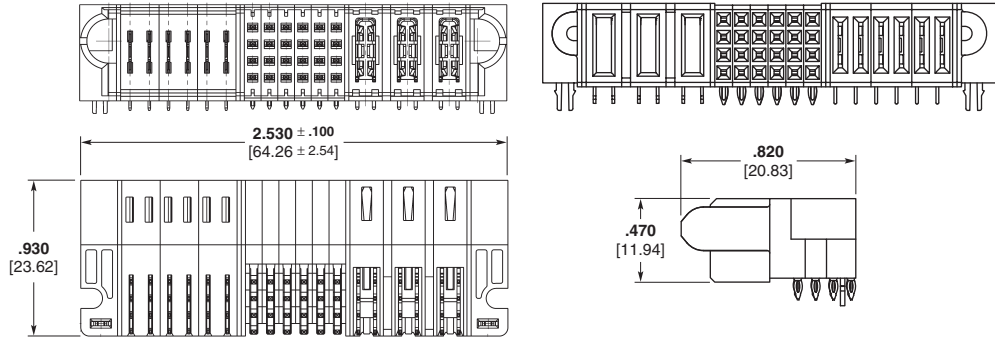
Boardlocks — Phosphor bronze

Finish

Power and Signal Contacts — 30 microinches [76 micrometers] min. gold over 50 microinches [1.27 micrometers] min. nickel on mating surfaces, 100 microinches [2.54 micrometers] min. tin over 50 microinches [1.27 micrometers] min. nickel at PCB terminations

Part Number 6450830-2
Right-Angle Plug

Part Number 6450880-1
Right-Angle Receptacle



MULTI-BEAM XLE Connector Part Numbers

Available Configurations	Part Numbers			Mating Part Numbers	
	Right-Angle Plugs	Vertical Plugs	Overall Length of Plug	Right-Angle Receptacle	Vertical Receptacle
1P/24S/1P	6450840-7	6450820-2	1.54" [39.12 mm]	6450870-5	6450850-3
2LP/8S/2LP	6450830-1	—	1.175" [29.84 mm]	—	6450860-1
6LP/24S/3P	6450830-2	—	2.555" [64.89 mm]	6450880-1	6450850-2
2P/32S/2LP	6450830-4	—	2.020" [51.30 mm]	6450870-1	—
2P/24S/2P	6450830-5	—	2.040" [51.81 mm]	6450870-3	—
3P/24S/3P	6450830-9	—	2.54" [64.52 mm]	6450870-4	—
3P/32S/3P	6450820-3	—	2.79" [70.87 mm]	6450870-8	—
32S/4LP	6450831-1	—	1.750" [44.45 mm]	6450871-1	—
6LP/24S/10P	1-6450830-0	—	3.86" [97.92 mm]	—	6450860-5
12P/48S/8LP	6450840-3	—	5.600" [142.24 mm]	6450880-4	6450860-3
4ACP/48S/12HDP	6450840-4	6450810-1	5.390" [136.90 mm]	6450880-3	6450860-2

Electrical

Current Carrying Capacity:

- 50 Amp high power contact (over 35% increase compared to MULTI-BEAM XL product)
- 20 Amp low power contact (occupies 50% PCB space than MULTI-BEAM XL power contact)

Contact resistance: 0.7 milliohm per contact at rated current

Configuration Description

ACP	P	HDP	LP	S
.300" [7.62 mm] spacing	.250" [6.35 mm] spacing	.200" [5.08 mm] spacing	.115" [2.92 mm] spacing	.100" [2.54 mm] spacing
300 Volts	200 Volts	50 Volts	200 Volts	50 Volts

ACP indicates the high power contact on 300 VAC spacing.
P indicates the high power contact on 200 VDC spacing.
LP indicates the low power contact on 200 VDC spacing.
S indicates the signal contact on 60 VDC spacing.

Application Tooling

Right-Angle Plugs:

Flat-rock seating tools (no unique tools required)

Right-Angle Receptacles:

Flat-rock seating tools (no unique tools required)

Vertical Plugs:

Contact Tyco Electronics for required seating tools

Vertical Receptacles:

Flat-rock seating tools (no unique tools required)

Note: All part numbers are RoHS compliant.

MULTI-BEAM XL Current Pass-Thru Power Distribution Connector System

Product Facts

- Combines PCB and cable mounted contacts
- Ideal for separating AC input from DC input
- Eliminates FASTON tab interface at the back of the connector housing
- Requires less space than two housing designs
- Terminates 12 AWG and 10 AWG wire
- Mates with Tyco Electronics vertical and right-angle PCB plugs
- High strength housing materials
- RoHS Compliant

Technical Documents

Product Specification

108-1973 and 108-2157

Application Specification

114-13038



The Cable Pass-Thru MULTI-BEAM XL receptacles securely terminate up to a 10 AWG wire directly into MULTI-BEAM XL PCB mounted receptacles. The design includes a “terminal position assurance” (TPA) feature that confirms the manually inserted wires are fully seated. The product offers a unique way of using the MULTI-BEAM XL PCB receptacles as a sort of “docking” connector. A single docking connector is far easier to mate to and to design around in a blind-mate application, than multiple power and signal connectors. By separating

some circuits to be cable terminated and some to be PCB terminated it allows both high voltage (AC) and low voltage (DC) power to pass through the same connector.

This separation of the AC and DC power eliminates the concerns of high voltage power running through circuit boards better suited to carry only low voltage circuitry. Additional applications may include designs where the power is better routed directly to a different PCB, through cables, yet passes through a single docking connector for ease in system design.

The Cable Pass-Thru connector is offered in both right-angle or vertical PCB-mount orientations and is supplied with either press-fit or solder pc tails. The connector is mate-able to either PCB mounted or cable mounted MULTI-BEAM XL or MULTI-BEAM XLE plugs. All MULTI-BEAM XL cable connectors are supplied pre-assembled by Tyco Electronics.

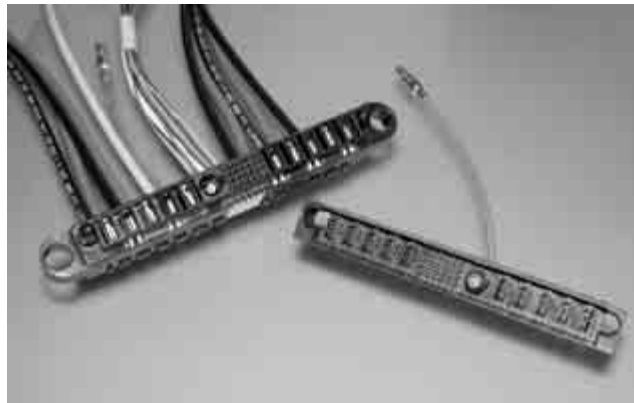
**MULTI-BEAM XL Current Pass-Thru
Power Distribution Connector System** (Continued)

Available Configurations	Part Numbers			
	Pass-Thru Right-Angle Receptacles	Mating Right-Angle Plugs	Pass-Thru Vertical Receptacles	Mating Vertical Plugs
3CP/1P/24S/2P	6450178-1	6450130-2	—	—
3CP/24S/2P	6450178-2	2-6450130-6	—	—
3CP/24S/3ACP	1888179-1	2-6450330-6	—	—
3CP/4P/24S	6450578-1	1-6450132-3	6450558-1	6600310-5
3ACP/24S/6P	—	1-6450130-4	6450558-2	—
3CP/8P/12S	1888132-1	—	—	—
3CP/20S/10P	6450578-2	6-6450130-2	—	—
3CP/16S	6450668-1	6450622-1	—	—

Note: Receptacles are the only MULTI-BEAM XL parts with Pass-Thru capability.

Configuration Description

CP	ACP	P	HDP	S
AC Power	AC Power	DC Power	High Density Power	Signal
Cable Power .300" spacing	PCB-Mount .300" spacing	PCB-Mount .250" spacing	PCB-Mount .200" spacing	PCB-Mount .100" grid



**MULTI-BEAM XL Coax Pass-Thru Connector —
Combine power, coax and signal all in one connector**

Right-Angle Plug	Cable Receptacle
292495-1	292491-1

The following coax contacts may be used with the coax pass-thru housings:

Pin Contact	Socket Contact
5221980-5	5221981-5

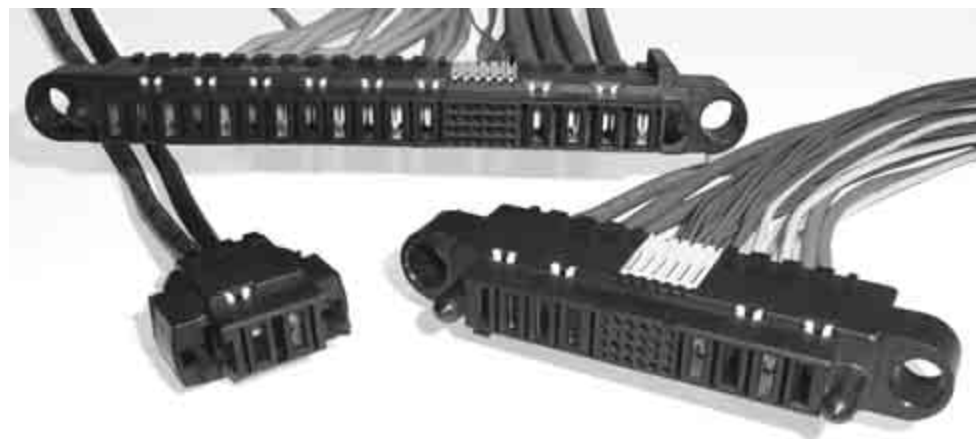
Note: All part numbers are RoHS compliant.

MULTI-BEAM XL Power Distribution Connector System Cable Receptacle Assemblies

Cable Receptacle Assemblies

Product Facts

- Single one-piece housing design
- Terminal Position Assurance (TPA) Secondary Locks on contacts help prevent contact back-out
- Pre-assembled made-to-order cable assemblies
- Installation to panel provides float in X, Y and Z directions
- Insulation crimp on all contacts
- 30 microinch (.76 micrometers) gold plated contacts for high reliability
- Touch-safe design passes UL1977 and IEC 60950 finger probe test
- AC and DC power in the same connector — meets UL & IEC safety requirements
- All MULTI-BEAM XL products in this section are RoHS compliant



MULTI-BEAM XL Cable Assemblies allow designers freedom to connect power supplies and power distribution subassemblies in a wide variety of applications. Expanding beyond board-to-board applications the cable assemblies are available for both cable-to-board or panel-mount applications and can terminate 8-16 AWG and 22-26 AWG wires all in one connector, without using adapter circuit boards. In addition, the power contacts are designed to be able to accept two-wire terminations which can further reduce harness complexity by reducing or eliminating mid-wire splices.

The use of high temperature glass filled housing materials, redundant contact retention and high conductivity contact materials allows the use of this connector in very high current density applications. The features work together to result in a highly durable and compact power connector, which offers industry leading minimum millivolt drop through the connection. The connector was designed to pass the UL 1977 and IEC 60950 finger probe test which makes the connector touch-safe. The insulation crimp adds further safety by keeping the insulation from being pulled away from the termination point. These features eliminate the

need for a secondary cable clamp which often can be size prohibitive.

The cable connectors are designed to mate to the de-facto standard Tyco Electronics MULTI-BEAM XL right-angle or vertical PCB plugs. The combination of PCB and cable connections, both with mixed power and signal arrangements provides a universal power distribution connector systems.

The cable assemblies are all RoHS compliant, designed to specific customer requirements and manufactured in Tyco Electronics' cable assembly manufacturing facilities.

Technical Documents

Product Specification
108-2157

Application Specification
114-13112

For More Information

Internet <http://tycoelectronics.com>

Check out product information at: <http://mbxl.tycoelectronics.com>

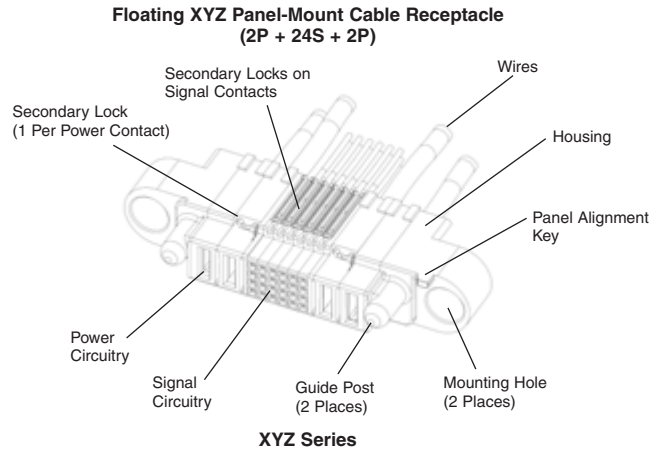
Technical Support Center 1-800-522-6752

MULTI-BEAM XL Power Distribution Connector System
Cable Receptacle Assemblies (Continued)

Configurations/Applications

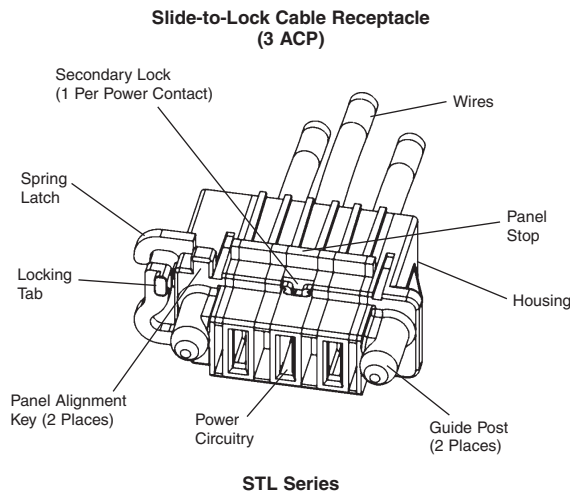
Floating XYZ Panel-Mount Receptacle

- 0.060" [1.52] Nominal Float in X, Y and Z direction
- For modular installation of large power distribution systems
- Single connector replaces multiple power and signal connectors



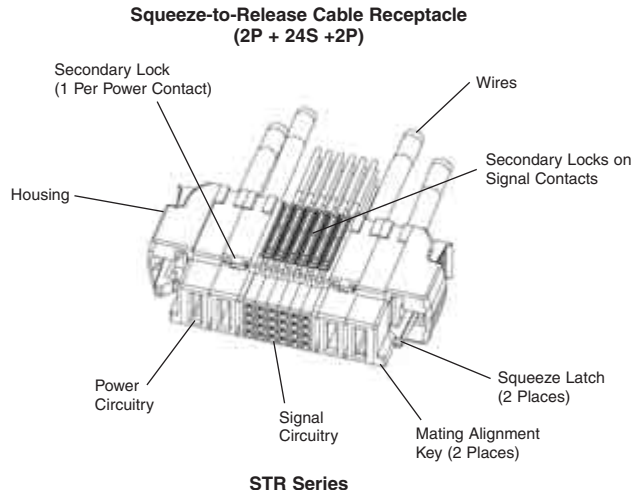
Slide-to-Lock Receptacle

- 0.030" [0.76] nominal float in X and Y direction
- Ideal for modular installation of smaller systems requiring less space and less float — such as fan trays
- Replaces connectors which use multiple low power contacts to carry the total current
- Power only or Power Plus signal mixed



Cable-to-Board Receptacle

- Easy to mate/disconnect with squeeze-to-release latches
- Mates to right-angle or vertical MULTI-BEAM XL STR plugs
- Replaces two traditional connectors (1 signal and 1 power) with just 1 connector



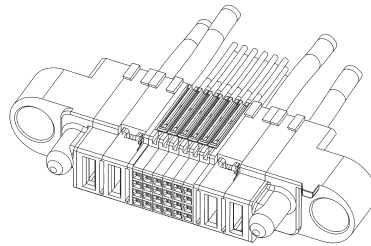
MULTI-BEAM XL Power Distribution Connector System
Cable Receptacle Assemblies (Continued)

Panel-Mount Receptacles

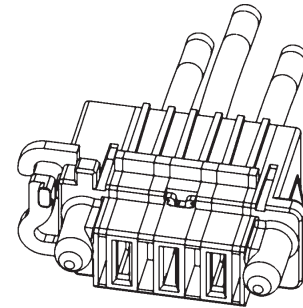
Product Facts

- High strength glass-filled housing materials
- Expandable/modular housing design
- PMT Series floats +/- 0.060" [1.52] in X, Y and Z directions
- STL series floats 0.030" [0.76] in X and Y directions
- Mounting Hardware Kits:
Part Number 1600914-1 — Standard
Part Number 1600914-3 — High Force

Part numbers shown identify the main receptacle connector housing. Additional components (contacts, contact locks, etc.) are used to complete the cable assembly. See page 23 for contacts, secondary locks and application equipment information.



X, Y, Z Floating Receptacle

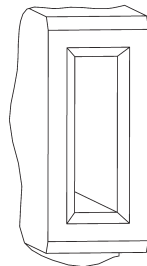


Slide-to-Lock Receptacle

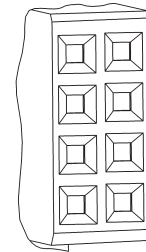
Power and Signal Module Specifications

Power Module Widths:	Module Designation	Maximum Wire Size AWG [mm ²]	Max. Insulation Dia. inches [mm]
0.300 [7.62] (ACP)	300 (ACP)	8 [10.5]	0.272 [6.91]
0.250 [6.35] (P)	250 (P)	10 [6.6]	0.215 [5.46]
0.200 [5.08] (HDP)	200 (HDP)	12 [2.6]	0.156 [3.96]

Signal Module Width	Module Designation	Wire Range AWG [mm ²]	Insulation Range inches [mm]
0.200 [5.08] (8 Contacts)	Signals	22-26 [0.14-0.32]	0.036-0.054 [0.91-1.37]



Power Module



Signal Module

Configurations/Part Numbers

Available Configurations	Part Numbers			
	XYZ Series	STL Series	Mating PCB Plugs	
			Vertical	Right-Angle
3ACP	1600606-2	292499-1	6600303-7	6450123-3
4P	—	292499-4	6600303-2	6450123-2
4ACP	—	292499-3	6600303-3	—
5P	1600606-1	1761419-2	—	6450123-6
6P	—	292499-8	6600303-6	—
1P/16S/1P	1-1600636-3	1761819-4	6600333-9	—
1P/24S/1P	1600636-9	—	6600330-4	6450330-1
2P/16S/2P	1-1600636-0	—	1-6600333-0	—
2P/24S/2P	1600636-2	1761819-2	6600333-5	1-6450330-4
3P/16S/3P	1600636-8	—	6600333-7	—
3ACP/24S/3ACP	1-1600636-4	—	1-6600333-1	—
4P/24S/4P	1-1600636-5	—	6600333-6	—
4ACP/24S/12P	1600636-6	—	—	2-6450120-6
5ACP/24S/5ACP	1600636-1	—	6600333-1	5-6450130-0
7P/48S/7P	1-1600636-6	—	—	3-6450120-4

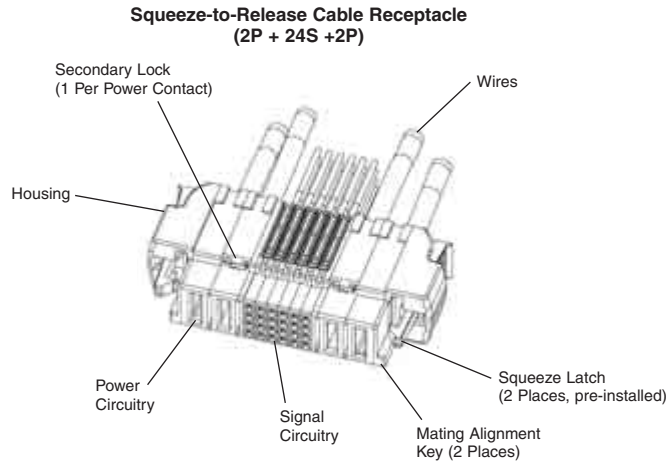
Note: All part numbers are RoHS compliant.

MULTI-BEAM XL Power Distribution Connector System
Cable Receptacle Assemblies (Continued)

Cable-to-Board Squeeze-to-Release Receptacles

Product Facts

- High strength glass-filled housing
- Pre-installed squeeze-to-release latches
- Expandable/modular housing design
- Mates to Tyco Electronics vertical or right-angle PCB plugs



STR Series

Power and Signal Module Specifications

Power Module Widths:	Module Designation	Maximum Wire Size AWG [mm ²]	Max. Insulation Dia. inches [mm]
0.300 [7.62] (ACP)	300 (ACP)	8 [10.5]	.272 [6.91]
0.250 [6.35] (P)	250 (P)	10 [6.6]	.215 [5.46]
0.200 [5.08] (HDP)	200 (HDP)	12 [2.6]	.156 [3.96]
Signal Module Width	Module Designation	Wire Range AWG [mm ²]	Insulation Range inches [mm]
0.200 [5.08] (8 Contacts)	Signals	22-26 [0.14-0.32]	.036-.054 [0.91-1.37]

Technical Documents:

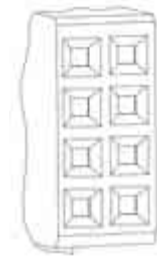
Product Specification
108-2157

Application Specification
114-13112

See page 23 for contacts, secondary locks and application equipment information.



Power Module



Signal Module

Configurations/Part Numbers

Available Configurations	STR Series	Part Numbers	
		Vertical	Right-Angle
2ACP	1600798-2	6600393-1	6450129-1
3P	1600798-3	6600393-2	6450129-2
3ACP	1600798-5	—	—
4P	1600798-4	6600390-1	6450129-3
6P	1600798-1	6600393-3	6450129-5
1P/24S/1P	1600788-8	6600380-2	6450128-1
2P/8S/2P	1-1600788-3	—	6450128-6
2P/16S/2P	1-1600788-0	6600383-5	—
2P/24S/2P	1600788-1	6600383-3	6450128-2
3ACP/24S/3ACP	1-1600788-2	6600383-6	—
4P/24S/4P	1-1600788-4	6600383-7	6450128-5
4ACP/24S/4ACP	1-1600788-5	6600383-9	—
6P/24S/6P	1-1600788-7	—	6450128-8
6P/32S/6P	1600788-7	6600383-1	—

Note: All part numbers are RoHS compliant.

MULTI-BEAM XL Power Distribution Connector System
Cable Receptacle Assemblies (Continued)

Cable Receptacle Components

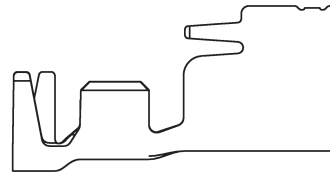
Material and Finish

Body — 50 micro inches nickel over high conductivity copper alloy
Mating Area — 30 micro inches gold

Technical Documents

Product Specification
 108-2157-1

Application Specification
 114-13164



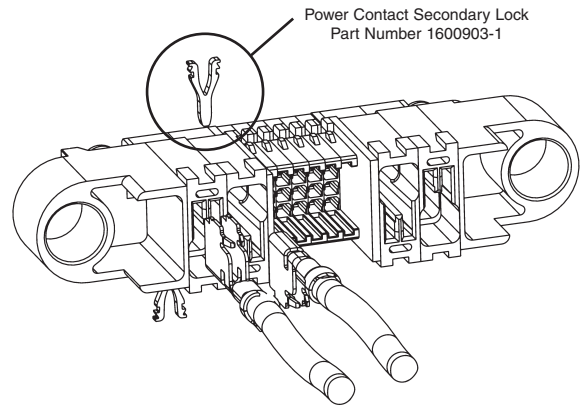
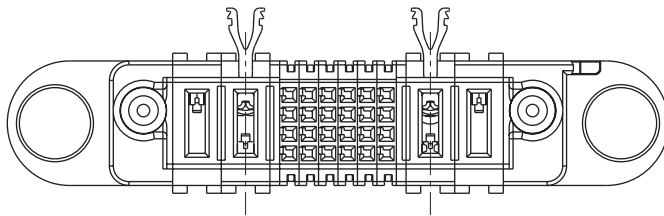
Power Contact

Power Contacts

Wire Size Range AWG	Insulation Diameter	Housing Width	Part Number	Applicator Tool	Hand Tool
12	.156 Max. [3.96]	.200 or .250 [5.08 or 6.35]	1-1600961-7 (make-first-break-last)	1385635-3	2063500-1
	.156-.176 [3.96-4.47]	.250 [6.35]		1385636-3	
14	.120-.156 [3.05-3.96]	.200 or .250 [5.08 or 6.35]	1-1600961-8 (Standard)	1385635-3	
	.090 Max. [2.29]	.250 [6.35]		1385636-3	
Wire Size Range AWG	Insulation Diameter	Housing Width	Part Number	Applicator Tool	Hand Tool
8	.215-.272 [5.46-6.91]	.300 [7.62]	1-1600960-7 (make-first-break-last)	1385637-3	N/A
10	.176-.215 [4.47-5.46]	.200 or .300 [6.35 or 7.62]		1385638-3	
2 @ 12	.130 Max. [3.30]	.300 [7.62]	1-1600960-8 (Standard)	1385637-3	
2 @ 14	.137 Max. [3.48]	.300 [7.62]		1385637-3	

Extraction Tool: Part Number 2063080-1

Note: Check the customer drawing for the applicable MULTI-BEAM XL housing to confirm the quantity of standard or make-first-break-last contacts needed. Standard and make-first-break-last contacts cannot be interchanged within the housing.



Power Contact Secondary Lock
 Part Number 1600903-1

Secondary Power Locks:
 Part Number 1600903-1

Note: One secondary lock needed for each power contact.



SDA SA Hand Tool
 Part Number 2063500-1

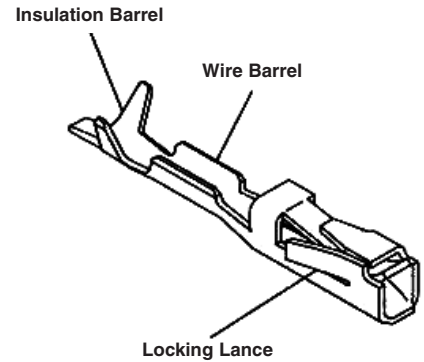
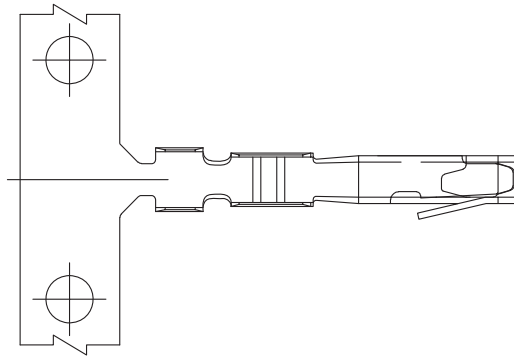
Note: All part numbers are RoHS compliant.

MULTI-BEAM XL Power Distribution Connector System
Cable Receptacle Assemblies (Continued)

Cable Receptacle Components (Continued)

Material and Finish

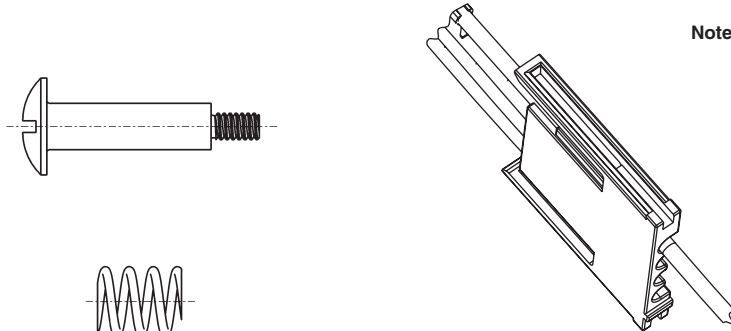
Contact — Phosphor bronze plated gold over nickel in mating area



Signal Contacts

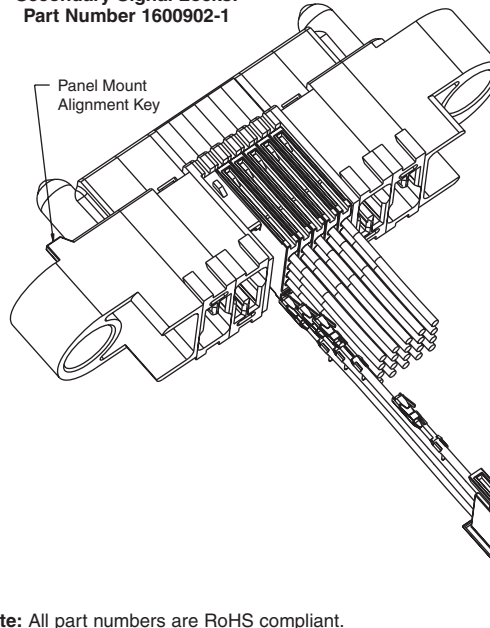
Wire Size Range AWG	Insulation Diameter	Version	Part Number	Extraction Tool	Hand Tool	Applicator
22-26	.036-.054 [0.91-1.37]	Low Pressure	5531216-5 (reel)	91156-2	91531-1	1426685-2
	.036-.054 [0.91-1.37]	High Pressure	5531224-6 (reel)			

Secondary Locks



Note: One secondary lock needed for each column of signal contacts

Secondary Signal Locks:
Part Number 1600902-1



Float-Mount Hardware Kit

Part Number 1600914-1

(Standard Force)

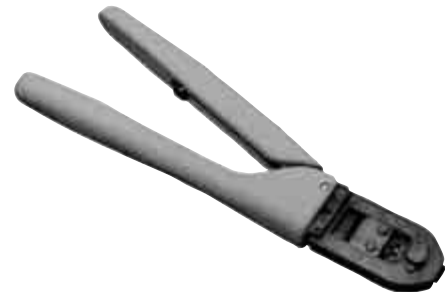
Part Number 1600914-3

(High Force)

1 Kit / Cable Assembly;

Kit includes 2 screws, 2 washers and 2 springs

Note: Kit not needed for STR or STL housings



CERTI-CRIMP Hand Tool
Part Number 91531-1

Note: All part numbers are RoHS compliant.

MULTI-BEAM XL Power Distribution Connector System
Cable Receptacle Assemblies (Continued)

Specifications

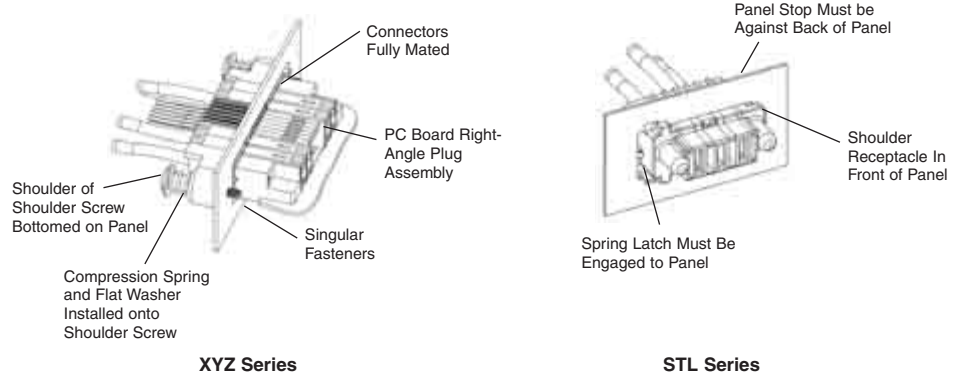
Product Specifications

Power Contacts —
 50 Amps on single 8 AWG wire

Signal Contacts —
 5 Amps on single 22 AWG wire
 0.050" [1.27] minimum float in X,
 Y and Z direction

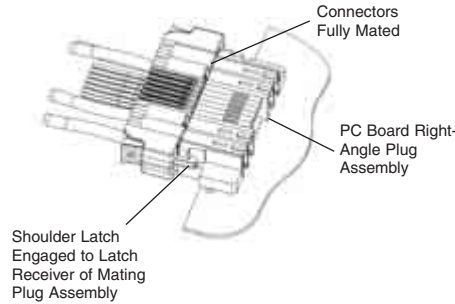
Sequenced Mating —
 3 Levels Pwr/Grnd, Pwr & Signal,
 Signal 250 Cycle Durability

Installed Connector Illustration



XYZ Series

STL Series

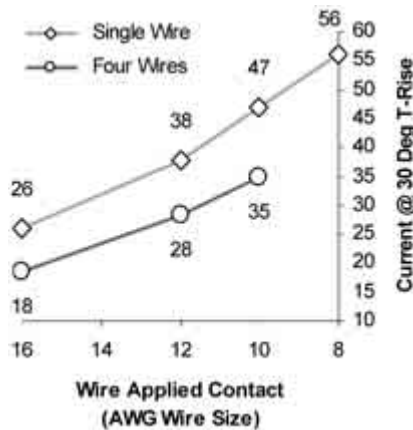


STR Series

Additional temperature-rise data available, contact Tyco Electronics Product Engineering.

Current/temperature rise data shown — from End-Of-Life qualification test.

MULTI-BEAM XL Product T-Rise Data



For more information see the product website @ <http://mbxl.tycoelectronics.com>

MULTI-BEAM XL Power Distribution Connector System Cable Plug Assemblies

Cable Plug Assemblies

Product Facts

- High strength housing materials
- Hot-Pluggable
- Installation provides float in X, Y and Z directions
- Sequenced mating
- RoHS complaint
- Modular mold design provides configuration flexibility
- Integral cable clamp supports contacts and provides strain relief in minimum amount of space
- 30 microinch (0.76 micrometers) gold plated contacts for high reliability
- Sold only as part of a pre-assembled cable assembly



The newest addition to the MULTI-BEAM XL cable assemblies are the cable mounted plugs. Produced with modular molds, the connectors can be made in a wide variety of sizes. The PCB mounted MULTI-BEAM XL plugs are typically rigidly mounted to hot-swappable power supplies and the systems they connect with. The "float blind-mate drawer connector" design of the MULTI-BEAM XL cable connectors helps eliminate the concern of an inadequately aligned chassis. The connector can accept mating parts misaligned by as much as 3 mm (± 1.5 mm), and still mate without applying stress

to solder or complaint pin terminations. The MULTI-BEAM cable plugs can terminate 8-14 AWG and 22-26 AWG wires all in one connector, without using adapter circuit boards. The use of high temperature glass filled housing materials, redundant contact retention and high conductivity contact materials allows the use of this connector in very high density applications.

The cable assemblies are all RoHS compliant designed to specific customer requirements and manufactured in Tyco Electronics' internal cable assembly manufacturing facilities.

Technical Documents

Product Specification

108-2157-1

Application Specification

114-13164

For More Information

Internet

<http://tycoelectronics.com>

Check out product information at:

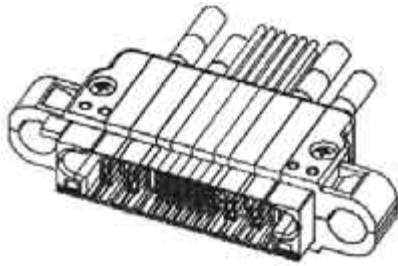
<http://mbxl.tycoelectronics.com>

Technical Support Center

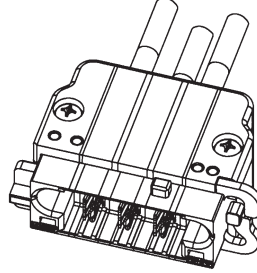
1-800-522-6752

MULTI-BEAM XL Power Distribution Connector System
Cable Plug Assemblies (Continued)

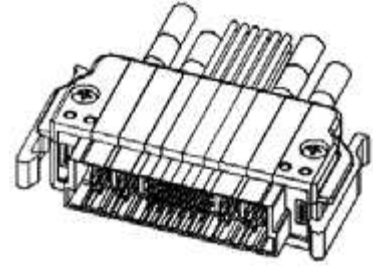
**Configurations/
Part Numbers**



PMT



STL



STR

Power Module Widths:

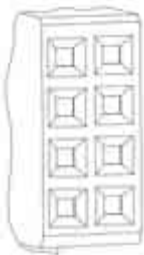
0.300" (ACP)
0.250" (P)
0.200" (HDP)



Module Designation	Maximum Wire Size		Max. Insulation Dia.
	AWG	mm ²	
300 (ACP)	8	10.5	.272 6.91
250 (P)	10	6.6	.215 5.46
200 (HDP)	12	2.6	.156 3.96

Signal Module Width:

0.200" (8 Contacts)



Module Designation	Maximum Wire Size		Max. Insulation Dia.
	AWG	mm ²	
Signals	22-26	0.14-0.32	.036-.054 0.91-1.37

Configuration	PMT Series Plug	STL Series Plug	Mating Receptacles*		STR Series Plug	Mating Receptacles Vertical
			Vertical	Right-Angle		
3 ACP	—	1761421-1	6450543-6	6450173-1	—	—
4 P	—	1761421-3	6450543-5	—	1600814-2	—
1P/16S/1P	1600236-5	1600820-2	—	2-6450170-0	1600238-4	6450740-4
1P/24S/1P	1600236-4	1600820-1	6450540-1	6450160-3	1600238-3	6450740-5
2P/24S/2P	1600236-6	1600820-3	5-6450540-9	2-6450170-1	1600238-5	6450740-6
3ACP/24S/3ACP	1600236-7	1600820-4	4-6450550-1	2-6450170-2	1600238-6	6450740-7

PMT Series — Panel-Mount with total 3 mm float in X,Y and Z directions
 STL Series — Panel-Mount with total 1.5 mm float in X and Y directions
 STR Series — Squeeze-to-Release for removeable Cable-to-Board / I/O Applications
 *Specifications on mating PCB mountable receptacles:
 Product Specification 108-2157-1
 Application Specification 114-13164

Note: All part numbers are RoHS compliant.

**MULTI-BEAM XL Power Distribution Connector System
Cable Plug Assemblies (Continued)**

Board-to-Board Products

Connector Styles

Intermateable with Tyco Electronics MULTI-BEAM XL PCB mounted receptacles

Specifications

Wire Gauge — 8 AWG – 14 AWG

Sequenced Mating — 3 Levels: Pwr/Gnd, Pwr & Signal, Signal

Current Carrying Capacity — Power Contacts — 45 Amps* on single 8 AWG wire
Signal Contacts — 4 Amps on single 22 AWG wire

Durability — 250 Cycle

Temperature Range — 40°C – 105°C

Float — 1.5 mm float in X, Y, and Z Direction**

RoHS Compliant

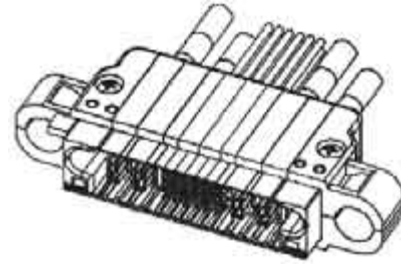
UL, CSA, VDE Approvals Pending

*Based on End-of-Design Life Qualification Tests

**Mated to Tyco Electronics MULTI-BEAM XL receptacles only

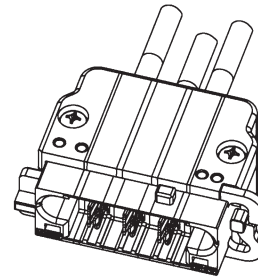
PMT (Panel-Mount) for True X, Y, Z Floating

- Single-piece contact design — eliminates multiple contact interfaces
- Insulation crimp on all contacts
- Installation to panel provides float in X, Y and Z directions



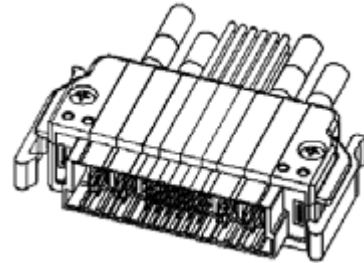
STL (Slide-to-Lock) — Most Economical — Still Offering X and Y Floating

- Single-piece contact design — eliminates multiple contact interfaces
- Insulation crimp on all contacts
- Installation to panel provides float in X and Y directions



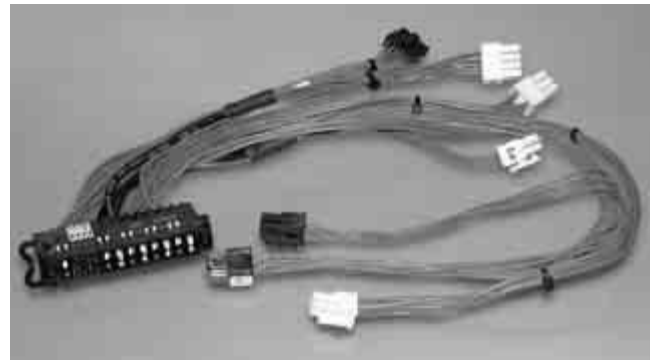
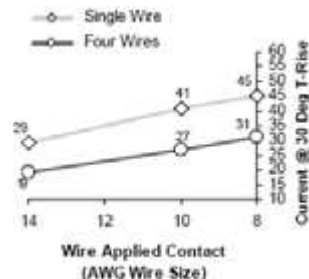
STR (Squeeze-to-Release) — To Connect Sub-assemblies

- Single-piece contact design — eliminates multiple contact interfaces
- Insulation crimp on all contacts
- Easy to mate/disconnect with squeeze-to-release latches



- Offered as pre-assembled, fully tested cable assemblies, as shown below
- Combines multiple power and signal connectors into a single Power I/O Connector

MULTI-BEAM XL Cable Plug T-Rise Data*



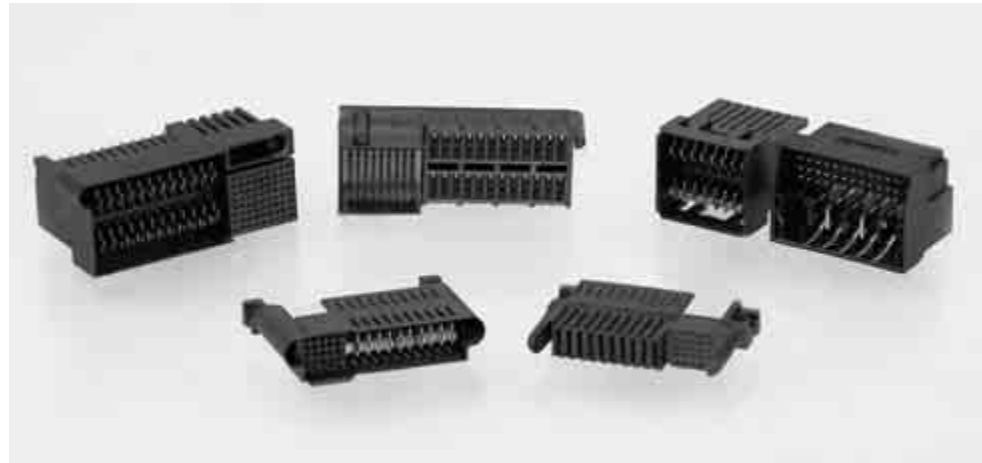
MINIPAK High-Density Board-to-Board Power Connectors

Product Facts

- High current per linear inch
- Various configurations to meet requirements using less board space
- Built-in alignment feature
- Shrouded insulator design
- Meets safety regulatory requirements
- All MINIPAK products in this section are RoHS compliant

Typical Applications

- Telecom and computer applications
- Routers
- Servers, mini and supercomputers
- Removable battery packs
- Uninterruptible power systems (UPS)
- Hot-swap N+1 power distribution



MINIPAK connectors are a family of board-to-board power connectors designed to deliver more current using less board real estate.

Product Varieties

This product family includes **MINIPAK high-density power connectors**, which are custom configurable and offer a combination of alignment guides, signal contacts, and DualBlade power contacts to meet different requirements. Following the PICMG μ TCA.0 Standard, the **MINIPAK HD**

connector is also available in this product line and is ideal for hot-plug telecommunications applications. With a two-row configuration, the **MINIPAK HDE** connector, designed to serve in both PCB-to-PCB and backplane power systems, occupies minimal PCB edge space. For applications needing a low profile solution, Tyco Electronics offers **MINIPAK HDL**, a blind-mateable board-to-board connector, which stands only 8 mm off the edge of the printed circuit board.

Wide Selection of Configurations

MINIPAK connectors are available in numerous configurations. Which MINIPAK connector is most suited to your application will depend on requirements such as AC input current and voltage, DC output currents and voltages, board-mount style, and available board space. Tyco Electronics will work with you to help determine the best solution to your application and can custom tool MINIPAK configurations if needed.

MINIPAK High-Density Board-to-Board Power Connectors (Continued)



MINIPAK High-Density Power Connectors

- 32 Amps per contact, fully loaded
- Features an innovative Dual Blade contact that allows splitting 4.5 mm pitch contacts into multiple voltage rails
- Various alignment guides, signal contacts, and power contacts available to use on 4.5 mm, 6.0 mm, and 7.5 mm pitches



MINIPAK HDL Connectors

- High density blind-mateable connector
- Low profile-stands just 8.0 mm off the PCB
- Solder and press-fit tails available
- Current rating of 16A
- Low contact resistance with mating forces less than 0.3lbs per contact



MINIPAK HD Connectors

- Designed to the PICMG MicroTCA.0 Standard
- Combines 24 power contacts and 72 high density signal contacts
- Rugged contact design helps provide long-term reliability
- Hot-plug design controls arc during hot mate/unmate cycles
- 3 mating levels



MINIPAK HDE Connectors

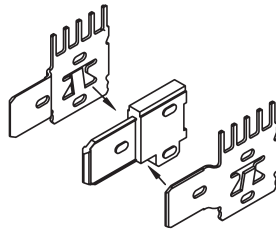
- Very high current density
- Two row configuration saves PCB space
- Two levels of contact sequencing available for mate-first-break-last operation
- Uses a hot-plug contact approved by UL for current interrupt applications

MINIPAK High-Density Board-to-Board Power Connectors (Continued)

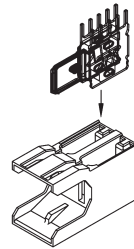


Part Number	Right-Angle PCB Plug				Mating Pair Overall Length	Vertical PCB Receptacle		
	No. 30A Pwr	No. 15A Pwr	Signal Contacts	Tails		Mating Part Number	Tails	Special Feature
6651672-2	3	2	6	Solder	1.38 35.00	6651673-1	Compliant Press-Fit	DualBlade
6651670-1	3	2	24	Solder	2.87 73.00	6651671-1	Compliant Press-Fit	DualBlade
6651742-1	8	12	58	Solder	3.78 96.00	6651743-1	Compliant Press-Fit	Stacked
6651668-1	21	0	24	Solder	5.71 145.00	6651669-1	Compliant Press-Fit	—
6651380-1	6	5	36	Solder	4.50 114.50	6651381-2	Compliant Press-Fit	DualBlade

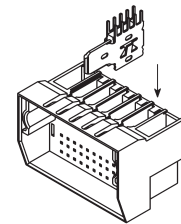
*The remaining power contacts are 30 Amps each



DualBlade Contact
DualBlade Contact provides two 15 Amp contacts in the space of one 30 Amp contact



DualBlade Contact Housing Assembly



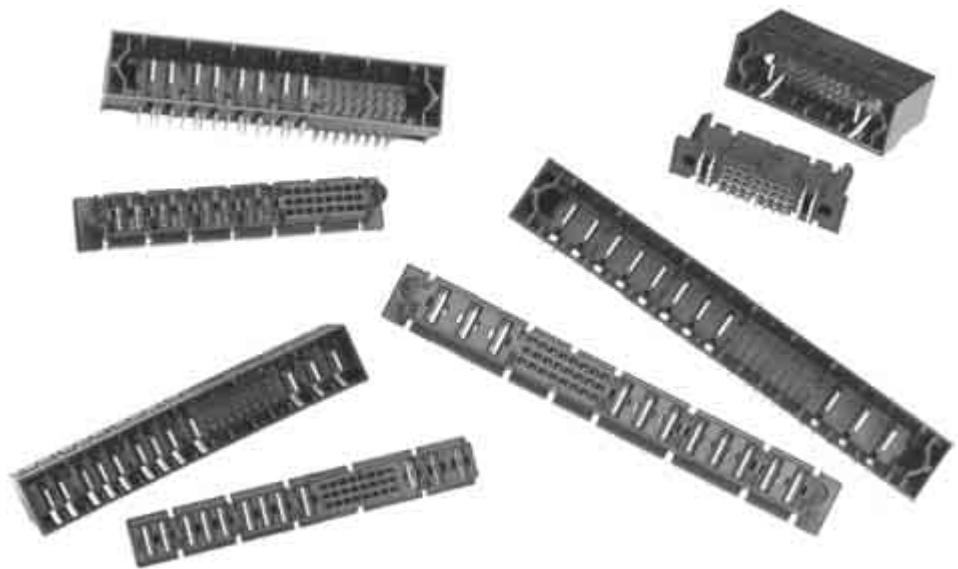
Stacked MINIPAK Connector

Co-Planar Stacked MINIPAK Connector

Part Number	Right-Angle PCB Plug				Mating Pair Overall Length	Right-Angle PCB Receptacle		
	No. 30A Pwr	No. 15A Pwr	Signal Contacts	Tails		Mating Part Number	Tails	Special Feature
1766056-1	2	6	36	Solder	1.55 39.30	1766057-1	Solder	Stacked

Custom MINIPAK Connector Configurations

If the standard MINIPAK connector configuration does not meet your application requirements, Tyco Electronics may be able to tool a custom MINIPAK connector solution depending on your requirements and production volume. Please consult Customer Service for details.



Note: All part numbers are RoHS compliant.

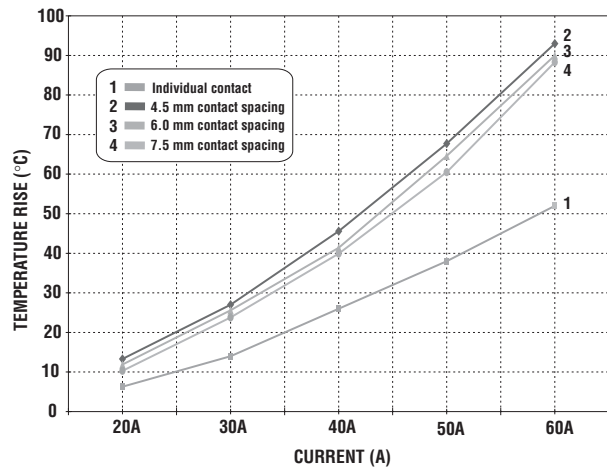
MINIPAK High-Density Board-to-Board Power Connectors (Continued)

Material	
Insulators	PPA, UL 94V-0 flammability rated, color black
Socket contacts	Phosphor bronze alloy
Signal pins	Brass alloy
Power blades	Copper alloy
Plating	
Contacts	Selective 30 microinches gold over nickel
Terminals	Tin over nickel
Environmental/Mechanical	
Connector operating temperature range	-40°C to +130°C
Mating forces	Power: 1.5lb/contact typical Signal: 0.2lb/contact typical
Electrical	
Contact current rating	Individual power contact: 65A max. ¹
Voltage ratings	AC Power: 125/250VAC, signal & DC power: up to 60V
Insulation resistance	5000Ω at 500V DC for 2 minutes, per MIL-STD 1344, Method 3003
Dielectric strength	Power 1,500VAC, signal 250VAC; for 1 minute, per MIL-STD 1344, Method 3001

¹ This is the UL rating for an individual power contact. Current rating for any given configuration with multiple contacts will depend on contact layout, quantity and spacing.

Contact Current Ratings

The graph to the right shows the current carrying capabilities of an individual power contact, and that of multiple contacts at 4.5, 6.0 and 7.5 mm contact spacing.



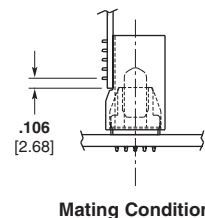
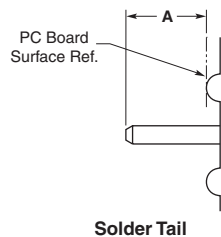
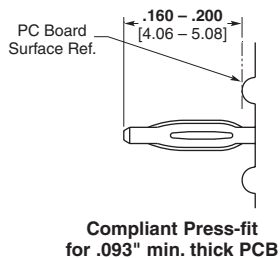
Safety Regulatory Agency Compliance

MINIPAK connectors have been evaluated and found to comply with the UL1977 standard and the CSA standard C22.2 No.182.3-M1987. Tyco Electronics will work with customers to obtain application-specific regulatory certifications if needed.

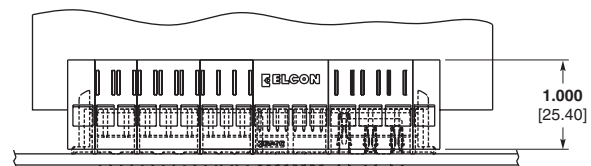


Connector Mounting

Termination Tails



Dimension "A"	
Long Tail	Short Tail
.180 ± .020	.120 ± .020
4.57 ± 0.51	3.07 ± 0.51



“NEW” MINIPAK HDL Connectors

NEW

Product Facts

- High-density, low profile, power/signal, blind-mate connector
- Developed to meet next generation 1U application by reducing airflow impedance
- Design is customizable
- Serves both solder reflow and press-fit applications with the same contact

Applications

- 1U Servers
- High End Servers
- Telecommunications Switches, requiring low profile
- Hot-pluggable power supplies

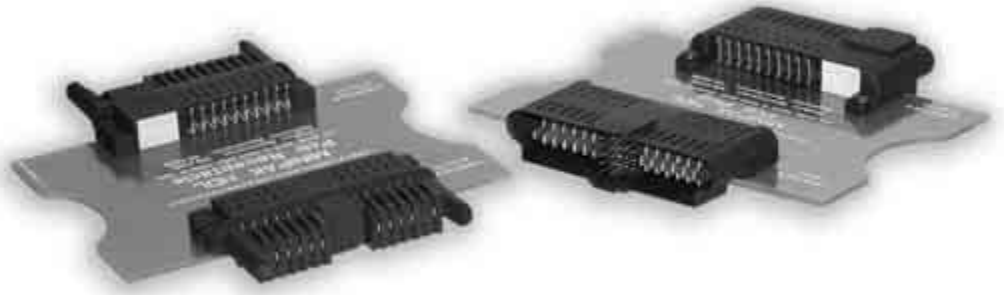
Technical Documents

Product Specification

108-2325

Application Specification

114-13215

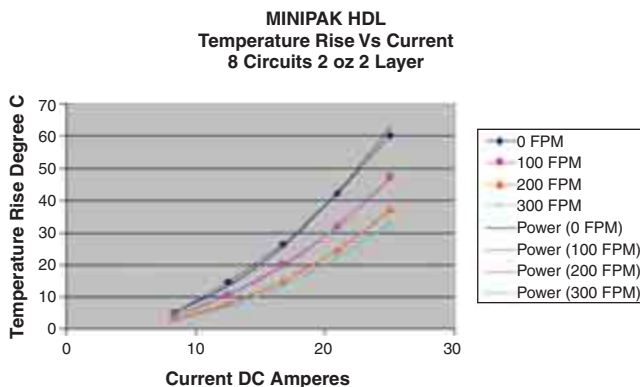


Tyco Electronics' new MINIPAK HDL connector combines a high-density power interface into a blind-mateable board-to-board connector, which stands only 8 mm off the edge of the printed circuit board.

The MINIPAK HDL product consists of a right-angle plug and right-angle receptacle, which utilizes an eye of the needle tail that can be used in both solder and press-fit applications. The contact offers a current rating of 16 amps, low contact resistance, and mating forces less than 0.3 pounds per contact.

The connector is designed and manufactured to be mass-customizable, allowing the customer to select a wide array of configurations and layouts. MINIPAK HDL connectors also contain three levels of mating sequences. This product is designed specifically for modular hot-swappable power distribution systems. The MINIPAK HDL connector offers 20% more current density in a smaller package than other products currently offered in the market.

Temperature Rise Chart



Simulated Side View of 1U Chassis

