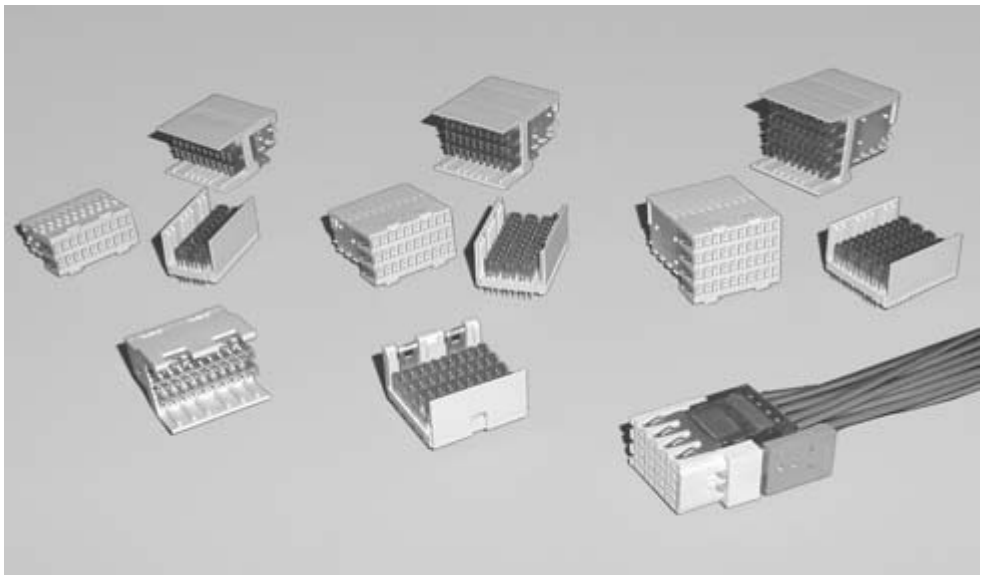
Z-PACK HM-Zd Product Line Overview

Product Facts

- **Z-PACK HM-Zd Connector is an extension of the Z-PACK 2mm HM product line**
- **Designed specifically for high speed differential applications**
- **A modular connector system with a standard module size of 25.00 [.984]**
- **Contact pitch is 1.50 [.059] within a pair and 3.00 [.118] pair to pair within a column; column to column pitch is 2.50 [.098]**
- **Card Pitch is less than 20.32 [.800] for 2 pair and 3 pair headers and 25.40 [1.000] for 4 pair headers**
- **Available in three versions:**
  - **2 signal contact pairs per column (20 pairs per 25.00 [.984]) compatible with 5 row Z-PACK 2mm HM Connector**
  - **3 signal contact pairs per column (30 pairs per 25.00 [.984])**
  - **4 signal contact pairs per column (40 pairs per 25.00 [.984]) compatible with 8 row Z-PACK 2mm HM Connector**
- **Available in vertical and right angle press fit pin headers and right angle and vertical press fit receptacles**
- **Optimized footprint for improved electrical performance and ease of trace routing (unobstructed routing channels on both daughtercard and backplane)**
- **Pin header and receptacle have the exact same footprint to simplify PC board layout**
- **Designed to meet Telcordia requirements**
- **Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476**



The Z-PACK HM-Zd Connector System is a high speed, differential connector system, which is compatible with the Z-PACK 2mm HM Connector Line. Z-PACK HM-Zd Connector provides Z-PACK 2mm HM Connector users with a migration path for serial switching applications from 3.125 Gb/s to 10+ Gb/s.

The Z-PACK HM-Zd Connector System features a highly reliable dual beam contact system with fully encompassing grounds dedicated to each differential pair. In addition, the Z-PACK HM-Zd Connector footprint is optimized for both routability and system performance with the use of a 1.50 x 2.50 [.059 x .098] row to column grid. The connector design features a robust mating interface with integral prealignment and polarization built into the mating interface.

Availability

Fully validated SPICE models: E-mail requests to modeling@tycoelectronics.com

Samples: go to http://tycoelectronics.custhelp.com

Pro/E models and IGES models: E-mail requests to TycoCAD@tycoelectronics.com

White Papers: available on product website at http://hmzd.tycoelectronics.com

Electrical Performance Report: http://hmzd.tycoelectronics.com
EPR #20GC014

Routing Guide: http://hmzd.tycoelectronics.com
Routing Guide #20GC015-1

http://hmzd.tycoelectronics.com

Technical Documents

Product Specification
108-2055

Application Specification
114-13059

Qualification Test Report
501-568

Material and Finish

Contact Area Finish — 0.80µm Au min. over 1.3µm Ni min.

Compliant Pin Finish — 0.8µm SnPb min. over 1.3µm Ni min.

Contact Material — Copper Alloy

Housing Material — Glass filled polyester, 94V-0 rated

Ratings

Current — 0.7A per signal contact, fully energized 2A per shield, all shields energized

Operating Voltage — 500 VAC maximum, signal to signal 250 VAC maximum, signal to ground

Temperature — –65°C to 105°C

Mating Force — 0.38N maximum per contact (signal = 1 contact, ground = 1 contact)

Durability — 250 cycles

* Reference Product Spec. 108-2055 for complete list of performance data.

Catalog 1773095
Issued 4-05

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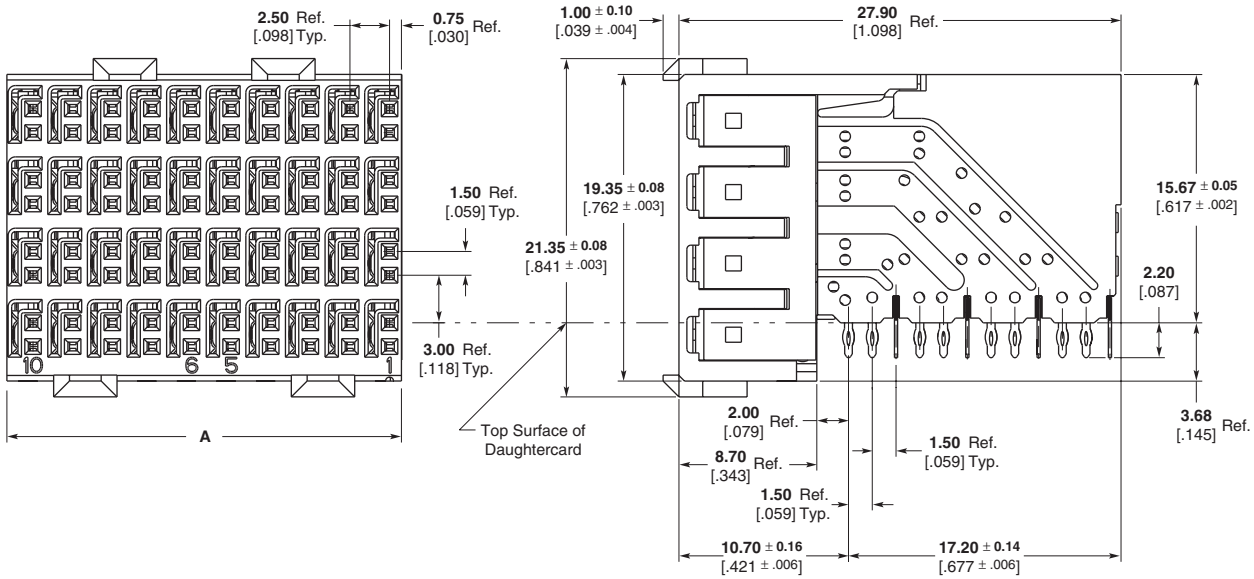
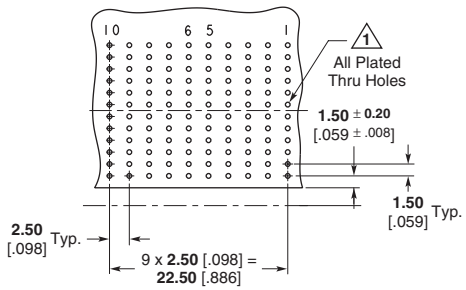
UK: 44-141-810-8967

4 Pair Right Angle Receptacle Assemblies





Recommended PC Board Layout
Daughter Board, Component Side Shown

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.375** ± **0.0125** [.0148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-13059.

Part Number	Column Count	Module Length (Dim. A)	Signals	Grounds	Application Tooling[2]		
					Insertion	Repair	
					Receptacle	Housing Removal	Chiclet Removal
1469001-1[1]	10	**25.00** .984	80	40	91347-1	1583224-1	1583248-1
1469286-1	12	**30.00** 1.181	96	48	91347-3	1583224-2	1583248-1
1469294-1	15	**37.50** 1.476	120	60	91347-2	1583224-3	1583248-1
1469061-1	20	**50.00** 1.969	160	80	91347-4	1583224-4	1583248-1

[1] **AdvancedTCA Zone 2 Daughtercard Connector.**
[2] See page 43 for Instruction Sheet Number.

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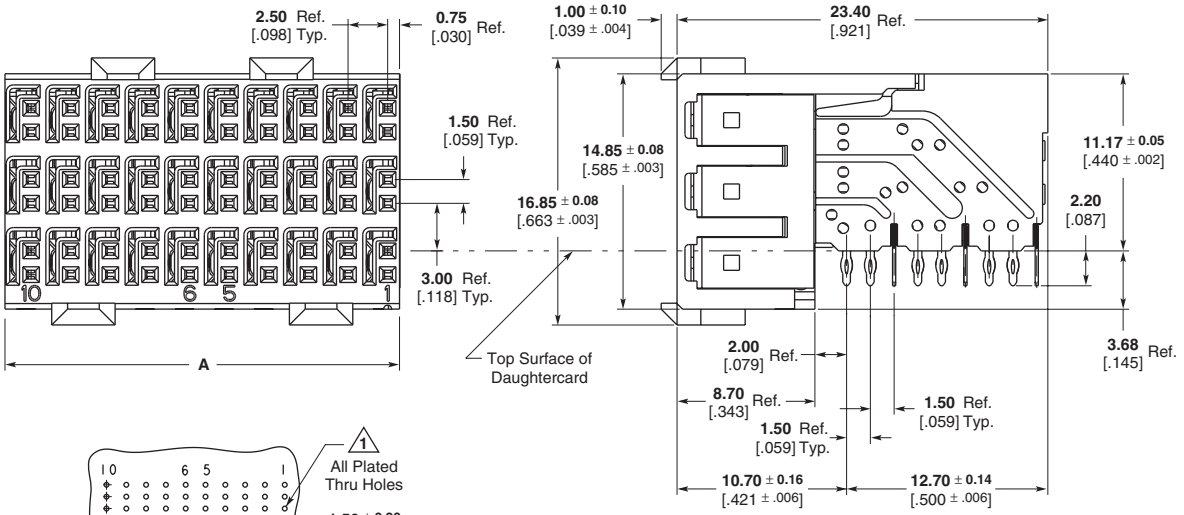
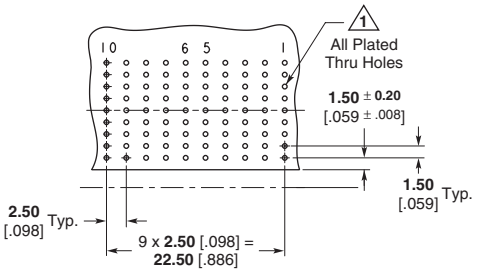
Z-PACK HM-Zd Connector (Continued)

3 Pair Right Angle Receptacle Assemblies

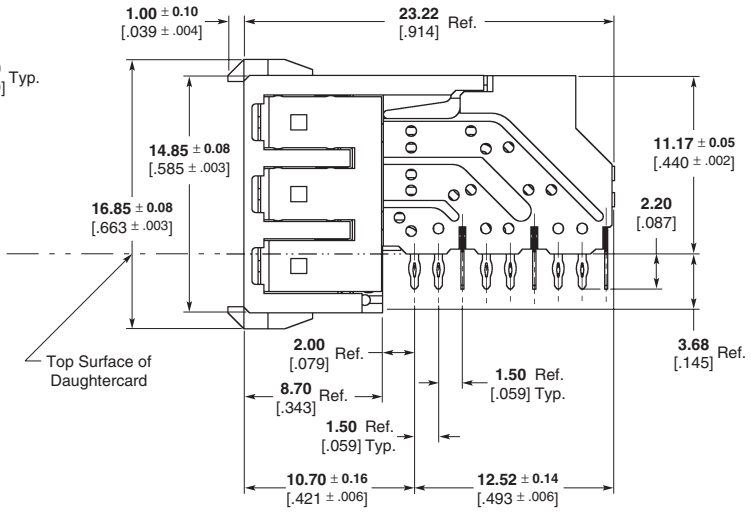




Recommended PC Board Layout
Daughter Board, Component Side Shown

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.0375** ± **0.0125** [.00148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-13059.



With Notch For PMC Applications

Part Number	Column Count	Module Length (Dim. A)	Signals	Grounds	Application Tooling[2]		
					Insertion	Repair	
					Receptacle	Housing Removal	Chiclet Removal
1469081-1	10	**25.00** .984	60	30	91376-1	1583224-1	1673952-1
1469514-1[1]	10	**25.00** .984	60	30	91376-1	1583224-1	1673952-1

[1] For CompactPCI and AdvancedTCA PMC Applications.
[2] See page 43 for Instruction Sheet Number.

CompactPCI is a trademark of PICMG-PCI Industrial Computer Mfg's. Group.

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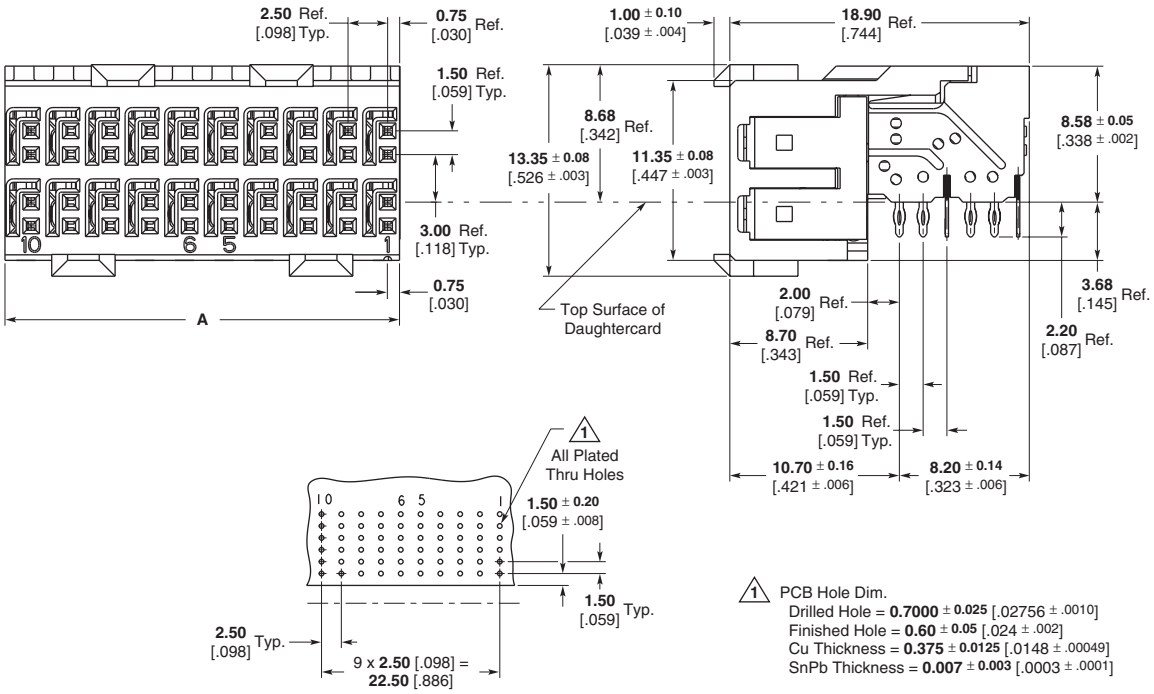
Z-PACK HM-Zd Connector (Continued)

2 Pair Right Angle Receptacle Assemblies



Recommended PC Board Layout
Daughter Board, Component Side Shown

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.375** ± **0.0125** [.0148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-13059.

Part Number	Column Count	Module Length (Dim. A)	Signals	Grounds	Application Tooling[1]		
					Insertion	Repair	
					Receptacle	Housing Removal	Chiclet Removal
1469028-1	10	**25.00** .984	40	20	91350-1	1583224-1	1583249-1
1469077-1	20	**50.00** 1.969	80	40	91350-2	1583224-4	1583249-1

[1] See page 43 for Instruction Sheet Number.

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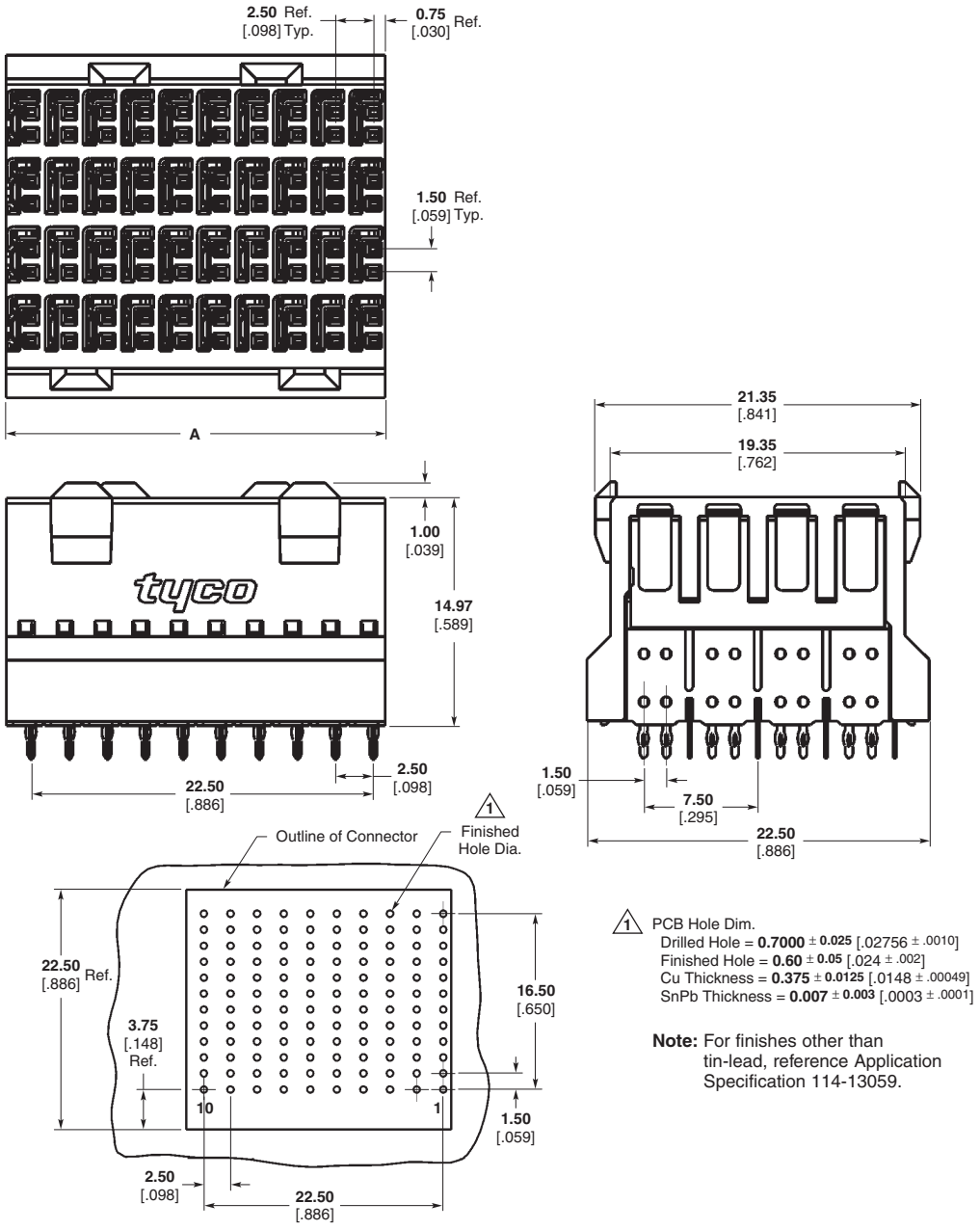
Z-PACK HM-Zd Connector (Continued)

4 Pair Vertical Receptacle Assemblies



Recommended PC Board Layout

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.375** ± **0.0125** [.0148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-13059.

Part Number	Column Count	Module Length (Dim. A)	Signals	Grounds	Application Tooling[1]	
					Insertion	Repair
					Receptacle	Housing Removal
1469362-1*	10	**25.00** .984	80	40	1804401-1	1804402-1

[1] See page 43 for Instruction Sheet Number.
* RoHS Compliant.

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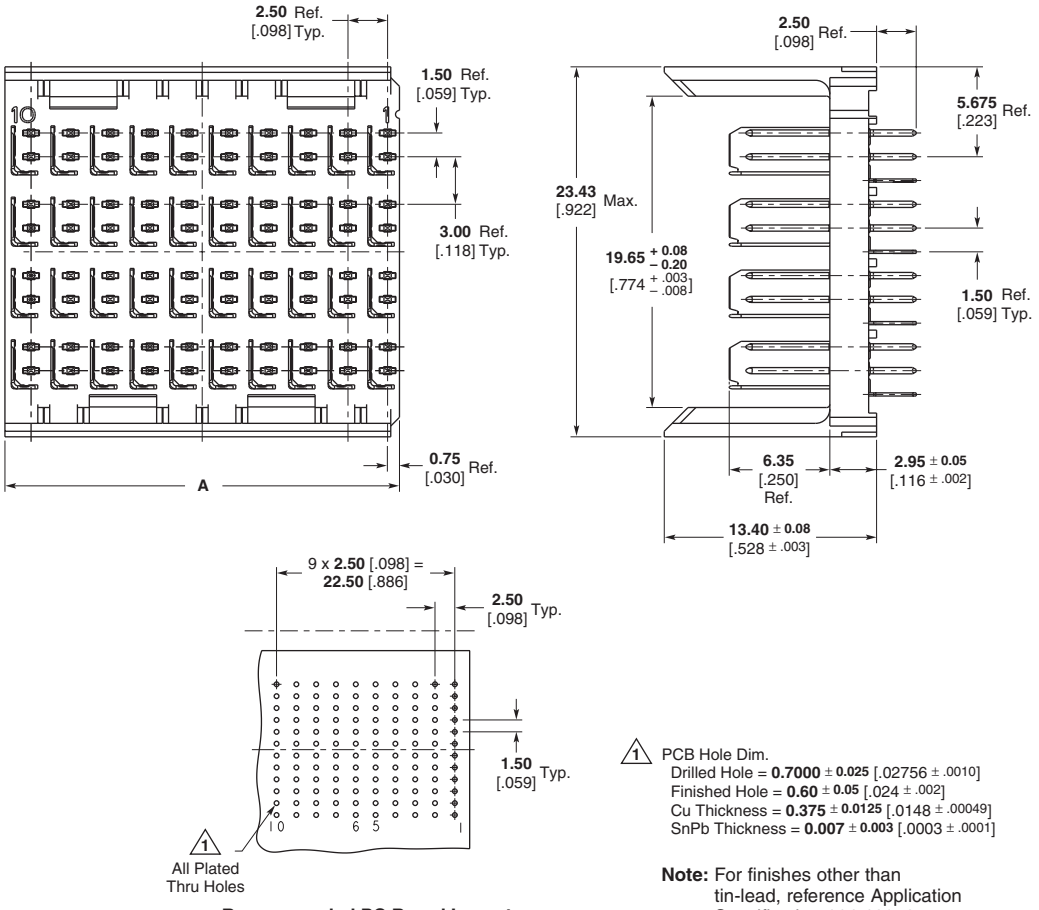
Japan: 81-44-844-8013
UK: 44-141-810-8967

Z-PACK HM-Zd Connector (Continued)

4 Pair Vertical Pin Header Assemblies



Recommended PC Board Layout
Backplane Component Side Shown

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.375** ± **0.0125** [.0148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-13059.

Part Number	Tail Length	Mating Pin Length	Column Count	Module Length (Dim. A)	Signals	Grounds	Application Tooling[3]			
							Insertion	Repair		
							Pin Header	Pin Removal	Housing Removal	Pin Insertion
1469002-1[1]	**2.50** .098	**5.30** .209	10	**25.00** .984	80	40	91349-1	1583237-1	1583220-1	1583255-1
1469046-1[2]	**2.50** .098	**5.30** .209	10	**25.00** .984	80	40	91349-1	1583237-1	1583220-1	1583255-1
1469074-1	**1.80** .071	**5.30** .209	10	**25.00** .984	80	40	91349-1	1583237-1	1583220-1	1583255-1
1469287-1	**2.50** .098	**5.30** .209	12	**30.00** 1.181	96	48	91349-3	1583237-1	1583220-1	1583255-1
1469296-1	**2.50** .098	**5.30** .209	15	**37.50** 1.476	120	60	91349-2	1583237-1	1583220-1	1583255-1
1469062-1	**2.50** .098	**5.30** .209	20	**50.00** 1.969	160	80	91349-4	1583237-1	1583220-1	1583255-1
1469099-1	**1.80** .071	**5.30** .209	20	**50.00** 1.969	160	80	91349-4	1583237-1	1583220-1	1583255-1

[1] **AdvancedTCA Zone 2 Backplane Connector.**
[2] Shallow Wall for Daughtercards thicker than 3.50 [.138].
[3] See page 43 for Instruction Sheet Number.

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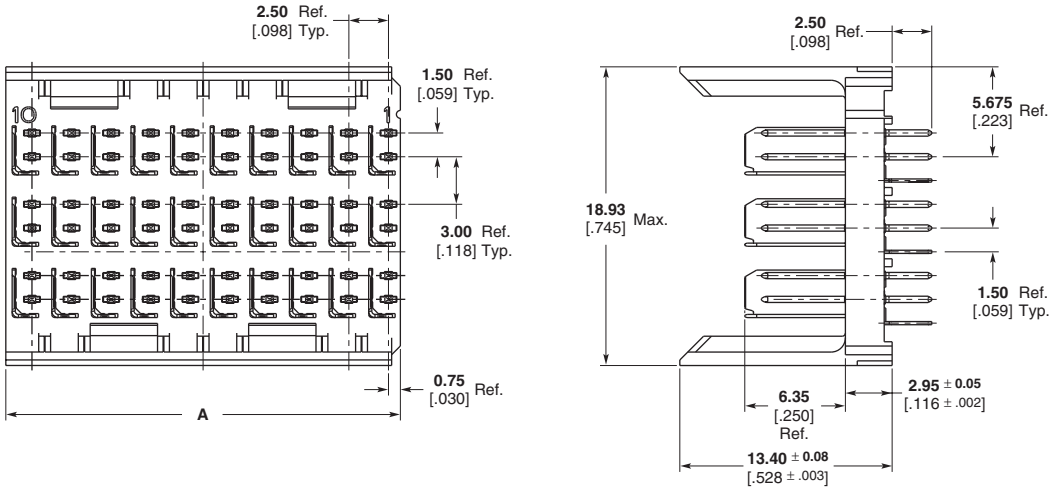
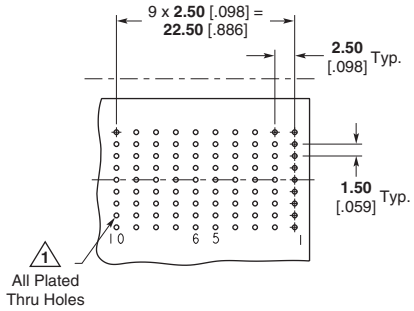
Z-PACK HM-Zd Connector (Continued)

3 Pair Vertical Pin Header Assemblies





Recommended PC Board Layout
Backplane, Component Side Shown

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.0375** ± **0.0125** [.00148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-13059.

Part Number	Tail Length	Mating Pin Length	Column Count	Module Length (Dim. A)	Signals	Grounds	Application Tooling[1]			
							Insertion	Repair		
							Pin Header	Pin Removal	Housing Removal	Pin Insertion
1469083-1	**2.50** .098	**5.30** .209	10	**25.00** .984	60	30	91375-1	1583237-1	1725634-1	1583255-1
1469085-1	**1.80** .071	**5.30** .209	10	**25.00** .984	60	30	91375-1	1583237-1	1725634-1	1583255-1

[1] See page 43 for Instruction Sheet Number.

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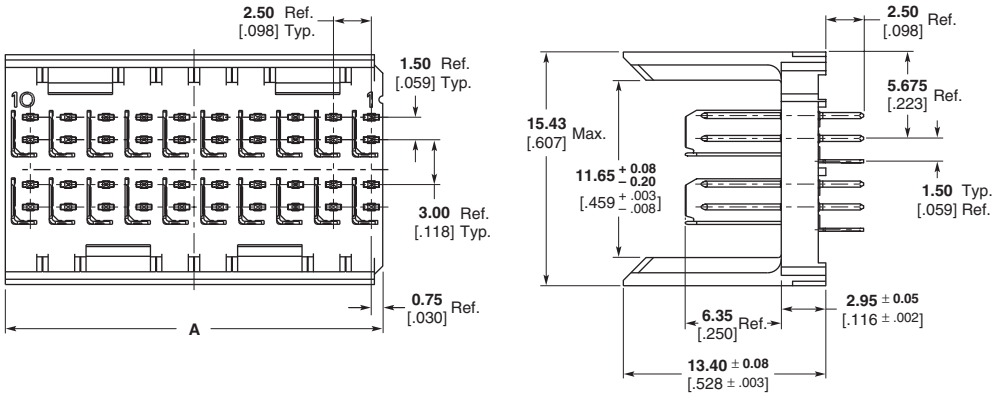
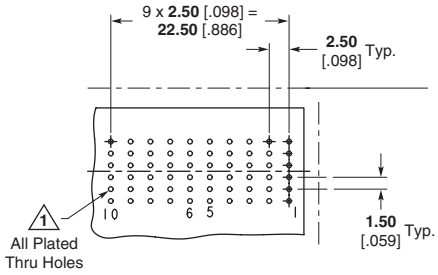
Z-PACK HM-Zd Connector (Continued)

2 Pair Vertical Pin Header Assemblies





Recommended PC Board Layout Backplane

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.375** ± **0.0125** [.0148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-13059.

Part Number	Tail Length	Mating Pin Length	Column Count	Module Length (Dim. A)	Signals	Grounds	Application Tooling[1]			
							Insertion	Repair		
							Pin Header	Pin Removal	Housing Removal	Pin Insertion
1469025-1	**2.50** .098	**5.30** .209	10	**25.00** .984	40	20	91348-1	1583237-1	1583234-1	1583255-1
1469076-1	**1.80** .071	**5.30** .209	10	**25.00** .984	40	20	91348-1	1583237-1	1583234-1	1583255-1
1469078-1	**2.50** .098	**5.30** .209	20	**50.00** 1.969	80	40	91348-4	1583237-1	1583234-1	1583255-1
1469101-1	**1.80** .071	**5.30** .209	20	**50.00** 1.969	80	40	91348-4	1583237-1	1583234-1	1583255-1

[1] See page 43 for Instruction Sheet Number.

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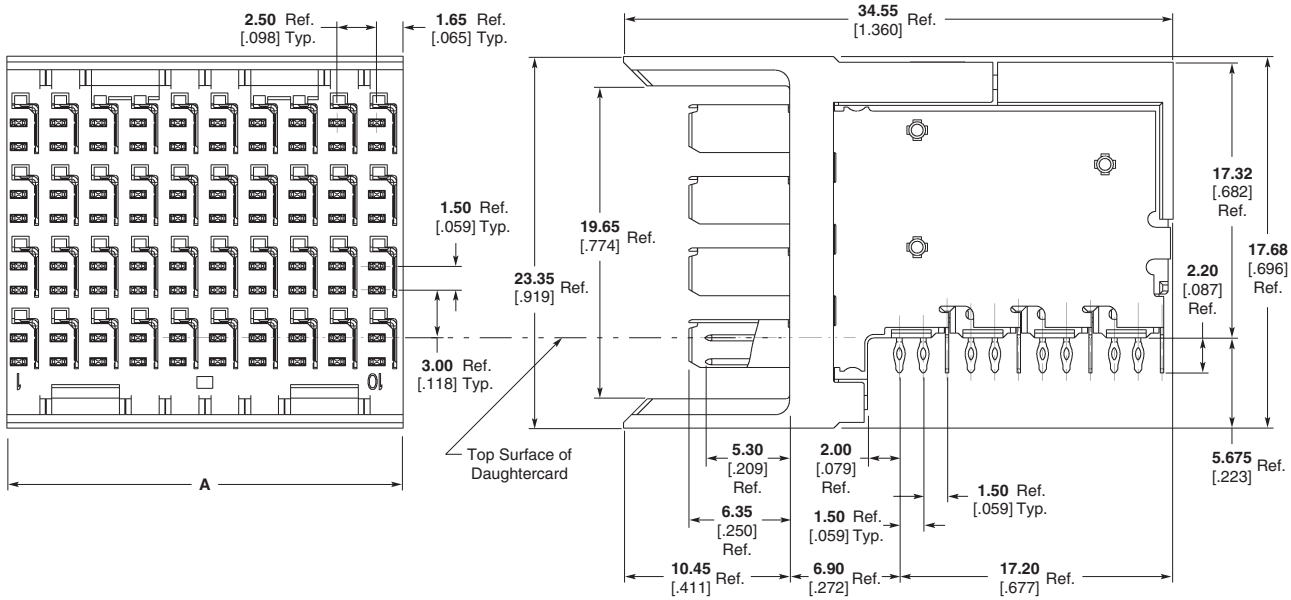
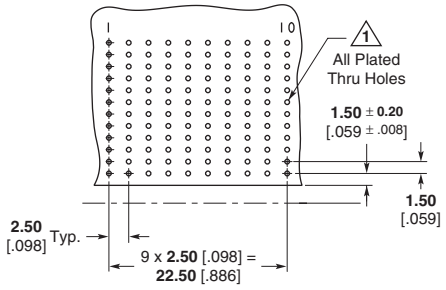
4 Pair Right Angle Pin Header Assemblies





Recommended PC Board Layout
Component Side Shown

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.0375** ± **0.0125** [.00148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-13059.

Part Number	Tail Length	Mating Pin Length	Column Count	Module Length (Dim. A)	Signals	Grounds	Application Tooling[1]		
							Insertion	Repair	
							Pin Header	Housing Removal	Chiclet Removal
1469048-1	**2.20** .087	**5.30** .209	10	**25.00** .984	80	40	91378-1	1804174-1	1804177-1
1469375-1	**2.20** .087	**5.30** .209	12	**30.00** 1.181	96	48	91378-3	1804174-1	1804177-1

[1] See page 43 for Instruction Sheet Number.

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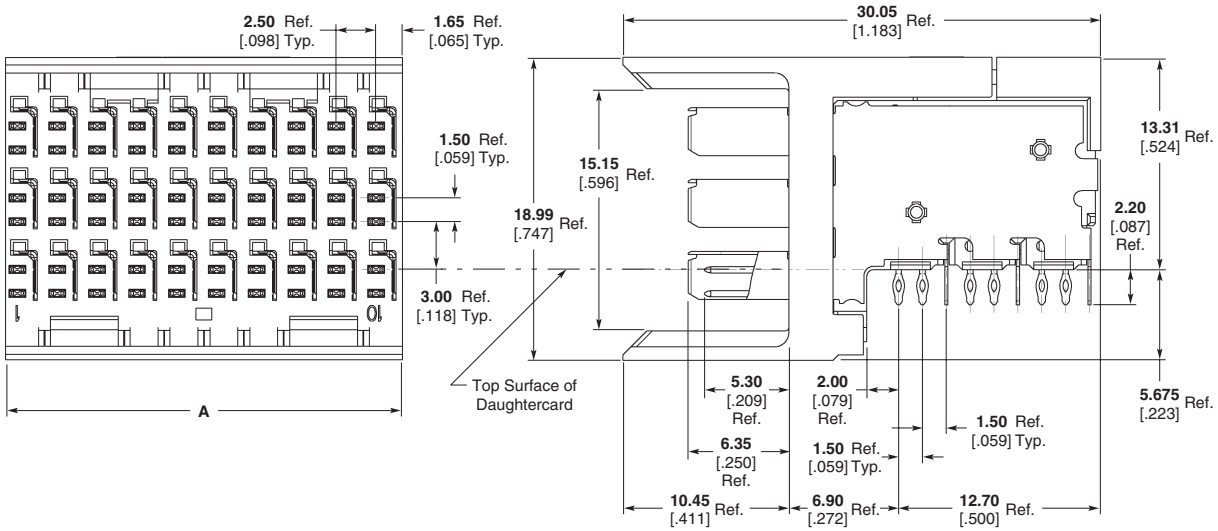
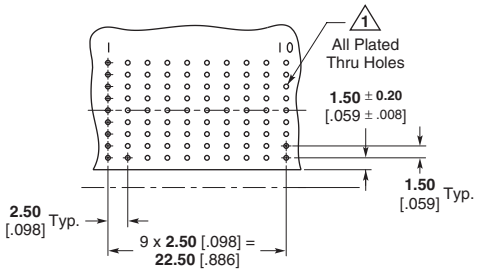
3 Pair Right Angle Pin Header Assemblies





Recommended PC Board Layout
Component Side Shown

1 PCB Hole Dim.
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Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.0375** ± **0.0125** [.00148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-13059.

Part Number	Tail Length	Mating Pin Length	Column Count	Module Length (Dim. A)	Signals	Grounds	Application Tooling[1]		
							Insertion	Repair	
							Pin Header	Housing Removal	Chiclet Removal
1469183-1	**2.20** .087	**5.30** .209	10	**25.00** .984	60	30	1804179-1	1804173-1	1804176-1

[1] See page 43 for Instruction Sheet Number.

Catalog 1773095
Issued 4-05

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Dimensions are shown for reference purposes only. Specifications subject to change.

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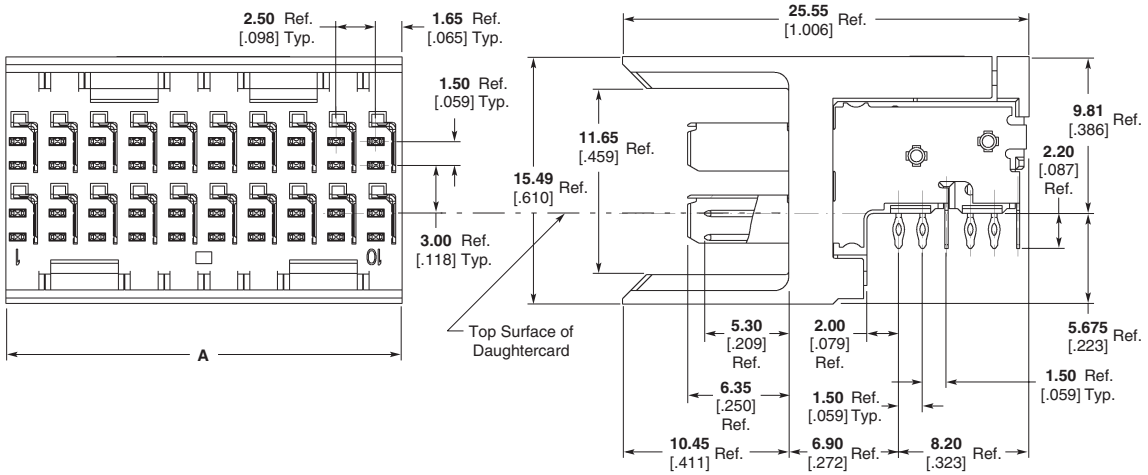
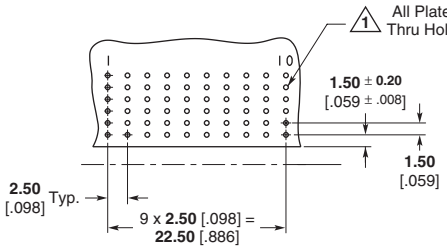
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-141-810-8967

Z-PACK HM-Zd Connector (Continued)

2 Pair Right Angle Pin Header Assemblies





Recommended PC Board Layout
Component Side Shown

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.0375** ± **0.0125** [.00148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-13059.

Part Number	Tail Length	Mating Pin Length	Column Count	Module Length (Dim. A)	Signals	Grounds	Application Tooling[1]		
							Insertion	Repair	
							Pin Header	Housing Removal	Chiclet Removal
1469169-1	**2.20** .087	**5.30** .209	10	**25.00** .984	40	20	91377-1	1804171-1	1804175-1

[1] See page 43 for Instruction Sheet Number.

Catalog 1773095
Issued 4-05

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UK: 44-141-810-8967

Z-PACK HM-Zd Connector (Continued)

Power and Guide Hardware

Universal Power Module Vertical Receptacle (3 Pos.)

The Tyco Electronics Universal Power Module is a three position, modular, Hard Metric board-to-board power connector designed to be compatible with Z-PACK 2mm HM Connectors. The design is in an "inverse-sex" orientation and the vertical receptacle module meets the IEC 950 safety requirements for finger probe protection.

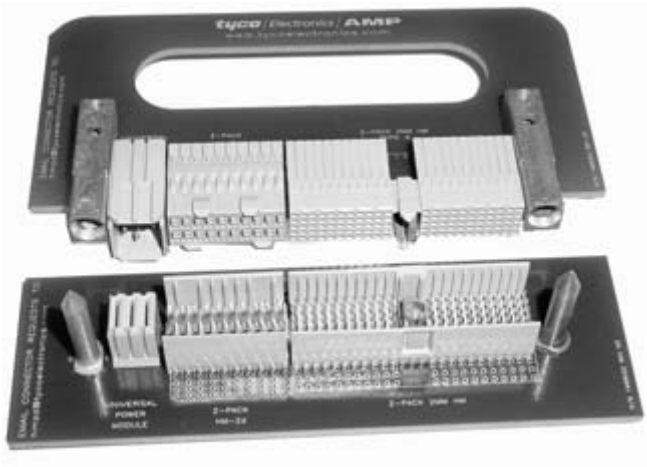
Both the headers and receptacle utilize Tyco Electronics ACTION PIN press-fit leads for ease of assembly onto printed circuit boards. Additionally, the vertical receptacle leads are polarized to allow only one orientation onto the printed circuit board, eliminating the possibility of reverse placement.

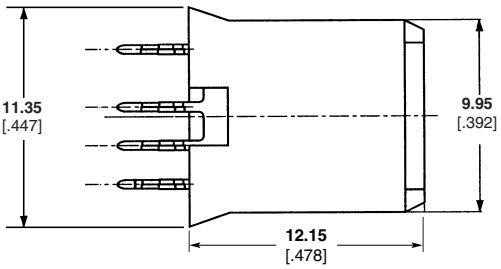
The Universal Power Module is compatible with a wide variety of other Tyco Electronics board-to-board connectors including Z-PACK HS3, Z-PACK HM-Zd, Z-PACK Strip-line 100, AMP-HDI, TBC, TBC Plus and Eurocard connectors.

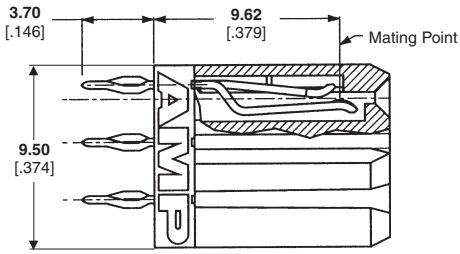
The housings are thermoplastic and the contacts are offered in either a standard or high current copper alloy. Contact finish is gold over nickel on the mating surfaces. The contacts are designed to carry 10 amperes per contact in standard assemblies and 15 amperes per contact in the high current assemblies. Actual values may vary depending upon connector size, board design, etc.

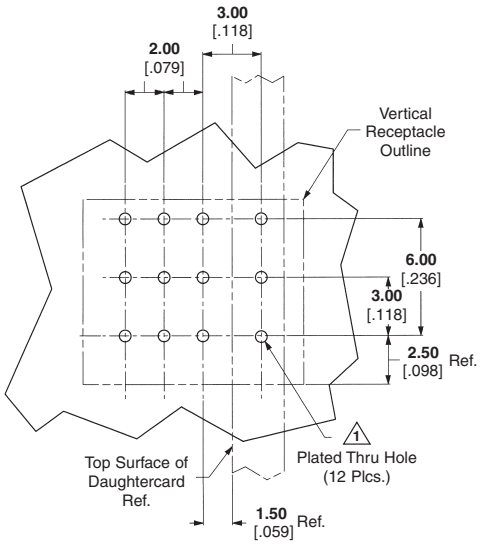
The right angle header contacts are available with sequenced lengths for "make-first/break-last" applications.

Generous alignment features designed into the housings and optional guide pins and receptacles make the Tyco Electronics Universal Power Module ideal for "blind mating" applications.









Recommended PC Board Hole Layout

	Position Loaded	Part Numbers
Vertical Receptacle	ABC	223955-2
	AC	223984-1
High Current	ABC	5-223955-2

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.375** ± **0.0125** [.0148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-1103.

Catalog 1773095
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UK: 44-141-810-8967

Z-PACK HM-Zd Connector (Continued)

Power and Guide Hardware
(Continued)

Expanded Universal Power Module Vertical Receptacles

Material and Finish
Housing — Polyester, gray

Contact — Copper alloy, plated 0.00127 [.000050] min. gold in mating area, 0.00050 [.000020] min. tin-lead on ACTION PIN area, with entire contact underplated 0.00127 [.000050] min. nickel

Related Product Data
Guiding Hardware (Optional) — pages 21-23

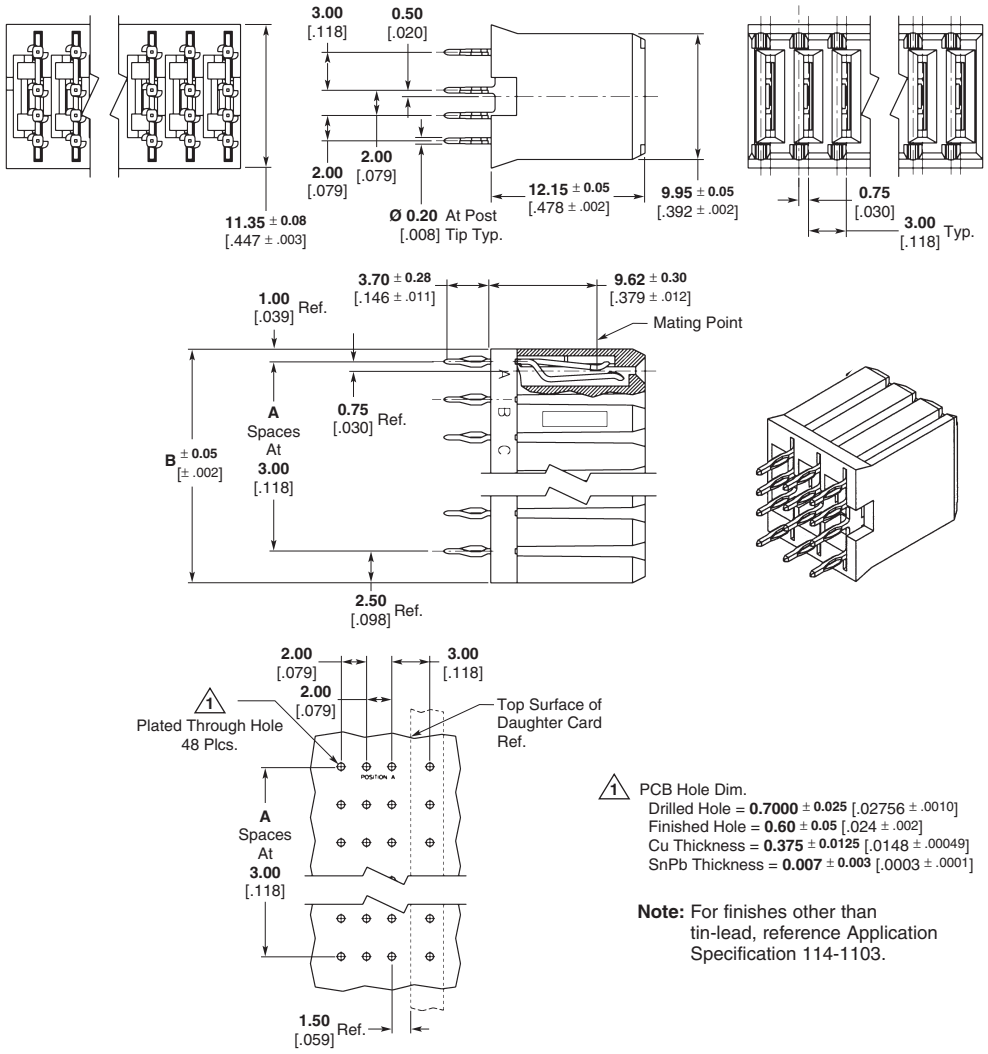
Application Tooling
Header
Seating Tool, 224441-1
Board Support Fixture, 224442-1

Receptacle
Seating Tool, 224421-1
Board Support Fixture, 217602-1

Technical Documents
Product Specification
108-1651

Application Specification
114-1103

Tyco Electronics Instruction Sheet
408-4169 (Receptacle Seating Tool 224421-1)



Recommended PCB Hole Layout

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.375** ± **0.0125** [.0148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-1103.

Position	A	B Ref.	Standard *10A Part Number	High Current *15A Part Number
4	3	**12.50** .492	223995-1	120953-1
5	4	**15.50** .610	223995-2	120953-2
6	5	**18.50** .728	223995-3	120953-3
7	6	**21.50** .846	223995-4	120953-4
8	7	**24.50** .965	223995-5	120953-5

*Reference Product Specification 108-1651.

Note: For additional Power Module options reference Catalog 1773096, "Power Connectors and Interconnection Systems," or contact your Tyco Electronics Sales Representative.

Catalog 1773095
Issued 4-05

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UK: 44-141-810-8967

Z-PACK HM-Zd Connector (Continued)

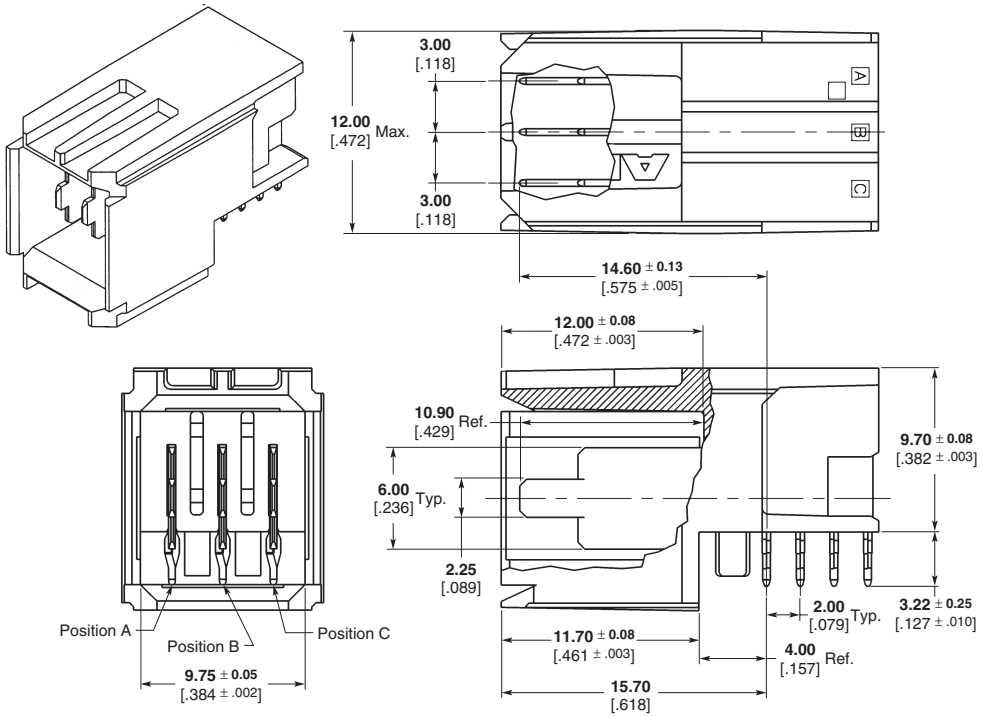
Power and Guide Hardware
(Continued)

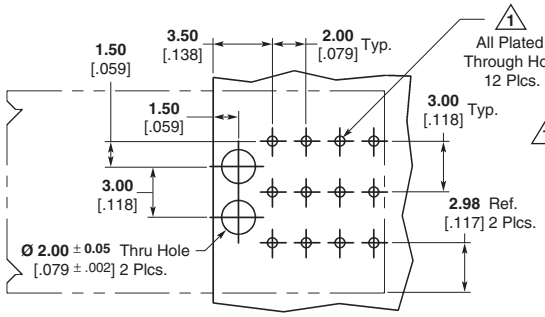
Universal Power Module Right Angle Headers (3 Pos.)

Material and Finish

Housing — polyester, natural color

Contacts — Copper alloy, plated 0.00127 [.000050] min. gold in mating area, 0.00050 [.000020] min. tin-lead on ACTION PIN post area, with entire contact underplated 0.00127 [.000050] min. nickel





1 PCB Hole Dim.
Drilled Hole = **0.7000** ± 0.025 [.02756 ± .0010]
Finished Hole = **0.60** ± 0.05 [.024 ± .002]
Cu Thickness = **0.375** ± 0.0125 [.0148 ± .00049]
SnPb Thickness = **0.007** ± 0.003 [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-1103.

Recommended PC Board Hole Layout

Blade Length Dimensions			Standard *10A Right Angle Header Part Numbers	High Current *15A Right Angle Header Part Numbers
Position A	Position B	Position C		
10.90 [.429]	**10.90** [.429]	**10.90** [.429]	223961-1	5-223961-1
10.90 [.429]	**9.30** [.366]	**10.90** [.429]	223962-1	—
10.90 [.429]	**9.30** [.366]	**9.30** [.366]	223968-1	—
10.90 [.429]	**7.68** [.302]	**10.90** [.429]	223972-1	—
10.90 [.429]	**7.68** [.302]	**9.30** [.366]	223971-1	—
10.90 [.429]	**7.68** [.302]	**7.68** [.302]	223970-1	—
9.30 [.429]	**10.90** [.429]	**9.30** [.366]	223963-1	—
9.30 [.366]	**10.90** [.429]	**7.68** [.302]	223964-1	—
9.30 [.366]	**9.30** [.366]	**9.30** [.366]	223967-1	—
9.30 [.366]	—	**9.30** [.366]	223975-1	—
9.30 [.366]	**9.30** [.366]	**7.68** [.302]	223981-1	—
9.30 [.366]	**7.68** [.302]	**9.30** [.366]	223965-1	—
7.68 [.302]	**9.30** [.366]	**7.68** [.302]	223983-1	—
7.68 [.302]	**7.68** [.302]	**9.30** [.366]	223980-1	—
7.68 [.302]	**7.68** [.302]	**7.68** [.302]	223974-1	5-223974-1

*Reference Product Specification 108-1651.

Note: For additional Power Module options reference Catalog 1773096, "Power Connectors and Interconnection Systems," or contact your Tyco Electronics Sales Representative.

Catalog 1773095
Issued 4-05

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UK: 44-141-810-8967

Z-PACK HM-Zd Connector (Continued)

Power and Guide Hardware
(Continued)

Expanded Universal Power Module Right Angle Headers

Material and Finish
Housing — Polyester, gray

Contacts — Phosphor bronze, plated 0.00127 [.000050] min. gold in mating area, 0.00054 [.000021] min. tin-lead on ACTION PIN area, with entire contact underplated 0.00127 [.000050] min. nickel

Related Product Data
Guiding Hardware (Optional) — pages 21-23

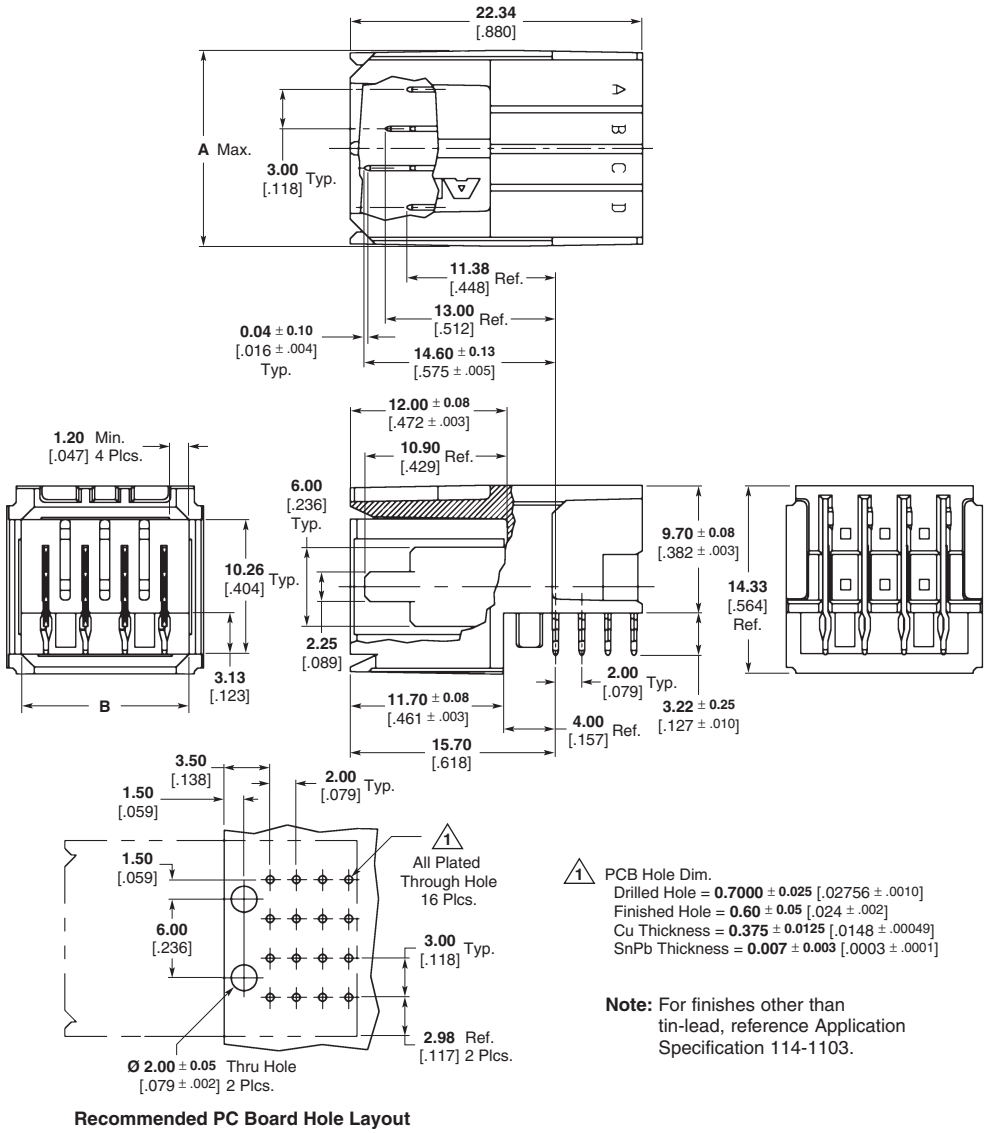
Application Tooling
Header
Seating Tool, 224441-1
Board Support Fixture, 224442-1

Receptacle
Seating Tool, 224421-1
Board Support Fixture, 217602-1

Technical Documents
Product Specification
108-1651

Application Specification
114-1103

Tyco Electronics Instruction Sheet
408-4169 (Receptacle Seating Tool 224421-1)



Recommended PC Board Hole Layout

1 PCB Hole Dim.
Drilled Hole = **0.7000** ± **0.025** [.02756 ± .0010]
Finished Hole = **0.60** ± **0.05** [.024 ± .002]
Cu Thickness = **0.375** ± **0.0125** [.0148 ± .00049]
SnPb Thickness = **0.007** ± **0.003** [.0003 ± .0001]

Note: For finishes other than tin-lead, reference Application Specification 114-1103.

Positions	Dimensions A	Dimensions B	Standard *10A Base Part Number[1]	High Current *15A Base Part Number[1]
4	**15.00** .591	**12.75** .502	646954	120954 [2]
5	**18.00** .709	**15.75** .620	646955	120955 [2]
6	**21.00** .827	**18.75** .738	646956	120956 [2]
7	**24.00** .945	**21.75** .856	646957	120957 [2]
8	**27.00** 1.063	**24.75** .974	646958	120958 [2]

[1] Dash number indicates sequence pattern. See customer drawing for specific dash numbers.
[2] RoHS Compliant.
*Reference Product Specification 108-1651.

Note: For additional Power Module options reference Catalog 1773096, "Power Connectors and Interconnection Systems," or contact your Tyco Electronics Sales Representative.

Catalog 1773095
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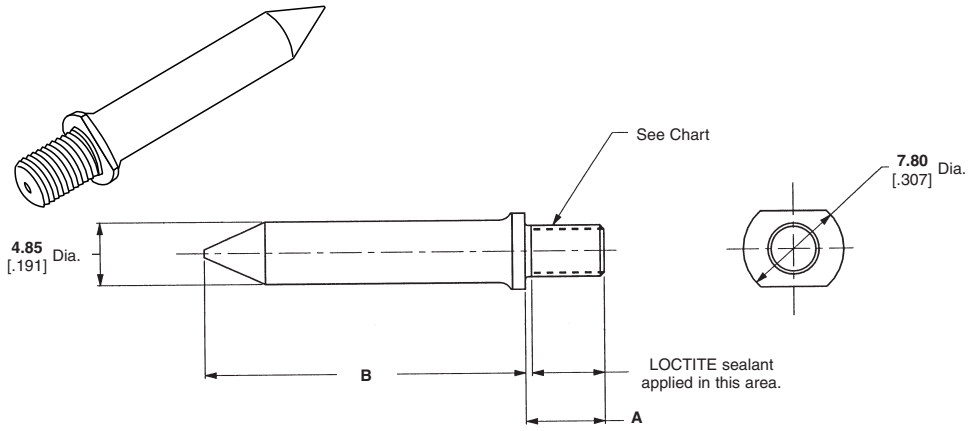
UK: 44-141-810-8967

Z-PACK HM-Zd Connector (Continued)

Power and Guide Hardware
(Continued)

Guide Pin (Unkeyed)

Material and Finish
Guide Pin — Passivated stainless steel
Part Number 223956-1



Dimension		Thread	Part Numbers
A	B		
7.50 [.295]	**24.73** [.974]	M4 x 7-6g	223982-1 [1, 2]
9.20 [.362]	**25.16** [.991]	M4 x 7-6g	223969-7 [2]
12.70 [.500]	**25.16** [.991]	8-32 UNC-2A	223969-4 [2]
12.70 [.500]	**25.16** [.991]	M4 x 7-6g	223969-1 [2]
6.20 [.244]	**25.16** [.991]	M4 x 7-6g	223956-1 [2]
12.70 [.500]	**31.25** [1.230]	8-32 UNC-2A	1-223969-0 [2]
3.80[3] [.150]	**27.16** [1.069]	M4 x 7-6h	120646-1 [2]
2.00[3] [.079]	**27.16** [1.069]	M3 x 0.5	223988-1 [2]

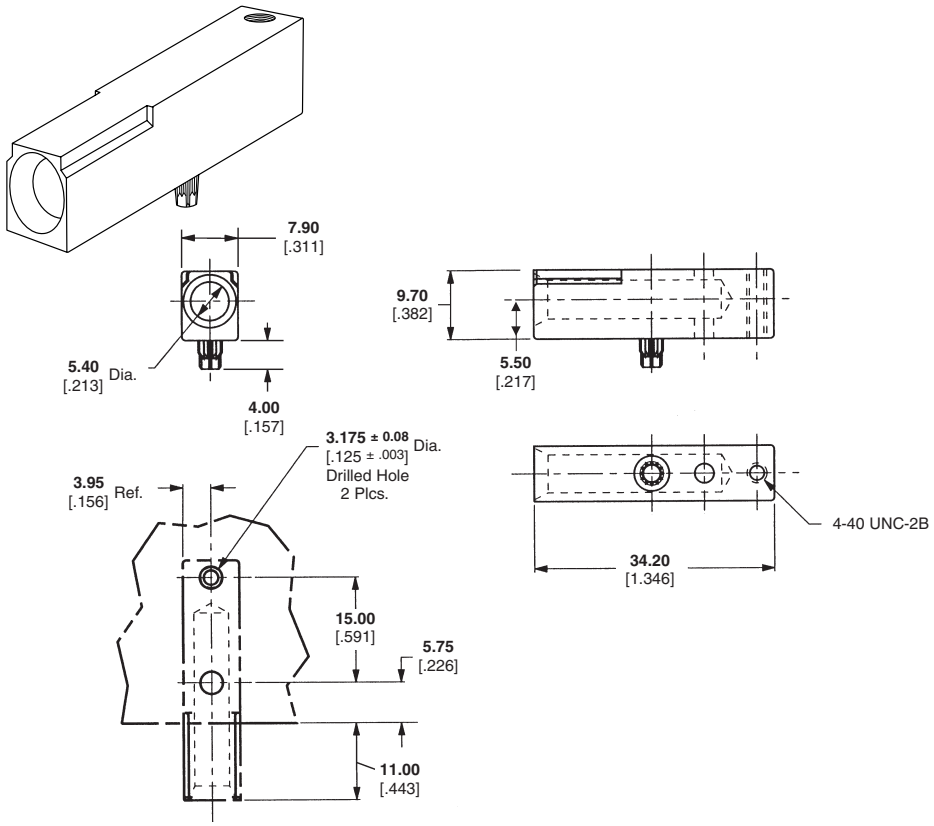
[1] 6.35 Hex Base.
[2] RoHS Compliant.
[3] Internal Thread.

Female Guide Module (Unkeyed)

Material and Finish
Guide Module — Zinc alloy, chromate conversion coated

Related Product Data
Application Tooling —
Seating Tool, 224440-1.
Board Support Fixture, 217603-1.

Technical Documents
Product Specification
108-1651
Application Specification
114-1103
Part Number 223957-1
(as shown)
Part Number 223979-1
(dual alignment posts)



Recommended PC Board Hole Layout

Catalog 1773095
Issued 4-05

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Z-PACK HM-Zd Connector (Continued)

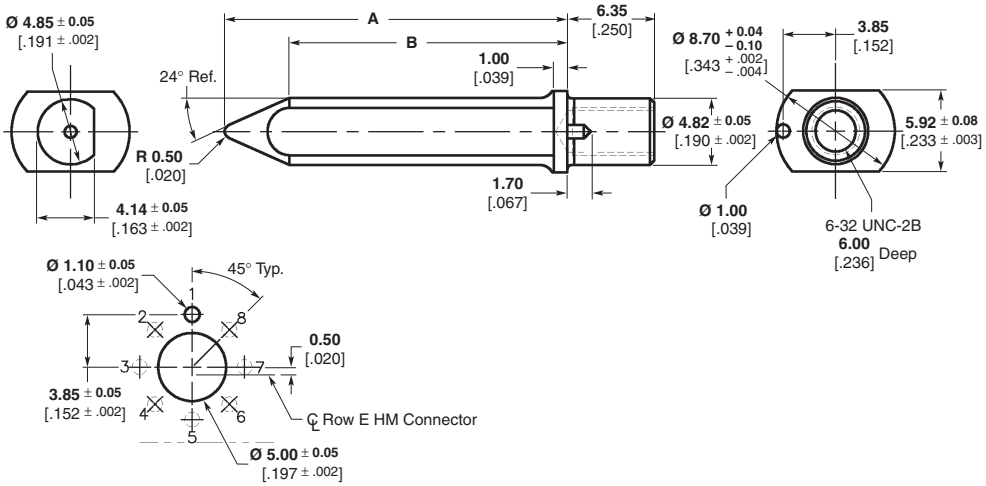
Power and Guide Hardware
(Continued)

Guide Pin (Unkeyed)

Material and Finish
Guide Pin — Zinc alloy, chromate conversion coated

Part Number 223985

Dimension		Part Number
A	B	
25.16 .991	20.39 .803	223985-1
29.00 1.142	24.23 .954	223985-3



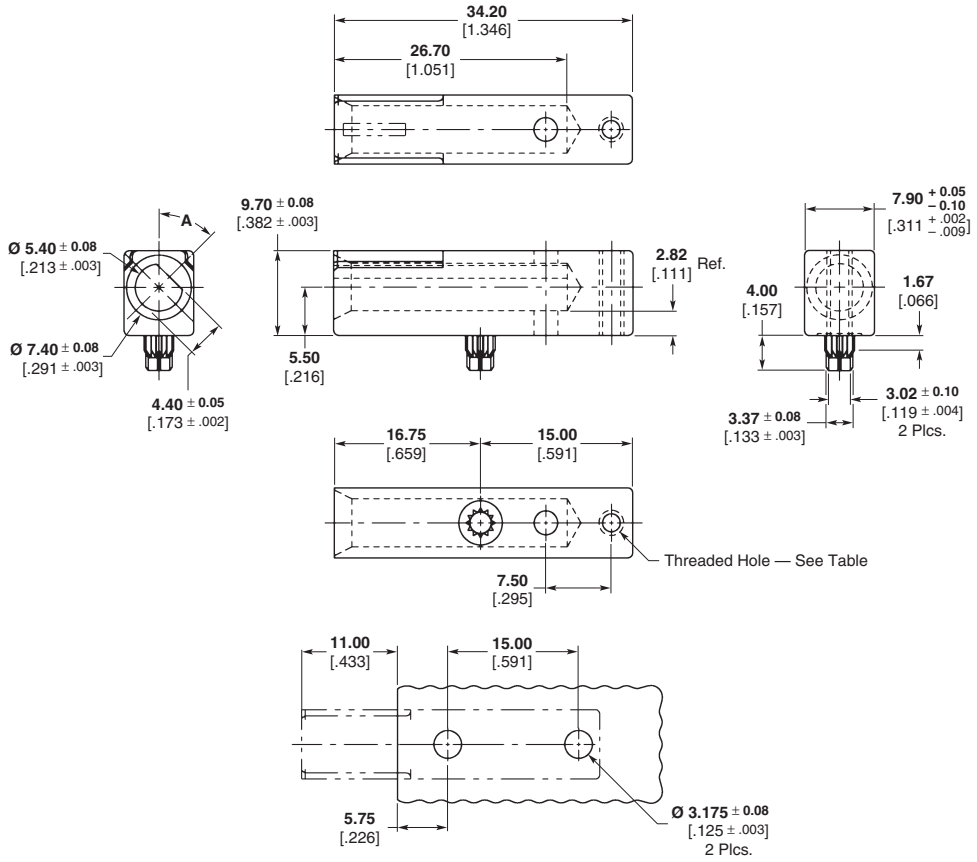
Recommended PC Board Layout (Position Shown Used with Part Number 223986-1)

Female Guide Module (Unkeyed)

Material and Finish
Guide Module — Zinc alloy, chromate conversion coated

Part Number 223986

Dim. A	Thread	Part Number
0°	4-40	223986-1
45°	4-40	223986-2
90°	4-40	223986-3
135°	4-40	223986-4
180°	4-40	223986-5
225°	4-40	223986-6
270°	4-40	223986-7
315°	4-40	223986-8
0°	M2.6	120913-1
45°	M2.6	120913-2
90°	M2.6	120913-3
135°	M2.6	120913-4
180°	M2.6	120913-5
225°	M2.6	120913-6
270°	M2.6	120913-7
315°	M2.6	120913-8



Footprint

Catalog 1773095
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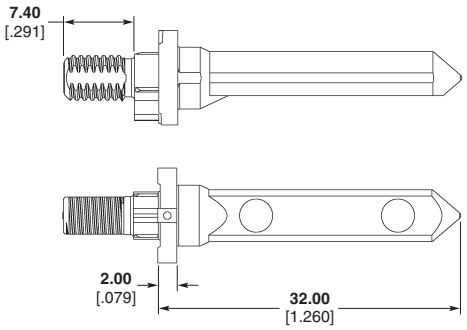
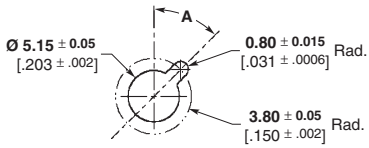
Z-PACK HM-Zd Connector (Continued)

Power and Guide Hardware
(Continued)

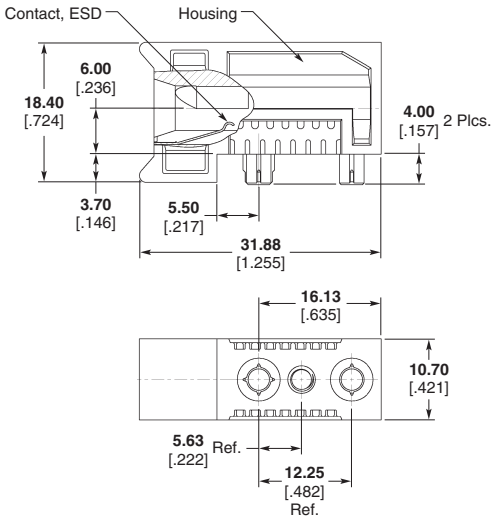


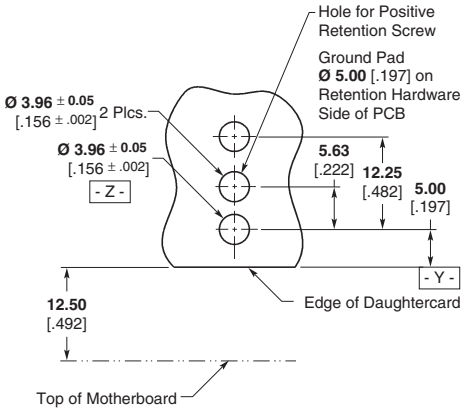


PCB Layout for Guidepost

Note: Key hole orientation (Dim. A) per mating guide module Part Number table (Orientation shown on PCB layout is for Part Number 1410297-2).

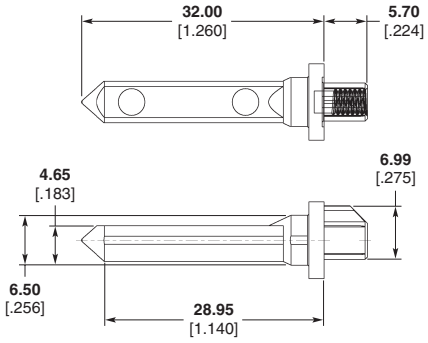
1410773 Series

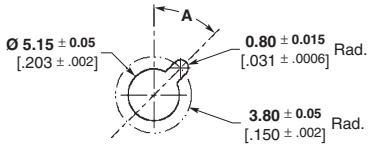




PCB Layout
Connector Side

1410297 Series





PCB Layout for Guidepost

Note: Key hole orientation (Dim. A) per mating guide module Part Number table (Orientation shown on PCB layout is for Part Number 1410297-2).

1410548 Series

MULTIGIG RT Guide Modules

Description	Part Number
Keyed/ESD Guide Module Assembly, **20.30** [.799] Daughtercard*	1410297-X
Keyed Guide Pin, Backplane Connector, Threaded Post**	1410773-X
Keyed Guide Pin, Die Cast, Rolling Thunder, Backplane Connector**	1410548-X

* See customer drawing for specific keying options.
** Internal and external threaded versions available, see customer drawings for available options.

Catalog 1773095
Issued 4-05

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UK: 44-141-810-8967

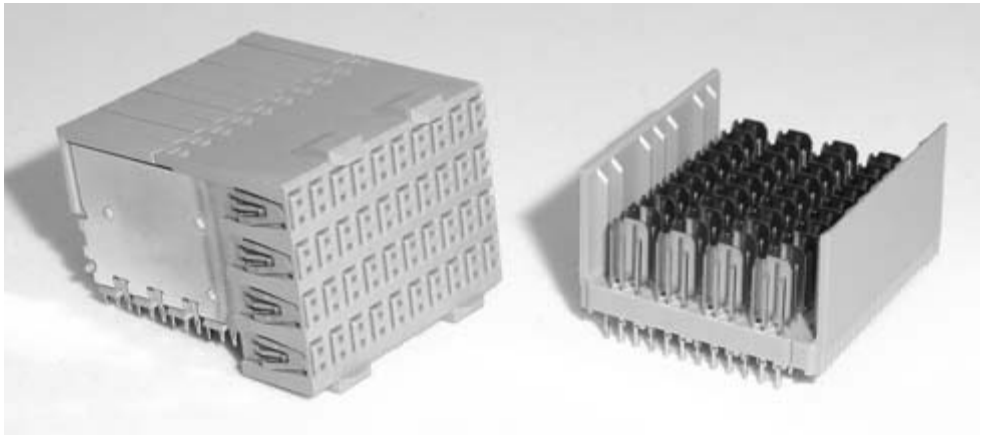
Z-PACK HM-Zd Connector (Continued)

"NEW" AdvancedTCA Connectors

AdvancedTCA Zone 2

Front Board Connector
4 Pair Right Angle Receptacle
Part Number 1469001-1
See page 7 for more details

Backplane Connector
4 Pair Vertical Header
Part Number 1469002-1
See page 11 for more details



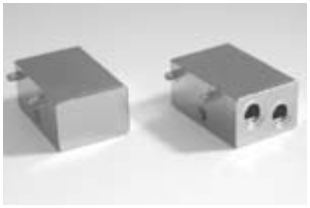
Front Board Connector | Backplane Connector

AdvancedTCA Guide/Keying Modules

The AdvancedTCA Guide Modules can be used in a wide variety of applications. For *motherboard-to-daughtercard applications* the vertical pin and right angle socket are used. This popular configuration is further supported by our wide offering of available keying positions. Each of the two keyed guide pins and guide sockets per module can be produced in a variety of different key positions. For *co-planar applications*, the right angle guide pins are used along with the right angle guide sockets. Both vertical and right angle guide pins are available in short or long sizes, to accommodate being used with different Tyco Electronics connectors.

rA1

A2 (RTM)



K1/K2

rK1

A1

A2

ATCA Name	ATCA Location	Description	Part Number
rA1	Backplane	Rear Alignment Post **3.00 – 4.00** [.118 – .157] PCB Thickness	1469269-2*
rA1	Backplane	Rear Alignment Post **4.10 – 6.00** [.161 – .236] PCB Thickness	1469269-4*
rA1	Backplane	Rear Alignment Post **6.10 – 8.00** [.240 – .315] PCB Thickness	1469269-6*
A2 (RTM)	Rear Transition Module	Right Angle Male, Keyed	1-1469372-1*
K1/K2	Front Board	Right Angle Female, Keyed	1-1469373-1*
K1/K2	Front Board	Right Angle Female, Unkeyed Dummy	9-1469373-9*
rK1	Rear Transition	Right Angle Female	1469374-1*
A1	Backplane	Vertical Male, Keyed, Short	1-1469387-1*
A2	Mid-Plane	Vertical Male, Keyed, Long	1-1469388-1*

* RoHS Compliant.

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Z-PACK HM-Zd Connector (Continued)

AdvancedTCA Power Connectors (Zone 1)

Backplane Connector Straight, Compliant Press Fit, Part Number 1766501-1*

Material and Finish

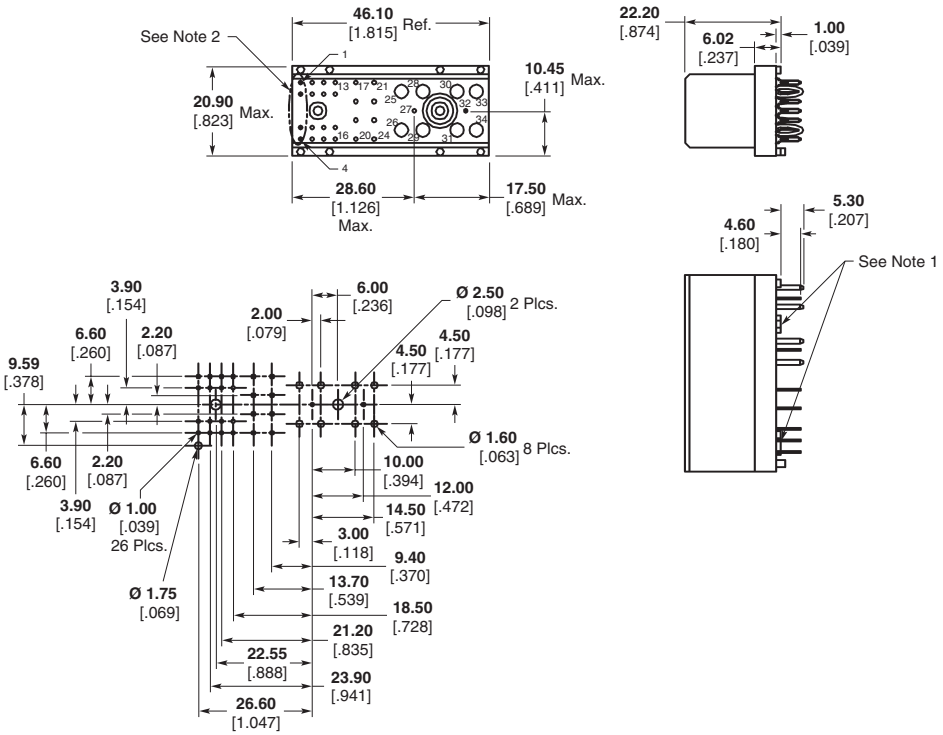
Insulators — Thermoplastic, glass reinforced, black, UL94V-0

Signal Pins — Copper alloy

Power Contacts — High conductivity copper alloy, plated 0.0076 [.000030] min. gold in mating area per Tyco Electronics Specification 112-162-5, over 0.00130 [.000050] min. nickel per Tyco Electronics Specification 112-25-2

Solder tails — 0.0030 - 0.0043 [.000120 - .000170] tin plated per lead free Tyco Electronics Specification 112-65-1, matt finish

Notes:
1. Mounting Holes (Ø2.00 [.079] x 5.00 [.197] DP) for use with self tapping screw (customer supplied).
2. Positions 1–4 not populated and reserved for future use.



Printed Circuit Layout

Front Board Connector Right Angle, Compliant Press Fit Part Number 1766500-1*

Material and Finish

Insulators — Thermoplastic, glass reinforced, black, UL94V-0

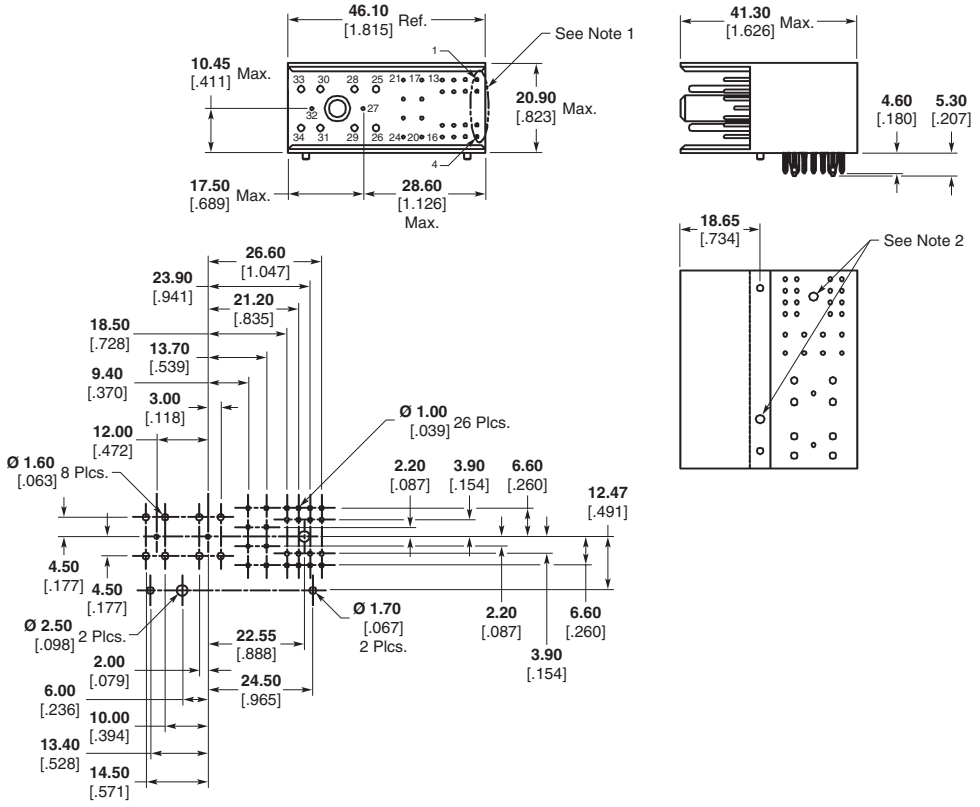
Signal Pins — Copper alloy

Power Contacts — High conductivity copper alloy, plated 0.00076 [.000030] min. gold in mating area per Tyco Electronics Specification 112-162-5, over 0.00130 [.000050] min. nickel per Tyco Electronics Specification 112-25-2

Solder Tails — 0.0030 - 0.0043 [.000120 - .000170] tin plated per lead free Tyco Electronics Specification 112-65-1, matt finish

Notes:
1. Mounting Holes (Ø 2.00 [.079] x 5.00 [.197] DP) for use with self tapping screw (customer supplied).
2. Positions 1–4 not populated and reserved for future use.

* RoHS Compliant



Printed Circuit Layout

Catalog 1773095
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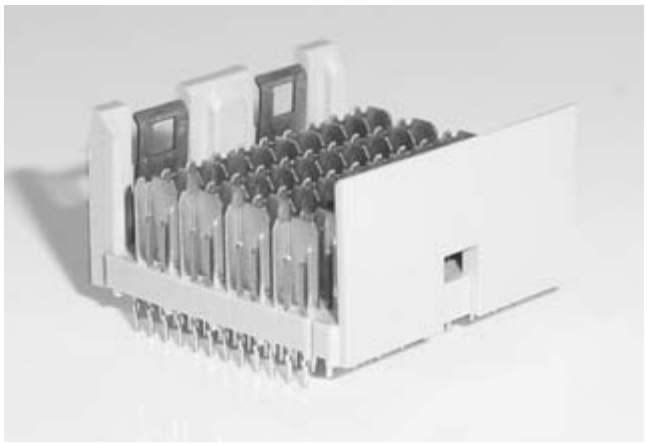
Z-PACK HM-Zd Connector (Continued)

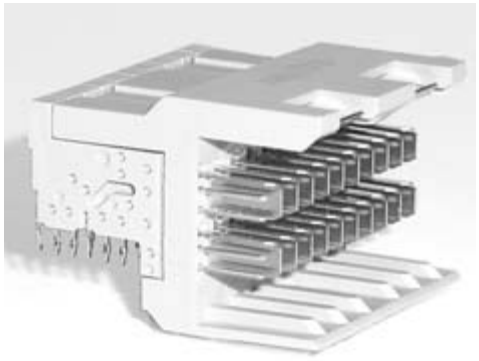
Vertical Pin Headers for Cable Assemblies

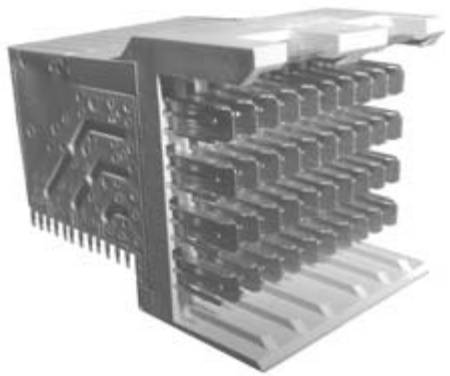


Pair Count	Part Number	Tail Length	Mating Pin Length	Column Count	Module Length	Signals	Grounds	Application Tooling[2]			
								Insertion	Repair		
								Pin Header	Pin Removal	Housing Removal	Pin Insertion
4	1469105-1[1]	**2.50** .098	**5.30** .209	10	**25.00** .984	80	40	91373-1	1583237-1	1725635-1	1583255-1
4	1469124-1[1]	**1.80** .071	**5.30** .209	10	**25.00** .984	80	40	91373-1	1583237-1	1725635-1	1583255-1
2	1469106-1[1]	**2.50** .098	**5.30** .209	10	**25.00** .984	40	20	91372-1	1583237-1	1804170-1	1583255-1
2	1469125-1[1]	**1.80** .071	**5.30** .209	10	**25.00** .984	40	20	91372-1	1583237-1	1804170-1	1583255-1

[1] With latch for cable assemblies.
[2] See page 43 for Instruction Sheet Number.
For PCB Layout, see pages 11-13.

Right Angle Pin Headers for Cable Assemblies





Pair Count	Part Number	Tail Length	Mating Pin Length	Column Count	Module Length	Signals	Grounds	Application Tooling[2]		
								Insertion	Repair	
								Pin Header	Housing Removal	Chiclet Removal
4	1469668-1	**2.20** .087	**5.30** .209	10	**25.00** .984	80	40	1804244-1	1804239-1	1804177-1
2	1469354-1[1]	**2.20** .087	**5.30** .209	10	**25.00** .984	40	20	1804178-1	1804172-1	1804175-1

[1] With latch for cable assemblies.
[2] See page 43 for Instruction Sheet Number.
For PCB Layout, see pages 14-16.

Catalog 1773095
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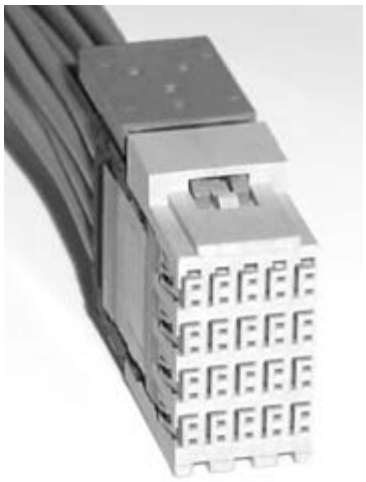
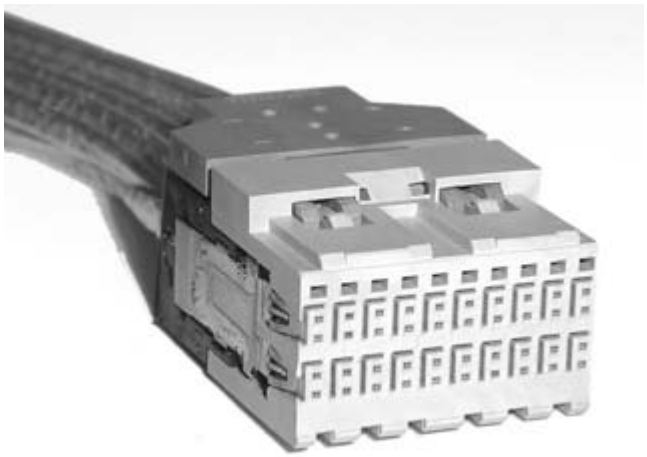
Z-PACK HM-Zd Connector (Continued)

4 Pair 5 Column and 4 Pair 10 Column Push-to-Release Cable Assemblies



Note: Design shown for reference only. Contact Tyco Electronics for other variations and configurations.

2 Pair 5 Column and 2 Pair 10 Column Push-to-Release Cable Assemblies



Note: Design shown for reference only. Contact Tyco Electronics for other variations and configurations.

4 Pair Cable Assemblies for Backplane Testing

Note: Design shown for reference only. Contact Tyco Electronics for other variations and configurations.

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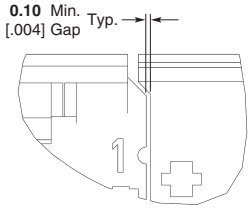
Z-PACK HM-Zd Connector (Continued)

Recommended Printed Circuit Board Layouts

Z-PACK HM-Zd Backplane and Z-PACK 2mm HM Connectors

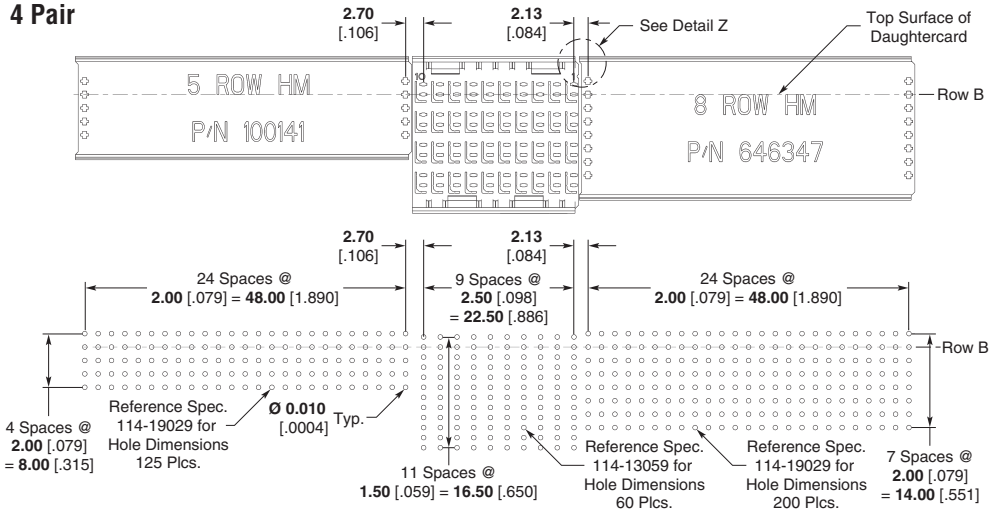


Detail Z

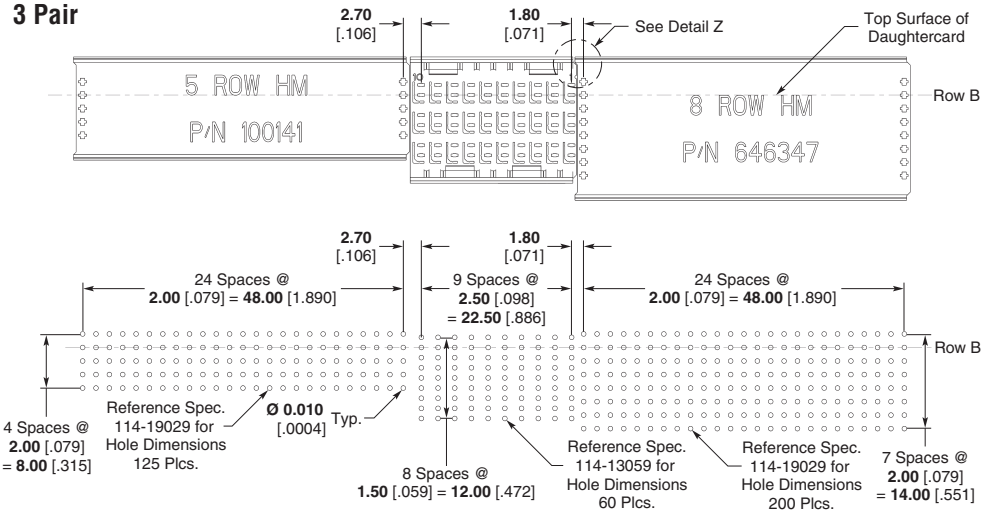
Note:

1. Dimensions shown represent minimum stacking dimensions allowable. Customer specific applications will dictate actual module spacing.

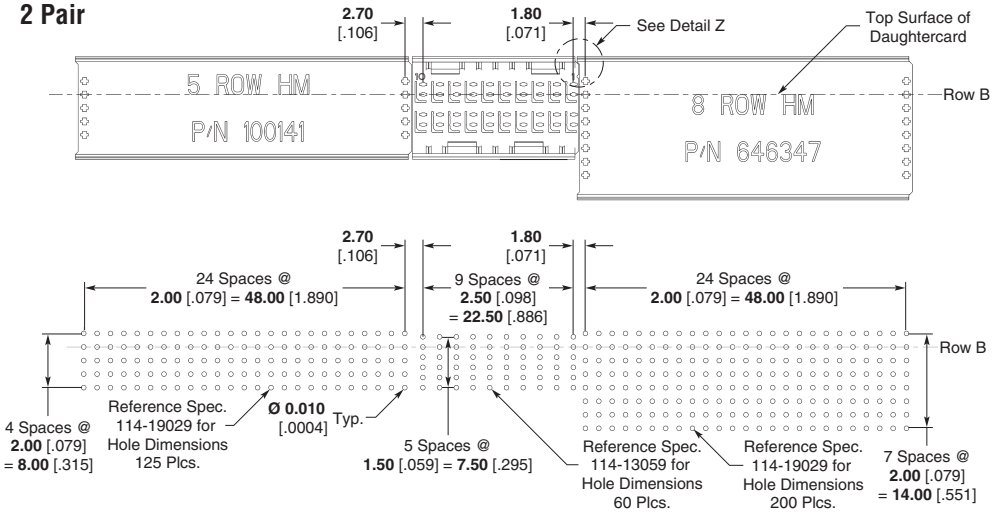
4 Pair



3 Pair



2 Pair



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Z-PACK HM-Zd Connector (Continued)

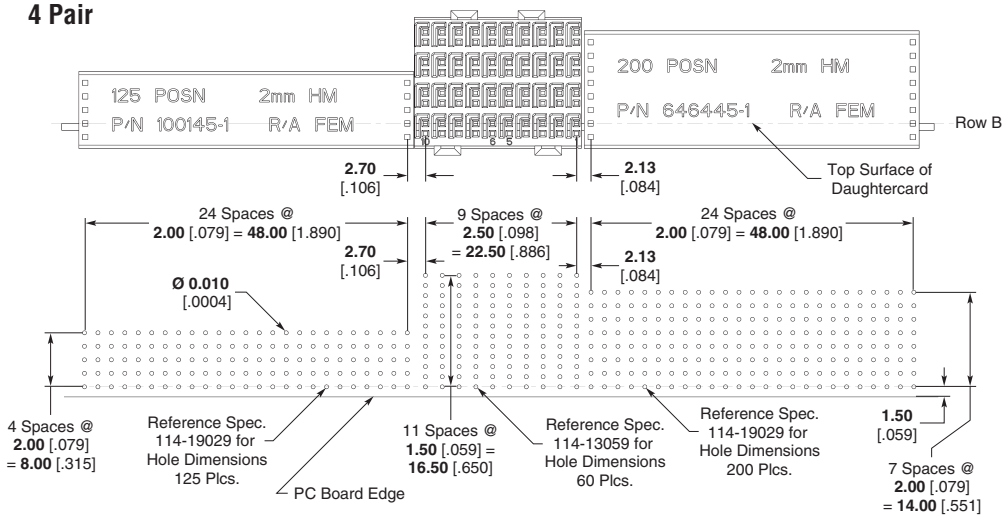
Recommended Printed Circuit Board Layouts
(Continued)

Z-PACK HM-Zd Daughtercard and Z-PACK 2mm HM Connectors

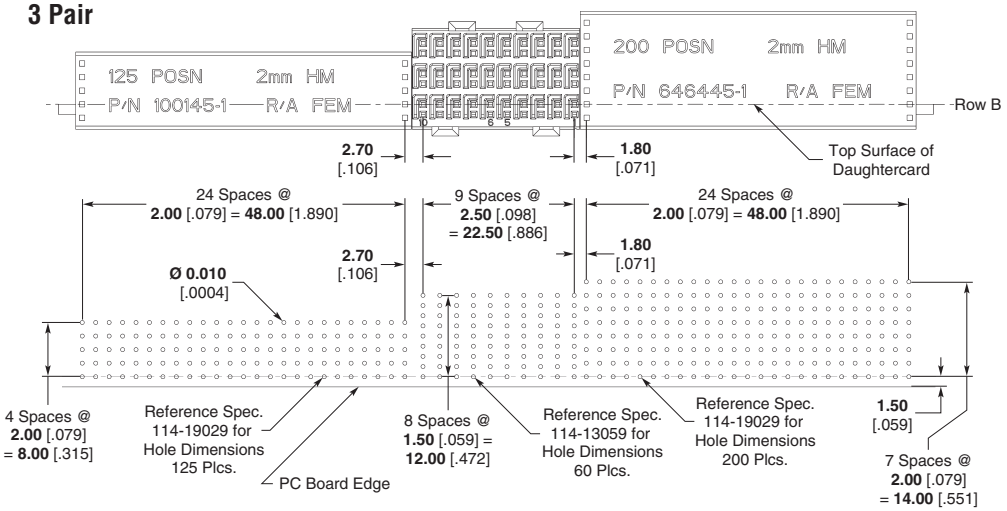
Note:

1. Dimensions shown represent minimum stacking dimensions allowable. Customer specific applications will dictate actual module spacing.

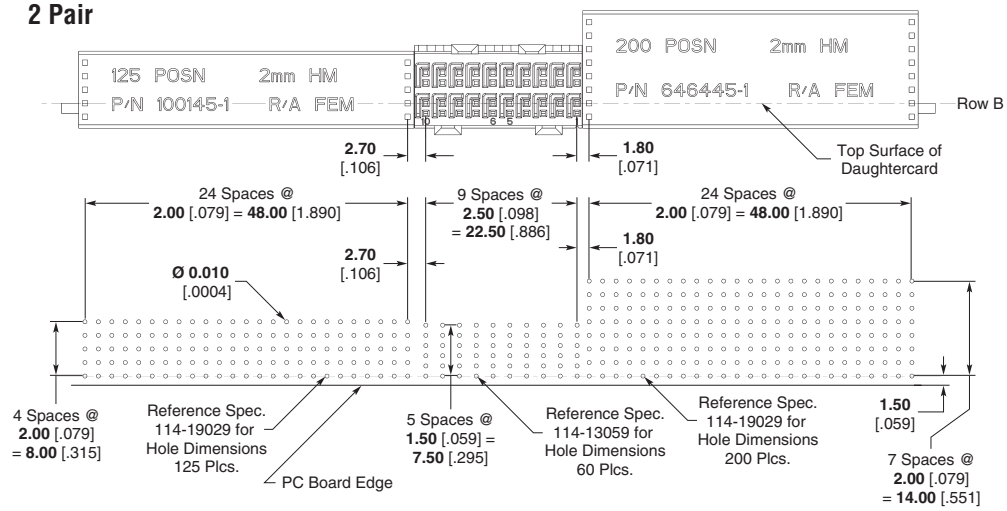
4 Pair



3 Pair



2 Pair



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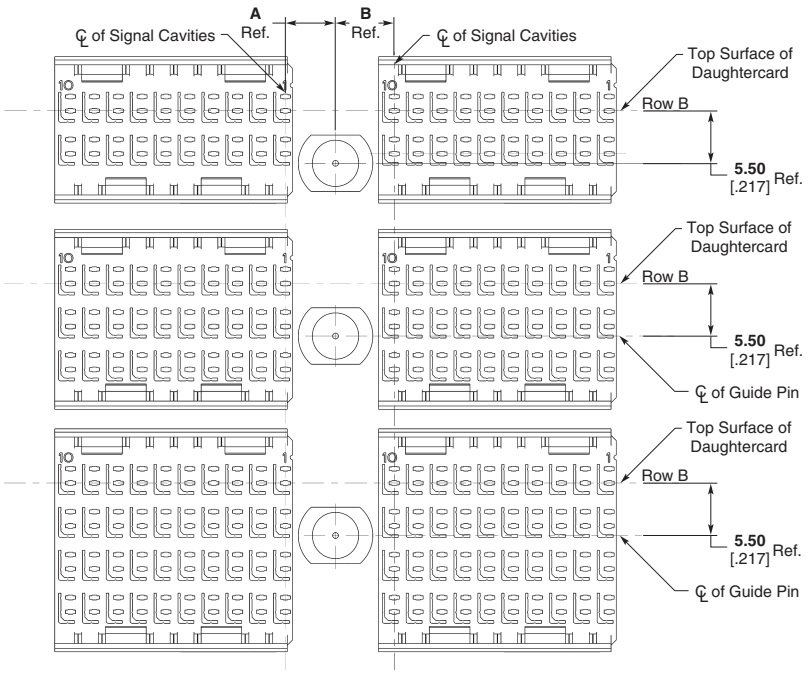
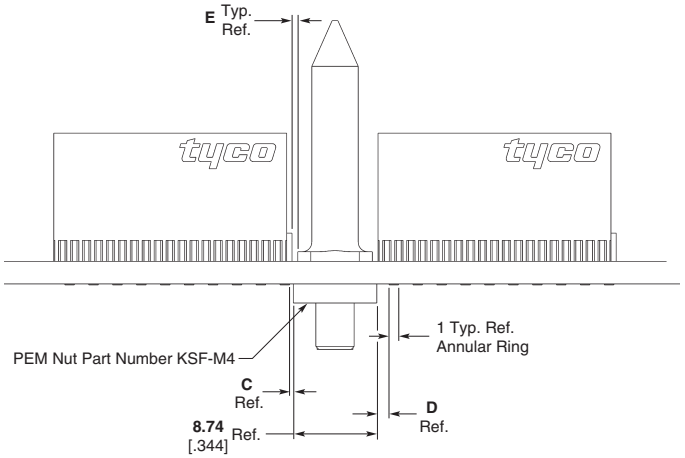
Z-PACK HM-Zd Connector (Continued)

Recommended Printed Circuit Board Layouts
(Continued)

Z-PACK HM-Zd Backplane Connector with Unkeyed Guide Pins





Note:

1. Dimensions shown represent minimum stacking dimensions allowable. Customer specific applications will dictate actual module spacing.

Dimension					Part Number
A	B	C	D	E	
5.25 .207	**6.15** .242	**0.40** .016	**1.30** .051	**0.60** .024	223956*
5.52 .217	**6.42** .253	**0.65** .026	**1.55** .061	**0.42** .017	223985

* RoHS Compliant.

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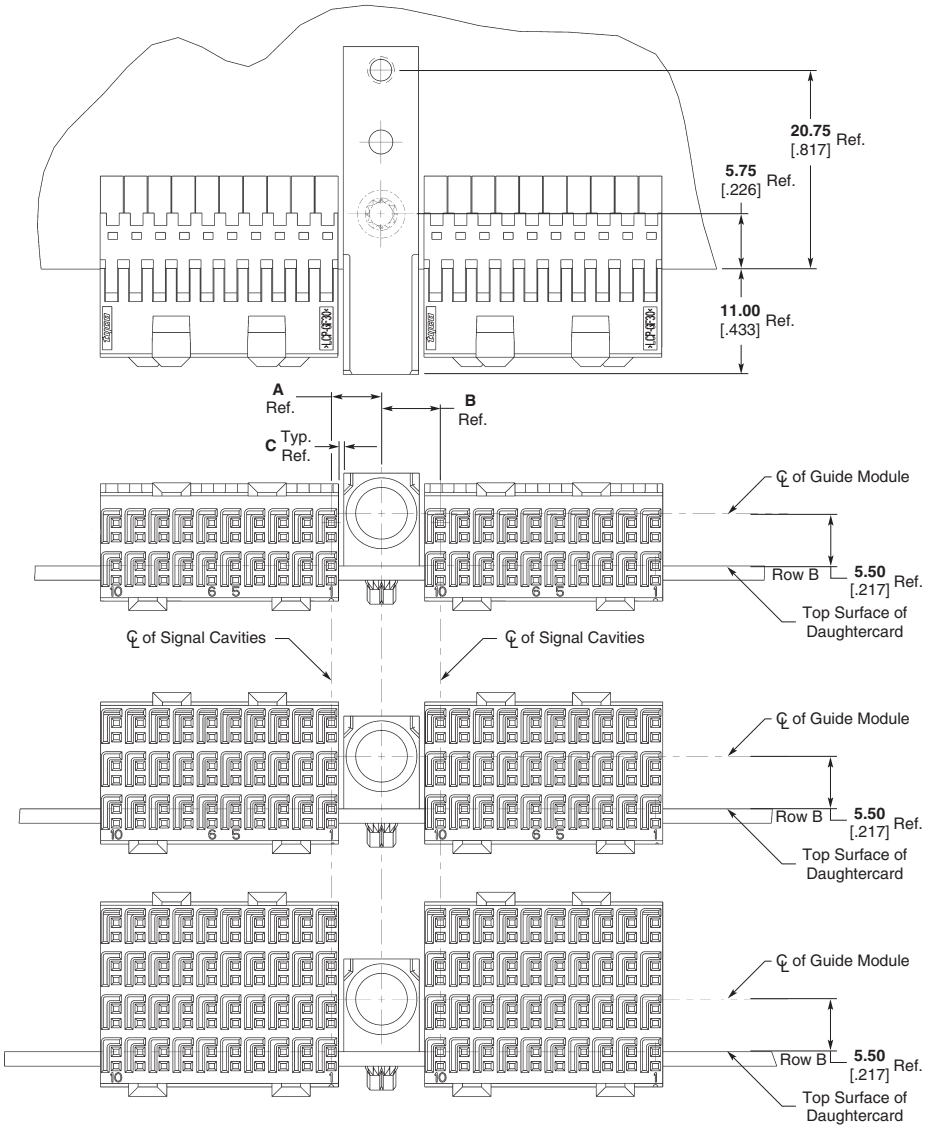
Z-PACK HM-Zd Connector (Continued)

Recommended Printed Circuit Board Layouts

(Continued)

Z-PACK HM-Zd Daughtercard Connector With Unkeyed Female Guide Modules



Note:

1. Dimensions shown represent minimum stacking dimensions allowable. Customer specific applications will dictate actual module spacing.

Dimension			Part Number
A	B	C	
5.25 .207	**6.15** .242	**0.56** .022	223957
5.52 .217	**6.42** .253	**0.83** .033	223986

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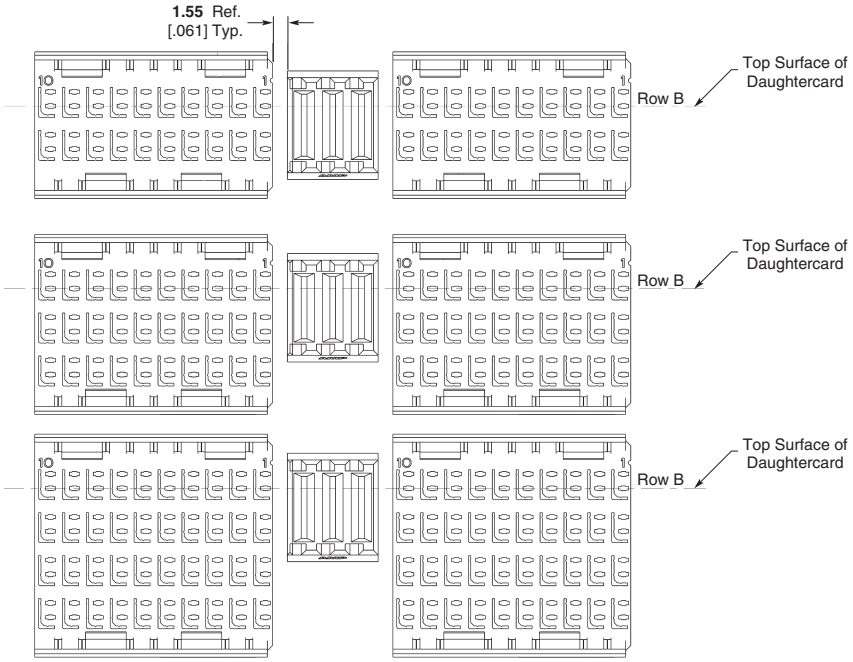
Z-PACK HM-Zd Connector (Continued)

Recommended Printed Circuit Board Layouts
(Continued)

Z-PACK HM-Zd Backplane Connector and Universal Power Modules



Note:

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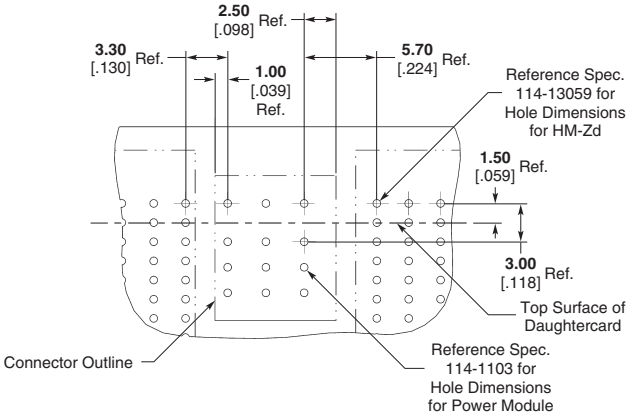

Recommended PC Board Layout
Component Side

Catalog 1773095
Issued 4-05

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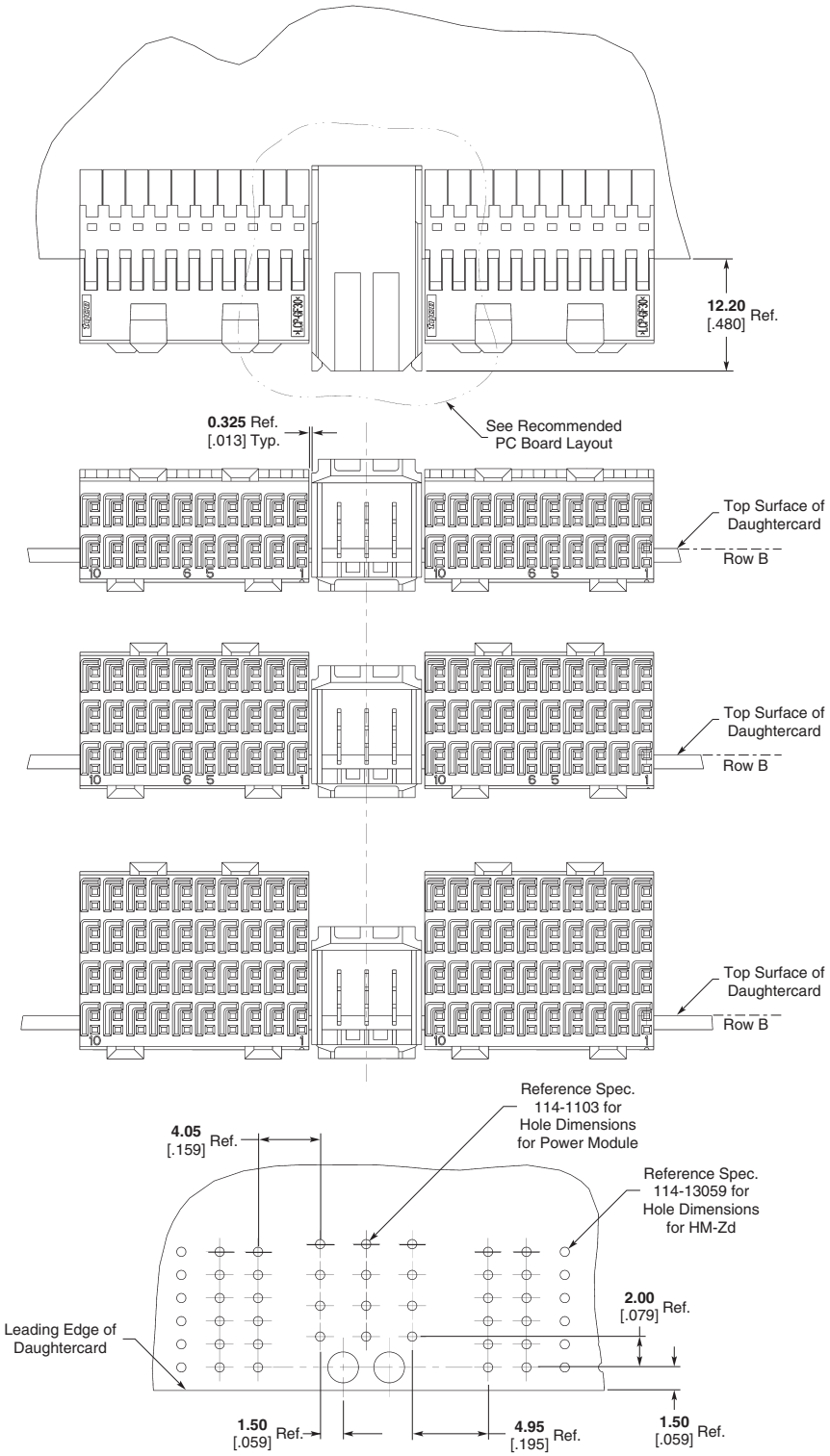
Z-PACK HM-Zd Connector (Continued)

Recommended Printed Circuit Board Layouts
(Continued)

Z-PACK HM-Zd Daughtercard Connector and Universal Power Modules

Note:

1. Dimensions shown represent minimum stacking dimensions allowable. Customer specific applications will dictate actual module spacing.



Recommended PC Board Layout
Component Side

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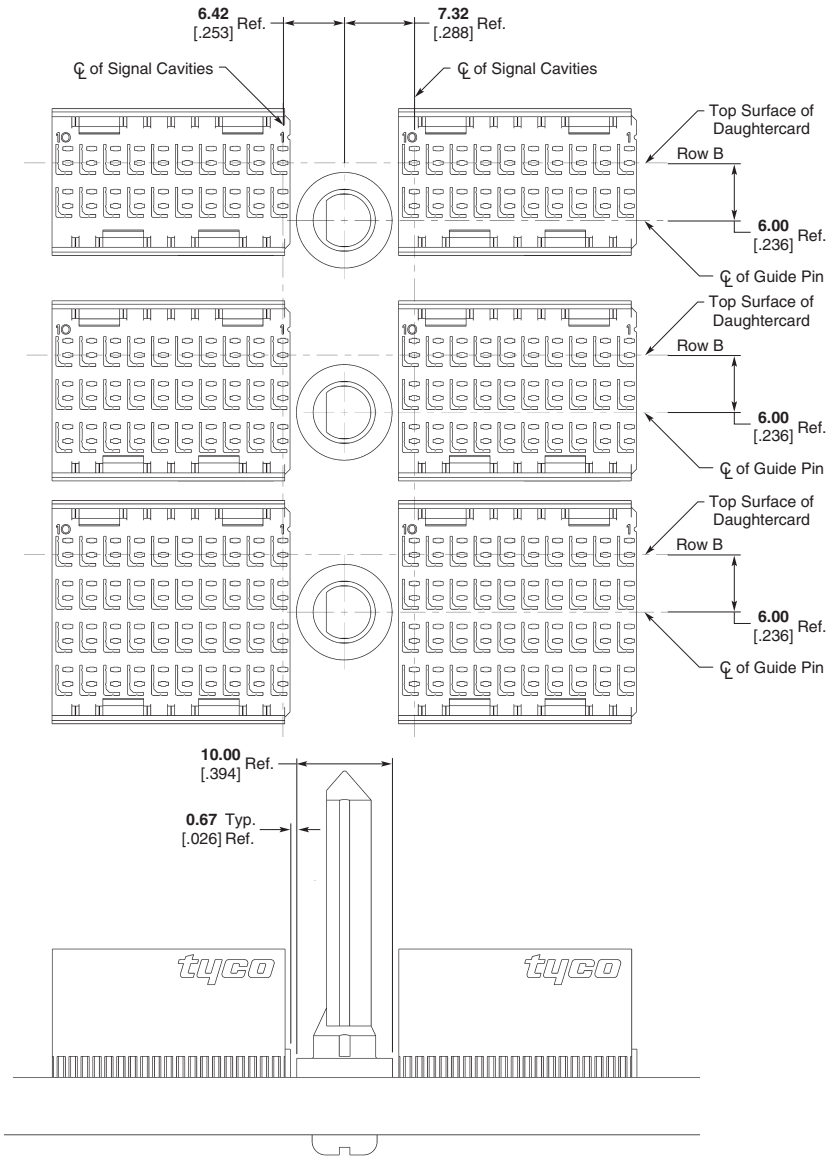
Z-PACK HM-Zd Connector (Continued)

Recommended Printed Circuit Board Layouts
(Continued)

Z-PACK HM-Zd Backplane Connector and MULTIGIG RT Connector Guide Modules



Note:

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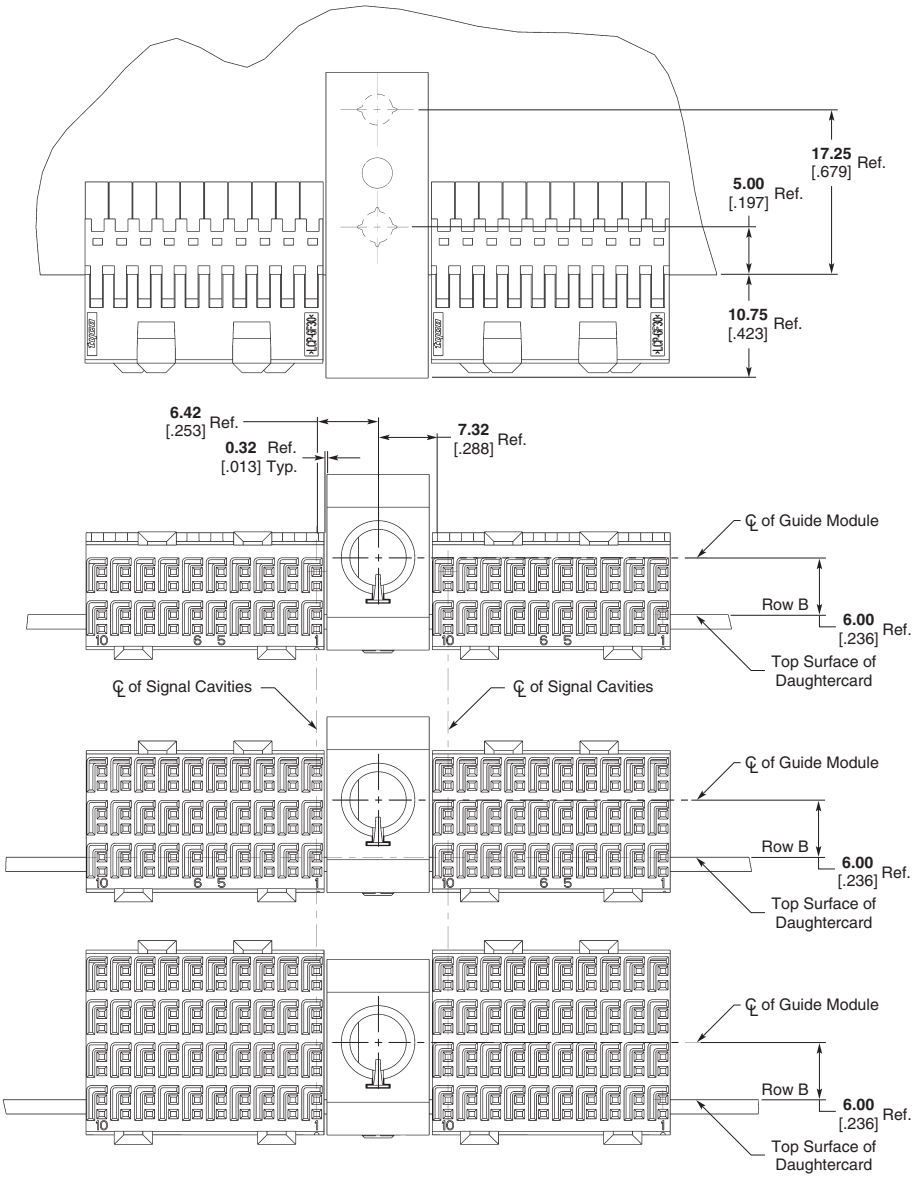
Z-PACK HM-Zd Connector (Continued)

Recommended Printed Circuit Board Layouts
(Continued)

Z-PACK HM-Zd Daughtercard Connector and MULTIGIG RT Connector Guide Modules



Note:

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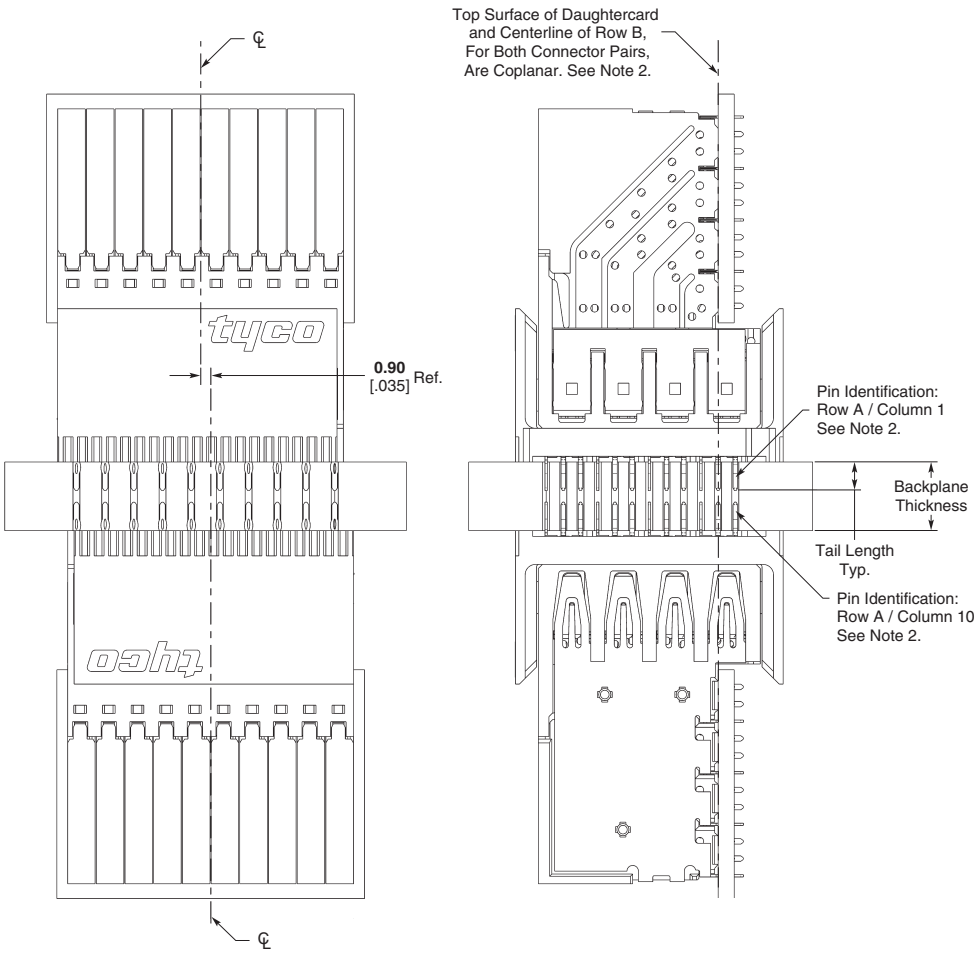
Z-PACK HM-Zd Connector (Continued)

Recommended Printed Circuit Board Layouts
(Continued)

Z-PACK HM-Zd Connector Recommended Mid-Plane Layout Option #1



Notes:

1. Minimum recommended backplane thicknesses calculated using maximum and minimum tolerances. No statistical methods were used.
2. Refer to the customer print for complete column and row designations.

Tail Length	Min. Recommended Backplane Thickness
1.80 .071	**4.00** .157
2.50 .098	**5.40** .213

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USA: 1-800-522-6752
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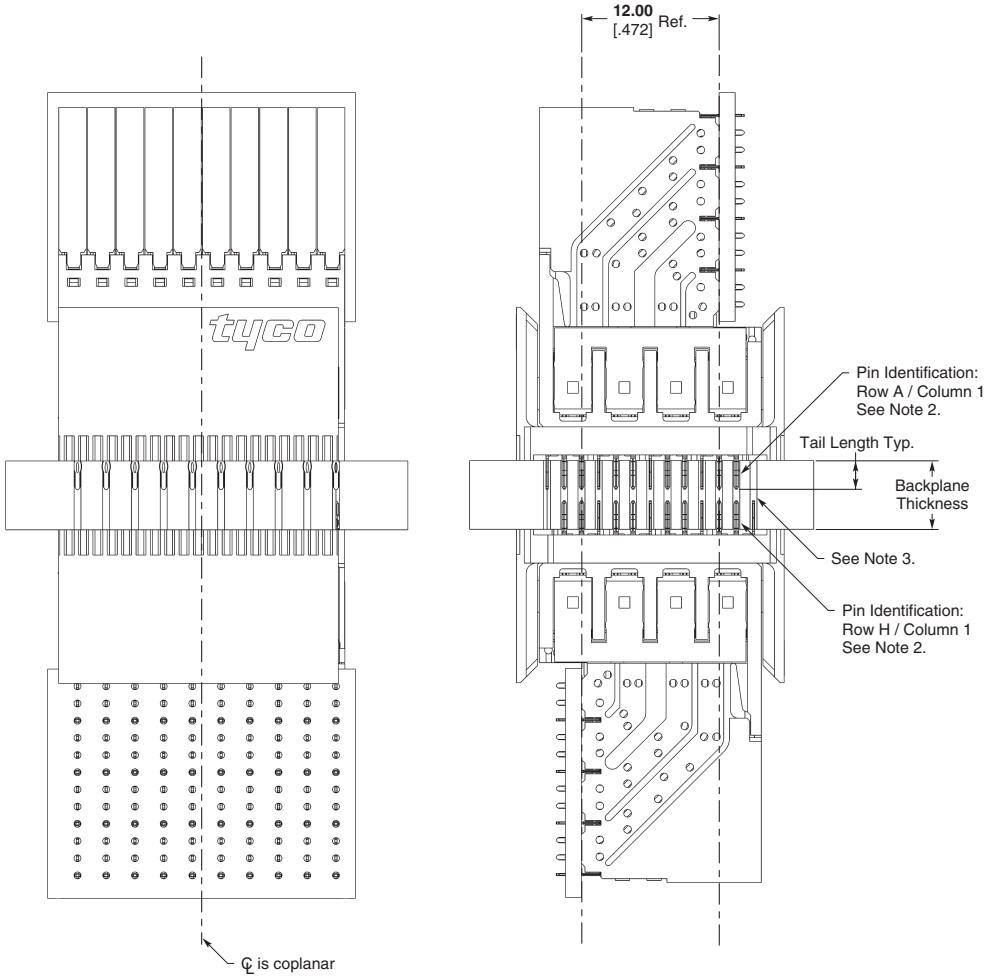
Mexico: 01-800-733-8926
C. America: 52-55-5-729-0425

South America: 55-11-3611-1514
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-141-810-8967

Z-PACK HM-Zd Connector (Continued)

Recommended Printed Circuit Board Layouts
(Continued)

Z-PACK HM-Zd Connector Recommended Mid-Plane Layout Option #2



Notes:

1. Minimum recommended backplane thicknesses calculated using maximum and minimum tolerances. No statistical methods were used.
2. Refer to the customer print for complete column and row designations.
3. **An additional row of holes must be drilled to accommodate this midplane application.**

Tail Length	Min. Recommended Backplane Thickness
1.80 .071	**4.00** .157
2.50 .098	**5.40** .213

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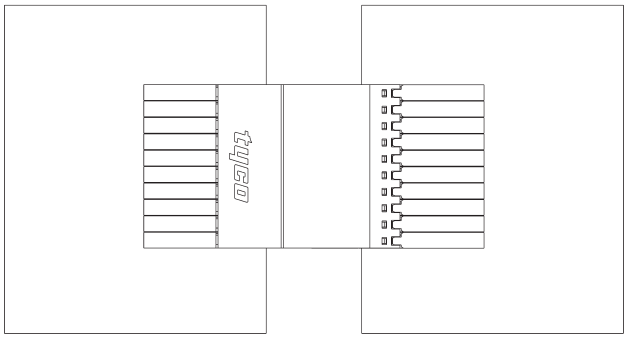
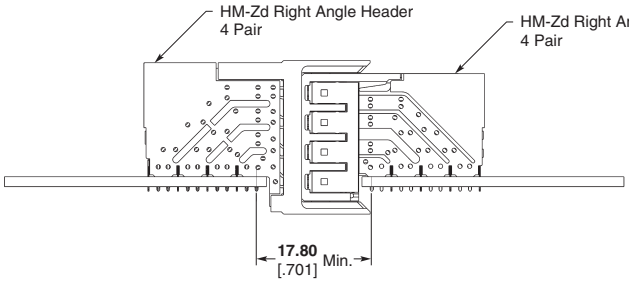
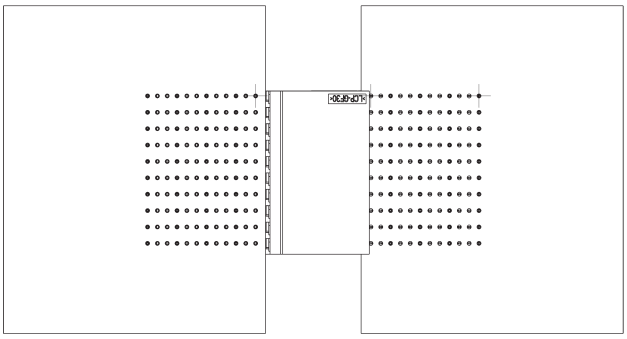
Z-PACK HM-Zd Connector (Continued)

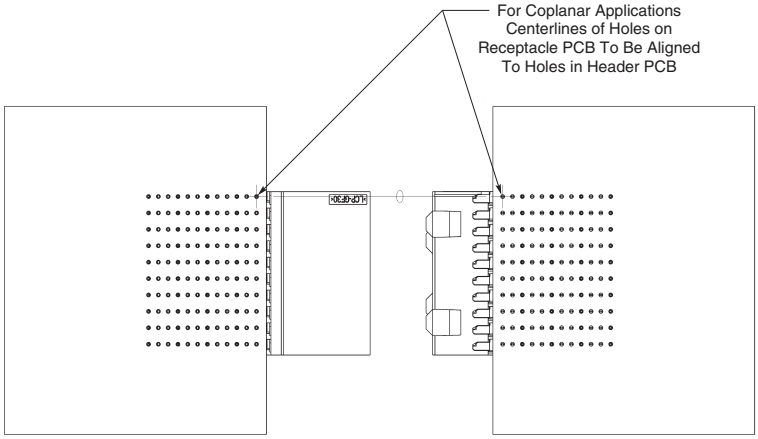
Recommended Printed Circuit Board Layouts
(Continued)

Z-PACK HM-Zd Connector Coplanar









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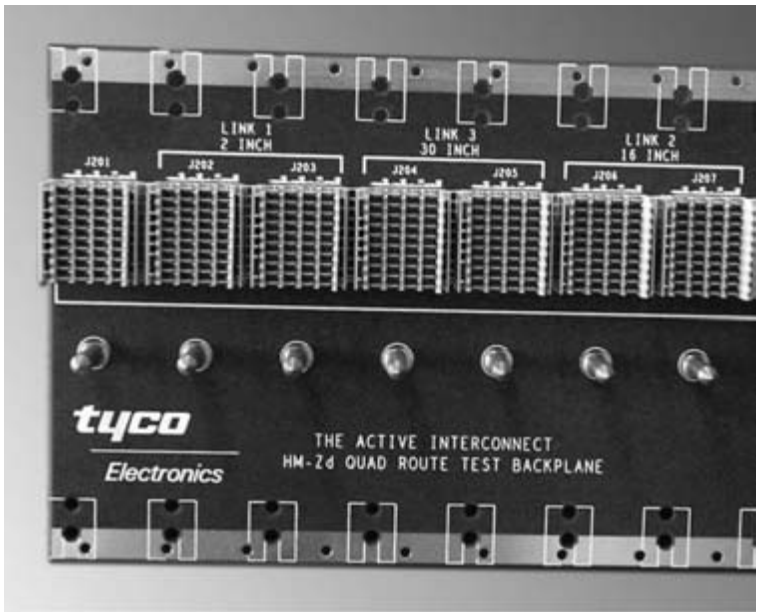
Z-PACK HM-Zd Connector (Continued)

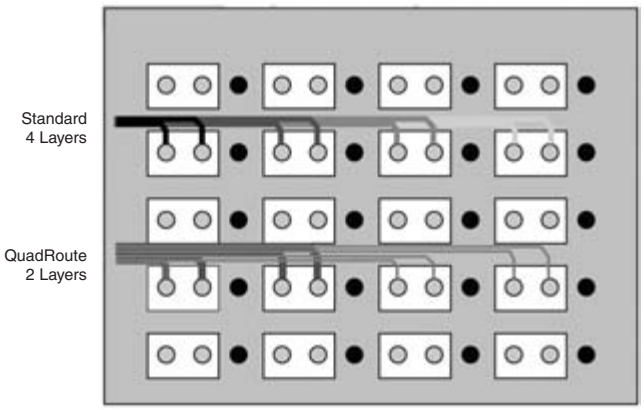
Z-PACK HM-Zd Connector Footprint and PC Board Trace Routing

- Accounts for system design requirements
- Footprint is optimized for low noise and ease of routing
- Footprint permits wide traces for long runs and without having to separate differential pairs
- Footprint supports quad routing techniques (see below)



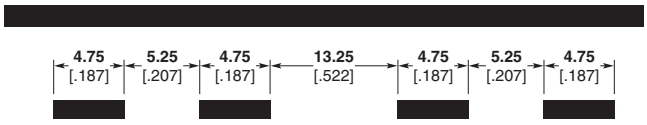
Benefits of Quad Routing

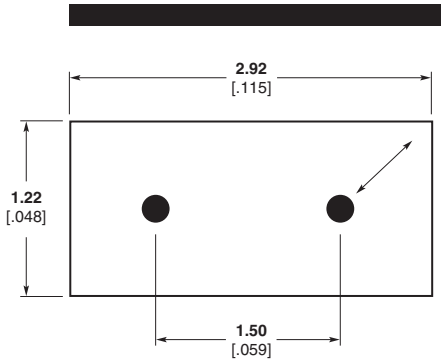
- Better Platform Characteristics
  - Performance variation due to layer connection is reduced
  - Crosstalk is reduced
  - Return loss is reduced
- Enables a lower cost solution
  - Cost of better materials is offset by reduced processing
  - Increased manufacturability—less layers and decreased aspect ratios
  - Decreased number of layers reduces the need for counterboring of PC boards



Notes Regarding Quad Routing:

1. Within pin field, center signal pairs between signal columns
2. Trace separation is increased over "standard" recommendations to further limit trace to trace crosstalk
3. Recommend Quad Routing pairs together that are propagating in the same direction





Notes Regarding Antipad Design:

1. An oval shaped antipad may be used to increase PC board manufacturability and to improve trace break-out
2. Antipad length shown is 2.92 [.114]. An antipad length up to 3.48 [.137] may be used.

For further details request Report # 20GC015-1 or visit
http://catalog.tycoelectronics.com/TE/GeneralInfo/footprint_optimization.pdf

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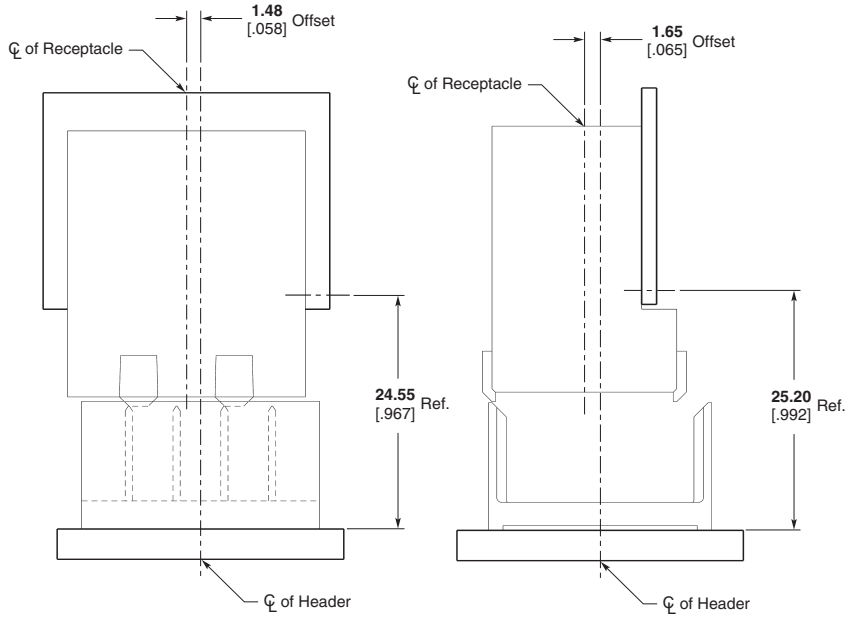
Z-PACK HM-Zd Connector (Continued)

Connector Housing Gathering Capabilities



Note: Dimensions are at nominal conditions. The offsets are to be applied to either side of the header center line.

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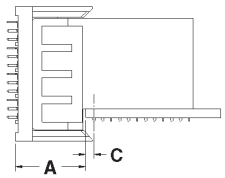
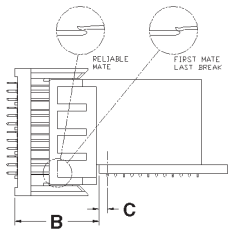
Z-PACK HM-Zd Connector (Continued)

Z-PACK HM-Zd Connector Mating Sequence Chart



Fully Mated



Reliable Mate

Product Family	Dim. C	Dim. A Fully Mated	Contact	Dim B. Reliable Mate	Dim B. First Mate Last Break	Fully Mated Wipe Length
HM-Zd	**1.50** .059	**12.50** .492	Ground Shield	**16.78** [.661]	**17.55** [.691]	**4.28** [.169]
			Signal Level 2	**15.41** [.607]	**15.85** [.624]	**2.91** [.115]
			Signal Level 1	**13.91** [.548]	**14.35** [.565]	**1.41** [.056]
HM-Zd Guide Hardware	**3.00** .118	**12.50** .492	24.0 mm Pin	**27.50** [1.083]	**33.40** [1.315]	N/A
			22.2 mm Pin	**25.70** [1.012]	**31.60** [1.244]	N/A
			Key Blocking Point	N/A	**22.03** [.867]	N/A
HM-2mm	**1.50** .059	**12.50** .492	Signal Level 3	**18.27** [.719]	**18.84** [.742]	**5.77** [.227]
			Signal Level 2	**16.77** [.660]	**17.34** [.683]	**4.27** [.168]
			Signal Level 1	**15.27** [.601]	**15.84** [.624]	**2.77** [.109]
MULTIGIG RT T1	**2.50** .098	**12.50** .492	Ground	**18.00** [.709]	—	**5.50** [.217]
			Signal Level 3	**18.00** [.709]	—	**5.50** [.217]
			Signal Level 2	**16.50** [.650]	—	**4.00** [.157]
			Signal Level 1	**15.00** [.591]	—	**2.50** [.098]
MULTIGIG RT T2	**2.25** .089	**12.50** .492	Ground	**18.00** [.709]	—	**5.50** [.217]
			Signal Level 3	**18.00** [.709]	—	**5.50** [.217]
			Signal Level 2	**16.50** [.650]	—	**4.00** [.157]
			Signal Level 1	**15.00** [.591]	—	**2.50** [.098]
MULTIGIG RT T3	**2.25** .089	**12.50** .492	Ground	**16.50** [.650]	—	**4.00** [.157]
			Signal Level 1	**15.00** [.591]	—	**2.50** [.098]
MULTIGIG RT Power Module	**5.50** .217	**12.50** .492	Power Level 3	**23.75** [.935]	—	**11.25** [.443]
			Power Level 2	**22.25** [.876]	—	**9.75** [.384]
			Power Level 1	**20.75** [.817]	—	**8.25** [.325]
MULTIGIG RT Guide Hardware	N/A	**12.50** .492	Guide Pin Key	**33.25** [1.309]	N/A	**20.75** [.817]
			Guide ESD Contact	**30.75** [1.211]	—	**18.25** [.719]
HS-3	**1.50** .059	**12.50** .492	Ground	**17.08** [.672]	**17.60** [.693]	**4.78** [.188]
			Signal Level 2	**16.05** [.632]	**16.47** [.648]	**3.75** [.148]
			Signal Level 1	**14.55** [.573]	**14.97** [.589]	**2.25** [.089]
UPM	**3.50** .138	**12.50** .492	Power Level 3	**20.25** [.797]	**20.95** [.825]	**8.10** [.319]
			Power Level 2	**18.65** [.734]	**19.35** [.762]	**6.50** [.256]
			Power Level 1	**17.03** [.670]	**17.73** [.698]	**4.88** [.192]
UPM Guide Hardware	**5.75** .226	**12.50** .492	Guide Pin Key	**31.39** [1.236]	**36.16** [1.424]	N/A
			Keyed Guide Pin	**31.39** [1.236]	**36.16** [1.424]	N/A
			Keyed Guide Pin	**35.23** [1.387]	**40.00** [1.575]	N/A
MULTI-BEAM XL Right Angle Header to Vertical Receptacle	**5.08** .200	**14.73** .580	PreMate Power — Level 1	—	**16.84** [.663]	**5.61** [.221] Min.
			PostMate Power — Level 2	—	**17.81** [.701]	**4.34** [.171] Min.
			PreMate Signal — Level 2	—	**18.26** [.719]	**3.81** [.150] Min.
			PostMate Signal — Level 3	—	**19.53** [.769]	**2.54** [.100] Min.
MULTI-BEAM XL Right Angle Receptacle to Vertical Header	**3.81** .150	**13.21** .520	PreMate Power — Level 1	—	**15.32** [.603]	**5.61** [.221] Min.
			PostMate Power — Level 2	—	**16.28** [.641]	**4.34** [.171] Min.
			PreMate Signal — Level 2	—	**16.74** [.659]	**3.81** [.150] Min.
			PostMate Signal — Level 3	—	**18.01** [.709]	**2.54** [.100] Min.

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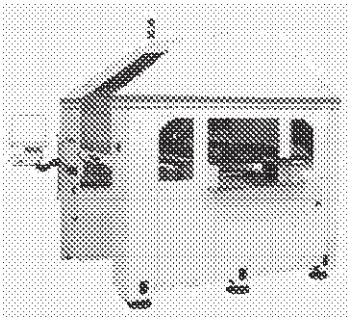
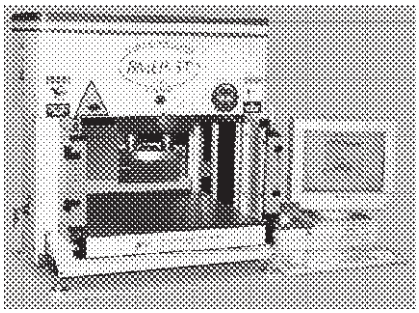
Z-PACK HM-Zd Connector (Continued)

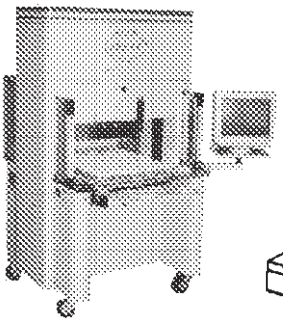
Z-PACK HM-Zd Connector Application Tooling and Equipment



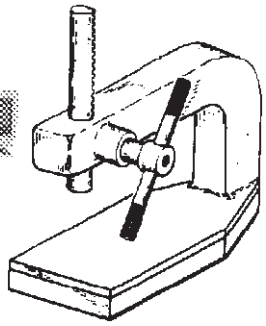
1585280-1 Model AP3



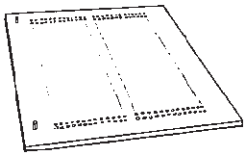
1585696-1 Model BMEP 5T



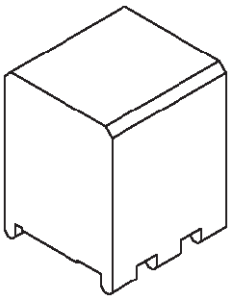
1585699-1 Model MEP 6T



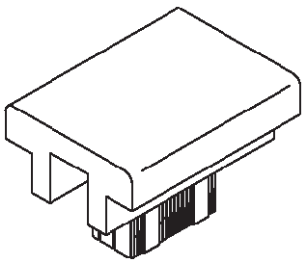
Typical Manual Arbor Frame Assembly (Commercially Available)



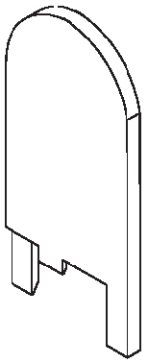
Typical PC Board Support (Customer Supplied)



Typical Receptacle Seating Tool IS 408-8500

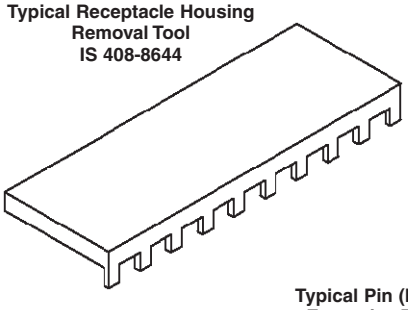


Typical Pin Header Seating Tool IS 408-8501

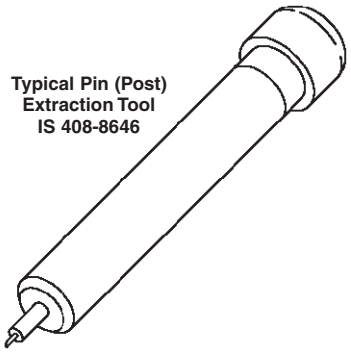


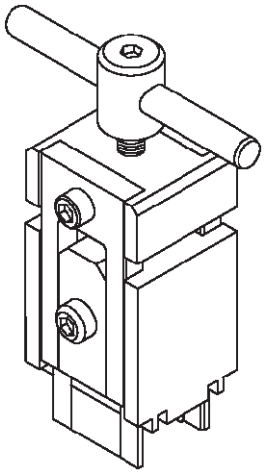
Typical Chiclet Removal Tool IS 408-8647

Typical Receptacle Housing Removal Tool IS 408-8644



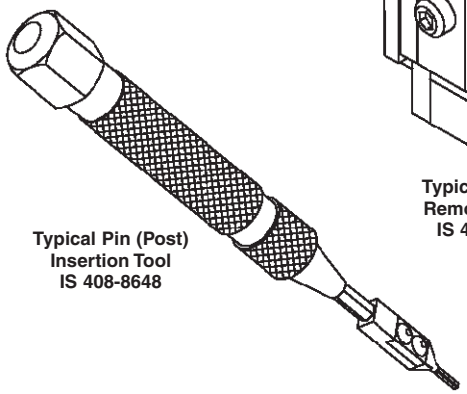
Typical Pin (Post) Extraction Tool IS 408-8646





Typical Header Removal Tools IS 408-8645

Typical Pin (Post) Insertion Tool IS 408-8648



Note: Typical power units from Tyco Electronics Automation Group include, but are not limited to those shown on this page.

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Z-PACK HM-Zd Connector (Continued)

Z-PACK HM-Zd Connector Application Tooling and Equipment (Continued)

Type	Description	Instruction Sheet	Part Number
Board to Board Insertion Tooling	Seating Tool, Receptacle, 4 Pair, 10 Column	408-8500	91347-1
	Seating Tool, Receptacle, 4 Pair, 15 Column	408-8500	91347-2
	Seating Tool, Receptacle, 4 Pair, 12 Column	408-8500	91347-3
	Seating Tool, Receptacle, 4 Pair, 20 Column	408-8500	91347-4
	Seating Tool, Receptacle, 3 Pair	408-8500	91376-1
	Seating Tool, Receptacle, 2 Pair, 10 Column	408-8500	91350-1
	Seating Tool, Receptacle, 2 Pair, 20 Column	408-8500	91350-2
	Seating Tool, Header, 4 Pair, 10 Column	408-8501	91349-1
	Seating Tool, Header, 4 Pair, 15 Column	408-8501	91349-2
	Seating Tool, Header, 4 Pair, 12 Column	408-8501	91349-3
	Seating Tool, Header, 4 Pair, 20 Column	408-8501	91349-4
	Seating Tool, Header, 3 Pair	408-8501	91375-1
	Seating Tool, Header, 2 Pair, 10 Column	408-8501	91348-1
	Seating Tool, Header, 2 Pair, 20 Column	408-8501	91348-4
	Seating Tool, Right Angle Header, 4 Pair, 10 Column	408-8810	91378-1
	Seating Tool, Right Angle Header, 4 Pair, 12 Column	408-8810	91378-3
	Seating Tool, Right Angle Header, 3 Pair	Note 1	1804179-1
	Seating Tool, Right Angle Header, 2 Pair	Note 1	91377-1
Board to Board Repair Tooling	Receptacle Housing Removal Tool, 4, 3, 2 Pair, 10 Column	408-8644	1583224-1
	Receptacle Housing Removal Tool, 4, 3, 2 Pair, 12 Column	408-8644	1583224-2
	Receptacle Housing Removal Tool, 4, 3, 2 Pair, 15 Column	408-8644	1583224-3
	Receptacle Housing Removal Tool, 4, 3, 2 Pair, 20 Column	408-8644	1583224-4
	Housing Removal Tool, Vertical Header, 4 Pair	408-8645	1583220-1
	Housing Removal Tool, Vertical Pin Header, 3 Pair	408-8645	1725634-1
	Housing Removal Tool, Vertical Header, 2 Pair	408-8645	1583234-1
	Extraction Tool, Individual Pin, Header, 4, 3, 2 Pair	408-8646	1583237-1
	Chiclet Removal Tool, Receptacle, 4 Pair	408-8647	1583248-1
	Chiclet Removal Tool, Receptacle, 3 Pair	408-8867	1673952-1
	Chiclet Removal Tool, Receptacle, 2 Pair	408-8647	1583249-1
	Insertion Tool, Individual Pin, Header, 4, 3, 2 Pair	408-8648	1583255-1
	Housing Removal Tool, Right Angle Header, 4 Pair	Note 1	1804174-1
	Housing Removal Tool, Right Angle Header, 3 Pair	Note 1	1804173-1
	Housing Removal Tool, Right Angle Header, 2 Pair	Note 1	1804171-1
	Chiclet Removal Tool, Right Angle Header, 4 Pair	Note 1	1804177-1
	Chiclet Removal Tool, Right Angle Header, 3 Pair	Note 1	1804176-1
	Chiclet Removal Tool, Right Angle Header, 2 Pair	Note 1	1804175-1
Cable to Board Insertion Tooling	Seating Tool, Vertical Cable Header, 4 Pair	408-8785	91373-1
	Seating Tool, Vertical Cable Header, 2 Pair	408-8785	91372-1
	Seating Tool, Right Angle Cable Header, 4 Pair	Note 1	1804244-1
	Seating Tool, Right Angle Cable Header, 2 Pair	408-8785	1804178-1
Cable to Board Repair Tooling	Housing Removal Tool, Vertical Header, 4 Pair	408-8645	1725635-1
	Housing Removal Tool, Vertical Header, 2 Pair	Note 1	1804170-1
	Housing Removal Tool, Right Angle Header, 4 Pair	Note 1	1804239-1
	Housing Removal Tool, Right Angle Header, 2 Pair	Note 1	1804172-1
	Chiclet Removal Tool, Right Angle Header, 4 Pair	Note 1	1804177-1
	Chiclet Removal Tool, Right Angle Header, 2 Pair	Note 1	1804175-1

Note: 1. Contact Tyco Electronics for Instruction Sheet.

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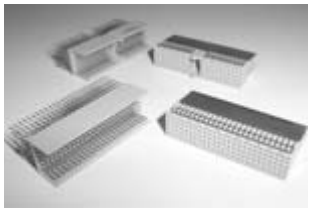
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-5-729-0425

South America: 55-11-3611-1514
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-141-810-8967

Z-PACK HM-Zd Connector (Continued)

Compatible 2mm HM Products

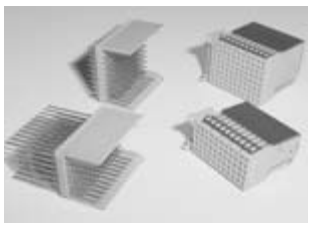


Z-PACK 2mm HM Type A & B Connector Modules

- Offered with five rows of signal contacts and two rows of ground contacts
- Type A offers center guiding and keying facility and 110 signal contacts
- Type B has 125 signal contacts
- Upper ground return shields are pre-fitted to receptacles and used with the 5+2 row male connectors
- Up to three levels of sequenced pins available on vertical pin headers
- Both types are end stackable without change in contact pitch

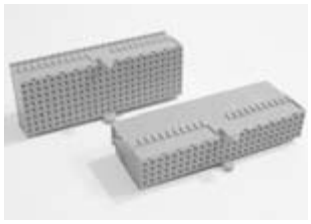
Z-PACK 2mm HM Type D & E Connector Modules

- Offered with 8 rows of signal contacts and two rows of ground contacts
- Type D offers center guiding and keying facility and 176 signal contacts
- Type E has 200 signal contacts
- Upper ground return shields are pre-fitted to receptacles and used with 8+2 row male connectors
- Up to three levels of sequenced pins available on vertical pin headers
- Both types are end stackable without change in contact pitch



Z-PACK 2mm HM Type F & C Connector Modules

- Half size modules which are intended for use at the end of a column
- Type C has 55 signal pins and guidance features
- Type F has 88 signal pins and guidance features
- Upper ground return shields are pre fitted to receptacles and used with 5+2 and 8+2 row connectors
- Three levels of sequenced pins available on vertical pin headers
- Both types are end stackable without change in contact pitch

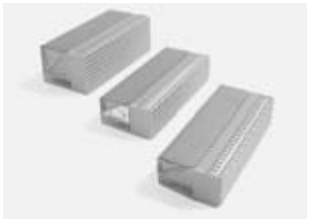


Type AB/ DE Modules

- Offers maximum signal density and alignment features of standard Type A & D modules
- Type AB offers 125 signal contacts and guiding and keying features
- Type DE offers 200 signal contacts and guiding and keying features
- Offers all the advantages of sequenced pins, pre-shielded receptacles and end stackable

Type L M & N Connectors

- DIN contacts can be fitted to types L, M and N style housings either in power or coax options
- 5 row and 5+2 row connector options
- Type L accommodates up to 6 DIN contacts
- Type M connectors are loaded with 55 signal contacts in row A to E and 3 cavities for DIN style contacts
- Type N accommodates up to 3 DIN contacts

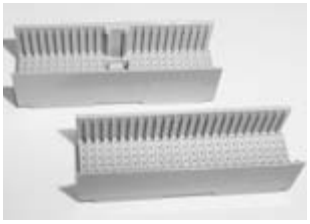


Receptacles with Upper and Lower Ground Return Shields

- Mates with 5+2 and 8+2 row male product to improve signal integrity
- Three levels of performance
  a) reduced cross talk
  b) ground return shields
  c) reduced cross talk and ground return shields

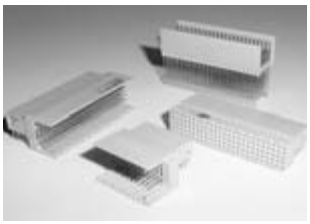
Z-PACK 2mm HM Connector Coding Keys

- Used in Type A, D, L and M male and female connectors
- Polarized features and used in the multi-purpose center of the male and female housings
- Keys are inserted in the mating faces of the housings
- Available in up to 70 different options



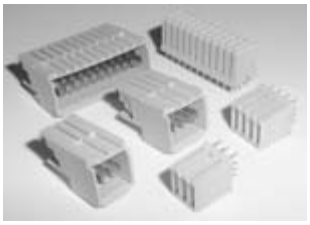
Shrouds

- Offered in type A, B, A/B, C, D, E, D/E, and F
- Product is offered in various standoff heights to accommodate a wide variety of pcb thicknesses



Right Angle Male Offering

- 5 row connector offering Type A, B & C style product mate with respective right angle product for card extender applications
- Type A has 110 signal contacts and center guidance and keying facility
- Type B offered in 25, 22 & 19 column offerings
- Type C has 55 signal contacts and guidance features
- Available in standard and reduced cross talk varieties



Universal Power Module

- Offered in 3 to 12 position sizes
- Inverse sex configuration offers a vertical receptacle for backplane applications
- Polarized vertical press fit leads
- Up to 15 amperes per contact with a durability rating of 250 mating cycles

Vertical Receptacles

- 5 & 8 row product offering
- Used with either vertical or right angle males in application
- Type A & D offers center keying and guidance
- Type B & E offers 25 columns of signal contacts
- Type C & F is a half size module with guidance features

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