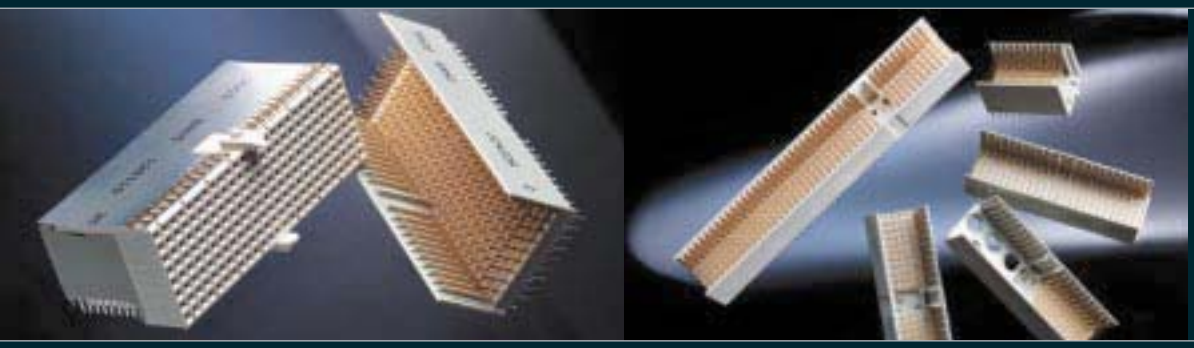
ERNI



ERmet® 2mm
Hard Metric Connectors

ERmet®

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ERmet® 2mm Hard Metric Connectors

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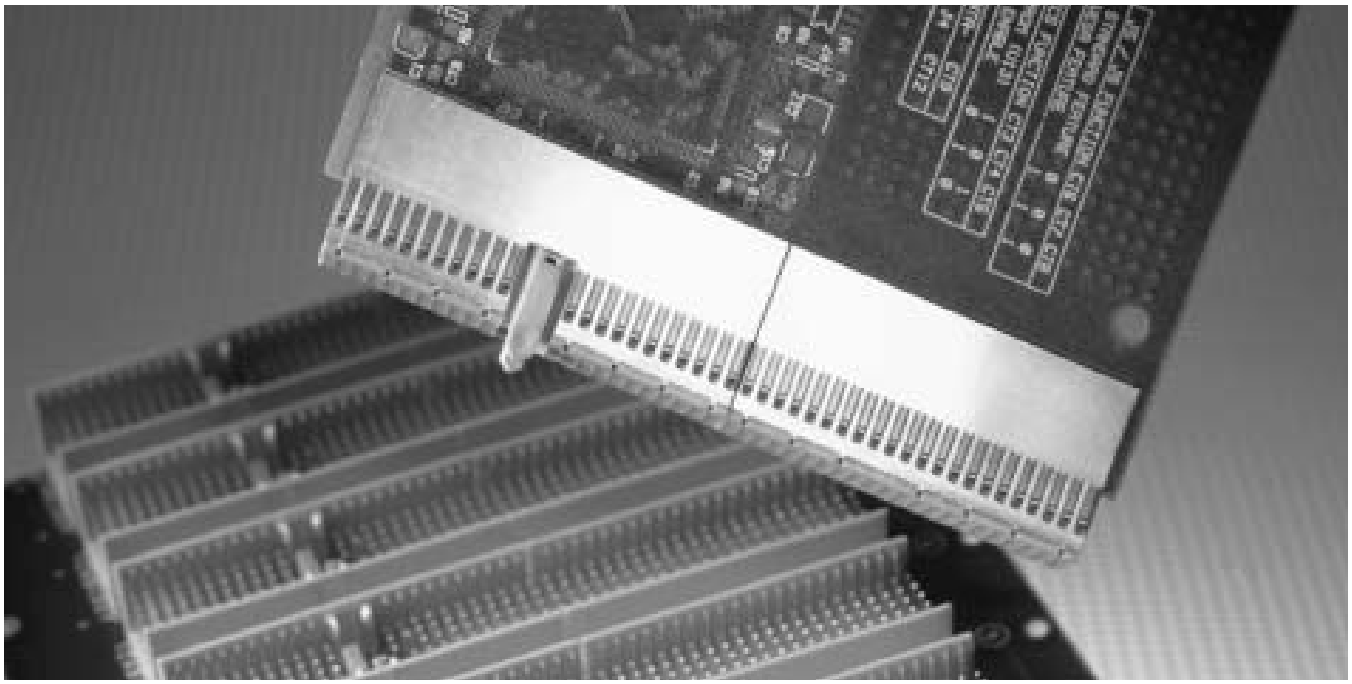

Introduction

The ERmet 2mm HM connector line from ERNI offers unparalleled performance and flexibility for today's high performance circuit designs. Since its introduction in 1993, this product line has expanded and now offers almost every module configuration possible in a board to backplane interconnect system. Standard and reverse configurations are available including shielded vertical females, stacking designs, stamped power connectors and cable systems. This connector system has now become the standard for board to backplane applications. The ERmet 2mm HM connector system has achieved widespread acceptance and popularity as the interconnect system chosen for CompactPCI. It is also widely used by OEMs serving the telecommunications and networking industry segments. It has achieved this unparalleled acceptance due to its high frequency performance, its wide selection of modular components and its cost-benefit ratio. This connector is supported by one of the industry's most comprehensive international connector standards, IEC 61076-4-101.
Whether you are developing a new backplane, a high performance CPU or I/O card or integrating a sophisticated hybrid system, ERNI has anticipated your needs. The ERNI team stands ready to partner with you to develop the most efficient solution to your design challenge.

Features

- Modular connectors with 2.0 mm signal contact pitch for backplanes and daughter cards.
- High density board to backplane connector system.
- Up to 8 signal rows plus two shield rows for optimum performance.
- Three levels of sequential mating for front or rear hot swap applications. 1.5 mm increments.
- 15 standard contacts available for any pin loading requirement.
- Complete line of complementary accessories to include stamped power connectors, color coded coding keys, latching shrouds, cable connectors, ground return shields, high frequency, and high power contacts.
- Superior female connector contact design provides a uniform signal path.
- Comply to the international standard IEC 61076-4-101.
- For networking, telecommunications, high performance computing and other demanding applications.

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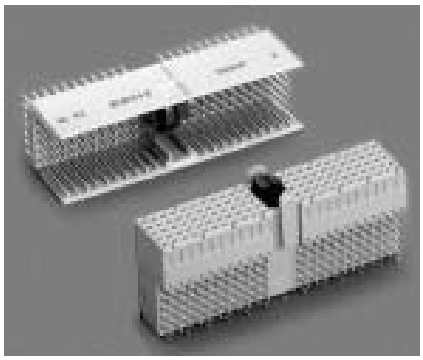
ERmet® 2mm Hard Metric Connectors

Product Overview

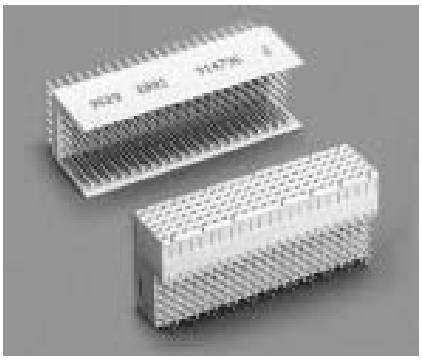
ERmet 2mm HM connectors are a versatile, cost-effective board-to-backplane solution for today's high performance, high density applications.
The ERmet 2mm HM line consists of 32 different module types including matching shrouds for midplane, stacking and cable applications, cable connectors, power modules, upper and lower ground return shields, coding keys and cable latches.

For circuit design versatility, the connectors are offered with a selection of contacts including signal, high power, high frequency and coaxial. They are available in 50mm, 44 mm, 38 mm, and 25mm modules for end-to-end stacking without contact loss. The dual beam female contact design provides equalized signal path lengths which results in virtually identical propagation times for each contact row.



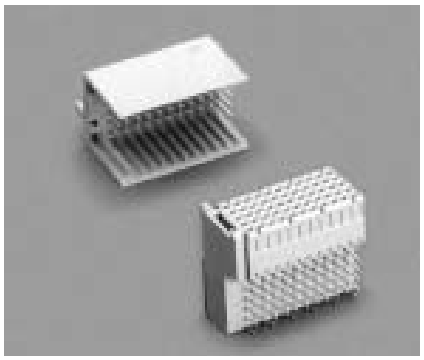
Type A Connector

- 110 signal contacts.
- 44 shield contacts.
- 50 mm long including the multifunction area for coding keys.
- Integral pre-alignment guide and polarizing pins.
- Optional locating pegs for printed circuit board (PCB) mounting.
- 3 contact lengths for sequential mating.



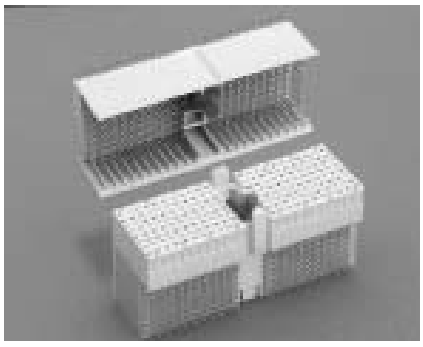
Type B Connector

- 125, 110 and 95 signal contacts.
- 50 shield contacts.
- 50 mm, 44 mm and 38 mm long without the multifunction area.
- 3 contact lengths for sequential mating.



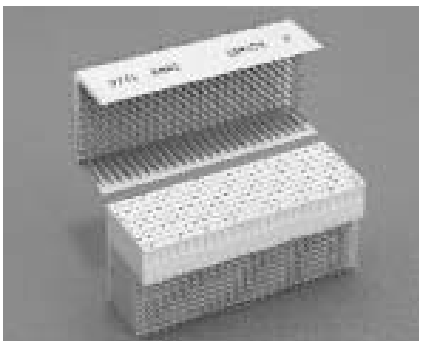
Type C Connector

- 55 signal contacts.
- 22 shield contacts.
- 25 mm long.
- For end positions only.
- Pre-alignment guide pins.
- Optional locating pegs for printed circuit board (PCB) mounting.
- 3 contact lengths for sequential mating.



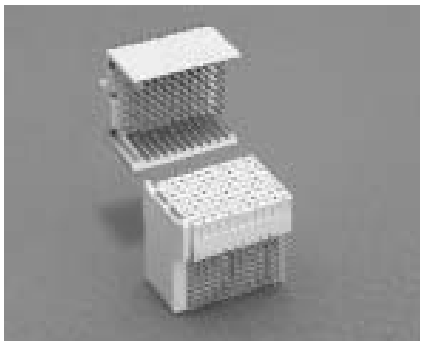
Type D Connector

- 176 signal contacts.
- 44 shield contacts.
- 50 mm long including the multifunction area for coding keys.
- Integral pre-alignment guide and polarizing pins.
- Optional locating pegs for printed circuit board (PCB) mounting.
- Provision for optional early mate ground pin.
- 3 contact lengths for sequential mating.



Type E Connector

- 200, 176 & 152 contacts.
- 50 shield contacts.
- 38 mm, 44 mm, and 50 mm long without the multifunction area.
- 3 contact lengths for sequential mating.



Type F Connector

- 88 signal contacts.
- 22 shield contacts.
- 25 mm long.
- For end positions only
- Pre-alignment guide pins.
- Optional locating pegs for printed circuit board (PCB) mounting.
- 3 contact lengths for sequential mating.

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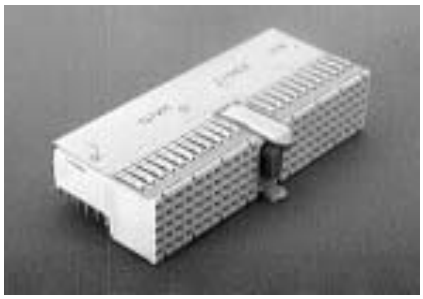
Product Overview



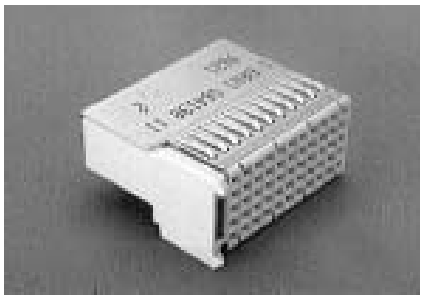
Type A Ground Return Shield

- Upper and lower shields for Type A connectors.
- Upper shield available integrated with female connector or as separate component.



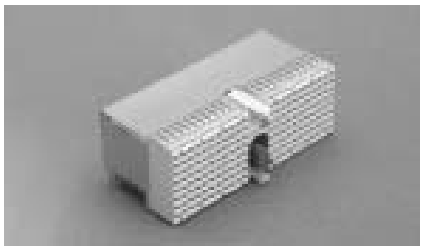
Type B Ground Return Shield

- Upper and lower shields for the Type B female connectors.
- Upper shield available integrated with female connector or as separate component.



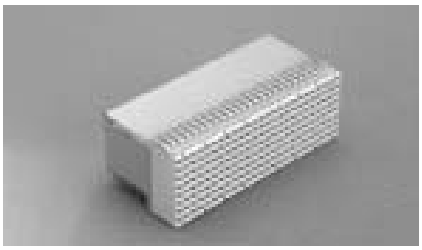
Type C Ground Return Shield

- Upper and lower shields for Type C and M connectors.
- Upper shield available integrated with female connector or as separate component.



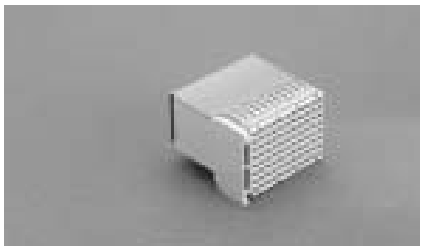
Type D Ground Return Shield

- Upper and lower shields for Type D connectors.
- Upper shield available integrated with female connector or as separate component.



Type E Ground Return Shield

- Upper and lower shields for the Type E female connectors.
- Upper shield available integrated with female connector or as separate component.



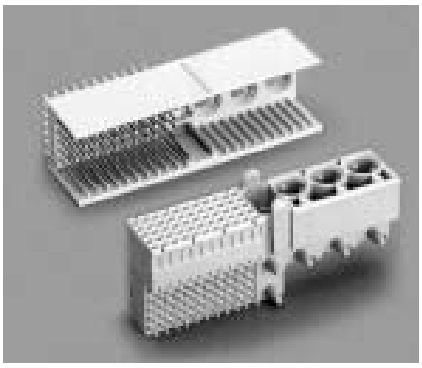
Type F Ground Return Shield

- Upper and lower shields for Type F connectors.
- Upper shield available integrated with female connector or as separate component.



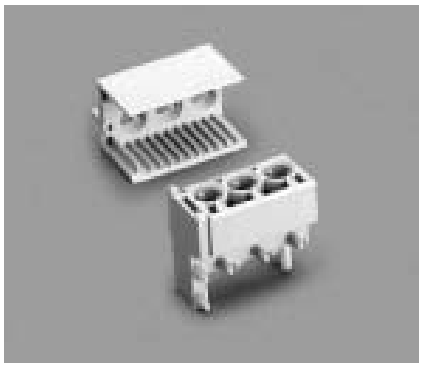
Type L Connector

- 6 special contact cavities.
- 50 mm long.
- Multifunction area for coding keys.
- Integral pre-alignment guide and polarizing pins.
- Optional locating pegs for printed circuit board (PCB) mounting.



Type M Connector

- 3 special contact cavities.
- 55 signal contacts.
- 50 mm long.
- Multifunction area for coding keys.
- Integral pre-alignment guide and polarizing pins.
- Optional locating pegs for printed circuit board (PCB) mounting.



Type N Connector

- 3 special contact cavities.
- 25 mm long.
- For end positions only
- Pre-alignment guide pins.
- Optional locating pegs for printed circuit board (PCB) mounting.

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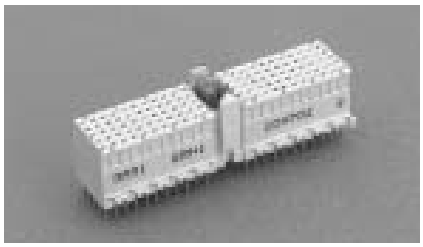
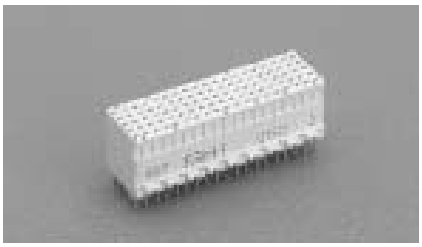
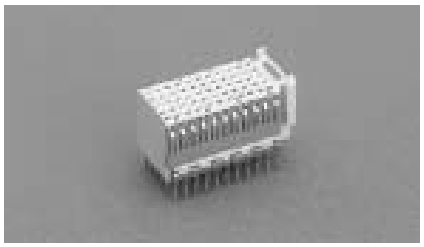


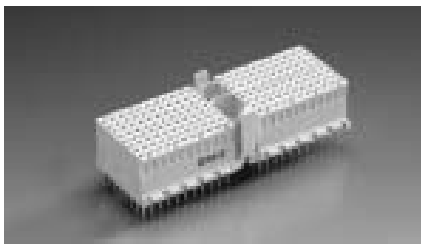
Type A Vertical Female
- 110 signal contacts.
- 44 shield contacts.
- 50 mm long including the multifunction area for coding keys.
- Pre-alignment guide and integral polarizing pins.
- Optional locating pegs for printed circuit board (PCB) mounting.
- Optional shields.
- Extended terminals and spacers available.



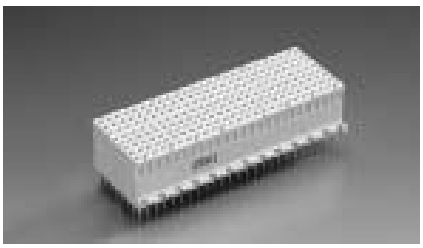
Type B Vertical Female
- 125, 110 and 95 signal contacts.
- 50, 44 and 38 shield contacts.
- 50 mm, 44 mm and 38 mm long without a multifunction area.
- Optional shields.
- Extended terminals and spacers available.



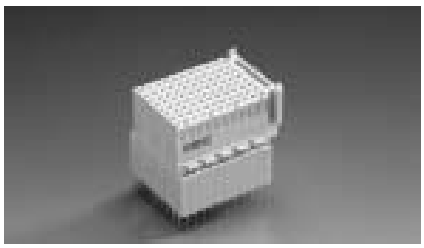
Type C Vertical Female
- 55 signal contacts.
- 22 shield contacts.
- 25mm long.
- For end positions only
- Pre-alignment guide pins.
- Optional locating pegs for printed circuit board (PCB) mounting.
- Optional shields.
- Extended terminals and spacers available.



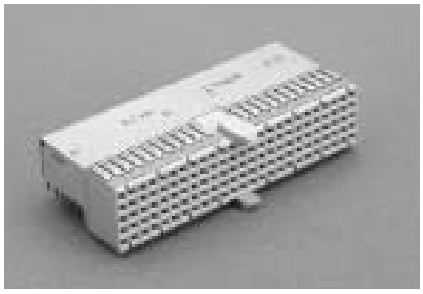
Type D Vertical Female
- 176 signal contacts.
- 44 shield contacts.
- 50 mm long including the multifunction area for coding keys.
- Pre-alignment guide and polarizing pins.
- Optional shields.



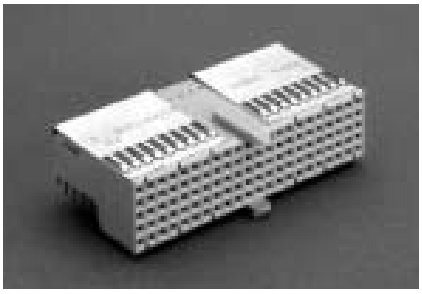
Type E Vertical Female
- 200 signal contacts.
- 50 shield contacts.
- 50 mm long without a multifunction area.
- Optional shields.



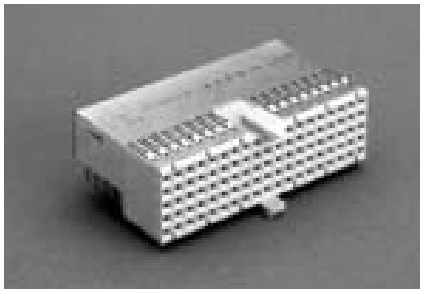
Type F Vertical Female
- 88 signal contacts.
- 22 shield contacts.
- 25 mm long.
- For end positions only
- Pre-alignment guide pins.
- Optional shields.



Type AB25 Right Angle Female
- 125 signal contacts.
- 44 shield contacts.
- 50 mm long.
- Integral prealignment guide and polarizing pins.
- AB compatible males also available.



Type AB22 Right Angle Female
- 110 signal contacts.
- 40 shield contacts.
- 44 mm long.
- Integral prealignment guide and polarizing pins.
- AB compatible males also available.



Type AB19 Right Angle Female
- 95 signal contacts.
- 32 shield contacts.
- 38 mm long.
- Integral prealignment guide and polarizing pins.
- AB compatible males also available.

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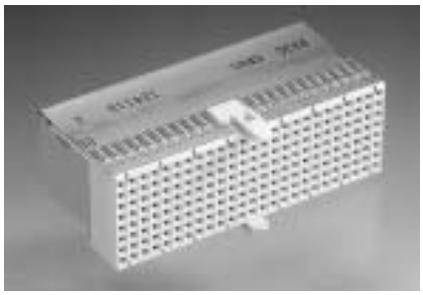
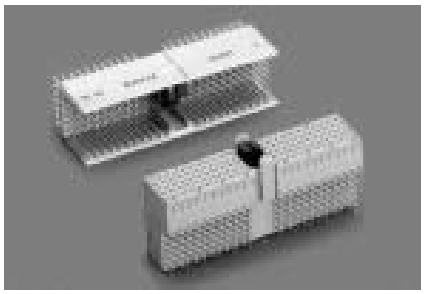
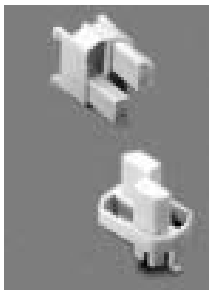
Product Overview



Type DE Right Angle Female

- 200 signal contacts.
- 50 shield contacts.
- 50 mm long.
- Integral prealignment guide and polarizing pins.
- DE compatible males also available.





Connector Coding System

- Up to 70 unique male and female coding keys.
- For use in the multifunction center of the Type A, D, L and M male or female connectors.
- Low cost, industry standard design.
- Easy snap-in installation – no epoxy adhesive required.
- Bright colors for quick visual identification conform to industry standard.
- Crush resistant construction, exceeds IEC requirements.

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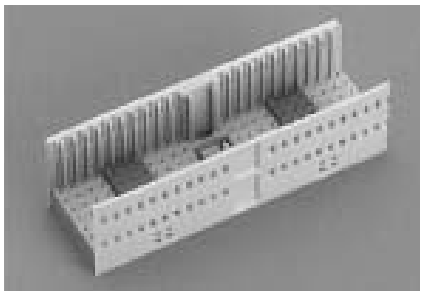
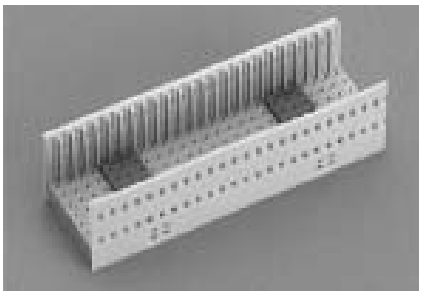
ERmet® 2mm Hard Metric Connectors

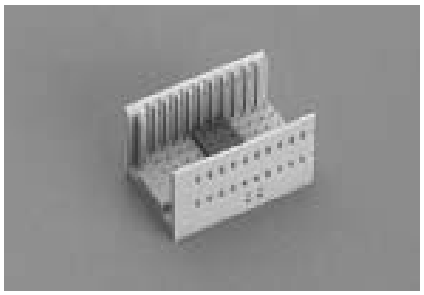
Product Overview



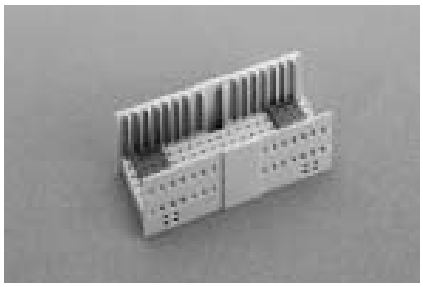
Type A Shroud
- 4 heights for printed circuit boards (PCBs) 1.6 to 6.0 mm thick.
- 50 mm and 38 mm long.
- Multifunction area for coding keys.



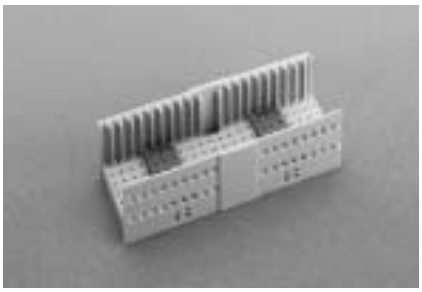
Type B Shroud
- 4 heights for printed circuit boards (PCBs) 1.6 to 6.0 mm thick.
- 50 mm, 44 mm and 38 mm long.



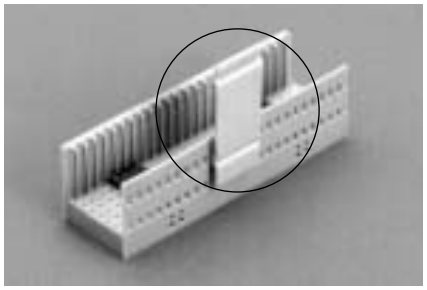
Type C Shroud
- 4 heights for printed circuit boards (PCBs) 1.6 to 6.0 mm thick.
- 25 mm long.
- For end positions only.



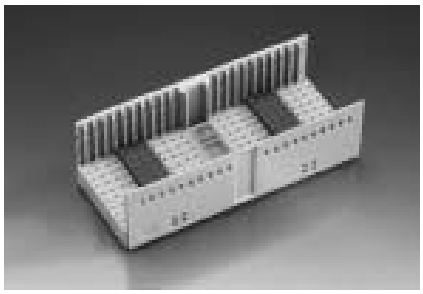
Type AB 19 & AB 25 Shroud
- 38 mm and 50 mm respectively.
- Integral pre-alignment and guide pins.
- 4 heights for printed circuit boards (PCBs) 1.6 to 6.0 mm thick.



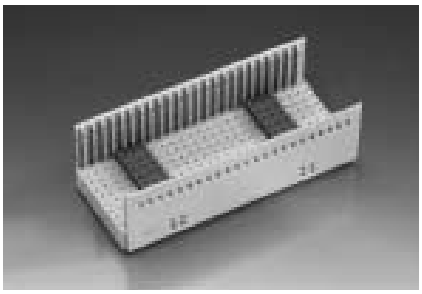
Type AB 22 Shroud
- 44 mm long.
- Integral pre-alignment and guide pins.
- 4 heights for printed circuit boards (PCBs) 1.6 to 6.0 mm thick.



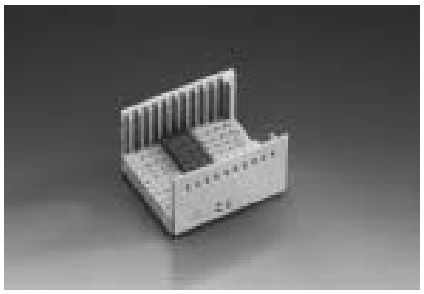
Optional Latch Arm
- Can be added to standard ERmet shroud body.
- Spring action latch.
- Easy installation, no tools required.



Type D Shroud
- 4 heights for printed circuit boards (PCBs) 1.6 to 6.0 mm thick.
- 50 mm long.
- Multifunction area for coding keys.



Type E Shroud
- 4 heights for printed circuit boards (PCBs) 1.6 to 6.0 mm thick.
- 50 mm long.



Type F Shroud
- 4 heights for printed circuit boards (PCBs) 1.6 to 6.0 mm thick.
- 25 mm long.
- For end positions only.

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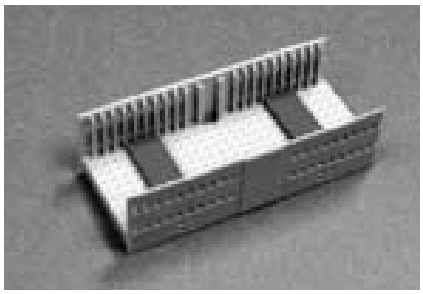
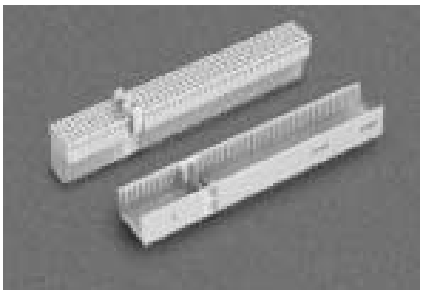
ERmet® 2mm Hard Metric Connectors

Product Overview



Type DE Shroud

- 4 heights for printed circuit boards (PCBs) 1.6 to 6.0 mm thick.
- 50 mm long.
- Integral prealignment and guide pins.



Monoblock Modules

- Male and Female monoblock modules.
- Optional integrated coding keys for 3.3V, 5.0V or Telecom applications.
- Multifunction area for coding keys.
- Available in a variety of configurations 94 or 100 mm long.



Male & Female Power Module

- Closed entry female connector for backplane.
- 3 pin levels for sequential mating.
- 8 ampere, per contact.
- Pressfit, flat rock assembly.

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ERmet® 2mm Hard Metric Connectors

Comparison Of 2.0 mm Connectors

A 2.0 mm Connector For CompactPCI® Needs To Be Different. Here's Why.

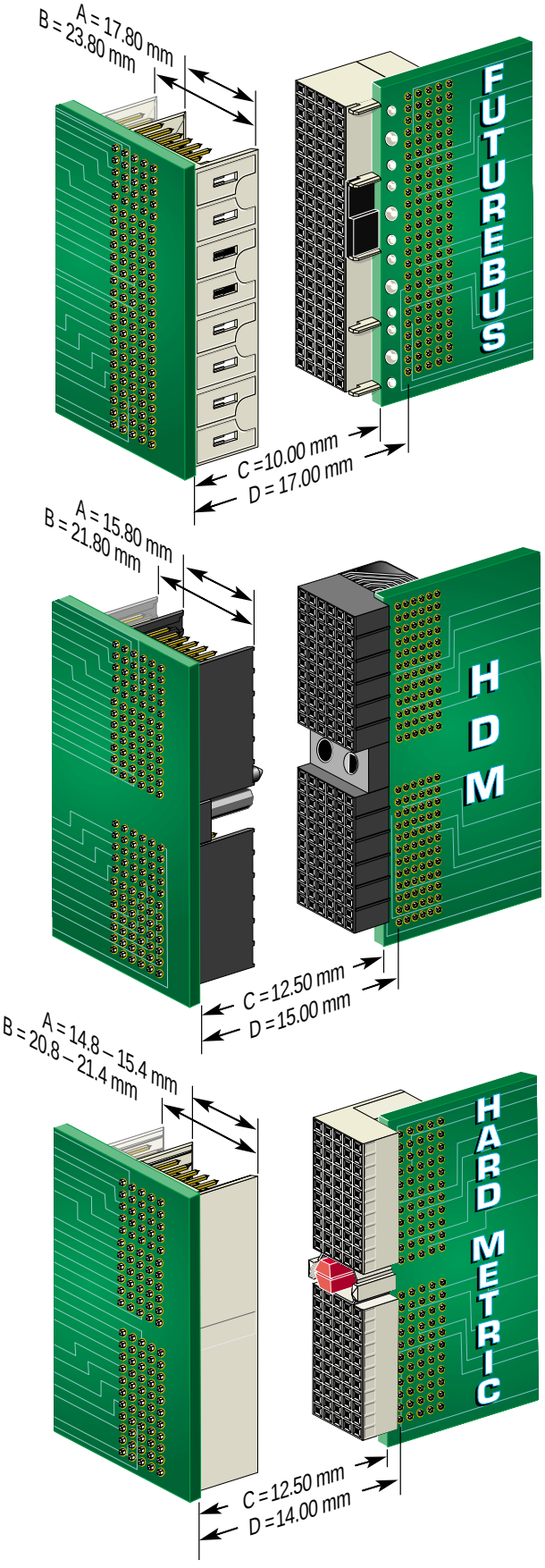
When you're choosing a 2.0 mm connector for your product, it pays to give your choice a little extra thought. Just knowing a connector is a 2.0 mm connector is not enough – there are really three distinctly separate and non-intermateable connector lines. They are the Futurebus style, the HDMTM* style and the Hard Metric style, such as the ERmet 2mm HM from ERNI for CompactPCI® architecture.

All three connector systems use a 2.0 mm grid and are offered in modular formats, but there the similarity ends. Each line has different printed circuit board hole sizes, contact sizes, shield configurations, keying methods and electrical characteristics. In short, there are very few similarities beyond the 2.0 mm grids they share.

All three 2.0 mm connector designs consist of multi-row pin headers on the backplane, right angle female connectors on the daughter card and a 2.0 mm grid spacing. One immediate difference is in terminal area design. The HDMTM style has exposed terminals on the right angle daughter card female connector, while the Futurebus and Hard Metric designs have encapsulated terminals. The 5+2 row Hard Metric backplane connector is 3.0 mm more narrow than the 5+2 row Futurebus connector. The 7 (5+2) row Hard Metric connector is more narrow even than the 6 row HDMTM connector. The Hard Metric design preserves more space on the backplane for components that must be placed between the connectors.

The mating distances also differ between the three product lines. Mating distance is measured from the rear edge of the daughter card to the front surface of the backplane when the daughter card is fully seated. The Futurebus mating distance is 10 mm, while the mating distance for both Hard Metric and HDMTM is 12.5 mm. The 12.5 mm measurement is important because it matches the mating distance of the established DIN 41612 connectors and the 2.5 mm IEC 61076-4-100 connector.

Matching mating distances allows industries that use Eurocard packaging (IEC 273 or IEEE 1101 or 1101.10) to build systems that combine the popular 96 pin DIN connectors and the newer Hard Metric and HDMTM connectors. This supports legacy architectures while allowing the addition of new features that require the greater signal density of 2.0 mm connectors. The VME64 Extensions committee chose the Hard Metric connector system for the P0/J0 connector because of this advantage.



ERmet® 2mm HM Connectors

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ERmet® 2mm Hard Metric Connectors

Comparison Of 2.0 mm Connector Lines

		Connector Lines		
Design Criteria		**HDM™**	**Futurebus**	**ERNI Hard Metric 5+2/8+2**
General Specification		Proprietary	IEC 1076-4-104	IEC 61076-4-101
Number of Rows (Signal and Ground)		6*	5+2	5+2/8+2
Total Contacts Per Linear Inch		76	88	88/127
Number of Standard Modules		3	7	12/7
Width of Male Housing		15.8 mm	17.8 mm	15.4 mm – 21.4 mm
Distance from Daughter Card Edge to Row A		2.50 mm	7.00 mm	1.50 mm
Mated Distance from Backplane Front to Row A		15.0 mm	17.0 mm	14.0 mm
Signal Mating Levels / Step Distance		3 levels, 0.50 mm each	5 levels, 0.75 mm each	3 levels 1.50 mm each
EMI Shielding		Yes	Yes+	Yes
Extended Guidance Features		See footnote +++	Add-On Module+	Integrated
Coding Locations		See footnote +++	Integrated	Integrated
Coding Combinations Per Location		8	3	70
Reverse Connector Configuration Vertical Male		Yes	Yes	Yes
Standard Connector Configuration Vertical Female		Yes	Yes+	Yes+
Power Contact Modules		Yes	Yes	Yes
Coaxial Contact Modules		Yes	Yes	Yes
Maximum Contact Resistance of Mated Pair		40 mΩ	50 mΩ	20 mΩ
Propagation Delay (max.)++		235 ps	210 ps	135 ps/190 ps
PCB Plated Hole Size		0.70 mm	0.70 mm	0.60 mm
Press-Fit Termination	**Daughter Card**	Yes	Yes	Yes
	Backplane	Yes	Yes	Yes

* Shield Pins Implemented Through Signal Pins

\+ Not Defined in (IEC) Specification

++ Published Industry Test Results

+++ Integrated in Header and add-on module for female

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ERmet® 2mm Hard Metric Connectors

Application Notes

The ERmet 2mm HM connector system now consists of two basic signal module configurations. The original 5+2 design and the newer 8+2 design for higher pin count requirements. Both connector systems consist of a daughter card mounted, right angle female connector featuring the high performance, low skew patented ERmet leaf contact design and a versatile vertical male header mounted on the backplane. Additionally, this arrangement is particularly effective for midplane application and makes sequential mating easy.

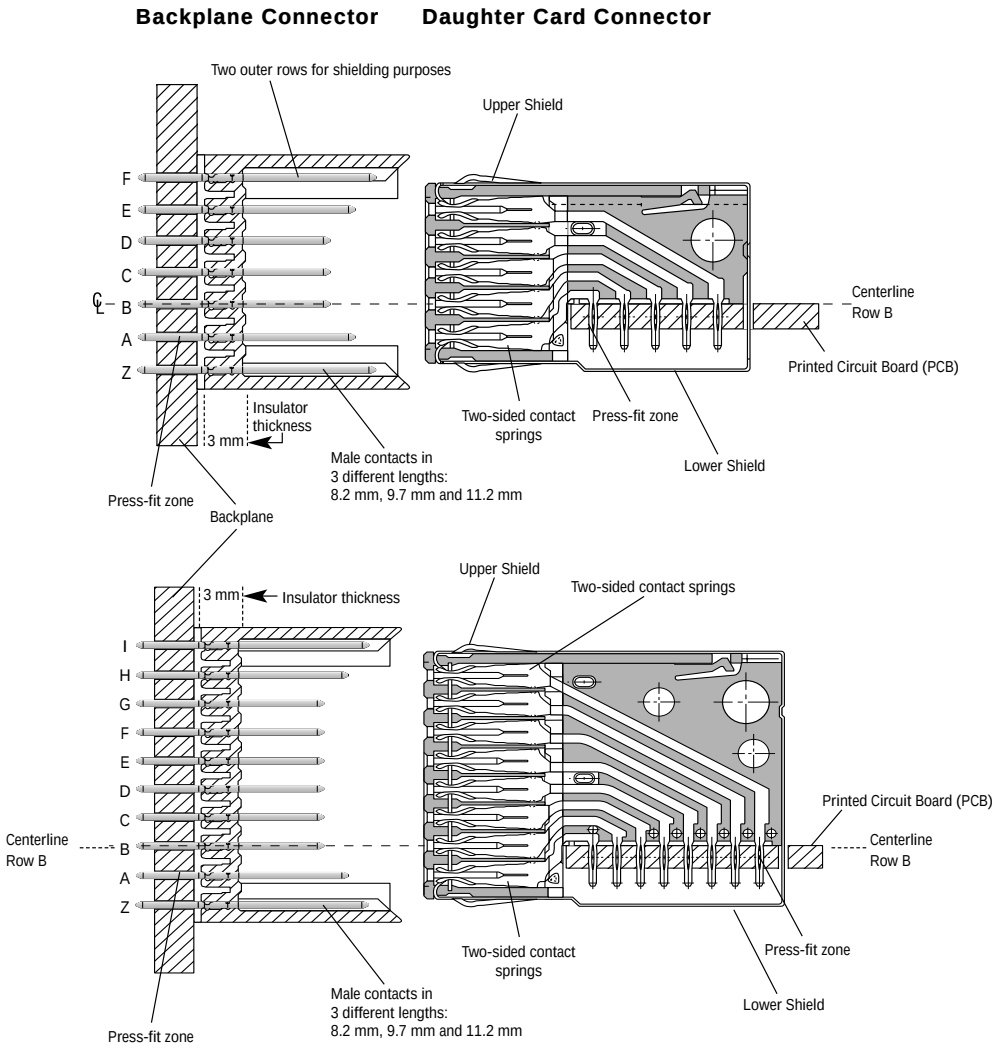
ERNI can provide 15 standard pins in any row or position required for your design. This allows for three levels of sequential mating in both the front and rear of the backplane, as well as two shorter terminal lengths for applications which don't require rear feed through pins.

For midplane and rear I/O applications, ERNI offers complementary 2.0 mm shrouds, vertical female connectors, cable connectors and latch accessories which are used in conjunction with the long terminal lengths (R1, R2 and R3). See page 104 for a complete description of the ERmet shroud system.

Specific contact loading configurations have already been defined for standard applications and special needs like live insertion on CompactPCI. However, to specify a custom loading configuration, use the ERNI customer request forms located in the back of the catalog. A form is provided for the 5+2 configuration and another form is available for the 8+2 configuration.

Features

- 3 step lengths in 1.5 mm increments ensure dependable sequential mating.
- Both front and rear mating areas meet the same IEC performance level.
- 15 pin lengths defined by IEC 61076-4-101.
- Long terminal contacts (R1, R2 and R3 - see page 12) require the use of rear shrouds.



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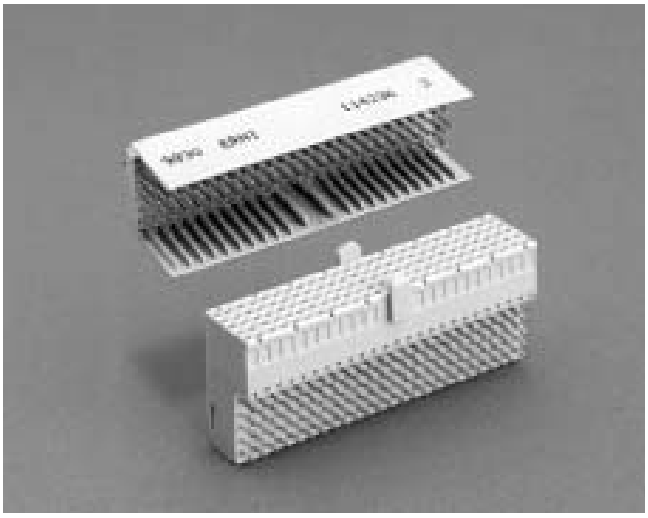
ERmet® 2mm Hard Metric Connectors

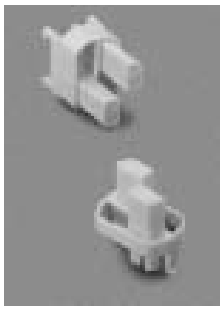
Product Features

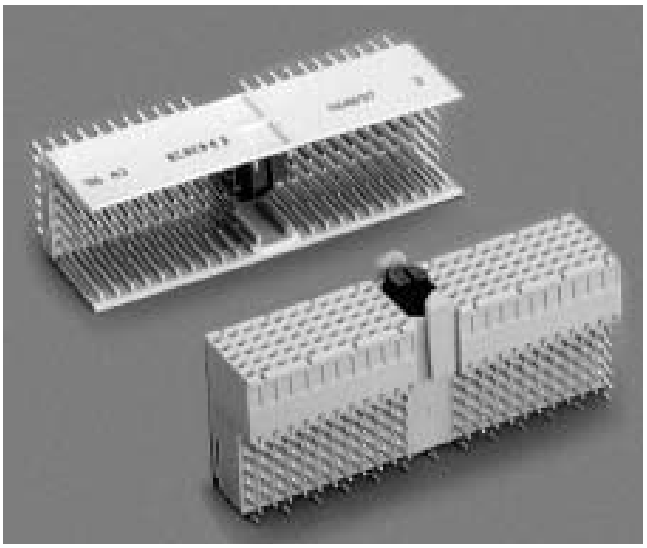
AB and DE Alignment Option (features)



The IEC 61076-4-101 connector standard only provides for connector Types A, B, C, D, E, F, L, M and N. Many customers require a connector with the density of a Type B or a Type E (25 columns) and with the pre-alignment guide pins of the Type A, D, L and M connectors. This became a particular issue within the CompactPCI computer architecture for rear plug in applications where only B connectors were being used. The problem is that if a plug in card only utilizes Type B connectors, the cards will not have adequate vertical alignment even in the most carefully constructed subrack. The result can be pin stubbing and ultimately serious damage to both the backplane connectors and the female connectors on the daughter cards. For our customers who need a solution to this situation, or who need the additional 15 pins that a Type B connector provides, or the additional 24 pins that a Type E connector provides, and also need the vertical alignment that the pre-alignment guide pins afford – ERNI has developed the Type AB and Type DE connectors. The new AB design, which does not allow for coding keys, is now required for rP3 and rP5 shrouds by the current draft PICMG Core specification (draft 3.0).

Coding Keys





CompactPCI® supports both conventional 5.0 V logic and 3.3 V logic. To prevent damage to the system resulting from incorrect insertion of cards with differing logic, coding keys are snapped into the multifunctional area of the male and female connector. This is done with the use of a plastic tool after the connector has been pressed in. The unique, bright color of the coding pairs allows for quick and easy visual identification and differentiation. For the 5.0 V logic, CompactPCI® use brilliant blue coding keys, 3.3 V logic use cadmium yellow and Telecom applications use strawberry red. The IEC 61076-4-101 standard defines a unique configuration and color for 70 different coding keys. The ERNI design has special integral supports that exceed the IEC requirements.

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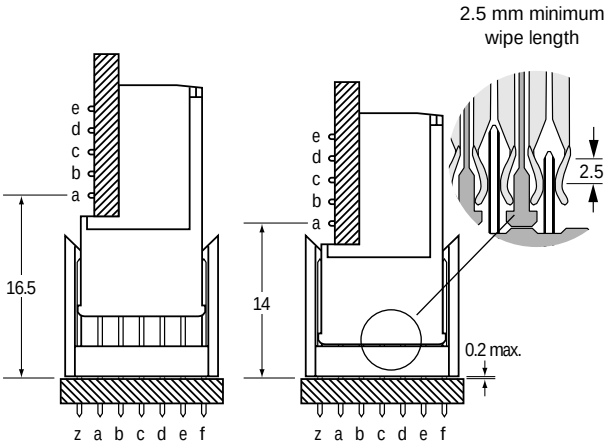
Male Contact Range

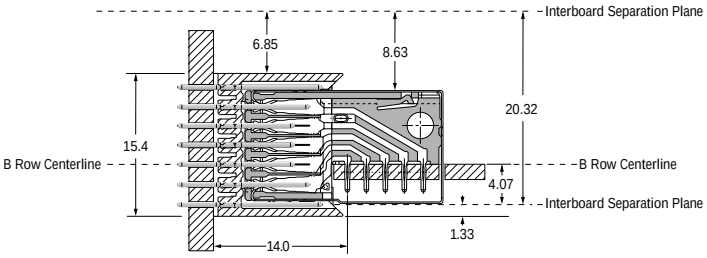
The ERmet 2mm HM Connector System has one of the longest wipe areas of any connector system as defined in IEC 61076-4-101. This ensures reliable contact mating even under adverse mating conditions. Features include:

- 2.5 mm minimum wipe length for all three contact lengths.
- The required wipe length for rear applications may be achieved by selecting the proper rear shroud height for the backplane thickness.
- IEC standardization completely defines tip blade and contact geometry, thus ensuring intermateability.



Relation To IEEE 1101.10 And IEC 297.3

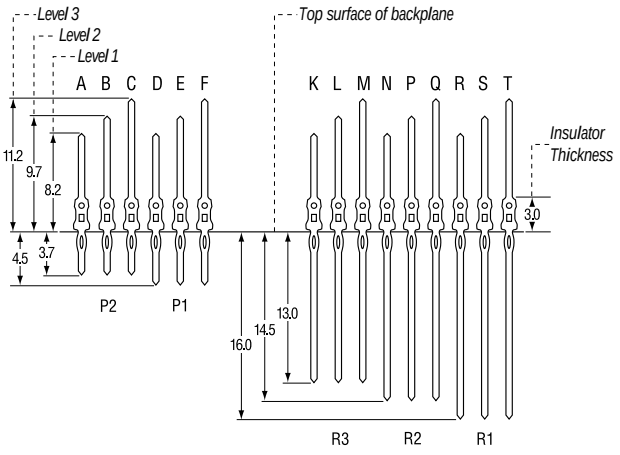
The ERmet 2mm HM Connector System has been chosen by the PICMG for the CompactPCI® bus architecture and the VITA Standards Organization for the VME64 Extensions, PO/JO connector. Both of these applications require this connector to be used in 0.8” wide slots in accordance with IEC 297.3 and IEEE 1101.10 mechanical chassis requirements. This chassis system defines the daughter card location within the card slot, relative to the interboard separation planes. When the ERmet Connector System is used within such a chassis system, the dimensions shown in the drawing will be observed. ERNI has designed the lower shield to avoid any interference with the interboard separation plane. This ensures that the daughter card and shield assembly will not snag or interfere with high components in the adjacent slot during installation or removal.



Male Contact Selection Options

The ERmet 2mm HM Connector System offers 15 standard contact lengths that utilize the proven pressfit assembly technique. Within the 15 contact lengths are 3 mating levels, achievable on both the plug-in and rear I/O side. Note you always keep 1.5 mm spacing between levels, for enhanced sequential mating.

On the plug-in side, the 3 contact levels are: 8.2 mm, 9.7 mm and 11.2 mm. On the rear I/O side there are 5 pressfit terminal length options: P1, P2, R1, R2, and R3. The P1 and P2 terminal lengths are for standard backplane applications with terminal lengths of 3.7 mm and 4.5 mm respectively. The R1, R2 and R3 terminal lengths are for rear I/O applications with lengths of 13.0 mm, 14.5 mm and 16.0 mm respectively. The optimum terminal length is determined by the printed circuit board thickness, rear shroud height and the desired mating level. Refer to page 106 for shroud and contact selection guidelines.



For contact plating information, refer to the Mechanical Specifications starting on page 16. To specify custom loading configurations, use the ERNI Customer Request Forms located on pages 152-154.

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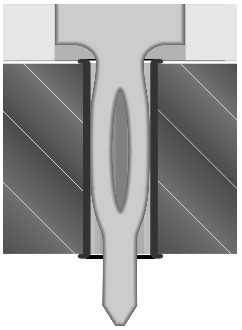
ERmet® 2mm Hard Metric Connectors

Compliant Pressfit Pins

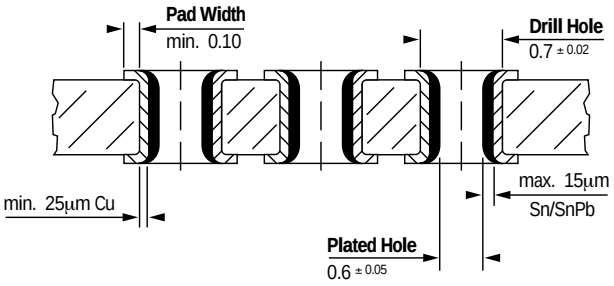
The ERmet 2mm HM connector line utilizes the proven pressfit assembly method. This design was chosen because it is an efficient assembly method that offers a number of benefits over soldering including higher reliability, easier inspection and repair, and easier installation. In addition, the pressfit method avoids exposing the high layer count printed circuit boards (PCBs) to the additional thermal stress of soldering.



Design Requirements For Printed Circuit Boards

Plated Through-hole For Pressfitting Signal Contacts, Power Contacts And Shielding Contacts

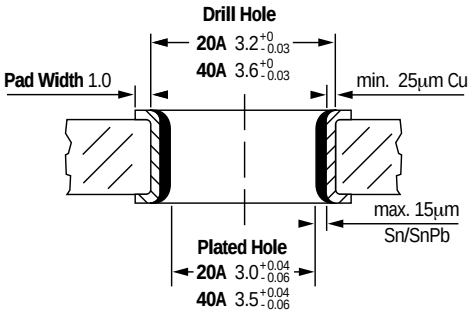
All ERmet 5+2 row and 8+2 row signal contacts are pressfit. In addition, the bladed ERmet power connectors are also pressfit and share the same board plated hole requirements as the male and female signal connectors. The ERmet 2mm HM Connectors have been used successfully with reflowed tin-lead, plated tin-lead, immersion tin, organic coatings over bare copper and immersion gold hole plating regimes. The hole recommendations and press in force information shown in this catalog are for reflowed tin-lead and plated tin-lead. Additional test data for other hole plating regimes are available through customer service.



Plated Through-hole For Pressfitting High-current Contacts (Special Contacts For Modules L, M And N)

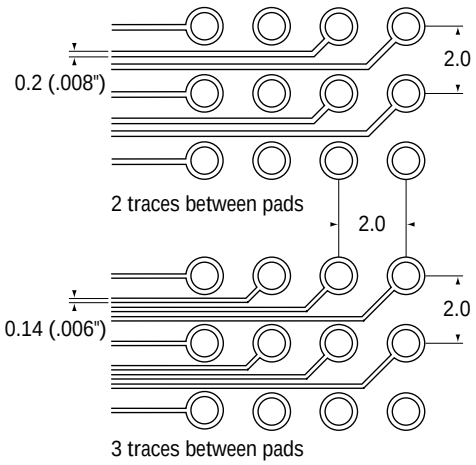
The ERmet Type L, M and N connectors have provisions for high frequency coaxial and high current circular contacts. These contacts have a variety of different plated through-hole requirements. For these, please consult ERNI Customer Service.

However, ERNI does offer both 20 Amp and 40 Amp high power pressfit contacts for the L, M, and N connectors, which have the specific plated through-hole requirements shown to the right.



Maximum Circuit Density

The dense ERmet 2.0 mm grid spacing utilizes a 0.6 mm plated through via. This via diameter, together with an appropriate plated annular ring, leaves a 1.0 mm minimum space between adjacent annular rings for trace routing. This space allows for either two equally spaced conductor traces of 0.2 mm (.008") wide or three equally spaced conductors 0.14 mm (.006") wide, as shown in the drawing to the right. This layout can be used to bus two or three rows of the connector on each layer respectively. Many designers bus each row on a separate layer with a ground or power layer between for best signal integrity.



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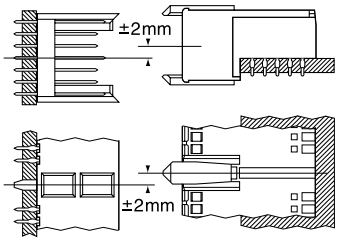
Alignment Tolerance

The pre-alignment pins ensure accurate alignment, eliminating the possibility of pin stubbing on the female insulator.

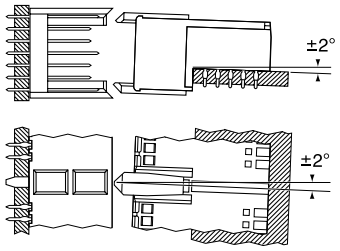
When modules with the pre-alignment feature are used, the following mating tolerances can be accommodated:

- Up to 2.0 mm of vertical or horizontal misalignment.
- Up to 2 degrees of vertical or horizontal angular inclination.

Allowed Misalignment



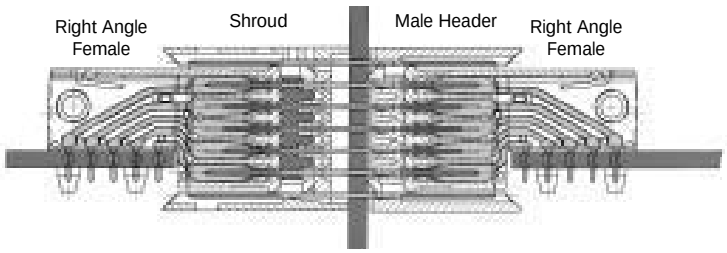
Allowed Angular Inclination



Midplane and Stacking Applications

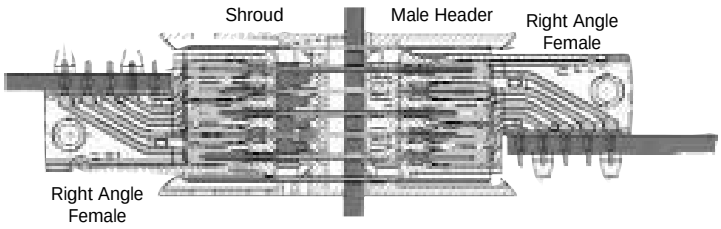
Midplane – inline

The most common configuration for mid plane applications is to have a rear shroud over long terminals. The rear shroud is oriented so that the shroud's "a" row lines up with the "a" row of the male connector on the front side of the backplane. In this configuration, the card guides in the front of the backplane line up exactly with those behind the backplane.



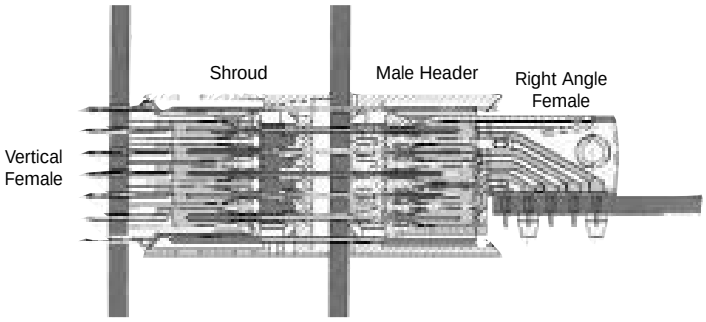
Midplane – out of line

This less common configuration has the "a" row of the shroud aligned with the "e" row of the male connector on the front side of the backplane. In this configuration, the card that plugs into the rear side has the same appearance as the board that plugs into the front side of the backplane. This usually requires a more complex card guide arrangement than the inline configuration.



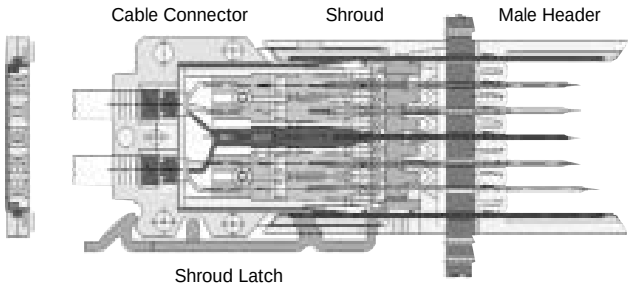
Parallel stacking

This configuration has a vertical female connector on a mezzanine board mating into a rear shroud on the rear of a backplane. This is a very popular method often used to connect two or more slots with a PCB which is parallel to the backplane. This is a common solution for switched fabrics such as Raceway or for modular dedicated bused lines such as a special processor to board memory bus. The ERmet vertical female is also available with long tails to allow two levels of stacking. The ERNI vertical female has shields so all male pins can be contacted. Vertical females with long terminals are available for additional levels of stacking.



Cable I/O

All ERmet rear shrouds can be fitted with optional latch arms. This can be done during backplane assembly or later by the end customer. The latch arms allow the ERmet 2mm cable connector to be retained by the shroud. The ERmet 2mm cable system also mates with the "z" and "f" shield rows. This cable system is a very flexible method for taking high speed signals from one backplane to elsewhere in a system or even to an adjacent backplane.



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Connector System Modularity And Configuration

Modularity

The ERmet 2mm HM connector has been designed in accordance with IEC 61076-4-101, with eleven basic connector types: A, B, AB, C, D, E, DE, F, L, M and N. These connectors can be assembled end to end in a great variety of combinations but certain guidelines must be followed:
You cannot mix 5+2 and 8+2 versions except under some very special situations.

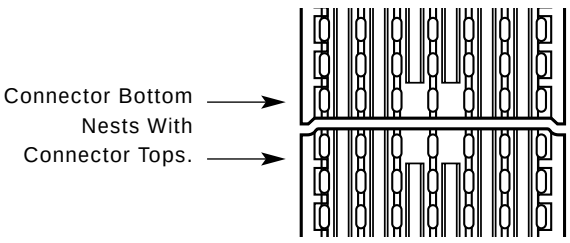
Type B connectors cannot be used alone. A Type B connector must be used in conjunction with a module containing a pre-alignment guide such as connector types A, AB, C, L, M or N.
Type E connectors cannot be used alone. A Type E connector must be used in conjunction with a module containing a pre-alignment guide such as connector types D, DE or F.
Type C, N and F connectors must be assembled at the lower end of a connector stack.

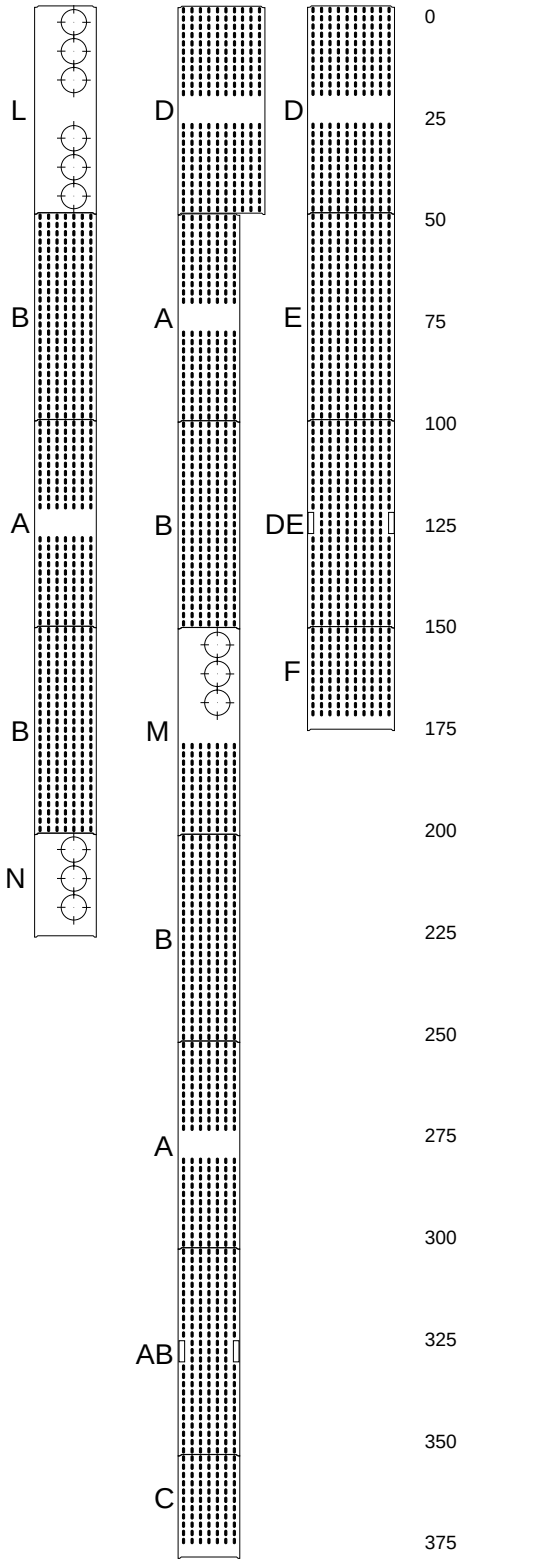
Each end of the connector is designed so that the modules "nest" together. This provides additional support for the side walls and makes for a very neat appearance.

When shrouds are used on the rear side of a backplane, care must be taken to align the shrouds properly. The correct orientation will depend upon the configuration of the rear plug in cards. For most applications following the "inline" configuration, the rear shrouds will have the convex end detail facing down which is opposite to the arrangement depicted in the detailed drawing on this page. The "a" row of the shroud will match the "a" row of the male connector.

Male Connector Stacking And Connector End Details

The ERmet 2mm HM Connector System is a modular system designed to be assembled on a 2.0 mm grid. The connectors are designed with a unique locking feature which ties the sidewalls together. This ensures that any stress is shared across an entire connector stack when assembled as a group. The connector's convex top end and concave bottom end fit together, maintaining the dense 2.0 mm grid. The bottom of the VME64 Extensions JO connector is the one exception. It is molded flat across as it is not designed for modular stacking and would otherwise interfere with the DIN 41612 connectors. It can be used in a modular stacking configuration but will not benefit from interlocking sidewalls.





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ERmet® 2mm Hard Metric Connectors

Mechanical Specifications And Performance

General Connector Specifications

Connector Pitch		2.0 mm
Temperature Range		-55°C to +125°C
Performance level 3 per 61076-4-101		≥ 50 mating cycles
Performance level 2 per IEC 61076-4-101		≥ 250 mating cycles
Performance level 1 per IEC 61076-4-101		≥ 500 mating cycles
Pressfit pin insertion (male or female)	.055 mm hole	36 Newtons (N) typical
	.065 mm hole	25 Newtons (N) typical
Contact Normal Force		0.8 Newtons (N)/contact
Insulation Resistance IEC 512-2 Test 3a	Contact	10^4 MΩ min @ 100 DC
	Shield	10^4 MΩ min @ 100 DC
Mating force per IEC 512-7, Test 13a	Contact	n x 0.75 Newtons (N) maximum (n=number of contacts)
	Ground pin to shield	n x 1 Newtons (N) maximum (n=number of contacts)
Withdrawal force per contact IEC 512-7, Test 13a	Contact	0.15 Newtons (N) minimum
	Ground pin to shield	0.15 Newtons (N) minimum
Contact insertion force (per pin) IEC 352-5 paragraph 3.2.2.2		36.3 Newtons (N) average (male or female)
Flammability		UL 94 V-0
Hole requirements for daughter card and backplane		0.6 mm ± 0.05 mm after plating
Contact Resistance per IEC 512-2. Test 2a		20 mΩ maximum

Male Contact and Housings

Housing Material (8+2) and (5+2)		PBT 30% Glass filled
Temperature Rating Per IEC 512		CTI 275 / CTI 175 M
Contact Material		Phosphor bronze
Contact Plating/Performance Level P1, P2	Contact area	Gold plated
	Compliant area	Sn
	Rear terminal	Sn
Contact Plating/Performance Level R1, R2, R3	Contact area	Gold plated
	Rear terminal	Gold plated

Right Angle Female Contact and Housings

Housing Material (8+2)		LCP 30% glass filled
Housing Material (5+2)		LCP 30% Glass filled
Wafer (8+2) and (5+2)		PBT 30% Glass filled
Temperature Rating Per IEC 512		CTI 275 / CTI 175 M
Contact Material		Phosphor bronze
Contact Plating/Performance Level	Contact area	Gold plated
	Compliant area	Sn
Contact Normal Force		0.8 Newtons (N)/contact

Vertical Females

Wafer (8+2) and (5+2) Material		LCP 30% Glass filled
Temperature Rating Per IEC 512		CTI 275 / CTI 175 M
Contact Material		Phosphor bronze
Contact Plating/Performance Level	Contact area	Gold plated
	Compliant area	Sn
	Extended Terminals	Gold plated

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ERmet® 2mm Hard Metric Connectors

Mechanical Specifications And Performance

Ground Return Shields for Right Angle Female Connectors

Base material		Copper alloy
Contact plating per IEC 512 Test 9A	Contact fingers	Gold plated
Performance level 2 per IEC 61076-4-101		≥ 250 mating cycles
Hole requirements for daughter card		0.6 ±0.05 mm after plating

Ground Return Shields for Vertical Female Connectors

Base material		Copper alloy
Contact plating per IEC 512 Test 9A	Contact fingers	Gold plated
Terminal plating per IEC 512 Test 9A	Extended terminals	Gold plated
Performance level 2 per IEC 61076-4-101		≥ 250 mating cycles
Hole requirements for daughter card		0.6 ±0.05 mm after plating

Shrouds

Temperature range	-55°C to +125°C
Housing material	PBT 30% glass filled
Flammability	UL 94 V-O

Coding Keys

Temperature range	-55°C to +125°C
Housing material	Polycarbonate 30% glass filled
Flammability	UL 94 HB
Mechanical strength	≥ 300 Newtons (N)
Weight	0.3 Grams (G) average

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ERmet® 2mm Hard Metric Connectors

Mechanical Specifications And Performance

Power Modules: General Connector Specifications

Temperature Range		-55° C to + 125 °C
Press-fit Pin Insertion (Tin/Lead Holes)	0.55 mm hole	~5000 N
	0.65 mm hole	~3500 N
Contact Normal Force		0.20 Nmin
Dielectric Withstanding Voltage	Contact/Contact	1000 V_{eff}
Insulation Resistance (IEC 512-2, Test 3a)		10^4 MΩ min
Mating Force per IEC 512-7, Test 13b		4 N max.
Withdrawal Force per IEC 512-7, Test 13a		4 N max.
Flammability		UL 94 V-0
Hole Requirements		0.70±0.02mm (drilled)
		0.60±0.05mm (plated)
Contact Resistance per IEC 512-2, Test 2a		15 mΩ max.
Current Rating per IEC 60512, Test 5b	20°C	9.0 Amps
	70°C	7.0 Amps
	100°C	4.5 Amps
UL Approval		File Number E84703
CSA Approval		File Number LK067018

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ERmet® 2mm Hard Metric Connectors

Mechanical Specifications And Performance

Power Modules: Right Angle Male Contact and Housing

Housing Material		LCP 30% Glass Filled
Temperature Rating		CTI 275
Contact Material		Phosphor Bronze
Contact Plating/Performance Level	Contact Area	Gold plated
	Compliant Area	Sn
	Terminal Area	Sn

Power Modules: Vertical Female Contact and Housing

Vertical Female Contact and Housing		
Housing Material		LCP 30% Glass Filled
Temperature Rating		CTI 275
Contact Material		Phosphor Bronze
Contact Plating/Performance Level	Contact Area	Gold plated
	Compliant Area	Sn
	Terminal Area	Sn

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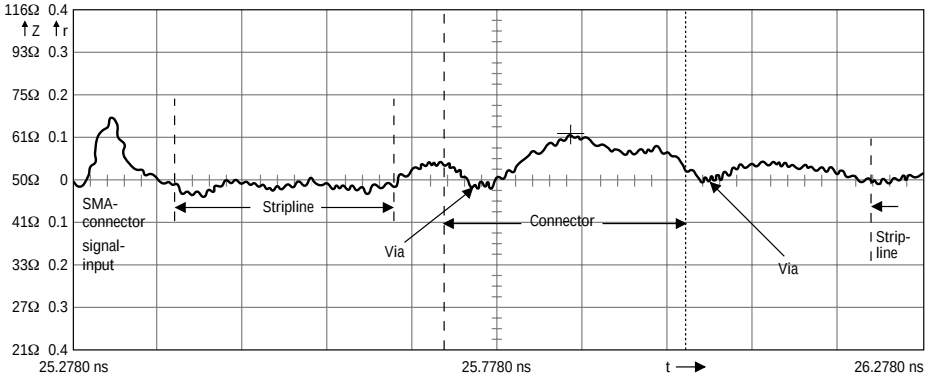
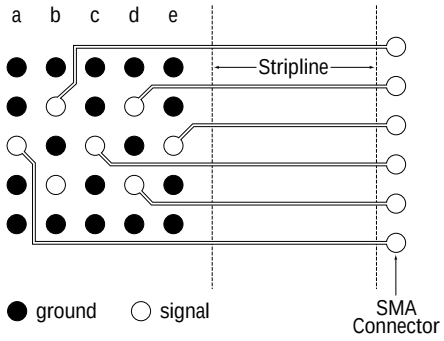
ERmet® 2mm Hard Metric Connectors

7-Row Electrical Performance

The ERmet line of 2mm HM connectors set a new, higher standard for 2.0 mm electrical performance. A collection of test reports is available which completely characterizes the connectors' mechanical and high frequency performance. In addition, ERNI can provide a SPICE (Simulator Program for Integrated Circuit Emulation) model to customers, utilizing advanced circuit simulation methods.

In the Time Domain Reflectometry (TDR) plot shown below, note the connector exhibits an almost ideal, 50 ohm characteristic impedance. This smooth, discontinuity-free, impedance progression is due, in part, to both the uniform contact spacing and constant cross section, as well as the uniform dielectric constant. This is a result of the encapsulated terminals of the right angle female connector.





TDR plot showing the impedance progression from a 2mm HM connector. Signal ground pattern as shown.

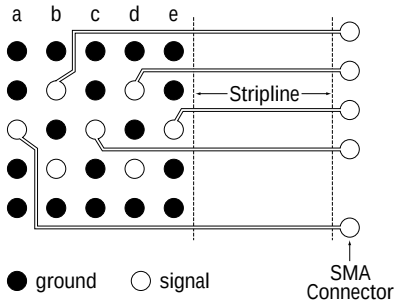
High Frequency Characteristics

The chart below summarizes the electrical characteristics of a test board with similar pin assignments. Note the remarkably low propagation delay (132 ps) and low total skew (a-e = 46 ps).

These factors, combined with the low capacitance and low inductance of the connector, make the ERmet 2mm HM Connector the best choice for demanding, high speed applications.

parameter	connector pin row				
	a	b	c	d	e
capacitance C (f = 100 MHz)	2.5 pF	2.8 pF	2.9 pF	3.1 pF	3.2 pF
inductance L (f = 100 MHz)	6.8 nH	7.6 nH	8.3 nH	8.7 nH	10.5 nH
characteristic impedance	52 Ω	52 Ω	53 Ω	53 Ω	57 Ω
propagation delay*	111 ps (86) ps	119 ps (94) ps	126 ps (101) ps	141 ps (116) ps	157 ps (132) ps
signal skew	8 ps	9 ps	14 ps	15 ps	
	maximum 46 ps				
crosstalk (f = 100 MHz)	← 57 dB →				
			← 53 dB →		
Reflection factor (50 Ω and f = 100 MHz)	0.02	0.02	0.03	0.03	0.065
VSWR (f = 100 MHz)	1.04	1.04	1.06	1.06	1.14
Reflection loss [dB] (f = 100 MHz)	34	34	30.5	30.5	24

* The higher value of the propagation delay is measured from solder-side to solder-side (rear side). The value in parenthesis is calculated from component-side to component-side (front side).



The measurement values are based on this pin configuration.

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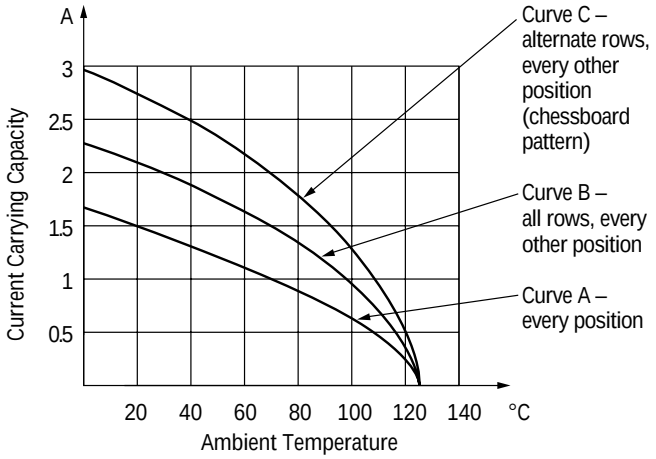
ERmet® 2mm Hard Metric Connectors

7-Row Electrical Performance

The specifications for contact current rating, dielectric withstanding voltages and creepage and clearance distances are all dependent on the contact loading configuration. For example, if contacts are loaded in a "chessboard pattern," each contact can carry more current than if every contact is loaded.

Current Rating For Various Contact Mounting Configurations



Dielectric Withstanding Voltage

Contact/Contact:

Row Designation		Fully Loaded	Every Other Position	Chessboard Pattern
Row a + c + e	Within the row	750Veff	1500Veff	–
Row b + d	Between the rows	1500Veff	1500Veff	–
Row a + b + c Row a + b + c + d Row a + b + c + d + e	Within the row	750Veff	1500Veff	1500Veff
	Between the rows	750Veff	750Veff	1200Veff
Contact to grounding rows or shielding frame: 750Veff				

Creepage Distances And Clearances Dependent On Contact Layout

Contact/Contact:

Row Designation		Fully Loaded		Every Other Position		Chessboard Pattern	
		Backplane Male Connector	Daughter Card Female Connector	Backplane Male Connector	Daughter Card Female Connector	Backplane Male Connector	Daughter Card Female Connector
Row a + c + e	Within the row	0.8	0.6	2.5	2.5	–	–
Row b + d	Between the rows	2.5	2.5	2.5	2.5	–	–
Row a + b + c Row a + b + c + d Row a + b + c + d + e	Within the row	0.8	0.6	2.5	2.5	2.5	2.5
	Between the rows	0.8	0.6	0.8	0.6	1.5	1.2
Creepage and clearance distances for contacts in the outer contact rows (A and E) to shielding rows (optional) is 0.8 mm.							

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ERmet® 2mm Hard Metric Connectors

10-Row Electrical Performance

The ERmet line of 2mm HM connectors set a new, higher standard for 2.0 mm electrical performance. A collection of test reports is available which completely characterizes the connectors' mechanical and high frequency performance. In addition, ERNI can provide a SPICE (Simulator Program for Integrated Circuit Emulation) model to customers, utilizing advanced circuit simulation methods.

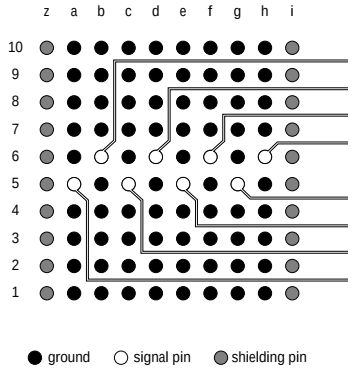
In the Time Domain Reflectometry (TDR) plot shown below, note the connector exhibits an almost ideal, 50 ohm characteristic impedance. This smooth, discontinuity-free, impedance progression is due, in part, to both the uniform contact spacing and constant cross section, as well as the uniform dielectric constant. This is a result of the encapsulated terminals of the right angle female connector.

High Frequency Characteristics

The chart below summarizes the electrical characteristics of a test board with similar pin assignments.

These factors, combined with the low capacitance and low inductance of the connector, make the ERmet 2mm HM Connector the best choice for demanding, high speed applications.

parameter	connection pin row							
	a	b	c	d	e	f	g	h
capacitance C [pF] **f = 300 MHz**	1.9	2.3	2.5	2.7	2.8	2.8	3.7	4.0
inductance L [nH] **f = 100 MHz**	5.4	6.3	6.9	7.5	8.1	8.9	11.9	15.5
characteristic impedance **z = √ L/C**	53	52	53	53	54	56	57	62
propagation delay [ps]	110	120	130	140	150	160	175	190
signal skew [ps]	10		10		10		15	
		10		10		15		
crosstalk [dB] f=300 MHz	34.9		32.7		30.2		-28.61	
Reflection factor 50 Ohm **f = 300 MHz**	0.03	0.02	0.02	0.03	0.04	0.06	0.06	0.11
VSWR **f = 300 MHz**	1.06	1.04	1.04	1.06	1.08	1.13	1.13	1.25
Reflection loss [dB] **f = 300 MHz**	30.5	34.0	34.0	30.5	28.0	24.4	24.4	19.2



The measurement values are based on this pin configuration.

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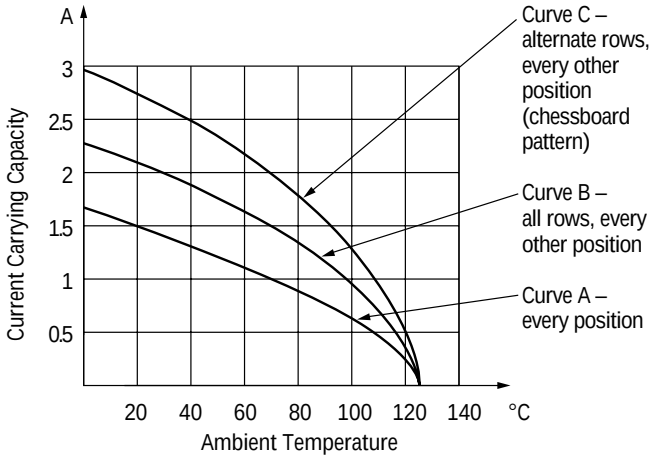
ERmet® 2mm Hard Metric Connectors

10-Row Electrical Performance

The specifications for contact current rating, dielectric withstanding voltages and creepage and clearance distances are all dependent on the contact loading configuration. For example, if contacts are loaded in a "chessboard pattern," each contact can carry more current than if every contact is loaded.

Current Rating For Various Contact Mounting Configurations



Dielectric Withstanding Voltage

Contact/Contact:

Row Designation		Fully Loaded	Every Other Position	Chessboard Pattern
Row a+c+e+g	Within the row	750Veff	1500Veff	–
Row b+d+f+h	Between the rows	1500Veff	1500Veff	–
Row a+b+c Row a+b+c+d Row a+b+c+d+e	Within the row	750Veff	1500Veff	1500Veff
Row a+b+c+d+e+f Row a+b+c+d+e+f+g Row a+b+c+d+e+f+g+h	Between the rows	750Veff	750Veff	1200Veff

Contact to grounding rows or shielding frame: 750Veff

Creepage Distances And Clearances Dependent On Contact Layout

Contact/Contact:

Row Designation		Fully Loaded		Every Other Position		Chessboard Pattern	
		Backplane Male Connector	Daughter Card Female Connector	Backplane Male Connector	Daughter Card Female Connector	Backplane Male Connector	Daughter Card Female Connector
Row a+c+e+g	Within the row	0.8	0.6	2.5	2.5	–	–
Row b+d+f+h	Between the rows	2.5	2.5	2.5	2.5	–	–
Row a+b+c Row a+b+c+d Row a+b+c+d+e	Within the row	0.8	0.6	2.5	2.5	2.5	2.5
Row a+b+c+d+e+f Row a+b+c+d+e+f+g Row a+b+c+d+e+f+g+h	Between the rows	0.8	0.6	0.8	0.6	1.5	1.2

Creepage and clearance distances for contacts in the outer contact rows (A and E) to shielding rows (optional) is 0.8 mm.

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ERmet® 2mm Hard Metric Connectors

Approval Certificates, Ordering Information and Spice Models

Approval Certificates

UL Approved by the American approvals authority (Underwriters Laboratories Inc.) File number E 84703.

CSA Tested and found in compliance with the requirements of the Canadian Standards Association (CSA). File numbers LR62504 & LR67018.

ISO 9001 All ERmet connectors are designed and produced in fully approved ERNI ISO 9001 facilities.

Telcordia™ GR 1217 CORE ERmet connectors are available that meet the requirements of Telcordia™ GR-1217-CORE for large systems in uncontrolled environments.

ECTF ERmet connectors are also available to meet the requirements of the Enterprise Computer Telephony Forum's (ECTF) H.110 specification.

IEC 917 And IEC 61076-4-101 The ERmet Connector System meets the requirements of IEC 61076-4-101 which was developed in accordance with the requirements of IEC 917 the standard for for Hard Metric mounting systems.

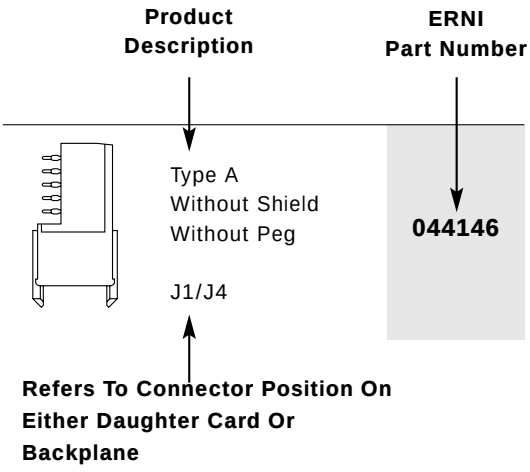
IEEE 1301 And IEEE 1101 And IEEE 1101.10 ERmet connectors were developed to meet the demanding board to backplane physical architecture of IEEE 1301 and have been adapted to meet the requirements of IEEE 1101 and IEEE 1101.10.

PICMG ERmet connectors have been adapted to meet the requirements of the CompactPCI® specification as defined by the PICMG. Special length connectors with the required loading have been molded and assembled for these applications. Type AB connectors have been developed for rear transition card applications.

Ordering Information

All ERNI ERmet 2mm HM Connectors for CompactPCI® and VME64 Extensions are assigned a six digit part number. The following pages contain part numbers, along with product descriptions of many popular ERNI 2mm HM Connectors, complementary components, application, repair and installation tooling. In addition to the configurations listed in this catalog, others are available. Please consult ERNI customer service for more information.

The information right shows the elements of an ERNI part number. Please refer to this page for any clarification.



Spice Models

Software Program for Integrated Circuit Emulation (SPICE) has become an important took for system architects and circuit designers.

With the increasing complexity and speed of today's system it is no longer practical to design by intuition and simple "rule of thumb" methods. ERNI can provide a designer with a fully validated set of matrix SPICE models of the ERmet®2mm Hard Metric Connector System.

These SPICE models allow the designer to simulate the complete signal path. This allows all trace geometries, device placements and interconnects to be optimized and analyzed before hardware is actually built.

Product Description	ERNI Part Number
5 + 2	104078 ENG
8 + 2	124763 ENG

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ERmet Daughter Card Connectors

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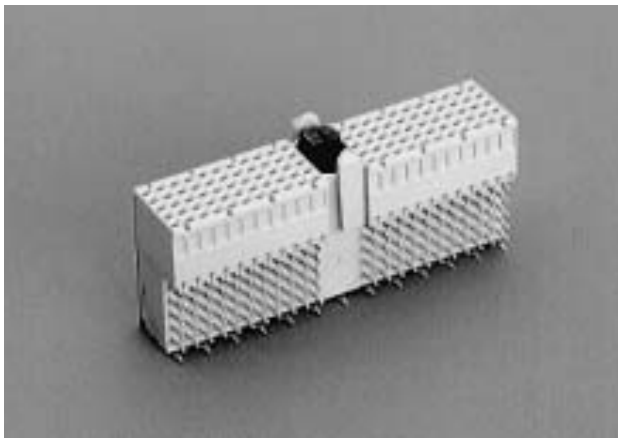
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type A For Daughter Cards

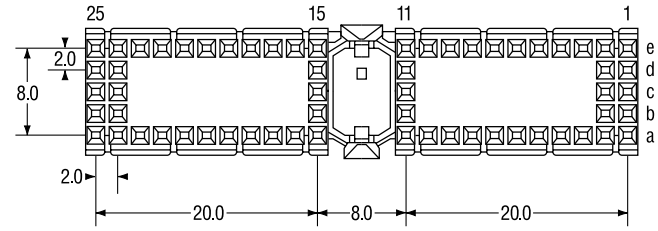


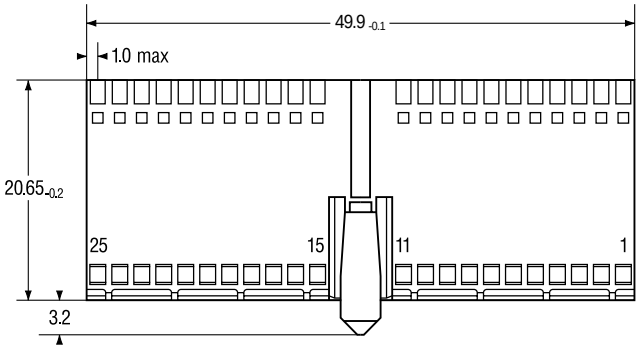
The ERmet type A female connector provides 110 contacts in a 5 row x 25 position (3 positions used by multifunction cavity), fully loaded configuration. This connector is used in the J1 and J4 positions of the CompactPCI® daughter card.
The connector is designed for gas tight, pressfit installation and is provided in two different configurations: with integrated upper ground return shields and without integrated upper ground return shields. Lower ground return shields are available separately.

The ERmet type A female connector has a multifunction cavity that incorporates pre-alignment guides and accepts optional coding keys. This connector is designed to be used alone or in conjunction with either a type B, C, L, M or N ERmet connector.

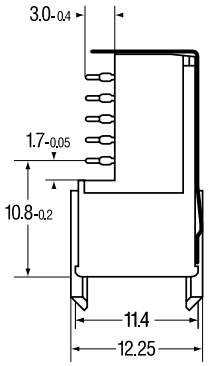
The type A female is also available with a locating and strain relief peg that helps secure the connector to the printed circuit board (PCB).

Dimensional Drawings

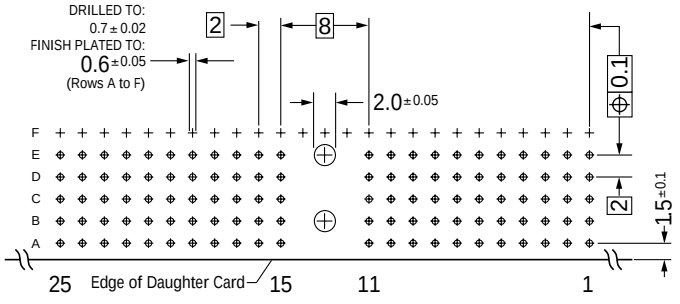




End View With Shield



PC Board Layout



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

For daughter card layout suggestions, see pages 122, 124, 126, 128 and 130.

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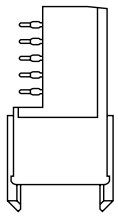
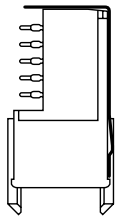
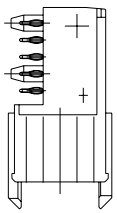
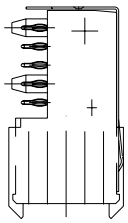
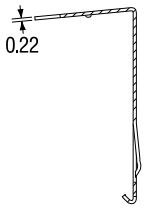
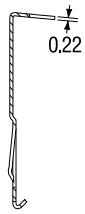
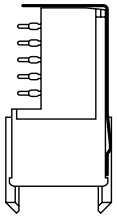
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type A For Daughter Cards

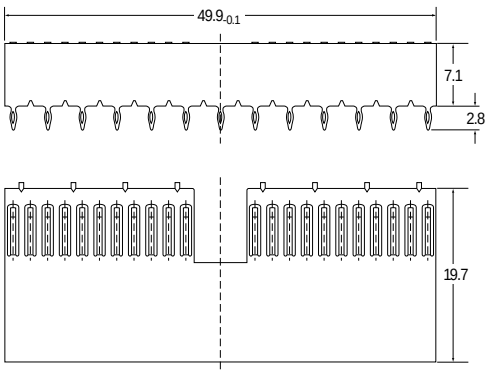
Ordering Information

	Part Number
 **Type A** **Without Shield** **Without Peg** **J1/J4** 25 positions	**044146**
 **Type A** **With Upper Shield** **Without Peg** **J1/J4** 25 positions	**064176**
 **Type A** **Without Shield** **With Peg** **J1/J4** 25 positions	**044766**
 **Type A** **With Shield** **With Peg** **J1/J4** 25 positions	**064558**
 **Type A** **Upper Shield** **J1/J4** 25 positions	**044445**
 **Type A** **Lower Shield** **J1/J4**	**044446**
 **Type A** **With Split Shield** **Without Peg** **J4 Telecom**	**104512**

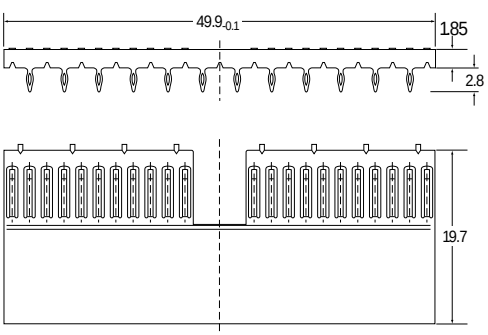
Note: The J1 & J4 refer to various positions on daughter cards as defined on pages 122, 124, 126, 128 and 130.

Shield Dimensional Drawings

Upper Shield



Lower Shield



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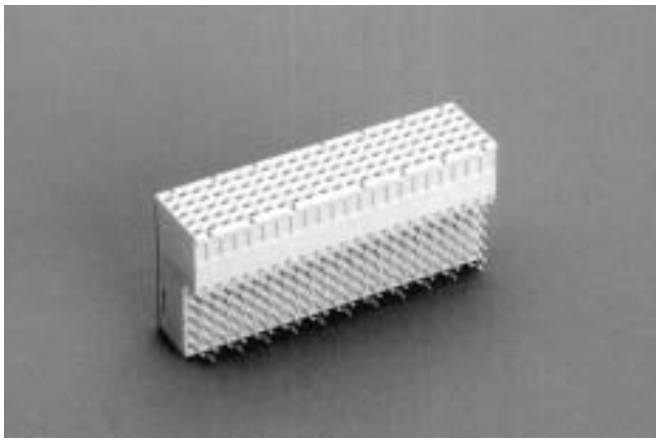
ERmet® 2mm Hard Metric Connectors

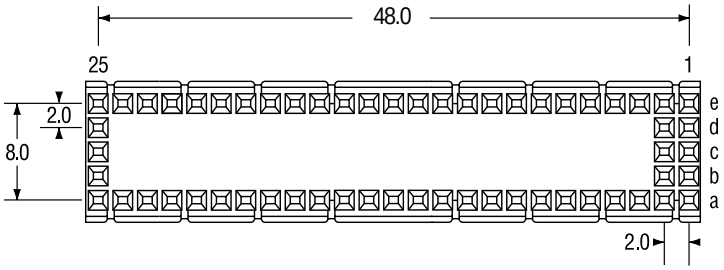
Right Angle Female Connectors Type B For Daughter Cards

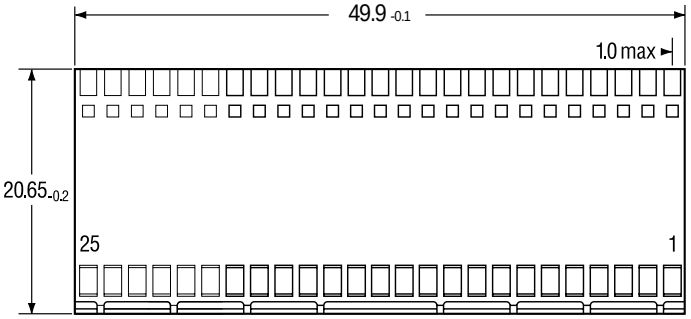


The ERmet type B female connector provides 125 contacts in a 5 row x 25 position fully loaded configuration.
The connector is designed for gas tight, pressfit installation and is provided in two different configurations: with integrated ground return shields and without integrated upper ground return shields. Lower ground return shields are available separately.

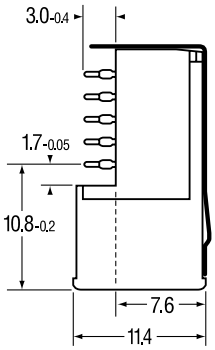
The ERmet type B female connector has an uninterrupted pin field with no multifunction cavity. This connector is not designed to be used alone, but is intended to be used in conjunction with either a type A, C, L, M or N ERmet connector.

Dimensional Drawings

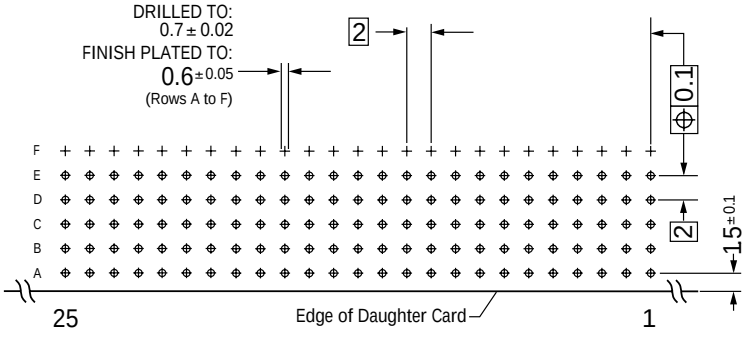




End View With Shield



PC Board Layout



Dimensions shown are for reference purposes only. All dimensions are in millimeters (mm) unless otherwise noted.

For daughter card layout suggestions, see pages 122, 124, 126, 128 and 130.

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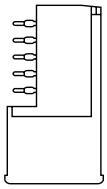
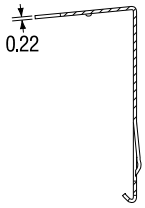
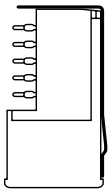
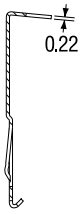
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type B For Daughter Cards

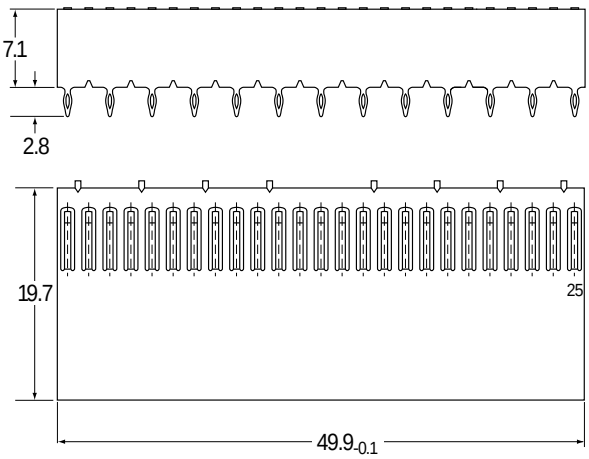
Ordering Information

		Part Number
	**Type B** **Without Shield** 25 positions	**044767**
	**Type B** **Upper Shield** 25 positions	**044451**

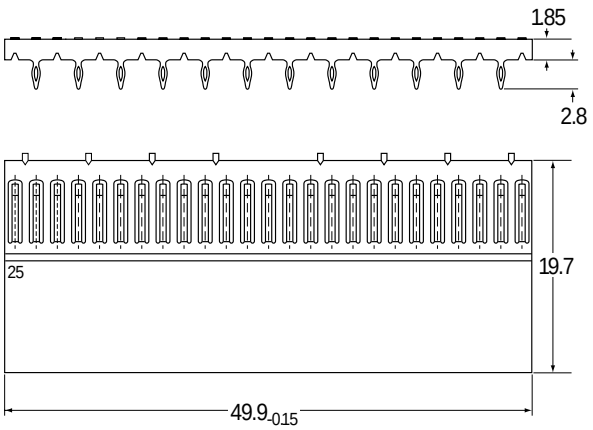
		Part Number
	**Type B** **With Shield** 25 positions	**064179**
	**Type B** **Lower Shield** 25 positions	**044452**

Shield Dimensional Drawings

Upper Shield



Lower Shield



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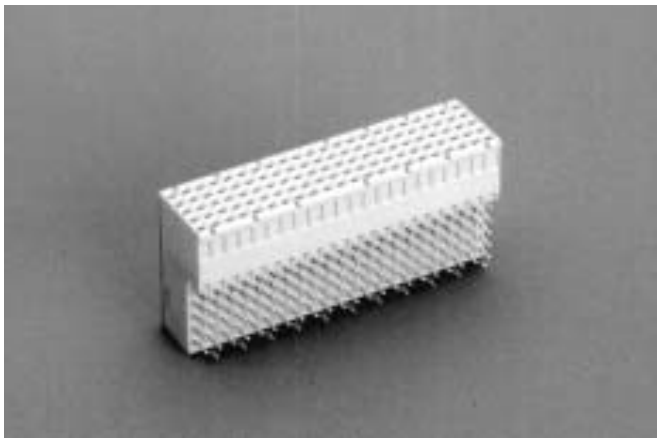
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type B For Daughter Cards

Other Lengths

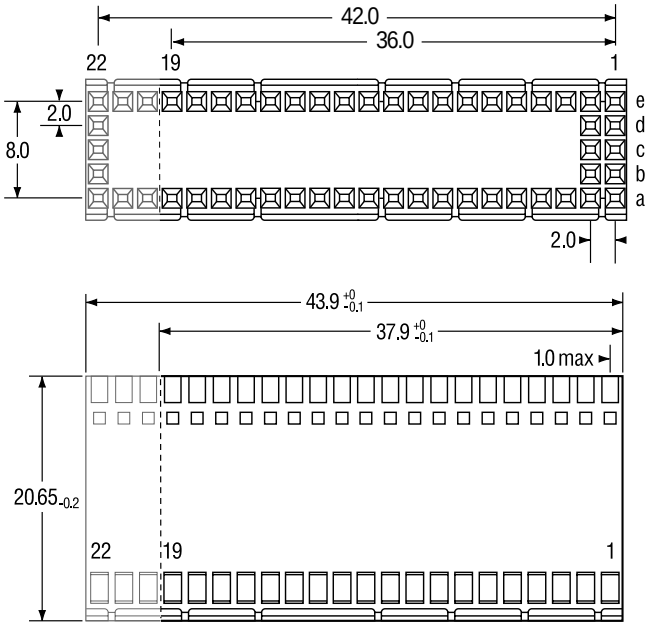


The ERmet type B female connector is provided in alternative lengths to the standard 25-position connector. It is available with 110 contacts in a 5 row x 22 position fully loaded configuration or 95 pins in a 5 row x 19 position configuration. The 19 position connector is used in the J3 location, and the 22 position connector is used in the J2 and J5 locations of the CompactPCI® daughter card.

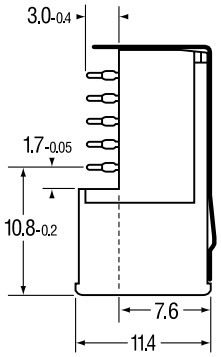
The connector is designed for gas tight, pressfit installation and is provided in two different configurations: with integrated ground return shields and without integrated upper ground return shields. Lower ground return shields are available separately.

The ERmet type B female connector has an uninterrupted pin field with no multifunction cavity. This connector is not designed to be used alone, but is intended to be used in conjunction with either a type A, C, L, M or N ERmet connector.

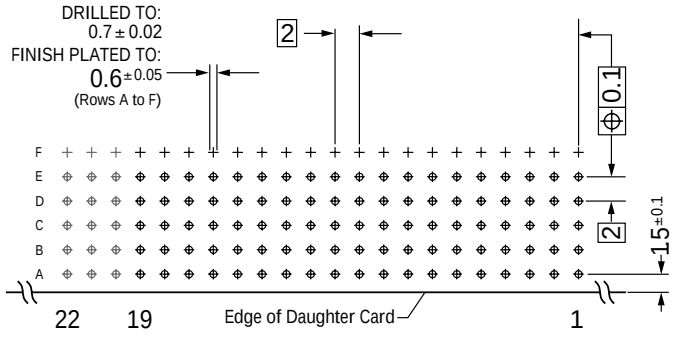
Dimensional Drawings



End View With Shield



PC Board Layout



Dimensions shown are for reference purposes only. All dimensions are in millimeters (mm) unless otherwise noted.

For daughter card layout suggestions, see pages 122, 124, 126, 128 and 130.

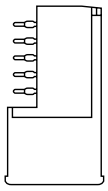
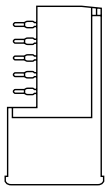
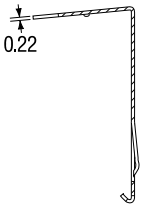
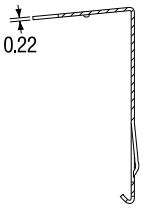
Downloaded from Arrow.com.

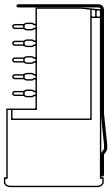
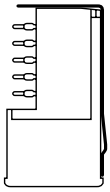
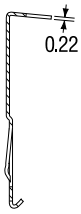
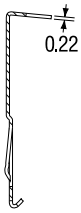
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type B For Daughter Cards

Other Lengths

Ordering Information

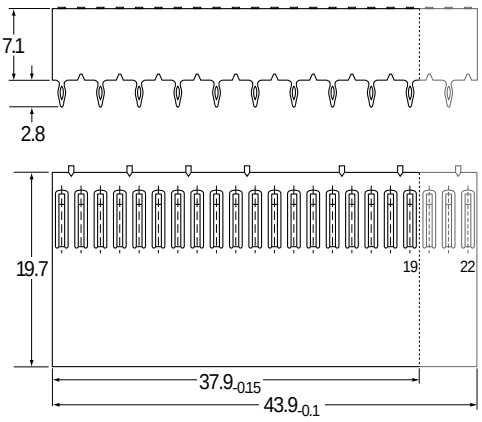
	Part Number
 **Type B Without Shield** **J2/J5** 22 positions	**914797**
 **Type B Without Shield** **J3** 19 positions	**914794**
 **Type B Upper Shield** **J2/J5** 22 positions	**914795**
 **Type B Upper Shield** **J3** 19 positions	**064781**

	Part Number
 **Type B With Shield** **J2/J5** 22 positions	**064785**
 **Type B With Shield** **J3** 19 positions	**064784**
 **Type B Lower Shield** **J2/J5** 22 positions	**064783**
 **Type B Lower Shield** **J3** 19 positions	**064782**

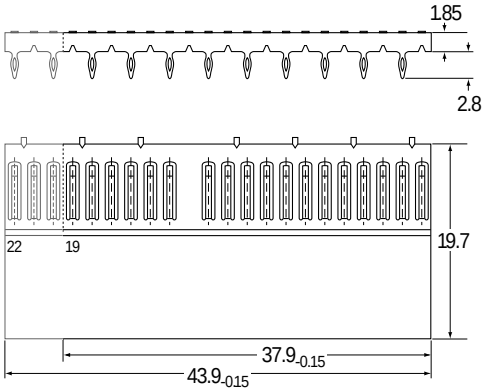
NOTE: J2, J3 and J5 refer to connector positions on various daughter cards as defined on 126, 128, 130, 132 and 134.

Shield Dimensional Drawings

Upper Shield



Lower Shield



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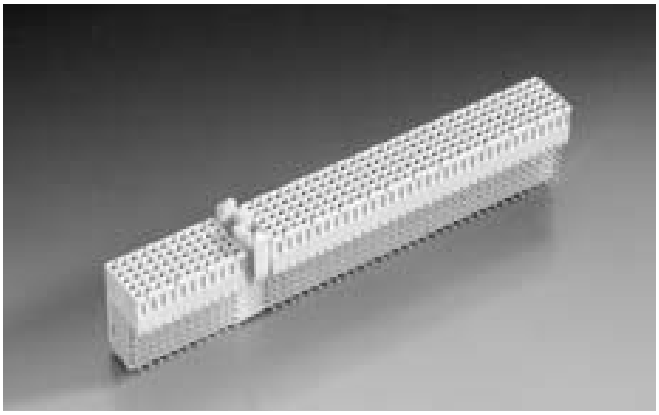
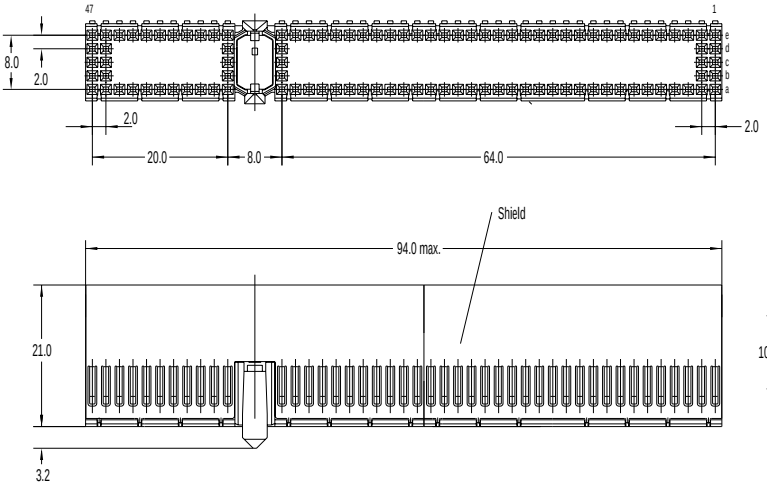
ERmet® 2mm Hard Metric Connectors

Right Angle Female Monoblock Connectors for Compact PCI

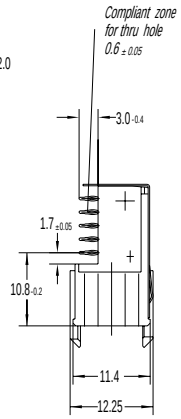


The ERmet™ female monoblock connector integrates the type A and the type B modules into one single piece. The monoblock provides a maximum of 220 contacts in 5 rows by 44 positions. It has integrated pre-centering, and as an option integrated coding, according to PICMG specification for 3.3V or 5.0V, which requires 3 positions. For applications requiring the use of shielding, the female connector is supplied with an upper shield. Lower shield may be ordered separately. The monoblock has been designed especially for CompactPCI applications for the positions P1/P2 and for the positions P4/P5. The monoblock has a length of 94mm (3U) and can also be used for other applications in 19" rack systems.

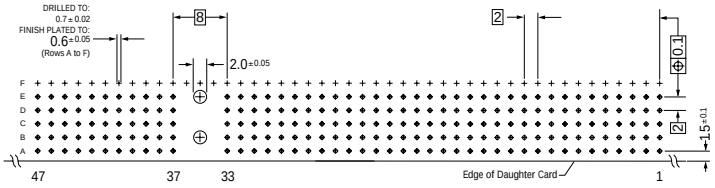
Dimensional Drawings



End Views



PC Board Layout (top view)

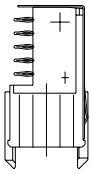
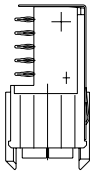
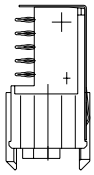
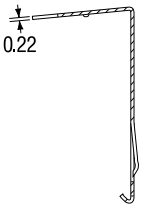
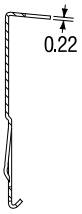


* Connectors available with shields on both sides, shields on side only, or without side shields.

Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

Right Angle Female Monoblock Connectors for Compact PCI

		Part Number
	**Monoblock for Compact PCI** **With Shield** **Without Peg** **Without Integrated Coding Key**	**104732**
	**Monoblock for Compact PCI** **With Shield** **Without Peg** **With Integrated Cadmium Yellow Coding Key–3.3v**	**104733**
	**Monoblock for Compact PCI** **With Shield** **Without Peg** **With Integrated Brilliant Blue Coding Key–5.0v**	**104734**
	**Upper Shields** **25 Positions** **22 Positions**	 **044445** **914795**
	**Lower Shields** **25 Positions** **22 Positions**	 **044446** **064783**

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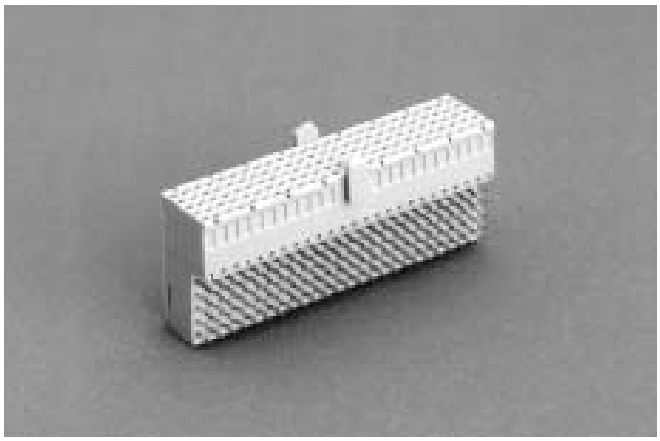
ERmet® 2mm Hard Metric Connectors

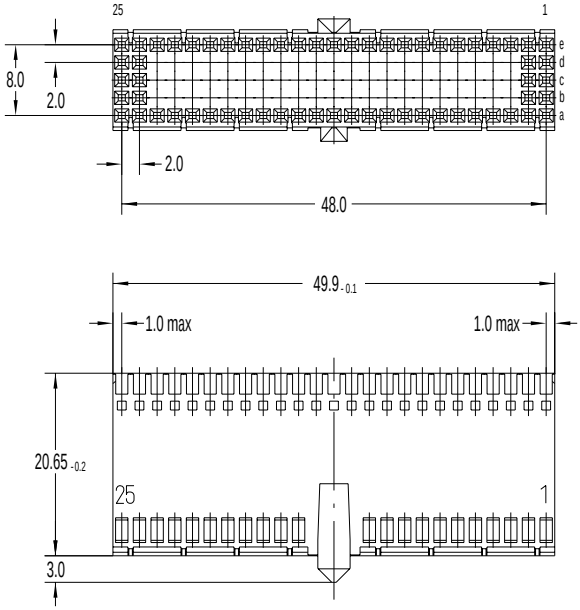
Right Angle Female Connectors Type AB For Daughter Cards



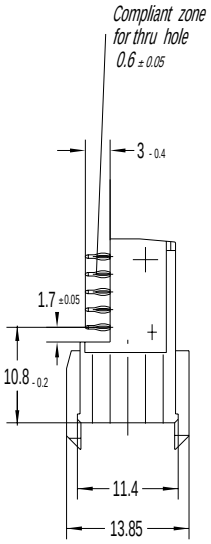
The ERmet type AB female connector provides 125 contacts in a 5 row x 25 fully loaded configuration,110 contacts in a 5 row x 22 position fully loaded configuration or 95 pins in a 5 row x 19 position configuration. The 19 position connector is used in the J3 location and the 22 position connector is used in the rJ2 and rJ5 locations of the CompactPCI® rear transition card. The connector is designed for gas tight, pressfit installation and is provided in two different configurations: with integrated ground return shields and without integrated upper ground return shields. Lower ground return shields are available separately.

The ERmet type AB female connector has an uninterrupted pin field with no multifunction cavity but does have integral prealignment guides. This connector can be used alone or in conjunction with either a type A, B or C ERmet connector. This connector will provide the necessary alignment for rear transition applications.

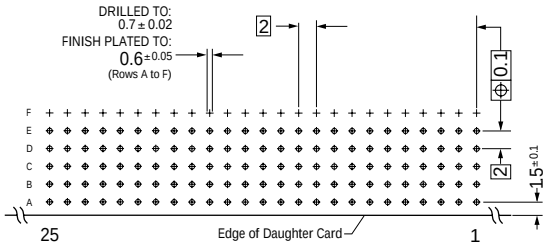
Dimensional Drawings (25 Positions)



End View With Shield



PC Board Layout (25 Positions)



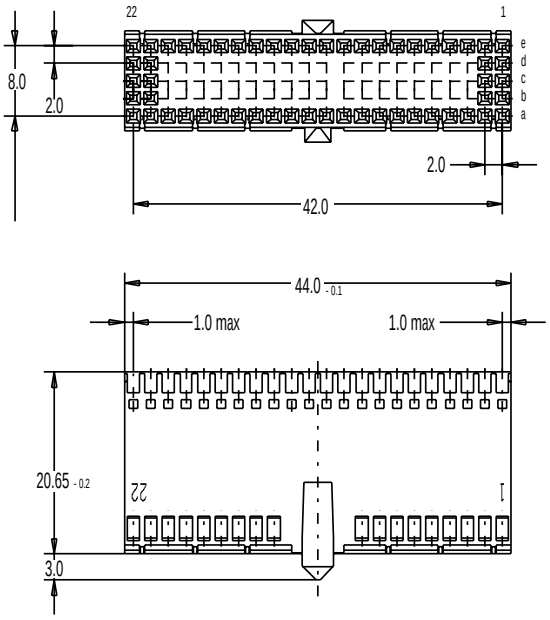
Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

For daughter card layout suggestions, see pages 122, 124, 126, 128 and 130.

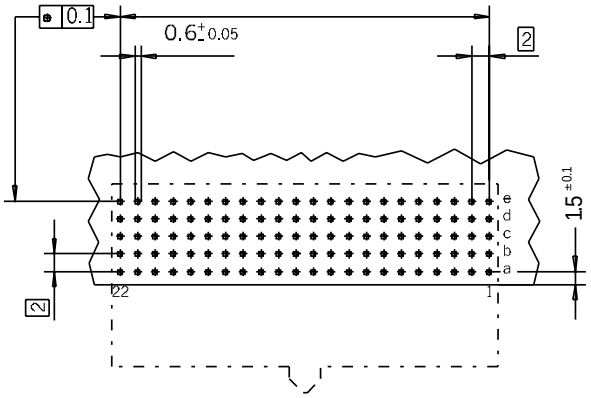
Downloaded from Arrow.com.

Right Angle Female Connectors Type AB For Daughter Cards

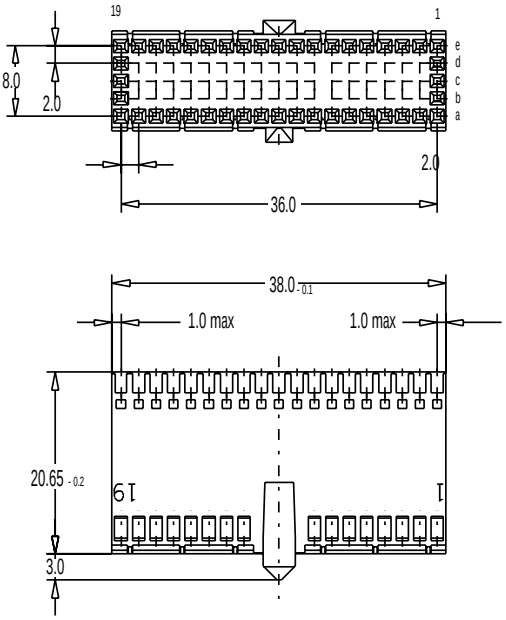
Dimensional Drawings (22 Positions)



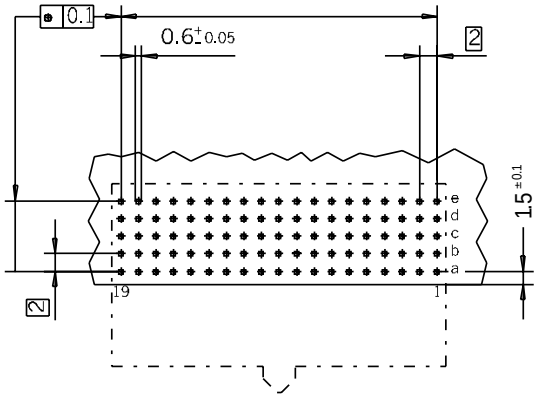
PC Board Layout (22 Positions)



Dimensional Drawings (19 Positions)



PC Board Layout (19 Positions)



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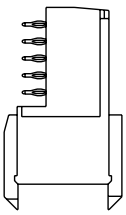
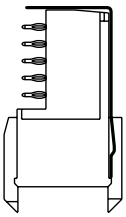
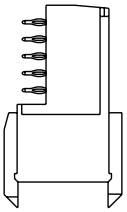
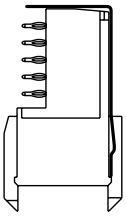
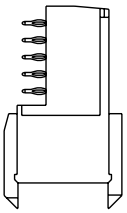
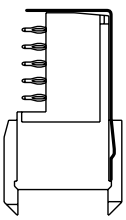
Right Angle Female Connectors Type AB For Daughter Cards

Ordering Information

		Part Number
	**Type AB** **Without Shield** 25 positions	**114154**
	**Type AB** **With Shield** 25 positions	**114538**
	**Type AB** **Without Shield** 22 positions	**104933**
	**Type AB** **With Shield** 22 positions	**114809**
	**Type AB** **Without Shield** **rJ3** 19 positions	**114529**
	**Type AB** **With Shield** **rJ3** 19 positions	**134075**

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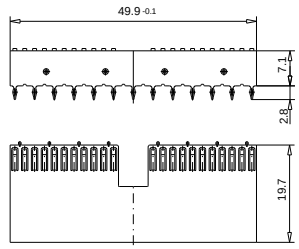
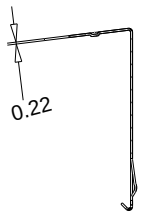
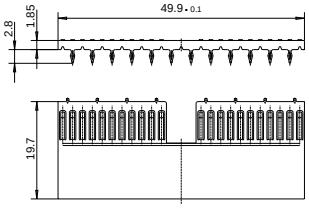
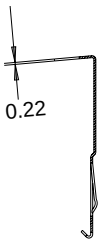
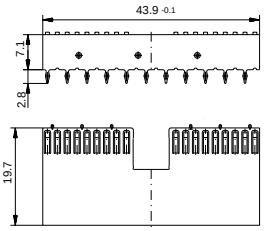
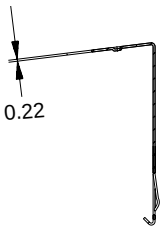
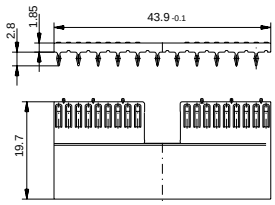
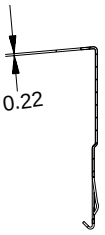
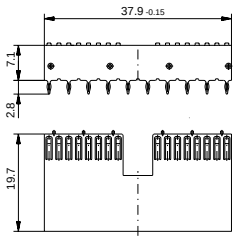
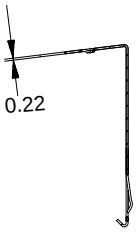
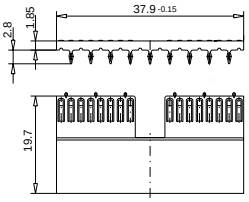
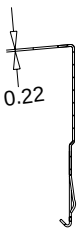
Right Angle Female Connectors Type AB For Daughter Cards

Ordering Information

			Part Number
		**Type AB Upper Shield** 25 positions	**044445**
		**Type AB Lower Shield** 25 positions	**044446**
		**Type AB Upper Shield** 22 positions	**114230**
		**Type AB Lower Shield** 22 positions	**114231**
		**Type AB Upper Shield** 19 positions	**124966**
		**Type AB Lower Shield** 19 positions	**124967**

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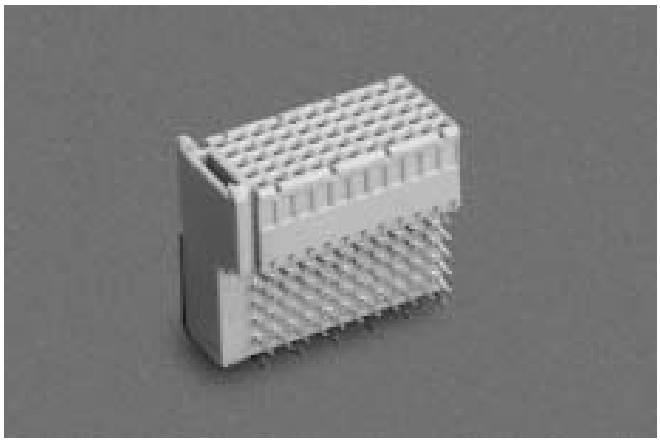
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type C For Daughter Cards

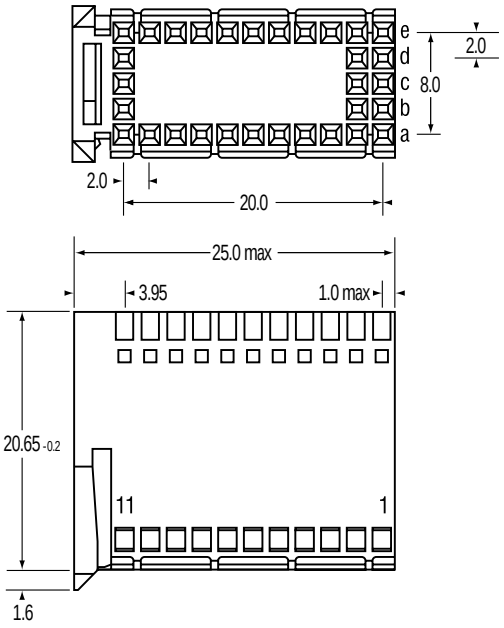


The ERmet type C female connector provides 55 contacts in a 5 row x 11 position fully loaded configuration.
The connector is designed for gas tight, pressfit installation and is provided in two different configurations: with integrated upper ground return shields and without integrated upper ground return shields. Lower ground return shields are available separately.

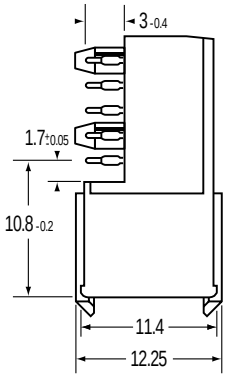
The ERmet type C female connector has pre-alignment guides. This connector can be used alone or in conjunction with either a type A, B, L, M or N ERmet connector, however it can only be installed at the lower end of a connector row. For detailed information on modular stacking, see.the stacking information on type C positioning on page 15.

The type C female is also available with a locating and strain relief peg that helps secure the connector to the printed circuit board (PCB).

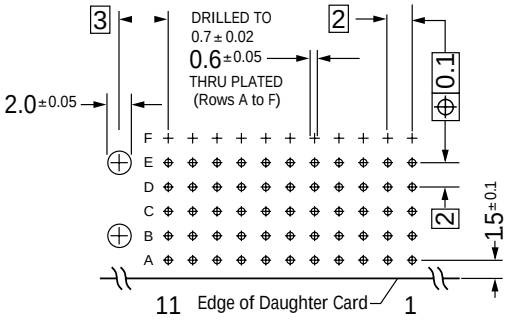
Dimensional Drawings



End View Without Shield



PC Board Layout



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

For daughter card layout suggestions, see pages 122, 124, 126, 128 and 130.

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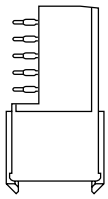
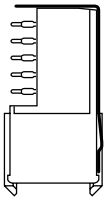
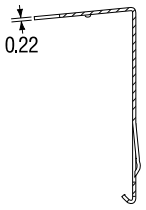
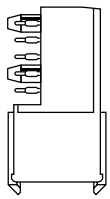
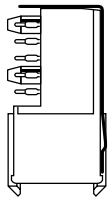
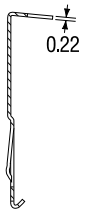
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type C For Daughter Cards

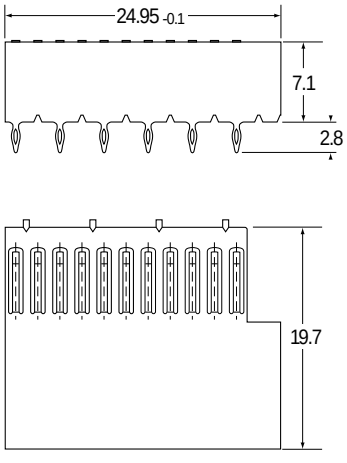
Ordering Information

	Part Number
 **Type C Without Shield Without Peg** 11 positions	**044145**
 **Type C With Shield Without Peg** 11 positions	**064198**
 **Type C Upper Shield**	**044457**

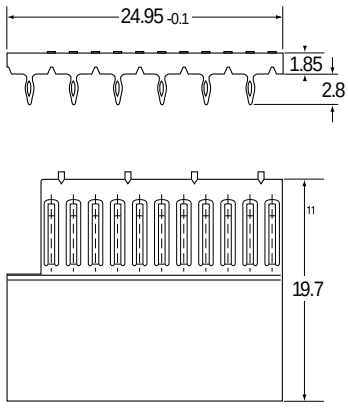
	Part Number
 **Type C Without Shield With Peg** 11 positions	**044768**
 **Type C With Shield With Peg** 11 positions	**064556**
 **Type C Lower Shield**	**044458**

Shield Dimensional Drawings

Upper Shield



Lower Shield



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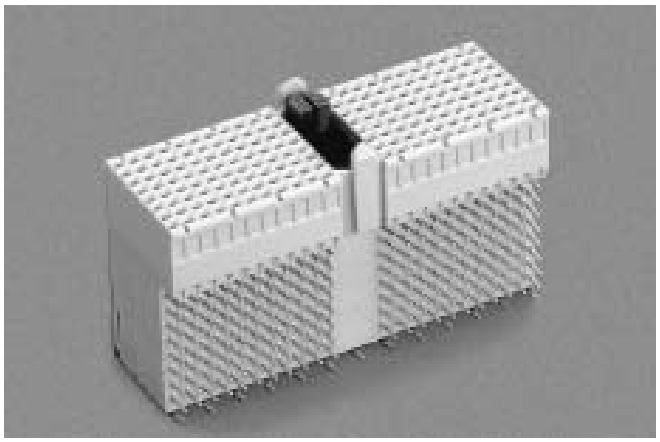
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type D For Daughter Cards



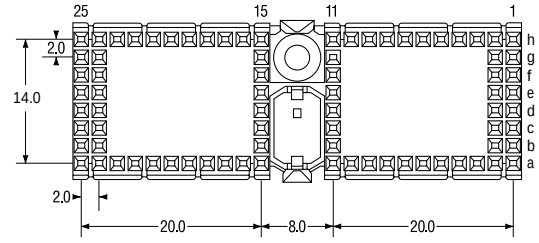
The ERmet type D female connector provides 176 signal contacts and 44 ground shield contacts in an 8 row x 25 position (3 positions used by multifunction cavity) fully loaded configuration.

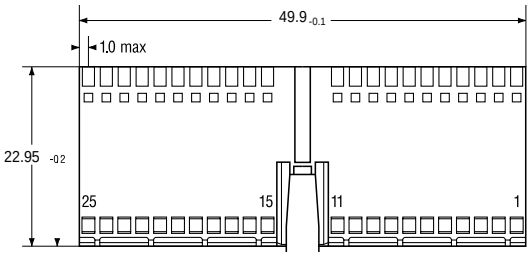
The connector provides for a gas tight, pressfit installation and is designed for two different configurations: with integrated upper ground return shields and without integrated upper ground return shields.

The ERmet type D female connector has a multifunction cavity that incorporates pre-alignment guides and accepts optional coding keys. This connector is designed to be used alone or it can be used in conjunction with either a type E or F ERmet 2mm HM connector.

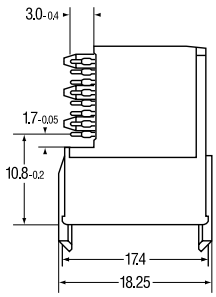
The type D female is also available with a locating and strain relief peg that helps secure the connector to the printed circuit board (PCB).

Dimensional Drawings

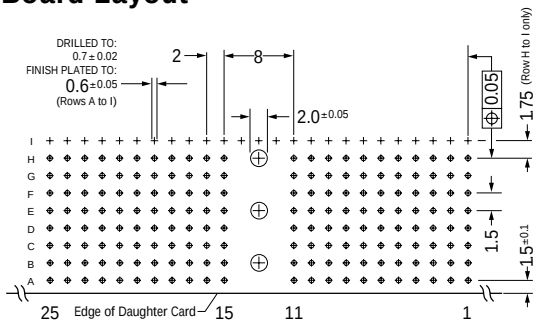




End View Without Shield



PC Board Layout



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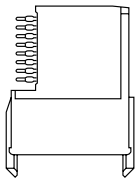
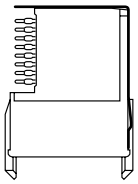
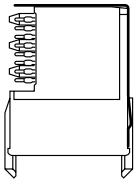
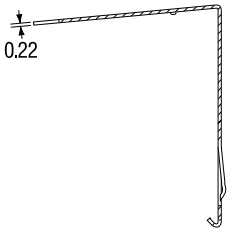
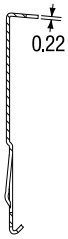
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type D For Daughter Cards

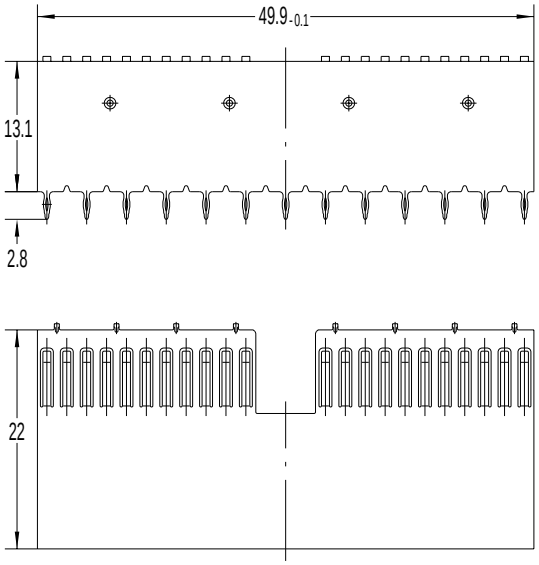
Ordering Information

	Part Number
 **Type D Without Shield With Peg** 25 positions	**104086**
 **Type D With Shield Without Peg** 25 positions	**104935**
 **Type D With Shield With Peg** 25 positions	**104415**

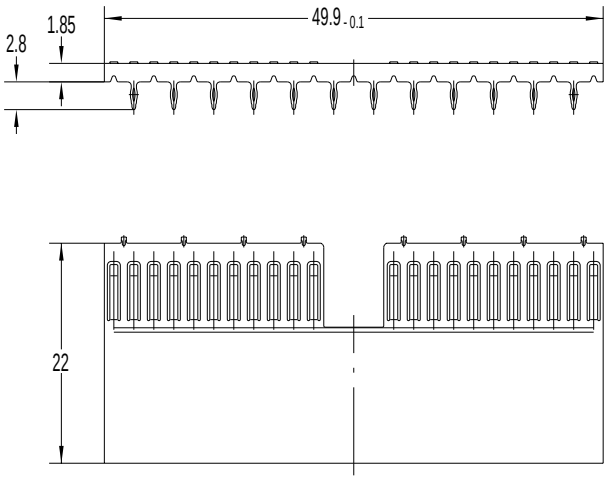
	Part Number
 **Type D Upper Shield**	**103846**
 **Type D Lower Shield**	**103847**

Shield Dimensional Drawings

Upper Shield



Lower Shield



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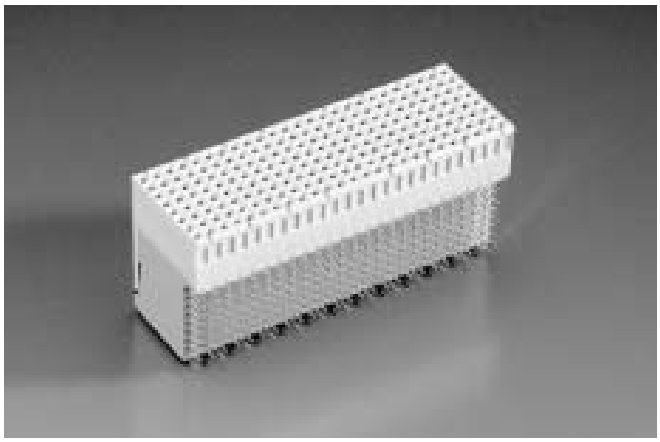
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type E For Daughter Cards

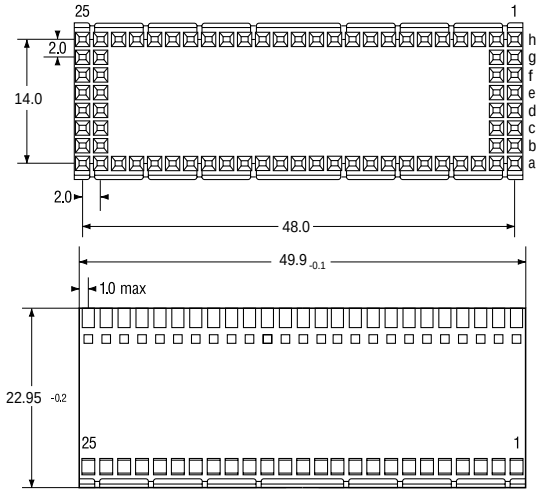


The ERmet type E female connector provides 200 signal contacts and 50 ground shield contacts in an 8+2 row x 25 position fully loaded configuration. These connectors are also available in an 8+2 row x 22 positions and and 8+2 row x 19 positions.

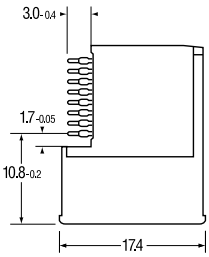
The connector provides for a gas tight, pressfit installation and is designed for two different configurations: with integrated upper ground return shields and without integrated upper ground return shields.

The ERmet type E female connector has an uninterrupted pin field with no multifunction cavity. This connector is not designed to be used alone, but is intended to be used in conjunction with either a type D, DE or F ERmet 2mm HM connector.

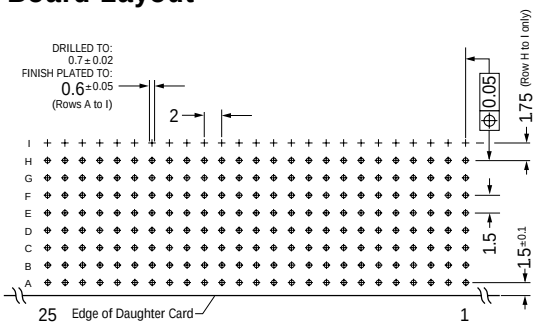
Dimensional Drawings



End View Without Shield



PC Board Layout



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ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type E For Daughter Cards

Ordering Information

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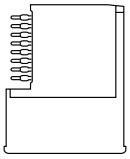
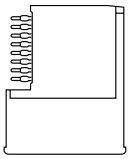
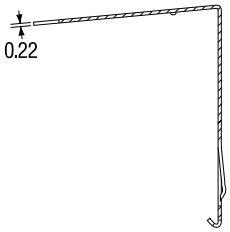
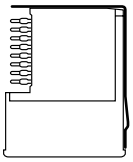
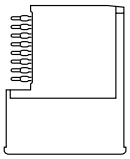
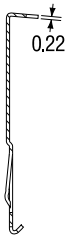
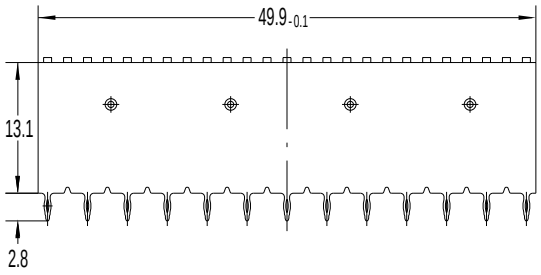
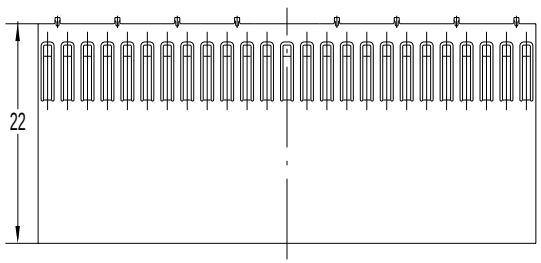
 **Type E Without Shield** 25 positions	**104087**
 **Type E Without Shield** 22 positions	**933052**
 **Type E Upper Shield** 25 positions	**103848**

	Part Number
 **Type E With Shield** 25 positions	**104416**
 **Type E Without Shield** 19 positions	**933054**
 **Type E Lower Shield** 25 positions	**103849**

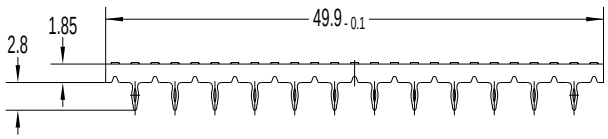
Shield Dimensional Drawings

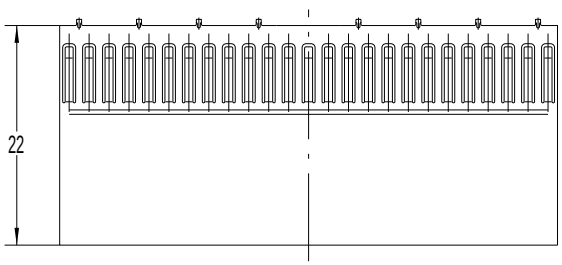
Upper Shield





Lower Shield





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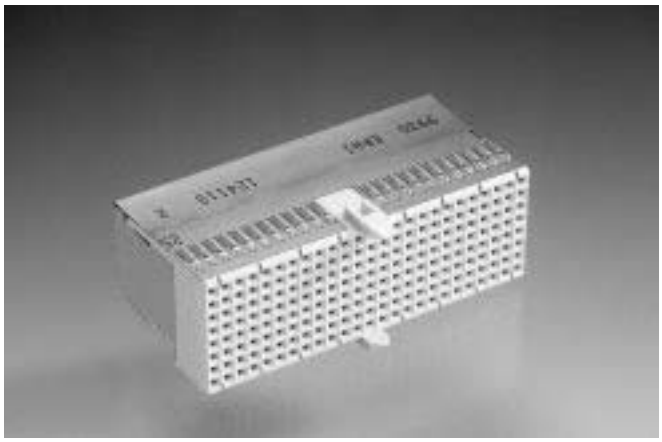
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type DE For Daughter Cards

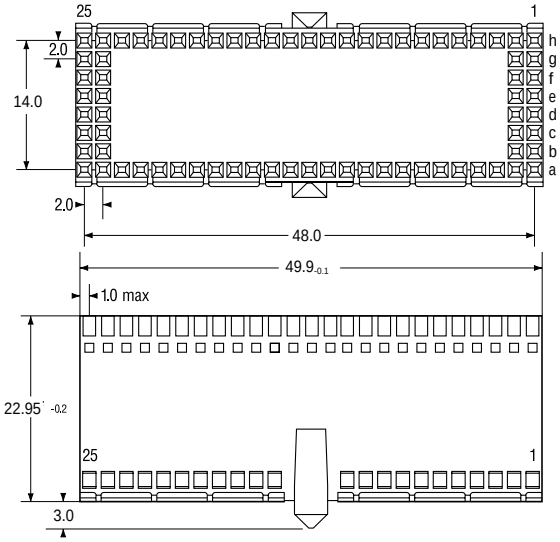


The ERmet type DE female connector provides 200 signal contacts and 25 ground shield contacts in an 8 row x 25 position fully loaded configuration.

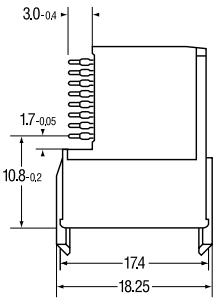
The connector provides for a gas tight, pressfit installation and is designed for two different configurations: with integrated upper ground return shields and without integrated upper ground return shields.

The ERmet type DE female connector has an uninterrupted pin field and integral pre-alignment guide. This connector can be used alone or in conjunction with type D, E, or F ERmet 2mm HM connector.

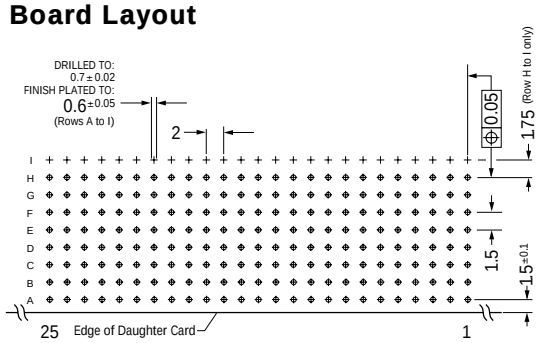
Dimensional Drawings



End View Without Shield



PC Board Layout

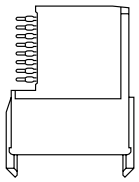
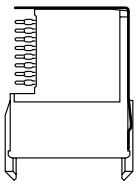


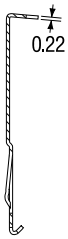
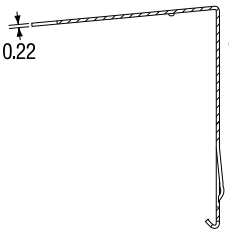
Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type DE For Daughter Cards

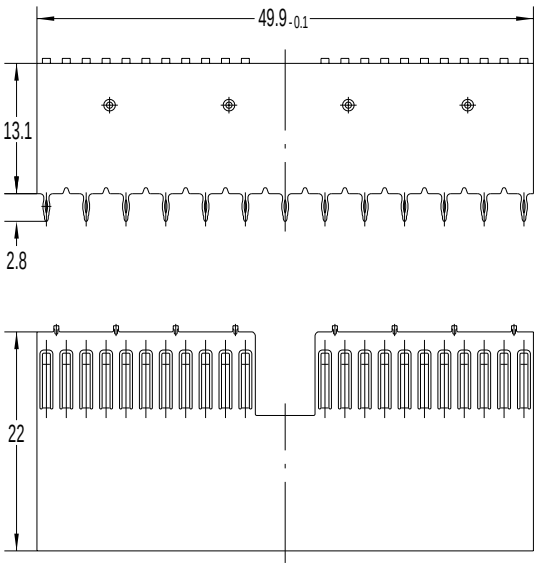
Ordering Information

		Part Number
	**Type DE** **Without Shield** 25 positions	**114281**
		**124118**

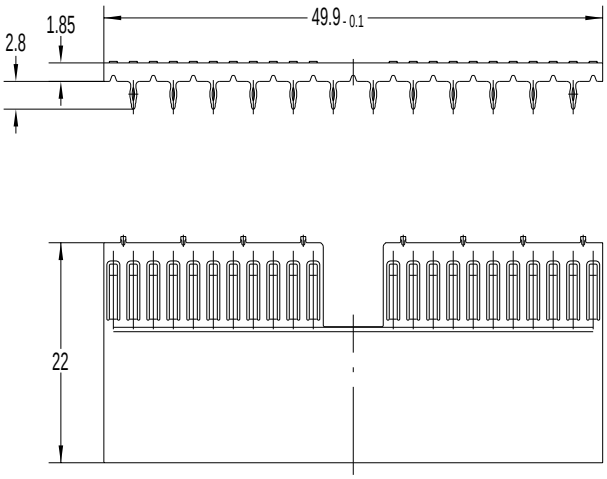
		Part Number
	**Type DE** **Lower Shield**	**103847**
	**Type DE** **Upper Shield**	**103846**

Shield Dimensional Drawings

Upper Shield



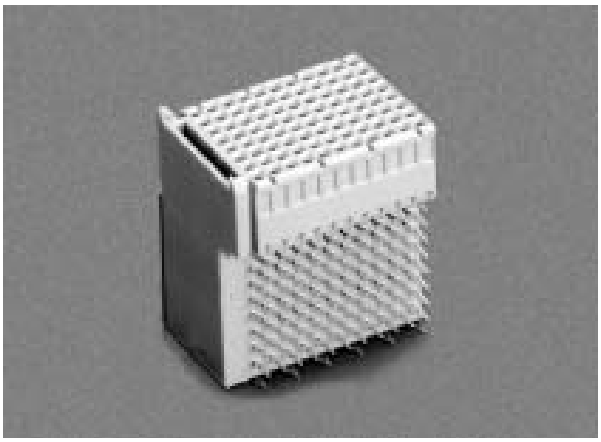
Lower Shield



Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type F For Daughter Cards



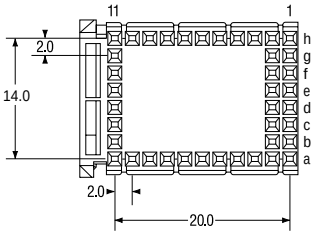
The ERmet type F female connector provides 88 signal contacts and 22 ground shield contacts in an 8 row x 11 position fully loaded configuration.

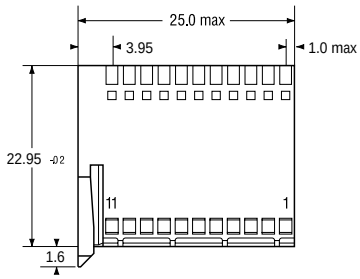
The connector provides for a gas tight, pressfit installation and is designed for two different configurations: with and without integrated ground return shields. The ERmet type F female connector has integral pre-alignment guides but no multifunction cavity.

The type F female is also available with optional locating and strain relief pegs that help secure the connector to the printed circuit board (PCB). This connector is designed to be used alone or with either type D, DE or E ERmet connectors, however it can only be installed at the lower end of a connector field.

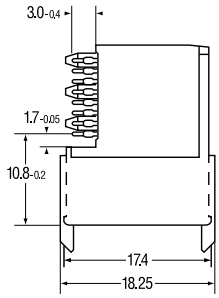
For detailed information on the modular stacking, see the information on type C positioning on page 15.

Dimensional Drawings

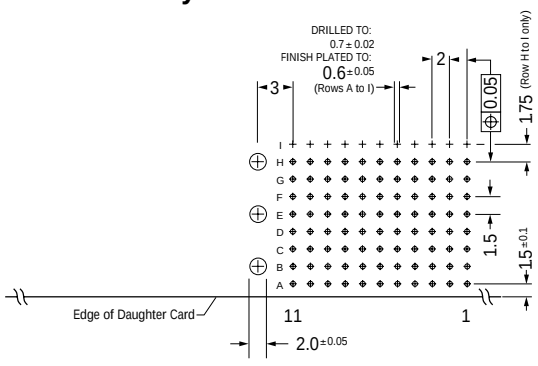




End View Without Shield



PC Board Layout

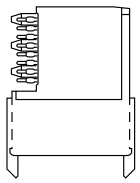
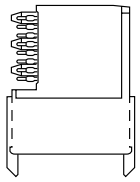
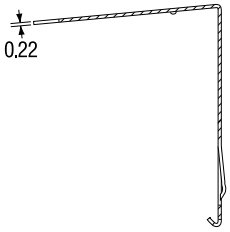


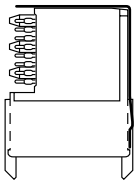
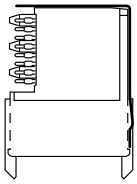
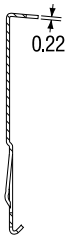
Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type F For Daughter Cards

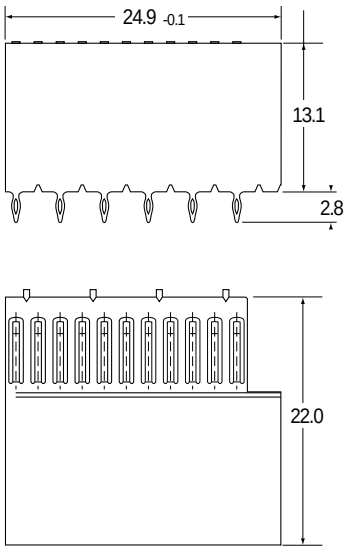
Ordering Information

	Part Number
 **Type F Without Shield With Peg** 11 positions	**104088**
 **Type F Without Shield Without Peg** 11 positions	**933012**
 **Type F Upper Shield**	**103850**

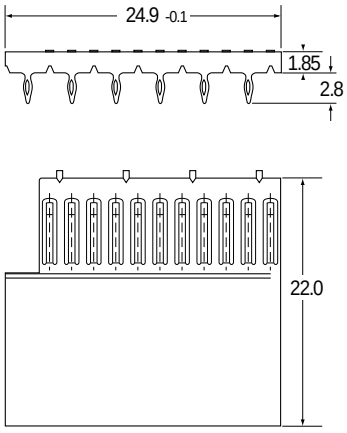
	Part Number
 **Type F With Shield With Peg** 11 positions	**104417**
 **Type F With Shield Without Peg** 11 positions	**933070**
 **Type F Lower Shield**	**103851**

Shield Dimensional Drawings

Upper Shield



Lower Shield



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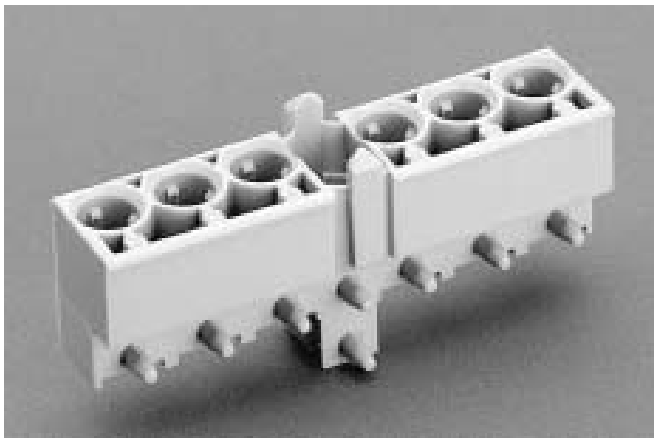
ERmet® 2mm Hard Metric Connectors

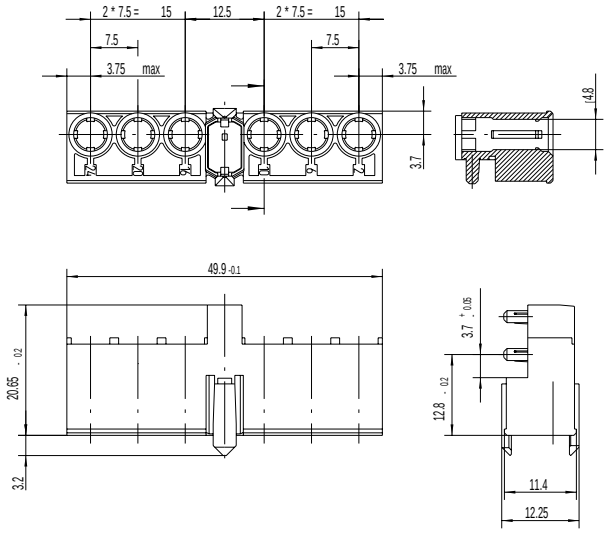
Right Angle Female Connectors Type L For Daughter Cards



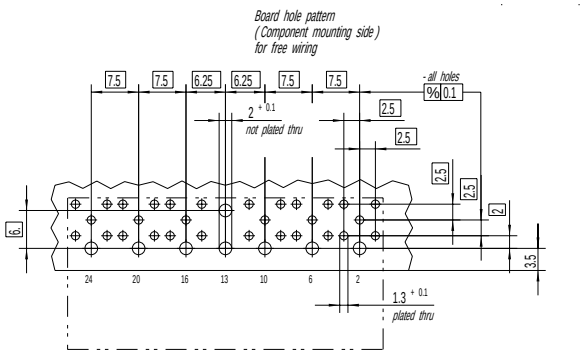
The ERmet type L female is an insulator that provides up to 6 contact positions for special power or coax contacts in a fully loaded configuration.

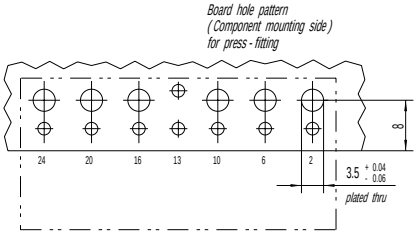
The ERmet type L female connector has a multifunction cavity that incorporates pre-alignment guides and accepts optional coding keys. This connector is designed to be used alone or in conjunction with either a type B, C, M or N ERmet connector. The type L female is also available with a locating and strain relief peg that helps secure the connector to the printed circuit board (PCB).

Dimensional Drawings



PC Board Layout





Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

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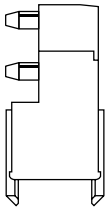
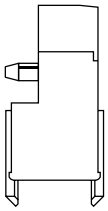
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type L For Daughter Cards

Ordering Information

	Part Number
 **Type L With Peg**	**044579**

	Part Number
 **Type L Without Peg**	**923364**

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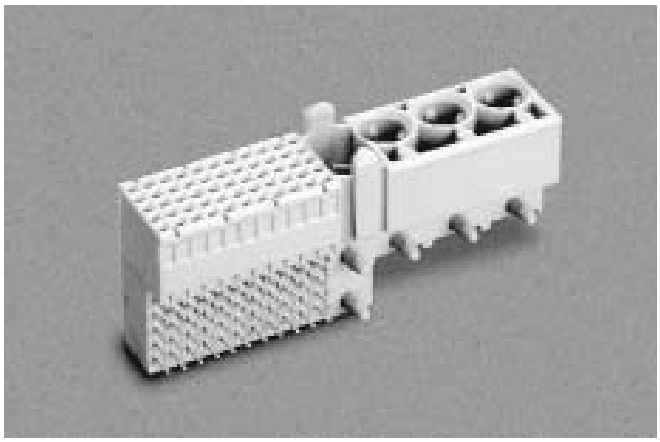
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type M For Daughter Cards

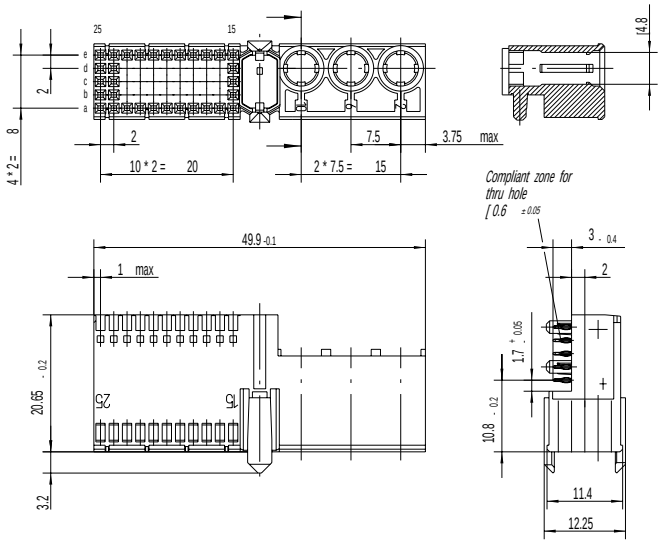


The ERmet type M female connector provides 55 contacts in a 5 row x 11 position (3 positions used by multifunction cavity), and also 3 contact positions for special power or coax contacts in a fully loaded configuration.

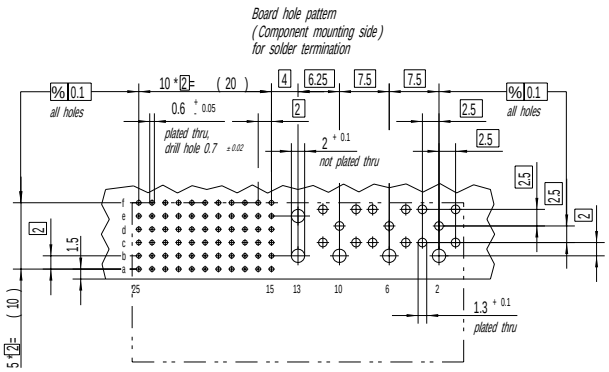
The connector is designed for gas tight, pressfit installation and is provided in two different configurations: with and without integrated upper ground return shields. Lower ground return shields are also available separately.

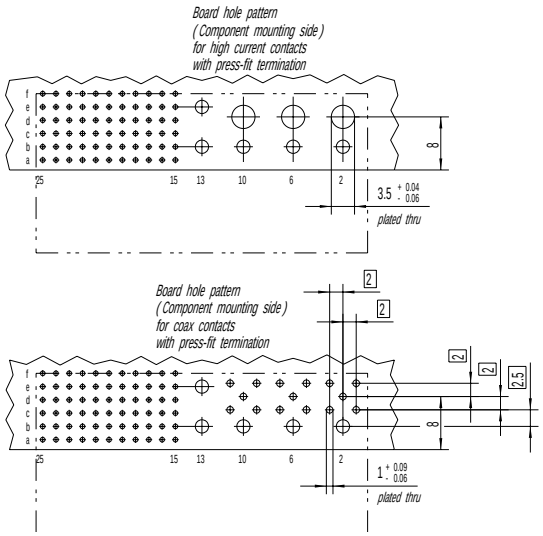
The ERmet type M female connector has a multifunction cavity that incorporates pre-alignment guides and accepts optional coding keys. This connector can be used alone or in conjunction with either a type A, B, C, L, or N ERmet connector.
The type M female is also available with a center pair of locating and strain relief pegs that help secure the connector to the printed circuit board (PCB).

Dimensional Drawings



PC Board Layout





Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

For daughter card layout suggestions, see pages 122, 124, 126, 128 and 130.

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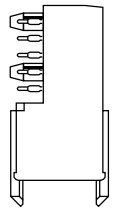
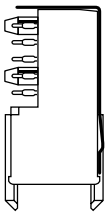
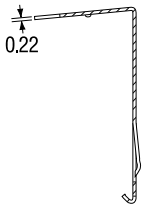
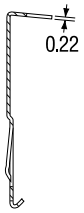
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type M For Daughter Cards

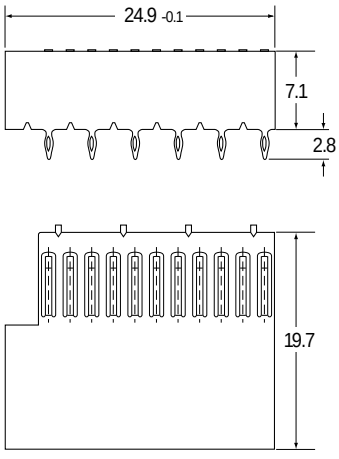
Ordering Information

	Part Number
 **Type M Without Shield With Peg**	**053792**
 **Type M With Shield With Peg**	**103804**

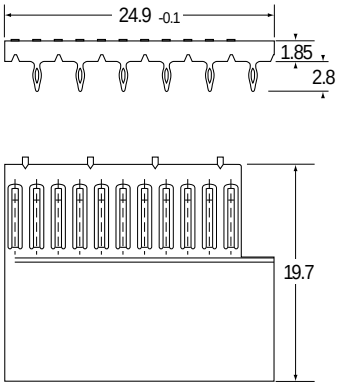
	Part Number
 **Type M Upper Shield**	**054353**
 **Type M Lower Shield**	**054354**

Shield Dimensional Drawings

Upper Shield



Lower Shield



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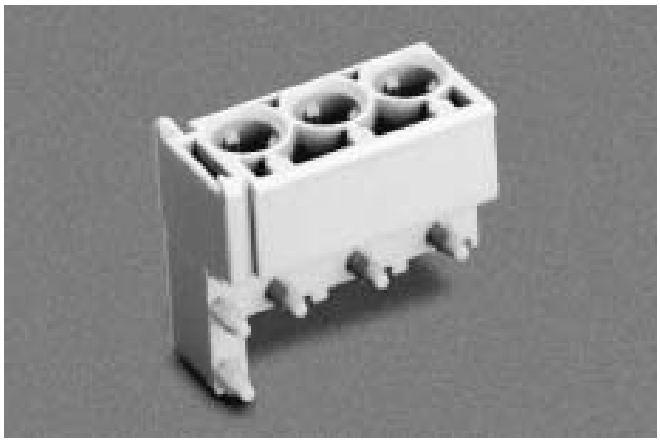
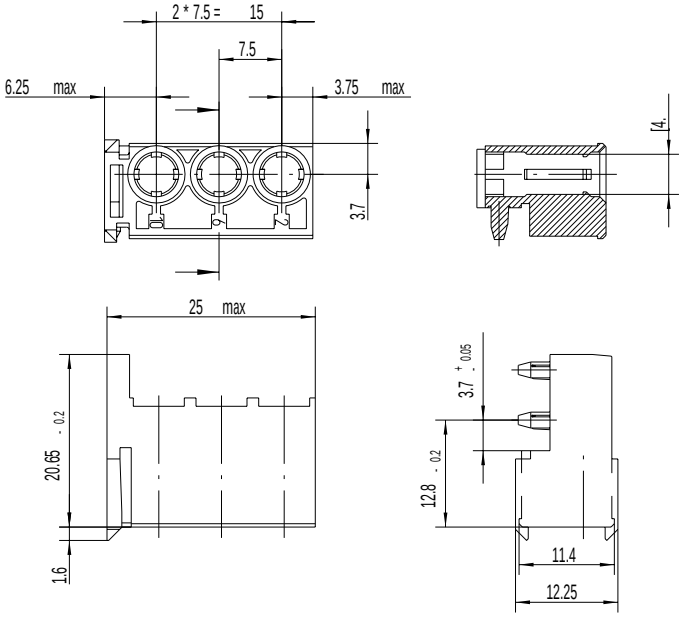
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type N For Daughter Cards

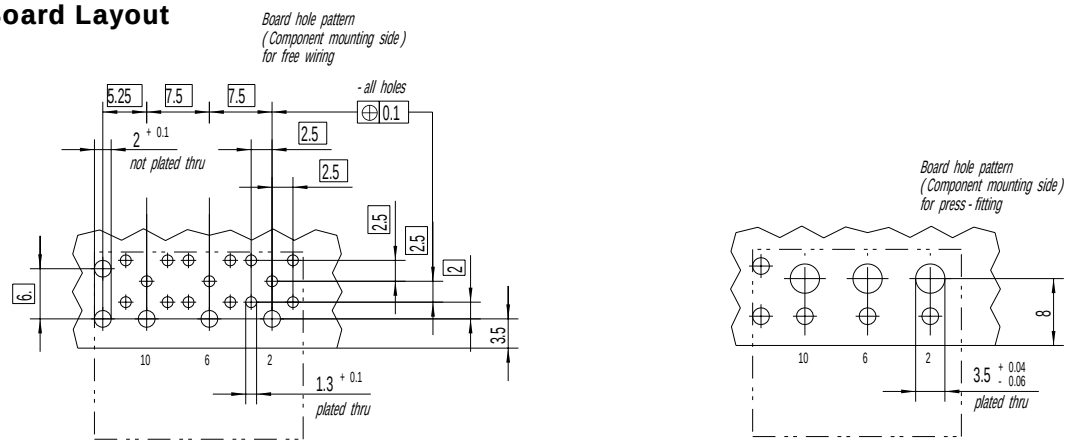


The ERmet female connector type N is a connector housing with contact positions for special power or coax contacts. The type N female is available with a locating and strain relief peg that helps secure the connector to the printed circuit board (PCB).

Dimensional Drawings



PC Board Layout



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.
For daughter card layout suggestions, see pages 122, 124, 126, 128 and 130.

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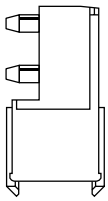
ERmet® 2mm Hard Metric Connectors

Right Angle Female Connectors Type N For Daughter Cards

Ordering Information

		Part Number
	**Type N With Peg**	**044581**

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ERmet® 2mm Hard Metric Connectors

Coaxial And Power Contacts

The 2mm ERmet Type L, M, and N modules are designed to accommodate a variety of coaxial and high power contacts which are also used in other connector systems including the popular Type M DIN 41612 connectors. Both the high power and coax contacts are inserted into the empty “power ports” provided in the Type L, M, and N connector and are ordered separately as they are typically crimped or soldered onto the cable before insertion into the connector housings.

When using the coax contacts in 2mm IEC 61076-4-101 applications, the female contacts are used in the backplane connectors. The contact interface for these connectors is in accordance with DIN 41626, part 2. The male contacts are usually right angle and are installed in the daughter card connectors. It is not uncommon to use a straight cable contact when signal cable needs to be routed directly to a device on the daughter board.

ERNI offers coaxial contacts in 50 and 75 ohm in both right angle and straight configurations. They can be crimped or soldered to cable or even directly soldered to the PC board.

In 2mm applications that require additional power, the male contacts are installed in the backplane connectors. The contact interface for these connectors is in accordance with DIN 41626, part 1. The female contacts are installed in the daughter card connector module and are typically right angle versions. As with the coaxial contacts, it is also common to use a straight female cable contact when the cable is used to route power directly to a device on the daughter card.

ERNI offers power contacts in 10, 20, 30 and 40 amps that will accommodate a variety of wire sizes. They can be soldered directly to the PC board or soldered or crimped to a cable. They are available in both right angle and straight. Special power versions are also available to pressfit into the board. ERNI even offers the popular EMLB (early mate, late break) versions to be used in the male backplane connectors.

Both the coax and high power contacts are simply snapped into the 2mm connector housings. No special tooling is required for insertion with the exception of the pressfit power contact. (A pressfit tool is required to press the entire assembly with the power contact into the board.) An extraction tool is available if it would become necessary to remove any one of the special contacts.

Please see the following tables for ERNI’s complete coax and power contact offering for Type L, M and N 2 mm ERmet modules. See page 86 for a listing of backplane contacts.

Coax Contacts for Daughter Cards

ERNI P/N	Rating	Class	Description	Cables
913549	50 ohm	2	R/A for .125" panel	RG179B/U, RG187A/U
053400	50 ohm	1	Straight, Double Braid	RG316D/B
013686	50 ohm	1	Inner Conductor Solder/Outer Conductor Crimped	RG178B/U, RG196A/U
053408	75 ohm	2	Inner Conductor Solder/Outer Conductor Crimped	RG179B/U, RG187A/U
594213	50 ohm	1	Inner Conductor Solder/Outer Conductor Crimped	RG174/U, RG196A/U, RG316/U
053299	50 ohm	1	Right Angle, 5 leg Solder To Board	PCB

Power Contacts for Daughter Cards

ERNI P/N	Rating	Class	Description	Cables
594172	10 amp	1	Solder	AWG 16-20
594178	10 amp	1	Crimp	AWG 16-20
594174	20 amp	1	Solder	AWG 12-16
594180	20 amp	1	Crimp	AWG 12-16
053456	30 amp	1	Solder	AWG 10-14
053452	30 amp	1	Crimp	AWG 10-14
594176	40 amp	1	Solder	AWG 8-12
594182	40 amp	1	Crimp	AWG 8-12
053298	40 amp	1	4 leg, Solder To Board	PCB
044965 *	40 amp	2	Press-Fit	PCB

* Requires special housing. Contact factory.

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ERmet Backplane Connectors

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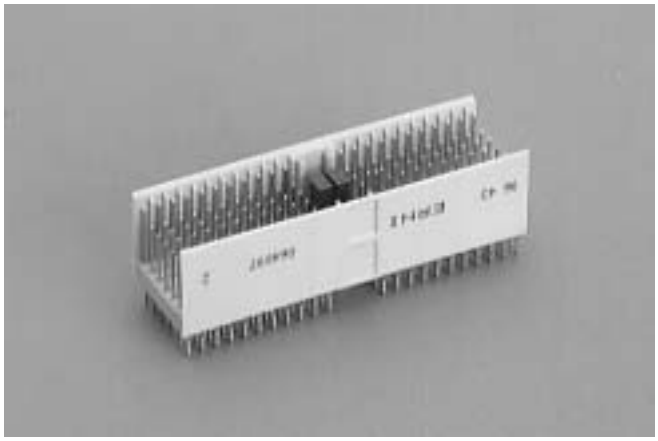
ERmet® 2mm Hard Metric Connectors

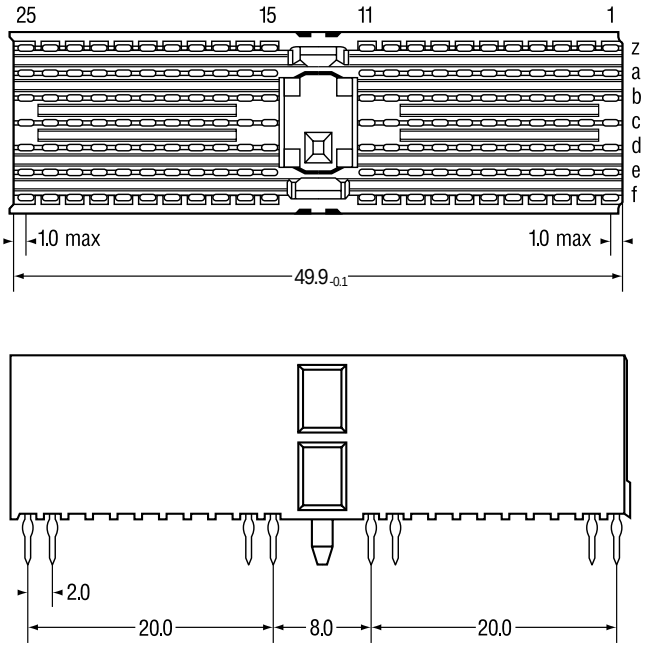
Vertical Male Connectors Type A For Backplanes



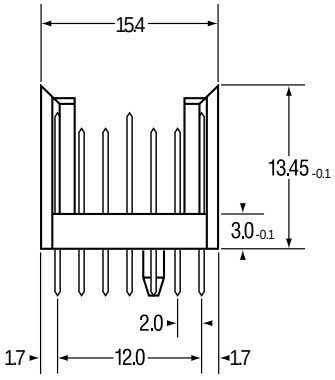
The ERmet type A vertical male connector provides 110 signal contacts and 44 ground shield contacts in 5+2 row x 25 position (3 positions used by multifunction cavity), fully loaded configuration. This connector is used in the P1 and P4 positions of a CompactPCI® backplane. With 15 different standard pin lengths to choose from, this is one of the most versatile connectors available. The connector is designed for gas tight pressfit installation.

The ERmet type A male connector has a multifunction cavity that incorporates pre-alignment guides and accepts optional coding keys. This connector is designed to be used alone or in conjunction with either type B, C, L, M or N ERmet connectors.

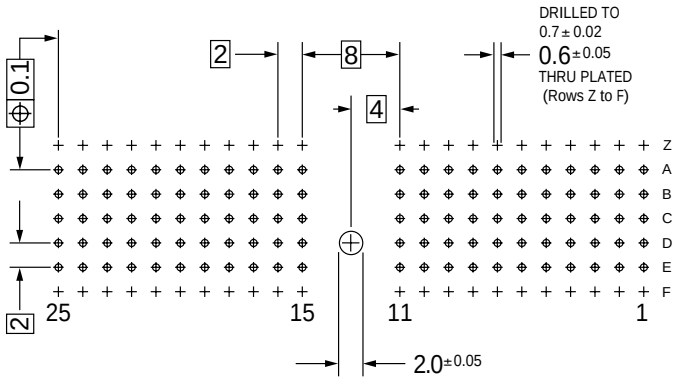
Dimensional Drawings



End View



Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

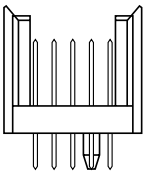
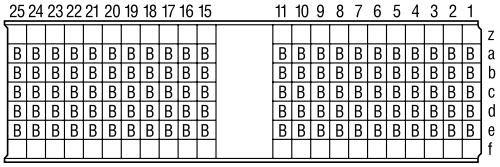
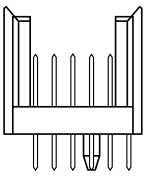
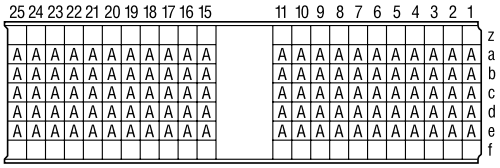
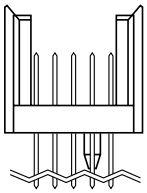
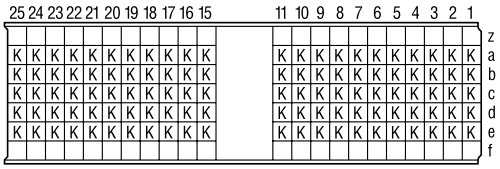
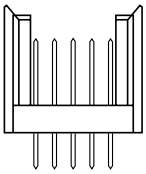
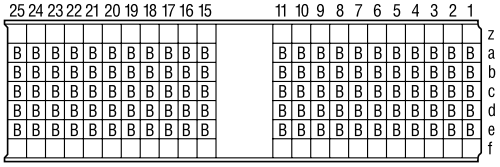
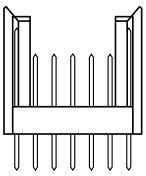
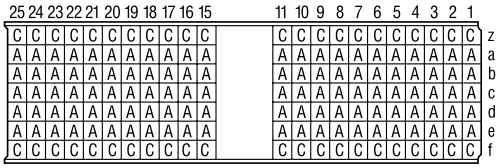
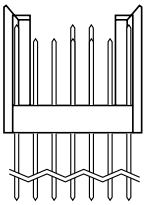
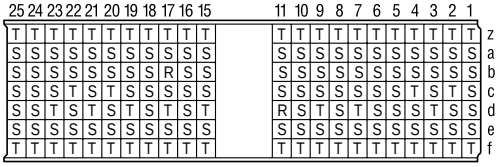
For backplane layout suggestions, see pages 123, 125, 127, 129 and 131.

Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type A For Backplanes

Ordering Information

			Part Number
	**Type A** **With Peg** 25 positions		**043136**
	**Type A** **With Peg** 25 positions		**043190**
	**Type A** **With Peg** **With Extended Terminals** 25 positions		**043477**
	**Type A** **Without Peg** 25 positions		**044148**
	**Type A** **With Peg** 25 positions		**053007**
	**Type A** **Without Peg** **With Extended Terminals** 25 positions		**923342**

For pin lengths see page 59.

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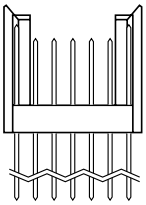
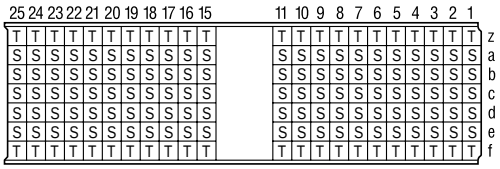
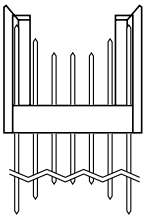
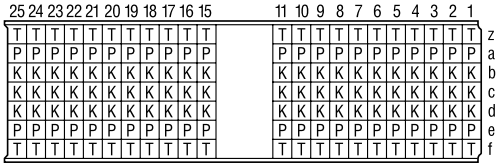
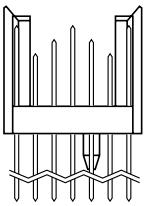
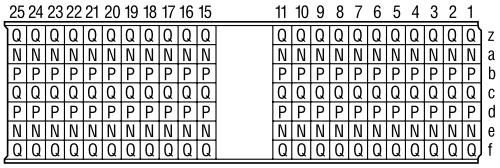
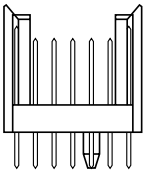
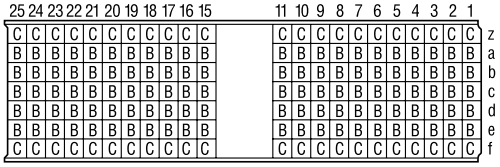
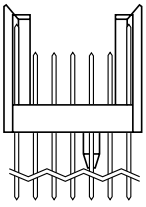
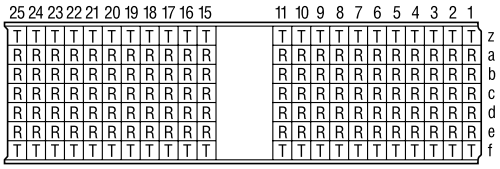
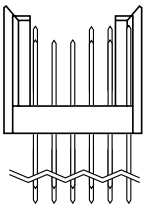
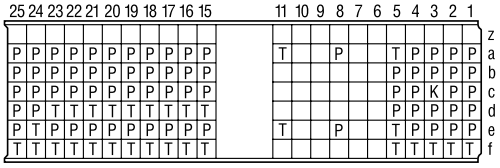
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type A For Backplanes

Ordering Information

			Part Number
	**Type A** **With Peg** **With Extended Terminals** 25 positions		**103975**
	**Type A** **Without Peg** **With Extended Terminals** 25 positions		**054034**
	**Type A** **With Peg** **With Extended Terminals** 25 positions		**054185**
	**Type A** **With Peg** 25 positions		**054528**
	**Type A** **With Peg** **With Extended Terminals** **P4** 25 positions		**064688**
	**Type A** **Without Peg** **With Extended Terminals** 25 positions		**923212**

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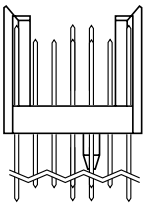
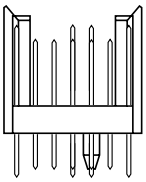
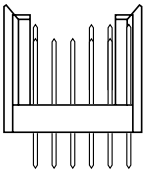
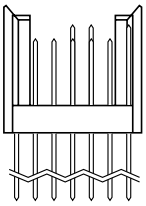
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type A For Backplanes

Ordering Information

		Part Number
	**Type A** **With Peg** **With Extended Terminals** **P1 Special** 25 positions	**923197**
	**Type A** **With Peg** **P1 Hot Swap** 25 positions	**923190**
	**Type A** **Without Peg** **P4 Telecom** 25 positions	**923160**
	**Type A** **Without Peg** 25 positions	**923347**

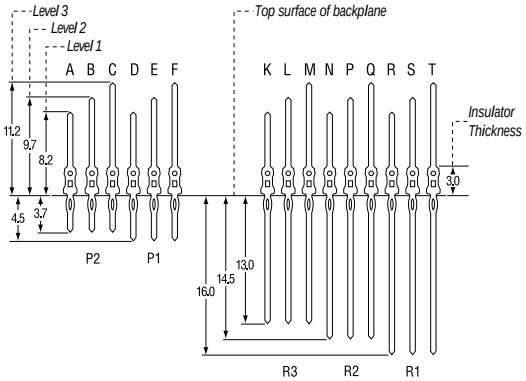
How To Order Special Contact Lengths

ERNI can accommodate any pattern of male connector contact loading. For shield rows Z and F, level 3 contacts should be specified.

For rear I/O and shrouds, choose contacts with the R1, R2 or R3 terminal lengths. Each contact has a unique letter designation.

Use this letter designation when filling in the contact loading requirements on the ERNI Customer Request Forms located on pages 152-154.

For additional explanations as to male connector contact loading, please refer to page 10.



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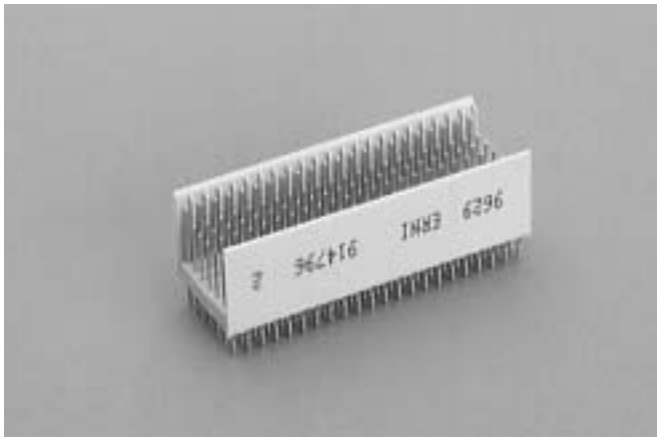
ERmet® 2mm Hard Metric Connectors

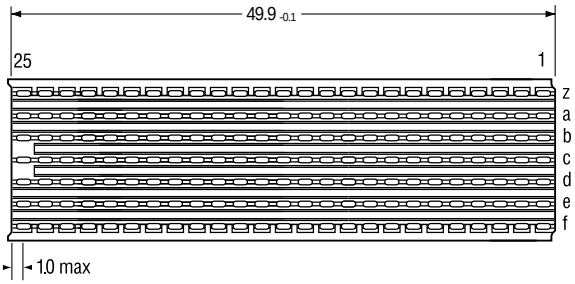
Vertical Male Connectors Type B For Backplanes

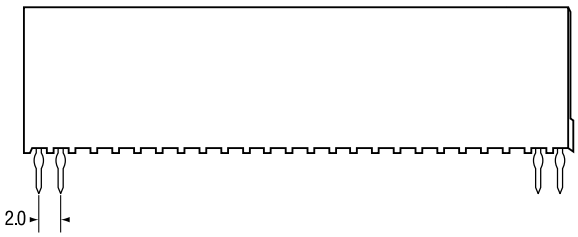


The ERmet CompactPCI type B vertical male connector provides 125 signal contacts and 50 ground shield contacts in a 5+2 row x 25, fully loaded configuration With 15 different standard pin lengths to choose from, this is one of the most versatile connectors available. The connector is designed for gas tight pressfit installation.

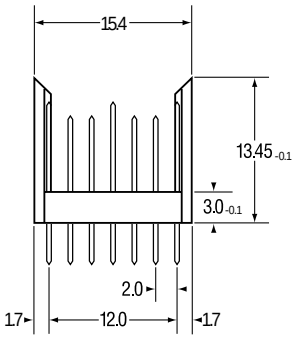
The ERmet type B vertical male connector has an uninterrupted pin field with no multifunction cavity. This connector is not designed to be used alone, but it is intended to be used in conjunction with either a type A, C, L, M or N ERmet connector.

Dimensional Drawings

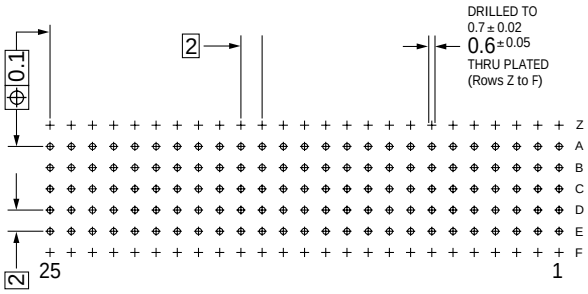




End View



Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

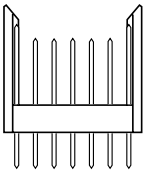
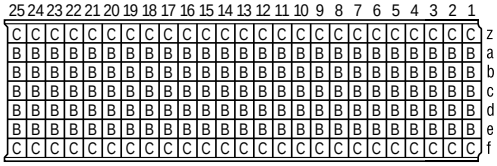
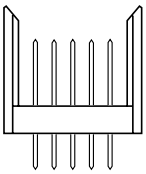
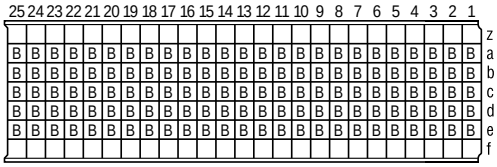
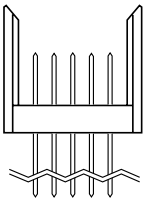
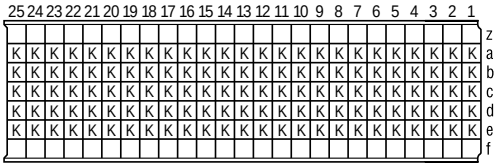
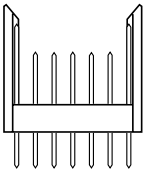
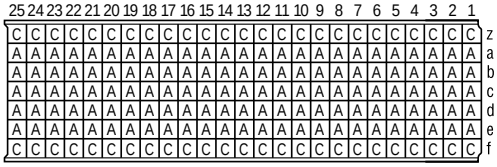
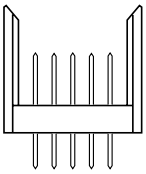
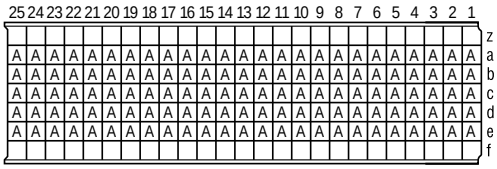
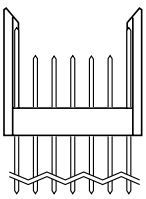
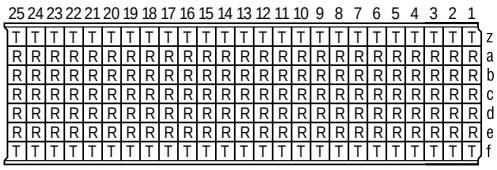
For backplane layout suggestions, see pages 123, 125, 127, 129 and 131.

Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type B For Backplanes

Ordering Information

			Part Number
	**Type B** 25 positions		**054392**
	**Type B** 25 positions		**043137**
	**Type B** **With Extended Terminals** 25 positions		**043476**
	**Type B** 25 positions		**053008**
	**Type B** 25 positions		**053088**
	**Type B** **With Extended Terminals** 25 positions		**064522**

For pin lengths see page 59.

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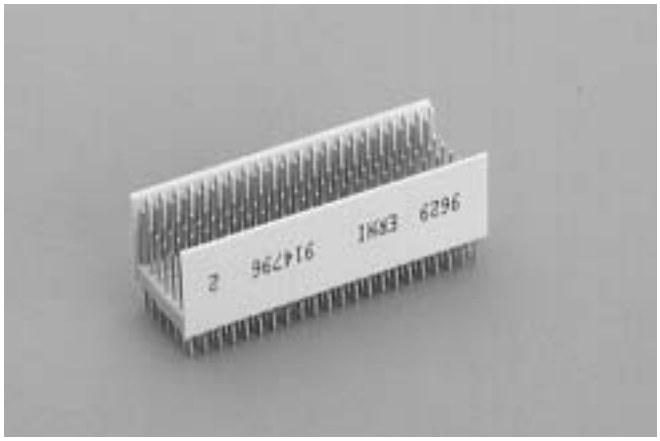
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type B For Backplanes

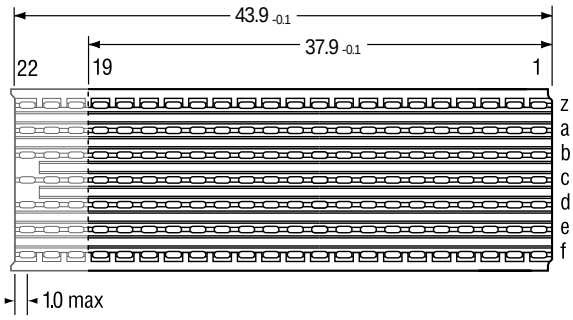
Other Lengths

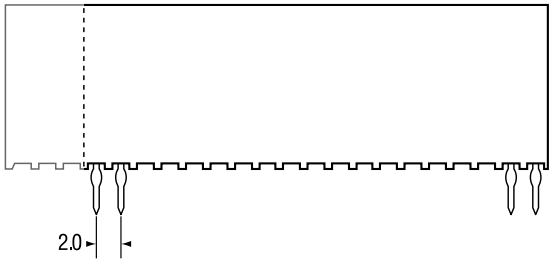


The ERmet CompactPCI® type B vertical male connector provides 110 signal contacts and 44 ground shield contacts in a 5+2 row x 22, fully loaded configuration; or 95 pins in a 5 row x 19 position configuration. The 19 position connector is used in the P3 location and the 22 position connector is used in the P2 and P5 locations of the CompactPCI® backplane. With 15 different standard pin lengths to choose from, this is one of the most versatile connectors available. The connector is designed for gas tight pressfit installation.

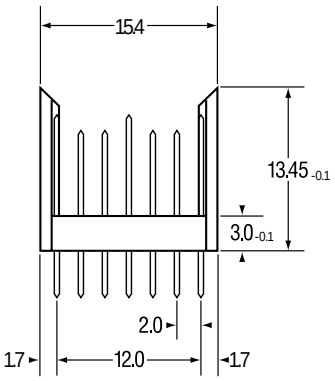
The ERmet CompactPCI® type B vertical male connector has an uninterrupted pin field with no multifunction cavity. This connector is not designed to be used alone, but it is intended to be used in conjunction with either a type A, C, L, M or N ERmet connector.

Dimensional Drawings

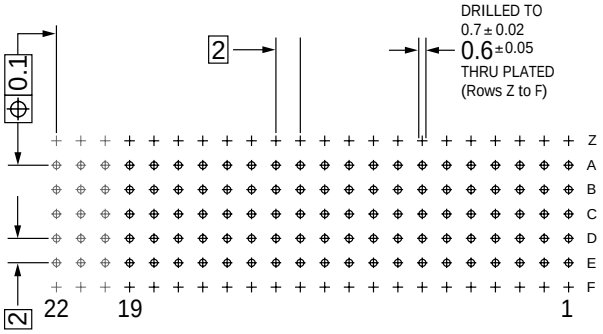




End View



Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

For backplane layout suggestions, see pages 123, 125, 127, 129 and 131.

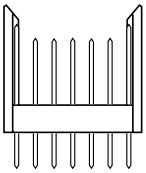
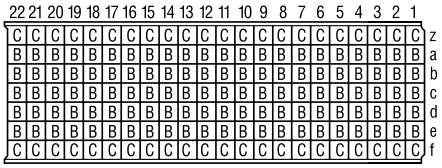
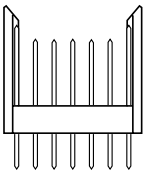
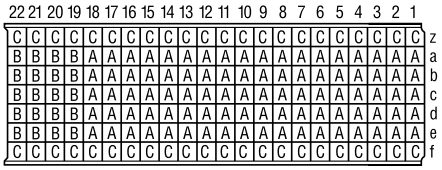
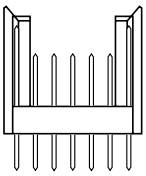
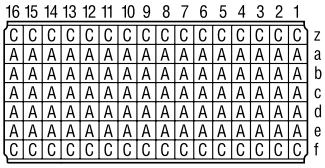
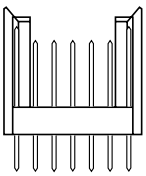
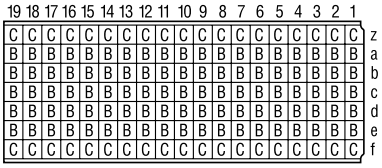
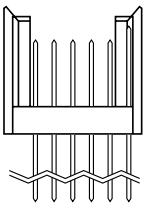
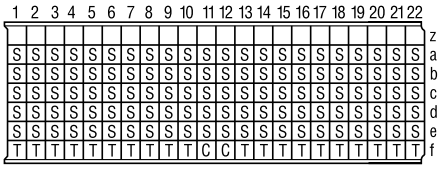
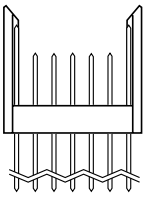
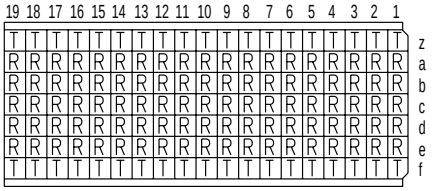
Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type B For Backplanes

Other Lengths

Ordering Information

			Part Number
	**Type B** **P2, P5** 22 positions		**914796**
	**Type B** **P5 Telecom** 22 positions		**923162**
	**Type B** 16 positions		**064766**
	**Type B** **P3** 19 positions		**103670**
	**Type B (AB Compatible)** **P2** **With Extended Terminals** 22 positions		**923345**
	**Type B** 19 positions		**914793**

For pin lengths see page 65.

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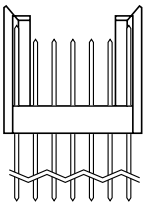
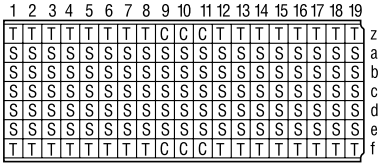
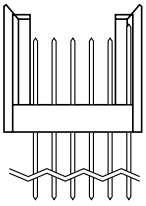
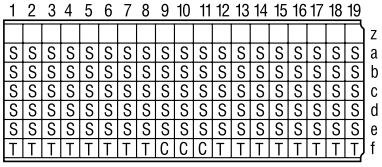
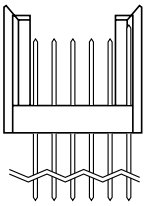
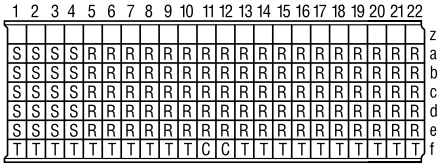
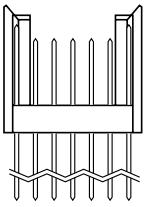
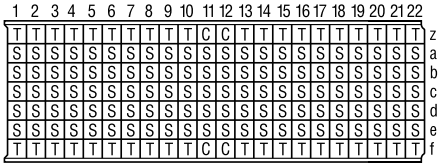
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type B For Backplanes

Ordering Information

			Part Number
	**Type B (AB Compatible)** **P3** **With Extended Terminals** 19 positions		**923341**
	**Type B (AB Compatible)** **P3** **With Extended Terminals** 19 positions		**923346**
	**Type B (AB Compatible)** **P5** **With Extended Terminals** 22 positions		**923339**
	**Type B (AB Compatible)** **P2** **With Extended Terminals** 22 positions		**923340**

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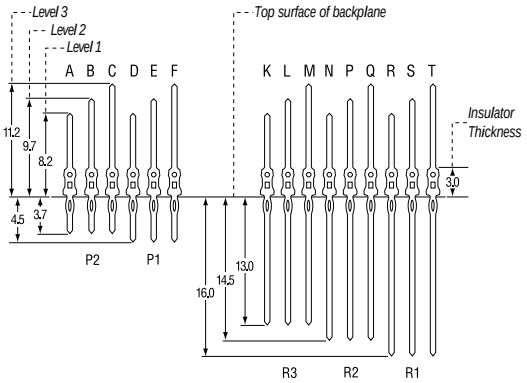
How To Order Special Contact Lengths

ERNI can accommodate any pattern of male connector contact loading. For shield rows Z and F, level 3 contacts should be specified.

For rear I/O and shrouds, choose contacts with the R1, R2 or R3 terminal lengths. Each contact has a unique letter designation.

Use this letter designation when filling in the contact loading requirements on the ERNI Customer Request Forms located on pages 152-154.

For additional explanations as to male connector contact loading, please refer to page 10.



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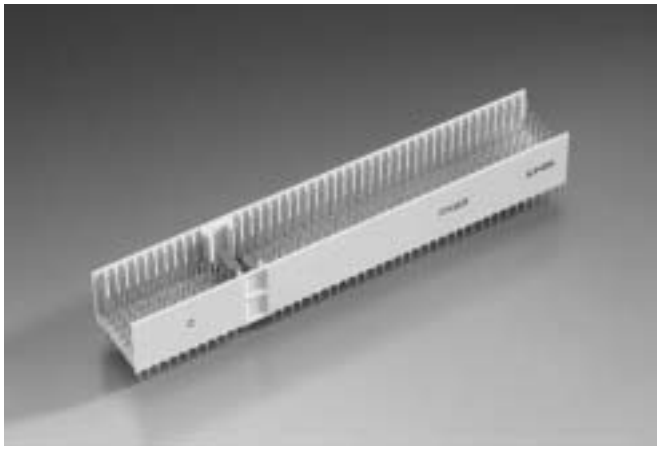
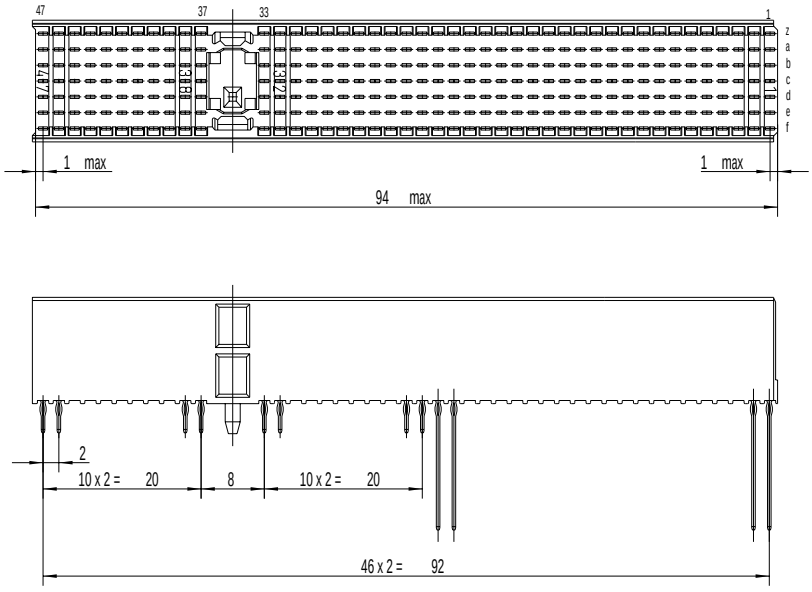
ERmet® 2mm Hard Metric Connectors

Vertical Male Monoblock Connectors for Compact PCI®

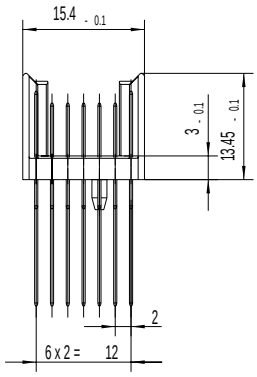


The ERmet™ vertical male monoblock connector integrates the type A and the type B in one single piece. The monoblock provides a maximum of 308 contacts in 7 rows by 44 positions. The two outer rows, z and f are for the shielding contacts of the female connector. The monoblock has integrated pre-centering and as an option it also has integrated coding according to PICMG Spec. for 3.3V or 5.0V, which requires 3 positions. The monoblock has been designed especially for CompactPCI applications. Available are versions with standard pin length for the positions P1 and P2 and versions with extended terminals for rear I/O for the positions P4 and P5. The monoblock has a length of 94mm (3U) and can also be used for other applications in 19" rack systems.

Dimensional Drawings



End Views

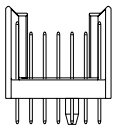
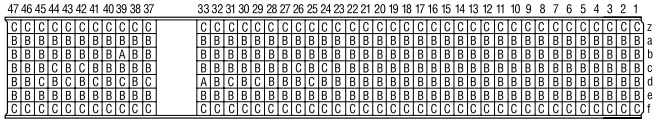
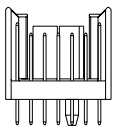
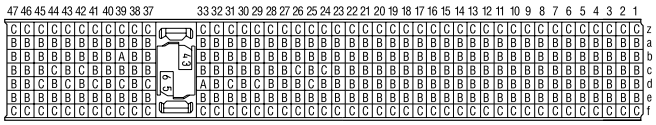
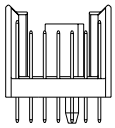
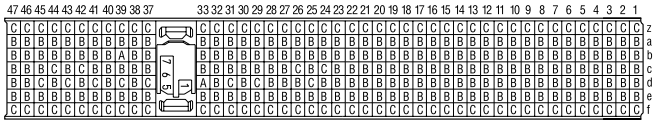
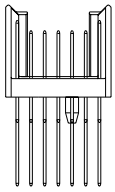
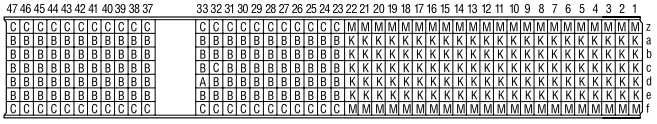
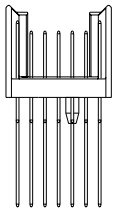
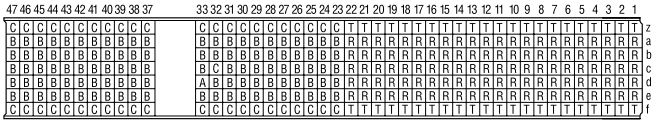


PC Board Layout (top view)

Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

Vertical Male Monoblock Connectors for Compact PCI®

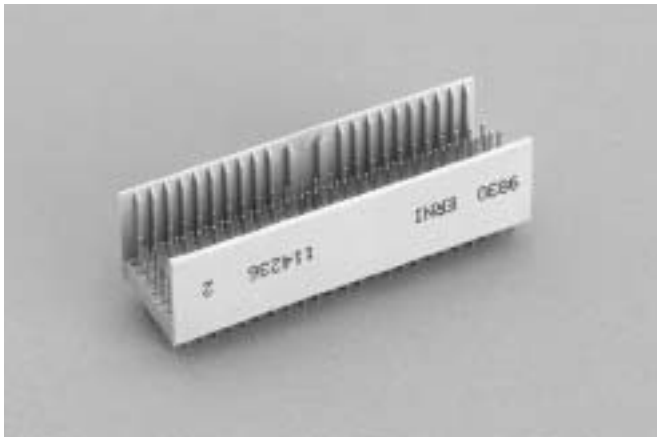
		Part Number
	**Monoblock for CompactPCI Without Integrated Coding Key** 47 positions 	**104735**
	**Monoblock for CompactPCI With 3.3V Coding Key Cadmium Yellow** 47 positions 	**104736**
	**Monoblock for CompactPCI With 5V Coding Key Brilliant Blue** 47 positions 	**104737**
	**Monoblock for CompactPCI Without Integrated Coding Key With Extended Terminals** 47 positions 	**104765**
	**Monoblock for CompactPCI Without Integrated Coding Key With Extended Terminals** 47 positions 	**104766**

For pin lengths see page 69.

Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

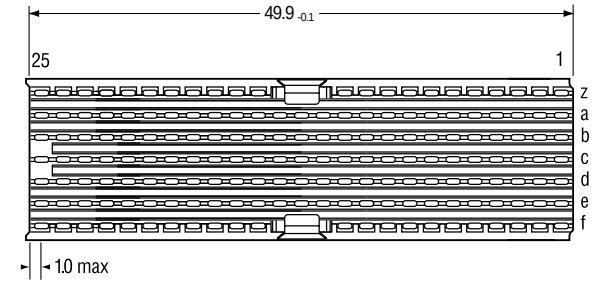
Vertical Male Connectors Type AB For Backplanes

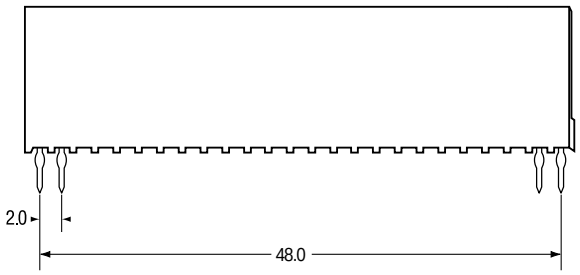


The ERmet type AB vertical male connector provides 125 signal contacts and 44 ground shield contacts in 5+2 row x 25 position, fully loaded configuration. This connector is used in the P1 and P4 positions of a CompactPCI® backplane. With 15 different standard pin lengths to choose from, this is one of the most versatile connectors available. The connector is designed for gas tight pressfit installation.

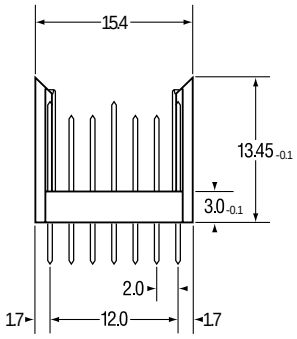
The ERmet type AB male connector has an uninterrupted pin field with pre-alignment guides, but does not accept coding keys. This connector can be used alone, or it can be used with either type A, C, L, M or N ERmet connectors.

Dimensional Drawings

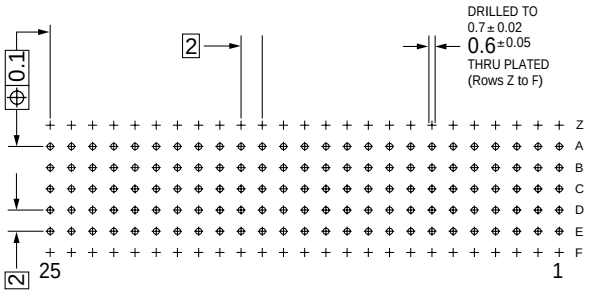




End View



Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

For backplane layout suggestions, see pages 123, 125, 127, 129 and 131.

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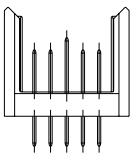
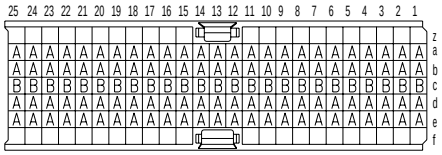
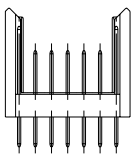
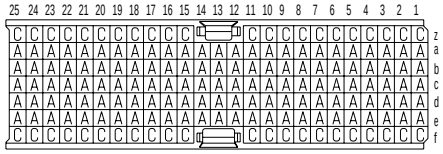
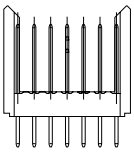
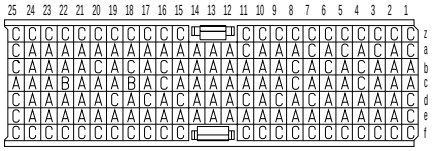
ERmet® 2mm Hard Metric Connectors

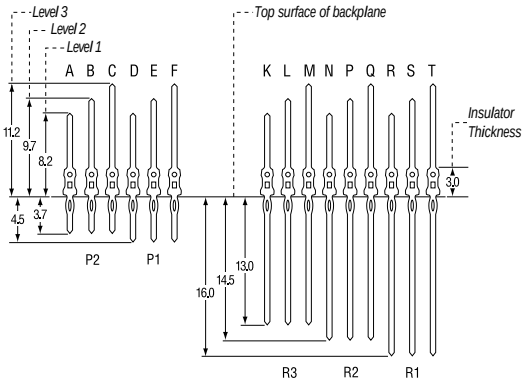
Vertical Male Connectors Type AB For Backplanes

Ordering Information

			Part Number
	**Type AB** 25 positions		**114236**
	**Type AB** 25 positions		**114153**
	**Type AB** 25 positions		**114539**

How To Order Special Contact Lengths

ERNI can accommodate any pattern of male connector contact loading. For shield rows Z and F, level 3 contacts should be specified.
For rear I/O and shrouds, choose contacts with the R1, R2 or R3 terminal lengths. Each contact has a unique letter designation.
Use this letter designation when filling in the contact loading requirements on the ERNI Customer Request Forms located on pages 152-154.
For additional explanations as to male connector contact loading, please refer to page 10.



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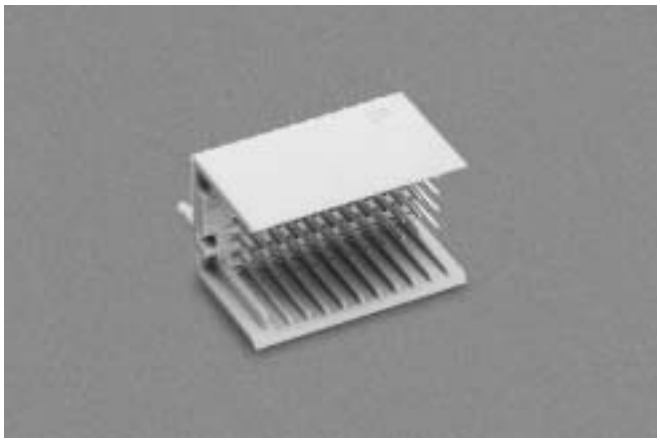
ERmet® 2mm Hard Metric Connectors

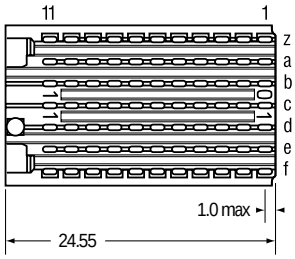
Vertical Male Connectors Type C For Backplanes

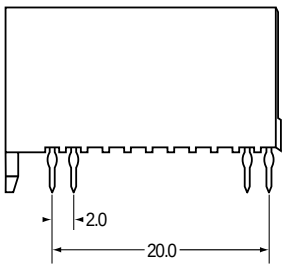


The ERmet type C vertical male connector provides 55 signal contacts and 22 ground shield contacts in 5+2 row x 11 position, fully loaded configuration. With 15 different standard pin lengths to choose from, this is one of the most versatile connectors available. The connector is designed for gas tight pressfit installation.

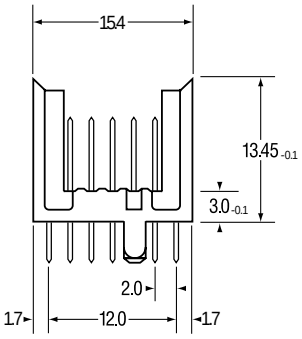
The ERmet type C vertical male connector incorporates prealignment guides but has no multi function cavity. This connector is designed to be used alone or in conjunction with either type B, L, M or N ERmet connectors, however it can only be installed at the lower end of a connector row. For detailed information on the modular stacking, see the information on type C positioning on page 15.

Dimensional Drawings

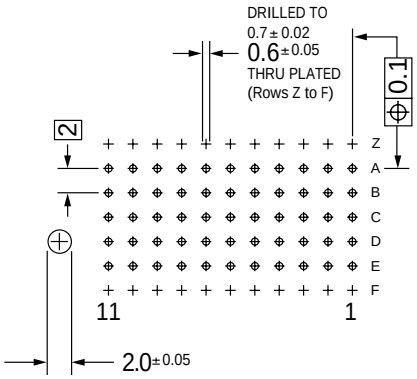




End View



Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

For backplane layout suggestions, see pages 123, 125, 127, 129 and 131.

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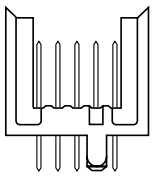
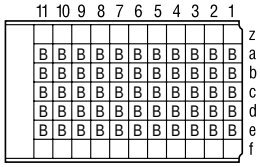
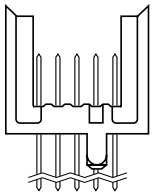
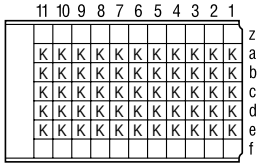
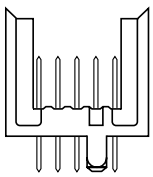
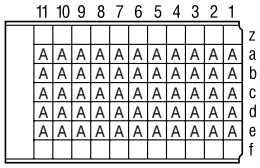
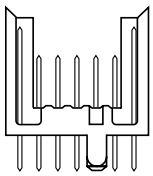
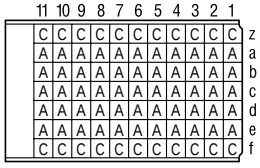
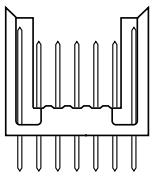
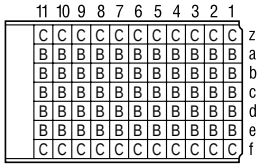
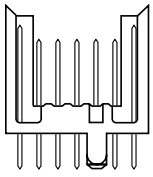
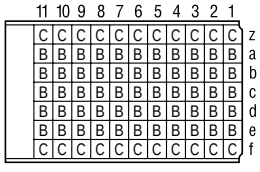
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type C For Backplanes

Ordering Information

			Part Number
	**Type C** **With Peg** 11 positions		**043138**
	**Type C** **With Peg** **With Extended Terminals** 11 positions		**054129**
	**Type C** **With Peg** 11 positions		**044147**
	**Type C** **With Peg** 11 positions		**053009**
	**Type C** **Without Peg** 11 positions		**054546**
	**Type C** **With Peg** 11 positions		**103749**

For pin lengths see page 73.

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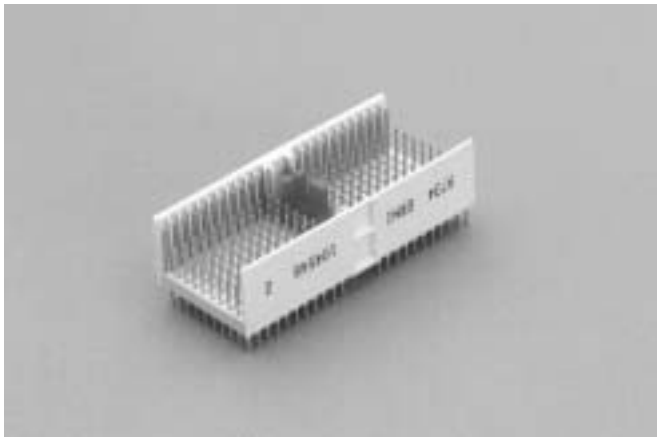
ERmet® 2mm Hard Metric Connectors

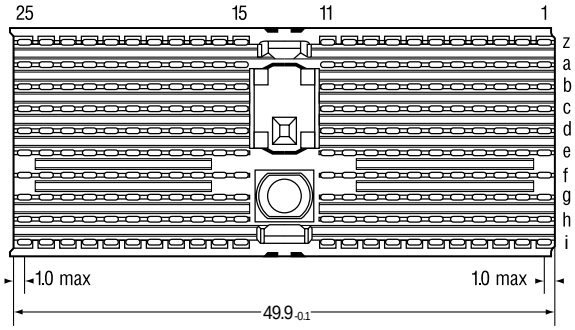
Vertical Male Connectors Type D For Backplanes

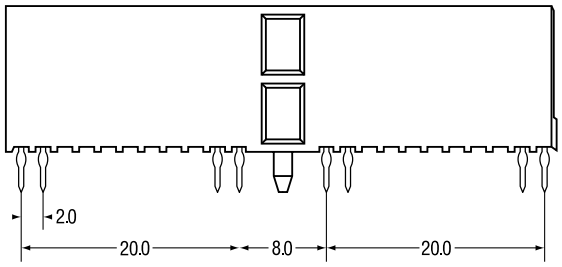


The ERmet type D vertical male connector provides up to 176 signal contacts and 44 ground shield contacts in 8+2 row x 25 position (3 positions used by multifunction cavity), fully loaded configuration. With 15 different standard pin lengths to choose from, this is one of the most versatile connectors available. The connector is designed for gas tight, pressfit installation.

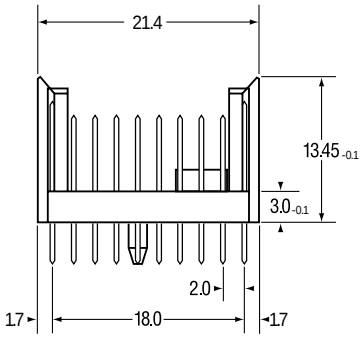
The ERmet type D male connector has a multifunction cavity that incorporates pre-alignment guides and accepts optional coding keys. This connector is designed to be used alone or in conjunction with either type E, DE or F ERmet 2mm HM connectors.

Dimensional Drawings

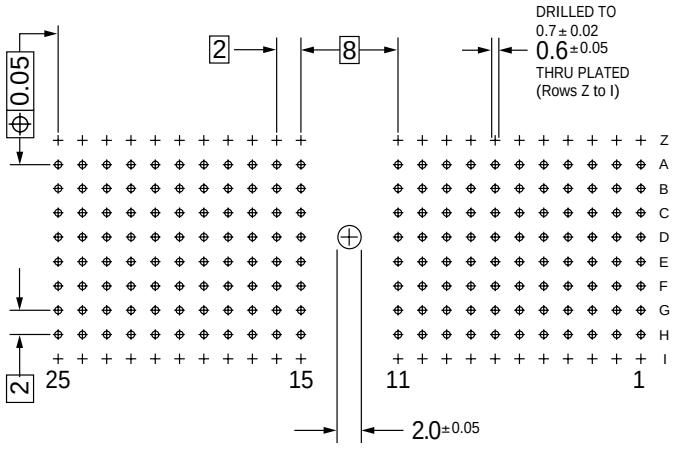




End View



Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

Refer to pages 116-118 for complete lists of application tooling.

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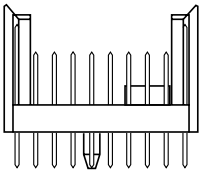
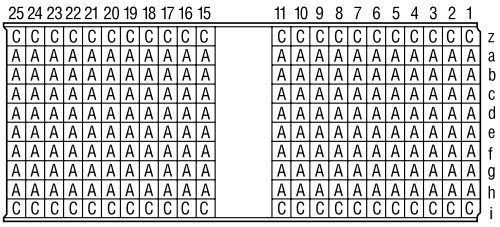
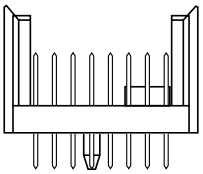
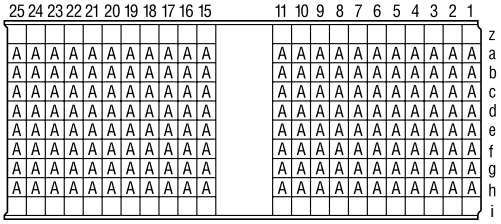
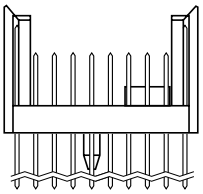
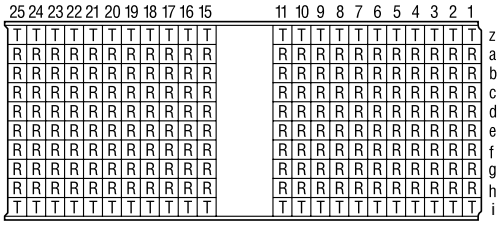
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type D For Backplanes

Ordering Information

Many other loading patterns are available.

		Part Number
	**Type D** **With Peg** 25 positions 	**104152**
	**Type D** **With Peg** 25 positions 	**104517**
	**Type D** **With Peg** **With Extended Terminals** 25 positions 	**933008**

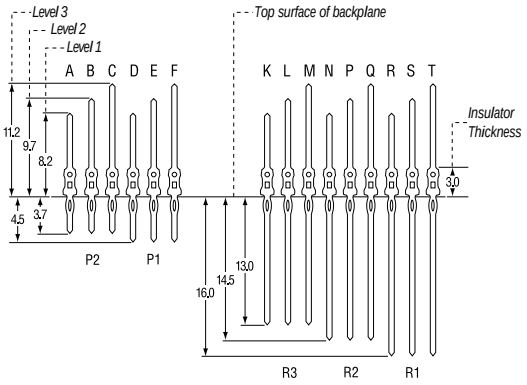
How To Order Special Contact Lengths

ERNI can accommodate any pattern of male connector contact loading. For shield rows Z and I, level 3 contacts should be specified.

For rear I/O and shrouds, choose contacts with the R1, R2 or R3 terminal lengths. Each contact has a unique letter designation.

Use this letter designation when filling in the contact loading requirements on the ERNI Customer Request Forms located on pages 156-158.

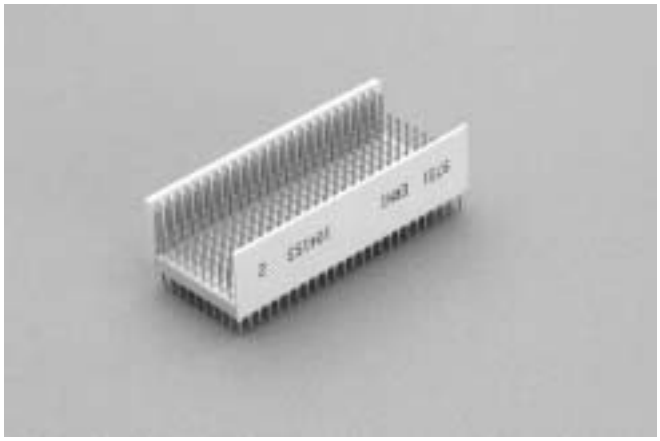
For additional explanations as to male connector contact loading, please refer to page 10.



Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

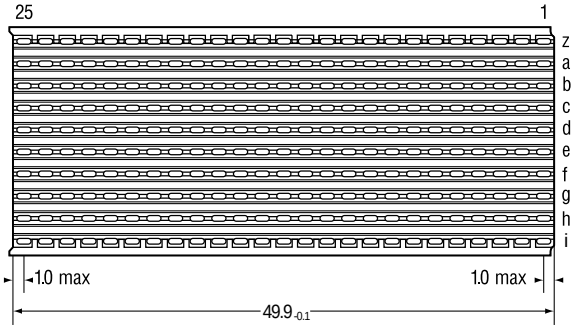
Vertical Male Connectors Type E For Backplanes

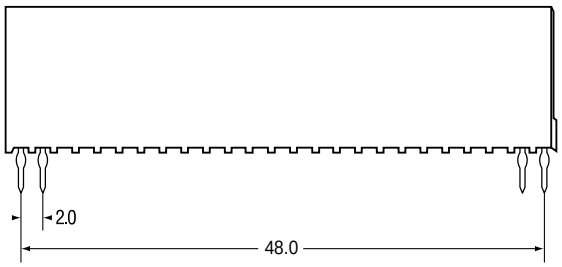


The ERmet type E vertical male connector provides 200 signal contacts and 50 ground shield contacts in an 8+2 row x 25 position fully loaded configuration. These connectors are also available in an 8+2 row x 22 positions and 8+2 row x 19 positions. With 15 different standard pin lengths to choose from, this is one of the most versatile connectors available. The connector is designed for gas tight pressfit installation.

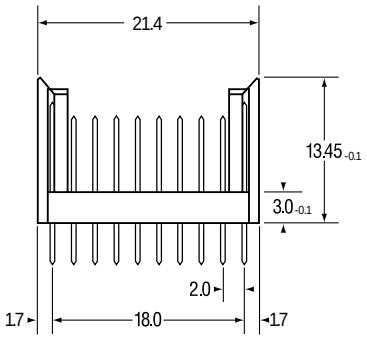
The ERmet type E vertical male connector has an uninterrupted pin field with no multifunction cavity. This connector is not designed to be used alone, but is intended to be used in conjunction with either type D, DE or F ERmet 2mm HM connectors.

Dimensional Drawings

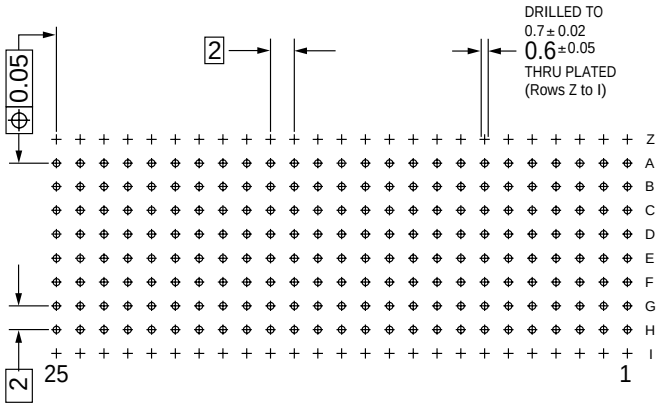




End View



Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

Refer to pages 116-118 for complete lists of application tooling.

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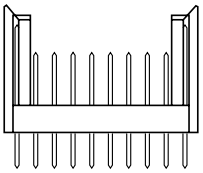
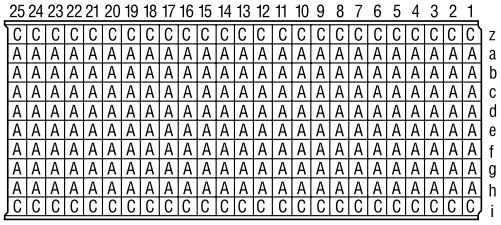
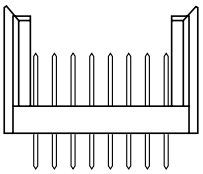
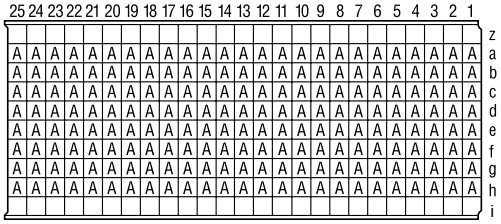
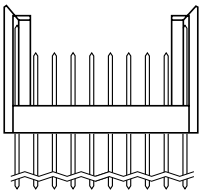
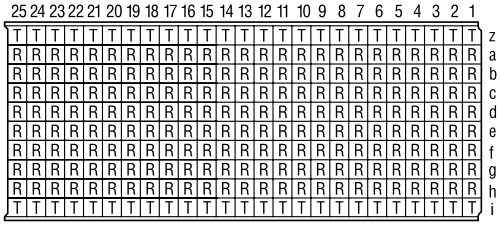
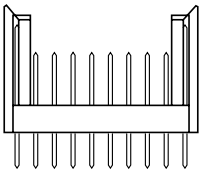
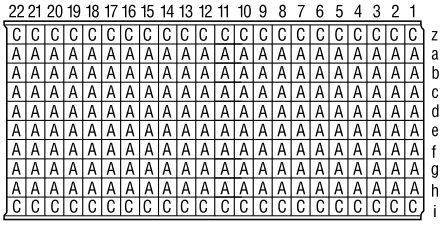
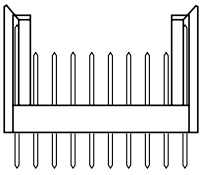
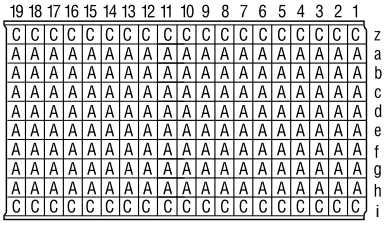
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type E For Backplanes

Ordering Information

			Part Number
	**Type E** 25 positions		**104153**
	**Type E** 25 positions		**104518**
	**Type E** **With Extended Terminals** 25 positions		**933007**
	**Type E** 22 positions		**933048**
	**Type E** 19 positions		**933049**

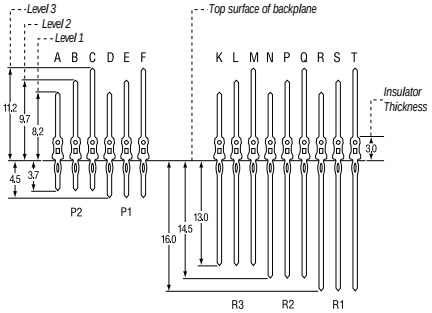
How To Order Special Contact Lengths

ERNI can accommodate any pattern of male connector contact loading. For shield rows Z and I, level 3 contacts should be specified.

For rear I/O and shrouds, choose contacts with the R1, R2 or R3 terminal lengths. Each contact has a unique letter designation.

Use this letter designation when filling in the contact loading requirements on the ERNI Customer Request Forms located on pages 152-154 .

For additional explanations as to male connector contact loading, please refer to page 10.



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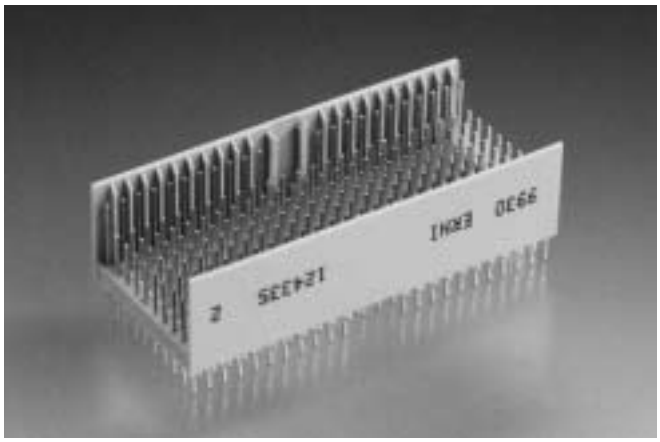
ERmet® 2mm Hard Metric Connectors

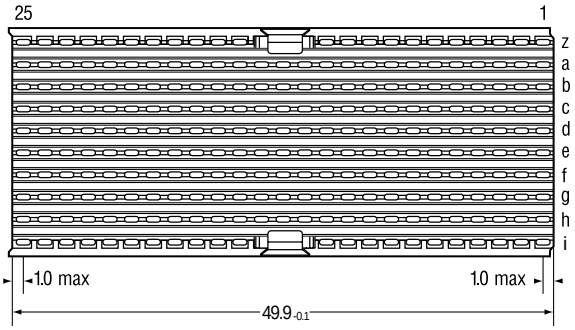
Vertical Male Connectors Type DE For Backplanes

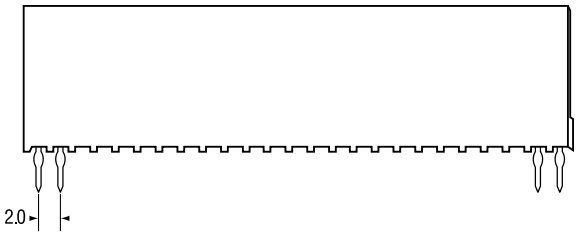


The ERmet type DE vertical male connector provides 200 signal contacts and 44 ground shield contacts in a 8+2 row x 25 position fully loaded configuration. With 15 different standard pin lengths to choose from, this is one of the most versatile connectors available. The connector is designed for gas tight pressfit installation.

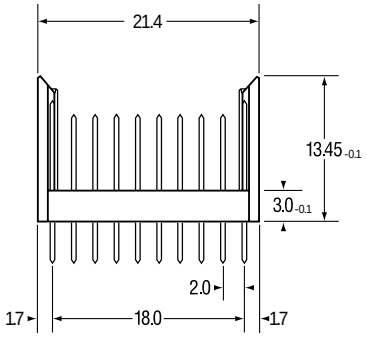
The ERmet type DE vertical male connector has an uninterrupted pin field with pre-alignment guides but does not accept coding keys. This connector can be used alone, or it can be used with either type D or F ERmet connectors.

Dimensional Drawings

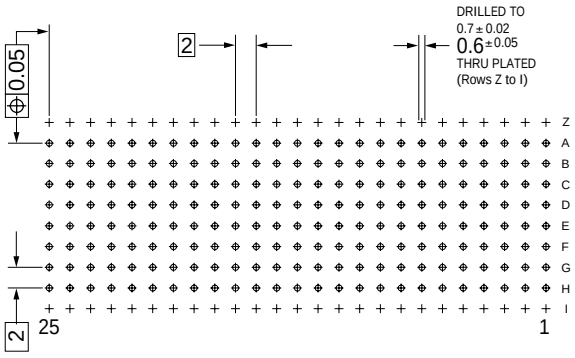




End View



Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

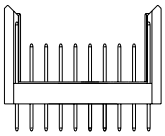
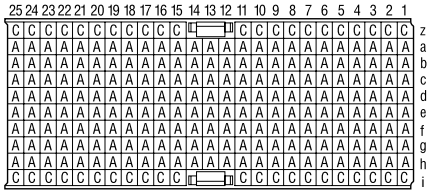
Refer to pages 116-118 for complete lists of application tooling.

Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type DE For Backplanes

Ordering Information

		Part Number
	**Type DE** 25 positions	 **114279**

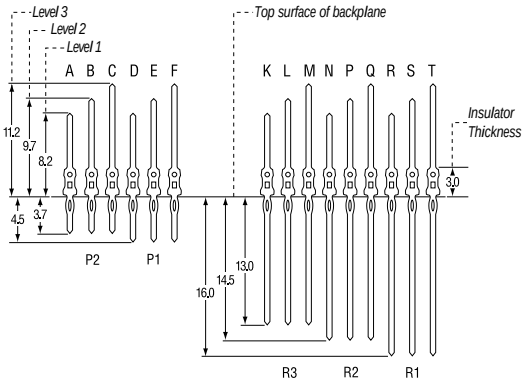
How To Order Special Contact Lengths

ERNI can accommodate any pattern of male connector contact loading. For shield rows Z and I, level 3 contacts should be specified.

For rear I/O and shrouds, choose contacts with the R1, R2 or R3 terminal lengths. Each contact has a unique letter designation.

Use this letter designation when filling in the contact loading requirements on the ERNI Customer Request Forms located on pages 152-154.

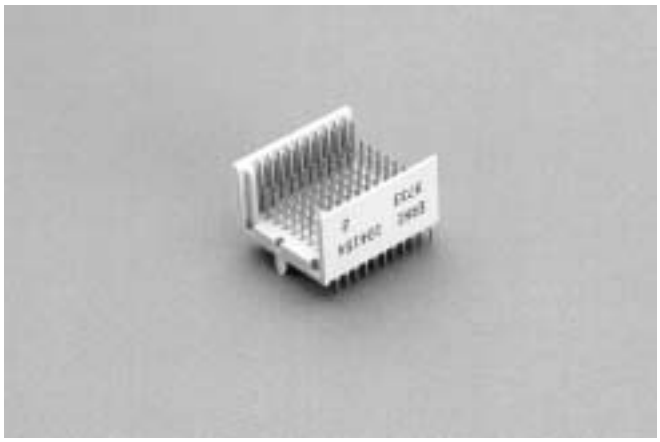
For additional explanations as to male connector contact loading, please refer to page 10.



Downloaded from Arrow.com.

ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type F For Backplanes

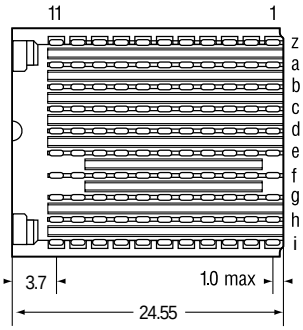


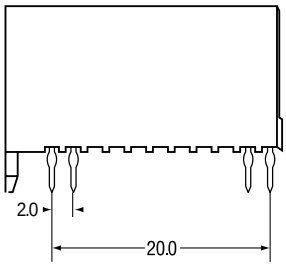
The ERmet type F vertical male connector provides 88 signal contacts and 22 ground shield contacts in a 8+2 row x 11, fully loaded configuration. With 15 different standard pin lengths to choose from, this is one of the most versatile connectors available. The connector is designed for gas tight pressfit installation.

The ERmet type F vertical male connector incorporates pre-alignment guides but has no multifunction cavity. This connector is designed to be used alone. The type F connector can also be used in conjunction with either a type D, E, or DE ERmet connector, however, it can only be installed at the lower end of a connector row.

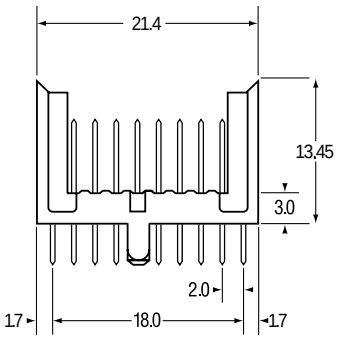
For detailed information on the modular stacking, see the information on type F positioning on page 15.

Dimensional Drawings

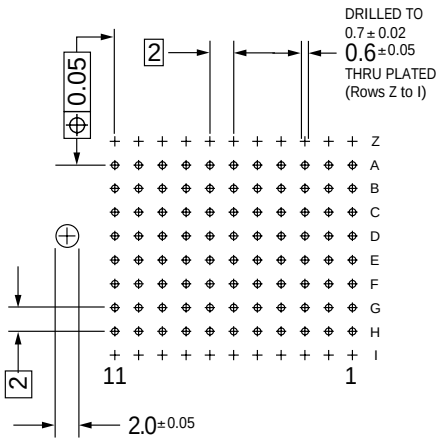




End View



Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

Refer to pages 116-118 for complete lists of application tooling.

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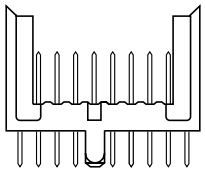
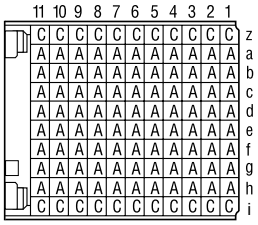
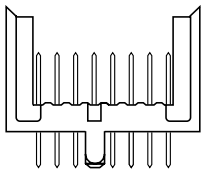
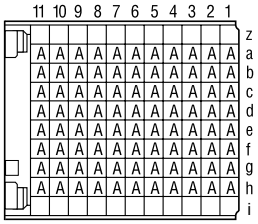
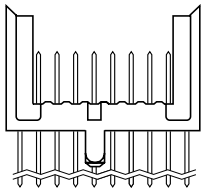
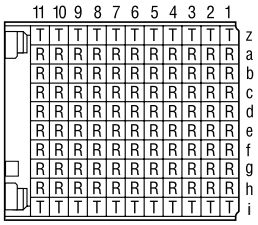
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type F For Backplanes

Ordering Information

			Part Number
	**Type F** **With Peg** 11 positions		**104154**
	**Type F** **With Peg** 11 positions		**104519**
	**Type F** **With Peg** **With Extended Terminals** 11 positions		**933006**

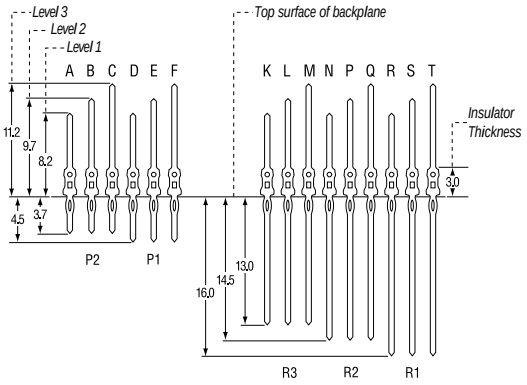
How To Order Special Contact Lengths

ERNI can accommodate any pattern of male connector contact loading. For shield rows Z and I, level 3 contacts should be specified.

For rear I/O and shrouds, choose contacts with the R1, R2 or R3 terminal lengths. Each contact has a unique letter designation.

Use this letter designation when filling in the contact loading requirements on the ERNI Customer Request Form, located on pages 152-154.

For additional explanations as to male connector contact loading, please refer to page 10.



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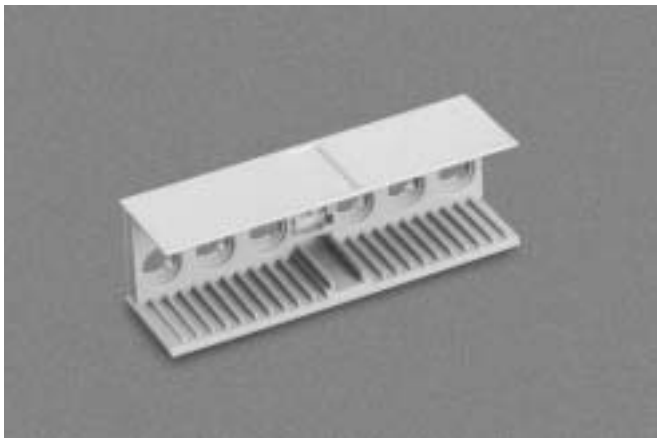
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type L For Backplanes



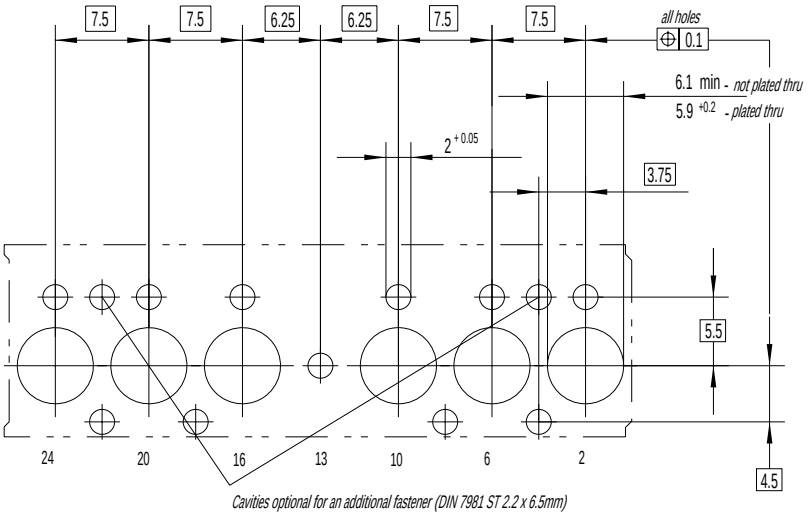
The ERmet type L male connector is an insulation body that could be loaded with up to 6 special power or coax contacts in a fully loaded configuration. The ERmet type L male connector has a multifunction cavity that incorporates pre-alignment guides and accepts optional coding keys. This connector is designed to be used alone or in conjunction with either a type B, C, M, or N ERmet connector.

The type L male is available with a locating peg that helps secure the connector to the printed circuit board (PCB).

Dimensional Drawings

End View

Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

For backplane layout suggestions, see pages 123, 125, 127, 129 and 131.

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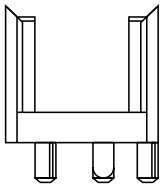
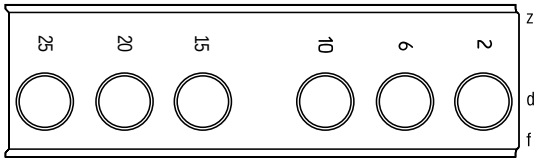
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type L For Backplanes

Ordering Information

			Part Number
	**Type L With Peg**		**104146**

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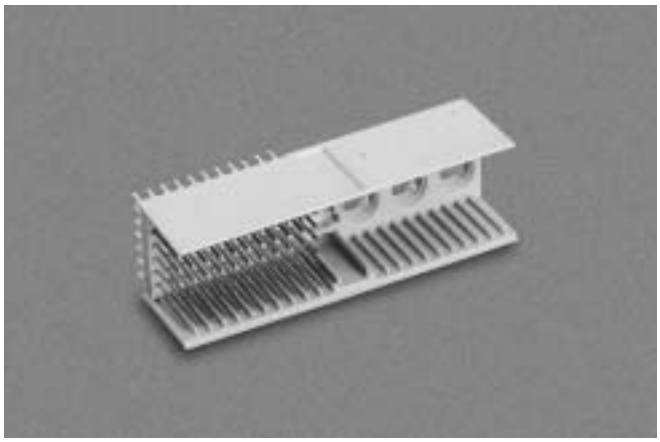
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type M For Backplanes



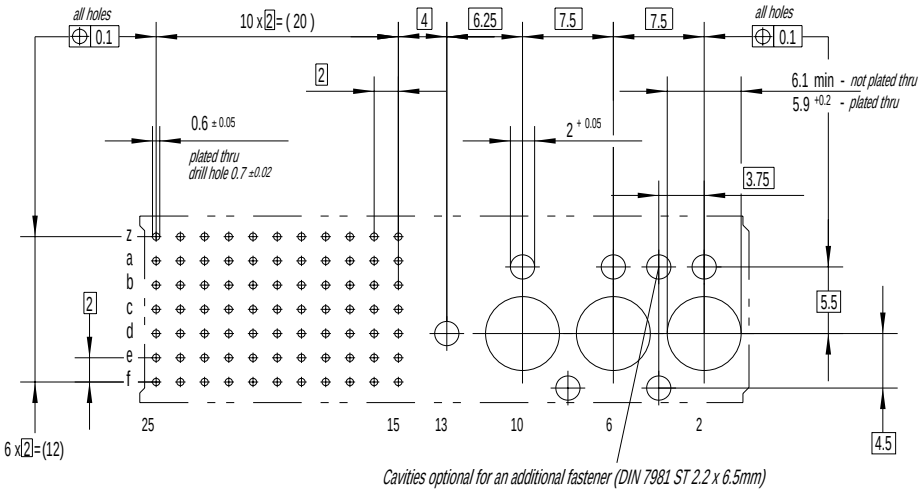
The ERmet male connector type M provides a maximum of 77 contacts in 7 rows by 11 positions. The two outer rows, z and f are for the shielding contacts of the male connector, along with 3 contact positions for special power or coax contacts. This type contains a multifunction cavity for coding and pre-alignment in the center position. This connector is designed to be used alone or in conjunction with either a type B, C, L, or N ERmet connector.

The type M male is available with a locating peg that helps secure the connector to the printed circuit board (PCB).

Dimensional Drawings

End View

Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

For backplane layout suggestions, see pages 123, 125, 127, 129 and 131.

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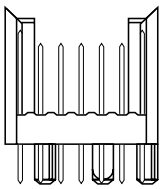
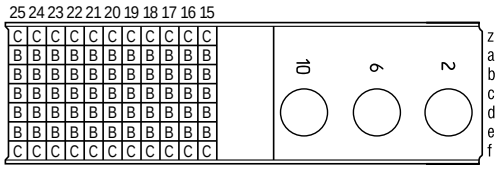
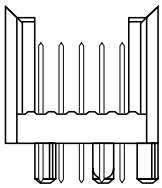
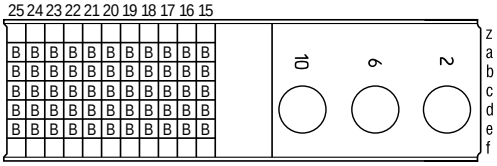
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type M For Backplanes

Ordering Information

			Part Number
	**Type M With Peg** 11 positions		**054087**
	**Type M With Peg** 11 positions		**064671**

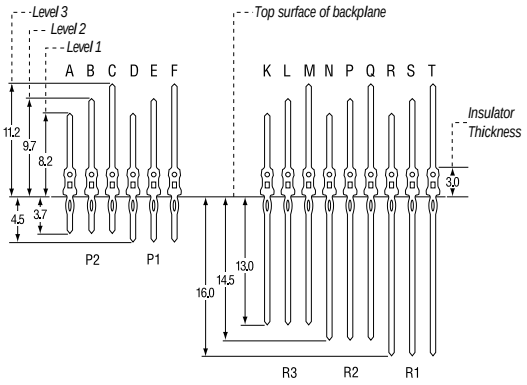
How To Order Special Contact Lengths

ERNI can accommodate any pattern of male connector contact loading. For shield rows Z and F, level 3 contacts should be specified.

For rear I/O and shrouds, choose contacts with the R1, R2 or R3 terminal lengths. Each contact has a unique letter designation.

Use this letter designation when filling in the contact loading requirements on the ERNI Customer Request Forms located on pages 152-154.

For additional explanations as to male connector contact loading, please refer to page 10.



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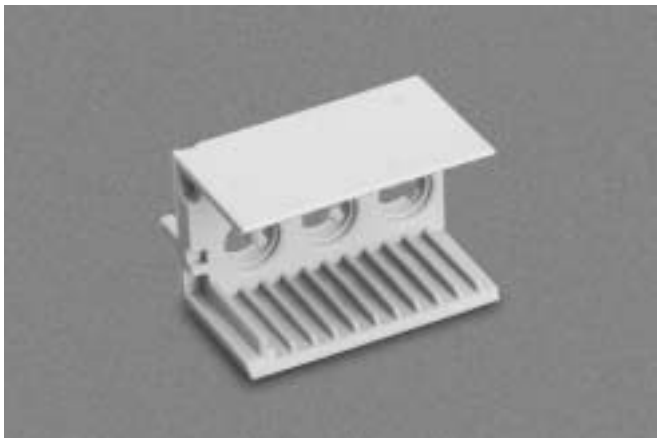
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type N For Backplanes

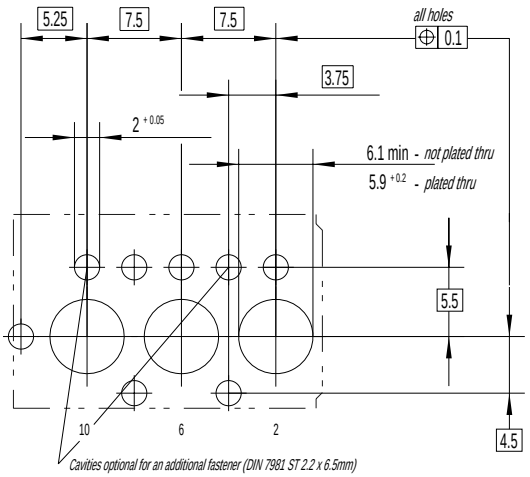


The ERmet type N male connector is a connector housing with 3 contact positions for special coax or high power contacts. The type N male is available with a locating and strain relief peg that helps secure the connector to the printed circuit board (PCB).

Dimensional Drawings

End View

Backplane Layout (viewed from connector side)



Dimensions shown are for reference purposes only.
All dimensions are in millimeters (mm) unless otherwise noted.

For backplane layout suggestions, see pages 123, 125, 127, 129 and 131.

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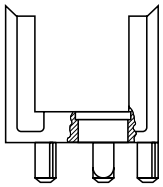
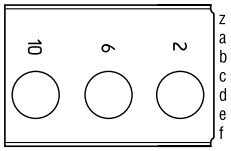
ERmet® 2mm Hard Metric Connectors

Vertical Male Connectors Type N For Backplanes

Ordering Information

			Part Number
	**Type N With Peg**		**104147**

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Coaxial And Power Contacts

The 2mm ERmet Type L, M, and N modules are designed to accommodate a variety of coaxial and high power contacts which are also used in other connector systems including the popular Type M DIN 41612 connectors. Both the high power and coax contacts are inserted into the empty “power ports” provided in the Type L, M, and N connector and are ordered separately as they are typically crimped or soldered onto the cable before insertion into the connector housings.

When using the coaxial contacts in 2mm IEC 61076-4-101 applications, the female contacts are used in the backplane connectors. The contact interface for these coaxial connectors is in accordance with DIN 41626, part 2. The male contacts are usually right angle and are installed in the daughter card connectors. It is not uncommon to use a straight cable contact when a signal cable needs to be routed directly to a device on the daughter board.

ERNI offers coaxial contacts in 50 and 75 ohm in both right angle and straight configurations. They can be crimped or soldered to cable or even directly soldered to the PC board.

In 2mm applications that require additional power, the male contacts are installed in the backplane connectors. The contact interface for these connectors is in accordance with DIN 41626, part 1. See page 54 for a listing of daughter card contacts.

Coax Contacts for Backplanes

ERNI P/N	Rating	Class	Description	Cables
013687	50 ohm	1	Straight Crimp	RG178B/U, RG196A/U
053395	50 ohm	1	Straight, Double Braid	RG316D/B
594207	50 ohm	1	Straight Crimp	RG174/U, RG188A/U, RG316/U
053410	75 ohm	1	Straight Crimp	RG179B/U, RG187A/U
913724	75 ohm	2	Straight, 50 ohm Compatible	RG179B/U, RG187A/U
913269	50 ohm	2	R/A, Double Braid	RG316D/B
914382	50 ohm	1	3 leg, Solder	PCB
114724 *	50 ohm	1	Pressfit	PCB

Power Contacts for Backplanes

ERNI P/N	Rating	Class	Description	Wire Size
053429	10 amp	1	EMLB, Crimp	AWG 16-20
053444	10 amp	1	EMLB, Solder	AWG 16-20
594221	10 amp	1	Solder	AWG 16-20
594227	10 amp	1	Crimp	AWG 16-20
053430	20 amp	1	EMLB, Crimp	AWG 12-16
053445	20 amp	1	EMLB, Solder	AWG 12-16
594223	20 amp	1	Solder	AWG 12-16
594229	20 amp	1	Crimp	AWG 12-16
053430	20 amp	1	EMLB, Crimp	AWG 12-16
033319	30 amp	1	Straight	AWG 10-14
053431	30 amp	1	EMLB, Crimp	AWG 10-14
053446	30 amp	1	EMLB, Solder	AWG 10-14
053447	40 amp	1	EMLB, Solder	AWG 8-12
594225	40 amp	1	Solder	AWG 8-12
594231	40 amp	1	Crimp	AWG 8-12
054432	40 amp	1	EMLB, Crimp	AWG 8-12
044846	40 amp	2	Press-Fit, Straight, EMLB	PCB
044847 *	40 amp	2	Press-Fit, Straight	PCB

* Requires special housing. Contact factory.

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ERmet Vertical Female Connectors

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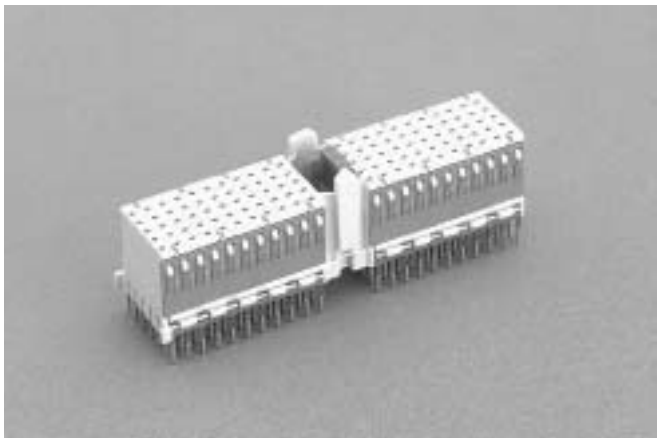
ERmet® 2mm Hard Metric Connectors

Vertical Female Connectors Type A For Stacking



The ERmet type A vertical female connector provides 110 contacts in a 5 row x 22 position fully loaded configuration. Versions with optional “z” and “f” row shields are available as well as extended terminals for use in stacking applications with rear shrouds.

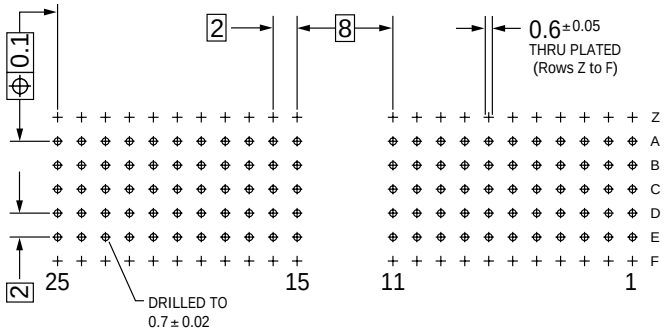
Two spacer heights are also available: 3.1 mm and 9.6 mm to provide additional component clearance.
The ERmet type A female has a multifunctional cavity that incorporates pre-alignment pins and optional coding keys. The pressfit terminals provide a convenient and reliable gas tight connection.

This connector may be used alone or in conjunction with Type B and C vertical female connectors.

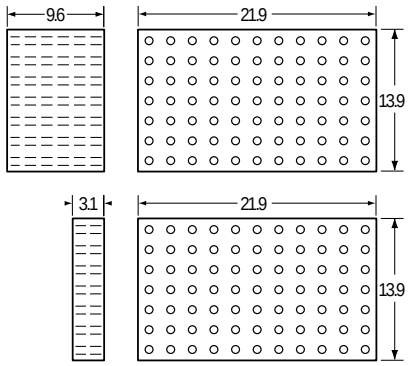
Dimensional Drawings

End Views With Shields*

PC Board Layout (top view)



Spacer Side and Top Views



** Connectors available with shields on both sides, shields on one side only, or without side shields.*

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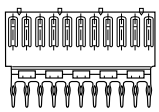
ERmet® 2mm Hard Metric Connectors

Vertical Female Connectors Type A For Stacking

Ordering Information

	Part Number
Type A25 **Without Shields** **3.7 mm Terminals** 25 positions	**104702**
Type A25 **Without Shields** **3.7 mm Terminals** **3.1 mm Spacer** 25 positions	**114009**
Type A25 **Without Shields** **3.7 mm Terminals** **9.6 mm Spacer** 25 positions	**114013**
Type A25 **Without Shields** **13 mm Terminals** 25 positions	**114007**
Type A25 **Without Shields** **13 mm Terminals** **3.1 mm Spacer** 25 positions	**114011**
 **11 Position Shield** **(4 Required)** **3.7 mm Terminal**	**104224**

	Part Number
Type A25 **With Both Shields** **3.7 mm Terminals** 25 positions	**104112**
Type A25 **With Both Shields** **3.7 mm Terminals** **3.1 mm Spacer** 25 positions	**114010**
Type A25 **With Both Shields** **3.7 mm Terminals** **9.6 mm Spacer** 25 positions	**114014**
Type A25 **With Both Shields** **13 mm Terminals** 25 positions	**114008**
Type A25 **With Both Shields** **13 mm Terminals** **3.1 mm Spacer** 25 positions	**114012**
Type A25 **With “F” Row** **Shields** **3.7 mm Terminals** 25 positions	**114132**

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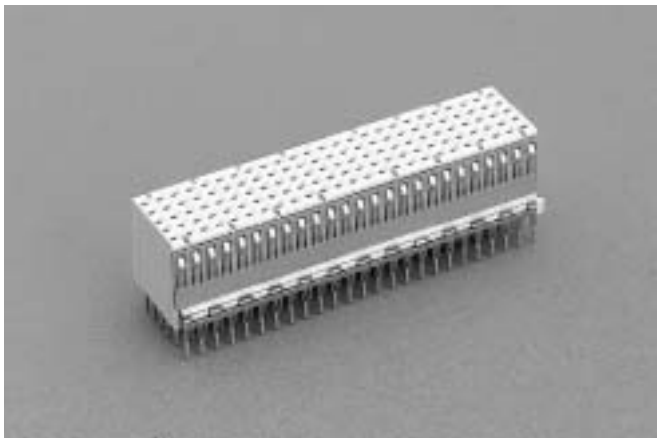
ERmet® 2mm Hard Metric Connectors

Vertical Female Connectors Type B For Stacking



The ERmet type B vertical female connector provides 125 contacts in a 5 row x 25 position fully loaded configuration. Versions with optional “z” and “f” row shields are available as well as extended terminals for use in stacking applications with rear shrouds.

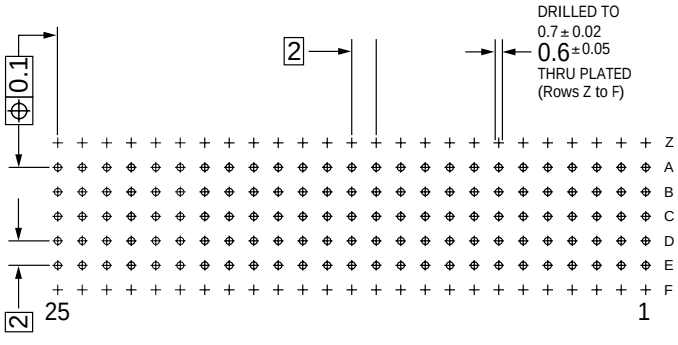
Two spacer heights are also available: 3.1 mm and 9.6 mm to provide additional component clearance.

The ERmet type B vertical female connector has an uninterrupted contact field and no multifunction cavity. This connector is not designed to be used alone, but is intended to be used with either a Type A or C female ERmet connector.

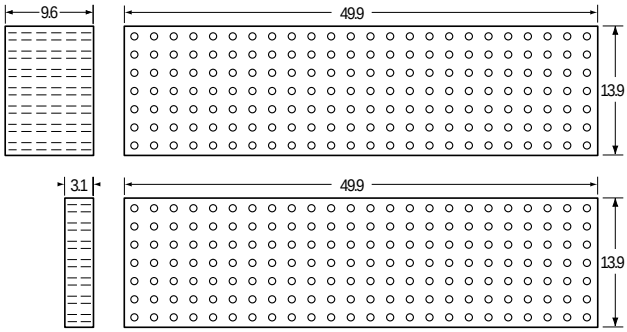
Dimensional Drawings

End Views With Shields*

PC Board Layout (top view)



Spacer Side and Top Views



* Connectors available with shields on both sides, shields on one side only, or without side shields.

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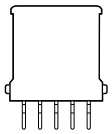
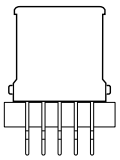
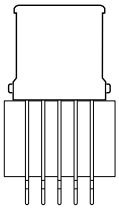
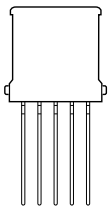
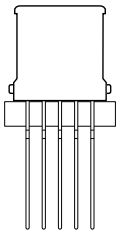
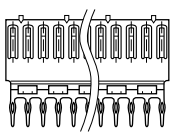
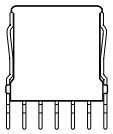
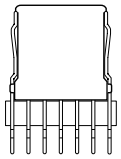
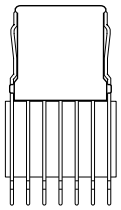
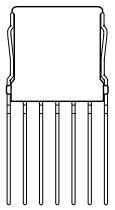
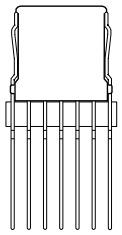
ERmet® 2mm Hard Metric Connectors

Vertical Female Connectors Type B For Stacking

Ordering Information

	Part Number
 **Type B25** **Without Shields** **3.7 mm Terminals** 25 positions	**104703**
 **Type B25** **Without Shields** **3.7 mm Terminals** **3.1 mm Spacer** 25 positions	**114017**
 **Type B25** **Without Shields** **3.7 mm Terminals** **9.6 mm Spacer** 25 positions	**114021**
 **Type B25** **Without Shields** **13 mm Terminals** 25 positions	**114015**
 **Type B25** **Without Shields** **13 mm Terminals** **3.1 mm Spacer** 25 positions	**114019**
 **B25 Shield** **3.7 mm Terminal**	**104225**

	Part Number
 **Type B25** **With Both Shields** **3.7 mm Terminals** 25 positions	**104113**
 **Type B25** **With Both Shields** **3.7 mm Terminals** **3.1 mm Spacer** 25 positions	**114018**
 **Type B25** **With Both Shields** **3.7 mm Terminals** **9.6 mm Spacer** 25 positions	**114022**
 **Type B25** **With Both Shields** **13 mm Terminals** 25 positions	**114016**
 **Type B25** **With Both Shields** **13 mm Terminals** **3.1 mm Spacer** 25 positions	**114020**

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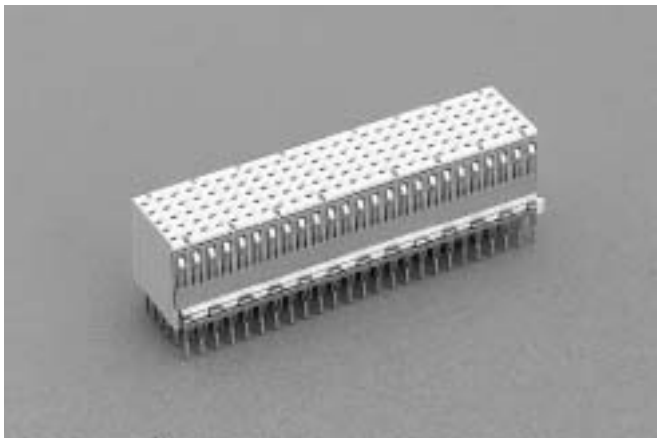
ERmet® 2mm Hard Metric Connectors

Vertical Female Type B Connectors for CompactPCI

Special Lengths



The ERmet type B vertical female connector is provided in alternative lengths to the standard 25-position connector. It is available with 110 contacts in a 5 row x 22 position fully loaded configuration or 95 contacts in a 5 row x 19 position fully loaded configuration.

Versions with optional “z” and “f” row shields are available as well as extended terminals for use in stacking applications with rear shrouds.

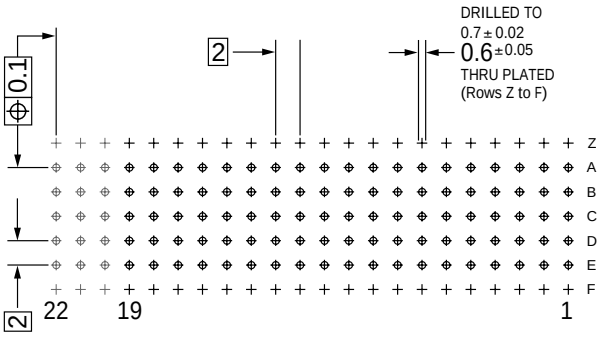
Two spacer heights are also available: 3.1 mm and 9.6 mm to provide necessary component clearance.
For versions with extended terminals and spacers, please contact the factory.

The ERmet type B vertical female connector has an uninterrupted contact field and no multifunction cavity. This connector is not designed to be used alone, but is intended to be used with either a type A or C vertical female ERmet connector.

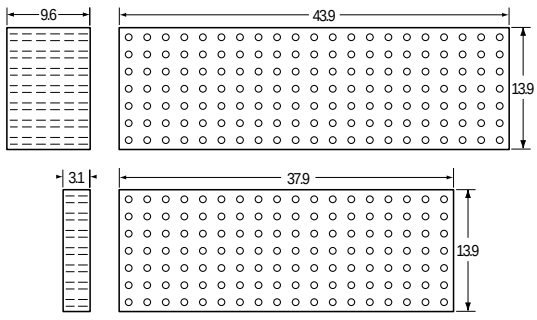
Dimensional Drawings

End Views With Shields*

PC Board Layout (top view)



Spacer Side and Top Views



* Connectors available with shields on both sides, shields on one side only, or without side shields.

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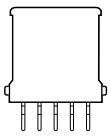
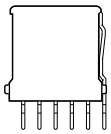
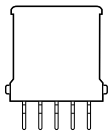
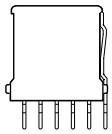
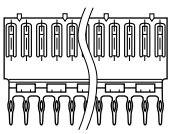
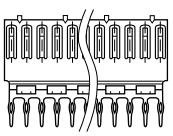
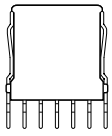
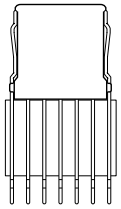
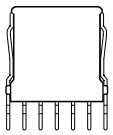
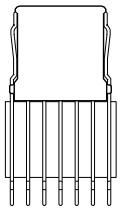
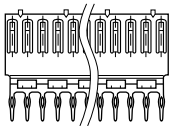
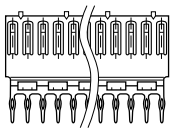
ERmet® 2mm Hard Metric Connectors

Vertical Female Type B Special Length Connectors

Special Lengths

Ordering Information

	Part Number
 **Type B22** **Without Shields** **3.7 mm Terminals** 22 positions	**114113**
 **Type B22** **With "F" Row Shield** **3.7 mm Terminals** 22 positions ***CompactPCI*** P2/P4	**114134**
 **Type B19** **Without Shields** **3.7 mm Terminals** 19 positions	**114111**
 **Type B19** **With "F" Row Shield** **3.7 mm Terminals** 19 positions ***CompactPCI*** P3	**114133**
 **B22 "F" Row Shield** **3.7 mm Terminal**	**114118**
 **B19 "F" Row Shield** **3.7 mm Terminal**	**114116**

	Part Number
 **Type B22** **With Both Shields** **3.7 mm Terminals** 22 positions	**114114**
 **Type B22** **With Both Shields** **3.7 mm Terminals** **9.6 mm Spacer** 22 positions	**134537**
 **Type B19** **With Both Shields** **3.7 mm Terminals** 19 positions	**114112**
 **Type B19** **With Both Shields** **3.7 mm Terminals** **9.6 mm Spacer** 19 positions	**134541**
 **B22 "Z" Row Shield** **3.7 mm Terminal**	**114117**
 **B19 "Z" Row Shield** **3.7 mm Terminal**	**114115**

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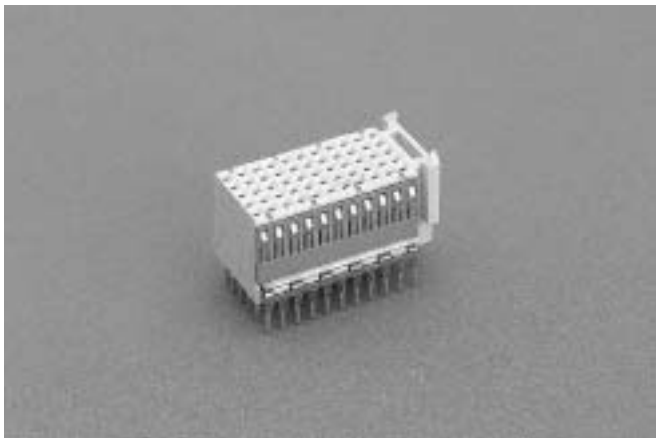
ERmet® 2mm Hard Metric Connectors

Vertical Female Type C Connectors For Stacking



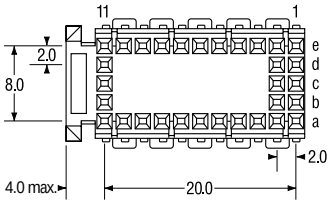
The ERmet type C vertical female connector provides 55 contacts in a 5 row x 22 position fully loaded configuration. Versions with optional “z” and “f” row shields are available as well as extended terminals for use in stacking applications with rear shrouds.

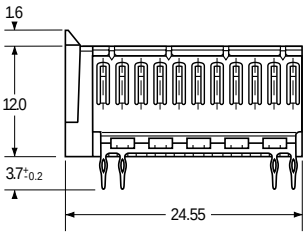
Two spacer heights are also available: 3.1 mm and 9.6 mm to provide necessary component clearance.

The ERmet type C female has no multifunctional cavity but is equipped with pre-alignment guides. The pressfit terminals provide a convenient and reliable gas tight connection.

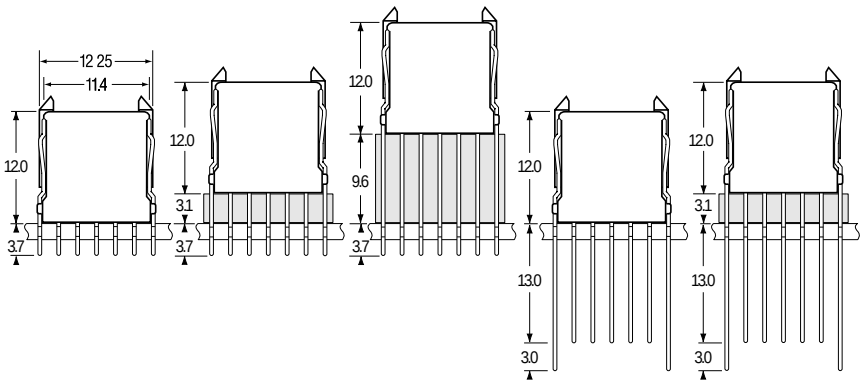
This connector may be used alone or in conjunction with either a type A or B vertical female connector, however it can only be installed at the lower end of a connector row. For detailed information on the modular stacking, see the information on type C positioning on page 15.

Dimensional Drawings

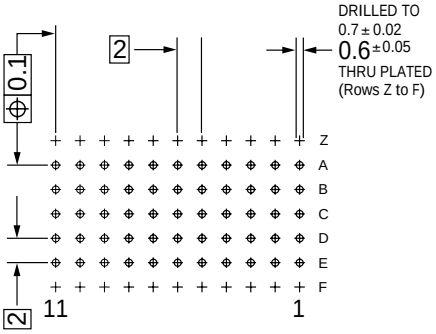




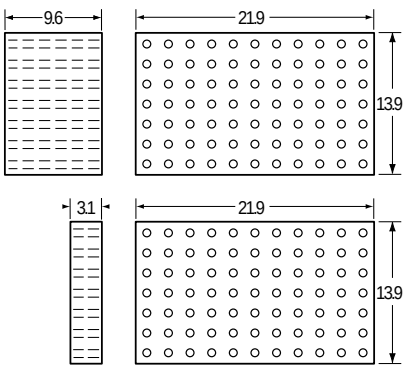
End Views With Shields*



PC Board Layout (top view)



Spacer Side and Top Views



* Connectors available with shields on both sides, shields on one side only, or without side shields.

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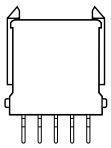
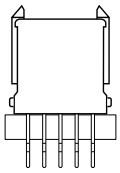
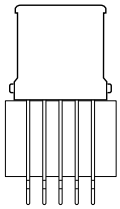
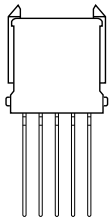
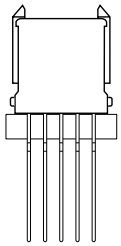
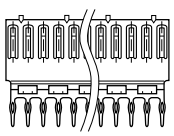
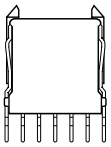
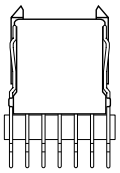
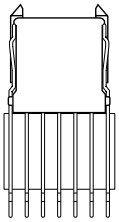
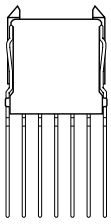
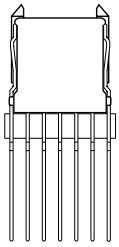
ERmet® 2mm Hard Metric Connectors

Vertical Female Type C Connectors For Stacking

	Part Number
 **Type C11** **Without Shields** **3.7 mm Terminals** 11 positions	**104704**
 **Type C11** **Without Shields** **3.7 mm Terminals** **3.1 mm Spacer** 11 positions	**114025**
 **Type C11** **Without Shields** **3.7 mm Terminals** **9.6 mm Spacer** 11 positions	**114029**
 **Type C11** **Without Shields** **13 mm Terminals** 11 positions	**114023**
 **Type C11** **Without Shields** **13 mm Terminals** **3.1 mm Spacer** 11 positions	**114027**
 **C11 Shield** **2 Required** **3.7 mm Terminal**	**104224**

	Part Number
 **Type C11** **With Both Shields** **3.7 mm Terminals** 11 positions	**104114**
 **Type C11** **With Both Shields** **3.7 mm Terminals** **3.1 mm Spacer** 11 positions	**114026**
 **Type C11** **With Both Shields** **3.7 mm Terminals** **9.6 mm Spacer** 11 positions	**114030**
 **Type C11** **With Both Shields** **13 mm Terminals** 11 positions	**114024**
 **Type C11** **With Both Shields** **13 mm Terminals** **3.1 mm Spacer** 11 positions	**114028**

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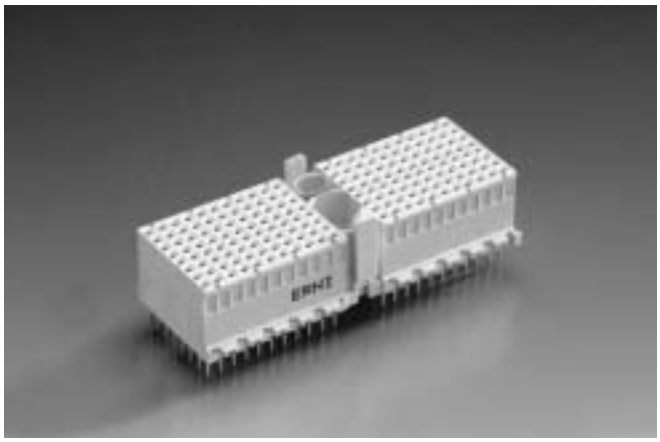
ERmet® 2mm Hard Metric Connectors

Vertical Female Connectors Type D For Stacking

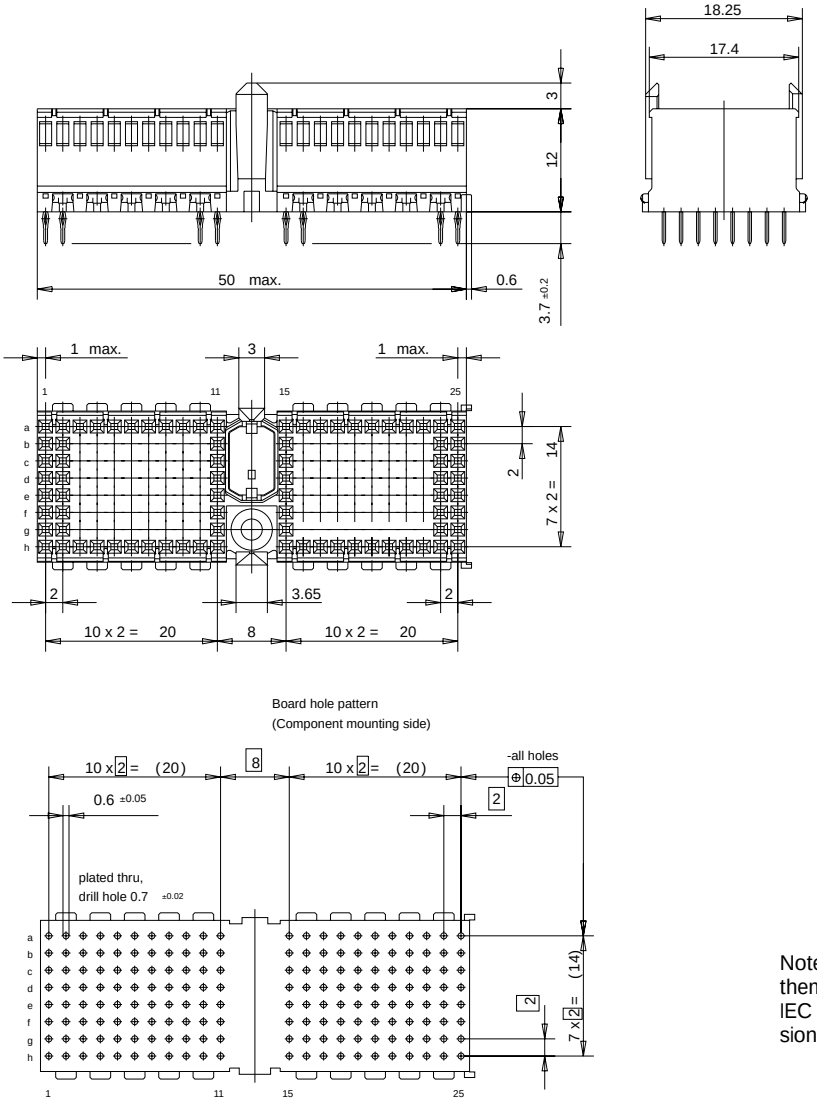


The ERmet type D vertical female connector provides 176 signal contacts in an 8 row x 22 position fully loaded configuration.

The ERmet type D female has a multifunctional cavity that incorporates pre-alignment pins and optional coding keys. It is designed to be used with or without ground return shields. The pressfit terminals provide a convenient and reliable gas tight connection.

This connector may be used alone or in conjunction with type E or F vertical female connectors.

Dimensional drawings and board hole pattern



Note: The numbering on the connectors themselves is in accordance with the IEC 61076-4-101 standard. All dimensions in mm.

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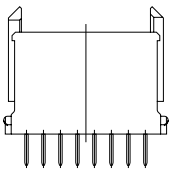
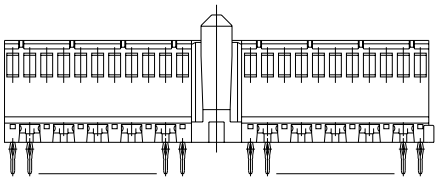
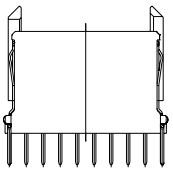
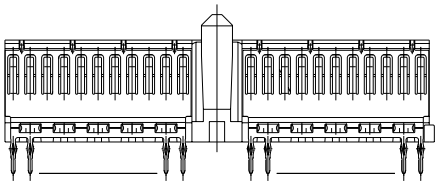
ERmet® 2mm Hard Metric Connectors

Vertical Female Connectors Type D For Stacking

Ordering Information

			Part Number
	**Type D** **Without Shield** **Without Peg** 176 Pins		**124093**
	**Type D** **With Shield** **Without Peg** 176 Pins		**124094**

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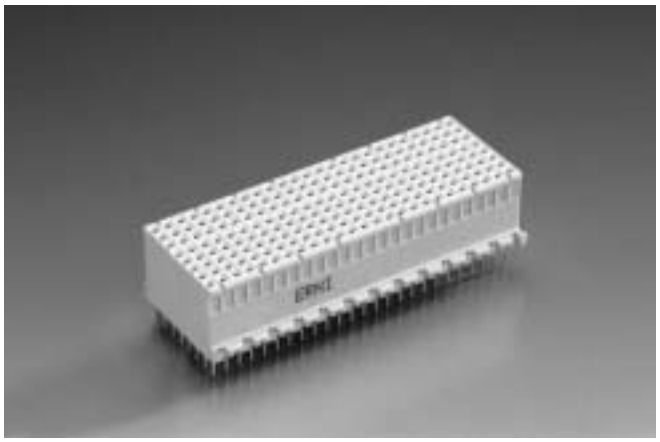
ERmet® 2mm Hard Metric Connectors

Vertical Female Connectors Type E For Stacking

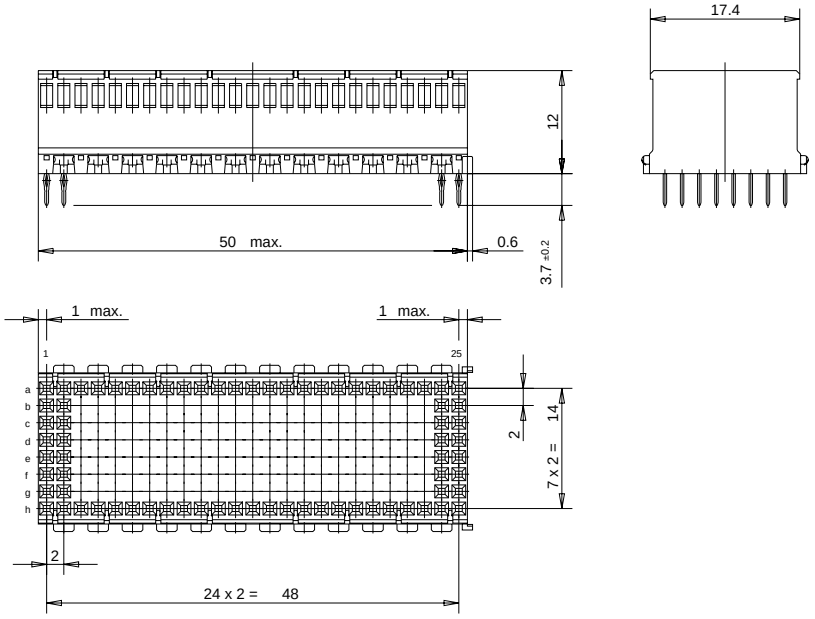


The ERmet type E vertical female connector provides 200 signal contacts in an 8 row x 25 position fully loaded configuration.

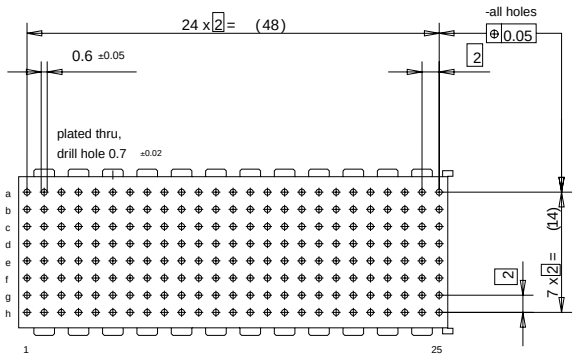
The ERmet type E female has an uninterrupted contact field and no multifunctional cavity. It is designed to be used with or without ground return shields. The pressfit terminals provide a convenient and reliable gas tight connection.

This connector is not designed to be used alone, but is intended to be used in conjunction with either a type D, DE, or F 2mm vertical female connector.

Dimensional drawings and board hole pattern



Board hole pattern
(Component mounting side)



Note: The numbering on the connectors themselves is in accordance with the IEC 61076-4-101 standard. All dimensions in mm.

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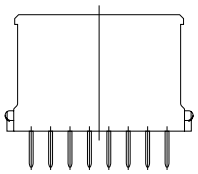
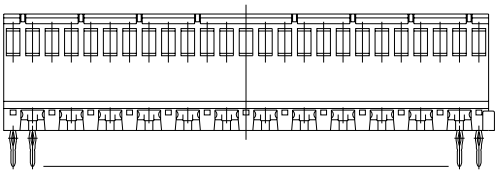
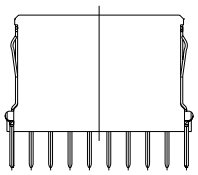
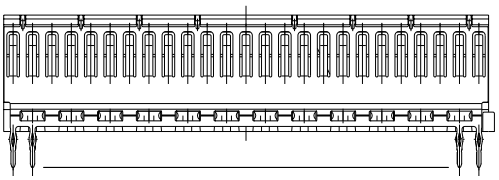
ERmet® 2mm Hard Metric Connectors

Vertical Female Connectors Type E For Stacking

Ordering Information

			Part Number
	**Type E** **Without Shield** **Without Peg** 200 Pins		**124095**
	**Type E** **With Shield** **Without Peg** 200 Pins		**124096**

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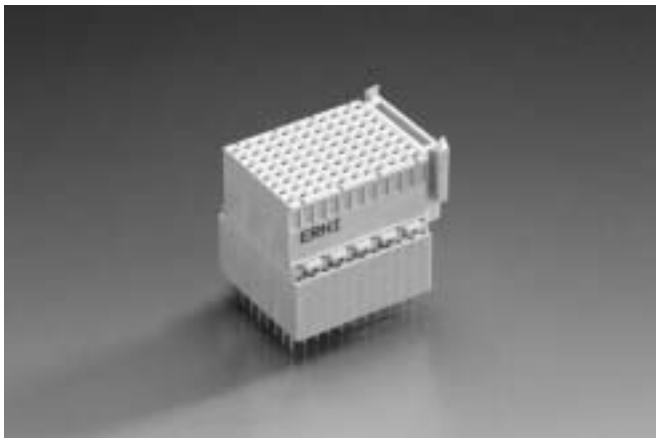
ERmet® 2mm Hard Metric Connectors

Vertical Female Connectors Type F For Stacking



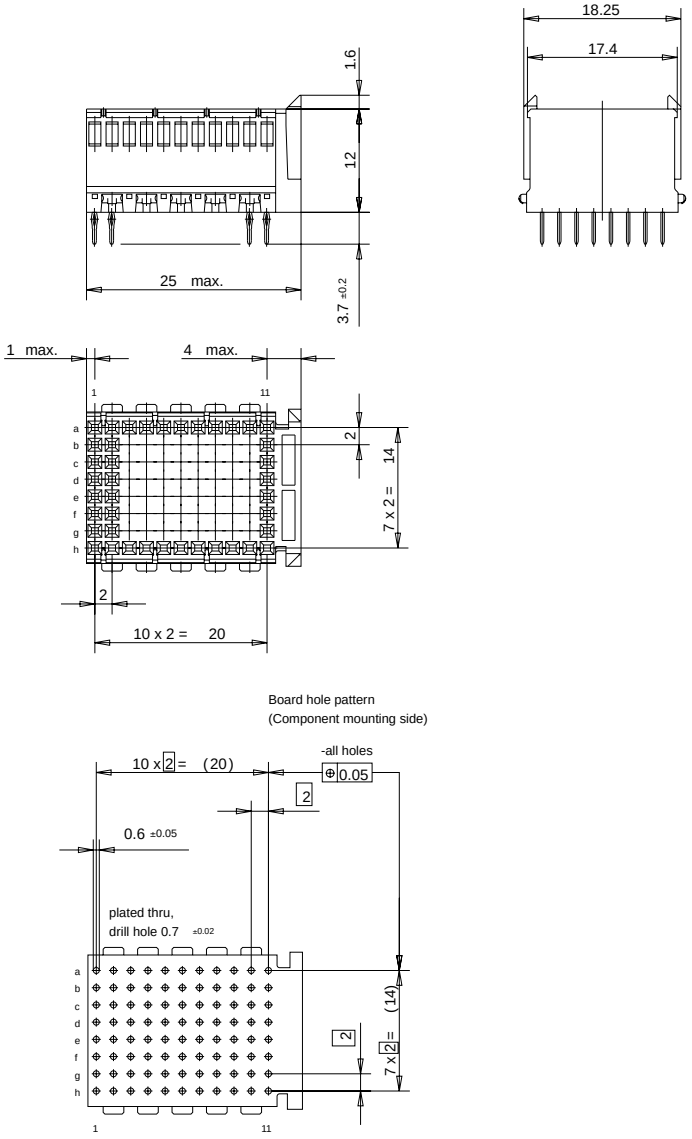
The ERmet type F vertical female connector provides 88 signal contacts and in an 8 row x 11 position fully loaded configuration.

The ERmet type F female has no multifunctional cavity but is equipped with pre-alignment guides. It is designed to be used with or without ground return shields. The pressfit terminals provide a convenient and reliable gas-tight connection.

This connector may be used alone or in conjunction with either type D, DE, or E vertical female connectors, however it can only be installed at the lower end of a connector row.

For additional information on modular stacking, see page 15 for type F positioning.

Dimensional drawings and board hole pattern



Note: The numbering on the connectors themselves is in accordance with the IEC 61076-4-101 standard. All dimensions in mm.

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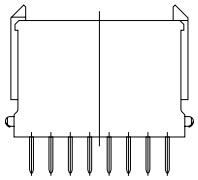
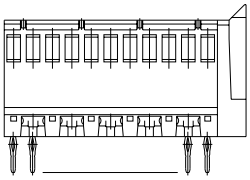
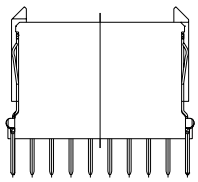
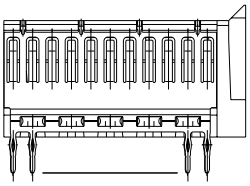
ERmet® 2mm Hard Metric Connectors

Vertical Female Connectors Type F For Stacking

Ordering Information

			Part Number
	**Type F** **Without Shield** **Without Peg** 88 Pins		**124097**
	**Type F** **With Shield** **Without Peg** 88 Pins		**124098**

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ERmet® 2mm Hard Metric Connectors

Summary Of CompactPCI® Connectors

CompactPCI® has many user defined pins and therefore invites many custom backplane implementations that could require specially loaded connectors. The following is a summary of the most popular connectors that are being used for “standard” designs.

Male Backplane Connector	Location	Number of Positions*	Contact Loading**	ERNI Part Number
Type A Standard Hot Swap	P1 Hot Swap	25	C B - - - B C	923190
Type A Special Hot Swap w/long terminals	P1 Special	25	T P - - - P T	923197
Type A w/ long terminals with z row	P1	25	T S - - - S T	923342
Type B w/ short terminals	P2, P5	22	C B B B B B C	914796
Type B w/ long terminals, w/o z row, AB compatible	P2, P5	22	S S S S S S -	923345
Type B w/ short terminals	P3	19	C B B B B B C	103670
Type B w/ long terminals, with z row, AB compatible	P3	19	- S S S S S -	923341
Type B w/ long terminals, w/o z row, AB compatible	P3	19	S S S S S S -	923346
Type A w/ short terminals for Telecom	P4 Telecom	25	- - B - - - C	923160
Type A w/ long terminals, w/o z row, AB compatible	P4	25	S - - - - S T	923347
Type A w/ long terminals for general I/O	P4	25	T R R R R R T	064688
Type A w/ long terminals for general I/O	P4	25	T S S S S S T	103975
Type B w/ short terminals for Telecom	P5 Telecom	22	C - - - - - C	923162
Type B w/ long terminals, w/o z row, AB compatible	P5 Telecom	22	- - - - - - -	923339
Type B w/ long terminals, w/ z row, AB compatible	P2, P5	22	- S S S S S -	923340

Female Daughter Card Connector		Location	Number of Positions*	Special Features	ERNI Part Number
Type A		J1, J4	25	without shield	044146
				with upper shield	064176
Type A	Standard for Telecom H.110	J4 Telecom	25	with split shield	104512
	Mirrored for rear transition	rJ4 Telecom		with split shield	104697
Type AB		rJ2, rJ5	22	without shield	104933
				with upper shield	114809
Type AB		rJ3	19	without shield	114529
				with upper shield	114810
Type B		J2, J5	22	without shield	914797
				with upper shield	064785
Type B		J3	19	without shield	914794
				with upper shield	064784

Coding Keys	Color	Application	ERNI Part Number
Male Backplane	Brilliant Blue	5.0 Volts P1	043347
	Cadmium Yellow	3.3 Volts P1	043345
	Strawberry Red	Telecom P4	043350
Female Daughter Card	Brilliant Blue	5.0 Volts J1	043337
	Cadmium Yellow	3.3 Volts J1	043335
	Strawberry Red	Telecom J4	043340

Rear Shrouds	Number of Positions*	Height	ERNI Part Number
Type A (rP1, rP4)	25	3.9 mm	114436
		4.5 mm	054795
		5.3 mm	054794
		6.1 mm	054793
Type AB (rP2, rP5)	22	3.9 mm	114425
		4.5 mm	114426
		5.3 mm	114427
		6.1 mm	114428
Type AB (rP3)	19	3.9 mm	114487
		4.5 mm	114488
		5.3 mm	114489
		6.1 mm	114490

* For the purposes of this catalog we refer to the overall length that the connector occupies. Therefore, a 50 mm long type A connector is considered to be 25 positions long.

** Cross sectional loading from rows Z to F.

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ERmet Accessories

Shrouds

Coding Keys

Power Connectors

Dust Covers

Tooling

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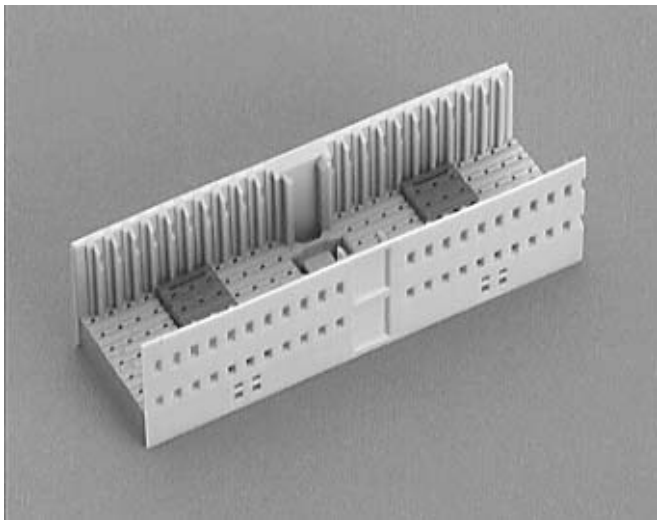
ERmet® 2mm Hard Metric Connectors

ERmet Shrouds For Midplane And Rear I/O Assemblies

For Midplane And Rear I/O Applications



Shrouds are used in combination with extended tail connectors for rear I/O or midplane applications.

When shrouds are installed over the extended tails of these connectors, a male connector is created that can accept either a daughter card assembly or a cable connector. When a cable connector is to be used, optional latch arms are available. These will retain the cable assembly and serve as a strain relief.

Shrouds also serve to protect and align the long extended connector tails until they are to be used.

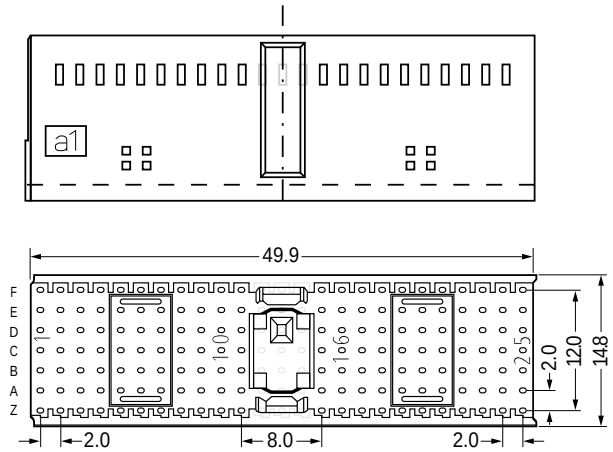
To determine which shroud height is appropriate for any given pin tail length and backplane thickness, please refer to the selection chart on page 106.

The shrouds are supplied with the clamping wafers installed. No additional spacers or securing accessories are required.

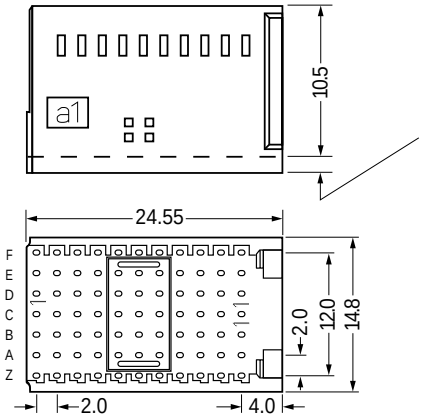
The ERNI shroud has a unique latching mechanism that is easy to use and securely affixes the shroud to connectors with long terminals.

See pages 107 and 108 for a complete listing of all available shroud part numbers.

Type A25 & B25 Dimensional Drawings*



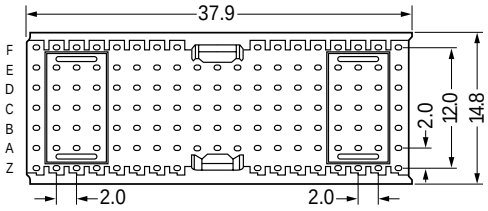
Type C11 Dimensional Drawings



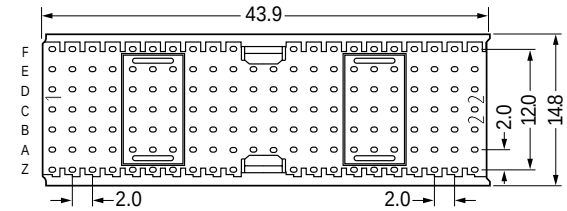
Each shroud is available in four different base heights (3.9 mm, 4.5 mm, 5.3 mm & 6.1 mm). See drawing on following page for standoff details.

* Type A shrouds have a multifunction area as shown at left. Type B shrouds have an unbroken contact field and no multifunction area.

Type AB19 Dimensional Drawings*



Type AB22 Dimensional Drawings



Dimensions shown are for reference purposes only. All dimensions are in millimeters (mm) unless otherwise noted.

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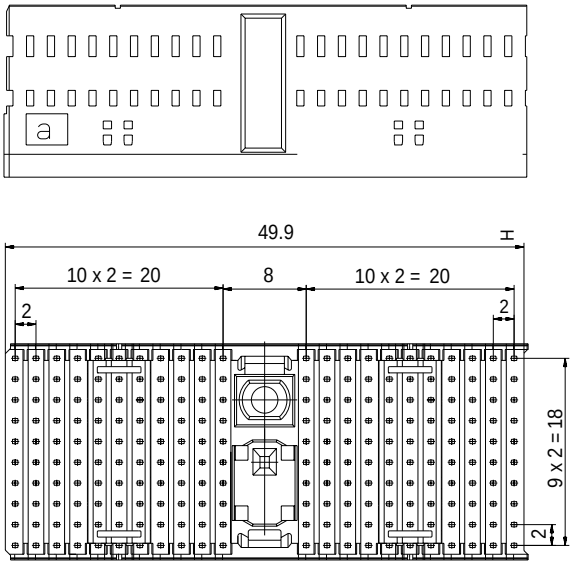
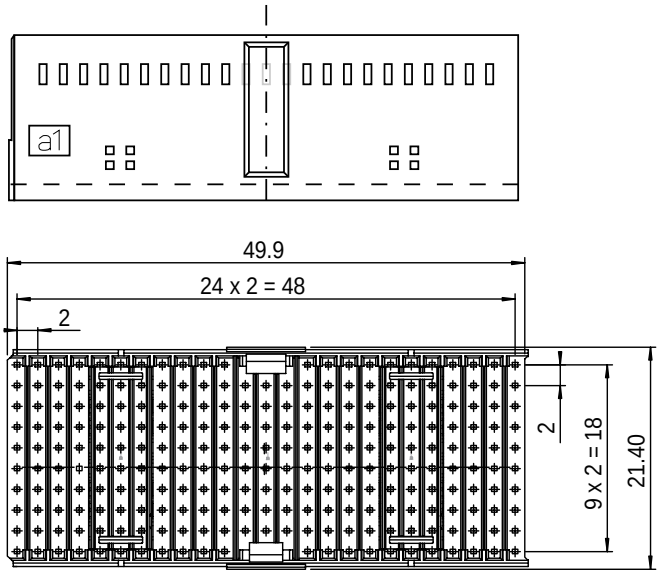
ERmet® 2mm Hard Metric Connectors

ERmet Shrouds For Midplane And Rear I/O Assemblies

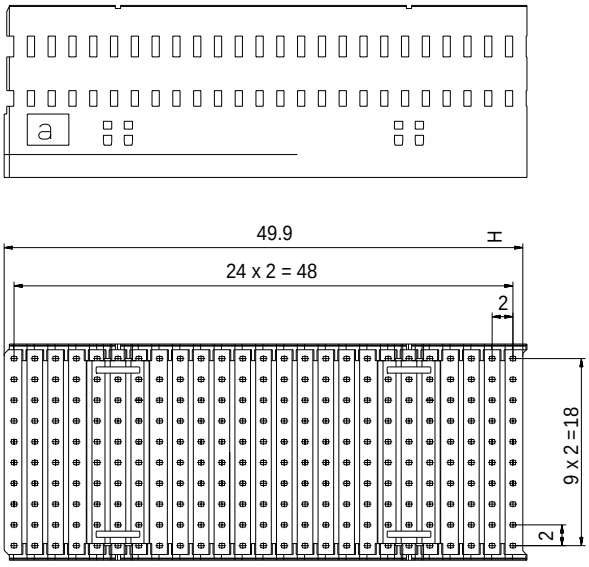
Type D Dimensional Drawings



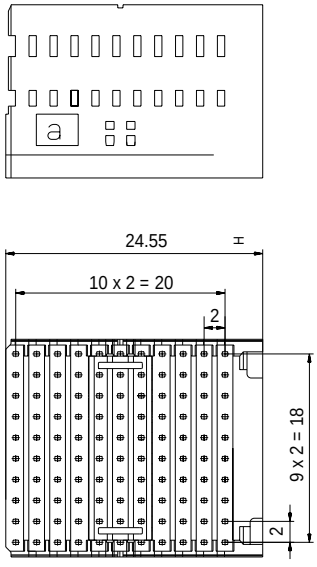
Type DE Dimensional Drawings



Type E Dimensional Drawings



Type F Dimensional Drawings



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ERmet® 2mm Hard Metric Connectors

Shroud Selection Information

After the backplane has been designed and its final overall thickness is determined, it is often challenging to select the proper shroud. Furthermore, a design may specify sequential mating in the rear which requires several different terminal lengths.

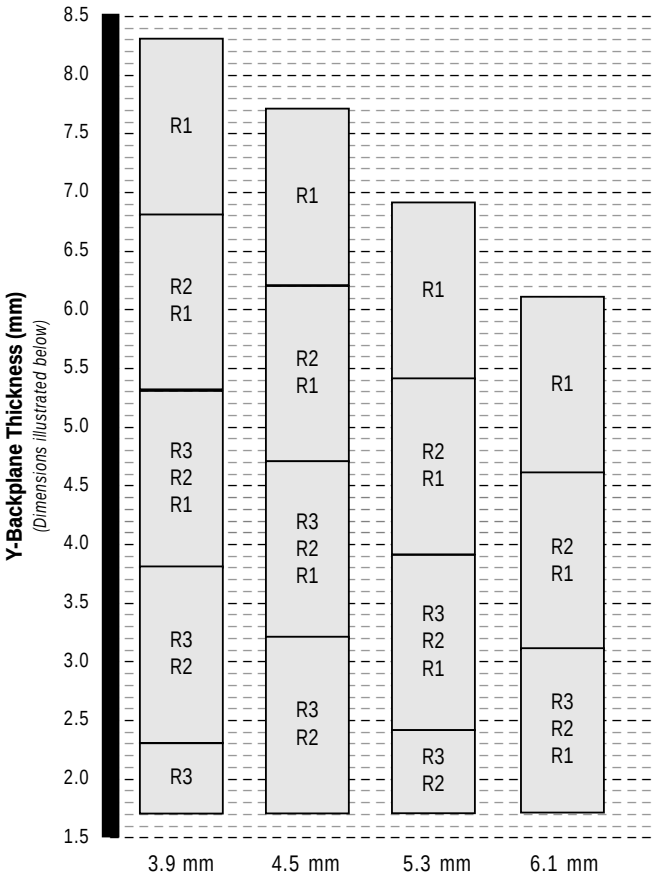
To accommodate a wide range of backplane thicknesses and up to 3 rear mating levels, ERNI offers shrouds with 4 different base thicknesses. Which base thickness you select depends on both the backplane thickness and the number of terminal lengths you need. Note that due to the extremely long contact wipe length (2.5 mm), several different combinations of pin terminal lengths and shroud base thicknesses may be used to achieve the same functional result.

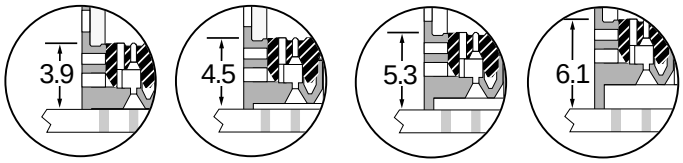
The chart at right shows for each of the four shroud base thicknesses, which connector terminal lengths (R1, R2 or R3) may be used for any specific backplane thickness (1.5 mm to 8.0 mm).

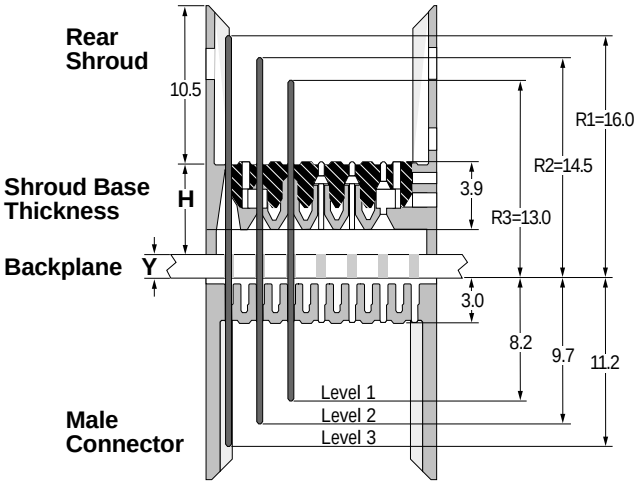
After selecting the proper shroud base thickness, find the shroud part number on pages 107 and 108.

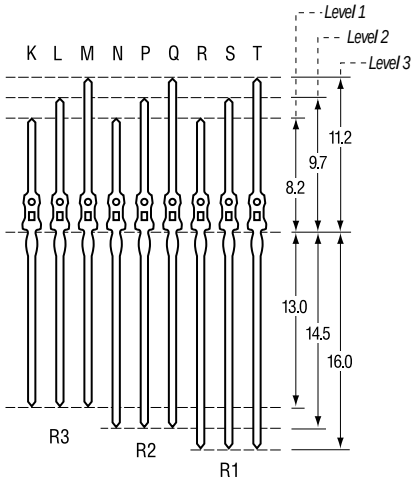
Examples:

- For a backplane thickness of 2.5 mm and the need to accommodate all three rear mating lengths (terminals R1, R2 and R3), a shroud base thickness of 6.1 mm must be used.
- With a 5.0 mm thick backplane and a shroud with a 5.3 mm base thickness, only the R1 and R2 terminal length pins may be used. The R3 terminal would be too short to ensure the proper wipe length for reliable mating.
- With a 3.0 mm thick backplane and a shroud with a 5.3 mm base thickness any R1, R2 and R3 terminal length pin may be used.









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ERmet® 2mm Hard Metric Connectors

ERmet Shrouds For Midplane And Rear I/O Assemblies

Ordering Information

Shroud Selection Chart for 7 row Shrouds

Description	Base Thickness (mm)	Length (A) (mm)	Shroud Part #	Tool for Press* Assembly
Type A25 Shroud ***CompactPCI***® rP1 and rP4 positions	3.9	49.9	114436	914070
	4.5	49.9	054795	914070
	5.3	49.9	054794	914070
	6.1	49.9	054793	914070
Type A19 Shroud	3.9	37.9	NA	914079
	4.5	37.9	923109	914079
	5.3	37.9	923108	914079
	6.1	37.9	923107	914079
Type AB25 Shroud	3.9	49.9	114482	914690
	4.5	49.9	114483	914690
	5.3	49.9	114484	914690
	6.1	49.9	114485	914690
Type AB22 Shroud ***CompactPCI***® rP2 and rP5 positions	3.9	43.9	114425	914691
	4.5	43.9	114426	914691
	5.3	43.9	114427	914691
	6.1	43.9	114428	914691
Type AB19 Shroud ***CompactPCI***® rP3 position	3.9	37.9	114487	914692
	4.5	37.9	114488	914692
	5.3	37.9	114489	914692
	6.1	37.9	114490	914692
Type B25 Shroud	3.9	49.9	114437	914069
	4.5	49.9	054797	914069
	5.3	49.9	054798	914069
	6.1	49.9	054799	914069
Type B22 Shroud	3.9	43.9	114619	914083
	4.5	43.9	064692	914083
	5.3	43.9	064693	914083
	6.1	43.9	064694	914083
Type B19 Shroud	3.9	37.9	114618	914084
	4.5	37.9	064622	914084
	5.3	37.9	064623	914084
	6.1	37.9	064624	914084
Type C11 Shroud	3.9	24.55	114438	914068
	4.5	24.55	064172	914068
	5.3	24.55	064171	914068
	6.1	24.55	064170	914068
Tool for Manual Assembly	–	–	924788	–
Latch Arm	–	–	064219	–
Replacement Locking Wafers	–	–	–	054521

Dimensions shown are for reference purposes only. All dimensions are in millimeters (mm) unless otherwise noted.

*The tools are the same tools used to pressfit the equivalent male connectors. The tools listed will only accommodate pins extending no more than 8.7 mm from the inside floor of the shroud. Calculated as follows: [8.7 mm > 16.0 mm – (BP thickness (mm) + shroud base thickness (mm))]

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ERmet® 2mm Hard Metric Connectors

ERmet Shrouds For Midplane And Rear I/O Assemblies

Ordering Information

Shroud Selection Chart for 10 row Shrouds

Description	Base Thickness (mm)	Length (A) (mm)	Shroud Part #	Tool for Press* Assembly
Type D25 Shroud	3.9	49.9	114467	201279
	4.5	49.9	114468	201279
	5.3	49.9	114469	201279
	6.1	49.9	114470	201279
Type E25 Shroud	3.9	49.9	114472	201280
	4.5	49.9	114473	201280
	5.3	49.9	114474	201280
	6.1	49.9	114475	201280
Type DE25 Shroud	3.9	49.9	933130	924891
	4.5	49.9	933132	924891
	5.3	49.9	933134	924891
	6.1	49.9	933136	924891
Type F11 Shroud	3.9	43.9	114477	201281
	4.5	43.9	114478	201281
	5.3	43.9	114479	201281
	6.1	43.9	114480	201281
Tool for Manual Assembly	–	–	924882	–
Replacement Locking Wafers	–	–	114408	–

Dimensions shown are for reference purposes only. All dimensions are in millimeters (mm) unless otherwise noted.
*The tools are the same tools used to pressfit the equivalent male connectors. The tools listed will only accommodate pins extending no more than 8.7 mm from the inside floor of the shroud. Calculated as follows: [8.7 mm > 16.0 mm – (BP thickness (mm) + shroud base thickness (mm))]

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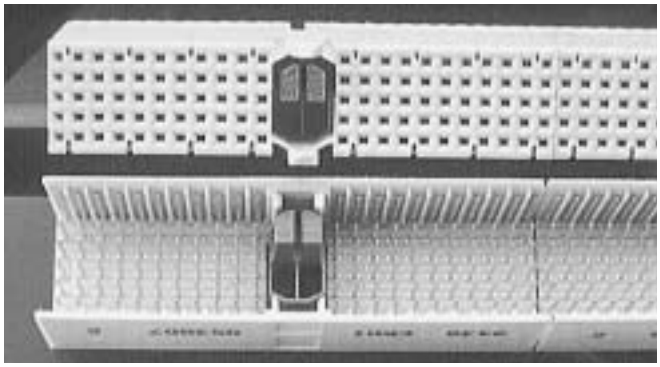
ERmet® 2mm Hard Metric Connectors

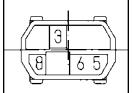
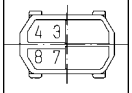
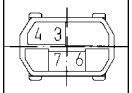
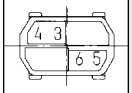
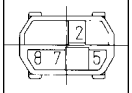
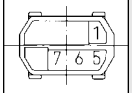
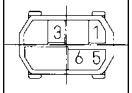
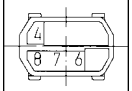
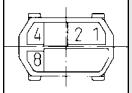
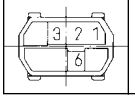
Coding Keys



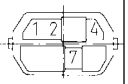
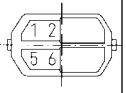
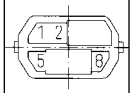
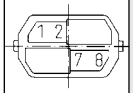
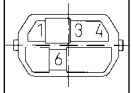
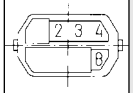
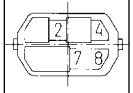
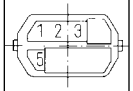
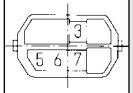
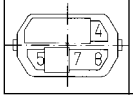
Many systems today have slot-specific printed circuit boards. To prevent electrical damage to the system resulting from incorrect insertion of cards with differing logic or pin assignments, a standardized coding system is available. This coding system is completely defined by IEC 1076-4-101. Color coded coding keys are snapped into the multifunction area of the male and female connector (Type A, D, L or M). The unique bright color of the coding key pairs allow for quick and easy visual identification and differentiation. The mechanical design ensures that electrical contact will not take place in the event that the wrong board is inserted into the wrong slot. The same coding keys are utilized by both the 5+2 and 8+2 designs. Specific coding key colors have been chosen by the PICMG for CompactPCI and are indicated by the shaded versions in the chart below.

Ordering Information

Coding Keys For Male Connector Modules

Coding Key	Code Number	Color	Part Number
	3568	Pastel orange RAL 2003	043342
	3478	Steel Blue RAL 5011	043343
	3467	Slate grey RAL 7015	043344
	3456	Cadmium yellow RAL 1021 **3.3v CompactPCI®**	043345
	2578	Reseda green RAL 6011	043346
	1567	Brilliant blue RAL 5007 **5.0v CompactPCI®**	043347
	1356	Blue/lilac RAL 4005	043348
	4678	Ocher yellow RAL 1024	043349
	1248	Strawberry red RAL 3018 ECTF H110 Member	043350
	1236	Nut brown RAL 8011	043351

Coding Keys For Female Connector Modules

Coding Key	Code Number	Color	Part Number
	1247	Pastel orange RAL 2003	043332
	1256	Steel blue RAL 5011	043333
	1258	Slate grey RAL 7015	043334
	1278	Cadmium yellow RAL 1021 **3.3v CompactPCI®**	043335
	1346	Reseda green RAL 6011	043336
	2348	Brilliant blue RAL 5007 **5.0v CompactPCI®**	043337
	2478	Blue/lilac RAL 4005	043338
	1235	Ocher yellow RAL 1024	043339
	3567	Strawberry red RAL 3018 ECTF H110 Member	043340
	4578	Nut brown RAL 8011	043341

RAL is a Trademark of the Central Organization for product assurance in Germany.
Color samples may be ordered from Munster-Schmidt KG, RAL-Farbkartenvertrieb, Postfach 2751, D-3400 Gottingen, Germany.
Note: The color/code number combinations, listed above, follow IEC 61076-4-101 recommendations.

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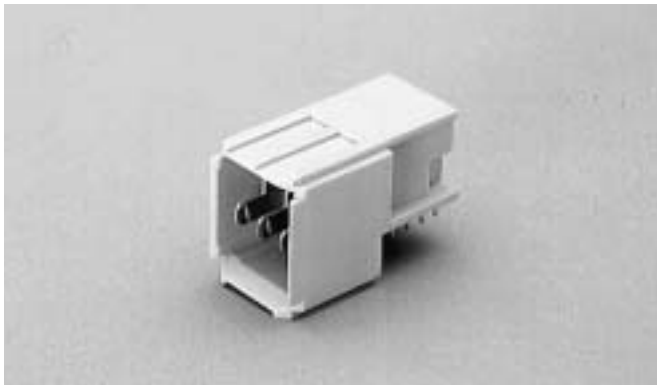
ERmet® 2mm Hard Metric Connectors

Right Angle Male Power Connector For Daughter Cards

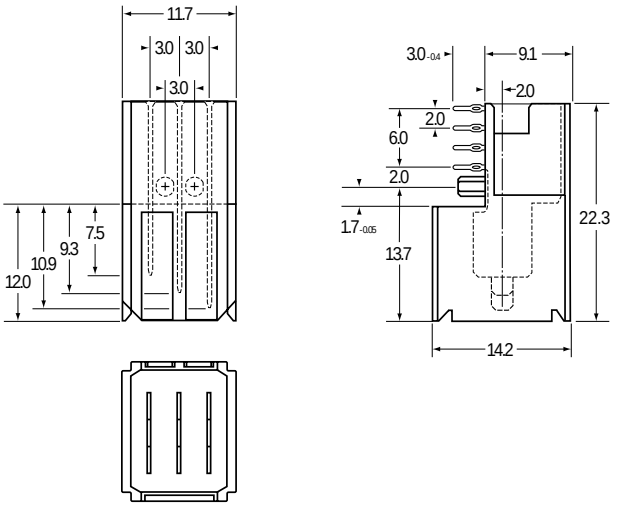


The ERmet 2mm HM power connector is used in conjunction with the ERmet 2mm HM signal connectors and the ERmet ZD high speed differential HM connector systems. It is also compatible with other popular 2mm HM connectors and the DIN 41612 line of connectors. This 12mm wide, right angle male connector provides up to three power contacts (8 amperes each). The male contacts are available in three heights for early mate, late break hot swap applications. This connector compliments the ERmet 2mm HM signal connectors by providing the safety of a closed entry female receptacle on the backplane and the right angle male header on the daughter card. This connector is designed to meet the IEC 950 finger probe safety requirements. The connector offers convenient pressfit assembly with inexpensive flat rock tooling. The pressfit hole requirements are the same as for the rest of the ERmet 2mm HM line.

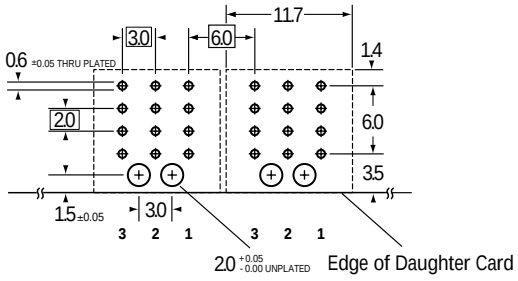
See pages 116-118 for tooling.

Right Angle Male Power Connector For Daughter Cards

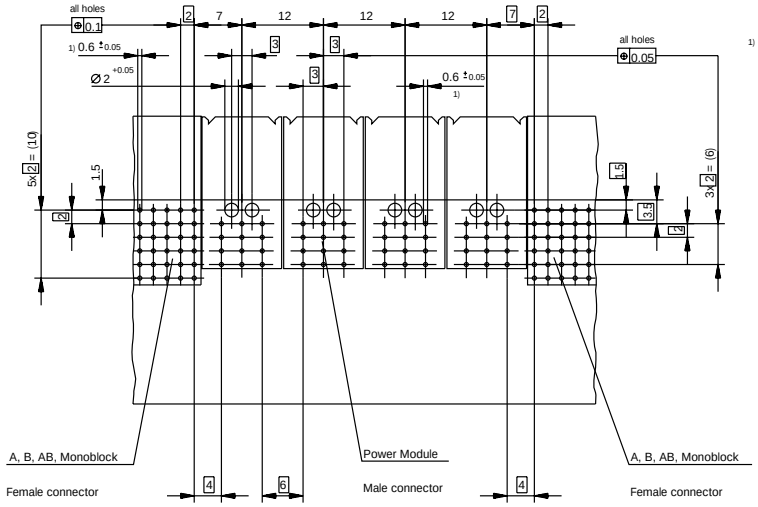
Dimensional Drawings

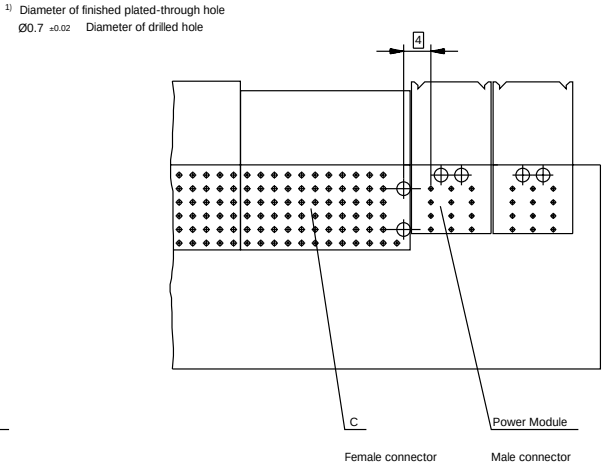


PC Board Layout (two adjacent connectors viewed from connector side)



Board Hole Pattern





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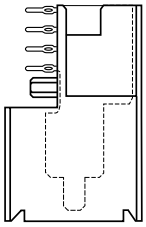
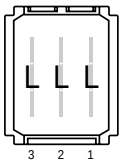
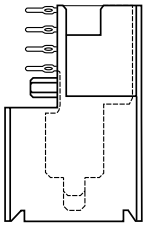
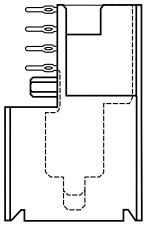
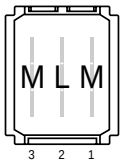
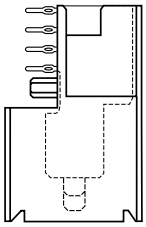
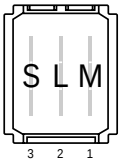
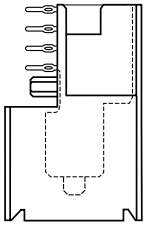
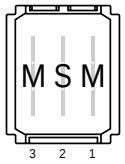
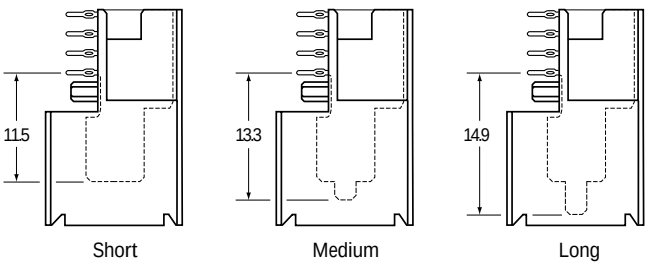
ERmet® 2mm Hard Metric Connectors

Right Angle Male Power Connector For Daughter Cards

			Part Number
	**Right Angle Male**		**114400**
	**Right Angle Male**		**114401**
	**Right Angle Male**		**114402**
	**Right Angle Male**		**114403**
	**Right Angle Male**		**124163**

Early Mate, Late Break

ERNI offers five standard power modules. Each right angle male module has a different configuration of the three standard male power contact lengths to support all early mate, late break and hot swap applications. The three contact lengths are: 11.5 mm, 13.3 mm and 14.9 mm.



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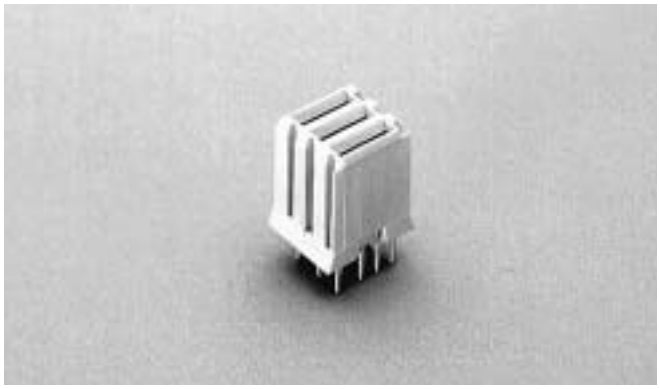
ERmet® 2mm Hard Metric Connectors

Vertical Female Power Connector For Backplanes



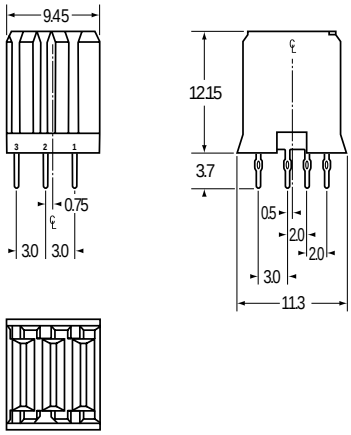
The ERNI vertical female connector for backplanes provides a reliable, closed entry dual beam connection. This power connector is designed to be used in conjunction with the ERmet 2mm HM signal connectors and the ERmet ZD high speed differential HM connector systems. It is also compatible with other popular 2mm HM connectors and the DIN 41612 line of connectors. When used on a backplane this female receptacle connector eliminates any possibility of shorting power pins. This connector is designed to meet the IEC 950 finger probe safety requirements making it ideal for telecom and instrumentation applications.

This 10mm wide module provides three female contacts (8 amperes each) in a reliable press fit configuration. The pressfit hole requirements are the same as the rest of the ERmet signal connector line and the connector can be assembled with inexpensive pressfit tooling.

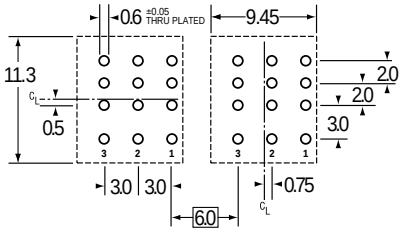
See pages 116-118 for tooling.

Vertical Female Power Connector For Backplanes

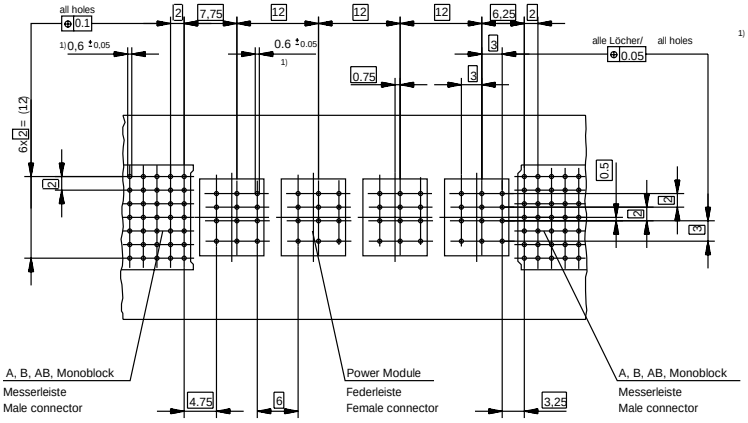
Dimensional Drawings



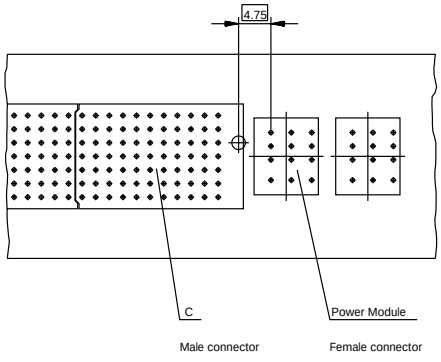
Backplane Layout (two adjacent connectors viewed from connector side)



Board Hole Pattern



1) Diameter of finished plated-through hole
Ø0.7 ±0.02 Diameter of drilled hole



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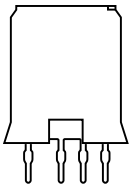
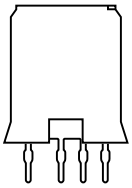
ERmet® 2mm Hard Metric Connectors

Vertical Female Power Connector For Backplanes

		Part Number
	**Vertical Female** **Fully Loaded**	**114404**
	**Vertical Female** **A & C positions Loaded**	**923571**

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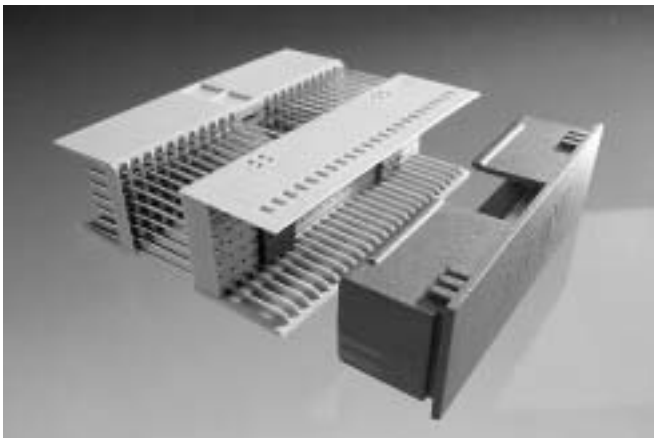
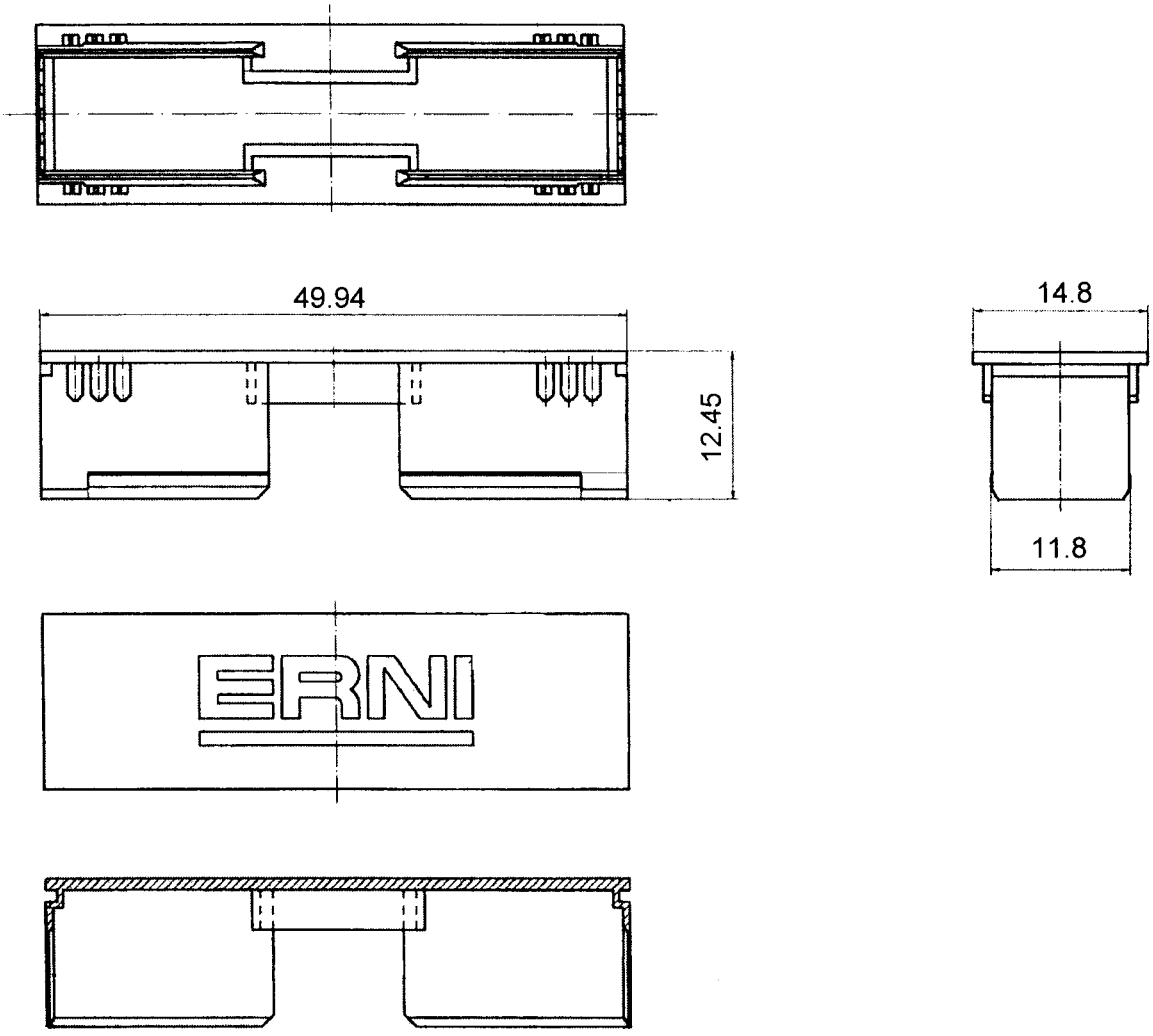
ERmet® 2mm Hard Metric Connectors

Dust Cover For Type A, B, AB, D, E, and DE



The dust cover for the male connectors for the ERmet 2 mm connector system according to IEC 61076-4-101 protects the mating area at the front side of the backplane and the shrouded pins on the rearside of the backplane against contact damage. They provide protection during handling, transportation and also against dust. The dust cover is available in two versions for type A, B, AB, D, E and DE with or without handle.

Dimensional Drawings



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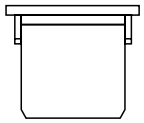
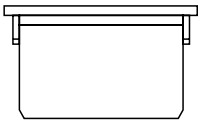
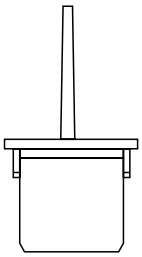
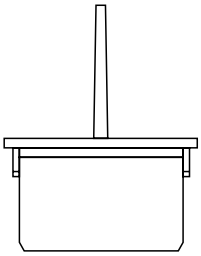
ERmet® 2mm Hard Metric Connectors

Dust Cover For Type A, B, AB, D, E, and DE

Ordering Information

		Part Number
	**A, B, AB Dust Cover Without Handle For Vacuum Pickup**	**104070**
	**D, E, DE Dust Cover Without Handle For Vacuum Pickup**	**104939**
	**A, B, AB Dust Cover With Handle For Hand Placement**	**114039**
	**D, E, DE Dust Cover With Handle For Hand Placement**	**114040**

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Low Profile Installation Tooling

ERNI offers application tooling for both the popular North American style bench presses as well as the European style universal presses. Both bench style presses as well as the European style universal presses can be of either a C or H frame design. The most important differences between bench presses and universal presses are the application tooling requirements.

For the bench style presses, the printed circuit board or backplane must be supported by a lower fixture. This lower fixture supports the printed circuit board during the pressing operation and provides clearance for the protruding pins that are being installed as well as clearance for any other rear side components. Such a fixture is often custom and is usually designed at the time the board mechanical drawing is completed. ERNI offers a standard lower fixture for the popular 6U-160 daughter card format. During the pressing operation, the upper tool is placed on top of the female connector by hand and the fixture holding the printed circuit board is positioned under the ram. The tool can be fixed to the end of the ram for repetitive operations.

ERNI offers a complete selection of low profile application tooling for bench style presses with flat working surfaces. The low profile male tools are typically 27 mm high and the female tools sit 23 mm above the female connector. These tools do not require any end clearances and the female tools only require 0.6 mm clearance along the inboard edge of the connector. For each connector style and length only one tool is needed.

The low profile tooling is designed to be used with the ERNI table top press as well as other arbor and bench top presses.

For the European style universal presses use the tools on page 117.

Male Connectors	ERNI Part Number
A25	914070
A19	914079
AB25	914690
AB22	914691
AB19	914692
B25	914069
B22 – Compact PCI	914083
B19 – VME J0/Compact PCI P3	914084
A/B 50 position monoblock	924892
A/B 47 position monoblock	924893
C11	914068
D25	201279
DE25	924891
E25	201280
F11	201281
Power module	924887

Female Connectors with Upper Shields	ERNI Part Number
A25, AB25, B25	914071
A19	914075
B22 – Compact PCI, AB22	914073
B19 – VME P0/Compact PCI J3, AB19	914075
A/B 50 position monoblock	924894
A/B 47 position monoblock	924895
C11	914078
D25	914573
E25	914573
F11	914574
Power module	924987
6U Daughter Card Lower Tool	914569

Female Connectors without Upper Shields	ERNI Part Number
A25, AB25, B25	914072
A19	914076
B25	914072
AB22, B22 – Compact PCI	914074
AB19, B19 – VME P0/Compact PCI J3	914076
C11	914077
D25	914575
E25	914575
F11	914576

Vertical Female Connectors	ERNI Part Number
A25, B25	201292
B22	201290
B19	201291
C11	201295

Lower Shield	ERNI Part Number
A16, B16, D16, E16	914564
A, B, AB, D, F	924883
A22, B22, AB22, D22, E22	924884
A19, B19, AB19, D19, E19	924885
C,F	924886

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Universal Press Tooling (European Style)

When using the European style universal presses, the printed circuit board or backplane is usually supported by a guide frame and positioned above a fixed lower tool. The advantage of this method is that the same lower tool can be used regardless of the layout of the printed circuit board. Care must be taken to accurately align the printed circuit board above the fixed lower tool. Also, the upper tool must be firmly attached to the ram so that its x-y position relative to the lower tool is constant as the ram descends through the z axis during the pressing operation. A manual operated lever is used to provide a sensitive "feel" that the tool has entered the connector correctly.

The ERNI European tools are all designed to be held in special tool holders which permit the tools to be changed easily for different connector lengths and styles. The tools are positioned within the tool holders by the use of captive spacers. For each connector style and length you will need the following: upper tool holder, upper insert, lower insert and lower tool holder. The lower holder has two dowel pins to position it on the table and the upper tool holder has a removable cylindrical collar designed for a 25 mm hole in the end of the press ram.

The lower tools are typically 60.0 mm high and the upper tools are designed to sit 40.0 mm above the printed circuit board. The tools do not require any end clearances and the female tools only require 0.6 mm clearance along the inboard edge of the connector.

For North American bench style press tooling see page 118.

Male Connectors	Upper Insert	Lower Insert
A25	220011	220026
B25	220012	220027
B22 - CompactPCI	220181	220182
B19 - CompactPCI	220173	220174
C11	220013	220028
D25	220244	220247
E25	220245	220248
DE	220410	220248
F11	220246	220249
L6 (Power Module)	220014	220029
M3 (Power Module)	220015	220030
N3 (Power Module)	220016	220031
L (Coax Contacts)	220420	220421
M (Coax Contacts)	220422	220423
N (Coax Contacts)	220424	220425
Male power module	220385	220386

Female Connectors	Upper Insert	Lower Insert
A25	220006	220020
B19 - CompactPCI	220175	220176
B22 - CompactPCI	220183	220184
B25	220006	220021
AB	220006	220021
C11	220007	220022
D25	220253	220250
E25	220253	220251
F11	220254	220252
L6	220008	220023
M3	220009	220024
N3	220010	220025
Female power module	220383	220384

Female Connectors with Upper Shield	Upper Insert	Lower Insert
A25	220093	220020
B19 - CompactPCI	220179	220176
B22 - CompactPCI	220187	220184
B25, AB25	220093	220021
C11	220096	220022
D25	220256	220250
E25	220256	220251
F11	220257	220252
M3	220322	220024

Vertical Female Connectors	Upper Insert	Lower Insert
A25	220204	220026
A19 - CompactPCI	220356	220174
B25	220204	220027
B19 - CompactPCI	220356	220174
B22 - CompactPCI	220357	220182
C11	220341	220028
D	220477	220247
E	220477	220248
F	220478	220249

Female Connectors with Lower Shield	Upper Insert	Lower Insert
A25, B25	220436	220437
B19	220449	220450
B22	220452	220451
C11	220453	220454
D25, E25	220455	220456
F11	220457	220458

Upper Holder	Part Number	
100 mm long with 20 mm diameter post	220001	
100 mm long with quick change slot	220002	
150 mm long with 20 mm diameter post	220188	
150 mm long with quick change slot	220003	
250 mm long with 20 mm diameter post	220004	
250 mm long with quick change slot	220005	

Lower Holder	Part Number	
100 mm long	220191	
150 mm long	220267	
250 mm long	220268	

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ERmet® 2mm Hard Metric Connectors

ERmet Repair Tooling



ERNI offers a wide assortment of application tooling, repair tooling and fixtures that have been designed for the 2mm connector line. We have also designed many special tools for specific customer applications. If you need a tool which you do not see described below, please contact your ERNI Customer Service Representative for assistance. ERNI applications engineers have many years of experience designing precise pressfit tooling for the most demanding requirements.

Description	ERNI Part Number
Tool Kit *(includes male contact removal tool-#924890, Punch Pin Guide R1/R2/R3 – #924102, and two replacement pins – #924989)*	914769
Male contact removal tool - P1/P2 terminals	924890
Replacement pin for 924890 and 924889	924989
Male contact removal tool - R1/R2/R3 terminals	924889
Male 8+2 contact pin installation tool	220308
Male 5+2 contact pin installation tool	220151
Special contact removal tool - modules L, M, N	044882
Hand crimping tool for high current contact	594184
Shroud clamp insertion tool 5+2	924788
Shroud clamp insertion tool 8+2	924882
Shroud clamp removal tool	914538
Shroud 8+2 pull-off tool	914590
Male connector and vertical female module A press out upper tool	220117
Male connector and vertical female module B press out upper tool	220195
Male connector and vertical female module C press out upper tool	220196
Male connector module D press out upper tool	220395
Male connector module E press out upper tool	220394
Male connector module F press out upper tool	220396
Male connector modules A, B, C press out lower tool	220193
Coding key installation tool	053593
Repair kit for contacts P1, P2 *(includes removal tool, insertion tool & contacts)*	914504
Repair kit for contacts R1, R2, R3 *(includes removal tool, insertion tool & contacts)*	914770
Female housing extraction pliers (requires necessary jaws)	220199
Type A & D jaw for female housing extraction pliers	220197
Type B & E jaw for female housing extraction pliers	220146
Type C & F jaw for female housing extraction pliers	220198
Female wafer 5+2 (chicklet) press out tool	220148
Female wafer 5+2 press out lower tool	220203
Female wafer 5+2 installation tool	220149
Drill guide for removing type A and C mounting pegs	220201
Long nose pliers for removing female wafers and male pins	914562
Punch Pin Guide – P1/P2	924101
Punch Pin Guide – R1/R2/R3	924102

Repair Contacts *	
Pin Type	**Part No.**
A	914774
B	914775
C	914776
D	914767
E	914767
F	914768
K	914777
L	914778
M	914779
N	914780
P	914781
Q	914782
R	914783
S	914784
T	914785

*** (Bags of 50)**

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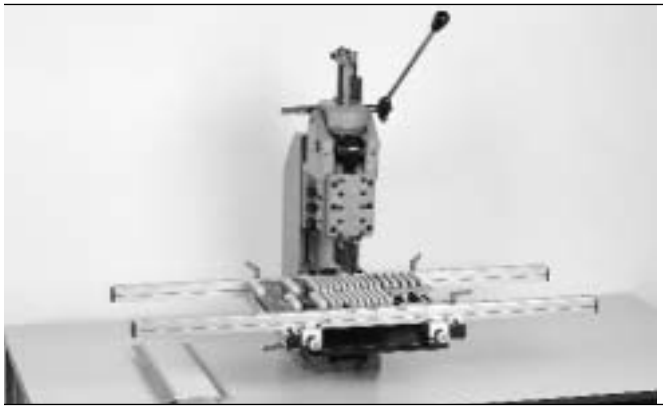
Presses

ERNI offers a wide variety of press machines for the assembly of pressfit connectors to backplanes and daughter cards. These presses range from manual to fully automatic.



Arbor Press with Sliding Table – Part# 801035

This European style toggle press is a precision manual press which is ideal for prototyping or low volume manufacturing applications. The over-center toggle action allows a large pressing force to be developed with little operator effort. This press comes with a base plate and x-y table configured to accommodate European style tools. This press has a 200 mm x 160 mm table, 130 mm throat depth. The x-y frame can accommodate a board up to 300 mm x 300 mm. The ram can press with 5000 pounds force. Net weight is 190 pounds.



Hydro Pneumatic Press I

This European style C frame hydro pneumatic press comes with a x-y table that will accommodate boards up to 300 mm x 300 mm. The ram will press 13,400 pounds force. The press table is drilled to accommodate the standard ERNI tool holders. Options include a retracting lower tool base and quick change upper tool holder.



Hydro Pneumatic Press II

This European style C frame hydro pneumatic press comes with a x-y table that will accommodate boards up to 300 mm x 300 mm. This press is ideal for low to medium volume manufacturing applications. A pressure sensor monitors the press force. The ram will press 13,400 pounds force. The press table is drilled to accommodate the standard ERNI tool holders. Options include a retracting lower tool base, quick change upper tool holder and a PCB thickness monitoring unit. The maximum tool holder length is 300 mm and the maximum stroke length is 46 mm.

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Presses



Right Angle Press

This European style, C frame hydro pneumatic press is designed specifically for 6U x 160 Eurocards. With two tooling positions, this press can complete the pressing operation on both the front edge and rear edge of the printed circuit board rapidly with one set up. This press is ideal for high volume applications. All connector pressing characteristics are stored within the on board Windows based PC. The computer can operate as a stand alone station or be networked for automatic back up. The ram can press with 13,400 pounds force.



EPC II

This press with automated X-Y motion can accommodate boards up to 500 mm x 500 mm, and holds up to 5 tools. This H frame press is designed for medium to large production runs where connectors will be preloaded before they are pressed in. Connectors up to 300 mm by 20 mm can be inserted in one stroke. PCB assembly programs are stored within the control system. Maximum press force is 22,400 lbs.



EPC I

This fully automatic pick and place press can accommodate boards sizes up to 800 mm x 800 mm and holds up to 10 tools in its automatic change station. This operator-free C frame press is designed for high speed assembly. This machine uses a vision system to confirm the pin alignment of the connector terminals before pressing and accurately monitors the press force. This machine can be provided with up to 5 linear feed lines and up to five vibratory bowl feeders. The ram can press with 13,400 pounds force.

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ERmet Design Supplements

Board Layouts

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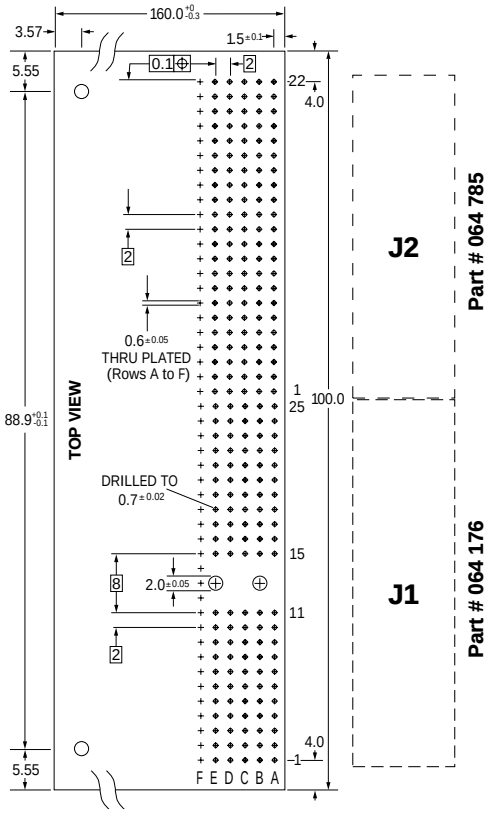
ERmet® 2mm Hard Metric Connectors

3U CompactPCI® Daughter Card Layout

The 3U CompactPCI® backplane and daughter card layouts are provided to clarify the contact numbering and connector nomenclature used within the specification.
As is typical of some telecommunication applications, the CompactPCI® specification numbers the signals and connectors from the bottom up. Manufacturers and users should note that the connectors themselves are labeled in accordance to IEC 61076-4-101 and prevailing industry practice from the top down.



Note that the backplane and daughter card are numbered in accordance with the CompactPCI® specification. The numbering on the connectors themselves is different and in accordance with the IEC 61076-4-101 standard.

For a complete description of the suggested parts, please see the summary on page 102. All dimensions are in millimeters (mm) unless otherwise noted.

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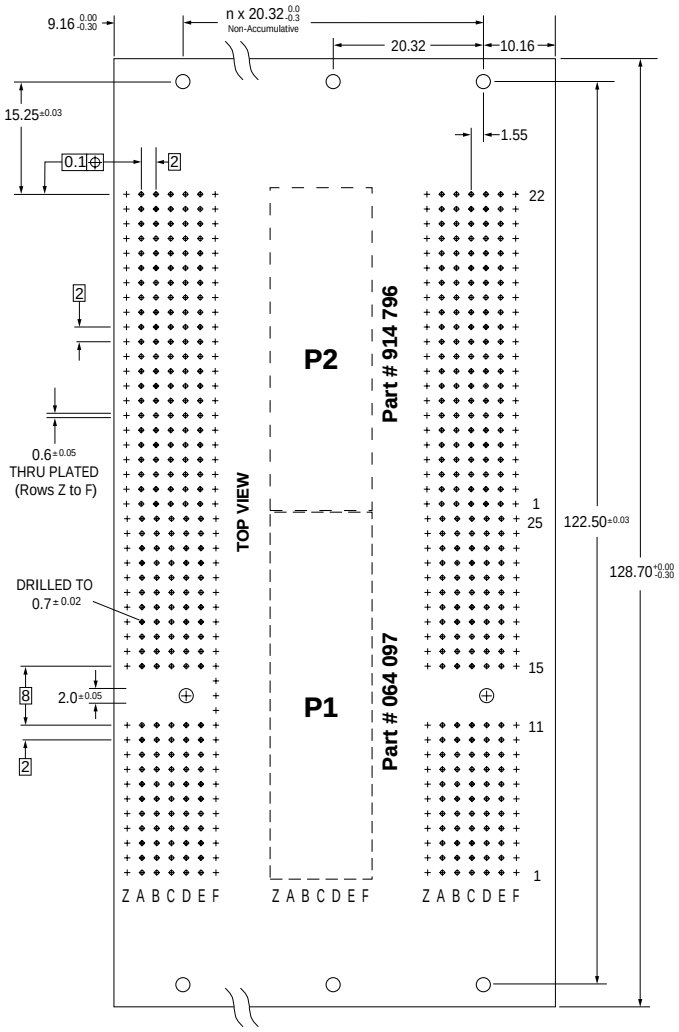
ERmet® 2mm Hard Metric Connectors

3U CompactPCI® Backplane Layout

The 3U CompactPCI® backplane layout is provided to clarify the contact numbering and connector nomenclature used within the specification.

As is typical of some telecommunication applications, the CompactPCI® specification numbers the signals and connectors from the bottom up. Manufacturers and users should note that the connectors themselves are labeled in accordance to IEC 61076-4-101 and prevailing industry practice from the top down.



Note that the backplane is numbered in accordance with the CompactPCI® specification. The numbering on the connectors themselves is different and in accordance with the IEC 61076-4-101 standard.

For a complete description of the suggested parts, please see the summary on page 102. All dimensions are in millimeters (mm) unless otherwise noted.

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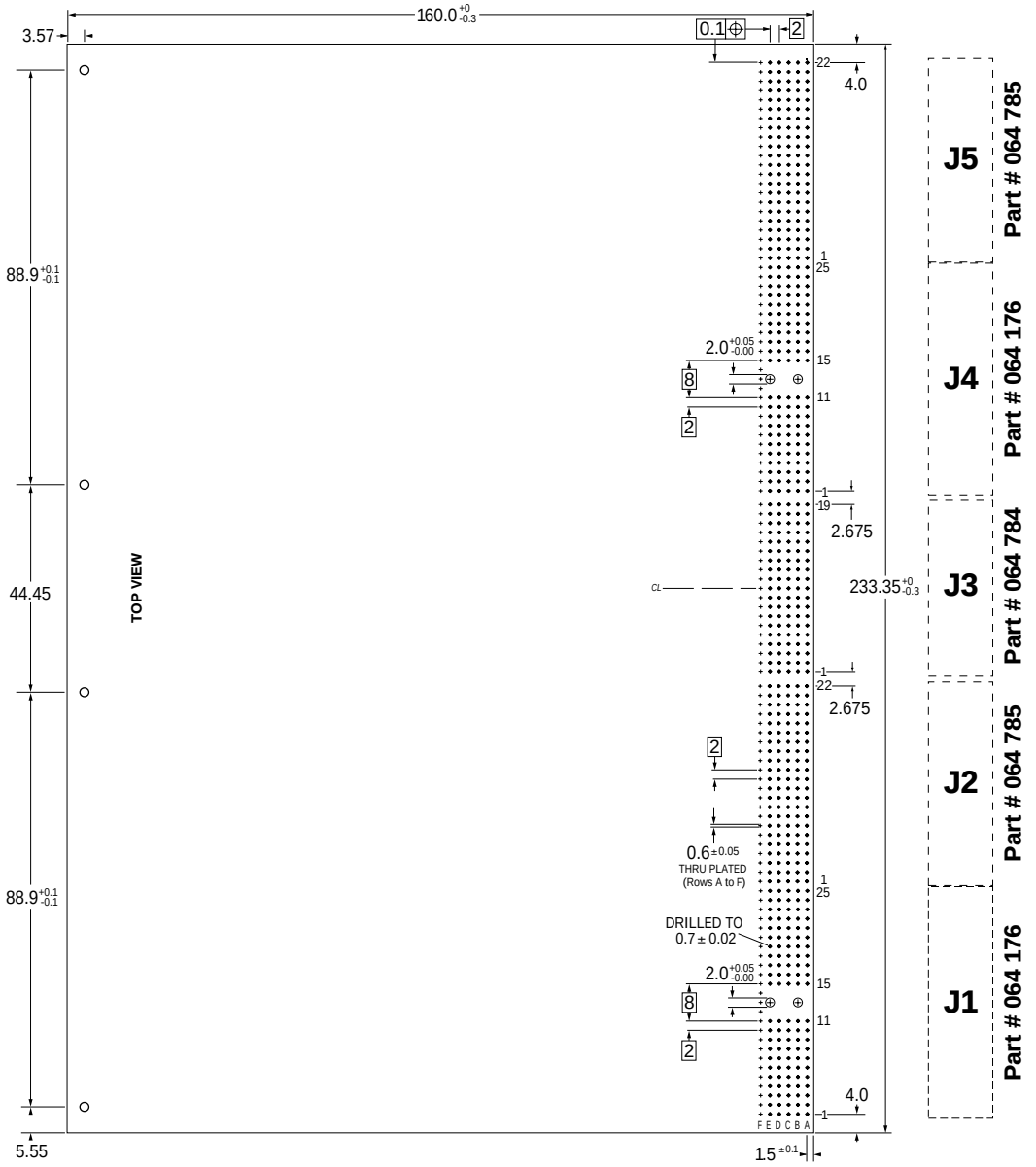
ERmet® 2mm Hard Metric Connectors

6U CompactPCI® Daughter Card Layout

The 6U CompactPCI® backplane layout is provided to clarify the contact numbering and connector nomenclature used within the specification.

As is typical of some telecommunication applications, the CompactPCI® specification numbers the signals and connectors from the bottom up. Manufacturers and users should note that the connectors themselves are labeled in accordance to IEC 61076-4-101 and prevailing industry practice from the top down.

In many applications, the J3, J4 and J5 connectors are used for user I/O. The J3 connector matches the VME64 extensions P0 connector exactly and falls symmetrically on the centerline of the daughter card. Designers should note that this connector is not on the same grid as the J1, J2, J4 and J5 connectors.



Note that the daughter card is numbered in accordance with the CompactPCI® specification. The numbering on the connectors themselves is different and in accordance with the IEC 61076-4-101 standard.

For a complete description of the suggested parts, please see the summary on page 102. All dimensions are in millimeters (mm) unless otherwise noted.

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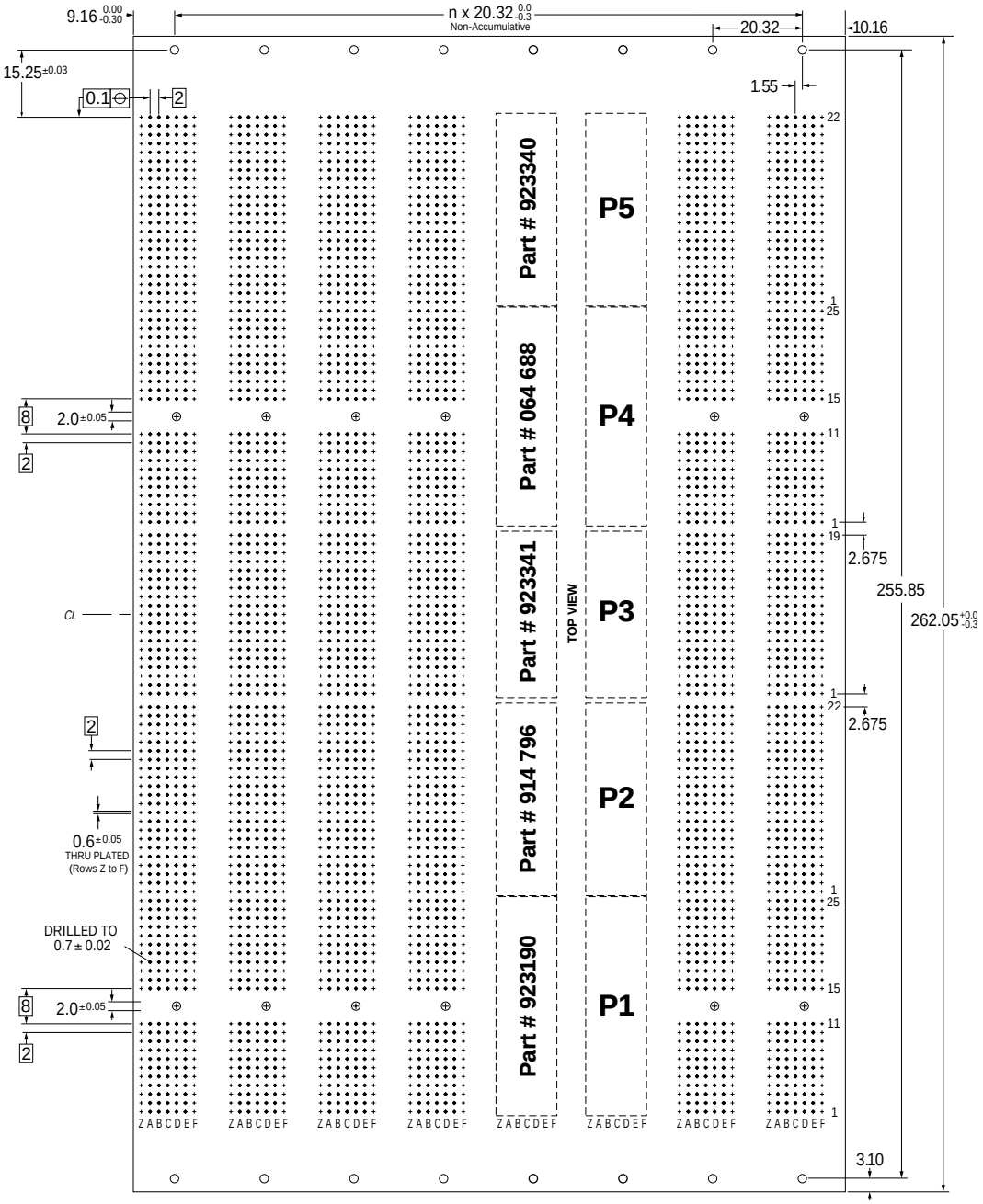
ERmet® 2mm Hard Metric Connectors

6U CompactPCI® Backplane Layout

The 6U CompactPCI® backplane layout is provided to clarify the contact numbering and connector nomenclature used within the specification.

As is typical of some telecommunication applications, the CompactPCI® specification numbers the signals and connectors from the bottom up. Manufacturers and users should note that the connectors themselves are labeled in accordance to IEC 61076-4-101 and prevailing industry practice from the top down.

In many applications, the P3, P4 and P5 connectors are designed for user I/O. Therefore connectors with 16 mm rear tails are used with shrouds installed on the rear side. The P3 connector matches the VME64 extensions J0 connector exactly, and falls symmetrically on the centerline of the backplane. Designers should note that this connector is not on the same grid as the P1, P2, P4 and P5 connectors.



Note that the backplane is numbered in accordance with the CompactPCI® specification. The numbering on the connectors themselves is different and in accordance with the IEC 61076-4-101 standard.

For a complete description of the suggested parts, please see the summary on page 102. All dimensions are in millimeters (mm) unless otherwise noted.

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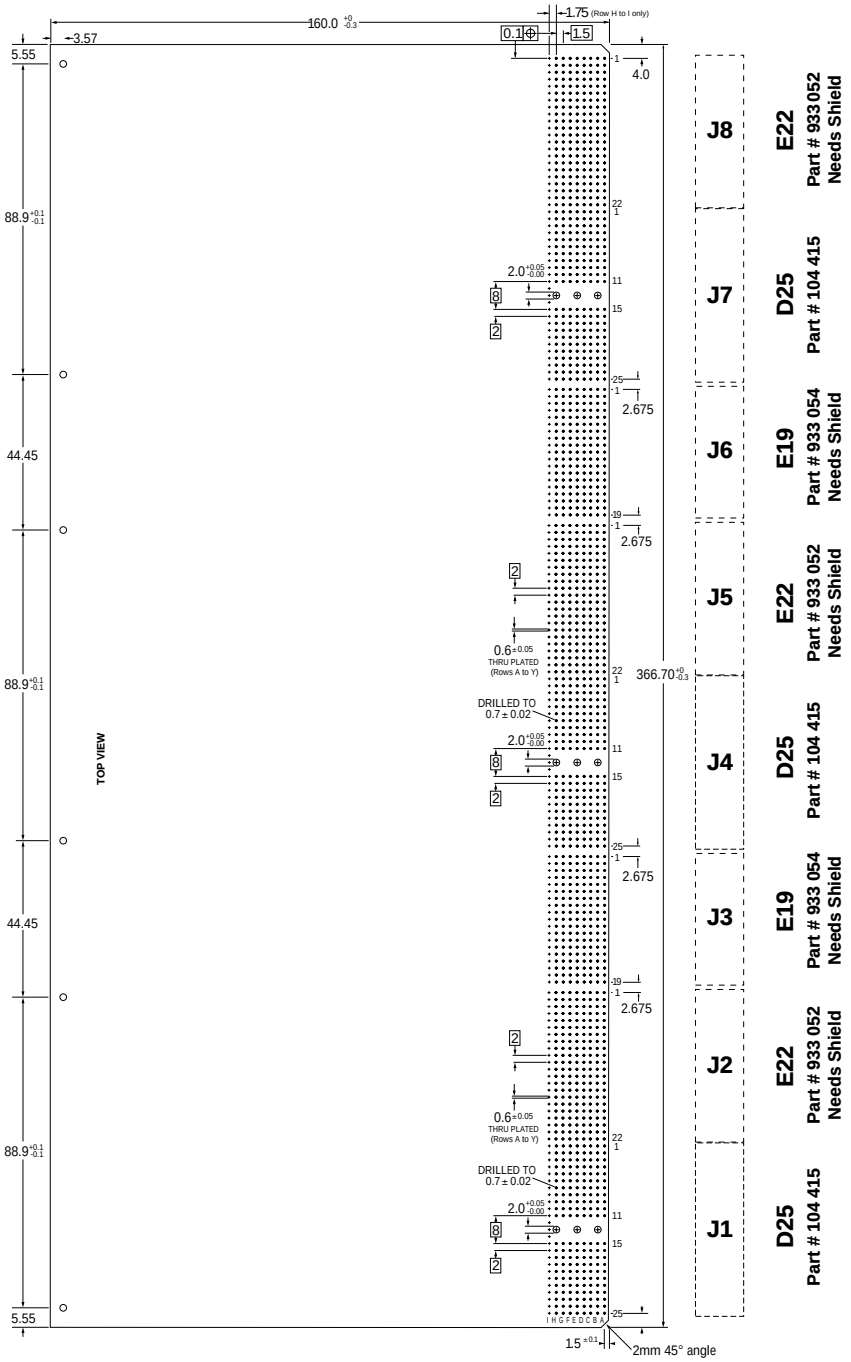
ERmet® 2mm Hard Metric Connectors

9U 10-Row 2mm Daughter Card Layout

This 9U eurocard compatible daughtercard layout is provided for designers who need over 1400 signal pins in a eurocard format. This is one of the highest I/O densities that is currently available in a eurocard format. This design is to be used with the ERmet 8+2 row connectors.



Note that the numbering scheme conforms with the Type V numbering as defined in ANSI/VITA30-2000 August 2000 and is from the top down. This numbering scheme is identical to the numbering established for the connector within the IEC 61076-4-101 standard.

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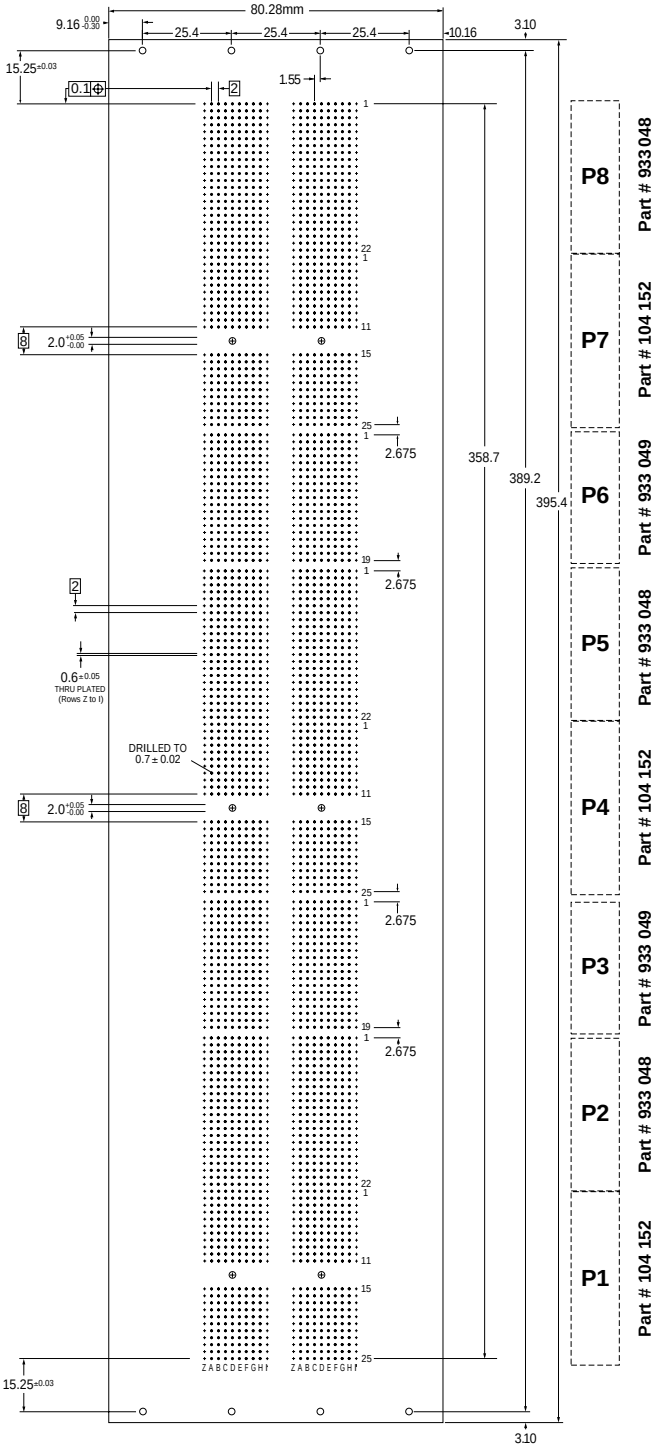
ERmet® 2mm Hard Metric Connectors

9U 10-Row 2mm Backplane Layout

This 9U eurocard compatible backplane layout is provided for designers who need over 1400 signal pins in a eurocard format. This is one of the highest I/O densities that is currently available in a eurocard format. This design is to be used with the ERmet 8+2 row connectors. Note that the backplane connectors have a 5HP or 25.4 mm slot to slot spacing.



Note that the numbering scheme conforms with the Type V numbering as defined in ANSI/VITA30-2000 August 2000 and is from the top down. This numbering scheme is identical to the numbering established for the connector within the IEC 61076-4-101 standard.

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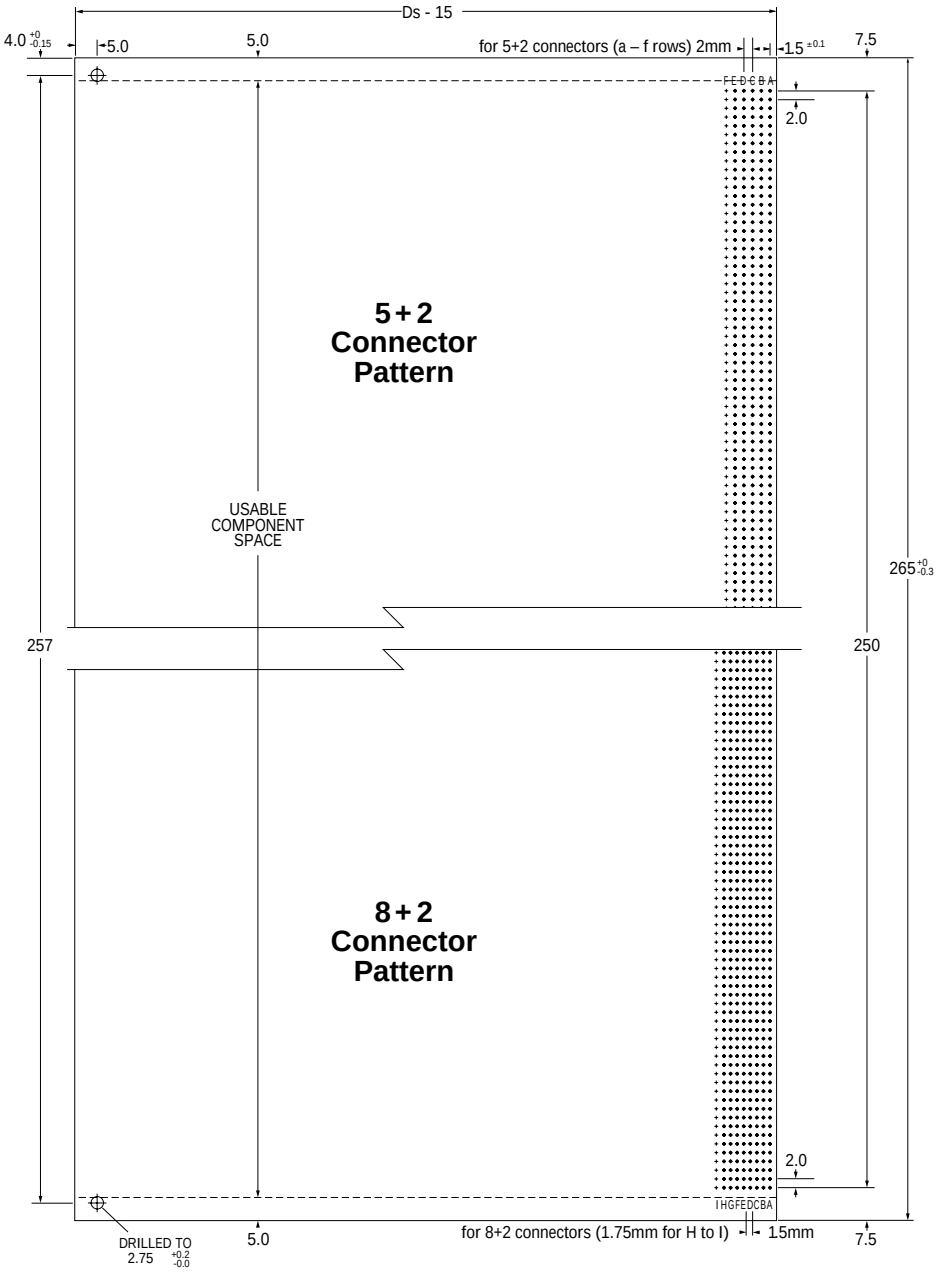
ERmet® 2mm Hard Metric Connectors

IEEE 1301 Daughter Cards for IEC 61076-4-101 2mm HM Connectors

The 2mm HM Connector was originally developed to be used within subrack and backplanes designed in accordance with IEEE 1301 Standard for Metric Equipment Practices for Microcomputers.

This was a standard that was popular with the large telecommunication companies.

Although IEEE 1301 never became as popular as the IEEE 1101 line of Eurocard Packaging, engineers still may occasionally need to layout daughter cards and backplanes to this standard.
Note that this layout is drawn to show both the connector grid for 5+2 row connectors and 8+2 row connectors.



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ERmet® 2mm Hard Metric Connectors

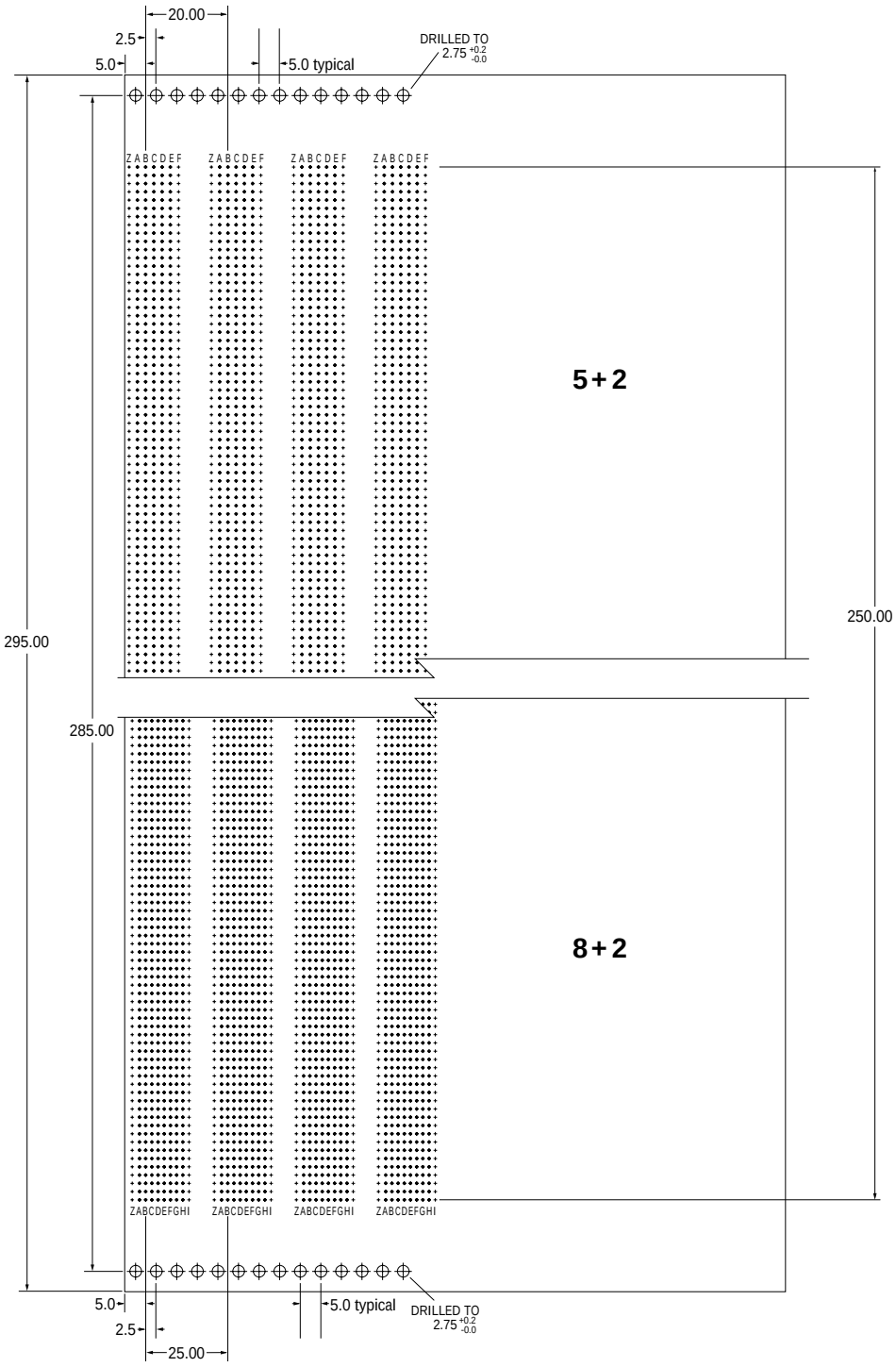
IEEE 1301 Backplane Layouts for IEC 61076-4-101 2mm HM Connectors

The 2mm HM Connector was originally developed to be used within subrack and backplanes designed in accordance with IEEE 1301 Standard for Metric Equipment Practices for Microcomputers.

This was a standard that was popular with the large telecommunication companies.

Although IEEE 1301 never became as popular as the IEEE 1101 line of Eurocard Packaging, engineers still may occasionally need to layout daughter cards and backplanes to this standard.

Note that this layout is drawn to show both the connector grid for 8+2 connectors and 5+2 row connectors. Although this standard defines multiple heights, this drawing is for the popular 12 SU height.



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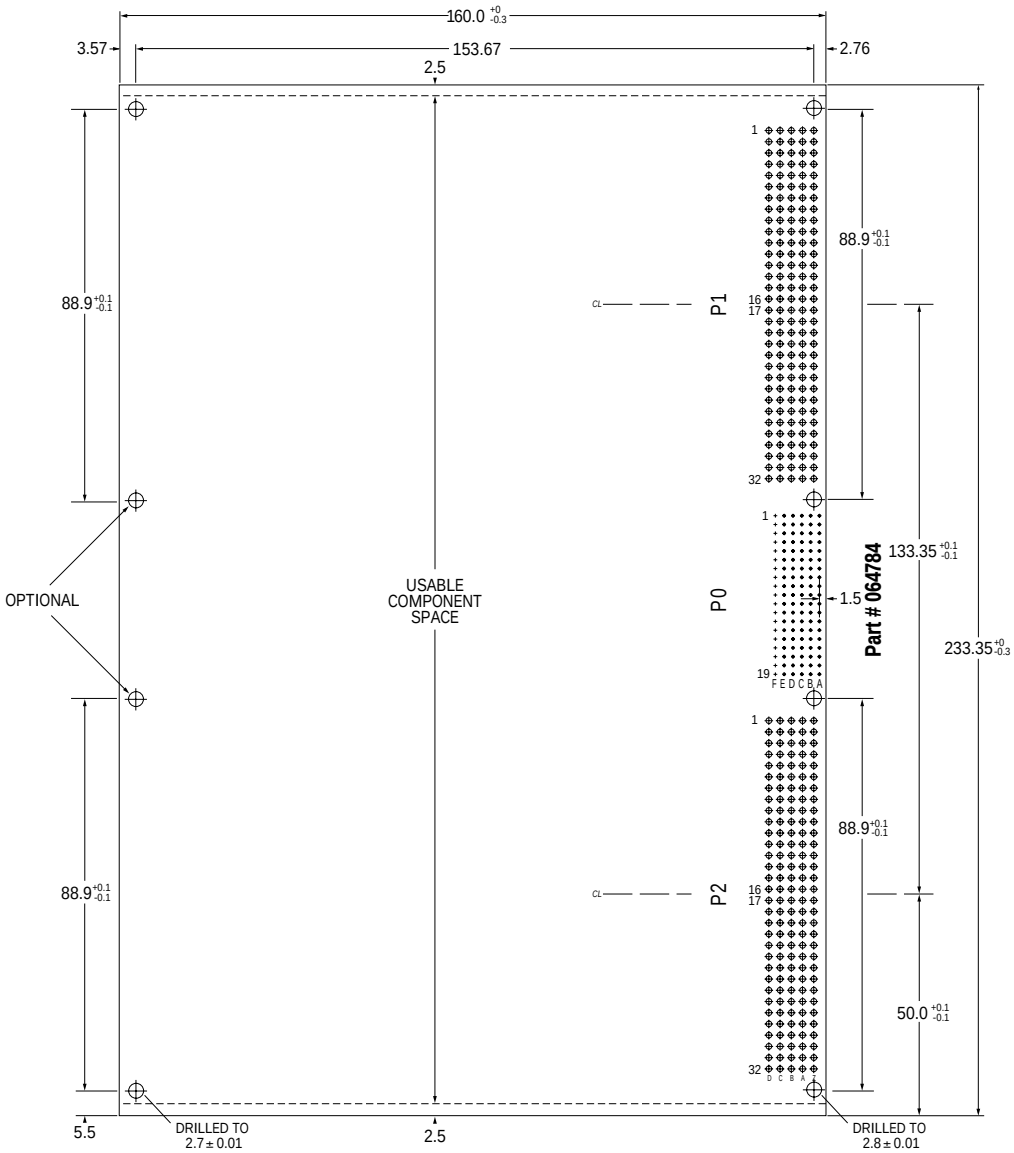
ERmet® 2mm Hard Metric Connectors

VME64 Extensions Daughter Card

The 6U VME64 Extensions document, IEEE 1101.10 defines the daughter card locations for a 2mm HM P0 connector. This connector is the same connector defined as the J3 connector defined in the VITA 30 2mm equipment practice and used for CompactPCI daughter cards.

Note that the 2mm HM connector is located symmetrically in between the upper P1 and lower P2 connectors. This connector is mounted 1.5 mm from the rear board edge but the 160 pin VME64x connector is mounted 2.76 mm from the rear board edge.



Note that the numbering of the P0 connector conforms to IEEE 1101.1 and 1101.10 and is from the top down. This also is the same numbering scheme established by the connector standard IEC 61076-4-101.

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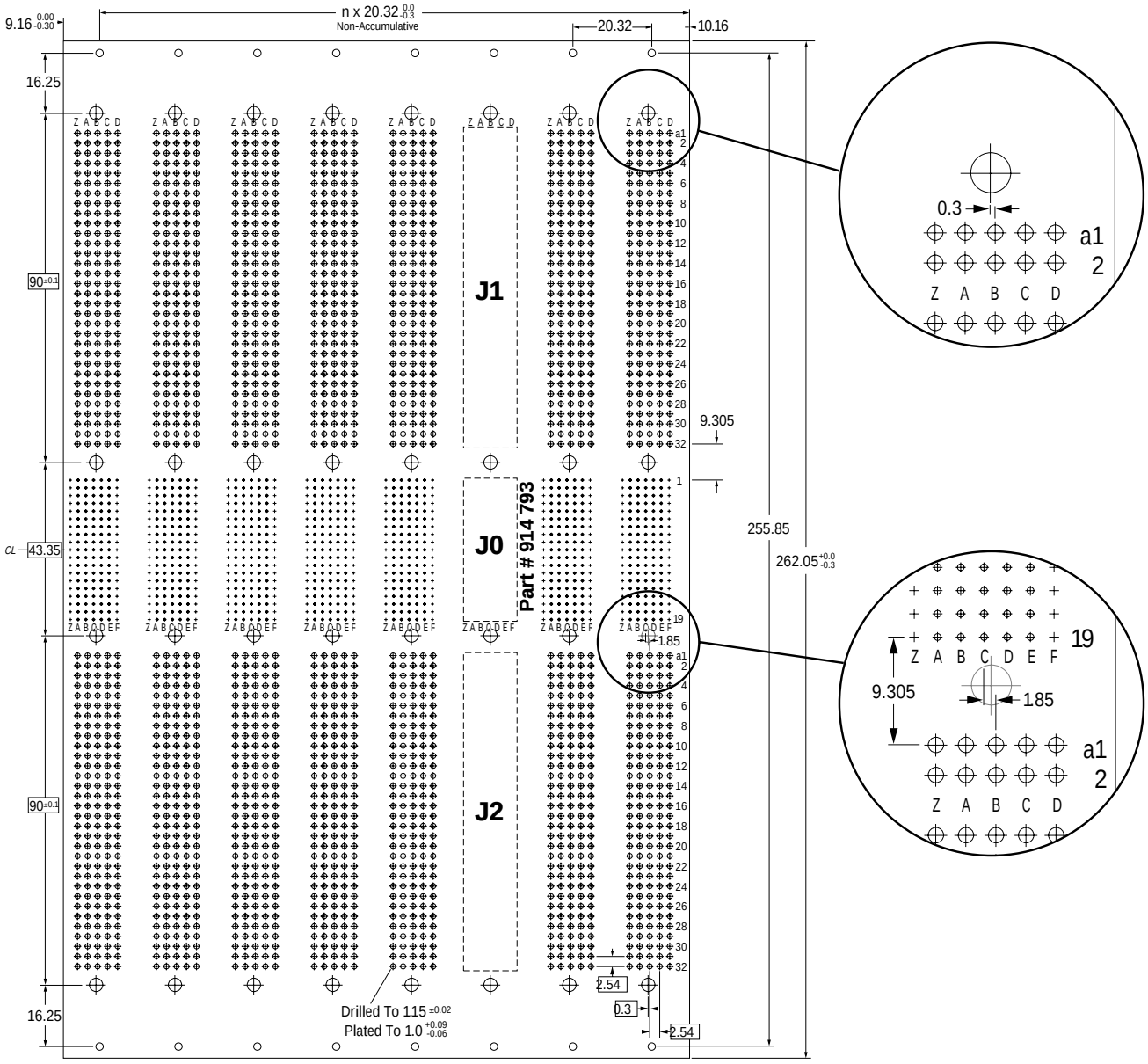
VME64 Extensions Backplane

The 6U VME64 Extensions backplane layout depicts the nomenclature and numbering conventions used in the IEEE 1101.10 draft standard. The J0 center connector is the same 19 position ERmet 2mm H. M. connector used in CompactPCI®.

The design of this connector allows it to mate properly with the J1 and J2 connectors which are in accordance with DIN 41612. Note that there is a 1.85 mm offset between the "C" row of the J0 connector and the "B" row of the 2.54 mm (.100") J1/J2 connectors. On the daughter card, pin 10 of the P0 connector falls exactly on the board's centerline, and pin "A 1" is placed 1.5 mm from the board's edge.



Note that the numbering of the P0 connector conforms to IEEE 1101.1 and 1101.10 and is from the top down. This also is the same numbering scheme established by the connector standard IEC 61076-4-101.

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ERmet® 2mm Hard Metric Connectors

64 Bit CompactPCI® System Slot Pin Assignments

In the case of the 64 bit CompactPCI®, both the P1 and P2 connectors are fully assigned with no pins available for user defined I/O. For such systems, only 6U designs can have rear panel I/O.

Although CompactPCI® is designed to be accomplished on 3U cards, 6U implementations provide optional P3, P4 and P5 connectors, which all have undefined pins for user I/O. 6U CompactPCI® provides more user defined pins than any other bus structure today.

PIN	Z[10]	A	B	C	D	E	F	
22	GND	GA4[6]	GA3[6]	GA2[6]	GA1[6]	GA0[6]	GND	
21	GND	CLK6	GND	RSV	RSV	RSV	GND	
20	GND	CLK5	GND	RSV	GND	RSV	GND	
19	GND	GND	GND	RSV[9]	RSV[9]	RSV[9]	GND	P2
18	GND	BRSVP2A18	BRSVP2B18	BRSVP2C18	GND[8]	BRSVP2E18	GND	
17	GND	BRSVP2A17	GND	PRST#	REQ6#	GNT6#	GND	
16	GND	BRSVP2A16	BRSVP2B16	DEG#	GND	BRSVP2E16	GND	
15	GND	BRSVP2A15	GND	FAL#	REQ5#	GNT5#	GND	
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND	C
13	GND	AD[38]	GND	V(I/O)[3]	AD[37]	AD[36]	GND	O
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND	N
11	GND	AD[45]	GND	V(I/O)[3]	AD[44]	AD[43]	GND	N
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND	E
9	GND	AD[52]	GND	V(I/O)[3]	AD[51]	AD[50]	GND	C
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND	T
7	GND	AD[59]	GND	V(I/O)[3]	AD[58]	AD[57]	GND	O
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND	R
5	GND	C/BE[5]#	GND	V(I/O)[3]	C/BE[4]#	PAR64	GND	
4	GND	V(I/O)[3]	BRSVP2B4	C/BE[7]#	GND	C/BE[6]#	GND	
3[3]	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND	
2[3]	GND	CLK2	CLK3	SYSEN#[4]	GNT2#	REQ3#	GND	
1[3]	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND	
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND	
24	GND	AD[1]	5V	V(I/O)[3][1]	AD[0]	ACK64#	GND	
23	GND	3.3V	AD[4]	AD[3]	5V[1]	AD[2]	GND	
22	GND	AD[7]	GND	3.3V[1]	AD[6]	AD[5]	GND	
21	GND	3.3V	AD[9]	AD[8]	M66EN[5]	C/BE[0]#	GND	
20	GND	AD[12]	GND	V(I/O)[3]	AD[11]	AD[10]	GND	P1
19	GND	3.3V	AD[15]	AD[14]	GND[1]	AD[13]	GND	
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND	
17	GND	3.3V	IPMBSCL	IPMBSDA	GND[1]	PERR#	GND	
16	GND	DEVSEL#	GND	V(I/O)[1],[3]	STOP#	LOCK#	GND	
15	GND	3.3V	FRAME#	IRDY#	GND[2]	TRDY#	GND	
12-14	KEY AREA							
11	GND	AD[18]	AD[17]	AD[16]	GND[1]	C/BE[2]#	GND	C
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND	O
9	GND	C/BE[3]#	GND[2]	AD[23]	GND[1]	AD[22]	GND	N
8	GND	AD[26]	GND	V(I/O)[3]	AD[25]	AD[24]	GND	N
7	GND	AD[30]	AD[29]	AD[28]	GND[1]	AD[27]	GND	E
6	GND	REQ0#	GND	3.3V[1]	CLK0	AD[31]	GND	C
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND[1]	GNT0#	GND	T
4	GND	IPMB PWR	HEALTHY#[7]	V(I/O)[3][1]	INTP	INTS	GND	O
3	GND	INTA#	INTB#	INTC#	5V[1]	INTD#	GND	R
2	GND	TCK[8]	5V	TMS[8]	TDO[8]	TDI[8]	GND	
1	GND	5V	-12V	TRST#[8]	+12V	5V	GND	
PIN	Z[10]	A	B	C	D	E	F	

Per CompactPCI® Specification 2.0 D3.0, June 21, 1999, Table 13

(1) Early mate pins.
(2) Late mate pins.
(3) 3.3 V or 5.0 V.
(4) Grounded in system slot.
(5) Ground for a 33 MHz backplane. Bussed slot to slot in 66 MHz systems.
(6) Each slot may have a unique geographic address encoding. See the CompactPCI® specification for details.
(7) Backplane must leave pin open and provide # bypass capacitor.
(8) JTAG is being discouraged. These pins will be redefined.
(9) To be used for I^2C bus.
(10) Daughtercards do not make use of “z” row grounds.

Note: Chart numbering conforms to the CompactPCI® specification. Connector numbering is from top to bottom in accordance with the IEC standard.

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ERmet® 2mm Hard Metric Connectors

64 Bit CompactPCI® Peripheral Slot Pin Assignments

In the case of the 64 bit CompactPCI®, both the P1 and P2 connectors are fully assigned with no pins available for user defined I/O. For such systems, only 6U designs can have rear panel I/O.

Although CompactPCI® is designed to be accomplished on 3U cards, 6U implementations provide optional P3, P4 and P5 connectors, which all have undefined pins for user I/O. 6U CompactPCI® provides more user defined pins than any other bus structure today.

PIN	Z(10)	A	B	C	D	E	F	
22	GND	GA4(6)	GA3(6)	GA2(6)	GA1(6)	GA0(6)	GND	
21	GND	RSV	RSV	RSV	RSV	RSV	GND	
20	GND	RSV	RSV	RSV	GND	RSV	GND	
19	GND	RSV	RSV	RSV	RSV	RSV	GND	P2
18	GND	BRSVP2A18	BRSVP2B18	BRSVP2C18	GND	BRSVP2E18	GND	
17	GND	BRSVP2A17	GND	RSV	RSV	RSV	GND	
16	GND	BRSVP2A16	BRSVP2B16	RSV	GND(8)	BRSVP2E16	GND	
15	GND	BRSVP2A15	GND	RSV	RSV	RSV	GND	
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND	
13	GND	AD[38]	GND	V(I/O)(3)	AD[37]	AD[36]	GND	
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND	
11	GND	AD[45]	GND	V(I/O)(3)	AD[44]	AD[43]	GND	
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND	
9	GND	AD[52]	GND	V(I/O)(3)	AD[51]	AD[50]	GND	
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND	
7	GND	AD[59]	GND	V(I/O)(3)	AD[58]	AD[57]	GND	
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND	
5	GND	C/BE[5]#	GND	V(I/O)(3)	C/BE[4]#	PAR64	GND	
4	GND	V(I/O)(3)	BRSVP2B4	C/BE[7]#	GND	C/BE[6]#	GND	
3(3)	GND	RSV	GND	RSV	RSV	RSV	GND	
2(3)	GND	RSV	RSV	UNC(4)	RSV	RSV	GND	
1(3)	GND	RSV	GND	RSV	RSV	RSV	GND	
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND	
24	GND	AD[1]	5V	V(I/O)(3)(1)	AD[0]	ACK64#	GND	
23	GND	3.3V	AD[4]	AD[3]	5V(1)	AD[2]	GND	
22	GND	AD[7]	GND	3.3V(1)	AD[6]	AD[5]	GND	
21	GND	3.3V	AD[9]	AD[8]	M66EN(4)(5)	C/BE[0]#	GND	
20	GND	AD[12]	GND	V(I/O)(3)	AD[11]	AD[10]	GND	P1
19	GND	3.3V	AD[15]	AD[14]	GND(1)	AD[13]	GND	
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND	
17	GND	3.3V	IPMBSCL	IPMBSDA	GND(1)	PERR#	GND	
16	GND	DEVSEL#	GND	V(I/O)(3)	STOP#	LOCK#	GND	
15	GND	3.3V	FRAME#	IRDY#	BD SEL#(2)	TRDY#	GND	
12-14	KEY AREA							
11	GND	AD[18]	AD[17]	AD[16]	GND(1)	C/BE[2]#	GND	
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND	
9	GND	C/BE[3]#	IDSEL(2)	AD[23]	GND(1)	AD[22]	GND	
8	GND	AD[26]	GND	V(I/O)(3)	AD[25]	AD[24]	GND	
7	GND	AD[30]	AD[29]	AD[28]	GND(1)	AD[27]	GND	
6	GND	REQ#	GND	3.3V(1)	CLK	AD[31]	GND	
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND(1)	GNT#	GND	
4	GND	IPMB PWR	HEALTHY(7)	V(I/O)(3)(1)	INTP	INTS	GND	
3	GND	INTA#	INTB#	INTC#	5V(1)	INTD#	GND	
2	GND	TCK(8)	5V	TMS(8)	TDO(8)	TDI(8)	GND	
1	GND	5V	-12V	TRST#(8)	+12V	5V	GND	
PIN	Z(10)	A	B	C	D	E	F	

Per CompactPCI® Specification 2.0 D3.0, June 21, 1999, Table 13

(1) Early mate pins.
(2) Late mate pins.
(3) 3.3 V or 5.0 V.
(4) Grounded in system slot.
(5) Ground for a 33 MHz backplane. Bussed slot to slot in 66 MHz systems.
(6) Each slot may have a unique geographic address encoding. See the CompactPCI® specification for details.
(7) Backplane must leave pin open and provide # bypass capacitor.
(8) JTAG is being discouraged. These pins will be redefined.
(9) To be used for I²C bus.
(10) Daughtercards do not make use of “z” row grounds.

Note: Chart numbering conforms to the CompactPCI® specification. Connector numbering is from top to bottom in accordance with the IEC standard.

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ERmet® 2mm Hard Metric Connectors

32 Bit CompactPCI® System Slot Pin Assignments

The CompactPCI® specification defines a 32 bit implementation. The 32 bit implementation makes the entire P2/J2 connector (upper) available for user defined I/O for slots 2-8. The controller card slot (usually slot 1) makes use of some P2 pins for such functions as clock, arbitration, grant/requests and some other system functions.

In many 32 bit systems, the backplane connector in the P2 position will have 16 mm rear tails and a shroud so I/O signals may pass through the backplane to rear mounted cards or cable assemblies.

PIN	Z(6)	A	B	C	D	E	F	
22	GND	GA4(5)	GA3(5)	GA2(5)	GA1(5)	GA0(5)	GND	
21	GND	CLK6#	GND	BP(I/O)	BP(I/O)	BP(I/O)	GND	
20	GND	CLK5#	GND	BP(I/O)	BP(I/O)	BP(I/O)	GND	
19	GND	GND	GND	BP(I/O)(9)	BP(I/O)(9)	BP(I/O)(9)	GND	
18	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	P2
17	GND	BP(I/O)	BP(I/O)	PRST#	REQ6#	GNT6#	GND	
16	GND	BP(I/O)	BP(I/O)	DEG#	GND	BP(I/O)	GND	
15	GND	BP(I/O)	BP(I/O)	FAL#	REQ5#	GNT5#	GND	
14	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	C
13	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	O
12	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	N
11	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	N
10	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	E
9	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	C
8	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	T
7	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	O
6	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	R
5	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
4	GND	V(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND	
2	GND	CLK2	CLK3	SYSEN#(10)	GNT2#	REQ3#	GND	
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND	
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND	
24	GND	AD[1]	5V	V(I/O)(3) (1)	AD[0]	ACK64#	GND	
23	GND	3.3V	AD[4]	AD[3]	5V(1)	AD[2]	GND	
22	GND	AD[7]	GND	3.3V(1)	AD[6]	AD[5]	GND	
21	GND	3.3V	AD[9]	AD[8]	M66EN(4)	C/BE[0]#	GND	
20	GND	AD[12]	GND	V(I/O)(3)	AD[11]	AD[10]	GND	P1
19	GND	3.3V	AD[15]	AD[14]	GND(1)	AD[13]	GND	
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND	
17	GND	3.3V	IPMBSCL	IPMBSDA	GND(1)	PERR#	GND	
16	GND	DEVSEL	GND	V(I/O)(1),(3)	STOP#	LOCK#	GND	
15	GND	3.3v	FRAME#	IRDY	GND(2)	TRDY#	GND	C
12-14	KEY AREA							O
11	GND	AD[18]	AD[17]	AD[16]	GND(1)	C/BE[2]#	GND	N
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND	N
9	GND	C/BE[3]#	GND(2)	AD[23]	GND(1)	AD[22]	GND	E
8	GND	AD[26]	GND	V(I/O)(3)	AD[25]	AD[24]	GND	C
7	GND	AD[30]	AD[29]	AD[28]	GND(1)	AD[27]	GND	T
6	GND	REQ0#	GND	3.3V(1)	CLK	AD[31]	GND	O
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND(1)	GNT0#	GND	R
4	GND	IPMB PWR	HEALTHY#(7)	V(I/O)(3) (1)	INTP	INTS	GND	
3	GND	INTA#	INTB#	INTC#	5V(1)	INTD#	GND	
2	GND	TCK(8)	5V	TMS(8)	TDO(8)	TDI(8)	GND	
1	GND	5V	-12V	TRST#(8)	+12V	5V	GND	
PIN	Z(6)	A	B	C	D	E	F	

Per CompactPCI® Specification 2.0 D3.0, June 21, 1999, Table 16

(1) Early mate pins.
(2) Late mate pins.
(3) 3.3 V or 5.0 V.
(4) Grounded in 33 MHz backplane. Bussed slot to slot in 66 MHz systems
(5) Each slot may have a unique geographic address encoding. See the CompactPCI® specification for details.
(6) Daughter cards do not make use of the “Z” row grounds.
(7) Backplane must leave pin open and provide # bypass capacitor.
(8) JTAG is being discouraged. These pins will be redefined.
(9) To be used for I^2C bus.
(10) Grounded in system slot.

Notes: All P2 terminals should be 16 mm long with shroud installed unless they are used for a secondary bus.
Chart numbering conforms to the CompactPCI® specification. Connector numbering is from top to bottom in accordance with the IEC standard.

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ERmet® 2mm Hard Metric Connectors

32 Bit CompactPCI® Peripheral Slot Pin Assignments

The CompactPCI® specification defines a 32 bit implementation. The 32 bit implementation makes the entire P2/J2 connector (upper) available for user defined I/O for slots 2-8. The controller card slot (usually slot 1) makes use of some P2 pins for such functions as clock, arbitration, grant/requests and some other system functions.

In many 32 bit systems, the backplane connector in the P2 position will have 16 mm rear tails and a shroud so I/O signals may pass through the backplane to rear mounted cards or cable assemblies.

PIN	Z(6)	A	B	C	D	E	F	
22	GND	GA4(5)	GA3(5)	GA2(5)	GA1(5)	GA0(5)	GND	P2 CONNECTOR
21	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
20	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
19	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
18	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
17	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
16	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
15	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
14	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
13	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
12	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
11	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
10	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
9	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
8	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
7	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
6	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
5	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
4	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
3	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
2	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
1	GND	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	BP(I/O)	GND	
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND	P1 CONNECTOR
24	GND	AD[1]	5V	V(I/O)(3) (1)	AD[0]	ACK64#	GND	
23	GND	3.3V	AD[4]	AD[3]	5V(1)	AD[2]	GND	
22	GND	AD[7]	GND	3.3V(1)	AD[6]	AD[5]	GND	
21	GND	3.3V	AD[9]	AD[8]	M66EN(4)	C/BE[0]#	GND	
20	GND	AD[12]	GND	V(I/O)(3)	AD[11]	AD[10]	GND	
19	GND	3.3V	AD[15]	AD[14]	GND(1)	AD[13]	GND	
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND	
17	GND	3.3V	IPMBSCL	IPMBSDA	GND(1)	PERR#	GND	
16	GND	DEVSEL	GND	V(I/O)(1),(3)	STOP#	LOCK#	GND	
15	GND	3.3v	FRAME#	IRDY	BD SEL#(2)	TRDY#	GND	
12-14	KEY AREA							
11	GND	AD[18]	AD[17]	AD[16]	GND(1)	C/BE[2]#	GND	
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND	
9	GND	C/BE[3]#	IDSEL(2)	AD[23]	GND(1)	AD[22]	GND	
8	GND	AD[26]	GND	V(I/O)(3)	AD[25]	AD[24]	GND	
7	GND	AD[30]	AD[29]	AD[28]	GND(1)	AD[27]	GND	
6	GND	REQ#	GND	3.3V(1)	CLK	AD[31]	GND	
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND(1)	GNT#	GND	
4	GND	IPMB PWR	HEALTHY#(7)	V(I/O)(3) (1)	INTP	INTS	GND	
3	GND	INTA#	INTB#	INTC#	5V(1)	INTD#	GND	
2	GND	TCK(8)	5V	TMS(8)	TDO(8)	TDI(8)	GND	
1	GND	5V	-12V	TRST#(8)	+12V	5V	GND	
PIN	Z(6)	A	B	C	D	E	F	

Per CompactPCI® Specification 2.0 D3.0, June 21, 1999, Table 14

(1) Early mate pins.
(2) Late mate pins.
(3) 3.3 V or 5.0 V.
(4) Grounded in 33 MHz backplane. Bussed slot to slot in 66 MHz systems
(5) Each slot may have a unique geographic address encoding. See the CompactPCI® specification for details.
(6) Daughter cards do not make use of the “Z” row grounds.
(7) Backplane must leave pin open and provide # bypass capacitor.
(8) JTAG is being discouraged. These pins will be redefined.

Notes: All P2 terminals should be 16 mm long with shroud installed unless they are used for a secondary bus.
Chart numbering conforms to the CompactPCI® specification. Connector numbering is from top to bottom in accordance with the IEC standard.

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ERmet® 2mm Hard Metric Connectors

cPCI Computer Telephony P4 Pin Assignments

Mechanical Specifications - Backplane and Chassis

Pos#	Row Z		Row A		Row B		Row C		Row D		Row E		Row F	
25	NP		SGA4	M	SGA3	M	SGA2	M	SGA1	M	SGA0	M	FG	L
24	NP		GA4	M	GA3	M	GA2	M	GA1	M	GAO	M	FG	L
23	NP		+12V	M	/CT_Reset	M	/CT_EN	S	-12v	M	CT_MC	M	FG	L
22	NP		PFSO#	M	RSVD	M	RSVD	M	RSVD	M	RSVD	M	FG	L
21	NP		-SELbat	L	PFS1#	M	RSVD	M	RSVD	M	SELVbatRtN	L	FG	L
20	NP		NP		NP		NP		NP		NP		NP	
19	NP		NP		NP		NP		NP		NP		NP	
18	NP		VRG	M	NP		NP		NP		VRGTN	M	NP	
17	NP		NP		NP		NP		NP		NP		NP	
16	NP		NP		NP		NP		NP		NP		NP	
15	NP		-VBAT	L	NP		NP		NP		VBATRTN	L	NP	
12-14														
11	NP		CT_D29	M	CT_D30	M	CT_D31	M	V(I/O)	L	/CT_FRAME_A	M	GND	L
10	NP		CT_D27	M	+3.3V	M	CT_D28	M	+5V	L	/CT_FRAME_B	M	GND	L
9	NP		CT_D24	M	CR_D25	M	CT_D26	M	GND	L	/FR_COMP	M	GND	L
8	NP		CT_D21	M	CT_D22	M	CT_D23	M	+5V	L	CT_C8_A	M	GND	L
7	NP		CT_D19	M	+5V	M	CT_D20	M	GND	L	CT_C8_B	M	GND	L
6	NP		CT_D16	M	CT_C17	M	CT_D18	M	GND	L	CT_NETREF_1	M	GND	L
5	NP		CT_D13	M	CT_D14	M	CT_D15	M	+3.3V	L	CT_NETREF_2	M	GND	L
4	NP		CT_D11	M	+5V	M	CT_D12	M	+3.3V	L	SCLK	M	GND	L
3	NP		CT_D8	M	CT_D9	M	CT_D10	M	GND	L	SCLK-D	M	GMD	L
2	NP		CT_D4	M	CT_D5	M	CT_D6	M	CT_D7	M	GND	L	GND	L
1	NP		CT_D0	M	+3.3V	M	CTP_D1	M	CT_D2	M	CT_D3	M	GND	L

Per CompactPCI® Specification PICMG 2.5 R1.0, April 3, 1998, Table 1

Key to P4 Pin Assignments

Ct_name	= H.110 TDM bus signals
+5V	= +5V power
+3.3V	= +3.3V power
GND	= LOGIC GROUND
V(I/O)	= I/O cell power
FG	= Frame Ground
RSVD	= reserved for future use
NP	= a pin and pad to Not be Populated
-SELVbat	= short loop battery
SELVbatRtn	= short loop battery return
-Vbat	= telecom power distribution bus
VbatRtn	= return bus pin for -Vbat
SGA0-SGA4	= shelf enumeration bus signals
GA0-GA4	= slot ID signals; not bussed
VRG	= bus for ringing voltage
VRGRtn	= bus for ringing voltage
PFS0#-PFS1#	= busses for power fail sense
KEY AREA	= area utilized for key
S	= Short (Level 1) front side pins
M	= Medium (Level 2) front side pins
L	= Long (Level 3) front side pins

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cPCI Computer Telephony Safety Classifications for J4/P4

Pos#	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25	SELV						
24							
23							
22							
21							
20	NP	NP	NP	NP	NP	NP	NP
19	NP	NP	NP	NP	NP	NP	NP
18	NP	HAZ	IN/C-NP	IN/C-NP	IN/C-NP	HAZ	NP
17	NP	NP	NP	NP	NP	NP	NP
16	NP	NP	NP	NP	NP	NP	NP
15	NP	HAZ	IN/C-NP	IN/C-NP	IN/C-NP	HAZ	NP
14	KEY AREA (keep unobstructed on backplane to ease routing constraints)						
13							
12							
11	SELV						
10							
9							
8							
7							
6							
5							
4							

Per CompactPCI® Computer Telephony Specification PICMG 2.5 R1.0, April 3, 1998, Table 11

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ERmet® 2mm Hard Metric Connectors

cPCI Computer Telephony P5 Pin Assignments

Pos#	Row Z		Row A		Row B		Row C		Row D		Row E		Row F	
22	NP-IN/C	U	T1	S	T9	S	T17	S	T25	S	IN/C	S	GND-IN/C	L
21	NP-IN/C	U	R1	S	R9	S	R17	S	R25	S	IN/C	S	GND-IN/C	L
20	NP-IN/C	U	T2	S	T10	S	T18	S	T26	S	IN/C	S	GND-IN/C	L
19	NP-IN/C	U	R2	S	R10	S	R18	S	R26	S	IN/C	S	GND-IN/C	L
18	NP-IN/C	U	T3	S	T11	S	T19	S	T27	S	IN/C	S	GND-IN/C	L
17	NP-IN/C	U	R3	S	R11	S	R19	S	R27	S	IN/C	S	GND-IN/C	L
16	NP-IN/C	U	T4	S	T12	S	T20	S	T28	S	IN/C	S	GND-IN/C	L
15	NP-IN/C	U	R4	S	R12	S	R20	S	R28	S	IN/C	S	GND-IN/C	L
13	NP-IN/C	U	R5	S	R13	S	R21	S	R29	S	IN/C	S	GND-IN/C	L
12	NP-IN/C	U	T6	S	T14	S	T22	S	T30	S	IN/C	S	GND-IN/C	L
11	NP-IN/C	U	R6	S	R14	S	R22	S	R30	S	IN/C	S	GND-INC	L
10	NP-IN/C	U	T7	S	T15	S	T23	S	T31	S	IN/C	S	GND-IN/C	L
9	NP-IN/C	U	R7	S	R15	S	R23	S	R31	S	IN/C	S	GND-IN/C	L
8	NP-IN/C	U	T8	S	T16	S	T24	S	T32	S	IN/C	S	GND-IN/C	L
7	NP-IN/C	U	R8	S	R16	S	R24	S	R32	S	IN/C	S	GND-IN/C	L
6	NP-IN/C	U	IN/C	S	IN/C	S	IN/C	S	IN/C	S	IN/C	S	GND-IN/C	L
5	NP-IN/C	U	IN/C	S	IN/C	S	IN/C	S	IN/C	S	IN/C	S	GND-IN/C	L
4	Np-IN/C	U	Uo0	M	Uo1	M	GND_Ft	M	GND_Ft	M	GND_Ft	M	GND-IN/C	L
3	NP-In/C	U	Ui0	M	Ui1	M	Uo4	M	Uo5	M	Uo6	M	GND-IN/C	L
2	NP-IN/C	U	Uo2	M	Uo3	M	Ui4	M	Ui5	M	Ui6	M	GND-IN/C	L
1	NP-In/C	U	Ui2	M	Ui3	M	+5V_FT	M	+12V_FT	M	-12V_FT	M	GND-IN/C	L

Per CompactPCI® Computer Telephony Specification PICMG 2.5 R1.0, April 3, 1998, Table 3

Key to P5 Pin Assignments

T*n* = Tip
R*n* = Ring
IN/C = No Connect required for safety agency Insulation requirements
NP = a position required to be Not Populated (i.e., no conductive element present
NP-IN/C = a position which may be either Not Populated or Insulation No Connect
GND-IN/C = a position which may be either LOGIC GROUND or Insulation No Connect
+*n*V_FT = positive supply voltage feed-through from CT Front Card
-*n*V_FT = negative supply voltage feed-through from CT Front Card
GND_FT = logic ground feed-through from CT Front Card
Ui*n* = Universal Input - user defined input signal (input to CT Front Card)
Uo*n* = Universal Output - user defined input signal (output to CT Front Card)
U = a pin of unspecified length
S = Short (Level 1) front side pins
M = Medium (Level 2) front side pins
L = Long (Level 3) front side pins

2.3.2.1. P5 Telephony I/O Pins

T*n* - Tip - short (Level 1) pins for connecting to the nominally positive side of a balanced pair telephony connection

R*n* - Ring - short (Level 1) pins for connecting to the nominally negative side of a balanced pair telephony connection

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ERmet® 2mm Hard Metric Connectors

cPCI Computer Telephony Safety Classifications for J5/P5

Pos#	Row Z		Row A		Row B		Row C		Row D		Row E		Row F	
22	NP-IN/C		TNV3-SELV						TNV1-SELV	S	IN/C		SELV	L
21	NP-IN/C									S	IN/C			L
20	NP-IN/C									S	IN/C			L
19	NP-IN/C									S	IN/C			L
18	NP-IN/C									S	IN/C			L
17	NP-IN/C									S	IN/C			L
16	NP-IN/C									S	IN/C			L
15	NP-IN/C									S	IN/C			L
14	NP-IN/C									S	IN/C			L
13	NP-IN/C									S	IN/C			L
12	NP-IN/C									S	IN/C			L
11	NP-IN/C									S	IN/C			L
10	NP-IN/C									S	IN/C			L
9	NP-IN/C									S	IN/C			L
8	NP-IN/C									S	IN/C			L
7	NP-IN/C									S	IN/C			L
6	NP-IN/C		IN/C		IN/C		IN/C		IN/C	S	IN/C			L
5	NP-IN/C		IN/C		IN/C		IN/C		IN/C	S	IN/C			L
4	Np-IN/C		SELV											L
3	NP-In/C													L
2	NP-IN/C													L
1	NP-In/C													L

Per CompactPCI® Computer Telephony Specification PICMG 2.5 R1.0, April 3, 1998, Table 12

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ERmet® 2mm Hard Metric Connectors

PXI Generic Peripheral Slot Pinout

PIN	Row F	Row E	Row D	Row C	Row B	Row A	PMC Slot	
22	GND	**PXI_RSVA22**	**PXI_RSVB22**	**PXI_RSVC22**	**PXI_RSVD22**	**PXI_RSVE22**	GND	
21	GND	**PXI_LBR0**	GND	**PXI_LBR1**	**PXI_LBR2**	**PXI_LBR3**	GND	**P2/J2**
20	GND	**PXI_LBL4**	**PXI_LBR5**	**PXI_LBL0**	GND	**PXI_LBL1**	GND	
19	GND	**PXI_LBL2**	GND	**PXI_LBL3**	**PXI_LBL4**	**PXI_LBL5**	GND	**C**
18	GND	**PXI_TRIG3**	**PXI_TRIG4**	**PXI_TRIG5**	GND	**PXI_TRIG6**	GND	
17	GND	**PXI_TRIG2**	GND	**PRST#**	**PXI_STAR**	**PXI_CLK10**	GND	**O**
16	GND	**PXI_TRIG1**	**PXI_TRIG0**	DEG#	GND	**PXI_TRIG7**	GND	
15	GND	**PXI_BRSVA15**	GND	FAL#	**PXI_LBL6**	**PXI-LBR6**	GND	**N**
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND	
13	GND	AD[38]	GND	V(I/0)	AD[37]	AD[36]	GND	**N**
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND	
11	GND	AD[45]	GND	V[I/0]	AD[44]	AD[43]	GND	**E**
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND	
9	GND	AD[52]	GND	V[I/0]	AD[51]	AD[50]	GND	**C**
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND	
7	GND	AD[59]	GND	V[I/0]	AD[58]	AD[57]	GND	**T**
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND	
5	GND	C/BE[5]#	GND	V[I/0]	C/BE[4]#	PAR64	GND	**O**
4	GND	V[I/0]	**PXI_BRSVB4**	C/BE[7]#	GND	C/BE [6]#	GND	
3	GND	**PXI_LBR7**	GND	**PXI_LBR8**	**PXI_LBR9**	**PXI_LBR10**	GND	**R**
2	GND	**PXI_LBR11**	**PXI_LBR12**	SYSEN#	**PXI_LBL7**	**PXI_LBL8**	GND	
1	GND	**PXI_LBL9**	GND	PXI_LBL10	**PXI_LBL11**	**PXI_LBL12**	GND	
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND	
24	GND	AD[1]	5V	V[1/0]	AD[0]	ACK64#	GND	
23	GND	3.3V	AD[4]	AD93]	5V	AD[2]	GND	**P1/J1**
22	GND	AD[7]	GND	3.3V	AD[6]	AD[5]	GND	
21	GND	3.3V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND	**C**
20	GND	AD[12]	GND	V[1/0]	AD[11]	AD[10]	GND	
19	GND	3.3V	AD[15]	AD[14]	GND	AD[13]	GND	**O**
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND	
17	GND	3.3V	SDONE	SBO#	GND	PERR#	GND	**N**
16	GND	DEVSEL#	GND	V[I/0]	STOP#	LOCK#	GND	
15	GND	3.3V	FRAME#	IRDY	GND	TRDY#	GND	**N**
12-14	GND	Key Area						
11	GND	AD[8]	AD[17]	AD[16]	GND	C/BE[2]#	GND	**E**
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND	
9	GND	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND	**C**
8	GND	AD[26]	GND	V[I/0]	AD[25]	AD[24]	GND	
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND	**T**
6	GND	REQ#	GND	3.3V	CLK	AD[31]	GND	
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#	GND	**O**
4	GND	BRSVP1A4	GND	V[I/0]	INTP	INTS	GND	
3	GND	INTA#	INTB#	INTC#	5V	INTD#	GND	**R**
2	GND	TCK	5V	TMS	TDO	TDI	GND	
1	GND	5V	-12V	TRST#	+12V	5V	GND	
PIN	**Row F**	**Row E**	**Row D**	**Row C**	**Row B**	**Row A**	**PMC Slot**	

Per PXI Specification R1.0 August 20, 1997, Table 4.9
Signals in Bold are PXI specific

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ERmet® 2mm Hard Metric Connectors

PXI System Slot Pinout

PIN	Z	A	B	C	D	E	F	
22	GND	**PXI_RSVA22**	**PXI_RSVB22**	**PXI_RSVC22**	**PXI_RSVD22**	**PXI_RSVE22**	GND	
21	GND	CLK6	GND	RSV	RSV	RSV	GND	**P2/J2**
20	GND	CLK5	GND	RSV	GND	RSV	GND	
19	GND	GND	GND	RSV	RSV	RSV	GND	**C**
18	GND	**PXI_TRIG3**	**PXI_TRIG4**	**PXI_TRIG5**	GND	**PXI_TRIG6**	GND	
17	GND	**PXI_TRIG2**	GND	PRST#	REQ6#	GNT6#	GND	**O**
16	GND	**PXI_TRIG1**	**PXI_TRIG0**	DEG#	GND	**PXI_TRIG7**	GND	
15	GND	**PXI_BRSVA15**	GND	FAL#	REQ5#	GBT5#	GND	**N**
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND	
13	GND	AD[38]	GND	V[I/0]	AD[37]	AD[36]	GND	**N**
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND	
11	GND	AD[45]	GND	V[I/0]	AD[44]	AD[43]	GND	**E**
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND	
9	GND	AD[52]	GND	V[I/0]	AD[51]	AD[50]	GND	**C**
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND	
7	GND	AD[59]	GND	V[I/0]	AD[58]	AD[57]	GND	**T**
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND	
5	GND	C/BE[5]#	GND	V[I/0]	C/BE[4]#	PAR64	GND	**O**
4	GND	V[I/0]	**PXI_BRSVB4**	C/BE[7]#	GND	C/BE[6]#	GND	
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND	**R**
2	GND	CLK2	CLK3	SYSEN#	GNT2#	REQ3#	GND	
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND	
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND	
24	GND	AD[1]	5V	V[1/0]	AD[0]	ACK64#	GND	
23	GND	3.3V	AD[4]	AD[3]	5V	AD[2]	GND	**P1/J1**
22	GND	AD[7]	GND	3.3V	AD[6]	AD[5]	GND	
21	GND	3.3V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND	**C**
20	GND	AD[12]	GND	V[I/0]	AD[11]	AD[10]	GND	
19	GND	3.3V	AD[15]	AD[14]	GND	AD[13]	GND	**O**
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]	GND	
17	GND	3.3V	SDONE	SBO#	GND	PERR#	GND	**N**
16	GND	DEVSEL#	GND	V[I/0]	STOP#	LOCK#	GND	
15	GND	3.3V	FRAME#	IRDY#	GND	TRDY#	GND	**N**
12-14	Key Area							
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND	**E**
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND	
9	GND	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND	**C**
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND	
7	GND	AD[30]	AD[29]	AD[28]	GND	AD [27]	GND	**T**
6	GND	REQ#	GND	3.3V	CLK	AD [31]	GND	
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#	GND	**O**
4	GND	BRSVP1A4	GND	V(I/O)	INTP	INTS	GND	
3	GND	INTA#	INTB#	INTC#	5V	INTD#	GND	**R**
2	GND	TCK	5V	TMS	TDO	TDI	GND	
1	GND	5V	-12V	TRST#	+12V	5V	GND	
PIN	**Z**	**A**	**B**	**C**	**D**	**E**	**F**	

Per PXI Specification R1.0 August 20, 1997, Table 4.10
Signals in Bold are PXI specific

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ERmet® 2mm Hard Metric Connectors

PXI Star Trigger Slot Pinout

PIN	Z	A	B	C	D	E	F	
22	GND	**PXI_RSVA22**	**PXI_RSVB22**	**PXI_RSVC22**	**PXI_RSVD22**	**PXI_RSVE22**	GND	
21	GND	**PXI_LBR0**	GND	**PXI_LBR1**	**PXI_LBR2**	**PXI_LBR3**	GND	**P2/J2**
20	GND	**PXI_LBR4**	**PXI_LBR5**	**PXI_STAR0**	GND	**PXI_STAR1**	GND	
19	GND	**PXI_STAR2**	GND	**PXI_STAR3**	**PXI_STAR4**	**PXI_STAR5**	GND	**C**
18	GND	**PXI_TRIG3**	**PXI_TRIG4**	**PXI_TRIG5**	GND	**PXI_TRIG6**	GND	
17	GND	**PXI_TRIG2**	GND	PRST#	**PXI_CLK10_IN**	**PXI_CLK10**	GND	**O**
16	GND	**PXI_TRIG1**	**PXI_TRIG0**	DEG#	GND	**PXI_TRIG7**	GND	
15	GND	**PXI_BRSVA15**	GND	FAL#	**PXI_STAR6**	**PXILBR6**	GND	**N**
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND	
13	GND	AD[38]	GND	V[I/0]	AD[37]	AD[36]	GND	**N**
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND	
11	GND	AD[45]	GND	V[I/0]	AD[44]	AD[43]	GND	**E**
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND	
9	GND	AD[52]	GND	V(I/O)	AD[51]	AD[50]	GND	**C**
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND	
7	GND	AD[59]	GND	V(I/O)	AD[58]	AD[57]	GND	**T**
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND	
5	GND	C/BE[5]#	GND	V(I/O)	C/BE[4]#	PAR64	GND	**O**
4	GND	V(I/O)	**PXI_BRSVB4**	C/BE[7]#	GND	C/BE[6]#	GND	
3	GND	**PXI_LBR7**	GND	**PXI_LBR8**	**PXI_LBR9**	**PXI_LBR10**	GND	**R**
2	GND	**PXI_LBR11**	**PXI_LBR12**	SYSEN#	**PXI_STAR7**	**PXI_STAR8**	GND	
1	GND	**PXI_STAR9**	GND	**PXI_STAR10**	**PXI_STAR11**	**PXI_STAR12**	GND	
25	GND	5V	REQ64#	ENUM#	3.3V	5V	GND	
24	GND	AD[1]	5V	V[I/0]	AD[0]	ACK64#	GND	
23	GND	3.3V	AD[4]	AD[3]	5V	AD[2]	GND	**P1/J1**
22	GND	AD[7]	GND	3.3V	AD[6]	AD[5]	GND	
21	GND	3.3V	AD[9]	AD[8]	M66#N	C/BE[0]#	GND	**C**
20	GND	AD[12]	GND	V[I/0]	AD[11]	AD[10]	GND	
19	GND	3.3V	AD[15]	AD[14]	GND	AD[13]	GND	**O**
18	GND	SERR#	GND	3.3V	PAR	C/BE[1]#	GND	
17	GND	3.3V	SDONE	SBO#	GND	PERR#	GND	**N**
16	GND	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND	
15	GND	3.3V	FRAME#	IRDY#	GND	TRDY#	GND	**N**
12-14				Key Area				
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND	**E**
10	GND	AD[21]	GND	3.3V	AD[20]	AD[19]	GND	
9	GND	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND	**C**
8	GND	AD[26]	GND	V[I/0]	AD[25]	AD[24]	GND	
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND	**T**
6	GND	REQ#	GND	3.3V	CLK	AD[31]	GND	
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT#	GND	**O**
4	GND	BRSVP1A4	GND	V[I/0]	INTP	INTS	GND	
3	GND	INTA#	INTB#	INTC#	5V	INTD#	GND	**R**
2	GND	TCK	5V	TMS	TDO	TDI	GND	
1	GND	5V	-12V	TRST#	+12V	5V	GND	
PIN	**Z**	**A**	**B**	**C**	**D**	**E**	**F**	

Per PXI Specification R1.0 August 20, 1997, Table 4.11
Signals in Bold are PXI specific

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ERmet® 2mm Hard Metric Connectors

VME64x on CompactPCI® J4/P4 and J5/P5 Pin Assignments

PIN	A	B	C	D	E	F	
22	ResU(1)	+3.3V	DOO	DO8	DO1	GND	
21	ResU(1)	ACFAIL*	+3.3V	DO9	DO2	GND	P5/J5
20	GND	SYSCLK	D10	+3.3V	BERR*	GND	
19	MPR	+3.3V	D03	D11	D04	GND	C
18	MCLK	SYSFAIL	+3.3V	D12	D05	GND	
17	GND	SYSRST*	D13	+3.3V	RTRY1*	GND	O
16	MSD	+3.3V	D06	D14	D07	GND	
15	MMD	AM5	+3.3V	D15	LWORD*	GND	N
14	GND	WRITE*	A23	+3.3V	DS1*	GND	
13	MCTL	+3.3V	A22	A21	A20	GND	N
12	BCLR*	AMO	+V1	A19	A18	GND	
11	GND	AMI	A17	+V2	DSO*	GND	E
10	BBSY*	+3.3V	A16	A15	A07	GND	
9	BGOIN*	AM2	-V1	A14	A06	GND	C
8	GND	AM3	A13	-V2	DTACK*	GND	
7	BGOOUT*	GAP*	A05	A12	A04	GND	T
6	BG1IN*	AM4	GAO*	A11	A03	GND	
5	GND	ResB[z13](2)	A10	GA1*	AS*	GND	O
4	BG1OUT*	GA2*	A02	A09	A01	GND	
3	BG2IN*	RsvB[z15]	GA3*	A08	A24	GND	R
2	GND	RsvB[z17]	A25	GA4*	RETRY*	GND	
1	BG2OUT*	+5V	A26	A27	A28	GND	
25	BG3IN*	RsvB[z19]	+5V	A29	A30	GND	
24	GND	RsvB[z21]	A31	+5V	RsvB[d19]	GND	
23	BG3OUT*	+5V	D16	D17	D18	GND	P4/J4
22	BRO*	RsvB[z23]	+5V	D19	D20	GND	
21	GND	RsvB[z25]	D21	+5V	RsvB[d21]	GND	C
20	BR1*	+5V	D22	D23	D24	GND	
19	BR2*	SERA	+5V	D25	D26	GND	O
18	GND	SERB	D27	+12V	RsvB[d23]	GND	
17	BR3*	-12V	D28	D29	D30	GND	N
16	LI/I*(1)	SBB	VPC(2)	D31	ResB[d25](2)	GND	
15	LI/0*(1)	SBA	ResU(1)	GND(3)	ResB[z27](2)	GND	N
12-14	Key Area						
11	IACK*	IACKIN*	IACKOUT*	IRQ7*	IRQ6*	GND	E
10	IRQ5*	IRQ4*	IRQ3*	IRQ2*	IRQ1*	GND	
9	GND	GND	GND	GND	GND	GND	C
8	UD	UD	UD	UD	UD	GND	
7	UD	UD	UD	UD	UD	GND	T
6	UD	UD	UD	UD	UD	GND	
5	UD	UD	UD	UD	UD	GND	O
4	UD	UD	UD	UD	UD	GND	
3	UD	UD	UD	UD	UD	GND	R
2	UD	UD	UD	UD	UD	GND	
1	UD	UD	UD	UD	UD	GND	
PIN	A	B	C	D	E	F	

Per PICMG 2.2 R1.0 August 7, 1998, Table 1

Notes:

(1) These signals are not bused (feed through the backplane).

(2) ResB is the ResBus (reserved bused) signal pins

Connector Key is Reseda Green (ERNI P/N 043346 male, 043336 female)

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ERmet® 2mm Hard Metric Connectors

PMC Mezzanine Card I/O Pin Assignments

Single PMC Slot's I/O Signal Mapping to CompactPCI® J5/P5 Connector

PIN	Row F	Row E	Row D	Row C	Row B	Row A	
22	GND	1	2	3	4	5	
21	GND	6	7	8	9	10	J5
20	GND	11	12	13	14	15	
19	GND	16	17	18	19	20	C
18	GND	21	22	23	24	25	
17	GND	16	17	18	19	30	O
16	GND	31	32	33	34	35	
15	GND	36	37	38	39	40	N
14	GND	41	42	43	44	45	
13	GND	46	47	48	49	50	N
12	GND	51	52	53	54	55	
11	GND	1	2	3	4	5	E
10	GND	6	7	8	9	10	
9	GND	11	12	13	14	15	C
8	GND	16	17	18	19	20	
7	GND	21	22	23	24	25	T
6	GND	26	27	28	29	30	
5	GND	31	32	33	34	35	O
4	GND	36	37	38	39	40	
3	GND	41	42	43	44	45	R
2	GND	46	47	48	49	50	
1	GND	51	52	53	54	55	
PIN	Row F	Row E	Row D	Row C	Row B	Row A	

Per PICMG 2.3 R1.0 August 7, 1998, Table 3

Notes: 1. Entries in table are of the PMC Jn4 pin number.

2. UD are the remaining user defined I/0 pins that can be used for other I/O functions.

Dual PMC Slot's I/O Signal Mapping to CompactPCI® J5/P5 Connector

PIN	Row F	Row E	Row D	Row C	Row B	Row A	PMC Slot	
22	GND	1	2	3	4	5	A	
21	GND	6	7	8	9	10	A	J5
20	GND	11	12	13	14	15	A	
19	GND	16	17	18	19	20	A	C
18	GND	21	22	23	24	25	A	
17	GND	16	17	18	19	30	A	O
16	GND	31	32	33	34	35	A	
15	GND	36	37	38	39	40	A	N
14	GND	41	42	43	44	45	A	
13	GND	46	47	48	49	50	A	N
12	GND	51	52	53	54	55	A	
11	GND	1	2	3	4	5	B	E
10	GND	6	7	8	9	10	B	
9	GND	11	12	13	14	15	B	C
8	GND	16	17	18	19	20	B	
7	GND	21	22	23	24	25	B	T
6	GND	26	27	28	29	30	B	
5	GND	31	32	33	34	35	B	O
4	GND	36	37	38	39	40	B	
3	GND	41	42	43	44	45	B	R
2	GND	46	47	48	49	50	B	
1	GND	51	52	53	54	55	B	
PIN	Row F	Row E	Row D	Row C	Row B	Row A	PMC Slot	

Per PICMG 2.3 R1.0 August 7, 1998, Table 4

Notes:

1. Entries in table are of the PMC Jn4 pin number.

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ERmet® 2mm Hard Metric Connectors

PMC Mezzanine Card I/O Pin Assignments

Single PMC's I/O Signal Mapping to CompactPCI® 3U J2 Connector

PIN	Row F	Row E	Row D	Row C	Row B	Row A
22	GND	UD	UD	UD	UD	UD
21	GND	UD	UD	UD	UD	UD
20	GND	UD	UD	UD	UD	UD
19	GND	UD	UD	UD	UD	UD
18	GND	UD	UD	UD	UD	UD
17	GND	UD	UD	UD	UD	UD
16	GND	UD	UD	UD	UD	UD
15	GND	UD	UD	UD	UD	UD
14	GND	+5V	+5V	+3.3V	+3.3V	+3.3V
13	GND	1	2	3	4	5
12	GND	6	7	8	9	10
11	GND	11	12	13	14	15
10	GND	16	17	18	19	20
9	GND	21	22	23	24	25
8	GND	26	27	28	29	30
7	GND	31	32	33	34	35
6	GND	36	37	38	39	40
5	GND	41	42	43	44	45
4	GND	46	47	48	49	50
3	GND	51	52	53	54	55
2	GND	56	57	58	59	60
1	GND	61	62	63	64	VI/O
PIN	**Row F**	**Row E**	**Row D**	**Row C**	**Row B**	**Row A**

J2 CONNECTOR

Per PICMG 2.3 R1.0 August 7, 1998, Table 1

Notes: 1. Entries in table are of the PMC Jn4 pin number.

2. UD are the remaining user defined I/0 pins that can be used for other I/O functions.

Dual PMC Slot's I/O Signal Mapping to CompactPCI® 6U J3/P3 & J4/P4 Connectors

PIN	Row F	Row E	Row D	Row C	Row B	Row A	PMC Slot
9	GND	GND	GND	GND	GND	GND	
8	GND	1	2	3	4	5	A
7	GND	6	7	8	9	10	A
6	GND	11	12	13	14	15	A
5	GND	16	17	18	19	20	A
4	GND	21	22	23	24	25	A
3	GND	26	27	28	29	30	A
2	GND	31	32	33	34	35	A
1	GND	36	37	38	39	40	A
19	GND	41	42	43	44	45	A
18	GND	46	47	48	49	50	A
17	GND	51	52	53	54	55	A
16	GND	56	57	58	59	60	A
15	GND	61	62	63	64	VI/0	A
14	GND	+5V	+5V	+3.3V	+3.3V	+3.3V	A&B
13	GND	1	2	3	4	5	B
12	GND	6	7	8	9	10	B
11	GND	11	12	13	14	15	B
10	GND	16	17	18	19	20	B
9	GND	21	22	23	24	25	B
8	GND	26	27	28	29	30	B
7	GND	31	32	33	34	35	B
6	GND	36	37	38	39	40	B
5	GND	41	42	43	44	45	B
4	GND	46	47	48	49	50	B
3	GND	51	52	53	54	55	B
2	GND	56	57	58	59	60	B
1	GND	61	62	63	64	VI/O	B
PIN	**Row F**	**Row E**	**Row D**	**Row C**	**Row B**	**Row A**	**PMC Slot**

J4 CONNECTOR

J3 CONNECTOR

Per PICMG 2.3 R1.0 August 7, 1998, Table 2 **Notes:** 1. Entries in table are of the PMC Jn4 pin number.

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ERmet® 2mm Hard Metric Connectors

IP Mezzanine Module I/O Pin Assignments

I/O Signal Mapping to CompactPCI® J2 Connector

PIN	Row F	Row E	Row D	Row C	Row B	Row A	IP Module
22	GND	B5	B4	B3	B2	B1	IP-B
21	GND	B10	B9	B8	B7	B6	IP-B
20	GND	B15	B14	B13	B12	B11	IP-B
19	GND	B20	B19	B18	B17	B16	IP-B
18	GND	B25	B24	B23	B22	B21	IP-B
17	GND	B30	B29	B28	B27	B26	IP-B
16	GND	B35	B34	B33	B32	B31	IP-B
15	GND	B40	B39	B38	B37	B36	IP-B
14	GND	B45	B44	B43	B42	B41	IP-B
13	GND	B50	B49	B48	B47	B46	IP-B
12	GND	+5V	+5V	+3.3V	+3.3V	+3.3V	
11	GND	A5	A4	A3	A2	A1	IP-A
10	GND	A10	A9	A8	A7	A6	IP-A
9	GND	A15	A14	A13	A12	A11	IP-A
8	GND	A20	A19	A18	A17	A16	IP-A
7	GND	A25	A24	A23	A22	A21	IP-A
6	GND	A30	A29	A28	A27	A26	IP-A
5	GND	A35	A34	A33	A32	A31	IP-A
4	GND	A40	A39	A38	A37	A36	IP-A
3	GND	A45	A44	A43	A42	A41	IP-A
2	GND	A50	A49	A48	A47	A46	IP-A
1	GND	+5V	+5V	+3.3V	+3.3V	+3.3V	
PIN	Row F	Row E	Row D	Row C	Row B	Row A	IP Module

J2 CONNECTOR

Per PICMG 2.4 R1.0 August 7, 1998, Table 1

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ERmet® 2mm Hard Metric Connectors

IP Mezzanine Module I/O Pin Assignments

I/O Signal Mapping to CompactPCI® J5 and J4 Connector

PIN	Row F	Row E	Row D	Row C	Row B	Row A	IP Module	
22	GND	D5	D4	D3	D2	D1	IP-D	J5 CONNECTOR
21	GND	D10	D9	D8	D7	D6	IP-D	
20	GND	D15	D14	D13	D12	D11	IP-D	
19	GND	D20	D19	D18	D17	D16	IP-D	
18	GND	D25	D24	D23	D22	D21	IP-D	
17	GND	D30	D29	D28	D27	D26	IP-D	
16	GND	D35	D34	D33	D32	D31	IP-D	
15	GND	D40	D39	D38	D37	D36	IP-D	
14	GND	D45	D44	D43	D42	D41	IP-D	
13	GND	D50	D49	D48	D47	D46	IP-D	
12	GND	+5V	+5V	+3.3V	+3.3V	+3.3V		
11	GND	C5	C4	C3	C2	C1	IP-C	
10	GND	C10	C9	C8	C7	C6	IP-C	
9	GND	C15	C14	C13	C12	C11	IP-C	
8	GND	C20	C19	C18	C17	C16	IP-C	
7	GND	C25	C24	C23	C22	C21	IP-C	
6	GND	C30	C29	C28	C27	C26	IP-C	
5	GND	C35	C34	C33	C32	C31	IP-C	
4	GND	C40	C39	C38	C37	C36	IP-C	
3	GND	C45	C44	C43	C42	C41	IP-C	
2	GND	C50	C49	C48	C47	C46	IP-C	
1	GND	+5V	+5V	+3.3V	+3.3V	+3.3V		
25	GND	B5	B4	B3	B2	B1	IP-B	J4 CONNECTOR
24	GND	B10	B9	B8	B7	B6	IP-B	
23	GND	B15	B14	B13	B12	B11	IP-B	
22	GND	B20	B19	B18	B17	B16	IP-B	
21	GND	B25	B24	B23	B22	B21	IP-B	
20	GND	B30	B29	B28	B27	B26	IP-B	
19	GND	B35	B34	B33	B32	B31	IP-B	
18	GND	B40	B39	B38	B37	B36	IP-B	
17	GND	B45	B44	B43	B42	B41	IP-B	
16	GND	B50	B49	B48	B47	B46	IP-B	
15	GND	+5V	+5V	+3.3V	+3.3V	+3.3V		
12 – 14	Key Area							
11	GND	A5	A4	A3	A2	A1	IP-A	
10	GND	A10	A9	A8	A7	A6	IP-A	
9	GND	A15	A14	A13	A12	A11	IP-A	
8	GND	A20	A19	A18	A17	A16	IP-A	
7	GND	A25	A24	A23	A22	A21	IP-A	
8	GND	A20	A19	A18	A17	A16	IP-A	
7	GND	A25	A24	A23	A22	A21	IP-A	
6	GND	A30	A29	A28	A27	A26	IP-A	
5	GND	A35	A34	A33	A32	A31	IP-A	
4	GND	A40	A39	A38	A37	A36	IP-A	
3	GND	A45	A44	A43	A42	A41	IP-A	
2	GND	A50	A49	A48	A47	A46	IP-A	
1	GND	+5V	+5V	+3.3V	+3.3V	+3.3V		
PIN	Row F	Row E	Row D	Row C	Row B	Row A	IP Module	

Per PICMG 2.4 R1.0 August 7, 1998, Table 2

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Telcordia™ Lubrication

For some telecom applications particularly those being sold to the various regional telephone companies, lubricated contacts are specified. There are many different ways of meeting this end customer requirement. ERNI will provide pre-lubricated male connectors upon request. There is an additional charge and a special part number for such connectors. It is also possible to apply the Telcordia™ lubricant to the male backplane connectors after the backplanes have been assembled. This process has the advantage that the lubricant is not as likely to be damaged or removed by subsequent handling as it is when the connectors are lubricated before assembly. Many end users do not require that lubrication be applied to the female receptacles as the lubricant is easily transferred to the female contacts after mating with a lubricated male contact. Lubricating the male contacts is a practical solution as it is quite difficult for an end customer to inspect the female connector contacts because they are hidden within the insulator.

Telcordia™ Requirements Summary
In accordance with Telcordia™ GR-1217

	CENTRAL OFFICE	UNCONTROLLED ENVIRONMENT
Prequalification Tests for Quality Level II, Level III	Shocks and Vibration - 24 hr., 18 shocks Temperature Life - 500 hr., 85°C Humidity and Temp Cycle - 25°C – 65°C MFG TEST - 10 days, less gas concentration	Shocks and Vibration - 24 hr., 18 shocks Temperature Life - 1,000 hr., 105°C Humidity and Temp Cycle - 5°C – 85°C MFG TEST - 20 days, more gas concentration
Level I	• Commercial Grade • Vendor Qualification Process	• Commercial Grade • Vendor Qualification Process
Level II	Level I with: • ***Tested for less than 1 in 1,000 failures over 10 year life*** • Monitor parametric attributes • Approved by OEM • Ship to stock allowed • Requalify every 5 years	Level I with: • ***Tested for less than 1 in 1,000 failures over 10 year life*** • Monitor parametric attributes • Approved by OEM • Ship to stock allowed • Requalify every 5 years
Level III	Level II with: • ***Tested for less than 1 in 10,000 failures over 25 year life*** • Monitor parametric attributes • Ship to stock allowed, provided that connector manufacturer's data are reviewed on lot-on-lot basis • Requalify every 3 years	Level II with: • ***Tested for less than 1 in 10,000 failures over 25 year life*** • Monitor parametric attributes • Ship to stock allowed, provided that connector manufacturer's data are reviewed on lot-on-lot basis • Requalify every 3 years

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ERmet® 2mm Hard Metric Connectors

Glossary Of Terminology

Annular Ring – The circular area around a hole that is measured by the difference between the radius of the wall of the hole, subtracted from the radius of the clearance or pad around the hole.

ANSI – Abbreviation for American National Standards Institute.

Artwork – The representation of the electrical layout of a printed circuit on a transparency.

Attenuation – When a signal travels along the bus, its amplitude decreases due to energy losses from heating, radiation, and so forth.

AWG – Abbreviation for American Wire Gage. A particular series of specified diameters and thicknesses established as a standard in the U.S.A. and used for nonferrous sheets, rods and wires.

Backplane – (1) A wiring board usually constructed as a printed circuit, used in micro and mini computers to provide the required connections between logic, memory and I/O modules.
(2) A two-sided or multilayer printed circuit board into which function cards can be plugged. The backplane transfers signals between the function cards. Mounted on the component side of the backplane are connectors into which function cards can be plugged.
On the solder side of the backplane are termination points (studs, power bugs, quick disconnects) for the distribution of power and ground.

Bus – A circuit over which data or power is transmitted.

Bus Structure – A set of rules governing the circuit design of a system such as: CompactPCI®, VME, Multibus I, Multibus II and Q-Bus, to name a few.

Characteristic Impedance – Impedance is referred to as Z_o, in ohms. It is the resistance seen by a digital signal and is measured between the signal line and the reference plane.
This impedance is a function of the signal line geometry and is independent of the line length. Impedance is the key parameter which interrelates all performance characteristics of the backpanel, including delay, noise and distributed capacitance.

CompactPCI® – A bus structure developed by the PICMG based on the desktop PCI architecture.

Compliant – A pin whose physical structure is designed to elastically deform upon insertion into a hole.

Component Side – The side of a printed wiring board or backplane into which connectors, resistors, capacitors and so forth are inserted.

Component Density – The ratio of the number of components to a given area of a board.

Conductor Width – The width of a given trace.

Conductor Spacing – The distance between adjacent traces on a printed wiring board.

Crosstalk – (1) The interaction observed due to electromagnetic coupling of adjacent conductors.
(2) A false signal picked up by a signal line (in an inductive manner) from an adjacent signal line.

Current – The net transfer of electric charge, per unit time, along a conductor. An amount equal to the voltage/resistance and measured in Amperes.

Data Bus – A bus structure used specifically to transmit data, or bits of information.

Date Code – Stamped or printed on a component the week and year the component was made (i.e. 9023 is the 23rd week of the year 1990, or June 3rd-7th, 1990).

Daughter Card – Same as function card or function board.

Decommitted – To physically remove material from an area of a board so as to break the electrical connection to that plane.

Decouple – To prevent transfer or feedback of energy from one circuit to another.

Dielectric – (1) A material which is an electrical insulator that can sustain an electrical field with minimum power loss.
(2) Any insulating medium that intervenes between two conductors.

Dielectric Constant – The property of a material that governs the propagation delay of a signal it surrounds, denoted by er.

DIN – (1) Stands for Deutsches Institut fur Normung, a German organization which established many mechanical specifications for connectors and packaging. (2) Vernacular for Standard European connector having 96 pins arranged in 3 rows of 32 pins each. The rows are labeled A, B, C.

DIP – Abbreviation for Dual-In-line Package. A device that has two rows or parallel pins. Usually the pins in each row are on .100" centers.

Discrete Resistor – An individual resistor, as opposed to a resistor network.

Distributed Capacitance – Distributed capacitance, referred to as Co, is the amount of capacitance per unit length of a signal line.

ECL – Abbreviation for Emitter-Coupled-Logic, a form of current-mode logic in which the emitters of two transistors are connected to a current carrying resistor in such a way that only one will turn on at time.

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ERmet® 2mm Hard Metric Connectors

Glossary Of Terminology (continued)

ECTF – The Enterprise Computer Telephony Forum is a trade association that has developed a number of specifications related to computer telephony. Their web address is: http://www.ectf.org.

EIA – Electronics Industry Association.

EMI – Electromagnetic interference.

Etch – To incise an area of a printed wiring board by immersing the board in an acid batch. The parts of the board not covered with an acid-resistant coating will be eroded.

ERNIPRESS – The particular compliant section design utilized by ERNI for many DIN 41612 and D-Sub press-fit contacts. This coined, elastic section provides a very reliable gas tight connection with the plated through hole in the backplane or daughter card.

Eye of the Needle – This is the compliant section design utilized by ERNI for our 2 mm ERmet pressfit contacts. This pierced and coined elastic section provides a very reliable gas tight connection with the plated through hole in the backplane or daughter card.

Function Card – A printed circuit board that plugs into a slot position of a backplane. Function cards can be custom designed by the user or bought as a standard off-the-shelf item. A series of these cards can make up a system or sub-system to run machinery or many other electronic functions.

GND – An abbreviation for ground. The potential referred to as zero volts. An electrical connection between any circuit and the reference potential.

Ground Guard – The pair of traces which surround a third conductor to minimize crosstalk.

Ground Plane – A common conductive surface that receives and returns power/signal transmissions.

Ground Shield – A conductor (usually a plane), at some reference potential (e.g. zero volts), which surrounds some other insulated conductor.

IEC 61076-4-101 – Global specification that governs 2mm Hard Metric equipment practices.

IEC 917 (DIN 43355) – Defines a basic pitch of 0.5 mm, with n x 0.5 mm as the multiple pitch, and a system unit of 25 mm. This, in turn, relates to Hard Metric Equipment practices, IEE 1301 and DIN 43356, used for mechanical arrangement of electrical/electronic equipment, including associated board layout and connections.

I/O – Abbreviation for input/output.

IEEE – Abbreviation for the Institute of Electronic and Electrical Engineers.

Impedance – Resistance of a signal line measured in ohms. One of the important electrical characteristics of a backplane, impedance is determined by the physical dimensions of trace width, dielectric thickness, dielectric constant, and so forth.

Inductance – The ratio of the voltage to the rate of change of current in a circuit ($V/\Delta L$).

Layer – A plane in a printed wiring board which has a copper covering in some specified pattern (e.g. plane, traces and pads).

Microstrip – (1) The name given to a signal line referenced above a single ground plane. (2) The outer etched portion of a backplane transmission line.

Output – The current, voltage, power, or signal which a circuit or device delivers.

Terminals where a device delivers its information.

Pad – The circular area that commits a hole to an uncommitted layer or trace.

PCMCIA – (Personal Computer Memory Card International Association). A standard for removable cards.

PICMG – The PCI Industrial Computer Manufacturer's Group is a trade association that has developed a number of specifications related to personal computer architectures and CompactPCI. Their web address is http://www.picmg.org.

Pin-out – A term used to describe the actual connections for each pin of a connector on a printed wiring board.

Plated through-hole – A hole in a printed wiring board, used to commit external or internal layers to one another produced by electro deposition of a conductive pattern.

Plating – To form a thin, adherent layer of material (usually metal) on an object.

PMC – PCI mezzanine card interface, defined by IEEE 1386

Pressfit – An interference connection used in the assembly process to eliminate the need for solder to make the electrical connection.

Propagation Delay – (1) Referred to as tpd, commonly expressed in nanoseconds per inch (ns/in.). It is the time required for a pulse to travel through a transmission line system. (2) The time it takes for a signal to spread or distribute across an entire circuit.

Rack – (See *Subrack*) – A sheet metal assembly that is made up of mounting bars and side plates to which a backplane can be mounted and printed wiring boards can be inserted

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Resistance – The opposition that a material or device offers to the flow of current, equal to the voltage drop across the element, divided by the current through the element.

RFI – Radio Frequency Interference.

Risetime – Often designated as tr, in picoseconds. It is the time it takes the signal to transition from 10 percent to 90 percent of its final value.

Skew – The time difference between the arrival of two related signals, often due to differences in their propagation paths.

Shroud – A male connector body designed to fit over the extended tails of a long tail connector which allows a female connector to be mated from the rear side for midplane or rear I/O applications.

Signal – An electrical pulse which conducts across a backplane.

Solder or Extended Tail – A term used to specify the length of the pins on any connector. Typically the pins will protrude through the printed wiring board. Extended pins extend much further.

Solder Mask – The coating on a printed wiring board, placed there for protection. Also aids in assembly and soldering.

S-Parameters – A popular mathematical representation of high frequency characteristics of a component such as a connector utilized for signal integrity measurement and analytical techniques. Often utilized in applications where SPICE modeling is not practical.

SPICE – Software Program for Integrated Circuit Emulation. One of several computer based techniques for simulating the electrical performance of various circuit components such as connectors and integrated circuits within a actual or theoretical circuit configuration.

Stripline – (1) The name given to a signal, referenced between two ground planes, at a defined spacing. (2) The etched portion of a backplane transmission line that is between two ground planes in a multilayer printed circuit board.

Subrack – A card cage assembly, usually designed to support a backplane, card guides and daughter cards.

Telcordia™ – Formerly Bellcore (Bell Communications Research), orginally the research division of AT&T.

Terminated – A line or trace is considered terminated at any point there is a resistor connected to it.

Tolerance – The permissible variations in the dimensions of manufactured parts or electrical components.

Trace – The conductor that physically joins two or more points on a printed wiring board.

Transition Board - A perpendicular board assembly used to plug into extended connector terminals on the rear side of the backplane as in mid plane chassis designs or when it is not desirable to utilize cables to interface to the rear connectors.

Transmission Line – A line is referred to as a transmission line when its capacitance and inductance are distributed over the line. Such a line will convey a signal without distortion and will appear as a purely resistive input impedance.

TTL – Transistor-Transistor Logic. A logic circuit containing two transistors, for driving large output capacitances at high speed.

Two Sided – A printed wiring board with only the outer layers containing traces. This product may or may not contain plated through holes.

U – An EIA unit of measurement equal to 1.75" for equipment racks.

Un-terminated – Any bussed trace that is not connected.

Vcc – Typically, the collector voltage level for a transistor. The designation of the primary voltage level on a printed wiring board, usually at the potential of +5 volts.

Via – A plated through-hole that is there for the sole purpose of conducting a signal trace or potential from one layer of the printed wiring board to another.

VITA – The VME International Trade Association is a trade association that supports VME and other imbedded industry computer manufacturers. It also supports an ANSI recognized standards producing organization, the VSO. VITA's web address is http://www.vita.com

VME – The initials for the backplane bus architecture known as Versa-Module -Europa.

Voltage – The electromotive force determined by the potential difference between two conductors, measured in volts.

VSO – The VITA Standards Organization. An ANSI recognized standards producing organization concerned with computer architectures. See VITA.

Wirewrap – A termination technique, used mainly to prototype computers and computer systems, identifiable by the presence of elongated pins to which signal wires and voltage and ground connections can be created.

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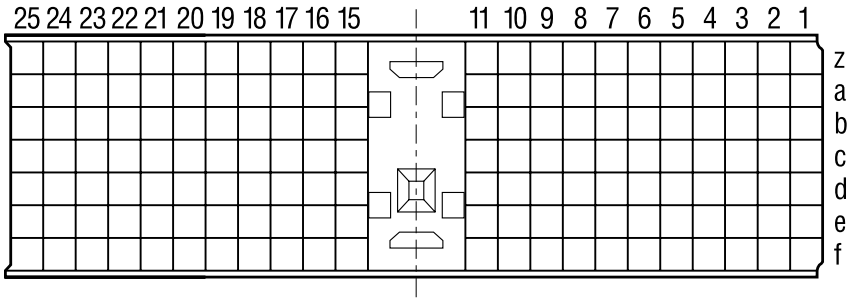
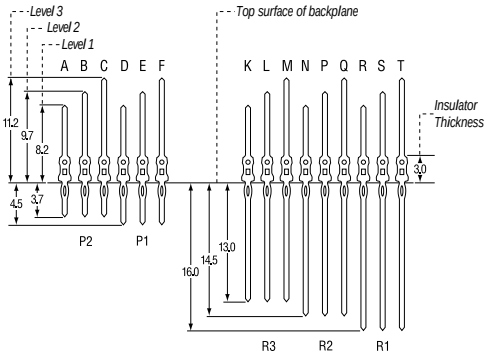
ERNI Customer Request Form

If you need a specially loaded configuration for your application, please use this form. Fill out the grid diagram for the connector style you desire (A, B, C, or M) and mark which pin (A, B, C, D, E, F, K, L, M, N, P, Q, R, S or T) is required in each position. Unloaded positions or rows may be left blank.

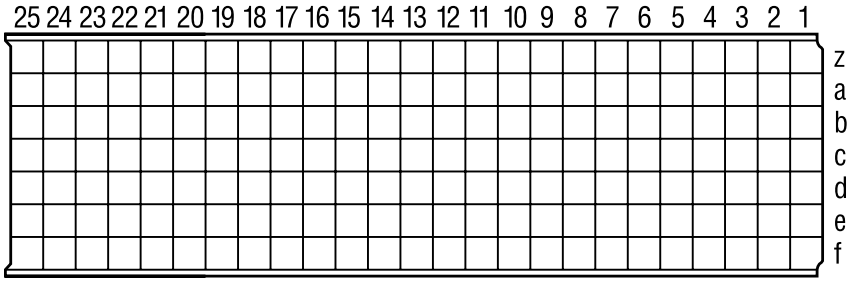
_____
Date Submitted

Connector Type A

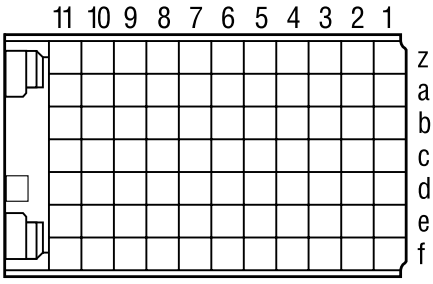




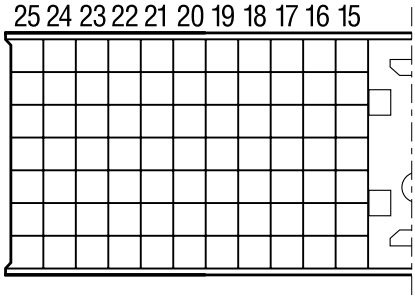
Connector Type B



Connector Type C



Connector Type M



☐ Connector with location peg ☐ Connector without location peg

_____
Sample Qty. Required

_____
Date Samples Needed

_____
Estimated Annual Usage

_____
Special Markings or Other Requirements

_____

_____

_____

Name: _____ *Tel:* _____ *Ext.* _____

Title: _____ *Fax:* _____

Company: _____ *E-mail:* _____

Address: _____

City: _____ *State:* _____ *Zip:* _____

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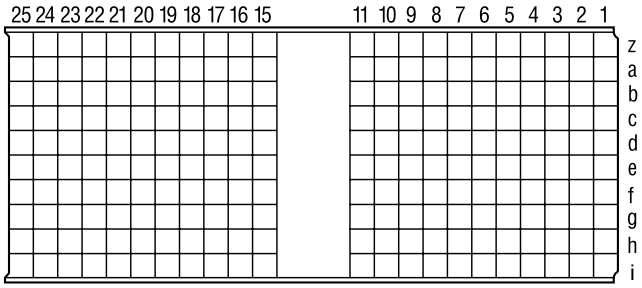
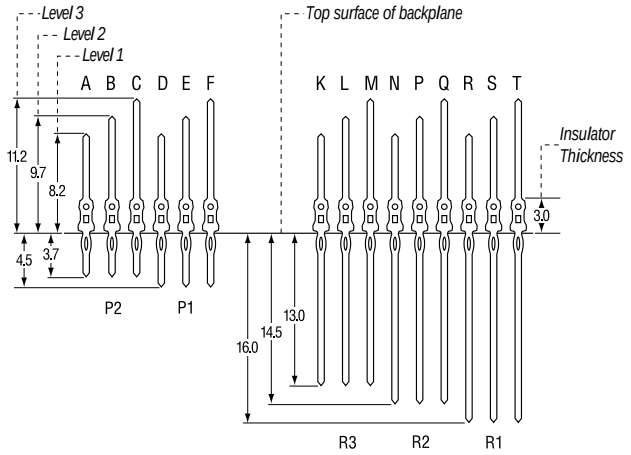
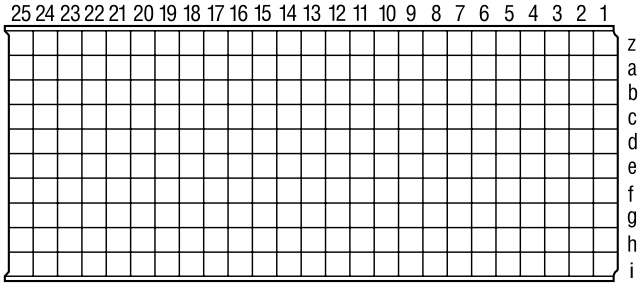
_____
Date Submitted

Connector Type D





Connector Type E



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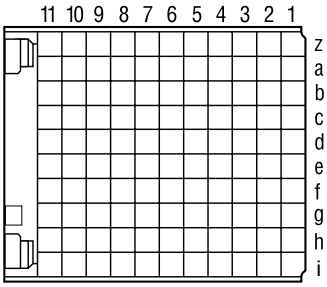

☐ Connector with location peg ☐ Connector without location peg

_____
Sample Qty. Required

_____
Date Samples Needed

_____
Estimated Annual Usage

_____
Special Markings or Other Requirements

_____

_____

_____

Name: _____ *Tel:* _____ *Ext.* _____

Title: _____ *Fax:* _____

Company: _____ *E-mail:* _____

Address: _____

City: _____ *State:* _____ *Zip:* _____

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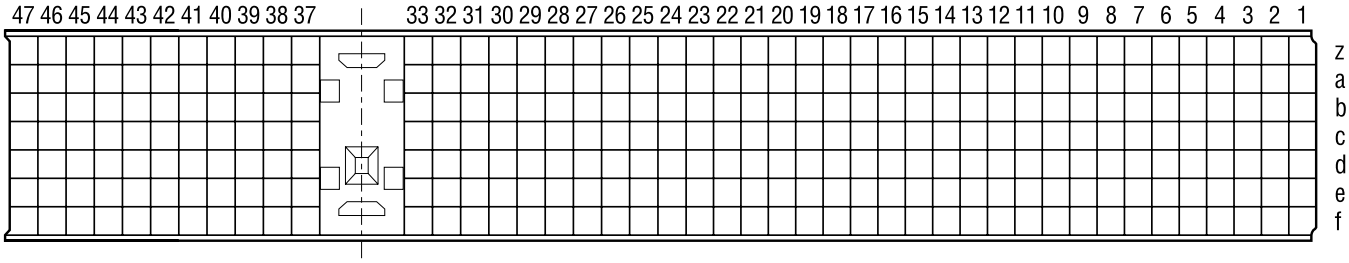
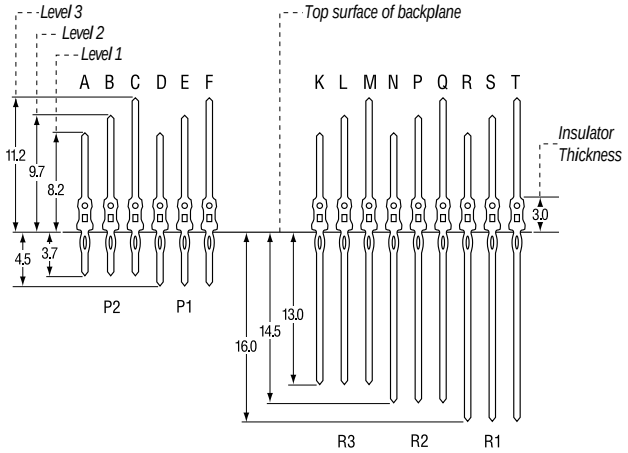
ERNI Customer Request Form

If you need a specially loaded configuration for your application, please use this form. Fill out the grid diagram for the connector style you desire and mark which pin (A, B, C, D, E, F, K, L, M, N, P, Q, R, S or T) is required in each position. Unloaded positions or rows may be left blank.

_____
Date Submitted

Monoblock Connector





_____
Sample Qty. Required

_____
Date Samples Needed

_____
Estimated Annual Usage

_____
Special Markings or Other Requirements

_____

_____

_____

Name: _____ *Tel:* _____ *Ext.* _____

Title: _____ *Fax:* _____

Company: _____ *E-mail:* _____

Address: _____

City: _____ *State:* _____ *Zip:* _____

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