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**Z-PACK HS3 Connector**

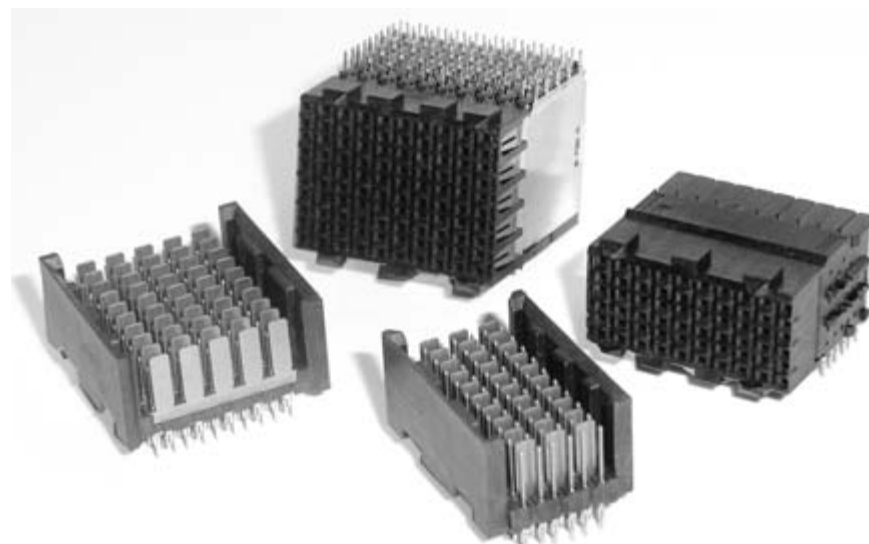
**Product Line Overview**

**Product Facts**

- High speed, high density two piece board-to-board backplane connector
- Dual beam provides redundant contact for improved reliability
- For data rates of 6.2+ Gb/s
- 10 row, 100 high speed lines per 25.00 [.984]
- 6 row, 60 high speed lines per 25.00 [.984]
- Controlled impedance: 50 ohm Single Ended 100 ohm Differential
- Feedthrough versions for midplane applications
- 250 mating cycles
- End stackable on 2.50 [.098] centerline, signal pin to signal pin
- Advanced ESD/Power (10 Amps) using optional guide pins and power contacts

**Applications**

- High Speed Telecommunications Equipment
- Mid-range and high-end services
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476



The emergence of high speed serial backplanes has forced interconnections to be able to transfer data at gigabit speeds.

The Z-PACK HS3 connector system has been specifically designed to support this generation of high speed serial data transfer. Tyco Electronics has incorporated a controlled impedance microstrip path through the connector to minimize signal degradation and

crosstalk. Compliant pins are used on both daughter-card and backplane.

This connector family is press fit and is compatible with other Z-PACK HM family connectors on the same board edge. Z-PACK HS3 connectors support data rates of 6.2+ Gb/s per differential pair. The 6 row version is optimized for 20.32mm or 0.8 inch card centerline applications, while the 10 row version is

optimized for high density for 25.4mm or 1.0 inch card centerline applications.

The Tyco Electronics Universal Power Module (UPM) is designed to be compatible with the Z-PACK HS3 connector.

Static Discharge Guide/Power Pins, Guide Pin/Power Receptacles, Universal Guide Pin and Receptacles, and Coding Keys (10 row only) are also available.

**Availability**

- Fully validated SPICE models:** E-mail requests to [modeling@tycoelectronics.com](mailto:modeling@tycoelectronics.com)
- Samples:** go to <http://tycoelectronics.custhelp.com>
- Pro/E models and IGES models:** E-mail requests to [TycCAD@tycoelectronics.com](mailto:TycCAD@tycoelectronics.com)
- White Papers:** available on product website at <http://hs3.tycoelectronics.com>
- Electrical Performance Report:** <http://hs3.tycoelectronics.com>  
6 row EPR #1308505; 10 row EPR #1308506
- Routing Guide:** <http://hs3.tycoelectronics.com>  
Routing Guide #20GC004-1

<http://hs3.tycoelectronics.com>

**Technical Documents**

- Product Specification**  
108-1957
- Application Specification**  
114-13020
- Qualification Test Report**  
501-501

**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** — Copper Alloy
- Housing** — Glass filled polyester, 94V-0 rated

**Ratings**

- Current** — 1.15A per fully energized
  - Operating Voltage** — 250 VAC max.
  - Temperature** — -65°C to 105°C
  - Mating Force** — 0.75N max. per contact (signal = 1 contact, ground = 1 contact)
  - Durability** — 250 cycles
- \* Reference Product Spec. 108-1957 for complete list of performance data.

**Z-PACK HS3 Connector (Continued)**

**Performance Specifications**

**Electrical Characteristics**

**Characteristic Impedance** —  
100 ± 10% Ohms

**Nominal Resistance** — 21 mOhm

**Crosstalk** — See table at right

**Insertion Loss** — See chart below

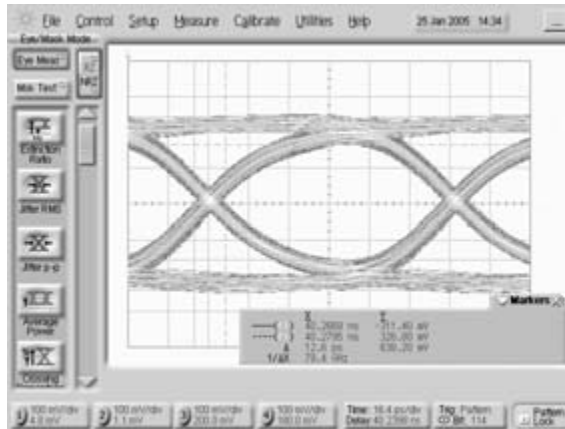
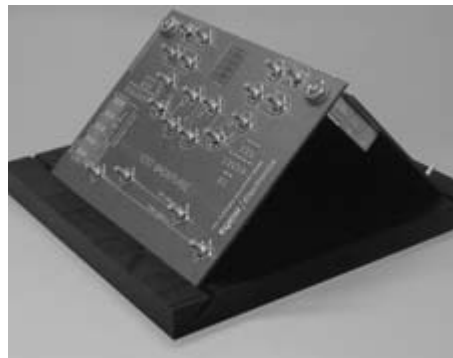
**Asynchronous Diff. NEXT (%)**

Edge rate 20-80%	HS3 10-Row Measured Noise Totals			
	50 ps	100 ps	150 ps	250 ps
BC Pair Total NEXT	2.3%	1.9%	1.7%	1.3%
DE Pair Total NEXT	4.0%	3.3%	3.0%	2.4%
FG Pair Total NEXT	4.0%	3.4%	3.1%	2.7%
HJ Pair Total NEXT	2.3%	1.9%	1.7%	1.5%

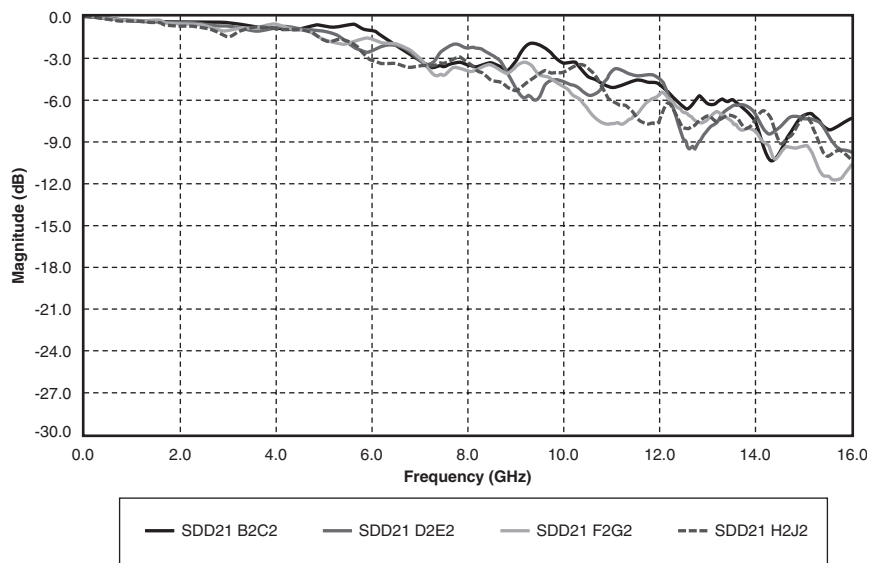
**Synchronous Diff. NEXT (%)**

Edge rate 20-80%	HS3 10-Row Measured Noise Totals			
	50 ps	100 ps	150 ps	250 ps
BC Pair Total FEXT	0.5%	0.3%	0.3%	0.2%
DE Pair Total FEXT	1.5%	0.8%	0.5%	0.5%
FG Pair Total FEXT	1.4%	0.8%	0.7%	0.5%
HJ Pair Total FEXT	1.0%	0.6%	0.4%	0.3%

Edge rates specified are at the connector.  
Noise includes 1.60 [.063] footprints on both sides of the connector.  
Totals include contributions from 8 adjacent aggressor pairs.



**PRBS 2<sup>7</sup>-1 data pattern**  
**10 Gb/s data rate**  
**BC Pair**  
**64% Eye Opening**  
**12.6ps Jitter**



Calibrated to include only the connector and the 1.60 [.063] footprints on both sides of the connector.

**Z-PACK HS3 Connector (Continued)**

**Z-PACK HS3 Connector:  
Printed Circuit Design Rules  
for Backplane Routing**

**Using Standard  
Commercial Design Rules**

This table lists routing specifications which meet design rules practiced by most printed circuit board vendors. This table should be used to route the Z-PACK HS3 connector for most applications and especially under one or more of these considerations:

1. Edge rates require the widest conductors possible.
2. Backplanes having layer counts above 16.
3. Backplanes which exceed 508mm (20") in length or width.
4. Cost is a major factor.

**Using Advanced  
Design Rules**

This table lists routing specifications which can be built by a limited number of leading edge printed circuit vendors using advanced design rules. This table can be used as a reference for Z-PACK HS3 connector in backplane applications where very high density is a major factor. The PCB vendor should be consulted regarding applicability of these rules to a specific design. Consideration should be given to the following:

1. Signal layer count reduction is possible with these design rules.
2. Backplanes which exceed 508mm (20") in length or width generally cannot be built with these rules.
3. Cost factors can potentially be higher.

**Z-PACK HS3 Connector  
Routing Pattern**

For more details request  
Report #20GC004-1  
or visit  
[http://www.tycoelectronics.com/  
products/simulation/files/  
papers/20GC004\\_1.pdf](http://www.tycoelectronics.com/products/simulation/files/papers/20GC004_1.pdf)

Finished Hole Dia.	Drilled Hole Dia.	Pad Dia.	Annular Ring	Pad-Pad Spacing 63 mils (1.58mm) C/C	Conductor Routing Options	
					5 mil spacing	6 mil spacing
24 mils 0.6mm	28 mils 0.7mm	44 mils 1.1mm	2 mils 0.05mm	19 mils 0.475mm	9 mils 0.225mm	7 mils 0.175mm
24 mils 0.6mm	28 mils 0.7mm	42 mils 1.05mm	1 mil 0.025mm	21 mils 0.525mm	11 mils 0.275mm	9 mils 0.225mm
24 mils 0.6mm	28 mils 0.7mm	40 mils 1.0mm	tangency tangency	23 mils 0.575mm	13 mils 0.325mm	11 mils 0.275mm

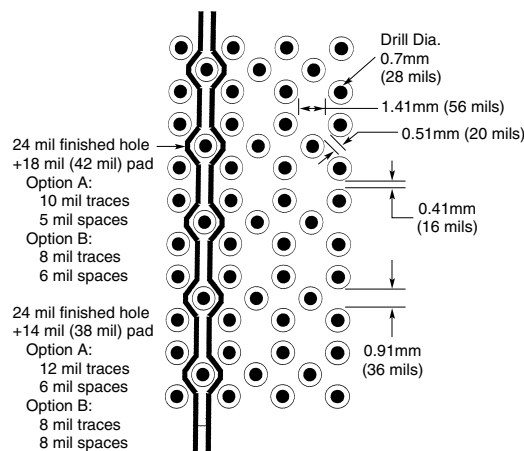
**Commercial Design Rules:**

Minimum pad diameter for tangency: Drill Diameter (D)+12 mils (0.3mm)  
Hole location tolerance: +/- 3 mils (0.075mm)  
Pad/Pad artwork tolerance: +/- 2 mils (0.05mm)  
Feature tolerance (1 oz foil): +/- 0.075 mils (0.0175mm)

Finished Hole Dia.	Drilled Hole Dia.	Pad Dia.	Annular Ring	Pad-Pad Spacing 63 mil (1.58mm) C/C	Conductor Routing Options	
					5 mil spacing	6 mil spacing
24 mils 0.6mm	28 mils 0.7mm	38 mils 0.95mm	tangency tangency	25 mils 0.625mm	15 mils 0.35mm	13 mils 0.3mm
<b>Two Conductor Routing</b>						
24 mils 0.6mm	28 mils 0.7mm	42 mils 1.05mm	2 mils 0.05mm	21 mils 0.525mm	4.5 mil lines/4 mil spacing 0.11mm lines/0.09mm spacing	
24 mils 0.6mm	28 mils 0.7mm	40 mils 1.0mm	1 mil 0.025mm	23 mils 0.575mm	5.5 mil lines/4 mil spacing 0.125mm lines/0.1mm spacing	

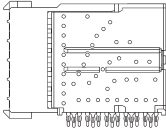
**Advanced Design Rules:**

Minimum pad diameter for tangency: Drill Diameter (D)+10 mils (0.25mm)  
Hole location tolerance: +/- 2 mils (0.05mm)  
Pad/Pad artwork tolerance: +/- 2 mils (0.05mm)  
Feature tolerance (1 oz foil): +/- 0.075 mils (0.0175mm)

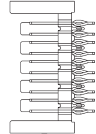


**Z-PACK HS3 Connector (Continued)**

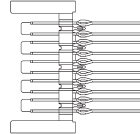
**Part Number Selection Chart  
10 Row Z-PACK HS3 Connector**



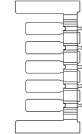
**Part Number 120874**  
50 Position  
Right Receptacle  
Univ Pwr Guide Pin



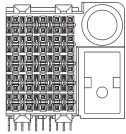
**Part Number 120670**  
50 Position  
Right Header  
Univ Pwr Guide Pin



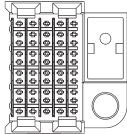
**Part Number 120665**  
50 Position  
Right Feed-Through  
ESD/HDI Guide Pin



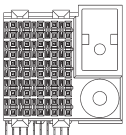
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50 Position  
Right Shroud  
ESD/HDI Guide Pin



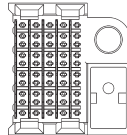
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Right Receptacle  
ESD/HDI Guide Pin



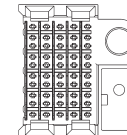
**Part Number 120661**  
50 Position  
Right Header  
ESD/HDI Guide Pin



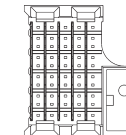
**Part Number 120790**  
100 Position  
Center Receptacle



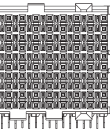
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100 Position  
Center Header



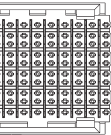
**Part Number 120664**  
100 Position  
Center Feed-Through



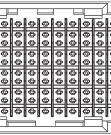
**Part Number 120663**  
100 Position  
Center Shroud



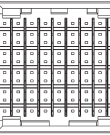
**Part Number 120791**  
50 Position  
Center Receptacle



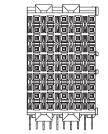
**Part Number 120747**  
50 Position  
Center Header



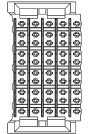
**Part Number 120748**  
50 Position  
Center Feed-Through



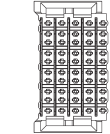
**Part Number 120750**  
50 Position  
Center Shroud



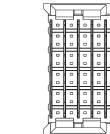
**Part Number 120793**  
50 Position  
Left Receptacle  
ESD/HDI Guide Pin



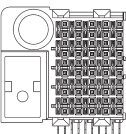
**Part Number 120662**  
50 Position  
Left Header  
ESD/HDI Guide Pin



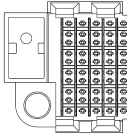
**Part Number 120666**  
50 Position  
Left Feed-Through  
ESD/HDI Guide Pin



**Part Number 120668**  
50 Position  
Left Shroud  
ESD/HDI Guide Pin



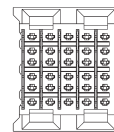
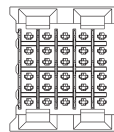
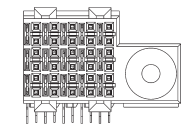
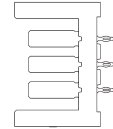
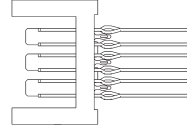
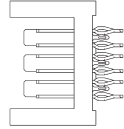
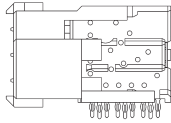
**Part Number 120875**  
50 Position  
Left Receptacle  
Univ Pwr Guide Pin



**Part Number 120672**  
50 Position  
Left Header  
Univ Pwr Guide Pin

2  
Z-PACK HS3 Connector

**Part Number Selection Chart**  
**6 Row Z-PACK HS3 Connector**

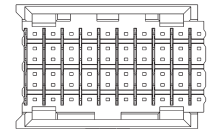
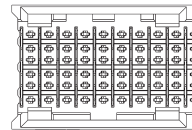
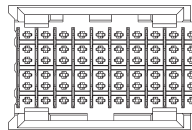
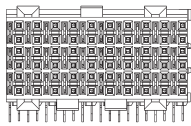


**Part Number 120788**  
**30 Position**  
**Right Receptacle**

**Part Number 120677**  
**30 Position**  
**Right Header**

**Part Number 120680**  
**30 Position**  
**Right Header**  
**Feed-Through**

**Part Number 120683**  
**30 Position**  
**Right Shroud**

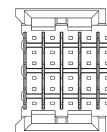
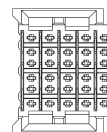
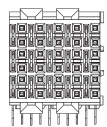


**Part Number 120786**  
**60 Position**  
**Center Receptacle**

**Part Number 120674**  
**60 Position**  
**Center Header**

**Part Number 120679**  
**60 Position**  
**Center Header**  
**Feed-Through**

**Part Number 120682**  
**60 Position**  
**Center Shroud**

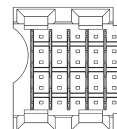
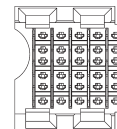
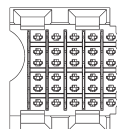
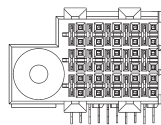


**Part Number 120787**  
**30 Position**  
**Center Receptacle**

**Part Number 120732**  
**30 Position**  
**Center Header**

**Part Number 120742**  
**30 Position**  
**Center Header**  
**Feed-Through**

**Part Number 120743**  
**30 Position**  
**Center Shroud**



**Part Number 120789**  
**30 Position**  
**Left Receptacle**

**Part Number 120678**  
**30 Position**  
**Left Header**

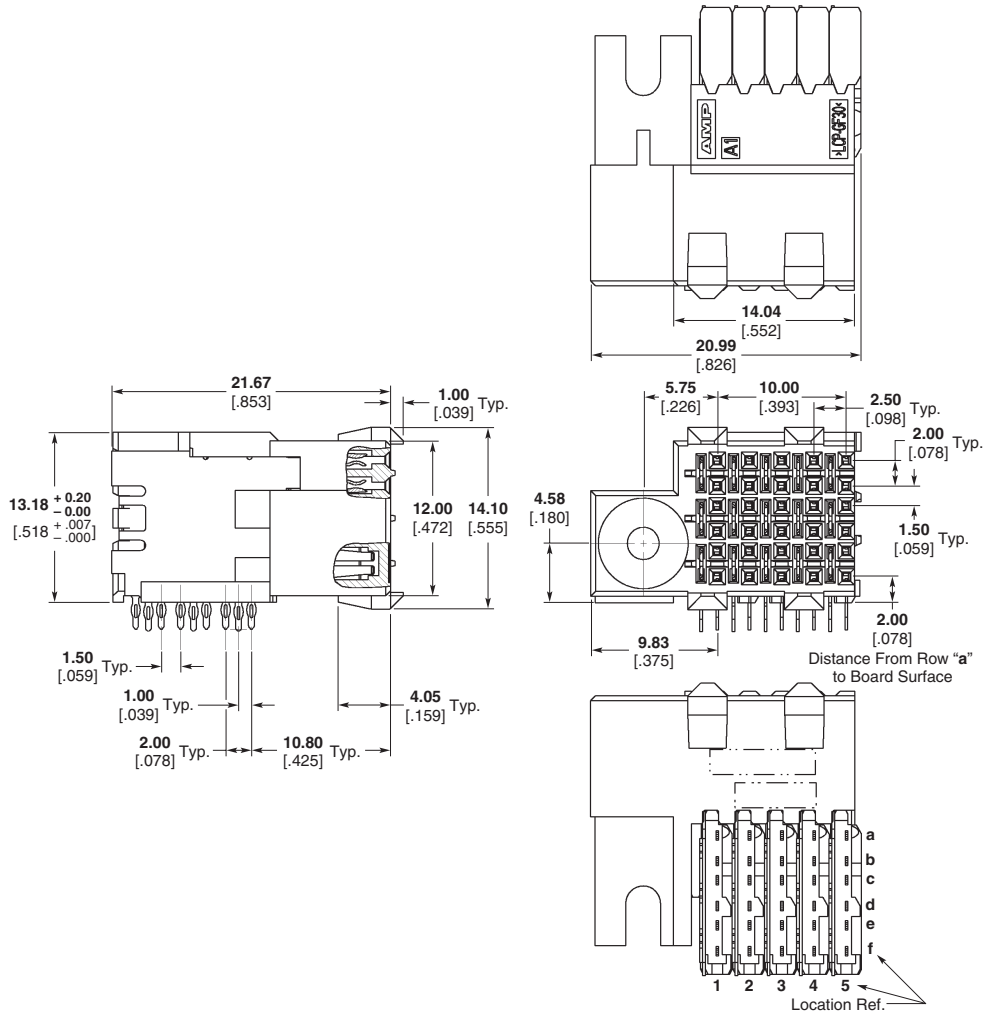
**Part Number 120681**  
**30 Position**  
**Left Header**  
**Feed-Through**

**Part Number 120684**  
**30 Position**  
**Left Shroud**

**Right Angle Receptacle  
6 Row, Left Module  
(accepts ESD Guide Pin)**

**Z-PACK HS3 Connector (Continued)**

2  
Z-PACK HS3 Connector



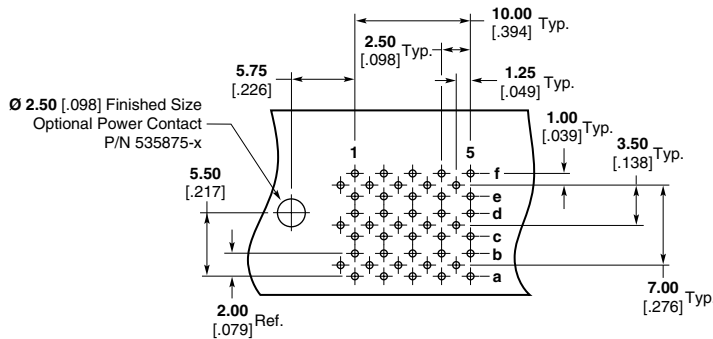
**Pin Header Assemblies**

Number of Positions	Part Number	Application Tooling					
		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
30	120789-1	1338742-1	408-8394	1338744-1	408-8393	1338745-1	408-8410

**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.

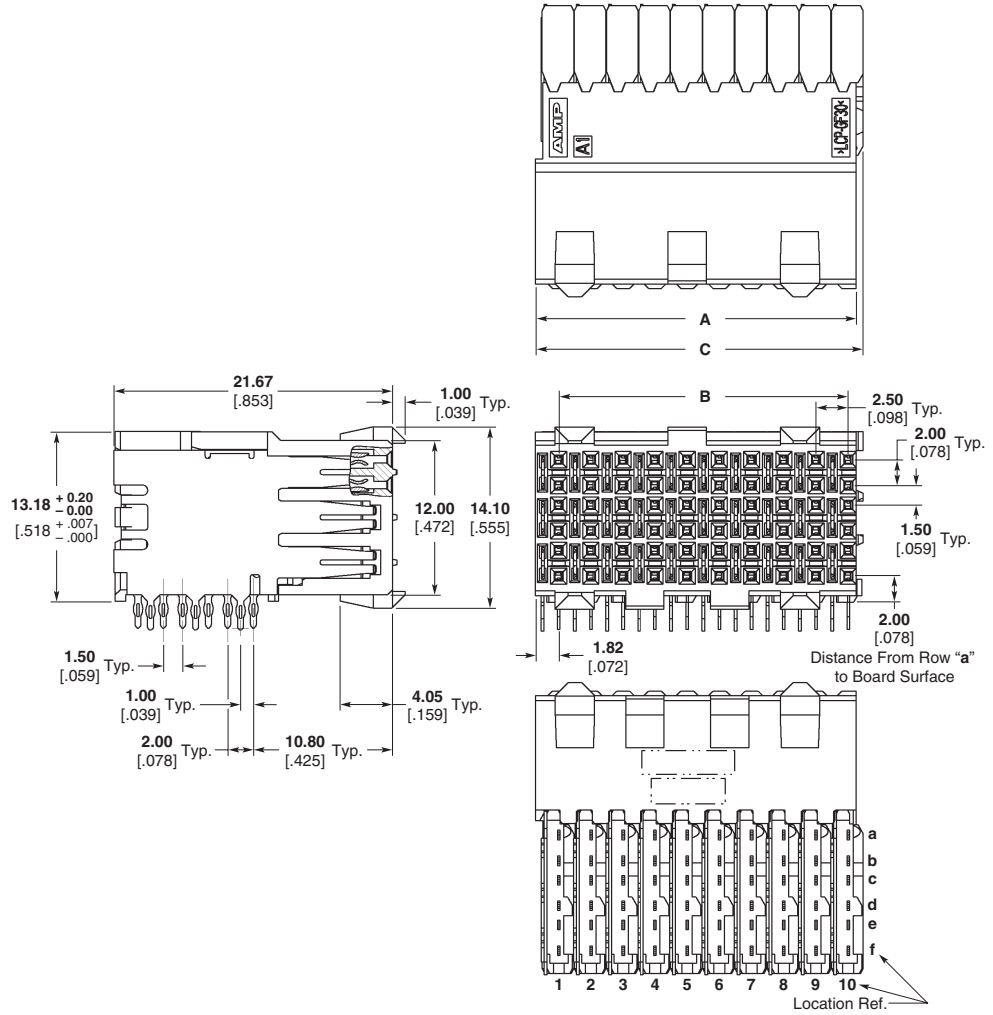


**Recommended PC Board Layout  
(Component Side Shown)**



**Z-PACK HS3 Connector (Continued)**

**Right Angle Receptacle  
(Continued)  
6 Row, Center Module**



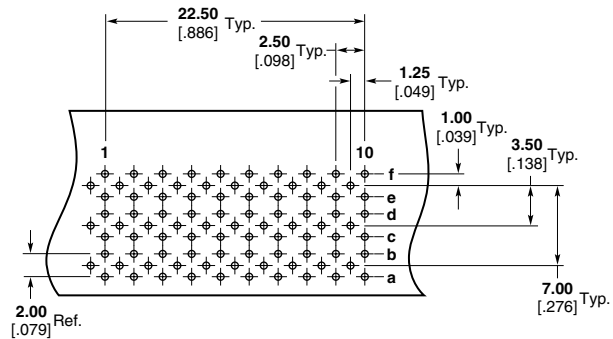
**Pin Header Assemblies**

Number of Positions	Dimensions			Part Number	Application Tooling					
	A	B	C		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
60	24.88 .980	22.50 .886	25.40 1.00	120786-1	1338742-2	408-8394	1338744-1	408-8393	1338745-1	408-8410
30	12.38 .487	10.00 .394	12.90 .508	120787-1	1338742-1	408-8394	1338744-1	408-8393	1338745-1	408-8410

**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



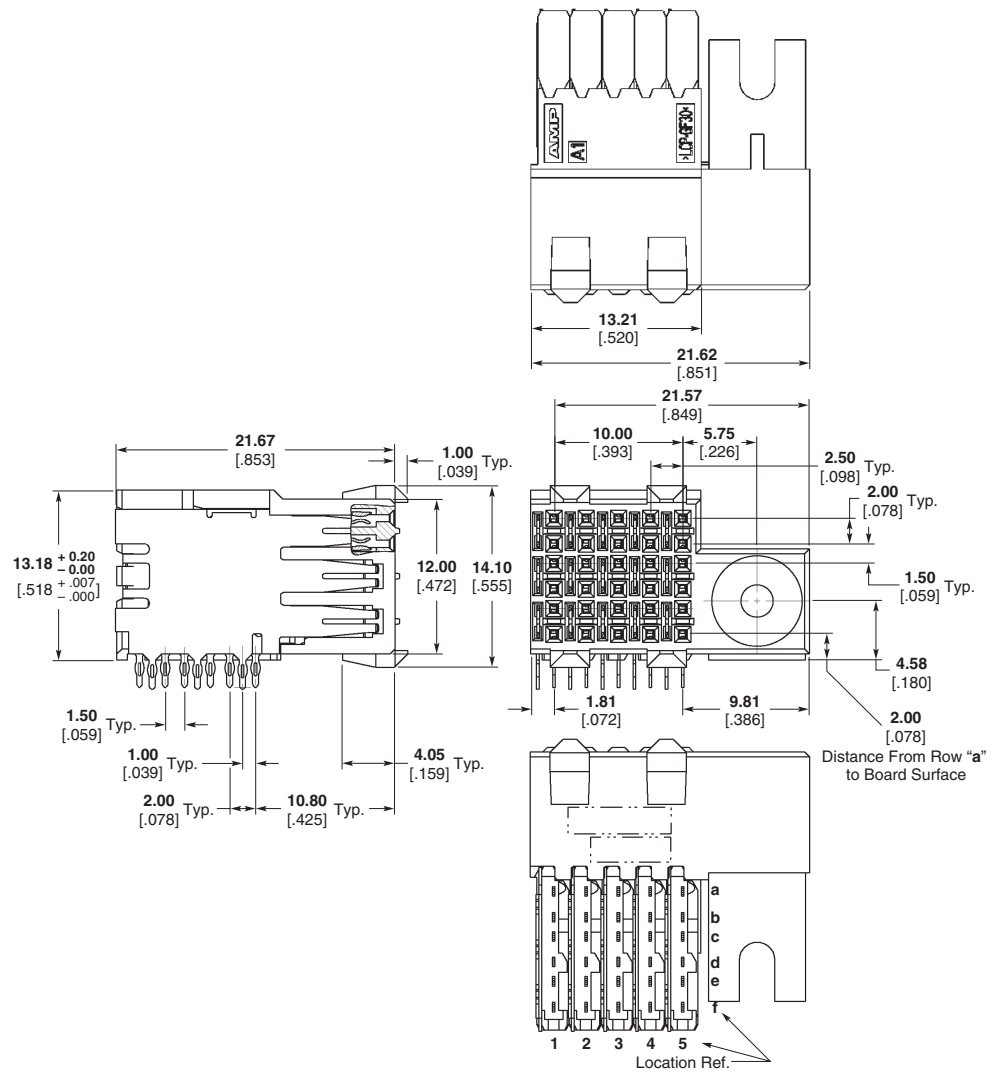
**Recommended PC Board Layout  
(Component Side Shown)**



**Z-PACK HS3 Connector (Continued)**

**Right Angle Receptacle**  
(Continued)  
**6 Row, Right Module**  
(accepts ESD Guide Pin)

**2**  
Z-PACK HS3 Connector



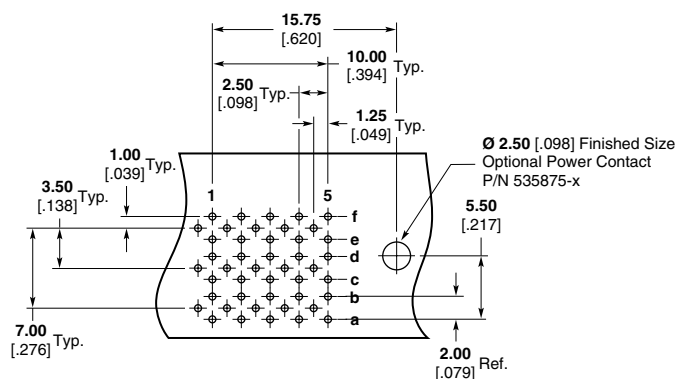
**Pin Header Assemblies**

Number of Positions	Part Number	Application Tooling					
		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
30	120788-1	1338742-1	408-8394	1338744-1	408-8393	1338745-1	408-8410

**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

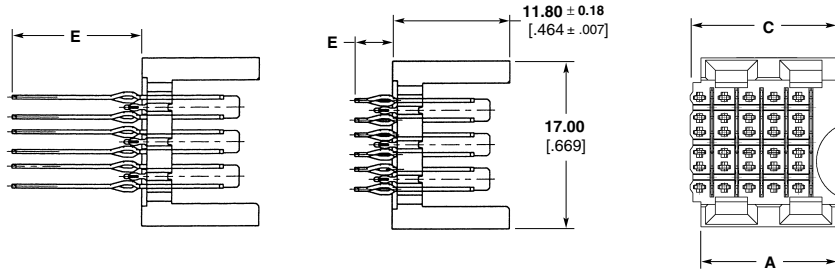
**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



**Recommended PC Board Layout**  
(Component Side Shown)

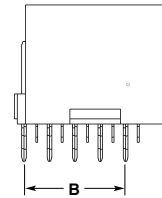
**Z-PACK HS3 Connector (Continued)**

**Vertical Pin Header Assemblies**  
**6 Row, Left Module (accepts ESD Guide Pin)**



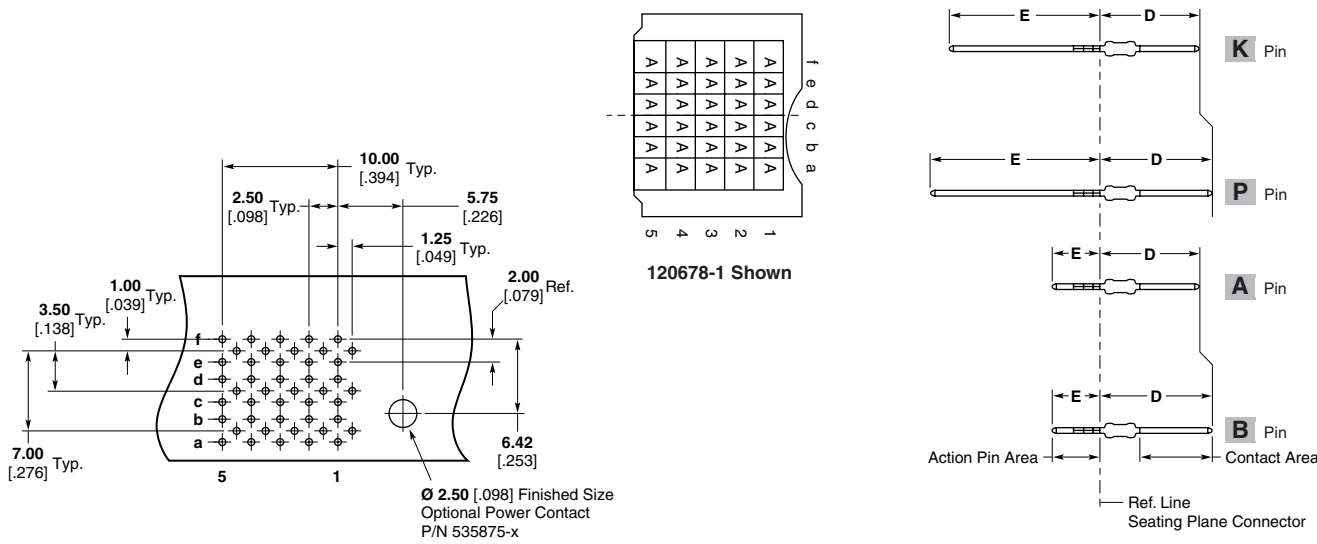
**P.C.B. Hole Dimensions**  
**Drilled Hole** — 0.7±0.025mm  
**Fin. Hole** — 0.55 to 0.65mm  
**Cu-thickness** — 0.025 to 0.050mm  
**SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



**Pin Header Assemblies**

Number of Positions	Dimensions					Pin Ref.	Part Numbers	Application Tooling					
	A	B	C	D	E			Seating	IS Sheet	Signal Pin		Ground Blade	
										Repair Kit	IS Sheet	Repair Kit	IS Sheet
30	13.70 .539	10.00 .393	14.80 .583	8.20 .322	3.70 .145	<b>A</b>	120678-1	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573
	13.70 .539	10.00 .393	14.80 .583	9.70 .381	3.70 .145	<b>B</b>	120678-2	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573
	13.70 .539	10.00 .393	14.80 .583	8.20 .322	13.00 .511	<b>K</b>	120681-1	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573
	13.70 .539	10.00 .393	14.80 .583	9.70 .381	14.50 .570	<b>P</b>	120681-2	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573



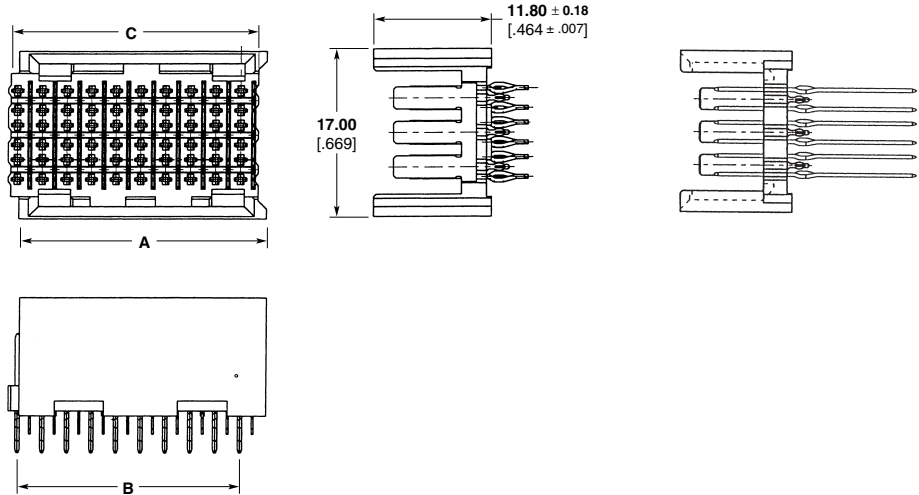
**Recommended PC Board Layout (Component Side Shown)**  
**For Non-Midplane Applications**  
**For Midplane Applications Reference Page 60**

**Z-PACK HS3 Connector (Continued)**

**Vertical Pin Header Assemblies (Continued)  
6 Row, Center Module**

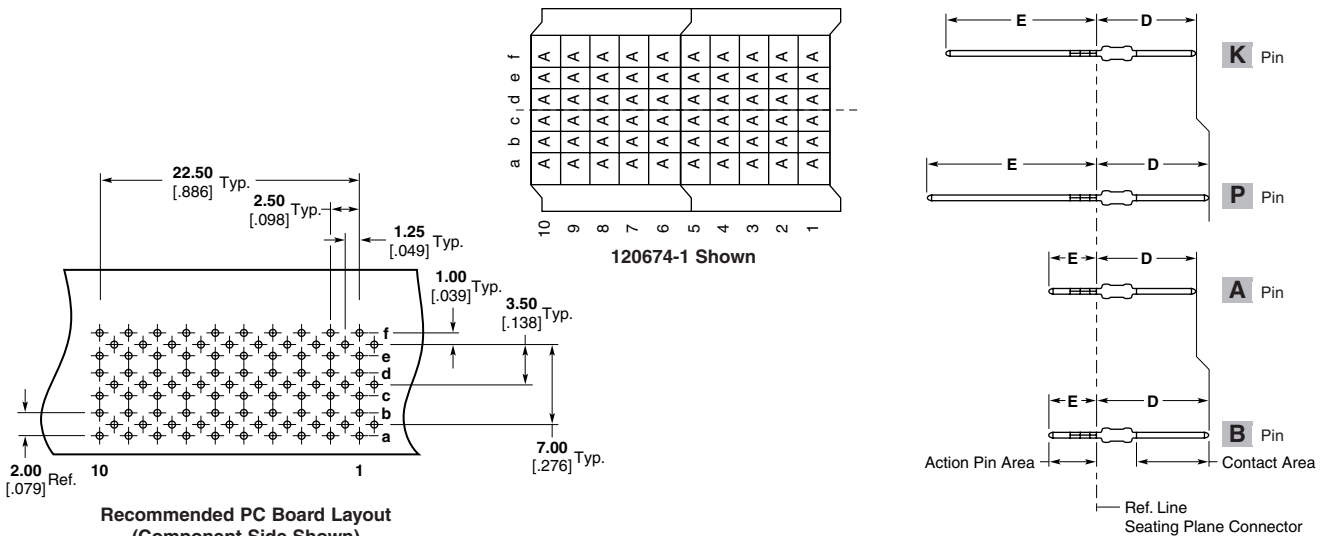
**P.C.B. Hole Dimensions**  
**Drilled Hole** — 0.7±0.025mm  
**Fin. Hole** — 0.55 to 0.65mm  
**Cu-thickness** — 0.025 to 0.050mm  
**SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



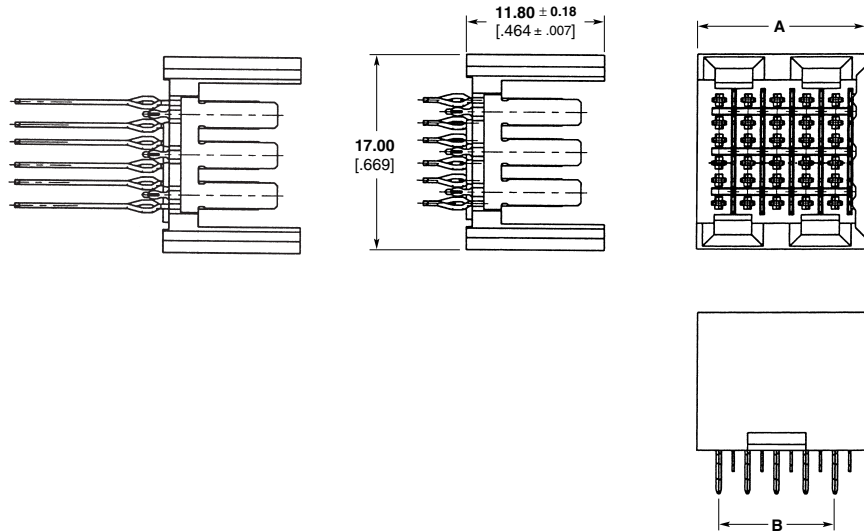
**Pin Header Assemblies**

Number of Positions	Dimensions					Pin Ref.	Part Numbers	Seating	IS Sheet	Application Tooling			
	A	B	C	D	E					Signal Pin		Ground Blade	
	Repair Kit	IS Sheet	Repair Kit	IS Sheet									
60	24.90 .980	22.50 .885	24.90 .980	8.20 .322	3.70 .145	<b>A</b>	120674-1	91313-2	408-4546	354687-2	408-9979	1320534-1	408-4573
	24.90 .980	22.50 .885	24.90 .980	9.70 .381	3.70 .145	<b>B</b>	120674-2	91313-2	408-4546	354687-2	408-9979	1320534-1	408-4573
	24.90 .980	22.50 .885	24.90 .980	8.20 .322	13.00 .511	<b>K</b>	120679-1	91313-2	408-4546	354687-2	408-9979	1320534-1	408-4573
	24.90 .980	22.50 .885	24.90 .980	9.70 .381	14.50 .570	<b>P</b>	120679-2	91313-2	408-4546	354687-2	408-9979	1320534-1	408-4573
30	12.41 .488	10.00 .393	12.40 .488	8.20 .322	3.70 .145	<b>A</b>	120732-1	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573
	12.41 .488	10.00 .393	12.40 .488	9.70 .381	3.70 .145	<b>B</b>	120732-2	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573
	12.41 .488	10.00 .393	12.40 .488	8.20 .322	13.00 .511	<b>K</b>	120742-1	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573
	12.41 .488	10.00 .393	12.40 .488	9.70 .381	14.50 .570	<b>P</b>	120742-2	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573



**Z-PACK HS3 Connector (Continued)**

**Vertical Pin Header Assemblies (Continued)**  
**6 Row, Right Module (accepts ESD Guide Pin)**



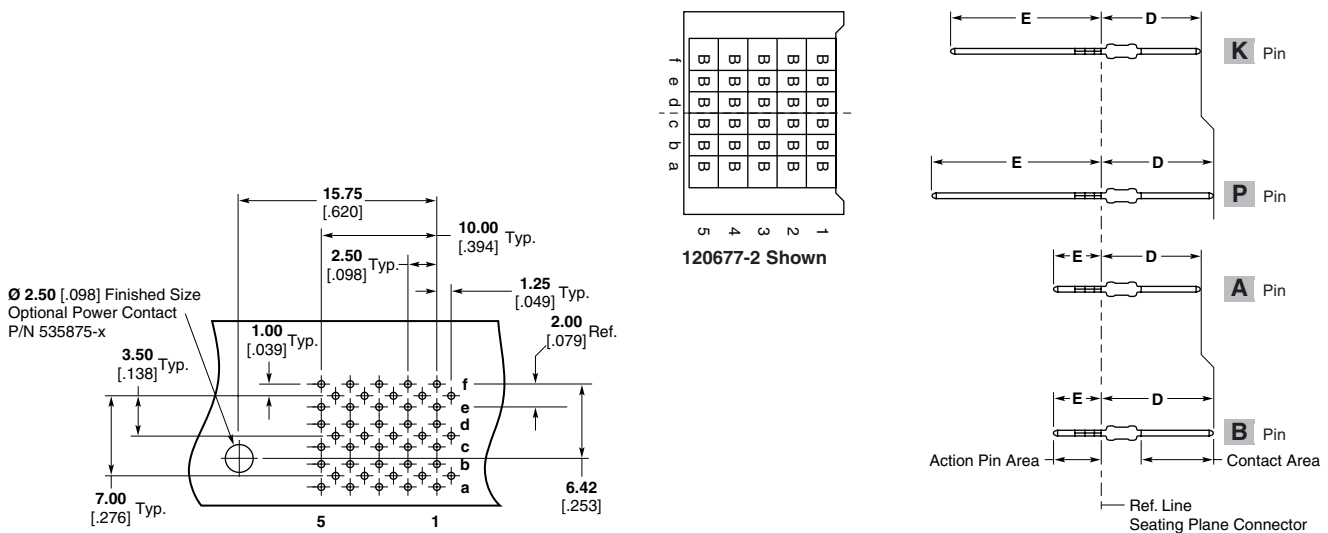
**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.

**Pin Header Assemblies**

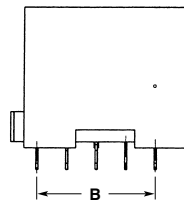
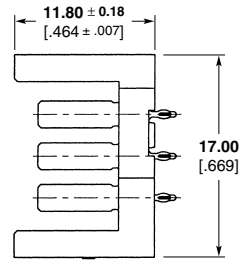
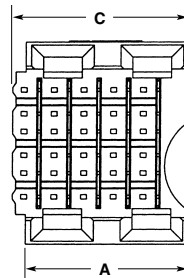
Number of Positions	Dimensions				Pin Ref.	Part Numbers	Application Tooling					
	A	B	D	E			Seating	IS Sheet	Signal Pin		Ground Blade	
									Repair Kit	IS Sheet	Repair Kit	IS Sheet
30	14.45 .568	10.00 .393	8.20 .322	3.70 .145	<b>A</b>	120677-1	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573
	14.45 .568	10.00 .393	9.70 .381	3.70 .145	<b>B</b>	120677-2	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573
	14.45 .568	10.00 .393	8.20 .322	13.00 .511	<b>K</b>	120680-1	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573
	14.45 .568	10.00 .393	9.70 .381	14.50 .570	<b>P</b>	120680-2	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573



**Recommended PC Board Layout (Component Side Shown)**  
**For Non-Midplane Applications**  
**For Midplane Applications Reference Page 60**

**Z-PACK HS3 Connector (Continued)**

**Vertical Pin Header Shrouds  
6 Row, Left Module**



**P.C.B. Hole Dimensions**

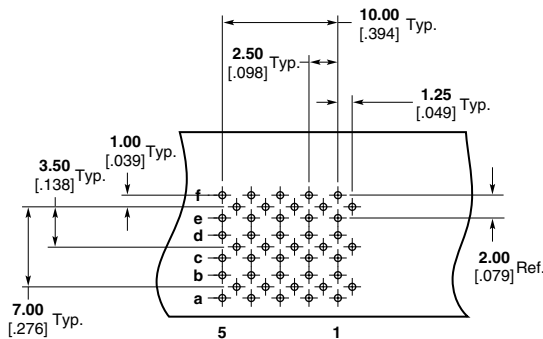
- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.

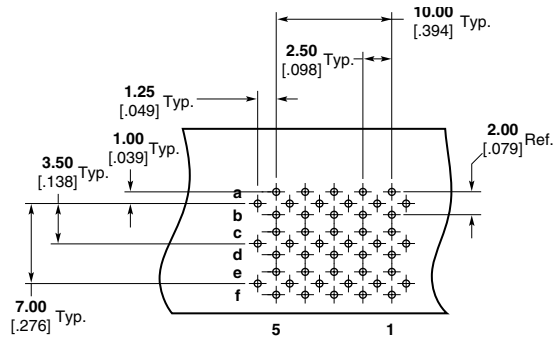
2  
Z-PACK HS3 Connector

**Pin Header Assemblies**

Number of Positions	Dimensions			Part Number	Application Tooling			
	A	B	C		Insertion	IS Sheet	Ground Blade	
							Repair Kit	IS Sheet
30	13.70 .537	10.00 .393	14.80 .582	120684-1	91313-1	408-4546	1320534-1	408-4573



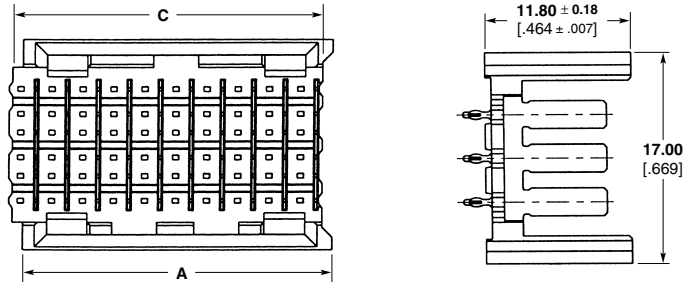
**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1f Shroud Side)  
Recommended PC Board Layout — Reference Page 60  
(Shroud Side Shown)



**Coplanar Daughtercards**  
(Pin 1a Header = Pin 5a Shroud Side)  
Recommended PC Board Layout — Reference Page 60  
(Shroud Side Shown)

**Z-PACK HS3 Connector (Continued)**

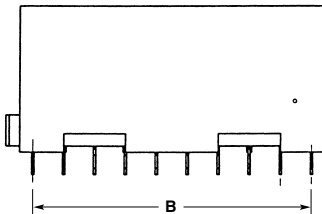
**Vertical Pin Header Shrouds (Continued)  
6 Row, Center Module**



**P.C.B. Hole Dimensions**

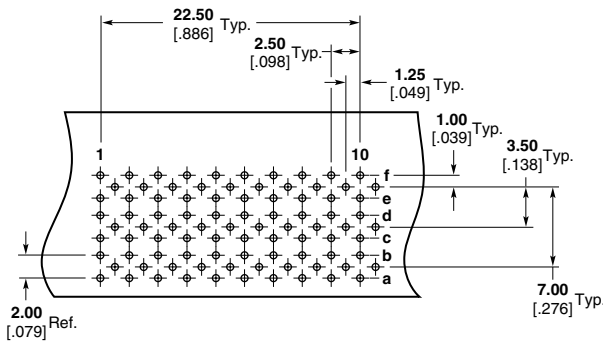
- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.

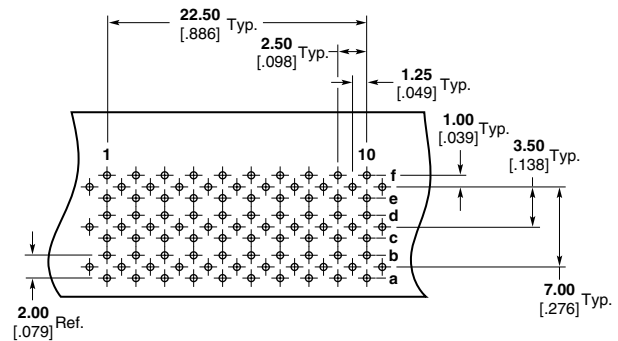


**Pin Header Assemblies**

Number of Positions	Dimensions			Part Number	Application Tooling			
	A	B	C		Insertion	IS Sheet	Ground Blade	
							Repair Kit	IS Sheet
60	24.90 .980	22.50 .885	24.90 .980	120682-1	91313-2	408-4546	1320534-1	408-4573
30	12.57 .494	10.00 .393	12.40 .488	120743-1	91313-1	408-4546	1320534-1	408-4573



**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1f Shroud Side)  
Recommended PC Board Layout — Reference Page 60  
(Shroud Side Shown)



**Coplanar Daughtercards**  
(Pin 1a Header = Pin 5a Shroud Side)  
Recommended PC Board Layout — Reference Page 60  
(Shroud Side Shown)

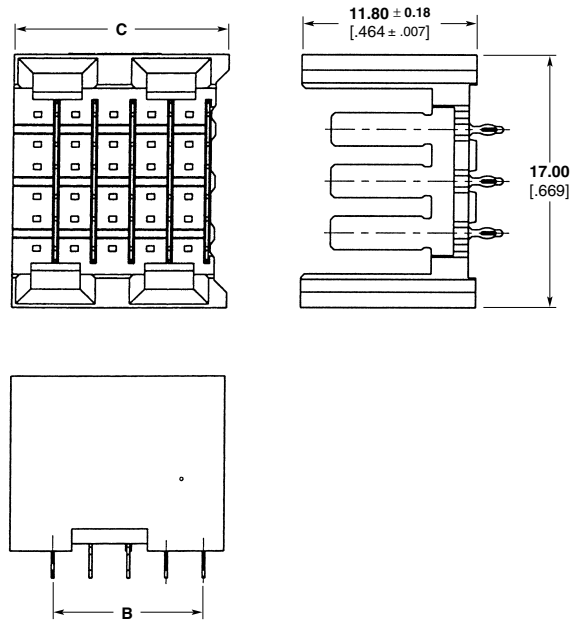
**Z-PACK HS3 Connector (Continued)**

**Vertical Pin Header Shrouds (Continued)  
6 Row, Right Module**

**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

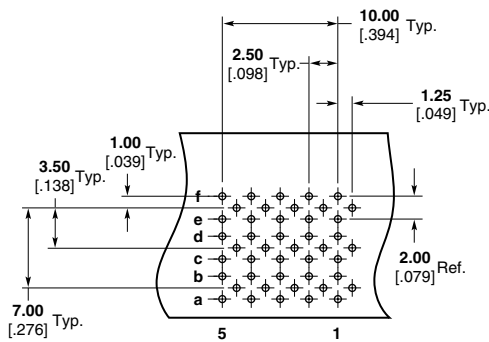
**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



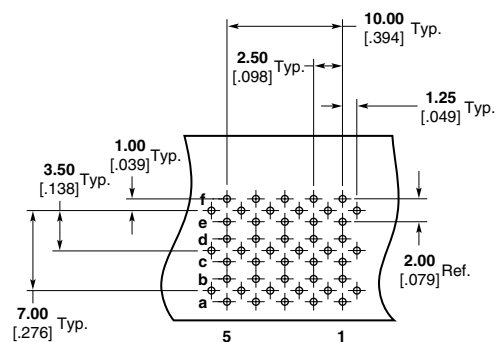
2  
Z-PACK HS3 Connector

**Pin Header Assemblies**

Number of Positions	Dimensions			Part Number	Application Tooling			
	A	B	C		Insertion	IS Sheet	Ground Blade	
							Repair Kit	IS Sheet
30	—	10.00 .393	14.20 .559	120683-1	91313-1	408-4546	1320534-1	408-4573



**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1f Shroud Side)  
Recommended PC Board Layout — Reference Page 60  
(Shroud Side Shown)

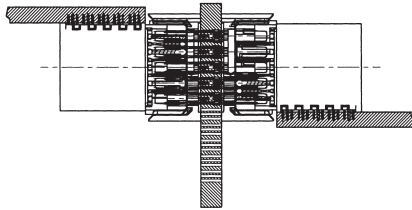


**Coplanar Daughtercards**  
(Pin 1a Header = Pin 5a Shroud Side)  
Recommended PC Board Layout — Reference Page 60  
(Shroud Side Shown)

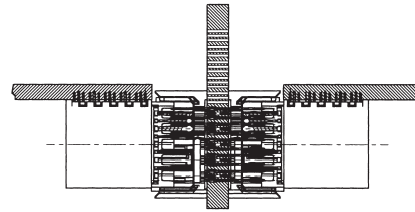


**Layout Guide for Midplane Applications**  
**6 Row Connectors**

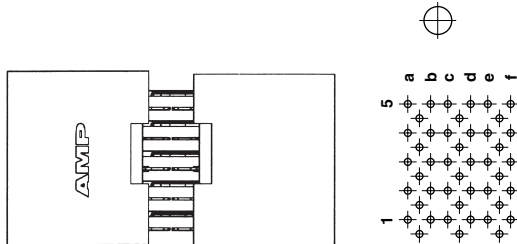
**Non-Coplanar Applications**



**Coplanar Applications**

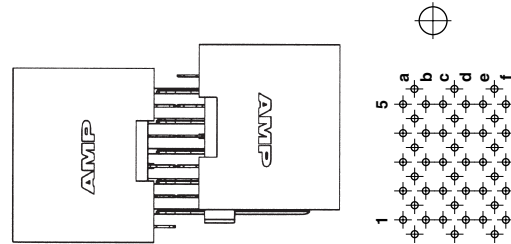


**Right Module**



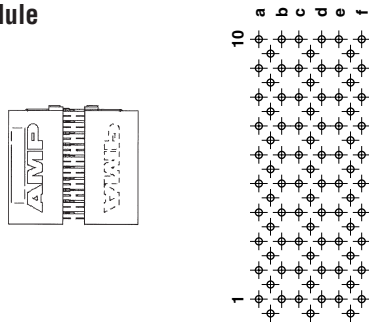
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
120680	120683-1

**Right Module**



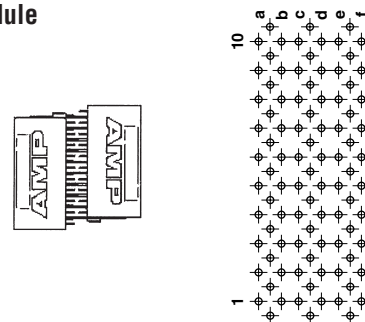
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
120680	120684-1

**Center Module**



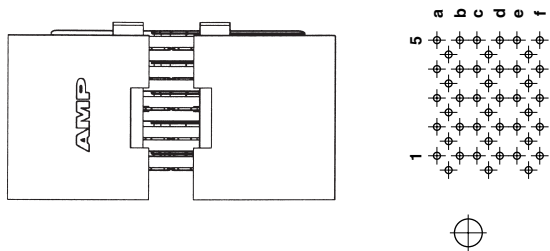
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
120679	120682-1

**Center Module**



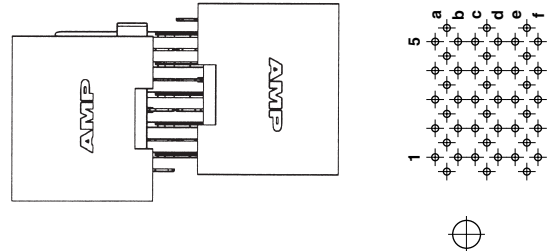
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
120679	120682-1

**Left Module**



Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
120681	120684-1

**Left Module**



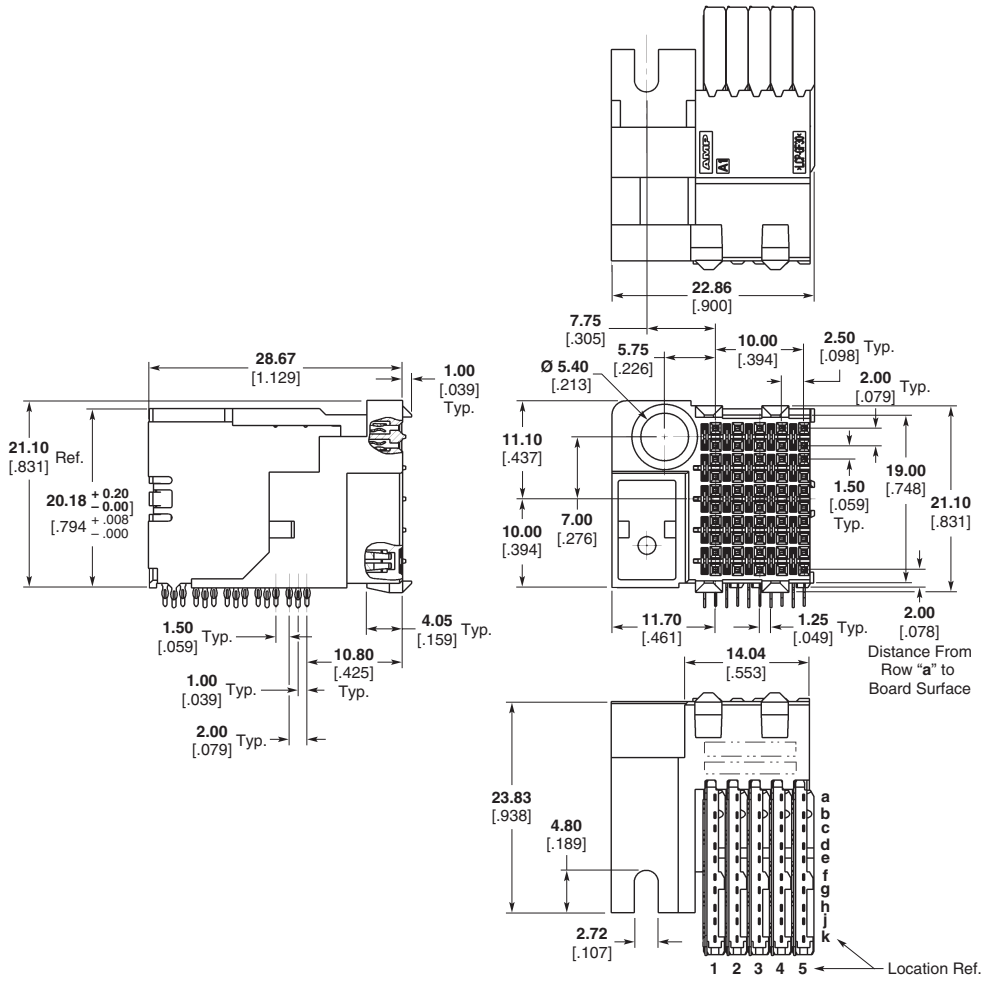
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
120681	120683-1

**Z-PACK HS3 Connector (Continued)**

**Right Angle Receptacle**

**10 Row, Left Module (accepts Universal Guide Pin)**

2  
Z-PACK HS3 Connector



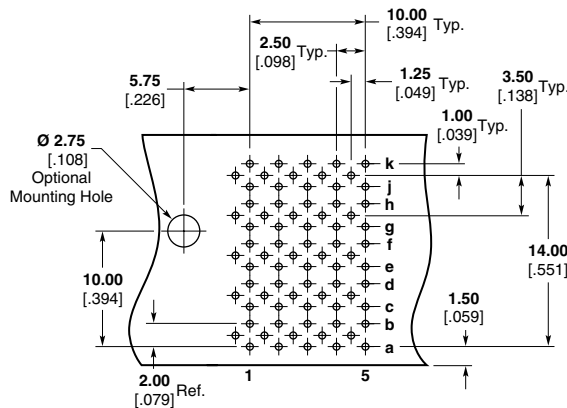
**Receptacle Assemblies**

Number of Positions	Part Number	Application Tooling					
		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
50	120875-1	1338743-1	408-8394	1338744-1	408-8393	1338746-1	408-8410

**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



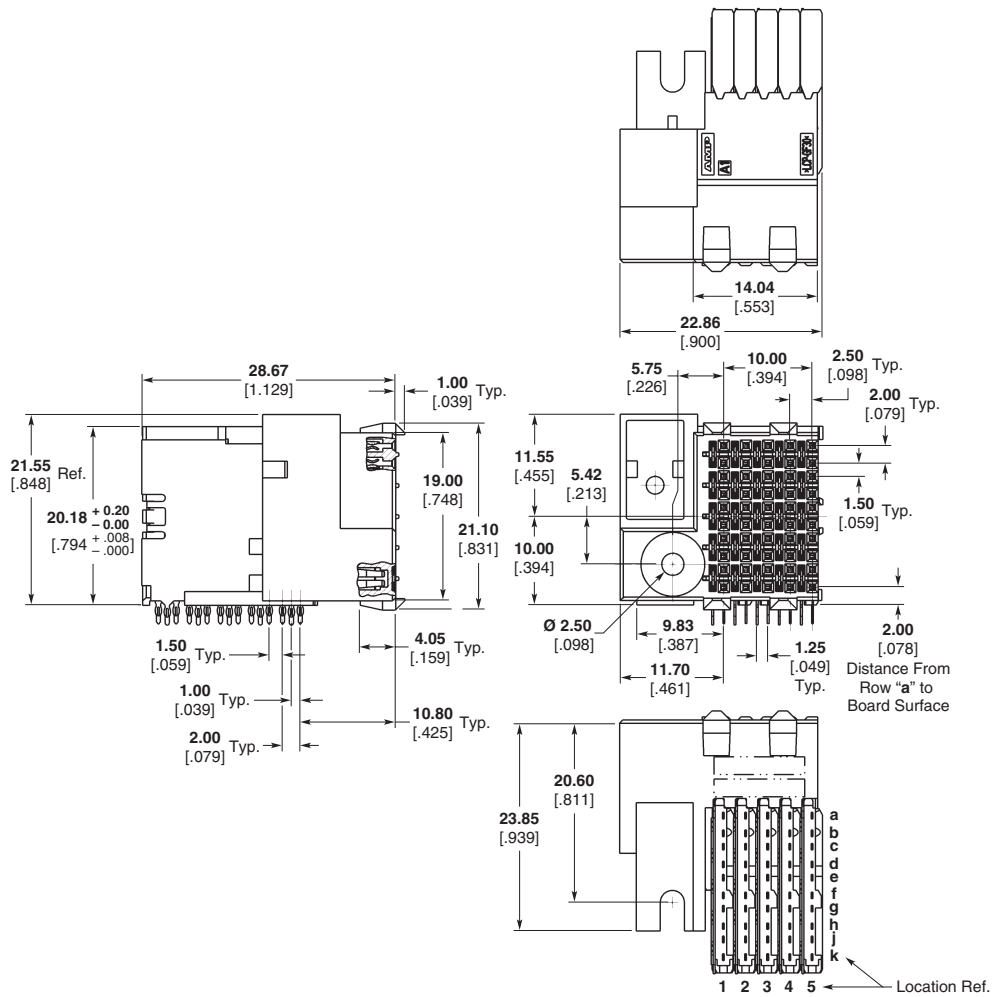
**Recommended PC Board Layout (Component Side Shown)**

**Z-PACK HS3 Connector (Continued)**

**Right Angle Receptacle**

(Continued)

**10 Row, Left Module (accepts ESD Guide Pin)**



**Receptacle Assemblies**

Number of Positions	Part Number	Application Tooling					
		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
50	120793-1	1338743-1	408-8394	1338744-1	408-8393	1338746-1	408-8410

**P.C.B. Hole Dimensions**

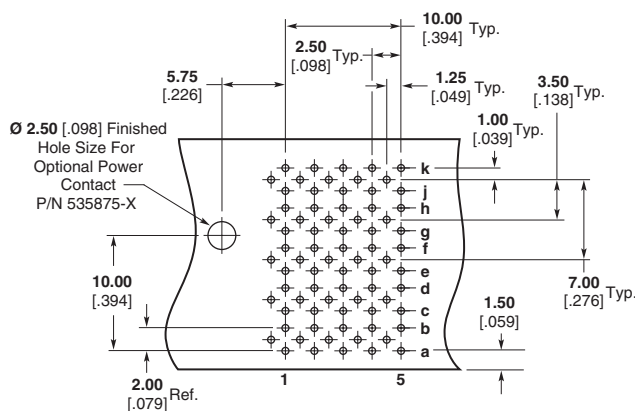
**Drilled Hole** — 0.7±0.025mm

**Fin. Hole** — 0.55 to 0.65mm

**Cu-thickness** — 0.025 to 0.050mm

**SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



**Recommended PC Board Layout (Component Side Shown)**

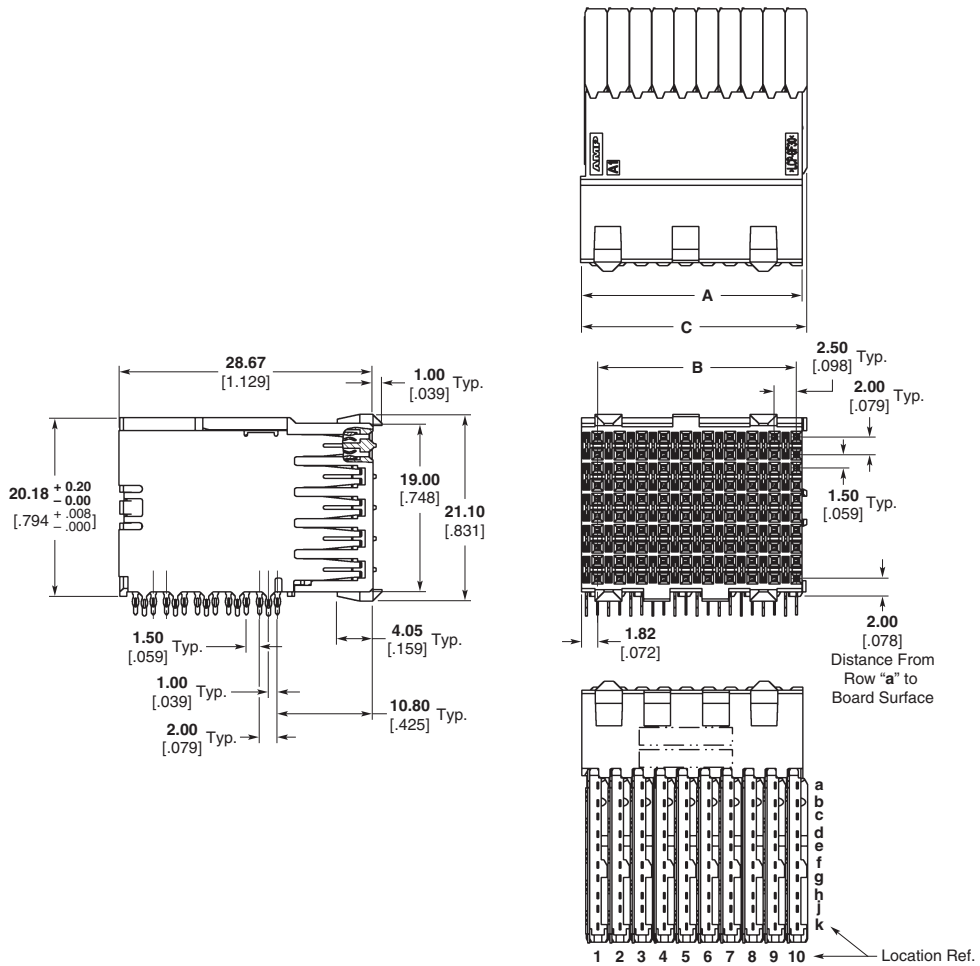
**Z-PACK HS3 Connector (Continued)**

**Right Angle Receptacle**

(Continued)

**10 Row, Center Module**

2  
Z-PACK HS3 Connector



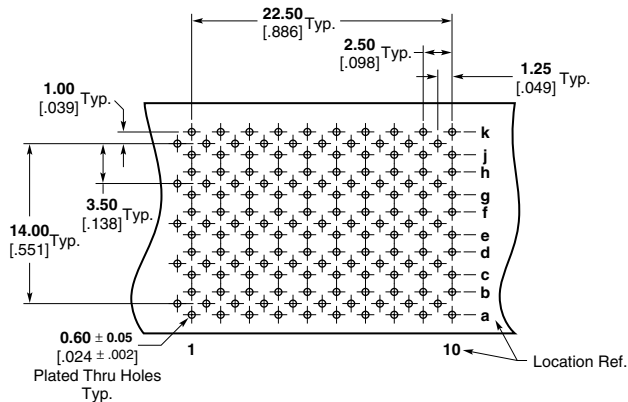
**Receptacle Assemblies**

Number of Positions	Dimensions			Part Number	Application Tooling					
	A	B	C		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
100	24.94 .982	22.50 .886	25.48 1.03	120790-1	1338743-2	408-8394	1338744-1	408-8393	1338746-1	408-8410
50	12.44 .490	10.00 .394	12.90 .508	120791-1	1338743-1	408-8394	1338744-1	408-8393	1338746-1	408-8410

**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



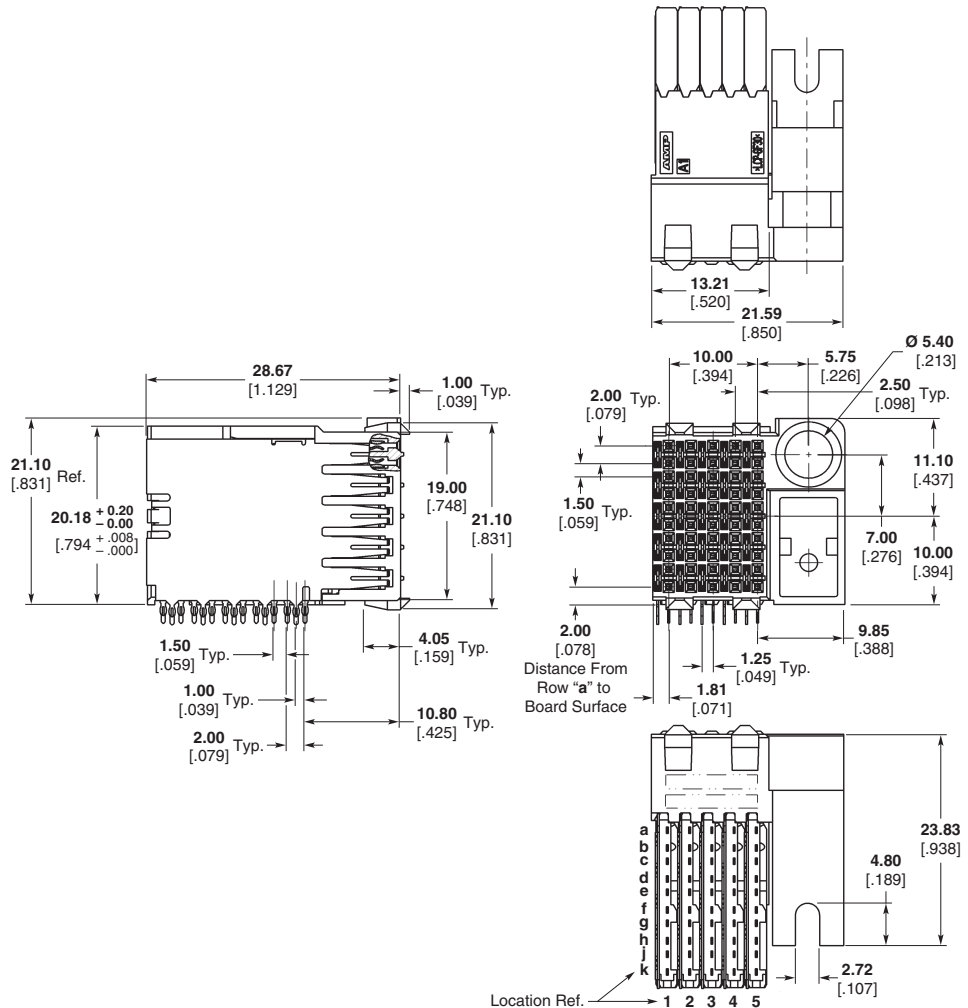
**Recommended PC Board Layout (Component Side Shown)**

**Z-PACK HS3 Connector (Continued)**

**Right Angle Receptacle**

(Continued)

**10 Row, Right Module (accepts Universal Guide Pin)**



**Receptacle Assemblies**

Number of Positions	Part Number	Application Tooling					
		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
50	120874-1	1338743-1	408-8394	1338744-1	408-8393	1338746-1	408-8410

**P.C.B. Hole Dimensions**

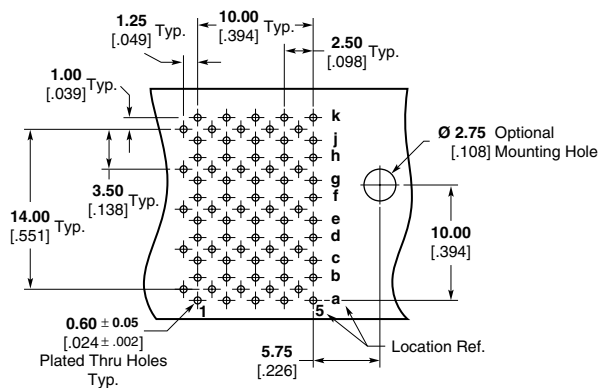
**Drilled Hole** — 0.7±0.025mm

**Fin. Hole** — 0.55 to 0.65mm

**Cu-thickness** — 0.025 to 0.050mm

**SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



**Recommended PC Board Layout (Component Side Shown)**

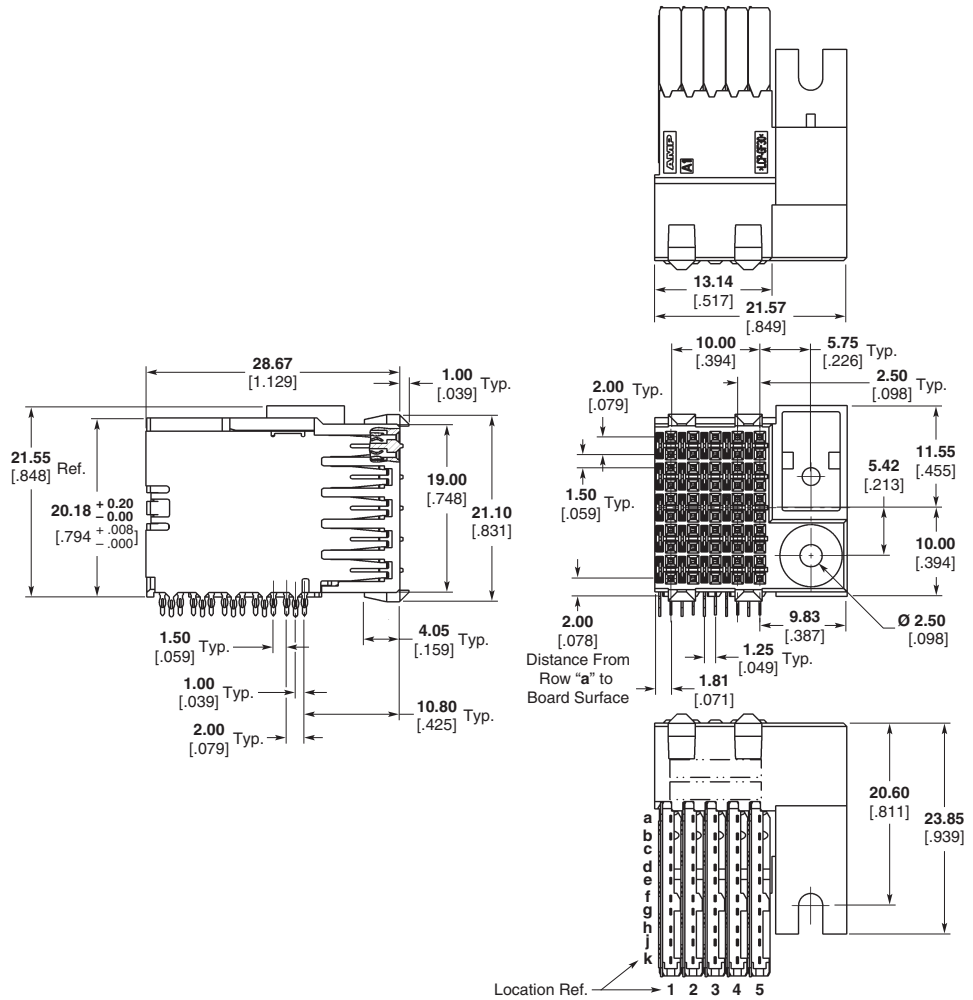
**Z-PACK HS3 Connector (Continued)**

**Right Angle Receptacle**

(Continued)

**10 Row, Right Module (accepts ESD Guide Pin)**

2  
Z-PACK HS3 Connector



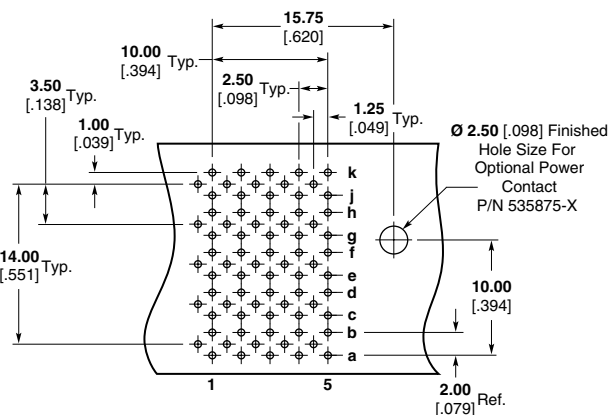
**Receptacle Assemblies**

Number of Positions	Part Number	Application Tooling					
		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
50	120792-1	1338743-1	408-8394	1338744-1	408-8393	1338746-1	408-8410

**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.

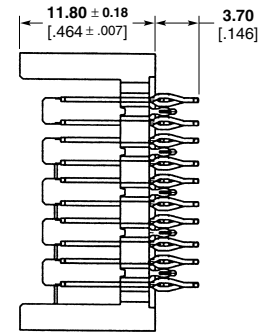
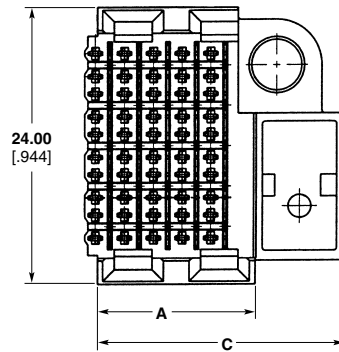


**Recommended PC Board Layout (Component Side Shown)**

**Z-PACK HS3 Connector (Continued)**

**Vertical Pin Header Assemblies**

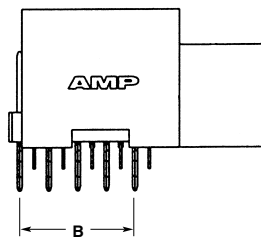
**10 Row, Left Module (accepts Universal Guide Pin)**



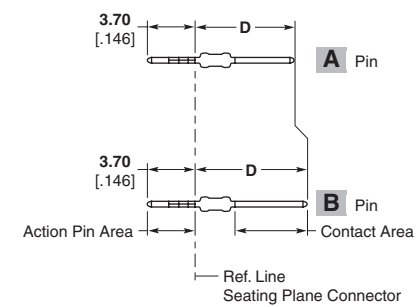
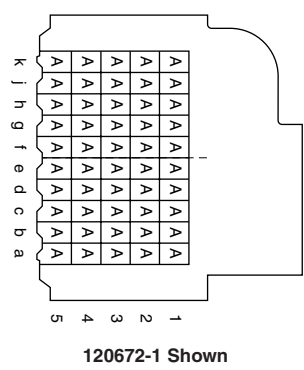
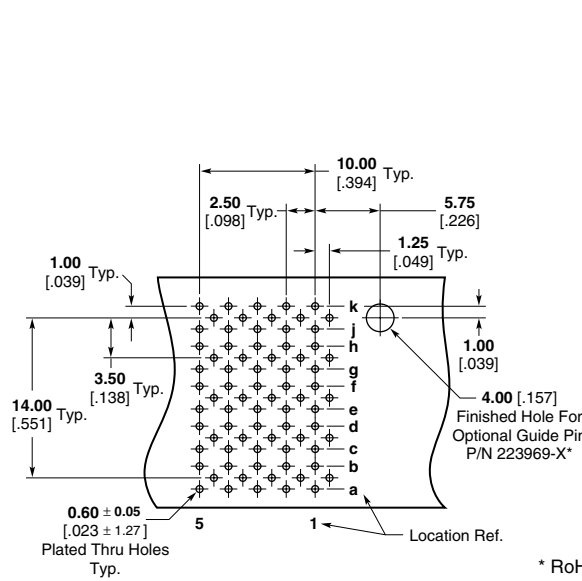
**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



Number of Positions	Dimensions				Pin Ref.	Part Numbers	Application Tooling					
	A	B	C	D			Seating	IS Sheet	Signal Pin		Ground Blade	
									Repair Kit	IS Sheet	Repair Kit	IS Sheet
50	13.70 .539	10.00 .394	21.61 .851	8.20 .323	<b>A</b>	120672-1	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	13.70 .539	10.00 .394	21.61 .851	9.70 .383	<b>B</b>	120672-2	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573



**Recommended PC Board Layout (Component Side Shown) For Non-Midplane Applications For Midplane Applications Reference Page 74**

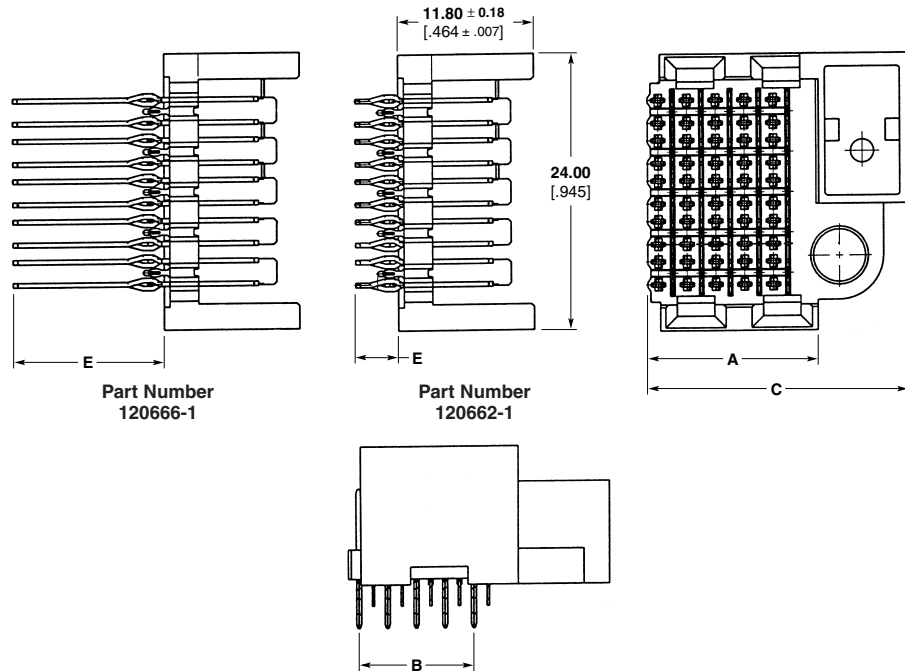
\* RoHS Compliant



**Z-PACK HS3 Connector (Continued)**

**Vertical Pin Header Assemblies (Continued)**

**10 Row, Left Module (accepts ESD Guide Pin)**

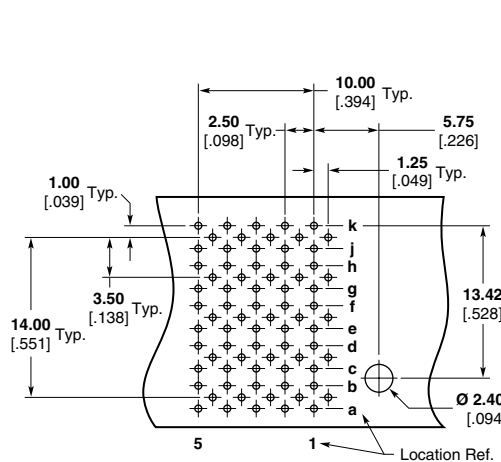


**P.C.B. Hole Dimensions**

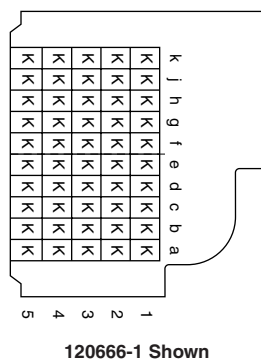
- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.

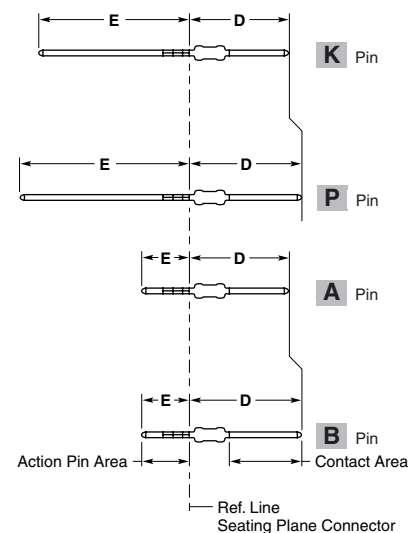
Number of Positions	Dimensions					Pin Ref.	Part Numbers	Application Tooling					
	A	B	C	D	E			Seating		Signal Pin		Ground Blade	
	Repair Kit	IS Sheet	Repair Kit	IS Sheet	Repair Kit			IS Sheet					
50	14.80 .583	10.00 .394	22.71 .894	8.20 .323	3.70 .146	<b>A</b>	120662-1	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	14.80 .583	10.00 .394	22.71 .894	9.70 .382	3.70 .146	<b>B</b>	120662-2	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	14.80 .583	10.00 .394	22.71 .894	8.20 .323	13.00 .512	<b>K</b>	120666-1	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	14.80 .583	10.00 .394	22.71 .894	9.70 .382	14.50 .571	<b>P</b>	120666-2	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573



**Recommended PC Board Layout (Component Side Shown) For Non-Midplane Applications For Midplane Applications Reference Page 74**



**120666-1 Shown**



**Z-PACK HS3 Connector (Continued)**

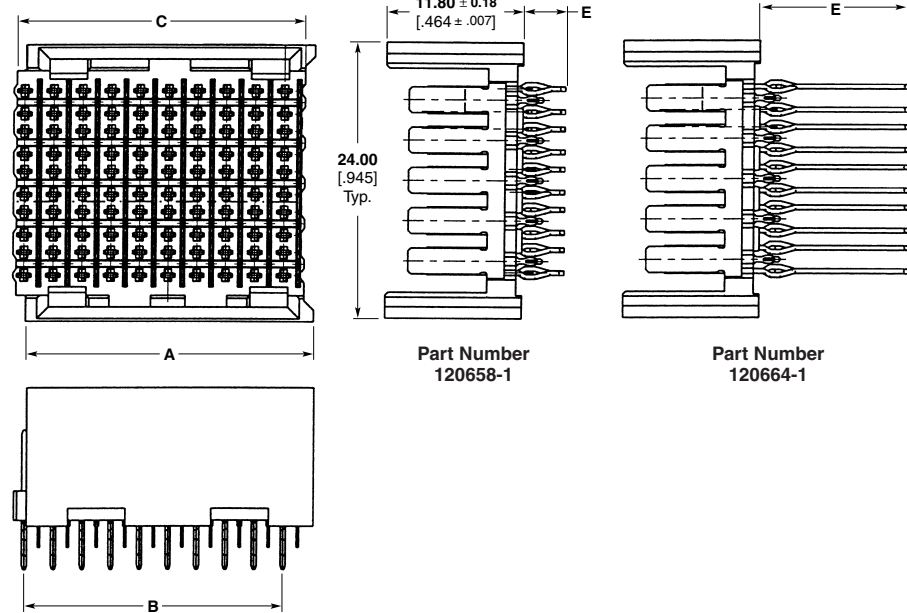
**Vertical Pin Header Assemblies (Continued)**

**10 Row, Center Module**

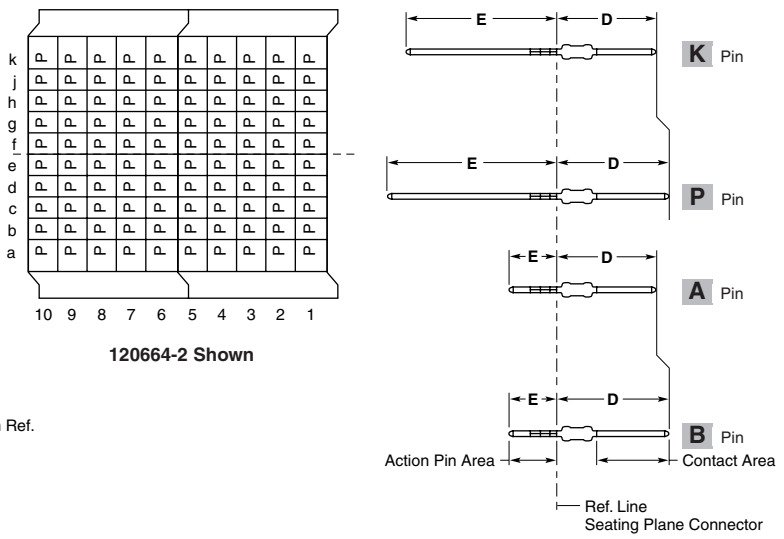
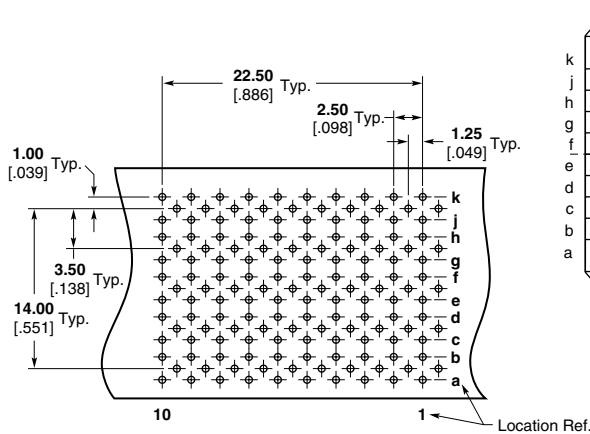
**P.C.B. Hole Dimensions**

- Drilled Hole — 0.7±0.025mm
- Fin. Hole — 0.55 to 0.65mm
- Cu-thickness — 0.025 to 0.050mm
- SnPb-thickness — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



Number of Positions	Dimensions					Pin Ref.	Part Numbers	Application Tooling					
	A	B	C	D	E			Seating	IS Sheet	Signal Pin		Ground Blade	
										Repair Kit	IS Sheet	Repair Kit	IS Sheet
100	24.90	22.50	24.90	8.20	3.70	<b>A</b>	120658-1	91312-2	408-4546	354687-2	408-9979	1320534-2	408-4573
	.980	.885	.980	.322	.145								
	24.90	22.50	24.90	9.70	3.70	<b>B</b>	120658-2	91312-2	408-4546	354687-2	408-9979	1320534-2	408-4573
	.980	.885	.980	.381	.145								
50	24.90	22.50	24.90	8.20	13.00	<b>K</b>	120664-1	91312-2	408-4546	354687-2	408-9979	1320534-2	408-4573
	.980	.885	.980	.322	.511								
	24.90	22.50	24.90	9.70	14.50	<b>P</b>	120664-2	91312-2	408-4546	354687-2	408-9979	1320534-2	408-4573
	.980	.885	.980	.381	.570								
50	12.41	10.00	12.40	8.20	3.70	<b>A</b>	120747-1	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	.488	.393	.488	.322	.145								
	12.41	10.00	12.40	9.70	3.70	<b>B</b>	120747-2	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	.488	.393	.488	.381	.145								
50	12.41	10.00	12.40	8.20	13.00	<b>K</b>	120748-1	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	.488	.393	.488	.322	.511								
50	12.41	10.00	12.40	9.70	14.50	<b>P</b>	120748-2	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	.488	.393	.488	.381	.570								



**Recommended PC Board Layout (Component Side Shown) For Non-Midplane Applications For Midplane Applications Reference Page 74**

**Z-PACK HS3 Connector (Continued)**

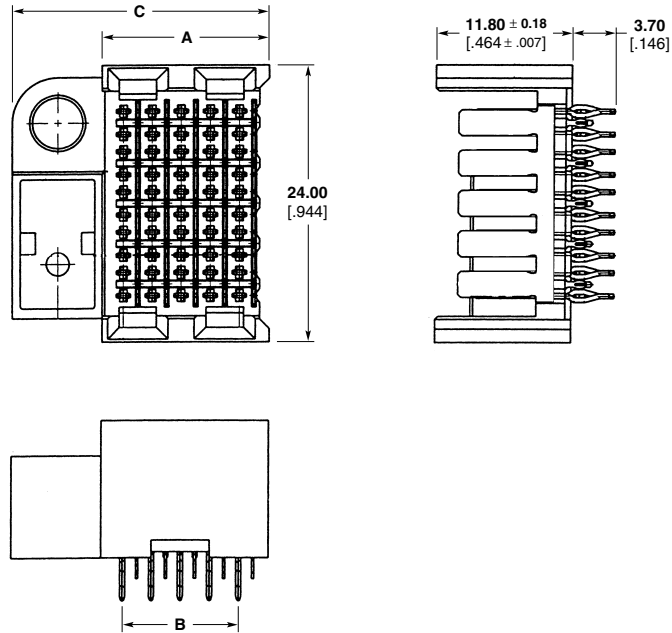
**Vertical Pin Header Assemblies (Continued)**

**10 Row, Right Module (accepts Universal Guide Pin)**

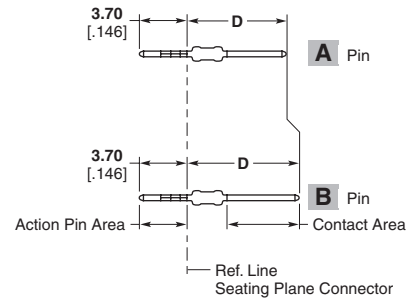
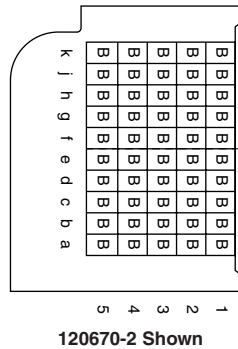
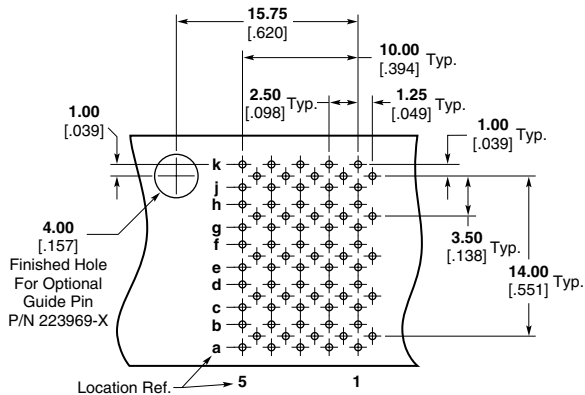
**P.C.B. Hole Dimensions**

- Drilled Hole — 0.7±0.025mm
- Fin. Hole — 0.55 to 0.65mm
- Cu-thickness — 0.025 to 0.050mm
- SnPb-thickness — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



Number of Positions	Dimensions				Pin Ref.	Part Numbers	Application Tooling					
	A	B	C	D			Seating	IS Sheet	Signal Pin		Ground Blade	
									Repair Kit	IS Sheet	Repair Kit	IS Sheet
50	14.45 .568	10.00 .393	22.28 .877	8.20 .322	<b>A</b>	120670-1	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	14.45 .568	10.00 .393	22.28 .877	9.70 .381	<b>B</b>	120670-2	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573

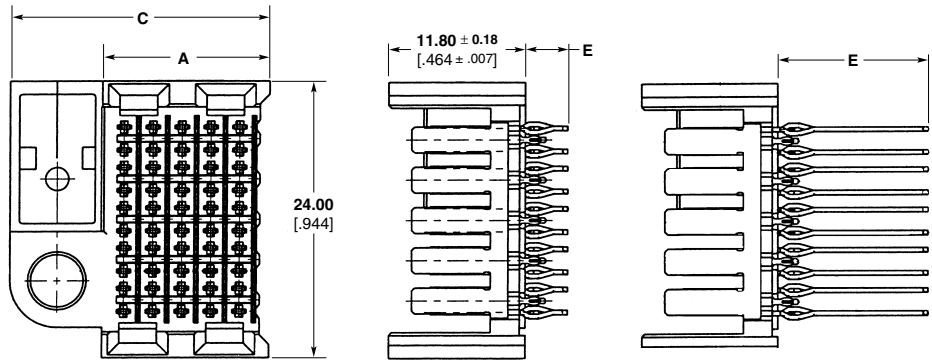


**Recommended PC Board Layout (Component Side Shown) For Non-Midplane Applications For Midplane Applications Reference Page 74**

**Z-PACK HS3 Connector (Continued)**

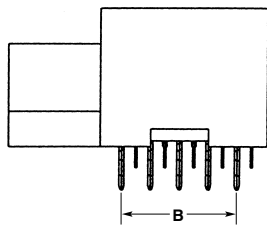
**Vertical Pin Header Assemblies (Continued)**

**10 Row, Right Module (accepts ESD Guide Pin)**



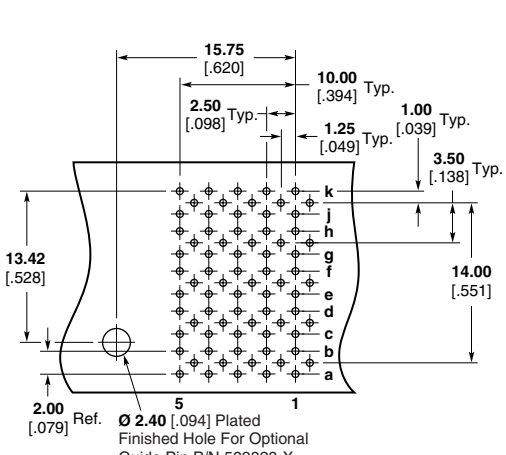
**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

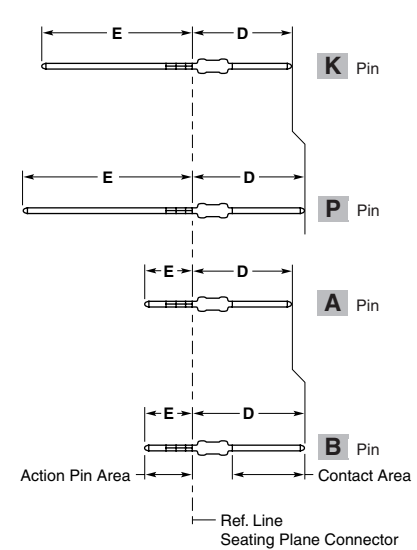
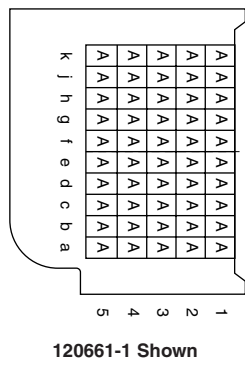


**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.

Number of Positions	Dimensions					Pin Ref.	Part Numbers	Application Tooling					
	A	B	C	D	E			Seating	IS Sheet	Signal Pin		Ground Blade	
	Repair Kit	IS Sheet	Repair Kit	IS Sheet									
50	14.46 .569	10.00 .393	22.28 .877	8.20 .322	3.70 .145	<b>A</b>	120661-1	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	14.46 .569	10.00 .393	22.28 .877	9.70 .381	3.70 .145	<b>B</b>	120661-2	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	14.46 .569	10.00 .393	22.28 .877	8.20 .322	13.00 .511	<b>K</b>	120665-1	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	14.46 .569	10.00 .393	22.28 .877	9.70 .381	14.50 .570	<b>P</b>	120665-2	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573



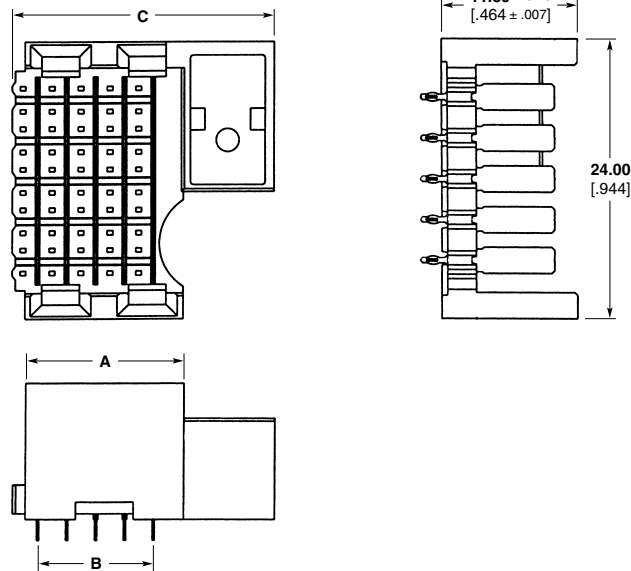
**Recommended PC Board Layout (Component Side Shown) For Non-Midplane Applications**  
For Midplane Applications Reference Page 74



**Z-PACK HS3 Connector (Continued)**

**Vertical Pin Header Shrouds**

**10 Row, Left Module**



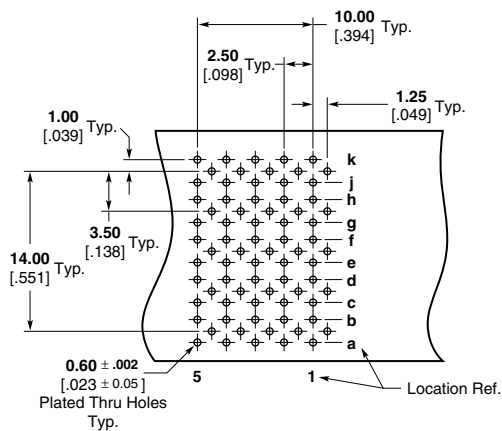
**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

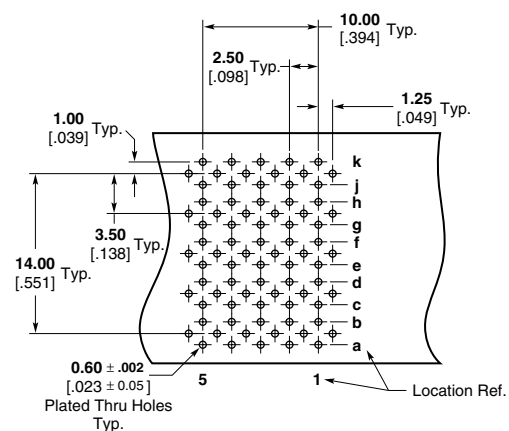
**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.

**Receptacle Assemblies**

Number of Positions	Dimensions			Part Number	Application Tooling			
	A	B	C		Seating	IS Sheet	Ground Blade	
							Repair Kit	IS Sheet
50	13.70 .539	10.00 .877	22.80 .322	120668-1	91312-1	408-4546	1320534-2	408-4573



**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1k Shroud Side)  
Recommended PC Board Layout — Reference Page 74  
(Shroud Side Shown)



**Coplanar Daughtercards**  
(Pin 1a Header = Pin 5a Shroud Side)  
Recommended PC Board Layout — Reference Page 74  
(Shroud Side Shown)

**Z-PACK HS3 Connector (Continued)**

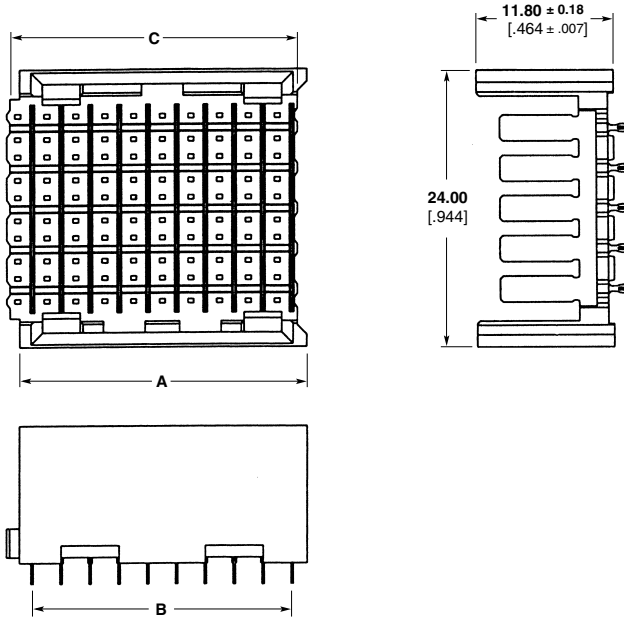
**Vertical Pin Header Shrouds (Continued)**

**10 Row, Center Module**

**P.C.B. Hole Dimensions**

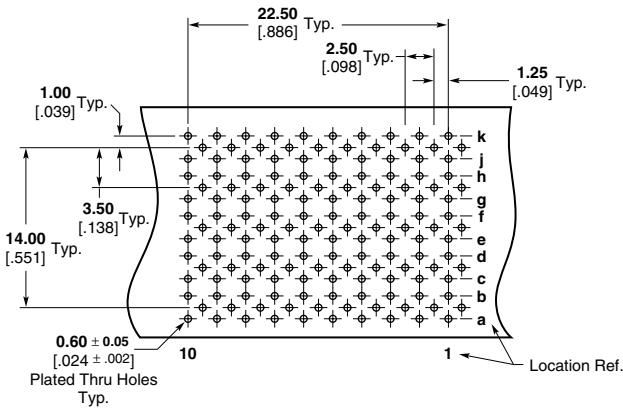
- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.

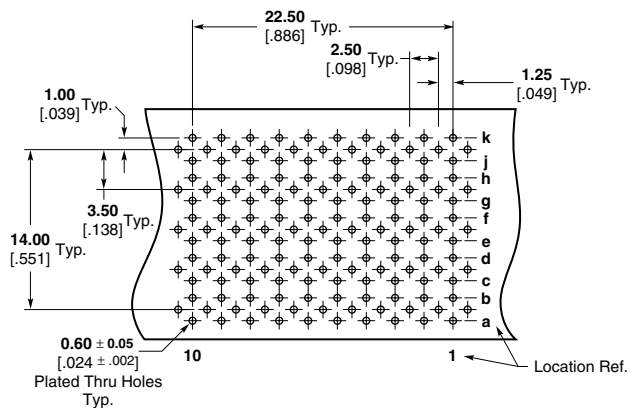


**Receptacle Assemblies**

Number of Positions	Dimensions			Part Number	Application Tooling			
	A	B	C		Seating	IS Sheet	Ground Blade	
							Repair Kit	IS Sheet
100	24.90 [.980]	22.50 [.886]	24.90 [.980]	120663-1	91312-2	408-4546	1320534-2	408-4573
50	12.41 [.488]	10.00 [.394]	12.40 [.488]	120750-1	91312-1	408-4546	1320534-2	408-4573



**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1k Shroud Side)  
Recommended PC Board Layout — Reference Page 74  
(Shroud Side Shown)



**Coplanar Daughtercards**  
(Pin 1a Header = Pin 10a Shroud Side)  
Recommended PC Board Layout — Reference Page 74  
(Shroud Side Shown)

**Z-PACK HS3 Connector (Continued)**

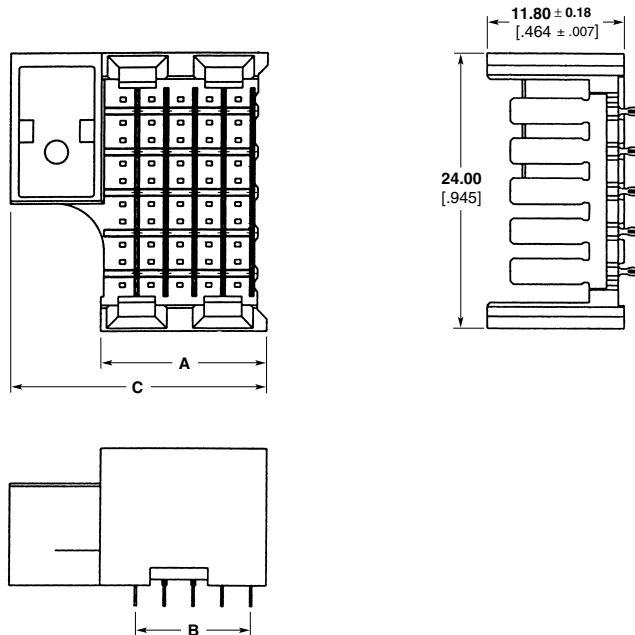
**Vertical Pin Header Shrouds (Continued)**

**10 Row, Right Module**

**P.C.B. Hole Dimensions**

- Drilled Hole** — 0.7±0.025mm
- Fin. Hole** — 0.55 to 0.65mm
- Cu-thickness** — 0.025 to 0.050mm
- SnPb-thickness** — 0.004 to 0.010mm

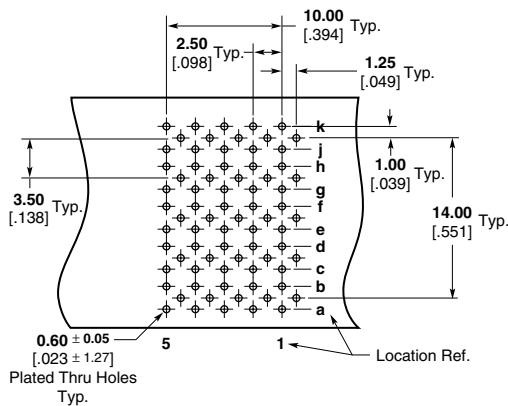
**Note:** For finishes other than tin-lead, reference Application Specification 114-13020.



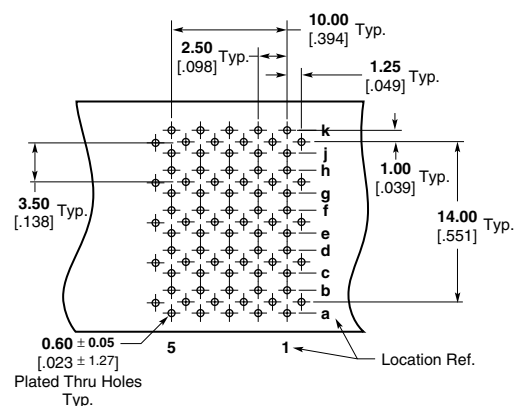
2  
Z-PACK HS3 Connector

**Receptacle Assemblies**

Number of Positions	Dimensions			Part Number	Application Tooling			
	A	B	C		Seating	IS Sheet	Ground Blade	
							Repair Kit	IS Sheet
50	14.46 .569	10.00 .394	22.28 .877	120667-1	91312-1	408-4546	1320534-2	408-4573



**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1k Shroud Side)  
Recommended PC Board Layout — Reference Page 74  
(Shroud Side Shown)

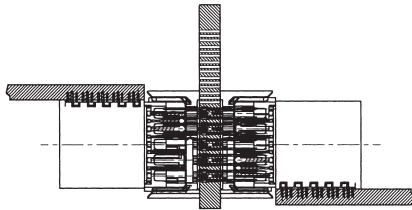


**Coplanar Daughtercards**  
(Pin 1a Header = Pin 5a Shroud Side)  
Recommended PC Board Layout — Reference Page 74  
(Shroud Side Shown)

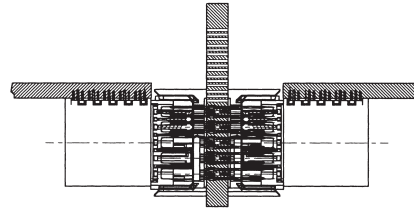


**Layout Guide for Midplane Applications**  
**10 Row Connectors**

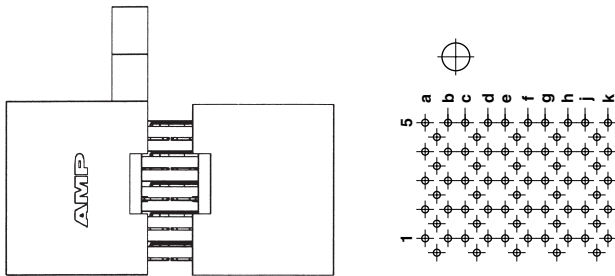
**Non-Coplanar Applications**



**Coplanar Applications**

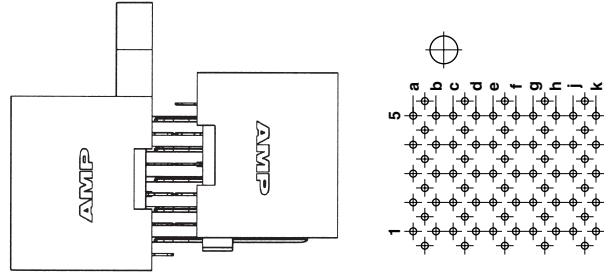


**Right Module**



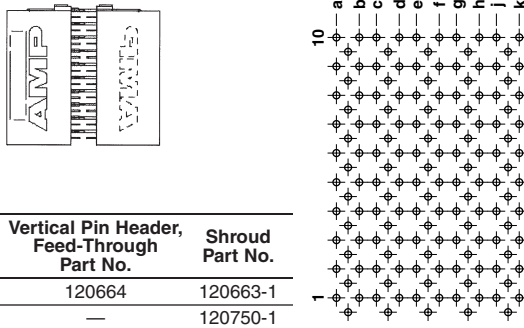
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
120665	120667-1

**Right Module**



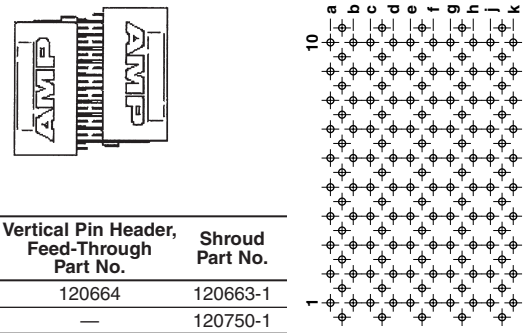
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
120665	120668-1

**Center Module**



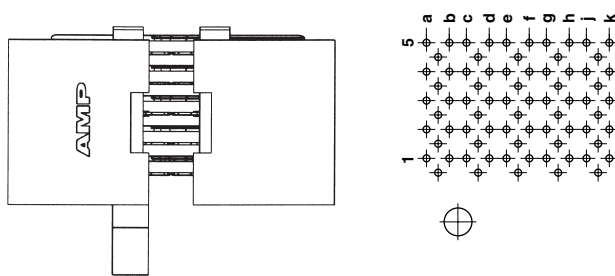
No. of Pos.	Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
100	120664	120663-1
50	—	120750-1

**Center Module**



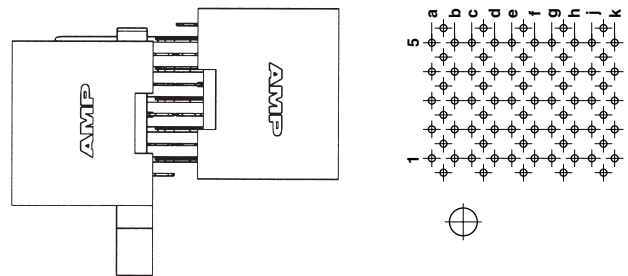
No. of Pos.	Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
100	120664	120663-1
50	—	120750-1

**Left Module**



Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
120666	120667-1

**Left Module**



Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
120666	120668-1

**Z-PACK HS3 Connector (Continued)**

**Coding Keys (10 Row Only)**

**Compatibility** — Z-PACK HS3,  
Z-PACK 12 row connectors  
Part Number 120639-3 (white)  
Part Number 120639-6 (red)

**Material & Finish** — Valox

**Power and Guide Hardware  
Universal Power Module  
Vertical Receptacle (3 Pos.)**

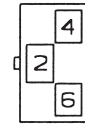
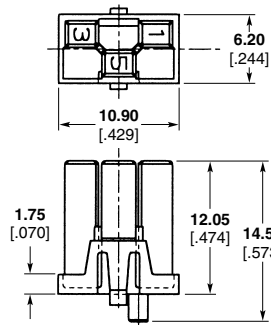
The Tyco Electronics Universal Power Module is a multi-position, modular, Hard Metric board-to-board power connector designed to be compatible with Z-PACK 2mm HM Connectors. The design is in an "inverse-sex" orientation and the vertical receptacle module meets the IEC 950 safety requirements for finger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

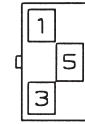
The Universal Power Module is compatible with a wide variety of other Tyco Electronics board-to-board connectors including Z-PACK HS3, Z-PACK HM-Zd, Z-PACK Strip-line 100, AMP-HDI, TBC, TBC Plus and Eurocard connectors.

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

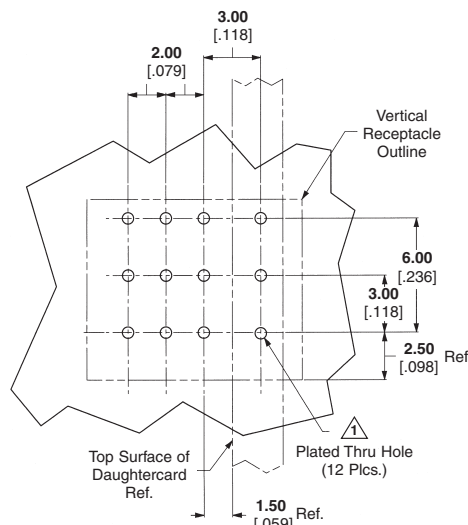
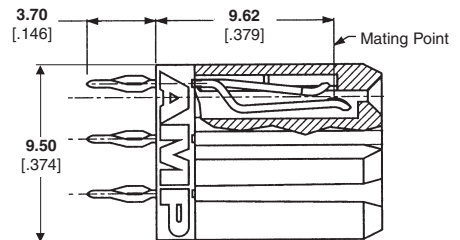
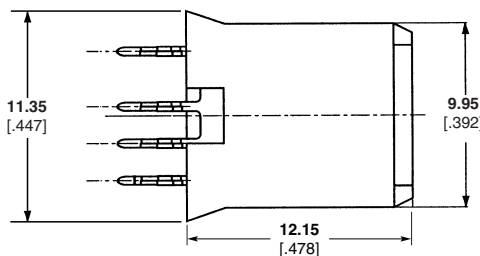
Generous alignment features designed into the housings and optional guide pins and receptacles make the Tyco Electronics Universal Power Module ideal for "blind mating" applications.



Part Number 120639-6



Part Number 120639-3



**Recommended PC Board Hole Layout**

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

**PCB Hole Dim.**  
 Drilled Hole =  $0.7000 \pm 0.025$  [0.2756 ± 0.010]  
 Finished Hole =  $0.60 \pm 0.05$  [0.24 ± 0.02]  
 Cu Thickness =  $0.375 \pm 0.0125$  [0.148 ± 0.0049]  
 SnPb Thickness =  $0.007 \pm 0.003$  [0.003 ± 0.001]

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

**Z-PACK HS3 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 80 and 81

**Application Tooling**

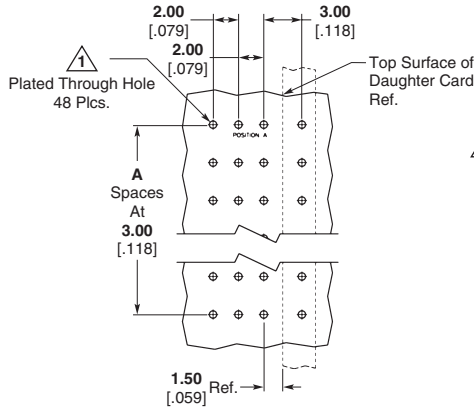
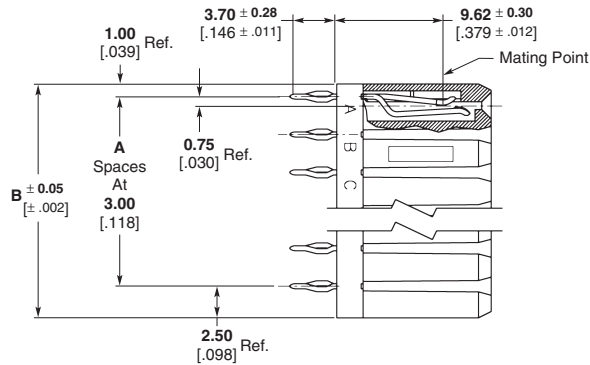
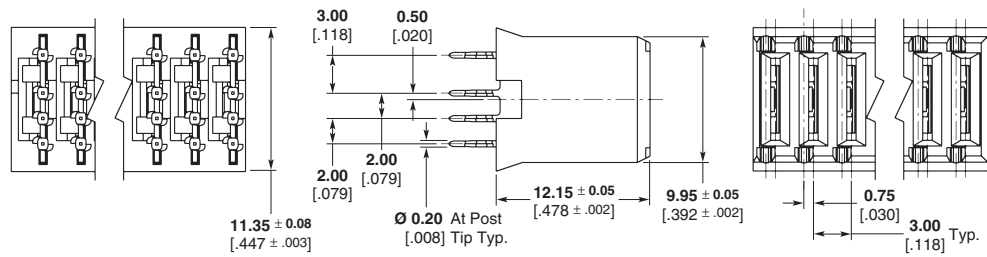
**Header**  
 Seating Tool, 224441-1  
 Board Support Fixture, 224442-1  
**Receptacle**  
 Seating Tool, 224421-1  
 Board Support Fixture, 217602-1

**Technical Documents**

**Product Specification**  
 108-1651  
**Application Specification**  
 114-1103

**Tyco Electronics Instruction Sheet**

408-4169 (Receptacle)  
 Seating Tool 224421-1)



**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 PCB Hole Layout**

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.

**Z-PACK HS3 Connector (Continued)**

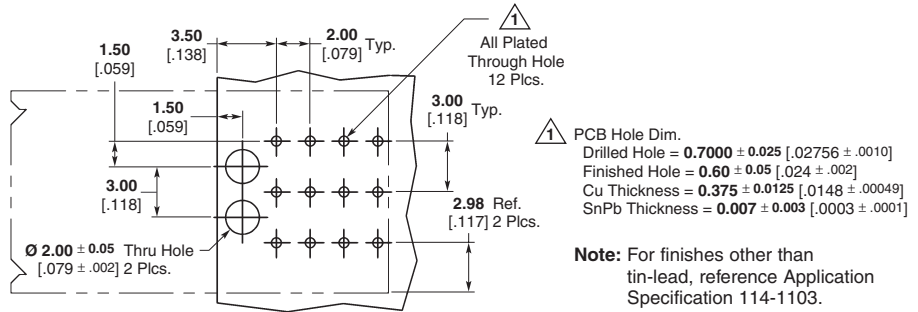
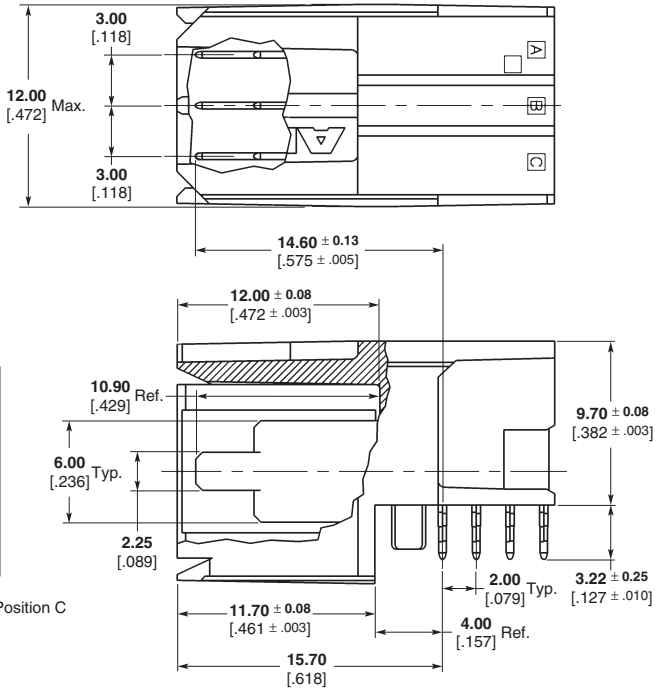
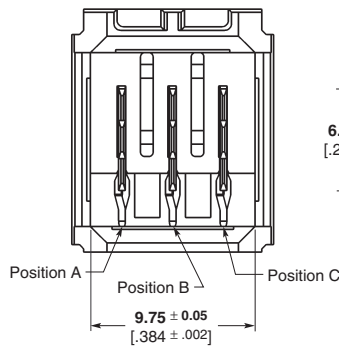
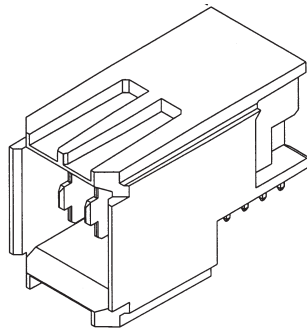
**Power and Guide Hardware**

(Continued)

**Universal Power Module Right Angle Headers (3 Pos.)**

**Material and Finish**

**Housing** — polyester, natural color  
**Contacts** — Copper alloy, plated 0.00127 [0.00050] min. gold in mating area, 0.00050 [0.00020] min. tin-lead on ACTION PIN post area, with entire contact underplated 0.00127 [0.00050] min. nickel



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

**Recommended PC Board Hole Layout**

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

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.

**Z-PACK HS3 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 [0.00050] min. gold in mating area, 0.00054 [0.00021] min. tin-lead on ACTION PIN area, with entire contact underplated 0.00127 [0.00050] min. nickel

**Related Product Data**

**Guiding Hardware (Optional)** — pages 80 and 81

**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**

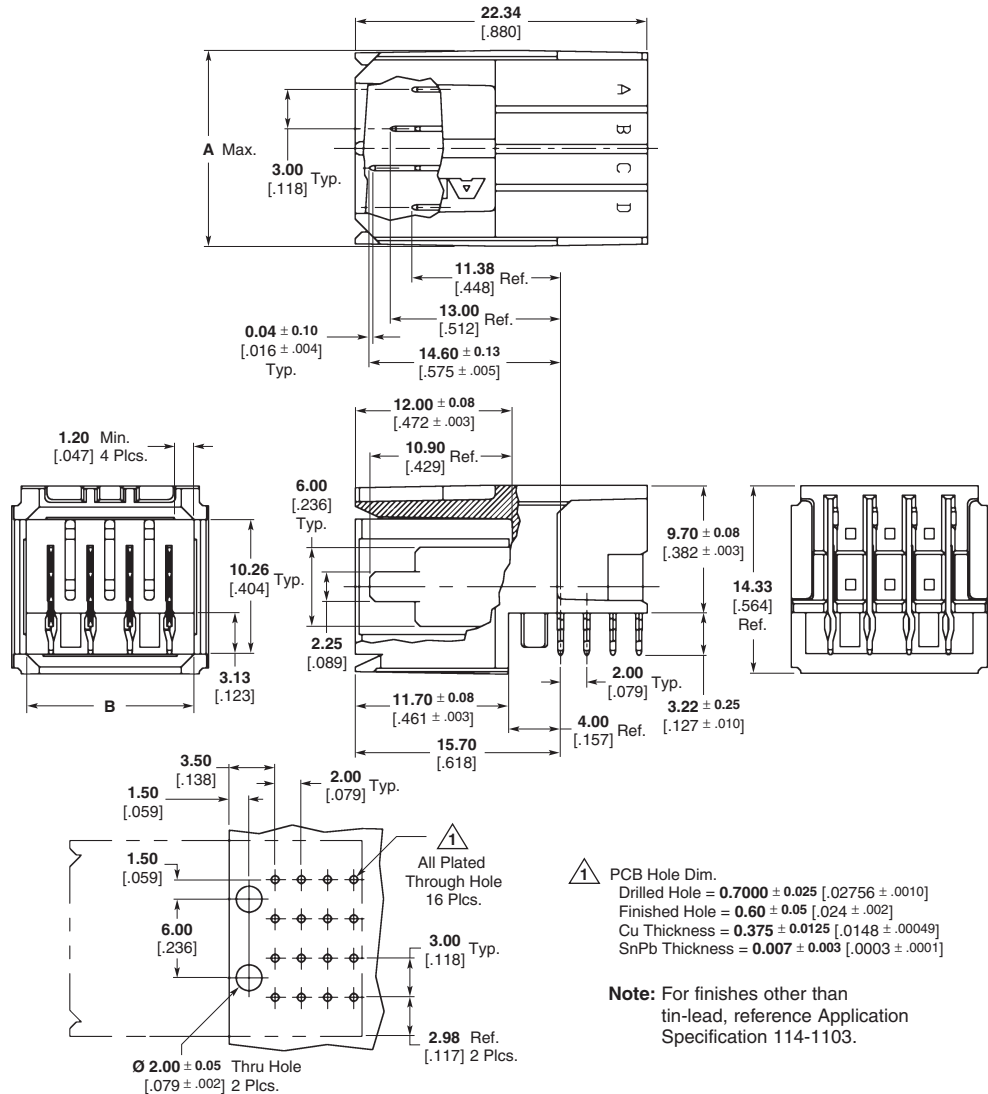
108-1651

**Application Specification**

114-1103

**Tyco Electronics Instruction Sheet**

408-4169 (Receptacle Seating Tool 224421-1)



**Recommended PC Board Hole Layout**

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

<sup>1</sup> Dash number indicates sequence pattern. See customer drawing for specific dash numbers.

\*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.

**Z-PACK HS3 Connector (Continued)**

**Power and Guide Hardware**

(Continued)

**AMP-HDI-Static Discharge Guide/Power Pins**

**Compatibility** — Z-PACK HS3, Z-PACK 2mm HM connectors

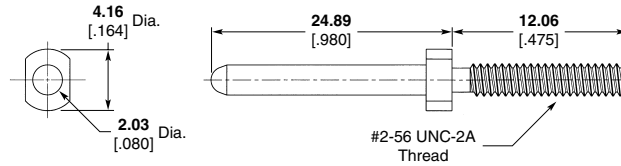
**Part Number** — 532828-5\*

**Nut** — 21124-4

**Washer** — 986794-1

**Max. Current Rating** — 10 Amperes

\*Additional sequence lengths are available, contact Tyco Electronics



**Material and Finish**

Brass, plated 0.00076 [0.00030] gold over 0.00127-0.00254 [0.00050-0.00100] nickel

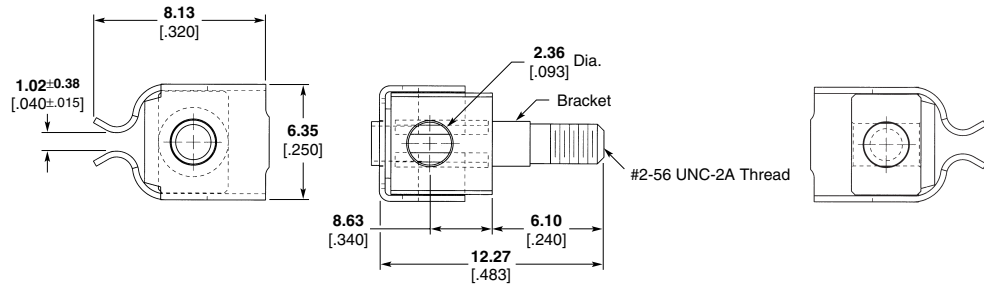
**AMP-HDI-Guide Pin/Power Receptacles**

**Compatibility** — Z-PACK HS3 Connector

**Part Number** — 535875-1\*

**Max. Current Rating** — 10 Amperes

\*Additional lengths are available, see customer drawing.



**Material and Finish**

**Contact Finish** — 0.00076 [0.00030] gold in contact area, over 0.00127 [0.00050] min. nickel underplate. Gold flash on remainder of the contact.

**ESD-Guide Pin/Feed-through**

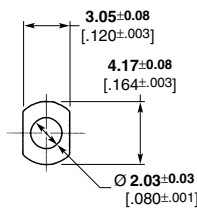
**Compatibility** — Z-PACK HS3 Connector

**Part Number** — 120759-2\* †

**Max. Current Rating** — 10 Amperes

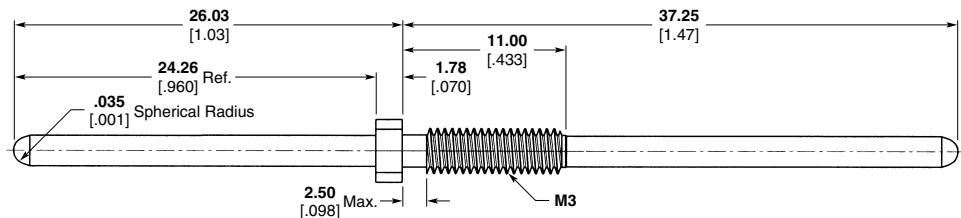
\*Additional sequence lengths are available, contact Tyco Electronics

† RoHS Compliant



**Material and Finish**

Brass, plated 0.00076 [0.00030] gold all over 0.001427-0.00254 [0.00050-0.00100] nickel underplate



**Z-PACK HS3 Connector (Continued)**

**Power and Guide Hardware**

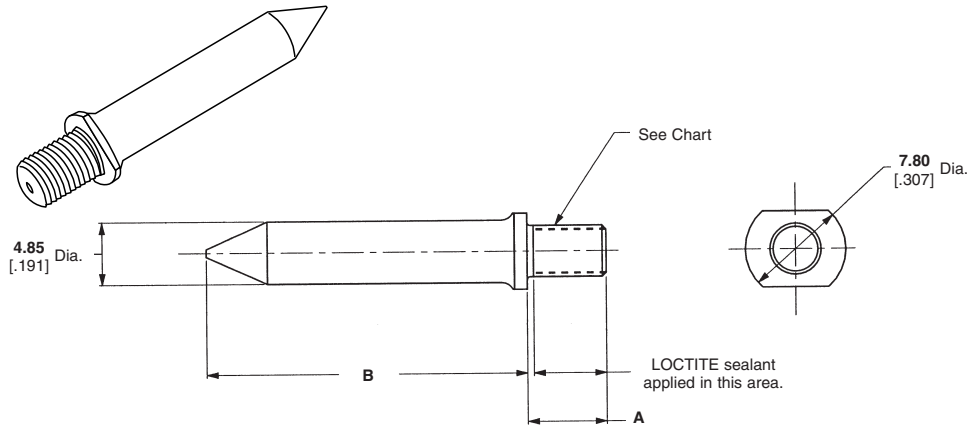
(Continued)

**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*
9.20 [.362]	25.16 [.991]	M4 x 7-6g	223969-7
12.70 [.500]	25.16 [.991]	8-32 UNC-2A	223969-4
12.70 [.500]	25.16 [.991]	M4 x 7-6g	223969-1
6.20 [.244]	25.16 [.991]	M4 x 7-6g	223956-1
12.70 [.500]	31.25 [1.230]	8-32 UNC-2A	1-223969-0
3.80** [.150]	27.16 [1.069]	M4 x 7-6h	120646-1
2.00** [.079]	27.16 [1.069]	M3 x 0.5	223988-1

\*6.35 Hex Base  
\*\*Internal Thread

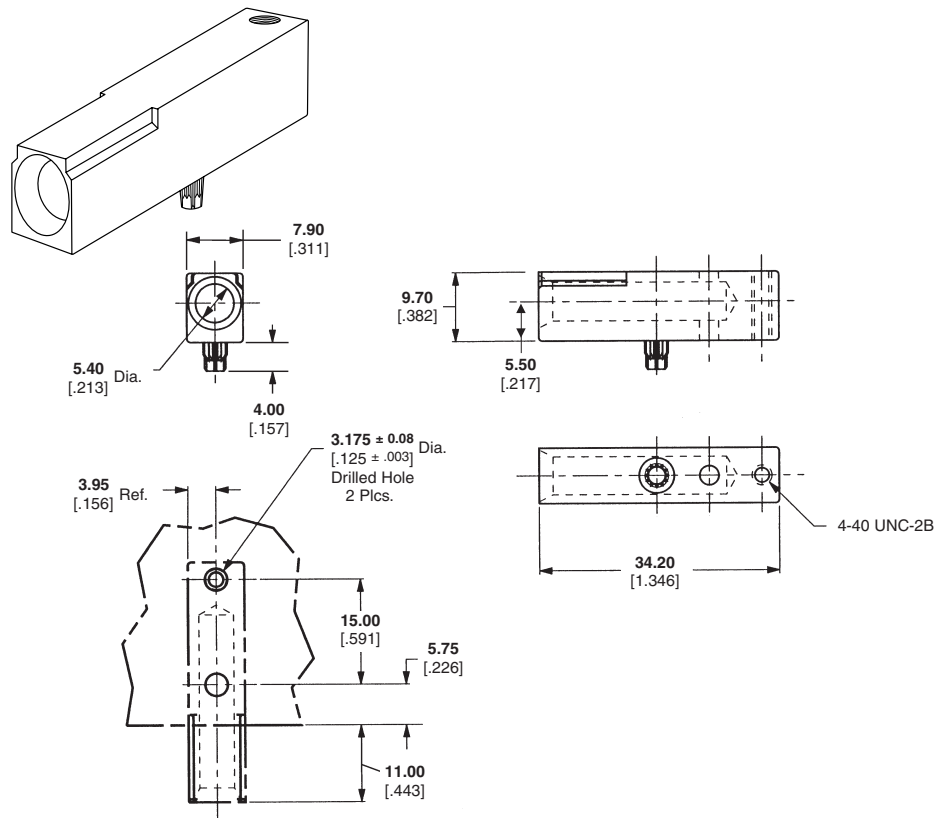
**Female Guide Module (Unkeyed)**

**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)

LOCTITE is a trademark of Henkel Corp.

**Recommended PC Board Hole Layout**



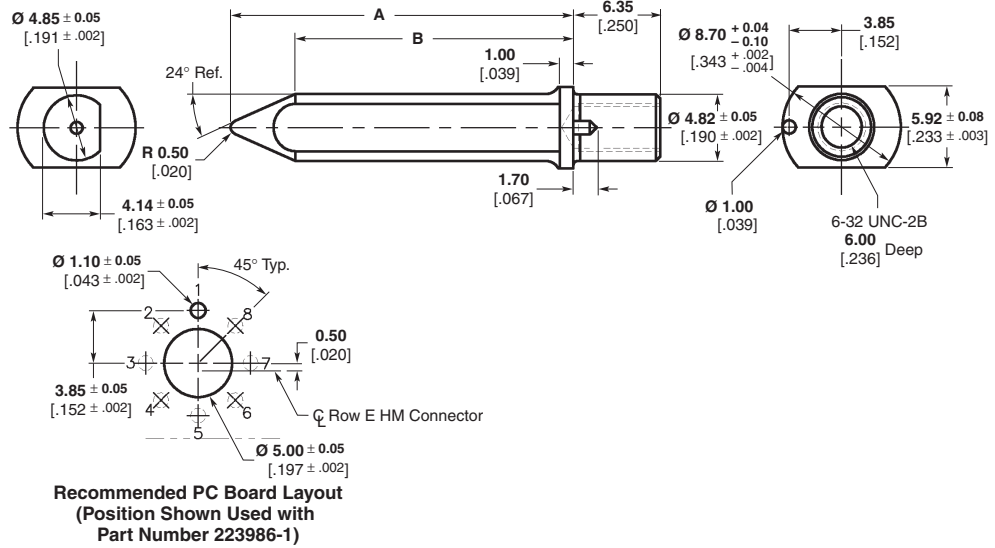
**Z-PACK HS3 Connector (Continued)**

**Power and Guide Hardware**  
(Continued)

**Guide Pin (Unkeyed)**

**Material and Finish**  
**Guide Pin** — Zinc alloy, chromate conversion coated  
**Part Number 223985**

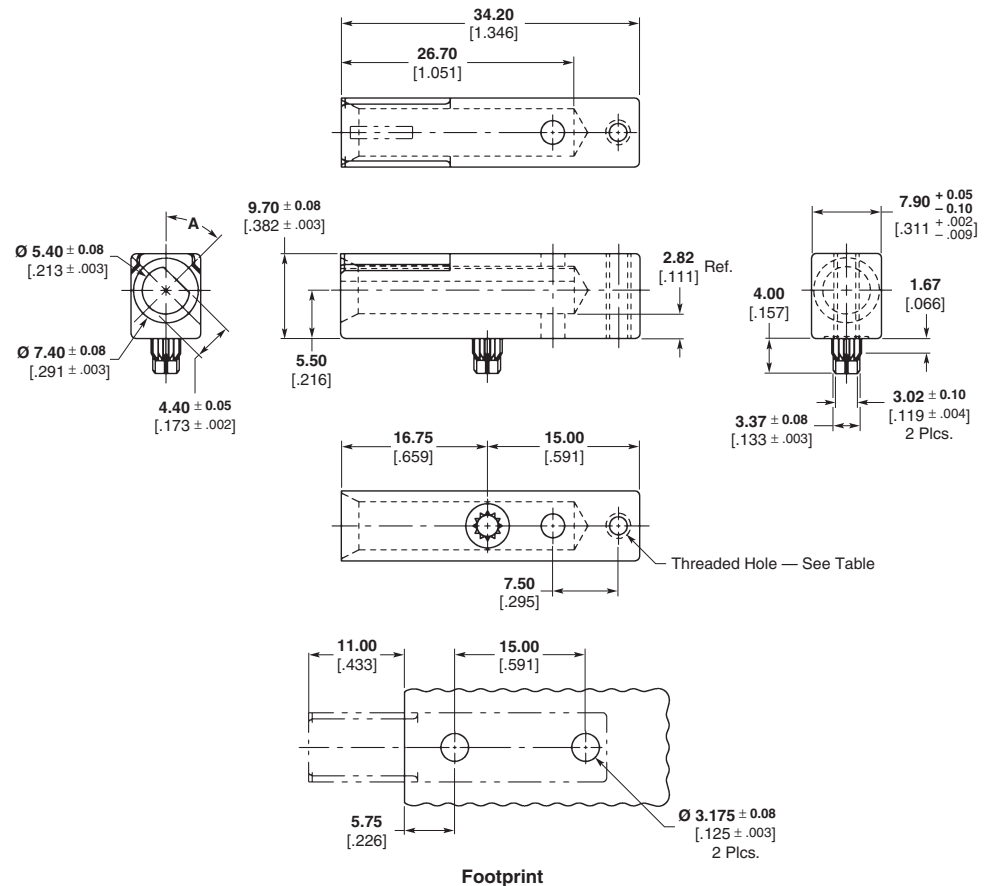
Dimension		Part Number
A	B	
25.16 .991	20.39 .803	223985-1
29.00 1.142	24.23 .954	223985-3



**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



**Z-PACK HS3 Connector (Continued)**

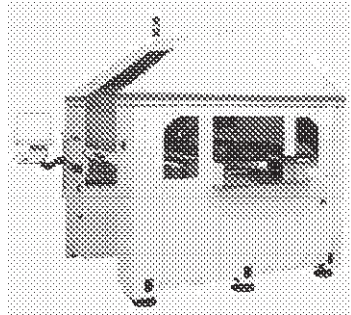
**Z-PACK HS-3 Connector Mating Sequence Chart**



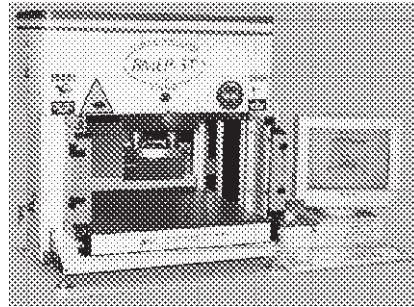
Product Family	Dim. C	Dim. A Fully Mated	Contact	Dim. B.		Fully Mated Wipe Length
				Reliable Mate	First Mate Last Break	
HM-Zd	1.50 .059	12.50 .492	Ground Shield	16.78 [.661]	17.55 [.691]	4.28 [.169]
			Signal Level 2	15.41 [.607]	15.85 [.624]	2.91 [.115]
			Signal Level 1	13.91 [.548]	14.35 [.565]	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]
			Power Level 3	23.75 [.935]	—	11.25 [.443]
MULTIGIG RT Power Module	5.50 .217	12.50 .492	Power Level 2	22.25 [.876]	—	9.75 [.384]
			Power Level 1	20.75 [.817]	—	8.25 [.325]
			Guide Pin Key	33.25 [1.309]	N/A	20.75 [.817]
MULTIGIG RT Guide Hardware	N/A	12.50 .492	Guide ESD Contact	30.75 [1.211]	—	18.25 [.719]
			Ground	17.08 [.672]	17.60 [.693]	4.78 [.188]
<b>HS-3</b>	1.50 .059	12.50 .492	Signal Level 2	16.05 [.632]	16.47 [.648]	3.75 [.148]
			Signal Level 1	14.55 [.573]	14.97 [.589]	2.25 [.089]
			Power Level 3	20.25 [.797]	20.95 [.825]	8.10 [.319]
UPM	3.50 .138	12.50 .492	Power Level 2	18.65 [.734]	19.35 [.762]	6.50 [.256]
			Power Level 1	17.03 [.670]	17.73 [.698]	4.88 [.192]
			Guide Pin Key	31.39 [1.236]	36.16 [1.424]	N/A
UPM Guide Hardware	5.75 .226	12.50 .492	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
			PreMate Power — Level 1	—	16.84 [.663]	5.61 [.221] Min.
MULTI-BEAM XL Right Angle Header to Vertical Receptacle	5.08 .200	14.73 .580	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.
			PreMate Power — Level 1	—	15.32 [.603]	5.61 [.221] Min.
MULTI-BEAM XL Right Angle Receptacle to Vertical Header	3.81 .150	13.21 .520	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.
			PreMate Power — Level 1	—	15.32 [.603]	5.61 [.221] Min.

**Z-PACK HS3 Connector** (Continued)

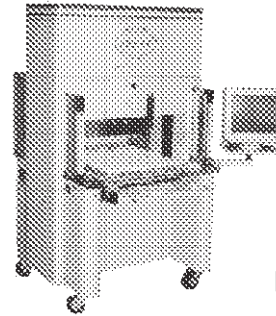
**Application Tooling and Equipment**



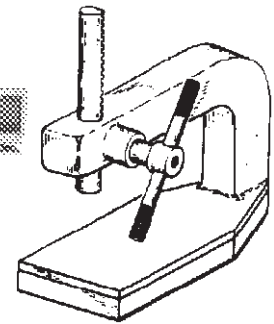
1585280-1 Model AP3



1585696-1 Model BMEP 5T

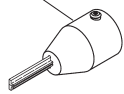


1585699-1 Model MEP 6T

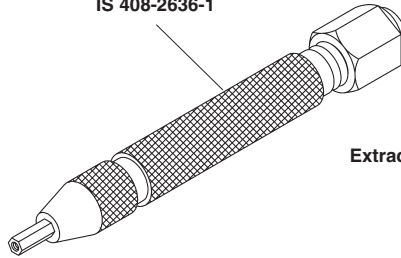


Typical Manual Arbor Frame Assembly (Commercially Available)

Insertion Tool Assembly IS 408-9979



Contact Replacement Tool IS 408-2636-1



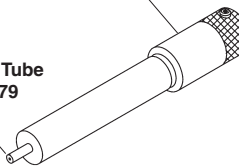
Replacement Pin Assembly IS 408-9979



Setscrew IS 408-9979



Extraction Tool Assembly IS 408-9979



Tool Tip IS 408-9979

Pusher IS 408-9979



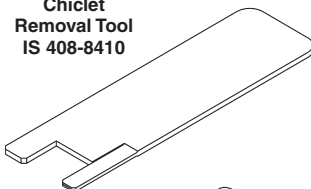
Spacer



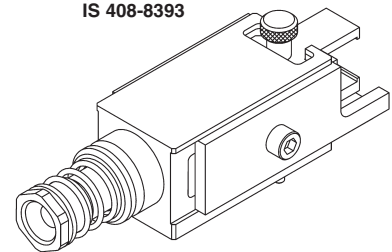
Pin Support Tube IS 408-9979

Pin Repair Kit IS 408-9979

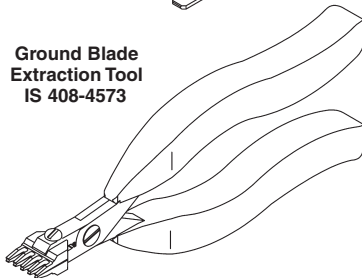
Chiclet Removal Tool IS 408-8410



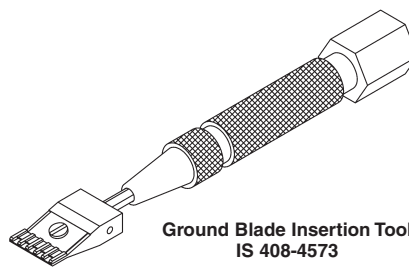
Housing Removal Tool Kit IS 408-8393



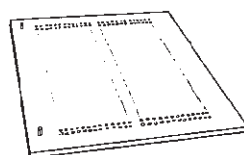
Ground Blade Extraction Tool IS 408-4573



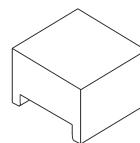
Ground Blade Repair Kit IS 408-4573



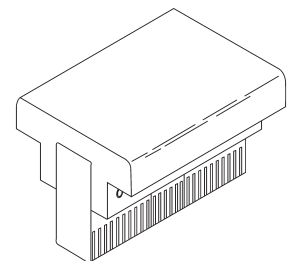
Ground Blade Insertion Tool IS 408-4573



Typical PC Board Support (Customer Supplied)



Typical Receptacle Seating Tool IS 408-8500



Typical Pin Header Seating Tool IS 408-8501