CompactPCI® Power Connector

Winchester Electronics

January 2003

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Introduction

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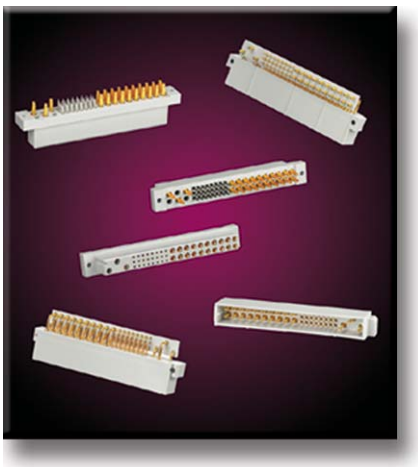
CompactPCI® is an industry-standard bus architecture designed for industrial computers based on the Peripheral Component Interconnect (PCI) specification Intel developed for desktop computers. In addition to CompactPCI standards providing designers and users with multiple sources and interoperability between system components, products designed to CompactPCI standards also contain the following benefits:

- Ability to utilize existing PCI microprocessors and software
- Rugged VME Eurocard-style chassis
- Ability to insert and remove plug-in cards without powering down the system (Hot-Swap)
- Superior system cooling due to vertical card orientation

The original CompactPCI specification was developed in 1994 by a small number of companies who formed the PCI Industrial Computer Manufacturers Group (PICMG). Today, PICMG® consists of over 650 member companies located worldwide and has released 16 different CompactPCI specifications, with several others currently under development. The electronics industry has embraced the benefits of standardization provided by the CompactPCI specifications, and systems designed to CompactPCI standards continue to grow in a wide range of industries including telecommunications, computer, industrial automation, medical, and instrumentation.

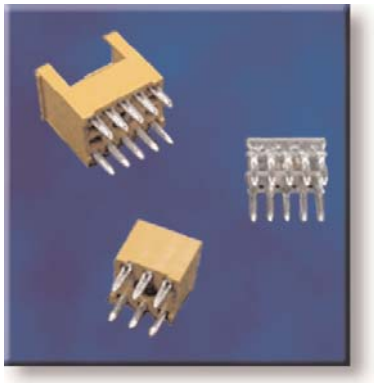
Winchester Electronics is an Executive Member of PICMG and is actively involved in the continuing development of high performance connector products to support CompactPCI applications. Winchester Electronics offers CompactPCI system designers a complete range of interconnect products including:

- 47-Position CPCI Power Connectors
- MetCon-2® 2mm Hard Metric Signal Connectors
- 10-Position C-Press® PCB Power Terminals



CompactPCI® Power

MetCon-2®



C-Press® PCB Power Terminals

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Product Features

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Winchester Electronics' 47-position CompactPCI® Power connector has been designed to the requirements of PICMG® specification 2.11 R1.0 for CompactPCI pluggable power supplies. This Winchester power connector is interchangeable and intermatable with other 47-position CompactPCI Power connectors that are manufactured to this PICMG specification.

The 47-position power connector is the latest version of the CompactPCI Power connector and supercedes a previous 38-position connector configuration as well as the DIN 24+8 Type-M connector for all new designs. This new power connector supports both 3U and 6U board configurations as well as hot-swappable applications.

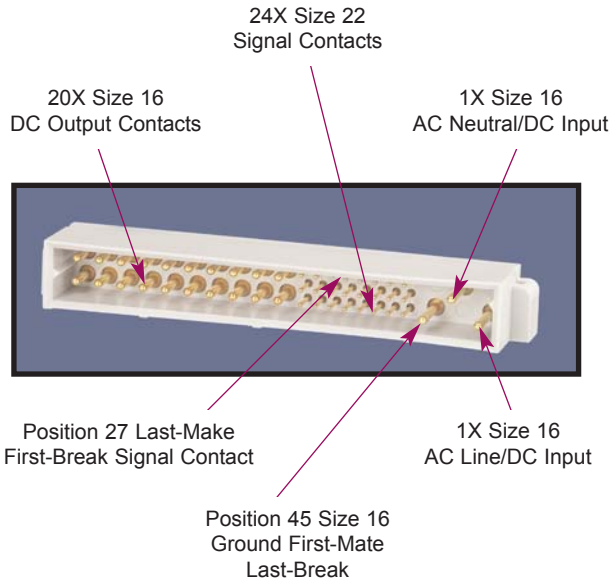
The 47-position CompactPCI Power connector provides both versatility and performance through its combination of signal contacts with both DC and AC power contacts.

- 20 DC power contacts fully loaded in positions 1-20. Available selectively loaded.
- 3 AC power contacts configured for sequential mating applications loaded in positions 45, 46, 47.
- 24 signal contacts loaded in positions 21-44.

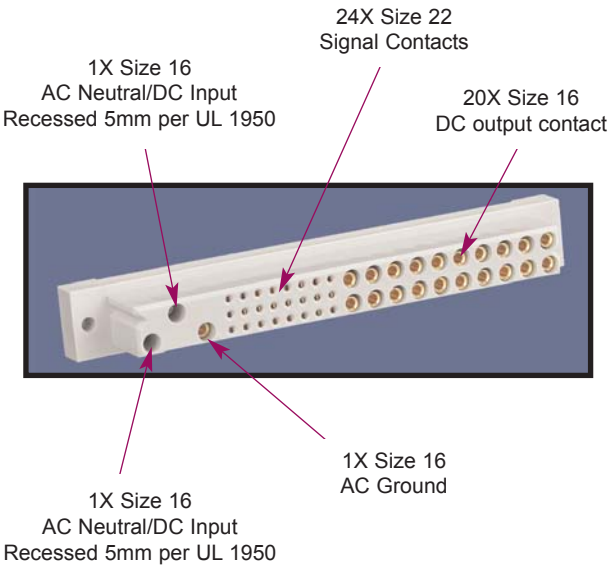
Winchester's standard headers and sockets are offered with 30 microinches of gold plating which comply with the PICMG specification requirement of 250 mating cycles. If this level of durability is not required, Winchester also offers these connectors in 10 microinches of gold plating for additional cost savings.

Contact Arrangements

Free Board Connector



Fixed Board Connector



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Performance Objectives

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Materials

Insulator . . . . . Polybutylene Terephthalate (PBT) UL 94V-0
Size 16 Power Contacts . . . . . Copper Alloy
Size 22 Signal Contacts . . . . . Copper Alloy
Contact Plating
Performance Level II (250 mating cycles):
Male Pin Header Connector . . . . . 30 Microinches Gold over 75 Microinches Nickel on Mating End, Solder Coating on Termination End
Female Socket Connector . . . . . 30 Microinches Gold over 75 Microinches Nickel, Solder Coating on Termination End (Solder Tail Only)
Performance Level III (50 cycles)
Male Pin Header Connector . . . . . 10 Microinches Gold over 75 Microinches Nickel on Mating End, Solder Coating on Termination End
Female Sockets . . . . . 10 Microinches Gold over 75 Microinches Nickel, Solder Coating on Termination End (Solder Tail Only)
Mounting Screw . . . . . Nickel Plated Steel

Performance Characteristics

Insulation Resistance . . . . . $\geq 10^{10}$ ohms
Initial Contact Resistance
Power Contacts
1-20, 45, 46, 47 . . . . . $\leq$0.7 milliohms
Signal Contacts
21-44 . . . . . $\leq$4.0 milliohms
Voltage Proof
Power Contacts
1-20 (DC) . . . . . 1,500 volts r.m.s.
45, 46, 47 (AC) . . . . . 3,000 volts r.m.s.
Signal Contacts
21-44 . . . . . 1,000 volts r.m.s.
Minimum Creepage and Clearance
Contact 47 to 45 . . . . . 3.2 mm (.126)
Contact 46 to 45 . . . . . 3.2 mm (.126)
Contact 47 to 46 . . . . . 2.5 mm (.098)
Contact 47 to Signal Contacts . . . . . 6.4 mm (.252)
Contact 46 to Signal Contacts . . . . . 6.4 mm (.252)
Contact 45 to Signal Contacts . . . . . 2.0 mm (.079)
Current Rating
Power Contacts
1-20 (DC) . . . . . 16A DC at 30°C Temp Rise per IEC 512-3, Test 5A
45, 46, 47 (AC) . . . . . 23A AC at 30°C Temp Rise per IEC 512-3, Test 5A
Signal Contacts
21-44 . . . . . 3A Nominal
Operating Temperature Range . . . . . -55°C to +125°C

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Mechanical

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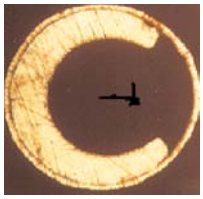
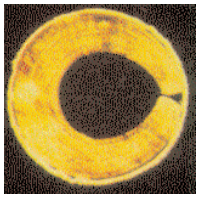
Insertion/Withdrawal Forces	≤100 N (22.5 lbs.)
Contact Retention in Insulator	
Size 16 Power	45 N (10.0 lbs.)
Size 22	27 N (6.0 lbs.)
PCB Thickness Range	
Male Pin Header Connector	1.6 mm (.063) to 3.0 mm (.118)
Female Socket Connector	3.2 mm (.125) to 5.6 mm (.220)
Compliant Contact	
Max Insertion Force per Contact	
Power	200.25 N (45.0 lbs.)
Signal	133.5 N (30.0 lbs.)
Min Retention Force per Contact	
Power	35.6 N (8 lbs.)
Signal	31.15 N (7 lbs.)

C-Press® Termination Technology

Winchester's CompactPCI® Power connector's compliant signal and power contacts utilize Winchester Electronics' proven C-Press® contact termination technology.

Horizontal Cross Sections





Macro-photo cut-away view of actual compliant contact "C" sections. At maximum and minimum plated through-hole diameters, contact pressure is distributed evenly along the inside circumferences of the plated through-holes. The "C" section ensures a gas tight connection without damaging the hole or warping the board.

State-of-the-Art Compliant Pin Technology

The advantage of the C-Press contact lies in its unique "C" shaped compliant section. Unlike two- and four-point press-fit systems, the crescent-shaped, tapered beam conforms naturally within the board to the shape of the plated through-hole. It expands or contracts to make contact around the circumference of the plated through-hole diameter, exerting an equal normal force onto the entire surface of the hole, while forming a gas tight and extremely reliable electrical connection.

True Compliant Fit

Because the compliant section of the C-Press contact neither warps a board nor distorts the hole, it is an excellent choice for use in multilayered boards. A major concern with "press-fit" contacts is the amount of axial and radial deformation imparted to the plated though-hole as a result of contact insertion. Because our C-Press contact offers a "True Compliant Fit," the concern for deformation damage to the plated through-holes and inner layers of a printed circuit board is eliminated.

Now, with the C-Press contact, you can insert a round pin into a round hole. This innovative engineering achievement ensures a spring-action pin to absorb potentially destructive energy while providing excellent electrical characteristics. C-Press contacts meet or exceed the performance specifications called for in MIL-STE-2116 and ANSI/IPC-D-422.

Over the years, communications, computer, and medical equipment manufacturers, as well as backpanel suppliers worldwide, have successfully installed billions of C-Press contacts. Because C-Press contacts are approved and used in 40-year life equipment, they clearly offer both dependability and performance. For design flexibility across the board, the C-Press contact gives you everything you need.

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Product Offering - Headers

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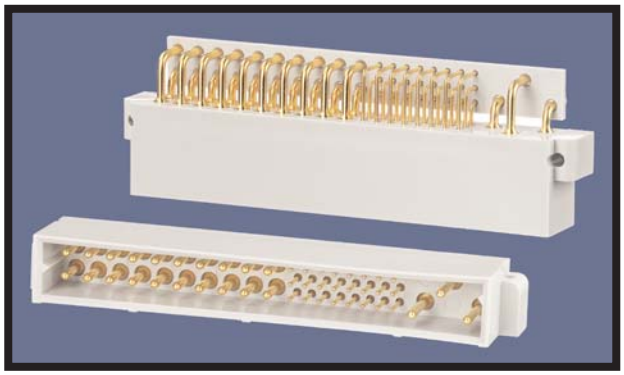
Introduction

Winchester 47-pin CompactPCI® Power headers are offered in two plating finishes - 30 microinches of gold to meet 250 mating cycles per the PICMG® specification and 10 microinches of gold for a lower cost alternative. Optional mounting screws are available if applications require connectors to be physically secured to the board.



Ordering Information

Part Number	Description	Termination	Plating Finish
CPCI47P52D101	Male Right Angle Header, Fully Loaded	Solder	10µ" Gold over Nickel
CPCI47P52C101	Male Right Angle Header, Fully Loaded	Solder	30µ" Gold over Nickel
CPCI47P52D106	Male Right Angle Header with 6 of 20 DC Power Contacts Loaded	Solder	10µ" Gold over Nickel
CPCI47P52C106	Male Right Angle Header with 6 of 20 DC Power Contacts Loaded	Solder	30µ" Gold over Nickel
CPCI47P52D110	Male Right Angle Header with 10 of 20 DC Power Contacts Loaded	Solder	10µ" Gold over Nickel
CPCI47P52C110	Male Right Angle Header with 10 of 20 DC Power Contacts Loaded	Solder	30µ" Gold over Nickel
CPCI47P52D116	Male Right Angle Header with 16 of 20 DC Power Contacts Loaded	Solder	10µ" Gold over Nickel
CPCI47P52C116	Male Right Angle Header with 16 of 20 DC Power Contacts Loaded	Solder	30µ" Gold over Nickel
26464-01	Optional M3 Mounting Screw		

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Headers

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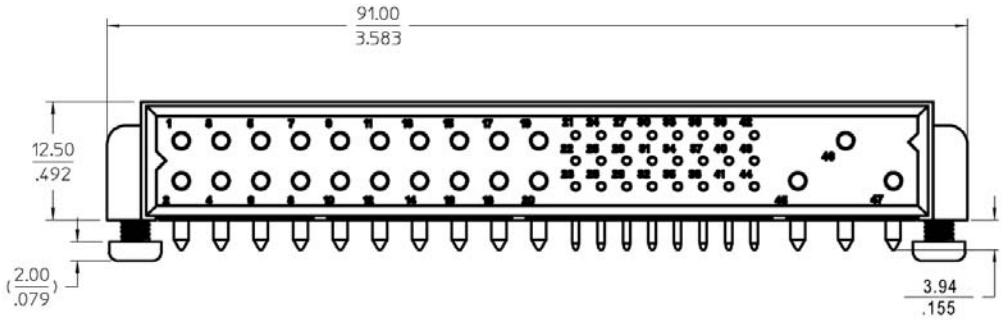
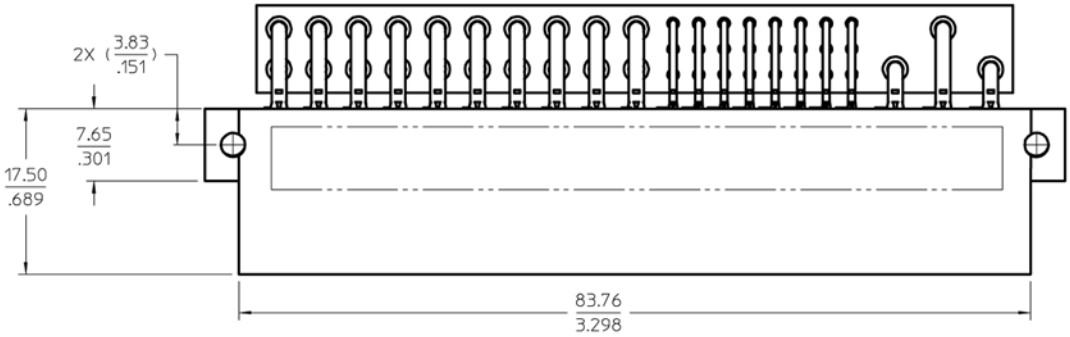
Front View



Top View



Power Contact Load Pattern	Size 16 Power Contacts	Size 22 Signal Contacts
Fully Loaded	1-20, 45, 46, 47	21-44
6	1, 5, 9, 13, 19, 20	21-44
10	1, 4, 5, 8, 9, 12, 13, 16, 19, 20	21-44
16	1, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 15, 16, 17, 19, 20	21-44

Note: Dimensions are shown in millimeters / inches. Dimensions shown for reference purposes only. Consult Winchester customer drawings for detailed specifications.

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Product Offering - Sockets

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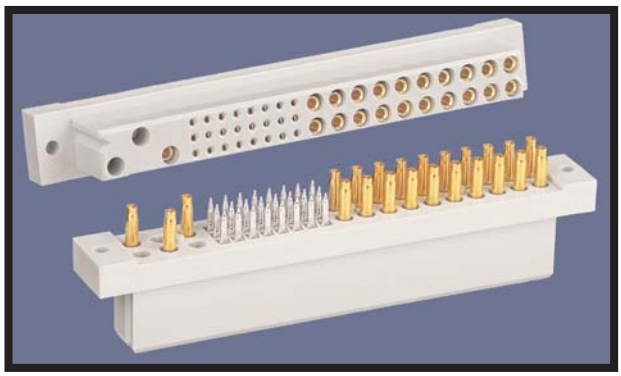
Introduction

Winchester 47-position CompactPCI® Power sockets are offered in two plating finishes - 30 microinches of gold to meet 250 mating cycles per the PICMG® specification and 10 microinches of gold for a lower cost alternative. Optional mounting screws are available if applications require connectors to be physically secured to the board. Our socket connectors have the added versatility of both solder and press-fit contact terminations. Press-fit terminations are available to fit both 0.080" and 0.064" plated through-holes.



Ordering Information

Part Number	Description	Termination	Plating Finish
CPCI47S41A104	Female Vertical Socket, Fully Loaded for .080" Plated Through-hole	Press-fit	10μ" Gold over Nickel
CPCI47S41B104	Female Vertical Socket, Fully Loaded for .080" Plated Through-hole	Press-fit	30μ" Gold over Nickel
CPCI47S42D104	Female Vertical Socket, Fully Loaded for .064" Plated Through-hole	Solder	10μ" Gold over Nickel
CPCI47S42C104	Female Vertical Socket, Fully Loaded for .064" Plated Through-hole	Solder	30μ" Gold over Nickel
CPCI47S43A104	Female Vertical Socket, Fully Loaded for .064" Plated Through-hole	Press-fit	10μ" Gold over Nickel
CPCI47S43B104	Female Vertical Socket, Fully Loaded for .064" Plated Through-hole	Press-fit	30μ" Gold over Nickel
26464-01	Optional M3 Mounting Screw		
107-50801	**Removal Tool - Socket (Press-fit only)**		

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Sockets

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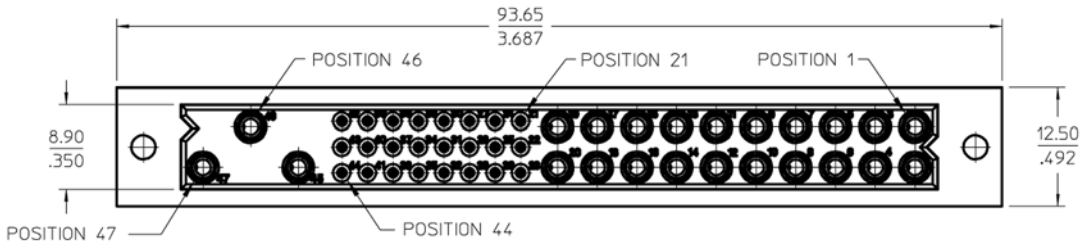
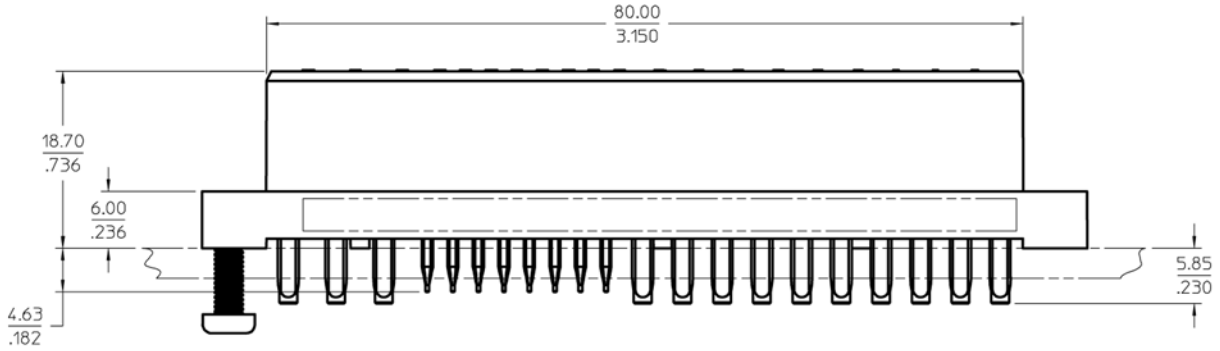
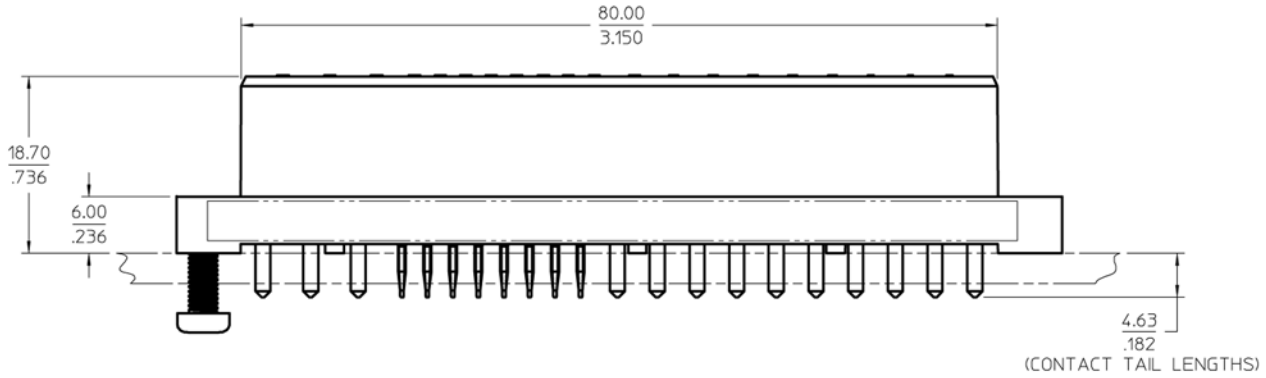
Top View



Side View - *Compliant Termination*



Side View - *Solder Termination*



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Printed Circuit Board Layout

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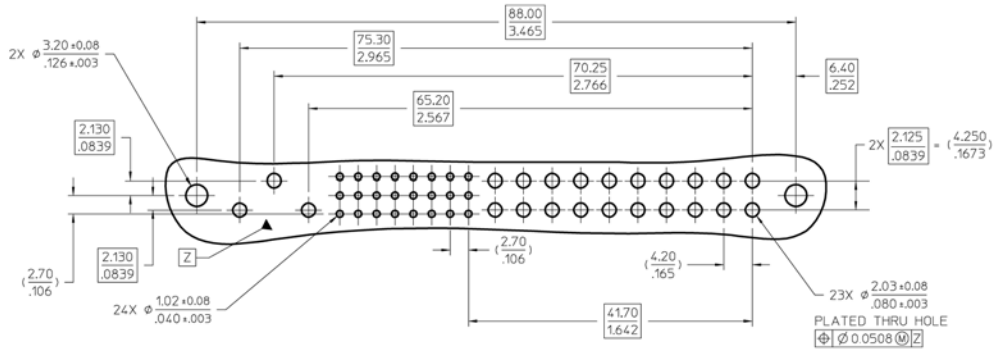
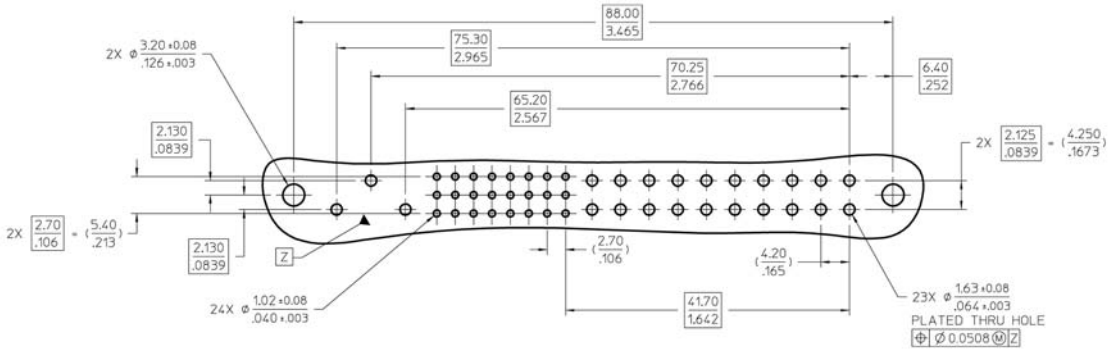
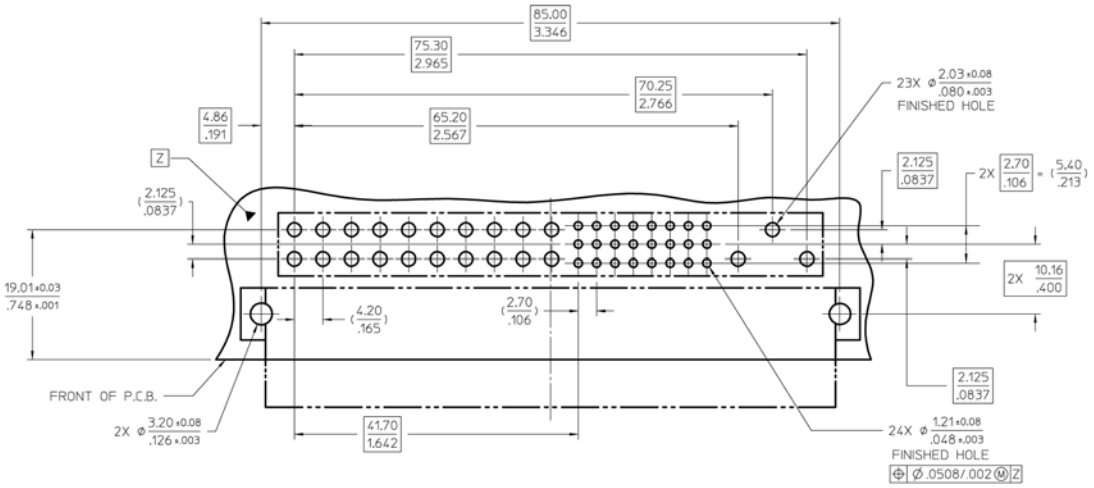
Sockets
0.080" Plated Through-hole (Power Contacts)



Sockets
0.064" Plated Through-hole (Power Contacts)



Headers



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Notes

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Notes

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