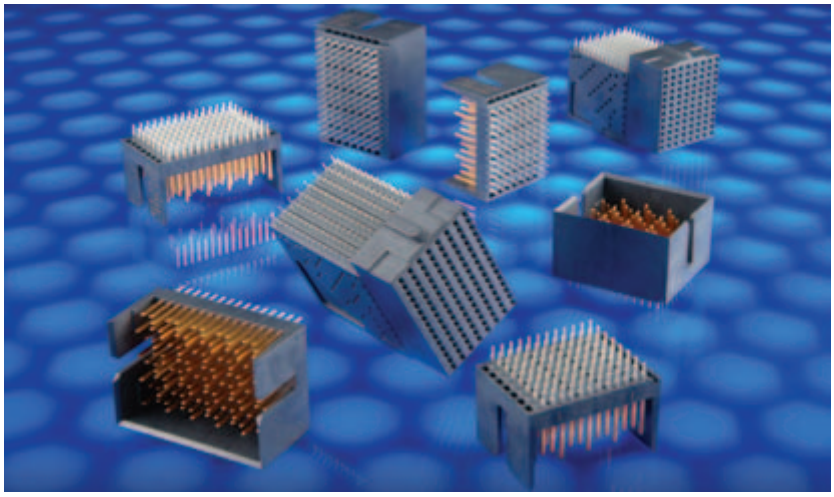
Introduction

Product Facts

- **10+ Gbps performance**
- **100 ohm Impedance for Differential Pair configuration**
- **5 pair version offers 26 pairs/10mm [66 differential pairs/inch] fitting within a 25.40 [1.00] card slot pitch**
- **4 pair version offers 21 pairs/10mm [53 differential pairs/inch] fitting within a 20.30 [.800] card slot pitch**
- **3 pair version offering 16 pairs/10mm [40 differential pairs/inch] fitting within a 16.25 [.625] card slot pitch**
- **Right angle pin headers (coplanar) in 3 pair, 4 pair, and 5 pair versions**
- **Reliable, redundant contact design on every signal contact**
- **Modular system offered in various column versions**
- **Meets Industry reliability requirements of Bellcore/ Telcordia**
- **Sequencing for ground and signal contacts**
- **RoHS Compliant**

Future Product Extensions

- **Vertical receptacles (mezzanine)**
- **High speed cable assemblies and hardware**



The Z-PACK MAX Backplane Connector family is a cost-effective solution for customers searching for a high density, high performance backplane interconnect system.

The Z-PACK MAX Connector design follows proven industry backplane convention by offering a fully protected right-angle receptacle for use on daughtercards where handling damage can be a concern when mating to a vertical male header. This connector permits field repairability at either the module or single pin levels.

Ground contacts positioned within each column of the connector, combined with unique contact lead frame arrangements, enable the Z-PACK MAX Connector to achieve low crosstalk and high through-put performance levels. Reliability is provided with a dual point of contact mating interface and compliant pin interface to the printed circuit board.

Industry Applications

Ideally designed for cost pressured, high signal density applications requiring interconnection between two printed circuit boards, such as those typically found in server, storage, switch, router, and similar applications. The Z-PACK MAX Connector product family is suited to meet the demands of today's modular system designs by offering a variety of configurations. The product family includes configurations to fit 20.32 [.800] and 25.40 [1.00] card slot spacing.

Technical Documents

Product Specification 108-2205

Application Specification 114-13144

Routing Guide Report #25GC004-1

Material and Finish

Signal Contact — High Strength Copper Alloy

Ground Contact — High Strength Copper Alloy

Housing — Liquid Crystal Polymer

Platings — Telcordia compliant interface, Nickel underplate

Compliant Pin Plating — RoHS Compliant

Ratings

Temperature Range — -65°C to +90°C

Current Rating — 0.5 A/contact @ < 30°C T-Rise

Durability — 200 cycles

Dielectric Withstanding Voltage — 560 VAC

Operating Voltage — 250 VAC max.

Signal Integrity

Characteristic Impedance — Differential @ 100 ohms ±10%

Crosstalk — Multi-pair differential crosstalk: 2.1% @ 50ps

Insertion Loss — -2 dB @ 10 GHz

For additional information visit:
http://www.tycoelectronics.com/zpackmax

Catalog 2-1773441-5
Revised 1-07

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Introduction (Continued)

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

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

Restriction on the use of Hazardous Substances (RoHS)

At Tyco Electronics, we're ready to support your RoHS requirements. We've assessed more than 1.5 million end items/components for RoHS compliance, and issued new part numbers where any change was required to eliminate the restricted materials. Part numbers in this catalog are identified as:

RoHS Compliant — Part numbers in this catalog are RoHS Compliant, unless marked otherwise. These products comply with European Union Directive 2002/95/EC as amended 1 January 2006 that restricts the use of lead, mercury, cadmium, hexavalent chromium, PBB, and PBDE in certain electrical and electronic products sold into the EU as of 1 July 2006.

NOTE: For purposes of this Catalog, included within the definition of RoHS Compliant are products that are clearly "Out of Scope" of the RoHS Directive such as hand tools and other non-electrical accessories.

Non-RoHS Compliant — These part numbers are identified with a "◆" symbol. These products do not comply with the material restrictions of the European Union Directive 2002/95/EC.

NOTE: Information regarding RoHS compliance is provided based on reasonable inquiry of our suppliers and represents our current actual knowledge based on the information provided by our suppliers. This information is subject to change. For latest compliance status, refer to our website referenced at right.

Getting the Information You Need

Our comprehensive on-line RoHS Customer Support Center provides a forum to answer your questions and support your RoHS needs. A RoHS FAQ (Frequently Asked Questions) is available with links to more detailed information. You can also submit RoHS questions and receive a response within 24 hours during a normal work week. The Support Center also provides:

- Cross-Reference from Non-compliant to Compliant Products
- Ability to browse RoHS Compliant Products in our on-line catalog
- Downloadable Technical Data Customer Information Presentation
- More detailed information regarding the definitions used above
- So whatever your questions when it comes to RoHS, we've got the answers at www.tycoelectronics.com/leadfree

RoHS Customer Support Center

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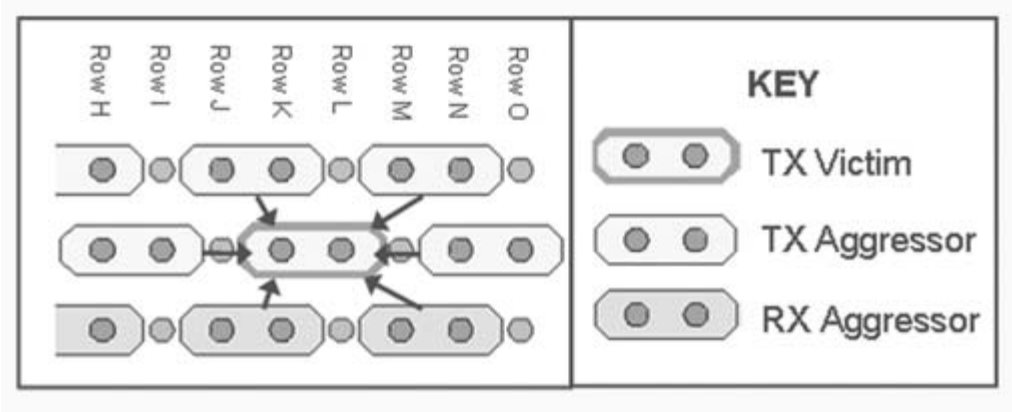
Introduction (Continued)

Noise Table

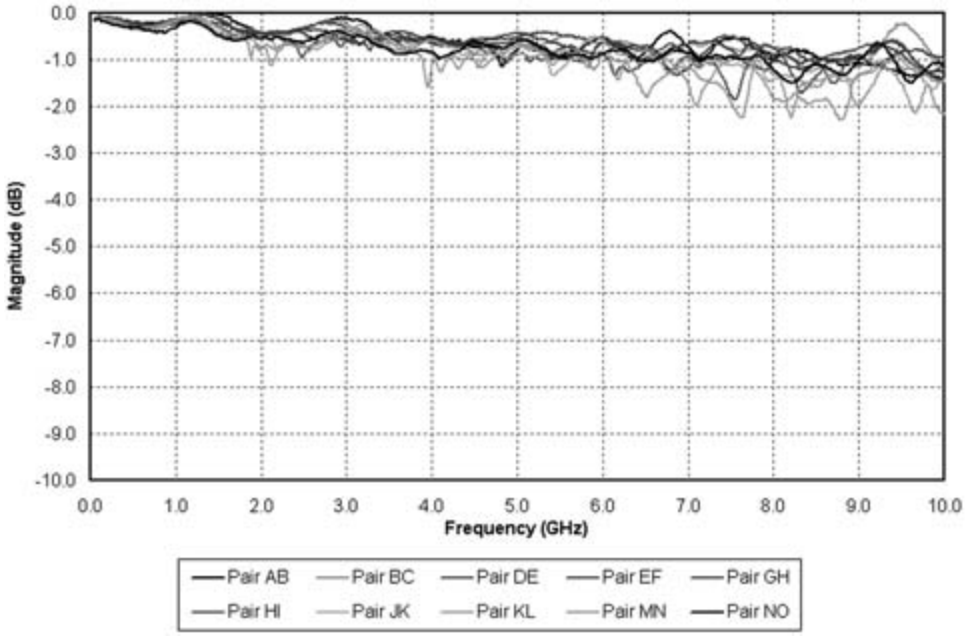
■ **Maximum, multiple source crosstalk**

Victim Pair	Total Peak Receiver Noise for Recommended Pin-Out
AB9	0.8%
BC8	1.6%
DE9	1.9%
EF8	1.9%
GH9	2.0%
HI8	2.0%
JG9	2.0%
KL8	2.1%
MN9	1.7%
NO8	0.8%

Note: Data includes PCB vias of both backplane and daughtercard connectors. Single mated connector pair 50 ps (20-80%) edge rate



Insertion Loss Plot



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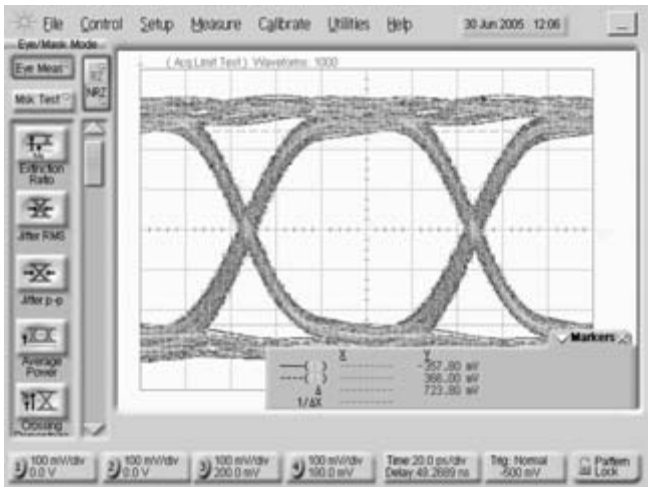
Introduction (Continued)

Representative Eye Pattern

- 10.0 Gbps data rate
- 2^7-1 PRBS
- Unequalized Signal

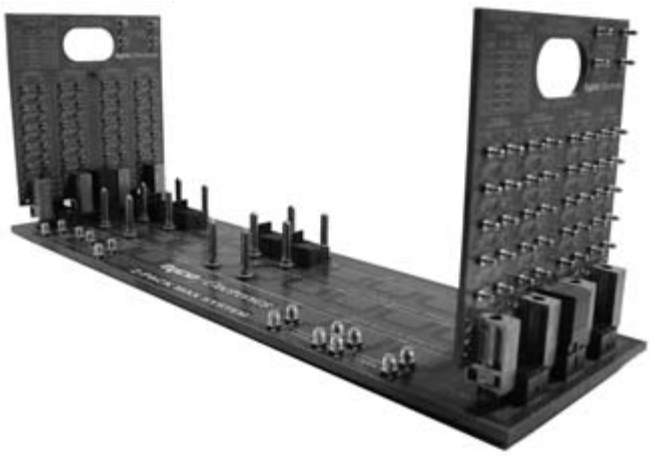


Customer Connector Evaluation Kit

- Connector characterization
- Available for loan — contact your local Tyco Electronics Sales Engineer
- Time and frequency domain testable
- Testable to 18+ GHz (25+ Gb/s)
- Multiple calibration options
- Convenient SMA interface

Customer System Evaluation Kit

- System characterization
- Available for loan — contact your local Tyco Electronics Sales Engineer
- Time and frequency domain testable
- Testable to 18+ GHz (25+ Gb/s)
- Multiple system lengths
- Convenient SMA interface



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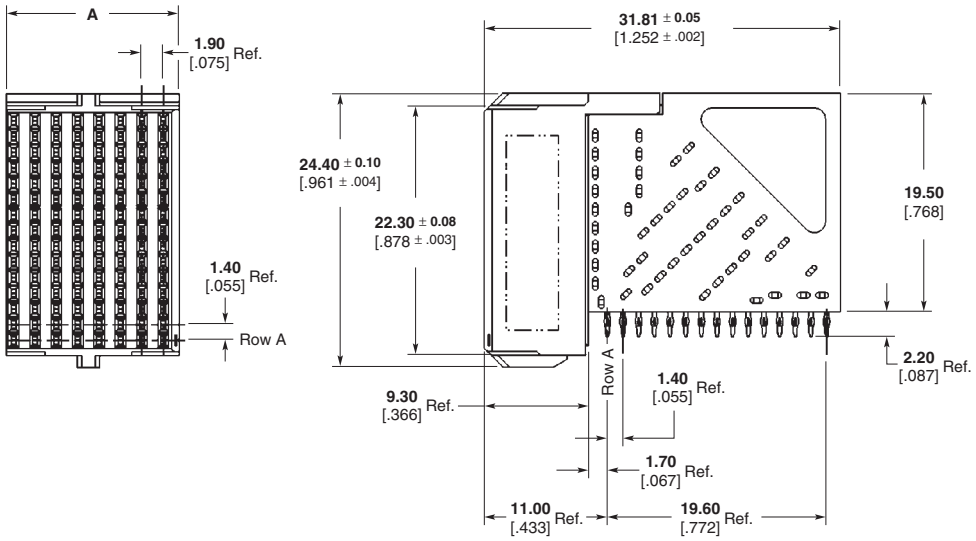
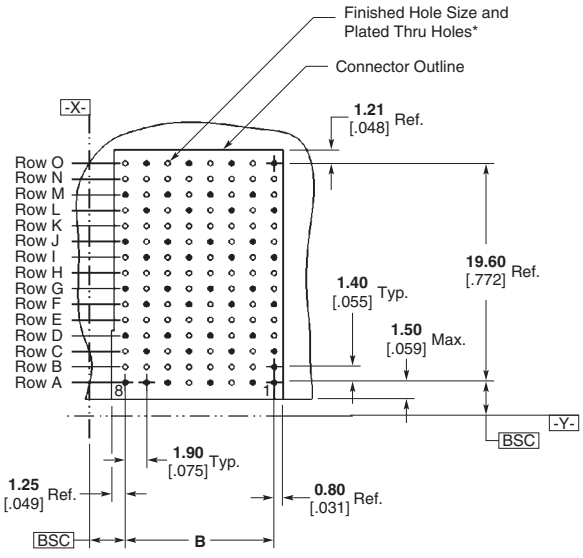
5 Pair Right Angle Receptacle Assemblies

Column	Part Number	Dimension		Application Tooling	Mates With
		A	B		
8	1469659-1	**15.35** .604	**13.30** .524	*	1469660-1, 1469680-1, 1469681-1, 1469735-1, 1469737-1
16	1469754-1	**30.55** 1.203	**28.50** 1.122	*	1469753-1, 1469755-1, 1469756-1, 1934018-1, 1934021-1

* Custom tooling not required. Utilizes flat-rock insertion tooling. Reference Application Specification 114-13144.





Recommended PC Board Layout
Daughterboard
Component Side Shown

Note: For additional information on pcb routing guidelines, reference the Z-PACK MAX Connector Routing Guide Report #25GC004-1.

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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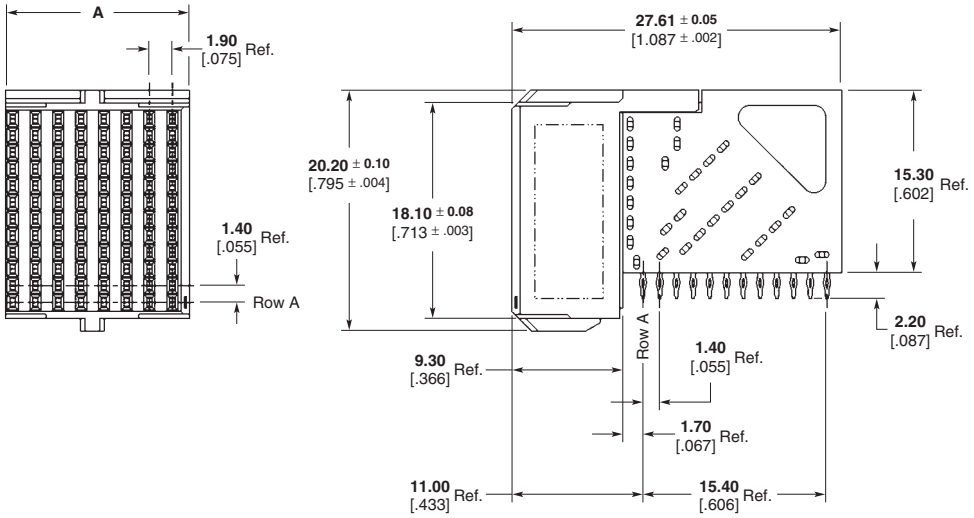
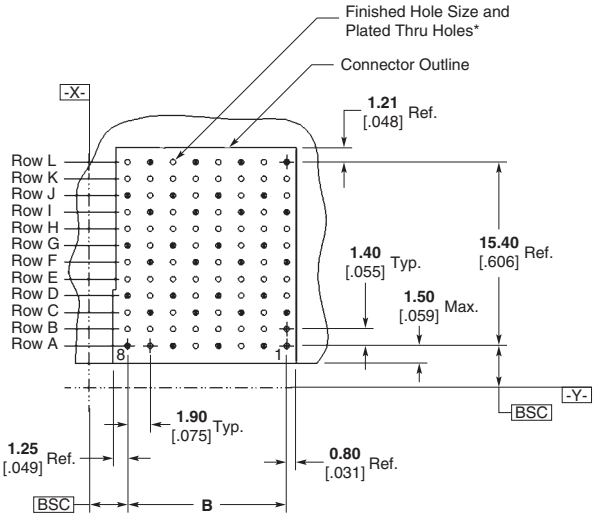
4 Pair Right Angle Receptacle Assemblies

Column	Part Number	Dimension		Application Tooling	Mates With
		A	B		
8	1469717-1	**15.35** .604	**13.30** .524	*	1469716-1, 1469702-1, 1469706-1, 1469793-1, 1469795-1
16	1469693-1	**30.55** 1.203	**28.50** 1.122	*	1469687-1, 1469703-1, 1469707-1, 1934026-1, 1934029-1

* Custom tooling not required. Utilizes flat-rock insertion tooling. Reference Application Specification 114-13144.





Note: For additional information on pcb routing guidelines, reference the Z-PACK MAX Connector Routing Guide Report #25GC004-1.

Recommended PC Board Layout
Daughterboard
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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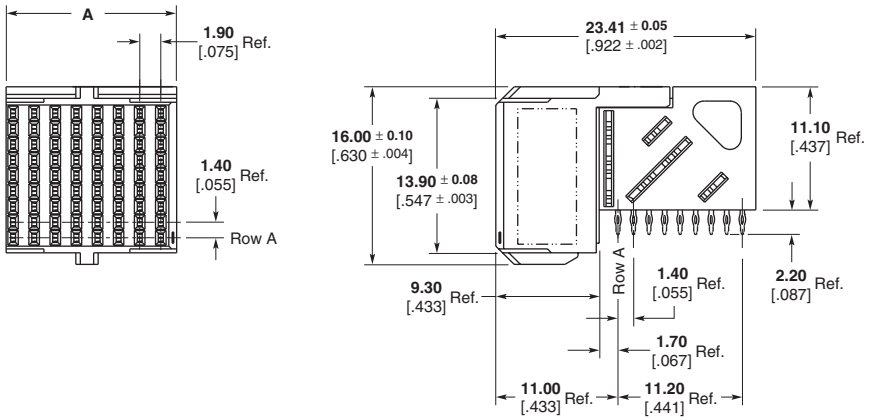
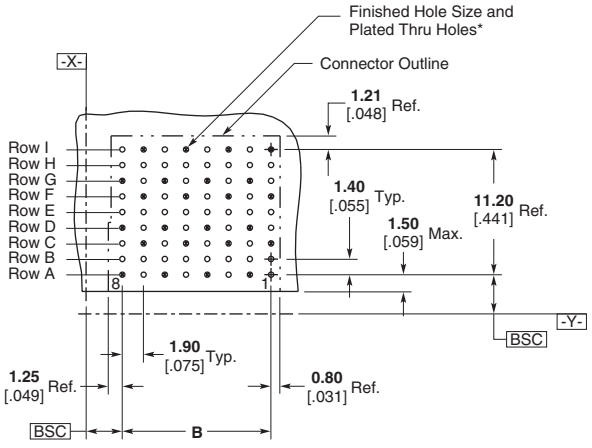
3 Pair Right Angle Receptacle Assemblies

Column	Part Number	Dimension		Application Tooling	Mates With
		A	B		
8	1469831-1	**15.35** .604	**13.30** .524	*	1469829-1, 1469945-1, 1469946-1, 1469974-1, 1469977-1
10	1469828-1	**19.15** .754	**17.10** .673	*	1469827-1, 1469867-1, 1469935-1, 1469871-1, 1469874-1
16	1469955-1	**30.55** 1.203	**28.50** 1.122	*	1469949-1, 1469950-1, 1469951-1, 1934034-1, 1934037-1

* Custom tooling not required. Utilizes flat-rock insertion tooling. Reference Application Specification 114-13144.





Recommended PC Board Layout
Component Side Shown

Note: For additional information on pcb routing guidelines, reference the Z-PACK MAX Connector Routing Guide Report #25GC004-1.

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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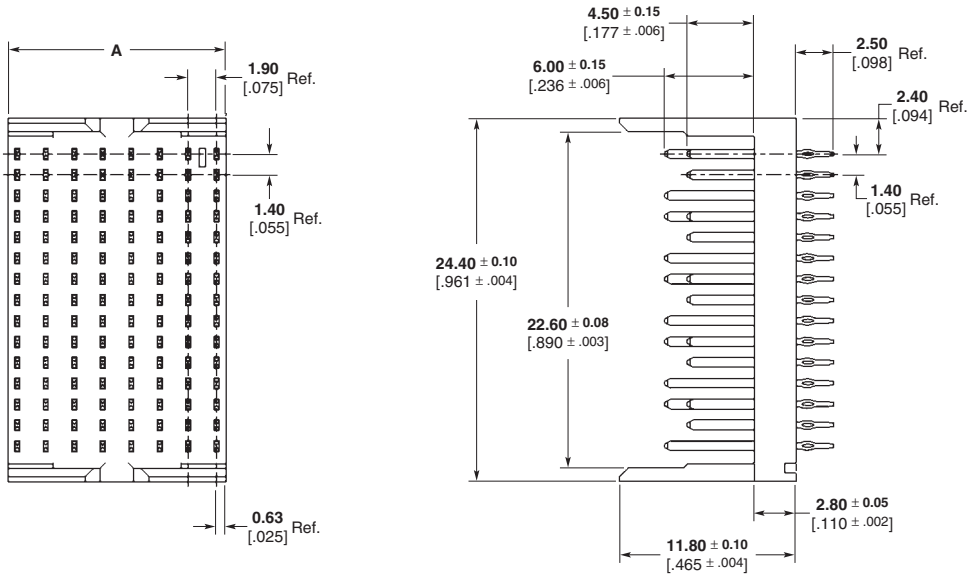
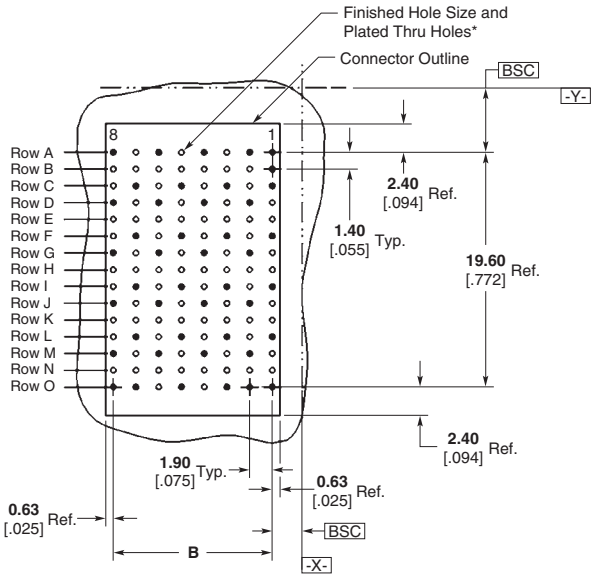
5 Pair Vertical Header Assemblies

Column	Part Number	Dimension		Application Tooling*	Mates With
		A	B		
8	1469660-1	**14.55** .573	**13.30** .524	1804791-1	1469659-1
16	1469753-1	**29.75** 1.171	**28.50** 1.122	1804791-3	1469754-1

* Reference Application Specification 114-13144.





Note: For additional information on pcb routing guidelines, reference the Z-PACK MAX Connector Routing Guide Report #25GC004-1.

Recommended PC Board Layout
Backplane
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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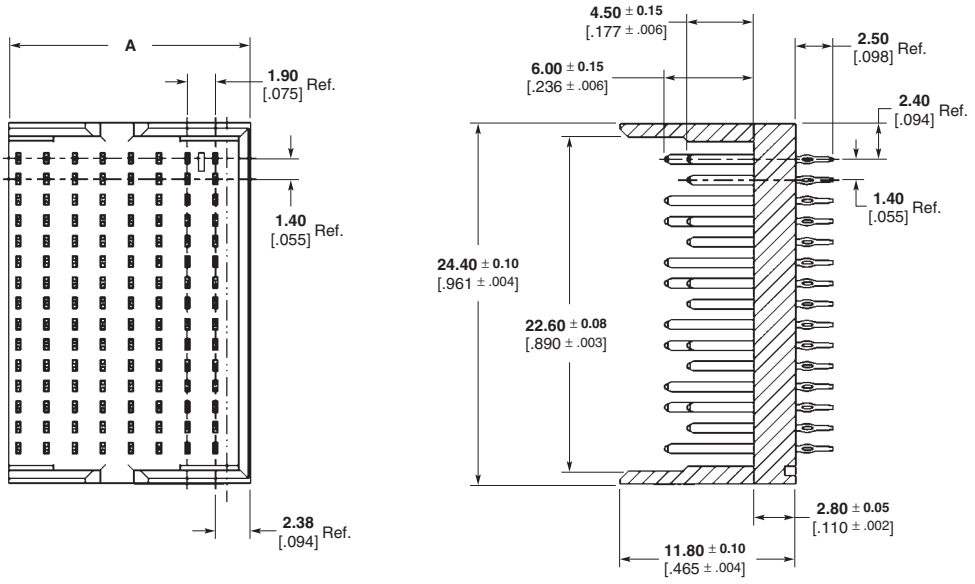
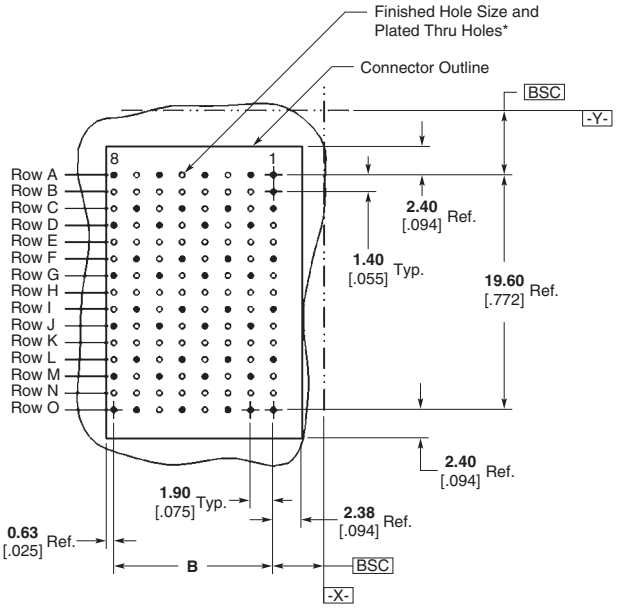
5 Pair Vertical Header Assemblies — Single End Wall

Column	Part Number	Dimension		Application Tooling*	Mates With
		A	B		
8	1469680-1	**16.30** .642	**13.30** .524	1804791-1	1469659-1
16	1469755-1	**31.50** 1.240	**28.50** 1.122	1804791-3	1469754-1

* Reference Application Specification 114-13144.





Note: For additional information on pcb routing guidelines, reference the Z-PACK MAX Connector Routing Guide Report #25GC004-1.

Recommended PC Board Layout
Backplane
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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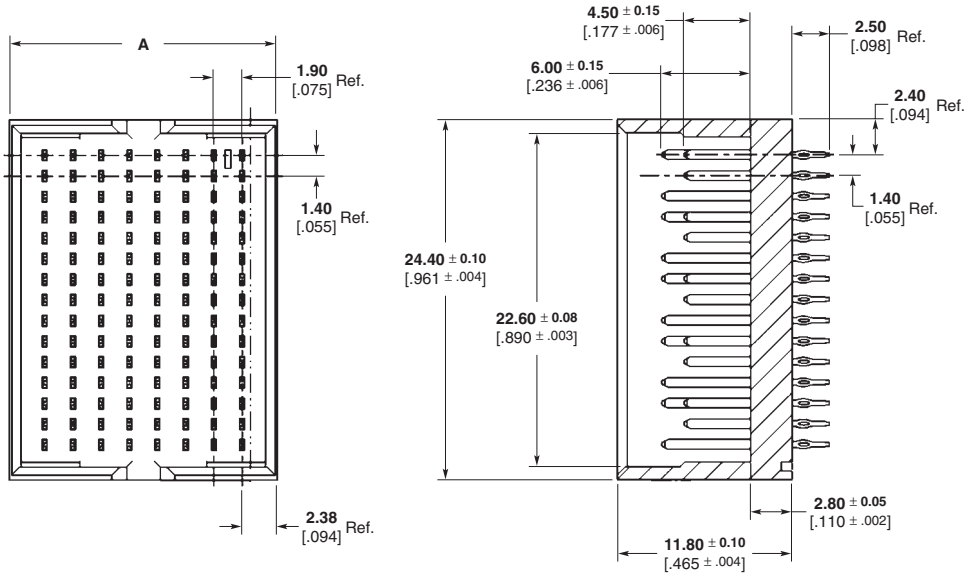
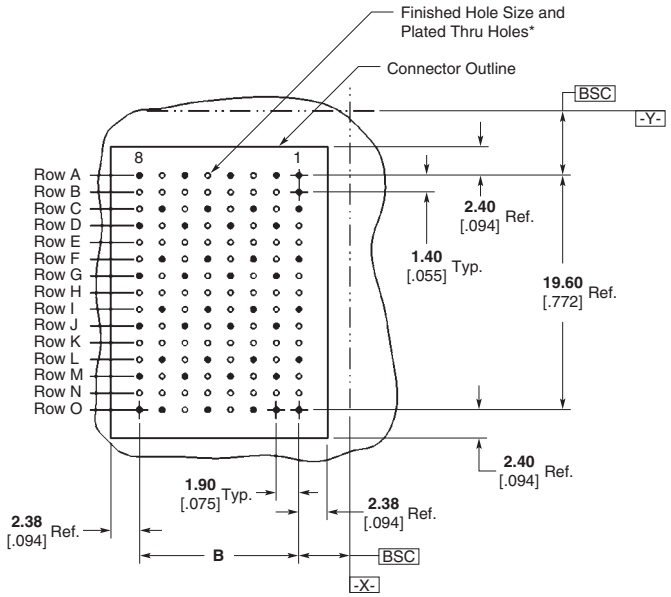
5 Pair Vertical Header Assemblies — Double End Walls

Column	Part Number	Dimension		Application Tooling*	Mates With
		A	B		
8	1469681-1	**18.05** .711	**13.30** .524	1804791-1	1469659-1
16	1469756-1	**33.25** 1.309	**28.50** 1.122	1804791-3	1469754-1

* Reference Application Specification 114-13144.





Note: For additional information on pcb routing guidelines, reference the Z-PACK MAX Connector Routing Guide Report #25GC004-1.

Recommended PC Board Layout
Backplane
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
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Japan: 81-44-844-8013
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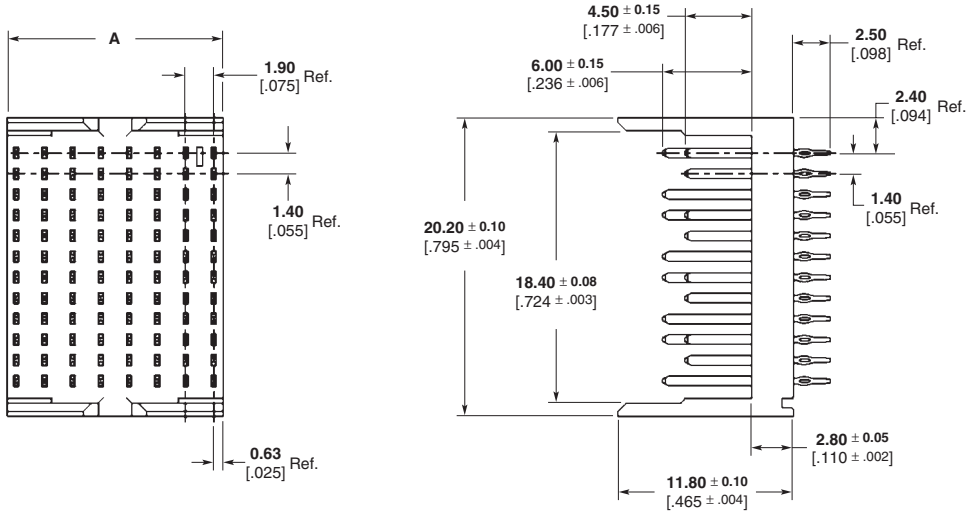
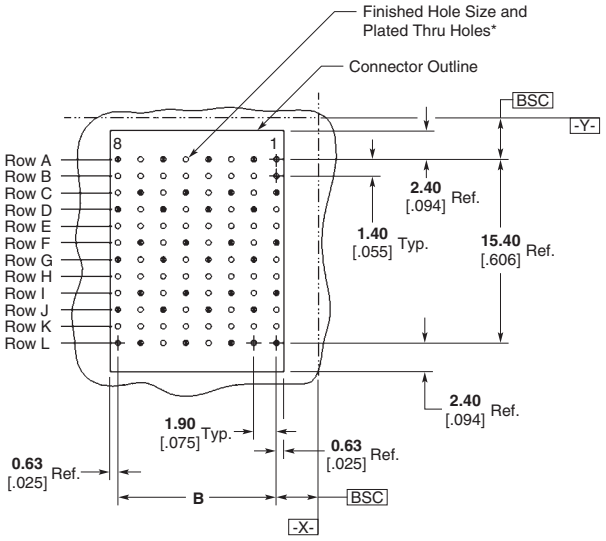
4 Pair Vertical Header Assemblies

Column	Part Number	Dimension		Application Tooling*	Mates With
		A	B		
8	1469716-1	**14.55** .573	**13.30** .524	1804790-1	1469717-1
16	1469687-1	**29.75** 1.171	**28.50** 1.122	1804790-3	1469693-1

* Reference Application Specification 114-13144.





Note: For additional information on pcb routing guidelines, reference the Z-PACK MAX Connector Routing Guide Report #25GC004-1.

Recommended PC Board Layout
Backplane
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

Catalog 2-1773441-5
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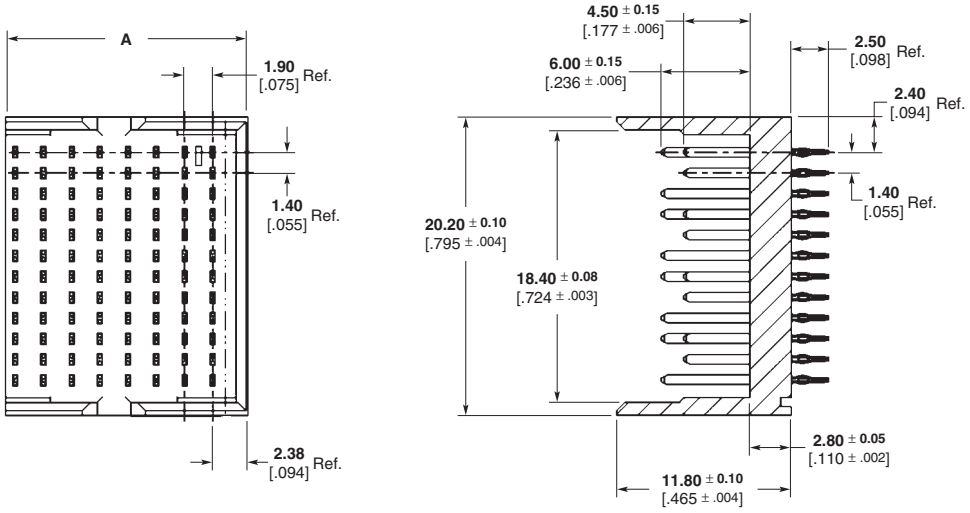
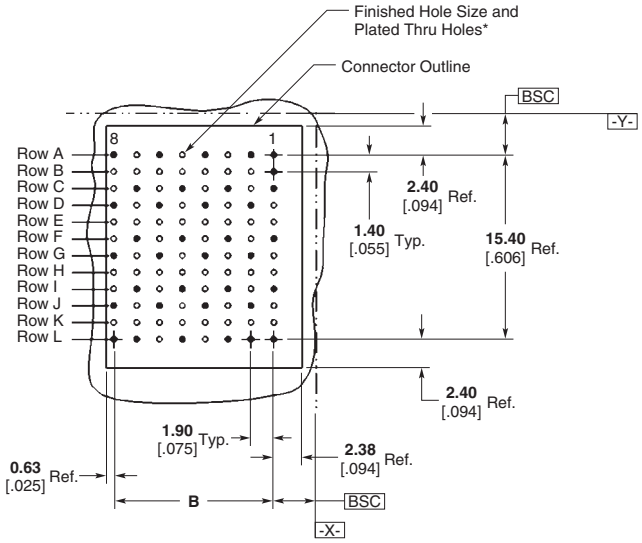
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

4 Pair Vertical Header Assemblies — Single End Wall

Column	Part Number	Dimension		Application Tooling*	Mates With
		A	B		
8	1469702-1	**16.30** .642	**13.30** .524	1804790-1	1469717-1
16	1469703-1	**31.50** 1.240	**28.50** 1.122	1804790-3	1469693-1

* Reference Application Specification 114-13144.





Note: For additional information on pcb routing guidelines, reference the Z-PACK MAX Connector Routing Guide Report #25GC004-1.

Recommended PC Board Layout
Backplane
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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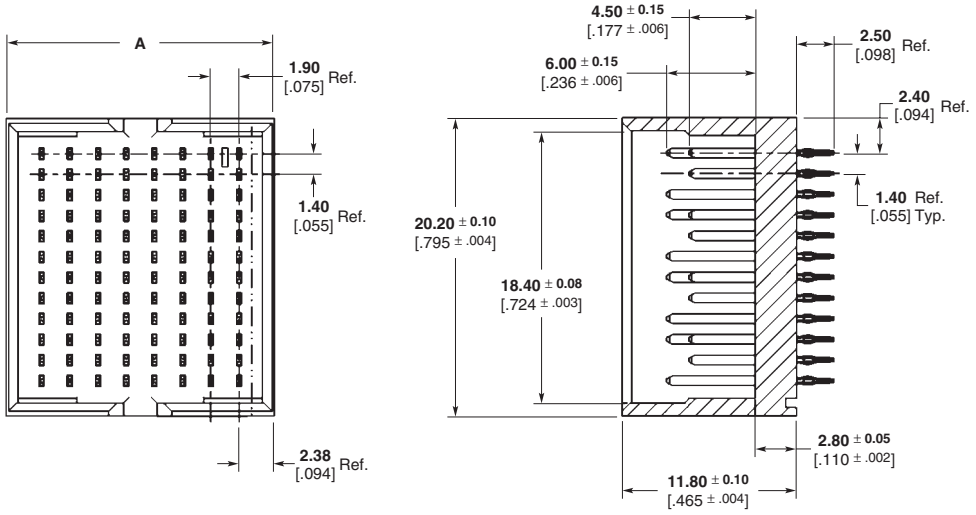
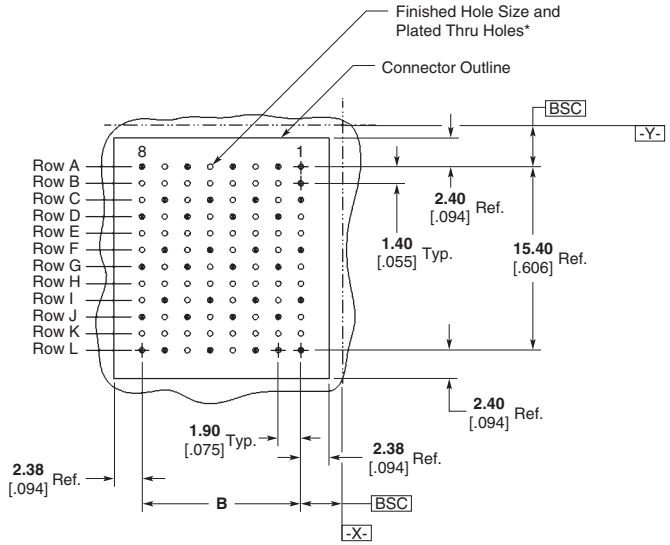
4 Pair Vertical Header Assemblies — Double End Walls

Column	Part Number	Dimension		Application Tooling*	Mates With
		A	B		
8	1469706-1	**18.05** .711	**13.30** .524	1804790-1	1469717-1
16	1469707-1	**33.25** 1.309	**28.50** 1.122	1804790-3	1469693-1

* Reference Application Specification 114-13144.





Note: For additional information on pcb routing guidelines, reference the Z-PACK MAX Connector Routing Guide Report #25GC004-1.

Recommended PC Board Layout
Backplane
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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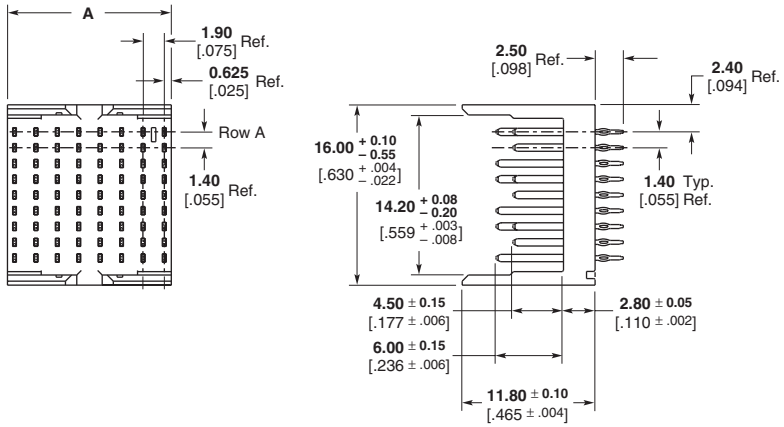
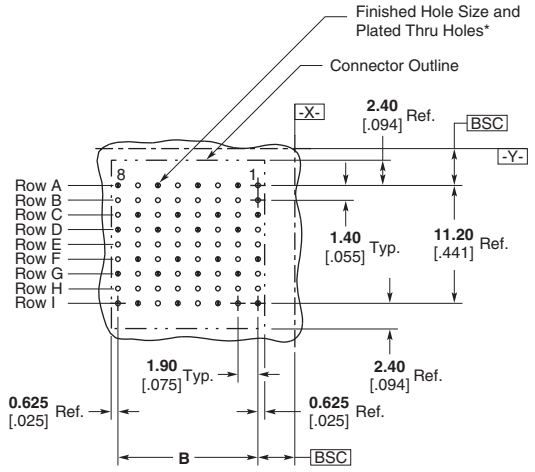
UK: 44-8706-080-208

3 Pair Vertical Header Assemblies

Column	Part Number	Dimension		Application Tooling*	Mates With
		A	B		
8	1469829-1	**14.55** .573	**13.30** .524	1901457-1	1469831-1
10	1469827-1	**18.35** .722	**17.10** .673	1901457-2	1469828-1
16	1469949-1	**29.75** 1.171	**28.50** 1.122	1901457-3	1469955-1

* Reference Application Specification 114-13144.





Recommended PC Board Layout
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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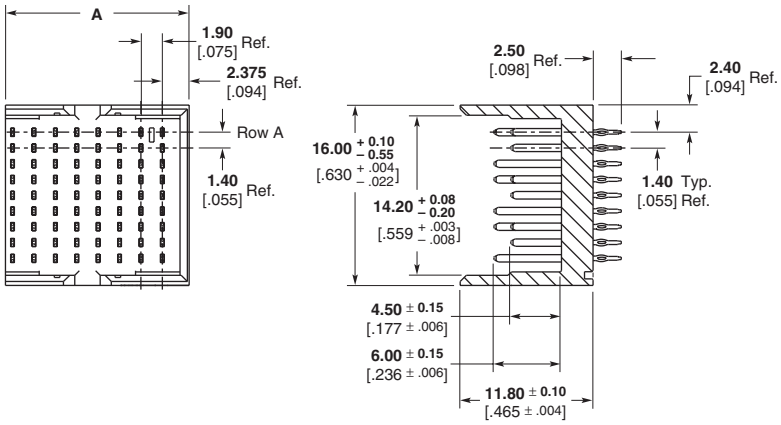
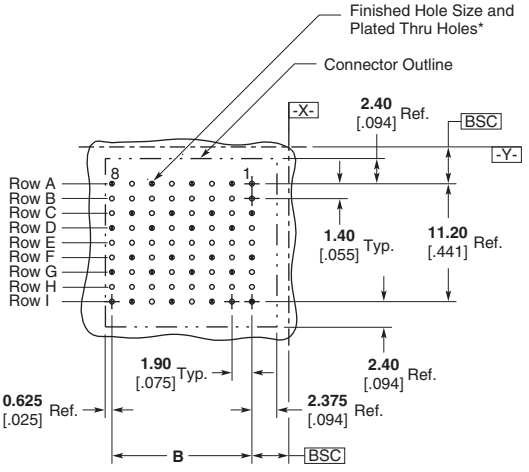
UK: 44-8706-080-208

3 Pair Vertical Header Assemblies — Single End Wall

Column	Part Number	Dimension		Application Tooling*	Mates With
		A	B		
8	1469945-1	**16.30** .642	**13.30** .524	1901457-1	1469831-1
10	1469867-1	**20.10** .791	**17.10** .673	1901457-2	1469828-1
16	1469950-1	**31.50** 1.240	**28.50** 1.122	1901457-3	1469955-1

* Reference Application Specification 114-13144.





Recommended PC Board Layout
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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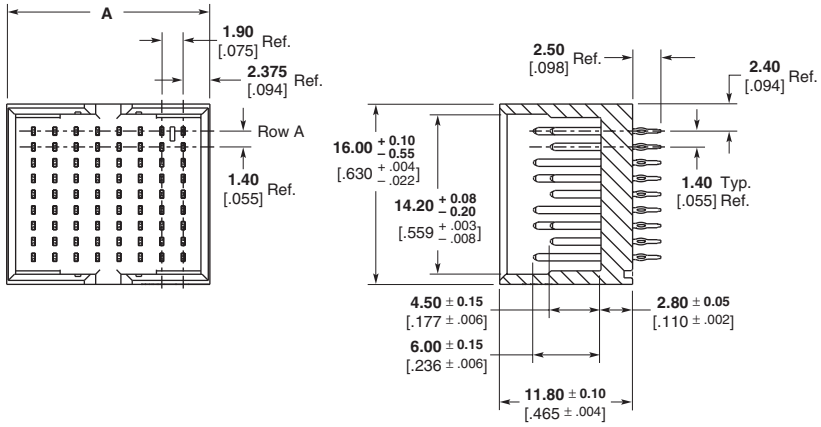
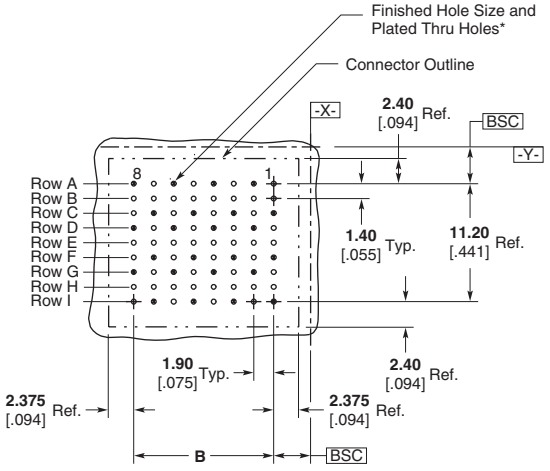
3 Pair Vertical Header Assemblies — Double End Walls

Column	Part Number	Dimension		Application Tooling*	Mates With
		A	B		
8	1469946-1	**18.05** .711	**13.30** .524	1901457-1	1469831-1
10	1469935-1	**21.85** .860	**17.10** .673	1901457-2	1469828-1
16	1469951-1	**33.25** 1.309	**28.50** 1.122	1901457-3	1469955-1

* Reference Application Specification 114-13144.





Recommended PC Board Layout
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

Catalog 2-1773441-5
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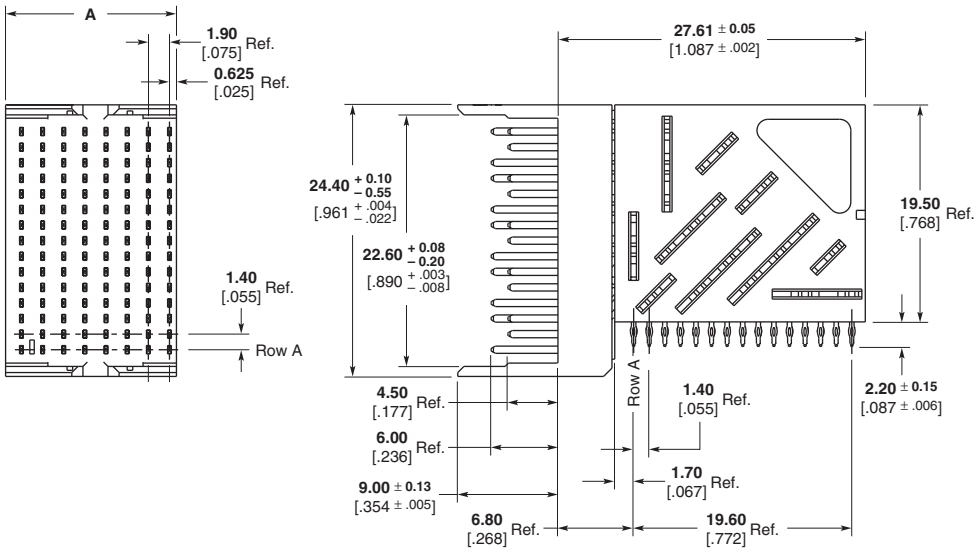
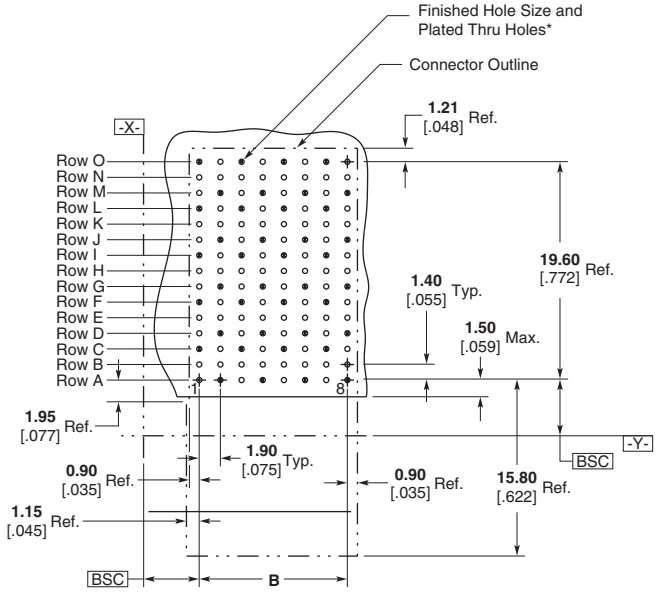
UK: 44-8706-080-208

5 Pair Right Angle Pin Header Assemblies

Column	Part Number	Dimension		Application Tooling	Mates With
		A	B		
8	1469735-1	**15.35** .604	**13.30** .524	*	1469659-1
16	1934018-1	**30.55** 1.203	**28.50** 1.122	*	1469754-1

* Custom tooling not required. Utilizes flat-rock insertion tooling.
Reference Application Specification 114-13144.





Recommended PC Board Layout
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

Catalog 2-1773441-5
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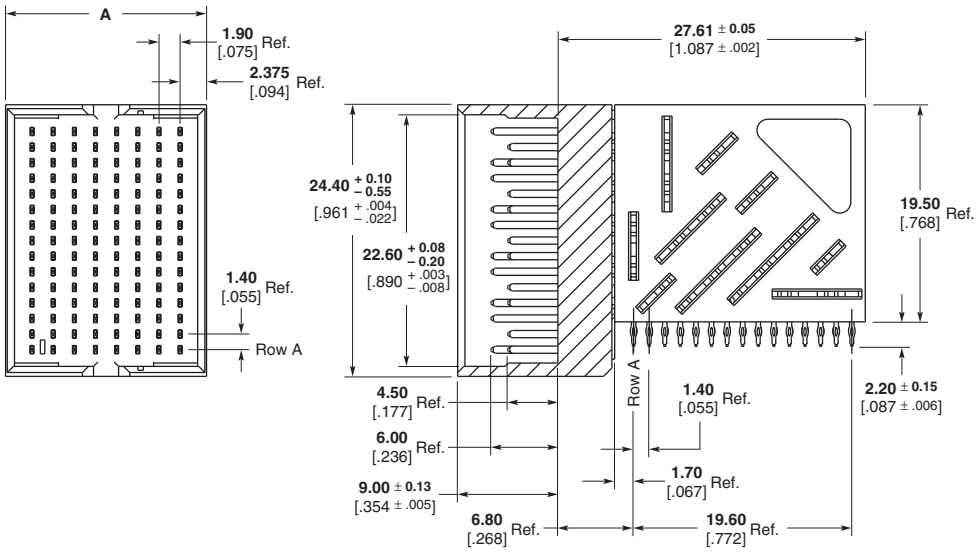
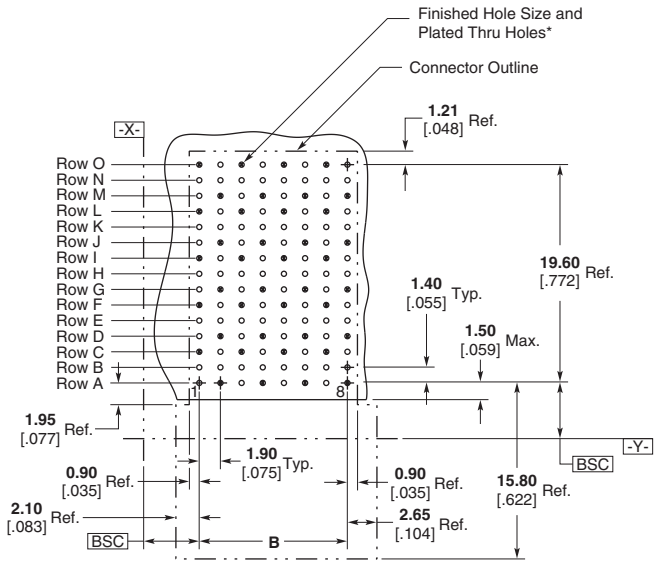
5 Pair Right Angle Pin Header Assemblies — Double End Walls

Column	Part Number	Dimension		Application Tooling	Mates With
		A	B		
8	1469737-1	**18.05** .711	**13.30** .524	*	1469659-1
16	1934021-1	**33.25** 1.309	**28.50** 1.122	*	1469754-1

* Custom tooling not required. Utilizes flat-rock insertion tooling.
Reference Application Specification 114-13144.





Recommended PC Board Layout
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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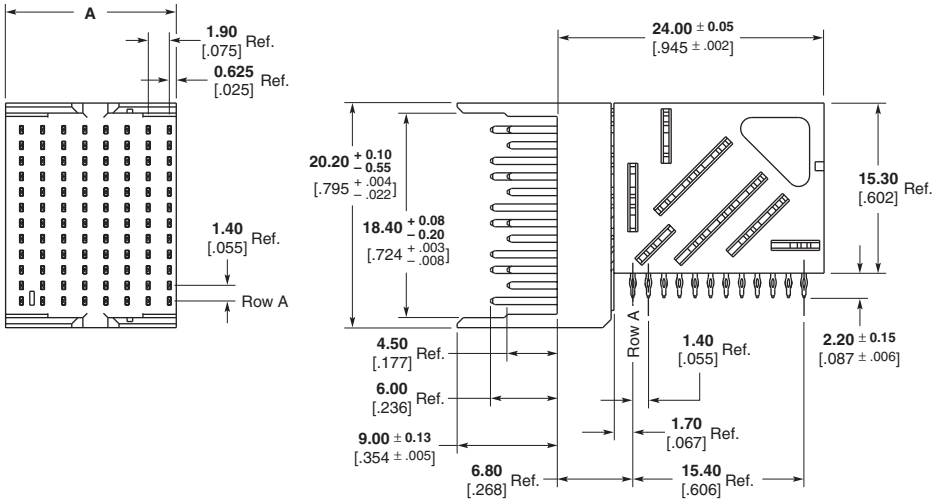
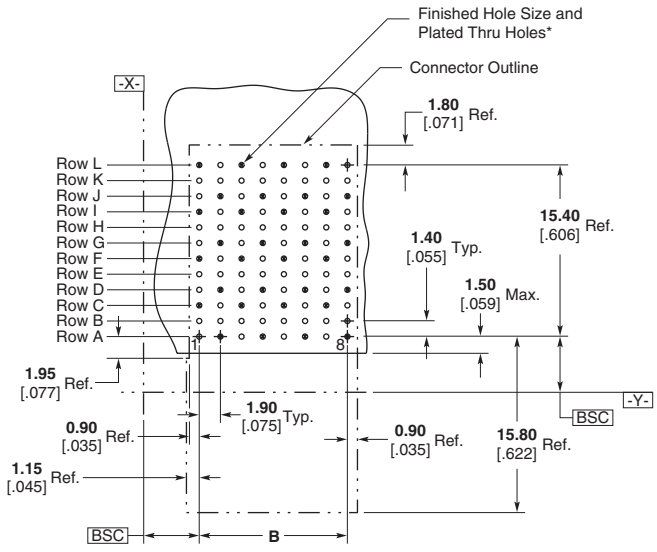
UK: 44-8706-080-208

4 Pair Right Angle Pin Header Assemblies

Column	Part Number	Dimension		Application Tooling	Mates With
		A	B		
8	1469793-1	**15.35** .604	**13.30** .524	*	1469717-1
16	1934026-1	**30.55** 1.203	**28.50** 1.122	*	1469693-1

* Custom tooling not required. Utilizes flat-rock insertion tooling.
Reference Application Specification 114-13144.





Recommended PC Board Layout
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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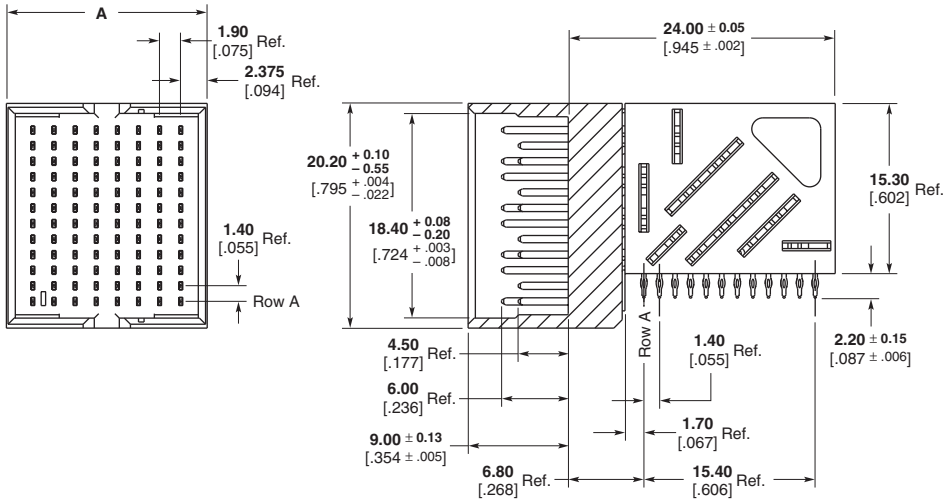
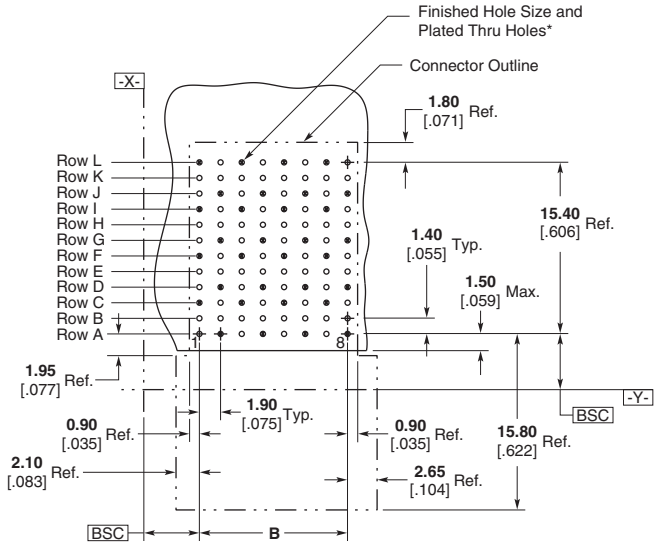
4 Pair Right Angle Pin Header Assemblies — Double End Walls

Column	Part Number	Dimension		Application Tooling	Mates With
		A	B		
8	1469795-1	**18.05** .711	**13.30** .524	*	1469717-1
16	1934029-1	**33.25** 1.309	**28.50** 1.122	*	1469693-1

* Custom tooling not required. Utilizes flat-rock insertion tooling.
Reference Application Specification 114-13144.





Recommended PC Board Layout
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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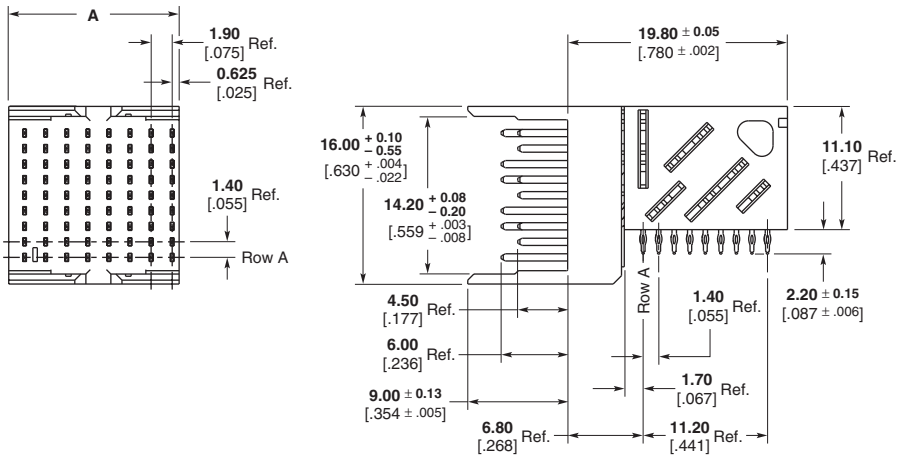
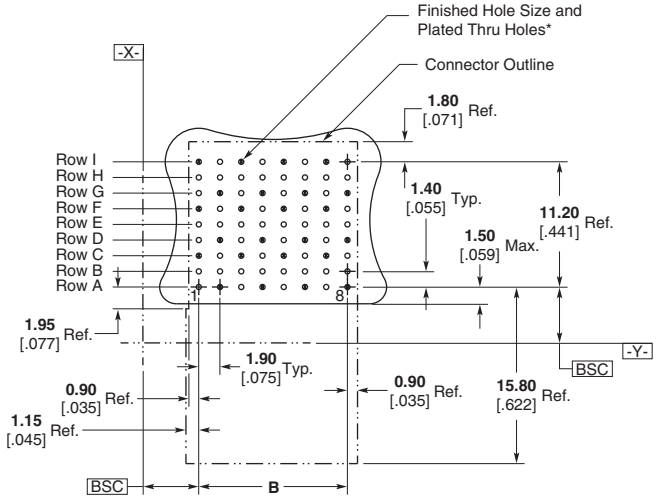
UK: 44-8706-080-208

3 Pair Right Angle Pin Header Assemblies

Column	Part Number	Dimension		Application Tooling	Mates With
		A	B		
8	1469974-1	**15.35** .604	**13.30** .524	*	1469831-1
10	1469871-1	**19.15** .754	**17.10** .673	*	1469828-1
16	1934034-1	**30.55** 1.203	**28.50** 1.122	*	1469955-1

* Custom tooling not required. Utilizes flat-rock insertion tooling.
Reference Application Specification 114-13144.





Recommended PC Board Layout
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

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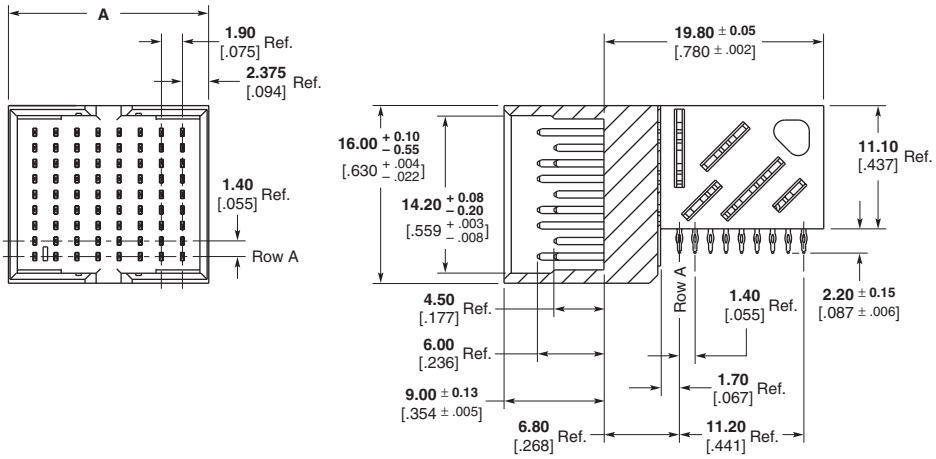
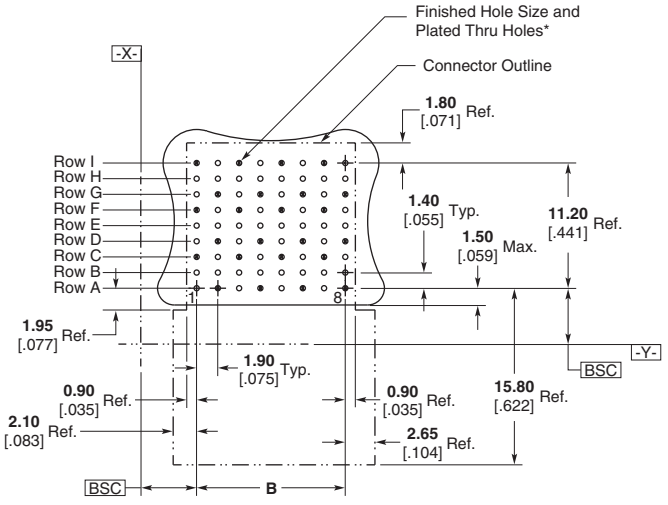
3 Pair Right Angle Pin Header Assemblies — Double End Walls

Column	Part Number	Dimension		Application Tooling	Mates With
		A	B		
8	1469977-1	**18.05** .711	**13.30** .524	*	1469831-1
10	1469874-1	**21.85** .860	**17.10** .673	*	1469828-1
16	1934037-1	**33.25** 1.309	**28.50** 1.122	*	1469955-1

* Custom tooling not required. Utilizes flat-rock insertion tooling.
Reference Application Specification 114-13144.





Recommended PC Board Layout
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

Catalog 2-1773441-5
Revised 1-07

www.tycoelectronics.com

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USA: 1-800-522-6752
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South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

Z-PACK MAX Mid-Plane (Orthogonal) Connector Overview

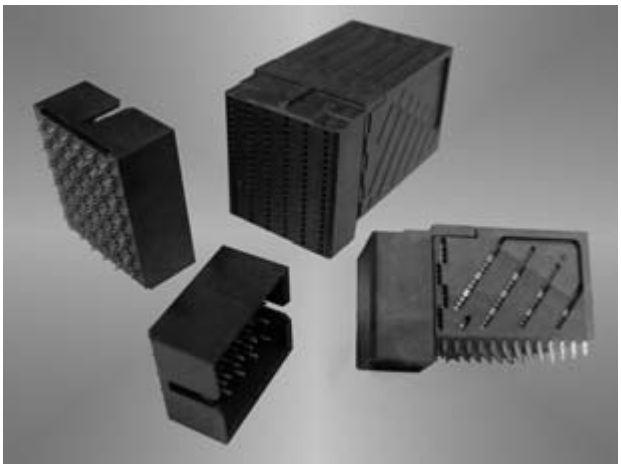
Product Facts

- **Scalable to 25 Gbps**
- **100 ohm impedance for differential pair configuration**
- **Very low noise**
- **Outstanding insertion loss through 2 connectors and vias**
- **Skewless differential pair in a 2-connector system**
- **Utilizes the same header and receptacle part on both sides of the mid-plane**
- **Compatible with standard Z-PACK MAX connectors and accessories**
- **4 pair x 4 pair and 6 pair x 6 pair modules available**
- **Reliable, redundant contact design on all contacts**
- **Reliable press-fit style termination to PCB**
- **RoHS compliant**

Applications

The Z-PACK MAX Mid-plane (orthogonal) connector is ideally designed for very demanding applications involving data rates in excess of 10 Gbps with many interconnections required. Such applications would include the following Telecom/Datacom equipment:

- **Switches**
- **Servers**
- **Routers**
- **Storage**



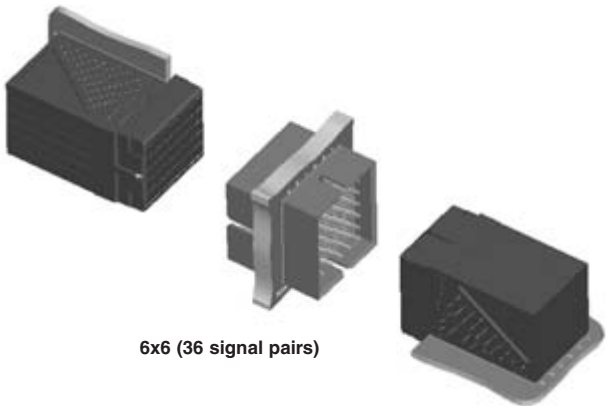
The Z-PACK MAX mid-plane (orthogonal) connector is an extension of the Z-PACK MAX connector product line, which includes perpendicular and coplanar interconnect solutions in 3 pair, 4 pair, and 5 pair versions.

This connector system is commonly referred to as an orthogonal connector system due to the orthogonal (perpendicular) orientation of the two system boards being connected on the front and rear side. It is built on the same technology and design approach as standard Z-PACK MAX connectors with the same mating interface and leadframe geometry.

Superior electrical performance is achieved for several reasons. The front board to rear board connection through the mid-plane makes the plated through hole (PTH) part of the signal transmission path eliminating the detrimental effects of via stubs. This construction also eliminates the need to route all the high speed signal lines along the backplane minimizing signal loss and significantly improving signal throughput. The wide column spacing establishes a connector footprint with improved impedance and reduced electrical noise. The in-line footprint version also provides ease of trace routing with wide channels and a connector interface compatible with the orthogonal receptacle. This permits the use of the same daughtercard in both mid-plane and backplane configurations.

The benefits are not limited to just signal integrity performance. The thinner mid-plane with fewer layers and significantly less complex routing is inherently less expensive. With trace routing typically limited to power distribution, low speed lines and potentially very few high speed links, the board can be fabricated from a cost effective material without the need to utilize techniques such as counter-boring or back-drilling.

All of this permits the implementation of small to large scale full mesh interconnects with significantly reduced complexity at a lower cost and with improved signal integrity.



6x6 (36 signal pairs)

For additional information visit:
http://www.tycoelectronics.com/zpackmax

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Z-PACK MAX Mid-Plane (Orthogonal) Connector Overview (Continued)

Noise Table

■ **Maximum, multiple source crosstalk**

VICTIM	Total Peak Receiver Noise for Recommended Pin-Out
AB3	0.50%
CD3	1.00%
EF3	0.90%
GH3	0.80%
JK3	0.90%
LM3	0.60%

Note: Data includes PCB vias of both backplane and daughtercard connectors.
Single mated connector pair.
50 ps (20-80%) edge rate.

Technical Documents

Product Specification 108-2205
Application Specification 114-13144
Routing Guide Report #26GC015

Material and Finish

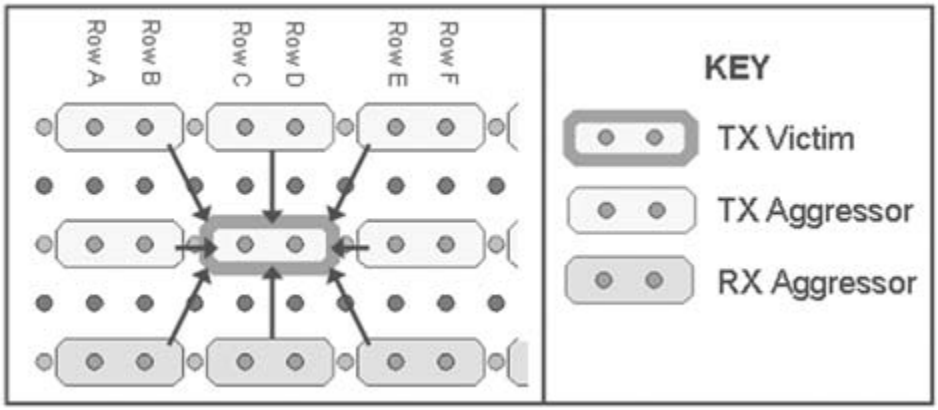
Signal Contact — High Strength Copper Alloy
Ground Contact — High Strength Copper Alloy
Housing — Liquid Crystal Polymer
Platings — Telcordia compliant interface, Nickel underplate
Compliant Pin Plating — RoHS Compliant

Ratings

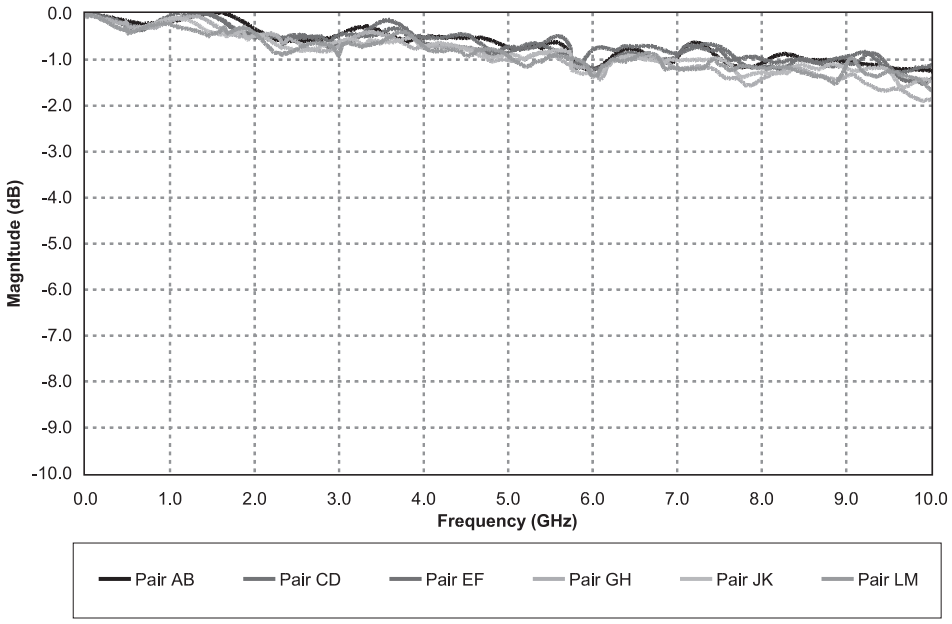
Temperature Range — -65°C to +90°C
Current Rating — 0.5 A/contact @ < 30°C T-Rise
Durability — 200 cycles
Dielectric Withstanding Voltage — 560 VAC
Operating Voltage — 250 VAC max.

Signal Integrity

Characteristic Impedance — Differential @ 100 ohms ±10%
Crosstalk — Multi-pair differential crosstalk: 1.0% @ 50ps
Insertion Loss — -2 dB @ 10 GHz



Insertion Loss Plot



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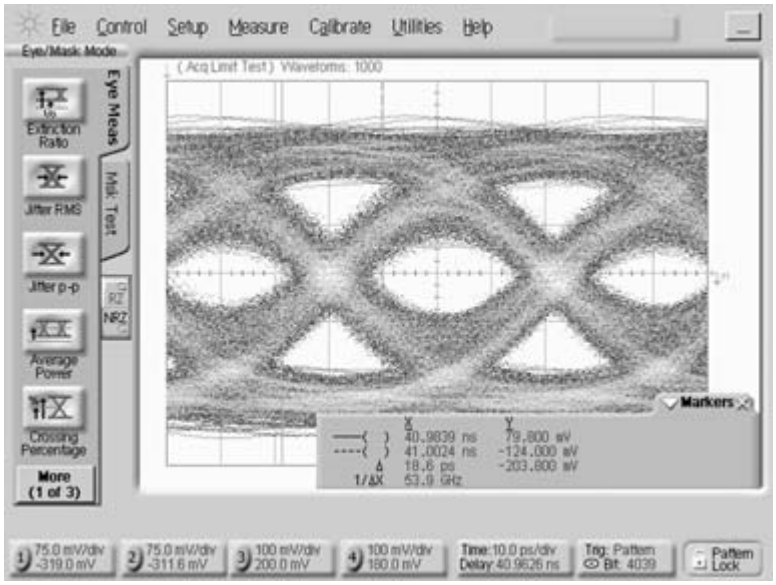
Z-PACK MAX Mid-Plane (Orthogonal) Connector Overview (Continued)

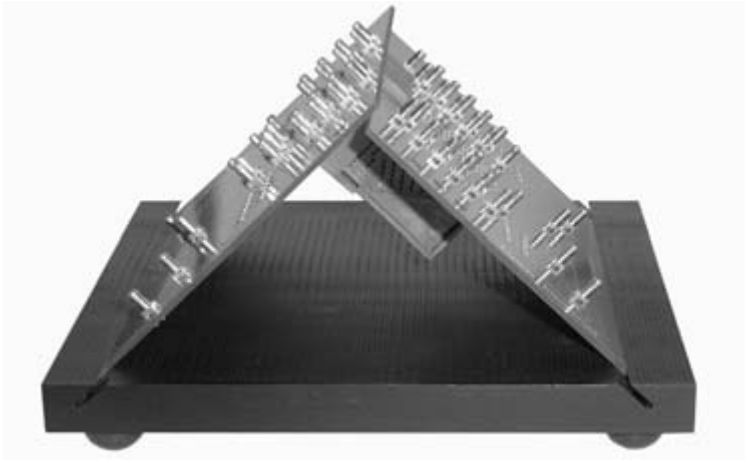
Representative Eye Pattern

- 10.0 Gbps data rate
- 2^7 -1 PRBS
- Unequalized Signal



Customer Connector Evaluation Kit

- Connector characterization
- Available for loan — contact your local Tyco Electronics Sales Engineer
- Time and frequency domain testable
- Testable to 18+ GHz (25+ Gb/s)
- Multiple calibration options
- Convenient SMA interface



Customer System Evaluation Kit

- System characterization
- Available for loan — contact your local Tyco Electronics Sales Engineer
- Time and frequency domain testable
- Testable to 18+ GHz (25+ Gb/s)
- Multiple calibration options
- Convenient SMA interface

Catalog 2-1773441-5
Revised 1-07

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6 Pair Mid-Plane Assemblies

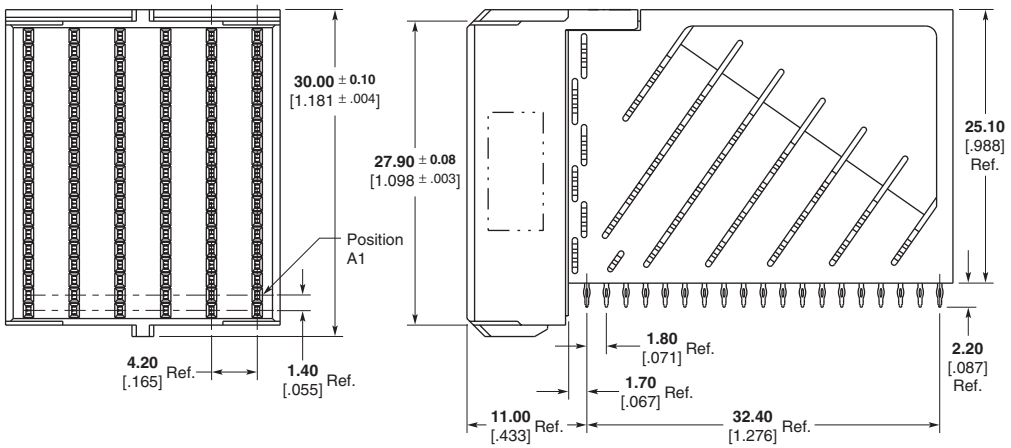
6 Pair Right Angle Receptacle Assembly

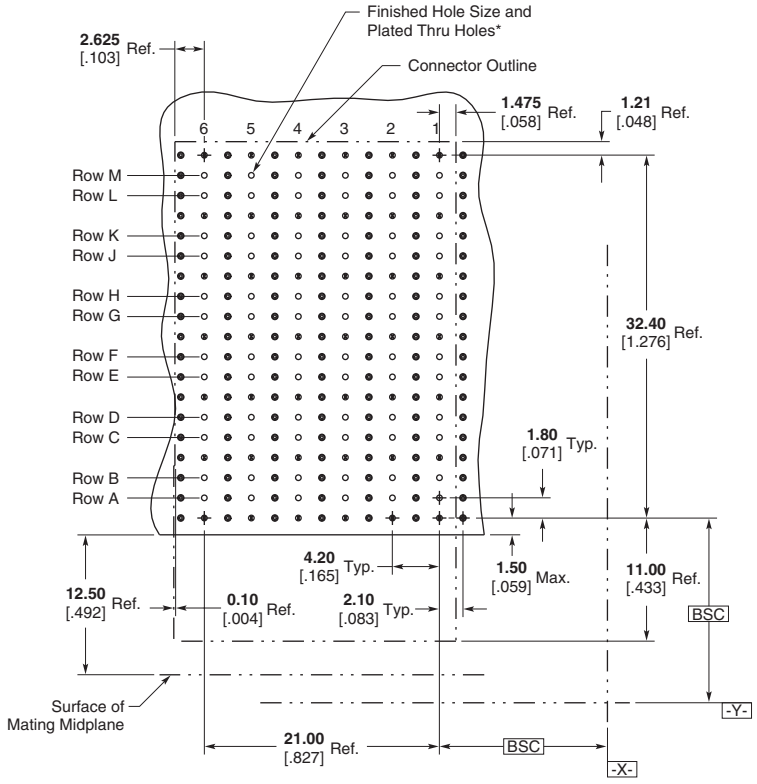
Part Number: 1469787-1

Custom tooling not required. Utilizes flat-rock insertion tooling.

Reference Application Specification 114-13144

Mates with: 1469786-1, 1934141-1





Recommended PC Board Layout
Component Side Shown

* Finished Hole Diameter = **0.46** ± **0.05** [.018 ± .002]
Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

Catalog 2-1773441-5
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6 Pair Mid-Plane Assemblies (Continued)

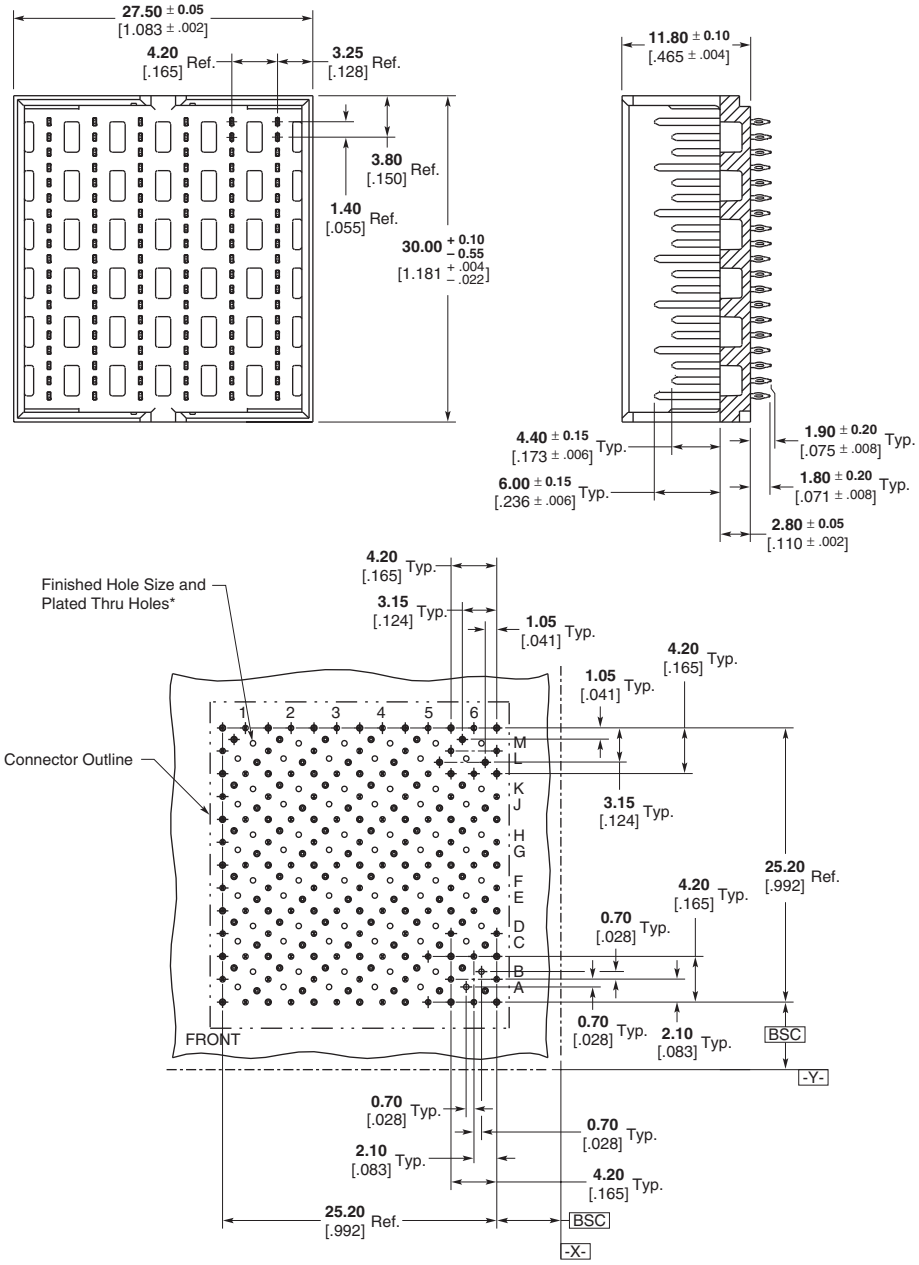
6 Pair Vertical Header Assembly

Part Number: 1469786-1

Insertion Tooling: 1901530-1

Reference Application Specification 114-13144

Mates with: 1469787-1



Recommended PC Board Layout
Component Side Shown

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Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

6 Pair Mid-Plane Assemblies (Continued)

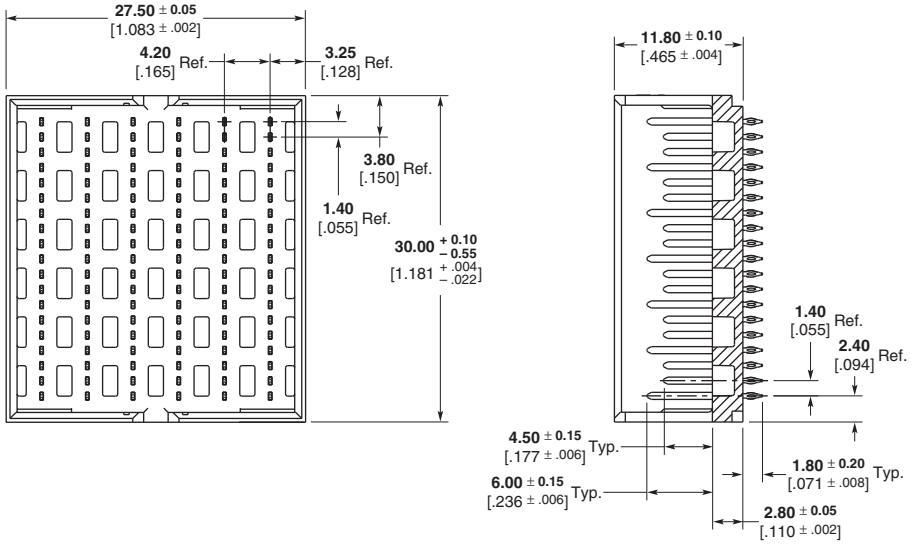
6 Pair Vertical Header Assembly — In Line Footprint

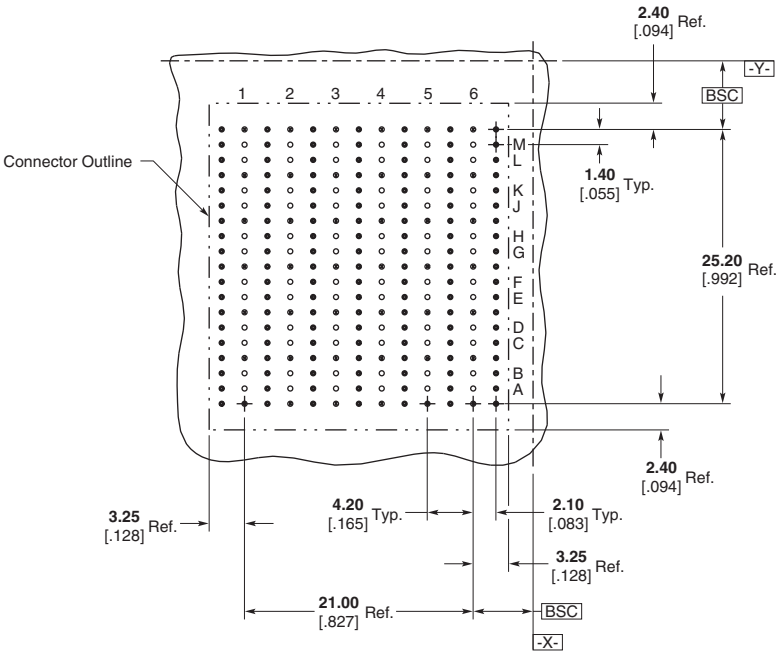
Part Number: 1934141-1

Insertion Tooling: 1901530-1

Reference Application Specification 114-13144

Mates with: 1469787-1





Recommended PC Board Layout
Component Side Shown

See Appl. Spec. 114-13144 for Recommended Plated Thru Hole Diameter and Plating Thicknesses

Catalog 2-1773441-5
Revised 1-07

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4 Pair Mid-Plane Assemblies

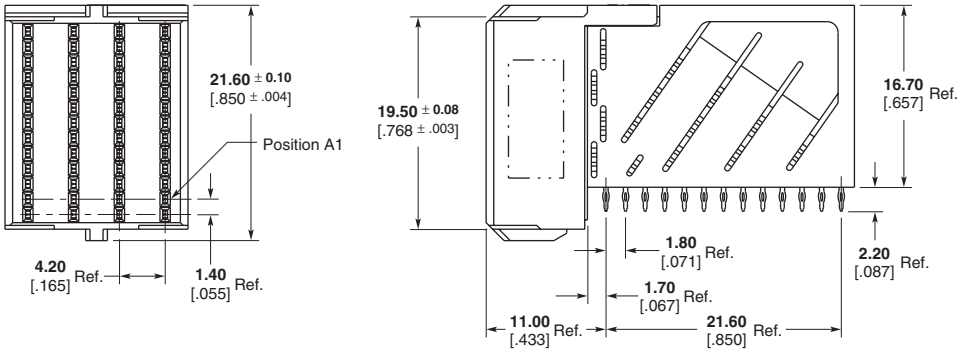
4 Pair Right Angle Receptacle Assembly

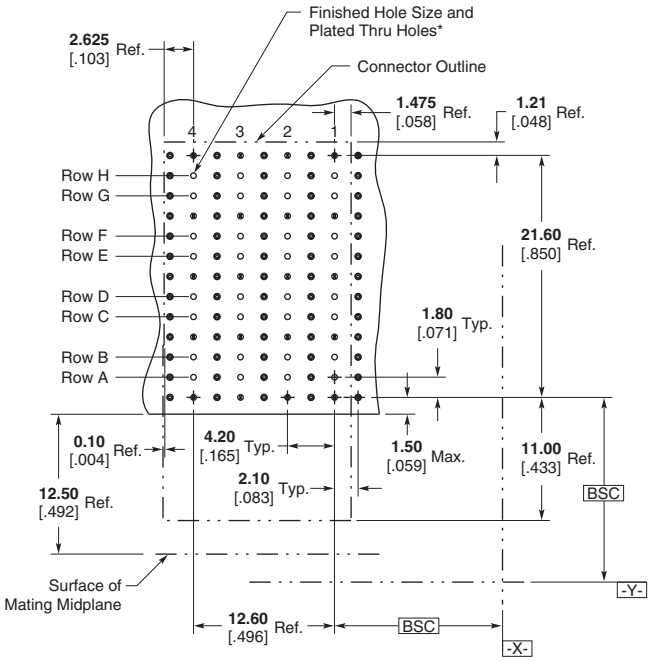
Part Number: 1469785-1

Custom tooling not required. Utilizes flat-rock insertion tooling.

Reference Application Specification 114-13144

Mates with: 1469784-1, 1934165-1





Recommended PC Board Layout
Component Side Shown

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Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
Copper Thickness = **0.038** ± **0.013** [.0015 ± .0005]
Tin-Lead Thickness = **0.008** ± **0.004** [.0003 ± .0002]
Finishes other than Tin-Lead, See Appl. Spec. 114-13144

Catalog 2-1773441-5
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UK: 44-8706-080-208

4 Pair Mid-Plane Assemblies (Continued)

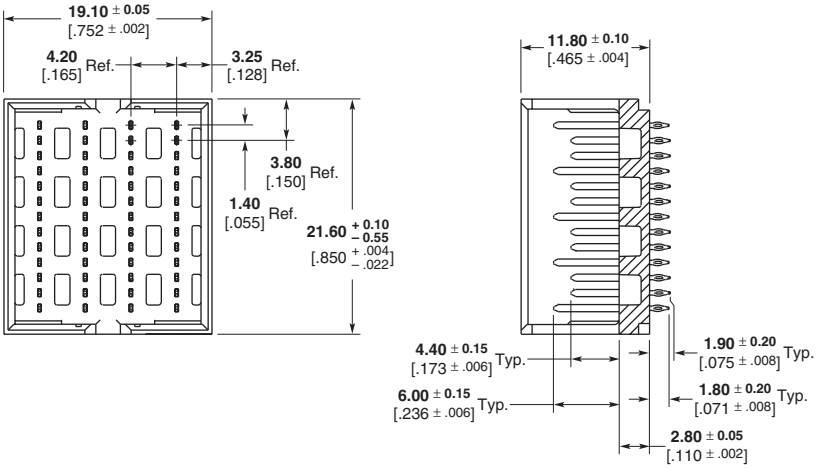
4 Pair Vertical Header Assembly

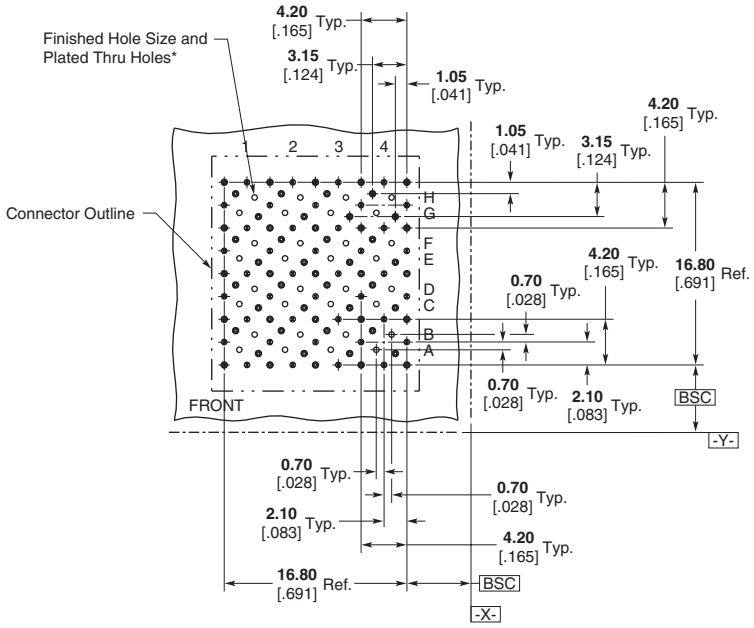
Part Number: 1469784-1

Insertion Tooling: 1901540-1

Reference Application Specification 114-13144

Mates with: 1469785-1





Recommended PC Board Layout
Component Side Shown

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Drilled Hole Diameter = **0.55** ± **0.02** [.022 ± .001]
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4 Pair Mid-Plane Assemblies (Continued)

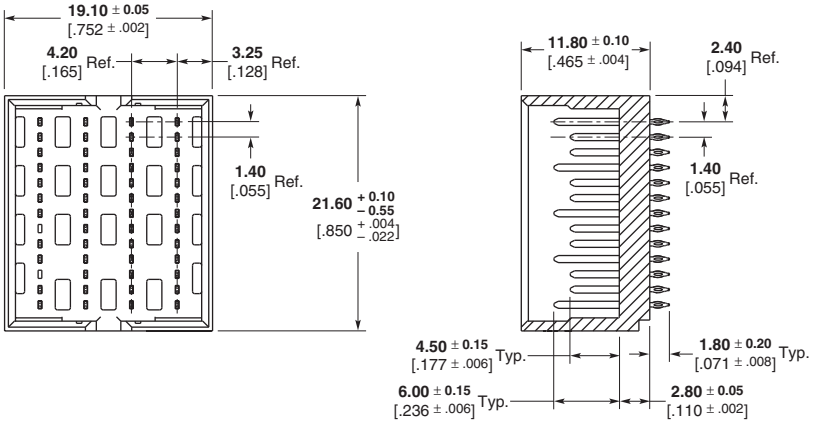
4 Pair Vertical Header Assembly — In Line Footprint

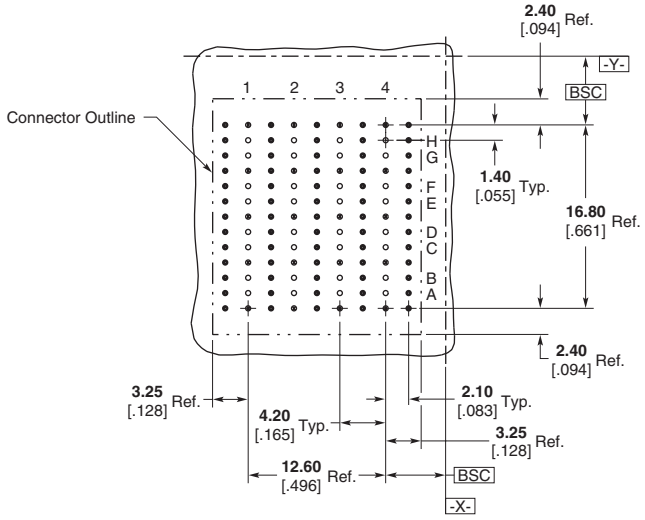
Part Number: 1934165-1

Insertion Tooling: 1901540-1

Reference Application Specification 114-13144

Mates with: 1469785-1





Recommended PC Board Layout
Component Side Shown

See Appl. Spec. 114-13144 for Recommended Plated Thru Hole Diameter and Plating Thicknesses

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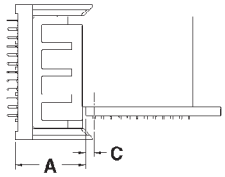
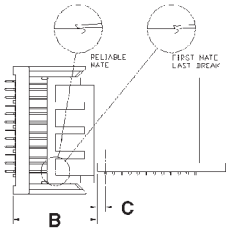
Z-PACK MAX Product Mating Sequence Chart



Fully Mated



Reliable Mate

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

Catalog 2-1773441-5
Revised 1-07

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Dimensions are in millimeters and inches unless otherwise specified. Values in brackets are U.S. equivalents.

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

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

Engineering Notes

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Hong Kong: 852-2735-1628
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Part Number Index

Note: This index lists all cataloged parts by base no. only. Complete part nos. (with prefixes and/or suffixes) are shown on the page(s) indicated.

Catalog 2-1773441-5
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Canada: 1-905-470-4425
Mexico: 01-800-733-8926
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Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

Americas

Argentina – Buenos Aires
Phone: +54-11-4733-2200
Fax: +54-11-4733-2211

Brasil – São Paulo
Phone: +55-11-3611-1311
Fax: +55-11-3611-0397

Canada – Toronto
Phone: +905-475-6222
Fax: +905-474-5520
Product Information Center: (Technical Support)
Phone: +905-470-4425
Fax: +905-474-5525

Colombia – Bogota
Phone: +57-1-231-9398
Fax: +57-1-660-0206

Mexico – Mexico City
Phone: +52-55-1106-0800
+01-800-733-8926
Fax: +52-55-1106-0901

United States – Harrisburg, PA
Phone: +717-564-0100
Fax: +717-986-7575
Product Information Center: (Technical Support)
Phone: +800-522-6752
Fax: +717-986-7575

For Latin/South American Countries not shown
Phone: +54-11-4733-2015
Fax: +54-11-4733-2083

Asia/Pacific

Australia – Sydney
Phone: +61-2-9554-2600
Fax: +61-2-9502-2556
Product Information Center: (Technical Support)
Phone: +61-2-9840-8200
Fax: +61-2-9634-6188

India – Bangalore
Phone: +91-80-285-40800
Fax: +91-80-285-40820

Indonesia – Jakarta
Phone: +65-6482-0311
Fax: +65-6482-1012

Japan – Toyko
Phone: +81-44-844-8111
Fax: +81-44-812-3207
Product Information Center: (Technical Support)
Phone: +81-44-844-8013
Fax: +81-44-812-3200

Korea – Seoul
Phone: +82-2-3415-4500
Fax: +82-2-3486-3810

Malaysia – Kuala Lumpur
Phone: +60-3-78053055
Fax: +60-3-78053066

New Zealand – Auckland
Phone: +64-9-634-4580
Fax: +64-9-634-4586

Philippines – Makati City
Phone: +632-848-0171
Fax: +632-867-8661

People's Republic of China
Hong Kong
Phone: +852-2735-1628
Fax: +852-2735-0243

Shanghai
Phone: +86-21-2407-1588
Fax: +86-21-2407-1599

Taiwan – Taipei
Phone: +886-2-8768-2788
Fax: +886-2-8768-2268

Singapore – Singapore
Phone: +65-6482-0311
Fax: +65-6482-1012

Thailand – Bangkok
Phone: +66-2-955-0500
Fax: +66-2-955-0505

Vietnam and Indochina –
Ho Chi Minh City
Phone: +84-8 930-5546
Fax: +84-8 930-3443

Europe/Middle East/Africa

Austria – Vienna
Phone: +43-1 90 5 60-0
Fax: +43-1 90 5 60-1333

Belgium – Kessel-Lo
Phone: +32-16-35-23-00
Fax: +32-16-35-23-52

Bulgaria – Sofia
Phone: +359-2-971-2152
Fax: +359-2-971-2153

Czech Republic – Kurim
Phone: +420-5-41-162-111
Fax: +420-5-41-162-223

Denmark – Glostrup
Phone: +45-43-480-452
Fax: +45-43-441-414

Egypt – Cairo
Phone: +20-2-29 04 281
Fax: +20-2-41 92 334

Estonia – Tartu
Phone: +372-5138-274
Fax: +372-7400-779

Finland – Helsinki
Phone: +358-95-12-34-20
Fax: +358-95-12-34-250

France – Cergy-Pontoise
Phone: +33-1-3420-8888
Fax: +33-1-3420-8600
Product Information Center: (Technical Support)
Phone: +33-1-3420-8943
Fax: +33-1-3420-8623

Germany – Bensheim
Phone: +49-6251-133-0
Fax: +49-6251-133-1600
Product Information Center: (Technical Support)
Phone: +49-6251-133-1999
Fax: +49-6251-133-1988

Germany – Langen
Phone: +49-6103-709-0
Fax: +49-6103-709-1223

Germany – Speyer
Phone: +49-6232-30-0
Fax: +49-6232-30-2243

Germany – HTS Division – Neunkirchen
Phone: +49-2247-305-0
Fax: +49-2247-305-122

Greece – Athens
Phone: +30-210-9370-396/397
Fax: +30-210-9370-655

Hungary – Budapest
Phone: +36-1-289-1000
Fax: +36-1-289-1010

Ireland – Dublin
Phone: +353-1-820-3000
Fax: +353-1-820-9790

Israel – Yokneam
Phone: +972-4-959-0508
Fax: +972-4-959-0506

Italy – Collegno (Torino)
Phone: +39-011-4012-111
Fax: +39-011-4031116

Lithuania – Vilnius
Phone: +370-5-2131-402
Fax: +370-5-2131-403

Netherlands – 's-Hertogenbosch
Phone: +31-73-624-62-46
Fax: +31-73-621-23-65
Product Information Center: (Technical Support)
Phone: +31-73-6246-999
Fax: +31-73-6246-998

Norway – Nesbru
Phone: +47-66-77-8886
Fax: +47-66-77-8855

Poland – Warsaw
Phone: +48-22-45-76-700
Fax: +48-22-45-76-720

Romania – Bucharest
Phone: +40-21-311-3479/3596
Fax: +40-21-312-0574

Russia – Moscow
Phone: +7-495-926-5506/07/08/09
Fax: +7-495-926-5505

Russia – St. Petersburg
Phone: +7-812-718-8192
Fax: +7-812-718-8193

Slovenia – Ljubljana
Phone: +386-1561-3270
Fax: +386-1561-3240

South Africa – Port Elizabeth
Phone: +2741-503-4500
Fax: +2741-581-0440

Spain – Barcelona
Phone: +34-93-291-0330
Fax: +34-93-201-7879
Product Information Center: (Technical Support):
Phone: +34-93-291-0330
Fax: +34-93-200-3779

Sweden – Upplands Väsby
Phone: +46-8-50-72-50-00
Fax: +46-8-50-72-50-01

Switzerland – Steinach
Phone: +41-71-447-0447
Fax: +41-71-447-0444

Turkey – Istanbul
Phone: +90-212-281-8181/2/3
Fax: +90-212-281-8184

Ukraine – Kiev
Phone: +380-044-206-2265
Fax: +380-044-206-2264

United Kingdom – Swindon
Phone: +44-8706-080-208
Fax: +44-1793-572-109
Product Information Center: (Technical Support)
Freephone GB: 0800-267-666
Phone: +44-208-420-8341 or 8343
+44-208-420-8081

For Middle East/African Countries Not Shown
Phone: +33-1-3420-8866
Fax: +33-1-3420-8300