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# 4

## Z-PACK HS3 Connector

## Z-PACK HS3 Connector (Continued)

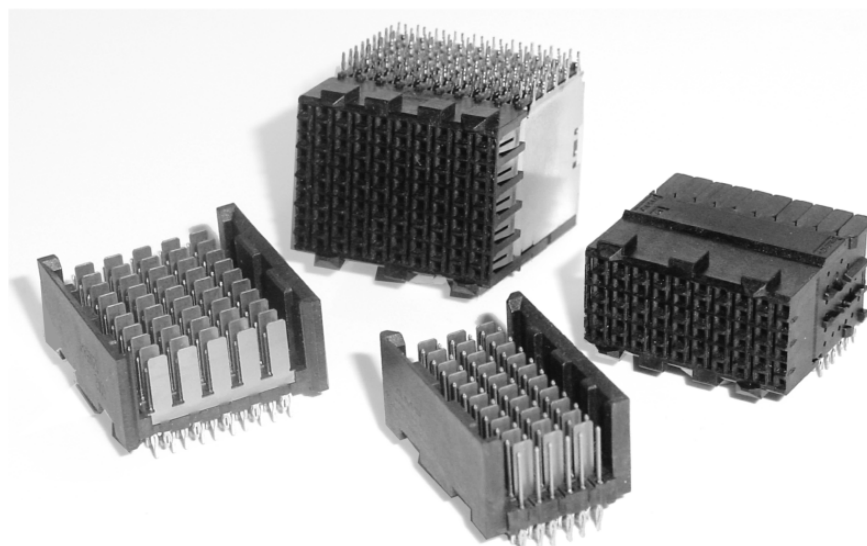
### Product Line Overview

#### 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 #138505; 10 row EPR #138506

**Routing Guide:** <http://hs3.tycoelectronics.com>  
Routing Guide #20GC017

<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.

IGES is a trademark of IAMBA Networks, Inc.

PRO/E is a trademark of Parametric Technology Corp.

## 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%

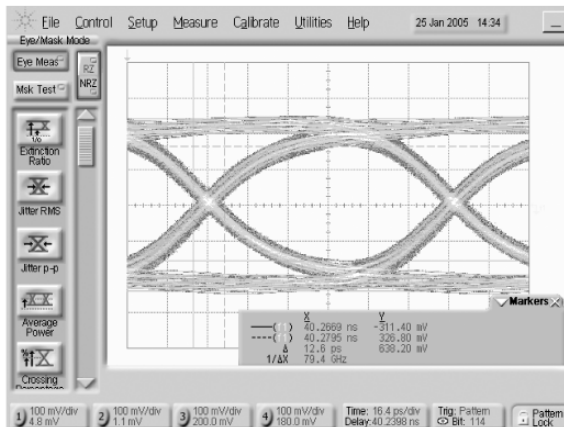
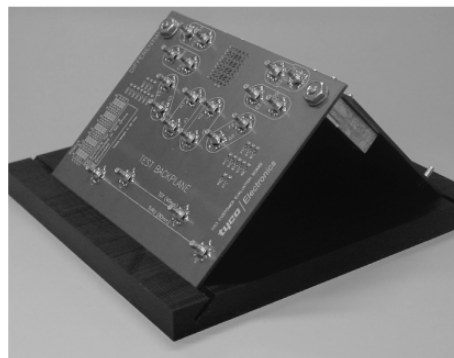
#### Synchronous Diff. NEXT (%)

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.

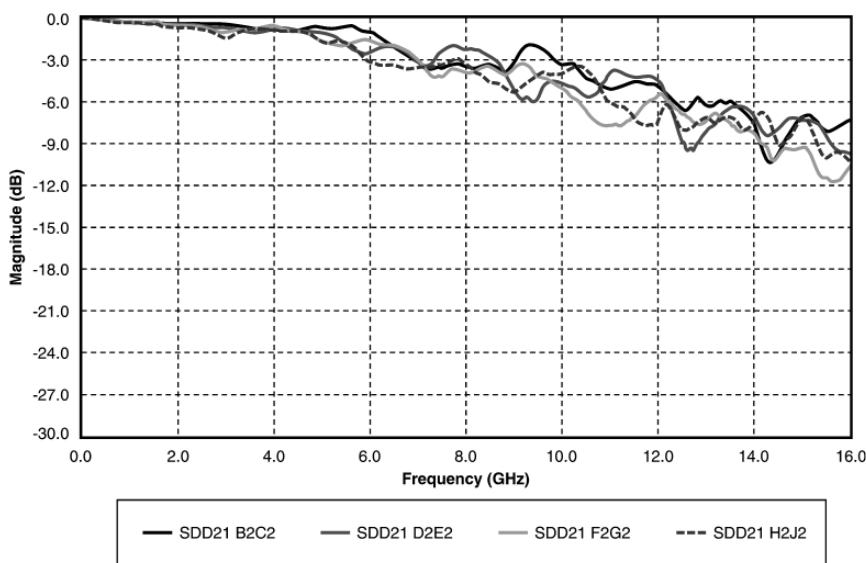
Noise includes 1.60 [.063] footprints on both sides of the connector.

Totals include contributions from 8 adjacent aggressor pairs.



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

**4**  
Z-PACK HS3 Connector



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

**Note:** All part numbers are RoHS compliant.

## 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.

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)

#### 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.

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)

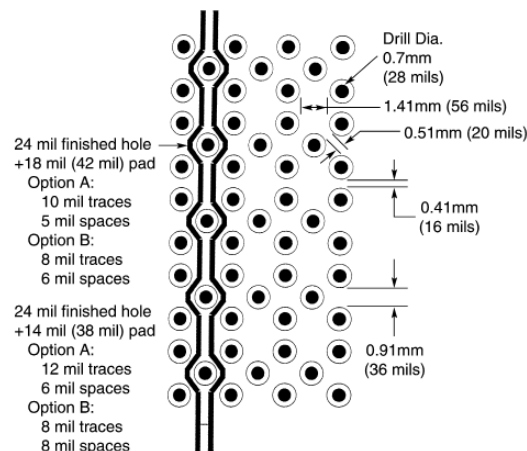
Hole location tolerance: +/- 2 mils (0.05mm)

Pad/Pad artwork tolerance: +/- 2 mils (0.05mm)

Feature tolerance (1 oz foil): +/- 0.075 mils (0.0175mm)

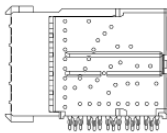
### Z-PACK HS3 Connector Routing Pattern

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)

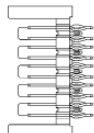


## Z-PACK HS3 Connector (Continued)

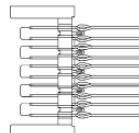
### Part Number Selection Chart 10 Row Z-PACK HS3 Connector



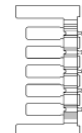
**Part Number 5120874**  
**50 Position**  
**Right Receptacle**  
**Univ Pwr Guide Pin**



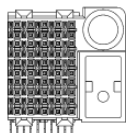
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**50 Position**  
**Right Header**  
**Univ Pwr Guide Pin**



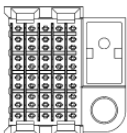
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**Right Feed-Through**  
**ESD/HDI Guide Pin**



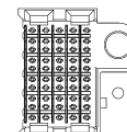
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**Right Shroud**  
**ESD/HDI Guide Pin**



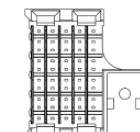
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**Right Receptacle**  
**ESD/HDI Guide Pin**



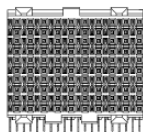
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**Right Header**  
**ESD/HDI Guide Pin**



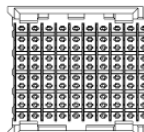
**Part Number 5120664**  
**100 Position**  
**Center Feed-Through**



**Part Number 5120663**  
**100 Position**  
**Center Shroud**



**Part Number 5120790**  
**100 Position**  
**Center Receptacle**



**Part Number 5120658**  
**100 Position**  
**Center Header**



**Part Number 5120791**  
**50 Position**  
**Center Receptacle**



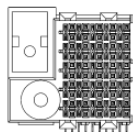
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**50 Position**  
**Center Header**



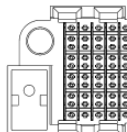
**Part Number 5120748**  
**50 Position**  
**Center Feed-Through**



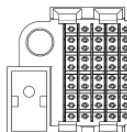
**Part Number 5120750**  
**50 Position**  
**Center Shroud**



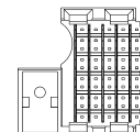
**Part Number 5120793**  
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**Left Receptacle**  
**ESD/HDI Guide Pin**



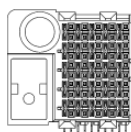
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**50 Position**  
**Left Header**  
**ESD/HDI Guide Pin**



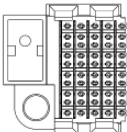
**Part Number 5120666**  
**50 Position**  
**Left Feed-Through**  
**ESD/HDI Guide Pin**



**Part Number 5120668**  
**50 Position**  
**Left Shroud**  
**ESD/HDI Guide Pin**



**Part Number 5120875**  
**50 Position**  
**Left Receptacle**  
**Univ Pwr Guide Pin**

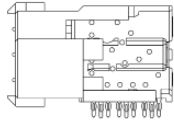


**Part Number 5120672**  
**50 Position**  
**Left Header**  
**Univ Pwr Guide Pin**

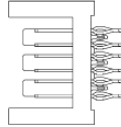
**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

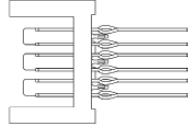
### Part Number Selection Chart 6 Row Z-PACK HS3 Connector



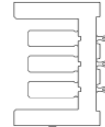
**Part Number 5120788**  
30 Position  
Right Receptacle



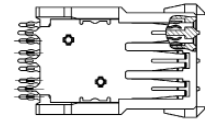
**Part Number 5120677**  
30 Position  
Right Header



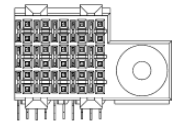
**Part Number 5120680**  
30 Position  
Right Header  
Feed-Through



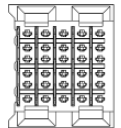
**Part Number 5120683**  
30 Position  
Right Shroud



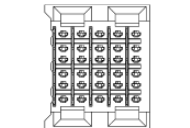
**Part Number 120949-1**  
60 Position  
Receptacle  
with Guide Module



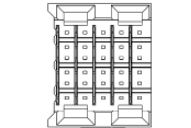
**Part Number 5120786**  
60 Position  
Center Receptacle



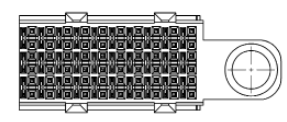
**Part Number 5120674**  
60 Position  
Center Header



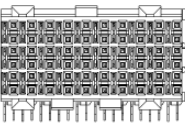
**Part Number 5120679**  
60 Position  
Center Header  
Feed-Through



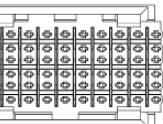
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Center Shroud



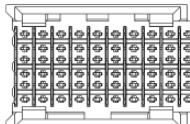
**Part Number 120948-1**  
90 Position  
Receptacle



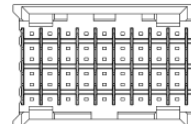
**Part Number 5120787**  
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Center Receptacle



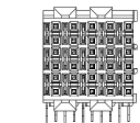
**Part Number 5120732**  
30 Position  
Center Header



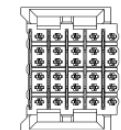
**Part Number 5120742**  
30 Position  
Center Header  
Feed-Through



**Part Number 5120743**  
30 Position  
Center Shroud



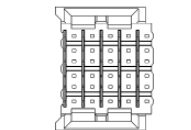
**Part Number 5120789**  
30 Position  
Left Receptacle



**Part Number 5120678**  
30 Position  
Left Header



**Part Number 5120681**  
30 Position  
Left Header  
Feed-Through

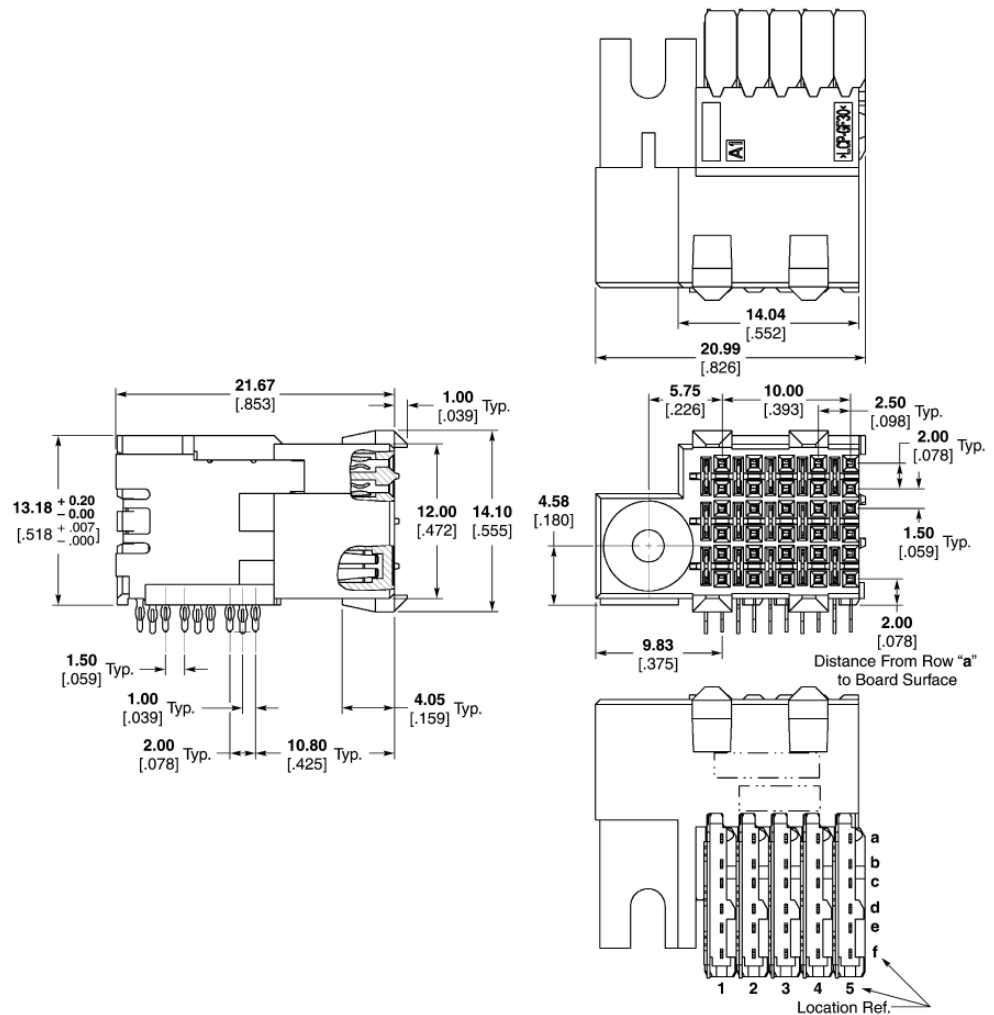


**Part Number 5120684**  
30 Position  
Left Shroud

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

**Right Angle Receptacle  
6 Row, Left Module (ac-  
cepts ESD Guide Pin)**



### Pin Header Assemblies

Number of Positions	Part Number	Application Tooling					
		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
30	5120789-1	1338742-1	408-8394	1338744-1	408-8393	1338745-1	408-8410

### P.C.B. Hole Dimensions

**Drilled Hole** — 0.7±0.025mm

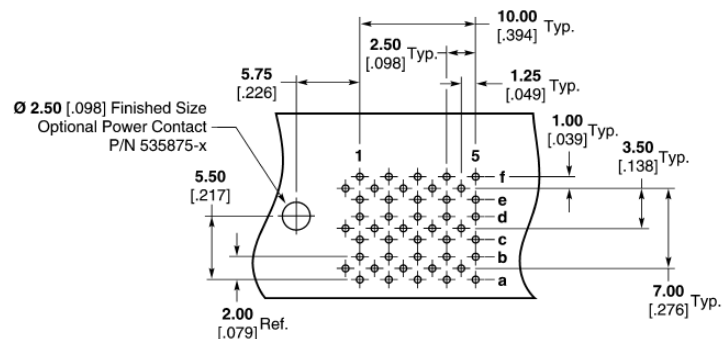
**Fin. Hole** — 0.55 to 0.65mm

**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.

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.



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

### 6 Row, Center Module





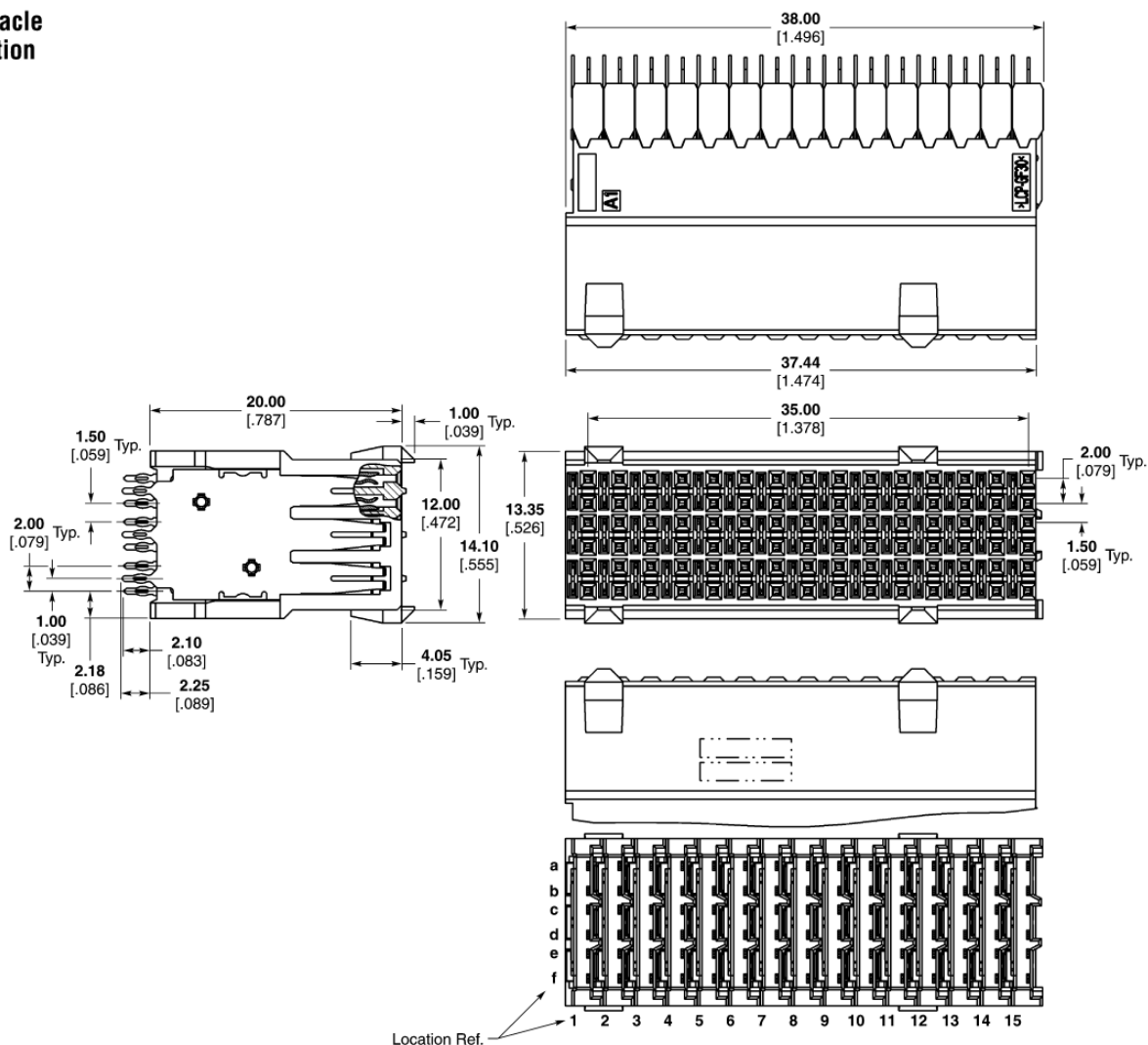
**6 Row, Right Module  
(accepts ESD Guide Pin)**



Number of Positions	Part Number	Application Tooling					
		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
30	5120788-1	1338742-1	408-8394	1338744-1	408-8393	1338745-1	408-8410

## Z-PACK HS3 Connector (Continued)

### Vertical Receptacle 6 Row, 90 Position



Number of Positions	Part Number	Application Tooling					
		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
90	120948-1	1725624-1	408-8870	—	—	—	—

### P.C.B. Hole Dimensions

**Drilled Hole** — 0.7±0.025mm

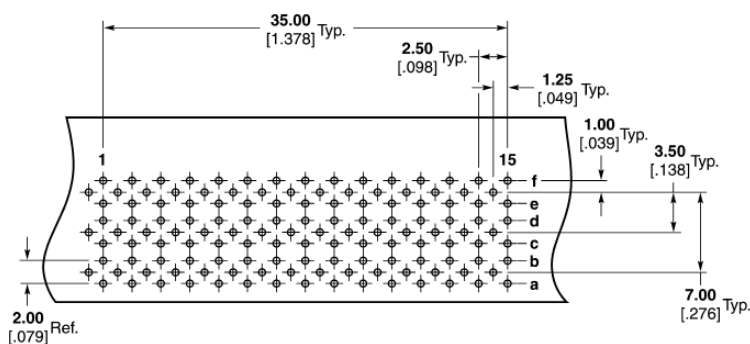
**Fin. Hole** — 0.55 to 0.65mm

**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.

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.



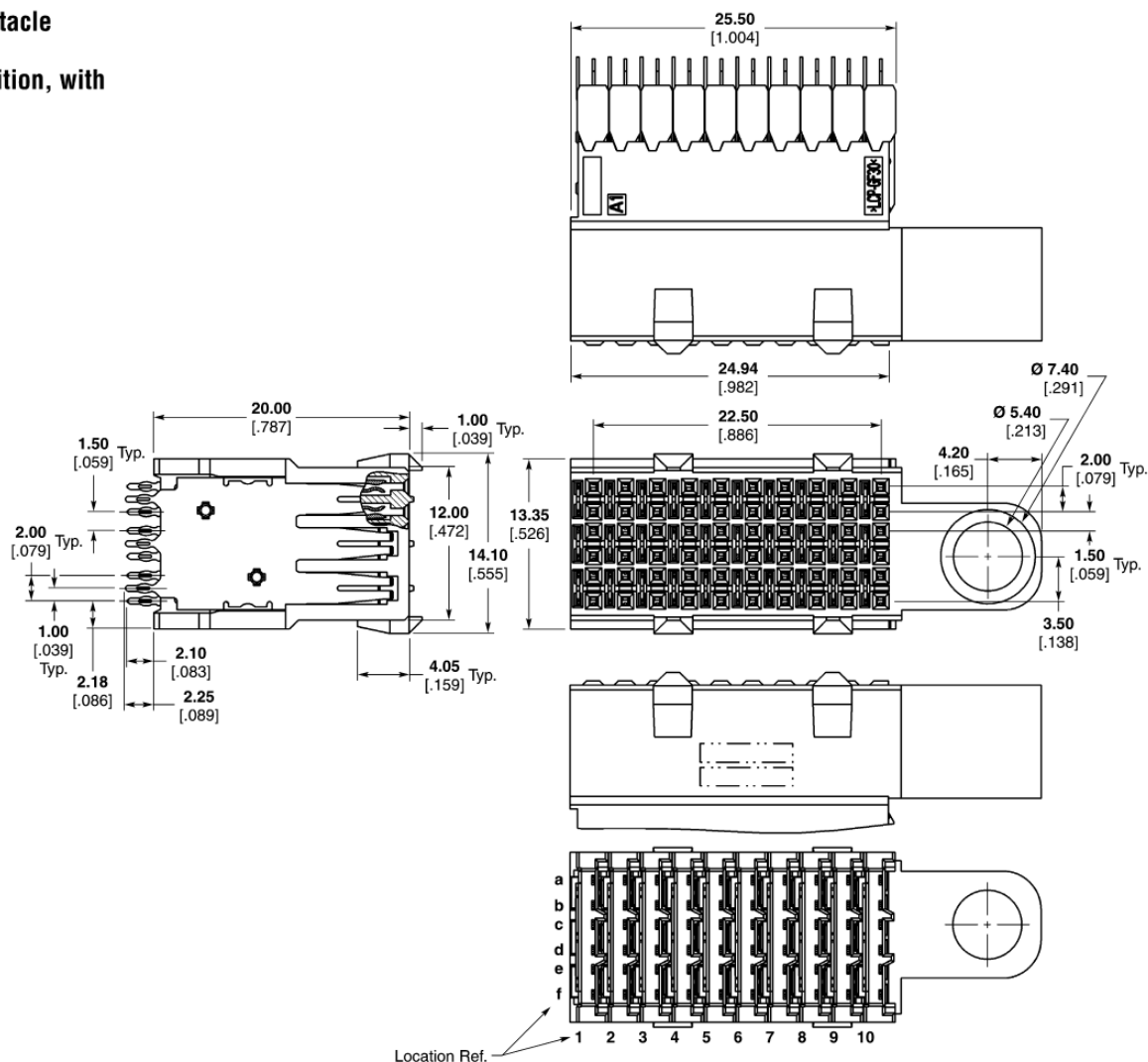
**Recommended PC Board Layout  
(Component Side Shown)**

## Z-PACK HS3 Connector (Continued)

### Vertical Receptacle

(Continued)

### 6 Row, 60 Position, with Guide Module



4  
Z-PACK HS3 Connector

Number of Positions	Part Number	Application Tooling					
		Insertion	IS Sheet	Hsg Removal	IS Sheet	Chiclet Removal	IS Sheet
60	120949-1	1725623-1	408-8870	—	—	—	—

### P.C.B. Hole Dimensions

**Drilled Hole** — 0.7±0.025mm

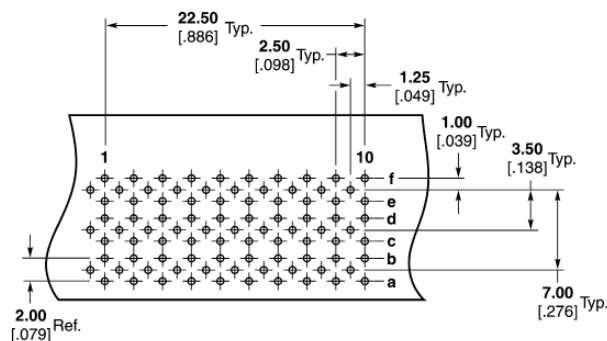
**Fin. Hole** — 0.55 to 0.65mm

**Cu-thickness** — 0.025 to 0.050mm

**SnPb-thickness** — 0.004 to 0.010mm

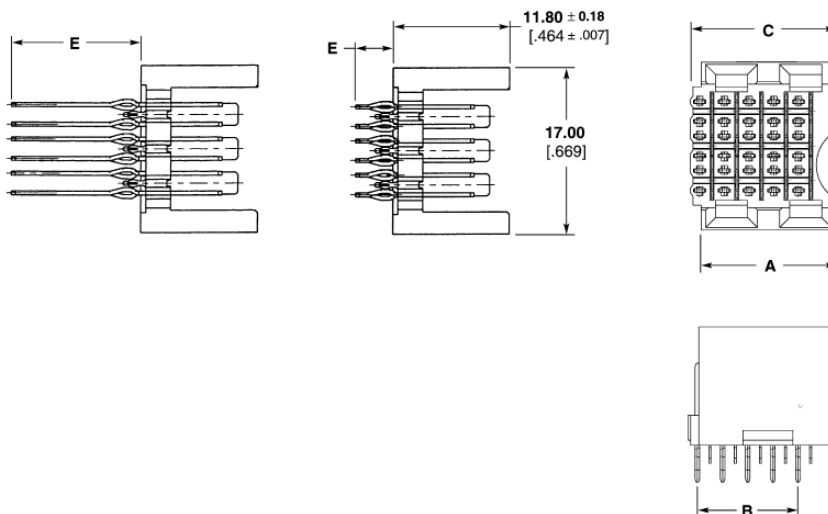
**Note:** For finishes other than Tin-Lead, reference Application Specification 114-13020.

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.



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

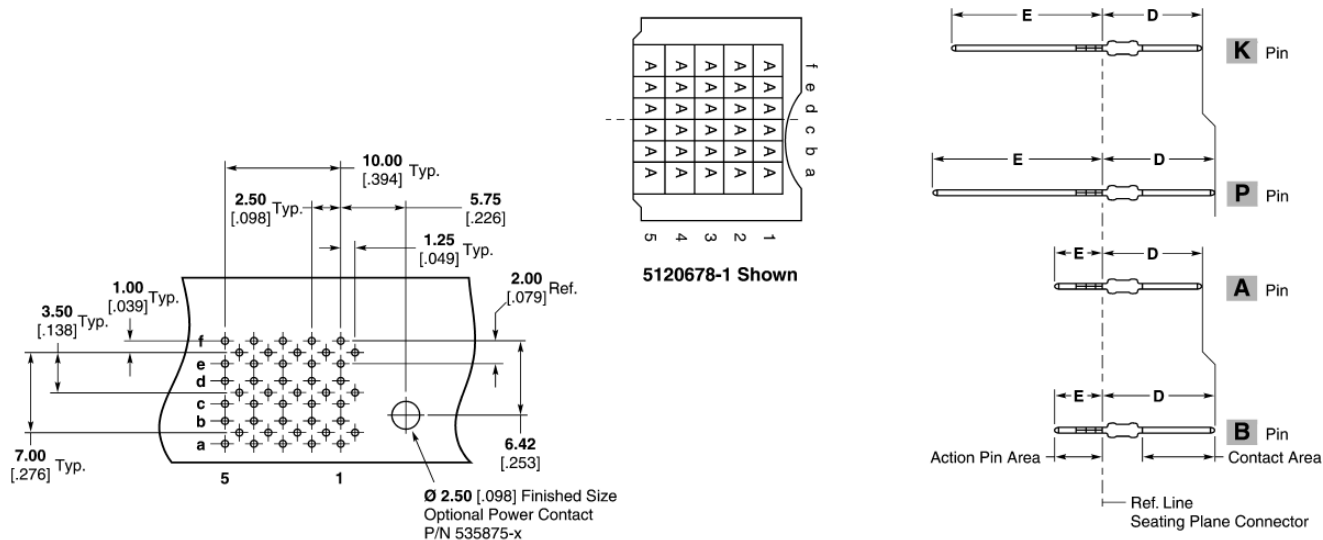
**Vertical Pin Header  
Assemblies  
6 Row, Left Module  
(accepts ESD Guide Pin)**



**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
30	13.70 .539	10.00 .393	14.80 .583	8.20 .322	3.70 .145	<b>A</b>	5120678-1	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>	5120678-2	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>	5120681-1	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>	5120681-2	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573



**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

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

#### P.C.B. Hole Dimensions

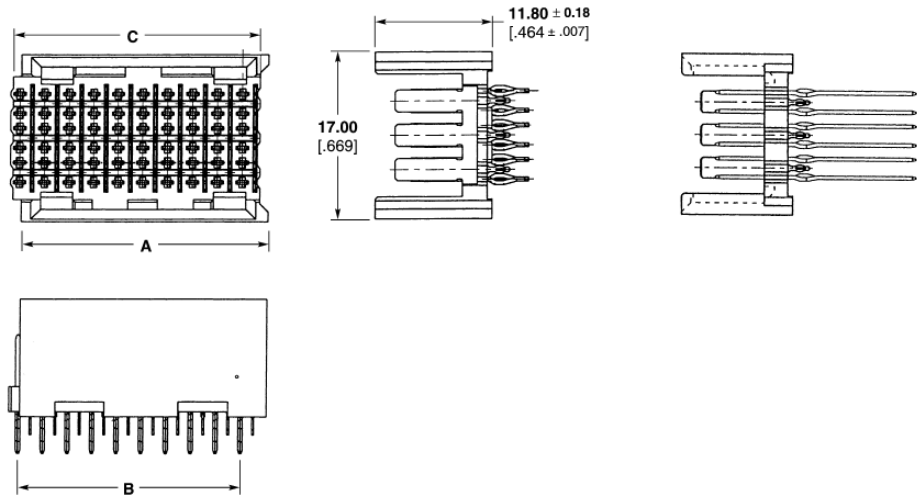
Drilled Hole — 0.7±0.025mm

Fin. Hole — 0.55 to 0.65mm

Cu-thickness — 0.025 to 0.050mm

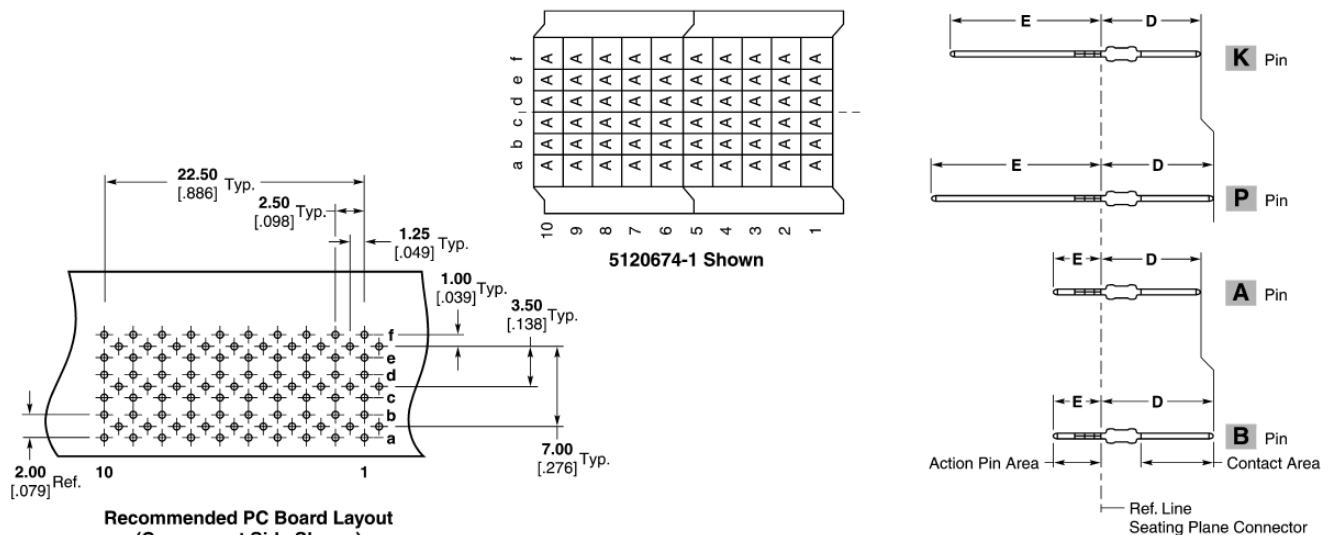
SnPb-thickness — 0.004 to 0.010mm

**Note:** For finishes other than Tin-Lead, reference Application Specification 114-13020.



### Pin Header Assemblies

Number of Positions	Dimensions					Pin Ref.	Part Numbers	Application Tooling					
	A	B	C	D	E			Seating	IS Sheet	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>	5120674-1	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>	5120674-2	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>	5120679-1	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>	5120679-2	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>	5120732-1	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>	5120732-2	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>	5120742-1	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>	5120742-2	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573

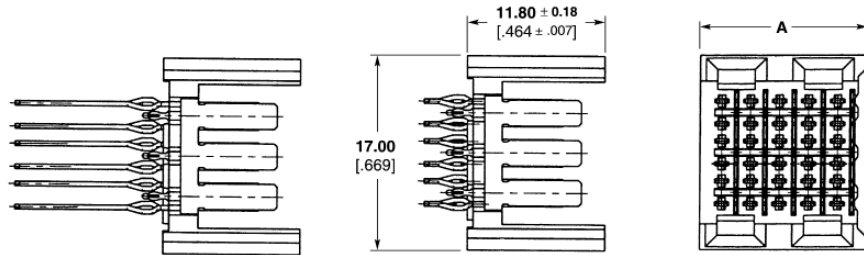


**Recommended PC Board Layout  
(Component Side Shown)  
For Non-Midplane Applications  
For Midplane Applications Reference Page 112**

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

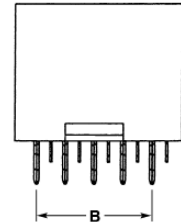
### Vertical Pin Header Assemblies (Continued) 6 Row, Right Module (accepts ESD Guide Pin)



### P.C.B. Hole Dimensions

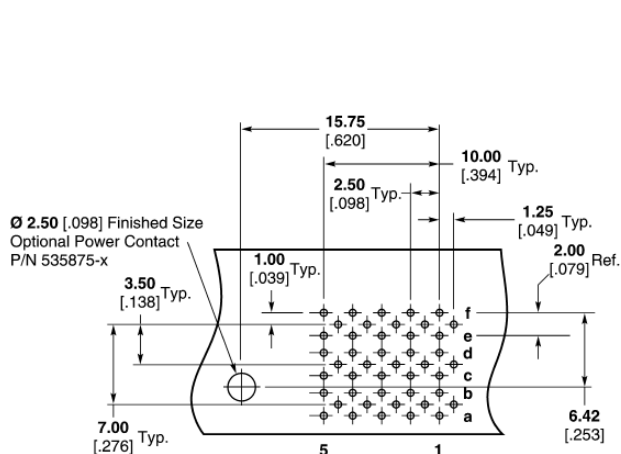
**Drilled Hole** — 0.7±0.025mm  
**Fin. Hole** — 0.55 to 0.65mm  
**Cu-thickness** — 0.025 to 0.050mm  
**SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than Tin-Lead, reference Application Specification 114-13020.

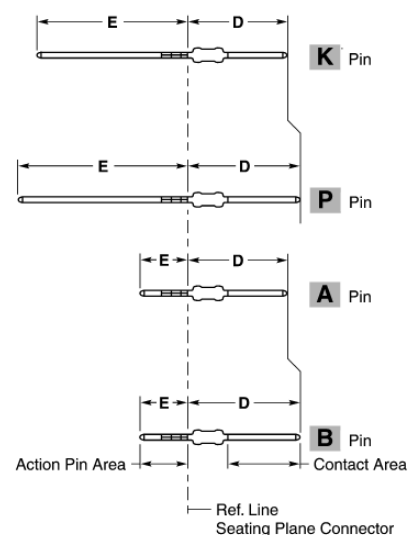
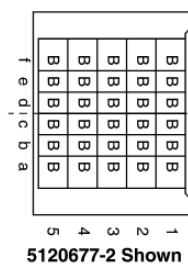


### Pin Header Assemblies

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>	5120677-1	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>	5120677-2	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>	5120680-1	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>	5120680-2	91313-1	408-4546	354687-2	408-9979	1320534-1	408-4573



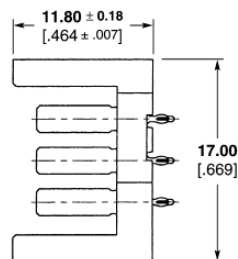
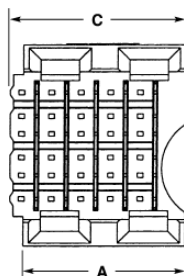
**Recommended PC Board Layout  
(Component Side Shown)  
For Non-Midplane Applications  
For Midplane Applications Reference Page 112**



**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

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



### P.C.B. Hole Dimensions

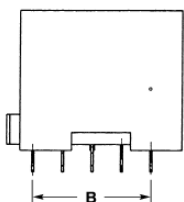
**Drilled Hole** — 0.7±0.025mm

**Fin. Hole** — 0.55 to 0.65mm

**Cu-thickness** — 0.025 to 0.050mm

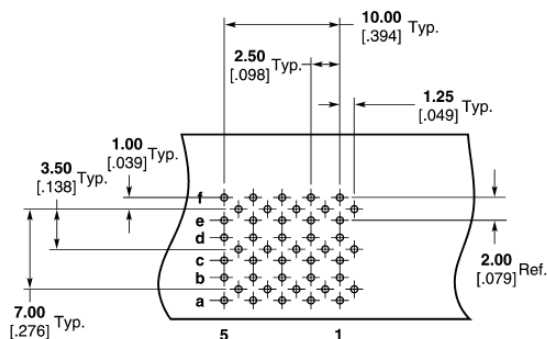
**SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than Tin-Lead, reference Application Specification 114-13020.

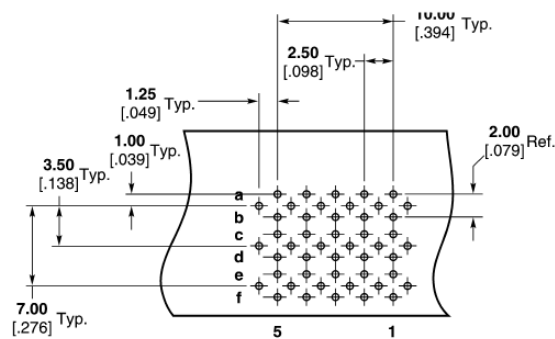


### Pin Header Assemblies

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	5120684-1	91313-1	408-4546	1320534-1	408-4573



**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1f Shroud Side)  
Recommended PC Board Layout — Reference Page 112  
(Shroud Side Shown)

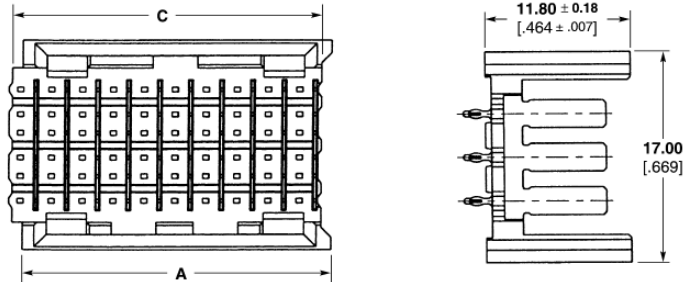


**Coplanar Daughtercards**  
(Pin 1a Header = Pin 5a Shroud Side)  
Recommended PC Board Layout — Reference Page 112  
(Shroud Side Shown)

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

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



### P.C.B. Hole Dimensions

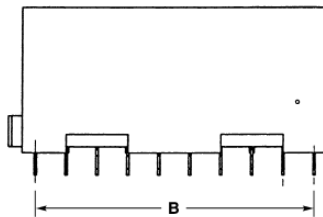
**Drilled Hole** — 0.7±0.025mm

**Fin. Hole** — 0.55 to 0.65mm

**Cu-thickness** — 0.025 to 0.050mm

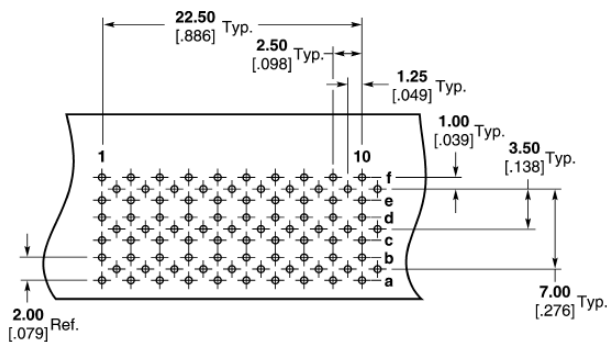
**SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than Tin-Lead, reference Application Specification 114-13020.

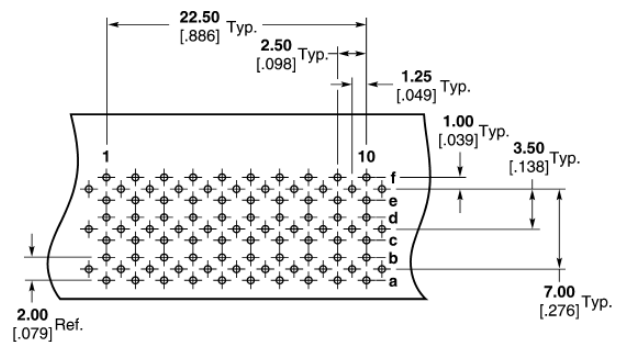


### Pin Header Assemblies

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	5120682-1	91313-2	408-4546	1320534-1	408-4573
30	12.57 .494	10.00 .393	12.40 .488	5120743-1	91313-1	408-4546	1320534-1	408-4573



**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1f Shroud Side)  
Recommended PC Board Layout — Reference Page 112  
(Shroud Side Shown)



**Coplanar Daughtercards**  
(Pin 1a Header = Pin 5a Shroud Side)  
Recommended PC Board Layout — Reference Page 112  
(Shroud Side Shown)

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.



## Z-PACK HS3 Connector (Continued)

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

#### P.C.B. Hole Dimensions

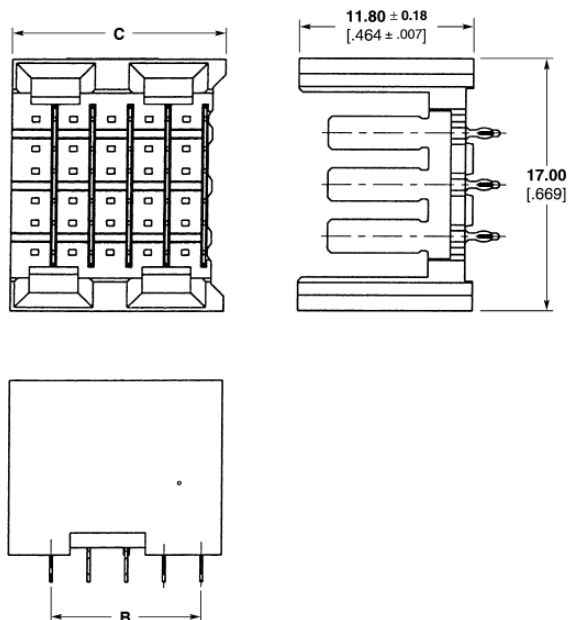
**Drilled Hole** — 0.7±0.025mm

**Fin. Hole** — 0.55 to 0.65mm

**Cu-thickness** — 0.025 to 0.050mm

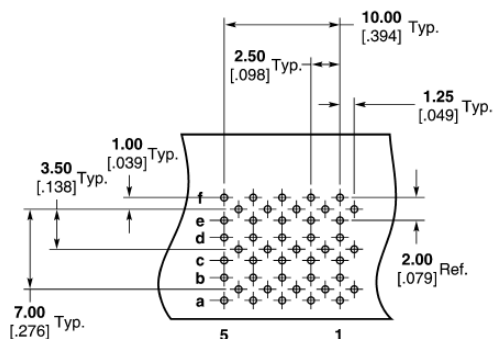
**SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than  
Tin-Lead, reference Applica-  
tion Specification  
114-13020.

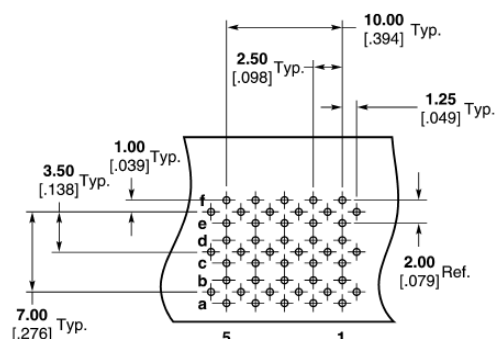


### Pin Header Assemblies

Number of Positions	Dimensions			Part Number	Application Tooling			
	A	B	C		Insertion	IS Sheet	Ground Blade	
							Repair Kit	IS Sheet
30	—	10.00 [.393]	14.20 [.559]	5120683-1	91313-1	408-4546	1320534-1	408-4573



**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1f Shroud Side)  
Recommended PC Board Layout — Reference Page 112  
(Shroud Side Shown)



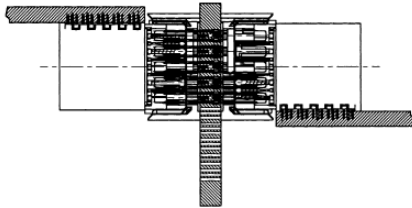
**Coplanar Daughtercards**  
(Pin 1a Header = Pin 5a Shroud Side)  
Recommended PC Board Layout — Reference Page 112  
(Shroud Side Shown)

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

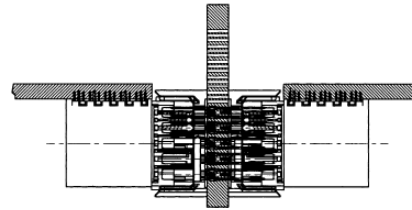
## Z-PACK HS3 Connector (Continued)

### Layout Guide for Midplane Applications 6 Row Connectors

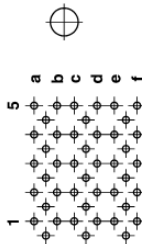
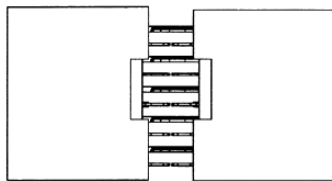
#### Non-Coplanar Applications



#### Coplanar Applications

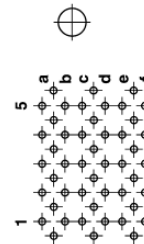
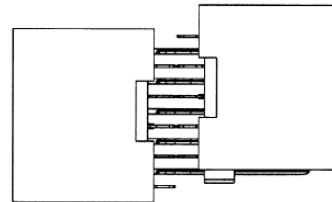


#### Right Module



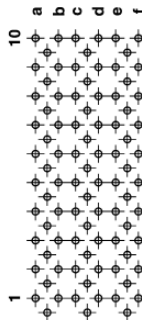
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
5120680	5120683-1

#### Right Module



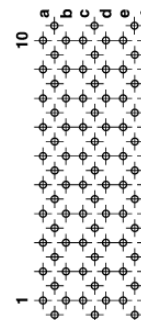
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
5120680	5120684-1

#### Center Module



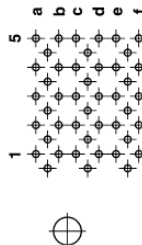
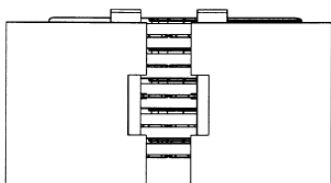
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
5120679	5120682-1

#### Center Module



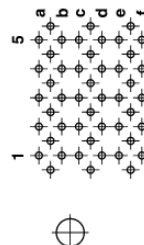
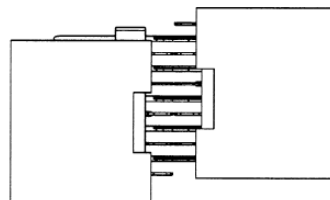
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
5120679	5120682-1

#### Left Module



Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
5120681	5120684-1

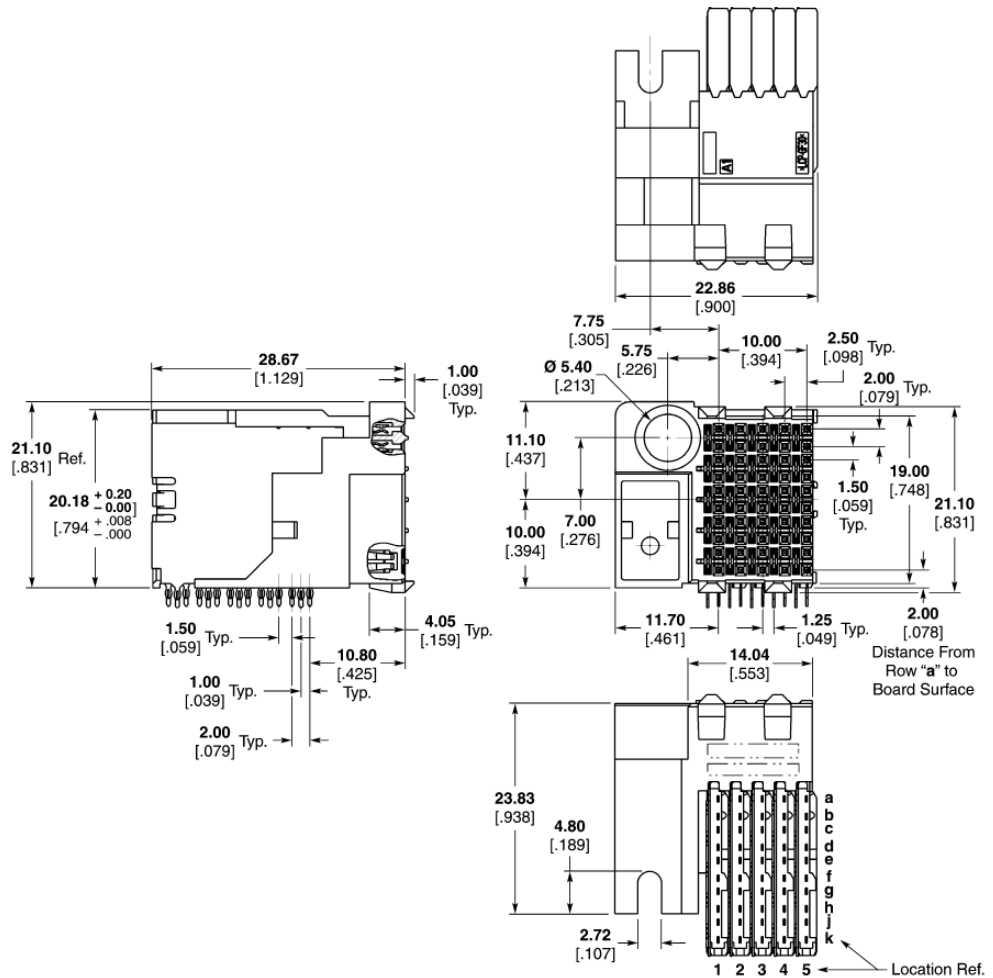
#### Left Module



Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
5120681	5120683-1

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

**10 Row, Left 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	5120875-1	1338743-1	408-8394	1338744-1	408-8393	1338746-1	408-8410

### P.C.B. Hole Dimensions

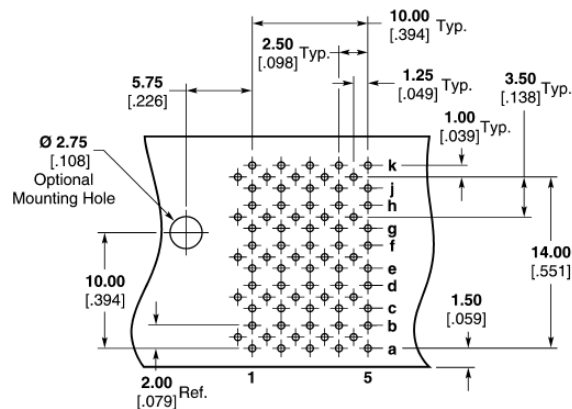
**Drilled Hole** —  $0.7 \pm 0.025 \text{ mm}$

**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.



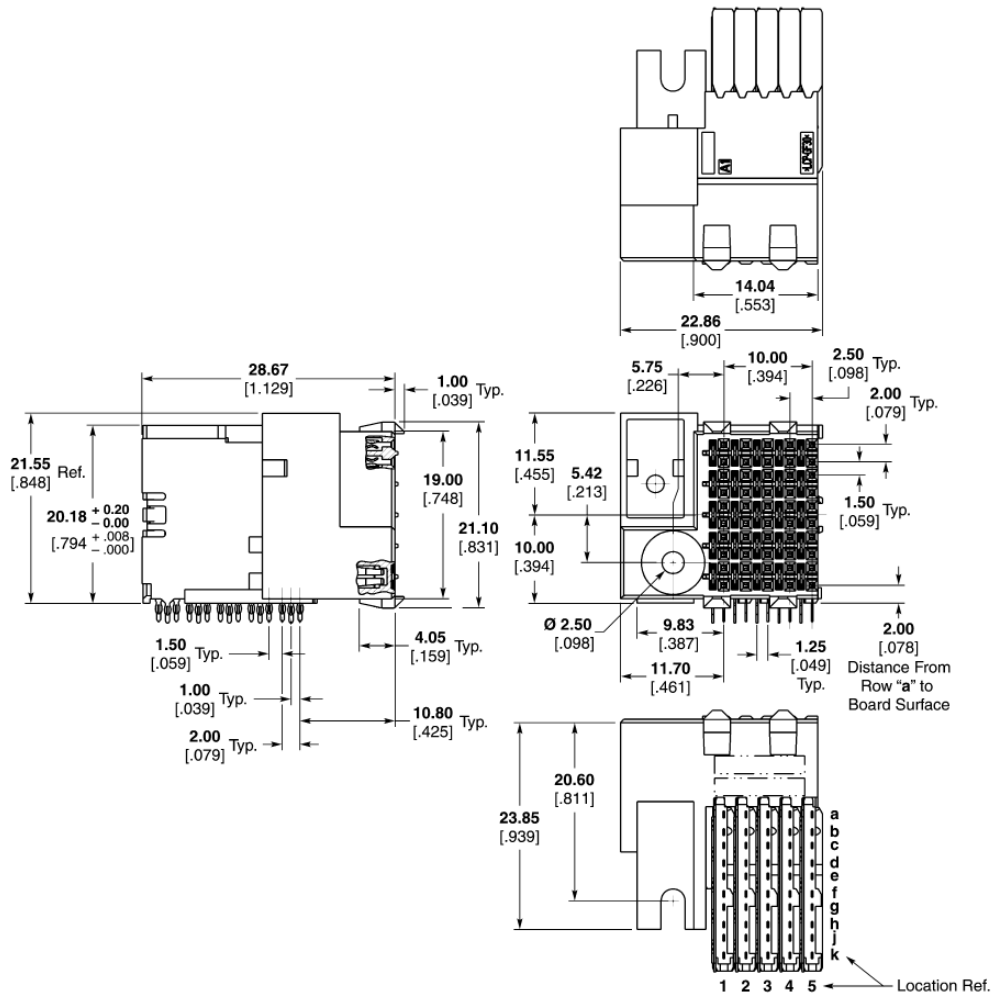
### Recommended PC Board Layout (Component Side Shown)

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## 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	5120793-1	1338743-1	408-8394	1338744-1	408-8393	1338746-1	408-8410

### P.C.B. Hole Dimensions

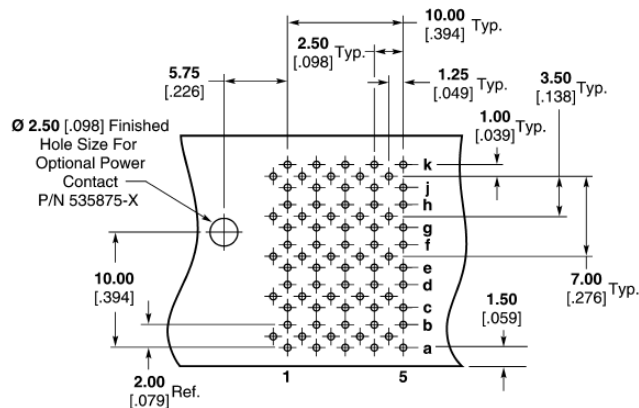
**Drilled Hole** — 0.7±0.025mm

**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)**

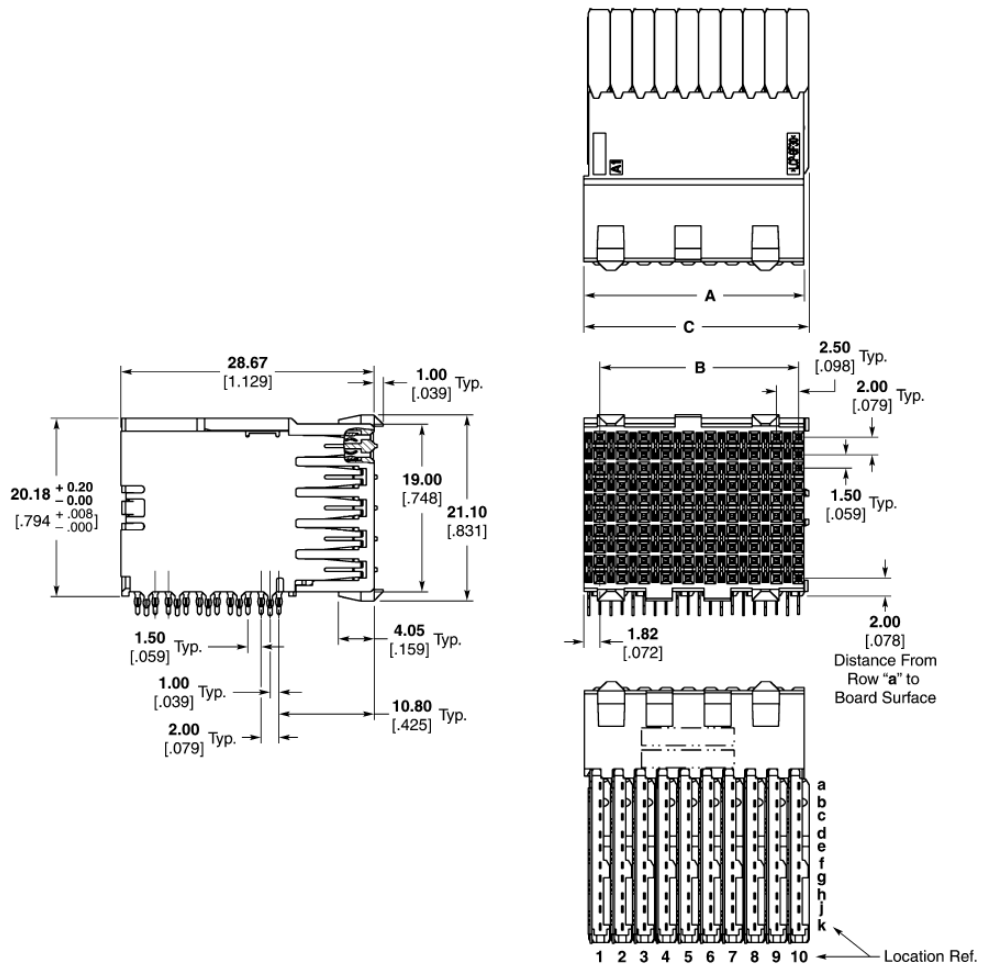
**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

### Z-PACK HS3 Connector (Continued)

### Right Angle Receptacle

(Continued)

### 10 Row, Center Module



## 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	5120790-1	1338743-2	408-8394	1338744-1	408-8393	1338746-1	408-8410
50	12.44 .490	10.00 .394	12.90 .508	5120791-1	1338743-1	408-8394	1338744-1	408-8393	1338746-1	408-8410

### P.C.B. Hole Dimensions

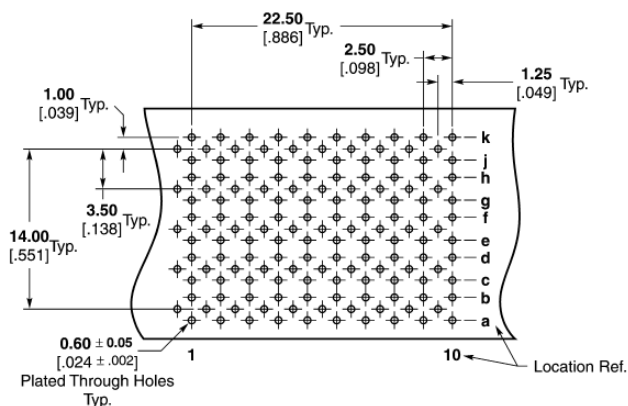
**Drilled Hole** —  $0.7 \pm 0.025 \text{ mm}$

**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)

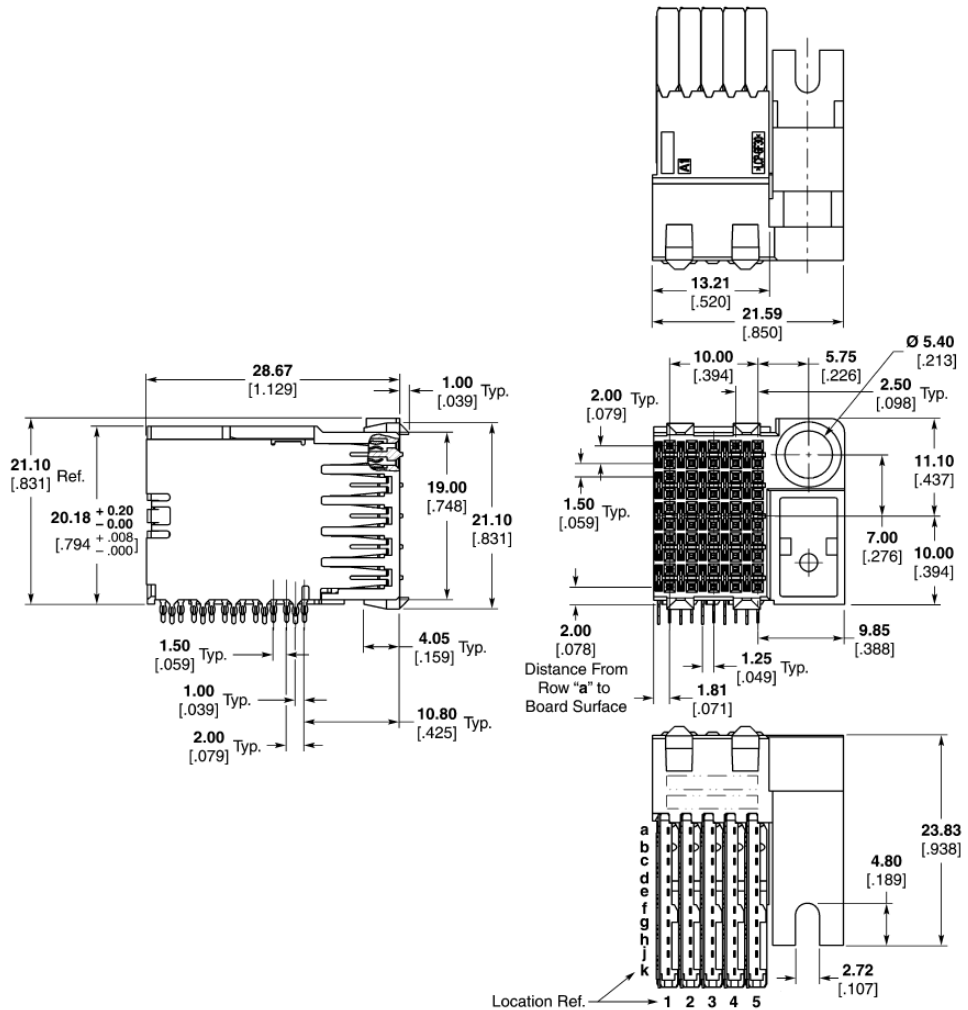
**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

### 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	5120874-1	1338743-1	408-8394	1338744-1	408-8393	1338746-1	408-8410

### P.C.B. Hole Dimensions

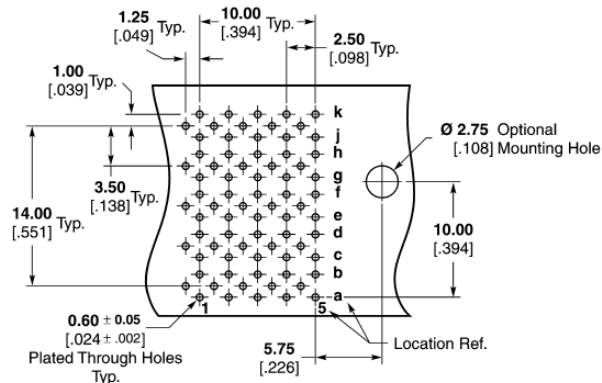
**Drilled Hole** —  $0.7 \pm 0.025 \text{ mm}$

**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.



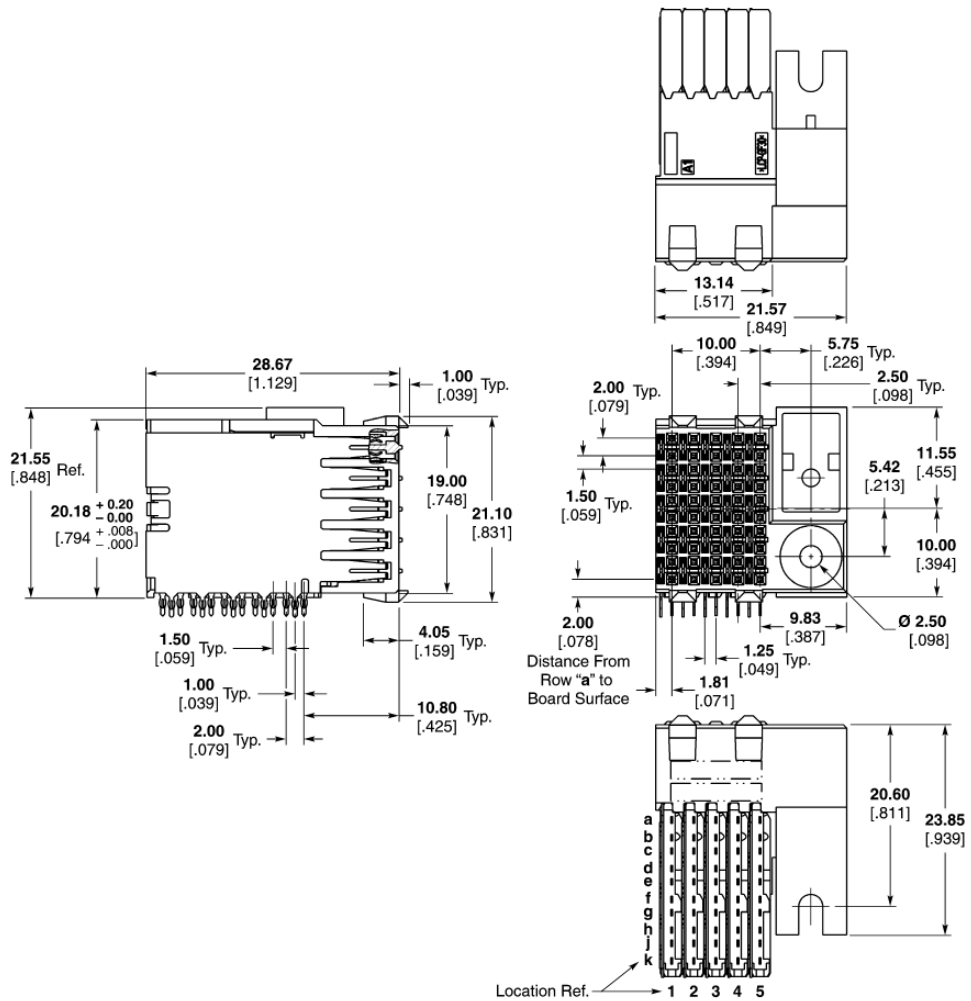
### Recommended PC Board Layout (Component Side Shown)

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

### Right Angle Receptacle (Continued)

### 10 Row, Right 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	5120792-1	1338743-1	408-8394	1338744-1	408-8393	1338746-1	408-8410

### P.C.B. Hole Dimensions

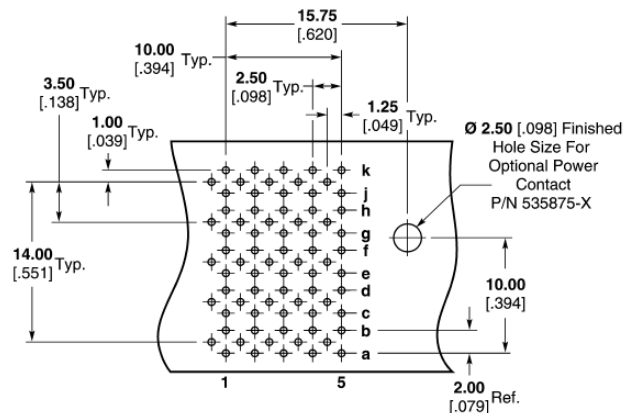
**Drilled Hole** — 0.7±0.025mm

**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)

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

### Vertical Pin Header Assemblies

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

#### P.C.B. Hole Dimensions

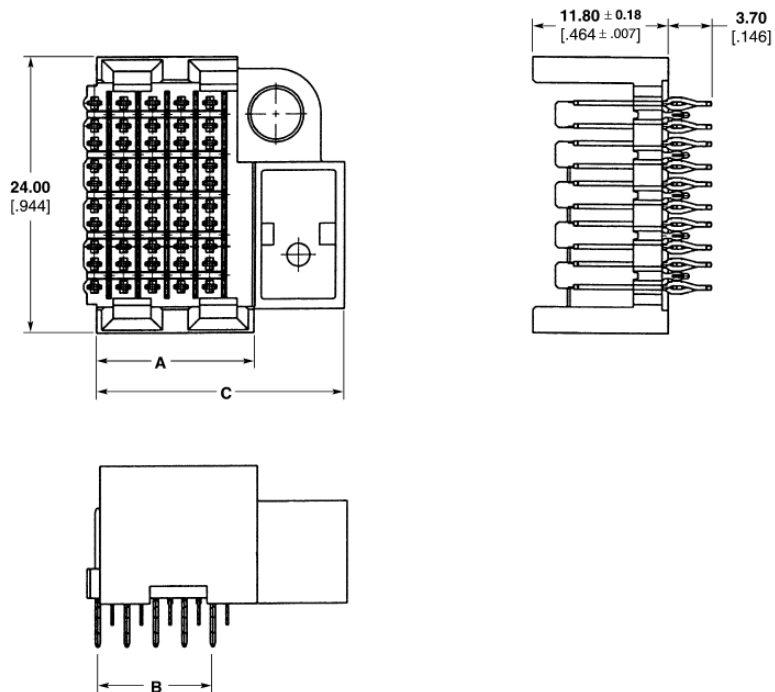
**Drilled Hole** — 0.7±0.025mm

**Fin. Hole** — 0.55 to 0.65mm

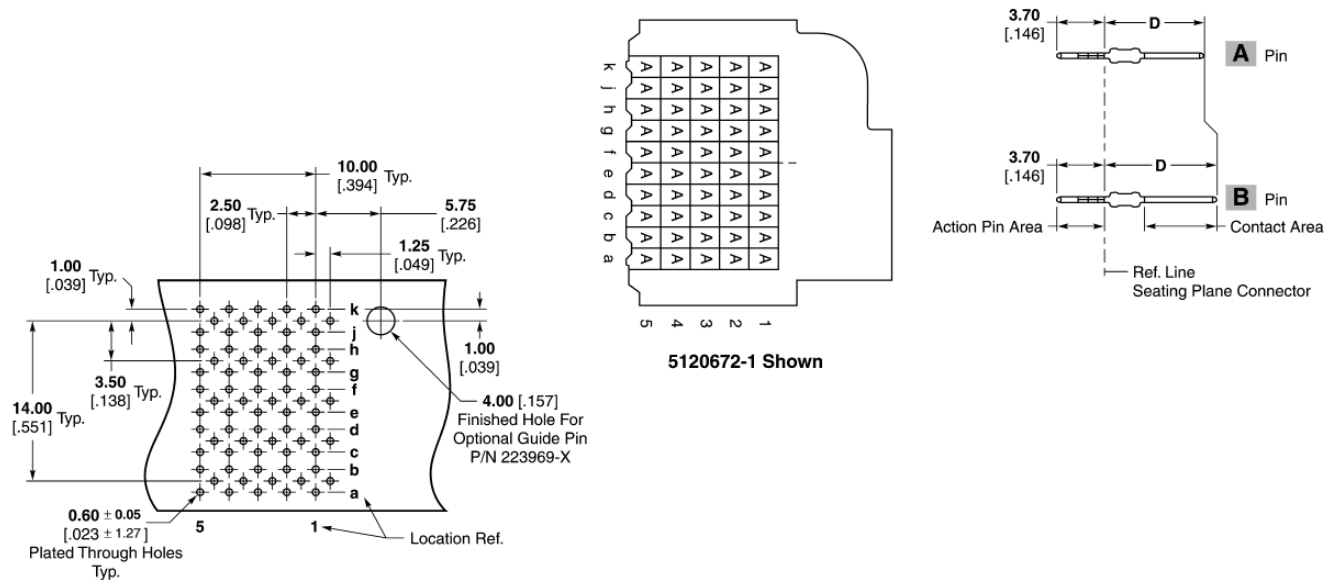
**Cu-thickness** — 0.025 to 0.050mm

**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	A	5120672-1	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	5120672-2	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 126**

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.



## Z-PACK HS3 Connector (Continued)

### Vertical Pin Header Assemblies (Continued)

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

#### P.C.B. Hole Dimensions

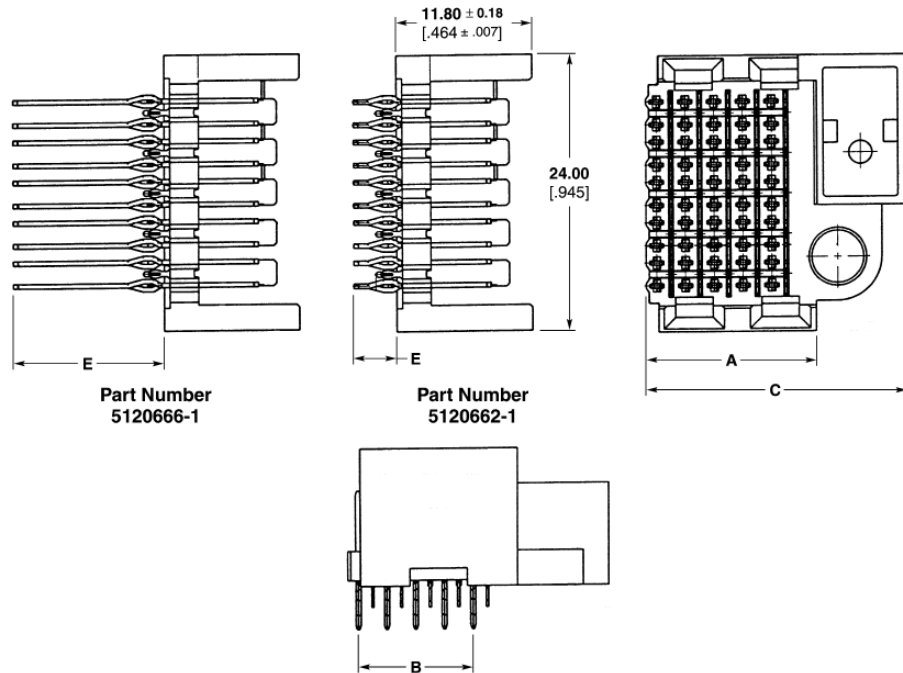
Drilled Hole —  $0.7 \pm 0.025\text{mm}$

Fin. Hole —  $0.55$  to  $0.65\text{mm}$

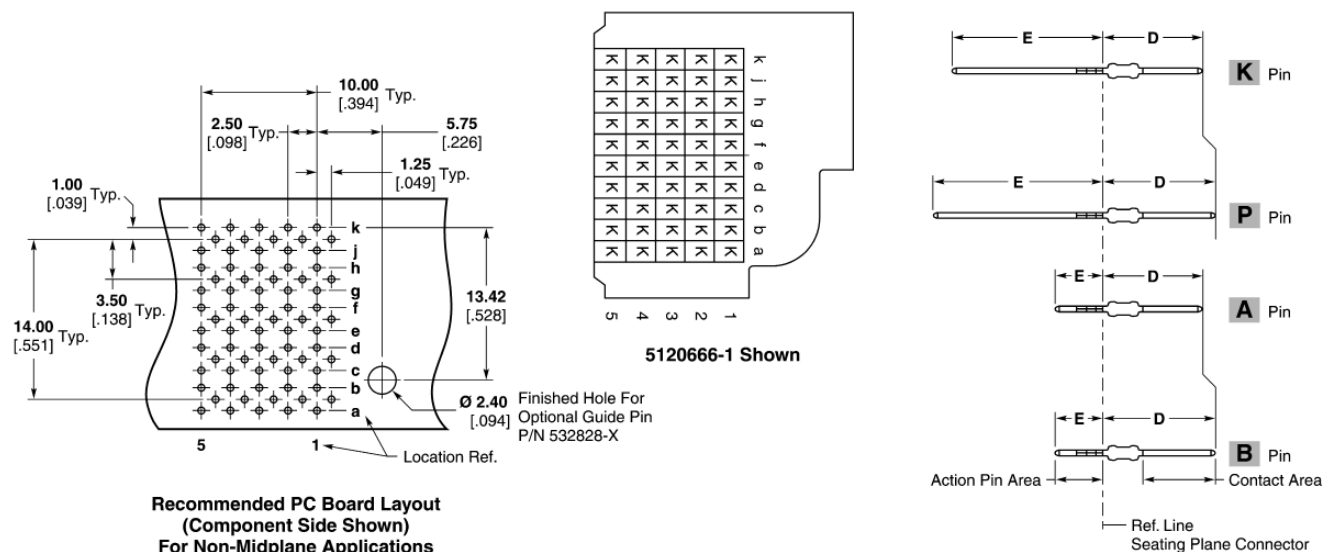
Cu-thickness —  $0.025$  to  $0.050\text{mm}$

SnPb-thickness —  $0.004$  to  $0.010\text{mm}$

**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	14.80 .583	10.00 .394	22.71 .894	8.20 .323	3.70 .146	<b>A</b>	5120662-1	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>	5120662-2	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>	5120666-1	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>	5120666-2	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 126**

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

### Vertical Pin Header Assemblies (Continued)

#### 10 Row, Center Module

#### P.C.B. Hole Dimensions

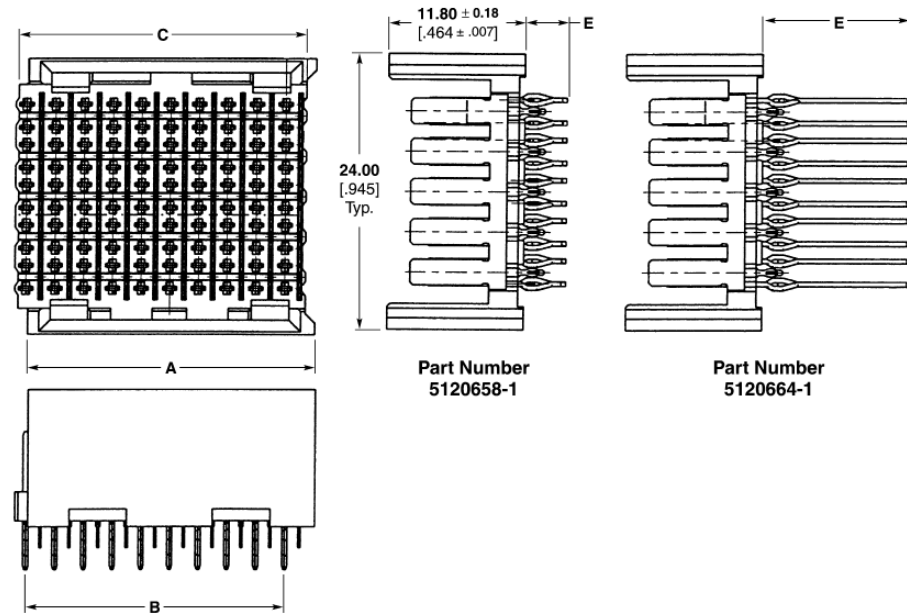
Drilled Hole —  $0.7 \pm 0.025\text{mm}$

Fin. Hole —  $0.55$  to  $0.65\text{mm}$

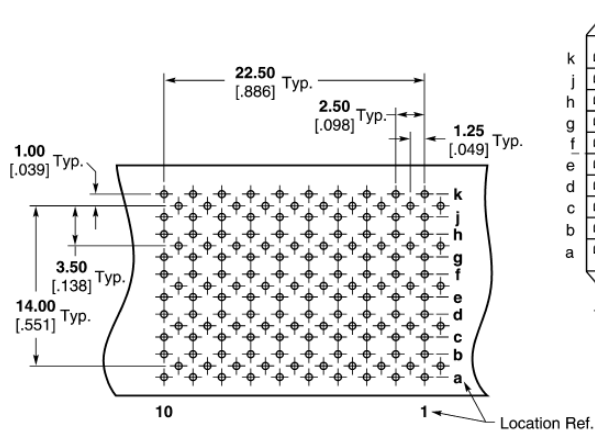
Cu-thickness —  $0.025$  to  $0.050\text{mm}$

SnPb-thickness —  $0.004$  to  $0.010\text{mm}$

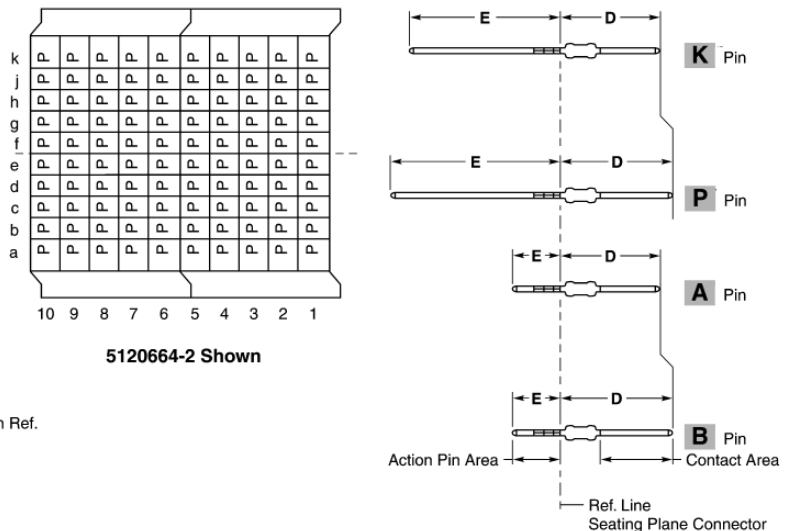
**Note:** For finishes other than Tin-Lead, reference Application Specification 114-13020.



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 .980	22.50 .885	24.90 .980	8.20 .322	3.70 .145	A	5120658-1	91312-2	408-4546	354687-2	408-9979	1320534-2	408-4573
	24.90 .980	22.50 .885	24.90 .980	9.70 .381	3.70 .145	B	5120658-2	91312-2	408-4546	354687-2	408-9979	1320534-2	408-4573
	24.90 .980	22.50 .885	24.90 .980	8.20 .322	13.00 .511	K	5120664-1	91312-2	408-4546	354687-2	408-9979	1320534-2	408-4573
	24.90 .980	22.50 .885	24.90 .980	9.70 .381	14.50 .570	P	5120664-2	91312-2	408-4546	354687-2	408-9979	1320534-2	408-4573
50	12.41 .488	10.00 .393	12.40 .488	8.20 .322	3.70 .145	A	5120747-1	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	12.41 .488	10.00 .393	12.40 .488	9.70 .381	3.70 .145	B	5120747-2	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	12.41 .488	10.00 .393	12.40 .488	8.20 .322	13.00 .511	K	5120748-1	91312-1	408-4546	354687-2	408-9979	1320534-2	408-4573
	12.41 .488	10.00 .393	12.40 .488	9.70 .381	14.50 .570	P	5120748-2	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 126



**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

### Vertical Pin Header Assemblies (Continued)

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

#### P.C.B. Hole Dimensions

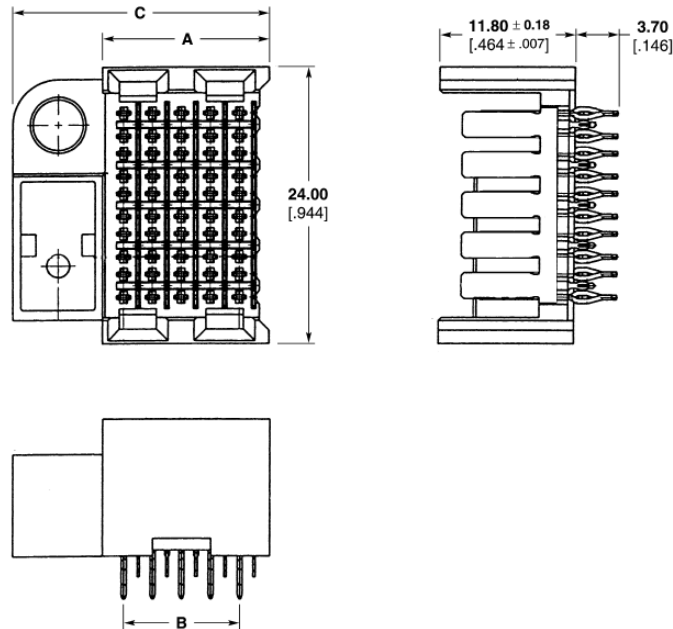
Drilled Hole —  $0.7 \pm 0.025\text{mm}$

Fin. Hole —  $0.55$  to  $0.65\text{mm}$

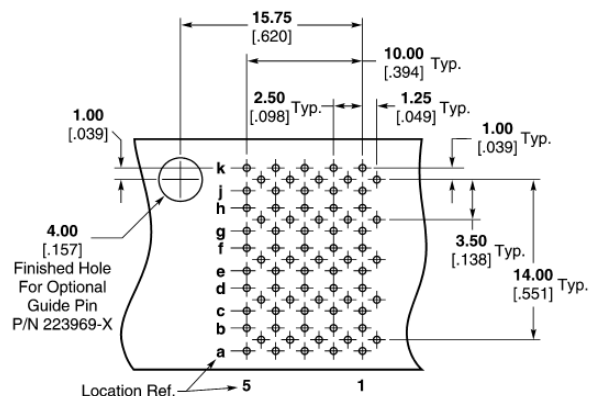
Cu-thickness —  $0.025$  to  $0.050\text{mm}$

SnPb-thickness —  $0.004$  to  $0.010\text{mm}$

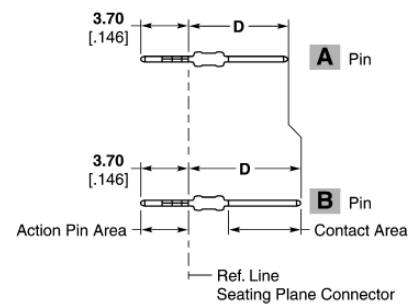
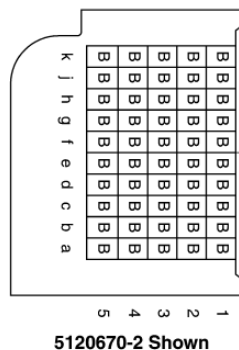
**Note:** For finishes other than  
Tin-Lead, reference  
Application Specification  
114-13020.



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	A	5120670-1	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	5120670-2	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 126**

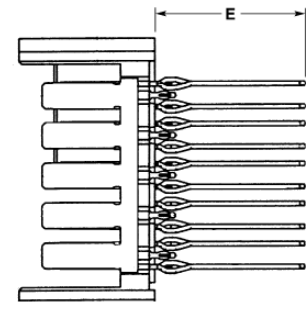
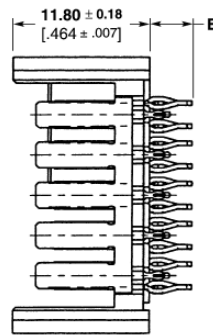
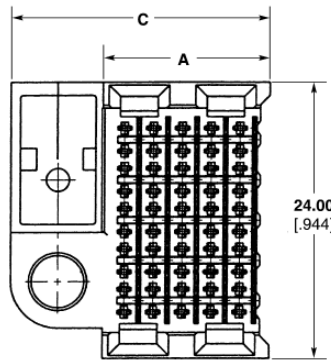


**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

### Vertical Pin Header Assemblies (Continued)

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



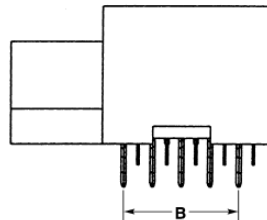
#### P.C.B. Hole Dimensions

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

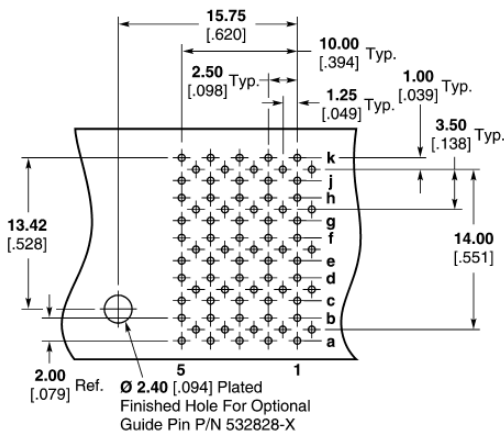


**Note:** For finishes other than Tin-Lead, reference Application Specification 114-13020.

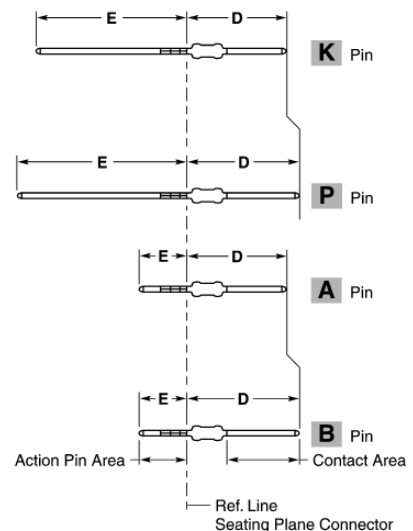
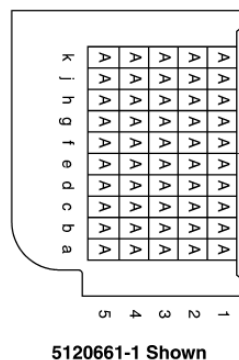
Part Number  
5120661-1

Part Number  
5120665-1

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>	5120661-1	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>	5120661-2	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>	5120665-1	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>	5120665-2	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 126**

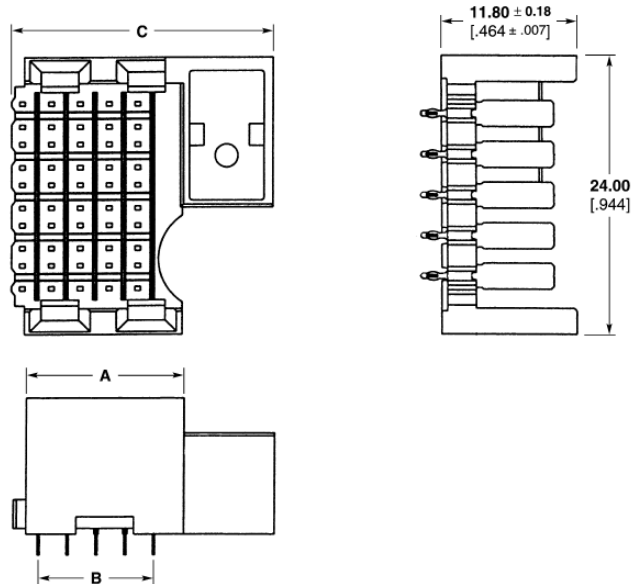


**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## 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

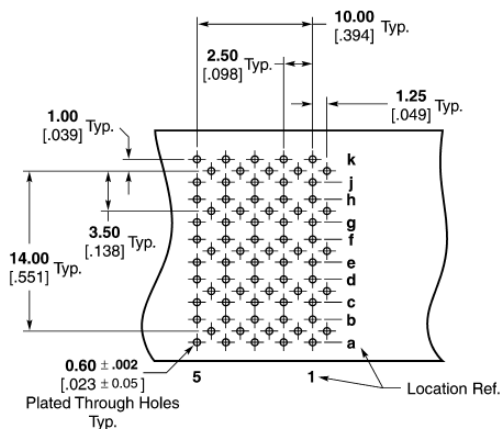
**Cu-thickness** — 0.025 to 0.050mm

**SnPb-thickness** — 0.004 to 0.010mm

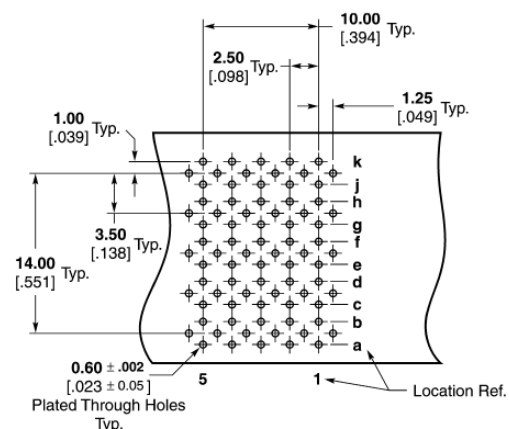
**Note:** For finishes other than  
Tin-Lead, reference  
Application Specification  
114-13020.

### 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	5120668-1	91312-1	408-4546	1320534-2	408-4573



**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1k Shroud Side)  
Recommended PC Board Layout — Reference Page 126  
(Shroud Side Shown)



**Coplanar Daughtercards**  
(Pin 1a Header = Pin 5a Shroud Side)  
Recommended PC Board Layout — Reference Page 126  
(Shroud Side Shown)

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

### Vertical Pin Header Shrouds (Continued)

#### 10 Row, Center Module

#### P.C.B. Hole Dimensions

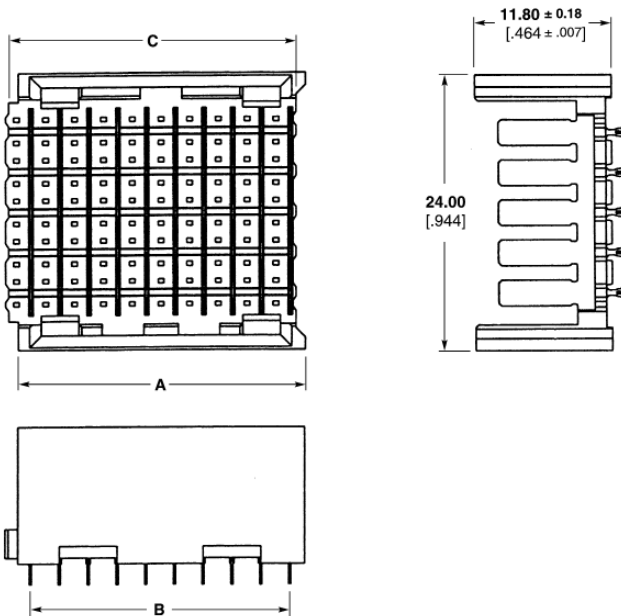
**Drilled Hole** — 0.7±0.025mm

**Fin. Hole** — 0.55 to 0.65mm

**Cu-thickness** — 0.025 to 0.050mm

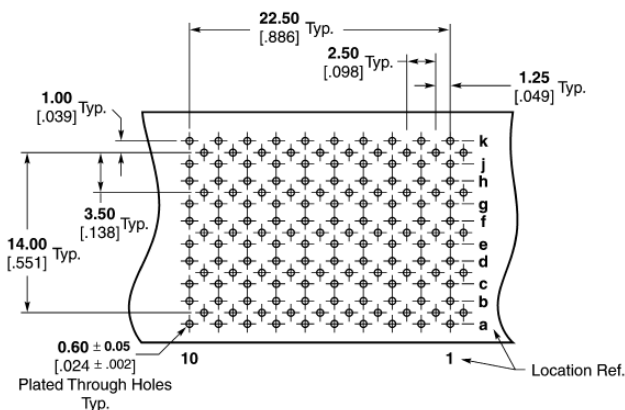
**SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than  
Tin-Lead, reference  
Application Specification  
114-13020.

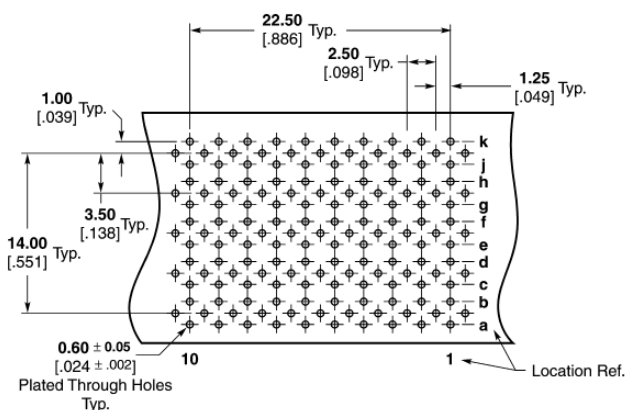


### Receptacle Assemblies

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	5120663-1	91312-2	408-4546	1320534-2	408-4573
50	12.41 .488	10.00 .394	12.40 .488	5120750-1	91312-1	408-4546	1320534-2	408-4573



**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1k Shroud Side)  
Recommended PC Board Layout — Reference Page 126  
(Shroud Side Shown)



**Coplanar Daughtercards**  
(Pin 1a Header = Pin 10a Shroud Side)  
Recommended PC Board Layout — Reference Page 126  
(Shroud Side Shown)

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## Z-PACK HS3 Connector (Continued)

### Vertical Pin Header Shrouds (Continued)

#### 10 Row, Right Module

#### P.C.B. Hole Dimensions

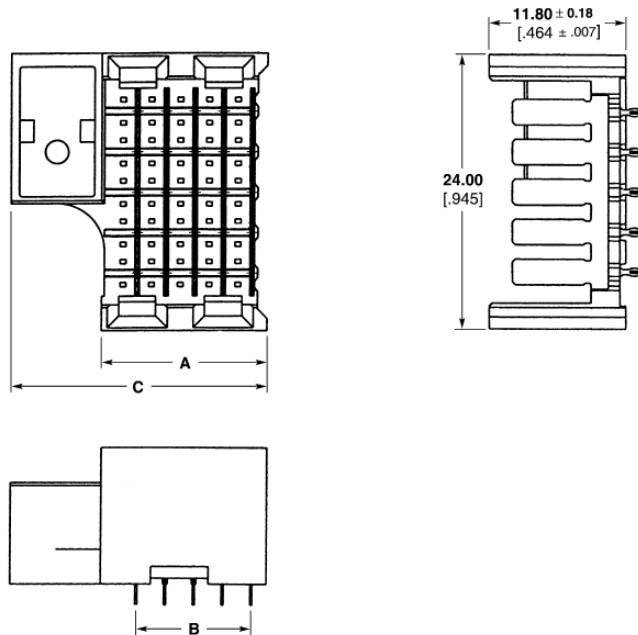
**Drilled Hole** — 0.7±0.025mm

**Fin. Hole** — 0.55 to 0.65mm

**Cu-thickness** — 0.025 to 0.050mm

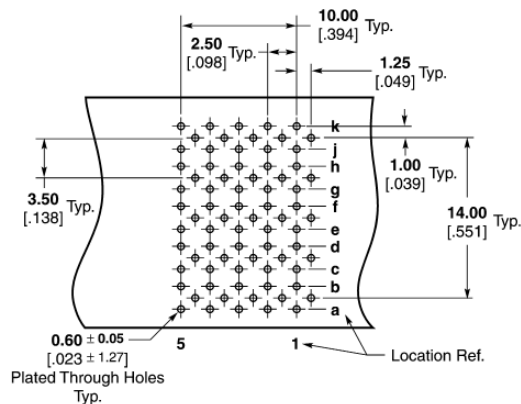
**SnPb-thickness** — 0.004 to 0.010mm

**Note:** For finishes other than  
Tin-Lead, reference  
Application Specification  
114-13020.

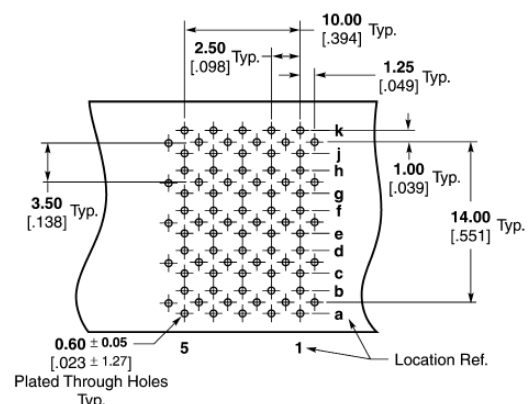


### Receptacle Assemblies

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	5120667-1	91312-1	408-4546	1320534-2	408-4573



**Non-Coplanar Daughtercards**  
(Pin 1a Header = Pin 1k Shroud Side)  
Recommended PC Board Layout — Reference Page 126  
(Shroud Side Shown)



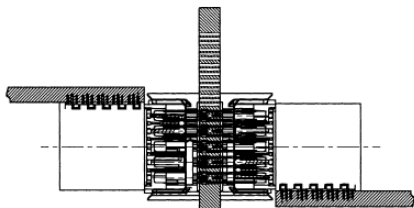
**Coplanar Daughtercards**  
(Pin 1a Header = Pin 5a Shroud Side)  
Recommended PC Board Layout — Reference Page 126  
(Shroud Side Shown)

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

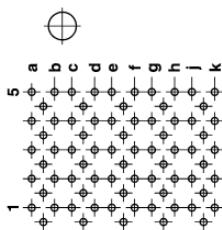
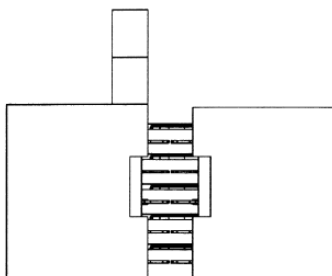
## Z-PACK HS3 Connector (Continued)

### Layout Guide for Midplane Applications 10 Row Connectors

#### Non-Coplanar Applications

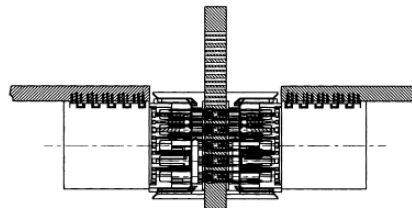


#### Right Module

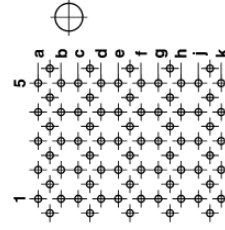
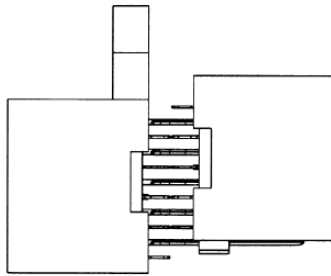


Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
5120665	5120667-1

#### Coplanar Applications

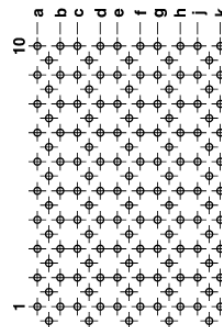
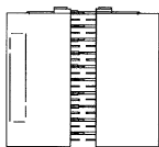


#### Right Module



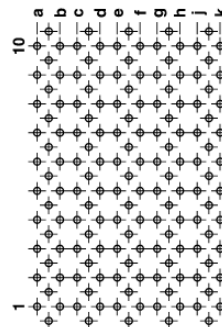
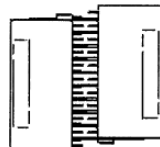
Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
5120665	5120668-1

#### Center Module



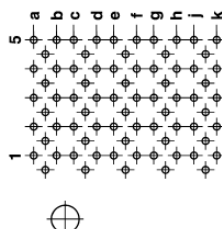
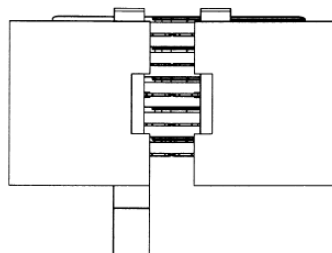
No. of Pos.	Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
100	5120664	5120663-1
50	—	5120750-1

#### Center Module



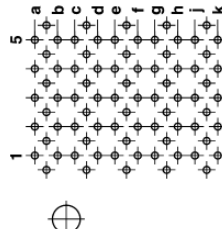
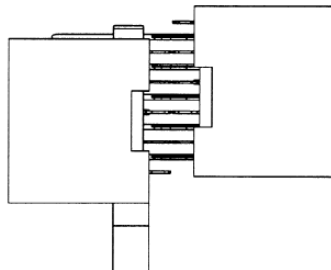
No. of Pos.	Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
100	5120664	5120663-1
50	—	5120750-1

#### Left Module



Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
5120666	5120667-1

#### Left Module



Vertical Pin Header, Feed-Through Part No.	Shroud Part No.
5120666	5120668-1

**Note:** All part numbers are RoHS compliant.



## 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.)

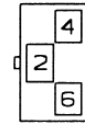
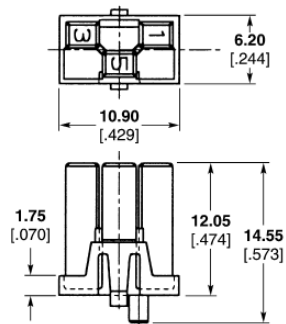
The Tyco Electronics Universal Power Module is a multi-position, modular, hard metric board-to-board power connector designed to be compatible with Z-PACK 2mm HM connectors. The design is in an "inverse-sex" orientation and the vertical receptacle module meets the IEC 950 safety requirements for finger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

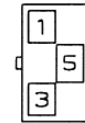
The Universal Power Module is compatible with a wide variety of other Tyco Electronics board-to-board connectors including Z-PACK HS3, Z-PACK HM-Zd and Z-PACK TinMan connectors.

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

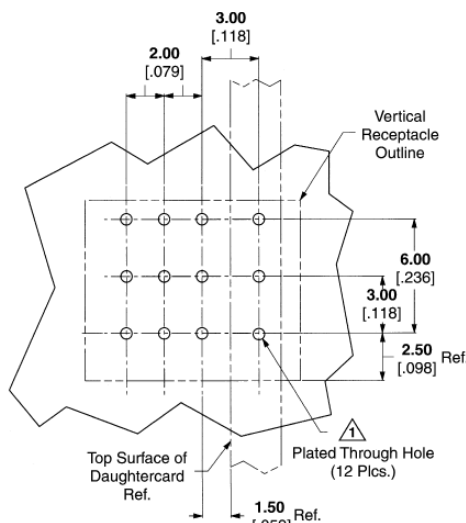
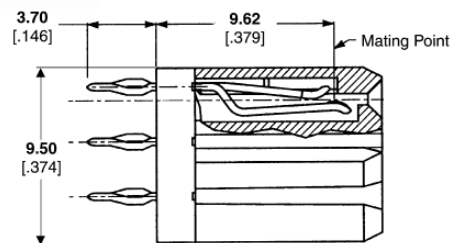
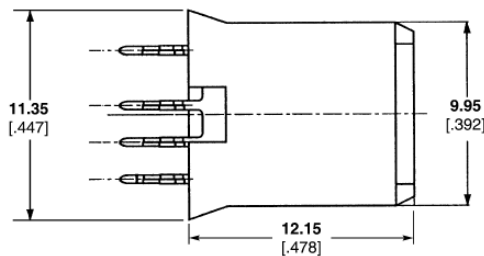
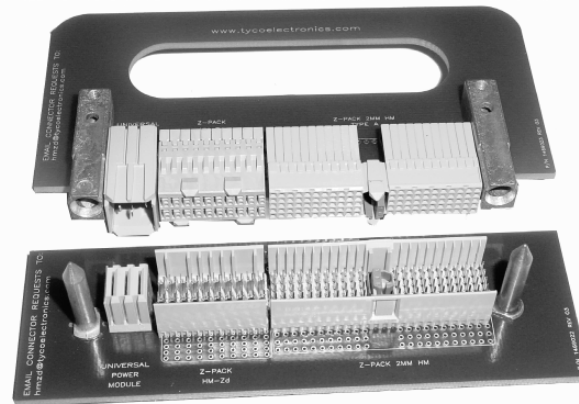
Generous alignment features designed into the housings and optional guide pins and receptacles make the Tyco Electronics Universal Power Module ideal for "blind mating" applications.



Part Number 120639-6



Part Number 120639-3



Recommended PC Board Hole Layout

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

	Position Loaded	Part Numbers
Vertical Receptacle	ABC	5223955-2
	AC	5223984-1
High Current	ABC	5-5223955-2

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

**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 product area, with entire  
contact underplated 0.00127 [.000050]  
min. nickel

### Related Product Data

**Guiding Hardware** (Optional) —  
pages 132 and 133

### 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

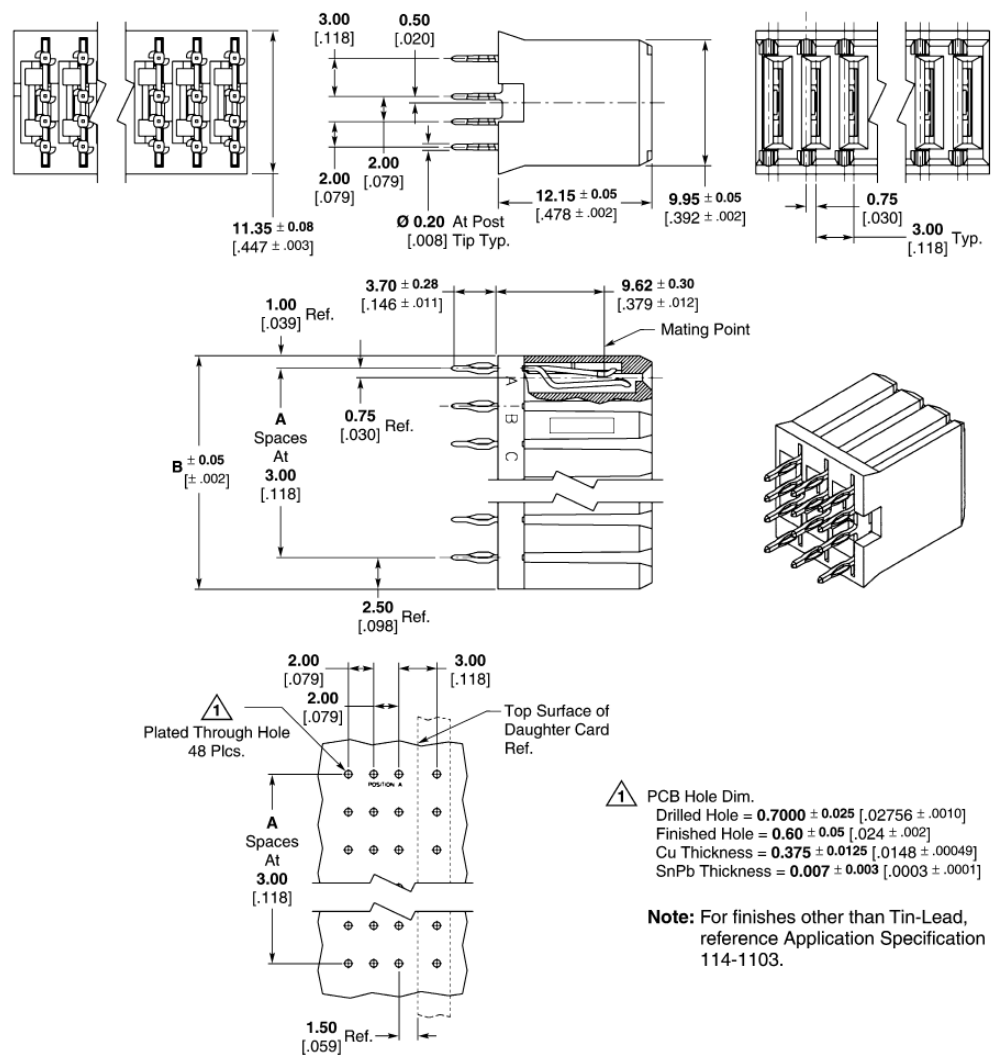
#### Application Specification

114-1103

#### Tyco Electronics Instruction Sheet

408-4169 (Receptacle)

Seating Tool 224421-1)



Recommended PCB Hole Layout

**PCB Hole Dim.**  
Drilled Hole =  $0.7000 \pm 0.025$  [.02756 ± .0010]  
Finished Hole =  $0.60 \pm 0.05$  [.024 ± .002]  
Cu Thickness =  $0.375 \pm 0.0125$  [.0148 ± .00049]  
SnPb Thickness =  $0.007 \pm 0.003$  [.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	5223995-1	120953-1
5	4	15.50 .610	5223995-2	120953-2
6	5	18.50 .728	5223995-3	120953-3
7	6	21.50 .846	5223995-4	120953-4
8	7	24.50 .965	5223995-5	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.

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in  
press-fit connectors.

## Z-PACK HS3 Connector (Continued)

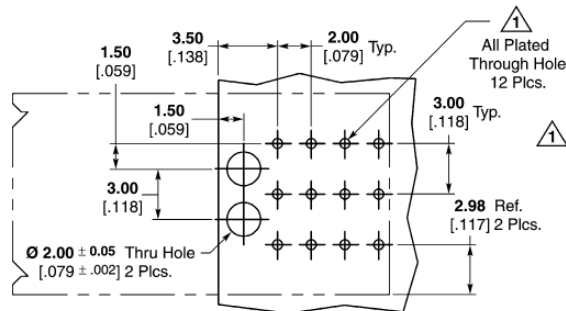
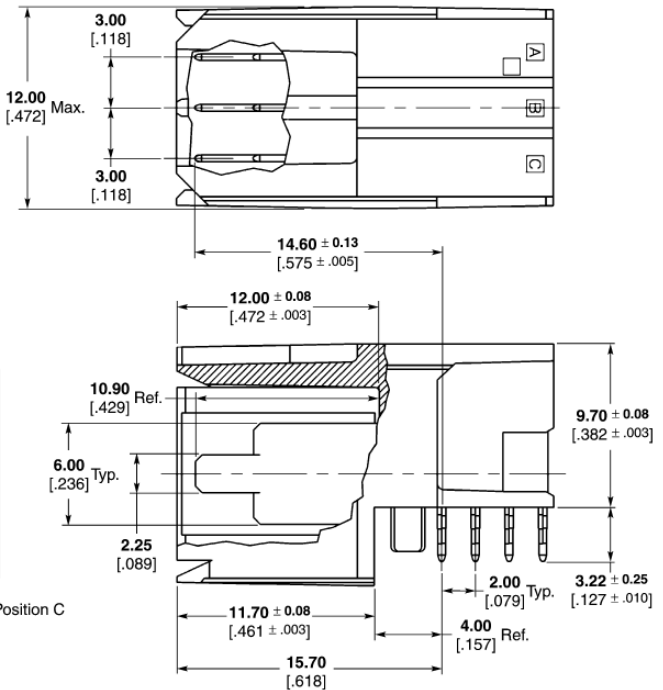
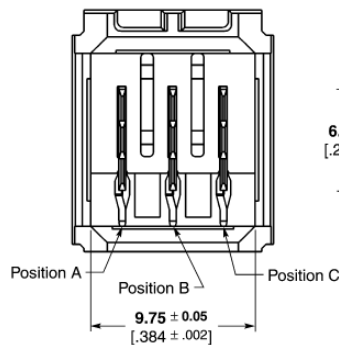
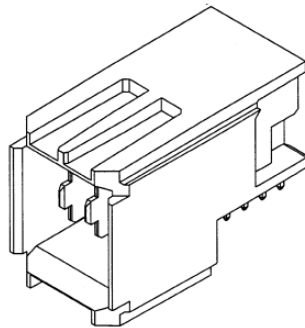
### Power and Guide Hardware (Continued)

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

#### Material and Finish

**Housing** — polyester, natural color

**Contacts** — Copper alloy, plated 0.00127 [.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



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

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

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

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]	5223961-1	5-5223961-1
10.90 [.429]	9.30 [.366]	10.90 [.429]	5223962-1	—
10.90 [.429]	9.30 [.366]	9.30 [.366]	5223968-1	—
10.90 [.429]	7.68 [.302]	10.90 [.429]	5223972-1	—
10.90 [.429]	7.68 [.302]	9.30 [.366]	5223971-1	—
10.90 [.429]	7.68 [.302]	7.68 [.302]	5223970-1	—
9.30 [.429]	10.90 [.429]	9.30 [.366]	5223963-1	—
9.30 [.366]	10.90 [.429]	7.68 [.302]	5223964-1	—
9.30 [.366]	9.30 [.366]	9.30 [.366]	5223967-1	—
9.30 [.366]	—	9.30 [.366]	5223975-1	—
9.30 [.366]	9.30 [.366]	7.68 [.302]	5223981-1	—
9.30 [.366]	7.68 [.302]	9.30 [.366]	5223965-1	—
7.68 [.302]	9.30 [.366]	7.68 [.302]	5223983-1	—
7.68 [.302]	7.68 [.302]	9.30 [.366]	5223980-1	—
7.68 [.302]	7.68 [.302]	7.68 [.302]	5223974-1	5-5223974-1

\*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 [.000050] min. gold in mating area, 0.00054 [.000021] min. Tin-Lead on ACTION PIN product area, with entire contact underplated 0.00127 [.000050] min. nickel

#### Related Product Data

**Guiding Hardware** (Optional) — pages 132 and 133

#### 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

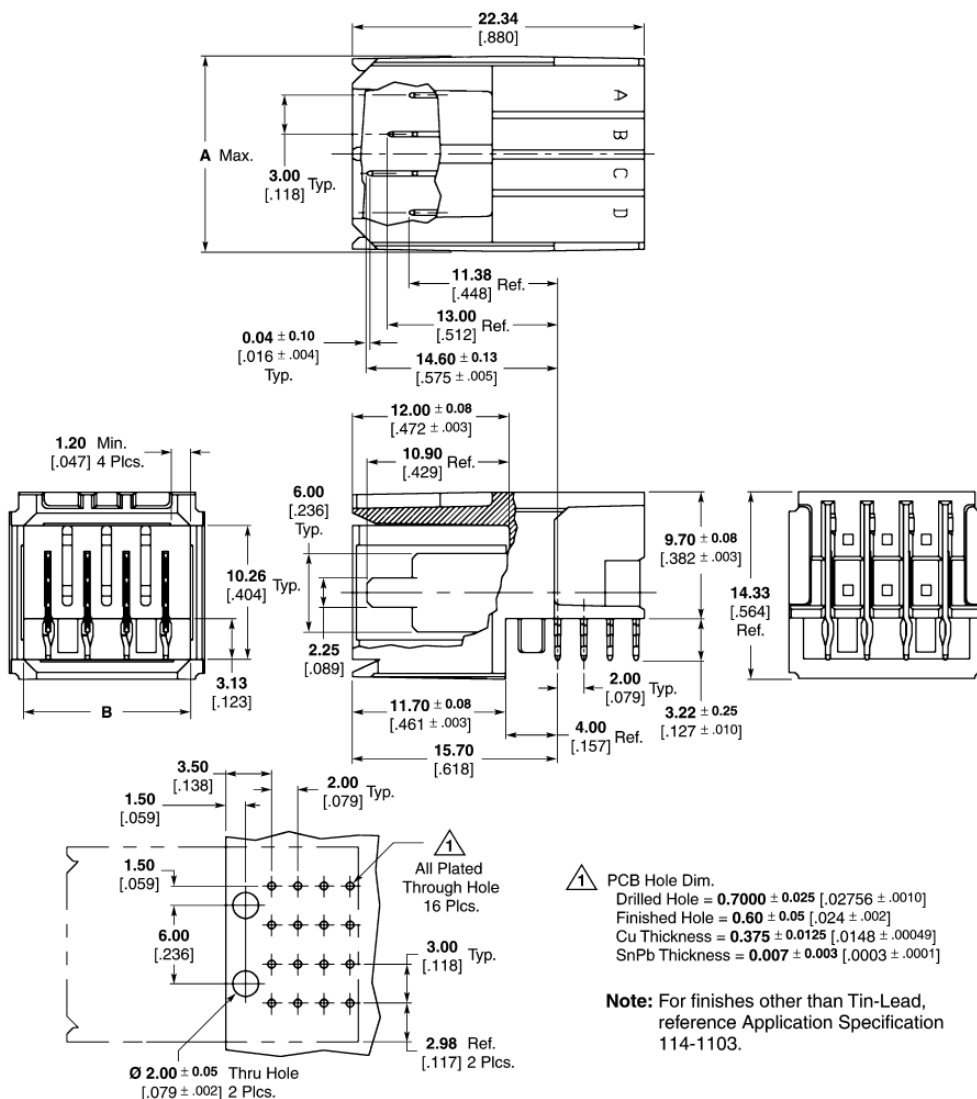
108-1651

##### 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	5646954	120954
5	18.00 .709	15.75 .620	5646955	120955
6	21.00 .827	18.75 .738	5646956	120956
7	24.00 .945	21.75 .856	5646957	120957
8	27.00 1.063	24.75 .974	5646958	120958

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

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

\*Reference Product Specification 108-1651.

**Note:** All part numbers are RoHS compliant. Tin-Lead parts are RoHS compliant through exemption for lead in press-fit connectors.

## 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

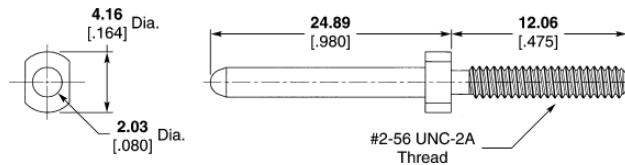
**Part Number** — 532828-5\*

**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 [.000030] gold  
over 0.00127-0.00254 [.000050-  
.000100] nickel

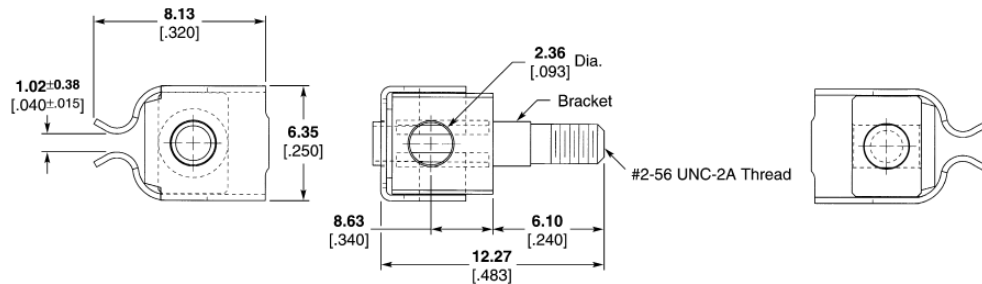
#### AMP-HDI Guide Pin/Power Receptacles

**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 [.000030]  
gold in contact area, over 0.00127  
[.000050] min. nickel underplate. Gold  
flash on remainder of the contact.

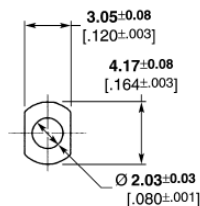
#### ESD-Guide Pin/Feed-through

**Compatibility** — Z-PACK HS3  
connector

**Part Number** — 120759-2\*

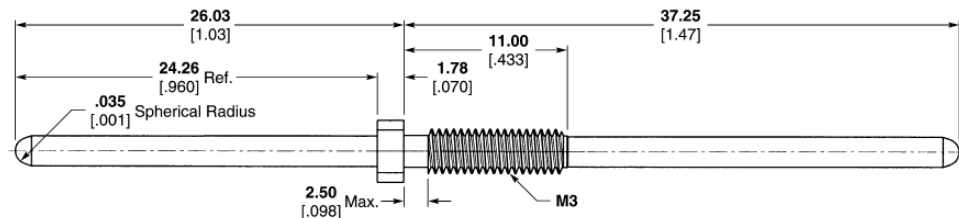
**Max. Current Rating** — 10 Amperes

\*Additional sequence lengths are  
available, contact Tyco Electronics



#### Material and Finish

Brass, plated 0.00076 [.000030] gold all  
over 0.001427-0.00254 [.000050-  
.000100] nickel underplate



**Note:** All part numbers are RoHS compliant.

## Z-PACK HS3 Connector (Continued)

### Power and Guide Hardware

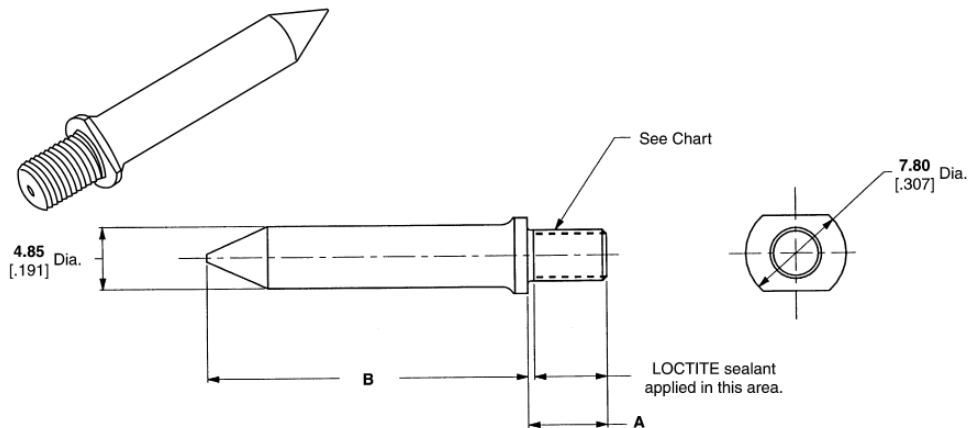
(Continued)

#### 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

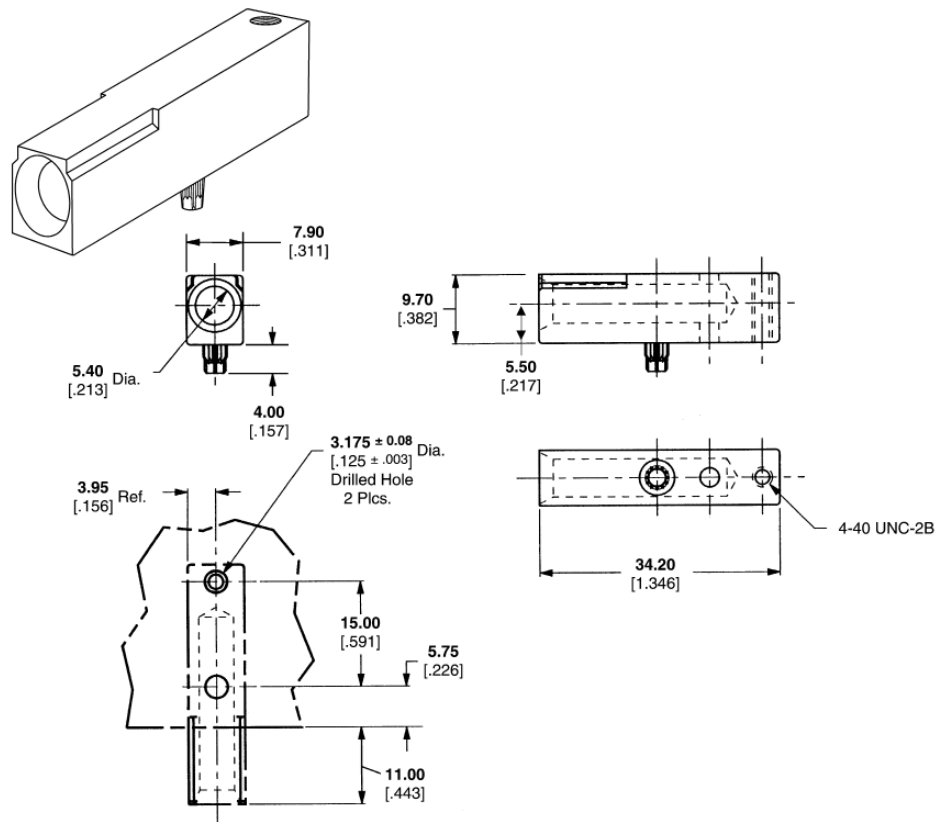
114-1103

**Part Number 223957-1**

(as shown)

**Part Number 223979-1**

(dual alignment posts)



LOCTITE is a trademark of Henkel Corp.

**Note:** All part numbers are RoHS compliant.

#### Recommended PC Board Hole Layout

## Z-PACK HS3 Connector (Continued)

### Power and Guide Hardware (Continued)

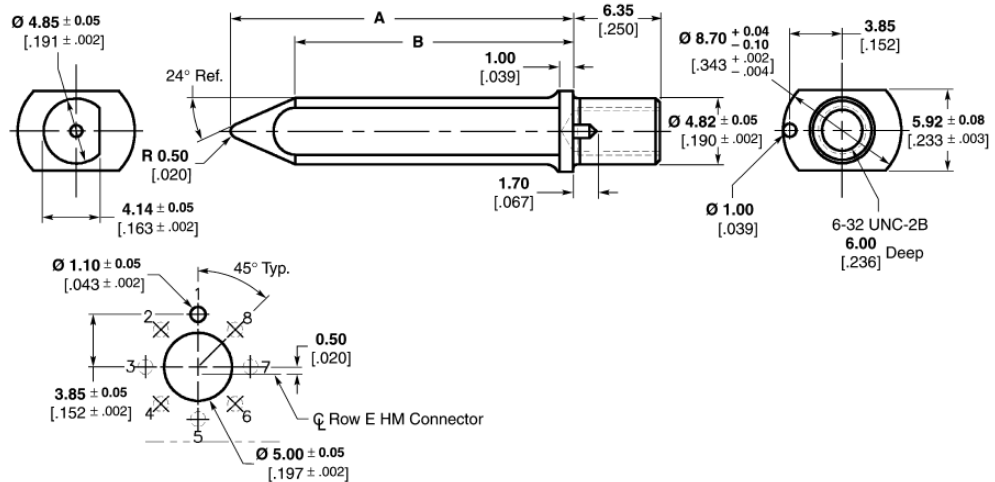
#### Guide Pin (Keyed)

#### 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 5223986-1)**

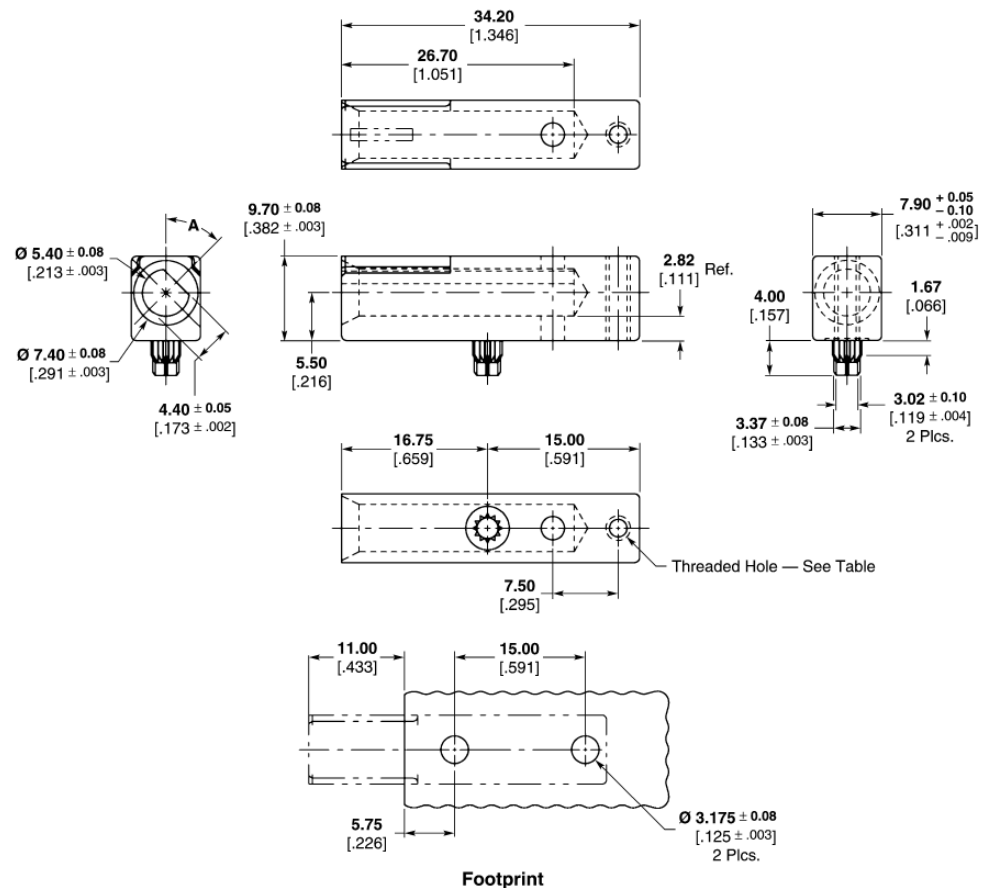
#### Female Guide Module (Keyed)

#### Material and Finish

**Guide Module** — Zinc alloy, chromate conversion coated

**Part Number 5223986**

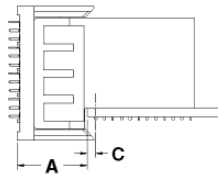
Dim. A	Thread	Part Number
0°	4-40	5223986-1
45°	4-40	5223986-2
90°	4-40	5223986-3
135°	4-40	5223986-4
180°	4-40	5223986-5
225°	4-40	5223986-6
270°	4-40	5223986-7
315°	4-40	5223986-8
0°	M2.6	5120913-1
45°	M2.6	5120913-2
90°	M2.6	5120913-3
135°	M2.6	5120913-4
180°	M2.6	5120913-5
225°	M2.6	5120913-6
270°	M2.6	5120913-7
315°	M2.6	5120913-8



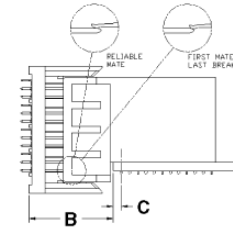
**Note:** All part numbers are RoHS compliant.

## Z-PACK HS3 Connector (Continued)

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



Fully Mated



Reliable Mate

Product Family	Dim. C	Dim. A Fully Mated	Contact	Dim B.		Fully Mated Wipe Length
				Reliable Mate	First Mate Last Break	
Z-PACK HM-Zd Product	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]
Z-PACK 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
Z-PACK TinMan Product	1.50 .059	12.50 .492	Ground Pins	16.44 [.647]	17.13 [.674]	3.94 [.155]
			Signal Level 2	14.94 [.588]	15.63 [.615]	2.44 [.096]
			Signal Level 1	N/A	N/A	N/A
Z-PACK 2mm HM Product	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 Product	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]
MULTIGIG RT T2 Product	2.25 .089	12.50 .492	Signal Level 1	15.00 [.591]	—	2.50 [.098]
			Ground	18.00 [.709]	—	5.50 [.217]
			Signal Level 3	18.00 [.709]	—	5.50 [.217]
MULTIGIG RT Power Module	5.50 .217	12.50 .492	Signal Level 2	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 Guide Hardware	N/A	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]
Z-PACK HS3 Product	1.50 .059	12.50 .492	Guide ESD Contact	30.75 [1.211]	—	18.25 [.719]
			Ground	17.08 [.672]	17.60 [.693]	4.78 [.188]
			Signal Level 2	16.05 [.632]	16.47 [.648]	3.75 [.148]
UPM	3.50 .138	12.50 .492	Signal Level 1	14.55 [.573]	14.97 [.589]	2.25 [.089]
			Power Level 3	20.25 [.797]	20.95 [.825]	8.10 [.319]
			Power Level 2	18.65 [.734]	19.35 [.762]	6.50 [.256]
UPM Guide Hardware	5.75 .226	12.50 .492	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
			Keyed Guide Pin	31.39 [1.236]	36.16 [1.424]	N/A
MULTI-BEAM XL Right Angle Header to Vertical Receptacle	5.08 .200	14.73 .580	Keyed Guide Pin	35.23 [1.387]	40.00 [1.575]	N/A
			PreMate Power — Level 1	—	16.84 [.663]	5.61 [.221] Min.
			PostMate Power — Level 2	—	17.81 [.701]	4.34 [.171] Min.
MULTI-BEAM XL Right Angle Receptacle to Vertical Header	3.81 .150	13.21 .520	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.
			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.



## 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

Set screw  
IS 408-9979

Pusher  
IS 408-9979

Spacer

Extraction Tool Assembly  
IS 408-9979

Pin Support Tube  
IS 408-9979

Tool Tip  
IS 408-9979

Pin Repair Kit  
IS 408-9979

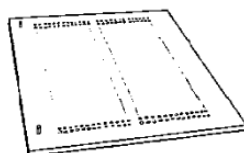
Chiclet  
Removal Tool  
IS 408-8410

Ground Blade Repair Kit  
IS 408-4573

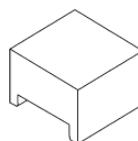
Housing Removal Tool Kit  
IS 408-8393

Ground Blade  
Extraction Tool  
IS 408-4573

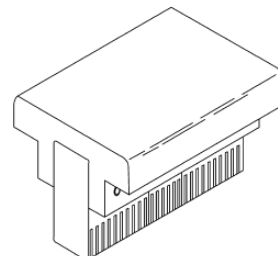
Ground Blade Insertion Tool  
IS 408-4573



Typical PC Board Support  
(Customer Supplied)



Typical Receptacle Seating Tool  
IS 408-8500



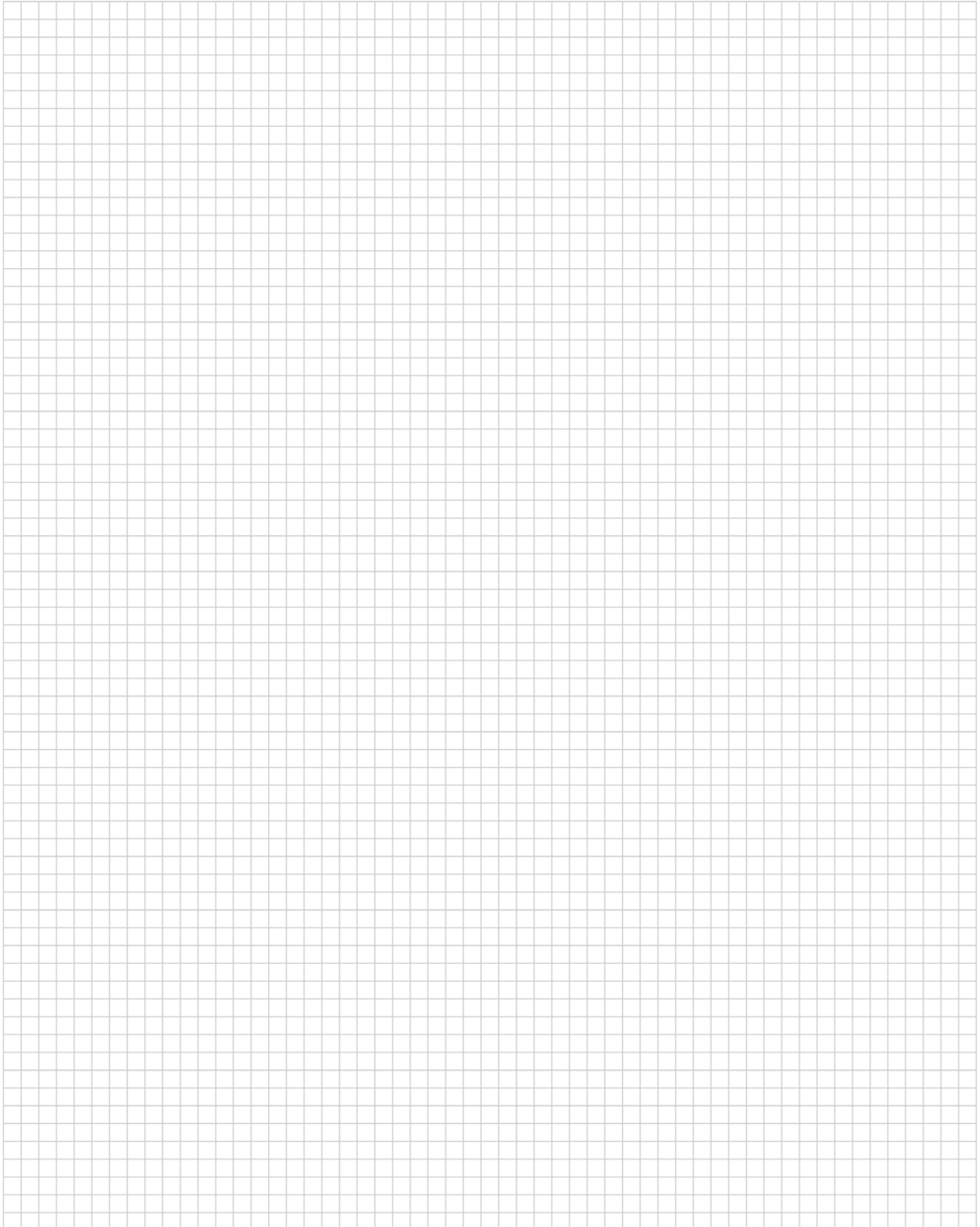
Typical Pin Header Seating Tool  
IS 408-8501

**Note:** All part numbers are RoHS compliant.

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**Engineering Notes**

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# Mouser Electronics

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